Design of Gnu Radio DRM Transmitter

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June 29, 2012

When designing the flow graph, I thought it would be favorable to work with vectors as they represent logical units that can be tracked when they are handed down the flow graph.

The image on the next page shows the flow graph. The given vector lengths are exemplary and represent a special - but quite common - transmission mode.

Some important parameters in this example:

- Robustness Mode B
- Spectrum Occupancy 3 (which denotes a bandwidth of 10 kHz)
- 1 audio stream, no data streams
- payload of 5826 bit per transmission frame (corresponds to one transmission frame (400 ms))
- Equal Error Protection (EEP)
- Symmetric (standard) mapping with 16-QAM for Main Service Channel (MSC) and 4-QAM for Service Description Channel (SDC) and Fast Access Channel (FAC).
- 207 occupied OFDM subcarriers and 45 OFDM symbols per super transmission frame (corresponds to 1.2 sec in time)

All parameters are generally highly flexible providing a huge amount of possible configurations. There is a set of (user defined) 'key parameters' like the Robustness Mode and the chosen bandwidth that decide many others. My implementation handles this with an init() routine that expects these key parameters, calculates everything that is needed and passes it to the signal processing blocks.

An example for these multiple dependencies: The code rates used in the channel encoder for the MSC depend on the chosen Robustness Mode, Spectrum Occupancy, error protection scheme and the mapping scheme. If you change one of the parameters, the code rate will change, too.

Conceptual DRM transmission block diagram