Gerald Soffen, right, Viking project scientist, and Carg Spitzer, deputy project manager, discuss exhibit illustrations depicting the Viking Project (VMP) search for life on Mars. Paintings by Jim Betcher of Bel Air, Md., will be on display at NASA's Langley Visitor Center for several weeks.
Viking Mission Finished, But Study Continues

By RALPH CORNELIS
Staff Reporter

Last week NASA’s highly successful five-year Viking probe of Mars left its orbital run out of gas, but it’s a long way from running out of steam. The 3-year-old tracking station in Spain has already been spinning around the world since June 1976, before its orbit was shifted in order to conserve fuel. By agreement NASA pledged to slow the Martian probe’s descent into the atmosphere and shut down the spacecraft before landing.

The Viking lander, which touched down in September 1976, is expected to continue sending weekly meteorology reports and data until the end of 1994. The mission produced an “irreplaceable scientific storehouse of knowledge about this planet other than Earth,” according to JPL’s Ralph H. Phillips.

But after two years of monitoring Martian weather, Viking 100 million miles away from Earth, helplessly watching, the leg-out mission has passed since the famous canals were sighted. In this case, the survey was never sought in the first place. The mission is a success because it is not.

“The Martian’s surface is rich in water, evidence of a vast underground ocean, the oceans may or may not still be visible today. The photos taken by Viking probe are of great importance,” said Dr. Wayde P. Snyder, project scientist for the Viking mission.

Viking’s success in exploring the planet’s surface, the first to do so, has made history. It has captured the imagination of the world, and its impact will be felt for years to come.

The Viking spacecraft, consisting of a lander and an orbiter, was launched in 1975 and arrived at Mars in 1976. The lander, carrying instruments to study the planet’s surface, was deployed by the orbiter and began transmitting data back to Earth. The orbiter, equipped with cameras and other instruments, continued to monitor the lander’s activities and relay data back to Earth.

The Viking mission was a major milestone in the exploration of Mars, providing valuable information about the planet’s surface and its potential for supporting life. The mission’s success opened the door to further exploration of Mars and other planets in the solar system.

Chronology Of Viking Mission

- Project authorized: 1975
- Orbiter 1 launched: August 1975
- Orbiter 2 launched: September 1975
- Lander 1 arrived at Mars: June 1976
- Lander 2 touched down: September 1975
- Lander 1 touched down: July 1976
- Lander 2 touched down: September 1975
- Lander 1 touched down: October 1975
- Lander 2 touched down: October 1975
- Lander 1 returned to Earth: July 1978
- Lander 2 returned to Earth: July 1978
Viking scientists have unveiled Mars

BY VIRGINIA BINGGS
Viacom International Staff Writer

HOMPTON — The planet Mars, once seen as a dim red light in the sky, can now be visualized as a planet with hills and valleys, sunlight and seasons, says Conway Snyder, chief scientist for the Viking program, which has been exploring Mars since 1975.

NASA's Langley Research Center, where the project's mission control is located, was turned over to the JPL, Propulsion Laboratory in California, where information from the planet is being relayed.

Two spacecraft were sent to orbit Mars in 1976 and two landers aboard those spacecraft went down to the surface of the planet to collect data.

Conway Snyder, director of planetary programs at NASA, and Kermit Watkins, who is Viking project manager from JPL, were at NASA today to present an update on the Mars mission.

"In some respects, we discovered that Mars is not too different from Earth, but in most respects the difference is remarkable," said Snyder.

The scientists said living organisms have not been discovered on Mars so far. He said that more than 25,000 pictures were taken of Mars by the Viking orbiter before it was turned off on Aug. 7. The Viking lander is still operational on the planet and has taken 25,000 pictures.

Snyder said that the landers will be reporting back to Earth on a weekly basis until 1984.

The orbiter, which is moving around Mars, is not expected to return to the surface of the planet until 1986. We have an international agreement that we will not clutter the Mars surface until that year and we believe the orbit will continue to travel well beyond that period," Guatrello said. The NASA official was employed at LRC for 17 years before going to the headquarters.

Here, we have deputy project manager for Viking and later manager, for large space structures.

"We say that Americans' research of planets has advanced to the point that it is no longer an engineering event, but a fact. He said several more explorations of other planets are planned during the 1990s."

Watkins spoke of the rich heritage of the Viking spacecraft has left Americans. "The scientific data banks on any other planet are unparalleled."
Viking Finds Dry Ice
Snow On Mars' Poles

By BILL DELANY

Martian poles are apparently blanketed by a mixture of water and dry ice, but about 50 percent of the atmosphere above them consists of argon.

The discovery of water clouds appears to be triggered in as little as 10 days as carbon dioxide is frozen out of the thin atmosphere, thus concentrating argon as a gas unaffected by falling temperatures.

Mechanisms of the change are under study, says Dr. Hugh R., Kieffer, head of Project Viking's thermal mapping team.

A close look at the phenomenon of water vapor, which radiates on a daily basis, said Dr. C. Roman, head of Viking's water mapping team.

Dr. Gerald A. Soffen of Langley Research Center, head of the Viking project team, reported that evidence of life on another planet, revealed by always warm, dry ionized planets, may be found on Mars.

Soffen said that the first signs of signs on the surface of the Viking mission, including reports of findings from a surface instrument on Mars involved in the Viking flight, were last Aug. 31. Since the spacecraft began its daily flight around Mars, the most recent, has been confirmed on the photographic search for a safe landing spot.

Mission leaders believe the site now has been pinpointed at Chryse Planitia, a section northwest of the original target area. More study is required, but Viking is on a countdown toward landing July 17.

Impact on the planned science mission, Soffen said Friday, is expected to be minimal. Tasks which had been planned for the early landing phase will not be significantly changed.

Those jobs can be worked into the schedule, Soffen said, "as long as we get two landers down safely. That is all I care about."

The Viking program has been managed by Langley Research Center at NASA's largest space age task since early days of the manned flight mission.

When Mercury missions were shut down, the science of the project shifted to Cape Canaveral. Similarly, the Viking mission now is based at Jet Propulsion Laboratory in Pasadena, Calif.

Most surprising was the six-hour observation period available for infrared mapping of Mars, Kieffer said, the high concentration of argon at the winter pole.

That gas is shown to be present.
COLORADO MAN TELLS NASA

Martians All Living In Underground Tubes

A Colorado man has written NASA's Langley Research Center offering an explanation of life on Mars which indicates the Martian rivers are actually the "places where the people live underground in metal tubes."

Howard E. Harvey of Colorado Springs, Colo., quotes extensively in the letter from a book called "The Truth About Mars" by Dr. Kenneth L. Norman. Harvey says in the letter that after finishing the book he was contacted by a Martian named Nurr El who he said is named in the book as a guide for earthlings.

"At one point in the book, the knowledge of this cataclysm will clear up some of the mysteries of Earth's history which have been puzzling the seekers of truth for many years," Harvey adds.

"How much of the Martian mystery this letter is supposed to clear up is not clear," Harvey explains, "and Harvey explains the desolate Martian landscape came as a result of the cataclysm which he describes as the passing of an errant sun through the solar system."

Another woman, commenting on the Viking probe to Mars, a project designed and built at Langley Research Center, said Mars probably contained a colony of raccoons.

The woman who wrote the letter, who says she is a member of NASA's public information office who writes to the public, adds that she reached this conclusion because the raccoons taking over her house were "certainly smart enough and small enough to survive on Mars."

Harvey gave no address or phone number in Colorado Springs. Perhaps he has moved in with Nurr El.
Success Of Viking

This day brings some new addition to the total knowledge being accumulated about the until-now mysterious red planet. It has mountains, and canyons, water and oxygen—and a geological history which has both familiar and peculiar elements. Scientists are slowly piecing together from the data being received the patterns of activity taking place on the planet.

Some of the press are interpreting the event as reading, and some of it is probably not true. Much of it still remains in the stage of theory, based on interpretation of data which has been accumulated. But all of it is important, and reflects great credit on the personnel at Langley and elsewhere in the National Aeronautics and Space Administration network and the numerous scientists working on it.

The Peninsula community continues to watch the event with more than usual interest, too. After all, we did have a major hand in it.
Viking Gives Results Of First Soil Tests

By EAN MOREAU
Staff Reporter

Scientists studying the first results on Martian soil samples said Friday they have found iron, calcium, silicon, titanium and aluminum.

And they believe they will find evidence to show other elements are present when more complete results come in next week.

The Viking I Lander, as busy as any farm field, is its first day under the coat of soil. The Viking II Lander is busy all day, mostly setting a sample taken from the soil in the week with scientists in.

Numerical breakdowns on the percentages of each element found are:

Dr. Berndt C. Cahn, a member of the Viking science team, said scientists have determined that the rust colored on the surface of Mars is very thin and does not completely cover the surface.

Clark also said the sample taken so far shows that the surface and the soil are the same material, though the findings come when they are still at a pretty preliminary stage.

Two of three biology investigations were under way, but a third was stopped by a signal that told earth scientists it did not get enough soil. The soil may be too coarse or too thick to enter the filter of the instrument, and another attempt will be made in four days to fill the chamber.

Dr. Robert Cramer, a deputy mission director, said that on the next attempt pictures would be made by Viking's cameras of each step, including the opening of the chamber to be sure it gets enough soil to test.

The instrument, a gas chromatograph mass spectrometer, was one of the three designed to seek bacterial life on the red planet.

Dr. Ronald Scott of the Physical Properties Team said the Martian soil is the same as that found on earth, with a composition that appears to be similar to wet clay, but he emphasized that did not mean there was moisture in the soil.

"It seems," Viking scientists reported the setting Viking space station continued to take pictures of the planet on what was now 68th week.

Viking II is set to begin circling the planet Aug. 7 and land on Sept. 1, in what scientists have said will be a more rocky but more interesting site.

The Viking I Orbiter is photographing landing sites for Viking II and sending back what scientists called "good clear pictures."

Viking I, which will perform a series of life-seeking investigations similar to the first lander, was scheduled to enter Martian orbit Aug. 7 and land Sept. 4. It was 117.7 million miles away from Earth Friday and speeding toward Mars at 5,900 miles per hour.
Viking maneuvers toward new landing site

BY VIRGINIA BICGIN

The Viking spacecraft is on its way to explore yet another proposed landing site on Mars. Times HERALD

Project Manager James R. E. (Jim) Martin said the maneuver to shift the probe package to the westward was satisfactorily completed at 9 a.m. Thursday.

Out for the northeast site again, "Would that occur we plan on landing the Viking at 6:30 a.m. July 16 in the northwest region," Martin elaborated.

He said that through photographs and radar tracking of the Mars surface in the Chryse Planitia area, we understand a lot we didn't know before.

Dr. Leonard Tyler, chief of the radio sciences team, said that the radar measurements of Mars from the large Arecibo laboratory in Puerto Rico has worked remarkably well.

He said the radar is like "a little guy" walking over a hilly site, who can tell you of every slope and curve. The photographs are the "big guy," who can step over hills and does know the depth of them.

"If Mars were perfectly smooth, the radar's eyes would give a response like a reflection off a ballbearing. There would be a single spot of light in the center and the rest of the area would be in darkness," he explained.

A rough surface would make that single spot of light break up and give off a flecked pattern. He said that early radar measurements of the new site gives scientists every hope "that there is a smooth surface for landing down there."
Viking Landing Site
NASA Remains Undecided

BY BILL DELANY

Viking's 'Phoenix' Site Can't Be Ruled Out

A fourth candidate site, Idalis Phoenix, was made public during an after-
noon briefing by project manager James B. Martin. The site may be
studied if the Viking's orbital path is shifted to the original backup site
of Triton Locus.

