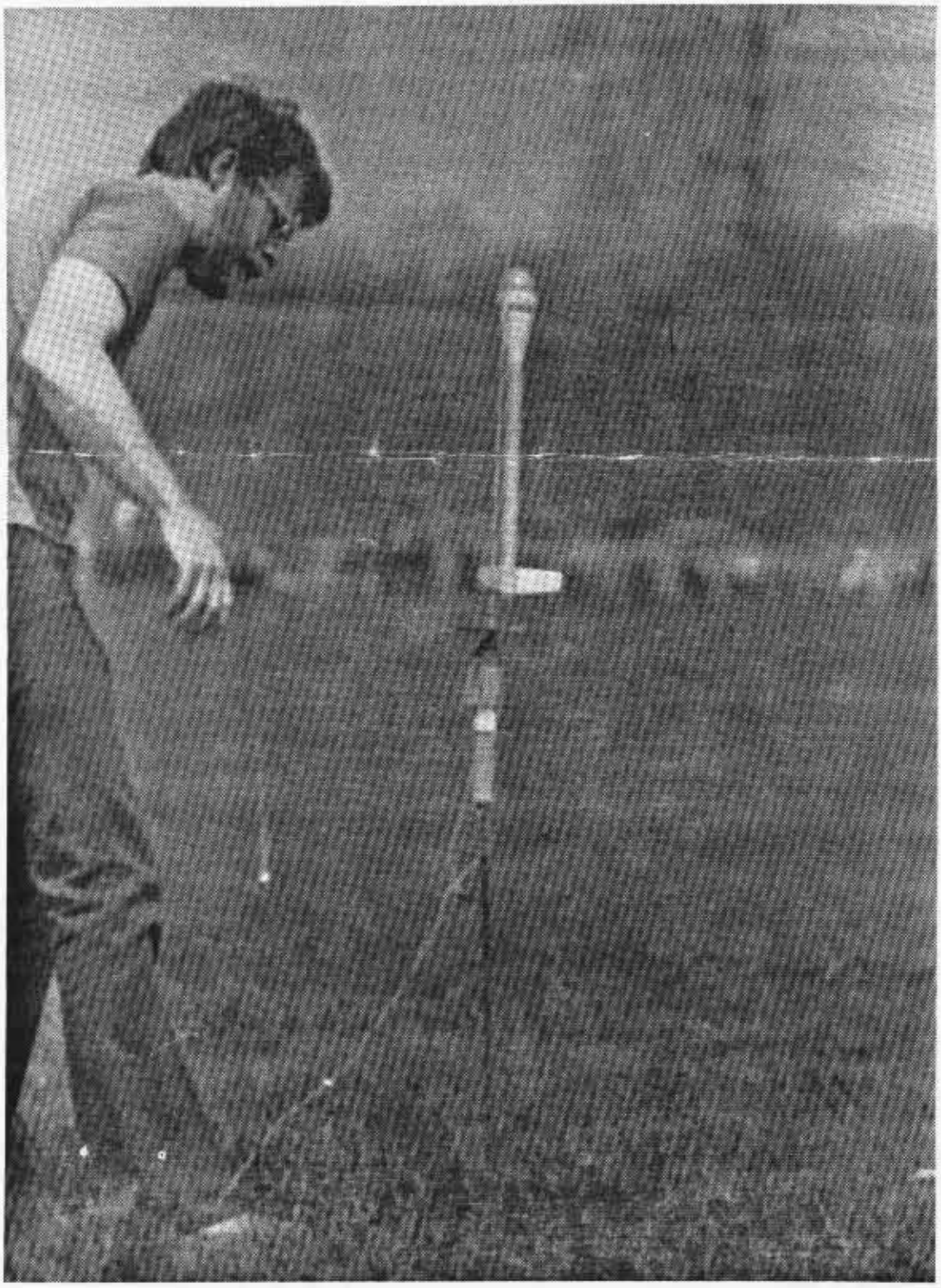
THE LEADING EDGE



JULY-AUGUST 1984 VOLUME 7 NUMBER 4

UNCLASSIFIED ADS

ATTENTION NIRA MEMBERS!!!

If you have anything you wish to sell, trade, give away or if you a service to provide, you can now advertise it in the LEADING EDGE'S UNCLASSIFIED ADS. There is no cost to you as a NIRA member. And ads may run as long as necessary. To place an ad, contact Richard Gaff, Editor.

ESTES KITS FOR SALE

Saturn V	$35.00
Omega	$12.00
Asteroid Explorer	$ 4.00
Galactic Taxi	$ 5.00
Sky High	$ 4.50
F-61 Star-Fighter	$ 4.00

All are unopened. Call or write:

Larry London
1811 Lawrence Lane
Highland Park, IL 60035
Phone: (312) 831-5370

"Hey . . Go in there and talk to them . . . you're just what they're looking for!"

