CENTRAL INDIANA AEROMODELLERS

INFORMER

FREE FLIGHT NEWS OF THE MIDWEST

** The Weather **
The East Wind
brings aches and pains!

- Editor -
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Prop Efficiency; and How To Measure It!
(...at least when applied to the Indoor case...)

The following article is a result of some prop testing recently done by Indoor Agent **Jim Clem.** (Jim's always on the lookout for "performance enhancements" for his Indoor stuff!) And he's always had the feeling that our Indoor props were closer to 50% efficient than the 70%-80% usually claimed. His data seems to confirm his gut feelings. (In my rubber model duration programs, I've found that any improvement in prop efficiency translates *directly* to improved durations – provided the rubber is re-scaled to take advantage of the gain – *ed.*)

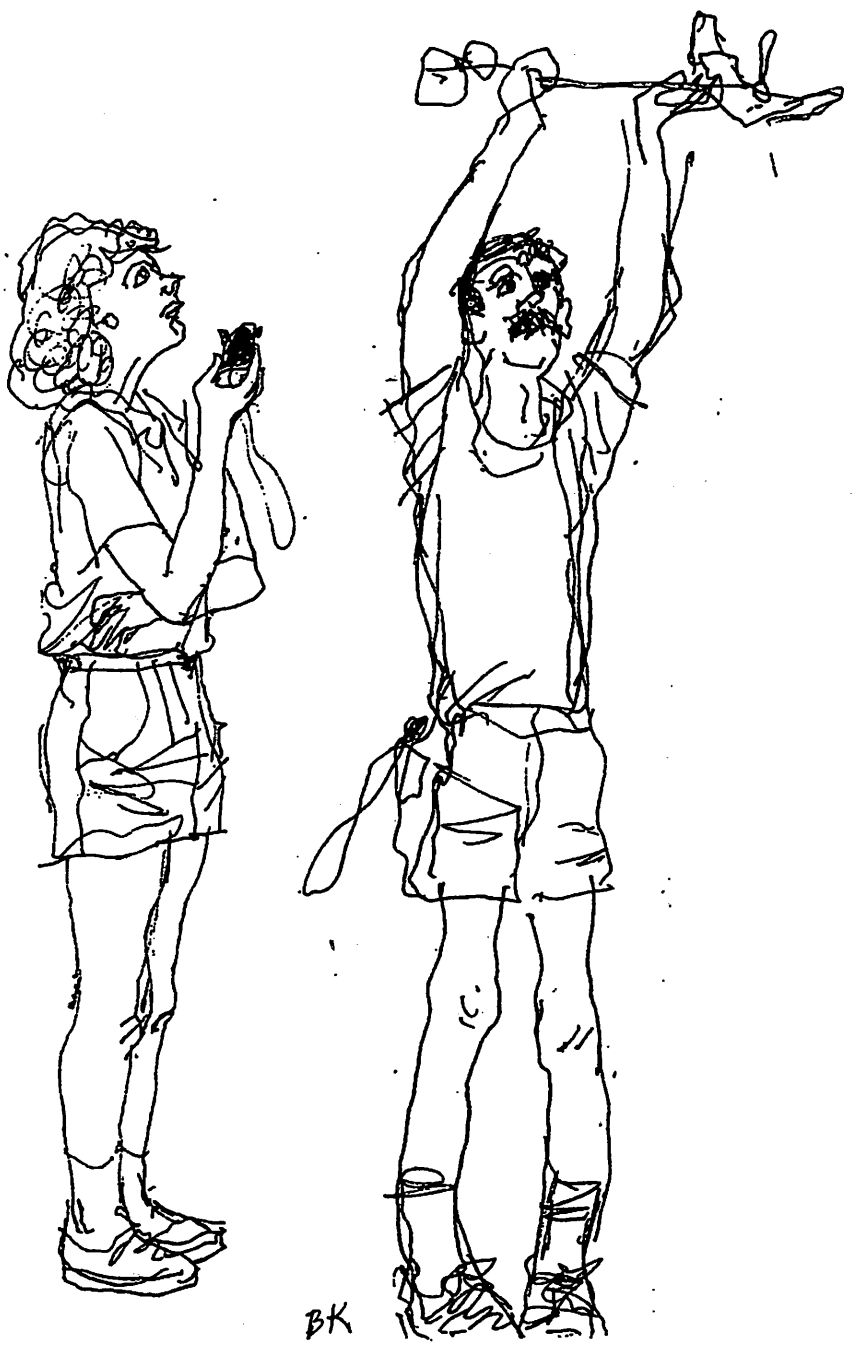
To measure this efficiency, Jim used the technique outlined by Hewitt Phillips and originally presented in the September 1965 issue of *Indoor News And Views* – another "oldie but goodie" that I couldn't resist passing along to our readership.

