

the

Ampeer

April		The EFO Officers		2010	
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Mailed <i>Ampeer</i> subscriptions are no long available		The Next Meeting: Date: Thursday, April 1 Time: 7:30 p.m. Place: Ken Myers' house (see above for address & phone)			

What's In This Issue:
 The Useful Outrunner Numbering System – Upcoming Keith Shaw Birthday Fly-in Info – Upcoming Mid-Am Info - A Video Worth Watching – The March EFO Meeting - A Winter's Work – More on Binding Spektrum Radios – Planes for Sale - Electric powered Legacy Control Line Stunt Plane - Ken's Progress on the Super Stearman - Upcoming E-vents

The Useful Outrunner Numbering System

From Ralph Cook
In Northern Germany

In the March issue of the Ampeer I stated, "3510 is stator diameter, the first two digits, and the length, last two digits, a non-useful number, in millimeters." Hopefully folks knew that I meant stator size, not diameter. Ralph has a different idea about the numbers. He feels that they can be useful. Here is his response that I received via email.
KM

Hello Ken,

I have been reading your newsletter for years. I thank you for your continued effort to put electric flight on a sound mathematical basis and the many useful concepts that you have presented. But after reading the March issue, I have to take issue with a statement made in the last paragraph on page 8, "a non-useful number" - It just isn't so.

Several years ago I was trying to make sense of all the numbers involved with the then new external rotary motors

(the correct English term not outrunners). I found a complete table of specifications from one manufacture for eleven LRK-motors from 75 to 1300 watts. Knowing that linear regression is a very powerful tool for analyzing data, I decided to try it on this data. The specification with the best correlation to the performance of the motor was the stator volume of nearly 98.9%. This is with manufacturer data, which like you have noted many times isn't all that reliable (fiddled with by the PR). 2 motors are outside one standard variance. If these 2 motors are moved closer to the best-fit line (MAYBE unfiddled), the correlation goes up to 99.9%. I certainly don't have to say that the stator volume is calculated from that "non-useful number".

This makes sense from the scientific view too, because the stator is the active unit converting electrical energy to mechanical energy, much like the sweep volume of an internal combustion engine converts chemical energy to mechanical energy. The rest is infrastructure. At the low end of performance, it isn't very accurate, because ten of eleven motors were 150 W or more.

How do you use it? The new nomenclature that Scorpion is using for the SII 30-series, e.g. the 3014-830, is for me almost perfect, because it tells you almost everything about the motor, that you need to know, without looking at anything else. The stator has a 30 mm diameter and is 14 mm long, which is a volume of 9,9 ml (ccm is a non-SI unit)(the same displacement as a “60-engine”). Air gap, magnets and can thickness add probably 3 to 4 mm to each side, so the total outside diameter is probably 36 to 38 mm diameter. The bells on both ends probably add 15 to 20 mm to the length, so the length of the motor without shaft is somewhere between 30 and 35 mm long. So we now know how big the motor is physically. With this we can answer the question, “Does it fit in my model?” My old linear regression predicts about 315 W and a weight of about 121 g for this motor. The questions are, “Is 121 g enough to get the CG in the right place and is 315 W adequate to power the model?” Ken your prediction methods tell us that. The Kv of 830 tells us the motor is turning relatively slowly, so combined with the 315 W, a decent size propeller can probably be turned with a 3s battery. A 4s battery might be used for smaller faster turning props, if the application demands it.

What does the Scorpion specifications say?

http://www.scorpionsystem.com/catalog/motors/s30_series_v2/SII-3014-830KV/
and

http://www.scorpionsystem.com/files/i1,072_data_chart.htm

The outside diameter is 37.5 mm, length is 39.7 mm, weight is 129 g, and maximum continuous power is 550 W. If you look at the prop data that Scorpion provides (second web address), the picture looks a lot different. The data is color-coded. The largest prop that is in the green on a 3s LiPo is a APC 12x8 E (for me a decent size prop) at 301 W and 7000 rpm, so the predicted 315 W looks much better when looking at the prop data and not the specs. On a 4s Li-Poly (in the green) it still will turn a APC 11x5.5E at 398 W and 9775 rpm, but a more typical prop, an APC 10x5 E, uses 290 W at 10400 rpm. The results - the motor diameter is right on, motor length a little short (the bells and other infrastructure take up more room than estimated), weight right on, predicted performance (on tested props) right on.

