

FlightLine

A Monthly Publication of Collins Model Aviators December 1999

Reminders:

- Next CMA meeting is Thursday December 2nd at the 35th Street Complex Cafeteria
- The next Build Session is Thursday December 9th at the 35th Street Complex Cafeteria

📖 In This Issue:

President's Column.....	2
CMA Meeting Minutes.....	3
My Little Airplane.....	4
Tips and Tricks.....	5
Indoor Model Flying.....	8
Heads Up, CMA Activities.....	9



Photo from a CMA Fun Fly this summer.

CMA Web Page Addresses:

<http://bbs.cacd.rockwell.com/data/clubs/cma/>
<http://members.xoom.com/cma3257/>



Collins Model Aviators
Academy of Model Aeronautics
Charter Club #3257



President's Column

By Frank Gutierrez

Presidents Minute, Recap of 1999.

This is a good time to reflect on the CMA's 1999 accomplishments. We were in need of a new flying field and were successful in obtaining a very good flying site with lots of room to fly our aircraft. The field committee, posted messages on bulletin boards and in local papers which, resulted in success for the CMA. The site owner has been very kind in accommodating our activities and is willing to let us continue another year at this location.

The membership wrestled over the idea of flying other than R/C airplanes only at our current flying site this year. The focus was on helicopters and the final resolve was one helicopter day a month. Because the general membership didn't have a good understanding of R/C helicopter flight, the topic took up a full season's worth of discussion. There is still much to be investigated on integrating a broader spectrum of R/C flight for the enjoyment of the membership. We got a clarification of the policies and procedures of Rockwell Collins recreational services and how that applies to the CMA. This prompted minor changes in the bylaws affording R/C aircraft as a whole to participate. The CMA still holds the ability to regulate how that is accomplished.

We had two flying events this year that a good number of people were able to enjoy. The first event was a skill contest and the second was based on luck. Each event held it's own level of enjoyment for members and families. The site owner accommodated us by cutting the grass for these events and allowing us to use his fence supplies to put up a safety net at the last event of the season. I am looking forward to more fun fly's next year incorporating smaller special events. We tried to make an effort to do it this year but the level of interest was low. As the skills of the membership increase I am sure we will see more activity of this type in the future.

We were able to help the site owner out in purchasing traffic cones and a windsock. This also helped us stay on the right path and off the dirt for parking our cars. The windsock is still in progress of getting Martinsons name on it in some way and should be up for the spring flying season. A sign will also be going up soon to be placed at the entrance to the flying site.

There was a significant number of new solo pilot signoffs this year. A greater number of new members also joined the club in 1999. New airplanes took to the sky as well as some old ones that haven't flown for many years. A couple of airplanes got lost in the fields and a few had some unrecoverable crashes. The new field gave us the opportunity to be flexible on runway position and most of the time we could find hard packed dirt for easier takeoff ground rolls.

I would like to encourage all current and potential CMA members to sign up for 2000 and gear up for making next years flying better than the last.

First Build Session.

I would consider the first build session a good success. Nine members were present and three of the nine made progress on new aircraft. Videotapes of R/C aircraft events were shown and hints and tips were exchanged by all. A

couple of nearly completed aircraft were there to view as well. I neglected to take pictures of the first event so I don't have anything to show. I would like to encourage you to come out and see what's going on. If you feel uncomfortable bringing your plane to the session, Show up anyway, have pizza and exchange stories. The next build session is December 9th.



LT-40 Tow Truck!

My SIG LT-40 has put on a new hat. It's a carrier for transporting gliders to a high altitude (1,000 ft. plus) then releasing them for the glider pilot to have many minutes of enjoyable flight. The results proved very successful on recent flight test. More pictures and information to come as a feature article in the January issue. If you have a glider and want to give it a try, let me know I might be up to it.

To the club officers of year 2000, the best of luck.

To the entire CMA membership, Merry Christmas and a Happy New Year!

Frank Gutierrez, CMA President →

CMA Meeting Minutes

By Jim Doty

4 November 1999

Doug Emerson was not able to attend the meeting so minutes were taken by Jim Doty

Frank Gutierrez called the meeting to order at 5:06 p.m. in the Main Plant Cafeteria (35th street facility). Twelve members were attending.

