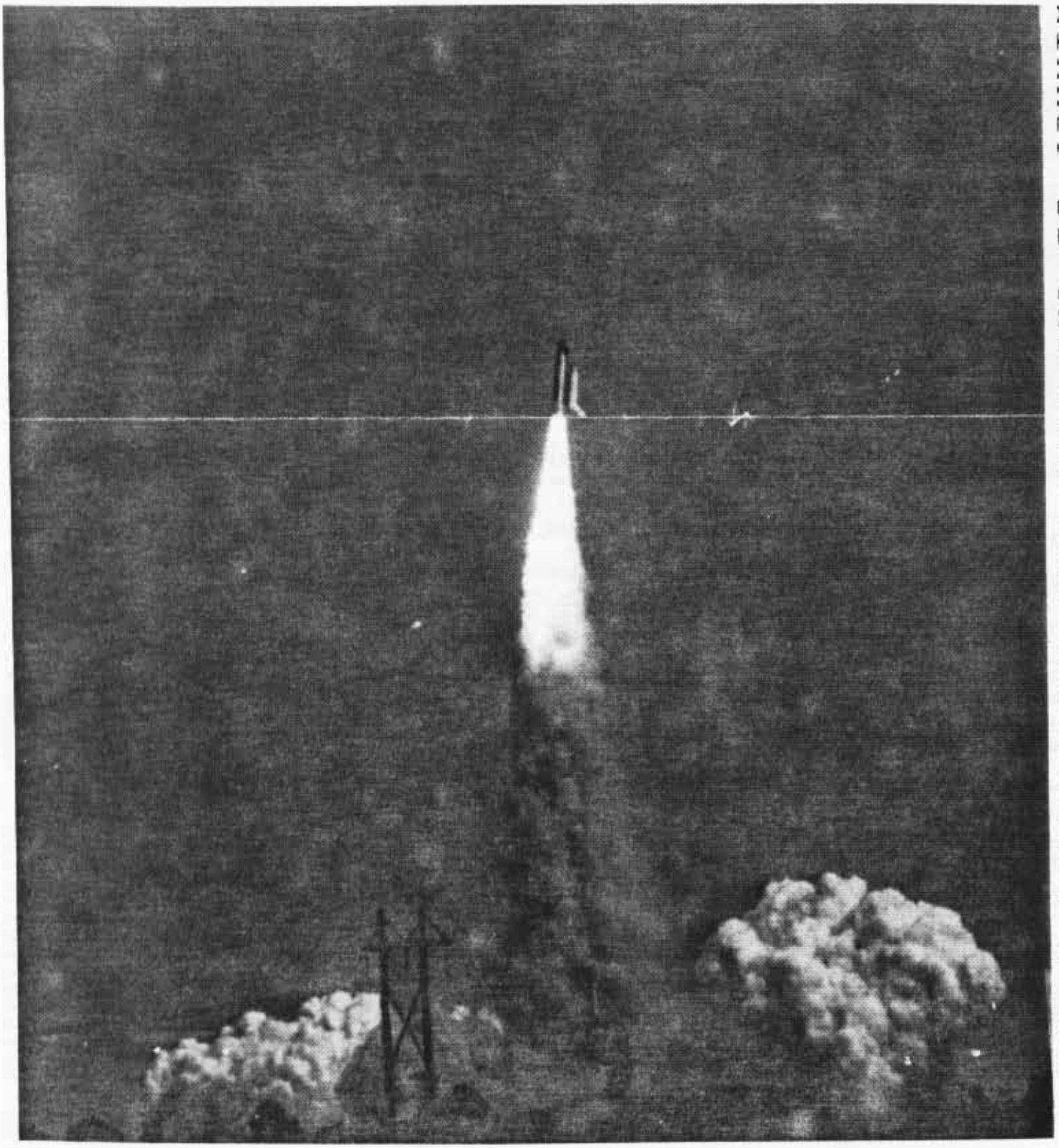
THE LEADING EDGE

MAY/JUNE 84 VOLUME 7 NUMBER 3

Winner of the 1982 LAC Newsletter Award



UNCLASSIFIABLE AD'S

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
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List - $29.00 each
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FOR SALE
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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).

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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 1

CLUB LAUNCH	May 13
Ackerman Park	2:00 PM
SECTION MEET	May 19 20
Ackerman Park	9:00 AM
OPEN MEET	May 26/27
Bong Field, WI	9:00 AM

MONTHLY NIRA MEETING June 1
G.E. Civic Center 7:30 PM
Competition strategy meeting for fall. We will also review our competition meet progress to date.

CLUB LAUNCH	June 3
Ackerman Park	2:00 PM
OPEN MEET	June 9/10
Bong Field, WI	9:00 AM
SECTION MEET	June 24
Ackerman Park	9:00 AM
OPEN MEET	June 31/July 1
Bong Field, WI	9:00 AM

MONTHLY NIRA MEETING July 6
G.E. Civic Center 7:30 PM
Begin planning for Annual Labor Day Launch. We will also make arrangements for NARAM 26 travel plans.

