



## July 2007 Edition

### 2007 Officers:

|                  |                                  |                |                    |  |                |
|------------------|----------------------------------|----------------|--------------------|--|----------------|
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|                  | <i>anderson.rich@comcast.net</i> |                |                    | <i>cargr@juno.com</i>                  |                |
| Vice Presidents: | Dean Chandler                    | (303) 652-2125 | Treasurer:         | Ken Jochim                             | (303) 444-3206 |
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CLUB MEETING: *July 11th, 2007* at 7pm at  
**Chandler Field**

### BAS MEETING MINUTES

Vance Brand Hangar 44  
June 13, 2006

Meeting called to order by President Rich Anderson at 7:11P.M. With 18 members present.

#### **Minutes**

Rich Anderson asked for a motion to accept last month meeting minutes as they appeared in the last newsletter. Motion by Arnold Peckar with a second by Dean Ehn to accept the minutes. Motion voted and passed.

#### **Treasurer's Report**

Treasurer Ken Jochim reported the following.

|                     |            |
|---------------------|------------|
| BAS Checking        | \$3665.88  |
| Field (runway) Fund | \$8150.30  |
| Jr. Training Fund   | \$2242.75  |
| Total               | \$14058.93 |

#### **Old Business**

Discussion was held on the fun fly for Saturday July 14. Rich Rooney has decided not to have any club sponsored events this year, so it will be an event—just as stated—a fun fly with good food and open flying. Augie Bruno and Rudy Furman will bring and cook the food, and Rich Anderson will be bringing drinks. Roast pig, hamburgers, hot dogs and bratwurst will all be on the menu. The fun will start at 10:00 A.M.

#### **New Business**

The Mal Meador youth program was discussed. Rich Anderson reported that Hobby Town USA (Joe Cowan) has helped on the purchase of three trainers for the youth program. We still need help with instructors and people to assemble the models (Sig Kadet LT-40 ARFs). Boris Sergeev will help compile a flight simulator program for training the students.

A work party on 6/14/07 will fill hole on the grass strip. Dean Chandler is bringing his tractor to help with the project.

Arnold Peckar reported the Arvada Model Club is installing a circle for control line flying. If interested contact Arnold.

#### **Show and Tell**

Arnold Peckar introduced our host for the meeting, Dan Murray. Dan gave a tour of his hangar, which is more of a museum than a hangar. He gave an interesting talk of his love of aviation and his skill is apparent when you see the different types of aircraft he has repaired and built. Thanks for the tour Dan.

#### **Adjourn**

Motion by Tony Kilwein with a second by Ken Jochim to adjourn the meeting. Motion voted and passed.

Respectfully submitted,  
Rudy Glick

## OUT AND ABOUT

### New Field Sign

A new field sign was installed on the west side of the shelter this month, courtesy of Dave Butler. The new sign is CNC laser-cut and powder-coated, and should last a long time. Thanks, Dave!



### Article: Electric Model Airplanes

Submitted by Chuck Armantrout

When I started to get involved with electric model airplanes, I knew nothing about electricity. I didn't know an Amp from a Volt. And, what's more, I've never been good at math, and the first thing I noticed about articles on electric model airplanes is the number of numbers...and the numbers multiply fast. (ouch...bad pun...sorry!)

I don't like numbers and formulas, but here's one formula that's hard to do without:

(V)olts \* (A)mps = (W)atts , example: 10 volts \* 30 Amps = 300 watts. The rule of thumb is: you need about 100 watts per pound to fly a typical RC sport airplane in a typical sport fashion. So the calculation above would apply to a 3lb airplane; IF the motor was capable of running a continuous 30 amps and IF the battery you used could produce 10 volts... See what I mean?

Don't feel bad if you don't. All of this went over my head in a big way. I've always wanted to get involved in e-flight, but was just never able to drive myself to the necessary trouble, and not a little expense, to make it happen. This time, I got stubborn. Starting in the early fall of 2006, I studied Internet documents on e-flight, and monitored discussion group websites (there are lots of these... the web-site I used the most was: [www.rcgroups.com](http://www.rcgroups.com)). I don't know if my research on the various websites helped or hindered, or maybe, to be fair, I didn't do enough. I don't really know. But, there WAS one thing that got through my electric brain block: "a good watt meter is helpful". Helpful? Ha! I don't know how it gets done without one! It tells you how many volts and amps your pack has and can show the number of volts and amps a motor is using while run-

ning, AND how many amps go back into a battery being charged. I asked for one of these for Christmas, and Santa came thru: I got a new Astro Super Wattmeter model 101. Now, to use it, I just needed something to measure! I needed another Christmas quick! Because, the thing that "jumped out at me" about electric systems, especially the new brushless outrunner motors, and the new lithium-polymer batteries, is *cost*. This stuff is not cheap, and the startup costs can mount up. Using less expensive equipment can be very tempting, but beware: "buy cheap, buy twice." However, "If you know what you're doing, do what you know."

For instance, you will want a good quality charger. Suggestion: when you buy your first charger, buy one that will charge more than one battery pack at a time AND, buy one dedicated to the type of battery you intend to use. There ARE chargers on the market that can safely charge a range of various batteries (the Triton is one of these...) but overcharging a "Li-Poly" battery pack can result in the destruction of the battery, and in a worse case scenario; fire. My personal opinion is: LiPos are safe if you respect their power. And they have power! A typical 2100 milliamp-hour (mah) battery can be discharged at 15 times their capacity. In other words  $2100 * 15 = 31500$  mah or about 32 amps! (the constant math drives me crazy, but I think I'm starting to get used to it...a little...) This type of battery is said to have a 15C discharge rate. Other batteries have higher rates; 20C up to 50C. That's a lot of current, and each lipo cell can push 4+ volts. This type of current won't electrocute you, but if you short circuit the battery or overcharge it, you could get burned.

Another piece of equipment you'll need is an ESC; Electronic Speed Control. You have to have one that will *handle the amp flow*. For instance, if your motor is going to be pulling 30 amps, you need one that will allow, at the least, a 30 amp flow. In general, more would be better, and this is up to you, don't plan to push your system to it's max all the time. But if you want to, of course you can.

Finally, after months of research and talks with the guys at the field, in frustration, I allowed my local hobby shop to provide for me. They said, "How heavy?" I said, "Three pounds." They sold me equipment that will see me thru this plane and others if my flying skills allow it to survive. i.e: E-flite 32 BL outrunner motor (continuous current 42A), Castle Creations Phoenix-60 ESC (max current 60A) and Thunder Power 2100 mah 15C batteries (I got two originally) Using my watt meter, I determined that a 13/8 MAS (Master Aircrew) prop pulled 30-32 amps which translated to 300+ watts at full throttle; just right. Further research, on the bench, showed the TP battery wouldn't supply the 40+ amps needed to turn a 14/8 MAS which demonstrated, to me, the difference between a 15C and a 20C battery. (numbers? Remember:  $2.100 * 15 = 31.5$  amps.  $2.100 * 20 = 42.0$  amps.)

So... Up to now: have I actually learned anything? Maybe a few things:

1) *The watts/lb number is good for a guide, but the number I've found to be most helpful is the "Continuous Amps"*

*rating for the Motor.* (Note: different manufacturers express this differently...) If you know a motor can be run at a continuous 30 amps, then you know (with the right prop... see *ground clearance* below...) you can fly your 3lb airplane at 300 watts if your battery can deliver 10 volts, BUT, *you will be flying flat out all the time.* If your motor is rated at 42A continuous, then, (with the right prop) you can fly your 3lb airplane at 300 watts if your battery can deliver 10 volts, and it will not be working as hard. BUT, now we come to another number: KV. This is the number of RPM per volt. This number also relates to *ground clearance.*

2) *A 14 inch prop requires more than 7.5 inches of ground clearance.* This can be tough to get even on a tail dragger. Which brings me to another number I still struggle with: KV=RPM per volt. The E-flite 32 has a KV of 770. So this motor will TRY to turn any prop you put on it at 7700 RPM at 10 volts. This can be important if you want to fly a tricycle gear airplane with only 5 inches of ground clearance! AND motors that turn faster (higher KV), pull more amps with the same prop. Confused yet? Me too. But this idea of ground clearance needs thinking out. This was the one concept that my research seemed to miss. *You need a motor that produces enough watts to fly your airplane using a prop that has the necessary ground clearance.* How do you figure this out? I don't know. I'm still working on this myself. Sorry. (Note: Reading the manufacturing data, and the sales pitches in the catalogs can help...)

3) *Modern electric systems are often less heavy than glow systems.* This is important. For reasons beyond the scope of this article, but mostly because of ignorance, I mounted the rudder and Elevator servos behind the radio compartment. To balance, I have 6ozs of lead in the nose and the airplane still only tips the scale at 3lbs! With some rework on the servo positions, this airplane would lose almost a half pound!

4) *Torque.* I consider this a safety issue. Blocked, electric motors will turn until something gives. Case in point: To make my airplane light, I filled it with lighting holes. Including the nose where the fuel tank normally sits and is now occupied by the battery. The second time I flew this bird I lost it in the sun and crashed it. Being new to this whole thing I didn't think to kill the throttle. The big plastic prop didn't break, no, the torque of the motor twisted the nose off the airplane! THEN the ESC decided enough was enough and shut the system down. With the front of the fuse rebuilt, I tried again. This time when I crashed, it ripped out the firewall, AND the nose. Maybe now I have learned to kill the throttle when unscheduled contact with the ground is expected, but I don't look forward to finding out. Never get your hand in any turning prop! But, whereas a glow engine may whack you and die, *an electric motor will whack you until something makes it stop!*

5) *Alternatives.* Outrunner motors and lipo batteries are not the say all/end all for electrics. There are less expensive inrunner brushed/brushless motors that combined with gear boxes can do the same thing. These can be less expensive and I've seen this type of electric system in action and I

like them, but to get involved in this, I'd have to deal with gearboxes, and that means more numbers! Still, those systems are out there and they work.

What do I like/dislike about electrics?

#### **Dislikes:**

Confusion surrounding electrics: I find computer programs like Motocalc and Electricalc unhelpful. But try them, maybe you will "get it" where I didn't. How do you quickly configure an electric system? I don't know. Maybe you don't. I'm hoping the process gets easier with practice.

It takes time to charge the batteries: With glow, and enough fuel, you can fly continuous. But even with more than one battery, there will be times at the field when you have to sit in the shade, if there is any, and inflict yourself on others (conversation, etc...this is actually a good time to complain about the confusion surrounding electrics... Accept it: you just never know when you might learn something!) while the batteries charge.

Diminishing power curve: Ever have your glow engine cough and die, and have to make a dead stick landing? Well, until the battery is completely drained, the electric motor always turns on. (great for missed approaches...if you don't miss too many...) But I need to say; while the well-tuned glow engine will deliver the same performance until the tank runs dry, the electric motor starts to lose performance from the moment it starts running. The longer the flight, the more throttle it takes to get the same power. Until finally, the throttle doesn't seem to have that much effect...time for that mandatory landing!

#### **Likes:**

Lack of mess: My flight box has lost a lot of weight. (I envy it!) The after-run oil, the fuel, the bottle of cleaning solution; all this stays at home. I still carry the cleaning rags; I throw them over my equipment to keep the sun off!

Convenience: No flipping the prop, or describing the needle valve in unpleasant terms, just drop in the battery and fly.

Power to weight ratio: I'm flying props on my E-flite motor I bought to use on my Saito 91 four stroke! And the motor weighs more than a pound less!

Quiet: With no other noisy airplanes in the air, I can still fly and listen to the birds sing! And all the pleasant /unpleasant comments in the pits...and the radios across the lake...etc.

One more thing, and this is no reflection negative or otherwise on anyone or anything: I'd like to make clear; I got into electrics to continue having fun with my hobby. My left shoulder was destroyed in a serious car accident in 1962, so it's not completely useless. Close...but not completely. Also, arthritis has now made many of my joints less useful. It has become very difficult for me to start a glow engine. I hope to fly my glow models again someday with help from the gentlemen RC flyers that come to the flying field, but for the present, it's nice to just drop in the battery, turn on, and go fly!

## ANNOUNCEMENTS

### OSPREYS ARE BACK!



The Ospreys are back and it's nesting season again. **We need to be careful not to fly in the Northwest section of our flying field.** It has been suggested that we use the East side of the shelter as an imaginary line running North and South as a boundary for flying North of the parking lot. Let's not fly in this NW quadrant of our flying space 'til the Ospreys head south in the fall.

#### New Club Website and Email Addresses

The club has registered a new Internet domain name, boulderaero.org. This means that you can now access the web-page by going to <http://www.boulderaero.org/>. The old address still works fine, too. Additionally, two new email lists have been set up. Mail sent to [officers@boulderaero.org](mailto:officers@boulderaero.org) will be sent to the current club officers, and mail sent to [club@boulderaero.org](mailto:club@boulderaero.org) will be sent to the most current club membership list. Please use the club address carefully; it goes to all club members and isn't intended for discussion.

#### Club Hats Available

The club has received its order of hats with the club logo. Hats are \$12 each and are available in blue/white or red/white. Contact Ken Jochim or come to a club meeting to learn more.

#### From The Editor

I am going to try to keep a calendar of upcoming events in the newsletter in the "announcements" section of the newsletter. Please let me know if you have any local events I have missed.

#### FIELD PARKING

There are parking spaces at the field marked and designated as handicap parking. We've been notified that if City Park Rangers see vehicles parked in those stalls without a proper handicap tag displayed they will start issuing violation tickets. **The fine for this type of ticket is \$125.00.** All members need to be aware that, if you park in a handicap stall without a tag and a ranger comes by, it could become *an expensive day of flying.*

#### UPCOMING EVENTS

*July 14<sup>st</sup>, 2007, 10:00 A.M.*

**BAS Funfly, BBQ, Picnic**

Chandler Field

*July 14<sup>st</sup>, 2007*

**IMAA Dawn Patrol Fly-In**

Mile-Hi R/C Field

*For more info:*

<http://www.milehirc.com/>

*July 28<sup>th</sup>, 2007*

**Vintage and Old-Timers Funfly**

Arvada Airpark

*For more info:*

<http://www.arvadamodelers.com/>

## FLYING FIELD HOURS

9:00am to dusk on weekdays

10:00am to dusk on weekends

### CLUB DVD LIBRARY OPEN

The Club DVD library is open:

[milehighwings.com/club/dvd.htm](http://milehighwings.com/club/dvd.htm)

You can request a title via e-mail and pick up the DVD at the club meeting. Don't miss *Tucson Aerobatic Shootout*, the best R/C video of all times!

Please feel free to [e-mail](#) me your suggestions regarding the new DVDs to add to the library.

*Boris Sergeev, Club Librarian*

## CLASSIFIEDS

Submit any classified requests to James Mack. Classifieds are free to club members!

## INSTRUCTORS LISTING

Call if you need help getting started:

|                   |                         |
|-------------------|-------------------------|
| Tony Kilwein      | 303-438-8500 Futaba     |
| Wendell Wickstrom | 303-494-9324 Airtronics |
| Ken Jochim        | 303-444-3206 JR         |
| James Mack        | 303-704-5464 Futaba     |

## THE YELLOW PAGES

A listing of area merchants, whose products are of interest to R/C enthusiasts; provided as a service to our members.

Some will give you a discount with your current club card.

**Eagle Nest Hobbies**, 360 Main Street, Longmont  
(720-494-4144)

**R/C Hobbies**, 3280 28th Street, Unit 1, Boulder  
(303-443-4446)

**Phil's R/C Playground**, 2850 Iris Ave. Suite k-1, Boulder  
(720-406-8409), Phil Bitter

**Mile Sky Hobbies** (formerly known as **HSJM Ltd. Hobbies**),  
1300 W Midway, Broomfield (303-439-2640), Steve Clark

**Action Hobbies**, 1477 Carr, Lakewood, (303-233-6275),  
Glen A. Magree

**Hobby Town**, 1935 Main St. Longmont, (303-774-1557)

**Mile High Wings** [store@milehighwings.com](mailto:store@milehighwings.com)  
Your source of R/C Simulator interfaces and all-composite  
ARFs: [www.milehighwings.com](http://www.milehighwings.com)

**Don's Hobbies**, 815 10th Street, Greeley (970-353-3115)  
Tony Farro

**Things with Wings**, 6268 W. 10th #2 Greeley (970-352-  
1067) Jim Richardson

**Hobby Town**, 6815 W. 88th Ave., Westminster, (303-431-  
0482), James Miley.

**Heliport Hobbies**, 1400 W. 70th Street, Denver 303-430-  
8828, also Magnum Fuels