

April 1, 1965

ZOG-43

Vol 1, #3

Pub. by Act. Com.

? LAST ISSUE ?

Yes alas! ZOG-43 is probably going to stop its presses (?). If you think that is bad wait to you hear the reason for this. The head of the records & contest committee, Carl Kratzer, is now officialy stating to everyone the facts that we are regreting to publish. Here is the official statement;

"Cap. Barnitz sent me a letter which I recieved the day of the 29th, this letter informed me that ...all points earned by NARHAMS members, Members of the other sections that have competed with NARHAMS, are herewith invalidated... (the points are invalid) This means that all the points you have earned this year are not any good, fortunately each member can start anew and fill up his queta of meets, (the contests we have already held do not count toward the queta). The other sections will only lose the points they have won in a NARHAMS meet. I am writting Cap. Barnitz a letter pleading that he count our points. Apparently the reasons for the disqualification were these infringements;

Rule one of the safty code (the older one that was in operation during our meets) I will obey the rules applying to Model Rockets, apparently we violated some small law that was buried in the books.

Rule six, My model rockets will contain a recovery device to return them safely to the ground so that they may be flown again. Apparently some of our rockets were not exactly obeying this rule. in

Rule eight, I will fly model rockets with adult supervision, open areas away from houses, buildings, trees, and power lines.

Rule ten, I will always use a launching device that is pointed within 30 degrees of the vertical.

Rule thirteen, I will not fly model rockets when they may endanger aircraft.

Rule fourteen, I will always act in a mature maner with saftety uppermost in mind.

Rule fifteen, I will not engage in any operation (Climing on buildings, poles, etc.) that may endanger myself or others.

That was the safety code rules wait to you see the pink book violations! Here are very few of the violations;

No flag. No weight ins or safety checks. To small flight area. Juniers operating the pannel and other posts they shouldn't have. Judges. You see, and there are many more. The reason for this problem was an anonomous letter sent to Cap. Barnitz, Cap. Barnitz knows the persens name but will not disclose it. CONT.

"DAAN ROCKET CLUB"

!!!!!!!!!!!!!!
 THINK
 ONIY YOU CAN PREVENT
 FO REST FIRES



Due to this disheartening we feel that NARHAMS will soon dissolve(/,?,!) (choose one). The people this will strike with the hardest blow are, Doug Frost, and Tom Renayne. We are for bringing the club back to a substantial position among sections. It will take strong spirit. One of my suggestions for reuniting the club; (by the way April 2004) NOW PLEASE DISREGARD THE PREVIOUS INFORMATION, NONE OF IT MAY BE TRUE.

Now that you are relieved!!!

As you probably already know; ZOG-43 sells for 15¢ Per issue, also for multiple copies to one address 15¢ for first issue, and 10¢ for the other issues. As you probably already knew ZOG-43 is sent to all active sections, free of charge. (This is another advantage to being an NAR section, since lone clubs will have to pay the 15¢ per copy rate.

I must congratulate Kirk Murrell for his numerous entries into the Idea Box, we are sorry that we cannot print all of his entries in this issue, but we will be printing them in future issues.

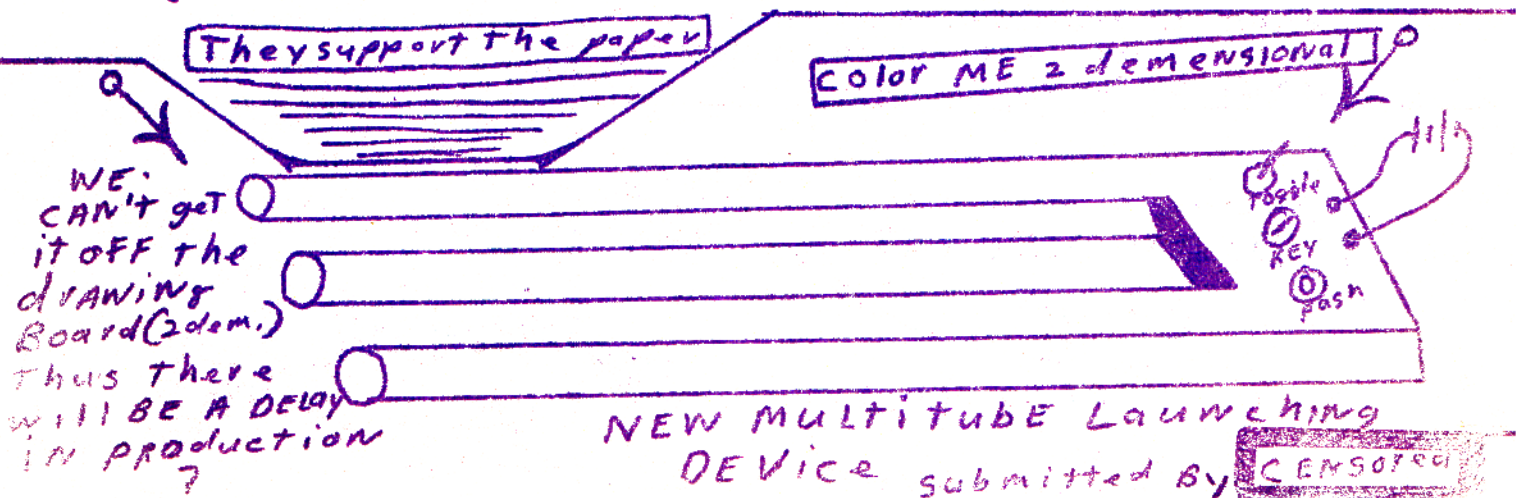
Other than Kirk, Carl, Doug, and I, we have seen very little in the way of entries. Let me remind you to try to have your entries in on the meeting before the meeting they will be handed out. If you have forgotten what we want here is a revised list; PLANS, (SCALE, REGULAR SPORT), ARTICLES, COMMITTEE REPORTS, IDEA BOX, R&D REPORTS, NEWS, AND ANY THING NEW OR OLD THAT HAS TO DO WITH ROCKETS (PIG ROCKETS, SMALL ROCKETS), EVEN ADVERTISEMENTS.

