



Vol. 2, No. 9

SEPTEMBER 1985

NATS '85

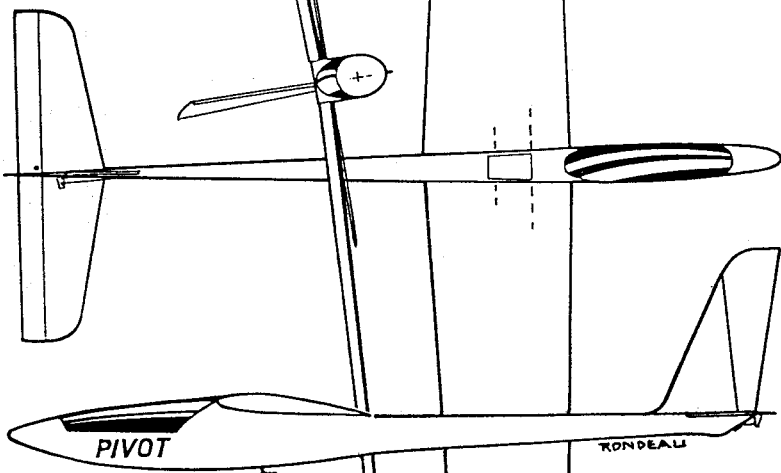
PIVOT

BY BOB DODGSON,
DODGSON DESIGNS

CONTROLS: ELEVATOR;
WINGERONS COUPLED
TO RUDDER

CONSTRUCTION:
COMPOSITE FIBERGLASS,
FOAM, BALSAs, SPRUCE

SPAN 60 IN.
AREA 350 Sq. IN.
A.R. 10.3:1
LOADING 7 Oz./Sq. Ft.
AIRFOIL EPPLER 387
WEIGHT 17 Oz. RTF



|||||

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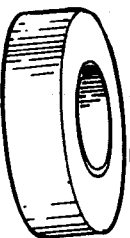
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Hi Start

You're all wondering, of course, where I was during the Nats Week at Chicopee. Well, I was there - but as a spectator on Wednesday and Sunday. It rained cats and dogs on Wednesday and the soaring was over on Saturday, so Sunday was a wander-around-and-meet-my-friends day. It was also a day to look at control-line scale and RC scale, both of which boggled the mind. Wednesday was a day to stand around under shelters with occasional sheets of water being sluiced down one's back, when one wasn't dashing to a shelter of the automobile or motel type. Nevertheless it was a grand time to meet and chat with the soaring folks from all over the U.S. It was also a good time to visit with people that I wouldn't otherwise be able to meet in person. Naturally, it was a soaring who's who, but in spite of the favorable opportunity to meet and greet, there just wasn't time to see everyone. Lack of time - vacation time, that is - made it impossible to fly, although I was entered in the Open class, Unlimited category...hoping to fly my Windsong. That wasn't quite ready, either, so we're a couple of lame ducks at the moment.

One of the highlights of the past two weeks was having Sean Walbank, editor of the White Sheet - an English soaring newsletter - and columnist for Radio Control Model World - an English RC magazine - as my house guest. Yes, we did get a chance to do some fun-type soaring at the local flying field, and yes, we did do a lot of comparing of information, pictures, plans, diagrams, and a whole lot of other good stuff. Besides all that, Sean was able to complete all of his landings for the New Zealand Soaring Society achievement scheme - Level III. (All had to be within 1.5 meters, or 4.92 ft.) It's not really amazing that soaring pilots from two separate and different continents or islands have so much in common because we do share the love of flying...yet it's a great pleasure to experience that sharing...and it proves that in spite of differences our interests do indeed overcome obstacles.

Perhaps the most interesting thing about the visit was that Sean borrowed my Gentle Lady to enter the 2-meter class at the Nats. It was interesting from several points of view: mine, Sean's and the on-lookers. Imagine, if you can, the last flight of the entire soaring meet (except for scale) in which all of the competitors are gathered to watch the pilot make his final flight. Also, imagine if you can, a Gentle Lady breaking a winch line! Finally, conjure up the vision of a Gentle Lady coming back from a down-wind spot, over trees, power lines, a TV cameraman...and making a landing within the circle with nearly max duration points...to the cheers and claps of the assembled multitude. Yep, it was Sean and my Gentle Lady!!! Look, Ma: we're on the tube!

Happy Soaring,

Jim

AT LAST! A WORK CENTER FOR MODEL BUILDERS

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- (J) Adjustable Swivel Casters
- (K) Sturdy Aluminum Frame



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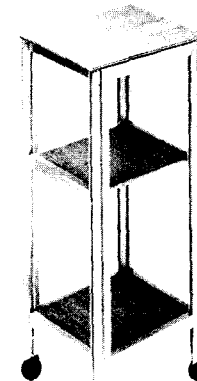
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A FEW ANNOUNCEMENTS

RCSD IS AVAILABLE IN SELECTED BACK ISSUES: JUNE, JULY, AUGUST, SEPTEMBER, OCTOBER AND DECEMBER 1984...FOR \$7.50 PLUS POSTAGE; AND JANUARY THROUGH AUGUST 1985...FOR \$10.50 PLUS POSTAGE. JUST WRITE TO JIM GRAY AT THE RCSD ADDRESS SHOWN ELSEWHERE IN THIS ISSUE, AND SEND YOUR CHECK OR MONEY ORDER. SINGLE COPIES FOR 1984 ARE AVAILABLE IN THE MONTHS SHOWN FOR \$1.25 PLUS POSTAGE; AND SINGLE COPIES FOR 1985 ARE ALSO AVAILABLE FOR \$1.35 PLUS POSTAGE.

