the Ampeer

February The EFO Officers 2013

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No Mailed Ampeer Subscriptions

The Next Meeting:
Thurs., Feb. 14, 7:30 p.m., Ken Myers' house (address above)

What's In This Issue:

November EFO Flying Meeting

The November EFO Flying Meeting was a surprise. The weather had turned and it seemed like winter was coming early. Ken had cancelled the November flying meeting. The weekend of 10 and 11 turned out to be pretty nice, but Ken did not 'call' a meeting as he had a prior commitment.

The turn out was excellent and so was the flying weather! A great time was had by all!

Keith Shaw with his 1905 Wright Flyer

As soon as Ken saw that Saturday, November 17 was going to be another pretty good weekend, he called the gathering.

Rick Sawicki brought out a lot of his planes.

James M. also had some very nice flyers out that day.

December 2012 EFO Meeting

The monthly EFO meeting was held at Ken Myers' house on the evening of December 13.

EFO vice-president, **Richard Utkan**, shared a "new" transmitter that he "created". He recently picked up a nice 7-channel Futaba 72MHz radio at a swap meet for $50. He added a Tactic AnyLink to it. (http://www.tacticrc.com/tacj2000.html) He can now fly any of the Flyzone AnyLink equipped planes with it. He also added a FrSky telemetry system. (http://www.frsky-rc.com/Products.asp?BigClassID=17) He now has two 2.4GHz systems for use with his $50 investment. Good job Richard!

Roger Wilfong shared his Camp e'Racer built from a Retro RC kit. (http://retrorc.us.com/katana-3-2-2-1-1-1.aspx)

It is a simple, 3-function, 15.5" design. The kit is laser cut, and the covering is pre-printed. The covering is available in eight color combinations. All of the hardware needed to complete airplane, as well as a pilot with imitation silk scarf, are included in the kit. The plane requires the motor, gearbox and Spektrum brick from a ParkZone Bind'n'Fly. The finished flying weight is in the range of 36 - 50g.

Bill Brown also had his Camp e'Racer. It was also done in the yellow and red scheme. He really likes the way it flies and loves doing slow circuits with it at the Ultimate Soccer Arenas.

Bill also asked some questions about designing a dummy engine for his Wright Model B. He had some photos of the original engine. Later on, Keith Shaw gave Bill some good ideas of how to replicate it.

Bob Blau showed off is scratch-built, blue foam, prop through the wing, F-22 Raptor. He had some blue foam left over from other projects. He got the plans off the Internet. It is mostly assembled with hot glue. The prop hole is 'rounded' at the end of the slot to try and keep the inherent noise of this type down a bit. It flies well and presents itself in a very scale manner in the air.

The members discussed the possibility of turning this design into a ducted fan type.

Hank Wildman brought his current project, a Falcon, which looks very much like a Jet-Cat. (http://www.nitroplanes.com/falconjets.html) Hank has done four months of work on it so far. He has done a lot of work to 'beef up' the structure, since the model has broken up in the air before when used with a turbine power plant.

He also turned the canopy into a hatch for easy access to the the 2 6S LiPo packs which are used in series.

One of his favorite building materials are the paint stir sticks from Lowe's. The inside canopy/ hatch framework uses them.

He also designed and built his own shock absorbing, retractable landing gear. The landing gear also features brakes, which he also built and designed.

Fantastic job Hank!!!

Ken Myers demonstrated the PowerMatch 3-in-1 meter that he reviewed in the December *Ampeer*. (http://www.theampeer.org/ampeer/ampdec12.htm)

Many of the members thought it looked useful and was a good value for the money.

Ken showed his new O.S. OMA-5010-810 outrunner motor. He also passed out a sheet to each member that showed the specification information from Tower Hobbies and the battery/prop test info provided by O.S. Motor on their Web site.

After reviewing the battery prop test data for just a couple of minutes, the members realized that the battery prop test 'results', as published by O.S. Motor, were nothing but 'fantasy' numbers.

