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# TELECOM

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## LRIC to Be Introduced

Yukihide Okano, Professor Emeritus of the University of Tokyo  
Chairman, Study Group on the Long-Run Incremental Cost Model

MPT recently released a draft of the Long-Run Incremental Cost (LRIC) Model. According to the draft model, the interconnection cost for zone center (ZC: toll switching center) connection becomes 5.84 yen for three minutes, down 51.3% from the current level and the interconnection cost for group center (GC) connection becomes 5.45 yen for three minutes, down 6.2%. MPT, on September 21, received the draft model from the Telecommunications Council, an advisory body to the Minister of Posts and Telecommunications. Based on the draft model, the Telecommunications Council will work out a formula for calculating interconnection rates. LRIC is not a historical cost but a forward-looking cost. A study group headed by Yukihide Okano, Professor Emeritus of the University of Tokyo, compiled the draft model.

The study group defined LRIC as the cost required for constructing the network capable of dealing with the same number of subscribers and amount of traffic as the current system, using the

least expensive and the most efficient equipment and technologies.

Under the current agreement between NTT and new common carriers (NCCs), interconnection charges for conventional subscriber's lines and ISDN differ. However, in the draft model, interconnection charges for the conventional subscriber's lines and ISDN are the same based on an idea that no specific facilities are needed for ISDN services.

The study group in its report pointed out the following two points which should be considered upon implementation of the model: existing networks have been constructed step by step over a long period of time, while the draft model was worked out on an assumption that the networks are constructed at once using the least expensive and the most efficient equipment and technologies; and, existing networks were designed to meet demands in the future, while the draft model was designed considering only the current demand.

Taking this into consideration, MPT is going to work out the formula for interconnection charges considering the financial status of NTT, service charges in the market and universal service costs.

Introduction of LRIC was decided upon during a bilateral negotiation between Japan and the U.S.

With the decision, MPT is to intro-

duce the LRIC-based interconnection charges before the end of March 2001 after revising the Telecommunications Business Law during the next Ordinary Diet Session.

TT: What was the mission of your study group?

Okano: Since MPT's Telecommunications Council decided to employ LRIC for determining the interconnection charges, our study group was founded in March 1997. The mission of our group was working out the model. Based on the model, the Telecommunications Council worked out a formula for calculating interconnection charges.

TT: How did you work out the draft model?

Okano: We invited draft models from the public. A total of five carriers (carrier groups) submitted their own version of draft models. We worked based on these.

TT: What is LRIC?

Okano: It is an old concept. LRIC has been used in some countries. In France, for instance, utilities firms are using LRIC for calculating their charges. In Japan there was consensus to employ LRIC. However, there are different opinions over what kinds of LRIC should be introduced. For instance, NTT and NCCs have completely different views over the issue. We carried out a series of hearings from many carriers, while examining the current implementation status of LRIC in foreign countries.

TT: What was the most difficult issues when you were working out the model?

Okano: In principle, LRIC should be worked out on the assumption that the networks are constructed at once using the latest and the least expensive equipment and technologies. However, if we work out a model based on the assumption, there will be some problems because existing carriers already have their own networks. In any country, carriers have certain facilities. If they have to construct new facilities completely, disposing of their entire system as it exists,

## ADSL Ready to Take off in Japan

It has been decided that Nippon Telegraph and Telephone Corp.'s access networks will be opened to NCCs from the autumn of 1999. As part of its effort to lower telecommunications service prices and to promote competition among carriers, MPT decided to let service providers use NTT access networks.

Some NCCs are believed to launch ADSL services based upon the new arrangement. NTT itself is planning to launch its ADSL service this autumn on an experimental basis. Although on a quite limited basis, there are some other xDSL applications in Japan, while vendors are developing the technology in targeting the potentially lucrative market.

ADSL (asymmetric digital subscriber line) is an evolving high-speed transmission technology originally developed by Bellcore and now standardized by ANSI. Using a specially developed modem, users can enhance the data transmission speed up to 10 Mbps using conventional

copper wires.

There are some variations in xDSL: SDSL (symmetric digital subscriber line), a non-standard version of HDSL plus POTS; HDSL (high-bit-rate digital subscriber line), the most matured type of xDSL technologies; and IDSL (integrated services digital subscriber line), a developing xDSL technology which uses ISDN technology.

NTT is scheduled to launch its ADSL services for service providers in Tokyo and Osaka in the autumn of 1999. Their service speed will be 500 kbps downstream from the NTT's regional office to the subscribers' premises and 200 kbps upstream. Their service prices have not been decided.

NTT is planning to launch commercial services over a wider area after the initial year of experimentation.

In Ina City, Nagano Prefecture, the

*Continued on page 7*

## JSAT and NTT to Launch Commercial Satellite Business

by Yaeko Mitsumori

NTT Communications Corp. (NTT Com), the long-distance/international carrier established as a result of the reorganization of NTT in last July (1999), will enter the satellite market by tying up with Japan Satellite Systems Inc. (JSAT).

Upon tie-up, NTT Com will use JSAT satellites to launch its international business. On the other hand, JSAT will be able to strengthen its financial basis and technology development through tie-up with the carrier.

Unlike NTT's regional carriers, NTT Com is a private company that can do business without restriction. JSAT is one of the two satellite firms in Japan which has five satellites in orbit (including one reserved).

Since PanAmSat International Systems Inc., the world's largest satellite business, entered the Japanese market, the Japanese satellite market has become globalized and more competitive. These two firms decided on the tie-up to cope with this competition by

taking advantage of the economy of scale.

Market watchers say the merger of communications and satellite businesses will be accelerated by this alliance. NTT Com has agreed to take 10-20% stake in JSAT and will transfer 60% of the ownership of N-Stars to JSAT. Both firms will then promote domestic and international business by using their total of seven satellites. The contract is to be

*Continued on page 6*

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**LRIC:***Continued from Page 1*

then they should have substantial losses. In other words, they will not be able to survive in the market. So we had to examine how much it would cost if they construct new facilities over the current system.

**TT: Did carriers support the draft?**

**Okano:** There are two concepts for the cost for telecommunications facilities. One is bottom-up and the other one is top-down. The draft model is a bottom-up plan. The Office of Telecommunications (OFTEL) of the U.K. worked out its own LRIC model merging a bottom-up and a top-down models. However, NTT prefers a top-down model. In June 1999, NTT released its top-down model and the carrier released interconnection charges based on its own model in September (1999). I believe that the Telecommunications Council is going to decide the formula considering these two models: the MPT model based on this draft model and the NTT model. NCCs are largely supporting our model. U.S. scholars who were invited to the spring seminar recognized our great efforts and said that Japan is working very

hard to introduce LRIC.

**TT: What is NTT's claim?**

**Okano:** NTT said that NTT has been constructing their facilities based on a long-term plan considering a demand in the future. They said they had never thought that their investments are too big. In the world of telecommunications, technology has been advanced so rapidly, and in the market new systems tend to be cheaper than conventional systems. However, if these conventional carriers introduce new equipment before their depreciation has been completed, then they should run in the red.

**TT: The study group released interconnection charges for GC connection and ZC connection according to the model.**

**Okano:** We worked out the model using the optimal connection way, either GC or ZC connection. NTT has been changing its position and started letting NCCs connect to local switches at GCs more than before. Since local network has been developed reflecting features of

the society, our efforts were spent to make use of the optimal method for the Japanese system when we worked out the model.

**TT: I understand that the model will be used for calculating costs for the universal service fund.**

**Okano:** Right. A study group of MPT in 1998 recommended in its final report that LRIC be used for calculating costs

**There are different opinions over what kinds of LRIC should be introduced. For instance, NTT and NCCs have completely different views over the issue.**

for the universal service fund. So LRIC will be the basis for calculating both interconnection charges and the cost for the universal service fund.

**TT: Will LRIC eventually be against the interests of NTT?**

**Okano:** We should not introduce any system which hinder NTT's business activities. Such an arrangement is against the national interest. In the world tele-

communications market where competition intensifies by the day, NTT will be an easy mark if we pull the legs out from under NTT.

**TT: What will happen on the draft model from now on?**

**Okano:** MPT invited public comments on the model in August. Considering these comments, MPT will finalize the model in FY 1999. As I mentioned before, NTT is planning to submit its own model. Then the Telecommunications Council will decide the formula for interconnection charges based on these models. The government is planning to submit a bill to revise the Telecommunications Business Law during the Ordinary Diet Session in the spring of 2000. If the bill goes through the Diet as scheduled, then the new system will be introduced by the end of March 2001.

**TT: What is the message behind the implementation of LRIC?**

**Okano:** It is a meaningful, forward-looking step for the Japanese telecommunications market. There was no need for such a model if the market is fully competitive.

## IT Industry News

### NTT

#### NTT Top-down Model to Estimate Long-Run Incremental Costs

The Long-Run Incremental Cost Model Study Group of the Ministry of Posts and Telecommunications has issued a draft Model dated July 30, 1999 and is inviting comments. In response, Nippon Telegraph and Telephone East Corp. and Nippon Telegraph and Telephone West Corp. submitted their comments on the draft Model and proposed the NTT Top-Down Model for estimating long-run incremental costs.

