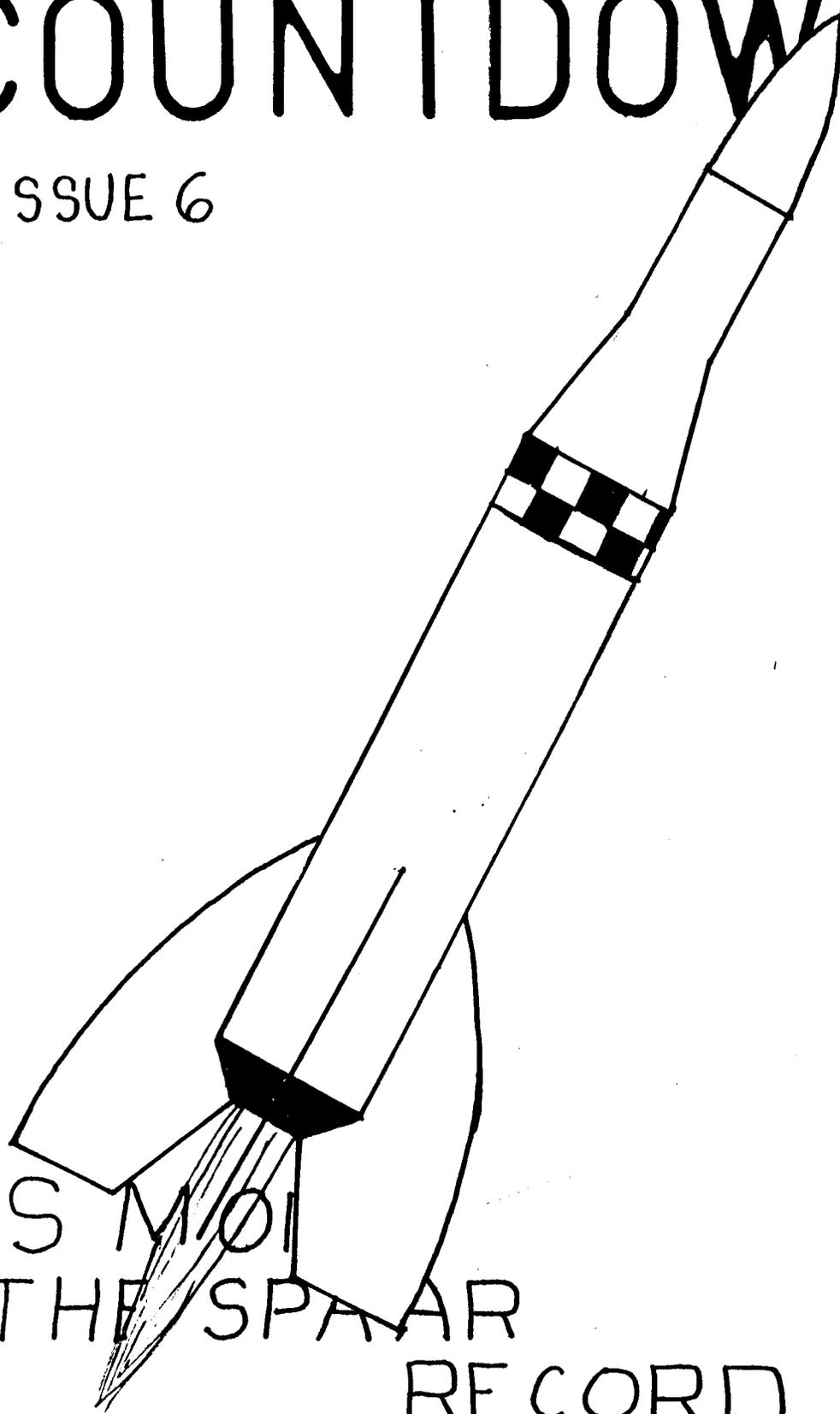


THE

SPAAR COUNTDOWN

VOL. 1 ISSUE 6

NOV. 88



THIS MONTH
THE SPAAR
RECORD
BOOK

MEETING MINUTES ♦ FLIGHT LOG ♦ MORE!

