ACADEMY OF MODEL AERONAUTICS CHARTERED CLUB #1255

# SERVO CHATTER

*A PUBLICATION OF:*

ANOKA COUNTY RADIO CONTROL CLUB, INC.

**JANUARY 2018**

***THE MEETING WILL BE THURSDAY, JANUARY 18, AT RIVERWIND!!***

## PRESIDENT'S CHATTER

Winter is back with a vengeance and has turned our hobby into Frozen Finger Simulator Flying. I do often wonder why I remain here in the North Country. I want to remind you to renew your ACRC memberships for 2018 Flying season. By doing so you aid in setting the club budget.

Don't forget to attend the club meeting on the third Thursday of each month. The meetings are at Riverwind during the winter. Bring out your projects to show and tell; let us see what you are doing or what RC Flying subject has your interest.

See you at the meeting, until then stay warm and healthy.

Virgil Okeson

## FROM THE VEEP

**Christmas handled:** One great way to make sure you have a great Christmas is to initiate a self-gifting agreement with your significant other. Needless to say my wife and I both had a great Christmas! I am hoping you all found a way to enjoy your holiday. In 2018 it will be my job to procure prizes for our monthly raffles. If anyone has any suggestions or donations I will take any and all help. I will try to keep all forms of power in mind as well as shop and field items. I think Tim has been doing a great job and I hope to continue. I'm sure my email and phone is available thru the club roster or our newsletter.

ACRC Forum - http://anoka-rc.com/forum

**Freeze fly:** I now have warm fingers and the satisfaction knowing I have participated in the 28th annual January 1st freeze fly-ins at ACRC. I was the first to arrive at 10:00 to -14 degrees and a pristine flying field then proceeded to scribe as many touch-n-go markings as I could before the fingers got too cold. I flew an electric SMUD (club build from MARCEE) high wing with my home built wood skis. Bob Svare came and flew the SMUD-DUCK amphibian and a small Cub

Jim Svare flew his I-BEAM with Dubro skis, which I think did very well. Mike and Brian Dorff both flew. Mike flew his corsair on skis?? and Brian embraced the challenge to fly his glow powered SIG Fazer fun fly plane.

Brett Ohnstad showed up to make sure all was done in a safe manor. Duane Orson was present to make sure we all had fun. Anyone showing up after 11:00 did not find me there as I thought an hour was long enough and an invite to a great brunch from Bob could not be turned down.

FYI The first Freeze Fly was January 1st 1990. I have some of the certificates that used to be presented to the participants at the following monthly meeting.

Happy New Year to all

Jeff Slater

## FROM THE FORMER VEEP

Kudo's to Jeff Slater for stepping up and filling the vacant Board position. Jeff will slide into the Vice President slot while I will continue on as recording secretary. Hopefully Jeff's construction job will

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allow him to perform the duties, if not, I will keep my VP hat close by.

Mother Nature really put the freeze in this year's Freeze Fly. Sub zero temps were no match for the brave souls who said "screw the weather, I'm going flying". It's moments like those that bring friendships and camaraderie to the forefront and strengthens our group.

For this month's raffle, I've got a couple of unique items. Slimline products just introduced a very sturdy airplane stand. It is strong enough to hold most any sized plane, even during transport to and from the field, and it can be easily customized to fit the profile of your particular fuselage shape. Also up for grabs is a set of extra long drill bits, and a few more items. So brave the elements and support your club.

Tim Karash

# MEMBERSHIP NEWS

## SEASONS GREETINGS AND HAPPY NEW YEAR!!

The Freeze-Fly is over and but I did not make it. The temperature was too much for my aging body. I drove to Duluth to visit my daughter and her family instead.

Membership applications were included with the November and December newsletters that were mailed out. Members that read the newsletter online can download a membership application from the website. After January 31 a $5.00 late fee will be added to your dues. This will also be the last newsletter that you will receive via snail mail because it is part of last year's membership. If you don't want to miss any of the newsletters, be sure you renew on or before January 31. If you don't have your AMA by the end of January you can send me your application and dues and I will mail you your ACRC membership card when you verify your AMA.

Anoka County R/C, St. Paul R/C and the other clubs in the area are working on their 2018 calendars. A complete listing of 2018 events and their dates will be published in future newsletters.

