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PHS MoU Group News

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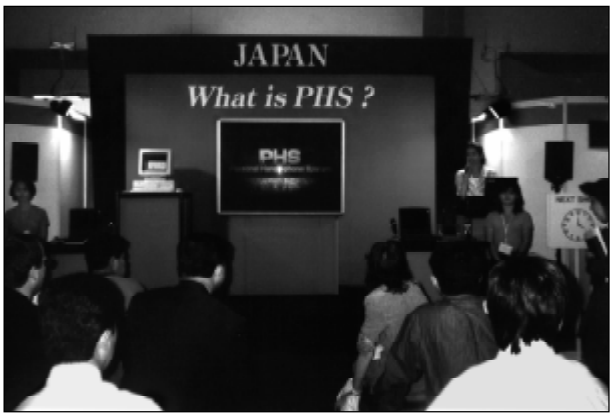
PHS Exhibition at the Asia Telecom '97

Asia Telecom is the largest telecommunications conference in the Asia-Pacific region to be held once every four years with the sponsorship of the International Telecommunication Union (ITU) that may be, as such, called the regional Olympiad of telecommunications.

The Asia Telecom '97, which was the fourth of these regular conferences, was hosted by the Telecommunication Authority of Singapore from 9 to 14 June at the World Trade Centre in Singapore.

At the conference, a joint exhibition of PHS was given by 13 companies including telecommunications carriers and manufacturers. The joint booth saw a presentation clearly explaining the current status, achievements and future perspectives of PHS technology as well as technical standards of data transmission (PIAFS).



Japan Pavillion at Asia Telecom 1997

The participating companies gave their own exhibitions while working on the common theme of data transmission, noting that the public service of 32-kbps high-speed data transmission just started in April 1997. Especially, the demonstration of radio data transmission and its PHS network deployment as with the WLL system attracted a great deal of attention from participants and visitors. Many of the exhibitors assured themselves that this would promote a wider use of PHS technology.

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Companies Participating in the Japan Pavillion at Asia Telecom '97

CASIO COMPUTER CO., LTD.; DDI Corp.; FUJITSU LTD.; HITACHI, LTD.; KYOCERA CORP.; Matsushita Communication Industrial Co., Ltd.; Mitsubishi Electric Corp.; NEC Corp.; Nippon Telegraph and Telephone Corp.; Oki Electric Industry Co., Ltd.; Sanyo Electric Co., Ltd.; Sharp Corp.; TOSHIBA CORP.

The Annual 1997 PHS MoU Group General Meeting and the 2nd PHS Symposium

The Annual 1997 PHS MoU Group General Meeting is held at the Central Plaza Hotel in Bangkok, Thailand on July 11 (Friday). Most of the Members, including the Chairperson, Vice-chairpersons and invited guests from Telecommunications Authorities, are expected to attend the Meeting in order to make further progress in pursuit of its objectives.

The 2nd PHS symposium, organized in association with the Telecommunications Association of Thailand (TCT), is provided to the invited guests after the meeting. Latest information on market situation, deployment, technical specifications, etc. is presented. PHS related products and services are also displayed by more than 20 exhibitors.

Dual-Mode for PHS and GSM Successfully Developed

NTT has successfully developed a common terminal capable of transmission and reception through dual-mode function for both the PHS and GSM systems.

This common terminal offers features combining the advantages of both PHS and GSM. It has automatic access to PHS (within PHS itself, the cordless telephone gives priority to the public PHS), and then to GSM, depending on the signal condition in the place where it is being used.

In the countries or areas where GSM is already in use, there will be a need for the services to be made available with a single terminal compatible with the both systems, to cope with constant shortage of frequencies in urban districts, to enable telephone services even in underground malls, and to ensure a lower air-time charge. It is also expected that a need will arise for a combined GSM and PHS cordless telephone at home and in the office.

