# *Communications Policy*

## I. Deployment of Info-communications Strategy toward the 21st Century

### 1. Principles of Major Info-communications Policies for FY2000

As the basis for new growth in the 21st century has been founded by the development of advanced info-communications networks and technologies, a dramatic surge in the efficiency of socioeconomic systems as a whole can be expected.

Yet, Japan must also take action to promote the development of advanced information infrastructure in the workplace, at home and in government, as well as to improve the general level of information literacy. This aims to boost industrial competitiveness, generate new employment and spawn new industries while upgrading the living standard in general.

With this in mind, Japan will take action based on the three principles listed below, in line with Cabinet initiatives to promote government measures for rebuilding its economy. Measures include "Millennium Projects," organized jointly by the industrial, government and academic sectors in order to create a strategic and prioritized action program.

The three principles of government measures are:

**1) To build a foundation for growth in the 21st century**

This foundation must include greater diffusion and use of information technology (IT) and telecommunications, such as the Internet, at the workplace, at home and in government administration.

**2) To create new industries and jobs**

Venture businesses in the info-communications field must be promoted along with R&D to create new industries and employment opportunities.

**3) To enable all citizens to participate in the information-based society**

The level of information literacy must be improved, so as to create a society in which everyone (including the elderly and people with disabilities) can participate and benefit from info-communications technologies.

In recognition of the importance of a coordinated effort to the revival of the Japanese economy, cooperation and joint projects among ministries and agencies will be encouraged upon implementing the above measures.

### 2. Millennium Projects

With an eye to the new millennium and in response to issues that humanity faces, the government inaugurated "Millennium Projects," or initiatives for creating new industries through robust technological innovations. The projects aim to establish a core which plays an important role in building a new century full of vision and vigor. The projects in fact deal with collaborative initiatives based upon technological innovations among the industrial, academic and public sectors in the following three fields, these being of urgency and importance for Japan socioeconomically: 1) IT; 2) the aging of the population; and 3) environmental protection.

In order to effectively implement the projects, favored budget treatments were made in the "Info-communications/Science and Technology/Environment, etc. Special Budget for Economic Rebirth Package" (250 billion yen) set forth in the

FY2000 budget.

Outline of IT projects in Millennium Projects

**1) Project "Computerization of Education"**

[Goals]

- Enable Internet access from all public elementary, lower secondary and upper secondary schools while having all public school teachers master the use of computers by FY2001.
- Aim to develop by FY2005 an environment where the Internet can be accessed from all elementary, lower secondary and upper secondary schools where teachers and students can use computers in all classes at all grade levels.

[Measures]

i) Provide computers and Internet connections at all schools
  - Develop and support intra-school LANs at public elementary, lower secondary and upper secondary schools
ii) Systematically support use of IT and computers
  - Implement training programs for teachers at public schools
  - Provide comprehensively high-quality content for schools

**2) Computerization of government administration**

[Goals]

Regarding administrative procedures between the private sector and the government, implement an infrastructure for "Electronic Government" to realize paperless administrative procedures over the Internet by FY2003.

[Measures]

- Build a common infrastructure (government approval infrastructure, standardized systems, security, etc.) to realize electronic administrative procedures between the private sector and the government
- Introduce a leading system utilizing the Internet to realize electronic filing (paperless procedures) of applications with the government

**3) IT 21st Century Plan (IT21)**

[Goals]

The government will create an Internet and computer environment in which all Japanese nationals regardless of location can securely, rapidly and easily obtain, process and transmit information they want through use of the ultrahigh-speed Internet by FY2005.

[Measures]

- Construct a super-Internet with 10,000 times faster transmission speed and 30,000 times bigger interconnection scale than the existing Internet, on which users can securely and accurately access information they want.
- Realize a new-generation computing environment in which everyone can easily handle high-performance information processing and network interconnection.

## 3. Info-communications Vision for the 21st Century
### -- IT JAPAN for ALL --

On March 29, 2000, the Telecommunications Council submitted a report entitled an "Info-communications Vision for the 21st Century" to the Minister of Posts and Telecommunications, describing info-communications infrastructure policies that act as a basis for people's lives and economic activities. The report, offering ways to deal with a number of problems in the 21st century including structural reform of the Japanese economy, the low birthrate and an aging population, comprises the following three chapters.

### Chapter 1
### Japan at a turning point in its civilization

The rapid decline in the birthrate as well as an aging population (demographic shift), and the rise of Asian economies are changing Japan's trade-oriented socioeconomic structure. The result is a relative decline in Japan's international presence. The number and size of socioeconomic structural changes occurring in Japan are increasing dramatically.

In particular, the wave of reform created by IT has brought changes to every socioeconomic field, a change that equals an agricultural revolution or the Industrial Revolution. As a result, the original premises on which Japan built its industrial society, and which brought this country so much prosperity, are undergoing transformation.

### Chapter 2
### Creation of attractive Japan in tune with the world
### -- IT JAPAN for ALL --

The target is to make Japan attractive -- a "Japan everyone wants to live, visit, work and invest in," as the new social image for the 21st century.

In other words, the trained workforce, businesses and introduction of funds necessary for IT will create a chain reaction in the development of IT, and accelerate socioeconomic reform. It is important that these processes realize social reform that can be favorably received.

This report shows a successful "IT JAPAN" model to the world, showcasing Japan as a proven IT environment that remakes itself through use of IT.

### Chapter 3
### Info-communications policies for the 21st century

In implementing info-communications policies, the report classifies info-communications policies into "five trends," "two problems" and "three principles."

MPT intends to deploy comprehensive policies aimed at the "realization of the world's most advanced network environment," "flexible and dynamic info-communications network," "creation of an environment in which anyone can use IT" and "contribution to the development of global harmony as well as of info-communications through enhanced international cooperation and tie-ups."

1. Five trends
   i) "High speed," "full-time connection to the Internet," "lower rate/flat rate"
   ii) Convergence of communications and broadcasting
   iii) Accelerating the advancement of networks and response to user needs
   iv) Borderless networks
   v) Diversification of leading players in the IT field

2. Two problems
   i) Digital information gap (Digital Divide)
   ii) Vulnerability of the Internet

3. Three principles
   i) "Precise trend research/information provision" through the gathering and disclosure of information
   ii) Appropriate "presentation of policy direction"
   iii) "Focused and speedy investment of policy resources"

Conclusion

Immediate implementation of this vision is necessary if Japan is to overcome the problems faced by its society and economy. It is also necessary to change from a traditional industrialized society into an advanced info-communications society.

In addition, reform of the "concept of values," "distribution of human and financial resources" and "structure" is necessary for the realization of those changes in the public and private sectors.

## 4. Promoting public sector info-communications

Info-communications plays an important role as a tool to drastically change the Japanese socioeconomic system as a whole.

The advancement of info-communications technology and the establishment of an advanced info-communications society by utilizing the technology is one of the most urgent goals needed to enrich people's lives.

Taking this into consideration, the government demonstrated issues to be solved concerning advanced info-communications and particular policies in the "Action Plan for Economic Structural Reform and Creation" (approved at the Cabinet meeting on May 16, 1997) and the "Basic Guidelines on the Promotion of an Advanced Information and Telecommunications Society" (decided by the Advanced Information and Telecommunications Society Promotion Headquarters on November 9, 1998).

Use of IT in the public sector will lead to a reduction in administrative service costs through use of IT in the government that improves consumer convenience.

It also takes on important roles for advancing the introduction of IT into the entire socioeconomic system.

It is necessary for the government to introduce advanced applications as a user and promote R&D on info-communications systems that will constitute the basis for a variety of public services including administrative, educational and transportation services, in cooperation with the relevant ministries and agencies, so that all Japanese can become beneficiaries of well-administrated public services.