### NTT DoCoMo

#### Number of Subscribers to "i-mode," a Mobile Communications Service with

#### Internet Capabilities, Exceeds 1 million

Although less than 6 months have passed since the launch of the "i-mode" service by NTT DoCoMo on February 22, it has acquired 1 million customers—more than meeting expectations. The number of subscribers is increasing at the rate of more than 80,000 per week.

The "i-mode" mobile platform has been designed to put the needs of users first, with features such as billing only on the volume of data actually exchanged, not on the time spent to access the network. Another feature is the primacy of voice communication, whereby, for example, if an incoming call is received while a user is accessing the Internet the call will be put through immediately. Then, when the call is finished, the "i-mode" screen will return and the connection to the data previously being accessed will automatically be resumed.

The attractiveness of the "i-mode" service is assisted by the wide diversity of its contents. At this time, 123 of Japan's major companies use a DoCoMo "i-mode" portal IP web to provide direct access to services that can be categorized into four areas: "online transaction," "databases," "information," and "entertainment." These "i-mode" portal IP web sites have been carefully selected to ensure both that the services they provide will be diverse and have usefulness in everyday life, and that they are suitable for the functioning of a cellular phone as a portable medium.

Users can also access hundreds of independently launched "i-mode" sites by simply entering a site's URL on the browser screen. Moreover, creating these sites is simple, because the "i-mode" is based on the HTML and HTTP Internet-language protocols. The "Oh! i-Search," an "i-mode" compatible site-search engine, detected 1,287 operational "i-mode" compatible web sites as of August 4, 1999. Those sites covered such categories as news, hobbies, entertainment, sports, travel, retail information, personal homepages and bulletin boards, education, chat, news groups and company information.

A particularly important function for business, and a great convenience for the consumer, is the ability of NTT DoCoMo to collect money, even if the amounts billed are small, spent by users on services from the pay sites on the DoCoMo menu. This feature allows companies to find opportunities to do business using the "i-mode" platform.

Many new uses are waiting to be discovered. In terms of possible business uses, for example, sales personnel who are out of the office could exchange data with their managers, check on inventories, and submit sales and travel reports—all without the need to use a PC. Thus, "i-mode" cellular phones have, in addition to their value as direct-sales tools, the potential to be effective tools for streamlining the business operations of an enterprise.

### NTT Com

#### NTT Communications Programs to Commercialize IP Network Services using MPLS

NTT Communications Corp. announced that it has commenced a program to commercialize flexible and low-cost IP network services by constructing new networks using the next-generation IP basic technology of multiprotocol label switching (MPLS). This is the first such program to be introduced in Japan. NTT Communications aims to completely replace current data and voice networks with IP networks for corporate users.

MPLS technology allows high-speed packet forwarding, secures the exclusiveness of networks, and permits the handling of different protocols. With an MPLS network, IP packet is assigned a label at the entrance of the network and within the network packet forwarding occurs using only the label and not the IP address.

NTT Communications hopes to complete the development and construction of MPLS networks by March 2000. By using this network the company is to provide IP network services for corporate users from the second quarter of 2000. This service aims to reduce cost, by over two-thirds of the former cost of corporate networks, and to provide various large-scale application services for the intranet.

### JT

#### Japan Telecom Reduces the Tariff Rates of the International Telephone Service

Japan Telecom Co., Ltd., on September 24, 1999, submitted to the Ministry of Post and Telecommunications the application of tariff rates reduction for the international telephone services. The reduction will take effect on October 1, 1999.

The average cut rate is about 10.3%, and the maximum cut rate is 28.6% (in comparison with the former tariff when weekday call of three-minutes duration from 19:00 to 23:00 is made to the mainland of the U.S. and Hawaii). This tariff setting targets at areas with the large volume of traffic from Japan like the United States, the United Kingdom and other Asian nations. The new tariff will be applied to all 223 service areas Japan Telecom currently provides.

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## Cable TV

# 2010 Digitalization Plan May Restructure Cable TV Market

By Yaeko Mitsumori

An advisory body for the Minister of Posts and Telecommunications recently recommended digitalization of all Japanese cable TV systems by 2010. According to the government's scenario, all broadcasting systems in Japan are to be digitalized by 2010.

As widely recognized, digitalization will bring many benefits to users. Viewers will be able to watch high definition images, purchase software or other content through cable TV system and receive a variety of new services including banking services such as money transfer.

On the other hand, broadcasters have to bear a heavy burden. Some market watchers say the Japanese cable TV market comprising tiny, newborn regional operators may be drastically reduced due to digitalization.

The Telecommunications Council, the advisory body, recommended that trunk lines of major cable TV operators be replaced by optical fiber networks by 2005, enabling these operators to provide high-speed Internet services prior to all cable TV systems in Japan being digitalized in 2010. The council also recommended the government provide support measures such as tax incentives for small operators in order to relieve or lighten their burden for digitalization.

According to MPT, there are 14 million Japanese cable TV subscribers. In Japan, CS digital broadcasting was launched in 1996. BS digital broadcast-

ing is scheduled to be launched in 2000, and terrestrial digital broadcasting is scheduled to be launched in the three metropolitan areas in 2003 and in the remaining areas in 2006. If digital cable TV systems are launched as recommended, then all broadcasting systems will be digitalized by 2010.

For equipment manufacturers, digitalization of broadcasting provides a big business opportunities.

The Electronic Industries Association of Japan (EIAJ) estimated that the digital TV market will reach 51.4 billion US dollars in 2004. Even if these manufacturers have to spend a lot of money for development of digital TV sets, they are expected to make enough profits by selling new digital TV sets.

However, it is not a very fortuitous trend for broadcasters who have to bear much investment cost in converting their infrastructure into digital systems. Much worse, even if they digitalize their broadcasting system to meet new viewer demands, they may not get much profits from the conversion. Some market watchers say the cable TV market might be reorganized due to this digitalization.

Large so-called MSOs have already started moving toward digitalization while promoting their effort to launch new services using the digital system. Jupiter Telecommunications Co., Ltd., an MSO having 25 systems around the nation, will launch a field test for digi-

talization this autumn (1999), and is scheduled to complete digitalization of all 25 systems by the end of 2000. In order to fully utilize their digitalized systems, Jupiter is going to establish At Home

Corp. in cooperation with At Home in the United States in August (1999) and will launch content distribution business including news and network games. Tsunetoshi Ishibashi, President of Jupiter, said distribution of motion pictures is the optimal way to demonstrate the advantage of cable TV networks. At Home Corp. expects to raise annual sales of 5 billion yen in three years.

Town Television Narashino, a cable TV operator in Narashino City, Chiba Prefecture partially owned by Marubeni Corp. has been promoting a demonstration experiment for cable TV Internet using NCTV. NCTV is a system developed by Oracle which lets users browse the Web sites using an ordinary TV set. Interactive Cable Communications Inc., a subsidiary of Marubeni Corp., is providing a variety of popular content including the timetable for buses and electronic bulletin boards.

TITUS Communications Corp. which is running six systems around the country is planning to launch digitalization of their system from 2000. As a preparation job, the operator will launch an experiment for digitalization this autumn.

Tokyu Cable Television which have six systems along the Tokyu train lines launched a field test for digitalization in 1995 in cooperation with several other operators.

Although the operator does not have any particular time schedule for digitalization, Chiaki Komatsu, Public Rela-

tions of Tokyu Cable, said the operator is well prepared for digitalization of all six systems.

On the other hand, small cable TV operators are worried about the MPT's digitalization plan. Since it was launched as regional media, most of cable TV have been operated within the boundary of a community. With such history, most cable TV operators are small and capitalized by many local businesses. It is said that it will cost 1 billion yen to digitalize one headend facility. On the other hand, a typical cable TV operator manages to earn approximately 500 million yen a year. Market watchers said only handful of operators can finance digitalization by themselves. But many operators said they have not even thought about digitalization yet.

Cable TV has quite an extensive access network that is in general considered a big business resource; however, major consumer electronics manufacturers and carriers are struggling to enter the access network market via wireless local loop, and not via cable TV network. MPT is reportedly expecting local governments to support their regional cable TV operators; yet local governments suffering from significant reduction in their tax revenues have no extra capacity for extending a helping hand to cable TV operators.

Nevertheless, cable TV operators have to go ahead, because NTT is scheduled to open its optical network to cable TV businesses and potential businesses looking to enter the cable TV market in September 2001. Unless they cope with the digitalization and full services issues, cable TV operators may have difficulties surviving in the borderless telecommunications market.

## Pacific Gateway Exchange, Inc. (U.S.)

### KDD Submarine Cable Systems Inc. (Japan)

#### Formation of a Joint Venture to Construct Backhaul Circuits

Pacific Gateway Exchange, Inc. and KDD Submarine Cable Systems Inc. on August 31, 1999, announced the formation of a Joint Venture (JV) in Japan. The JV will construct and sell backhaul telecommunications circuits, between cable landing stations and major metropolitan centers in Japan, to the telecommunications carriers (customers) in the world. The JV will employ a new architecture for backhaul network, including the location of the cable terminating equipment in the metropolitan area instead of at the cable landing point. This architecture will result in a dramatic reduction in facility cost, while significantly improving quality in transmission and service. The first stage provisions of the backhaul circuits by the JV shall be made between Chikura/Maruyama submarine cable stations and Tokyo metropolitan area, from the middle of 2000.

