



# The Seminole Flyer

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Aeronautics  
AMA Charter #216, 1969-2006



[www.seminolerc.com](http://www.seminolerc.com)

"The Seminole Flyer" is a publication of the Seminole Radio Control Club of Tallahassee, Florida

**MAY 2006**

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It's Float Fly Time again May 13<sup>th</sup>. See "Upcoming Local Events".

## Letter from the Editor- Stephen Warmath

Well guys, it hasn't been a real newsworthy month, but there is some light reading available to pass on. I have collected some interesting articles on **Toe-In** (Wheel Toe-In, not how one stands at the pilot station), **Kevlar Composite Materials** and **Color Theory** to help us see our aircraft better in different lighting conditions.

Having the Club meeting at the Field in April was a real hoot. Good time, good folks, good flying and good food. We've decided to do it again and keep doing it through September. See my Secretary's Report.



Also for those of us who are storage challenged and for the **very few** that have too many of whatever, some ideas on how to turn that garage ceiling and wall into storage solutions. For you video lovers, check out this month's serving at.... [http://www.alexisparkinn.com/aviation\\_videos.htm#Videos](http://www.alexisparkinn.com/aviation_videos.htm#Videos)

Happy Building & Flying- Steve

## Chief Pilot- Mike Atkinson

April was a very good month for the club. We had several good opportunities to showcase some of the positive assets of the club and were able to accomplish our goals.

First, some of our club members assisted in hosting members of the Tallahassee Boys & Girls Club. They brought several kids, as well as numerous adults to the field on April 15, 2006.

They were greatly impressed with the hobby and some of them indicated their plans to pursue more extensive involvement. I would like to send a special thanks to Tristan Seeley for his assistance with the trainer planes during the event.



The Apalachee Regional Park community meeting was held on April 18, 2006. We had very good representation from the club. I would estimate in excess of 20 club members were present. Jeff Owens had planned to be the spokesperson for the club. But, as the meeting progressed, it became apparent that would not be necessary. The club has an excellent history with all parties involved. There will be a time in the future we may need to "sell" the committee on the positive benefits of our hobby, but for now, we should concentrate on being good tenants of the property and be as "community minded" as we can. Incidentally, the county commission is set to renew our property lease this month.

Finally, my dad, Bill Atkinson, and I had an opportunity to put on a day-long flight demonstration for the students at Shadeville Elementary School, in Crawfordville. We began flying at 9:00 a.m. and continued until nearly 3:00. The students were brought out 3-4 classes at a time, for 45 minute sessions. In all, we were able to entertain 7 groups of students. We flew the Senior Kadet (with parachute drops), the flying lawnmower, the flying Batmobile, a "vintage" Moreine Salneir (piloted by Snoopy), and placed some teachers and students on the buddy box flying a World Models' trainer plane.

John Hall and I performed a similar show at Medart Elementary School last month. The kids loved the show and it gave us quite an ego boost with all the applause after our flights. The hardest thing about these events is to maintain AMA recommended safety precautions. If that can be done, though, it's a blast!!!

I mentioned Tristan Seeley earlier. He has agreed to join Geoff Lawrence and me as certified flight instructors for the club. The designation carries with it a special membership with AMA, and allows us to legally work with an individual for up to 30 days without them having to belong to AMA. We still encourage all new members to join AMA immediately, however. Also, we would like to coordinate about 5 more members as "beginning" instructors, capable of performing a pre-flight check and general high altitude flight instruction. Geoff, Tristan, and I will continue full flight instruction. For helicopter instruction, please see Gordie Meade, John Hall, or Jay Luedecke. We are getting into the busy part of the flying year. If you are willing to be a "beginning" instructor, please let one of us know.

Don't forget the meeting at the field this month at 7:00, instead of the usual 7:30. The club is buying the food and Hobbytown Frank is preparing it. Thanks, Frank!!!

See you at the field, Mike Atkinson



**Chief Copilot- Geoff Lawrence**  
**Upcoming Local Events:**

**Saturday, May 13.** We've scheduled a **Float Fly** for this date. We've been invited by Francis Surovec to hold our next Float Fly at his 30-acre pond. Directions:

Go North on HWY 27 from Havana and take the HWY 111 split toward Calvery. Take Lower Hawthorne Rd. Turn on Dickey Ferry Lane. Riverwoods Plantation is about 3/4 mile down on the left at the bend in the road. Look for the pond. If you need help, contact Francis Surovec at 656-2113.