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SECTION MEET EVENTS Sport Scale, 1/2A IBG, 1/2A PD, B ISD, C Egg. Dur., Open Spot Landing.

OPEN MEET EVENTS Sport Scale, 1/2A IBG, 1/2A PD, A SD, 1/2A RG, D Egg. Dur. Predicted Duration.
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MODEL OF THE MONTH WINNERS

The Model of the Month Winner for March is Jim Hogue and his scratch-built X15. Congratulations, Jim!!!

The Model of the Month Winner for April (Under 18) is Larry Mika and his scratch-built Nike-Tomahawk. Congratulations, Larry!!!

The Model of the Month Winner for April (Over 18) is Henry Veldenz and his Centuri Saturn 18. Congratulations, Henry!!!

LEADING EDGE STAFF

EDITOR - Ric Gaff
HALFTONES - Tom Pastrick
MAILING LIST - Bob Kaplow
TYPIST - Mark Bundick

COVER PHOTO: What could I add? (RG)

THE LEADING EDGE

is published bimonthly by and for members of the Northern Illinois Rocketry Association, NIRA, NAR Section 117, and is dedicated to the idea that Model Rocketry is FUN! Membership dues are $3.00 per year and include a one year subscription to the Leading Edge. Non-member subscriptions are available for $2.00 per year. All membership and subscription fees should be sent to Bob Kaplow, 1628 Waterford Lane, Palatine, IL 60067. Articles, plans, other newsletters and news items of interest should be sent to Ric Gaff, Editor, 331 Third Street, Northfield, IL 60093. Any material in the Leading Edge may be reprinted if proper credit is given.

CONTRIBUTORS

MARK BUNDICK
LARRY MIKA
MARK SCHMITT

MARCH CLUB LAUNCH
by Larry Mika

The club diehards showed up for this wet, windy, and winter cold launch. The Gabrius family was already packing it up when the rest of us arrived. They didn't realize that 2:00 PM really meant 2:30 PM!!! (Since when? - Bunny) They decided to hang around to watch some good flight and excellent prangs. (See? I knew misery loved company! -RG)

Bob Smith catoed a C in his **Big Bertha** as it left the pad. Larry Mika sent up his B ISD model for a stable flight and a landing in the church parking lot. He then tried his **Rainbow** 3 1/2 A BG for a decent flight and another long drift. Tom Pastrick picked a monokoted ring tail model out of his box and lofted it for another religious recovery. He also tried an A RG slide wing that didn't slide. It broke the boom into three pieces when it hit. "Figure out what went wrong and win a cupie doll!" Paul MikKila shot up a prang shortened **Satellite Interceptor** with a rubber Corsair Kiddie glider tied on to the tail. It went off at a weird angle, so it was hard to judge the glide performance or lack thereof.

Paul Mikkila and his strange B/G!

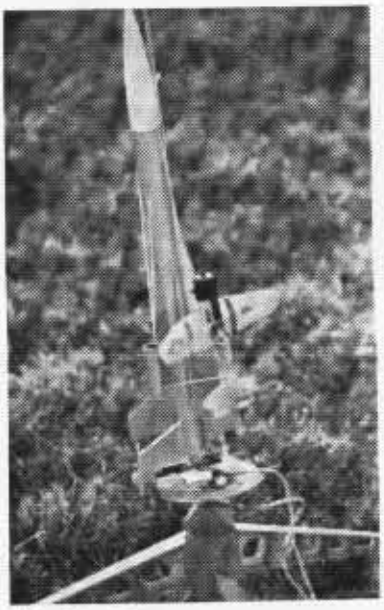
Craig Dudek was definitely the star of the launch. He brought a D12 "Michael Jackson" model. It blew through 50 feet off the pad, and sent a large fireball skyward. Tommy P., the club shutterbug, got a good picture of the smoldering remains. Craig also brought a ton of plastic model conversions (PMC's). He had a Nike-Hercules, Space Shuttle, X-3 Stilleto (My first PMC. - Bunny), F-16, and F-104's in 1/72 and 1/48 scales.

The Nike made its usual good flight as did the F-16. The Shuttle made three great round trips. I hope we see some plans for the next issue. (So do I! - RG) The smaller F-104 was unstable due to a lack of power. It landed on the muddy infield after a bout with inertial coupling. All the above PMC's flew on mini-A's.

The best shots of the day were the mini-A X-3 and the C powered F-104. The Stilleto went straight up and straight down. While Craig pulled the body out of the mud, Paul dug out the nose. The F-104 flight was the best "flight" I'd ever seen. It was more of an accident that a true prang. The F-104 arced up over the power lines, but when it started to come down, it hit the tower. The chute and nose cone separated and landed safely. The body crashed down the tower, hitting every steel member at least twice. Plastic rained down everywhere. It looked like a big pinball game. When the model finally hit dirt instead of steel, it was pronounced "really banged up". Larry London said he'd give Craig an old pranged F-104 for rebuilding parts.

