Issue no. 79
JAN.
1982

KR NEWSLETTER

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

HAPPY NEW YEAR!

I just looked back at my last New Year's resolutions to see if I actually kept any. Glad I did, cause now I'm all set for this year's resolution...I hereby resolve not to make any more resolutions. Now there's one I think I can keep. This time next year maybe I won't feel so guilty. HA! Anyway on to airplanes & stuff.

The flight reports always draw more favorable mail than any other part of the Newsletter. Everybody likes them it seems and several KR pilots have credited them with preparing for their first successful KR flight.

Several of the flight reports I've published haven't ended all that successfully. This unhappy fact probably can be attributed to any one of several reasons but I think there is one major underlying factor...lack of a formal test program.

There is more to testing an aircraft, KR or otherwise, than just taking it around the pattern once, and it starts on the ground. I'm going to suggest the following test guide for you to follow with your KR. It is going to be quite lengthy and it will require you to do some paper work but...when you have completed the form, you will know your KR.

GROUND & FLIGHT TEST REPORT FOR EXPERIMENTAL AIRCRAFT

I. Fill in the blanks or circle the correct answer.

AIRCRAFT TYPE _____ REGISTRATION #N _____

ENGINE TYPE _____ ENGINE MODEL _____

PROPELLOR MFG. _____ DIA _____ PITCH _____

PROPELLOR TYPE...wood metal composite adjustable

ENGINE/PROPELLOR GEAR RATIO _____ CARBURETOR TYPE _____

AIRCRAFT EMPTY WEIGHT _____ EMPTY C.G. POSITION _____

AIRCRAFT GROSS WEIGHT _____ GROSS C.G. POSITION _____

ALLOWABLE C.G. RANGE...Forward _____ Aft _____

II. TEST PILOT DETAILS

NAME _____ LICENSE TYPE _____

NUMBER OF HOURS IN PREVIOUS 12 MONTHS AS P.I.C. _____

ANY EXPERIENCE IN THIS TYPE AIRCRAFT? yes no _____ HRS

III. GROUND TEST

PARK AIRCRAFT 90° TO WIND. NOTE O.A.T. _____ °C WITH FULL THROTTLE (AND ADJ. PROP IN LOW PITCH) RECORD THE FOLLOWING INFORMATION (WHERE APPLICABLE).

STATIC RPM _____ MANIFOLD PRESS. _____ OIL PRESS. _____

OIL TEMP _____ CYL HEAD TEMP _____ EXHAUST TEMP _____

AMMETER/VOLTAGE _____

WITH THE ENGINE RUNNING ON THE GROUND, CHECK THE FOLLOWING:

1. Is the engine apparently developing full power?..... yes no
2. Do vibrations appear normal at all RPM?..... yes no
3. Do the instruments shake excessively at any RPM?..... yes no
4. Does the engine accelerate promptly when the throttle is opened quickly?.yes no
5. Do the following items show signs of excessive vibration and/or distortion due to engine movement?

A. Cowlings.....yes no		E. Manifolds.....yes no	
B. Fuel lines.....yes no		F. Engine controls.....yes no	
C. Oil lines.....yes no		G. Engine mount.....yes no	
D. Instrument lines...yes no		H. _____.....yes no	

6. Engine idling speed_____RPM Is idling speed such that engine functions properly during all ground running conditions?.....yes no
7. Note any problems encountered with engine, controls, instruments, structure....

_____

_____

(use separate paper if needed)

IV. FIRST FLIGHT

1. Flight tests should be carried out only when all ground tests have been satisfactorily completed. Check all controls for proper movement, including freedom from interference with pilots' clothing or aircraft structure.
2. Prior to first take off and climb, several taxi runs should be carried out. Any problems with landing gear, wheel alignment, or rudder control should be corrected.
3. Elevator response may be checked on the ground in some tailwheel aircraft (KR) by the following method:

   A. Face aircraft into the wind and securely chock main gear.
   B. Tie tailwheel with a length of chain or rope that will allow the tail of the aircraft to rise but <u>not</u> enough for the prop to strike the ground (at least 2" of prop clearance).
   C. Sit in the cockpit, start engine and advance throttle to full power. Push the control stick forward slowly, until the tail of the aircraft rises. Practice for a few minutes holding the aircraft steady at different attitudes. This should help prepare you for pitch sensitivity and elevator response.