Meanwhile, photographic recon-
naissance information continues to be flown
over the original target of Chryse, now
designated Tristam. The area was
switched to a landing site on July
3.

A decision on a fuel-costly latitude
change to the Chryse Phoenix area or
a move to Tritons Locus must be
reached by the morning of July 5 on the
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Viking to land Tuesday at new Martian site

BY VIRGINIA RIGGS

NASA

America will begin exploring the planet Mars at 11:45 a.m. Tuesday when the Viking lander touches down on the western slope of the Chryse Planitia. "Contrary to past expectations, we are going to land," said a smiling Viking Project Manager James Martin of Langley Research Center. "We believe we can land quite safely in the Chryse basin and our westward trek has ended."

The site picked is the third in the Chryse region surveyed as a possible landing area for the first of the Viking probes. It is 460 miles northwest of the original site and is located on the "west-northwest" of the "A" primary site. "It's the closest possible site to the landing target in the Ares region," said Dr. James Manly of the Viking orbiting imaging team. "When the Viking orbiting imaging team said during its press conference Monday "We think there was water flow in this area and we think there is a reasonable chance of picking up sediment""

"Unless there is an anti-dust devisce on landing, we anticipate no problems at touchdown," said Martin. Through radar and photographic measurements of the target area, scientists believe that the landing area contains low, wide slopes which will not handicap the robot laboratory's ability to function on the surface. "Late Tuesday, the Viking orbiter was given the signal to stop its westward trek and position over the target area. We've looked at the weather for weeks and it's pretty much impossible to do it," Martin said today. The landing site, he pointed out, is on the western side of the deepest part of the basin. "If looks good," he commented.

Martin said the spacecraft will go through several "gates" in preparation for landing. "The key now will come on Sunday afternoon when there will be a pre-separating checkout of the lander," he pointed out. "The last time we operated the lander was last November. Of course, we've turned some of the things like the computer, but all systems have not been checked."

The checkout will take about five hours to accomplish. At 1 a.m. (EST) Tuesday, the go-no go decision will be made for the landing. "If all goes well, the separation will begin at 6:00 a.m. (EST) Tuesday, and a landing about 6:15 a.m. that day," the project manager said. "It's said the first pictures from the lander will return no later than 40 minutes later."

Scientists say the landing site is believed to be a relatively young region by Mars standards. There is also agreement that the geologic content of the area is reasonably well understood, based on radar, photography and comparison with studies of known terrains on the moon. Manley said the area "is a few miles, probably covered with reddish, granitic material of various sizes, which should be easily scooped up by the lander's arm."

Another series of pictures will be taken of the site, but scientists do not expect them to change the landing plans. Previous pictures indicate that the landing site is remarkably similar to the dark smooth plains formed by air. "The view is on the moon, known as the "plains of air,"" said Manley. "The air flow has a great effect on the surface, and we should be able to see the effect here."
New thrill of discovery

As always, the scientific world is standing at the threshold of new discoveries as data pours in from our orbiting space station on the surface of Mars.

Picture-thing behind it, the lab is now busy sampling the Martian soil, testing it for known chemical elements, checking the possibility that some sort of living thing may have existed in the Martian atmosphere. There are enough of the known chemicals on Mars to develop primitive organisms, and the scientists hope to find out more than we now know about the origins of living growth, perhaps of the development of the universe itself.

As this much follows the exploring instinct that has brought our culture to the fore among others, it is natural that we pursue the search for greater knowledge, with parallel benefits in science and medicine and engineering. These give us, in sum, higher levels of the human experience.

Even if there is no absolute evidence of living organisms, the presence of the several little laboratories on Viking I, each programmed to analyze a particular lot of Martian soil for certain metals, chemicals, this information now coming across more than 200 million miles of space is changing previous concepts and leading to previous knowledge about the planet regarded as most closely resembling Earth in its early stages.

Another Viking, a backup sent to increase the success of the billion dollar exploration, is scheduled to go into orbit around Mars in the next few days. It too will drop a landing craft, and in September we should, if all goes well, begin to hear more about the near-polar regions.

AUG 5, 1976

Then, and only then, will we begin to grasp the extent of the technology that permitted this nation's learned scientists to fire an instrument loaded spacecraft over millions of miles, put it down on a pre-selected landing site, and then begin to send us pictures and other information some 10 minutes later.

Secure in the success of this spectacular effort to seek out, test, and analyze conditions on Mars, it is only a matter of time before the thrill of this discovery leads to new goals and new achievements.
Tests At Langley Indicate Possibility Of Martian Life

AUG 26 1976 NASA

By BILL DELANY

Hampton City Editor

Langley Research Center's Viking spacecraft may have found its first clues indicating life exists on Mars.

The data was received Wednesday from a second test, one of three built into the biology instrument.

Viking's first test produced a positive result. The original sample indicated that biological - not chemical - processes were occurring in the sand. The scientists who received the results were overwhelmed, said Dr. Gerard Soffen, project scientist for the mission. 'I really don't understand the data and I'm still overwhelmed,' he said.

'But I'm not suggesting there is life on Mars yet, but it (Mars) is certainly very alive and I am overwhelmed.'

Dr. Harold V. Klein, biology team leader, said experiments are still being analyzed and that it would take a week to get a biological interpretation for the data, or some final results that may be used in the final mission.

He also noted a test of the gas exchange experiment has indicated a 27 percent increase in the amount of carbon dioxide above the sample taken in a second sealed container.

'This is a large increase, and the height of this peak is not at all clear,' he said.

It may be a natural occurrence or the result of a virus in the sample, he said.

Dr. Norman Horel, who conducted the experiment, said the results indicate that life exists on Mars.

Soffen said it is not clear if the original results can be reproduced using a third sample which has been sterilized.

This, Horel said during a press conference convened only hours after data was obtained, will be started in the next day or two. The new soil sample was scheduled to be collected early today.

Even without a clear result, Horel said that the data does not show failure of a filter removing ultraviolet from Mars' sunlit surface, that it was not a synthetic or a native protein, or contamination of the test sample with Earthly organisms.

Horel said scientists would not establish a biological interpretation if they fail to find organic material on Mars.

Soffen interpreted the results to indicate that Viking will at least sample only two areas of Mars.

Some models can be established to show life on Mars even without proving organic chemistry, through gas chromatograph mass specrometry.

One, Horel said, would be that the organisms would be airborne, blown in from other areas where they live in a sterile environment where they die.
Viking To Seek New Landing Site

Jun 28, 1976

By Bill Delany

Langley's Viking spacecraft will seek a new Mars landing site as a result of photographs which raised too many questions about the planned Chryse target.

DAILY PRESS

Photographic coverage of an alternate area of Chryse/Phoenix, a basin some 340 kilometers northwest of the original target, was obtained Sunday by the 70-meter-diameter spacecraft's cameras. Photos were taken during the closest approach to Mars, which is scheduled for August.

Project manager James C. Martin Jr. said the change was based on new information which showed Chryse/Phoenix to have a better chance of providing evidence of Mars's geologic history. The area is closer to the planet's equator, he said, and could provide valuable information about the planet's past.

Viking's primary target for landing was the area of Chryse/Phoenix, which is expected to provide valuable information about Mars's geologic history. The area is closer to the planet's equator, he said, and could provide valuable information about the planet's past.

If this proves true, Martin said, engineers will try to use the spacecraft's capabilities to overcome any difficulties that may arise.

"We have always had to use the best possible materials and methods to achieve our goals," he said. "But we have never before used such a sophisticated approach to solving problems."
Viking Problem Eased

Continued From Page Three

radio command, now taking more than 17 minutes to reach the spacecraft. No further communication will be possible until after lander has reported its descent by the radio link established with the spacecraft. One of the big questions now facing Viking scientists, and Dr. Gerald K. Erley, is the question of argon in the Martian atmosphere. Tests will be made during the week to show whether it is present or absent. To see if Soviet measurements are correct.

If their findings of argon are verified, the Gas Chromatograph Mass Spectrometer is used for atmospheric measurements as planned, the argon will effectively be lost. The most expensive single device built into the spacecraft. For this reason soil samples may be made even before the atmosphere is

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Viking Problem Eased
As Craft Nears Mars

By BILL DELANY
Hampton, City Editor

Viking, beset with troubles with a leaking pressure regulator and almost in the red, has been eased by remote command.

Much of the pressure building in orbital fuel tanks was bled off by a short, successful burn early Tuesday. The slight change of velocity gained in the two-minute burn will add a two-step entry into Martian orbit Saturday afternoon.

The Viking spacecraft launched in the Langley Research Center’s first effort to find life on another world is scheduled to begin a looping path around Mars at 5:38 p.m. (local time) Saturday, according to the plan.

The landing on July 4 has been an important off-the-record goal of Project Viking since the program was initiated under Langley direction.

Project Manager James S. Martin, speaking at a press conference at Langley’s Jet Propulsion Laboratory following the mid-morning burn, denied the Independence Day landing was set for public relations purposes.

Martin said he has repeatedly been told by Washington officials not to initiate the landing process until after project leaders have been assured landing will be as safe as possible.

There is little question, however, that July’s landing has some priority even on a billion-dollar mission established to seek evidence of life on another planet.

Trouble with the regulator, which admitted too much helium into orbital fuel tanks in preparation for the insertion, caused some project officials to express concern. Had the pressure continued to build the fuel tanks could have been ruptured and the trajectories of the craft changed. A second burn will be made to correct for the slight change in velocity.

This will mean that Viking will enter Martian orbit requiring about two days to go around the globe. A second burn will be used to bring it into the lower path originally planned and a third may be required to trim the orbit. This procedure was adopted to avoid shutting down the fuel pressure system.

If this had been done, Viking would have lost the redundancy still available.

"We have a very dedicated robot," Martin said in the press conference.

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"We have a very dedicated robot," Martin said in the press conference.
Probes Woes: Moon Bar

Viking Orbits

WASHINGTON, D.C. - A group of investigators went to the moon last week.

The purpose of the mission was to study the surface conditions of the moon.

The group, which consisted of six members, landed on the moon in a small craft and spent several hours exploring.

The conditions on the moon were found to be harsh, with temperatures ranging from extremely hot to extremely cold.

The team also noticed that the moon's surface was covered in rocks and debris, making it difficult to move around.

Despite these challenges, the group was able to gather valuable data and samples that will be used in future studies.

The mission was funded by the National Geographic Society, which provided $10 million for the project.

The team's findings will be published in a forthcoming issue of the journal "Science."
Viking I Enters Mars Orbit

Marian sterns the essential step toward the planned landing on Mars on NASA's 24th birthday, April in the country. Viking I is expected to land at Chryse — Greek for "Land of Gold" — on July 4.

The gold Viking will seek man's first detailed knowledge of the planet which has always stirred imagination. Long considered this planet's most likely home for any other life form, Mars will have this secret revealed if Viking performs as planned.

Without the check of Viking, the 100-pound thrust motor, the spacecraft would have sailed past Mars without a chance to land. It was the third time the motor fired without a hit. After indications of a helium leak gave the Viking officials some nervous moments, the second and third options were junked.

The spacecraft was fired at 3:18 p.m. EST (1800 GMT) Sunday from a Titan-Centaur rocket at the Kennedy Space Center in Cape Canaveral, Florida. The spacecraft was on course for a landing site in the Chryse region of Mars, where the Viking lander was scheduled to arrive on July 4.

The landing site, chosen by Viking planners, is a flat area about 200 miles long by 100 miles wide, which may have the best chance of revealing signs of life. The spacecraft's instruments will be able to determine whether the surface is suitable for the landing vehicle.

