THE

SCATER

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Predident-Jim Trego; Secretary-John Wordin; Editor-Ken Sykora, 6717 Wilkinson, Apt. 205, North Hollywood, California Subscriptions: $2.00 per year

WHO WILL DRAW THE "FRESH" LINE?

Thumbing through a pre-war mag recently we saw a double page photo spread from a U.S. Nationals of the period. It presented a variety of model approaches. Some of these, admittedly, must have been "conversation pieces", being quite wierd in concept and construction. But many proved to be good airplanes...and, they were different, exciting, ventures into "out-of-the-rut" design approaches.

Later, looking through immediate post-war mags, we ran across several articles on "dream ships" that designers were going to produce...just as soon as they got back home and could get balsa again. These largely seemed to be continued logical developments of those varied designs which were actually built and flown in the late thirties and early forties. Few, if any, of these "dream" jobs, however, ever materialized!

Which brings us to the present and the current trends in FAI design. It would seem relatively easy to produce a simple shadow-pattern monograph which would easily fit the large majority of current designs. Only in detail, and here only slightly, does there seem to be any really original thinking.

All this seems such a shame. Surely the accumulative design work and experiments of the past 15 or 20 years have uncovered raw material for varied new models! Yet today's designs seem to reflect little of this progress!

Of course past successes and popular approaches are useful stepping stones...but should they become the cement blocks in which our "designing feet" are embedded? Instead of accepting the limitations imposed by these old patterns and copying them over and over again, why can't we utilize them only as starting points to strike out for new and perhaps much better designs?

The areas of investigation are limitless. Just look at the present state of FAI power models. Must this plan form be stereotyped into a low/medium pylon with polyhedrial taper tipped wing, and "die-cast" moment arm and tail size? Is this the only answer? Is it, indeed, the best answer? Or is it that this "right-from-the-cookie-cutter" design rut has just been repeated to such an extent that there are no designers left who aren't satisfied with it? We just can't believe any design concept is that ultimate!

And what of the A/2's? Here surely some keen exploratory work would reap rich performance rewards for the brave adventurous designer with a bit of the gambler's blood in his make-up. Look at the possibilities already foreseen....

the extreme aspect ratio , for one. Here it is a case of everybody talks it, and few do it. And why? No good in the wind? Too tough to build? How do you know?...Who the heck says so?...

The opportunity and the intriguing challenge are there...why not accept it? Approach that new FAI ship with some new unconfined thinking...and with your only firm guideline the desire to come up with something new, different, and just maybe, a great deal better.

Then just for once, hide all your Zaic's and any other designing "crutches" under the bed...roll out a couple of new yards of drawing paper, sharpen the old pencil...and draw a fresh line!

"WN-120" 1961 Polish Team Wakefield by W. Niestoj, Warsaw Aero Club

(Ed. note: The Polish Wakefield Team at the '61 Finals, made a very impressive showing; they were first in Team with placings of 2nd (in the fly-off), 5th and 22nd. Kosinski's fly-off machine has been well published in many magazines, and Zurad's advanced designs are of course very well known to any Wakefielder who follows the design trends. So when we found a good 3-view of Niestoj's 5th place model in the excellent Swedish magazine, "Modellflyg" we thought many readers would like to see it also.

With the possible exception of the Italians, the Polish modelers, as a group, are about the most gadget-happy bunch you'll ever run across...and, again like the Italian designers, they have an absolute fetish about details; in both design and construction. A look at the 3-view will point out this fact. Just look at all those pieces! The wing alone is a real work of art, and it's interesting to note how Niestoj has approached the ticklish problem of building reasonable strength into his extremely thin airfoil section. Anyone contemplating an equally thin section might do well to study this solution carefully...it would seem to be quite field-proven!)

