



ACADEMY OF MODEL AERONAUTICS CHARTERED CLUB #1255

# SERVO CHATTER

A PUBLICATION OF:

ANOKA COUNTY RADIO CONTROL CLUB, INC.

**JULY 2014**

**THE MEETING WILL BE THURSDAY, JULY 17, AT THE FIELD!!**

## PRESIDENT'S CHATTER

What can I say; there will be no Warbird event for the year 2014. What the heck. Mother Nature was a little less than helpful; it is the first event that has been completely canceled. However combat was a little windy with a whopping 4 flyers to fly and some spectators to fill in as the peanut gallery. There were filler air shows provided by Roger and Jeff, both of whom did a good job.

It was informed about a situation at the field regarding AMA cards, club cards and rules. I heard about it and not very happy with what happened. The situation was that non-renewed members were flying high speed passes with people on flight line and not calling it, flying over pits at high rate of speed, and not being cooperative when being asked for AMA or club card, with attitude. I do not like getting a butt chewing over stupid stuff like this. Use your head, pay your dues like everyone else and follow the rules. Or don't come to the field; it's that simple!

Till next month

Andy Thunstrom

## ACRC EVENTS

Hey everyone, I hope you and your families all had a great forth of July this year! I managed to end up floating on the massive Lake Minnetonka, and found myself in the middle of an air show while I was there. Through donations the lake association puts on a small scale air show including, parachutists, multiple warbirds

**Andy Noll Update** - Andy got a call July 3rd telling him that they had found kidney donor match. On the fourth of July he had his transplant surgery and is in the hospital recovering.

performing rolls and low passes over the lake as well as a B-25 which also to my surprise was rolled several times. Following that 2 professional Pitts S-1-11B drivers came in and showed there stuff boasting 195 MPH 310 horse craziness all while 20 feet off the water. It was pretty awesome and if you ever get the chance to spend the afternoon out there it's worth the effort!

Okay back to business here. Come out and enjoy the potluck fly in we are having July 12. Bring whatever you have to fly and something to share with us all! We will see you there! I felt bad that the warbird event didn't go as planned; we tried and the weather just isn't our friend this year. Hopefully the rest of the year will be smoother flying for us all!

Chris Cone

## ACRC TRAINING

Wednesday Night Training continues to be pretty steady. The New Pilot attendance is down by a bit this season in comparison to last season. No new solos that I'm aware of yet this year either. As I mentioned last month, a couple guys are pretty close though.

If you are currently receiving training at ACRC please understand that the ACRC instructors want to solo new pilots as soon as we can. We realize

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training can take some individuals longer than others to complete but that is completely OK. The last thing an ACRC instructor wants to see is a new pilots equipment get damaged and more importantly, the safety of ALL club members and spectators being compromised. To solo, a new pilot is required to demonstrate positive control and safely command his/her model during all phases of flight. This also includes ground handling, run up procedure if applicable, pit safety, club rules and flight line communications.

I apologize in advance to all of the WNT attendees, I will miss 3 weeks in a row during July due to family events and work travel.

Scott Oleson  
(Cell) 952-201-3352  
smo47@live.com

## MEMBERSHIP NEWS

The July meeting is at the field starting at 7:00PM. If you get there early you can get in some flying before the meeting. The board also tries to make the meetings short so that you can fly afterwards. Remember that you should be using your current membership card to mark your channel and guests should be using their AMA card to verify their AMA membership. If you need a new membership card let me know. I can send you a new card – no charge.

### FLOAT FLY

The ACRC float fly, scheduled for July 23, has been postponed due to high water. The land-owner's yard is flooded and he has not been able to install his dock. As soon as a new date has been set the membership will be notified by email. It will probably be held in late August or early September.

### ELECTRIC FLY

The ACRC Electric Fly will be September 6 this year. Flying starts at 8:00 AM.

THE NEXT MEETING WILL BE AT THE FIELD ON JULY 17 AT 7:00 PM.

There will be a Fun-Fly on Saturday July 19.