I think this demonstrates that this nomenclature is everything but a “non-useful number”. I personally would like to thank Scorpion for making this move. If all manufactures were as honest about their specifications as Scorpion, we would certainly have it much easier in determining, which motor to buy.

There is one problem with this number though; at least one manufacture uses the outside dimensions of the motor and not those of the stator, which throws a monkey wrench in the works.

This nomenclature for motor size comes from the inventor of the LRK - Christian Lucas and has been used since the beginning. Weight correlates well, too, but not as good as the stator volume.

I think if enough data were collected and analyzed, it would be possible to tell a newcomer from the wet stuff that a motor with a stator volume “X” times larger is approximately equivalent to IC engine displacement. Then you have to get the industry to always supply the stator volume in the specification list.

The formulas are:

$$V_s \text{ [ml]} = \pi/4000 \times d_s \text{ [mm]} \times d_s \text{ [mm]} \times l_s \text{ [mm]}$$

$$P \text{ [W]} = 34,265 \times V_s \text{ [ml]} - 24,732 \rightarrow r^2 = 0,999 \text{ (corr)}$$

$$m \text{ [g]} = 9,921 \times V_s \text{ [ml]} + 22,842 \rightarrow r^2 = 0,991 \text{ (corr)}$$

V_s = Volume of stator; d_s = diameter of stator; l_s = length of stator; P = power; m = weight. Inside the square brackets are the units that are being used.

All of the calculations are easily done with a hand-held calculator but I find a worksheet easier, especially if you are trying to find a special configuration for your motor and plane. I like Open Office “Calc” for 3 reasons; it is free to download, it has more functionality than the expensive product from M\$, and it is available practically for all computer platforms.

Put This One On Your Event Schedule!

Keith Shaw Birthday Party Electric Fly-In

From Dave Grife grifesd@yahoo.com

The Balsa Butchers will once again be hosting the “Keith Shaw Birthday Party Electric Fly-In” at their field near Coldwater, MI. The event will take place on June 5 and 6, 2010.

Contest Director: Dave Grife - E-mail: grifesd@yahoo.com or Phone: 517.279.8445
Please e-mail or call with any questions

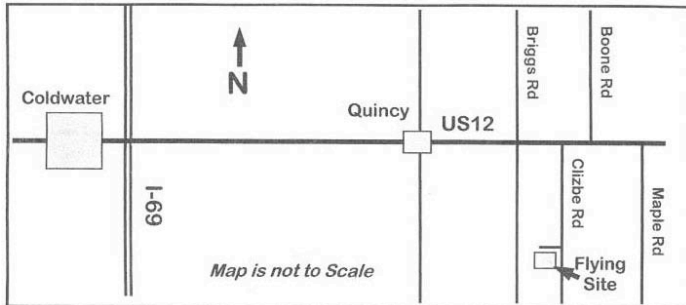
The Flying Field will be open Friday, June 4 for early arrivals

Saturday, June 5, hours are from 9 a.m. 'til 5 p.m.

Sunday, June 6, hours are from 9 a.m. 'til 3 p.m.

Landing Fee is \$10 for the weekend.

Directions: Quincy is approximately 4.5 miles east of I-69. Clizbe Road is approximately 1.6 miles east of Quincy. The Flying site is approximately 1.5 miles south of US-12 on the west side of Clizbe Road.



I love this meet. There is a lot of laid back flying with some of the Midwest's best pilots, Electric Flight Designers, Builders and Authors. I wouldn't miss it! It is a lot of fun for everyone with an interest in electric flight. KM

Mid-America Electric Flies 2010 At the 7 Mile Road MRCS Field Same Field as Last Two Years!

