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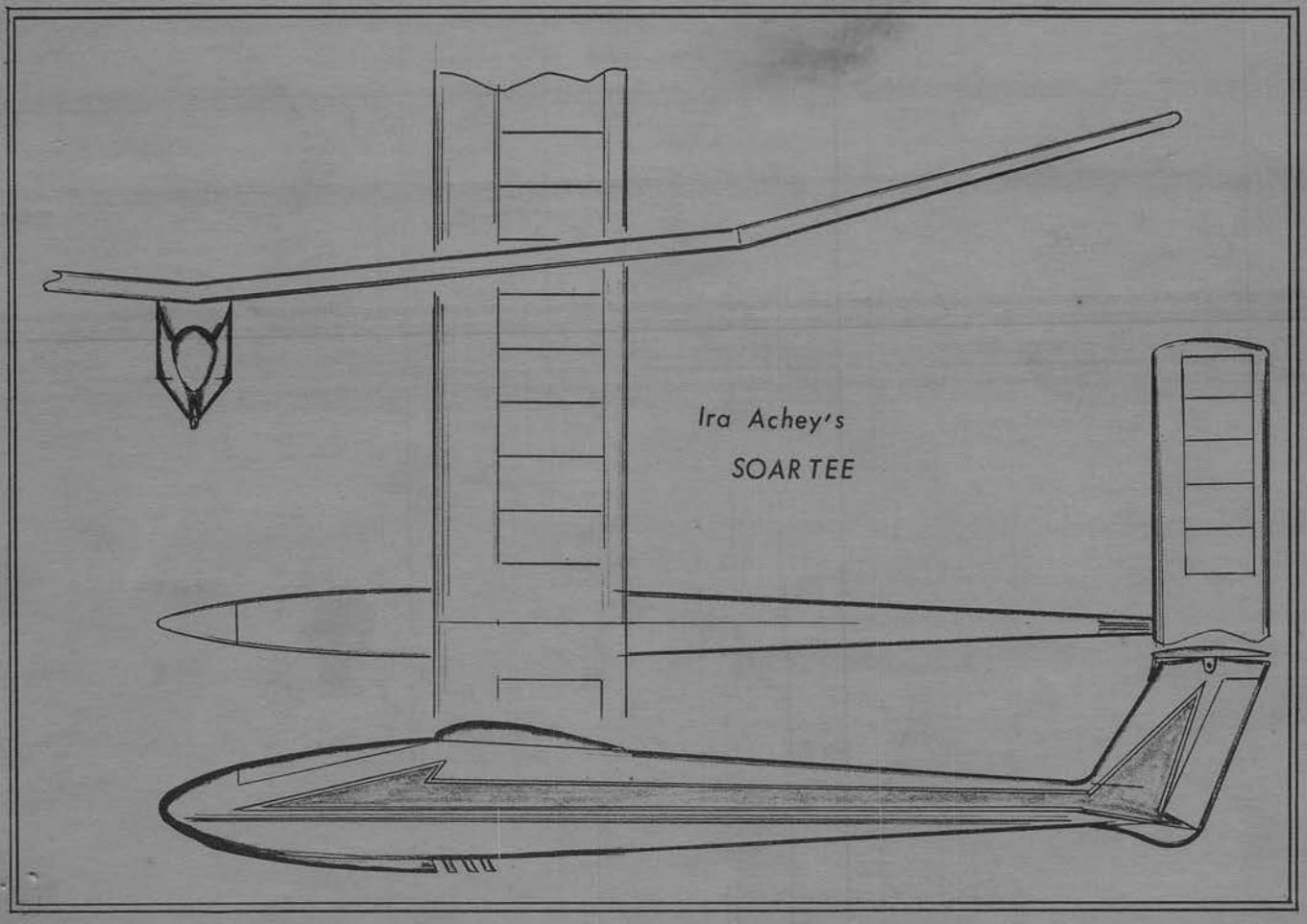
In This Issue -



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

Volume One Number Two

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
14695 Candeda Place
Tustin, California,92680

CONTENTS

EDITORIAL POLICY

This is not a House organ or Newsletter for Willoughby Enterprises and no direct advertising for their model R/C glider kits will appear herein.

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.

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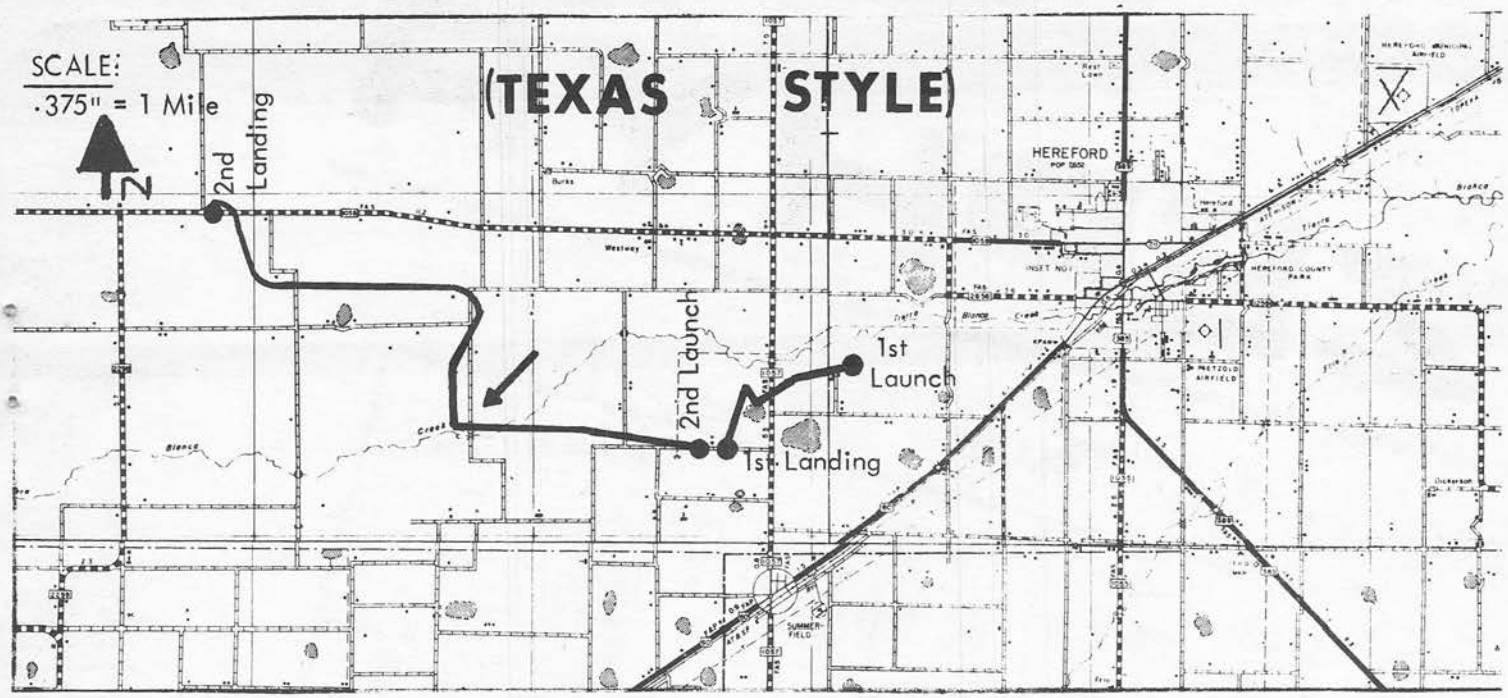
X-C GLIDING



" I thought you might be interested in a flight I made on February 7 with my SNIPE glider to explore the possibilities of record type distance flights in this area as per our conversation on the phone. As you know the two major full scale sailplane distance records were made crossing this part of Texas. The free distance record of over 640 miles by Al Parker of Odessa, Texas and the declared distance goal of over 500 miles by Wally Scott.

Enclosed you will find a map showing my route of the sailplane in an effort to determine the requirements for cross country distance flying for R/C models. The initial starting point was in the green triangle Southwest of Hereford. (Ed.. the black dots indicate launching and landing spots.. the green would not pick up on the printing process) The temperature was 63°F with a 5 mile variable Easterly wind. The tow was with an electric winch with approximately 750 ft of line.

I towed twice before picking up a nice thermal and working the SNIPE up to Maximum Visible Altitude (MVA). I was then forced to loiter overhead for about ten minutes, while my crew cleared up a bad back-lash in the winch. They picked me up at the corner of the pasture and with high hopes started out in a Southwesterly direction. I did not have any goal in mind, but intended to just fly downwind as far as was practical. As you can see from the map the wind varied from Northeast to Southeast.

Unfortunately, I was down on a road in 23 minutes and only two miles out. Needless to say, I was pretty disgusted and was preparing to take it home when twin dust devils passed not twenty feet away. I launched again at 2:49 pm and in a short time again was up to MVA. Although another low point came within ten minutes after launching the second time, I was able to locate more lift by observing a hawk and circling with him. The most critical point of the flight came at the arrow. This is where we were trapped in a quarter section with no gate in the fence. I was forced to leave the pick-up and tried to keep the glider airborne while the driver, Wylie Thomas, found a way out and then met me back on the road. Although this took over ten minutes, it was accomplished with the SNIPE still a dot overhead.

Then a marvelous thing took place in the weather conditions in that I was able to fly the glider with no circling and yet retain MVA until we had gone the last 3 miles. The landing was made on the grass shoulder of the pavement at 4:01 pm with an elapsed time of 1 hour and 12 minutes. The straight line distance was 8.67 miles.

I can hardly describe the pleasure and satisfaction that we got from this flight. I say "we" because my crew included my two young sons and my driver-time keeper. They all seemed to enjoy the whole thing as much as I.

I have made arrangements with a Contest Director from Amarillo to help me attempt to set a new Distance Record as soon as I get my KURWI 68 glider finished. Thanks for the advice on the tele phone about FAI Rules and Record procedures."..... Good Soaring.....

