PRINCIPAL FINDINGS

Finding 1

The media's experience with satellite imagery has thus far been extremely limited. Therefore, the precise value of satellite imagery to the media is uncertain and is likely to remain so until experience and a more robust remote sensing market combine to define a stable demand for these data.

The media have used and continue to use satellite images in their news gathering activities. Whether this limited use will blossom into extensive, routine use or even a dedicated "mediasat" organization will depend on:

1. the cost of remotely sensed data;
2. the demand for, and therefore the value of, "media-quality" images to the media and to other users; and
3. U.S. and foreign government policies regarding the collection and distribution of high-quality satellite images.

Much of the current writing on the mediasat concept has stressed the desire for high resolution, timely delivery, and assured access to data. Although these demands follow logically from current newsgathering practices, they are not the product of detailed technical or economic research or of experience. It is important to recognize that, in the absence of such research or experience, the news media can have only an imprecise understanding of the value of low- and high-resolution data and the value of real-time and delayed information.

Finding 2

The current commercial remote sensing systems, the U.S. EOSAT and the French SPOT, allow the media to experiment with satellite imagery but lack the high resolution, timely delivery, and assured access to data that some media experts feel could make satellite imagery an integral part of the newsgathering process.

EOSAT (figure 1) and SPOT (figure 2) provide a relatively low-cost means by which the media could practice both using satellite imagery and working within current government policies. However, existing commercial systems do not provide "timely access" or high resolution, primarily because these capabilities are expensive and unnecessary to meet the needs of the traditional purchasers of remotely sensed data. In addition, the media's access to data cannot be assured because the remote sensing companies currently depend on ground stations owned by other countries to collect certain data. Experience gained with the current commercial systems has shown that delivery of data considered by a foreign government to be sensitive may be delayed or denied.

