CHAPTER XIII

COMPETITION

Section 1 — Thermal Contests

I've had people say, "I have no interest in contests, I like to fly for fun." Then they turn around and say, "I'll bet I can stay up longer than you on this flight." The first statement implies that contest flying is not fun — but it is! Almost everything is a contest of some sort. People play golf for relaxation and fun and, yet, in every game they are competing - - - either against other players, or themselves, or the course. One real benefit of competitive flying is that it is the fastest way to become a really good flier. A second reason for flying in contests is the wonderful people you will meet. Glider Guiders are the best, and you will begin to look forward to the next contest with anticipation of a good time. The interchange of technical information with your peers is also an invaluable plus to contest flying.

A good way to start competing is with yourself. Join the League of Silent Flight. The LSF program is purely an achievement program. There are no meetings, or dues. You administer it yourself, and send in your achievements at each of five stages. To get started, send 25¢ in stamps or coin to LSF, P.O. Box 39068, Chicago, Illinois 60639 (or send a dollar, this is the only income this program has). Tell them you want to get started in the LSF program. You will receive a form that explains the tasks, and gives you a place to record your completions. To qualify for Level I, the flier must complete a five minute thermal duration flight, landing no more than 200 meters (656 ft.) from the launch point. He must also complete a fifteen minute slope flight, also landing within 200 meters of the launch point. However, for those without a slope site, a second five minute thermal duration flight may be substituted. In addition to the flying requirements, five spot landings must be made within three meters (9.8 ft.) of a designated spot. These tasks must be witnessed and signed off by either a Level I pilot, not related to the flier, or someone over 21 years of age, not related to the flier. The tasks increase in difficulty up through Level V. Level V tasks are sufficiently difficult that only a handful of fliers in the world have attained this level.

Contests come in all sizes. At the local level, most clubs hold monthly events with three or four entrants; up to thirty or forty for the larger clubs.

Associations of clubs hold regular contests. Groups such as the tri State Soaring Society in the Pennsylvania, Ohio, West Virginia, area, and the Southern California Soaring Council are typical. The Southern California group is a council of ten soaring clubs in Southern California, and one club sponsors a thermal contest in each of ten months. These contests draw from fifty to eighty contestants each month.

On the National level, the AMA sponsors a National Contest "NATS" each year and eighty to one hundred fliers compete. The grand-daddy of all times was the SOAR NATS, held in Lockport, Illinois, and sponsored by the Greater Detroit Soaring and Hiking Society. This one grew so big it finally had to be discontinued. The last one, in 1976, had 186 entries. Master Contest Director, Dan Pruss, had that meet organized better than any before or since. With that many entries it took an iron hand and a chair and a whip to finish before dark.

To become familiar with contest procedures, it will be helpful to understand the duties of the key people running the contest. Not all these people are in place at every contest. Sometimes the contestant performs the function. It depends on the size and formality of the contest. Nearly all the tasks must be performed by **someone,** however.

Contest Director (CD)

The Contest Director **runs** the contest. He decides which events will be held, sees to pre-contest publicity, assigns people to the tasks, makes sure all needed equipment is at the field and in place. He conducts a pilot's briefing before the contest to spell out the rules, especially deviations from accepted practice, or local ground rules. He is **the** authority who settles all disputes. But, most important of all, he makes sure the contest is moving along smoothly and on schedule.

Winch Boss

Someone is needed to keep the fliers moving to the launch area and get them into the air. In a man-on-man contest, the winch boss stands in front of the line of winches and directs the sequence of launches so there is no interference between sailplanes on tow, waiting until the launching ship is clear before giving the go-ahead to the next. When one group has launched, he makes sure the next group is in place and ready, when winches and frequency pins are available to **all** fliers. If the Winch Boss is busy at the winch area, an assistant is needed to call up the next flight and get the fliers and their sailplanes into the staging area. In small contests the function of Winch Boss is usually performed by the Contest Director.

Winchmaster

Someone must take care of the winches. At large contests, a person is assigned to each winch. At a small contest, one person can handle more than one winch. In any event, no matter how small the contest, someone must

have equipment responsibility. After launch, each winch must be run down, and the parachute pulled down close to the turnaround. Otherwise, lines get crossed and fouled, and the contest grinds to a halt. Run-down can be done by the flier's helper, or helper/timer, but he must know this is his responsibility and do it. The winchmaster also makes sure that line breaks are promptly repaired, and that the broken line does not foul another launch station.