The technique lends itself especially to the Indoor prop case, because the prop rates and flying velocities involved are readily observed and easily logged. But maybe some of our Power & Outdoor Rubber flyers can figure a way to measure your higher-velocity parameters necessary for Hewitt's efficiency equations - and thus give more insight as to ways to improve your 'front ends'. Anyway, let the Derivations begin!

First, a brief physics review:

Hewitt sez: "Most Indoor modelers will agree that propeller efficiency is important. In fact, many hours are spent discussing the merits of a particular diameter, pitch, airfoil, planform, etc. Yet how many of these builders can show quantitative data to back up their arguments? Actually, measurement of the efficiency of an indoor model prop can be done quite easily and with very simple equipment."

(cont'd. p.4)



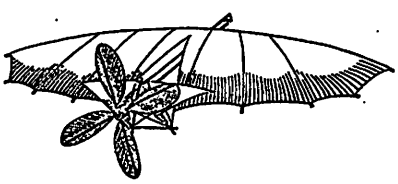
I got a 'contest' notice the other day. Seems that there'll be another flying session August 3 & 4th at West Baden – courtesy of the *Historic Landmarks Foundation of Indiana*! But there weren't any particulars about the schedule of events, other than "Scale on Saturday, Duration on Sunday", and some daily open & close times, so I called **Walt VanGorder** to get some details.

So far as the Duration events go, Walt's got them set up as an AMA sanctioned Record Trials – fly anything in the AMA book. A further breakdown of duration events and their schedule is still forthcoming (glider first up?, heavy vs. light separation?, etc...). Awards will probably be in the form of certificates.

But the bottom line with the promoters seems to be the Scale events (*"Give us color"*, sez HLFI's Andrea Hill!) They remember the majestic Coconut scale monster flown by Dave Aronstein last year that got the "ooohs & aaahs" from the spectators. Apparently they want more of this kind of thing! It's difficult to make 'em understand that only 4 or 5 of these huge models are flown even at the NATS!

The Scale events seem to be FAC influenced, being grouped into WWI, Golden Age, WWII and Modern categories. From what Walt & I have been able to figure from perusing the notice, all scale events are *mass launches*. (Midwest's **Tom Sanders** is the contact man for the Scale events.)

I've included a condensation of the contest notice on a later page of this issue for our readers who wish to participate in the soiree (too bad it conflicts with this year's Canadian NATS, which is offering Indoor events for the 1st time in a blue moon). To check on event scheduling updates, please contact Walt VanGorder on (513) 922-3351.

