THE LEADING EDGE

The Newsletter of the Northern Illinois Rocketry Association Nov/Dec 2008

In This Issue

Great Holiday Gift Ideas For The Rocketeer Who Has Everything!

THE LEADING EDGE

Anthony Lentini
Newsletter Editor/Publisher
editor@nira-rocketry.org
630-372-4999

NIRA OFFICERS

Jim Basile
President

Angel Cooper
Vice President

Rick Gaff
Secretary/Treasurer

Bob Kaplow
Range Safety Officer

Marty Schrader
NIRA Webmaster

Visit our web site & message board;
http://www.nira-rocketry.org/
http://groups.yahoo.com/group/nirarocketry/

The Leading Edge is published bi-monthly for members of the Northern Illinois Rocketry Association (NIRA) NAR Section#117
Dedicated to the idea that rocketry is fun!

Contributors this issue;

Articles	Tony Lentini
Photographs	Rick Gaff, Tony Lentini

-T Minus One-

Launch Windows

NIRA Club Launches

Mar 15 East Branch Forest Preserve

Meeting Calendar

NIRA

Jan 2	Monthly meeting Helen Plum Library
Feb 7	Monthly meeting / NIRACON Bloomingdale Library
Mar 6	Monthly meeting Helen Plum Library

Fox Valley Rocketeers

Jan 5	Monthly meeting McHenry Public Library
Jan 11	Building session Bundick residence
Feb 9	Woodstock Public Library
Mar 2	Monthly meeting McHenry Public Library

With the Bush presidancy winding down, I have to use up these last few items I found.
Ed.

Model Of The Month

November Winners
Joe Charaska took adult with his **M.M.M.D.I. (Marty Made Me Do It)**
Angel Cooper won youth with her **Corona**.

December Winners
Youth fell to **Jon Mitchell**, showing his **Hot Spot** 1/2 A altitude competition rocket.
Tony Lentini took Adult honors with his Semroc clone of the original Centuri **Space Shuttle**.