AMA Sanctioned
Saturday, July 10 & Sunday, July 11, 2010

Hosted by the:

**Ann Arbor Falcons and Electric
Flyers Only**

Flying Site Provided by the:
Midwest R/C Society

Your Contest Directors are:

Ken Myers phone (248) 669-8124 or
KMyersEFO@mac.com –

<http://homepage.mac.com/kmyersefo/>
Keith Shaw (734) 973-6309

Flying both days is at the Midwest R/C Society Flying Field - 7 Mile Rd., Northville Twp., MI
Registration: 9 A.M. both days
Flying from 10 A.M. to 5 P.M. Sat. & 10 A.M. to 3 P.M. Sunday

Channels 00 through 60, the six 27Mhz frequencies, the eight 53MHz frequencies and 2.4Ghz, will be in use. Flying on five 49 MHz frequencies may be accommodated on request - Narrowband receivers are recommended for flying on Channels 00 - 60 - Very Wideband 27, 49, & 53 MHz, receivers may be accommodated on request – 2.4Ghz controlled at impound

Pilot Entry Fee \$15 a day or \$25 both days - - - -
Parking Donation Requested from Spectators

Saturday's Events

Best Scale
Most Beautiful
Best Ducted Fan
Best Sport Plane
CD's Choice

Sunday's Events

Best Scale
Most Beautiful
Best Mini-Electric
Best Multi-motor
CD's Choice

Planes Must Fly To Be Considered for Any Award

Open Flying Possible on Friday
Night Flying Possible, Weather Permitting,
Friday & Saturday Nights
Refreshments will be available at the field both days.

Potluck picnic at the field on Saturday evening.

Come and join us for two days of fun and relaxed electric flying.

Come, Look, Listen, Learn - Fly Electric - Fly the Future!

Saturday's & Sunday's Awards:
Plaques for 1st in each category

Merchandise drawing for ALL entrants



Photo of Entrance to MRCS Site off 7 Mile Rd.

To locate the Midwest R/C Society 7 Mile Rd. flying field, site of the 2010 Mid -America Electric Flies, look near top left corner, where the star marks the spot, near Seven Mile Road and Currie Rd. The field entrance is on the north side of Seven Mile Road about 1.6 Miles west of Currie Rd.
Address: 7419 Seven Mile Road, Salem Twp, MI 48167-9126 - numbers on the fence
Mid-America Flies Hotel List – 2010 Please call the hotels for current rates

Possible Places to Stay

Please note that this list is not updated and some phone numbers may have been changed.

Novi Hilton
 21111 Haggerty Rd.
 236 rooms
 800-445-8667
 248-349-4000

Sheraton Oaks
 27000 Sheraton Dr.
 206 rooms
 248-348-5000

Travelodge Detroit
 21100 Haggerty Rd.
 124 rooms
 800-578-7878

Detroit Marriott Livonia
 17100 Laurel Park Dr. N.
 227 rooms
 800-228-9290

Hampton Inn Northville
 20600 Haggerty Rd.
 125 rooms
 800-426-7866 or 313-462-1119

Wyndham Garden Hotel
 42100 Crescent Blvd.
 152 rooms
 800-222-4200 or 248-344-8800

Holiday Inn Livonia
 17123 Laurel Park Dr. N.
 225 rooms
 800-465-4329 or 313-464-1300

Hotel Baronette
 27790 Novi Rd.
 149 rooms
 248-349-7800

Days Inn Livonia
36655 Plymouth Rd.
72 rooms
800-325-2525 or 313-427-1300

Comfort Inn Livonia
29235 Buckingham Ave.
112 rooms
800-221-2222 or 313-458-7111

A Video Worth Watching

From Gary Gullikson Garden Grove, CA

I seldom recommend videos on the Internet. They are usually accompanied by absolutely horrible music and really aren't generally that good, but this one is worth your time! KM

Hi Ken,

Glad the shoulder is getting better. Haven't flown the ME-262 after the re-build and re-wiring, since heavy southern California rains have our field full of weeds, which is unfriendly to small wheels.

