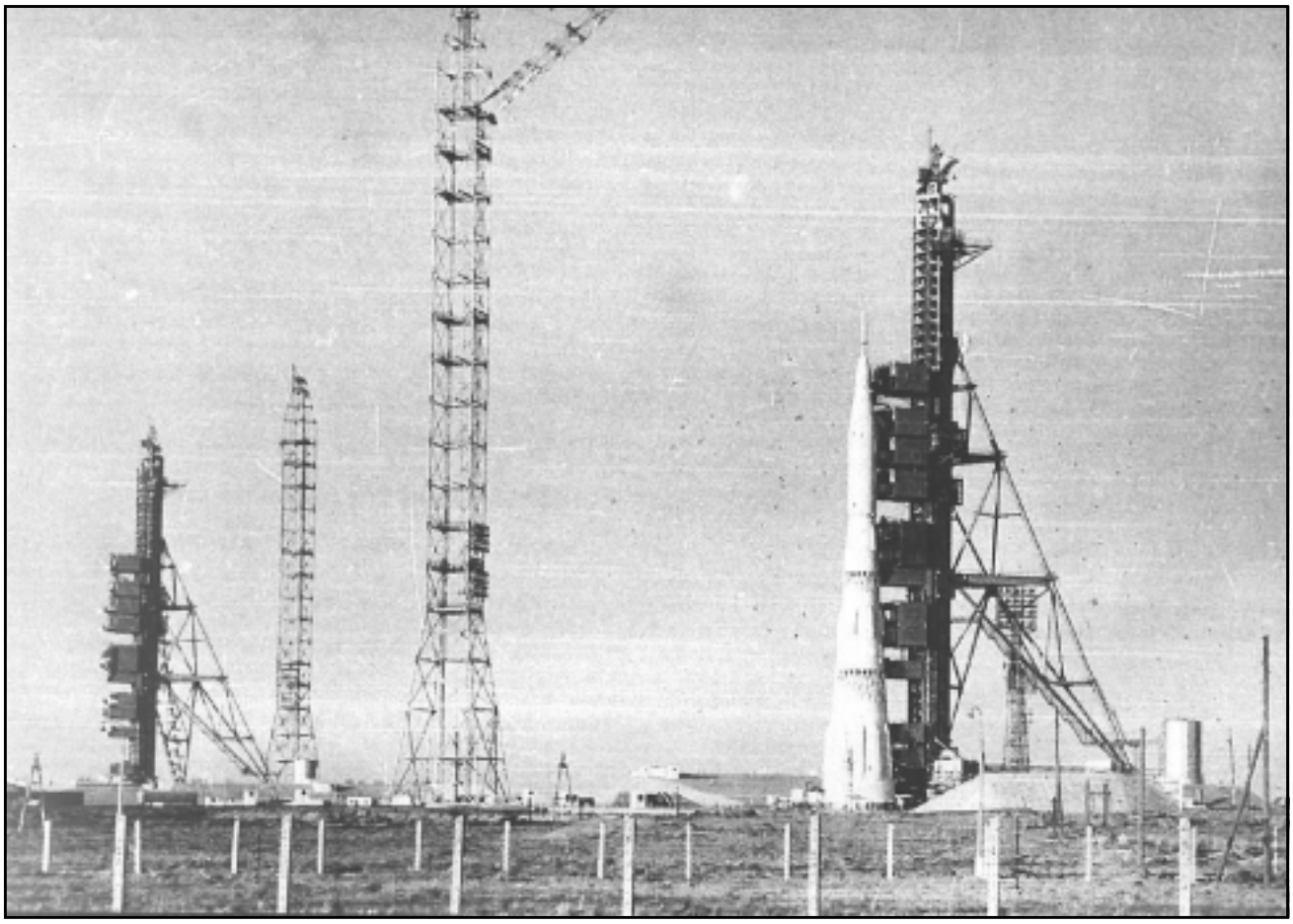
THE LEADING EDGE

Newsletter of the Northern Illinois Rocketry Association,
NAR Section #117, TRA #36

Volume 18, Number 1
January/February 1995



T MINUS 1 - NIRA'S CALENDAR OF UPCOMING EVENTS

MONTHLY MEETINGS

All meetings start at 7:30 PM, and include refreshments, entertainment and a brief business meeting. Don't forget a model for "Model of the Month" voting. We need volunteer speakers to entertain the troops after the business meeting, so call Bob Wiersbe at (708) 690-5442 if you can help with ideas or can speak yourself.

February 3 - Regular Monthly Meeting.

March 3 - Regular Monthly Meeting.

OTHER ITEMS OF INTEREST

March 25 - High Power Launch, 10am-6pm. Hosted by the CIA. Call (217) 352-9655 for site information and directions.

April 22 - HUVARS 1/2A Section/Local Meet. Hamburg, MI

May 27,28 - Midwest Spacemodeling Championships at the Michigan Space Center Regional Contest (MSC^2). Jackson Community College, Jackson, MI.

May 27,28,29 - National Sport Launch, Amesbury, MA.

STAFF

Bob Wiersbe - Cutum Pasteumupus
Ric Gaff - Copium Foldandstapleupus

CONTRIBUTORS

Peter Alway, Mark Bundick, Jim Cook,
Ric Gaff, Steve Koszuta, Gary Rosenfield, Me

1994 CLUB LAUNCH DATES

All launches or other activities start at 2:00 PM. BYOL (bring your own launcher). Casualty insurance required or else RSO must inspect and launch your model. Location for our 1993 launches is Community Park in Lisle. Get off Route 53 at Short and head west. If you have questions prior to any launch, call either Bob Wiersbe at 708-690-5442, or Mike Jungclas at 708-910-1267.

February 19: Building Session at Bob Kaplow's. See map on Page 11 for details.

March 19: We're going somewhere. Come to the February or March meeting for details.

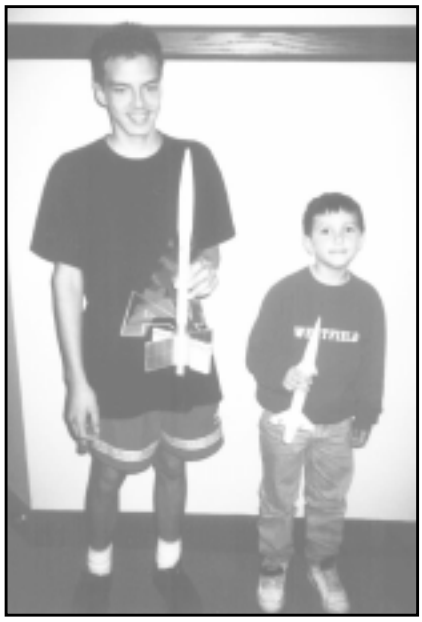
April 23: First launch of the 1995 season!

Your address label contains an item of vital information, your NIRA membership expiration date! Please check your expiration date and renew your NIRA membership before it expires. You will not receive any more newsletters after your expiration date has passed!

THE LEADING EDGE, published bimonthly by and for members of the Northern Illinois Rocketry Association, NIRA, NAR Section #117, is dedicated to the idea that Sport Rocketry is FUN! Articles, plans, photos, other newsletters, and news items of interest should be sent to Bob Wiersbe, 1835 Shetland Drive, Wheaton, IL 60187 (or electronically via Internet to hrbob@ixstar.ih.att.com.) Photos will be returned, other material returned if requested. Send membership applications (dues: $3/year, including a six issue subscription to the Leading Edge) and nonmember subscriptions ($5 per six issues) to Ken Hutchinson, 84 Jefferson Lane, Cary, IL 60013. Any item appearing in the Leading Edge may be reprinted by Sport Rocketry with proper credit given; all other uses require written permission of the Northern Illinois Rocketry Association. The Leading Edge: "Oddly going where no newsletter has cared to go!" - W. Shatner

Model of the Month Winners!

