



**SKYMASTERS RADIO CONTROL CLUB  
OF MICHIGAN**

AMA Chartered Club #970  
15 Year Gold Leader Club

[www.skymasters.org](http://www.skymasters.org)



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### From the President...



This winter has been a bit more of a challenge for flying than last year, between snow squalls, wind, rain and actual sub-freezing temperatures. In other words, a more typical Michigan winter as opposed to the tropical winter we had last year. But if you check the sign in sheets, there are still pilots out there braving the cold at the field, including yours truly. Others are taking advantage of the frozen lakes. The fact that so many are out there despite the cold shows a real enthusiasm and love of the hobby. That enthusiasm was in evidence at the swap shop where we had a hard core group show up at 6:00 in the morning

to start setting up. Most of the same group was there when we cleaned up as well. Between putting up tables, directing traffic, handling the food and even mopping the floor, this group did an outstanding job and I can't thank them enough. The volunteer work is what keeps the club and the hobby going. Our club members are also showing their zeal in setting up and attending the visits by the leaders in developing new aspects and new technology in the hobby. Thanks to Pete Foss and Joe Hass for setting up the visits by Joe Malinchak, Hobbico and Horizon. These give us an opportunity to see what's new and to dream up new projects for the off season. Most importantly, perhaps, is that it gives us something to do so we can stave off

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the winter blues.

We have been negotiating with the state and with the farmer who leases the land that surrounds our field to get a helicopter pad put in. As of this writing we think we're close to a deal, but we need to work out the final details. Also, the Bald Mountain manager has approved our plans for improving the field within our current borders. We will be working on some new signage, a new information center and possibly a new flag pole as noted at the last club meeting. Gary Wells is heading up these projects. Please offer him your support in any way you can.

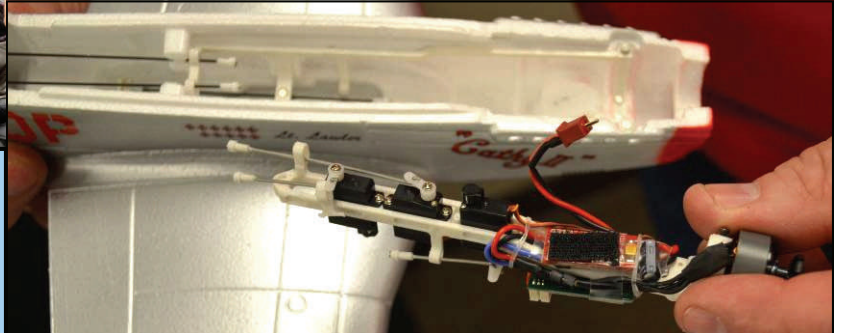
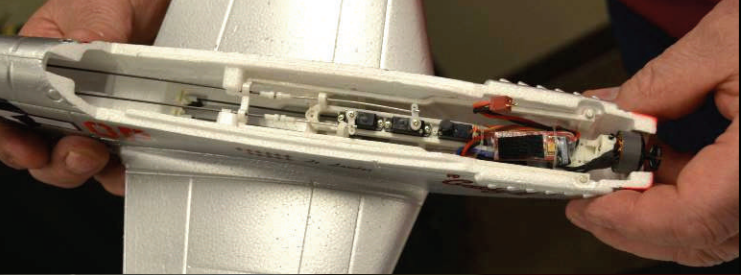
As the weather begins to turn (hopefully) in the next month or two, please enjoy your flying and enjoy it

safely. And please consider doing something to give back to the club. Whether it's volunteering to help at a flying event, joining us for Bald Mountain Involvement Day or just helping to clean and maintain our flying field, it is the efforts of all the members that keep us going. I believe participation is also rewarding for the individual members. It gives us a chance to get to know people we might not see regularly and allows us to contribute to maintaining and improving the wonderful field that we call home.

