

M.A.R.C.S. SPARKS

Monthly Newsletter of the Madison Area Radio Control Society
Madison, Wisconsin AMA Charter #665

Volume 44 - February 2005 - Issue 2

Come Fly With Us

MARCS meetings are held on the first Thursday of every month at 7:00 P.M. in Room 201B of the Madison Labor Temple, 1602 S. Park St. in Madison. Visitors are always welcome. We think we have a great hobby and we invite you to come and see and consider joining us.

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Contribution of articles for publication is encouraged.

Deadline for publication is the 20th of the month.

Minutes of MARCS General Membership Meeting, Jan. 6, 2005

by Patricia McDonald, Secretary

The meeting was called to order at 7:08 by President Tom Lazar, there were 30 people present. Andrew Morrow's minutes of the December meeting as printed in the January issue of SPARKS were accepted as published.

Treasurer's Report: Year-end financial statements were available for review. Ed reported there appeared to be some confusion about the dues for 2005. Dues for members with an email address are \$50.00 (\$5 discount if paid before January 1). Dues for members who receive a print copy of SPARKS are \$55.00 (\$5 discount if paid before January 1). Some members have sent in \$45.00, but did not send an email address; they will not receive a copy of SPARKS in either form.

Guests, visitors new members: None

New Business: Tom Lazar reported that the business portion of future meetings will be limited to 15 minutes. The remaining portion of meetings will feature talks or programs about airplanes and or aviation. Anyone wishing to discuss club business should appear at the Board of Directors meeting where the business of the club is taken care of by the elected officers. More talk about airplanes should make meetings more exciting. A show of hands indicated the members present would like meetings to be formatted this manner. Bring new projects and any type of widget you have found that helps the sport for show and tell. Program will be Tom's focus this year.

There is a big Swap Meet in Waukesha on 1-9-2005.

There is a volunteer to run War Birds over Dane. Members wishing to help out with the event should contact Tom.

Anyone wishing to run a new event and Event Directors need to contact Tom to line up schedules with AMA. Also, anyone wanting to present a program at the meetings should contact Tom.

Don Weigt will direct the Scale Rally on August 20, 2005

Fred Bast told the story of a plane he rebuilt

from Ed McDonald's crashed AeroStar remains from last summer. With the help of Charlie Schultz, Jim Biersach he found an ARF fuselage, rebuilt the wings and Harold Blossom painted them. He presented the plane to Pat McDonald under the condition Pat would not let Ed fly her plane again, and she should call Fred for flight instruction.

Raffle winners were Wendell Hottman - Brushless motor; Bob Hinrichs - House of Balsa Super Decathlon.

Show and Tell: Dustin Buescher a portion of the 80 inch wing from his F-86 Sabre Jet (Bob Violett Models) which he will be using in the Jet World Masters Competition.

Wendell Hottman 46" wing span 1/7th scale Fokker D-VIII Electric Scale.

Dan Sutter a twin electric A-26 Wing Manufacturing Short Kit.

Tom Lazar ¼ Scale plans by Gary Allen for a Fokker D-VII that he is building. Will use Quadra 42. Also a Herr Engineering Kit Fokker D-VII converted from rubber to electric. Tom also displayed some See-Temp Material.

Philosophy 101

I often feel like the director of a cemetery. I have a lot of people under me, but nobody listens.

General John Gavin

All Good Things Must End

I know this comes as bad news, but for last year's winners of the **Smoking Hole, Submarine Commander** and **Paul Bunyon Tree Chopper Trophies**, it's time to give up the fame and notariety that comes with those prestigious and much sought after icons. Please either bring your torphy to the February meeting or make arrangements to get it to **Dave Rush** by the date of that meeting. It's time to get some other poor fish's name engraved on it. Where the Scooter Nice Guy Award is concerned, Dave has that problem cornered, having won it last year himself.

If you need to make other arrangements for delivery or pick up, **call Dave at 838-9704**. Thanks.

