

6th RC Soaring Nationals

Dan Pruss

In the Scale pit area Gordon Pearson's IBEX drew rapt attention. The full-scale machine, though orthodox, offers "different" features.

A FEW YEARS ago when plans were formulated for the R/C Soaring Nationals, nearly all aspects of a large contest were considered and were planned for accordingly. All, that is, except the drama that climaxed the 1975 event.

Many descriptions of the contest—from great theatre to great sport—followed the final round of competition and if great theatre is a proper simile, then it is because the stage, Lewis University and its management, saw to it that the field was groomed for the event. Some 29 members of S.O.A.R. made up a production staff that makes a contest director's chair a chaise lounge. Add to this a cast of 184 and the curtain is all but ready to open. The first two acts, Monday and Tuesday, had near perfect weather. Temperatures were in the 80's—wind was southerly, same velocity. Wednesday, between scenes one and two, saw a shower come as per forecast and remain long enough to dampen everything except enthusiasm. The gods of fury were with us, for the rain was gone within two hours and scene two followed. The third round climaxed the greatest R/C soaring event ever held and the "theatre" became history.

If "great sport" is a more accurate way to describe the three days of competition, who can dispute that description? With names of past Nationals' winners—Mark Smith, Walt Good, Jeff Mrlik, and Otto Heithecker—in the same arena with past event winners like California's Rick Walters, Texas' LeMon Payne, and Ohio's Warren Plohr. Add to these the names of local area winners through the contest season, and you include John Baxter, the first LSF Level V, from Calif.; Dick Beltz, Penn.; Mike Broadbent, Canada; Denny Darnell from Okla.; California's Kirk Hanson—Don Edberg and Junior-Senior competitors Pete Rambo, Terry Malsbury and Jeff Walters. The list goes on: Clarks, Al, Chuck and Don; Finkenbiner, Gill,

Goughnour, Haga, Hayes, Koplan—include Pike—Kelly and Dick, Tiaht, Thornburg, Tuthill, Wagner, and a pair of Williams (both Toms) from Calif. and Tex., and Young from the state of Wash. Omit a name and you might exclude a new champion.

Saturday and Sunday, July 19 and 20, saw the 184 flyers out of 209 pre-registrations getting processed. This period is not unlike homecoming week for many; past acquaintances seeing one another, old friendships being renewed, new friendships being made. The processing included verification of assigned frequencies that were issued as a part of pre-registration; name tags, besides bearing the contestant's name, included flight group, state, and

color group, were also issued during processing. AMA and FCC licenses were checked, banquet tickets issued, and room assignments made if campus housing was being used. The dormitory accommodations, while not necessarily AAA in rating, were low in cost and convenient. Where else can you stay overnight and walk out the front door and across the road and be at the contest site?

The pre-registraion and processing procedures are imperative for contests with the magnitude of the Nationals. These two steps are both parts of the master plan so that flying can start as scheduled without those preliminaries that usually bog down the start of a contest and produce so many unpredictable vari-



Gil Rifkin, left, gently moves the stick while thermal hunting. Timers, Don Clark with parasol (or is it a hat?) and Keith Berquist who darts an interested glance at a gaggle of sailplanes; 184 fliers entered most exciting, climatic meet to date.

RC Soaring Nationals

ables—number on a given frequency, the crowded frequencies, number of contestants per age group, and size class.

As mentioned earlier, all aspects of this contest were considered years ago. This included the 15 contestants per frequency restriction. So that one may more clearly

understand the thoughts and ideas behind the system for the conducting of the flying, a little background is in order.

If flying site boundaries were of no limit and logistics presented no problems, a contest could be run with 17 winches, one for each frequency. We are also as-

suming that the retrieval of lines is no problem. With such conditions, one can readily see that there is no reason why 17 sailplanes couldn't be in the air at all times. And with efficient retrieval systems—the most efficient to date seems to be motor-bikes or cycles. Lines can be returned within two minutes after release.