**Saturday and Sunday, May 20 and 21.** AirFest 2006 at the Tallahassee Airport.

**Saturday May 27.** Open House at our field.

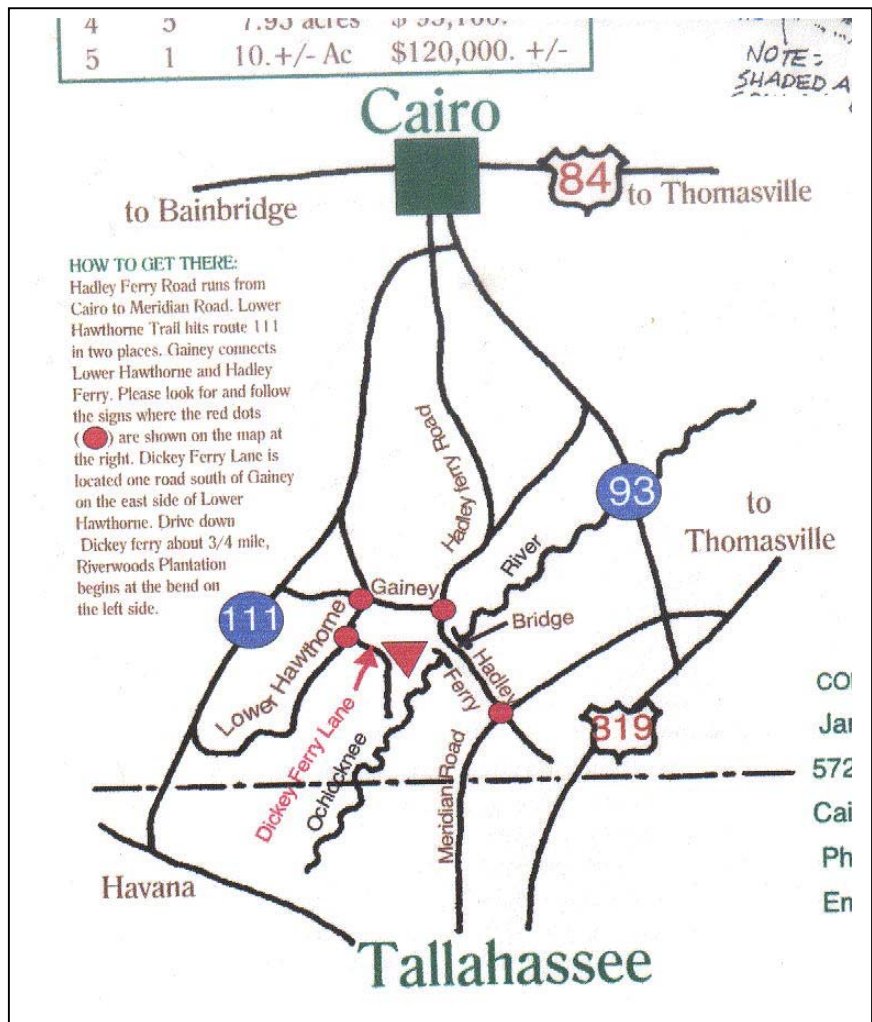
**Regional Events:**

**Southeast Electric Flight Festival**

GA  
 5/04/06-5/07/06 - Andersonville, GA (C) Southeast Electric Flight Festival. Site: Hodge's Field. Ernest Schlumberger CD, 4993 Saxony Court Stone Mountain GA 30083 PH:678-458-4773 email: [eschlumber@aol.com](mailto:eschlumber@aol.com). The South's premier electric fun fly open to all forms of E-powered flight. Primarily open flying, demo flights, BBQ Saturday night, top electric flight vendors and full line hobby shop on site. LMR Sailplane (class B and SEFF no excuses) and F5B competitions on the 4th from 9am to 3pm. Open flying after 3pm and throughout the weekend. See event website for details at [www.fayetteflyers.com](http://www.fayetteflyers.com). Sponsor: FAYETTE FLYERS

**Jets Over the Swamp 9**

GA  
 5/05/06-5/07/06 - Waycross, GA (C) Jets Over the Swamp 9. Site: Waycross, Ware Co Airport. Allen Smith CD, PO Box 36 Waresboro GA 31564 PH:912-285-8022 email: [lasuga56@hotmail.com](mailto:lasuga56@hotmail.com). Ducted fan or jet aircraft only. Campers on site. No hookups. Landing fee \$30. Sponsor: OKEFENOKEE RC CLUB



### **O J Stillman Memorial Pattern Contest**

FL

5/06/06-5/07/06 - Pensacola, FL (AA) O J Stillman Memorial Pattern Contest for 401, 402, 403, 404, 406(JSO). Site: Escambia Co Model Park. Tony Stillman CD, 3702 N Pace Pensacola FL 32505 PH:850-434-0909 email: [tony@radiosouthrc.com](mailto:tony@radiosouthrc.com). Sponsor: NORTHWEST FL MODELERS INC

### **Shadetree Fun Fly/Swap Meet**

FL

5/06/06-5/07/06 - Glen St Mary, FL (C) Shadetree Fun Fly/Swap Meet. Site: Club Field. Robert Kelley CD, 5356 Chicory Circle Middleburg FL 32068 PH:904-282-0840. For additional info: BJ Cannon PH: 204-259-6843. Big Birds - Small Birds - All Welcome. \$10 registration fee all pilots. Your tailgate or table. Food and beverage available. RV's welcome, no hookups. Directions - Take I 10 to exit 333(old 47) 3.2 miles north on CR 125 Sign marks field. Sponsor: SHADETREE

### **Chap. 665 - "8th Annual Big Bird Air Fest & Trac Field - Seffner Swap Meet" - May 07, 2006**

FL

LF \$5 reg 8:00am fly 9:00am SF GR & Paved 400'x48' food/bev Full Concession stand, IMAA/AMA membership required, memberships available, Impound in use Located: Trac Field Seffner, FL Field on Taylor Rd off Pruett Rd. - off @ exit 9 off of I-4.

**Contact: Jim Saiff 2727 W. Fletcher Ave # 25-C Tampa, FL 33618 (813) 969-4262**

**E-mail: [jsaiffchipmunkrc@earthlink.net](mailto:jsaiffchipmunkrc@earthlink.net)**

### **Spring Fly In and Swap Meet**

AL

5/13/06 - Ft Mitchell, AL (C) Spring Fly In and Swap Meet. Site: Club Field. Richard Conkle CD, 9 Country Place Phenix City AL 36869 PH:334-291-7645 email: [vcrc002@phenixcable.net](mailto:vcrc002@phenixcable.net). All sizes and type aircraft. Entry fee \$10. Drawings for door prizes, radio for registered pilots. Take Hwy 165 to County Rd 18, east on 18 to field. Sponsor: COLUMBUS FT BENNING RC FLYERS INC

### **3rd Annual May Madness**

GA

5/13/06 - Loganville, GA (C) 3rd Annual May Madness. Site: Club Field. Don Pruitt CD, 4054 Pinewood Ter Lilburn GA 30047 PH:770-921-7596 email: [dppruitt@earthlink.net](mailto:dppruitt@earthlink.net). 8 rounds of SSC RC Combat. Trophies 1st to 3rd. \$20 entry fee and free lunch to competitors. Primitive camping, no hookups. Pilots meeting at 9am, first round at 9:30am. Sponsor: HILL TOP FLYERS

### **Joe Nall Giant Scale**

SC

5/17/05-5/20/05 - Woodruff, SC (C-Restricted to IMAA) Joe Nall Giant Scale. Site: Triple Tree Aerodrome. Michael Gregory CD, 28 Rocky Point Way Greenville SC 29615 PH:864-297-1201 email: [mikegregory@charter.net](mailto:mikegregory@charter.net). Early registration \$35. After April 15th \$40. BBQ Friday Night May 19th \$25. Float Flyers - must be on Ch's 22, 23, 24. Must be IMAA member. Sponsor: CONFEDERATE AIR FORCE

### **Atlanta Stunt Meet 2006**

GA

5/19/06-5/21/06 - Marietta, GA (AA) Atlanta Stunt Meet 2006 for 323, 324, 325, 326(JSO). Site Lockheed Martin. Tom Dixon CD, 315 Santa Anita Ave Woodstock GA 30189 PH:770-592-3279. PAMPA OTS, Profile Stunt, Nostalgia Stunt (1981 cut-off). No appearance points or BOM rule in any event. Sponsor: COBB CO SKYREBELS