Figure: Prototype of the developed PHS/GSM dual-mode terminal

As one of the attempts to address these needs, NTT has made a prototype dual-mode terminal and confirmed with a system simulator that it can be used with the hybrid PHS/GSM system at a satisfactory quality level.

This prototype terminal is expected to help develop the PHS system in countries where GSM is already available.

For more detals, please visit:
http://www.nttinfo.ntt.co.jp/NR/1997/3_6est.html

A PHS-WLL System under Field Trial in China

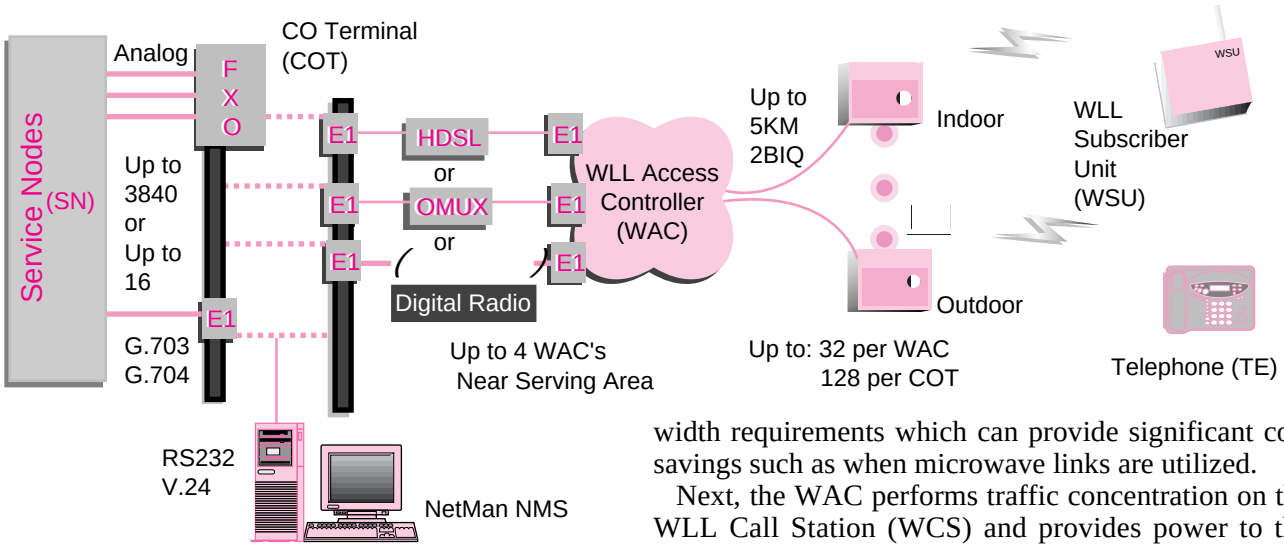
The AIRSTAR-WLL system, PHS-based Wireless Local Loop (WLL) solution, has been co-developed by UTStarcom, Inc., a manufacturer of digital loop carrier and fiber transport systems, and Matsushita Communication Industrial Co., Ltd. (Panasonic) of Japan.

By taking advantage of the advanced and widely deployed Radio Frequency Systems of Panasonic and the state-of-the-art New-Generation Telephony Switch interfaces and transmission techniques of UTStarcom, the AIRSTAR-WLL is a very advanced and cost-effective WLL solution. AIRSTAR-WLL is currently in pilot

projects in China and various countries in South East Asia.

Service providers in emerging countries seek to offer quick, reliable and inexpensive service to meet their subscribers growing needs. A PHS-WLL system is an advanced, low-cost alternative to traditional fixed telephone system. It supports digital 32-kbps air channels for great sounding voice and voice-band data, provides billing and required features such as toll like voice quality, authentication, encryption, minimal network planning and the ability to interface to the Service Node (SN) with a very flexible network interface.

Fig.1 Flexible AIRSTAR-WLL system architecture



Protocol flexibility to interfaces to different SN and physical transport flexibility, to make use of existing infrastructure, are required to meet the needs of rapid roll-out and low-cost WLL solutions.