Stan Zdon

## ACRC SAFETY

The other day I found my wife putting \$5.00 on one of the big jackpot lotto games. I told her that she was wasting her money as she had a better chance of getting struck by lightning. She responded by telling me that the \$5.00 gave her a cheap way to daydream for the next week about what she would do with her winnings. I told her that I had a better deal as I did not spend anything but I get all week to daydream about what I would do with her winnings. And I find the best time to do that is while standing in my garage watching a storm blow through.

But realistically what are the odds of winning the lotto verses being struck by lightning. For that matter, what is lightning and how does it affect the RC pilot. Now I don't know too many pilots who are willing to risk their airplanes to the wild winds and rains associated with a typical thunderstorm. But I have seen several people, myself included, who have been tempted to get one last flight in while the storm is still quite a ways away, especially if it is dead calm. This is not the time to fly RC however. We have all seen the warnings and statistics about lightning safety but I think it helps to understand a little about the science that is behind Lightning and Thunder in order to get a grasp of what makes it dangerous.

At any given moment we are surrounded by an electrical charge with a gradient between  $\frac{1}{4}$  and  $\frac{1}{2}$  million volts from the ground up to the ionosphere or about 100 volts per every vertical meter. Due to the amperage being extremely low, on the order of about  $2 \times 10^{-12}$  amperes/meter<sup>2</sup> and air being a poor electrical conductor, we are kept safe.

During a thunderstorm these values can go much higher. As air currents within the storm cloud move particles of ice, water, and dust around, separating the electrical charges pushes the voltage potential up to 100 million volts within the cloud. This difference in voltage becomes great enough to cause ionization within the atmosphere. An initial spark starts as electrons begin jumping across ionized air molecules in what is called a stepped leader. The tip of this leader can reach

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over 10 millions volts and is attracted downward toward the opposite charge of the ground.

Each step or jump in the leader can be between 30 to 150 feet in length with a cumulative length of up to 5 miles or more, the final jump being toward anything on the ground that creates a positively charged streamer. Once the stepped leader attaches with the charged streamer a "short circuit" is created as a return stroke or flash channel in a massive electrical discharge. This discharge of energy is the way in which the earth balances the electrical charges in what we see as lightning.

Just as there are many unattached leaders that appear like branches of a tree coming off the main strike, there can be unattached streamers reaching up from the ground that do not connect to the bolt of lightning demonstrating that the ground has a large potential of energy to dissipate. Although the point of contact of the lightning strike receives a huge electrical current at around 30 kilo-amperes, the voltage differences along the surface of the ground radiate outward from the point of contact. These voltage differences are called Step Potentials and are as dangerous as being struck directly by lightning.

Electrical energy on the ground may vary greatly, on the order of several thousand volts per foot radiating out from the point of contact, as the surface charge races towards the flash channel during the discharge. As the ground has a high degree of impedance, the current will follow the path of least resistance which may be through the legs of someone standing near the point where the lightning strikes.

One way to picture this is to think of the ground as giant bank of car batteries that are placed end to end away from a central common point. The batteries would be connected in series in a direction away from the central point, and as such the voltage would increase the farther away that you go from that central point. Checking the voltage from point to point traveling outward from the central point you would also see a jump in voltage. However, two batteries that are the same

distance from the center but on two separate strings would be effectively wired in parallel and would show a potential voltage difference of zero. If you then stand on this giant bank of batteries you might be safe if you are standing on two batteries that are the same distance from the center. Those two batteries would essentially be wired parallel with each other and would have a voltage difference of zero. Stand on two batteries in series, or at a right angle to the central point, and your legs will then close the circuit and you would feel the voltage difference. This is what the ground would act like if you were near an object such as a tree when the lightning strikes it.

When the lightning strikes the ground near where you are standing the voltage in the ground would be much greater than in the battery bank described above. You, standing on that ground, would be a far greater conductor of electricity compared to dirt or gravel, especially with electricity of such high voltage and amperage that is associated with a lightning strike. This is assuming that you are not in fact directly struck by the lightning bolt its self.

