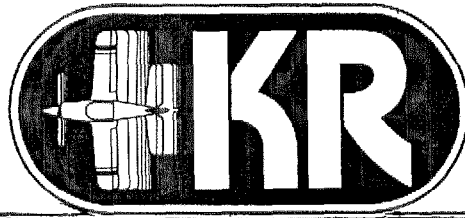


Issue no.82
APRIL
1982




KR NEWSLETTER

RATES
USA \$12.00 Yr
CANADA \$15.00 Yr U.S.
OVERSEAS \$20.00 Yr Funds

A basis for ideas and food for thought only. Use of any of the idea material is at the user's discretion. Not affiliated with Rand/Robinson Engineering Inc.

There were sure a lot of people waiting for the special on back issues I had in Issue #80. Orders for the early issues really came pouring in. The predictable result is what the sale was designed to do, clear out the older issues so I would have some room. The sale is still in effect so if you want to finish your collection of the KR Newsletters you better do it soon. At this time we have sold out of the following issues....1,3,5,22,27,34,37,44,& 46. Prices of the remaining issues are: single issues over one year old are 50¢ each. Any six over one year are \$2.50, any 12 over one year are \$5.00. Order soon, they're going fast!

BUY * SELL * TRADE



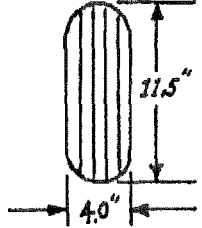
NEW! 11.400x5 6 PLY, RATED

TIRE WT. 3 LBS. TUBE WT. ½ LB.
LOAD RANGE C - 70 P.S.I. MAX.

This tire fills the size gap between the 500x5 aircraft tire and the 3.40-3.00x5 go-kart tire. Looks like a scaled-down 500x5. Fits KR-1 & 2's and is recommended by Burt Rutan for the varIEZE and longEZE. Also fits most other experimentals using 5 inch rim's.

TIRE 6 PLY RAT. 25.00 TUBE 6.50 + SHIP & HAND.
MIKE LAMB P.O. BOX 3324, QUARTZ HILL, CA. 93534

INFLATED



FOR SALE...KR-2 project. Fuselage and elevator completed. Spars and gear mounted. Includes foam, wood, epoxy, hardware, dnyel, canopy, some fiberglass parts. Good workmanship.... Roger Lindeman, 3827 Abbotsford Rd. Rockford, IL 61107 (815)399-7538.

FOR SALE...KR-2 project on gear, controls installed, fuselage and spars signed off, material to finish except engine and instruments..... \$1000.00 or best offer (919) 436-5081 N.C.

FOR SALE...Engine mount for VW. Bead blasted and epoxy painted...\$90.00., Mike Twombly 602-748-4971 days.

FOR SALE...Completely finished KR airframe. Just needs the engine installed and instruments and its ready to fly. Has passed Canadian D.O.T. inspection with flying colors...\$5000.00. Gordon Young, 305 Marmont St., Coquitown B.C. Canada V3K 4P9

FOR SALE...Save \$65.00. H.A.P.I. exhaust manifold..NEW, never used. Fits KR-1 and -2...\$100.00. Frank Walker, 11226 Kibbee Ave., Whittier, CA 90604 phone 213-943-7658

FOR SALE...KR-2 approx. 50% complete. Passed initial F.A.A. inspection. several components & hardware items included. Priced reasonable, willing to work out installment payments. Call David DeMunbrun, 1818 Cripple Creek, Garland, TX 75041(214)271-8692.

FOR SALE...KR-1 project. Fuselage on gear, controls in. Spars signed off, 1650 VW, all materials to complete.. \$3000.00. Wayne Kemp, Rt. 5, Millen GA 30442 (912)982-4901.

FOR SALE...Rand 3-blade prop w/instructions. New, never mounted..\$190.00. KR-2 smoke tint canopy..\$60.00. Larry Zepp (419) 352-2357 after 6 eastern-no collect.