A NEW BOOK ON THERMAL SOARING, EDITED BY BILL KOURNAKAKIS AND PUBLISHED BY RC SOARING DIGEST, IS EXPECTED TO BE AVAILABLE BEFORE CHRISTMAS. MORE ON THIS LATER.

ANNUAL SOARING MEET - CAPITAL AREA SOARING ASSOCIATION - TO BE HELD ON SEPTEMBER 7TH AND 8TH AT THE NATIONAL GEOGRAPHIC SOCIETY FACILITY IN GAITHERSBURG, MD. GUY DICKES, CD. UNFORTUNATELY, RCSD DID NOT RECEIVE THIS ANNOUNCEMENT IN TIME TO MAKE THE AUGUST ISSUE... AND IT'S TOO LATE FOR SEPTEMBER. WE HOPE YOU HAVE A GREAT MEET, CASA.

NATIONAL RC SAILPLANE SYMPOSIUM - NOVEMBER 9/10 - MADISON, WI
ONCE AGAIN THE LATEST TECHNIQUES AND TECHNICAL ADVANCES IN RADIO CONTROL SOARING WILL BE THE MAIN TOPICS AT THE 1985 MARCS NATIONAL SAILPLANE SYMPOSIUM TO BE HELD NOVEMBER 9TH AND 10TH AT THE RAMADA INN IN MADISON, WISCONSIN. THIS YEAR'S THIRD ANNUAL SEMINAR WILL FEATURE A SESSION ON WOODEN AIRCRAFT STRUCTURES AND BONDING TECHNIQUES, TO BE PRESENTED BY AN ENGINEER FROM THE U.S. FOREST PRODUCTS LABORATORY. THERE WILL ALSO BE A SESSION ON THERMALS (A CONTINUATION OF THE MOST POPULAR PART OF LAST YEAR'S PROGRAM) AGAIN PRESENTED BY A METEOROLOGIST FROM THE UNIVERSITY OF WISCONSIN.

OTHER TOPICS WILL INCLUDE HAND-LAUNCHED SAILPLANES, RADIO EQUIPMENT, COMPOSITE MATERIALS FOR SAILPLANE CONSTRUCTION, CONTESTS, AND LAUNCHING TECHNIQUES.

THERE WILL BE A SESSION ON BASIC AERODYNAMICS AND AN ADVANCED SESSION ON SAILPLANE DESIGN. THERE WILL ALSO BE PLENTY OF TIME, AS BEFORE, FOR THE MANY 'SHOW AND TELL' SESSIONS FEATURING SAILPLANES AND EQUIPMENT. PARTICIPANTS ARE INVITED TO BRING THEIR OWN SAILPLANES FOR DISPLAY.

THE SATURDAY - SUNDAY PROGRAM, PUT ON BY THE MADISON AREA RADIO CONTROL SOCIETY, WILL INCLUDE AN INFORMAL GROUP DINNER ON SATURDAY EVENING. FOR INFORMATION ABOUT THE SYMPOSIUM, MOTEL ROOMS AND COSTS, WRITE OR CALL DR. CARL MOHS, 5024 LAKE MENDOTA DRIVE, MADISON, WI 53705. TELEPHONE: (608) 238-2321.

THE WING'S THE THING...

DAVE JONES, WESTERN PLANS SERVICE, 5621 MICHELLE DRIVE, TORRANCE, CALIFORNIA 90503 HAS LONG BEEN AN ARDENT SUPPORTER OF FLYING WING SAILPLANES, AND IS THE 'FATHER' OF THE RAVEN SERIES, AMONG MANY OTHERS. THIS MONTH, DAVE HAS SENT IN SOME PHOTOS THAT WILL INTRIGUE YOU, BECAUSE THEY ARE OF A SCALE MONARCH FLYING WING (SEE COVER OF JULY '85 RCSD). DAVE DOESN'T HAPPEN TO KNOW THE NAME OF THE BUILDER/FLIER SHOWN IN THE PICTURE...SO IF ANY OF OUR READERS KNOWS WHO IT MAY BE, PLEASE LET ME KNOW SO THAT I CAN PASS IT ALONG TO EVERYONE.

DODGSON'S "PIVOT".....BOB RONDEAU

WHAT DO YOU DO AFTER DESIGNING AND KITTING STATE-OF-THE-ART PLANES FOR 2-METER, STANDARD, AND UNLIMITED CLASS DURATION CONTESTS? WELL, YOU GO FOR HAND-LAUNCH GLIDERS, OF COURSE! AT LEAST YOU DO IF YOUR NAME IS BOB DODGSON.

DODGSON DESIGNS HAVE HAD A CONSIDERABLE IMPACT ON CONTEST FLYING WITH IMPRESSIVE WINS IN BIG MEETS ACROSS THE COUNTRY. IN THE '84 NATS, HIS WINDSONG, K-MINNOW, AND CAMANO DESIGNS TOOK HOME A PILE OF TROPHIES. MORE RECENTLY, BRIAN AGNEW WON THE BIG FLORIDA STATE CROSS-COUNTRY RACE, FLYING AN UNBALLASTED WINDSONG OVER A 13-MILE COURSE IN 20 MPH WINDS!

NOW, BOB HAS INTRODUCED HIS 60-INCH WINGSPAN PIVOT TO TAKE ON THE HLG COMPETITION. I GOT MY FIRST GLIMPSE OF THE PIVOT AT THE NATS (BOB BROUGHT ALONG THE PROTOTYPE PIVOT AS BACKUP FOR HIS 2-METER PIXY). WHILE HANGING AROUND THE REGISTRATION CENTER, I COUNTED AT LEAST 25 DODGSON SAILPLANES GOING THROUGH PROCESSING.