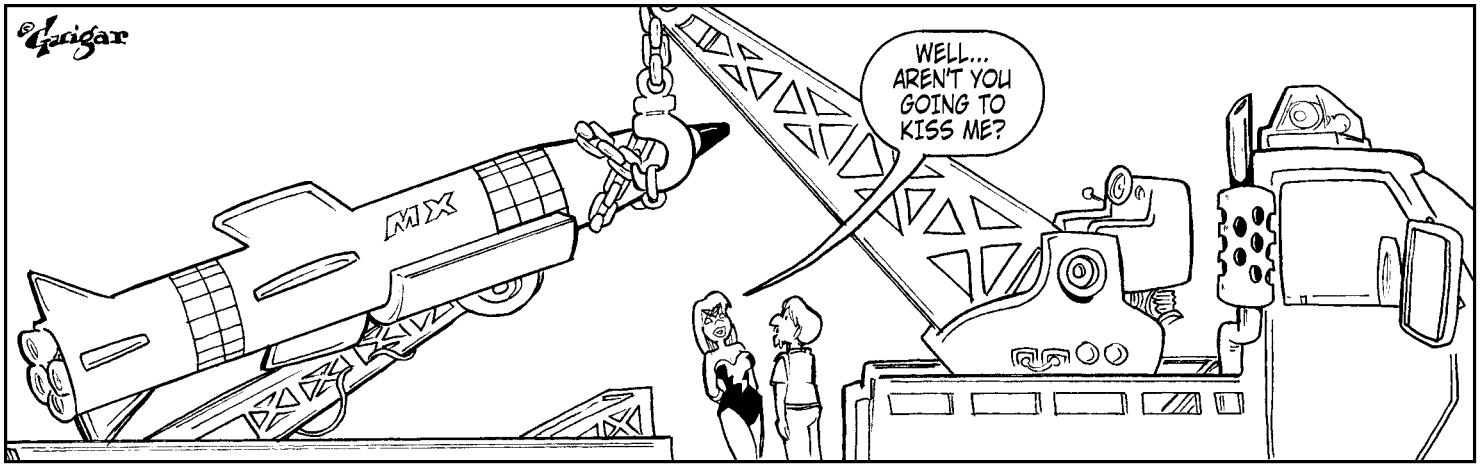
Lift Off With the Rocket-Powered Chair

By Bryan Gardiner May 07, 2008

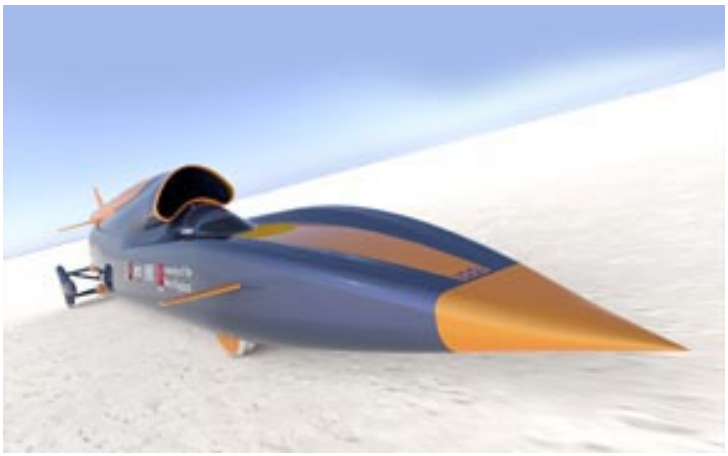
Ky Michaelson, better known as “the Rocketman,” stumbled upon a simple, yet profound truth early in his life: There is no item that can’t be made infinitely better by strapping rockets to it. Indeed, Michaelson has made a career out of proving this fact over and over and over again. One of his latest creations, the aptly named Rocket Chair, is capable of launching you into the air for a full 45 seconds, thanks to a 500-pound thrust hydrogen peroxide rocket motor affixed to its rear and four stabilizing nozzles. The all-metal chair even features three wheels with independent suspensions — for those rough landings, we would imagine.

Michaelson believes that in the future “there will be Rocket men racing rocket chairs and rocket belts just like the airplane races they have today.” Good Lord, I hope he’s right.

Reprinted from ‘Wired Blog Network’



BGUIGAR@yahoo.com www.evil-comic.com © 2007 Brad J. Guigar. All rights reserved.



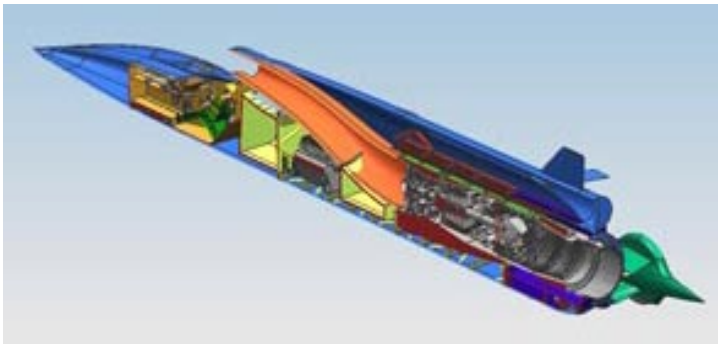
LONDON, England (CNN) — Speed enthusiasts hope to build a rocket car that can go faster than a bullet from a handgun — and break the world land speed record. If it succeeds the Bloodhound SSC (super sonic car), unveiled at London's Science Museum Thursday, will travel at more than 1,000 mph — or Mach 1.4 — beating the existing low altitude record for aircraft of 994 mph.

The vehicle's driver will be wing commander Andy Green, a Royal Air Force fighter pilot, who set the current speed record of 763 mph with Thrust SSC in October 1997. The three-year mission will be led by Richard Noble, who also project-led the Thrust SSC and himself held the world speed record between 1994 and 1997.

Noble said: "The next three years are going to be tough, testing and damned exciting."

The wheels on the jet- and rocket-powered car, which will be 12.8 meters long and weigh 6.4 tons, will spin at more than 10,000 times per minute. Green added: "I've met graduate engineers who are adamant that our previous record was what inspired their career choice as youngsters: that sort of thing makes all the effort worthwhile. Bloodhound SSC will be so much faster and, we hope, will fire up every school kid about the science and technology.

The project, which is privately financed through sponsorship, hopes to promote public interest in science and technology as well as develop new technology in engineering. Paul Drayson, science minister for the UK government, which is funding an accompanying education program, said: "This project is not just about the bragging rights to the world land speed record. This will result in tangible scientific developments that will benefit

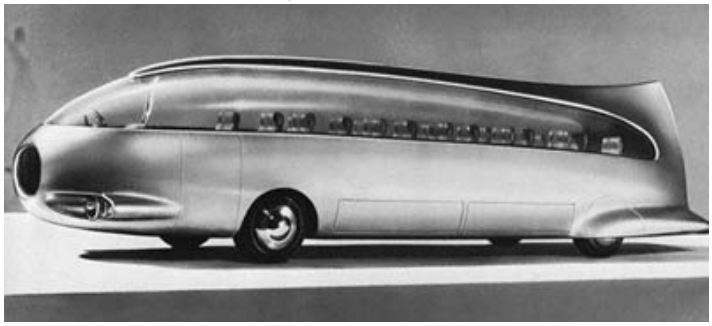


all, for example in areas such as fuel efficiency and safety and which could be used in the cars we drive in the future.

