simple toy

We've just maxed out at the '79 World Championships! A combination of how model is being held plus photographic obliquity causes wing to appear to have trailing edge taper—it doesn't: Trailing edge is straight tip-to-tip, and all taper is in the leading edge.

FLASH! Jim Wilson, flying the Simple Toy, was first place in the U.S. Team Finals at Taft over the Labor Day weekend.

For a world-class FF Towline Glider to be given this name must have been with at least a bit of tongue-in-cheek. It's a top model in the class, placing 4th in the 1979 World Championships. Take note of the author's personal preparations, an important factor when ultimate competition is involved.

■ Jim Wilson

MY CURRENT F1A Glider, Simple Toy, is the result of studying other airplanes, and four years of methodical development with seven models. (Editor: F1A is the designation given by the Federation Aeronautique Internationale (FAI) for the World Championships class of Free Flight Towline Gliders, also referred to as A-2 or Nordic Glider.) Technically, it is similar to other world-class gliders. Wing airfoils, aspect ratios, stability margins, and turning tendancies of these models have reached practical optimums. Individuals now use different layouts and structural details just to suit their particular flying styles.

Simple Toy suits the way I like to fly. It parks high on the line without constant attention, follows obediently when towed to lift, and is structurally strong enough to withstand the strongest zoom launches. Gliding free, it can 3-min. max with no help, and it stays in a thermal when put there.

Within the restrictions of the class rules, these flight modes demand compromises, but development has produced a strong, stable model that is reliable in competition. Number 6, the original Simple Toy, has well over 1,000 flights, and a second Toy is approaching 500. Both have maxed in still morning air, and also survived Taft's violent trash-moving thermals; Number 6 scored a 240-second max from Pole 13 in the 13th Round at the Team Finals to help me gain a U.S. team place. At the 1979 World Championships Simple Toy contributed to the U.S.'s first-ever team win in Towline by maxing out, and then placing fourth in the flyoff.

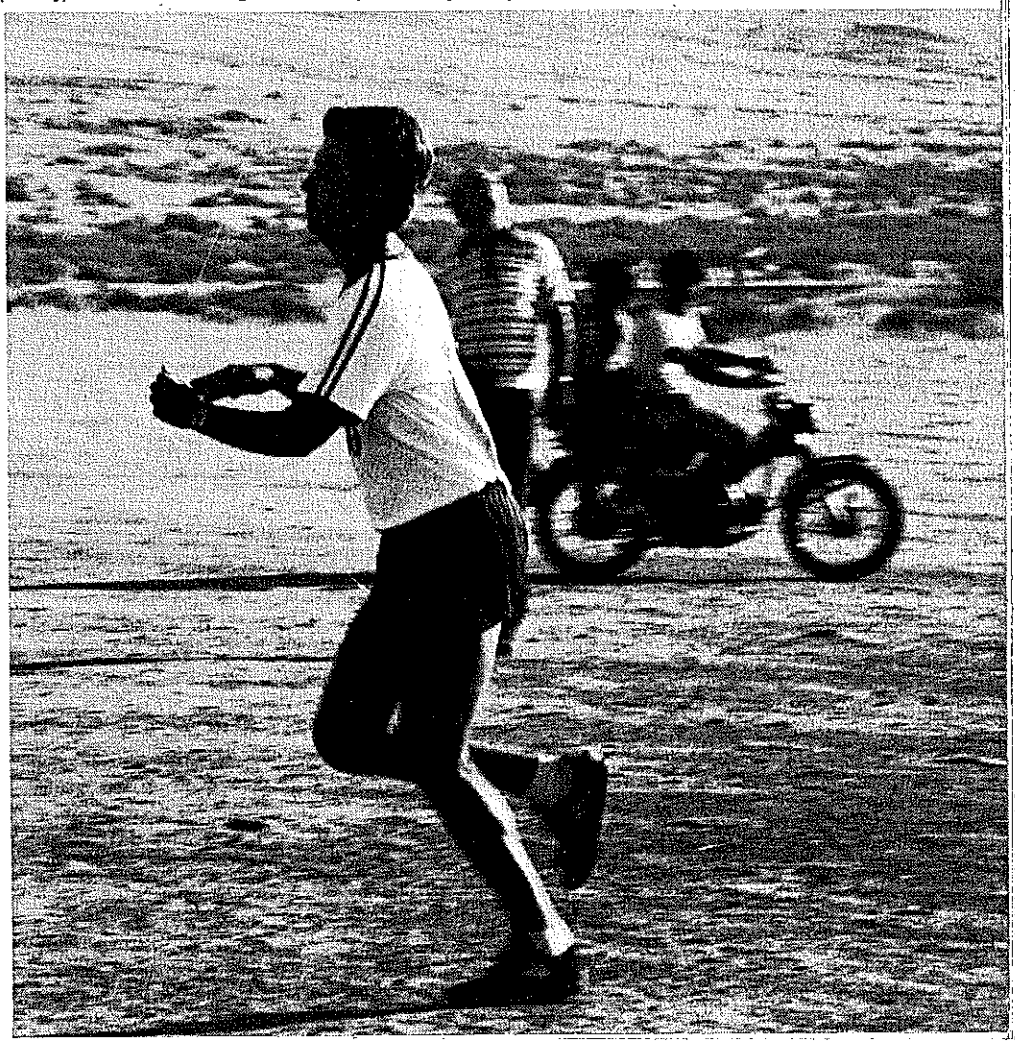
As far as how Simple Toy was developed, I fly a lot (about 60 days in 1979) and just tried a variety of different ideas; the present collection in this model work pretty good. It wasn't really "designed," which I think is a funny word in this Reynolds' number range, anyway, but rather the design evolved through playing around with different things, and trying to have a little fun. I do keep asking myself how the ship could be improved, and the new answers are always surprising. My friends and competitors have been helpful, and my SCAT Club mates have really offered a lot of encouragement, which I'd like to acknowledge.

