the

Ampeer

November The EFO Officers 2009

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The Next Meeting:
Date: November 7, 2009 **Time: 11:00 a.m.**
Place: Midwest RC Society 7 Mile Rd. Flying Field

What's In This Issue:

More Information on Indoor Flying Starting This Month at the Ultimate Soccer in Pontiac, MI

From Joe Hass

Please check the Skymasters' Web site at http://www.skymasters.org for the latest information and flyer.

Starting Tuesday, November 10, 2009
11 AM to 1 PM
Also flying MLK Day and President's Day (both Mondays)
23 sessions total
Single session $15.00
Punch Card for 5 sessions $30.00
Gold Card for all sessions $100.00
Spectators FREE!

Lots of fun planned throughout the year. Many of the same sponsors have pledged to support us again.

Joe Hass
President
Skymasters
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Selecting Power Systems

Hello Mr. Myers,

I haven't been into flying for a while and now I'm slowly getting back into it. Last time I was into it, I had read some wonderful articles from your website written on how to determine a power system for a particular airplane, especially the ones written by Keith Shaw. Today, the technology for electrics has jump tremendously I think.

I was wondering if those rules and formulas back then would still work today?

Also, how do you, personally, determine a power system for your scratch built projects?

Derrick Longshore
Albuquerque, NM

Ken's Reply

Yes, Keith's rules and formulas still work. The physics don't change. It is just a lot easier to hit the high end of the performance range today because of the lighter batteries and somewhat lighter motors.

How I select a power system for MY planes – revised September 2009

While it may not seem like it to many *Ampeer* readers, I try to use the "keep it simple stupid" (KISS) process to select power systems for my planes.

First, I know what the mission is (sport type flying) and what results I am trying to achieve. Almost all of my planes are typical sport planes that fly for 6 minutes to 7 minutes of sport and somewhat precision aerobatics. There are several assumptions that I use that are based on my experience and research. I do, occasionally, wonder outside my "comfort zone" to extend my knowledge.

Second, I choose to stick with one brand of RC "thing", instead of trying to figure out the whole gamut of what I might use. I stick with what I know works.

I prefer to use the 2300mAh cells from A123 Systems, Inc., which I call "A123" 2300mAh cells, whenever possible. This is just a personal preference. I prefer to use them at 100 watts in per cell, which is about a 35-amp draw. Again, that is a personal preference. I have some applications where I could not achieve the 100 watts in per cell, and they have also worked well in those applications. **There are always exceptions!**

Data that I have collected shows that "sport" electrically powered planes have a wing cube loading/CWL of 7 oz./cu.ft. to 9.99 oz./cu.ft. If you are unfamiliar with this term, you can visit the EFO site Table of Contents page on the Web at http://homepage.mac.com/kmyersefo/sitetoc.html and check out the articles on wing cube loading, which I call cubic wing loading (CWL). The sport planes that I have archived in this CWL range have an average pitch speed of about 50 mph, but I generally try for more, at least 55 mph. My two most recent designs, the *Son of Swallow* (http://www.rcgroups.com/forums/showthread.php?t=788482) and the *Fusion 380* (http://www.rcgroups.com/forums/showthread.php?t=990241), both have pitch speeds of about 65 mph.

The planes in my archived data for sport planes have an average stall speed of about 14 mph, giving them a pitch speed to stall speed ratio of about 3.5:1, which is good. My two most recent planes do have stall speeds of about 14 mph, but the pitch speed to stall speed ratio is closer to 4.5:1, which is very good. The pitch speed to stall speed ratio is an important concept to understand for non-3D type planes.

All of my archived information is available on the EFO Web site as a Microsoft Excel file.
http://homepage.mac.com/kmyersefo/M1-outrunners/metricnewthrory.xls

Table 1 relates prop pitch to RPM for pitch speeds between 50 mph and 85 mph. Because of formatting considerations, all tables appear at the end of the article.

Since I prefer to use "A123" 2300mAh cells at about 100 watts in per cell, it makes figuring all kinds of things much easier.

Both the motor and airframe can be easily defined using the input watts that I am targeting.