AIRSTAR-WLL extends the SN switch to a remote area by means of UTStarcoms's AN-2000 Access Server Central Office Terminal (COT) already deployed by more than 200 PTT operators worldwide. The system offers transmission solutions based on users needs through analog or digital connections. The physical transport to the COT can be 2-wire, E-1, fiber or microwave.

• **Analog Interface**: The SN connects to the COT using a 2W loop start interface, exactly as with wired telephone subscribers. This permits providers to install a flexible mix of wired and wireless capacity without constraints or need to reconfigure the SN switch.

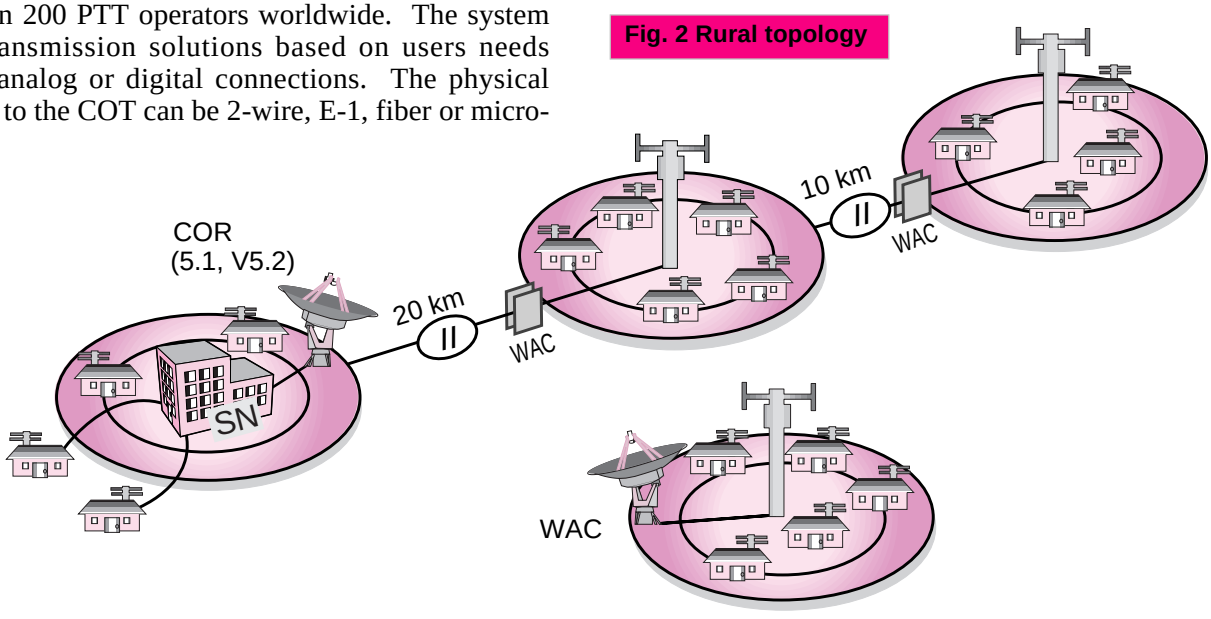
• **Digital Interface**: V5.1 and V5.2 options eliminate the expense of COT and SN line cards thus providing an extremely cost effective solution. V5.2 has the additional benefit of providing a concentrating interface between the SN and the WLL Access Controller (WAC). This concentrating interface reduces the back-haul bandwidth requirements which can provide significant cost savings such as when microwave links are utilized.

Next, the WAC performs traffic concentration on the WLL Call Station (WCS) and provides power to the WCSs. Up to 32 WCSs, strategically placed for traffic requirements, are controlled by one WAC.

The WCS terminals can be located indoors or outdoors. They are line powered over ordinary twisted-pair cabling and can be added wherever there is a need to expand system capacity.

