

M.A.R.C.S. SPARKS

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

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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 is encouraged. Deadline for submittal is the 20th of the month

Minutes of MARCS General Membership Meeting, May 2, 2002

by Burr Fontaine, Secretary

The meeting was called to order by Vice President Don Weigt at 7:10 p.m. with 55 in attendance. President Lanphear was out of town.

Visitors: John MacKenzie, a neighbor of Chris Spierings, was visiting tonight. John denies any current involvement with the hobby, but according to Chris, "John will be a future victim."

New Members: Nicholas Burgette became a new member tonight. Nicholas goes to Gompers School and is looking forward to flying lessons with his Extra Easy ARF.

Vince Streif was also a new member tonight. Vince describes his level as "flying electrics badly," and says he's thankful those Zagis are so tough.

April Minutes: The minutes of the April meeting as printed in the May issue of SPARKS were accepted as published.

Old Business: The SPARKS editor, Jerry Buss, explained the reason for the several references to "putrids" in Don Weigt's Landing Gear article in the May issue of SPARKS. Jerry said he was doing a final spell check and while trying to decide if "pushrod" should be one word or two inadvertently accepted the spell checker's suggestion that the word he was looking for was spelled "putrid." and did a universal change to that spelling.

There was no raffle tonight because the Club is in need of a member to act as the raffle chairman.

We are also in need of a couple of general members to serve on the nominating committee for the election of next year's officers and three new Board members. Please see President Lanphear if you would like to volunteer for either of these tasks.

Scott Nelson, reporting for Harley on the work day at the field last weekend, thanked the 18 people that were there. Dirt was moved and used to fill in and seed several low spots. The newly seeded spots have been marked with flags. Please avoid taxing and landing on the bare spots until the grass has had a chance to grow. Jerry Buss organized the food for the work day.

The Club's events that are scheduled for the summer were reviewed. A First Flight Day for new RC flyers is set for May 11. New students are encouraged to attend with their planes and equipment for checkout and discussions with an instructor.

The June 8, Warbirds Over Dane fly-in promises to be well attended. There are 22 pilots, not including MARCS members, that have indicated they are coming and bringing a total of 40 planes. Chris Spierings said the major organizational tasks are pretty well covered but volunteer help will be needed in several areas on the day of the event. Please plan to help out for an hour or two if possible.

The Big Bird Fly-In on June 22 will feature monoplanes with 80" minimum wingspan, and biplanes with 60" minimum wingspan or full ¼ scale models of any span. Jets must have a combined length plus wingspan total of 140" or more. Spectators are welcome.

The last event in June is a Fun Fly scheduled for June 29. More information will be available later.

Dave Rush summarized the details of an Electric Fun Fly that is scheduled for Saturday, July 6 (rain date July 7). Registration starts at 7:30 a.m. and flying starts at 8:00 a.m. Five vendors have contributed raffle prizes.

Jerry Buss will organize a Boy Scout Fly-In for July 13 (14, if rain). Present plans are for two shifts, one morning and one afternoon, that overlap for lunch. Members are encouraged to come out and help with this and bring your trainer if possible.

Charlie Schultz is working on the details of the July 21 Float Fly and Picnic. He hopes to secure permission for some float flying time a week or two before the picnic and is trying to arrange a pig roast again. More details will be available at the June meeting.

There are three events scheduled for August. The 1.5 Meter Hand Launch Glider Contest will be on August 17. This is a very informal contest although last year there were four or five pilots from out of town.

The Ken Kindschi Scale Rally is set for August 18. Any kind of scale airplane is welcome. Last year there were 27 pilots registered. Don Weigt will have sign-up sheets at the next meeting for people to volunteer a couple of hours or so of time to help out on the day of the rally.

Another Fun Fly will be held on August 24. More information will be available later.

The last scheduled event of the summer is the September 24th Fall Thermal Soar at the 40 acre, Long Island Sod Farm. Sailplanes up to 150 inch wingspan are expected. This event in the past has attracted pilots from Illinois and Iowa. Even if you are not flying, this will be a good opportunity to see a variety of sailplanes.

New Business: A rudimentary web page has been

set up at the new MARCS website, marcswi.org. Club member Willy Velez has volunteered to be the webmaster and the full website should be in operation soon.