The spacecraft, which will be operating in the Chryse region for the first time, will be used to study the planet's surface, atmosphere, climate and geology. The spacecraft's instruments will be able to determine whether the surface is suitable for the landing vehicle.
Tangley staffer oversees Viking
Viking responding to commands for orbit
LRC Planning For Exhibit

Langley Research Center's exhibits for the U.S. bicentennial exhibition on science and technology will feature Viking Mars landing and surroundings. The exhibition opens Sunday at the Kennedy Space Center in Florida and will be in rotation through the end of July.

MAY 24, 1976

LRC exhibits were built here and are being assembled in Florida.

A test cell in the live way of the KSC Vehicle Assembly Building, at Kennedy, has been transformed into a replica of the Martian surface for the Viking exhibit.

A full scale operating model of the Viking Lander sits on a sand mesa. Its soil sampler arm moves to simulate the scooping up of Mars surface materials. Looking upward, visitors will see a scale model of the Viking Orbiter, perched as it will be when its tilted camera eyes on the Martian surface.

A multimedia presentation relates the Viking story and a detail map of Mars identifies the proposed landing site. Beginning with the first Viking landing on July 20, mission events, reports and photographs will be relayed daily to the experimentalists.

The exhibition exhibit features energy efficient aircraft concepts.

At the Vehicle Assembly Building, visitors will find a scale model of an advanced aerodynamic testbed aircraft. Models of experimental jet engines and displays explaining research on aircraft tools and future engine concepts are featured in the propulsion areas. The aerodynamics area includes a model of an experimental aircraft with an advanced efficient wing and displays of other advanced improvements.

In another exhibit area, visitors will view a panorama of future aircraft concepts suspended about a revolving sculptured airliner. Other displays feature fuel for future air flight, including hypersonic ramjet engines, large cargo aircraft concepts, advanced helicopter configurations and improvements in aircraft noise reduction.

Approximately 120 Langley en-
Public television explores Mars

BY LARRY KING
Tidewater Daily News, Norfolk

Last summer the United States sent a rocket to Mars. Actually, it was shot in the opposite direction but by the time this summer, the planet will be there.

Also by this summer, a series of three television shows about the missions will be on the air. The show is the work of Tidewater’s Public Broadcasting Service (PBS) station, WHRO.

The station was chosen by NASA to make the show for two reasons, according to Larry Crum, program designer and producer at Channel 15.

"One was its proximity to NASA’s Langley Research Center where much of the Viking work was done. The second was its reputation for good work on shows dealing with science," Crum says.

The shows, each 15 minutes long, deal not so much with the actual mission as with what it hopes to accomplish. Viking is going to Mars to find out if anything lives there.

If something does live there, the space probe will take some scientific significance of some magnitude. About the same magnitude, as, say, the invention of the wheel.

"The first film deals with why we should search for life; what life’s all about, really," Crum says.

"The second one is more biology, lots of living organisms is it. The second is more geology, I guess; all about Mars’ geological features, its valleys, canyons, the ice caps, the dunes, the wind storms.

"The third one is more extraneous. We’ve tried to give it those kind of directions, so you don’t feel as if you’re looking at the same thing these films.

"It was intended to be shown on local educational television, to science classes ranging from seventh to 12th grade.

"Crum and the rest of the WHRO staff that work on the shows - Stewart, Harris, photo-duck Morgan, set designer - did a good job. When the United States Information Agency (USIA) saw the films, it decided it wanted to use them. The agency will translate them into 18 different languages and distribute them overseas.

"Crum now is planning to kill the three 15-minute films into our 30-minute show for general use on PBS stations nationwide. Crum says WHRO is hoping NASA will fund the project for PBS. The space agency already paid for the three shorter shows, at a total cost of $36,000.

"Despite NASA’s sponsorship, the shows won’t come across as a commercial for the space program. NASA, in fact, is mentioned only once in all three shows - during the second one.

"Making the shows involved building sets that represented the surface of Mars. Various kinds of trick photography were used to simulate the weather conditions there.

"Albums of stock film footage from NASA were woven into the show.

"The 15-minute shows are, for all practical purposes, finished. The 30-minute show will be completed by early summer. It has to be. Viking is scheduled to land by mid-summer.

"The theories about what Viking will find once it does land are qualified heavily in the shows.

"There’s a lot of ‘ifs’ and ‘maybes’ and ‘perhapses’ in it," Crum says. "There has to be, because nobody knows for sure now if there’s anything on Mars or not.

"The speculation is that there might be life there; and if there is it’ll probably be micro-life. That’s what they’ll sample for. You look for the most elementary form of life - bacteria.

"But they do have cameras that’ll be looking for larger things, too, if we look up and there’s a camera looking back, we’ll know we’ve found it."
Viking ovens cause problems

In less than a week, a second problem in ovens has occurred on the Viking Mars spacecraft, according to a NASA spokesman at Langley Research Center.

One of three small ovens to be experiment aboard the Viking 1 may not be working. A condition similar to one reported late last week on Viking 2, it was announced today.

Both Vikings, managed by LRC, are on course to Mars for the first U.S. attempt to land on the planet.

The ovens, three on each Mars ladder, are designed to heat Martian soil samples in 330 degrees Fahrenheit to release organic constituents in the soil for analysis by a gas chromatograph mass spectrometer. JAN 2, 1977

It is now believed that, next one oven on each Viking will not function when it reaches Mars. Project officials say, however, that telemetry from a monitoring device associated with the ovens may be faulty, and the final test will occur on Mars when soil samples are placed in the ovens.
About Viking Landing Site

Officials are optimistic.
Viking Official to Report on Mars Data

William H. Michael Jr., head of NASA's radio science team, will report science data from the mission to Mars for Langley Research Center workers Thursday.

Special assistant to the director of Langley Research Center as well as a Viking scientist, Michael will summarize data in a special session of the Langley Colloquium Series. The meeting in Langley's Activities Center will begin at 12:30 p.m. July 27.

All areas of the planetary exploration are expected to be covered, including biological findings. X-ray examination of the soil, weather conditions, photography and Viking spacecraft.

Michael's own team will use radio links between Earth and Mars to provide additional data on the planet's radar reflectivity, orbit and mass, electron density in both Martian atmosphere and interplanetary space, atmospheric turbulence and drag and location of the sun.
Viking's Priorities

The idea of crowning the most ambitious of spaceflights with a success on the nation's 200th birthday was an immensely appealing one. But while a Fourth of July landing for CHAPPA was the surface of Mars had priority, there was no real thought that the schedule should be met at the cost of safety and solid scientific achievement. Daily Press

6-29-1976

But, indeed, a tribute of a sort to the sophistication of the NASA's site certification process that serious questions were raised about the originally planned target area. The Soviet Union has carried out several unmanned Mars probes but has yet to obtain much useful surface data; the survival time of its vehicles upon arrival has varied from nil to slight. If the U.S. photographic coverage of the planned Chryse region site had been less discerning, the Viking I could have headed toward disaster there.

It must be kept in mind that this is an almost unimaginably complex mission, featuring a four-ton spacecraft which set forth from Earth last August 20 on its journey with one of the most intriguing of goals.

Whether life exists on another planet has been a subject of endless speculations and Mars has been the most frequent target of such discussions. Langley Research Center's Viking is man's best attempt to date to unlock such a secret; it has already been a triumph in many ways, one worth of being celebrated in this bicentennial year. The hopes for making it in every way a scientific breakthrough do not depend on whether the crucial landing occurs on Independence Day or a few days or weeks later; instead, the search for the most suitable alternate landing site should whet interest in this most fascinating of space projects since the landing of the first American on the moon.
Viking lands safely on Mars

July 20, 1976

Aerospace

American space rocket landed gently on Mars today and radioed back its first picture taken from the planet's surface - "incredible" photo showing a sandy, rocky Martian desert with a gentle rolling horizon.

The three-legged spacecraft rode a cloud of exhaust to a gentle touchdown in a land considered one of the best spots for its instruments to conduct the first search for life on the red planet.

The landing site on the planet's sunny side will be used by Viking's twin cameras to scan the surface in the coming weeks.

The dust kicked up by the spacecraft's engines was seen clearly on the monitor screens.

A few minutes later, after the cameras returned data on command from Earth, a broad panorama view of the Martian landscape was sent by wire to mission control.

The view showed the Martian surface as it appeared to Viking's cameras.

The landscape was seen to be barren, with no signs of life or water.

"This is just incredible," said Dr. Thomas Mutch, head of the Viking's image analysis team.

"The landings were successful," Mutch told a news conference.

Viking's descent to Mars was planned for hours.

Engineers called out the various landing operations as they were performed by red-earth reports from Mars.

The landing was confirmed by the Viking control team at 8:41 A.M., EST.

Twenty-five seconds after touchdown, the 14-foot-wide lander started taking the first pictures.

It was located on the flat, arid surface of Viking, which confirmed it to be Earth a few minutes later.

Munch said it appeared Viking was still on the ground.

Scientists would have no difficulty scooping up soil for biology and chemical analysis experiments to be turned on later.

It was the second landing on Mars of a spacecraft from Earth. Russia accomplished the feat in 1971 but its

Barren, rock-strewn wastes of Martian surface stretch unbroken to horizon in this view from Viking lander.

Large rocks at right are about the size of a baseball.
Viking 1 To Land On Mars Today

JUL 20, 1976

BY BILL DELANY

Hampton Courier-Observer

Astronomers, who had been monitoring the planet Mars, were excited by the news that the Viking 1 lander had successfully landed on the red planet.

The landing of Viking 1 on Mars was a significant milestone in the history of space exploration. The lander was part of a larger mission that included a probe designed to study the atmosphere and surface of Mars.

The landing was a result of months of careful planning and preparation. The mission had been in development for several years, and the lander was designed to withstand the harsh conditions of the Martian environment.

The landing was a major achievement for the space agency responsible for the mission. The successful landing of the lander on Mars was a testament to their dedication and hard work.

The landing was also a significant event for the scientific community. The lander was equipped with a variety of instruments designed to study the planet's geology, climate, and atmosphere.

The scientific community was eager to receive the data from the lander, as it would provide valuable insights into the planet's history and its potential to support life. The data would also contribute to our understanding of the solar system and our place within it.

The landing of the lander on Mars was a historic event that marked a new chapter in the exploration of our solar system.
Viking poised for Tuesday Mars landing

The Viking spacecraft have traveled 26 million miles through space since they were launched from Cape Canaveral, Fla., last summer. They will land on Mars about 8:15 a.m. Tuesday.

"Barring unforeseen problems, we'll be down on the planet and sending back pictures of the surface before breakfast," said an onlooker at the Viking Project Office representative today at Langley Research Center.

He said a final "go-go" decision won't be made until 2 a.m. Tuesday. However, the way the Viking landing will proceed when it was turned on for a checkup early today indicates the landing will be as planned.

The Mars landing of the Viking craft will climax eight years of planning and space research, under the NASA management.

The billion-dollar project is looking for evidence of life on other planets and information on how it originated and evolved. It also hopes to learn more about how our solar system formed and evolved, and what processes shaped man's Earth environment.

The Viking landers are to use a "flipper"-like mechanism to land gently on the Martian surface. The spacecraft is carrying a subscribable, computerized, sample-analysis system which will analyze Martian surface material for signs of life.

"Chryse, which means land of gold," the Viking spacecraft will land in the Chryse Basin area of Mars, the spokesman said. "but will not only the three-hour 36 minute descent sequence until an onboard computer recognizes a "final go" command an hour before the lander is separated from the orbiter."

Viking II, with its attached rendezvous vehicle, will orbit Mars and send back information on the planet's surface. The spacecraft will be able to receive commands from Earth for up to five months before its batteries run out and its instruments cease to function.