THE SPAAR COUNTDOWN

Volume 1, Issue 6

November, 1988

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"BLAST FROM THE PAST" Classic Model Rocket Plan..... Page 9

This month's "Blast From the Past" Classic Model Rocket plan, the Astron Cobra, should be familiar to our Senior members. It was marketed as a kit from 1962 through 1973, by Estes Industries. The Astron Cobra, like it's half brother the Astron Ranger, were the first cluster powered kits available. However, they were both withdrawn from the market, (along with the Astron Scrambler) when clusters faded in popularity when "D" and higher powered motors became available. The single engine reliability offered by "D" or higher motors made cluster ignition a thing to be avoided. However, with the appearance in the hobby of high-power rocketry and flshbulb cluster ignition, these old designs seem to be coming back.

The SPAAR COUNTDOWN is the official journal of the Southern Pa. Area Association of Rocketry, PO Box 127, Reamstown, Pa., 17567, and is published on a monthly basis for the benefit of the members of SPAAR.

Section Calender: November 20, Sunday, 1PM: Section Launch, Cocalico High School, Denver.
November 21, Monday, 7PM: Monthly Section Meeting, Lancaster Library.
December 18, Sunday, 1PM: Section Launch, Cocalico High School, Denver.
December 19, Monday, 7PM: Monthly Section Meeting, Lancaster Library.

The Southern Pennsylvania Area Association of Rocketry is an officially chartered Section of the National Association of Rocketry (#503).

SECTION MEETING MINUTES

The monthly section meeting for the month of October, 1988, was held on Monday, October 17, at the Lancaster County Library on N. Duke St., Lancaster. The meeting began at 7PM; present were section members John Yost, Dick Rhoat, Bill Rhoat, Dave Wenrich, Jess Wenrich, Ed Miller, Glenn Feveryear, and George Beever.

George Beever gave the Treasurer's report, which reported a total of \$92.32 in the General Fund.

The results from UNCLE - 1 were announced, and prizes awarded: an Estes "Phaser" kit to Glenn Feveryear for overall first place; a pack of Estes recovery wadding to John Yost for second, and a pack of Estes ignitors to Dan Yost for fourth place.

The October issue of "The Countdown" was passed out to all members present.

It was reported that the Section Charter application had been sent to the NAR on 29 September, and as of the time of the meeting, no reply had been recieved.

George reported that in September, he had recieved, from the NAR, a computer print out listing all NAR members in the area around and in Lancaster County. He states that he has sent letters or post cards to 28 persons, announcing our ex-istance, and inviting them to join SPAAR.

The time of the October 30 launch was moved up, from a 2PM start to 1PM.

The date of the next club launch (after 10/30), was originally scheduled for Sunday, 27 November. However, due to the fact that deer season opens the next day, the November launch will be held on Sunday, 20 November, at 1PM, at Cocalico. The next meeting will be held at it's usual time, Monday, 21 November, at 7PM, at the Library.

A discussion was then held on how best to approach area hobby shops, in an effort to enlist their aid and support for the section, specifically with our upcoming membership drive. It was the general consenses to make contact with the owners of the shops now, with the goal of placing posters and flyers in the stores after Christmas, when cabin fever starts setting in. To go along with the idea of posters and flyers, the idea of having section business cards printed up was discussed. Each section member then took a store or two, that they frequent, to make their responsability: John Yost- Smitty's (Manor Shopping Center) & The Pit Stop, Mt. Joy; Bill & Dick Rhoat- Boscov's and the Education & Fun, Fruitville Pike; Ed- The Rail Fence, Cleona; Dave & Jess- Good's, at the Green Dragon; Glenn- Yorktowne Hobbies, Cockeysville, Md; George- The Crossing, East Towne Mall.

A discussion was held on the various other methods of gaining publicity, thereby increasing membership. These included area newspapers, radio, TV, etc.

A need for a section logo was discussed; this may or may not incorporate the NAR logo, but would be nice for patches, cards, etc.

The club launch system was discussed. John presented a list of the items he will need to construct the system. Members stated that they could help with various parts, either from their own supply, or stated that they had access to them. John stated that the system will have at least 8 firing positions (pads), and will be flashbulb-compatable for cluster ignition. Hope fully, the system will be up by the first of the year, or at least for the first club launch in 1989.

A discussion was held also on the club's plans for the winter of 88/89. It was decided to hold regular club launches up thru December, and hold workshops in January and February instead of launches. Glenn stated that the Delta-Cardiff fire hall would be available, provided that there are no fire company functions slated at that time. A workshop on basic construction and finishing techniques was scheduled for Saturday, January 14, and a workshop on competition rocketry to be held on Saturday, February 11.