**TCRC ANNUAL AUCTION** - The TCRC auction will be on Saturday, February 3, at Cross Point Church on 98th and Bloomington. Registration starts at 7:30AM and the auction starts at 9:30AM. Go to the TCRC website for more information:

http://www.tcrconline.com/pages/auction_seller_registration.htm

Both Big Sky Hobbies and Hobby Warehouse will be at the auction to take your hard earned money.

The next meeting will be at **Riverwind** on January 18 at 7:00 PM.

Stan Zdon

# A Look Back

## January 1990

28 Years Ago

The weather at this year's Freeze Fly really put the "fun" in Fun Fly. 15-degree temps and 20 plus mph winds kept all but the hardiest from participating. To minimize the number of "crabby" engine starts because of the cold and wind, each pilot flew three events back to back.

The 3M R/C club announced a summer Fun Fly event that's open to the public. Over 100 vendors had been contacted, bringing in over $2000.00 in prizes with 6 months to go.

## January 2000

18 Years Ago

The Y2K scare has come and gone. Fuel and glow plugs still work, not so sure about my thumbs.

The Northtown Mall show was a huge success especially since ACRC took home the "Best Display" trophy.

This year's Freeze Fly had nearly a dozen foolhardy souls braving the sub-zero wind chill. Stan Zdon was braver than most as he not only flew the ACRC Freeze Fly, but went on to fly at the St. Paul and Grassfield events as well.

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The contest/event calendar is coming together with three events scheduled so far. St Paul R/C and ACRC will publish their respective schedules soon.

Don Nix of PowerMaster fuels brought us number three in a series of glow fuel information. This month, Don explained the details of nitromethane and the family of nitroparaffins and how they affect an engines's performance. Don's depth of knowledge on the subject of glow fuels really boggles the mind.

Tim Karash

# ACRC MINUTES

**Board members present:**
Virgil Okeson, Stan Zdon, Marc Tellevik, Bob Proulx, Brett Ohnstad, Tim Karash, Jeff Slater.

**Members Present:**
18 including Board

**Treasure's Report:**

| | |
|---|---|
| Income: | $2000.00 |
| Expenses: | $1937.44 |

**Membership Report:**
40 Members have renewed or joined for 2018

**Events Updates:**
January Freeze Fly on New Year's Day.
Pattern contest sanction has been approved for June 16 & 17.
Three events scheduled for 2018: Spring Fly-In, Pattern Contest, and Fall Fly-Out. Additional events if interest is shown.

**Safety Report:**
No issues have been raised. A reminder to all who fly during winter months to prepare for cold temps. Fingers, toes, ears, and nose can be frost bitten within a few minutes of exposure.

**Old Business:**
Grass runway to get minor improvements next spring - dethatching of grass and possible rolling to smooth bumps.

**New Business:**
FAA registration is required again. Both AMA and FAA numbers should be visible on your airplane. See rules for proper location of the numbers.

Fence and runway contractor ads in our newsletter have generated business for them.

**Show and Tell:** None

**Raffle:**

| | | |
|---|---|---|
| 1st | Proud Bird ARF | Brian Godspeed |
| 2nd | Long Reach Tool | Brian Godspeed |
| 3rd | Bench Tool Holder | Lucky Godspeed |
| 4th | Mini Wooden ARF | Bob Nagle |

## Board Minutes:

**Board members Present:**
Virgil Okeson, Stan Zdon, Marc Tellevik, Brett Ohnstad, Bob Proulx, Tim Karash, Jeff Slater

After considerable discussion, the 30 dollar upfront training fee will be designated towards membership of that student should he/she join ACRC. Payment will be deposited into club checking account and tracked on AMA 60 day instruction application. If the student does not join ACRC, the fee will not be refunded.

Tim Karash

# ACRC SAFETY

What a difference a year can make. I attended this year's freeze fly to ring in the New Year and it was a stark contrast to last year's event.

Last year we had a couple dozen pilots and spectators brave temperatures that hovered around the warm side of freezing and the runway and pits area were relatively free of snow. In fact, one of the pilots was wearing shorts, not exactly my choice for winter flying apparel.

New Years Day 2018 was a different story. With a temperature sitting at -3° only the most daring came out to put their airplanes through the paces. A little under a dozen people showed up with everyone donning snowmobile pants and heavy jackets. Planes were either launched on skis or hand launched but the cold, crisp air was very dense and made for some interesting flying.

