Established 1936
SKY-SCRAPERS BKLYN NY
AMA Club Charter 470

FLYOFF

Round 20 / Winter 1992

The **SKYSCRAPERS** Quarterly

Edited by Bob Hatschek

What's Up? XX

Happy New Year: The 1993 flying season!

Merry Christmas! Happy Hannukah! And best wishes for the New Year, which seems to promise a full season!

It starts in Palm Bay (Fla) with the King Orange International on Jan 1-3 (contact Bob Junk, 984 Williams Ditch Rd., Cantonment, FL 32533, 904/968-9619).

Next comes the Skyscrapers' First Annual St. Valentine's Meet, tentatively scheduled for Feb 14 at Galeville. Events are Coupe d'Hiver (Winter Cup, remember) and P-30. But please note that the date is not yet firm. Before you load the car to go, contact Dave Acton (RD#3 Box 227, Mahopac, NY 10541, 914/628-0526) for confirmation.

Galeville Maintenance Fund, 10/23/92

	Amount	Balance
Previous Contributions		
Skyscrapers	2099.00	
Friends of the Skyscrapers	2340.00	
		4439.00
Previous Expenditures	—2200.00	
		2239.00
New Contributions		
Skyscrapers		
Al Abriss (8/92)	5.00	
Vic Gagliano (8/92)	25.00	
Mirek Hrycak (8/92)	50.00	
John Condon (10/92)	100.00	
		2419.00
Friends of the Skyscrapers		
Anonymous field contributions (8/92)	42.00	
Bob Reinhard (8/92)	10.00	
Jerry McGlashan (8/92)	28.00	
Ed Keck (8/92)	50.00	
Bob Lieber (9/92, 10/92)	50.00	
Bill Burris (10/92)	20.00	
		2619.00
New Expenditures		
None (as of 10/23/92)	— 00.00	
Current Balance (10/23/92)		$2619.00

Sincere thanks to all individuals and all organizations who have already given to the Galeville Maintenance Project. We welcome additional contributions for continued work on the field. Funds are kept in a separate account reserved for this use and full accounting is published in *FLYOFF*. Make donations payable to "Skyscrapers," and send either to Tom Waddington, 3504 Carol Ct, Yorktown Hts, NY 10598 or to *FLYOFF*. Thank you!

We are now negotiating Galeville dates for the entire year.

Other high points in the free-flight year will be the USIC (June 3-6, Johnson City, Tenn), the AMA Nationals (July 17-26, Lubbock, Tex), the USOC (Sept 3-6, Muncie, Ind), and the Free Flight World Championships (Oct 5-10, Lost Hills, Calif). Those dates and sites are pretty firm, but the rest of the schedule is still a bit hazy. We'll let you know for sure in *FLYOFF 21*—**and we urge all sponsors of 1993 meets to contact us immediately to be listed in our free-flight calendar.**

USOC 92 and the AMA Muncie facility

Best meet I attended in 1992!

That says it in short, but a few more specifics are in order. Again we'll leave the who-won-what to *Model Aviation* and the *NFFS Digest*. What follows are the observations, opinions and comments of this one free-flighter.

The United States Outdoor FF Championships sponsored by NFFS (in cooperation with FAC and SAM 57 and 28) on Sept. 3-7 at your field and mine in Muncie, Indiana, was well run, well attended, well competed, on a good field, and blessed by quite decent (but not perfect) weather.

Phil Sullivan (an AMA employee—since terminated for unknown reasons having nothing to do with the USOC) did an exemplary job as CD in leading his crew of volunteer free-flighters and wives in running the entire affair. I am not aware of any glitches, problems, or complaints on the administrative side. Phil and crew (who will remain nameless here) deserve our congratulations and gratitude!

Two weeks after the meet, all contestants received from Sullivan a complete listing of scores for all contestants who flew in every NFFS and AMA event. A very nice touch! And a week after that from Jim Bennett—the man who sparkplugged revival of the Moffett Trophy—came a "Numberless Newsletter" with a 5-page illustrated report on that newly reconstituted event. Thanks to both gentlemen: such reports are greatly appreciated!

Wind never exceeded about 10-12 mph (my estimate) and was much less most of the time. Wind direction was different every day. The Bean Feed was deluged Thursday evening, fairly heavy rain fell for an hour or more late Saturday afternoon, and Monday was largely overcast. In all, the weather was rather similar to Westover's for the Nationals, but not as bad in the extremes of wind and rain.

Under these conditions, AMA's National Flying Site proved to be an excellent venue for Category III competition and would probably be fine for Category II. However, it can be and should be improved for free-flight use, and Executive Director Vince Mankowski was indeed soliciting comments about how to improve it for the future.

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The field is approximately a mile by a mile-and-a-half; it is mostly smooth and very gently rolling terrain; except for some central parking and RC facilities it is entirely short grass (pretty much like a lawn that hasn't been mowed lately) with a few trees. I did not witness any tree problems, but at least some of these will be removed, I am told. Some of the AMA land is still in corn—the closest packed, densest cornfield I have ever searched through. Thank heaven (and a couple of cottage-industry free-flighters) for radio trackers! This corn will not be replanted in 1993.

