enerjet news

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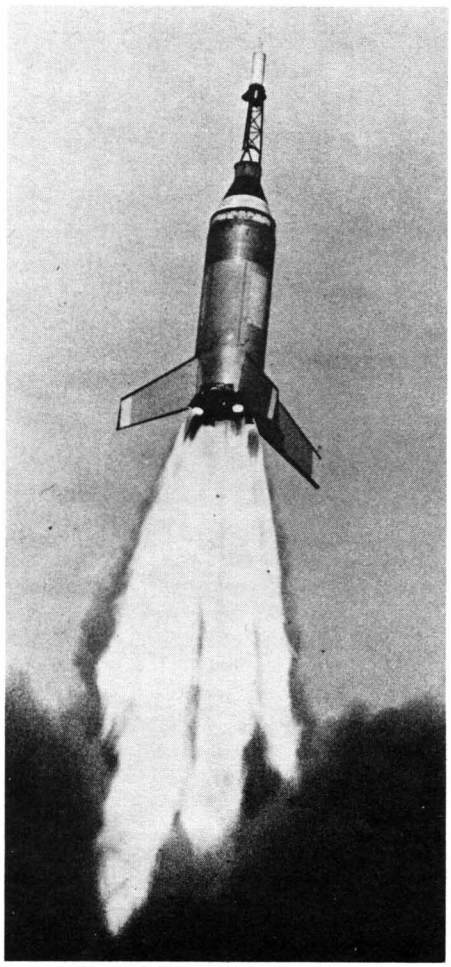
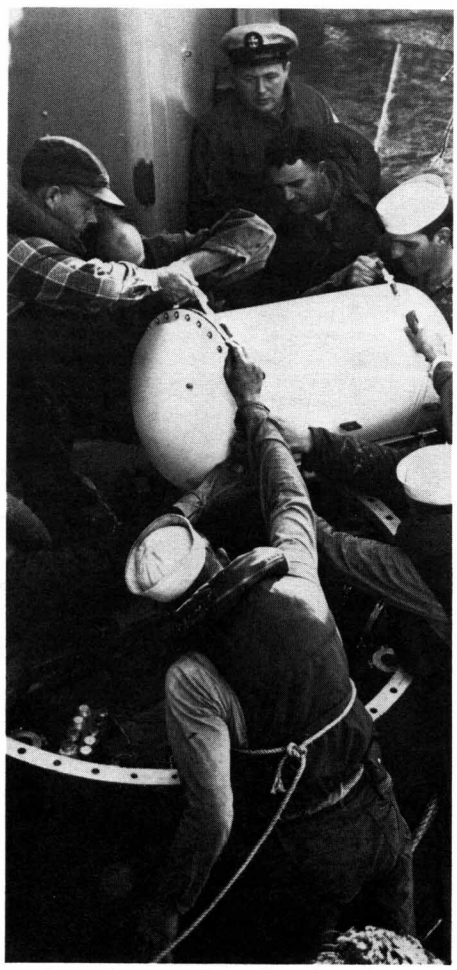


Little Joe lifts off with "Sam" aboard.



An anxious crew hoists Sam from the sea.

HISTORY OF MERCURY LITTLE JOE

Project Mercury was born shortly before the formation of NASA in 1968. Lagging desperately behind the Russians, we pressed hard to launch the first man into orbit. We didn't make it; Yuri Gagarin beat us to it in April 1961. Those were difficult years for American self confidence. In retrospect we have made some progress: in 1962 we were questioning our technological competence; in 1972 we take our technical competence for granted and question instead the moral wisdom of our technological choices.