Landing Judge

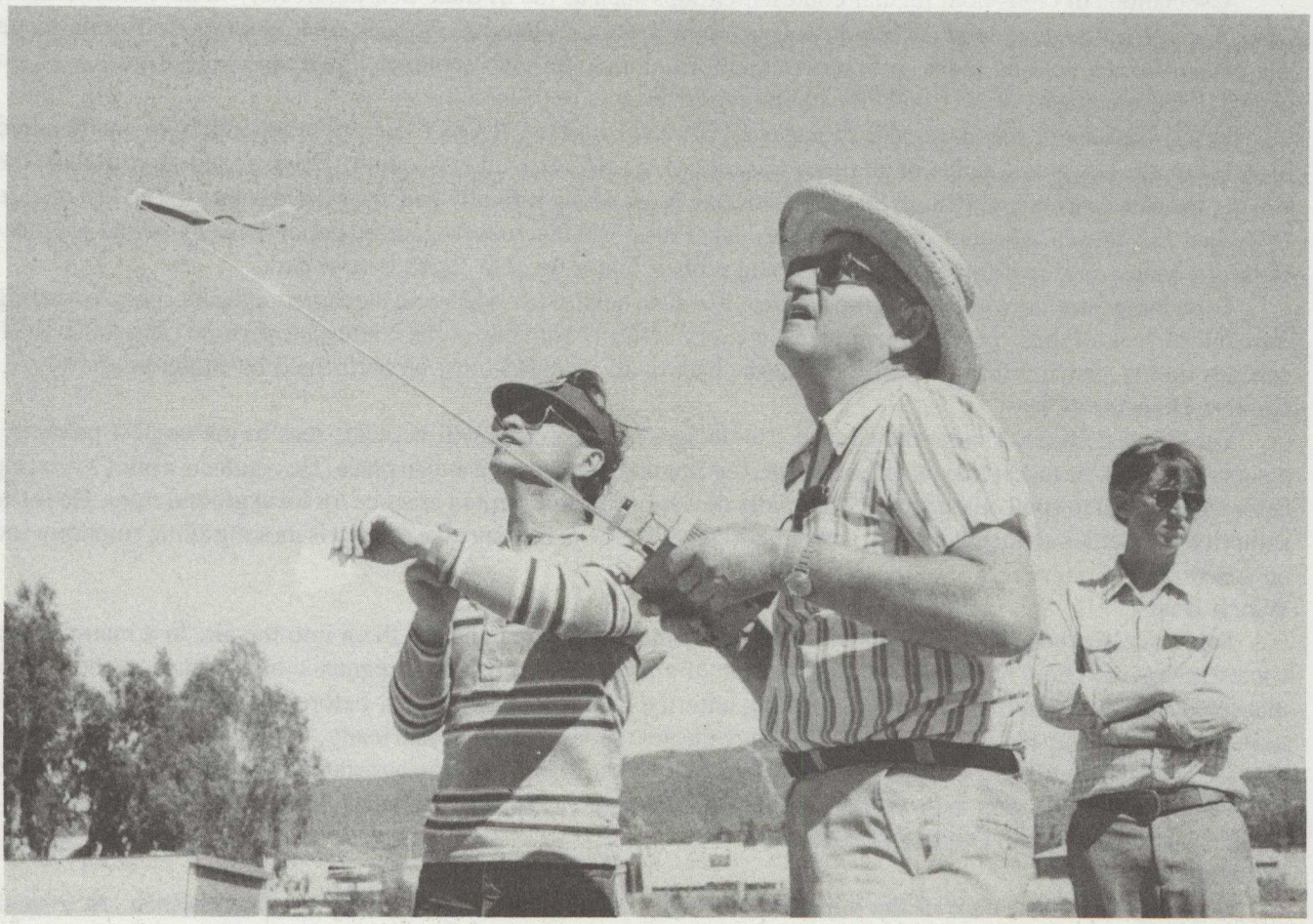
It is the responsibility of the Landing Judge to determine the landing score of each flier, and enter it on the flier's score card. It is also preferable that he look at the timer's stopwatch, and enter the time. Even if no landing score was made, the Judge must enter the zero score. It is also the responsibility of the Judge to keep the landing area clear. If one plane has landed and another is on close final, the Judge should mark the nose position of the plane on the ground and remove it from the landing area. He can then read the score after the last plane has landed. Many times the flier is prohibited from entering the landing area and must remain behind a ''foul'' line. In this case the Landing Judge, after reading the score, picks up the sailplane and carries it to the flier. It is important that the Landing Judges be competent people.

Timer

The function of the Timer is to start the stopwatch when the tow line leaves the sailplane on launch, and stop it when the sailplane touches the ground, or some ground-based object. This means if the sailplane hits a tree, the time is stopped, even though the plane might continue to fly. The Timer **may** also record the time and landing score on the score card, though it is preferable that a Landing Judge be assigned this function. This procedure will have been established by the Contest Director. The Timer may also act as the flier's helper in informal contests. If the Timers are assigned to the fliers by the CD, the one assigned may not be known by the flier. In this case, the flier may wish to have a helper with whom he feels more comfortable.

Flier's Helper

The Flier's Helper will assist the flier in getting ready to launch. He may actually do the launching and run the winch, unless specifically prohibited from doing so by the contest rules. After launching, the helper will guide the flier away from the winch and to the landing area — permitting him to keep his eye on his airplane. The Helper must also call time to the flier. If there is an assigned Timer, the Helper should provide a second stopwatch, having the Timer start both watches simultaneously. He should check to see that both watches are synchronized. If the Helper



Timer/Helper must be alert.

does not have a watch, he can read the time from the Timer's watch. The Helper should remain alert and note the progress of other contestant's planes which are in the air, and advise the flier just who is in lift, and who isn't. If the Helper is more experienced at thermal flying than the flier, he may assist him in finding thermals and staying in them, He may not, however, touch the transmitter.

Before the flight, the flier must tell the Helper (or the Timer, if they are one and the same) exactly how he wants the time called. On a 2 minute precision flight, it is normal to call each 10 or 15 seconds for the first minute; then each 5 seconds until 1 minute, 30 seconds; then each second to 2 minutes. The last count may be either up or down. That is: 30, 31, 32, etc. Or: 30, 29, 28, etc. It takes experience to count down, and it behooves the flier to find out whether the Helper is comfortable with this count. It is also very difficult to do, using a digital stopwatch. Reading one number, and saying another, takes discipline. I find it less distracting if the Helper stops counting, with 5 seconds to go. At this point, you are committed to do whatever you are doing, and it doesn't help to know the time unless you have no chance for landing points. It is better to concentrate on a proper landing. Time-counts for longer flights are normally spaced out. In a 10 minute flight, it doesn't help to know you have only been up for 2 minutes. In fact, it's downright disappointing. It does help to know when you are half way through. From then on, time calls at frequent intervals, say 15 seconds, are important, especially if you are nearly out of sight. The correct time to start your descent is crucial. Too soon can put you on the ground early, and too late will run over the time, and you may incur a penalty.