Not much needs to be said about Simple Toy's construction. Bill Blanchard's fine plan is self-explanatory. Here are just a few tips.

Take your time. A poorly built model is poorly built forever. It takes me about three months to build a Simple Toy, but these models last a long

War council before first round at the '79 World Championships. Matt Gewain faces the camera, counterclockwise are Bill Blanchard, Dick Myers, and the Simple Toy.

Jim Wilson at play. Note that he is towing without a reel for best mobility. Coach Isaacson would gripe about poor arm position and knee lift, but Wilson would reply: "Yeah, right, but it maxed (barely)." Glider is over right shoulder, following easily.



time, so the building effort is a good investment.

Build straight. Cut parts accurately, and fit them carefully. A ship with few built-in stresses will be less likely to warp, and won't constantly surprise you with trim changes.

Build light. Add ballast to bring the model up to the 410-gram minimum weight, plus margin. Watch wood densities, especially in sheeted areas, and use small amounts of glue. You don't need as much as you think.

Use Titebond glue, thinned about 10% with water, for most construction. Epoxy is only required for the metal-to-wood joints. Clear K&B Super Poxy paint is used to apply light fiberglass cloth to the D-box and boom. Nitrate dope is used for all other covering and finish. Spray tops of wing and stabilizer with a commercial lacquer flattener to provide surface roughness.

Double-cover the wing to help torsional rigidity and ease the inevitable punctured tissue repairs. New tissue is about as light and strong as that of 20 years ago, but the colors are less vivid. Color can be enhanced by leaching the dye out of a Magic Marker wick with lacquer thinner, and using it to make a thin colored dope. Spraying this dope on tissue of the same color produces a dense, light-weight finish.

Simple Toy has black underwings for increased visibility. Opaque black, combined with V-dihedral, makes the plane easy to spot as it soars up to another max.

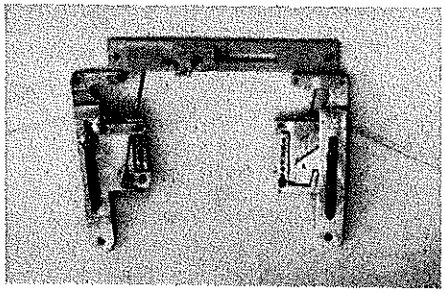
Build the wing flat, and then washout the tips when doping the covered wing. This washout prevents tip stall, and smooths the flight path in turbulence.