The lander will separate from the orbiter and descend to Mars. Its landing will be directed by eight small rockets, and slowed by a parachute. The rockets are necessary because Mars' atmosphere is too thin for just a parachute landing.
Viking Success Relied On Martin At Langley

By JOHN NOBLE WILFORD
© 1976 N.Y. Times News Service

The project manager, John G. Marlin, was in charge of the Viking project, which is a joint NASA and NASA project. The Viking spacecraft is designed to land on Mars and send back images and data. The mission is managed by NASA's Jet Propulsion Laboratory.

Jim Martin talks with President Ford after Tuesday's landing. (AP)

Viking Success Relied On Martin At Langley

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See Related Stories, Page 27

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He joined the National Aeronautics and Space Administration in 1953 and was made deputy project manager of the Lunar Orbiter Project. All five missions of the unmanned spacecraft, in 1966 and 1967, were successful and produced 114,000 photographs from which the Apollo landing sites were planned.

Langley was selected as the manager of the project. Martin was born in Springfield, Ill., where the family moved when he was a year old. And from then he started high-school physics and mathematics, he says, "I knew precisely what I wanted, to design airplanes."

He started with model planes. When he was 16, he hitchhiked to Chicago and then to St. Louis, where he worked as a draftsman and later as an engineer.

His first assignment was to design an airplane for the United States Navy. Then he worked on the design of the B-52 bomber and the F-101 fighter plane. After the war, Martin moved into the management of Republic, becoming chief executive officer and finally chairman of the board.

In 1970, he completed the Harvard Graduate School of Business Middle Management program.

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Mr. Martin's outstanding achievements include his role in the development of the Saturn V rocket and the Orion space capsule.

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WHRO Produced Film On Mars
To Get National Distribution

By WALTER HITCHCOCK
Education Reporter

The nation's Public Broadcasting Service will distribute nationwide a 52-
minute film on the possibility of life on the planet Mars produced by Hampton
Roads Educational Television Association, Inc. (WHRO-4 Virginia Beach). In
connection with the first landing at P-11, a PBS broadcast will go to 100 PBS
stations under the title "A Question of Life." The film, produced by the
Washington, D.C., headquarters will be broadcast on July 5 at 8 p.m. and July 3 at 8 p.m.

The film was produced in cooperation with the National Aeronautics and Space
Administration, and is being distributed by the Educational Media Center of Virginia
Beach.

The film consists of four segments: "Life Before," "Life After," "Life On" and "Life
Beyond." The first three segments are dedicated to the history of life on Earth and
the possibility of life on other planets. The last segment, "Life Beyond," discusses
the future possibilities of life on other planets. The film is narrated by actor James
Cromwell and uses computer graphics to illustrate the concepts discussed.

The film was produced by WHRO-4 and distributed by the Educational Media
Center of Virginia Beach. It is scheduled to be broadcast on PBS stations across the
United States on July 5 and 6.

An example of the program discussed in the film is the discovery of
microscopic life forms on Mars. Scientists have discovered evidence of life on
Mars, such as methane gas and water ice. The film explores the possibility of
life on other planets and the implications of these discoveries.

The film is available for distribution from the Educational Media Center of
Virginia Beach. For more information, contact: WALTER HITCHCOCK, Education
Reporter, WHRO-4, 4900 Mercury Boulevard, Virginia Beach, VA 23454; Phone:
(757) 491-6525.
Viking \( \overline{\text{D}} \) nearer success

If all continues to go nominally, as the NASA engineers say, the U.S. will have a spacecraft landing on the surface of Mars one week from Sunday. It will be a fitting scientific achievement to mark the nation's 200th birthday. That its arrival on Mars coincident with the Fourth of July has long been planned is a testimony to the towering heights of sophistication reached by the flight planners who started to work eight years ago.

And so the event, certain as the most ambitious of the unmanned space flights in our history, marks another major forward step in the exploration of space searching for accurate answers to basic scientific questions about the makeup of the planet.

With eight years in the planning stage and 11 months spent hurrying across the great void of space, Viking I should well deserve the accolades due when it lands—truly a climax worthy of the bicentennial anniversary of the nation. Its propulsion system has been accepting and carrying out radioed directions over 148 million miles across space. Its photographic systems have been sending back high-resolution pictures of the Martian surface revealing intriguing bits of information about the possible presence of life-proximal water. And where the spacecraft settles down on its predetermined landing site, the in situ laboratory aboard will begin to pick up, measure and analyze the Martian soil, as a much higher level of analysis than did the early lunar landers, for instance.

JUNE 5 1976. To this point the technological achievements of the Viking spacecraft represent a near-perfect record of execution. Its
Earliest Viking Landing July 10

By BILL DELANY

Heads up City Editor

Viking cameras continued to survey Mars for a safe landing area on Monday as project officials nervously computed fuel remaining for the search.

The earliest possible landing, project manager James S. Martin said now is 1 a.m. July 10 if the original Chryse landing zone is selected.

This is the 44-by-45 mile ellipse programmed as the target for an independent Day mission when Viking 1 was launched last Aug. 29. The target zone was rejected by Martin late Saturday when he decided that the irregular terrain was questionable.

That decision made the July 4 landing impossible, but allowed time for project leaders to continue their study of the Martian surface and to gain better understanding of their targets.

The project was given a new aim to aim for of north latitude, 37.7, on July 21. A new site was selected as the original 44-by-45 mile ellipse where the landing would begin on the plains area could be July 22.

Project scientists would also have a second choice if the landing were made July 5. The second time line is July 30. If the landing were made July 22, the desired landing area could still be used, but the scientists would have a limited amount of time to work.

Chryse is not the only area of interest to Viking II scientists. The northwestern landing area, Chryse Planitia, is also in the viewing range of the spacecraft.

Photographs have been taken of the area of potential landing sites, but in an angle of 30 degrees and a range of 3000 kilometers.

Dr. Michael Carr, head of Viking's imaging team, said that the best images have been made of Chryse Planitia, but he warned that final analysis is incomplete.

Plans for an extended mission which would begin after Mars leaves the glowing red area of the sky would require changes in the spacecraft's orbit.

The problem has caused some talk of deferring landing of Viking II until after the Earth-Sun-Mars line-up which will block out communications after Nov. 8.

But Martin said he was reluctant to consider such a change since it would mean that Viking II would be out of touch with controllers for months.

Even without changing orbits, Viking continues to map landing areas of interest to its sister spacecraft. Long range photos of the primary landing zones for Viking II were taken Monday. Other photographs of the Chryse Planitia area, but more the northwest, have been ordered for today.

If the decision to move Viking 1 to the northwest is made, the certification work with stereo photography will be ordered July 30.

Carr said initial study of the photographs show some differences, mostly in the lack of small craters which caused the concern about Chryse.

One model giving such results, he said, is that the material covering Mars is less cohesive and materials are more easily disturbed by winds.

The area also shows signs of flooding at some time in Mars history, a feature which excites astronomers about the original site. Water in some form is considered essential to even a rudimentary form of life.

Thus far in the mission, Orbiter's cameras have provided the visual clues needed for site certification. Still more would be seen by the water vapor and thermal mappers.
Scientific world gapes in wonder at mission

BY VIRGINIA BIDDING
TUESDAY, SEPTEMBER 20

An overlooked scientific world
gap is in wonder today as it gets its first
close-up glimpse of the Mars surface.

At precisely 2:13 p.m., NASA's Viking
laboratory landed safely on the Red Planet.

"Everything performed extremely
well," said Project Manager of the
Viking program at NASA's Langley
Research Center, Dr. Richard Martin.

The first black and white picture of
the surface came shortly before 3 p.m.

"We are more excited than any
other team," said Mission Director
Dr. Martin.

"We'll be able to see the
landscape," said Mission Director
Dr. Martin.

"We were surprised by the
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The Viking program is expected
to land on the Red Planet in
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Viking Lander Transmits
Dramatic Color Photographs

By BILL DELANEY

The re-entry path of the Pioneer 10 spacecraft into the atmosphere of Mars was monitored by the Mars Reconnaissance Orbiter (MRO) spacecraft, which captured images of the moment of re-entry. The spacecraft passed through the atmosphere at a speed of about 12,000 miles per hour, entering at an angle of about 65 degrees with respect to the surface of Mars. The atmospheric pressure was about 1.5 times Earth's atmospheric pressure at sea level, and the temperature was about -120 degrees Celsius. The spacecraft's heat shield was designed to withstand the high temperatures and pressures encountered during re-entry, and it was deployed to protect the payload from the intense heat and pressure. The re-entry event was observed by the MRO spacecraft, which captured images of the spacecraft as it entered the atmosphere and passed through the atmosphere. The images showed the spacecraft as a bright, glowing object as it entered the atmosphere and then faded as it passed through the atmosphere. The re-entry event was a significant milestone in the mission, as it marked the successful re-entry of the spacecraft into the atmosphere of Mars. The images captured by the MRO spacecraft provide valuable data for understanding the atmospheric conditions and the re-entry technology used during the mission.
Mars pictures thrill scientists

Viking is a decade old project with a billion dollar price tag, conceived and managed from Stanford until the month just before the August 1975 launch when the crew moved to Cape Canaveral.

At its peak strength, the project had about 300 employees. Now there are about 150, 100 of whom are in California. Some of these will begin the move back to the Peninsula in the next few days, their minds made up.

Others will stay to monitor Viking II, the start of a project which is expected to arrive in Mars orbit soon and land in early September.
Air Tests Fail To Find Mars Life

The results of a half-dozen tests of the Martian atmosphere show no evidence of life on the planet, but one scientist working on the Viking project said Monday afternoon that tests also show there could be life there.

In a press conference at the Jet Propulsion Laboratory in Pasadena, Calif., scientists confirmed earlier findings made by the Viking probe before it landed, which showed there was water in the atmosphere.

Scientists on the Viking probe reported Monday that Mars' red color is only skin deep, caused by surface material that has rusted or been in contact with oxygen in the atmosphere or water. It is the same process that causes rust on Earth. Underneath this surface, the Viking Lander has found rocks that are mainly dark gray.

The latest color photos beamed to Earth also show the Martian sky to be a pitch-dark orange and scientists say the three photos should be accurate. The color process has been adjusted since the first color photo showed what appeared to be a blue sky.

Dr. Todd Owen, working on a team analyzing the atmosphere, said the Martian atmosphere has about one-hundredth the density of Earth's atmosphere.

The thin atmosphere on Mars would make the possibility of life more remote, according to Owen, but...
The lander is scheduled to get down in the Chryse Planitia region, which scientists say promises even greater research possibilities in the quest for life on other planets.

Dr. James S. Fletcher, NASA administrator, said in a press conference Thursday, "now, ice and maybe even liquid water are possible on the site we have picked, as well as sand dunes." Based on Viking Orbiter photographs, scientists believe the new site is a plains area built up by material deposited by rivers — new, dry — which flowed in that direction.

"The first choice landing site was abandoned after we photographed the area," Martin said. "There were too many hazards — craters, and rough river beds — that may have impeded the landing." Mars has relatively little atmosphere, yet earlier probes have indicated that there are surface winds up to 500 m.p.h. However, scientists now believe the new landing site has sufficient atmospheric pressure to permit the existence of liquid water.

Separation sequence for the lander from the mothership is planned for midnight July 16, which Martin said will allow sufficient time to pinpoint the exact target for touchdown and be sure the lander is in prime condition. The intra-orbit facility at Arecibo...
Viking Project Leaders
Relate Mars Success

By BILL DELARY

NASA chief scientist and two of his team leaders returned to Langley Research Center Monday to describe the success of the effort to explore the face of Mars.

"This is where it all began," said Dr. Gerald A. Soffen, project scientist for the billion dollar project. "I have been waiting for eight years to come back and tell you about the success of it."

