With the proliferation of wireless standards in television, radio and mobile communications, compatibility issues have emerged in wireless networks. Inconsistency between wireless standards is causing problems to subscribers, wireless network operators and equipment vendors. Traditional wireless systems, with their capabilities hard coded in them, are no longer able to keep pace with the brisk growth rate in telecommunication sector. These issues can be addressed using the “Software Defined Radio (SDR)” approach. SDR provides the necessary flexibility and adaptability required to build systems which support multiple standards, multiple bands, multiple modes and offer diverse services to its user.

In this thesis we have started the process of mapping required SDR functionality onto hardware. The target hardware platform chosen for this project is the parameterizable TACO protocol processor architecture. TACO processors are constructed of Functional Units (FUs) that each are optimized for a specific protocol processing task. Implementing parts of SDR on the TACO architecture requires design and implementation of novel FUs that support operations needed in the SDR application domain. The target technologies selected for the implementation of SDR are “Digital Video Broadcasting (DVB)” standards for terrestrial and handheld devices.

This thesis has focused on the implementation of demapper and channel coding schemes, in DVB-T and DVB-H receiver, using synthesizable VHDL. Parts implemented in hardware include: demapper, symbol deinterleaver, bit deinterleaver, depuncturer, convolutional deinterleaver, input module, output module and network controller. All these blocks are carefully tested and synthesized using 0.18 micron technology. Hardware modules are then mapped according to TACO processor architecture.

Keywords: Software defined radio, digital video broadcasting, DVB-H, DVB-T, TACO protocol processor architecture, hardware/software co-design, transport triggered architecture.