# Mobitex-8000 Packet System

Advanced Protocols

WAVECOM
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## Mobitex-8000 Overview

Mobitex was originally implemented in 1986 for Televerket Radio, the radio department of the then Swedish telecommunication administration, later Telia and Teliasonera. The development and production of equipment was undertaken by Ericsson. Today Mobitex is in operation worldwide in half a dozen countries. Mobitex has been under constant development and the latest version operates at 8000 bps whereas the older system operates at 1200 bps. Mobitex-8000 is operational in 30 private and public networks in Australia, Austria, Belgium, Canada, Chile, China, France, Holland, Hong Kong, Indonesia, Italy, Korea, Mexico, Singapore, Sweden, Switzerland, UK and USA.

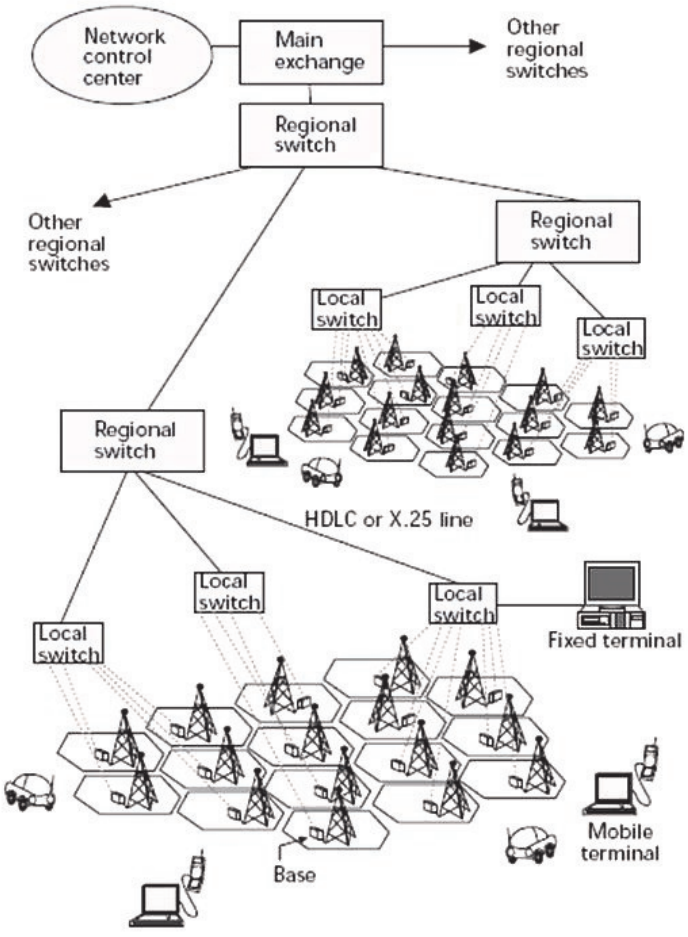


*Fig. 1 MOBITEX-8000 network architecture*

## Mobitex Architecture

Mobitex is hierarchically organized having a main exchange through which all national traffic is switched (see fig. 1). Regional exchanges connect to the main exchange and are in turn connected to area exchanges. The regional exchanges switch interregional traffic. Fixed terminals and external gateways for exchange of traffic with the Internet, PSTN, GSM/SMS etc. are connected to the area exchanges as are the base stations.

At the lowest level of the switching hierarchy mobile terminals connect to the base stations. Traffic between mobiles connected to the same base station will be switched there, the principle being to switch at the lowest possible level. By using this architecture, unnecessary traffic load is removed from the trunks, and a high degree of autonomy and resilience is ensured even if the higher level links are not operational. MOBITEX-8000 is only enabled for data.