That is too bad, as this is a pretty nicely produced motor. O.S. Motor really needs to 'get their act together' as far as publishing data for their motors is concerned.

O.S. Engine/O.S. Motor OMA-5010-810 Preview

By Ken Myers

December 8, 2012 - Revised January 16, 2013

Forward

While helping a friend select a power system for his new, kit built, Sig LT-25, I found that O.S. Engine/O.S. Motor had added several new sizes to their line of available outrunner motors.

The power system goal for the LT-25 is to swing an APC 12x8E through possibly an APC 13x8E at about 400 watts in using a 4S "A123" 2300mAh pack. The glow to electric conversion .xls workbook (http://www.theampeer.org/Glow2Electric/2011-glow2electric.xls) recommended an outrunner weighing between 175g and 275g and having a Kv between 780 and 865.

Name of Plane:	Sig LT-25					
Recommended Largest 2-stroke:	0.32	displacement in cubic inches				
Recommended Largest 4-stroke:	0.26	displacement in cubic inches				
Mfg. Max. Weight:	4.25	lb.				
Mfg. wing area:	724	sq.in.				
Desired watts in per pound:	100	Use 100 if in doubt				
Cubic area:	11.27	cubic feet				
Wing Cube Loading:	6.03	oz./cu.ft.				
Average watts in:	46.84	selected from watts in/cu.ft. table				
Median watts in:	42.38	selected from watts in/cu.ft. table				
Suggested Power:	434	watts in				
Lightest Motor:	174	g				
Heaviest Motor:	271	g				
80% watts in:	347	watts out				
Largest Dia. Prop:	12	in. (see dia. note)				
Prop pitch:	8	in.				
Target RPM:	7772					
Pitch Speed:	58.88	mph - verify with pitch speed table				
Stall Speed:	13.61	mph				
Pitch Speed to Stall Speed:	4.33	:1				
mber of "A123" 2300mAh cells:	2		3	4	5	6
Anticipated Amp Draw:	77.5		52	38.8	31	25.8
Estimated Kv (RPM/v):	1690		1112	823	649	533
Kv (RPM/v) Range High:	1780		1171	866	684	562
Kv (RPM/v) Range Low:	1605		1056	781	617	507
Approx. Battery weight:	160		240	320	400	480
ESC amp rating = or greater	97		65	48	39	32

The OMA-5010-810 appeared to fit the requirement with a given weight of 234g and a given Kv of 810.

Unfortunately, at the beginning of December 2012, there were no reviews of the real world performance for this motor.

I have three O.S. Motor outrunners. They are an OMA-3825-750 and two OMA-3820-1200s. Real world testing reviews appear on the *Ampeer* Web site.

OMA-3825-750 (updated Nov. 26, 2012)
http://www.theampeer.org/OMA-3825-750/OMA-3825-750.htm

OMA-3820-1200
http://www.theampeer.org/OMA-3820-1200/OMA-3820-1200.htm

The outrunners appear to be well made and the OMA-3825-750 has been inservice for over a year on the 'club trainer', which gets a lot of flying time. It is holding up well.

After testing the three previous O.S. Motor outrunners and gathering real world data for them, it was apparent that the data supplied by O.S. Motor was inaccurate. The motors tested at a higher Kv than stated, and the supplied prop performance data was not accurate.

The Two year limited warranty, from a trusted supplier like Tower Hobbies, is a big plus for this motor!

Tower Hobbies/Hobbico - USA
http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXCNVR&P=7

At the beginning of December, 2012*, in the section "NOTES FROM OUR TECH DEPARTMENT", Tower Hobbies stated, "This is the .40 5010-810 Brushless Electric Motor from O.S. Motors." Just a bit further down the page it stated, "FEATURES: For airplanes using a four-stroke .52 cu in (8.5 cc) engine". O.S. Motor's Web site states, "OMA-5010-810 (4-stroke . 52 size)"
http://www.osengines.com/motors/index.html

According to http://www.coastalplanes.com/tools/propchart.htm, a typical 0.48-0.56 4-stroke turns an 11x7 prop at between 10,000 and 11,000 RPM. An APC 11x7 sport prop requires about 630 watts **out** (Pout) to turn at 10,500 RPM.