ZOG-43 is now starting a advertisement feature, the committees will be able to advertise for free, and private individuals will be able to advertise for almost free.

The rates for private individuals, and companies are as follows; One full page (one side) for only 50¢ per issue. One half page for only 30¢ per issue. One quarter page for 15¢ per issue. One eighth of a page for a total sum of ten cents per issue. One 16th of a page for a nickel per issue.

As you will hopefully find out next issue this is not going to be the last issue (hopefully).

PAY YOUR DUES!!!!!!!



POINTS OF INTEREST by Carl Kratzer #5568

Through the help of Kirk Murrell, NARHAMS has acquired a temporary launch site in Damascus, Md. The land belongs to the manager of his skating rink. The events for WARM-1 (to be held against Whitman and News) are Scale, Hawk B/G, Swift B/G, Peewee Payl, Para. Durat., Spot Langing. A regional meet will be held against Mid-Island and North Shore with the following events: Scale, Plastic Scale, Cl. 2 Scale Alt., Peewee Payload, Para. Durat., Cl. 1 Alt., Hawk B/G, Swift B/G.

I have built one of the new Amroc accelerometers and it looks as if it will work fine. With the Accelerometer you can calculate max. acceleration, max. velocity, max. altitude, relative drag coefficients, and ejection charge strengths.

Central Rocket Company has come out with a new catalog. They now have five kits and many other interesting items.

I have received a batch of the Krueger engines and have several comments to make. The engines are not NAR certified and are a direct violation to the NAR safety code. They are made out of a propellant loaded 16 gauge shotgun shell with an outer cardboard casing. They contain a metal part and are supplied with fuse ignition. The engines have no ejection charges; the rockets use stable recovery with a spring loaded nose cone to absorb the shock. These engines are very dangerous and I suggest that rocketeers not order them at this time. You might say, however, that these are the first engine to be NRA certified!!

Intersection Relations by Carl Kratzer

The relations between NARHAMS and the Star Spangled Banner section have not been favorable for some time. Recently their section voted unanimously not to allow NARHAMS members to watch their range meet. At two previous meets held with them, Mr. Galloway their advisor demanded that he compile the results so that no errors were made. Later, I had to correct his multiplication errors. SSB's members have tried to be friendly with us but Mr. Galloway insists that we are immature and does not allow them to associate with us. When one of their members signed one of our member's witness form Mr. Galloway gave him a lecture on why he should not do this because we might be forging our parent signatures. When he heard that we found a tremendous launch field he rushed down to see it. I think that an effort should be made on both sections part to become friends. Both sections may benefit from it. In the future I hope to see the two sections helping each other.

NOTE

The NARHAMS and Whitman sections both voted to combine the two libraries making more materials available to each section than before.