Left - Lawrence "I'll never fly this!" Bercini shows off his Jayhawk, the October winner. **Center -** Ron Husak with his Explorer Aquarius (a stock kit?? what's the deal, Ron?) and Ryan Noon with his Bullpup were the winners in November. **Right -** Bryan Chesi proudly displays his U.S.S Enterprise, and Bill "Birthday Boy" Thiel holds his couch potato trophy; the December winners. Congratulations to everyone who won in 1994! Special thanks to Ric Gaff for taking pictures at every meeting!



Staging a Terrier-Sandhawk

by Bob Wiersbe

One of my favorite rocketry projects is building electronically staged models. In my collection I've had 1/12 and 1/5 scale Nike-Apaches, a Gemini-Titan, a 1/5 scale Nike-Tomahawk, and a few non-scale models. My most recent project has been to convert the Estes Terrier-Sandhawk into a staged model.

This first time I saw this model I knew mine would have to be staged, and I found it wasn't very difficult to make the necessary modifications. Figure 1 shows the circuitry used to ignite the upper stage motor: the capacitor is C1, the mercury switch is MS1, the charging jack is J1, the arming jack is J2, the arming plug is P1, and the "cato switch" is SW2. Just before the rocket is launched the capacitor is charged using the circuit in Figure 2. When the booster motor burns out, the mercury in the mercury switch (hence, it's name) gets thrown to the top, making contact with the metal poles. When this happens, current flows from the capacitor to a flashbulb, setting it off. This in turn lights a fuse, which ignites the upper stage motor.

The "cato switch" is used for safety reasons. It's purpose is to short the capacitor out whenever the adapter section is removed from the Terrier tube. I call it a "cato switch" because I wanted to disable the staging mechanism in case the booster motor catos. The switch is also used to safe the rocket during flight preparation, or when it needs to be removed from the pad due to a misfire. The switch closes as soon as the adapter leaves the end of the tube, which shunts all the charge in the capacitor through essentially a short circuit. I've actually had this work twice, once when a C5-3 catoed on the pad, and another time when a B6-4 catoed in mid-air. In both cases the upper stages did not ignite.

The arming plug (P1) is removed while the rocket is being prepped, this prevents any charge from reaching the flashbulb. The arming plug is inserted into J2 just before launch, and only after the capacitor has been charged. If you need to disarm the rocket for any reason, simply remove the plug, then remove the adapter section so the capacitor is shorted out.

Terrier-Sandhawk Construction

Build the Sandhawk according to the instructions, except for the motor mount. Build the motor mount shown in Figure 3, and glue it inside the Sandhawk motor mount tube (BT-50) with the tube ends flush. Put one packet of clay in the nose, then glue it to the payload section.

For the Terrier, use LOC 24mm motor tubing, and make an extra centering ring out of 3/32" plywood. The aft centering ring is not attached during motor mount construction, but is glued in place after the fins have been attached and fillets have been made inside the Terrier tube. Use Figure 4 as a guide for building the Terrier motor mount.

Sand the Terrier fin tabs a little so they will fit properly with the thicker LOC tube. Use epoxy to attach the fins, with a small dab of CA on the corners of the tab to hold them in place while the epoxy cures. Add fillets inside the Terrier tube at the Terrier/fin junction and the motor tube/fin junction (see Figure 5). This makes the fins sturdy enough to handle an Aerotech E30 (and probably an F reload). Use the aft centering ring to make the balsa centering ring used in the adapter section (see text below), then glue it in place.

The Terrier needs a sturdy shock cord and mount; I used 5 feet of 3/8" wide elastic that was attached to a wire loop fed through two holes in the forward centering ring, and secured to the motor mount with epoxy (see Figure 4). Use whatever method you're comfortable with, but make sure it's strong.

Interstage adapter Construction

DON'T GLUE THE PLASTIC INTERSTAGE ADAPTER TO THE TERRIER! This piece needs lots of modifications and serves as the "nose" of the Terrier after staging.

Figures 6 through 10 show how the components are located inside the adapter. Several of these components must be made by hand. First, carefully cut off the part that extends inside the Sandhawk. Then, enlarge the hole created by this step until the expended E casing slides easily inside. Next, cut off the back of the adapter, leaving the straight section only (same as in Step M). Finally, cut all the material inside the "groove" so that nothing protrudes into the adapter.

Using the rear of the adapter like a cookie cutter, gently scribe a 1/8" thick sheet of balsa to create the outline for the outside of the centering ring. Using the aft centering ring from the Terrier as a guide, mark the inside of the ring where the BT-50 goes. Cut out the ring, sand it smooth, and test fit it into the adapter until it fits snugly.

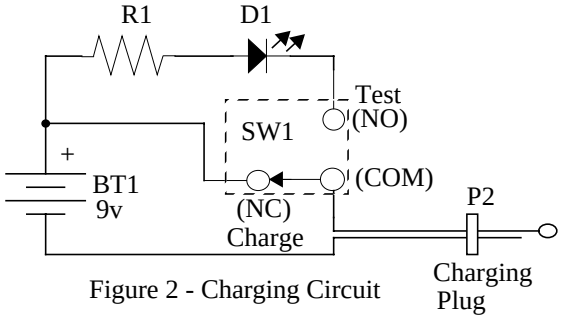


Figure 2 - Charging Circuit

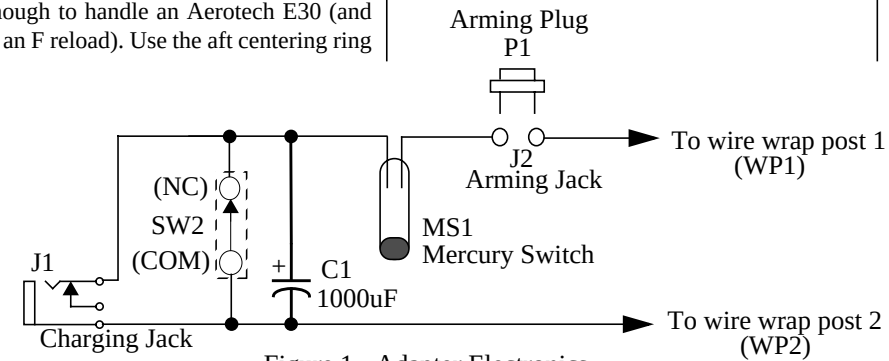


Figure 1 - Adapter Electronics

Part No.	Description
BT1	9v Battery
C1	1000uF, 16-25v Capacitor
D1	Red LED
J1	DC Power Jack, 2.5mm
J2	Wire-wrap socket
MS1	Mercury switch
P1	Wire-wrap header
P2	DC Power Plug, 2.5mm
R1	220 Ohm, 1/4 watt resistor
SW1	SPDT switch
SW2	SPST normally closed momentary switch
WP1, WP2	Wire-wrap posts
Misc.	9v Battery Clip
	Case for charging circuit

Qty.	Parts List
1	6” LOC MMT .95 (motor mount tube)
1	6” BT-20
1	1.5” BT-50
2	AR-2050
1	AR-5055
1	EB-20A
1	Expended Aerotech E motor casing
1	3/32” Balsa (1” x 2”)
1	1/8” Balsa (2.5” square)
1	1/2” Balsa (2.5” square)
1	Screw Eye
1	1/8” Launch Lug (1.5” long)
1	3/8” Elastic (5 feet long)
1	6” 50lb Test Leader Wire

Remove the outer layer from an AR-5055 centering ring until it fits snugly in the position shown in Figure 6. Glue this ring in place using CA. Cut a 1.5" length of BT-50. Using the balsa centering ring as a guide at the rear and the E casing as a guide at the front, glue the tube into the AR-5055 centering ring with wood glue. Don't glue the balsa centering ring or the E casing in place when you do this step!