"We are very excited to be working together in a joint venture with complementary participation. We will be the most outstanding and technologically advanced provider of backhaul circuits in Japan connecting the undersea fiber optic cable landing stations with access to the major city centers," said Mr. Howard A. Neckowitz, President and CEO of Pacific Gateway, and Dr. Y. Niuro, President of KDD-SCS. "Pacific

Gateway has an extensive bandwidth sales team, and KDD-SCS is the global system integrator providing the most advanced fiber transmission technology. Together, we will be the most outstanding provider of backhaul circuits in Japan."

The JV will provide its customers with state-of-the-art technology and economically reasonable connectivity to city centers from the cable landing points in Japan, thus meeting the exploding demand for the backhaul circuits in Japan to be used for global Internet and data services. The JV will advance the scope of customers' interconnection between their respective worldwide undersea fiber optic cables and points of presence in Japan.

## Oki

### New Chips Extend the Battery Life of Personal Digital Assistants

In response to the overwhelming demand for smaller, faster and longer-lasting personal digital assistants (PDAs), Oki Electric Industry Co., Ltd., on August 31, 1999, unveiled the Oki MSM 51X18160 DSL and MSM 51X18165 DSL 16-Mbit DRAM chips.

Operating on a voltage of 2.0 and a bit configuration x16, the MSM 51X18160 DSL and MSM 51X18165 DSL significantly extend the battery life of many small personal electronic communication devices. Sample shipments of the MSM 51X18160 DSL and MSM 51X18165 DSL begin immediately.

"PDAs are no longer just portable event planners and contact managers.

They are quickly becoming remote email terminals and Web access devices, and longer battery life is required. By using Oki's MSM 51X18160 DSL and MSM51X18165DSL chips, the battery life of PDAs can be dramatically extended, and manufacturers can continue the trend toward smaller and lighter remote data terminals," says Dr. Masayoshi Ino, Director and General Manager, LSI Division, Device Business Group of Oki Electric.

With a bit configuration of x16, the Oki MSM51X18160DSL and MSM 51X18165DSL are ideal for most PDAs, which generally come with either 16 or 32 bit data buses. In addition, the chips' operating timing and pin assignments are compatible with all existing general-purpose DRAM offerings.

MSM 51X18160 DSL and MSM 51X18165 DSL have self-refresh function and PDAs can be kept on standby with memory kept, without external refresh controls. Its power consumption at the self-refresh status is dramatically reduced, which will be most effective to extend battery life.

## Toshiba

### Introduces 64 Megabyte SmartMedia Card Packages and Two 256-Mb NAND Flash Chips

On July 30, Toshiba Corp. demonstrated its continued leadership in the fast-growing market for NAND flash memory with the announcement of a 64-megabyte (MB) SmartMedia™ card and a 512-megabit (Mb) NAND memory in a thin small outline package (TSOP).

Both devices double the capacity of NAND flash products currently on the market.

At the heart of both new devices is Toshiba's latest innovation in flash memory, a 256Mb NAND chip fabricated with 0.25 micrometer process technology and a shallow trench isolation structure. The new 64MB SmartMedia card mounts two of these chips in parallel in its postage-stamp size package and meets all the specifications of the Solid State Floppy Disk Card Forum, which defines standards for SmartMedia. The 512-Mb NAND TSOP flash memory consists of two 256Mb chips stacked one on top of the other, which minimizes the overall package size.

A rapidly growing market, including digital still cameras, personal digital assistants, set-top boxes and portable audio players, confirms SmartMedia as the digital memory of choice in applications requiring reliable, rewritable, non-volatile, high-density data storage in a small, light, thin, attractively priced product. The doubled capacity of the new 64MB SmartMedia card adds to the versatility already shown by its predecessors: it supports the latest generation of 2-million-plus pixel digital still cameras with storage of 72 digital images recorded in 1,800 x 1,200 pixel fine-mode resolution.

Commercial samples of the 64MB SmartMedia card and 512-Mb TSOP are now available, at 25,000 yen and 24,000 yen, respectively. Mass production will start this September, at an initial monthly volume of 50,000 pieces each.

## Net Music

# MP3 Will Change Music Mart

By Yaeko Mitsumori

A consortium backed by the government will launch a music distribution project over the net in October (1999).

In this three-month experiment, users can purchase their favorite music at a kiosk called Street Studio and download it on their own terminals. They will settle the payment with a "flexible electronic ticket" developed by NTT Corp., a participant of the consortium. When users dub the music over another terminal, their "flexible electronic ticket" is consumed accordingly. It will be the first governmental project for music distribution over the net.

"We decided to launch the project in order to promote net music distribution system," Mitsutoshi Oriyama, Deputy Director of Electronics Policy Division of MITI. "We hope these participants will launch commercial-based service on the basis of the experiment after December."

Other participants of the "Waveless Radio Project" are: the Japan Digital Content, Hummingbird Network, Victor Co. of Japan and Dinnerware.

Sony Group last March (1999) started distributing music through Music Link, a channel of SKYPerfectTV. Users can select their favorite music from 60 pieces distributed through the channel and download on their own MD player at 150 - 200 yen per music. In Japan a single CD is selling at around 1,000 yen. But to enjoy the new music distribution services, users have to be a subscriber of SKYPerfectTV and have to purchase a new type of tuner at 50,000 yen. The basic subscription fee for SKYPerfectTV is 290 yen per month (2,800 yen initial fee is required upon registration). At the moment, Digital Media Entertainment (DME), the consignor (program-supplying broadcaster) of the channel, is providing so-called Indies and foreign music because of the difficulty with copyrights issues in Japan. But Sony Group is planning to expand the number

of programs to 12 and will start airing major music in August (1999).

As you see, net music is entering the Japanese market.

Net music distribution has already taken off in the United States. But illegal distribution is a big problem for both manufacturers and record companies.

In January 1999, five major record companies in the world as well as electronics companies including IBM, AT&T, Sony, Matsushita and Toshiba formed the Secure Digital Music Initiatives (SDMI) aimed at standardizing technologies and developing measures to protect copyright. The SDMI recently released standardized specifications for net music players.

Separately, these five major record companies -- Sony Music Entertainment, EMI, BMG, Universal Music Group, Warner Music -- launched a joint experiment for distributing music over the net using a new system developed by IBM. In the experiment launched in San Diego, California in which some 1,000 residents are participating, users can download a full album for 10 minutes in a way copyright is tightly protected.

Other smaller operations have been kicked off in Japan. Tenproxy, a translation agency in Tokyo, in June started selling copyright-free music over the net. Users can select their favorite music among 50 newly created pieces, typically 10-45 seconds, and purchase them over the net at 300 yen per piece. The firm is going to expand the number of music to 1,000 pieces by the end of this year.

TDK Corp., a major electronic part manufacturer, mid-July (1999) started selling Indies brand music using Windows Media Audio system developed by Microsoft. Yamaha Corp., world's largest musical instrument maker, at the end of July started selling music over the net. Users of the "Midradio" can pur-

chase favorite ones from 4,000 listed pieces after tasting them for the first 90 seconds. Costs are 200 - 300 yen per piece.

Manufacturers are struggling to enter the net music market.

Rio PMP300, an MP3 player, is winning popularity in the U.S. market since it was put on the market last November (1998). The player weighs only 70 grams and can store up to 60 minutes of music into its built-in flash memory card. The Rio is selling in Japan at 27,000 yen per unit.

Other several MP3 players have been introduced in Japan.

Mansei Corp. is selling MPMAN MP-F20 at around 20,000 yen, Futures is selling MPlayer3 at around 29,800 yen and Creative Media K.K is planning to market Creative Nomad Digital Audio Player 64 MB in August 1999.

Some firms are providing handheld computers and mobile computers which can be used as MP3 player. Toshiba Corp.'s Libretto ff1100 has function to replay MP3 format music data. Once a pair earphones and a remote controller are connected, then it can be used as a MP portable player. Casio Computer Co., Ltd.'s Cassiopeia E-500 can store MP3 format music on its memory card. Japanese major electronics manufacturers including Matsushita Electric Industrial Co., Ltd., are planning to release net music players later this year targeting the Christmas season.

One of the reasons why Japanese net music is behind the United States is complexity of copyrights.

In the U.S., record firms typically reserve the right for producing CD (or other media) based on the music; however, in Japan the right holders are widely diversified. In many cases there is no written contact exchanged between music creators and the right holders. Aimed at preventing infringement of copyright by providing the correct in-

formation of music to the public, the Japan Society of Rights of Authors and Composers (JASRAC) and the Recording Industry Association of Japan (RIAJ) and the Japan Council of Performers Organizations jointly opened an Internet portal site called Music Forest in June (1999).

The portal site provides a variety of information regarding music distribution such as copyright holders of a certain work and a list of CD distributors. From next year (2000), users will be able to listen to a part of the listed music on the website.

