What Price Privatizing Landsat?

Reagan's free market science policy could soon produce a land and weather satellite monopoly—on COMSAT's terms

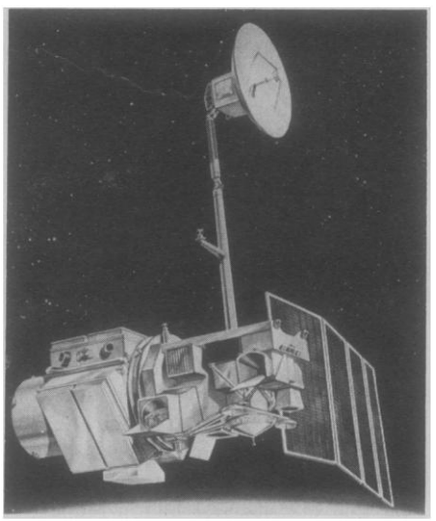
In the name of free enterprise, the Reagan Administration has spent 2 years figuring out how to transfer the government's land remote sensing satellites (Landsats) to the private sector. Ironically, it may soon find itself setting up something that looks a lot like a government-subsidized Landsat monopoly. The federal system of weather satellites may be thrown in too, with the government buying back the weather data for more than it spends now.

According to a plan recently adopted by the Cabinet Council on Commerce and Trade, and now awaiting President Reagan's approval, the Communications Satellite Corporation (COMSAT) is likely to take over Landsat and weather satellite operations with the government providing a guaranteed market for land and weather data for 15 years. This arrangement would essentially subsidize commercial operations through government purchases. How an administration that loathes subsidies on principle came up with such a plan is a story worth recounting: it offers a classic study in the collision of ideology with reality.

Landsat's commercial potential has been clear from the beginning. The National Aeronautics and Space Administration (NASA) launched Landsat 1 in 1972 (*Science*, 26 March 1982, p. 1600) and followed it with Landsat 2 in 1975 and Landsat 3 in 1978. The satellites' sensors imaged the earth both in visible light and at infrared wavelengths, producing false-color images of scarlet forests, red patchwork farms, blue city grids, and brown crinkled mountains. Agronomists were able to quickly inventory crops over vast areas and monitor the course of diseases such as corn leaf blight. Geologists could take in whole fault zones at a glance, as they pinpointed possible new mineral deposits or oil fields. Land-use planners could monitor urban sprawl and strip-mine damage on a regional basis.

Economists have estimated that the ultimate economic value of land remote sensing to the United States could approach $10 billion per year, and virtually everyone has agreed that Landsat should eventually be transferred to the private sector. Unfortunately, NASA, Congress, and the community of Landsat users have spent the last decade arguing about how to accomplish the transfer (*Science*, 2 April 1982, p. 40).

In 1979, President Jimmy Carter tried to cut through the fog by presidential directive. On 31 January 1983, he said, NASA would hand over Landsat operations to the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), which would also be responsible for working out a long-term commercialization plan. Meanwhile, to soothe users' fears of an interruption in the data flow, NASA would guarantee continuity into the 1990's by launching a series of four advanced satellites known as Landsat D, D′, D″, and D‴.



Landsat 4 in orbit

Too many bells and whistles?

NOAA took charge of Landsat operations last month, on schedule. But little else in Carter's plan has survived, because in 1981 the Reagan Administration abruptly changed the ground rules.

In its first budget-slashing exercise in February 1981, the White House Office of Management and Budget (OMB) decreed that the federal involvement in Landsat would end with the launch and eventual demise of D′—and it would go that far only because D and D′ were already in production. (Landsat D was launched in July 1982; D′ is planned for launch in 1985 and is expected to last through 1988.) Ten years of demonstration was enough, said OMB. If the market was adequate, the private sector would move in and start building its own satellites. If not, why should the government continue to do so? Indeed, the government should sell both Landsat D and D′ to a private operator as soon as they were launched.

The laissez faire logic was impeccable. Unfortunately, as many people in the remote sensing community have pointed out, it had little to do with the real world.

