

COMPETITION CONFIDENTIAL

A REVIEW OF THE "PROCEEDINGS OF THE FIRST ANNUAL SYMPOSIUM ON COMPETITIVE SOARING" FEATURING

DICK SCHREDER

A. J. SMITH

GEORGE MOFFAT

Okay, for the past three or four months you've been reading ads and editorial comments about an outfit called Soaring Symposia and by now you've heard just about all you care to hear, right? And if we told you that this same Soaring Symposia is currently selling a 124-page, soft-bound book with a title like *Proceedings of the First Annual Symposium on Competitive Soaring*, you might be more tempted to give out a yawn than \$5.25. I mean, you and I know that people who use words like *proceedings* and *symposium* not only went to school a whole lot longer than we did, they probably even *enjoyed* all that dull text-bookish stuff that goes on at things like symposiums—er, symposia. And, hell, for \$5.25 a fella can go out and buy himself something *useful*—like one whole aero-tow.

A moment, if you will please. In the nearly two years that I've been editor of *Soaring Magazine*, *Proceedings* just happens to be—to me, at least—the single most interesting manuscript that has crossed over my desk. The material (edited by Ed Byars and Bill Holbrook) completely caught me up; I found it almost impossible to put the darn thing down, and anyone who has any ambition to ever venture beyond gliding distance of his home field is apt to feel similarly.

Fine, so what's it all about? Well, let's look at the table of contents. The first "session" (or, if you like, substitute a word like talk, chapter, or lesson) is "Do's and Don'ts of Contest Flying" by Richard Schreder; session II is "Low Loss Flying" by George Moffat; session III is "The Electric Variometer System" by A. Gene Moore; session IV is "Panel: Factors Influencing Crucial Decisions" by A.J. Smith and Richard Schreder; session V is "Soaring Contest Forecasts and Weather" by Charles V. Lindsay; session VI is "The Philosophy of Winning" by A.J. Smith (who else?); and session VII is "Answers to Questions from Participants" by all the aforementioned gentlemen.

Sounds impressive, doesn't it? And, yet, a simple recounting of the subject matter and the luminous names that accompany it doesn't really do justice to the excitement and fascination that comes with listening to a group of experts reacting to each other's views—sometimes agreeing, occasionally in conflict—as they present an "inside" view of their trade. Equally interesting, champions like Smith, Moffat, and Schreder—as well as some of the other contest pilots they refer to—tend to come off as people and personalities in this kind of presentation, rather than impersonal names that shuffle about at the tops of various contest standings.

I know that because some of you don't engage in contest flying, or ever intend to, you think it's at least a mildly uninteresting activity as far as your own personal standpoint of view goes. I think that this sort of attitude has to be rooted in the fact that you don't really grasp the marvelous complexities of competitive soaring, the drama of its intriguing challenges, and the

less than predictable manner in which various human beings respond to these factors. And why should you? Contest pilots play their games as single individuals in the splendid isolation of a sky without boundaries, grandstands, press boxes, or instant television replays. The only way to truly know what it's all about is to be part of it. Or talk directly to those who are—and that's what this book is all about. A chance to gain a real insight into the remote and esoteric world of top-level sailplane competition by listening to those who have been there, made it big, and can tell it like it is.

Soaring Symposia has graciously granted us permission to publish a few excerpts from this work (the material is copyrighted, and others should seek written permission before reprinting anything). Actually, we would like to bring you every single word, but then you wouldn't pay much attention to SS's ad in this issue—which would be a shame because the publishers deserve a fair economic return for having brought off this concept so successfully.

In choosing excerpts we have concentrated on remarks that capture the spirit and flavor of things from the *pilot's* point of view. And we have tried to include comments that shed additional light on events that have previously been reported in *Soaring*, as well as attempting to give you a better understanding of the all-important goings-on taking place at Marfa, Texas, right now (the Nationals) and next year (the World Championships).

There's just one trouble with the *Proceedings of the First Annual Symposium on Competitive Soaring*: when you finish reading the last page, you may feel a sense of disappointment that the authors didn't just whisper all their secrets into your ear alone—I mean, why did they also have to go out and tell everything to all those other pilots you and I will be competing against? Of course, knowing what to do and actually *doing* it can often be two separate things . . .

In any event, we hope you enjoy the following quotes.

BENNETT M. ROGERS

Dick Schreder: U.S. National Soaring Champion 1958, 1960, and 1966

In all of your contest flying, you must be somewhat conservative. Because if you go down on one day and most everybody else completes the task, you are out of the contest. It used to be in the old days that there were not too many good pilots, six or seven, and you could have one bad day and recover, but not any more. The ships are getting better, the pilots are getting better, and you just cannot afford to make mistakes, and especially obvious mistakes.

* * *

I think it's important for the pilot to be comfortable. If he isn't comfortable, if he has problems, physical



The First Annual Symposium on Competition Soaring was presented March 8th and 9th at the White Sulphur Springs Hotel in Mann's Choice, Pennsylvania. At the blackboard is A. J. Smith, while Dick Schreder looks on.

problems in the cockpit, he can't concentrate on flying the sailplane and doing his best. I think he's lost the day if he's uncomfortable and has problems. Along with this, you need good ventilation in a sailplane. Almost always, you'll get fogging when you get up under the bottom of the cloud bases in Texas. You need something to keep your canopy clear; you need good cushions to keep comfortable so you don't get bed sores. I know all of us have flown over nine hours two, three, or four days in these contests, and you're going to do it in Marfa, so you want to really make sure your cockpit's comfortable and that you're not sitting on things you shouldn't be sitting on. And I think we should all give more attention to having some kind of a relief tube.

* * *

Don't pay too much attention to thermals chosen by other gliders unless you are desperate. I've gotten trapped so many times by dashing over under a thermal or circling glider, expecting to go back up, and I get there and find there is absolutely nothing. And by that time, I am down a lot closer to the ground than I want to be. I have actually gone down and landed because I have done this. So one thing that will help you is to carry a sheet with the numbers of the competitors on it. You will find that there are certain numbers that circle in thermals, and there are certain other numbers that circle in zero sink.

