



MAY-
JUNE
1954

Soaring

TORREY PINES MEET
WHAT PRICE PERFORMANCE?
MEASUREMENT OF VERTICAL CURRENTS
TSA YOUTH TRAINING



Maggie Kensey, Toledo Glider Club, after first solo in Club's 2-22.



Ohio's Aviation Board Director, C. E. A. Brown, flies with "Diamond C" holder Rudy Opitz.

PROGRESS REPORT FOR 21st NATIONAL CONTEST

By L. A. (PETE) BONOTAUX

Contest planning is in progress by the Elsinore Soaring Contest Committee under the Chairmanship of Hal Smith at Elsinore and under the Chairmanship of L. A. (Pete) Bonotaux, for the Pilot's Advisory Groups to the Contest Committee. The advisory groups are people who are advising in detail to the Contest Committee, making recommendations to provide for every need of the contest.

Bill Young, of the Elsinore Glider Club, is the Chairman who is arranging for our relations with C.A.A., leases, insurance, and all details regarding the cost and expense of the contest. This work is well planned and a great deal of it completed.

Publicity and Fund raising, under the Chairmanship of John Murdock, of the Elsinore Glider Club, has already arranged many publicity releases for national distribution through newspapers, magazines, radio and T.V.

The Contest Committee under its Chairman, Hal Smith has cooperated with the John Roche Co., public relation specialists, who are already at work organizing the contest booklet and who will raise the bulk of the necessary contest funds. This booklet and program, being handled by professionals, should prove to be one of the nicest and most interesting contest booklets to date.

The Welcoming and Entertainment Committee, under the Chairmanship of Bill Rodenberg of S.C.S.A., is seriously concerned to make full use of the variety of things to see and do in Southern California during the days and the evenings, for the pilot, his wife and his crew, so that everyone will take back fond memories of this contest, as well as having achieved some excellent soaring. Besides their plans for a western barbecue, dances, technical speakers and side trips to Hollywood, Long Beach's famous Pike and the San Diego Naval Base, etc., Bill has also arranged for a very interesting display of antique airplanes and another display of experimental airplanes, many of which will be on display for the first time.

The scoring system which appears in detail in this issue of SOARING, has been devised with great care under the direction of John Williams, Vice President of the Elsinore Glider Club, and some of the best pilots in Southern California, Bill Ivans, John Robinson, Paul Bickle, Paul MacCready and many others. They have devised a scoring system, which will pick a truly worthy National Champion using a



"Dust Devil" indicating strong thermal at Lake Elsinore, site of 21st National.

single-seater, high-performance sailplane.

The scoring system has been carefully devised so as to encourage and stimulate the owners of second-class and war surplus type sailplanes to participate in this National Contest. These second and third class type of ships are expected to make distance flights of over 100 miles and achieve altitudes up to 15,000 feet. We expect 10 to 15 new designs which have not previously competed at a National, some having never been flown before.

Field Operations and Safety, under the Chairmanship of Lou Mass, of the Elsinore Glider Club, have geared

their planning towards 100 ship participation, and aim to have at least 10 tow-planes to launch their operation under very precise regulations so that all ships can be launched between 10 A.M. and Noon, or a 2-hour period. Preliminary planning now provides for the use of an extra airport, which is adjacent to the Elsinore Glider Club field. They also plan to have several property fences which surround the airport, removed for the duration of the contest to ensure greater areas for take-offs and emergency landings. We have assurance of cooperation from the March Field Air Force Base, at Riverside, California, of their best weather advice. Additional cooperation has been obtained from the Sheriff's Highway Patrol throughout So. California to report and assist, by direct short wave radio to the field, and report all landings so as to expedite retrieving crews' work, etc.

We have recently learned that C.A.A. has just completed the establishment of many emergency landing strips throughout the Mojave Desert and other desert areas in So. California. These strips are stocked with food, water and gasoline, intended of course, for forced airplane landings in this very rugged area. It may never be necessary for a contestant to have to use these fields, nevertheless it is a great boon to our contest that they are available in the event that a cross-country aspirant falls short of his goal.