Frank and Basil Tilley pointed out that John Crilley requested the copy of the update of the Bylaws and not Basil Tilley as reported in minutes. This error was corrected and the November minutes were approved as corrected.

Frank Gutierrez reported that \$340, in 2000 membership dues, have been turned into Employee Services. The report on the Subsidy will be available the second week in November.

Frank Gutierrez reported that the field rent for 2000 has been paid and that winter flying will be allowed at the field.

Old Business:

Frank reopened discussion on the purchase of a new club trainer.

Crist Rigotti recommended that the club set up a budget for next year before committing any funds. He also volunteered to build the fuselage for the new club trainer.

Crist Rigotti moved that we build an LT-40 after the first of the calendar year and that the cost of the LT-40 be included in the 2000 budget.

Larry Kerns seconded the motion, and the motion passed without opposition.

Jamie Johnson volunteered to build the wing of the new club trainer.

Frank Gutierrez made the following three announcements:

1. Jim could use some input for the FlightLine in November. The article would be published in December. Any volunteers please see Jim?
2. As a reminder, Next week is the first build session for the season. I would like to encourage, as much support members are able to give to this activity. It is an informal activity where members can share ideas, stories and all around

fellowship. If you choose to build at home, come out anyway and help others.

3. If you think you have the right stuff and would like to be of service, sign up to be a CMA instructor in training. Just let one of the club instructors know that you are interested.

The votes were counted for the change in the bylaws clarifying who should be able to vote. The change to the bylaws passed 10 to 2.

New Business:

Frank announced that the CMA currently has 53 members (39 full members and 14 provisional members) and that 26 members have paid their 2000 dues.

Only three nominations were received for club officers for 2000. Frank asked for additional volunteers or nominations, but no additional nominations were made at the meeting. The nominations were closed with the following candidates:

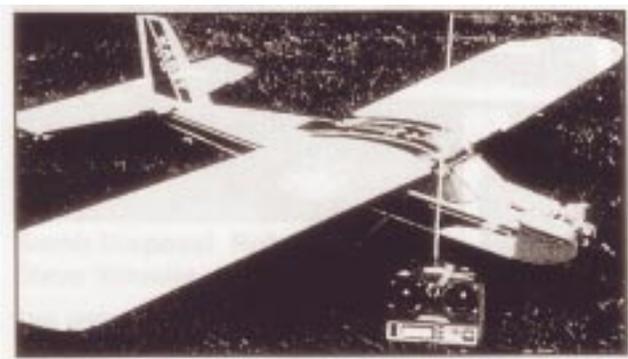
President: Jamie Johnson

Vice President: Gregg Lind

Secretary: Christopher Heald

The meeting was adjourned.

James H. Doty, CMA FlightLine Editor →

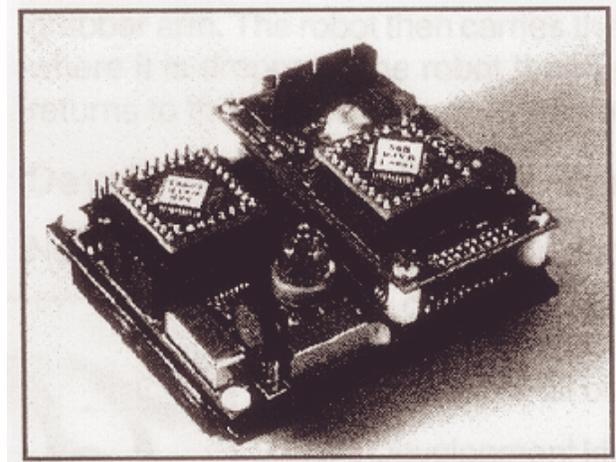


My Little Airplane

By Steven Sarns

Reprinted from: The Vesta Product Report, Volume 3 Issue 1

For years I have wanted to do a project for myself and this is it. Inside this ".40 Trainer" RC model aircraft are two MC2000-074s. One is responsible for controlling the stability of the airframe; the other handles navigation and mission control.