4. The first flight should be under optimum conditions, wind, weather, traffic, etc. Take-off roll should begin with throttle advanced slowly. Pilots in an aircraft using a direct drive VW engine should be aware that <u>left</u> rudder pressure will be necessary to counter torque on take-off roll and climb.

   First flight should include a brief check of the stall speed to determine a suitable approach speed (1.3 Vs). For instance if the stall is at 50 mph, multiply 50 by 1.3 to get an approach speed of 65 mph.

   Pay very close attention to engine temps on this first flight. Many engine failures could have been prevented with a little more airspeed on climb-out to keep the engine cool. Keep the first few flights short and within gliding distance of an airport. Don't retract landing gear until you are satisfied with performance and handling.

V. FLIGHT TESTS

You should have all mechanical problems well behind you before you start this phase. If you aren't satisfied the aircraft is performing well and the engine is running normally, <u>don't</u> continue testing until you are.

You should be very familiar with the area where the tests are to be made. Possible forced landing areas should be noted in case they are needed. Once you have accomplished all these precautions, you are ready for the following steps.

1. Load the aircraft to gross weight (in C.G. range) record the following:
   TAKE OFF WEIGHT_____lbs C.G. LOCATION _____

2. Take-off
   LIFT OFF SPEED_____ENGINE RPM_____

   MANIFOLD PRESSURE_____inches Hg (if applicable)

   HANDLING SATISFACTORILY...yes no IS ENGINE SMOOTH...yes no

3. Climb
   Set altimeter to 29.92", establish a stable climb at 300 ft. and start timing at 500 ft . Use full power, gear and flaps up, at best climb speed (if this is not known use 1.45 Vs1)

   CLIMB SPEED_____ENGINE RPM_____

   MANIFOLD PRESSURE_____O.A.T. @1000'_____^{0}C

   TIME TO CLIMB FROM 500' TO 1500' INTO WIND_____MIN._____SEC.

   REPEAT DOWNWIND.....MIN._____SEC.

   HANDLING SATISFACTORY...yes no ENGINE OK...yes no

4. Stalls
   A. Power off, Level Stall
   Approach stall by decreasing airspeed slowly (1 mile per second)

   IAS AT STALL (GEAR & FLAPS UP) Vs1_____ALTITUDE LOSS_____ft.

   MAX. RECOVERY AIRSPEED_____BEHAVIOR DURING STALL_____

   _____

   Is there any stall warning?...yes no If yes, record nature of warning (buffet, etc.) and airspeed warning begins_____

   _____

   Repeat test with gear and flaps down...IAS AT STALL Vso_____

   ALTITUDE LOSS_____ft. MAX. RECOVERY IAS_____

   BEHAVIOR DURING STALL_____

   STALL WARNING?...yes no CHARACTERISTICS_____

   B. Power on level stall (Full power)
   Approach stall by decreasing airspeed slowly (1 mile per second)

   IAS AT STALL (GEAR & FLAPS UP)_____ALTITUDE LOSS_____ft.

   MAX. RECOVERY AIRSPEED_____BEHAVIOR DURING STALL_____

   _____

   Is there any stall warning?...yes no If yes, record nature of warning, (buffet, etc.) and airspeed warning begins_____

   _____

   Repeat test with gear and flaps down...IAS AT STALL_____

   ALTITUDE LOSS_____ft. MAX. RECOVERY IAS_____

   BEHAVIOR DURING STALL_____

   STALL WARNING?...yes no CHARACTERISTICS_____

   C. Power on banked stall
   Establish a steady, level, co-ordinated 30^{0} bank turn at cruise power (gear & flaps up) IAS_____

Maintain the 30° bank and stall the aircraft by steadily tightening the turn with the elevator.

STALL SPEED_____left_____right

ALTITUDE LOSS_____ft. left _____ft. right

MAX. IAS DURING RECOVERY_____left_____right

BEHAVIOR DURING STALL_____

Are there any uncontrollable rolling or spinning tendencies?...yes no
Stall warnings...yes no CHARACTERISTICS_____

D. Aborted landing
Establish a glide at 1.3 Vso (gear and flaps down)

IAS_____at an altitude of 25 ft. apply full power and begin climbing.
Is the engine responding satisfactorily?...yes no
Is the aircraft handling satisfactorily?...yes no
Can gear and/or flaps be retracted with safety and without loss of altitude?...yes no

REMARKS_____

This Flight Test Guide will be continued next month. Any comments on the contents, methods, and maneuvers are welcomed.