Please check the listing of your personal information (address, phone number, and e-mail) in the 2002 Club Roster booklet and forward corrections to Ed McDonald. (*Editor's Note: Please send the corrections to me so they can be listed in future issues of SPARKS. I will pass them on to Ed.*)

Show & Tell: Pictures will be at until the new webmaster has had time to link them into the Club's new webpage.

Dan Sutter brought a Top Flight J-3 Cub that he had made for his father in 1990. The model was very scale and finished with the same color scheme as the J-3 that Dan's father flew. Dan recently converted the model to an electric with an Astro Flight geared-25 and is very satisfied with the results.

Dan Stammen built a Lanier Shrike 10 and powered it with an OS-15. The construction process was unusual since the wing is permanently fastened to the fuselage and had to be built with the fuselage hanging over the edge of the table.

A recent article, indicating that a Dymond Hobbies Lo 100 could be towed behind a park flyer and released, caught **Dave Rush's** eye and motivated him to buy a Lo 100 at the Toledo show. Dave has managed to piggyback his Lo 100 aboard one of Pete Aarsvold's Dome flyers with a subsequent release of the Lo 100 at the top of the Dome.

Wendell Hottmann finished a Sky Arrow ARF (Dymond Hobbies) and said it went together reasonably well. Wendell also brought some zip-lock bags filled with lead shot and recommends them for use as a clamping aid when gluing.

Craig Lovell brought the Jet Hanger Hobbies F-100 that he wrote about in the May issue of SPARKS. This is a ducted fan model with standard controls plus retracts, flaps, wheel brakes, speed brake, and is powered by a Turbax 48.

Mark Miller's Zephyr Glider is a 59 inch glider of his own design that he used to win the MARCS Hand-launch Contest 2001 last fall. Mark also brought a set of laser cut parts and is about ready to market the Zephyr Glider as a kit.

Greg Sutter assembled a Kyosho Star Shooter T-33, ducted fan, electric. Greg used the stock motor that comes with the kit and a 9-cell, 1200 mAh pack to yield "spectacular, 3-minute, full-throttle flights."

Don Weigt is developing a lighter weight version of his flat wing model he had at last month's meeting. He has replaced the 1/4" foam core wing with a 1/8" dowel frame

MARCS 2002 Calendar of Events

Event	Date	Location
War Birds Over Dane	June 8 (9, if rain)	Kettle Field
Big Bird Fly In	June 23	Kettle Field
Fun Fly	June 29 (30, if rain)	Kettle Field
Electric Fun Fly	July 6 (7, if rain)	Kettle Field
Boy Scout Fly In	July 13 (14, if rain)	Kettle Field
Float Fly and Picnic	July 23	Rilie Deppe Park, Marshall
1.5 Meter Hand Launch	August 17	Long Island Sod Farm
Ken Kindschi Scale Rally	August 18	Kettle Field
Fun Fly	August 24 (25, if rain)	Kettle Field
Fall Thermal Soar	September 7	Long Island Sod Farm

covered with Nelson LiteFILM and plans to use a speed 300 or 280 motor.

The meeting adjourned at 9:00 p.m.

Philosophy 101

Sometimes in the grim, uncompromising brutality that is war, a glimmer of humor appears. As American soldiers fought their way bloodily and brutally up the Italian boot, correspondents who represented various news services became aware that General Mark Clark was having a birthday. Not knowing which birthday it was, a teletype message was sent to Clark's headquarters in the usual word conserving style of that form of communication asking: "How old Mark Clark?"

Soon a reply was received, saying: "Old Mark Clark fine. How you?"

Help!!!

Wayne Lanphear is requesting urgently that someone step forward and volunteer to run the club raffle at monthly meetings. No more raffles will occur until such a volunteer is found.

And, by the way, Wayne also extends his thanks to all of you who came out in cold, miserable, lousy weather to help at the field day.

Wayne also expresses his thanks to those who have expressed good wishes for his daughter in her surgery. It turned out well and she is recovering rapidly.

More Help!!!

Ye Olde Editor has a busy month coming up and if those of you who have ads for the Aeromart or articles to contribute to the July issue can send your stuff to me a couple of days earlier than normal, it would be much appreciated.

On May 31, I'm leaving for Alaska for some halibut and king salmon fishing and just looking around.

The current price of air fares makes Northwest's offer one that can't be refused. I'll be back on June 9, just in time to miss the June meeting and War Birds Over Dane. Then on June 21 I'm off for some more fishing near Hayward for another week, thus also missing the Big Bird event. Bad planning or strange priorities on my part, I guess, but if you can get the minutes, articles and ads to me by not later than June 18 (or sooner is better yet), rather than the 20th, it would really help a lot.