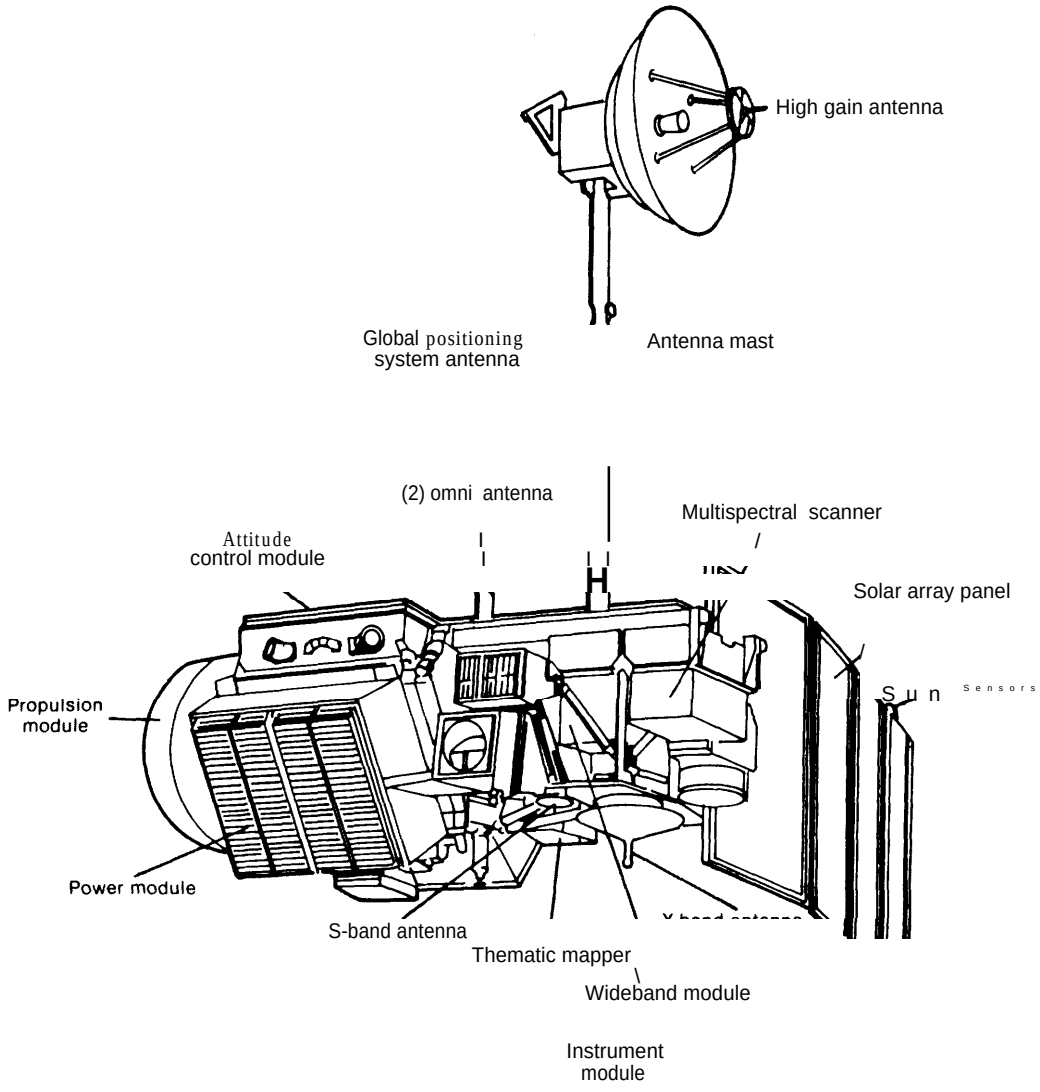
Finding 3

It *is possible to build a mediasat system with high resolution, timely global coverage, and assured access to data using current technology.*

Experts generally agree that costs and market uncertainties, more than technology, inhibit the establishment of a mediasat system. Media experts have identified high spatial resolution (5 meters or less) as the principal performance requirement for a mediasat. By comparison, the Thematic Mapper (TM) and the Multispectral Scanner (MSS) sensors on EOSAT's satellite provide 30 and 80 meter resolution, respectively. The French SPOT system provides 10 meter panchromatic (black and white) as well as 20 meter multi-spectral (color) imagery. Nonetheless, sensors capable of producing 5 meter images are readily available and could be flown on existing spacecraft designs.

To be effective, a mediasat needs more than high resolution; it must also be able to sense news wherever and whenever it occurs and to transmit the news rapidly to the news agency. A mediasat system would need at least two satellites to ensure same day coverage of events around the globe. In order to receive data in near-real-time, a mediasat system would need to have access to ground stations all over the earth, use on-board tape recorders, or use space-to-space communications similar to the National Aeronautics and Space Administration's (NASA) partially complete Tracking Data Relay Satellite System (TDRSS). The technology exists to obtain high-resolution, near-real-time imagery; what is lacking is the clear financial justification for employing this technology.

Figure 1.— Landsat-5 Spacecraft



SOURCE: National Oceanic and Atmospheric Admintstration

MISSION: Collect remotely sensed multispectral land data broadcast **data for** receipt **at** ground stations operating under formal agreements

ORBIT. 705-mm sun synchronous 16 day repeat cycle

SENSORS AND FUNCTIONS

Multi-spectral Scanner (MSS):
Swath width is 185-km resolution is 80-m

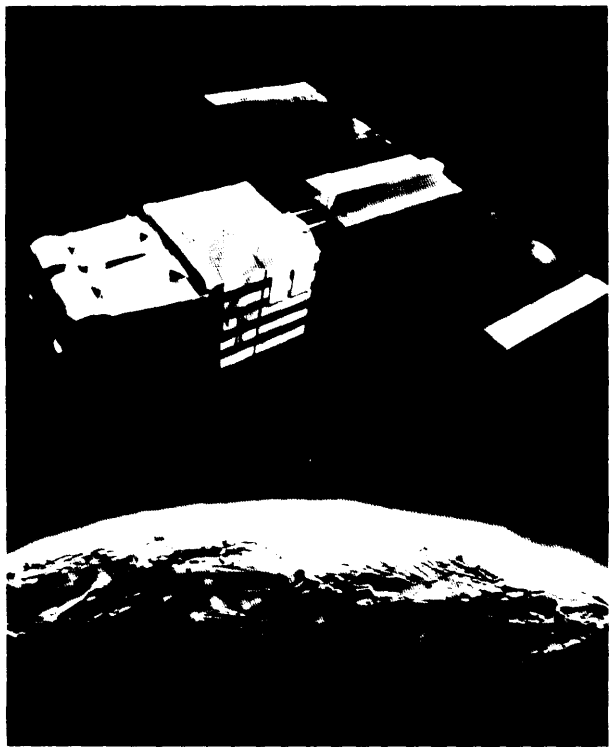
Sensor Wavelengths (μm)	Primary Uses
10 5 13 6	Movement of sediment laden waler delineation of shallow water areas
0 6 0 7	Cultural features
0 7 - 0 8	Vegetation boundary between land and water landforms
08-1 1	Penetration of atmosphere haze vegetation boundary between land and water landforms

