



State of the Sport Free Flight Part 3

12/16/2006

Author: Don DeLoach

There has never been a better time to get started in FF modeling. For one thing, kits are much better today. For those who don't enjoy building, expert builders are selling excellent RTF models. Great videos, books, and other resources are available, and excellent clubs and fields still exist.

(The following makes several references to various FF suppliers and sources. Refer to the sidebars "FF Suppliers" and "FF Reading Room" for detailed information.)

Starting With Gliders: Since the early days of model aviation, simple FF gliders have been the natural starting point for most beginners. They are still a great place to start. Many glider kits are available in the \$10-\$20 range, producing nice-flying models and teaching much about flight trimming in the process.

Hand Launched Gliders are great for kids and beginners—anyone with at least average arm strength. If you'd rather rest your arm, rubber-band Catapult Glider kits are equally rewarding.

Three of the best small glider-kit suppliers are Stan Buddenbohm, Sting Aero Products, and Campbell's Custom Kits. Each offers kits, plans, and supplies in all size and complexity ranges, with excellent wood and good instructions. Check John Kaufmann's Book Building and Flying Hand-Launched Gliders or Bob Johannes' how-to glider video, both available from www.freeflight.org.

Towline Gliders: "Nordic" Towline Gliders have been around since the 1920s. Some devotees consider Nordic Gliders to be the purest form of model airplane, and it is hard to argue the point. No engine, no control from the ground, majestic circling, silent flight—a good Nordic Glider is an object of immense beauty and simplicity.

Towlines for all competition classes are limited to 50 meters in length (164 feet). The established Glider classes fall into three basic categories of complexity:

straight tow, or "classic" style; intermediate/

circle tow; and modern bunt.

Classic-style gliders are the simple, mostly balsa "A-1"-sized models which are straight-towed and "kited" off the line within a few seconds. Good small glider kits for roughly \$30 are the Lil' Dip and Jetstream, both from BMJR Model Products.



Above and below right: Expert Glider flier Lee Hines shows the details of his legendary Sweepette HLG, originally designed in the late 1950s and still competitive. Little black rotary gadget is a lightweight DT timer. After two minutes the spring tension on the timer releases the line holding down the wing, which then hinges back abruptly, parachuting the model to the ground.



Jerry Murphy and his Russian-built F1G (Coupe d'Hiver). Such models are available from Russian builders and fly great.



Bob Hanford launches his Class C glow-engine Pilfered Pearl. It is typical of AMA Gas FF: fast and light, with a lot of power. A K&B 6.5cc (.40) hauls the 35-ounce airframe to roughly 500 feet in seven seconds.

A small step up from A-1 is the F1H kit from Campbell's Custom Kits called the Jesse James. It is also a straight-tow model but has a better glide and more advanced design than the simpler A-1s.

Another classic Glider kit—albeit larger and more expensive—is the Thermal Probe from GlideTek. It is easy to fly and the best-performing classic Towline design available.

The intermediate style of Nordic Glider uses “circle-tow” technology. That means the flier circles the model overhead while it's still attached to the towline. When rising air is sensed, the flier sprints forward and the glider is “zoomed” off the line, at which point the timekeeper begins timing the flight.

Good circle-tow designs are the Sija F1A from W-Hobby and the Mini Master F1H by Stan Buddenbohm. Both are available in kit form and offer high performance for relatively little money. Intermediate-tech Nordic models in experienced hands are still competitive with the best high-tech Nordics.

High-tech Nordic means mostly carbon and Kevlar, complex auto-gadgetry, and significantly greater expense. High-tech gliders also use circle-tow hooks, but with the added complexity of “bunt” transition.

“Bunt” is simply a timer-actuated one-quarter outside loop at the top of the fast zoom launch. The bunt transition gains the model an extra 20-30 feet of altitude, which is precious at high levels of competition.

Check out the many RTF F1A and F1H Gliders available from such Eastern European builders as Beschasny, Stamov, Bolgov, Makarov & Kochkarov, glideTEK, and W-Hobby. Prepare yourself for a significant dent in your bank account for these finely engineered machines. However, their performance is nothing short of astounding, and their carbon airframes will stand up to many years of abuse.



