

A Resource List for Free Flight Model Airplanes

Vendors, Terminology, Web Sites, and
Other Necessities

Updated March 2014

The following is a basic list of a few of free flight resources (there are many more), and is aimed primarily at newcomers and “returnees” to the hobby of free flight. Many of these vendors offer model kits suitable for inexperienced first-timers. **Please feel free to copy and distribute this list**, and understand that merchandise availability, prices, e-mail addresses, and web site URLs are subject to change without notice. If a web site address doesn't work, use your favorite browser. Contact me if you have questions.

Bob Clemens

Western New York Free Flight Society

rclemens2@rochester.rr.com 585-392-3346

A2Z Corporation

3955 S. Mariposa Street

Englewood, CO 80110 877-754-7465

www.a2zcorp.us/store

Whether you fly indoors or out, the Peck-Polymers and Indoor Model Supply divisions of A2Z Corp. have loads of kits, plans, supplies, select balsa wood, and tools of all kinds for both beginners and experienced modelers. Many of their kits now feature laser-cut parts. Check their well-illustrated web site. They take phone orders and accept Visa, Amex, MasterCard, & PayPal. Tim Goldstein is the proprietor. *There are many excellent beginner-friendly kits in their inventory.* Pictures of all are on the web site.

Campbell's Custom Kits

P.O. Box 251

Anderson, IN 46015 (765) 289-7753

thermalpiglet@comcast.net

<http://campbellscustomkits.com/>

Lee Campbell, a veteran free flight competitor, is the proprietor and kit maker. His inventory includes lots of gliders (see glossary): at least 14 hand-launched models, three catapult types, and several towline designs. All this plus rubber-powered duration models, power models, and scale kits keep Lee busy cutting the top-quality balsa wood he puts in his kits. He also sells kits and accessories from other manufacturers.

Diels Engineering, Inc

P.O. Box 167016

Oregon, OH 43616

Web site: <http://dielengineeringinc.com/>

Dave Diels offers lots of excellent stick-and-tissue kits, most of which are of pre-WWII and WWII military aircraft with vacuum-formed canopies where called for and great decals for insignia and markings. *Some are now laser cut.* Lots of plans, too, if you like to pick your own wood and tissue for scratch

building. Check his well-illustrated web site. Not recommended for beginners.

Easy Built Models

P.O. Box 681744

Prattville, AL 36068-1744

daveann@easybuiltmodels.com

www.easybuiltmodels.com

Easy Built models offers a staggering number of its own kits, plus balsa, tissue, a unique magnetic building board, rubber winders, propellers, and other supplies. Many of the kits are laser cut. Proprietor Dave Niedzielski is an experienced free flight modeler and supporter of the Flying Aces Club (see glossary). His web site is a must visit.

F.A.I. Model Supply

P.O. Box 181

Avon Lake, OH 44012

440-930-2114

<http://domino-35.prominic.net/A55C2D/fai.nsf>

FAI sells more than 100 free flight kits, and the list keeps growing and includes three excellent ready-to-fly indoor rubber models plus kits and materials for the Wright Stuff Science Olympiad event. FAI carries a great selection FF supplies and accessories, including Tan Super Sport rubber strip that is the performance standard of the hobby.

Golden Age Reproductions

P.O. Box 1685

Andover, MA 01810 (978) 687-0024

E-mail:

garepro@aol.com

www.goldenagereproductions.com/

Looking for model plans? GAR has hundreds of Comet, Peerless, Megow, Scientific, Ace Whitman, and other reprinted plans from 1930's and 40's rubber-powered scale kits that those of us over 60 fondly remember. They also have over two dozen excellent rubber scale kits, most updated versions of those same old-time models, some of later design including the Curtiss Robin, P-51 Mustang, P-47 Thunderbolt, and Messerschmitt BF-109E of WWII fame. Their catalog is \$3.00, a must for rubber scale fans. Proprietor of GAR is Jim Fiorello.

Laser-Cut Planes

Colorado Springs, CO

www.lasercutplanes.com

johnmcgrath2@comcast.net

This site deserves a good look by beginners, returnees, and experienced modelers. It features 10 great designs, all easy to build models designed for outstanding flight and ease and simplicity of construction. There are good photos of all models offered, including the 19 1/2" span "Meadowlark," seen flying in a video at: http://www.youtube.com/watch?v=JCug6Cs_5hU Some kits, such as the beginner-designed *Mountain Lion*, are also offered in bulk, great for school, Scout, or other group projects. Highly recommended!