The other issue is dominance of the JASRAC. In Japan the JASRAC has been dealing with copyright of creators and musicians for the past 60 years under the protection of governmental policy.

Some people said that the present copyright regulation is out of date and does not fit the current world where digitalization and networking has been promoting.

Some musicians who openly criticized the present system such as Ryuichi Sakamoto and Motoharu Sano last February formed the Media Artist Association (MAA) as a forum where people who have interests in music exchange their views regarding copyrights. When their discussion is matured, they are planning to submit their position paper to the Ministry of Education's Agency for Cultural Affairs, which is in charge of copyright issues.

Meanwhile, taking recent deregulation trend into consideration, the Ministry is going to relax its regulation on the intermediary business. Due to the Law on Intermediary Business Concerning Copyrights established in 1939, only JASRAC is allowed to collect and distribute royalties regarding their music works among copyright holders. Once the law is relaxed, other private firms may be able to enter the business and handle such copyright management businesses. If this happens, royalty distribution may be liberalized -- as some net distribution advocating musicians hope.

## New Products

### Toshiba Offers ATM Switch Chipset Scaleable from 622Mbps to 20Gbps

On August 9, 1999, Toshiba Corp. announced a highly integrated, scalable Asynchronous Transfer Mode (ATM) switch chipset that provides a highly effective solution for implementing complete ATM functionality in high-performance switching systems. The chipset is targeted for use in ATM Wide-Area Networks (WAN) edge networking equipment, such as access/concentrators, multi-service edge switches, Digital Subscriber Line Access Multiplexers (DSLAM), and IP router WAN access cards.

Toshiba's chipset comprises three devices: the Switch Element (SE), TC35880TB; the Switch Access with Multiplexer (SAM), TC35881TB; and the Distributor/Arbiter (DA), TC35882TB. Different combinations of these devices allow various configurations that support switching levels ranging from 622Mbps to 20Gbps.

The chips are interconnected to each other by the industry standard Low Voltage Differential Signal (LVDS) bus, and the LVDS bus control circuits are embedded into each chip.

The chipset features a broad range of traffic congestion and switch management functions to maintain optimum performance under varying conditions. Five quality-of-service (QoS) classes are supported: constant bit-rate (CBR), real-time variable bit-rate (rt-VBR), non-real-time variable bit-rate (nrt-VBR), available bit-rate (ABR) and unspecified bit-rate (UBR).

The chipset also incorporates the functionality of 32 shapers, flow control, scheduling and per-VC queuing.

The highly integrated SAM performs the majority of switching and traffic management functions. While the SAM is capable of operation as a stand-alone ATM switching node at 622Mbps, a switch fabric consisting of a single SE device is required for architectures from 622Mbps to 5Gbps. For solutions requiring performance beyond 5Gbps, multiple SEs and DAs are utilized. A 5Gbps, 8 x 8 (OC-12/link) implementation requires only eight SAMs and one SE.

The SAM and SE are manufactured in 0.3 micron CMOS and the DA is manufactured in 0.4 micron CMOS. All devices operate at clock frequencies from 25MHz up to 200MHz with 3.3V supply voltage and are packaged in Tape Ball Grid Array (T-BGA) packages.

ATM networks are key elements of high speed, high capacity data networks. They support high speed switching of multiple data with diverse content—audio, images, text and voice—along a single line at the same time, thus making more efficient use of networks. Data flows are broken down into cells of 48 bytes of information and 5 bytes of address data. Cells are individually transmitted in a prioritized order through high speed switching. The addressing, prioritization and switching of each cell is handled by the switching LSIs, the core control unit of an ATM exchange.

### Matsushita Electric, SanDisk and Toshiba

#### Agree to Join Forces to Develop and Promote Next-Generation Secure Memory Card

Matsushita Electric Industrial Co., Ltd., best known by its Panasonic brand name, SanDisk Corp. and Toshiba Corp. have reached an agreement on comprehensive collaboration to jointly develop, specify and widely promote a next generation secure memory card.

The global market is growing rapidly for flash-memory based removable storage cards. These cards provide a compact, reliable, and easy-to-use medium to store high volumes of visual, audio and other data for digital music players and cameras, personal digital assistants (PDAs), video cameras, cellular phones and other digital consumer electronics products. Several major formats including SmartMedia, CompactFlash and MultiMediaCard are gaining solid support as leading media to meet these requirements.

In addition to these segments, recent years have seen an increased need for methods to improve copyright protection for artists and other content owners and provide greater data security for users.

The agreement is aimed to jointly develop a small size, high speed read/write next generation memory card capable of providing a high level of copy protection for music, movies and other artistic and commercial content. Each company will aggressively promote development of application products for this card.

# Nissan

## Cellular Market to Be Reorganized into 3 Groups

by Yaeko Mitsumori

Nissan Motor Co., Ltd. decided to sell all of its stakes in the nine cellular companies in which Nissan is the largest shareholder to Japan Telecom Co., Ltd. (JT) and to DDI Corp.

Upon the arrangement, the Japanese cellular market will be reorganized into three groups: NTT DoCoMo Group, JT Group and DDI & IDO Group.

The government last year (1998) announced that it will grant a license for the third-generation or 3G business to the three groups.

At present, capital relations of Japanese cellular carriers are complexly intertwined. For instance, DDI and Nissan are jointly doing business in the Kanto and Tokai areas; however, DDI Cellular and Digital TU-KA are competing with each other in Hokkaido, Tohoku, Hokuriku, Chugoku, Shikoku and Kyushu areas.

This complicated capital relationship is considered to be one of the reasons why NTT DoCoMo Group, the sole nationwide cellular service provider, has a dominant 57% share of the market.

Such complicated capital relations were created partly due to MPT's regional licensing policy in the wake of the deregulation of telecommunications market. Taking such criticism into consideration, MPT decided to grant a license for 3G services to carriers providing nationwide services. Since the spectrum available for the 3G services is limited, MPT also decided to limit the number of carriers for 3G business to three. At the moment, four carriers are operating cellular business in the three metropolitan areas of Japan: Tokyo, Nagoya and Osaka. It was inevitable for the telecommunications market to reconstruct itself without straightening out the current intertwining of capital relations, to smoothly shift to the 3G business.

While the cellular market as a whole has been rapidly expanding and has reached the 44-million mark for subscribers, Nissan's nine TU-KA compa-

nies have not expanded their market share so rapidly. As of the end of August 1999, the market share of these nine companies remained at 12%.

On the other hand, TU-KA group's accumulated losses reached 700 billion yen as of March 1999. Nissan, the largest shareholder of these firms, has to cover 400 billion yen of these losses.

JT (130 billion yen) and DDI (270 billion yen) are going to take over the virtual guarantee of obligation under the arrangement, to be finalized by the end of fiscal 1999 (at the end of March 2000).

Nissan will also decrease its stake in IMT-2000 Planning, a company which was established last December by Nissan, JT and AirTouch International, from the present 34% to 8%. Instead, British Telecommunications plc will obtain a 20% of the stake in IMT-2000 Planning.

Nissan is now in the process of financial rehabilitation under the leadership of the French motor company Renault. By shrinking its cellular business, Nissan is aiming to regain its financial health.

Regarding 3G business, NTT DoCoMo is planning to launch its W-CDMA services in the spring of 2001. Selecting a dozen vendors for its 3G services last April (1999), the carrier has been gearing up its effort to develop the required systems.

By purchasing all of Nissan's shares, JT will be able to provide nationwide cellular services.

Even today, three Digital Phone Group companies and six Digital TU-KA Group companies are providing their services for their customers in a cooperative manner. For instance, they are providing roaming services between these two groups not only in voice but also in text messaging services.

However, some inconvenience for their customers remained: their brandnames are different — the former one is using J-Phone and the latter one is using Digital TU-KA — and their service names are different — the former one provides their text messaging service un-

der the name of Sky Walker while the latter one provides the same service under the name of Sky Warp.

Upon taking over Nissan's stake, these two groups under JT are to unify their brand and service names.

Koichi Sakata, chairman of JT, said he would like to make the IMT-2000 into J-Phone Communications and turn the rest of the group companies into its regional firms such as J-Phone Hokkaido, J-Phone Tohoku and so on.

"So far Nissan and JT have had the equal number of stakes in these six firms. So we could not take a strong leadership position in management. But (after taking over the Nissan's stake) we will provide unified services under a global, comprehensive strategy," he said.

DDI Corp. last summer tied up with IDO Corp., and these two firms have been promoting cdmaOne nationwide services since last April (1999).

By taking over Nissan's stakes of TU-KA Cellular Tokyo, TU-KA Cellular Tokai and TU-KA Phone Kansai, DDI Group will bring all of them into the Group.

However, the shift may not as smooth as JT's.

The service area of TU-KA Phone Kansai and Kansai Cellular, the core firm of DDI Cellular Group, are overlapped with each other, and the service areas of TU-KA Cellular Tokyo and TU-KA Cellular Tokai are overlapped with that of IDO, its partner for cdmaOne and cdma2000, the 3G services.

Mamoru Mishina, a spokesperson for DDI, said that these three firms will continue to provide the same services after the takeover "for the time being" in order to avoid confusion in the market and to protect the interests of existing customers.