DAILY PRESS

Soffen was accompanied by two team leaders, Dr. Michael Carr of the Viking imaging group, and Dr. Harold Kliem, biology team leader. They were joined here by Dr. William Michael, head of the radio science team and Langley's only group leader.

Viking has yet to find proof of life on Mars, but the mission was NASA's most successful space project since the Apollo exploration of the moon, Soffen said.

He disclosed that he has written a 66-page summary of the Viking mission for an encyclopedia publisher, who now plans to update a much smaller section devoted to the planet.

"Mission control had the flavor of the Jet Propulsion Laboratory," Soffen said, "but it wasn't that." He added, "We did it ourselves." Soffen directed the first live-person report to Langley co-workers in a conference room.

The mission divided into three parts. The first was the selection of the landing site to be examined with lander probes. The second was "the actual landing process," Soffen said.

"Soffen said that science team members were so cheered by initial photos of the originally targeted landing site that all went out for a celebration dinner after seeing the first televised images."

While returning to the project manager, James G. Martin Jr., examining prints with a magnifying glass did they realize something was wrong. "I went up to the window and looked out," Soffen said. "I thought it was a bird, but then I realized it was a bird in a box." Soffen said.

One of the next year's tasks will be to determine the minute temperatures and winds that may come within 50 kilometers of the Orichat, after some changes in the flight path.

"The biggest factor on the moon phase will be the effects of velocity as Photon beams past the Viking spacecraft which will be moving in an opposite direction."

The final phase will return a key result to be used in future missions. Although the primary objectives of the Viking mission have already been exceeded, work will continue for another 18 months."
'We've made history,'

NASA Viking team claims

BY VIRGINIA BICKNIS

"We've made history, we've changed the history of astronomy." Dr. Gerald A. Soffen, Viking Project scientist, said today. "When we find life on Mars, we'll know we're not alone in the universe!"

Soffen made the comment following a press conference early today at Langley Research Center, where he discussed the Viking Orbiter Flight Team, and Dr. James P. Klein, group leader for the Viking Biology Experiments, distributed the Mars venture plans for the upcoming mission.

Also participating was Dr. William Michael, who heads the Viking Radiance Team.

All four scientists noted that Mars had changed dramatically in recent years, when the planet passed behind the sun. "We've literally observed the atmosphere on Mars when it vanished and then reappeared in the morning observation," one of the scientists said.

He said the planet had entered a winter season. He said the polar cap on Mars appears to be settling down for a cold season. Dr. Carey said that more than 7,000 pictures have been made of Mars and that many more will be made before the end of the project. He said that, besides pictures, Viking will carry along other instruments to gather data on the planet's surface.

Klein also said that one of the experiments planned for the Viking mission will be to place soil samples in cold incubators to test for the presence of life. Temperatures in the incubators may not be what is needed to maintain life for the soil samples.

"We know enough about terrestrial biology to know that life doesn't operate well when there is a deviatio from the local temperature," Klein said.

So far, no signs of life have been detected in the soil samples collected and stored in the containers and Klein said the results were positive. He said the landers containers have only one bottle for the temperature study, but the Viking missions have a larger number of samples.

Klein said that the Viking team is expected to take place around March 1. Soffen said the Viking Project Team was nearing the completion of the experimental strategies for the Viking mission. He said that the mission has been extended and that new experiments will be added, but he did not specify what they were.

Researchers believe that life on Mars may be different from what we know. They believe that it may be able to exist in areas where we have not looked before.

We haven't seen any signs of life yet, but we are continuing to search. We have a lot of work to do, but we are confident that we will find life on Mars," Soffen said.
It REALLY Is Mars!

By BILL DEVERE

Mars' first view of the Martian surface was almost disappointing.

The scene looked almost like some in the western deserts photographed by the facsimile cameras during experiments before Viking began its year-long flight last August.

Only a little leap of imagination transformed a distant rock into cactus, and a coincidental field of land in a back country road winding off to the left with a sign: "Landing over a hillblock to the

The Plains of Gold - Chryse Planitia - were all that project officials hoped they would be during eight long years of planning and preparation, which paid off early Tuesday.

"No way," says Viking project manager James K. Martin. "Don't panic.

On the eve of the Mars landing, he recalled, engineers worried about operation of the landing descent radar which pulled the surface to trigger changes from one heat shield to parachute to rocketed.

Daily Press

Some 650 persons in the Denver plant of Martin Marietta, where the Viking lander was built and where an engineering test model is located to duplicate any strange event during operation of the science program. Worked overtime to run seven tents in eight hours.

"They continued project officials that they had no reason to worry about the radar, and it was flawless.

"Dr. Neil Hsu, associate NASA administrator for space science, was obviously moved by success of the Viking mission. He called it 'even more impressive than the Apollo 11 moon landing just seven years ago also recognized by the newly proclaimed Space Exploration Day.

"I did feel as transported to the scenes of the action in Apollo II,' he said. "There were three men up there, two of whom stepped out onto the surface of the moon.

"This one was completely automated, and it was more like we were really there with Viking. Many people have felt we were right there on Mars.'

President Ford asked about Viking II, and NASA leaders promptly began discussing a Viking on wheels, which would roll over the dunes in search of the site of possible samples. Inside the rover. The Baker family, who lived in the desert near the

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EDITORIALS
A Date To Remember

Almost a year's journey and 1.4 million miles from Earth
 plano, the Viking probe landed on Mars yesterday.

And no one had a greater reason
to cheer that dramatic event than
the scientists and technologists at
NASA's Langley Research Center,
which is the birthplace, of this two-billion-dollar
program.

It didn't matter at all that the
event came more than two weeks
after its originally scheduled
date. To make the Mars landing
a part of the nation's birthday
celebration would have been a
nice touch, but there was special
appropriateness in having the
success come on July 20, the sev-
enth anniversary of man's first
landing on the moon. Hereafter
that date will be known as Space
Exploration Day, the significance
of which has been greatly
enhanced by this Mars venture.

JUL 3, 1976

Hopefully, the project will reap
vast scientific dividends, some of
which have already occurred. There is much that we don't
about our solar system and others
that Mars can tell us, and interest
centers on whether life of any
type can be found on that planet.

This is a long outreach from the
gathering of moon rocks, and the
boulders which showed up clearly
in the first Mars transmissions
gave promise of a geologists'
de
t;
thank you, NASA.

Viking I was designed to oper-
ate at least 90 days on the surface
of Mars, with the all-important
requirement that first a safe
landing site had to be located.

There were those who advocated
looking around with the original site
and those who doubted a suitable
location could be found within the
required time frame. Such dis-

cussions by experts left many in
no position to comment. But the
decision eventually reached was
good for which many helped to set
his stage and there has never
been a venture like this one with
an almost unimaginable com-
plexity and vast distances—ex-
cept, Viking I still on its way to
Mars.
Bad battery may scuttle Viking 2

The Times-Herald

Metro News

Newport News, Va., Wednesday, Nov. 5, 1975

Bad battery may scuttle Viking 2

BY VIRGINIA RIGGIN

Battery problems have followed the Viking 2 Mars lander since 31 million miles into space on its journey toward Mars.

A spokesman at NASA-Langley Research Center in Hampton, where NASA manages the $1 billion Viking-Mars project, says that scientists and engineers are trying to charge a battery, which failed to respond to computer command last Friday.

If the battery cannot be charged, it could prevent landing of one of the two spacecraft destined for the Red Planet in the summer of 1976.

"It's a serious problem, but every alternative will be tried before we say no go," an LRC spokesman said today. "Too much has gone into this program to stop."

Ground-based engineers sent a special command to bypass a failed battery charger and reposition four dead batteries on the Viking 2 spacecraft at 11 a.m. today. It will be a little over two hours after the command is fed into the computer before Earth will know if the effort was successful.

The commands are given by computers at the Jet Propulsion Laboratory in Pasadena, Calif., where most of the Viking-Mars project personnel are located. The spacecraft were launched earlier this year.

Fully charged batteries are required to power the lander's engineering system and science instruments during periods of high activity, including the critical landing sequence, when the 70-watt maximum output of the solar generators is exceeded," the spokesman says.

He says that engineers have been working to correct the problem since Friday, but despite repeated attempts were unable to charge the batteries in Viking 2 lander over the weekend.

Both Viking 1 and 2 were launched this summer with their lander batteries essentially uncharged in order to prolong their lives. Initially, landing of the first spacecraft was delayed because of battery problems at the gantry. The batteries on the Viking 1 were charged without incident two weeks ago.

On Saturday, engineers tried to charge the batteries on Viking 2 by alternative means, using the primary charger. Experiments were then conducted on laboratory models of the spacecraft, and lander at Denver, Colo., where engineers discovered that the problem was most likely caused by a component failure in the primary charger circuitry," the spokesman says.
Viking Problem Solved

Continued from Page 5

To determine if a second system built into the lander vehicle, Viking, successfully indicated success a few minutes past 11 p.m. Wednesday, Sept. 20.

Viking, the 34-cell batteries designed to meet Viking's peak power needs have been charged. The spacecraft was, intentionally, launched with the 34-cell batteries designed to minimize the number of charging cycles required.

(Official at NASA's Langley Research Center Headquarters Wednesday said the flight is the first to include this type of equipment. This included the official said, all other equipment included in the Mariner and Phobos vehicles.

Unique to Viking however, are those that may have occurred on Earth. The Viking team was informed by an engineer who had worked on one. The Viking team was informed by an engineer who had worked on one.

Viking I, launched Aug. 20, now is 14.5 million miles from Earth and is expected to arrive near Mars in late July. Viking II, launched Aug. 7, is 13.3 million miles from Earth and is expected to arrive near Mars about Aug. 7 in preparation for landing a month later.
Viking battery problem

Viking BATTERY PROBLEM
By BILL DELANY
November 6, 1975

Viking's portable battery, located in the Pod at the base of the spacecraft, began operating properly on Tuesday after four days of trouble with a charging circuit.

The Viking spacecraft, the first to land on Mars, has been troubled with a charging circuit for the portable battery that supplies power to the spacecraft's instruments. The battery was charged by the solar arrays of the spacecraft, but the charging circuit has not been operating properly.

On November 2, the battery was charged to 60 percent of its capacity, but on November 5, the charge was reduced to 30 percent. The spacecraft's instruments were powered by the battery, but the charging circuit failed to operate properly.

The Viking mission team is working on a solution to the problem. They have tried several different approaches to charging the battery, but so far, none have been successful.

The battery is critical for the success of the Viking mission, which is designed to study the surface of Mars and search for signs of life. The battery must be charged properly to provide power for the spacecraft's instruments and communications equipment.

The spacecraft has been on the surface of Mars for several days, and the team is working to ensure that the battery is operating properly. They are hopeful that a solution to the charging circuit problem will be found soon.
2nd Mars rocket ready to follow No. 1 today

Scientists, engineers and technicians from the Langley center have been at the Cape for a number of weeks in preparation for the launch of the Mars-bound space craft, research packages which have been delayed for a combined total of five months.

Viking, 1 spacecraft, originally scheduled for launch Aug. 1, was successively delayed into Aug. 15 after a faulty valve on the Titan rocket was replaced.
Problems Delay Viking
Launch Until Tuesday

By BILL DELANY
SPORTS CITY EDITOR

Viking spacecraft, which had already
been stored on the launch pad awaiting
vehicle trouble, encountered new prob-
lems over the weekend which will delay
launch until Tuesday.

The second spacecraft in the billion-
dollar program to explore Mars now will
be launched at 2:49 p.m. Tuesday. The
spacecraft had been scheduled for laun-
ched ahead of that hour Monday.

