THE LEADING EDGE

The Newsletter of the Northern Illinois Rocketry Association Sept/Oct 2008

CHAOS 4

THE LEADING EDGE

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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

Nov 16 East Branch Forest Preserve

Meeting Calendar

NIRA

Nov 7 Monthly meeting Helen Plum Library
Dec 5 Monthly meeting Helen Plum Library
Jan 2 Monthly meeting Helen Plum Library

Fox Valley Rocketeers

Dec 1 Monthly meeting Woodstock Public Library

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

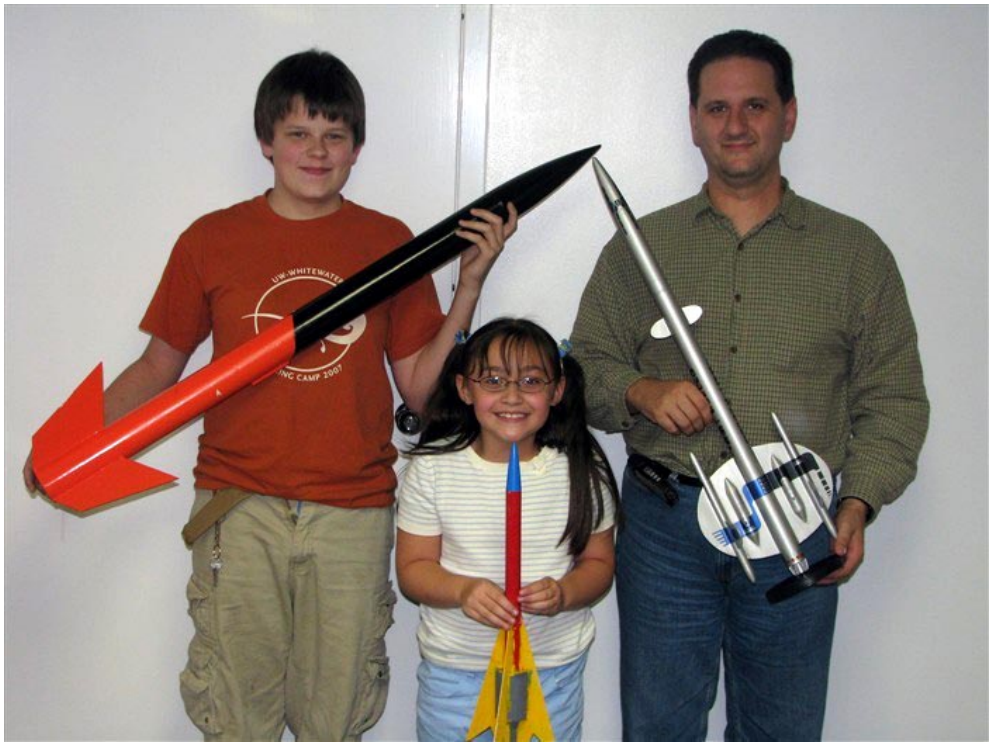
Bush Vows To Discover, Legalize Aliens On American, Martian Soil

WASHINGTON, DC—President Bush restated his commitment to the quality and discovery of immigrant and Martian life Monday, calling for increased efforts to register and search for gainfully employed and extra-terrestrial aliens. “America must further pursue the quest for a better way of, or undiscovered forms of, life,” Bush said Monday. “To this end, I will commission the INS and NASA to assemble committees and probes to explore potential minimum-wage and minimum-risk endeavors in the service sector of the economy and the Olympus Mons sector of Mars.” Conservative radio host Rush Limbaugh criticized the endeavor, saying the social and scientific programs will take jobs and money away from domestic workers and domestic security.

Reprinted from “The Onion”

Model Of The Month

September Winners
In Youth **John** Mitchell and his United IV.
Adam Elliot won Adult with his Baby T.



October Winners
Junior was taken by **Joey Charaska** and his **Grappler.**
Youth was won by **Saane** and her **Explosion 5**.
The Adult winner was **Tony Lentini**, with his **UFO Invader.**

September Club Launch

October Club Launch

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The Editor's Corner

This issue marks the beginning of my second year as editor of the Leading Edge, and I wanted to take this opportunity to re-print a theme I wrote when I took over as editor last year.