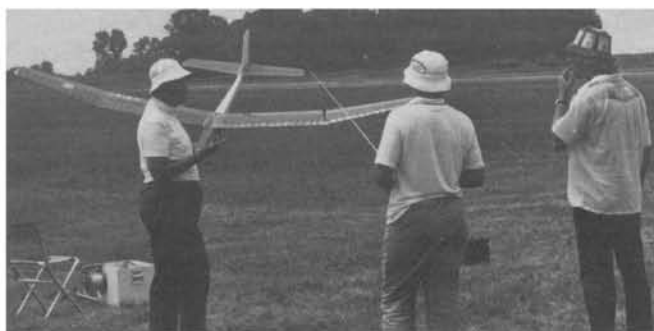
If Utopian contest facilities as mentioned did exist, one must admit this would be a slight case of extravagance on the part of contest managers and surely a case of "over-kill" with respect to the solution of the logistical problems.

Since the sailplane Utopia is still beyond the horizon and fields do have boundaries and the work force numbers are finite and the conveniences for the contestants are a consideration, S.O.A.R. has planned contests since 1973 as follows.

Since 17 winches surely aren't needed and an efficient means of line retrieval is available, the number of winches was determined to be eight. (This does not include three spares, along with spare batteries and other winch components.) The eight winches are arranged into four groups of two each. Both of the two are spaced about 12 feet apart, the next two, 60 feet away. The two winches are considered one winch site, and each of the four sites is identified



Left: Jack Hiner with Jim Simpson's Phoebus. Left, below: Unlimited champion Frank Deis, Jr., with Greg Smith's original Courageous. Below: Doc Hall's SG-38 Scale entry.



Left: Dick Naldony about ready to winch off. Bottom: Jim Simpson either is losing balance or is about to launch friend's Legion Aire. Twenty-nine S.O.A.R. members made up production staff.



OVERALL STANDINGS UNLIMITED CLASS

Name	State	Pts.	#	Sailplane
1. Frank Deis	AL	5260	---	Legion Aire
2. Terry Koplan	CA	5193	+80	* Windrifter
3. Gregory Smith	AL	5191	---	J Courageous (0)
4. Chris Adams	CA	5127	+399	* Windsock (0)
5. Bob Gill	IL	5050	---	Cirrus
6. David Banks	WA	5026	+00	Maestro
7. LeMon Payne	TX	5025	+24	Legion Air
8. H. Warren Plohr	OH	4906	-152	Grand Esprit
9. Kelley Pike	CT	4813	+217	* Hobie Hawk
10. Walt Good	MD	4659	+231	Kurwi
11. Randy Warner	CA	4659	+598	* Windfree
12. Kendall Wagner	CA	4623	+60	* Windrifter
13. Erich Kugler	MI	4615	---	Grand Esprit
14. Dave Thornburg	NM	4615	+87	* Windrifter
15. Jeff Mrlik	MI	4592	+164	J Astro-Jeff (0)

OVERALL STANDINGS STANDARD CLASS

1. Mark Smith	CA	5257	---	Windfree
2. Peter Rambo	CA	4833	---	J Windfree
3. Rick Pearson	CA	4680	+364	Windrifter
4. Rod Smith	CA	4615	+61	Windfree
5. Don Edberg	CA	4541	+103	Aquila
6. Kirk Hanson	CA	4484	+46	Hobie Hawk
7. Ray Hayes	IN	4474	+265	Aquila
8. Terry Malsbury	CA	4454	-87	J Windfree
9. Keith Finkenbiner	IL	4451	-192	Aquila
10. Col. Thacker	CA	4345	+49	Hobie Hawk
11. Dale Martell	MI	4334	+14	Plagerist (0)
12. Warren Tiahrt	MI	4204	+175	Legionaire D2
13. Robert Hicks	MI	4134	+221	TeQuila (0)
14. Donald Harris	OH	4100	+423	Flo-Drifter 2
15. Eric Podzielinski	IN	4082	+25	Windfree

