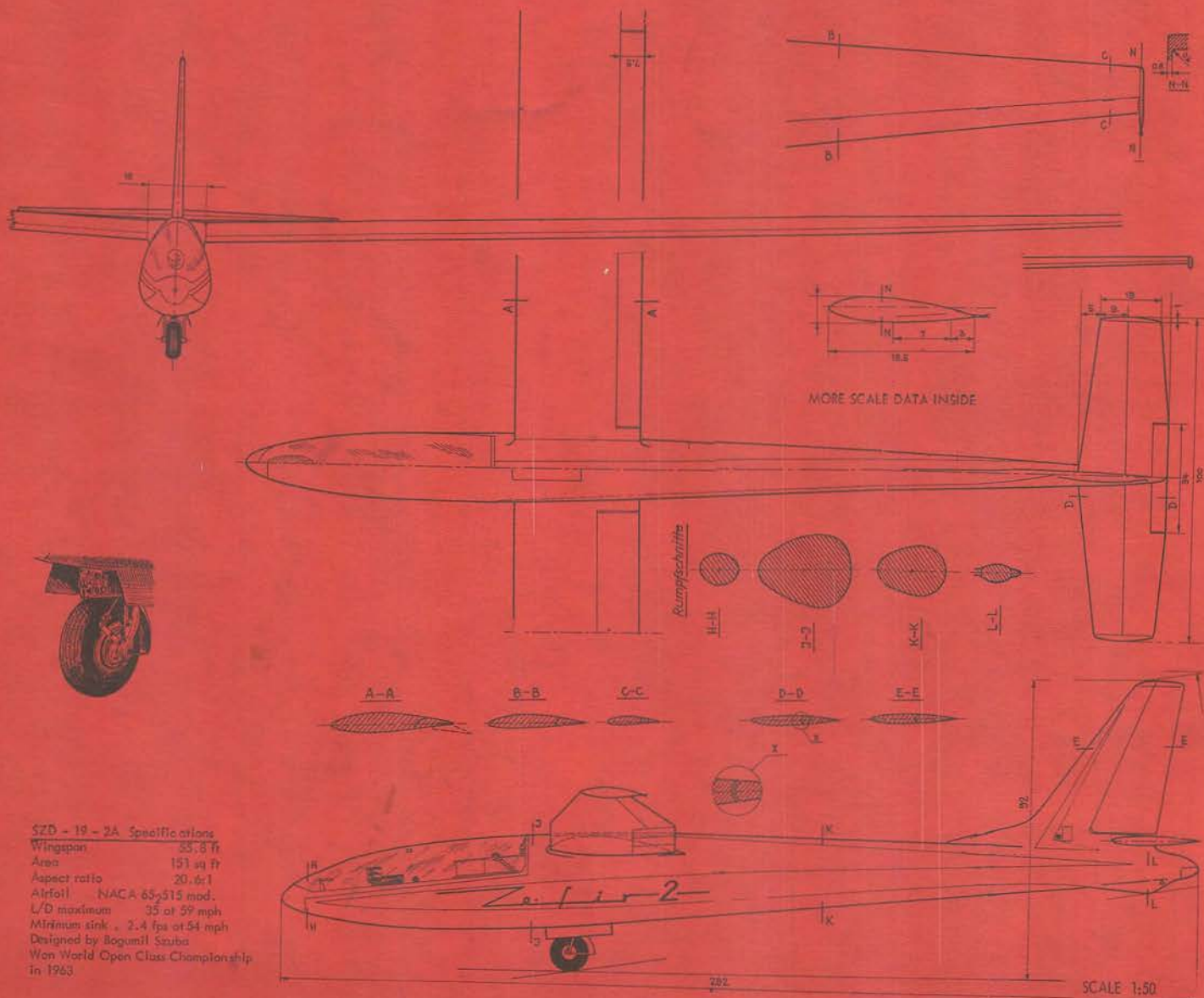


# ZEPHYR

In This Issue-



SZD - 19 - 2A Specifications  
 Wingspan 85.8 ft  
 Area 151 sq ft  
 Aspect ratio 20.6:1  
 Airfoil NACA 65-515 mod.  
 L/D maximum 35 at 59 mph  
 Minimum sink 2.4 fpa at 54 mph  
 Designed by Bogumil Szuda  
 Won World Open Class Championship  
 in 1963

Zephyr II

THE

# ZEPHYR

DEDICATED TO FURTHERING THE ART AND  
TECHNIQUES OF THERMAL AND SLOPE  
SOARING IN AMERICA

PUBLISHED BI-MONTHLY

Release dates 10th of every other month

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### EDITORIAL POLICY

The sole aim of this publication is to endeavor to bring together, through the exchange of ideas, photos, designs and techniques, and the publication of R/C glider contest calendars, those individuals in this world who are firm in their opinion that of all the various phases of modeling -- THE SIGHT OF A RADIO CONTROLLED GLIDER FLYING HIGH ABOVE -- is the most satisfying.

Help us achieve this aim by your contributions and support of the ZEPHYR. We are looking for consistently reliable reporters who are also R/C glider fans.

ADVERTISING RATES - Furnished on request.

Publishers Note: This issue was not mailed until 20 May due to additional Postal Department requirements.

## NEW WORLD RECORD SET FOR DISTANCE - 21.5 MILES

Hereford, Texas... April 13, 1970. For a long time now I have planned a thermal flight from the Hereford Municipal Airport to the Canyon Airport... a straight line distance of 21.5 miles. After I had completed the KURWI 68 purchased from Willoughby Enterprises this Spring, I spent as much time as possible to get acquainted with this beautiful R/C glider. This sailplane has the qualities I have been looking for.. It has a fine L/D factor, plus it will climb on the weakest up currents and added to this, a factor which is very much help on real long flights..... it has fine stability. Although I had more experience with the stock balsa and silk wings, I elected to try my own foam wings covered with Krome-Kote paper for the World's Record Trials as I feel they offer a slight increase in performance... better L/D ..

Prior to the Record Flight a good day (rare this time of year in this part of Texas because of the spring winds) would find me in the back of my pick-up truck going down the road on practice flights. I had made three flights worthy of mention, each progressively longer prior to this date. All going down the track toward Canyon, each ending with a landing on the shoulder of Hiway 60. First a distance of 9.5 miles, then 18.2 mi then 18.4 miles. The last flight was short of the declared goal and therefore not a record.

On April 13, with all the necessary officials required for the World's Record Attempt, we proceeded to the Hereford Airport. The Contest Director was Bill Dennis from Amarillo, with Key Crawford and Reverend Bob Williams as witnesses. Although the temperature was close to 70°F, the wind was "whistling Dixie" and gusting about 15 kts, and these conditions had me in doubt. I know that the thermals would be tied in knots at low altitudes, and could be expected to reach a good velocity of around 15 fps as they went higher. Barely able to hold the KURWI down in that wind, I launched with the electric winch using 900 ft of #12 nylon line. It was pretty hairy on the tow and even with full down trim the wings bent alarmingly under the strain.

A kind word here about my winch operator is in order. He is Wylie Thomas. He also serves as driver/navigator. For those attempting this type of gliding, this is an important man. He must be able to operate the winch satisfactorily in all different wind conditions, and once the model is airborne, set the winch out quite quickly so as to pick up the pilot before the glider has flown too far down wind. He must then quickly navigate the truck down a pre-determined track and keep up with the airborne glider without dislodging the pilot from his perch in the back of the truck as he goes around corners and over rough spots. Wylie not only does a great job as winch operator/truck driver, but has been very much a source of encouragement to me.

Back to the flight.. the KURWI is now at low altitude after release from the tow, and I am about to give up when I succeed in catching some lift the last minute. We all pile into the pickup truck and are off. Onto Hiway 60, I trim right circle and let the KURWI 68 take care of itself until we manage to catch up to it. The wind direction looks good. About a mile away from the airport, the KURWI is slightly north and climbing slowly as we come under it and slow down. We are moving briskly along with the following wind. Soon the glider gains altitude faster in stronger thermals. Using this thermal to the best advantage, I soon have the bird up to MVA - Maximum Visible Altitude - all the time circling.