THE DESIGN LOOKS A BIT LIKE A SCALED-DOWN WINDSONG, ALTHOUGH THE 10.3:1 A.R. SEEMS A BIT MORE LIKE THE PIXY. IN FACT, MUCH OF THE CONSTRUCTION IS THE SAME AS FOR OTHER DODGSON KITS: TACO-SHELL AND Balsa FUSELAGE, SHEETED FOAM WING, ETC., BUT THE SIMILARITIES END THERE. THE PIVOT GETS ITS NAME FROM THE PIVOTING WING ROLL CONTROL SYSTEM. THE AIRFOIL IS NOT THE EXPECTED EPPLER 214 BUT, INSTEAD, A LESS CAMBERED EPPLER 387 IS USED FOR THE WING WHICH IS CONTROLLED BY TWO SIDE-MOUNTED BELLCRANKS IN THE FUSELAGE. THE RUDDER IS TIED INTO THIS ARRANGEMENT THROUGH SOME NEAT LINKAGES TO PROVIDE COUPLED ROLL-YAW CONTROL FOR SMOOTH TURNS. THE ONLY OTHER CONTROL SURFACE IS THE ELEVATOR.

PIVOT'S PROFILE IS VERY CLEAN, WITH NO DRAG-PRODUCING HORNS OR LINKAGES MARRING THE EXTERNAL SURFACES OF WINGS OR FUSELAGE. EVEN THE RUDDER AND ELEVATOR HORNS ARE SMALL AND KEPT FLUSH WITH THOSE SURFACES.

AFTER THE COMPETITION WAS OVER, I ASKED BOB IF WE COULD GET SOME PHOTOS FOR RCSD. HE WAS HAPPY TO OBLIGE AND EVEN FLEW A FEW DEMONSTRATION FLIGHTS. USING A GOOD, STEEP HAND LAUNCH, THE PIVOT CLIMBED SMOOTHLY AND EASILY TO ABOUT 40 FEET AND TRANSITIONED SMOOTHLY TO A LEVEL GLIDE. HANDLING WAS BRISK AS IT WOUND OUT A COUPLE OF FIGURE-EIGHTS WORKING THE SPOTTY LIFT. THE PIVOTING WING SEEMED TO ME TO SOLVE SOME OF THE YAW PROBLEMS ENCOUNTERED WITHAILERONS AT LOW SPEEDS, AND IT IS APPARENT THAT BOB HAS ALSO INCORPORATED DIFFERENTIAL INTO THE PIVOTING WING ARRANGEMENT TO HELP THIS PARTICULAR PROBLEM FACED BYAILERON-CONTROLLED AIRCRAFT.

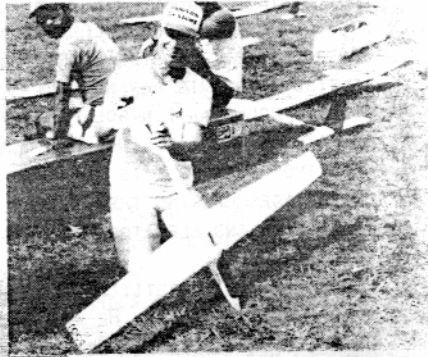
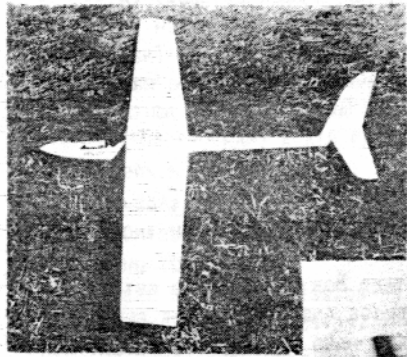
ON THE WINCH, PIVOT EASILY CLIMBED OUT WITH THE 2-METER SHIPS, WORKING INTERMITTENT LIFT IN VERY TIGHT, EVEN CIRCLES. AFTER A VARIETY OF LOOPS AND INVERTED FLIGHT, BOB PUT THE NOSE DOWN AND SET UP FOR A HEAD-ON ROLL. THE COUPLED RUDDER GAVE THIS MANEUVER A SLIGHT BARREL EFFECT, BUT THE PLANE TRACKED STRAIGHT INTO WHAT I THOUGHT MIGHT BE A FINAL APPROACH...BUT NO! THE PIVOT STILL HAD A LAP OR TWO OF INERTIA AT EYE LEVEL BEFORE SETTLING DOWN AT OUR FEET.

PIVOT (CONTINUED)

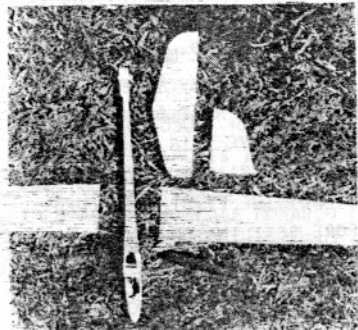
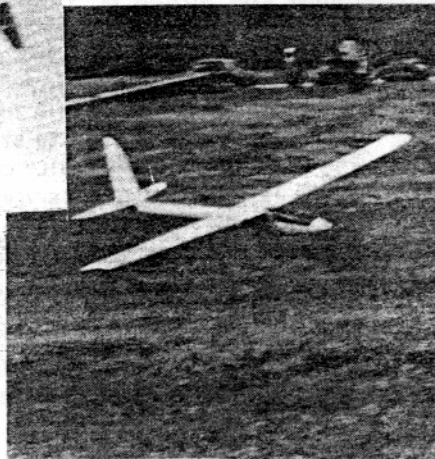
I THINK THE PIVOT MAKES A LOT OF SENSE FOR THOSE OF US WHO LIKE THE HLG SIZE. ON A RECENT TRIP I CARRIED MY ONE-PIECE TWO-METER-WING SAILPLANE ON A TREK THAT INCLUDED FITTING IT INTO A COMPACT CAR, A FERRY BOAT, AND A BICYCLE BEFORE I EVEN GOT TO FLY IT! CONTRAST THAT TO THE PIVOT WHICH IS DESIGNED TO BREAK DOWN INTO ITS COMPONENT PIECES THAT WILL FIT INTO A 3" X 6" X 36" BOX. YES, THE STAB AND FIN ARE REMOVABLE.

