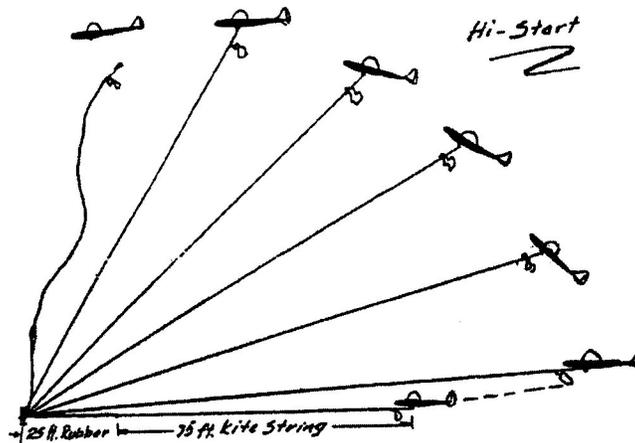


Hi Start Revisited

By Jim Walters '75, '77, '79' USA FAI Team

The following article was printed in the January 2005 Issue of Flight Plug, the newsletter of the Southern California Ignition Flyers, Mike Myers, Editor, who says he took it "right out of SAM8 Speaks Newsletter, Bob Harper, editor

HI START is a method of launching a glider using a line composed of a thin, single-strand of rubber and some string. It is attached to a fixed stake so no helper is required. A tow ring on the end of the line is attached to the towhook on the glider. To launch, the glider is pulled back stretching the rubber about three times it's original length. The flyer then releases the glider and watches the ensuing climb, level off and graceful transition to glide after the trowing slips off. Despite what many of our R/C colleagues might think, HI START was probably invented by Free-Flighters. Frank Zaic's 1938 Model Aeronautics Yearbook on page 130 shows a catapult launch of a glider using 25% rubber and 75% thread.



(Ed Note) The diagram above and the paragraph which follows are from "Model Glider Design," 1944 by Frank Ziac

"Hi-Start Launch was imported from Germany. It is a combination of catapult and towline launching. By using light rubber, the tow is fairly slow and glider has no trouble in reaching altitudes equal to length of string. After you've had some experience you can add more rubber and get higher altitudes due to extra speed. Some of you may have tried this idea and have been disappointed. , This was probably caused because the rubber was too powerful. Use smallest amount of rubber possible; just enough for the glider to struggle up. We use about 25 ft. of rubber with 75 ft. of towline. Use a single strand of the following sizes of rubber for a particular job: 1/16 flat for up to 150 sq. in., 1/8 flat up to 350 sq. in., 3/16 up to 500 sq. in., and 1/4 flat for larger jobs. By using such light rubber you cannot harm the glider. Yet there is enough power to apply a steady pull on the string which is all that is needed. After you have proved to yourself that Hi-Start is practical you can slowly add more power. See sketch for general set-up. Use side hook and other adjustments as already described. (Ed Note: Ziac proposes that if the glider has rudder offset or other adjustment for a right or left turn, you can counter this problem during tow by placing a towhook on the same side as the rudder or other adjustment is set to turn the model)

Hi-Start is especially fun in calm weather. By progressive adjustments you can make the glider circle back to you at the starting line. It is thrilling to watch your ship climb up and automatically take care of itself, especially if you are reluctant to run."

Zaic's book, *Model Glider Design*, (1944) shows several HL size and slightly larger glider designs, (the Thermic 36,20 and 18), being launched by the HI START method. (Ed Note: See plan in this issue for the Thermic 20). Modeling, at least to me, falls into two categories. First is the building phase and secondly, the flying. For me, the payoff is the flying. A freeflight model not flown isn't much different than a plastic scale model sitting on the shelf. There is nothing that gives more pleasure than seeing the un-powered glider overhead, drifting to and fro, wingtips bobbing, picking up some light lift then lazily ascending higher and higher until the dethermalizer brings it safely back to earth.

My early modeling interests centered on gliders perhaps because of their simplicity for a beginner. Not having to deal with prop carving or the gadgetry and cost of motor driven airplanes was a big factor. After all, the birds make the most of flying, utilizing wind, thermal currents, gravity and a little flapping. Hand thrown gliders, the simplest to construct and smallest in size, provide the quickest way to get airborne. But they involve some tricky adjustments to blend the heave into a slow graceful glide. Next, the towline gliders offer the graceful glide utilizing a kite flying technique of simply towing it up with a string and letting it float off into the glide. A drawback of towing the model is that you must move fast enough to keep the line tight to achieve the launch altitude while keeping one eye on the model the other eye on the terrain, (usually uneven). Stumbling and falling is not uncommon. especially for the inexperienced, or more senior flyers who have lost some of their agility. Many times the flyer simply runs out of steam and the model comes off the line without the flyer having any idea of what's going on, (or off).

Recently, when trying to fly one of my old Nordics, I found great difficulty and lots of pain from stumbling and falling without attaining a good launch. For my recent junior flyers class, I designed and built a simple glider - thirty-inch span, flat bottom no taper wing, straight dihedral, profile fuselage with a solid tail boom. There was no auto-rudder. An offset towhook was used to offset the rudder trim. And, of course, there was a D/T. Once the C/G was set at 55-60% of wing cord from L.E., the rudder offset for the turn, the model was launched using a thin 3/32nd strand of rubber 25 ft long attached to 75' of monofilament fishing line staked to the ground. Aimed into the wind and modestly stretched back the released model climbed steeply under a combination of slight breeze and pull from the stretched rubber. Best of all, once I released it, I simply just watched as it climbed on a true trajectory until it was near vertical. The tow ring slid off the hook once the rubber tension was gone and it floated into its smooth circling glide. Best of all, I got to see and enjoy the whole thing without being all pooped out or picking myself up off the ground. What a delight!

A streamer on a pole to verify wind direction is essential to avoid crosswind launches. Towhook location, both forward and side, is somewhat critical.

As a second subject, I used an old A1 glider With autorudder. The HI START was 1/8" rubber and string the same length as with the smaller glider. With autorudder, its trajectory was even more true. A flag or pennant attached near the towhook provides the drag necessary for the ring to slide off the hook with no hang ups. Recently, at the Albany contest, I flew a demo flight in light thermal conditions. The glider tethered for a few seconds. Then, when the rubber relaxed enough, the towing slid off and the model circled gently. It was gaining altitude when it D/Td.

This type of model flying would be an excellent introduction for youngsters and newcomers to modeling. When my young class members fly, I start the stopwatch when the model leaves their hand. This way the kiting of the model goes to the total flight time. Thus all flights are good flights whether the line is attached or not. (Beginners should have encouragement).

A1 size models such as the Jetstream, Li'l Dip or Ghost are good candidates for HI START. For smaller gliders up to 30" span 3/32" rubber 25' long with 75' of string works well. For 40 - 50" span models 1/8" rubber is OK. Perhaps for A2 size gliders, (14 - 15 oz.) I would guess that 3/16" or 1/4" rubber would work.

I fully recommend HI START as a launching method for all those towline gliders relegated to the attic and, who knows, maybe it will become popular as has catapult glider.

Taken right out of SAM 8 SPEAKS newsletter, Bob Harper editor