Here is a fancy video of my friend Bob Goff's geared inrunner electric DH Mosquito built from Cleveland plans. He used the Mega motor/inner-demon gear drives out of his recent successful Amelia Earhart Lockheed Electra, which was also from Cleveland plans. He values light weight flying ability with sticks showing semi-scale models more than scale sheeted fuselage models. The take off, fly with scale aerobatics in our confined and hard dirt/weedy venue at Fairview Park, Costa Mesa, CA. Video is by a friend of Bob's, quite professional with lots of special effects.

<http://www.youtube.com/watch?v=9ipu9NxxvKnY>

The March EFO Meeting

The March 11 meeting was held at Ken Myers' house and was well attended with lots of projects shared.



Hank Wildman showed us the F-14 that he's working on. It is an old glow pusher kit from sometime in the 80's or early 90's. Hank is converting it to EDF power and was seeking some advice on the setup of the power system.



James M shared his new and latest Mountain Models Swtichback aerobatic plane. He loves the Mountain Models kits, and especially the Switchback. This is his third small one and he's got the large one as well!



Roger Wilfong is in the process of resurrecting a basket case. It is an E-Flite Beaver that got "bonked" pretty hard at the field last year, and its owner didn't want to redo it. Roger has it stripped and most of the major repairs completed. He's now deciding on what "Beaver" cover scheme it will look best in.

Keith Shaw brought a Buecker Jungmeister. It was originally built by Ellis Grumer, a friend of Keith's from the KRC days. That name may be familiar to some. Ellis was a longtime attendee of the KRC meet. He also designed several planes that were featured in magazines. Some of you may remember the Grandpa/Grandson biplanes that appeared in *Model Aviation*.

Ellis gave Keith the plane shortly before he died. Keith removed the original covering, did a little “fixing up” of the structure and then recovered it. The model retains Grumer’s “registration” on the fuselage. It also features Keith’s special Griffon design on the vertical stabilizer. Even though Ellis has passed on, his plane will continue to fly. While the motor is the original Astro Flight geared 40, the batteries have been upgraded to a 7S “A123” 2300mAh pack.



Richard Utkan showed the progress on his e'Moth. He noted that he was having a bit of a problem trying to follow the directions and the black and white photos had him scratching his head a few times. Bill Brown and Roger Wilfong, both e'Moth builders gave him a few pointers and noted some of their confusions during construction as well. It is a very nice flying plane, so the “extra” effort is worth it.



Arthur Deane gave us the lowdown on his new foam Avro CF-105 Arrow. Besides sharing the details of the model, Arthur provided us with a lot of background on this best ever Canadian fighter that was scrapped! Between Arthur and Keith we had quite a learning session about this great machine.

Arthur noted that he had quite a bit of foam left over from making his Eagle, featured last month, and even after this build, still has a lot left. We guess we'll be seeing a lot more scratch built foam projects from Arthur!

Ken Myers had a blow-by-blow Power Point presentation that he gave on his conversion of an E-Flite PT-17 into Super Stearman N56772. He showed photos of the full-scale and noted what he did to do the conversion over the last four-and-a-half months.



Bill Brown brought a video to share with everyone. The video was taken at the Ultimate Soccer Arenas and showed Bill and his son, Bill Brown, Jr., flying Bill Senior's Sig 1909 Demoiselle and Sig 1910 Deperdussin. The air was clear of all other planes, except for another 1910 Deperdussin. These planes float around in beauty and grace in a great facility like this. The first few moments of the video show this very well. I think most of you might

have an idea about what happened next. Yep, Junior managed to collide with Senior and two of Bill Brown, Senior's planes lay in pieces on the floor. Being the nasty type guys we are, we did have to watch it over and over and over. ;-)

It is not everyday that you can see two of one man's planes destroyed as well as both of the pilots being named Bill Brown. While we are really sorry for the loss of the very nice planes, thanks so much both Bills for the entertainment value. We hope you get them back together soon!

Ken then took the folks downstairs to his shop where he demonstrated balancing his new Super Stearman with a Vanessa CG rig.



The night was topped off with snacks and airplane talk.

As usual, it was another fantastic EFO meeting.