Motorbike retrieval is excellent, foot retrieval is pretty good (this old geezer has to slow down for the gentle rises in the terrain, but I've chased on worse). I did drop 2 sec from a perfect total when my P-30 flew behind a slight rise, but my "demand" that the field be bulldozed flat was strictly tongue-in-cheek. The point is, you can follow a straight line across the field and find your model even if you didn't see it land (assuming there's no interfering activity going on in the middle of the field). Bicycle retrieving, however, is impossible.

The rain left some very small boggy areas in low spots, but these caused no major retrieval detours. Having recently been farmed, the soil is soft and the rain did turn some of the parking into a morass that required pushing and even towing some vehicles out (especially campers). Hardened parking areas at the periphery of the field are mandatory for free-flight use.

Furthermore, suitably located peripheral parking areas would have kept models out of the corn. The day that the corn was most troublesome had us launching long-flying Mulvihills and Moffett models virtually from midfield in what may have been the strongest breezes of the contest.

High-voltage power lines across one end of the property came as a surprise to most free-flighters (at least those of us who traveled greater distances), but posed no difficulties during the USOC. Whether this remains true under different wind conditions remains to be seen.

Many of those attending the USOC stayed at the Muncie Holiday Inn, which was more than adequate and only a few minutes drive from the field. A number of other facilities were also available and it has to be said that Muncie should easily be able to handle the living needs of contestants for most major meets. We didn't check out the local hobby shop.

Overall, the site should prove more than adequate for a FF Nats, though I would question the wisdom of holding FF events simultaneously with a major RC or UC event in the middle of the field. But, after all, we own this site and its use can be scheduled to avoid the conflicts that have reduced previous Nats to less than true national competitions for free-flighters.

FAI competition involving long flyoffs should be approached cautiously. Certainly the next FF team selection cycle should include a Muncie semifinal (which does not require a flyoff). And it would provide valuable experience if further FAI events were scheduled for the site.

In time, given peripheral parking facilities (all the way upwind), the elimination of some crops and trees, the possible acquisition of additional acreage, and some weather data, it might even be possible to stage a team-selection final at the site. Remember, AMA owns the site, and it would easily be possible to schedule a longer meet, canceling any days or rounds during which conditions are unfavorable.

26th Skyscrapers International Challenge

Galeville, NY, July 25-26, 1992—Dave Acton, CD

F1A — A2 Towline (4 flyers)

1	Bob Sifleet	180	180	105	180	180	62	133	1020
2	Kevork Fags	8	180	95	175	92	158	10	718
3	Vince Croghan	62	180	69	65	—	—	—	376
4	Aram Schlosberg	91	180	—	—	—	—	—	271

F1B — Wakefield (14 flyers)

1	Jim Brooks	180	180	180	138	210	180	180	1248
2	Tom Ioerger	180	180	180	180	210	148	166	1244
3	Bob Lipori	180	180	180	158	180	180	180	1238
4	Jerry McGlashan	180	95	180	180	210	178	180	1203
5	Jack Minassian	180	180	180	151	151	180	180	1202

F1C — FAI Power (5 flyers)

1	Ed Keck	180	180	180	180	240	180	180	1320
	Bob Sifleet	180	180	180	180	240	180	180	1320
3	Bob Gutai	180	144	180	180	240	180	180	1284
4	Mirek Hrycak	180	180	105	180	240	120	180	1185
5	Larry Pelatowski	178	180	180	180	189	180	21	1108

F1G — Coupe d'Hiver (7 flyers)

1	Vic Nippert	120	120	97	120	120	577
2	Bob Hatschek	120	120	99	120	111	570
3	Bill Buss	90	120	118	96	120	544
4	Art Phillips	112	76	120	76	78	462
5	Joe Williams	102	55	67	98	90	412

F1H — A-1 Towline (9 flyers)

1	Ed Pelatowski	89	120	91	68	115	483
2	Vic Nippert	44	120	80	99	120	463
3	Rod Ioerger	111	51	120	60	115	457
4	Jean Pailet	71	69	79	57	102	378
5	Fred Blom	48	81	77	67	97	370

F1J — FAI mini-power (5 flyers)

1	Jack Nix	120	120	111	120	120	591
2	Jean Pailet	120	96	120	120	120	576
3	Dick Delinski	120	96	120	99	120	555
4	John Carbone	120	90	109	81	87	487
5	Pete Ferrara	74	120	120	0	—	314

Hand Launched Glider — German Flight Rules (5 flyers)

1	Art Ellis	31	34	4	32	50	43	24	26	28	54	244
2	Ron Midgett	32	27	36	38	60	31	28	29	32	22	229
3	Ed Pelatowski	—	—	28	46	16	20	43	41	38	30	226
4	Larry Pelatowski	—	—	22	9	24	46	33	60	14	36	221
5	Jean Pailet	20	17	28	7	29	7	12	5	9	23	129

Correction. And an apology to Matt

We goofed in the last issue by awarding first place in Open Indoor Glider at the Westover Nats to Charlie Gagliano. We should have said Matt Gagliano, who tied for first. We apologize to our readers, and especially to Matt.