NEWS FROM THE READERS

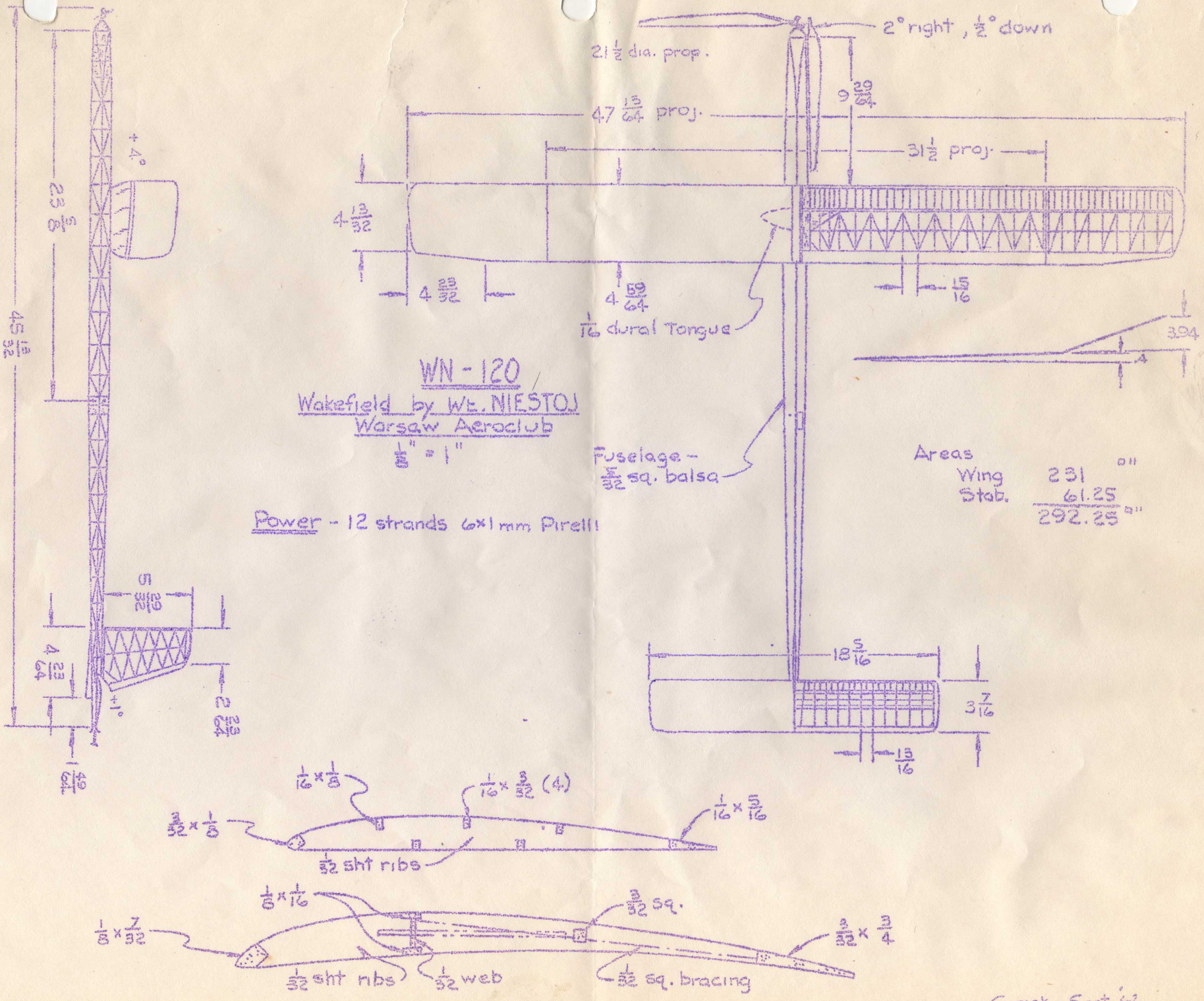
This month's list of new comers includes:

HERMAN ANDRESEN, Phoenix , Ariz. LYLE ELYER, Addison, Ill.
KELVIN KIDD, Christchurch, New Zealand

PETE VISSER, from down in Capetown, S.A., sends a newsy letter in which he asks about the Swiss bank account (for which we forgive him) and says kind words about SCATTER's value to him (for which we thank him). Winds up by saying thanks for Bob Dunham's address...and that the prop fittings have just arrived. Hope readers won't think we're being smug when we say it gives us a good feeling to think we're helping in little ways like this to bring FAIers from places like Tulsa and Capetown closer together.

