the Ampeer

December The EFO Officers 2005

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The Next Meeting:
Date: Thursday, Dec. 8 **Time:** 7:30 p.m.
Place: Rick Sawicki's (see map in this issue)

What's In This Issue:

Review: Air Hogs' Aero Ace

By Camille Goudeseune cog@uiuc.edu

Specifications:

Wingspan 8.5 in.

Wing area 38 sq. in.

Weight 19.1 g (0.67 oz), without stickers

Thrust: full power climb 12 g, cruise about 6 g

Motors: two pager motors

Propellers: 1 3/4 in. press-on, direct drive

Flight duration: 10 to 15 minutes

The Aero Ace is a Li-poly twin-motor differential thrust RTF airplane. It has no moving control surfaces, though the tail feathers can be trimmed like a dime-store balsa glider's. It recharges from the transmitter's 6 AA cells in about 30 minutes. If it takes you two minutes to open the box, that means 32 minutes later you can start a ten-minute flight.

I find that NiMH AA's work as well as alkaline batteries.

It costs $25 to $30. Haggle with your Toys-R-Us manager: it might not yet be in their computer since it's being marketed experimentally.

The manufacturer may know more by the time you read this (Spin Master Ltd., 1-800-622-8339, www.spinmaster.com, toys@spinmaster.com).

My brother accuses me of ritually burning my models' assembly manuals, so I bought this as a challenge to not spend a hundred bucks and a hundred hours upgrading an airplane with the same price, weight, and setup time as a servo.

Let me heretically say that this RTF model is not amenable to The *Ampeer's* precise numerical analysis. If you really want to know its cubical wing loading, pitch speed, and airfoil camber, then you won't be modifying it to increase performance. You'll throw out the airframe and build a proper one from scratch.

But you'd be wrong to "improve" this airplane. This model is a powerful evangelizer for our hobby. More people see me fly this in my office lobby, parking lot, and driveway than ever hear my hotliner's whistling low passes.

And John Doe gets really interested -- pulls out pen and paper – after he's

seen it recover from a dozen impacts and when I tell him it costs him 25 bucks plus 2 minutes, he's very interested. When our security guard investigated the odd phasing-twin sound in the lobby, far from shooing me away, she actually insisted on launching it for me.

And John Doe's children chase it around the park because it's soooo cute. With big googly eyes and a soft pelt, they would cuddle up with it at night. And it would fly fine the next day, after wiping off the drool.

Construction:

It has an EPP foam pod and wings with a drinking-straw boom. The tail feathers are 0.5 mm foam. There are decorative plastic (!) heat sinks on the motors. Tiny charge jack and on/off switch is under the pod. It's as indestructible as a tennis ball, because of the EPP and lightweight.

My model's EPP interplane struts unglued after a few flights. It flew fine without them but looked weird. All right, weirder. In the photos here, I've replaced them with thin drinking straws cut to length and CA'd in place.

Photo shows Plane, Transmitter & CD Note the upgraded drinking straw struts!

Controls:

The left stick controls throttle, the right controls differential thrust. Ease off from full throttle to increase the differential if you need to turn more sharply. Play the throttle to reduce porpoising. When you cut throttle, you of course have no turning control at all, and the plane starts to glide like a crumpled paper ball. Its glide ratio is about 1 to 10.

Motors control speed and direction

Flight Report:

First, set the steering trim with the little knob on the transmitter. As a first guess, twiddle the knob until both motors hum at the same pitch. The Aero Ace doesn't have enough thrust to rise off ground, even from freshly waxed terrazo. (High-tech wheels might help.) Hand-launch any way you like: technique is irrelevant. Even from a spinning Frisbee launch it will eventually recover.

Up and Away!

Indoor flight initially requires an unobstructed space the size of a basketball court. For a pilot used to 72 MHz responsiveness, it takes time to adapt to the 0.15 second lag between moving the sticks and hearing the motor whine change. It feels more like remote suggestion than remote control.

Outdoors, it does best in winds under 3 mph. Since it has such low mass and low airspeed, gusts

and micro-thermals lift it frighteningly. Within two seconds it can leap up 20 feet. Cruising 60 feet high, trying not to lose it to a tree or roof, is in its way as exciting as working a thermal far downwind in a glider worth a hundred times as much.

Outdoors, the humming motors attract dragonflies and even hummingbirds. (Indoors, they attract security guards. Conclude what you will.)

It's more typical to fly low and bash it around, classic foamie abuse but with even fewer consequences. Flying circles around my waist, it feels more like a pet than an airplane.