Pete McQuade with his high-tech F1A Towline Glider. Modern F1As feature a “bunt” transition following a zoom launch; both aid in height gain.



Greg Simon launches his FF HLG at the 2005 Nats. HLGs are the simplest entry point into FF and provide excellent flying fun for little money.



Dohrman Crawford checks the air at the 2005 Nats before sending his HLG into orbit. HLG kits are readily available, easy to build, and cost approximately \$10.

Getting Started in Rubber Flying: As I wrote in Part 1 of this series, rubber-powered model airplanes are the original form of heavier-than-air aviation, dating back to 1871. And rubber power is the FF class that is best known in the wider American audience. Slide-together, rubber-powered toys are still widely available at discount stores and toy shops—just as they were 100 years ago.

Rubber-powered FF is still popular, with great kits, plans, and excellent rubber strip still readily available. Hobby shops rarely carry everything you need, but some still stock kits and some supplies. See the “Free Flight Suppliers” sidebar for quality sources of kits, supplies, and information.

A good starter kit for an inexperienced modeler is the Peck R.O.G. from Peck-Polymers. It is a simple design, with a stick fuselage that goes together in a couple hours. For more ambitious beginners and those with some modeling experience, consider one of the many P-30-class kits that are available.

P-30 was conceived as an entry-level event, and it still offers excellent performance. Most P-30s will easily fly one to two minutes without thermal help, even in beginners' hands. This makes them perfect for most average-sized fields.

Try the Majestyk or Souper P-30 from Campbell's Custom Kits, the Kiwi or Tail-Firster from BMJR Model Products, or the Model Aircraft Labs (MAL) Sparrowhawk. Almost any P-30 kit will build easily and fly well. With a good-flying P-30 you will soon find the need for larger fields and the use of DT. P-30 is an excellent event to enter at your first FF contest.

As the next step up from P-30, try a Society of Antique Modelers (SAM) Old-Timer (OT) Rubber design. Many great kits, short kits, and plans are available. Designs including the Sparky, Gollywock, and Casano Stick are still bringing joy to Rubber fliers around the world 60-70 years after they first appeared.

The Gollywock is a favorite of beginners and experts since it is easy to build and climbs like a rocket. Campbell's Custom Kits, Bob Holman Plans, Jim O'Reilly Model Plans, and Starlink are great sources of OT Rubber kits and plans.

If you prefer the size and power of the larger OT Rubber models, try the Korda 1939 Wakefield, Korda Stickler, Red Buzzard, or Smith 1941 Mulvihill from Bob Holman Plans. All have performance equal to or better than their smaller cousins; they just require larger motors.



Tim Batiuk shows a recent innovation in FF HLG: the “broken back” DT setup—a nearly foolproof method of breaking models out of strong lift.



This is a typical Gas FF front end. The bladder pressure, fuel feed, and mechanical timer provide fuel shutoff and quick DT for test-flying.



Flying Aces FF Scale events are more popular than ever, thanks to friendly competition and unique rules that promote difficult subjects. Duke Horn prepares to wind his rubber-powered P-38.

The largest and best-performing Rubber models are those belonging to the AMA "Mulvihill" class, referring to the AMA's historic Mulvihill Trophy of the 1920s. This category is synonymous with Unlimited Rubber, meaning there are no wingspan, length, propeller, weight, or rubber restrictions. The only rule is that the model must have less than 300 square inches of wing area.

The typical Mulvihill model that results from the rules is light (4 ounces or less), large (4-5 feet long), and carries a huge amount of rubber—approximately equal to its empty weight. After a two-minute propeller run, a typical Mulvihill will often fly 10 minutes or more and require several miles of downwind recovery area unless the wind is calm.

Flying Mulvihill is uniquely fun because the models climb so high and for so long. Their performance is amazing to watch, especially for someone whose mental picture of rubber power is of a child playing with a toy in the front yard.

An excellent source of Mulvihill plans and articles is the NFFS Plans Service (www.freeflight.org/store/plans/plans.htm) and NFFS Symposium digital archive

(www.freeflight.org/store/symposiums.htm). You can also search for “Mulvihill” in the AMA Plans Service (www.modelaircraft.org/plansmain.asp) to find several designs that were published in MA throughout the years.