**Ken Gutelius**

*President, Skymasters*

kennanc@msn.com



**Front Cover:**

The tiny airplanes of Joe Malinchak at the flying demo preceding his presentation to the Skymasters meeting.

*Paul Goelz photo*

# Propwash

By

Joe Finkelstine

March, 2013



Hi All,

As I warned you in my last column, I will repeat myself from columns I wrote some time ago, but given the turnover in our hobby, I continue to believe that revisiting several topics is still valuable now as it was back then. Today I want to talk about prop selection. If I remember correctly, I wrote about this topic long ago, well before electric flight was popular.

The range, style, and brands of props available to us has increased considerably since I last visited this topic, so the need to understand this has not gone away - so let's get started.

The first thing I want to discuss for those unfamiliar with how props are described are the way most props are identified via their numbering scheme. Way back when 2 stroke glow was king, a very common prop to find at the field was known as an 11-7, or perhaps a 12-6, as these props fit the .40 two-stroke, which was the mainstay when I entered the hobby.

Just what do these numbers mean? - Glad you asked. Let's take the 11-7 for this example. The 11 refers to the prop having an 11" diameter (apologies to the metric crowd reading this, I am sticking with SAE props!). The 7 in 11-7 refers to the prop having a theoretical pitch of 7". I am hoping that the diameter of the prop is pretty straight forward, but as I will describe later it actually has quite a bearing on the thrust of the prop.

For now, let's concentrate on the term pitch. On a prop, pitch refers to the theoretical distance the prop (and the airplane attached to it!) would travel in one revolution if there was no slippage or other loss. So, for our example, the 7" pitch prop should move 7" forward for each revolution. A 20" pitch prop would travel 20" in one revolution.

Now then, the question might become one of "what do these two numbers tell me about the prop and how it will fly my airplane?". One way I like to look at these is that I think of Diameter as having the greater effect on acceleration, and pitch having greater say on top end speed. While the aerodynamics are complicated on this, my statement above works well for us in RC with some caveats I will mention in a bit.

If I were to change only diameter on a series of props on some test flights for the same airplane, I should see that as I add diameter, the airplane accelerates on the ground and in the air faster. The price I pay for this increasing acceleration will generally be a slower top end speed. Conversely, If I instead keep diameter constant and alter only pitch, my plane would reward me with a higher top end speed at the cost of less and less acceleration.

We are not free to make any change we like in the above paragraph, as it is time to mention a big disclaimer. We need to remember about the ability of the engine (or motor) to swing the new prop!

For glow, we could try a prop that has either too much pitch or diameter (or both !) and be rewarded with a detonating engine soon to throw a rod or seize a bearing because it is overloaded.

The situation with electric is even more nefarious. In an effort to reward our foolishness in adding too much prop to an electric motor, the motor will attempt to draw more and more current to swing the new monster prop to the motor's Kv rating and will gladly destroy itself in the process. They are happy to please you and will self destruct if you overload a motor (although your speed control might go first!).

So with the caveat in mind that we have to remember to not over (or under!) load our engine/motor, we can still experiment with various props within a defined range. One way, although a bit dated is to take a prop that is known to be well within the engine recommendations and determine its "load factor" The load factor is simply the diameter \* pitch. For our 11-7, the load factor would be

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11\*7 = 77 (let's ignore the units, they are meaningless) - If I want to try a new prop, I would look for an alternate prop whose load factor is same or near the load factor of 11-7. How about a 12-6? The 12-6 has a load factor of 72, and a 10-8 has a load factor of 80. Both are within 10% of the known good prop, so they might be reasonable props to try.

Why would you want to try these new ones out? - another good question. Perhaps the 12-6 prop will offer a snappier acceleration that you prefer more as it suits your flying style. Perhaps you want to buzz the field on a fast low pass, then the 10-8 might suit you better. There is no correct answer here as long as the physical constraints on load and clearance are OK, you can fly with whatever prop makes your plane fly the way you like.