Glenn handed out some information on flashbulb ignition for clusters and sources for body tubes and other parts.

General discussion followed, and the meeting adjourned at 9PM.

MONTHLY LAUNCH RESULTS

The October monthly launch was held, as scheduled, on Sunday, October 30th. The 45 degree temperatures and 10-15 MPH winds kept the number of flights down, and at times the wind seemed stronger than 15 MPH, and the temperature seemed much colder than 45 degrees! It all goes to show that model rocketry buffs are a strange bunch. Present were Rick Hackman, Dave and Jess Wenrich, Bill and Dick Rhoat, Ed Miller, Dave Bender, Glenn Feveryear and his dad, whose first name I'm sorry to say I cannot remember, so we'll refer to as MR. Feveryear, George Beever, new member Bryon Beiler, and John "Videoman" Yost.

George had volunteered to be RSO for this launch, and at 1:22PM, finally got things going with the launch of Dave Wenrich's Estes Mini Mars Lander. From then on, RSO-in-training Dave Bender handled the bottle washing and button pushing chores. Hey, he really wanted to do it!

There were many interesting flights made; of course we won't even mention a certain motor malfunction, which caused a certain two months in the making Jupiter-C to take the SPAAR Frang of the Month Award, hands down. Ever see one of these things hit the ground at a 90 degree angle?

Glenn Feveryear gave a demonstration of flashbulb cluster ignition, using an old Estes Astron Ranger cluster model, with three B4-4s. Everything worked as advertised; now, not only do we get smoke and fire, we get a FLASH! POP!, then the smoke and fire. Glenn also flew a swing-wing boost glider, the "Gull", on a 154 second flight with a B4-2, that was very impressive.

Bill Rhoat flew a large model that he calls the "Jalopy", which turned in a very nice flight, even though it had a separation problem. Rick flew a model called "XR-16" with a C6-5, which turned in a very stable, high altitude flight. Unfortunatly, when last seen, it was drifting over a feild about 3/4 of a mile away, and still going. I don't know if he ever got it back... Ed Miller flew his usual collection of well finished models, including a "D" powered model he calls "Gone", and that's almost what happened to it. Those who fell victim to the "Igottawork" syndrome included Dan Weinhold and Mark Snyder. Hope to see you next time, guys. John Yost didn't fly, but he had his video camera going almost all afternoon, and he should have some good footage. Dave Wenrich almost got arrested for Assault with a Deadly Ninja; he almost took out John and Dick Rhoat when the streamer didn't deploy. Yikes!

FLIGHT LOG

<u>Flight#</u>	<u>Name</u>	<u>Model</u>	<u>Motor</u>	<u>Time</u>	<u>Dur.</u>	<u>Misc.</u>
1	Dave W.	MiniMars Lander	A10-3	1322	-	GF
2	Dave B.	Honest John	A8-3	1330	-	GF
3	George	Jupiter-C	C6-3	1335	-	CATO, PRANG, YUK
4	Bryon	Yankee	B8-5	1348	-	GF
5	Dave B.	Interceptor	C5-3	1351	20.8	chute problem
6	Rick	Heres Hopin'	B6-4	1355	-	unstable
7	Ed	X-1	A3-4	1359	37.4	GF
8	Rick	XR-12	C6-5	1401	-	GF
9	Dave W.	Ninja	A8-3	1403	-	no streamer
10	Dave B.	Liberty	A8-3	1412	16.5	GF
11	Rick	XR-16	C6-5	1415	-	GF
12	Glenn	Ranger	(3) B4-4	1420	-	GF

<u>Flight#</u>	<u>Name</u>	<u>Model</u>	<u>Motor</u>	<u>Time</u>	<u>Dur.</u>	<u>Misc.</u>
13	Bill	Jalopy	B6-2	1432	15.3	½GF
14	Dave B.	Transtar Carrier	B6-4	1437	14.0	GF
15	George	Stealth	B4-4	1440	-	GF
16	Glenn	Mercury Redstone	B4-2	1449	-	GF
17	Dave W.	Skinny Mini	A3-4	1453	-	GF
18	Ed	Nike Smoke	B6-4	1502	-	GF
19	Ed	Big Bertha	C6-5	1509	24.0	GF
20	George	LTV Scout	C6-5	1512	-	GF
21	Glenn	Gull B/G	B4-2	1526	154.0	GF
22	Ed	Gone	D12-7	1533	83.7	GF
23	Dave B.	Mega Sizz	D12-5	1543	-	GF
24	Rick	XR-19	1 A8-3, 4 ½A3-2	1600	-	unstable
25	Ed	Orion	C5-3	1601	-	GF
26	Ed	X-1	A3-4	1605	-	GF