A.A. Lidberg Model Plan Service
1127 W. Dunbar Drive
Tempe, AZ 85282
480-309-6564
aalmps@aol.com www.aalmps.com/

Al Lidberg offers a most interesting and extensive selection of plans and kits. He has profile ("no-cal") scale plans, peanut scale plans, 16 larger size rubber scale plans, plus a growing number and variety of kits. Al is a master draftsman and his plans and kits are excellent. Check his offerings at his well-illustrated web site.

Midwest Products Co., Inc.
Educational Products Division
400 S. Indiana Street
P.O. Box 564
Hobart, IN 46342 1-800-348-3497
www.midwestproducts.com/

Midwest offers a number of model kits through its Educational Products Division. Ideal for beginners, they are available both as single kits or multi-model "class kits" for school or other group programs. Included are some gliders and four rubber-powered models plus teaching texts, wood, tools, and adhesives. The rubber models include a *Delta Dart* (similar to the *AMA Cub*); a larger *Super Delta Dart*; a 12" *Shoeblox R.O.G.* ("Rise Off Ground"); and the *Right Flyer*, a robust 19" R.O.G. Both of these are capable of flights of well over one minute in a 20 ft. high gym. All can be flown outdoors in calm weather. Pictures of all their models can be seen on their web site.

Penn Valley Hobby Center
837 W. Main Street
Lansdale, PA 19446 (215) 855-1286 (215) 368-0770
Web Site: www.pennvalleyhobbycenter.com/

Penn Valley offers free flight kits from many of the U.S. vendors shown elsewhere on this list, and at discount prices. They also have their own unique line of rubber scale kits, authentic reproductions of those pre-WWII kits so fondly remembered by most over-60 modelers (like me). Many of these are replicas of the 10¢, or "dime scale" models of that era that typically had wingspans of 16-20 inches. Some are larger, some are non-scale types. PV carries lots of other items, such as rubber strip, wheels, tissue, and more. Catalog is \$2.00.

Tailspin Aviation
301 East 11th Street
St. Elmo, IL 62458 tailspin@tailspinaeriation.com
<http://www.tailspinaeriation.com/index.html>

Tailspin has lots of kits and supplies. It's a good shopping location for both beginners and experienced fliers.

Volaré Products – Shorty's Basement
7686 B Drive South
Battle Creek, MI 49014 <http://volareproducts.com/BUY/>
269-339-9795

Volaré is one of the most dynamic sites on the web. Kits of all kinds, including the *Triflyer* for novices, plans, accessories, winders, rubber, tissue, and tools are available. The site is well illustrated and is a must visit for modelers of all skill and experience levels. George Bredehoft is the proprietor.

Just getting started? Here are some suggestions:

It's a good idea to start with one of the many relatively simple, easy-to-build models available in kit form. They can be flown indoors in a school gym or outdoors when the air is calm. They fly well despite their unsophisticated designs. Don't bite off more than you can chew!

- The *Squirrel* (see web site listing for information).

- The *AMA Cub*, a very simple to build and robust model that flies well. Some hobby shops carry this kit. You can see a picture of the *Cub* and order kits on the AMA web site, www.modelaircraft.org, either singly or in bulk packages of 12 and 40 kits for group projects. The *Delta Dart*, sold by Midwest Products (see page 6), is a clone of the *AMA Cub*. AMA stands for Academy of Model Aeronautics, the national governing body of model aviation in the United States. Visit www.luminet.net/~bkuhl/rubber.htm where you'll find lots of excellent basic Cub information. I highly recommend this site!

- *Right Flyer*, a sturdy and great-flying model from Midwest Products (See page 6 for photo).

- *Prairie Bird* and *Bostonian Pup* non-scale endurance models, *Nesmith Cougar* and *Lacey M-10* peanut scale models. All four are from Peck-Polymers and are basic stick-and-tissue models with boxy built-up fuselages and wheels with simple structures. They are excellent fliers, suggested as second or third projects, and will hone building skills needed for more sophisticated subjects, such as scale models. NOTE: Peck Polymers changed ownership in early 2007, but their excellent kits and modeling accessories are still available. This includes their easy-to-build *Peck ROG*, another good beginner kit.

