CENTRAL INDIANA AEROMODELLERS

INFORMER

FREE FLIGHT NEWS OF THE MIDWEST

** The Weather **
Milk a cow on the rising tide,
more cream will come to the top!
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Scale Stuff - #4! - by Jim Miller

The grand-daddy of all free flight scale events is officially titled *Free Flight - Indoor and Outdoor Rubber Flying Scale.* Most competitors refer to it as 'AMA Scale'.

With the introduction of FAC scale events and AMA Peanut Scale, entries in AMA Scale have been at a minimum. The main reason for this may be that fliers are not willing to spend the time to build a model to definite standards as spelled out in the rules. Another reason was the requirements for the model to ROG successfully. This essential maneuver caused many beautiful scale models to be damaged or destroyed, especially in windy conditions. The ROG requirement has been eliminated.

I think that too many builders who might want to compete in AMA Scale are awed by the Total Scale Points possibility of 100. They think a model has to push the 100 point mark to be competitive. Actually, a score in the low 70s can be competitive at the present level of participation. If the event ever becomes more popular, scale scores will undoubtedly rise, but even then a score in the mid-80s will be the norm.

Keep in mind that scale scores depend on the experience and knowledge of the scale judge. Even museum quality models will get some deductions from a critical judge! The best advice I can offer is do the best job you can, recognize your shortcomings and hope for the best!

Case in point: I went to the USIC at Johnson City, TN some years ago with decent looking model. It had scored as high as 82 points in previous contests. When the judging was finished, the best model received 100 points (Perfect!). My model was given 98 points - almost perfect - but still ranked 3rd behind a 99 pointer! How do you figure that??

(cont'd p.5)



Last Minute Change!! The WNYFFS Indoor bash has been changed to ***May 13th***, due to a conflict at the Buffalo Bills training center site! Be advised!

A Question..... I've been receiving quite a few requests recently for a compact, phone-book-style listing of the CIA membership roster. This list could also include email addresses. Are there any Agents out there who object to the release of their email addresses?? Let me know.....

Another Call For Informer 'Papers'..... But first, let me thank our stalwart contributors - **Dick Covalt, Gil Morris, Chris Matsuno, Norm Poti, Jim Miller** - who bail me out a couple times a year with their material.

But **Bob Mattes** and **Bob Spinks'** full-color pix of their projects will have to wait just a bit longer, as color deserves color! (Watch for a full color page in a near-future issue of the Informer.)

I fully intend to divulge the rubber test data (and performance predictions) submitted a while back by Chris, **Frank Heeb** and **Jack Eskew** - before their batch-dependent equations need updating because the rubber they tested becomes obsolete!

And, of course, we sure could use someone to fill in for **Harry Murphy** - in contributing 'original' OT & NosGas material.

Sorely needed are tech articles (any tests you might have run that makes sense - or not!); 3-views (especially of modern gas models!); casual observations, hints 'n tips, electronic gadgets, field meteorology, etc. - anything a FF'ter can use. Any indoor or outdoor subject is fair game!

Original FF artwork is always welcome to keep our signature 'look' going! (I'm tempted to take some art/cartooning classes so's I can contribute.....) I'm kinda pleased with the fact that so many FF publications over the past 5 years or so have gotten on this bandwagon - many times with 'our' artwork!! (Original artwork is worth a free membership....)

Jokes and cartoons are always welcome to round out an issue. Send 'em in!

How 'bout it, Agents???

A Neat Magazine..... Ever seen the model 'zine *Aviation Modeller International*? It's a good one - an English publication. It should now be available in most hobby shops. There's quite a bit of FF stuff aboard. And it features 1 or more full size plans per issue - as a large centerfold! Over the last 4 months or so, I've seen 2 FF model plans featured. Not bad, in this ARF R/C world!

By Request..... Since some flyers wanted plans for my Cat I IHLG *"Groove Merchant"* and no one submitted any 3-views this issue, I'm taking an ego trip to (re)run the plan on the facing page!

Scale Flyers..... Be sure to check out the June 17 scale contest notice on p.11! Lots to do!

...and a couple of jokes (from Agent **Joe Macay**).

A man called, furious about a Florida package we did. I asked what was wrong with the vacation in Orlando. He said he was expecting an ocean-view room. I tried to explain that is not possible, since Orlando is in the middle of the state. He replied, "Don't lie to me. I looked on the map and Florida is a very thin state."

or,

A woman called and said, "I need to fly to Pepsi-cola on one of those computer planes." I asked if she meant to fly to Pensacola on a commuter plane. She said, "Yea, whatever."



WHEN F'FERS WON'T CHASE ANYMORE.....

