

Teracom reply to DR FRANCE

Inter-professional consultation on digital radio

Question 1 : Can we say that the standard that could be used for existing multiplex covering one zone could be T-DMB or DAB+ (example : 3 MUX in DMB and 5 in DAB+)?

Yes, the Eureka-147 system allows for all three standards DAB, DAB+ and DMB to be covered within a zone. Teracom AB, network operator in Sweden, has been trialing DAB, DAB+ and DMB within the same zone and has no reason to doubt that it will work.

When it comes to making a choice of technology, Teracom follows the WorldDMB recommendation that “DAB (ETSI 300 401) or DAB+ (ETSI TS 102 563) should be used for radio-centric services and that DMB (ETSI TS 102 428) should be used for services which include a video component”.

Our plan, at Teracom AB, is to aim for at least two nationwide multiplexers in band III, using DAB+. The plan includes a switchover to DAB+ for current DAB services in multiplex 1 and in parallel to establish a second nationwide multiplex with DAB+ only services.

Question 2 : Is it technically correct to say that it is perfectly possible without particular risk nor significant cost, within the same multiplex to use both T-DMB and DAB+ standard ?

Yes, it is of course possible to transmit DMB and DAB+ within the same multiplex, using the same infrastructure without particular risk nor significant cost, as these examples show:
[http://www.worlddab.org/introduction to digital broadcasting/dab dmb dab plus multiplexes](http://www.worlddab.org/introduction%20to%20digital%20broadcasting/dab%20dmb%20dab%20plus%20multiplexes)

If any, the difference in cost is on the encoder side where DAB+ today has a small advantage over DMB because of less complexity. Also, the cost for a single audio program (a single broadcaster) in a common multiplex will most

probably be lower when using DAB+ instead of DMB-audio, because of the larger overhead that DMB-audio services require.

It is a well known fact that you can fit more audio programs, of the same perceived audio quality, in a single multiplex when using DAB+ compared with using DAB or DMB-audio.

The important question is that the receivers must support the standard you choose to adopt: DAB, DAB+ or DMB-audio. A common standard for audio-centric services is needed if we wish pan-European coverage in the same way that made analogue FM a success.

Question 3 : Could you make some propositions of possible composition in term of number of programs based on the necessity to have optimum sound quality and be able to broadcast PAD as well with the option of question 1 (3 MUX in T-DMB and 5 in DAB+) and the option of question 2 (1 MUX only) ?

The question of number of programs per multiplex is in reality a case for the broadcasters, and possibly the legislator, to decide. The technical limit of the Eureka-system is a factor of approx. 1,1 Mbit/s per multiplex multiplied with the number of available frequencies/multiplexers.

As a network operator Teracom would like to point out that the system DAB/DAB+/DMB provides an efficient way to broadcast a whole range of possible service scenarios. The number of programs and their respectively bit rate could easily change several times during the course of a day. The possibility to transmit “event channels” and to use different bitrates on different programs depending on the source material (voice, music etc) is only some of the advantages that come with digital technology in comparison to analogue FM.

However, it is our estimation today that the broadcasters will aim for audio quality parameters in a way that it will be possible to fit approx. **10-16 audio programs per multiplex when using DAB+.**

In the case of DAB/DMB-audio, corresponding audio quality should result in approx. **6-10 audio programs per multiplex when using DAB/DMB-audio.**

Question 4 : Is it true to say that radio receivers that can receive T-DMB audio (T-DMB Radio) can all also receive DAB+ ?

Yes, provided that the receiver manufacturer will comply with the The World DMB Digital Radio Receiver Profiles which define a “minimum functionality for different classes of digital radio receivers that use the Eureka 147 based DAB system”. The Receiver Profiles states that all digital radio receivers should decode DAB, DAB+ and DMB-audio, http://www.worlddab.org/news/document/896/World_DMB_Receiver_Profiles_Final_charset_2.pdf

In reality, there are more than 1000 receivers for digital radio (DAB, DAB+, DMB) out on the market today. Not *all* of them can handle DMB *and* DAB+. In fact, many of them don't. This is likely to change in the coming months and years as penetration of the (relatively) new DAB+ and DMB standards will increase and new receivers that comply with “the minimum functionality set” are rolled-out. Legislation on national and European basis plays a key role in speeding up this process.

The important question for members of the European Radio industry is to strive to ensure that all receivers launched on the market from now on, will be compliant to “the minimum functionality set”, i.e. capable of decoding DAB, DAB+ and DMB-audio. Only then can we achieve the goal of pan-European coverage, in the same way that made analogue FM a success.

Yours Sincerely
Per Gunnarsson
TERACOM AB

About Teracom Group

Teracom AB is a Swedish limited liability company wholly owned by the Swedish state. The owner is represented by the Ministry of Enterprise, Energy and Communications. The Teracom Group consists of the Parent Company, Teracom AB and its subsidiary, Boxer TV-Access AB. Boxer TV-Access AB is wholly owned by Teracom AB and compiles, markets and sells attractive program packages for terrestrial digital tv in Sweden. Teracom AB owns the Group infrastructure consisting of a nationwide broadcasting network for radio and TV and nationwide backbone networks used for audio/video contribution, data communication and monitoring. The main product areas are radio and tv broadcasting, Pay-tv offerings, transmission capacity for data connection, co-location and service. Read more on <http://teracom.se/?page=6327>