"However, in the long run, we may consider unifying our services and brandnames," he said.

The market is now keeping a close eye on how KDD and other (foreign) carriers will move to respond to the recent arrangement. In launching into the 3G business, they have no way but to join the three (almost) established groups. KDD has already launched a series of field tests for W-CDMA, a 3G system that NTT DoCoMo and JT are planning to introduce as their next-generation services.

Neither KDD nor any other carrier has released a comment concerning the position to be taken concerning this issue yet.

## IT Industry News

### Sony

#### Reorganizes Wireless Phone Business

Sony Corp. announced that it will reorganize its wireless phone business operations worldwide. Currently, Sony is conducting its wireless phone business in three major markets -- Asia (including Japan), North America and Europe. These activities encompass R&D, engineering, manufacturing, sales and marketing.

In order to revitalize its wireless phone business, Sony will implement a plan to strengthen its operations by optimizing resources. Specifically, Sony will discontinue its engineering, sales and marketing teams for wireless phones in North America, and concentrate on R&D for next-generation telecommunications technology. This will be completed within the first half of Sony's fiscal year 1999 (April-September period). About 200 people will be affected by this move. Affected employees will be provided with information regarding opportunities at other business units within Sony Electronics Inc. Moving forward, Sony will focus its wireless business activity including its CDMA business in Asia, Oceania, and Europe.

Sony will retain its U.S. based R&D team developing "cdma2000" technology, which is viewed as a promising next-generation telecommunications technology in North America and Japan. At the same time, Sony will step up its R&D efforts for "W-CDMA" which is anticipated to be a promising next-generation telecommunications technology in Japan and Europe.

"Wireless technology is indispensable for Sony to create a new IT-telecommunications world in the digital network era," said Katsumi Ihara, president of Sony's Global Digital Telecommunications Company in Tokyo. "Sony will continue with its efforts to develop new products and technologies in this area, while supporting and reinforcing our current wireless business in Asia, Oceania and Europe," he added.

### NEC

#### Develops Ultrahigh-Resolution TFT Full-Color Liquid Crystal Display

NEC Corp. has developed a 9.4-inch (24cm) ultrahigh-resolution TFT (thin film transistor) full-color LCD (liquid crystal display) module that provides near print or photographic quality reproduction. In addition to the new amorphous silicon TFT LCD, the manufacturing technology has also been developed that will allow the company to bring the modules to production by the end of the year 2000.

The new ultrahigh-resolution 9.4-inch LCD module provides resolutions of up to 1,600 x 1,200 for a highly detailed screen of 1.92 million pixels. Compared to conventional TFT full color LCD modules used in current desktop monitors and notebook computers, the pixels in the new screen occupy less than one-fifth of the screen space enabling much more detailed image reproduction. Combined with NEC's proprietary analog signal processing technology, there is no limit to the number of steps per pixel thereby enabling full color.

In addition, NEC has also developed a new COT (Color filter on TFT) filter that is indispensable for this class of ultrahigh-resolution display, together with the necessary manufacturing technology.

The new full-color display is the most detailed color TFT LCD display, providing resolution of 211 pixels per inch (ppi) and a large number of pixels in full color to enable the display to rival the quality of photographic prints. It provides an electronic display that offers both detailed image reproduction and a complete depth of color.

Large TFT color LCD displays feature slim profiles, lightweight and low power consumption. Starting with notebook computers, advances in screen size, resolution, color reproduction and viewing angle have enabled them to quickly become common as monitors for desktop computers. Though these conventional LCD modules, however, have provided standard reso-

lutions of between 80-100 ppi they do not provide the detailed resolution needed to meet the capability of the human eye such as printed material and photographs provide.

#### Launches "Converged Open Network Architecture"

NEC Corp. (NEC) announced, on August 31, 1999, that it has launched "Converged Open Network Architecture," a new network architecture which can offer flexible solutions for various kinds of IP (Internet Protocol) network. NEC will launch new architecture and a "Converged Service Node" the key system for the architecture to the market from the end of 2000 and also launch QoS (Quality of Service) servers and other related systems in the future.

IP network is a "Connectionless (CL-type)" network in which information and data are sent out by packets with header. IP networks have been expanding so rapidly in the field of the Internet and computer communications where any real-time communications are not required. However, IP network will be becoming the infrastructure and IP networks are expected to progress to be able to handle real-time and highly-guaranteed applications.

The new architecture employs ideas of "Connection-Oriented (CO-type)," a network which establishes connection between sender and receiver beforehand, into CL-type IP networks. With this, applications such as E-Commerce/money and stock transactions, medical services, real-time image/video transmissions/monitoring and also emergency calls will be realized with a high degree of reliability. In this architecture, any mixture of Quality of Service (QoS), from current IP network QoS to high-quality, real-time QoS, can be handled properly in the entire network without any degradation of service can be set flexibly without realizing the change in telecommunication service ratio for same level of cost performances as current IP networks.

## NEC: Develops Friendly, Walkin' Talkin' People Partner Personal Robot

NEC Corp. has developed a prototype mobile personal robot designed to be a partner for people in their homes with its ability to recognize people, understand voice commands and talk with users. The R100, as the robot is code-named, provides a much more natural, button-less interface for people to a variety of electronic appliances while supporting communication between people, and is seen by NEC as the future of computing in the home.

The prototype robot has two cameras for eyes that provide a stream of visual data, analyzed in real-time, enabling it to recognize people and avoid bumping into objects such as furniture. Its "ears" are comprised of three microphones from which the robot can detect voices and understand orders given to it from a

select vocabulary. Movement is based on mechatronics specially developed for the robot, and consists of a simplified control structure based on four motors for locomotion. With Internet communications capability incorporated into the unit, the R100 enables users to send video e-mail messages by just talking naturally to the robot, as well as a whole range of other functions.

With these technical abilities, the R100 can recognize people approaching it and talk to them, while it will respond if called, turning its head and body to face the direction the voice came from. Just by talking to the robot, a range of commands can be given to it to operate appliances such as air-conditioners, TVs, and lighting. The same features can also be used to send messages to

other people, either by leaving a message with the robot for it to playback on TV for the intended person, or via the Internet as video e-mail. Its ability to interact so naturally with people opens up a variety of application possibilities for home automation systems including support for implementing safety measures, support for elderly or disabled persons, emergency communications systems, and for home security. With use of the Internet and software, the robot also makes possible a wide range of other applications such as tutoring children or providing remote care for sick or disabled people.

Constructed from a list of software-based technological achievements such as visual and voice recognition, sensor,

movement decision-making, emotion modeling, memory, mechatronics control, and motion pattern library technologies, the robot offers potential for expanding its abilities through a range of possible configurations. NEC's research team plan to continue their research work in this field to bring about technology with a more human face.



### ADSL:

*Continued from Page 1*

country's largest ADSL experiment has been promoted since last June (1999) under the leadership of Ina Chamber of Commerce and Industry. Their system is based on copper cables for wire broadcasting. During this one-year experiment, 100 selected monitor residences and a dozen stores were linked with each other using ADSL, while the Ina Chamber of Commerce and Industry and the broadcaster's office were linked with HDSL. A user obtains access from their TV set at home (connected with a card reader built-in STB) to a store via the system and can shop a merchandise at a participating store. They will settle the payment with a prepaid IC card. Their ADSL devices were provided by NEC Corp., Sumitomo Electric Industries, Ltd., Sumitomo Densetsu Co., Ltd. and others.

Ina City, a small city (with a population of 62,000) located about 140 kilometers west of Tokyo, is a high-tech oriented city. In 1998 the city carried out an experiment for high-speed Inter-

net access using the ASDL system.

Akira Yasue, an official at the Ina Chamber of Commerce and Industry, said: "In our experiment last year, we confirmed that we would be able to provide data transmission services with a speed of 10 Mbps or more to every part of the city. This time we would like to seek for applications using the high speed network."

NEC Corp. had developed the internationally standardized DMT-based ADSL system last May (1999) and has been providing the system overseas. The firm's system consists of DSLAM (digital subscriber line access multiplexer) and ATU-R (ADSL terminating unit-remote) or STB, and can transmit 6-Mbps downstream from the carrier to the subscriber's premises and 1-Mbps upstream. The ATM switch and the DSLAM are linked to each other with a 155-Mbps optical fiber.

Last May (1999), NEC provided a system capable of handling 2,600 lines to Hong Kong Telecom. The per line cost for the system is about \$500-\$700.

Although it was an old CAP system,

the manufacturer last year provided a system for 1,000 lines to cantv, a carrier in Venezuela.

Although the maximum downstream speed of their system is 6 Mbps, the speed can be modified to meet customer demands due to use of RADSL (rate adaptive ADSL).

"Since demand for high-speed Internet has been growing rapidly, we expect this market will expand further," said Yoshitaka Shimada, Department Manager of NEC's 1st Development Department. NEC estimates that the world xDSL market will be 50 billion yen in 2000 and 72 billion yen in 2001. NEC is also targeting Japanese market once carriers launch their ADSL services.

