The Flightline

Volume 31, Issue 3 Newsletter of the Propstoppers RC Club AMA 1042 February 2001

Editorial – It's Not Too Late

So what are you building for the new season? Well on the way to completion of your latest and greatest? Maybe still contemplating the magazines and catalogs, trying to select the ideal ship?

Let's get some factors in this decision so we can move you along and appreciate your efforts this year at the field. Seems to me they are;

- Personal goal or dream ship
- Club activity related
- Open contest meets
- Open fly-in meets

Of course, they can be any combination of these so let's examine a few of them; maybe I can get you fired up.

First I will skip the serious competitive activities such as AMA or IMAC pattern, AMA pylon racing and the various sailplane competitive events. Not that I would discourage such activity within the club, but I don't think you have time to build and check out a competitive airplane in the next few months! Same applies to the serious AMA Scale events.

There are an abundance of fly-in meets in our immediate area and of course, even more if you are prepared to drive a bit.

Warbirds over; Delaware, Pennsylvania, New York and New Jersey are a superb way to immerse yourself in this genre. Since they are for IMAA legal airplanes they have to have at least an 80-inch wing span and somewhat less for biplanes. For this reason it is a bit late to start building one from scratch or a kit, but what about an ARF. Last year I planned for Al Tamburro fly my Hangar 9 Cub at the Pennsylvania meet, it qualified on a size and type basis but I had not incorporated WWII markings so they denied my request. You could build one and easily modify it to the L-4 markings.

I enjoy the Electric Fun Flies that are held around our area and anything electric qualifies here. The first is May 12th in Hope NJ, just beyond the Delaware Water Gap, about 1 ½hour's drive. In addition to the fun fly Joe Beshar, the meet director will hold a contest for the Elexaco class. There are simple sets of rules for these airplanes, which use a specified motor/prop/ESC available from Dymont for $39.95. About a third of our flying members are already equipped for electric fun flies but you do have time to build something special which you can also fly at the field and at our fall meet.

Some of our members compete in the Society of Antique Modelers meets. Ed Goretzka flies his SAM legal Lanzo Bomber at our field and competes at SAM events in the area. Although there are a seeming infinite number of qualified model designs there are some favorites which are available in kit or plan form. There are both IC and electric powered events.

Float-flies appear to be a rip and it should be quite easy to modify a model you already have. Perhaps we should hold a club clinic and get someone to explain to us how it is done. There are meets that are scheduled each year in Binghampton NY and in New Jersey. Of course, you could build the Cub for the Warbirds meets and put it on floats (save some of that OD paint).

RC Combat is a popular and growing facet of our hobby. The formats vary from the 1/12 th scale warbird variety to the free form type designed by Marty Bakalorz, which is so popular in our club.

With the number of club members already equipped for combat we can conduct these events at our field but the added factor of competition is always a draw to attend open meets. I wonder if the AMA has formalized the rules for these airplanes so that inter-club meets are possible? However, if you really want inter-club combat there is abundant Zagi combat in our area and there are already a number of them in our club.

Our normal club activities can provide a focus for that last minute building spree.

How about a modification of that trusted trainer for parachute or candy drops?

How about modification of a large airplane into the club glider tow-plane? You can also add the tow hook to a glider.

Can we muster a fleet of warbirds that can be flown together in simulated combat or as armada's of bombers or interceptors?

I want to try a 4 x speed 400 B-24 that would qualify for the Warbird meets. How about you?

Now just go do it!

Dave Harding.

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Calendar of Events

Club Meeting - Regular Meeting
Tuesday 6th March 2001
Marple Newtown Library, 7:30 p.m.
Supervisor's Board Room
Note Time and Place Change

Central Penn Flea Market 10th March
Lebanon, PA
See flyer in Model Aviation
Club will run an excursion from Granite Run Mall. See Mike at the club meeting for details.