An open shelter will not offer adequate protection from lightning, and in fact may attract lightning. Lightning striking a building like this is dangerous because the unimproved surface below will still leave the person open to an electrical discharge and, unlike a house, which has plumbing and electrical wiring to dissipate the charge, offers little protection. But this may be better than standing under a tree or even out in the open holding a transmitter with a long metal lightning rod shaped antenna. If caught outdoors during a lightning storm the better choice for protection would be to get into a vehicle with a metal roof, as the body of a car will provide better protection for you than being exposed outdoors or under a lightning attractor.

But does this answer the question of whether or not it is easier to win the lotto or get struck by lightning. Recent statistics have shown that injuries and fatalities have been on a steady decline over the past few years with an average of 51 people killed by lightning per year for the last

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30 years. There were however, as few as 23 people killed by lightning in the last year. This decline may be due to better lightning education, advanced warnings, and shelter protection. The largest number of incidents occurred during outdoor activities such as fishing, camping, and golfing. Statistics say that your chance of being hit by lightning in the U.S. is about 1 in 1,000,000. This makes sense if there are about 300 injuries caused by lightning per year and there are 300 million people in the U.S. This drops significantly to 1/10,000,000 if you only include fatalities

On the other hand, winning the lottery seems much easier. If you only count people who have won jackpots of one million or more, every year, according to one source, there are about 1600 who win every year, or about 4 per day, a lot more than the three or so per month for lightning strikes. But these numbers are skewed considering that purchasing a one dollar ticket in a "pick 6" (1-48) where the odds of winning are 1 in 12,271,512 or 1 in 48!/(6!/42!). Buying more tickets would increase your odds of winning just like holding more lighting rods would increase your chance of being hit. To be a comparable comparison, if every person were to be able to buy only one lottery ticket each year would result in 25 people winning the lottery each year. This turns out to be about the same number as people killed last year by lightning

So, it turns out that you do have a better chance of getting hit by lightning, and that is something that I would bet my wife's money on.

Brett Ohnstad

## ACRC CRASH OF THE MONTH TROPHY

There are two contenders for this month's **Crash of the Month** trophy. Virgil Okeson and Roger Jeffrey both had planes that had a physical engagement with the ground.



*Virgil's Plane*



*Roger's Plane*

## June Fun Fly Results

1st Event – 5 touch and goes with the shortest time wins. No disqualifications, must touch runway. First place was Paul Rono with a time of 57.68 seconds.

2nd Event – As many loops as you can do in 15 seconds. Only completed loops count. Mark Tellevik won with his electric cub with 8 loops, next closest was 6 loops so this one wasn't even close!

3rd Event – Takeoff, three horizontal figure 8s and land, fastest time wins. Jeff Flander won with a time of 25.56 seconds

*Fun Fly results compiled by Marc Davis*

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



**June Fun Fly Results**

Name	1st Evnt	2nd Evnt	3rd Evnt	Ttl	Plce	Pnts
Jeff Flander	2	2	1	5	1	25
Paul Rono	1	4	4	9	2	24
Dan Thiede	4	3	2	9	2	24
Stan Zdon	5	5	3	13	3	23
Chris Cone	6	3	6	15	4	22
Kris Westerbur	7	4	5	16	5	21
Phil Vaughn	3	4	11	18	6	20
Mark Tellevik	9	1	9	19	7	19
Andy Noll	8	4	7	19	7	19
Virgil Okeson	11	4	8	23	8	18
Dale Anderson	10	4	10	24	9	17

**Current Standings - 2014:**

Name	Apr	May	Jun	Ttl	Plce
Paul Rono	25	22	24	71	1
Jeff Flander	23	20	25	68	2
Andy Noll	24	23	19	66	3
Kris Westerbur	20	25	21	66	3
Chris Cone	18	24	22	64	4
Stan Zdon	24	15	23	62	5
Mark Tellevik	21	17	19	57	6
Dale Anderson	18	16	17	51	7
Andy Thunstrom	22	21	0	43	8
Roger Jeffery	19	19	0	38	9
Phil Vaughn	0	18	20	38	9
Scott Oleson	24	0	0	24	10
Dan Thiede	0	0	24	24	10
Virgil Okeson	0	0	18	18	11