Skyscrapers report from Lawrenceville

The 1992 SAM Champs and a NosGas meet were held in tandem early in July at Lawrenceville—with rather light attendance by the Skyscrapers. Nevertheless, the club's competitive honor was mightily upheld!

Our adopted Skyscraper from Geneseo, Illinois, Guy Eaves, captured firsts in 1/4A and 1/2A NosGas events, then went further back in time to take firsts in .020 Replica

and Old Time HLG. Meanwhile, Skyscraper Larry Davidson, SAM RC champ last year, did it again in 1992 with a come-from-behind triumph. After an embarrassingly slow start—zilch in the first two days—Larry took second in Texaco and topped 'em all in B Ignition and C Ignition, all in flyoffs, to earn the title of 1992 Grand Champion.

Congratulations, Guy! Congratulations, Larry!

The 1993 Skyscrapers annual banquet

Bob Langelius reports that the Skyscrapers' annual dinner will be Saturday, March 13, 1993, at Manero's Steak House in Greenwich, Conn. Once again we will have a private room with a cash bar. The party starts at 3:00 in the afternoon, and dinner will start at 5:00.

The menu will include your choice of filet mignon, chicken Florentine, or the fish of the day. Price will be $19.00 per person, including gratuities. You do not have to make an advance menu selection nor even pay in advance. But please call Bob Langelius (914/949-6083) in advance to tell him how many places to set.

To get there, take I-95 (north or south) to Exit 3 (Arch St.) in Greenwich. Take Arch St. east for a short distance to Steamboat Rd. Turn right (south). Manero's is at 559 Steamboat Rd. (on left) one long block from Arch St. If lost, call us at Manero's (203/869-0049) for directions.

But report your 1992 scores first!

One feature of the banquet will be presentation of annual awards: High-point trophies for the club's top three contest flyers in 1992; the Royal Order of the Purple Shaft to the Skyscraper who had the worst stroke or string of bad luck in 1992—self-inflicted or not; and the trophy for the Outstanding Skyscraper of the Year. Nominations for these latter

[Continued on page 4]

1992 Skyscraper Monthly Meet Results

May 10, (Solid cloud, light drift), Bob Lipori, CD

F1ABC		.02 Repl		PW-30	
Hank Cox	84	John Carbone	33	Dick Delinski	216
P-30U		**Cat G**		**P-30**	
Bill Buss	345	Vic Nippert	232	Bob Hatschek	340
Art Phillips	329	John Carbone	102	Vic Nippert	317
		Dick Delinski	74	Bob Hudson	187
ABCD		Hank Cox	48	Dick Delinski	168
Clark Darling	480	**1/2A**		**Mulvihill**	
Dick Delinski	351	Burt Church	358	Vic Nippert	755
Burt Church	200	Dick Delinski	353	Bob Hatschek	653

June 14, Bob Lipori, CD

NosGas		PW-30		P-30U	
Dick Delinski	352	Al Abriss	1338	Art Phillips	270
		Dick Delinski	1297	Bob Hatschek	120
P-30		**Jr HLG**		**Cat Glider**	
Vic Nippert	336	Greg Abriss	32	Bob Hatschek	152
Bob Hudson	214	Allison Abriss	25	Dick Delinski	73
Mulvihill		**1/2A**		Vic Nippert	59
Vic Nippert	350	C. McGeary	120		

July 5, (Cloudy, light drift), Dave Acton, CD

NosGas		Mulvihill		.02 Repl	
D. Phillips	309	Ed Pelatowski	511	Dick Delinski	114
Dick Delinski	294	**1/2A**		**ABCD**	
PW-30		Jack Rice	301	D. Phillips	218
Alan Abriss	1501	Dick Delinski	299	**Cat Glider**	
Dick Delinski	1497	C. McGeary	132	Bob Hatschek	133
P-30		**P-30U**		Dick Delinski	113
Bob Hatschek	335	Bob Hatschek	360	Vic Nippert	98
Hank Cox	244	Jack Rice	342	**Jr HLG**	
HLG		Art Phillips	327	Greg Abriss	16
L. Pelatowski	137	Bill Buss	98	Allison Abriss	15

August 9, (Severe rainstorms) Cancelled, Dave Acton, CD

September 20, (Superl Sunny, low drift), Vito Gagliano, CD

HLG		Cat Glider		ABCD	
Ed Pelatowski	199	Vic Nippert	318	Clark Darling	360
Vito Gagliano	108	Bob Hatschek	221	Dick Delinski	345
L. Pelatowski	102	Dick Delinski	169	D. Phillips	146
John Barron	50	Jo Darling	109	**P-30**	
Mulvihill		**P-30U**		L. Pelatowski	450
Vic Nippert	540	Bob Hatschek	540	Dick Delinski	329
Hank Cox	352	Art Phillips	448	John Barron	295
NosGas		**.02 Repl**		Vic Nippert	274
D. Phillips	225	Dick Delinski	210	Hank Cox	94
M. MacLean	207	**F1ABC**		**PW-30**	
		Andy Barron	660	D. Delinski	2366