Electric motors typically have a much wider range of prop sizes, as we can change the voltage and current supply to the motor to make it function across a much wider output power range than a typical glow motor. It is easily possible to make a single electric motor have output equivalent to a 20, 40, and perhaps even 60 size glow - we change the number of cells in the pack and judiciously choose the prop. Our choices with glow are much more limited. A 90 size 4-stroke glow will put out power like a 90 size 4-stroke glow (but sound wonderful doing so!)

You should also soon notice that you will have choices of prop style even for the same pitch and diameter. You can choose wood, carbon fiber, or composite. Each of these props will almost certainly have different characteristics and you may prefer one over the other. A carbon fiber prop will probably be the lightest and stiffest, so it will usually be the most quiet and efficient amongst the other material choices. It also will be the most expensive though!

Some props have 3 numbers, and these typically signify that the pitch of the prop varies along its length. Most often, prop like this will start out with a higher pitch near the root and decrease towards the tip.

APC composite props have a number of props like this and I have experimented with them a few times.

Recently, a manufacturer of props, mostly for bigger gas engines, has done away with the pitch listing completely. If I remember correctly, Vess props only list a diameter and then a letter - Not sure if I can help you out on that one, but if you have a plane that is a candidate for these props, you don't need my explanation anyways.

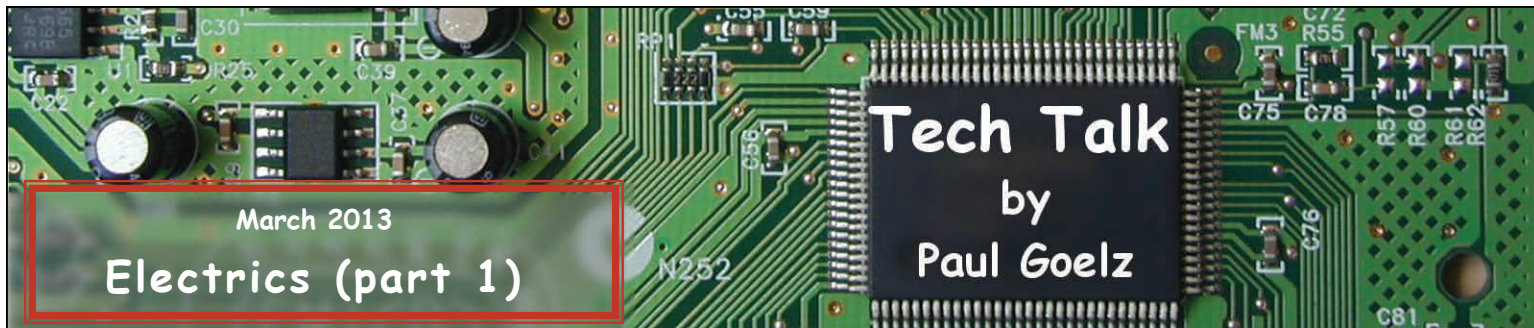
Even if all you have are RTF ARF's that came with a prop, you still have choices available to you. Perhaps you can try out a composite prop of the same size and see how your plane flies - Trust me on this, sometimes you will notice a substantial change in the way your plane flies with a different prop even with the same diameter and pitch.

Often, your fellow modeler may have a prop sitting unused that you can try before you buy one, or you can always check with that vast vestibule of experience intermixed with ignorance called the internet.

I would encourage you to experiment with props that your combination can swing - you may find an old dog of a plane will suddenly wake up for you - it is quite an eye opener, at least it was for me.

Hope you leave the field with the same number of pieces you bring!

Joe Finkelstine



March 2013  
**Electrics (part 1)**

**Tech Talk**  
by  
**Paul Goelz**

For the next couple months, Tech Talk will feature Teo Terry as a guest columnist. Teo has written a great series of articles on the ins and outs of electric aircraft. It ties into Joe Finkelstine's Propwash column for this month as well.