Gerald Martin, Box 824, Hereford, Texas 79045

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ZEPHYR

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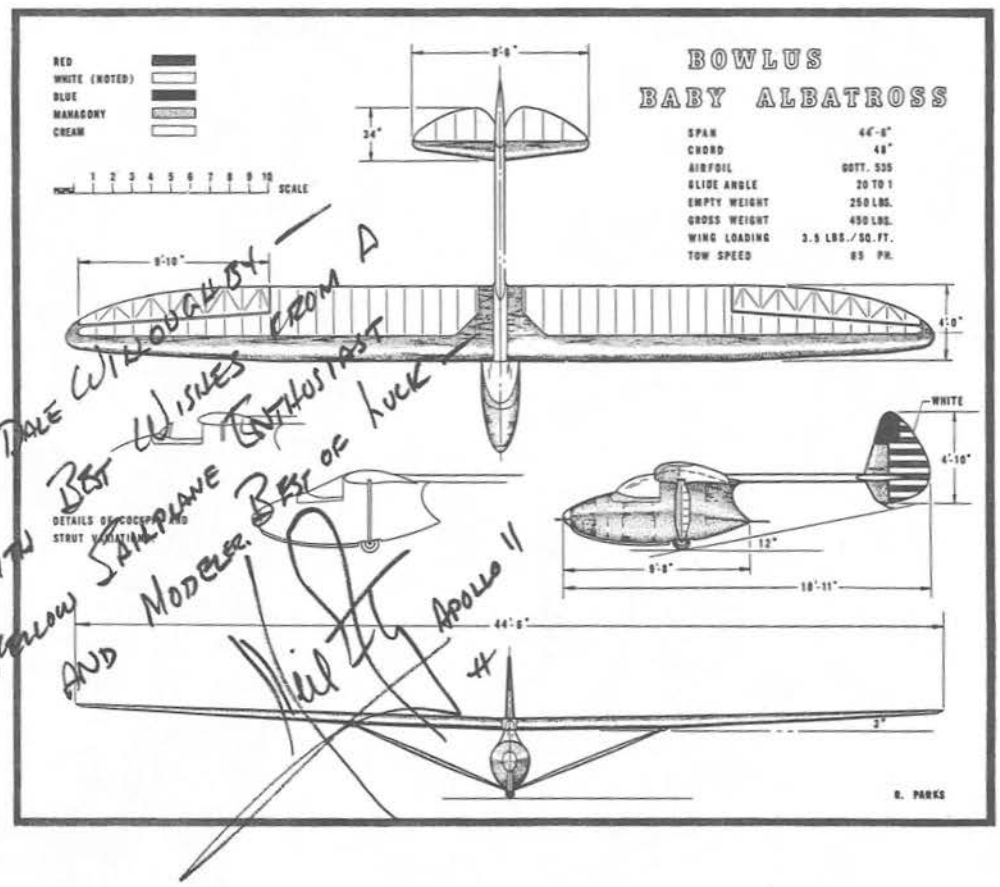

To Dale Wilcoxby —
Best Wishes from a
With Best Wishes Enthusiast
Fellow Sailplane Best of Luck
and Modeler. Apollo 11

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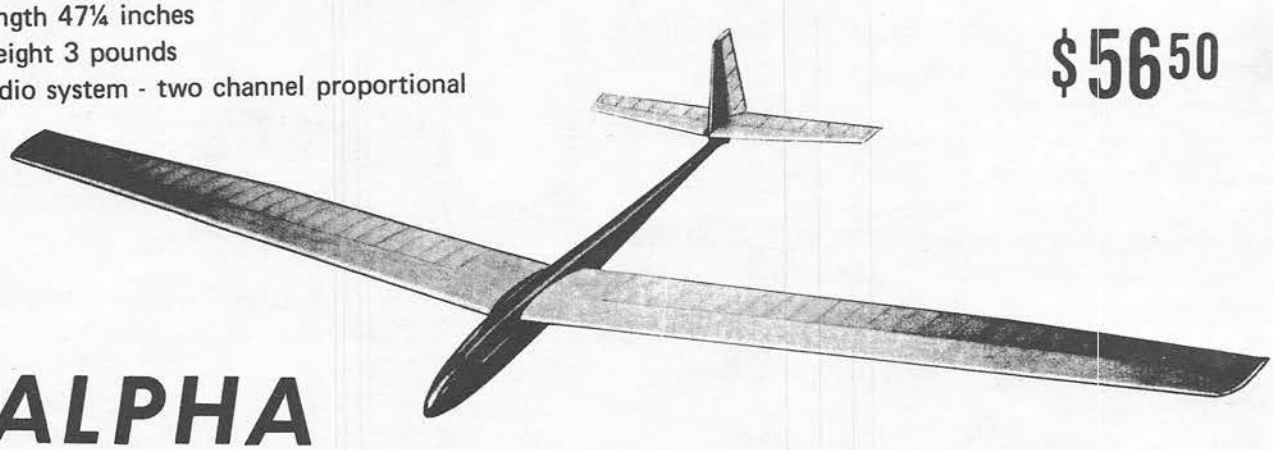
3 New Kits

wing span 110 inches
length 47¼ inches
weight 3 pounds
radio system - two channel proportional



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ALPHA

Wing span	118 1/8"
Fuselage length, approx.	45 1/4"
Length o.a., approx.	49 1/8"
Wing area, approx.	806 sq. in.
Stab area, approx.	124 sq. in.
Total surface area, approx.	930 sq. in.
Weight ready to fly	53 ozs.

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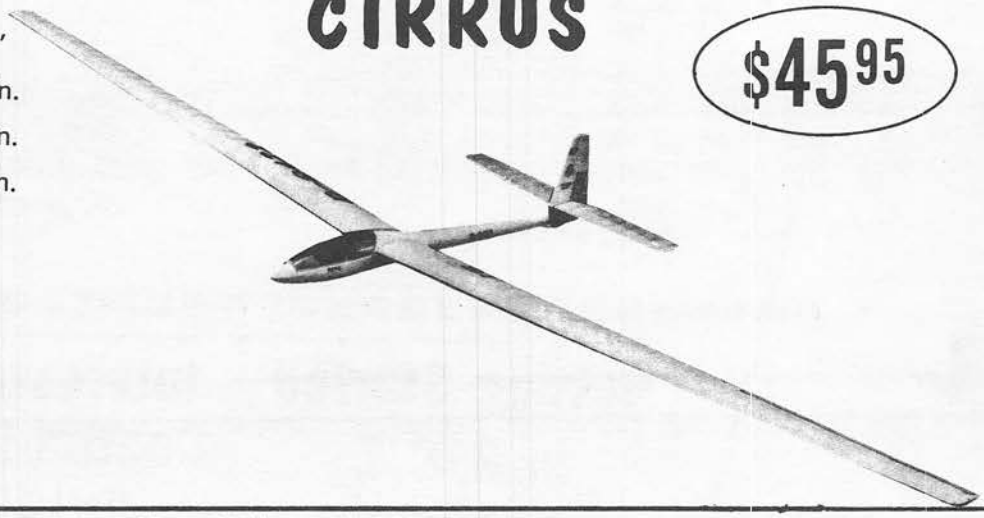

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Wing area: 825 sq. inches
Airfoil: Eppler series
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Radio system: two or three channel proportional

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35	82 "	15	3.3K	50	33K
6	100 "	50	3.9K	50	47K
50	120 "	70	4.7K	40	56K
60	180 "	85	5.6K	90	100K
25	220 "	70	6.8K	35	470K
65	270 "	40	8.2K	16	820K
105	470"	45	10K	35	9.1K 5%
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1140 Capacitors - D-Disc T-Tublar M-Mylar

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25	.047 MFD - T	45	20 pf 10% -D
25	.022 MFD - T	40	470 pf 20% D
100	.0033 MFD - T	35	3.5 MFD 20vT
20	.05 1000vDC-T	25	.1 MFD 50v D
4	.1 200vDC- T	45	.001 pf 20% D
20	390 pf - M	85	.01 MFD 20%D
65	33 pf - D 10%	45	10 pf 20% D
5	.22 MFD 200vDC	10	5 MFD 30vDC D
45	2.2 - D	7	5 pf 10% D
115	.005 MFD - D		
80	2700 - 10%		
45	25 uf 20v - T		
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GOAL AND RETURN (CALIFORNIA STYLE)

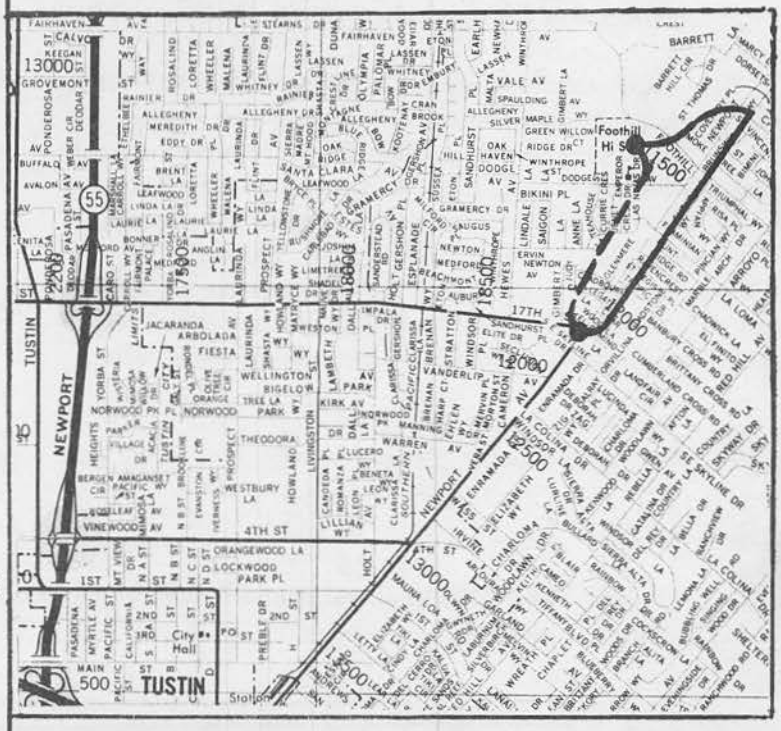
Since Level III of the League of Silent Flight Soaring Accomplishments Program (detailed in the Jan/Feb 70 issue of the ZEPHYR) requires a Goal & Return flight of 1 Kilometer (0.62 mile)... and since I had Maximum visible Altitude with the CIRRUS, I thought I'd Give a try to Cross Country flying.