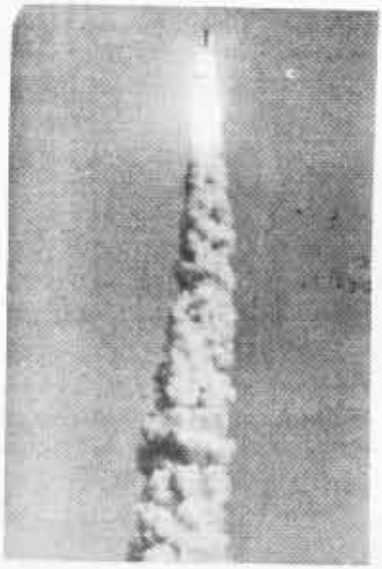
In all, it was a fun launch, especially if you were just watching and had warm gloves.

Bob Smith returns his somewhat charred Big Bertha.



OH MA GOSH!!!

Lift-off of Craig Dudek's Space Shuttle.



JEDI-MARK ATTENDS A SPACE SHUTTLE LAUNCH

On November 24, 1983, my family boarded a plane for Orlando, Florida. We arrived at the Orlando Airport at about 1:00 PM. This was the same airport that we flew into for NARAM-24 just over a year ago. Even though the airport and surroundings reminded me of NARAM-24, it was NARAM-25 I was thinking about. This is because NARAM-25 had supplied me with the reason to go back to Florida.

Going into NARAM-25 in third place in the A Division National standings, little did I know what was in store for me. After spending a week sloshing through the mud and flying (or trying to fly) model rockets in the rain, the results were finally in. I had won the A Division National Championship. The awards and celebrations were great.

About a month after NARAM, I receive a letter from J. Patrick Miller, the NAR President. He informed me he was making arrangements with NASA to get national champions and their families VIP passes to upcoming Shuttle launches. About a month after Pat's letter, I received the VIP passes.

VIP passes entitled us to many things. On the second day of our trip, we went on a guided tour of the launch area. We drove around on a bus, and went right around the Shuttle while it was on the pad. We also saw the huge crawlers they use to move the Shuttle onto the pad.

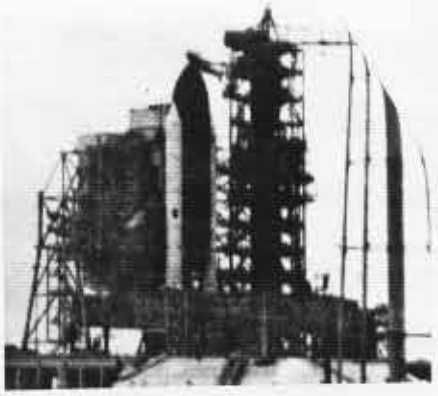
The morning of the launch, we got up about 6:00 AM. The sky was clear blue and there was little wind. (See? Even NASA likes it that way when they fly their rockets! - RG) We had an interesting and very informative briefing with a member of the ESA, European Space Agency, and a representative from NASA. After the briefing, we boarded buses and headed for the VIP Viewing Area. When we got there, the bleachers were full. We found a spot on the grass right up front where we could see through the trees. The only problem was we had to watch out for alligators!

The countdown went smoothly, and at T -9 minutes, the countdown was stopped. This built in delay allowed some final checks to be made. By this time, however, the sky was overcast, and it looked like rain. John Young, the first Shuttle pilot, took a plane up to check out the weather. He needed to see that there was enough visibility to land the Shuttle in case of an aborted launch. (What? Isn't the Shuttle an IFR rated aircraft? - Bunny) After a ten minute wait, the PA announcer said the countdown was starting and we were going to launch.

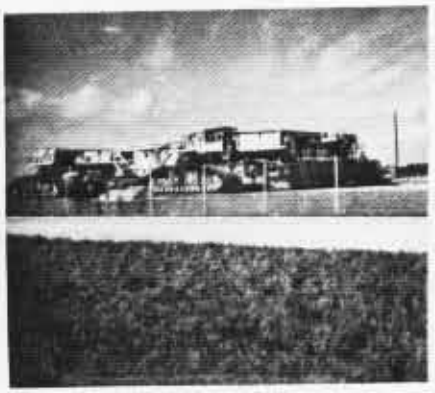
Just before 11:00 AM, a flash from the Shuttle could be seen as the engines were ignited. A huge cloud of smoke rose from under the Shuttle and covered the whole area around it. Slowly, the Shuttle lifted off the Pad 39 Complex and started picking up speed. Because we were four miles away, it took four seconds before we heard anything. When the sound did reach us, it was louder than lund thunder, and the ground shook from the sound's vibrations. As the Shuttle gained altitude, it would crackle, and the sound would shoot though you like an arrow. After about T +1 minute, the Shuttle disappeared though the clouds, leaving behind a huge column of smoke, lots of noise, and hundreds of rolls of exposed film. A cheer went off in the crowd as the announcer said Shuttle was past the point of no return and everything was "GO". The crowd soon broke up and returned to the busses for the ride home to watch the launch on the news.

This ninth launch of the Shuttle was very historic. It was the first flight for Spacelab, the ESA's self-contained laboratory. The lab was carried in the payload bay of the Shuttle. Spacelab can be changed and modified for other experiments very easily for future launches. The scientists work in a section of modules. Modules can be added or taken away depending on the size of lab needed. The second half of Spacelab consists of pallets. Pallets sit outside Spacelab, and contain the experiments that need to be exposed to outside elements in space. The pallets can also be taken off or added as needed.