In consideration, a "Law to Promote R&D for Developing Technologies Related to Specified Public Telecommunications Systems" was enacted on May 6, 1998. MPT, in cooperation with relevant ministries and agencies, decided to conduct all necessary procedures to enable the Telecommunications Advancement Organization of Japan (TAO) to conduct R&D on the technology necessary for telecommunications systems (specified public telecommunications systems) conducive to the following public services.

1) Educational support system (in collaboration with the Ministry of Education, Science, Sports and Culture)
2) Irrigation control system for agriculture (in collaboration with the Ministry of Agriculture, Forestry and Fisheries)
3) Electronic filing system for application procedure (in collaboration with the Ministry of Transport and the Telecommunications Bureau of MPT)
4) Support system for people with disabilities who have restricted mobility (in collaboration with the Ministry of Transport)
5) System for electronic certification of content (in collaboration with the Postal Bureau of MPT)
6) Telecommunications system which improves security of police communications (in collaboration with the National Police Agency)
7) Telecommunications system which helps information collection regarding natural disasters (in collaboration with the Ministry of Home Affairs)
8) Telecommunications system which helps advanced use of information regarding fishery (in collaboration with the Ministry of Agriculture, Forestry and Fisheries)
9) Telecommunications system which helps electronic procedures in filing applications with local governments (in collaboration with the Ministry of Home Affairs)

## II. Promotion of Multimedia Content

### 1. Results Deploying-Type R&D

There is a growing need for research and development of telecommunications systems with advanced functionality, for such purposes as facilitating distribution of content suitable for the Internet and digital broadcasting. In FY1999, the Telecommunications Advancement Organization of Japan (TAO), with the cooperation of local governments, universities and private enterprises, conducted the "New Techno-appli-

cation Research Project," which applies the fundamental technology resulting from R&D efforts to further research into advanced telecommunications systems which facilitate distribution of content appropriate for the Internet and digital broadcasting.

Outline of the projects

**1) R&D on creative communications/broadcasting systems**

TAO, by entrusting R&D projects to other parties, conducted R&D into such projects as: 1) an advanced system that contributes to the enhancement of education, transport and social welfare services for daily life;

and 2) multipurpose system-configuration technology which works as infrastructure for an advanced system which facilitates distribution of content including broadcast programming.

**2) R&D on content distribution platforms**

TAO has been promoting systems development for distributing, via the Internet, content suitable for e-publishing, digital music, streaming video and the Internet, under an appropriate charging system, maintaining high quality and without posing stress on users.

mation on the Internet, among others.

ii) Enhance "heartfelt education" (cultivation of sentiments)

It is necessary for students to strengthen "heartfelt education" in parallel with i) above, paying due consideration to concerns about lacking experience in society and nature, failing to establish human relationship and losing a grasp on the realities of life due to immersion in virtual space.

iii) R&D on teaching methods

The government decided to commence R&D on filtering and blocking harmful information over the Internet in the Millennium Projects, in order to promote info-communications technology indispensable upon introducing IT in education.

## III. Building of an Information Society Open to Everyone

### 1. Virtual Agency's "Education Computerization Project"

The Virtual Agency is a task force under the direct control of the prime minister, and not otherwise associated with any particular ministry or agency, set up in December 1998 as a solution to deal with the increasing number of issues that fall outside the jurisdiction of ministries and agencies. The Agency identifies concrete goals and schedules.

In December 1999, the Virtual Agency submitted its findings as a final report, describing projects including measures for realizing an electronic government (E-Government) and the "Education Computerization Project."

1) Goals and targeted schedule

Aiming to implement by FY2005 environments where the Internet can be accessed from all elementary, lower secondary and upper secondary schools and teachers, the government will foster human resources suitable for an advanced information society through drastic changes in teaching methods, resulting in heightened student capabilities in thinking, imaginative and expressive power.

2) Necessary measures

  i) IT equipment environment

The government will prepare settings where teachers and students can use computers and access the Internet in all classes at all grade levels.

  ii) Support measures

- Enable all teachers to gain computer literacy, through training for teachers, to teach their students.
- Support IT introduction into schools through the participation of human resources from outside schools in cooperation with communities and private enterprises.
- Implement initiatives to promote the development and provision of high-quality educational content in collaboration with the private sector and relevant ministries and agencies.
- Develop functions for a national center for school education

3) Issues

  i) Adopt education concerning morals, rules and netiquette

It is necessary for students to understand: a) roles of information and IT in society; b) common rules concerning morals and copyrights in dealing with information; and c) responsibilities in transmitting infor-

### 2. Use of the Internet in schools

Aiming to establish an environment where children can freely use the Internet

Schools have a responsibility to develop in children as high a degree of information literacy as possible, to enable them to live successfully in an advanced information society of the future. Of Japan's public schools, 35.6%, up 16.9 percentage points over the previous fiscal year (FY1998: 18.7%), had access to the Internet by the end of March 1999 (**Table III-2**). There are moves to connect all schools to the Internet by FY2001, and new National Curriculum Standards will be introduced in FY 2002 that include education in information technology (IT).

MPT has been conducting the three-year "R&D project on network management with multi-type access lines for Internet connection (School Internet)" since FY1999, in collaboration with the "R&D project into teaching methods using advanced education networks" of the Ministry of Education, Science, Sports and Culture (MESSC), in order to promote use of the Internet in education. The School Internet project aims to develop network construction technologies toward the imple-

*Table III-2   Number of state schools with Internet access (as of March 31, 1999)*

|  | Number of schools (A) | Schools connected (B) | Ratio of connected schools (B/A) | Schools with computers (C) | Ratio (C/A) |
|---|---|---|---|---|---|
| Elementary schools | 23,686 | 6,499 | 27.4% | 23,140 | 97.7% |
| Lower secondary schools | 10,432 | 4,461 | 42.8% | 10,426 | 99.9% |
| Upper secondary schools | 4,161 | 2,651 | 63.7% | 4,161 | 100.0% |
| Special schools | 920 | 334 | 36.3% | 910 | 98.9% |
| Total | 39,199 | 13,945 | 35.6% | 38,637 | 98.6% |

Source:   "Survey of IT Education in Schools (FY1998)," the Ministry of Education, Science, Sports and Culture

*Fig. III-2   Experimental advanced Internet access networks for schools*
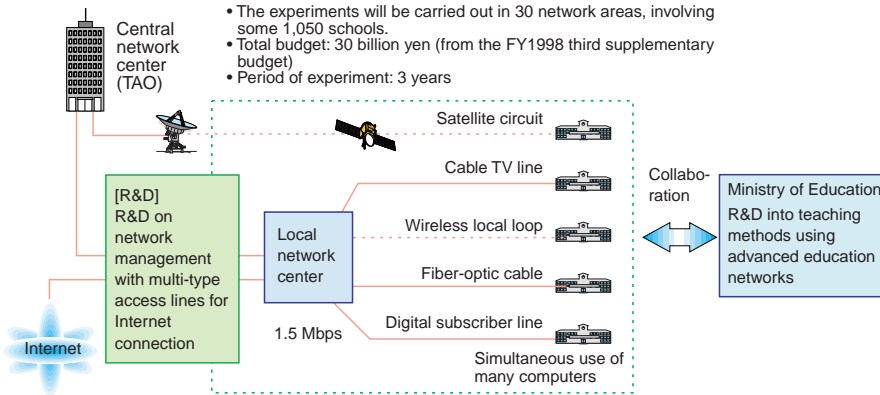


mentation of advanced Internet access networks for all schools, by connecting 1,050 model schools from among some 40,000 elementary, lower and upper secondary schools throughout the country to the Internet via various access lines including digital subscriber lines (DSL) and satellite circuits.  Based on an estimate that each school has 20 access terminals on average, under the School Internet project, 30 regional network centers, that connect 1,050 schools via high-speed access lines equivalent to 1.5 Mbps, were constructed in 30 network areas.  In September 1999, the Central Network Center (located in Mitaka City Education Center), which controls regional network centers and conducts R&D activities on high-speed routing and other technologies, started full-scale operations in carrying out experiments.