Model Glider and Model Airplane Contest Committee under the Chairmanship of Lloyd Licher is organizing a 2-day contest for model sailplanes, radio controlled sailplanes, and certain airplane models. These events will be conducted according to National Model Organization Regulations, will earn their own awards, and will be conducted during a period that will not interfere with the normal operations of the main glider contest. We feel that this will perhaps make a timely connection between the modelers and our sport of soaring.

We have recognized that several of the Eastern pilots are going to make

(Continued on Page 17)

(Continued from Page 16)

out and the sensitivity increases about 0.7 percent per 1000 feet.

Experiments at the Bureau of Standards⁹ and at Wright Field have shown several variometer types to have either a very slight decrease of sensitivity with altitude or a very slight increase. The variations of the atmosphere from standard and the variations of sailplane cabin temperature mean that in actual circumstances the sensitivities will differ from the calculated ones.

The sinking speed function described earlier has a different altitude correction function that a variometer has. Therefore, to minimize errors, adjustment (by needle valve) of the magnitude of the sink correction should be done at some intermediate elevation, such as 5000 feet.

Recommendations

The following would be my idea of the "perfect" variometer setup for a glider.

A. A Temple discontinuous venting type with buzzer in addition to lights, to give audio information.

B. Also a French Badin model with venturi and sinking speed correction. The linear scale makes it readily adaptable to the Ring Scale Airspeed Selector.

C. Also an Aircraft Indicators Company variometer for general use, standby, and the indication of true climb rates.

Appendix

Symbols

| | |
|------------------|---|
| p | pressure (p_0 outside, p_i inside, p_s static) |
| K_1, K_2 , etc | constants |
| V | volume of air in air capacity |
| t | time |
| R | indicator reading |
| T | absolute temperature |
| g | gravity acceleration |
| Z | elevation |
| W | glider weight |
| μ | air viscosity coefficient |
| ∂ | ratio of air specific heats |

A. Reading of Variometer

$$R = K_1 (p_0 - p_i) \quad (1)$$

$$\frac{dV}{dt} = \frac{K_2}{\mu} (p_0 - p_i) \quad (2)$$

(Poiseilles Law, giving the volume rate of outflow through the vent in laminar flow.)

$$pV^\gamma = K_3 \quad (3)$$

(The adiabatic expansion law, for ex-

(Continued on Page 19)

(Continued from Page 15)

extra effort to attend this 21st National at Elsinore in the hope that by doing so they will be able to achieve long cherished dreams of high altitude and long distance flights, which the soaring conditions in So. California almost guarantee; and by making these flights they will achieve the necessary "legs" on their Golden "C" and Diamond "C" awards. These coveted awards can be won by the visiting pilots for the trying. In order to help these pilots, we are now making arrangements with airports at Bishop, Bakersfield, El Mirage, and Blythe, California, and Phoenix, Arizona, for these airports to have suitable towing equipment available so that pilots, who are driving through these cities, on their way to the contest, can stop off, set up their sailplanes, be launched, and make an official long-distance flight from those cities to Elsinore. These facilities will be arranged for July 23, 24, 25, and 26. In conjunction with this over these four days prior to the contest, we will have available at Elsinore, sufficient tow planes to allow contestants plenty of time for practice soaring in the area or long-distance soaring flights from Elsinore.

The Design Competition Awards Committee under the Chairmanship of George L. Rounds, of S.C.S.A., will judge and give awards to the designers and builders of the best new sailplanes, which are entered in the contest. They will also give an award for the best improved standard type of sailplane. If you have a new ship and expect to enter this competition, write the contest committee immediately, so that

we may tune you in on all developments.

There will be technical speakers and discussions at the contest. This is under the Chairmanship of Dr. W. B. Klemperer. Tentative plans of this Committee have lined up Bob Symons of Bishop, to talk on the jet stream. This will be very interesting, as Bob is a recognized authority on this phenomenon. Several other technical speakers have been asked to speak at the contest.