Banquet & Name the Plane Contest

I have decided to upgrade the contest prize Chateau du Buss wine from Concord Bridge 2001 to Sweet Red Razzleberry, also a 2001 vintage. Last year's winner was very complimentary on it and, considering

that it takes 20 pounds of raspberries that sell for \$4 a pint at the Farmer's Market to make five gallons, it's not exactly Ripple.

Below is another view of the contest plane. To win, be the first to correctly ID this bird. E mail your answer to me at jbuss@itis.com or phone me at 244-8534 and then **be at the MARCS Awards Banquet on February 20 at the Dry Bean Saloon**. See the next to last page of this bulletin for the sign up sheet. Please get your reservation to Dave Rush by February 10. Dave reports that he only has seven reservations as of January 20. I'm sure a lot more of you are coming, but it puts Dave in an ulcer mode to have his commitment made to the Dry Bean and then have to bite his nails over whether anyone is coming. Please get your reservations made ASAP. Dave will appreciate it. Just because the deadline is February 10 doesn't mean that they can't be made earlier



Correction

In reviewing the need for a volunteer to replace Chris Spierings as the organizer of Warbirds Over Dane, I gave the impression that he organized it from the beginning. Chris points out the following:

Y Mike Pirkl and Mike Piechowski ran the first Warbirds Over Dane. Craig Lovell, Mike Pirkl, Mike Piechowski and Chris Spierings ran the second. Mike Pirkl ran the third. Dave Jeardeau and Chris Spierings ran the last one.

Destroyed Gate Locks

Please don't abuse the combination locks on the gate. During the past year two locks costing \$25 each were destroyed by someone who took out frustrations on them, apparently by pounding on the combination dials.

The dials cannot be rotated upward past zero. If you pass the intended number, you must back the dial down to the intended number. You cannot rotate up, all the way around past zero. These locks are much too expensive to be the objects of "lock rage." Remember,

MARCS Calendar of Events

<u>Event</u>	<u>Date</u>	<u>Location</u>
Field Work Day	April 23	Kettle Field
IMAA Big Bird Fly In	June 11	Kettle Field
Ken Kindschi Scale Rally	August 20	Kettle Field

War Birds Over Dane, Soaring, Electric and Boy Scouts events will happen, but are pending scheduling.

your dues are paying for them.

Volunteers

Mark Finley has volunteered to be the Adopt a Highway guru again this year

John Granberg will organize War Birds Over Dane.

Thanks guys.

The Bent Bird

Radios in the "Good Old Days" Then and Now, Part 3

By Don Weigt

By the mid 1960s, most radio control equipment used "superhet" (super heterodyne) receivers for good selectivity, and transistorized transmitters and receivers. The flying weight and number of batteries had been reduced some. It was a good time to be a model airplane builder and flier! Back then, to be a flier you had to be a builder: there were no ARFs and foamies, and no iron on covering. You built it, you covered it, you painted it, you installed the engine and radio, you flew it (you hoped!), you broke it, you fixed it!

It was about 1966 that I first had a radio controlled plane survive 25 flights (with repairs.) All my previous planes had been wrecked and discarded with fewer total flights. And, the flights were only about 10 minutes long! So, I spent several weeks building, or longer, for every four hours of flying. That's quite a change from today!

Reed radios were still top of the line, but expensive and heavy. The radio gear in a 10 channel reed plane weighed over a pound. The planes had to be quite large, with rather large engines, to carry it and have decent performance. A .35 engine was about the minimum for a 10 channel reed plane. Flying with reeds took a lot of skill and hard to come by practice. Reed radios had another disadvantage. Each receiver needed its own transmitter, because the reed banks were slightly different. Each transmitter had to be tuned to the tones the reeds in the receiver needed. No flight packs: one

receiver, one transmitter!

Single channel planes were typically smaller and used smaller engines. Just as today, that meant they cost less to build and operate, and were easier to transport and store. One single channel transmitter could be used with many planes, since the receivers weren't particular about the tones sent. That was another big advantage, for both cost and convenience.