## IV.  R&D to Support Advancement and Diversification of Info-communications

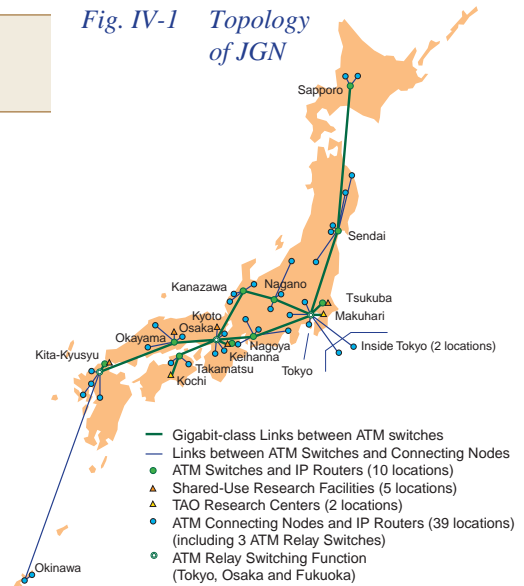### 1.  Promoting R&D using Japan Gigabit Network

Japan Gigabit Network (JGN) is a nationwide open testbed for promoting R&D activities on very high-speed networking technology including next-generation Internet and high-performance application technologies.  It was established by MPT and TAO with a total cost of 57.3 billion yen from the supplementary budget in FY1998.

The JGN consists of three bodies: The very high-speed optical-fiber network called "Gigabit Network Link," which has 49 access points nationwide; five shared-use research facilities (Gigabit Laboratories) located in Tsukuba, Keihanna (Kansai Science City), Kita-Kyushu, Kyoto and Okayama (Kyoto and Okayama facilities also have WDM network); and Research Centers where TAO itself carries out R&D activities.

Note: WDM: wavelength division multiplexing

Gigabit Network Link and the shared-use research facilities are open to universities, research institutes, private companies and other organizations for a variety of R&D activities for five years from FY 1999 through FY 2003.  The former is rented out free of charge (users pay for network charges from access points to their own facilities) and users of the latter are charged minimum expenses for fuel, lighting and other items.

In close collaboration with the Next Generation Very High-Speed Network Promotion Conference, which has been formed with a primary function to maintain the smooth and efficient operation of JGN, TAO has been improving the performance of JGN and promoting R&D activities utilizing JGN, by entrusting or jointly carrying out R&D themes invited from the public under a scheme, "R&D system utilizing JGN" established in FY1999.

The latest information is available at:  http://www.jgn.tao.go.jp/english/

### 2.  R&D master plan for info-communications technologies

On February 28, 2000, MPT received a report entitled "R&D Master Plan for Info-communications Technologies," which is a revised version of the master plan originally

*Fig. IV-1   Topology of JGN*

formulated in April 1997, from the Telecommunications Technology Council in response to an inquiry of February 22, 1999 on "Desirable R&D on Info-communications in the 21st Century."

Taking into account the rapid innovation in info-communications technologies in Japan, this report recommends 1) desirable themes for R&D activities to be conducted by Japan as a whole, 2) desirable R&D methods, and 3) concepts that form the basis of R&D work. The plan proposes R&D promotion measures from now on, and identifies 85 priority R&D projects as a result of the revision of former priority R&D projects.

Paying due respect to the report as a guideline, MPT will implement, as promptly as possible, policy measures for strengthening R&D activities into info-communications technology.

### 3. Subsidies for funding international joint research

In the info-communications field with rapid innovation, it is vital for Japan to reinforce technological competitiveness through exchange and fusion with leading technologies overseas and to develop world-class state-of-the-art technologies in Japan.

To this end, TAO invites R&D themes from the public, then subsidizes part of expenses for promising R&D activities in the info-communications field conducted by international joint research teams.

In FY1999, TAO subsidized five research teams.

### 4. R&D on info-communications infrastructure technology

The telecommunications field is playing an important role in making an affordable lifestyle for people in Japan and socioeconomic restructuring in the 21st century a reality. Taking this into account, the Communications Research Laboratory (CRL) has been carrying out fundamental and universal technologies in net-

work systems, terminal systems and database systems for info-communications infrastructure, with the aim to enable all people in Japan to benefit from the info-communications infrastructure in a rapidly developing advanced information society.

CRL has achieved a number of R&D results in such fields as 1) ultrahigh-speed network technology; 2) human-care interface technology; and 3) advanced information resources transmission and storage technology.

### 5. Promotion of "Basic Research 21 for Breakthroughs in Info-communications"

Fundamental interdisciplinary R&D, more than simply an extension along the lines of existing technologies, is essential for "breakthroughs" that will open up new modes of info-communications in the 21st century. In FY1998, MPT began a fundamental and interdisciplinary research project called "Basic Research 21 for Breakthroughs in Info-communications (BT21)." The aim of the project, which will be carried out under the direction of MPT's Communications Research Laboratory (CRL), is to conduct R&D as well as encourage international research exchanges

based on cooperation between government, academia and industry.

This project has established three main focal areas of study in response to new technological needs: "Advanced materials, devices and photonics for communications technology," "Realization of friendly communications society" and "Education of biological information function and its application." These research themes are intended to promote more effective and efficient research incorporating a wide range of related sciences, including physical and life sciences as well as humanistic and social sciences.

### 6. R&D for promotion of leading technology transfer

Within the basic/leading technologies in which CRL has conducted R&D, TAO succeeds in R&D activities that contribute to the creation of new businesses in collaboration with CRL, shifting to the development of applications.

Under this technology transfer scheme, applied R&D with strong social demand is carried out in such R&D fields as "R&D on 3D sign language database technology," "R&D on distributed multimedia information retrieval technology," "R&D on

*Fig. IV-5 Basic Research 21*
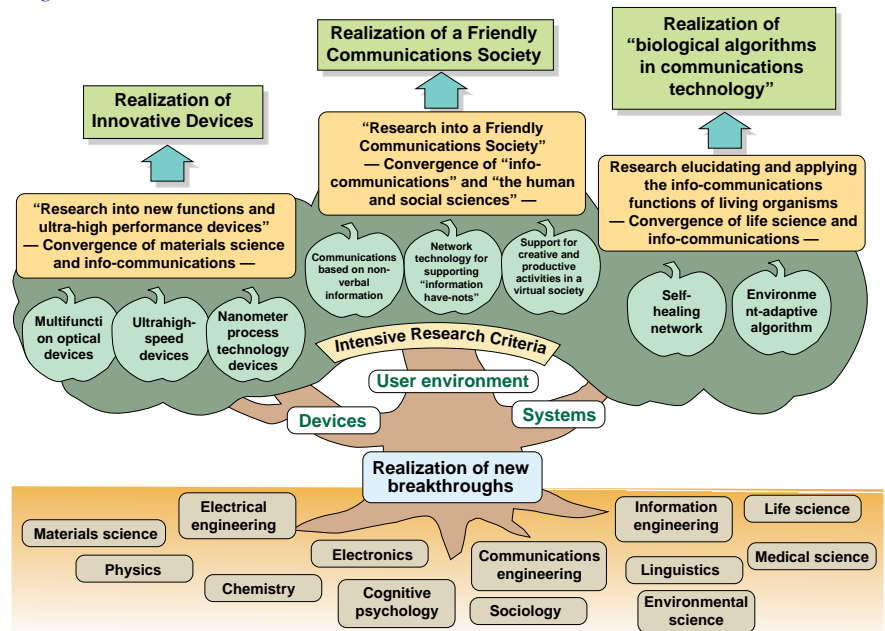
remote access of 3D image database technology" and "R&D on 10-GHz band efficient light modulator devices." Through the promotion of technology transfer from CRL to the private sector, this R&D is contributing to the rebirth of Japanese economy.