The Bloodhound team are now searching the world's deserts, hunting for a race track capable of taking the supersonic car, the project said on its Web site.

The location needs to be perfectly flat and without vegetation for 10 miles, as well as reliably dry for at least three months each year and capable of supporting living quarters, technical backup and security. So far the team has narrowed the hunt down to 14 sites — eight in the United States, four in Australia, one in Turkey and one in South Africa.

Rocket cars today, rocket busses tomorrow?



November Club Launch

East vs. West

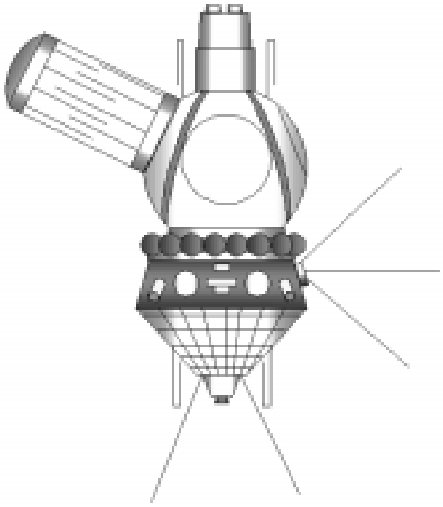
Voskhod vs. Gemini

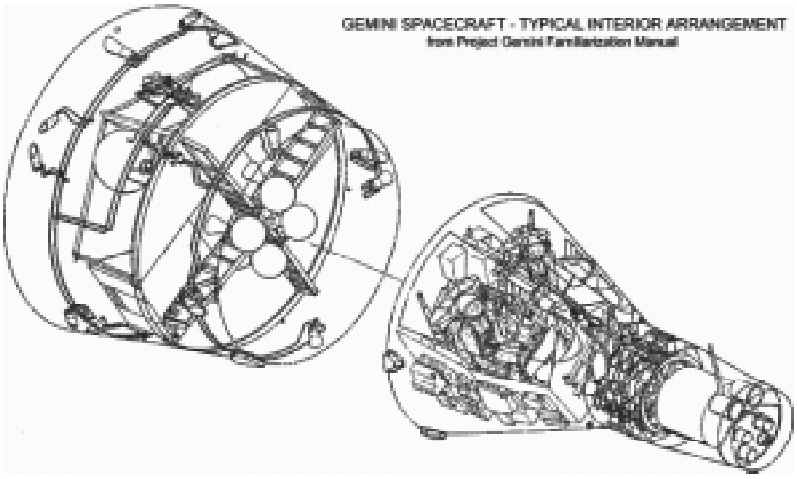
With the space race now gathering real momentum after the Vostok and Mercury programs, both Russia and the United States moved on to the next step of creating multi-passenger modules.

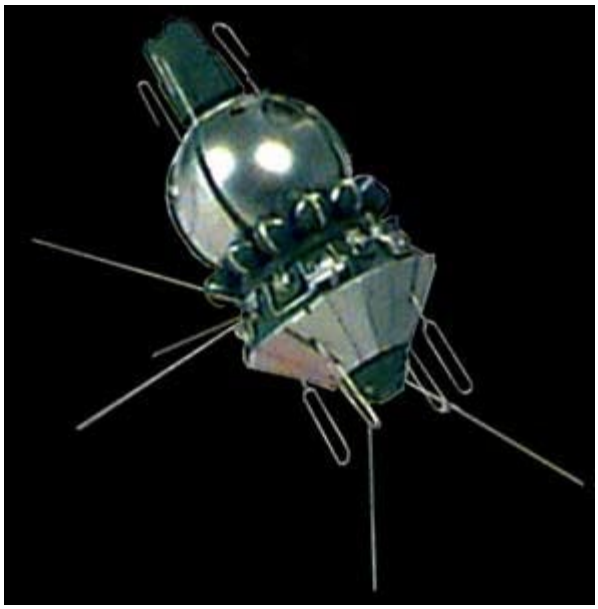
For the Russians, this meant modifying their existing Vostok by simply removing the ejection seat and adding additional couches. It also involved a more robust landing system, since the cosmonauts would now be riding inside their capsule, rather than ejecting after re-entry as before. Three Voskhods were launched. The first was a three seat version which flew unmanned. The second carried three cosmonauts, setting a first for three men launched into space together. The last Voskhod carried only two cosmonauts, plus an inflatable external airlock which allowed Alexi Leonov to set another milestone as the first man to walk in space.

