



# Sanderson Field R.C. News



**HOPE TO SEE YOU ALL AT THE FLY-IN ON MAY 10TH FROM 9 TIL WHENEVER!**

## Club Meeting

This months meeting will be held on Thursday May 8th at the field weather permitting otherwise it will be at Choice High School, located at 201 N. 9th St. Shelton WA. Time: 7:00 p.m.

Check out the web site at  
<http://sfrcf.quintex.com>

Minutes from the last meeting were read and approved. The treasurer's report was approved as read.

I'd like to welcome 4 new members:

Ken and Megan Burns  
Scott Simpson  
Allan Pointsett

The new Jet rules were discussed and three lines were added. You can see the additions on the Info web page. Download "Club Procedures"

**IF YOU PAY BY MAIL SEND YOUR DUES, PROOF OF 2003 AMA MEMBERSHIP AND A SELF ADDRESSED STAMPED ENVELOPE TO THE TREASURER:**

**CHUCK KENTFIELD**  
6843 Gallagher Cove Rd. NW  
Olympia WA 98502

Concerns were raised about the new Helicopter hovering rules, it was decided to try them and alter them later if necessary.

The Scholarship committee was set up, Sharon Diaz will be the head with Chuck Kentfield, Gordon Osberg and Bob Beatty helping out.

Thanks to Hugo VanPaassen for loan of the TV and VCR for the swap meet.

It was noted that the lock on the main gate was getting bad again, it has been replaced.

The swap meet went fairly well, however more advertising and RC swap meet signs would probably help for next year.

Bob Beatty won the raffle which was a P-47 ARF.

Gathering of Warbirds will be in Olympia on June 13th, 14th and 15th. The Bellingham air show is on the 15th so go early the 14th to be sure to see all there is to see.

**The Field will be closed to us on June 24th from 10am to 12pm and June 25th from 1pm to 5pm for WSP skid training.**

## A Visit to a Phoenix AZ RC Club

By Bob Beatty

While on a recent visit to Sun City AZ to see my mother, I visited one of the four RC clubs I could find in the area named Arizona Radio Control Society. I found their web site and used the E-mail link and got 4 replies, one of whom was the club president, Jack Knuth. He said he would be at the field on Sunday morning so I headed out early that morning (about a half hour drive from Sun City where my mom lives) for Mustang field. When I got there, only one person was there. I introduced my self and sure enough it was Jack Knuth. The field was about a mile down a dirt road at the foot of the White Tank Mountains. They have a covered area to put planes together and fuel them up using old wire

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## A Word from the President

A special thank you to the volunteers who signed up to be on the scholarship committee. Every year we give a \$500.00 scholarship to a Shelton student to go towards there college funds. It is a very rewarding project that the club is involved in.

# Laser Cutting Model Airplanes

## DESIGNING AND LASER CUTTING MODEL AIRPLANES

By Robert J Caso and William Doucet

A number of people have asked me about the process followed in cutting RC airplane parts on a laser, so here goes. A laser cutter is nothing more than a glorified 2D plotter having a moveable arm that moves along a "Y" axis with a lens mounted thereto that moves along an "X" axis. The light reaches the lens by way of precisely mounted 45-degree mirrors that direct the laser beam emanating from a laser fixed at the back of the machine. A small blower cools the laser itself and a larger external blower used to extract fumes is hooked up to the laser with flexible pipe and is vented to outside air. Software-driven servomotors driving rubber belts provide the required movement of the arm and lens head, and the 12" x 24" stainless steel cutting table automatically adjusts up and down ("Z" axis) to provide the correct focal length for the laser beam. Printer drivers loaded into a PC drives the laser - just like any printer - and just about any software that has that feature can perform "printing." Most of the wood we commonly use in RC aircraft construction can be accurately cut - up to about 1/4" for balsa and 1/8" for plywood. The wood itself is temporarily affixed to the cutting table using tape to prevent movement during the machining operation. Our laser is rated at 30 watts, although a number of ratings are available, and it runs on normal 115-volt household

current. Some of the higher-powered lasers require 220 volts and water-cooling.

