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# TELECOM

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## Flat-Rate Services to Expand Internet Use in Japan

### ADSL, Wireless or Fiber-Optics?

In 2000, Internet users may be able to browse web sites in a more relaxed mood: carriers and providers are planning to launch flat-rate Internet access services with which users can enjoy data communications services at a higher speed, at a lower rate. A variety of new services including asymmetric digital subscriber loop (ADSL), wireless LANs, full flat-rate services are planned for launch, one after another. It seems that individual Internet users may be able to receive up to 10 Mbps data transmission service at several thousand yen per month within several years.

Although all these new services are remarkable, all of them have both advantages and disadvantages.

At the moment, it is hard to say which system will win a large market share.

The fixed-rate Internet access using ISDN seems to win greater number of users in 2000. Since the service is based on conventional ISDN technology and facilities, it has many advantages: the technology is well established, there are at least one point of interconnection (POI) in each prefecture, and it uses the conventional ISDN routers. No new investment is necessary to launch the new service.

However, the service is slow. The data transmission speed is limited to 64 kbps now, and as far as it uses the ISDN technology, NTT cannot increase the speed drastically.

In addition, at the moment, the service charge is 8,000 yen per month (except ISP access charges and basic monthly charges), much higher than any other new services.

On February 9, Junichiro Miyazu, President of NTT Corp., said that the firm would reduce the service rate up to one-fourth of the current level from May 2000. According to Miyazu, the charges will be pushed down under 5,000 yen in any service areas and in case the user's home and one of the access points of the Internet provider are in the same message area (MA), then the charges will be under 3,000 yen.

When the new price level is applied, then the flat-rate Internet access user

will pay around 8,000 yen including the Internet access charges plus NTT's basic monthly charges.

Regarding the Miyazu's announcement about the new price level, NCCs raised an objection saying that NTT should reduce the interconnection charges if the carrier has enough financial resources (to push down the flat-rate Internet access services)

ADSL services were launched in Japan at the end of last year (1999) partly because ADSL modems (DSLAMs) were standardized and partly because NTT decided to open its copper cable for non-NTT firms.

Tokyo Metallic Communications Corp. and New COARA launched their ADSL services in December 1999 placing their own devices within NTT's branching units. Their data transmission speed is 640 kbps for a descendent network. Tokyo Metallic is charging 6,300 yen including both the Internet access charges and the rental fee for the copper wire network from NTT.

Following them, NTT itself launched ADSL services. Unlike Tokyo Metallic and New COARA, users of the NTT ADSL services have to subscribe to an Internet access services. NTT is charging 5,100 yen for its 512 kbps services (excluding Internet access charges).

NTT Communications Corp. (NTT Com), an NTT group firm, is planning to launch its flat-rate Internet connection services at less than 4,900 yen per month utilizing the NTT ADSL services.

Some other carriers are planning to launch flat-rate Internet access services using the ADSL technology. But non-carrier ISPs are taking a wait-and-see attitude.

It is because that ISPs have to bear a lot of cost for launching the service and both the technology and the marketability of ADSL are still unknown.

In order to launch the services, ISPs have to place specific devices within NTT's facilities and construct networks linking these devices and their own facilities. In addition, ADSL has some problems: when the distance between

## Electronic Signature/ Certificate Business to Take off

By Yaeko Mitsumori

The Japanese government is going to submit an electronic signature/electronic certificate bill into the current Diet session. If the bill goes through the Diet, the new electronic signature/electronic certificate law will be enacted before the end of 2000 at the earliest.

The new law will grant the same legal status of conventional (handwriting) signature and seal impression to electronic signature and electronic certificates. Under the new law, private CAs (certificate authorities) can seek a license from the government on a voluntary basis in order to get a higher social status. In addition, private firms will be able to use electronic certificates for Internet business without any concern about malprac-

tices. Norihiko Yoshida, a spokesperson of SECOM Co., Ltd., said that he believes that the law will vitalize the e-business by granting the same role of conventional signature and seal impression to electronic signature and electronic certificates.

The electronic signature verifies that a certain document with the electronic signature has been approved by the person who put the electronic signature. Over the Internet, it is impossible for anybody to know whether a certain document is written or approved by the genuine person. In order to verify the writer or the sender of the document, the system gives an encryption key to each user and let them "virtually" put a

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## Japanese Banks Split into 2 Camps for E-business Settlement

Japanese financial institutions are divided into two camps over the e-business settlement and struggling each other for winning the *de facto* standard. Both admitted there should be the only one standardized settlement system for convenience for end users; however, there has been no negotiation toward the harmonization or standardization between them so far.

One of these groups is the Japan Internet Payment Promotion Association led by MPT's Postal Savings Bureau, with support from Fuji Bank Ltd., Nomura

Securities Co., Ltd., and NTT Data Corp.; and the other is the Japan Payment Network led by Sumitomo Bank, Ltd., Sakura Bank, Ltd., Daiichi Kangyo Bank, Ltd. and Sanwa Bank, Ltd.

The former is using the Secure Electronic Transaction (SET) and the latter the Secure Electronic Commerce Environment (SECE). SECE is Japan's unique settlement protocol developed by NEC Corp., Fujitsu Ltd. and Hitachi, Ltd., under the direction of the Ministry of International Trade and Industry (MITI). Both insist that their

own system is superior to the other one.

Their movements are winning attention by market watchers because they may become influential settlement measures that will replace the conventional settlement methods such as "cash-on-delivery."

"Current settlement systems for e-business such as credit card settlement is not very secure. But our new settlement platform is very safe and convenient," Takao Yamamura, Managing Director of the Japan Internet Payment

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### Flat-rate services:

*Continued from Page 1*

the user and the NTT switch is long, the data transmission speed goes down; ADSL services may interfere communications of the ISDN; and copper wired network is diminishing due to construction of optical fiber network.

It is said that NTT has already constructed fiber-optic networks around Tokyo area. Some market watchers said the carriers may be forced to shift their targeting area to rural area as expansion of optical fiber network.

One non-carrier type ISP said that it is impossible for one ISP to provide the services.

Access services using the wireless

LAN is going to take off. Some business such as the SpeedNet is going to launch the high-speed wireless LAN services using 2.4-GHz band. Masayoshi Son, President of SOFTBANK Corp., a firm which holds a stake in this wireless access service provider, said that the firm will provide more than 1 Mbps services at less than 5,000 yen per month.

Although marketability of wireless LANs is still unknown, the services may be superior to other services like ADSL in their prices and data transmission speed. Also some carriers and vendors are scheduled to launch an experiment for wireless LAN services using the 5-GHz spectrum in the autumn of 2000. Commercial application has not been

decided yet; however, Akinori Hirukawa, NTT Wireless Service Systems Lab., said NTT is targeting to launch commercial services in 2001.

NTT East and NTT West Regional Companies are scheduled to launch another high-speed flat-rate services in the autumn of 2000.

According to their plan, these carriers are going to provide Mbps-class services via optical fiber for multi-users at several thousand yen per month.

Although it is an experimental case, NTT-ME Corp. is going to launch flat-rate data transmission services at 5,000 yen per month at an apartment building in Hyogo Prefecture in April 2000. NTT-ME explained that the carrier was able

to realize such low charges by collecting network and device fees as part of construction fees.

NTT has been promoting its fiber-to-the-home (FTTH) project targeting to provide 10 Mbps services at 10,000 yen per month in 2005.

Thanks to other advanced technology such as ADSL, WLL and wireless LAN, however, the targeting services might be realized before the schedule.

Such development is, needless to say, beneficial for consumers. It will push up the number of Internet users, promote Japanese e-business, and eventually help Japan to catch up with the U.S. in the Internet business.

## Carrier News

### NTT Communications

#### NTT Com to Take Equity in AT&T Global Network Services - Japan

NTT Communications Corp. (NTT Com) signed an agreement with AT&T Corp. to acquire an equity interest in AT&T Global Network Services - Japan, part of AT&T Solutions Group, a wholly owned subsidiary of AT&T, the companies announced.

NTT Com, the long-distance and global communications arm of the NTT Group, which also provides business services and solutions, will purchase a 15-% interest in AT&T Global Network Services - Japan (AGNS-Japan). NTT Com will invest US\$50 million in AGNS-Japan.

NTT Com will allow AGNS-Japan to use the NTT Com logo with the AGNS-Japan logo in Japan. NTT Com will have the ability to increase its ownership in AGNS-Japan. Further, it will hold two seats on the board of directors of AGNS - Japan. The two companies will also continue to develop complex outsourcing opportunities.

"Today's business customers' needs for network solutions services are skyrocketing -- especially in the Japanese market," said Tatsuo Kawasaki, NTT Com vice president, Global Strategy, Corporate Planning Department. "Having a quite broad customer base together, NTT and AT&T, the two most prominent telecommunications companies in the world, are going to develop and enhance solutions services through this joint venture, in order to fully satisfy our customers' growing demand."

"Both NTT and AT&T have a long and distinguished history in the communications industry," said Jonathan Stretch, AT&T Global Operations vice president, Asia Pacific. "With this landmark agreement we have built the foundation upon which our companies can develop and accelerate the growth of the network outsourcing services business in Japan."