For the U.S. a new capsule was designed which would not only carry two crew, but would also allow for greater maneuverability. This was crucial to the American plan, as one of the program's chief aims was to test rendezvous and docking procedures in orbit. This would be a cornerstone for the success of the upcoming Apollo project to travel to the moon. Twelve Gemini were launched, two unmanned, and ten manned.

Russia continued to use the R7 ICBM which they used successfully on the Sputnik and Vostok projects. NASA however opted for the new Air Force Titan ICBM. This was a risky move, as the Titan's record was one loss out of every five launches. However safety measures were improved, and apart from one on-pad abort, there were no major incidents.







The Voskhod (Voschod, or Wosschod, translated as "Rising") was a spacecraft built by the Soviet Union's space program for human spaceflight. It was a development of and a follow-on to the Vostok spacecraft.

The craft consisted of a spherical descent module (diameter 2.3 meters), which housed the cosmonauts, and instruments, and a conical instrument module which contained propellant and the engine system.

The Voskhod spacecraft is basically a Vostok spacecraft that has had a backup, solid fuel retro rocket, added to the top of the descent module. The ejection seat was removed and two or three crew couches were added to the interior at a 90 degree angle to that of the Vostok crew position. In the case of Voskhod 2, an inflatable exterior airlock was also added to the descent module opposite the entry hatch. After use, the airlock was jettisoned. There was no provision for crew escape in the event of a launch or landing emergency. A solid fuel braking rocket was also added to the parachute lines to provide for a softer landing at touchdown. This was necessary because, unlike the Vostok, the crew lands with the Voskhod descent module.

In order to create more space inside the descent module, the cosmonaut's ejection seat was removed, meaning that the Voskhod crews would return to Earth inside their spacecraft, unlike the Vostok cosmonauts who ejected and parachuted down separately. The lack of space also meant that the Voskhod 1 crew did not wear space suits. Both crew members wore spacesuits on the Voskhod 2 mission, as it involved an EVA and using an airlock. The second crew member wore a spacesuit as a precaution against the possibility of accidental descent module depressurization. Because the crew was required to land with the descent module, a new landing system to slow the craft was developed. This added a small solid-fuel rocket to the parachutes lines. It fired as the descent module neared touchdown, providing a softer landing than did Vostok. A backup solid-fuel retrorocket was added to the top of the descent module. The original Vostok spacecraft only had one liquid fuel retrorocket and no provision for backup. The Vostok did carry enough onboard supplies for a 10-day flight. This would allow for natural orbit decay and reentry if the retrorocket failed.

Voskhod 2 ("Dawn 2") was a Soviet manned space mission in March 1965. It established another space milestone when one of the cosmonauts on board became the first person to "walk in space".

The Voskhod spacecraft had an inflatable airlock extended in orbit. Cosmonaut Alexey Leonov donned a space suit and left the spacecraft while the other cosmonaut of the two-man crew, Pavel Belyayev, remained inside. Leonov began his spacewalk 90 minutes into the mission at the end of the first orbit. Cosmonaut Leonov's spacewalk lasted 20 minutes (08:30–08:50hrs UTC), beginning over north-central Africa (northern Sudan-southern Egypt), ending over eastern Siberia.

After use, the airlock was jettisoned. There was no provision for crew escape in the event of a launch or landing emergency. A solid fuel braking rocket was also added to the parachute lines to provide for a softer landing at touchdown. This was necessary because, unlike the Vostok, the crew lands with the Voskhod descent module.

Despite this spectacular feat, the mission was plagued with problems. After his ten minutes outside the Voskhod, Leonov found that his suit had stiffened to the point where he could not re-enter the airlock. Leonov worked around this by allowing some of his suit's pressure to bleed off, making it easier for him to bend the joints. After coming back inside, there were problems with sealing the hatch properly, and this was followed by a troublesome re-entry, when the automatic landing system had malfunctioned and the manual system had to be used. Finally, the crew landed in an inhospitable and heavily-wooded part of the Ural Mountains and spent a night surrounded by wolves while waiting for their recovery team.