Thematic Mapper (TM): The TM is designed 10 provide 30-m resolution except for 120-m resolution in the thermal infrared band

Sensor Wavelengths (μm)	Primary Uses
0 45 0 52	Coastal water mapping soil vegetation differentiation deciduous coniferous differentiation
0 52 0 60	Green reflectance by healthy vegetation
0 63 0 69	Chlorophyll absorption for plant species differentiation
0 76 090	Biomass surveys waler body delineation
1 55 1 -5	Vegetation moisture measurement
10 40 1 2 50	Plant heat stress management other thermal mapping
2 08 2 35	Hydrothermal mapping

DIRECT BROADCAST Broadcasts are provided for ground stations which **have** entered Into formal agreements covering the receipt and distribution of these data

Figure 2—Artist's Conception of the French SPOT Remote Sensing Satellite



Finding 4

Although cost and market research have yet to be done, preliminary calculations indicate that the costs of a mediasat might exceed the expected revenues of such a system.

To be financially viable, a mediasat would have to generate revenue sufficient to offset the costs of the system. Experts have estimated that a complete one or two satellite mediasat system (i.e., sensor, spacecraft, launch vehicle, data collection facilities, and image processing facilities) capable of.5 meters resolution, designed to operate about 5 years, could cost between $215 million and $470 million to establish and $10 million to $15 million a year to operate. Even if each network used satellite images every day, only a few thousand images would be used per year; hence the system's development and operating costs could only be paid back if networks were willing to pay *$35,000* to $73,000 per "story," an order of magnitude more than existing expenditures for daily news coverage.

Nonetheless, should it turn out that OTA's cost estimates for a mediasat are dramatically overstated (because the technology has become more sophisticated and/or less costly) or a very high demand (from the media and other data users[5]) were to develop for satellite images, mediasat might become an economically viable concept.

Finding 5

A mediasat would probably compound problems inherent in the management of national security and foreign policy in a spirited democracy; however, such problems would likely be manageable.

Experts generally agree that the media's extensive use of high-resolution satellite imagery for newsgathering could complicate certain U.S. national security activities and certain U.S. foreign policies. Experts disagree, however, about the nature and seriousness of these "complications," and the extent to which they differ from traditional tensions between the press and the national security and foreign policy communities.

Although each is the subject of some controversy, national security experts consulted by OTA identified five areas where a mediasat could complicate U.S. national security and foreign policies. The media could:

1. disseminate information regarding U.S. military operations, thereby depriving U.S. troops of the critical element of surprise;
2. reveal information considered sensitive by foreign governments, thereby prompting them to retaliate against U.S. Government activities, assets, or personnel;
3. provide valuable intelligence to countries currently lacking their own reconnaissance satellites;
4. reveal facts about an unfolding crisis, making it more difficult for government leaders to act calmly and responsibly; and
5. misinterpret satellite data in such a way as to precipitate a crisis.

[5]Some of the costs of a mediasat could be offset by selling data to map makers, geologists, agricultural planners, and other current users of remotely sensed data.

Photo credit Copyright 1987 EOSAT Provided courtesy of EOSAT

Washington, D. C., and Surroundlng area—Thematic Mapper band 4 is used, and illustrates major areas an-d buildings of the downtown area. For exam pie, the Washington Monument, Pentagon Capitol, and National Airport can be seen

The most common media response to all of these allegations is that, although a mediasat could provide a substantial new source of data, the media's extensive contacts and information sources within the United States and around the world already provide the press with near-real-time information concerning fast-breaking news stories. The U.S. media are also proud of their "track record. " They assert that where lives have been at stake or serious national securit, issues have been raised, they have cooperated with the government by withholding information until the danger or sensitivity has passed. Finally, some national security and media experts argue that granting the media access to high-resolution satellite data could halve a stabilizing influence, in that nations would realize that aggressive actions would be seen and reported throughout the free world.

Finding 6

Within a decade, many nations still have their own remote sensing systems. It is unclear whether the U.S. Government could effectively limit or control media access to satellite imagery if foreign governments do not exercise similar controls.