Number of flights, by participant:		Motors fired, by type:			
Bill	1	½A3-2	4	C5-3	2
Bryon	1	A3-4	3	C6-3	1
Ed	6	A8-3	4	C6-5	4
Glenn	3	A10-3	1	D12-5	1
Dave W.	3	B4-2	2	D12-7	1
Dave B.	5	B4-4	4		
Rick	4	B6-2	1		
George	3	B6-4	3		
TOTAL	26	B8-5	1		

Number of succesful flights, 22;
 Number of unsuccessul flights, 4
 Total flight time: 2 hours, 43 minutes.

ADVANCED MODEL ROCKET FINISHING TECHNIQUES

Part III, by Ed Miller

PART III, Painting and finishing your model

I have found that the easiest way to hold a model rocket while painting is to use a 7/16" dowel rod. Use a 3/8" rod for mini engine rockets. With a dowel rod you can hold the rocket in one hand, while painting with the other. If the rocket spins when you spray the fins, use a piece of tape inside the body tube to hold it on the dowel. The model can be painted on all sides by rotating the dowel in your hand. The model can be left to dry on the dowel by clamping it in a vise or holding it with weights. If the model is too long to hold on a dowel (Estes Mean Machine or Long Shot) paint tubes separatly and assemble them after paint work is complete.

Step 1- Sand all plastic parts with 400 grit sandpaper. Remove all high spots at mold parting lines. Don't worry about the low spots, they will be taken care of later.

Step 2- Wipe model with tack cloth. Stir the can of Velvaseal thoroughly. Pour into a clean Air Brush jar. Use no thinner, it is ready to spray straight from the can. Set your air supply at 30 PSI. Adjust your Air Brush to wide open and let it that way for all painting operations. Put on your dust mask, and wear it any time you are spray painting. Give the entire model one coat of Velvaseal. Make sure you spray all of the

fin edges. Let dry for 12 hours.

Step 3- Now that the Velvaseal is dry, you will notice small surface imperfections in coated parts and fillets. Using the Acryl-Blue Glazing Putty and a plastic spreader cover the fins with a thin coat. Cover the mold parting line on the plastic parts. Check edges of fins, also. Allow to dry for 24 hours.

Step 4- Using 320 grit sandpaper, sand the glazing putty until it remains only in the low spots. If you must sand the body tube, do not sand into it. Blow or wipe dust from model with tack cloth.

Step 5- Spray entire model with one coat of Velvaseal. Let dry 12 hours.

Step 6- Check for surface imperfections again. If there are any, repeat Step 2, but only coat with putty where needed. Let dry 24 hours.

Step 7- Sand with 400 grit paper where needed. Wipe with tack cloth.

Step 8- Spray with Velvaseal on sanded areas only. Let dry 24 hours.

Step 9- Using 600 grit Wet-O-Dry sandpaper, sand the entire surface lightly. Do not sand thru the sealer! You can also use a little water on the sandpaper. This will give you a smoother finish. Do not get any water inside the tube, or sand thru the sealer on the tube. Wipe down the model with a dry towel to remove all dust, water, and sanding residue. Let dry overnight.

Step 10- Choose a color of lacquer paint. Make sure that you stir the paint thoroughly. Scrape all pigments and metallics off the bottom. You can't stir too much.

Step 11- Wipe down model with tack cloth. Using a clean air brush jar, mix 1 part lacquer paint with 3 parts 3661 Medium Thinner. Stir it thoroughly. If this mixture stands still for more than 3 minutes, the pigments and metallics will start to settle out. Stir occasionally. When you are painting, the movement of the air brush will keep the paint mixed. Set your air supply at 30 PSI. Apply 4 coats, allowing 15 minutes in between coats. Make sure that you paint all of the edges. Allow to dry for one hour before you proceed to Step 12.