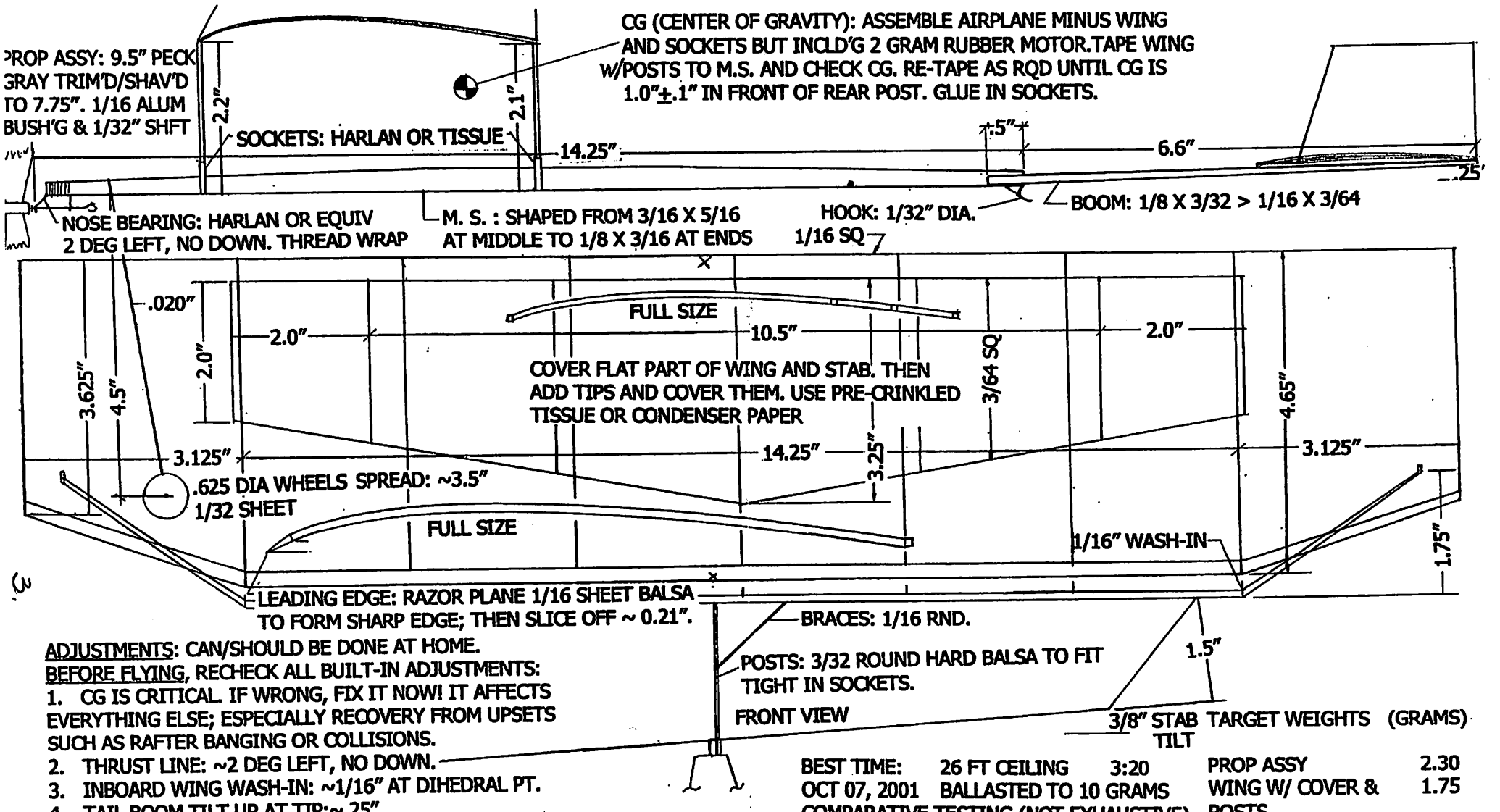


The Indoor modeling community suffered a huge loss with the recent death of **Richard Doig**. Rich was only 46! He was a super flier, specializing in the very light classes – most notably F1D. When not flying, he was generally CD'ing national and regional Indoor events with his wife, Melody. Rich will be sorely missed.....



New Faces! Let's extend a big, chunky handshake for 2 new Agents: **Albert Pardue** of Vestavia Hills, AL and **John Campbell** from Hamilton, OH. Welcome aboard!

The model on the facing page was lifted from the 3-4/02 *El Torbellino* (San Diego Orbiteers n'letter, Howard Haupt, ed.) Seems that Cezar Banks was able to improve his indoor times by sharpening-up his wing leading edges! I thought that the technique would be of interest to all classes of fliers. (I've found that doing the same on my outdoor stuff has helped quite a bit. Makes for a natural, 'self-turbulating' setup – at least at outdoor NRs:...)



ADJUSTMENTS: CAN/SHOULD BE DONE AT HOME.
BEFORE FLYING, RECHECK ALL BUILT-IN ADJUSTMENTS:

1. CG IS CRITICAL. IF WRONG, FIX IT NOW! IT AFFECTS EVERYTHING ELSE; ESPECIALLY RECOVERY FROM UPSETS SUCH AS RAFTER BANGING OR COLLISIONS.
2. THRUST LINE: ~2 DEG LEFT, NO DOWN.
3. INBOARD WING WASH-IN: ~1/16" AT DIHEDRAL PT.
4. TAIL BOOM TILT UP AT TIP:~.25"
5. TAIL TILT: IN-BOARD SIDE ~ 3/8" HIGHER

TRIMMING/FLYING

USING A WINDER, PUT IN ABOUT 600 TURNS AND BACK OFF 200. HAND LAUNCH AT SHOULDER HEIGHT AND OBSERVE. YOUR GOAL IS A SMOOTH, SLOW "CRUISE" FLIGHT SPEED AND A LEFT CIRCLE OF ABOUT 25 FEET DIA. TWEAK (COERCE) BOOM UP OR DOWN AS NEEDED TO ACHIEVE SLOWEST SPEED W/O "MUSHING". FINE TUNE BY ADJUSTING POSTS IN SOCKET. CRUISE CIRCLE SIZE CAN USUALLY BE ADJUSTED BY TWEAKING THE BOOM SIDEWAYS AND/OR CHANGING STAB TILT. IF THAT DOESN'T DO IT, LEFT THRUST AND/OR WING WASH-IN MAY ALSO NEED TO BE CHANGED. FINALLY, DON'T PROCEED TO FULL OR NEAR FULL WINDS FLYING UNTIL "CRUISE" TRIMMING IS RIGHT.

BEST TIME: 26 FT CEILING 3:20
OCT 07, 2001 BALLASTED TO 10 GRAMS
COMPARATIVE TESTING (NOT EXHAUSTIVE) SEEMS TO GIVE THIS WING A 10-15 SECOND ADVANTAGE OVER STD SQUARE/RECT'GULAR LEADING EDGE WINGS. WING CONFIG ALSO RETRO-FITTED ONTO OTHER S.O. DESIGNS WITH SIMILAR IMPROVED RESULTS.