Single channel planes could be lots smaller and lighter, even using .049s or even .020s for power. See the early designs by Ken Willard for examples. But, with no throttles and short engine runs from their small tanks, these weren't as capable as the reed planes. Like reeds, single channel planes with escapements had only neutral and full control, but more limited because there weren't a lot of turns to spare for repeated short pulses of control to approximate proportional control. One single channel transmitter could be used with several planes. Unlike reed receivers, single channel receivers weren't fussy about the tone that operated them.

Some of the more inspired or desperate modelers began to search for ways to get more and better control from the less expensive single channel radios. The goal was control nearly as good as with a reed radio, with less cost and expense, and perhaps with proportional control with a lever or stick.

Compound escapements gave right turns on the first button press, so it was easier to fly planes that turned a little to the left with no control, and just give them the occasional "blip" of right rudder. Some of the earliest radios could only move the control one way! They simply connected the receiver relay to the rudder. A received signal made the relay pull in, and that deflected the rudder.

Perhaps as a logical extension of that, "pulse rudder" was developed. A lever or single axis stick, operated by the pilot, caused the tone to be pulsed about once a second. When the control was centered, the tone was on about as long as it was off. There were two types of "actuators" used to operate the rudder.

On smaller planes, the rudders usually were operated by "pulse actuators", often made by the Adams company. These weighed about half an ounce: as much as two Hitec HS-55s, but were a lot less powerful. They had one or two disks of permanent magnetic material mounted on a wire in a bearing, like the head of a nail or an engine valve. A magnet coil alongside the permanent magnet(s) had its pole pieces extended around the back of the permanent magnet disk(s). The disks were magnetized across their faces.

The magnet coil had a third connection at about the middle of its winding, called a center tap. This made it possible to use the coil as two electro-magnets of opposite polarities. The center tap was connected to one end of a battery. The receiver relay or a pair of switching transistors controlled by the receiver would connect the other end of the battery to one coil end when there was no tone (signal), and to the other end when there was a tone.

When the control was at neutral, the rudder would flap back and forth, full right and full left, as often as the tone was pulsed, which we've said was about once a second, spending about equal times in the two positions. You always knew the radio was working before you launched, as you would see the rudder wagging away! If the control stick or lever was pushed to the right, the farther the control was moved, the greater the time the rudder spent at the right stop, and the shorter the time it spent at the left. At full right control, the rudder might stay hard right, or briefly move away from the stop before returning to it. Moving the control to the left made the rudder spend more time at the left stop than at the right, until at full left control, it stayed at the left stop most or all of the time.

If the rudder worked backward, you switched the wires you had soldered to the two coil end terminals to reverse the actuator action.

This seems weird and crude! But, planes do not respond in an instant. So, they responded to the average control positions, and the control worked quite well! It was even proportional, which reed radios couldn't be. But, it was pretty much limited to controlling just the rudder.

Because the actuators were powered the whole time the planes were flying, they did use more power than escapements. But, this wasn't a big problem once nicad batteries came into use, which also happened in the mid 1960s. You could see the tails of the planes fishtailing back and forth with the rudder pulses. But,

the flight of the planes was quite smooth.

Magnetic actuators were mostly limited to .049 and .020 powered planes, though some folks managed to fly them in .010 powered models, and a few planes up to about .15 engine sizes. Bigger planes used motors, geared down to turn output cranks that were spring loaded to center.

The "Mighty Midget" motors, which I think were imported from England, were often used for rudder control in bigger planes. Usually a 4 cell battery pack was used for motor power, with one motor brush wired to the center tap of the battery, and relay contacts used to connect the other motor brush to one or the other end of the battery. The pulsed radio signal made the motor drive clockwise and counterclockwise as the tone was switched on and off. As it moved away from neutral, it would stretch the centering spring. As the control lever or stick was moved away from center, the motor would stretch the spring more in that direction, and the output gear's back and forth motion would shift toward one side or the other. A torque rod linkage to the rudder would make it wiggle along with the output gear, and if the gear motion shifted toward one side or the other, so did the rudder. The result was the same as with magnetic actuators. The planes' tails wiggled a bit, but they flew the same as they would with a modern servo on their rudders.