This agreement increases the portfolio of services NTT Com offers its customers to include AT&T Global Network Services' network outsourcing and secure managed Internet access services.

This announcement follows a Memorandum of Understanding (MoU) AT&T and NTT signed April 27, 1999, in which they committed to work together to develop definitive agreements and business ventures that provide value-added networking solutions for large and mid-sized multinational businesses and industries.

"As the strategic partner and one of the largest customers of AGNS-Japan, I think this is a very powerful combination which will benefit IBM and its customers," said Takuma Otoshi, president of IBM Japan. "We believe this agreement will help us to promote the effec-

tiveness of our current e-business strategy."

Increasingly, large- and medium-sized multinational firms are choosing to place the responsibility for the management of their complex corporate networks with service providers that can assure end-to-end cost, quality and reliability, freeing themselves to focus on core business issues. The growth opportunity for these services is accelerating as customers want and need to connect their business processes to customers and suppliers via custom designed and managed enterprise and Internet protocol networks.

"This agreement combines the managed networking expertise of AGNS-Japan with the strength and quality of NTT's telecommunications services," said Yoichiro Yatsurugi, president, AGNS-Japan. "Together we will focus on developing new services to satisfy the networking solutions needs of Japanese customers, and on broadening our collaboration in network outsourcing markets in Japan."

In May 1999, AT&T acquired the global network services business in Japan as part of its worldwide US\$5 billion acquisition of the IBM Global Network business, now part of the AT&T Solutions Group.

AT&T Global Network Services offers a portfolio of services for enterprise connectivity and network outsourcing. It is deployed worldwide in over 850 cities in 80 countries and serves the managed networking needs of several hundred large global companies, and tens of thousands of mid-sized companies.

### Japan Telecom NTT Communications

#### Announcement of the Participation in the Japan-Australia Cable Project

Japan Telecom Co., Ltd. and NTT Communications Corp. (NTT Com) announced that a Shareholder's Agreement has been signed for the newly established Special Purpose Vehicle (SPV) Company for the Japan-Australia cable project, which objective is to build the high-capacity submarine cable connecting Japan and Australia. AT&T/BT Concert, MCI WorldCom, Teleglobe, and Telstra also signed the agreement.

The Japan-Australia cable connects Japan (landing points: Maruyama and Shima) and Australia (Oxford Falls and Paddington) directly via Guam (Tanguisson and Tumon Bay) and plans to operate in June 2001. The initial capacity will be 40 Gbps, and later it will be able to increase up to 320 Gbps with WDM (Wavelength Division Multiplexing) system, which is capable of meeting a burgeoning Internet data transmission demand between Japan and Australia.

The Japan-Australia cable is designed

to interconnect with other submarine cables such as Japan-U.S. cable network providing its bandwidth between Australia and U.S. via Japan.

<Japan-Australia Cable Project>

- Cable Root: Japan-Guam-Australia
- Designed Capacity: 320Gbps
- Planned Operation Date: June 2001
- Shareholders of SPV: AT&T/BT Concert, Japan Telecom, MCI WorldCom, NTT Com, Teleglobe, Telstra

### Japan Satellite Systems Inc. NTT Communications Reach a Formal Agreement on Investment

Japan Satellite Systems Inc. (JSAT) and NTT Communications Corp. (NTT Com) announced that they have reached a formal agreement on NTT Com's investment in JSAT and the transfer of NTT Com satellite assets to JSAT. The announcement follows a basic agreement, which both firms reached July 6, 1999, to jointly explore new business horizons concerning the aforementioned matters.

Details of the investment and assets transfer are as follows:

- NTT Com will invest 31.45 billion yen in JSAT. JSAT will issue 62,900 new shares (approximately 18.6%), with a 50,000-yen face value, to NTT Com in the manner of a third party.
- Also, NTT Com will transfer its assets, which include satellites (NTT Com's property in N-STAR a & b satellites jointly owned by NTT Communications, NTT Mobile Communications Network, NTT East and NTT West) and other equipment worth approximately 31.5 billion yen to JSAT.
- The investment and transfer of assets is scheduled to be completed by the end of March 2000.

## IT Industry

### Hitachi

#### H-6593/6596 Disk Array System, Offering Effective Consolidation of Storage in a SAN Environment

Hitachi, Ltd. announces that on February 15 it will release the H-6593/6596, a disk array subsystem for enterprise systems with enhanced functions for Storage Area Network (SAN) environments. The H-6593/6596 uses 47-gigabyte (GB) drives that rotate at the world's fastest speed of 10,025 rpm.

The large capacity and high performance of the H-6593/6596 provides an improvement of some 50% in terms of data read capabilities in a random access environment.

Moreover, to enable effective storage consolidation in a SAN environment, the H-6593/6596 offers enhanced storage management functions, Fiber Chan-

nel connectivity and disaster recovery capabilities.

As the use of the Internet continues to expand rapidly into companies, communities and homes, it is reaching the stage where it is forming a true infrastructure for new businesses and electronic commerce (EC). At the same time, this is also increasing the volume of data held and handled by companies. Moreover, with competition continuing to intensify, more and more companies are merging and entering into alliances. In such an environment, the ability to survive in the marketplace depends on companies' abilities to consolidate their data systems and provide more competitive services. This is generating an increasing need for large-scale data storage systems able to integrate existing data resources maintained on a variety of platforms, and thereby make effective strategic use of such resources.

Along with this, companies are looking for functionality and solutions that enable them to operate their systems more efficiently and centralize system management.

Hitachi has been responding to such market needs for some time already. In 1997, for example, its H-6592/6595 disk array subsystem offered connectability to both mainframes and open systems, thereby enabling data to be exchanged without using a LAN. Also, in July 1999, the company announced "Storeplaza," a SAN solution concept that helped to expand the range of SAN product compatibility. In January 2000, Hitachi established a Storage Area Network Systems Solution Division as part of its continuing expansion of its solutions business.

The 47GB diskdrive capacity of the H-6593/6596 is 1.3 times larger than that of the current H-6593/6595, and at 10,025 rpm, the disk rotational speed is some 1.6 times faster, and, at 7.4 terabytes (TB), the maximum subsystem storage capacity is around 1.3 times greater. Moreover, in a random access environment, database applications being a typical example, read performance has been improved by around 50%. When building a large-scale, high-speed storage system, these improvements translate into an ability to greatly reduce system introduction and running costs.

The H-6593/6596 incorporates a number of enhancements relating to system storage performance, capacity and security management functions. Fibre Channel switch is included for connectivity with different platforms, and remote data copy functions have been strengthened to enable the data to be copied without adversely affecting online operations. Hitachi intends to continue to release products for SAN applications and to strengthen product functions. The H-6593/6596 will be available in March.

# Music Copyright Market To Be Opened

By Yaeko Mitsumori

Some 100 billion yen music copyright market which has been occupied by the sole agent will be opened to anybody very soon.

The Copyright Council, an advisory body to the Director-General of the Agency for Cultural Affairs (ACA), submitted in January a report in which it recommends liberalization of the music copyright market. Following the recommendation, the government is going to submit a revision bill for the current intermediary law (the Law on Intermediary Business Concerning Copyrights) to the Diet in the spring of 2000.

If the bill successfully goes through the Diet, then the new law will be enacted in April 2001 at the earliest.

When it happens, anybody including private companies will be able to enter the business.

In Japan the JASRAC (Japan Society of Rights of Authors and Composers) has been dealing with the music copyright business under the intermediary law since the law was established in 1939.

The law was initially established for protecting rights for the Japanese music industry.

It was the latter half of the 1930s that Japanese music businesses first learned about the copyright controlling business.

A German, who worked as an agent for copyright holders in Europe, launched his agent business in Japan in the 1930s. Then Japanese music businesses which did not have any concept of music copyright fought with the foreign agent. As a result, many cases were brought to a court.

In order to protect Japanese businesses from "gaiatsu" (foreign pressure), the government established the intermedi-

ary law in 1939. The law allows the only licensed agent to collect copyright fees (royalties) from businesses and individuals who use music for any media including karaoke, broadcasting or music concerts. Then the JASRAC became the sole licensed agent.

The council, however, recommended openness of the music copyright market because the conventional system does not work efficiently any more due to diversification of music usage. Due to development of media and technology, usage of music has changed: in the 1970s rental record shops won popularity; in the 1980s karaoke became in; and recently electronic music distribution was launched following expansion of the Internet. Such changes in music usage caused frictions between users and the JASRAC, the rigid business under the law.

Under the JASRAC system, copyright holders are required to assign all of their rights for all of their work to the JASRAC once they conclude a contract with them. Their royalties are fixed by the JASRAC, and not these holders but the JASRAC decides the process how to grant a permission for users when any music is used. There is no choice for copyright holders under the JASRAC system.

For instance, some young musicians may want to distribute their music free of charge until their names become well known, and they want to get some royalties once they become a big name. But JASRAC does not have such a flexible system. Once the market is opened and other businesses enter the market, then copyright holders may be able to choose a more flexible system.