TIPS FROM OTHER BUILDERS

From Harold R. Daniel, Box 374, Augusta, KS 67010..."This is how I made my drill guide for drilling the spars for the wing attach fittings; Using the dimensions given in the R/R manual, shape two pieces of 3/4" plywood. Then go to your friendly auto salvage yard and get a pushrod from a 66 to 69 240 cu. in. Ford 6 cyl. engine with hydraulic lifters. Cut off the ends and you will find that the I.D. is exactly the right size for a 3/16" bit. Make grooves in the two pieces of plywood where the guide hole should be with a rat tail file. Leave these grooves slightly undersized so that you can compress them together in a vise. Coat the two surfaces with epoxy and clamp in the vise til cured, then remove it and cut out the piece of pushrod in the center. You now have a guide that will never wear as this pushrod is case hardened steel. If you have trouble finding a pushrod, come by my place and I'll give you one as I have several."

From Patrick Russe, Star Route, East Haven, VT 05837..."I have purchased a set of KR-2 plans with a friend and we intend to build two KRs. We managed to find another KR builder and Newsletter subscriber, Herbert Spies. We would like to thank Herb and his wife for inviting us to their home, giving us several hours of advice, good tips on building, and for just being down-to-earth hospitable. We're off to a great start. The first "tip" I have to offer should be credited to Herb, who suggested that local or construction grade spruce from area lumber yards could serve as aircraft quality material. I researched this and found the following...

AVERAGE ALLOWABLE UNIT STRESS IN P.S.I.

WOOD	wt./ cu. ft.	Extreme fiber in bending	Compression perpendicular to grain	Modules of elasticity
Eastern Spruce Structural grade	28 lbs	1300	300	1,320,000
Aircraft Quality Sitca spruce	28 lbs	975	305	1,320,000

The above figures do not hold if the lumber has defects such as knots. Choose only those pieces that have close, straight grain. I found that many 2 x 10s and 2 x 12s had perhaps 3" of ideal wood. I ripped off the good section and used the remaining 2 x 6s or whatever for various home projects, such as building a layout table for a KR!"

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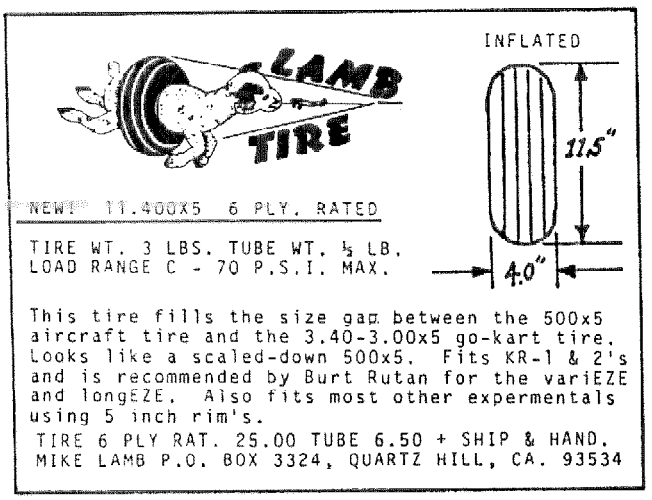
KR-1 & KR-2 PROPELLERS
Custom carved, laminated hardwood propellers for your KR. Made of top quality birch, oak, walnut, koa, mahogany...your choice. $150 - $175 fast delivery. Don J. Pearsall, 2039 S. Cherry, Cornelius, OR 97113 Phone (503)640-3398



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 expermentals 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

NEW! FROM MINATURE METRICS
A stick switch for your KR. Will fit the plans drawing (3/4" .035 wall 4130) and the KR wiring diagram in your plans book. Only $3.00 postpaid U.S.
Minature Metrics
Liteflite Hardware
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Westminster, CA 92683

FOR SALE...KR-1 project. Fuselage, center section and tail group wood-work complete. Excellent workmanship. All materials to finish...$3800.00 U.S. Ronald Smith, 61 Durocher, St. Lambert, Quebec, Canada J4P 3B9 (514)671-7526

FOR SALE...R/R fiberglass cowl. Never used..$75.00. Walter Melton, P.O. Box 8176 CR8, Tucson, AZ 85738 phone (602) 825-9730 no collect.

FOR SALE...KR-2 project, fuselage, spars gear, controls complete. Revmaster 2100, Maloof prop, fiberglass parts, trailer, extras...$3500.00 (919)868-2007.

