

A Challenger Replacement and Other Changes

Three major space program decisions announced in a four-day span have grown out of the series of launch mishaps that began with the Jan. 28 explosion of the space shuttle Challenger. The decisions range from the merely nuts-and-bolts variety to one that bears on what for more than a quarter-century has been a fundamental part of the U.S. civilian space program. Yet all underscore a common point: that the trip back to space is both long and far from its end.

First came the word last week from engineers at NASA's Marshall Space Flight Center in Huntsville, Ala., that a leading method had been selected for the redesign of the shuttle's solid rocket motors, whose O-ring seals had been blamed for the loss of Challenger and the seven people in its crew. The second decision was then handed down by President Reagan himself, who declared, after months of waiting by NASA officials and others, that a fourth shuttlecraft would be built as Challenger's replacement. And at the same time, Reagan announced, "it has been determined . . . that NASA will no longer be in the business of launching private satellites."

This last, in a way, was the most momentous of all, since the redesign of the shuttle was virtually a foregone conclusion and the President's oft-repeated goal of having a U.S. space station would presumably make the shuttles a necessity even if there were not a backlog of military and civilian satellites awaiting trips into orbit.

At the same time, however, Reagan in effect recast the shuttle disaster into an occasion to further another of his particular space passions, the increased participation of private industry. "NASA and our shuttles," he said, "can't be committing their scarce resources to things which can be done better and cheaper by the private sector. Instead, NASA and the four shuttles should be dedicated to payloads important to national security and foreign policy, and, even more, on exploration, pioneering and developing new technologies and uses of space. NASA will keep America on the leading edge of change. The private sector will take over from there."

About two and a half years ago, Reagan designated the Department of Transportation as the lead agency to facilitate the development of a commercial launch industry. This week Transportation Secretary Elizabeth Dole held a press briefing only three days after Reagan's announcement, in which she spoke of "eliminating the government monopoly in space." Even before the Challenger accident, she said, the "highly subsidized shuttle sys-

tem" had already "forced U.S. companies into a losing contest against their own government for launching routine communications satellites."

Also on the heels of Reagan's announcement, an official from General Dynamics, a major launch-vehicle manufacturer, noted that the firm had been approached by seven companies about launch possibilities that could involve as many as 20 to 25 satellites. Similarly, Dole said that Martin Marietta, another rocket builder, had gotten "formal requests" for 21 launchings. She added that Transpace Carriers, Inc., a firm with marketing rights to the McDonnell Douglas Delta rocket, has launch contracts for two.

Even so, plans to build a replacement for Challenger as well as to encourage launchings by private industry still leave many uncertainties for some previously scheduled satellites, as well as for a variety of scientific spacecraft programs whose launch plans had been thrown into a tizzy by 1986's launch failures. Referring to the 44 launches for which NASA had previously made commitments, NASA Administrator James Fletcher said this week, "There's no way we can possibly launch that many." A more likely number, at least by 1992, is perhaps 15, accord-

ing to some administration officials.

A variety of special problems confront NASA's space science missions. The Galileo orbiter and probe of Jupiter, for example, uses a radioisotope-powered generator, and was to have been sent on its way from earth-orbit by a Centaur rocket that burns the same kind of liquid hydrogen that "powered" the Challenger blast. Neither technology is now likely to be carried aboard the manned shuttle, so mission officials are studying a variety of alternatives such as unmanned rockets for launching and gravitational assists from earth and Venus to set the craft on course to Jupiter.

Also awaiting launch is NASA's billion-dollar Hubble Space Telescope (see story below), which is often described as the most expensive scientific instrument ever built and which is dependent on the shuttle. Elsewhere in the wings are the Magellan Venus radar-mapper, which had been planned for use with a Centaur upper-stage rocket, and the still-in-the-works Mars Observer, first in a planned new series of spacecraft that is foreseen as being adapted for a variety of missions. All face uncertain futures, each adding further questions to a list that is far from complete. — J. Eberhart

A stellar opportunity for amateurs

Attention amateur astronomers: Bring out your best ideas for stargazing, and you may get to try them on the space telescope.

Riccardo Giacconi, director of NASA's Space Telescope Science Institute in Baltimore, is offering part of his time on the Hubble Space Telescope (HST) to a few amateur astronomers. The idea, he says, is not only to reward amateurs for their contributions to astronomy, but also to allow the HST to benefit from good amateur ideas.

"At long last, there seems to be recognition by the professional community of the contributions amateur astronomers are capable of," says George D. Ellis of Ft. Worth, Tex., president of the Astronomical League, the largest U.S. amateur astronomy association.

At least since the late 18th century, when orchestra conductor William Herschel discovered Uranus, amateurs have been making substantial contributions to astronomy. Today, thousands of amateurs around the world look for stars that vary in brightness, measure star sizes, observe asteroids passing in front of stars and look for unknown stars, supernovas and other objects.

The time Giacconi donates may be anywhere from a few minutes to a few hours, depending on the amateurs' ideas, according to Laura Fournier of the Space Telescope Science Institute. It will come from Giacconi's "discretionary time" (15 percent of the director's total allotment).

Although the space telescope is unlikely to fly until at least mid-1988, Giacconi intends to select the winning amateurs by December of next year. He has called together a working group of representatives from seven amateur astronomy associations to solicit proposals and recommend the top five, from which he will choose up to three.

"The exciting part of this project is that it really will stretch the creative thinking of the public at large," says Janet A. Mattei, director of the American Association of Variable Star Observers in Cambridge, Mass.

Application kits are to be mailed out beginning in October. To request one, mail \$1 to HST Amateur Astronomers Working Group, c/o American Association of Variable Star Observers, 25 Birch St., Cambridge, Mass. 02138.

— M. Murray