Scorekeepers

As the fliers are called up to fly, the Scorekeeper will hand the score card to the flier, or to the Winch Boss, as instructed. When the card is returned by the Timer, it is checked for the flier's and timer's initials (if required). The score is then calculated, and entered on a tabulation sheet. It should also be posted on a larger scoreboard as soon as practical. It is preferable if the scoring can be done in a trailer, or van, to protect Scorekeepers from interruption. Some large meets are scored by computer.

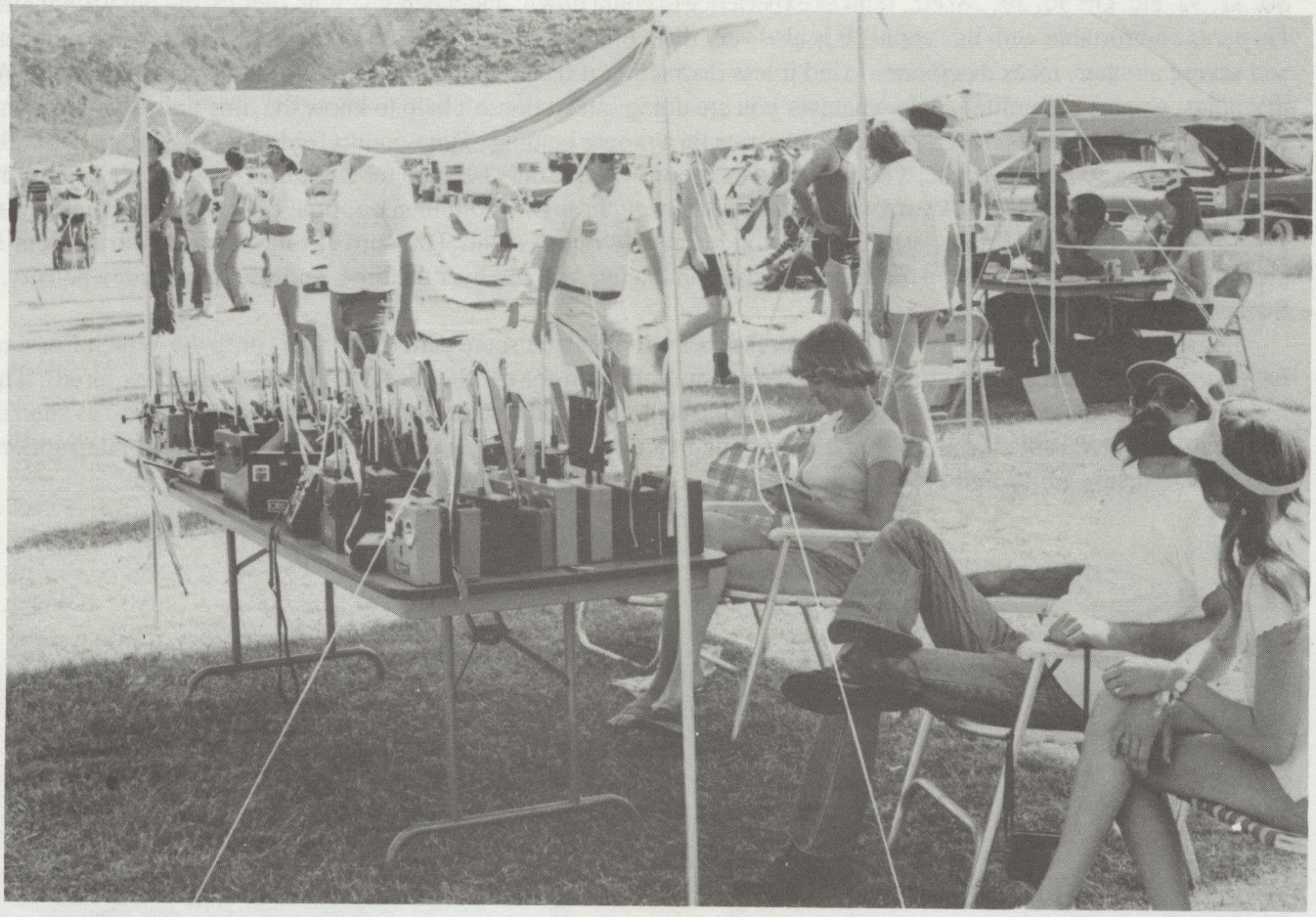


Computers are used to score large contests.

Transmitter Impound and Frequency Control

Basic frequency control at any field is usually by means of clothespins, painted with the various frequency colors. That is, orange and white, red and white, etc. — one for each authorized frequency. When ready, fliers take the pin corresponding to the frequency flag on their transmitter, and clip it to the transmitter antenna. It is the gravest of sins to turn your transmitter on without the correct pin.

To greatly reduce the possibility of interference, transmitters are usually kept in a compound area for the duration of the contest.



Transmitters are kept in impound area.

The transmitters are never allowed out of the area, unless the correct frequency pin is attached. When fliers are called to fly, they go to the impound area and ask for their transmitter, usually by contestant number. The pin is attached, and the unit given to the flier. It is important for the contestant to return the transmitter and pin as soon as possible after each flight, to keep crowded frequencies moving. If a real jam exists on one or more frequencies, a runner is sometimes used to take the transmitter from the flier, at the landing area, and expedite its return to the impound. Before the transmitter is returned to its place, it is the responsibility of the frequency controller to check that it is turned off.