Now I turn it down wind and we have to accelerate to 60 mph to keep up with the glider. I crank in full down trim but its still climbing. Suddenly, it vanishes in front of my eyes. People can hear me hollering "Where is it?" for miles around, but my companions have lost it too. I feel completely helpless so I look down at my Kraft transmitter to check RF output on the meter (its o.k.) and I wonder what to do. The thought of this happening hasn't entered my head. I know from experience that this KURWI won't spin and more than likely it wouldn't come down in the booming thermal it was in anyway. So we maintain the same speed in the car down the Hi way, so I try some full left rudder and full down trim (not wanting the wings to separate from the fuselage like Dale Willoughby's did in Norway) and desperately scan the approximate area where it disappeared. After an eternity... really a few minutes... the KURWI suddenly appears in the same relative area of sky... producing many sighs of relief. Gently I guide the glider out of the spiral and head down wind.

The check points go by quickly now with the KURWI climbing to MVA on each thermal and then proceeding to the next thermal with down trim. We round the last curve about a mile from the declared goal and I have enough altitude to glide straight to the airport if necessary. However, when we arrive out in the center of the airport, the KURWI is still quite high and so I head it back into the wind with full down trim so to maintain my position over the airport. I hear Bob Williams holler to a couple of men nearby that the flight from Hereford is a NEW WORLD'S RECORD. This comment urges me to do a loop before making a tight turn to a landing about fifty feet away from where I dismounted from the pick-up truck. ...a very satisfying feeling.....

Glider : KURWI 68 with Elite Model Mfg foam wings  
R/C Equipment: Kraft KP-6 Gold Medal Series  
Launch: Hereford airport -- 1:40 pm CST  
Landing: Canam airport - 2:36 pm CST  
Time Enroute: 56 minutes - Average speed: 23 mph  
Straight Line Distance Claimed: 21.5 statute miles

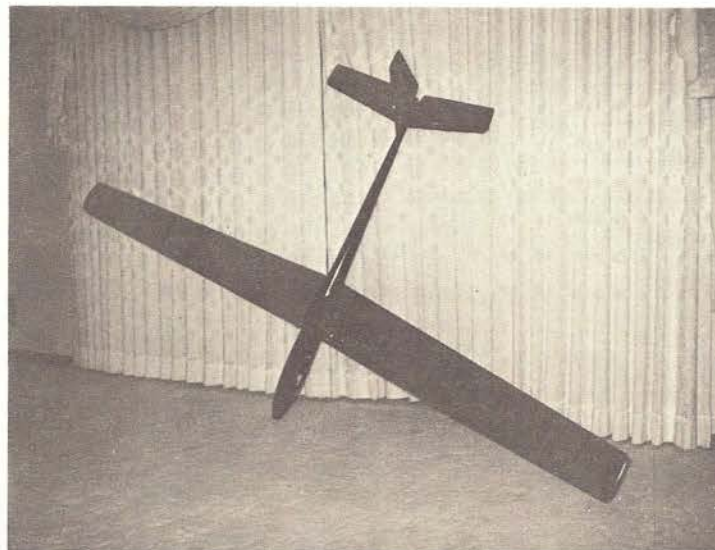
P.S. - Dale, thanks for your help in sending the FAI rules and all the encouragement, and I can assure you that if this claim for a new World's Record for FAI Class F3B - Category 25 is accepted, it will not stand long. I feel that 100 miles is just around the corner. We have been looking at the charts for a good route.

..... Gerald Martin, Box 824, Hereford TX....



REALLY TO PLUG IN AND GLIDE —

## KURWI 68 WINGS



FOAM WINGS COVERED WITH BUFF COLORED 12 POINT KROME KOTE PAPER - 115" span

Identical to those used by Gerald Martin who claimed new FAI World Record Distance Mark of 21.5 miles.

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.....Other R/C glider wings in our Engineering Department - Write for more details.....

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HEREFORD, TX 79045

# Rules Fever !

Rules fever is developing in the fascinating sport of radio controlled thermal soaring. R/C soaring apparently is ripe to be regulated.

But what is "regulated"? One definition is Webster's "is to make regular, uniform, methodical..." How inviting... If rules are of true value they enhance rather than merely regulate.

Current proposals suggest that thermal soaring competition must be defined within very narrow limits... that the freedom symbolized by the graceful beauty of long soaring wings must be clipped to conformity. Most major proposals, including the new FAI Provisional rules, specify repetition of one basic task which combines duration and landing precision. This task... in any of its proposed variations... is a reasonable one, a challenging one, and a competitive one. But... that it is only ONE is the problem. A notable exception is the Harbor Slope Soaring Society proposal which supplements the basic duration/spot landing task with a distance event. This is a marked improvement.

Historically, aero modelling competition has offered a single flight parameter for a given type vehicle: Free-flight duration, Control line speed, R/C pylon, R/C Pattern, etc. As with any background, automatic response to any new problem is the imposition of a "proven" formulae. Unfortunately, this is what most of the published R/C thermal soaring rules represent: an expedient, stereotyped reaction.

The radio controlled, thermal sailplane is a versatile machine and deserves better than unimaginative competition. Development of rules should be accepted as a challenge and undertaken with the philosophy of creating something really new and exciting. An enlightened approach could result in an "R/C Soaring Competition Guide", consisting of numerous, proven tasks and variations... a shopping list for a Contest Director.. "building blocks" to be selected and combined to define a unique program, suited to the location, weather, and expected attendance for any given contest.

The "R/C Soaring Competition Guide" can represent the experience and best thinking of active clubs and individuals throughout the country... or world. It can be a collection of many contest tasks for duration, for altitude, for speed, distance, spot landing, precision time, etc., as well as incorporate suggestions for aerobatics, scale and other speciality events. Each task in the Guide would offer a complete description of the event, its philosophy and scoring.

A typical contest developed from the Guide might call for four flight tasks:

Task I      Duration - 15 minute maximum

- Task II    Closed Course Distance
- Task III   Spot Landing
- Task IV    Closed Course Speed

Other programs might be Maximum Average Distance for a given number of flights, plus a Task for Spot Landing vs. Precision Time; or Tasks for Altitude and Speed; or certainly just pure Duration. The potential combinations would be limitless. Each contest could be a fresh, new challenge, rather than just a repetition of last month's exercise in monotony. Assuming that many contests will impose a one sailplane/one wing ruling, this approach to competition will produce real champions as well as designs that reflect true genius, rather than highly specialized freaks or look-alikes. The luck factor will be minimized to non-existence.

The "R/C Soaring Competition Guide" can be a reality. It can be created by the AMA R/C contest Board. The Board can act directly or delegate the assignment to a committee of interested and active soaring competition enthusiasts. The Board or Committee would act as a clearing house. soliciting and distributing ideas...establishing a central point for exchanging information. In very little time, the first edition of the "R/C Soaring Competition Guide" could be issued... looseleaf sheets reproduced on order and at cost with supplements as necessary. Proposed tasks from all sources could be evaluated in the field by all sources. As experience is gained, the Guide can become a formal document by incorporating "official" Tasks as well as "provisional" events and thereby continue to be a dynamic source of contest inspiration and definition.

The concept of the Competition Guide approach to thermal sailplane contest rules works... and works well. It has been developing and it has been in practice for almost two years in the Santa Clara Valley/San Francisco Bay area of California. The multi-task concept has been tested, modified, and proven in regular monthly contests the year round.

There is little reason to relegate the R/C Thermal sailplane into just a guided duration machine.

