Structured Hardware Design

A design is required for a battery-operated device that replays stored music through headphones.

(a) What are the properties of EAROM memories (also known as Flash)?

(b) Given that CD quality music is sampled at 44 ksps with 16 bits per stereo channel, and that MP3 compression will be used at a ratio of about 5 to 1, and that three hours storage capacity is required, how much EAROM memory is needed?

(c) Ignoring partition of function between silicon chips, sketch a block diagram for a basic design, including any connections, controls and features that are likely to be needed.

(d) How many custom chips should be developed for this product and what other custom toolings should be used for a profitable run of 250K production units?