Line Retrievers

Somehow the launch lines must be brought back to the winch area in a timely fashion. A most satisfactory retrieval method is to have youngsters do it. Sometimes a Boy Scout troop, or other such youth organization, will take on the job to raise money. Often, as part of the entry fee, each contestant pays twenty-five cents per flight for retrieval. He is given tickets to give to the Line Retriever. At the end of the day the tickets are turned in for cash. In a large contest, twenty-five or thirty dollars is available for retrieving. Even in a small club contest, the children of the fliers can make spending money. Also, any flier who doesn't want to pay for retrieval can shag his own lines and collect tickets too. A less satisfactory retrieval method is to have the contestants shag their own lines. It is less satisfactory because this nearly always slows up the contest. This forces the honor system and it has been found that not all fliers are completely honorable in this matter. It is much better if the person up to fly does not retrieve his own line, but is ready to fly when the line is brought to him.

Types of Thermal Contest Events

There are two basic types of contest events. One is Precision Duration. The idea here is to launch and stay up exactly a given number of minutes, and land with the nose of the sailplane exactly on a target. Duration times are popularly two, five, six, seven, or ten minutes. The time selected by the Contest Director is usually based on flying conditions and the number of fliers in the contest. The second general contest type is commonly called "add 'em up." In this type of contest, each flier has three flights to stay up a total time of fifteen minutes, with no one flight lasting longer than seven minutes. Flying longer than seven minutes penalizes the flier a specified number of points a minute, that cannot be made up. The interest in this type contest is that nearly all fliers are in the race until the last flight — except those whose time remaining is greater than seven minutes.

The Two Minute Precision event is seen at eighty percent of the contests. It is very popular with Contest Directors, if not the contestants, because it is a good contest opener. It doesn't make much sense to start a contest in the cool of the morning with a Ten Minute Duration flight when nobody can make more than two minutes. In this event, a premium is placed on precision, both in landing and duration time. Missing two minutes by one second reduces the score by one percent. Missing by four seconds gives a ten percent reduction. Ten second miss penalizes forty percent, and a thirty second miss gives zero. Landing points are usually half the score, so are extremely important. This event is AMA Task III and the bell-curve scoring is listed in the score table in the R/C Sailplane section of the Official Model Aircraft Regulations.

Landings

All times are measured from the time the ship leaves the tow line. Landings are most often made using a twenty-five foot radius circle as a target. Points are awarded using a twenty-five foot tape measure, marked at each foot. Measurement is to the nose of the sailplane. If the plane turns over on landing, all landing points are lost. If any part of the plane is shed during landing, except rubberbands, all landing points are lost. If the plane is damaged in landing, so it cannot be immediately flown, all landing points are lost. These rules are an attempt to prevent "spear landings." Some fliers, in order to get maximum landing points, approach the center of the circle slightly high. When over the center of the circle, they dive the last foot or two and spear the circle center with the nose of the sailplane. This is very hard on airplanes, especially if the circle is painted on asphalt. There have been suggestions that landings be judged as to their "scale-like" qualities, as well as awarding points for accuracy. This procedure has



Landing through gates.

proved very difficult as it requires subjective judging, and at least requires a trained judge at each landing circle. Some Contest Directors have used landing centerlines and measured points from the line to remove the incentive to "spear." To date, no universally satisfactory method has been found.

Another problem facing the Contest Director are the landing patterns of the sailplanes. There are times when the contestant is really not set up for a proper landing pattern. Perhaps he was far out in front of the winches and is falling out of the air. The temptation is to by-pass a sensible landing pattern, take the shortest return path, zing right through the launch area, fliers, Timers, etc., and go for the landing circle. This is not only dangerous, but throws the launch area into, at least, temporary confusion. To prevent this, a pair of poles (knock-down type) are sometimes placed about 25 feet apart, and about 25 feet in front of the landing circle. To receive any landing points at all, the landing sailplane must pass through these gates. This removes all incentive for anyone to approach the landing from any direction except the normal, straight-in direction.

Time-count is extremely important in setting up your landing pattern. Landing accuracy depends on setting up a timed pattern and practicing, practicing, practicing, and practicing. It doesn't matter what pattern you establish. What **is** important is that you use the same pattern **every time** you land. There are exceptions, of course. Sometimes you are just not in position; such as coming in from far out, without enough altitude, or time to set up a pattern. A pattern used by many fliers is shown in Figure 1.

