THE DISH

DECEMBER 1976

No Life Found on Mars

The Viking 2 landed on the planet Mars September 3rd at 6:58 P.M. (EST, but was a frustrating delay until the first photographes reached Earth. The region of landing is called Utopia also called B-3 and about 1,000 miles from the original site selected, about 4,000 miles from the Viking 1.

A communications problem with the orbiting mother craft blacked out details of the landing and delayed transmission of its first pictures to Earth. Seconds after separation of the lander from the orbiter, something caused the mother craft to twist seven degrees from its proper attitude and turned its main antenna away from Earth. Pictures received from the Viking 2 indicates many boulders and one footpad may be resting on a rock. One rock, near the foot pad had a spongelike appearance. Other rocks were flat in the manner typical of sedimentary formations such as sandstones.

What appeared to be a tear in the antenna was later thought to be dirt spattered up when Viking landed. The seismometer on Viking 2 was working were on Viking 1 something went wrong.

The Viking 2 soil tests were almost the same as Viking 1, but the Viking 2 did find frozen water locked beneath the icy surface. As the latest reports come in for Viking 1 & 2, it seams life does not exist on Mars, but information received is of great help and will be in future years to come and when a manned landing is made.

The overall science activities of the Viking mission have been managed by the Viking Science Steering Group; group members are:

Gerald A. Soffen (Chairman)
Viking Project Office
Langley Research Center

A. Thomas Young (Secretary)
Viking Project Office
Langley Research Center

R.S. Young (Vice Chairman)
Viking Program Office
NASA Headquarters
Washington D.C.

Conway W. Snyder
Jet Propulsion Laboratory
Pasadena, Calif.

The Viking Project has 80 Science Team members(78 listed) who act as the principal investigators for the 13 Viking investigations. The scientists are divided into 13 teams, one team representing each investigation. Each Team Leader is listed first, with other members following:

BIOLOGY

Harold P. Klein, Ames
Norman H. Horowitz, Caltech
Joshua Lederberg, Stanford
Gilbert V. Levin, Biospherics
Vance I. Oyama, Ames
Alexander Rich, MIT

MOLECULAR ANALYSIS(GCMS)

Klaus Beimann, MIT
Duwayne M. Anderson, CRREL, U.S. Army
Alfred O.C. Neir, Univ. of Minn.
Leslie E. Orgel, Salk Institute
John Orc Univ. of Houston
Tobias Owen, SUNY
Priestley Toulmin III, USGS, Reston
Harold C. Urey, UC San Diego

LANDER IMAGING

Thomas A. Mutch, Brown Univ.
Alan B. Binder, Sci. Applic. Inc.
Friedrich O. Huck, LRC
Elliott C. Morris, USGS
James A. Pollack, AMES
Carl Sagan, Cornell Univ.

INORGANIC CHEMICAL

Priestley Toulmin III, USGS, Reston
Alex K. Baird, Pomona College
Benton C. Clark, MMA
Klaus Keil, Univ. of N. Mex.
Harry J. Rose, USGS, Reston

MAGNETIC PROPERTIES

Robert B. Hargraves, Princeton

METEOROLOGY

Seymour L. Hess, FSU
Robert M. Henry, LRC
Conway B. Leovy, Univ. of Wash
Jack A. Ryan, McDonnell-Douglas
James E. Tillman, Univ of Wash.

SEISMOLOGY

Don L. Anderson, Caltech.
Fred Ducnebier, Univ. of Texas
Robert L. Kovach, Stanford
Gary V. Latham, Univ. of Texas
George Sutton, Univ. of Hawaii
Nafi Toksoz, MIT

PHYSICAL PROPERTIES

Richard Shorthill, Univ. of Utah
Robert E. Hutton, TRW
Henry J. Moore II, USGS, Menlo Pk
Ronald F. Scott, Caltech

ENTRY SCIENCE

Alfred O.C. Nier, Univ. of Minn
William B. Hanson, Univ. of Texas
Michael B. McElroy, Harvard Univ.
Alfred Seiff, Ames
Nelson W. Spencer, GSFC

ORBITER IMAGING

Michael H. Carr, USGS, Menlo Pk
William A. Baum, Lowell Obs.
Carl R. Blasius, Sci. Applic. Inc.
Geoffrey Briggs JPL
James A. Cutts, Sci. Applic. Inc.
Thomas J. Duxbury, JPL
Ronald Greeley, Univ. of Santa Clara
John E. Guest, Univ. of London
Keith A. Howard, USGS, Reston
Harold Masursky, USGS, Flagstaff
Bradford A. Smith, Univ. of Ariz.
Lawrence A. Soderblom, USGS, Flagstaff
John B. Wellman, JPL
Joseph Veverka, Cornell Univ.

RADIO SCIENCE

William H. Michael, LRC
Joseph P. Brenkle, JPL
Dan L. Cain, JPL
J.G. Davies, Univ. of Manchester
Gunnar Fjeldbo, JPL
Mario D. Grossi, Raytheon
Irwin I. Shapiro, MIT
Chas. T. Stelzried, JPL
Robert H. Tolson, LRC
G. Leonard Tyler, Stanford

THERMAL MAPPING

Hugh H. Kieffer, UCLA
Stillman C. Chase, SBRC
Ellis D. Miner, Caltech
Gerry Neugebauer, Caltech

WATER VAPOR MAPPING

C.B. Farmer, JPL
Donald W. Davies, JPL
Don LaPorte, SBRC

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The Hamilton Standard Division of United Technologies, Inc., of Windsor Locks, Conn has been selected by NASA for negotiations leading to the award of a contract for the development and production of space suits to be used by men and women during Space Shuttle flights. The suits will be manufactured in small, medium and large.

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NASA's FY 1977 budget estimates call for authorization and appropriations of $3.697 billion and net outlays of $3.676 billion. NASA planners had "hoped and fully expected to present a much more aggressive space and aeronautics program for 1977 a program that would have provided for a more adequate level of advanced research and technology for the future..." The major deferrals, include a year's delay in starting production of the third Shuttle orbiter; and a delay in the creation of the Space Telescope, a new orbiter and probe of Jupiter, and work on the wind tunnel at Ames Research Center. NASA was at its peak of Apollo at $11.4 billion down to the $3.6 billion in FY 1977. At the peak of Apollo, NASA's share of the Federal budget was 4.4 percent, but today the agency receives less than one percent.

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The U.S. Navy became the largest single tenent at NASA's National Space Technology Laboratories when some 1,300 civilian and military employees of the Naval Oceanographic Office were transferred to the Bay St. Louis (Miss) Facility in July 1975.

THE KOMAROV, A RUSSIAN TRACKING SHIP by Seymour Rodman

At last we have been able to locate an authentic Russian tracking ship cover, the Komarov, with the ship's rubber stamped cachet, post marked Odessa, a seaport on the Black Sea. Two individual members received covers so post marked. One was dated Oct 10, 1975 and one July 21, 1976, the later date may possibly be for the Soyuz 21, launched July 6, 1976 and was in orbit for 50 days.

These tracking ships are used for other purposes other than tracking cosmonauts so that a Russian collector would not ask his own people for such a cover.

The Kosmonaut Vladimir Komarov was built at the Leningrad shipyards and launched in 1966. It was designed for the Soviet Academy of Science as a research vessel to study higher layers of atmosphere in the tropical zone of the western part of the Atlantic Ocean. Prominent features of the ship are the unusual massive plastic spheres enclosing radar arrays. The ship is named in honor of the Soviet Cosmonaut who died when his space ship crashed in 1967.

These covers were obtained by dilligence by sending covers to the name printed in the tracking cover list published by Bob Ekas. There are no guarantees you will get one, but it is worth a try. The address is as follows;

Master
Motorship Kosmonaut Vladimir Komarov
c/o Ministry of Maritime Ships
Passenger Service Odessa Black Sea
Odessa, U.S.S.R.

Be sure to put Russian postage on the envelope you wish them to return to you.

Editor: Am happy to hear from time to time of someone receiving covers from the Russian ships. For the ASTP I send two covers to each Russian tracking ship, with letter in Russian and at this time no covers have come back.

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MY VISIT TO THE GODDARD SPACE FLIGHT CENTER by John J. Macco

Being a space cover collector and living only 20 miles from Goddard Space Flight Center, I got in my car and visited the new Goddard Visitors Center. Located off Route 193 in Greenbelt, Md., the Visitors Center is open 10 AM to 3 PM Wednesday thru Sunday. As you drive up toward the Visitors Center, the first thing that catches your eye is a full size model of the Delta launch vehicle whose management responsibility is that of Goddard. In the courtyard outside the Visitors Center, there are exhibits such as a Agena nose cone, Space Shuttle model and exhibit on the Skylab space suits. Once you get inside the Visitors Center, there are various exhibits showing the various spacecraft NASA has sent into space. In this same building, there is a wall with 16 screens on it. Each screen has a different film pertaining to an aspect of space that NASA deals with. Aircraft safety, space shuttle, Skylab and Delta launch vehicle were topics of some of the films.

In another building where the old visitors center was located, there are additional exhibits. You can walk into a room and look to your right and you would see the control center where GSFC personnel supports Delta launches. On the day I visited the center (Oct 14) GSFC personnel were preparing to launch MARISAT-C, a maritime communications satellite. In the control room there are 3 status boards which show the readiness of the tracking stations around the world, a world map showing the locations of the tracking stations and three projection screens which show information about MARISAT. When I arrived at Goddard, the countdown clock read T-4 hours. I watched for 2 hours. I learned the next day that MARISAT-C was successfully launched at 6:44 PM EDT Oct 14 by Delta #127. By watching these preparations first hand, I felt a real sense of participation in the space program.

There is no charge for admission and no advance reservations are necessary I feel and space cover collector or anybody that follows the space program like I have since the flight of John Glenn should take the time to visit the Goddard Space Flight Center Visitor Center in Greenbelt, Md.

If any space cover collector is ever in the area feel free to call me at (301)-721-2346, I'll be glad to meet with you.

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SCIENTIFIC TEAMS NAMED FOR UNMANNED MOON FLIGHT

A team of scientists has been selected by NASA to study and develop experiments for a proposed unmanned lunar mission to take place in 1980.

Plans call for the spacecraft to orbit the Moon for one year, examining nearly the entire lunar surface with a battery of scientific instruments. Scientists expect to be able to measure the Moon's gravity, magnetism and heat flow, and to determine the chemical and mineral composition of the surface on the basis of the data obtained. Surveying the Moon from pole to pole on near and far sides would add data on the entire surface, greatly increasing the earlier information collected in small areas by U.S. and Soviet missions. The contemplated mission will be the first global survey of a planet other than Earth.