TARGET WEIGHTS (GRAMS)

PROP ASSY	2.30
WING W/ COVER & POSTS	1.75
FUSE/BOOM/TAIL/L.G.	3.95
TOTAL: 2002 "C"RULES	8.00

FOR "B" RULES: REMOVE L.G. ADD BALLAST AND/OR BUILD HEAVIER TO WEIGH 10.0 GMS

"Leading Edge"

SO by Cezar Banks

SCALE 1" = 2"

(Prop Efficiency..... cont'd from p.1)

"First, let's state what is meant by efficiency. The purpose of a prop is to convert power supplied in the form of the torque of a rubber band turning a shaft to useful power in the form of a thrust pulling the model through the air at a given velocity. The efficiency is simply a measure of how well the prop does this job. That is, the ratio of the thrust power produced to the torque supplied."

"A review of the basic concepts of work and power is desirable in order to understand the procedure of measuring propeller efficiency. Work is simply Force times Distance. *The Distance, however, must be measured in the direction of the Force.* A few simple examples will make this clear. First, consider a man pushing against a wall (see Fig.1). He may get tired, but he does no work because the force he exerts does not move through any distance. Next, consider a boat towing a water skier (Fig.2). The towrope does Work on the skier equal to the Force times the Distance traveled, and the boat has to continuously use fuel because work is being done."

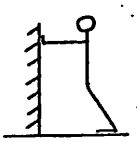


Fig 1.

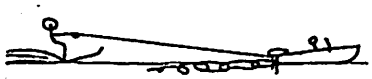


Fig 2.

"Finally, consider a wagon rolling down an inclined plane (see Fig.3). The Force of gravity does Work on the wagon equal to the Weight of the wagon multiplied by the change in its' height. This vertical distance, rather than the distance along the incline is used because the Distance has to be measured in the direction of the Force. This same principle will be used later in connection with a glide test of the model."

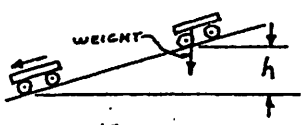


Fig 3.

"Next, consider the concept of power. Power is the rate of doing Work. It's obvious that a more powerful motor must be used to pull the skier at a higher speed. This is because the Work done in travelling a given Distance is happening in a shorter Time (the rate of doing Work is higher)."

"A few words about units will conclude this physics lesson. Then we can continue with the subject of measuring prop efficiency. If the Distance is measured in feet and Force in pounds, the Work is then expressed in foot-pounds. For Indoor models, however, we will find it more convenient to measure Distance in inches and Force in ounces. Work will then be expressed in inch-ounces. If the water skier mentioned previously is pulled 55ft in 1 second with a Force of 10lbs, then the Power required is 550 foot-pounds per second. Note that we can also get this answer by multiplying the Force (10lb) by the Velocity (55ft/sec). Thus Power is Force times Velocity. It happens that 550 ft-lb/sec is exactly 1 horsepower, by definition. Here again, either horsepower or ft-lb/sec are rather large units for indoor model calculations, so we'll measure Power in inch-ounces/sec."

And now, the Power to turn the prop.....

"We must now find methods to measure the Power required to pull the model through the air (the Thrust Power) and the Power to turn the propeller. The ratio of these two quantities is the prop efficiency.".

"Consider first the Power required to turn the prop. Our examples so far have consider-ed power generated by a force pulling in a straight line. In the case of the prop, however, the power is generated by twisted rubber strip turning a shaft. To measure the twisting tendency of the rubber motor, we use the quantity "propeller torque". Prop Torque may be measured by measuring the Force exerted at a known Radius (Distance) from the hub (see Fig.4). The Torque is the Force multiplied by the

Radius. It doesn't matter what Radius we choose. (If we put a gauge twice as far from the hub, the force will be half as great, etc., so the torque remains the same.)"

"Now consider the the Work done done by this prop Torque – *as the prop turns through one revolution.* Remembering that we must measure Distance in the direction of the Force (see fig.5), the Distance through which the Force moves is $2\pi R$, where R is the radius at which the Force is measured. The Work done in one revolution is therefore $2\pi FR$. But the Torque, Q, is FR – therefore the Work is $2\pi Q$."

"If the prop turns at the rate of N rev/sec, the Work $2\pi Q$ is done N times/second. Therefore, *the rate of doing work (Power) is* $2\pi NQ$ – one of the quantities needed in determining the prop efficiency."

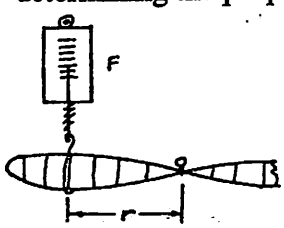


Fig. 4

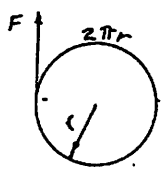


Fig 5

Now for the Thrust Power.....