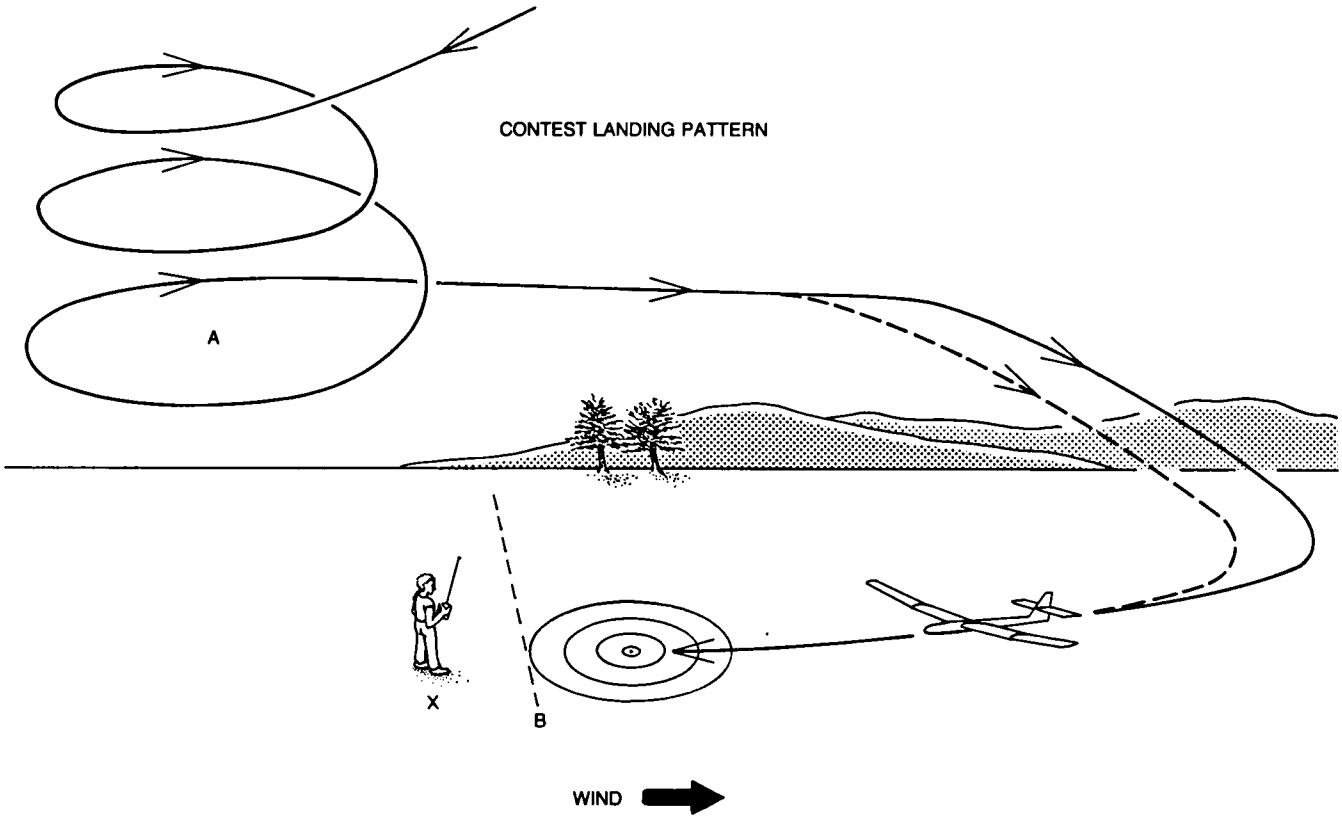


FIGURE 1
LANDING PATTERN

With the flier standing at X, arrival is made at point A, about 1 minute before target time, at an altitude of about 100 feet or so. The altitude depends on conditions, and the sink rate of the sailplane. A flat turn is set up, and held, until 30 seconds to go. Then roll out of the turn and head downwind, crossing line B at 20 seconds to go. Line B is normally a foul line, set up 30 or so feet from the target, beyond which the flier is not permitted to stand. If there is no wind, a fairly long approach is used. With wind, the downwind leg is shortened; otherwise; you won't make it back to the target. Using a set pattern, and practice, you will be able to set the ship down, not always in the exact center, but within 5 seconds or so of target time. Even if you see that you are going to be off a little in time, go for the center of the target. If you try to take action to stretch, or shorten, the time, chances are that you will miss the spot, and lose more points than can be gained with the few seconds of time.

Contest Luck

There is no doubt that luck plays a part in contest success. One does notice, though, that the top fliers are "lucky" time after time. This is because it is under the really marginal conditions that flying skill becomes apparent. However, when the air is "down," the best flier in the world will fall out of the sky. The good flier can recognize the symptoms of bad air and, if possible delays his flight until conditions are more favorable. This has led to a practice known as "sandbagging." Sandbagging means that the flier uses every legal (and sometimes questionable) means to avoid flying during bad conditions. Unscrupulous fliers have been known to try everything from hiding the frequency pin to deliberately breaking the launch line on tow. It doesn't take long, though before their reputation becomes well-known, and all eyes are on them every flight. The really top fliers are mostly straight arrow, and would rather take a loss in standings than a loss in their reputation.

There have been many attempts by means of contest format, or rules, or scoring, to equalize the air for all flights. If the lift was exactly the same all day, then every contest would be a true test of soaring skill and not depend on the time of the day you flew. One quite widely used means of lift equalization is called "Man-on-Man." In Man-on-Man, fliers are launched in groups nearly simultaneously. The number of fliers per group will depend on the number of winches available — at least four is desirable. Launches are made at about fifteen second intervals, as directed by the Winch Boss. The flier staying up the longest wins the round and gets a thousand points (or whatever), plus his landing points. All other fliers are awarded points based on how they did against the round winner. That is — flier's time divided by winner's time, times one thousand. The winner is the person who is closest to target time. In a seven minute precision event, one flier may stay up 6:56 and another, 7:05. As 6:56 is closer to 7:00, that flier is the winner. From a scoring standpoint, the flier who went five seconds over seven minutes must be treated as though he was short of seven minutes by five seconds. Otherwise, by the above formula, he would be awarded more points than the winner.