Depending on the efficiency of the motor, that is about 780 watts in to 830 watts in.

It is typical for an electric conversion to use a prop 1 inch to 2 inches larger in diameter than is typical for its 4-stroke "equivalent", if there is ground clearance for the larger diameter prop. This gives one 'clue' as to what diameter prop to consider for this motor. Unlike a glow motor, the same electric motor can be used in much broader applications, but at least it is a start.

According to the Tower Hobbies' Web page*, "SPECS: Rated Power: 700W" and "Rated Current: 45A". 700 watts in is noted on the O.S. Motor Web site at http://www.osengines.com/motors/index.html. 700 watts in / 45A suggests 15.6V or a 4S Li-Po pack. This is quite interesting when compared to the prop performance data table for this motor as supplied by O.S. Motor.
http://www.osengines.com/motors/motor-specifications.pdf

Singapore Hobby Supplies, http://shop.singahobby.com/?q=node/30933, gives the **maximum** watts in as 1310. It appears that they chose the highest wattage noted in the Owner Instruction Manual for this motor. (http://manuals.hobbico.com/osm/osmg9538-9550-manual.pdf) They noted the **maximum** current as 55 amps. I have no idea where they came up with the maximum amp draw number except that six of the fourteen prop tests are about 55 amps. O.S. Motor gives the maximum current as 80 amps for 5 seconds.

Model Engines, http://www.modelengines.com.au/retail_catalogue_27/51012900_item.html?ref_cat_id=DUBAA, gives the watts in as 666. This is 14.8V (3.7V per cell for a 4S LiPo pack) times 45 amps. It is interesting that they also use 55 amps as the maximum current.

Graupner, http://www.graupner.de/en/products/011d9fbf-1c6d-48d3-9e59-36145b92db13/6634/product.aspx, notes, "Output 885 W". They also noted the "Recommended propeller Best.-Nr. 1326.13x8" and "Maximum efficiency 85%". The Graupner prop appears to be an APC 13x8E.
http://www.graupner.de/de/products/0e83a7f8-937c-4999-aa76-dda2618f2c65/1326.13X8/product.aspx

The O.S. Motor Owner Instruction Manual notes the following for an APC 13x8E; 4-cell, 16.8V, 62A, 1042W, 9930 RPM.
1042W * 0.85 = 885.7W.

This could be how Graupner derived the Output of 885 W.

IF the maximum continuous amp draw is 45 amps, then the amp draw where the motor has an "85%" efficiency has to be less than 45 amps, not more.
9930 RPM / 810Kv = 12.26 Vnet (Vin - back EMF)
back or counter EMF = 16.8V - 12.26V = 4.54V
Rd = 4.54V / 62A = 0.0732258 ohms
O.S. Motor states that the Io is 1.8A at 10V
Resistance Loss (RL) = 10V / 1.8A = 5.5555556 ohms
Pout = Vnet x (A - (Vnet/RL))
Pout = 12.26V * (62A - (12.26V/5.5555556 ohms)
Pout = 12.26V * (62A - 2.2068A) = 733 watts
Drive efficiency = 733 Pout/1042 Pin = 0.7035 or 70.35% not 85%

The amps in the previous example are well above the 'rated current' (45 amps) and watts in (700) as recommended by O.S. Motor.

The Tower Hobbies' Web site* stated, "REQUIRES: 90A brushless ESC" and "Rated Current: 45A". Also on that page it stated, "80-amp ESC was used for the testing". The O.S. Motor Owner Instruction Manual suggests an 80-amp ESC for this motor and a 90-amp for the OMA-5020-490 and OMA-5025-375. This motor is 'rated' 45 amps continuous and 80 amps for 5 seconds by O.S. Motor. A 60-amp ESC should be more than enough, if the amp draw is kept within the O.S. Motor continuous rating.