FOR SALE
PLASTIC MODEL COLLECTION

I have over 50 plastic model kits I wish to sell. Most are convertible to fly. Some are old collectors items. Mostly jets, scale model and science fiction models. Too many to list here, so write, call or ask me for a complete list. See Ric Gaff (address below.)

FOR SALE --- OLD MOTORS

What happens to rocket motors when they go out of production? or the company folds? Why, they become valuable collector's items! I have a number of out-of-production model rocket motors that are surplus to my own collection. Start or add to your collection with some of the bargains I've got for you! Centuri and MPC mini-B's, MPC and Cox D's just to name a few. A complete list is available. See Ric Gaff (address below).

FOR SALE
MICROPROCESSOR COURSES

Heathkit microprocessor courses with completely wired trainer and expansion accessory. Voice synthesiser courses. List prices over $1000; yours for $500. I will negotiate and/or break up set. Courses are 6800 based. See Ric Gaff (address below).

For any of the above items write or call:

RICHARD GAFF 331 Third St. Northfield, IL 60093 (312) 724-2975

T MINUS

MONTHLY NIRA MEETING Aug. 3
G.E. Civic Center 7:30 PM
VERY IMPORTANT!!!
VERY IMPORTANT!!!
PLANING FOR LABOR DAY LAUNCH
Posters to put up in local businesses will be available. Also planning for Fall Contests. Last chance to hitch a ride to NARAM-26

CLUB LAUNCH Aug. 12
Ackerman Park 2:00 PM

CLUB LAUNCH Aug. 26
Ackerman Park 2:00 PM

SHOOTING STAR 9 Open Meet
SEPT 1-2, TOMAH, WI.
1/2A PD, A HD, B PAY, PM, 1/2A SD, B RG, C SR ALT, A I BG (no flex). Contact: Jim Zingler, 324 W. Milwaukee, Tomah, WI 54660. Bunny, Bob and Ric also have info. Call 724-2975 or 475-5048.
NIRA WILL COMPETE HERE FOR CLUB POINTS!!!

LABOR DAY LAUNCH Sept. 3
Newton Park 2:00 PM
Be there by no later than ONE PM!! We need you to help set up and get ready. Bring only your best models.

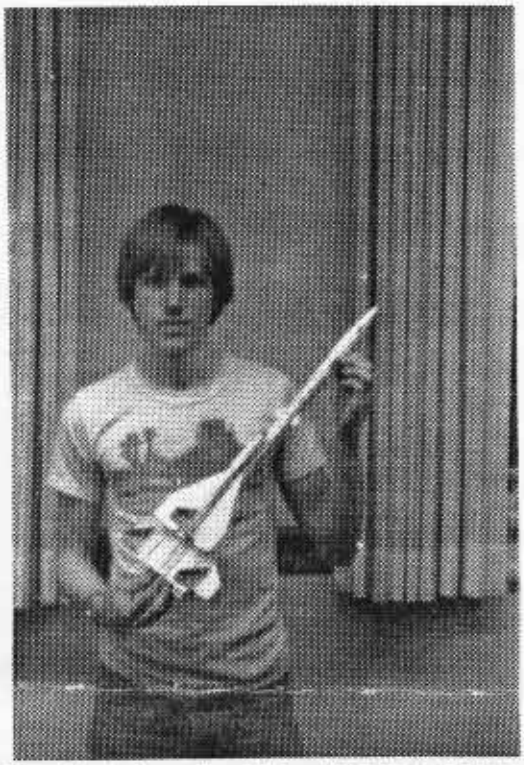
MONTHLY NIRA MEETING Sept. 7
G.E. Civic Center 7:30 PM
VERY IMPORTANT!!!
VERY IMPORTANT!!!
WELCOME NEW MEMBERS FROM THE LABOR DAY LAUNCH
Help explain the fun and excitement of NIRA to the new kids on the block.

CLUB LAUNCH Sept. 9
Ackerman Park 2:00 PM
Help welcome the newcomers from the Labor Day Launch to a more normal (?) launch.

CLUB LAUNCH Sept. 23
Ackerman Park 2:00 PM

MODEL OF THE MONTH WINNERS

The Model of the Month Winner for June is Henry Veldenz and his plastic model conversion. Congratulations, Henry!!



The Model of the Month Winner for July is Tim Marcy and his Estes Orbital Transport. Congratulations, Tim !!!

LEADING EDGE STAFF

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HALFTONES - Tom Pastrick
MAILING LIST - Bob Kaplow
TYPIST - Mark Bundick

THE LEADING EDGE

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GETTING STARTED IN BOOST GLIDE.

IT AIN'T AS HARD AS IT LOOKS!

CONTINUING IN BOOST GLIDE
or, "It's a Bit Harder Now."
by Bunny

Advanced Trimming

Last issue, we finished up all our primary glider training. Now you should have some idea of how these things work, and have probably got a couple of good flights and good crashes under your belt. You're ready to move on. Our first article will deal with trimming, and how to get better at it. As I said last time, trimming your glider is a lot of fun. In fact, we used to have hand-launched BG contest at my old club's launches. Trimming does take patience though. But a few simple principles will help you through.

