

MOBITEX 8000

Mobitex was originally implemented in 1986 for Televerket Radio, the radio department of the then Swedish telecommunication administration, later Telia and now 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

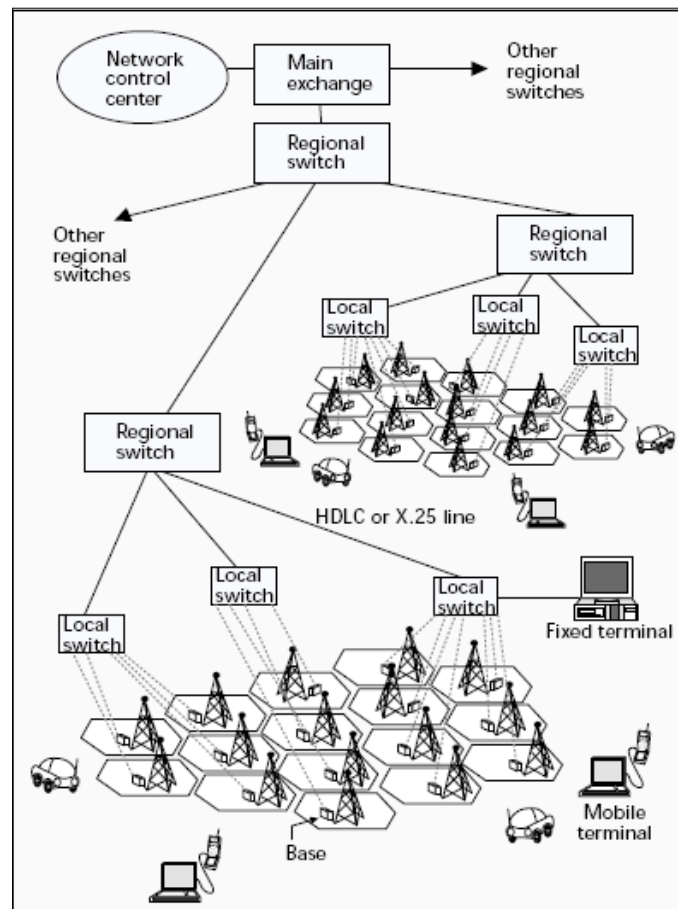


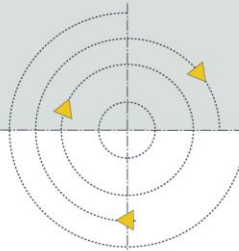
Fig.1 Mobitex 8000 network architecture

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 mo-

biles 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.



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 Commu-nication 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.

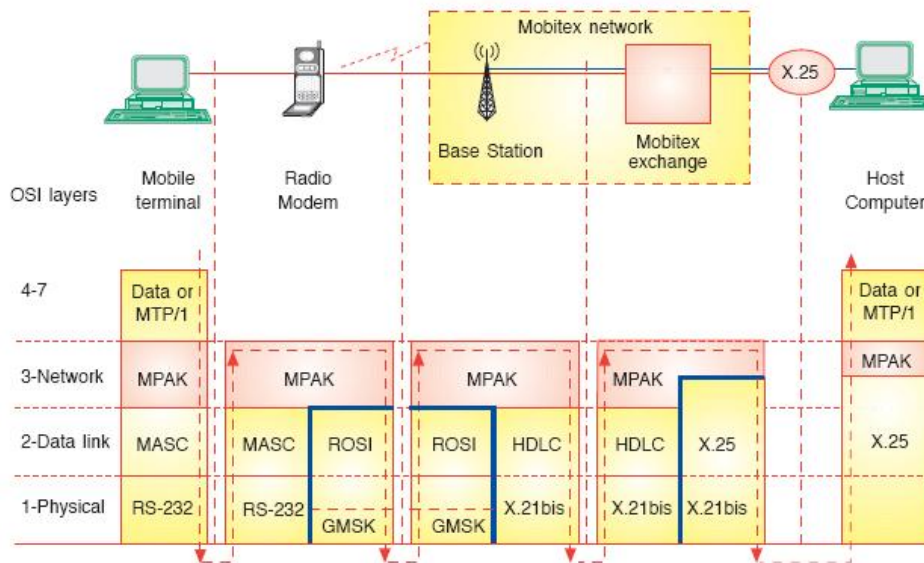


Fig. 2 Mobitex protocol stack

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.

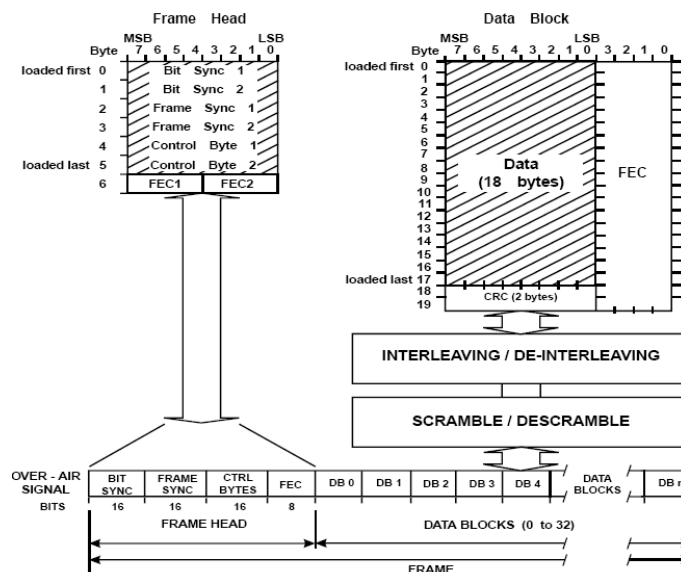
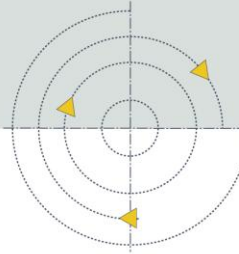


Fig. 3 Mobitex air protocol



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 have one or more 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.