Regular Club Flying At Moore Field
Every Saturday and Sunday weather permitting

Daily	**10 am til Dusk**
Saturday	**10 am til Dusk**
Sunday	**12 p.m. till Dusk**

Propstoppers RC Club of Delaware County, Pennsylvania.

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President's Message

Mike Black

Please bring your calendars to the March meeting so we can make plans for club events for the upcoming flying season.

We will finalize plans for our annual jaunt to Lebanon for the Central Penn Aeromodelers Flea Market.

For everyone's information, I mailed the AMA re-charter kit forms yesterday.

A special thanks you to Al Tamburro for running an excellent auction. Special thanks also to Al Gurewicz and Rusty Neithammer for calculating, collecting, and distributing the money. On behalf of all of the buyers, thanks to all that brought in items for sale. I believe and have heard others state that it was by far our best auction/sale. It was especially gratifying to see our youngest members walk out of the meeting with ready to fly airplanes. For those who were not able to attend, there were about 10 airplanes auctioned that needed little more than an engine and a radio to get them ready for flight. There were four others on the sale table that were in similar condition. Many other quality items of interest were sold or auctioned, including new and barely used engines and antique engines.

I am looking forward to the March meeting Show'n Tell. It is always a great month for members to show off their new models. Please finish up those projects and share them with us.

Please make it a point to welcome our new members at the March meeting. When I last spoke to Ray Wopatek he informed me that we have 8 new members up to this point in time.

I hope this nasty weather lets up and allows some late winter/early spring flying.
See you at the meeting,

Mike.

Meeting Minutes February 6, 2001

Russell Neithammer

President Mike Black called the meeting to order at 7:00 PM at Marple Library**.** Membership Chairman **Ray Wopatek** read the roll call there were 25 members and 5 guests present.

The minutes of the January 2001 meeting were approved as published in the February 2001 newsletter, by the membership.

Treasurer **Al Gurewicz** gave the treasurer's report with income of $877.50, expenses of $97.90 and a new balance of $3319.17 reported. It was noted that the rental fee for use of Moore field for 2001 is paid, and that the fee for the use of the Marple Library meeting room is due in April.

Membership Chairman Ray Wopatek has been calling all members who have not renewed, and there are at least 5 confirmed openings for new members at this time.

Old Business

New field selection chairman **Chris Catania** had the following news to report:

> Details of our field use at the Sleighton site have been worked out with the farmer. Final approval for our sublease of the ground from the farmer, by Sleighton School officials, is expected by Friday, February 9.

Chris will notify members of the outcome by email.

Members who fly at Moore field are advised to be aware of slippery conditions driving up the dirt lane from the field. This can be expected any time that the sun warms frozen ground for a few hours, softening the top few inches. Several members recently had trouble getting out because of this.

Members are advised to be careful of possible interference on channel 12. This may be a countywide problem (possibly due to the 911 system).

Additional keys have been made for the lock at Moore Field. See **Ray Wopatek** if you need one. The lock has not been changed, so members who already have a key should continue to use the same key.

Send classified ads for sale items or items wanted, to newsletter editor **Dave Harding**, for free publication in the newsletter.

New Business

March 10 – The Central Penn Aeromodelers will hold their annual auction at the Lebanon Fairgrounds. As usual, there will be a convoy that will leave from the parking lot at the Granite Run Mall.

Next meeting (March 6, 2001) – members should bring their calendars, so that we may plan the club events for the upcoming flying season.

President **Mike Black** motioned to hold next year's auction at the January meeting, so as to avoid having to hold the auction and conduct membership renewal during the same meeting. This will also allow for a show and tell at the February meeting, when many new projects have been completed. There were several suggestions to move the auction to the March meeting, the advantage being that many trainers are sold at the auction, and this would be a benefit to new members.

Break

The 50-50 winner was **Del Glennon**, who generously donated his portion to the club treasury**.**

Show and Tell

There was no show and tell, due to the auction. Many items were sold at the auction, with some serious cutthroat bidding.

President Mike Black adjourned the meeting at 9:00 PM.

Rusty Neithammer, Secretary. .