You may notice that as the paint dries it will take on a whiteish appearance. This is called blushing. It is caused by humidity. Don't worry about it.

Step 12- Using a clean jar, mix 1 part clear lacquer with 3 parts 3661 Medium Thinner. Stir thoroughly. Apply 2 coats, 15 minutes apart. The clear lacquer will protect the painted surface from damage during handling.

If you are doing a 2 color paint job, proceed to step 13;
If you are using decals, proceed to Step 14;
If neither of the above, proceed to Step 17.

Step 13- See material description for proper use of fine line tape. Make sure all edges of tape are down tight. Mix your paint as described in Step 10. When you apply your first coats do not spray heavily on tape edges. A few light dust coats are better. After the dust coats apply paint as in Step 11. Wait one hour and then repeat Step 12 on second color. Let dry 24 hours before removing tape. Peel off tape very slowly.

Step 14- Decals and lacquer paint work together only under very special circumstances. Preparation, technique, and luck are very important. First, mix 1 part clear lacquer and 3 parts 3979S retarder. Stir thoroughly. Apply 1 coat. CAUTION: this paint mixture dries extremely slow. It will run if applied too heavily. Just enough should be sprayed on to make the surface smooth and shiny.

This smooth surface will promote decal adhesion. Let dry 24 hours.

Step 15- Apply decals as per decal instructions with kit. Make sure there are no air bubbles underneath. If there are a few stubborn ones, puncture them with a needle. Apply decal setting solution as per instructions on jar. This will help decals settle into uneven surfaces. It is very important that the decals are completely dry before you paint over them. If there is the least bit of moisture under them, they will wrinkle when the paint is sprayed on. They will wrinkle even when dry if the paint is sprayed on too heavy. Estes decals take about 4 days to dry in non-humid conditions. I have used decals that have taken 2 weeks to dry. Don't take chances - WAIT! If you use rub-on decals (dry transfer) or self-adhesive mylar decals, no wait is necessary.

Step 16- All types of decals except self-adhesive, must be protected from the Urethane Clear Coat. If you are using self-adhesive decals, skip Step 16. We will cover them with 4 coats of clear lacquer. In a clean jar mix 1 part clear lacquer with 3 parts 3613 Fast Dry Thinner. Mix thoroughly. Spray 1 light coat over decals. Wait 2 hours and spray another coat. Spray a total of 4 coats, with a 2 hour wait between each. These 4 coats of clear lacquer will blush very bad under almost all conditions. Don't worry about it.

Step 17- Now, using some 600 grit Wet-O-Dry sandpaper, sand your entire model very lightly. Use a little water on the sandpaper. Sand just enough to take the overspray mist off. Be careful over the decals. Wipe with dry towel and let dry.

Step 18- Wipe all sanding residue off the model with a tack cloth. Using the Air Brush with no paint in the jar, blow off entire model. In a clean glass jar, mix 4 parts 580 Urethane enamel Clear Coat, 1 part 582S Activator, and 1/4 part 289S Accelerator. Stir thoroughly. Using 30 PSI, spray on your first coat, doing the edges first. It should be sprayed on just heavy enough to make the entire surface smooth and wet. Wait 15 minutes, then give it a second wet coat. Let model hang on the dowel in a dust free area for 24 hours. You can now touch it, but the paint will still be soft and easily damaged. It takes a few days for the Clear Coat to cure completely.

I hope you had fun painting your model. It may seem difficult and time consuming at first. I have been in business painting model cars and other plastic kits for almost 10 years using this procedure. I've now extended it to my model rocket hobby.

If you have any questions or comments, I'd like to hear from you.

Ed Miller

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SECTION NEWS NOTES

As you can see, this portion is now called Section news notes. That's right, we're now an official NAR Section, # 503. Section Advisor John Yost received the charter certificate during the last week in October, and is now in the Section files. Copies will be passed out at the next meeting.
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We'd like to welcome SPAAR's newest member, Bryon Beiler, of 1505 S. Cocalico Rd., Denver. Bryon, 14, was sponsored by Dave Wenrich. You may have met Bryon at the launch on 30 October. We hope to see more of Bryon at meetings and launches.
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Of the 28 letters and cards that were sent to prospective members, 5 people responded. They received membership information, and will be receiving copies of this issue of the Countdown. They were Chad Snader, Eprata; Jason Goodling, York Haven;

April Craig, York; David Harvey, Delta; and Randy Myers, Spring Grove.
 Hopefully, we can look forward to meeting these folks soon!