ED HOPPER, Baltimore Aerocraftsmen Club, writes that his group seems to be slowly turning into an FAI bunch. Good news!, and understandable, since many modelers (FF, CL, radio, indoor, etc.) are becoming more aware of the rewards of serious FAI flying...i.e. overseas trips with a chance to fly against top competition on a world-wide scale.

KELVIN KIDD, Christchurch, N.Z. writes to add yet another club news letter to our exchange program. He says the C.M.A.C., Inc. would like to trade papers with other clubs here in the U.S. too. Other overworked bloodshot eyed editors can contact Kelvin at: P.O. Box 2332, Christchurch, N.Z.



Cusick - Sept. '62

DON GOLDBERG, Reynoldsburg, Ohio, asks if we've thought of expanding to include FAI Indoor in our paper. Well, its like this, Don; we do publish Teams, Finals results, news of special interest, etc. on indoor. But right now the entire field of indoor is being beautifully covered by the Indoor News & Views, edited by Bud Tenny for the Nat'l Indoor Model Airplane Society. If you like indoor, this is for you...write Bud at Box 545, Richardson, Tex.

MORE ON STABILIZER AIRFOILS by David Bevan, Lawson, Maryland

Your May issue contained a two-part inspiration; first a description of those readers who will send contributions "tomorrow" and second, a lament that very few suggestions for tail airfoils have been presented to you. As a result I have a suggestion: use a flat* airfoil. *(Ed. Note: i.e. - flat plate airfoil)

Some preliminary calculations were done a year or two ago to determine the horizontal tail load and attendant drag contribution to my A/2. At that time I decided that the tail drag was small potatoes but was interesting to analyze. Here is some analysis:

A model can be made quite stable and at the same time have no lift on the tail in steady trimmed flight. This is easily proven by solving these standard equations:

$$\text{Neutral point, NP} = \frac{(AC)_w C_{L\alpha w} + C_{L\alpha T} \frac{S_T}{S_w} \frac{L_T}{C}\left(1 - \frac{d\epsilon}{d\alpha}\right)}{C_{L\alpha w} + C_{L\alpha T} \frac{S_T}{S_w}\left(1 - \frac{d\epsilon}{d\alpha}\right)}$$