However, there are some uncertainties in the Japanese ADSL market: the rent for NTT's access lines has not been decided yet, although MPT decided to open NTT's access networks to NCCs; NTT is not necessarily putting an emphasis on ADSL, and rather focusing on FTTH; NCCs are taking a wait-and-see attitude because they have not been able to confirm marketability for the busi-

ness.

But NEC's Shimada said once the rental fee for access lines is fixed at a reasonably low level, then carriers would rush to enter the market.

For the time being, NEC seems to put an emphasis on the U.S. market and other Asian market such as China, Singapore and Malaysia.

Separately, Shikoku Information and Telecommunication Network Company Inc. (STNet) last February (1999) started providing leased line services using SDSL under the brandname of "STCN Advances."

The services prices are: 78,000 yen for 192 kbps, 88,000 for 256 kbps, 108,000 yen for 384 kbps, 128,000 yen for 512 kbps, and 168,000 yen for 768 kbps. In addition, users are charged 4,500 yen for modem rental fee.

The STNet is planning to provide ADSL services on an experimental basis and also plans to launch VPN services using xDSL modem.

### Satellite:

*Continued from Page 1*

finalized within a couple of months.

Other NTT companies (NTT Mobile Communications Network, Inc., NTT East and NTT West) jointly hold the balance (40%) of the ownership of N-Stars. The Japan's satellite market with a total sales of about 50 billion yen is being shared by JSAT and Space Communications Corp. (SCC), the other satellite firm in Japan. The world satellite market is worth around seven billion dollars. Since the Japanese market is so small, Japanese satellite firms have no option but to look to the international market. Both JSAT and SCC have launched satellites whose beams cover all of Asia. On the other hand, NTT's N-Stars only cover the Japanese archipelago.

NTT has two satellites — N-Star a and N-Star b — launched in 1994 and 1995, respectively. Yet, usage of these two satellites have been limited to in-house use or emergency communications in order to maintain fair competition. However, NTT Com was allowed to launch services on a commercial basis with these two N-Stars upon NTT's reorganization in July 1999.

NTT and JSAT in 1998 established a joint venture called NTT Satellite Communications Inc. which provides Inter-

net services. Upon the recent tie-up agreement, their alliance will be expanded from one limited to the Internet business to a comprehensive one with capital relations. Both firms are going to carry out satellite business collaboratively.

NTT decided to tie-up with JSAT because the carrier has little know-how in satellite business although it is the dominant telecommunications carrier, especially in voice communications. In addition, since life-span for their two satellites (N-Stars) will expire around 2005, it should launch the next-generation satellites before then. It is estimated to cost 70 billion yen.

At a press conference announcing the business alliance, President Masanobu Suzuki of NTT Com said that his firm chose the tie-up because by doing so NTT will be able to business target the entire Asian region where NTT Com is placing first priority. "By purchasing time, we will be able to launch international services swiftly," he added.

NTT Com is planning to send some executives into JSAT to exert influence over its management. JSAT has been gradually expanding its business. This fiscal year, JSAT is expecting to clear all of its accumulated deficit.

However, its business is largely dependent upon revenues from CS digital

broadcasting which has rapidly expanded over the past several years. Despite the rapid expansion in the number of channels and broadcasters (program-supplying broadcasters), most broadcasters (program-supplying broadcasters) are having financial difficulties. At least nine broadcasters (program-supplying broadcasters) have returned their respective license to MPT and, in addition, five stopped airing their channels. Under the circumstances, JSAT now has obtained a strong reliable and secure net by concluding an alliance with the giant NTT.

Yasuo Okuyama, a JSAT spokesperson, said that the firm does not have any intention to launch new services upon the alliance. "By tying up with the NTT company, we will be able to use our satellites more efficiently and to enjoy the benefit from the economy of scale," he said. Market watchers say that the merger of communications and broadcasting will accelerate further upon this arrangement. The merger has already been kicked off.

Japan Digital Broadcasting Service Inc. (SKY PerfecTV!) last year launched SKY PerfecTV!, a digital data broadcasting services. Users can receive a variety of data on their PCs at up to 6 Mbps via JCSAT-3 once they pay 680 yen per month.

NTT Satellite Communications, a joint venture of NTT and JSAT, last year launched a satellite Internet service called Mega Wave. Users can receive a variety of data from the Internet at up to 1 Mbps via JCSAT-4. The monthly charge is 3,980 yen.

SKY PerfecTV! is scheduled to launch SKY PerfecTV! Communications in November 1999. Using the services, for instance, the headquarters of a company will be able to send information on new products or new technologies to the company's branches or outlets. SKY PerfecTV! is planning to sell the services to convenience stores, consumer electronics stores, life insurance agencies and cosmetics stores. The service prices has not been decided.

NTT-ME Corp., an NTT subsidiary specialized in construction and maintenance of communications facilities, last July (1999) launched "broadcasting" services in cooperation with SKY PerfecTV!. User companies of this service called the "Xephion IP moving picture multicast service" will receive some SKY PerfecTV! programs via optical fiber constructed by NTT-ME. The monthly charge is around 200,000 yen for 50 terminals and 10 programs. The NTT firm is targeting to get several dozens of customers for this service by the end of this year (March 2000).

## Technology

# Can TLO Revitalize Japanese Sluggish Economy?

Technology Licensing Organization (TLO) is winning attention as a way to create new business and support venture business. These two are believed to be the most urgent remedy for revitalizing gloomy Japanese economy.

The TLO is an organization established by universities, university professors or companies aimed at rediscovering unused technology developed by professors and transferring these technology to private companies.

A recent survey conducted by MITI showed that 33% of Japan's 680,000 research workers are in universities compared to 13% of the 960,000 in the U.S. These academy researchers are using 20% of the 15 billion yen total research spending in Japan. However, only 0.04% of Japan's patent applications come from universities. In the U.S. university researchers founded a total of 184 venture companies in 1996 partly through the TLOs.

As part of their effort to promote technology transfer from the academy to the industry, MITI and the Ministry of Education revised the University Technology Transfer Promotion Law last August (1998). Many universities and professors have rushed to create their TLOs either within their universities or outside.

The TLO organization works as follows: The TLO evaluates research fruits of researchers of the member universities. When the TLO considers a certain research fruit is usable, then it will apply the patent right for the invention for the Patent Office on behalf of the professor. At the same time, the TLO will try to find out companies which want to use the new invention. When it finds one, it will exchange a contract with the company. When the company successfully markets any product based on the invention, then the TLO collects certain royalties from the firm and distribute it among the members and investors after subtracting the operational fees.

The TLO gives benefits to professors, universities and companies.

Professors will be able to gain the patent right for their invention without spending much energy for complicated paper work. Universities will be able to receive some extra financial resources from royalties and spend it for their future research. Private companies will be able to get seeds for their new business. Once approved by the government TLOs will be able to get government subsidies up to 20 million yen a year to compensate their operational costs.

In the United States, the TLO system was said to be established in the 1980s. According to the AUTM, an association for TLOs, TLOs in the United States gave an impact of 28.7 billion dollars over the U.S. economy in fiscal 1997 and created 245,000 new jobs in the same year.

On the other hand, in Japan the academy had been traditionally isolated by itself from the industry activities. However since the law was revised last August, six TLOs have been approved by the government in Japan.

The Tohoku Techno Arch, a TLO established by universities in the Tohoku region, in May 25 successfully transferred a technology to Hitachi Ltd. Hitachi later May started selling the software -- a simulation system for metal processing -- after applied some modification. It was the first contract of the TLO which was established in November 1998 by Tohoku University and other universities in the Tohoku area.

Masaaki Tsushima, a controlling manager of the TLO, said that it is planning to sell 25-30 new technologies in a year and create 10 million yen in revenues. At the moment, the Tohoku Techno Arch is reviewing 27 inventions and applying patent for 12 inventions.

Nihon University is also quite successful in its TLO activities. The university in November 1998 established the Nihon University International Industry Technology Business Development Center headed by University President Yukiyasu Sezai.

Since then the center has concluded a contract over technology transfer with three firms.

Among them is Shinku Riko. The measurement device manufacturer in Yokohama, last February (1999) concluded an agreement with the center over transferring technology for measuring physical characteristics of materials. Upon the agreement, the firm is going to develop a new measurement machine by June 2000.

Tadashi Nishijima, President of Shinku Riko, said that his firm did not have any enough resources to employ engineers in new business areas to expand its business. "It is inevitable for small business like us to get technologies developed by outsiders including universities in the future," he reportedly said.

The Center for the Advanced Science Technology Incubation (CASTI) was established in August 1998 by some professors at the University of Tokyo.

Unlike other governmentally approved TLOs, the CASTI assigned Recruit for sales jobs. A couple of Recruit employees are currently working for selling University of Tokyo's brain child technologies to companies. Targeting overseas market, the TLO has also employed a U.S. consulting firm. Megumi Takada, the representative of the CASTI, said that it is targeting to manage 100 patents.