This newsletter is a collaborative effort between myself, and the members of this club. I rely very heavily on input from the membership for material to fill these pages. Thanks goes firstly to Rick Gaff who kinly allows me to raid his web page of photographs for pictures of our launches. Thanks also go to Jim Basile, Adam Elliot, Marty Schrader, Joe Charaska, and Bob Kaplow, all of whom have contributed at least one article over the last year.

This year I have intend to submit The Leading Edge for the NAR's LAC Newsletter Award, which has been won by our club several times in the past, most notably by Rick Gaff. These are the criteria which newsletters are judged by;

1. Frequency and Regularity: A newsletter that is issued infrequently or irregularly does not provide current information.

I have in the past delayed the publication of the newsletter several times due to slow influx of material.

2. Club News: Point totals, contest results, meeting reports, schedules, etc., are included here.

We've seen these from some of our members. We can always use more!

3. Other News of Interest to Section Members: Such things as activities of other clubs, product reviews, changes in legislation regarding model rocketry, reports on NASA activities, etc. are included here.

Again, if you know of something going on, forward the information to me.

4. Editorials and Other Commentary: Letters to the editor (and the amount of Section involvement and interaction with the newsletter that they indicate) are considered here.

So far, nuthin', nada, zip, zilch, goose egg.

5. Special Features: These are things such as stories (fictitious, humorous, accounts of meets, etc.) cartoons, etc., where there is much room for creativity and originality.

Creativity and originality? I think our group has some of that.

6. Club Contribution to Newsletter: Is the newsletter a club effort, with contributions from many members, or does it look as though it was done entirely by one or two people?

The BIG ONE. We need more involvement from more members.

7. Variety of Content: Is the newsletter well-balanced? Does it contain things of interest to all members of the club (scale data, R&D, fun articles, competition hints, etc.)? Each issue need not contain everything.

The more the merrier. Send in your ideas.

8. Originality: Is the material contained in the newsletter original and reflective of the Section or is it an imitation of that contained in last year's winning newsletter?

To fill space I've had to rely a lot on re-printing material and articles I've found online. We can do better than relying solely on retread articles.

So let's hear from you out there. This newsletter is a reflection of our club and it's members. Let's see more of your photos whether they are taken at a club launch, or of your favorite rocket in your collection. Tell us about your experiences at our club launches and other events. Write a short article about happenings in the industry, and pass along any interesting news you come across. And as always, I would like to see more contributions to the 'Member Profile'. If you have an idea for the East vs. West column, please do a little research and send it in. Some of the other features I still hope to see in future issues of the Leading Edge include "My Favorite Rocket' where everyone is encouraged to write in and tell us about that one kit in your fleet that you love to fly more than any other.

So at this point it's up to you all out there. I would much rather have to add pages to our newsletter to make room for your submissions than take them out because I have nothing to run with. Let's really give the LAC judges something to look at this year!

Tony Lentini

Paste Member Contributions

Here.

Swiss man flies over Channel on jet wing

'We prepared everything and it was great,' he says

updated 8:25 a.m. CT, Fri., Sept. 26, 2008

DOVER, England - A Swiss daredevil crossed the English Channel strapped to a homemade jet-propelled wing Friday, parachuting into a field near the white cliffs of Dover after a 10-minute solo flight.

Yves Rossy leapt from a plane at more than 8,800 feet, fired up his jets and made the 22-mile trip from Calais in France. Rossy passed over a thin strip of land in front of South Foreland lighthouse, looped over onlookers and opened his parachute, his wings still strapped to his back.

"It was perfect. Blue sky, sunny, no clouds, perfect conditions," he said. "We prepared everything and it was great."

The trip across the Channel is meant to trace the route of French aviator Louis Bleriot, the first person to cross in an airplane 99 years ago.

The lighthouse was the site of Guglielmo Marconi's experiments with radio telegraphy in 1898. Bleriot used the white building as a target during his pioneering flight, the building's manager, Simon Ovenden, said.

Several hundred spectators rushed to greet the pilot, trying to take photographs with cameras and cell phones.

"It's a remarkable achievement, we saw the climax of his attempt as he came down to earth with his parachute. It's been an exciting afternoon," said Geoff Clark, a 54-year-old onlooker from Chatham, in Kent.

The carbon composite-wing weighs about 121 pounds when loaded with fuel, and carried four kerosene-burning jet turbines that kept him aloft. The wing had no steering devices — Rossy moved his body to control its movements.

He wore a heat-resistant suit similar to that worn by firefighters and racing drivers to protect him from the heat of the turbines. The cooling effect of the wind and high altitude also prevented him from getting too hot.