### **FCF Spring Fun Fly**

AL

5/20/06-5/21/06 - Autaugaville, AL (C) FCF Spring Fun Fly. Site: NB Reynolds Fld. Robert Ernsbarger CD, 108 Twelve Oaks Court Prattville AL 36066 PH:334-361-0669 email: [ernsbarger@knology.net](mailto:ernsbarger@knology.net). LF \$10. reg 7:30am. GR 600'x600'. Located: From Birmingham I-65S or from Montgomery I-65N Exit 179. At AL Hwy 6 left turn (1st traffic light) at 3rd traffic light (5.2 mi) left turn, Hwy 14 (9.7 mi) left turn Co Rd 21 (2.8 mi) Fld on left. Sponsor: FOUNTAIN CITY FLYERS

### **2006 Heart of Dixie FF Championship**

FL

5/20/06-5/21/06 - Pensacola, FL (AA) 2006 Heart of Dixie FF Championship for CAT III 101, 102, 103, 104, 105, 101C,

102-103C, 104-105C, 120, 124, 128, 140, 142, 153, 154 (JSO). Site: Escambia. Tom Hepler CD, 808 Rigel Drive SW Decatur AL 35603 PH:256-350-9263 e-mail: [buzzardbombshell@aol.com](mailto:buzzardbombshell@aol.com). Nos ¼ A, ½ A, A, B, C, Early ½ A Nos, OTR(L), OTR(S), Gollywocks Galore, OT Gas Pyl/CAB, .020 Replica, Commercial Rubber, Classic Towline, FAC Dime Scale, FAC Jimmy Allen, FAC Jet CAT Scale, FAC OT Replica Gas, FAC Embryo. Sponsor: MODEL AIRPLANE CLUB OF HUNTSVILLE

### **First Coast Helicopter Fly In**

FL

5/20/06 - Jacksonville, FL (C) First Coast Helicopter Fly In. Site: Lannie Rd Field. Andrew Griffith CD, 1600 Chain Fern Way Orange Park FL 32003 PH:904-993-4956 email: [barracudahockey@aol.com](mailto:barracudahockey@aol.com). Restricted to rotary wing only. Fun fly and clinics. Autorotation sport landing, sonar dip. Beginners encouraged. Field open Friday 5/19 for early bird/open flying. Concessions, \$10 landing fee. <http://www.gatewayrc.org>. Sponsor: GATEWAY R/C

### **Gentle Lady Plus**

FL

5/20/06 - Oviedo, FL (C) Gentle Lady Plus. Site: Red Ember Road. Tom Galloway CD, 2173 Mohawk Trail Maitland FL 32751 PH:407-628-5040 email: [gallowaytr1@earthlink.net](mailto:gallowaytr1@earthlink.net). Thermal duration contest for Carl Goldberg "Gentle Lady" sailplanes plus any 2 meter rudder controlled sailplane. Sponsor: ORLANDO BUZZARDS

### **Air Fair 2006**

FL

5/20/06-5/21/06 - Sarasota, FL (C-Restricted to IMAA) Air Fair 2006. Site: Club Field. Michael Winter CD, 4287 Hearthstone Drive Sarasota FL 34238 PH:941-966-7786 email: [mikeandeva@comcast.net](mailto:mikeandeva@comcast.net). Sound restrictions apply. 104 dB(A) at nine feet. Directions: I75 exit 207 East 4 miles to SRQ Field. Visit [www.sarasotar.com](http://www.sarasotar.com) for map. Sponsor: SARASOTA RC SQUADRON

### **May Daze**

GA

5/21/06 - Whitesburg, GA (A) May Daze for CAT III 101,102, 103, 104, 101C, 102-103C,124, 140, 142, 150, 154, 156, 160, 161, 162, 163, 164(JSO). Site: N GA Turf Farm. Dohrman Crawford CD, 1400 Mile Post Dr Dunwoody GA 30338 PH:770-698-8737 email: [tum25@mindspring.com](mailto:tum25@mindspring.com). Sponsor: T.T.O.M.A.

### **Warbirds Over Valley**

AL

5/26/06-5/27/06 - Valley, AL (C) Warbirds over Valley. Site: Club field. Chris Joiner CD, PO Box 4469 Columbus GA 31914-0469 PH:706-649-1834 email: [giantwarbirds@hotmail.com](mailto:giantwarbirds@hotmail.com). Giant scale rules apply. 80"60", warbirds only. 1911-1950 era. \$15 entry fee. Concessions on site. Co-sponsored by the Giant Scale Warbirds Assn. Sponsor: VALLEY RC FLIERS

### **Spring Fun Fly**

AL

5/27/06 - Morris, AL (C) Spring Fun Fly. Site: Club Field. Stephen Box CD, 6554 Letson Lake Rd Hueytown AL 35023 PH:205-425-9849 email: [boxpinenott@netzero.net](mailto:boxpinenott@netzero.net). Contest in two categories. \$5 landing fee that includes raffle ticket and lunch. \$10 entry fee to compete in contest. Pilots meetin at 11:30. Prizes awarded in three places. See [www.birminghamrc.net](http://www.birminghamrc.net) for info and directions. Sponsor: BIRMINGHAM RC ASSOCIATION

### **FMA Rebel Rally**

FL

5/27/06-5/28/06 - Palm Bay, FL (AA) FMA Rebel Rally for 101, 102, 103, 104, 105, 101C, 102-103C, 104-105C, 120, 124, 128, 140, 142 (JSO). Site: Club Field. Bill Barr CD, 2235 Chinaberry Cir SE Palm Bay FL 32909 PH:321-725-5063 e-mail: [bdbarr@strato.net](mailto:bdbarr@strato.net). 1/4A-C Nost., Early 1/2A Nost., Nost Rubber, Classic Towline, FAC Scale. Sponsor: FLORIDA MODELERS ASSOC

### **Electric Fly**

FL

5/27/06-5/28/06 - Morristown, FL (C) Electric Fly. Site: Club Field. Richard Hinton CD, 851 SE 148 Terrace Williston FL 32696 PH:352-528-0229 email: [rhinton1@peoplepc.com](mailto:rhinton1@peoplepc.com). Sponsor: THE OWLS

## Chief Treasurer- Sam Varn

*Editor's Note: The Treasurer's report is published for Members only. The public version of the Newsletter does not include this information.*

This month's financial report:

Cash: -  
Checking -  
Savings -  
CD -  
Total Funds -

At the last meeting, we collected a total of \$57.00 for membership dues (pro-rated) and the net proceeds of the Military Fly In. We paid out \$161.61 to John Hall for various field maintenance items and I reimbursed Awards4U \$61.25 for charging our Corporate Filing Fee to their corporate credit card so we could pay that fee on-line. All income and expenses for April are reflected in our balances shown.

If any member has any questions on any item, please let me know.

Thanks,  
Sam

## Chief Scribe- Steve Warmath

The meeting at the Field was called to order at approximately 7:05 pm, April 6, 2006.