I use brushless outrunners, preferably Scorpion (http://www.innov8tivedesigns.com/), if they meet my criteria. Again, this is a matter of keeping it simple and sticking with one brand that I know works well and has plenty of trustworthy data available. You can use the Scorpion Motor Comparison Chart at http://innov8tivedesigns.com/Scorpion/Motor%20Comparison%20Web.htm or the brushless motor list at Progressive RC http://progressiverc.com/Brushless_Motor.html to help select motors that might be somewhat equivalent to the Scorpion outrunners if you prefer to experiment with other brands.

For outrunners, I have a range of watts in per gram of motor weight that I use. I use about 1.75 watts in per gram of motor weight for the "heavy" end of my scale and 3 watts in per gram for the "lightest" motors that I would consider. My data shows that I mostly use about 2 watts in per gram of motor weight for my projects. While using this method suggests a motor towards the "heavier" end of the scale, it allows for a useful amount of nose weight, and the motor is running well within its limits for cool running and long life. **Also, a larger, heavier motor is generally more efficient when turning the same prop from the same power source.**

Using 2 watts in per gram of motor weight makes selecting a motor much easier. I just divided the expected watts in by 2. For example, an outrunner for a 300 watts in system, for me, would weigh about 150g or about 5.3 oz.

For the airframe, I've found that I like 60 watts in to 75 watts in per ounce of wing cube loading for monoplane sport and sport scale planes. A 300 watts in system has a maximum wing area of (60 watts in per oz. of CWL) 421 sq.in. and a minimum wing area of (75 watts in per oz. of CWL) 363 sq.in. The maximum ready-to-fly (RTF) weight is then easily calculated remembering that the heavy end of the sport CWL is 9.99. (Yes, 10 is okay – it is all relative). The maximum weight for a wing area of 421 sq.in. at 9.99 oz./cu.ft. is about 50 ounces and for a wing area of 363 sq.in. at 9.99 oz./cu.ft. it is about 40 ounces.

I know that all of the math formulas I frequently give in the *Ampeer* drive folks nuts. **Table 2** shows the wing areas and target ready to fly weights for 3 through 10 cell "A123" 2300mAh power systems.

Table 3 shows the motor and prop combinations that I would consider for various "A123" 2300mAh packs. All of the props noted are APC brand except for the 10x8, which is a Master Airscrew standard wooden prop. The noted props are starting points that should pull about 35 amps at an elevation of 287m/940 ft. and 22-deg C/71-deg F. Higher elevations will require larger pitched props. **Always use a power meter/watt meter to verify the amp draw of YOUR system.**

Putting Theory Into Practice

I have a winter project that I wish to purchase a power system for. The plane is a Bob Benjamin Classic 1989 *Tigerkitten.* If you are unaware of Bob and his designs, you should check out http://www.rcmodel.com/. He was one of the first and best designers of airframes for electric power. The information on the *Tigerkitten* can be found at http://www.rcmodel.com/tiger/tigerk.html. I will be creating my model from a "new, unopened" ACE kit from the 1990's.

The photo shows EFO member and flying buddy Roger Wilfong's *Tigerkitten*. He carried through on the "Tiger" theme quite nicely.

The *Tigerkitten* has 450 sq.in. of wing area. According to Table 2, it requires a 400 watts in/4S "A123" power system. Table 3 indicates that I have two possible Scorpion motors to consider. The plans show 8.5" from the center of the motor shaft to the bottom of the wheel, when the plane is setting level. I like a minimum of 1.5" of ground clearance on a tail-dragger. That means that the largest diameter prop that I might use would be a 14-inch. The motor chart shows that the Scorpion SII-3026-890 could only use one prop, the APC 10x7E that will draw about 35 amps. Since this is not a "sleek" plane, that is probably not the best choice for this project. The Scorpion SII-3026-710 gives me three prop choices. Two of the prop choices have pitch speeds of about 70 mph. The SII-3026-710 will be my motor for this project.

