

# The Satellite Sale: Another Dose of Reality

*Congress and the business community are skeptical, but the Administration forges onward; meanwhile, Landsat 4 is dying*

The Reagan Administration's controversial plan to sell the Landsats and weather satellites to the private sector could cause a hiatus in U.S. remote sensing in the late 1980's—just when other countries will be launching their own versions of Landsat. That prospect, the result of the impending demise of Landsat 4 and the Administration's decision to cancel government development of several future Landsats, could derail the satellite sales (*Science*, 11 February, p. 752; 25 March, p. 1410). The Commerce Department's Land Remote Sensing Advisory Committee is already sufficiently alarmed that, at a meeting on 29 July, it urged the Administration to start building an advanced Landsat immediately.

A critical factor in all this is the fast-failing health of the year-old Landsat 4 (formerly known as Landsat D), the only such satellite now operating. John H. McElroy, head of satellite services for the National Oceanic and Atmospheric Administration (NOAA), reviewed for the committee the three major breakdowns that Landsat 4 has suffered since February:

- The communications and data handling module has failed; commands from the ground are now sorted and routed by a backup.

- The x-band antenna has failed. As a result the satellite's advanced experimental sensor, the Thematic Mapper, has been unable to transmit its imagery to Earth since March (*Science*, 11 March, p. 1200). In principle the mapper could transmit via the new Tracking and Data Relay Satellite, but that spacecraft has only recently limped into place in geosynchronous orbit and is still undergoing checkout. Even when it does become operational, radio traffic for upcoming space shuttle operations will take precedence.

- The cables that bring power from the solar panels to the Landsat spacecraft proper are progressively deteriorating, with two of the four panels already inoperable. This leaves just enough power to run the satellite's Multispectral Scanner, an older-style imaging system that is cranking out scenes at a high rate for the Landsat user community. However, McElroy expects a third panel to fail by October.

"The end is in sight," he said. He hopes to use Landsat's last sputter of power to bring it down to a lower orbit for later repair or retrieval by the space shuttle. However, since Landsat is in a polar orbit such a rescue mission would have to be launched from Vandenberg Air Force Base in California, which means 1986 at the earliest.

Meanwhile, said McElroy, it appears likely that NOAA will get the funds to move up the launch of Landsat 4's successor, Landsat D', from 1985 to March 1984. (The design flaws that led to the earlier failures have been identified and are being fixed in Landsat D', he noted.)

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## There is growing consensus in Congress that the weather satellite sale is a bad idea.

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This shortens the immediate gap in the data stream to about 6 months. However, because the later Landsats in this series (Landsats D'' and D''') were canceled in the 1981 budget exercise, shortening the data gap now opens up a longer gap later.

"If we launch D' in March and get a full three years out of it," said McElroy, "the end of service will come roughly in March 1987." If, however, the Administration sticks to its current commercialization schedule, and if the new operator takes the typical 4 years to build a new spacecraft, then a successor to Landsat D' will not be launched until about October 1988—an 18 month gap. As it happens, this gap will come at a time when the French will be flying SPOT, a heavily subsidized competitor to Landsat. The Japanese are also hard at work in the field. As McElroy finished his presentation, the prospect of the United States once again losing out to high-tech foreign competition lay heavy in the air.

"A net 2 year gap!" exclaimed chairman Michel T. Halbouty of Houston, who specializes in interpreting Landsat data for oil and mineral companies, and who called this meeting to get the committee on record as urging the government to start work on a Landsat D'.

"We should do whatever we can to get

D' going," he declared. "The cost could be transferred to industry later if the system is commercialized." But somebody, he said, has got to start cutting hardware now. He also wondered anew why the government could not continue to operate the satellites indefinitely and simply commercialize the data distribution system, as his committee recommended originally.

Halbouty got his recommendation on Landsat D' and, since he and many of his committee members are well connected in Washington, the action should carry considerable weight. However, it is less clear what effect the committee will have on the administration's commercialization plans for the land and weather satellites. The schedule is already set. The Commerce Department is now drafting the request for proposals, which will be formally issued in November; replies are due by February; the Commerce Secretary will decide by May whether the results justify going ahead; and the transfer, if he approves it, will take place in October 1984.

But Halbouty's committee is a gathering of businessmen, and on 29 July their skepticism was apparent. Quite aside from wondering why anyone would want to buy a system with Landsat 4's track record, they were disturbed by some profound ambiguities:

- Air Force Colonel Quentin Wilkes told the committee that the government would reserve the right to review and perhaps deny any improvement in sensors that could jeopardize national security—for example, any improvement in resolution to below 10 meters or so. Committee members responded with some heat that, given the existence of international competitors, this could either drive an American operator out of business or else drive him overseas.

- Lisle Rose of the State Department told the committee that the government would have to approve any new Landsat ground stations overseas. "What if an operator wanted to put a station in an eastern bloc nation?" he asked. "There could be technology transfer problems"—to which committee member Donn Walklet, president of Terra Mar, Inc., replied, "You can't make a livelihood in this business just in North America. You have to go international. If I

have to put up with these uncertainties, then I don't even want to get into it." The committee pointedly added a recommendation that the government not review and regulate any private Landsat operators to death.