Two things for all members to keep in mind for the January, 1989 meeting: the election of officers and the Section Board of Directors, and (boo hisss) the payment of dues for 1989.

At the last meeting, John Yost mentioned that this club is first and foremost a rocket club, and that we're here to have fun. We don't want to be known as strictly a competition club; we want to attract persons who have interests in all phases of the hobby, and make things interesting for all. Along those lines, Glenn Feveryear suggested keeping a club record book, as an aid in keeping participation high. Dick Rhoat agreed, stating, "that could give people something to shoot for." Hmmmm, another area of statistics to play with. Throughout the next week, I started to go over the flight logs of all of the past launches, and checking the NAR Pink Book, to check the various events. Apparently, Bill Rhoat had the same idea, because he was doing somewhat the same thing, too. Well, the more I delved into this, the more I realized just how many events were sanctioned by the NAR! So, friends, after staying up until 2 AM one night, I present to you...(drum roll please).... the SPAAR Record Book!

Not so fast. A couple of things to keep in mind. First, no altitude records are recorded, for the simple fact that we don't have an altitude tracking capability yet. That makes sense. Second, the question arose of "how does a flight qualify for a club record?" I propose the following solution: a record flight must be a flight taking place at a regularly scheduled section launch. If you spend hour upon hour designing, building, testing, or talking to that ever-so-special $\frac{1}{2}$ A Streamer Duration model, and on a sunny Saturday afternoon gather up Mom, Uncle Irving, and the family cat and head out to Aunt Bessie's meadow, and launch it to a total flight time of 4 days, 2 hours, 8 minutes and 12 seconds, you would get everyone's undying admiration, and maybe a call from the President, (or even G. Harry Stine no less), but no record. Ah, but hang on Bunky, there may be a way around this yet. How about a provision whereby notice be given to the Section Advisor and/or the Section president prior to the record attempt, in order to obtain some sort of verification. It's not a matter of trust, but there has to be some way to keep track of this stuff. This is something we can discuss at the next meeting. Also, I propose that it be the modeler's responsibility to see to it that his/her flight is timed, by notifying the RSO of thier wishes.

Some of you may find your names in this record book, and say to yourself, "Gee, I didn't know that!", which is all part of the fun of this stuff. Also, take note that the NAR does not sanction "D" through "G" Parachute Duration, but I included it here just for the heck of it. I figured it won't hurt for us to keep track of such things. Now, could we have that drumroll again please?

THE SPAAR RECORD BOOK

Event: Parachute Duration

<u>Class</u>	<u>Impulse</u>	<u>Name</u>	<u>Model</u>	<u>Motor</u>	<u>Date</u>	<u>Time</u>
00	$\frac{1}{4}$ A	OPEN				
0	$\frac{1}{2}$ A	Glenn Feveryear	Perihelion	$\frac{1}{2}$ A3-4T	10/9/88	105sec
1	A	George Beever	Mighty Moe	A6-5	8/14/88	40.8
2	B	Mark Snyder	Alpha	B6-4	7/3/88	98.4
3	C	Mike & Tim Singles	X-16	C6-7	7/3/88	116.3
	D	EdMiller	Gone	D12-7	10/30/88	83.7
	E	OPEN				
	F	OPEN				
	G	OPEN				

Event: Streamer Duration

<u>Class</u>	<u>Impulse</u>	<u>Name</u>	<u>Model</u>	<u>Motor</u>	<u>Date</u>	<u>Time</u>
00	$\frac{1}{4}$ A	OPEN				
0	$\frac{1}{2}$ A	John Yost	Un-named	$\frac{1}{2}$ A3-4T	6/5/88	20.2
1	A	Glenn Feveryear	Perihelion	A3-4T	10/9/88	85.8
2	B	Glenn Feveryear	Yellow Pencil	B4-4	8/14/88	44.9
3	C	OPEN				
4	D	OPEN				
5	E	OPEN				
6	F	OPEN				
7	G	OPEN				