The WLL Subscriber Units (WSU) are installed indoors. Depending on the WSU proximity to the WCS, an internal omni or an external high-gain antenna is utilized. The customer's phone connects to an RJ-11 jack on the WSU.

Fig. 2 Rural topology



ASTEL Aims to Lead in Mobile Computing toward the Multimedia Era

1. Profile of ASTEL Tokyo

ASTEL Tokyo Corp. is a core company of the ASTEL Group of carriers that provide PHS service in 10 regions nationwide, including Okinawa. Since October 1995, the company has been providing PHS service in the Kanto region. Its service area covers Tokyo's 23 wards, principal cities in the Tokyo environs, areas along major railway lines in neighboring prefectures and prefectural capitals in Kanto. ASTEL Tokyo started out offering mainly voice service and launched 32-kbps data transmission service in April 1997.

PHS is distinguished by its markedly lower tariffs than cellular phone service and high-speech quality, thanks to the use of 32-kbps ADPCM (Adaptive Differential Pulse Code Modulation). The recent introduction of data transmission service is expected to expand the possibilities for using PHS even further. Overall PHS subscribers have already exceeded six million in less than two years since service was inaugurated. ASTEL aims to take the lead in providing a variety of new mobile computing services geared to the emerging multimedia society.

2. Smaller, lighter PHS terminals

One salient feature of PHS terminals in comparison with cellular phones is their low transmitter power, allowing a smaller terminal design and a longer battery life. Thanks to recent technological advances and the fabrication of communications protocols on a single chip, terminals have become even smaller and lighter. Terminals weighing less than 100 g and measuring less than 100 cm^3 in size have already been commercialized.

Photo 1. ASTEL's PHS terminal — the world's smallest handset as of May 1997 (weight: 80 g; volume: 66 cc; call duration time: 5 hours; standby time: 450 hours)

3. Seamless service: Indoors to outdoors

Many PHS users have expressed a desire to use their PHS phones as terminals for accessing the public switched telephone network both at home and in the office. This desire has been voiced in particular by many users aged 10 to 29, who account for over half of ASTEL Tokyo's subscriber base at present. Initially, most of ASTEL Tokyo's cell stations transmitted signals at 20 mW, but that proved difficult to provide coverage in all homes and offices. To augment its cell station transmitter power, the company has been installing cell stations with a high transmitter power of 100 ~ 300 mW in suburban areas. ASTEL Tokyo is also considering providing a simple repeater to amplify cell station signals that reach as far as the exterior of users' homes. Further, the carrier is installing a PHS cell station system for indoor (ASTEL PHS Business System) in order to extend the service area to the interiors of department stores and office buildings. Using exceptionally small cell stations and allowing easy wiring of communication lines to the stations, this system enables the service area to be extended to offices in existing buildings without undertaking any large-scale construction work.

4. Concept of a Cyber-office using PHS

PHS has the advantage of allowing two modes of use — a private mode and a public mode. The combination of public and private modes, which do not involve any call charges, can be skillfully utilized to configure an extremely efficient and flexible system. Moreover, a highly convenient system can be constructed by combining ASTEL PHS Business Systems and office cordless phones with PHS terminals that provide simultaneously both private and public modes of use. Price Waterhouse Consultants Co., Ltd. (PWC) has implemented a system that reliably delivers messages to intended recipients via a single PHS number. This system allows calls to be transferred from a PHS to the company's direct lines and incorporates voice mail and pager capabilities. Moreover, call-forwarding and connection to international call are also possible through the company's PBX system. All employees have been given PHS terminals in an effort to slash overhead through shared use of office space. Employees can use their PHS terminals as public phones when they are away from the office. Thus, by using their PHS terminals in combination with PDA, they create a cyber-office that allows them to access the company's in-house systems while away from the office.

5. Call-forwarding / voice mail service

Besides expanding its service area, ASTEL is also striving to upgrade its diverse services so as to increase the reception rate of PHS calls. It has added voice mail service for storing voice messages when PHS is outside the service area or is turned off. It also provides a call-forwarding service that transfers calls to a specified destination, and a paging service that rings a user's pager when a voice message is recording on the voice mail system.