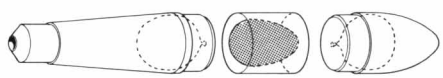
In 1960 everything was new. No one knew what would happen to a man in space or during the rocket trip into space. Our rockets as often as not, exploded in mid-air and their fireballs must have reflected frighteningly in the ashen faces of the astronauts scheduled to ride them. Into this arena the scientists of the Langley Research Center introduced the Little Joe. It had one very heartwarming mission --- to qualify the escape system that rescued astronauts if the booster failed. The Little Joe would take the capsule through the initial phases of launch at which point the escape mechanism was to pull the Mercury capsule free. In short, Little Joe was to mimic an Atlas for the first minute of an orbital mission.

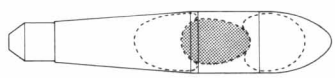
The imitation was almost too good; the first shots failed. Then, finally, luck turned. The rocket demonstrated the soundness of the escape concept with a successful abort-rescue of a Mercury capsule. This was no ordinary capsule; inside was an affectionate monkey called Sam. This feat was repeated with a second monkey, Miss Sam. Both animals were safely retrieved from the Atlantic and our astronauts presumably breathed more easily after that. Within another year our luck was to turn. With men's lives at stake, our boosters were to become 100% reliable through the entire Mercury project, then Gemini, and finally Apollo. Which is why it's fun to remember the days when funny looking flying contraptions like Little Joe laid the foundations for our trips to the stars.

Above Photos Courtesy of NASA

ENERJET EGGS YOU ON TO TRY OUR NEW CAPSULE

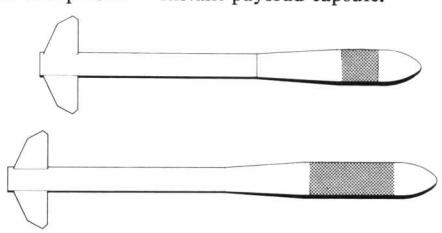
We were pretty excited when our new capsule came back from the molders. At last we had a truly competitive piece of equipment. At NARAM-14 we found out just how competitive it was when the Enerjet Egg Crate cleared the NAR record for class C Roc Egg Loft. To get a rocket back from 3,000 feet you can't use a very large parachute. At NARAM-14 we used a 12" silk chute that allowed the whole assembly to drop rapidly. This means hard knocks for the egg. Enter another concept: Balloon cushioning.



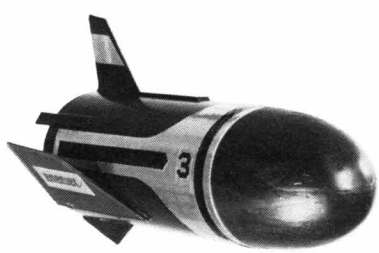


The egg is cushioned from impacts from the side as well as up and down. Even when the chute doesn't open, the egg comes out whole. So much for the egg capsule. Once in a while a little radicalism pays off.

What if you want to loft two eggs - or three? The center tube comes out, a longer tube comes in and presto . . . instant payload capsule.



And then the capsule can be used in ways that have nothing to do with lofting eggs or payloads. The nose section is so light that a new kind of lifting body can be made from it. We call it the PRIME and it works surprizingly well. Stub fins with radical dihedral keep it directional and roll oriented and it just drifts back in. The design is very rugged and could be boosted on an Aerodart. An internal pod with a B4-2 can boost the PRIME for trimming flights.



THE THOR-DELTA LAUNCH VEHICLE

Now that our astronauts have walked on the moon, it's hard to believe how few years have passed since we were debating whether we could go to the moon rather than shall we go to the moon. Let's set the stage. It's 1955; we hear that the Russians are developing rocket weapons capable of hurtling atomic bombs across the world in a mere 30 minutes. Scrambling to catch up, several missle projects are begun in hopes that at least some of them will work. Different industries and services work on competing projects. The competition leads to backbiting, accusations, political squabbling - and wasted time. Then the public watches in anguish as one by one, the new rockets are set up at Cape Canaveral and blow apart in roaring explosions.

At this point the Soviets launch the world's first satellite. The following month they launch a second, weighing over a thousand pounds. Our rockets continue to fizzle and the prestige of the United States drops to an all time low. The soviet Premier appears on television and taunts us to launch the tiny grapefruit that he holds in his hand . . .