Think of your glider as a see-saw or tetter-totter. The balance point is the center of the see-saw, the wing is a "weight" or "person" on one end, and the stab is the other. All ou have to do is balance the see-saw for a stable glide.

We balanced things before with clay weight. It works OK assuming the glider has a stable design and most gliders are. By putting clay weight on or taking it off, you are really altering the stability margin of the model. This will result in a flat stable glider, but it sacrifices glide performance. You can increase your times and get rid of dives and/or stalls with a more efficent method.

The secret to effective glider trimming is to set a balance point that gives you a stable machine, then warp all the flying surfaces, wing, stab, rudder, to get a flat glide.

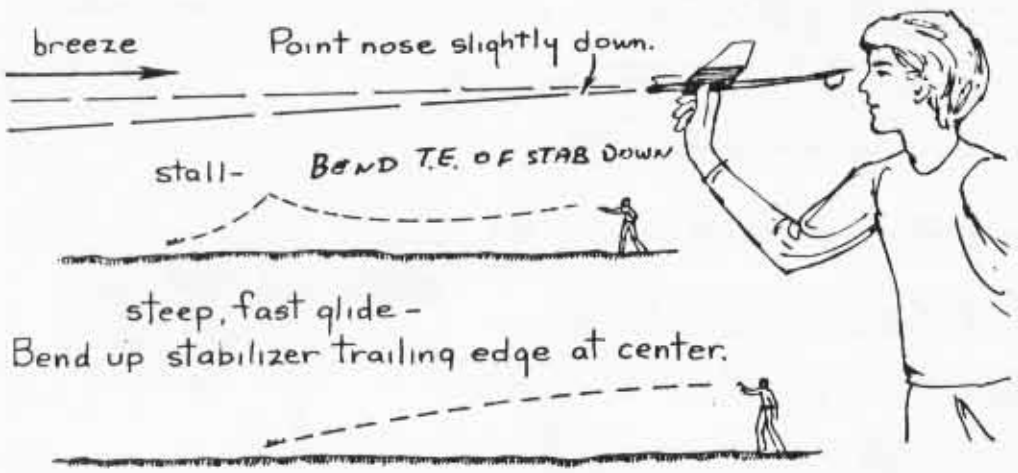
To begin, find your glider's **neutral point**. This is actually the same as the center of pressure for the glider. While there are formulas to help you do that, there's a simpler way. Wait for a day with a stiff breeze. Go outside with our glider and hold it pointing the nose straight up. Now try to balance the glider with one finger so that the breeze pushes the glider onto your finger. Keep moving your finger up or down along the boom until it wants to stay vertical. The point at which your finger is located is approximately the neutral point.

If your glider is stable, any CG location in front of the neutral point will be OK. It's smart to leave a good static stability margin, say between 10 and 30% of the root chord. Use clay to get the glider to balance ahead of the neutral point.

Now, take your glider to a grassy area. Point the nose of the glider at a point about 20-30 feet in front of you and give the model a gentle toss. Do this five or ten times to get an idea of what the model wants to do. Watch for stalls and dives.

If the model stalls, you want to force its nose down, right? So do what I do with controls on the full-sized Cessnas. Bend the trailing edge of the stab DOWN. Like so: /------. Don't go hog wild. A little bending goes a long way.

If you get a dive, bend the trailing edge of the stab up,



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MITCON XVII

OR

"BACK TO BASICS"

"Mellow" was the word for MITCON-XVII. There was much less of the hightech atmosphere that MITCON had been noted for and more of a friendly get together. This was mostly due to the small turnout of about 25 rocketeers. Friday evening saw Bob Tycot giving the keynote address, titled "Back to Basics". Following his short talk was the instant kitbash contest. A drink and nosh party then gave the attendees a chance to get to know one another. I had a reunion with a fellow DEC employee, Gary Hughes. I last saw him as the interperter half of the Austrailian 1980 WSMC team. He has been transfered to the States and we should be seeing more of him at rocketry activities soon.

Notably absent from this year's MITCON were any entries in R&D. This seems to follow the trend in R&D at the NARAM. I still remember my first MITCON six years ago; there were at least a half a dozen entries in R&D. It is most unfortunate that the increase in technology available to the model rocketeers has not produced the increase in Research and Development that this hobby needs for its growth. There also weren't any entries in 1/2 A RG or static spacemodeling, and few entries in the photo contest.

Landis and Flynn with their "Instant Space Shuttle". At least they got all its engines lit!

Saturday morning started with the launch. It featured many dull kitbash models and only three entrants in the B standard streamer duration event. The only noteworthy flight was the Flynn/Landis

Jake Kane prepares to static test an engine. Why is he smiling? Maybe he enjoys his work!

Space Shuttle. A meter tall, the model was hotwired out of foam, complete with external tank and SRB's. Geoff flight converted it during the instant kitbash session. When finally launched, it rose slowly in a scale-like manner under the smoke of a D12 and two C6's, reaching an altitude of about 4 meters. It then began its RTLS maneuver, (That's "Return To Launch Site" for you folks not in the know. - RG) landing right next to the pad.

