

FIRST DRAFT

Decisions of the CEPT/CCH/GSM meeting in Madeira 16-20 February 1987 concerning the recommended technical standard for a pan European digital cellular radio system

1. The meeting of the CEPT/CCH/GSM in Madeira 16-20 February 1987 has been required to take decisions on a number of important points of principles concerning the technical standard for a pan European digital cellular radio system.
2. These decisions have been taken on the basis of an agreed set of conclusions of the extensive technical studies and practical trials carried out by experts participating in the work of GSM. These conclusions are given in Table 1 attached.
3. GSM has decided that digital cellular radio has advantages over analogue cellular radio in meeting the minimum requirements of a pan European cellular radio systems and should be adopted for the CEPT recommended standard.
4. GSM has decided that Time Division Multiple Access TDMA has advantages over Frequency Division Multiple (FDMA) and should be adopted for the CEPT recommended standard.
5. GSM has decided that Narrowband TDMA has advantages over Broadband TDMA and should be adopted for the CEPT recommended standard. France and Germany at the time of the Madeira CEPT/CCH/GSM meeting could not support this decision and therefore made a reservation on this point.

not
accepted

6. GSM has decided upon a set of working assumptions for the particular characteristics of a narrowband TDMA pan European digital cellular radio systems. These working assumptions will be used in a manner which has been agreed by GSM for the purpose of optimisation and specification of detailed parameters and in the case of mobile stations, for the world wide consultation obligation agreed at the meeting of the CEPT Telecommunications Commission and Technical Recommendations Applications Committee in Odessa in 1986.
7. The "set of working assumptions" for the base station air interface requirements are given in annex 1. The "set of working assumptions" for the mobile station air interface requirements are given in annex 2. The characteristics are largely the same in both cases but are given separately due to the fact that the Technical Recommendations Applications committee has flagged a pan European digital cellular mobile radio terminal equipment as a prospective European Telecommunications Standard (NET) However a difference may be noted in that GSM has decided that a frequency hopping capability will be a mandating feature for mobile stations but network operators will have the freedom to implement or not frequency hopping in all or certain of the base stations.
8. GSM has decided that every effort will now be made to complete sufficient detailed definitions of the recommended standard such that those CEPT Administrations who so wish can commence procurement action at the end of 1987 in order to allow systems to have been implemented by 1991.

TABLE 1 - Conclusions of the technical studies regarding relative advantages of the various radio sub system alternatives for a pan European cellular radio system against major factors used as criteria in the evaluation.

	Analogue/Digital	FDMA/TDMA	NB/WB TDMA
Speech Quality	Comparable	Comparable	Comparable
Spectrum Efficiency	Comparable	Comparable	NB
Infrastructure & Mobile Cost	Digital	TDMA	NB
HP Viability	Digital	TDMA	NB
Flexibility for New Services	Digital	TDMA	Comparable
Risk	Analogue	FDMA	NB
Spectrum Management	Comparable	FDMA	NB

abbreviations: FDMA Frequency Division Multiple Access
 TDMA Time Division Multiple Access
 NB Narrowband
 WB Wideband
 HP Handportable Mobile Terminal Equipment

CEPT/CC H/GSM
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DRAFT RECOMMENDATION

Some characteristics of base stations meeting the air interface (MS-BS) requirements of the public 900 MHz pan European digital cellular radio system

Base stations of a 900 MHz European digital cellular radio system shall meet the following requirements at the air interface (MS-BS):

[Note: the values given are the working assumptions for the commencement of the optimisation phase. Stabilised values will be agreed following according to the definitions of "working assumptions" and the guidance ^(to its interpretation) agreed by GSM to its interpretations.]

ANNEX 1

Working assumptions for the Base Station Air Y Interface

Traffic channels:

- 16 kbit/s gross bit rate on a full rate channel.
- 8 kbit/s ^{maximum} gross bit rate on a half rate channel.

Multiple access

- Eight full rate channels/carriers per TDMA frame with interleaving
- 16 Half rate channels will be able ^{to be} accommodated in the frame structure

Modulation

- mRC modulation will be used

Equalisation

- ~~At least~~ 20 μ sec delay spread will be catered for.
- Spectrum Efficiency - A C/I performance of better than 10-12 dB is required, ^{between} the carrier spacing is 200 to 300 kHz.

Speech Coding

- Will use an RPE-LPC coder with a frame length using a multiple of 5 msec.

DTMF - Will be provided using the Dm channel

Data Services - Will be provided via digital transmission on a traffic channel.

Frequency Hopping - Will be specified but optional feature

Sleep Mode - A facility will be specified for

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DRAFT RECOMMENDATION

Some
1 characteristics of mobile stations meeting the
air interface (MS-BS) requirements ^{to access} ~~at~~ the
~~following~~ European digital cellular radio
systems

~~the following characteristics~~
(of ~~any~~ ~~second~~ European digital cellular radio system)
Mobile stations shall meet the following
requirements ~~at~~ the air interface (MS-BS):

[Note : the values given are the working
assumptions upon ^(commencement of the) the ~~initialisation~~ phase and
world wide consultation. ^{for the} stabilised values will be
agreed following the ~~initialisation~~ and specifications phase
and taking into account ^{any} ~~the~~ comments received ^(on the values ~~the~~ below) during
the world wide consultation.]

Working assumptions for the Mobile Station and interfaceTraffic Channels

- 16 Kbit/s gross bit rate on a full rate channel.
- 8 Kbit/s maximum gross bit rate on a half rate channel.

Multiple Access

- Eight full rate channels / carrier for TDMA frame with interleaving
- Sixteen half rate channels will be able to be accommodated within the frame structure.

Modulation

- nRC modulation will be used.

Equalisation

- ~~At least~~ 20 μ sec delay spread will be catered for.

Spectrum Efficiency - a C/I performance of 10-12dB is required, the carrier spacing is between 200 and 300 KHz

Speech Coding

- will use an RPE-LPC coder with a frame length using a multiple of 5mSec.

DTMF will be provided using the SM channel

Data Services - Will be provided using Terminal Adapter

via a traffic channel using digital transmission.

Frequency Hopping - This capability is mandatory. ~~For optional implementation.~~

RF Power Control. - Is a mandatory feature.

Hand Portable - The peak RF power is limited
to 5 watt ERP.

Sleep Mode - specified for optional implementor