The Stability Control Computer (SCC) gets information from a two-axis accelerometer, two gyros, a pressure sensor based altimeter and an airspeed sensor. This information is used to compute 4 PID (Proportional, Integral, Derivative) control loops that stabilize the airframe in flight. Airspeed is used as the primary control variable to establish elevator position, altitude is used to establish the throttle needed and the local gravity vector is used to control the ailerons. The fourth loop uses navigation information acquired from the navigation computer to control the rudder. The SCC also interfaces to a standard 5 channel RC radio receiver to control operation of the model during takeoff and landing. The SCC drives 5 servos to control all of the flight surfaces of the model. The SCC code occupies about 4k bytes and executes in less than two RC frame times, or about 25 times per second.

The navigation computer is attached to a Rockwell GPS "Jupiter" OEM receiver exchanging NMEA (National Marine Electronics

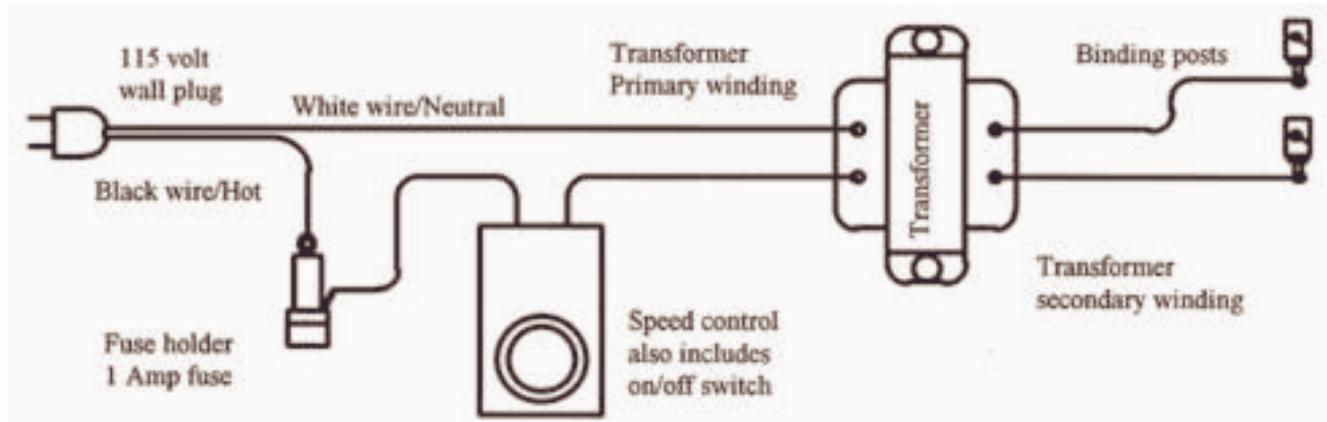
Association) messages. The information from the GPS receiver is compared to a stored sequence of waypoints and the path to the next waypoint is computed. This steering information, together with the flight leg's prescribed altitude and speed, are sent to the SCC.

Code and data for up to 30 waypoints in the navigation computer occupies 8k and executes much faster than the once per second update rate of the GPS receiver. The navigation computer also maintains a stored sequence of events that can be executed at specific times or locations by controlling up to 3 servos.

Foam-cutting power supply

by Mike Reed

It has been brought to my attention that there is a mystery about power supplies for foam cutting. A glance through any of the major model publications will turn up at least one power supply made just for foam cutting. A list of sources will be included at the end of this article. Being industrious and a bit of a tightwad, I have made my own power supply. This is nothing new. This power supply has been around for a long time and has been seen in newsletters across the country. The only thing different about this one is



A dual channel ultrasonic low altitude altimeter with transducers mounted in each wingtip will enable the craft to take off and land semi autonomously.

UAVs (Up-piloted Aerial Vehicles) have been used by the government and armed forces for several years and represent a fascinating branch of robotics that combine even more than the usual mix of cross-disciplinary skills.

Steven Sarns
 stevensarns@sbc2000.com
<http://www.csn.net/stevensarns>

Thanks to Crist Rigotti for sending in this article →

Tips and Tricks

From the September National Newsletter

that it is documented.