World's largest range kit--the VAB!!



The Shuttle, all preped and ready to go.

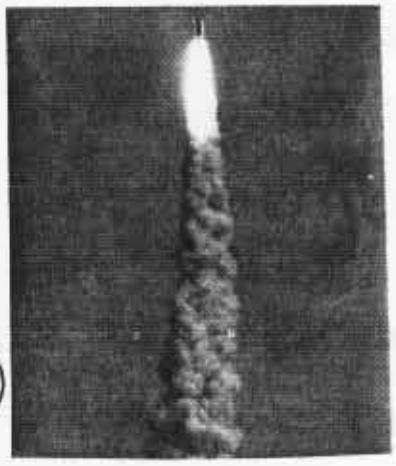


Even the Space Shuttle has to crawl before it can fly.

The launch also had many other firsts. The crew of six was the largest ever. Two of the crew were pilots, two were mission specialists and two were scientists. This was the first time a non-astronaut had gone on a mission. It was finally the first joint European-US mission with a European joining the American crew.

MARK SCHMITT

Mark Schmitt taken by surprise.



GETTING STARTED IN BOOST GLIDE.

IT AIN'T AS HARD AS IT LOOKS!

Last issue, we got all of the glider's parts cut out and sanded. We did a little assembly on the pod. Now it's time to complete the assembly, finish the glider and get it ready to fly.

Begin the final assembly by gluing the wing halves together at the proper dihedral angle. It helps to make this bond **a double glue joint.** To make a double glue joint, spread a little Titebond on each edge of the root wing, and let it dry. After it's dry, spread a little more glue on one edge, and join the two halves together. The first coat of glue soaks into the wood, and insures a very strong joint.

While the wings are drying, attach the stab to the boom. You want to keep the glue to a minimum here. Any weight in the rear of the model means more noseweight to compensate. For lower power models, say up to an A engine, Hot Stuff is OK.

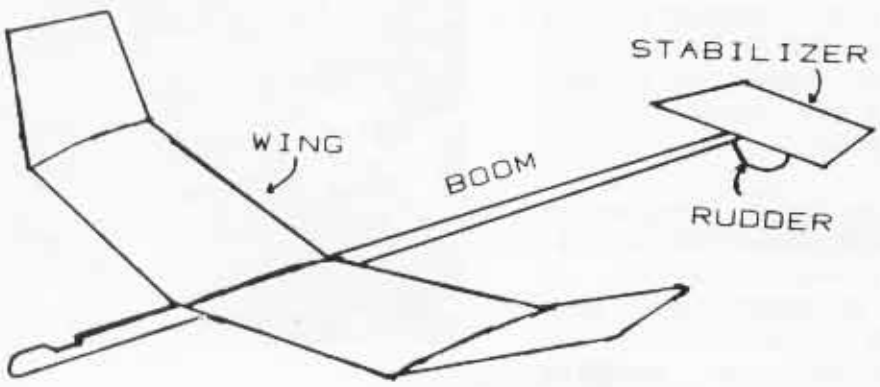
When the stab is attached, put the boom/stab assembly onto a flat table. Tape it down, then test fit the wings on the boom. Take a ruler and measure the height of each wing tip. They should be exactly equal. When the heights are exactly equal, put scrap wood blocks, paint bottles, etc. in position to hold the wing up while the glue dries. Another double glue joint is recommended here.

When the wing is dry, the rudder can be attached. Again, minimize the glue used. I usually Hot Stuff mine on, unless there's a C or larger engine involved. Make sure the rudder is on perfectly straight. Rudder misalignments are extremely bad news. They will force your glider into an ever-tightening spiral dive.

If you haven't already done so, cover the hole in the boom where the xerclod came from with two small balsa or plywood plates. They should extend past the edges of the hole about 1/8 to 1/4 inch. Be careful not to get any glue in the hole. If you do, you'll have to trim the xerclod to fit.

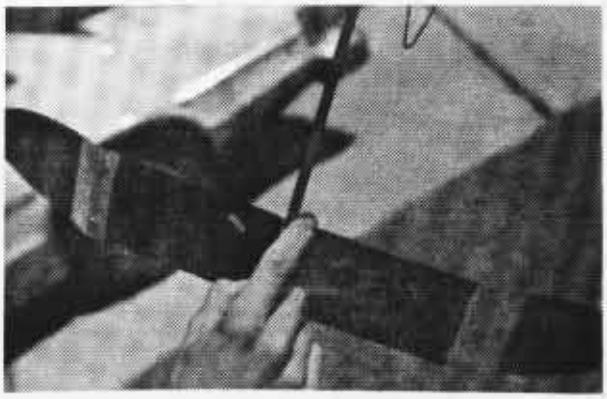
Voila! Glider and pod are done. Congratulations. Now don't blow it by painting the model. Paint adds weight to a glider, and weight is your enemy in the gliding game. Before doing any finishing at all, take 320-400 grit sandpaper and sand all surfaces as smooth as you can. Use very light pressure. You don't want to change the shape of your wing. You just want to get rid of fuzziness.