## **A sensible approach to flying electric powered RC aircraft**

By Teo Terry

Over the last couple of years I have noticed that more and more club members are giving electric RC a try. As an electric flyer, this is a very exciting development.

From what I have observed, most get started by experimenting with parkflyers. I believe that cost is the main reason for this; smaller airplanes are generally less expensive than larger ones. Given how many highly capable parkflyers are available, this is a sound approach; however, you might find it surprising that the cost of flying larger planes is really not that much greater. Don't discount starting out "big" just yet.

At this point, it might be helpful to explain what makes up an electric power system. Like a glow power system, it is made up of three components:

1. The electric motor.
2. The electronic speed control which serves the same purpose a throttle servo in conventional system.
3. The battery pack; the electric version of the fuel tank.

So how much does it really cost?

Regardless of what you might have heard, **flying**

**electric powered planes is more expensive than flying glow or gas powered planes of similar size.** The good news is that it is getting cheaper, but there is still a ways to go.

As an example, let's consider the cost of converting a medium sized plane such as Sig's Something Extra. The prices were obtained from popular online hobby stores and rounded to the nearest dollar. For reference, I used to fly my Something Extra with a Saito 56 which I purchased for about 200 dollars.

A couple of observations are in order:

1. Over the life of the model, the battery will probably be the most expensive item. Unlike motors and speed controllers, batteries have a finite life and need to be replaced from time to time. Conversely, you might decide that you need more than one in order to fly as often as you would like.
2. Electric motors typically turn large propellers and are therefore more comparable to four stroke glow engines than two stroke engines in terms of performance and cost.
3. There are more expensive as well as cheaper alternatives to the motors and controllers. As Keith Shaw, the electric flight "guru", has said many times, buy cheap, buy twice. My experience supports that observation.
4. The cost of the electric option did not include the expense of the necessary support equipment since these are mostly one time purchases:
  - 12 volt deep cycle RV battery: \$ 100.00
  - 12 V lead acid battery charger: \$ 50.00
  - Flight pack battery charger : \$ 130.00
  - Whattmeter (a must have) : \$ 60.00

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- Power supply : \$ 100.00

### Boy, electrics can be expensive, so why bother?

In reality, an airplane does not care whether a glow engine or an electric motor spins the prop. As long as it gets the thrust and power it needs to fly, fly it will. With the exception of small models where electric power has a clear advantage, there is no compelling reason to choose electric power over glow or gas. However, electric power does have some nice features:

1. Electric power is extremely reliable. It is unlikely that you will miss a day of flying because of problems with the power system.
2. Electric power makes multiple engine aircraft almost as easy to set up as single engine aircraft.
3. Electric power made parkflyers a viable reality while at the same time, giving us the ability to fly almost anywhere (within reason).
4. Electric power can be quiet. As development continues to encroach open areas, it is becoming more difficult to secure flying sites. The noise associated with model airplanes is part of the problem and electric power might provide us with a way of keeping flying sites.
5. No mess to clean up after a day of flying.

So, if you have not lost interest by now, you must be curious about electric flight. In the sections that follow we will cover information which will help you match power systems to airframes.

### I have an airplane in mind, so how much power do I need?

The first step in an electric project is to determine how much power you will need. Since power and cost go hand in hand, this step also defines how much the project will cost. How much power you need depends on:

1. Your style of flying
2. The size and weight of the model

Unlike the case of glow engines, where one thinks

about power in terms of horse power (HP), the power generated by electric motors is more commonly measured in Watts (W). The conversion from one unit to the other is quite simple:

$$1 \text{ Horse Power} = 746 \text{ Watts}$$

Over the years, rules of thumb have been developed to help modelers select a power system. Years ago, Bob Kopski developed a set of rules which were further refined by Keith Shaw. Although many years old, this set of guidelines are still in use; you probably have heard it referred to as the "watts per pound rule":

Keep in mind that this rule was developed using Astro Coblat motors as the benchmark; these motors are about 75% efficient.. Fortunately, brushless motors can meet or exceed this level of efficiency.