The tow hook shown on the plan is easy to make with hand tools, and it works well. For those without sheet metal skills, one of my SCAT Club mates, Juan Livotto, makes and sells these hooks ready to use. You can write him for price and availability. See reference list at the end.

Simple Toy's dimensions are mostly metric for two reasons. First, metric units are easier to use in computations, being decimal. Second, a majority of the best Gliders are measured in the metric system because of their birthplace. Familiarity with the units makes it easier to understand what other fliers are doing, and to learn from their experiences.

Flight-trimming a straight, properly balanced Simple Toy is easy. Preparing yourself to compete is more difficult. Let's go over the easy part first.

Build in one mm right wing washin at the root tab to start. Then hand-glide the model to get fin settings and wing-stab angular difference (longitudinal dihedral) roughly okay. Typical fin offsets for right glide; straight tow, 5 mm left; glide circle, 8 mm right; tow circle, 12 mm right. Start the auto-fin line in the third hole up on the hook lever.



This is actually parts from two towhooks, arranged so that both sides of the "busy" part can be seen. The baseplate is at the top. Look closely for details of the adjustment bolts for tow and glide circles. It can be made with hand tools.

When hand-glides don't stall or plow furrows, tow up on a full-length line, and proceed with trimming for the four flight modes. Adjust the link in the auto-fin line to get the tow straight. Adjust the rear baseplate bolt to get about a 30-sec. glide circle. Adjust the tow circle with the front baseplate bolt to the largest that you can control in the wind. Add or remove stab shims to get a reasonably flat glide.

Launch trim may take a bit longer because of the speed range through the transition. The right zoom is a climbing turn, with a smooth roll on top into the glide. End points of launch trim are in the calm, where it's hard to get enough speed to climb, and in the wind, where it's easy to get too much speed and to spiral in.

Adjust the zoom fin offset in the calm to get a smooth turn. If the model stalls, add offset. If the model spirals down, increase the washin. Now repeat in the wind, and retrim as needed for height and safety. Right stab tilt may help recoveries. Washin changes will affect glide and tow trim, so you will have to readjust them. Just keep repeating the process in all weather conditions—until you know what the model will do, and you like what it does.

Fine trim depends on your flying style and field location, but here are several suggestions. First, place the tow-ring as far rearward as required for calm-air launches. This produces a ring position more rearward than is traditional, but if it were placed any farther forward, the model's nose wouldn't come up well in a calm-air launch. Tow control doesn't suffer, as long as you stay alert and mobile. Every ship is different, so be prepared to move the hook around for best performance. Second, always use a little less longitudinal dihedral than you can get away with in calm air. This will let the plane maintain airspeed and not stall in ground turbulence. On paper, a glider gives up a little performance by flying faster, but a stall close to the ground is disastrous to flight time. Even less longitudinal dihedral is required for the steady circles needed in thermal flying. Third, launch consistency is mostly up to the flier, so develop this in practice to match your physical ability.

Contest flying is my favorite part of modeling. It's the payoff for all that building and practice. It's also the most neglected facet in modeling literature.

The ideas here are just one way of approaching competition. They may not suit you. If not, develop your own method. You'll probably do that, anyway, making best use of your own personal advantages.

Contest success is determined on the practice field. There are no mirrors, no magic, no shortcuts. Wouldn't be fun if there were. You need strong motivation to do whatever is required to succeed. If you measure your success using John Wooden's yardstick, "the peace of mind in knowing that you have done your best at performing up to your capability," you can succeed and make progress, regardless of trophies collected.

Have a plan for every contest possibility you can imagine. For the World Champs, my written plan ran about eight pages long. It had every circumstance that might affect the flying—weather, competition, team responsibilities, and the like, and the preparation needed to reply appropriately. The act of thinking out and writing a plan clarifies each thought and cements them in the subconscious where they can surface as reasoned reactions at the right time. It's difficult, during major contests, to analyze situations and change tack with predictable results. You have to depend on judgment responses acquired during planned practice.