Setting a RTF Target Weight & Selecting Components

With 450 sq.in. of wing area and a maximum CWL of 9.99, the **maximum target weight is 55 ounces.** At 55 ounces and with about 400 watts in the watts in per pound is about 116. That's good.
I have found that I can build a completed airframe for a bit less than 1/2 the target weight, or in this case, 27.5 ounces. (See Table 4) The completed airframe includes everything dealing with the airframe, including landing gear, wheels, control horns, etc. I include the push rods or other surface controlling devices in the completed airframe weight as well. The motor and its related components, the battery, and the onboard radio components are not included in the completed airframe weight.

I also like to check to see how much "wiggle" room I might have with the completed airframe weight. I can use **Table 5** to select components that I would use.

Once I've selected the components, I can subtract the power system and onboard radio components from the maximum target weight to get an approximate maximum airframe weight as shown in **Table 6**.

While I believe that I can build the completed airframe, including a pilot bust and aileron extension cable at 27.5 oz. or less, it is nice to know that I have a couple ounces of "wiggle" room for those extra weights that creep into every build.

What I Do If I Don't Have the Plane or Plan In Hand

If it is a glow plane, I check the glow plane's CWL based on the supplier's data to see if it is within the sport range. If the CWL does not fall within the sport range as a glow version, it won't as a conversion using "A123" 2300mAh cells. That does not mean that the model cannot be converted to an "A123" power system, just that it will not fly like a "sport" CWL plane.

The Great Planes Super Sportster 40 MkII ARF at 5 lb. using a glow engine has a CWL of 10.6, putting it into the "advanced sport" range of 10 oz./cu.ft. through 12.99 oz./cu.ft. It would not fall into the sport range of CWLs, but it would the advanced sport range when converted to an electric power system using the "A123" 2300mAh cells.

The often-converted 604 sq.in. Sig Four-Star 40 Kit, with a RTF weight of 4.75 lb. (76 oz.) has a CWL of 8.84. Subtracting the weights of a 40 2-stroke, 4 standard servos, a standard receiver and 4.8v 700mAh receiver pack suggests that the completed airframe weight could be about 50 ounce.

Table 1 indicates that this 604 sq.in. plane would require a 6S "A123" 2300mAh pack. **Table 7** is a component break down for this plane.

With a RTF weight of 86.6 oz, this 4-Star would have a CWL of 10, which is right on the cusp between "sport" and "advanced sport". I am pretty sure that I can build the airframe lighter than 50 ounces. (See Table 4) My 615 sq.in. Flite 40 ARF (http://www.rcgroups.com/forums/showthread.php?t=735972) has a completed airframe weight of 44.25 oz. and a RTF weight of 87.3 oz. giving it a CWL of 9.89 oz./cu.ft. ARF type glow planes are not noted for their lightweight airframes!

If you are observant when looking at **Table 7**, you may have noticed in **Table 5** that I recommended Hitec HS-81/82 servos when using a 6S pack and in the Table 7 for the 4-Star, I chose to use Hitec HS-225 servos. When I am on the cusp between two components, I tend to error in favor of "too much" rather than "too little". The HS-225 servos in my Flite 40 have worked out just fine.

What I do if the plane is already designed for Li-Poly batteries?

Horizon Hobby has created quite a few almost-ready-to-fly (ARF) planes designed specifically for electric power that have the designation "25e", as part of their names. They include, when powered by the E-Flite Power 25 outrunner, the *Diamante 25e* 485 sq.in. 57.6 oz. 9.32 CWL sport/precision aerobatic plane, *T-34 Mentor 25e* 545 sq.in. 80 oz. 10.87 CWL scale "trainer", *Ultra Stick 25e* 480 sq.in. 54.4 oz. 8.94 CWL sport plane, *Pulse XT 25e* 495 sq.in. 59.2 oz. 9.29 CWL sport low-wing and the *DHC-2 Beaver 25e* 565 sq.in. 78.4 oz. 10.08 CWL scale high-wing.