Among the questions scientists hope to answer in whole or in part are:

*Did the Earth and Moon form from a common "reservoir" of original material?

*Does the Moon have an iron-rich core like Earth's? If so, when did it form? How did its formation affect the Moon? If it is not present, what is the source of the magnetism found in lunar rocks?

*Does evidence exist pointing to large-scale movements of material in the Moon's interior similar to those on Earth?

*What was the nature of the intense meteorite bombardment that altered the surface of the Moon early in its history?

*Have the cold, permanently shadowed polar regions of the Moon trapped volatiles particularly water-that might be used as resources to help support a lunar base?

The eight experiment areas selected for study are highly complementary and interdependent. Three would use advanced remote sensing techniques based on gamma ray, X-ray and reflection spectroscopy to create chemical maps of the lunar surface. A fourth experiment, spectro-stero imaging, would provide photographic data to match the chemical maps with individual features of the landscape. The magnetometer and electron reflection experiments would map the electrical and magnetic properties of

the lunar surface and sub-surface. The remaining two experiments, on heat flow and gravity field, would provide information on the deep interior of the Moon. Combining all these data would help scientists to understand the entire body of the Moon.
The principal scientific investigators named ny NASA's Office of Space Science and their fields of interest are: Dr James R. Arnold, University of California at Berkeley, electron reflection; Dr. Thomas B. McCord, Massachusetts Institute of Technology, infrared spectrometry; Dr. Duane O. Muhleman, California Institute of Technology, microwave radiometry; Dr. Roger J. Phillips, Jet Propulsion Laboratory, gravity and altimetry; Dr Christopher T. Russell, University of California at Los Angeles, magnetometry; Dr Jacob I. Trombka, NASA Goddard Space Flight Center, X-ray spectrometry.
(This is in part from NASA Activities)

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THE RECOVERY OF SKYLAB II — Submitted by Reuben A. Ramkissoon, M.D.

The USS NEW ORLEANS (LPH-11) and its Commanding Officer, Captain R.W. Carius, USN, are no strangers to the United States Manned Space Program, having served in the Apollo 10 (Executive Officer) and Apollo 14 (Prime Recovery Ship) missions.
The next space mission began when the New Orleans left San Diego, California on August 18, 1973, for the recovery of Skylab II. The final leg of this training commenced on September 14, 1973, when she departed Pearl Harbor, Hawaii, sailing toward the Apollo space rendezvous at a splashdown point 225 miles southwest of San Diego, California.
During the cruise, almost a score of simulated test excercises (SIMEX) were completed, involving the entire special teams--both navy and civilian-- so that a state of readiness was achieved before splashdown day. Despite adverse weather conditions, this well-trained team effected a speectacular recovery on September 25, 1973 returning the crew and Apollo ferry ship to the deck of the New Orleans in record time.
This 'philatelic log' of the final leg of the recovery cruise covers each day's major events and major accomplishments. It introduces the various supporting groups--both military and civilian--through a series of autographed official ship covers, with a complement of a few non-official covers--but all carried aboard the recovery ship for the final two-week period of the recovery mission. The 'log' concludes with the return of the astronauts to the Manned Spaceflight Center, Houston, Texas, on September 27, 1973.
Due to the Apollo 15 'moon cover' incident, the Navy ceased the operation of the recovery ships' post offices, following the conclusion of the Apollo 16 mission. All recovery covers sent to the ship are postmarked at CTF 130 in Hawaii, and bear the Navy Official Recovery Cachet, along with the date of the recovery, September 25, 1973, in this instance, for the Skylab II mission.
Recovery covers carried on the Prime Recovery Ship for the Skylab II Mission do not carry the Navy Official Cachet, nor do they show a September 25, 1973 cancellation. All carried covers are postmarked on September 26 (AM), 1973, the day after recovery, since the ship's post office was not operative on recovery day.
The USS NEW ORLEANS (LPH-11) was chosen for the final recovery of the last (Skylab III) astronauts, successfully completing this fourth space-related mission with the return of that crew to San Diego, on February 9, 1974.
(Note: This represents a Court of Honor Exhibit that was stolen at Spacepex '76. Many of the covers are autographed and most addressed.)

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A large rocket section from a Soviet satellite came down in Montana. The rocket body from the Soveit Cosmos 854 has not yet been recovered by U.S. officials, who say it was tracked by radar.

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Scientists in Puerto Rico have taken detailed radar pictures of Venus, giving astronomers the first broad view of the planet's topographic features. The pictures-taken at the Arecibo Observatory indicated the liklihood of a lava flow roughly the size of Oklahoma and ridges that may have been formed by movements similat to those that shaped Earth. Scientists believe that Venus, may have a molten core and other internal activity. With the heavy cloud cover, a complete mapping cannot be expected until the end of the decade.

Tracking Station Report

Since the manned space flights have ceased, not as many covers have been going out and very few reports have come in of stations or facilities closing or address changes.

ORR or S109 will no longer service covers. Sometime ago a cover was serviced from X-110 with a note from one of the station personal wanting interesting stamps, the address is; W. Vonk, Waterweg 74, De Bilt, The Netherlands.

SPACE SHUTTLE

Development-Design, fabricate, Tests for Fuel cell servicing system
Beech Aircraft Corp.
Boulder, Colo

Information on the shuttle write to;
Rocketdyne Division
Rockwell International
Public Relations Dept.
6633 Canoga Ave.
Canoga Park, CA 91303

Dryden Flight Research Center will not service covers for the shuttle. Covers will be handled by the NASA Exchange Council for you covers and 15¢ per cover service fee.
NASA Exchange Council
Dryden Flight Research Center
Edwards, CA 93523

A new NORAD station has openned on Nov 9th and covers are available for 75¢.
N- Satellite Identification & Tracking
James Park, N.B.
Canada EOCIJO

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These are new addresses and if letter appears before each this is the category.

T Dominion Astrophysical Observatory
Royal Oak, British Columbia, Canada

T Bijursken Astrophysical Observatory
Soviet Armenia, U.S.S.R.

T Radio Telescope Observatory
Brevard Cimmunity College
Cocoa, FL

P Noble Planetarium
1501 Montgomery
Fort Worth, TX

Byurakan Astrophysical Observatory
Yerevan, U.S.S.R.

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SOVIET UNION

No address is available for the following, only the station name or location.

CONTROL CENTERS

Yevpatoriy (Deep Space)

Kaliningrad

TRACKING STATIONS

Yevpatoriya	Tbilisi	Dzhusaly	Kolpashevo	Ulan-Ude
Ussuriyisk	Petropavlovsk	Bear Lake	Sriharikota	Vladivostok

USSR FOREIGN STATIONS

Helwan, United Arab Republic	Aswan, United Arab Republic	Guinea, West Africa
Fort Lamy, Chad	Khartoum, Sudan	Afgui, Somali
Kerguelen (S Indian Ocean)	Cuba	Mali
	Mirnyy (Antarctica)	

These are television receiving stations from the Soviet Orbita satellite. Most stations are complete but a few will not be completed until 1980 and then virtually all of the Soviet Union will have television service.

Murmansk	Arkhangelsk	Syktyukar	Ashkhabad	Frunze
Alma-Ata	Novosibirsk	Surgut	Varkuta	Kemerovo
Noriksk	Krasnoyarsk	Bratsk	Irkutsk	Chita
Yakutsk	Magadan	Komsomolsk	Gur'yev	Khabarovsk
Abakan	Kyzyl	Dzhezkazgan	Bilibino	Aldan
Pevek	Sangar	Tazovskiy	Anadyr	Nar'yan-Mar
Skovorodino	Nadym	Ust'Ilimsk	Dushanbe	Khorog
Tadzhikidtan	Aleksandrousk	Poronaysk	Yuzhno-Kurilsk	Yuzhno-Sakhalinsk

Petropavlousk-Kamchatka Nikolayeusk-na-Amure

OUTSIDE USSR

Ulan Bator, Mongolian Harvco, Cuba Prague, Czechoslovakia

SOVIET UNION SATELLITE WEATHER STATIONS

Moscow Novosibirsk Khabarousk

In the Directory of addresses is listed 16 Soviet Space and Missile Monitering and Control Ships. Listed here are 9 more and after each is a C or M indicating if it is Civilian or Military.

Aksay C Apsheron M Baskunchak M Dauriya M Dikson M
Donbass M Sevan M Taman M Yamal M

SOVIET UNION OBSERVATORIES

Sternberg Astronomical Institute Transili
Transili Alatau (Central Asia)

Alma Ata Observatory

Georgia Astrophysical Observatory

Byurakan Observatory

INDIA FACILITIES

Thumba Equatorial Rocket Launch Station
(West Coast India, near Trivandrum)

Trivandrum Observatory
Trivandrum, Kerala, India

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John Mitchell has sent a 3 page list of Russian addresses and will check these over and print at a later date; Thanks John.

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Listed are a few observatories with the diameter in inches of the lens they have and the year observatory completed.

REFRACTING TELESCOPES

Yerkes Observatory	40"	1897
Lick Observatory	36"	1888
Paris Observatory	32.7"	1889
Potsdam Observatory	32"	1899
Allegheny Observatory	30"	1914
Bischoffsheim Observatory	30"	1886
Pulkovo Observatory	30"	1885

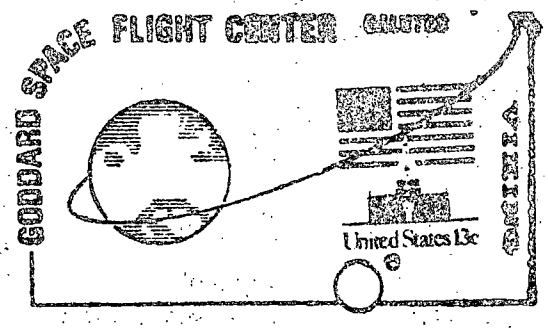
REFLECTING TELESCOPES

Hale, Palomar Observatory	200"	1948
Lick Observatory	120"	1959
Crimean Observatory	102"	1960
Mount Wilson Observatory	100"	1917
Royal Greenwich Observatory	98"	1966
Kitt Peak Observatory	84"	1963
McDonald Observatory	82"	1939
Schwarzschild Observatory	80"	1960
Haute-Provence Observatory	76"	1958
Dunlap Observatory	74"	1935
Radcliffe Observatory	74"	1938
Mt Strimlo Observatory	74"	1955
Tokyo Observatory	74"	1960
Helwan Observatory	74"	1960
Dominion Observatory	72"	1919

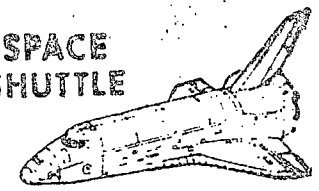
The Radio and Radar Telescopes will be listed at another time. If anyone has other or further information, sent it along.