Over time, I have found that these rules work best when you consider the following as well:

1. For a .40 sized model, assume that the conversion will add  $\frac{1}{2}$  lb to the model's advertised weight.
2. Select a power system which can spin a prop which is at least 1" larger in diameter larger than what a suitable four stroke engine would spin. For example, a Saito 56 can spin a 12" prop; therefore, I would look for a motor which could spin a 13" prop or larger.
3. Do not exceed a wing loading of 1lb per 100 sq in of wing area for good sport performance: A model with 600 sq in of wing area could weigh up to 6 lbs. For small models you probably want to limit your wing loading to 12 oz for each 100 sq in of wing area.

Now that we know how to determine how much power we need, we can start looking at how to select the motor, prop, battery and speed controller.....

*To be continued in the April Skywriter.*

**Teo Terry**

# February indoors at Ultimate



# ON THE WING

## Skymasters Breakfast!

First and Third Monday  
of each month

9AM

Everyone welcome

Red Olive restaurant  
In the strip mall on  
Walton, across from  
Crittenton Hospital



## Indoor Flying

every Tuesday

11AM to 1PM

At Ultimate Soccer,  
Opdyke and South Blvd  
Pontiac, MI



## Two Skymasters meetings this month...

Thursday, March 14th

6:45 to 8:45pm

"In The Bones"

Thursday, March 28th

6:45 to 8:45pm

"FPV" with Wade Wiley

Both meetings are at the Orion Center  
1335 Joslyn Road  
(just south of Clarkston Road)  
Lake Orion, MI

## Other local indoor flying sessions

Thursdays, 9AM to 3PM (6 hours)

51379 Quadrate, Macomb MI

(north off 23 mile, east of Hayes)

Small electric planes and helis

(safe separate heli space)

AMA not required

\$10/session

Information: Steve Durecki 586-246-4203



# March 2013

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4 Skymasters Breakfast at Red Olive 9AM	5 Indoor flying at Ultimate 11AM to 1PM	6	7 Indoor Rubber Power at Ultimate 1PM to 3PM	8	9
10 Flint Swap 9AM-1PM Lake Fenton High School	11	12 Indoor flying at Ultimate 11AM to 1PM	13	14 Indoor Rubber Power at Ultimate 1PM to 3PM Skymasters Meeting 6:45PM Orion Center	15	16
17	18 Skymasters Breakfast at Red Olive 9AM	19 Indoor flying at Ultimate 11AM to 1PM	20	21 Indoor Rubber Power at Ultimate 1PM to 3PM	22	23
24	25	26 Indoor flying at Ultimate 11AM to 1PM	27	28 Indoor Rubber Power at Ultimate 1PM to 3PM Skymasters Meeting 6:45PM Orion Center	29	30
31						

## 2013 Club Officers & Appointees...

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Membership:	Bob Chapdelaine	Lake Orion	231-675-8590	rdchapdelaine@gmail.com

### Newsletter Submissions

Please send all articles, photos and announcements to the Skywriter editor at:  
[newsletter@skymasters.org](mailto:newsletter@skymasters.org)  
 Deadline is the 20th of each month.

The Skywriter newsletter is published monthly by the Skymasters Radio Control Club of Michigan

[www.skymasters.org](http://www.skymasters.org)

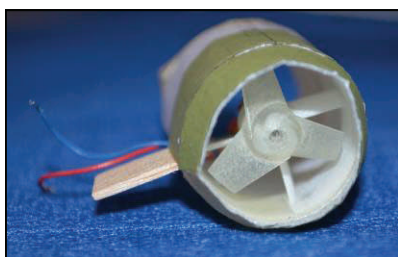
**On February 7th,** Skymasters was very happy to host Joe and Cindy Malinchak for a visit. Joe is one of the "Micro Flying" columnists for Model Aviation and is very well known around the world for his extremely small RC airplanes. I first met Joe and Cindy at the NEAT Fair and have been working ever since to bring them out for a meeting. Our first stop after Metro airport was the indoor flying run by Steve D. in Macomb Twp. We got there around 10:30 or so and flew many of Joe and Cindy's planes including his 9.4" wingspan A-10 Warthog with two 18 mm ducted fans. Cindy also flew her Butterflight Monarch butterfly. We had a great time flying and the 20+ pilots there sure were interested in their airplanes.