[It should also be noted that the Administration has just recently, after a bitter internal fight, agreed to continue the century old tradition of the free international exchange of weather data—even if it requires a government subsidy to a private operator of the weather satellites. This effectively undercuts any market for specialized weather services in this country, since the data will be available free in Canada and Mexico.]

• Few potential satellite operators show much enthusiasm for sinking \$1 million or so into a proposal when Congress and the Administration have still not made up their minds about the rules of the game—and could change the rules at a stroke. The Administration, however, does not plan to start talking legislation with Congress until next April, some 2 months after the proposals are due.

Indeed, even as the Halbouty committee met last week there were people on Capitol Hill already fuming over this very point. The Commerce Department recently told Congress that it needed to reprogram \$1 million this year to work on the Request for Proposals. The House appropriations subcommittee on commerce, under Representative Neal Smith (D-Iowa), wrote back and said "No," not until Commerce submitted legislation for the transfer. The subcommittee did allow \$350,000 for determining the value of the existing satellites and ground facilities, however.

Commerce replied in effect, "We aren't asking you; we're *telling* you." The department is spending the \$1 million accordingly.

As one staffer drily put it, "This is an unusual way to proceed." While the tiff hardly makes for a constitutional crisis, it does give impetus to the growing consensus on Capitol Hill that the sale of the weather satellites is a bad idea. Few Democrats on the relevant committees seem to support it; their Republican counterparts seem willing to let the Administration go through the request for proposal process, but only as a prelude to withdrawing gracefully.

On the other hand, there is no congressional consensus yet about the virtues of a Landsat sale. However, members and staff do largely agree that insuring data continuity is crucial to the process—which is exactly the point that Halbouty's committee was trying to make.

—M. MITCHELL WALDROP

## A Push for Animal Welfare Bills

Animal welfare groups are certainly making their presence known this year through a variety of lobbying efforts and publicity, and legislators seem to be paying more attention. The result is that a hodgepodge of federal and state legislation has been introduced with some provisions that many in the biomedical research community find onerous.

On Capitol Hill, there are two leading proposals. One, introduced by Senator Robert Dole (R-Kans.) has drawn fire from the Association of American Medical Colleges (AAMC) and others who claim it could lead to federal interference in the laboratory. Christine Stevens, a leader among animal welfare groups, is largely responsible for the bill.

The provision that has caused the most consternation states that the Secretary of Agriculture "shall promulgate standards for research facilities, including proper requirements for animal care, treatment, and methodology in experimental procedures to ensure that animal pain and distress are minimized." It is the word methodology, AAMC and others argue, that can create mischief because it might be interpreted to mean that the Agriculture Department could regulate protocols of federally funded researchers. Dole has said he had no such intention but researchers are not reassured.

To head off the Dole bill, biomedical groups have thrown their support behind legislation proposed in the House and Senate that requests the National Academy of Sciences to conduct an 18-month study evaluating the current use of animals in research. The proposal is incorporated into the reauthorization bills for the National Institutes of Health (NIH) and was introduced by Edward Madigan (R-Ill.) in the House and Orrin Hatch (R-Utah) and Edward Kennedy (D-Mass.) in the Senate. (The House NIH bill also includes an authorization of \$20 million over 3 years to study alternatives to the use of animals in experiments.)

The future of the various proposals is unclear because the NIH bills are currently caught in a politically volatile fight, particularly in the House. Madigan and James Broyhill (R-N.C.) plan to introduce substitute legislation for the NIH budget bill which does not include any animal welfare proposals, even the Academy study. Dole may also cause a delay in the Senate's consideration of the NIH bill because he may try to add his proposal to the legislation and push for a 6-month Academy study.

Animal welfare groups have been active in state legislatures as well. Officials and scientists at Stanford University and the University of California are currently trying to counter a proposal that would ban the use of pound animals in state-funded research and ban the transportation of pound animals across state lines. The legislation was introduced by David Roberti, a Democrat from Hollywood, whose position as Senate President Pro Tem eased passage through that chamber. The bill must now go before two more committees and the full assembly for approval. The universities say it has a good chance of passing.

Last week the schools held a joint press conference to try and break the momentum of growing public support for the bill. Julius Krevans, chancellor of the University of California at San Francisco warned that the bill would disrupt research and drive up its costs. Norman Shumway, Stanford's renowned heart transplant surgeon, credited the bill's success to the "pleas of Hollywood persons who know nothing about research." Eight states already have laws barring the import of pound animals for research, including New York, Pennsylvania, Rhode Island, and Connecticut.

In a separate but related issue, Defense Secretary Caspar Weinberger told the military's medical school and other defense research centers to heel when news broke that dogs were to be shot so medical students and other scientists could study gunshot wounds. Plans for the experiment were publicized by an animal welfare group. The Uniformed Services University of the Health Sciences, located in Bethesda, Maryland, has built a \$70,000 firing range in which dogs, pigs, goats, and monkeys would be anesthetized, suspended in slings, shot with high-speed bullets, studied and then put to death. On 28 July, Weinberger announced a halt to the planned experiments until the matter is investigated.—MARJORIE SUN