The launch was made about 2:10 pm Sunday afternoon, February 15. It was actually a poor launch as the hook came off at about 250 ft altitude. The wind had suddenly dropped a few moments before release..... it was a prelude to a good strong thermal and soon the circling red, white and blue CIRRUS was quite high (probably 1,000 ft) and gliding over the nearby stables. When I asked Dave Anderson, the President of Tustin Model Club if he had a sun roof on his VW bug, he replied inthe affirmative, so I told him..."Lets go cross country". "Roll back the roof and park as close to the gate as you can." The CIRRUS was still high when I left the landing area and as I ducked thru the fence and approached his VW, I lost sight of the glider in the air. This happened to me in Norway during World Record Trials for Duration, and I panicked then and gave full "up". That was when the BIG SAILOR came apart in the air as it was in a dive headed right for me.

So this time I gently tweaked the rudder stick and at the same time swept the sky back and forth with my eyes. After just a few seconds, in which the possibility of losing this beautiful flyer loomed strongly in my mind, I saw the sunlight reflect off the wings. So I carefully steered it about a half a mile back to our position at the intersection of Foothill and Newport Avenues. As it is difficult to control any model which is directly overhead, I maneuvered the CIRRUS to fly about a half a block to my left and parallel to Newport Blvd.

Standing on the seat, half my body protruded out the top of the VW Bug. Once the airborne glider caught up and came abreast with the car, Dave gave it the gun and started out with gusto and left the glider behind. Before I could get him to slow down the wind pressure on the two frequency flags bent the antenna. However, once the forward speed of the VW matched that of the CIRRUS, we were just putt-putting along in low gear. We were headed into the wind.

After 20 minutes from the launch time, we reached the intersection of 17th and Newport with nearly 400 ft altitude. As I dismounted from the car, preparing to land, Dave suggested that I try to fly back as long as I was that high. So then he turned the VW around and as soon as I had circled the CIRRUS up to over 600 ft in another strong thermal, I ran across the road and handed Dave the transmitter, while I popped my head out the Bug like a gopher out of its hole. The return flight was down wind and much faster... 7



minutes for the return flight... 9 mph.... Coming over the fence that surrounds the athletic field at about 100 ft, I ran across the warming track to the Spot Landing pylon and found two seagulls circling over the field. Carefully, I exploited their thermal until another five minutes had passed, then blew the Spot Landing by overshooting.

Airborne time..... 51 minutes
Goal & Return Distance .....1.8 miles
Satisfaction..... Immense

..... Dale Willoughby .....

oooooooooooooooooooooooooooooooooooooooooooooooooooo

HAD AN INTERESTING FLIGHT ???

GOING TO TRY FOR A WORLD RECORD?

Send details and maps, if available, to:

Editor, The ZEPHYR
Box 824, Tustin, CA 92680

FREQUENCY MONITORS

The commercially available tone monitors are of the super-regenerative type and are useless at the flying field with other frequencies operating and flying. An economical Tone Monitor for a specific frequency is possible. The electronic parts house Radio Shack (200 stores Coast to Coast) offers a superhet "Realistic" Citizens Band 27 MHz receiver - Number 21-109 at $7.95 (no volume control).... MICROSONIC. This has a plug in crystal which can easily be removed with pliers and the proper receiver crystal purchased from your nearest R/C transmitter manufacturer for approximately $3.00 inserted in its place.

The proper receiver crystal is either 455 KHz overtone or undertone harmonic to the transmitter crystal frequency. When ordering, specify the receiver crystal for 27.045 frequency., i.e., Orbit red 27.045 transmitter uses a 27.500 MHz receiver crystal (overtone), while some other manufacturers use 26.590 MHZ (27.045 minus 0.455) undertone. Either overtone or under tone receiver crystal can be used in the tone monitor/receiver to effectively detect radio interference, etc.

Brown - 26.995 - Use 27.450 or 26.540
Red 27.045 - Use 27.500 or 26.590
Orange 27.095 - Use 27.550 or 26.640
Yellow 27.145 - Use 27.600 or 26.690
Green 27.195 - Use 27.650 or 26.750
Blue 27.255 - Use 27.710 or 26.800

The same addition or subtraction applies to the 72-75 MHZ band now in use for model aircraft.

If you have more than one 27 MHz frequency, you canget a receiver crystal for each frequency. Paint the receiver crystal casing the respective color for easy identification. When you are ready to fly, insert the appropriate crystal into the monitor and check for interference.

Other Citizens Band type superhet transmitter-receivers are feasible and some can switch between two and three or more channels and would be desirable if you have several different transmitters, or as a Club Monitor project. As a precaution, REMOVE the transmitter crystals and eliminate any possibility of accidental CB transmission at the flying field.

In useage, a low hum will indicate a transmitter on either side of your frequency. A moderate hum indicates your transmitter or another transmitter is on your frequency, which increases materially when another transmitter is turned on.

Flying a glider in the neighborhood of $200-$400 airborne costs (receiver, servos, battery pack and model glider) a $11.00 Monitor is good insurance and will indicate when it is reasonably clear and permissible to try out that glider. On the other hand, when interference is indicated, if it is even suspicioned it is quite logical to stay on the ground.

..... Walter R. Fischer, M.D. .....

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 baragraphs 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 also climbs to over 100°. Bring your own binoculars or tracking devices. Please state your frequency when sending in the registration. It is anticipated that once the frequencies are sorted out, simulaneous launches will be made during the best thermal conditions.

Contest Director is Dale Willoughby, AMA 4277 current holder of the World's Speed Record for R/C gliders. Complete rules are available from Academy of Model Aeronautics, 1239 Vermont Ave N.W., Washington, D.C., 20005, for $1.00... Ask for the New FAI Sporting Code, Section VII - World Records.

At the time of writing, the World's Record for Altitude (Height) is 4,908 ft held by Ray Smith of Silver Spring, MD. The World's Record for Distance in a Straight Line (Declared Goal) is 15.8 miles and held by Winfried Kaiser of Hamburg, Germany. It is likely that both these records can be broken if the weather remains constant at El Mirage Dry Lake, on the days chosen for World's Record Trials.

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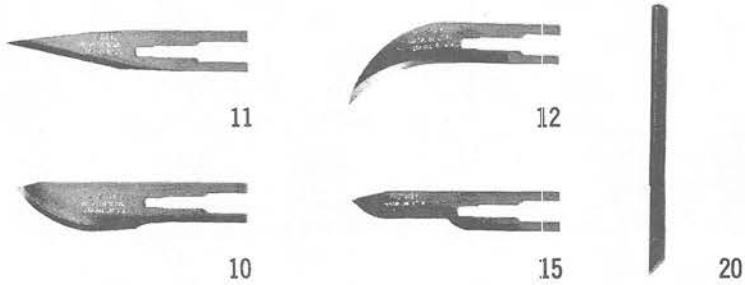

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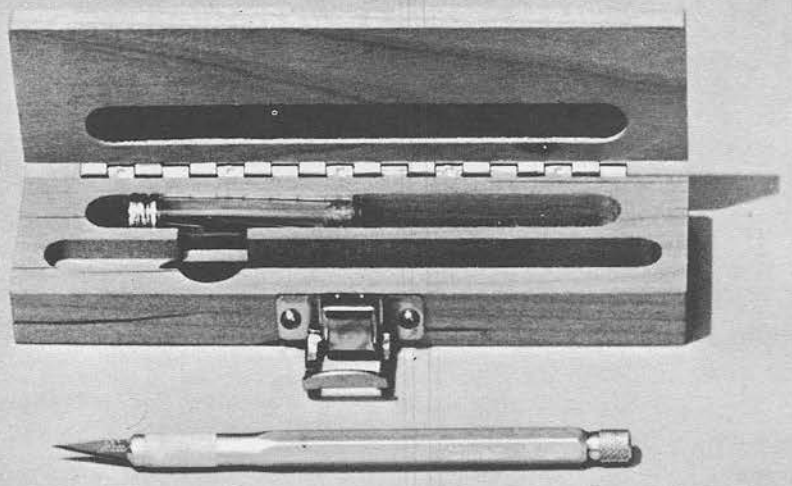

h-1 handle with no. 11 blade

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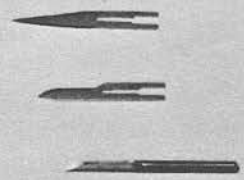
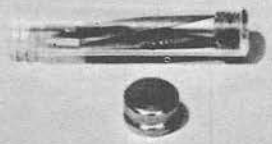


6 no. 11
6 no. 15 } *blades*
2 no. 20



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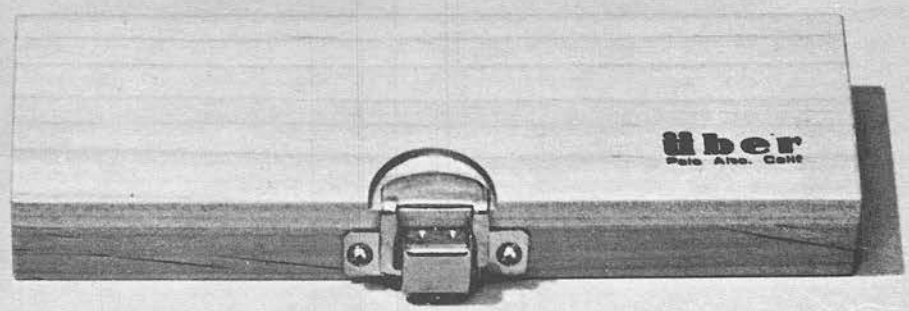

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Ghost Family Of Soarers

PART ONE

By Major Ottar Stensbol, Norwegian Air Force

When some eight or nine years ago I took up R/C Soaring, it was all on a very basic level. I had previously been flying single-channel motor models, mainly rudder-only types, which gave me a lot of fun. Then on a trip down to Germany during the summer of 1960, I got hold of a Schuco "BERGFALKE" kit. A couple of weeks of work later the new wonder was ready for trimming.