- 10:1 and 15:1 K&P rubber winders (see photo on bottom of page 6) from FAI, Midwest Products, Laser-Cut Planes, and others. They're easily identified with their bright yellow cases.

A brief glossary of Modeling terms

Adhesives: These are vital products used to hold model parts together. Commonly used model adhesives include aliphatic resin wood glues such as Titebond; traditional model airplane cement in tubes such as Testors, Duco, or Ambroid; various epoxies, and instant glues such as Zap. The aliphatics are strong, safe, and easy to clean up with water, and allow ample time for adjustment while setting. Instant glues are just that, and are especially useful for quick field repairs. Not recommended for inexperienced builders. Other kinds of adhesives are used to attach tissue to a model's framework. Commonly used for this are clear dope (see below) and glue sticks. Dope is a liquid applied with a brush. Glue sticks work well and have little if any odor or fumes, unlike dope. They are available wherever office supplies are sold. Be careful not to crush delicate framework when using a glue stick.

Dope: A lacquer-like liquid that is available in clear and colored versions. Clear dope can be applied to a model's framework to attach tissue covering and can also be used to seal tissue after it has been applied. Colored dope is used over tissue for decoration and realism, especially on scale models. Dope is available by mail order or from hobby shops that carry model airplane supplies.

Electric Model: A model powered by one of the ever-growing number of tiny electric motors now available. Power is supplied by small rechargeable batteries carried in the model. These motors can power free flight models ranging from 12 inches to several feet in wingspan. There are some good almost-ready-to-fly ("ARF") models that use electric motors. You can find these at toy stores as well as various Internet retailers.

Endurance model: A power, rubber, or glider competition model that is designed and built solely to stay aloft for as long as called for under the competition rules for its particular event. There are many competition categories for indoor and outdoor endurance models. These models may or may not have a realistic appearance, and are a good starting projects for beginners rather than more difficult to build and fly scale models. See page 6 for a photo.

Free flight model: A model that flies "free" of any external control while airborne. It uses settings of balance, flying surfaces, rubber motor size, and propeller thrust angle put into the model prior to launch for in-flight guidance, stability and flight duration.

Glider: A model plane that flies without a motor. Free flight gliders come in three types: Models that are launched by throwing them into the air, models that are launched using a rubber band catapult, and larger models that are towed aloft on a long line like a kite, then set free at the peak of the tow. Hand launched and catapult launched gliders are generally small models with wingspans of 12 to 20 inches and are typically made from solid sheets of lightweight balsa wood. More recently larger hand launched gliders have appeared in competition that use a discus-style launch by means of a reinforced grip on one wingtip. Towline gliders use stick and tissue style construction and generally range in wingspan from four to six feet.

Indoor model: A model built specifically for flying in an indoor site, such as a gym, fieldhouse, aircraft hangar, or other draft-free interior location with suitable floor space and ceiling height. Gliders, rubber-powered, and electric-powered models are flown indoors. They are comparatively lighter and more fragile than those intended to be flown outdoors. Some of the more robust indoor models, such as the *Right Flyer*, can be flown outdoors under calm air conditions.

Laser Cut: A term referring to the relatively new technique of precisely pre-cutting model parts, such as wing ribs and fuselage formers, from balsa sheets using a very thin, precise laser beam. This eliminates the traditional and time-consuming task of manually cutting out parts printed on balsa sheets using a hobby knife or razor blade.

No-Cal scale: A class of comparatively simple, easily-built semi-scale rubber models having a two-dimensional profile fuselage in place of the traditional built-up, three dimensional hollow fuselage. Typically they are of stick-and-tissue construction are covered on only one side of their framework. They can be flown indoors or out. "No-Cal" is short for "no calories," a reference to the lean, minimal structure of these models.

Outdoor model: A model built for outdoor flying, using relatively robust design and construction compared to indoor models. Various types of gliders, rubber-powered, and engine-powered models are flown outdoors, often using thermals (rising warm air currents) to achieve long flight duration. See page 6.

Power model: A model plane using an internal combustion engine, electric, or CO2 (compressed gas) motor as its power source.

Peanut Scale: A popular class of small rubber-powered scale models with a maximum wingspan limit of 13 inches. There are many kits and plans available for peanut scale models. They can be flown both indoors and out. Not recommended for beginners.

ROG: Initials for the term "rise off ground." While generally applied to small, comparatively simple rubber-powered models equipped with landing gear that permits them to take off under their own power, it also describes a takeoff capability or competition requirement for any free flight model so equipped. Some of the vendors listed sell kits for ROG models.