When done sanding, you can put on a light coat of clear dope. This seals the wood from moisture. When dry, sand again, and apply a second coat. After you sand this



PARTS OF A BOOST GLIDER.

coat, you are done. If you want to make your model more colorful, use some Magic Markers to "paint" the glider. Most glider pros use black on the bottom of their wings because it shows up really well when the timers are trying to find your model. Use bright colors, red, yellow and orange, on all other surfaces. These help you find your glider on the ground.



After all finishing is done, test fit the pod and glider again. Remember, the pod should just barely stay on when you turn it upside down. Sand the sides and rear of the xerclod until you get this loose fit. NEVER, NEVER sand the front edge of the xerclod. If you do, your pod may come off when the engine is still thrusting. This means a disqualified flight and some hairy moments for those on the range.

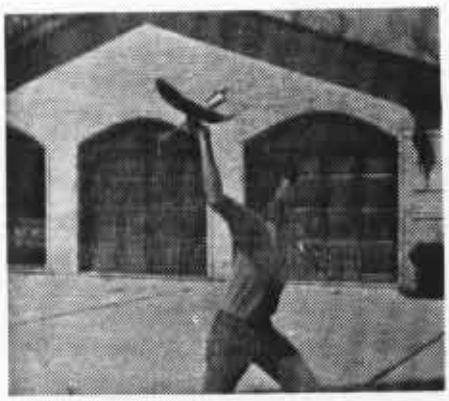
Trimming your glider is a lot of fun, though most people treat it as some kind of terrible torture. Take your glider and some modeling clay to a grassy area. Point the nose of the glider at a point about 20-30 feet in front of you and give the model a gentle toss. Do this five or ten times to get an idea of what the model wants to do. Most gliders want to nose up.

This is a **stall**. A stalling glider traces a path through the air like a set of waves; like so: /\/\/\/\. Nose up; then nose down; then nose back up again. You need to add a small amount of clay to the nose. Keep tossing until you get a flat glide. If you want to introduce a turn into your model's glide, wait until you get a flat glide going. Then pinch a small bit of clay from the nose and put it on a wing tip. The model will turn in the direction of the weighted tip.

If you buck the trend, and nose down consistently, you have a **dive**. Take weight off the nose, or add weight to the tail. It takes a little patience to get a glider trimmed right, but it's worth it when you fly.

Now comes the moment of truth, the flight. Prep the pod just like a normal rocket. When hooking up the glider onto the pad, two things should be kept in mind. First, the glider cannot rest on its tail. It must be attached to the xerclod and not touching anything else. Secondly, the micro-clips should be taped to the launch rod. This way, they won't get caught in your wings or stab.

This concludes our series on Beginning Boost Glide. If there is enough interest, we may try an cover some more items like tissue covering and rocket gliders in upcoming issues. Let Uncle Ric know what you want to see, and I'll get right on the article. Until then, I hope this series has give some of you the gumption to try gliders. If you have any further questions, just write (1523 Cleveland Street, Evanston, IL 60202) or call (312-475-5048). Happy thermals!



THE X-15 ROCKET PLANE

by Larry Mika

This X-15 is a semi-scale sport plan wihich flies great on a D or better engine. This is NOT a plan for novices. The assembly is pretty much self-explanatory, but some parts are tricky. So read the instructions throughly before you start building. Gluing should be done with Titebond or Hot Stuff, and fillets with expox. If you're using E or F power, you better tissue all the balsa parts. (Also, please tell me how it flies!) Make sure the wings are smooth, symmetric airfols, not just planks with rounded edges.

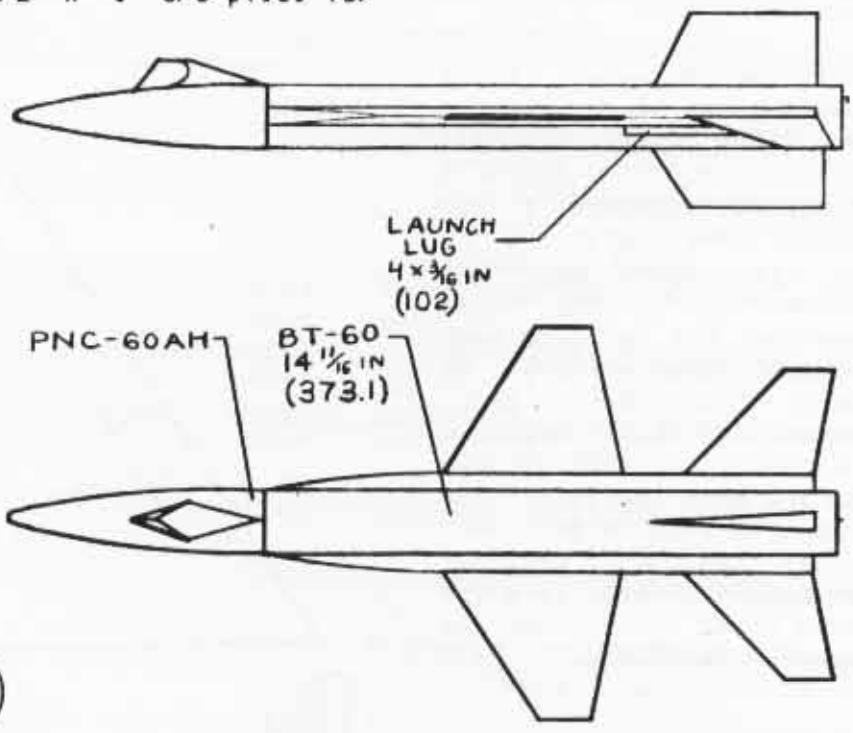
The body chines [Chines are those funny looking pieces on the side of the X-15. - RG] are cut to a "V" cross section from 3/8 x 1/2 x 14 3/16 balsa. Sand the body curvature into the chine root. Otherwise, you're left with Grand Canyon gaps to fill in! Round the front of the chine, and glue them into place, 180 degrees apart. Fillet well; you wouldn't want to shread a Mach 6.72 aircraft, would you?