PIVOT CAN FLY FROM SMALL FIELDS AND SLOPES, CAN BE HAND-TOWED, WINCH-LAUNCHED, AND HI-STARTED. IN FACT, BOB RECOMMENDS A HEAVY HIGH START RUBBER OF ABOUT 50 FEET, PLUS 100 FEET OF LINE TO MAKE A PERFECT 'CATAPULT' LAUNCH. WITH ITS QUICK AILERON CONTROL AND SMOOTHLY COUPLED RUDDER, PIVOT CAN SOAR ALONG WITH MUCH LARGER SAILPLANES (AS LONG AS YOU CAN STILL SEE IT). AS BOB POINTED OUT TO ME, PIVOT IS EXCELLENT PRACTICE FOR THE WINDSONG YOU'VE BEEN THINKING ABOUT!

PIVOT'S INTRODUCTORY PRICE IS \$69.95 AND IS AVAILABLE FROM DODGSON DESIGNS, 2904 SW CAMANO DRIVE, CAMANO ISLAND, WA 98292. IF YOU CAN'T WAIT FOR THE LETTER TO GO THROUGH, CALL BOB AT (206) 387-7412, BUT DON'T BE SURPRISED IF THE 'PHONE IS BUSY...THERE'LL BE A LOT OF GLIDER GUIDERS CALLING.



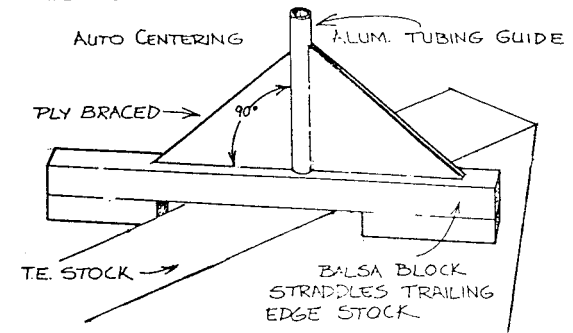
A FEW SHOTS OF THE "PIVOT"



TYRIE TIPS.....JIM TYRIE

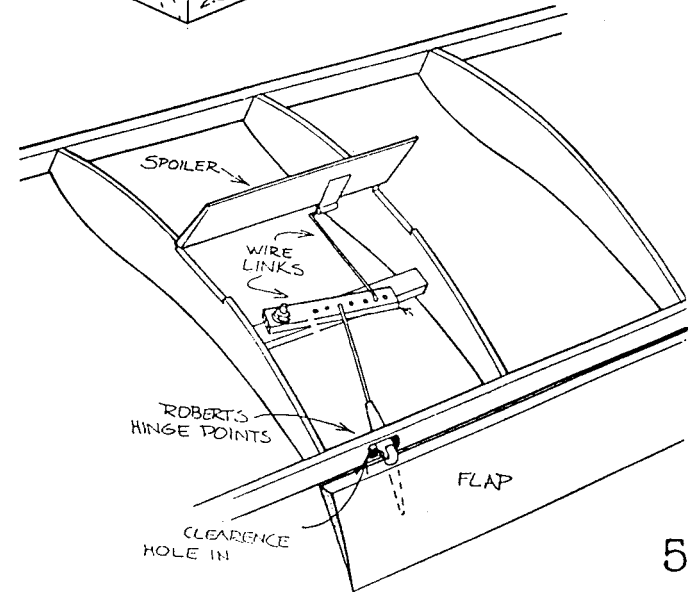
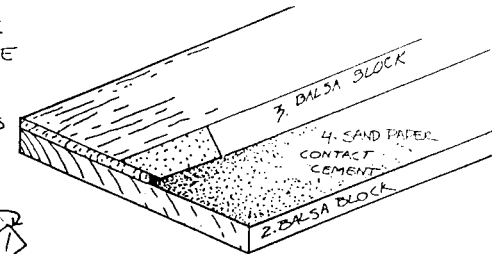
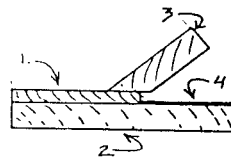
MOST OF YOU KNOW THAT JIM TYRIE IS A PROLIFIC BUILDER, AND HAS BEEN KNOWN TO FRAME UP AN ACCURATE, STRAIGHT, AND BEAUTIFUL SAILPLANE IN JUST A FEW DAYS. BESIDES BEING A SKILLED WOODWORKER, JIM IS ALSO POSSESSED OF A LOT OF NEAT LITTLE TRICKS AND HOME-MADE "TOOLS" THAT HE USES FOR SPEED AND ACCURACY. HERE ARE A FEW THAT COULD HELP YOU WITH YOUR BUILDING. WE ALSO THROW IN A NEAT DESIGN FOR A COMBO FLAP-SPOILER SYSTEM THAT WORKS GREAT.