General Kamanin's diary later gave the landing location of the Voskhod 2, "Saransk" (ball), as: "54 deg 12 min North, 45 deg 10 min East." Also according to General Kamanin's diary, a commander of one of the search helicopters reported finding Voskhod 2, "On the forest road between the villages of Sorokovaya and Shchuchino, about 30 kilometers southwest of the town of Berezniki, I see the red parachute and the two cosmonauts. there is deep snow all around....."

The capsule is currently on display at the museum of RKK Energiya in Korolyov, near Moscow.

Copied from 'Wikipedia'

Project Gemini was the second human spaceflight program of the National Aeronautics and Space Administration. It operated between Projects Mercury and Apollo, with 10 manned flights occurring in 1965 and 1966. Its objective was to develop techniques for advanced space travel, notably those necessary for Project Apollo, whose objective was to land men on the Moon. Gemini missions included the first American extravehicular activity, and new orbital maneuvers including rendezvous and docking.

Gemini was originally seen as a simple extrapolation of the Mercury program, and thus early on was called *Mercury Mark II*. The actual program had little in common with Mercury and was in fact superior to even Apollo in some ways. (See Big Gemini.) This was mainly a result of its late start date, which allowed it to benefit from much that had been learned during the early stages of the Apollo project (which, despite its later launch dates, was actually begun before Gemini).

Its primary difference from Mercury was that the earlier spacecraft had all systems other than the reentry rockets situated within the capsule, to which access of nearly all was through the astronaut's hatchway, while Gemini had many power, propulsion, and life support systems in a detachable module like a huge bowl; many components in the capsule itself were reachable each through its own small access door. The original intention was for Gemini to land on solid ground instead of at sea, using a paraglider rather than a parachute, and for the crew to be seated upright controlling the forward motion of the craft before its landing. To facilitate this, the parachute cord did not attach just to the nose of the craft; there was an additional attachment point for balance near the heat shield. This cord was covered by a strip of metal between the doors. Early short-duration missions had their electrical power supplied by batteries; later endurance missions had the first fuel cells in manned spacecraft.

The "Gemini" designation comes from the fact that each spacecraft held two men, as "gemini" in Latin means "twins". Gemini is also the name of the third constellation of the Zodiac and its twin stars, Castor and Pollux.

Unlike Mercury, which could only change its orientation in space, the Gemini capsule could alter its orbit. It could also dock with the Agena Target Vehicle, which had its own large rocket engine and was used to perform large orbital changes. Gemini was the first American manned spacecraft to include an onboard computer, the Gemini Guidance Computer, to facilitate management and control of mission maneuvers. It was also unlike other NASA craft in that it used ejection seats, in-flight radar and an artificial horizon - devices borrowed from the aviation industry. Using ejection seats to push astronauts to safety was first employed by the Soviet Union in the Vostok craft manned by cosmonaut Yuri Gagarin.

The Gemini program was managed by the Manned Spacecraft Center, Houston, Texas, under direction of the Office of Manned Space Flight, NASA Headquarters, Washington, D.C, Dr. George E. Mueller, Associate Administrator of NASA for Manned Space Flight, served as acting director of the Gemini program. William C. Schneider, Deputy Director of Manned Space Flight for Mission Operations, served as Mission Director on all Gemini flights beginning with Gemini VI.

The Gemini Program was conceived after it became evident to NASA officials that an intermediate step was required between the projects Mercury and Apollo. The major objectives assigned to Gemini were:

To subject two men and supporting equipment to long-duration flights, a requirement for projected later trips to the Moon or deeper space.

To effect rendezvous and docking with other orbiting vehicles, and to maneuver the docked vehicles in space, using the propulsion system of the target vehicle for such maneuvers.

To perfect methods of reentry and landing the spacecraft at a pre-selected land-landing point.

To gain additional information concerning the effects of · weightlessness on crew members and to record the physiological reactions of crew members during long-duration flights.

