



The Newsletter of the *Manned Space Center Radio Control Club*

**WHAT GOES UP ...**

In the world of club business, the reservations have been made at Louie's on the Lake for the Christmas party. There will be a limit of 100 people at \$10.00 a ticket. There is more specific information on page 3 of this newsletter, as well as a ticket registration form. If this year's party goes well, then we will increase the limit of people for next year. Hope to see everyone there.

I still have 5% fuel left. I know that we are out of 10% fuel, but I am in the business trip time of 'he month and my usual 'pick up the fuel' person has been busy as well. So I will get to it as soon as possible; if someone wants to take over this time, then give me a call.

In the world of the NATS, the Texas trio did pretty well this year. Steve Rhodes of the Texas City Club, Wayne Green, and myself from our club went to the Helicopter part of the NATS. This year there were 102 contestants in helicopter alone. This is a record for the chopper guys and as you could guess, the competition was tough! Wayne Green did extremely well, especially since this was his first helicopter contest ever. He captured fifth in novice out of 27. Steve Rhodes also did very well with a fifth in intermediate out of 41 and yours truly got ninth in intermediate as well. We all had a great time at the NATS this year and are already planning to go to next year's! Congratulations to Wayne and Steve on a great showing! I didn't get a chance to watch any of the other competition, so I don't know how our sailplane friends did at the NATS this year. Give me a call and let me know how you did. I am sure our members are interested in the results. I may have some pictures of the competition for Joe to publish in next month's newsletter. We'll see how they turn out.

Well that's it for this month. I won't be able to chair the next meeting due to work so Preston will run it this time. Have fun and keep em flying till next time...

Mike Goza

**NEXT MEETING  
THIS THURSDAY  
AUGUST 9th  
at 7:30 PM**  
in the Clear Lake Park Building



Mobile hobbyists

**ALL PEOPLE SMILE IN THE  
SAME LANGUAGE!**



## MINUTES FOR THE JULY MSC/RCC MEETING

On July 12, 1990 the MSCRCC monthly meeting was called to order by president Mike Goza.

### Old Business:

Mike Goza expressed thanks to everyone who cleaned the flying field. The field may have to be swept again depending on whether the rocks stay off of the field or not. Also, the gravel piles may need to be spread out since the NASA mowing crew has not mowed around the piles.

No news was available on new T-shirts or hats.

Mrs. Hoffman will not be able to head the usual Christmas party this December. Sharon Goza researched the possibility of having a Christmas banquet as opposed to the usual finger food party. The only possible place found was Louie's on the Lake. The club voted in favor of the banquet. The limit was set to 100 tickets at \$10.00 a ticket. A menu and registration form will be in the next newsletter. Members wishing to attend should send in the form with their money and top 4 entree choices.

### New Business:

Ken White has papers on rules and events for Fun flies. Anyone wishing to put on a fun fly can contact Ken for the information and some tutoring.

Six contestants participated in the Glider contest/fun fly. Dave Hoffman expressed thanks to all who helped and participated.

Thanks were expressed to John Campo for erecting the shade on the flying field.

Shane Palmer will bring refreshments for the August meeting.

### Treasurer's Report

income: \$179.00

output: \$334.00

total: \$3585.00

### Model of the Month

"Dangerous" Dan Hamala won model of the Month with his Super Sportster.

### Entertainment

Entertainment consisted of a presentation on Sail Planes and 1991 radios.

Secretary  
Sharon P. Goza

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## VOLUNTEERS WANTED!!

The Club would like some representatives to participate in an Air Show being held on August 25th at the Houston Gulf Airport in League City. Radio control flying demonstrations are scheduled for 10 AM and 1 PM --- programs are flexible. Static displays are also desirable. Full size airplane rides and skydiving demonstrations are also scheduled. Hopefully, more information will be available at the club meeting.