Thanks.

July Meeting Date is Changed

Because the July meeting would fall on July 4, that meeting will occur on July 11 in room 201c.

New Website is Running

The new MARCS website, marcswi.org, is now running. The old website still exists, but only provides a link to the new one. The MARCS site will carry links to the Warbirds and Electric sites.

Roster Corrections

Following is a list of phone number corrections for the club Roster. Please note the changes in your copy.

Birr Fontaine 233-9063
 Dave Jeardeau 837-8773
 Mike Pirkl 877-0419
 Dan Stammen 220-0181

While making calls to shift the field work day from Saturday to Sunday due to weather, callers reported that there were a quite a number of other errors in phone number listings. Please check your copy of the Roster and see if your number is correctly listed. If not, please report the right number to me for listing here. If you don't have a copy of the Roster, please pick one up from Ed McDonald.

Help for Boy Scout Fly In is Needed

We need volunteers for the Boy Scout event on July 13, 14 if rain. We will start about 9:00 AM.

We will mainly need people with trainers and buddy boxes and people with trainers who can use the club's buddy boxes that we have in the shed. The club has a trainer, but we will need a pilot to fly it. Eight or nine such people will be needed for flying and also someone to teach things like what an airfoil is and what it does, how the control surfaces work and other basics such as the radio control system, as well as the working of the buddy box and field safety rules. Someone who could entertain by just talking about flying to the scouts who are waiting for their turn to fly or have already flown would be good to have. Bill Rewey says he will try to fly his Pietenpol in and tours of it will be good amusement and teaching.

We will serve lunch; something easy, like BBQ's, chips and soda. It will only require heating and dishing up, but two or three of people will be needed there.

Depending on how many scouts sign up, it may be necessary to split them into morning and afternoon groups with lunch served in between. Each scout should get at least one flight of 10 to 12 minutes and hopefully more, if time permits.

On the one hand, this event is a community service, but it also serves MARCS by instilling interest in aviation in kids who may become our future members or full scale, maybe even military flyers, so come on out and give us a hand.

Gate Keys May Not Work

With the arrival of the long promised long hasped lock on the main gate, some of us are finding that our old keys fit rather badly. If you are one of these folks, see Ed McDonald to exchange it for a new key. (Now if I can only remember to do that myself! Although it opens the lock, it only does so with a lot of fiddling and jiggling.)

June Fun Fly

By John Thompson

The first club fun fly of the year will be June 29th with a rain date of June 30th. Hopefully the weather gods will smile on us this year, and we will not need the rain dates. Starting time is 9:00 am on Saturday the 29th, or 11 am on Sunday the 30th.

Since we were not able to have the second fun fly last year, we will take those 5 events and add 5 other events and draw from a hat 5 events for this first fun fly. We will fly the other 5 events at the August fun fly (August 24, 25 if rain).

As a reminder, fun fly type aircraft such as stickits, lawn darts, and the like are NOT allowed. This fun fly is intended for sport type aircraft so as to give a more level footing for all entrants. While some events may not be "newbie friendly", newer flyers are encouraged to participate, as you may be surprised at how well you could do in some events.

As with last year, plaques will be awarded through 3rd place in each event, as well as the prestige (such as it is) that goes with it.

Don't forget, we will also need helpers, volunteers that is, for some of the events!

Whizzers WarBird Report

By Craig Lovell

This month's gathering was typical of most; lots of the latest reference material in print and some interesting "stuff" to paw over, and the usual hangar talk of course.

Frank Baker brought in his completed Douglas O-46 observation plane. This is 54" in wing span and is powered by an OS .25. Frank used EconoCote in the yellow and blue pre-WWII training colors. He also molded his own cowls and canopy sections. One of the unique design elements incorporated by Frank has to do with the thickness of the wing along its span. On the O-46, the center section and tips are very thin in comparison to the mid-span sections. This makes the typical aileron servo installation a bit of a challenge. Frank's solution was to place a single servo in the thick section of one wing panel, and run a cable to drive the aileron on the opposite wing panel. The O-46 has a classic, pleasing look, and Frank's latest creation is no exception.