Mark Dale, the senior technical officer for the British Hang Gliding and Paragliding Association, described Rossy's flight as a "fabulous stunt."

East

vs.

West

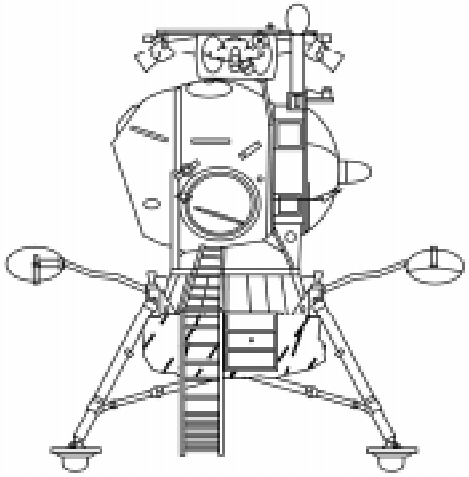
Lunniy Korabl
vs.
Lunar Excursion Module

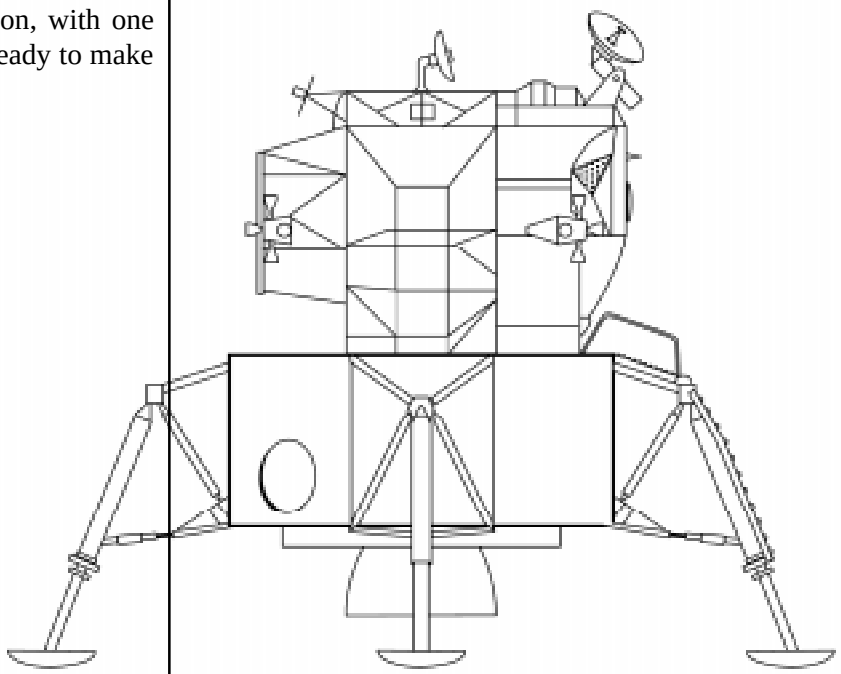
In the days of the race to the moon, the Soviet Union under Sergei Korolev designed their own moon launch system similar to the American Apollo effort. Combining a modified Soyuz and a small lunar lander with the giant N1 rocket, this system would ferry two cosmonauts to the moon, with one making the actual landing before America was ready to make their attempt.

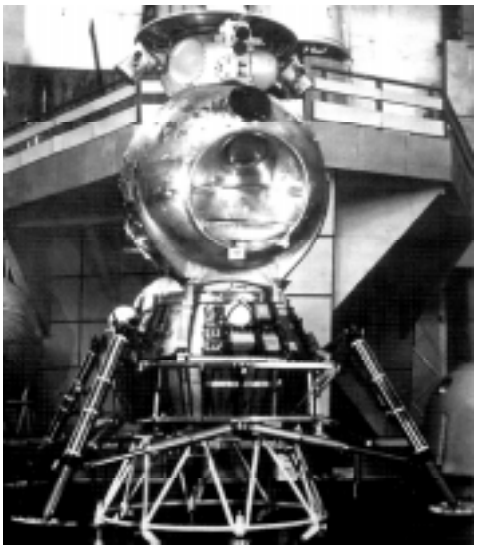
The Lunniy Korabl, or Lunar Craft, was similar to the American Lunar Excursion Module in appearance, but with several key differences. Firstly, it was much smaller, being able to carry only one man. Second, the craft would land and then take off again relying on only one engine, as opposed to the LEM which used two engines. Both craft would abandon their landing bases on the moon to save weight at liftoff. Also, the cosmonaut would be required to spacewalk from the soyuz module to the LK and back again wher the LEM had a direct docking tunnel.