Some market watchers warn that the new system may cause some problems. Since new entrants (music copyright business) will work according to the

principle of the liberalized market, they may decide the royalties intentionally for making more money. For instance, they may charge higher royalties on popular music, and lower charges on less popular music.

In order to avoid such manipulation, the council in its report recommended that items mentioned in the bilateral contract be stipulated by the law and the contract be opened to the public.

The other problem is that some dispute may occur between new entrants (music copyright business) and users. Under the new system, anybody can enter the market. The agency worked out the new system assuming that both sides will reach an agreement over the conditions by themselves. However, if such a dispute occurs and fails to be solved for a long time, then the operation of the market system might be deteriorated.

Since the council submitted the recommendation for liberalization of the market, the music industry people are carefully watching who will apply for the license first.

The Music Copyright Agency (MCA) and the Media Artists Association (MAA) are the two front runners.

The MCA, a private company consisting of musicians and creators, filed an application with the ACA, seeking for the license in April 1998. However, the firm suddenly dropped its application in October 1998. It is said that the firm did so because it considered it had better take a wait-and-see attitude while the government and the market are discussing toward liberalization of the market.

As the MCA desired the Copyright Council in July 1999 submitted an interim report recommended liberalization of the market. A director of the MCA, however, said that the firm has no plan to apply for the government in order to launch the copyright business.

The MAA is an association of prominent artists such as Ryuichi Sakamoto, a

popular musician, and Kenichi Ino, a popular game creator, for further advancing rights of artists in the digital era.

On the other hand, the JASRAC posed a doubt for the liberalization of the copyright business. Kosuke Hayashi, a spokesperson for JASRAC, said, "The JASRAC has accumulated its knowhow for the past 60 years and has managed the well established nationwide system. I don't think new entrants can do the business profitably."

Today the JASRAC is a well-established business. Some 500 employees of the JASRAC are working at 23 branches around the country. They collect music usage fees from nationwide bars, karaoke and theaters and distribute the royalties to copyright holders four times a year. It has also a well-established database for music.

According to the business achievement report in FY1998, the JASRAC collected a total of 98.5 billion yen as copyright usage fees. About 14% of the fees were taken out as the running costs for the JASRAC and the rest was distributed for the copyright holders.

According to the council report even private firms can enter the market. Then, can music copyright business take off in Japan? Some market watchers said that private firms may do the business quite well.

Due to its characteristics, the JASRAC is said to be inefficient in doing business. And even Hayashi of the JASRAC said if a private business launches copyright business focusing on certain low-cost business area such as music net distribution business, then they may be able to make money.

But the government is quite cool. Takahiro Hatakeyama, Copyright Division of the ACA, said that the government now offered the choices. "Whether a copyright holder or a user choose the JASRAC or a new entrant is all up to them."

Market liberalization brings new business opportunity. On the other hand, in return for winning freedom, users and copyright holders are required to bear the responsibility. Under the 1939 Law, they did not have any choices. But now they are given the right and responsibility.

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## World's Fastest High Electron Mobility Transistor Developed

The world record high-speed high electron mobility transistor (HEMT) has been successfully developed by three collaborative research groups of the public, private and academic sectors in Japan. They demonstrated the world's highest frequency, 362GHz, as the limit frequency for possible amplification, thereby promising a high-performance device for practical use to be available in the whole millimeter-wave range. The R&D on millimeter- and submillimeter-wave HEMT devices was launched in April 1998 by a group of the Communications Research Laboratory (CRL) in cooperation with Dr. Takashi Mimura's research group of Fujitsu Ltd. and a research group of Dr. Satoshi Hiyamizu, Professor of Graduate School of Engineering Science, Osaka University. The frequencies ranging from millimeter-wave to submillimeter-wave fre-

quencies is not often utilized as it is, left behind between the microwave and the light spectra, but it needs to be researched for future high-speed communications systems. The collaborative research groups have aimed to engineer a high-performance transistor -- a key device for the effective use of millimeter- and submillimeter-wave frequencies. The HEMT, which was invented by Japanese researchers, is now regarded to be indispensable for the future development of ultrahigh-speed communications technology.

The newly developed HEMT device adopted InP as the substrate material suitable for applying to optical and high-speed devices. InGaAs was used for the free-electron channel layer structure. A simple lift-off technology was developed using electron beam lithography to form fine gates. The 50nm-long low-resistivity T-gate structure was optimized to reduce the parasitic capacitance, resulting in the improved high-speed device performance.

## School Internet

# Japanese Schools Get Connected

By Yaeko Mitsumori

The Internet is penetrating into schools in Japan.

MPT and the Ministry of Education in September 1999 jointly launched the School Internet Project that links 1,050 nationwide schools to the Internet. These two ministries are going to launch the second phase School Net Project linking another 600 schools in FY2000 starting in April 2001.

Meanwhile, CSK group and intellectuals formed the School Communication to Home Cooperation League by the Internet Experimental and will link 10 schools around the nation each other using home video game machines.

Internet access at schools in Japan has been largely behind compared to the U.S., the most advanced country in the Internet business and services. But now, the school Internet market seems to be ready to take off in Japan partly due to these governmental projects and partly due to the industry's effort to explore a new market.

In the first phase of the School Internet Project, which MPT and the Ministry of Education, Science, Sports and Culture (MOE) jointly launched in September, a total of 1,050 schools in 30 regions around the Japanese archipelago were linked with the Internet. These schools including high schools, junior-high schools and elementary schools were linked up with either optical fiber, cable TV, xDSL, WLL or satellite networks with a minimum data transmission speed of 1.5 Mbps.

All the costs for constructing the backbone network running through the Japanese archipelago, networks linking each school with the local network and the Central Network Center as well as operational costs will be covered by governmental budget of 32.2 billion yen. (30 billion yen comes from MPT and 2.2 billion yen comes from the MOE.)

According to Naoaki Kaneko, Advanced Network Division, Telecommunications Business Department, Telecommunications Bureau, MPT, the ministry is promoting this project for studying high-speed communications networks by comparing a variety of networks being used in the project each other. On the other hand, Saburo Sekiguchi, of Information Education Planning Division of the MOE, said the MOE launched this project aimed at promoting advanced education methods fully utilizing high technology.

These two ministries are going to jointly launch the second phase School Internet Project in fiscal 2000. In the second phase, using a total of 20.2 billion yen budget (1.8 billion yen comes from the MOE and 18.4 billion yen comes from MPT) additional 600 schools in 25 regions will be connected with the backbone constructed in the first phase.

Both projects are three-year projects. Both ministries said that they have not decided how to deal with the network (for the School Internet) after three years. But Yoshiyuki Doi, R&D Management Division at the Telecommunications Advancement Organization of Japan (TAO) said that they may sell at a reasonable price or give away with free of charge the facilities to local governments and these governments may continue to provide similar services to schools after the three-year term expires. But even it happens, each school seems to have to bear the operational cost. The TAO, a special corporation under MPT, is actually promoting these School Internet projects.

Most of schools in Japan have PCs today. According to the MOE, 97.7% of the elementary schools and 99.9% of junior-high schools have at least one PC.

But the number of PCs per school is limited to 12.9 units at elementary schools and 32.1 units at junior-high schools. And much worse many of them are still used as stand alone, without connection with the Internet: the Internet access rate is 13.6% at elementary schools and 22.7% at junior-high schools as of the

end of March 1998. (They are the latest figures available from the MOE). In term of the Internet connection, Japan is largely behind other advanced nations.

The government decided to launch the School Internet projects to narrow the gaps. MPT also said these School Internet projects will help the market to expand by more than 100 billion yen a year by expanding R&D expenditures, pushing up the PC penetration rate at home, and expanding content market.

Meanwhile, the School Communications to Home Cooperation League by the Internet Experimental will launch an Internet connection experiment using DreamCast (a home video game machine provided by Sega Enterprises) in April.

The League will give away 3,000 units of DreamCast to students of the selected 10 schools around the country. The League will also distribute a communications server, a PC (for constructing home pages), a printer and a scanner to each of the 10 schools. The League will provide subsidies to partially cover communications charges of each participating family in order to let these participate school kids use the Internet and exchange email with their school and school mates as much as they like. Different from the governmental School Internet projects, the League's experiment is putting an emphasis on communications among families, communities and schools.

Another remarkable feature of this experiment is that the experiment will use not PCs but DreamCast as terminals. ASCII, the secretariat of the League, said that usage of DreamCast will lower the hurdle for school kid parents to launch Internet use because a unit of DreamCast costs merely about 20,000 yen per unit, roughly one-tenth of PCs.

Other private firms are making efforts for providing schools with access to the Internet.

SpeedNet, a private company established by SOFTBANK Corp., Microsoft Corp. and Tokyo Electric Power Co., Inc., is planning to provide free Internet

access services to schools in the Kanto area for coming 10 years.

Hitachi, Ltd. launched an experiment for education support system using the Internet in cooperation with a dozen of universities.

An expansion of school Internet connection is a good news for PC manufacturers. All of the PC manufacturers have been gearing up their efforts to sell PCs to schools for the past 10 years. Partly due to their efforts, almost all of the schools have now a certain number of PCs.

