Module: COMP3215  
Real-Time Computing and Embedded Systems  
Lecturer: D A Nicole

Assignment: 3 of 3  
Contribution to Module: 10%  
Due Date: 10/12/14

Module Aims and Objectives

Knowledge and Understanding
Having successfully completed this module, you will be able to demonstrate knowledge and understanding of:

1. The requirements placed on real-time systems
2. The design space in which real-time system designers operate

Subject Specific Intellectual
Having successfully completed this module, you will be able to:

3. Select an appropriate architecture to meet a real-time requirement
4. Select an appropriate operating system and program design

Transferable and Generic
Having successfully completed this module, you will be able to:

5. Use graduate-level literature to expand your understanding of real-time systems

Subject Specific Practical
Having successfully completed this module, you will be able to:

6. Implement the design of a real-time system
7. Verify at least some of the functionality of a real-time system

Instructions

You are asked to implement the core of a software radio on the TMS320C6713 development board. You should be able to resolve individual SSB speech channels from the 48kHz I/Q recordings.

Marking Scheme

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>MAOs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td>Does it work reliably as intended?</td>
<td>1,2,6,7</td>
<td>10</td>
</tr>
<tr>
<td>Usability</td>
<td>Have the radio functions been implemented effectively using the available interfaces?</td>
<td>1,2,4,5</td>
<td>10</td>
</tr>
<tr>
<td>Clear and unambiguous statement of copyright constraints</td>
<td>How may the software be legitimately used?</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Build</td>
<td>A simple reliable (e.g. gcc/make) build that does not depend on an IDE or remote compilers.</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Kernel</td>
<td>Effective implementation of the Hilbert transform.</td>
<td>4,6</td>
<td>5</td>
</tr>
<tr>
<td>Clarity</td>
<td>Clear and readable code.</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

You should expect to spend up to 15 hours (two working days, including the laboratory itself) each on this assignment. Your attention is drawn to the University regulations concerning academic integrity, late penalties, and extensions.
Advice and Suggestions for Improvement

Marks Breakdown

<table>
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Note that marks are provisional until the June exam board. Please retain all assignments and associated paperwork until then.