October 25, (Overcast, windy, 47-49°), Jack Minassian, CD

F1ABC		ABCD		Mulvihill	
Andy Barron	133	Clark Darling	66	Jack Rice	120
HLG		**Cat Glider**		**P-30**	
L. Pelatowski	206	Jo Darling	152	L. Pelatowski	286
John Allen	185	Dick Delinski	104	Ray Factor	232
John Barron (J)	88	**P-30U**		John Barron(J)	154
Ed Pelatowski	77	Jack Rice	347		

Final Point Standings

Best 3 scores count

(1st =10, 2nd = 7, 3rd = 5, 4th = 4, 5th =3, 6 & lower = 1)

F1ABC	Best 3	P30U	Best 3	PW30	Best 3
Andrew Barron	20	Bob Hatschek	27	Dick Delinski	27
Hank Cox	10	Art Phillips	24	Al Abriss	20
NosGas		Jack Rice	17	**1/2A**	
Dennis Phillips	20	Bill Buss	14	C. McGeary	15
Dick Delinski	17	**HLG**		Dick Delinski	14
Mal MacLean	7	L. Pelatowski	25	Burt Church	10
P30		Greg Abriss (J)	17	Jack Rice	10
Vic Nippert	21	Ed Pelatowski	15		
Bob Hatschek	20	Alisn Abriss (J)	12	**ABCD**	
L. Pelatowski	20	John Barron (J)	11	Clark Darling	30
Bob Hudson	12	Vito Gagliano	7	Dennis Phillips	15
Dick Delinski	11	John Allen	4	Dick Delinski	14
Hank Cox	10	**Cat Glider**		Burt Church	5
John Barron (J)	10	Bob Hatschek	27	**Mulvihill**	
Ray Factor	7	Vic Nippert	25	Vic Nippert	30
		Dick Delinski	21	Ed Pelatowski	10
.02 Rep		Jo Darling	14	Jack Rice	10
Dick Delinski	20	John Carbone	7	Hank Cox	7
John Carbone	10	Hank Cox	4	Bob Hatschek	7

[Continued from page 3]

two awards may be made to Jean Pailet, who will pass along your comments to the "selection committee."

Details of the point system are in *FLYOFF 9*. All members who competed in any 1992 free-flight event should report their placings at every contest to Jean Pailet (30 Emerson Rd, Brookville, NY 11545 **before Jan.31,1993**.

Who lost a 1/2A at Galeville?

Bob Reinhard reports that he found a "very nicely built Cox-powered 1/2A pylon job" at Galeville in July. The model, which had no identification anywhere that Bob could find, was probably lost at the Eastern US Free-Flight Championships. If you lost a model, or if you know someone who did, Bob Reinhard's phone number is 914/778-5456. Please call after 6:00 pm.

Rules proposals — READ THIS

Several rules proposals have been brought to our attention by the CIA *Informer* (ably edited by Moe Whittemore). Get you opinions to your FF Contest Board member. Here are our opinions, following a heated discussion at a meeting:

Proposal FF 94-1 (by the late Mark Valerius) would reduce the maximum wing area for Mulvihill to 150 sq. in. —but only for Category III. Although a reduction to 150 would be quite reasonable in view of the excess performance, to do it for only Cat III is not desirable. **Reason:** The category of a meet is often established on the field in accordance with the prevailing weather. To cut from II to III would thus disqualify some models on the spot. A reduction for ALL categories would be reasonable.

Proposal FF 94-2 (by Harry Murphy) would prohibit all but loop-scavenged, plain-bearing engines in 1/2A, and create a new 1/2A event "allowing ball-bearing, multi-ported racing engines." **Vote No.** Part one is unnecessary inasmuch as it essentially duplicates the NosGas events. And part two merely recreates the present 1/2A.

Proposal FF 94-3 (by Harry Murphy) would prohibit metal covered flying surfaces in AMA FF events. **Vote No.** This is a step into the past, like putting a ban on plastic film coverings, CyA cements, and carbon fiber. It would eliminate another incentive for builders (including juniors) to progress up the line to World Championship categories.

Proposal FF 94-4 (Harry Murphy) and FF 94-8 (Linwood Cochran) would both change status of Catapult Glider from Provisional to Official. **Vote Yes.** It's time to do it.

Proposal FF 94-5 (Harry Murphy) would change Payload engine run to 13 sec ROG. No comment here.

Proposal FF 94-6 (Harry Murphy), for Payload, would change flyoff procedure from incremental maxes to reduced engine runs with the same max (at least in Category III, proposal is a bit ambiguous on this), as in AMA gas events. Again, no comment here.

Proposal 94-7 (Linwood Cochran), in Outdoor Catapult Glider, would delete present fixed catapult and substitute hand-held catapult (9-in. loop of 1/4-flat rubber on 6-in. handle). **Vote Yes**, emphatically. **Reason:** The hand-held catapult does the job better, with more convenience for contestant and CD, and greatly enhanced SAFETY. The present pole-type catapult encourages a nearly horizontal launch that inevitably results in more gliders hitting the ground or people who may think they're safe. With a hand-held catapult, you launch nearly vertically; if the glider spins, it does so after it has lost most of its energy.