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I noted that a few pilots also wore lightweight gloves or even no gloves at all in order to work their radio. I attempted to take a few pictures and needed to expose my digits for a while also. Fortunately there was little to no breeze so there was no bitingly cold wind chill. When flying in these conditions of course it would be best to use a very lightweight glove or a winterized radio case.

If that won't work you can always wait until spring to fly. Me, I hate the cold so I think I will wait until summer to fly so that I can stay as warm as possible.

Brett Ohnstad

# 2018 FREEZE FLY PIX

# FACTS ABOUT BALSA

Model airplanes are no different from any other type of flying machine, large or small. The lighter it is built, the better it will fly! With that in mind, it is easy to understand why balsa wood has been the standard material for model airplane construction since it first became readily available in the US in the late 1920s. Its outstanding strength-to-weight ratio enables hobbyists to construct durable models that fly in totally realistic manner. Balsa also absorbs shock and vibration well and can be easily cut, shaped, and glued with simple hand tools.

**Where Does Balsa Wood Come From?** Balsa trees grow naturally in the humid rain forests of Central and South America. Its natural range extends south from Guatemala, through Central America, to the north and west coast of South America as far as Bolivia, however, the small country of Ecuador on the western coast of South America is the primary source of model aircraft grade balsa in the world. Balsa needs a warm climate with plenty of rainfall and good drainage. For that reason, the best stands of balsa usually appear on the high ground between tropical rivers. Ecuador has the ideal geography and climate for growing balsa trees. The scientific name for balsa wood is *Ochroma lagopus*. The word balsa itself

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is Spanish meaning raft, in reference to its excellent flotation qualities. In Ecuador it is known as Boya, meaning buoy.

**How Does Balsa Wood Grow?** There is no such thing as entire forests of balsa trees. They grow singularly or in very small, widely scattered groups in the jungle. For hundreds of years, balsa was actually considered a weed tree. They reproduce by growing hundreds of long seedpods, which eventually open up and, with the help of the wind, scatter thousands of new seeds over a large area of the jungle. Each seed is airborne on its own small wisp of down, similar to the way dandelion seeds spread. The seeds eventually fall to the ground and are covered by the litter of the jungle. There they lay and accumulate until one day there is an opening in the jungle canopy large enough for the sun's rays to strike the jungle floor and start the seeds growing. Wherever there is an opening, made either by a farmer or by another tree dying, balsa will spring up as thick as grass. A farmer is often hard put to keep his food plot clear of balsa. As the new balsa trees grow, the strongest will dominate and the weaker trees will die. By the time they mature, there may be only one or two balsa trees to an acre of jungle.

**How Long Does It Take A Balsa Tree To Grow?** Balsa trees grow very rapidly (like all pesky trees). Six months after germination, the tree is about 1 1/2 inches in diameter and 10 to 12 feet tall! In 6 to 10 years, the tree is ready for cutting, having reached a height of 60 to 90 feet tall and a diameter of 12 to 45 inches. If left to continue growing, the new wood grown on the outside layer becomes very hard and the tree begins to rot in the center. Unharvested, a balsa tree may grow to a diameter of six feet or more, but very little usable lumber can be obtained from a tree of this size. The balsa leaf is similar in shape to a grape leaf, only a lot bigger. When the tree is young, these leaves measure as much as four feet across. They become progressively smaller as the tree grows older, until they are about 8 to 10 inches across. Balsa is one of the few trees in the jungle that has a simple leaf shape. This fact alone makes the balsa tree stand out in the jungle.

**How Are Balsa Trees Harvested?** While nature intended the balsa tree to be a short-lived nursemaid, humans eventually discovered that it was an extremely useful resource. The real start of the balsa business was during WW I, when the allies were in need of a plentiful substitute for cork. The only drawback to using balsa was, and still is, the backbreaking work that is necessary to get it out of the jungle. Because of the way the individual balsa trees are scattered throughout the jungles, it has never been possible to use mass production logging procedures and equipment. The best way to log balsa trees is to go back to the methods of Paul Bunyan - chop them down with an ax, haul them to the nearest river by ox team, tie them together into rafts, and then float the raft of balsa logs down the river to the saw mill. The logging team usually consists of two native Ecuadorians, each armed with a broad Spanish ax, a machete, and a long pole sharpened like a chisel on one end for removing the bark from the downed trees. Because of the hilly terrain, an ox team may only be able to drag two logs to the river per day. At the saw mill, the balsa is first rough cut into large boards, carefully kiln dried, and packed into bales for shipment to the US via ocean freighter.