ASTEL Tokyo has also introduced a service that allows users to freely change the forwarding destination or voice mail service parameters according to their personal needs. In May 1996, the company released a terminal that integrated PHS with a pager in single unit. This terminal has enhanced the convenience of the service by allowing users to check their messages with one touch operation after their pager rings.

6. Short message service: "Mojitalk"

In addition to two-way direct exchange of messages be-

tween PHS terminals, ASTEL Tokyo also provides its "Mojitalk" service that enables users to receive a text message of kana/alphanumerics sent from a DTMF phone, in the same manner as with pagers. Transmitted messages are initially stored at ASTEL Tokyo's Mojitalk Center, making it possible for users to receive messages reliably even when they are outside the service area or have their terminals turned off. Moreover, whenever a message is stored at the Mojitalk Center, a notice is sent to the user's PHS terminal, enabling the person to check the message immediately.

7. Information provision service

Because ASTEL Tokyo's core PHS subscriber base has been shifting toward users between the ages of 10 and 29, the company has introduced a voice information service aimed at the preferences of the younger generation. The types of information provided at present include fortune-telling, sports news and information about music, club activities and recruiting. ASTEL Tokyo intends to continue to provide such information geared to the needs of its PHS users.

8. 32 kbps data transmission service

ASTEL Tokyo provides 32 kbps data transmission service with a maximum effective throughput of 29.2 kbps. This service is available between 32 kbps PHS terminals connected to data cards having PIAFS (PHS Internet Access Forum Standard) compatibility as well as between such PHS terminals and Internet access providers or PC communications service companies that have installed PIAFS-compatible terminal adapters. In addition, the company also provides a service that converts a PIAFS digital signal to a modem signal or an ISDN signal by means of a protocol converter installed at ASTEL's center facility. Using this protocol converter facilitates high-speed data transmission at a maximum speed of 33.6 kbps between PHS terminals and Internet access providers or PC communications service companies that do not have PIAFS compatibility.