Man-on-Man would **seem** to solve all the problems. The truth is, it creates a new bunch of problems. It is cumbersome to run. First, a lot of winches are needed. They all must be good winches, and not malfunction. If anything goes wrong with a launch, such as a broken line, all fliers are brought down (usually), and the round is started over. It is hard to get four to six fliers all at the winch at the same time, ready to fly. So, the whole thing tends to move rather slowly. It is harder to score. Fliers in each round must be carefully identified as to which round they were in. And scoring is more confusing, and can't be done until all score cards for a round are in. Worst of all, you may be flying with the world champ in your flight. The next flight has a herd of turkeys. So, your good flight scores worse than a bad flight in the next round.

Fliers in the Pacific Northwest part of the United States have tried yet another method of providing the pilot who hits bad air with a way to score well. It is called "Variland Scoring." The scoring graph is shown in Figure 2.

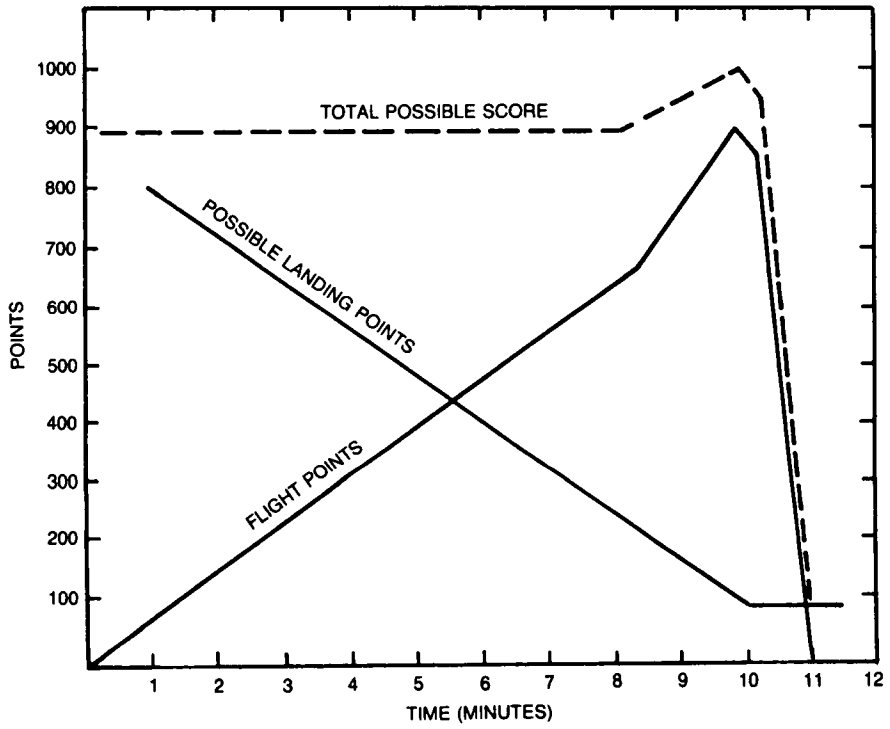


FIGURE 2
VARILAND SCORING

In this method, possible landing points start at 800 for a 1 minute flight and fall to 100 for a 10 minute flight. Flight points start at 0 and go up to 650 for an 8 minute flight. At this point, they go up at a greater rate, giving an extra bonus for flights over 8 minutes. The net result is a total possible score of 900 points for all times above 1 minute, up to 8 minutes. Above 8 minutes, the possible score increases linearly to 1000 at 10 minutes, so that long flight times are rewarded. After 10 minutes, scoring falls rapidly. This system says that if you hit bad air, and come down early, you still have a chance to place, if you ace your landings.

The complaint, of course, with this system is that it takes the luck out of the air, and puts it in the landing. A flier **could** make all two minute flights and, if he aced his landings, make 90% of a perfect score — beating someone making all ten minute flights. Maybe the guy who can make all perfect landings deserves to win. And anyway, 90% of perfect, and forty cents, will get you a cup of coffee in a great many contests I've attended.

Yet another equalizer is called "Triathlon." Here the score is the total of three separate scores — for duration, for precision, and for landing. Duration points are awarded at so many per second of flight. The longer you stay up, the more points you get. Precision points are awarded for landing at one of the exact minute intervals. Or, to make it harder, on either even or odd minutes. Points are on an AMA Task III bell-curve, and are the same as two minute precision points. The points fall off very rapidly either side of the minute, and go to zero at the half minute. This creates an interesting decision point for a flier who is having difficulty staying up. Should he try to make the next precision point minute, or be safe and land on the precision minute coming up? Contests that involve decisions, risks, and rewards are always fun.

So, these are some of the things that have been tried to take some of the luck-of-the-draw out of sailplane contests. There are those who say, "Let me fly when **I** think best, that's part of the skill." That is the free-flight way of doing it. One big constraint is that we have a limited number of radio frequencies. Everyone can't wait until the eleventh hour to fly so I guess we will have to continue to queue up, or devise yet another neat way so we don't have to.

Participating in your First Contest

You will find the date and place of all AMA sponsored contests in the contest calendar section of the AMA publication, "Model Aviation." Most contests require membership in the Academy of Model Aeronautics (AMA), to enter. This is because of the insurance coverage afforded members for accident liability. Other contest information comes word of mouth, or from club newsletters.

At most contests, you can register at the field on the day of the contest. Some larger contests, however, require advance registration. This is because of the R/C frequency problem. With advance registration, the number of fliers on one frequency can be limited, to prevent slowing down the contest. Advance registration involves filling out the form attached to the contest notice, and sending it in with your entry fee. This is normally required a month or so before the contest. Acceptance notification is then sent to the entrant in time for him to plan to attend. It is probable that at your first contest, you will register at the field. With your AMA membership, you will receive a publication, "Official Model Aircraft Regulations." These rules are used to guide most contests, read them carefully.