Next stop after flying and dinner was Ultimate Soccer Arenas for the evening meeting. Joe talked about how he designs his airplanes in Adobe Illustrator and then inkjet prints the graphics on very thin Durabatics or Depron foam. Both materials are about 0.5 mm thick. After printing, Joe cuts the foam by hand and assembles the airframe

and electronics. In the past, most of his planes used Plantraco radio gear and he is now moving to the Del Tang (<http://www.deltang.co.uk/>) series of Spektrum compatible receivers. Joe uses a combination of brushed and single phase brushless motors with most batteries in the 10-30 mAh range. Tiny stuff!

After talking about his planes and building techniques, Joe treated the 50+ attendees to a flight demo of virtually all of the planes he brought except for the A-10. That one is too fast to fly in the meeting room at Ultimate. I'd like to thank Joe and Cindy for a whirlwind 23 hour visit! Was a great time and I have heard from many attendees how much they enjoyed the meeting.

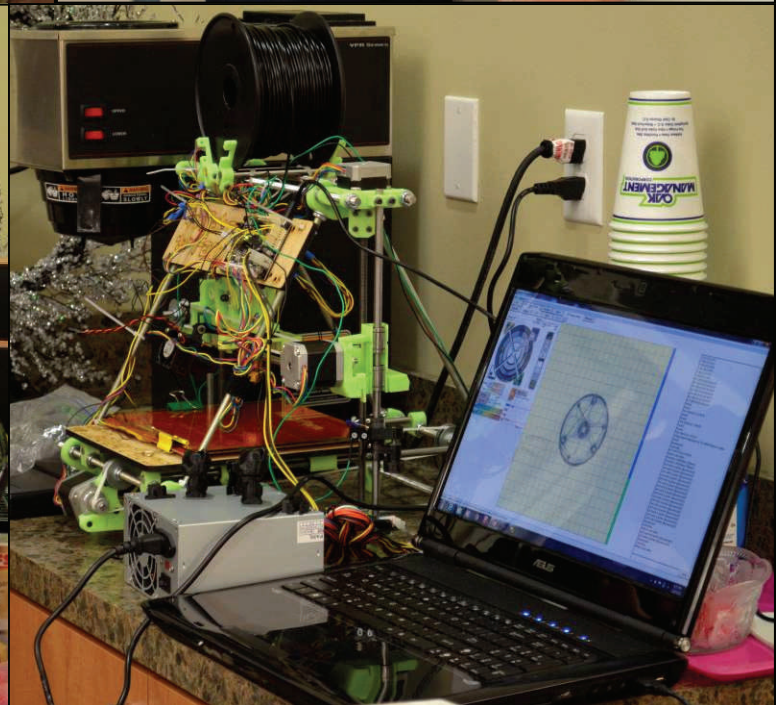
**Pete Foss**  
Secretary  
Skymasters RC of Michigan



# Skymasters meeting February 28th, 2013

Introduction to Pattern Flying

- Skymasters R/C club -  
Teo Terry  
Feb 2013





46156 Woodward Avenue  
Pontiac, Michigan 48342  
248.920.6000  
LighthouseOakland.org

December 27, 2012

Skymasters Indoor Flying Club  
c/o Ultimate Soccer: 867 South Blvd  
POntiac, MI 48341

Dear Friends of Lighthouse PATH,

Thank you very much to Skymasters Indoor Flying Club for your donation of \$400.00. On behalf of the residents, Board of Directors, volunteers, and staff please accept our sincere appreciation.