**Why Is Balsa Wood So Light?** The secret to balsa wood's lightness can only be seen with a microscope. The cells are big and very thinned walled, so that the ratio of solid matter to open space is as small as possible. Most woods have gobs of heavy, plastic-like cement, called lignin, holding the cells together. In balsa, lignin is at a minimum. Only about 40% of the volume of a piece of balsa is solid substance. To give a balsa tree the strength it needs to stand in the jungle, nature pumps each balsa cell full of water until they become rigid - like a car tire full of air. Green balsa wood typically contains five times as much water by weight as it has actual wood substance, compared to most hardwoods that contain very little water in relation to wood substance. Green balsa wood must therefore be carefully kiln dried to remove most of the water before it can be sold. Kiln drying is a tedious two-week process that carefully removes the excess water until the moisture content is only 6%.

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**How Light Is Kiln-Dried Balsa Wood?** Finished balsa wood, often found in model airplane kits, varies widely in weight. Balsa is occasionally found weighing as little as four pounds per cubic foot. On the other hand, you can also find balsa that can weigh 24 pounds or more per cubic foot. However, the general run of commercial balsa for model airplanes will weigh between 6 to 18 pounds per cubic foot. 8 to 12-pound balsa is considered medium or average weight, and is the most plentiful. Six pounds or less is considered "contest grade," which is very rare and sometimes even impossible to obtain.

**Is Balsa The Lightest Wood In The World?** No! Most people are surprised to hear that botanically, balsa wood is only about the third or fourth lightest wood in the world. However, all the woods that are lighter than balsa are terribly weak and unsuitable for any practical use. The very lightest varieties don't really resemble wood at all, as we commonly think of it, but are more like a tree-like vegetable that grows in rings, similar in texture to an onion. It is not until balsa that there is any sign of real strength combined with lightness. In fact, balsa wood is often considered the strongest wood for its weight in the world. Pound for pound it is stronger in some respects than pine, hickory, or even oak.

from RC Propwash
Ocala Flying Model Club
Dick Smith, editor

# PROPELLER SAFETY CONCERNS

*By Fred Burgdorf of Landing Products (makers of APC Props)*
*From R/C Report – October 1994*

All propellers are inherently dangerous. Model airplane propellers are especially dangerous. Model airplane propellers used in high performance racing are extremely dangerous. Model airplane engines designed and modified to achieve maximum operating capabilities create unpredictable and potentially severe loads, leading to various forms of potential propeller failure. Ignoring reasonable safeguards may be catastrophic. This concern is the motivation for the following discussion.

Warnings included with propellers are intended to protect consumers. They also protect manufacturers against claims resulting from misuse of the product. Most products with potential for causing injury contain ample warnings about misuse. Some advertisements for products now contain warnings even before the product is sold! There is a strong proliferation of warnings in most products having potential for creating injury or damage. This inundation of warnings may cause consumers to become inured to product warnings.

The warnings about propeller use must be taken seriously, especially for racing applications. It is very risky to assume that a racing propeller blade will not fail, especially when used with state-of-the-art racing engines. Nevertheless, occasionally model aircraft operators are observed standing in the plane of propeller rotation of high performance racing engines running at full power. This is very frightening. The following information reinforces the assertion that dangers of misuse are very real.

Ideally, a product can be designed with credible knowledge of the environment (loads acting on the product) and capabilities of the product to withstand that environment (not fail). There is nothing ideal about designing a model airplane propeller for stress because some major components of propeller loads are very uncertain. The principal load components acting on a propeller are:

Centrifugal (from circular motion causing a radial load)
Thrust/drag (from lift and drag acting on blade sections)
Torsional acceleration (from engine combustion and/or pre-ignition)
Vibration (from resonant frequencies or forced excitation)

Centrifugal loads are very predictable**,** given the rotational speed and the mass density distribution of blade. Their contribution to total stress is relatively small.

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Thrust/drag loads are somewhat uncertain due to complexities of aerodynamic environments. The relative axial speed of the prop (at any radial station) is aircraft speed plus the amount the air in front of the blade is accelerated by the mechanics creating thrust. The latter may be approximated using first order classical theory. Much empirical lift/drag data (from wind tunnel tests) exists to quantify lift/drag loads, once relative velocity and angle of attack distributions are established. These loads are nominally the major source of stress when torsional and vibration effects are benign.