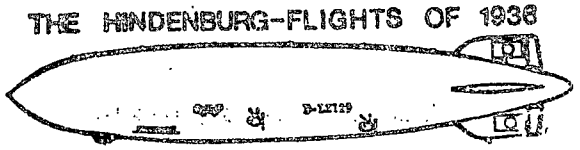
TEMPORARY STATION





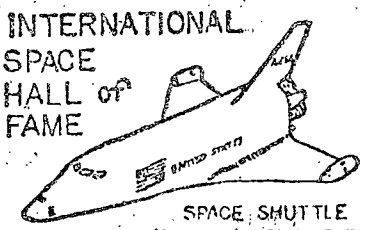


A NEW ERA

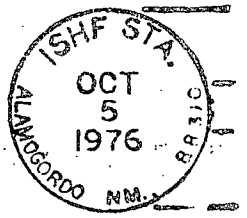


SEP 10
1976

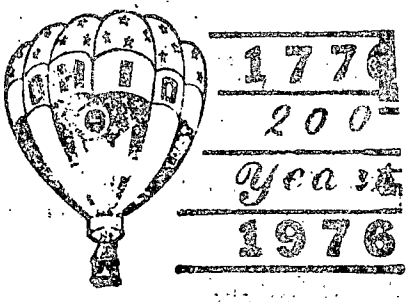
ZEPPEX 76 STATION
BROOKFIELD, IL 60513

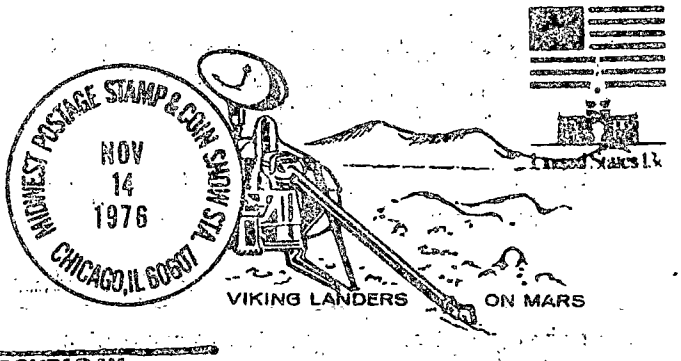


SPACE SHUTTLE
"ORBITAL GLIDER"



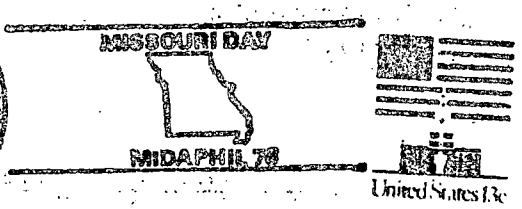


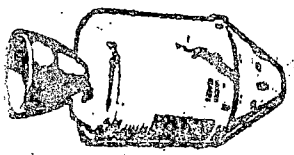




VIKING LANDERS ON MARS



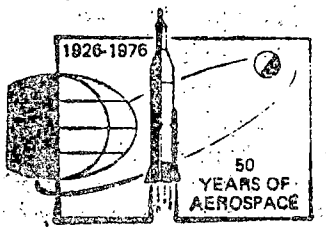


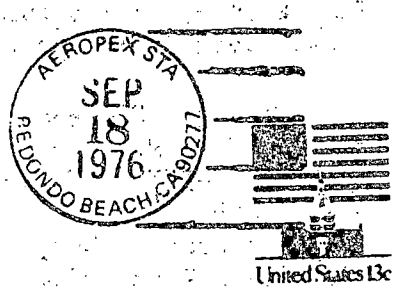


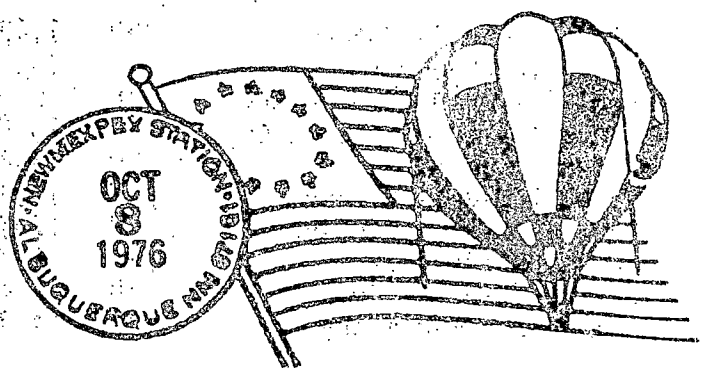
MIDAPHIL '76

SEP 25 1976

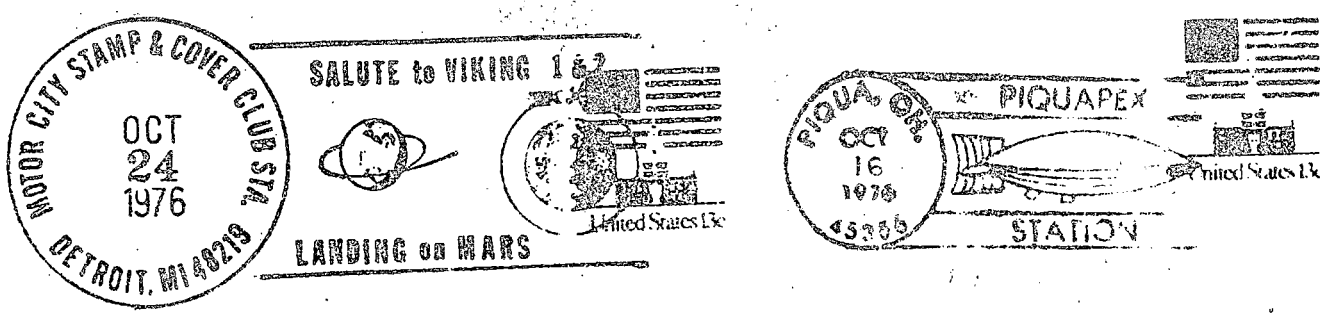
KANSAS CITY, MO.
ISAP

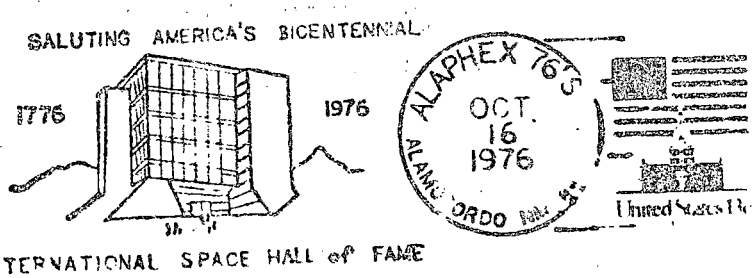






On this and the following page are picture canceles of space and objects lighter than air. The addresses of where to send can be secured in the philatelic publications.





SPACE SHUTTLE EVENTS: NORTHRUP STRIP, WHITE SANDS MISSILE RANGE 1976

August 13 NASA GULFSTREAM II Shuttle Training Craft Arrives WSMR. First Flight Over Northrup Strip by Instructor Pilot

September 24 Shuttle Flight Instructor Training With T38 Jet over Northrup Strip to Develop Flight Training Procedures. Pilot-R.F. Overmyer, Astronaut

September 28 First Flight of NASA Gulfstream II to Refine Flight Training Procedures in Shuttle Program. Instructor Pilot: David Griggs & Ted Mendenhall

October 1 Flight of NASA Gulfstream II to Refine Flight Training Procedures in Shuttle Program, Instructor Pilots: David Griggs & Ted Mendenhall

October 7 One T-38 Mission, pilot CDR Richard Truly, USN and LTC K. Bobko, USAF (Both Astronaut-pilots) Time: 1300-1400. Shuttle Flight Instructor Training With T38 over Northrup Strip to Develop Flight Training Procedures

October 13 Flight of NASA Gulfstream II to Refine Flight Training Prodedures in Shuttle Program. Instructor Pilots Al Manson, Ted Mendenhall

October 14 Flight of NASA Gulfstream II to Refine Flight Training Procedures in Shuttle Program. Instructor Pilots Manson and Griggs. Overmeyer-Astronaut (2 flights)

NOTIFIED OCTOBER 29th ASTRONAUT TRAINING BEGAN WEEK OF 18 OCT.(First week Astronaut Train at Northrup Strip)

October 20 GRUMMAN GULFSTREAM II Shuttle Training Aircraft (STA) Flight Over Northrup Strip WSMR Instructor Pilots: David Griggs, Ted Mendenhall

October 21 GRUMMAN GULFSTREAM II Shuttle Training Aircraft (STA) Flight Over Northrup Strip WSMR Instructor Pilots: Al Manson, Joe Algranti-Astronaut?

October 27 GRUMMAN GULFSTREAM II Shuttle Training Aircraft (STA) Over Northrup Strip WSMR-Harley Meyer-Flt. Sys. Eng., Joe Engle-Student Pilot (Astronaut) and Ted Mendenhall-Instr. Pilot.

October 29 GRUMMAN GULFSTREAM II Shuttle Training Aircraft (STA) Flight Over Northrup Strip WSMR. Ted Mendenhall, Inst., Richard Truly, Astronaut

November 4 Ted Mendenhall, Instr.; Ed Rainey, Astronaut-Pilot. Dave Griggs, Inst.; Joe Engle, Astronaut-Pilot. Two flights (Refueling at El Paso International Airport)

November 5 Ted Mendenhall, Inst.; Fred Haise, Pilot-Astronaut.

November 9 1100-1230 Joe Engle, Astronaut; Ted Mendenhall, Inst. Pilot
1530-1730 Ed Rainey, Astronaut; Dave Griggs, Instr. Pilot

November 10 1130-1300 Fred Haise, Astronaut; Ted Mendenhall, Instr. Pilot
1530-1700 Ed Rainey, Astronaut; Dave Griggs, Instr. Pilot

GRUMMAN GULFSTREAM II STA no longers refuels at Holloman AFB, now refuels at El Paso International Airport. Holloman provding crash crew vehicles only.