5600 Points Possible; --- Indicates 9th round was passed; (0)—Original Design; *—Standard Size Sailplane Entered in Unltd. Class; J—Junior-Senior; #—9th Round Effect on Score

red, white, blue, and green. When a sailplane is launched and release of the towline is realized, that towline is further run in by a winch operator until the tow ring is about 30 feet from the upwind turn-around pulley. (Pre-marking a portion of the line so that when it approaches the the winch drum permits the winch operator to know when to stop winding.) At this point—and this is vital to the efficiency of the system—the second winch is used for launch *while the first line is being brought back*. When the line from the second winch is released, it is “run down” as the first had been. By this time, the first line is ready for another launch. This alternating launch-retrieve system is being repeated at the other three launching stations. With the 17 frequencies being broken down into groups of four or five, each station can and does get their respective group into the air in as little as seven to eight minutes.

That the system does work was evident at the 1974 Soaring Nationals when 17 sailplanes were in the air at one time during the ten-minute duration task. This year, the first round on Wednesday was reeled off in one hour and 40 minutes while putting 184 contestants into the air!

The flight group concept—number assignments determined after pre-registration is closed—has proven to be most practical and efficient. Each flight group is broken down into the four color groups mentioned earlier. Besides the winch

areas, the transmitter impound areas are also color coded. This permits each impound area to provide service for approximately 45 transmitters and contestants.

The system has the effect of running four sub-miniature contests simultaneously. The system has been proven; it works. The only problem to face—either one gets one good contest or four lousy ones.

With that brief background, it is hoped that the reader can better understand the operation of the 1975 R/C Soaring Nationals.

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\$2,500 was spent on an outstanding collection of trophies. Below: Gene Sauter, left, offers advice to Dave Burt and Tom Ruddy, S.O.A.R.



Right: With spoilers and polyhedral added to his Cirrus Paul Kelley applies “body English” to launch. Below: Scale pit. When these models fly other events stop so all can watch “show stoppers.”

JUNIOR-SENIOR OVERALL STANDINGS

Name	State	Pts.	Sailplane
1. Gregory Smith	CA	5191	Courageous
2. Peter Rambo	CA	4833	Windfree
3. Jeff Mrlík	MI	4592	Astro-Jeff
4. Terry Malsbury	CA	4454	Windfree
5. Jeff Walters	CA	4183	Rainbow

SCALE

Name	Model	Static Points	Flight Points	Score
1. Bob Thacker	Baby Bowlus	369	353	722
2. Kendall Wagner	Libelle	351	296	657
3. Bob Elliott	Glasflugel 604	230	420	650
4. Dennis Hall	SG 38	277	316	593
5. Jim Simpson	Phoebus B.	240	323	563

TOP THREE JUNIOR-SENIOR TEAMS

1. Rocket City R/C Club—Ala.	11,758
2. Greater Detroit Soaring & Hiking Society—Mich.	11,669
3. Harbor Soaring Society—Calif.	10,761

TOP FIVE TEAMS

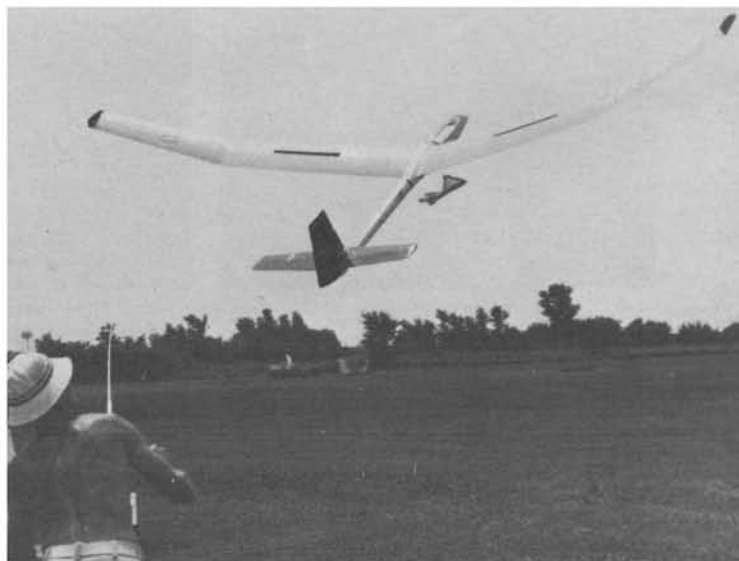
1. San Fernando Valley Silent Flyers—Calif.	14,408
2. Soaring Union of Los Angeles—Calif.	14,049
3. San Diego Sewer Slough Soaring Society—Calif.	13,934
4. Rocket City R/C Club—Ala.	13,001
5. Harbor Soaring Society—Calif.	12,906