Note of caution! If you are not comfortable working with electricity, this power supply is not for you. **One hundred and fifteen volts can kill you!** All wire connections should be insulated by heat shrink tubing or silicon sealant to prevent electrical shock or short circuits. I recommend that this power supply be housed in a metal project box to protect the components from damage.

The diagram below shows how all the parts are hooked up. The most difficult part to find is the transformer. The transformer needs to have a 115 volt primary winding and a 24 volt secondary winding. The current rating should be at least three amps. The fuse holder is a panel mount type and should be used with a one amp fuse. The

speed control is NOT a lamp dimmer. It is a speed control for ceiling fans and is designed for inductive loads such as the transformer. The binding posts allow easy connection of the cutting bow to the power supply.

Operation: Connect your cutting bow to the binding posts on the power supply. Make sure that speed control is turned off (counter clockwise). Plug in wall plug and then turn switch all the way to the right (which is the lowest setting). Adjust the speed control for the best heat range.

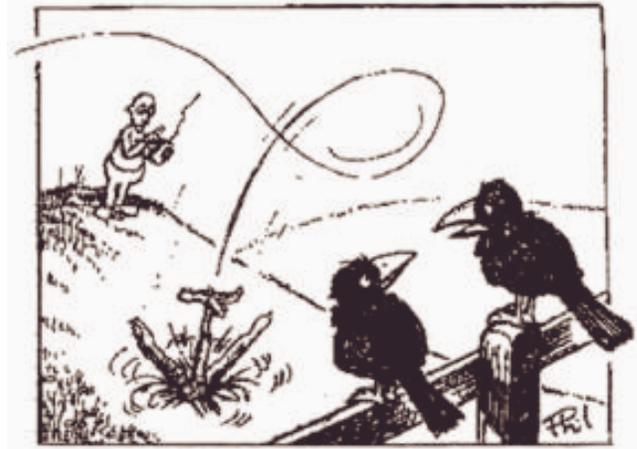
Parts Suppliers:

C&H Sales Co. (800)325-9465: transformer no. TR9300 or TR9600 and various metal enclosures.
Tech America (800)877-0072: transformer no. 900-5828 or 900-5829, fuse holder no. 900-2470 or 900-2472, one amp fuse no. 900-2450, binding posts no. 910-0885 and metal enclosure.

I found the following parts at my local home center. Your local home center or hardware store should have the same parts available. Do not substitute the speed control. The Speed control called out works excellently. Buss fuse holder (catalog no. BP/HKP) and one amp fuse (catalog no. BP/AGC-1) Leviton Fan Speed Control (P/N 830-6616-1)

The only commercially available power supply that is widely advertised is from TEKOA. It is used with their Feather Cut foam cutter. You can contact them at (909) 763-0464 or visit their homepage at www.tekoa.com.

from Mike Reed
SOSS Newsletter, editor
<http://www.soaroregon.com>
(541) 488-3489
Aerofab@grtech.com ➔



"If he's really diving for worms, how does he know where they are?"

No More Ripped Out Gear

by Dan Wolanski

I would like to share a design improvement with you. During the construction of my Extra 300S, I came across a very unusual way of attaching the landing gear. The plans showed the gear attached to a couple of aluminum angles. The angles, in turn, were attached to the side of the fuselage with screws and blind nuts. Additionally, the landing gear block had been reduced to 1/8 inch light ply because no load actually went through the gear plate.

After studying the design, I immediately began to see the great advantage of this system over the current system of using a block with corner stock epoxied in place. The design is meant to transfer the load induced by the gear directly into the side of the fuselage where it is absorbed over a larger area.

Sure, the same intent is used with the block and corner stock method, but the weakest point is always the corner stock. Hence the load never fully distributes into the fuselage.

The beauty of the aluminum angle is that the angles are no longer the weakest point and the load truly transfers the way it is supposed to.

The disadvantage of the system is that it can transfer too much load if you are not careful and

rip your fuselage apart in a less than perfect landing.

After some thinking and calculating, I came up with a solution on how to make this the perfect system.