**Visitor/ New member introductions-** New Member- **Craig Zody** See New Member Spotlight)  
Guests- **Robert Hunter** and **Shannon Black**

**The Treasurer's Report-** Sam said he had the list of current AMA Members and the No Fly list. He encouraged those who have not renewed their AMA membership to do so. The Club made a net \$27.00 on the War bird Fly-in. Sam read the current assets of the Club. The Treasurer's report was accepted.

### Old Business-

- Steve Warmath mentioned he had met with the graphics designer to help get a revised concept together for a new Club logo and hoped to have something in the next few weeks.
- Bob Burke said that something needed to be done with the Field sign down near the church that would direct people to the landfill entrance. This issue is still pending resolution with the County in what they will allow. One suggestion was to move the sign to the corner of the turn inside the entrance along the new gravel road. We still need to address this. Issue is still pending.
- Jeff Owens gave an update on **Airfest 2006**. Ron Fisher- FAA Tower Chief said we were "good to go" and agreed on the location of the demo area. (North taxiway, above T-Hangars). The static display area will be the same and outside the Operations area, so getting to it will not be a problem. There will be a small area set aside for small electrics. The north demo area will have two demos. 12:00 am and 2:00 pm, each 1 hour in length. This could include 3-5 flights per show. We would need to work out a sequence of maneuvers ahead of time. EAA will be providing ropes to set up on Friday the 19<sup>th</sup>. Names of helpers and schedule to be announced. Jeff encouraged members to participate in the static display and be available to mingle with the Public. Jeff asked for volunteers for flying the demos using heli's and pattern type aircraft, etc. There will be specific flight rules to follow. He would like to have an announcer. Sam Varn said he could provide a PA system. There will be a walk-thru one-week prior to the event. Jeff will be out of town and will need someone to stand in. Probably Jeff or Mike. There will be FAA safety councilors and EAA representatives to control the public. There will also be a pilot's safety briefing Friday evening or Saturday morning. (RC will be a separate briefing). Jeff noted that this was going to be a great opportunity to showcase the Club, a good PR effort and the importance of putting our best foot forward. Members are encouraged to wear Club apparel. Theo Titus asked if insurance had been secured. Jeff said no, but it should be no problem. Jeff will give directions on how to get planes into the static display area.
- John Hall has completed some repair work on fences at the field.



- The local RC forum “Tallyfreak” was mentioned and is currently linked from our web site.
- Jeff said the mower had been repaired and serviced.
- The survey for the County landfill questionnaire was available on-line. You have to print it out, fill it out and either mail or fax it back. Mike had e-mailed the membership a notice about this. The County meeting had been rescheduled for April 18<sup>th</sup>.
- There will be a Fun-Fly April 29<sup>th</sup>.
- A Float-Fly will be held May 13<sup>th</sup> at Francis Surovec’s pond. Note, this is the same day as the Airfest walk-thru.

**New Business-**

- John Hall asked about recycling and encouraged the Club to do so. He suggested we get a third can strictly for recycling. (No fuel cans). Flatten all cans to provide extra room. It was agreed to obtain a third can.
- Marvin wanted to have a metal can filled with sand for smokers to put their butts in. (cigarette). A motion to obtain (2) tall cigarette disposal containers was made and approved.
- Thanks went out to Frank Bastos of HobbyTown for providing the food and cooking for the meeting.
- A motion was made to change the venue of our monthly meetings to **7:00 pm at the Field through September**. The motion was seconded and approved. Frank will continue to cook for the club but will also be reimbursed.

With no additional business, the meeting was adjourned at approximately 7:45 pm.

**New Member Spotlight- Craig Zody**

Craig is our newest member and is interested in gas airplanes enjoys tinkering with computers and playing the piano. Craig is from Pennsylvania and moved to Tallahassee in 1990. He’s married with a young boy and is a computer programmer and support staffer at FSU. Welcome Craig.



**Toe-In** By Russ O'Brien, (Valley Forge, Pa "Signal Seekers")

Toe-in is utilized in cars and in airplanes but for different purposes:

**Car Toe-In**

In cars it is applied as a compensation for the effects of camber angle. Camber is the outward tilt of a car wheel at the top, which places the car weight mostly on the larger inner bearing where the axle is strongest. It also places the projected steering axis (through the upper and lower ball joints) near the center of the tire footprint on the ground to ease steering and reduce tire scuffing. A disadvantage of camber is that it causes the two front wheels to roll not as cylinders but as cones, with the right wheel tending to roll toward the right gutter and the left wheel toward the left gutter. Roll a paper cone on the table and you will see that it doesn't go straight. Toe-in introduces a snow-plow effect which cancels out the camber disadvantage.

**Airplane Toe-In**

In airplanes, toe-in aids in keeping a plane going straight during take-off roll and landing rollout, particularly with tail draggers. Planes with tricycle gear have the CG forward of the main gear. This automatically helps to straighten out a plane, which has developed a yaw angle between where it is pointed and where it is actually going. A tail dragger has the CG behind the main gear and a slight yaw angle is not automatically corrected but is made worse and can rapidly result in ground loop. Here is where toe-in of the wheels helps both types. A plane rolling straight ahead has equal drag from each of the wheels (Fig. 1). When the plane starts to take an unwanted turn to the left, the drag from the left wheel goes to zero while the drag at the right wheel

increases (Fig. 2). The net effect is that the unbalanced drags exert a restoring torque to turn the plane back to the desired direction. This would not happen without toe-in.

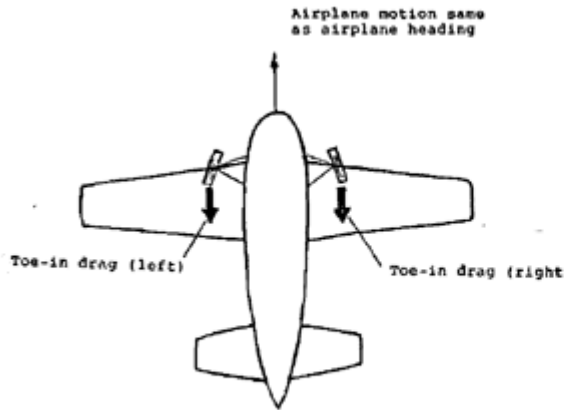


Fig. 1. Left and right toe-in drags are equal when plane is rolling in the direction it is pointed.