#####

ROCKET ENGINE CALCULATIONS

by

Carl Kratzer #5568

Part 2 of a series on Rocket Math

The following equations were taken in part from Rocket Manual for Amateurs. The equations may be expressed in other forms to find different variables.

$$\text{Specific Impulse (I}_{sp}\text{)} = \sqrt{\frac{2}{k-1} \frac{RT_c}{M_w g} \left[1 - \left(\frac{P_e}{P_c} \right)^{\frac{k-1}{k}} \right]} = \frac{I_t}{W_p} = \frac{c}{g}$$

$$\text{Total Impulse (I}_t\text{)} = W_p I_{sp} = F \cdot T$$

$$\text{Propellant Bulk Spec. Gravity (}\delta\text{)} = \frac{1+r}{\frac{1}{\delta_f} + \frac{r}{\delta_o}} \quad (r = \text{oxidizer-fuel ratio})$$

$$\text{Burning Surface (S)} = \frac{\dot{W}}{r_b \delta} \quad (\delta = \text{density, } \dot{W} = \text{wt. of prop. burned per second, } r_b = \text{burning rate in inches of propellant})$$

$$\text{Thrust (F)} = \frac{\dot{W} v_e}{g} + A_e (P_e - P_c) = \frac{I_t}{T} = A_t C_F P_c$$

$$\text{Coefficient of Thrust (C}_F\text{)} = \sqrt{\frac{2k^2}{k-1} \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}} \left[1 - \left(\frac{P_e}{P_c} \right)^{\frac{k-1}{k}} \right]} + \frac{P_e - P_c}{P_c} \left(\frac{A_e}{A_t} \right) = \frac{F}{A_t P_c}$$

$$\text{Exhaust velocity (v}_e\text{)} = \sqrt{\frac{2gk}{k-1} RT_c \left[1 - \left(\frac{P_e}{P_c} \right)^{\frac{k-1}{k}} \right]}$$

$$\text{Effective Exhaust velocity (c)} = \frac{F}{\dot{W}} = v_e + \frac{P_e - P_c}{\dot{W}} A_e g = I_{sp} \cdot g$$

$$\text{Characteristic Exhaust velocity (c}^*\text{)} = \frac{P_c A_t g}{\dot{W}} = \sqrt{\frac{g k R T_c}{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}} = \frac{I_{sp} \cdot g}{C_F}$$

$$\text{Area of Chamber (A}_c\text{)} = \frac{A_t}{0.3} \left[\frac{1 + \frac{k-1}{2} (0.9)}{1 + \frac{k-1}{2}} \right]^{\frac{k+1}{2(k-1)}}$$

$$\text{Volume of Chamber (V}_c\text{)} = \frac{\pi D_c^2 L_c}{4} = L^* A_t$$

$$\text{Diameter of Chamber (D}_c\text{)} = \sqrt{\frac{4 A_c}{\pi}}$$

$$\text{Characteristic Length (L}^*\text{)} = \frac{V_c}{A_t}$$

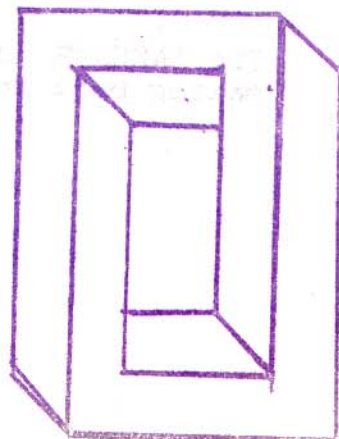
$$\text{Area of Throat (A}_t\text{)} = \frac{F}{C_F P_c}$$

$$\text{Diameter of Throat (D}_t\text{)} = \sqrt{\frac{4 A_t}{\pi}}$$

$$\text{Area of Exit (A}_e\text{)} = \frac{A_e}{A_t} = \frac{M_t}{M_e} \left[\frac{1 + \frac{k-1}{2} M_e^2}{1 + \frac{k-1}{2} M_t^2} \right]^{\frac{k+1}{2k-2}}$$

$$\text{Diameter of Exit (D}_e\text{)} = \sqrt{\frac{4 A_e}{\pi}}$$

Explanations of these equations to come in May issue.



ROCKET ENGINE CALCULATIONS (CONT.)

Specific Impulse is the capacity of a propellant to produce thrust. A specific impulse of one sec. is the thrust developed by one lb. of fuel for one sec.

Total Impulse is the total amount of work an engine will perform.

Thrust is the propulsive force produced by a rocket engine.

Coefficient of Thrust is an approximate measure of a nozzle's efficiency.

Exhaust Velocity is determined on the basis of the energy content of the propellant.