The stabs can be made in three ways: 1/16 plywood, two sheets of 1/16 balsa glued together with the grain running in opposite directions, [This is Tom Pastrick's famous "Balsa plywood". - RG], or 1/8 balsa. The latter way is sure to break the stabs on every landing. It's also weak for higher power flights, so don't use it if you're planning to fly with stuff above D's. To glue on the stabs, put the body on a table and make sure the chines are the same height above the table. Glue the stabs in place with their tips resting on the table. This gives the proper amount of anhedral [That's "droop" to us mortals. - RG]. Glue the wings on with NO dihedral. They are located 1 9/16 inches in front of the leading edge of the stabs.

The tail components are tricky. They're built up and hollow. [Veteran readers will recall Bunny's "This Old Rocket" fins were made in this fashion. - RG] The main parts are shown in the plan, but don't be fooled. Those parts are only the sides. You'll need to cut some wedge shaped pieces to hold the two sides apart.

For each tail part, cut a wedge from 1/8 balsa. Make the wedge 1/2 inch wide and as long as the tail part's root edge. Put this wedge between the sides at their tip edges and glue. When dry, cut a small rectangle of 1/16 plywood; you'll need a 1/2 x 1 1/4 piece for the bottom tail and a 1/2 x 1 3/8 piece for the bottom tail. Glue these in place along the trailing edge of the tail. What you end up with is a wedge with one side (the root edge) missing. The tail assemblies are really fun to attach because the back ends of the tail roots will need to be shimed a bit. This is due to the curvature of the body tube. You can fill the resultant gaps with fillets.

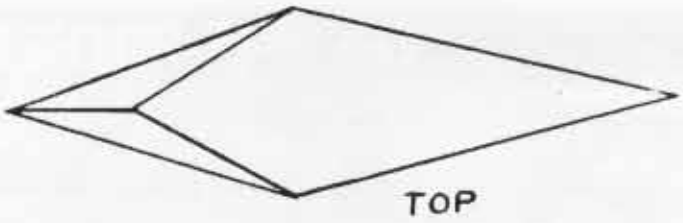
Install the engine mount for the motor you want to use, and install the recovery system. A 24" chute works fine. Try my method for keeping those slipery lines on. Put double sided tape, 1/2 inch square, on the circles on the chute. Now run the shroud line 1/4 inch through a punch hole renforcer; press it onto the chute on top of the double sided tape. Now cover it all up with the Estes tape disc. Make sure the 1/4 inch line doesn't hang out.

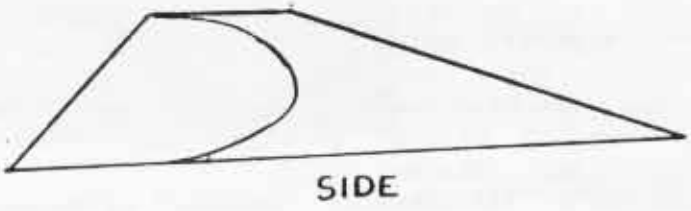


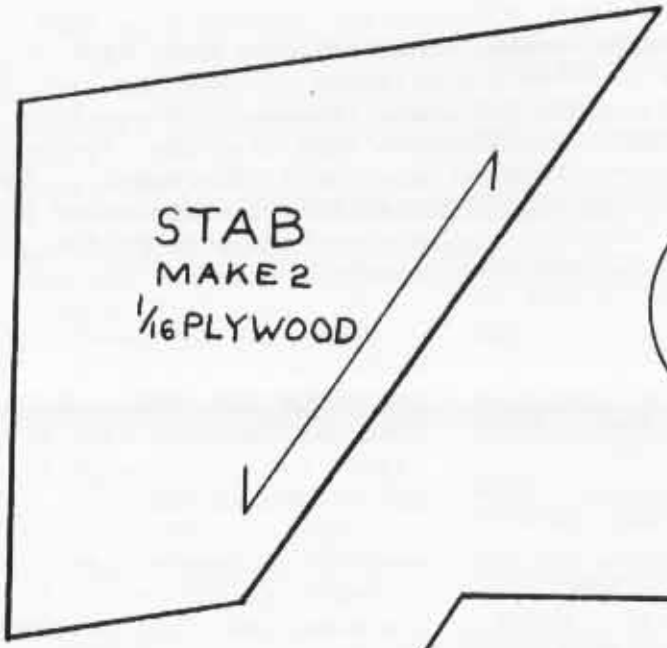
The cockpit is the hardest piece to build. Make it from block balsa or styrofoam coated with epoxy. [Jim Houge makes his cockpits from an epoxy putty material, sanded to shape. - RG] I drew two different views for you. You're on your own from here. I used a belt sander to shape mine, then dug out the center of the cockpit. By doing this, I had an easier time sanding the hollow cockpit to fit the nose cone. Glue, fillet and let dry. Put an ounce of weight in the nose, more if you intend to go beyond D power. The CG should be less than ONE INCH back from the leading edge of the wing where it joins the body. This machine is really stable.