## Mobitex Protocol stack

In fig. 2 the Mobitex protocol stack is depicted. Software in the mobile terminal formats text or data into Mobitex PAcKets (MPAK), which in turn are carried in MASC (Mobitex ASynchronous Communication protocol) packets. The MASC packets are forwarded over a RS-232 link to the radio modem. In the modem MPAKs are formatted into ROSI data blocks, which eventually are fed to a GMSK modulator. In the base station the inverse process takes place except for the landline protocol which is X.25, HDLC or using a gateway TCP/IP.

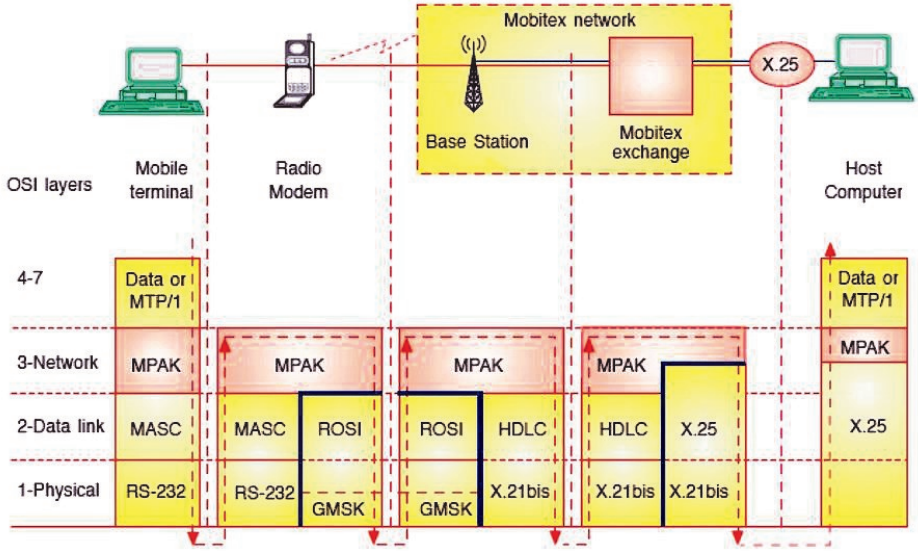


*Fig. 2 Protocol*

MOBITEX-8000 operates in the 450 or 900 MHz frequency range using GMSK having a shift of +/-2 kHz and a bit rate of 8000 bps. The adjacent channel spacing is 12.5 kHz and the duplex spacing is 5 MHz.

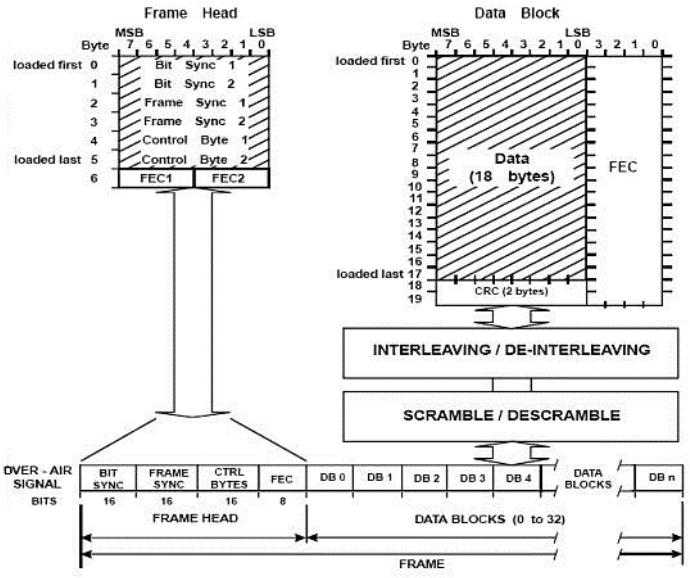


*Fig. 3 Air protocol*

## Mobitex Air protocol

Transmissions take place as frames. A frame consists of zero or more blocks with a frame head. Each block contains 240 bits of which 144 bits (18 bytes) are payload data, the remaining 96 bits being CRC and parity check bits. A frame may contain up to 32 blocks. Data block bits are scrambled and interleaved (see fig. 3).
The frame sync bytes are used as a network identifier. An inverted frame sync field identifies from-mobile traffic.
Frame heads without an appended message are used for base station availability and identification purposes.
The primary block contains addressing and control information, and if it is a MRM frame it may also contain payload information.
The sequence number field may be used for other purposes, e.g. priority and address mask or timeout value.
User data is contained in MPAKs which may contain up to 512 bits. If the message is bigger than 512 bits, the message must be distributed over more packets and sequences (see fig. 4).

