Bend Aero Modelers

Flight Report

March 2014

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One of our newest members, Tom Rainwater, brought something a little out of the ordinary to our February meeting. This scale tugboat has motor sounds, bells, whistles, horns and smoke all remotely controlled. More inside!!!

Next Meeting

March 26, 2014
6:30 pm at Jake's Diner

Food available
come early to visit and eat.

From the Editor

by Andy Niedzwiecke

Seems like the months just get closer and closer together and I start worrying about interesting stuff to provide you with in the newsletter and then I end up with almost too much. I'm not complaining! It is great that the members have responded to the call for items of interest to share, which makes this a more personal newsletter and club.

The weather is getting progressively better and better and more and more people are making it out to the field to enjoy. In spite of the occasional wind, we have been getting in some pretty good flying. On a regular basis we are seeing more and more visitors (potential new members) at the field. Our message is getting out that we are a good group of people and are more than willing to help those that show interest in joining our great activity.

I plan on doing an article next month that deals with setting up a twin engine aircraft. I did this once before and lost the programming so I have been struggling to get my Hobbico Twin Star re-set up without the use of a separate syncing box. On that note, I put out a call for help and I got a lot of responses and suggestions from our members and members of other clubs. It just goes to show what a friendly model aviation community we have in our club and in Central Oregon and I certainly enjoy that.

BAM president Waldemar Frank will be addressing necessary safety guidelines for the flight of quad-copters and hovering aircraft at the field so be sure not to miss our next meeting. That along with the usual show and tell should make for a very informative and pleasurable meeting.

See you at the meeting on March 26 at Jake's

Some Safety Reminders

At the last meeting safety officer, Bruce Burgess, asked me to mention a couple of items that need to be addressed at the field. There has been and remains a problem with people flying over or landing in the pit area. You are reminded that there is absolutely no landing in the pit area for any reason and flying over the pits is also a no-no. All flying is to be done North of the runway except when called or when taking off or landing and this applies to quad-copters and hovering aircraft as well. Pilots are reminded when taking off, especially tail-draggers, in an East to West direction to use and maintain rudder control as best you can. If you need practice to do this and you are the only one flying, please announce your intentions so others can be aware in case something goes wrong.

Thank you all for your consideration of our rules and other members.

FROM THE PRESIDENT

Message from the President

by Waldemar Frank

Dear Members, Fellow RC Pilots, and Interested Readers:

Winter time is passing quickly and the next official flying season is just around the corner. Although we regularly fly during the winter when weather permits, this part of the off-season generally remains quiet for the club.

Even so, we have several planned activities scheduled for this year (please see the club calendar for details) with the first activities such as Pylon Racing and Park Flying starting in April. To kick off the pylon racing season, we will need to schedule a work party in the near future (March/April) to carry out some required field maintenance.

The two main things that we need to address within the next month are rolling the field and replacing the torn sections of the geotextile fabric in the pit area. Rolling the field needs to happen fairly quickly because it is weather dependent and requires moist soil to be effective (so we won't have to apply any water). In contrast, replacing the fabric in the pit area requires compacted and dry soil to properly anchor the stakes that secure the fabric to allow it to shrink and tighten (and avoid wind damage due to loose fabric).

Ideally, the rolling of the field would involve an application of Bentonite to help seal the loose gravel and provide a solid, protective surface. However, this requires additional funding (savings) and must be budgeted since the needed amount of Bentonite is significant and would not allow us to accommodate several larger projects in the same year. This field improvement project might be something to consider for next year.

In addition to the fabric replacement, we will also need to start our preparation for the safety fence project that we have been discussing off and on for the past two years. It requires a more thorough cost analysis and design specification to ensure that we can effectively execute and complete this project in a timely manner (e.g., completion by June or sooner). Be prepared to start this discussion at the next club meeting and to form a project committee.

Likewise, I would like to submit our application for BAM to become a leader club, which is mostly a prestigious recognition of clubs by AMA that meet certain requirements. It makes grant applications and general support from AMA easier while acknowledging the hard work that we have been putting into the club for the past few years. In general, we meet most if not all of the requirements. The only area that requires improvement to proceed with the application is the signage and information posted at our field. This is an easy task to complete and we will discuss next steps very soon.

Concerning upcoming events, this year's Park Flying might be affected by planned changes to selected (currently) open areas at Pine Nursery Park. You may have seen a recent communication distributed by Andy Niedzwiecke regarding the addition of baseball fields and other amenities that would likely eliminate suitable areas for park flying, including the grass section that we have been using for the past two years. So we will need to see if we can continue flying at Pine Nursery Park or whether we should look for another park.

As you can see from the brief summary of different projects and events, our quiet time will soon come to an end and we will be back to our busy routine.

See you at the field!

Sincerely,
Waldemar Frank
BAM President

Finwing Penguin— My FPV Experience

By Greg McNutt

I developed a real interest in First Person View (FPV) model aviation after reading a review of the Finwing Penguin in an online article in Model Airplane News (http://www.modelairplanenews.com/blog/2013/01/16/finwing-penguin/). As many of you know, I am interested in the photo/video side of model aviation, so the idea of "virtually" sitting in the cockpit of an RC plane while it soared high in the sky was very appealing. So began my journey of discovery into the world of FPV flying. I soon found out that the world of FPV flying was a very new world. A world in its infancy. A world without a very good road map to getting airborne. Imagine opening up a kit of a vintage RC WWII aircraft and finding no instructions. You are excited about how the plane will look and fly when completed, but you are going to have to put the thing together using your instinct, your experience, your desire. That is pretty much how it is with FPV at this time. Looking for a plug-n-play solution . . . Forget about it! It doesn't exist . . . Yet.

Finwing Penguin's unique canopy and FPV platform

I realized that I had a lot of options available to me. This developing segment of model aviation combines RC aviation with video technology (including video transmission & receiving). There are a myriad of cameras, receivers, transmitters, telemetry applications, global positioning systems, video displays (monitors and goggles) available to choose from. Like a puzzle, you have to figure out what pieces fit together and what pieces don't. Price is another factor. Like many hobbies, the greater the power and sophistication, the higher the cost. Do you want to have a full blown UAV that is capable of going many miles or a more simple, line of sight aircraft, capable of providing pilots (and passengers) with the thrill of flying high in the sky while sitting safely on the ground in a comfortable chair? For me, I chose to start simple, but I also wanted quality components. I ended up going full circle in my quest. I started with the article about the Finwing Penguin on the Model Airplane News website, then explored multiple options available on the web. In the end, I chose to begin with the Finwing Penguin via ReadyMadeRC (www.readymaderc.com/store). ReadyMadeRC specializes in FPV model aviation and offers some good "package" options for those pilots just starting out in FPV flying.

The Penguin, complete with transmitter, pan/tilt module & Go Pro

The package I chose gives me the ability to combine a nice flying and stable airplane (Finwing Penguin), with my GoPro HD video cameras, a 600mW, 5.8GHz AV Transmitter, FatShark Goggles (w/head tracking module), pan & tilt camera mount and my Futaba 10c radio. Though I purchased this package in April of last year (2013), similar packages are still available at ReadyMadeRC. It is interesting to note that the plane (w/motor) equates to 13% of the total FPV setup cost. To give you an idea of the individual components and cost that I chose, see the attached breakdown (below). Keep in mind that the listed cost does not include the GoPro camera. It does include a Pro700 TVL camera. I understand that the Pro700 is a good camera to use in low light environments. Yes, FPV night flying is a real possibility here.