The almost assured proliferation of sophisticated, government-owned, remote sensing systems has caused many analysts to question the practicality of attempting to regulate the media's use of satellites to gather news. Some experts main-

tain that since U.S. laws would not be applicable to foreign systems, U.S. news agencies could bypass U.S. restrictions by purchasing data from, or investing in, foreign remote sensing systems.

Others disagree, arguing that foreign remote sensing systems—either as a result of financial constraints, less sophisticated technology, or a country's own domestic policies—might have limited resolution. Therefore, it is possible that, with minimum intergovernmental coordination, the United States could substantially delay the time when the media would have access to very high-resolution satellite images.

Finding 7

Government attempts to limit access to or use of satellite imagery would likely result in first amendment challenges to such limitations. The outcome of these challenges would turn on the exact nature of the government limitations and the Supreme Court's ultimate determination of the status of newsgathering activities under the Constitution.

Should the U.S. Government desire to inhibit a media-owned satellite from gathering potentially sensitive information it could—either permanently, through the licensing procedures established in the 1984 Landsat Act, [b] or temporarily during a crisis —attempt to limit:

1. the resolution of the satellite's sensors;
2. the images that the satellite is allowed to collect; or
3. the images the media are allowed to disseminate.

The 1984 Landsat Act requires all remote sensing system operators to obtain a license from the Secretary of Commerce, who is charged with the duty of ensuring that applicants comply with the "international obligations and national security concerns of the United States. " Some media representatives have argued that such licensing provisions should be declared invalid because they are not drafted with the narrow specificity required of statutes affecting first amendment interests. The validity of this point of view will rest heavily on the Supreme Court's ultimate determination of the status of newsgathering activities.

If newsgathering is given the degree of first amendment protection afforded traditional speaking and publishing activities, the licensing procedure established in the Landsat Act and future restrictions on mediasat activities might be regarded as impermissible "prior restraints" on free speech. The doctrine of "prior restraint" holds that advance limitations on protected speech may not be "predicated on surmise or conjecture that untoward consequences may result."7 Prior restraints are allowable only if necessary to prevent "direct, immediate, and irreparable damage to our Nation or its people."8 On the other hand, should the Supreme Court hold that news gathering was deserving of some lesser degree of protection than publication of information already obtained, the government would have considerably more latitude to limit mediasat activities. Restrictions on the *dissemination* of information already gathered would, of course, receive the full protection of the first amendment.

If the media do not own a satellite system, but rather rely on a commercial company such as EOSAT to provide them with data, it would be less clear whether the media could successfully argue that licensing restrictions violate their first amendment rights. Should the U.S. Government ask EOSAT to stop distributing raw data for a few days during a crisis and EOSAT agreed, the news media might have a case against EOSAT for breach of contract, but their case against the U.S. Government for infringing their first amendment rights would be less clear.

Finding 8

Should the U.S. Government wish to encourage the eventual development of a U.S. mediasat industry, it should continue its support for the U.S. Landsat system; such support would likely require sizable subsidy for a period of years. [9]

'15 U.S.C. 4201-4292

'Justice Brennan concurring in, New *York Times Co. v. United States,* 403 U.S. 713, 724 (1971).

'Justices Stewart and White, concurring, New *York* Times Co. v. *United States,* ibid.

'The funding problems and opportunities of the Landsat program and EOSAT are beyond the scope of this paper. *In* reaching this conclusion, OTA drew upon its previous work. See: U.S. Congress,

A mediasat industry is less likely to develop in the United States if the media must shoulder the entire cost of the "infrastructure" needed to support its occasional use of satellite images. If, on the other hand, there already existed in the United States a strong "value-added" industry—small firms expert in the interpretation and visual presentation of data—and a large pool of experienced photointerpreters, the mediasat concept would become more viable. A robust value-added industry and a cadre of experienced photointerpreters are more likely to develop if the United States has a healthy land remote sensing industry catering to diverse scientific and commercial needs.

Office of Technology Assessment, *lnternational Cooperation and Competition in Civilian Space Activities*, OTA-ISC-239 (Washington, DC: U.S. Government Printing Off Ice, July 1985), p. 15, U.S. Congress, Office of Technology Assessment, *Remote Sensing and the* Private *Sector: Issues for* Discussion —*A* Technical Memorandum, OTA-TM-ISC-20 (Washington, DC: U.S. Government Printing Office, March 1984).