TIPS FROM OTHER BUILDERS

Over the past few years there has been much pro and con about the need for a carb heat device on a Posa carb. Here is one more vote for heat.

From LeRoy Barnes, 3042 Waterman Ct., El Dorado Hills, CA 95630..."Just a little info on icing with a Posa carb. I had a Jeannies Teenie with 1600 VW and a Posa. On two occasions I had a rough running engine and on landing I found ice melting off the outside of the intake manifold directly behind the Posa. The engine was ground run under similar conditions...40° to 50° temp., clear but high relative humidity and ice formed on the outside of the manifold. Upon immediate removal of the Posa, ice was found on the inside wall of the manifold tubing also. This engine did not have any cowling to retain any warm air around the intakes but I am convinced you could get ice on a cowled engine with the Posa carb. Needless to say, my KR will have carb heat."

The letter from Pat Russo in Issue #79 of the Newsletter prompted some inquiry about the spruce he used. Here is some more info that should be very welcome to east coast KR builders that are just getting started.

From Herb Spies, Painter Hills, Middlebury, VT 05753, phone 802-388-7443...."I would like to clarify a point on the Eastern Spruce I used in my KR. First, it is not available in the local common lumber yards. I bought mine from a wholesale lumber yard that specializes in Vermont native lumber. The proper name for the spruce I used is "Vermont Mountain Spruce". Most of this spruce comes from about 1500 ft. and is found in select sheltered valleys. Due to the elevation and sheltered conditions, you get a wonderful straight close grained spruce. They get about 500 to 800 board ft. of this select spruce out of every 10,000 board feet cut! If anyone here in the east should be interested, it costs about 56¢ a board ft. and lengths up to 16 ft. It is all 1 5/8 in. thickness and is available in 4", 6" and 8" widths, sometimes 10". I will help any KR builder that is interested in buying some. All my spruce cost about \$35.00..a large savings."

From Richard Kunc, 7429 Tufts Court, Orlando, FL 32807....."I've found many ways to improve my KR-2 right in the pages of the KR Newsletter over the past few years, and I guess it's about time I began returning the favor!

CORRECTING SPLAYED GEAR LEGS. If your KR-2 is a bit on the heavy side, and has a tendency to ventilate the tops of the wing roots with anything less than a greaser of a landing...if you don't think it's cute that your KR-2 looks like a Messerschmitt Me-109 from the front...there is a cure. Shortening the gear bar has been know to work, but that narrows the tread of your gear and makes the gear recesses in your wing roots useless. You can add wedge spacers between the gear forks and the bar ends, but that won't keep the top of the bar from punching through the wing top. You can go to a 1" thick gear bar, but that's extra weight. Try this: Prop your KR-2 up on whatever you can find that works, so it's in level flight attitude and the gear is off the ground. Now unbolt everything from everything else in the gear assembly so you can slide the gear bar completely out. I had to cut a small rectangular hole in one wing root end to extract the bar, and then sealed it up with cloth and epoxy later on. When I got my bar out it was clearly bent UPwards, probably from hard landings, which aggravated the splayed stance. I took the bar to an excellent machine shop I know and discussed things with the chief. He felt that we could curve the bar slightly without destroying its temper. **IMPORTANT:** The **ONLY** part of the bar you can alter is that section between the hinge and the gear fork attach area. All other parts of the bar **MUST** be maintained flat! If the area where the gear fork bolts into place is curved, the casting will be put under stress and could easily crack! If you curve the part between the hinges, the associated bolts will not line up properly, and stress will be put upon the hinge castings. My machine shop friend did a great job! He curved the bar back to straight, and then **DOWN** just about 1/4". The results are excellent! The aircraft now sits on perfectly straight gear, taxis like a dream, and looks great! Several landings have not changed the angle perceptibly, and it appears this cure will last for some time. By the way, while you have the gear all apart it's a good time to install Rex Taylor's safer, stronger, lighter gear latch mechanism...and to have those brakes taken care of!