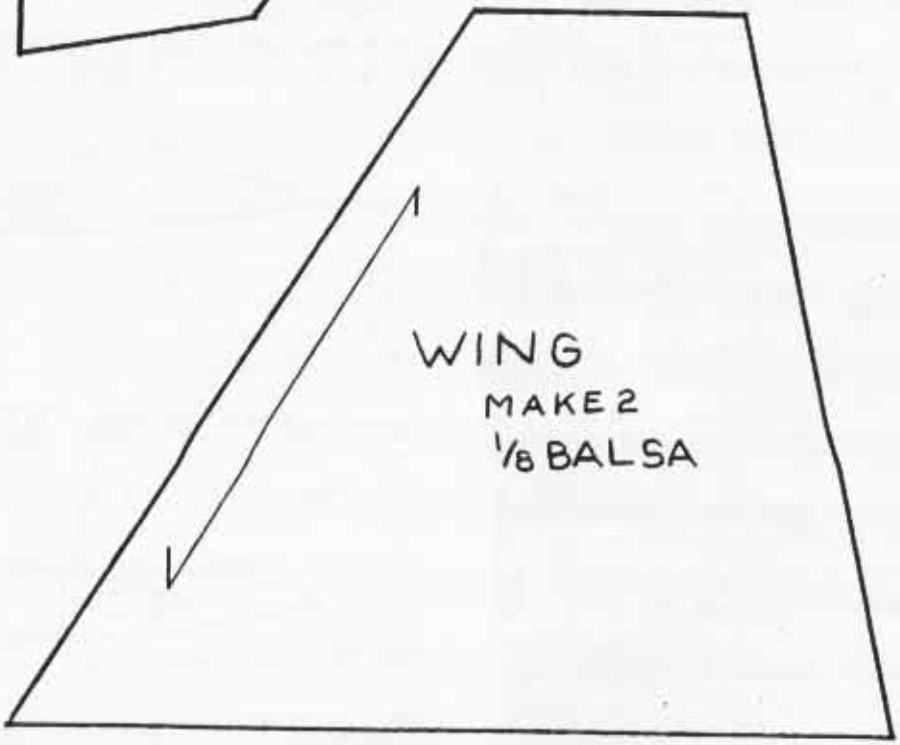
Some of you may want to experiment and make this bird a BG like the old Estes Bomarc. If you attempt that, try these tips. Put that nasty noseweight in the engine pod, with just enough left in the nose for glide trim. Make the wings undercambered and glue the stabs on with a slight negative angle of attack. [Modelers should go easy here; these modifications might make the bird loop. - RG]

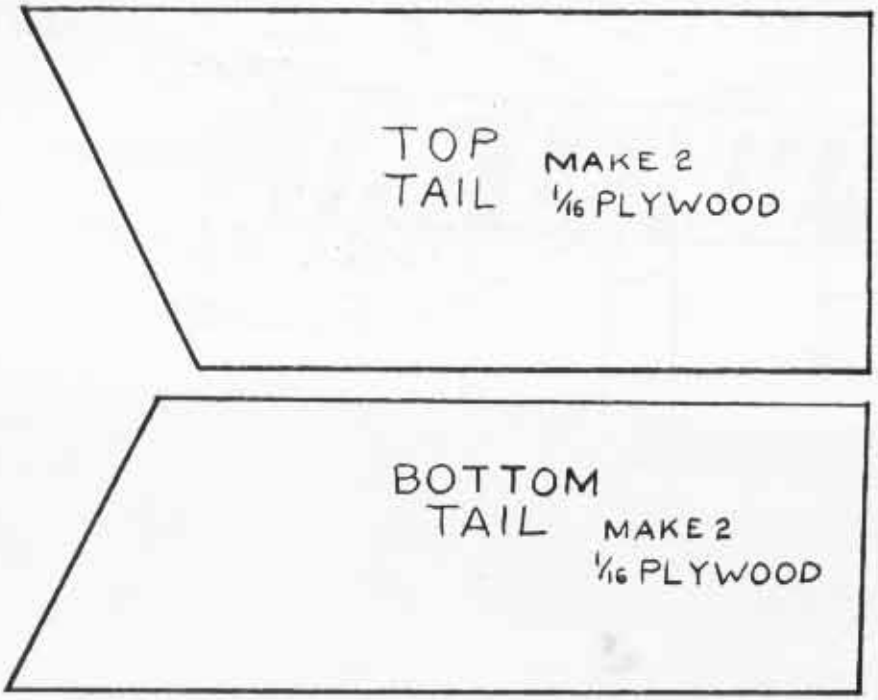
Finishing is easy. Paint the beast gloss black. I used mylar for the cockpit windows. Since I couldn't find any white decals, I had to paint the lettering by hand. If you want a reference, go to the local library and get a good book with some color pictures of the early "Space Race" days. You might find some drawings with lettering indicated, but photos are much better. You high power freaks might want to model the #3 vehicle, serial number 66672. It's the one that tried to reenter the atmosphere sideways. Talk about the ultimate shread!