"The other quantity needed to determine prop efficiency is the thrust power, which is equal to the prop thrust times the airspeed. The prop thrust, however, is a very difficult quantity to measure in flight. Some other approach to measure the thrust power must therefore be used. This problem my be solved by noting *that the power required to fly the model in level flight is exactly the same as the power required to cause it to glide* – assuming that the adjustment of the model remains the same. The only difference is that in a glide, the Power required to fly the model come from gravity rather than from the motor. We have already seen that the Work done by gravity on the wagon rolling down the incline is the Weight multiplied by the change in Height. In exactly the same way, the Work done by gravity on the gliding model is the model Weight times the change in altitude, and the Power is the Weight times the rate of change of altitude – in other words, by the model's sinking speed. The *Thrust Power in level flight may therefore be written* WV_S, where W is the weight and V_S is the sinking speed.

Putting the symbols together.....

Finally, summarizing the formulae developed, the prop efficiency (E) is:

$$E = WV_S/2\pi NQ$$

Now, the practical stuff – getting numbers:

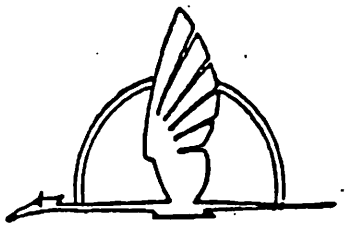
The experimental procedure for measuring prop efficiency is now described as follows. It is assumed that we have a properly adjusted Indoor model.

1. Weigh the model – complete with rubber motor.
2. Remove the prop, but keep the rubber on the model – hooking it over the front thrust bearing.
3. Replace the prop with an equivalent weight of clay.
4. Glide test the model from a convenient (but measured) altitude, and record the time required for the model to reach the floor. *(The height divided by the time yields the sinking speed,* V_S*.)*
5. Now replace the prop and wind the motor. Allow the model to fly without letting it getting out of reach – ***until it just flies level.***
6. Now measure the revolutions per second made by the prop (the term *N*).
7. Next, catch the model and measure the prop torque (the term *Q*). (A hand-held torquemeter is handiest for this job, but a fixed unit will also suffice – with a bit more effort....)

   We now have all the necessary data to determine propeller efficiency!

And now, using ***Jim Clem's numbers*** *gathered from his Mini-Stick model*....(Jim's prop is the one used on Rob Romasch's 15:06 AMA Cat IV record effort.)

(cont'd, overleaf...)



- **Wt.** Of model + rubber motor = 0.768g **(0.027oz).**
- **Vs** = sink speed = **9.68in/sec.**
- **N** = prop rate in level flight = **3.875r/sec.** *(This parameter was measured counting prop position frame-by-frame, using a video camera! Frame rate = 30/sec.)*
- **Q** = torque for level flight = **0.026in-oz.**
- **Thrust Power** = 0.027oz*9.86in/sec = **0.266in-oz/sec.**
- **Motor power** = 2*π*3.875*0.026 = **0.633in-oz/sec.**

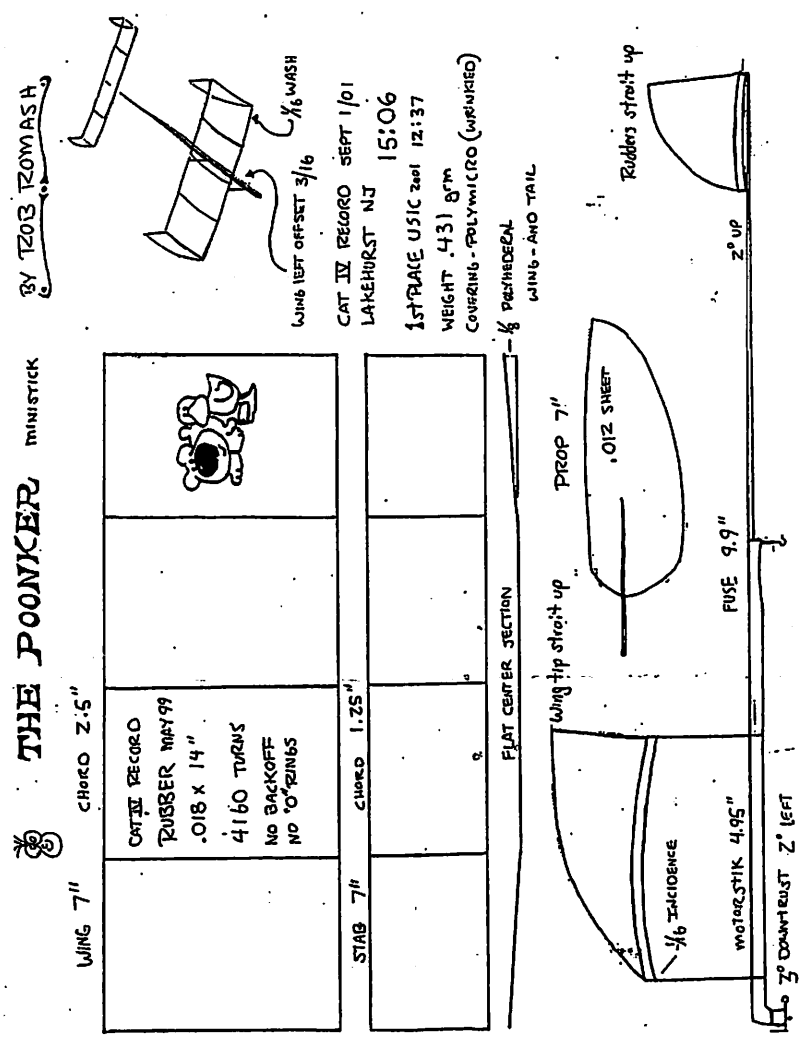
Finally.....

