

naire," Lasagna says.

The recommendations on use of prisoners were the most controversial proposals. According to Karen Lebacqz of the Pacific School of Religion in Berkeley and a member of the commission, the group rejected the argument that prisoners cannot give *truly* voluntary consent. The commission did require that to reduce pressure on the prisoners, certain minimum living standards must be met by the prison (such as single-occupancy cells and an opportunity to work for remuneration comparable to that received for research participation). Furthermore, participation in research must not be a factor in parole judgments, and channels of public appeal and monitoring must be available. The commission concluded that research using prisoners should be done only if there are compelling reasons to use prisoners instead of some presumably less "vulnerable" group.

Lasagna feels that the "laundry list" of proposed requirements almost certainly cannot be met by any prison, and that elimination of prison research will certainly deprive researchers of a research population that is both healthy and available for continuous close scrutiny and medical supervision.

Lasagna points out one prison facility, the Addiction Research Center in Lexington, Ky., "whose demise will be of incalculable harm." Studies on morphine users there have provided information on the mechanisms of drug addiction and have predicted whether new medicines will be addictive. Lasagna called on William R. Martin of the center to confirm that no population so far identified could substitute for the imprisoned group. "Without such a facility, this work will not be done, and the sick public will become the unwilling [and unconsenting] research subjects of the future," Lasagna says. Lebacqz disagrees, contending that different subject populations will be found to test addictive properties of drugs.

Proposals on use of children and the mentally ill brought a more favorable response from the pharmacologists. Stanford Cohen of Wayne State University School of Medicine emphasized the need to test on children drugs that will be used on children. "Children are different in unpredictable ways," Cohen says. Gerald L. Klerman was concerned that research would be limited by the recommendation that mentally ill patients participate only in studies that could directly benefit them, and that costs would be increased by proposals for appointing legal representatives of subjects and for a federal agency to approve investigators and facilities. Nonetheless, Klerman concludes, "In my opinion, the commission has acted with great care and consideration and the scientific community can feel it has had an opportunity to present its point of view before an informed, competent and responsible group." □

NASA urged to resume talksat R&D

One of the major accomplishments of the National Aeronautics and Space Administration has been the development of certain areas of space technology—notably communications satellites—to the point where they could be taken over by the private sector as self-sustaining enterprises. In 1973, however, budget ceilings forced the agency to cut back its research and development in the field, leaving satellite communications to commercial entrepreneurs and quasi-governmental consortia. Now a special committee of the National Research Council's Space Applications Board has urged that NASA get back into the act.

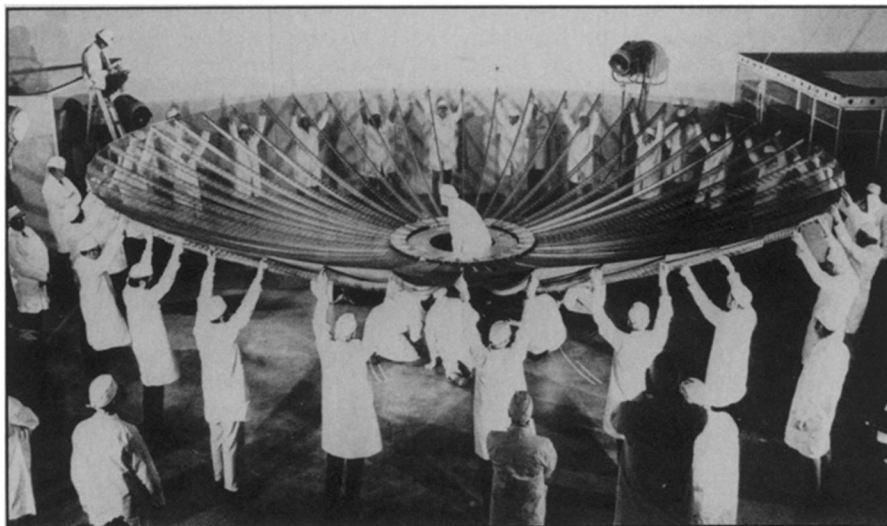
At a too-brief glance, the committee's 33-page report seems like a vote for the ultimate boondoggle, with NASA doing all the R&D, checking it out on test satellites, paying all the bills and then turning the whole Christmas present over to industry. Yet that, according to committee member Eberhardt Rechtin, chief engineer at Hewlett-Packard, "is exactly what we don't want." It would be "a false R&D subsidy," he says, adding that it would be rather pointless to spend \$50 million to \$100 million a year hyping a business whose whole proceeds are only about \$250 million a year.

Instead, the committee's report—prepared at NASA request—calls for the agency to assume the role of identifying and working with a wide spectrum of potential satellite-communications users who are individually too small to take advantage of present services at what the industry would have to charge. Experimental programs that have been conducted with the Applications Technology Satellite ATS-6, for example, have shown potential for remote-area medical services, interstate teacher-to-classroom broadcasts and a variety of community projects.

Such uses, however, also pose special

technological challenges. If low-income areas are to get by with inexpensive ground stations, for example, the satellites will have to be more powerful. One approach is stronger transmitters, such as the 200-watt (at 12 GHz) monster now being tried on a Canadian-U.S. probe called CTS. Another avenue lies in the development of large, high-gain antennas, perhaps like the 10-meter-diameter mesh "dish" on ATS-6. Power by a sharp-focusing antenna, however, creates another problem if the users are localized and widely separated: limited coverage. The signal beam of ATS-6 is only about 1° wide at 2.6 GHz, the report points out, which would necessitate about 75 separate beams to usefully cover the part of the earth that the satellite can see from its geosynchronous orbit. Multiple "feed horns" may thus be necessary to direct the signals where they are needed. There are other problems too, such as a need for on-board switching to see that the various signals coming up to the satellite will be relayed down in the proper directions.

The committee report describes several possible levels of NASA involvement, but its choice is a program in which the agency would plan, develop and test an "experimental public-service satellite communications system program." An absolute "must," however, is that potential users would be consulted every step of the way, right from the beginning. First, needs of the users would be noted, together with projections for the requisite technology and a plan for the program design. Then a three-phase progression would lead to test satellites, criteria for judging the worth of the use-tests, and finally a fledgling "operational" system. All this while, the users and the system would be coming more closely together, finally leading, the committee hopes, to a system that could stand on its own. □



Furling the ATS-6 10-meter antenna for pre-launch storage: Shape of things to come?