Lighthouse PATH is devoted directly to the elimination of homelessness, a key issue with many families that are struggling with poverty in Oakland County. Since 1991, our program has helped over 1,000 homeless families who were in need of a safe, secure place to live, employment skills, childcare, and life skills programs.

We are fortunate to have achieved and maintained a 91% success rate in our housing programs. This success is measured by the number of families that are able to become independent and self-sufficient through securing education, employment and housing.

Thanks to the support we receive and generosity of people like you, we are able to continue to ensure the mission of PATH will be achieved and that the lives of our residents and their children will continue to become rewarding and productive.

Sincerely,

Tia Cobb, LMSW  
Executive Director

In accordance with IRS regulations, Lighthouse PATH acknowledges that no goods or services were provided in consideration for this tax-deductible gift. Please retain this letter with your tax information.

LIGHTHOUSE PATH  
BOARD OF DIRECTORS

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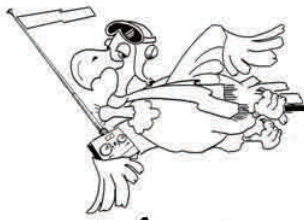
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Executive Director





**22nd ANNUAL**

# FLINT'S R/C SWAP MEET

SPONSORED BY  
The Flying Aces R/C Club  
Swartz Creek, MI

**OVER  
120 Tables  
Available**

Jase Dussia will be demonstrating foamie kit's offered  
by West Michigan Parkflyers LLC.  
Check [www.jasedussia.com](http://www.jasedussia.com) for information about Jase

**DEALERS  
WELCOME**

**SUNDAY**  
March 10, 2013  
Public  
9 AM until 1 PM

**LAKE FENTON HIGH SCHOOL**  
4070 Lahring Rd, Linden, MI 48451  
42° 51' 32"N 83° 45' 5" W  
SEE MAP BELOW, ALSO SEE OUR WEB SITE  
**WWW.RCFLYINGACES.COM FOR DETAILED DIRECTIONS**