## 7. R&D for space communications technology ushering in the future

MPT is promoting the timely implementation of the following R&D projects in fixed and mobile communications as well as broadcasting and positioning technologies to build satellite communications networks interoperable with fiber-optic and terrestrial wireless networks.

**1) Engineering Test Satellite-VIII (ETS-VIII)**

Includes the development of technologies for 10-meter-class deployable antennas, 400W-class high-power transponders and satellite on-board switches, all of which are conducive to the realization of personal mobile multimedia satellite broadcasting and communications, among other areas. Verification and testing in space is scheduled to start in 2003.

**2) Next-generation LEO System (NeLS)**

Includes R&D into technologies needed for mobile satellite communications systems using next-generation low-earth orbit (LEO) satellites that will enable worldwide video transmission with handheld terminals, in line with increasing globalization and needs for multimedia in communications. Verification and testing in space are planned to start around 2005.

**3) Gigabit satellite**

Includes the development of technologies for Ultrahigh Data-rate Satellite Communications Systems that will also enable mutual supplementation with global fiber-optic communications networks. The Gigabit satellite contributes both to the construction of GII (Global Information

Infrastructure) and to the narrowing of the info-communications infrastructure gap between developed and developing countries. Verification and testing in space are planned to start at the beginning of the 21st century. After the launch, the government is planning to conduct joint experiments with countries in the Asia-Pacific region using the Gigabit satellite.

**4) Communications and Broadcasting Engineering Test Satellite (COMETS)**

i) Purpose

The satellite was launched for developing advanced satellite broadcasting technology, large volume of data communications between mobile terminals and satellite as well as inter-orbit communications, and for conducting a series of experiments and verification tests.

ii) Schedule

The satellite was launched in February 1998. However, it was not placed in its planned geostationary transfer orbit because the duration of the second firing of the second-stage engine was shorter than planned. Experiments were being conducted on an elliptical orbit by MPT's CRL, the National Space Development Agency of Japan (NASDA) and the COMETS User Experiments Implementation Council, the latter being made up of researchers invited from the public.

Beginning from the spring of 1999, Ka-band reception experiments were conducted in Thailand, the Republic of Korea, Singapore and Australia. After the experiments, COMETS stopped operations in August 1999.

**5) Research on orbital maintenance system (OMS)**

With the progress of space development such as the growth in the number of satellites for communications and broadcasting, concerns about the worsening of the space environment caused by increasing space debris are arising. To this end, with the aim to preserve the space environment and to enhance the reliability of space communications,

MPT has been conducting R&D on an orbital maintenance system (OMS) for eliminating unnecessary satellites on orbits, repairing and inspecting satellites, etc. In FY2001, prior verification experiments of remote inspection technology will be conducted in space.

**6) Research on quasi-zenith satellite system ("Figure-8" satellite)**

MPT has been carrying out R&D on the Quasi-Zenith Satellite System.

A minimum of three satellites will be placed into synchronous orbit at an inclination of approximately 45 degrees to the geostationary orbit. These orbits are seen from the Earth as a figure of "8" from north to south with its center on a point on the geostationary orbit. One of the three satellites is always seen near the zenith from Japan. With the three satellites at a higher elevation than geostationary satellites, high-quality mobile communications systems, etc. will be enabled through the development of new orbits which complement geostationary orbits which are congested.

**7) R&D on advanced broadcasting satellite systems**

In response to the need for sophisticated and diversified satellite broadcasting, the next-generation advanced broadcasting satellite system is anticipated to be realized. MPT has been conducting a satellite broadcasting system which enables compensation for rainfall attenuation throughout Japan, utilizing the 21GHz broadband satellite broadcasting band that can be used from 2007 under the authorization of the International Telecommunication Union (ITU).

## 8. Advanced technology R&D support system (termed "Telecom Incubation")

Since FY 1995, MPT has been providing subsidies to fund part of R&D expenses under the "Advanced Technology Research and Development Support System" (or "Telecom Incubation") via the Telecommunications Advancement Organiza-

tion of Japan (TAO) to small- and medium-sized enterprises (SMEs) engaged in progressive, creative technological research, which is thought to create new businesses, in the communications and/or broadcasting fields.

Starting from FY 1999, MPT also set up a support system to subsidize projects for promoting technology transfers between universities and SMEs (joint industry-academia R&D subsidization scheme); and the newly instituted scheme will facilitate and promote R&D in technological fields designated by TAO as promising and growing fields (priority technological fields subsidization scheme).

R&D on global environment measurement technologies using short wavelength millimeter-wave, while launching studies on the construction of the global environment observation research network aimed at understanding the mechanism of the global warming phenomenon and the destruction of the ozone layer.

3) MPT has been conducting R&D on devices that significantly reduce the electrical power consumption by communications facilities and multimedia terminals.

Note: Weight of $CO_2$ indicates $CO_2$ carbon equivalent.

Source: The Telecommunications Council report "Addressing Global Environmental Protection through Info-communications"

## V. Measures for the Environmental Protection with Use of Info-communications

### 1. Measures to cope with global environmental problems using info-communications

MPT has been promoting the following measures in order to realize the proposed policies recommended in the "Addressing Global Environmental Protection through Info-communications" compiled by the Telecommunications Council, an advisory body for the Minister of Posts and Telecommunications, in May 1998.

1) MPT has been promoting telework (or, telecommuting), SOHO (small office home office) and Intelligent Transport Systems (ITS ) that significantly reduce the emissions of the greenhouse gas $CO_2$ by, for instance, replacing the need for commuting traffic or making the traffic flow smoother. For promotion of telework/ SOHO, MPT is granting subsidies to telework center construction projects and offering tax incentives upon purchase of certain facilities that are necessary in launching telework/SOHO and conducting systems developments. For promotion of ITS, MPT has been carrying out R&D on info-communications technology and standardization activities in cooperation with relevant ministries and agencies.

The report estimated that annual emissions of $CO_2$ would be reduced by 1.29 million tons (of carbon equivalent in terms of $CO_2$) in CY2010 by promoting telework/SOHO and 1.1 million tons by promoting ITS in the same year.

2) MPT has been promoting studies on global environment measurement technologies using the light bands and radio waves including

## VI. Regional Information Intensification in the Promotion of Info-communications Usage

### 1. Vision for the next-generation local information community — ICAN 21 Strategic Plan —

MPT received a report from the Telecommunications Council on May 31, 1999, entitled "Vision for the Next-Generation Local Information Community - ICAN 21 Strategic Plan." The report was made in response to MPT's inquiry concerning the "desirable policies for introducing information technology (IT) to local communities for the following generation" on October 21, 1998. The objectives of the inquiry were to formulate long-term policies for local information communities to be established around 2010 and to promote these communities.

The ICAN (Information Community Area Network) 21 Strategic Plan was proposed in the report which suggests that the top local government official should have the power to promote local information policies based on the self-reliance of each community, in cooperation with local citizens, the private sector and nonprofit organizations (NPOs). The highlights of the strategic plan are as follows:

1) **Future local info-communications systems**

Local communities should establish an autonomous decentralized Local Public Network to enhance services for citizens as well as ensure interconnection among autonomous decentralized information systems by adopting international technical standards and establishing a middleware function.