Chris Spierings brought in the main gear strut and retract mechanism for a Platt P-51. This unit is made by Sierra Precision and is a dead ringer for the original. This is a blend of cast and/or machined parts and is very well designed and constructed. All the odd angles have been built in to allow for an accurate installation. The retract mechanism itself is one of the smoothest I've seen. Definitely a high quality unit.

The only business conducted was to talk about the Warbirds Over Dane event, to be held Saturday June 8th. This appears to be shaping up to be a neat event with many more participants from around the Midwest. We encourage anyone who has a warbird in warbird markings to bring it out, even if it's just for static display. We are still in need of some help on the day of the event so please volunteer to give us a hand. We have structured things such that nobody has to do any one job for very long, unless of course you wish to

do so. We would definitely appreciate some more volunteers so don't hesitate to sign up at the upcoming MARCS meeting.

Well, I'm going to keep things short, so let me close by reminding you to show up for Warbirds Over Dane event on June 8th, and also let me remind you that our Warbird group (therapy) gathering for June is set for Tuesday the 18th at 7 PM. Rm. 100 at the Labor temple. By all means, join us if you can. That's it for now... We're off!!!

Current Affairs

By Clayton Greaves

Last month I was finishing my new Electro Streak ARF and promised a flight report. This is an excellent flying airplane. Running the stock Turbo 550 motor and 8x5 prop on 7 2000 mAh cells I got 10,000 rpm for 8 minutes, a bit below that calculated last month on Motocalc. I also pronounced this power setup to be a bit marginal considering the plane built a bit overweight at 46-ounces.

In the air it was no hotrod but I was pleasantly surprised by the plane's overall performance. Firstly, it balanced perfectly with the recommended equipment. Hand launch was very solid. Climb on a fresh charge was acceptable but by the third climb I was nursing it to altitude. I definitely want more power and plan to install a hotter motor over the next month. Roll authority, even on the recommended 1/8" aileron low-rate deflection was smooth and axial. In short, it behaves like a pattern plane when in the air.

Sadly, on flight number two, a too- cold solder joint failed on the negative pole of the battery causing the Streak to become a lawn dart. Luckily, the plane nosed into freshly plowed earth with minimal structural damage. The battery split the two 4" slices in the fuse sides, the battery and server trays popped loose and the ESC was smashed by the advancing mass of the battery pack on impact. I was very impressed that the firewall extracted from the crater without damage. This is one strong fiberglass fuselage. I'll have it going again soon enough.

In other news, I passed a significant personal milestone today as I embarked on the dual instruction phase of instruction toward my Private Pilot Certificate. As a child I flew regularly with my father only to see him forfeit his medical- months before my 15th birthday. Today, I am living out a promise I made to myself as a child and it just feels great! Let me know if you care to hear about the nitty-gritty of primary flight instruction 1:1 scale or any other e-flight topic. E-mail your comments to or give me a call at 664-5546.

The Bent Bird

Trick Question

By Don Weigt

OK, everybody, and especially you new fliers and about to be new fliers, here's the question:

Which control turns an airplane?

The most basic answer is: **the elevator!**

What? Yep, the elevator. Bet many of you thought it was the rudder or the ailerons!

Controlling airplanes in flight is different than controlling ground vehicles. Some characteristics of airplanes are quite different from surface vehicles.

Difference 1: An airplane almost can't be turned if its wings are level! Note that as models and full size planes turn more sharply, their bank angles increase. The bank angle pretty much controls how tightly the plane turns, if it is maintaining a constant altitude and speed.

Something has to control the bank. That is the main job of the ailerons, if a plane has them. If not, then it is the job of the rudder, working with the plane's dihedral (the wings being "bent" so their tips are higher than their centers). Ailerons bank a plane directly. Rudders work by making the plane slip sideways, which makes the dihedral bank the plane. Once banked, the elevators can turn the plane. The coupling between rudder input and the bank angle change is so good on most planes without ailerons that flying them seems just like flying with ailerons, except in some aerobatic situations. Push the stick to the side, and the bank angle changes.

Difference 2: On most planes, the bank will continue to increase as long as the stick is held to the side, and the turn will continue to tighten. This is very different from a car, where the turn radius would be constant. It probably is the main reason new pilots tend to over-control their planes.

Difference 3: Unlike a car or bike, there is no solid surface under a plane's wheels to push against, only the air around it. To turn, the plane must produce lift to the side, that will push or pull the plane through the turn. The rudder could push a plane through a flat, unbanked turn. Usually, it would be a wide turn, as the side of a plane's body isn't very good for making lift.