MAKING THE HAND BRAKES WORK RIGHT. You don't have to go the added weight and expense of substitute brakes just to make them work. Try this...assemble the aluminum wheel halves with bearings and brake drums, and bolt them tight. Make punch marks on everything so you can get it all back together in the exact same positions and combinations later. Have your machine shop chuck the WHEEL in his lathe, referencing his center to the bearings, and then have him turn just enough metal from the inside of each drum to true it up. Some guys have the shoes turned to match but I've found that several good solid applications of the brakes produce the same results. Just be sure to put everything back together EXACTLY the same way when you add the tubes and tires and axles.

THE 50-CENT BORESCOPE. I built my own 1835 up, using Rex Taylor's wonderful book and it's a real tiger! One of things I learned while putting it together besides patience, was always double check everything while you can still get at it. Well, I had the engine in the airframe and was just finishing boltin' on the oil cooler when a horrible thought flashed through me. "Did I make sure to install ALL the pistons with their little arrows pointing toward the flywheel end?" I unfroze and grabbed a flashlight, trying to peek into the cylinders through the spark plug holes. There's just no way. Then it struck me! I soldered wires to a very small 12-volt panel bulb, conneted the wires to my battery, and lowered the bulb right into the cylinder through the spark plug hole. With the piston at the bottom of its stroke, you can easily spot those little arrows, or cracks or anything else you'd want to see on the top of the piston.

USE A CHECKLIST! The wisdom of a preflight checklist applies even more strongly to experimental aircraft. If it does nothing else, it makes me feel better about each take-off. Here's the one I worked up. Cut it out, laminate it front and back with clear plastic and keep it in your plane.

Well, Ernest...that's gonna be it for this time around. There's many more tips to come in future months. I'm also writing a series of KR articles along similar lines for "Sport Aviation". Be sure to look for them. I will send you a shot of my KR-2, N81932, originally built by Jack Aldrich of Bradenton, FL (Issue #32), after I've finally had it re-painted. Right now it's covered with patches of primer and bare epoxy. Incidentally I can't say enough nice things about Rex and Phyllis Taylor and all the people at HAPI. They were always there when I hit a problem, and always had the right answer. And they have some great stuff in their catalog too!

I think the KR Newsletter is an important publication for KR builders and for anyone else involved with homebuilding. Keep it coming!"

- Engine mount bolts, nuts, pins
- Fuel lines, clamps
- Gascolator bowl tight
- Intake plumbing clamps
- Carb heat mechanism
- Plug wires secure
- Magneto "P" wire secure
- Other wiring secure
- Engine controls secure
- Oil level; condition
- Oil pressure line secure
- Prop & spinner secure
- Cowling secure
- Drain gascolator bowl
- Fuel vent uncovered & clear
- Fuel level; cap & cover secure
- Pitot tube uncovered & clear
- Main gear structures OK
- Tire pressures
- Brake cables secure
- Wings: no damage
- Wing attach hardware secure
- Aileron pushrod hardware secure
- Inspection plates secure
- Antenna secure
- Vertical stabilizer OK
- Horizontal stabilizer OK
- Trim tab OK
- Tailwheel assembly OK, secure
- Control hardware secure
- Seat belts secure
- Seat backs secure
- Canopy & hardware OK
- Rudder pedals & hardware OK
- Gear locks & handle OK
- Brake grip OK
- Rudder action normal
- Elevator action normal
- Aileron action normal
- START ENGINE
- Instruments reading normal
- Circuit breakers normal
- Radio check
- Carb heat normal
- Altimeter set
- Test brakes