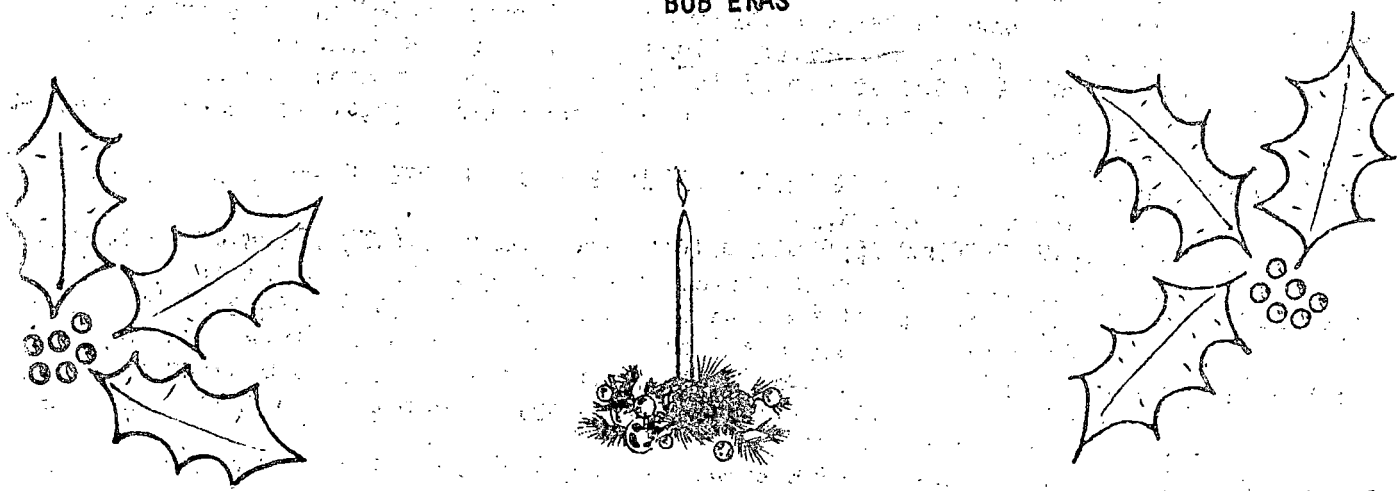
This list has been sent through the courtesy of J.T. Lovelady who services covers from WSMR.



AT THIS TIME IS EXTENDED TO YOU AND YOUR FAMILY GREETINGS AND GOOD WISHES FOR THE NEW YEAR. WE MUST BE THANKFUL WE LIVE IN A LAND WHERE WE CAN EXPRESS OURSELVES AND LIVE IN PEACE.

I HOPE ALL OF YOU A SINCERE, PROSPEROUS AND HAPPY NEW YEAR IN 1977.

BOB EKAS



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The opening scenes of the television drama, "The Six-Million Dollar Man", which shows a test pilot and his wingless craft crashing into a desert landscape, are real. They were taken in May, 1967, when test pilot Bruce Peterson was trying out the wingless M2F2 experimental lifting body at the Dryden Flight Research Center. The footage came from cameras in the cockpit. Soon after the pictures were taken the vehicle turned upside down and burst into flames. Peterson was badly injured, though not as severely as his TV counterpart. He suffered partial loss of sight in one eye, a broken hand, loss of teeth, a fractured skull, and virtually the total loss of his forehead. Rebuilding and rehabilitation took almost two years. He now is Director of Safety and Quality Assurance at the Base.

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Helios 2 launched January 15, 1976 will come closest to the Sun 93 days after launch and every 186 days thereafter. After initial maneuvers were monitored by a German team at JPL, spacecraft control was transferred to a German team at the German Space Operation Center near Munich. Helios 2 will fly nearly 3 million km. (2 million mi.P closer to the Sun than its predecssor, Helios 1.

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The Bendix Field Engineering Corp., Columbia, Md., has been awarded a contract to operate and maintain portions of NASA's worldwide Spaceflight Tracking and Data Network. The two-year, cost-plus-award-fee contract is about $104 million. It contains a provision for the negotiation of up to three additional one-year extensions. The worldwide STDN is operated to meet the tracking and data acquisition needs of NASA's Earth orbital space programs, both manned and unmanaged. The contract will be supervised by the Goddard Space Flight Center.

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After four months of analysis, the Soviet Union has made public first detailed findings of its two spacecraft that reached the planet Venus last October 1975. Some of the information is expected to help America in planning the Pioneer mission scheduled for 1978. A 2,500 word report appears to answer questions posed by NASA after the two Soviet craft, Venera 9 and 10 reached Venus. Although the two Soviet landing capsules gave out after an hour the Venusian surface temperature of 900 degrees Fahrenheit and a pressure 90 times that of the earth, the two orbiters have continued to transmit data on the cloud cover and the upper atmosphere. They are orbiting Venus every 48 hours in a highly elliptical path with a maximum distance of 70,000 miles and a minimum distance of about 1,000 miles from the planet's surface. The americans plan to launch two spacecraft toward Venus in 1978, with the lander separating into four or five probes that would enter the atmosphere and relay data via the orbiter back to earth. One of the primary problems of interest to American scientists was the angle at which the Soviet landers entered the atmosphere. The Russians have now reported that Venera 9 entered at 20.5 degrees and Venera 10 at 22.5 degrees to the horizon.

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NASA charges at least $25-million to put a $12-million communications satellite into orbit. When a reusable space shuttle is introduced this cost should drop, but many experts in European satellite program fear that it will go down only 25 percent instead of the 50 percent promised in 1971. A mr Kayser has designed what he calls a "space truck" to put satellites in orbit for half the price that NASA charges. He has established a concern called Orbital Transport and Raketen A.G. to build and launch his rockets on a commerical basis.

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The space station planted on the moon by the Apollo 14 astronauts stopped transmitting data on January 18, 1976, but started transmitting once again on February 19th. The station almost five years old was expected to operate for another two or three years. When it returned to life, its receiver, transmitter and experiments functioned extremely well and now is expected to continue to operate for two or three more years. What caused the trouble is not known but temperatures variation range as much as 400 degrees in two hours on the moon.

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The seventh ITOS operational weather satellite to be launched by NASA for the National Oceanic and Atmospheric Administration became NOAA-5 once obit was confirmed.

TRADING & SELLING CORNER

SPACECRAFT COVERS: The classic U.S. space cover series with cachets designed by Swanson. Pricelist free for an SASE. Leo Malz, P.O. Box 566, Forest Hills, NY 11375

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Manned, unmanned space covers: KSC, CC, Palestine, Tracking Stations, etc. Choose your own lot size-10-200 different at 33½¢ cover, cacheted, most unaddressed. Fred Bean 619 Wakanda Circle, Menomonie, Wis., 54751

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I've been away from the cover collecting field for the past 11 years, so have much to catch up on. I have for TRADE nuclear sub covers (early patrols, etc), Deep Freeze & MSTS Arctic covers, surface ships events with early Beck printed cachets, foreign ship markings upon visit to Norfolk, GT-2 recovery ships, and more from 1963-1965. I need ASTP, Skylab, Lifting Bodies, etc. Send me your lists and let me know your interests. Marty Halpern, P.O. Box 995, Sebastopol, Calif., 95472

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Space-Viking, Mars Lander, Bicentennial, U.S.P.S. Pictorial Canacellation, November Midwest Show. Three cacheted covers: (one illusrated #15) $2.00 (eight: $5.00) American Topical Association, 5014-V West Center St., Milwaukee, WI 53210. Price includes postpaid mailing under separate protective unaddressed cover.

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VIKING 2 Landing Sept 3, 1976, Pasadena, Calif., Illusrates the spacecraft landing on Mars. Five colors. Limited issue. $1.00. Free JPL space cover list. Gauthier Industries, 9550 Gallatin Rd., Downey, CA 92040.

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U.S./FOREIGN special cancels; FDC's; commemorative covers; satellities; manned launches, events, recoveries, official cachets; autographs, Local Post. List 25¢ (Deductible first order). Frasketi, Box 2114, Ft Myers, FL 33902.

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WANTER: X-24B covers dated 10-4-73, 8-8-74 and 6-6-75, autographed by Mike Love, with official NASA cachets. Peter W. Tierney, Jr., 152 Tahattawan Rd., Littleton MA 01460.

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SPACE COVER & FREEDOM TRAIN COVER SALE No. 3, yours for 10¢ & SASE with 24¢ postage. Write E. John Staba, 2840 Stinson Blvd., Minneapolis, Minn 55418

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SPACE SHUTTLE COVERS for the trip from Palmdale to Dryden Flight Reasearch Center California. Two cover with cachet and canceled at Palmdale and Edwards on the day of departure and arrical. $2.00 per set with address label before January 15, 1977, after this date write for information. E.J. Rusinek, 11291 Wembley Road, Rossmoor, CA 90720. Sponosred by Rockwell Space Division Stamp Club.

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Official British Government Heathron Airport Post Office Souvenir Cover of the first commercial flight of The Concorde, London to Washington, DC. Limited supply, one per person. Postpaid $2.25.

DIRECTORY-Space Addresses-Tracking-Installations, available in Regular issue at 60¢ (printed on both sides and mailed folded), Deluxe issue at $1.40 (printed on one side in a binder and mailed flat), postpaid.

MAINER 9 in orbit around the planet MARS, hand cancelled Noverber 13, 1971 (first time a Mariner orbited Mars), postmarked MARS, PA, 25¢ plus a SSAE

List of rubber stamps and foreign stamps for postage for a stamped addressed envelope.

List of all my duplicate covers, ships, conventional & nuclear, First Day Covers of USA & UN, space and etc. Send a #10 addressed envelope with postage for 2 oz.