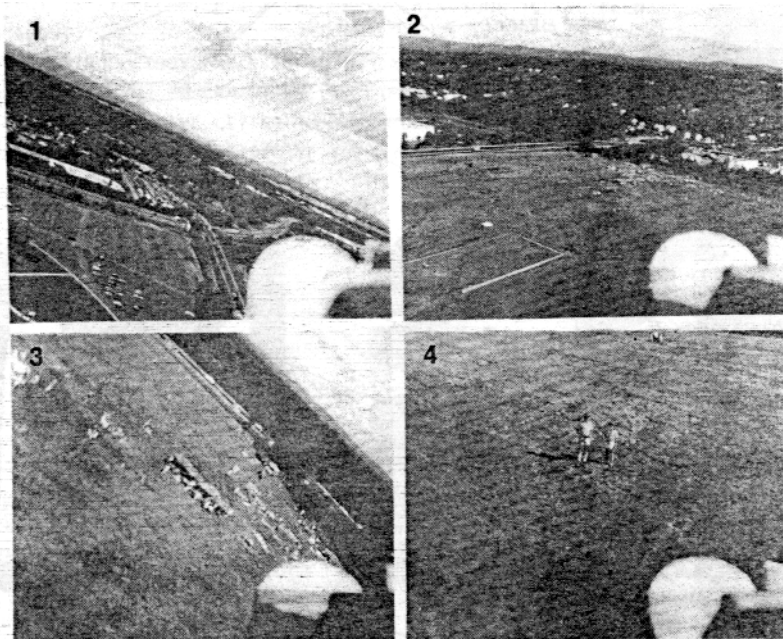
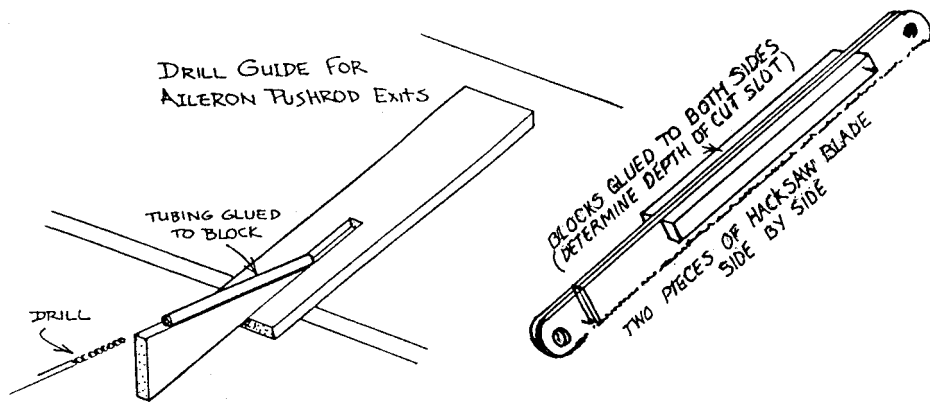
DRILL GUIDE FOR TRAILING EDGE HOLES



TRAILING EDGE SANDING GUIDE

1. THICKNESS OF SHEET TO BE DESIRED THICKNESS OF T.E.





AERIALS OF THE NATS.....TY SAWYER

TY USED HIS AQUILA TO TAKE THESE PIX WHICH YOU MAY FIND INTERESTING. HE SUBSTITUTED A 'CAMERA BOARD' FOR THE CANOPY. THE BOARD HAS A SERVO THAT ACTUATES THE SHUTTER RELEASE ON A KODAK DISKTM CAMERA. THE CAMERA IS MOUNTED TO THE BOARD, FACING FORWARD, AND THE WHOLE ASSEMBLY MERELY RUBBER-BANDS INTO PLACE IN THE CANOPY SEAT. HE SAYS THAT THE SAILPLANE HAS A LOT OF DRAG WITH THIS ARRANGEMENT, AND THE GLIDE RATIO GOES TO POT, BUT IT WORKS! TY MERELY AIMS HIS AQUILA AT THE SUBJECT TO BE PHOTOGRAPHED AND ACTUATES THE SHUTTER WITH A FLIP OF THE SWITCH ON THE TRANSMITTER. AUTOMATIC REWIND ON THE CAMERA MAKES EVERYTHING VERY SIMPLE AND EASY. ALIGNING THE CAMERA WITH THE CENTERLINE OF THE AIRCRAFT WOULD PERMIT SIDEWAYS SHOTS, LOOKING ALONG THE WING, FOR EXAMPLE. THIS MAY BE THE NEXT STEP. ONE GOOD THING WITH GLIDER - MOUNTED CAMERAS IS THE LACK OF VIBRATION.

NATS SCORES (TO FIFTH PLACE)

JUNIOR - STANDARD CLASS SAILPLANE

1. CHERYL BORDER
2. PETER CLARKE

SENIOR - STANDARD CLASS SAILPLANE

1. TIMOTHY GOLD
2. SHAWN LENCI
3. CHARLES MOHS
4. CHRIS BOVAIS
5. RAND SHELDON

OPEN - STANDARD CLASS SAILPLANE

1. LARRY JOLLY
2. WILLIAM WEGMAN
3. TERRY EDMONDS
4. HELMUT LELKE
5. ANTHONY MATYI

JUNIOR - UNLIMITED CLASS SAILPLANE

1. CHERYL BORDER

SENIOR - UNLIMITED CLASS SAILPLANE

1. TIMOTHY GOLD
2. SHAWN LENCI
3. MIKE GARTON
4. RAND SHELDON
5. ALEX BERECKZY

OPEN - UNLIMITED CLASS SAILPLANE

1. TERRY EDMONDS
2. HELMUT LELKE
3. LARRY JOLLY
4. FRED WEAVER
5. JAMES THOMAS

JUNIOR - TWO-METER CLASS SAILPLANE

1. CHERYL BORDER
2. DAVID CARR
3. TIMOTHY ANDERS
4. PETER CLARKE

SENIOR - TWO-METER CLASS SAILPLANE

1. SHAWN LENCI
2. MIKE GARTON
3. ALEX BERECKZY
4. TIMOTHY GOLD
5. TYSON SAWYER

OPEN - TWO-METER CLASS SAILPLANE

1. TOM BRIGHTBILL
2. TERRY EDMONDS
3. HELMUT LELKE
4. PAUL CARLSON
5. FRED WEAVER

COMMENTS:

NOTICE THAT HELMUT LELKE PLACED IN THE TOP FIVE IN ALL THREE CLASSES. WHAT IS MORE UNUSUAL IS THAT HE USED THE SAME SAILPLANE - A TWO-METER ORIGINAL DESIGN - IN ALL THREE! STILL MORE UNUSUAL IS THE FACT THAT AN ELECTROSTATIC STABILIZATION DEVICE WAS USED TO KEEP THE SAILPLANE STRAIGHT AND LEVEL DURING THE TIMES THAT THIS KIND OF ASSISTANCE WAS NEEDED. I HOPE TO BE ABLE TO BRING YOU MORE DETAILS OF HELMUT'S UNUSUAL BIRD IN THE NEAR FUTURE. IT IS A POD-AND-BOOM DESIGN WITH A RELATIVELY HIGH WING LOADING...AND IT IS VERY 'CLEAN'.

ANOTHER COMMENT THAT I'D LIKE TO MAKE IS THAT MY STUDENT, TY SAWYER, WHO HAS BEEN FLYING FOR ABOUT TEN MONTHS, MANAGED TO MAKE A CREDITABLE SHOWING IN THE TWO-METER AND STANDARD CLASSES (SENIOR). TY IS FIFTEEN, AND ALSO IS LEARNING TO FLY THE 'BIG' ONES. HE IS EXPECTED TO SOLO A PIPER CUB (J-3) ON OR ABOUT HIS SIXTEENTH BIRTHDAY LATER IN AUGUST. HE MAY SOLO SEVERAL DIFFERENT AIRPLANES ON THE SAME DAY, IF ALL GOES WELL.

I DON'T HAVE ANY COMMENTS ABOUT SCALE, WHICH WAS FLOWN ON SATURDAY, BECAUSE I DON'T HAVE THE RESULTS OF THAT COMPETITION.

EXCEPT FOR ONE DAY, WHEN IT POURED RAIN, THE WEATHER WAS GOOD. A REPORTED 318 (LESS SCALE) ENTRANTS WERE PRE REGISTERED...THE LARGEST NUMBER OF NATS ENTRIES EVER IN ONE CATEGORY (RC SOARING).

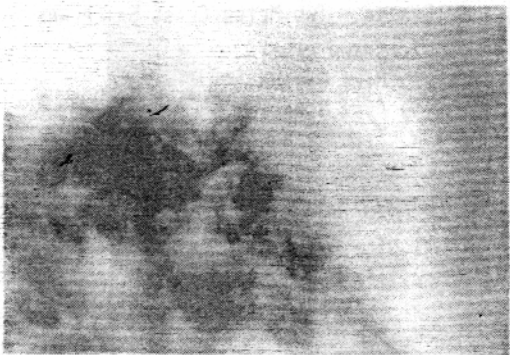
NATs '85

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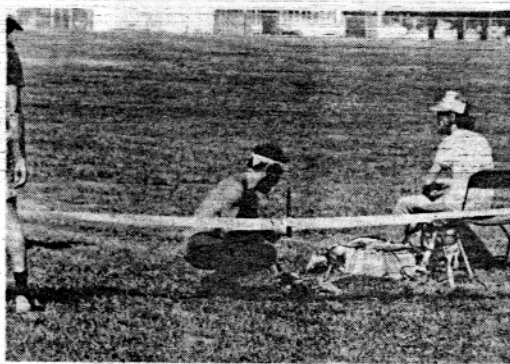
PHOTOS BY BOB RONDEAU



NATS HQ PARKING LOT
JOHN CLARK, RAY JUSCHKUS, ED REINTE



SKY OVER NATS



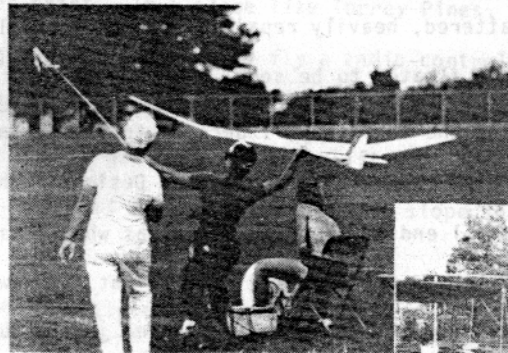
TOM BRIGHTBILL - "WINDSONG"