The Thor rocket was born during this painful period. It was, at first, no help to our frazzled egos; Thor number one was counted down and and at "ZERO" blew up where it sat, melting down into its own fireball. Thor number two actually took off, then blew up as it raced out to sea. Someone had reversed two wires on the range safety officer's console. According to his readout, the Thor was headed for Savannah, Georgia . . . and so he blew it up.

What could go wrong now? Thor number three sat on it's pad, awaiting launch. At four minutes to "zero" it blew up. All by itself. Thor number four flew out to sea and, at T+ 94 seconds, broke apart and blew up. Finally, Thor number 5 made a perfect flight out to sea and dropped it's warhead over a thousand miles away. The next Thor blew up on the pad; the one after that worked. Thor number 9 flew almost twice as far as originally called for - almost 3,000 miles. That extraordinary success was kept a secret.

By now, the Russians were shooting rockets at the Moon. Still straining to show we were not too far behind, we looked for a Moon rocket. The Thor was the most reliable big rocket we had at the time - for all its early troubles - and so it was selected as the first stage. The second stage was taken from the Vanguard satellite rocket (with a success record of 3 in 10 tries itself). The third stage was also from the Vanguard.

On August 17, 1958, the nation gathered around it's TV sets to watch a reach for the Moon - our first. The rocket, called Thor-Able, lifted off nicely and blew up. The show lasted 76 seconds.

The next try, dubbed Pioneer I, did much better, soaring 70,700 miles into space. It was a great step - and a world record for flights into Space. The third try was a disappointment; the second stage never fired. As the year went by, however, the record improved. The Thor-Able was perfected during a series of re-entry vehicle tests, flinging nose cones 6,000 miles out to sea. When the Thor-Able was again called on as a space booster, it was up to the task - at last we had a mature booster system. A Thor-Able boosted Explorer VI into a highly elliptical orbit, swinging out into space farther out than Pioneer I and then back within 200 miles of Earth. Pioneer made the trip once; Explorer VI made it hundreds of times, out and back.

On March 11, 1960, the Thor-Able sent Pioneer V into an orbit around the Sun, passing between the orbits of Venus and Earth.

THE DELTA SERIES

In 1960, the Space Agency improved the Thor-Able and called the combination the Delta.

(Continued)

It was the beginning of a stunning success story. In quick succession the Delta vehicle orbited the world's first weather satellites - TIROS - that sent back thousands of weather photos; TELSTAR, the first orbiting navigation beacons; RELAY and SYNCOM, the first communications satellites; and a steady stream of research satellites. By 1967, the Thor had logged 100 consecutive successes.

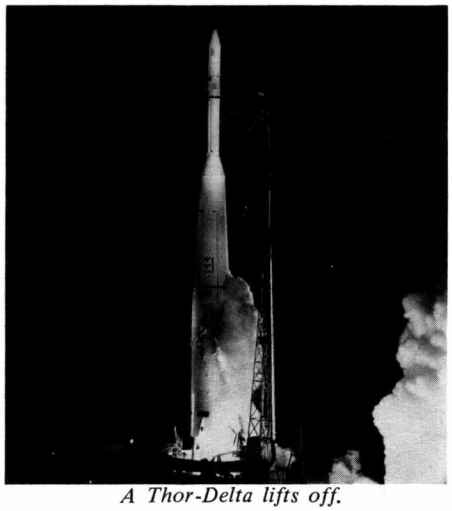
As the years go on, the Delta continues to evolve. Strap-on solid boosters have increased its load carrying abilities. It's tank has been lengthened to hold more fuel. Undoubtedly, the Delta will continue to do our yoeman spacework until it is finally replaced by the Space Shuttle in the 1980's.

