

4 Promoting Research and Development

1. Creative Info-communications Systems

There is a growing need for research and development of telecommunications systems with advanced functionality, for such purposes as facilitating distribution of content appropriate for the Internet and digital broadcasting. Telecommunications Advancement Organization of Japan (TAO), with the cooperation of local governments, universities, and corporations, is engaging in “New Techno-application Research Project,” which applies the elemental technology resulting from R&D efforts so far to further research into advanced telecommunications systems.

2. Multimedia Platform Technology

With multimedia developing and the Internet gaining in popularity all the time, a great variety of multimedia services using high-speed networks are forecast as being created. Beginning in fiscal 1999, TAO has been implementing a five-year R&D plan for developing multimedia platform technology designed to enable shared middleware, which refers to communications protocols usable by various multimedia services and network infrastructure terminals (Exhibit 51).

3. Japan Gigabit Network

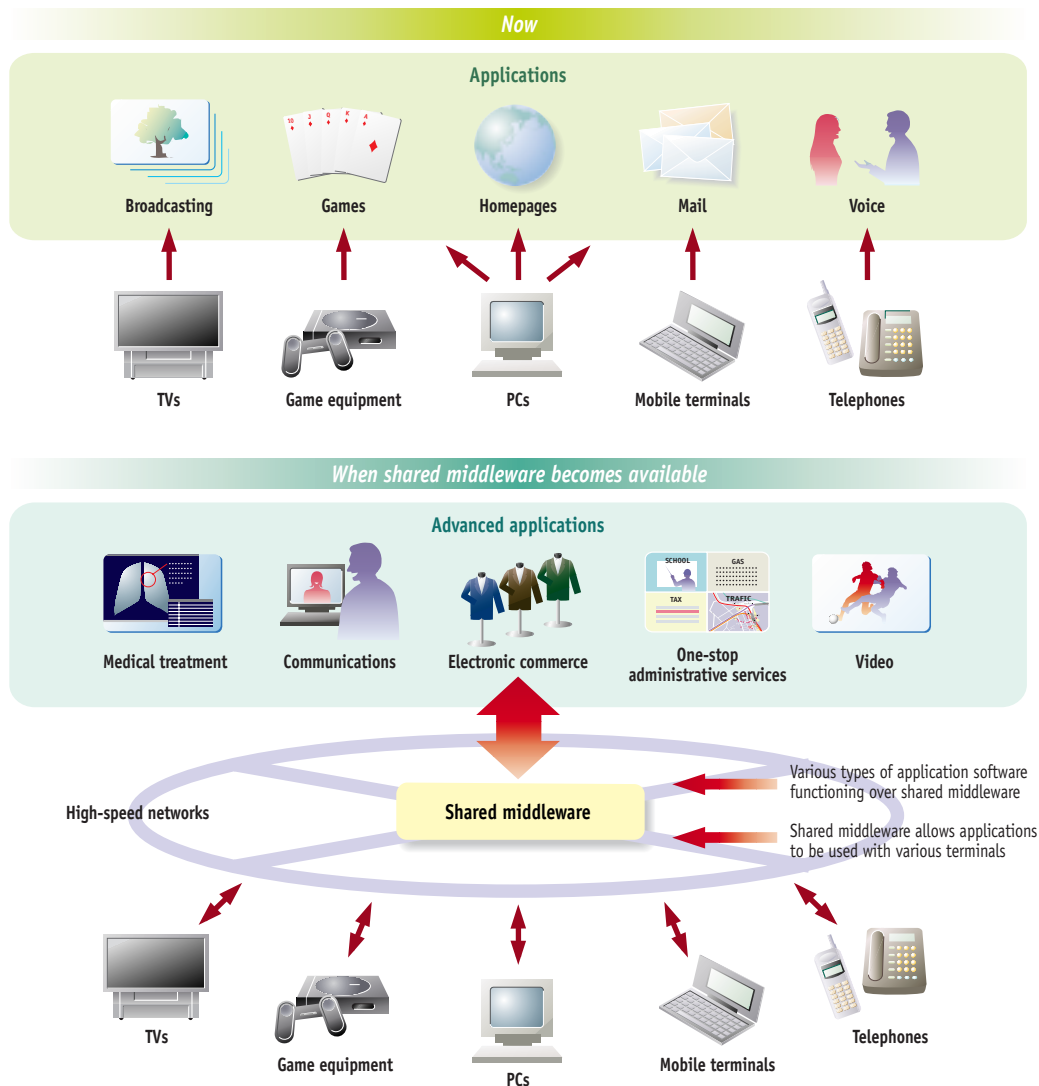
In fiscal 1998, TAO established the Japan Gigabit Network (JGN), comprising the Gigabit