Coyle & Wake & F1C & F1J 48" 1.093
$15 x 1 x 1½ | 13" straight → 5⅛
9 gr 1½ x 24 29-34 gr
$30 25-27 gr 1¼ 27-29 $37.50

ShuriKing — By Jean Pailet, the Skyscrapers

The ShuriKing follows my basic design philosophy of "bigger is better." The first model was designed and built during the 1990-91 winter season with the intent of enlarging and improving upon my earlier ShocKing design to take better advantage of the increased performance available from the then new Shuriken .050 and .061 engines.

ShuriKing was first flown in competition at the June 1991 Lawrenceville Nats, where it placed third in 1/2A gas (with the .050 powerplant, of course), third in F1J, and seventh in A gas (the latter two places with the .061). Since then it has placed in every event entered, including two firsts (1/2A and F1J) and a second (A gas) at the 1992 Westover Nats.

The wing area of 343 sq. in. and stab area of 100 sq. in. represent an increase of approximately 4.5% over those of the ShocKing and yield a stab area that is 29% of the wing area.

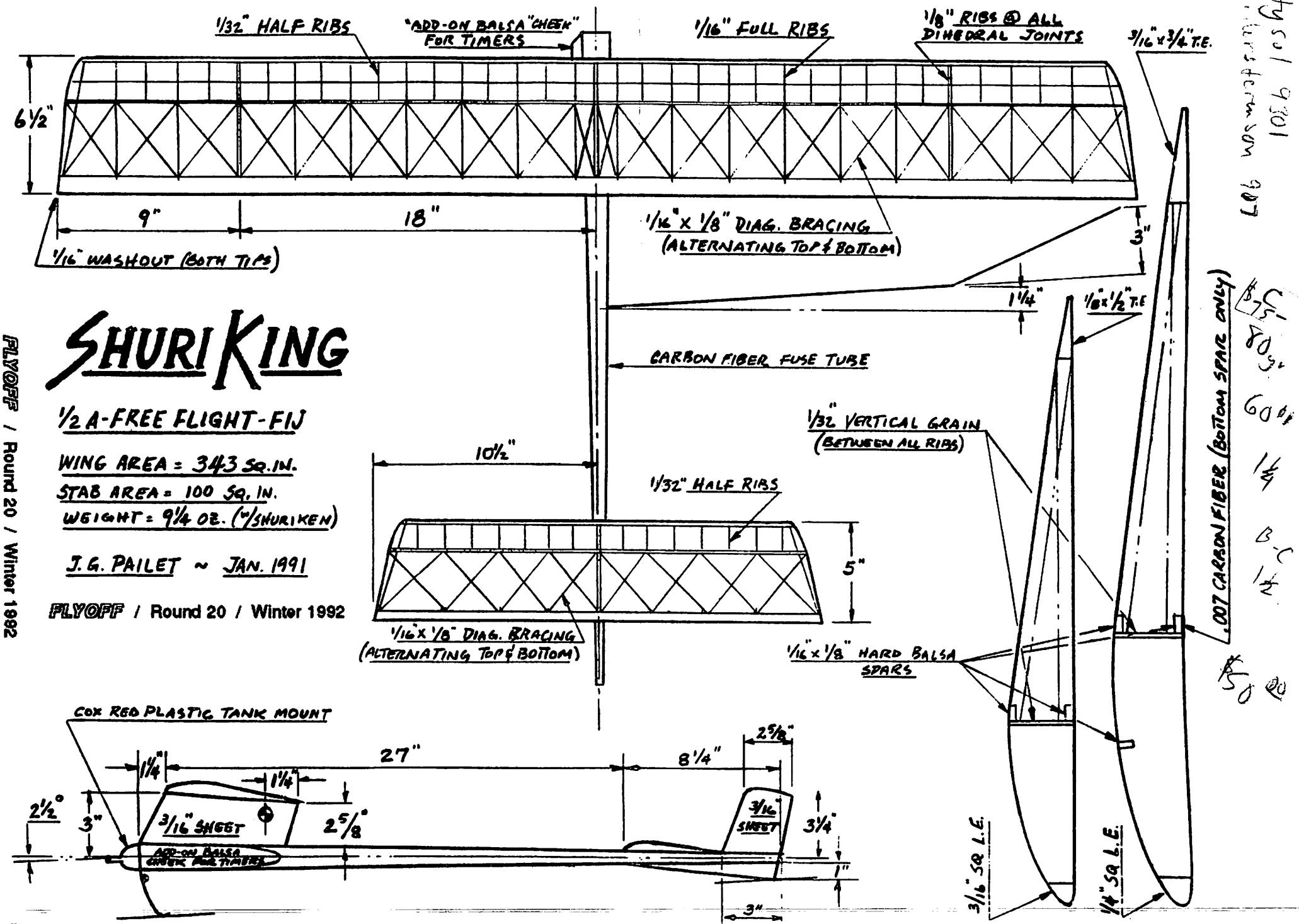
Design and construction "innovations" used on the ShuriKing include a carbon-fiber fuselage tube from Ron McBurnett's Acme Aero Composites (phone: 503/363-7180), carbon-fiber-reinforced bottom wing spar and wing leading edge, undercambered wing airfoil (*a la* Jedelsky), and Micafilm wing and stab covering. Specialized "equipment" includes the Shuriken engines, Mario Rocca's carbon-fiber single-blade folding prop, and dual timers (a Tatone "squeeze-off" for engine shutdown and a Fletcher Arrow from Australia for dethermalizing).

