

Epilog

NOVEMBER 16, 1971: Pioneer 10 gleamed under the brilliant lights of an artificial Sun in the harsh vacuum of the space simulator at TRW Systems, Redondo Beach, California. The spacecraft was in final test before being shipped to the Kennedy Space Center at the end of December. A group of science correspondents from the national press who were in Los Angeles for the arrival at Mars of the first orbiter spacecraft, Mariner 9, were at TRW Systems for a briefing on Pioneer. After being briefed by project management and principal investigators they had been invited to see the spacecraft under a test that was simulating conditions at six astronomical units from the Sun (figure E-1).

I was among those correspondents. When I looked at Pioneer through the portholes of the simulator, I suddenly became aware that this small but intricate machine would actually leave our Solar System. In

several earlier books I had developed the idea of sending probes to search for planets of other star systems. Now I visualized how Pioneer 10 escaping from the Solar System would become mankind's first emissary to the stars. I thought of the importance of the spacecraft carrying a special message from mankind. Not the name of a president, or the names of politicians, or even the name of the fabricator of the spacecraft, all of which are quite meaningless in a cosmic context. Instead it should carry a message that would tell any finder of the spacecraft a million or even a billion years hence that planet Earth had evolved an intelligent species that could think beyond its own time and beyond its own Solar System.

The few people with me on the platform of the simulator did not see the importance of the idea when I mentioned it to them. But a little later at lunch I mentioned the idea to Richard Hoagland, a freelance

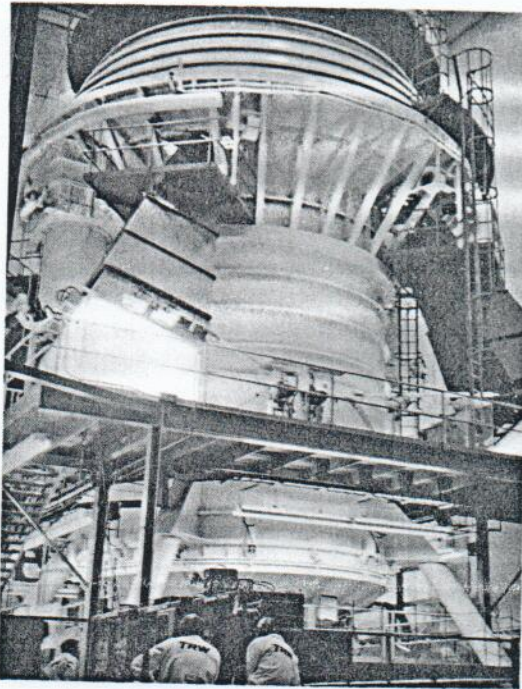


Figure E-1: Space simulator at TRW Systems, Redondo Beach, California in which the Pioneer spacecraft were tested before embarking on their endless journey into space.

(TRW Systems)

writer, and to Don Bane, then with the *Los Angeles Herald-Examiner*, and they enthusiastically agreed on the need for such a message.

But how to get it on the spacecraft? Obviously if a few science writers approached NASA they would be unlikely to convince the right people that a message should be placed on the spacecraft. So who could do this?

A few days earlier I had dined with Carl Sagan at the home of Merton Davies, who was entertaining a mutual friend from England, Charles Cross. Carl had related his experiences when he and Frank Drake had attended an international conference in the Crimea to design a radio message suitable for transmitting to extraterrestrials. Obviously, I thought, Sagan

and Drake are the two people who are the most likely to be able to get the message on the spacecraft.

So with Hoagland I approached Carl, who was still visiting the Jet Propulsion Laboratory, Pasadena, in connection with Mariner 9's mission to Mars. Carl's eyes lit up as I explained the idea to him. With his usual enthusiasm he then talked with Frank Drake, who was also enthusiastic about the idea. The two of them designed a message, and Linda Salzman Sagan prepared artwork for a plaque to carry this message. The idea was then presented to the National Aeronautics and Space Administration. I heard nothing further about the idea until mid-December, when I was in Boston appearing on a panel with Bob Cowen of the *Christian Science Monitor* and Homer E. Newell, NASA Associate Administrator for space sciences. Homer told me that the plaque was on the spacecraft but there would be no publicity until the launch. Here I was with a story of mankind's first message to the stars and unable to publish! But it was wise to keep the plaque a secret, as some of the antiplaque stories that erupted later showed. Actually, when the story finally broke it proved to be one of the most widely used stories about a spacecraft, generating thousands of articles.

The plaque design was etched into a gold-anodized aluminum plate, 6 by 9 inches, and 0.05 inches thick. The plate was attached to the antenna support struts of the spacecraft in a position where it would be shielded from erosion by interstellar dust (figure E-2).

When Pioneer 10 flew by Jupiter it acquired sufficient kinetic energy to carry it completely out of the Solar System. About 40,000 years hence it will reach the distance of the nearest star, heading in the direction of the constellation of Taurus, the Bull. Somewhere between one and ten billion years from now it may pass through the planetary system of a remote stellar neighbor, one of whose planets may have evolved intelligent life. If that life possesses sufficient intelligence to detect the Pioneer spacecraft—needing a higher technology than mankind