Combat with other Aero Aces is fun but difficult, because of the mushy controls: planetary collisions are far more common than the mid-air kind.

Radio range is entirely adequate: no glitching even a hundred feet out. At that distance the airplane's hardly visible and, if downwind, it may take 5 minutes to reach you again.

Inverted flight, loops, and rolls are impossible. At least you can't command them. You can only wait for a strong gust and then claim you meant to do that.

Three feet of videotape scotch taped to the forward end of the boom damps its porpoising (pitch instability), and glistens prettily in flight. Multiple cassette tape streamers work too, but they snarl the propellers in wilder crashes.

As the battery fades (unknown capacity, I haven't taken my model apart), the clear symptom is refusal to climb. It just hums along a few feet above the ground.

I expected the Aero Ace to be a silly toy, perhaps fun for an hour before I got bored and went back to aerobats and sailplanes. But, like disposable cameras, it fills a niche I didn't know existed.

It's plain fun to fly this jalopy, and it attracts attention that sticks. So I expect it to endure as long as disposable cameras, too. Particularly since the only practical way to hurt it is with repeated low passes over an enraged kitty cat.

(*Thanks Camille for a review of a really different kind of flying machine! Some of you may recognize Camille's name, as he is a constant contributor to Quiet Flyer magazine. Check out his review of the New Ultrafly Motors in the November QF. KM*)

Grant Calkins Gray Delta

From Grant Calkins GrantCalkins@adelphia.net

Hello Ken,

I am writing to show EFO readers my latest electric, the Gray Delta. This plane started life as the Mini Delta 2000 kit for glow power from Windsock Models (now virtually defunct) in the UK, but I've made so many changes (improvements?) that I felt OK renaming it the "Gray Delta".

Power is an AXI 2820/10 motor-Jeti Master 40 ESC with 10x5E prop and 3S2P Thunder Power LiPo. Current at full power is 33A. The wingspan of the model is 36" and it has an all-up weight of 56 oz. The canard is static. I added tricycle landing gear. On it's maiden flight roll, the Gray Delta went straight up when I applied up elevator! This AXI on "hard timing" is so strong that I had to keep the throttle below 1/2 to keep the plane in sight. Thank heavens for the bright diamond patterns on the upper wing (the camera fails here; they really are a bright fluorescent green), or it would be difficult to tell if the plane was upside down or what on an overcast day. On subsequent flights I switched the motor timing to 'soft', which yields less power in exchange for increased efficiency and lower current draw. The plane is easier to handle with that setting, and flight times exceed 15 minutes.

Cheers from Southern California.

Grant and his Gray Wing

More on AXI/Model Motors

From Don Belote dkb923@wcnet.org

Ken,

I have been using AXI Motors for two years now. I have about 25 of them, from the smallest to several of the 4100 series. I have had no problem with any of

them. As far as I am concerned the AXI is the OS of the electric motors.

As far as any of them being mislabeled, I don't think I have any. Although a few seem to have more power than you'd expect. I especially like the 2820/10 and the 2826/10. These work great on three Li-Poly cells. An APC 11x5.5E prop on the 2820/10 and an APC 13x 6.5 prop on the 2826/10 give loads of power.

I have found that the 12 turn windings on these two motors need both a larger load and four cells to develop their maximum power. Hobby Lobby, in their new catalog (#46), lists the 2820/08 and 2826/08. They do not give much information on it. What I think it is that it is for Hotliner type Sailplanes but I'm not sure of that.

(*Thanks for your input Don. I am sure that most folks would agree that these are very dependable and reliable motors. I was just sharing what I personally experienced. Will I get more AXI motors? Probably, but right now I'm very happy with the one and only Hyperion I have, a Z3019-10, and I do have plans for more Hyperion motors as well. The new Z40xx looks very interesting! KM*)

And More

From Jim LaLone lalone@rcn.com

I also purchased an AXI 2820/10 from Hobby Lobby in mid-August of this year. Even though I had read about the issues you had with this motor, I decided to give it a try anyway. It seemed like a good match for the Great Planes Ryan STA that I'm building. And besides, I wanted to try a brushless outrunner.

I ran it up on the bench, and it looks like it matches your experience. The prop was an APC 11x7E, battery is a 7-cell pack of Sanyo RC2000, and the ESC is a Jeti JESAP40. Electrical measurements were made with an Astro Flight Super Whattmeter. With a full charge on the pack, the motor was drawing 32 A, 245 W, and a prop speed of 7500 RPM. That is much more current and RPM than the 24.2 A, 6650 RPM shown on the Model Motors web site for this prop and battery configuration.