So how do we make the parts for a model? There are basically two ways. The first is starting with an already drawn paper plan, the parts printed thereon being scanned using a tabletop scanner. Once all the required parts are scanned, they must be imported into a CAD package (we use ModelCAD) and traced by hand, since the resulting outlines of the scanned bit-mapped image are usually ragged and imprecise. This is a labor-intensive process. A bit-mapped image is basically a series of small black blocks forming the outline of an object. CAD packages produce vector lines which are much more precise. Therefore, an added issue is one of obtaining a precise part during the tracing process - where do you draw your line against a bit-mapped image? This is espe-

cially an issue where parts contain a slot, such as in the case of a spar slot in a rib. If you're off a couple of thousandths either way, the parts won't fit well. To deal with this, we have created in CAD a separate file of pre-toleranced slots such as 1/8" x 3/16 that we import and lay into the drawing. While this saves time, there still is the issue of exactly where along the rib that the slot lays. Only by making some test cuts in poster board or by redrawing the entire wing plan form and comparing it against the ribs will give you this answer.

The second way to make a model is to start from scratch right in CAD. If you're doing something that's scale, a good way to start is to get a three view, scan it in and import to CAD. This will give you the overall outline of the aircraft and then you can start drawing its infrastructure. This is where it pays to have built a few model airplanes. Sometimes we cheat and look at plans for a similar airplane to get some ideas. Before you start draw-

### CLUB OFFICERS

|                        |                       |               |
|------------------------|-----------------------|---------------|
| President.....         | Jody Diaz .....       | (360)427-6102 |
| Vice President .....   | Dick Robb .....       | (360)427-4521 |
| Treasurer .....        | Chuck Kentfield ..... | (360)866-9473 |
| Secretary .....        | Bob Beatty .....      | (360)426-5601 |
| Field Marshal .....    | Chuck Kentfield ..... | (360)866-9473 |
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| Alt Board Member ..... | Bob Beatty .....      | (360)426-0677 |
| Alt Board Member ..... | Chuck Kentfield ..... | (360)866-9473 |

## Laser Cutting Model Airplanes (cont.)

ing away, however, you first have to scale the model - how big do you want it? CAD doesn't care - it works in units: millimeters, inches or miles. The infrastructure for an 80" Fieseler Storch would differ greatly from a 30" inch model in terms of wood sizes, rib and bulkhead spacing, materials and the complexity of the parts. How accurate do you want the model to be? Gas or electric? Flaps or not? All these questions play a part in the basic design. Referencing proven designs helps immensely in solving these model-engineering problems.

OK, so you have the three view of the model scanned and scaled, now what? Start at the beginning - for the fuselage side view, put a line in for the thrust line of the model and draw lines corresponding to its outline. Determine your bulkhead spacing and draw vertical lines up and down through the thrust line to the outlines. Do the same for the top view. The lines in the side view corresponding with those in the top view represent a 2D general boundary outline of bulkhead. Put them together and you have the front view of a rectangular bulkhead. Now any curves are lofted in, and slots and lightening holes are added. There's a bulkhead. I am oversimplifying a bit here but this is the general procedure. For the wing, import a rib profile (many CAD programs have them) - perhaps a Clark Y. Draw the outlines of the wing and put in centerlines for the spars and ribs. Take your rib profile and lay it against one of the rib centerlines. If the rib is too big or small, adjust it by squeezing or stretching it with the appropriate

CAD function. Import an appropriate slot from your library and place a few on your rib where it intersects any of the spar centerlines. Cut off the front and back of the rib to allow for leading and trailing edge structure. At this point, the rib is a series of separate drawings so the thing to do is to retrace the rib along its curves and around its slots so you have a single entity. If you're working with a constant chord wing, you're pretty much done.

OK, so you have all these parts drawn and want to cut them. Let's say some are to be cut from 1/16" balsa and some from 1/8" balsa. Create a "cut" file in CAD by cutting a pasting your parts in to a separate file. What sizes does balsa come in? Well, the thicknesses here are no problem, but should we use 3"x 36", 4"x 48" - or what? It depends on the overall size of the parts and the limitations imposed by the size of your laser's cutting table. Three, four, and six inches by 48" (cut in half) go nicely into a 12x24 table area, so what's the easiest? We prefer a 4"x 24" piece, and 3 such pieces can be loaded into the laser for cutting. However, if two of your overall dimensions for a single bulkhead exceed 4", either you have to use 6" wide wood or redesign the part into two pieces. As a practical matter, 3.75" is the outside limitation on 4" wide wood to allow for warping and imprecise machining of the wood stock at the mill. Set your CAD's grid setting to 4" and copy in your parts to your new file, keeping the parts within a 12"x 24" field on the

screen. Wood's expensive, so nest them together. To keep the parts from flying around while they're being cut,