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.

The sequence number field may be used for other purposes, e.g. priority and address mask or time-out 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).

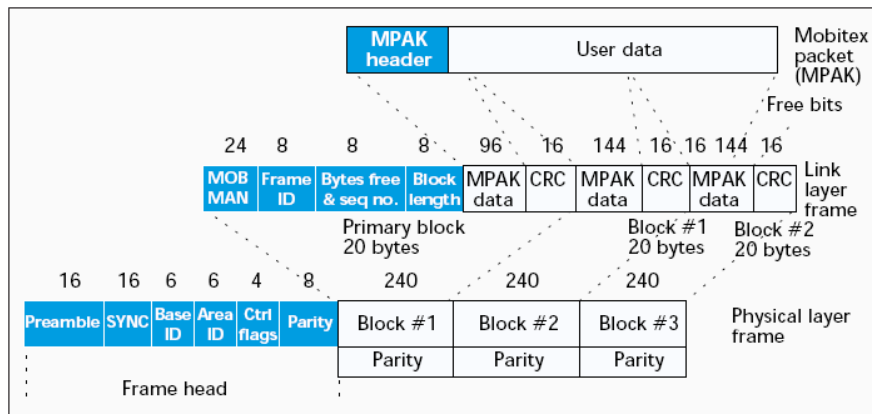


Fig. 4 Mobitex 8000 frame format

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.

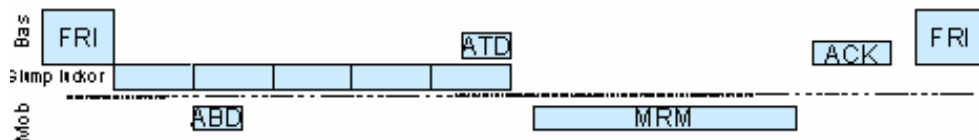


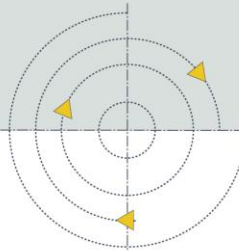
Fig. 5 Mobitex packet transfer

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 mo-



ble 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).

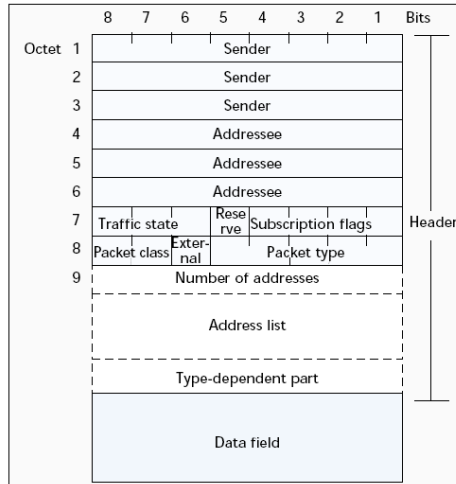


Fig. 6 MRM structure

PSUBCOM transfers four types of packets: 7-bit printable ASCII, 8-bit transparent ASCII, one byte user defined status messages and higher protocol data. DTESERV is used for signaling at the network layer. 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.

The structure of a MRM packet is shown in fig. 6. At the network layer Mobitex has two packet classes: Packet subscriber communication (PSUBCOM) and network layer signaling (DTE-SERV). CSUBCOM transfers packets used for the control of circuit switched communication, e.g. setting up and tearing down voice calls.

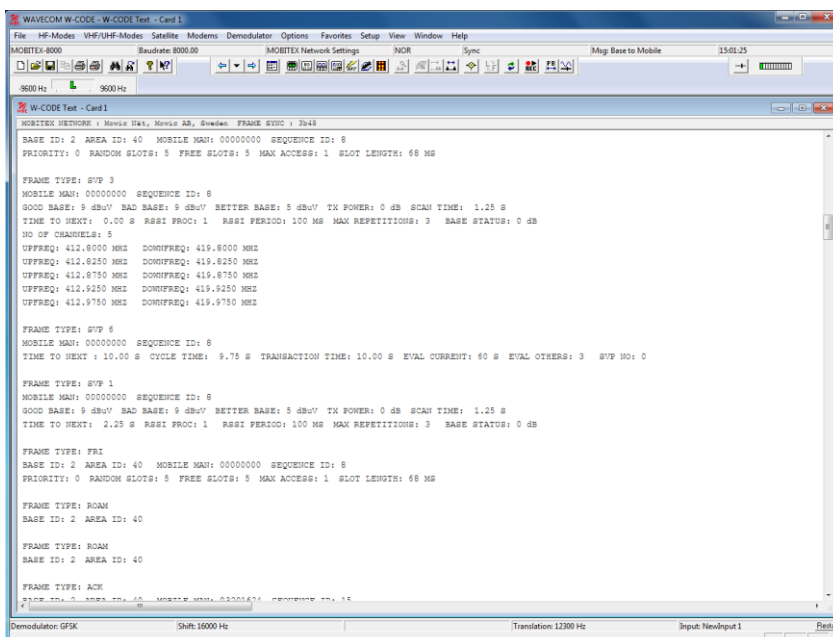


Fig. 7 WAVECOM W-CODE screen shot

For further information please contact:
WAVECOM Elektronik AG
Hammerstrasse 8
CH-8180 Buelach
Phone: +41 44 782 7060
FAX: +41 44 782 7066
Email: sales@wavecom.ch