



Crosswinds

February 2007



Newsletter for the SPring Area Radio Kontrol Society

SPARKS 2005 - 2006 Officers

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From the Cockpit by President Chris Fredona

Welcome to the February 2007 Crosswinds newsletter.

It is time again to consider the financial requirements for our club and to determine whether our initiation and yearly fees require adjustment. Per our By-Laws, these topics must be raised and decided at the February meeting, so this will be a significant topic on February 7th agenda, so bring your ideas and comments. I will ask George Terry to prepare a financial summary for our discussion.

Paul Johnson has made contact with the Harris County Flood Control District concerning the flood retention area at Cutten Road and Beltway 8. This flood zone is very large and could easily accommodate our activities if allowed by the County. Paul has prepared and issued a formal letter to his contact at the Flood Control District requesting consideration for our club's use of the land. In addition, Nick and Mark have done initial frequency scans at this field and have not recorded any interference. A more detailed scan is being investigated. Thanks to all members who have assisted in this pursuit.

Lastly, don't forget about the upcoming Junk Yard Wars Fun Fly in early April. Each team will build a plane from materials provided by SPARKS and their team during the morning and fly for points in the afternoon. Be sure to sign up with Mark Hunt immediately to be a part of this novel event. Team assignments are being made now so don't wait! **Please bring spare wings, landing gear, usable "crash remains", balsa, fuel tanks, etc. for the "Junk pile" of parts from which the teams will select their components to the February meeting.**

Our next membership meeting will be on Wednesday, February 7th at the Valley Ranch Grill. Randy Ritch, of Randy's Hobbies, will make a presentation on RC Pylon Racing.

Hope to see you all there.

Fly safe!

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January Meeting Highlights.....

Jake Jacobsen reviewed a "Scratch Built" kit designed by fellow member J.R. Carpenter. As work progresses, Jake will report upon the success or not of the endeavor. The presentation was enjoyed by all.

An AMA archive movie of "Scale modeling in the 70's and 80's" was shown. It was interesting to compare the technology then with today's advances. One of the most noticeable was the difference in transmitters. However the scale models were very detailed and actually built...no ARF's in sight.

Currently we have 90 regular members and 3 honorary ones. George mailed Club stickers to those members who have renewed their 2007 AMA membership. There are several members who have not renewed their AMA membership and thus will not be allowed to fly at SPARKS until doing so. Always display your current 2007 AMA membership card with Club sticker when picking up your frequency pin.

Mark Hunt, Event director, for the Inaugural "Junk Yard War" announced the date as March 31, 2007. Please see page 13 in this issue for details....
their craft

**Looks like
lessons are
too late for
this pilot....**

Submitted by
Mike Rose



January Model of the Month

Venus II (by Great Planes)

Mike Rose

Wingspan: 66in

Wing Area: 866 sq in

Length: 69.5 in

Radio: Futaba 9C Super

Servos: Ail - 2 x Futaba S9405;

Elev - 2 x HiTech Digital HS5245MG;

Rudder - 1 x Futaba S9206:

Throttle - 1 x Futaba S3004

Dry Weight: 7.5 to 8.0 lbs. (several readings using bathroom scale)



The Venus II was received on Dec 4, 2006. This plane was to replace the beautiful Widebody I crashed (wing separated from the fuse) on Nov 19. As I wanted to continue my pursuit of imitating pattern flying I decided I would be back in the air faster buying the ARF instead of rebuilding the Widebody. And since I was very pleased with the Venus 40 (over 300 flights), I felt comfortable purchasing its big brother the Venus II. The airplane as received had several air bubbles in the covering which I promptly made worse with my iron and heat gun.

I removed the engine, servos and all the hardware from the Widebody for installation in the Venus II. The Elevator and Rudder servos were installed in the tail since I thought that would offset the YS91's weight.