First, while the market potential may be huge, 10 years of demonstration has *not* been enough. NASA designed and operated the Landsats as an experimental system. Practical applications were peripheral to proving out the technology. One can fault NASA for this attitude—and many people have, loudly—but the fact remains that the government has done relatively little to promote remote sensing, or to tailor the product to the market. Moreover, many potential users have shied away because Landsat applications require a considerable investment in computers, software, and personnel, with no guarantee that the government or anyone else will continue to provide the data. Thus, Landsat enthusiasts remain widely scattered in government agencies, private corporations, and universities. The market as a whole is still small, immature, and fragmented.

Second, even in a vigorous market it is not clear that anyone would want to buy the NASA satellites. As experimental spacecraft they are complex and expensive. So are their ground stations. Landsat D (known as Landsat 4 now that it is in orbit) will cost a total of $300 million. It is producing scenes of unprecedented richness and detail—but only a few per day. A private vendor would prefer to operate a simpler, cheaper set of spacecraft based on proven technology, and put out hundreds of scenes per day. "Why should we pay for a lot of bells and whistles we don't want?" asks one corporate specialist.

Third, given the first two realities, no private operator is going to touch the land remote sensing business without some form of subsidy. The situation is just the inverse of what happened in the communications satellite boom of the 1960's: the communications market was already fully developed (everybody had

a telephone) and there was no satellite system in place (the operators could build what they wanted). For Landsat, however, many in the remote sensing community favor some form of "phased" commercialization. The existing system breaks naturally into pieces, they point out: the satellites, built and launched by NASA; the ground stations, now operated by NOAA; data archiving and distribution at the Department of the Interior's EROS Data Center in Sioux Falls, South Dakota; and a "value added" industry comprised of entrepreneurs who analyze and interpret the scenes for paying customers. The far end is commercial already. The idea is thus to work back up the chain, spinning off the less expensive and risky pieces as the market develops and leaving the big ticket items—the satellites—with the government until the market is fully mature.

Finally, by truncating the Landsat D series, the OMB might well have truncated the whole industry. It takes years to build a satellite, users warn, and if somebody does not start cutting hardware soon, there will be nothing to replace Landsat D′ after 1988. They point to the French, who plan to launch a commercial remote sensing satellite known as SPOT in 1984, backed by a government that has no qualms about subsidies. They point to the Japanese, who have announced similar plans. "If we fail to provide the data, France and Japan will step in to fill the gap," says Michel T. Halbouty, a Houston entrepreneur who uses Landsat data for oil and gas exploration, and who recently headed a major Landsat study committee for the Commerce Department. Among the users, at least, the situation has become urgent to the point of crisis: the United States is on the verge of abandoning yet another industry to foreign competition.

All this was pointed out at length in 1981. Yet the OMB remained adamant: no government support after Landsat D′.

Little of the users' urgency seemed to penetrate the White House. The details of the transition clearly needed a lot of thought, and the voluminous studies that led up to Carter's 1979 plan had been . . . well, Carter's. So the question was handed off to the Cabinet Council on Commerce and Trade, headed by Commerce Secretary Malcolm Baldrige, and from there to a sublabyrinth of working groups and advisory committees.

Meanwhile, COMSAT was quietly making OMB an offer. COMSAT had been enthused about land remote sensing for some time, and had tried hard, without success, to get the Carter Administration to set up a phased commercial system. But now the mind-set of the new Administration was clear. So COMSAT proposed the following: the company would take on Landsat, build new satellites, and nurse the market for however long it took—exactly what OMB wanted—*if* the government would also sell COMSAT its weather satellites and guarantee that every year for 15 years it would make some hefty minimum purchase of land and weather data.

The *weather* satellites? No one in Washington had ever contemplated commercializing the weather satellites. Why bother? Who would buy the data, other than NOAA and the Department of Defense (DOD)?

Still, to hear COMSAT tell it, the plan was quintessential Reaganomics. Through the virility of the private sector, COMSAT would achieve substantial savings by consolidating and modernizing the two systems and by more efficient operation. In fact, the deal might actually save the government money—as much as $1 billion over 10 years. True, the guaranteed purchase of land and (especially) weather data would be used to cover the initial losses on Landsat. But it would not really be a subsidy. The government spends a lot for Landsat and weather data anyway and, as COMSAT was fond of pointing out, there was a precedent: in the 1930's the government had introduced air mail, in large part to provide security and cash for a fledgling airline industry.

