

SOUTHERN CALIFORNIA
AERO TEAM

THE

SCATTER

A TECHNICAL PAPER
FOR THE
FREE FLIGHT FRATERNITY

VOL 1, NO. 1 APRIL, 1961

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April, 1964

THE SCATTER is published by The Southern California Aero Team (SCAT). President: Bill Hartill, Secretary: Jim Trego, Editor: Ken Sykora, 6717 Wilkinson, Apt. 205, North Hollywood, California.

FIRST ISSUE

This is the first issue of a new monthly (we hope!) publication to be produced by the members of the Southern California Aero Team (SCAT). SCAT is a model airplane club, operating in the Los Angeles area. The bond which brought its highly individualistic (!) members together was a common interest in the development and flying of FAI class free flight models (Gas, Wakefield, and A/2).

SCAT's main aim is to foster more serious attention on developing and flying these models, and through the individual efforts of its members, to establish a hard core of active FAI modellers who can compete, on an equal basis, with other such serious modellers throughout the world.

To assure our readers that we practice what we preach, we modestly mention that three charter members have been on five previous USA teams- three in FAI Gas and two in Nordic A/2.

The purpose of this publication is to provide a publishing medium for technical information, 3-views, general FAI news, and other data pertaining to FAI models, for the benefit of like-minded modellers both here and overseas. Since this data will not be limited to the efforts of modellers in Southern California, or for that matter, in the USA, all readers are urged to contribute such material for publication.

Since this is a nonprofit venture, we won't provide formal subscriptions, however, a dollar contribution toward covering the personal postage of each reader will insure placing his name on the active mailing list for a year. Nuff said?

Now, a brief word about why a big, rich, modelling country like ours needs a little amateur effort like this. The reason is plain to any serious modeller who has tried to find good technical information on FAI models in the commercial mags. There just ain't any! With our humble little rag we hope to correct this oversight, as has been done so nobly by the Montreal bulletin, and a handful of similar club publications from this country.

CONTRIBUTORS, PLEASE

With this first issue the SCAT club extends a general invitation to readers to contribute data they would like to see published. This covers 3-views of their models (1/8" to the inch, if possible), sketches of technical gadgets and design ideas. We'd also appreciate comments on design, trimming, rules, and other such topics.

One of the prime motives for this publication is to provide a "Clearing house" for publication of models, ideas and comments pertaining to FAI free flight modeling. If it serves this purpose it should become a valuable and useful addition to every FAI'ers files. Your individual contributions will help us realize this goal.

TOWLINE TENSION by John Nordin

(Ed. note: At a recent club meeting the new 5 kg. towline pull test was discussed. A lot of theory and ideas came to light. Member John Nordin, being the type who likes to mix theory with actual field testing, came up with the following information.)

At the December 1960 CIAM meeting Sweden pointed out Nordic nylon towlines stretch 20% and an increase in performance was gained by the lengthened line rather than by more legitimate means. Whether the stretch occurred while the model was on tow, or by means of an intentional stretch before each flight was not pointed out. In any case, a pull test rule was enacted to prevent future reoccurance of over stretched lines. We investigated the effects the rule will have on lines and models. (Description and drawing of testing equipment is given on following page.) Several towlines were tested to see if they could withstand the 5 kg. pull and not stretch. The results are as follows:

TOWLINE	REMARKS
10 lb. nylon monofiliment	This line broke after a stretch of 10 ft. under a load of 2 kg.
25 lb. nylon monofiliment	16 ft. stretch under 5 kg. load
30 lb. nylon monofiliment	14 ft. stretch under 5 kg. load
Shoemaker's linen thread	13 in. stretch under 5 kg. (Broke on third test pull.)
.012 dia. steel wire	Neglible stretch under 5 kg. load. (Disadvantages: snags, snarls, electrical conductor)
.012 dia. steel wire with nylon coating (18 lb. test)	Negligible stretch 5 in. under 5 kg. load.