Here is an item from my WC Plan: give yourself a little slack. I read contest reports on all the Free Flight World Champs, and tried not to repeat problems other people had already experienced. In 1971, a Wakefield contestant was disqualified for having an underweight model. So, I ballasted my gliders to 417-420 grams (7-10 grams overweight) at home—where it is more humid than at Taft, the WC site, to ensure, even after drying out, that they would be legal. Over-organized you say? In 1979, history repeated itself, and another Wakefielder was disqualified for an underweight model. Your model's flight will never notice being 1% overweight, but the processors will always catch even a fraction of a gram under. Give yourself a little slack!

Modern Towline Glider flying requires that you are aerobically fit. A modest running program of 20 miles a week, at an 8-9-min. per mile pace, will prepare you for a half-hour tow in that calm early-morning round. Hills, fartlek (Swedish word for speed play training), intervals or other resistance workouts are also beneficial. Quick-

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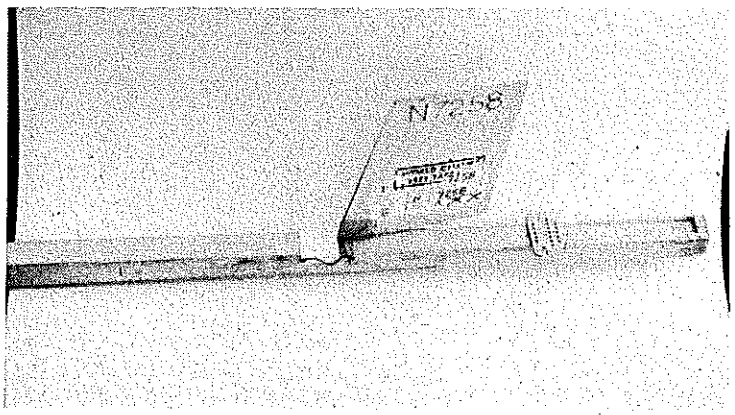
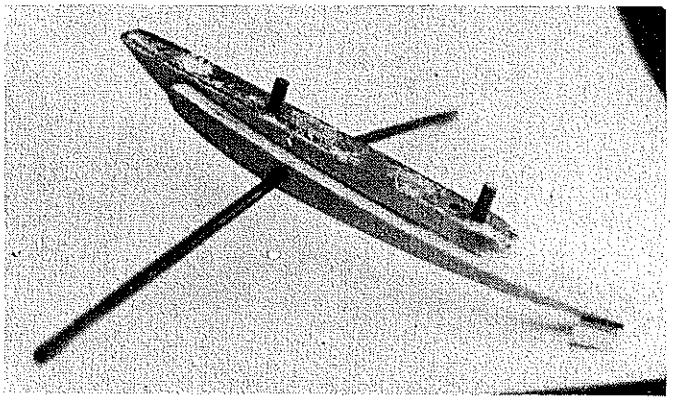
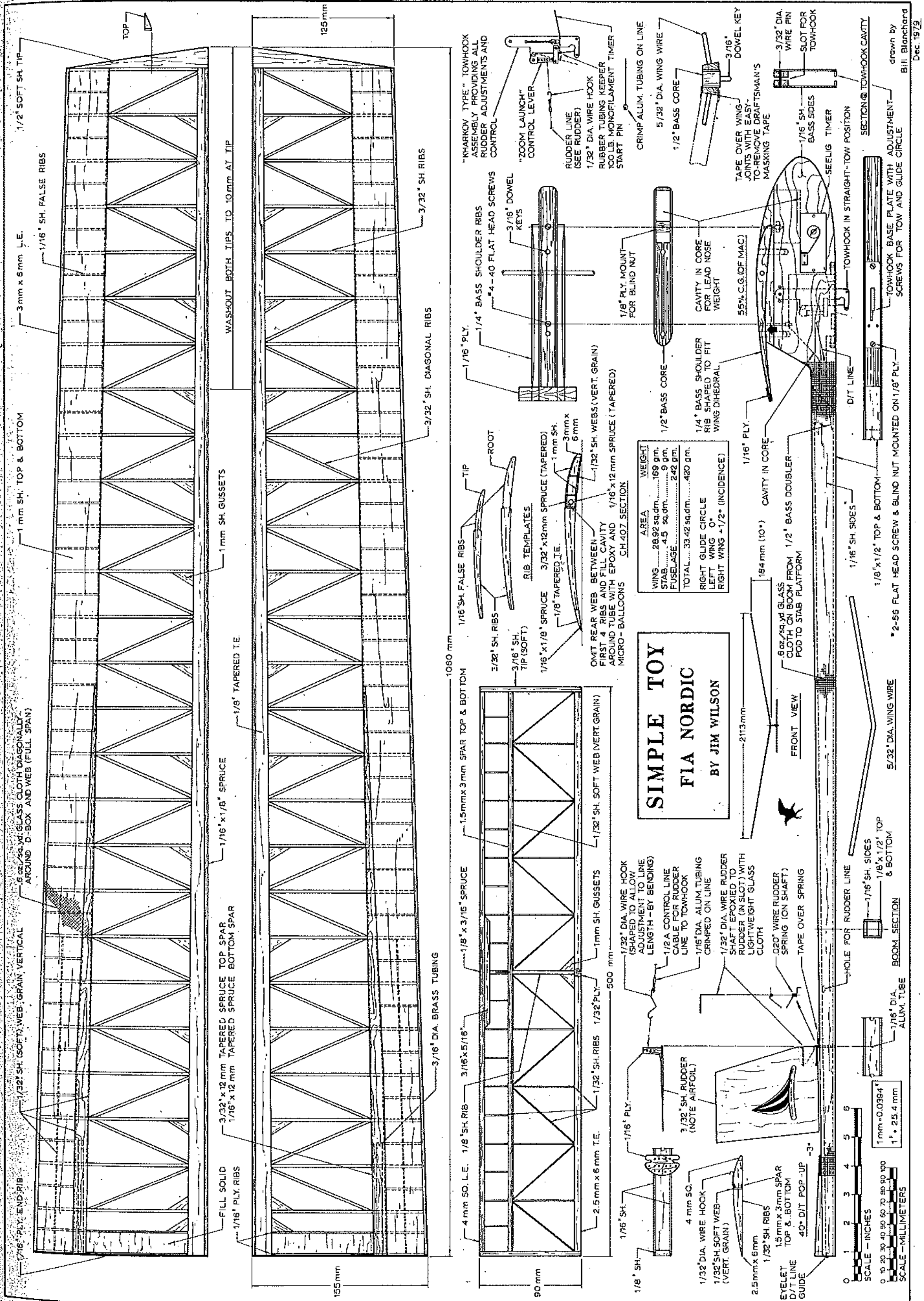