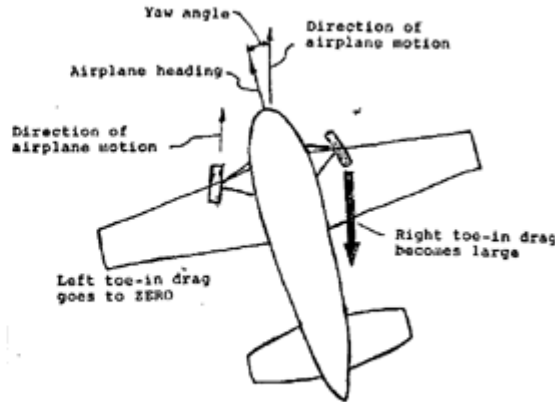


Fig. 2. Showing how wheel toe-in tends to straighten out an unwanted yaw angle during ground roll.

## Composite Materials: Kevlar

by Art Gajewski

This article will provide some insight into aramids commonly known as Kevlar. As jet modelers, most of us are familiar with the popular fabrics used in the construction of our aircraft. Certainly, we have all built or flown models made of fiberglass and even some with carbon fiber and Kevlar. However, have you ever wondered how these materials are made and what are some of the tricks to use them properly?

Introduced commercially in the 1970s, Kevlar aramid is an aromatic organic compound of carbon, hydrogen, oxygen, and nitrogen. Kevlar fiber is produced by spinning long-chain polyamide polymers using standard textile techniques. The low-density, high-tensile strength, low-cost fiber produces tough, impact-resistant structures. The compressive properties of Kevlar laminates are low (because of poor coupling of resin matrixes to the aramid fibers), so, applications are typically secondary structures or tension-critical applications.

Kevlar fiber, originally developed to replace steel in radial tires, has found increasing use in the belts of radial car and truck tires, where it saves weight and increases strength and durability compared to steel belts.

### Two Common Kevlar Alloys

Kevlar 29 is a low-density, high-strength aramid fiber designed for ballistic protection, slash-and-cut resistance, ropes, cables, and coated fabrics for inflatable and architectural fabrics.

Kevlar 49 aramid fiber is characterized by low-density and high-tensile strength and modulus. These properties are the key to its successful use as reinforcement for plastic composites in aircraft, aerospace, marine, automotive, other industrial applications, and in sports equipment. It is available in continuous-filament yarns, chopped fiber, woven and unidirectional fabrics, tissues or veils, and tapes for reinforcement applications.

Kevlar 49 aramid is used in high-performance composite applications where lightweight, high strength and stiffness, vibration damping and resistance to damage, fatigue, and stress rupture are key properties. Reinforced composites can save up to 40% of the weight of glass-fiber composites at equivalent stiffness. The aramid composites resist shattering upon impact, and the presence of the fiber inhibits propagation of cracks. Depending upon the selection of resin systems, aramid composites have a useful temperature range from -320° to 400° F (-196° to 204° C).



Kevlar 49 is not a carbonized or graphitized material. Unlike other organic materials, its stress-strain behavior is linear to ultimate failure in tension at 340-kips/square inch (2344 MPa) and 1.8% elongation. Toughness of the fiber composites is significantly higher than carbon graphite composites. Furthermore, the very low density of the fibers provides a higher specific strength than glass or carbon reinforcing fibers. The specific modulus is between four and five times higher than that of glass fiber. The usable strength of Kevlar 49 reinforced epoxy is about four times that of 7075T6 aluminum at less than half the density.

### **Kevlar—Getting the Most Out of Yours**

Kevlar is lighter than fiberglass (for a given strength) and tougher than carbon fiber. Therefore, it sounds like the ideal composite, right? Well, yes and no. Let's see how to best use this aramid material.

First, cutting it can be a real pain. Special shears are required to cut Kevlar fabrics and tapes. These shears are designed to hold the fabric securely as the cutting blade does its job. If you look at these shear blades closely, you'll notice that there are serrations on the "holding" edge and a sharp edge on the cutter. These shears are a specialty item and are therefore somewhat expensive, but they are well worth the price in reduced aggravation and improved results. Don't try to cut Kevlar without them.

Second, use a compatible resin. Kevlar does not bond well with polyester resins. Keep it simple and use epoxy resins for the best results.

Last, use Kevlar for specific applications including reinforcements as opposed to entire structures, predominantly tensile loads, vibration damping, or scuff resistance. Kevlar works well as reinforcement in fiberglass structures. Cost may become prohibitive when used as the only fabric in a composite structure and its compressive strength isn't as good as some other materials. I have seen Kevlar canoes, but I don't know how well they perform. Kevlar works really well as localized reinforcement in vibration-prone applications (e.g. engine-mount boxes in Giant Scale airplanes with gasoline engines). Scuff resistance is another good application—wing tips, fuselage bottoms, etc.

Always use high-quality, engineered resin. Some hobby resins may not have all of the strength properties we desire in our applications. I personally use and recommend WEST Systems 105 resin with fast or slow hardener. WEST Systems is competitive on a cost-per-ounce basis. This resin dries hard, is easy to sand, it's tough and not easily damaged compared to some other hobby resins intended for the same application.

Once again, a quick word about hybrid fabrics (carbon fiber and Kevlar)—these hybrid fabrics are popular because not only do they look attractive but they also can provide the best of both worlds. They provide the lightweight, high strength, and stiffness of carbon fibers with the lightweight, toughness, and abrasion-resistance of aramids. I have built hybrid composite landing gear using alternating layers of carbon fiber and Kevlar with excellent results. One would need to understand the application very well to select the right composite properly (fiberglass, carbon fiber, aramid, or a hybrid). Hybrids have their place.

Note: Information in the article is adapted from *Composite Materials Handbook*, M.M. Schwartz, McGraw-Hill Book Company, 1984.

## **Beginner's Corner -Color Theory for Models: Choosing the Right Color**

by Dr. Robert Suding

All RC fliers have gotten that "I can't tell which way it's going" feeling when learning to fly RC. Several simple color trimming steps can help you fly your airplane better, whether you are a beginner or top dog in Pattern. Most airplanes, especially ARFs, are covered or painted to look good in the store. But in the air it's a different story. The situation is very simple—if you can't see it, you can't fly it.

To successfully fly an RC aircraft, the pilot must have good orientation and distance perception. The eyes estimate aircraft orientation based on the perceived position of the model's outer edges, and the relationship of these outer edges to the edges of any discernible trim markings on the airplane's wings or fuselage. Distance perception, in turn, depends on a combination of one's perception of the aircraft's outside edges and

its estimated orientation.

After you have located your airplane and estimated how far away it is, you must immediately recognize several attitude orientations:

- Is it flying toward me or away from me?  
Is it upright or inverted?  
Are the wings flat, vertical, or tipped?  
Is it flying horizontal, upward, or downward?  
Is it flying parallel to the runway or vectored?  
Is it flying perfectly vertical or skewed sideways or fore/aft?