The Kansai TLO was established in October 1998. Different from other governmentally approved TLOs, the Kansai TLO has corporate investors. Two major investors of the Kansai TLO are Kyoto Research Park, an incubator in Kyoto, and Osaka Small to Medium Enterprise Investment Development, an Osaka-based venture capital, as well as Ritsumeikan University and some professors of Kyoto University. With a total of 378 research members and 140 corporate members, the TLO has applied or going to apply a total of 26 technologies for the Patent Office. The TLO has been assigned to manage other 27 patents that member universities have already gained. Akira Yamada, Man-

ager of Technology Transfer Division of the TLO said that the TLO is putting the first priority on distributing information for member firms, but it is also seeking for other channels for distributing information of their inventions.

The Tsukuba Liaison Research Institute was established in May 1997 by some professors at Tsukuba University. The TLO is going to find out investors under the leadership of JAFCO, the largest venture capital in Japan. Under the leadership of President Kenichi Uehara, an employee of JAFCO, the TLO is going to do seek for companies which will use their invention and seeking for researchers who will do research meet-

ing companies' demand.

Waseda Daiwa TLO Pilot Project was launched in July 1998. Wining 300 million yen investment money from Daiwa Group., the TLO has been aggressively doing technology transferring business with both domestic and overseas firms.

Although TLO seems to have a rosy future, there are several problems.

First, there is the difficulty of operating their organizations based on profits from patent royalties. Even if these TLOs successfully obtain many patents, they will not create any profits unless any companies use them. Also, if they would like to let their technology be used widely, they have to seek for the patent right in foreign countries. But if so, who should bear the application cost?

## MPT

### Price Gap Survey on Telecommunications Services Between Japan and Abroad in FY 1998

MPT has conducted a survey on the price gap between domestic and international telecommunications services annually, because the issue needs to be addressed by all government ministries and agencies of Japan.

#### Summary

Comparing both findings of the surveys in FYs 1997 and 1998, the domestic and international price gap is decreasing due to yen depreciation in the exchange rate (from 120.99 yen to 130.91 yen to the dollar) as well as the tariff revision by Japanese telecommunications carriers. The findings in each area are as follows.

#### i) Domestic call service (wire circuit)

In the comparison of domestic call charges, Tokyo stands on average compared to other cities. In the comparison of specific charges, initial payment for subscriptions is higher, but local call charges are lower in Tokyo than in other cities. Charges for long-distance calls are on the average.

#### ii) Cellular and mobile phone service

With the reduction of basic and call charges in Japan, model charges have fallen lower than most major cities excluding Paris.

#### iii) International call service

The cost of a call to the U.S. from Tokyo has fallen lower than that of a call from New York because of the reduction of international call charges from Tokyo. The price gap between a call from Europe and a call from Tokyo has been reduced, although call from Tokyo to Europe remains relatively high.

#### iv) ISDN service

A comparison of model charges of ISDN service shows Tokyo rating lower than other cities in price. Specific charges in Tokyo rated the lowest of basic charges. Tokyo also rated the lowest in subscription charges when switching from conventional telephone service.

#### v) Domestic leased circuit service

In domestic leased circuit service broken down into service items and under economy-class leased circuit service charges, the charge for the 64-kbps digital circuit in Tokyo is lower than in other cities for model charge and short-distance (15km) service and as low as in New York for long-distance (50km) service. The charge for the 1.5-Mbps digital circuit service in Tokyo is lower than all cities excluding New York for short-distance (15km) service and higher than all except Geneva for long-distance (50km) service.

#### vi) Internet access service

Although comparison with last year's findings cannot be done easily due to fee

calculation based on the OECD model since this survey, communication charges of the Internet in Tokyo are lower than in other cities except New York. The level of Internet access charge in Tokyo is comparable to Düseldorf and higher than other cities.

## IT Industry

### Hitachi

#### To Release "Partout," a Position/Condition Recognition System to Check One's Position and Condition on PC

Hitachi, Ltd. announced the release of "Partout," a position and condition recognition system to check one's position and condition on a PC from August 2 from its Information & Telecommunication Systems.

This system allows, in addition to position information of a user, detection of a user's condition (walking, running, stopping and falling) by a body motion sensor built into a dedicated terminal. "Partout" can be used in a variety of fields such as protection/ search of elderly people with symptoms of dementia, support for the handicapped when going out, and emergency assistance of the outdoor worker.

It is now estimated that the number of elderly people with symptoms of dementia will reach 1.5 million in the year 2000. Securing the safety for these elderly people, while relieving the spiritual/physical burden on the caregivers is an important task in today's society.

Hitachi developed a prototype position and condition recognition system in July 1998. A trial test using this search system for elderly people with symptoms of dementia was performed in Abiko City, Chiba from August, 1998 and Subo-Oshima, Yamaguchi in November 1988. The trial test, taken with the consent of the family, was conducted in homes that cared for elderly people with symptoms of dementia. The dedicated terminal combines a portable telephone and a GPS, covering a wide area capable of detecting a user's position with precision from near and far distances.

In addition, Hitachi's original body motion sensor is designed to monitor, on a PC in real time, the condition of a user (walking, running, stopping and falling) fitted with a terminal. Map data, "MapDK client map" made by IncrementP Co., Ltd. was used to map countryside areas in 1/6250 scale providing pinpoint information.

Hitachi expect to receive orders for 200 sets of the center system and 10,000 dedicated terminals by the end of 1999. Sales are being promoted mainly to local outlets (names not disclosed), the police and security companies.

## Statistics

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

#### Production

Type	Mar. '99		Compared with Mar. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>477,433</b>		5.0
<b>Terminal Equip.</b>	<b>185,100</b>		11.3
Wire Telecommunications Equip.	52,302		-13.2
Telephones Sets	8,734	979,376	-32.6
Standard Type	787	121,258	7.5
Functional Type	484	108,143	-62.9
Wireless Phone	6,479	740,873	-32.7
Others	984	9,102	-24.4
Telephone Application Equip.	17,444		7.4
Key Telephone Systems	7,160	335,318	-30.6
Small Capacity	696	37,292	0.4
Medium/Large Capacity	6,464	298,026	-32.8
Telephone Auxiliary Equip.	74	7,909	-63.5
Interphones	3,991	343,188	9.4
Others	3,440		65.1
Telegraph & Picture Transmission Equip.	26,124		-15.9
Facsimile	19,353	385,887	-28.7
Super High-Speed Facsimile	601	3,184	34.5
High-Speed Facsimile	17,782	380,144	-28.8
Other Facsimiles	970	2,559	-43.1
Others	6,771		72.6
Mobile Terminal Equip.	132,798	5,022,588	25.3
Land	127,271	4,996,798	24.6
•Automobile	151	10,189	-90.5
•Portable	110,293	4,316,931	-36.8
•Pager	343	30,649	-80.1
•MCA	889	7,549	209.8
•Public PHS Terminal	6,614	389,492	-24.9
•Others	8,981	241,988	-1.7
Maritime and Airplane	5,527	25,790	44.1
Personal Radios (900 MHz)			-
<b>Network-Related Equip.</b>	<b>289,480</b>		2.1
Wire Network-Related Equip.	212,583		0.9
Switching Equip.	88,713		-13.5
Electronic Switches	60,194		8.7
For Telephone Offices	44,571		10.5
For PBX	15,623		3.7
Other Switching Equip.	28,519		-39.6
Carrier Equip.	123,870		14.6
Code Transmission Equip.	64,862	17,273	-4.6
MODEMs	6,555	17,606	-31.5
Others	52,453		71.6
Mobile-Related Network Equip.	75,217	28,272	3.3
Fixed Station Communications Equip.	62,239	14,111	9.1
Terrestrial	49,870	11,637	22.9
Satellite	12,369	2,474	25.0
Base Stations	12,978	14,161	-17.7
<b>Wire Telecommunications Parts</b>	<b>2,853</b>		-38.9
Relays (1,000 units)	2,644	36,210	-40.9
Other Components	209	0	5.6

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	Mar. '99		Compared with Mar. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>68,082</b>		-8.2
<b>Wire Telecommunications Equip.</b>	<b>57,029</b>		-0.2
Telephones	2,124	302	-51.5
Cordless Telephones	1,102	117	-61.7
Other Types	1,023	185	-32.1
Telephone Application Equip.	755	54	-54.6
Key Telephone Systems	200	6	-71.1
Automatic Answering Telephone Sets	134	5	-21.6
Intercoms	189	39	-36.2
Others	232	4	-53.9
Telegraph and Picture Transmission Equip.	8,081	212	-26.7
Facsimile Equip.	8,081	212	-26.7
Teleprinters			
Others			
Switching Equip.	4,245	17	-28.3
Carrier Equip.	10,202	52	229.9
Components	31,622		1.9
<b>Radio Communications Equip.</b>	<b>11,053</b>	<b>392</b>	-35.2
Transmitter and Transmission/Receiving Equip.	10,123	138	-31.8
For Long/Medium/Short Waves	632	5	-9.9
For Ultra Short Waves	1,797	79	-4.9
For Other Waves	7,693	55	-37.2
Receivers	930	254	-57.8

#### For Reference

<b>Broadcasting Equip.</b>	<b>538</b>		-60.8
<b>TV Camera</b>	<b>19,190</b>	<b>420</b>	18.8
<b>Radio Application Equip.</b>	<b>3,845</b>	<b>1,121</b>	13.2
Radars	1,521	5	17.7
For Navigation	65	36	41.6
Direction Finders	1,200	36	16.6
Others	1,060	1,079	29.6
Radio Remote Control Equip.			