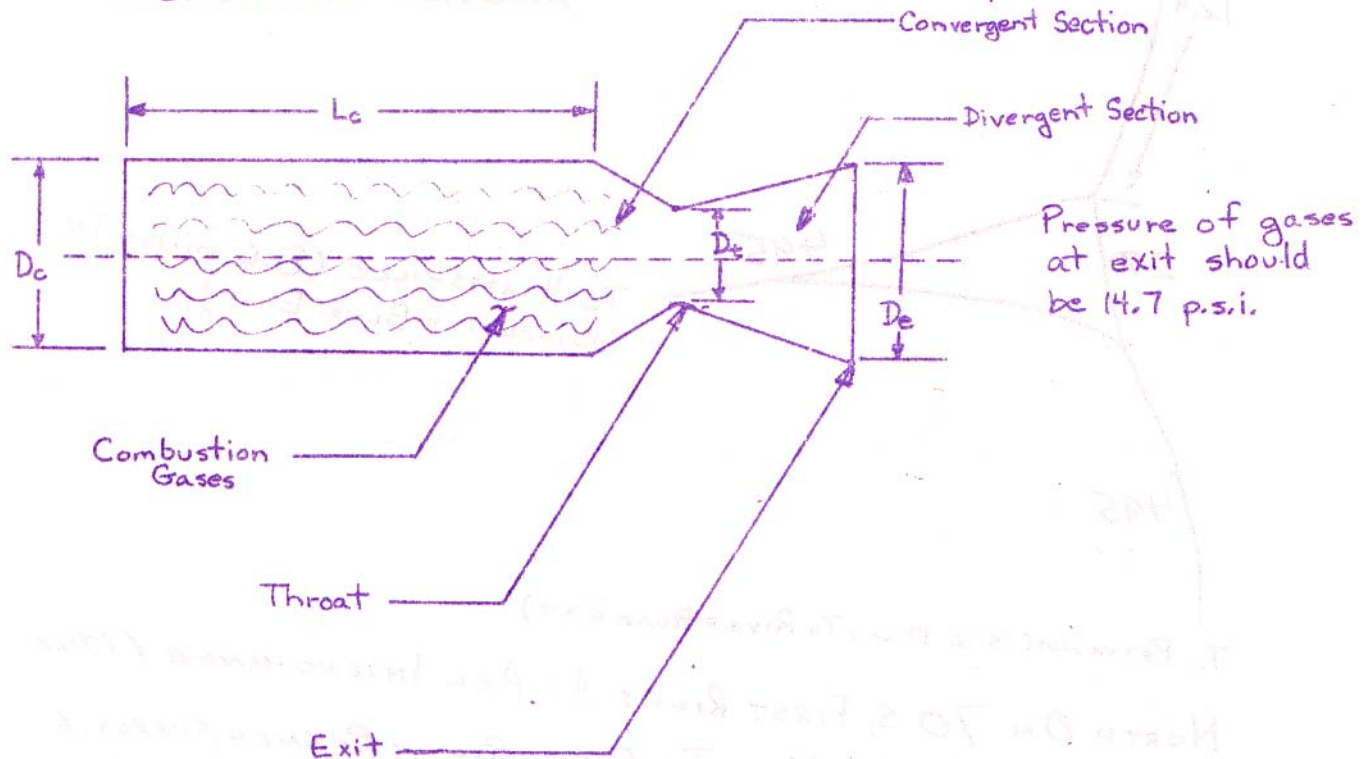
Effective Exhaust Velocity is determined on the basis of thrust and propellant flow.