Le Gray, P.O. Box 187  
Sunnyvale, CA 94088

Editor's Note - While Mr. Gray has had extensive experience in thermal soaring, and is concerned about that phase, I feel there are others on the West Coast with Slope Soaring experience who could contribute their knowledge to the Guide.

## LOS REMOLINOS

Whirling Dervishes, Miniature Cyclones or Whirlwinds, call a Dust Devil like but the end product is the same; tons of lift generated in an enormous cyclonic-like winds. In the past there has been much controversy as to the of the Dust Devil.

In 1966, Peter Sinclair finished his Doctoral thesis at the University subject. I have relied heavily upon his work for much of the following great energy of these rather predictable atmospheric disturbances can sailplane pilots, a whole new realm of flying may be realized.

Basically, a dry thermal updraft develops into vorticies, which selves because the swirling air pulls in more warm surface air and in most cases the insurge of warm air accelerates the effect. The seems to be in low areas such as dry river beds or washes. If there the newly formed dust devil will accelerate to the speed of the the top end leading the way or bending down wind. This is whether you are attempting to avoid or to enter the upper

Not all Dust Devils move, however. There was a story Arabia desert which stayed in the location of a sand pile. cubic yard of sand an hour until a bull dozer was parked at its wind pattern. Another aspect which may effect your soaring surrounding our swirling "friend" is a strong movement this can make for BIG SINK.

Just as the direction of rotation of the Dust Devil is feel they turn counter-clockwise as a result of the Earth's usefulness of this phenomena to the model sailplane pilot.

Several times I have relied upon Dust Devils in welcome lift, but I use a rule of thumb which dictates below 1,000 ft above the ground. Even though altitude increases, I have had some very bumpy rides above the ground. However, I feel that if a Dust a model glider, it can be used briefly for a momentary the glider holds together and the pilot elects to ride

This time of the year (Springtime) is the time for changing and the air is becoming more and more fact that surface temperatures are daily rising the spawning of Dust Devils.

Dale Willoughby tells me that he has flown Devils and he insists that they must be hit squarely be prepared to feed in down elevator.

In experiments, I have watched several hand sight in a matter of seconds by Dust Devils here opportunity to "hook" one at a safe altitude recommendations are:

1. Be at a safe altitude when you force
2. If the Dust Devil is moving counter-to the left so as to enter it with the rotation.
3. When experimenting, use your best

whatever you fashion by cause and effect

of Arizona on that information. If the be utilized by model

in turn magnify them-perpetuates the motion, most frequent occurrences is any indidental wind, environmental wind with important to remember currents of a Dust Devil.

of one formed in the Saudi The updrafts siphoned away a base and broke up the whirling flight in the immediate area downward of cooler air.....

debatable (most scientists rotation), so is the relative

full scale sail planes for some that no dust Devil will be entered turbulence smooths out a bit as the in Dust Devils thousands of feet Devil can be entered properly by altitude gain. Or, even as long as it out.

such disturbances, the season is unstable. This changing, plus the should provide fertile ground for

a Kurwi 33 R/C glider through Dust in the center by the glider, even so,

launch gliders of my own whisked out of in Tucson: so far I have not had the with either of my R/C Sailplanes. My

your R/C sailplane to enter the Dust Devil. clock-wise approach it in an arch moving

model with penetrating capabilities.

# Dust Devils

# ZEFIR 2 R.C. SCALE SAILPLANE

The Polish SZD 19-2A has long been a favorite of the Editor, and is presented this month with the hope that others, too, will like this sleek appearing sailplane. The full size ZEFIR 2 is a leading Open Class competition sailplane which won the 1963 World Championship. Featuring a retractable wheel/tow hook unit, a reclining pilot position, slotted flaps and was one of the first to use the tail parachute for braking. It was my pleasure to see the only one in United States land at Skylark Field, Elsinore, under the pilotage of Jerry Austin early in 1967. His ship was extensively damaged in competition in Utah and since a new fuselage will cost in the neighborhood of \$4,000 delivered from Poland, it is unlikely that it will fly again.

An abundance of scale detail is provided in this issue and in conjunction with the full size plans presented, it is possible to build a well detailed scale model which will not only look good, but will fly as well.

I will admit that some liberties were taken with the model sailplane in that it is not in every detail true scale. However, this is common with many R/C scale models... supposedly to provide better flying qualities... which is not always so.

This model ZEFIR 2 is easily constructed from the materials most model shops stock; has only 9 formers and a stalwart pair of strong spruce stringers on the sides and spruce top and bottom longerons. This same technique of hardwood frame with balsa sheeting and the use of more balsa to streamline and to round off the corners is very prevalent in Europe. Most of the kits I have imported and sold embody this method of construction. The wings are the same type of building... using the "D" box section for strength. Study the exploded step-by-step building instructions first to become acquainted with this method of construction.

## FUSELAGE

Start by cutting out all the formers. This can easily be accomplished by pasting the former patterns cut from the plans to the specified size balsa or plywood with rubber cement. The dime store offers a 29c bottle which is sufficient for this purpose. Use it also for the ribs. After they are cut out, both the paper and the rubber cement adhesive is removed by rubbing. Next taper the 3/32" x 1/8" spruce side longerons to a 1/16" thickness at the rear, then marking the posi-

tion of each former lightly with pencil. Begin cementing at Former #3 and join the two longerons simultaneously. Work toward the rear, wrapping each station with rubber bands, making sure they are square with each longeron and properly aligned. Use white glue (Elmer's or Wilhold) as the adhesive for joining balsa to hardwood and plywood to hardwood. You will find they will adhere better than cellulose cements. Cement Formers #2 and #1 last, then add the top & bottom longerons which are 1/8" square spruce. A word here about spruce. Don't buy spruce that has a very distinctive grain running on a diagonal thru the piece. It has no shear strength and will break upon a hard landing, whether it is used in the fuselage or in the wing. Using a white glue also affords the time to check the alignment of the fuselage from time to time ..... don't build in a left circle.....

If you are unable to buy spruce in 48" lengths it will be necessary to splice as shown on the plans. Next add the nose block, and when dry carve to shape. Note the details on the scale sketches show the nose block is detachable with the canopy, however, this feature was not designed into the model, due to the length of the canopy available. Now add the wing saddle blocks, #19 and #20 and carve to fit the curvature of the fuselage, remembering that the whole fuselage is sheeted. Next add the rudder post, #11 to the fuselage. Construct the fin on the plans adding the fin ribs in sequence, then mount to the fuselage. Do the same for the rudder and when dry sand to a streamline shape, add hinges and lay aside to dry well. You will find that additional rudder area is evident, in comparison with the scale drawings. The absence of ailerons made it imperative. Next cut out the servo tray, which serves to strengthen the center section of the fuselage, make a dry fit of the servos to be used, then remove the servos and add the tray (1/8" ply) to the center of the fuselage. We advise the pushrods be installed prior to sheeting the fuselage. On the prototype ZEFIR 2, we installed a real neat wheel for cushioning the landing, which had a telescoping spring action, between Formers #4 and #5. It almost is like the scale wheel on the prototype. It was mounted on a piece of 1/8" plywood with a sheet metal bracket to retain the wheel. It is non-steerable. Originally it was a steerable tail wheel made in Germany and is available from TECHNICALSALES, P.O. Box 2233, Alhambra, CA., 91803 for \$11.95. Ask for the one called Cushion-Aire. It has a 1 5/8" wheel and tire. It looks nice, but the installation required some modi-





# LET'S GO TO THE (GLIDER) RACES - OR WHO'S GOT SOME DEVCON?

The Santa Cruz R/C Bees Fourth Annual Sail-plane Pylon Race had wide publicity as it has been an annual affair in the springtime since 1966. This year they attracted 38 contestants on Saturday... mostly from the Bay area, though one contestant from up Seattle way and your Editor from Southern Calif.