A plane's wings produce most of its lift. If an airplane and its wings are level, then the wings' lift is straight up. Picture this as a line or arrow straight up through the center of the plane's top. When the plane banks, its wings and the lift will be banked, too, still through the same point on the top of the now banked plane.

When the bank is shallow, then most of the wings' lift is still upward. But, a small fraction of it is to the side. This sideways force pulls the plane around the turn.

If we've only banked the plane, then its wings are making the same amount of lift. But, since some of that lift is now horizontal and there's less vertical lift than before. To maintain level flight, the wing will need to make more lift, and that takes more speed or more elevator input. As the bank gets sharper, more and more elevator is needed to maintain altitude (level flight). But, in addition to maintaining the vertical lift to support the plane, it's also adding more sideways lift, which makes the turn tighter.

Difference 4: As we straighten the wheels on a car or other surface vehicle, its path straightens out. When we center the stick to straighten the ailerons or elevator, most planes stay in whatever bank they are in, or only slowly return to level flight. Some will even bank more! An airplane will continue to turn as long as it is banked. So, turns end slowly, if at all, unless opposite control is used to roll the plane back to level.

Summary: The ailerons or rudder are used to control the bank angle, and then the elevators are used to control the altitude and turn.

Banks and turns usually increase as long as the rudder and/or aileron inputs continue.

Banks and turns remain nearly constant when the rudder and ailerons are at neutral (centered) and will decrease or increase gradually. (Any decent trainer will slowly return to level flight).

Stopping a turn quickly requires opposite aileron or rudder control to level the wings.

This unfamiliar set of responses makes a plane difficult to control at first, as it doesn't match what we have learned to expect from other vehicles.

What's in a Name?

By Clay Ramskill

Editor's note: I had never totally understood the designations of Navy planes that were used prior to 1960 until I read the following article by Clay Ramskill in a recent issue of Looops and Lies, the monthly bulletin of River Valley Flyers, the club from Wisconsin Rapids. I thought you might be interested too, so here 'tiz.

Maybe the British got it right. They just give their military (and civilian, too) aircraft a name (like Spitfire) and let it go at that. If there are major modifications, then they will put a number behind the name of the plane, like Spitfire 9. This is a simple, easy to remember system, which also tends to allow citizens to sort of identify with their aircraft.

But not so here in the colonies. We Americans seem to require more, like some sort of designation to go

along with the name. The word "Scorpion" just isn't enough, it has to be the F-89 Scorpion. "Stratojet" could not be enough, it had to be the B-47 Stratojet. Oh, yes, adding the designation does give you more information; in the case of the Scorpion, we can then know that this plane is a fighter, and was the 89th fighter bought by the Air Force. Likewise, a B-47 was the 47th bomber bought by the USAF.

Unfortunately, the Navy did not use the same system. Until the services were forced to adopt the same designation system in the 1960's, the Navy had a completely different way to designate their aircraft, which was very confusing for those who were not too familiar with the military way of doing things! The Navy designations started much like the Air Force system, in that the first letter described the type of aircraft, i.e. "F" for fighter, "C" for cargo, and so on. It was the rest of the designation that was so different. The number following the aircraft type letter was the number of aircraft of that type the Navy had bought from the MANUFACTURER. And then the next digit was a letter denoting the manufacturer of that aircraft. So for instance, the F6F Hellcat was a fighter, and was the 6th fighter that the Navy had bought from the manufacturer, Grumman. The letter "F" denoted Grumman. Likewise, the letter "B" denoted Boeing- so an F2B was the 2nd fighter that the Navy had bought from Boeing. A P2V was the second Patrol plane the Navy had acquired from Lockheed, denoted by the "V". For the first plane of any type, the number was just omitted. Thus, the first fighter obtained from North American ("J") was simply designated the FJ "Fury". The Douglas Skyraider was the first Attack plane bought from Douglas ("D"), and was therefore designated the AD.

Thoroughly confused? Oh, this can get to be fun. Let's take the 4th fighter the Navy had from various manufacturers. The F4B was a Boeing biplane. The wonderful little Grumman Wildcat was the F4F; the McDonnell Phantom 2 was the F4H. And we also had the Douglas Skyray, the F4D. Oh, and don't forget the Vought Corsair, the F4U!