<u>TRIM FEATURE</u>	<u>MANEUVERS</u>	<u>OBSERVATIONS</u>	<u>CORRECTIONS</u>
CONTROL CENTERING	Fly general circles and random maneuvers.	Try for hands off straight and level flight.	Readjust linkages so that Tx trims are centered.
CONTROL THROWS	Random maneuvers.	A. Too sensitive, jerky controls. B. Not sufficient control.	If A, change linkages to reduce throws. If B, increase throws.
ENGINE THRUST ANGLE <sup>1</sup>	From straight flight, chop throttle quickly.	A. Aircraft continues level path for short distance. B. Plane pitches nose up. C. Plane pitches nose down.	If A, trim is okay. If B, decrease downthrust. If C, increase downthrust.
CENTER OF GRAVITY LONGITUDINAL BALANCE	From level flight roll to 45-degree bank and neutralize controls.	A. Continues in bank for moderate distance. B. Nose pitches up. C. Nose drops.	If A, trim is good. If B, add nose weight. If C, remove nose weight.
SPLIT ELEVATORS (Also Yaw and C.G.)	Into wind, pull open loops, using only elevator. Repeat tests doing outside loops to inverted entry.	A. Wings are level throughout. B. Plane tends toward outside when right side up, and to inside when inverted. C. Plane goes in on regular loops, and out on inverted. D. Plane goes out on both types of loops. E. Plane goes in on both types of loops.	If A, trim is fine. If B, add weight to right wing, or add right rudder. If C, add weight to left wing, or add left rudder. If D, raise right half of elevator (or lower left). If E, raise left half of elevator (or lower right).
YAW <sup>2</sup>	Into wind, do open loops, using only elevator. Repeat tests doing outside loops from inverted entry.	A. Wings are level throughout. B. Yaws to right in both inside and outside loops. C. Yaws to left in both inside and outside loops. D. Yaws right on insides, and left on outside loops. E. Yaws left on insides, and right on outside loops.	If A, trim is correct. If B, add left rudder trim. If C, add right rudder trim. If D, add left aileron trim. If E, add right aileron trim.
LATERAL BALANCE	Into wind, do tight inside loops, or make straight up climbs into Hammerheads. Do same from inverted entry.	A. Wings are level and plane falls to either side randomly in Hammerhead. B. Falls off to left in both inside and outside loops. Worsens as loops lighten. C. Falls off to right in both loops. Worsens as loops tighten. D. Falls off in opposite directions on inside and outside loops.	If A, trim is correct. If B, add weight to right wing tip. If C, add weight to left wing tip. If D, change aileron trim. <sup>3</sup>
AILERON RIGGING	With wings level, pull to vertical climb and neutralize controls.	A. Climb continues along same path. B. Nose tends to go to inside loop. C. Nose tends to go to outside loop.	If A, trim is correct. If B, raise both ailerons very slightly. If C, lower both ailerons very slightly.
WING INCIDENCE	Knife edge flight.	A. Model tends to veer in nose up direction. B. Model veers in nose down direction.	If A, reduce wing incidence. If B, increase wing incidence.

1. Engine thrust angle and C.G. interact. Check both.

2. Yaw and lateral balance produce similar symptoms. Note that fin may be crooked. Right and left references are from the plane's vantage point.

3. Ailerons cannot always be trimmed without sealing the hinge gap.

## FLIGHT TRIMMING

... A model is not a static object. Unlike a car, which can only hunt left or right on the road (technically, a car does yaw in corners, and pitches when the brakes are applied), a plane moves through that fluid we call air in all directions simultaneously. The plane may look like it's going forward, but it could also be yawing slightly, slipping a little and simultaneously climbing or diving a bit! The controls interact. Yaw can be a rudder problem, a lateral balance problem or an aileron rigging problem. We must make many flights, with minor changes between each, to isolate and finally correct the problem.

The chart accompanying this article is intended to serve as a handy field reference when trimming your model. Laminate it in plastic and keep it in your flight box. You just might have need to consult it at the next contest! The chart is somewhat self-explanatory, but we will briefly run through the salient points.

First, we are assuming that the model has been C.G. balanced according to the manufacturer's directions. There's nothing sacred about that spot — frankly, it only reflects the balance point where a prototype model handled the way the guy who designed it thought it should. If your model's wing has a degree more or less of incidence, then the whole balance formula is incorrect for you. But, it's a good ballpark place to start.

The second assumption is that the model has been balanced laterally. Wrap a strong string or monofilament around the prop shaft behind the spinner, then tie the other end to the tail wheel or to a screw driven into the bottom of the aft fuse. Make the string into a bridle harness and suspend the entire model inverted (yes, with the wing on!). If the right wing always drops, sink some screws or lead into the left wing tip, etc. You may be surprised to find out how much lead is needed.

At this point the model is statically trimmed. It's only a starting point, so don't be surprised if you wind up changing it all. One other critical feature is that the ailerons must have their hinge gap sealed. If shoving some Scotch tape or Monokote into the hinge gap to prevent the air from slipping from the top of the wing to the bottom, and vice-versa, bothers you, then don't do it.