THE DELTA 2

We chose to model the second Delta vehicle ever launched. Delta 2, on August 12, 1960, launched a silver mylar balloon into orbit that inflated to a diameter of 100 feet. Probably more people saw this sphere than any other manmade satellite. Radio signals were bounced off this satellite, called Echo I, making transcontinental transmissions possible. We would wait two years for another system that worked better.

As months wore on, scientists observed that the pressure of sunlight was pushing the balloon around, changing it's orbit. Meteorites zoomed through its skin and slowly Echo took on the appearance of a prune. All in all, the experiment was one of the most spectacular of the early Space Age.

Our second version, The Thor-Agena (b) is less accurate but Representative of the Air Force vehicle that has launched dozens of satellites over the years.

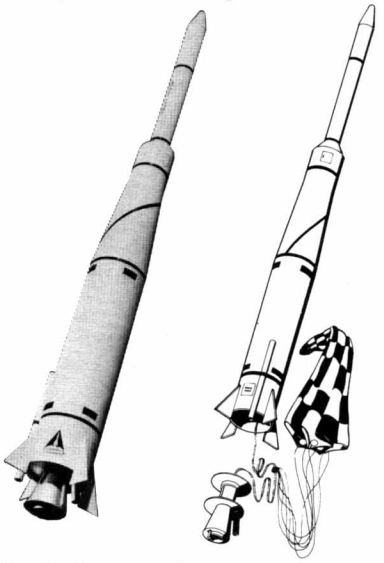


A Thor-Delta lifts off.

AN EASY THOR-DELA MODEL

All us old wrinkle faces have always wanted to make a decent model of the Thor Rocket Systems. That long Tapering section was the difficult part . . . until we stood the Egg Crate capsule on end and saw that sweet reducer. Is it absolutely scale? No. But it sure is close enough to bring a smile to your lips when you're done.

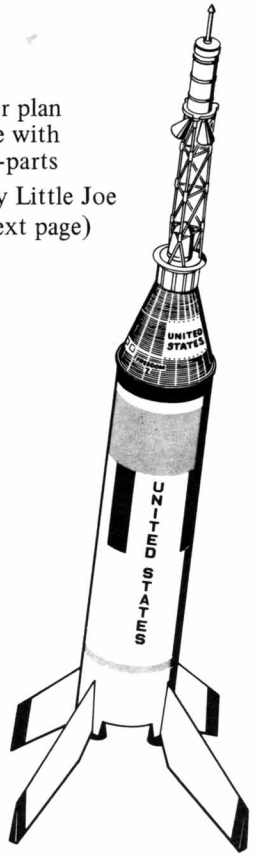
A rough approximation of the Thor-Agena (A) can be made by plugging an Agena right into the #13 end of the adapter. The Thor-Delta is much closer. A #5 tube comes out a neat hole cut in the adapter's closed end; The anchor loop is neatly trimmed off. The plastic adapter is glued in place as follows; Two pressure sensitive disks (parachute type) are pressed onto the coupler's outside surface. White glue is applied to the inside of the body tube and when the adapter is pushed in place, holds to the pressure sensitive disks. To paint onto the black plastic, spray the finished rocket with a PRIMER paint. Do two coats. This will stick to the plastic. Your white paint goes on over that. Anyway, you've got the idea. We'll furnish you plans & parts lists on request.



So that's a few things you can do with our wonderful egg capsule. Now the big surprise - This capsule is for sale and we'll be delighted to sell you one for only $1.50! If you want a whole egg lofter, of course, one exists already, but if you want a Prime and/or a Thor or whatever else is lightweight and teardrop shaped . . . Now you know we have what it takes.