Rubber lubricant: A slippery substance, usually a liquid, applied to a rubber motor to reduce friction between the strands when they are being tightly wound for flight. *Use of a proper lubricant is vital!* It enables many more turns to be wound into a rubber motor than would be possible without it. While dedicated rubber lubricants are sold by some of the listed vendors, automotive protectants such as Armor All, Formula 2001, and Son of a Gun make very good rubber lubricants too and are readily available in retail stores.

Rubber motor: The loop, or multiple loops, of rubber strip that provide power for rubber-powered model aircraft. Tan Super Sport rubber strip (see below) is formulated especially for powering model planes and is sold by a number of the above vendors, most notably *F.A.I. Model Supply*. When used with a mechanical winder (see *winder*, below) and a proper lubricant, rubber motors can be wound up to several thousand turns to give long flights of several minutes duration with a properly prepared free flight model.

Scale model: A model plane designed, built, and decorated to closely resemble a particular full-size, man-carrying aircraft. In competition, scale models are scored on their depiction of the subject aircraft, overall craftsmanship, and flight duration.

Stick-and-tissue: Model airplane jargon referring to the traditional method of free flight model construction which uses balsa wood sticks and pieces for the model's framework

and tissue paper to cover it. This tissue is most often a fine, lightweight grade imported from Japan called Esaki. Many of the vendors on the above list sell Esaki tissue.

Stooge: Free flight slang for a fixture designed to securely hold a rubber-powered model in place while it is being wound for flight (see page 6). This omits the need for another person to hold the model during winding. Once wound, the rubber motor is hooked to the model, which is then removed from the stooge and is ready for flight. Some vendors, such as *F.A.I. Model Supply*, sell stooges. Some web sites have pictures of various styles of stooges.

Super Sport Rubber Strip: The brand name of rubber strip specifically formulated for powering model airplanes. It's sold in long continuous strips of various widths, usually 1/16, 3/32, 1/8, and 3/16. Its thickness is approximately .045 inch. Rubber-powered models fly using one or more loops made from one of these widths. *F.A.I. Model Supply* (see vendor list, above) markets Tan Super Sport to both modelers and vendors and works directly with the U.S. manufacturer to constantly monitor and maintain its quality. Some vendors strip it into an even wider range of thinner widths required for flying various classes of ultra-light indoor models. Most serious modelers have their own rubber strippers, but these very useful tools are expensive. See Thayer Syme's web site (listed below) for pictures of various models of rubber strippers.

Tools: Basic tools for model airplane building include a flat work surface such as a sheet of smooth ceiling tile, a supply of single-edge razor blades; a hobby knife such as the Xacto; needle nose pliers for bending wire; sandpaper and sanding blocks, straight pins for holding parts in place during assembly on the plan (ceiling tile makes this easy), waxed paper or plastic wrap to place over the plan to keep adhesives from sticking to it, a metal straight edge/ruler, adhesives of choice for sticking parts together, and glue sticks or dope for attaching covering if required.

Winder: A hand-held mechanical device used to conveniently and quickly wind the motors of rubber-powered free flight models. *A proper winder is a must-have piece of equipment for successful rubber model flying and long flights!* Winders have a hand crank which turns a simple gear train connected to a hooked output shaft. The hook holds one end of the rubber motor; the other end remains attached to either the rear rubber hook or propeller shaft of the firmly held or anchored model (see *stooge*, above). The lubricated motor is then stretched to three or four times its slack length and winding is begun. With each single turn of the hand crank, the output shaft turns anywhere from 5 to 20 times, depending on the particular gear ratio of the winder. The person slowly shortens the length of the stretch as he winds, starting to come in at about 50% of desired turns and finishing with the motor at its flying length. The motor is then carefully transferred to the model. This classic technique allows many more turns to be put into a rubber motor than would be possible using manual winding of the propeller. Stretch winding permits 1,000, 1,500, 2,000 or even more turns to be quickly put into a rubber motor for longer flights. K&P winders with their distinctive yellow bodies are an excellent choice. See page 6 for a picture of a model being wound and a closeup of a typical winder.

Web Sites

There are many excellent web sites devoted to free flight modeling. The following are just a few. Many of them have links to still other sites. Google "free flight model airplanes and see what happens! Also check *You Tube* for loads of free flight videos!