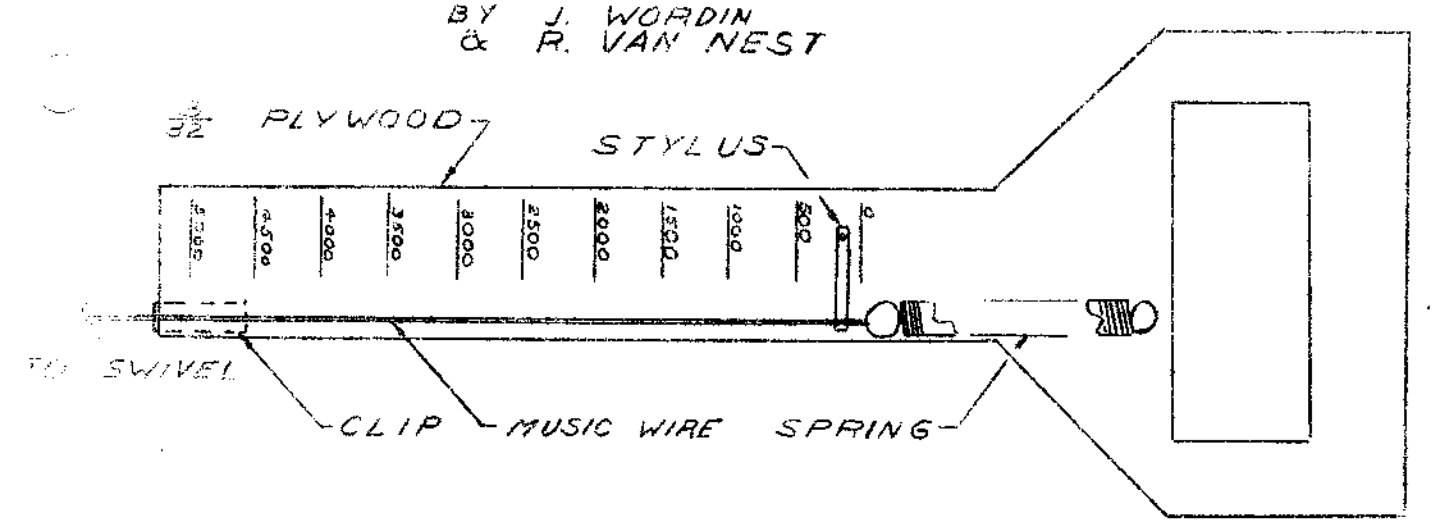
A recording spring scale was built to determine the load on the model while on tow. The spring was calibrated by hanging gm. weights on it in 500 gm. increments. Strips of paper were placed under a stylus to record the deflection of the spring. A clean strip was used for each test.

Seven flights were made under windy, thermal conditions. The maximum load sustained was 3020 gm., minimum load was 1550 gm., and the average was 2217 gm. (4.95 lbs.)

Test Number	Load (GM)
1	1550
2	1550
3	3020
4	1900
5	2250
6	2850
7	2400
average	2217 gm.

TOWLINE TENSION RECORDER

BY J. WORDIN & R. VAN NEST



From these preliminary tests it can be seen that a non-stretch type of towline will be a necessity.

It is hoped that CIAM will use this data to modify the rule to make it more useful and without loopholes. These tests show that a 5 kg. load will stretch a nylon line approximately 10%. Nylon has a permanent deformation when stretched, thus a nylon line can be stretched another 10% after the line is measured. Perhaps the line should be measured before and after each flight.

(Ed. note: John made these field tests with a "past prime" A/2, in windy conditions. He made no attempt to "baby" the tests, but towed "fullout" to simulate, as near as possible, normal contest stress and strain.)

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SCAT TRAVEL FUND FOR FAI TEAM MEMBERS

A couple of meetings back the SCAT membership decided it was time to quit talking about the lack of funds for FAI FF team members (to get from here to the East Coast) and start doing something about it. So they came up with a plan, designed to be supported by those most interested and affected--namely, potential team members themselves!

Here is how it works. Anytime between now and the beginning of the first round of the Semi-Finals in Fresno, any flyer who plans to try for a team place in Wake, A/2, or FAI Gas, can buy a "share" in the Fund. This share costs $10.00, payable to the SCAT club, and for which a receipt will be given. After the team is decided at Fresno, the total Fund (SCAT takes nothing) will be equally divided (in cash [illegible] among the team members who have purchased shares. For example: if only two of the selected team personally hold a share each, they will [illegible] the total funds if one lucky guy happens to be the only share [illegible] three, he takes all! It is just possible, none of the [illegible] have bought a share. If this happens the total fund [illegible] and will be held by SCAT until next year's trials, when it will be put up again for share holders only. Persons other than the flyers themselves can, of course, buy a share in some flyer's name. [illegible] any body shops, parents of younger flyers etc., can [illegible])

Now if you have tried to buy air fare from here to the East and back you don't have to be told this is a good deal. If you don't make the team, your ten bucks has gone a long way toward making travel for the guy who does a lot easier. If you are a team member, you'll have to admit that ten bucks is mighty cheap traveling round trip to the East Coast.