The arming jack (J2) is held in place by 2 small pieces of 3/32" balsa. The jack is really made from two terminals from a SIP wire wrap socket. Cut the leads at an angle as shown in Figure 6, then solder 6" wires to them. Cut a 3/4" x 1/4" piece of 3/32" balsa, hold the jack tightly against it, then insert it into the adapter. Line the jack up so that it is flush with the adapter, then use CA to glue it and the balsa in place. Once the CA has set trim the balsa flush with the plastic, then add another small piece of balsa below the jack to fill in the gap (see Figures 6 & 7).

Cut a small "V" in the balsa centering ring at a point inside the inner circle, feed the leads from J2 through the "V", then glue the ring in place at the rear of the BT-50. When the glue has dried, drill a hole for the mercury switch in the ring near the BT-50 (see Figure 8).

Wire the capacitor to the charging jack (J1), positive lead to the tip, negative lead to the ring. Attach two 4" wires to the capacitor, one on each lead. These will be connected to the "cato switch", SW2. Wire one lead from the mercury switch to the positive lead of the capacitor, the other lead of the mercury switch is connected to one of the wires from the arming jack (J2) (shorten the wire, if desired). The other wire from the arming jack is connected to one of the wire- wrap posts. The last wire is also to a wire-wrap post and connects to the negative lead of the cap. These last 2 wires will be connected when the rear bulkhead is attached.

Using the adapter like a cookie cutter again, mark it's outline on a block of 1/2" thick balsa. Trim the block until you have a bulkhead that will fit snugly into the rear of the adapter. Drill a 1/8" hole in the center, and two 1/16" holes on either side (See Figure 9). Feed the wires to be connected to the wire-wrap posts through one 1/16" hole, and the wires to SW2 through the other. Solder the wires to the switch (normally closed and common pins), and to the wire-wrap posts.

With everything soldered, run a test using the charging circuit (Figure 2). Short the wire-wrap posts together, then connect the charging circuit with the Test Mode selected. With the arming plug removed and SW2 held closed, the LED should light then slowly go out. If it stays lit continuously, then there is a short in the wiring (or the wrong pins of the cato switch are connected). With the adapter held up (launch position) and the arming plug inserted, the LED should remain off. When the adapter is turned upside down, the LED should light. When the cato switch is released (opened) the LED should come on and stay on under all situations.

If it all checks out, glue the mercury switch into the hole (leads first!), glue the cap and charging connector to the centering ring (see Figure 8). Cut a hole in the side of the adapter where the charging plug will be connected. Push all the wires away from the center, then glue the balsa bulkhead in place. Glue the wire-wrap posts to the bulkhead, and push the excess wire back inside the adapter (or cut and re-solder). Align SW2 so that it will be open when inserted into the Terrier tube, and closed when outside, then glue it in place (see Figure 9 & 10). [Note: I used a switch salvaged from a defective disk drive, but a levered microswitch will work too. You'll have to mount the switch by either cutting a slot in the rear bulkhead, or adding an external support.]

Cut the E casing about 3/8" from the ejection charge end, and clean it out. Then glue the it into the adapter so that 1" extends past the end of the adapter. Finally, glue a 1/8" launch lug through the hole in the rear bulkhead to the nozzle of the E casing (Figure 10). This is used to bring the leads from the flashbulb to the wire-wrap posts.

Tips

Check the flashbulb for continuity with a low current Ohm Meter first (just like you would continuity test an igniter). Look the thermalite fuse over carefully and if there are a lot of cracks in it, don't use it. I often use 2 pieces of fuse for added reliability. Always use a fresh battery to charge the capacitor.

I flew my staged Terrier-Sandhawk for the first time at the National Sport Launch in Dallas. I used an Aerotech E15-4W in the Terrier, and a B6-6 in the Sandhawk. The flight was almost perfect, marred only by a jammed chute in the Sandhawk. Fortunately, the Sandhawk landed in tall grass and suffered minor damage to 1 fin. The last time I flew it, I was in a hurry and forgot to connect the flashbulb to the circuit. The resulting prang was spectacular, although disappointing (and embarrassing).

If you're looking for an extra challenge, try staging a Terrier-Sandhawk. It might stretch your modeling skills, and you'll end up with a rocket that's outstanding in flight!