Academy of Model Aeronautics:

<http://modelaircraft.org/> The AMA is the official governing body of all phases of model aviation in the United States. *AMA Cub* kits (see suggested models list on page 2) in bulk can be ordered on this site.

DC Maxcutters club site:

<http://dcmaxcutters.org/index.html> The D.C. Maxcutters are one of the best known free flight clubs in the country, particularly where Flying Aces competition is concerned. There's lots of great scale information, model action photos, and links.

Bill Kuhl's AMA Cub web site:

www.luminet.net/~bkuhl/rubber.htm This site is a must for anyone just starting out who's interested in easy-to-build models. Lots of good information, pictures, and many video clips showing these fun aircraft in action. Bill's site is particularly aimed at youngsters who want to get a model into the air. Highly recommended!

Darcy Whyte's informational site: www.endlesslift.com/

The best site for beginners, educators, Scout leaders, and anyone interested in learning what basic free flight model aviation is all about, how to get started, building and flying the *Squirrel*, an easily constructed and great flying rubber band-powered model. The site has lots of contributions from others as well. This site is a must for anyone wanting to learn the basics of model plane building, flying, and teaching.

The National Free Flight Society

<http://freeflight.org/> This is the home of the *National Free Flight Society*, an organization dedicated to promoting and encouraging the hobby of free flight model aviation. There's lots of good information and resources here. Why not join? Their all-color newsletter is superb, with lots of photographs.

The book, "Rubber Band Powered Flying Machines"

This unique book has everything you need to fly, indoors or out. The three rubber band powered airplanes included have been carefully engineered, from the extra-large *Firebird* (an impressive 19-inch wingspan), to the acrobatic *Lightning Looper* (it really loops), to the Shooting Star (which makes such tight turns you can fly it in the living room). Simple directions explain how to assemble the planes from the provided parts and, just as importantly, how to fly them for maximum performance. For ages 8 and up, it's also available at Amazon.com and some book stores.

Thayer Syme's free flight web site:

www.gryffinaero.com/models/ Thayer's very active site is full of ever-growing amounts of information, tips, plans, and

model photos. His pictures and explanations of tools and fixtures are very informative. **Science Olympiad** information is included too. It's a great place to start surfing. This site is highly recommended!

Rubber Powered Model Airplanes by Don Ross covers the basics very well. It can be purchased from Carstens Publications for \$14.95 at www.carstensbookstore.com.

NOTE: There is a ton of free flight videos on You Tube showing both indoor and outdoor models in action. Search away and enjoy the flying!

New to all this? Try a *Squirrel*, *AMA Cub* (a.k.a *Delta Dart*), *Mountain Lion* from *Laser-Cut Planes* or the *Right Flyer* (pictured, right).

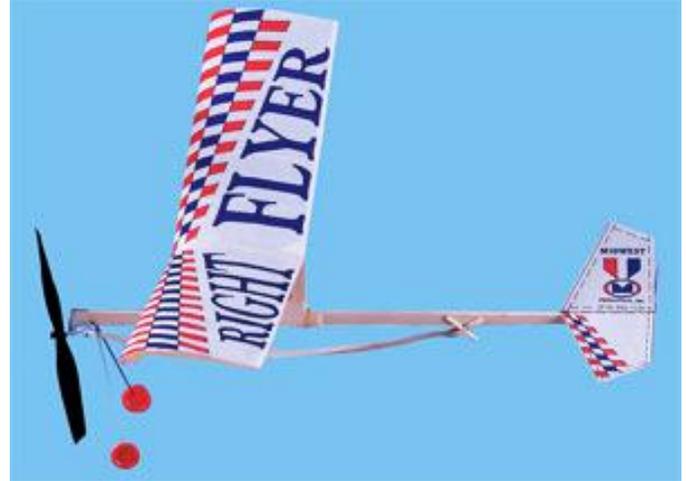
We've all heard of the flying squirrel, an airborne gliding version of the more common bushy-tailed rodent. Well, here's a flying model named the *Squirrel*, arguably the easiest-to-build and best flying of any beginner rubber-powered model. It can be easily built from scratch using free instructions or from a purchased kit. The man to contact is the *Squirrel's* designer and enthusiastic promoter, Canadian Darcy Whyte. Check out his web site for more information, instructions, kit purchases, and some great action videos showing the *Squirrel* in flight. It's great for classroom projects and can be flown indoor or out. Contact Darcy at darcy@siteware.com His web site is located at <http://www.rubber-power.com/>. See page 6 for a picture of a *Squirrel*.