Answer in wing chords

Stability margin (in wing chords) = NP-CG

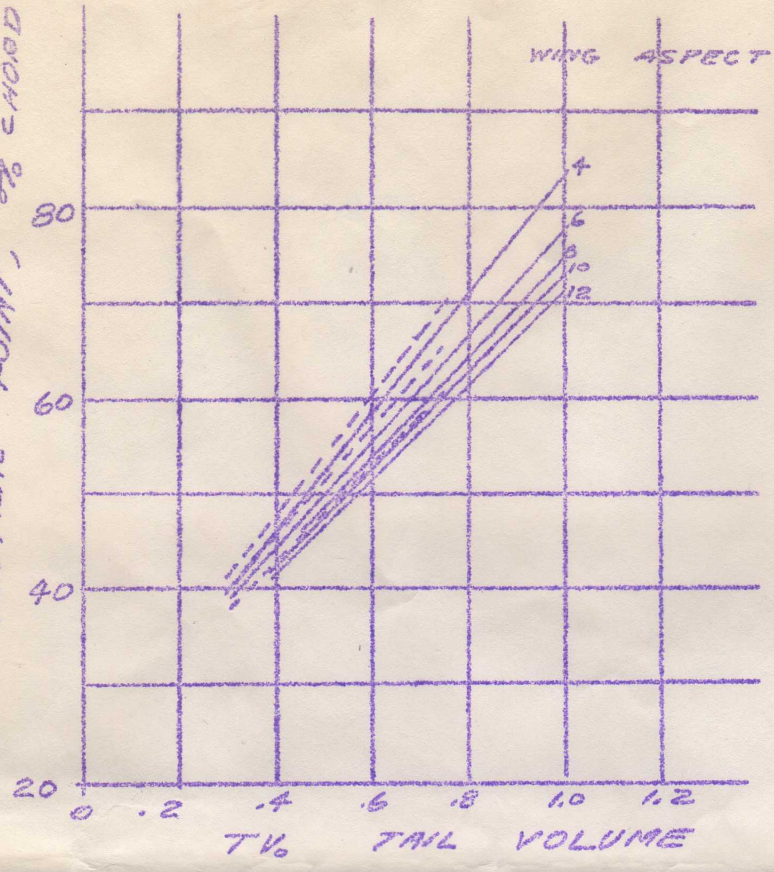
$$C_{L_T} = \frac{C_{L_w}(CG - AC_w) + C_{mow}}{\frac{S_T}{S_w}\frac{L_T}{C}}$$

Some sample results are shown in the following graph of NP versus tail volume $\frac{S_t}{S_w}\frac{L_T}{C}$, and in the graph of tail lift coefficient, C_{L_t}, (based upon tail area) versus tail moment arm. The aerodynamic center of the wing, AC_w; was taken as .25 and a value of .3 was used for the downwash derivative $\frac{d\epsilon}{d\alpha}$. The usually destabilizing effect of the fuselage was ignored. Wing and tail lift curve slopes were computed using $C_{L\alpha} = .1095\left(\frac{AR}{AR+2}\right)$. AR=Aspect Ratio.

St and Sw-are tail and wing areas
Lt-is tail length from wing leading edge
C-is chord of wing
Cmow-is zero lift moment coefficient of wing.

Note that many combinations in addition to those shown are available which result in zero tail lift depending upon airfoil (CL used, Cmow) and tail volume $\left(\frac{S_T}{S_w}\ \frac{L_T}{C}\right)$.

By setting the tail load to zero in trimmed flight, the full CL max of the tail is available for pitch damping and for producing stability at other angles of attack than trim angle. I think this is an advantage although admittedly a curved plate can have Cl max in one direction nearly twice that of a flat plate. This is shown by comparison of the ebene platte data and Gö 417A data at 42,000 Reynolds number in "Aerdynamics des Flugmodells" by F. W. Schmitz.