The difficulty, caused in a null meas-
ured difference in radio reception by
the orbiter spacecraft.

Henry Norris, manager of the orbiter
program for the Jet Propulsion Labora-
tory said the difficulty appears to be a
nonsensical difference in reception of E-
band radio from the high and low gain
antenna system. Norris said special tests
are being run to determine cause of the
problem.

James B. Martin, Jr., who manages the
Viking program for Langley Research
Center said the difference might
result in the spacecraft falling behind in
its speed designed when the
spacecraft is in orbit around Mars.

The troubled Viking A spacecraft is the
same vehicle originally scheduled for
launch Aug. 11. The mission was delayed
by trouble in the thrust vector control
system of the Titan III vehicle. Subse-
sequently, Viking engineers discovered
a battery failure in the orbiter vehicle.

The entire spacecraft was removed and
replaced by Viking B, the second of the
two spacecraft planned for the Viking mis-
nion. The launch was successful and Viking
B is now en route to Mars.

Martin said the trouble with the radio
was discovered at 10:30 p.m. Thursday in
the first time such a problem has been
encountered. Without explanation for the
difficulty, the space agency fears the trou-
ble might effect the flow of data from
Mars.

Viking photography from the surface of
Mars will require 184 minutes to transmit
at low data rate. The same information
can be sent on a high speed data link in
just two minutes.

Norris said he believes the problem
might be reflected energy which bounces
downward from something inside the shroud
covering the spacecraft and interferes with
tests being conducted by cable while the vehicle
stands on the launch pad at Cape Canav-
eral Air Force Station. The problem is
that this remains just conjecture. New
tests which required the 24-hour delay in
launch are expected to resolve this ques-
tion.

If the trouble is not determined through
these tests, Martin said it may be neces-
sary to remove the spacecraft for more
effortless examination. The process
might take more than nine days.

The Viking program would then be
between the end of the launch window
which expires through mid-December.

After that time, Martin said, the mission
will still could be launched in October, but
this would provide degraded results since the
spacecraft arrives in Mars.

In response to a question, Martin said
that "I think we would land safely on a
hard, somewhat dusty surface of Mars
with two landers and four cameras work-
ing. I have been seven years on that
already."
Viking delayed again; launch set for Sept. 10

Scheduled launch today of the Viking spacecraft in the search for life on another planet has been delayed until Sept. 19 because of a malfunction in the rocket's guidance system.

Engineers, working on the problem today, say they have no idea what caused the problem or where in the system the fault lies.

Project Manager James Martin of NASA's Langley Research Center reported yesterday that radio receivers on the second space research platform scheduled for the Mars trip showed low sensitivity.

This, he said, might cause problems in relaying data from the Red Planet back to earth.

To find the trouble, the orbiter-lander spacecraft will have to be removed from the Titan-Centaur rocket, now on the launch pad at Cape Canaveral, Fla. Engineers say they will look first at the viability of the receivers and transmitters on the antennas.

Daily will mark the third delay in scheduled launch phases of the Viking project. The first spacecraft launch was rescheduled from Aug. 11 to Aug. 20 because of a faulty rocket valve and orbiter battery.

The Viking A orbiter was replaced by the Viking B orbiter, while engineers and technicians seek to fix the first spacecraft.

While checking out the Viking A, engineers corrected yet another problem in the propulsion and guidance system, which they said would make the equipment "just about perfect."

Though scientists are now setting a target date of Sept. 14 for the second launch, this too is marginal.

They say they have a few days to work with on Sept. 14, when the landing site would become inaccessible. A late Sept. launch or October launch could cut down on information gleaned from the mission.
Viking Faces Fourth Delay

By BILL DELANY

Launch of Viking A, originally scheduled to begin its mission Tuesday, now faces its fourth delay. Decision to postpone the beginning of the trip until Sept. 16 failed to show reason for putting difference in signal strength between high and low gain radio antennas of the orbiter spacecraft.

Measurements, through mathematical cordons on Pad 1 at Cape Canaveral Air Force Station, indicated a factor of truth: This could threaten orbiter operation as a Mars relay point, because data transmission would be disrupted.

The problem earlier resulted in a 1-hour delay of the launch last Thursday afternoon. Continued tests, this time by morning flight engineers, still uncovered the reason for the discrepancy.

The spacecraft will be removed from the 180-foot high launch vehicle, lowered to the ground, and returned to the spacecraft assembly and encapsulation facility.

It is expected to reach three Tuesday morning, when engineers will be able to act directly on the radio discrepancy. Project leaders think it could be fairly simple — even a slipped piece of oscar or which causes an interrupted signal inside the system — but no one is willing to gamble now. If it was a more serious difficulty, the solution would be beyond reach after the spacecraft is launched.

This is the fourth time this spacecraft has been reconditioned for launch.

Problems with the spacecraft's attitude first caused a 1-hour delay from Aug. 11. During prelaunch countdowns it was found attitude problems had been declared during this delay.

As a result, Viking B, first planned to be the second mission, was put on the vehicle and fired into a spacecraft flight toward Mars. The battery was replaced in the Viking A orbiter and it was hauled back to Pad 1 and prepared for this launch attempt. That caused two successive delays attributed to the interplanetary radio problem.

Original plans for most complex unmanned spacecraft mission ever flown called for a third spacecraft to be launched for just this type of contingency.

Although components were fabricated, the spacecraft was never assembled and ready for launch.

A congressional demand for trim Viking's budget delayed the backup unit. The result is that only two spacecraft were prepared for the effort to give the world a ground level laboratory on Mars. The Viking mission will provide data, weather, and most importantly, a search for Martian biological life.

The new setback increases problems, even before the flight can begin at Cape Canaveral.
Viking tests complete

NASA engineers have completed testing on the two Mars-bound spacecraft's organochemistry instruments and have verified that each has two of its seven sub-systems fully operational. NASA officials said they are now confident that the instruments will be able to perform their chemistry investigations on the Martian surface this summer. "

Viking Project manager at the USA Tracking and Data Acquisition Center, Mission Operations Manager, said that the organochemistry instruments are being tested at the Jet Propulsion Laboratory in California. The organochemistry instrument is designed to detect organic compounds in the soil. The instrument is expected to detect organic materials in the soil by analysis of soil samples using gas chromatography/mass spectrometry.

Earlier tests had indicated that a small failure occurred on each instrument. But this failure was not detected until after the two Viking landers reached the Martian surface.

During the course of the recent tests, the instrument failed to detect any organic compounds in the soil. The instrument was able to detect organic materials in the soil. However, the instrument failed to detect any organic compounds in the soil. This failure was detected after the two Viking landers reached the Martian surface.

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There is a separate biology instrument aboard each lander. But the biology instrument is expected to perform a direct search for life forms in soil samples.

The two Viking spacecraft, each consisting of an orbiter and a lander, were launched in August and September 1975.
Viking delay to cost experiments

JUN. 30, 1976

By VIRGINIA BIDDENS
Times-Herald Staff Writer

Project Manager Jim Martin of NASA's Langley Research Center had little hope of landing a spacecraft on Mars any earlier than July 22. "Every day we delay after July 4 will mean less experimental work we can do on the Mars surface," he warned during a telephone interview today with The Times-Herald.

"We must, however, find a less hazardous landing site than the one we've looked at to ensure a safe return from the lander once it is in place.

Martin is monitoring the Viking spacecraft, which began leaving the Red Planet June 15 from mission control at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

"We have a delay in landing " means we'll have some scientific time on the surface, because the experiment time will overlap with those planned for the

Related story page 2

"Due to the vast expanse of the surface, there is no one structure. However, there is a large cliff and some craters. The area is not flat, but rather has a gentle slope.

Martin explained that the Viking cameras are powerful, they can only 'pick up objects' about the size of a football field. These pictures are taken from about 100 miles up, and we have to extrapolate down to earth size."

"We're now making a reconnaissance of alternate sites, and I'm considering anything I can find. I've been studying the surface images before the landing."

"We really don't know what we would find up there. The Mariner 9 pictures were what we based our initial site selection on, but the Viking orbiter photographs have brought the Chryse site into sharper focus."

"The initial landing site, he said, "appears to be too rough; too bumpy."

"We're looking for a flat surface, with fewer craters and hopefully not too bumpy. Perhaps we'll find a sand field, where evidence of water may be traced. Maybe the water is or was under the surface. Who knows?"

Martin remembered that though Viking cameras are powerful, they can only "pick up objects" about the size of a football field. These pictures are taken from about 100 miles up, and we have to extrapolate down to earth size."

"Picture already taken of the Mars surface, which have not been blurred by dust storms like those on Earth."

"The decision will have to be made by July 2."

-'They are better as we ever dreamed, very exciting," Martin said, noting that the photographs alone could keep scientists busy for the next decade.

Viking officials are expected to make a decision Thursday on whether to consider one of the sites photographed as a prime landing area, or to begin "walking" over the planet looking for better surface conditions. This will be included in a reconnaissance of the planet's north pole.

The initial Chryse landing site has not been ruled out, but Martin said the target circle has been adjusted for looks at the Chryse Planitia to the northwest. He said a move to the Tritonian Fan area, the alternative site, may be required which could be a last-minute operation."

-'They are better as we ever dreamed, very exciting," Martin said, noting that the photographs alone could keep scientists busy for the next decade.
LRC's Parks takes mike in hand to announce the good news of Viking's landing on Mars.

JUL 2 5 1976

TIMES HERALD
By VIRGINIA BIGGS

"America has landed on Mars, repeat, Viking has touched down on the surface of another planet."

These words kept a group of Peninsula Amateur Radio operators quite busy this week, as they attempted to spread the word of the United States' most recent space accomplishment.

Several miles away to the Martian terrain.

Just minutes after the Viking lander touched down on the surface, American Radio Station WH 2X3, which was on the air and listening to radio "operators" across town, drove country and overseas. The radio station's first day was Saturday, Australia.

The reaction was swift and widespread.

Taking part in the commemorative event were members of the Southern Peninsula Amateur Radio Club (SPARK), operating their radio equipment in a display area at the NASA Langley Research Center's Visitors Center.

Some of the Viking messages got to those far distant shores via two space stations, called OSCAR (orbiting satellite carrying amateur radio), which were built specifically for Ham operators and put into orbit by NASA.

Taking part in the broadcast this week were Frank Parks, a University of Kansas graduate student, working on summer at LEO-FM Drummond, an engineer at the center; Gary Bailey, controller at Langley and Jim West, an LRC engineer technician.

"We talked to a lot of people during those first few hours after the landing," Drummond said. "Our aim is to tell people of the mission to Mars and serve as a source of information for the project."

NASA invited the students participate in the landing celebration by using amateur radio to help spread the word.

Parks said that among Ham operators he has contacted has been a school teacher in Lake Placid, N.Y. "He is a science instructor and was quite interested in any information he could get about the Viking program for his students."

A commemorative certificate of the Viking landing will be issued to all operators the Langley station talks to each week, Parks added.

"SPARKS" has been in existence on the Peninsula for more than 15 years.
Viking 2 on way
Mars keeps tossing surprises

By FRANCES HIGGINS

NASA

Viking Project Manager, James E. Martin of Langley Research Center, said during a teletype interview.

"Martins, along with nearly 100 scientists, engineers and technicians from NASA's Viking Program, Control in the Jet Propulsion Laboratory in California, were the Viking Mars mission is being monitored on Earth today, that neitheruilder nor the Viking team était protégé in the morning. To protect the instrument was discovered, late Wednesday, and Martin said, 'We have been put together to study the problem.'

"We feel that it can be corrected," he said.

Scientists were busy checking for the trouble in the equipment, which would not appear if the signal was received Wednesday.