The Fuel Tank was also moved back from just aft the firewall to a point closer to the CG. The plane was balanced to the specified CG by adjusting the location of the battery pack and receiver. Assembly was complete Dec 18th with an assortment of epoxy laden fingerprints on various surfaces of the Monocoat covering.

Maiden flight was with the retirees Dec 19th. The plane was nose heavy and needed quite a bit of up trim for level flight. I was originally concerned that the YS 91 would not be enough power, but the first flight proved there was no need for concern. This airplane has a large profile which makes knife edge flight very easy and exhibits little or no coupling. It responds positively to all inputs, and is very effective in slow flight maneuvers. If I could ever figure out how to fly those pattern maneuvers, I am sure this would be a very competitive airplane. I am pleased with the decision to purchase this airplane and recommend it for any other would be pattern flyer imitators

TWIST 3D

submitted by Paul Johnson

My new plane is a Twist 3D .40 ARF made by Hanger 9. It is a plane that is really priced right at \$99. The model was put together very well and covered with Ultra Cote. Many of the little things that normally are required to be fit by the assembler were predrilled (holes and grooves for elevator joiner wire, tail wheel wire and hinge holes, etc.).

I powered it with a Super Tigre GS 45 ABC made in China. I have quite a few Super Tigre engines that were made in Italy. I was concerned that the quality would suffer now that they are made in China. I was very pleasantly surprised. The quality, if anything, is better and the price is right at \$65 from Tower Hobbies. The engine has tremendous power for its size and turns a 12.25x3.75 wide blade fun fly prop quite a bit faster than a Super Tigre 51 I previously had.

I put JR FM R700 receiver in it with JR 537 servos. My transmitter is a JR XP61002. This transmitter has digital trim levers. I didn't know if I would like them because of not as rapid response in the initial trim. It turns out that if I look closely at the position of the control surfaces before my first flight, only minor trim is required. The great feature is that the transmitter remembers the trim position for all of the models you can program in (10). So, you don't have to worry about re-trim when you switch models.

It flies extremely well. It is extremely maneuverable. It is advertised as a sport 3D plane. It will do everything that I can do and I am able to hold a torque roll at about ½ throttle better than any other plane that I have. It certainly flies a lot better than the SIG Fazer that I bought it to replace.

I would recommend it to anyone who wants a great 3D fun fly plane.



**42% Extra 300 Mid Wing
By Aerotech**

Submitted by Dean Nistetter

Built from a kit (not an ARF)
Plane design - 42% Extra 300 Mid-wing
Kit Manufacturer - Aerotech
Wing length - 121"
Fuse Length - 110"
Wing Area - 2650 Square Inches
Weight - 40 Lbs.
Motor - DA150 Twin with KS Canisters
Covering - Monocote
2 Futaba Synthesized Receivers
3 Lion Batteries
3 Power Regulators
10 Digital Servos



Man flies with jet engines attached

submitted by Ed Pierce, J.R. Carpenter and Lee Dillenbeck

Yes this (crazy/brave?) man flies with two jet engines attached. Here are a couple of websites... one note, since he is Swiss, French is spoken on one but enjoy the videos....

English one http://www.jet-man.com:80/actuel_eng.html

French video <http://www.youtube.com/watch?v=bEXxkWXncuo>



Battery Basics



*Reprinted from
the Horizon
Hobby
Website*

Submitted by
Nick Marson

Whether you are involved in electric or glow-powered flight, rechargeable batteries have a dramatic impact on the performance of your particular model. Combine the varying range of experience that someone might have before they even pick up a radio with the numbers of different battery types, chemistries, and capacity and it can be rather easy for someone to do the wrong thing when it comes to battery selection or maintenance. Quite often people may damage or otherwise reduce the life of their rechargeable cells before they even use them for the first time. While it may seem like there are too many different types of cells and it might seem confusing, knowledge is power.

Choosing the Right Pack for You:

Regardless of what type of model you will be using your particular battery in, there will undoubtedly be a number of different chemical compositions to choose from.

Nickel Cadmium (NiCd), Nickel Metal Hydride (NiMH), and Lithium Polymer (LiPo) cells are currently the most commonly used, but each needs to be charged, discharged, and stored differently. On top of that, each model may require a different cell count or battery configuration as well. To determine what pack configuration you will need, check the owner's manual of your particular model for more info. The battery you will need should be listed in the "Items Needed to Complete" section of your manual.

Battery Basics:

One of the most common misconceptions about batteries and battery packs is that a battery pack is made up of one very large battery. Truth be known, a battery pack is actually constructed from a number of individual batteries, called cells, that have been connected together to work as a single pack. There are two ways that the cells can be connected together. The first is called "Series", where the positive terminal of one cell is wired to the negative terminal of another cell. This method is used when you want to increase the output voltage of the total battery pack, as the individual cell voltages



These are three of the most common park-flyer battery packs. Each one has a slightly different capacity, size, connector, and chemical composition. You can see here how much smaller a comparable LiPo is versus a standard battery pack

Battery Basics, cont....

are actually combined to create one large voltage output. For example, a 6-cell NiCd or NiMH pack is made up of cells rated at a nominal 1.2 volts each. When wired in series, you take the individual voltage (1.2V in this case) and multiply that by the number of cells in the pack (6) to get the total pack nominal voltage. If you do the math, you'll see that a 6-cell pack has a total nominal voltage of 7.2 volts. This is



While a battery may be a battery in many instances, the connectors can vary quite a bit. This battery from a HobbyZone Firebird Commander 2 is similar in dimensions to the standard ParkZone J3 Cub's pack, but the connector is significantly different



Here we have a winner. The right battery with the right connector makes all the difference in the world



Rechargeable receiver packs save you money in the long run and are generally lighter than equivalent alkaline packs

The second way to build a pack is called "Parallel." In this method, you connect the positive terminal of one cell to the positive terminal of another, and do the same with the negative terminals. Unlike a Series connection that increases the voltage output of a battery pack, wiring cells in Parallel increases the total capacity of the pack. Much like the voltage calculation, but to figure out what the actual end result capacity will be, simply add the mAh rating (milli-amp hour) of the cells being paralleled together to figure out what the capacity of the pack is. If you are using 2100mAh cells in a 2-cell parallel pack (commonly referred to as "2P"), multiply 2100 by 2, and you will get a total capacity of 4200mAh. Just remember though, a Parallel connection does not change voltage, so while you can get 4200mAh out of a 2P pack, the nominal voltage will remain

Chemistry Class

As mentioned before, there are three major chemistry types used in constructing a rechargeable battery. The first one is called Nickel Cadmium, or NiCd (pronounced Ni-cad) for short. While not as commonly used as they once were, there are still a number of NiCd packs sold and used each year. NiCd batteries are relatively inexpensive, but they have a number of negatives. NiCd batteries need to be fully discharged after each and every use. If they aren't, they will not discharge to their full potential (capacity) on subsequent discharge cycles, causing the cell to develop what's commonly referred to as a memory. Additionally, the capacity per weight (also known as "energy density") of NiCd cells is generally less than NiMH or LiPo cell types as well. Finally, the Cadmium that is used in the cell is quite harmful to the environment, making disposal of NiCd cells an issue. In fact, several countries in Europe have banned NiCd batteries for just this reason. This ban is what sped up the demand for alternative cell types, and the first to really answer the call was Nickel Metal Hydride (NiMH).

NiMH cells have many advantages over their NiCd counterparts. With the removal of Cadmium from the cell, the NiMH cells were able to fill the need for industrial and hobby-grade batteries all over the world. NiMH cell manufacturers were also able to offer significantly higher capacities in cells approximately the same size and weight of comparable NiCd cells. NiMH cells have an advantage when it comes to cell memory too, as they do not develop the same performance issues as a result of improper discharge care.

Battery Basics, con't

Lithium Polymer (LiPo) cells are the newest and most revolutionary cells to come to market. LiPo cells typically maintain a more consistent average voltage over the discharge curve when compared to NiCd or NiMH cells. Add to that the higher nominal voltage of a single LiPo cell (3.7V versus 1.2V for a typically NiCd or NiMH cell), making it possible to have an equivalent or even higher total nominal voltage in a much smaller package. LiPo cells also typically offer very high capacity for their weight, delivering upwards of twice the capacity for sometime ½ the weight of comparable performance NiMH cells and packs. That's right, with LiPos you can often achieve higher voltage and power output, with more capacity, in a lighter weight package.

With all of these benefits, why aren't LiPo packs more widely used? With so much energy packed into such a small space, there are some important safety measures to take when dealing with LiPo cells. A LiPo cell needs to be carefully monitored during charging as overcharging a LiPo cell (to beyond 4.2v), or the charging of a physically damaged or over discharged cell (discharged to below 3.0v under load) can be a potential fire hazard.

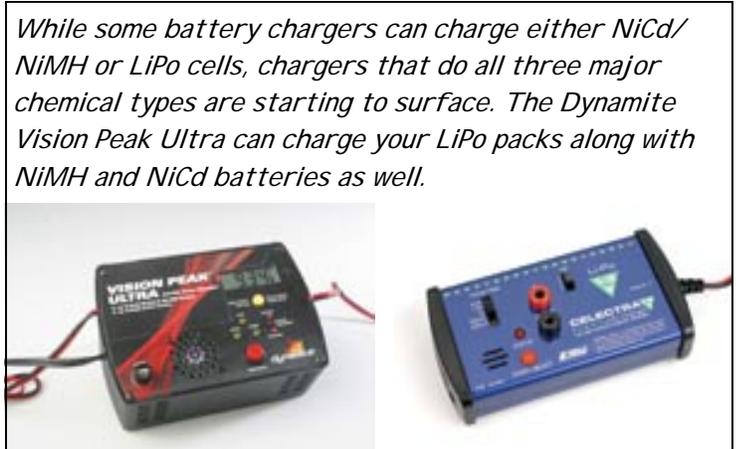
If you are going to go the LiPo route, use a charger that can correctly charge them (using a constant current, constant voltage method of charging as LiPo cells can not be "Peak Charged"), such as the Vision Peak Ultra (DYN4053) or the E-flite Celectra 1-3 Cell charger (EFLC3005). Not only must care be taken when charging LiPo cells, but when discharging them as well. You should never over-discharge a LiPo pack to below 3.0v per cell under load, and you must use an ESC programmed to provide the proper low voltage cutoff for your pack (for example, a 9v cut off for a 3 series LiPo pack). Also, you should never dead short a LiPo pack, even if only for an instant, as the large amount of energy stored in the small package can catch fire quite quickly as a result. While these seem like major deterrents to using a LiPo battery, these usage guidelines are quickly becoming well known as they are typically well outlined in the instruction manuals included with most LiPo packs, ESCs and LiPo chargers. However with all of their performance benefits, there is little doubt that lithium polymer battery packs are currently the future of battery technology for electric powered models.



Lithium Polymer batteries have really taken a foothold in the air market due to their high capacities, high voltage outputs, and light weight. A LiPo pack can weigh as much as 50% less than a conventional can-style battery pack



Many LiPo batteries come with safe charging circuitry integrated into it. This circuitry prevents over charging, over discharging, and in some instances helps to balance the pack out. If your pack has a "Charge" lead on it, always charge through that connector



While some battery chargers can charge either NiCd/ NiMH or LiPo cells, chargers that do all three major chemical types are starting to surface. The Dynamite Vision Peak Ultra can charge your LiPo packs along with NiMH and NiCd batteries as well.

Battery Basics con't.

"To built or not to built"

There are two different ways to purchase your batteries, either as loose cells or as pre-assembled packs. With individual batteries (cells), you'll need to solder the cells together yourself to create your own battery pack. The second option is to purchase a pre-assembled battery pack that comes with the pack pre-assembled and shrink-wrapped, often times with the connectors pre-wired. If you do not have much soldering experience and/or do not have a high-quality soldering iron, it will generally be best to purchase a pre-assembled pack.

As a safety note, you should NEVER attempt to solder LiPo cells together into a pack configuration yourself. LiPo cells are very susceptible to heat damage, and excessive heat can cause them to possibly leak or even explode. For this and other reasons, most LiPo manufacturers will offer pre-assembled packs only.

Discharging and Storage:

Discharging and storage really go hand in hand. For NiCd packs, you should completely discharge them, to 0.9v per cell, before you store them NiMH packs should be stored with roughly a 50% charge in them for best performance. And before you charge a NiMH pack for the first time in the day, simply drain the pack completely on a discharger or in the model and you are then ready to charge the pack for use throughout the day.

LiPo batteries are completely different when it comes to discharging and storage. Depending on the output voltage of your pack, you should only discharge your pack so far. For example, during use, a 7.4V LiPo battery (also known as a "2 series" or "2S" pack) should never be discharged below 6.0 volts under load (3.0v per cell). For storage of 2 weeks or more, LiPo packs should be stored at approximately 3.8v per cell to prevent over discharge or imbalance from developing among series cells in the packs due to differing levels of each cell's self-discharge rate.

In the case of a 2S 7.4v pack, the pack should always be stored at 7.6v. You should also store your LiPo batteries in a fireproof container or cabinet and never store your LiPo, or any other battery for that matter, in the model itself.

Perhaps no other item has quite as much effect and influence on our hobby as rechargeable batteries do. There are almost as many different theories and misconceptions out there about rechargeable batteries as there are individual battery sizes and types. Just remember that knowledge is key when it comes to batteries, as is consistent charging, discharging, and storage. Whether you are in the hobby shop or at the flying field, feel free to ask questions of those around you who may be more experienced. That is one of the best ways to learn and grow in the hobby



Some people prefer to assemble their own battery packs rather than buy preassembled packs. Before you solder on the cells, scuff up the terminals to provide a better connection and more secure solder joint.



Many people damage their battery packs before they use them for the first time with poor soldering techniques. Remember to use an iron with a large enough tip to transfer heat, apply solder to the items being joined and not the iron itself, and don't hold the iron onto the battery for too long.

Multiplex Acromaster

submitted by Alan Buckner

Over the holidays, I built and maiden'd a Multiplex Acromaster. Here's a quick overview of the specs, some unique features, a safety tip, and some helpful links.

Specs:

Wingspan:	43"
Wing Area:	557.27 sq in
Weight:	32-36oz
Wing Loading:	8.19 oz/sq ft
Length:	45.25"
Airfoil:	Fully-Symmetrical, mid-wing placement
Material:	Primarily Elapor foam

I built mine with the following equipment:

Motor:	Himax 3516-1130 Outrunner
ESC:	Castler Creations Phoenix 35 (I should probably upgrade to a 45)
Prop:	11x5.5
Battery:	Thunder Power 3S1P 2100
Servos:	Hitec HS-81's for rudder & elevator and HS-65's for ailerons

Unique Features:

I really like the design of this plane. Here are a few unique features which make it stand out:

- It is made from Elapor foam which is very durable and easy to repair. In my mind, it is far superior to EPS/Depron which breaks pretty easily and to EPP which is often too flexible. I have had a few mishaps with my AM (pilot error, of course) and it has survived very well. It is especially nice for people like me who are still learning the ropes.
- It is larger and heavier than most foam electrics, allowing it to be flown in higher winds and handling more like a larger plane. At the same time, it is small enough to fly in a baseball field or small garden (see the video below for proof!).
- Unlike most foam planes, it is shaped much like a typical pattern plane. This allows you to use it for quick pattern practice (local parks, no clean up, can hide in car trunk, etc) using low throws or for 3D practice using full deflections.
- The large fuselage side makes knife-edge circles and loops really easy - even for a novice like me!
- With the large wing area and relatively low weight (just over 2 lbs), it has a very wide flight envelope, allowing for very slow flight and easy landings. In fact, mine is trimmed where it will practically land itself until the final flare.
- Fear not the dreaded tip stall! First, you have to fly REALLY slow for it to stall. Second, it stalls straight forward which is easy to detect and correct.
- The spinner is also Elapor foam. At first, I thought that was cheap, but then I realized what a great idea it was. In the event of a nose-in, it can take much of the impact rather than transferring all the impact to your expensive motor.

Con't next page please



Multiplex Acromaster con't

- Multiplex designed this well so the build was relatively quick. I would, however, strongly suggest modifying the landing gear and wheels for grass. The suggested mod is pretty straight forward and works well.

You can adjust the down and side thrust very quickly, simply by adjusting 4 screws in the motor mount. This allows you to get it just right with little fuss. Not only is this a ton easier than adding washers, it allows for much greater precision.

To see the Acromaster in action, check out these videos:

1. This is my favorite. The pilot is Derk van der Vecht - A teenager that is one of the top flyers in the Netherlands. <http://airtoimedia.nl/web/upload/vdVechten/AcroMaster2.wmv>

This was made by Ian Watson. The most impressive part is the second half where he flies it in a small English garden... <http://www.flyinggiants.com/gallery/showphoto.php?photo=10214&cat=729>

Safety Note:

I have one additional safety note which not only applies to the AM, but all electrics using outrunner motors. With outrunners, the body of the motor spins and if you are not careful, the wires can rub against it, causing an electrical short. In the attached picture, you can see how the insulation on the wires of my Himax was worn off (left circle) because it was touching the rotating outrunner which has sharp edges (right circle).

To avoid this situation, mount the motor so the wires come out the bottom and tack them to the side (I just used tape). If the wires come out the top, there is very little room and they naturally want to rest on the motor. I think this is more of a problem for the Himax motor because of the jagged edges, but suspect you could eventually see this on other outrunners, too.



The symptoms of this were strange. I would be flying along fine and without warning, the motor would make an odd sound and it would cut off and on momentarily and randomly. When I removed the motor, it worked fine (no shorting then). When I inspected it closer, I saw gray dust in the spinner and knew something was rubbing. That's when I spotted the wires. Fortunately, my CC Phoenix didn't get damaged.

Conclusion:

For fun flying or learning 3D, I would highly recommend the Acromaster. There is a great thread on RC Groups that has lots of great testimonies and build/equipment tips. <http://www.rcgroups.com/forums/showthread.php?t=474738> If you plan to build one, I compiled a list of comments/build tips which are in post #[1094](#) which will save you hours of reading...

2006 Reno Air Show photos and article submitted by Mike Rose

The 43rd. Annual Reno Air show and race was last September. It would be quite an thrill to visit in person....but the next best thing is a review and some great photos.

<http://www.aafo.com/>



Editor's note: Ok, Mike, not all the scenery was in the air.....

SPARKS Inaugural "Junk Yard Wars" March 31st, 2007

The objective is to have fun. The secondary objective will be to create a plane from scrap/junk parts in a 4hr time frame with 3 SPARKS's friends. After building your creation, there will be flying sessions to test your flying skills and your creation. The first session will simply award points for a successful takeoff and further points for 3 circuits around the patch, with further points for a successful landing. Further flying sessions will test you and your plane further. In addition, there will also be static judging by your peers that will be worth team points. (Yes before the first flight). Make your junk pretty....it might get you the points needed for the win.