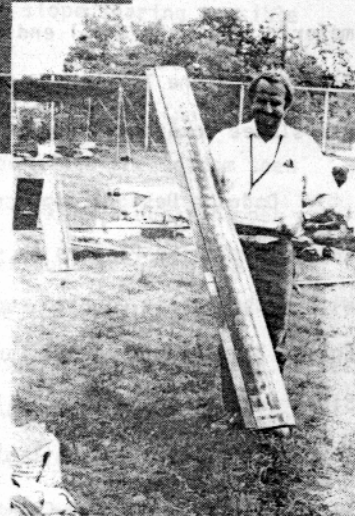
EARLY ARRIVALS - 11:00 AM



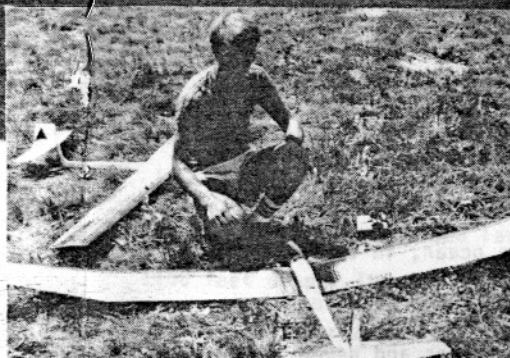
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BRIAN AGNEW w/ "SAMUN"



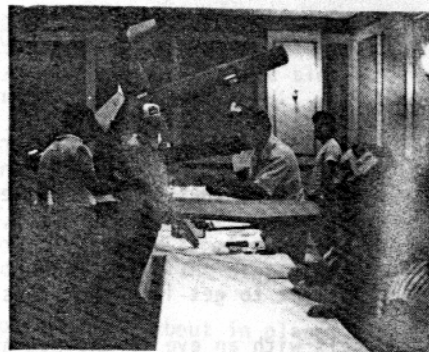
HELMUT LELKE - "HEIDI"



TY SAWYER AND "AQUILA"



JIM TYRIE AND "PARAGON"



FLAPS ON THE SLOPE

by
John Benson

In the fall of '84 after three seasons of dedicated slope flying, it seemed to me that I ought to learn something about thermal flight. Slope, after all, is a pretty narrow segment of the hobby, and it was clearly time to get into the mainstream. I took a look at my stable of models with an eye to the new task. One look was enough. In all my assemblage of battered, heavily repaired, radio-controlled projectiles there wasn't a single floater to be seen.

After reviewing the territory, I decided to invest in a new model and settled on the PIXY two meter from Dodgson Designs. Why a two meter? Well, the small end of the size range was what I was used to flying, and the likelihood was that I'd want to put the new model off the slopes sometimes as well. A two meter looked just about right.

Dodgson Designs produces beautifully engineered and very handsome sailplanes. The Pixy is no exception. It features three axis control with mechanically coupled rudder and ailerons. The airfoil is an Eppler 214 which also has large flaps capable of being dumped to 80° or so. Since such a change in profile would cause a terrific balloon and stall, a special linkage is available that automatically feeds in down elevator to compensate. Dodgson calls it the Devastator, and it's really something for spot landing.

As usual, my carefully laid plan had a subtle but significant flaw. The Pixy, beautifully built for me by Jim Thomas of Holland, Michigan, was ready to fly in the late fall. At that time of the year what we have in Newport is wind. Strong winds off the ocean, in truth, are what we have most all year long. You know what a 20 mph breeze does to thermals. I spent weeks stalking the blasted things and never caught a single one.

After a month or so, I'd had enough and started to chuck my shiny, clean, smooth, new two meter off our ratty, rocky, nasty little slopes. Two things happened almost immediately. The first? You guessed it: wing-dings, stress cracks, scuffs and dents, and a sad farewell to my snappy, contest finish. The other thing, however, made it all worthwhile. I started to learn what the flaps would do. Flaps on the slope; amazing!

The whole business of R.C. slope soaring came about in places where good slopes exist. In a place like Torrey Pines, the lift is so steep and strong you can practically fly a radio-controlled brick. The large sites in England and Europe are much the same. Even light winds on those big hills will generate workable lift. In fact, most people have come to believe that only at such sites is slope soaring possible at all.

Modelers who fly big cliffs like these generally have no need for the subtleties of variable camber, so flapped wings are seldom seen on the serious slopes. But what about us poor folks who don't happen to live on the Pacific coast of the U.S. or next door to Germany's Wasserkupf? It turns out that we can fly slope too, as long as we are willing to work in less than perfect conditions. With enough clear, free wind just about any decent rise in the ground will kick up a standing wave of rising air that can give solid lift and enjoyable flying. You do need the right model, though, and it must have the right airfoil. This is where flaps can be a help.

The whole trick to low slope flying is finding free-flowing wind. Over most of the world the wind stream near the ground is so disturbed by vegetation, uneven terrain, and variations in temperature that it is quite unworkable. By and large, this blanket of junk air is about 50 to 100 feet deep. This is why conventional, inland slopes are so hard to find. But over any body of water measuring a mile or better, the wind will begin to smooth out and blow freely along the surface. It is in such waterfront locations that the low slopes really start to work.

The first place I threw my Pixy was over a sloping, scrubby piece of ground that ended in a rocky cliff dropping 10 feet to the waters of Narragansett Bay. Total elevation of cliff and slope was about 30 feet, and the wind was blowing near 20 mph. There was a patch of tall grass that, with dumped flaps, I figured to land in. Picking a spot about halfway down the slope, I gritted my teeth and threw the plane as hard as I could.

After the pitch, the exquisite 214 airfoil lifted the model to a point about 40 feet over my head. At this elevation upward motion stopped and a gentle backward motion began. Slowly reflexing the flaps first arrested the backward drift and then caused slow, forward progress down the slope. Altitude dropped to about 20 feet. In this attitude, the Pixy moved out over the small cliff. Just over the rim the lift was steeper and the effective headwind slightly reduced. A little positive flap now gave more height with no penalty in leeway. Soon I was able to fly back and forth at the rim, out over the water, and back up the slope with just minor adjustments to the flaps. It was even possible, with the marvelous Devastator linkage, to land smack in the tall grass.