2) **Three points for local information policies**

Local information policies in the future should be considered according to the following three points:

i) Promote wide-area local information policies;

ii) Discuss measures for supporting the private sector, academic institutes in local areas, residential information communities and NPOs as well as the local governments; and

iii) Promote model projects and activities based on geographic conditions, population trends, regional culture, etc.

3) **Promotion of local competition**

As a principle of local information

policies in the future, "Promotion of local competition" should be proposed, including enhancement of support for model projects by local governments and temporary tolerance for the increasing gap between each community which provides a result of the enhancement of the nationwide information environment and public services for local citizens.

**4) Combination of local information policies and administrative information policies**

Electronic administrative procedures and open systems should be promoted, because administrative informatization is part of local information policies and realizes communities led by local citizens in accordance with the decentralization of authority.

**5) Measures for promoting local information policies**

Local information policies should contain measures for the "information barrier-free" environment, local information communities for global space as well as creation of information amenities to solve problems of metropolitan areas.

According to the ICAN 21 Strategic Plan, MPT will promote local information policies of local governments, citizens and the private sector by supporting wide-area collaborations for model projects, promoting information infrastructure without regional gaps, developing general technology as a basis of local information communities, etc.

## 2. Teletopia project

The Teletopia Project is an initiative aimed at solving a variety of problems in local communities and reinvigorating societies by promoting regional IT through the introduction of info-communications media such as cable TV and data communications into designated communities.

Since its launch in FY1985, a total of 182 communities have been designated as Teletopia communities throughout Japan as of the end of March 2000, where a variety of systems have been built to accommodate the special needs of each community including the revitalization of a community, the promotion of local business and the expansion of medical as well as social welfare services.

## 3. Project for Enhancement of Regional and Life-related Information Infrastructure

The Project for Enhancement of Regional and Life-related Information Infrastructure is a modeling project aimed at enhancing the convenience of people's daily lives, reinvigorating local economies and accelerating the development of info-communications infrastructure by developing and introducing info-communications applications to public-sector services such as administrative, educational, medical and welfare services.

During the period between April 1994 and March 2000, the project was implemented at 303 sites nationwide including 79 local government networks, eight telework centers, 184 advanced local cable TV networks, four districts designated under the City Central District Revitalization Project Using Multimedia, and 26 facilities under the Regional Intranet Infrastructure Construction Project, and two information barrier-free telework centers.

## 4. Promotion of Telework/SOHO

Telework (or, telecommuting) and small office home office (SOHO) offer a workstyle free from confinement to fixed work locations, as enabled by the use of info-communications. Not only individuals and businesses, but also society as a whole can benefit from telework/SOHO because it reduces the burden of commuting on workers, improves productivity, realizes a comfortable lifestyle, enables engagement in work while childrearing, increases job opportunities for the elderly and people with disabilities, and contributes to environmental preservation by making actual traveling unnecessary.

In particular, with the rapid penetration of IT including the Internet and the revision of traditional employment conditions such as lifetime employment and seniority systems, SOHO businesses are emerging and their number is increasing rapidly as independent businesses ignoring conventional corporate structures.

To promote telework/SOHO, MPT has been carrying out the following measures:

i) Telework Center Construction Project (see **Note**.);
ii) R&D on info-communications systems contributing to SOHO, etc.;
iii) Reduction of the fixed assets tax on facilities and equipment for telework;
iv) Funding scheme for facilities and equipment for telework/SOHO;
v) Hosting telework promotional events; and
vi) Trials on telework by MPT personnel

Meanwhile, the Asia-Pacific Economic Cooperation (APEC) project to compile a "Telework Manual," which was proposed by Japan to promote telework in the Asia-Pacific region, has been completed, and the manual has already been made public.

Note: Telework Center Construction Project: Since FY1994, subsidies from the national funds have been granted to local governments or third-sector bodies that proceed with the construction projects of shared-use telework centers, with the aim of creating a base for further introducing telework into local communities.

## 5. Advanced Info-communications System Model City Construction Program

The introduction of IT in the public sector is expected to spur widespread adoption of IT in Japanese society, which will lead to the creation of an advanced info-communications society.

In line with this, MPT, in collaboration with the Ministry of Interna-

tional Trade and Industry (MITI), has been carrying out the "Advanced Info-communications System Model City Construction Program." It constructs advanced info-communications systems in highly motivated municipalities which provide public-sector applications covering more than one field including administrative, educational, medical and social welfare aimed at realizing "future multimedia cities" of the 21st century in advance as well as realizing an advanced info-communications society as soon as possible.

This program has a greater degree of appeal than similar programs in the past, for following reasons:
1) Financial support for software has been made available for the first time, targeting content production expenses.
2) Financial support for hardware has been expanded to include transmission lines and terminals.
3) The level of financial support, at 50%, is quite high.
4) Financial support has been expanded to include third-sector organizations and nonprofit organizations.

MPT expects that these "future multimedia cities" will serve as role models for 3,300 local governments in Japan, spurring them to introduce public sector applications. As of March 31, 2000, 34 projects in 29 areas were designated as future multimedia cities.

## 6. Promotion of Results Expansion-Type R&D (Multimedia Pilot Town Project and others)

Through the Telecommunications Advancement Organization of Japan (TAO), MPT will conduct follow-up R&D, winning cooperation from enthusiastic local governments, universities and private companies, for realizing further advanced info-communications system based on basic technology which has been developed in designated communities under pilot projects.

Through these activities, MPT will create new demand for a variety of multimedia models which will produce new lifestyles, and contribute to a socioeconomic revolution toward an advanced information society.

## 7. Okinawa International Information Special District Project

In addition to the "Okinawa Multimedia Special District Project" (the Multimedia Island <MMI> Concept in Okinawa) which started four years ago since the establishment of the "Okinawa Policy Council" and the "Chief Cabinet Secretary's Commission on Okinawan Issues (Shimada Commission)," in order to transform Okinawa into an "info-communications hub" in the Asia-Pacific region, MPT implemented the environment for strengthening the Okinawan economy through the integration of IT industries. MPT held a study group from September 1999 through April 2000 to consider measures to implement the "Okinawa International Information Special District Project." After a series of deliberations, the study group compiled its findings as a report.

In the report, with aims at helping the islands to gain economical self-reliance by integrating IT industries and improving the islanders' living standard by utilizing IT, the following five measures are proposed:
1) Constructing a Global Internet eXchange (IX) for building an info-communications hub in the Asia-Pacific region
2) Advancing regional info-communications networks
3) Inviting, grouping and fostering domestic and overseas IT-related industries and research institutes
4) Concentrating domestic and overseas content and applications
5) Promoting accelerated and mass human resources development programs
6) Promoting R&D

Thus, MPT is promoting these info-communications-related measures in a multifaceted and multilayered manner.

## 8. Telecom Venture Business Fund

In May 1998, the "Telecom Venture Business Fund" (or Telecom Investment Enterprise Cooperative) was established with the aim of spawning new telecommunications and broadcasting businesses (Note). Both TAO and the private sector invested in the fund.

It is necessary to give financial assistance to venture businesses in their infancy in order to help them start and develop new business, in addition to setting the right kind of environment for venture businesses to flourish.

Note: "New telecommunications and broadcasting businesses" means a person who is given authorization by the Minister of Posts and Telecommunications under the Law for Promoting Specified Telecommunications and Broadcasting Businesses.

## 9. Promotion of Geographic Information System (GIS)

The Geographic Information System (GIS) enables users to retrieve, analyze and display specific data from the combined and interlaced pieces of information made up of statistics, ledgers, various types of lists and digitized geographical information. As GIS makes various economic activities more efficient, Western nations are promoting the construction of GIS as national projects.