QUESTIONS & ANSWERS

Q. Is the antenna info shown in the plans book used by many builders and how is it working?

A. I have seen several of this type of antenna installation, they work well. Some have reported better results by using an aluminum ground plane for the transmitter antenna tho.

Q. My plans show the pulley bracket for the elevator cable mounted on top of the horiz. stab. spar. Can it be mounted on the front side of the spar?

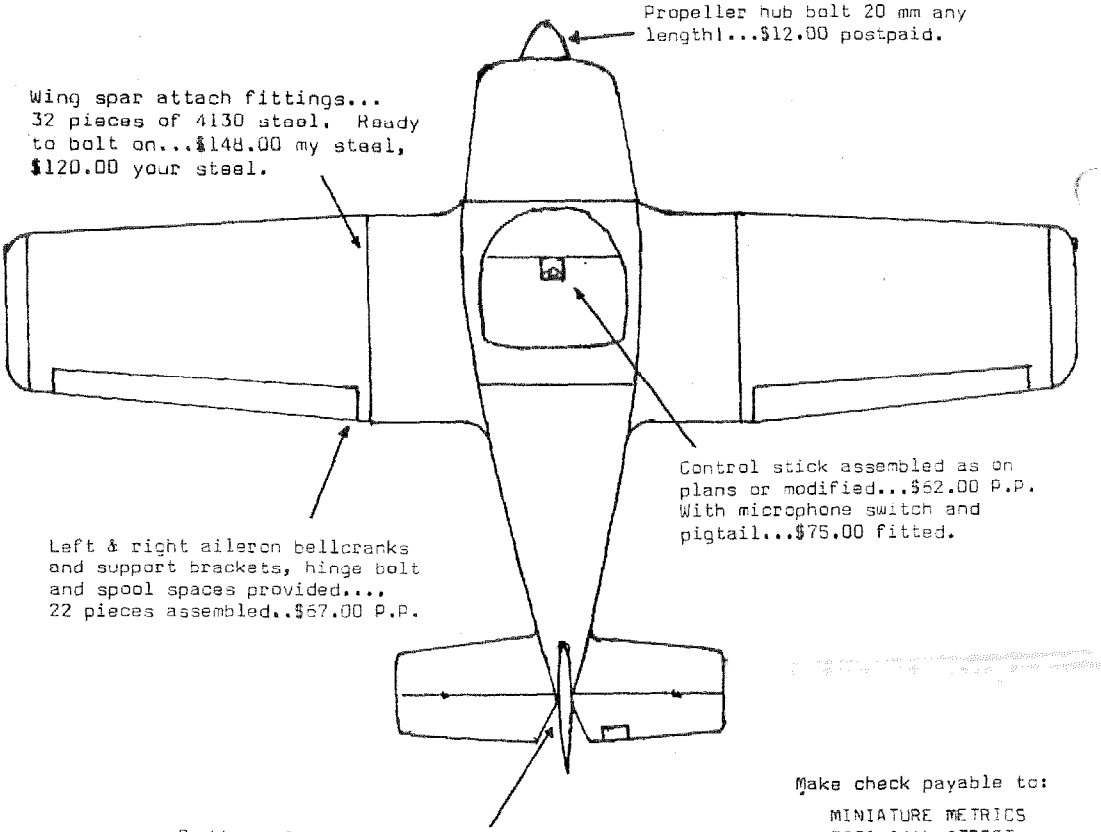
A. No problems. Just make sure you have good cable alignment thru complete range of movement.

Q. I'm having trouble getting my wing planform to match that of the plans. If I use a straight edge from the plywood outer rib (tip) to the plywood center section rib, I get a shape very different from the drawings. What am I doing wrong?

A. Don't use the center section plywood rib as a guide in making the outer wing panels. Best procedure is to complete the center section through the glass/epoxy stage and then use the outer edge of the center section as a guide rather than the plywood rib.

Q. Is it too late to have my name included with the KR group at the University for the EAA Fly-in at Oshkosh?

A. The KR reservations for Oshkosh have long since been mailed. I recommend you send your $14.50 room deposit straight to the University and request that you would like to be with the KR group. Write to: University of Wisconsin-Oshkosh, Gruenhagen Conference Center, Oshkosh, WI 54901.



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P.O. BOX 981
JENKS, OK 74037
JANUARY 1982 ISSUE #79

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