The definition for Continuous rated current (ICR) (Amperes) is the same as for Rated Current, "The maximum allowable continuous current a motor can handle without exceeding the motor temperature limits."
http://www.engineersedge.com/motors/motors_definitions.htm

The O.S. Motor Owner Instruction Manual states that 80 amps for 5 seconds is the maximum current. This number is a determination made by the manufacturer as to the highest amount of load current a device can reliably carry.

http://www.toolingu.com/definition-460375-83964-maximum-load-current-rating.html

The Tower Hobbies' Web page* stated only the, "No Load Current: 1.8A" without stating the volts.

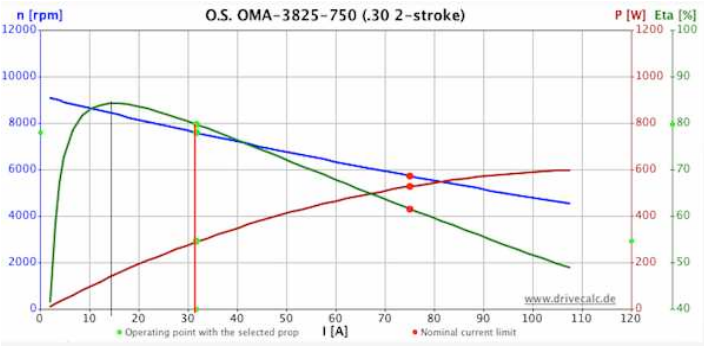
The Io with the applied voltage is an extremely important number when mathematically modeling a given motor. Io is not a constant constant. Io, the no load current, changes slightly with the applied voltage. Io is used to determine the Net Current (Inet) under load. Inet = Iin - Io. It varies slightly with the applied voltage.

None of the five supplier Web sites sourced noted the voltage. It is only noted in the O.S. Motor Owner Instruction Manual. It states "1.8/10V".

It is best to have two no load voltages and currents given as well as the RPM for each. The increase, or decrease, of the Io is not directly proportional to a single given Io. With two no load currents at different voltages, the slope can be calculated, and it provides a bit more accurate Io for a given voltage. Note how the Io was used previously to determine the Pout at 62 amps, but it will be 'off a bit' since the slope of two no load amps and volts could not be determined.

Again note that the Tower Hobbies' Web site* stated, "Maximum Efficiency: 85%".

Theoretical motor efficiency, by itself, is not very useful and can be misleading. The drive efficiency of the brushless motor AND electronic speed control (ESC) must be considered at the anticipated or actual operating current.



Power Graph

The power graph of the OMA-3825-750, **this is NOT the OMA-5010-810**, illustrates that typical hobby motors are not generally used near their maximum efficiency point, which is just over 84% for the OMA-3825-750 motor at about 15 amps. The 3825-750 is used in the club trainer, with a 4S "A123" 2300mAh battery and an APC 12x8E prop and draws about 32 amps static. The drive efficiency at 32 amps is just shy of 80%, which is actually quite good.

OMA 3825-750 Pin = 11.4V * 31.77A = 362.2W
RPM 7700 / 812 (measured Kv) = Vnet 9.48V
O.S. Io at 10V = 1.5A RL = 6.667
Pout = 9.48V * (31.77A - (9.48V/6.667))
Pout = 9.48V * (31.77A - 1.42A) = 287.7 Pout

Not surprisingly, 287.7W / 362.2W = 79.44% as indicated by the previous graph.

The Tower Hobbies' Web site for the OMA-5010-810 stated, "kV: 810". It is interesting to note the various spellings used by different suppliers and even the manufacturer for the rpm/V motor constant. It is Kv, and it is directly related to Kt (the torque constant). Kv * Kt = 1355 (sometimes the constant is given as 1352)

The Tower Hobbies Web site *stated, "Weight: 8.3oz (234g)" 234g is 8.25 oz.