Finwing Penguin (FPV) Package

* **Penguin V2 Kit M2815 Motor**	**$149.99**
* **Castle Creations Phoenix Ice 50 brushless ESC, 34V Max, w/BEC**	**84.99**
* **HS –82MG servos (3 units)**	**59.97**
* **HS-65MG servo**	**21.99**
* **Layer Lens GoPro Lens Protection**	**23.99**
* **GoProHD Pan and Tilt Kit (w/servos)**	**83.99**
* **Fat Shark Dominator Head Tracking Module**	**69.99**
* **Camera Pan/Tilt Kit (w/servos) for Pro700 TVL Camera**	**28.99**
* **Custom FatShark Goggles FPV Starter Package: 5.8GHz,** 2 Bluebeam Whip, RMRC 450mAh 3s Lipo Pack, Pro700 TVL WDR CCD camera, camera cable, Fat Shark Dominator Video Goggles, Fat Shark Dominator 5.8GHz Receiver Module, Fat Shark Lipo Battery for goggles, 600mW 5.8GHz A/V Transmitter, 5.8GHz Cloverleaf Whip Antenna (single, straight), 5.8GHz Planar Wheel Whip Antenna (right angle)	**559.99**
• **GoProHD Camera Cable (audio and Video)**	**8.99**
• **Shpping & Handling**	**35.08**
Total	**$1,127.96**

As of this writing, my plane and FPV setup is complete and ready to go. I have not maidened this plane yet, but by the time this article reaches the BAM Newsletter, I will have had this bird in the air. I intend to bring this plane and FPV setup to our next BAM meeting (in March). You can check out the details of the Finwing Penguin (below).

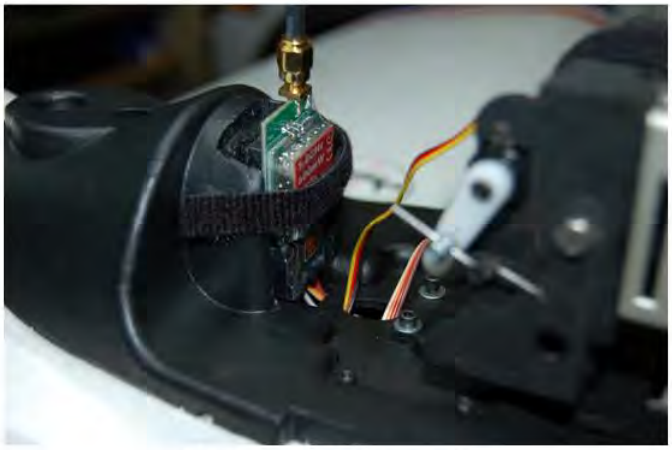
As I mentioned earlier, this segment of the hobby is still in its infancy. As a result, a person can spend a lot of hours researching options, viewing videos, reading the various FPV forums, checking out hobby stores on the web and talking to folks who are already going down the FPV road. I have easily spent 50 hours in research and another 50 hours getting my bird ready for flight. I still consider myself to be a beginner at best. That being said, if you have an interest in taking a closer look at this segment of our hobby, I would be more than happy to spend some time with you and introduce FPV flying to you. Though I am still just a beginner, I can probably save you some time in your journey, by giving you the details of the research that I have done so far.

Penguin Plane and Power Station

- **Wingspan:** 67.7 inches
- **Length:** 48.5 inches
- **Wing Area:** 3.9 (Mainwing area)
- **Motor:** Brushless motor M2815 KV1280
- **ESC:** 60 A
- **Servo:** 3pcs 17g, 1 pce 9g
- **Battery:** Li-Po 11.1V 3300 mAh
- **ARF Weight:** 34.6oz (not incl batt or FPV Devices)
- **Static Thrust:** Motor M2815 1.95kg/69oz.
- **Max Flight Weight:** 77.0oz.
- **Payload:** 35.5oz.
- **Material:** EPO Wing and Fuse w/wood & Carbon Fiber wing tube

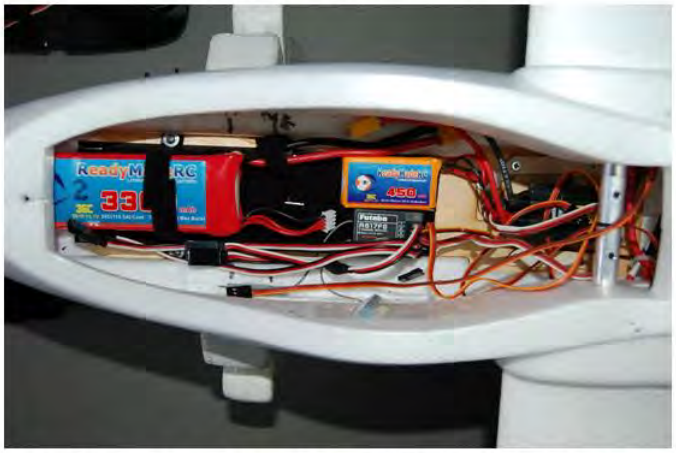
Finally, I want to emphasize that this blossoming segment of our hobby comes with a great deal of responsibility on the part of the pilot. The temptation to test the limits of our UAV's is strong. How high can I fly? How far can I go? How stupid can I get? I see more and more Youtube videos of UAV's being flown in very unsafe circumstances. Some are being flown in crowded urban areas, crowded sporting events, neighborhoods, etc. It seems that a lot of folks want to create videos that will amaze others. Videos that go higher and farther than the last video creator. I found a Youtube video of someone flying the Finwing Penguin at an elevation of 7,500 feet. This guy was flying in and out of the clouds with soft music playing in

GoPro Hero Camera mounted on the Penguin



600W 5.8GHz A/V Transmitter

Lots of room in this cavernous cockpit



Batteries (for plane & video transmitter) + Receiver & ESC

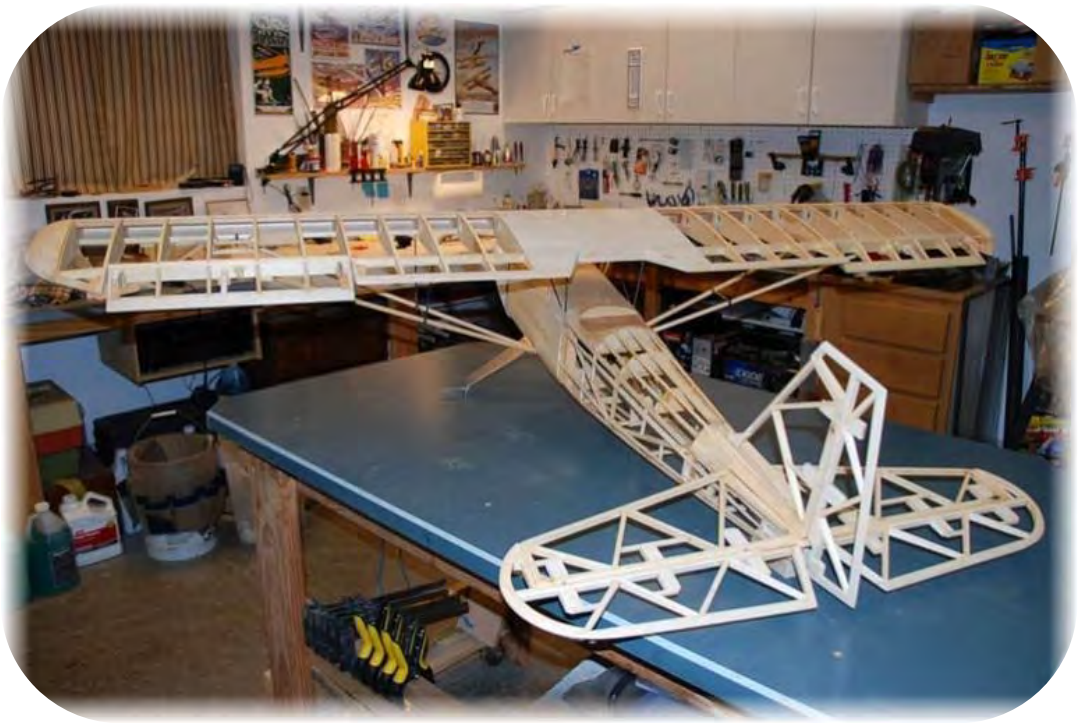
the background. What happens if a family of four comes through those same clouds in a Cessna 182 and runs right into this 5 pound FVP aircraft at a combined speed of 100mph? The answer is obvious. Needless to say, we all need to exercise a great deal of caution when adding UAV's to our hangars. Let common sense, our RC experience and a lot of wisdom help us as we explore this new and exciting segment of model aviation. Happy Flying! Greg

