A Low Cost All-Band All-Mode Radio for Public Safety Applications
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Interoperability Problem
Current State of Public Safety Radio
- Incompatible equipment
- Lack of interoperable standards
- Disparate, stove-piped & proprietary systems
- Rigid allocation of band & mode

Barriers
- Time required to develop standards
- Maturity of technology
- Regulatory issues (FCC)
- Cost/Time required to replace equipment

Goal
- Standards-based systems
- Ability to dynamically accommodate new standards
- Flexible & automatic allocation of band & mode

Intermediate Step
- Replacement of existing user terminals with a low cost all-band / all-mode radio
- Technology already exists to solve the hardware design problem
- Smooth transition to goal architecture with backward compatibility
- Possibly simplified regulatory acceptance
- Immediate relief for first responders, not requiring dramatic changes to systems or operations

Project Summary
- Develop and demonstrate a single radio which can operate in all bands and using all modes of relevant to public safety applications
- Aggressive cost reduction
- Validation though laboratory testing and field demonstration
- Open & free dissemination of results at each phase
- 3 year plan (Oct 05 – Sep 08)

Implementation Issues
- “Functional” View of this Radio
  - At least 13 bands relevant to Public Safety x Many channels per band = A lot of radios!

Approach - 1
Digital IF Processing: Altera Development Board (Altera Stratix FPGA)
General Purpose Processing: Analog Device’s Blackfin board with BF537 Processor
Software: C on uClinux

Approach - 2
Digital IF Processing: Ettus Research USRP (Altera Cyclone II FPGA)
General Purpose Processing: Texas Instruments OMAP
Software: SCA-Compliant Embedded

These two parallel approaches are mainly for assessing the advantages and disadvantages of SCA based software design in public safety SDR.

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