But still the most of the Japanese schools have only one "PC room" where a couple of dozens of PCs are placed. In many cases, two students have to share one PC in class. As everyone may admit such an arrangement is not efficient and the class (with sharing PC) tends to be boring. Even if each school decides to give each student one PC at the PC room, then the demand for PCs will be easily doubled.

There are some other hurdles for introducing PCs at schools.

The most serious problem is that the number of communications lines at schools is strictly limited. Most of schools are subscribing to only a couple of lines. In order to let many students use the Internet at school at the same time, schools definitely have to subscribe more lines.

Furthermore, the PC market is one of the most rapidly changing markets. New models are put into the market every three months. So, it is occasionally difficult for schools to purchase the most appropriate PCs on the right timing.

In addition, since a few conventional PC manufacturers such as Fujitsu and NEC are occupying large share in the PC market for schools, it is difficult for new entrants to get orders.

Although there are some negative factors in the market, certainly there are more positive developments besides these governmental projects and private companies' efforts.

For instance, some schools are still using very old PCs like 16 bit machines. If they decide to change their PCs to recent models, demands will be jumped up. In addition, some private firms have launched distance learning services using PCs which definitely push up demands for PCs.

The School Internet market seems to be further swelling and many other businesses seem to try to struggle to enter the market.

## IT Industry

### Intel and Sony Team on Connecting PCs and Consumer Electronics in the Home

Intel Corp. and Sony Corp. announced that they intend to collaborate in an effort to give consumers the ability to share electronic content between PCs and various consumer electronics such as digital cameras, digital camcorders and portable music players. The effort is part of Intel's vision of the e-Home, where the Internet is seamlessly available throughout a range of devices in an increasingly connected home.

With the PC as the primary Internet access device for the e-Home, Intel and Sony are teaming to ensure connectivity and interoperability between PCs, Internet appliances, and the increasing number of digital consumer electronic devices. The PC has assumed a central role in providing such connectivity and interoperability between these various devices in the e-Home. This will make it easy for consumers to quickly transfer digital content, such as photos, music and video, over the Internet to their other devices in the home.

As part of the collaboration, Intel and Sony will help make the e-Home a reality by working together in several areas. The two companies will work to enable PC manufacturers to implement Sony's Memory Stick read and write capability. Memory Stick is a removable IC recording media based on flash memory technology that allows off-line sharing of digital content. This will allow consumers to share digital content between various consumer electronics such as digital cameras, digital camcorders, and portable music players. To allow networked sharing of digital content and the control of various devices, the two companies will work together on wired and wireless home networking solutions for the e-Home. As part of their efforts, the

companies will work on the possibility of bridging uPnP (Universal Plug & Play) and HAVi (Home Audio Video interoperability), which is used to control consumer electronic devices.

For the next-generation of flat-panel PC displays, the two companies will work together to enable PCs with the Digital Video Interface (DVI). DVI provides high bandwidth, plug and play digital connections for the highest quality displays. The two companies will work toward establishing industry wide adoption of DVI to assure compatibility among the next-generation flat-panel PC displays.

To protect content owner rights to digital content in the networked environment, Sony and Intel have been working together on 5C Digital Transmission Content Protection (DTCP) bus encryption technology, and will work on establishing interoperability between the Intel Software Integrity System and Sony's OpenMG copyright protection technology. The two companies will continue to work together to announce products throughout the year that support the e-Home vision.

"In Intel's vision of the e-Home, we see the Internet being within arm's reach in the home, and adding value to both PCs and a wide range of devices," said Pat Gelsinger, vice president and general manager of Intel's Desktop Products Group. "We are pleased to be working with Sony to make our vision a reality, and to be able to provide consumers with their favorite content, where they want it, how they want it, and when they want it."

"In light of the approaching digital network era, the e-Home concept can offer easy access to the Internet on a broad range of applications," said Kunitake Ando, corporate senior executive vice president of Sony. "We hope to contribute to this concept with our technologies, and a wide variety of digital electronics devices including Memory Stick, to offer consumers a new way to share and enjoy digital content."

## IT Industry

### Kokusai Electric, Hitachi Denshi and Yagi Antenna

#### Agree to Be Merged

Kokusai Electric Co., Ltd., Hitachi Denshi, Ltd., Yagi Antenna Co., Ltd. and Hitachi, Ltd., the parent firm of the aforementioned three companies, announced that Kokusai Electric, Hitachi Denshi and Yagi Antenna have signed a memorandum of merger under which the three companies agree to be equal parties in the merger to take place on October 1, 2000. The new company thus formed, provisionally named Hitachi Kokusai Electric Inc., will provide complete continuity with respect to the existing business operations of the three companies, providing all customers with full support. At the same time, the consolidation of operations and the concentration of the companies' extensive wireless communications technologies will be used to develop business and customers in new sectors.

In November 1999, Hitachi announced its "i.e. HITACHI medium-term business plan," which sets out how the company is focusing on the strategic use of Hitachi Group resources as it restructures itself as a best solutions partner. Moreover, Hitachi is promoting consolidated management by reorganizing, reviewing and strengthening liaison and coordination among Hitachi Group companies.

Hitachi is currently reviewing its communications systems business on a consolidated basis. As part of this, in contrast to the former focus on telephone exchanges/transmission equipment, the company is now considering strengthening its business operations in the areas of IP network systems, wireless communications, optical products and network solutions and services to meet the increasing demand in data communications.

The wireless communications business is a market sector that is undergoing rapid change. The three companies agreed to the merger as a way of meeting the challenge of such change by consolidating their operations, thereby helping to enhance their management structure and strengthen their development system.

Hitachi Kokusai Electric Inc. will take over and continue the individual business operations in which the three merger partners are engaged in the areas of communications, broadcasting and semiconductors, and will use the consolidation and improvement of sales bases to expand sales networks in Japan and abroad and strengthen product service capabilities to thereby increase the scale of the business.

Hitachi Kokusai Electric Inc. will use its extensive strengths in wireless technology combined with data and video technologies to provide a broad spectrum of wireless communications solutions in the sectors of mobile communications systems, digital broadcasting systems and customized communications systems and will also develop new areas of business such as Intelligent Transport Systems (ITS) and the next-generation of information terminals.

Hitachi Kokusai Electric Inc. will focus on expanding its business with the emphasis on the following strategic sectors.

1. Mobile communications systems: Base stations and other infrastructures, systems, and mobile terminals
2. Digital broadcasting systems: Satellite/ground wave and TV/radio total systems
3. Customized communications systems: Customized wireless infrastructures for subscriber-system based wireless access, and systems which ensure reliable communication for disaster control, airport and public safety, and other such applications.
4. New sectors: ITS, next-generation information terminals and other such new wireless markets

With respect to the exchange ratios for the merger, Kokusai Electric will allot 0.44 new shares to shareholders of Hitachi Denshi, and 0.52 shares to shareholders of Yagi Antenna, for each share of respective companies. The new company will be headed by Makoto Endo.

### Toshiba

#### World's First Single-chip MPEG-4 Videophone LSI with Embedded 16Mbit DRAM

Toshiba Corp. announced the world's first single-chip MPEG-4 videophone System Level IC for IMT-2000, the next-generation digital mobile phone system scheduled for introduction in Japan in early 2001. Toshiba's System Level IC achieves full conformity with the latest industry standard video-and-speech

compression and integrates an MPEG-4 video encoder and decoder (codec), a speech codec, an audio and video multiplexer and a 16-megabit (Mb) DRAM.

IMT-2000 handsets and mobile terminals will support transmission of high-quality motion pictures and improved sound quality. MPEG-4, a recently established video compression technology, is specifically designed for wireless video transmission and is expected to become a key element of IMT-2000 services.

Toshiba is the first semiconductor manufacturer to develop a single-chip System Level IC capable of supporting MPEG-4 image compression and decompression along with high-quality sound, and that also offers the low power consumption that is indispensable for battery-powered mobile terminals.

Toshiba's leadership in 0.25-micron CMOS technology has allowed it to integrate the major video and audio processing functions on a single 10.84mm x 10.84mm chip and to cut power consumption of the device to only 30% that of current multi-chip solutions. A battery-powered mobile videophone incorporating the new System Level IC will give about some two hours of continuous service, against one hour for the same phone with a multi-chip solution. Toshiba will release engineering samples in the 3Q of 2000 and follow up with a new version offering a lower power consumption at the end of 2000.

#### <Main Specifications>

- Process: 0.25-micron CMOS process; triple-well and quad layer-metal structure
- Transistor count: 20.5 million
- Voltage: 3.3V 10% (I/O), 2.5V10% (Internal)
- Power consumption: 240mW at 60MHz/ 80 W in standby mode
- Frame transfer rate: 15 frames/s (QCIF format)
- Chip size: 10.84 x 10.84mm
- Maximum frequency: 83.3MHz

#### Introduces World's Highest Resolution 10.4-inch Display -- First UXGA Display for B5-Sized Portable PCs

Toshiba Corp. announced that it has reinforced its leadership in high-resolution low-temperature polysilicon TFT LCDs by bringing 1,600 x 1,200 UXGA resolution to a 10.4-inch display. The new LCD achieves an unmatched 0.132-millimeter dot pitch and a density of 192 pixels per inch (PPI), producing images matching those found in high-quality printed materials.