**DO WE NEED A NEW RULE??**

Some of the members are continually griping when they are at the field or at the meeting and most members realize the atmosphere would improve if that griping would stop. Because of this I am issuing a NPR (Notice of Proposed Rulemaking) that would address the problem that some members have with PMS (Piss and Moan Syndrome). NPR-001, proposing a rule designated the NGR (No Gripping Rule), would address the problem that some members have with PMS. The NGR would have two main sections. The first section would specify how many gripes were allowed per day at the field or at a meeting. Since the flying field visit is supposed to be an enjoyable time for all members, the gripe limit would be set at one (1). At the meeting gripes would be limited to two (2) unless the topic is brought up in the business part of the meeting. The limit during the business portion of the meeting will be four (4). If you have more than four gripes, they will have to be saved for the next meeting. All club members will be responsible for enforcing this rule by giving gentle reminders to those who continually suffer from PMS. The second section of the rule would include a CGA (Continual Gripping Assessment) of \$5.00. If a member continues to gripe after being reminded that he or she is breaking the NGR because of their PMS, the CGA will be added to their following years dues. Hopefully this will be enough incentive to get some individuals to change their behavior or get treated for their PMS. On the other hand, if they continue to violate the NGR, ACRC may not need a dues increase in the foreseeable future. *Editor's Note - If you were offended by this attempt at humor you need to buy a new plane or radio to calm yourself down.*

CLOSE TO HOME

BY JOHN MCPHERSON



## ACRC MINUTES

**Members:** 18

**President:** Opened meeting and reported that Stan's computer died so we think we are at about 105 members.

**Vice President:** Presented raffle prizes.

**Safety:** Please make sure that you have your AMA number in your plane. AMA has a sticker that you can buy and write your information on it. 10 stickers can be purchased for \$2.89 from the AMA at:

<http://www.modelaircraft.org/shopama/product.aspx?id=085231B9FD2F4B75972075D290D200CC>

**Training:** Weather has been good so there has been lots of good flying. We have one member close to soloing. To date we have had only had one training related issue (crash) which is great. (Secretary note: Thanks to Scott for getting the club trainers up and going.) Scott thanked everyone that pitched in for their help. There was also lots of great help at the fly-in; we had 2 nitro planes and electric plane in the air most of the time.

The Civil Air Patrol day was a big success and we might do it again with a different chapter. Chris Cone also mentioned that he has a Boy Scout troop that might also be interested in coming out to get a change to fly on a trainer.

**Events:** The War Bird was postponed due to bad weather and was moved to the June 28 at 10:00 AM (canceled due to weather). There is a fun fly this weekend. Combat will be on Friday night the June 27<sup>th</sup> at 6PM. July 12 is the potluck fly in. There is a place to sign-up for what you are bringing on the ACRC forums to so we have an idea we will have. Amy Thiede is bringing strawberry shortcake so we have desert covered. You can sign up here:

[http://anoka-rc.com/forum/discussion/294/july-12-2014-potluck-sign-up#Item\\_3](http://anoka-rc.com/forum/discussion/294/july-12-2014-potluck-sign-up#Item_3)

### Old Business:

The starting stands have been moved to a new location. Please do not move them to the old location. This is to help with the updated club rule that dealing with run-ups behind the flyers. In addition the starting stands need a little refresh if you would like to do that, please contact Andy Thunstrom.

### Show and Tell:

**Stan Zdon:** Fokker tri-plane with graphics from Cali-Graphics. Balsa USA DRI triplane ¼ scale. OS 155 Surpass engine. Not a WWI vintage color scheme but from the movie "The Great Waldo Pepper". Go to YouTube and search for waldo pepper dog fight. Covered with Solartex.

*See last page for picture of plane being modeled.*

### Raffle:

Servo Crimper	Virgil Okeson
Heat Gun	Scott Oleson
Electric Full Pump	Tom Janos
Sealing Iron	Tom Janos
Power meter	John Jensen
Fuel	Bruce Martin

Marc Davis

## PROPELLER SAFETY CONCERNS

*By Fred Burgdorf of Landing Products (makers of APC Props)*

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.

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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.