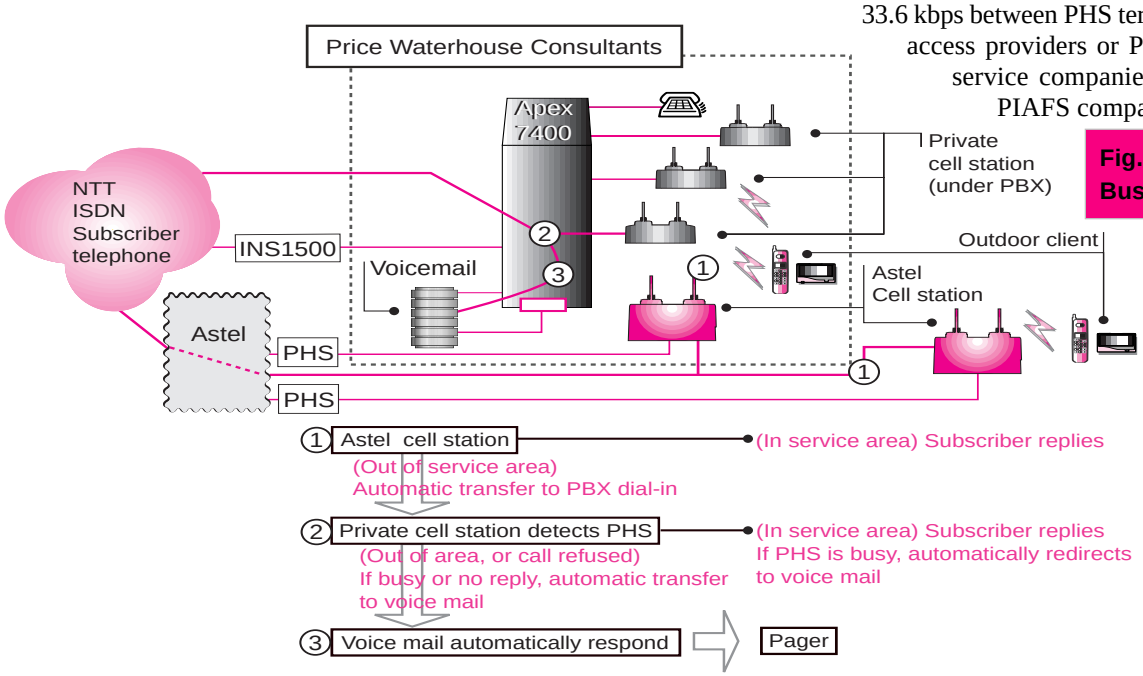


Fig. 1 ASTEL PHS Business System

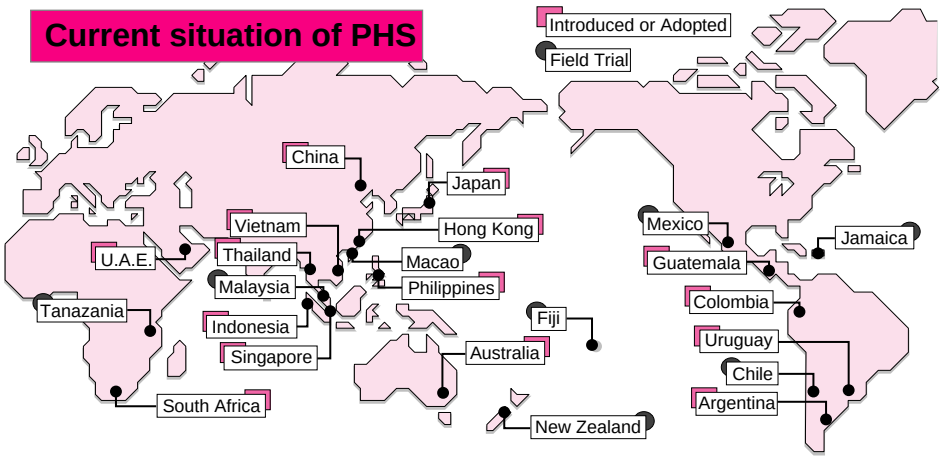
Deployment of PHS

PHS subscribers in Japan exceeded six million at the end of May 1997, less than two years after the start of public PHS service in July 1995. The high-speed data transmission service which started in April will accelerate new subscriptions by opening the door to new applications.

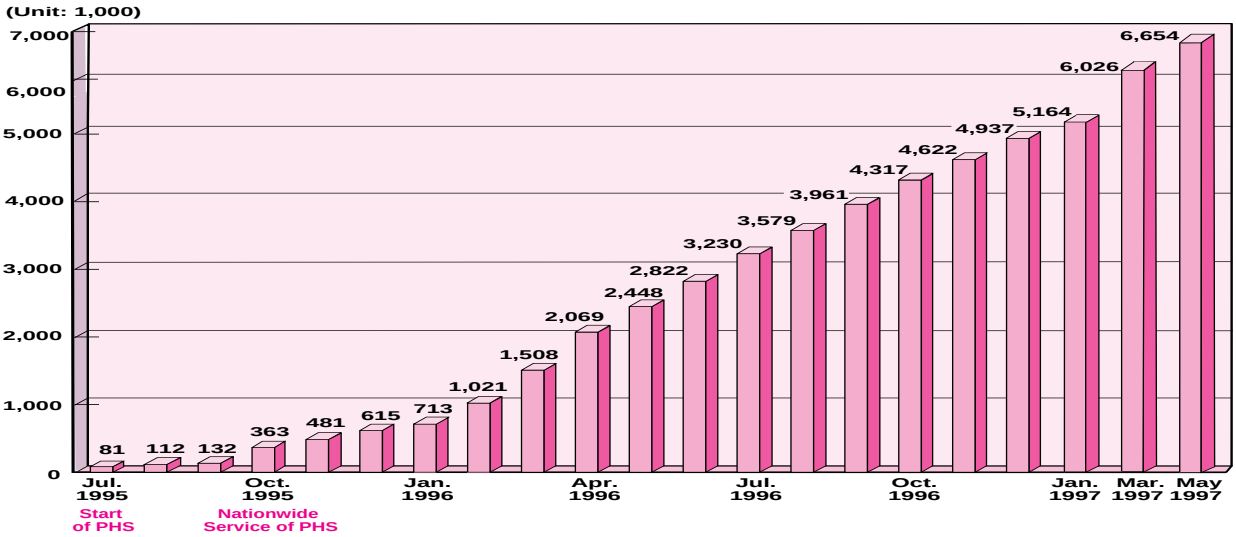
PHS is also being actively introduced around the world. Frequency assignment in China has opened the way for introduction of the PHS system. The telecommunications authorities of South Africa and Australia have allocated frequency bands for PHS, and OFTA in Hong Kong, has officialy approved the PHS indoor system.