In Japan, government policies are coordinated at the "Liaison Committee of Ministries and Agencies Concerned with Geographical Information System (GIS)." In January 1999, the "GIS Promotion Conference between the Government and the Private Sector" was established for efficiently implementing and utilizing GIS with collaborative efforts between the government and the private sector. In FY 2000, model district initiatives with collaborative efforts between the government and the private sector will be carried out.

From FY 1998, MPT kicked off R&D activities concerning communications protocols for constructing distributed GIS which combines and operate multiple GIS dealing with various types of data; and by FY 2000, MPT will develop a distributed GIS prototype model.

In addition, from FY1999, R&D on information technologies which, unlike existing labor-intensive systems, automatically compile landscape and location information, such as efficient 3-D information collection and processing technologies, have started toward the construction of 3-D GIS. In FY2000, the expansion of area data and R&D on improved automated operations ratios and precision data will be conducted.

For further promotion of GIS, as a member of the "Liaison Committee of Ministries and Agencies Concerned with Geographical Information System (GIS)" and the "GIS Promotion Conference between the Government and the Private Sector," MPT will make efforts to implement government measures.

## VII. Contribution to the Development of the Global Information Infrastructure

### 1. Promotion of satellite communications application experiments

Since October 1997, MPT has been hosting the "Satellite Application Experiments Promotion Conference," chaired by Dr. Yasuhiko YASUDA, professor at the School of Science and Engineering, Waseda University. One of this committee's missions is to support three high-data rate (HDR) satellite communications experiments jointly conducted by Japan and the U.S., Japan and Europe, and Japan and the Republic of Korea, that are to verify the feasibility of HDR satellite communications technologies in an advanced info-communications infrastructure. Another mission is to promote experiments on satellite-based applications in Japan.
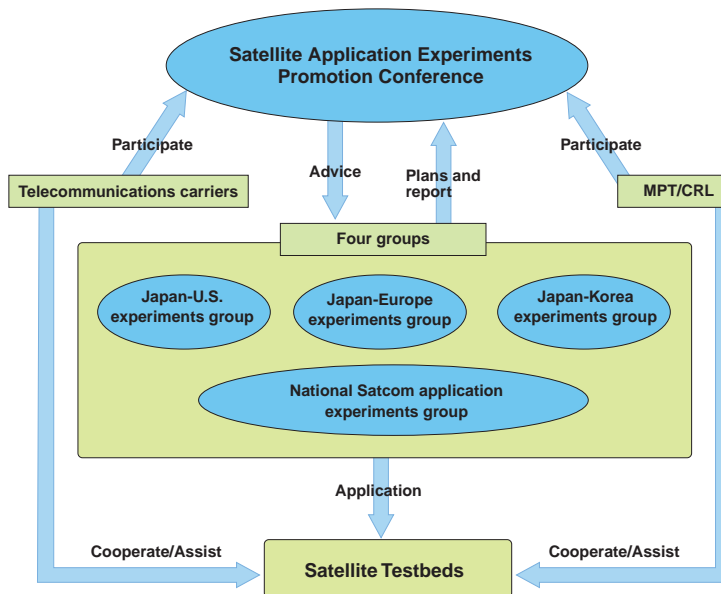
**1) Roles of the conference**

The conference comprises representatives from satellite communications carriers, communications equipment manufacturers, relevant organizations, as well as experts and users of satellite communications services. (See **Fig. VII-1**.)

They will carry out the following tasks.

i)  Preparation of testbeds for the joint government and industry satellite application experiments;

ii) Discussion, evaluation, and suggestions on experiment plans and results; and

iii) Inviting participants to the experiments, as well as publication of experiment plans and results.

*Fig. VII-1  Promotion of Satellite Communications Application Experiments*



**2) Organization of the conference**

To proceed with its tasks, the conference formed the following four experiment groups.

i)  The Japan-U.S. experiment group

The Communications Research Laboratory (CRL) and the National Aeronautics and Space Administration (NASA) of the U.S. are the chief promoters of experiments being carried out jointly by industry and academia. This is part of the Global Interoperability for Broadband Networks (GIBN), one of the G7 Pilot Projects. The group represents the Japanese side in the Japan-U.S. HDR Satellite Communications Experiments.

In March 1997, "experiments on ultrahigh-definition video post production" succeeded as Phase 1 experiments of GIBN. Currently, the group is preparing communications experiments utilizing ATM high-speed satellite circuits at 155 Mbps in coordination with the U.S. side.

ii) The Japan-Europe experiment group

A group representing the Japanese side in the Japan-Europe Joint HDR Satellite Communications Experiments is also part of GIBN. Experiments (Japan-Europe Gamma: JEG, which links Japan and Europe via HDR satellite circuits) are carried out primarily by the CRL and the European Space Agency (ESA) as well as by industry and academia, in collaboration with the ESA-led GAMMA (Global Architecture for Multi-Media Access) project.

In Phase 1 (from July 1997 through November 1999) of the project, various experiments utilizing 2Mbps links were successfully closed. Currently, the group is preparing Phase 2 experiments in coordination with ESA.

iii) The Japan-Republic of Korea experiment group

At a Japan-Republic of Korea Bilateral Consultation between MPT and the Republic of Korea's Ministry of Information and Communication in April 1995, Japan's proposal to conduct the International Joint High-speed Communications Experiments linking Asian countries/areas gained consensus. A group consisting of researchers from CRL and the Electronics and Telecommunications Research Institute (ETRI) of the Republic of Korea is conducting the HDR Satcom (High-Data Rate Satellite Communications) Experiment Project as agreed upon between the Republic of Korea's Ministry of Information and Communication in September 1997.

iv) The national Satcom application experiment group

The group, in February 1998, conducted experiments on 3D ultrahigh-definition video transmission at the 18th Nagano Winter Olympic Games. Currently, the group is inviting new satellite communications experiment themes from the public.

## 2. Promotion of the POST-PARTNERS Project

MPT, in cooperation with countries in the Asia-Pacific region, has been promoting an international joint experiment known as the POST-PARTNERS (Post-Pan-Pacific Regional Telecommunications Network Experiments and Research by Satellites) Project.

The purpose of this project is to promote technology transfers, human resources development and the diffusion of satellite communications in the region.
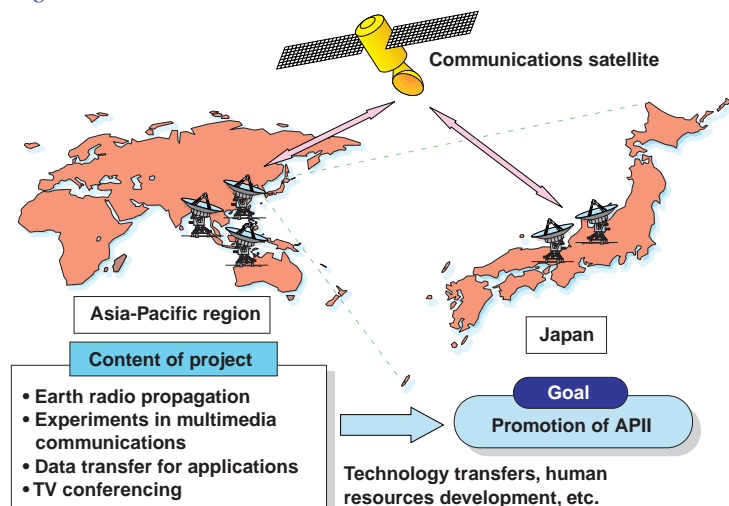
Many countries in the Asia-Pacific region are made up of many islands with populations spread out over a wide area, and with insufficient transportation and communications networks.