What I came up with was to install the aluminum angles with steel fasteners and blind nuts to the fuselage (fuselage must be light ply or have light ply doublers). Then, attach the gear with aluminum fasteners to the angles. This allows me to accurately calculate the shear strength of each fastener to ensure the aluminum fasteners fail before the steel fasteners. The variable with this scenario is not knowing exactly what temper steel and aluminum screws you are buying from the hardware store, so I made sure that the aluminum only achieved 60% of the strength using the worst case scenario (soft steel and hard aluminum). After some calculations, I came up with the following chart.

This system weighs about the same as the typical heavy ply and corner stock method so there is no real weight advantage, just a predictable and stronger attachment method.

This system can be easily built-in during the construction of the plane. Remember, you don't need any corner stock or epoxy. Just replace the landing gear block with 1/8 inch light ply and CA it in place.

Airplane Weight (lbs.)	Size of Steel Bolts	Size of Aluminum Bolts	Thickness of Aluminum Angles
10	4-40	6-32	1/16
10-13	6-32	8-32	1/16
14-16	6-32	8-32	1/8
17-25	6-32	10-24	1/8

Now, I know some of you are reading this and saying, "Heck, I use nylon bolts and it works just as good!" Not really.

What you are doing with the nylon bolt method is "hoping" that your glue joint is stronger than your nylon bolts. Additionally, you are lowering the gear's load bearing capabilities significantly by using nylon to ensure it is weaker than the unpredictable glue joint.

from Flight Lines

Michael Schauer, editor

P.O. Box 1781

Loveland CO 80539-1781 →

Keep Your Eyes on Your Model

by Chuck Hutton

Never take your eyes off your model. This is good advice, and advice I've generally tried to follow. However, while flying at our regular Old-Timers contest, I didn't follow this advice, with unfortunate consequences!

After an uneventful climb to about 1500 feet with my 84-inch wingspan bomber, I felt comfortable taking my eyes off the model. I walked back from the takeoff point to a safe area from which to fly the model.

This was a big mistake, and was compounded by another mistake. I started to fly what I thought was my model. When this model didn't respond to my transmitter commands, I assumed radio contact had been lost.

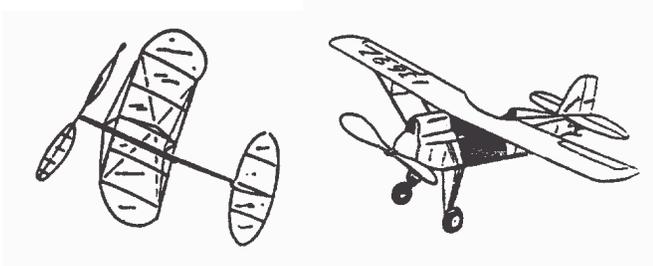
Since it turns out I was flying the wrong model, all the exaggerated control commands I was inputting to the wrong model were actually being received, and responded to, by my bomber which promptly crashed!

I'm sure, that by the time I sorted out all these details and asked for help finding my model, it was all over, which is why about eight pair of eyes couldn't find it!

We found the crashed Bomber fairly close to the flying area. So, to make a long story short, the lessons are:

1. Don't ever take your eyes off your model
2. Before you conclude you don't have it, be sure you are flying the right model
3. Don't try extreme control inputs (like lots of down elevator) while checking this out

from SAM 40 News
Joe Roose, editor
4318 Strathcona
Highland MI 48357
pepsijoe12@aol.com →



Indoor Model Flying

This announcement was shown at the last CMA meeting. It's probably too late to register for the flying, but you can still stop by one of the December sessions to see what they are all about.

Flying sessions for indoor model airplanes will resume in Kirkwood's Johnson Hall gymnasium this winter per the schedule below. If you have flown with us before, register now, dust off the old models, (or quickly build some new ones,) and be ready to fly at the first meeting.

If you've never flown with us, stop in at our first session and check out the activity. You may be surprised by the performance of these little lightweights—a lot of fun for a small investment of time and money. We fly gliders, models with rubber band and electric motors, and occasionally an indoor radio controlled model shows up.

I'm trying to update my Former and Future Flyers list. If you have a friend who might be interested in indoor flying, bring him along, or give me his name at the first meeting. Visitors are always welcome.