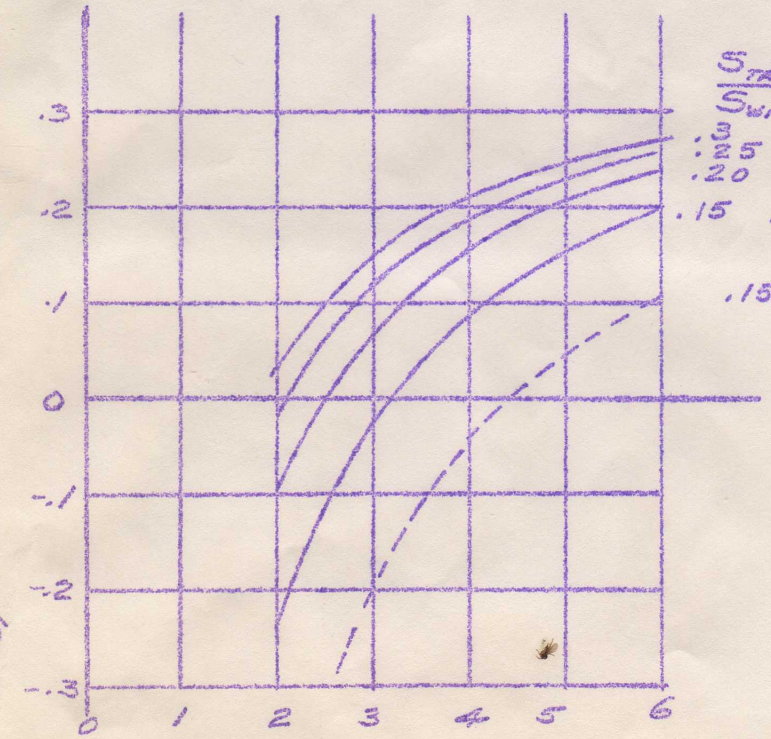


$\frac{S_{TAIL}}{S_{WING}} = .20$

$\frac{S_{TAIL}}{S_{WING}} = .15$

NOTE: TAIL ASPECT RATIO = 4

$\frac{d\varepsilon}{d\alpha} = .3$



$\frac{S_{TAIL}}{S_{WING}}$

.3
.25
.20
} STATIC MARGIN 10%

.15 STATIC MARGIN 20%

NOTE: AR WING = 10
AR TAIL = 4
$\frac{d\varepsilon}{d\alpha} = .3$
$C_{M_0} = -.1$
$C_{L_{WING}} = .8$

$\frac{l_{TO}}{c} \sim \frac{\text{TAIL LENGTH}}{\text{WING CHORD}}$

Now for the drag. Assume that the wing lift coefficient is the same no matter what the tail lift. (Small error here but maybe no one will care). Using the data mentioned above, the flat plate tail at zero lift has a drag coefficient of .0120, while the curved plate Gö 417A at a modest CL=.35 (which happens at zero tail angle of attack) has a profile drag of .0350. To this last value must be added the induced drag of $\frac{C_L^2}{\pi AR}$ or $\frac{(.35)^2}{\pi \frac{4}{1}}$ ≅.0097. With tail area 15% of wing area the no-load tail adds .0018 drag to the total model drag and the curved lifting tail adds .15 (.0447) = .0067. For an A/2 flying at CLW - 1.2 and making 150 seconds from 164 feet height with a flat no load tail the time would increase to about 152 seconds if the lifting curved plate were used. The time would drop more than two seconds, however, if the curved tail were used without a lifting load.

This analysis shows that within the assumption of linearity of data the flat tail is about as good as any other.

Fortunately, the Gottingen data for the Gö 795, 796, 801, and 803 airfoils as discussed by W. Thies and H. Thomann, in Aeromodeller (Feb. & July '62) have come into my hands and I expect to make a more accurate study of A/2 stability, trim, and performance using these data.

Thank you for the opportunity to comment.

MEMO FROM COLORADO

(Ed. note: The following memorandum was sent to SCATTER recently. Since it contains commentary which should be of general interest to all U.S. FAIers who participated in the last series of Team Qualifications and since there was no stipulation concerning reprinting of it by the authors, we must assume it was intended for reprint here. We present it in full and without comment.)

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10 August 1962

TO: FAI Contest Directors
FROM: Robert R. Lynch and George Batiuk
SUBJECT: Method of Conducting 1962 Qualifying Trials

"It was brought to our attention in a conversation with Gerry Ritz at the Nationals that all FAI Qualification Trials were not operating under the same rules.

The program as set forth in Model Aviation was to have three Qualification Trials on specific dates. Our interpretation was that no shifting of dates was allowable, since that was one of the purposes in having more than one date. After the first qualification date had passed a notice was received to the effect that we could have the qualifying trials on two days if we wanted. This notice also said we could relax processing procedures and change weekends if it was more convenient.

In our talk with Gerry at the Nationals we discovered, to our amazement, the Chicago area, with Pete Sotich as Contest Director, started qualification trial number one and then after two or three rounds had been flown called the contest off due to "bad weather". Gerry said they have done this three times and still haven't completed qualification trial number one.