The 3-view shows the current (1992) model, which varies from the original in that the pylon asnd vertical tail comprise flat sheet-balsa construction as opposed to the earlier styrofoam-cored airfoil-sectioned surfaces. Also, the wing and stab are now tissue covered for increased torsional strength and reduced weight; the wing is 10 grams lighter and the stab is 3 grams lighter.

While this model is large by most contemporary standards, it conforms to my preference for emphasizing glide performance over power performance. Besides, with the Shuriken-engine/Rocca-prop combination, the power performance is nothing to be ashamed of. On Cox Racing Fuel, the Shuriken .050 turns the Rocca 7 x 3 prop at 23,550 rpm and generates 25.5 ounces of static thrust!

In addition to lots of wing area, the ShuriKing was designed with lightness and simplicity in mind. Therefore the wing and stab structures utilize minimum wood sizes while trying to attain maximum strength. Simplicity is the keynote of the Cox red-plastic Tank Mount with suction feed. The combination of the Tatone "squeeze-off" timer and the Fletcher/Arrow dethermalizer timer (available from World Free Flight Supplies (phone: 011-612-639-3421) have a total weight of 20 to 22 grams.

My ShuriKing is flown in a right-right flight pattern with stab tilt used to adjust the glide circle and rudder trim coupled with small CG and side-thrust variations used to determine the power pattern. Since most of my flying is done in the Northeast and Midwest, most flights are aimed at AMA Category III duration. With a 7-second engine run, the ShuriKing has frequently turned in dead-air flights of 1:45. Therefore 2-minute maxes come fairly easily and regularly with a little thermal help.



SHURI KING

1/2 A-FREE FLIGHT-FIJ

WING AREA = 343 SQ. IN.
STAB AREA = 100 SQ. IN.
WEIGHT = 9 1/4 OZ. (w/SHURIKEN)

J. G. PAILET ~ JAN. 1991

FLYOFF / Round 20 / Winter 1992

Effects of Launch Velocity and DPR in F1B

By Dave Lacey, CAAMA

Delayed Prop Release (DPR) is impressive to watch when done by masters of the art. But is it worth it? Spurred on by previous articles in *FLYOFF 16* and *18*, I decided to do a simulation of the first 2 sec of a Wakefield's flight. The simulation uses previously published characteristics of the prop, motor, and airframe. The equations are:

$m\dot{v} = T - D - W\sin\gamma \quad = T - (D+W)$

$T = \eta * n * Q * 2\pi / v \quad = \eta * Q * 2\pi / J * d \quad \text{or } C_T \rho n^2 d^4$

$n^2 = Q * 2\pi / C_p d^5 \rho \qquad J = v/n*d \qquad D = .5 * C_D * \rho * v^2 * S$

Meuser published in an early NFFS Symposium report the prop and rubber characteristics in Fig 1 and Fig 2. The prop is 24" diameter and 28.8" pitch (P/D ratio of 1.2).

The simulation used finite difference methods to integrate for velocity (v) and altitude (h). Flight path angle (γ) was assumed vertical ($\gamma = 90°$).

The dynamics of the hand launch for DPR were simulated by: $m\dot{v} = -(D+W)$

Velocity and altitude are obtained by:

$$v_{\eta+1} = v_\eta + v_\eta \Delta t$$

$$h_{h+1} = h_h + .5(v_h + v_{h+1}) * \Delta t$$

C_p and γ were matched by an iterative scheme described as follows:

Assume C_{p0}

Calculate $n = Q * 2\pi / C_{p0} * \rho * d^5$, $J_{new} = v/n*d$

Look up C_{Pnew} at J_{new}

If $(C_{Pnew} - C_{P0}) = 0$, Stop

If $(C_{Pnew} - C_{P0}) \neq 0$, Try again until match.

Integration was done at a time increment of 0.1 sec (Δt = 0.10 sec).

Results of initial launch velocities of 0, 15, 30, and 45 fps are presented in Fig. 3 and 4. Velocity variation with time is presented in Fig. 3 and, as can be seen, velocity is the same in all cases about 2 sec into the flight. The same is not true, however, for altitude (Fig. 4). Letting the model out of your hand versus a hard hand launch can lose as much as 23 feet in altitude for the case of V = 45 fps. Altitude difference at 2 sec is shown in Fig. 5.

