



The Flightline



Volume 36, Issue 1

Newsletter of the Propstoppers RC Club

AMA 1042

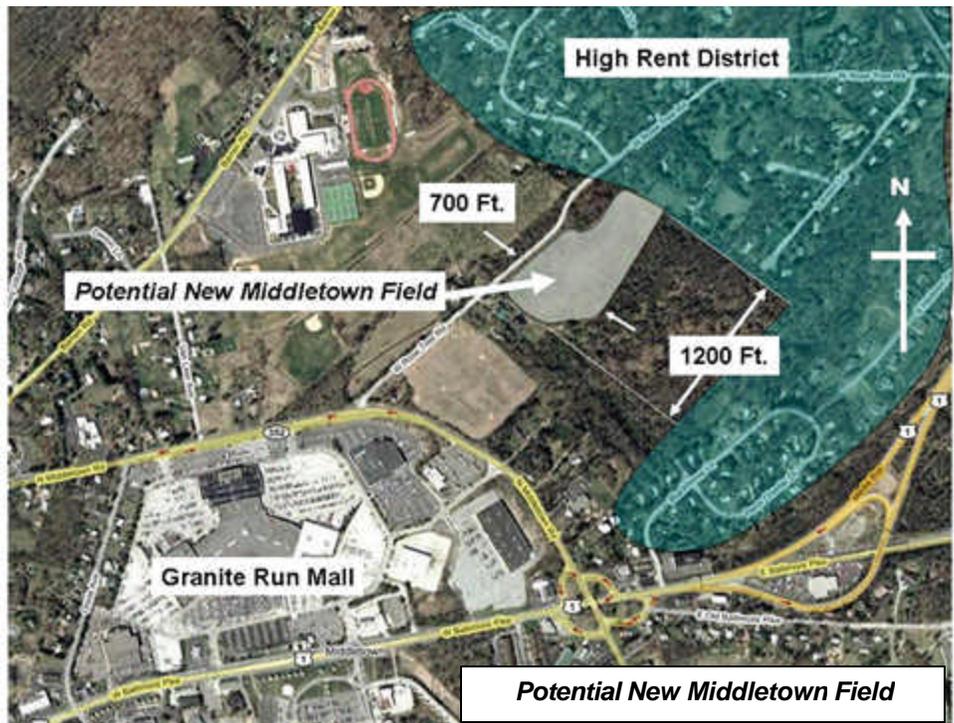
January 2006

President's Message

First I would like to wish everyone a Happy New Year. Then I wish to thank you for your vote of confidence in electing me as your President. I will try to live up to the responsibilities of the role and keep the Propstoppers healthy in our 36th year.

The Middletown Library would like us to fill a showcase with pictures, flying models, radio gear, and any other things pertaining to our club. They would like us to do this for the month of February. The cabinet is quite small so please give it some thought and bring your ideas or potential show items to the January meeting.

We finally have a limited flying for fuel models on Saturday at Sleighton and I plan to request an extension for Wednesday evenings so we can all fly there during our summer meetings. Perhaps we can also get permission to fly gas



Agenda for January 4th Meeting Middletown Library 7:30 pm

- ? Approval of December meeting minutes
- ? Membership Report and Discussion
- ? Finance Report
- ? Flying Field Status and Issues
- ? Initial Planning for 2006 Events
- ? Show and Tell

powered helicopters there whenever the field is open. Helicopters, when well muffled, seem to be much quieter, or at least less objectionable than up-and-away glow planes. Flying time for electric for both fields are normal flying hours Monday through Sunday.

I understand there are concerns about lower membership for this coming year. I also understand with limited fuel time this may affect some members' renewal. I am trying my best to locate a field to accommodate both fuel and electric.

We do have two fields for electric now and a when we do find a field for fuel, I'm sure a membership will grow.

The board and I would to thank everyone for sticking with the club during these stressful times.

As you can see there is another field possibility depicted above. This is property the township bought from the Smedley family. I understand it will not be developed soon or maybe never. The development plans are just in the talking stage, but I feel it has great potential for us. If this goes through we will be able to fly both fuel and electric (and use the bathrooms in the Mall!). We may have to share it with a farmer, but many clubs do that. Keep your fingers crossed.

All show and tell are welcome to the January meeting.

Please don't forget indoor flying at Tincum School on Friday, January 6th from 7-9p. m. and again on the first Fridays in February and March.

There were a lot of helicopters and planes at the December meeting (see the article in this issue), so come on out and join us.

Dick Seiwel, President.

P.S. - All members are invited in the search for a field, we don't need a committee, we **need a FIELD.**

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Calendar of Events

Club Meetings

Regular Meeting 7:30 pm
Wednesday 4th January, 2006
Middletown Library
Behind Weather's Dodge on Rt, 452

Tuesday Breakfast Meeting
The Country Deli, Rt. 352 Glenn Mills
9 till 10 am. Just show up.
Flying afterwards at Sleighton Field

Regular Club Flying

At Middletown / Sleighton Field
Monday - Friday;
10 am until dusk - Electric Only
Saturday
10 - 3pm-for FUEL PLANES and
10 - Dusk for Electric
Sunday - 12 - Dusk - Electric Only

At Christian Academy; Electric Only
Monday through Friday after School till dusk
Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk

Indoor Flying

Tinicum School Fridays;
1/6, 2/3, and 3/3; 7 - 9 PM.

Special Club Flying

Saturday mornings 10 am Sleighton Field
Tuesday mornings 11 am Sleighton Field
Thursday evenings 4:30 on, at CA field.

Note; only electric powered airplanes.
Beginners using due caution and respecting club
rules may fly GWS Slow Stick without instructors.

Propstoppers RC Club of Delaware County, Pennsylvania.

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Minutes of the Propstoppers Monthly Meeting December 7th at the Middletown Library

The meeting was called to order at 7:30 p.m. by Vice President Dick Seiwel presiding in the President's absence.

There roll-call by membership chair Ray Wopatek showed 13 members and 1 guest present.

Minutes of the November meeting as printed in the newsletter were accepted by the membership.

Treasurer's report by Jim Barrow was presented to the members.

Old Business:

In response to several questions, the officers noted that club dues for the upcoming year will remain at \$60.

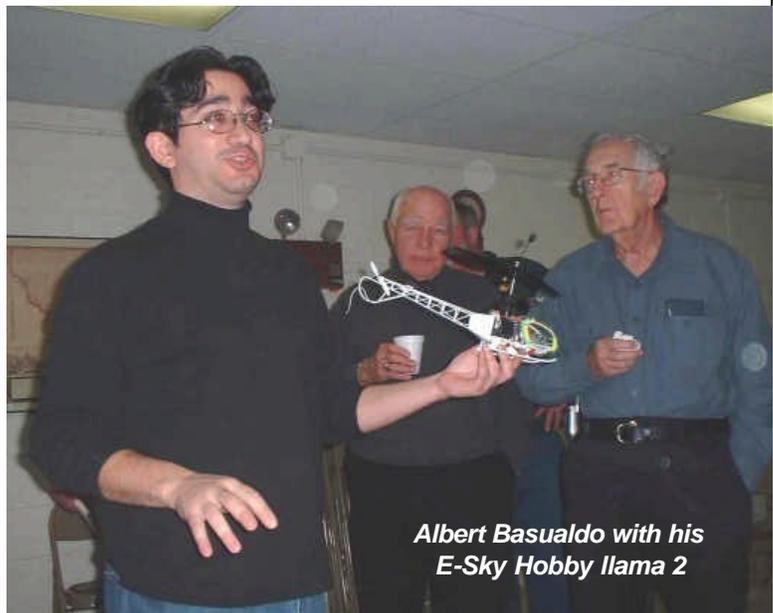
New Business:

Dick Seiwel asked for members to contact him with display models that could be placed in a temporary exhibit at the library as a showcase for the Club.

Break and Informal Session:

Eric Hofberg talked about his order of eight small indoor R.C. helicopters capable of hovering and some maneuvering. While he admits they're not ideal, they came at a cost of just \$30 a unit. He and several other members flew them successfully at last week's indoor flying session. He says they're fun to fly in your living room. See Eric for further details.

Albert Basualdo showed his E-Sky Hobby I lama 2 indoor helicopter. It has only pitch control in the blades and flies with counter rotating blades that keep it stable. It also has built-in a gyro were further stability. He flew it in the club room showing its lively climb. He also showed control of flight angle and forward speed flying it around the room with a high degree of control.



*Albert Basualdo with his
E-Sky Hobby I lama 2*

The meeting was adjourned at 8:45 p.m.

Richard Bartkowski, Secretary.

Propstoppers Help Widener Student Engineers

"The Primes" an enthusiastic groups of senior Widener University engineering students has entered an international flying contest. They plan to compete against student engineering teams from around the world. The task is to build a model aircraft that can carry the greatest payload after taking off from a 200 ft. runway. All teams must use the same engine, a 0.61 fuel type and all planes must have a 96 in. wingspan. The team to lift the greatest payload and fly around a circuit to land successfully is the winner.

Here is a picture of the type of model that is built for this competition.

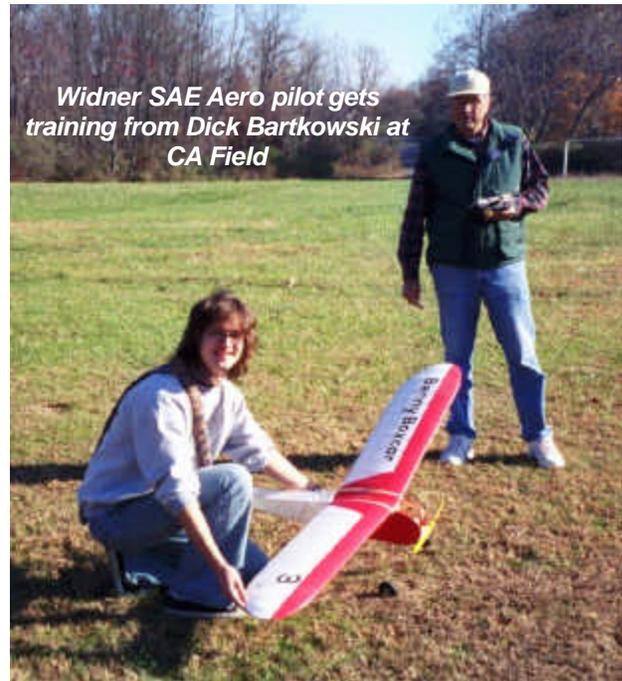


Vice-President elect Dave Bevan is a technical adviser for the team. He felt it would be wise if the team had some experience with a model plane before developing their design. None of the students had any experience in the building or flying of model aircraft. So, on rainy Tuesday morning at the Country Deli, Dave asked the breakfast group if anyone had an old plane that could be used for practice. Unfortunately, no one had a complete ready to fly plane, but a few of us had parts. Mick Harris said that he had an Old Timer airframe sitting in his garage. It was a beautifully appointed, "Benny Boxcar" built with Mick's usual attention to detail. It is a Henry Struck design with a reputation as a good flyer. Dick Bartkowski said he had a transmitter, receiver, motor, speed control and suitable batteries. The two got together and realized that they had all the parts needed to make a complete flying model. Dick mounted the parts he had into Mick's air frame and the two went out for a flight test. Luckily, the plane flew beautifully. The only thing the students were missing was a battery charger which generously was supplied by Jerry Harrison.

Dave then arranged for the students to join us at the Christian Academy field one sunny Saturday morning. Dave brought along his park flyer to start out the flying session. Although he had never flown a radio controlled model, our budding pilot had many years experience handling a computer joystick playing a multitude of video games. After quick instruction on the use of the transmitter controls, the student pilot took it around successfully for a few flights. Then it was time to try the Benny Boxcar. After a successful take off, our intrepid pilot flew around above the trees and set up for an approach. Unfortunately there were some difficulties with the controls because a servo might have

come loose. In the end of the plane ended up in a tree. The plane was retrieved with just some minor damage. But this was not going to set back our fearless team.

Dick repaired the model overnight and on the following morning Dick, Dave and the pilot were back out for another session. Things could not have gone better. Our pilot successfully took the plane off from our grass runway nine times. He flew it around in various patterns and landed it each time without any damage to the plane. With that success behind us, all went home to prepare for further flying and continuing on the payload project.



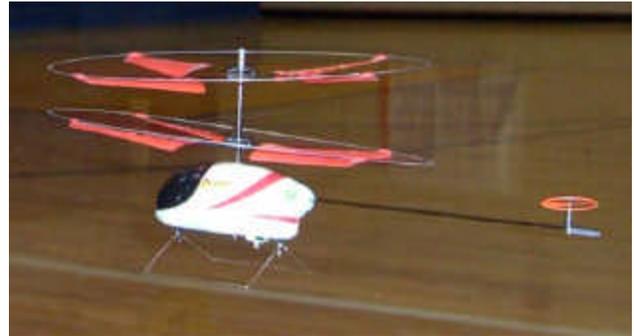
This is the kind of model the project produces. Maybe Dave Bevan can keep us up to date with the Widner team progress.

Dick Bartkowski

First Propstoppers Indoor Meet of the Season

We will just call this the helicopter meet, as that was what you saw; anytime, anywhere. The sky seemed to be just filled with them. Eric Hofberg started things off with one of his \$30 coaxial rotor machines. This incredible helicopter came complete with radio and charger. Truly ready to fly, and fly it did.

Eric Hofberg with the \$30 helicopter



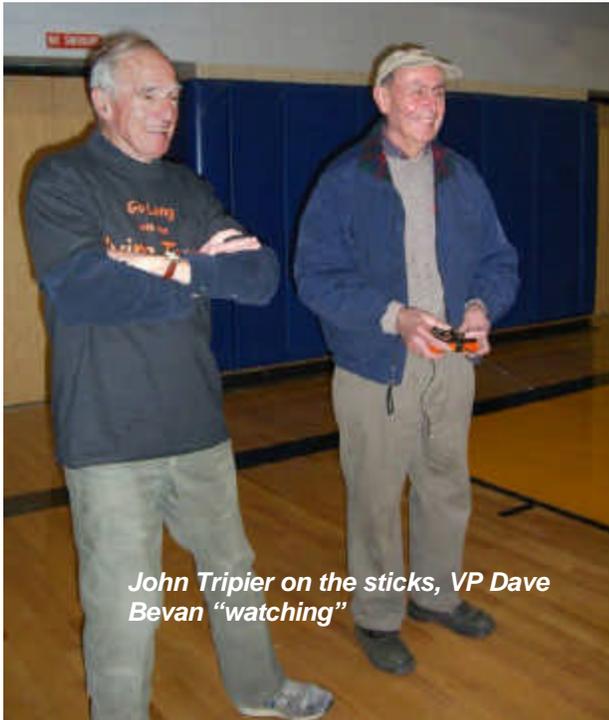
Bart Hirst with his \$30 helicopter

There are a number of these kinds of machine on the market but Eric and his buddies decided to buy a case lot of eight of this one; a good decision as it flew beautifully. Bart Hirst and John Tripier also bought them and the three of them flew constantly. Notice the little horizontal tail rotor that provides pitch control. It is powered by a minute direct drive pager motor.

In addition to excellent stable flight performance these machines come with a fine transmitter. If you closed your

eyes you would swear it was a Futaba; and remarkably, if you did, when you opened your eyes the model would still be in a steady hover.

John Tripier has been flying several different small helicopters for a year or more and recently bought one of these coaxial machines too.



John Tripier on the sticks, VP Dave Bevan "watching"

At the other end of the hall Albert Basualdo flew his more expensive version, an E-Sky Hobby llama 2, as well as a single rotor machine with all the normal controls. Albert is an excellent pilot of all kinds of airplanes and also wowed us with his virtuosity with his 3D biplane too.



Al Basualdo wows the crowd with three-foot diameter outside loops

Your editor had acquired a very large two-cell LiPoly battery as a "speed secret" for an up coming European SAM Champs "winner". It occurred to me that it might be the trick that would make my old Kyosho Conquest 30 sized electric powered helicopter fly better than it had with an eight cell NiCad pack. The NiCad's weighed 16 ounces and put out 9.6 volts, whereas the LiPoly weighed only 6 ounces and 7.6 volts nominal. Steve Boyajian had tried the machine at the last indoor of last season and found the results poor.

Since I am not helicopter qualified I just tried some short hops at the beginning of the meeting and much to my surprise the machine had power to spare and also handled well. I was able to make several short and rather stable hops. Whereupon my grandson, good hands Matthew Everett, he who took 2nd place and beat me at the Electric Scale Nationals, asked for a try. He immediately flew into a stable hover and made some mild maneuvers, like he knew what he was doing. After all, he has spent his lifetime twiddling the sticks on the computer.



Dave Harding's Kyosho Conquest electric helicopter before the "event".

Anyway, the machine began to drift towards the stage so he decided to put it down; wrong, first big mistake; you don't chop the throttle with a helicopter (at least, not unless you are very high and have practiced autorotations before). With a throttle chop near the ground the machine just drops as though you just held it there and dropped it cold. However, with all that spinning machinery the resulting impact causes all kinds of moving part impacts. I am now in the market for a new tail boom and several main rotor parts. It might be difficult to find them as this machine has not been made for some time.

Meanwhile, that building and flying machine, Joe Mesko, built yet another home brew aerobat. This one is covered in the new Saran self adhesive product. Naturally, it flew well even though it has no dihedral. So much for Physics!



The Brain Trust looks on

The "Brain Trust" mulled over Joe's design and pronounced it impossible to fly!..... While they admired his precise control!



Joe "foamy" Mesko with his latest.

Other flyers included Mike Black with his trusty IFO. These really are marvelous machines and still every bit as modern in their capabilities as the current fleet of foamy 3D's. Eric Hofberg flew one of those tiny foam RTF models, also bought in case lots for about \$30. Your Editor flew, or tried to fly his ageing fleet of electric powered scale freeflights. I think they are now well and truly retired, so on to RC versions.

So once again we had a good turnout, an interesting visitor and a great time. And, as usual every indoor is different. This one was clearly "Helicopter Time". These machines have now reached the stage where good flying machines are available in a range of affordable prices.

The next meet is on January 6th followed by two more on the 3rd of February and the 3rd of March. Get with it, buy or make something now.

Dave Harding

Why Limiting Throttle Will Not Protect Components Propped "Over the Limits"

One of the most common misconceptions, and least understood important concepts in electric R/C is in matching the components to their current capabilities.

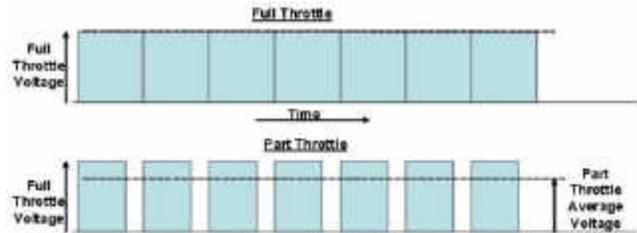
The primary limit for most electrical components is one from excessive temperature. This is true for Motor, Controllers and Batteries, particularly LiPolys. When current limits are stated they are based on the heating resulting from this current level and the heat dissipation expected in the application.

Quite often people build a system and select a propeller that at full throttle will pull in excess of the component limits with the expectation that flying most of the time at reduced throttle will protect them. We know that at reduced throttle the motor "sees" lower effective voltage and experiences lower current. Now many electric flyers use a Wattmeter or similar device to measure the current "pulled" by their power system and they have observed that both voltage and current reduces at lower throttle settings.

This view is quite wrong as we will see.

The speed controller functions by chopping the battery voltage

on and off at high frequency. The throttle varies the on and off time. At full throttle the time blocks are at battery voltage all the time, and so the average voltage is battery voltage. At reduced throttle the output is seen as the average voltage over the block counting on and off time.



The motor "sees" the reduced average voltage and produces output power accordingly.

However, the components in the system; battery, ESC and motor are heated by the current flowing through them by the amount of their internal resistance, R_i and the **square** of the current, I

$$\text{Power} = I^2 \times R_i$$

And the overall heating is the average of current squared over the on/off cycle.

For example - you read 20 amps on your Wattmeter at full throttle. But you argue that you fly your airplane most of the time at half throttle; 10 amps, you can get away with an ESC, motor and LiPoly rated at this 10 amp level. Indeed the Wattmeter shows this to be so as it reads 10 amps at 1/2 throttle.

What is REALLY happening, is when you are at 1/2 throttle, there is 1/2 of every time frame that the ESC is "on" and the components see the full 20 amps, then for the last 1/2 of every frame it is "off" and the current drops to zero.

Regardless of how long per second it is "off" or "on", when it is "on", it is drawing full throttle current from the batteries, through the controller, and into the motor.

Since the heating of these components is a function of the **square** of the current it is this squared current that is averaged over the ESC cycle in setting the component thermal limits.

In this example, the average heating power at 1/2 throttle and 20 amps full throttle is;

$$\text{Heating Power} = \frac{1}{2} \times 20^2 = \frac{1}{2} \times 40 = 20 \text{ amps}$$

Or 100% over the 10 amp ESC and battery limits you chose.

So, when you select your components based on the average throttle usage you are taxing your batteries, ESC and motor. With continued use, this practice will, at best, reduce the life span of the Li-Po pack, the ESC, and the motor, and at worst will burn out those components in one flight.

Of course, if you really need 20 amps for the takeoff or any other maneuver, then you should use components rated for this level. This is certainly true for ESC's because they are so small and light that they heat very quickly. It is less true for batteries and indeed the LiPoly manufacturers recognize this by specifying both a continuous rating and a burst rating too. Same with motor manufacturers. But as a rule it is wise to watch these things.

So the next time you put together a power system - try to prop the system to be within specs on all components of your power system while at full throttle, and enjoy all the longevity and other benefits that come from today's modern equipment.

Dave Harding, liberally editing from Shawn Plummer, Castle Creations Marketing Director.

DX6 DSM Spektrum 6CH Park Flyer System

By now most of you have heard about the new 2.4 GHz spread Spektrum park flyer radio system released through Horizon Hobby; it was reported in Model Aviation and other magazines. It is a radio that allows us to just turn up, turn on and fly, regardless of who is flying what, or how many of them are flying. You won't shoot them down and vice versa.

This is a comprehensive computer radio with all the advanced features you would expect of a mid range conventional radio, including mixes and ten model memories. The transmitter hardware is actually a mid level JR unit. At \$199 it seems a bargain, regardless of its special features. But does it work, and how well?

First let's re-cap the special technologies. This radio operates on a completely different frequency band to conventional radios; 2.4 GHz, or 2400 MHz; over thirty times the frequency of our "normal" 72 MHz systems. In practice these higher frequency systems are not prone to the kinds of interference we sometimes experience. One reason is that the FAA has not authorized high power uses to squeeze between the bands in this spectrum.

The second part of the special features is the use of spread spectrum technology. This technique is where the message you want to send is chopped into many small pieces, each redundant and sent on a different frequency band. The receiver knows which bands to look for and re-combines the pieces into the original message. When you fire up your DX6, it searches for, selects and locks onto clear channels. (There are 80 channels in the 2.4GHz band.) And because international regulation of the band is very strict, your radio will neither sustain interference from – nor cause interference to – any other 2.4GHz device worldwide. And that applies, of course, to its simultaneous operation near other 2.4GHz RC radios as well.

Now having selected the clear channels it "phones" the receiver. Each Spektrum transmitter has a GUID (Globally Unique Identifier) code. Binding is the process of programming the receiver to recognize the GUID of a single, specific transmitter. Binding teaches the receiver the specific GUID of that transmitter so that the receiver will only listen to the information from its previously bound transmitter and ignores everything else. With over 4.2 billion GUID codes, the chance of having interference from another transmitter is virtually impossible.

The final feature of the Spektrum is that the receiver actually contains two receivers, all the way to the antennas. The reason for this is the "weaker" quality of the radio link at this high frequency. The two receivers work in tandem such that loss of signal on one results in patching in the signal from the other. Furthermore, because there is a degree of risk in momentary loss of signal the system is equipped with a fail safe function, allowing you to set the default control settings to a safe flight condition.

So much for what it does and how it functions; does it work, and how well?

The reason I started this article is that one of my SAM competitors, Eut Tileston, has bought the system and installed it in a couple of his airplanes; a Spirit of SAM Miles Magister and a Lazy Bee. The advantage of this radio to SAM competition flyers is that you can fly when you want regardless of frequency pin availability. Second, some of the events are flown as a mass launch, and again you are always able to fly here too.

Well the fundamental issue is, since this is sold as a park flyer system, is will it have the range necessary to fly competition models to the limits of visibility? So Eut did an instrumented test. Here is Eut;

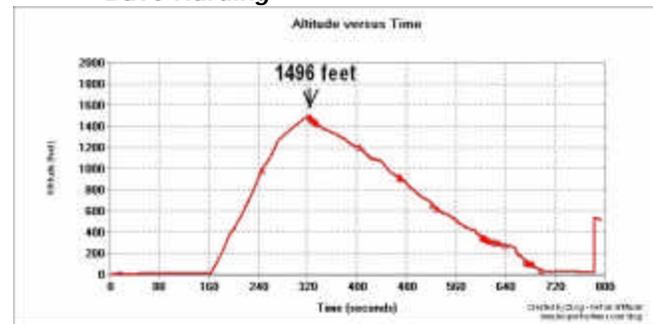
I made a flight with the DX6 in my Lazy Bee today. Made a range check by taxiing down the street with the range check button depressed until the motor stopped. It stopped at about 120 feet. Then I tried it with the antenna pointed at it and the motor cut off at about 75 feet. Then came the flight. The chart shows the altitude. Control was lost when I pointed the antenna at the model at about 1250 feet (see break in climb at that altitude) and recovered almost immediately when the antenna was repositioned.

Searching through the discussion boards I found that others had similar or even better results, in terms of range, loss of signal and recovery. One thing is clear; this system is more sensitive to antenna orientation than we are accustomed. As with any dipole the signal 'end-on' is low and with this system signal drops are experienced, albeit, recovery is quick ~ in the order of milliseconds.

One of the future features advertised by the manufacturer is that of adding telemetry; a system that allows the model to talk back to the receiver sending model information. This must be a legacy of the cell phone technology and hardware on which this system is built.

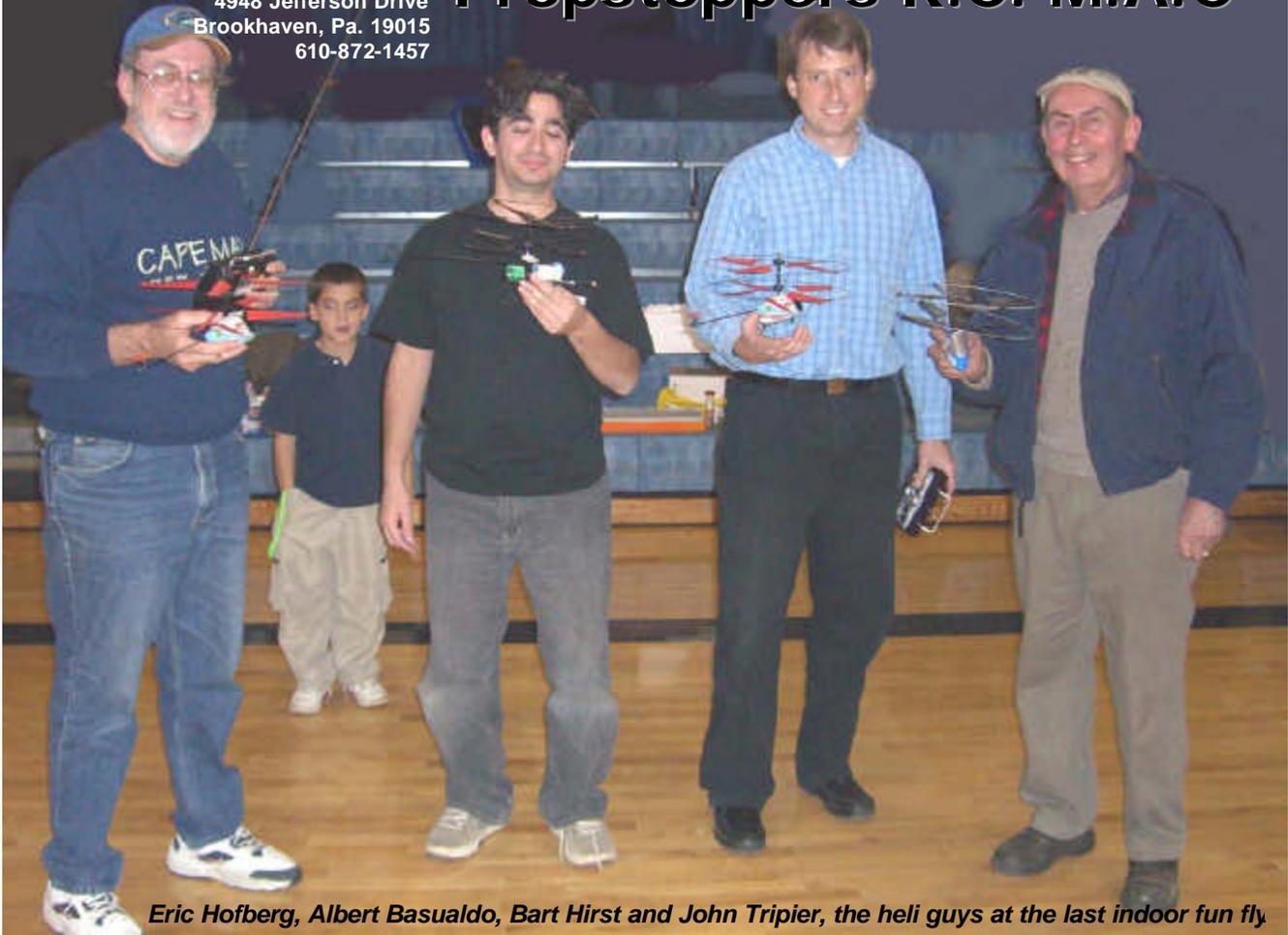
All in all, this system looks like a good one. It clearly points towards our future.

Dave Harding



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Propstoppers R.C. M.A.C



Eric Hofberg, Albert Basualdo, Bart Hirst and John Tripier, the heli guys at the last indoor fun fly

Indoor Fun Fly
Friday 6th January
Tinicum School
7 to 9 pm

**Come on, you must have
something to fly.**
**Or just come and take pictures for
the newsletter.**
**Alright, just come and chat with
your buds.**
Be there!

Regular Meeting Wednesday

4th January

At the

Middletown Library

7:30 till 9 pm

*The Middletown Library is on Rt. 452 behind
Weather's Dodge, just beyond Granite Run Mall.
From Baltimore Pike, Rt. 1, going south, turn right at
the 452 light and drive into the Library on the right.
From Rt. 352 going west, from Chester, pass the mall
and then turn left onto 452 at the light. The library is
on the left 200 ft before the Rt. 1 light*

*Bring your show and tell and suggestions for the
Propstoppers display in the Library display case. We
need to attract new members and this is an ideal and
free opportunity.*