* * *

Always pick a suitable area for possible landing. I am different than most people—I'm not like Paul Bikle. Paul Bikle will head out into any area at any altitude, and he doesn't mind me saying this because he tells everybody that he does this, and he saves himself lots of times, but occasionally he goes down too. But I personally *never* go into an area unless I am

sure I can land. I went down in East Germany once, I forgot about it then, but . . . as a general rule, if I am flying in rough country and I can see nothing but woods and trees up ahead and not any good indication of lift, in other words if there aren't cu's all the way and it looks like there is a big hole, I won't head over that area. I'll try to skirt around it, because if you can't fly the next day, you are out of the contest. And if your glider is hanging in a tree, you are out of the contest. So you can't be reckless. You have to fly safely and remember that there is another day. Of course if it's the last day of the contest, well, then you can smash up the glider.

* * *

Use the yaw string for accurate flying. A lot of people laugh at me; they think I'm back from the age of the Wright brothers when they look at my ship and see a little piece of yarn on the canopy, but frankly this is one of the best instruments I have. You'll find, with a turn and bank with a ball in it, that the ball will sit there right in the middle and that yaw string will be pointing off this way or that way, or it will be swinging back and forth and the ball will just sit there. I think most of you can realize that the glider flies a little better if it is going straight into the wind than if it is skidding. So I'd suggest a yaw string.

* * *

Fly at minimum weight in poor conditions. If I had disposable ballast in my glider, I would not start out, for instance, with the water tanks full on a very weak day; or if carrying sandbags and uranium blocks, like some other pilots do (I'm not mentioning any names here), you wouldn't want to start out with these on a very poor day. The reason I wrote this down was that at Marfa, I put 165 pounds of sandbags in the HP-14 and started out on what looked like a good day; and next thing I knew, I was down to 300 feet with 165

pounds of sand in the back of the sailplane. Luckily I got back up and I still can't figure out how I did it.

* * *

The higher the thermal tops, the stronger and fewer the thermals. This is a general rule, it's not always true. On days when you have very high thermals, you can be quite sure that they are going to be a little farther apart, because these high thermals take a lot of energy and there just isn't enough energy left for a lot of small ones in between. And, conversely, when the thermal tops are low, you are going to find a lot more, or on the average you will. I remember one day in particular when A.J. Smith and I were flying in a local contest from Adrian, we wound up in Dayton. I don't think we got more than 1800 feet above the ground all the way down there, and every glide you made you thought you were going to land, but you picked up another thermal and just kept going. We would go up to 1800 feet and come down to a thousand and back up to 1800 all the way. About 190 miles, I guess.

George Moffat: 4th Place, World Standard Class 1968; U.S. National Soaring Champion 1969

It seems to me that very few sailplane pilots properly appreciate how long a second is and how fast seconds add up . . . Just to dramatize what I'm talking about, last year in Poland I lost third place by 20 seconds and second place by 55 seconds. Now let's say that a circle takes most of us about 20 seconds to fly—that is one circle during eight days of contest flying, mind you. I was one circle out of third place and three circles out of second place. Well, if you would like other illustrations, consider this. The U.S. Nationals have been won—and lost—four times in the last eight years by margins of under 20 points. In American contest flying, points tend to average about six to eight a minute. Not much of a margin.

* * *

Now in Germany last spring I was fortunate and had a sabbatical, so I could spend a lot of time working on the Elfe. I spent I would say about five to six hours a day on the Elfe for a bit better than a month, doing this and that, a lot of little things, nothing very vital: aileron seals, improved canopy fit, improved dive-brake fit, covering up the tow release, improving the wing fillets, a few little odds and ends of that sort. There was a list of about three pieces of paper filled up with things to do; I think there were about 30 or 40 items all told. My guess is from making

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comparison flights before and after with one of the Swiss Elfes (Bloch's) that perhaps, *perhaps*, we gained two to three percent from doing this. We modified A.J.'s ship to match mine, so the two ships were, at least supposedly, very much alike. Two to three percent. Well, that worked out at about 30 minutes saved in an eight-day contest. I worked out the number of hours we flew and found out what two or three percent would get you. It got you about 20 to 30 minutes, which happens to be just about exactly the margin that the Swiss ship lost by; and yet Bloch, a very nice chap, rather a casual type, told me just about this time last year when I was starting to work on the Elfe, "Oh, these little things can't make any real difference." Well, I think they did make a real difference. They gave A.J., they gave me, a margin to play with over the Swiss Elfe.

Now, aside from changing around physical properties of the ship, what else can save a few seconds? Well, for one thing, how about the ship you fly? Does everything really work all the time, are you really confident about it? Because a lot of the ships I fly, borrowed ones, have variometers like that of a BS-1 I flew last summer that had something like a seven-second lag. They have total-energy systems that don't work at all or very badly. All sorts of little things that don't happen the way they ought to happen. Well, how about these things? Do they add up at all?

I can only tell you from my own experience what happened in Texas in 1967. There I had a brand new Diamant 16.5, the ship Walt Talalas has now, absolutely fresh out of the crate. I had about three hours flying on it (in rather bad weather), I think, before I took it to Texas. We soon discovered in practice in Texas that the total-energy system worked dreadfully, and yet this was the system I had just taken lock, stock, and barrel out of my Austria, in which it had worked perfectly for two years. All sorts of experts were brought in, this one and that one, and nobody could figure out what was wrong. Finally, with the help of Paul Bikle and Dick Schreder and others, we found out what the problem was on the fourth contest day. At the same time the ballast tanks finally arrived from Switzerland, so I had total energy that worked and ballast tanks for the first time on the fifth day. Well, you might be interested in how the scores went. On days one through four I placed 28, 21, 1, and 13, (the 1 was mostly from following Dick around, using his instruments). On days five through eight, with the working instruments, the places were 6, 1, 1, 4. Now you can say, "Oh, well, he learned how to fly the ship." Yes, no doubt, a little bit, but I don't think an average that went from about sixteen to about three was entirely due to the ship. It was partly due to knowing where the thermals were by having decent instruments.