Rear fuselage detail shows layout, flying fin, and the adjustable link in the auto-fin line for straight tow trimming.



Close-up view of the wing wire and fuselage top. It is removable so that the model can be put in a small box for easy transportability—an important consideration when you are considering competing abroad.

FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 128



CLASS F2C TEAM-RACE RESULTS

PLACE	NAMES	COUNTRY	NO.	1-st FLIGHT	2-nd FLIGHT	1-st SEMIFINAL	2-nd SEMIFINAL	FINAL
1	B.METKEMEYER R.METKEMEYER	HOL	355	3.29.2"	4.04.3"			
2	J.E. ALBRITTON W. PERKINS	USA	377	3.33.6"				
3	J. BALOGH V.DORANT	HUN	340	3.36.5"				
4	SMITH C. BROWN	ENG	374	3.42.3"				
5	H.VISSER E.BUYS	HOL	356	3.46.6"				
6	A.CIPOLLA P.CIPOLLA	ITA	350	3.48.2"				
7	D.HEATON M.ROSS	ENG	376	3.48.5"				
8	J. FISCHER H. STRANIAK	A	308	3.50.4"				
9	L.JACKSON H.NELSON	USA	379	3.53.9"				
10	V.SHAPOVALOV V.ONUFRIENKO	SOV	380	3.55.3"				
11	H. GESCHWENDTNER J. MAU	DEN	331	3.56.2"				
12	B.DELOR R.SURUGUE	FRA	338	3.58.2"				
13	W. CHRISTEN V. SACCAVINO	SWI	371	3.59.00"				