Weight in grams is a significant number. It is used, sometimes, to estimate the maximum power by multiplying it by 3 (3 watts in per gram of motor weight). 234 * 3 = 702 watts in. Apparently O.S. used this method. It is NOT exactly valid. The similar 253g Cobra C-3525/10 notes a continuous amp draw of 62 and a Maximum Continuous Power on 6S Li-Po of 1380 Watts in.

1380 Pin/ 253g = 5.45 watts in per gram of motor weight.

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_123&products_id=887&osCsid=775f727a42854adb0fdab92f66e233e1

Graupner states "All-up weight, approx. 234 g". The given weight usually includes the motor leads and connectors but not the "+" mount, and prop adapter. Therefore, the all-up weight is greater than 234g.

The Tower Hobbies' Web site* stated, "Length of Motor Can to Backplate: 1.7" (42.5)" and "Diameter of Motor Can: 1.98" (50mm)"

42.5mm is what is shown on the O.S. Motor dimension sheet for the length and 50mm for the diameter.

http://www.osengines.com/motors/motor-dimensions.pdf

Once the 'can' diameter and length are known, a generic name can be determined for comparing various outrunner motors to each other. The generic name for this motor, based on the supplier's data, is O.S. Motor 5043-810, 234g (volume 84.43 cm^3) The similar Cobra C-3525/10 is a Cobra 4351-780, 253g (volume 94.68 cm^3)

Notice that they have approximately the same 'can' volume and are within 30Kv and 19g of each other.

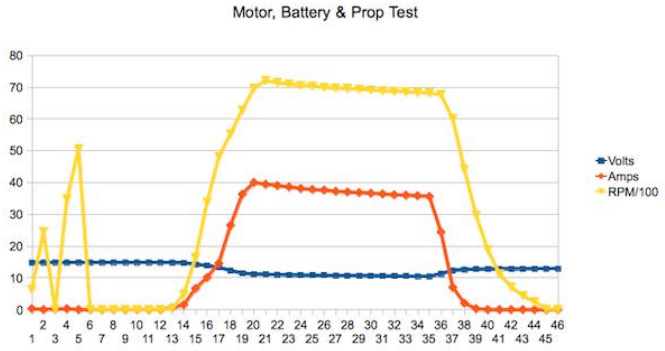
In an effort to help consumers select applications and props for this motor, the Tower Hobbies' Web site* copied the battery and prop data supplied by O.S. Motor.

The O.S. Motor prop data is located on their specifications page.
http://www.osengines.com/motors/motor-specifications.pdf

The O.S. Motor data is inaccurate and not useful. Unfortunately, Tower Hobbies also included a couple of typing errors of their own; 8S where they meant 4S and RPM 7.380 when they meant 7,380.

Tower Hobbies chose only to copy the battery configuration and not the voltages for their Web page. The O.S. Motor specification page shows LiPo Cell 4S Voltage 16.8 and LiPo Cell 3S Voltage 12.6. These are unusual 'test' voltages for the given cells. The voltages they chose to use are the fully charged LiPo battery voltages.

Using 16.8V for a 4S LiPo and 12.6V for a 3S LiPo is a problem. When a real LiPo is used there is a relatively large voltage drop in the first few seconds of the discharge. It is typical for user data to be gathered with a power meter within the first 10 seconds to 20 seconds of a battery discharge.



The graph was created from data captured by an Emeter 2 of a real motor, battery and prop test. The data was captured using a fully charged "A123" 2300mAh battery pack. The voltage spikes seen near the beginning of the discharge were caused by the Ice 50 ESC initialization.

The data was captured over a period of 23 seconds from initialization through the amperage and RPM returning to 0.