Fun in the Sun

You may remember the hardship I must withstand in dealing with my West Coast daughter. Well, I had to suffer through another trip to help out, but although she lives in Pasadena it seems that it is just as easy to fly to San Diego and more agreeable.

What's that, Good Grief, another model airplane meet! It seems that the Silent Electric Flyers of San Diego are holding their annual Mid Winter Electrics meet. Guess I'll have to go, well, I'll be, there is my friend Ron Samuels with his 10 foot span Paragon electric glider, what, you want me to fly it? Guess I had better register, good job I brought my AMA card!

Although San Diego is close to paradise it can be cool and wet in the Winter. In fact the last two Mid Winter Electrics have been held in poor comparatively weather. This year the weather was superb with very light winds and full sun on Friday, partial sun on Saturday.

The Silent Electric Flyers of San Diego is one of the leading electric clubs in the country. Their members include World Champions, Nationally known flyers and technologist and a good number of very active fun flyers.

Their regular field, which is for electrics only, is situated right alongside Sea World in the Mission Bay

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water sports area; no way you could fly gas here. It is kind of small and the flying is done off a dirt surface. The pit area is carpeted! Well let's put it this way, over time people have donated carpets which are just laid on the dirt and eventually seem to sprout roots so they don't blow away. I does keep the dirt down a little. The view at the field is very attractive although not quite as attractive as the view over the harbor to downtown in the graphic above.

For the Mid Winter meet they used another area on nearby Fiesta Island, similar to their regular field but more remote from the casual public and with more room. The views are just as good. This is the field they used when hosting the World Electric Championships last year.

The meet lasts from Friday lunch time through the Monday holiday. I had to leave on Saturday afternoon. It features a mixture of open flying and various competitions although none of them seemed very serious while I was there.

There was a fairly extensive array of vendors so the pressure on the old wallet was severe. In fact I was bowled over by the weekend Hobby People sale. Since I am going to be in Southern California for a month I thought that I should build and fly something. I couldn't take much with me so I just had to buy the absolutely essential stuff, airplane (Zagi), radio etc.

There were a fairly wide variety of airplanes flying. Of course, the weather conditions were ideal for the park flyers and there were many in variety and quantity. The Speed 400 aerobats were quite impressive, several manufactures make kits and ARF's I must build one.

The meet featured a pylon race and combat for Hitec's FunTec Sky Scooters. They were on the whole unimpressive, in fact I believe them to be a poor beginners airplane, too little power and therefore too little maneuver room. Of course some of the San Diego crowd had done the usual hop-up tricks and these flew better but still not impressive.

The field surface was quite rough, probably due to the record rainfall on Tuesday before the meet but I would have thought that they could have done a better job of smoothing it. Many of the scale airplanes had difficulty dealing with this surface. Takeoffs were aborted or occasionally hooked to one side into the weeds or lurched into the air when bounced off an errant furrow.

There were a few hot liners or "welders". These 100 / 150 mph "gliders" always impress; out-of-sight straight up is impressive in models as well as the real thing. One suffered aileron failure and lost a wing while pulling out of a long dive. Fortunately it impacted beyond the flight line.

There were a few different models that really excited me.

First was a pair of red "Stolchnaya" Mig 15's.

Both featured significant brushless power to their fans, they had different numbers of cells and different weights but both had 130-mph performance. They were flown as a pair by two very accomplished pilots who put on a thrilling duet air show performance with low high speed passes followed by a variety of turn around maneuvers. A pair of healthy bungees launched them in tandem.

The fuselage is available as a fiberglass molding; the wing and tails are balsa over foam. The fan units are commercially available. There was a recent article on these models in S&E Modeler. I gotta have one of these airplanes!

The owner of one of the Migs built the second impressive airplane. It was a Brietling CAP also with substantial brushless motor power and lots of cells. This airplane took off into a maybe 500-foot vertical followed by an upward spin.

Knife-edge across the field was routine and the rest of the IMAC aerobatics were first class. I didn't time the flights but they seemed to be what you would expect from a gas-powered airplane.

Other models that were very impressive were a fleet built by Chuck Havalah, a man who specializes in small airplanes.

Small but not simple as the first was a roughly 50 inch span Lockheed TR-2 with of course a ducted fan. The real trick with this airplane was that it had a wing mounted "sensor pod" with a video camera and a digital recorder. After the flight the video was downloaded into a laptop computer. He received the camera on the Tuesday before the meet then engineered and built the system for the Saturday event!

His second airplane was a B-25 at about 30 inches span. This airplane has a fixed gear but had no problem with the rough surface. In fact the flight performance was sparkling. The airplane was powered by two Light Stick motor / gearbox assemblies (less than $20 each) it had a built up balsa / tissue wing. The fuselage and nacelles. were carved from foam, covered with tissue and painted.

His final spectacular airplane was a P-51 at about 15 inches span. It is apparently a foam rubber-powered kit that he modified to electric power. It is powered by the latest Astroflight miniature coreless motor with a built-in 16:1planetary gearbox. The whole thing is about 1/3 inch diameter and 2 inches long. This model performed like a 40-powered airplane viewed from a distance, it flew just as long. Spectacular indeed.

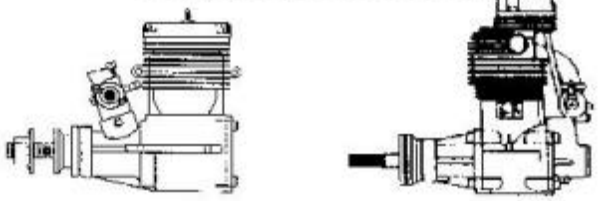
A few helicopters also made impressive flying demonstrations. Seemingly equal in every way to the best gas powered aerobatic machines in maneuver and duration. I didn't get a close look but they seemed to have the usual brushless motor and 18 / 20 cells.

Well, I can report that there is no shortage of continued innovation in the electric field and that the major manufacturers are jumping on the bandwagon in a big way with ARF's, kits, motors and speed controllers. Must be healthy for the sport.

Way to go SEFSD, thanks for a great time.

Dave Harding.

Engine Tech. Notes



Tuned Pipes and Homemade Fuel.

Tuned pipes are a means of boosting the power of two-stroke engines. When properly set up, they can be very effective.

If you have ever played a note by blowing over the end of a piece of tubing, you are using the same principle. That is, any tube has a natural resonant frequency, usually dependent on its length and the speed of sound in air. This means that some oscillations will die away quickly, but one in the right range will resonate, and be strengthened in force when the wavelength matches the resonant length of the tube. As a pressure wave in the sound reaches the end of the pipe, a reflection is set up, and moves back up the tube. This occurs at the end, whether open or closed, and at changes of section or taper.

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Now, if we arrange a length of pipe as a muffler for a two-stroke engine, we will find that at a certain rpm, the pipe will resonate, and boost the engine's rpm up. This is because the reflected pressure wave arrives at the exhaust port just in time to push some fuel/air mixture that was about to be lost (due to timing overlap), back into the cylinder, where it will be burned producing more power.

All we have to do is arrange the length of the pipe so that the boost occurs at a specific RPM range that is useful to us with the relevant load (propeller). It may be that the engine cannot produce enough power to turn the fitted prop at a useful speed. Also, some engines have port timing that cannot benefit fully from any pipe.

The major factor in setting up a pipe is the length, for any given propeller and rpm range. Some examples are given later. Different designs of pipes will produce different apparent lengths, because of the effects of diameter, taper angle, and type of end reflector. Many pipes also have a muffled section that hides the rear cone or reflector's shape. Here are the basic questions to ask yourself before trying a pipe:

- Is the engine likely to benefit?
- Is the aircraft capable of handling extra speed?
- Is the pilot capable of handling extra speed?
- What propeller and rpm range are you targeting?