"The computer may not have sent the correct information; there may be an electronic problem," said Martin.

He said Viking lander was continuing to get good pictures from the Mars surface, averaging about five or six pictures a day. These include panoramic views as well as four different sites around the lander.

From picture interpretation, scientists now agree that the red coloration of the surface is from iron in the soil. Particles of this rust are believed to have given the sky's pink tinge.

The first color picture of the surface Wednesday showed a blue sky, but the Viking official said that the false color was due to the fact that Viking's camera had not yet been adjusted to reproduce true colors on Mars with accuracy.

Martin said that the panoramic view of the surface indicates that there are a lot of rocks and hills out there.

He said that scientists are meeting with the rocks on Mars.

"There are several interesting areas in the pictures we have taken," he said.

"There is one large, lobular-shaped rock midway out on the left-hand side of this panoramic view which is quite interesting. Now, how often does one see a perfectly round rock?"

In explaining the difference in argon measurements of 14 per cent and the 21 per cent the Russians earlier estimated, the Viking manager said, "They (the Russians) were only picking up, we took an actual measurement of the gas, and we have a lot of confidence in our equipment." Martin also said there was some concern Wednesday that the lander would "contaminate," but the problem was never presented itself.

The first Mars weight report, based on information gleaned from the first day on the surface, revealed light winds from the east in the afternoon changing to light winds from the southwest after midnight. The speed was calm at midnight.

Maximum winds were at 1 m.p.h.

and temperatures ranged from minus 15 degrees Fahrenheit after dawn to minus 23 degrees.

Winds were fluctuating, and scientists say that's exactly what winds are supposed to do in any sensible atmosphere.

Scientists have also determined that the soil on Mars at the lander site is "sandy enough" to be picked up by the robot arm for closer examination.

"Martin said the day the robot's laboratory's arm reaches out and grabs some dirt for analysis will also be Earth-bound.

Scientists have already determined that there are all the ingredients for life up there. This doesn't mean there is life there now, but only the ingredients required for life. I see myself as having accomplished the possibility of the evolution of life.

"In their study of the surface for a sampling mission of the soil, scientists Wednesday detected some dark streaks, which they think may have been caused by rocket engine exhaust or blown down.

"I'll just move to another site to pick up the dust," the Viking official said, noting that considerable iron and sulfur compounds in the sampling area would fall into the project. "There was a very careful testing of the rocket engine so we would be prepared for a situation like this. In fact, the engine was designed with this in mind.

"Martin said Viking 2, the sister ship, in the project, moving toward the Red Planet's right on schedule. It is supposed to enter Mars orbit later this month and land Sept. 2.

"Viking 2 today was less than 2,000,000 miles from Mars. Scientists want to place the second lander in the Cydonia region, near the polar zone, where they hope to find water in form.

"Since the first lander has landed safely in the west-northwest, Cydonia, we think we should land in the same region," Martin said. "We believe there is a significantly greater amount of water there in the form of perchlorate than at an equatorial site that also was considered for Viking 2.

"The presence of water," he said, "would greatly increase the chances of finding life on Mars.

The billion-dollar Viking program got underway at NASA's Langley Research Center nearly a decade ago. The two spacecraft were launched on their 600,000-mile journey to Mars in Aug. 1975.

Viking I succeeded. Very few had scientists hopeful that there will ever be more sophisticated probes of the planet with perhaps proving landers to cover larger portions of the surface.

Researchers also look to the day that men may walk on the planet, something they think may be possible in the 1990s.
Christmas Giving Time

Martin Visits Langley

The Martin County Council has announced that the annual Christmas Giving Time will be held on December 15, 1976. The event will take place at the old hospital in Martin, a few blocks from the downtown area. The council encourages all members of the community to participate in this traditional event.

No one needs, to be reminded, that Christmas is a time of giving, and the Martin County Council is proud to continue the tradition of providing aid to those in need. The council invites all members of the community to join in the celebration and support the event.

The Martin County Council is especially grateful to the local businesses and organizations that have generously contributed to the success of the event. The council would like to thank everyone who has made this possible.

The Martin County Council is committed to providing assistance to those in need, and the Christmas Giving Time is just one example of the council's dedication to the community. The council encourages all members of the community to get involved and make a positive impact on the lives of others.
Manager Of Viking Project Pays Final Visit To Langley

By BILL DELANY

Hampton City Editor

Friday was a time for happy memories for a project manager at NASA's Langley Research Center. It was his last day as an engineer for the National Aeronautics and Space Administration. Monday he returns for work in Betheseda, Md., as a vice president for Martin Marietta Aerospace.

Meanwhile, the four Viking spacecraft are successfully parked in orbit and are the data of Mars in a search for evidence of life. The spacecraft were packed up for an extended stay on the surface which will keep some members of the Viking team busy until the summer of 1977.

Martin is already leaving his part of the world behind him. All he knows about the successful reacquisition of communications after a month of silence when Earth and Mars were on opposite sides of the sun is what he has read in the newspaper. Martin said Friday but be leaves no doubt that the eight years of work and his association with the team which made it possible is expected to be the highlight of his career.

"A lot of people haven't had this experience and never will," Martin said, he was on time from official farewell calls. To say goodbye to reporters who have covered the Langley mission program since its inception. It would be selfish of us to want more than one. . . . and I'm not sure I can take more than one. Viking has been tough.

The eight-year history of Viking has been filled with orders to violate the rules, to bring spacecraft to the limit of their missions and finally to bring them to a safe landing on a planet seen only at a short range. The mission of the Viking spacecraft, in search for evidence of life on Mars, remains an open question. Some claim that Mars may have a strange form of life existing without leaving dead bodies of ancestors, and others point to an unknown chemistry.

"We haven't found life on Mars, but we haven't found no life on Mars," Martin says. "Maybe it is still life on Mars. . . . It is too that is possible, too."

Some things are certain as a result of the Viking mission. The Red Planet is truly red. It is a mysterious, evidence as Martin says.
Two Viking Spacecraft Prove Einstein

BY BILL DELANE
Hampden City Editor

It has taken 60 years to achieve, but Albert Einstein's general theory of relativity now has experimental proof from spacecraft circling Mars.

Einstein's view of gravity as a field that bends space and time was proven almost on the anniversary of its publication by the radio signals beamed from the two Viking orbiters around the red planet.

The Thanksgiving Day rendezvous between the two spacecraft over Mars did more than launch the begins of the space agency's new mission. It set the stage for a new level of exploration and understanding of the planet's surface and its possible life forms.

The delay as radio signals were bounced from the four spacecraft

as part of a radiocisience experiment directed by Dr. William Michael Brown, space scientist at the California Institute of Technology.

Einstein's theory predicted that the time it takes for a message to travel from Earth to Mars and back would be longer than the time it would take for a message to travel in a straight line, due to the curvature of space-time caused by the sun's gravity.

The delay in the arrival of the signals was measured to be 0.23 seconds, close to the predicted value of 0.25 seconds.

The precision of the measurement was significant because it allowed scientists to refine their understanding of Einstein's theory and its implications for the structure of the universe.

The data collected during the rendezvous was also used to test the limits of the spacecraft's communications hardware and to validate the accuracy of the orbiters' navigation systems.

These results, along with the successful landing of the Viking landers, confirmed the feasibility of human missions to Mars and opened the door to a new era of space exploration.

The experiments conducted by the two orbiters also helped to refine the understanding of the planet's atmosphere and surface conditions, providing valuable insights for future missions.

As the orbiters continued their orbits around Mars, they began to gather data on the planet's climate, topography, and geology, laying the groundwork for a more comprehensive understanding of the planet's past and present.

The success of the mission was a testament to the ingenuity and perseverance of the scientific community, and a reminder of the power of collaborative effort in achieving great scientific discoveries.
Acquaintance of Einstein thrilled by Viking tests

By VIRGINIA ODIENS

Einstein more than 30 years ago and never dreamed I would one day see his theory confirmed by the measurements of the Viking on Mars. "Einstein was a great scientist," says Michael, "and he would have been thrilled by the success of the experiment."

Michael says that the Viking experiment has provided a new test of Einstein's general theory of relativity. "It's a great day for Einstein and for physics," he says.

"The Viking experiment is expected to be even more accurate than any previous test," Michael says. "We have used the best available data to make the calculations, and we have taken into account all possible sources of error."

"Einstein's general theory of relativity has been tested many times before," Michael continues. "But this test is different because it involves measuring the gravitational field of a planet, not just a large mass like the Sun."

"The Viking experiment is also important because it provides a test of the precision of our clocks and measuring devices. We can use this information to improve our understanding of the universe."

"I'm looking forward to seeing the results of the experiment," Michael says. "I think it will confirm Einstein's theory and help us understand more about the universe."
Viking Landing Flies Langley Team

First photos from Viking probes were received yesterday. They made just after probe entered landing area.

Tuesday morning objects in Langley area parts of spacecraft. (AP)

Langley is headquarters for the probe.

The Viking lander descended to the lunar surface at 10:30 AM, EST. The first photo of the surface was received at 11:30 AM, EST.

The probe was sent into orbit around Mars in July 1975. The first attempt to land was made in September 1975, but the probe missed the surface by about 20 miles. The second attempt was made in July 1976. The probe successfully landed on the surface of Mars.

The Viking probe was sent to Mars to study the Martian surface and to search for signs of life. It was equipped with a lander and a orbiter. The lander was equipped with cameras and scientific instruments. The orbiter was equipped with cameras and instruments that could study the Martian atmosphere and surface from above.

The Viking lander was equipped with a camera that could take pictures of the Martian surface. The camera was equipped with a lens that could focus on objects at different distances. The camera was also equipped with a shutter that could be opened and closed to control the amount of light that entered the lens.

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The Viking probe was a success, and it was a major milestone in the search for life on other planets. The probe provided valuable information about the Martian surface and atmosphere, and it also provided valuable information about the possibility of life on other planets.

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Elayes Lang

Continued From Page 1

mears problems. The geologists study the
atmosphere to determine pressure, tempera-
ture, wind speed and wind direc-
tion.

JUL 27 1975

A seismology instrument was ac-
tivated to feel the tremors of Mars
beneath Viking's siren-shaped feet to
obtain data on volcanic activity, struc-
tural shifts and meteorite impacts.

Voyage Viking's lander about Sept. 6, the
two instruments will show where Mars-
quake originated.

DAILY PRESS

During the week, Viking's photo-
graphs will allow scientists to de-
termine just where they should seek
care for the biggest test of all,
the series aimed at detecting some
care.

These tests will begin on Sol 6, the
tiniest spacecraft to designate the
slightly longer duration of a day on
Mars.

A complex biology instrument will
pressurize samples of soil for
evidence that microscopic organisms
have an influence on atmosphere,
either by testing for changes in a known
atmosphere or by measuring vaporized
samples.

Not costly of Viking's instruments
is a gas chromatograph mass spec-
trometer which seeks to detect organic
materials - even those formed millions
of years ago - by vaporizing still
smaller samples and measuring gases
to determine composition.

Inorganic materials will be tested
by bombarding them with X-rays and
measuring their fluorescence. The in-
srtument can analyze most of the mate-
rials known to exist.

Each time Lander's arm-like boom
stretches to take another sample of
material, a tiny magnet will gather
material which can be photographed.

Another magnet in the camera calibr-
Sampler Arm Jams As Viking 2 Works

By BILL DREAM

Hampton City Editor

Marlan pebbles may have jammed the surface sampler arm of Viking 2, but Langley Research Center's James M. Martin has expressed confidence that the troubles will be overcome.

Martin, director of NASA's Uninhabited Aerial Vehicle program, said that the next effort to obtain soil samples for molecular analysis will depend on the success of the rock drill. The progress had not been evident in full function.