DIEHL WING TIP MODIFICATION

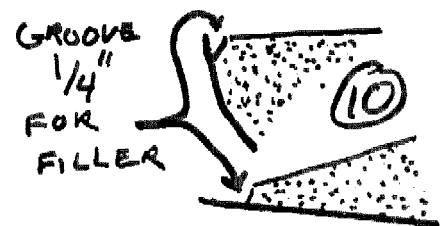
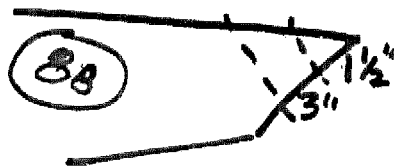
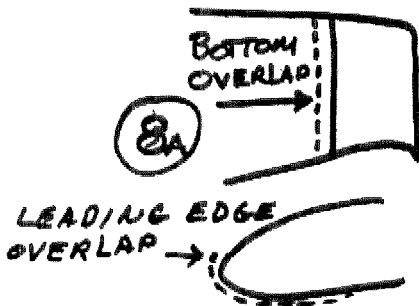
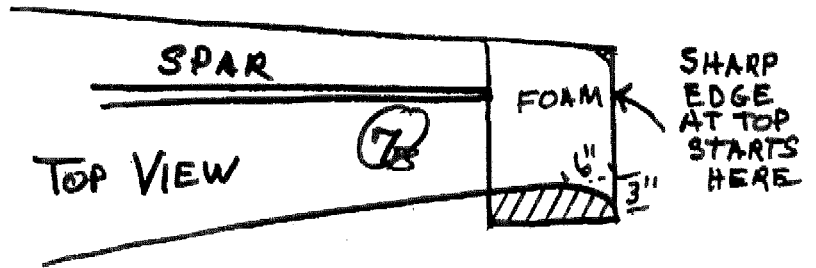
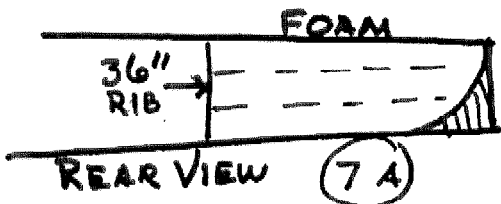
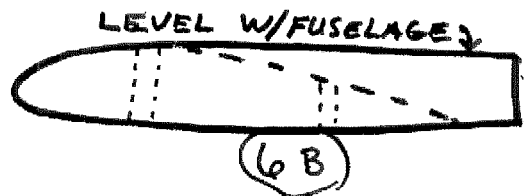
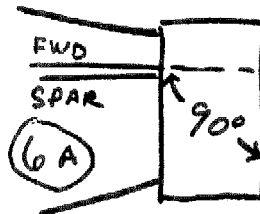
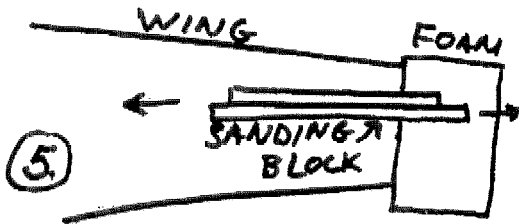
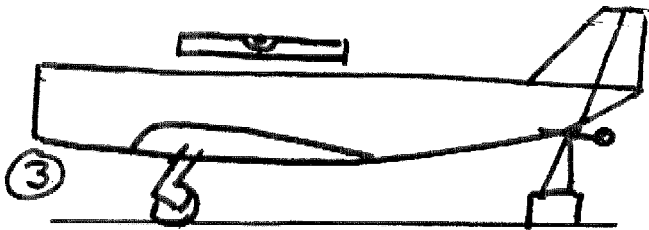
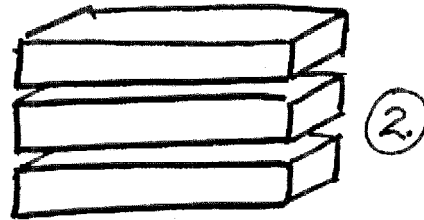
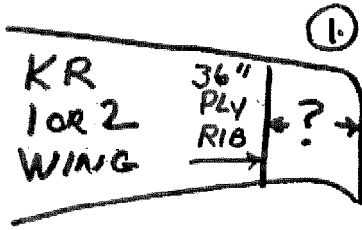
Lots of KR builders must have liked what they saw and read in the last issue. Bob Passmore's KR-2 with the Diehl tips is a real performer and several builders have asked for some sketches or plans on how to put the tips on their KR. O.K....here we go. Let's build some Diehl tips.