Using MotoCalc, if I change the RPM/v to 1300, I get current and RPM similar to what I measured. But, I suspect that I can still use this motor in the Ryan STA, just throttled back a bit more.

In the November Ampeer you implied that your AXI 2820/10 was dead. What was the failure mode? I only ask because if it was operator error, I'd like to learn what to avoid.

I flew it four times with a standard 10x6 Master Airscrew Wood prop, CC Phoenix 45 and 10 RC1700 cells. Made clicking noise that I've not investigated yet. Don't do it. KM

What I Think is Going On

Let's look at some data for the AXI 2820-10 with an APC 11x7E:

AXI site:
7xRC2000, 7.5v, 24.2 A, 6650 RPM, 181.5 watts in
Comparison using Drive calculator, Version 2.11, database 010:
Input volts: 7.5v, 28 A, 7143 RPM, 210.3 watts in

B. König, www.kb-modell.de:
Unk 7 cells, 7.8v, 27.9 A, 7350 RPM, 218.74* watts in
Comparison using Drive calculator, Version 2.11, database 010:
Input volts: 7.8v, 30.1 A, 7381 RPM, 234.5 watts in

flyingmodels.org:
Unk 7 cells, 7.52v, 21.4 A, 6390 RPM, 161 watts in
Comparison using Drive calculator, Version 2.11, database 010:
Input volts: 7.52v, 28.2 A, 7159 RPM, 211.9 watts in

Jim's Data:
7xRC2000, 7.66v, 32 A, 7500 RPM, 245 watts in
Comparison using Drive calculator, Version 2.11, database 010:
Input volts: 7.66v, 29.1 A, 7270 RPM, 223 watts in

Jim's data / AXI site data:
Volts: 2% higher, Amps 32% higher, RPM 13% higher
Jim's data / König data:
Volts: 2% lower, Amps 15% higher, RPM 2% higher
Jim's data / flyingmodels.org data:
Volts: 2% higher, Amps 50% higher, 17% higher
Jim's Data / Drive calculator data:
Volts: same, Amps10% higher, RPM 3% higher

Problem 1: Model Motors has recently updated the specifications for this motor. I had heard rumors of

this, but it became a fact when I checked out the updated MM Web page for this motor.

Old data:
Kv=1100 RPM/v, Io= 1.9 amps @ 10v, Resistance 0.0390 ohms

New data:
Kv=1200 RPM/v, Io= 2.3 amps @ 10v, Resistance 0.0390 ohms

It appears that while Model Motors updated the motor data, they did NOT update the battery/prop data, rendering it completely useless, as well as the fact that I found out this data is NOT measured but simulated.

Problem 2: APC changed the prop design of the "E" series props. While doing some testing on my AXI 2820/10 I accidentally broke the prop I was using. It was then that I discovered that I had two different props in the same type of packaging with the same labeling.

I got out the calipers and measured the hub thicknesses. The "thick" one, which is the current version, measured 0.385 in. or 9.779mm, both "thin" ones measured 0.285 in. or 7.2389mm. I weighed them on my digital scales and found that the "thin" hub ones weighed about 15g each and the "thick" hub one weighed about 20g. I checked the APC Web site at apcprop.com. They had posted that a 10x7E had a hub thickness of 0.31 in. or 7.874mm.

I sent an email to APC and received the following reply;

"The original prop (15 grams) met with disfavor due to interference with the larger spinners. The subsequent design has the blades shifted forward to fix this problem. Other thin electric props have been modified as well. All of our stock is up to date. Hobby shop inventories, (two years or so), might still have the old style.

Regards,
Fred Burgdorf"

My AXI tests showed that these two variants of the same prop had significantly different current draws and RPM on the same battery and motor.

With two major problems in collecting motor/battery/prop data, it is no wonder that the numbers are all over the place. There is no way to know what version of the motor or APC 11x7E prop flyingmodels.org or B. König used.

Jim's data appears to be based on the current motor and prop versions, as well as the data in the Drive Calculator spreadsheet.

The question still remains, if we can't trust the manufacturer's data to help us in selecting the correct motor for our specific application, who can we trust?

