Monthly Progress Report

SPIRE Test Facility and Scientific Support

Contract Number: 9F007-020251/001/SR
Prepared By: Peter Davis

Date: August 7, 2003
Period: July 2003

Part 1

1. Is the project on schedule? **Yes.**

2. Is the project within budget? **Yes.**

3. Is the project free of any areas of concern in which the assistance or guidance of Canada may be required? **No.**
   Contract amendment 001 takes the project through September 2003. The contract needs to be extended in order to cover the complete fiscal year 2003/04.

Part 2

On July 9 & 10, the SPIRE Instrument Hardware Design Review (IHDR) was held before an ESA board at the Rutherford Appleton Laboratories (RAL). David Naylor and Peter Davis attended the review meeting to represent Canada. On July 11, David Naylor attended the Co-Investigator meeting that was held at RAL. A respective travel report was submitted to CSA.

In July, many team members of the Canadian contribution to SPIRE were on vacation. This time of the year was deliberately chosen as vacation time since the control software and the optical system were stable at the end of the last month and the fall will see the delivery and use of the Test Facility FTS which will therefore be a phase of intense activity. Substantial progress was made concerning the electronic systems and the data analysis software.

Task 3.1: Provide SPIRE Test Facility FTS

- The setup of the Test Facility FTS requires two crucial electronics elements: a clock counter and the break-out box. They will guarantee the time synchronization between measurements of the Test Facility FTS and the instrument models (see Figure 1).

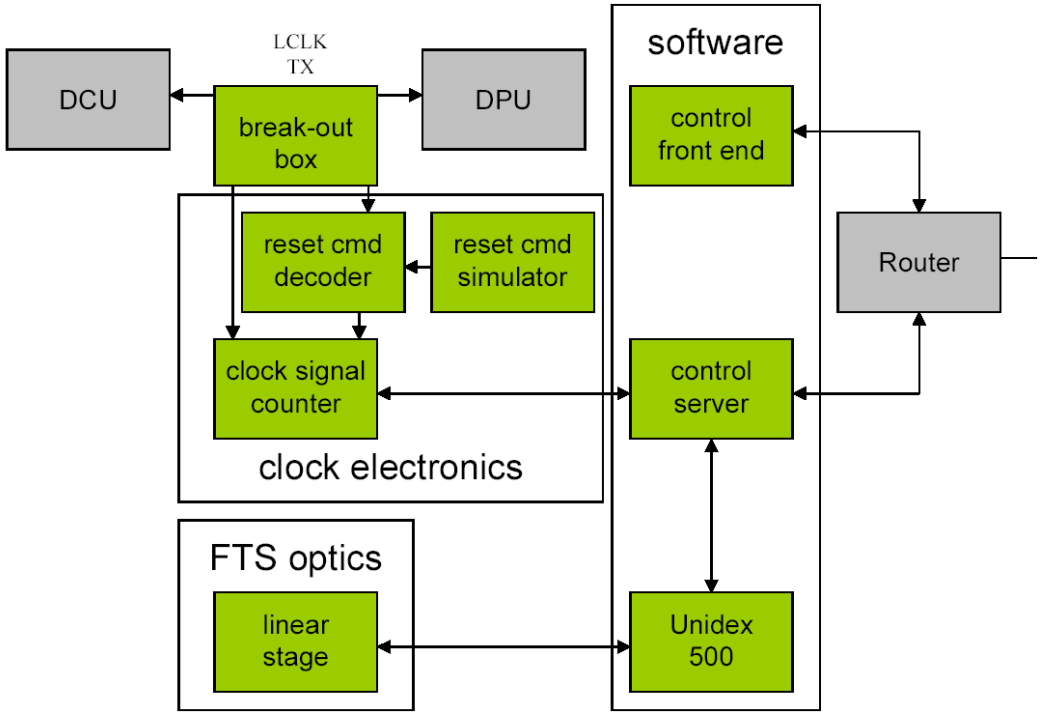

Figure 1: Overview of the setup of the Test Facility FTS
(green boxes refer to components provided by the University of Lethbridge)

- Greg Tompkins, the electronics support at the University of Lethbridge, has implemented the final design of the clock counter board and the break-out box. Nathan Fitzpatrick, a summer student from the University of Alberta, and Locke Spencer, a graduate student from the University of Lethbridge have provided support.

- The layout of the circuit board of the clock counter board has been finalized after the thorough analysis of an earlier prototype. Some issues with the integration of the redesigned board and the control software were identified and resolved by minor changes in the software. Long term tests are currently under way.