Best Original Design

James Porter IA

Technical Achievement

Tom Williams TX (Magnet Spoiler Return)



RC Soaring Nats/Pruss

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Monday 0750. The site is nearly ready for the first call for flight groups. As mentioned at the pilot's briefing on Sunday evening, the order of call-up would be announced Monday morning. Rick Pearson from Calif. draws number seven from a hat and that flight group is called to the ready area. In the meantime, transmitters are being impounded in their respective areas. Order for the day would be flight groups seven through 15 and one through six. Moans and sighs echo through the massive pit area—the moans no doubt from flight group six, the last to be called after about two hours. That second cup of coffee will be sipped on the field not leisurely at some motel as they would have had they realized the order of call-up earlier. Besides that, more timers will be available when all flight groups are on the field. There is a method to S.O.A.R.'s madness.

0831. The first plane is launched and underway—Don Ellis, from Ill., flying a modified Imperial 100—a Jetco kit designed by Don McGovern over 15 years ago!—has the honor of launching the 1975 R/C Soaring Nationals. The crowd roars as it displays its approval and anxiety. In a matter of minutes, seven sailplanes, their transparent wings glistening, are seen in the early morning sun.

This year's tasks, the two-minute precision and the ten-minute duration, are not unlike past contests. The landing zone, while not entirely a new system, is new to this contest. Four landing circles, each with a radius of 25 feet are located behind each launch area. Each circle has two tapes anchored in the center of the circle. Point values for landings vary from 100 points to zero. These values, in one point increments, are marked on the tape every three inches. The value of a landing is read directly from the tape as it is measured to the nose of the sailplane after it has come to rest.

The method of flying the tasks is different. Each contestant will have one minute after a launch to decide which task—the two minute precision or ten minute duration—he or she will fly. This gives the flyer the opportunity to be able to take advantage of "down air" should it prevail. However, in all cases, at the end of round eight each contestant will have flown four rounds each of the two-minute and the ten-minute tasks.

The ninth round will be at the option of the flyer so he or she can better either of the two tasks. If the contestant chose the ninth round, the task must be declared and the low round for that task struck from the score card. The flyer will then accept whatever points are scored in the ninth round. (This innovation was greatly accepted and proved to be a most popular feature in the discussion that followed the contest.)

0910. The early morning air is warming, but the contestants are choosing the two-minute task during the first go.

0934. The first ten-minute max, a respectable 09:48, is by Ken Bates of Mich. flying a Legion Air. He proves the air is alive and many follow suit to "max out." Ken is one of the few to declare himself for the ten-minute duration task the first four times he flies!

1007. The first round is being flown at a record setting pace. The mixture of "two-minute" and "ten-minute" flights won't permit the likelihood of 17 sailplanes in the air at one time, but ten to 13 in the air is not an uncommon sight.

1014. The first perfect score is turned in by Col. Bob Thacker, 02:00 and a 100-point landing for a 700 point total.

1052. The first round is completed and it is the consensus of nearly everyone that this year's competition is of the highest calibre ever assembled. More landings, more good landings, were made than ever before and more near-perfect flights were recorded than in previous years. The scores posted at the end of round one verified this.

As round two began, more and more flyers were recording their second near perfect flights. Now an individual's attention shifted from his own achievements to the score cards of others.

Round two went as routinely as the first. At 1357 the third round was ready to begin.

Ten-minute breaks were taken between rounds to give everyone a chance to relax during this first day. Radios failed as did sailplanes, and back-up ships and electronics had to be replaced. However, the attrition rate was extremely low the first two rounds which further attested to the proficiency of the competitors.