THE "THEY CAN'T DO THIS TO US" DEPARTMENT!!!

There is a reliable rumor going about that Estes Industries is planning to drop the A3-2T and A3-6T mini-motors. Apparently, plans are not, as yet, definite. A show of dissatisfaction on our part could change their plans. I urge ALL NIRA members, subscribers, newsletter editors, etc. to write a strong but polite letter to ESTES Industries protesting this loss of yet more engines. No one seems to miss the 1/4A's yet, but I sure miss the B14's. The real question is "How many more engines will we lose?" Write today, and do it right now! Send letters to the attention of Dane Boles, Estes Industries, Box 227, Penrose, CO 81240.

ATTENTION, NIRA MEMBERS!!!

MORE CHEAP ROCKETRY

Several new cheap rocket deals have come to my attention. They include: (1) A deal for 60% off old Centuri kits from a local distributor. Jim Houge has a list of what is available. I hope to have a copy by next club meeting. (2) Tom Thumb Hobbies in Evanston wants to sell their Centuri models, too. This is potentially another Squadron Shop type deal! Larry London is looking into it. (3) Squadron Shop has a supply of FSI motors, parts and kits costing them $230. They are willing to sell it at or below their costs. Jim Houge is looking into this. I'll keep you informed as to how these deals are going. You keep me informed as to your interest.

WHAT EVER HAPPEN TO . . .

Speaking of Jim Houge, he called me at work recently (to tell me about the deals mentioned above). Seems he is working 70 hours a week driving truck for the Tootsie Roll Company. Easy to see why we haven't seen him for several months!

ATTENTION, SUBSCRIBERS!!!

The increasing cost of living has unfortunately hit the Leading Edge. It is my unpleasant duty to inform all subscribers that the price of a year's subscription to the LE is being increased to $5.00 effective with this issue. The Leading Edge will continue its tradition of being a quality newsletter. I hope those of you who have been subscribing these last few years will continue to do so. A similar increase in dues is still being considered for NIRA members as well.

DESIGNER ROCKETS!

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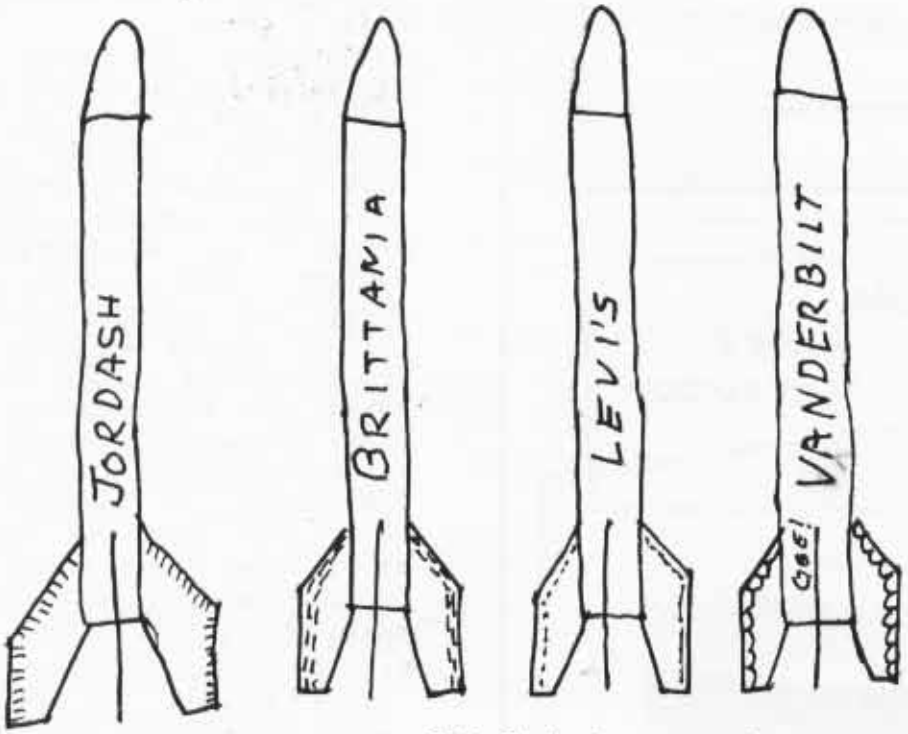

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