Bob Ekas P.O. Box 295 Chicora, PA 16025

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Send 25¢ for latest list of covers: ASTP, Arctic, Ships, Oceanography, Inaugurations, and many others. Art Silhanek, 536 Willow Ave., Piscataway, NJ 08854

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List of space covers from Edwards, VAFB, Wallops, Cape, JFK, Palestine, Alaska, WSMR, Alamororgo and many others. Robert J. Boudwin, 1119 Harkin Ave., Woodbury, NJ 08096

Space Covers Reported & Received

WHITE SANDS MISSILE RANGE, NM

8-25-76 HAWK AIR DEFENSE MISSILE/NO.1A 10-5 vs. MQ,61A
8-25-76 HAWK AIR DEFENSE MISSILE/NO. 1A 10-6 vs. MQM74C
8-27-76 TOMAHAWK CRUISE MISSILE/NO. 10:1 FROM NAVY A6
9-3-76 STANDARD ARM (ANTI-RADIATION MISSILE)/NO. 1:3 LAUNCHED FROM NAVY A-6
9-3-76 STANDARD ARM (ANTI-RADIATION MISSILE)/NO. AF:4 LAUNCHED FROM USAF F-105
9-9-76 AIR LAUNCHED CRUISE MISSILE(AGM-86)/FTM $.FLIGHT TEST OF NAVIGATION
9-24-76 See Space Shuttle
9-28-76 1st 1976 STRATCOM BALLOON FLIGHT OVER/WSMR(16 Mil.Cu.Ft.)
9-28-76 See Space Shuttle
9-30-76 2nd 1976 STRATCOM BALLOON FLIGHT/OVER WSMR(12 Mil.Cu.Ft.)
9-30-76 TOMAHAWK CRUISE MISSILE/NO. 10:2 FROM NAVY A6
10-1-76 See Space Shuttle
10-7-76 See Space Shuttle
10-13-76 See Space Shuttle
10-14-76 See Space Shuttle
10-14-76 AIR MAUNCHED CRUISE/MISSILE FTM #7 FROM B52
10-20-76 See Space Shuttle
10-21-76 See Space Shuttle
10-22-76 BLACK BRANT VC NASA 21.036 TO PHOTO-/GRAPH EXTREME ULTRA-VIOLET SUN
10-27-76 See Space Shuttle
10-29-76 See Space Shuttle
11-4-76 See Space Shuttle
11-5-76 See Space Shuttle
11-9-76 See Space Shuttle
11-10-76 See Space Shuttle

WALLOPS ISLAND, VA (Wallops Flight Center)

10-6-76 NIKE-CAJUN/T2-8020/3 30PM

CHATANIKA, AK (Poker Flat Rocket Site)
None Reported

VANDENBERG AFB, CA (Western Test Range)

8-19-76 MINUTEMAN/INSTRUMENTATION/IMPROVEMENT/MISSION
8-26-76 MINUTEMAN 2/WEAPON SYSTEM/LAUNCHED BY/STRATEGIC AIR COMMAND
9-1-76 METEOROLOGICAL/SPACE PROBE/SCOUT BOOSTER
9-11-76 USAF SECRET/RESEARCH SATELLITE/THOR-DELTA BOOSTER
9-15-76 SECRET PAYLOAD/TOWARD POLAR ORBIT/USAF TITAN-3B BOOSTER
9-23-76 BOMARC TARGET/MISSILE DESTROYED BY AIR TO AIR/OR GROUND TO AIR MISSILE
10-26-76 US AIR FORCE/MINUTEMAN 2/COMMUNICATION/VERIFICATION/TEST
10-28-76 BOMARC/SALVO/LAUNCH
11-5-76 MINUTEMAN 3/MULTI WARHEAD/ICBM

PALESTINE, TX (Balloon Site)

1-12-76 See Space Shuttle
5-20-76 See Space Shuttle
9-15-76 EXPERIMENT TO MEASURE THE LARGE/ANGULAR SCALE ISOTROPY OF THE COSMIC
9-16-76 TO CONDUCT RESOLUTION ULTRAVIOLET/STELLAR SPECTROSCOPY.BBUS TELESCOPE

9-23-76 TO MEASURE PRIMARY COSMIC/RAY ELECTRON SPCTRUM
9-24-76 TO MEASURE SUN SPECTRAL DISTRIBUTION
10-2-76 TO MEASURE THE IMPACT OF GASES SUCH/AS EFFLUENTS S.S. EXHAUST & PROPELLANTS
10-10-76 RAYS OF ENERGIES FROM SOURCES/OUTSIDE THE ATMOSPHERE/8:05 P.E.
10-11-76 COSMIC RAY/SAMPLES FROM THE GALAXY/GODDARD SPACE FLT CENTER/8:10 A.M.
10-13-76 INVESTIGATION OF SOLAR/CORONA IN THE NEAR INFRARED
10-20-76 FAR INFRA/RED TELESCOPE. PHOTOMETRY OF HII REGION

EDWARDS, CA (Dryden Research Center)

3-23-76 FLIGHT 1-27/PERFORMANCE AND/PROPULSION TESTS/B-1
3-30-76 FLIGHT 1-60/STABILITY & CONTROL/AUGMENTATION/YC-15
4-1-76 B-1 S/N 74-0160/FIRST FLIGHT ARRIVES EDWARDS/B-1
4-7-76 FLIGHT 1-28/SPEED, POWER/AND AICS TESTS/B-1
4-9-76 FLIGHT 1-70/THRUST REVERSER/OPERATION/YC-15
4-15-76 FLIGHT 1-29/SENATOR GOLDWATER/PILOTS AIRCRAFT/B-1
4-19-76 FLIGHT 1-30/SECTY D. RUMSFELD/PILOTS AIRCRAFT/B-1
4-25-76 FLIGHTS 1-80 & 81/AERIAL REFUELING/PROXIMITY TESTS/YC-15
4-30-76 FLIGHT 1-31/NOS 3 & 4 ENGINE/NOZZLES DAMAGED/B-1
8-10-76 YF-16 TEST FLIGHT
8-11-76 See Space Shuttle
8-12-76 See Space Shuttle
8-13-76 See Space Shuttle
8-16-76 See Space Shuttle
8-17-76 See Space Shuttle
8-18-76 See Space Shuttle
8-19-76 See Space Shuttle
8-20-76 See Space Shuttle
8-31-76 YF-16 TEST FLIGHT
9-3-76 See Space Shuttle
9-8-76 See Space Shuttle
9-9-76 See Space Shuttle
9-16-76 YF-16 TEST FLIGHT
9-28-76 YF-16 TEST FLIGHT
10-20-76 YF-16 TEST FLIGHT

KENNEDY SPACE CENTER, FL (Eastern Test Range)

10-14-76 MARISAT-C/pmk Kennedy Space Center,Astronaut Trail Sta;St Davies Bermuda & FPO 09560 (BDA);Greenbelt MD(GSC);Agana GU(GWM);Haleiwa HI(C-4);Andover ME (C-5);Brewster WA(C-7);Carmel Valley CA(C-8);Talkeetna AK(C-9;Savanna IL (Hanover);Oxnard CA(Santa Paula);Haleiwa HI(GSAT Hawaii);Bridgeport CT (Southbury CONN)

KOUROU, FRENCH GUYANE (CNES)
None Reported

KIRURA, SWEDEN (ESRO)
None Reported

ANDOYA, NORWAY (Andoya Rocket Range)
None Reported

CHURCHILL RESEARCH RANGE
None Reported

WOOMERA AUSTRALIA LAUNCHES
None Reported

HOLLOMAN AFB, NM

8-3-76 AIRCRAFT BLAST INTERFERENCE TEST
8-6-76 SMALL HARDENED INERTIAL PLATFORM TEST
8-24-76 SMALL HARDENED INERTIAL PLATFORM TEST
8-26-76 AIRCRAFT BLAST INTERFERENCE TEST
9-16-76 ACES II/B-1 DRGUE TESTS
9-17-76 SMALL HARDENED INERTIAL PLATFORM TEST
9-22-76 ROTOR SYSTEMS RESEARCH AIRCRAFT TEST
9-23-76 ACES II/B-1 DROGUE TESTS
9-24-76 ARMY PLUME STUDY
9-27-76 ACES II/B-1 DROGUE TESTS
9-29-76 AIR COMBAT FLIGHTER TEST
9-30-76 MX GUIDANCE TESTS
10-4-76 ACES II/B-1 DROGUE TESTS
10-6-76 ROTOR SYSTEMS RESEARCH AIRCRAFT TEST
10-8-76 ACES II/B-1 DROGUE TESTS
10-13-76 F-16 CREW ESCAPE TEST
10-14-76 ACES II/B-1 DROGUE TESTS
10-15-76 PROJECT ARROWHEAD/TESTING EXPERIMENTAL RECOVERY/PARACHUTE
10-20-76 ROTOR SYSTEMS RESEARCH AIRCRAFT TEST
10-20-76 ACES II/B-1 DROGUE TESTS
10-22-76 LANCE ARMA GYRO TEST
11-3-76 ROTOR SYSTEMS RESEARCH AIRCRAFT TEST

MISCELLANOUS

Received Late or Reported Late

7-22-76 COMSTAR-B/pmk St George Berumda(BDA);Hanover IL(AT&T);Haleiwa HI(GTE) (Dates vary)

SPECIAL EVENTS/POSTMARKS/CACHETS

8-21-29-76 11TH ANNIVERSARY GEMINI 5 (launching & recovery)/pmk Astronaut Trail Sta, Kennedy Space Center, FL
9-6-76 LAST DAY SLOGAN CANCEL/pmk Kennedy Space Center, FL
9-7-76 LAST DAY OF KSC BICENTENNIAL EXPO/pmk Kennedy Space Center, FL
9-10-76 SLOGAN CANCEL/THE HINDENBURG-FLIGHT OF 1946/ZEPPEX 76 STATION BROOKFIELD IL
9-11-76 SLOGAN PICTURE CANCEL/BALLOON RALLY '76/pmk Marysville OH
9-11-76 SLOGAN PICTURE CANCEL/VIKING/TEMPORARY STATION/pmk Greenbelt MD
9-14-76 ESA BODENSTATION/pmk Michelstadt West Germany
9-12-15-76 10TH ANNIVERSARY GEMINI 11/pmk Cape Canaveral & Astronaut Trail Sta. FL
9-18-76 SPACEPEX 76/EXPLORERS OF SPACE/pmk JSC SPACEPEX Houston TX(Picture pmk)
9-18-76 50 YEARS OF AEROSPACE/pmk AEROPEX STA REDONDO BEACH CA (Picture pmk)
9-25-76 MIDAPHIL '76/MISSOURI DAY & Picture Apollo/pmk USPS EXHIBITION STA Kansas City
10-3-76 14TH ANNIVERSARY SIGMA 7/pmk Cape Canaveral FL
10-5-76 SLOGAN PICTURE CANCEL/INTERNATIONAL SPACE HALL OF FAME(picture Space Shuttle) pmk ISHF STA. Alamogordo NM
10-8-76 PICTURE CANCEL(Balloon 3/13 star flag/pmk NEWMEXPEX STA Albuquergue NM
10-11-76 8TH ANNIVERSARY/APOLLO 7/pmk Cape Canaveral (10-22-76 Astronaut Trail Sta)
10-12-76 GRAF ZEPPELIN ANNIVERSARY/ZEPPELIN FLIGHT(Picture Cancel/pmk DANEPEX '76 Madison WI
10-16-76 PICTURE CANCEL/pmk Piqua OH PIQUAPEX STATION
10-16-76 PICTURE CANCEL(INTERNATIONAL SPACE HALL OF FAME/pmk ALAPHEX Alamogordo NM
10-24-76 PICTURE CANCEL(SALUTE TO VIKING 1&2/pmk Motor City Stamp & Cover Detroit MI
11-7-76 75TH ANNIVERSARY/ZEPPELIN FLIGHT(Picture Cancel/pmk DANEPEX '76 Madison WI
11-11-76 10TH ANNIVERSARY GEMINI 12/pmk Cape Canaveral FL
11-13-76 PICTURE CANCEL/pmk Rubber City Stamp Club Arkon OH
11-12-76 PICTURE CANCEL/VIKING LANDER ON MARS/pmk Midwest Stamp & Coin Chicago IL