The following suggestions will help you with distance and attitude perception. Visual acuity and contrast perception diminish with age, but by using correct color concepts, even senior fliers will find that visual orientation of their aircraft can be consistently and reliably achieved.

### **Solid-Colored Aircraft**

RC airplanes are flown in all kinds of weather and background conditions. A solid-colored aircraft will sooner or later fly into a condition where it blends into the background. This will result in a complete loss of location and orientation since no edges can be perceived. The absolute worst, in my opinion, is a silver Mustang in a heavily overcast sky. Yellow Cubs are tough to see when back lit by the sun. I had a dark green airplane that would disappear when I landed with a background of green trees. Red Stiks and dark blue airplanes go invisible in late evening and storm conditions. A solid-colored airplane is easier to cover, but it won't do you any favors up in the sky.

### **Wing and Horizontal Stabilizer Shades**

The top of the wing and horizontal stabilizer is normally lit by sunlight. The bottom of the wing and horizontal stabilizer is shadowed. Coloring the top lighter and the bottom darker keeps this same relationship even in changing lighting conditions.

ARFs are classic blunders in coloring. Either they have identical top and bottom wing colors, or they put some token color on the top of the wings and leave them white underneath. They look good in the store, but don't help the beginner at all.

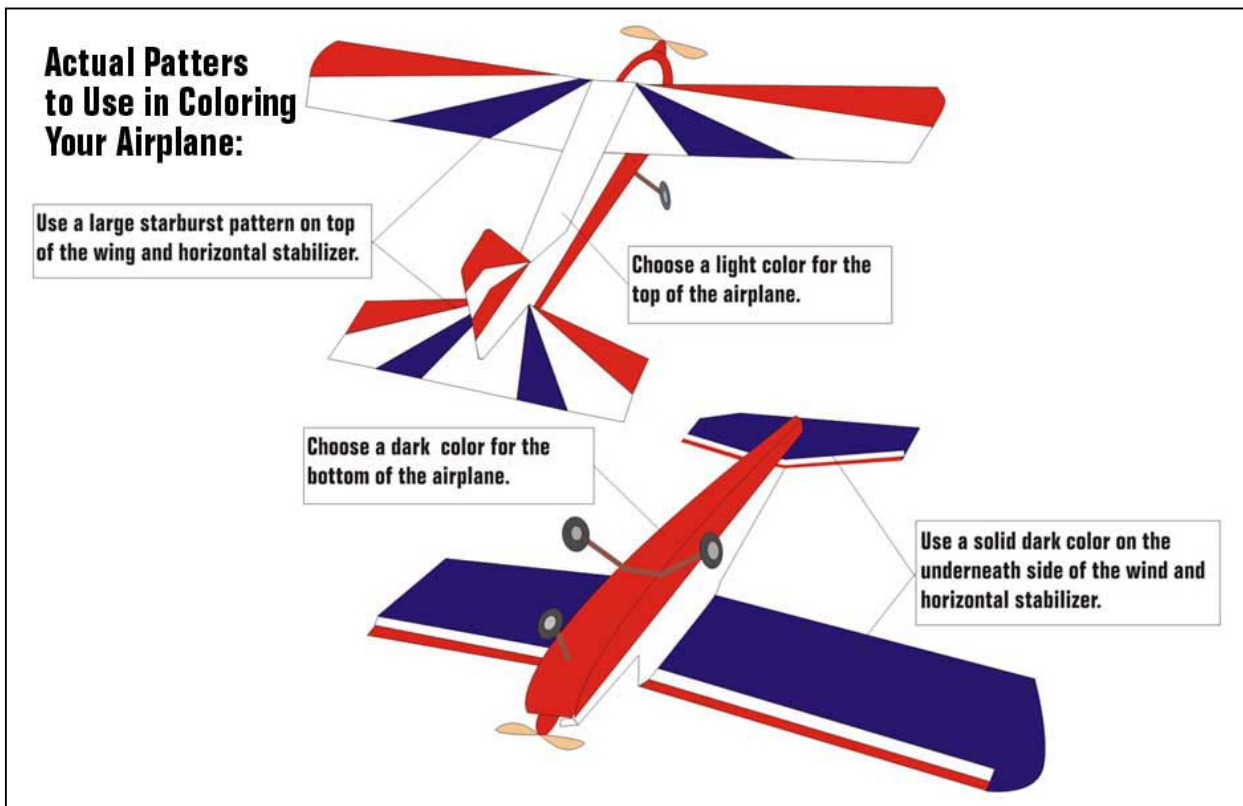
I always recommend that beginners cover the bottom of the wing and the bottom of the horizontal stabilizer with dark-blue contact paper before flight.

When flying at a distance of 500 feet or more (depending on the size of the model and lighting conditions) you can't see colors, because the cones of your eyes that perceive color are 2,000 times less sensitive than the rods, which perceive illumination.

In these circumstances, your gray-scale vision (your perception of lightness and darkness in a black-and-white image) provides your orientation and depth perception, not color. Any series of adjacent colors on your aircraft that are intended to facilitate orientation should therefore be gray-scale opposites. For example, a series of bands consisting of red, yellow, blue, and then white is desirable. Don't assume a series of "color opposites" such as red, green, blue and black will be effective. These all have the same dark gray-scale shade and will show an equal tendency to disappear in a deep blue or heavily overcast sky.

If you use the wrong series of color bands, you won't know how far away your aircraft is, and you won't even know which way it's heading to bring it pack. Also, don't rely on intricate patterns. They blend together to form edgeless fuzz approximately 100 feet away. You can test potential color schemes for gray-scale perceptibility by video taping and playing back alternative color schemes on a black-and-white television or on a color television with the color control turned down.

## Actual Patterns to Use (click here to see the pattern)



The best color scheme for beginners that I have found is a combination of large starburst patterns on top of the wing and horizontal stabilizer, and a solid dark color underneath the wing and horizontal stabilizer. Beginners consistently become perceptually disorientated when flying at a distance, especially when the airplane flies at a 45° angle away or toward the pilot, since the aircraft silhouette is identical. With the starburst pattern, all the beginner has to do is slightly roll the wings towards him, and the starburst pattern becomes an arrowhead, pointing in or out, the direction of flight.

Start by covering the bottom of the wing and horizontal stabilizer with any dark color. The exact color could be black, deep red, dark blue, or green, it doesn't matter; they will be the same gray-scale color at a distance. Then put a 2-inch strip of some light color along the leading edge of the bottom. Do the same for the bottom of the horizontal stabilizer, and make the light strip roughly 1 inch wide.