Winter 2005 Indoor Flying in Fenton, MI

From Dan Schwartz Hippo@FoamFly.com
www.FoamFly.com
4077 WoodCreek Dr.
Ypsilanti, MI. 48197
TEL: (734) 528-9446

Hello all,

I wanted to let you all know the schedule for some indoor flying that will begin this Saturday from 1:00 to 4:00pm at Premiere Indoor Sports in Fenton MI. This is a regular event (although at varying days and times) 3-4 hours of indoor flying for about $15/pilot

The place is well lit, and heated, so winter nights are great there. It is over twice the size of the gymnasium where we flew in Saline last year. Last year Premiere Sports was only mildly "infested" with hovering 3D flyers, and although I don't organize the events I've been successfully asserting the rights of park flyers to have a traffic pattern. Here is the tentative schedule:

October 15, 2005	Saturday	1:00pm - 4:00pm
October 21, 2005	Friday	5:00pm - 8:00pm
Nov. 5, 2005	Saturday	9:00pm - 12:00am
Nov. 12, 2005	Saturday	9:00pm - 12:00am
Nov. 19, 2005	Saturday	9:00pm - 12:00am
Nov. 26, 2005	Saturday	9:00pm - 12:00am
Dec.3, 2005	Saturday	9:00pm - 12:00am
Dec. 17, 2005	Saturday	9:00pm - 12:00am

More info here:
http://www.htugrandblanc.com/Events/PreimierIndoorSportsSchedule2005.htm

Email me with any questions. Hope to see you there!

Hobby Lobby is Hurting Electric Flight With Overstated Ads!

Editorial by Ken Myers

You have seen the ads for months now. Hobby Lobby claims that the AXI 4120/14 motors are 44%

more powerful than a .40 glow engine. This is not true, and it is very misleading.

Hobby Lobby's claims are based on part of one sentence, taken out of context, of one review of the O.S. .40 LA engine written in 1997. You can read the full review at http://www.osengines.com/reviews/osmg0040-rcr.html.

The review, originally written by Brian Lee, was published in RC Reports. No prop data or rpm was presented in the review. The partial sentence Hobby Lobby used in the ad actually relates to the sound produced, not the power.

One sentence Hobby Lobby didn't give in the ad was the summary sentence at the end of the review. Here is that sentence in its entirety. "It definitely falls into the low power range for 2C .40's, but for many modelers, its positive features will more than outweigh its modest but acceptable performance."

Now, exactly how does the AXI 4120/14 relate to a .40 glow engine?

I can only make some guesses. I'm not sure what prop they are talking about in the ad when they give the size as a 14x9.5, but they do sell a 14x9.5 CAM Folding Prop. Using the prop power constants from Mr. W. Geck of PF 3.08 and PC 1.089 for that prop yields about 403 watts out at 6820 RPM. The theoretical pitch speed for the 14x9.5 @ 6820 is about 61 mph.

The O.S. 46AX reviewed in the December 2005 issue of *Fly RC* p.37 can swing an APC 12x7 @ 9990 RPM. I chose the lowest RPM figure noted in the review of the .46. Power out using the Emeter prop formula for APC sport props is a PF 3.00 and PC 0.584 for 582 watts out at 9,990 RPM. The theoretical pitch speed for the 12x7 at that RPM is 66 mph.

Obviously the O.S. 46AX is not an O.S. 40LA, and the LA would certainly have less performance than the 46AX, but to say that the AXI has 44% more power is also not true because hardly anyone would use a 9x6 on a .40 engine. It is pretty much standard to use a 10-inch prop and sometimes an 11-inch, with the 9-inch used on racing .40 type glow engines, which put out a lot more power at higher RPMs.

So how does it relate to a .40? Equivalent, maybe, but more power, hardly.

The ad also noted 12 cells. That means 12 of some nickel-based cells. The only way to do equivalent power systems and keep the weight of the power system nearly the same is to use lithium-polymer cells.

All in all, the ad is misleading and full of half-truths, at best.

Which plane would I rather fly? Silly question. The AXI powered one, of course!

Let's just keep the hype and half-truths out of the advertising. These types of ads are not helping the hobby.

Watts In Isn't the Whole Story

By Ken Myers

Bob Aberle recently did a product review of the Hobby Lobby International "Graupner Taxi Cup-II" as an ARF Glow power to Electric Conversion for the *Sport Aviator* (http://www.masportaviator.com/) e-zine, which is part of the AMA Web site (http://www.modelaircraft.org/). The article is located at http://www.masportaviator.com/ah.asp?CatID=1&ID=103.

