



# NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
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## PIONEER V PROGRESS REPORT

Launch: 11 March 1960 080007 EST

Altitude 78.1 degrees  
Azimuth 92.9 degrees

Burn Out: Velocity 24,886 miles per hour or 36,499 feet per second.

Orbital Elements: Period 312 days  
Time to perihelion 152 days  
Eccentricity .104  
Semi major axis 0.899 A.U. or  
83.6 million miles  
Inclination of ecliptic 3.35 degrees  
Longitude of ascending node -10.3 degrees  
Argument of perihelion -2.6 degrees

Geocentric Phenomena: Superior conjunction 5 December 1962  
Inferior conjunction 19 January 1966

Helicentric Phenomena: Perihelion 10 August 1960  
Aphelion 13 January 1961

Distances:  
At perihelion, from Sun 74.9 million miles  
from Earth 46 million miles  
from Venus orbit 8 million miles  
from Venus 140 millions miles  
  
At aphelion, from Sun 92.3 million miles  
from Earth 84 million miles

Speeds:

At perihelion,	78,000 miles per hour
At aphelion ,	63,300 miles per hour
Earth mean speed	66,593 miles per hour
Pioneer V mean speed	68,750 miles per hour
Venus mean speed	78,403 miles per hour

At 1,000,000 miles for earth:

Time	about 2 a.m., 18 March 1960
Velocity	approximately 5,680 miles per hour
Time for signal to reach probe	5.4 seconds

Experiments:

Radiation

1. University of Chicago. Proportional counter telescope. Counts particles having minimum energies of 70 Mev for protons or 12 Mev for electrons.

2. University of Minnesota. Ion chamber and Geiger-Muller Tube. Results from these two instruments will provide information on incident particle flux and mean ionization per particle.

Magnetic Field:

STL. Combination search-coil magnetometer and aspect indicator. By using the output of a sun scanner (aspect indicator) to indicate vehicle rotational position at the time of maximum search-coil output, the direction as well as the magnitude of the components of the magnetic field normal to the vehicle spin axis can be determined.

Micrometeorite Measurements:

AFCRC/GSFC. Micrometeorite momentum spectrometer. The instrument determines the times of impact of micro meteorites and separates the momenta into two groups by establishing two threshold levels.

Transmitters:

For the first few weeks, a five watt transmitter operating on 378 mc cycles will be used. Then the five watt transmitter will become amplifier for a 150 watt transmitter which will be the sole radio contact.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

WASHINGTON 25, D. C.

Friday, 18 March 1960.

**PRESS CONFERENCE****PIONEER V PROGRESS REPORT**

The press conference was called to order at 1:54 a.m. by Mr. Herb Rosen, NASA, moderator.

**PANEL MEMBERS:**

**DR. KEITH GLENNAN**, Administrator, National Aeronautics and Space Administration.

**THE HONORABLE OVERTON BROOKS**, Member of Congress, Chairman, House Committee on Science and Astronautics.

**DR. JOHN LINDSAY**, Project Officer for the Pioneer V Project.

**ED CORTRIGHT**, Assistant Director of Lunar and Planetary Programs, Office of Space Flight Programs, NASA.

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DR. GLENNAN: Ladies and gentlemen: I will concede that 2:00 a.m. is an unusual hour for a press conference, but we think the significance of this occasion warrants special observance.

Briefly, in a few minutes the United States interplanetary probe Pioneer V, launched last Friday morning from Cape Canaveral, Florida, will be 1,000,000 miles from Earth. We will command a radio transmission from South Point, Hawaii, which is to turn on Pioneer V's 5-watt transmitter to mark another milestone in space to earth communication. If all goes well, we will hear the probe's reply here in Washington.

But first let me tell you of Pioneer V's progress. The probe will fly closer to the sun than any man-made object has ever flown -- within 74.9 million miles of the sun -- and within 8,000,000 miles from the orbit of Venus. It is exploring the 26,000,000 mile gap between the orbits of Earth and Venus.

Tracking stations in the United States, England and Malaya have received approximately 14 hours of telemetered data. The probe's transmitter is being commanded on 4 to 5 times a day for 15- to 30-minute transmissions. The signal strength has been good. Instrumentation aboard the 94.8 pound probe appears to be working well.

Data received to date indicate the internal probe temperature is running about 75 degrees Fahrenheit. External temperatures on the solar cell paddles are about 27 degrees Fahrenheit. These readings are well within the design criteria.

To sum up, we here in NASA are very pleased with Pioneer V, and I also want to cite and commend our colleagues in this program: The Air Force Ballistic Missile Division, which furnished technical assistance; the Space Technology Laboratories, Inc., which provided design and systems engineering; the University of Chicago and the University of Minnesota, and a lot of other groups in science, in industry, and in Government. To all of you: well done!