Figure 3 - Sandhawk Motor Mount

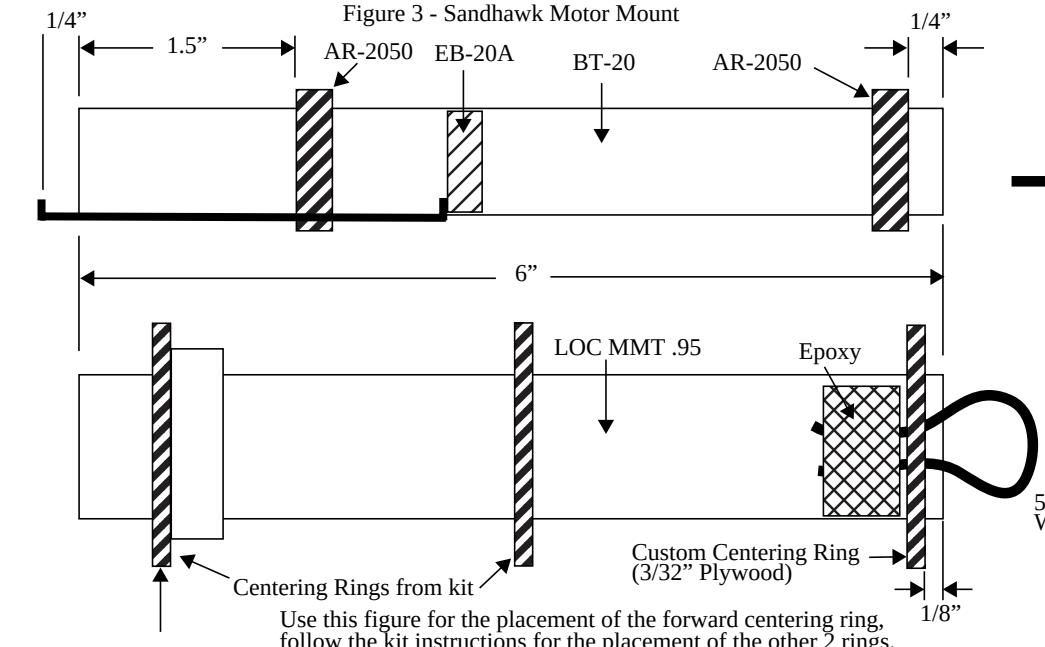


Figure 4 - Terrier Motor Mount

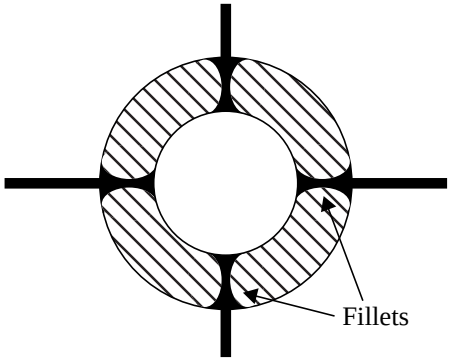


Figure 5 - Rear View of Terrier Showing Internal Fillet Detail

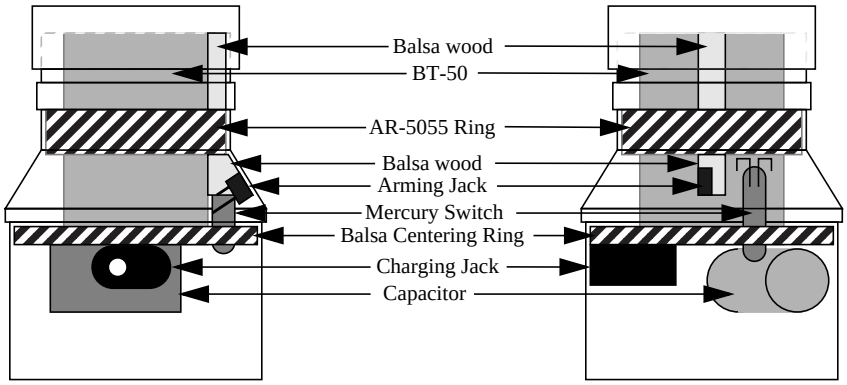


Figure 6

Figure 7

(Note: Figures 7, 8, & 9 are shown in the same orientation)

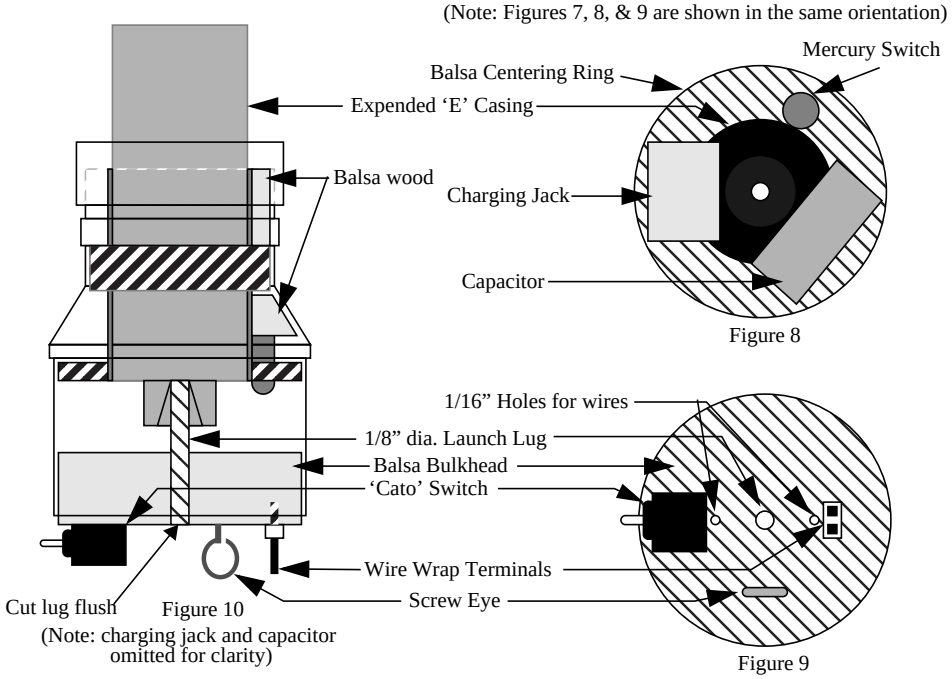


Figure 8

Figure 10

(Note: charging jack and capacitor omitted for clarity)

Figure 9

Reload Tips from Aerotech

taken from a CIS posting by Gary Rosenfield

1. Always use grease sparingly. Apply a thin coat of grease to the o-rings. If grease covers the face of the delay element, ejection charge reliability will suffer. Use enough grease on the threads to allow the closures to tighten smoothly.

2. Make sure you shake the completed motor, ejection cap up, before installing in the rocket. This settles some of the ejection charge in the transfer cavity above the delay element, which helps to ignite the charge when the delay burns out.

3. Make sure the end closures are tightened completely against the case. This preloads the o-rings to prevent combustion gas leakage.

4. The delay element or delay spacer must protrude slightly (about .020"-.030") above the forward closure after being installed. When the closure is tightened, the delay or spacer compresses the delay o-rings.

5. Ensure that the motor is cleaned thoroughly after each use. Residues, especially in the forward closure delay o-ring area, can prevent proper sealing and result in the forward closure being turned into a nozzle.

6. Inspect the o-rings for nicks, cuts, thin sections or other defects. AeroTech will replace these or any other defective parts you find in your reload kits. Defective o-rings can cause hot gas leaks and motor failure. Don't use a reload kit with defective or missing parts.

7. The parts must be assembled in the correct order and location. We've seen o-rings stretched around the end closure threads, for example. Needless to say, the subsequent flight using that motor was less than perfect.

8. If you have a misfire and need to remove the aft closure and nozzle insert to install a new igniter, hold the motor nozzle up and avoid moving the liner or other internal parts. If the delay moves after the ejection charge is installed, the charge may leak under the delay o-rings and cause a forward seal failure.

9. Don't leave a motor assembled for an extended period. This can cause a compression set of the delay element. If necessary to store the motor before launch, loosen the aft closure slightly (a couple of turns) to reduce the preloading of the delay o-rings.

10. A real indication of trouble is if you have parts left over. Check your assembly again, or call AeroTech.

11. Other Notes

A hobby knife is useful for clearing out the ejection transfer port in the forward closure. The edge of a 6" steel ruler can be used to (gently) scrape any carbon build-up from the inside ends of the motor case.

The RMS casings are a *little* heavier than their single-use counterparts, but no stability problems have yet been discovered or reported. You should always check the stability of a questionable rocket/motor combination before flight.

If you rush, you can re-load in less time, but it's not recommended <grin>. My estimate is 5-10 minutes under typical conditions.

NIRA Buy-Laws

1) Never pay list price for anything.

2) If you do pay list price, buy 2 and give the other one to a rocketeer less fortunate than yourself. This will not only ease your conscience, but will raise your stature in the rocketry society.

3) If you find an out of production kit that isn't overpriced - buy it! If there are 2, buy both!

4) Always check the prices, sometimes they get mislabled and you can get a $21 kit for $12.

5) Michael's sometimes offers 30-50% discount coupons for 1 item. These are great for high priced items like Saturn V's, bulk packs, etc.

6) Ask the manager if they give a discount to members of the NAR or NIRA. Sometimes they do, sometimes they don't. (We're working on this one!)

7) If you know of someone having a sale by mail order, let others in the club know. It saves on shipping (especially if you're ordering motors), and lets others take advantage of the discount.

8) Bulk orders for body tubes is the only way to do it.

9) If you find a kit with a dented tube try and talk the owner into lowering the price (or throwing in a free replacement from their stock). It might work.

10) Never, never, never buy anything from U.S. Rockets.

Cover - A photo of the Soviet N1 Moon Rocket, and the logo from STS-47. Just an example of the things you can find on the Internet.