The *Diamante 25e*, *Ultra Stick 25e* and *Pulse XT 25e* have wing areas that I suggest using a 4S "A123" 2300mAh pack with. The difference in weight between the recommended E-Flite Power 25 outrunner (190g) and my recommended Scorpion SII-3026-710 outrunner (205g) is 15g. Horizon Hobby recommends a 3200mAh 3S 11.1V 20C with the Power 25. It weighs 310g compared to a 4S "A123" 2300mAh pack of 320g for a difference of 10g. The total weight increase for the heavier "A123" system would be about 25g or 0.88 oz. That weight increase would not change the resulting CWL for any of these three planes appreciably.

Both the *T-34 Mentor 25e* and the *DHC-2 Beaver 25e* already have CWL loadings in the "advanced sport" range. The switch to five "A123" 2300mAh cells and the appropriate motor would still leave them with CWL loadings in the advanced sport range, but they would increase their RTF weights by 114g for the motor and 91g for the battery or a total of 205g or 7.23 oz. The 7.23 oz. weight gain would give the *T-34 Mentor 25e* a CWL of 11.85 (almost in the expert sport range) and the *DHC-2 Beaver 25e* a CWL of 11.

What I do About Biplanes

Horizon Hobby Photo

I have not had a biplane since my glow days in the 1980's. I used to fly an Airtronics kitted Acro Star bipe in IMAC competition and for fun, and I loved it. Why I have not added a bipe to my electric fleet, I do not know.

The recent introduction of the E-Flite *Stearman PT-17 15e ARF* piqued my interest in having a bipe again.
(http://www.horizonhobby.com/Products/Default.aspx?ProdID=EFL2950)

I created **Table 8** for sport biplanes showing the appropriate wing area and RTF weights.

The E-Flite *Stearman PT-17 15e ARF* has 608 sq.in. of wing area. Table 8 suggests that a 4S "A123" 2300mAh 400 watts in system would be appropriate. Table 3 implies that a SII-3026-710 weighing 205g would be a good choice. I would start with the APC 13x7 sport, since a biplane flies a bit more on thrust than using pitch speed when compared to a monoplane. Replacing the E-Flite Power 15 outrunner (152g) with the Scorpion SII-3026-710 outrunner (205g) increases the weight by 53g. Replacing the recommended 309g 3200mAh 3S 11.1V 20C LiPo with a 320g 4S "A123" 2300mAh pack increases the weight by another 11g for a total increase of 64g or 2.25 ounces.

Horizon Hobby gives the "heavy" weight as 3.8 lb. (60.8 oz.). With the addition of the heavier Scorpion motor and 4S "A123" 2300mAh pack, it should weigh about 63 oz. RTF. At 63 ounces it has a CWL of 7.26 oz./cu.ft. and about 102 watts in per pound. It should fly quite well.

Some Final Thoughts

Whether this is the "best" way to select a power system when using "A123" 2300mAh cells, I don't know. This method has eliminated the math, and I hope that some folks find it useful when creating "sport" planes using systems based on the "A123" 2300mAh cells.

A Request

I am missing several prop weights from the components table. If anyone can accurately weigh some of the "missing" props and get the information to me at kmyersefo@mac.com, I would appreciate it.

It's Combat Time

Several of the EFO members decided that it would be a lot of fun to fly combat. They built up some Fast and Furious foamies, attached streamers and had a ball. This is a fun and growing segment of our hobby.

From Left to Right: Richard Utkan, Paul Sockow, Jim Maughan, Rick Sawicki, Dave Stacer

Three of the planes caught in action (top) & five (below)