I once saw a program on PBS many years ago about the space race, showing both American and Soviet progress. For the program, the producers were allowed to take cameras into the Russian cosmodrome at Baikanor. While there, the camera team spotted a strange looking craft in the corner of the building. When asked, their hosts told them it was a lunar landing craft which had been put in a corner and left since the early seventies. They were allowed to film inside it and I was struck by how simple and primitive the controls were. As I recall, the engines were actually controlled with what looked like simple hand valves to regulate fuel to the thrusters.

Ultimately the Soviets never reached the moon, as their N1 moon rocket never flew successfully, and the race ended when Apollo 11 landed safely and returned to Earth. With the race lost to America, the Russians kept their cloak of secrecy in place and publicly claimed that they were never really interested in sending anyone to the moon in first place. Soon after they began to focus their efforts on building space stations, and setting space endurance records.







The **LK (Lunniy Korabl - lunar craft)** was a Soviet lunar lander and counterpart of the American Lunar Module (LM). The LK was to have landed a single Soviet citizen on the Moon before the Americans, winning the moon race. It completed development and was test flown successfully in earth orbit, but never reached the moon because the N1 rocket required to take it to the Moon was never successful.

Because the translunar payload capacity of the N1 rocket was only 70% that of the American Saturn V, the LK differed in many ways from the Apollo Lunar Module.

- It had a different landing profile
- It was only 1/3 the weight of the Apollo Lunar Module
- It was limited to a crew of one
- It had no docking tunnel (the cosmonaut had to space walk from the LK to the LOK (Soyuz 7K-L3) Command Ship.
- Unlike the LM, the LK did not use a separate descent stage to go from lunar orbit to landing on the surface. A braking stage, the Block D, took the LK out of lunar orbit and slowed it to 100 m/s at an altitude of 4 km above the lunar surface. From there the LK used the engines of its Block E stage to soft land on the moon. The Block E also served as the ascent stage to return the LK to lunar orbit.

The LK consisted of four primary modules:

- The LPU landing gear, which allowed landing on the lunar surface. The LPU remained behind on the lunar surface, acting as a launch pad for the rest of the LK;
- The Block E rocket stage, which soft landed the LK on the moon and returned it to lunar orbit;
- The Lunar Cabin, the pressurised semi-spherical cabin where the cosmonaut was located;
- The Integrated Orientation System, a pod of small thrusters to orient the spacecraft. Atop the pod was the large hexagonal grid of the Kontakt docking system.

Korolev's final plan for a manned landing adopted the same method of Lunar Orbit Rendezvous as Project Apollo.

A variant of the Soyuz, the LOK (Soyuz 7K-L3) Command Ship (Lunniy Orbitalny Korabl), would carry a two-man crew atop a single three-stage N-1 booster.

A fourth stage pushed the 'LOK', the 'Block D' fifth stage and the 'LK' Lander (not to be confused with Chelomei's LK circumlunar capsule) toward the moon. The 'Block D' fifth stage engine slowed the 'LOK' and 'LK' into lunar orbit.

Following the coast to the moon, one cosmonaut would spacewalk from the 'LOK' to the 'LK' Lander Lunniy Korabl and enter it.

He separated 'Block D' and LK' from 'LOK' and dropped toward the moon using 'Block Ds engine.

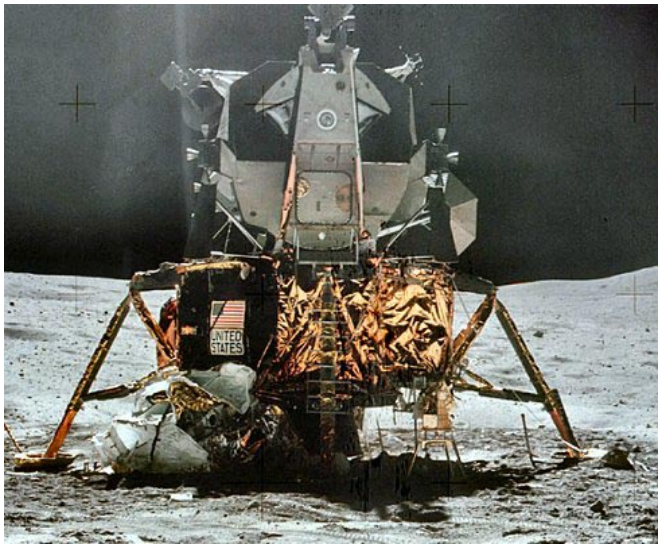
After 'Block D' exhausted its fuel, the 'LK' lander separated and completed landing using its own engine. As originally planned, an earlier unmanned probe of the Luna programme would act as a beacon for the LK. The lone cosmonaut would collect moonrocks and hoist the Soviet flag.