Nomenclature, constants, assumptions

- m = Mass (slugs) = W/g
- v = Velocity (ft per sec)
- $\dot{v}$ = Acceleration (ft/sec^2)
- T = Thrust (lb)
- t = Time (sec)
- D = Drag (lb)
- W = Weight (0.507lb, or 230 grams)
- γ = Flight-path angle (degrees)
- ρ = Air density (0.002378 slug/ft^3)
- n = Prop rotational speed (rps)
- Q = Prop torque (lb-ft)
- d = Prop diameter (ft)
- J = Advance ratio (v/nd)
- C_T = Propeller thrust coefficient
- C_P = Propeller power coefficient
- η = Propeller efficiency
- S = Wing area (1.67 ft^2, or 240 in^2)
- C_D = Coefficient of drag (0.5)

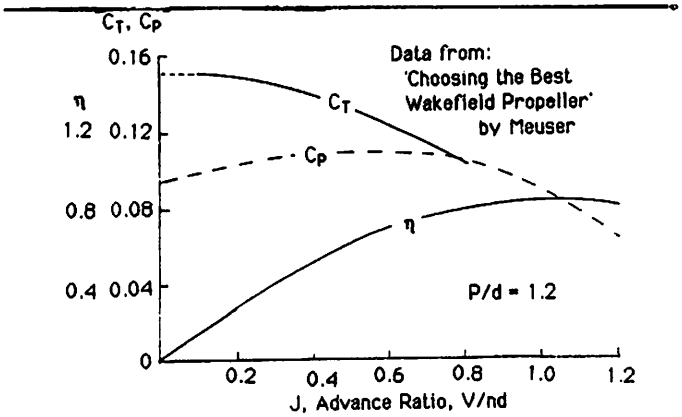


Fig 1—Propeller Characteristics of P/d = 1.2 Prop

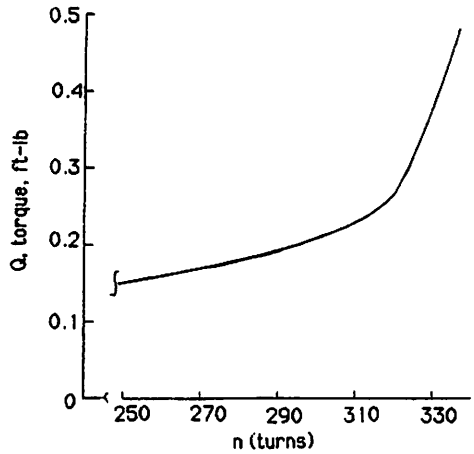


Fig 2—Rubber Motor Characteristics

These results assume no delayed prop release; only that the flyer can impart these velocities to the model at the instant the model leaves his hand and releases the prop.

What about delayed prop release? The velocity and altitude profile of a hard vertical hand launch at 30 and 45 fps are shown in Fig. 6

Adding the altitude gained by the hand launch to the altitude gained by the zero delay altitude presented in Fig. 4 will thus provide the total altitude obtained. For example, assume that the model is thrown at 30 fps and the prop is delayed until the model has decelerated to 15 fps, total altitude will be 9.5 + 72.7 or 82.2 feet.

The variation of altitude with propeller start velocity is shown in Fig. 7 for cases of no prop delay and delay launches of 30 and 45 fps, which correspond approximately to 4g and 9g, respectively. It can be seen that there are slight gains to be obtained if the model can be thrown very hard (i.e. 45 fps). These gains amount to approximately 3 feet if the prop is released at the apogee of the hand launch (v = 0) to a maximum of 6 feet at a prop release of 15 fps.

Throwing the model at lower velocities results in negligible gains over that obtained with no delayed prop release (1 ft at 15 fps prop start for a 30 fps launch).

In conclusion, it appears that, for simplicity, the instantaneous prop release may be the easiest way to go. However, if you can really heave the model, small gains in altitude can be obtained if the prop is released at the optimum velocity.