* * *

I think one thing to remember about what Dick said on gaggles is that it's an awfully good idea to have at least a mental list of the top contest numbers. I find it very handy to note the top paint jobs as well. Paul Bikle, for example, is a lovely type. I don't know a nicer man. He always paints the nose of the ship a nice shiny red. You can spot it from four miles away, a real good trick for the opposition. Me, I like to have the most anonymous glider I can possibly get. If they'd allow you to throw a veil over the numbers from start

to finish, I'd do it. I think if you're too far away to read numbers, there are other ways to tell whether gaggles are worthwhile or not. Obviously if you're low and desperate, gaggles are always worthwhile. However, if you're not low and desperate but see what you suppose to be some pretty good ships wrapped up in good tight angles of bank, you can be fairly sure that the gaggle is worth going to. If you see a bunch of Ka-6's milling around in 20-degree banks, run, do not walk, in the other direction. It's almost sure-fire that a decent thermal has tightly banked ships. The only exception is very very late in the day, or very very early in the day when the thermals are gentle sorts of things.

* * *

Terrain is often very important, particularly down in Marfa. I don't think there was anybody in '67 who didn't get caught in the McCamey trap at one time or another. You know, you'd be barreling along up to Fort Stockton, you'd have five meters, and you'd think you're really going, and all of a sudden you'd be barreling along—and barreling along—and barreling along—and you'd passed up a whole lot of thermals you wished you hadn't. You hadn't noticed that the terrain had changed; fundamentally, it had all gone sand, and sand doesn't make very good thermals. People with their eyes open saw that sort of thing. Dick mentioned irrigation areas—sudden death all over the Midwest—especially around Texas, where there are getting to be so many of them these days. Where you see irrigation, you may assume there are no thermals—and for a long way to leeward of the irrigation areas as well.

* * *

You may have noticed if you listen to your radio very much that you don't hear much of Dick Schreder or A.J. Smith or Ben Greene. Now, some might think that this is because they are nice chaps and have very good manners and things like that; but I think it's because talking on the radio takes concentration, and concentration is what makes you go faster—not talking on the radio.

A. J. Smith: U.S. National Soaring Champion 1961 and 1967; World Standard Class Champion 1968

In the decision-making process in soaring, you should *search* for decisions to make. We've tried to determine how many decisions one makes during a soaring flight. I've concluded that really basic decisions probably are made, or reviewed, at the rate of two or three or several a minute. I constantly use this conclusion to test my level of activity during a flight.

As Moffat pointed out, perhaps we should be doing most decision-making during cruise between thermals. George was telling us that it's more important to do plan work during cruising flight than it is to work hard at the stick-and-rudder bit of thermaling. I agree with him. I would say, further, that you should be using the same decision-making process, the same planning and review, while thermaling that you might when you're cruising. That is, decide where you should go next, where the next lift is, where the next workable thermal is, what the course is, what problems are anticipated (are there shadows of cirrus here or more sunlight there, cloudless blue holes or better cloud structures, or whatever?). Simply, then, work hard in both cruising and thermaling conditions. But always work at

the same thing. Planning. Not planning how to move the stick and rudder in a thermal but, rather, how long to stay in it and what to do next. *Look* for decisions to make.

We each must rattle our own drum and go according to our own rhythm. Perhaps others won't find the things we do to be successful for them in soaring. However, one thing that's apparently important for success is worry. It doesn't always make a happy life, but worrying helps in sorting out decisions that might be crucial. With worry, one looks harder for decisions to make.

You actually can time yourself and say that if you haven't been making or reviewing decisions, really basic decisions, at the rate of several per minute, you've been asleep.

* * *

Cloudless blue holes are unpredictable; avoid them if you can. You are certain to build up a philosophy about this problem through the decision-making practice. If you realize that often you have suddenly arrived at the edges of a blue hole, you've probably made your mistakes 15 or 20 minutes before these shocking arrivals and didn't realize it. It really shouldn't happen to you that way. You should see situations developing way ahead. It's good if, as you're getting near the tops of thermals or as you begin cruising, that you condition yourself to make a general assessment of the weather. Then you will begin to see bad situations from some distance off. You might be surprised at the number of times you find that blue holes can be avoided with minor deviations from course. If, however, you find yourself right at the edge of a hole, you'll probably fly a greater distance to get around it or take an unnecessary risk to get across it. In those sudden confrontations, you've got a hard problem to solve because you've either got to slow down and gamble on getting across the hole or take the long way round. Either is bad.

* * *

Most of us would agree, if there is any one characteristic that we would recognize in a good competition pilot, it's determination. I've heard this word used by almost all of the people who were involved here. I've probably heard it used more often by pilots who are not at this meeting. How this determination shows up in a pilot's character is a changeable thing. Sometimes it is difficult to recognize. After you know competitors as individuals, you realize that in one fashion or other they have a great deal of determination. Sometimes, because of their nature, it's a hidden thing. And sometimes, with others, because of their character, you automatically stand to one side because they're volatile. However it is expressed, determination is a necessity, I am certain.

If you want to compete successfully, you've got to talk in terms of being in first place. Second place only gets you the opportunity to try harder, which is no great pleasure in this world. It's best to be in first place and have a sufficient advantage so that you can relax. First of all, then, you've got to have a determination to be in first place, not second place. Excuses are no good. A Ka-6 isn't a good excuse. It really isn't. If you use it for an excuse, you're defeated before you come to a contest. I'm certain that Wally Scott, for example, while he moans a lot, is not defeated before he comes to a contest with a Ka-6; and he moans in

hopes you'll discount him as a competitor and be overconfident. That gives him a perfect opportunity to climb up through you. First, you've got to have determination.

* * *

The tow car has to be good. The trailer has to be good. You should buy your next automobile only on the basis of its ability as a tow car. There is no other justification. This means you have a fight with Detroit first of all. Own your own car, so that when you say "drive the wheels off the car," the crewman cannot misinterpret that. Prepare yourself physically, not only in terms of physical conditioning, but in terms of weight. There is certainly an optimum pilot weight for Elmira, one for Marfa, and so on.