In talking with responsible FAI competitors from Wichita, Tulsa, Dallas, and Ft. Worth, we found they were aware of the above procedure because they called Gerry. Since the rules were quite specific, we could see no reason to call, despite the fact that none of the FAI fliers in the Denver area agreed

with the method of qualification.

This memo is not intended to attempt any reforms at this late date but merely to call to your attention the facts about the 1962 FAI eliminations as they were presented to us by ICC chairman Gerry Ritz at the NATS. Facts, incidentally which are contrary to the program set forth prior to the first qualifying trials and later changed with derogatory remarks regarding the interpretive abilities of certain CD's.

It is a real shame that once a procedure is set up it cannot be adhered to so that everyone has an equal opportunity. All in all, this relaxing of procedures and willful shifting of date gives smacks of sloppy management and communication. Or is it merely the fact that some areas came to realize that they may not qualify enough flyers even with three dates?"

(signed) Bob Lynch
Geo. Batiuk

"YEARLING" A/2 Glider by Pat Curtis, Cape Province, South Africa

This model won for me the "Western Province" A/2 trophy at our biggest local meeting apart from the South African Championships. I named it "Yearling" because its first flights were made on my daughter's first birthday.

The first four bays of the wing are boxed in to take brass tubes for plug in. The first five ribs are 1/16 ply and the leadings edges of the outer panels are made up of four 1/32 lamanated strips to enable the curve.

The leading edge of the stab is built of four 1/32 strips. The stab must come out at .25 ounces.

The nose of the fuselage running to just behind the wing T.E. is 1/2 inch hardwood, covered both sides with 1/8" sheet balsa. Rear of the fuselage is made up in the usual box form and rounded. The holes in the fuselage to take in the plug in wires must be bushed to prevent wear.

The tow hook screws into the hardwood at best position (adjustable). The auto rudder pin is attached to the towline and releases when the line comes off the hook.

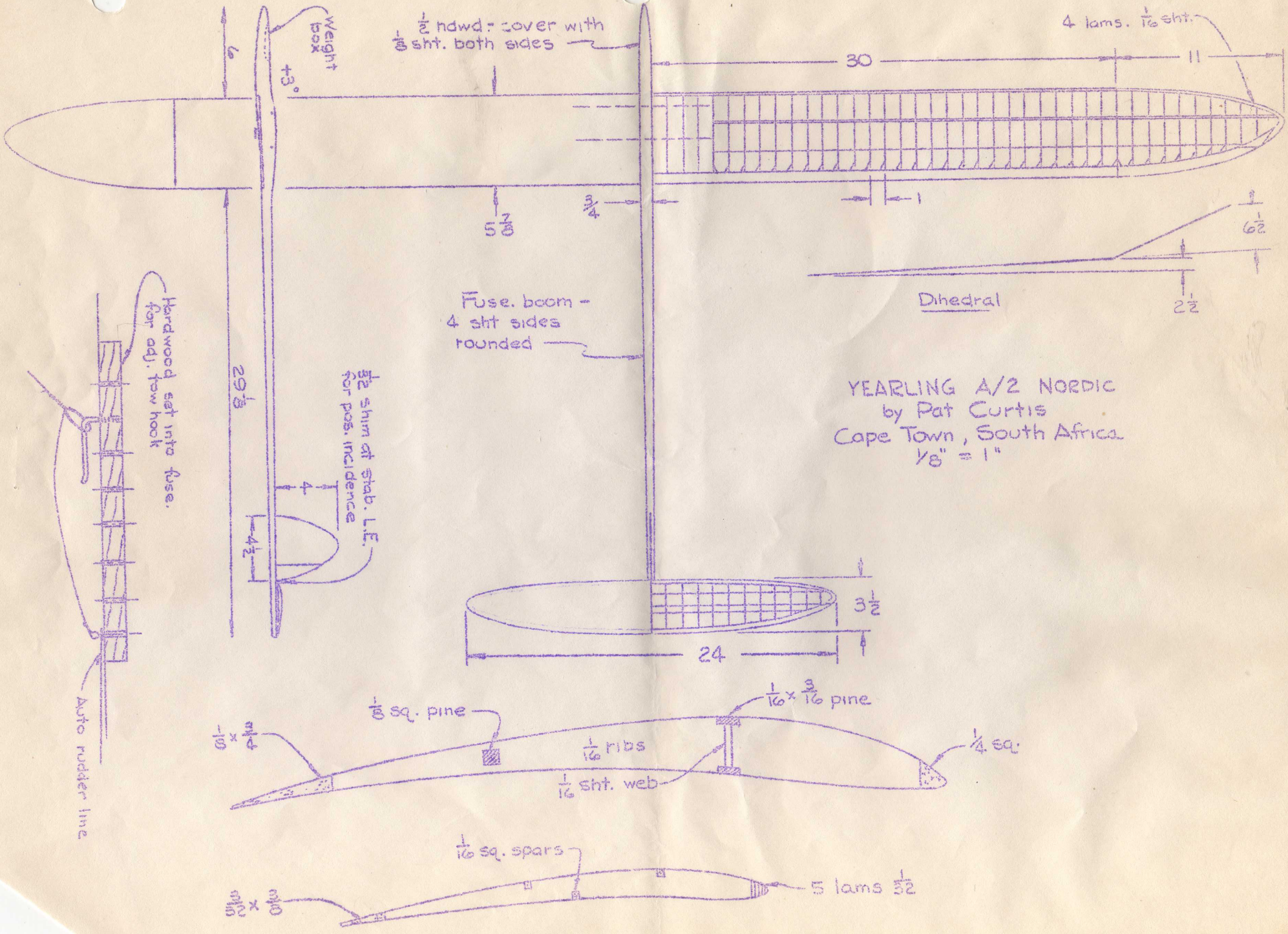
The Yearling flew right off the board with only 1/32" positive incidence added to the stab. Tow is 100% and with a slight breeze it can be walked all over the field. On release the model should be put into a left glide turn.