After a day on the lunar surface the LK's engine would fire again using its landing leg structure as a launch pad. To save weight, the engine used for landing would also blast the 'LK' back to lunar orbit for an automated docking with 'LOK'. The cosmonaut would then spacewalk back to 'LOK' carrying the moonrock samples, with the 'LK' being cast off. After this, the 'LOK' would fire its rocket for the return to Earth.

The success of Project Apollo in putting American astronauts on the Moon in 1969 meant that the United States won the Space race, and that was the deathblow to the Soviet moon program, although plans were drawn up until the early 1970s. Four N-1 launches were attempted but all were failures, despite engineering improvements after each failure. The second launch attempt on 3 July 1969, just 13 days prior to the launch of Apollo 11, was a catastrophic failure which destroyed both the rocket and the launch complex. Subsequently, the Soviets decided to concentrate on the development of space stations, achieving several firsts in the process, and also a long term Mars program, which continues to the present day.

The LK was tested unmanned in 1971 (Cosmos 379,Cosmos 398 and Cosmos 434) in earth orbit and proved its design. A replica of it now stands in Disneyland Paris.

Copied from Wikipedia



The **Apollo Lunar Module** was the lander portion of the Apollo spacecraft built for the US Apollo program by Grumman to achieve the transit from cislunar orbit to the surface and back. The module was also known as the **LM** from the manufacturer designation (often pronounced "lem," from NASA's early name for it, **Lunar Excursion Module**).

The module was designed to carry a crew of two and rested on four landing legs. It consisted of two stages—the descent stage module and the ascent stage. The total mass of the module was 15,264 kg, with the majority (10,334 kg) in the descent stage. Initially unpopular because the many delays in its development significantly stretched the projected timeline of the Apollo program, the LM eventually became the most reliable component of the Apollo/Saturn system, the only one never to suffer any failure that significantly impacted a mission.

The Apollo Lunar Module came into being because NASA chose to reach the moon via lunar orbit rendezvous (LOR) instead of by direct ascent or Earth orbit rendezvous (EOR). Both direct ascent and EOR would have involved the entire Apollo spacecraft landing on the moon. Once the decision had been made to proceed using LOR, it became necessary to produce a separate craft capable of reaching the lunar surface and ascending back to lunar orbit.

The LM contract was given to Grumman Aircraft Engineering and a number of subcontractors. Grumman had begun lunar orbit rendezvous studies in late 1950s and again in 1962. In July 1962, eleven firms were invited to submit proposals for the LM. Nine did so in September, and Grumman was awarded the contract that same month.

The initial design iteration had the LEM with three landing legs. As any particular leg would have to carry the weight of the vehicle if it lands at any significant angle, three legs was the lightest configuration. However, it would be the least stable if one of the legs were damaged during landing. The next landing gear design iteration had five legs and was the most stable configuration for landing on an unknown terrain. That configuration, however, was too heavy and the designers compromised on four landing legs.

The first LM flight was on January 22, 1968 when the unmanned LM-1 was launched atop a Saturn IB for testing of propulsion systems in orbit. The next LM flight was aboard *Apollo* 9 using LM-3 on March 3, 1969 as the first manned test flight (crew McDivitt, Scott and Schweickart) to test a number of systems in Earth orbit including LM and CSM crew transit, LM propulsion, separation and docking. *Apollo 10*, launched on May 18, 1969, was another series of tests, this time in lunar orbit with the LM separating and descending to within 10 km of the surface. From the successful tests the LM successfully descended to and ascended from the lunar surface with *Apollo 11*.