Another plan possible with custom-parts

The Mercury Little Joe (details next page)

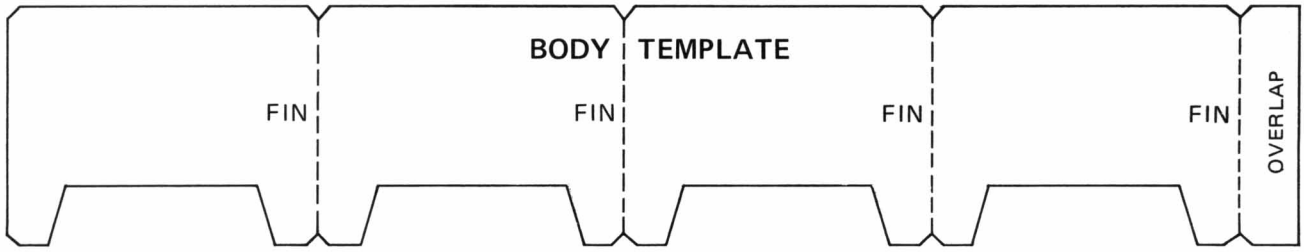


MERCURY LITTLE JOE ASSEMBLY PLANS

The real Mercury Little Joe test vehicles were designed and built in a very short span of time, soon after the first Sputnik was launched. Detailed scale data is somewhat scarce due to the hurried pace of the early days of the Space Race.

Our flying scale model is not authentic scale in every last detail, but it captures the spirit of the real Mercury Little Joe. For instance, the body is slightly lengthened for better flight characteristics and ease of parachute packing.

The following plan is intended only as a rough guide for constructing a semi-scale flying model of the Mercury Little Joe. The model is recommended for experienced rocketeers who have successfully built models from "scratch" before. The fully detailed capsule kit really "sets-off" the appearance of the completed model.

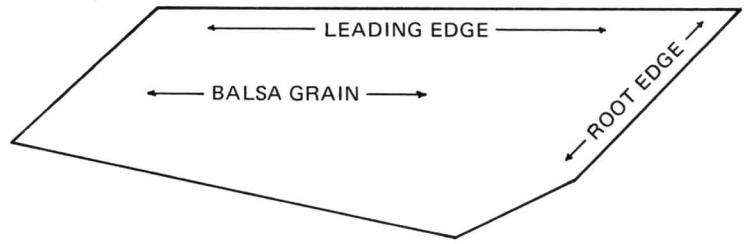


PARTS LIST

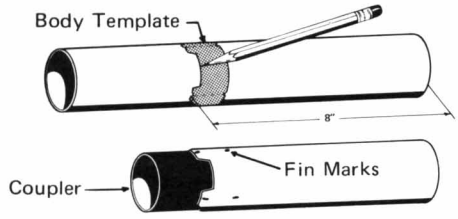
Qty.	*Name*	*Centuri Cat. No.*
1	Plastic Mercury Capsule Kit	MR-36
1	Body Tube	ST-2012
1	Balsa Sheet (3/16" x 3" x 12")	BFM-14
1	Engine Mount Kit	EM-20
1	Launch Lug	LL-2
2	12" Diameter Plastic Chutes	CP-12
1	16" Shock Cord	SC-18
4	Wooden or Plastic Golf Tees	Not Available from us.
	OPTIONAL PARTS	
2	#8 Red Roll Pattern Decals (for the "United States")	DC-32
1	Engine Lock	EL-1
1	Enerjet Engine Mount (95¢)	EEM-20

by Grant Boyd
Director, Centuri R & D

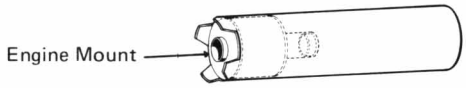
FIN PATTERN
4 REQUIRED



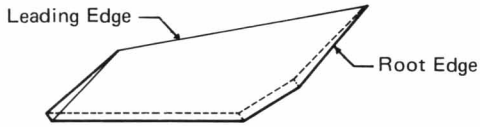
1 The 12" body tube needs to be cut to an 8" length with the 4 equally spaced indentations. Cut out and wrap the body template around the body tube as shown. Trace the indentations and mark the fin positions. Use the #20 engine mount coupler as an interior brace while cutting.