The 1995 NIRA Membership List
Please don't use this for business purposes! Thank You.

Robert Adams
19 Waterbury Lane
Schaumburg, IL 60193
708 980 3316

Michael Alterio
1128 Lakewood
Elgin, IL 60123
708 695 4474

Andy Apel
4201 S. Washington
Marion, IN 46953

Jay Apt
808 Shorewood Drive
Seabrook, TX 77586

Dave Auer
43W890 Nottingham Drive
Elburn, IL 60119
708 557 2682

John Barrett
644 North Oak Park Ave.
Oak Park, IL 60302
708 848 4179

Fred J. Becker
4646 Dean Street
Indianapolis, IN 46226
317 545 3114

Lawrence Bercini
6033 North Sheridan Road, #33J
Chicago, IL 60660
312 561 8098

Craig E. Blohm
16151 South 84th Place
Tinley Park, IL 60477

Jim Brankin
311 North Park
Glen Ellyn, IL 60137
708 469 4564

Mark Bundick
1350 Lilac Lane
Carol Stream, IL 60188
708 293 9343

Eric Burmester
343 South Addison
Villa Park, IL 60181
708 833 7793

Joe Cacioppo
2743 South Oak Park Avenue
Berwyn, IL 60402
708 749 7604

Patrick Cannon
6S060 Hyacinth Court
Naperville, IL 60540
708 355 1142

Anthony Cekay
201 Chasse Circle
Saint Charles, IL 60174
708 513 9129

Cheri & Jenny Chaney
2016 Canterbury Place
Wheaton, IL 60187
708 462 0260

Jonathan Charbonneau
417 N. Main St. Apt 7
Glen Ellyn, IL 60137
708 665 7281

Bryan Chesi
732 Hawthorne Circle
Lombard, IL 60148

James & Andrew Christensen
852 Stonebridge Court
Palatine, IL 60067-6487
708 358 2425

John Christensen
P.O. Box 2339
Glen Ellyn, IL 60137

Donald Cvetko
4N539 Kingery Highway
Bensenville, IL 60106
708 766 6745

Elliot D. Dibbs
1307 Wyndham Drive #104
Palatine, IL 60067
708 776 1820

Eric Dunker
64 Starling Lane
Naperville, IL 60565
708 369 6145

Andy Dyckman
4640 North Reserve
Chicago, IL 60656
312 625 7904

Adam Elliot
1921 Burlington
Lisle, IL 60532

Rich Frank
1524 North Columbia
Naperville, IL 60563
708 420 0888

Richard Gaff
3175 Norwood Court
Streamwood, IL 60107
708 483 2468

Jeffrey Gahris
520 Longfellow Avenue
Glen Ellyn, IL 60137
708 469 2056

Aaron & William Gerow
1534 Castlewood Drive
Wheaton, IL 60187
708 665 6250

Marshall Goldsmith
P.O. Box 241
Northbrook, IL 60062
708 272-0199

Vincent Gordon
563 East Avenue
Streamwood, IL 60107
708 837 9223

Jim Grotelueschen
21W43 McCarran
Glen Ellyn, IL 60137

Mike Guslick
711 Highway C
Grafton, WI 53024
414 377 4428

Jasper Hausner
1914 North Eastwood Drive
Arlington Heights, IL 60004
708 870 1217

Roger Heidlauf
4122 North Bell
Chicago, IL 60618-2914
312 478 3839

Matt Herzog
2759 Springdale Circle
Naperville, IL 60564
708 983 4688

Mark Holle
7060 Foster Road
Downers Grove, IL 60516
708 963 0759

Thomas Hulina
1961 Pleasant Hill Lane
Lisle, IL 60532-2870
708 355 0770

Ronald C. Husak
2633 South Home Avenue
Berwyn, IL 60402
708 788 2111

Ken Hutchinson
84 Jefferson Lane
Cary, IL 60013
708 516 1654

Cindy Ingrum
714 North Scott Street
Wheaton, IL 60187-4226
708 510 7595

Richard Mike Jungclas
2504 Woodlyn Dr. #201
Woodridge, IL 60517
708 910 1267

John Kallend
402 Arizona Avenue
Glenwood, IL 60425-1004
708 798 7242

Robert G Kaplow
35W525 Parsons Rd #933
West Dundee, IL 60118
708 428 1181

Andy Konkol
211 North Linden
Oak Park, IL 60302
708 386 2540

Terry Kosel
901 Corey Lane #120
Wheeling, IL 60090
708 255 2861

Steven J. Koszuta
306 East Wilbur Avenue
Milwaukee, WI 53207-3342
414 481 6341

Charles Kruminas
603 Dorchester Court
Naperville, IL 60565
708 527 9138

Mark Lakomski
1720 Chestnut Lane
Hoffman Estates, IL 60195
708 358 1905

William Larry
1369 Eastwood Drive
Aurora, IL 60506

Tim Marcy
707 University Ave. SE #107
Minneapolis, MN 55414

Jay Marsh
3227 Pine Needles Road
High Point, NC 27265
919 869 4844

Patrick & Michael McGuan
912 Lexington Street
Wheaton, IL 60187
708 690 5967

Kevin McKiou
6 South 211 Cohasset Rd
Naperville, IL 60540
708 717 5830

Steven P. McNicoll
1851 South Sunkist Circle
DePere, WI 54115-3732
414 336 9163

Dudley Meyer
5701 North Sheridan Road
Chicago, IL 60660
312 878 1992

James Pat Miller
2518 Ridgecrest
Garland, TX 75041
214 278 9865

Drue Mills
6390 North Lynn Street
Columbia City, IN 46725

Gary Morris
662 West Thunderbird
Carol Stream, IL 60188
708 665 6349

Blair Morrison
2593 Legacy Drive
Aurora, IL 60504

Alex Nesenjuk
1440 Spero Court
Wheaton, IL 60187
708 510 7929

Andrew Newman
34 Joslyn Drive
Elgin, IL 60120
708 695 5903

Brian & Ryan Noon
P.O. Box 87541
Carol Stream, IL 60188
708 858 7566

Joe Nowak
1117 East Liberty Drive
Wheaton, IL 60187
708 668 5516

Peter G. Olivola
12 Central Avenue
Nyack, NY 10960-1902
914 358 3238

Mike Oswald
18 W. 701, Route 2
Lemont, IL 60431
708 985 3255

Roger Otto
1200A Bunker Hill Court
Wheaton, IL 60187
708 510 2071

Damien Palmer
9534 South Longwood Drive
Chicago, IL 60643-1112
312 238 3507

Julia A. Pask
1505 North Chestnut Dr.
Round Lake Beach, IL 60073

Thomas Pastrick
8809 Carleah, Apartment GN
Des Plaines, IL 60016

Harland Harper Pell
6033 North Sheridan Road, #33J
Chicago, IL 60660
312 561 8098

Art Peterson
354 Parkview
Elmhurst, IL 60126

Bill Piva
7306 Poplar Lane
Darien, IL 60561
708 325 1677

Daniel Plotnick
928 South Home Avenue
Oak Park, IL 60304
708 524 7931

Doug Pratt
2598 John Milton Drive
Herndon, VA 22071
703 435 0750

David, Matthew, & Thomas Price
611 East Prairie Avenue
Wheaton, IL 60187
708 665 1507