To achieve the maximum lateral trim on the model, the hinge gap on the ailerons should be sealed. The easiest way to do this is to disconnect the aileron linkages, and fold the ailerons as far over the top of the wing as possible (assuming they are top or center hinged). Apply a strip of clear tape along the joint line. When the aileron is returned to neutral, the tape will be invisible, and the gap will be effectively sealed. Depending on how big the ailerons are, and how large a gaping gap you normally leave when you install hinges, you could experience a 20 percent increase in aileron control response just by this simple measure.

Your first flights should be to ascertain control centering and control feel. Does the elevator always come back to neutral after a 180-degree turn or Split-S? Do the ailerons tend to hunt a little after a rolling maneuver? Put the plane through its paces. Control centering is either a mechanical thing (binding servos, stiff linkages, etc.), an electronic thing (bad servo resolution or dead-band in the radio system), or C.G. (aft Center of Gravity will make the plane wander a bit). The last possibility will be obvious, but don't continue the testing until you have isolated the problem and corrected it.

Let's get down to the task of trimming the model. Use the tachometer every time you start the engine, to insure consistent results. These trim flights must be done in calm weather. Any wind will only make the model weathervane. Each "maneuver" on the list assumes that you will enter it dead straight-and-level. The wings must be perfectly flat, or else the maneuver will not be correct and you'll get a wrong interpretation. That's where your observer comes in. Instruct him to be especially watchful of the wings as you enter the maneuvers.

Do all maneuvers at full throttle. The only deviation from this is if the plane will be routinely flown through maneuvers at a different power setting. . .

Let's commence with the "engine thrust angle" on the chart. Note that the observations you make can also be caused by the C.G., so be prepared to change both to see which gives the desired result. Set up a straight-and-level pass. The model should be almost hands-off. Without touching any other control on the transmitter, suddenly chop the throttle. Did the nose drop? When you added power again, did the nose pitch up a bit? If so, you need some downthrust, or nose weight. When the thrust is correct, the model should continue along the same flight path for at least a dozen plane lengths before gravity starts to naturally bring it down.

Do each maneuver several times, to make sure that you are getting a proper diagnosis. Often, a gust, an accidental nudge on the controls, or just a poor maneuver entry can misled you. The thrust adjustments are a real pain to make. On most models, it means taking the engine out, adding shims, then reassembling the whole thing. Don't take shortcuts. Don't try to proceed with the other trim adjustments until you have the thrustline and/or C.G. correct. They are the basis upon which all other trim settings are made.

Also, while you have landed, take the time to crank the clevises until the transmitter trims are at neutral. Don't leave the airplane so that the transmitter has some odd-ball combination of trim settings. One bump of the transmitter and you have lost everything. The trim must be repeatable, and the only sure way to do this is to always start with the transmitter control trims at the middle.

The next maneuver is somewhat more tricky than it looks. To verify the C.G., we roll the model up to a 45-degree bank, then take our hands off the controls. The model should go a reasonable distance with the fuse at an even keel. If the nose pitches down, remove some nose weight, and the opposite if the nose pitches up. The trick is to use only the ailerons to get the model up at a 45-degree bank. We almost automatically start feeding in elevator, but that's a no-no. Do the bank in both directions, just to make sure that you are getting an accurate reading of the longitudinal balance.

We now want to test the correct alignment of both sides of the elevator (even if they aren't split, like a Pattern ship's, they can still be warped or twisted). Yaw and lateral balance will also come into play here, so be patient and eliminate the variables one-by-one. The maneuver is a simple loop, but it must be entered with the wings perfectly level. Position the maneuver so that your assistant can observe it end-on. Always loop into the wind. Do several loops, and see if the same symptom persists. Note if the model loses heading on the front or back side of the loop. If you lose it on the way up, it's probably an aileron problem, while a loss of heading on the way back down is most likely a rudder situation.

After you get the inside loops going correctly, do the same maneuver to the outside, entering from an inverted position. . . Before you make too many dramatic changes, glance at the remainder of the chart and note the myriad combination of things we can do just with the ailerons. Each change you make will affect all other variables!

Note that the Yaw test is the same looping sequences. Here, however, we are altering rudder and ailerons, instead of the elevator halves. We must repeat that many airplanes just will not achieve adequate lateral trim with sealing the aileron gaps shut. The larger you make the loops (to a point), the more discernable the errors will be.