I shall never forget those first graceful flights with my "BERGFALKE", it was surely something different from the flight of a motor model. Gradually I grew up with this soaring "bird" and a new world of R/C flying was revealed, not only to me but also to my R/C friends who very often joined me on those trim-sessions. We soon got quite a few chaps with R/C soarers, mainly BERGFALKEs and TRABANTs, both German kits. We gained much experience on different slopes and many new pilots joined the gang. Multi-Channel type of equipment, mostly the German tuned-filter units, now became a standard feature and most models were controlled by rudder and elevator.

We got a lot of experience and fun during those first years on our mountain slopes. Strong winds offered very good lift so almost anything could fly. However, I was not satisfied with any of the standard kit-models when it came to "Thermal Flying" and/or marginal lift conditions on a shallow slope. Too heavy, quite often too clumsey and usually sporting a very simple wing-section (airfoil), these models did not pay off during real competition according to my requirements. I wanted something which assured me a minimum sinking speed in thermal flights and in light wind slope soaring conditions. As the European trend in R/C soaring is obviously focused on thermal-type competitions, I naturally concentrated on this aspect. After all, I think it is right to say that thermal flying offers the greatest challenge for a model soaring pilot. On a slope almost anything with wings can fly, on a thermal territory (flat land), only the most capable models will stay aloft.

With these considerations in mind, I turned, during the summer of 1964, into an "analyzing and wondering" period where mathematics once again had to be the guide along a path where different ideas were tried and calculated for the best possible theoretical performance.

Very much could be written about this evolution in my designing period, but I'd rather give you the results as they appeared to me. You may (or may not) agree with my theories... thats fine. Maybe you have ideas that could still increase the capabilities of the basic layout of my "Ghost Family". If such be the case, please write to me and state any significant change.

The GHOST soarer, regardless of the Mark number, is an unconventional/unorthodox model primarily designed for thermal work. The GHOST series also has some slope capabilities, normally limited to approximately 20 knots, (23 mph) but the main purpose of this kind of design will always be thermal soaring.

You may wonder why I chose a swept-forward wing combined with a swept-back, "T" tail. First, let's take a look at the swept-forward wing. Generally, a swept-forward wing has a higher overall lift factor than a straight wing, mainly due to a positive airflow toward the center section. A swept-forward wing possesses a lesser degree of directional stability than straight wings - therefore has a more ideal turning and circling in flight characteristic. Also this means that you need less rudder area/rudder travel to induce a turn which requires an overall turning force of much less power than for a model with a straight wing. In the turn a swept-forward wing has a higher lift capability on the inner wing panel than on the outer... a very valuable factor considering loss of height in circling flight. The increase in this particular lift-capability is a function of forward sweep and could be calculated thru plain mathematics. A swept-forward wing has some structural disadvantages at the center section, but for the GHOST family, they have no significant value.

A swept-rudder will create a useful "up" elevator effect in a turn. In the GHOST design it was used to create a long fuselage with minimum weight, combined with a swept elevator, all-flying by the way, gives a considerable moment arm. Placing the elevator atop the rudder keeps it well above the turbulence of the wings. Then, you can keep the elevator area down to a minimum to save weight and reduce drag without any loss of stability.

Thus the overall layout gives maximum effective moment arm with the least weight penalty, combined with optimized aerodynamical performance. During the last three or four years a different number of GHOST designs have been flown and proven my theories. I still believe the design can be further develloped, especially along the lines of a trimmable trailing edge of the wing and better wing structure for optimal use of the wing section, etc. Any body interested in experimenting should always bear in mind that only one change at a time should be allowed. This precaution will insure the best possible result, that of improving an excellent flying soarer.

GHOST FAMILY OF SOARERS - Cont'd

INTRODUCTION

The GHOST "1" thru "4" used the same common fuselage, but different wings and stabilizers. The first two were rudder only, while the last two used rudder & elevator for controls. The description generally applies to these four of the GHOST family, but the building instructions were written for the GHOST I.

GHOST 1 is a real light-weight R/C soarer for thermal work. It can be flown rudder-only which is an ideal set up for the new-comer, or it can be flown as a R&E type for better control with any of the modern proportional equipment.

GHOST 1 has a rather unorthodox shape. If you wonder why, the following criteria was laid down for this special design : -

a. A fairly light but reasonably strong model with minimum building time.

b. Good circling characteristics, flat and tight.

c. Fairly long moment arm with the least physical weight combined with an optimized aerodynamical shape.

d. An efficient tail section in all flying conditions.

e. Thermal-sniffing capability.

CONSTRUCTION

No step by step detailed description of the construction will be given inasmuch as this model is very easy to build and the many sketches should be nearly self-explanatory. Just remember, don't hurry, be patient and make everything right and the end product will be good.

1. The wings - All ribs are cut from 2mm medium balsa and sanded, then checked for accuracy. The center section ribs are strengthened with 2mm plywood cut to the same shape. Take your time and make that plywood tongue-box accurate. The longerons, leading and trailing edges should be selected from top-grade balsa. Check for equal weight on each side. Make two wash-out fixtures that provide the wings with 3° wash-out.

2. The stabilizer - This "T" tail requires a light-weight construction technique.... hard balsa in 2mm sizes. Try to keep the weight below 2½ ounces covered, with only two or three coats of dope.

3. The fuselage and fin - Make two fuselage frames and glue them together at 90° angle to a diamond shape. Install the hardwood parts and fasten the wing-tongue in with reinforcing balsa (soft) and butt two plywood wing ribs along the dotted line shown on the wing tongue. Next build the cockpit frame. When the controls are installed and working freely, cover the entire fuselage with light 3mm balsa. Complete the fin and cement to the fuselage as shown in the sketches. If you prefer to use fiberglass on the nose section, do this before applying the silk covering. Install the radio equipment so the C.G. is at 35 to 40% of the chord at the center section.

4. Test flying and trimming - Put the completed model together and check the decalage angle between the wing and tail surfaces which should be 2°. Make a second check of the C. G. location and balance the model on the keel to determine if both wing panels weigh the same..... add clay to the lighter one. Make all the test glides on level ground with the radio on. It is very useful to have a helper/observer with you on these test hops. Hi-Start the GHOST in calm weather and with the stop watch, time each flight, keeping notes of the results. Make only one trim adjustment at a time, and trim for minimum sink. With your GHOST trimmed to perfection, it is a hot-blooded thermal sniffer. You can easily locate the thermal with it and with practice will be able to locate and center the thermal cone for some thrilling flights.

5. Precautions - NO STUNTING .. Keep this GHOST 1 as a thermal hunter for European Class IV competition, and you will be happy with it. Or for evening flying when the sun is about to set and you can relax by making the GHOST 1 do figure "8"s above your head. It has just a whisper of sound in flight and then you will agree, it deserves the name of GHOST.

P.S. - Metric sizes into inches....

1mm = 1/25th of an inch - next to 1/32"
2mm = 1/12th of an inch - next to 1/16"
3mm = 1/9th of an inch - close to 1/8th "
4mm = 1/6th of an inch - between 1/8 th and 3/16"
5mm = 1/5th of an inch - next to 1/4"

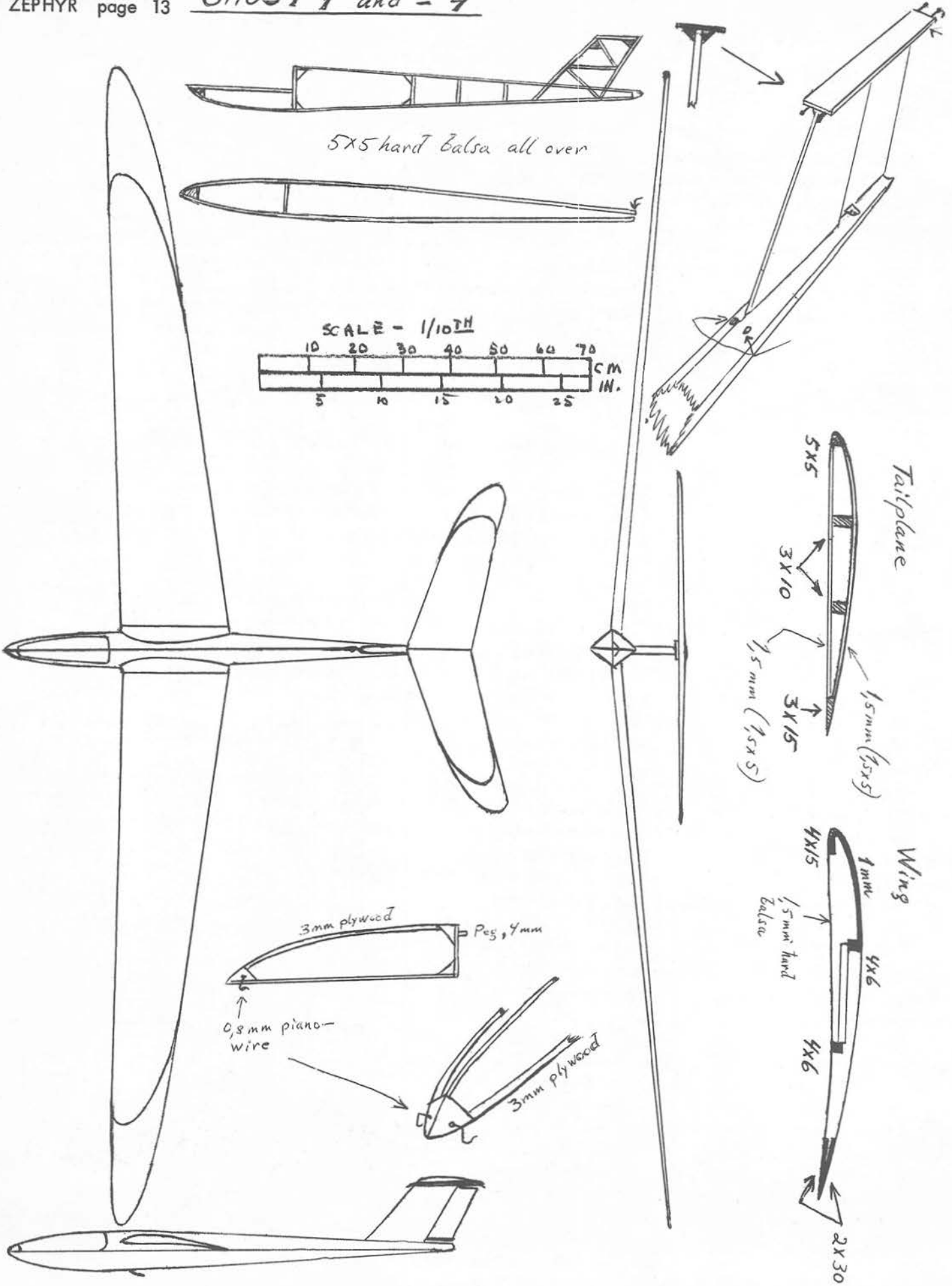
.... Major Ottar Stensbol................
N. Bjertnes 31A
Nittedal, Norway

