

# Viking corrects its own troubles

PASADENA, Calif. (AP) — The two Viking probes to Mars have been marked by mechanical difficulties that have threatened the success of their missions, but the program's space mechanics — 228 million miles away — have had little trouble fixing the problems.

They aren't so pessimistic as to believe that everything will go wrong. But, just in case, they filled a 3-inch-thick book with countless scenarios of things going wrong aboard Viking — and how to fix them.

It was this book that the engineers opened last week when the Viking 2 orbiter wandered out of position, breaking radio contact between Earth and the Viking lander during its descent to Mars.

Without making a service call, the engineers eventually traced the problem to a short circuit that blew a fuse in the power supply to the gyroscopes that hold the orbiter steady in space. As a result, the craft wobbled and its high-gain radio antenna swung away from its target — Earth.

Similar long-distance diagnosis has been necessary several times to fix crucial experiments or running gear aboard Viking.

In every case but one — a Marsquake measuring seismometer on Viking 1 that never moved into working position after landing — remote repairs were successful.

The book of contingency plans is crucial in these situations, said Ron Ploszaj, chief of the Orbiter Performance and Analysis Group.

He figures that analysts spent the equivalent of two or three man-years dreaming up the possible breakdowns. Many of them are culled from the reports of failures on past space missions.

Another key strategy is recreating the breakdown, using a spare lander and orbiter at Jet Propulsion Laboratory, the mission control headquarters. Planned repairs are tested on these earthbound Vikings to make sure they'll work.

Using these strategies, the engineers have so far been able to:

— Solve a buildup of pressure aboard Viking 1 caused by a

helium leak.  
— Free the Viking 1 lander's jammed mechanical digging arm when it was stuck because a small locking pin failed to fall out after landing.

— Pep up a weak signal from a radio transmitter on the lander.

One of the potentially most serious troubles was the communications blackout that struck the landing craft last Friday, seconds after the landing craft separated from its mother orbiter ship and headed for Mars.

"The first thing we noticed was that one of the solar panels that generate electricity was putting out too much power," Ploszaj said. "Then we saw a decrease in current in the power supply that feeds the gyroscopes. Then there was an oscillation back-and-forth movement of the spacecraft ... those three measurements confirmed we had a problem."

By this time only a few minutes had elapsed, but the engineers knew what was wrong. A gyroscope unit had failed and Viking was drifting.

After the fuse blew, the computer sensed the problem and switched on a standby gyro unit and the electronics that power it. It was too late, however, to keep the orbiter from rolling out of position — a device on the orbiter called a star tracker, which locks onto a particular star for a reference point, had lost the star Vega.

At this point a weak signal was still coming from the orbiter, but nothing from the lander, which was descending towards Mars. The radio blackout did not affect the computerized landing procedure. But since the orbiter has to relay radio transmissions between the lander and earth, the lander's messages weren't getting through.

The engineering analysis experts gathered in a locked conference room in the control center, said Ploszaj, and decided to wait until after the lander touched down before trying to re-orient the orbiter. During its plunge, the lander was sending out a lot of important data that was now going to be lost in space. Or was it? Among the plans in the book of possible problems was a command that was immediately sent to the Viking orbiter, telling it to turn on its tape recorder.

That meant that the information being beamed by the lander radio was caught on tape, where it could be played back later to Earth.

After working until exhaustion early Saturday morning, the troubleshooters had the situation well in hand. All that remains in the recovery plan is to switch back from the reserve gyro electronics unit to the main unit. That is to be done this weekend.

# Soviet pilot given refuge

LOS ANGELES (UPI) — Secluded in the first class section of a jumbo jet out of sight of other passengers, Soviet fighter pilot Viktor Ivanovich Belenko arrived in the United States last night to begin a new life "of my own free will."

The Soviet pilot was granted asylum in the United States after he landed his top secret MIG25 in Japan Monday.

The 29-year-old Belenko will remain in the Los Angeles area at least overnight, according to a spokeswoman for Los Angeles International Airport, and there were no im-

mediate plans for him to leave the city.

Following his 8:45 p.m. EDT arrival aboard a Northwest Orient 747, Belenko was immediately whisked off by a caravan of five cars led by two cars with Department of Defense markings.

Defense Department officials huddled in a secret meeting at the airport at 4 p.m., according to the airport spokeswoman. A department spokesman would give no further details about the final destination of Belenko.

He departed Japan yesterday aboard the jumbo jet and had a two-hour refueling stop in Honolulu

before traveling on to Los Angeles.