The site, perched on the top of a huge sand hill, overlooked the Pacific Ocean from about 200 feet, so the winds provided good lift... when they blew. Sunset Beach State Park charges an admission of 75c per car per day, and when the Ranger took my money I was free to travel to the base of the hill to park. Access to the site, except by foot, was prohibited, so when I arrived there, lines of modelers wound their way up the roughly surfaced road, huffing and puffing, burdened with transmitter, tool boxes and assembled glider of various wingspans and colors. Bright sunshine turned the cold wind from the ocean into a pleasant breeze, once one found shelter among the small pines, or amidst the scrub bushes that sometimes served to help retain the sand on the hill.

Transmitters were placed inside the only vehicle allowed on the hill-top, then three bucks together with name, frequency, glider and club affiliation gave you the privilege of test flying. First, though obtain a ribbon festooned clothes pin from the top edge of the Ford Van roof which contained the transmitters, which corresponds with your own frequency flag. Test flying was really inconclusive as there were no marked pylons and not too much wind with which to "speed" the glider, so after a few laps to check trim, head down wind turn baseleg and try to pick the softest greenest bush for the landing. Had one all chosen but gusty winds knocked the glider off course, so it is landed anywhere. Almost a controlled crash.

Now its time for the Official Racing, so all of the pilots are summoned by the Contest Director who mounts the back of the Ford as a speakers stand and begins the Pilots Meeting.

"All right, guys, we are going to raise the planes up one at a time and the flagman at the other end of the course will raise a colored flag. We have marked off a place to fly and we want you guys to stay in the area marked. The reason is that the Rangers don't want too many of these nice bushes trod on, so go around - not over them. The flag colors will change from race to race depending upon your position on the hill. We are going to fly only three

planes at a time today, probably four tomorrow. We need three Lap Counters - probably someone out of the crowd and each contestant needs a co-pilot to call the turns for him. The guys on Stand-By (next up) can count laps if they want to, but do not delay the race. The co-pilot must retrieve the glider. The pilot takes his transmitter back to the Van with the switch OFF. You got to go around the pylon." concludes the Contest Director.

One of the contestants says, "You keep saying the glider has to go around the pylon, don't you mean he just has to pass it?"

"Right, he just has to pass it and the flagman will flag him. See that stick with the orange pennant on it about three fourths of the way down the course? When the glider comes even with that marker, the flagman will raise the colored flag, then when your glider passes him he will bring it down. This end pole is both the Start and Finish Line, the model must cross the line from right to left and then re-cross it to finish the race. The Pylon Judge on this end will signify if you have not crossed it by calling 'Cut pylon'. Any questions? Yes?" (pointing to one hand in the crowd).

"How long is the Count Down?"

"It will be a ten numbered Count Down, not with the stop watch but just verbal and will end on a ZERO. There will be three rounds of flying, with scoring for points based on 3 points for 1st, two for 2nd, and one for 3rd, when three planes race. When four planes race add one point to each score. The ten highest scores will qualify today for the Finals tomorrow. Those not qualifying today may still enter tomorrow and if they qualify tomorrow morning, can compete in the Finals to be flown in the afternoon."

"How about substituting gliders?"

"You can substitute gliders IF you have a crack-up. But you cannot change either wing or stabs from round to round. In other words, you must keep the same configuration allday long. You can race today with one configuration, disqualify yourself if the weather changes or if you so choose, then enter a different glider tomorrow. However, if the wind conditions are not what you expect and are not suitable for your Sunday's choice, you are out of the race if you don't qualify. Any more questions? O.K., then the first race is up and the second is on Stand-By."

Then followed a general milling around, a check of the wind indicator, which was hovering around 10 kph, which is 6 mph. This was marginal lift, so the

with notable success. Others flew with full down trim on the transmitter, and about half forward stick, but was at a disadvantage for the turn sometimes required not "up" but "down" and when pressure was relaxed on the forward stick, the glider would climb like a "homesick angel", thus killing the forward speed.

Then suddenly in the middle of the fourth race of the Finals, the wind dropped to a mild breeze, the sun became brighter and the heavier loaded sailplanes could hardly make the course. After some hesitation, the Contest Director made the decision to continue the race, and a bare 5 minutes later the wind was again blowing at 20 mph, this time blowing directly off-shore and providing excellent lift.

Racing in the finals is like no other type of sailplane flying. The winners were now acquainted with their own gliders... the amount of stick pressure to keep their birds on a straight path in the gusting wind, and had pretty much settled down to concentrated racing. With all senses focused on the flight of the sailplane in the race, it was go-for-broke all the way. As a consequence, by the middle of the Finals, at least six, if not more, gliders out of 20 were damaged due to mid-air collisions. I counted 9 gliders down at the end of the race, some reduced to "Instant rubble". My Elfe had the wing sheared off by Bob Francis's Del Gavilan, at a time when we both had high point totals. One failed to go "down for the count" however. It kept on flying with only the forward one third part of the left half of the all - flying stabilizer, and what's more, went on the record as a 1st placer for that race. It was pretty audacious flying and it seemed as though it hardly affected the flying qualities of the glider.

Then came an unusual situation. In the Finals, two contestants were on the same frequency, so they could not fly in the race together. Each was launched and flew against the clock for the 5 laps and the fastest of the two contestants ( 1 minute 13 seconds) went on to fly off for his standing among the winners.

By this time the wind was approaching storm strength and the high cirrus clouds had dimmed the sun, thus making the wind seem colder. The approaching storm was clearly visible now in the distance, but there was only one or two more races yet on the schedule. Then suddenly it was all over.

People began to straggle down the hillside with mostly the same load of gliders, tool boxes, etc., and the photographers were rushing around to get photos of the winners. Strangly enough, all three winners were from the same South Bay Soaring Society, who put on a monthly thermal soaring contest.

The winner had designed his racer specially for the contest with a low profile fuselage, a wide low aspect ratio wing with no dihedral for faster turning capabilities, with ailerons and V-tail. Second place model was also designed for the event and would not stay airborne in less than 18 mph winds according to the designer. It lacked ailerons, but had an unusually large rudder area. The third place winner was that generally by default, especially when there were 10 models eliminated by mid-air crashes and he won by borrowing a wing from the Contest Director.

Let me hasten to explain there is no "Builder of the Model" rule at this contest. In one instance Pilot "A" borrowed a plane from Pilot "B", his friend with whom he was competing directly against. Pilot "A" did not win.... but two contestants flying the same sailplane.... ??

Certainly some concessions were in order because of the strong winds, and the lack of a suitable place to land. Try landing in scraggly bushes resembling sagebrush with its feet buried in the sand and only the green tops exposed. Heavier gliders penetrated beneath the green tops and sometimes would contact the hard trunk of the bush beneath... with damaging effects. Such landings are hard on both the bushes and the gliders..... especially the gliders over ten pounds.

This type of racing is not for the glider buff who nurtures their gliders for years at a time, season after season, but for the modeler who enjoys a solid bit of competition... yes even showmanship... for the brighter the glider and the more dashing is the pilot, the better chances of winning the race, at least most of the other contestants watch him when he is in the air. And don't hesitate to shout words of encouragement when he competes.

This kind of competition requires a complete knowledge of your sailplanes capabilities, a big hunk of skill in piloting, and a devil-may-care attitude about his racer.... WINNING the race is the most important reason why he is there...

So the planning for such a race should begin at least 6 months earlier. And at this race, the fourth to be held since its conception, there is a marked swing toward not flying the "Sunday flier" but real design work toward the ultimate in racing gliders.

In my opinion, the next years race will see some gliders with variable camber wings, i.e., airfoils adjustable in flight to create a highly undercamber wing section, then that same area moved by servo to form a reflex section with high speed capabilities. Will you be there with your creation? Hope so.

..... Dale Willoughby, Editor

Launching was delayed for about an hour. Finally the meter read 15 kph (9 mph) and the Race began. Three pilots walked down the marked area, three co-pilots carried the gliders while three Lap Counters stood behind the co-pilots.