Col. Bob Thacker's lovely Bowlus scored 722 points to win Scale.

The end of round three came at 1637 and the prediction of ending the first day at 1630 was missed by a mere seven minutes.

As Tuesday dawned and the winches with fresh line were positioned, it was determined, again by chance, that flight group 12 would begin the competition.

This day saw the strategy of many competitors vary. Those that decided to take three two-minute flights on Monday knew that at least two flights today would have to be attempts to get ten-minute "maxes." Those few that maxed out three for three on Monday knew they could relax a bit for they had two full days to get one more ten-minute duration flight.

0945. By this time the air was alive and many flyers found themselves riding out super "boomers." More and more concern for the others' scores became evident as club teams were getting increasingly aware of their own possibility for taking home the "hardware."

This year over one-half of the contestants represented 34 AMA chartered clubs. Twenty-nine Open age groups and five Junior-Senior groups from 27 states made team competition the toughest ever. A ten-dollar team entry fee was imposed this year with the proceeds going towards a USA/FAI team's expenses.

1117. The fifth round is well underway and the weather is as favorable as predicted. Thermals abound and the sight of the sun playing out the colors of a dozen or so gossamer-like wings creates a picture seen in no other sport. The beauty of these same planes is further realized as many try to outride the same thermal long enough to see their transparent colors change to a black silhouette against a billowing cumulus. This is R/C soaring at its best!

This pattern is repeated throughout the day and broken only when one of the planes nearing a "max" is flown out of the thermal—if possible—and spiraled down towards the landing areas.

Mishaps do occur. Dave Shadel, after four "in the money" flights, has a sure ten-minute max in the making when he decides to elude the thermal that has already given him eight minutes. Flying inverted—not an uncommon maneuver for some—but dissipating altitude at an alarming rate his plane sheds a wing! The model plummets immediately—luckily onto the field where it is retrievable. However, part of the wing that was shed disappears into a blue part of the sky.

1310. Between rounds five and six—rounds two and three for the day—scale flying is scheduled. This year out of 15 pre-registered entries, seven were statically judged on Monday.

All regular flying is stopped and every chance is given the scale flyer as he prepares his ship. These "show stoppers" prove to be a high level of interest category from a spectator's viewpoint as the pit area nearly empties and lines form around the launch and landing areas.

Colonel Bob Thacker from California is first in the air. His scratch-built Baby Bowlus goes up the tow as if it were on a rail and the crowd applauds with approval. Ken Wagner launches his Libelle and turns in a 01:34 flight time. Of the seven planes entered three are "scratch built"—Thacker's Bowlus, Doc Hall's SG-38, and Gordon Pearson's IbeX. Hall's entry is the same ship that he flew last year—not a soaring machine by definition; the real one was not meant to be. However, after a launch that had the crowd again cheering, the SG-38 was seen to immediately enter "up" air. Just in case Doc had missed the existence of that bubble, 183 other contestants told him it was there!

What the crowd did not know was that Doc's original entry was a more refined version, larger with more detail. On the July Fourth week-end, it was destroyed during a launch after undergoing a rather successful first test flight.

A similar fate was to strike Gordon Pearson this day. His newly built IbeX was destroyed during its launch. A most unusual modeling subject, this sailplane was the epitome of scale craftsmanship. The other models—all from kits—were Bob Elliott's Glasflugel 604, Kevin Pearson's Kestral 19, and Jim Simpson's Phoebus—entered for the fifth year.

This year's newly formulated N.S.S. scale points system whereby a maximum of 500 can be earned for presentation and 500 for flying, proved that many kit models can compete with the "museum pieces."

An event that has become a tradition with the R/C Soaring Nationals is the "Best Original Design Award." Aesthetics—use of materials, the design itself, and its flight performance are among the factors considered. This year's judges were Gil Rifkin, N.Y., Bill Stamm, Mo. and Dick Shilling and Larry Fogel from Calif. This event, held as the final event of the second day, determined Jim Porter and his "Volant" to be the winner.