ooooooooooooooooooooooooooooooooooooooooooooooo

The next issue of the ZEPHYR will continue the GHOST STORY - GHOST "5"

ooooooooooooooooooooooooooooooooooooooooooooooo

GHOST 1 and - 4

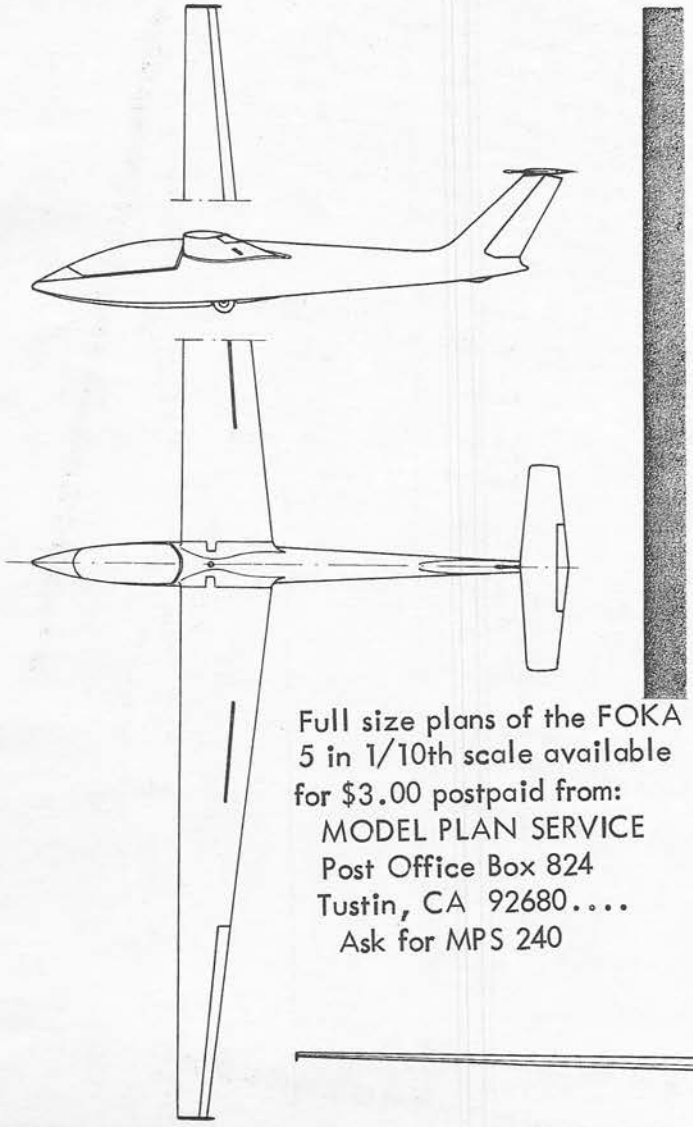

5x5 hard balsa all over
SCALE - 1/10TH
10 20 30 40 50 60 70
CM
IN.
5 10 15 20 25
Tailplane
5x5
3x10
3x15
1,5 mm (1,5x5)
1,5 mm (1,5x5)
Wing
4x15
1 mm
1,5 mm hard balsa
4x6
4x6
2x30
3mm plywood
Pegs, 4mm
0,8 mm piano-wire
3mm plywood

NEW SAILPLANES DESCRIBED

foka 5

SZD

SZD-32

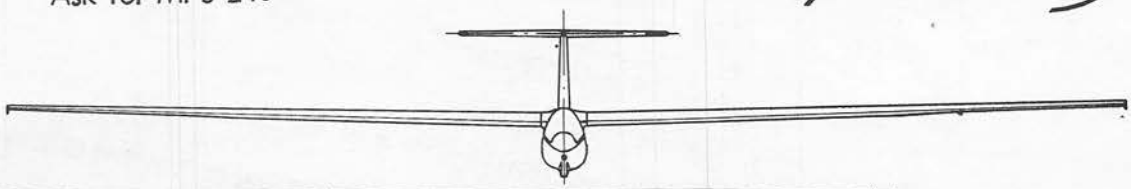


Full size plans of the FOKA 5 in 1/10th scale available for $3.00 postpaid from:
MODEL PLAN SERVICE
Post Office Box 824
Tustin, CA 92680....
Ask for MPS 240

BASIC TECHNICAL DATA

a) Dimensions:			
Span		14.98 m	49.15ft
Length		7.17 m	23.5 ft
Height		1.61 m	5.28 ft
Lifting surface	130.8 sq.ft	12.16 sq.m	
Aspect ratio		18.5	
b) Weights:			
Weight empty+equipment		256 kgs	
Useful load		129.0 kgs	
Max. permitted flying weight		385.0 kgs	
Wing loading		31.7 kg/sq.m	
Ultimate load factor		+10.5/–5.25	
c) Performances:			
Max. L/D ratio		**36.3**	
– at an airspeed of		94 km/h	
Minimum speed		68 km/h	
Minimum sinking speed		0.65 m/sec	
– at an airspeed of		76 km/h	
Never exceed speed		250 km/h	

foka 5



Manufacturer:
SZYBOWCOWY ZAKŁAD DOŚWIADCZALNY Bielsko-Biała, POLAND

What new sailplane would you like described next? The Editor has over 100 3 views of sailplanes from all over the World in his files, even from China and Russia. Drop a card.

BEGINNERS - TRY THIS ONE

SOAR TEE

By Ira Achey

Webster's Dictionary defines a sortie as: "The flying of an airplane on a combat mission." This fine R/C glider does not qualify as an airplane, nor will it fly too many missions, so the name was changed to SOAR TEE.... it will soar and has a "T" tail.

In the Spring of 1966, before the Li'l T was kitted by Midwest, I had flown one of the prototypes built to check the dimensions on the plans and assist with the building instructions which appeared in the June-July 1965 issue of FLYING MODELS. I found it to be an excellent rudder-only glider. However, control by only the rudder has its limitations, mainly the long time to recover from a dive without elevator control, and so the logical thing was to design a larger model to accomodate the Digitrio system... then in its heyday.

Following Bob Hahn's layout and construction methods in larger proportions, the SOAR TEE was the result. With a wingspan of 94" containing 725 square inches, the same proportion dihedral and the nearly flat-bottom airfoil, the ultra-stable characteristics were retained. Such stability is the mark of a beginners first successful radio controlled glider, and this SOAR TEE design is considered one of the best for both thermal and slope soaring.

FUSELAGE

Select a matched pair of 4" wide sheets of 1/8" balsa and cut out the sides to the outline shown. If 36" stock is used, splice in the front section where the doublers are shown. Cut out the 1/16" plywood doublers and contact cement the sides as shown on the plans. Next add the 1/4" sheet triplers. Be sure to make one LEFT and one RIGHT side. Cut out formers 1 thru 6, noting that formers 2 and 3 are cut from 1/8" plywood. Next cut the 1/8" sheet floor to outline as shown. Notch to fit inside formers 2 and 3. Make sure these notches are even on both sides and that the formers set at 90° angles to the center line of the floor..... as this is the alignment fixture. Next cut out the 1/8" keel former, and now try all these parts for a dry fit before cementing together. Now cement formers 1, 2, and 3 to the floor and when dry add the keel former. I suggest that you use Devcon 5 minute epoxy on this application as it will save a great deal of frustration and speed up your construction by at least a day. When dry the sides are cemented in place, using epoxy glue, pulling the sides into former 1. Wrap the structure with tape or rubber bands after formers 2 and 3 are liberally coated with adhesive. Pull the rear of the fuselage together by hand in order to check the alignment and set aside to dry. Next construct the vertical fin from 1/4" square balsa and spruce, but be sure to allow for the 1/8" plywood gusset for the stabilizer support. The sheeting should extend beyond the leading edge to streamline the NyRod used for elevator control. Put a healthy gusset to ease the radius of the NyRod between the fuselage and the fin. The 1/16" sheet should extend into the fuselage at least an inch. When both sides of the fin are sheeted and dry, it may be installed on the fuselage. ... squarely. Pull the sides together, add the spacers at the front and check again for alignment. Now add formers 4, 5, and 6 at the location shown. Next insert and epoxy the NyRod into place, insuring that you have sufficient length to reach the servo. Might as well install the rudder NyRod at this time since you likely have the epoxy mixed up. These NyRod must be anchored at both ends to attain maximum control on the surfaces. Next add the top sheeting. Glue the 1/8" x 5/8" keel doublers and when dry, add the 1/8" x 3/8" keel cap (See former 2 for details).