"O.K.... Hold your glider up.... Got a co-pilot? Lap Counter? All right. Your color is blue."

To the next man, "Need a Lap counter? Got one? O.K.... your color is red." After he held up his glider and watched the distant flagman wave a flag.

"Ready? All set. Your color is yellow."

"Wait a minute... Need some tape for this nose. Now I'm ready."

"All ready?" All pilots assent. "Maintain your present position on the hill, do not get into the area behind the yellow line as it will interfere with the Pole Judge, Co-pilot can launch for you.. He also can re-launch for you if you go down."

"Any time limit?" from one of the pilots.

"No time limit, but be reasonable, the Race must go on. O.K. Launch at will."

Three sailplanes whistle slightly as the co-pilots launch. One runs, one heaves and the other holds the nose down and walks into the wind to the very edge of the hill and lets the glider slide into the up-draft. Slowly they climb into the wind, each in a different direction, the sun sparkling the waves the freshened breeze had kicked up, and soon all were high and circling behind the Starting Pole.

"All ready?" the call goes out... and three responses indicate the race is about to start.

"Ten, nine, eight, seven, six, five, four, three, two, one, ZERO..... Good start, its an official race". And now the airborne sailplanes, once high and slow in flight, are pushed over into a dive headed for the pylon about 500 feet away. Had one sailplane crossed the line (imaginary) projected into the ocean at the Starting Pole prior to the time the ZERO was reached, he was required to circle back and again cross the line AFTER the ZERO was pronounced. Such a "no-no" can take time and in several cases cost the pilot who jumped the gun the race.

The lift is slight because the wind, though fresh, is coming at an angle to the face of the cliff, so the pilots must turn the gliders carefully and try not to lose precious altitude. One huge sailplane comes by the pit area, hits the sighting pole on the very tip of the wing (another half a foot and it would have missed the pole entirely) and the glider goes into a very flat spin and hits the ground with a thud... no damage. The co-pilot hastily retrieved it, holds it aloft for a quick check of the controls by the pilot, and heaves it off to continue the race... losing about 10 seconds.

One co-pilot, a three year veteran of the races, in a calm even voice tells his pilot, "Keep her coming... good, turn." A few seconds later he cautions, "The flag is up, take it easy, turn... nice.. Go outside of the red bird. "

From some bystanders... "Oh, oh", as two gliders collide, one heading for the side of the cliff minus both wings. Making a graceful arc into the side of the hill, it bounces down the steep slopes to disappear from sight in the greenery. The wings, one damaged and the other intact, are blown like falling leaves up over the hill side. Once out of the lift spiral down into the green bushes near the access road. The other glider with one wing panel dangling and only held by the silk, quickly disappears in a wide arc over the sandy beach.

Again comes the calm urgent voice, "Keep going, keep going, ready, turn." and silence for a few seconds, then again tersely, "The flag is up, ready, turn. Come straight down wind, this is your last lap. You're coming in good, now dive and zoom back to the pole.... you have just won yourself a race..... you've won... Nice race! Bring it over there and I'll get it."

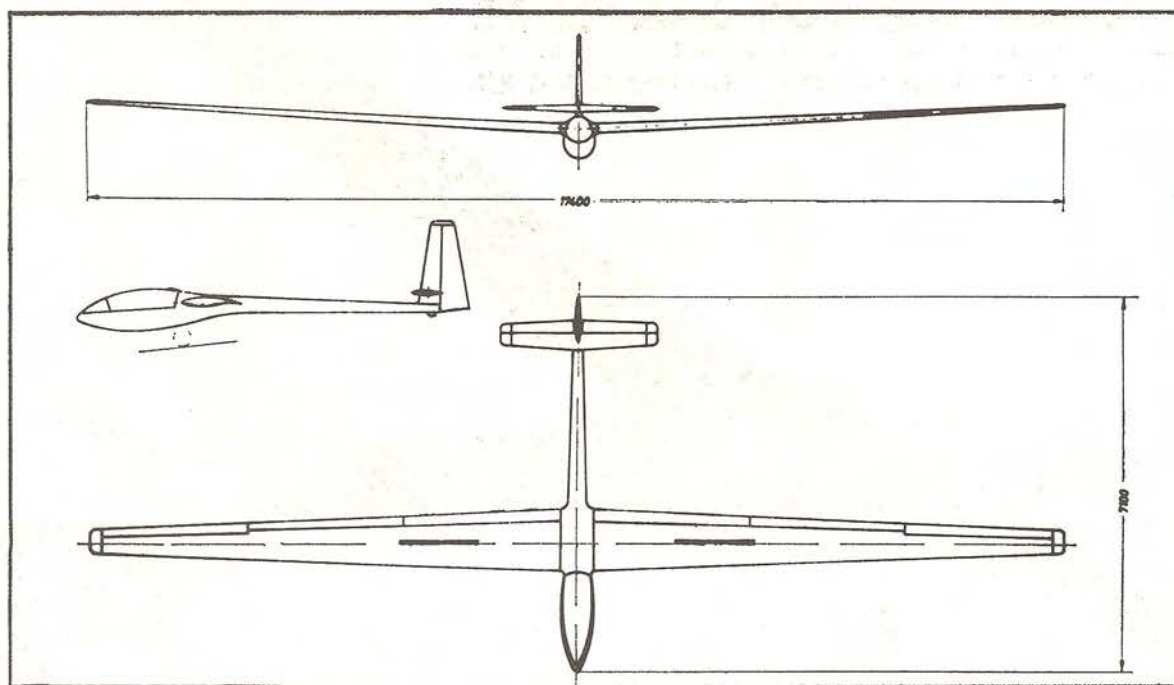
This same kind of action goes on race after race, with the sun now over head, now beginning to shine into eyes on launching.... getting lower and closer to the shining blue sea.

Now the wind has freshened and is gusting to nearly 20 mph making headway against the force of the wind a slow and tedious process, especially for the sailplanes with undercambered airfoils. Far out to sea, in the haze of salt spray, the clouds are darker over the horizon, fortelling rain. The whitecaps get more numerous and more distinctive on the water below, the roar of the surf increases, but the races go on.

Soon the preliminary races are over, the contestants given a 20 minute lunch break. During this time the top ten from Saturday's race are combined with the top ten of Sunday's race, and sorted according to frequencies so as to get four models in the air at one time. With that many flying at one time, the heats are flown in less than 2½ minutes, so the Finals move right along timewise. And the tension mounts.

The dark clouds are closer on the horizon, but still the sun shines and the wind has now picked up. The Wind indicator is steady at 24 mph and some contestants are furtively balancing additional weight in the hand, trying to determine just how much to add and still remain airborne. For the record, one contestant added 14 ounces of lead and a pair of Ford pliers (7 ounces) to the nose of his 10 ft glider





Germany's VFW FK 3 All Metal Sailplane

**Fk 3**

The Fk 3 was developed by the Vereinigte Flugtechnische Werke as a single-seater high-performance glider of the open class. Series production commenced in the VFW Speyer plant a few months ago.

All structural parts of the Fk 3 are of metal; it is specifically designed for bad weather conditions, having retractable landing gear and fixtures for installing two 50-kp water tanks in the wings as ballast. Technical data of the Fk 3: wing span 17.4 m, length 7.2 m, wing area 13.8 sq. m, maximum speed 270 km/h under all weather conditions, minimum rate of descent 0.5 m/sec., glide ratio at 88 km/h 42.

**TECHNICAL INFORMATION:**

- Wingspan 58 ft
- Wing area 153 sq. ft.
- Aspect ratio 22: 1
- Full span flaps - Variable -10° to +15°
- Water ballast (2 - 55# adjustable)
- L/D maximum 42 at 55 mph
- Minimum sink - 1.65 fps at 40 mph
- Placed 10th at 1969 U.S. Nationals with Harro Wodl at the controls.