Let's get started. Record the static rpm on the prop of your choice with a muffler before doing anything else, so we know a starting point to make all comparisons. Try to get a starting point for the length from a similar set up if possible, and fit your pipe. If you have a choice, get a header that is a bit (one-inch) longer than you think you need. It is easier to shorten than lengthen the header.

Now, start the engine and tune for slightly rich from peak rpm. Note that this may require a richer setting than usual, as we (hopefully) are producing more power than before. If we have fewer rpm than with a muffler, something is wrong, the pipe is probably too long. Try shortening the header (or pipe if more convenient) in ¼inch increments until the rpm starts to rise. If the pipe is too short, the engine will run harshly and the needle setting will be unstable. Add ¼inch spacers between the header and the pipe to resolve this problem.

Now to fly it. If it is not visibly faster in the air, try a shallow dive. If there is a distinct jump in rpm and speed, the pipe is too short, and the 'coming on' is caused by the prop unloading in the dive and coming up to a resonant rpm. If, however, the dive produces no change, but the vertical performance is better, the pipe is too long. Note that the references to 'short' and 'long' are relative, the pipe cannot improve the speed over all rpm ranges, and you will have to decide what the most appropriate compromise is for your case.

Most flyers do not need to have the engine speed up while descending, only to slow down in level and upward flight; so most adjustments will be aimed at improving level and upward flight.

From the Bee Line
Mark Gollattsheck, editor
Chester VA

Homemade Fuel

By Terry Joe Sprinkle

Using reasonable care and good clean chemicals, you can make up a simple and effective model airplane fuel for your own use. I recommend that if you mix your own fuel, you do your mixing outside, away from open flames, pilot lights, and static electricity. Use clean dry fuel jugs. Fill your jugs up nearly full, tightly cap them to reduce moisture in the fuel, and store them in a clean dry area.

I personally use the formulations below for my engines. These model airplane fuels cost me about $10 per gallon for the last 10 gallons I made. This includes purchase, tax (if any), hazardous shipping, and regular UPS shipping charges.

All of the following percentages below are by volume. You can use clean dry Pyrex measuring cups, the ones that hold up to 4 cups and have a 1000 ml line at the top.

You will need the following ingredients

Castor oil; be sure to get high quality castor oil. I recommend Bakers AA castor, Klotz Blensol castor or Castrol M castor oil. Generally, medicinal castor has been extensively processed and may have additives, and therefore is generally less suitable for model airplane fuels.

Synthetic oil; I suggest Klotz KL-200 Techniplate.

Nitromethane-Remember that it doesn't matter how many gallons you purchase, you still pay $13 hazardous shipping fee, so order several gallons and split them up among club members to save a little money on this charge. I recommend buying Nitromethane from FHS Supply (http:I/members.aol.comlfhsoill) this is excellent nitromethane and is about 99+% pure.

Methanol; I buy mine from a local performance shop.

Heavy Duty High-Density PolyEthylene (HDPE) gallon jugs; I also purchase these from **FHS Supply, Inc.** These gallon jugs are great to put your freshly prepared fuel in and are several times the thickness of the commercial fuel jugs.

Fuel # 1.10% Bakers AA castor oil, 10% Klotz KL-200,

10% nitromethane and 70% methanol. For example, using a four-cup Pyrex measuring cup (buy at the local supermarket), take exactly four cups of Bakers AA castor oil and put it in a clean container that can hold two and one half gallons, add four cups of Klotz KL-200 oil,

then four cups of nitromethane. Now add 28 cups of methanol and mix thoroughly. I use a good clean 10-liter (2 ½gallon) Nalgene jug with a spigot for this or a 20-liter Nalgene jug with a spigot for making up five gallons at a time.

It is okay to put the methanol in first, followed by the oils and then the nitromethane. Mix in between each step.

Do this carefully. The methanol is the more volatile and flammable, not the nitromethane. Mix well, allow to sit, then remix. Now, immediately fill up your clean HDPE gallon jugs. Tightly cap them; you do not want them to pick up excess moisture from the air. Store all chemicals at about room temperature. Pure nitromethane should be stored in the dark.