1963 U.S.A. FAI FREE FLIGHT TEAM

Since this issue is being written in September, we now have the results of the Labor Day weekend Semi-Finals; which selected the U.S. FF Team for the 1963 Finals in Austria.

The Team Members will be:

WAKEFIELD	East - SAL CANNIZZO, Long Island, N.Y. Central - DAVE KNEELAND, Hickman Mills, Missouri West - CARL HERMES, Palo Alto, Calif.
POWER	East - JAMES WARNOCK - Perrys Bury, Ohio Central- FRANK SPEARMAN, Chicago, Ill. West - DOUG GALBRAITH, Davis, Calif.


Weight box
+3°
6
29⅜
½ hdwd. cover with ⅛ sht. both sides
4 lams. 1/16 sht.
30
11
5⅞
¾
1
6½
2½
Dihedral
Fuse. boom - 4 sht sides rounded
Hardwood set into fuse. for adj. tow hook
Auto rudder line
3½ shim at stab. L.E. for pos. incidence
4
4½
3½
24
YEARLING A/2 NORDIC
by Pat Curtis
Cape Town, South Africa
⅛" = 1"
⅛ sq. pine
⅛ x ¾
1/16 ribs
1/16 sht. web
1/16 x 3/16 pine
¼ sq.
1/16 sq. spars
3/32 x 3/8
5 lams 1/32
Cusick Sept. '62

A/2 NORDIC

East - EDWARD HOPPER, Baltimore, Md.
Central - ART FROST, St. Louis, Mo.
West - NORM INGERSOLL, Ogden, Utah

Well Done!!!... and let us be among the first to congratulate you, and wish you the best in the World Championships next year.

COMING NEXT MONTH

In the September issue we'll bring you a neat A/2 from the East coast; a power model from Austria; and goodness knows what else!

SYKORA
6717 WILKINSON
APT. 205
NO. HOLLYWOOD, CALIF.
U.S.A.