Telecommunications: U.S. Applications Fall Short

For the American telecommunications industry, it must have come as at least a mild shock to read a recent *Wall Street Journal* advertisement soliciting U.S. firms to lease time on a Canadian transcontinental communications satellite. Yet more of the same may be what the future holds, if members of the U.S. telecommunications community, both governmental and industrial, do not look beyond mere superiority in technological research and development. Such is the message contained in a two-volume report released last month by a National Academy of Engineering Panel on Telecommunications Research.*

The telecommunications report, sponsored by the National Science Foundation, was intended to survey the "status and trends" of telecommunications research in the United States and other technologically advanced countries. The panel members first stressed two things: that their report is of a preliminary nature and that the strictly technological aspects of telecommunications cannot be divorced from broader economic, political, and social considerations that can either hinder or promote the application of telecommunications technology. Then the panel found that the United States is "generally ahead" of Canada, Japan, and the nations of Western Europe in such technology. But, the panel added, practical application of the technology falls short of what might be expected in at least two areas: maintenance of a favorable balance of trade and improvement of the quality of life, especially in the cities.

Telecommunications broadly includes all forms of telegraph, telephone, radio, and television transmission, including transmission via satellites or ground-based mobile units. The lion's share of telecommunications research has been done by the Bell Telephone System, the Department of Defense, and the National Aeronautics and Space Administration, whose combined expenditures for such research came to a total of about $750 million during fiscal year 1973. Each of these organizations approaches its research from the standpoint of its own particular mission, and none is oriented toward exploiting research by marketing technology. The Bell System, for example, sells telephone service, not telephones.

Much American telecommunications research is available to foreign countries and their governments through technical publications and through licensing agreements. Moreover, foreign governments frequently support telecommunications research with an eye toward capturing a larger share of international trade, whereas the United States has not been pursuing such a policy.

Government regulatory policy also can hinder the application of technology to economic and social concerns, the panel noted. For example, the field of long-distance commercial telecommunications has been reserved primarily to the Bell Telephone System, and only recently has the Federal Communications Commission opened the way for other companies to provide competitive services. U.S. companies will now be permitted to use satellite communications systems domestically, but, even so, the Telesat Canada system is already operating and accepting customers, for its development was not inhibited by Canadian regulatory restrictions. Thus, some American companies will be buying communications channels on a foreign satellite built largely from American technology.

The telecommunications panel observed that "we have only scratched the surface" in the search for ways to use telecommunications to improve the quality of life. For example, the quality of health care in the United States is affected by the simple fact that sick or injured people often do not have access to modern medical centers or even to physicians. An extension of the cable television system could provide one solution to this problem, because cable systems have a two-way communication capability by which a viewer can communicate with others on the cable network via a microphone, keyboard, television camera, or other suitable terminal device located in the home or office. By this means, medically trained personnel, such as nurses or paramedics, in outlying clinics could obtain medical data and make certain tests, transmit their observations to a central hospital for evaluation by physicians, and receive return instructions for further care. Advanced systems could directly transmit such medical data as x-rays or electrocardiograms, and, if communications satellites were used, even patients in very remote locations could be served.

An extended telephone system which included transmission of television-like pictures, facsimiles of written materials, and electronic data could provide many of the same services as a two-way cable television system. However, regulatory problems, such as the decision as to which system should be permitted to offer such services, arise when competing interests clash.

While interactive communications experiments, including telemedicine, aimed at curing societal problems are under way, problems, such as the design of terminals for optimum man-machine interaction, have yet to be solved. Moreover, the telecommunications panel worried about the possibility of abuses of advanced telecommunications systems. For example, the opportunities for the invasion of privacy are far from negligible, and, in the extreme case, could make much of 1984 a reality. In one surveillance system already tried (in Mount Vernon, New York) television cameras were placed at various street locations to watch for crime on city streets.

Overall, the telecommunications panel concluded that support for telecommunications research per se is adequate. It felt, however, that additional support in the form of "seed money" is needed for interdisciplinary research useful in making decisions, such as devising export strategies, regulating telecommunications carriers, and understanding the social consequences of new telecommunications services—in sum, research that would adequately promote the application of telecommunications technology in ways consistent with the nation's economic and social well-being.—ARTHUR L. ROBINSON

* Panel on Telecommunications Research, National Academy of Engineering, *Telecommunications Research in the United States and Selected Foreign Countries: A Preliminary Survey*, volumes 1 and 2 (Order number PB 222 080, National Technical Information Service, Department of Commerce, Springfield, Va., 1973), $10.