Network, linking 10 pieces of ATM switching facilities nationwide by ultra-high-speed fiber-optic circuits, and the Gigabit Labs, shared R&D facilities. These facilities are open to universities, research institutes, national and local government entities, and corporations for R&D of high-speed networking and high-performance application technologies from fiscal 1999 to the end of fiscal 2003. As of the end of March 2000, 185 research organizations are using the Gigabit Network for 60 projects, while 33 organizations are engaging in 36 projects at the Gigabit Labs.

4. Multimedia Mobile Access Communications (MMAC)

In April 1998 the MPT referred the issue of “Technical Conditions for Broadband Mobile Access Systems Using Frequencies in the 5-GHz Band” to its Telecommunications Technology Council to study the feasibility of high-speed wireless LANs and wireless home-links having twice the speed of existing systems; these would be considered first-stage multimedia mobile access communications (MMAC) systems. In September 1999 the council submitted its report on the subject, on the basis of which the MPT revised several sets of regulations in March 2000: Radio Law Enforcement Regulations, Radio Equipment Regulations, and regulations on verifying the conformity of specified radio equipment with technical standards.

Exhibit 51. A Vision for Shared Middleware



5. Basic Petabit-Level Network Technology

To ensure that the advanced info-communications society of the 21st century has an enriching, human side to it, the MPT's Communications Research Laboratory is engaging in the following research projects under its five-year plan beginning in fiscal 2000: (1) humanization technology for info-communications; (2) next-generation multi-gigabit communications platforms; (3) basic

petabit-level network technology.

6. Stratospheric Platforms

In light of the results of research undertaken in fiscal 1998, the MPT and the Science and Technology Agency (STA) asked the Stratospheric Platform Development Association, comprising leading figures from industry, academia, and government, to evaluate the results

of the research and development that was undertaken on the basis of the “Fundamental Principles on Consistent Evaluation of Research and Development Undertaken Nationwide” (approved by the prime minister on August 7, 1997). The evaluation was compiled in a report submitted in September 1999, which concluded that the projects in question should indeed be undertaken in order that Japan might lead the world in stratospheric platform development. Additionally, in August 1999 the MPT and the STA solicited views on stratospheric platform development from a wide range of sources. Based in these, the two entities worked out the plan of R&D for the Stratospheric Platform to give direction to R&D over the near term. An outline of the program was released in September 1999.

7. Global Multimedia Satellite-mediated Mobile Communications

To ensure the development of a next-generation low earth orbit (LEO) system (NeLS)—which will allow compact portable terminals to access the Internet at high speeds and to transmit moving images—TAO has been conducting research on a global multimedia mobile satellite communications system (NeLS) since fiscal 1997. The goal is to begin trials in space in about fiscal 2005 (Exhibit 52).

8. Gigabit Satellite Network

The MPT is conducting research into a ultra-high-speed (gigabit-level) satellite communications system (a “gigabit satellite”) that will be

mutually connectable with fiber-optic networks, for the ultimate purpose of realizing ultra-high-speed satellite communications and high-speed multimedia satellite communications by sometime between 2005 and 2010, when network development will be taking place on a global scale.