Pitch	RPM for Pitch Speed 50 mph	RPM for Pitch Speed 55 mph	RPM for Pitch Speed 60 mph	RPM for Pitch Speed 65 mph	RPM for Pitch Speed 70 mph	RPM for Pitch Speed 75 mph	RPM for Pitch Speed 80 mph	RPM for Pitch Speed 85 mph
3.5	15086	16594	18103	19611	21120	22629	24137	25646
4	**13200**	**14520**	**15840**	**17160**	**18480**	**19800**	**21120**	**22440**
4.5	11733	12907	14080	15253	16427	17600	18773	19947
5	**10560**	**11616**	**12672**	**13728**	**14784**	**15840**	**16896**	**17952**
5.5	9600	10560	11520	12480	13440	14400	15360	16320
6	**8800**	**9680**	**10560**	**11440**	**12320**	**13200**	**14080**	**14960**
6.5	8123	8935	9748	10560	11372	12185	12997	13809
7	**7543**	**8297**	**9051**	**9806**	**10560**	**11314**	**12069**	**12823**
7.5	7040	7744	8448	9152	9856	10560	11264	11968
8	**6600**	**7260**	**7920**	**8580**	**9240**	**9900**	**10560**	**11220**
8.5	6212	6833	7454	8075	8696	9318	9939	10560
9	**5867**	**6453**	**7040**	**7627**	**8213**	**8800**	**9387**	**9973**
9.5	5558	6114	6669	7225	7781	8337	8893	9448
10	**5280**	**5808**	**6336**	**6864**	**7392**	**7920**	**8448**	**8976**
10.5	5029	5531	6034	6537	7040	7543	8046	8549
11	**4800**	**5280**	**5760**	**6240**	**6720**	**7200**	**7680**	**8160**
11.5	4591	5050	5510	5969	6428	6887	7346	7805
12	**4400**	**4840**	**5280**	**5720**	**6160**	**6600**	**7040**	**7480**
12.5	4224	4646	5069	5491	5914	6336	6758	7181
13	**4062**	**4468**	**4874**	**5280**	**5686**	**6092**	**6498**	**6905**
13.5	3911	4302	4693	5084	5476	5867	6258	6649
14	**3771**	**4149**	**4526**	**4903**	**5280**	**5657**	**6034**	**6411**

Table 1 – Prop Pitch/RPM/MPH

Monoplane Watts in	Motor Wt. g	Suggested Maximum Area sq.in.	Max. Wt. oz.	Approx. Stall Speed mph	Watts In per lb.	Suggested Minimum Area sq.in.	Max. Wt. oz.	Approx. Stall Speed mph	Watts In per lb.
300	150	421	50	15.29	96	363	40	14.73	120
400	**200**	**510**	**67**	**16.04**	**96**	**440**	**53**	**15.46**	**120**
500	250	592	83	16.65	96	510	67	16.04	120
600	**300**	**668**	**100**	**17.17**	**96**	**576**	**80**	**16.54**	**120**
700	350	741	117	17.61	96	638	93	16.97	120
800	**400**	**810**	**133**	**18.01**	**96**	**698**	**107**	**17.35**	**120**
900	450	876	150	18.37	96	755	120	17.69	120
1000	**500**	**940**	**167**	**18.69**	**96**	**810**	**133**	**18.01**	**120**

Table 2 – Wing Area and Weight Ranges

Watts in	Motor Wt. g	Watts in per g mtr. Wt.	Scorpion Motor	RPM ~35 amps	Prop	Pitch Speed mph	Prop	Pitch Speed	Prop	Pitch Speed mph
300	166	1.81	SII-3020-1110	8200	11x7E	54	10x8	62	10x9 sport	70
300	166	1.81	SII-3020-890	5800	13x10E	55				
400	205	1.95	SII-3026-890	9800	10x7E	65				
400	205	1.95	SII-3026-710	7500	13x7 sport	50	12x10 Pat	71	11x10E	71
500	304	1.64	S4020-10	8000	13x8E & sport	61	12x8 sport	61		
500	304	1.64	S4020-12	6500	14x10E	62				
600	304	1.97	S4020-12	7800	14x8.5E	63	14x7E	52	12x10E	74
600	304	1.97	S4020-14	7100	13x10 Pat	67				
700	304	2.30	S4020-14	8300	14x7E	56	13x9 Pat	71	12x10E	79
700	304	2.30	S4020-16	7000	14x10E & sport	66				
700	354	1.98	S4025-12	7550	13x10 Pat	71				
700	354	1.98	S4025-16	5650	17x10E	54				
800	354	2.26	S4025-16	6500	16x10 sport	62				
800	442	1.81	S4035-330	7000	15x10 Pat & sport	66	14x12E & Pat	80		
900	442	2.04	S4035-330	7800	14x10E & sport	74				
1000	490	2.04	E-flite Power 110	7500	16x8E	57	15x10 Pat & sport	71	14x12E & Pat	85