Be sure you have enough of each chemical before you make up your fuel. If you do this, your fuel will turn out the same every single time and you can depend on the fuel to perform properly. You should read your engine manual and see what the requirements are for your particular engine.

Fuel # 2. For those pilots who prefer a castor oil based fuel, you can use the following: 20% Bakers AA castor oil, 10% nitromethane, 70% methanol. This is among the simplest fuels you can make. I prefer the mix of castor and synthetic oil in formulation one above and have been using it since Klotz KL-200 was first sold in about 1958.

Fuel # 3. For the old cast iron piston Fox .35, you need a castor-based fuel. The older formulations for this engine (e.g., Fox Superfuel) was about 29% castor oil, 5% nitromethane and the rest clean, dry methanol. This still works great in this engine. In this case, if it isn't broke, don't fix it. However, do not go below about 25% castor oil in this engine or you may damage your engine. There are still a number of engines, like the Cox .049 that require a castor-based fuel for proper lubrication of the ball-and-socket connection of the connecting rod to piston, so these engines do well on straight castor-based fuels, but run well on about 15-30% nitromethane.

3. For the larger two-stroke engines, use 2-4% percent castor oil, the remainder of the 12% total oil will be Klotz Techniplate oil. Use 3-5% nitromethane. For the rest, use clean, dry methanol. The smaller ST engines may need up to 16% oil.

4. For the larger 4-stroke engines, you can use 2-4% castor oil; the remainder of the 18% total oil is Klotz Techniplate oil and 15% nitromethane. The rest should be clean, dry methanol. I use 3.6% castor, 14.6% Klotz Techniplate oil, 15% nitromethane, the rest methanol, all by simple volumes. This works in my Saito FA-915 and Saito 170 R3 engine. Some folks even run helicopter fuel at 30% nitromethane in these engines for a little better performance. I prefer 15% nitromethane for routine flying. The idle is fine, power is adequate, and the engine lasts a little longer, too.

My latest FA-90 Saito engine recommended 20% oil in the manual, so I would use that at least for break-in and use at least 18% total oil and 20% is even better. No need to see how little oil you can use before you burn up your engine! Remember this: I have seen engines get destroyed by too little oil, but seldom ever by too much oil, the worst thing they usually do is run crummy.

Discussion

Low lubrication fuels can account for at least some cases of nickel liner separation. Moreover, many pilots run their engines very lean, and with relatively flat props. This further compounds the problem and can lead to premature failure of an otherwise good, strong engine. A strong, well-built ABC engine is often capable of several hundred hours of running.

Many medium sized two-stroke engines (e.g. .19 - .65 displacement) come with instructions to use a minimum lubrication of 18%. There is good reason for them to recommend this. Some of the Control Line folks even use 22-23% total oil in their engines routinely, including their ABC, ABN, AAC and similar engines. Engines run well on these fuels and typically last for years and years.

I find that around 20% oil is fine for RC use. Remember that larger 2-strokes and 4-strokes generally use less oil than this. This formulation is a bit greasy, so direct your exhaust either down, or down your landing gear and it will keep most of it off your plane. Using formulation 1 above, you will find that your engine runs cooler, runs strong and will last a long time, just like it should.

I am not afraid to lean-out my engine a bit and enjoy it. You will also find that your 2stroke engines will generally run well with 5% to 15% nitromethane. I use 15% nitromethane on my 2-stroke performance planes, but nearly all my other sport planes run fine on 10% nitromethane.

I hope this is clear and of interest to your club members. I will be glad to answer any questions they may have about mixing up their own fuels. I mix up my own fuels basically for four reasons:

1. It is relatively inexpensive and very simple,
2. I have done so for more than 45 years,
3. I can mix up better fuels than are available to me at my local hobby shop, and
4. I know exactly what is going in my engines and can tailor it as I need for a given engine.

Happy flying!
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