The *AMA Cub* is a simple, very easy to build rubber-powered model. The balsa wood sticks that comprise its wing and tail framework are glued directly to the paper plan, which when trimmed becomes the covering. Tens of thousands of Cubs have been built since it was first kitted back in the early 1970's. Its design is robust and it can be flown indoors or out, the latter when the air is calm. You can see a picture of the *Cub* and order kits on the AMA web site, www.modelaircraft.org, either singly or in bulk packages of 12 and 40 kits for group projects. The *Delta Dart* sold by Midwest Products is a clone of the *AMA Cub*. See their web site. Visit www.luminet.net/~bkuhl/rubber.htm where you'll find lots of excellent basic Cub information. I highly recommend this site!

Laser-Cut Planes offers 10 kits, some for beginners, some for people with a bit of aeromodeling experience. All are solid designs featuring laser-cut parts.. This enables quick and accurate assembly. Some, such as the beginner-recommended *Mountain Lion*, can be purchased in bulk for school, Scout, or other group projects.

The *Right Flyer* model from Midwest Products (see vendor list) is a good trainer for newcomers to free flight modeling and makes a great school science or aeronautic project. Somewhat more complex to build than the *Squirrel* or *Cub*, it's a fine flier and can fly for a minute and a half or more under a 20 ft. ceiling. Its sturdy construction, using a tough paper covering material, can withstand a beginner's rough handling as well as the inevitable collisions with walls, chairs, and other obstacles usually found at indoor flying sites. It has wheels and takes off the floor or pavement easily. It can be

flown outdoors too, providing the air is calm. Midwest sells kits of the *Right Flyer* in "class packs" of eight and 24 models as well as single kits. Some hobby shops may carry these kits, or can order them. The *Flyer* kit is complete with very good instructions. Here's a photo of the *Flyer*. The single-loop rubber motors is suspended beneath the balsa motor stick.



Here's a 24" rubber-powered scale model of a 1932-era French lightplane. Below: An engine-powered contest model is launched showing its high-angle climb. A timer will shut off the single-cylinder motor after a pre-set number of seconds.





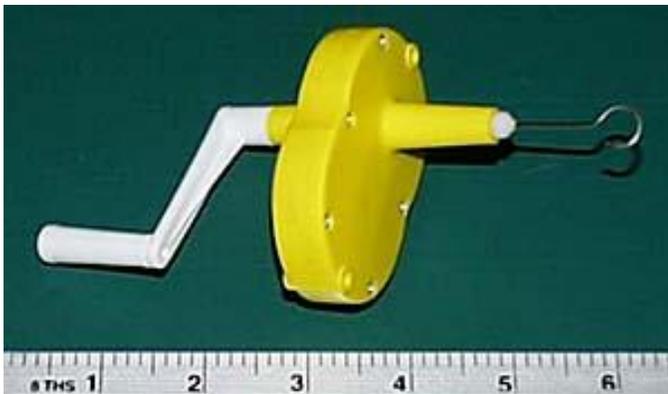
Above: An outdoor endurance model is launched. The model has a wingspan of 36 Inches and uses multiple loops of rubber strip for power. Below: This is the *Squirrel*, a beginner's model that's easy and quick to build and is a fine flier. See page 5 for more information on the *Squirrel*.



An indoor endurance model is seen just after being launched. This one uses a molded plastic propeller and a solid balsa stick for a fuselage.



This is the AMA Cub. It's an easy-to-build beginner model. See the vendor list for more information. The balsa wood framework is glued direct to the plan, which then becomes the model's covering after careful trimming around the outlines with a single-edge razor blade.



Here's a typical rubber motor winder. This one has a gear ratio of 10:1. One turn of the white handle gives ten turns of the winding hook, speeding the winding process and enabling stretch winding of long motors for highest number of turns.



The rubber motor of a small scale model is stretched to permit the maximum number of desired turns to be added. The model is anchored securely in a winding "stooge" (see glossary) mounted on the flier's field box. He'll slowly start coming in as he completes the second half of the desired turns, finishing with the front end of the winder just in front of the model's nose. He'll then hook the propeller to the motor, detach the model from the stooge, and be ready to fly. For long flights, proper winding technique is important.