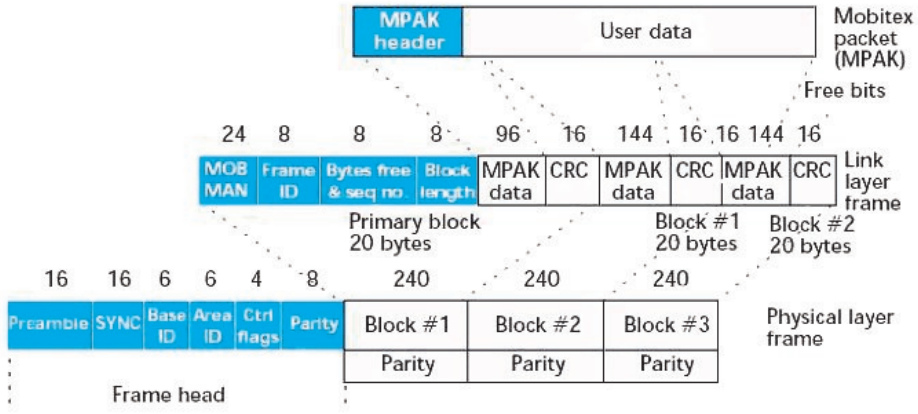


*Fig. 4 Frame format*

Data is protected by a Hamming FEC code in conjunction with selective ARQ. If a block is received in error, the receiver attempts to correct the errors and otherwise asks for a repetition of the block in error.
If the MRM in error has three or less blocks, the receiver sends a NAK and all blocks are repeated.
If the MRM in error is bigger than three blocks, the receiver sends a REB packet containing a bit map of the blocks in error. The transmitter then responds with a RES packet with the requested blocks appended.

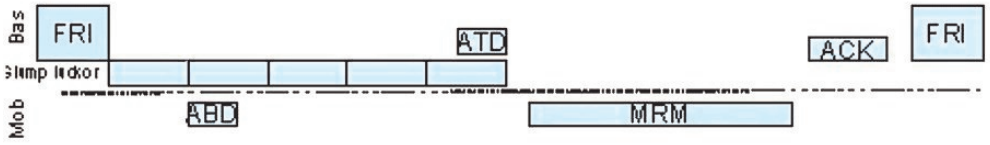


*Fig. 5 Packet transfer*

A frame always contains a primary block and may contain up to 31 additional data blocks called “following” blocks.

Mobitex data link signaling uses slotted Aloha with dynamic frame length control as an access method. Stations wishing to communicate must request permission from the network if they need to transmit packets longer than one slot. Based on signal strength measurements stations normally listen to a traffic channel. Channels may be dynamically configured to offload traffic. Local channel availability is signaled in SVP link frames.

A mobile station listens for the FRI link frame from the BAS. The FRI contains information on the slot length and the number of available free slots during the following free period and. A mobile with data to transmit picks a random free slot and start to transmit at the beginning of that slot. If the mobile data is longer than one slot, the mobile station must request more slots using an ABD link frame (access request data). The base station will issue a silence signal to prevent other stations to transmit at the same time (see fig. 5).

