The Transmitter

Suburban RC Barnstormers - P.O. Box 524, Bloomingdale, IL 60108

AMA CHAPTER 640 IMAA CHAPTER 194 August 2012

http://www.suburbanrcbarnstormers.com

Coming in August and September

August 13th, Club Meeting, Bloomingdale Public Library, 7:00pm
August 19th, Fun Fly #4, Pratt's Wayne Woods, 9:00am Trim Flights, 10:00am First pilot off

September 10th, Club Meeting, Bloomingdale Public Library, 7:00pm
September 16th, Fun Fly #5, Pratt's Wayne Woods, 9:00am Trim Flights, 10:00am First pilot off
September 23rd, Giant Scale Fun Fly, Pratt's Wayne Woods, 9:00am
September 24th, Board Meeting

President's Message

By Mike Maciejewski

Hello to all,

Even though it has been hot, I have seen members out at the field flying their planes. I have seen a couple go down in the weed and helped retrieve one. Then came home with a couple new friends, ticks. So if you go out into the weeds make sure you have on some bug spray.

I've talked to one of the ladies from the Forest Preserve office this month. Still no word on the ground breaking for the new flying field. In a few months it will be the fall, so enjoy the field for another year.

It was a nice idea of Ron Hilger to suggest having a swap at the next meeting. This is a way to show off the things you bought, but later found out you didn't need.

There have been some nice fun flys in the area. If you have a specific part of the hobby you like, I'm sure you can find a fun fly in a couple hour drive.

August Entertainment

By Scott Taylor

Is it possible to over Swap? Answer: No!

To that end, we have another! It is becoming a tradition to have an annual swap amongst the members. In the past, this has been done later in the year. But given the likely longer than normal flying season, we are moving the swap up.

So, this month, we will be holding our annual member Swap at the Library as part of our entertainment.

Please get those unused items out of the basement and/or bring some cash! It is always fun to see what shows up.

Notes of the Suburban RC Barnstormers Membership Meeting

July 9, 2012

ATTENDANCE
There were 34 regular members present.

OFFICER REPORTS
President: Mike Maciejewski presided over the meeting.

Mike reported that he had spoken to Doreen at the Forest Preserve and their position is that pilots need 1 million in insurance to fly at the field. A regular AMA membership provides this, but an AMA Park Flyer membership does not. Please be aware of which type of membership you hold. You should also be aware that Park Flyer members cannot fly in AMA "Rules" sanctioned events.

Vice President: Dave West said door prizes for the evening were a combination wrench and a drill bit sizer. The UpRoar will again serve as the rollover tonight, but we will roll until it goes!

Entertainment tonight includes an explanation of the "thing" at the front of the room by Keith Egging, and a demonstration of a 3D printer by Dave West.

Dave extended his thanks to Steve Thill for his presentation at the last meeting on parallel charging of batteries.

Treasurer: Bob Elsner said the Forest Preserve had given us a $45 credit for the Fun Fly that was cancelled due to Presidential TFR.

Bob reported we got our refund for unused chairs at the Swap. That amounted to $336, which left us with a final profit of $1771.

Secretary: Scott Taylor mentioned a couple of things about the newsletter. First, if you haven't gotten an email message saying it is available, please check our website. You may very well find it there. The newsletter is usually available on the Website by Thursday.

Scott had some AMA labels for sale for 15 cents each. While these particular labels are not required, some form of identification is required to be inside your aircraft in order for AMA insurance to provide coverage.

If you know anyone that requested a nametag and has not received it, please let Scott know. The inventory is building and we would love to get these to their owners!

COMMITTEE REPORTS
Fun Flys – Mike Maciejewski broke the news for those that missed the event, that the Prop Master's took home the trophy once again. But it was very close; one spot landing in our score could have turned things around.

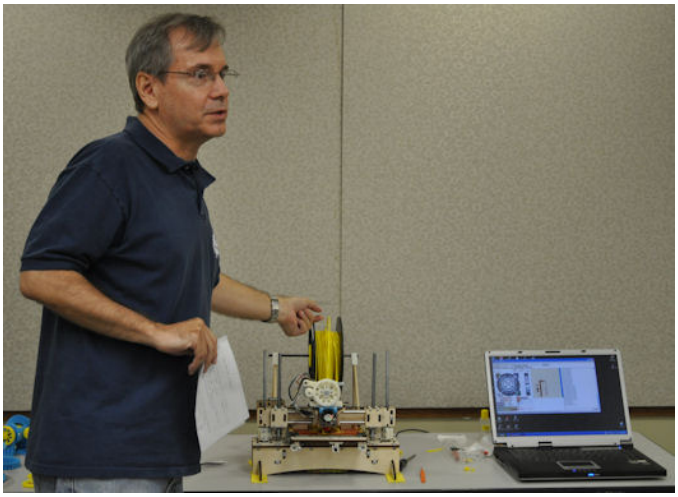
Mike also said that a couple of cars had items stolen from them during the event. Pilots should be careful to lock their cars while at the field.