Prop Efficiency = 0.266/0.633 = **0.420** (*42%!!*) – *Just as Jim suspected!*

Always the experimenter, Jim's been revisiting the Gurney flap – having seen some results of their use on indoor models in #3/99 issue of the Informer. In addition, he's trying out one-bladed props and turbulators on his indoor models, but the results to date are inconclusive concerning solid improvements in duration. Since turbulator calc's require a measure of flying/gliding velocities, Jim was surprised to find that his Mini-Stick glide velocity was 3.35 ft/sec, but the velocity required for level flight was 3.94ft/sec – an 18% increase! *(He measured the flight velocity by flying the model "round the pole" using a 4ft long, 0.002"dia thread, and timing it like a speed model.)*

Need to visualize airflow over surfaces? Jim suggests the **Fog Machine.** When on sale it sells for $39.95 at Eckerd's Drugs. It's non-toxic and fill the room in a couple of minutes!

Jim sez.... **"Old Model Builders never die. They just turn scientific"!**



ROB ROMASH'S RECORD SETTING MINISTICK, "THE POONKER"

"FROM THE 2/02 "BRAINBUSTER" N'LETTER. ED- ABE VANDOVER....

Here's Rob's AMA record setting ministick. It's not shown full size as we do not want to appear as stealing his design. It was shown on the internet, so I guess it's fair game. We'll have the full size plans at the next meeting with wood sizes from other ministick designs. You should read Rob's notes as they reveal a lot about the model and it's capabilities. Be sure to use wrinkled Polymicro as it should help hold down the warps and lighten the load. How about those 4,160 turns on .018 rubber.

If you go to Johnson City for the Indoor Nationals, check with Rob. He'll be running F1D. I know I'll be picking his brain, I'm getting tired of you guys kicking my butt in ministick.

Ballot: Top FF Modelers and Model Designs

Top Free Flight Modeler Nominees

(Vote for only five by making a check (√) on the blank in front of the names of your choice.

___Merrick "Pete" Andrews
___Alex Andruikov
___Randy Archer
___Cezar Banks
___Bob Bienenstein
___Joe Bilgri
___John Blair
___Alan Brockelhurst
___Jim Cahill
___Al Casano
___Charles Caton
___Jim Clem
___Bob DeShields
___Frank Ehling
___Joe Elgin
___Walter Ehrbach
___Lou Garami
___Carl Goldberg
___Kenneth Grubbs
___Bob Hatschek
___Frank Heeb
___Bob Hunter
___Ed Konefes
___Dick Korda
___Thomas Koster
___Tom Hutchinson
___Chet Lanzo
___Keith Laumer
___Ed Lidgard
___Gil Morris
___Jim Noonan
___Jim O'Reilly
___George Perryman
___Hewitt Phillips
___Jim Richmond
___Jerry Ritz
___Bud Romak
___Bucky Servaites
___Ron Sharpton
___Bob Sifleet
___Wally Simmers
___Hank Sperzel
___Earl Stahl
___Ron St. Jean
___Hank Struck
___Sal Taibi
___Walt Van Gorder
___Eugene Verbitsky
___Bob White
___Lou Young
___Frank Zaic
___(write-in_____
_____

Top Free Flight Design Nominees

Vote for only five by making a check (√) on the blank in front of the designs of your choice.

___Aiglet A-1
___AMA Cub/Delta Dart
___Bandit
___Brooklyn Dodger
___Buzzard Bombshell
___Chenault's Pearl Bird Series
___Comet Clipper
___Comet Intercepter
___Coot IHLG
___Da Box
___Dakota
___DeShaye's Bipe Ornithopters
___Dove A-2
___ Ehrhardt's Wake
___Excaliber F1C
___Geef
___Gieskieng Flappers
___Gollywock
___Hervat HLG
___Jabberwock
___Korda Wakefield
___Kukon's Pennybipes
___Lamb Climber
___Lanzo Bomber
___Lanzo Puss Moth
___Lanzo Stick
___Lucifer A-2
___Maverick 1/2A
___Miss World's Fair
___New Ruler
___Playboy Sr.
___Perryman Speckled
___Ramrod
___Richmond's F1Ds
___Ritz Continental A-2
___Sailplane
___Satellite
___Schroedter's WakeUp
___Sniffer
___Sparky
___Square Eagle P-30
___Spacer
___Stahl's Rearwin Speedster
___Starduster Series
___Stratostreak
___Summerwind F1C
___Sweepette HLG
___Tadpole A-1
___T-Bird
___Tempest 370
___Thermic 50
___Upstart IHLG
___Viking
___White's Twin Fin
___White Wakefields
___Witch Doctor X
___Ultimate Dragmaster
___Van Gorder's Manhattan Pieces
___Zipper
___(write-in)_____
_____

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(1) Photocopy this page.