The Coupe d’Hiver (FAI class F1G) event originated in France after World War II. It specifies a fairly heavy airframe (70 grams empty) with a relatively small rubber motor (10 grams maximum). The result is a two-minute model that is more challenging than P-30 or OT Rubber but flies beautifully.

Coupe motors are short and stout because they swing large-diameter propellers on few turns (400-500). Following a quick 30-second ascent to approximately 150 feet of altitude, the Coupe model begins its graceful glide. Modern Coupes—though definitely underpowered—excel in the glide phase. In fact, with sink rates of approximately 1.5 feet per second, they are sometimes hard to DT reliably.

If you prefer the challenge of building, check out the Kiwi Coupe from BMJR Model Products or the Souper Coupe from Campbell’s Custom Kits. The best of the balsa-kit Coupes is MAL’s Winterhawk.

Since Coupe is an FAI event, the Builder-of-the-Model Rule is nonexistent; therefore, F1G provides a nice entry point for FF competition. There are many RTF and ARF Coupes and Coupe parts available from the European market. Consult the suppliers sidebar for these options.

Among the world’s best F1Gs are those by Burdov (Starlink), Alexei Bukin, and Evgeny Gorban. Simpler ARF Coupe kits from Starlink are also available—notably the Beau Coupe and Burdov’s Candy G.

F1B Wakefield represents the pinnacle of technical performance in rubber power. These models are limited by airframe weight (200 grams minimum) and rubber weight (30 grams maximum).

Despite those limitations, modern F1B airplanes are capable of breathtaking performance. Motors are wound to the verge of breaking and models are javelin-launched to vertical climbs before the propellers fold at approximately 250 feet. Then the outstanding glide of the modern F1B takes over, often clocking five to seven minutes in calm air.



Ed Wiley checks wind speed and temperature for thermal activity before launching his F1B Rubber model. Electronic thermometers, Mylar streamers, and anemometers are commonplace in FF competitions.



Duke Horn looks proud of another of his Flying Aces Rubber Scale aircraft: a Heath Parasol on floats.

European F1Bs and parts for building your own are readily available. For starters try one of the simpler entry-level varieties by Vivchar (Prima) or Burdov (STARter). Both will provide excellent performance and will give you a good taste of F1B flying for less than \$250. When you are ready for the big time, world-class F1Bs by champions such as Burdov, Bukin, Vivchar, Andriukov, and Gorban will run in the neighborhood of \$800-\$1,500.

Glow-Engine FF: FF Gas is still quite popular today, thanks to the many kits and equipment suppliers that keep it going. Campbell's Custom Kits is one of the best, offering more than a dozen kits in various sizes and a dozen more plans. BMJR Model Products, Team Satellite, and The Model Box are other excellent suppliers of Gas kits.

Gas FF is basically a vertical drag race. The object is to get your model as high as possible in the allotted engine-run time (which varies from four to 12 seconds). Then the model transitions to a longer glide phase. Four to 12 seconds isn't very long to get the model high, so the design trend is for small, fast, and amply powered aircraft.

For instance, a hot .049 setup has a 250- to 300-square-inch wing and 6- to 7-ounce total weight. This type of model will attain roughly 400 feet of altitude on a seven-second engine run, aiming for a two-minute maximum ("max"). Typical larger models are:

- Engine Class A/B: .15-.21 cu. in.-displacement engine, 450- to 600-square-inch wing area, 18-25 ounces.
- Engine Class C/D: .35-.65 cu. in.-displacement engine, 700- to 1,200-square-inch wing, and 35-60 ounces.

Gas models are among the best-performing FF airplanes. One look at the AMA national records list will confirm this. The current record in Class A Category III is 105 minutes, or 43 consecutive max flights!

The ultimate in Gas FF performance is found in FAI classes F1J and F1C. Both are typically high-aspect-ratio (long wingspan and narrow chord) models with mostly composite construction and top-of-the-line engines.

F1J is for 1cc or .061 power with no weight minimum. F1C is the World Championships class, with 2.5cc (.15 cu. in. displacement) power and a minimum weight of 750 grams.