SPACE SHUTTLE TESTS

9-29-75 GRUMAN GULFSTREAM II SPACE SHUTTLE CREW TRAINER FLIGHT/pmk Bethpage, NY
12-3-75 GRUMAN GULFSTREAM II SPACE SHUTTLE CREW TRAINER FLIGHT/pmk Calverton NY
1-12-76 SPACE SHUTTLE/EXHAUST AND AEROSOL PROPELLANTS/pmk Palestine TX
2-1-76 MAIN ENGINE TEST 001 ENGINE 002/pmk Bay St Louis MS
2-13-76 GRUMMAN GULFSTREAM II SPACE SHUTTLE CREW TRAINER FLIGHT/pmk Calverton NY
3-17-76 GRUMMAN GULFSTREAM II SPACE SHUTTLE CREW TRAINER FLIGHT/pmk Calverton NY
4-7-76 GRUMMAN GULDSTREAM II SPACE SHUTTLE CREW TRAINER FLIGHT/pmk Calverton NY
5-20-76 SPACE SHUTTLE EXPERIMENT/pmk Palestine TX
6-2-76 MINI-ALT SPACE SHUTTLE MODEL TEST/pmk Houston TX
6-8-76 FIRST SHUTTLE TRAINING AIRCRAFT ARRIVED ELLINGTON AFB/pmk Houston TX
6-18-76 GULFSTREAM TWO/FUNCTIONAL CHECK FLIGHT/pmk Houston TX
6-21-76 GULFSTREAM TWO/FIRST TRAINING FLIGHT/pmk Houston TX
6-22-76 GULFSTREAM TWO/SECOND TRAINING FLIGHT/pmk Houston TX
6-23-76 GULFSTREAM TWO/AIRCRAFT RETURNED TO/GRUMMAN NY/pmk Houston TX
7-7-76 GULFSTREAM TWO/RETURNED TO ELLINGTON FIELD/pmk Houston TX
7-12-76 GULFSTREAM TWO/TRAINING FLIGHT/pmk Houston TX
7-26-76 SCIENTISTS MEET/AT MARSHALL/SPACELAB EXPERIMENT/pmk Marshall Space Flight Ct.
8-11-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/FITZ FULTON/pmk Edwards CA
8-11-76 FRED HAISE/FLIES A-7 DIGITAC/FAMILIARIZE SHUTTLE CONTROLS/pmk Edwards CA
8-11-76 GORDON FULLERTON/FLIES A-7 DIGITAC/FAMILIARIZE SHUTTLE CONTROLS/pmk Edwards CA
8-12-76 VANCE BRAND/FLIES A-7 DIGITAC/FAMILIARIZE SHUTTLE CONTROLS/pmk Edwards CA
8-13-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
8-16-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
8-17-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/FITZ FULTON/pmk Edwards CA
8-18-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/FITZ FULTON/pmk Edwards CA
8-19-76 MINI-ALT SPACE SHUTTLE MODEL TEST/pmk Houston TX
8-19-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
8-19-76 COL JOE ENGLE/FLIES A-7 DIGITAC/FAMILIARIZE SHUTTLECONTROL/pmk Edwards CA
8-20-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
8-20-76 CDR DICK TRULY/FLIES A-7 DIGITAC/FAMILIARIZE SHUTTLE CONTROLS/pmk Edwards CA
8-29-76 FIRST TEST ENGINE 003/pmk Bay St Louis MS
8-30-76 MAIN ENGINE TEST 002 ENGINE 003/pmk Bay St Louis MS
8-31-76 MAIN ENGINE TEST 003 ENGINE 003/pmk Bay St Louis MS
9-1-76 MAIN ENGINE TEST 028 ENGINE 002/pmk Bay St Louis MS
9-2-76 MAIN ENGINE TEST 029 ENGINE 002/pmk Bay St Louis MS
9-2-76 MAIN ENGINE TEST 004 ENGINE 003/pmk Bay St Louis MS
9-3-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/FITZ FULTON/pmk Edwards CA
9-8-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
9-9-76 JET STAR/SPACE SHUTTLE/SIMULATED LANDING/DON MALLICK/pmk Edwards CA
9-13-76 MAIN ENGINE TEST 030 ENGINE 002/pmk Bay St Louis MS
9-14-76 MAIN ENGINE TEST 031 ENGINE 002/pmk Bay St Louis MS
9-15-76 MAIN ENGINE TEST 005 ENGINE 003/pmk Bay St Louis MS
9-16-76 MAIN ENGINE TEST 032 ENGINE 002/pmk Bay St Louis MS
9-17-76 SPACE SHUTTLE ROLL OUT/pmk Palmdale CA
9-20-76 MAIN ENGINE TEST 006 ENGINE 003/pmk Bay St Louis MS
9-24-76 SHUTTLE FLIGHT INSTRUCTOR TRAINING/WITH T38/pmk White Sands Missile Range NM
9-27-76 MAIN ENGINE TEST 033 ENGINE 002/pmk Bay St Louis MS
9-28-76 FIRST FLIGHT OF NASA GULFSTREAM II/pmk White Sands Missile Range NM
9-28-76 MAIN ENGINE TEST 007 ENGINE 003/pmk Bay St Louis MS
9-29-76 MAIN ENGINE TEST 034 ENGGINE 002/pmk Bay St Louis MS
9-30-76 MAIN ENGINE TEST 008 ENGINE 003/pmk Bay St Louis MS
10-1-76 NASA GULFSTREAM II FLIGHT TO REFINE/TRAINING PROCURES/pmk White Sands Missile
10-1-76 MAIN ENGINE TEST 009 ENGINE 003/pmk Bay St Louis MS
10-4-76 MAIN ENGINE TEST 035 ENGINE 002/pmk Bay St Louis MS
10-5-76 MAIN ENGINE TEST 010 ENGINE 003/pmk Bay St Louis MS
10-6-76 FIRST 300 SECOND TEST/TEST 011 ENGINE 003/pmk Bay St Louis MS
10-7-76 MAIN ENGINE TEST 036 ENGINE 002/pmk Bay St Louis MS
10-7-76 SHUTTLE FLIGHT INSTRUCTOR TRAINING/pmk White Sands Missile Range NM

10-13-76 MAIN ENGINE TEST 037 ENGINE 002/pmk Bay St Louis MS
10-13-76 MAIN ENGINE TEST/FIRST 650 SECOND TEST/012 ENGINE 003/pmk Bay St Louis MS
10-13-76 FLIGHT OF NASA GULFSTREAM II/TRAINING PROCEDURES/pmk White Sands Missile
10-14-76 FLIGHT OF NASA GULFSTREAM II/TRAINING PROCEDURES/pmk White Sands Missile
10-15-76 WIND TUNNEL TEST #LA-89/pmk Moffett Field CA
10-18-76 WIND TUNNEL TEST/4th TEST TO MEASURE/pmk Moffett Field CA
10-20-76 WIND TUNNEL TEST/pmk Moffett Field CA
10-20-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
10-21-76 GRUMMAN GULDSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
10-21-76 WIND TUNNEL TEST/pmk Moffett Field CA
10-27-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
10-29-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-1-76 MAIN ENGINE TEST 013 ENGINE 003/pmk Bay St Louis MS
11-4-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-4-76 MAIN ENGINE TEST 014 ENGINE 003/pmk Bay St Louis MS
11-5-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-9-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-10-76 GRUMMAN GULDSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-11-76 MAIN ENGINE TEST 015 ENGINE 003/pmk Bay St Louis MS
11-17-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang
11-18-76 GRUMMAN GULFSTREAM II SHUTTLE/TRAINING AIRCRAFT/pmk White Sands Missile Rang

VIKING 1 & 2

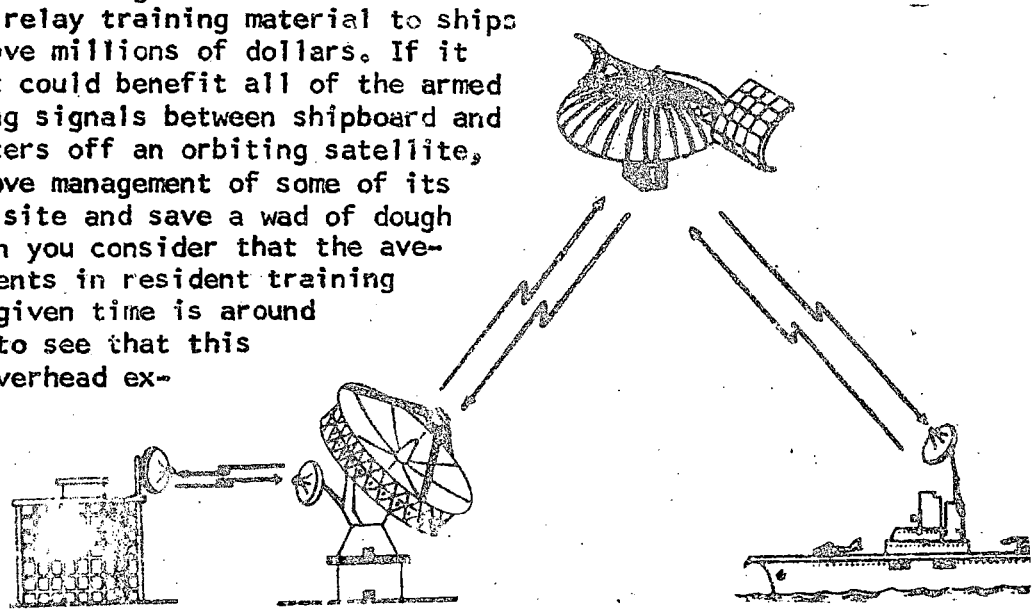
8-7-76 MARS ORBIT INSERTION VIKING 2/pmk Pasadena CA (JPL);Barstow CA (GDS; Kennedy Space Center FL (KSC); Lompac Vandenberg AFB CA; Mars PA; Madrid Spain (DSS-61,DSS-62,DSS-63,Communications); Gmund Austria