Among the traditions established for the Nationals, a few social aspects must be noted. Among them is the "Watermelon Roast(?)" originated by Johnny Osborne of Midwest Model Supply. His gesture was, as usual, a most refreshing climax to a long, hot day.

Wednesday, July 23rd. The third and final day of competition. The day where the ninth round would make, or break some, if the forecast of rain doesn't materialize. The method of determining the winners, should the ninth round be a wash-out, is a most complex formula and too involved to discuss here.

0630. In the University's banquet hall, a fellowship breakfast is attended by most of the contestants. After two days of hard fought competition, the spirit of camaraderie is most high. And just in case anyone's competitive spirit needs whetting, the display of nearly \$2500 worth of trophies will act as an elixir.

0730. The pit area is formed in a most orderly fashion and much earlier than on the previous days. The first launch is ready by 0745. The air of excitement is intense. Other contests have this same flavor, but for some reason it's at a much higher pitch today. Flight group 11 is the first to be called today, and this group is poised for its flight almost immediately after call-up.

0800. At precisely eight o'clock the first flight is airborne. The pattern of call-up goes on most routinely. Each contestant as for the past two days must provide his own timer, never the same twice, and in all cases from one of the 50 states other than his own. This system has also proven itself to be a most successful part of the Nationals.

For a contest to run most efficiently it takes the utmost teamwork of those hosting the contest. The effects of long days of preparation becomes evident when the contest runs smoothly. However, it also takes the cooperation of the contestants to make it run efficiently. Today would be an example of their fullest cooperation. In one hour and 40 minutes the first round saw nearly 200 flights! This remarkable pace meant that competition could be finished by two o'clock.

However, the rain that was forecast was already in sight. As the second round was about half-way through, the rains came and all operations were ceased.

The next two hours were spent in up-dating the score

board, shop talk and lunch. At about one p.m. the sky showed some promise of allowing the eighth round to be completed. It was, and at the same pace as the early morning round. By now the sun was again shining and an assuring promise that round nine could be completed seemed to be in the air.

The second round of scale was flown, and during this time contestants were contemplating how best to use that ninth round. Many phrases of strategy could be heard. "If Smith blows his ninth and I can better my 454 then maybe I" "Let's see, it's easier to better a two-minute score, mathematically speaking, because if I don't max then I lose"

1410. One final announcement on the "P.A." is heard before the final round begins: "The first eight rounds are posted! Contestants will have one final chance to study the score board and to plan your strategy. As flight groups are called, each of you will either pass the ninth round and stand pat on your score or declare the task you will fly."

As contestants and timers filed past the call-up area, cards were either filed for final tabulating or an "X" was crossed over the lowest round—the task selected by the contestant.

In all cases, as a flight was completed, the results were not given to other contestants—lest one who had not flown suddenly realize someone had "blown" round nine and his own score is suddenly better.

However, gamblers abounded! Monday morning quarterbacks later would have a field day. Examples: Warren Plohr with a 5058 score threw away 450 points and ended up with 298 and 4906 for a final score, thereby giving away a chance on at least fifth place. Keith Finkenbinder had a sure fourth and threw away a 340-point flight and entered the biggest sink that he had seen since he left N. J. His "ten-minute max" ended up 02:28 and 148 points. Others profited. Rick Pearson, Calif., gave away 193 points and bettered the throw-away round with a 557. A few others and how they fared: Chuck Anderson, Tenn., threw away 133 and picked up 557; Don Harris, Ohio, gambled away 252 and got back 675! Biggest gambler was Steve Work, New Mex., who threw away 613 points to come back short with 595.

It should be noted that scoring per round was as follows: The ten-minute duration task was based on a point per second up to ten minutes or 600 points. This plus a perfect landing (100 points) method, a total of 700 points for the flyer.

The two-minute precision was scored on a curve that gave a contestant 100 points for a perfect two-minute flight. More than 30 seconds either side of two minutes results in a zero score. The landing was scored as in the ten-minute duration task. All scores in the two-minute task (a perfect one being 200 points) were then multiplied by a normalizing factor of 3.5; this result in all rounds having a potential value of 700.