So get your Share now. If you want to order by mail, send to Bill Hartill, 7513 Sausilito, Canoga Park, California. Or, see any SCAT member at the FAI eliminations at the basin.

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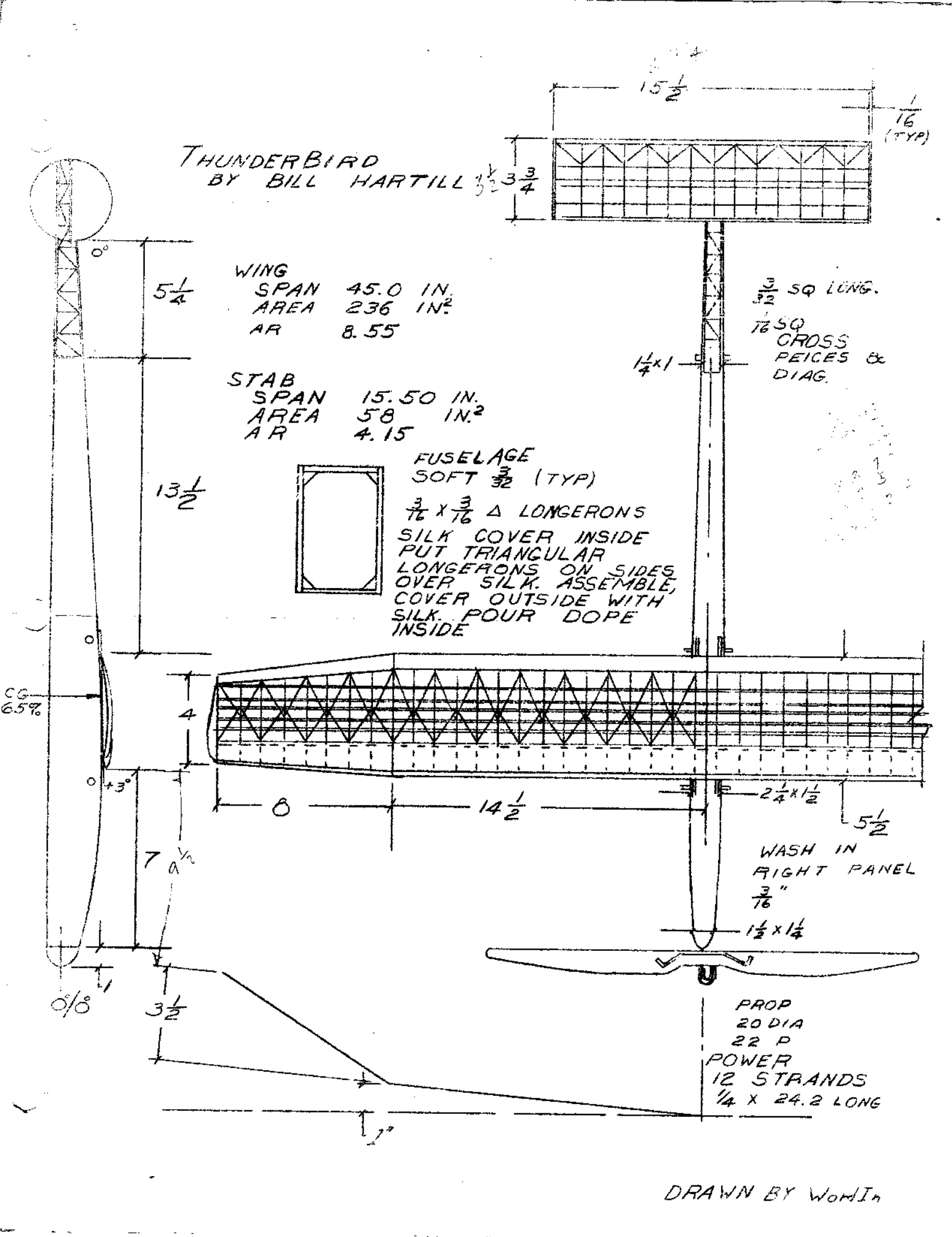
"THUNDERBIRD" Wakefield by Bill Hartill

This Wakefield, developed in early 1960, is the result of applied past experience, both mine and others, to produce a consistant "pay-off" design. The shoulder wing, box fuselage, twin-rudder layout has long been my favorite because I like the general appearance of this combination. The idea was to concentrate the weight as near the CG as possible. To this end the tail boom was built up for lightness, the wing tips kept light, and the nose short. This short nose also seems to make power adjustments less critical. Weight has been built into the power carrying part of the fuse. where it is best used and most needed. Prop design is an old favorite, and shaft, hook, and hinge, although troublesome to make, really do the job and require no further repair or tinkering to keep serviceable. (For further details on how the hardware is put together, see Bob Hatsheck's plans in the magazines). Wing section is the Gott. 342. I have been using this little gem for years and haven't been shown evidence to indicate that there is anything better.