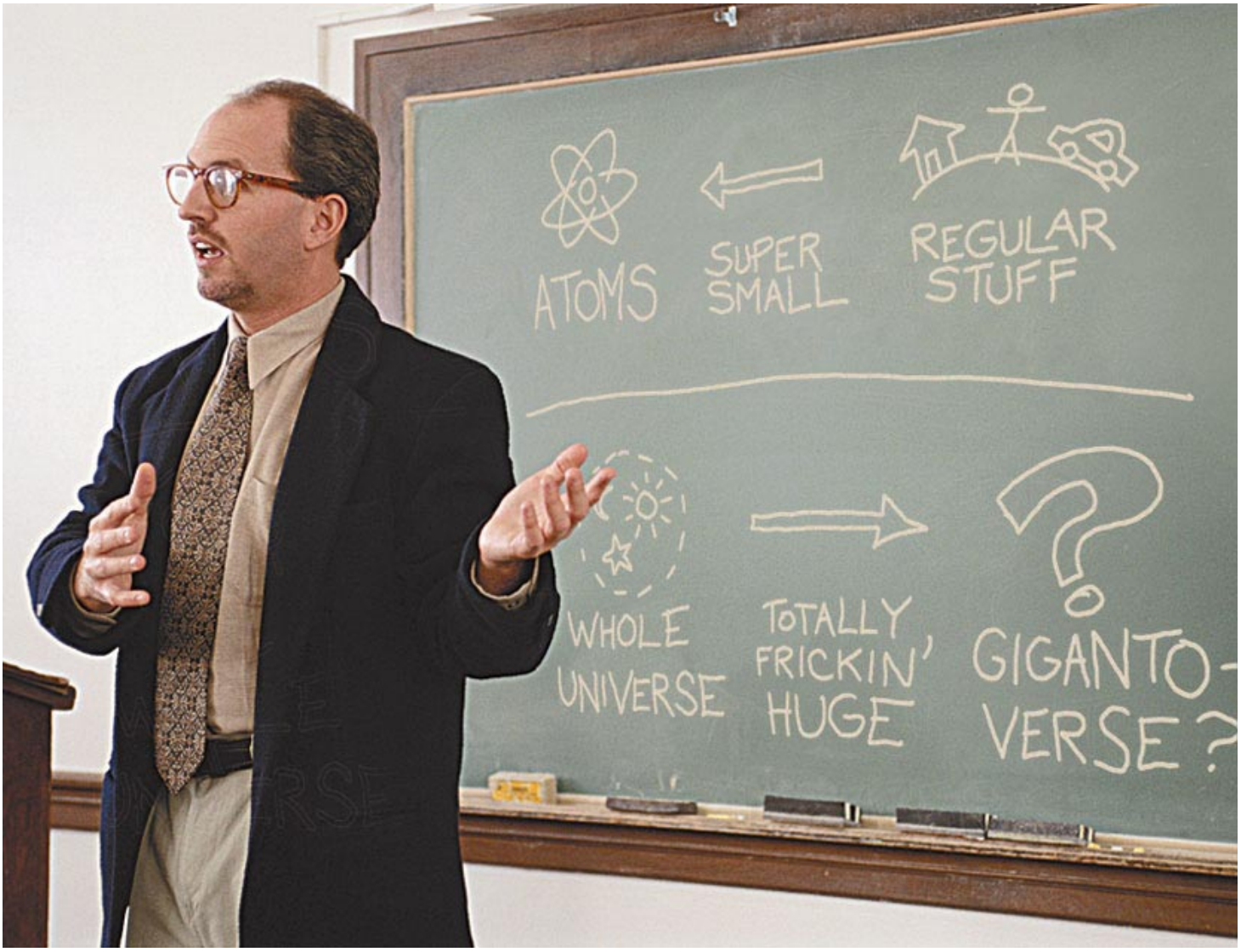
To accomplish EVA, (Extra Vehicular Activity) or spacewalks outside the protection of the space craft.

After 10 successful flights, the Gemini program clearly placed the United States in the lead over the Soviet Union in manned spaceflight. The flight of Gemini VIII concluded with the successful emergency recovery of the tumbling orbiting capsule piloted by Neil Armstrong and David Scott.

Copied from 'Wikipedia'

All The News That Fits To Print

World's Top Scientists Ponder: What If The Whole Universe Is, Like, One Huge Atom?



Cal Tech physicist Dr. Jonathan Friedrich postulates a bunch of freaky stuff that makes his colleagues' heads spin right the hell off.

Among the revolutionary ideas expected to be raised at the historic week-long summit is the possibility that, like, our whole friggin' universe might be just one big atom in, say, some super-duper huge thing out there somewhere, or something.

"Whoa, man," Dr. Jacob "The Boz" Bozeman of MIT told reporters. "The implications of this deceptively simple hypothesis are, like, completely blowing my mind. Like, we could all be nothing more than this little dot in the finger-nail of some huge giant dude. Or maybe a seed in the mustard of, like, some really big sandwich, or even a germ on the back of a flea that's, like, sitting on a hair on some giant dog. Truly, it boggles the freakin' mind, man. It freaks me the hell right *out*."