Now most observers agree that, from a technical standpoint, COMSAT's plan has a lot to recommend it. There are real advantages to combining and streamlining the two systems, especially since COMSAT also hopes to incorporate a series of ocean sensing satellites, which no one is working on right now. Moreover, having control of the whole system would allow COMSAT (or any other operator) to tailor new satellites to the needs of the market. All of this would indeed be more difficult in a phased commercialization where the government retained the satellites.

On the other hand, COMSAT's cost estimates have been highly controversial. For one thing, the billion dollar savings figure assumes that the government would otherwise continue a land remote sensing program after Landsat D′, when in fact OMB has explicitly ruled that out. Then there are uncertainties over how to compare different accounting practices and how to figure out what the government actually does pay for remote sensing.

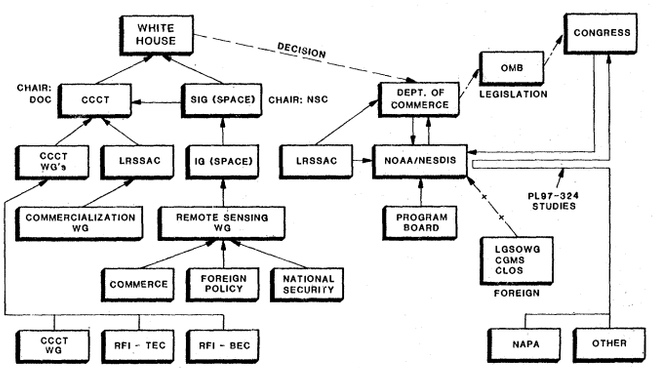
But in 1981, all this was really beside the point. The OMB liked any idea that enhanced the private sector, especially if it could also be construed as slimming the budget. Commerce Secretary Baldrige and his deputies liked the idea for less ideological reasons: if the weather system was COMSAT's price for taking over Landsat, then COMSAT should have it.

Thus, the commercialization of the weather satellites became a major issue for the Cabinet Council and its multitudinous advisory groups. The deliberations continued.

In due course—November 1982—the deliberations came to an end and all the reports and findings landed back on Baldrige's doorstep. Unfortunately for the vision of subsidy-free transfer, however, they all said pretty much the same thing:

- There is no market that can fully support the Landsat system in its present form; furthermore, the development of a self-sustaining market for land remote sensing will take a decade or more.
- There is no conceivable savings on the weather satellites (by common operation, for example) that could offset the losses on Landsat; neither is there an untapped, nonfederal market for weather data that could offset the losses.
- There is no way that a private opera-

A simple guide to Landsat advisory committees



tor can afford to do an adequate job on advanced remote sensing research and development; NASA and DOD must both maintain a vigorous effort.

There is, in other words, no magic way out. After 2 years of study the Administration still had the same choices it had in the beginning: subsidize the land remote sensing industry for a decade or watch it crumble to foreign competition. COMSAT's plan for a guaranteed purchase of weather data would at best be a cross-subsidy. In fact, many advisors—particularly the industry representatives who constituted the Land Remote Sensing Satellite Advisory Committee under Houston's Michel Halbouty—were still calling for some form of phased commercialization, with government providing continuity of data beyond Landsat D′.

However, the Commerce Secretary's staff did not quite see things that way. By the time they had distilled the reports into a concise set of recommendations, the idea of phased commercialization had vanished. As approved in a closed session by the Cabinet Council on 15 December 1982, the recommendations call for competitive bids to be solicited for the land and the weather systems separately. Interested parties would be allowed to submit a joint bid on both, of course.

To cynics this was a clear setup for COMSAT. And, in truth, COMSAT does seem the only realistic candidate to win the bids. No one else has demonstrated the slightest interest in the weather satellites, or in taking over all of Landsat. The company is very well connected in Washington. And Baldrige and his deputies have been the capital's most enthusiastic supporters of the weather transfer.

On the other hand, the people at Commerce maintain that their opposition to phased commercialization was not a favor to COMSAT. Rather, they saw it as a source of endless turf battles and foot dragging. Every time they tried to spin off another piece of the system, they explained, the bureaucracy would fight to keep it. Best to get the government out quickly.