GROOVE MERCHANT

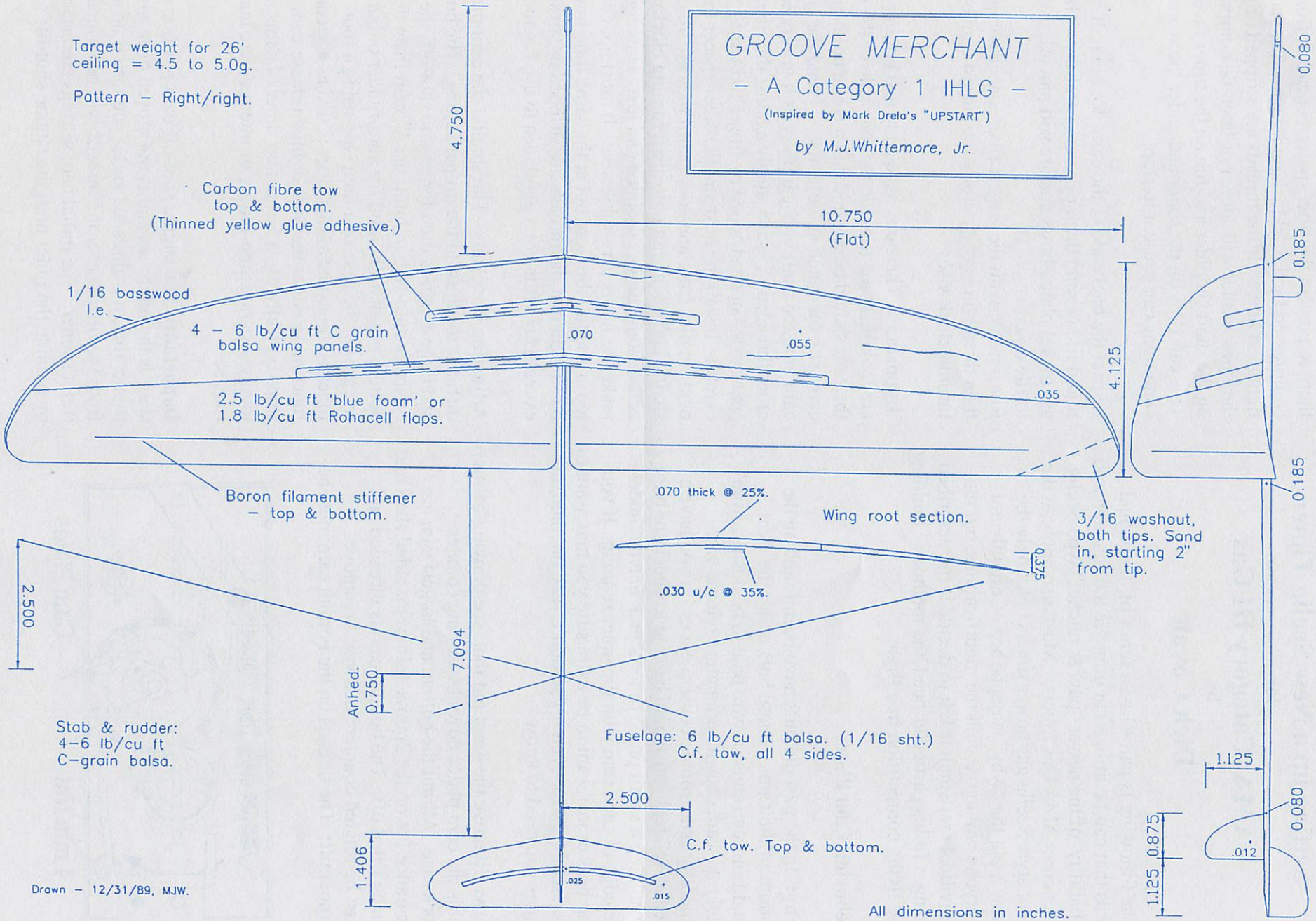
– A Category 1 IHLG –

(Inspired by Mark Drela's "UPSTART")

by M.J.Whittemore, Jr.

Target weight for 26' ceiling = 4.5 to 5.0g.

Pattern – Right/right.



Drawn – 12/31/89, MJW.

All dimensions in inches.

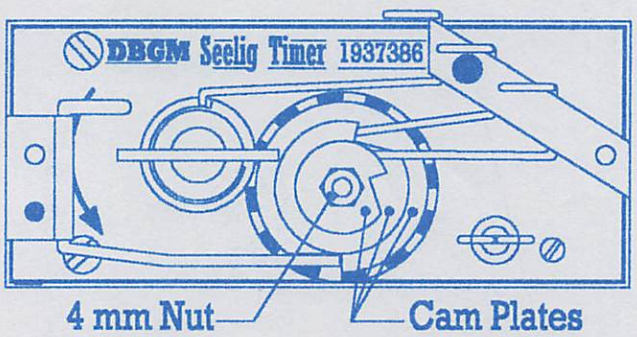
Setting up a New Seelig Timer
for
AMA Category III Gas
by
Dick Covalt

The following is part #1 of a series of individual steps that can be utilized to improve the function and reliability of the newer "paw & ratchet" type Seelig 4-function AMA Gas timers. Most also apply to the older style Seelig gas power timers. Not only the "how", but the "why" is explained. Certainly not everyone will agree with the modifications, but the individual craftsman is left to decide if the described changes fit his particular need and method of building and flying competition free flight.