Toshiba has led the industry in developing low-temperature polysilicon LCDs, and its 200 PPI series of products offers the highest resolution available in screens for mobile personal equipment. The new 10.4-inch display is positioned to bring a new level of display performance to B5-sized notebook PCs, with UXGA resolution that surpasses that of standard desktop monitors to offer an image quality comparable with color photographs. The new LCD can display a 2-million-plus image taken with a digital still camera without any reduction in the resolution level.

Low-temperature polysilicon TFT LCDs bring brighter, higher resolution images to mobile personal equipment than any other commercialized display, thanks to use of crystallized silicon that allows electrons to pass transistors with much greater mobility than in amorphous silicon TFT. Their display panels are also significantly smaller, as the display drive circuits can be formed directly on to the display's glass substrate, reducing peripheral pin connections by 95%.

The new 10.4-inch UXGA display joins 4-inch VGA and 6.3 XGA displays in Toshiba's 200 PPI series. These strategically sized displays support a wide spectrum of mobile personal equipment with the highest resolutions available. The new display retains design compatibility with earlier SVGA and XGA 10.4-inch displays, and will be commercialized in October 2000 at a sample price of 150,000 yen.

<Background of Development>  
Growing use of the Internet and other information services is accompanied by user-ex-

pectation of portable PC displays matching that of desktop PC. Toshiba meets such demands with this new display, and also seeks to support the medical and printing industries, which demand stable, high-quality images as true to the original as possible.

#### <Main Specifications>

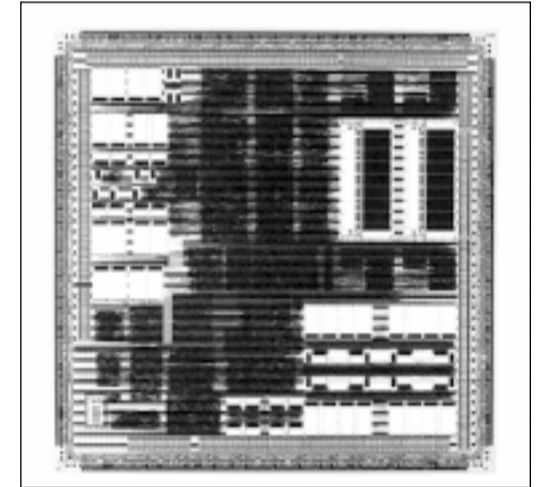
- Part number: LTM10C386
- Pixel count: 1,600 x 1,200 (UXGA)
- Pixel pitch: 0.132 x 0.132 mm (192 PPI)
- Display size: 10.4-inch/26-centimeter diagonal
- Gradation: 64-gray scale per color, 262 thousand colors
- Brightness: 150 cd/square meter
- Power consumption: 3.7W at 70 cd/square meter
- Response time: ton + toff: 40 ms
- Contrast ratio: 250:1
- Dimensions: 238.6 (w) x 173.2 (h) x 6.6 (d) mm
- Weight: 300 g (provisional)

### NEC

#### Researchers Announce High-Speed Microprocessor with One-fifth the Power Dissipation of Predecessor Chips

NEC researchers announced a key breakthrough in microprocessor technology at the International Solid State Circuit Conference (ISSCC) 2000 in San Francisco on February 9. The MP98, a prototype next-generation, high-performance microprocessor, boasts on-chip parallel processing and a power dissipation only one-fifth that of contemporary chips.

A first evaluation prototype MP98 device demonstrated a performance level of 1 billion instructions per second while consuming less than 1 Watt of power for the first time in the world. In practical terms, the MP98 brings the level of performance and low power consumption needed for portable terminals to be able to offer full multimedia features such as motion video and audio. By 2003, however, NEC expects to develop a similar high speed processor with a power dissipation of just 0.3 Watts that will be well suited for use in future generations of advanced smart phones



and possibly handheld interpretation systems.

The MP98 consists of a number of elementary processors operated by an "on-chip parallel processor." This use of highly power efficient elementary processors provides both the prototype's high performance and its frugal power dissipation.

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Data/network system development, graphics by Jay Richards

## IT Industry

### NEC

#### Develops Low-Cost, High-Speed 16Mbit Four-Transistor SRAM Macro

NEC Corp. has developed a 16-Mb load-less four-transistor SRAM macro with a speed of 400MHz. By using 0.18-micron process technology, the size of the chip is halved compared with a conventional six-transistor SRAM macro, significantly enhancing density and speed of memory available for System-on-a-Chip applications.

The technology was presented at the International Solid State Circuit Conference (ISSCC) 2000 in San Francisco on February 8.

NEC's new technologies enable the development of low cost and high-performance system LSIs, which employ logic and memory components on a single chip. Using the four-transistor SRAM macro, the delivery time of system LSIs will be shortened, making it possible to bring the device to the market at the same time as standard logic components are released.

### eBay/NEC

#### Joint Venture in Japan

NEC Corp. and eBay, the world's leading person-to-person online trading community, have announced a major joint venture in Japan. The agreement is expected to significantly boost eBay's entry into Japan -- bringing together eBay's unrivalled trading presence and NEC, one of the world's most innovative technology companies with a commanding presence in the Japanese market. As part of the agreement, NEC will take an equity stake in eBay Japan and promote the site in many ways, including through its BIGLOBE Internet Service Provider (ISP), personal computer products and off-line marketing campaigns.

### Fujitsu

#### Introduces "TeamPoS2000" POS Terminals for the Retail Market

Fujitsu Ltd. enhanced its Global-STORE total solution offering for the retail segment with the introduction of TeamPoS2000, a new series of point-of-sale (POS) terminals. Comprising two models (standard and compact), the new TeamPoS2000 series was developed jointly with Fujitsu group company ICL and will be marketed worldwide. The terminals will be on display at the RETAIL TECH JAPAN 2000 exhibition - Tokyo Big Site - starting February 29.

Retail systems running on the Windows NT platform are now widely used around the world. However, as retail databases and applications have become more sophisticated, system burdens have increased and the need for faster processors and greater storage capacity has become more acute. TeamPoS2000 responds to these requirements, incorporating the latest technology and building on Fujitsu's expertise in open, standardized retail systems to help retailers maximize efficiency and reduced total cost of ownership (TCO).

Conforming to NLX (NLX: Standard for PC mother board established by Intel and other firms. Enables compact design with high performance CPUs and ease of maintenance.) and PC99 (PC99: PC hardware specification guidelines set by Intel and Microsoft. Guarantees operation of Microsoft's Windows products.) standards, TeamPoS2000 is powered by the Intel Celeron 500MHz processor, the fastest CPU currently available for POS systems, and is the first POS terminal in the

industry equipped with a built-in CD-ROM drive for easy software installation and remote firmware maintenance.

Fujitsu aims to sell 200,000 TeamPoS2000 units during the next three years. Initial customers for the new system include Universal Studios Japan, Inc. and KASUMI Co., Ltd. Prices start at 784,000 yen in Japan.

In the future, Fujitsu plans to enhance TeamPoS2000 with such features as Windows2000, Pentium III 700 MHz processors and an internal DVD drive to provide an even more open, high-performance terminal that will include Internet connectivity and video applications.

### Fujitsu

#### Receives SDH Telecom Orders from Brazil

Fujitsu Ltd. has been awarded orders by two Brazilian telephone companies for SDH (Synchronous Digital Hierarchy) transmission systems -- its first telecommunication systems orders in that country. TELAMAZON placed an order for an SDH optical transmission system project valued at 400 million yen and TELEPARA signed a 50 million yen contract for an SDH microwave transmission system.

The TELAMAZON project, which is intended to strengthen the company's networks and to add high-speed transmission capabilities, involves building optical cable networks in the city of Manaus in Amazonas state. More specifically, Fujitsu will construct one 2.5Gbps and two 600Mbps ring networks. The Fujitsu project will be the first implementation of SDH transmission systems at TELAMAZON.

The project for TELEPARA involves constructing two 5GHz microwave ring networks in the city of Belem in Parana state, expanding the existing network and providing it with high-speed capability.

Fujitsu's subsidiary in Brazil, Fujitsu Do Brazil Ltda (FBR), will be responsible for construction, local testing and commissioning for both projects, while backup support will be provided by Fujitsu Ltd. Established in Sao Paulo in 1972, FBR handles sales for Fujitsu's Information Processing Systems in Brazil, where it holds a market share of 15% in the mainframe business. FBR's successful record of providing mainframe computers to TELAMAZON helped Fujitsu win the new order.

TELAMAZON and TELEPARA are among the sixteen telephone companies which belong to a regional telecommunication giant, TELEMAR Corp. TELEMAR is one of the three companies established in July 1998 as the result of the privatization of the state-owned TELEBRAS. The privatization, which opened up Brazil's huge telecommunications market, was the largest in South America and the second largest in the world after that of Japan's NTT. Fujitsu has been working to enter the new growing market since, and the current projects are fruits of these efforts.