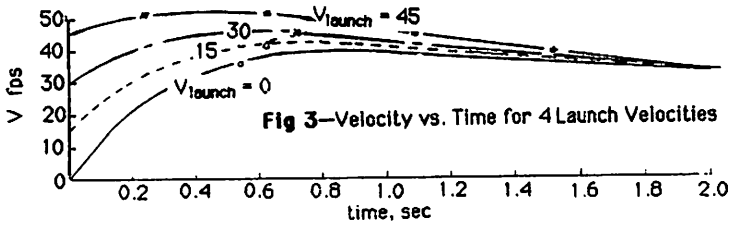


Fig 3—Velocity vs. Time for 4 Launch Velocities

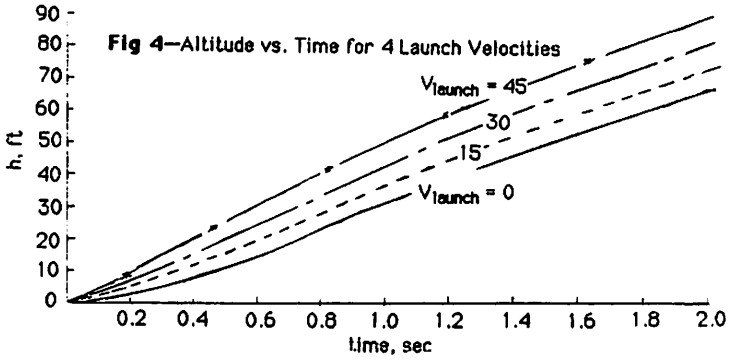


Fig 4—Altitude vs. Time for 4 Launch Velocities

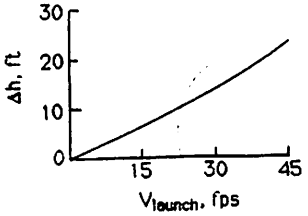


Fig 5—Change in Height at 2 sec Due to Launch Velocity

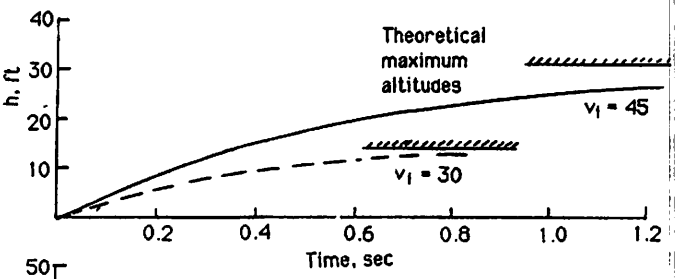
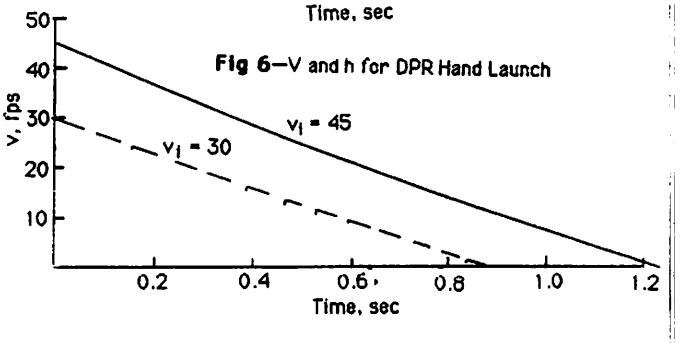


Fig 6—V and h for DPR Hand Launch



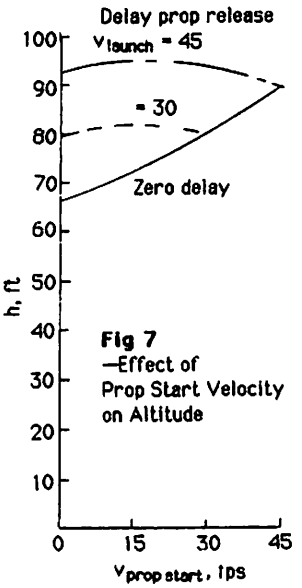


Fig 7
—Effect of Prop Start Velocity on Altitude

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Letters to *FLYOFF*:

"Primarily because of a lack of available candidates I recently acquired the job of Northeast Regional Vice President of NFFS. But I am serious about doing a good job of representing our region in NFFS matters.

"The next few years will be very important in shaping the future of free flight, and I'd like as much input as possible from the flyers of this region. I already know many of you and I have some idea of what you want. But more input can't hurt. After all, I can't speak for you if you don't speak to me!

"What are the issues we need to address—both within the region and beyond it? Does it boil down to 'good sites, good contests' or is it more? What about rules? The role of NFFS *vs.* AMA? The Team Selection Program? I need your ideas and opinions on all of these—and more—to speak for all of us. My aim is to represent all of FF in this region—not just a particular interest—so we are all accounted for. What should we be doing?

"The largest number of NFFS members are in the Northeast region! I don't want to let any of us down!"

Jim Haught
3069 Sovereign Dr.
Cincinnati, OH 45251.

Everybody, That's not a letter to the editor. That's to every free-flighter in the Northeast! —the Editor

"Enclosed is $10 to keep your issues of *FLYOFF* coming.

"Enjoy your publication. The pitch gage in Round 19 is exactly what I was looking for. If you have any more good ideas be sure to publish them in future issues. This is the kind of stuff that makes *FLYOFF* worthwhile.

"If the '93 Nats are in Lubbock, be sure to bring sun tan protection. . . and build strong wings as this part of the country is usually breezy. It's also great flying country."

Don Simpkins
Arlington, Texas

Don, Thanks for the kind words. . . and for the preview of what to expect at Lubbock.—the Editor

"I was happy to read in *FLYOFF 19* that an article on Art Ellis's *Window Plane* will be coming soon. I hope you'll include a 3-view.

"Art has flown the *Window Plane* at NEWG meets here on the Cape, and I was lucky to be the timer for one of the fabulous flights at the Westover Nats.

"Art Ellis is also a person who gives back to the sport, helping other modelers, including kids. I look forward to the next issue."

Frank Andrews
Centerville, Mass.

Frank, Yours is the first fan mail we have ever received before an article was published! You'll get the 3-view —with enough info to build the model. And we'll try to give you enough inside-track so you'll know why the remarkable model is designed the way it is.—the Editor