A word about airfoils at this point: there are a lot of good sections around, which confuses more than it helps. This is because there is very little measureable performance difference between the many good sections. One of the things I object to is the highly detailed analysis of airfoil performance versus geometry that some of our "experts" get entangled in. This is an area where a little knowledge can be dangerous. The problems of low speed aerodynamics are intimately associated with the vagaries of boundary layer development. Boundary layer is one of the most frustrating unsolved problems of aerodynamics. We should encourage experimentation with our models, but when we use intuition, guesses, thirdhand information, etc., let's admit it and not confuse the issue.

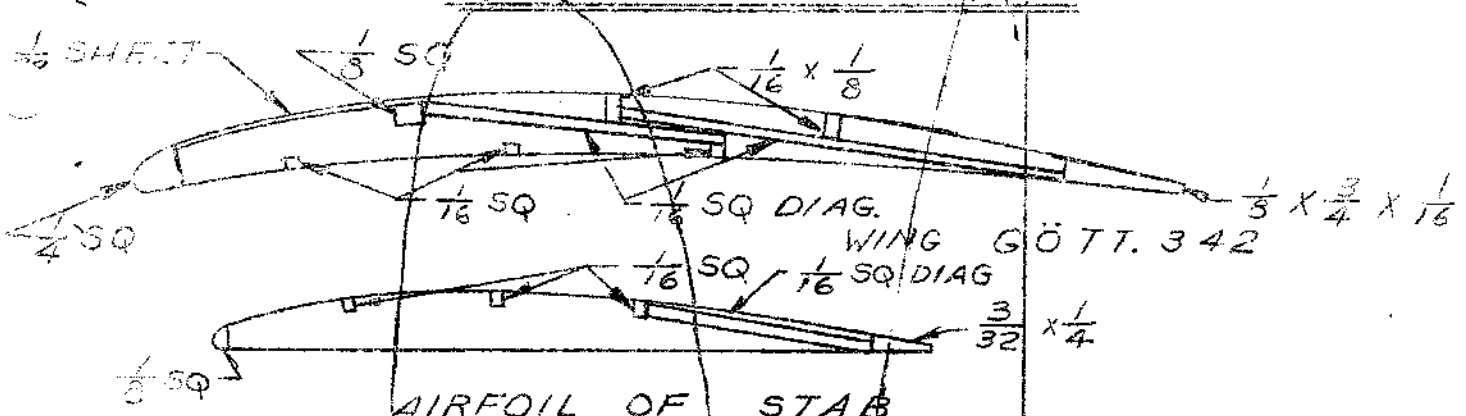
Back to the Wakefield: it has done quite well for me at several local meets, and has proven both rugged and reliable. For example: recently I went back East on business--just before leaving, the model was returned after having been lost out in the open for over three weeks. On a whim, I sawed it up (literally) fitted it into a small box and carried it on the 707 with me. On arrival, I put it back together and flew it at a local contest of the Thunderbirds, where it turned in a creditable job. Try this sometime with one of those fragile, touchy-to-trim jobs!

SCAT member Milt Harker has also built this ship, and it has been winning for him at local meets. He used it to set a new Wakefield record which was only recently lost to George Reich. Milt has also designed an unlimited fuse. for the ship which is working well in the open meets. Milt has full size plans covering the Wake. and Unlimited ver-