Two other interesting committees are active in conjunction with the National Contest. They are the Editorial Appreciation Awards Committee under the Chairmanship of Paul Bickle of Edwards, California. This Committee is endeavoring to recognize the skill and editorial ability of many people who are interested in soaring and have expressed their interest through the medium of club bulletins, magazine articles, newspaper accounts, and books, both technical and non-technical, related to soaring.

We urge all readers to send in their club bulletins, or favorite magazine articles, or newspaper accounts of their glider contests and events, so that this Committee may review them.

Another Committee, new to the annals of National Soaring Contests, is the Art Appreciation Awards Committee, Chairman, Jack Lambrie of S.C.S.A. (Recently from the Chicago Glider Council). Purpose of this Committee is to collect and review photographs, art paintings, sketches and cartoons of sailplanes and soaring subjects; to display them at the contest or in a suitable hotel or store in Elsinore

(Continued on Page 25)





CONTEST RULES AND REGULATIONS

FOR

TWENTY-FIRST NATIONAL SOARING CONTEST

Elsinore, California

I. Awards

- a. National Soaring Champion — Single place only. All pilots and ships compete on an equal basis with respect to point score — 3 awards.
- b. Handicap Awards — Highest adjusted point score; point score modified by handicap factor for particular class (I, II, or III) — 3 awards.
- c. Class Awards — Highest point score within each handicap class — 3 awards in each of 3 handicap classes.
- d. Two — Place Award — Highest two-place point score. 1 award. NOTE: Two-place entries are eligible for all handicap and class awards.
- e. Women's Soaring Champion — Single place only. Highest point score earned by a woman pilot — 1 award.
- f. Junior Champion — Single place only — Highest point score earned by a pilot under 21 years of age — 1 award.
- g. Club Champion — Highest point score earned by a club-owned glider. (Club must have 6 or more share-holders) — 1 award.

II. Qualification of Pilots

- a. Pilot must hold current F.A.I. sporting license. (Active membership in SSA satisfies this requirement.)
- b. Minimum of Private CAA Glider Pilot rating.
- c. Pilot shall have made a minimum of five airplane tows during the fourteen months preceding start of contest. Contestants may be called upon to demonstrate aero tow proficiency.

III. Qualification of Gliders

- a. Current CAA certification.
- b. Shoulder harness required.

- c. Parachute required.
- d. Emergency kit required (tie-down, water, etc.) Safety Committee will issue advance bulletin on this requirement.
- e. Barograph not required, but strongly recommended.

IV. Contest Flights

- a. Nine contest days, one rest day. Contest Committee may declare a No Contest day. If all nine days are Contest days, four shall be task days and five open days. Choice will be made by Contest Committee as contest progresses.
- b. Final Point Score for each pilot will be computed for one less number of official task days and one less than number of official open days; i.e., if there are nine contest days (as in a. above), best 3 task days and best 4 open days will be counted.
- c. Task may include: Goal, Goal & Return, Triangular Course, Continuous Circuit, Speed Dash. It is expected that speed dash courses will be relatively short (about 100 km.) closed courses, with landing at point of departure.
- d. On open days, contestants may choose straight distance, goal, or goal and return flights only (no triangular course or continuous circuit).

V. Scoring

- a. Basic Score (will be multiplied by daily weighting factor to establish point score)
 1. Straight Distance — 1 point per mile.
 2. Distance to Goal (must land at goal) — 1.2 points per mile.
 - a. On task days, if goal is not reached, points will be awarded for distance projected on line from contest site to goal — 1 point per

mile, no points beyond goal distance.

- b. On open days, if goal is not reached, points will be awarded for straight distance to landing point (not projected).
3. Goal and Return — 1.3 points per mile.
 - a. If pilot fails to return to take-off site, straight distance points will be awarded for distance toward goal and partial return, if any. No bonus for reaching goal if return is not completed. Distances projected along line from contest site to goal. This holds true for both open and task days.
 4. Speed Bonus — On speed dash task days, distance points earned (as outlined above) will be multiplied by a speed factor, determined as follows:
 - a. If task is completed, factor is $V^2/500$, where V is pilot's average speed in miles per hour from release to landing.
 - b. If task is not completed, the factor is that of the slowest pilot who does complete the task.