Mike Provenzano
6652 Chuck Evans Lane
Woodridge, IL 60517
708 527 0011

George A Riebesehl, Jr.
4089 Lakeside Drive
Hanover Park, IL 60103-6022
708 843 3444

Greg Roman
695 Bryan
Elmhurst, IL 60126
708 941 7445

Kyle Saginus
1101 Washington
Lockport, IL 60441
815 838 5675

Mark Seppelfrick
1021 North Elmwood Drive
Aurora, IL 60506
708 892 9472

Mark Sieving
1221 Kings Court, Apartment 38
West Chicago, IL 60185-4343
708 231 5175

Kevin J. Smith
516 Redwood Road
Bolingbrook, IL 60440
708 739 5785

Mark Soppet
14040 Oak Ridge Drive
Lockport, IL 60441
708 301 1744

Phillip E. Steinhauer
791 Queenswood
Wheaton, IL 60187
708 462 0131

Martin Strumilowski
7306 West 86th Street
Bridgeview, IL 60455
708 598 5920

Bill & Ed Thiel
3911 Eagle Lane
Rolling Meadows, IL 60008
708 394 8434

Trent Tidmore
718 North Street
Geneva, IL 60134
708 208 0541

Dale Toberman
1017 Southport
Lisle, IL 60532
708 963 7277

John Trilik
1127 South Taylor
Oak Park, IL 60304
708 848 7904

Michael & Sabrina Ugorek
522 East Liberty Drive
Wheaton, IL 60187
708 653 5689

Bob Venable
100 Ainslie Drive
Westmont, IL 60559

Zach Vicha
675 Western Avenue
Glen Ellyn, IL 60137-4017

John E., Sandy, John, Mark, & Matt Walts
110 South Clinton
Oak Park, IL 60302
708 383 6225

Thomas Webb, Jr.
4485 Brittany Drive
Lisle, IL 60532
708 778 1357

Robert E. Wiersbe
1835 Shetland Drive
Wheaton, IL 60187
708 690 5442

Ron Zorn
5N208 Goldeneye
Bartlett, IL 60103-6361
708 830 6724

Space Models Available
(from the sci.space netnews group)

Part Time Models has a number of spacecraft and rocket models available, with more coming. These models are in polyester resin, and are fairly easy to assemble.

The newest model is of the Manned Orbiting Laboratory from the mid-1960's; it can be built in either the orbital configuration, or configured for launch and placed on the Part Time Models Titan III kit. Most kits are in 1/144 scale for commonality.

The next kit due out is a 1/144 scale Apollo Command + Service Module; more complete and accurate than the Monogram C/SM from the Saturn V kit. following that will be the M2-F2 lifting body and the Black Horse spaceplane.

1/144 Scale Manned Orbiting Laboratory $12.50 (model of early 1960's USAF space platform - comes with parts to model it on top of Titan IIIE)

1/288 scale DC-Y $18.00 (model of SSTO VTOL rocket vehicle, including options on body flaps, cargo bay doors, landing gear and rocket nozzles)

1/144 scale HL-20 $9.00 (model of NASA design for lifting-body Personnel Launch System and Assured Crew Return Vehicle; includes landing gear options)

stand for HL-20 $1.00 (includes base, lead weight, clear plexi rod and variable position hardpoint for attaching to model)

1/144 scale X-20 $7.00 (model of final design for early 1960's USAF spaceplane) stand for X-20 $1.00 (similar to HL-20 stand)

1/144 Sanger Antipodal Bomber $15.00 (model of 1939-1944 German rocket bomber/spaceplane design)

1/1000 scale DC-Y $3.00 1/1000 scale NASP $3.00 1/1000 set - includes both DC-Y and NASP $5.00

1/144 Titan IIIE $35.00 (model of U.S. space launcher. Includes hollow payload shroud; no stand.)

1/144 X-20/Titan III Conversion Kit $6.00 (Includes parts - transstage, adaptor, etc. - to model the X-20 on the Titan III.)

1/144 Centaur G' Upper Stage $4.00 (Upper stage for Titan IV/Shuttle. NO PAYLOAD - suggestions welcomed.)

1/144 V-2 (A-4) Rocket $4.00 (Revolutionary German W.W. II Ballistic Missile)

1/144 A-4b $5.00 (Long range, winged V-2)

1/144 A-9/A-10 $15.00 (Proposed German W.W.II ICBM.)

1/144 Gemini Capsule $3.00

1/144 DC-Y...LIMITED NUMBERS - RELATIVELY LARGE KIT $45.00

To order, add 9% shipping and handling (Iowa orders add an extra 6% for tax); non-U.S. orders add 35%. Send check or money order to:

Part Time Models
P.O. Box 1554
Ames, IA 50014
Scott E. Lowther, owner

NAR S&T NEWS

RELEASE 21: MOTOR CERTIFICATION

The following motor has been certified by NAR Standards & Testing as of December 5, 1994 for general use as a model rocket motor. It is certified for contest use as of March 5, 1995.

The following is a single-use disposable motor certified with either the "Apogee" or "Aerotech" label.

Aerotech: 29mm x 85mm: F10-6 (80.0 N-Sec total impulse, 40.7 grams propellant mass)

RELEASE 23: MOTOR DECERTIFICATION

Effective immediately, Estes E15 motors with date codes of 13X10 and 15X11 are decertified for general and contest use. In April 1994, Estes Industries officially recalled E15 motors with these two date codes. MESS data collected by NAR Standards and Testing since August 1994 substantiates this action. Only these production lots are immediately decertified. If you possess these motors, Estes asks that you contact your local retailer for a product exchange in accordance with the recall announcement issued by Estes to its distributors and retailers.

Due to a year long production hiatus, all other Estes E15 motors will lose contest certification on 1-July-95, except for contest use at NARAM 37. General use certification will expire in three years, on 1-July-98, per S&T decertification policy.

At the time these motors are reintroduced, they will undergo a full certification test as if they were new, first-time motors.

Jim Cook, Secretary for NAR Standards & Testing <JimCook@AOL.COM>

Jack Kane, Chairman

NIRA REPRINT SERIES

The NIRA Reprint series, which has been available for months at NIRA meetings, is now available by mail. The reprint series is a an effort to get interesting useful information out of the collections of "Old-Timers" and into the hands of people who don't have access to the original material.

Sources for the reprint series include back issues of Model Rocketeer/American Spacemodeling/ Sport Rocketry, Model Rocketry Mag., main stream magazines, and the Internet's Usenet rocket group Rec.Models.Rockets (R.M.R.) just to name a few.

There are currently 6 booklets available.

1) Sport Plans of the Model Rocketeer. A collection of 10 easy to build single page plans. 16 pages

2) Sport Plans of the Model Rocketeer #2. A collection of 12 single page plans with the emphasis on ODD. 16 pages

3) Glider How-to articles from the Model Rocketeer. How to build, trim, and fly a rocket powered glider. In addition to the how to articles are several more technical articles. 20 pages

4) Boost/Glider plans from the Model Rocketeer. Collection of 7 interesting 1 and 2 page plans. 20 pages

5) Ideas. A collection of 10 articles about ... well ...IDEAS! Some things you may not have thought of such as launching from under water! or kitbashing. 16 pages

6) Reusable Rocket Ships. Set of 3 articles about the Delta Clipper (DC-X) from Popular Science, Air & Space and Sky & Telescope. 20 pages

7) Rec.Model.Rockets Glossary of Rocket Terms.