The racing is under way on the second day, and the U.S. still had two teams in the semi-finals!

the second semi-final round started after lunch. Again Albritton/Perkins went off in the first heat, and again they were a little slow with a 3:42—even though the Cipollas gave them a good shot by sitting out the race. Heaton/Ross could only manage 3:52; they were out. In the second heat, Smiffy managed a 3:40 and seemed set for the final. The Dutch and Hungarian teams both ran out of fuel and flying space; they failed to finish. That left Geschwendtner/Mau and the Metkies with a shot in the last semi-final heat. Robbie blew it with an overcooked first tank, but cooled it quickly in the pit, and reset to get right back on the Danish tail. They came home together in a tight race and time, with Metkemeyer sneaking in ahead for the third finals spot at 3:42.

The final looked like a lock-up for Albritton/Perkins as they re-propped for a commanding speed, which neither of the opposition could match.

Fate had the last laugh, however, just as we had built a two-lap lead coming into the first pit stop. The Danes were in, and Albritton came in over their pit, and Perkins made the grab. As he did so, Smiffy came in immediately behind and struck the lines before Perkins could get the ship down on the ground. Both ships spilled, Perkins' out of reach, and Smith/Brown not moving.

All eyes turned to the Jury tower as the Danish ship started again. Silence. The Danes came in to pit again, and again everyone turned to the Jury. Silence.

The competitors and the entire crowd stared in disbelief as the Jury sat seemingly in paralyzed inactivity. The satisfying thing would have been to stop at once and restart, with the prospects of a race to watch and remember. But it doesn't always work out that way.

Despite many minutes of wrangling and no disqualifications, the race ended as a solo benefit to no one's satisfaction. There was no winner, only a survivor.

The U.S. and British teams finally were granted a refly attempt by the FAI Jury, but by that time the organizer said that the show had to go on. No refly was run, and all went home disappointed.

Simple Toy/Wilson

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ness, speed, and stamina should be your goals. Proper training allows you to fly the 10th Round as solidly as the first. Fliers who like to run can

certainly benefit from more difficult workouts. For those who like goals to aim for, possibly the most fit U.S. Glider flier is Dennis Mihora of Santa Barbara, CA. Dennis has run a 10K (6.2 mile) race in just over 32 minutes, and he's completed a marathon (26.3 miles) in about three hours.

Running is popular now, and there are uncounted books on the subject. Running training can be an obsession by itself. One training book is mentioned at the end of this article. No single book is perfect, but the one suggested covers 80% of the good stuff. Put as much effort into running as you can enjoy. Towline Glider is the most athletic of all the modeling events, and there's no single more important part to the plane/preparation/practice equation than fitness. Fitness can't be overemphasized; Glider flying ability follows fitness.

Stretching exercises help balance muscle development and reduce injuries. Preventing injury allows regular workouts and steady fitness improvement. Stretching also improves flexibility, which helps speed. Stretching before flying is a good warm-up, and it reduces strain. Basic stretches for running include the Achilles tendons, calves, hamstrings, quadraceps, hips, back, and shoulders. Some modest strengthening exercises will also aid your running. These include calves, hamstrings, stomach, and upper chest.

For mental preparation, I practice rehearsal, concentration, and relaxation techniques to free myself of distractions while flying. These drills help smooth peaks in performance to consistent high levels. If you're interested, start by reading Dr. Tutko's book. His approach has helped many neighborhood and galaxy class athletes perform at their best.