Example: Pilot completes 60 mile triangular course with average speed of 35 mph.

Basic Score =

$$60 \times 1.3 \times \frac{(35)^2}{500} = 191 \text{ points}$$

Example: Pilot lands short, covering only 50 miles. Of the pilots who completed the course, the slowest average speed was 22 mph.

$$\text{Basic score} = 50 \times 1 \times \frac{(22)^2}{500} = 48.4 \text{ points}$$

Example: Slowest pilot to complete course averaged 22 mph.

$$\text{Basic score} = 60 \times 1.3 \times \frac{(22)^2}{500} = 75.5 \text{ points}$$

5. Pilot may make more than one flight per day, but only the one flight which results in the highest score will be counted.
- b. Point Score — A daily weighting factor will be employed to compensate in part for changes in soaring conditions during the contest by proportionately reducing everyone's score on days when long flights are easy, and increasing everyone's score on days when even hard work and exceptional skill will not yield more than a short or medium length flight. The Basic Scores when so modified will become point scores. The Point Score will be the official score for each pilot for each day. This will tend to make every day worth while from a competition standpoint, as Point Score totals will not be unduly dominated by flights made on the very good days. A similar weighting factor was used with success at the International Contest in Sweden in 1950. Note that the Point Score is independent of any class of ship or handicap.
- c. Weighting Factor — The weighting factor for each day will be determined from the 3 highest basic scores of that particular day, (1), (2), and (3):

$$\text{Factor } F = \frac{20}{\sqrt{(1) + (2) + (3)}}$$

Example: If the three best flights of the day yield Basic Scores of 210, 196, and 170 points,

$$F = \frac{20}{\sqrt{210 + 196 + 170}} = .83$$

and all contestants' Basic Scores are multiplied by .83 to arrive at each contestant's official Point Score. The Point Score for the 3 top pilots would then be

$$\begin{aligned} 210 \times .83 &= 174 \\ 196 \times .83 &= 163 \\ 170 \times .83 &= 141 \end{aligned}$$

Example: If the day is poor and the three best flights of the day yield basic scores of 105.89 and 62 points:

$$F = \frac{20}{\sqrt{105 + 89 + 61}} = .25$$

and the Point Scores for the 3 must be on the take-off line, ready

$$\begin{aligned} 105 \times 1.25 &= 131 \\ 89 \times 1.25 &= 111 \\ 62 \times 1.25 &= 77.5 \end{aligned}$$

It should be noted that the pilot need not concern himself with the weighting factor insofar as pre-flight or in-flight decisions are concerned. Since every pilot Basic Score will be modified by the same percentage, the pilot should be concerned only with acquiring the highest possible Basic Score.

- d. Handicap Factor — This factor will be used to modify the official Point Scores for computation of handicap awards. The means of computing this factor have not yet been determined, but this will be accomplished shortly.

VI. Flight Regulations

- a. Take-off Order — Demand System. Pilot will request take-off time in advance and will be assigned nearest available time position by starter. Pilot and glider must be on the take off line, ready to take off at time assigned. Failing this, take-off will be moved back to next available time.
- b. Take-off and Landing Cards — No flight will be officially scored unless a properly filled out take-off card has been handed the starter just prior to take-off (includes goal declaration) and until a properly filled out landing card (includes landing witnesses' signatures) has been turned in to the Chief Scorer.
- c. Spiralling — Pilots should circle in same direction as first glider in a particular thermal.
- d. Retrieve — Pilot must accompany glider during retrieve.

Send comments or suggestions to John W. Williams, 2327 Cecilia Terrace, San Diego 10, California.

(Continued from Page 17)

pansion without the addition of heat.)