Event: Eggloft Duration

2	B	OPEN				
3	C	Glenn Feveryear	EggThing	C6-3	10/9/88	156.0
4	D	OPEN				
5	E	OPEN				
6	F	OPEN				
7	G	OPEN				

Event: Helicopter Duration

00	$\frac{1}{4}$ A	OPEN				
0	$\frac{1}{2}$ A	John Yost	Roto-Roc	$\frac{1}{2}$ A3-2T	6/5/88	24.2
1	A	OPEN				
2	B	OPEN				
3	C	OPEN				
4	D	OPEN				
5	E	OPEN				
6	F	OPEN				
7	G	OPEN				

Event: Boost/Glide Duration

Gnat	$\frac{1}{4}$ A	OPEN				
Hornet	$\frac{1}{2}$ A	John Yost	Gnat	$\frac{1}{2}$ A3-2T	8/14/88	48.5
Sparrow	A	OPEN				
Swift	B	OPEN				
Hawk	C	OPEN				
Falcon	D	OPEN				
Eagle	E	OPEN				
Condor	F	OPEN				
Dragon	G	OPEN				

Event: Rocket/Glide Duration

Gnat	$\frac{1}{4}$ A	OPEN				
Hornet	$\frac{1}{2}$ A	OPEN				
Sparrow	A	OPEN				
Swift	B	Glenn Feveryear	Gull	B4-2	10/30/88	154.0
Hawk	C	OPEN				
Falcon	D	OPEN				
Eagle	E	OPEN				
Condor	F	OPEN				
Dragon	G	OPEN				

Event: Flex-wing Boost/Glide Duration

All classes, $\frac{1}{4}$ A through G, all OPEN.

Event: Super-Roc Duration

All classes, $\frac{1}{4}$ a through G, all OPEN

Event; Precision Duration

All classes, $\frac{1}{4}$ A through G, all OPEN.

As you can plainly see, most catagories are open. All you have to do to hold a record, is to fly a rocket in any open catagory! Since the long, cold winter is about to set in, these facts and figures could keep a good many of you designing and planning over the next few months, to try for that record in the spring of '89.

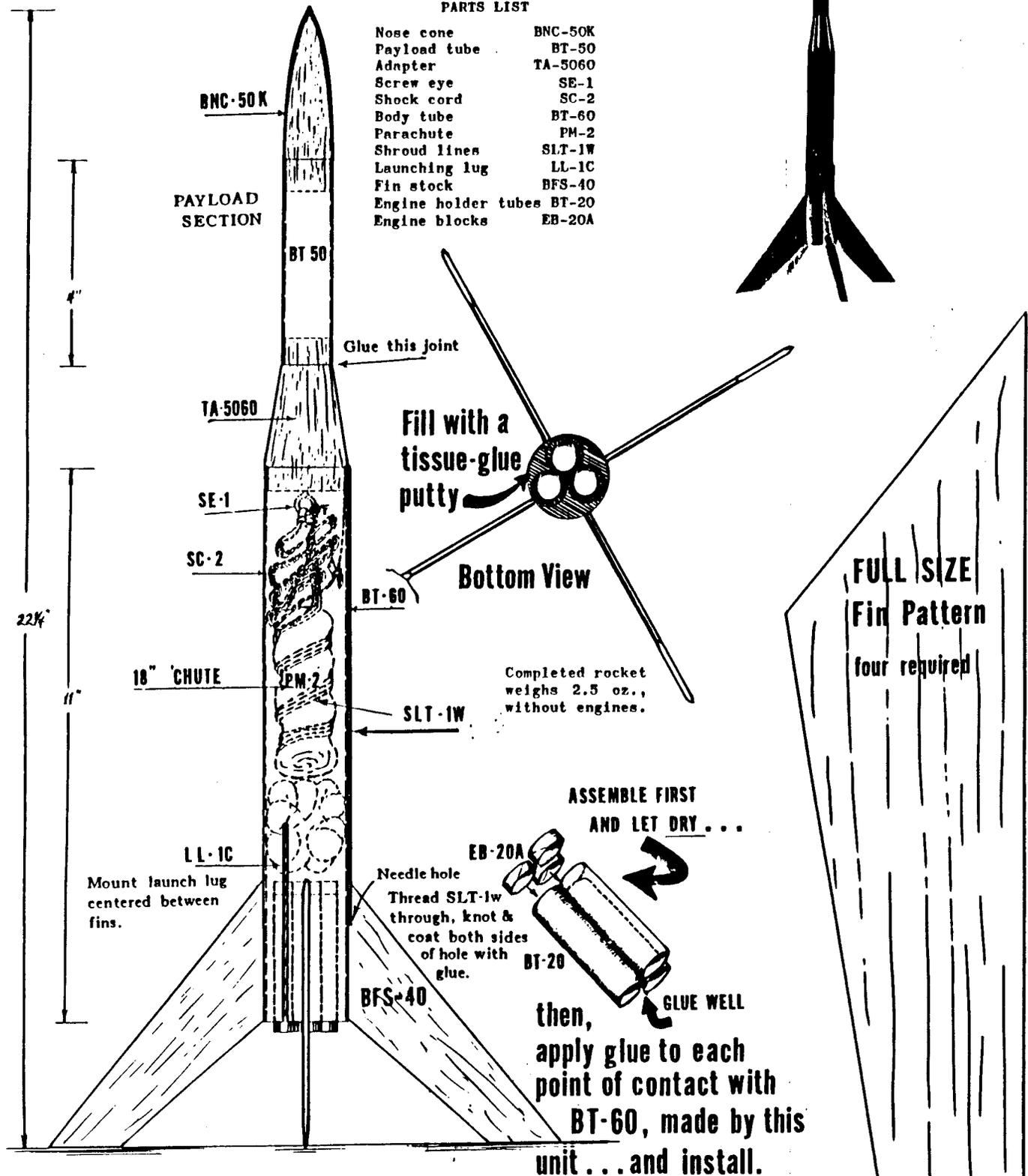
As I mentioned at the last meeting, I am collecting any old model rocketry items that may be out there. Kits, parts, parts of kits, literature, catalogs, old retired models, magazines, plans (especially plans), hardware, ground support equipment, stickers, logos, publications, etc, etc. If you know where any of this junk is, please let me know. If you have it, and want to sell it, we can negotiate a price. (George Beaver)