Reprint booklets are FREE to members at club functions. If you want them by mail simply send 32 cents in stamps or cash for EACH booklet you order. Or (best of all) a large 9x12 Self addressed stamped envelope (the SASE can be used for several at once, be sure to include postage for EACH booklet) to:

Richard Gaff
3175 Norwood Ct.
Streamwood, IL 60107

[Coming Soon - The NIRA Big Book-o-Tips!]

John Kallend and his Ladyhawk RCRG (with an airstarted motor!) at the 1994 Labor Day Launch. Ric Gaff photo.

Dallas, Tx API- The peaceful calm of a pleasant Texas weekend was shattered when a rocket - the Suicidal Sudden Sensation - literally exploded at launch. The rocket was powered by 43 Estes E15 motors, many of which appeared to fail after ignition. Actually, this is a picture of a real cato - a Titan SRB blew up during a static test firing. But admit it, I got your attention. Another cool picture I found while surfing the Internet (yes, I do really work and don't spend all my time surfing).

Rachel Kaplow is excited about Bottle Rocketry!

Ed Thiel reaches for the sky with his 12 foot long Neon 12. Photo by Ric Gaff.

John Barrett is somewhere behind the smoke of his Phoenix.

Explorer 1 lifts off on January 31, 1958 on top of a Jupiter C.

Adam Elliot's Mercury Redstone blasts off to a successful sub-orbital flight. Photo by Adam Elliot.

If you missed the last few meetings..
by Bob Wiersbe

At the December NIRA meeting we had long discussions about how the range will be run and what events we will have next year. Bob Kaplow and Mark Bundick put together an outline of the items they felt were necessary to allow NIRA to run safe launches next year, and the outcome is that things will be a lot different next year - and better! Look for the full story in the March/April Leading Edge.

The biggest news from the December meeting is that we have officially decided NOT to have the Labor Day Launch this year. The reason is that most people felt that there were too many events scheduled towards the end of the year and the Labor Day launch would be the one event we could drop. The other events were MRFF, the August HPR launch, August club launch, Labor Day, September club launch, October club launch, RCHTA, and the RCHTA launch. While it's not easy to drop something after 31 years, most people felt that the time was right to do it.

We also celebrated Bill Thiel's birthday with cake, pop, and a song. Bill celebrated by winning Model of the Month with his Pringle can tube fin rocket. Quote of the meeting by Mark Bundick - "The adults have got to do a lot better." A GI Joe, a pack of Rock-a-chute motors, a Nike-K, and a bunch of Pringle cans that were glued together were entered by the adults for Model of the Month.

In January we elected the 1995 officers (well, we re-elected most), and after a rather interesting nominating session and write-in campaign the following people were unanimously elected:

Ed Thiel (Prang Party) - President
Cheri Chaney (Very Silly Party) - Vice President
Ken Hutchinson (Staging on Impact Party) - Secretary/Treasurer
Bob Kaplow (Silly Party) - Safety Officer

Kudos go to Cheri, who not only volunteered to be VP, but also became a NIRA member just so she could officially run for the position (and to Bob Kaplow for paying for her!).

Bill Thiel is looking in to setting up a tour of Monogram Models for the March outing. We may need to take the tour on a Saturday instead of Sunday. If the tour falls through we were thinking of going to see the new movie "Apollo 13", if it's out by then. Ric Gaff says that the movie is an accurate portrayal of the real thing, except for the 4th crewmember who is a female. If the movie isn't out, we don't know what we'll do for the March outing. Come to the March meeting to find out for certain, or call me after March 3rd.

Bob Kaplow announced that he is in the process of working out a deal with some other clubs to do a bulk buy of body tubes. The sizes will be BT-5, BT-20, BT-50, BT-55, BT-60 and BT-80. The prices haven't been worked out yet, but it should be really cheap. The only drawback is that we will have to buy 100 of each type of tube (that's 600 tubes!). Someone will have to set up a bulk order to BMS for a few hundred nose cones.

Cindy Ingrum lugged up about ten 6v 10Ah rechargeable batteries that Paul Marcy (Tim Marcy's dad) donated to the club. They disappeared rather quickly, in fact they were gone before we could decide what to do with them!

Saturn V Building Tips
by Peter "Buy my books" Alway

1: Some permanent spray adhesive isn't. I suggest that when applying body wraps, use a better adhesive. I used wood glue (though wood glue applied directly to paper wraps will wrinkle them-apply it to the body in a thin layer). Wrap the corrugation around dry for good alignment. lift one end and glue it. Re-adjust aliment and allow to cure with a rubber band holding alignment. then glue the rest of the wrap down.

2: Paint white paint, then black paint, and finally silver.

3: Mask with scotch Magic tape (the frosty stuff) and aluminum foil covering the vast white expanses.

4: There are white areas on the service module. refer to the launch close-up of the real thing on the box. The pattern repeats at 180 degrees.

5: Do not fly with Estes E15's with X in the date code.

6: I really love flying mine on D12-3's, but lotsa folks like to fly with bigger engines. Those may require high-power construction techniques.

7: Apply decals to glossy surfaces only.

8: If you want to be accurate for Apollo 11, omit half the ullage rockets. Keep those that are nearly in line with the fins. with care you can burnish the remaining locations on the wrap-around to match the surrounding corrugations (those places will be painted black, so flaws should be inconspicuous)

9: Leave the decal(s) off the nose cone (command module's boost protective cover).

10: Take the effort to sand and seal the fins well. They'll be painted silver, and the grain will really show.

11: Only fly your Saturn V for an appreciative audience. I believe that every model rocketry flight has a 10% chance of ending badly, and your Saturn V will be too precious to waste flying alone, or after a bunch of G and H flights that will make the Mighty Saturn V look not so mighty. After a bunch of Alphas and Berthas, you can really relish a Saturn V launch. And don't you go snapping photos. Let somebody else do that. Enjoy the flight! It's the about the coolest rocket around.

Bong High Power Launch
by Steve Koszuta

Dateline: January 1st, 1995 12NOON

15 degrees above zero - winds gusting to 25mph. Putting the wind chill at somewhere below zero Fahrenheit.

I could be doing one of two things:

1.) Sitting in my nice warm house watching football bowl games on television, or ....

2.) FLYING HIGH POWER ROCKETS!!!!

Yes, I chose number two. My wife, Marie, thinks I'm a little strange too!

Tripoli Madison/Wisconsin have obtained a standing waiver to 8000' MSL for Bong State Rec. Area. They now have monthly launches there on the fourth Sunday of each month. Call ahead to verify.

Well, I got to the launch an hour and a half late. (Thanks to the 3" of snow which had to be shoveled at my house.) I thought I would have missed a lot, but it turned out Dave Sutton was prepping the first rocket of the new year - a J180-10 powered LOC Magnum. It had a perfect flight and landed only 100 feet from the pad.

The launch equipment suited the rate of fire quite nicely. One pad with an Impulse Aerospace Veri-Fire launch controller.

Somebody should have warned Mark O. that sub-zero weather and phenolic tubing don't mix. When his PML Ariel flown on an I161 touched back to Earth - it re-kitted itself. Mark was seen finishing the job by banging the model against his car's bumper.

A new Prefecture is forming in Green Bay, Wisconsin and it's Prefect - Jerry Huebner was out flying some smaller rockets. His stretch FSI Hercules on a RocketFlite G160SS had a nice flight.

Paul Olson (?) flew two rockets - a Laser Loc with a G160 which was not recovered and another model on a H220SS, which drifted quite far to the east.