(2) Sign Your Name Below

_____

(3) Print Your Name Below

_____

Note: Only one ballot permitted per person.

(4) Send the completed ballot to:
Bob Stalick, NFFS Top 10 Survey
5066 NW Picadilly Circle
Albany, OR 97321
USA

Deadline for receiving ballots: September 1, 2002.

Newsletter editors: Copy and print this document and run it in your publications. Please provide information to your readers about the purpose of this survey.

Note: Only one ballot permitted per person.

HISTORIC LANDMARKS FOUNDATION OF INDIANA

Fly Me to the Moon, August 3 and 4

West Baden Springs National Historic Landmark

Historic Landmarks Foundation of Indiana is delighted that the Academy of Model Aeronautics commits to provide an indoor model airplane competition at West Baden Springs on **Saturday and Sunday, August 3 and 4, 2002**. The competition is for scale model and endurance model airplane flyers. Indoor electronic radio-controlled planes are not permitted.

If you are a scale model participant, the mass launch events are Saturday, August 3 from 11 a.m. to 3 p.m. with trim flying from 8 a.m. to 11 a.m. The four categories of scale airplanes are WWI, Golden Age, WWII and Modern.

If you are an endurance model airplane participant, the competition is Sunday, August 4, from 8 a.m. to 5 p.m. You will also be able to practice flying from 3 p.m. to 6 p.m. Saturday, August 3. All endurance classes are invited to participate in the competition.

A minimum of 10 participants is required to guarantee the competitions occur at West Baden Springs. If the minimum number of participants is not met by July 17, 2002, Historic Landmarks Foundation reserves the right to cancel the weekend.

There is no registration fee for participant. Spouses of the flyers receive complimentary admission on Saturday and Sunday as well. The $10 tour fee will be required if anyone is interested in taking a tour of the landmark. You will receive an identification badge upon check-in. You are welcome to come from noon to 5 p.m. on Friday, August 2, to set up your area. However, you fly at your own risk since the air-conditioning will not be turned off at this time.

West Baden Springs will open at 8 a.m. August 3 and 4 for participants to begin flying. The air conditioning will be turned off at this time and will not be turned back on until 6 p.m. on Saturday and 5 p.m. on Sunday. Flyers will not be admitted before 8 a.m. each day, and you must not launch after 5:30 p.m. on Saturday and 4:30 p.m. on Sunday. We mandate this rule to ensure we clear the building by the designated closing time.

Plastic will be used to deter model airplanes from flying into the center disk, but the rafters will not be covered. Historic Landmarks is <u>not</u> responsible for retrieving any airplanes that get stuck in the rafters.

Participants are responsible for their own travel expenses including overnight accommodations. Motels under $50 a night include Lanes Motel, French Lick, (812-936-9919) and Midwest Inn, Paoli, (812-723-4555.) The E.B. Rhodes Bed and Breakfast, West Baden springs, has rooms from $50-$75 a night (812-936-7378.) The French Lick Springs Resort, which offers golf, horseback riding, tennis and spa treatments is located just one mile south of West Baden Springs. A special Friday and Saturday rate of $89 a night offered to participants (800-457-4042.) To receive the special rate please call the French Lick Springs Resort and tell them you are with the Model Airplane event at West Baden Springs.

Please contact Andrea Hill if you have any questions or concerns at 317-639-4534 or 800-450-4534. **You must sign, date and return a copy of this form to Historic Landmarks Foundation, 340 West Michigan Street, Indianapolis, IN 46202, by July 17, 2002.**

Please check the category of model airplane flying you plan to participate in:

Scale Model mass launch events _____

Endurance model competition _____

Both competitions _____

NAME:_____ **DATE:**_____

2002 Canadian Free Flight Nationals
August 10 & 11, 2002
Base Borden

Open Events:

Open Power
Open Rubber
Open Glider
Combined Hand-Launch/Catapult Glider
P-30

SAM Events:

Small Stick Rubber
Small Cabin Rubber
Large Stick Rubber
Large Cabin Rubber
.020 Replica

Nostalgia Gas Events:

1/2A Nostalgia
ABC Nostalgia

FAI Events:

F1A
F1B
F1C
F1G
F1H
F1J

Schedule:

F1A, B &C - 7 1-hour rounds
Saturday 5 p.m., 6 p.m. and 7 p.m.
Sunday 8 a.m., 9 a.m., 10 a.m. and 11 a.m.
Rounds 7 and 8 maxes may be extended depending on weather.