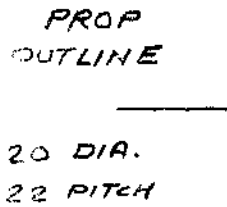
DRAWN BY WoHIn

"THUNDERBIRD" AIRFOILS

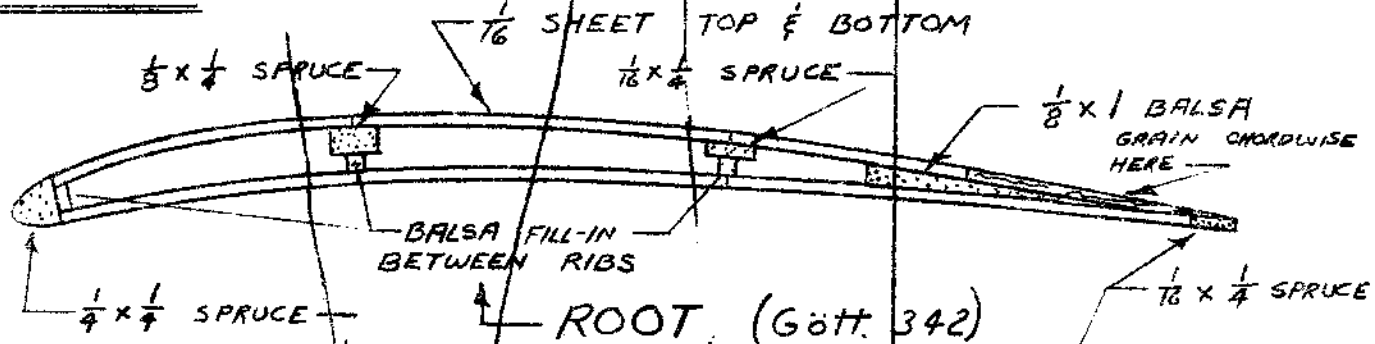


AIRFOIL OF STAB

NOTE: ALL RIBS MADE FROM 1/32 IN. SHEET



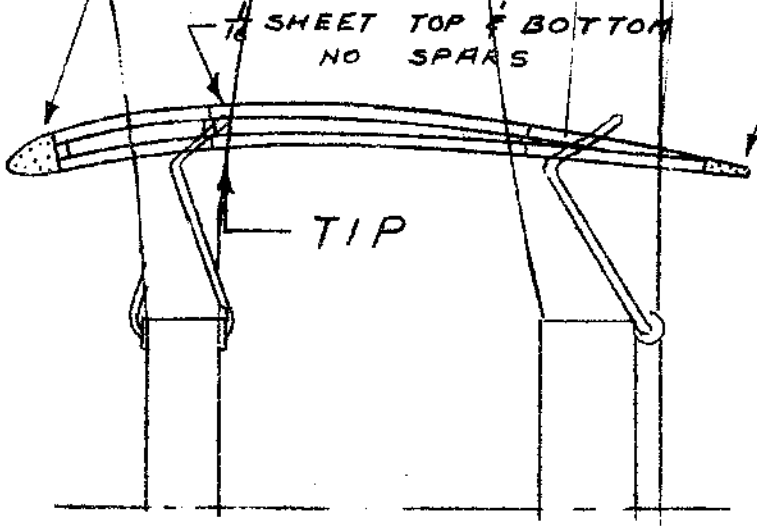
FAI 14



WEIGHTS

WING - 9.2 OZ.