### BT and Fujitsu

#### Distributed Knowledge Management System Using Intelligent Agent Technology Developed

British Telecommunications plc and Fujitsu Ltd. have revealed their jointly developed Intelligent Distributed Information Management System (IDIoMS), an intelligent information system using a unique and most advanced agent technology. The system was described at the Foundation for Intelligent Physical Agents (FIPA) meeting held in January 2000 in London.

Agents are a new and novel software technology that can modularize and conceal the complexity of design and development of large-scale distributed systems. IDIoMS is an agent-based information management system that provides a comprehensive set of tools for personalized information delivery built upon a platform that enables flexible management of distributed information systems using Internet technologies. IDIoMS benefits users through the automatic provision of timely and relevant information with minimal need for users to search for that information. The system also benefits service providers through the plug-and-play provision of information services.

The development of IDIoMS began when BT and Fujitsu entered into a joint agreement in July 1999. IDIoMS is an agent-based system providing intelligent knowledge management with distributed information resources under a wide and dispersed platform environment. The development of this system has been realized by the integration of BT's Personal Agent Framework (PAF) and Fujitsu's Open Agent Middleware (OAM) technologies.

The Personal Agent Framework has been developed at BT Laboratories to provide a secure and private registered user environment, and a dynamic user profile that can be shared among agents in the framework. The user profile is then available to personal agent applications through a common API, as well as for user review. The PAF provides a suite of personalized applications, such as a daily newspaper, a contact finder to locate other people with similar skills and interests, web searching, and just-in-time information delivery. The PAF has been successfully subjected to trials within BT over the last two years and has provided a significant benefit to users.

OAM is a technology developed by Fujitsu Laboratories Ltd. that allows a dynamic, flexible and robust operation and management of service components (agents) distributed over a wide network, which in turn realizes plug-and-play, component repository management, connection between various kinds of components, non-fixed workflow, dynamic customization according to user preference, etc. Currently the PI@za engine, the web application environment of Fujitsu's Teamware Group ([www.teamware.com](http://www.teamware.com)) is equipped with OAM technology. Teamware PI@za is a dynamic Internet service platform promoting professional interaction among a community and its members.

The combination of PAF and OAM technologies has realized IDIoMS, a system that intelligently supports the sharing, management, search, and production of information in a multiple platform environment, corresponding dynamically and flexibly according to users' needs.

BT and Fujitsu have been promoting the standardization of agent technology through FIPA. A demonstration of IDIoMS took place at the FIPA meeting in January 2000 in London, which was well-received by the agent community. BT and Fujitsu will continue their research collaboration program in agent technology, and are considering future exploitation of IDIoMS into the world market.

In the U.K., BT serves 28 million exchange lines and seven million mobile customers. International direct-dialled telephone service is available to more than 200 countries and other overseas territories -- covering 99% of the world's 800 million telephones.

BT is expanding its presence overseas rapidly and has operations in more

than 30 countries worldwide, with ventures in Ireland, France, Switzerland, Spain, Germany, Italy, the Netherlands, Sweden, New Zealand, Japan, Singapore, Malaysia, Korea, Latin America and India.

BT and AT&T have also created Concert, the leading global telecommunications company serving multinational business customers, international carriers and Internet service providers worldwide. Concert provides customers with communications services on an unprecedented scale, scope and quality, with the industry's broadest portfolio of voice, data and Internet services. Concert's frame relay network reaches every major city in the U.S. and the U.K., and extends to an additional 170 cities in 47 countries. Its global public network reaches directly 237 countries -- more than any other existing network.

## Administration

### MPT

#### Draft Policies for Introduction of IMT-2000

The Ministry of Posts and Telecommunications (MPT) drafted its policy for introduction of IMT-2000 (International Mobile Telecommunication-2000) and policy on radio station licensing of the system. The document describes essence of each policy.

MPT drafted its policy for introduction of IMT-2000 (See the annex 1). This is based on the "Basic Guideline for Introducing the Third-Generation Mobile Communications Systems (IMT-2000)," publicized in July 1998 (and comments on it) and the "Principles on Radio Station Licenses for IMT-2000," announced in December 1999. Also, the licensing policy for IMT-2000 radio stations (See annex 2) is drafted based on the related ministerial ordinances.

### Annex 1

#### The Policy for Introduction of IMT-2000 (Draft)

##### 1. The System

The system should be standardized by the International Telecommunication Union (ITU) as IMT-2000 and should consist of radio stations for code division multiple access mobile radio communication prescribed in Article 7, (9), iii of the modified Ordinance for Regulating Radio Equipment. Each radio station should consist of radio equipment prescribed in Article 49, (6), iv of the ordinance.

##### 2. The Object of the Introduction of the System

The system shall comply with demands for mobile telephone and multimedia communications including high-speed data communications.

##### 3. Acceptance of Applications for the Licenses

Starting on the date of enforcement of the modified Ordinance for Regulating Radio Equipment, MPT shall accept applications for the Type I telecommunications business authorization and radio licenses related to the system, complying with laws.

##### 4. The Policy on Radio Spectrum Allocation

Based on the "Principles on Radio Station License" announced in December 10, 1999, (see Attachment 1) radio spectrums for this system are allocated as follows:

- 1) To prevent harmful interference with PHS, spectrum band between 1920MHz and 1925MHz (5MHz in total) shall not be allocated until it becomes clear that the interference is avoidable by, for example, appropriate technologies developed. For the time being, to secure

*Continued on Page 8*

**E-signature:***Continued from Page 1*

signature by encrypting the document with the key. The electronic certificate is an electronic version of certificate of one's seal. The system prevents anybody from doing malpractice that one person disguises himself as another person. Some firms such as VeriSign Japan K.K. are already providing this kind of services. With the new law, the government is going to establish a system that a designated organization assigned by the government examines the CA's technological level and business practice and grants a license for qualified CAs. Once obtaining the license, then electronic documents certified by the CA have legal validity.

Since licensed CAs clearly mention that they are the licensed CAs on their electronic certificates, Internet users can identify whether their CAs are licensed one or not easily.

Prior to creation of the new electronic signature and certificate law, many companies are gearing up their business.

NTT Electronics Corp., Toshiba In-

formation Systems (Japan) Corp. and Toyo Information Systems Co., Ltd. jointly developed a CA system called "Hakusan." These three firms are going to start selling the system in March. The system which is consisting of a CA and a registration agency costs 2.5 million yen (for up to 1,000 users). Toshihide Watanabe, Toshiba Information Systems, said that they are planning to sell 100 units of the system for the first six months.

Mitsubishi Electric Corp. in cooperation with other Mitsubishi Group firms has developed an electronic certification system. The system has been implemented at 200 firms of the Mitsubishi Electric Group since November 1999. At the same time, the Mitsubishi firm is selling the system for other firms. Shin Aoi, Mitsubishi Electric, said that the firm is planning to sell 200 units of the CA system by the end of 2001. The basic system for up to 500 users costs 2 million yen and an enlarged system for 5,500 users cost 5 million yen.

SECOM in October 1999 launched

certificate services by a third party.

Corporate users of electronic certification services have two choices: either constructing a CA by itself or using CA services provided by a third party. Constructing a CA by itself costs a lot. Secom is focusing on the latter services, expecting that firms using the third-party certification services will increase in the future.

Tying up with a Canadian CA service firm, SECOM is issuing certificates for qualified web sites. Yoshida of SECOM said that the firm is expecting the sales of the services will grow this year partly due to the new law and partly due to a series of crackings into governmental web sites.

However, there are some unsolved issues regarding the electronic signature and electronic certificates.

With technological limit, the current electronic certificates are valid among users who use the same certification systems. Since e-businesses are run on a global basis, a cross certification system among domestic and foreign CAs

should be established. Some advanced firms have already taken a step for tackling with the issue.

Toshiba Information's Watanabe said that the present version of Hakusan does not have any cross-certification function, but the version 2 will carry the cross-certification function.

The more serious issue is that Japanese firms tend not to pay attention on importance of security. Especially executives who are in charge of making business strategy tend to lack of consciousness of security. Unless these top business people realize the importance of security and become paying more attention on information security, these businesses may not take off soon.

But many businesses are expecting the market will expand once the new law will be enforced. Mitsubishi's Aoi said that the law will be "following wind" for their business.

Japanese e-business which has been largely behind compared with the U.S. and Europe, seems to gain more momentum.

**Settlement:***Continued from Page 1*

Promotion Association said.

Both organizations are targeting to produce a similar settlement scheme. They are going to produce a "common" settlement platform for various financial institutions by constructing a clearing center. When their platform is established, a virtual store and a customer who has their accounts at different financial institutions can settle their payment on the platform through the clearing house.

Their system will work as follows: when a customer shops at a virtual store, the charge is withdrawn from the customer's bank account immediately, and the amount of the payment will be transferred to the bank account of the virtual store through the clearing center.

The remarkable feature of their systems is under their systems, the virtual store can not get the payment information of the customer such as the card number, while the financial institution can not get the buying information such as what the customer purchased.

The differences between the two groups lie in their different settlement protocols.

The Japan Internet Payment Promotion Association is preparing for launching its operation step by step. One of the leading members of the Japan Internet Settlement Promotion Association is MPT. Since there are more than 20,000 post offices around the nation, the Promotion Association can use the post office network nationwide.