There were only a couple of discussion groups at any one time; thus I didn't have too many choices to make. First up Saturday was Geoff Landis, with a good introduction to model rocket flight analysis. He managed to cover a lot of technical material without losing everyone in the math. (Are we talking about the Geoff Landis I know? - Bunny) Next up was an impromptu slide and video type presentation by John Langford on **Monarch**. **Monarch** is the MIT human powered airplane that eventually won the Kremer Speed Prize. At the time, Monarch had demonstrated the speed, 20+ MPH, and turn ability to win, and the team was waiting for improving weather.

A combined session, with Bernie Biales talking about airfoil selection, and Mark Drela, demonstrating advanced construction techniques, was next. Bernie's group talked

MITCON XVII

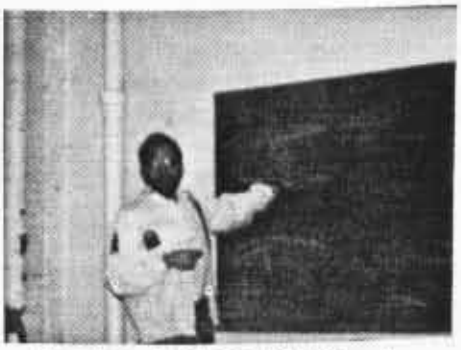
OR

"BACK TO BASICS"

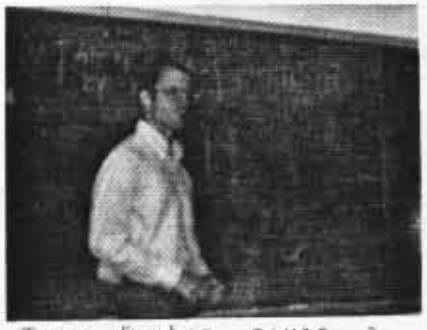
about airfoils for rockets as well as BG's. Mark Drela is an expert indoor hand launched glider builder and flyer. He has brought composite structures into the hobby, setting US records in the process. His use of carbon fibers have applications in BG and RG events. The carbon fibers are laid criss-cross the balsa grain if increased torsional strength is needed (e.g., in supersonic fins) and parallel to the grain to reduced bending (e.g., booms) is the goal. Attachment is with Ambroid's cement, thinned 50% with acetone. Both sides must be covered to have any increase in strength.

Art Rose talked about helicopter models and the effects of different rotor shapes on model performance. The best of three shapes tested was a constant L/D model. The blade is pitched at -90 degrees in the center, increases to zero at 50% of span, and has +4-6 degrees at the tip. Art also found that sink rate didn't depend on the aspect ratio of the blades, but that RPM did. Trip Barber finished up with a session on high power rocketry, discussing engine technology, supersonic flight and safety.

The Standards and Testing Test Cell session was held twice, and I skipped it,



Bernie Biales gives a lecture on airfoils for gliders and supersonic!



Trip Barber gives a lecture on High Powered Rocketry.

having seen it at previous conventions. I instead followed Trip Barber and MITRS members over after the convention. Trip test fired two Aerotech G motors to obtain data for the NAR Blue Ribbon Panel on high powered rockets. Within the 62.5 gram propellant limit, one can make a G motor of about 125 NT-sec. Both motors, a G25 and a G125 were right at that limit. The G25, a "moonburner" with a grain down the side of the motor, had a peak thrust at 1/2 second, a flat power range for the next three seconds, and a taper down to zero at 5 seconds. The G125 was a typical core burner, but with a roar so loud, Trip jumped at ignition. The thrust was so strong that smoke blew through the door of the test cell. Maximum thrust was about 160 newtons, enough to loft even the fattest cat. Complete results of the studies will be presented to the Trustees at NARAM.

All in all, a fine old convention. Be there next year, and bring your R&D report.

Bob Kaplow

PORTRAIT OF THE LATE NIGHT BUILDER

You know a modeler has had an all-night building session when:

1. He's wearing odd combined colors of "nail polish" on only one hand.

2. His fingers are glued together.

3. His fingers are glued to model.

4. He doesn't leave finger prints.

5. He has a huge balsa dust dandruff problem in his hair.

6. He yells if you approach his plastic or scale model because it's still wet. (Note: decals have already been applied.)

7. He has a white powder all over his shirt and pants.

8. He tells bad puns or jokes. (Note: excluding a person with the initials "RG", who always tells bad puns or jokes.)

9. He has fluorescent red or orange nose hair.

10. He has silvery material stuck to the bottom of his shoes.

Now that you know the disgusting symptoms of late night building, I am confident you will do your best to avoid this contagious virus by building all your models a month in advance.