* * *

As has been pointed out, this is a strange kind of competition we're in because we don't often have measuring sticks. If you have an automobile alongside of you as you go through a corner, you've got a good measuring stick. It's tough to find a parallel in soaring. Some of us who progressed faster have been fortunate to be able to fly with others who are good soaring pilots, so that we've had a measuring stick with us. We've developed our techniques not only in contests, but in comparison flying during the week. The real breakthrough, perhaps, for both Dick Schreder and myself came the one spring when we said, "Let's go flying every day the weather is good or even halfway good." We went out on Mondays, Tuesdays, Wednesdays, and whatever. We flew pretty much by ourselves in the Adrian area. We experienced the first sea-breeze front I saw in that area and we were a bit puzzled by that. What we developed, most importantly, I think, was a rhythm in using thermals. We got to work very efficiently because we were, in a sense, competing with each other constantly, trying to outclimb the other, trying to leave the thermal before the other, trying to find the next thermal before the other. That sort of thing. That spring was a revolutionary one for us. We went to Elmira that year and we did quite well. You've got to have a plan to win, and you've got to practice.

* * *

Have plans to win the little bits of each day. You can, for example, try to win the start. Again, if you have measuring sticks, this helps. If you can get across the start line faster and closer than the others, then you're really winning the start. You're breaking the whole task down into the first of its components. How do you win the start? Let's consider an example.

My start of the last day in Poland last year was difficult. I got off late in the tows; the good weather was coming through in a series of waves perpendicular to the course, and the people who got off a few minutes ahead of me got into a wave of good weather. I got off into a trough, a wave of poor weather. I saw pilots, as I was releasing from tow, making very high-speed starts off under their wave of good weather. You could recognize the good starts because they were done in 30-degree dives—long, long, dives. As I got into the starting altitudes, approximately 3000 feet, it was in very, very, weak weather. There was no chance for me to make that good kind of start. At least, not at that time. Because of my position in the standings, if I didn't make that kind of start, I probably had no chance of winning the competition. So I stayed around the

field for nearly an hour until the next good wave came through. This necessitated, just to stay up, flying approximately 25 miles away from the field back under some good weather, then slowly working upwind to get back under the next good wave, then drifting down to the start line with it. This whole process took about an hour and involved probably 60 miles of flying. I arrived over the field, nearly the last man to start—everybody else had disappeared, but I was still quite confident that I was at least taking care of one factor that was necessary for me if I were to win the competition, and I did get a good start.

As I passed over the start line, I was on the back side of a good wave so that I could make a high-speed run and a few miles out come under the good wave and then have the advantage of riding with it for a while.

As I made my start, I saw one sailplane come back to make a start. I have a feeling that it may have been Stouffs. [*Going into the final day of the 1968 Internationals, Henri Stouffs of Belgium, flying a Standard Libelle, held a 156-point lead over second-place A. J. Smith in their fight for the Standard Class championship. The final day's task, as described here by A. J., was a 124-mile goal race. Stouffs finished 44th for the day, dropping him to fifth place in the final contest standings, while A. J. came in sixth to become the World Champion.—Ed.*] I felt then that I had him beaten because he was fully two minutes too late to make a good start. He had little chance to catch the wave I was going to catch and he apparently didn't. I would like to talk to him someday to confirm that. Timing was essential. I had a plan to win the start. It was successful.

* * *

Review your situation in the contest. If you're fortunate to be in first place at the end of the first day, with a good margin, this should tell you something about how you should fly the next day. Depending on that margin, perhaps it should tell you how you should fly for the next seven or eight days. I found myself in that position in 1967, and it made the contest easy for me. My crew doesn't know it, but they should have appreciated this because they had only a mildly abrasive two weeks compared with a normal operation. [*In the '67 Nationals at Marfa, A. J. virtually won the contest at the first turn of the first day when the unexpected "wall of dust" front advanced over the turn-point and shot down almost all the other favorites, leaving A. J. with a 700-point cushion over the likes of Schreder and Moffat.—Ed.*] I was able to determine at the end of the first day that I could be conservative for the entire contest. This is not a putdown on anybody else. It was just a fortunate position to be in. My flying didn't suffer all that much. I think my performance probably was perhaps 10 percent less than what I might have done if I'd pressed and, at times perhaps, 20 percent less than what might have happened if I had gambled. But I was able to coast at that conservative level and take fewer chances and know that I had a good chance, from the first day on, to win the competition.

I have found it just as often to be the other way. I've been far down in the standings on the last day

George Moffat at the 1967 Nationals over Marfa, Texas, in the Diamant 16.5 mentioned in the article.

Photo by Alex Aldott



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of the competition and have known that the only thing to do is to gamble everything every day—to fly faster than the best-speed-to-fly ring says, in hopes that I'd be lucky to continually get thermals that are better than the last one, or that I'd find some extraordinary circumstance that would enable me to catch the six people who were ahead of me. I have indeed been fortunate to be successful in that situation too and to win the competition on the final day, as have others here. In either situation, you've got to have a plan to win the contest, first in the form of general guidelines for the entire competition, modified as you go along, and then, second, in the form of a detailed plan for each day.

* * *

Who can define psyching? To psyche or not to psyche? Is there any value in really tuning yourself up for competition or for a flight? As you can infer from my comments, for me I am convinced there is. You can begin it, or rather you can continue it, through the year. You do it by working on your sailplane, thinking about the flying you're going to do, keeping records, studying, and whatever. This keeps your mental facilities tuned to the problem of competition. Does it really help? I'm certain it helps all of us.