The Lateral Balance test has us pulling those loops very tightly. Actually, we prefer the Hammerhead as a better test for a heavy wing. Pull straight up into a vertical and watch which wing drops. A true vertical is hard to do, so make sure that your assistant is observing from another vantage point. Note that the engine torque will affect the vertical fall off, as will rudder errors. Even though we balance the wing statically before leaving for the field, we are now trimming it dynamically.

The Aileron Coupling (or rigging) is also tested by doing Hammerheads. This time, however, we want to observe the side view of the model. Does the plane want to tuck under a bit? If so, then try trimming the ailerons down a small bit, so that they will act as flaps. If the model tends to want to go over into a loop, then rig both ailerons up a few turns on the clevises. Note that drooping the ailerons will tend to cancel any washout you have in the wing. On some models, the lack of washout can lead to some nasty characteristics at low speeds.

The effects noted with the Aileron Coupling tests can also be caused by an improperly set wing incidence. The better test for this is knife-edge flight. . . If the model tends to pull upward, i.e., it swings toward a nose up direction, then reduce the wing incidence. If the model tries to go off heading toward the bottom side of the plane, then increase incidence.

Again, we reiterate that all of these controls are interactive. When you change the wing incidence, it will influence the way the elevator trim is at a given C.G. Reshimming the wing will also change the rigging on the ailerons, in effect, and they may have to be readjusted accordingly.

The whole process isn't hard. As a matter of fact it's rather fun — but very time consuming. It's amazing what you will learn about why a plane flies the way it does, and you'll be a better pilot for it. One thing we almost guarantee, is that your planes will be more reliable and predictable when they are properly trimmed out. They will fly more efficiently, and be less prone to doing radical and surprising things. Your contest scores should improve, too.

We wish to acknowledge the Orlando, Florida, club newsletter, from which the basics of the chart presented here were gleaned.



# MSC/RCC Christmas Banquet at Louie's on the Lake

(buffet style)

Saturday, December 8, 1990  
Cost: \$10.00 per person



6:30 PM Cash Bar  
7:30 PM Dinner

\* only 100 tickets will be sold! \*

Entree Selections: (Note! only one Seafood and one Meat Entree will be available at the banquet, the choices being determined by the results of the most popular selections entered on the registration form below.)



Seafood:

- Popcorn Shrimp
- Fried Catfish
- Blacked Redfish
- Shrimp Creole
- Trout Almondine
- Broiled Trout with Capers and Cream
- Seafood Newburg
- Seafood Au Gratin
- Seafood Florentine

Meat:

- Brisket of Beef Au Jus
- Braised Sirloin Tips
- Sirloin Diane
- Beef Stroganoff
- Chicken Fried Steak
- Bar-B-Que Baby Back Ribs
- Ham Steak
- Chicken Cordon Bleu
- Chicken Kiev
- Chicken Marsala
- Chicken Picatta



To attend, please fill out this registration form and send it to Dave Hoffman at 130 W. San Augustine Deer Park, Texas 77536



Name \_\_\_\_\_

Number in Party: \_\_\_\_\_ Amount Enclosed: \_\_\_\_\_

Seafood Selections (choose 2) \_\_\_\_\_

Meat Selections (choose 2) \_\_\_\_\_

\*\*\*\*\* WORD FIND PUZZLE \*\*\*\*\*  
 BY DAN HAMALA

SKY	R.C. SPECIAL
CAP	COLLECTIVE
CANOPY	LOOP
M.A.H.	SWITCH
BACKPLATE	TX
PLUG	HELLCAT
BLUE	PYLON
FLIGHT	FLIP

PEHBGAMPVCFIGHO  
 ANTULMQBOGATEWF  
 CRXBJUHINODLKPL  
 OSCLMWEAFILNALI  
 DATSUFLOQCYKPOG  
 IMAJPMCCABIVGCZ  
 LZA OHETTONAMEOT  
 BOGHOKCKJLECBLN  
 FLIPOOBIUTHGILF  
 SHTULPWPAVOCAEM  
 CWFLIYOLALZHBCP  
 CPIDCBPUVQDIDTD  
 ABLTEKIGUONIMIT  
 NOMUCLQLLOPWXVB  
 OWAAOHBOLPVSREM  
 PJB IJNUYMBLLKQK  
 YZDAC KPLATFE OYG

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 Words may be found: down, up,  
 forward, backwards, or diagonally.  
 HAVE FUN !!!

*The R/C Flyer*

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