(Ironically, many working-level bureaucrats in the satellite services want to get the government out too but for different reasons: the COMSAT proposal may be the last best hope of sheltering Landsat from the OMB. "This administration shows no capability of sustaining operations," says one weary veteran. "It's the worst I've ever seen it: the OMB endlessly tweaks the operations and changes the budget, just because we're under their control. We don't know what we've got from one month to the next. Get [the land and weather satellites] out in the world, get them free of these biennial shifts. At least that would keep the data coming in.")

What happens now is not clear. The Cabinet Council's recommendations—which have not yet been made public—went to the White House in January for final approval by the President. At this writing there is still no indication of whether that approval will be forthcoming, or when. The OMB is now dragging its feet, since the council was honest enough to admit that "establishing a private entity and assuring the U.S. of a competitive entry in international civil space remote sensing will require an enhanced budget commitment [in fiscal 1984]"—that is, a subsidy and a big infusion of research and development funds.

On Capitol Hill, meanwhile, eyebrows have been raised at how quickly and quietly the decisions have been made since November. "Greased" is one staffer's word for it. Could it be that no one in the Administration wants Congress' advice on the subject?

The two senators who were most interested in land remote sensing, Senators Harrison H. Schmitt (R–N.M.) and Howard W. Cannon (D–Nev.), were both defeated last year. But others, such as Representatives James H. Scheuer (D–N.Y.) and Raymond J. McGrath (R–N.Y.) have begun to express concern and may well call hearings on the matter. Some key questions:

- Will the Cabinet Council plan lead to the creation of a government-subsidized monopoly? American Science and Technology (AS&T), for example, a small new company in Bethesda, Maryland, is gambling that the remote sensing market is already mature enough to support an inexpensive, proven-technology system. It will attempt to fill the post–Landsat D′ gap with its own, privately financed satellites—which would be launched on the privately financed Conestoga rocket of Space Services, Incorporated. Prospects for venture capital look good, claims company spokeswoman Diana Josephson. But money could dry up fast if AS&T had to face a large, heavily subsidized competitor such as COMSAT.

It would be ironic indeed if the Administration's plan to promote the private sector were to end up stifling genuine entrepreneurs. One would also have the spectacle of NASA doing advanced research for the benefit of a single corporation.

- How much will it cost? The detailed cost estimates on COMSAT's land/weather proposal will remain proprietary until the company submits a bid. Then the arguments can begin in earnest over how much the government will really have to pay. (The purchase guarantee could not be absolute, by the way, since Congress has to approve the budget every year.) "If it is a subsidy," says one Hill staffer, "why not just call it that?" A related issue is whether the President's fiscal 1984 budget actually contains enough funding to cover the cost, or even the research and development that everyone is asking for.

- Should the weather satellites be commercialized? This idea seems to scare people, giving them visions of coastal cities that cannot afford hurricane warnings, and the like. In fact, COMSAT would be selling its data directly to NOAA, so everyone would hear their weather reports as usual on the morning radio. A more serious concern is the fact that NOAA's weather satellites are a prime source of weather data for the DOD. (The DOD is supposed to have its own satellites, but it is rumored that in one recent year, they were all inoperable. NOAA was providing everything.) It is unlikely that DOD would get overly nervous about relying on a commercial weather system—it now routes about 80 percent of its communications traffic through COMSAT satellites—but the contract would nonetheless have to preserve DOD's right to commandeer the weather system in case of emergency.

Finally, before people go carping too much at COMSAT, they might want to recall who precipitated the whole episode. First, Reagan's OMB struck down the Carter plan, truncated the Landsat D series, and threw the system into crisis for reasons of ideology and budget. Then, with foreign competition already coming on strong, it spent two fruitless years in quest of a magic way to commercialize Landsat without subsidies. In the process it caused reams of studies to be generated on an issue that had already been studied ad nauseum.

Meanwhile, work on the successor to Landsat D′ should have started last summer. It must start this summer if the program is to have continuity. Congress and the Administration may now be forced to accept the Cabinet Council plan as the only way to get someone moving in time. If they reject it and send the issue back for still more studies and reports, then maybe a new and struggling venture such as AS&T can fill the gap. Maybe. But it is certain that the French will be launching their competitor, SPOT, in 1984.—**M. Mitchell Waldrop**