Larry London

ISSUES OF HIGHPOWER--

ONE TRUSTEE'S VIEWS

by Bunny

For the past 18 months, the political issue within the NAR has been high power rocketry. Only now is the NAR really coming to grips with the issue. The next few months will see the formulation of an operational NAR policy on the "proper" place and limits of high powered rocketry. I'd like to offer one trustee's prospective on these issues. I'd also like to receive feedback from NAR members during NARAM-26 about these issues.

The first issue concerns the illegal manufacturer and shipment of motors not meeting the DOT requirements for shipment. Both the NAR and high power community agree. The illegal sale and shipment of model and amateur rocket motors cannot be tolerated and must be stopped at all costs. Letting a few irresponsible people jeprodize our freedom to fly rockets would be folly on the part of the NAR.

From here on, the issues become more muddled. Should the HIAA-NAR Safety Code, NFPA 1122, DOT shipping regulations and the Federal Air Regulation be raised to "legalize" G and larger engines and rockets over 16 ounces, and allow such activities to be classed with model rockets?

The Board, asks a simple question. Do such changes significantly increase the probability that an average consumer will be hurt or killed in a model rocket accident? The answer is currently unknown, but Trip Barber's special committee is gathering computer simulation data on the flight characteristics of such models. I am convinced that Trip's study will stop the casual, totally unscientific debate about the relative safety of these vehicles. ("I know it's safer, because bigger models, even with an F, move slower than a model rocket with a B.")

Issue number three: should the NAR expand its service offerings to meet the high power market needs? Debate here has been understandably murky. Until the Board reaches some conclusion about the safety, it's hard to design new services or open up old ones to high power people.

Unfortunately, time waits for no trustee nor high power person. Illegal rockets continue to be flown, and the use of uncertified motors promoted. There are certainly some responsible people flying what I call amateur rockets, and it might be nice to have them involved in NAR activities. However, there are some equally irresponsible people doing some incredibly stupid things that are bound to cause an accident. What sort of impressions have the discussions and activities created within the Board?

The vast majority of the trustees, in my opinion, have no strong feelings in the matter. They view the activity as a minor part of the hobby spectrum. They're concerned over the safety issues, and will probably base most of their policy decisions on the outcome of our safety study.

The rest of the Board is split into two camps. The first group sees high power rocketry as a possible adult retention tool. They want to standardize all government regulations, regardless of what agency, and have them adopt the same definition for a model rocket and model rocket motor. The final group, of which I am a member, is nervous about the inclusion of high power activities within the NAR and within the NAR supported regulatory environment.

"THE VAST MAJORITY OF THE TRUSTEES, IN MY OPINION, HAVE NO STRONG FEELINGS IN THE MATTER."

Aside from the safety issue, the key factor for me is the viability of the high power market. Is the "market" big enough to matter, or is it too limited to have a substantial impact on the NAR membership and the long term potential of the organization? The activity takes a large flying field, has a small, little known set of manufacturers with currently limited distribution capabilities, and is considerably more expensive than model rocketry.

I'm generally unimpressed with the administrative capabilities of the people involved in this activity.

ISSUES OF HIGHPOWER-- ONE TRUSTEE'S VIEWS

They can organize but a single event a year. Their publications are spotty, and concentrate on the "gee-whiz-isn't-this-neat" aspects. I'm still looking for the supposed technical achievements possible with higher power engines, or the Mach 2 flights that are possible.

I spent a weekend discussing these issues and the NAR's position with these folks, and got a cordial reception. But since then, there's been no follow up. I find that amazing. If you were on the "outside" of the NAR's political structure, and had an "in" to the decision making body, wouldn't you use every one you had? Aside from some spotty phone calls to Pat Miller, the high power community has not taken advantage of its opportunities to plead its case. The distinct impression is that the average high power person doesn't see any benefit to the NAR's involvement in their activities, isn't interested in "unification" of the two groups, and isn't demanding NAR services.

When you're involved in an organization with few resources, you have to be careful to select the most important and meaningful activities to work on. We trustees should direct your money, volenteer time and most importantly, our people at problems and issues that affect the greatest number of current and potential NAR members.

When you look at the total picture of high power activities you see safety questions, a small number of people, an activity needing specialized resources, and a group with little administrative talent. If you think the future of the Association lies in increased revenues, a better retention rate and membership levels above 5,000, the rational NAR manager must seriously question the wisdom of pursuing the high power market.

GETTING STARTED IN BOOST GLIDE.

IT AIN'T AS HARD AS IT LOOKS

like so: \------. Again, do so gently, and in small amounts. Both these adjustment alter the stab's lift, and so affect the see-saw's balance.

If your glider isn't tissue covered, breathe on the wood before you try bending it. Moistened wood will bend much better. If you did tissue cover the model, you can skip this step and start bending to your heart's content.

Assuming you've stopped the diving or stalling, you may be left with some other problems. If the glider wants to turn sharply one way or another, you must find some way to hold the wing on the inside of the turn up. Again, follow the example of full sized airplane, and warp the wing.