How much we want to tune ourselves up is probably quite a personal thing. I don't always try consciously to tune myself up. I've discovered through the years that I do get twitchy as the take-off time comes. Sometimes twitchier than others. I have found myself in some circumstances where I realized this and began consciously to build on it. To begin consciously to develop the pitch faster for myself. There are a number of ways to do this. You can take long, quiet walks, or you can get back in the corner of the hangar. You can sit in an air-conditioned car and give yourself pep talks or whatever. Sometimes your competition helps in this problem. They come up to you and say things like, "Boy, the Sisu will never climb on a day like this." It's usually not that obvious and probably not calculated at all. They say innocent things. Perhaps they don't mean them that way, but they say just enough to tick you off; and, on occasions, almost consciously I've seized on this opportunity and read them off for about five minutes and then, almost at the conclusion, jumped into the cockpit and gone like stink for an hour. Mad! It really works for me. As I say, it's not completely a conscious thing, certainly. It begins as a subconscious thing. I'm quite aware of it now. I don't fight it. I relax with it. It annoys the other people. It really does. It gets the people around you so choked up that the officials, if they could appoint a firing squad at any one point, would get them together. But, we're not competing with them.

* * *

To sum up. Be determined. Be prepared. In equipment, body, and mind. Plan. Plan to win the bits. The components. Focus your energy. Concentrate on the contest. Don't waste your energy on diverting influences. Win.

Questions and Answers

Question: Do you use oxygen to speed up your mental processes if you're operating, say, eight, ten thousand feet, or do you just use it if you go above twelve thousand?

Dick Schreder: Well, I suppose everyone has a different idea of this, and it also depends upon how plentiful your supply is. I personally use it as soon as I get to 12,000. Now other people, people who smoke, of course, have to start sooner. But I do think that you should plan on using it at least by twelve, maybe some other people at ten, but there again it depends on how long the flight's going to be. If it's a race where you're only going to be in the air for a couple of hours, you could use it all the time, especially if you had a headache; it would help clear you up. I don't know, A. J., what do you do about oxygen?

A. J. Smith: I make it a point to taste the pleasures of life almost every night. And Dick's right. I went through the physiological test center at Chanute Field. They took us up to 23,000 feet in the altitude chamber. We took off our masks, and I passed out almost immediately. Others were sitting there four minutes later writing away. This gave me a clue about my own capacity. I would say that I've had one chance to put this information to work. I did use oxygen at Marfa, no matter the altitude (we were there mostly at eight to twelve thousand feet), and I used it regularly, not constantly, every 15 or 20 minutes. I felt that it helped tremendously. I measured that by my fatigue at the end of the day. The first few days I didn't use the oxygen and I was fatigued, even on short flights. I realized that we could carry much more weight. I put the oxygen system in and used it, and I was in better condition at the end of a flight. My mental processes were much more efficient through the flight. I think that this is an important point because you are asking your brain to work on these flights, and if it isn't working at maximum efficiency, then you aren't going to do your best.

Question (Steve du Pont): This may be a silly question, but at Marfa I got lost and badly lost several times. Do you have any suggestions about that?

A. J. Smith: Steve, this is a general answer and not directed particularly to you, but you know there's a basic thing that we do wrong. I wonder if you people have thought this out; I'm certain you have. I put marks on the map to indicate my positions. Next to the marks I put the time. If I get confused, I can go back to this log and see how I've been moving. I can project and estimate my position. But, to get a position, *first* look for something on the ground, something really prominent. It may be far off. *Then* locate it on the map. Pilots in general aviation who've been lost were looking first at the chart, and they'd say over and over again, "I couldn't find that town; you know, I just couldn't find the town." They've had it reversed, you know. Find the landmark first and then locate it on the map.

Question: I'm sure that you do much compass navigation, particularly when you consider the flat gliding angle that some of these sailplanes have and you start your final glide and you simply just cannot see your goal. And a few degrees error with the altitude margin you're leaving yourself . . . you could be wiped out just by missing the airport. How do you go about this and how do you handle the problem?

Dick Schreder: I'm sure A. J. does the same thing I do. First of all, you make sure you have a good compass in the ship and that it is well compensated so

that you know exactly what your deviation is; and I'm sure all of us are forced to fly compass headings even when we have landmarks. If you're off to one side, you still need a compass heading to be sure of where you are.

A. J. Smith: One of the beautiful things about panel discussions is that you find the divergency of operations. I don't carry a compass. The only really satisfactory compass I've found is one that Dick got surplus a long time ago. I installed this for a while. I had it on the cockpit. I really liked the way it worked, but I didn't ever use it. It even got to be annoying because it fell off when you trailered the ship. Perhaps the safest thing, though, is to start working with a compass. I have an advantage, and this works for me even in Texas, Steve. I can see major landmarks on the ground, a section of road or whatever, and because I'm graphically oriented, I can put my ship within a degree or two in relation to that landmark. More times than you realize, if you use the concept of major landmarks, you *know* where the turn-point is. You know, and you can practically stop detailed navigation. You don't worry any more about details once you've picked a major landmark in relation to a turn-point or a finish line. A final glide from 40 or so miles out is possible, relating to just one landmark. The finish may actually be out of sight behind a ridge or whatever. But you get to it through a particular valley, or between two mountains. Even in desert country, goals are easily related to major landmarks. Don't waste time with detail navigation. Just fix your goal from 40 miles out.

Unidentified: There's another way. You can thermal a couple of times, and the way you want to go is always upwind.

George Moffat: I used to be of A. J.'s persuasion and very rarely used compasses, but I certainly got my comeuppance last year flying in some of the German contests, because there—well, a little like Elmira, but, say, Elmira squared—everything looked exactly like everything, and there's much too much of it. Furthermore, the charts are not nearly as good as ours. I found that a trick the German pilots use helped immeasurably: Get a good compass and install it. Get it swung. But before you start, fly all the courses that you're going to use. Note down what you actually have to fly to make them good on the chart. Now, of course, the wind may change before the first turn-point, but it's not likely to change that much without your knowing about it. This way you get a sort of gunsight navigation, which I found was extraordinarily important after you went around a turn. Then you knew exactly what to set off for, even if there didn't happen to be any handy landmarks. You just set off on compass, and you couldn't be too far off. Then you begin to check your landmarks off to see whether you're drifting one way or the other. But this is a technique that a lot of the German pilots are using, and it seems to me a very, very, good one.