Breaks are made in each part to interrupt the cut. Ready to go. Turn on the laser and the blower, load your wood and have the laser adjust the table height to your wood thickness (i.e.: press a button!). Before you cut, you have to tell the laser print driver how fast you want the head to move, and how intense the laser beam should be. 1/16" wood cuts faster than 1/8" wood due the different thickness. We got to be right answer only after trial and error and created a resulting file of cutting drivers to cut anything from Monokote to 1/8" plywood. Balsa can be unpredictable at times since its density can vary from 4 to 16 pound per cubic foot. We try to use only contest grade balsa, but even this varies greatly. Since the laser leaves kerf just like a band saw, wood density plays a big role in determining how accurate a part can be cut. The softer and thinner the wood, the wider the resulting kerf. Sometimes the laser won't cut through if the wood is too hard for the given speed/power setting. If you've done everything right, the parts should slightly interference fit together, giving you a great glue joint.

That's about it. I recommend that you try ModelCAD and try drawing some parts. We can cut the parts at about \$40 per hour and would be happy to answer any questions.

Robert J Caso and William Doucet,  
TurnKeyRC.com, 610-369-0822



**Barbecue and Picnic area**

spools covered with carpet as work area's. As I was talking to Jack, more people started showing up and I met a few more people. The flying area has 5 stations which are protected by 4' high cages of wire mesh with a couple of stops in the ground between each one for an engine starting station. They have much the same rules as we do and seem to be some what relaxed on them the fewer people are there.



**Impound station**

After being there for about a half an hour there were about 10 people there with only 4 of them flying. The club has 170 members and everyone was wondering where the usual crowd was. They have a radio impound station in the middle



**Aircraft assembly area**

of the ramada with the assembly stations on one side and the picnic area on the other.

The runway is about 650' long and 60' wide. I asked if they had any turbines there and they don't, however they are considering it although it will mean extending the runway. I would think it would entail considerable fire risk considering the dryness of the area.

After the tour and bull session was over Mr. Knuth asked if I'd like to fly a lazy bee and assured me they would put me on the cord so I wouldn't be responsible for any crash. The funny thing was it wasn't even his

plane.

I though the field was very well set up and would be a pleasure to fly there except for the wind. Most of the time the flag at the field was



**Pilot Stations and runway**

standing straight out. They don't consider it windy until the flag really gets whipping and bending the flag pole! I guess you must get used to it.

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**Other Scheduled Events**

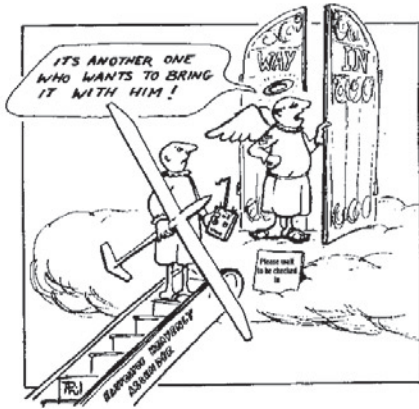
**May 10th ..... Fly-in/Barbecue 9:00 am to ???**

**August 23rd..... Scale fly-in**

**July 12th..... Invite TCMAA to our field for a fly-in (Tentative)**

**No other events are scheduled at this time**

The people there were friendly and helpful and I got to see a brand new Condor 120 size GeeBee ARF on it's maiden flight which went with out incident. If you are traveling get out there and meet the locals!



Condor 120 size GeeBee ARF

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### (9/8/96) BOB'S TOP TEN RULES OF MODEL AIRPLANE CRASHES...

- #10 - Batteries only last as long as the warranty on the radio.
- #9 - If it's gotta go in, make it one worth talking about.
- #8 - If it does turn out to be a crash that legends are written about, don't exaggerate on it's retelling - others will do that for you.
- #7 - Bask in your moment of glory while you can - some other damn fool will out-do your crash tomorrow.
- #6 - There is no such thing as "fool proof".
- #5 - Unbreakable props do, untearable fabric does and seamless tanks aren't...
- #4 - Any landing that the engine walks away from is a good one.
- #3 - Canopies do not make good landing gear.
- #2 - Trainer cords should not be used to lynch pilots who turn their radios on when someone else has the frequency.... that's what they make rope for.
- #1 - Never let them see you cry.... especially if there's women around.

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**DON'T FORGET THE FLY-IN ON  
MAY 10TH. COME OUT AND HAVE  
LUNCH (HOT DOGS AND HAMBURGERS) AND JOIN  
THE FUN!**

**WE'VE GOT A \$250 RAFFLE GO-  
ING ON SO COME TO THE MEET-  
ING AND BUY SOME TICKETS.  
THAT'S ENOUGH FOR A NEW  
PLANE FOR THE LUCKY WINNER!**