1. First thing you have to do is decide how long you want the tip to extend beyond the outer rib. Up to 18" is allowable without adding a spar of some kind (dwg #1). This decision is all yours but I find that most KR-1 and -2s could benefit by a little more wing span. Construction of the tips will be the same regardless of length.
2. Glue 3 layers of 2" foam into a 18"(?) x 40" rectangle 6" high (dwg #2). Use liquid foam to laminate the foam block for ease of sanding.
3. Now comes the tricky part. The tips are made on the wings, on the airplane. Level the airframe fore and aft with wings on (dwg #3). Use any point along the top longeron to level the aircraft but mark it carefully so that you are using the same spot each time the aircraft is leveled.
4. Glue the foam blocks you made to each wing tip rib. Leave just enough foam at the top, bottom and front of the tip rib to allow for shaping (dwg #4).
5. Use a long sanding block along the bottom, around the leading edge and back to the highest point on the rib. This should be where the main spar is attached. Move the sanding block with the wing surface so the new tip will blend nicely (dwg #5).
6. Now that wasn't hard, was it? Next we square the tips with the fwd spar (dwg #6a). And we need to level our foam block from the highest point (at the spar) to the rear of the tip (dwg #6b). Now you're ready to "rough-in" the tip from the spar back.
7. First let's get rid of some excess foam. Looking at the tip from the rear, mark a quarter circle from the top to the bottom at the outer most corner (dwg #7a). Next draw a line from the trailing edge of the wing to 6" from the end of the tip, then curve the line aft (dwg #7b). The shaded area of the foam is excess so cut it off and sand to a finish contour. The bottom front of the tip should be rounded slightly to blend to the top. As you get to the highest point of the tip the angle should come to a sharp edge and continue back all the way to the rear point. You haven't removed foam from the top of the fwd spar to the back of the tip yet. So let's get rid of some of it now. Just enough to give a general shape to the top side. Reason for this is that the bottom of the new tip is fiberglassed first.
8. Look at the tips carefully. Check for level lines and smooth curves. If you're satisfied with the work you have done so far you can remove the wings for ease of fiberglassing the under side of the tip. Now with the wings off...fiberglass the bottom side of the tip. Let your cloth overlap the wing 2" and the leading edge approx. 2" (dwg #8a). Use one layer of cloth for tips less than 12". Use two layers for tips 12" to 18". The aft tip of the Diehl tips tend to be a little bit fragile so we add some strength. Cut two triangles of fiberglass cloth 3" and 1½" and lay on the tip while the epoxy/glass lay-up is still wet. The 3" piece goes on first (dwg #8b). Don't try to bend them around the tip, just let everything lay flat and trim it later. Let everything cure overnight.
9. Cured O.K.? Good! Now trim the edges of the tip. Make a good straight trim line along the top and the trailing edge. Sand the foam on top of the tip to blend into the wing and to a good sharp trailing edge. This is your final shape so make it nice. Use sandpaper on a round object to get the top inside curve.
10. Square corners and trailing edges of foam/glass parts aren't very strong and break easily unless they are re-inforced (dwg #10). Excavate foam ¼" against skin and fill with an epoxy and micro-balloon or * flox mixture that is stiff enough to stand without spreading. While this mixture is still wet go ahead and cover the upper surface of the tips with epoxy/glass. Again you are going to overlap the wing 2" and the

(DIEHL TIPS cont.)

leading edge 2". Also add the 1 1/2" and 3" triangles to the top side of the tip. Now let everything cure overnight. *(finely chopped cotton fiber)

11. You're ready now for the finishing touches. Trim off excess cloth and use a short sanding block to smooth out the edges and overlaps. The Diehl tips should now look like a natural extension of the wing (as indeed they are) and ready for paint. Let's go fly 'em!



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APRIL 1982

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