Now get a large flat piece of wood (I used a piece 4" x 10" with a different grit sandpaper on each side). and sand the sides and the keel at an angle to accept the 1/8" sheet sides. If it is rounded it will not fit properly. It is best to dry fit the bottom and rough trim to fit first. I taped mine into place with masking tape until dry and used Tite-Bond as an adhesive. White glue does not sand well, nor does contact cement. Now epoxy the nose block in place and tack glue the hatch cover enough so it can be shaped without moving. Then add the sub-fin and when dry the 1/16" wire skid is bent and epoxied in place. Save some of the balsa dust accumulated in sanding the keel, mix with cement and make a fillet where the sub-fin joins the fuselage.

Most gliders take their worst beating on the nose so make sure it is fully strengthened. Generally it is necessary to add weight to the nose, so make it count by a layer of fiberglass cloth over the nose extending back past former 3 on the "V" bottom, and including the laminated skid.

STABILIZER

Nothing exceptionally noteworthy about the stab except do not install the stabilizer pivot ribs until the stab is removed from the plans. Use of hard balsa on the stab will make it heavy, so choose with care.

WING

Here again the construction is easy. Note how the full depth spar is used (from 1/8" sheet) full span and the 1/8" x 3/8" spruce spar is cemented in front of the main spar for strength. The $\frac{1}{4}$" x 1" trailing edge stock is not cemented flush with the ribs. Instead a strip of 1/16" x 1" balsa is cemented to the bottom of each rib along both the leading edge and trailing edges. When dry, remove from the plans and add the 1/8" plywood dihedral braces, then the 1/16" x 3/16" cap strips and the 1/16" sheet leading edge back to main spar. We have had good success with this SOAR TEE in flight by pinning down the trailing edge with a piece of 1/4" block under it and weighting down the leading edge so it is flat then giving the wing another coat of dope. The block must be under the tip of rib W9. This gives a wash-out to the tips allowing the center section to stall first, i.e., more stability.

Perhaps your means of transportation will not permit a 94 inch wing inside. The solution is to make a two-piece wing using the 3/16" diameter wire and the brass tubing with 3/16" inside diameter, positioned as indicated on the plans. The first three W1 wing ribs are plywood, so drill and epoxy the tubing in place before covering. The pressure of the wing in flight will hold the wing sections together and the crossed rubber bands also serve that purpose. Naturally if you are going to have a nice looking SOAR TEE, plenty of elbow grease will be used in sanding. A covering of silk will serve to strengthen the balsa, as will an application of the Hobby Poxy Formula 11. The original was colored with International Orange and trimmed with Metallic Blue, which was outlined with 1/16" silver trim tape.

FLYING

After installation of the radio equipment with lots of foam to protect against damage to the equipment in case of hard landings, add sufficient weight to the nose to balance at the C.G. point. The best C.G. range is from $3\frac{1}{2}$" to 4" from the leading edge of the wing. Don't try to have a lighter wing loading by withholding weight, it will only make the flight path too erratic. Test glide with sufficient forward speed to permit the SOAR TEE to fly, and soon it will seek its own flying speed. With the elevator control, it is easy to kill the stall, but add more weight if necessary. Check for a heavier wing panel by balancing the model on the keel. Add clay to the lightest wing panel.

The SOAR TEE likes thermals. When you are flying along on a straight path and the SOAR TEE wants to turn suddenly to the right, count to three and then bank it around to the left and watch it rise. If it does not then you may have flown thru the thermal. Search the area by flying in ever widening circles until the thermal is relocated. It is best to put "up trim" and "right trim" into the model and let it circle, rather than flying by the stick alone. Then it is possible to correct any stalling tendencies by using "down elevator".

The SOAR TEE is quite a challenge to keep airborne after it leaves the tow line. Why don't you try it? Built well, it will fly well.....Ira Achey.....

Extra set of SOAR TEE PLANS - $3.00 pp
Request MPS 218 Z

R.C. GLIDER CONTEST AT GLENVIEW NATS FINALIZED

Dan Pruss, in a letter received just before press time, sent the abbreviated rules for the unofficial NATS R/C glider contest, definitely scheduled for 27 and 28 July, at a site other than at the Naval Air Station, Glenview, ILL. The NATS planning committee could only offer a Time Slot AFTER the days competition in other events was over, which would be AFTER 5 p.m. It was felt by those attending the meeting at the Toledo R/C Conference in which most of the rules were finalized, that the best possible weather conditions should be offered the contestants for this contest:

Line Length: 300 Meters - Hi-Start & Power Winch. Both systems will be furnished, however modelers may elect to furnish their own.

Classes: Two classes based on total flying area - about 700 sq. inches being the Class separation. This to be verified after a more thorough kit and plan study.

Events: 15 minute maximum and Spot Landing. This may be adjusted at the discretion of the C.D.

Points: Total of the best three flights each day.

It was pointed out at the Rules Meeting that these rules did not represent the rules to be adopted by the AMA at a later date. It was also stated that there was a wide divergence of opinion on what a R/C Glider was expected to do at a contest..... especially from the West Coast versus the East Coast clubs.

Those in attendance at the Rules Meeting were:
West Coast: Mark Smith and Dale Willoughby
Midwest: Dave Burt (CD), Neil Liptak and Dan Pruss
East Coast: Fred Collins, Walt Good and Howard McEntee

Because the NATS R/C glider contest was scheduled on Monday and Tuesday, 27 and 28 July 1970, which is early in the competition week, it will afford those who are entering other events to compete. The NATS will run from 27 July thru 2 August, at the Naval Air Station, Glenview, ILL, which is near Chicago, ILL.

Further details can be obtained from:
Dan Pruss, 22 Pennington Lane, Plainfield, ILL 60544
or
Dave Burt, 3048 Central Ave, Evanston, ILL 60201

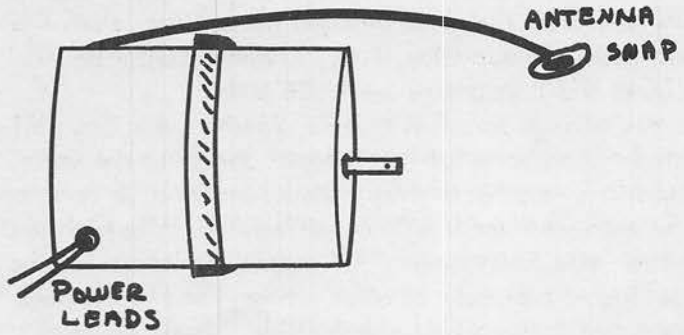
TESTING THE JANSSON THERMAL SENSOR

When Maynard Hill released details on the "Thermal Sensor" in the March 1969 issue of FLYING MODELS, I bought the necessary components to construct this helpful aid to thermal flying. The thermistors were the most difficult to obtain... as a matter of fact the electronic supply houses in the whole Los Angeles basin could not furnish the exact thermistor called out in the article. I had planned a self-contained unit within a fiberglass helmet with the receiver and batteries taped into the foam lining of the helmet.. it once belonged to a Marine jet pilot. The low cost Pixie transmitter and receiver offered by World Engines seemed to be the logical radio link. These were procured and stripped of their outer shells and the receiver fitted inside the helmet, with pencells on the opposite side and the ear plug dangling with-in easy reach from the back of the helmet. The transmitter antenna, complete with loading coil, was secured into the thirteen foot wing with the threaded base terminating at the center section. The transmitter and thermistor head was also placed in the wing, while the pressure bottle was fitted into the fuselage.

Because I used substitute thermistors my thermal sensor was overly sensitive and quite readily would squeal into a real howling high tone when ever touched by warm hands. For those of you not familar with the thermal sensor concept let me give some details. Two thermistor beads, which are really a heat sensitive resistor, were placed in parallel, while air from an outside source was directed on them. The temperature differential would then be amplified, fed into an oscillator converted to audio tone and broadcast by the transmitter. A fairly simple narrow band receiver on the ground would then keep you informed whether the model was going up or down by an audio tone.

The delicate task of soldering the thermistors with the hairline wires was overcome and several heads were made. However, on each there was a slight defect and I presume that one of the thermistors was scorched, or was so mis-matched that the pair of them would not function properly. So the units were set aside and I went to Europe for R/C glider World Record Trials without a Thermal Sensor for the "BIG SAILER"..

Then last November there began a two way phone conversation with Dick Jansson who wanted a KURWI kit. He repairs the Command Master R/C systems in Wellesley Hills, outside of Boston. In the exchange of ideas, I stressed the fact that I had good weather for flying most all year long, and offered to test his thermal sensor. Dick uses an entirely different approach in his thermal sensor than the concept that Hill uses for the entire unit is self contained in a much smaller package. While I am not an artist or draftsman, the unit is shown full size ---



Bare weight is only 1.6 ounces and with the tuned ferrite core antenna the total weight is 2.4 ounces. Most R/C gliders can carry this additional weight without too much shift in the C.G. location. The Thermal Sensor itself used 4.8 volts directly from the airborne battery pack and the drain is something on the order of 10-16 MaH.

The first installation was in a Thermic 100 Pod and Boom glider, which worked out pretty well, but the range was limited (different antenna) and in flying the glider in a path straight away from the receiver on the ground, there was evidence of a "null" in the radiation pattern of the antenna. Also the Hallicrafter receiver, on FM reception, had a switch for tunable frequencies and though the transmission was on 27.24 MHz, I was getting lots of hash and talk from 27.255 MHz and other spots on the CB. Sometimes I was able to separate the tone from the "hash" and verify thermal conditions during the tests.

The tone is transmitted on FM and the neutral level of the tone is about the same as F above middle C on my wife's organ. When the Thermal Sensor goes thru a drop in barometric pressure the tone rises. When the pressure remains the same, the tone gradually degrades to the neutral tone.