As usual, Bob has done an outstanding job with his review. He used Hobby Lobby's recommended power system conversion, which is found in the Hobby Lobby Catalog #46. The power system components recommended by Hobby Lobby are:
Motor: AXI 2826/12
ESC: Jeti Advance "PLUS" 40 amp brushless "Opto"
Battery: Thunder Power 3S2P 4200mAh Li-Poly

Here is a quick review of his data:
Wing Area: 597 sq.in.
RTF weight: 96 oz.
Wing Loading: 23.16 oz./sq.ft.
*CWL: 11.37 oz./sq.ft. (Level 5/sport & sport scale 10 – 12.99 oz.)
Motor: AXI 2826/12
Battery: Thunder Power 3S2P 4200 Li-Poly
Watts in/lb. APC 13x10E: 72 watts in/lb.
Watts in/lb. APC 13x8E: 59.5 watts in/lb.
*My calculation

Bob really likes the way this conversion came out and enjoys flying it very much, but could this conversion be better?

I used a spreadsheet to get the following data for the output of the AXI 2826/12. As with all of these types of tools, they must be taken with a grain of salt!

13x10 APC E | No Gear / as measured

Speed [rpm]	6443	**Current [A]**	38.2
Static thrust [g]	1559	**Pin [W]**	416.6
Vopt [m/s]	22.5	**Pout [W]**	320.2
Vopt [km/h]	81.1	**C. dens. [A/mm^2]**	n.a.
Efficiency [g/W]	3.7	**Motor efficiency Eta**	76.9%

13x8 APC E | No Gear / as measured

Speed [rpm]	6878	**Current [A]**	31.9
Static thrust [g]	1924	**Pin [W]**	355.4
Vopt [m/s]	18.8	**Pout [W]**	282.3
Vopt [km/h]	67.6	**C. dens. [A/mm^2]**	n.a.
Efficiency [g/W]	5.4	**Motor efficiency Eta**	79.4%

It can be seen in this "predicting" spreadsheet that the RPM and Power In (Pin) are pretty close to what Bob measured. Bob said that with an APC 13x8E the volts under load were 11.15, amps 32 and RPM 6800. When he used the 13x10E the volts under load were 10.9, amps 39 and RPM 6300. It can also be seen that the efficiency of this motor, being used in this manner is fairly good, but not what might be expected, as the efficiency is in the range of an equivalent Astro Flight brushed cobalt motor. The watts out per pound are 53.3 watts out/lb. for the APC 13x10E and 47 watts out/lb. for the APC 13x8E.

At 6300 RPM using a 10-inch pitch prop the theoretical pitch speed is 59.7 mph and at 6800 RPM with an 8-inch pitch it would be about 51.5 mph.

With the pitch speed, relatively large diameter prop and watts out taken into consideration, this combination makes for a fun airplane to fly, just as Bob noted!

What happens if the motor is changed to an AXI 4120/14? With no other changes, the RTF weight goes up to 100.3 oz. because of the heavier motor weight. That seems like a lot of increased weight, but… the maximum CWL, to keep this plane flying just about the same, is 8.44 cu.ft. times 12.99 oz. for an RTF weight of 109.7 oz. Therefore the 100 oz. plane should seem to fly very much like the 96 oz. plane.

What do we get in exchange for the 4 plus oz. weight increase?

13x10 APC E | No Gear / as measured

Speed [rpm]	6448	**Current [A]**	35.6
Static thrust [g]	1561	**Pin [W]**	392.9
Vopt [m/s]	22.6	**Pout [W]**	321.1
Vopt [km/h]	81.2	**C. dens. [A/mm^2]**	n.a.
Efficiency [g/W]	4.0	**Motor efficiency Eta**	81.7%

13x8 APC E | No Gear / as measured

Speed [rpm]	6771	**Current [A]**	28.9
Static thrust [g]	1860	**Pin [W]**	326.2
Vopt [m/s]	18.5	**Pout [W]**	268.5
Vopt [km/h]	66.5	**C. dens. [A/mm^2]**	n.a.
Efficiency [g/W]	5.7	**Motor efficiency Eta**	82.3%

At first glance, it looks like a loss of performance by changing to the larger motor, but…

Bob's version of the Taxi Cup-II carries an 1800 mAh NiMH receiver pack that weighs between 4.5 oz. and 5 oz. If a Kool Flight Systems UBEC weighing approximately 0.7 ounces replaces that NiMH reciver pack, then the RTF weight remains virtually unchanged.

When using the APC 13x8E:
Watts out: 2826/12, 282.3 – 4120/14, 268.5 – 5% less
Watts out/lb.: 2826/12, 47 – 4120/14, 45 – 4% less
MPH: 2826/12, 52 mph – 4120/14, 51 mph – 2% less
Watts in: 2826/12, 355.4 – 4120/14, 326.2 – 9% less
Amps draw: 2826/12, 32 – 4120/14, 29 – 10% less
Flight time: 2826/12, 15 min., 4120/14, 16.5 min

Conclusion, with the same prop and battery on this plane, it will fly longer at just about the same level of performance due to the AXI 4120/14 being more efficient, as the watts out are about equal.