There were two extensions of the motorize pulse rudder actuator. One added throttle control, the other added elevator control. Adding throttle may not have had a name, but getting pulse proportional control of rudder and elevator with one motor did. It was called "Gallop Ghost"!

Throttle was easy to add to motorized pulse rudder setups. The motorized actuators didn't have stops like magnetic actuators. They relied on the tension of the centering springs to give the actuator a neutral reference. As long as the motors weren't driven either direction too long before reversing, their output gears would oscillate back and forth without ever going over the top and completing a full revolution.

But, someone realized it might be useful to intentionally run the motor in one direction long enough that the output gear did make one or more revolutions. By adding a worm gear or using a bolt and nut on the end of the gear shaft, running the motor one or more revolutions could be made to move a throttle linkage. Maybe right rudder for several seconds would increase the power and left would decrease it.

Rudder control would be interrupted, but the effect would be close to neutral rudder. By adding a pair of buttons to the transmitter, the pulsing could be interrupted to make the motor run a few turns one way or the other and change the throttle! Wow! Extra control, nearly free! No separate motor or escapement: just an added linkage on the existing motor.

Galloping Ghost varied the pulse rate to get elevator control from the motorized actuator that was controlling the rudder. Picture the output gear facing you, spring loaded so neutral is with the output crank at bottom and centered. The centering spring is pulling it straight down. The gear moves left and right as the motor pulses, and so does the rudder. Moving the control left or right moves the center of the gear's motion that way, along with the rudder. The gear is still moving back and forth about once a second.

To add elevator control, the number of pulses per minute was varied. Neutral rudder was still tone on half the time, and tone off half the time. The output gear's motion stayed centered. But, if the pulses were fast, the gear only drove a short distance either side of center. A second linkage to the output crank, picking off the vertical motion, would stay low. This was down elevator.

At medium pulse speeds, the gear would move farther back and forth, and the output crank would be higher at each end of its motion. The average vertical position would be higher. This was around neutral elevator. Note that a small amount of rudder control would raise the elevator position at one end of the gear's motion, and lower it about the same amount at the other end of motion, and so rudder didn't interact much with elevator.

At the lowest pulse speeds, the gear moved quite far back and forth, at least 180 degrees, maybe even more. That raised the crank quite a distance above its position at the center, and this gave full up elevator. Up elevator was where the pulsing was most obvious, because both rudder and elevator moved farther and stayed at extreme positions longer. Very much rudder along with up elevator might accidentally cause the output to go over the top, and change the throttle, too. But, it did work!

Some rudder was always available along with elevator, so it was truly proportional control of two axis with one motor. It gave independent control of throttle, too, though not without interrupting rudder and elevator control. Also, while rudder was approximately centered

during throttle control, elevator was approximately full up! This was a very noticeable and unpleasant side effect of the "free" throttle control.

Running a motor continuously, changing its direction over and over, with mechanical relay contacts switching the power, was a crude way to control an airplane. The batteries ran down fast. The motors ran hot, and their brushes had short lives. The relay contacts could (and mine did!) get hot enough to stick for a few pulses, causing loss of control for several seconds and unwanted throttle changes.

There was a brief time in the mid 1960s when Galloping Ghost seemed like a good idea. RCM had very positive reviews of it. But, it was quickly passed over when the first proportional radios were offered for sale. With real servos that didn't pulse back and forth, making the airplanes hunt and wasting battery power, with truly independent controls that didn't interact, with more reliability and longer life, and able to control more functions, they were clearly superior. They cost and weighed more, but that could be improved with new designs, new technology, and higher production volumes.

The days of radio control tinkering was about over. The modern era of superb radio control equipment was about to begin.

Next month: proportional radio control, analog and digital. And, possibly, an attempt to explain single and dual conversion receivers: what the difference is, and the advantages of dual conversion, and what things dual conversion doesn't improve.