The base color of the top of the wing must be a very light color such as white, yellow, or some other very light color. The starburst pattern starts out at the center of the wing, from 3/8 inch under the wing's leading edge to roughly 1 inch back from the leading edge at the top. Then it is a large "pie slice" to the wing tip, where it extends from 3/8 inch under the wing leading edge to the trailing edge on the top. A second pie slice of a different dark color extends from the center of the wing to points one third and two thirds out on the wing. Both sides of the wing are colored like this as is the top of the horizontal stabilizer.

### Landing Considerations

Landing requires keeping your wings flat and knowing where you are in the landing approach. You are generally close to the airplane during the later stages of the landing approach, so your color perception is improved, but the wings will be edge-on to your line of sight. The leading edges should be very prominent against any background such as blue sky, white clouds, dark overcast, distant mountains, or green trees. All of these items have spectral lines toward the higher frequency blue or green region, so a very simple solution would be to have a low frequency color such as red or orange on your wing and horizontal stabilizer leading edge.

At the field where I fly in Colorado, ARFs with blue wing edges are almost invisible when a low approach from the West dips the airplane visually below the mountains, resulting in very klutzy landings by beginners.

The leading edge red or orange pie slice is wrapped around the leading edge so that it has the maximum area of visibility when edge on. The 2-inch strip of white on the bottom of the wing near the leading edge will become visible during the landing flare, aiding in precision landings.

I prefer a white background on the top of the wing and horizontal stabilizer, with a bright red leading edge pie slice and a metallic blue inner pie slice on trainer airplanes. The same metallic blue under the wing looks nice, but any dark color works fine

### **Fuselage and Rudder Coloring**

The same coloring rules apply to the fuselage. Keep the top of the fuselage light, and the bottom dark.

The sides of the fuselage should aid you in flying horizontal passes. A solid color fuselage is very difficult to keep straight and level because all of the aircraft reference lines are curved. Light blue-and-white fuselages (a favorite ARF color scheme) blend in with the sky and clouds too well, and will become invisible under some lighting conditions.

Draw a line along the thrust line of your aircraft, roughly splitting the top and bottom of the sides in half. Make the top half of your fuselage sides a light color. Make the bottom half a dark color, usually one of the wing pie slice colors.

Analyze how you fly. Beginners and experts, who fly inverted much of the time, should make the fuselage line color demarcation exactly follow the thrust line. Beginners fly airplanes with lifting, flat-bottom wings, so the aircraft fuselage side flies a straight line.

The expert flies an airplane with symmetrical wings, so he flies at a slightly raised altitude to maintain level flight, whether upright or inverted. Therefore he should also have the fuselage line color demarcation exactly following the thrust line. When doing a horizontal pass, he should maintain an equal rising thrust line sight picture whether upright or inverted.

The interesting situation is the beginning aerobatic pilot. His routines do not include horizontal, inverted passes, but his maneuvers do include many horizontal flight components. He will usually be flying an aircraft with symmetrical airfoil wings, so the aircraft will be moving through the air with a slight upward orientation. He should offset the fuselage side color demarcation upward at the tail of the aircraft by roughly an inch. Now he can practice his horizontal passes by keeping the fuselage side lines parallel with flat ground.

The vertical stabilizer and rudder should have very wide horizontal bands of color. Make the top of the horizontal stabilizer the same color as the wing tips. Then put a light-colored band, and below this a dark-colored band, usually the same color as the inner pie slice on the top of the wing. The base color of the vertical stabilizer and rudder should be the same light color of the wing.

Another variant for the vertical stabilizer and rudder that works well on trainers with very big tails—such as the Kadet series—is a starburst pattern on the top of the wing. This aids the beginner in determining the direction of travel when flying at a distance. The tail's starburst pattern becomes an arrowhead pointing out the direction of flight.

### **Looping**

Consider what the usual looping problem always is for the beginning aerobatic pilot. The pilot does not begin the loop with his wings flat. He usually corkscrews in or out. Proper coloring of his low-wing or mid-wing airplane can be a major help.

Make the wing tips stand out. I usually make the outer 2 inches of each wing and 1 inch of each horizontal stabilizer the same bright red that I color the leading edge. If you follow my advice above on the wing bottom and the fuselage sides, the wing tip can be visually correctly placed for a perfect loop. If the wing tip is too high, resulting in a corkscrew out, the pilot will see the dark wing bottom. If the wing tip is too low, resulting in a corkscrew in, the pilot will find that the wing tip blends too well with the bottom of fuselage side. The correct sight picture will be the wingtip cleanly placed against the upper lightly colored fuselage side. Look at the International Miniature Acrobatic Club or Pattern airplane pictures in RC magazines. They always have a dark color on the top half of the fuselage side into which the wing tip blends, causing looping problems.

### **Geometric Shapes**

Humans can recognize different geometric shapes 1/10 of a second faster than colors. I use this phenomenon to help me with the vertical rolls performed in advanced aerobatics. Instead of a solid dark color on the bottom of my wing and horizontal stabilizer, I put four large circles on the bottom of the wings and two large circles on



the bottom of the horizontal stabilizer. The noticeably faster recognition of the round shape verses the line shape aids me in nailing the vertical rolls.

A number of people at my field have copied my bottom circles without knowing the reason why I use them. The solid colored bottom is preferred unless you are doing vertical rolls.

### Sunglasses

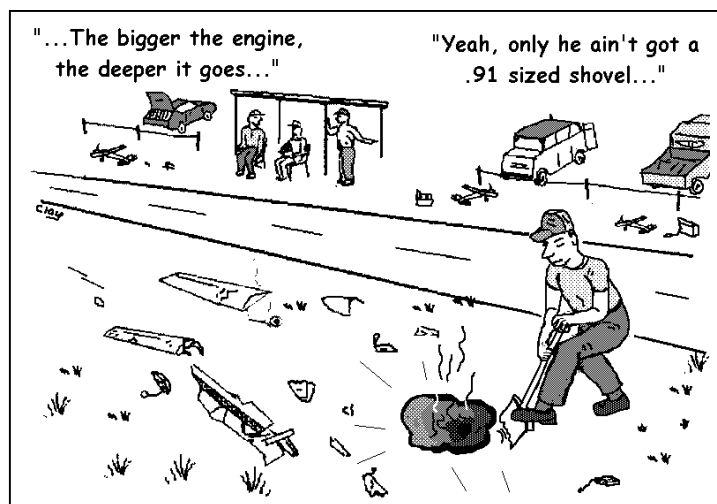
Several years ago I flew with some expensive Serengetti Driver sunglasses. These had a red tint to them, I guess to cut down on the ultraviolet region. I lost visual perception on a solid dark blue airplane during a landing approach and crashed.