As part of the Promotion Association's efforts to launch the settlement services, the postal savings system is scheduled to launch a demonstration experiment on March 13. In the experiment, 40,000 monitors will shop at one of the 17 virtual shops operated by JTB, Nomura Securities and others, and settle their payment using a part of the Association's system. In June, Fuji Bank will launch the settlement experiment. When their clearing house will start operation in April 2001, then settlement among different financial institutions will be available.

On the other hand, the Japan Payment Network said that SET is not desirable

for debit settlement. In response to SECE supporters' criticisms, the Promotion Association said that SET is the global standard and it is the optimal solution for the three-party settlement (among the customer, the store and the financial institution) like this service. The Promotion Association also said that by adding extensions such as SJR (Support for Japan Request) and PBD (Pin Based Debit), SET can be used for transactions in the Japanese market and for debit settlement. SJR and PBD are the extensions for the SET that were developed for applying SET for Japanese unique commercial practices (the former one) and transactions among banks (the latter one). Both sides officially said that the harmonization or standardization of the settlement methods is the optimal solution. But they seem not to offer any compromise. The Promotion Association's Yamamura said that standardization is possible if the Japan Payment Network employs SET. Takashi Murakami of the Network said that he thinks it is better to have more than one settlement systems because (when there are two systems) there will be some competition among them, and consumers may be able to receive better services. Both said that they have won more than 100 member companies. But, in fact, some of them are overlapped.

The Japan Payment Network is to establish a corporation "soon" which will run the clearing center. The clearing center will launch its services upcoming summer (2000). The Network will work out the system design by the end of March and will open it to the public early in April.

However, besides differences of their settlement protocols, there are many other unsolved problems such as planned M&A among key banks, technological problems, costs for users (banks, stores and customers) and handling of devices and software.

Consumers who use both systems need to install the software called "wallet" into their PCs. But some watchers pointed out that it is quite complicated for ordinary people to install the wallet software. In order to let a new infrastructure take off, service providers have

to develop their system putting an emphasis on users' convenience. Both organizations are developing simpler system to install the wallet software.

Unlike the wallet software, the merchant server (for virtual stores) and the gateway server (for financial institutions) are expensive. The former ones cost several million yen per unit and the latter ones cost several tens of million yen per unit. It might be difficult for small business to bear the cost to participate to the services. The Promotion Association's Yamamura said that they are going to provide a shared system for small businesses for reducing each business' cost burden.

The Megabank movement is the headache for both organizations. Fuji Bank, Daiichi Kangyo Bank and the Industrial Bank of Japan, Ltd. are going to merge

with each others in April 2002. Both organizations said that they do not have any idea how these three banks will deal with the settlement business after the merger.

However, the most serious issue still remains to be the differences in the two camps' settlement systems.

There might be a solution. Murakami of the Network suggested that the organization will consider employing other settlement protocols including SET. According to him, the purpose of founding the organization is to work out a common settlement system among various member banks, and because of the reason they will not stick to SECE. According to some reports, the Network recently launched studies for employing the Secure Sockets Layer (SSL) for their system.

## JCB, Oracle Japan Tie up for Corporate Card Solutions ERP Business

JCB, Japan's largest credit business has tied up with U.S. software giant Oracle's Japanese subsidiary. They have developed, with the assistance of Japanese software developer CSK, the JCB Expense Data Integrator that combines the JCB corporate card system and Oracle's Internet ERP (Enterprise Resource Planning) applications strengths. CSK will act as the marketing outlet.

This tie-in of the corporate card and ERP package is a first in Japan. The market is Japan includes some 500,000 firms for now, but this market is seen growing in size as the e-business takes hold here.

## InfoComm Japan 2000 Held

InfoComm Japan 2000, organized by The International Communications Industries Association and The Japan Industrial Journal, was held from February 8 through 10. The confab focused on such topics as ITS, use of visual communications terminals in education and the future of visual entertainment.

Organized in collaboration with the Japan Business Machine Makers Association, JVR Association and The Society of Picture Quality Engineers, numerous companies from Japan and abroad showcased their products and services at the Tokyo Big Sight waterfront convention facility.

## NTT's TwinVQ Encoding Method to Comprise MPEG-4 Audio Standard

The Transform Domain Weighted Interleave Vector Quantization (the so-called TwinVQ) audio encoding technology, along with the German Advanced Audio Coder method, has been adopted into the international standard set by the International Organization for Standardization (ISO)/the International Organization for Standardization (IEC) for audio compression known as MPEG-4.

## Statistics

### Records of Telecom Equipment (As of August 1999)

#### Production

Type	Aug. '99		Compared with Aug. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>246,697</b>		<b>6.8</b>
<b>Terminal Equip.</b>	<b>111,331</b>		
Wire Telecommunications Equip.	32,472		-11.6
Telephones Sets	6,897	875,536	-13.7
Standard Type	446	47,884	-19.3
Functional Type	530	145,994	-15.5
Wireless Phone	5,388	675,594	-36.0
Others	533	6,064	-16.9
Telephone Application Equip.	12,944		-25.1
Key Telephone Systems	6,008	260,227	13.1
Small Capacity	357	23,593	-11.7
Medium/Large Capacity	5,651	236,634	10.9
Telephone Auxiliary Equip.	331	83,636	-12.8
Interphones	3,314	311,788	86.0
Others	719		0.5
Telegraph & Picture Transmission Equip.	12,631		-38.7
Facsimile	11,784	250,551	-28.4
Super High-Speed Facsimile	100	942	-23.6
High-Speed Facsimile	11,777	248,171	-21.8
Other Facsimiles	507	1,438	-39.4
Others	847		-24.6
Mobile Terminal Equip.	78,859	3,413,842	-10.7
Land	77,846	3,394,685	-10.4
•Automobile	39	1,860	-94.2
•Portable	67,495	2,788,370	-4.1
•Pager	309	33,774	-83.5
•MCA	165	3,128	14.6
•Public PHS Terminal	5,894	386,328	18.3
•Others	3,944	181,225	-55.2
Maritime and Airplane	1,013	19,157	-30.0
Personal Radios (900 MHz)			
<b>Network-Related Equip.</b>	<b>132,539</b>		<b>31.0</b>
Wire Network-Related Equip.	106,662		28.9
Switching Equip.	44,808		16.1
Electronic Switches	29,266		2.9
For Telephone Offices	22,554		15.6
For PBX	6,712		-29.4
Other Switching Equip.	15,542		53.1
Carrier Equip.	61,854	10,894	40.0
Code Transmission Equip.	42,643	10,894	48.8
MODEMs	3,512	11,046	20.6
Others	15,699		24.6
Mobile-Related Network Equip.	23,973	13,474	30.4
Fixed Station Communications Equip.	18,306	5,787	51.8
Terrestrial	16,607	5,299	127.7
Satellite	1,699	488	-64.4
Base Stations	5,667	7,687	-10.3
<b>Wire Telecommunications Parts</b>	<b>2,827</b>		<b>-25.3</b>
Relays (1,000 units)	2,675	40,157	-25.3
Other Components	152		-24.4

<For Reference>			
<b>Broadcast Equip.</b>	<b>122,599</b>	<b>0</b>	<b>3,293.3</b>
<b>TV Camera</b>	<b>13,412</b>		<b>36.4</b>
<b>Radio Application Equip.</b>	<b>6,271</b>	<b>4,927</b>	<b>69.8</b>
Radars	1,110	3,776	35.7
For Navigation	6,031		13.3
For Aviation	2,317	535	1.3
For Mobile Telephone	3,714		22.4
For Long/Medium/Short Waves			
For Ultra Short Waves			
For Other Waves			
Receivers			

Remarks: 1) Data are based on the Statistics of Actual Production by the Ministry of International Trade and Industry (MITI).  
2) Radio Communications excludes the citizen band transceivers and the amateur telecom equipment.