Photo and data courtesy of -

# SCHWEIZER SGS 1-34 SAILPLANE

Kit FS-26 Span 8 ft. 2 1/2 in. Area 615 Sq. in. Wgt. 2 1/4 lbs. (less R/C) Scale 2 in. = 1 ft.  
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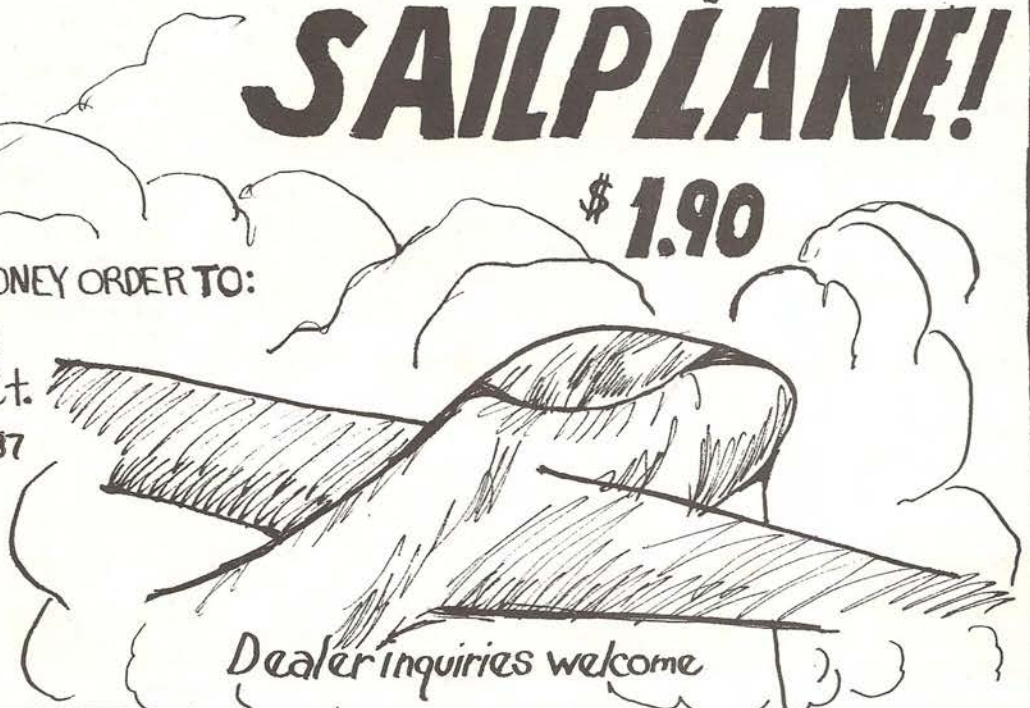
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## WORLD RECORD TRIALS - FAI HEIGHT AND DISTANCE

The Tustin Model Club will sponsor World Record Trials for R.C. Gliders - FAI Class F3B - Category 25 - Distance in a Straight Line AND Category 26 - Height (Altitude) on 29 and 30 May 1970. Site of the Trials will be El Mirage Dry Lake, a perfectly flat and dry lake bed about five miles long and at least two miles wide; situated near the famous El Mirage Field. Next August (11-21) the National Soaring Championships will be held at El Mirage Field, (California). The Tustin Model Club will provide an electric winch, Hi-Starts and tow lines which will not exceed 300 meters. Arrangements have been completed for a full size Chase aircraft for Altitude (Height) flights and portable barographs will also be furnished. The event will be sanctioned by the AMA and participants must be current AMA members with a valid FCC license for radio operation AND must pre-register prior to 20 May by sending the \$4.00 towing fee to Tustin Model Club, 14695 Candeda Place, Tustin, CA., 92680.

Flying will begin at 8 a.m. on both days and cease at dusk... NO sport flying will be permitted at the Record Trials site. Memorial Day falls on a Saturday this year and normally the day before a National holiday on Saturday is observed on Friday.

In this area, dust devils and visible thermals go to 10,000 ft. The temperature in late May also goes to above 100°. Bring your own binoculars or tracking devices. There will be a certified barograph on the chase aircraft for the altitude trials. The cost of the Cessna Skyhawk to record your altitude has been fixed by the pilot at \$15.00 per hour. Please state your frequency when sending the registration. It is anticipated that once the frequencies are sorted out simultaneous launches will be possible at the peak of the best thermal conditions.

Contest Director will be Dale Willoughby, AMA 4277, current holder of the World's Speed Record for R/C gliders. Complete FAI rules governing the conduct of the FAI Record Trials are available from the Academy of Model Aeronautics, 1239 Vermont Ave, NW, Washington, D.C., 20005 (\$1.00) or will be available for reference at the Dry Lake.

At the time of writing, the World's Record for Category 26 - Height - stood at 4,908 ft which was set in 1968 by Ray Smith of Silver Spring, MD. The World's Record for Distance - Category 25 is now in America (tentatively) and was set by Gerald Martin, details which appear on pages 3 and 4 of this issue.

On 18 April members of the Tustin Model Club visited El Mirage Dry Lake in preparation of holding the FAI Record Trials, found that after 12 noon, the surface winds were strong enough to break up the then forming thermals. Prior to that time, thermals were

abundant and fairly strong. The group arrived at 9 a.m., and found the sun shining nicely. Dale Willoughby, the Editor, was one of the first to put up his CIRRUS R/C sailplane via Hi-Start to about 400 ft altitude and found a 6 minute thermal. By the time he had landed, Dan Hill and Al Mitchell had flown into the area and landed the Cessna 150 Skyhawk on the flat bed of the dry lake. With this aircraft on hand, which has been chosen for the chase aircraft to record altitude and calibrate the precise height above the ground, Dale Willoughby launched again... this time for only a 4 minute flight.

Then came the briefing of the Tustin Model Club members as to their respective duties and then a few "dummy runs" were made. Again Dale's Cirrus was launched and found a thermal right off the top of the tow. Dave Stefan radioed the Pilot, Dan Hill, on the portable Bayside radio, to take off immediately. Al Sargeant kept the binoculars handy while he watched the circling CIRRUS. As soon as the pilot had taken off with his back to the circling CIRRUS, by radio he was advised as to the exact location of the glider, and soon reported by radio he had it in sight.

The CIRRUS was travelling fast down wind, even though in a thermal and circling, so it was necessary for Dave Stefan (with his portable radio), Al Sargeant with the high powered binoculars, and Doug Volder carrying the portable radio, to pile into the Volkswagen House car, driven by Dave Anderson, TMC President, and follow the glider down wind. Of course space was no problem as the dry lake bed is perfectly flat for 4 miles down wind from the launch site. As soon as the Volkswagen would catch up with the Cirrus, all would dismount to keep the glider in view and to advise the pilot about its location.

Never exceeding the height of the CIRRUS, the pilot of the SKYHAWK found it easier to keep the glider in view by flying an oblong race-track course, rather than a constant banking circle. Thru the use of three Thermals Dale Willoughby managed to keep the CIRRUS up for 40 minutes, but never exceeding 3,300 feet. At about that altitude the thermals lost their lift and dissipated. He managed to get one leg on his Level III League of Silent Flight Certificate for the flight.

Increasingly strong winds kept most of the other gliders there limited to not over 7 minutes, mostly because of the down wind drift. Then by noon it was impossible to find any strong thermals. Dan Hill, a commercial pilot, predicts higher temperature range in late May will result in more verticle thermals.

## R.C. GLIDER CONTEST AT GLENVIEW NATS FINALIZED

### Rules for use at the 1970 National Experimental R/C Soaring event

- 1) The purpose of this competitive event is to obtain maximum flight duration from an efficiently designed aircraft and skilled piloting.
- 2) All contestants will be required to hold valid AMA and FCC licenses for entry in this AMA sanctioned competition.
- 3) Aircraft requirements:

Maximum weight	11.00 Pounds
* Maximum area	16.146 square feet
* Minimum area loading	3.95 oz/sq. ft. 2.75 oz/100 sq. in.
* Maximum area loading	24.51 oz/sq. ft.