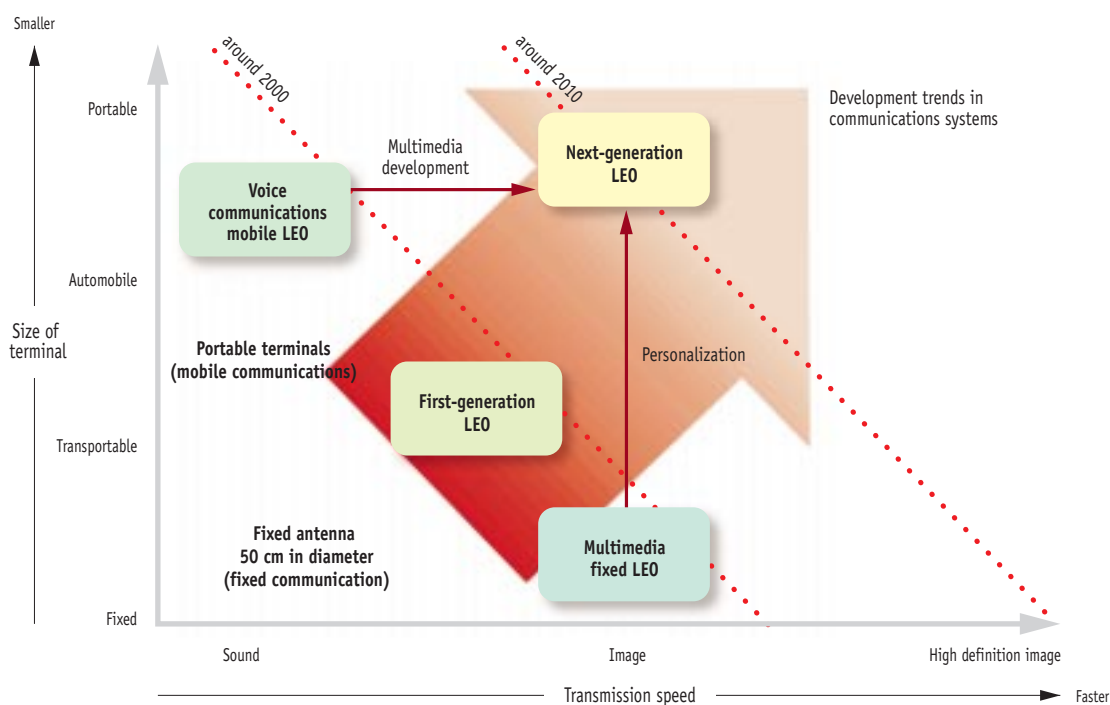
9. Engineering Test Satellite VIII (ETS-VIII)

The MPT, along with the STA and other entities, is undertaking R&D of the Engineering Test Satellite VIII (ETS-VIII), as part of the R&D in the ETS series, whose purpose is the development of shared basic technology for artificial satellites. Specific areas of R&D, which is being undertaken at the MPT’s Communications Research Laboratory, include (1) S-band mobile communications, to allow people to have conversations over cell phones anywhere in Japan, and (2) S-band mobile digital satellite broadcasting, to allow multimedia broadcasting to mobile entities, with better sound quality than current FM broadcasting.

10. Orbital Maintenance System

The Communications Research Laboratory is undertaking R&D of an orbital maintenance system (OMS) under an eight-year plan lasting from fiscal 1996 to fiscal 2003. The OMS will comprise a remote inspection service that will rendezvous with a troubled spacecraft, diagnose the problem, and assist with recovery. The system will also remove debris in orbit.

Exhibit 52. Outlook for the Development of Global Multimedia Mobile Communications Satellite System



11. Quasi-zenith Satellite System

The Communications Research Laboratory is developing a quasi-zenith satellite communications system (“Figure 8” Satellite) under a four-year plan that began in fiscal 1999. The purpose of the system is to develop new orbits to supplement already-crowded geostationary orbits and ensure high-elevation-angle, high-quality satellite-mediated mobile telecommunications. Several specific activities were undertaken during fiscal 1999: investigation of optimal satellite orbital positions for communications services; measurement and actual survey of satellite outlook ratios using actual vehicles; and investigation of ways of keeping satellites in set orbits and of measuring whether they are in the desired orbit.

12. Technology for Measuring the Global Environment

Devising effective ways to counter such worldwide environmental problems as global warming, ozone layer depletion, and rain forest destruction requires finding ways of measuring these phenomena quantitatively and accurately and of determining their causes. The Communications Research Laboratory is promoting an International Information Network for Global Environmental Preservation and is undertaking various research projects in preserving, improving, and determining the condition of the global environment, as well as a joint international research project on how advanced electromagnetic wave technology can be used for the global environment.