Also at the last meeting, Glenn was kind enough to bring in some hand-outs to pass around. If anyone has something of a similer nature to share with the other members of the section, by all means bring it in! If you need copies to be made, contact the acting prez, and he can get copies made (cheap).

Now that Part III of Ed Miller's "Advanced Model Rocket Finishing Techniques" article has been printed, we're in need once again of items written and/or submitted by the members of the section. This of course, includes plans for models. ANYTHING and EVERYTHING will help. And I promise that your article, plan or whatever won't meet the same fate as a plan submitted by Rick Hackman. I know that plan is around here somewhere Rick, honest. I'll find it, too. Would you believe my dog ate it? OK, so I don't have a dog. Details, details.

Hopefully, we will see all of you at either the next section launch on 20 November, or at the next meeting on 21 November. If not, Mrs. B and myself hope you all have a very enjoyable Thanksgiving.

the COBRA



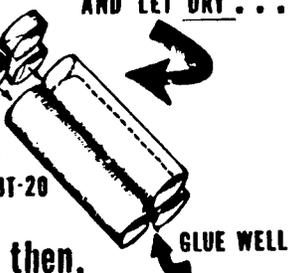
PARTS LIST

Nose cone	BNC-50K
Payload tube	BT-50
Adapter	TA-5060
Screw eye	SE-1
Shock cord	SC-2
Body tube	BT-60
Parachute	PM-2
Shroud lines	SLT-1W
Launching lug	LL-1C
Fin stock	BFS-40
Engine holder tubes	BT-20
Engine blocks	EB-20A

Completed rocket weighs 2.5 oz., without engines.

ASSEMBLE FIRST AND LET DRY . . .

Needle hole
Thread SLT-1w through, knot & coat both sides of hole with glue.



then, apply glue to each point of contact with BT-60, made by this unit . . . and install.

Glue engine holder assembly together first . . . then glue into end of body tube with the engine blocks on the inside. Use standard procedures for the rest of the rocket. Shock cord is attached to one end of a 13" piece of shroud line, other end of line is glued to hole in fin. Read the technical report on cluster rockets before building and flying the Cobra.

Also available as a kit, complete with all parts and detailed, easy-to-follow instructions! Order the Astron Cobra, Cat. No. 631-K-10, \$3.50. Shipping weight, 13 oz.