Let's say you have a sharp turn to the left. The left wing will be on the inside of the turn. If you bend the trailing edge of the left wing down, more lift will be created on the left wing. The wing will be held up by the additional lift, and the turn will flatten out. bending down of the edge is called **"washin'**

If you want more decrease the washin, or the trailing edge of the w up. This is called **"washout** If the turn is so severe tha washin or washout is not helping, look for a rudder misalignment. Rudder misalignment is super for starting and sustaining spiral dives. If a glider "expert" tells you to bend the rudder to induce a turn, forget it. The "expert" doesn't know which end of the model is up.

A far better way to induce a good, gentle turn into a BG or RG is to use **stab tilt.** The next time you build a BG, try putting on the stab so one tip is 1/16-1/8" higher than the other. This construction misalignment vectors the stab lift out toward one side, and the model turns as a result. Gliders will turn towards the higher tip of the stab (e.g., right tip higher than left results in a right turn).

If you can find a model airplane hand launched glider (HLG) flyer around you, you're in luck. The princples outlined here are the basics of HLG trimming. MOdel airplane guys ahve been at it for 40+ years, so tap in on their experience. Try experimenting with an older glider, too. Unless you try this stuff, you'll never incorporate it into your glider flying.

We'd like to hear from you about other topics to cover in this series. We're thinking about tissue covering, wood selection, thermal hunting, and advanced design formulas. Let us know what'd you'e like, and until then, fly REAL gliders!!! Happy thermals!

MIDCON-84

RIC GAFF

According to all reports, this year's MIDCON was not as good as last year's. Unfortunatly, the convention was hamstrung by the last minute loss of a number of speakers, including our own Bunny. This made the convention schedule a little light. Be that as it may, there were some good talks given.

Saturday morning started with Vince Bonkowski's talk on **Static Spacemodeling** and **Fantasy Spacemodeling.** Vince has been quite active the last few years promoting these two activities in the NAR. The man is a great modeler! The models he had as examples of his art were superb. Several large and highly detailed spaceships were good enough to be in the movies (Return of the Midcon? NAHHHH!). Vince's secrets? Time, patience and a stock of cheap plastic models for material.

Gary Flatt answers a few questions after his talk.

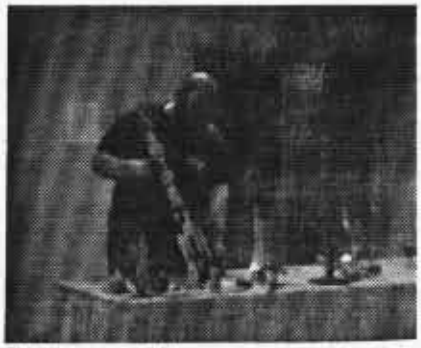
Two conventioneers check out the outsized HPR Polaris and Mark

Gary Flatt gave a talk on **Model Rocket Electronics.** It dealt slightly with launch systems but was primarily concerned with telemetry. Several circuit diagrams were shown. Gary also displayed a transmitter he is currently working on. The most interesting part was discussion concerning the use of the LM1871 and 72 radio control chips for telemetry. This idea, unfortunaly, is much talked about and not much else!