Subsequent flights in this and other locations strengthened my conviction about the value of variable camber. One breezy day at a 40 foot slope, an abrupt wind shift caught me in a low, eye-level pass. This particular hill has a road running along the base with a 10 foot rock bluff dropping from the road to the water. At one point, this primary bluff turns out from the main slope to form a sort of mini bowl at right angles to the hillside above. I was just approaching this spot when the shift occurred. Suddenly the wind was blowing almost straight along the main slope directly into the mini bowl. The Pixy came to a stop right in front of me and just hung in the cone of lift from that little rocky hollow. I clicked in a couple of notches of

Flap line



E 214



HQ 2.5/9



JC 11



SOS airfoil by Mark Rebeck



JC 16

flap. The plane rose gently and backed up a few feet. Reflex flaps. A soft dive and easy penetration. Quick neutral on the flaps and back in the cone, steady, solid, motionless before me. It was like my own personal wind tunnel.

Over the next few months, I continued this type of flying with the Pixy and tried to learn as much as possible about variable camber. Observing the performance of the E214 also got me thinking about a custom designed airfoil tailored to the local conditions. Penetration was needed on our windy hills, so a thinner section seemed promising and, perhaps, a sharp entry. Much of my interest centers around aerobatics, so a near symmetrical shape was also called for. Finally, the flexibility of a flapped section was a must. By spring a new model was completed with an airfoil drawn up from scratch.

The actual drawing of the airfoil, though done by eye, was based on good, hard, empirical data. Five other airfoils had been exhaustively flown, and their performance observed over the past three seasons. There was the old reliable E193; the beautiful E214, a slope airfoil designed by Mark Rebeck; and two airfoils by Jack Chambers--the JC16 and the JC11. The latter featured a 7.5% thickness section with a significant undercamber. It showed remarkable lift, speed, and penetration. At about this same time as well, I got my first look at some of the Quabeck sections flown by many of the top finishers at the '83 F3B Champs in York. These had been specifically drawn for F3B tasks with flaps or flaperons in mind.

My new shape was sharp at the entry with a near symmetrical front section and a max thickness of 7.5% located at about 33% of the chord. Span was 54", construction was solid blasa, and the flaperons were 20% of the chord. It was clear from the start that such an airfoil was bound to possess an alarming stall. In fact, it embodied some of the characteristics that designers quote as fatal flaws. In strong slope



Benson slope airfoil

lift, however, flying is mostly done at good speeds with a lot of down trim and in the attitude of an appreciable dive. As a result, the stall tends to be less imminent.

Early flights were extremely promising, and in about a month the model was doing all the tricks. Inverted flight is particularly nice. With the flaps reflexed a few degrees, the effect of undercamber is achieved and the plane will fly upside down hands off. Playing the flaps in level flight allows maximum altitude to be gained on better sections of air slope. A few clicks back to neutral and the aerobatics are smooth as silk.

Now, I don't suggest that all you people go out and start throwing your Saratoga Windsongs off low sand dunes or highway abutments. Low slope soaring isn't for everyone. But there is a lot of very exciting flying to be had out there on those little bumps. And if you try it for a while, you might start to wonder what it would be like to have an airfoil that let you play that sharp, little lift for all it's worth. An airfoil with variable camber, for instance. Say, a wing with flaps. It worked for me.

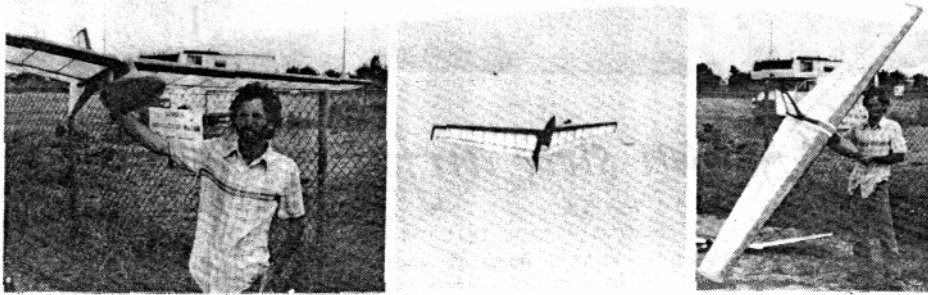
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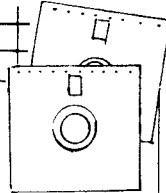
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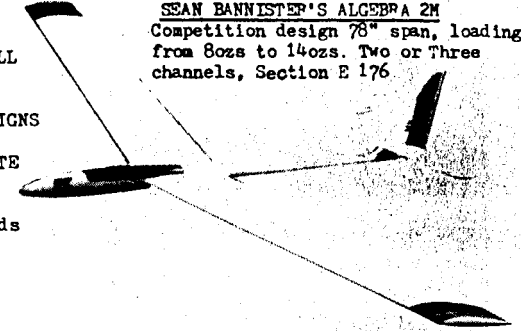
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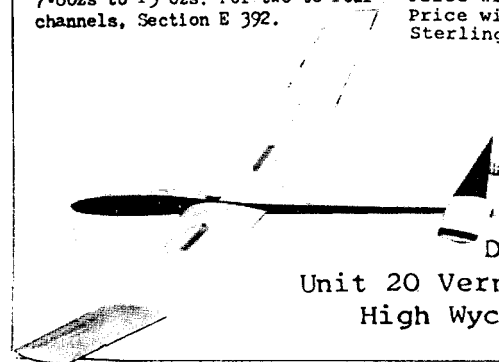
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