Johnson Hall Gym Class Section # 172575

Kirkwood campus Tuition \$47

5 weeks - Saturdays 8-11AM ~:

November 13, 20, No class November 27

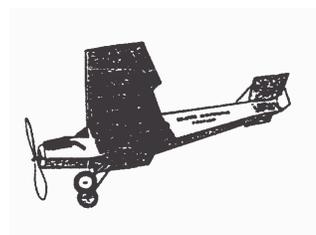
December 4, 11, 18.

Registration:

Register by phone beginning October /2 Call 398-1022 or 1-800-332-8833, Mon through Thurs 8AM-6PM, Friday 8AM-4: 30PM

Tell the operator: Your Social Security number - Section number of the class - Your name, address, and phone number If you will pay by check or credit card. Have credit card handy.

Make out your check for tuition to Kirkwood Community College. Write your Social Security Number and class section number on your check. Send to: Business Services, Kirkwood Community College, PO Box 2068, Cedar Rapids, Iowa 52406.



Paul McIlrath →

Heads Up, CMA Activities

December 1999

2-Dec 5-6 PM Meeting at Main Plant Cafeteria

*Election held

9-Dec 6-9 PM Build session

17-Dec 5:00 PM FlightLine deadline

January 2000

6-Jan 5-6 PM Meeting

13-Jan 6-9 PM Build session

21-Jan 5:00 PM Flightline deadline

Local events:

2/06/00 Waterloo, IA (E) Blackhawk RC Pilots Annual Swap Meet. Site: Local 838 UAW Hall, 2615 Washington St For info: Dennis Nissen, 1021 W 1st St Cedar Falls IA 50613 PH:319-266-3060. Sponsor: BLACKHAWK RC PILOTS

2/13/00 Davenport, IA (E) Swap Meet. Site: IA National Guard Hangar, Davenport Airport. For info: William Whetstone, 28164 219th St LeClaire, IA 52753 PH:319-289-4329. Annual swap meet. US Hwy 61 north of I-80, exit 124 west to Harrison St, 1/2 mile north. Swap 10AM to 3PM. 8 ft tables \$8, admission \$2. Reservations requested. Sponsor: DAVENPORT RADIO CONTROL SOCIETY

For up-to-date AMA events schedule see the AMA web page:

<http://www.modelaircraft.org/Comp/Contest.htm>

For an AMA membership application:

<http://modelaircraft.org/Mem/Memapp.htm>

 **Send your input for the CMA Web Page to:**

Steve Plantenberg x5-9625
scplante@cacd.rockwell.com

CMA voice bulletin board

Call 295-8888

For flight and weather information

1999 CMA Staff

President: Frank Gutierrez.... x5-0969

Vice President: Dan Cooley x5-0401

Secretary/Treasurer: Doug Emerson ... 377-6971

Field Marshal

FlightLine Editor: Jim Doty x5-2931

Web Page Editor: Steve Plantenberg . x5-9625

Senior Flight Instructors and Test Pilots

First flights of new airplanes:

Frank Gutierrez

Mark Woytassek

First flights of new helicopters:

Crist Rigotti

Flight Instructors in training:

Irv Anderson

For membership information:

Contact: President Frank Gutierrez III

MS 108-166

X5-0969

fsgutier@collins.rockwell.com

Build Sessions

Build Sessions are held every second Thursday of the winter months in the Main-Plant Cafeteria, to provide hints, tips, and help in building models.

Build Sessions are open to everyone who is interested in RC model building.

Send your input for FlightLine to:

James H. Doty

MS 108-205 x5-2931

jhdoty@collins.rockwell.com

I need photos of models and model projects for the cover, as well as full articles



**Academy of Model Aeronautics
5151 E. Memorial Drive
Muncie, IN 47302**

**Box-Kar Hobbies
3661B 1st Ave. S.E.
Cedar Rapids, IA 52402**

**H & J Hobbies
Marion Heights Center
Suite 1185 Grand Ave.
Marion, IA 52302**

**Hobbytown
2737 16th Ave. S.W.
Cedar Rapids, IA 52404**