I found in my earlier tests, conducted at a slope site, that the thermal sensor would send out a higher tone and advise the presence of a thermal (or warmer less dense air) a fraction of a second before I could see any change in the attitude of the glider. At real low altitudes, frankly the thermal sensor was no help in detecting thermals for as long as I could watch the attitude of the model in flight I could "latch onto" the thermal. BUT, when the glider gets so high it

is barely visible, then the Thermal Sensor becomes a valuable tool in aiding the thermal-seeking R/C glider fan. AND, like any tool, it must be used properly. There is a learning curve, wherein the more it is used, the more useful it can become.

At the moment this Thermal Sensor is still in the testing stages, for with a transmitter and a receiver in the same R/C glider, it could fly to a point where the transmitter broadcast could overpower the incoming commands from the ground-based transmitter, even tho on different frequencies, i.e., Thermal Sensor on 27.24 MHz and Transmitter on 72.96 MHz.

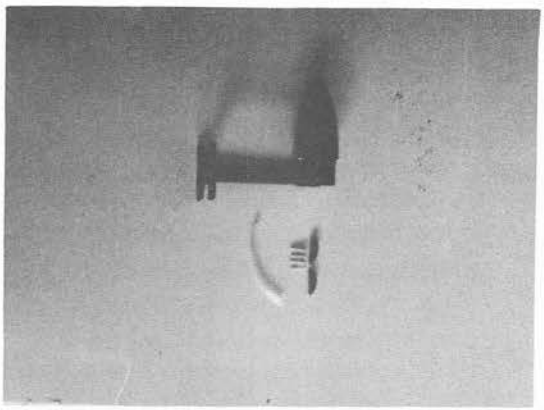
And though Mr. Bill Gatlin, Model Labs, has calibrated the antenna for the Thermal Sensor to the same frequency, in other words, a tuned antenna, it remains to be seen whether it will be sufficient a mile high and another mile down range. Of particular interest is the matching of a closely coupled antenna on the Thermal Sensor and the receiver capabilities. These all work fine on the bench, however, more testing and variations in the air at distances greater than possible in a small town like Tustin, replete with telephone and high tension power lines, chain link fences, etc.

The two Thermal Sensors in existence at the time of writing have been hand-made, but with commonly available IC and other components. While not a firm price, the Thermal Sensor will probably sell for $50-65, and if any presently manufactured receiver can be found that will do the job adequately, it will preclude engineering necessary to design and manufacture a compatible receiver.

There are present plans to approach two large manufacturers of Nationally known R/C systems with the engineering package necssary to put this unit into production, but until something firm is agreed upon, nothing will be done to offer the Jansson Thermal Sensor to any other R/C glider buffs.

However, we will, from time to time, keep our readers posted on developments.

..... Dale Willoughby .....



Just released - a Power Pod for .049 - .051 engine - self contained fuel tank good for about 4 minute run. Unit being tested on CIRRUS R/C glider with QZ muffler installed. Results

The ZEPHYR is published bi-monthly and released for mailing on the 10th of every other month. Subscriptions are $15.00 annually with a full size plan mailed with each copy.... or $6.00 annually but WITHOUT the full size plan. Use the attached coupon for your subscription.

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FAI PROVISIONAL RULES FOR R.C. GLIDERS

1. OBJECTIVE - The objective of these rules is to provide standards for two classes of competition for Radio Controlled Soaring Gliders. Class A competitions are for thermal or "flat-land" competitions while Class B are for Slope Soaring. If only a single site is to be used, the organizer must select either Class A or Class B depending on the type of site available for the competition. The very nature of the two classes precludes the possibility of holding both competitions at exactly the same site. However, organizers may run a contest for both Class A and Class B using two separate sites at nearby locations if they so desire. The rules are presented in three parts. Part 1 contains general rules applicable to both classes. Part 2 contains rules for Thermal Soaring and Part 3 gives rules for Slope Soaring.

PART 1

1.2 Characteristics of Models

Maximum surface area ..... 150 dm^2 (2,325 sq. in or 16.146 sq.ft.)

Maximum weight ..... 5 kg (11.023 lbs)

Loading/on the supporting surfaces/..... Between 12 and 75 g/dm^2 (3.95 - 24.51 oz/sq.ft.

Radios shall be superheterodyne or able to operate simultaneously with other transmitters 50 KHz from the control transmitter.

1.3 Competition flights

The competitor has the right to three official flights. There is an official flight when the model has left the hands of the competitor or his assistant. The competitor can repeat his attempt on start only if:

a) His model collides in flight with another model or an obstacle without the fault of the competitor or

b) The flight was not judged by fault of judges.

1.4 Cancellation of a Flight or Disqualification

a) The flight is annulled if the competitior used a model not conforming with the FAI rules. In case of intentional or flagrant violating of the rules the competitor may be disqualified.

b) The flight is annulled if the model loses any part in flight. The losing of a part during landing is not taken in account/possibility of landing in mountainous country/.

1.5 Organization of Starts

The sequence of the competitors is determined prior to the beginning of the contest by lot. This basic sequence is valid for all rounds. However, the organizer may make minor shifts in position, i.e., he may call up a contestant as far as 4 positions ahead of the sequence, in order to conduct simultaneous flights on different radio frequencies. The organizer may call for up to six competitors to be airborne or in the process of launching simultaneously, provided this can be done with no radio interference to any competitor.

a) The competitor is entitled to 5 minutes of preparation time which is counted from the moment he is called to take place at the starting area.

b) When the preparation time has elapsed the starter gives order to counting of working time, during which the competitor/his assistant/ must launch is model. The working time is 3 minutes and is counted from the moment the starter gives his order.

1.6 Special Rules

a) The organizer can not begin the competition flights until all competitors have handed over all transmitters under the supervision of a special official. The official hands out the transmitter to the competitor at the beginning of the preparation time according to 1.5.a. During the whole preparation time he watches the competitor to prevent his switching on the transmitter before the preceding competitor has finished his flight.

b) Any test transmission during competition flights is forbidden and entails immediate disqualification.

c) The competitor must hand over his transmitter to the official in charge immediately after finishing his flight.

PART 2

CLASS A RULES FOR THERMAL SOARING RADIO CONTROLLED GLIDERS

2.1 The launch may be by hand towing, high start, or winch devices. Towing by moving vehicles such as bicycles or automobiles is not permitted. The length of rigid tow lines shall not exceed 150 meters when tested at a tension equal to twice the weight of the glider. For high start devices or other tow lines using elastic members, the stretched length at the time of launch hall not exceed 150 meters. The tow line shall carry a colored banner at least 50 cm long and 10 cm wide (19.7" x 3.937")

2.2 The glider shall be released from the tow line withing 60 seconds after release of the glider by the launcher.

FAI PROVISIONAL RULES FOR R.C. SOARING GLIDERS - Cont'd

2.3 SCORING

a) One point will be awarded for each second from the time the model is released from the tow line to the time it touches down, up to a maximum of 360 points (6 minute maximum).

b) One point will be deducted for each second flown in excess of 420 seconds (7 minutes).

c) Fifty additional points will be awarded for landing within a 25 meter diameter circle selected and marked by the organizer. No points will be awarded for the quality of the landing. The model does not have to touch down in the circle, but must come to rest with its nose within the circle to obtain the landing bonus. No landing bonus will be awarded if the flight time exceeds 7 minutes.

d) The score will be the total number of points earned for all three flights.

Note: For international competitions with limited entry the organizers may run more than three rounds provided they announce this prior to the end of the second round. When more than three rounds are flown, the score shall be the sum of scores for all flights. Also, at the discretion of the organizer, the maximum flight time may be increased to more than 6 minutes with a corresponding increase in the maximum possible score. This change must be announced prior to the start of the first official flight of the contest.

2.4 SITE The competition will be held at a site having reasonably level terrain that does not include the possibility of slope or wave soaring.

PART 3

CLASS B RULES FOR SLOPE SOARING RADIO CONTROLLED GLIDERS

3.1 Launching - The competitor or his assistant launch the model by hand from the starting area indicated by the organizer.

3.2 Flight requirements and Scoring

a) The competitor controls the model in sucha a way that it flies along the slope and passes two vertical mutually parallel planes perpendicular to the slope, the distance between which is 100 meters. The course is marked in a suitable way, e.g., by two flags at each end. The number of completed passings is scored together with the landing on a rectangular are 50 x 100 meters (164.05 x 328.1 feet) (the longer side of this rectangle being paralled to the slope), marked by flags located at the corners.

b) For every passing between these two planes, irrespective of the direction of flight, the competitor is awarded 25 points.

c) Only the passings and landings completed within 6 minutes from launching are scored.

d) One point will be deducted from each second flown in excess of 420 seconds (7 minutes).

e) The landing is scored according to the position of the nose of the model after stopping. Landing in the marked area is awarded 50 points. No points will be awarded for the quality of the landing.

Note: (Same as above under 2.3.d)

3.3 Classification - The final classification will be determined by the aggregate of points received for the best two flights. In the case of a tie for first place, the third flight is decisive. If even then the two first competitors are in atie then within a half an hour after finishing the official starts these two competitors begin a fly-off.