Table 3 – Motor Choices With Suggested Prop and Pitch Speed

Plane	Wing Area sq.in.	Airframe Wt. oz.	RTF Wt. oz.	Airframe oz./cu.ft.	CWL oz./cu.ft.	% Airframe /RTF	Flies Like
Modifly - scratch	174	3.88	8.11	2.92	6.11	0.48	Park Flyer
Fledgling ARF	469.5	20.50	40.30	3.48	6.85	0.51	Park Flyer
Son of Swallow - scratch	415	20.20	40.80	4.13	8.34	0.50	Sport
ElectroFlying Fusion - kit	569	33.50	74.00	4.27	9.42	0.45	Sport
Fusion 380 - scratch	375.5	18.82	39.78	4.47	9.45	0.47	Sport
Sportsman Sport Stik ARF	585	36.51	79.88	4.46	9.76	0.46	Sport
Sonic 500 ARF 4S 4000	512	33.29	66.00	4.97	9.84	0.50	Sport
Flite 40 ARF	615	44.25	87.30	5.01	9.89	0.51	Sport
Sonic 500 ARF 5S 4000	512	33.29	69.80	4.97	10.41	0.48	Advanced Sport
Ryan STA 40 ARF	461.7	37.41	71.00	6.52	12.37	0.53	Advanced Sport
Interesting E-flite Data on two of their planes I've considered. Airframe weights back figured							
E-flite RV-9 450 ARF 450	385	24.00	36.00	5.49	8.23	0.67	Sport
E-flite RV-9 450 ARF 480	385	24.00	40.00	5.49	9.15	0.60	Sport
E-flite Stearman PT-17	608	37.00	60.80	4.26	7.01	0.61	Sport

Table 4 – Data for my most recently completed planes

Prop	Wt. g	-	Motor Parts	Wt. g
APC 10x7E	19.5	-	5mm prop adapter	14
MA 10x8 std. wood	15	-	6mm prop adapter	29
APC 10x9 sport	30	-	"+" mount w/screws for 30mm mtr	5.5
APC 11x7E	22	-	"+" mount w/screws for 40mm mtr	22.8
APC 11x10E	---	-		
APC 12x8 sport	48	-	**ESC**	**Wt. g**
APC 12x10 Pat	46	-	3S CC Thunderbird 54	42.5
APC 12x10E	24	-	4S Scorpion Commander V2 45 amp	47.6
APC 13x7 sport	---	-	5S - 7S Scorpion 6-cell 45 Amp	47.6
APC 13x8E	27	-	8S - 10S CC Phoenix HV-45 + BEC Pro	88
APC 13x8 sport	49	-		
APC 13x9 Pat	63	-	**Servos**	**Wt. g**
APC 13x10E	26	-	3S Hitec HS-55	8
APC 13x10 Pat	---	-	4S - 6S Hitec HS-81/82	19
APC 14x7E	---	-	7S - 9S Hitec HS-225	27
APC 14x8.5E	33	-	10S JR Z590M	45
APC 14x10E	29	-		
APC 14x10 sport	---	-	**Receivers**	**Wt. g**
APC 14x12E	---	-	CC Berg 4	5
APC 14x12 Pat	---	-	CC Berg 7	9
APC 15x10 Pat	---	-	Spektrum AR500 (5-ch)	7
APC 15x10 sport	---	-	Spektrum AR6200 (6-ch)	10
APC 16x8E	---	-	Spektrum AR7000 (7-ch)	14
APC 16x10 sport	---	-		
APC 17x10E	---	-	For each "A123" 2300mAh cell	80

Table 5 – Typical Component Weights

Power System Tigerkitten	Wt. g
SII-3026-710	205
"+" mount w/screws for 30mm mtr	5.5
5mm prop adapter	14
4 "A123" 2300mAh Cells	320
APC 12x10E	24
Total g	569
Total oz.	20.1