Dave Sutton flew again with a Laser Loc 4 on a H180 for a beautiful flight.

I stayed as long as I could, but never did see Mark Strehl's Cluster R Standard ARM fly on a J275. I heard from Stan Wagner that it was a great flight.

Heard On The Street

Rumors and such, with apologies to the Wall Street Journal

Final Flight - Col. Stuart Roosa, USAF retired, one of six Apollo astronauts to fly solo around the Moon, died Dec. 12 due to complications from pancreatitis. Roosa, 61, was Command Module Pilot for the Apollo 14 mission in 1971. He was buried at Arlington National Cemetery.

Welcome to the Club - Andy Konkol, Tom Pastrick (long time NIRA member, back after a hiatus), newly elected VP Cheri Chaney, and the Walts family: John E., Sandy, Matt, John, and Mark have recently joined NIRA. Welcome!!

HUVARS Contests

HUVARS is planning two contests for this spring:

Event: 1/2 A Section/Local Meet**

Location: Merril Field (West side of Merril Road) Hamburg, Michigan

Date: April 22, 1994

Fee: $1.00 (HUVARS members free)

Events: 1/2A Streamer Duration, 1/2A Helicopter Duration, 1/2A Super Roc Duration, 1/2A Flexie Duration, 1/2A Altitude, Open Spot Landing (1/2A encouraged)

Event: 1995 Midwest Spacemodeling Championships at the Michigan Space Center Regional Contest (aka 95*(MSC)^2)

Location: Jackson Community College, Jackson, Michigan

Dates: May 27-28, 1995 (Memorial Day Weekend)

Fee: $3.00

Events: 1/2A Parachute Duration, C Streamer Duration, A Boost Glide Duration, C Rocket Glide Duration, C Egg Loft Altitude, Plastic Model Conversion, Open Spot Landing

You don't need to be an NAR or HUVARS member to fly the contests (you do need to an NAR member to earn contest points). And HUVARS encourages any one who wants to sport fly to come out and join the fun. For more information, contact Peter Alway 2830 Pittsfield Ann Arbor, MI 48104 (313) 677-4399

Unsolicited Endorsements

"The Leading Edge is fantastic! There's nothing in the world like it, to be at the very rim of the envelope, trying to push beyond it! What? It's a newsletter for a bunch of nuts who fly rockets?? You're kidding me, right?" - C. Yeager

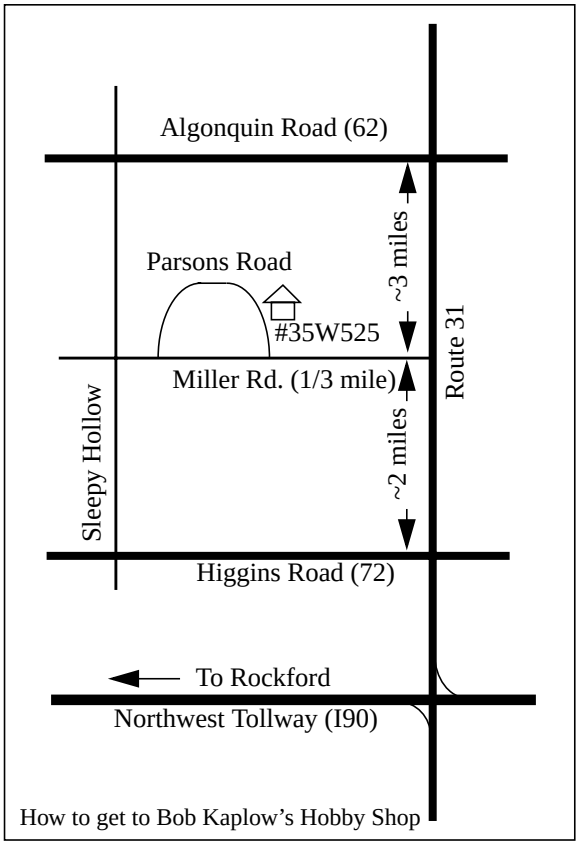
"I've tried many newsletters in my life, but nothing has satisfied like The Leading Edge. It absorbs more parrot droppings than any other newsletter in its class." - Capt. Hook

"We used to enjoy reading The Leading Edge, but they've been making fun of our new E15 motors far too much lately. Now we just recycle the newsletter to make casings for our new motors. At least it's good for something." - Estes Industries

"The Leading Edge was *my* idea." - J. Irvine

■	S	■	■	■	■	■	■	D	■	■	■	■	■	N	I	R	A
■	T	■	N	I	K	E	D	E	A	C	O	N	■	O	■	■	■
C	A	T	O	■	■	S	■	L	■	■	■	■	■	S	E	A	M
■	G	■	■	L	■	T	I	T	A	N	I	I	I	E	■	■	E
N	E	P	T	U	N	E	■	A	■	A	■	N	■	B	E	T	A
I	■	O	■	G	■	S	■	■	■	S	■	I	■	L	■	■	N
K	■	W	■	■	■	■	■	S	■	A	S	T	R	O	C	A	M
E	■	E	■	■	V	■	■	P	■	■	■	I	■	C	■	■	A
T	E	R	R	I	E	R	S	A	N	D	H	A	W	K	■	■	C
O	■	P	■	■	G	■	■	C	■	■	■	T	■	■	■	■	H
M	A	R	S	L	A	N	D	E	R	■	R	O	O	T	■	■	I
A	■	A	■	■	■	■	■	S	U	P	E	R	R	O	C	■	N
H	O	N	E	S	T	J	O	H	N	■	L	■	I	■	■	B	E
A	■	G	■	■	A	■	■	U	■	■	O	■	G	L	U	E	■
W	A	I	V	E	R	■	■	T	■	F	A	■	I	■	■	R	■
K	■	N	■	■	T	■	■	T	R	I	D	E	N	T	■	T	■
■	■	G	■	■	A	■	■	L	■	N	■	■	A	■	■	H	■
■	■	■	A	E	R	O	B	E	E	■	■	A	L	P	H	A	■

Answers to last months puzzle. There was a mistake in #22 Across, the clue should have read "Base of 31 down". Thanks to Rich Husak for finding this! Hope that it didn't keep anyone from doing the puzzle.



How to get to Bob Kaplow's Hobby Shop

THE LEADING EDGE
C/O Bob Wiersbe
1835 Shetland Drive
Wheaton, IL 60187

1995 NIRA LAUNCH SCHEDULE

DATE	TIME	PLACE	SPECIAL EVENT
01/15/95	2:00-5:00	Hesterman Bowl	NIRA Annual Sports Outing
02/19/95	2:00-5:00	Bob Kaplow's	Building Session
03/19/95	2:00-5:00	Site to be determined	Field Trip!
04/23/95	2:00-5:00	Community Park, Lisle	First Launch of 1995
05/21/95	2:00-5:00	Community Park, Lisle	
06/17&18/95	All day	Pratt's Wayne Woods	Midwest Regional Fun Fly
07/16/95	2:00-5:00	Community Park, Lisle	
08/20/95	2:00-5:00	Community Park, Lisle	
09/17/95	2:00-5:00	Community Park, Lisle	
10/15/95	2:00-5:00	Community Park, Lisle	
10/28&29/95	9-5	Rosemont Expo Center	RCHTA Show
11/5/95*	2:00-5:00	Community Park, Lisle	RCHTA Launch
12/10/95*	2:00-5:00	Bundick Residence	Holiday Party

* Date subject to change, call before coming