Combining these equations, noting $(dp/dt) = (dp_i/dt) = (dp_o/dt)$ under steady state conditions,

$$R = K_4 \frac{\mu}{p} \frac{dp}{dt} \quad (4)$$

If we let p be the static pressure p_s , since $p = K_7 \rho T$, and $dp = \rho g dz$,

$$R = K_5 \frac{\mu}{T} \frac{dz}{dt} = K_6 \frac{\mu}{T} \frac{d(Wz)}{dt} \quad (5)$$

B. Total Energy Venturi

Wz is the potential energy of the glider. When the variometer is connected to static pressure, the reading shows rate of climb or rate of change of potential energy. If we let p be $p_s - (1/2) \rho v^2$, and use Eq. (4) again while considering an incompressible fluid and $(1/2) \rho v^2 \ll p_s$, then we

$$R = K_8 \frac{\mu}{T} \left(\frac{d(Wz + \frac{1}{2} \frac{W}{g} v^2)}{dt} \right) \quad (6)$$

Thus, when the variometer is connected to the venturi, the reading shows the rate of change of total glider energy, potential plus kinetic.

C. Sensitivity versus Altitude

NACA T. N. 1428 gives $(\mu/\mu_o) = (T/T_o)^{-0.9}$, so from Eq. (5)

$$R \sim T^{-0.25} \frac{dz}{dt}$$

If the cockpit temperature is constant, μ does not change, so

$$R \sim T^3 \frac{dz}{dt}$$

D. Restrictor Tube for Sinking Speed Correction

If the desired calibration point for the sinking speed correction is sink rate " w " at airspeed " v ," it turns out that the restrictor tube length " l " and radius " r " should be related as follows:

$$\frac{l}{r^5} = \frac{\pi p_s \rho}{8 \mu g} \times \frac{1}{V} \times \frac{v^2}{w}$$

1. Paper presented at the joint meeting of the IAS and the SSA, New York, January 28, 1954.
2. Designed by P. Temple. Soon to be manufactured by Marplesons Limited, Haven Works, Shillito Road, Parkstone, Dorset, England.
3. This instrument, manufactured in Memphis, Tennessee, is at present not in production and there is no adequate substitute for it in the U. S. In France, the "Variometer Badin" is of similar quality. The "Badin" features a double linear scale with the sensitivity change at the 5 meters per second point.
4. Availability from Schweizer Aircraft Corp., Elmira, New York.
5. "Gliding," Winter 1952-53, and see also "Gliding," Summer 1952.
6. "Gliding," Autumn 1953.
7. Both the Irving and Temple venturis are manufactured by Cobb-Stater, England, and sold through the Schweizer Aircraft Corp., Elmira, New York.
8. NACA Report No. 126, Aeronautics Instruments, Section II, Bureau of Standard, 1922.

LARGEST GLIDING ORGANIZATION

Britain's Air Training Corps now has the largest gliding organization in the world. France comes a close second, with its many civilian gliding clubs. The A.T.C.'s claim to be the largest is based on the number of pupils and instructors continuously engaged throughout the year at its numerous schools, the hours of flying and the number of launches.

Achievements for 1953, just compiled, include the following:

| | 1953 | 1952 |
|------------------------------|--------|--------------|
| Launches | 97,114 | 92,584 |
| Hours of flight | 7,346 | not recorded |
| Certificates issued | 1,478 | 1,184 |
| Cadets qualified proficient— | | |
| B Certificates | 1,403 | 1,130 |
| Cadets qualified advanced— | | |
| C Certificate | 71 | 54 |

These figures show that with only a 4% increase in launches over the previous year, the number of proficient and advanced cadets increased by 24% and 29% respectively. Among the improvements made during the year which contributed to these results was the re-equipment of schools with two-seater gliders. There was a higher standard of instruction, and much hard work by gliding school staffs. Reasonable gliding weather during the year was another factor.

There are now 44 A.T.C. gliding schools in the country.