Onboard radio components	Wt. g
CC Berg 7	9
Scorpion Commander V2 45 amp	47.6
3 each Hitec HS-81/82	57
Total g	114
Total oz.	4.0

Target RTF Wt. oz.	55
Maximum Airframe Wt.	30.9

Table 6 – Maximum Target Airframe Weight

Power System 4-Star	Wt. g
S4020-14	304
"+" mount w/screws for 40mm mtr	22.8
6mm prop adapter	29
6 "A123" 2300mAh Cells	480
APC 13x10 (guess weight)	65
Total g	901
Total oz.	31.8

Onboard radio components	Wt. g
CC Berg 7	9
Scorpion 6-cell 45 Amp	47.6
3 each Hitec HS-225	81
Total g	138
Total oz.	4.9

Airframe Wt. estimate	50
Estimated RTF Wt. oz.	86.6

Table 7 – Estimate for a Sig 4-Star 40 kit conversion

Biplane Watts in	Motor Wt. g	Suggested Maximum Area sq.in.	Max. Wt. oz.	Approx. Stall Speed mph	Watts In per lb.	Suggested Minimum Area sq.in.	Max. Wt. oz.	Approx. Stall Speed mph	Watts In per lb.
300	150	534	50	13.59	96	460	40	13.09	120
400	200	647	67	14.25	96	558	53	13.73	120
500	250	751	83	14.79	96	647	67	14.25	120
600	300	848	100	15.25	96	731	80	14.69	120
700	350	940	117	15.65	96	810	93	15.07	120
800	400	1027	133	16.00	96	885	107	15.41	120
900	450	1111	150	16.31	96	957	120	15.72	120
1000	500	1192	167	16.60	96	1027	133	16.00	120

Table 8 – Biplanes

New Planes from Carlos Reyes Based on the Modifly

From Carlos Reyes creyes123@yahoo.com

I'm finalizing two new designs. The first is a small motorglider (ModiSoar), about 9 ounces and 60-inch wingspan. I get at least three vertical climbs to altitude on one battery pack.

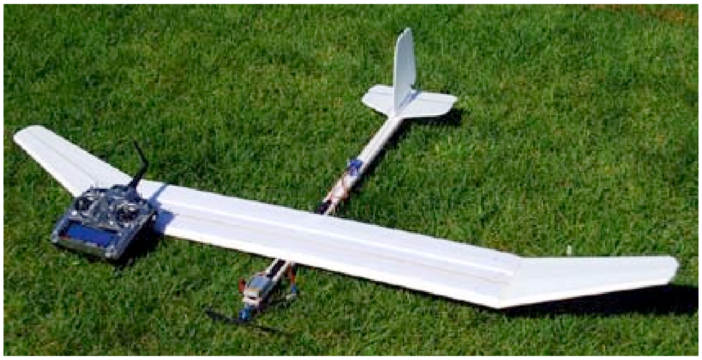
The second is a mini pylon racer. 5.5 ounce flying weight, 20-inch wingspan. With flaps, it lands at close to the landing speed of ModiFly. Snap rolls are a lot of fun with it.

Both use the flight pack for the ModiFly model. Both also use a new variation on the Kline-Fogleman (KFm) airfoil that I invented. This new airfoil has much improved efficiency (L/D).

The idea is to write them up in separate 100 page books that will sell for $9.95 each.

Carlos Reyes
Author of RCadvisor's Model Airplane Design Made Easy and RCadvisor's ModiFly

www.RCadvisor.com founder - Brainy calculator, so you don't have to be.



The October EFO Flying Meeting

Friday, October 9 was a cool, gray, rainy day here in southeastern Michigan. All in all it was another unremarkable autumn day. My shoulder pain was up and down all day long, but I was looking forward to Saturday, when I would get my first chance to really get out of the house since my rotator cuff operation on September 18. Little did I know that Saturday was going to be one of the most uplifting days of my life.

I was a bit slow in getting going on Saturday morning, so I didn't arrive at the field until almost 10:30. Several of the guys were standing around near the frequency board talking and there was a plane or two in the air. The sun was out. The sky was blue and it was a beautiful fall day. The trees on the north side of the field were giving a hint of the vibrant colors they were about to burst into.