Volts	Amps	RPM/100	RPM	MaOut	hh:mm:ss	TempA	
14.79	0.3	6.34	634	0	21:38:55	14.6	
14.86	0	24.51	2451	0	21:38:56	14.6	ESC
14.86	0.2	0	0	0	21:38:56	14.6	Initialization
14.85	0.3	34.71	3471	0	21:38:57	14.6	
14.86	0	50.48	5048	0	21:38:57	14.6	
14.86	0	0	0	0	21:38:58	14.6	
14.86	0	0	0	0	21:38:58	14.6	6 Seconds
14.86	0	0	0	0	21:38:59	14.6	
14.86	0	0	0	0	21:38:59	14.6	
14.86	0	0	0	0	21:39:00	14.6	
14.86	0	0	0	0	21:39:00	14.6	
14.86	0	0	0	0	21:39:01	14.6	
14.82	0.6	0.34	34	0	21:39:01	14.6	throttle on
14.72	1.5	4.79	479	1	21:39:02	14.6	
14.27	6.6	16.28	1628	1	21:39:02	14.6	
13.84	10.1	33.85	3385	3	21:39:03	14.6	
13.3	14.6	48.08	4808	5	21:39:03	14.6	4 seconds
12.31	26.5	55.28	5528	9	21:39:04	14.6	
11.47	36.3	62.82	6282	14	21:39:04	14.6	
11.19	40	69.59	6959	19	21:39:05	14.5	Max. Amps
11.09	39.4	71.99	7199	25	21:39:05	14.5	
11.01	39	71.39	7139	30	21:39:06	14.3	
10.93	38.6	70.88	7088	36	21:39:06	14.3	
10.89	38.1	70.53	7053	41	21:39:07	14.3	
10.84	37.8	70.28	7028	46	21:39:07	14.3	
10.8	37.6	69.94	6994	51	21:39:08	14.3	
10.76	37.2	69.68	6968	57	21:39:08	14.3	
10.72	37	69.51	6951	62	21:39:09	14.3	8 seconds
10.68	36.8	69.33	6933	67	21:39:09	14.1	Including
10.64	36.6	69.08	6908	72	21:39:10	14.1	Max. Amps
10.6	36.4	68.82	6882	77	21:39:10	14.1	
10.56	36.1	68.65	6865	82	21:39:11	14.1	
10.53	36	68.48	6848	87	21:39:11	14.1	
10.5	35.8	68.31	6831	92	21:39:12	14.1	
10.47	35.6	68.13	6813	97	21:39:12	14.1	throttle off
11.32	24.4	67.62	6762	100	21:39:13	14.1	
12.35	7	60	6000	101	21:39:13	14.1	
12.63	2	44.14	4414	102	21:39:14	14	
12.76	0.3	29.65	2965	102	21:39:14	14	
12.79	0	18.76	1876	102	21:39:15	14	5.5 seconds
12.81	0	11.22	1122	102	21:39:15	14	
12.84	0	7.11	711	102	21:39:16	14	
12.85	0	4.36	436	102	21:39:17	14	
12.86	0	2.48	248	102	21:39:17	14	
12.88	0	0.17	17	102	21:39:18	14	Total logging
12.89	0	0	0	102	21:39:18	14	23 seconds

The ESC initialized and rested 6 seconds and the resting battery voltage was 14.86V. From the time the throttle was advanced to the maximum amp draw was 4 seconds. The voltage under load, at the 40 amp draw, had dropped to 11.19V. The power in at that point was 447.6 watts in. As the graph and the data illustrate, it was all downhill from there.

Any point from the maximum amp draw to the throttle off amp draw could be used as the stated

amp draw or watts in. The maximum amp draw for this motor, battery, and prop combination will never be much higher than the 40 amps measured at 14-deg C/57-deg F.

When I share information on powers systems I tend to average, in this case, the 8 seconds from the maximum amp draw to the shut off. To me it is about a 400 "watt" system at about 37 amps and about 7,000 RPM.

An equivalent capacity LiPo would be a 2600mAh pack when using only approximately 80% of the pack's capacity for the 'good health' of the LiPo.