The Lunar Modules for the final three *Apollo* missions (15, 16, and 17) were significantly upgraded to allow for greater landing payload weights and longer lunar surface stay times. The descent engine power was improved by the addition of a ten-inch (254 mm) extension to the engine nozzle, and the descent fuel tanks were increased in size. The most important cargo on these missions was the Lunar Roving Vehicle, which was stowed on Quadrant 1 of the LM Descent Stage and deployed by astronauts after landing. The upgraded capability of these "J-Mission" LMs allowed three day stays on the moon.

The Lunar Module was the Apollo spacecraft that landed on the moon and returned to lunar orbit. It consists of the Descent and Ascent stages.

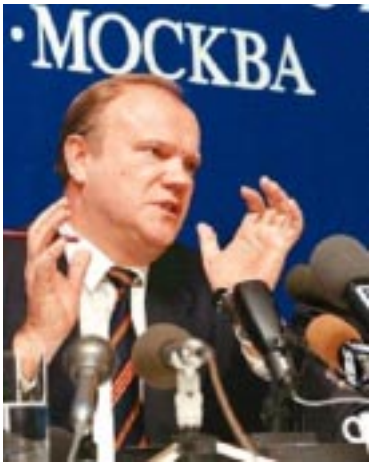
The Descent stage contains the landing gear; EVA ladder; landing radar; descent rocket engine and fuel to land on the moon. It has several cargo compartments with replacement PLSS batteries and lithium hydroxide canisters; the Apollo Lunar Surface Experiment Packages ALSEP; Mobile Equipment Cart (a hand-pulled equipment cart used on *Apollo 14*) or the Lunar Rover (used on *Apollo 15*, *16*, and *17*); deployable S-band antenna (Apollo 11-14); surface television camera; surface tools; and lunar sample collection boxes. The descent stage carried consumables for the lunar stay: batteries; oxygen and water for drinking and cooling. The descent stage ladder carried a plaque.

The Ascent stage contains the crew cabin; environmental control (life support) system; instrument panels; overhead hatch/docking port; forward hatch; reaction control system; rendezvous radar; VHF and S-band communications equipment and antennae; guidance and navigation systems (primary and backup); active thermal control system (an ice sublimator); ascent rocket engine; and enough fuel, battery power, and breathing oxygen to return to lunar orbit and rendezvous with the Apollo Command and Service Module.

Copied from Wikipedia

All The News That Fits To Print

Russian Scientists Announce Six-Month Delay In Carving New Space Station



Russian Space Agency director-general Yuri Koptev answers reporters' questions about splitting and warping on the new Russian space station.

MOSCOW—Citing safety concerns as well as the importance of proper craftsmanship, Russian Space Agency officials announced Tuesday a delay of at least six months before carving is completed on the newest Russian space station.

"The two-by-four frame which forms the station's primary airlock is still in the clamps and hasn't even been sanded yet," said Russian Space Agency director-general Yuri Koptev, explaining the delay. "There are also a number of key navigational instruments which we have not yet begun to whittle."

Originally scheduled for completion this month, the new station ran into difficulties on June 2, when several nails came loose during a routine docking exercise, resulting in an explosion that destroyed the space station's guidance system and badly injured cosmonaut Nikolai Budarin. The malfunction, which also caused serious damage to the station's steering thruster, was traced to faulty hammering.

"The nails were not hammered in straight," Koptev said. "We will pull them all out and do it again."

Another major setback occurred just two days later, when a pair of vagrants jimmied open the lock on the space station's main entry hatch and spent the night in it.

"They urinated all over the place," chief engineer Talgat Musabayev said. "This created serious problems, as the floor had not yet been varnished and sealed, so the urine soaked through and caused a terrible smell. I cannot go in the space station now without covering my nose."

Musabayev said the agency has requested $3 in additional funding from the Russian government to purchase a pine-scented bathroom spray to combat the urine odor, but the request has not yet been approved.

Despite his frustration, Koptev said the setbacks have taught Russian Space Agency officials much about the construction and maintenance of space environments, knowledge which will help them greatly in future missions. "We may decide to work with clay in the future, so that even if we make many mistakes, we can correct them before the final firing," he said.

Another breakthrough for the Russian team was last week's discovery of rigid, circular devices that facilitate the transportation of heavy items. "We used to carry all of our components many miles to the space center in our arms," Koptev said. "But now, by affixing these round devices to boxes and baskets, we can transport items with far greater ease."

For reasons of national security, Koptev declined to elaborate on the specifics of the device.

Russian aerospace engineer Aleksandr Kirov installs software on the new space station's mainframe computer.

Reprinted from 'The Onion"