Source: Communications Industry Association of Japan

#### Export

Type	Aug. '99		Compared with Aug. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>49,540</b>		<b>-14.1</b>
<b>Wire Telecommunications Equip.</b>	<b>43,911</b>		<b>-11.7</b>
Telephones	3,473	445	-29.1
Cordless Telephones	2,571	296	-28.0
Other Types	902	149	-32.0
Telephone Application Equip.	481	40	-38.8
Key Telephone Systems	154	7	-52.2
Automatic Answering Telephone Sets	146	2	-6.0
Intercoms	133	29	19.8
Others	49	3	-75.4
Telegraph and Picture Transmission Equip.	7,200	173	-29.5
Facsimile Equip.	5,944	170	-41.8
Teletypewriters	0	0	0.0
Others	1,255	3	0.0
Switching Equip.	1,682	24	-44.9
Carrier Equip.	3,646	38	128.4
Components	27,429		-5.9
<b>Radio Communications Equip.</b>	<b>5,629</b>	<b>219</b>	<b>-29.4</b>
Transmitter and Transmission/Receiving Equip.	4,946	129	-23.4
For Long/Medium/Short Waves	668	3	3.5
For Ultra Short Waves	1,576	82	-8.7
For Other Waves	2,703	44	-33.9
Receivers	683	91	-54.8

#### <For Reference>

<b>Broadcasting Equip.</b>	<b>133</b>	<b>0</b>	<b>-82.3</b>
<b>TV Camera</b>	<b>9,544</b>	<b>203</b>	<b>-51.1</b>
<b>Radio Application Equip.</b>	<b>2,577</b>	<b>659</b>	<b>-15.7</b>
Radars	667	2	-37.6
For Navigation	1,116	25	-5.5
Direction Finders	79	1	-25.5
Others	1,038	24	8.9
Radio Remote Control Equip.	794	632	-14.6

#### Import

Type	Aug. '99		Compared with Aug. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>38,299</b>		<b>1.3</b>
<b>Wire Telecommunications Equip.</b>	<b>35,357</b>		<b>3.7</b>
Telephones	1,546	346	-18.6
Cordless Telephones	609	115	-33.5
Other Types Telephone Sets	973	231	-4.7
Telephone Application Equip.	1,007	67	138.2
Automatic Answering Telephone Sets	43	3	-31.1
Others	964	64	167.7
Telegraph and Picture Transmission Equip.	1,746	118	-14.9
Facsimile	1,710	115	-14.5
Teletypewriter			
Others	36	3	-30.9
Switching Equip.	11,852	40	5.0
Carrier Equip.	4,532	156	38.1
Components	14,674		-3.2
For Wire Telecom Only	12,654		-9.0
Parts for Common Use in Wired/Radio Communication Equip.	2,020		61.2
<b>Radio Communications Equip.</b>	<b>2,942</b>	<b>65</b>	<b>-20.3</b>
Transmitter and Transmission/Receiving Equip.	2,783	42	-15.0
Transmitting Equip.	163	13	41.6
Transmitting and Receiving Equip.	2,547	19	-15.6
For Aviation	106		131.1
For Mobile Telephone	123	2	-86.8
For Long/Medium/Short Waves	25	6	34.4
For Ultra Short Waves	48	4	-61.4
For Other Waves	2,319	17	13.6
Receivers	159	23	-62.0

Remarks: 1) Data are based on the Statistics of Custom Clearance by the Ministry of Finance.  
2) Radio Communications excludes the citizen band transceivers and Cordless microphones.  
3) There are cases in which the total value will not equal the components because the figures have been rounded one decimal place. Also, the comparative ratios are calculated in ¥1,000 units.

Source: Communications Industry Association of Japan

### Current Electric & Electronic Machinery Statistics (As of August 1999)

Products	Unit	Production			Sales			Stock		
		Jul. '99	Aug. '99	Aug. '99/Aug. '98 (%)	Jul. '99	Aug. '99	Aug. '99/Aug. '98 (%)	Jul. '99	Aug. '99	Aug. '99/Aug. '98 (%)
Video Tape Recorder	Sets	679,939	570,512	79.8	1,345,985	1,241,553	110.3	1,381,575	1,313,842	114.9
Video Disk Player	Sets	5,943	2,398	19.9	6,506	7,885	43.3	19,942	17,455	108.9
Video Camera	Sets	1,056,008	907,705	114.8	993,457	899,474	105.1	644,159	643,760	103.9
Car Navigation System	Sets	215,257	132,909	154.9	173,005	106,446	126.0	110,912	133,712	139.6
Digital Audio Disk Player	Sets	1,696,132	1,416,712	125.9	1,615,863	1,449,488	116.1	1,989,985	1,875,786	137.9
Active Liquid Crystal Device	1,000 units	4,745	4,648	201.6	3,826	3,900	187.9	1,084	1,004	93.1
Passive Liquid Crystal Device	1,000 units	39,774	38,969	121.7	38,097	33,847	114.4	17,150	20,939	89.5
Photoelectric Converter	1,000 units	992,223	982,639	135.4	1,148,882	1,093,338	143.1	365,590	381,593	92.2
Bipolar Semiconductor IC	Mil. yen	8,881	8,379	143.8	5,841	5,798	144.8	-	-	-
MOS Semiconductor IC (logical element)	Mil. yen	153,169	151,117	118.2	134,516	131,200	115.1	-	-	-
MOS Semiconductor IC (memory element)	Mil. yen	64,117	62,857	96.0	66,815	67,123	113.6	-	-	-
Hybrid IC	Mil. yen	24,252	22,991	114.4	21,680	21,316	115.3	-	-	-
General Purpose Computer	Mil. yen	21,874	16,569	57.3	-	-	-	-	-	-
Mid-range Computer	Mil. yen	27,963	28,931	104.4	-	-	-	-	-	-
Personal Computer	Sets	1,205,449	941,007	120.6	-	-	-	-	-	-
Electrical measuring instrument (Except for semiconductor and IC measuring instruments)	Mil. yen	14,217	12,917	90.6	-	-	-	-	-	-
Semiconductor and IC Measuring Instrument	Mil. yen	15,730	14,625	150.9	-	-	-	-	-	-
Industry-use Measurement Control Unit	Mil. yen	13,729	15,531	95.8	-	-	-	-	-	-

Source: Machinery Statistics and Research Office, MITI

### Cable Supply & Demand Classified by Type (As of August 1999)

Type of Cables	Orders Received			Shipment		
	Aug. '99	Aug. '99/Jul. '99 (%)	Aug. '99/Aug. '98 (%)	Aug. '99	Aug. '99/Jul. '99 (%)	Aug. '99/Aug. '98 (%)
Open Wire (OW)	7,329	88.4	98.4	7,659	92.9	112.0
Winding Wire	13,771	93.4	98.0	12,725	80.6	102.6
Cable for Machinery	4,980	95.3	103.5	4,920	94.5	104.3
Communications Cable	3,603	82.2	91.2	3,453	84.2	94.6
Power Cable	21,527	93.0	103.2	21,152	97.5	102.4
Covered Wire	14,080	91.3	97.7	13,925	91.1	98.7
Cable for Transportation	3,680	77.0	109.0	3,754	78.1	108.7
Total	68,970 (76,446)	90.8 (87.4)	100.1 (98.2)	67,588 (74,538)	90.0 (86.1)	102.7 (96.8)
Aluminum Power Cable	3,739 (2,237)	114.0 (97.6)	98.0 (91.3)	3,631 (2,146)	92.4 (102.5)	66.4 (58.8)
Optical Cable				935,325 (20,834)	99.7 (88.4)	153.6 (122.1)

Remarks: 1) Figures of optical cable show "km Core."

2) Figures in parenthesis represent the amount in yen.

Source: The Japanese Electric Wire and Cable Makers' Association

### Cable Supply & Demand Classified by Major Consumption Fields (As of August 1999)

Fields	Orders Received				Shipment			
	Aug. '99 (Actual)	Aug. '99/Jul. '99 (%)	Aug. '99/Aug. '98 (%)	Sep. '99 (Estimated)	Aug. '99 (Actual)	Aug. '99/Jul. '99 (%)	Aug. '99/Aug. '98 (%)	Sep. '99 (Estimated)
Telecommunications	2,423	82.1	87.5	2,400	2,338	82.2	98.2	2,700
Electric Power	8,720 (2,939)	115.5 (131.1)	104.9 (99.5)	7,400 (5,000)	6,912 (2,715)	92.7 (112.4)	87.5 (57.0)	8,900 (5,700)
Electric Machinery	17,031 (312)	92.4 (83.6)	97.3 (170.5)	18,700	16,079 (286)	82.4 (81.0)	100.6 (183.3)	19,500
Automobile	5,142	81.7	109.4	6,700	5,069	80.2	109.5	6,800
Construction/Cable Shops	27,487 (35)	91.5 (61.4)	105.0 (102.9)	29,700	28,048 (39)	93.3 (83.0)	105.7 (95.1)	30,600
Others	5,223 (98)	95.8 (136.1)	84.4 (69.0)	6,400 (500)	5,336 (75)	94.3 (121.0)	92.5 (70.8)	6,300 (500)
Domestic Demand Total	66,026 (3,384)	93.4 (123.4)	100.6 (102.1)	71,300 (5,500)	63,782 (3,115)	88.8 (108.3)	101.0 (61.5)	74,800 (6,200)
Export	2,944 (355)	56.0 (66.2)	90.7 (70.9)	4,400 (200)	3,806 (516)	115.6 (49.1)	144.1 (125.9)	3,400 (400)
Total	68,970 (3,739)	90.8 (114.0)	100.1 (98.0)	75,700 (5,700)	67,588 (3,631)	90.0 (92.4)	102.7 (66.4)	78,200 (6,600)
Core Cable Sales	30,645 (98)	116.9 (64.9)	114.8 (80.3)	33,200 (100)	26,592 (104)	84.5 (74.8)	102.7 (75.9)	33,700 (100)

Remarks: 1) Figures of optical cable show "km Core."

2) Figures in parenthesis represent the amount in yen.

Source: The Japanese Electric Wire and Cable Makers' Association

## IMT-2000

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fair utilization of radio spectrums, each licensee shall be allocated up to 15MHz X 2 from each spectrum block.

- Spectrum allocation for each base station shall avoid harmful interference with existing fixed stations because some fixed radio stations will continue to use these spectrums in some areas until November 30, 2002 at latest.