Collishaw

After having his goggles shot off for a second time and being hospitalized for frost bite to his face Ray Collishaw returned to the front April 26, now posted to Naval 10 equipped with the new Sopwith Triplane. The "Tripe" was even more agile than the Pup. With three wings it had an incredible rate of climb, better visibility above and a small turning radius. It was slower than the Albatros DIII but in WW I aircraft agility counted for a lot. Its major drawback was the single machine gun, as the Albatroses had two forward firing guns. Even so, the Germans had a nasty surprise with the appearance of the Triplane. Collishaw downed a plane with it in his first day in combat. In the next few weeks he downed four more aircraft. Then Naval 10 was moved to Droglandt, near Belgium.



Raymond Collishaw

Preparations for the Messines Offensive¹ were underway and the RFC needed assistance in providing protection for reconnaissance and bombing flights. Collishaw and Naval 10 were facing the cream of the German Army Air Service and would be in the thickest air combat facing Baron von Richthofen's Flying Circus. Collishaw commanded "B" flight comprised solely of five Canadians. The fighters in Naval 10 had painted the cowlings of their Triplanes to identify the various flights in the air. Collishaw's flight had black noses, so, in an effort to boost morale and solidarity they painted the rest of their Triplanes black and added suitable names to each. Collishaw flew "Black Maria", Ellis Reid flew "Black Roger", John Sharman was in "Black Death" and Mel Alexander flew "Black Prince". Thus they became Naval 10s "Black Flight". Within weeks they were the terror of the German Army Air Service.

June 6 was their grandest day. They were flying offensive patrols with 10 Triplanes. Collishaw was leading a patrol when they came across an Albatros 2-seater escorted by a mix of 15 Albatros, Aviatik and Halberstadt fighters. In the "fur ball" that ensued Collishaw dropped three Albatroses, Nash downed an Aviatik two-seater and an Albatros, Reid downed a Halberstadt scout, Sharman and Alexander each downed an Albatros. In total the RNAS shot down 10 German aircraft without any losses.

Two days later Collishaw was shot down. He

¹ The Messines Offensive was the one in which the British relied on Welsh coal miners to tunnel under the German lines. A massive explosive charge was then set off in the tunnel that obliterated a large segment of the enemy's trenches.

had been in a tight circling fight with an Albatros and was about to fire on it when German bullets from an aircraft behind him smashed into his cockpit. His aircraft fell out of control in a dizzying series of spins, cartwheels, swoops and dives from 16,000 feet. Just before he hit the ground the Triplane pulled nose up and slammed belly down into the ground. English Tommies pulled him from the wreck, dazed but unhurt. In early July Collishaw was promoted to acting Flight Commander. For his combats in June, 1917 he was awarded the Distinguished Service Cross. The citation reads:

COLLISHAW, Flight Lieutenant Raymond - Distinguished Service Cross - awarded as per London Gazette dated 24 July 1917:

In recognition of his services on various occasions, especially the following:

On June 1st, 1917, this officer shot down an Albatross scout in flames.

On June 3rd, 1917, he shot down an Albatross scout in flames.

On 5th June, 1917, he shot down a two-seater Albatross in flames.

On the 6th June, 1917, he shot down two Albatross scouts in flames and killed the pilot in a third machine.

He has displayed great gallantry and skill in all his combats.

On July 2nd, Collishaw was involved in the air battle that nearly killed Baron von Richthofen. Six FE2bs had been set upon by 30 Albatroses, some from Richthofen's Jasta 11. One FE2b gunner grazed Richthofen's skull with a bullet. The German "Ace of Aces" was lucky to come to before he crashed and managed to land his aircraft. The wound put him out of action for a month. In fine style Collishaw shot down 6 Albatros scouts in this fight, Alexander got two and Reid one. Collishaw was awarded the Distinguished Service Order, the 2nd highest award for bravery in combat, for his day's work.