9-3-76 MARS LANDING VIKING 2/pmk Pasadena CA (JPL); Barstow CA (GDS); Tharaw Australia (HSK DSS-44); Greenbelt MD (GSC); San Juan PR (Arecibo Observatory) Lompac Vandenberg AFB CA; Kennedy Space Center FL (KSC); USPS CA 910 (Slogan cancel); Mars PA; Madrid Spain (MAD DSS-61, Dss-62, DSS-63, Communications); Patrick AFB FL; Smithsonia Sta DC; Moffett Field CA; Grand Bahama; Grand Turk; Viking NM; Agana Guam

7-20-76 VIKING 1 LANDING (not reported last time) Johannesburg South Africa(S-107); Tharwa Australia(D-101); Canberra City Australia (C-102); U.S. NAVY 17075BR (Exmouth Australia)

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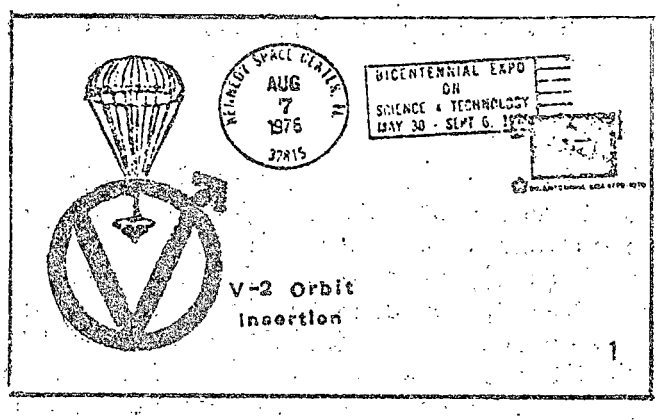
Navy researchers are checking on a "farout idea- using satellites to relay training material to ships at sea-that could save millions of dollars. If it proves practical, it could benefit all of the armed services. By bouncing signals between shipboard and training site computers off an orbiting satellite, the Navy hopes to move management of some of its training to the job site and save a wad of dough in the process. When you consider that the average number of students in resident training in the Navy at any given time is around 65,000, it is easy to see that this represents a hugh overhead expense- in the neighborhood of $624 million a year. NASA has offered the use of one of its satellites, but the Navy may decide to use one of its own already in orbit, and equipment they now have.

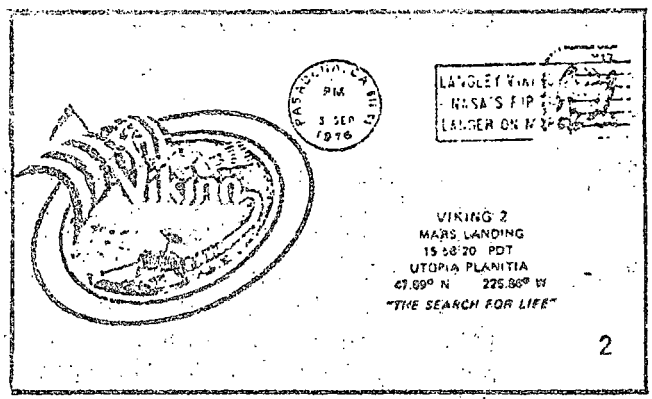


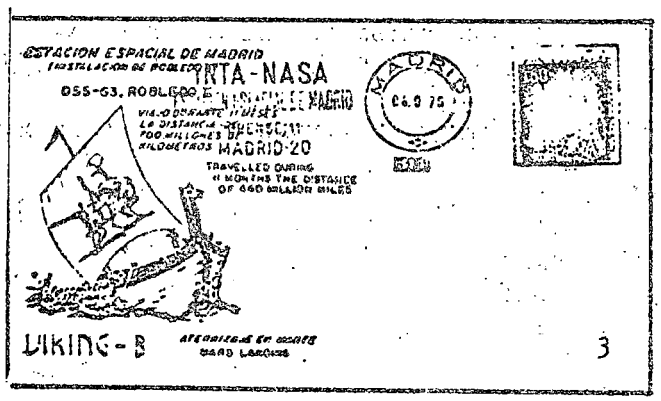
Cachets

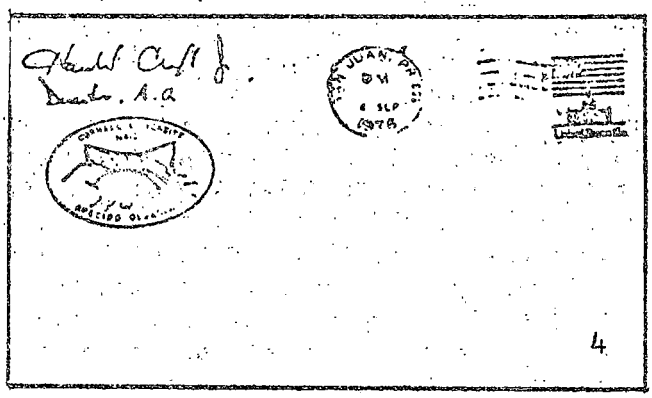
On this and the following pages are covers with cachets. If not stated the cachets and postmarks are in black. Listed is person or servicer of cover if not supplied by station or facility. Those people servicing covers have been listed many times and if address or information is needed, please send inquiry to the Editor with a SASE for information needed.

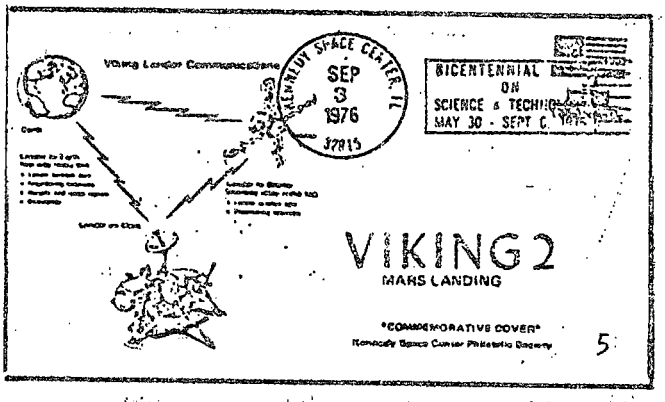
(1) for the Viking 2 orbit insertion with large cachet in red and name of event in blue and serviced by Havekotte. (2) for Viking 2 landing with a red, white, blue and yellow cachet from Gauthier of JPL Stamp Club. (3) another for Viking 2 landing and cachet is in burnt yellow and postmark in red, cover is printed and from Grandela. (4) is for Viking 2 landing and cachet is purple red from Arecibo Observatory with autograph of director. (5) for Viking 2 landing with printed cachet in red and blue, from the KSC Philatelic Society. (6) is a printed cachet and postmarked with Viking 1 and 2 planet Mars landing from the town of Mars PA, cover received from the postmaster and sponsor unknown.