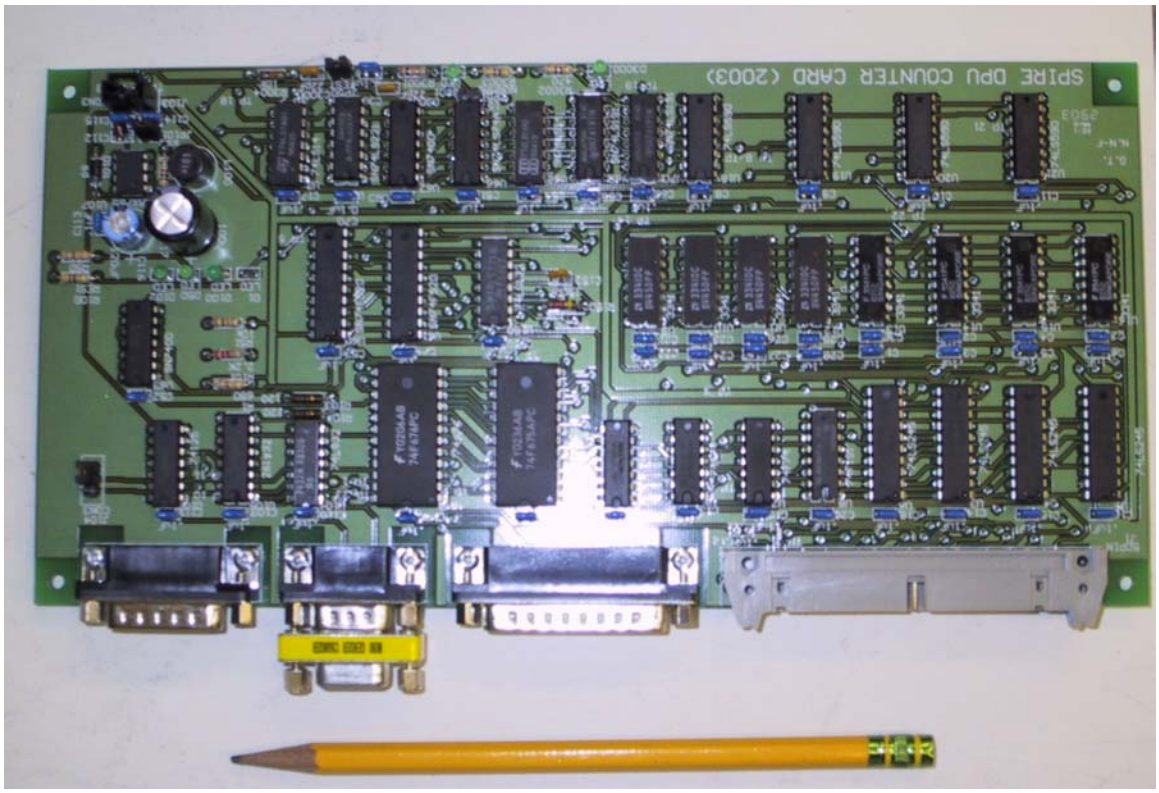

Figure 2: The clock counter board

- The final version of the break-out box has been manufactured after the functionality of the system had been proven on a bread board. Stability tests are currently under way to proof the performance and stability of the board.

Figure 3: The break-out box

- A last set of tests remote tests of the Test Facility FTS has been performed by SPIRE staff at RAL, assisted by staff at the University of Lethbridge. From Lethbridge, Trevor Fulton and Ian Schofield, were involved as SPIRE software developers. At RAL, Sunil Sidher, the SPIRE Operations Scientist, Asier Abreu, Canada's SPIRE instrument control centre (ICC) member permanently deployed at RAL, and Peter Davis, participated in these tests. Tests were successful in proofing that the Test Facility FTS can be fully operated with the Spacecraft Operating System (SCOS) used for the instrument level tests at RAL.
- Graduate and summer students at the University of Lethbridge have implemented a weather station to monitor atmospheric conditions during tests at RAL. Ian Schofield has developed an embedded computer that reads out the weather data. Samuel Ronayette, Canada's SPIRE instrument test team (ITT) member permanently deployed at RAL, has written an interface to integrate the weather station into the Test Facility Control System (TFCS).

Task 3.2: Provide SPIRE Data Analysis Software

- A data analysis toolkit, written in IDL, will allow for flexible and efficient analysis of data collected with the Test Facility FTS. A comprehensive set of modules has been defined and development for most modules has been concluded. Progress has been steady since the group has had extensive experience with data analysis for FTS. Component testing and integration testing are currently under way as well as detailed documentation of the individual modules.

Task 3.3: Canadian SPIRE Team Support

- Preparations for the SPIRE consortium meeting in early October are on-going. Gary Davis from the Canadian Science Steering Committee has canceled his attendance. Currently, three Associate Scientists from Canada will be present at this meeting.

Task 3.4: SPIRE ITT and ICC Support

- Samuel Ronayette, the SPIRE ITT member for Canada at RAL, has done work in LabView to integrate the weather station into the TFCS (see above). He spent more than a week at Cardiff University to assist the assembly and calibration of the cold black body.
- Asier Abreu, the SPIRE ICC member for Canada at RAL, has participated in the remote testing of the Test Facility FTS (see above). He has developed and tested various tests scripts for the instrument level testing at RAL.