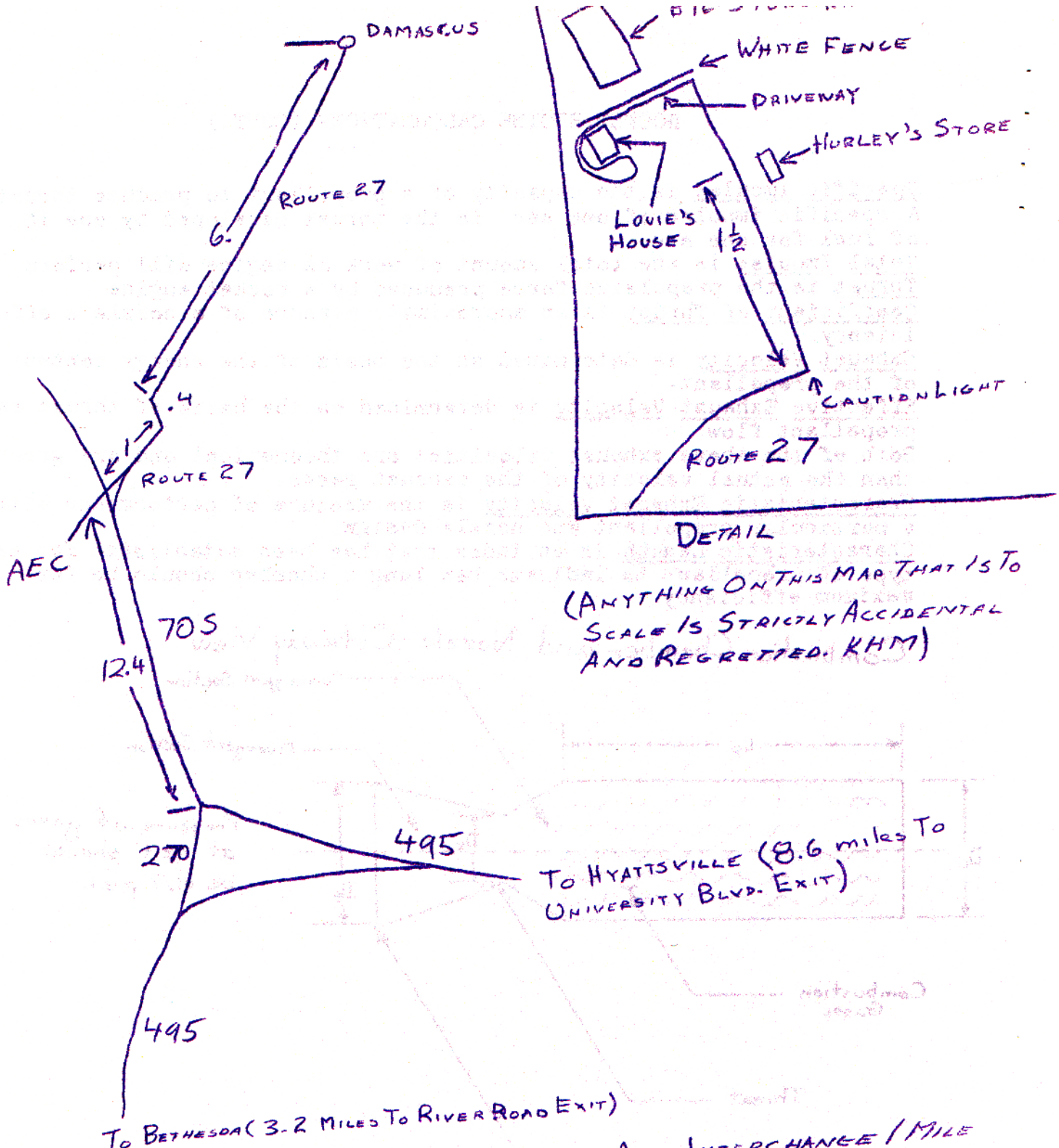
Both of the above exhaust velocities are theoretical and are greater than the actual velocity of the exhaust gases.

Characteristic Exhaust Velocity is the measure of performance with a particular propellant and nozzle design.

Characteristic Length is an index that has been established for each type of propellant to indicate how long a chamber should be for maximum efficiency.

Combustion Chamber and Nozzle - Cutaway View





(ANYTHING ON THIS MAP THAT IS TO SCALE IS STRICTLY ACCIDENTAL AND REGRETTED. KHM)

NORTH ON 70S, FIRST RIGHT AT AEC INTERCHANGE 1 MILE TO CHURCH. LEFT 0.4 MILE TO FORK. RIGHT BRANCH APPROX. 6 MILES TO YELLOW CAUTION LIGHT IN DAMASCUS. LEFT 1/2 MILES TO HURLEY'S STORE ON RIGHT. STRAIGHT SEVERAL BLOCKS AND LEFT DOWN DIRT DRIVEWAY JUST BEFORE AND DIRECTLY ADJACENT TO WHITE FENCE JUST BEFORE LARGE STONE RAMBLER. DRIVE SLOWLY DOWN THIS ROAD SO AS NOT TO STIR UP DUST AND NEIGHBORS' IRE.

The Pittsburg Convention

The Pittsburg model rocket convention was a first in model rocketry. About 140 people attended; NAR members from Virginia to New York, and general model rocketteers from the entire Pennsylvania area. Elementary to college students came, as well as adults such as Jim Kukowski (executive director of the NAR), LeRoy Piester (president of Centuri), and a representative from ESTES industries.

Friday, March 11, the rocketteers arrived at a private school for boys near Pittsburg, where the convention was held. After registration and putting away bags, the conferees talked model rocketry until dinner. After dinner, while the modelers got to know one another better, a special meeting was held with the manufacturerers, old NAR members, and Mr. Kukowski to discuss NAR policy and what the NAR is doing. NARHAMS and WARS were represented.

Saturday was busy - most of the convention business was done then. After breakfast, workshops dealing with working in clubs, starting clubs, and general model rocketry were attended until lunch. That afternoon, the non-NAR members attended a field trip to a NIKE launch site, while the more advanced modelers attended other workshops. Also that afternoon a demonstration launch was held - Pat Artis showed a new pod rocket, Irving Wait demonstrated his new RDC igniters (he is president of RDC), and Doug Frost unveiled his Bat glider.

