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navigation

- [Main page](#)
- [Contents](#)
- [Featured content](#)
- [Current events](#)
- [Random article](#)

interaction

- [About Wikipedia](#)
- [Community portal](#)
- [Recent changes](#)
- [Contact Wikipedia](#)
- [Donate to Wikipedia](#)
- [Help](#)

search

[Go](#) [Search](#)

toolbox

- [What links here](#)
- [Related changes](#)
- [Upload file](#)
- [Special pages](#)
- [Printable version](#)
- [Permanent link](#)
- [Cite this article](#)

languages

- [Deutsch](#)
- [日本語](#)
- [Polski](#)
- [中文](#)

[article](#) [discussion](#) [edit this page](#) [history](#)

Personal Handy-phone System

From Wikipedia, the free encyclopedia

The **Personal Handy-phone System (PHS)**, also marketed as the **Personal Access System (PAS)** and known as ***Xiaolingtong*** (小灵通) in [China](#) , is a [mobile network](#) system operating in the 1880-1930 MHz frequency band, used mainly in [Japan](#) , [China](#) , [Taiwan](#) and some other [Asian](#) countries.

Contents

- Outline
 - Technology
 - Implementation
- International development
- See also
- External links

Outline

Technology

PHS is, essentially, a [cordless telephone](#) like [DECT](#) , with the capability to [handover](#) from one [cell](#) to another. PHS cells are small, with transmission power of [base station](#) a maximum of 500 mW and range typically measures in tens or at most hundreds of meters (some can range up to about 2 kilometres in line-of-sight), as opposed to the multi-kilometer ranges of [GSM](#) . This makes PHS suitable for dense urban areas, but impractical for rural areas, and the small cell size also makes it difficult if not impossible to make calls from rapidly moving vehicles.



PHS Japan 1997-2003
(Willcom- NTT DoCoMo- ASTEL)

PHS uses [TDMA/TDD](#) for its radio [channel access method](#) , and 32 kbit/s [ADPCM](#) for its voice [codec](#) . Modern PHS phone can also support many [value-added services](#) such as high speed wireless [data](#) / [Internet](#) connection (64 kbit/s and higher), [WWW](#) access, [e-mailing](#), text messaging and even color image transfer.

PHS technology is also a popular option for providing a [wireless local loop](#) , where it is used to bridge the "[last mile](#)" gap between the [POTS](#) network and the subscriber's home. Actually, it was developed under the concept that it makes up a wireless [front-end](#) of [ISDN](#) network. So a base station of PHS has a compatibility with, and is often connected directly to [ISDN telephone exchange](#) equipments(aka digital switch).

As for its low-price [base station](#) , [micro-cellular](#) system and 'Dynamic Cell Assign' system, PHS can afford more number-of-digits [frequency](#) use

Mobile communication standards

3GPP: GSM / UMTS Family

2G

- [GSM](#)
- [GPRS](#)
- [EDGE \(EGPRS\)](#)
- [EDGE Evolution](#) (Evolved EDGE)
- [HSCSD](#)

3G

- [W-CDMA](#)
 - [UMTS \(3GSM\)](#)
 - [FOMA](#)
- [UMTS-TDD](#)
 - [TD-CDMA](#)
 - [TD-SCDMA](#)
- [HSPA](#)
 - [HSDPA](#)
 - [HSUPA](#)
- [HSPA+](#)
- [GAN \(UMA\)](#)
- [Mobile WiMAX\(WiBro\)](#)

Pre-4G

- [UMTS Revision 8](#)
 - [LTE](#)
 - [HSOPA \(Super 3G\)](#)

3GPP2: cdmaOne / CDMA2000 Family

2G

- [cdmaOne](#)

3G

- [CDMA2000](#)
- [EV-DO](#)

Pre-4G

- [UMB](#)

Other Technologies

0G

- [PTT](#)
- [MTS](#)

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Kangxi Communication Technologies (Shanghai) Co., Ltd. v. Skyworks Solutions, Inc.

001

efficiency with lower cost ([throughput](#) per area basis ^[1]), compared with typical [3G cellular telephone](#) systems. It makes possible the flat-rate wireless service such as [AIR-EDGE](#) all over Japan.

The speed of AIR-EDGE data connection is accelerated by combining lines, each of which basically is 32 kbit/s. AIR-EDGE 1x or first version introduced in 2001 provide only 32 kbit/s service. In 2002, 128 kbit/s service (AIR-EDGE 4x) started. In 2005, 256 kbit/s (AIR-EDGE 8x) service started.