F1G, H & J - 5 1-hour rounds
Saturday 10 a.m. start.

All other events may be flown on either day, **Saturday from 8 a.m. to 7 p.m.** and **Sunday 8 a.m. to 1 p.m.**

For competitors new to Base Borden, **maps and field entry instructions** are available from Jerry McGlashan.

Contest Directors:

Cameron Ackerley
212 Water St.
Guelph, ON N1G 1B2
E-mail: sandcamsam@sympatico.ca

Jerry McGlashan
R. R. 2, 6 Harvest Dr.
Niagara-on-the-Lake, ON L0S 1J0
E-mail: rgmcg@cogeco.ca
Tel: 905-468-1829

2002 Outdoor Free Flight Nationals
NFFS United States Outdoor Championships

August 5 – 9, 2002 (8:00 a.m. – 4:30 p.m. daily)

FINAL SCHEDULE

AMA EVENTS IN THE FIRST THREE ROWS

Mon Aug 5	Tue Aug 6	Wed Aug 7	Thurs Aug 8	Fri Aug 9
B-Gas (O) Payload (J)(SO) AB-Classic Gas	D-Gas (O)	C-Gas (O) Cargo CD-Classic Gas	A-Gas (O) ABCD-Gas (JS) Gas Scale	1/2A-Gas (J)(S)(O) 1/2A-Classic Gas
Moffett Electric B	Mulvihill (J)(S)(O) Electric A	HH Cat Gldr (J)(S)(O)	Dawn Unlimited OHLG (J)(S)(O) CO2 Unlimited	P-30 (J)(S)(O) Rubber Scale Peanut Scale
F1A (J)(SO)	F1C F1H (J)(SO)	F1B	F1G (J)(SO) F1J (J)(S)(O)	USA F1K CO2
	NFFS /OT/Special	**Events**	**Below**	
C Nos Gas	B Nos Gas Ignition Nos Gas (small and large combined)	A Nos Gas Early 1/2A Nos Gas Nostalgia Rubber (non-Wakefield)	1/2A Nos Gas	1/4A Nos Gas Nostalgia Wakefield
020 Replica HH Cat OT HLG	OT OHLG	OT A-B-C Cabin Gas	OT A-B-C Pylon Gas OT Rubber Cabin (large and small)	OT Rubber Stick (large and small)
Super D (1000 sq in wing minimum, engines .60 - .67)	Jetex	Jimmy Allen Event	1/2A T-Bird	Pee Wee 30 A-1 event (Li'l Dip, Jetstream, Ghost)
		NFFS Banquet Muncie Convention Center. 7 p.m. cocktails, 7:45 p.m. dinner. Junior-Senior Night Fly 7 p.m.	Texas Timers/NFFS Cookout 5:30 p.m. AMA Field HQ	

Notes: Super D will be flown as a single event using AMA Cat II rules engine runs for fixed-surface models and AMA Cat III rules engine runs for VIT models. All flyoff maxes in Super-D will follow AMA Cat III rules. New events for 2002 are catapult launched OT HLG, Nostalgia Rubber (non-Wakefield), Nostalgia Wakefield, 1/2A Classic Gas, AB Classic Gas, CD Classic Gas and F1K. The OT rubber events (Stick and Cabin) were opened to all sizes. Dakota and Korda '39 Wake have been removed as individual events; Korda '39 Wake models, however, qualify for the OT Rubber Cabin event.





"Hey, man - more flyin' munchies comin'!"

.....This is what you get when I run out of reader input.....

2002 AREA F.F. SCHEDULE

Jun	1-2	CIA OT/NoGas FF Contest	AMA Site
	3-4	CIA National Cup Challenge	AMA site
	7-9	AMA Grand Event	AMA Site
	15-16	FF Contest	KS City, MO
	22-23	Inter-City FAI/NOS/AMA Contest	AMA Site
	28-30	NOFFA FF Contest	AMA Site
Jul	17-21	FAC NATS	Geneseo, NY
Aug	3-4	"Fly Me To The Moon" Indoor Event	West Baden, IN
	5-9	USOC/AMA NATS	AMA Site
	16-18	Empire State FF Champs	Geneseo, NY
	24-25	Aeronuts Midwestern Sts FF Champs	AMA Site
	26-30	SAM Champs	AMA Site
	31-Sep1	COFFC FF Contest	AMA Site
Sep	7-8	Flying Aces Midwest NATS	AMA Site
	21-24	FAI Team Selection Finals	Palm Bay, FL
	27-29	CIA Regional FF Champs	AMA Site
Oct	5-6	Tri-County Aero contest	Lawrenceville, IL
Dec	29-31	King Orange, International	Palm Bay, Fl

The **INFORMER**

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