(Continued from Page 22)

pounds. Top speed was 169 MPH, and best cruise was an even 100 MPH for a range of 375 miles. Following the German lead, the U. S. Air Force added power to several of its own cargo models, and eventually abandoned gliders altogether in favor of "Assault Transports" that were actually powerplanes evolved from airframes that were originally designed as gliders. Presently existing examples are the Chase C-122 and C-123 series.

(Continued from Page 17)

where they can be seen by the public; to judge these items submitted and give an honorary plaque, no cash prizes. General idea of these awards is to stimulate new interest in soaring activities by groups inside and outside of soaring, and to recognize the photographic and art ability of many of

REPORT FROM THE SCHWEIZERS

The 1-23D: We are running another batch of 1-23D's. One is for Captain Edward Butts of Washington State, another for Paul MacCready's use in England. Other deliveries can still be made in plenty of time for National Contest use.

The 1-26: The decision was made to go ahead on this project and we now have firm orders up to ship No. 23. It is quite likely that we will build several more prototypes to carry out some production changes, as well as to get more of these flying around the country. We think the potential of this ship as a high performance sailplane is very great and are very optimistic about its future.

The 2-25: Work is speeding along on the 2-25 prototype and the wings and fuselage are now in the jigs. It is hoped that it can be done in time for use in the International. However, there is still a great deal of work to be done and it is going to be close as to whether it can be ready in time to allow for suitable testing and practice. Other company work may also effect this so we are all just hoping.

The 2-22: The demand for this excellent trainer is growing and practically every ship is in active use with a club. As soon as sufficient orders are on hand, it is our plan to produce this ship again. This will probably not be until next year, at the earliest.

The 1-19: This ship will be replaced by the 1-26. We do not have any 1-19's left except our own company ship which we plan to keep. We do, however, have a few partial kits available.

these people who have skill and talents in these directions, and to allow these same persons, who live at great distances from Elsinore and cannot attend the contest, to send in the best of their works in the hopes that they will get national recognition for their arts and crafts which they have tried to express through the medium of soaring subjects.

Events

1. Best still photograph of a glider or soaring event.
2. Best active photograph of a glider or soaring event.

Both black and white or color photographs can be entered and will be judged in separate events. Entry can be of any size, however, it is suggested that the entrant maintain a

SOARING CALENDAR

- May 27-31
Sixth Annual Wright Memorial Glider Meet
South Dayton Airport
Dayton, Ohio
- June 19-20
New England Soaring Meet
La Fleur Airport
Northampton, Mass.
- July 2, 3, 4, 5
Seventh Mid-West Soaring Contest
Municipal Airport, Toledo, Ohio
- July 11-17
Philadelphia Glider Council
Summer Training Camp
Philadelphia Gliderport
Pennsylvania
- July 11-25
Western Canada Soaring Meet and Contest
- July 21-August 5
World Gliding Championships
Derby & Lincs Gliding Club
Camphill, England
5th OSTIV-Congress
C Ve M (Gliding Commission Meeting)
Buxton, Derbyshire, England
- July 27-August 5
21st National Soaring Contest
Elsinore Gliderport
California
- Sept. 4-6
Chicagoland Glider Council, Inc.
Annual meet and contest
Elgin, Illinois

minimum size of 8x10 for all photographs submitted.

Art

1. The best oil painting, water color or sketch, of a glider or soaring subject.
2. Best cartoon.

Each contestant will be limited to three items each in any of the above classifications. Each entry requires \$1.00, for which the contestant will receive a sticker admitting him to the soaring contest.

In general, our planning and our results to date, have been very encouraging. The only restrictions which have been imposed upon us have been reasonable restrictions of flight operations, over and around the March Field Air Force Base, which is 23 air miles from Elsinore. These will not inflict any difficulty. The only other restriction to be imposed on us to date, has been that we do not fly over a Nudist Camp on top of a mountain about 2 air miles from our glider airport. We are endeavoring to make this a contest to your liking, therefore, if you have questions, wish hotel reservations, or need detailed information not given here, please write Elsinore Contest Committee, Elsinore, California.