## FOOD and REFRESHMENTS

► Airplanes

► Kits

► Boats

50/50 Drawings

Door Prizes

Helicopters ◀

Gliders ◀

Cars ◀

## WIDE SCREEN TV With R/C Videos Galore!

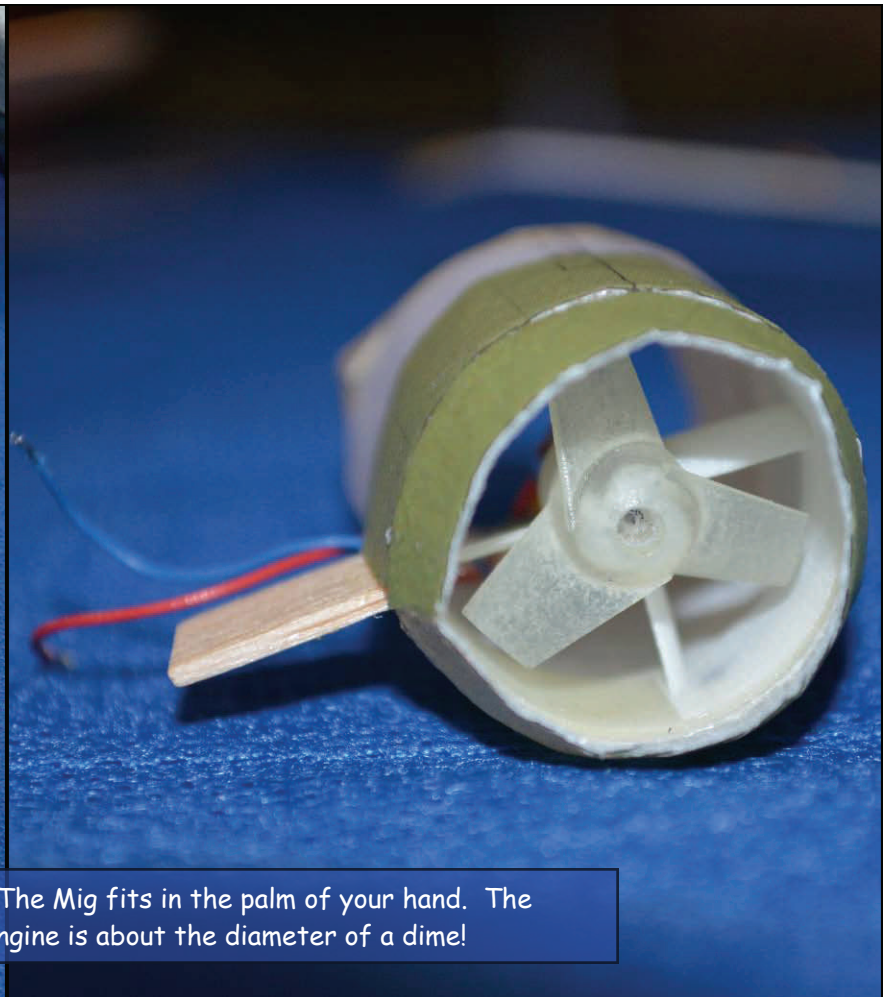
ADVANCE TABLE REGISTRATION \$15.00, EACH ADDITIONAL TABLE \$12.00, (IF PAYMENT RECEIVED BY MAR. 1, 2013) PLUS ADMISSION. TABLES AT THE DOOR \$18.00  
ADMISSION FOR EACH ADULT \$5.00  
17 AND UNDER \$1.00.

MILITARY ID and LADIES ADMITTED FREE.



Advanced Table Registration  
**Make Checks Payable To:**  
**The Flying Aces R/C Club Inc.**  
Mail to:  
Flying Aces R/C Club Inc.  
6184 King Arthur Dr.  
Swartz Creek, MI 48473  
For Info. & Table reservations:  
Call Bill Gerald 810-655-6420 or  
Cell 810-845-3007  
Set-up 8:00 AM Reserved tables will be  
held until 9:00 AM. Then released to  
be issued as unreserved  
General Information ONLY:  
Steve Polen 810-635-9392  
9100 Cook Rd.  
Gaines, MI 48436





More from Joe Malinchak. The Mig fits in the palm of your hand. The ducted fan Warthog engine is about the diameter of a dime!

## Skymasters Information...

The Skymasters field is located in Lake Orion, within Bald Mountain State Park on Scripps Road (see map). A state park Permit is required and can be obtained from the Park Headquarters located on Greenshield Road or at club events. Flying is permitted from 10 AM to 8 PM. The noise limit is 94 dBA at 10 feet. This noise rule is strictly enforced.

**Wednesday evening (through August) is Family Night** with flying and a pot luck buffet. Bring something for the grill & a dish to pass.

**Wednesday 5PM to 8PM is also Student Night (through August)** but there are usually instructors around all day. Meet the instructors and arrange for more instruction time together on other days. Our

Chief Flight Instructor is Greg Brausa, 248-373-8949  
cgbrausa@gmail.com

From June through August, **Club meetings** are held at the field, on the second Wednesday of the month at 8 PM. A great chance to fly and socialize. **Winter meetings** (September through May) are usually held at the Orion Center, 1335 Joslyn, in Lake Orion. Check the calendar here or on the web site for specifics. Bring a model for Show and Tell, enjoy coffee with donuts and listen to the speaker of the evening.

The Skywriter newsletter is sent to members, local hobby shops, and other R/C clubs in the area and around the country. All contributions are welcome. Please send photos and articles

to [newsletter@skymasters.org](mailto:newsletter@skymasters.org) If you know of anyone who may be interested in R/C Aviation, please give them a copy of this newsletter or a copy of an AMA magazine. It may spark their interest!