On the flying field, practice the fundamentals. Have a goal list, and try to practice smart and hard. Expect that your competitors are prepared to the best of their ability and interest, but that they have no strategic secrets. Contests are decided on execution of fundamentals and conditioning. I practice tow mobility, parking, air picking, launch positioning and mechanics, and trimming the glide for all weather conditions. Many different strategies can work fine, as long as you choose one suited to your nature, and can execute it reliably in contests. Practice what you plan doing in contests, and practice with your best airplanes. They will have different personalities, and you have to get to know them well. Don't be afraid of crashing. Gliders frequently fly better after repairs, anyway.

It's difficult to over-practice or over-organize, but you can become mentally stale. Prevent staleness by playing games at practice. Some things to try:

1. Piggy-back drills, wherein a number of fliers tow, and all must launch and max in air that the first launcher takes—regardless of where he launches on the field.
2. Flying two ships in still air, to really check trim and times.
3. Champagne flyoffs at contests that all can fly in.
4. Downwind starts.
5. Ending practice on a positive note, with a good flight.

The end result of the right practice is confidence and poise: you know you can handle yourself and your airplane. To be really prepared on a world class level is no accident, only the product of organized, well thought-out practice. It isn't cheap at this level, but the effort is everything, and I love it. World level competition should be all-out. To the several people who have published desires to simplify FAI competition back to sport flying, I say phooey! To those who enjoy flying once a month between 10 and 2 on a perfect Sunday—great, do it. But stay with what you enjoy. Remember that it's only work if you'd rather be doing something else.

When a contest starts, draw confidence from your preparation. Know that you're as fit as you planned. Know that your airplanes are proven and ready. Clear your head, and concentrate on making maxes. Just before you fly, take a moment and mentally rehearse your flight from tow up through recording the max. Stay alert, keep your head in the contest, and pay attention to every sign of lift. After each flight, I write a brief note for later collation; in this way I can be encouraged by the good, and can learn from the bad. If you do drop a flight, try to bear down harder. Max out the rest of the way. As Yogi Berra once said, "You're never out of it till you're out of it." You never know what other fliers will do, or what the outcome will be, until all scores are in. Never give up!

References:

Stretching, Bob Anderson, Box 2734, Fullerton, CA 92633.

Sports Psyching, Dr. Thomas Tutko, Tarcher.

Sports Illustrated Track and Field: Running Events, James Dunaway, Lippincott.

Practical Modern Basketball, John Wooden, Ronald.

Seelig Timers, Doug Galbreath, Box 707, Davis, CA 95616.

Towhooks, Juan Livotto, 13212 Lake St., Los Angeles, CA 90066.

Launch Chute/Gist

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article describes the one I use now.

Materials and equipment. You will need two pieces of fabric, 12 x 4 in. each; four pieces of shroud line, about 36 in. each; and two tow rings.

Polyester or nylon sailcloth is ideal. I went to a hot-air balloon maker and got some rip-stop nylon. You might try a sailboating shop, or sailmaker.

The shroud line should be braided or twisted; monofilament will not do. Since there are actually eight shroud lines, the line material does not have to be super strong. If it has 25% of the strength of the main launch line there will be a two-to-one margin.

You will also need a sewing machine. The best kind is one that not only does zigzag stitches, but also does what is called a darning or smocking stitch. This looks like a zigzag stitch, with one difference: where the needle only pierces the fabric at each end of the zigzag, the darning machine also fastens the fabric one or more times between the ends of each zigzag. But a plain zigzag will work.

Assembly. Lay the two pieces of fabric on one another in a cross, as shown in the drawing, and pin them together. Starting at the corner of one piece, run a zigzag stitch all the way around that piece, and back to the same corner. The pieces should be joined by two seams. Now repeat the process on the other piece, and remove the pins. Make sure that the outside edge of the zigzag is right at the edge of the fabric, or even slightly off the edge. This keeps the fabric from raveling. The four seams around the center square lock the two pieces together.

Next, lay one of the four shroud lines across the chute as shown, diagonally from one corner to the opposite corner, with the center of the line at the center of the chute. Thread the first tow ring on the line. Using the darning or zigzag stitch, sew the line to the fabric all along the line, keeping the tow ring in the center (the drawing shows only part of the seam). Try to keep the line