\* Note: area is TOTAL projected area of wing, horizontal stabilizer and elevator.
- 4) Aircraft classes:

Class "A"-Gliders with 750 sq. in. of area or less.  
Class "B"-Gliders with over 750 sq. in. of area.
- 5) Entry fee:

\$3.00 per event. Contestants may enter both classes only if two separate and complete ships are used.
- 6) Launching methods:

All flights must be launched by hi-start line or gas-electric powered winch.  
Active length of winch line or stretched length of hi-start line will be a maximum of 984.3 feet (300 meters) when wind direction and field conditions permit.
- 7) Contest procedures:
  - a. At the start of the contest all transmitters will be impounded and issued only for official flights.
  - b. Flight order for each two days will be determined by drawing lots.
  - c. Flying will be done in rounds with the number per day limited only by time, weather, and C.D.'s discretion.
  - d. Winners in each class will be determined by their high point total of their best three flights of each day. Only flights in a completed round will be used for determining the winners.
- 8) Scoring:
  - a. Maximum flight time will be 15 minutes with one point awarded for each second duration.
  - b. One point per second will be deducted for flight time over the 15 minute maximum.
  - c. Timing will start when the launch line releases from the model.
  - d. 100 points will be awarded for landing within a 15 foot diameter circle and 50 points for landing within a 30 foot diameter circle.

For further information, including entry blanks a list of rules please advise those interested to send a STAMPED, SELF ADDRESSED ENVELOPE to:

1970 Soaring Newsletter  
P.O.Box 49D  
Plainfield, Illinois 60544



# Ghost Family Of Soarers

ZEPHYR page 19

GHOST FIVE - Part 2

By Major Ottar Stensbol, Norwegian Air Force

This number 5 in the Ghost-series was intended to be an experimental thermal soarer with some slope capabilities. I decided to use a laminar wing-section to find out how this would work out compared with orthodox sections like the under-cambered type. The general layout of the Ghost-family was naturally retained as there are no reason to change this aerodynamical/mathematical solution of the laid down requirements to flying performances.

It should be noted that this particular model has a very short moment-arm. With such a short couple the theoretical performances in circling thermal flight should be the best possible. The present design, however, can easily be changed into a "normal type" by increasing the moment-arm and simultaneously reduce tail-area. But such reduction in tail-area must be done according to proven formulae such as:

$$\text{Moment arm} = \frac{\text{Wing area} \times \text{Mean wingchord}}{\text{Tail area} \times \text{A factor "K"}}$$

Put "K" for this type and size of a model to  $K=140$  and you are safe.

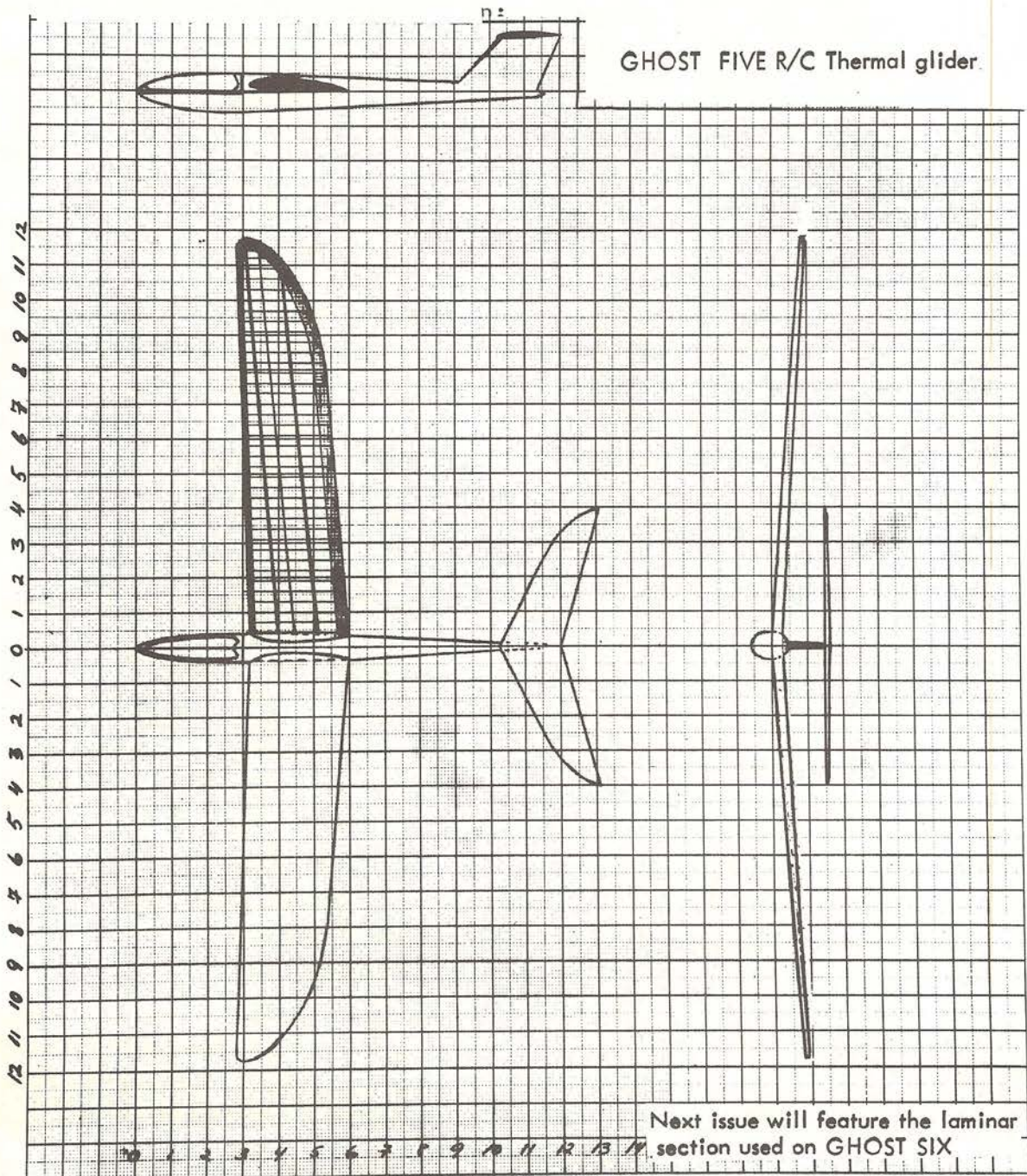
## Some data on "Ghost 5":

Wingspan : 236 cm  
Wing area : 54 dm<sup>2</sup>  
Incidence : + 3°  
Wash-out : + 4° (along the elliptical wing-tip only!)  
Wing-section : NACA 65-414  
Tail-span : 30 cm  
Tail-area : 9,7 dm<sup>2</sup>  
Incidence : + 1°  
Controls : RET  
Flying weight : 1600 gram  
Wingloading : Approx. 29 gr/dm<sup>2</sup>  
Flying speed : Approx. 6 m/sec  
Calculated Reynolds-number with these data ( $V = 4 \sqrt{\frac{VG}{F}} \cdot 0,8$ ) and ( $R = 70 \times V \times C$ ) equals 109 200. Very easy to adjust  $\overline{F}$  over a wide R-area.

The advantages obtained with a laminar section like NACA 65-414 are many. First of all this wing can be used for both thermal-flights and slope-soaring with only minor trim-changes in Cg. Naturally, the physical strength must be granted! Secon, this NACA 65-414 is ideally suited for trim-able trailing edge (almost like "flaps") in order to increase performances in circling flight. Such a "flex-able" trailing edge of a wing-section will no doubt be a common feature very soon! With modern proportional soaring birds we will definetly see some really fine flying performances along these lines.