Torsional acceleration loads are generally not reasonably quantified. Analytical techniques used by Landing Products to estimate torsional acceleration loads suggest that they can become strongly dominant when pre-ignition or detonation occurs. These analytical observations are supported by test experience with very high performance engines running at elevated temperatures. The latter causes a high torsional load (about the engine shaft) that creates high bending stresses, adding to those from centrifugal force and lift/drag effects. These torsional acceleration loads depend on unique conditions for specific engines. Engines "hopped up" for racing appear to be especially prone to create high torsional loads when lean mixtures lead to high cylinder temperatures and pre-ignition/detonation.

Vibration causes additional loads from cyclic motions. These motions occur when resonant frequencies are excited or when cyclic load variations exist on the blade. The magnitude of these variations depends on how close the driving frequency is to the resonant frequency and the level of damping in the propeller material. Engine combustion frequency is an obvious excitation. Obstructions in front of or behind the blade can cause cyclic variations in thrust load. Once a blade starts to flutter, those motions further alter the flow, causing additional variations, in loading. High performance engines have caused propeller tips to break, presumably due to fatigue failure from vibration.

Efficient propeller design practice utilizes analytical/empirical computer models to predict propeller performance and stresses. However, the uncertainty in impressed and inertial loading from complex phenomena requires substantial testing to assure safe performance. Unfortunately, it is not possible to assure testing that convincingly replicates worst case conditions. The large combinations of engines, fuels, temperature, humidity, propeller selection, aircraft performance and pilot practices create an endless variety of conditions. If the origins of severe loads were well understood, quantified, and measurable then structured testing that focuses on a worst-case stack up of adverse conditions might be feasible. However, since the origins of severe loads are really not well understood, it is essential to provide sufficient margins in material properties and design to assure safe performance. Propellers that are used in fairly routine and widespread applications (sport and pattern) lend themselves reasonably well to test procedures that provide reasonable confidence. In time, a sufficient database develops that can be used to empirically quantify performance and "anchor" or "tune" assumptions used in analytical models.

However, propellers that are used for increasingly extreme performance applications do not benefit from the large empirical data base sport and pattern propellers enjoy. Assumptions and design practices developed for current generations of engines may not be valid for emerging engines whose technologies continue to push engine performance to greater extremes. Consequently, propellers that are used in applications where performance is already relatively high (and expanding) must be used with great caution.

In summary, please abide by the safety practices recommended by propeller manufacturers. This is especially important for high performance propellers. Assume that propellers can fail at any time, especially during full power adjustments on the ground.

**NEVER STAND IN, OR EXPOSE OTHERS TO, THE PLANE OF THE PROPELLER ARC.**

ACRC Forum - http://anoka-rc.com/forum

# SERVO CHATTER

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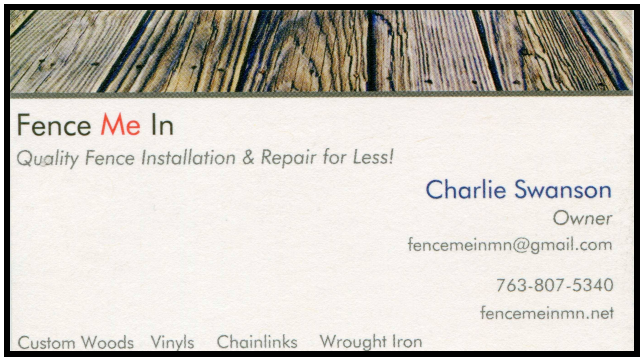



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Quality Fence Installation & Repair for Less!

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Abraham Technical
Aerospace Welding
Cambridge State Bank
T & G Hardwood

## *CALENDAR OF UPCOMING EVENTS*

Thursday – January 18
•ACRC Meeting-Riverwind

Saturday – February 3
TCRC Auction

Thursday – February 15
•ACRC Meeting-Riverwind

Thursday – March 15
•ACRC Meeting-Riverwind

Thursday – April 19
•ACRC Meeting-Riverwind

Saturday – April 21
•ACRC Fun Fly #1

Thursday – May 17
•ACRC Meeting-At field

Saturday – May 19
•ACRC Fun Fly #2

AMA