

Emergency Warning Systems in DAB

The DAB family of standards are an effective tool for enabling an effective Emergency Warning System (EWS).

- Provides free to air terrestrial broadcast
- Covers large populations areas
- Enables robust, wide scale coverage – important when transmitting emergency messages in cases of major natural or manmade disasters.
- Broadcast radio remains on air whilst other communication channels fail such as internet or telecommunications networks

Some EWS will only inform key people that will take the necessary action while other EWS are designed to cover the whole population.



In South Korea all Samsung and LG phones are equipped with the EWS feature

In the first case, key individuals will have been equipped with dedicated receivers while the other case requires mass availability and usage of consumer receivers. The DAB/DMB system can be used in both scenarios.

A perfect case study of EWS in use

A good illustration of how EWS can be implemented with DAB/DMB is the South Korean EWS which was implemented in 2007. They created a national standard based on the T-DMB standard called the Automatic Emergency Alert Service. TTAK.KO-07.0046/R2), (AEAS). This is designed to transmit basic and short text messages to T-DMB receivers of which over 60 million have been sold in South Korea. It is operated by KBS, with messages issued by the National Emergency Agency.

Receivers and EWS compatibility

In South Korea all Samsung and LG phones are equipped with the EWS feature as well as most of the car navigation systems. In Fig.2 you can see how the text message is shown in the devices. The user would see the message on the screen and the T-DMB video services goes on in the background.

The Korean EWS has been used successfully during the earthquake and tsunami disaster in Japan in 2011. Another way of alerting a maximum of people with DAB consists in using the announcement feature in combination with the automatic frequency switching feature. In this case one DAB service would contain the emergency message and all the other services would switch over to the service with the emergency message.

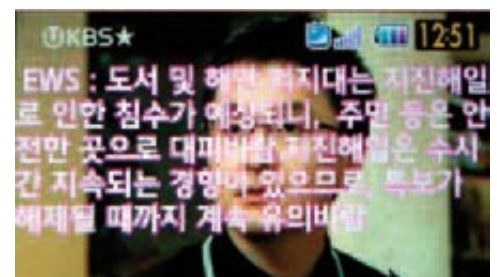


Fig2: An example of how the EWS text message is shown on screen

The message can be in audio, text, program associated data services or all of them at the same time meaning multimedia messages are possible. Again the FIC would be used for this, in particular FIG (0/18) Announcement Support and FIG (0/19) Announcement Switching and FIG (0/21) Frequency Information. With this feature it is even possible to switch over to a service transmitted by another standard, making sure that the receiver always switches to the strongest signal on air.

Last but not least, it is also possible to implement a wake up feature with DAB. This feature would be used by dedicated EWS receivers that monitor permanently if a wake up signal is broadcast on DAB. As soon as this signal is detected, the receiver wakes up alerts and transmits the emergency message.

How does it work?

In the AEAS you will find the typical architecture of a EWS, similar to what has been used in other countries such as in the US. The EWS message format should contain the following key elements:

- kind of disaster
- order/priority of the warning
- announcement time
- disaster area
- and finally the message itself

The kind of disaster is typified by a three byte value such as FLW (flood warning) or EQW (Earth Quake). In South Korea four priority function levels have been defined meaning the receiver will signal the emergency in a different way to the user for each of these such as: no signal, flashing message, ringing signal and so on. For the implementation of this feature the Fast Information Channel (FIC) of the DAB system was used.

As the EWS messages represent a very low bit rate service the FIC (Fast Access Channel) is particularly well suited. It is a highly protected channel (code rate 1/3), which makes it very robust. It is decoded immediately (no interleaving) without reference to any other transmission frames. The FIC has been designed to transport the most important information of the DAB systems such as the multiplex structure with all labels and parameters. The FIC is organized in Fast Information Groups (FIG). For the EWS feature the FIG 5/2 is defined in the standard.