According to Drive Calculator, about 655 watts **out** are required to turn an APC 12x8E prop at 10,300 RPM at an elevation of 287m and 15-deg C ambient temperature. **It is important to note the elevation and ambient temperature.**

The first line of data on the O.S. Motor specification page and repeated on the Tower Hobbies' Web site* is:

Prop Size	LiPo Cell	Voltage	Current	Wattage	Thrust	RPM
12x8E	4S	16.8V	51A	857W	3.2kg	10,300

To turn an APC 12x8E at 10,300 RPM 'requires' about 655 watts **OUT**. 655Wout / 857Win = 0.764294 or 76.4% drive efficiency. That is a somewhat realistic drive train efficiency for an outrunner.

The second line of data on the O.S. Motor specification page and repeated on the Tower Hobbies' Web site* is:

Prop Size	LiPo Cell	Voltage	Current	Wattage	Thrust	RPM
12x10E	3S	12.6V	54A	680W	1.7kg	7,380

To turn an APC 12x10E at 7,380 RPM 'requires' about 369 watts **OUT**. 369Wout / 680Win = 0.5426471 or 54.3% drive efficiency. That is an unrealistic drive train efficiency. The voltage decreased but the amp draw increased to greater than that of the APC 12x8E at 16.8V. It is to be expected that the 12x10E would draw more current at 12.6V than the 12x8E, but not more than the 12x8E at 16.8V.

The rest of the 3S, 12.6V data is also inaccurate.

The other APC 12x8E in the O.S. Motor prop data chart is the last example in the table:

Prop Size	LiPo Cell	Voltage	Current	Wattage	Thrust	RPM
12x8E	3S	12.6V	75A	945W	2.9kg	9,300

To turn an APC 12x8E at 9,300 RPM 'requires' about 472 watts **OUT**. 472Wout / 945Win = 0.4994709 or 49.9% drive efficiency.

That is very unrealistic because when less voltage is applied to the the same motor and prop combination, the current and wattage should drop, not increase as they did in this example.

The prop table data lines 8 through 13 are definitely inaccurate. They show an input voltage of 12.6V, yet the Vnet, RPM / Kv, is higher than the input voltage. Data line 13:

Prop Size	LiPo Cell	Voltage	Current	Wattage	Thrust	RPM
12x6E	3S	12.6V	66A	832W	2.8kg	10,400

10,400 RPM / 810Kv = 12.84Vnet

Data lines 8 through 12 have even higher RPMs stated.

There are 14 examples in the prop performance table. Thirteen of the examples shown are rated above 45 amps, the continuous rating by O.S. Motor.

There was one more absolutely glaring error from just 'looking' at the data.

Prop Size	LiPo Cell	Voltage	Current	Wattage	Thrust	RPM
12x10E	3S	12.6V	54A	680W	1.7kg	7,380
14x10E	3S	12.6V	54A	680W	2.7kg	7,380
11x5.5E	3S	12.6V	54A	680W	2.4kg	11,500

There is no way for this to happen.

It is admirable for suppliers like O.S. Motor and Tower Hobbies to give battery and prop information. Unfortunately, their information is not valid.

Only Mission Modelisme in France tried to simplify the prop selection and stated, "Hélices compatibles hélices 12x8 à 14x10".

Suppliers should always make clear what battery/voltage goes with which prop. Many users are confused by this.

Something like this would be much clearer for everyone.

4S LiPo up to APC 12x8E

3S LiPo up to APC 14x8.5E (not a typo)

Conclusion

O.S. Motor brushless outrunner motors seem to work well and be produced from decent materials.

Unfortunately, the battery/voltage and propeller combinations they state appear to be 'fantasy' numbers. So far, their Kv numbers have not been very accurate either. These numbers are not very useful in helping the end user to decide whether to purchase an O.S. Motor outrunner or not.

I am satisfied enough with O.S. Motor outrunners to have recently purchased another, my fourth. I wish that O.S. Motor would provide more accurate information to its worldwide suppliers.