Preparation for the contest starts the night before. Put your name on your transmitter; there will be others that look exactly like yours. Be sure your name, address, and phone number is in, or on, your sailplane. Make a list of everything you will want to take. Completely check your sailplane; charge your batteries in the normal manner. Get all your gear together: flight box, chair, umbrella (if you take one), plane, transmitter, hat, sunglasses, jacket, FCC license, and AMA card. These last two items must be shown at AMA sponsored contests. Before leaving, you will want to make a lunch (contests are almost never near a MacDonalds). Take water, or something cold to drink, as you will be in the sun all day (hopefully). Check the operation of your radio and, for goodness sake, turn it off! Check this three times. Arriving with a dead radio is just as bad as arriving without your transmitter. After the car is loaded, check your packing list once more. Check for things like wingtips and stabilizers. Mentally go over putting your plane together, and flying, to see if you have everything in the car you will need. Now, you are ready to leave.

Plan to arrive at the flying site a half hour before the scheduled start of the contest. This will give you ample time, as contests never seem to start when scheduled. Locate the site on a map before you leave so you won't be wandering around in the backwoods all morning. Most contests are scheduled in the morning, before the wind comes up. Nine o'clock is a normal starting time although smaller contests may start later.

When you arrive, find the registration table and sign up. You will probably fill out a score card with your name, AMA number, FCC number, transmitter frequency (or colors), and, perhaps, the type sailplane and class (i.e., Open, Standard, Modified Standard or Two Meter). The score card is normally left at the desk. You pay the entry fee and, perhaps, receive retrieval tickets. You may receive two stickers with your contestant number printed on them. One goes on your transmitter, and the other you stick somewhere where you can see it. You may need to know your

contestant number to get your score card and transmitter. You may also be required to turn in your transmitter to a compound area. In any event your transmitter should be turned into impound, if there is one, as soon as practical. Under no circumstances should you turn on your transmitter at the field unless you have the proper frequency clip attached. This would make you extremely unpopular right off the bat.

Unpack the car and stake out a place to camp. Assemble your sailplane right away so you will be ready to fly when it is your turn. Some Contest Directors allow test gliding before the contest, some do not. Check first, and if you would feel better about the whole thing, give it a few chucks — **but only after getting the frequency pin**! When you are all set, scout the site. Go out and look at the landing area close up. Note any hazards on the approach path such as trees, etc., and plan your landing pattern. Look around the field for possible areas that might generate lift, such as asphalt parking areas or plowed ground. Look for possible wave generators such as buildings, rolling ground, etc. Then talk to some local flier about typical field conditions. I've never found a glider guy yet who isn't willing to tell you all he knows about what to expect at his field. Now go back, sit down and relax.

It is usual to start with a pilot's meeting. Here the rules of the contest are explained by the Contest Director. You should make **sure** you understand. The CD should explain whether there is a landing qualification area --- that is, whether you must land within certain boundaries to get any points at all — usually the field boundaries. It is important to know what the penalty is for popping off the tow line — usually you get whatever points you are able to get from that altitude. A broken line or malfunction of launch equipment, though, entitles the flier to a re-launch. You will find out about the launching order — whether you will be called, or whether it is open winch. You should know how the rounds are scored --- that is, what is the ratio of flying points to landing points. This helps if you are faced with the decision whether to try to stay up a little longer, or to get into position for a maximum landing. The CD should also say whether times should be written on the individual score sheets in minutes and seconds (usual), or just seconds; also, whether the timer and flier must sign the score sheet. Again, who writes down the times, the timer or landing judge?

Decide who is to be your timer, or helper. Ask him ahead of time and talk over the time-hack strategy. Select a ''silent Sam'' if you can. There is nothing more distracting than listening to all the details of your timer's last flight. An experienced timer never talks except to give pertinent, and requested, information. When you are called, try to keep from throwing up — keep calm. You may need to know your contestant number when you go to the scoring



Launch with wings level.

table for your score card. Proceed to transmitter impound and ask for your transmitter by contestant number, or whatever. Make sure the proper colored clothespin is attached. Give your score card to your timer, get your sailplane and proceed to the winch, if so instructed. Give the ticket to the retriever, and turn on your radio. Check all controls. Make sure the rudder and elevator are in neutral. If not, set them with the trim control. Now, hook up and you are ready to go. Get your mind working. Think about what you are doing. Okay, check that your timer is ready. Start the winch, let plenty of tension build up. Make sure your wing is level. Now, rear back and heave.

Don't forget to pulse the winch, you don't want to pull your wings off, but keep the ship moving **up**. When ready to release, pulse slower and slower, letting the winch come to a stop. Let the sailplane fly off the hook. Now, off on the search pattern you have decided on. Don't change your mind unless there is strong evidence you were wrong. Try to fly smoothly. If you find a thermal, circle smoothly. If you don't, head back in time to set up your landing like you practiced. If you are short of target time, forget the time and concentrate on the landing. Crank in down trim, come in low, and **concentrate** on the target. If you miss the spot, take it in stride. Don't yell "oh do-do," throw your transmitter, or stomp on your airplane. These are definitely bad show. Now, you can stop shaking and pick up your plane, unless the landing judge is to bring it to you. **Turn off your radio** — both receiver and transmitter. Return your transmitter, with the frequency clip, to the impound area as soon as possible. Your timer will turn in the score card to the scorekeeper but, before he does, **check it** to make sure it is correct — sign it if that is required. Now you can turn to the crowd and take your bows — you did it — up and down in one piece. Go back to your chair, sit down, have a cup of coffee and think over the flight. Decide what you are going to do different on the next round. You are now a contest veteran.