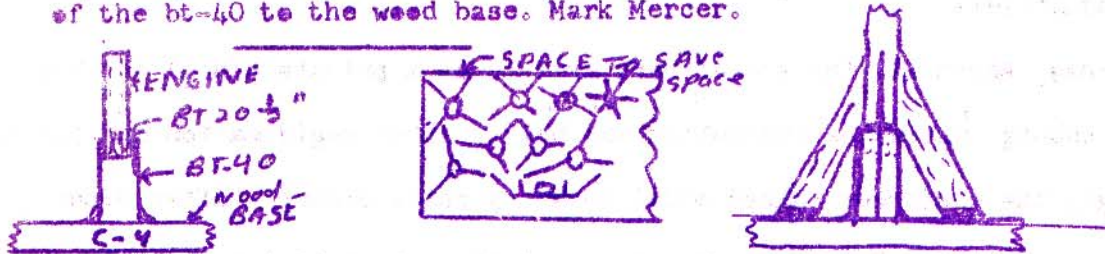
After dinner came a dance (girls were imported from Pittsburg; nice looking ones too). Curfew was at 1:00 A.M., but some bull sessions lasted until 2:30. Sunday, after breakfast, came evaluation. It was decided the conference was a great success.

Jay Apt, from Steel City section, was convention chairman. Much of the conference's success was due to his hard work - before and during the conference, he received ten hours sleep in five days.

Bob Wallace

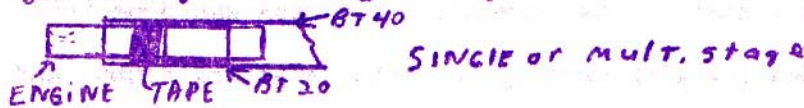
IDEA BOX

To keep your rockets from harm, try this tip. Use old engines, $\frac{1}{2}$ " pieces of bt-20, and bt-40, glue, and a good beard. The $\frac{1}{2}$ " piece of bt-20 is glued to the bottom $\frac{1}{2}$ " of engine (used engine of course). Now measure the distance between the end of the bt and the ground (when the rocket is sitting on the ground). If the distance is 0 you can forget the bt-20 and the bt-40. If the distance is for instance 3", you will make your piece of bt-40 3" long. Now glue the bt-40 (cut) to the $\frac{1}{2}$ " bt-20 that is glued to the used casing. Spacing can be done for beauty or to save space. Now glue the open end of the bt-40 to the wood base. Mark Mercer.



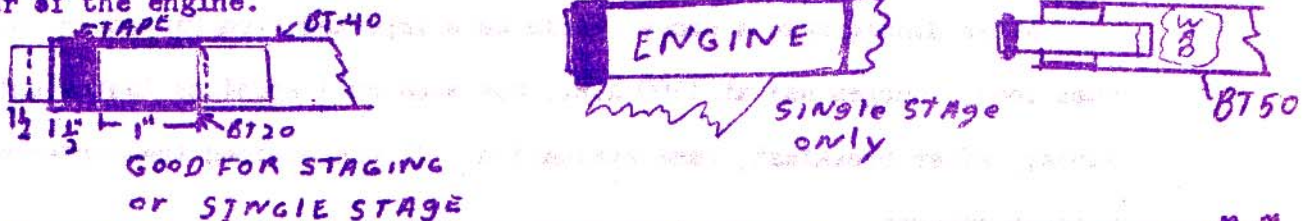
MM

In bt-40 bird you can try this idea for centering and adjusting stability. A one inch piece of bt-20 glued into the main tube (bt-40) 1 inch up will serve both as an engine block, and as a centering device. The depth is adjustable by relocating the tape. Kirk Murrell



KM

The editor suggests a slight modification of the above design. To make your rocket capable of quick change between series I and series III engines. The first design is for bt-40 birds and the second is for bt-20 birds. The bt-40 design is basically the same as the above, except the length the bt-20 is recessed is $\frac{1}{2}$ " instead of 1". The second design involves a Disposable, Rearward located, engine retaining device. It involves a plain normal rocket except that the rocket doesn't have an engine block. The engine is kept from moving up into the rocket by tape put around the rear of the engine.