Reference sites:

O.S. Motor
Main brushless motor page
http://www.osengines.com/motors/index.html

Brushless motor dimension page
http://www.osengines.com/motors/motor-dimensions.pdf

Brushless motor specifications page
http://www.osengines.com/motors/motor-specifications.pdf

Hobbico - Owners Instruction Manual for the O.S. Brushless Motors OMA-5010-810/OMA-5020-490/ OMA=5025-375
http://manuals.hobbico.com/osm/osmg9538-9550-manual.pdf

Graupner - Germany (who appears to be European distributor) - specifications
http://www.graupner.de/en/products/011d9fbf-1c6d-48d3-9e59-36145b92db13/6634/product.aspx

Singapore Hobby Supplies - Singapore - specifications
http://shop.singahobby.com/?q=node/30933

Model Engines - Australia - specifications
http://www.modelengines.com.au/retail_catalogue_27/51012900_item.html?ref_cat_id=DUBAA

Mission Modelisme - France - specifications
http://www.mission-modelisme.com/moteur-electrique-brushless-oma-5010-810.html

* All the Tower Hobbies statements were gathered from their Web site page for this motor at the beginning of December, 2012. They may change over time.

Painting and Detailing Parkzone Albatros DV5a

From David Hipperson
Kilsyth, Victoria, Australia
via email

Just prior to Christmas I purchased a Parkzone Albatros. I must admit to being very fond of the PZ products having had from their "scale" range a T-28, Bf 109, Wildcat and SE5a. Each has performed perfectly and given great service which I suppose means that must mean that they are good value for money. The T-28 and SE5a have been absolutely superb. So, always being an Albatros fan anyway I just had to get one.

I'll be honest and say that the least appealing part was the colour scheme, which I believe was supposed to be von Richthofen's mount. From my perspective it looked a little too toy like for me so a repaint was on the cards. Though I went through my library I did not want to plunge into the "lozenge" camouflage but I did come up with the one shown that purports to be the mount of a Leutnant Klein of Jasta 5. On my example the decals on the upper wing and that on the fin/rudder were very bubbly and peeling around the edges. So, after taking a deep breath these were peeled off and the residue of any adhesive carefully removed.

The scheme is not absolutely right as I wanted to hold on to the fuselage decals which meant a slight adjustment to the proportions of the green band and star. All of the foam painting used artist's acrylics and were simply brushed on. Three paper templates were cut and used for making the crosses and star but no masking was used. Plastic components were painted using Humbrol oils which I guess are similar to US Floquil paints for plastic kits.

The tyres were lightly sprayed with matt aerosol enamel to change from pale grey to sort of black.

The whole job took around 15 hours and the Albatros is delightful in the air. Can't send you any airborne photos at this time as we are not using our flying field due to the danger of summer bush fires but hope to pass some on as soon as possible. I have now added the engine inlet manifolds and coolant pipes but am not bothering with rigging simply out of practicality. (photos on page 10)

Upcoming E-vents

January 21, Monday, Martin Luther King Day - Skymasters Indoor Electric Flying at the Ultimate Soccer Arenas, 11 - 1, 2 hours of flying for $10. More info Roger Schmelling 248-321-7599

February 2, Saturday, Skymasters' Annual Super Swap, 9 a.m. to 1 p.m., New Location - Lake Orion Community Schools, Community Education Resource Center, 455 E. Scripps Rd., Lake Orion, MI 48360

For more information on the Skymasters' Events, visit their Web site a http://www.skymasters.org

February 14, Thursday, EFO meeting at Ken Myers, 1911 Bradshaw Ct., Commerce Township, MI 48390, 7:30 p.m. Everyone with an interest is welcome!

Tuesdays through March - Indoor flying at the Ultimate Soccer Arenas, Pontiac, MI, 11 a.m. - 1 p.m.

David Hipperson's Albatros - more info on page 9

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390
http://www.theampeer.org

The Next Monthly Meeting:
Date: Thursday, February 14, 2013 **Time:** 7:30 p.m.
Place: Ken Myers' house (address above)