How to set up a DAB+ digital radio trial

Make contact with the government

- Speak to the major broadcasters in your country or local area and agree to jointly approach Government and the regulator to seek permission to run a DAB+ digital radio trial.

- Write on behalf of the group of major broadcaster, to the Minister, with a copy to the Prime Minister or President, to make them aware of the mainstream radio industry's wish to move to DAB+ digital radio.

- In your letter outline the benefits of digital radio for listeners, more choice of content provided by **current** radio operators; robust reception; interference free clear digital quality; easy tuning, new text and graphic functions to make radio competitive in a digital age. Advertisers will also love these new multimedia features.

- Explain also the benefits for the country are more efficient use of spectrum, more energy efficient, and the benefit for broadcasters is significantly lower set up costs and lower transmission costs than analogue.

- You should ask for, and then attend, a meeting with the Minister and or Regulator to explain the reasons for your wish to establish DAB+ digital radio broadcasts which would include information on the superiority of DAB+ over other digital radio technologies, DAB+ benefits for listeners and for regulators in best use of spectrum and a broad proposed timetable for migration. The first step is a trial.

- Indicate to the Minister and your Regulator that the major radio broadcasters are requesting access to VHF Band III spectrum otherwise known as Band III spectrum (174-240MHz) for DAB/DAB+ transmissions from one or more sites.

- There are benefits of the radio industry working together to mount a trial as ultimately multiplexers will be shared by broadcasters.

- A major broadcasters, (or even an industry wide), approach also makes it easier for Government and regulators to support you, rather than asking them to approve a trial for one or two operators which may cause a competitive issue with broadcasters who are not involved.

Obtain a trial licence

- Meet, or write to, your Regulator requesting a trial licence for a minimum of 2 years to trial DAB+ digital radio in VHF Band III spectrum.

- If you know the specific channel that you wish to use, specify the particular channel or channels in VHF Band III.

- A single DAB+ Ensemble requires 1.712 MHz of spectrum (including guard bands). Up to four DAB+ ensembles can fit inside a single 7MHz Band III TV channel.

- You should also specify the power level you may wish to use.

- In order to be confident of how much power you need it is a good idea to carry out coverage predictions first. Based on practical experience of the recent rollout, Commercial Radio Australia (CRA) recommends a target field strength of 63 dBuV/m at 1.5m metres for indoor reception in urban areas.

- It is important to plan for in-building coverage not just vehicular coverage - to achieve good in-building coverage you should aim for the highest possible power practicably achievable. In Australia a main site at 50 kW ERP is typically used with low powered infill repeaters to cover a single large city such as Sydney or Melbourne.

- You should send a copy (cc) any letters you write to the regulator also to the Minister so that the Minister is aware of progress.

Equipment for the trial

To trial DAB+ digital radio you will need:

1. **Transmission site or sites**: You may need one high power site or a number of low power sites. A single high power site may be cheaper, and may cause less interference into existing band III television services if these exist, particularly if the DAB+ transmission is co-sited with television transmissions. Multiple sites may give you better coverage – particularly in hilly areas or areas with tall buildings.

2. **Transmitter and Filter:** There is no difference between DAB, DAB+ or DMB transmitters, these are all interchangeable. While the transmission power of trials in Australia ranges from 3.1kW to 12.5kW ERP, it is recommended to operate your trial at the highest power possible. For an ERP of 10kW you will typically require a transmitter capable of between 1 and 2kW depending on the antenna system gain. You will need a filter on the output of the transmitter to prevent the radiation of out-of-band RF power.

3. **Antenna**: All DAB+ transmissions should be vertically polarised. For a trial the cheapest antenna may be a vertical array of dipoles mounted on a single pole. Be aware that such an antenna will not be completely omni-directional and will have reduced gain in the direction of the tower it is mounted on.

   Beam tilt can be used if required. This may be necessary for roof top sites in the middle of large cities to ensure coverage near the transmission site. For high tower sites beam tilt may be required to limit the interference caused to other broadcasts.

4. **Encoders and Multiplexers:** Encoders take an audio input and convert it into the correct format for DAB+ transmission. Multiplexers take a number of such services and combine them into a single Ensemble which is then relayed to the transmitter site or sites. The encoders may be located at a radio studio centre, or at a central multiplexing site, depending on the equipment used and existing infrastructure.

   There are strong benefits if the broadcasters retain ownership and control of the encoders and multiplexers – as this allows the broadcasters greatest flexibility to experiment with audio and data bit rates.

5. **Data Services**
   All your audio services should have an allowance for data, typically between 8 and 16kbps. This will allow you to transmit text and images alongside the audio. Even for a trial service it is very cheap and easy to set up a carousel of images to enhance your audio services.

6. **Data Circuits**
   The lowest cost is obtained if all the activities are at the antenna / transmitter site. Alternatively you can locate the transmitter and multiplexer equipment at the antenna site and the encoder equipment at the studio sites although additional equipment and IP capable data circuits will be required.

   To obtain equipment for a trial you should contact the WorldDMB Project Office who will be able to put you in touch suppliers who may wish to assist you with your trial.

   - For a trial you should seek a loan of equipment or a very low cost lease or purchase.

   - Suppliers should see helping you with your trial as an opportunity to trial their equipment and to build a relationship with broadcasters and regulators.

Working with consumers and receiver manufacturers

- You should contact receiver manufacturers and request that they supply you with DAB+ receivers for consumer panel testing during the trial on loan or for cost price to help develop the market.

- Establish a small number of listener panels or focus groups of 10-20 persons. You would need to provide a DAB+ receiver free to each member of the listener panel for use in the trial.

- You can use the listener panels or focus groups to get feedback on:
    1. content - audio and data
    2. coverage and reception
    3. receiver performance.

- You may manage this yourself or use a third party research firm to set up and manage the panels/groups. In Australia during the trial the following panels of were set up:
    1. table top or kitchen radio panel
    2. mobile DAB+ device panel
    3. car radio panel

- You could also choose to have panels organised by age or by location

Stakeholder input

- You may find it helpful to set up an Advisory Group for the trial comprised of manufacturers, equipment suppliers and broadcasters to look at progress and all consumer data.

- You should talk to retailers and the automotive sector and keep them updated on your plans to trial or launch digital radio services

- It is important to create detailed contact lists for all these stakeholders so you can contact them frequently and easily keep them updated.

Source: Commercial Radio Australia, http://www.commercialradio.com.au/