SDR Cube Features

It was important for us to understand the natural constraints offered in embedded systems with limited resources and computing power. The designer's goal is always to provide "just enough" without over-taxing the available resources; or conversely without creating a radio with more bells and whistles than are actually warranted.

- *Portable, standalone, QRP-level, all-mode SDR transceiver for Amateur Radio*
  - Portable: 12-volt battery operated, easily transportable, hand-held form factor for convenient field use *(EmmCom, Field Day, Trail usage, etc.)*
  - Standalone: Design uses embedded microcontroller for all signal processing - no PC or Laptop required. *(Decouples the product from PC complexities, cost & usage concerns.)*
  - Band Coverage: 160-10 meters (1.8-30 MHz). *(Base design provides for 20m BPF/Output modules, with other plug-ins accommodated.)*
  - Low Power: Low current draw from power source, approx. < 500 ma. *(Maintains battery life in field use.)*
  - QRP: RF transmissions < 5 Watts, typical. *(QRP output levels are achievable in small form factor. Can later add options for power amp.)*
  - Modes: Voice, CW, and select Digital modes. Digital modes achieved by interoperation with NUE-PSK Digital Modem. *(These modes cover the wide range of anticipated user needs: bench/field use, casual use, EmComm use, etc.)*
- *Built-in Transceiver "RF front end"*
  - QSE/QSD-based quadrature signals provided to HF modem for all-mode modulation/demodulation of signals. *(Easiest , least expensive and most convenient architecture for implementing SDR.)*
  - Softrock RxTx 6.3 transceiver assumed in base design of enclosure. *(Best performing and most compact Softrock transceiver. 50 kits already stocked for this SDR use.*
  - Other Softrock models or other QSD-based transceivers able to be plugged into core signal processing of the HF modem. *(Leverage the > 10,000 Softrocks already in the field, lowers the user's cost of ownership by optionally selling the built-in RxTx)*
- *HF Modem*
  - Microchip dsPIC33FJ used as the primary embedded signal processor performing the HF modem functions *(Software architecture available, easy to port in critical functions from digital modem: display, USB, bootloader, keyboard)*
  - TLV320AIC23B codec used as the multi-channel, gain-controlled analog-digital-analog signal conversion *(Driver available, sufficient bits & sampling)*
- *Form factor*
  - Size: Small, driven by graphic LCD and controls, also including Softrock. *(Facilitates convenient and integrated portable operation.)*
  - Material: Aluminum. *(Needed for RFI shielding)*
- *Software Field Upgradeability*
  - Integrated bootloader (*Allows user to download improved software versions from the website and load into SDR.)*