When using the APC 13x10E:
Watts out: 2826/12, 320.2 – 4120/14, 321.1 – same
Watts out/lb.: 2826/12, 53.4 – 4120/14, 53.5 – same
MPH: 2826/12, 61 mph – 4120/14, 61 mph – same
Watts in: 2826/12, 416.6 – 4120/14, 392.9 – 6% less
Amps draw: 2826/12, 39 – 4120/14, 36 – 8% less
Flight time: 2826/12, 12 min., 4120/14, 13 min

Conclusion, the plane would be "peppier" using the AXI 4120/14 with only a little loss in flight time compared to the 2826/12 using the APC 13x8E prop.

From this example it can be seen that watts in is only a part of the whole equation when looking at possible power systems. The expected power out, as it relates to the overall efficiency of the power system, must also be taken into consideration. When using the APC 13x10E the watts out are virtually equal for both motors, while the AXI 2826/12 requires almost 24 more watts in to produce the same power out.

Bob's plane flies very well, and most people would be very satisfied with it. I believe that using the AXI 4120/14 would make this conversion even better.

Some missing pieces found:

As I was researching this article, I asked RCgroups for anyone using the 4120/14 for some real world data. I got very little helpful information, but this did appear from John E of Bristol, England. "… last season we were displaying a 4120/14 in a Crazy Impulse on 10 and 11 cells, and it is a hugely successful system on a 14x10 APC-E, with Watts in the 300s, but unfortunately I don't have the specific info that you seek."

Then I found this
http://www.rcgroups.com/links/index.php?id=4651
"12x8 3s 22 amps
14x10 3s 40 amps"

This helped me a lot! Using Drive Calculator I came up with the following values if a Kokam 3200 20C 3S1P pack was used:
APC 12x8E, 11.11v, 24.6 amps, 273.1 watts in, 6773 RPM, 51.3 mph, 224.6 watts out, 82.2% eff.

APC 14x10E, 10.69v, 42 amps, 448.5 watts in, 6083 RPM, 57.6 mph, 361.2 watts out, 80.6% eff.

On a 3S, at about the same amp draw as the 2826/12 the motor would be turning an APC 13x10E the 4120/14 would be using an APC 14x10E with a lot more thrust, good speed and better performance.

I am quite convinced that this motor, with a 3S would be a "better" choice for this, or other 40 conversions.

More Info on the Drive Calculator Spreadsheet I Used for the data presented above:

To come up with the data I used for the motor comparisons above, I used an Excel spreadsheet called Drive Calculator. It is available for free at http://www.elektromodellflug.de/datenbank.htm. Look for Antriebsrechner / Drive Calculator near the top right of the page.

I ran several tests of the spreadsheet against some supposed real world data to see how well this calculating tool performed when compared to that supposed real world data.

Here are just a couple of comparisons for the AXI 2826/12 and an APC 14x7E prop that demonstrate the potential accuracy of the Drive Calculator spreadsheet.

B. König, www.kb-modell.de: 10.4v, 27.2 amps, 6020 RPM
Drive Calculator: 10.4v, 28.9 amps, 6213 RPM
flyingmodels.org: 10.2v, 28.3 amps, 6020
Drive Calculator: 10.2v, 27.9 amps, 6110 RPM
My measured Hyperion Z3019-10 & APC 10x7E: 10v, 38.9 amps, 9840 RPM
Drive Calculator: 10v, 37.6 amps, 9537 RPM

For me, these are very good results for a "calculating" program. It must be remembered that altitude, temperature and air density will affect the outcome of real world measuring. I am amazed that this spreadsheet can come as close as it does to real world number. I highly recommend it as a motor modeling aid.

One side benefit of the Drive Calculator spreadsheet is that if you have Microsoft Excel on your Mac, it works great, since one of the creators of the spreadsheet uses a Mac.

The November EFO Flying Meeting

Saturday, November 5, 2005 was probably one of the very best "flying days" of the year! It was completely overcast, but not too "dull." The temperature was about 60 degrees F and there was no wind. It was the ideal day for flying. The turn out was good, and the enjoyment factor extremely high.

James Maughan, a very active EFO member, sent along a few photos that he took on that day.

I had two new "students" up on the Multiplex EasyStar RTF constantly. This plane once again has proven itself a most exceptional trainer. I cannot recommend it highly enough as a beginner's first airplane. The students "loved" flying it as much as I enjoyed introducing them to electric flight via this great trainer.