The universe-as-possible-giant-atom theory originated in May with a team of Cal Tech particle physicists, who developed the theory late one night while sitting around on a couch in the Physics Department's cyclotron and foosball facility, "just shooting the s***." The theory, which was reportedly conceived after the group became highly engrossed in ceiling-tile patterns for several minutes while waiting for a pizza to arrive, is said to be so advanced that only a few scientists in the world even have their heads together enough to really, you know, deal. Yet even among this elite group, many are said to be "seriously thrown for a loop" by its implications.

"I'm like, 'Whoa there, man, slow *down*,'" said Dr. Dieter Gerhardt, a low-temperature physicist at Cornell University. Pausing for a moment to collect himself, the renowned scientist then placed his hands on his forehead before extending them outward in a sweeping gesture and making a buzzing "space-noise" sound effect with his lips, non-verbally indicating the degree to which his mind was blown by the whole freaky deal.

Among other topics to be explored at the Stanford conference, according to Bozeman: the concept of parallel, or "alternate," Earths; the theory of multi-dimensional "superstrings" that fold backward and forward throughout the fabric of the universe; and "a whole bunch of other stuff I totally can't even handle thinking about right now."

On Monday, the most high-profile conference attendee, Cambridge's Dr. Stephen Hawking, discussed his recent research exploring the possible existence of "sideways," or lateral, time, a concept most scientists in attendance described as "way out there."

"I don't want to mess with anybody's head here," Hawking told the assembled scientists via his voice-simulation device, "but if time goes sideways as well as forward, there might be, like, other versions of this reality, where, say, the Roman Empire is still in charge and stuff."

"By the way," Hawking added, "ever think about what'd happen if you, say, went back in time and accidentally killed your own younger self? *Man*, that would be so *screwed up*."

Hawking's ideas provoked strong reaction. "I remember I was pretty wigged out when Feynman came up with that stuff about antiparticles just being normal particles traveling backwards in time," said Dr. Wei Lo-Huang of Princeton. "That was heavy enough to have to deal with. But now Hawking comes up with this? What is with that?"

"Man... if this turns out to be true, it will require a total recalibration of all our methods for measuring space-time flux, and that means all my old equations are gonna be, like, garbage," Wei said. "Aw, *man*."

Though Hawking's lateral-time theory may prove significant, most scientists in attendance said they plan to avoid it for now, explaining that the "whole one big atom deal" (or "WOBAD" theory, as it has come to be known within physics circles) is more than enough to completely freak them out, and that they would prefer to take these mind-blowing questions one at a time, just so they don't completely, you know, lose it.