Our next meeting will be on Thursday, April 1 at 7:30 p.m. at Ken's house again. No, it's not an April Fool's joke. See ya then!

A Winter's Work From Walt Thyng

I finished up a Puddlemaster, but I have no photos of it.

These planes represent about a building season's work. Well not quite. I also built the floats and rebuilt the Faux Ag (aka Fag (-:)).

The E-Hog sits on homebuilt, balsa over foam floats. Note that the rear attachment point uses wing bolts. It is a highly modified Astro Hog with over 100 (land) flights.



The Contender uses a Phasor 45/3, GP SS 60 esc, 4s Turnigy 2600 Li-Poly, and an APC 11x6E Prop. Its all up weight (AUW) is 4.5 lbs with about 125+ w/lb.



The Wilga has a 60-inch span sail of approximately 750 sq.in. She is powered by an Astro Cobalt 40w/Superbox and an APC 16x10E prop. AUW 8.5 lbs



The SureFlite Spitfire came out tail heavy with a Power 25. I changed it to a Power 46 equivalent and repositioned it 1/2 inch forward. It uses a 4S Li-poly. AUW w/P25 4.25lbs.

I'd rather add power than dead weight. I bought this plane for \$2.00 at last year's FVAC. The BOX was crushed, water soaked and dirty, but all the parts were there and undamaged. The retracts are Hobbico that somebody gave me.

The Spitfire's modifications include adding wing fairings, retracts and split flaps. I can't have a Spit w/o wing fairings! I used pink foam to make them. Yes, the Spit is very light pink! It is a stand waaaaay off sport scale early recon version. The pinkies were for dawn and dusk missions where the color was thought to blend in with the pink sky.



More on Binding Spektrum Radios

From John Rossetti

Hello Ken,

Last summer I had a problem with my Unionville Hobby Tiger Moth that I had converted to electric. Initially everything worked fine, but one day both aileron servos went wild. I thought they had failed, so I installed new ones, but they too gave problems. One of the club members suggested that re-binding might resolve the problem --- and it did.

This week I was installing a new Spektrum 6 channel in my Edge and could not get any of the servos to work. Finally I decided to go through the binding process again --- slowly and carefully. Presto --- everything is working fine. Clearly the binding process is the remedy for many problems.

Vacuum Pump For Sale

From Plenny Bates plennyb@mchsi.com

Description:

Welsh 1400 B01 vacuum pump. New price \$1890.00. Belt drive and I believe the motor is 1/3 HP. Very quiet running. I believe it is a vane type

pump and believe has a quart of oil (maybe more) moving around inside the large cast iron pump housing. Industrial quality is evident. Sold as surplus by Iowa State University but far from worn out for purposes of vacuum bagging model aircraft parts.

I could bring it to **Mid Am** or **Coldwater** if there is a buyer. Packing for shipment and shipment itself would be very expensive.

Price: \$80.00 delivered to Mid-Am or Coldwater meets.

I would be happy to supply photos (e-mail) and discuss the set up I used with this pump for bagging wings.

Enclose my e-mail address so the prospective buyer can contact me. It is good for bagging. I did not want to pull more than 4"Hg doing veneer on foam so needed to fuss with the comparator but it worked well. If it were used to put glass on balsa would need to do nothing but hook it up and let it rip.

When new this thing pulls the same vacuum as the units used to evacuate air conditioning systems. And of course run for decades with little service.

Thanks,

Plenny Bates

plennyb@mchsi.com

Planes For Sale

From Leon Narozny

Leon38spl@aol.com or 313 938 3539

All of the planes have motor, Li-Poly battery and ESC included. If you want the Futaba 2.4 RX left in, add \$90.00. Also have many parts including cowls, and canopies, decal sets, inquire.

Included with the plane will be the assembly manual. No planes are crash damaged.