Richard Utkan with his 1 oz. Rookie RTF.
Flies okay and it is inexpensive for the whole outfit!

Dave Stacer with his Mountain Model's MiniFlash.
Both Dave and James love the Mountain Models Kits.
The EFO members highly recommend them!

The December EFO meeting will be held on Thursday, December 8 at 7:30 at Rick Sawacki's house, 5089 Ledgewood Dr., Commerce Twp, MI 48382. Rick's phone number is 248-685-7056. I have put a mapquest

map on the last page of this issue. Hope to see you there. Remember, you do not have to be an EFO member to attend, just have a desire to learn more about e-power!

Polk Tracker III Radio

By Jim Yuzwalk jjy@pop4.net

Ken,

I can happily say that I am very pleased with the Polk Tracker III radio. It's 2.1 oz lighter than my Hitec Prism 7 with synthesizer. And it is about 3/4 of an inch wider than the Hitec -- or any similar Asian radio for that matter.

And believe it or not, it doesn't feel like a brick!

The weight difference with batteries installed between the two radios is modest: 2 lbs 1.5 oz vs. 2 lbs 3.6 oz is a 12% difference. Without batteries the weight difference is only 1.4 oz with the Tracker III still being the lighter of the two. The Tracker III came with a 900mAh Ni-Cd battery whereas the Hitec came with a 650mAh Ni-Cd.

The radio, with antenna fully extended, balances nicely along a line going through the center points of the two gimbals -- the Hitec is properly balanced as well. The big difference in feel is the slightly wider transmitter case combined with the less angular attributes of the radio's case. The Tracker III's styling is less angular, and softer to the touch. The Tracker III has flat and smooth surfaces near the gimbals with fewer sharp angles than the Hitec.

This translates into a "softer" feel while holding the radio. This is especially noticeable if you fly with fingers versus thumbs.

As far as features are concerned the radio is loaded. It has a built in Radio Frequency (RF) synthesizer that is programmable from the radio's front panel -- no more removing the synthesizer module to change frequencies as with the Hitec. And it has a frequency scanner built in!

The radio checks the frequency you have selected to ensure that it is not already occupied -- if it is, the radio's RF section will not energize. With its antenna fully extended, the radio can be used as a very sensitive frequency scanner at the club field.

I compared the Tracker III's scanner to a Hobbico Frequency Checker. For the test I used my Hitec Prism 7, with its antenna fully collapsed, as a source in one of the bedrooms in my home. Then I traversed the hallway connecting the bedroom to another room while checking the scanner for reception. In all cases the Hitec, Hobbico, and Tracker III had fully collapsed antennas. Here's what I got...

1. The Hobbico detected the signal within 7 paces, approximately 21 ft, of the source.

2. The Track detected the signal within 18 paces, approximately 54 ft – I couldn't get further away in my house.

Other features of note include: 99 model memory, eight character model naming, V-tail, Elevon, Flaperon, EPA, exponential, sub-trim, dual rates, servo reversing, etc.

One of the nicest features is "trim memory." With it you can save a model's trim lever positions. Once you've set your model up and stored its trim positions you can return the radio's trim levers back to their neutral position. If you have quite a few models, this is a very nice feature. Another nice thing is that the frequency the model's receiver is set to is also stored with the rest of the model's information. One other nice feature is the ability to program the various switches on the radio. I set my radio up so that one switch would engage dual rates for aileron, rudder, and elevator. Many other possibilities exist.

By the way, the Seeker 6 receiver is truly remarkable in that it will detect the transmitter's frequency and lock to it.

In other words the receiver is fully synthesized! Now I haven't used the receiver yet, so I can't comment in regard to how well this works. But it does sound like a great idea.