In 2006, the speed of each line was also up-graded to 1.6 times with the introduction of "W-OAM" technology. The speed of AIR-EDGE 8x is up to 402 kbit/s with the latest "W-OAM" capable instrument.

In April 2007, "W-OAM typeG" was introduced allowing data speeds of 512 kbit/s for AIR-EDGE 8x users. Furthermore, the "W-OAM typeG" AIR-EDGE 8x service is planned to be upgraded to a maximum throughput of 800 kbit/s, when the upgrading for access points (mainly switching lines from ISDN to fibre optic) in its system are completed. And it may exceeds the speeds of popular [W-CDMA](#) 3G service like [NTT DoCoMo](#)'s [FOMA](#) in Japan.

Implementation [edit]

Originally developed by [NTT Laboratory](#) in [Japan](#) in 1989 and far simpler to implement and deploy than competing systems like PDC or [GSM](#), the commercial services has been started by 3 PHS operators (NTT-Personal, DDI-Pocket and ASTEL) in Japan in 1995. However, the service has been pejoratively dubbed as the "poor man's cellular", due to its limited range and roaming abilities. Market share in Japan has been declining and NTT DoCoMo, which has absorbed NTT Personal, and ASTEL is going to terminate the PHS service. Some of other countries have already terminated offering PHS services and migrated to GSM.

But PHS has seen a resurgence in markets like [China](#) , [Taiwan](#) , [Vietnam](#) , [Bangladesh](#) , [Nigeria](#) , [Mali](#), [Tanzania](#) and [Honduras](#) where its low deployment costs (estimated to be as low as 20% of a GSM network) make it attractive to operators. [Wireless local loop](#) (WLL) systems based on PHS technology are in use in some of the above-mentioned countries. In recent years, [WILLCOM](#), formerly DDI-Pocket, is introducing flat-rate [wireless network](#) and flat-rate calling in Japan, which has reversed the local fate of PHS up to an extent. In [China](#), there was seen an explosive expansion of subscribers until around 2005, but it has been calming down in 2006. In [Chile](#), [Telefónica del Sur](#) on March 2006 launched a PHS based telephony service in some cities of the southern part of the country. In [Brazil](#), [Suporte Tecnologia](#) has a PHS based telephony service in [Betim](#)^[2]^[3] , state of Minas Gerais and [Transit Telecom](#) has announced a rollout of a PHS network in 2007^[4].

[China Telecom](#) operates a PAS system in China, even though technically it was not regarded as allowed to provide mobile services, because of some particularities of the Chinese governance. [China Netcom](#) , the other fixed-line operator in China, also provides Xiaolingtong service. The system has been a runaway hit, with over 90 million subscribers signed up as of 2007 . The largest vendors of the system are [UTStarcom](#) and [ZTE](#).

A PHS global roaming service is available between Japan (WILLCOM), Taiwan and Thailand.

International development [edit]

- PHS's subscribers and major operators
 - Japan : 4,769,900 (June, 2006) ^[5]
[Willcom](#), [ASTEL](#)
 - China : 79,800,000 (June, 2005) ^[6]

- [IMTS](#)
- [AMTS](#)
- [OLT](#)
- [MTD](#)
- [Autotel / PALM](#)
- [ARP](#)
- 1G
- [NMT](#)
- [AMPS / TACS / ETACS](#)
- [Hicap](#)
- [CDPD](#)
- [Mobitex](#)
- [DataTAC](#)
- 2G
- [iDEN](#)
- [D-AMPS](#)
- [PDC](#)
- [CSD](#)
- [PHS](#)
- [WiDEN](#)
- Pre-4G
- [iBurst](#)
- [HIPERMAN](#)
- [WiMAX](#)
- [WiBro \(Mobile WiMAX\)](#)
- Frequency bands
- [SMR](#)
- [Cellular](#)
- [PCS](#)

[China Telecom](#) , [China Netcom](#)

- Taiwan : about 1,000,000 (Sep., 2005) [FITEL](#) 
- Thailand : [PCT](#) , Asia wireless communication [FITEL](#)
- Other major countries: Vietnam, Chile

See also [\[edit\]](#)

- [PHS](#)  in Taiwan

External links [\[edit\]](#)

- [PHS MoU Group](#) 
- [Article on Xiaolingtong](#) 

Categories : [Mobile phone standard](#) | [Mobile telephony standards](#) | [Wireless networking](#) | [Local loop](#)



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