#### Import

Type	Mar. '99		Compared with Mar. '98 (%)
	¥1 Mil.	Sets	
<b>Telecom Equipment</b>	<b>31,841</b>		-20.9
<b>Wire Telecommunications Equip.</b>	<b>27,305</b>		-24.6
Telephones	1,814	331	-47.4
Cordless Telephones	641	108	-67.9
Other Types Telephone Sets	1,174	224	-19.0
Telephone Application Equip.	224	96	-62.4
Automatic Answering Telephone Sets	3	3	-44.2
Others	188	93	-64.6
Telegraph and Picture Transmission Equip.	1,843	108	-47.8
Facsimile	1,733	96	-47.5
Teleprinter			
Others	109	11	-51.5
Switching Equip.	7,432	13	7.8
Carrier Equip.	3,041	205	-24.4
Components	12,951		-26.9
For Wire Telecom Only	11,138		-34.3
Parts for Common Use in Wired/Radio Communication Equip.	1,813		139.7
<b>Radio Communications Equip.</b>	<b>4,537</b>	<b>150</b>	12.2
Transmitter and Transmission/Receiving Equip.	3,780	88	7.2
Transmitting and Receiving Equip.	205	12	-25.3
For Aviation	3,484	66	12.7
For Mobile Telephone	210	30	290.3
For Long/Medium/Short Waves	545	3	-33.7
For Ultra Short Waves	59	4	-47.0
For Other Waves	2,729	35	4.3
Receivers	757	62	46.1

#### For Reference

<b>Broadcasting Equip.</b>	<b>838</b>	<b>5</b>	17.9
<b>TV Camera</b>	<b>2,187</b>	<b>2,856</b>	-40.3
<b>Radio Application Equip.</b>	<b>134</b>	<b>4</b>	32.2
Radars	559	7	32.2
For Navigation	1,494	2,846	23.8

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 March 1999)

Products	Unit	Production			Sales			Stock		
		Feb. '99	Mar. '99	Mar. '99/ Mar. '98 (%)	Feb. '99	Mar. '99	Mar. '99/ Mar. '98 (%)	Feb. '99	Mar. '99	Mar. '99/ Mar. '98 (%)
Video Tape Recorder	Sets	627,146	621,074	65.4	1,215,971	1,351,456	94.2	1,073,513	957,017	102.2
Video Disk Player	Sets	4,068	2,145	12.7	6,005	9,029	37.3	21,818	17,869	22.0
Video Camera	Sets	738,137	902,717	100.7	769,967	1,015,288	105.7	589,905	486,796	97.0
Car Navigation System	Sets	130,835	138,163	142.7	112,229	151,590	139.6	102,626	78,040	82.2
Digital Audio Disk Player	Sets	1,446,983	1,664,297	112.1	1,392,784	1,667,498	101.1	1,646,636	1,515,678	128.4
Active Liquid Crystal Device	1,000 units	3,890	4,633	221.6	3,323	3,762	236.0	1,005	1,112	151.5
Passive Liquid Crystal Device	1,000 units	29,737	33,122	85.8	30,766	33,808	89.3	18,612	17,343	76.2
Photoelectric Converter and IC measuring instruments	1,000 units	777,419	896,243	117.4	831,355	988,143	120.6	406,285	399,682	102.6
Bipolar Semiconductor IC	Mil. yen	5,747	6,203	86.3	4,293	5,762	101.6	-	-	-
MOS Semiconductor IC (logical element)	Mil. yen	124,854	149,163	100.5	105,914	132,216	106.9	-	-	-
MOS Semiconductor IC (memory element)	Mil. yen	70,132	82,999	98.6	62,936	73,002	109.6	-	-	-
Hybrid IC	Mil. yen	22,436	25,231	100.5	19,798	21,662	97.8	-	-	-
General Purpose Computer	Mil. yen	38,745	40,654	99.1	-	-	-	-	-	-
Mid-range Computer	Mil. yen	32,126	75,694	97.8	-	-	-	-	-	-
Personal Computer	Sets	1,106,329	1,447,472	139.9	-	-	-	-	-	-
Electrical measuring instrument (Except for semiconductors and IC measuring instruments)	Mil. yen	15,896	21,321	92.4	-	-	-	-	-	-
Semiconductor and IC Measuring Instrument	Mil. yen	9,725	17,757	77.9	-	-	-	-	-	-
Industry-use Measurement Control Unit	Mil. yen	16,818	33,763	98.5	-	-	-	-	-	-

Source: Machinery Statistics and Research Office, MITI

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

Type of Cables	Mar. '99	Orders Received		Mar. '99	Shipment	
		Mar. '99/ Feb. '99 (%)	Mar. '99/ Mar. '98 (%)		Mar. '99/ Feb. '99 (%)	Mar. '99/ Mar. '98 (%)
Open Wire (OW)	10,000	135.3	108.6	8,675	110.8	95.4
Winding Wire	16,938	105.1	102.8	17,656	112.5	97.6
Cable for Machinery	5,507	108.7	100.3	5,448	104.5	95.0
Communications Cable	5,085	111.9	111.9	5,437	125.6	103.8
Power Cable	22,983	86.4	86.7	25,790	100.5	92.4
Covered Wire	14,494	105.1	90.9	14,825	105.7	91.4
Cable for Transportation	5,106	112.4	105.6	5,053	109.7	106.1
Total	80,113 (91,297)	102.6 (103.0)	96.5 (89.6)	82,884 (97,674)	107.1 (108.2)	95.2 (93.5)
Aluminum Power Cable	3,978 (2,262)	114.8 (97.2)	74.9 (62.4)	6,335 (4,142)	111.3 (111.0)	81.8 (64.5)
Optical Cable				1,543,868 (44,975)	175.2 (158.5)	183.5 (119.6)

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 March 1999)

Fields	Mar. '99 (Actual)	Orders Received			Mar. '99 (Actual)	Shipment		
		Mar. '99/ Feb. '99 (%)	Mar. '99/ Mar. '98 (%)	Apr. '99 (Estimated)		Mar. '99/ Feb. '99 (%)	Mar. '99/ Mar. '98 (%)	Apr. '99 (Estimated)
Telecommunications	3,790	101.3	117.3	3,300	4,213	130.8	111.8	3,500
Electric Power	8,681 (3,056)	69.3 (128.9)	86.5 (68.8)	8,300 (1,700)	10,608 (4,947)	97.6 (102.8)	95.4 (76.0)	8,900 (2,400)
Electric Machinery	19,935 (250)	102.4 (98.0)	96.2 (153.4)	19,300	20,937 (268)	108.4 (101.5)	94.0 (116.0)	19,700
Automobile	6,688	104.2	111.4	5,600	6,705	103.0	111.8	5,500
Construction/Cable Shops	29,260 (32)	105.6 (71.1)	95.3 (46.4)	28,300	28,811 (42)	103.0 (82.4)	92.9 (51.9)	27,800
Others	6,421 (135)	108.1 (236.8)	92.3 (148.4)	6,900 (300)	6,341 (88)	104.5 (123.9)	88.2 (73.9)	6,700 (400)
Domestic Demand Total	74,775 (3,473)	98.6 (127.4)	96.3 (72.8)	71,700 (2,000)	77,615 (5,345)	105.0 (102.8)	95.4 (77.0)	72,100 (2,800)
Export	5,338 (505)	235.8 (68.4)	99.4 (93.3)	3,500 (1,100)	5,269 (990)	153.9 (201.2)	92.6 (122.5)	3,800 (600)
Total	80,113 (3,978)	102.6 (114.8)	96.5 (74.9)	75,200 (3,100)	82,884 (6,335)	107.1 (111.3)	95.2 (81.8)	75,900 (3,400)
Core Cable Sales	30,711 (90)	97.9 (60.0)	92.1 (42.9)	29,600 (100)	31,466 (165)	104.8 (110.7)	99.6 (100.6)	29,900 (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

### Enhancement of Regulatory Environment for Proliferation of Satellite Broadcasting

— Partial revision of ministerial ordinances, etc. relating to satellite broadcasting —

MPT consulted the Radio Regulatory Council on such issues as partial revision of related ministerial ordinances and notification for the implementation of the following:

- Utilization of statistical multiplexing for the transmission of broadcast programs among program-supplying broadcasters (Part of the Three-Year Program for the Promotion of Deregulation [Cabinet decision dated March 31, 1998])
- Establishment of a target for the number of data broadcast programs in the CS digital broadcasting services (Referring to the results of hearings conducted during the period between June 15 through July 3, 1998 relating to the application for participation into CS broadcasting operation.)
- Establishment of provisions (related to BS digital broadcasting) necessary for the implementation of the law (promulgated on June 3, 1998) representing a partial revision of the existing Broadcast Law.
- Revision of the stipulation that is associated with abolition of standard TV broadcasting from CS analog broadcasting service (Referring to the results of hearings conducted during

the period between June 15 through July 3, 1998 related to the application for participation in the CS broadcasting operation.)

The details of these issues are as follows: