

January 2007



## Safety is our most important Product!

The Spread Spektrum DX7 for any size plane gas, glow or electric has arrived. If you are flying either DX6 or the DX7 you will see the SPEKTRUM pin holders on the bench side of the pin board. Clip your AMA card with your membership sticker on the back in one of the clips, fly, be safe and have fun. AMA has approved these systems provided the OEM's use restrictions are complied with.

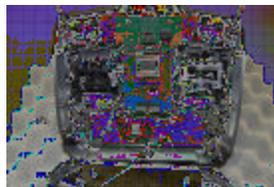
### Spektrum DX7

By Don Schultz

It's here, it looks good, it has some new features I like and some I could live without. As most of you know I have flown the DX6 with some small and some not so small electrics since Spread Spektrum first hit the market. The new DX7 has the look and feel of a real quality product. There are two receivers in the new system connected together. They are mounted in the airframe perpendicular to one another at least two inches apart. This allows the signal to reach the receivers regardless of the shadow effect of a large airframe. Videos of the test process of this system show that extensive testing that was done before release.



In the box: Xmitter, Rec, 4 digital Servos, 1100 mAh Receiver battery, Switch, Charger and all the fittings.



In the case: Stick adjustment screws and lots of those little 2.4 GHz's waiting to get out.

There it is, I picked it up from Pat at RC Modeler, the

**The next meeting is:  
Monday, January 15<sup>th</sup>**

**General Meeting 7:00 pm**

6<sup>th</sup> of December, charged everything over night and started converting models on the 7<sup>th</sup> of December.

I connected the receivers, servos and ignition cutoff to a Smartfly power distribution block. The receiver channel positions are Throttle, Aileron, Elevator, Rudder, Gear, Aux1 and Aux2 while the power block is standard. Therefore receiver channel 1 is plugged into PB channel 3, receiver channel 2 is plugged into PB channel 1, receiver channel 3 goes to PB channel 2 and after that it's a match.

The next step was the binding process to teach the receiver the model code for model 5 that will eventually be the Super Flying King model number. This means the SFK will only fly with my transmitter on model # 5 and will not be interfered with, glitched or bumped by any other transmitter, radio station, electrical interference or what have you. With the DX6 if you left the power on a model and switched on another model at the same time the controls on both models were active at the same time just like 72 MHz with 2 models on the same channel. Not so with the DX7. The DX7 is bound to one model by program # and only to that model. The next step was to check the failsafe concept of the DX7. It functions the same as the DX6 that is it's kind of a fail-



**Happy New Year to all. Hey guys, this is my buddy Zipper. I just installed an AR 7000 in him and I fly him with a new DX7. Now if I could just keep him out of that feeder filled with Cooper Mountain Pinot Noir I could really fly him hands off. .... Sq Earl Jr.**

Safe system for dummies. At bind time the failsafe position of the throttle, Aileron, Elevator and Rudder are set to the position they are in. The remaining three channels have no failsafe setting. This means the primary safety factor of electronic ignition engine shutoff for large gasoline powered planes in the event of transmitter failure is missing from the basic programming. The workaround is to set the throttle to idle cutoff at bind time. The only time failsafe should activate is if the transmitter fails. There should never be any interference problems.

This is only a 7 channel system so those who require more channels will be at a disadvantage. My SFK has flaps and smoke and an electronic ignition cutoff so if I want aileron differential I'm one channel short. Smoke, ignition cutoff and aileron differential are more important to me so the flaps are history.

Just about every thing I can think of that 7 channel flyers would want in the transmitter setup is available.

NOTE: This transmitter will fly both fixed wing heli. If you switch between heli and arco the model memory is cleared.

Dual Rates and Expo are available for aileron, elevator and rudder. There is no Expo for the throttle so the throttle servo is linear in movement while the RPM to throttle plate position is not. I will use a servo with the arm shorter than the throttle arm to get some stick response feel to throttle RPM position and maybe I can develop a fake nonlinear mix. Just another workaround. Since I have limited myself to sport flying this is not a serious problem.

Dual Rates can be set as high/low on individual switches or a common switch. I have always had doubts about low rate giving enough control when landing especially if the plane is a little slow at the flair point. Dual Rates for the SFK are set at 100% across the board. The Expo is set at +70% for the Aileron, Elevator and +30% for the Rudder. The plus setting are the correct slow at stick center curve for JR while minus setting are used by other manufacturers.

Total or End Point movement is then controlled by the DX7's travel adjustment. These are Throttle high at 98%, low at 88%, Aileron left & right at 60%, Elevator up at 70%, down at 66%, Rudder left and right at 100%. Over the course of the flight test these settings will probably change. This the initial setting for the maiden flight with this new radio system.

The mixes are set as follows:

1. Aileron to Rudder: The mix is controlled by the mix switch, 1 = on and the rate is 15%. When the ailerons are applied the rudder is automatically applied in proportion to the stick movement if the mix switch is on.
2. Differential: Differential is controlled through Differential program and applied through the Flaperon system meaning the differential is applied from channel 6 as opposed to channel 7 on most other systems. The differential setting is 22%.
3. Program Mix 1: This mix applies right rudder at high throttle to counteract left torque. The mix is on all of the time and the rudder is applied only at high throttle settings. The rate is -10% and the offset is zero.
4. Program Mix 2, 3 and 4 are inhibited.
5. Program Mix 5: The mix is controlled by the mix switch, 1 = on and the rates are +10% and -10% with an offset of plus 9. The mix applies positive elevator when the ailerons are moved. The offset indicates how far the ailerons must move before the elevators become active.
6. Program Mix 6: The mix is on all of the time however since it controls the speed of the smoke pump through the throttle position it has no effect unless the smoke system controlled by the gear switch is on. The rate is set at -70% with an offset of zero.

The timer is set as a down timer for a duration of 10 minutes. The timer is reset by power off. It shows 10 minutes at power on and is started or stopped by the increase/decrease switch on the transmitter.

The switches. The gear switch turns the Smoke system on and off. It also opens and closes the Bombay doors when that module is installed in place of the smoke module. When the remote controlled parachute is dropped from the Bombay the DX6 will be used to control the parachute decent.

The DX7 program settings for the small electrics is not as complex at the gas powered models. Aileron differential is not used and only simple mixing is used on the Ultra Stick.

We will detail the flight tests starting on the next page.

Link to the photo section just click: [DX7](#)

The transmitter physical setup changes:

1. I like to fly with short sticks because I'm a thumb flyer and the stick movement with short sticks gives me a better feel. I removed the set screws from the top of the sticks, ground off 3/16 of an inch from the bottom of the transmitter knobs, drilled out the bottom of the transmitter knobs to depth of 3/16 and screwed them down until they bottomed out on the gimble bracket. Now the top of the threaded part of the stick is even with the top of the knob.
2. I removed the back cover of the transmitter and tightened the tension screws to the highest tension setting. The throttle detent plate was left at the factory setting.

### Let the Flight Tests Begin!

**Outrage:** The Outrage is an electric bi-plane by Ultrafly. This one has 186 flights and is on its third set of wings/tail feathers. The motor is a 2212/34 AXI, Jetti 12 amp controller and a TP 21003S battery. The receiver is the Spektrum AR6000. The plane has no landing gear so it's a hand launch. It's 13 December, 2006 at Fly-A-Ways Bob Jenne Field with a 12-15 mph wind from the south, preflight is complete and we are off.

The plane is very controllable even with the wind. It was to bouncy to trim but the control response was excellent. The transmitter programming was:  
THR=100% AIL=40% ELV=100% RUD=100%.  
Dual Rates all at 100%.  
Expo AILE=+70% ELVE=+70% RUDD=+30%.  
All mixes off and JR rules apply to the Expo settings.

The flight was about 5 minutes most of the time spent testing the response into the wind when power was reduced. When compared to the DX6 the response seems more precise. I'm satisfied with this test considering the weather. One more "yes" in the switch to 2.4 GHz.

Went to the field 12-15-2006 to start the Ultimate test. Wind about 8 mph. Flew the Outrage again and got it trimmed. There is no change in my opinion of the AX7.

**Ultimate:** The Ultimate is an electric bi-plane by Ultrafly. The motor is a B-18-10 Ultrafly, Apollo 25 amp controller and an E-Flite 1500S3 battery. The receiver is the Spektrum AR6000. The plane has landing gear so take-off will be from the runway It's 15 December, 2006 at Fly-A-Ways Bob Jenne Field with a 8-10 mph wind from the SE, preflight is complete and we are off.

Takeoff was normal, the ailerons are too sensitive and the plane is tail heavy, it will need some nose weight.

Even with the changes needed the plane flew well and control was adequate. I'm going to add 1/2 ounce to the nose and replace the landing gear wire with carbon fiber. The ailerons are at 70% and I will reduce this travel to 50%. I hope Saturday the weather is better and I can finish the electric plane tests on both the Ultimate and the Ultra-Stick.

It's Saturday the 16<sup>th</sup> and I'm back a Fly-A-Ways for more tests. I made the above changes to the Ultimate. The take off was great no spooky flippy problems. The nose weight (1/2 ounce) put the CG where it belongs. The ailerons travel at 50% is just right. Well that does it for plane number two.

The transmitter programming was:  
THR=100% AIL=50% ELV=100% RUD=100%.  
Dual Rates all at 100%.  
Expo AILE=+70% ELVE=+70% RUDD=+30%.  
All mixes off and JR rules apply to the Expo settings.

**Ultra-Stick 25e:** This is an E-Flite design that copies the Hanger-9 Ultra-Stick series. Wingspan 50", length 41.5", weight is about 4 lb. The motor is a 2826/12 AXI, Jetti 40 amp OPTO controller and a HYP3700S4 battery for power with a 1700 MAh NimHd receiver battery. The receiver is the Spektrum AR6000. With the installed motor this plane is a streak and with the radio change this is really the maiden flight all over again.

Preflight is done and it's time to do it. As with most small tail draggers the quicker you have rudder control the better, push full throttle, five foot roll and we are airborne. Up twenty feet and it wants to roll right, 7 clicks left on the ailerons, 6 clicks left on the rudder and hands off is pretty good, just a little nose down at half throttle. Two clicks up elevator and its trimmed.

It's a dark day so the flight will not be to long. Loops are good and rolls are better than I usually can do. Here goes vertical until I can't tell if it's right side up or inverted. Cut power and let it fall down to where I can see it again, cool.

Down at eye level, do some approaches and get ready to land. The plane is real stable at the lower throttle settings. The first approach to a landing is to high and to fast, go around. The second attempt looks good, touch down in front of pilot station 4, roll out about 10-12 feet, test complete.

Yip Yip Yahoo that was a good test flight. Well that's two more yes votes for the DX7.

The transmitter programming was:  
THR=100% AIL=60% ELV=100% RUD=100%.  
Dual Rates all at 100%.  
Expo AILE=+70% ELVE=+70% RUDD=+30%.  
All mixes off and JR rules apply to the Expo settings.

The Stick mix settings, Aileron to rudder mix was off for this test. Program mix 1, throttle to rudder was on at 10% right rudder proportional to the throttle position. No other mixes were set or used during this test.

That's the end of the Saturday tests. Hopefully if the weather cooperates I will get to test the Super Flying King next week.

**Super Flying King:** It's Thursday the 21<sup>st</sup> and the usual suspects are having breakfast at Shaeries on 185<sup>th</sup>, the sun is up creating fog, can we fly today, at 12:30 we will know for sure. It's a go and we are off to Bob Jenne field. Of course as soon as we turn in to the Flint farm the sky starts to haze up and the sun sneaks behind a cloud.

The SFK is assembled, full of fuel, batteries checked and preliminary preflight is complete. Time to stick a battery in the Outrage and make sure the DX7 works. The Outrage is airborne, flight 189, a few laps around the field. The speed is a little slow looks like the TP battery is getting weak, after all it's two and a half years old. Well every thing is ok time to land and get it on with the SFK.

The ZDZ60 starts easy, a few flips with the choke on and it pops, six more with the choke off and it's running. The first order of business is a range check with the engine running. Hold down the bind button to reduce the receiver power, can't collapse the antenna, it doesn't have a pullout. Walk off 120', twice the recommended distance, every thing is fine. Walk back and do the control surface again, all surfaces move in the right direction time to do a taxi test.

Out to the runway, hold the SFK and run-up the engine to clear it out, sounds good. Turn it loose, advance the throttle, pickup speed the tail comes up, reduce the throttle, it's easy to keep the SFK on the runway. Turn around and taxi back. Well this is Oregon the wind changes direction so we taxi walk to the west end, the wind coming from the southeast. Well that's ok, the takeoff is away from the Flint's house. A slight crosswind maybe 4 to 6 mph. Smoothly apply full throttle,

the SFK picks up airspeed and she is off. Climb out is uneventful. It's essentially a maiden flight because of the radio and flap change, however the plane has close to fifty flights so I know how it handles, kind of.

I do some 3/4 throttle hands off laps, roll and tracking are ok, pitch needs two clicks of down. I'm not going to work on any mixes today. I fly some more laps varying the altitude, come down for a low and slow pass. Full throttle climb is excellent and all the controls movements are precise, if it's not better than the 9c it's at least as good, nah, I think it's better. Well it's time to do some approaches to a full-stop landing.

Landing will be left to right and I need to do some left to right approaches turning base and downwind without getting too close to the driveway and the house. With this transmitter the turns seem more controlled than with the 9c. I can't say it's all transmitter because I have changed to full throws with at least 70% exponential.

Well that's that, as far as I'm concerned the DX7 and it's companion receiver the AR7000 are here to stay. I will be changing all my gas engine planes to the AR7000 receivers as they become available. For all practical purposes the DX7 system will be adequate for most sport and some IMAC and INAA flying. Some scale masters plane will need more channels because of breaks, flaps, lights and retracts. Not me, all my flying will be in accordance with the KISS rules.

Two noticeable missing items in the DX7 system are throttle exponential and no failsafe available for channels five through seven. I need to try throttle to throttle mix to see if I can make the throttle think it has a nonlinear curve. In the event of transmitter failure if you bind the throttle at idle cutoff with the throttle trim down the engine will shut down in the event of transmitter failure in place of ignition cutoff.



SFK, Span 134', Cord 25", Length 95", Weight 40 lb  
Power ZDZ60RV, Tuned Pipe, Smoke Module.

# MOTOR MOSCA

By Aaron Wilson

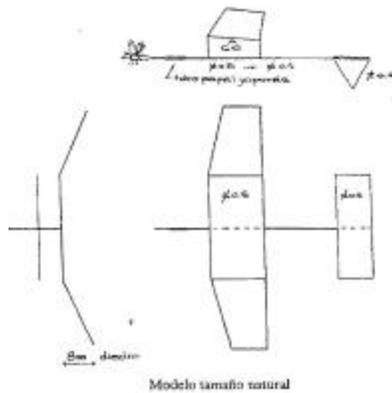
I found the following article while surfing the internet. With indoor flying season upon us, I thought it would be appropriate to share this novel approach to powering lightweight indoor flyers. This method is non-polluting and certainly less expensive than the latest out-runner motor and speed controller. Anybody want to experiment with twin engine power?

From the humorous article “Temas de Salón” by Ata Rafaelino (translated, roughly, by **Aaron Wilson**)

“While looking for “interesting and ingenious things” in indoor modeling, I came upon a publication from some years back containing this curiosity—a small flying machine. The interesting thing about this airplane, designed by Guillermo Lastra, is that the motor is a fly.

The model was constructed in 1976 and achieved flights of up to 50 inches, depending on the strength of the motor. The model was fabricated from microfilm and Japanese paper. The only special recommendation is that care is taken when gluing the motor (the fly) to the tip of the paper nosecone. Ensure that excess glue does not get on the wings of the motor, otherwise the motor will not function. The cone is then fitted to the fuselage, thereby mounting the motor.

The builder should prepare several motors before flying. It may be necessary to adjust the motor to correct the center of gravity and to trim for stable flight. And now you know, it is better not to kill these “motors” but to mount them alive and enjoy good flying.”



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