Dick Schreder: That's a very good point. I'd forgotten that I do that myself. What I do is when I start down a leg after making a turn, I try to pick out some kind of a prominent landmark that's on the course and I head towards it. I keep glancing at the compass as I'm heading towards it, and then I know that if I stay within a few degrees of that, I'll at least be able

to see the turn when I get near it. I had this work out very well in the Internationals over in England.

Question: I have a difficulty in clear air and small thermals when I'm pressing hard, wrapping up, and getting centered. What is your technique?

Dick Schreder: Well, I suppose most of us have a little different technique here. I think I've already told you mine. I wait until I begin to get a drop off in the thermal. Also I watch the total-energy variometer; and if it's not indicating as strong as an average thermal and I have enough altitude, I immediately decide that I'm not even going to circle. If it reaches, say, two meters and I've been getting four, I just decide right there, as it begins to drop off, that I'm not even going to bother with it and I start pressing on. But if it's a good thermal, then I do the same thing that George does. I zoom up; and as you're zooming up, if you have a lot of speed, you go almost straight up, and then you start your turn when you're down at low speed so that you can make a small radius turn and stay in the thermal. But I imagine everybody does it a little differently, and we haven't heard your method, A. J.

A. J. Smith: I think my technique is different. I'm probably reacting a bit more on the feel of the thermal. I use the same indications Dick does when coming into the thermal. I make certain I've got a good total-energy system and a good indication on it. If the source of lift is indicated by a cloud, the problem is easy. The problem is tough with the blue thermal that you're talking about. As I begin to get the turbulence at the edge of a thermal, if I'm cruising at high speed, I begin to slow a bit, but I don't get below eight or ten knots above the best glide angle (ten or fifteen knots above the best glide angle on a good day), and I keep going through the turbulence, the washboard effect you quite often have on the edge of the thermal. I begin to be very careful and look for the wing that comes up as you bounce about, and from then on I'm operating on the seat-of-the-pants feel of that surge that's really the core of the thermal. I want to react instantly when I feel that surge. I react essentially the same each time. I use as little aileron as possible and as much elevator as possible to zoom up in the core. As the ship starts to slow, I tuck in a little aileron and let it fall into the turn. It does this quite naturally without violent control movements. I'm operating on, and reacting to, the feel of the thermal. I would say that from my experience in flying with Dick that I think I gain a bit on a successful entry, but at times I lose a bit because I've made a poor decision. I think I've felt the surge and I really pull up in it, make a turn, and it's no blasted good. Dick overcomes this by going kind of through the thing. He makes a complete assessment of the thermal before he makes a decision. I think, in the end, we come out about the same. It's just that for me those wingovers right into the core make you feel big . . . good!

Question: I'm interested in hearing you fellows discuss crew communications back and forth. I understand you don't say much, and I'd just like to know what you do say and if it means something?

A. J. Smith: It's strange your asking me for a definition of crew communications because I have a reputation for not communicating with a crew in certain areas. However, I assume you mean on the radio.

. . . I've thought about radio procedure. I think

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I have developed a technique. I tell the crew that they don't need to use the call sign. If they can't recognize my voice after the first practice day, they're in bad shape or haven't been listening. I call my crew and simply say, "Two ground, go Van Horn." They simply reply, "Going to Van Horn." I can recognize their voices. The reply confirms that they've received me and they understand the message. That's all that's necessary.

A typical crew report is, "Two ground at Van Horn." If I happen to have the radio on, I'll give them the courtesy of a "roger." Nothing else. About the only other transmission code I use is, "Hold at Fort Stockton." The crew has instructions then to drive the wheels off the car to get to Fort Stockton. To use the car up. The car is to be just as exhausted at the end of the competition as is the pilot. That's hard to make a crew understand. It's really difficult to make them use the blasted automobile.

Again, a crew report at a holding point when they finally get there is, "Holding at Fort Stockton," or "Two, holding at Fort Stockton." And, again, if I happen to be listening to the radio, I'll give them the courtesy of a "roger."

Question: A. J. Smith, primarily what is the value of the 45-degree wing sanding you reportedly are so enthusiastic about?

A. J. Smith: It's a peculiar thing with the Sisu. The Sisu airfoil, in my opinion, is sensitive to atmospheric turbulence. It doesn't climb well in a turbulent thermal and it doesn't glide well in turbulent air. Over a period of years of having prepared the sailplane in the winter, contouring the wing and that sort of thing, I have experienced that it seems to fly better in the first of the season just after I've rough sanded it with 320 paper. I've sanded it diagonally. First, because that's the way to get the contours right in the easiest and most efficient manner. During contests I clean the bugs from the leading edge of the wing each day. The polishing compound, or cleaning or rubbing compound, puts a glossy finish on the wing. After three or four days, perhaps halfway through the contest, I seem to be aware that the ship is beginning to lose its ability to climb in turbulent air. I've roughed the wing up a few times, and each time it seemed to be improved. And I say "seemed to" with a purpose, because this is difficult to evaluate. That next day might have been a slightly smoother day. All this may apply only to the Sisu.

Question: How did you rough it up?

A. J. Smith: With a long, contoured, smooth sanding block and 320 paper moved at 45 degrees. If this does work, apparently the theory behind it is that a slightly turbulent air flow is more difficult to separate than a laminar air flow.

Dick Schreder: I too have had a similar experience. In the Nationals last year, my ship hadn't returned so I had to borrow Joe Perrucci's and couldn't keep it in the air for several days and started looking around and found quite a few things wrong. We got working on it, and the biggest improvement we got was with sanding the wings.

Question: What precontest-flight sailplane preparations are used? What materials are best to prepare wings?

Dick Schreder: I think we've handled that pretty well. The Russians have been showing up in the last two

world competitions with bare metal, and I think this is a mistake. I don't think you can get bare metal anywhere near what you can with a fiberglass or painted finish.