In such a region, satellite links are an extremely effective means of communications and are expected to play an essential role in building the Asia-Pacific Information Infrastructure (APII) network of the future.

As the very first project of the POST-PARTNERS, a joint experiment was launched in January 1997 between Japan and Thailand. Since then a variety of experiments have been conducted including a measurement of the characteristics of satellite radio-wave propagation for studying basic satellite communications technology, a multimedia satellite communications experiment using 1.5 Mbps satellite links, a distance learning (telelearning) experiment by holding an international workshop at which reports on the current status of each country's communications and cultural affairs were provided, and a telemedicine experiment in which medical images were transmitted.



Fig. VII-2  POST-PERTNERS

- Communications satellite
- Asia-Pacific region
- **Content of project**
  - Earth radio propagation
  - Experiments in multimedia communications
  - Data transfer for applications
  - TV conferencing
- Japan
- **Goal**
  - Promotion of APII
- Technology transfers, human resources development, etc.

As of FY 1999, Thailand, Indonesia, Malaysia, Fiji and the Philippines are participating in the project. MPT is going to expand the experiments by connecting with conventional networks.

## 3. Asia-Pacific Telecommunity Standardization Program (ASTAP)

In recent years, remarkable progress has been made in the info-communications field. However, in order to further improve consumer

Table VII-3  ASTAP Experts Groups

| Expert Group | Rapporteur |
|---|---|
| Network and Service Management for IP World | Mr. Parthasarathy Ganesh (India) Dr. Cherng Yeh (Lucent Technologies Japan Ltd.) |
| Intelligent Networks | Mr. I. Srinivasa Sastry (India) |
| IMT-2000 | Mr. Akio Sasaki (ARIB) Dr. Kyu-Jin Wee (Korea) |
| Intelligent Transport Systems | Mr. Satoshi Oyama (Hitachi, Ltd.) |
| Fixed Wireless Access | Mr. Yoshihiko Shindo (NTT Access Network Service System Laboratories) |
| High Altitude Platform System (HAPS) | Dr. Katsuhiko Kosaka (ARIB) |
| Interoperability/Asia-Pacific All Backbone | Dr. Jong-Jin Sung (Korea) |
| ATM/xDSL | Dr. JangJin Lee (Korea) |
| Internet Related Topics | Dr. Hui-Lan Li (Lucent Technologies Japan Ltd.) Dr. Yon Hyeon-Jeong (Korea) |
| Digital Broadcasting | Mr. Toshiro Yoshimura (Science and Technical Research Laboratories, NHK) |

convenience, it is urgent that unified technical standards be introduced around the world.

In the Asia-Pacific region, in order contribute to the institution of international standards by strengthening standardization activities in the telecommunications field, the Asia-Pacific Telecommunity (APT) in November 1997 set up the Asia-Pacific Telecommunity Standardization Program (ASTAP).

The Third ASTAP Forum was held in the Republic of Korea from June 20 through 23, 2000. At the Forum, the issues including the revamping of ASTAP's organization and the establishment of new Experts Groups were discussed.

As the result of the discussion, the Forum decided to revamp ASTAP's organizational structure, abolishing the previous Coordination Groups for the Experts Groups, terminating the Experts Groups on Environmental Issues, forming a new Experts Group on High Altitude Platform System (HAPS) and a new Group for Regulatory Liaison.

MPT will continue to do its utmost through APT activities in order to strengthen standardization activities in the Asia-Pacific region.
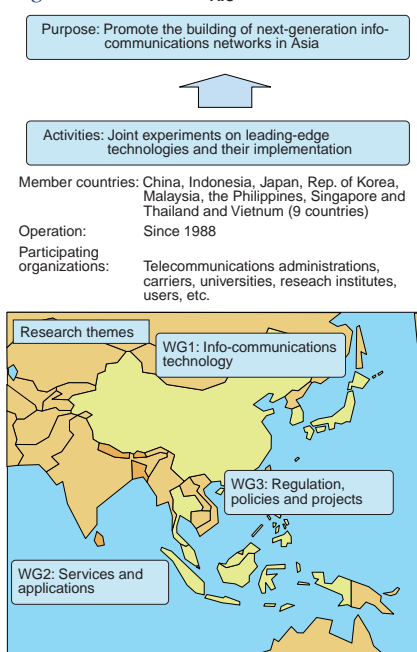
Note: Asia-Pacific Telecommunity (APT): A regional international organization (established in 1979) consisting of telecommunications administrations, operating bodies, etc. of 35 countries and areas in the Asia-Pacific region.

## 4. Promotion of the Asian Info-communications Council (AIC)

Based on Japan's proposal, the Asian Info-communications Council (AIC) was established in FY1988 aimed at supporting the sound development of the telecommunications infrastructure, contributing to socioeconomic development and improving the quality of life in each member country.

AIC, initially started with four countries (Japan, the Republic of Korea, the Philippines and Singapore) was expanded to nine coun-

Fig. VII-4  AIC



Purpose: Promote the building of next-generation info-communications networks in Asia

Activities: Joint experiments on leading-edge technologies and their implementation

Member countries: China, Indonesia, Japan, Rep. of Korea, Malaysia, the Philippines, Singapore and Thailand and Vietnam (9 countries)

Operation: Since 1988

Participating organizations: Telecommunications administrations, carriers, universities, reseach institutes, users, etc.

Research themes
WG1: Info-communications technology
WG3: Regulation, policies and projects
WG2: Services and applications

Note: ISDN (Integrated Services Digital Network) refers to a digital network enabling simultaneous transmission of images, voice and data. ISDN is expected to play a very important role in the approaching multimedia society.

tries with the participation of China, Indonesia, Malaysia, Thailand and Vietnam. A total of 85 organizations participating in AIC include telecommunications administrations, carriers, communications equipment manufacturers, universities and other related organizations.

So far 23 conferences of AIC have been held. By designating a five-year period from April 1998 to March 2003 as the third AIC term, AIC has launched new extensive joint experiments on Internet Protocol (IP), Wireless Local Loop (WLL) and other items. In October 1999, the name AIC was changed from the

Asian ISDN Council to the Asian Info-communications Council, in order to respond to the latest technological trends.

In February 2000, the first AIC meeting since the name change was held in Denpasar, Indonesia on the threshold of new millennium. The meeting was successfully closed with the first official participation of a Vietnamese delegation.

The AIC joint experiments are anticipated to contribute to the development of Asian info-communications infrastructures and the revitalization of the Asian economy.
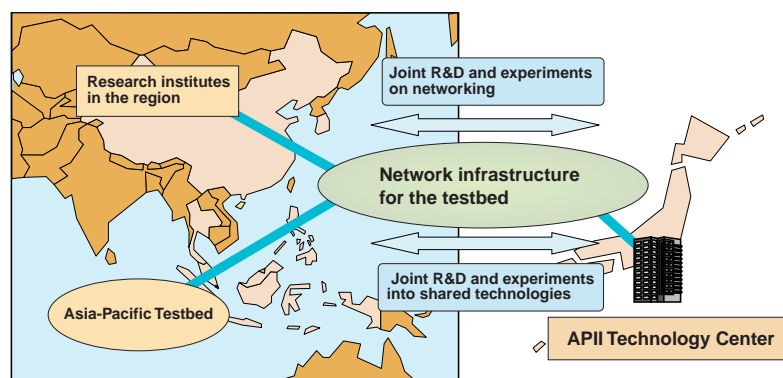
## 5. Promotion of the APII Testbed Project

The Asia-Pacific Information Infrastructure (APII) Testbed Project is aimed at contributing to regional economic development by promoting the construction of an info-communications infrastructure in the Asia-Pacific region.