The highest score attainable for the contest was 5,600 points.

This method of scoring had a definite advantage. Rather than wait, as in previous contests, until a task was completed and award 1000 points to the winner, a score with the present system was immediately known. Past contests required pro-rating all scores less than the highest, a most time consuming chore.

1525. As round nine was nearing the end, one could, as during past rounds, watch the spectrum of sailplane

designs fill the air. If statistics indicate one design to be more popular than the next, this was not necessarily evident during any one ten-minute portion of a day. To see a dozen different brands mixing it up with models of original design all riding in the same thermal proves, to some degree, that this competition is that of man with his machine.

At 1540 on Wednesday, July 23 the curtain lowered on the Sixth R/C Soaring Nationals after what was the most hard-fought three days of sailplane competition ever seen. The 1,800-plus flights establishes a high for any contest. Line retrievers logged nearly 700 miles(!) in performing their tasks and over 12 miles of tow line were used.

The blood and the sweat on the part of the winch operators was not measured.

The Awards Presentation

If any of modeling's social events are to be recognized, surely the R/C soaring banquet is on that list.

Emceeding for the third year was John Nielsen, who also wears that hat of LSF secretary. This year 310 guests saw honors bestowed and prizes awarded mixed in with moments of both reverence and irreverence. Guests included University representation, AMA's Executive Director, John Worth and District VI V.P., Glenn Lee.

For a few, the limelight shined more than once on banquet night; most often for Mark Smith who swept the Standard Class by taking first places in the Two-Minute Precision and Ten-Minute Duration tasks and First Place overall. Frank Deis from Huntsville, Ala., took the overall Unlimited honors by placing 12th in precision and first in duration. Deis flew a Legion Air with rudder, elevator, spoilers, releasable tow hook, and thermal sniffer.

Smith flew his Windfree rudder-elevator only and missed Deis' score by only three points! (Those proponents of a rudder-elevator-only standard class—as a beginners' class—now have further opportunity to speculate the future for such a category.)

Scale honors were taken by Col. Bob Thacker with a score of 722 points out of a possible 1000.

Best original design was won by Jim Porter and "Texas" Tom Williams won Best Technical Achievement laurels.

Team honors for Open age category went to the San Fernando Valley Silent Flyers. Team members were Terry Koplan, Rick Pearson, and Bill Nibley. The Junior-Senior team trophy went to Gregory Smith, Richard Kucejko, and James Fitch of the Rocket City Radio Controllers, Huntsville, Ala. This is the second time in two years this club has won this award.

For the second year, the University of Michigan presented the Felix Pawlowski Memorial Trophy. This award honors the memory of the aeronautical engineer from this same University. The winner, Pete Rambo, from Calif., earned the award by having the highest combined score on a written examination and flight sheet.

The coveted Willow-Bee Wand was presented to Sid Axelrod by last year's recipient Rod Smith. Traditionally, something must be added to this dubious award and the West Coast will be glad to know that Colonel Thacker's 1956 vintage tie now adorns the Wand.

The awarding of door prizes, some 75 in all, closed out the festivities. If any contest can be labeled successful then part of that success can be attributed to the generosity of sponsors and donors. To list them all would be like an index in an R/C buyer's index. To them, on behalf of all associated with the Sixth R/C Soaring Nationals, a sincere thank you.

The top 15 in each class are presented together with the results on how round nine affected the scoring.

Some Facts and Figures

Twenty-seven states and Canada were represented. Mich. had 36 entries; Calif. had 32. Of the 184 contestants, 85% were LSF members. Six contestants were women. Of the planes entered, 34% were original designs or built from plans; 21% of the flyers used thermal sniffers. Thirteen "Standard" size ships were entered in the "Unlimited" category; Seven of these finished among the top 18—all seven were rudder-elevator function only. Approximately 85% of all landings were "in the circle"; 22 different "kitted" models were flown.