3.4 Organisation of the Contest and Sports - Officials

a) With the agreement of the international jury the organizer must not open the contest, or must interrupt it in the event that:

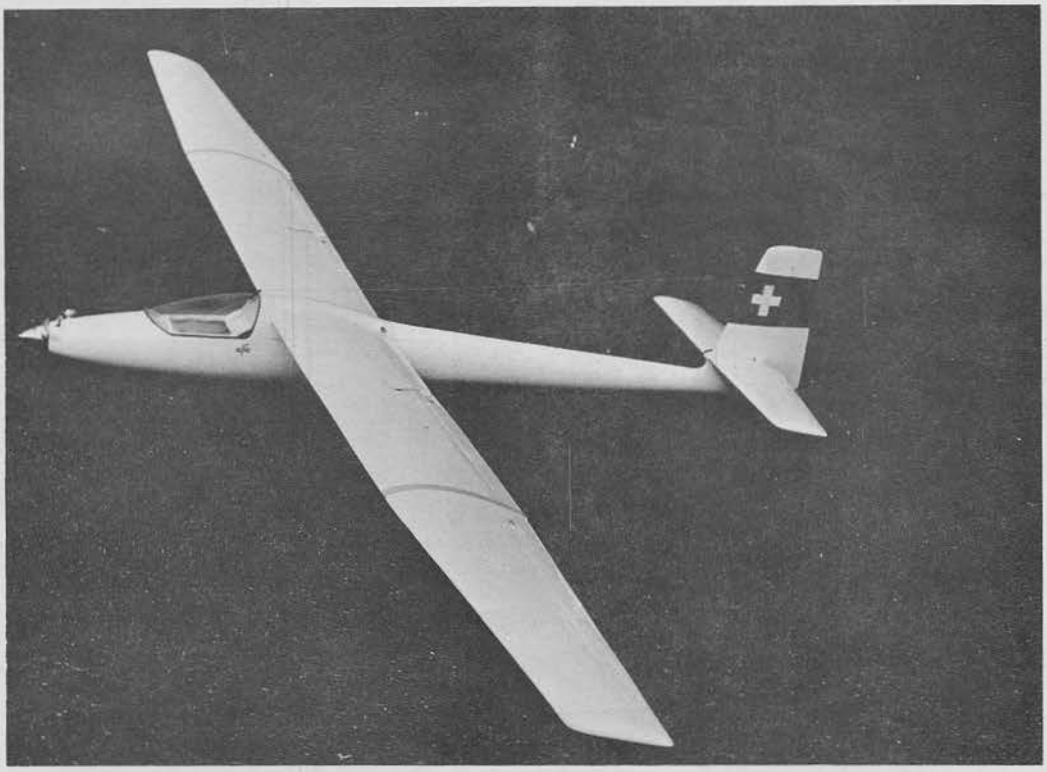
- the velocity of the wind is less than 3 meters/second (6.71 mph) or more than 20 meters/second (44.74 mph)
- the direction of the wind is incessantly deviating more than 45° from the direction perpendicular to the slope.

b) When marking the starting and landing areas and the turning planes the organizer must take into account the configuration of the terrain and the wind. Any changes in the flight and landing areas may be made only between flight rounds, ie., every flight round must be finished in the same area.

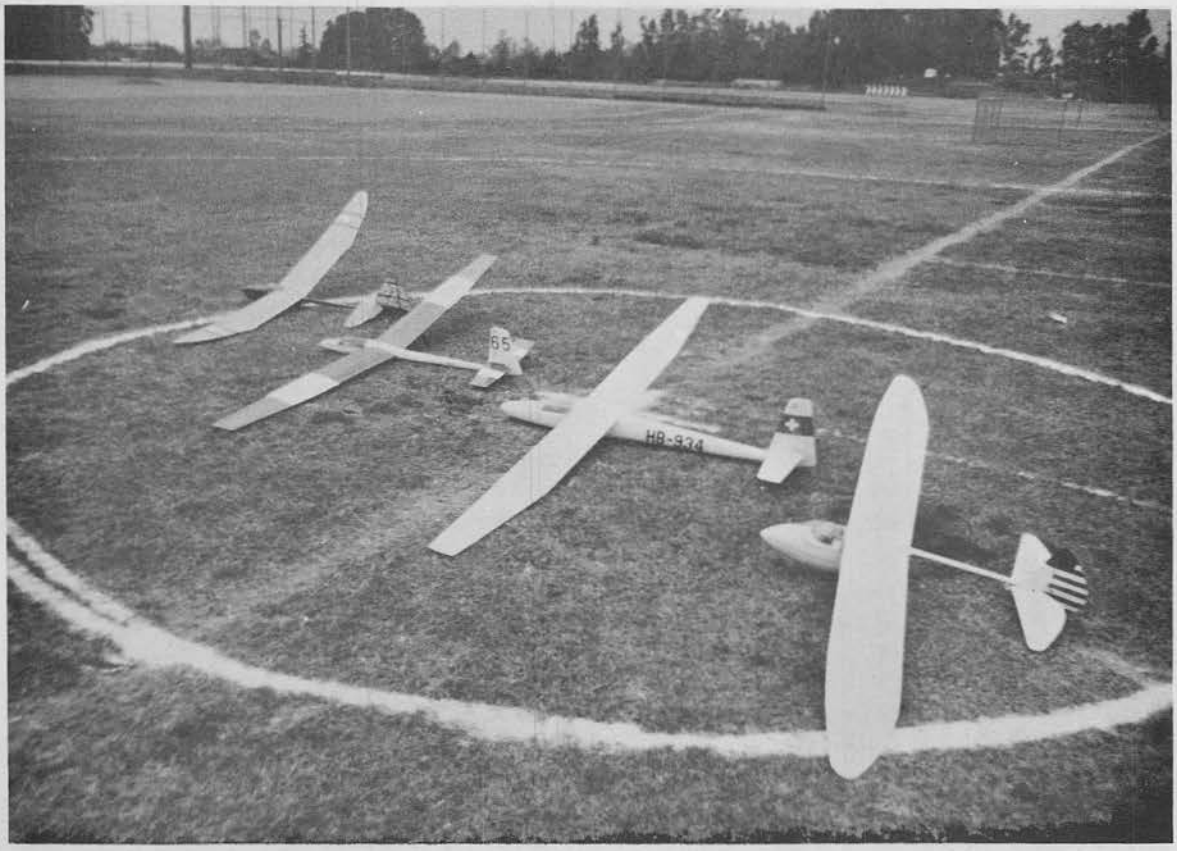
c) The organizer must provide for the scoring of flights the following officials:

- controllers of passing the turning planes - two at each turning plane. One of these controllers at each turning plane must give visual and sound signal of passing that turning plane by a model.
- two counters of finished eights.
- one judge at the landing area. This function may be performed if the flight area is suitable for that by one of the counters of finished eights.

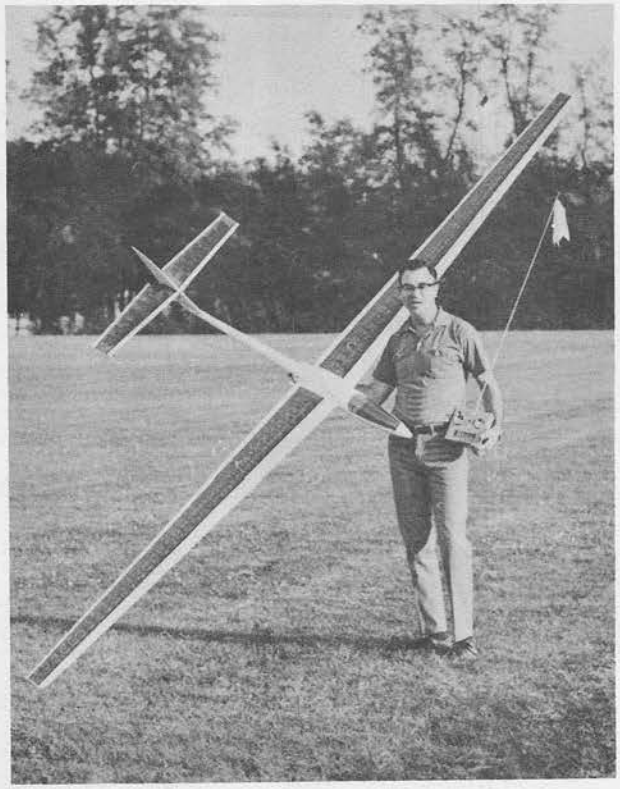
..... Adopted November 1969 by CIAM, Paris .....



The Swiss designed "ELFE S-3" sprouts an engine..... Nose was cut off to allow tank and Supertigre 15 with muffler to be installed. Lazy way to fly, sez I.



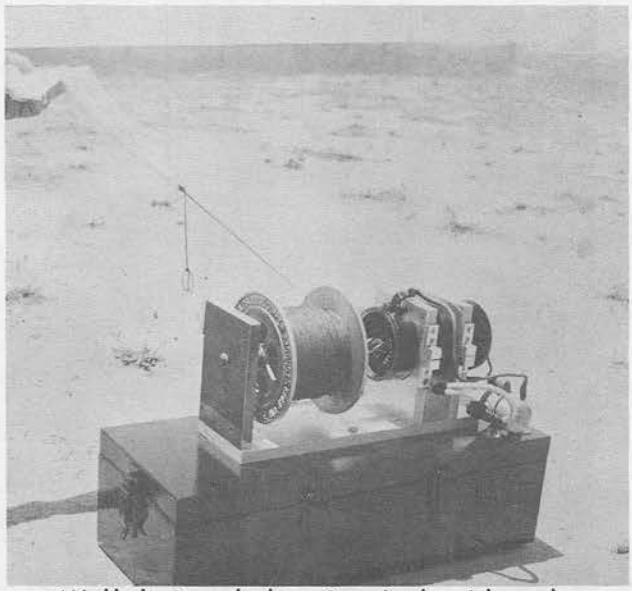
The Editor's fleet of R/C gliders and sailplanes, all within a 50 ft circle, to demonstrate the easy area to land in, when flying by the Tustin Model Club Rules proposed to AMA.



Harley Michaelis with his MISKEET which has a 12 ft wingspan and fiberglass fuselage.

Sheffie Worboys, Queen of the Pacific Coast Mid-Winter Soaring Championships at Torrey Pines in February 1970, holds the Editor's CIRRUS, just before demonstration flight before a huge crowd.

Detlev Draheim and his WINDSPEIL" original R/C Glider. Kitted by Rowan of Germany and sold in US by Nelson Model Pdts



Well designed electric winch with push-button handy for one-man tows. The line is looped around a pulley and returns to area of launch. NiCads in bottom.