In order to practically promote the project, MPT on February 13, 1997 opened the APII Technology Center inside the Kansai branch of the Communications Research Laboratory (CRL) in Kobe City, Hyogo Prefecture. The center, which is equipped with advanced info-communications experimental facilities including an ATM-backboned network, serves as a regional hub for international joint studies on the info-communications infrastructure in the Asia-Pacific region.

The project members are conducting international joint R&D and ex-

Fig. VII-5  APII Testbed Project



Research institutes in the region

Joint R&D and experiments on networking

Network infrastructure for the testbed

Asia-Pacific Testbed

Joint R&D and experiments into shared technologies

APII Technology Center

periments on next-generation networking technologies such as the next-generation Internet, as well as application technologies including telemedicine by using the APII Technology Center as a hub. They also have been training multimedia information engineers who will be required to promote the series of experiments.

Note: A testbed is an experimental network for developing networking and applications technologies for conducting verification experiments.

## 6. Promotion of GENESIS project

Toward the realization of a global multimedia society, in promoting interconnectivity and interoperability experiments on broadband networks by G7/G8 countries, a variety of issues have emerged for building and utilizing the next-generation global broadband networks.

In carrying out the "GENESIS" project, participants identify technological problems and find solutions through R&D, thus contributing to the realization of a global multimedia society.

Beginning from FY 2000, from the viewpoints that R&D activities on 1) network control technology which offers and guarantees the quality of service (QoS) meeting user needs and 2) application technology which utilizes the offered QoS are indispensable, the participants in the project are conducting the following

elemental technologies:
1) R&D on network control technology for utilizing the next-generation global broadband networks;
2) R&D on application technology for utilizing the next-generation global broadband networks; and
3) R&D on measurement technology for realizing the next-generation global broadband networks.

In conducting R&D, the international broadband networks linking the U.S., the EU and the Asia-Pacific region are planned to be constructed, through the collaboration with the Japan Gigabit Network (JGN) Project in Japan, and JEG (Japan-Europe Global Architecture for Multi-Media Access) Project and APII (Asia-Pacific Information Infrastructure) Testbed Project at international levels.

## VIII. Preparation of "Information Barrier-Free" Environment

### 1. Executive Meeting on "Information Barrier-Free" Environment

There are concerns about the "digital divide" which can be seen widening between those without disabilities and people with disabilities as well as the elderly. The "digital divide" could lead to further gaps in social and economic conditions. In response to those concerns, an "information barrier-free" environment where everyone can enjoy the benefits of info-communications must be created.

For the purpose of exchanging views of experts with wide-ranging perspectives on the creation of an "information barrier-free" environment, MPT held the "Executive Meeting on the Information Barrier-Free Environment" four times during December 13, 1999 through February 25, 2000. The report from the

meeting was released in February 2000. In the report, as issues/proposals for R&D; i) the need for additional public support; ii) a reflection of user opinions; and iii) practical measures, were raised. As tasks/proposals on the accessibility of telecommunications equipment; i) the formulation of "Guidelines for Accessibility to Telecommunications Equipment"; and ii) the concept of "universal design," etc., were raised.
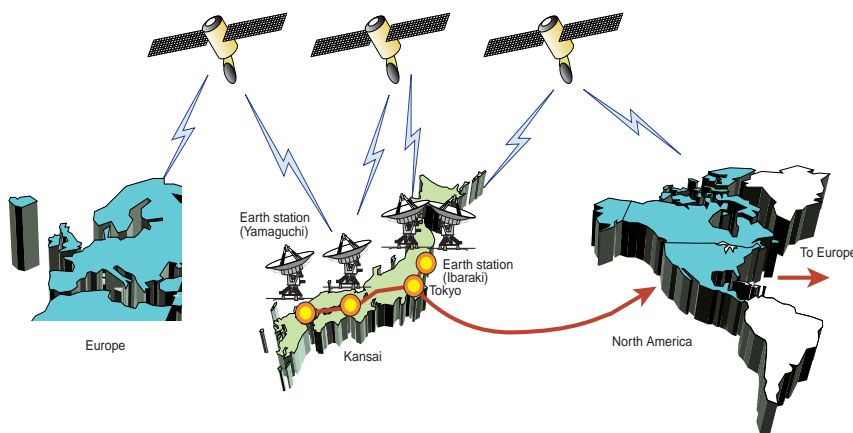
### 2. Study Group on Info-communications Accessibility for the Elderly and People with Disabilities

The "Study Group on Info-communications Accessibility for the Elderly and People with Disabilities" (Chair: Professor Hiroshi TAKAHASHI, College of Community and Human Services, Rikkyo University), after completing a series of meetings since January 2000, compiled its findings in a report in May 2000. The group was jointly held by MPT and the Ministry of Health and Welfare (MHW).

The report covered issues and measures that ensure web accessibility and enable support for IT, the latter relying on voluntary assistants to allow the elderly and people with disabilities to use IT.

As regards enabling support, this report recommends two measures, namely 1) support measures to secure facilities for the services and 2) demonstration of the effectiveness of

*Fig. VII-6  Configuration of experimental networks and*



Europe

Earth station (Yamaguchi)

Kansai

Earth station (Ibaraki) Tokyo

To Europe

North America

services by taking initiatives.

In order to ensure web accessibility, the report describes issues and measures such as 1) practical policy measures to be promoted by the public sector and 2) collaboration with users.

Based on the report, MPT and MHW will jointly work to realize these measures.

### 3. R&D on Information Barrier-Free telecommunications and broadcasting systems

The Telecommunications Advancement Organization of Japan (TAO) has been carrying out R&D on "information barrier-free telecommunications and broadcasting systems" designed to alleviate various barriers encountered by the elderly and people with disabilities.

More specifically, TAO is promoting R&D on a system which provides a number of functions over networks in order to cope with a variety of disabilities and automatically controls as well as distributes information according to an individual's characteristics, a technology which substitutes and supports disabilities of the elderly or others, for instance handwritten-letters recognition technology and a system which automatically produces TV programming with closed-captioned text.

### 4. Development and deployment of welfare support info-communications systems

In Japan, it is predicted that a full-fledged aging society, in which one in four Japanese will be over 65, will come by about 2015.

As the society is aging, the number of people demanding community welfare and care is high. Since FY1999, MPT, through TAO and with the cooperation of local governments, etc., has been conducting R&D for realizing the "welfare support info-communications systems," enabling 1) the efficient provision of high-quality welfare services and 2) self-reliance and social participation of the elderly and people with disabilities.

Thus far, in five cities, towns and villages, R&D has been conducted on: 1) the next-generation visiting-care support systems with which nurses, etc., can get the latest care information on the homes being visited; and 2) social participation support systems with which the elderly, etc., can easily get information on local events and welfare over the networks.

### 5. Subsidies to private enterprises engaged in R&D on telecommunications and broadcasting services for the elderly and people with disabilities

TAO grants subsidies to enterprises engaged in R&D projects for developing communications and broadcasting services that accommodate the needs of the elderly and people with disabilities. In FY 1999, 23 projects were selected for grant subsidies from TAO.

### 6. Verification experiments to enable easy website development services for the elderly and people with disabilities

In order to create an "information barrier-free" environment, verification experiments were carried out to enable easy website development services.

The verification experiments, with twenty seniors and people with disabilities living in Kanazawa city, clarified the effectiveness of and problems with an info-communications system with a function to create webpages on the Internet easily. The webpages created include the barrier-free map of Kanazawa City (a map showing barrier-free information for the elderly and people with disabilities upon going to town and upon sightseeing).

Positive effects, such as enabling the elderly and people with disabilities to create webpages by using materials and systems provided under the verification experiments, that will promote an "information barrier-free" environment in which everyone can enjoy the benefits of info-communications, are foreseen.