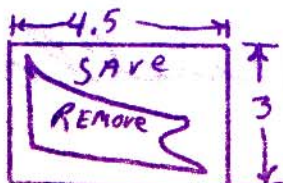
MM

For engine storage try putting your engines into a 3" by 5" card file, the 3" height is perfect for the 2.75" engines. Kirk Murrell

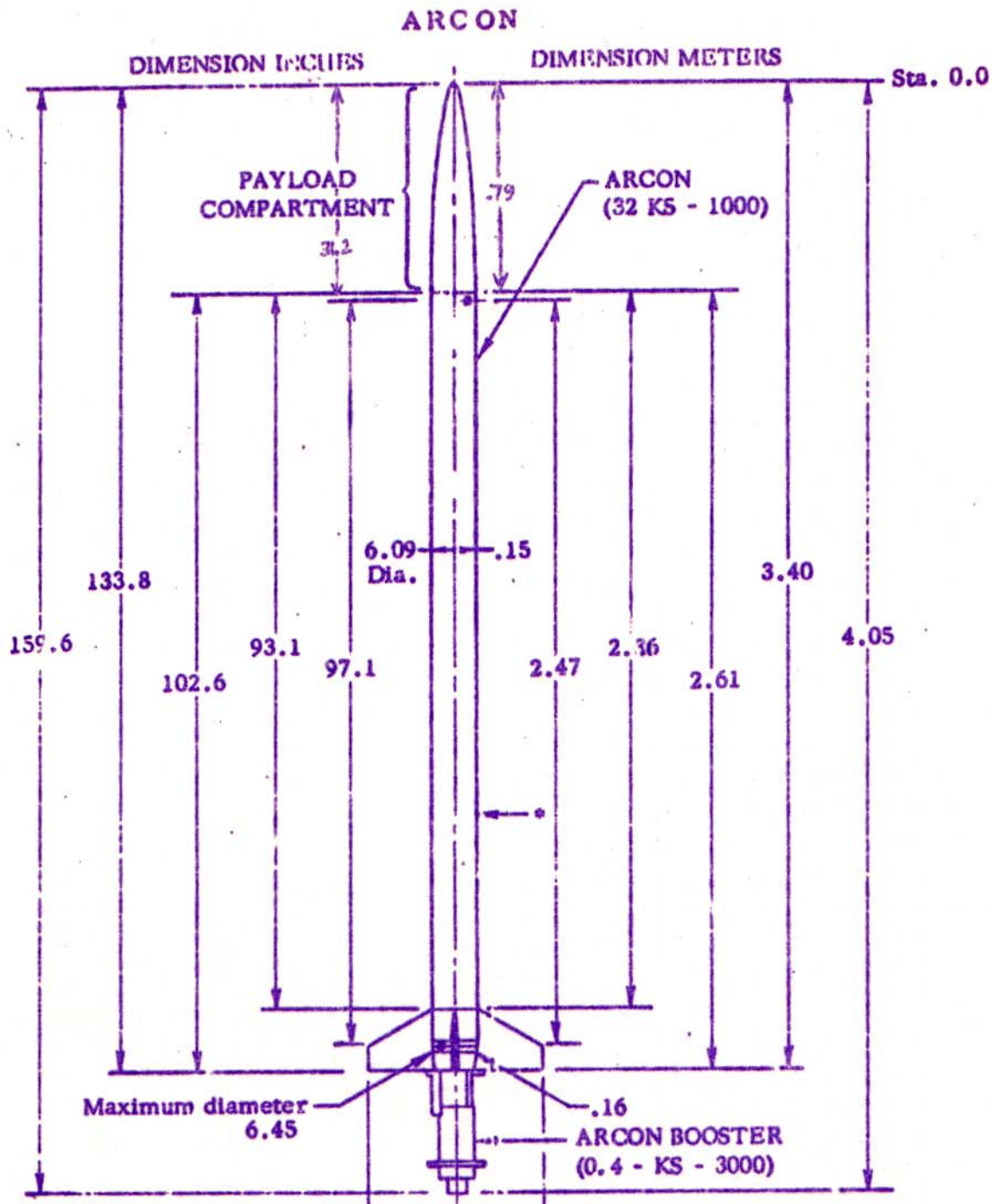
KM

For keeping these favorite fin patterns, try Kirks "Favorite Flexible Fin Firms" That even fit into a 3" by 5" card file. Cut your cfs-20 into two equal parts ($4\frac{1}{2}$, 3), now cut your design out of the sheet. Don't forget to save the inside for your scale birds. Kirk Murrell

KM



NOTE: HEAVY SHIRT CARDBOARD MAY BE USED, IT IS CHEAPER THAN CFS-20, BUT NOT AS GOOD.



**PERFORMANCE WEIGHTS
LESS PAYLOAD**

POUNDS		KILOGRAMS
239.5	Launch	108.6
231.4	B. O. 1st Stage	105.0
212.3	Drop 1st Stage	96.3
67.6	B. O. 2nd Stage	30.6

* Aerodynamic Reference Area = .196 ft²

Date Submitted by:
Carl Kratzer
Ncr #5568

Source of data:
Wallops Island
Test Station

?????????Would You Believe?????????????