F1C is extremely demanding (high minimum wing loading) but offers amazing performance. The best F1Cs today have wingspans in excess of 100 inches and climb to incredible altitudes on scant five-second engine runs.

F1C maxes are three minutes, but a good F1C model will glide for five to 10 minutes in calm air. Because of this, “flyoffs” (think overtime in football) are often held. A typical flyoff involves several competitors aiming for a long max time at sunrise or sunset, when thermal activity is nil.



This Webra .32 is in typical configuration for FF Gas: no carburetor or muffler for maximum power and weight savings. FF Gas is a vertical drag race for only a few seconds, then the model becomes a glider.

Current state of the art in ultra-high-performance F1C is the folding-wing model. The idea is simple: long-winged airplanes glide better but have more drag in the climb, reducing altitude. Folding the wings for the climb and then unfolding them at the top of the power pattern is the best of both worlds—a higher climb and a better glide.

Folding-wing F1Cs have been developing since the 1960s. In 2003 an F1C folder finally won the World Championships. Since then, many of the world’s top F1C competitors have acquired at least one.

Beginning FF Gas Flying: Getting started in Gas FF is fairly easy if you’ve had any experience at all with glow engines. The main challenges are making your engines run consistently and then learning the fine art of Gas FF trimming.

There are roughly three kinds of Gas FF models: those with no auto surfaces, also called “lockdown” or “Classic Gas”; those with variable incidence tail and auto rudder (VIT and AR) only; and bunters (VIT, AR, and one-quarter outside loop after engine shutoff).

Typical starter models for Classic Gas are the Mini Pearl 1/2A from Campbell’s Custom Kits or Jim O’Reilly Model Plans, the Satellite series from Team Satellite, or any of the Nostalgia series from BMJR. Kits from The Model Box are also excellent.

If you want to jump into FAI Gas flying without getting into building, you can purchase an RTF F1J model for as little as \$500. Check out glideTek, Vasily Beschasny, W-Hobby, or International Model Group for F1J models. The best .061 engine currently available is the Cyclon from Doug Galbreath. Most modern F1Js are designed around it.

For a longer discussion check out my article in the 2004 NFFS Symposium "Beginning FF Power: A Journey" or get the NFFS video by Bob Johannes. Most important, understand that flying FF Gas requires a healthy respect for fast-moving engines and models.

These airplanes are spectacular when things go right but can be quite dangerous when things go wrong. Minimize the danger by having an experienced flier close by when you are starting out.

Hearing protection is a must since FF engines have no mufflers and run at full throttle. And always make sure you test-fly and practice on secluded fields with no spectators. The models are much safer later, when they have been trimmed.



Above and left: Mike Isermann and his obscure FAC Rubber Scale Lippisch P-13 twin-engine flying wing. Flying Aces rules encourage challenging subjects with bonus points.

FF Scale: FF Scale today means one thing: Flying Aces Club (FAC). This organization published its own rule book and has many AMA sanctioned contests from coast to coast and around the world. Most Scale meets in the US today are run according to FAC Scale and flight rules instead of AMA rules.

The FAC's core mission is to preserve the traditional stick-and-tissue building philosophy that was the embodiment of model aviation in the 1930s. There are huge yearly FAC contests at the Geneseo, New York, Historical Air Group field and the AMA field in Muncie. The highlight of attending an FAC meet is seeing one of the masters with a multiengine Scale subject, detailed down to the last rivet.

Most FAC Scale models have wingspans ranging from 1 to 3 feet and are rubber powered, but larger models and electric and CO2 engines are also used. For a rule book and a year's worth of a great newsletter, send \$15 to FAC-GHQ, 3301 Cindy Ln., Erie PA 16506.

There are more FF categories and events I haven't listed (we have too many). There's Payload, Cargo, Rubber Speed, rocket power, Slope Soaring Glider, CO2, electric, and even compressed

air. Most of those aren't flown very often, but their existence underscores the diversity of the FF experience.

Large or small, low-tech or high-tech—if chasing after models soaring free in lazy circles gets your blood pumping, you're bound to be one of us: a rare breed called the Free Flighter. Join us!
MA

Don DeLoach

ddeloach@adelphia.net