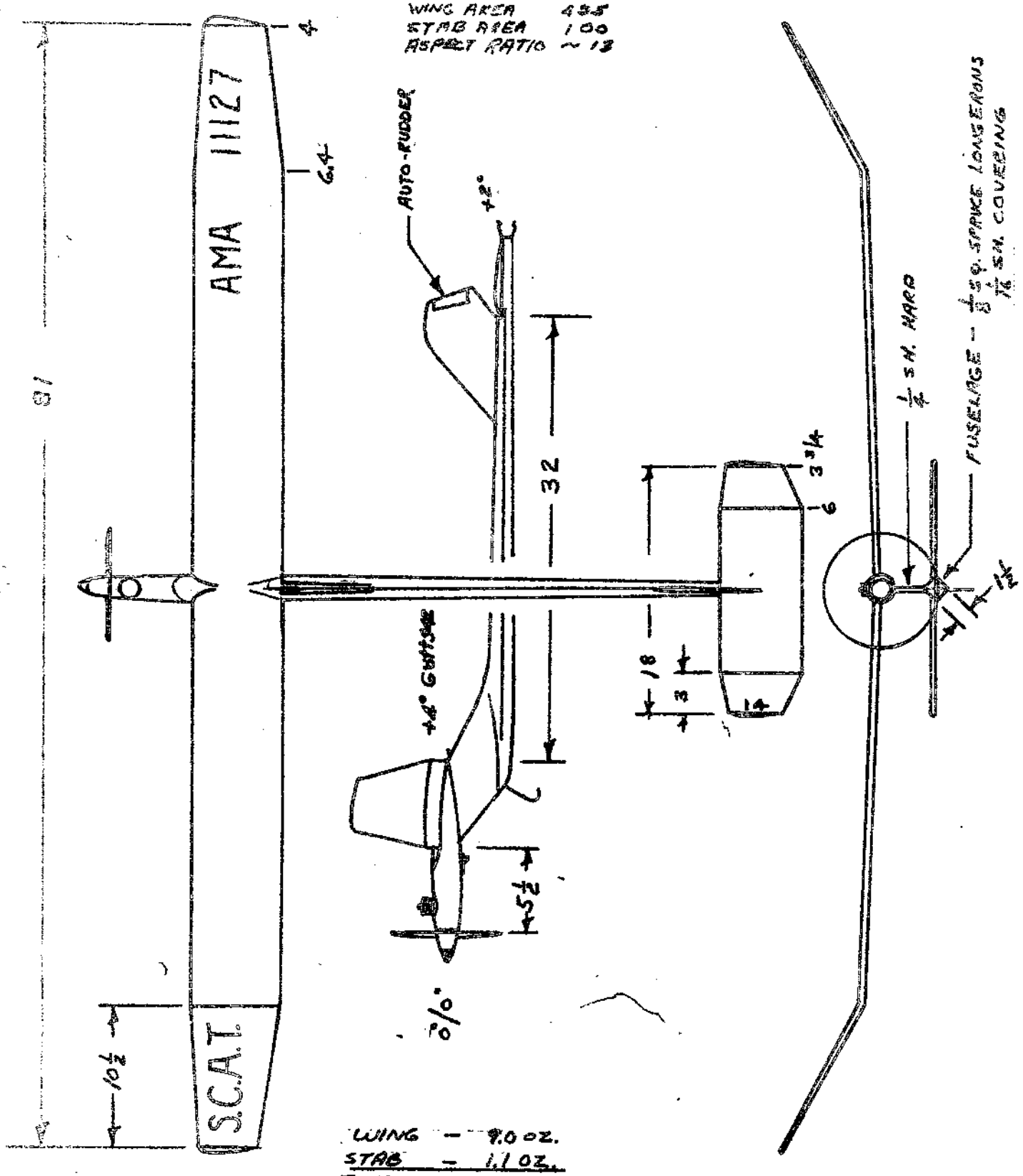
STAB 1.1 OZ.



FAI NO. 14

BILL HARTILL SCAT CUB

WING AREA 455
STAB AREA 100
ASPECT RATIO ~ 13



WING – 9.0 oz.
STAB – 1.1 oz.
TOTAL 27 oz.

sions) which are available for $1.50. (If interested, write the Editor.)

"FAI 14" by Bill Hartill

The FAI job does not represent the final pinnacle of 49 odd perturbations of something or other. It is sort of a maverick to me in that it is a high thrust line. I have been ape about high aspect ratio as a way of life and have been urging it on the free world for some time now. One of the problems, however, with hi AR is getting them to roll in the climb with those skinny wings. I used to get away with this with lower powered engines, but as engines got hotter I became known as the "flutter king."

The idea behind the hi-thrust was to provide a layout which might not require rolling, but just go out and up. This ship was only partially successful--it glided beautifully. Power pattern, however, seemed to be very sensitive to the particular attitude used at launch. A right or left climb could be induced just by changing the launch attitude a little. This made for inconsistant patterns and pull-outs. An auto-rudder was used and this helped make the ship decide which way to go, but I'm still not satisfied with it.

Under ideal conditions of launch, engine run, etc., 4 to 4-1/2 minutes could be stretched out of 15 seconds run, under those beautifully calm, ideal conditions at the Basin just at sunset. With a little turbulence performance was less. Power flight was also handicapped by virtue of the 30 ounce total weight!

Engines tried were: Super Tigre (1959 version), OS Max Diesel, OS Max II glo, and Super Tigre G20 (1960) glo. One flight only was made with the last engine--I forgot to set the auto-rudder! Repair is almost finished (gluing the wing tips back on).

The all sheet surfaces are just about the most efficient way to get torsional rigidity into a hi-aspect ratio wing, but you have to watch the weight. Make tip dihedral joints butted with no splices, like a hand launch glider wing (no gauze either) because then they knock off clean. Another tip: structural failures in all of the hi-AR wings I've built always involved rib breakage and to the best of my recollection never spar failure (excent for a complete tip going where it was butted).

High aspect ratio will carry the mail. All you need is a little confidence in structures.



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