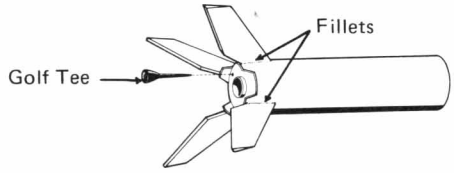
2 Assemble the #20 engine mount according to it's instructions, and install flush with the upper edge of body indentations. NOTE: If you choose to fly with Enerjet motors ("E" series only), we recommend shortening the engine mount tube by 2" to allow enough room for chutes.



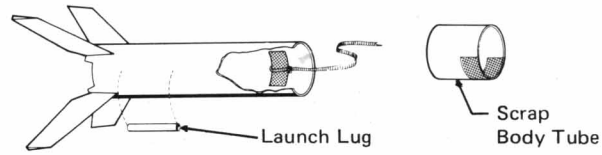
3 Trace the fin pattern onto 3/16" thick stock, aligning grain with leading edge, and cut out. Cut and sand each fin to the symetrical, tapered shape shown.



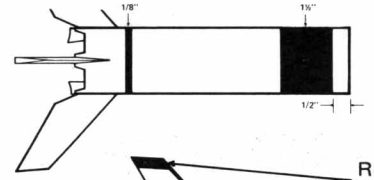
4 Glue the fins in place, being sure to apply glue fillets at the joints. The four Recruit rocket engines are easily simulated by using golf tees. Cut small holes in the engine mount centering rings, behind each fin, and glue the tees in place tilted slightly outward.



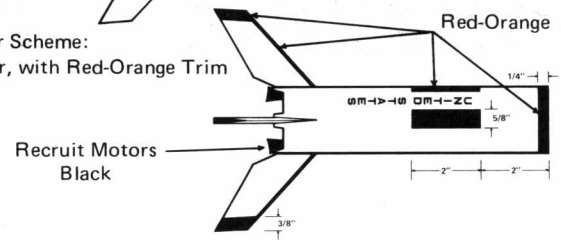
5 For a no-cost shock cord fastener, cut a shape from the scrap body tube as shown. Tie the shock cord around it and glue in place at least 1" down inside rocket, to allow room for the Mercury capsule base. Tie one 12" chute onto shock cord. Tie the other chute onto Mercury capsule as explained in its instructions. Glue launch lug on.



6 For added interest and authenticity, apply strips of tape or pressure-sensitive paper around the body tube. These will simulate sheet-metal work, after the rocket is painted.

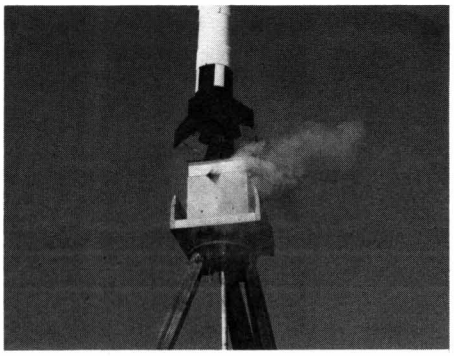


7 Color Scheme:
Silver, with Red-Orange Trim



Here's the easiest way to paint the Mercury Little Joe vehicle: Spray paint the entire vehicle with bright red-orange enamel. When the paint is dry, cover the parts labeled "red-orange" with masking tape. Spray paint with bright silver. Removing the masking tape should then reveal a handsome color scheme. The two verticle "United States" decals (available on our DC-32 decal sheet) are applied between the rectangles.

8 The rocket may be launched with B4-2 or C6-3 engines. It may also be flown Unibody, with a B4-4 or C6-5 sustainer (see Enerjet News #1). The E24-7 is the recommended motor for Enerjet launches, however, about 2 ounces of nose weight must be added for stable flight. The Mercury capsule is intended to recover by separate parachute, to minimize damage to its structure.



YOUR SKY-TRAK MAKES A GREAT LAUNCH TRIPOD!