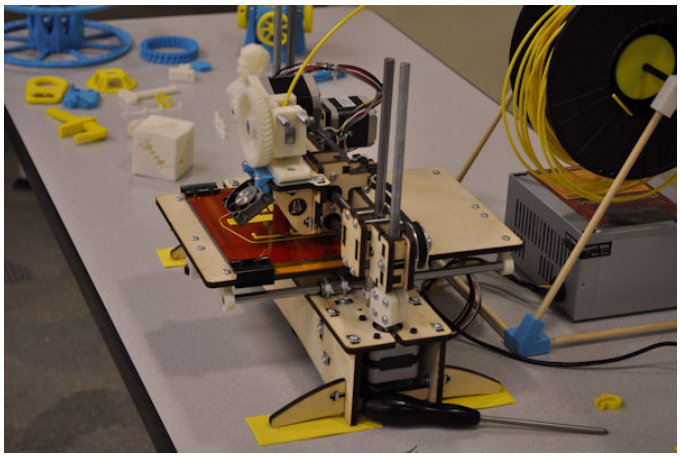
Scott Stampfli said we would have a Fun Fly next Sunday, but there was no competition planned. This will be a show up and fly event!

ENTERTAINMENT
Ron Hilger suggested we hold our annual club member's only swap at our next meeting. Everyone felt it was a good idea. Get your surplus items ready and bring them to the next meeting!

Keith Egging brought in his "ultimate" flight box. Something he designed and built many years ago. This box did just about everything from mixing fuels to mixing drinks. This box even had an early 4 bit Intel processor in it that was used to transmit a preprogrammed or "learned" set of maneuvers. Most members felt this box deserved a spot in the AMA museum, but Keith had the curbside recyclers in mind. "It was too much work getting it out of the basement"!

Dave West demonstrated his new Fuse Deposition Model (FDM) printer. Prices have been dropping radically from the 100's of thousands, to thousands, and now hundreds of dollars (Dave's breaking point!). This is a single nozzle deposition model, which means some planning is required when designing parts to be printed, so that they can be built continuously from the bottom up.





Dave described the technology and software that can also render designs from photographs. As he did, his printer worked to create a plastic clamp, which became an additional door prize.

PLANES AND THINGS

Bob Sarley showed the members his new Yak 55 pattern plane. It is a Great Planes model that is powered by a Rim Fire 32 motor. This model weights in at 3.7 pounds and sells for about $180 dollars. This plane is for precision pattern flying, not 3D.

Marty Schrader brought in a scaled up version of a rocket-powered glider. However, this model uses a 10-gram electric motor for power.

RAFFLES

Lynn Littlefield was the winner of the Turkey raffle. **John Cacciatore** took home the 3D printed clamp, **Barry McConnell** grabbed the multi-wrench**,** and **Steve Merrill** won the drill gauge**. Leno DiDonna** was the winner of the rollover raffle.

Roll-Over Raffle

By Dave West

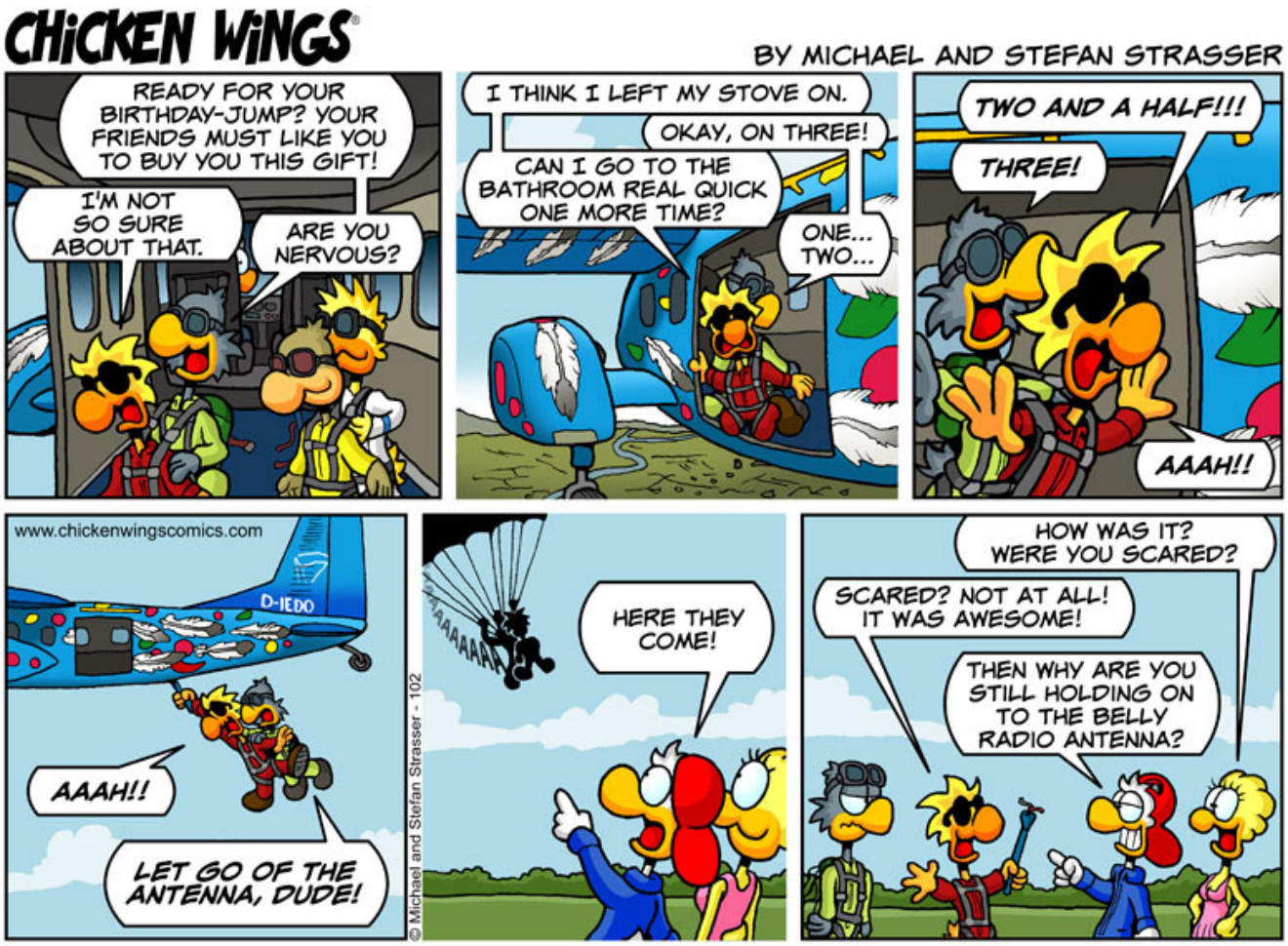
The roll-over starts anew this month. The prize is an ElectriFly F-20 Tigershark ducted fan model. The model is receiver-ready and includes the fan unit, speed control, and pre-installed servos. Add your own receiver and a LiPo battery and you are ready for 85+ MPH jet flight. It could be yours for as little as a dollar!

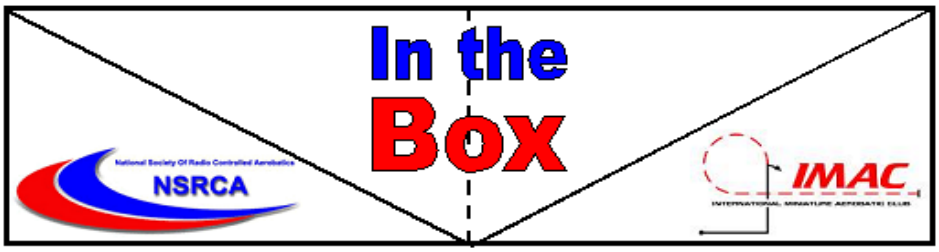
.

Builders Door Prize

By Dave West

We'll have a special door prize for builders. It's a Fun 51 kit from Tower Hobbies. The kit was donated by member Jerry Jeske. It's a 44-inch span .40-size profile model with a P-51 outline -- but optimized for sport aerobatics. The box claims it "... can be ready for fun and glory in less than a day"! To make sure it goes to someone who will build it, only those interested will put their name in the drawing. Someone will win this great kit! Thanks Jerry!





Pattern Flying - Precision Aerobatics

Taking your passion for flying RC airplanes to the next level!

By: Bob Sarley

R/C servos in the digital age - Yet another step forward in the quest for precision pattern flying excellence.

Last month we explored the configuration and operation of our typical analog (standard) servos. This time we will explore the newer digital servos that are destined to replace the older designs and discuss the major differences and similarities between them. The current breed of available analog servos is certainly adequate for many of our sport and leisurely flying applications. Their performance, reliability and durability have been optimized over the years. However, the performance levels of the quintessential servo that is demanded of some of the categories of R/C aircraft flying these days has raised the bar in terms of speed, power (torque) and positioning precision. The digital servo seems to have responded well to these challenges.

When comparing the physical properties of an analog servo to its digital counterpart we find that they are similar, if not identical, in most R/C hobby applications. The cases are the same, the available gear trains are the same (nylon, Karbonite, metal), the available motors are the same (3-pole, 5-pole, coreless and brushless) and they both utilize a potentiometer for their positional feedback loop. A digital servo can be plugged into any existing R/C receiver channel that is used for an analog servo. Where the digital servo differs from the analog servo is the motor control electronics.

Laptops and i-phones aren't the only things with computer chips. . .

The analog or "standard" servo has a logic chip and timing components connected to the receiver with a typical 30 strand lead. The digital servo, on the other hand, has a full blown quartz crystal controlled microprocessor and FET (field effect transistor) amplifier that is connected to the receiver with a heavy duty 50 strand lead.

In a standard servo at idle, no power is being sent to the servo's motor. When a signal is received for the servo to move, or pressure is applied to the output arm from the control surfaces, the servo motor controller responds by sending voltage pulses to the motor. This voltage (typically 4.8 to 5 volts DC, which is the maximum your BEC or on-board receiver battery is supplying), is pulsed or switched on and off at a fixed rate of 50 cycles per second, resulting in small blips of power. By increasing the duration (pulse width) of each blip of power within that 20 millisecond window, the speed and acceleration of the servo arm to its new position can be controlled. As the servo position feedback potentiometer indicates to the servo's electronics that it is reaching its required position, the power blips are reduced in duration to slow it down, until the power applied to motor (and subsequent servo arm rotation) is reduced to zero.

Because of the relatively short duration pulses occurring 50 times per second, this quick blip of power-on', followed by a pause, does not give the motor much incentive to turn. As the power is turned on for longer periods of time (by increasing the width of the pulses), the servo will eventually develop more speed and torque. What this means to us is that for small movements of the control on your transmitter (which in turn sends short duration initial pulses to the motor), the available torque to move the control surface is minimal resulting in sluggish or virtually no movement around the center position of a standard servo. Friction from linkages and hinges as well as aerodynamic forces placed on the control surfaces can overpower the available torque and render the small input command ineffective. That is why there is what is termed a "dead-band" associated with any servo and is more predominant in an analog servo.

Although the digital servo is subject to the same 50 pulses per second and 20 millisecond time window, the digital servo uses the microprocessor to interpret the incoming signal and apply preset (programmed) parameters to that signal before sending its pulses of power to the servo motor. The duration of the power pulses and, therefore, the total effective amount of power sent to activate the motor can be adjusted by the microprocessor's programming to optimize servo performance.

The result of all this computer power is that a digital servo can send pulses to the motor at a significantly higher frequency. The digitally processed signals allow the servo motor to receive 300+ pulses per second instead of 50. Even though the width of the individual pulse are narrowed to squeeze them into the 20 millisecond window, the amount of effective power sent to the motor is much higher. Since the power is being turned on/off more frequently, the motor has more incentive to turn (can produce more torque). The results is a servo motor that can respond faster to commands giving the digital servo a much improved dead-band, a faster response, quicker and smoother acceleration/deceleration, better resolution (more accurate positioning of the control surface) and increased holding power.

But there is a price to pay for this performance increase. . .

This increase in overall servo performance comes at a price - two prices, actually. The first is cost of the servo itself. Digital servos are typically 20% to 50% higher in cost than their analog or standard counterparts (same size, gear types, motor types, etc.). But remember, the specs for speed and torque of an analog servo represents the maximum developed values. Maximum torque and speed is not available in the dead-band or at the end points of the servo arm travel. The torque and speed capabilities specified for the digital servo, however, are almost constant throughout the range of servo arm travel with the full amount of torque available for holding its position.

The other “price” is power consumption. Since power is being transmitted to the servo motor more frequently, the overall power consumption is increased. Even at idle (no commanded servo arm motion), the digital servo motor is receiving as much power as it needs to hold the position of the servo arm against any forces that might be trying to move it. That fact plus the 300+ pulse per second delivery rate is why you may hear a singing note from digital servos when they are powered up.

With the lighter weight and higher capacities now available from Lithium Ion (Li), Lithium Polymer (LiPo) and Lithium Iron Sulfate (LiFe) battery technologies, the increased current drain of the digital servo is no longer a significant problem. Whether you are using a BEC for electric flight or a separate battery pack for glow or gas powered flight, always incorporate the largest capacity battery that space and weight will allow for your airframe of choice.

Author’s Opinion: Since there are no technological problems and no differences in size and weight, if you can afford the increased cost of digital servos the improvement in performance is well worth the price. I switched to Futaba 3150 metal geared digital servos in my 51 inch, 3.75 pound YAK 55M that I am now using for my pattern flying and have found the difference in control to be significant. So much so that I will never be able to revert back to analog servos in any aircraft used in my attempts to improve my pattern flyin

Digital Servos – In Summation:

- Better resolution
- Smaller dead-band
- More accurate positioning
- Faster control response
- Constant torque throughout travel range
- Increased holding power at station

An apology from the author

I must apologize for an oversight on my part regarding the exclusion of a very significant AMA special interest group that contributes much to the diverse interests of pattern and precision aerobatic flyers. The Senior Pattern Association was formed in March or 1991 by Mickey Walker. He and some of his flying buddies were concerned that pattern flying in general and pattern competition in particular was becoming too complicated and expensive for the average enthusiast. I’m sure some of us Barnstormers can relate to that.

In an attempt to atone for that oversight, the new header (shown below) that includes the Senior Pattern Association logo will be used for all subsequent “In the Box” issues. I will be including articles that relate to the preservation and continuation of the simplicity, challenges and enjoyment that was indicative of the early days of pattern flying.

The Transmitter

This newsletter is published monthly by the Suburban RC Barnstormers, Inc.

We reserve the right to edit all information forwarded to us. Permission is hereby given to reprint any article that we publish as long as proper credit is given.

Material can be submitted for publication: (1) at a meeting, (2) by mailing to Suburban RC Barnstormers, Inc., P.O. Box 524, Bloomingdale, IL 60108, (3) sending it to the email of the editor, Scott Taylor, at taylorsr@core.com

Articles must be received by the 4th Saturday of the month to be included in the following month's newsletter.

OFFICERS/BOARD OF DIRECTORS

President	**Mike Maciejewski**	**630-513-1476**	macieml@sbcglobal.net
Vice President	**Dave West**	**630-837-6553**	dwest@wingedshadow.com
Treasurer	**Bob Elsner**	**630-653-5345**	Srcbarn@aol.com
Secretary	**Scott Taylor**	**630-669-7287**	taylorsr@core.com
Flight Instruction	**John Howe**	**630-541-3054**	lflyrc2@comcast.net
Fun Fly Chairman-Dome	**Ron Hilger**	**630-833-8111**	Ronhilger@aim.com
Fun Fly Chairman-Outdoor	**Scott Stampfli**	**630-440-6475**	stamper022@comcast.net
Safety Officer	**Tom Lyons**	**630-668-9525**	gtpslyons@comcast.net
Board	**Orvil Fluharty**	**708-624-3856**	orvilret@comcast.net
Board	**Steve Dietrich**	**630-272-0005**	sgdtrick@gmail.com
Board	**Jeff Peca**	**630-305-0018**	j_peca@yahoo.com
Board	**Glen LaRocco**	**847-741-9363**	EagleN2FB@comcast.net
Board	**Stan Warden**	**630-654-8476**	frenchstan@comcast.net

NEWSLETTER STAFF

Web Masters	**Marty Schrader**	**(630) 588-0241**
Editor/Publisher	**Scott Taylor**	**(630) 669-7287**

Please Support The Following Hobby Shops

Al's Hobby Shop,Inc.	**121 Addison, Elmhurst, IL**	**(630) 832-4908**
HobbyTown–St Charles	**2061A Lincoln Highway, St. Charles, IL**	**(630) 587-1256**
Lagrange Hobbies	**25 South LaGrange Rd, LaGrange, IL**	**(708) 354-1220**
Strictly R/C	**7719 W Lawrence Ave., Chicago, IL**	**(708) 456-9100**
True RC	**http://www.TrueRC.com**	**truerc@comcast.net**
Adventure Hobbies	**23 Huntington Lane, Wheeling, IL**	**(847) 537-8669**

Visit our web site at http://www.suburbanrcbarnstormers.com