Section 2 — Slope Contests

In the U.S., slope contests are few and far between. A big reason is that slopes, suitable for big contests, are few and far between. Another reason is the weather. Thermal contests can be held in a fairly wide-range of weather conditions, perhaps not comfortably, but they can go on. Slope flying demands at least a minimum wind velocity, and it must be from the right direction. It is very distressing to have fliers travel long distances for a slope contest, and have two days of dead calm.

Most slope contests are devoted to pylon racing. Very few fliers have developed aerobatic slope gliders. I have never heard of any serious aerobatic contests. Many club contests have aerobatic events however, usually flown with regular thermal, or slope aircraft. A most prestigious slope meet is the International Trophy Race, held in April of each year in Northern California. This event has drawn fliers from as far away as England. Most all entries have been specially designed slope racers.

The Torrey Pines Gulls club is quite active in slope flying, holding monthly slope contests, weather permitting, at the famous Torrey Pines Cliff. The Gulls have developed a club slope racer in order to hold one-class pylon races. This equalizes the aircraft, so the pilot skill determines the winner.

Many other clubs regularly hold slope contests: San Fernando, California; Seattle, Washington; Denver, Colorado; Salt Lake City, Utah; Los Angeles area; and I'm sure, many more. Inquire at your local hobby shop, or ask other glider guiders for locations of slope sites, if you are interested.

Section 3 — Fun Contests

Many contests are just held for the fun of it. These are mostly club affairs, and are held to get the whole group involved in a day of flying. They may hold bomb drops or other events that do not involve a high degree of pilot skill. One club held a contest where the flier launched, got the glider flying level, then handed the transmitter to a blindfolded flier. He then flew his ship by giving instructions to the blindfolded pilot. His time was measured from the time he handed off the transmitter, until he couldn't stand it any more and took the transmitter back. Only one team had enough nerve to continue all the way to a landing.

Some fun-flys are just a gathering at some famous soaring site. Annual get-togethers take place at Harris Hill, New York, and the Cumberland Slope Soaring Site in the Blue Ridge Mountains of Virginia. Fliers gather for two days of good fellowship and fun soaring under conditions not possible at their home fields.

GLOSSARY OF TERMS

Aileron: A portion of the trailing edge of each wing which is movable, usually both up and down. The right hand and left hand ailerons are cross connected; that is, when one rotates up, the other rotates down. When deflected, air reaction on the aileron that was raised causes that wing to drop. Reaction on the aileron that was lowered causes that wing to rise. The aircraft, therefore, rolls in the direction of the lowered wing. Also see Flaperon.

Attack Angle: The angle the wing makes with respect to the passing air. It is measured from the chord line, drawn from the forwardmost tip of the leading edge to the rearwardmost point of the trailing edge. Also see Incidence Angle.

Bank: To tip the aircraft to one side or the other on an axis through the length of the fuselage. This is known as the roll axis.

Center of Gravity: The static balance point of the entire aircraft. Or, more precisely, the centroid of the forces of gravitation acting upon all the particles.

Channel: The ability of the radio to control one independent action. For instance, a three channel radio can control, for example, rudder, elevator, and spoilers.

Drag: A force exerted against the direction of flight by the resistance of air.

Elevator: The movable portion of the horizontal stabilizer. When moved, it causes a change in pitch of the aircraft.

Flaperon: A term used to describe a combination control wherein both aileron and flap action are obtained from a single control surface.

Flaps: Panels hinged to the lower surface, or trailing edge, of the wing which, when lowered, can increase lift and reduce speed.

Glider: A term used synonymously with sailplane to describe a powerless aircraft. More properly, a glider is an older training aircraft, without much ability to soar in thermals as does a sailplane.

Incidence Angle: The angle formed between the chord line of the wing and the datum line of the fuselage.

Inertia: The tendency of all objects not to move, if at rest or, if moving, to keep moving in the same direction.

Lift: The upward force exerted by the wing. Or, the upward force of air due to thermal, or wave action.

Moment: The product of a force magnitude and the distance from its action line. As used in modeling, it refers to the distance through which a force is acting, and should more properly be called the moment **arm**. That is, the tail moment is the distance from the center of pressure of a tail surface, and the Center of Gravity.

Pitch: The control movement effected by the elevator, causing the aircraft to move in a nose up, or nose down condition.

Reynolds Number: A correction factor related to air density and viscosity; but more importantly to chord length, and velocity of the wing. The greater the chord, and the higher the velocity, the higher the Rn.

Rudder: The movable portion of the vertical fin which affects the yaw mode of the aircraft.

Roll: See Bank.

Sailplane: See Glider.

Sink: Downward movement of air.

Spoiler: Panels hinged to the upper surface of a sailplane wing which spoil the lift of a portion of the wing, and increase the drag, causing it to descend.

Stall: A condition usually characterized by the dropping of the nose and rapid descent of an aircraft due to loss of lift caused by the angle of attack of the wing reaching a critical angle.

Thermal: An upward current of air caused by warming of the ground.

Tip Stall: Loss of lift at the wing tip caused by the tip area reaching the critical stall angle before the root.

Turbulence: Swirling air currents.

Undercamber: Normally refers to an airfoil shape with a concave lower surface, fore and aft.

Wing Loading: The weight each unit of wing area must support. For models, it is the total weight, in ounces, divided by the wing area, in square feet. For sailplanes, it usually runs between 6 and 10 ounces per sq. ft.

Yaw: A rotation about a vertical axis through the center of the aircraft normally caused by rudder action. This vertical axis is called the yaw axis.