Now, wasn't that fun? Let's do another. The Navy called their bombers "attack" planes, the type designation being "A". For the third one bought from various manufacturers, we have: The A3D Skywarrior, a twin engine jet from Douglas, and the A3J Vigilante, a supersonic bomber from North American. But there were also torpedo bombers- these got a "T" for the first letter. The famous Avenger of WW2 fame was the first of its type bought from Grumman, and was therefore designated the TBF. Interestingly, the TBM was the same aircraft, manufactured by General Motors during the war! The two services also differed in how they added modifications in the

design to the designations. An Air Force modification to the P-51, for instance, would show up as a letter added to the initial designation, like P-51 B. A Navy modification would usually be added as a dash, then a number, like F8U-2.

Alas, everything changed though, in about 1960. Designations for Air Force and Navy planes would be the same, and later most of the numbering systems were "sort of" reset to zero. Many of the Navy planes in the inventory were able to keep a recognizable number; the F8U Crusader, for instance, simply became the F-8; the A4D Skyhawk then was just an A-4. There had to be some changes, though. We've already noted two A3's; these were both in the inventory at the time of the designation changes. The A3D Skywarrior kept the A-3 designation, the A3J Vigilante became the A-5. Any differences between Air Force and Navy versions of the same plane were taken care of in the modification letter. An A-7D was the USAF version of the Corsair 2, an A-7E Navy version.

The present system for numbering our military aircraft, then, is far simpler and more logical than what we saw in the past. But where's the romance- the oddities? Where did all the "pursuit" planes go? And just what kind of plane drops torpedoes?

Dimples

Bill Rewey has pointed out an article by Anthony Occhipinti in *Sport Aviation*, the magazine of the EAA, about dimple tape which enhances performance of airfoils and may have useful applications on larger scale RC planes and RC helicopters. It's much too long to include here verbatim, but I will give you the highlights and if you are interested in finding out more, see Bill. He says he has used dimple tape on the prop of his Pietenpol and obtained 75 more static RPM's, which converts to about a 10 percent increase in power for take off.

The article reports that dimple taping a 50 inch RC helicopter rotar blade enabled the use of less throttle and a lower rotar blade angle of attack on take off and softened autorotation landings.

Dimple tape is a pressure sensitive .015 inch thick perforated urethane material that is used to create indentations on airfoils at the point of maximum camber. They are like the dimples you see on golf balls. Placing it over the entire airfoil, however, , as on a golf ball, would create additional drag, causing performance to decay. Thus, in applying it to an RC prop, one would probably need a fairly large plane, such as something carrying perhaps a 20 or 24 inch prop. It could, however, be used on almost any wing where it might improve efficiency to at least some degree on certain high performance models, probably including pattern types.

The dimples smooth air flow over the airfoil surface by reducing the separation of air from the surface, thus reducing turbulence over the airfoil and thereby reducing wake drag. Prop noise is often a considerable concern and the effect of dimple tape on reducing it is said by the author to be significant, in addition to increasing effectiveness..

As noted above, if you want to learn more about this, talk to Bill, or you can read about it in the January 98 issue of *Sport Aviation*.

The AEROMART

Hangar 9 1/4 scale CAP 232. Some repaired landing gear damage, cosmetic damage on bottom of cowl. Ready for your Saito 150/180 and radio. **\$250** obo

Sig Field Boss field box. Painted with white hobbyoxy paint. Includes unfinished homemade starter box that holds a battery, mini power panel, and starter. **\$50** obo

Unusual T-tailed pattern type aircraft, intended for a piped .60 rear exhaust. With mechanical retracts. Dimensions on website. Bought at swap meet, never flown.

Free for the taking: Twinstar 15, plans built from RCM plans. Very similar to the Hobbico Twinstar, but slightly larger, for .15-.20 engines. Covered in yellow, probably needs work. No engines or radio gear.

Also: remains of a Carl Goldberg field box. Needs repair and repaint.

2 gallon jugs of Byron 15% fuel. Never used, but one has castor added. Make offer.

John Thompson

rcav8r@chorus.net

Photos can be seen at

<http://personalpages.chorus.net/rcav8r/forsale.htm>

Moving, must sell: Two (2) Hobbico .40 WARF trainers. One is NIB and the other is complete and has 4 flights on it. Offer.

Ed Muehlfelt.

(608) 356-5636

This space is available free to MARCS members to buy and sell non-commercially