A. J. Smith: I think one area that we haven't covered here might be worth a few minutes conversation. Number one, seal up all leaks. Seal every tiny leak, because that leak is an air flow, usually perpendicular to the surface that's leaking, and it's like an antenna sticking out of your wing. Seal all the leaks first. Number two, saw off all the protuberances. Don't fair them in, saw them off. And then number three, get every surface smooth and wave-free.

George Moffat: Even the best ships, I mean Libelles and Cirruses and so on, need never less than 50 hours work before they're ready for a contest, and often very much more.

Question: What decrease in performance do you experience from raindrops on your wing surface?



Photo by John Armitage

Dick Schreder: It feels like you've thrown a sea anchor out.

George Moffat: It varies very greatly with airfoils. John Ryan won't like me for saying this, but I flew with a Phoebus A last year which was absolutely even with the Elfe when we were both dry, but I wouldn't say his performance was even half that of mine when he was wet. Now this isn't saying nasty things about the Phoebus A because you're really not going to be flying in rain all that much. But there are some airfoils that are quite a lot more sensitive than others, as A. J. remarked on the Sisu a moment ago.

A. J. Smith: I think as soon as the first raindrop hits the ship, you should make a basic decision. If you possibly can, go somewhere else. Out of the rain.

Dick Schreder: Most of you can check this yourselves if you get the opportunity to fly through a cloud that'll leave water droplets on the wings, and you can check that the rate of descent is much higher when you come out the other side, and you can actually feel the ship accelerate when it evaporates off.

Question: Is there any attempt being made to have the U.S. team fly U.S. sailplanes in 1970?

Dick Schreder: I'm doing everything I can!

George Moffat: I'm not very patriotic when it comes to sailplanes. I want the one that'll win the contest.

A. J. Smith: I wish Dick a lot of luck.

Question: George Moffat, why do you not like the cat's cradle as a task, and regardless of your personal opinion, do you recognize it as a good task for national competition?

George Moffat: No, it's a very bad task in my opinion for national competition. The purpose of a competition is to measure the ability of the pilot. You cannot measure ability of pilots if they're not doing fundamentally the same thing. Imagine that you start an auto race from here this afternoon at two o'clock. Turn-points are Cumberland, Martinsburg, and Baltimore. The driver getting the most mileage wins. That is a cat's cradle! If you really want to make it a cat's cradle, imagine that there have been quite a few floods nearby, and some of the bridges are out, some aren't; you have no way of knowing which ones are which. You do have some fairly inaccurate information thanks to some maps compiled that morning from spot observations taken 200 miles apart.

The cat's cradle is a very thinly disguised free distance. The basic problem with free distance is the same lack of direct competition. Take Texas in '67. Dick Johnson went due east, got absolutely no place. Dick Schreder went north, contacted a front and won. He probably wouldn't have chosen the route he took if he had flown a lot in Texas like, say, Ben Greene. Bikle went someplace that nobody in his right mind would have gone that day, but he was so far down in the standings that he had to do something far-out. He went very very well and got second for the day, taking a long chance; but these people hadn't been competing against each other. You don't know if Bikle was a better pilot than Johnson. Johnson went 226 miles, Bikle went 450. Do you really think that Bikle is twice as good as Johnson? You don't know from that task. This is my fundamental objection to both free distance and cat's cradle.

Dick Schreder: The British and the people who draw up our rules are in favor of the cat's cradle. When I left the meeting in Paris day before yesterday, the Poles and the Germans were fighting the cat's cradle like mad at Marfa. How it turned out I don't know, but our people were holding out for the cat's cradle.

... I would say to a certain extent that my greatest objection is that I've flown, I believe, three cat's cradles, and I was in the air over nine hours on each of them. I think that this is too long in a national contest.

George Moffat: There's one other problem that comes up on these open-end tasks of any sort, and that's quite simply that frequently, especially in Texas, you can fly after dark. That does put you in a rather awkward situation. There's a strong tendency to stay in the air too long, especially if you're at high altitude; you don't realize how dark it is on the ground. I know at least three pilots in this group that have landed after dark, myself included, and that is a kind of scary feeling.

Question: Do you make any changes in thermal technique when you're below 1000 feet?

George Moffat: When low, below four or five hundred, I often thermal a bit more on instruments because there is a tendency to skid on turns a good deal if you look

out the window.

A. J. Smith: That's good. I think my thermaling techniques change when I'm low. I play it a bit safer, faster, shallower, etc. Any sailplane at a low altitude is more apt to get into a wind shear condition, and this aggravates things.

George Moffat: I think there's another point about it. In several regional contests I have seen people who have had bad accidents by circling right on down into the ground. To me this is absolutely unforgivable. I hardly know anybody who could pick up a thermal below 150 feet. It's just not sane to keep on going below that altitude; and, furthermore, I think you want to consult your altimeter regularly, once a circle. Memorize whatever you've got, say, 210 feet; then if you go down to 200 feet, make sure you take another look out the window to see how your clearances are doing. Then go back and concentrate on variometers and yaw strings, but look at the altimeter again every round to see whether you're making or losing.

Dick Schreder: I do something different when I'm down that low; and the first thing I do is get within gliding distance of a good field to land in; and then, and only then, do I continue circling; and I never start another turn when I'm not positive I can still make it into the field.

A. J. Smith: We can't be too careful about this. The things we've been talking to you about in the last few days can lead you into some bad situations. Exercise your judgment. Most of us talk from a great deal of experience. I've got photographs of two separate sailplanes that were badly wrecked because I didn't follow this kind of discipline. Pick a good landing spot at 1000 feet and just don't leave it until you start getting back up again.

Dick Schreder: I'd like to add to that, too. I've been flying quite awhile, and I haven't had a serious sailplane injury or damage, just because I follow this technique religiously. And I've had three real bad auto accidents during the contests.

Question: When the wind is too weak for ridge lift, would you expect the thermals to form on the upwind or downwind slopes of the ridge?

Dick Schreder: I'd rather stay on the upwind side.