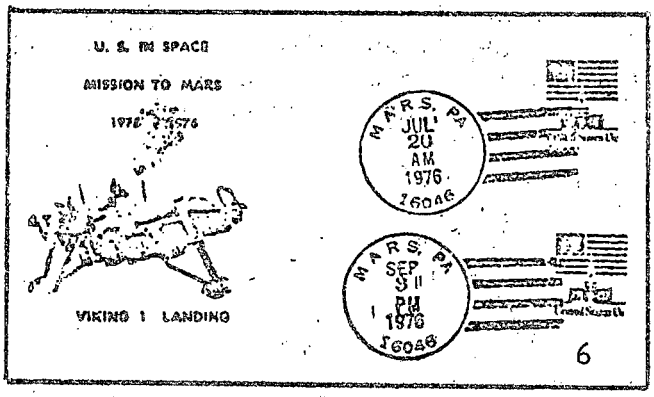


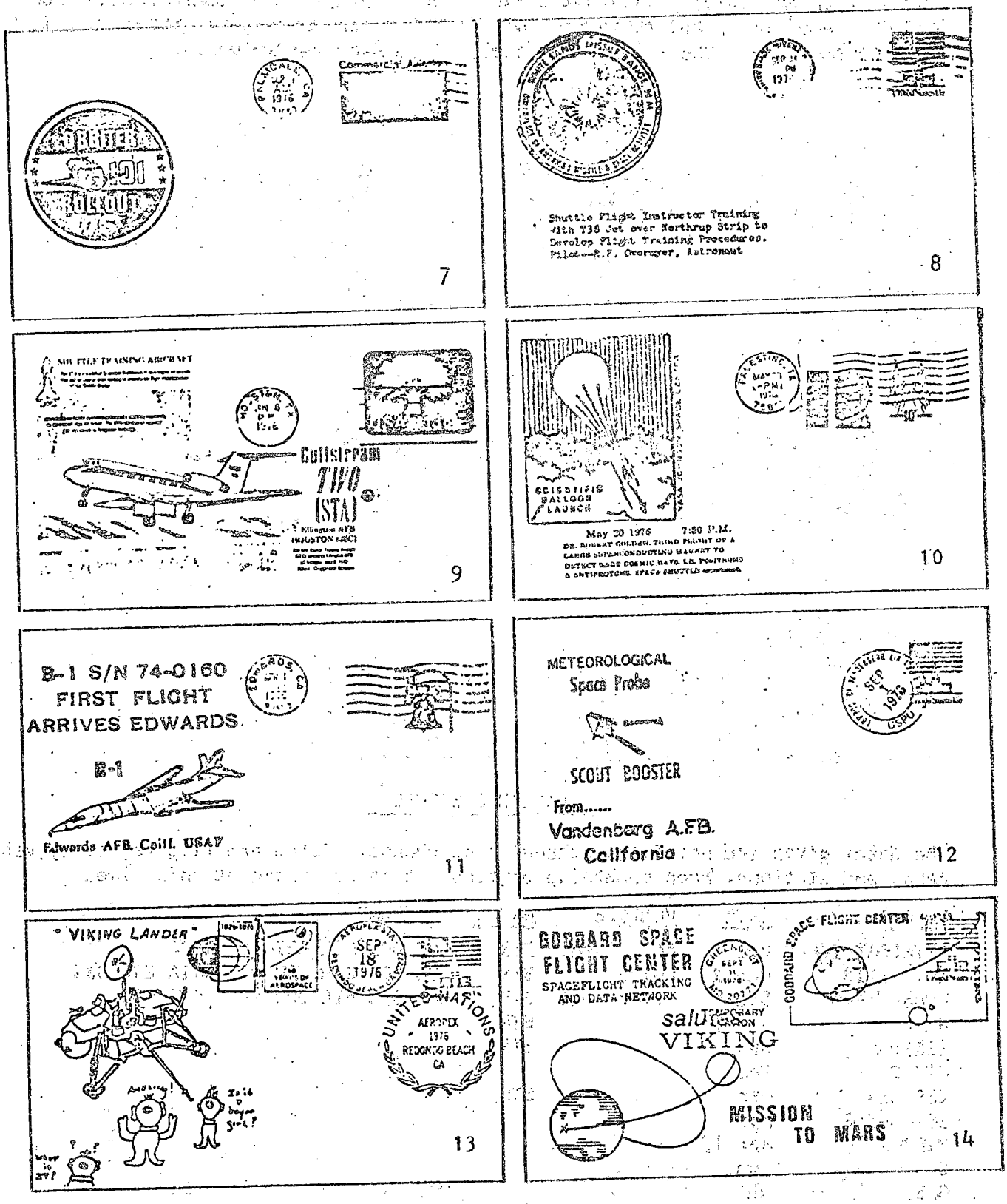






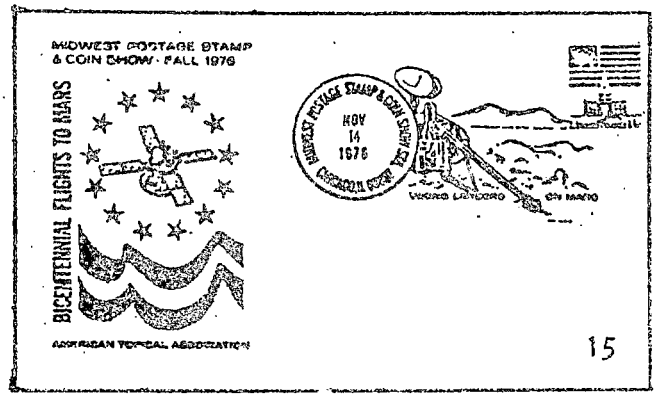


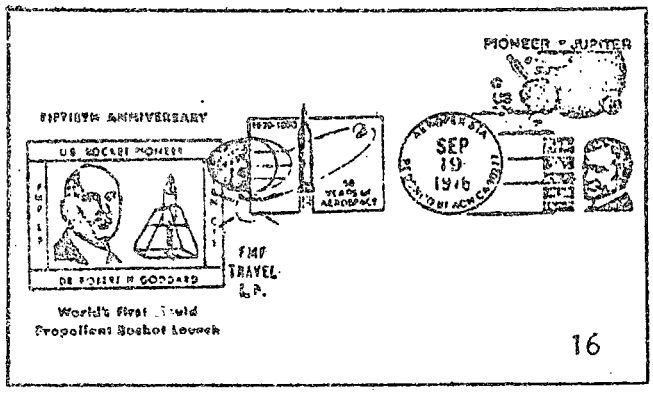


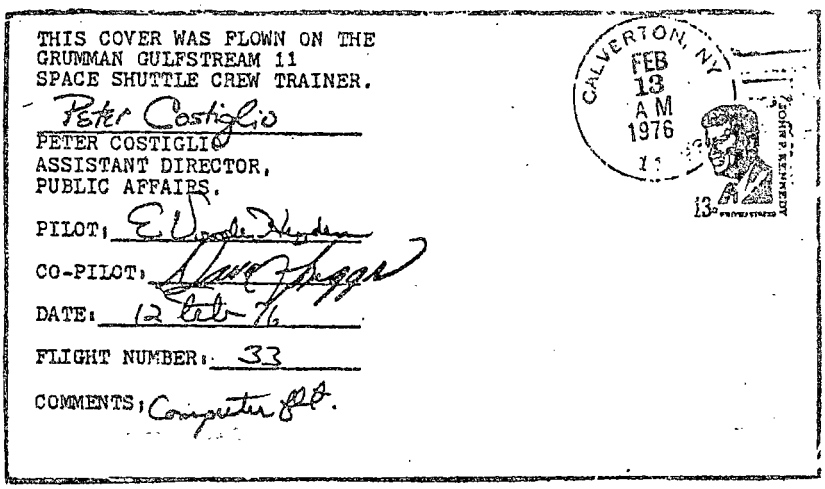


(7) for the rollout of the Space Shuttle at the Rockwell site at Palmdale California, cachet is in red, white and blue, cover by Rockwell Space Division Stamp Club. (8) for Shuttle Flight Instructor Training, cachet in blue and by Lovelady. (9) is for the crew training, cover in several colors, by Space Voyage from Bob Rank. (10) scientific balloon launch with picture cachet in green and words in red and by Mrs Ward. (11) for B-1 test with cachet in blue and red and by Bande Covers. (12) for Meteorological Space Probe with cachet in green and postmark in red and by Vandy Cover. (13) is more or less a novelty cover for Viking Landing with picture cancel and UN cancel, from Ed Isler. (14) from the Goddard Space Flight Center Stamp Club with a picture cancel, a salute to Viking.

(15) is printed cover by ATA for Viking and listed under trading & Selling page. (16) is 15th Anniversary of Wrold's First Liquid Propellend Rocket Launch from Joe Frasketi Local Post. Not numbered cover is from Sean Marsar, for Space Shuttle Crew Training and flown. The other is a sticker from Mars Pennsylvania.









LAUNCH SCHEDULE

The dates given are not firm, schedules do change. Listed are flights, date, vehicle, range and stations. When something omitted, it is not known at this time.

FLIGHT	DATE	VEHICLE	RANGE	STATIONS
INTELSAT IVA-C	Dec	Atlas Cent	ETR	ACN BDA MIL ARIA ETR GSC
NATO IIIB	Dec 2	Delta	ETR	ACN BDA GWM HAW MIL ARIA ETR GSC
COMSAT F-3	Dec	Atlas Cent	ETR	ACN BDA MIL ORR ARIA ETR GSC
GOES-B	Jan 77		ETR	
SIRIO-A	Jan		ETR	
FTS-2	Feb			
WESTAR-C	Mar		ETR	
ESRO-GEOS	Apr			
HEAO-A	Apr 15			
OTS	Jun			
GMS	Jul			
IUE	Jul			
METEOSAT	Aug			
MJS 77-A	Aug 17			
PALAPA-B	Sep			
MJS 77-B	Sep 4			
LANDSAT-C	Sep 25			
FLTSATCOM-1	Sep			
INTELSAT A-4	Sep			
ISEE-A	Oct 15			
ISEF-B	Oct 15			
CS FLTSATCOM-2	Nov			

Dear Collectors,

Some confusion prevailed from the notice in the last issue about some subscriptions running out and amount due for balance of 1976. The number 1 or 3 on the address label indicates mailing by 1st or 3rd class. Ishould have said the amount due would be in red. Received was amounts from 3¢ to $3.00 and some have been returned and the balance will be in the mail shortly.

In the last issue I was wanting someone to take The Dish over. A couple of years ago Bill York, president of IASP and publisher of the Explorer, and myself talked of merging the two publications. Bill once again suggested this, the problem, I would still have to make all material up. Until such a time when I can get out of this completely, The Dish will come your way only when time permits. This will probably be two or three times in 1977 and I am not setting a deadline, but when received you will know I am still active. I am not taking subsciptions for 1977, but when The Dish is received will let you know the cost (50¢,75¢ or $1.00) and each can send payment. As for those having a balance of over $1.00; will be refunded. For those under $1.00 will hold and let you know how we stand after first issue in 1977.

Most of the Dish readers belong to the IASP or the APA ATA Space Unit, one or both. From time to time material will be in the IASP Explorer. I would very much like to have the Space Unit Astrophile publish some material but since the new editor took over, the only material she will publish is my paid ad. The reason for mentioning this is for those inquiring as to why the Astrophile has not had anything from this writer.

Those receiving covers for the Space Shuttle engine tests at NSTL probably noticed the poor date in the machine cancel. Carol Noble has tried her best to have the Postmaster do something. In order to get some action on this write to Paul McMahon, Asst. Postmaster, Gulfport, Highway 49N, Gulfport, MS.

GOOD COLLECTING

Bob

xxxx

thrust engines built to date, including the F-1 and J-2 (Saturn/Apollo engines). In regenerative cooling, propellant is flowed through passages in the walls of the thrust chamber and returned to the injector to be burned with the balance of the propellant.

SSME's combustion chamber will be a slotted rather than a tubular design, using NARloy-Z, a Rocketdyne-developed copper alloy that is easily machined, has higher strength than pure copper, and very high thermal conductivity. The lower nozzle section features conventional tubular construction.

The engine incorporates a unique engine control system--a digital computer that monitors engine parameters such as pressure and temperature and automatically adjusts the engine to operate at the required thrust and constant mixture ratio. The system also records engine operating history for maintenance purposes to insure a flight-ready engine and extend total engine life.

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NASA CONTINUES TDRSS COMPETITION BETWEEN TWO CONTRACTORS

NASA has selected Western Union Telegraph Co., Upper Saddle River, NJ, and RCA Global Communications, Inc., New York, NY, for competitive negotiations leading to award of a single contract to provide Tracking and Data Relay Satellite System (TDRSS) services for support of Earth orbital spacecraft for a 10-year service period beginning in 1980.

TDRSS will consist of two specialized relay satellites in synchronous Earth orbit and ground terminal facilities located at White Sands, NM. These satellites will relay data, command and voice to and from spacecraft and the ground terminal.

This system will support spacecraft in Earth orbit up to at least 5,000 kilometers (3,100 miles) altitude. For this group of satellites, the system can provide coverage for 85 to 100 per cent of each orbit as compared to an average of 15 per cent for today's world-wide ground-based system.

The Tdrss spacecraft and ground station facilities will support all NASA Earth-orbital scientific, applications and manned spacecraft missions including the Space Shuttle, Spacelab and the automated spacecraft to be inserted in orbit by the Shuttle in the 1980s.

When fully operational, TDRSS will permit closing many of the government-owned ground stations and associated leased communication circuits now required for support of Earth-orbital satellites in the NASA Spaceflight Tracking and Data Network.

Portions of the ground-based system will be retained only for synchronous and higher elliptical altitude spacecraft orbit.

Goddard Space Flight Center, Greenbelt, Md., is responsible for management.

THE DISH
P.O. Box 295
Chicora, PA
16025 USA



MAILED

December 1, 1976

THIRD CLASS

TO--

Mark P. Hroben
156 Bacon Street 3
Rossford, OH 43460