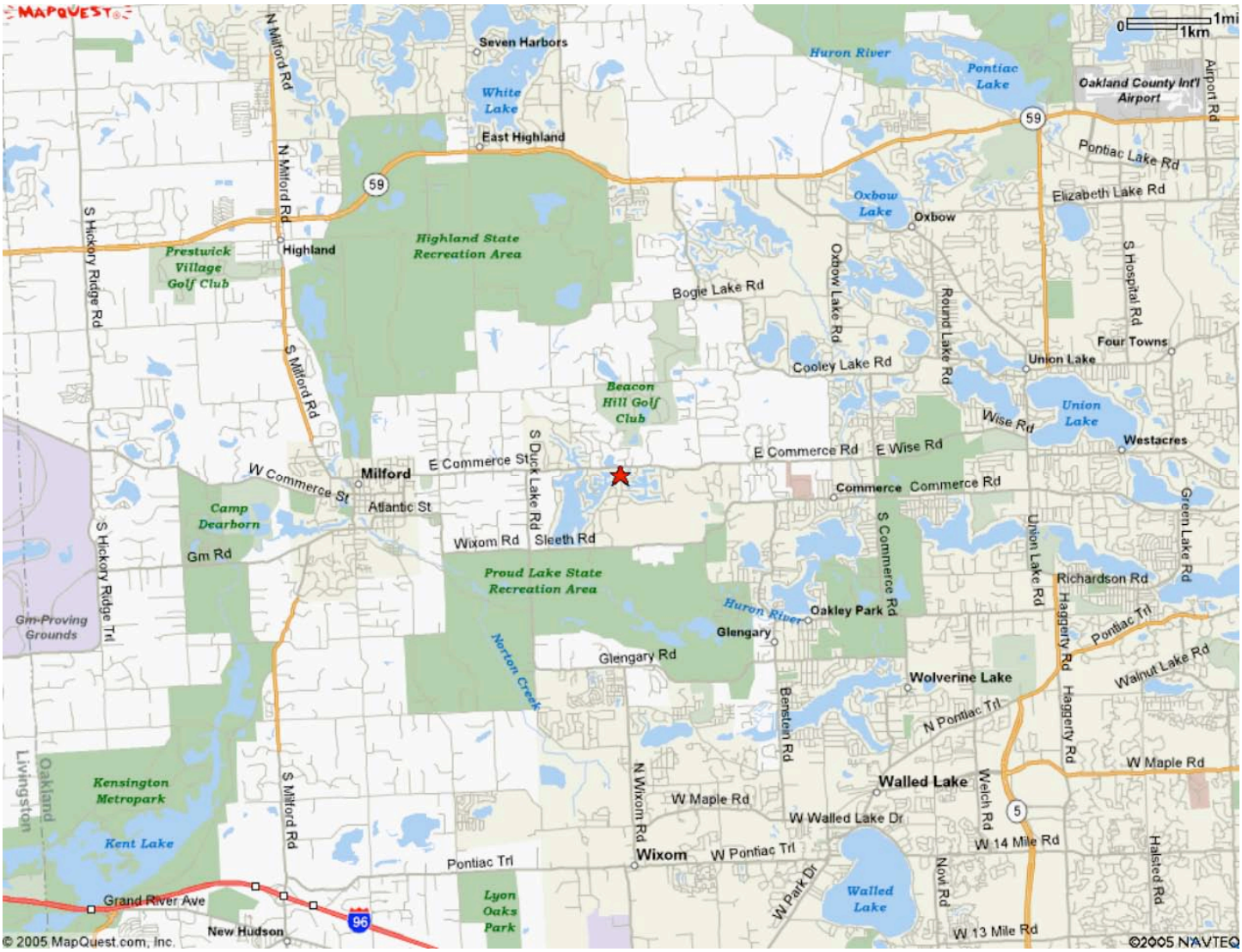
So far I have programmed four electric models into the radio, and I have successfully flown them all: GWS P51 Mustang, Direct 280, Wingo, and U-Can-Do-3D.

Programming the radio is fairly intuitive, and the "trim memory" feature is great. But, more importantly, using the radio is very comfortable -- unfortunately I have carpel tunnel syndrome in both of my hands, so radio feel is important to me. I'd be interested in hearing comments in regard to how the Tracker III feels as compared to the Multiplex Evo.

The Polk Tracker III is designed in the USA, and it is an outstanding value at $180. The manual, written by Lewis Polk himself, is only 26 pages long and is easy to read and understand. You can take a look at the manual at http://www.polkshobby.com/pdf/tracker3manual.pdf

One last thing, the folks at Polk's Hobby are remarkable. They went way out of their way to answer quite a few questions I had regarding the radio before making a purchase decision. In particular, there was one question they could not immediately answer regarding using one switch to handle multiple dual rates. So, they called me back the next day with the answer. Their support staff is very knowledgeable and friendly. We talked quite a bit about the various features of the radio and how they would work with the models I fly. Oh, I almost forgot to mention the radio comes with a five-year warranty!

Best regards,
Jim Yuzwalk
November 24, 2005



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The Next EFO Meeting:
Date: Thursday, December 8 **Time:** 7:30 p.m.
Place: Rick Sawicki's house
5089 Ledgewood Dr., Commerce Twp, MI 48382