And now, hello, Hawaii. Proceed to interrogate Pioneer V at 0700 Greenwich Mean Time.

VOICE: This is Span Center calling Hawaii. You will proceed to operate Pioneer V at 0700 GMT. You will operate the 5-watt transmitter at one pulse per second. Your command will be 0-7. Your azimuth will be 239.035 degrees. Elevation 19.105 degrees.

Range, from your station, will be 1,002,740 statute miles.

You will turn on your ground transmitter at 0659 GMT. It is now 0658.

It is now 20 seconds to turn on.

Turn on the Bell transmitter. On my mark turn on ground transmitter.

Mark.

Ground transmitter is now on.

Are you receiving the signal in L.A.?

VOICE: Yes, we are.

DR. GLENNAN: We are receiving it in Washington loud and clear.

VOICE: What is your signal strength?

VOICE: Minus 147 dbm. It came up a little about minus 146.

VOICE: Continue sending signals to L.A.

DR. GLENNAN: I would like to introduce to you Dr. John Lindsay, who has been our chief scientist, the NASA chief scientist on this project.

John?

DR. LINDSAY: Thank you.

You notice that when the received signal was first placed on the line that there was a background noise. This might be called cosmic noise. The reason for that is that

in transmitting the signal there is a delay due to the time it takes for the transmitting signal to reach the Pioneer V payload and for it to respond, and the signal to be transmitted back to the Earth.

I understand it takes about 5.4 seconds each way. Each transmission is about 25 minutes long. So the one that was initiated just a few minutes ago will continue for about 25 minutes.

Hawaii will be reducing the data that has just been received, and very shortly it will be transmitted to Washington and will be presented to you in just a few minutes.

The data will consist of the cosmic ray counts from the University of Chicago and the University of Minnesota experiments, Goddard Space Flight Center micro-meteorite experiment, Space Technological Laboratories magnetometer experiment, and some internal temperatures. I don't know whether they will be able to supply reduced data on all of these experiments in the next few minutes or not. We anticipate that they will be able to reduce some of it in the next few minutes.

I would like to say a word about some of the scientific possibilities of this payload.

We are exploring the part of space that has been unavailable to us before. It is possible, with the experiments aboard, to determine the time of flight of cosmic ray particles from the sun to the Earth, the idea being that since this payload is closer to the sun than the Earth, the payload will encounter them at a certain time and we can measure the delay.

Of course the other point that I mentioned was that this is an experiment that may establish where cosmic rays come from. If they are from the sun we should be able to determine that.

In this interplanetary space it is anticipated that the payload will encounter some plasma clouds, drifting clouds of charged particles. If this is the case we should be able to detect it, measure the particle flux in these plasma clouds, and also have measurement of the magnetic fields.

One of the other points is that during the solar cycle -- as you know there is an 11 year solar cycle, the solar activity being more intense at some times than others -- it has been observed on the Earth that the cosmic ray background decreases from solar maximum. We have just been passing through a solar maximum. By getting outside the influence of the Earth it will be possible to determine whether this cosmic ray decrease is due to some effect associated with proximity to the Earth or whether it is actually a decrease in the particles emitted by the sun.

One other point. It has not been established whether the high energy particles measured in the radiation field arrive from the sun with high energies or whether they are accelerated by some process in the Earth's magnetic field.

Pioneer V should be able to answer the question whether high energy particles are emitted by the sun.

I believe that that is all that I have to say.

QUESTION: Dr. Lindsay, I believe you mentioned that the decoding would be done in Hawaii, at South Point Station. I was wondering if I just heard wrong. I thought I heard something from Los Angeles, that they were going to have the signal transmitted there and do the decoding?

DR. LINDSAY: Standard procedure is that the raw data would be transmitted to Los Angeles, and they reduce the data. For this particular occasion I think that they are using the instrument in the field to read the data off as they come in, and transmit directly to us. If they do otherwise we would be here for quite awhile.

QUESTION: "In the field" being at South Point this time?

DR. LINDSAY: Right. This was the information that I have.

QUESTION: How many channels of data are coming through?

DR. LINDSAY: I don't quite know what you mean by channels.

QUESTION: Will they be modulating the 163 megacycle signal?

DR. LINDSAY: 378, yes. It is supposed to be that, approximately. This is an additional system.

MR. ROSEN: We have the data from the last transmission.



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DR. GLINNAN: I am going to ask Congressman Overton Brooks, whom you all know as Chairman of the House Committee on Science and Astronautics, to read back the first information received from somewhat over a million miles in space.