Maxford Ultimate Biplane.....	\$150.00
Maxford GeeBee sportster.....	\$150.00
E Flite Hawker Sea Fury.....	\$150.00
GP SE5A.....	\$100.00
* GP Combat Series F4U Corsair.....	\$175.00
(Jeti 15 Inrunner)	
*GP Combat Series F4U Corsair.....	\$150.00
(outrunner)	
* GP Combat Series Spitfire.....	\$150.00
* GP Combat Series P51 Mustang.....	\$150.00
* GP Combat Series P40 Warhawk	\$150.00
* "belly" landers	



Rick Sawicki and his Electric Powered Legacy Control Line Stunt Plane

From Rick Sawicki Rrjjjsss@aol.com

Hi Ken,

I've included some pictures of my latest electric control line project. It is a Brodak Legacy.

It is the 10th electric u/c stunter that I have built during the past 6 years. Six years ago it was pretty lonely flying electrics in Michigan. since I was the only one! With only a handful in the entire country, I am now happy to report that electric control line has really expanded tremendously, especially during the past two years. Now there are 6 of us in Michigan alone with several others now "suddenly being very interested" in electric power for the Control line pattern event.

Electric power provides an extremely consistent run throughout the entire AMA stunt pattern flight, lasting approximately 5.5 minutes

A little about the plane.

It is the first "modern platform" plane I have built. Prior to this one, all of my projects have been models of the "classic" and "old time era". (The era I

actually flew in...competitively) In fact one past project was the "electrification" of a 45 year old stunter, the story was covered in a prior Ampeer. I found it interesting to note, how little some things have changed.

The Legacy has almost the exact same airfoil and moments as the 45 year old stunt plane I designed back in 1962. The one area that is substantially larger is the stab, which measures almost 30 inches!. The Legacy has a 60-inch span with 690 sq inches. The current framework, as shown, weighs 29 oz. The engine compartment area is "wide open" as I plan to use the model as a "test bed" for testing several various motors and batteries. It will initially be set up with an AXI-2826/12 with 4 cell 3700mAh batteries, PX 50 ICE controller and a Will Hubin timer. The plane, as you see it, was still "in the box" just one week prior. I tried a "power build" schedule just to see what I could accomplished in "1 week".

If anyone would like assistance in electric control line I will be glad to help.

Thanks,
Rick Sawicki



Ken's Progress on the Super Stearman

My conversion of the E-Flite PT-17 Stearman into a Super Stearman is just about complete. I have a few more things to finish up and she'll be flyable.



Upcoming E-vents

April 1, Thursday EFO monthly meeting, 7:30 p.m., Ken Myers' house, 1911 Bradshaw Ct., Commerce Township, MI 48390, phone: 248-669-8124
Everyone with an interest is welcome

April 7, Wednesday Skymasters Meeting, Ultimate Soccer Arena, 867 South Blvd, Pontiac - 7:00 PM An Evening with Horizon - Representatives from Horizon Hobby will join us on their way to the Toledo Expo! Come join us and see a sneak peek of Toledo! The restaurant will be open before and after the meeting for dinner and drinks.

April 9, 10, 11 Toledo Weak Signals RC Expo, Seagate Centre, Toledo, OH
Full information at www.toledoshow.com
If you live anywhere in the area, YOU don't want to miss this one!

May 2, Sunday Radio Control Club of Detroit Watts Over Wetzel (W.O.W.) - Electric Fly-in, Pilot's meeting 8:45, RCCD Flying Field, located in Wetzel State Park, CD Mike Pavlock (586)-295-3053 Event Information [here](#)

June 5 & 6 Balsa Butcher's Keith Shaw Birthday Party Electric Fly-in, near Coldwater, MI., Contest Director: Dave Grife - E-mail or Phone: 517.279.8445 Please e-mail or call with any questions

July 10 & 11 26th Annual Mid-America Electric Flies (the Mid-Am), Midwest RC Society Flying Field, 7 Mile Rd, Salem Township, MI, Starting time both days: 10 A.M., More information in future Ampeer newsletters, contact: Ken Myers Return to Mid-America Flies



The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390
<http://homepage.mac.com/kmyersefo>

The Next Monthly Meeting:
Date: Thursday, April 1 **Time:** 7:30 p.m.
Place: Ken Myers' house
Everyone with an interest is Welcome