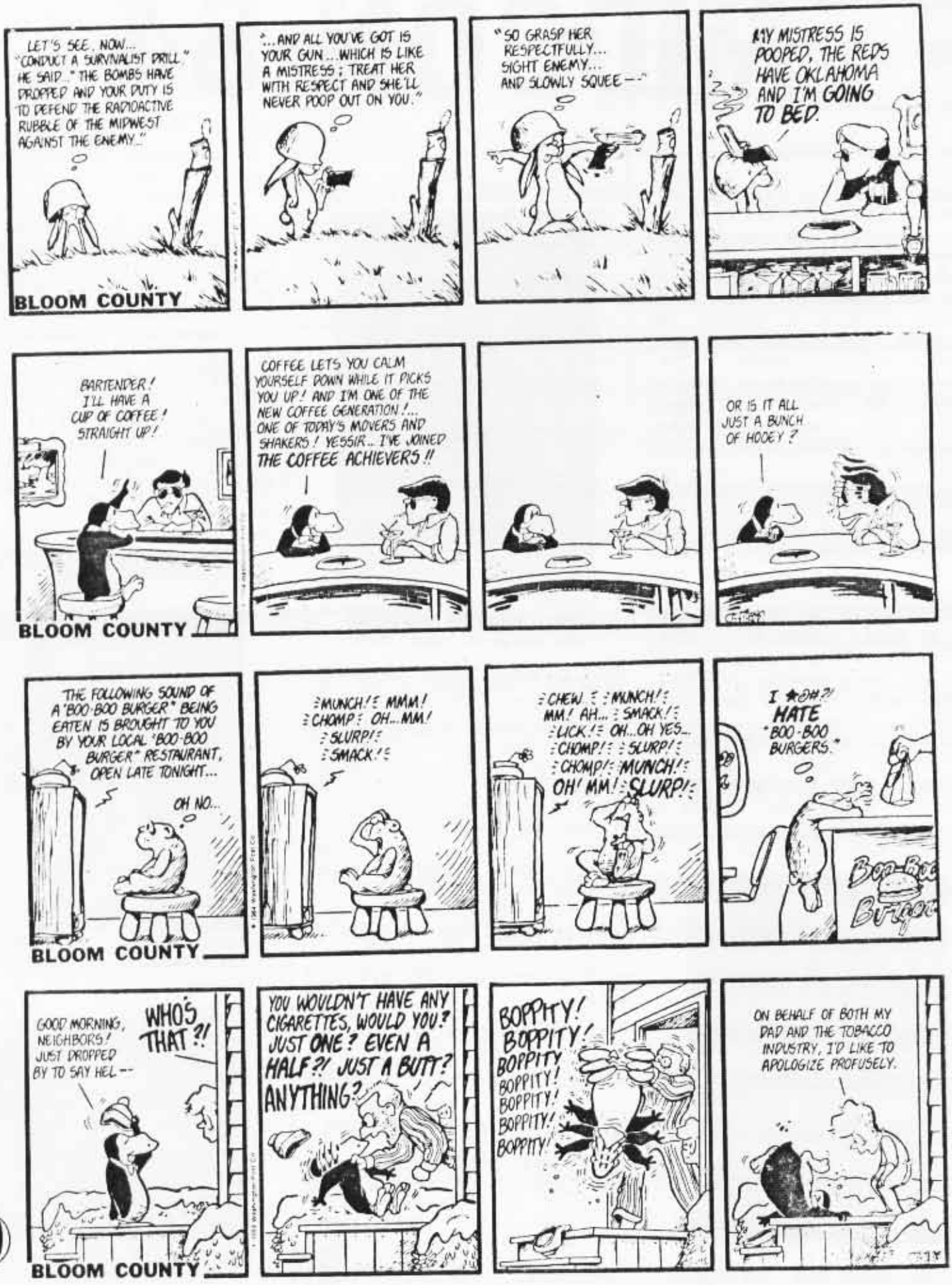
Sam and Joe Phillips gave several talks on high (eg. non-model rocket) powered rocketry. I'm not a big fan of HPR, but Sam and Joe have a pleasant presentation style that makes them watchable. I even picked up a few good ideas.

MIDCON-84 was history by noon Sunday and ended with an awards presentation. Donated prizes were given for most club attendence (won by SNOAR with more than 6 members) and a patently rigged photo contest (Sour grapes, Gaff! - Bunny). While this was not the best convention I've ever attended, I can say that I did basically enjoy it and it holds promise for the future.

Part of Gary Flatt's electronic rocketry group.



Vince with some of his impressive static models.


LET'S SEE. NOW... "CONDUCT A SURVIVALIST DRILL," HE SAID..." THE BOMBS HAVE DROPPED AND YOUR DUTY IS TO DEFEND THE RADIOACTIVE RUBBLE OF THE MIDWEST AGAINST THE ENEMY..."
BLOOM COUNTY
"...AND ALL YOU'VE GOT IS YOUR GUN...WHICH IS LIKE A MISTRESS; TREAT HER WITH RESPECT AND SHE'LL NEVER POOP OUT ON YOU."
"SO GRASP HER RESPECTFULLY... SIGHT ENEMY... AND SLOWLY SQUEE—"
MY MISTRESS IS POOPED, THE REDS HAVE OKLAHOMA AND I'M GOING TO BED.
BARTENDER! I'LL HAVE A CUP OF COFFEE! STRAIGHT UP!
BLOOM COUNTY
COFFEE LETS YOU CALM YOURSELF DOWN WHILE IT PICKS YOU UP! AND I'M ONE OF THE NEW COFFEE GENERATION!... ONE OF TODAY'S MOVERS AND SHAKERS! YESSIR... I'VE JOINED THE COFFEE ACHIEVERS!!
OR IS IT ALL JUST A BUNCH OF HOOEY?
THE FOLLOWING SOUND OF A "BOO-BOO BURGER" BEING EATEN IS BROUGHT TO YOU BY YOUR LOCAL "BOO-BOO BURGER" RESTAURANT, OPEN LATE TONIGHT...
OH NO...
BLOOM COUNTY
:MUNCH!: MMM! :CHOMP: OH...MM! :SLURP!: :SMACK!:
:CHEW: :MUNCH!: MM! AH... :SMACK!: :LICK!: OH...OH YES... :CHOMP!: :SLURP!: :CHOMP!: MUNCH!: OH! MM! SLURP!:
I ★@H?! HATE "BOO-BOO BURGERS."
GOOD MORNING, NEIGHBORS! JUST DROPPED BY TO SAY HEL— WHO'S THAT?!
BLOOM COUNTY
YOU WOULDN'T HAVE ANY CIGARETTES, WOULD YOU? JUST ONE? EVEN A HALF?! JUST A BUTT? ANYTHING?
BOPPITY! BOPPITY! BOPPITY BOPPITY! BOPPITY! BOPPITY! BOPPITY!
ON BEHALF OF BOTH MY DAD AND THE TOBACCO INDUSTRY, I'D LIKE TO APOLOGIZE PROFUSELY.