In Honolulu, Chief customs inspector Edward Gilbert said Belenko was permitted to remain inside the 747 after the other passengers disembarked for customs and immigration clearances.

Belenko was wearing a broad-striped suit and dark glasses when he boarded the flight in Tokyo. Prior to his departure he told Japanese authorities he was coming to the United States of his "own free will" and repeatedly refused appeals from Soviet officials for a face-to-face confrontation during which they had hoped to convince

him to return.

Still at Hakodate City in northern Japan was Belenko's MIG25 Foxbat which he flew to Japan Monday. Japanese diplomats insisted the plane had not been touched by anyone since it landed at the airport 500 miles north of Tokyo. But American military sources in Hawaii said "you can bet your paycheck that we'll know about everything there is to know about that plane before the Russians get it back."

Another Hawaii source said Belenko was believed to have left a wife and family in Russia.

# Regional plan close to approval

The Comprehensive Plan is moving closer to adoption in the Centre Region with the approval of the plan by Harris Township, Regional Planning Director Ron Short reported last night at the Centre Region Planning Commission (CRPC) meeting.

State College Municipality will discuss the plan at the Municipal Council meeting Monday, College Township's planning commission has recommended approval to its

governing body, Half Moon township's planners commission have recommended the policies but not the maps of the plan, and Patton and Ferguson townships' planning commissions are still discussing it, Short said.

The Comprehensive Plan is a detailed document of the goals and policy guidelines for the physical development of the region. If adopted by the municipalities, it will

influence planning through the year 2000.

In other business, CRPC refused to act on an application of the University Area Joint Authority (USJA) for Public Works Employment Funds to build a maintenance building.

Short said the application for the building, which would cost about \$500,000 and be built totally with federal funds,

should be approved because the commission's approval would aid in getting the funds.

Commission members refused to approve the application without further discussion until Short could demonstrate how much maintenance costs would be for the building and show whether townships served by the UAJA would have increased sewer rates.

# Woman has unlucky evening

A woman was arrested late Wednesday night and charged with prostitution.

State College police received a complaint and took the woman into custody at 11:30 p.m. in front of a local motel. She was arraigned before Phillipsburg District Magistrate Shoff. She was taken to the Centre County jail when she was unable to post bail.

Harry Benjamin, of 121 Porter Hall, was arraigned

Tuesday before State College District Clifford H. Yorks on aggravated assault, harassment and minors law violation charges.

## Police log

Benjamin and another male juvenile were apprehended late Saturday night and cited for beer possession north of Hibbs Hall when Benjamin allegedly assaulted a

University police officer.

Stephen Vanwinkle, of RD 4, Bellefonte, yesterday told University police his \$80 watch had been stolen from the second floor men's room in Willard Building.

Michael Sherman, a graduate assistant in vocational education, yesterday reported to University police the theft of about \$80 worth of books from 108 Rackley.

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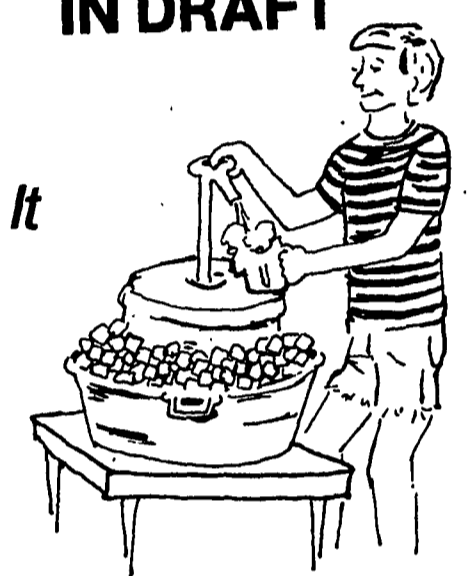
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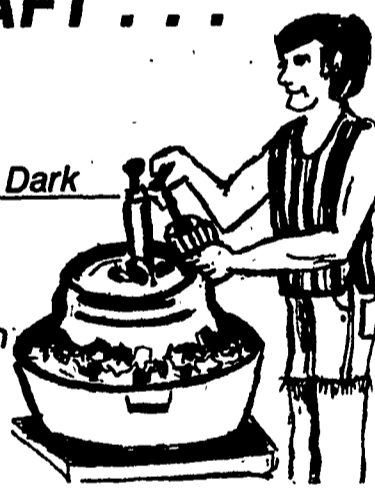


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