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

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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 data base 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.**

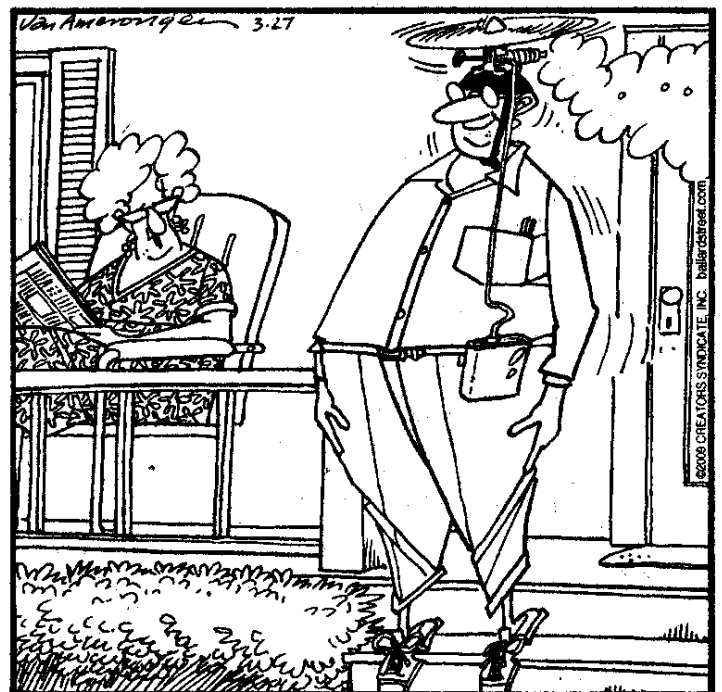
## PILOT QUIZ

1. T or F An airplane is climbing at 200 feet per minute flying directly into the wind. With the same power and trim settings it would also be climbing at 200 feet per minute directly downwind.
2. T or F Assuming the same power and trim settings, an airplane has a higher angle of climb, as measured with the ground, flying into the wind compared to flying downwind.
3. T or F The wing on a nose heavy airplane has to generate more lift for level flight than if the plane was properly balanced, even if the weight of the plane is the same in both instances.

4. T or F Assuming level flight and a constant bank angle, a plane flying at 120 mph will take twice as long to make a turn as a plane flying at 60 mph.
5. T or F If a plane has a groundspeed of 50 mph into the wind and a groundspeed of 100 mph with the same wind, its airspeed is 75 mph.
6. T or F If you fly your 75 mph Cub 100 miles into a 25 mph wind and then return the 100 miles in the same wind, your average speed will be less than 75 mph.
7. T or F If you fly with a 90 degree crosswind your average speed will be less than if there is no wind.
8. T or F If you were flying above a smooth cloud layer and there were no gusts or turbulence, you would not be able tell the difference between an upwind turn and a downwind turn.
9. T or F The prop that gives the most thrust as measured with a scale will usually not produce the highest airspeed.
10. T or F Once the wheels have left the ground, a steady crosswind will not lift a wing or flip a plane over.

*All questions are TRUE*

### BALLARD STREET JERRY VAN AMERONGEN

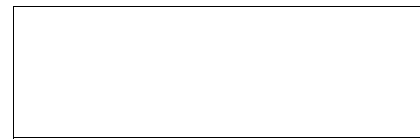
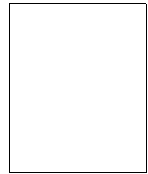


"Don't get grass stains on your pants!"



# SERVO CHATTER

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

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*Brett Ohnstad*

*Scott Oleson*

*Andy Thunstrom*

*Stan Zdon*

### ACRC SPONSORS

King Kong Hobbies  
Abraham Technical  
Aerospace Welding  
Cambridge State Bank  
T & G Hardwood

*Deadline for the  
next newsletter is:  
August 1, 2014*

## CALENDAR OF UPCOMING EVENTS

Saturday – July 12

- ACRC Pot Luck Fly

Thursday – July 17

- ACRC Meeting

Saturday – July 19

- ACRC Fun Fly #3

Wednesday – July 23

- ACRC Floatfly-Postponed