TRANSITION

a Parachute and Streamer Duration model designed, built and flown by Craig Beyers, Annapolis, MD

Craig Beyers won _ International SD at NARAM-23 with three maxes, the only contestant to do so. At first glance, the winning model isn't anything to write home about, but closer examination shows an interesting method of attaching the external shock cord that makes for a novel way to reduce drag as well.

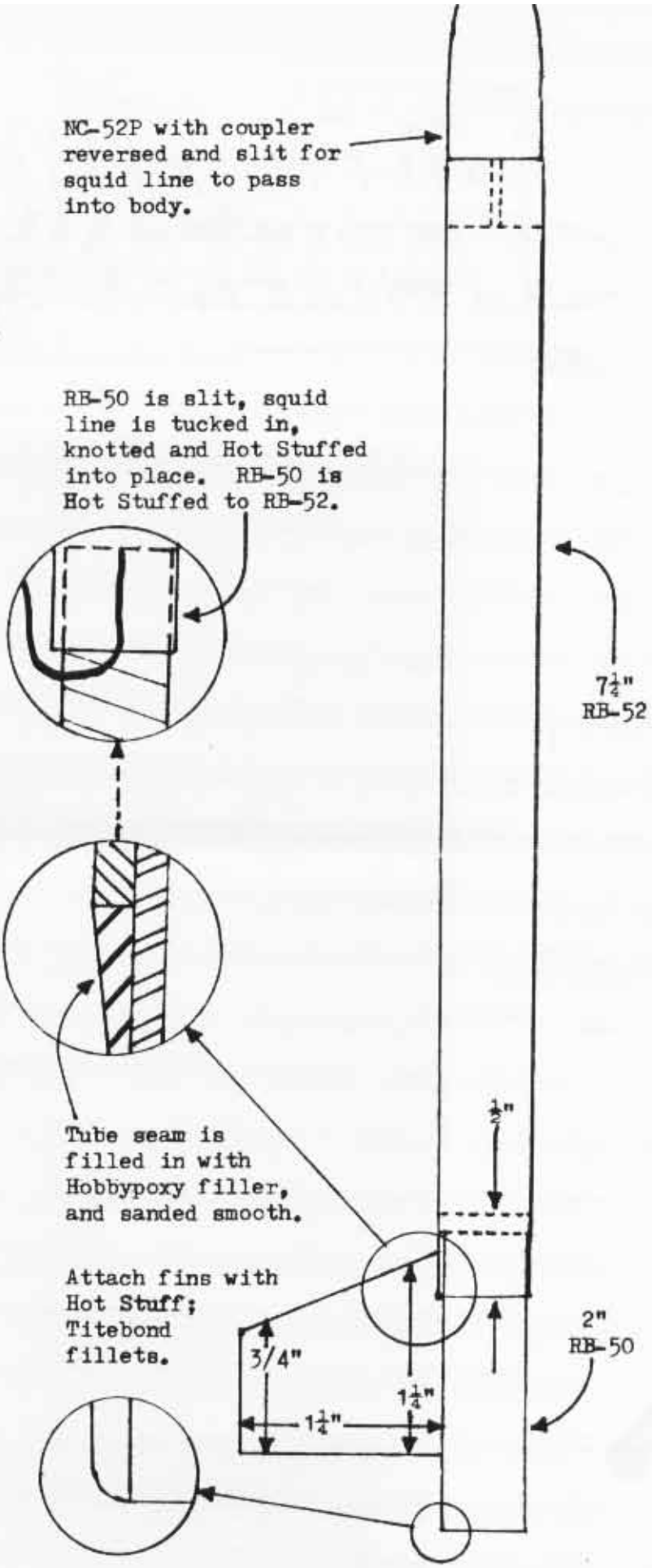
About 20" of 30# squid line is attached to the RB-50 engine mount. The mount is inserted ½" into the main body of RB-52, then the joint is sealed with Hobbypoxy Filler and sanded smooth.

The fins are 1/16" balsa airfoiled and finished with the same Hobbypoxy Filler. The model was painted with Krylon orange red.

For recovery, Craig used a 4x40 Sykos streamer of light yellow tracing paper. If PD is your game, he recommends either a ½ mil dry cleaner or mylar chute, 18" in diameter, with 24" shroud lines. Power your finished "Transition" with a ½A3-4t and fly from a tower.

PARTS LIST

7¼" RB-52 tubing
2" RB-50 tubing
1/16" soft balsa
NC-52P plastic nose cone
30# squid line
1/8" engine block
4x40 tracing paper streamer
Hot Stuff
Titebond
Hobbypoxy Filler
spray paint



GLEN ELLYN TOY
AND CARD SHOP

(Sorry, TooBusy building For NARAM to be Funny, R.G.)

RIC GAFF
331 THIRD ST.
NORTHFIELD IL
60093