MR. BROOKS: Dr. Glennan and friends. Here are the data just received and given to me from a million miles out in space, transmitted through Hawaii and Los Angeles to here. It is technical and I will read it very slowly.

Computed results from data just received:

Cosmic ray experiments: There are two counts from the University of Chicago. One count is 374; the other count is 569.

There are two counts likewise from the University of Minnesota. Count 1 is 49, steady; the other is 149, steady.

Here are the results from the micrometeorite experiment: light impacts, 87; heavy impacts, 5.

The temperature in the payload is 63 degrees Fahrenheit; the solar cells temperature is 27 degrees Fahrenheit.

The magnetometer is functioning satisfactorily.

Those are the first data just received from this vehicle a million miles out in space.

I want to say here -- because I am Chairman of the House Committee on Science and Astronautics -- that this is an historic occasion. The results achieved here at this hour are really fantastic. It is almost unbelievable, for this is the first time in all history that sound has been transmitted a million miles and then a reply has been received. And not only sound transmitted, but intelligible sound transmitted in the way of messages.

This means, to my mind, there is no such thing any more as distance, and there is no such thing as space when you can transmit messages at that great distance.

This means to me, as a Member of Congress, as Chairman of the House Committee on Science and Astronautics, substantial progress is being made in our space program, and I am sure that the Members of Congress, generally, will feel

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I wish to say for Dr. Glennan and NASA: Many more successes in the future of this character and this magnitude. I want to congratulate Dr. Glennan and NASA, and Dr. Lindsay, who has parented this particular project, for the magnificent results obtained, and I know the American people are going to be literally thrilled by the results given them by the press, radio and television in the morning.

MR. ROSEN: Gentlemen, if you wish we will throw the floor open to questions and answers.

Let me repeat them so everybody can hear them.

QUESTION: Would you ask somebody to give us a quick meaning of these counts on the cosmic rays?

MR. ROSEN: May we have what the counts mean?

DR. LINDSAY: The storage system in the payload is an accumulator, very much like your automobile mileage indicator, your odometer. This is the total number of particles detected.

Let me clarify that. It is not necessarily the total. It is the total that is in the accumulator at this time. The accumulator resets after the number 1024 setting. That is the largest number that you can store. So after reading 1024, it resets. So this is the total number that is in the accumulator.

For this to mean anything scientifically you should take the difference between this and the last number that has been measured, because that represents the number of particles that have been detected.

It is a measure of the particle flux.

QUESTION: Is it remarkable, different, startling, or what?

DR. LINDSAY: I have talked to the University of Minnesota and the University of Chicago this evening, and they are very well pleased with their equipment. It is functioning perfectly.

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As far as there being any startling scientific discovery at this time, no one is in a position to say, because reducing the data is a long drawn out affair.

They have correlated quick-look data with that which was obtained on Explorer VI. They correlate very nicely. In fact, within two percent of each other for the two experiments.

QUESTION: Do you think these are cosmic ray counts? Or what are they?

DR. LINDSAY: I am not in a position to answer that right now. They may be. They may be due to the kind of measurement I mentioned a while ago. You may be going through a plasma field with particles. I don't think we are going to know until we have really made a carefully analysis of the results.

QUESTION: Is this micrometeorite count unusual, heavy, or low?

DR. LINDSAY: It is about what one should expect.

In other words, it is no different at that distance than in close.

QUESTION: Are all four of the paddles, or vanes, in position? Is that knowledge known?

MR. ROSEN: The question is, Do we know that all the paddlewheels are in position?

DR. LINDSAY: Let me make a statement. In the checks that I have made, there is no deficiency in this payload that is known. There is some question about the magnetometer experiment, but it is suspected that the spin axis of the payload is pointing toward the sun, so the photo tube that detects phase is not able to see the sun. At a later time as it proceeds around its orbit they think that it will be able to see the sun and function properly. Of course one of the first questions I asked after launch was How is the charging rate on the batteries, because we did have some difficulties you know with Explorer VI.

It appears that if anything it is a little better than normal.

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QUESTION: I remember when it was launched it was said at one point that two of them were definitely in position.

DR. LINDSAY: This is correct. The reason that this statement was made was the one of the paddles, when it locks up, turns on the 5-watt transmitter during launch. The transmitter came on.

One of the other paddles arms separation. Separation of the third stage payload was by radio command. Separation would not have occurred if the paddle did not lock up. So we are sure, even at the early moments after the launch, that these two paddles had locked up.

The only way of ascertaining how the others were working was to examine the charging rate on the batteries. This has been done and it was reported to me that the charging rate is above normal, slightly, which means that the solar power supply is working very well.

MR. ROSEN: Are there any more questions?

Thank you very much, Gentlemen.

(Whereupon, at 2:25 a.m., the Press Conference was concluded.)