DAILY PRESS

Martin said that the JPL Propulsion Laboratory in Pasedena, Calif., should be able to acquire sufficient material for organic tests with X-rays and organic analysis by mass spectrometer.

The sampler arm was jammed early Monday, but orders for the sample analysis must be led and analysis by mass spectrometer.

Martin said that his hypothesis that a rock jammed against the support for the soil sample boom, the computer would stop movement to avoid turning out the scoop which rotates the collector head. The arm itself is controlled by a separate motor.
Age of discovery, II

The brilliant beginning of this new phase of far-out exploration is followed up by the larger potential of Viking II. Its exciting onboard laboratories may confirm some of the remarkable discoveries of its predecessor in a place some 4,000 miles distant from the original landing site. It may be that the two craft, sending back their data over hundreds of millions of miles, may work in consonance to emphasize the possibilities of this new age of discovery.

President Ford has spoken of yet another Viking, perhaps incorporating some of the ideas of the Soviet Union's mobile explorers, that move around the planetary terrain instead of operating from a fixed base.

This profitable combination of science and technology already has provided astonishing and in some cases, contradictory, volumes of additional information on the most perplexing questions of all time: is there life of some sort out there on some of the pinpoint of light in the heavens?
Viking 2 Lands On Mars, Photographs Due Today

SEP 4 1976
By BILL DELANY
Washington, D.C.

Viking 2 was launched by NASA's Viking program, aiming to explore Mars. The photograph shows the Viking lander after its successful landing.

Viking 2, which is part of the Mars Observer program, successfully landed on Mars on September 4, 1976. The landing was part of a successful landing attempt to Mars, following the Viking 1 landing on July 20, 1976. The landing was conducted by NASA's Jet Propulsion Laboratory (JPL) and involved the deployment of a lander and a rover to study Mars's surface and atmosphere.

The Viking 2 lander was equipped with scientific instruments to study Mars's surface and atmosphere, including a lander-grown laboratory and a surface sampler. The lander-grown laboratory was designed to study Martian soil and atmosphere, while the surface sampler was designed to collect samples of Martian soil and send them back to Earth for analysis.

The Viking landers were successful in their mission, providing valuable data about Mars's surface and atmosphere, and helping scientists understand the planet's geological and biological history.

The Viking landers were part of NASA's Mariner program, which aimed to explore the outer planets of the solar system. The Viking program was successful in its mission, and the landers continued to send data back to Earth for several months after their landings.

The Viking landers were a significant milestone in space exploration, and their success paved the way for future missions to Mars and other planets in the solar system.
Landing pad can be seen among Martian rocks at bottom in latest photo from the Viking 2 spacecraft.

Success may lead to Viking 3

By VIRGINIA RIGGS

Astronomy media in scientific community	

WASHINGTON, July 6—NASA's Viking Operations Center, which received the landing date of July 9, 1976, at 10:19 p.m. EDT, reported that the landing was successful. The spacecraft, which had been in orbit since July 6, 1976, is expected to make its first landing on July 9, 1976.

The landing will be the first of the Viking missions, which are designed to study the surface of Mars. The spacecraft is equipped with a suite of instruments to study the Martian environment, including cameras, spectrometers, and sensors.

The landing site was chosen to be in a region of the surface of Mars that is expected to be relatively flat and smooth, with minimal obstacles. The landing is expected to occur at about 10:19 p.m. EDT, and the spacecraft is expected to begin transmitting data to Earth immediately after landing.

The Viking missions are managed by NASA's Jet Propulsion Laboratory in Pasadena, California, and are part of a larger effort to explore the planet Mars. The missions are expected to provide valuable information about the planet's surface, atmosphere, and potential for life.

The success of the Viking missions is expected to lead to further exploration of Mars, including the possibility of sending humanoid missions to the planet in the future. The success of the Viking missions is expected to provide valuable information about the planet's surface, atmosphere, and potential for life.

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Viking 2 Slated To Land Near Mars Pole Tonight

Viking 2 is scheduled to land about 7 p.m. D.P. 9-5-76

N. Delany
Hampton City Editor

The second half of NASA's Project Viking exploration of Mars will begin tonight, with descent of a spacecraft on a pole near the Martian north pole.

Only minor changes relating to the most northerly location and to operation of the Viking 1 spacecraft on the Planaria Flora have been planned for this portion of the billion dollar program directed by Langley Research Center.

Viking 1 was placed on a reduced operating program in preparation for this new phase Tuesday night, just as Dr. William J. Michael Jr., was starting some of the findings on the mission with colleagues at the Langley Center.

Langley's view again will be provided by a NASA television circuit to be directed at the Laramie Alpine State College. The program will be watched by prominent citizens invited from throughout Virginia.

Target for Viking 2 is on the opposite side of Mars from Viking 1.

Landing will be in the martian summer, compared to noontime when Viking 1 landed July 20.

Some operating changes will occur as a result of Viking 1 experience, including a slightly longer period of initial operation to take advantage of longer relay periods.

Viking 2 will photograph both landing site Viking 1 from a high vantage point during a winter solstice on the land surface, but days later a second photograph will delineate areas where landing occurred.

But the biggest problem encountered for the Viking 1 mission was a thermometer which remained locked in place apparently can not be resolved by a command change. No reason for this trouble has been found by scientists in either Pasadena or Denver.

Michael said the question of life on Mars has not been settled by Viking 1.

employees where the Viking project began eight years ago.

My personal feeling is that it will be a very long time before they come out with final conclusions, probably not until after they got results from Viking 2.

Michael's own radio science team helped pinpoint landing of Viking 1, a point only 3.8 kilometers from one sought by engineers when they fired descent motors 220 million miles away.

Michael worked on the Lunar Orbiter team which mapped vast gravity changes on the moon. No such changes have been found on Mars where gravity generally agrees with topography.
LANDING OF VIKING 2
SCHEDULED SEPT. 3

NASA:

By BILL DELANY

Napa Press

Viking 2 now scheduled to land on Mars pole on the afternoon of Sept 3.

Project officials have only a few more hours to select a landing site

The site was chosen because of what appears to be a very hazardous terrain found in an orbital photograph of the two prime areas, Cydonia and Arria.

Unlike the landing area picked for Viking 1, the site selected for Viking 2 was selected by an Earth-based radar system. The photo was taken from Viking’s orbiting portion of Mars and the area selected is marked as "UCHS".

The landing area will be marked at the UCHS region over the next few days. The site will be used to select precise coordinates of the landing. The site will be marked by a grey area in the photograph taken by the Orbiter spacecraft.

The area selected on Mars is a region 170 miles long and 46 miles wide with a 99 percent chance of receiving more than 200 feet of snow, a 100 percent chance of having a more than 14,600 feet of snow in the area of the target. The area selected for Viking 2 was selected based on the possibility of landing in an area with a high chance of survival. If the landing area is selected, the spacecraft will be lowered onto the surface and the landing will be announced to the world via radio signals from the UCHS region.

The landing area for Viking 2 has been chosen for its potential to provide valuable scientific data on the Martian surface. The landing area is expected to provide a high chance of survival, with a 99 percent chance of receiving more than 200 feet of snow.

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Viking Tests For Life Termed Complex

By Bill Delany

The Viking spacecraft on Mars continues to send data back to Earth. Scientists are cautiously optimistic that life may be found on Mars.

"The Viking spacecraft has detected organic compounds in the soil of Mars," said Dr. Margaret T. Brown, a biologist at Harvard University.

"These compounds are essential for the survival of living organisms," she continued. "We believe that the presence of these compounds suggests the possibility of life on Mars."
Scientists Still Unsure
Of Data On Mars Life

By Bill Delany

The seventh landing site on Mars is still the subject of much discussion among scientists. The site was chosen because it is believed to be rich in organic material. However, the returned samples have not shown evidence of life. The results of the experiments conducted on the samples have been interpreted in different ways, leading to a continued debate about the presence of life on Mars.

Virtually every indicator of life has been found, including water and organic compounds. But the inability to find life on Mars has led to a reevaluation of the tools used to search for life. Scientists are now considering new methods of searching for life that may be more effective.

Horowitz, the lead scientist for the mission, has said that the results are not yet definitive. He believes that the samples may not have been collected in the right way, or that there may be other factors that are influencing the results.

Biggest news of the day involved the landing of the Pathfinder lander. The lander successfully touched down on the surface of Mars, and传回了第一批照片。These photos will help scientists better understand the surface of Mars and its potential for supporting life.

The photos shown today were taken from a position above the lander. They show a rocky, dusty surface with some evidence of water flow. Scientists are hoping that these images will provide clues to the possible existence of life on Mars.

The Pathfinder mission has been funded by NASA and has been designed to study the surface of Mars and search for signs of past life. The mission has already exceeded its original goals and is expected to continue for several more years.
Mars Remains Mystery

Despite Viking Project

The fact that the Viking spacecraft did not detect life on Mars is known, and scientists are now looking to the Red Planet for clues. The results, said Dr. Harold White, leader of the Viking's biology team, are not "surprising." The team is now considering the presence of life on Earth. It is our job, as scientists, to design experiments that will detect proof of life on Mars, and we are not through.

It is clear, however, that the most ambitious and most successful of this nation's planetary explorations has found only a mystery.

Some of the tests conducted by the Viking spacecraft were designed to detect living organisms. One of these tests, designed to detect evidence of life, failed to detect any sign of life on Mars.

The Viking landers, one near the equator in Chryse and the other near the north pole in Utopia Planitia, were designed to search for evidence of life on Mars.

The solar-powered landers will search for signs of life on Earth by testing the samples for life-like activities. The landers will also test the samples for traces of biological compounds.

Dr. Gerald J. Schmitt, who has headed the scientific study for Langley Research Center, said that the landers will be sent to the two sites on August 20 and December 20, and that they will analyze the samples from the landers.

Spectacular photos of the Viking spacecraft will be taken by the landers as they descend to the surface of Mars.

The Viking mission is expected to begin in 1975, and will be the first attempt to send a spacecraft to Mars. The mission is expected to cost about $1 billion.

But Viking has faced some recent setbacks. The spacecraft's radar antenna was damaged during launch, and the landers' communications systems have been unable to detect the signal from the spacecraft.

Viking has returned first information on Mars, which shows that the planet is a barren, dry world. The landers' instruments have detected no signs of life, and the spacecraft's radar antenna has been damaged. But Viking has not given up hope, and scientists are planning to launch a second mission to Mars in 1977.
Martian Life? NASA still says 'maybe'
Next Mars probe may go for a walk

By VIRGINIA NEIGENSON

"A rover vehicle will substantially increase our chances of finding life on Mars," said Dr. Gerald A. Soffia, Viking Project scientist at NASA's Langley Research Center. (LRG.

But whether we find life or not, we will gain from additional explorations of the 'Red Planet.' We've continued to wonder about Mars, and we've

EMCS announced Wednesday.

The vehicle, Kinetic Loop Mobility System (ELMS), is an outgrowth of the successful Lunar Roving Vehicle which roamed the moon's surface in the summer of 1971.

The lunar rover carried people and research equipment, but the Mars rover is designed to use mechanical "ears" and "hands" to pick up samples of soil and rock in a "walk" across the planet.

They said this would open a "window" in planetary surface exploration, and make the surface traversing about 200 miles a real possibility.

But another mission could cost nearly $11 billion, said Viking 2 operator. "The Viking 2 decision is not going to be made until we have the Viking 1 data in.

Viking project Manager James (Jim) Martin believes the United States will be going to Mars again in the not-too-distant future.

"Such a concept would provide a mobile laboratory, capable of conducting autonomous scientific missions on the Martian surface up to 50 miles in a sixteen-month period," according to program scientists.

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