That The Famous Name for a newspaper

ZOG-43

Does have a real meaning

By Deug Frost

Would you believe that ZOG-43 actually means something? It all started with Ed (ole Ed) Pearson who was the NARHAMS Section's first president. He lives at 43rd Avenue and the last two digits of his phone number are also 43. Ed became suspicious when he saw the number 43 in other places too. Do you remember the tv jingle "You get 43 beans in every cup of _____" (The previous name of a coffee company has been censored because they did not pay for a advertisement). He also noticed 43 in drug stores and many other places. The number 43 was interesting to Ed, But do the research into the origin of ZOG-43 by our research staff, we bring you the latest in ZOG-43 derivations.

"43" is a phenomenal astronomical term. The entire term ZOG-43 was presented as a possible name for the section newspaper and won the vote because of its clever and paradoxical ring of nothingness! The word or term was a mystery to Ed who invented the term. He says that it ~~my~~ doesn't mean a thing, and that is the beauty of it.

But would you believe that ZOG is a handy abbreviation for a well-known German rocket term. This term is today known under a different abbreviation. Well it's true! I was only one of many who heard Dr. Willy Ley, the vice president of the German rocket society until World War II, tell us at NARAM-6 that the problem with the German V-2 was its; "difficulties with its Zenter of Gravity."

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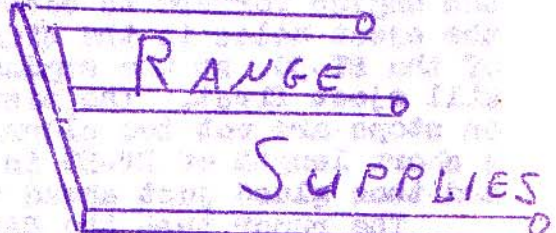


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NEW SHIPMENT COMING SOON

The BATROC was designed primarily for the Estes Industries Odd-Ball Design Contest with the idea that the most odd-ball of possible odd-ball designs would be a follow on of the odd-ball Batman craze. The BATROC was the oblivious answer. The BATROC is shaped like a bat, (notice the wings, tail, head, and ears) and is the rocket's answer to the BATMOBILE!

The BATROC flies like the devil when stable, and, after it screams off the launch pad like a vampire, it reaches peak altitude (under ideal weather conditions) where small models of Batman and Robin (one of each is enough) are ejected with their own parachutes. The black beast (the BATROC) then flaps into glide patterns where it neezly misses hitting Batman and Robin, but it doesn't!!! The glide pattern of the BATROC will be entirely independent of the modeler's skill, however, impact is guaranteed!

The BATROC in flight is a moving sight. I moved too, when at the Pittsburgh Convention its second flight was unstable! Batman and Robin were loaded in for this flight and the extra weight behind the center of gravity showed up a marginal stability tendency in the model.

The BATROC is not a simple rocket to build---- one look at the plans will bring out this realization. Much patience will be demanded of the modeler in building a BATROC as well as much of his previous model building experience. The adventure of the BATROC design intrigues the novice--which is an expected result. Unfortunately, the complexity of the BATROC's construction requires an experienced modrocnut.

Many changes were made from the original plans. Look at the plan you received. The BT-30 engine tube length should be 3 7/8" long. The original plan had a 4 1/2" length BT-30 but can be corrected easily. The reason for the change was to move the engine forward to cover the eject holes in the side of the BT-30, so the engine will eject first. The piston stops are not too clear.

<u>BATROC PARTS LIST</u>	
1 BT-50L	(12.7" BT-50 Tube)
1 BT-30F	(7.0" BT-30 Tube)
2 BNC-50X	Balsa Nose Cones
1 BNC-30D	Balsa Nose Cone
3 JT-50C	Stage Couplers
1 JT- 50C 20C	Stage Coupler
1 EH-2	Engine Holder
6 BFS-20	1/16" Balsa
1 LL-2A	Launch Lug
3 NCW-1	Nose Weights
2 PK-12	Parachutes

A short length of BT-50 is slit lengthwise, rolled within itself and then glued just ahead of Batman. Robin needs a piston stop 2!

The rumor that the BATROC looks like a bat and flies like a rock, is not entirely true, nor should one believe the story that the BATROC will set model rocketry back to the dark dungeon days of the Dark Ages from whence the bat came. The Terrific Truth is: The bat came from the Stone Age, ----- that's why he flies like a rock!! And as for the BATROC: HOLY FLYPAPER WHAT A PERFORMER!!

What to say at the launching:

Dare the Dynamic Duo detach from the
 SEE OUR EXCITING Devilish Derelict??!
 Misplaced - CENTER FOLD
 OF THE FULL SIZED BLUE PRINT