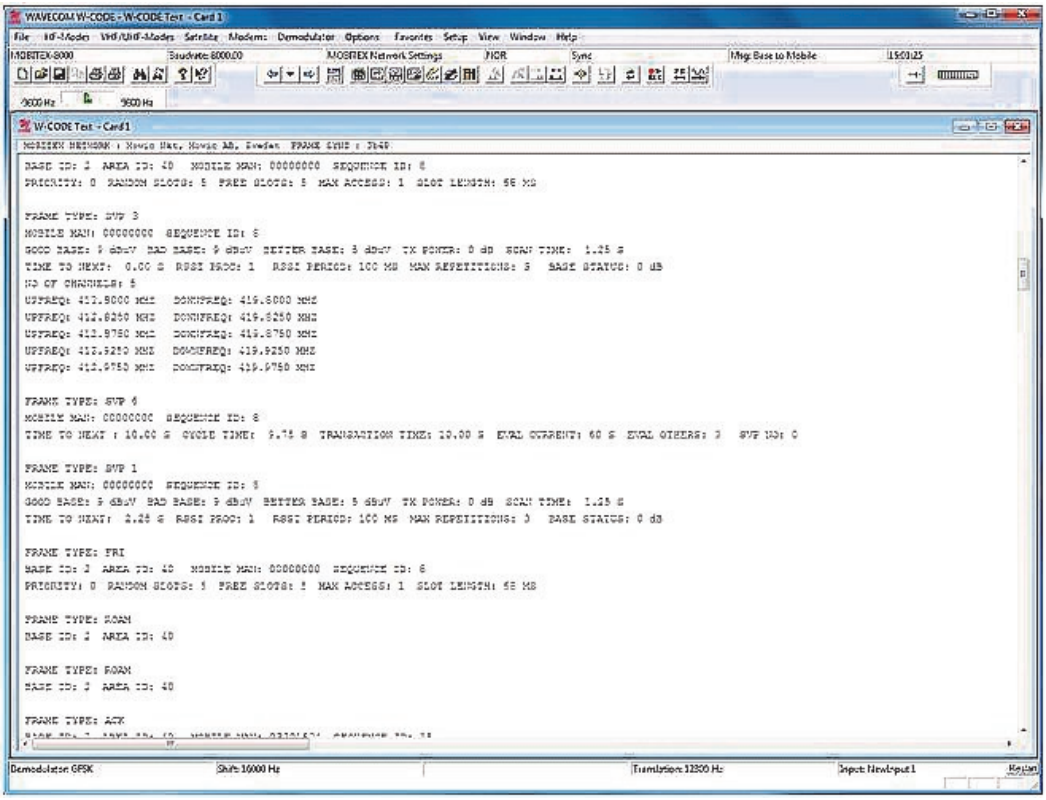


*Fig. 6 W-CODE screen shot with Mobitex-8000 decoding*

Since more than thirty years Wavecom Elektronik AG has developed, manufactured and distributed high quality devices and software for the decoding and retrieval of information from wireless data communication in all frequency bands. The nature of the data communication may be arbitrary, but commonly contains text, images and voice. The company is internationally established within this industry and maintains a longstanding, world-wide network of distributors and business partners.

## Product Information

| | |
|---|---|
| Products | http://www.wavecom.ch/product-summary.php |
| Datasheets | http://www.wavecom.ch/brochures.php |
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| Online help | http://www.wavecom.ch/content/ext/DecoderOnlineHelp/default.htm |
| Software warranty | One year free releases and bug fixes, update by DVD |
| Hardware warranty | Two years hardware warranty |
| Prices | http://www.wavecom.ch/contact-us.php |

## System Requirements

| | *Minimum* | *Recommended* |
|---|---|---|
| CPU | Core i5 or Core i7 2.8 GHz | Core i7-6700 3.4 GHz |
| Memory | 4 - 8 GB RAM | 16 - 32 GB RAM |
| OS | Windows 7 | Windows 10 32-bit or 64-bit |

## Distributors and Regional Contacts

You will find a list of distributors and regional contacts at http://www.wavecom.ch/distributors.php

WAVECOM ELEKTRONIK AG
8090 Zurich, Switzerland
E-Mail: sales@wavecom.ch
Internet: www.wavecom.ch