Deburing Cam Plates

Why: In the past die burs have been found on the bottom of the cams. These burs under the right conditions can cause a wire bale to be pushed from under the cam causing premature release with generally catastrophic consequences. If you have a "sensitive" feel you should be able to check for burs by holding a small probe (a toothpick maybe) under the edge of each cam with the timer running. If you find burs or just want to be extra sure you may want to disassemble. But even if you don't, read on, there are things you need to know.

How: Remove the 4mm nut that (see drawing below) holds the cam plates down by turning counter-clockwise. All but the bottom and largest cam are clearance fits on the 2mm x 1/2mm threaded shaft and can be lifted off. The bottom cam is threaded and must be rotated counterclockwise to remove.
Important: The threads on the bottom cam must be



there to prevent the fiber spacer beneath it from being compressed by the shaft shoulder when the stack is tightened down. If the threads are stripped or gone the fiber washer will sooner or later be compressed on the shaft shoulder and rub on the timer faceplate. This can slow up the timer and under the worst conditions can cause it to stop!

Inspect the back side of the cams for burs. If burs are found file or sand them off very carefully. The cams are nickel plated brass and are soft and relatively easy to file down.
Reassemble with the largest fiber spacer going on first then thread on very carefully the largest cam by turning clockwise.

Important: The cams have a top and bottom. If you are looking at the top side the long side of the notch in the cam should be pointed down while holding the cam with the notch at 3 o'clock. Thread the largest cam onto the shaft very carefully as it is very easily cross threaded. Thread snugly against the fiber spacer. It can be stripped by finger tightening so be careful. Install the next smaller fiber spacer then the next smaller cam, and-so-on until they are all on the shaft. Thread the nut onto shaft turning clockwise, before something is dropped and lost. How tight to make the nut is very subjective. It must not come loose due to vibration, but at the same time must not be so tight that the threads are stripped or stressed excessively. It is not a good idea to use Loctite here!

Adjusting the Cams: The smaller the cam the more difficult to adjust to the proper setting. The bottom and largest cam is used for engine shut-off, the next is typically auto-stab or bunt, the 3rd cam from the bottom is generally used for auto-rudder or bunt-release (in the case of a bunt ship using a four function timer the auto-rudder is tied as a second function to either the bunt or bunt release cam.) F1C ships typically use a 5-function timer (4 cams) for a totally separate auto-rudder or intermediate bunt release.

Important: The engine shut-off cam position on the shaft is the reference and is not moved once installed. Remember, it is threaded and if you turn it up away from the fiber spacer the threads will be stripped later if not sooner. The initial cam settings are established by running the timer until the engine shut-off just

(Scale Stuff IV, cont'd from p.1)
The AMA Scale worksheet can be found on page 133 of the AMA Competition Regulations 1999-2001. Look at each of the 7 major items that are judged before you start building and decide how much effort you are willing to expend to get as many points as you can.

If you have made a special effort to build the wing showing the indicated structure, make sure your documentation calls attention to this detail. The same is true of tail and fuselage structure.

Remember that if you provide an all inclusive 3-view, with lots of details, you will be expected to have them **all** if you hope to receive a score between 10 and 12. Personally, I am satisfied with a score between 6 to 9 for *Slight or Medium Deviation.*

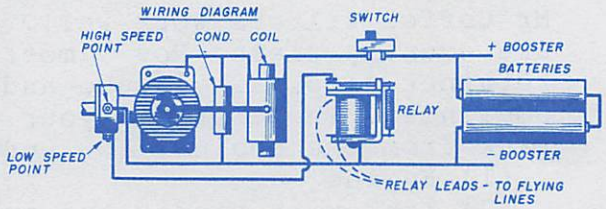
A good color photo is probably needed to receive an Excellent (16 to 19) score in *Finish, Color and Markings.* Some of my models only have a b&w photo with a written color reference. As a result, I am satisfied with a Good (12 to 15) rating.

Workmanship depends upon the skill of the builder. I know my faults, and so does the judge. Should I get 16 out of 20 (Excellent), I am elated! A Good rating (11 to 15) should not make any model builder ashamed. You are in the ballgame, and have a model you can be proud of!

As stated at the beginning of this column, ROG is not required. If you do decide to ROG and the model flies for at least 10 seconds, a bonus of 10 points is awarded. Since the maximum flight points awarded is 100, a successful ROG flight only has to fly for 90 seconds to achieve a max of 100. A model that does not ROG must therefore fly for 100 seconds to obtain a max.

It is hoped that this discussion of all the rules governing rubber-powered free-flight scale will encourage more readers, especially CIA members, to participate in the AMA Nats this year. If you look at the number of competitors entered in scale events, your chances of winning an award in national competition is better in free-flight scale than any other event!

Once more, the welcome mat is out. I'm offering help and suggestions to increase your chances of competing successfully in free-flight scale. Send all questions to: Jim Miller, 107 Loreli Drive, Fayetteville, OH 45118.



(SEEING TIMER - CONT'D ....)

adjusting the other cams relative to the engine shut-off.

It helps to know how fast your timer runs. The standard check for timer speed is to fully wind with the engine shut-down cam notch in the 12 o'clock position, then timing the run for ½ turn from 12 o'clock to 6 o'clock (engine shut-off). The time should typically be from 7 – 9 seconds with the extra weights removed from the escapement paw. If it is much different clean and lube the timer and check again. If it is still much different you may have a problem – find an expert to look it over.

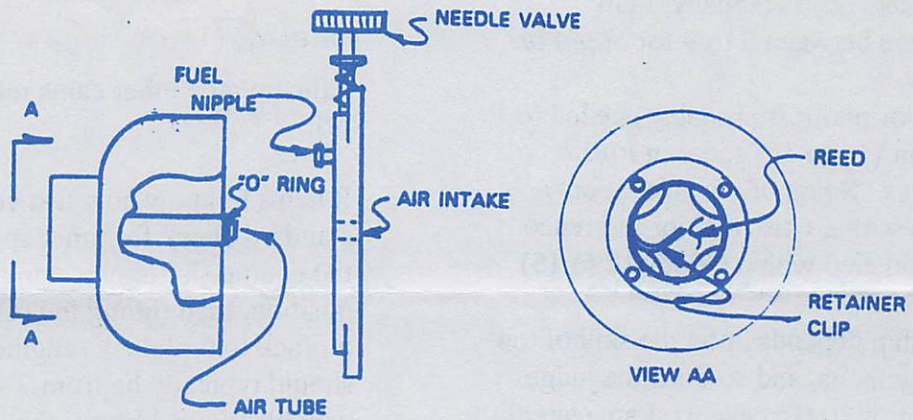
The time recorded is divided by 12 (there are 12 black/white segments between 12 & 6 o'clock) and the resulting fraction of a second per division can be used to set the bunt (zero to 1 second after engine shut-off) and bunt release (1 to 3 seconds after bunt) cams.

Future articles for the INFORMER will cover the following items:
- Installing guide post for engine shut-off wire bale
- Adding 3rd post to intermediate bearing plate and removing ratchet weights to speed up timer
- Drilling and bushing mounting holes installing, winding pin, and making winding tool
- Cleaning and lubricating, and easing timer start effort

FINE TUNING THE PEE WEE 020 ENGINE (BY DON BARTICK)

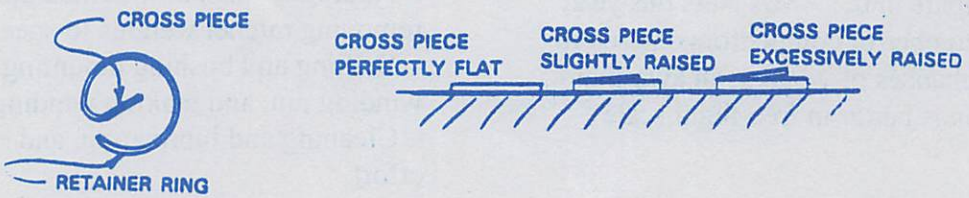
Like all good things there are a few minor drawbacks. In the case of the Pee Wee 30, the weak link is the Cox 020 reed valve engine. Nothing will upset a flyer more than an engine that won't start or run smoothly through the duration of a flight(a measly 15 seconds). If a Pee Wee 30 is to survive in the hands of a novice or rubber powered flyer, the engine must be manageable. To that end, I offer the following advice for those of you who are expecting to have your little Cox 020 spring start the first or second try. First of all that's too much to expect, but close never the less. I have found that a clean fuel system is an absolute must.Start with the fuel and filter it. Mr Coffee filters work well. Make sure your fuel syringe, pump, etc, are equally clean. Now , most important is the reed valve, reed seat, retainer clip, air intake and needle valve. Cleanliness is next to Godliness. Therefore if your engine is misbehaving, disassemble the tank from the engine. You end up with three big pieces:

(1) Engine
(2) Tank with reed valve assembly.
(3) Tank end plate with needle valve assembly, air and fuel intakes.



Quick check of reed valve is to affix a clean piece of fuel tubing to the air tube leading to the reed valve assembly. Using your mouth or empty fuel syringe, blow air into the air tube. The reed valve, if working at all, will vibrate and an audible sound will be heard. The higher the frequency of the sound, the less flexure of the reed. What sound is right is uncertain, but I understand the engine performance increases as the frequency lowers (more flexure from the reed) Life of the reed reduces also with the increased flexure-so beware. Control of the flexure is dependent on the tightness of the retainer clip across the reed. If it presses the reed against the reed seat, most likely you will get no reed flexure which creates the condition that the engine will not sustain running. Burns off prime only-very frustrating.

To Fix:
Remove retainer clip carefully watching not to damage the reed.



3 RAINBUSTERS 11/07

The following is another article dealing with the problems encountered in the progressive-max flyoff requirements of FF rubber competition. This is the reply from Tom McCoy to Hal Lorimer's article *"One Man's Opinion"* featured in the Sept/Oct '99 Informer:

"I have said with tongue-in-cheek, that 3 things happen in a rubber flyoff - all of them bad;
1) You drop the max.
2) You lose the model.
3) You die trying to retrieve the model from the highest tree in the county - 5 miles downwind!
Our rules truly require an enormous field!"

"As you probably remember, we tried to address this problem at the 1996 SAM Champs held at Pensacola, where I ran the rubber events. Spencer Field is a great model flying site; one mile square of cut grass - a great R/C venue and adequate power F/F field, but not very good for rubber flyoffs."

"We were concerned with the rubber events for two reasons. First, if we had winds over 5 miles per hour, the models would be off the field in 3 minutes! This spelled trouble - with lots of lost models. The second reason, with modelers tromping through private property downwind, we jeopardized the use of the field for modeling in the future. There have been incidences where the homeowners have called the police, and we really heard about it!"

"You will recall we used the *target flight* to solve the flyaway problem. Let me say now, I do **not** like this system and I think there has got to be a better way. I did not casually arrive at the target flight rule. First, we needed a flyoff rule that kepe the models on the field. This system did! It was necessary to have a flyoff rule that didn't require a model to be readjusted. The target flight also accomplished this. Since the '96 SAM Champs, we have modified the target flight to two or three flyoff target flights. This cuts the lick in half or in third, and seems to stop the one 'lucky flight'. It is still a fuse-cutting flyoff. To really face the problem we need a new system!"

"This is not Spencer Field or Muskogee, OK. It is about small fields. Our friends who fly Power, fly in our SAM fields. They declare it a two-minute-max contest and limit the motor run. Simple. They can make achieving a max progressively harder by limiting the motor run even more for their flyoffs. Your approach does the same thing."

"When I return from the SAM Champs, I will make up some motors and try it. As I read your letter I thought it could be possible to develop a weight-of-rubber-per-sq.-in-of-wing-area formula that would be used for all Old Timer models. Of course, it would also require a minimum weight-per-sq.-in.-of-wing area. The only real change would be that a contest would require the model be weighed. Not too much a hassle, for the benefits."

"Hal, if we could only get enough modelers to recognize that there is a problem, we could be on the way to a solution! After the 1996 SAM Champs, I caught a lot of heat about the target flight, but not one solution - or even idea - to solve the problem. I hope to see you at the Muskogee, or the Gathering Of The Turkeys and we could talk more...."

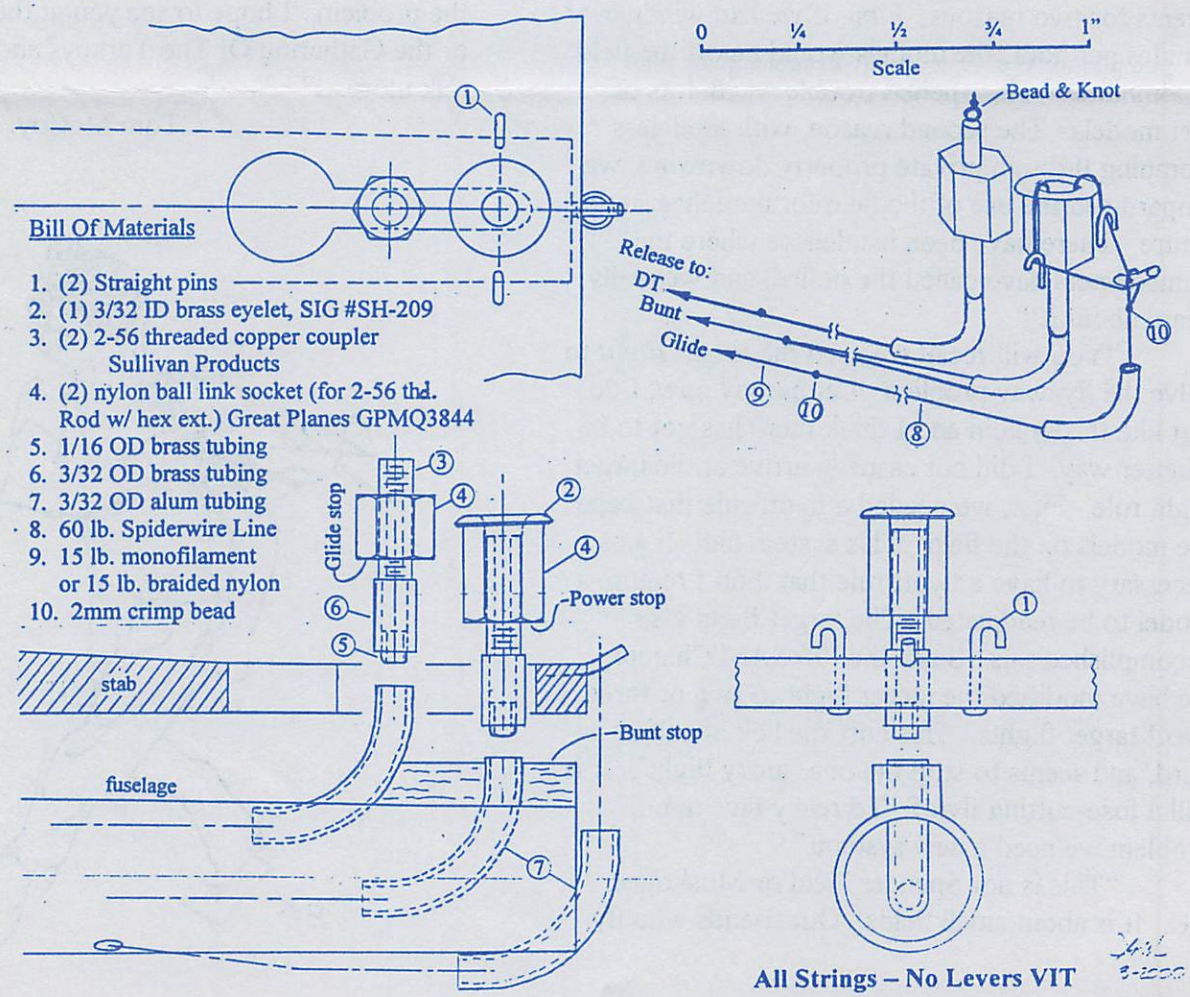
– Tom McCoy



GIL'S MULTI-FUNCTION SCHEME

Use the **All Strings – No Levers VIT** once and you will chuck your old locked-up models. It is easy to make, it is light, precise and it works great! I have used this system on four different ½A models dating back to 1990, simplifying and improving each step of the way. The drawing is pretty much self-explanatory after a little study.

Cut required lengths of hex nylon stock from parts of Item 4. The ball link socket was the only source of hex nylon I could find. Bore the end of the one Item 4 and press in Item 2. Items 3-5-6 are soldered together. The two threaded stems are identical. Anchor the Item 7 elbows securely to the fuselage with epoxy. The Spiderwire fishing line is a Kevlar product, which is very limp, and it has no stretch. It moves through the elbows very smoothly. The loop through the eyelet is a continuous piece with ends terminating at the crimp bead. The Spiderwire lines splice to stretch monofilament or braided nylon which acts like a rubber band to facilitate hook-up to the timer and to actuate the VIT. A lighter Spiderwire, down to 30 lbs., can be used, but I do like the 60 lb. I ordered mine from Bass Pro Shops (800-227-7776). The crimp beads are available from some arts and crafts stores, or you can make your own out of 1/16 OD brass tubing.



THE EFFECT OF TAN II ON RUBBER MODEL DESIGN

By Ron Pollard

There is no doubt that the advent and introduction of Tan II has transformed the flying of rubber driven models. The performance has been improved out of all recognition from any period in the past.

All classes of rubber models, including F1B, F1G (CdH), indoor, open and even vintage models, perform better than previously. Improvements in wing sections, propellers and stiffer structures have had their effect but none have had as big an effect as the quality of the present Tan II rubber.

The ability of the rubber to store energy and to release that energy to do useful work, i.e. drive a propeller to generate thrust, is fundamental and well-known to those who fly rubber models. Energy storage levels have increased from about 2500 ft lb/lb approx 50 years ago to the present levels in excess of 4000 ft lb/lb (4500 ft lb/lb has been reached).

However, it is not only the total energy release that is important but also the shape of the output characteristic which determines how the energy is released. We would all like a flat output curve, a constant output to optimise our prop design, but that is not a characteristic of rubber!

However, the flatter the curve the better and high energy and a flatter curve are the two characteristics of Tan II which make it so attractive to those flying rubber models. One of the indications of rubber quality is its stretch ratio. That is, its ability to stretch many times its own length before it breaks.

Having tested over 200 samples of rubber over the last 15 years, I have seen the stretch ratio increase steadily to its present level. To give an indication as to how this applies, it is reported that in the 1940s and early 1950s Dunlop had a stretch ratio (SR) of about 6.5, Pirelli improved this to 7.5, with the very best up to 8.0. Black FAI was typically 7.5 with the odd exceptional batch at 8.0. Chinese rubber was unstable but the best, if it held together, was 9.0 to 9.5. The introduction of Tan I in 1989 brought stability and consistency with SRs of 8.2 to 8.5 and then in 1993 Tan II with the unheard of stretch ratio of 10.5 !

It can be seen that in very simple terms, ignoring other factors, the more the rubber can be stretched (before it breaks) the more energy it will store.

This now brings me to the influence of the rubber characteristics on model design.

Tan II has transformed the performance of F1B and F1G models. Who could have predicted flights of 8 minutes with a motor run of 50 sec from 35g of rubber in F1B. As stated earlier, improvements in wing sections, prop design and stiffer structures have played a part but any attempt to use the latest trim techniques using any rubber other than Tan II would be a disaster. With say 35g of black FAI from the mid 70s to mid 80s set for a 50 sec motor run, I would predict that the model would be descending for over half the run instead of climbing.

In F1G, when the max was set at 2 minutes, normal flights were sub-max (without lift). However, now the best models have performances approaching double that figures and still from only 10g of rubber. It does need to be Tan II and with modern structures and trim techniques, however, to attain these high performances.

The effect has also been felt in vintage. The design is, of course, fixed in the past but the new rubber has meant that significant changes in power can be made. With a flatter curve, the initial burst is easier to control and with more energy in the cruise, the model will climb for longer. However, the most significant change for vintage with Tan II is the stretch ratio. With an increase in SR of approx 60% from the time a vintage model was originally designed this can be translated into smaller, shorter motors, more turns and, most importantly, less pre-tensioning turns with less problems of bunching and trim changes.

With indoor models it is enough to point to the fact that the record for durations indoors has now exceeded one hour! The rules do not allow dramatic design changes.

With open rubber models the changes in design are less obvious. This is almost certainly due to the fact that there has always been a surplus of performance and, being unrestricted, more power (rubber) and lower weight has almost always been an easy way to increase performance. Also, the limiting factor of eye-sight in timekeeping has masked steady improvements in total time in winning performances.

Nevertheless, a 10 minute flight is no longer a guarantee of first place as times for flyoffs have increased towards 15 minutes with a number of models capable of achieving it in the same flyoff.

However, there are some improvements in open rubber design which can make use of the characteristics of Tan II. With approx half of the total all up weight of the model in rubber, this is the dominating factor in the CG position of the complete model. Also with the motor weight distributed over a large portion of the model length, this guarantees a long nose length with its problems of moments of inertia. The stretch ratio and energy in the cruise allows the motor length to be reduced but the motor run to be increased! If the prop and the power are matched and the balance of the parts of design are correct, it is possible to reduce the weight of the rubber, reduce its length, use more turns, increase the motor run and still climb all the way to the end of the run.

This is the concept of the open rubber design shown. The previous model of similar design with a non-composite wing and tail climbed less well than the 1998 model. All the evidence seems to point to the fact that stiffer structures lead to increased performance. The use of cartridge paper for the D-box is motivated by ease and speed of construction and low cost. A large sheet of cartridge paper of 130 g/m will cost less than £1 from an art materials shop and can be cut and folded to size and shape without the chores of making D-boxes with Kevlar or carbon and resin. Dope will stiffen the D-box further, but does increase the weight and this is the reason mylar was used on the original.

This is no 15 minute design. However, I thank that the design concept with a stiffer wing structure, slim fuselage, shorter nose, longer moment arm and smaller tailplane is the way forward to increased performance of open rubber models. All by courtesy of Tan II.

Central Indiana Aeromodellers

AMA Field
Muncie Ind.

21st Annual

AMA
Sanctioned
Sam-Nffs

OLD TIMER
NOSTALGIA GAS
CLASSIC POWER

Regional Free Flight Champs

June 3rd & 4th 2000

Sat June 3rd (9 - 5) EST

I/4 A Nos. Gas
B Nos Gas
A/B Fuselage OT Gas
Early I/2 A Nos gas
Nos Gas Ignition
OT Gas (Glow) Pylon/Fuselage.
Small OT Rubber Stick
Classic Power .IIcu.in. or more.
Jimmie Allan Rubber
Large OT Rubber Fuselage
C NOS gas

Sun June 4 th (8 - 4) EST

I/2 A Nos Gas
Commercial Rubber
A/B Pylon OT Gas
C Pylon/Fuse OT Gas
A Nos Gas
Small OT Rubber Fuselage
Large OT Rubber Stick
.020 Replica
Classic Power .IOcu.in. or less
OT HLG

National Cup competition for Nostalgia Gas classes

(AWARDS) thru 3rd place in all events
(ENTRY FEE) $10 first event $15 Lets you fly everything. JR/SR FREE
(OLD TIMER] Sam rules except approved ignition engins only. No converts. Glow. or diesels)
(NOSTALGIA GAS) NFFS Rules. 9 sec. engine runs. Flyoffs are 6,6,6,6 etc.
(OLD TIMER GLOW) Any old timer model with any nostalgia legal engine (NOSTALGIA RULES WILL APPLY] EXCEPTIONS NO WEIGHT RULE and NO SCALING ALLOWED
[CLASSIC POWER] C.I.A. 1999 RULES

CD: Gib Robbins 1507 Patterson St Anderson Ind. 46012 (765) 644 2046
Alternate CD: Merideth Chamberlain 5810 S. Madison Av. (765) 643 1885

Millennium 2000

Dayton Sector Skirmish

Sponsored by

McCook Field Squadron F.A.C.

Events

1. F.A.C. Scale
2. Peanut Scale
3. Embryo Endurance
4. Watson Unlimited Challenge
5. Electric O.T.
6. Power Scale
7. Jimmie Allen
8. Dime Scale
9. No-Cal
10. O.T. Rubber
11. Catapult Glider
12. W. W. I Dogfight
13. W.W. II Combat
14. ***And introducing Electric No-Cal ***



Located at Wright Field (Wright-Patterson A.F.B.)
Dayton Ohio
June 17, 2000

Entry Fee $10.00 for one or all events. Juniors free. A.M.A. license required. Contestants please register with the C.D. by 1 June so you can gain admittance to the field.



C.D. Frank Scott
6633 LeFevre Rd
Casstown Ohio
45312

Mr. Richard Meixell
5467 Coleraine Dr.
Dayton, OH 45424

The INFORMER

2348S, 700W
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IN
46163

2000 President
Phil Sullivan

Vice President
Moe Whittemore

Sec'y/Treasurer
Meredith Chamberlain

Issue No. 2 - 00

2000 C.I.A. AREA FREEFLIGHT CONTEST CALENDAR

JAN	15,16	FF – SOUTHWEST REGIONALS	ELOY, AZ
JAN	29	C.I.A. ANNUAL BANQUET	HAGERSTOWN, IN
MAR	11	COFFC ANNUAL BANQUET	COLUMBUS, OHIO
APR	7,8,9	R/C EXPO (COLLECTO SAT)	TOLEDO, OH
MAY	6,7	FF AMS ANNUAL FF CONTEST (Featurng (3) America's Cup & (7) National Cup Events)	AMA FLYING SITE - MUNCIE, IN
MAY	14	MOTHER'S DAY	
MAY	29	MEMORIAL DAY	
MAY 31-JUN 4		**USIC/AMA INDOOR NATIONALS**	**JOHNSON CITY, TN**
JUN	3,4	CIA OT / NOS / CLASSIC GAS FF MEET (Featurng all National Cup Nostalgia Events)	AMA FLYING SITE - MUNCIE, IN
JUN	**9-11**	**AMA GRAND EVENT**	**AMA FLYING SITE - MUNCIE, IN**
JUN	17,18	M.A.M. OT FF MEET/RC ASSIST, Slag & Nos.	STURGIS, MI
JUN	25	AERONUTS FUN FLY	BONG, WI
JUN	24,25	INTER CITY FAI/NOS/AMA	AMA FLYING SITE - MUNCIE, IN
JUL	9	IMAC ANNUAL	BONG, WI
JUL	16	AERONUTS OLDTIMER	BONG, WI
JUL	23	PELICAN OLD TIMER	BONG, WI
JUL 30-AUG 3		**NFFS/AMA FREE FLIGHT NATIONALS**	**MUNCIE, IN**
AUG	6	BONG EAGLES ANNUAL FF MEET	BONG, WI
AUG	12,13	NOFFA FREE FLIGHT CONTEST	AMA FLYING SITE - MUNCIE, IN
AUG	13	J. NOONAN MEMORIAL - SILENT FF	BONG, WI
AUG	18-20	ANNUAL DOG SHOW	AMA FLYING SITE – MUNCIE, IN
AUG	18-20	EMPIRE STATE FREE FLIGHT CHAMPS	GENESSO, NY
AUG	26,27	AERONUTS MIDWESTERN STATES CHAMPS	AMA FLYING SITE - MUNCIE, IN
AUG	26,27	40th Annual Chicago Aeronuts FAI Invitational	AMA FLYING SITE - MUNCIE, IN
SEP	2,3	COFFC FREE FLIGHT MEET	AMA FLYING SITE - MUNCIE, IN
SEP	4	LABOR DAY	
SEP	16,17	C.I.A. 28th Annual AAA FF CONTEST	AMA FLYING SITE - MUNCIE, IN
SEP	16,17	HOOSIER CUP (America's Cup FF Competition)	AMA FLYING SITE - MUNCIE, IN
OCT	**6-13**	**SAM CHAMPS**	**PENSCOLA, FL**
OCT	14,15	CIA FALL SCRAMBLE (Featurng all National Cup Events)	AMA FLYING SITE - MUNCIE, IN
DEC	29-31	47TH KING ORANGE INTERNATIONAL	PALM BAY, FL