As soon as I stepped from the car I was greeted with warm hellos and "how ya doing" from the gang. Both Arthur Deane and Denny Sumner checked out my sling. It was not at all like anything they had had with their rotator cuff surgeries.

I walked up and down the flight line checking out the planes and friends I'd not seen since early September.

While I was watching someone fly, Tim Young, Jim Young's young son, came up to me with a HUGE smile on his face and said, "Ken, here's my new plane."

It was amazing, not for what it was but for what it stood for. It was a small, delta wing design held together with Scotch tape. It was made with some foam sheet for the wing and some thin, clear plastic sheet for the fuselage and the landing gear from some other small model. It used the electronics and power system from an Air Hogs Aero Ace with the props swinging through holes in each wing panel. Tim spent quite a while pointing out the various features of his design and particularly the pilot, which had to be reconfigured to fit correctly in the fuselage after some kind of problem involving his sister. You know sisters can really mess up the design process. ☺

The most remarkable, most rewarding and most hopeful thing about Tim's plane was that HE designed and built it. It was HIS idea and HIS execution. Jim Young, the great designer that he is, stepped back and gave his son room to grow and be creative on his own. That is what I call one heck of a dad and one heck of a learning experience!

Tim's maiden that day was not a success. Many of us spent some time with Tim making some suggestions for improving HIS design. It was just neat watching him getting advice and also listening to all of us "old geezers" giving him some useful advice.

Jim continued to "teach" and give Timmy more airtime on his trainers. Tim is turning into quite a good pilot. But the "good stuff" still wasn't over!

Denny Sumner was up on the flight line flying his beautiful version of a Blue Baby foamie. Tim wondered up and was talking to Denny about his plane. Denny convinced Timmy to fly the Blue Baby for a quite awhile. Now there is a confidence builder for you. Another adult, besides your dad, has faith in your flying skills. Neat.

The day continued with some folks taking flights, while others watched and kibitzed and of course rib each other about "blown landings" and the like.

Tim's day wasn't over yet! 87 year young Bill Brown came walking down the flight line winding the prop on an AMA Delta Dart. He piqued Tim's interest and the two of them headed off to an unused area of our airfield where they could safely fly the Delta Dart and a chuck glider that Bill had also brought along. The best part was that Tim was about to get another lesson from a "master"! Instead of just winding 'er up and letting her rip, Bill showed Tim how to trim the Delta Dart for best flight characteristics by using masking tape as rudder and elevator trims. They'd fly, discuss, trim and fly.

The wind had been coming up and by early afternoon, it was getting a bit dicey trying to get the planes back safely onto the ground. Jim asked Tim if he'd like to get in one more flight on the trainer, but Tim said, "I think it might be too windy now Dad." That showed great judgment!

Even though I didn't have a plane with me, I left thinking, "What a super day at the flying field!"
My arm wasn't hurting too much. I was feeling good and happy that we are all "just boys with our flying toys." Ya gotta love this hobby!

Ampeer Paper Subscriber Reminder

When subscribing to or renewing the paper version of the *Ampeer*, please make the check payable to Ken Myers. We do not have a DBA for the *Ampeer* or EFO. Thanks, Ken

Upcoming E-vents

November 7, Saturday Last EFO Flying field meeting for the year. Midwest RC Society **11:00 a.m.** Anyone with current AMA membership is welcome to join us.

November 8, Sunday, MIDWEST R/C SOCIETY 21st annual, R/C SWAP MEET, 9:00 a.m. to 12:00 p.m.
Location: Northville Senior Community Center, 303 W. Main St., Northville, Michigan 48167
Admission Charge, $5.00 per person, (kids under 12 and women are FREE)

Jim & Tim Young at the October EFO Flying Meeting

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390

http://homepage.mac.com/kmyersefo

The Next Monthly Meeting:
Date: November 7, 2009 **Time: 11:00 a.m.**
Place: Midwest RC Society 7 Mile Rd. Field