SPARKS R/C will provide materials (glue, foam, chloroplast, ply, props, some wheels and landing gear, etc.), SOME Tools (generator, Drill, Hot Foam Cutter, Scroll Saw, etc.). Your team entry fee will provide us with lunch of some sort.

Your Team will need to provide the following.

4 man team - If on the day of the contest you only have three no big deal...Just keep in mind...4hrs is not long to build a plane from JUNK.

Electronics - Sacrificial (Old) Servos, Receiver, Switch, Battery, Extensions, etc etc....basically whatever radio equipment you normally use to equip a trainer.

RADIO - You can use whatever radio you have, but we are not allowing computer mixing/functions of any sort. If you want mixing, you will have to build your own mechanical mixer. YES IT CAN BE DONE....and it will likely get you more static points. Dual aileron servos are allowed.

Tools - Bring all the tools you can muster....you will likely use them. Whatever you think will help you, but I do believe we will only have 1 generator....cordless stuff will be an advantage here.

Materials - Bring anything you have laying around....Hinges, threaded rods, control rods, control horns, bolts, screws, nuts, FUEL TANKS, clevises, tape (lots of clear tape), etc.

Motor - Up to a .46 STOCK motor with a stock muffler...it must have a muffler. No DUBB JETT/NELSON 40's please. Electric power is not allowed for this year. Be sure to bring a simple nylon motor mount and fuel tank for your engine.

MISC - If you happen to have old wheels, landing gear, tires, or airplane parts for the junk pile, feel free to bring it. Any junk airplane parts will be subject to approval for the pile by the Contest Director.

The event will start at 8:00am sharp. Yes, 8 am. Please arrive about one hour early to get your team and your tools organized and ready to go when we start. When we start you will see 3-4 piles of junk out in the middle of the field. At 8:00am 1 member from each team will be allowed to run out and GRAB 1 ITEM AT A TIME. (Don't worry the junk piles won't be far out) You may hand off the item to another team member and go back or allow another team member to go out. JUST KEEP IN MIND, 1 TEAM MEMBER AT A TIME AND 1 ITEM AT A TIME. This keeps one person from running out there real fast and grabbing a whole pile and leaving nothing for the other teams.

By now I'm sure you are wondering what items you will be grabbing for. It will be all the materials you need to build a flying piece of junk. You will have from 8am-12pm to make whatever you can. If you go over the 4 hr time frame, not a big deal, you will just lose some points. You will be deducted points every 15min there after. Lunch will be served from 12-1 and we will start flying promptly at 1pm. If you are done ahead of time and want to get a "TRIM" flight in....go ahead....just keep in mind...that could be its only flight.

We will have a list of maneuvers (loops, slow flight, fast flight, etc) that will be worth points. At the end of the event, whoever has the most points will win a TEAM TROPHY and bragging rights till next year.

Before flying we will have a static judging among the builders. We will have about 3 categories worth X amount of points.

The teams must be set by the end of the Meeting. If you plan to enter and don't have a team to join with at that time, we will arrange a team. It is not necessary that every team member be present, but the team will need a representative who can pay the entry fee which will be due that night or prior. All teams need to be selected and worked out at that time in order to provide enough supplies.

Team entry fee will be \$30.00 (\$7.50 per person).

For questions and Team entry information (I need to know who you are...) contact Mark at 281-290-0327 or at flyintexan@houston.rr.com

“ Oops! ” Photos

submitted by

J.R. Carpenter



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To all who contributed to this month's issue...

Alan Buckner, J. R. Carpenter, Lee Dillenbeck,
Mark Hunt, Paul Johnson, Nick Marson,
Dean Nistetter, Ed Pierce and Mike Rose

If you have any suggestions or ideas for future issues, articles, photos,
plane reviews, websites, or just interesting "stuff" please send to

dgmarson@earthlink.net

Thanks, Diane Marson