In July, he was again shot down. This time, a powerful burst of bullets from a German aircraft broke the wires keeping the two sides of the metal cowlings on the aircraft. One side piece flipped off and jammed into his wing struts causing an immediate and rapid, spin. His Triplane began tumbling end-over-end and with the added stress his seat belt snapped and he flew out into space. Frantically, Collishaw grabbed a centre-section strut and hung on for dear life. His arms were being slowly pulled out of their sockets and his hands were losing their grip as he was flung about by the wildly

gyrating aircraft. In one of its swoops he was thrown part ways back into the cockpit. With strength borne of desperation he hooked a boot around the control column and pushed it forward enough that he could get further into the cockpit. By now he could pick out individual trees. With an immense effort he levered himself into the cockpit with his foot and pulled back on the stick. The airplane levelled out somewhat before slamming into the ground and was destroyed, but he walked away unhurt. The next day the RNAS sent him back into the fray; the need for experienced pilots was great and there was no recognition of battle fatigue.

Near the end of July the "Black Flight" ran into Richthofen's "Flying Circus" with Nash being shot down by Richthofen's second in command, Karl Allmenroeder. It was his 30th kill.. Collishaw had noticed Allmenroeder's green and red plane but hadn't realized that he had shot down Nash. The next day the two flights met again but at long range. Collishaw fired at Allmenroeder mostly as a matter of challenge, not really expecting to hit him because of the very long range, however he killed Allmenroeder with the buirst.



Karl Allmenroeder, note the "Blue Max."

Ray ended his period with Naval 10 at the end of July, 1917. He downed 27 German aircraft during his command of the Black Flight of Naval 10. All-together the Black Flight was responsible for the downing of 87 German airplanes with only two losses (Nash and Sharman). He was granted a three-month leave in Canada to recuperate from combat stress. In August he was awarded the second highest award for gallantry in action, the Distinguished Service Order:

COLLISHAW, Flight Lieutenant Raymond - Distinguished Service Order - awarded as per

London Gazette dated 11 August 1917.

For conspicuous bravery and skill in consistently leading attacks against hostile aircraft. Since the 10th June, 1917, Flight Lieutenant Collishaw has himself brought down four machines completely out of control and driven down two others with their planes shot away. Whilst on an offensive patrol on the morning of the 15th June, 1917, he forced down a hostile scout in a nose dive. Later, on the same day, he drove down one hostile two-seater machine completely out of control. On the 24th June, 1917, he engaged four enemy scouts, driving one down in a spin and another with two of its planes shot away; the latter machine was seen to crash.

Continued next month

The AEROMART

- ÿ DB Sport and Scale Hawker Hurricane MK1 kit, built up fuse, wing center section, and tail. Foam outer panels, 88" span. Includes cowl, canopy, spinner. Needs 30-45 cc gas or glow. **\$375**
- ÿ Balsa USA 1/4 SE-5A kit, 80" span 18-20 pounds, **\$240**
- ÿ Midwest Messerschmitt 109, 54" Span approx 5#. Pix at <http://www.spieringswi.com/109E.JPEG>. Has .46 Thundertiger Pro with Macs muffler, Futaba radio with s3001 servos, Hitec battery.. **\$175**, sans engine and radio gear, **\$100**.

Chris Spierings

spieringswi@msn.com

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Don Manthey

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New Year's Day Fly In - a Cold and Snowless Day With Tom's Chile and Other Stuff
By Otto Oie



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**MARCS Awards Banquet Reservations and Award Nominations
Sunday, February 20, 2005, 5:00pm at the Dry Bean Saloon**

Name _____

Number of Persons Attending _____ x \$22 = \$ _____, enclosed

Please make your check payable to MARCS and mail to:

Please mail on or before February 10, 2005

You may also pay Dave at the February meeting

Dave Rush

5113 Ridge Rd.

McFarland, WI 53558

Nominations

Smoking Hole _____

Submarine Captain _____

Paul Bunyon (Tree Chopper) _____

Scooter (Nice Guy of the Year) _____

Briefly, why:

Nominations for Awards for Service to MARCS and/or RC Flying, give a brief reason for each nomination. Use an additional sheet of paper, if needed::

M.A.R.C.S.
1918 Gulseth St.
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