Field trials are expanding in various locations, as can be seen in the map. Some trials are for public PHS services, others are for PHS WLL or PHS indoor system. Negotiations for PHS field trials are also underway in a number of other countries.

Public PHS services in Thailand, the first public PHS service to be offered outside of Japan, are under construction, services start in the fourth quarter of this year.



PHS Subscribers Over 6.5M in Japan



Home Pages of MoU Group & Members

All articles contained in the PHS MoU News are now available on the PHS MoU Group Website at:
http://www.phsmou.or.jp

Additional information and resources will be made available in the future.
Below is a list of PHS MoU Group member home page (URL) addresses.

Company Name	URL	Company Name	URL
• ArrayComm, Inc.	http://www.arraycom.com	• Mitsubishi Electric Corporation	http://www.melco.co.jp
• Casio Computer Co., Ltd.	http://www.casio.co.jp	• NEC Corporation	http://www.nec.co.jp
• Cirrus Logic K.K.	http://www.cirrus.com	• Nippon Telegraph and Telephone Corporation	http://www.nttinfo.ntt.co.jp
• FUJITSU LIMITED	http://www.fujitsu.co.jp	• Nitsuko Corporation	http://www.nitsuko.co.jp
• Hitachi, Ltd.	http://www.hitachi.co.jp/Div/jyotsu/jpn	• NTT Central Personal Communication Network Inc.	http://www.nttphs.co.jp
• Hong Kong Telecommunications Ltd.	http://www.hkt.net	• PHS International Ltd.	http://www.phsi.com
• Ikegami Tsushinki Co., Ltd.	http://www.ikegami.co.jp	• Pioneer Electronic Corporation	http://www.pioneer.co.jp
• Itochu Corporation	http://www.itochu.co.jp	• Sharp Corporation	http://www.sharp.co.jp
• Japan Radio Co., Ltd.	http://www.nihonmusen.co.jp	• ST Telecommunications Pte Ltd.	http://www.stt.st.com.sg
• Kenwood Corp.	http://www.kenwoodcorp.com	• Sumitomo Electric Industries, Ltd.	http://www.sumiden.co.jp
• Kokusai Denshin Denwa Co., Ltd.	http://www.kdd.co.jp	• Tokyo Electric Power Co., Inc.	http://www.tepco.co.jp/
• Kyushu Matsushita Electric Co., Ltd.	http://www.kme-lab.co.jp	• Toshiba Corporation	http://www.toshiba.co.jp
• Lucent Technologies Japan, Ltd.	http://www.lucent.com	• Uniden Corporation	http://www.uniden.co.jp
• Matsushita Communications Industrial Co., Ltd.	http://www.panasonic.co.jp/mci	• Victor Company of Japan, Ltd.	http://www.jvc-victor.co.jp

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