Futaba 10 c w/Fat Shark Dominator Goggles with, battery, receiver & head tracking module.

Tom Schramm is At It Again!

Tom Schramm is currently in the process of completing a 1/5th standoff scale Balsa USA Citabria Pro that he recently acquired fully framed from a D's Hobbies consignment.

The plane is of the old fashion stick build type, with a wingspan of 80", and fuselage length of 43". An O.S. 120 four stroke with McDaniel onboard glow driver will provide power. Covering will be bright yellow 21st Century 'Coverite' fabric (trim/color to be decided), and guidance will be Futaba 2.4 with four Hitec 456 MG servos and one standard Futaba (throttle) servo.



Modifications include wing mounted aileron servos in place of the original single servo, long pushrods/ bellcrank system. He also located the rudder and elevator servos at rear of fuselage. Acquiring a model built by someone else presents a construction and alignment concern. However, this model was well built Although alignment required some adjustments to the wing incidence. He says it should be completed for summer flying season.

At The Field

Doesn't anyone know it's winter???? These photos were shot at a gathering of our members on February 22. I took pictures of the parking area just to emphasize the amount that were in attendance. Ya just never know when you're going to find a bunch of enthusiasts at our field.....

Hey, you talkin' cool…...I'm cool!

Here we go again, cold and parked right next to a gas can

Beats me…..I'll Google it.

Hey, I never noticed this before, I wonder what it's supposed to do

Show & Tell

February Meeting

Andy Niedzwiecke brought in his newly acquired Durafly Retro Jr. It looks stick built but it is all foam…..nice!

Jerry Burgess showed off his OS FR5-300 5-cylinder radial.

Waldemar Frank just got this neat soldering station from Hobby King 60W adjustable

Chris Rankin brought his Bruce Tharpe Reaction 54 jet to show us. A lot of members have seen this fly but you have to see it in person to appreciate Chris' craftsmanship on this project. He also showed us his newly acquired STBL floor stand. It is a really nice product.

Chris also brought in his new discus-launched sailplane. He still has some work to do on it so we'll have to wait a bit to see it fly.

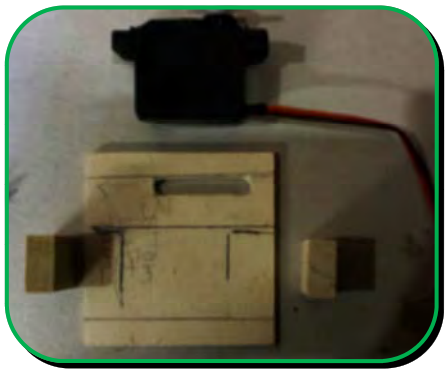
One of our newest members, Tom Rainwater, is not only a model aviation buff but he is also a scale boat craftsman. He seems to do everything in a large way. This scale tugboat has to be seen to be appreciated! It has a myriad of working features and to view all the electronics and craftsmanship that has gone into this project, you can tell he leaves nothing out on his projects. Of course you can see in the picture at the right that this boat drew a lot of attention during the night. It is good to have some diversity within the RC community.

Bob's Big Ad-Venture 60

continued

Our intrepid builder continues!!! Bob Ingram has persevered and is getting close to the exciting stage of building.....covering. Although this is Bob's first build he is proving himself to be quite the builder with minimal help from others. Let's see what Bob has done since last month.

Bob looks like he has created some jigs to get the proper alignment of the fin and the horizontal stabilizer to the main wing. This is something that is very important and it looks like Bob is not taking any chances with alignment. Good job on the jigs Bob!

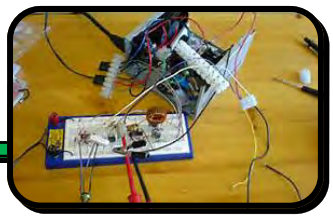


Bob elected to buy the dual aileron servo kits for his Venture 60. Normally this plane uses one servo in the wing center section but offers the dual servos as an upgrade.

Bob altered the design of the wingtip slightly to make for a better covering job.

Here it is.....a trial fit in anticipation of getting close to covering. Just a tad more sanding and a couple more mounting holes to make and she's ready to become pretty, although to some a bare airframe is pretty...I agree.

Modifying a Sport Design for Electric power



by Jon Putnam

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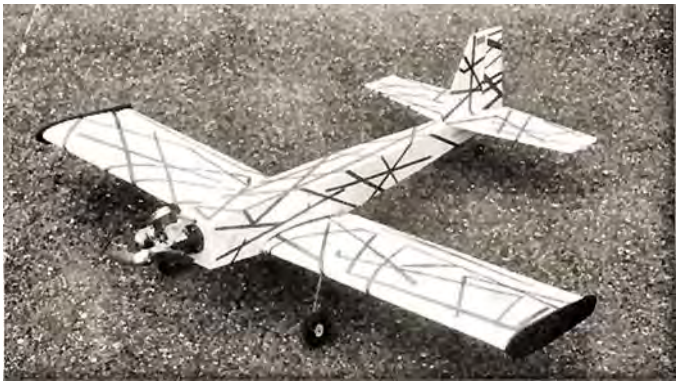


For those of you who missed Part 1 of Beep [See the February BAM Newsletter], it is a low-wing sport or pattern-capable trainer published in the 4/96 issue of Flying Models Magazine. Designed by Derek Woodward, it is built mainly out of ¼" foam board with 1/32" plywood fuselage doublers, foam board ribs with balsa cap strips, and spruce spars. Plans are available from Flying Models Magazine or you can see me about making a copy of what I have which were enlarged by me using the grid method from the magazine plan.

Stats on Beep are:
Channels: 4
Power:
Engine: OS.25FP – OS .32 SF ABC
Motor: 300-350 Watts
Wingspan: 44-50"
Wing Area: 352 in^2
@Weight: 35.30 Oz.
Wing Loading: 14.47 Ounces /Ft^2

Last year at a club meeting I used Beep as the subject for a talk on how to choose an electric motor for a conversion. Part 2 of the Beep Saga will be mainly concerned with those calculations. So without further ado, "Beep, Beep", and off we go.

An Overview of Motor Determination

There are 4 main steps in determining what motor and battery combination you need for a plane:

1. **Weigh Everything:** Determine how many pounds and ounces you need to get into the air.
2. **Determine the Wing Loading:** This is the wing area of the plane in square inches divided by the weight of the plane in pounds.
3. **Determine Your Comfort Zone and Wing Loading:** Wing loading for a plane like Beep differs by whether it is a sport plane, racer or trainer.
4. **Do the Math:** Weight in Pounds x Watts equals the size motor needed.
5. **Choose the Right Motor, Battery and ESC combination.**

Let's look at each one of these steps in more detail.

Weighing the Components: Weigh What You Have, Estimate What You Don't Have.

There is an old adage that if you put enough power on anything you can get a brick to fly. A better way is to figure out how much the brick weighs and then calculate how much power it will need. But what if the plane you are considering is not built or partially built? You can actually get a pretty accurate measurement of what a plane will weigh by calculating how many sheets of what density balsa will go into a plane and then adding it up to get a weight total. It is not easy but it can be done. In the instance of Beep it was mostly built when I decided to do an electric conversion so the weighing process broke down into weighing what I had and I estimating what I didn't have.

I use tables a lot to organize data. Excel is great for this. Here is the basic weight table I created after measuring the components for Beep:

Item	Weight in Grams	My Process
Airframe	493	Weighed, Gram Scale
4 HS65 Micro Servos or Equiv	48	From online ads
Receiver	12	From online ads
480 Size Motor	102.8	Weighed, Gram Scale[1]
3S 2200 MAh Battery	168	Weighed, Gram Scale[1]

40 Amp ESC	30.5	Weighed, Gram Scale[1]
2 Wheels	10	From online ads
10 x 5 Prop	10.9	From online ads
Covering	104	Weighed samples of covering and calculated total square inches of covering
Misc Hardware	20	From online ads
TOTALS in Grams	999.2	Added up the above
Total in Ounces	35.30	Total grams divided by 28.3. I ounce= 28.3 gm grams.
Beep Total in Pounds	2.2 Lbs	Total ounces / 16. I pound = 16 ounces.

[1]Originally I estimated this component and then went back and corrected it once I bought the component

A few things you may wonder about or that are worth mentioning. I weighed things in grams because I have a very nice non-electronic Ohaus gram scale. It's a little inconvenient to have to convert them but more inconvenient to shell out what a new scale in ounces costs. That said, there are now some very inexpensive ones available for under $20 at Harbor Freight. This one does ounces, grams or pounds and sells for $18.99.

You may also wonder about my note that says I weighed certain components like the motor after I bought it but estimated it originally. That is correct. My original calculations for Beep were done with estimates from online ads and then I bought a motor, ESC and battery and went back and updated the table. You may already have components you can weigh. Any method that gets you to a final weight of all the components works. Lastly, doing this kind of work on an Excel spreadsheet is a big plus and will save you time.

Determine Your Comfort Zone and the Wing Loading for it

My research into wing loading said there were 5 main types of prop plane types; sport, sport scale, powered glider, racer, and trainer. I knew that Beep was not a scale plane of any type and by its plan form was not a powered glider or trainer, though one can argue that I am using it as a low wing trainer. That left racer or sport. I am definitely not a "racer" type of flyer boring holes in the sky so that left sport as my Comfort Zone Target.

Here is what a wing loading table looks like. Note that it is subdivided into what I would call small, medium, large planes. Beep noted in Red.

Type	Wing Area in Square Inches	Wing Loading Recommendation in Oz/Ft²
Sport	150-200	10-14
Sport Scale	150-250	17-25
Powered Glider	300-400	7-10
Racer	150-200	12-14
Sport	**250-350**	**15-20**
Sport Scale	250-400	17-25
Powered Glider	500-650	8-12
Racer	250-300	25-20
Sport	400-600	15-20
Sport Scale	450-700	20-30
Powered Glider	700-1000	10-15
Trainer	500-600	17-25
Sport Pattern	700-800	25-30
Sport	700-1000	15-25
Sport Scale	800-1000	20-30
Trainer	800-1400	15-25

Calculating Beep's Wing Loading:

Beep Calculation: Following each figure is how I got the information.

Square Foot Conversion	352 in^2/144 = 2.44 Ft^2	Wing loading is in square feet so this is the conversion to square feet
Wing Loading Calculation	35.30 Oz/2.44 Ft^2 = **14.46 Ounces /Ft^2**	This is the final calculation dividing ounces by square feet

In the Wing Loading Table and in the Beep Calculations you can see that I highlighted in bold red where I think Beep ends up. It has a wing loading of 14.46 Oz/Ft^2. 14.46 is right on the line between the high end of wing loading for the 150-200 inch category and the low end of the 250-300 inch category…. Which is good as it means Beep as built is not in the lead sled category.

Diet Options

So before we get into determining which motor is correct, let's say for fun that you have done all these marvelous calculations and you realize you have a lead sled, a flying brick, a cement sack with wings on your work table. How can you put this baby on a diet and have some hope of getting it into the wild blue? Here are some ideas.

Airframe	Too heavy? Rebuild with lighter material, less glue, buy a new plane, add extended tips to wings to decrease wing loading
Motor	Can you get away with a smaller, lighter motor. Can you use a motor that does not require a 4S battery
Battery	Can you use a smaller cell battery, 3s instead of 4, 2s instead of 3s. Can you use a smaller MAh battery
ESC	Can you reduce the size of the ESC and save weight?
Servos	Instead of standard servos are there any lower weight options such as Micros that meet your torque, size requirements and will save you weight?
Wheels	Consider lighter wheels, sponge instead of hard rubber to reduce weight.
Covering	Will a lighter covering work? Can you get by with a lighter covering on the fuselage and solid surfaces and heavier on the wing where strength counts?

Calculating Power: How Big of a Motor Do You Need?

In calculating what motor you need it comes down to watts per pound to get it into the air. I looked at two different recommendations both of which said that for an aerobatic airplane, which Beep is, that I needed to be in the 100 watts per pound range. The red circles show where Beep "landed" in these charts

Lee Estongoy's Recommendation[1]

Type / Performance Expectation	Watts Per Pound
Sunday Flyers, Sport Models, Old timers	40-50
Mildly Aerobatic Aircraft	60-70
Aggressive Aerobatic Airplanes	80-100
Ducted Fan, Competition Sailplanes, 3-D Aircraft	100 Plus

E-Flite Recommendation[2]

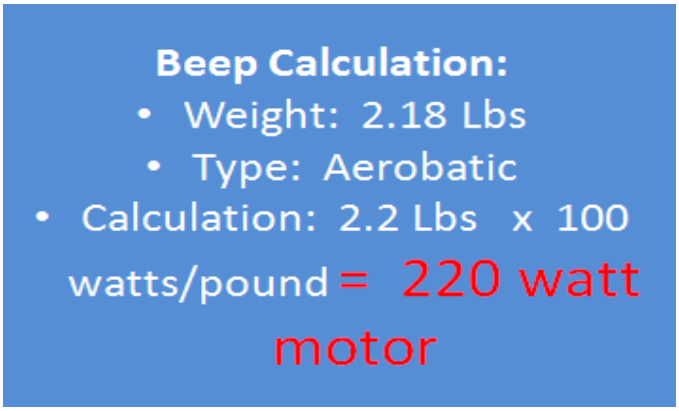
Type / Performance Expectation	Watts Per Pound
Lightly Loaded Slow Flyer or Park Flyer	50-70
Trainer, Slow Flying Scale Models	70-90
Sport Aerobatic, Fast Scale Models (WWII)	90-110
Advanced Aerobatic (Pattern) and High Speed Models	110-130
Lightly Loaded 3D and Ducted Fan Models	130-150
Unlimited 3-D Aircraft	150-200+

[1]Source: Model Aviation, September 2010, *Clean Horsepower* by Lee Estongoy

[2]Source : E-flite Motors Website

Beep Power Calculation

So, based on this set of recommendations I was looking for ~100 watts per pound or as the below graphic shows, for a ~ 2.2 Lb airplane, a 220 Watt Motor.



Choosing the Actual Motor

A motor choice has a lot of different factors thrown in besides just wattage. There are some almost intangible factors that have nothing to do with wattage including cost, reliability (reviews such as on Hobby King are good indicator if it's a piece of junk of not), what your friends and fellow flyers think of it, reputation of the manufacturer, reputation of the vendor.

One tangible factor is Kv. Kv equals RPM per volt under no load. The higher the Kv number means a motor with more winds, thinner wire and more top end speed. Think about slot car race motors that were rewound with thin wire to go until they nearly exploded on the backstretch. At the other end are lower Kv motors which mean less winds, thicker wire, more torque, bigger props, a great combination I would think for getting that scale plane into the air. I felt what I probably wanted for Beep was a motor with a higher Kv as this is a light plane that will want to go fast if you let it.

I looked at a number of motors on various sites and to me the Suppo Motors from Altitude Hobbies in Fort Collins, Colorado (http://altitudehobbies.com) . I liked them for a solid line of products and good customer service. They also have a $3.49 flat rate on shipping which is a nice plus. The Suppo motors which I have used before, appear to be a good blend of quality and price with a level of proven reliability. Can also get spare shafts and parts for them which is a plus. I also had to be straight with myself and say I am not a competitor, I don't need the hottest piece of high-revving iron in front of my plane but on the other hand I don't want to make an investment in a motor that in a week the bearings die on.

Image courtesy Altitude Hobbies

My choice was a Suppo 2814/8. It's a 480 size motor with a maximum watts spec of 380 and a Kv rating of 1100. This extra power gives me a nice cushion in case my weight guesstimates are off.

Here are the specs for the 2814/8.

No. of Cells:	3 - 4 Li-Poly 8 - 12 NiCd/NiMH
Kv:	1100 RPM/V
Max Efficiency:	81%
Max Efficiency Current:	15 - 25A (>75%)
No Load Current:	1.8A @10V
Resistance:	0.072 ohms
Max Current:	35A for 60S
Max Watts:	380W
Weight:	102.8 g / 3.62 oz
Size:	35 mm x 36 mm
Shaft Diameter:	4mm
Poles:	14
Model Weight:	1000 - 1700 g / 35 - 60 oz

One site says this motor is roughly equivalent to a .22 2-stroke or a .32 4-stroke. Incidentally Suppo motors are almost always an anodized gold can and I think are relabeled by other vendors including RC Hot Deals, AXI, and Grayson Hobbies to name a few. When you see that gold can and if the naming nomenclature is of the 2814/8 variety then check the Suppo website and you can find performance stats on it. RC Hot Deals is another site that has good specs and prop recommendations on Suppo Motors. I mention this because Altitude Hobbies did not have these specs.

The Other Parts: ESC

Image courtesy Altitude Hobbies

The rule for an ESC is take the maximum current and add 20% to it. In the case of the 2814/8 the max current is 35 Amps so 35 x 1.2 = a 42 Amp ESC. After another phone conversation with Altitude Hobbies I settled on the Suppo SP-40A, a 40 amp ESC.

The Other Parts: Battery

For the Li-Po battery I checked the spec sheets on the motor and they said I could run it on a 3S or 4S pack. I settled on a 3S 2200 mAh pack as a good compromise between power, flying time and weight. Actually flying the plane will be the proof of how right I was in this choice and I may find that I need to go up to a 4S.

The Other Parts: Propeller

For prop recommendations I looked at what the various sites recommended and one said to prop for about 350 watts continuous power. I also checked test data like those shown below.

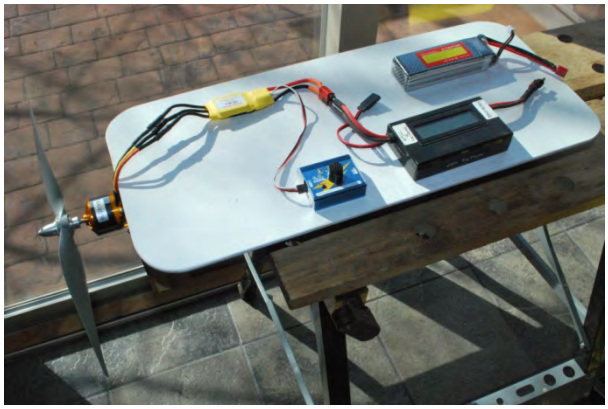
Test Data

Propeller	Gear Ratio	Volts	Amps	Watts	RPM	Speed (mph)	Thrust (g)	Thrust (oz)
GWS HD 9x5	1	7.9	9.55	75	7350	34.8	546	19.26
GWS HD 9x5	1	7.9	7.8	61	6570	31.1	423	14.92
GWS HD 9x5	1	8.8	11.4	100	8190	38.8	670	23.63
GWS HD 9x5	1	9.8	13.25	129	8880	42.0	810	28.57
GWS HD 10x6	1	6.9	10.05	69	6360	36.1	540	19.05
GWS HD 10x6	1	7.8	12.2	95	7080	40.2	681	24.02
GWS HD 10x6	1	8.8	14.4	126	7800	44.3	820	28.92
GWS HD 10x6	1	9.8	16.9	165	8490	48.2	982	34.64
GWS HD 10x6	1	10.8	19.1	206	9120	51.8	1131	39.89
GWS HD 11x7	1	6.8	14.7	99	5820	38.6	745	26.28
GWS HD 11x7	1	7.7	17.55	135	6450	42.8	914	32.24
GWS HD 11x7	1	8.7	20.5	178	7020	46.5	1095	38.62
GWS HD 11x7	1	10.7	27	288	8070	53.5	1454	51.29
GWS HD 12x8	1	7.7	22.4	172	5850	44.3	1062	37.46
GWS HD 12x8	1	11.3	37	418	7500	56.8	1800	63.49

In a call to Altitude Hobbies, I asked about both props and batteries. The owner asked what altitude I was at and I said about 4000 feet. He also flys at altitude and recommends a 10 x 4.7 for most 2814/8 use but for altitude he recommends an 11 x 4.7.

Testing it.

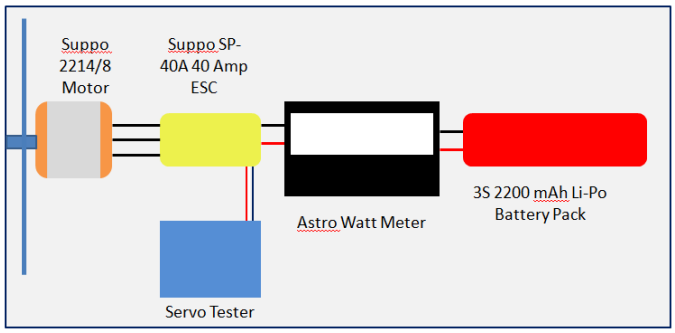
The real proof of course is will the motor, ESC, battery and prop combination you have worked so lovingly to come up with fly the plane? The best way to do this is to finish covering the plane which I am still in the process of doing. In lieu of that there are other means of testing the combo you have chosen. I put together the test stand in the photos to see how far off I was and how closely my results lined up with the published test data for amps and wattage.



The test stand is built of 1” x 4” pieces with a removable motor mount on the front so that I can swap out

It is set up to be used with a portable work stand though you could also use it on a saw-horse by clamping it in place.

In addition to the motor, ESC and battery it uses a Astro Flight Super Watt Meter to measure amps, volts, and watts for a given propeller / motor/ battery and it also includes a servo tester in place of a receiver to control the ESC. Here is a wiring schematic for it:



The snow has now melted enough to do the motor tests outside rather than scattering paperwork and sawdust all over my shop from the prop blast. If you build a setup like this be sure and use normal safety precautions when testing a motor. Make sure the prop is tight and that no lose wires or components will end up in the prop (I use Velcro or hot glue to hold them down) and wear eye protection.

Stay tuned for the next part of the Beep Saga. There may be a delay of a month while I cover it and install components but I have another article in the works on a different subject.

OBITUARIES

Rest In Pieces

Well, fortunately or unfortunately for Jason Westlind, we only have one crash at press time to report. This was the maiden flight of this plane and the takeoff was perfect but the landing……..not so good……

The plane was…..actually still is…….an Aerobeez YAK 54 with a DLE35RA gas engine and it sports a wingspan of 73". Jason reports that it is now fixed and ready to go. Jason commented "I must have used up all my skill in the take-off and was all out on the landing". The good news is that this plane lives to fly another day!

Bend Aero Modelers - 2014 Event Calendar

Last Update: 12/26/2013

- Club Meeting
- Pylon Race Workshop
- Contest Pylon Race
- BAM Renewal Deadline
- Pine Nursery Park Fun-Fly
- Competition Fun-Fly
- National Holiday
- BAM Christmas Party
- Family BBQ & Scale Fun-Fly
- Annual National Model Aviation Day & Firecracker Fun-Fly

January

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1				1	2	3	4
2	5	6	7	8	9	10	11
3	12	13	14	15	16	17	18
4	19	20	21	22	23	24	25
5	26	27	28	29	30	31	

January 1st - New Year's Day

February

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
5							1
6	2	3	4	5	6	7	8
7	9	10	11	12	13	14	15
8	16	17	18	19	20	21	22
9	23	24	25	26	27	28	

March

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
9							1
10	2	3	4	5	6	7	8
11	9	10	11	12	13	14	15
12	16	17	18	19	20	21	22
13/14	23/30	24/31	25	26	27	28	29

April

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
14			1	2	3	4	5
15	6	7	8	9	10	11	12
16	13	14	15	16	17	18	19
17	20	21	22	23	24	25	26
18	27	28	29	30			

April 20th - Easter Day

May

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
18					1	2	3
19	4	5	6	7	8	9	10
20	11	12	13	14	15	16	17
21	18	19	20	21	22	23	24
22	25	26	27	28	29	30	31

May 11th - Mother's Day / May 26th - Memorial Day
May 17th - Pylon Race at Popp's Field/BAM

June

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
23	1	2	3	4	5	6	7
24	8	9	10	11	12	13	14
25	15	16	17	18	19	20	21
26	22	23	24	25	26	27	28
27	29	30					

June 15th - Father's Day
June 21st - Pylon Race at Dorrance Meadow/La Pine

July

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
27			1	2	3	4	5
28	6	7	8	9	10	11	12
29	13	14	15	16	17	18	19
30	20	21	22	23	24	25	26
31	27	28	29	30	31		

July 4th - Independence Day
July 26th - Pylon Race at FOD/Redmond

August

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
31						1	2
32	3	4	5	6	7	8	9
33	10	11	12	13	14	15	16
34	17	18	19	20	21	22	23
35/36	24/31	25	26	27	28	29	30

August 30th - Pylon Race at Popp's Field/BAM
NOTE: Due to a scheduling conflict with Jake's Diner the August meeting is on a TUESDAY.

September

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
36	31	1	2	3	4	5	6
37	7	8	9	10	11	12	13
38	14	15	16	17	18	19	20
39	21	22	23	24	25	26	27
40	28	29	30				

September 1st - Labor Day

October

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
40				1	2	3	4
41	5	6	7	8	9	10	11
42	12	13	14	15	16	17	18
43	19	20	21	22	23	24	25
44	26	27	28	29	30	31	

November

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
44							1
45	2	3	4	5	6	7	8
46	9	10	11	12	13	14	15
47	16	17	18	19	20	21	22
48/49	23/30	24	25	26	27	28	29

November 27th - Thanksgiving Day
NOTE: Due to Thanksgiving and a scheduling conflict with Jake's Diner the November meeting is a week earlier and on a TUESDAY.

December

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
49		1	2	3	4	5	6
50	7	8	9	10	11	12	13
51	14	15	16	17	18	19	20
52	21	22	23	24	25	26	27
1	28	29	30	31	1		

December 24th - Christmas Eve
December 25th - Christmas Day
December 31st - New year's Eve
January 1st - New Year's Day

Club 40 Racing

by Bruce Burgess

We are going to have our fifth consecutive pylon racing season this year. It's hard to believe that we have been racing for this long! We still recall our humble beginnings that quickly became a well-established club activity with regular participation by pilots, helpers, and spectators.

And this racing season looks to be a promising one, too, as we are anticipating a few new pilots: Tom Rainwater from Bend and Ron Wallace from Redmond. Both have expressed their interest and will be a welcome addition to our mix of current pilots. Good luck to both of you!

Even though the last year saw some unfortunate (and unusual) carnage, we had a great season with amazingly competitive races. It is simply a reflection of the intense and refined flying demonstrated by many pilots.

To provide a glimpse of Club-40 racing and get our new season started, we will be holding a race clinic on April 12th at our flying site (Popp's Field). It will include one or two race planes that will be set up for buddy box flying.

If you would like to give it a try and experience the actual racing planes and the challenge of flying around pylons, please join us, watch, or help if you can.

For our new and old racers, check out my basic airplane settings in the February 2013 newsletter.

The race plane of choice is the **Sky Raider Mach II,** which is manufactured by **The World Models Manufacturing Co.** and distributed by **AirBorne Models** here in the US. The ARF version comes in a variety of color choices, including four solid color schemes (white, yellow, orange, and red). I personally like the solid color schemes because you can customize them to your liking.

The airplane costs around $129.99 for the ARF and can be purchased from the below website:

http://www.airborne-models.com/html/productdetails.asp?ProductID=147

By the time you read this I will have assembled one for my backup plane and it should be ready for the racing clinic.

The engine of choice is the Thunder Tiger Pro 40, which is a great running and reliable engine. You can essentially use any ball bearing 40-size engine you want with a few exceptions. If unsure, please confirm prior to participating in a race that your engine and airplane configuration is acceptable for Club-40 racing.

More information about the specific rules for Club-40 racing—including a 2014 Racing Schedule—is available via our club website. Simply go to the event calendar shown on the home page of the website and then click on the listed Pylon Racing event shown for April 12th. It will display the event details and provide the mentioned documents for download.

See you at the races!

The Race Committee
Bruce, Waldemar and Rick

Bend Aero Modelers

Bend, Oregon | AMA District XI | AMA Charter 2311

CLUB-40 Pylon Racing Schedule — 2014 Season

General Overview

Racing Dates (weather permitting)

• Race Workshop	12-April-2014	(Popp's Field)
• Contest race	17-May-2014	(Popp's Field)
• Contest race	21-Jun-2014	(Dorrance Meadow)
• Contest race	26-Jul-2014	(Field of Dreams)
• Contest race	30-Aug-2014	(Popp's Field)

Locations (see next page for directions)

- Popp's Field at Horse Ridge (Bend Aero Modelers)
- Dorrance Meadow (La Pine R/C Flyers)
- Field of Dreams (Field of Dreams Redmond R/C Club)

NOTE: Contest races are hosted by the above clubs.

Registration Fee (per pilot)

- $10 (contest races only)

Fuel/Supplies

- Bring your own fuel (max. 15% nitro) and food

Course and Race Configuration

- 2-pylon course (400 feet apart)
- 4-pilot heats (3-pilot heats optional)
- Ground start (flying start optional / based on wind)

Participation Requirements/References

- Active AMA membership

Safety & Rules

- Hard hats are required within safety zones during racing (refer to BAM racing manual)
- AMA safety code applies
- RCPRO Club 40 racing rules (www.rcpro.org)

Racing Day Schedule

Time	Activity
9:00 a.m. – 10:00 a.m.	• Course setup • Pilot registration • Technical inspection • Role assignment (of volunteers)
9:15 a.m. – 10:00 a.m.	• Test flying (optional)
10:00 a.m. – 10:05 a.m.	• Racing matrix setup
10:05 a.m. – 10:15 a.m.	• Pre-race orientation & safety briefing
10:20 a.m.	• Start of first heat
NOTE: Heats will be conducted in 5-minute intervals (includes lineup, start, and landing).	
11:30 a.m. – 12:00 p.m.	• Break
12:05 p.m. – last heat	• Continuation of heats
Shortly after last heat	• Final scoring • Winner announcements

BAM's Pylon Racing Committee Members

Contact	Email/Phone
Bruce Burgess	ke6gkc@ykwc.net
Rick Burgess	rickb@bendbroadband.com
Waldemar Frank	info@bamrc.com +1-541-330-5508

Bend Aero Modelers

Bend, Oregon | AMA District XI | AMA Charter 2311

CLUB-40 Pylon Racing Schedule — 2014 Season

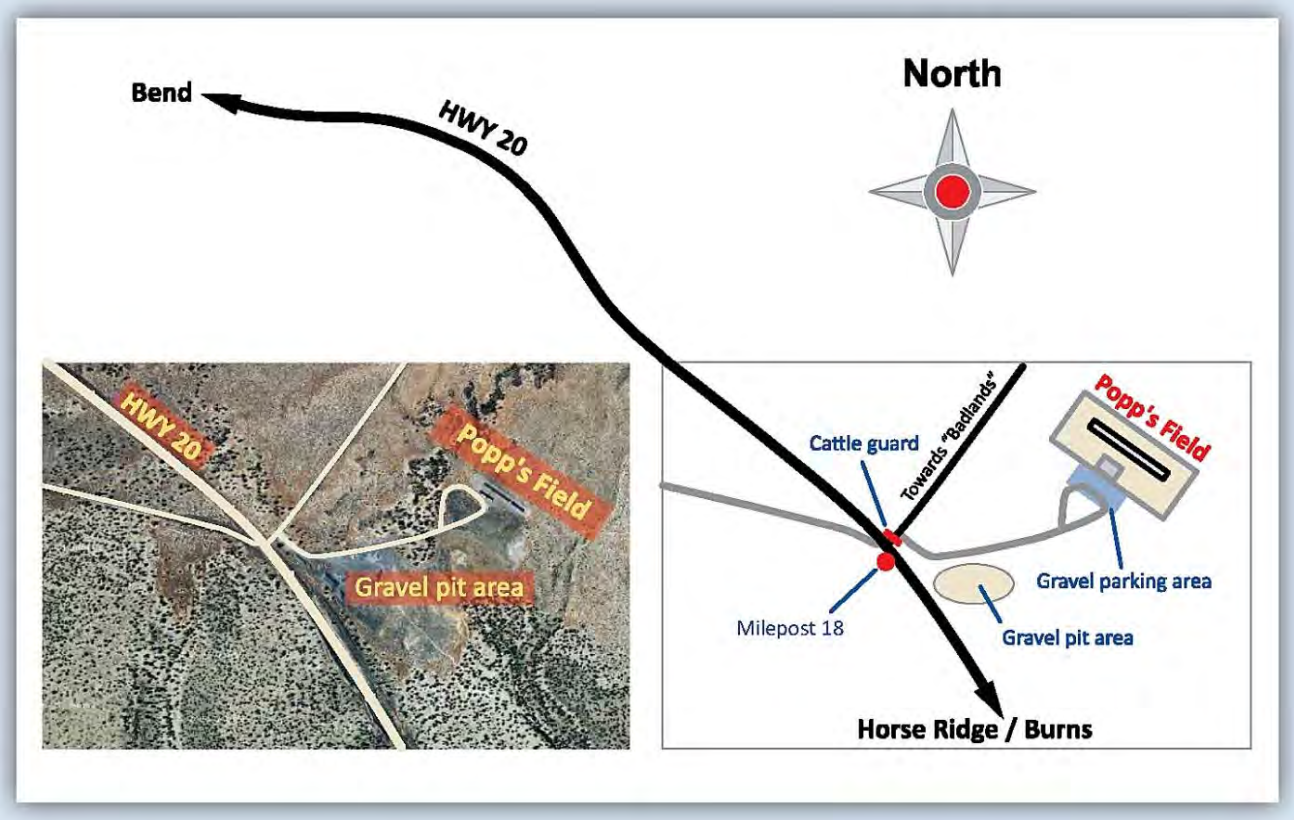
Directions to Popp's Field

Popp's Field is located approximately 18 miles east of Bend, OR, just off State Highway 20:

1. Follow Highway 20 east towards Horse Ridge (look for signs towards ***Burns***).
2. Shortly before reaching milepost 18, you will see a paved road towards the ***Badlands*** and a gravel pit area on the left of Highway 20.
3. Make a left turn and cross the cattle guard.
4. Immeditaely after you cross the cattle guard, make a right turn and follow the dirt road that passes by the gravel pit area. Don't follow the paved road towards the *Badlands*.
5. After a few hundred yards, you will see a gravel parking area and Popp's Field.

Directions to Field of Dreams

For directions, please refer to the below link:
http://fieldofdreamsrc.com/



Bend Aero Modelers

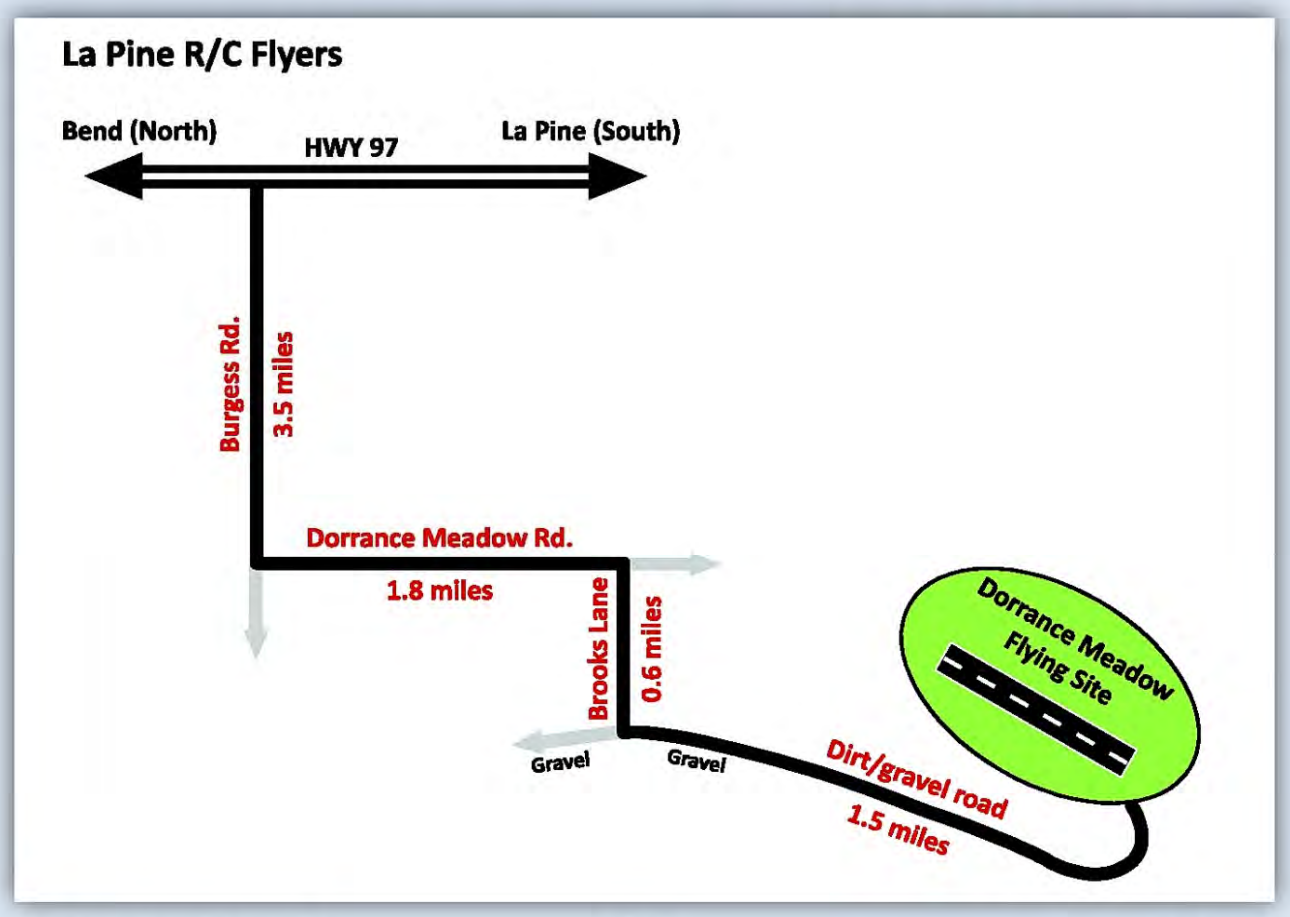
Bend, Oregon | AMA District XI | AMA Charter 2311

CLUB-40 Pylon Racing Schedule — 2014 Season

Directions to Dorrance Meadow

Dorrance Meadow is located in La Pine, OR, and is the club field of the **La Pine R/C Flyers**.

1. In La Pine, at the junction of Highway 97 and Burgess Rd., take Burgess Rd.
2. Continue for 3.5 miles and then make a left turn onto Dorrance Meadow Rd.
3. Go about 1.8 miles on Dorrance Meadow Rd., and then make a right turn onto Brooks Lane.
4. After approximately 0.6 miles, Brooks Lane forks into two directions. Stay left and follow the gravel road.
5. Proceed for about 1.5 miles to the entrance of Dorrance Meadow.
6. The entrance is a left turn (it's not easy to see, but it's just as the road makes a shallow bend to the right.
7. The entrance road is narrow with wash board terrain. This leads you into the flying site.



POPP'S FIELD SAFETY GUIDELINES

POPP'S FIELD SAFETY GUIDELINES

All pilots shall be current members of A.M.A. and B.A.M. Proof of current A.M.A. membership is required prior to flying at B.A.M.

Visiting A.M.A. pilots and new members of B.A.M shall receive a safety orientation prior to their first flight.

Pilots shall ensure safe flight operations in concordance with A.M.A. Safety Rules and these Field safety Guidelines.

Pilots shall ensure safe operation of their aircraft and associated equipment prior to use.

Pilots are encouraged to verbally enforce safe flying practices.

All guests, children, and pets shall be supervised by a B.A.M. member while inside the flying field and are encouraged to remain behind the pit tables.

All pilots shall restrain their aircraft during the start-up/arming process. This includes electrics.

Pilots shall never leave their aircraft unattended while the aircraft is running or armed..

Pilots shall only taxi aircraft in the specified taxi area and use caution while taxiing.

While flying, pilots are encouraged to remain 25 feet behind the closest edge of the runway, preferably behind a pilot station.

Pilots shall verbally communicate their intensions such as landings, take-offs, or aircraft problems while flying.

Pilots shall fly their aircraft north of the centerline of the runway. This is known as the "deadline".

POPP'S FIELD SAFETY GUIDELINES

continued

POPP'S FIELD SAFETY GUIDELINES

Pilots only are permitted beyond the flight line (e.g., to retrieve an aircraft)

Landing aircraft have the right of way. Dead-stick landings shall be announced as such and given full priority.

Pilots shall communicate any aerobatic maneuvers such as, low passes, touch and go's, and hovering directly near or above the runway.

Pilots shall not take-off or land on the taxiways.

A maximum of five (5) aircraft is allowed in the air at one time. This includes helicopters and micros.

Pilots shall call all maiden flights prior to flight. All other aircraft shall be grounded throughout the entirety of the flight.

Hand launches shall be performed approximately 25 feet from the edge of the runway closest to the pilots' station.

Pilots using AM/FM radio equipment shall have the appropriate frequency pin attached to the transmitter antenna whenever the radio is in use.

R/C cars and other surface vehicles are prohibited anywhere inside the flying field.

Smoking is prohibited anywhere inside the flying field and shall be carried out in a safe and respectful manner in the parking lot.

The consumption of alcoholic beverages before or during flight is prohibited.

Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2014

A. **GENERAL**: A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.

1. Model aircraft will not be flown:
   (a) In a careless or reckless manner.
   (b) At a location where model aircraft activities are prohibited.
2. Model aircraft pilots will:
   (a) Yield the right of way to all human-carrying aircraft.
   (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)
   (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport without notifying the airport operator.
   (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
   (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Airplane program. (AMA Document 520-A.)
   (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors.)
   (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
   (h) Not operate model aircraft while under the influence of alcohol or while using any drug that could adversely affect the pilot's ability to safely control the model.
   (i) Not operate model aircraft carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.
   Exceptions:
   - Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
   - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
   - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document. (AMA Document #718.)

   (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A.)
3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
   (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
   (b) An inexperienced pilot is assisted by an experienced pilot.
4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. **RADIO CONTROL (RC)**

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Document #706.)
   (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
   (b) At air shows or demonstrations, a straight safety line must be established.
   (c) An area away from the safety line must be maintained for spectators.
   (d) Intentional flying behind the safety line is prohibited.
4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
5. RC model aircraft will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement. (AMA Documents #922 and #923.)
6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flightline.
7. Under no circumstances may a pilot or other person touch an outdoor model aircraft in flight while it is still under power, except to divert it from striking an individual.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
9. The pilot of an RC model aircraft shall:
   (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
   (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.
   (c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

C. **FREE FLIGHT**

1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed its function.

D. **CONTROL LINE**

1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line Precision Aerobatics.
4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 feet to any above-ground electric utility lines.
5. The flying area must be clear of all nonessential participants and spectators before the engine is started.