Fortunately they were stolen at a hobby store a week later, and I got some RayBan aviator sunglasses with a blue-gray tint. What a difference!

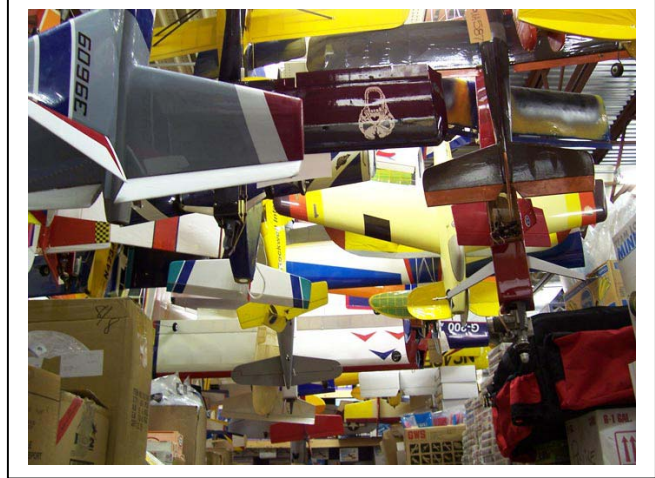
Red is at the low frequency part of the visual spectrum, and blue is at the high frequency part of the spectrum. Red or yellow-tinted sunglasses reduce all colors to high-contrast shades of gray, making your aircraft in the air appear completely different from the appearance of your aircraft at home or in the pits. Gray, light blue, or light green tinted sunglasses make the airplane in the air look just like the airplane in the pits, and because your vision is extended into the high frequency part of the visible spectrum, you will have twice the visual perception range!

### Final Thoughts

- Evaluate color schemes for visibility first, beauty second. Dark-colored airplanes are more difficult to see in overcast skies and in the evening.
- Scale airplanes are a special problem. Warbirds were colored to avoid detection, just the opposite of RC airplanes. Avoid flying scale-colored airplanes until you a very experienced flier.
- Avoid dark colors on the fuselage where your battery and receiver are located. The heat buildup can result in loss of battery capacity and premature radio failure.
- Don't fly when someone with a airplane identical to yours is already flying. ARFs and yellow Cubs are particularly susceptible to this problem. Several years ago two fliers were flying with identical ARFs. When one of the models landed, both modelers went out to get the airplane. Much to the entertainment of the folks in the pits, one modeler discovered that his airplane had crashed out in the field five minutes previously because he had lost track of which airplane was his, and he was "flying" the wrong one.



## Mystery Photos of the Month

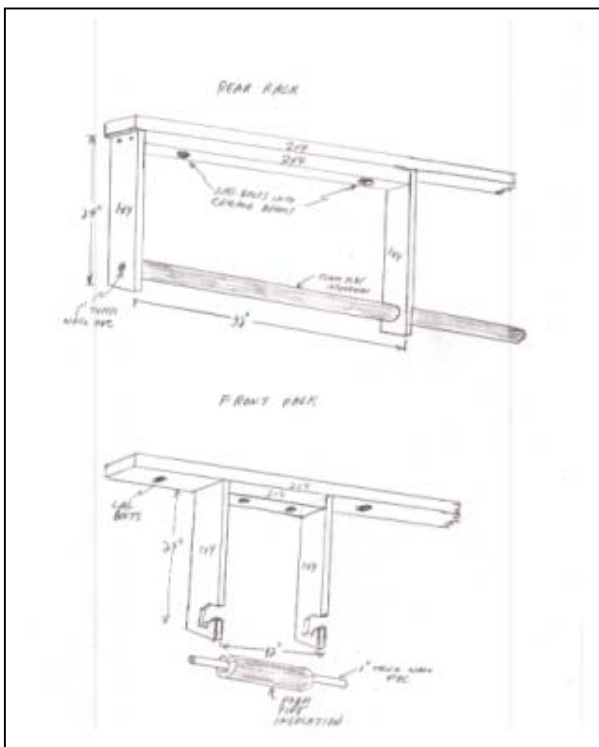


### OK..... What do we have here?

1. Bob Burke's Garage.
2. Frank Bastos' Living room.
3. Woods behind the field.
4. Someone with a real problem.

Answer: It is **Graves Hobby Shop in Orlando, FL**. It is pretty incredible. Visit their web site at [www.gravesrc.com](http://www.gravesrc.com) to see more of this place. Thanks to Bob Burke for sending us a note on this. Ooooh...Ahhh. Support your local Hobby Shop.

## Some Storage Solution Ideas



# Seminole Radio Control Club Tallahassee, FL

AMA Charter #216, 1969-2006

## SRCC Officers

President – Mike Atkinson  
Vice President – Geoff Lawrence  
Secretary/ Newsletter Editor – Steve Warmath  
Treasurer - Sam Varn  
Field Marshall – John Hall  
Field Safety Officer- Gordie Meade

## Field Hours

12 Noon till Dark- These hours apply to **all** aircraft, gas **and** electric.

## Training Notes

To schedule a training time contact Mike Atkinson.

## Flight Instructors

Mike Atkinson (Coordinator) 926-4692 (H)  
Ed Budzyna                      Jeff Owens                      Bob Burke  
Geoff Lawrence                John Clark

## Club Meeting Location and Time

**Please Note: Club meetings from April 2006 though September 2006 will be at the Flying Field at 7:00 pm. A cookout is planned for every meeting.**

The regular club meetings are held on the first Thursday of each month at 7:30 PM at the Grace Lutheran Church on Miccosukee Rd. Head out Miccosukee Rd., cross Capital Circle NE, and the entrance will be the first one on your right. Once you park, follow the sidewalk around the left side of the building and go down the hill. We meet in a room on the first level.

**Submissions-** Submissions are requested to be in M.S. Word format. Photos should be in .jpg or .tif format. Vector art accepted in Corel, Illustrator and AUTOCAD format. We will, however, accept anything to make it easier for those who wish to contribute. Submissions are due no later than the 23<sup>rd</sup> of the month. Send your submissions to [ssw@nettally.com](mailto:ssw@nettally.com) or by phone, Steve at 509-0672.

**Editor's note:** Please contact the editor for any reporting contribution assistance and for reporting formatting problems, errors, omissions or corrections. The views expressed in the newsletter are of those of the specific authors and do not represent a majority consensus of the club membership unless voted upon at a club meeting. **For Sale** items will be cleared from the newsletter every month. If you wish your ad to keep running, it must be resubmitted prior to the 23<sup>rd</sup> deadline.

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