"Ghost 5" is a typical "short-couple" type and should be trimmed out quite carefully. It should also be appreciated that such a design must be light, so please take care during the building stages.

For those who prefer a ready-made fuselage instead of a tedious, orthodox build-up, I can recomend a FOKA-fuselage. Only minor changes in the tail-section are necessary in order to adopt this particular fuselage to the standard "Ghost 5" - set up.





# X-TRA/KÖST

*MUSIC*

Salutes

ZEPHYR

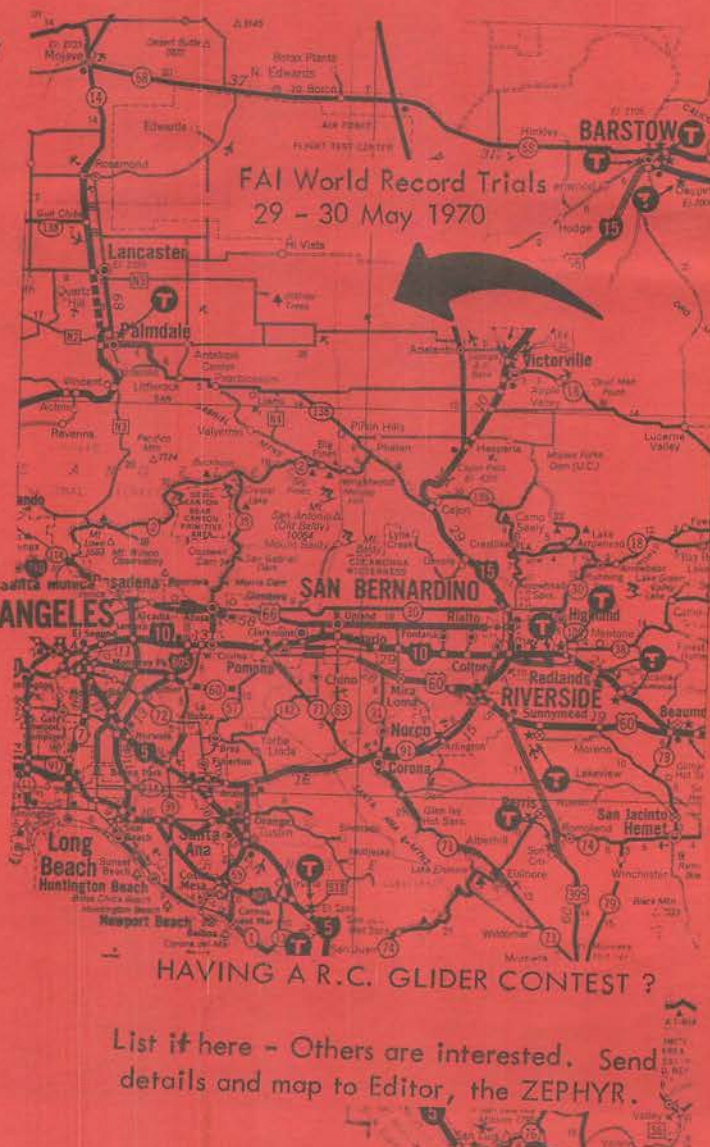
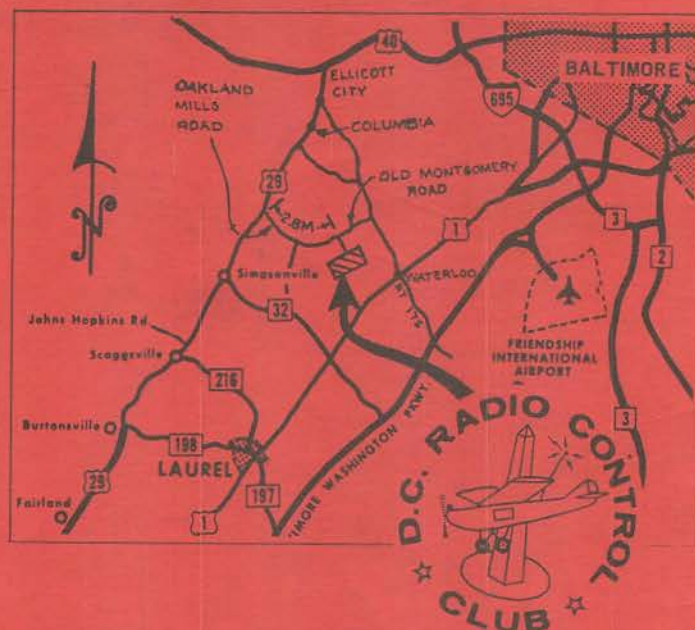
We Wish You Much Success

Presented this 19 day of May 1970

*Norman M. Shelton*  
GENERAL MANAGER  
LOS ANGELES, CALIFORNIA, USA

## CONTEST CALENDAR

- 10 May - North Bay Soaring Society - See note "C"  
 23 May - Tustin Model Club - See Note "A"  
 29-30 - FAI WORLD'S RECORD TRIALS - Details on  
 May page 17 - Map on this page -  
 24 May - South Bay Soaring Society - See note "B"  
 6-7 - East Coast Soaring Societies - DC/RC Field  
 June CD: Carl Maroney, 3107 McComas Ave,  
 Kensington, MD, 20795. Barbeque on Sat.  
 13-14 - Karlovy Vary MFC, CSSR, Class F3B comp.,  
 June Multi-channel, Czechslovakia.  
 13-14 - Harbor Soaring Society - Western R/C Soar-  
 June ing Championships, Riverside site, CD:  
 Bob Hahn, 1866 Chateau, Anaheim, CA  
 20-21 - Rhineland Soaring Championships, Thermal  
 June (RC IV) only, Eudenbach, NRW, Germany  
 28 June - South Bay Soaring Society - See note "B".  
 27-28 - Nats R/C glider meet - Rules and CD on pg  
 July 18 - No location stated.  
 22 Aug - East Coast Soaring Societies - Monmouth M.  
 A.C., CD: Dick Sarpolus, 32 Alameda Ct,  
 Shrewsbury, NJ, 07701, Site: NAS Lakehurst  
 29-30 - LSF 1970 R/C Soaring Tournament, LSF with  
 Aug North & South Bay Soaring Societies, Site:  
 Hummingbird Field, Livermore, CA, CD: ?  
 More details in next issue of ZEPHYR.  
 12-13 - International R/C glider competition - Thermal  
 Sept and Slope, Site: Rana & Loun, CSSR.  
 19 Sept - Tustin Model Club - See Note "A"  
 27 Sept - East Coast Soaring Societies - Dover Mosquit-  
 os, Site: Dover, Delaware. CD: ?



**NOTE A - TUSTIN MODEL CLUB** will hold a R/C  
 Glider contest on this date, LSF competition points,  
 TMCRules for 3 rounds, FAI provisional rules (see  
 pages 20 & 21) for 2 rounds, flying from 8 a.m. to  
 4 p.m. at Foothill High School. Contact, Dave  
 Anderson, 13892 Holt Ave, Santa Ana, CA. (714)  
 544 - 5820.

**NOTE B - SOUTH BAY SOARING SOCIETY** will hold  
 a R/C glider contest on this date, LSF Comp. pts,  
 usually at Del Mar High School, San Jose, CA.,  
 with rotating CD. Further details from: Keith  
 Brewster, 556 So. Murphy Ave, Sunnyvale, CA.,  
 (408) 245 - 3050.

**NOTE C - NORTH BAY SOARING SOCIETY** will hold  
 a R/C glider contest on this date, LSF Competition  
 points, usually at Bundy Field, Larkspur, CA. with  
 rotating CD. Further details from: Sam Crawford,  
 65 Maplewood Dr., San Rafael, CA (415) 456-9591.

List it here - Others are interested. Send  
 details and map to Editor, the ZEPHYR.

# ZEPHYR

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