George Moffat: Just one thing on that. If you're low on the ridges, watch your step. That's how Philip Wills came very very close to killing himself last year—broken back and all that sort of thing. He was wandering around the end of a little ridge. The wind was not quite in the direction he thought it was. He got a little shear, and first thing you know, instead of flying 50 knots, he was flying at 37, according to the airspeed. And the Dart didn't fly too well at 37 at 200 feet.

Dick Schreder: I'd like to add to Philip Wills' accident. I think another thing that got him into trouble was that he completely forgot that if the wind is strong over the top of a hill, that it very often blows in the opposite direction on the lee side, and I think he landed downwind, too.

George Moffat: He landed at a bad angle, if you call that a landing. Seventy degrees, measured.

Question: In Marfa 1969 outlandings, comment on this please.

Dick Schreder: They can be tough. There are lots of places you have trouble finding anything but yucca trees and sagebrush. I think all of us who have flown out there have landed in some rather bad fields, and

even on the highways occasionally; and now with the reflectors on both sides of the highways, be very wary of those.

George Moffat: I think I've flown there longer than either Dick or A. J. On the reflector problem—reflectors will always be found on curves (even slight curves). If you see it's straight, there's a reasonable chance that the reflectors will not be there or won't be too frequent. However, you will not be able to see them from much distance, so keep an alternate. And I don't really agree with Dick. I think very much of Marfa is very easy to land in, particularly the area covered by the cat's cradle. Even if you get stuck in the mountains up by Livermore, you'll find quite nice grass meadows that you can land on, even make air tows out of. Philip Wills did in 1964. Last point. Be extremely careful of ranch strips. All the local ships are Cessnas because Cessnas are about the only thing that operate very successfully out of those altitudes—base altitude is 5000 feet. Ranchers make those strips about 35 feet wide. They don't cut the brush below about four feet on the sides. I would not ever land on a ranch strip unless I knew the strip. I'm really quite surprised that we haven't had some accidents from that. The only reason, I believe, is because all the local people know this.

Ed Byars: The reflectors are also over the dry washes, even on the straight stretches. You can see the culverts pretty well, even if you can't see the reflectors.

Dick Schreder: I'd like to add to that. The people from Texas say that the highway department has had a very ambitious program to put reflectors along straight stretches. I would say everybody that goes out there ought to look the situation over carefully while you're driving into Marfa.

George Moffat: I agree completely with what Dick says. However, do not die of a heart attack if you come in by way of Pecos. There are two ways to get to Marfa; either go by Fort Stockton or go by way of Pecos. The easiest way, the usual way, is by Pecos. If you go that way, you drive through about 35 miles of the wildest-looking mountains you ever saw. Don't turn around and come back. It looks a whole lot better from 2000 feet higher. I say that as someone who darn near did turn around and come back in 1962 when I went down there to auto tow the HP-8 around and try for a few records. The country just plain seems impossible, but it really isn't that bad from the air at all. Further, even in the open desert there are a great many places to land. Brush is clearly defined, and you'll see quite a number of openings. Here's just one other thing. You'll find quite a few very much abandoned World War II airstrips. Be very cautious about them indeed. They're frequently gullied three feet deep.

A.J. Smith: I don't think that that area between Pecos and Marfa looks that much better from the air. Exercise a little caution when you go to your first competition, particularly in areas like Marfa. I would have to add to what Dick and George have said. If you haven't planned a landing on an airfield or a ranch strip that you personally know, or on a public airport or some facility like that, then everything else that you might do is strictly a gamble. I made two landings in the desert, and I was pleased to find that they were safe. But I was not confident that I was safe until I was practically on the ground. Those landings were unpredictable. That's bad.

Dick Schreder: One thing you have to watch in the desert is that the sagebrush looks very innocent from the air; but when you get on the ground, you'll find that they have very well-developed roots, and the sand has been blown up into the roots and packed, and it would be just about like hitting a tree stump.

Question: What is the minimum practical experience level to get in the '69 Nationals?

Dick Schreder: Well, like A. J. said, everybody should go expecting to win, but I seriously doubt if anyone could go and win if they didn't have several years of soaring under their belt. I don't think anybody that has an airplane pilot's license can buy any kind of a sailplane and go to the Nationals without any practice and hope to win.

George Moffat: I agree completely with what Dick said; however, the only way to learn to fly in contests is to fly in contests. They don't want to be pip-squeak contests, they want to be darn good contests, because one of the first things that everybody says when he flies in a contest is, "Gee, I never learned so much in two days in all my life." I've heard this so often; and the reason, in my opinion, is that you get to see what people like A. J. or Dick can do in weather in which you don't think anybody would even bother to open the hangar doors.

A.J. Smith: I would agree. It's a good bit of advice. Your experience or lack of experience is not going to bother other competitors in the Nationals, but if you're not safe, if you can't circle safely in thermals with a good number of other ships, be careful. Don't go. If you do go, get out of the way. Go as soon as you're safe and can handle the equipment and realize what kind of terrain you're going to be flying in. This should be a part of personal judgment.

Dick Schreder: I agree 100 percent with all that A. J. and George said, but you'll find that you will learn more in your first national competition than you've learned in all of your soaring to date.

* * *

A final editorial note: Contest flying, as practiced by the three men you have been listening to, is a highly serious and demanding business. Like any form of flying, it can be dangerous under certain conditions. It would be less than truthful for us to suggest that competitors struggling for the very pinnacle of success in any sport invariably follow the safest procedures. But when they deviate from accepted practice, they have the knowledge and experience to be aware of the risks—and hopefully they have the skills to overcome them. The non-expert does not.

A few of the techniques discussed in this symposium (which was held for *advanced* soaring pilots) are probably no more appropriate for the weekend glider pilot than Mario Andretti's driving style is suitable for the average motorist. If you want to be an A. J. Smith, a Dick Schreder, or a George Moffat, work into the role *gradually*. They didn't become who they are overnight; it will take you a while, too. Just keep in mind that if you should manage to break your silly neck in the process—well, as Dick would say, "You're out of the contest." Permanently.

Take pleasure and satisfaction in a knowledgeable appreciation of what the great pilots can do, but stay safely within the limits of your own ability.