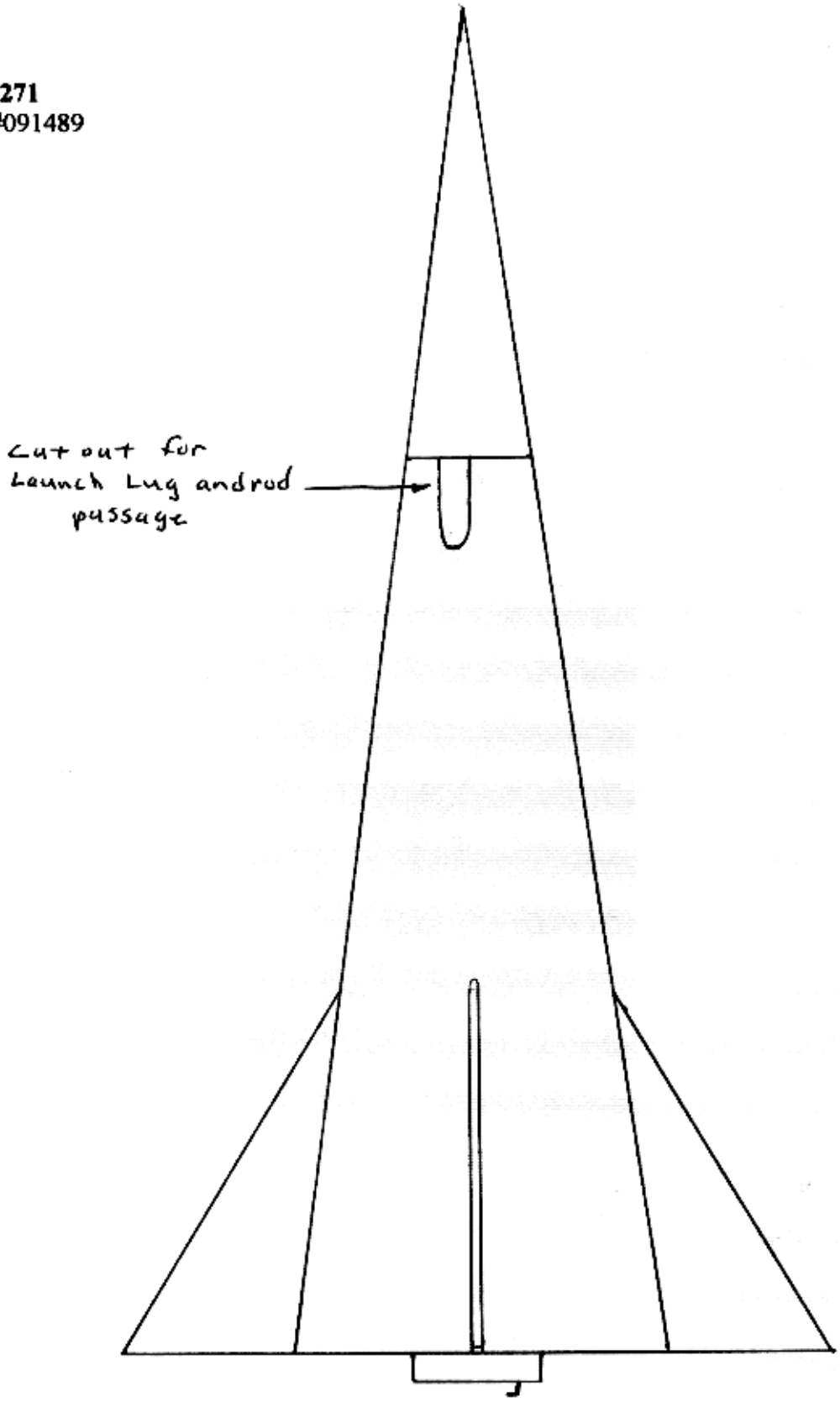
"I totally can't get with where my head is at, if you dig what I'm saying," said Dr. Sanjay Gupta, renowned for his work in advanced quantum hydroponics theory. "It's like, one big atom? Forget about it, man. Even weirder is, like, if we're just one big atom in a larger universe, how do we know all the little atoms don't have, you know, little universes in them, with, like, little people living on them, with little cars and little houses, and maybe even itsy-bitsy tiny international symposiums on cutting-edge theoretical physics, even."

"That would be *too much*," Gupta said. "It'd be like that Dr. Seuss book *Horton Hears A Who*. I read that when I was, like, six, and it totally weirded me *out*."

"Say, can I get another handful of those chips, dude?" Gupta asked.

Reprinted from 'The Onion"

EXP-271
Plan #091489



EXP-271
Plan #091489
Designed by: Mark Kotolski
NAR #35707

SPECIFICATIONS
Length.....8 ½"
Diameter.....2 3/8" (shroud)

RECOMMENDED MOTORS
A3-2T a10-3T

PARTS LIST
BNC20R nose cone
BT20 x 5.75" body tube
520 motor mount
Motor hook
Small screw eye
Launch lugs (2)
1/16" balsa fin stock
Heavy card stock for shroud end plate
Card stock for shroud
Shock cord
Streamer
Nose weights

CONSTRUCTION HINTS

- Glue In the assembled motor mount so the motor tube and body tube are even.
- Glue one launch lug ¼" from the motor end of the BT20.Glue the 2nd lug flush with the top of the body tube. Use 1/16" x 1/8" balsa strips along each side of the launch lugs, the full length from lug to lug to act as a rod guide to make it easier to put the model on the launch rod.
- The bottom ring is glued in place about ¼" from the end of the body tube. The ring should fit just inside the end of the shroud.
- Use the fin marks on the bottom ring to draw fin lines onto the shroud. With the nose cone in place, use a ruler to connect the fin placement mark on the shroud to the tip of the nose cone.

❖ NOSE WEIGHT MAY BE NEEDED TO MAKE THE MODEL STABLE FOR FLIGHT. TEST FLY WITH OUT SPECTATORS UNTIL SUFFICIENT BALANCE IS ACHIEVED. START WITH 2 LEAD NOSE WEIGHTS IN PLACE.

➢ Diagrams are shown actual size.

EXP-271
Plan #091489