Sometimes you hate bending over all the time. We made up a launcher that fits on top of our Sky-Trak with a rod that passed down through the socket on the mounting plate. It worked out fine - especially for photographic purposes. You can shoot up on your rocket as it flies off. Give it a try. Get a Sky-Trak, you'll wonder how you ever got along without it.

USAF TO USE 2250 SOUNDING ROCKET

Enerjet's professional forte is the application of model rocketry technology to solving aerospace problems. With experience in the model rocket market, Enerjet offers unheard of cost effectiveness in small sounding rockets. For most major aerospace companies, economy means laying off some engineers; for us it means total economy starting in product design.

We have larger motors in our future plans - motors rating up to 400 pound seconds, but these are not available now. So when the Air Force Academy came looking for a rocket to boost a one pound payload to 500 mph, we designed the 2250 based on existing componants.

The rocket is powered by a three-motor cluster and performs much like the Nike Ram or the 1340 but with a much higher payload capability. The rocket is so stable it will even operate in a one-motor-inert situation. It will be made available to select groups and institutions in kit form for $22.00.

We want to emphasize that the 2250 is NOT a model rocket. It's launch weight, propellant weight and total impulse go beyond the definable limits of model rocketry. FAA clearence for launch is required. While not offered for sale on an indescriminate basis, the vehicle will be sold to select groups who meet basic requirements for age, experience, supervision and launch facilities. Further information is available on request.

MOODS

CURRENTS & OPINIONS

"HOW TO SHAKE THE MONEY TREE"

Every so often you read about a model rocket group engaged in fantastic projects . . . the Atmospheric Research group in Montreal flying highly sophisticated rockets at an Army test range complete with helicopter and bunkers, etc. . . . the Southwest Arc Polaris group, the MIT organization . . . and you think "boy how can they DO that-where do they get the MONEY?" Well they don't get it from ME - I don't have any and besides I've got to sell rockets so I can publish newsletters like this one etc. Seriously though, Enerjet has enormous experience in developing overgrown model rockets; some experiences that bear repeating and some that don't. Technical advice and practical suggestion are available. Write me if you get stuck and I'll try to help out.

We digress. Where can you get funds for advanced work? Let me pass along some suggestions. First of all let's settle on where you are. Good chance you're in school, right? Maybe you're in college which is even better. Go see the head of your science department or visit specific professors who teach subjects that might benefit from rocket-borne experiments. Think up experiments relevant to their fields of interest. Briefly outline each possible experiment. Then pay a call on these individuals. Inform them that you are interested in experiments (in their fields) and that you belong to a rocket group with certain capabilities. Offer to put on a demonstration launch for him. Don't launch a showy design or a scale model - show him a payload vehicle that can lift moderate weights as high as possible. See if his departmental budget has room for rocket work. He may want his students to build a payload and you to launch it. Fine. You can learn about what they're doing as their work matures. Basically you are offering your expertise in rocket design and perhaps in payload design too.

Suppose your prof is interested but has no money in his budget. Then you get on a coat and tie and start visiting any local industries engaged in aerospace type activities. See their public relations director. What's in it for him? "Local Aerospace Company lends a helping hand to young rocketeers." Goodwill. Image. I'm not being cynical, I'm being realistic. Have something to offer to everyone you meet and you'll make friends and make progress too.

Lastly your local Armed Forces might be able to offer facilities and manpower. Don't get discouraged if your first attempts don't get too far. Public relations is an acquired talent. Know what you want to do. Know what outside help is required. Find out whom to see. Offer something in return - often public gratitude is sufficient. Then be yourself and speak your piece. That's how NASA gets its money and it will work for you too. If Enerjet can help along the way, let us know. Mainly though, it's up to you. Good Luck.

Lawrence W. Brown, Editor
Director Enerjet Programs

enerjet NEWS

January, 1973

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MERCURY LITTLE JOE ASSEMBLY PLANS INSIDE