

Monthly Progress Report
SPIRE Test Facility and Scientific Support

Contract Number: 9F007-020251/001/SR
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Period: May 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? **Yes.**

Part 2

Task 3.1: Provide SPIRE Test Facility FTS

- After the preliminary alignment of the Test Facility FTS, tests have been performed to verify the integration of the optical hardware, software, and electronics. The functionality of the setup was demonstrated. Problems with the detector (aperture too large) and the alignment (black body not in position) were identified. A smaller aperture was implemented to accommodate the F/8 output beam from the FTS and the black body has been repositioned. Further tests will be necessary to quantify the performance of the instrument. The test setup is equivalent to that required for the verification tests after shipping the Test Facility FTS to RAL.

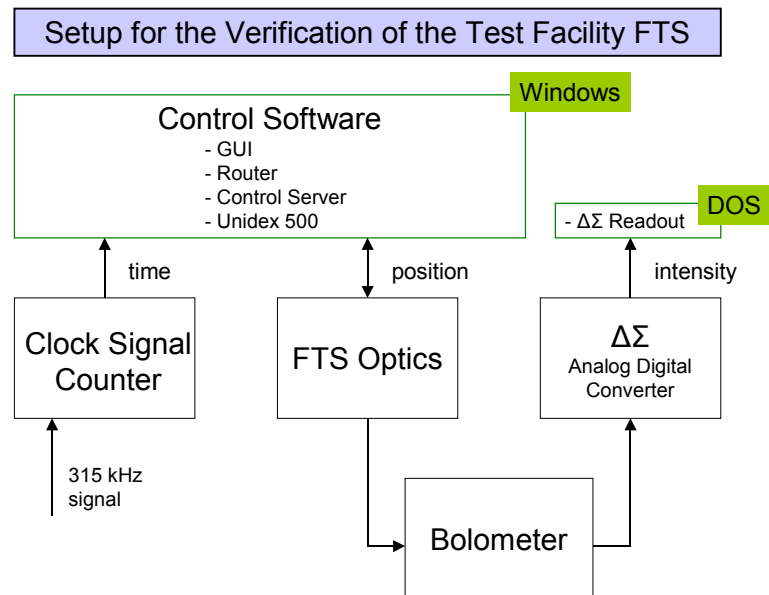


Figure 1: The setup for the integration tests

- A test beamsplitter of the correct thickness has been manufactured and inserted into the optical system.

- The development of the 315kHz clock signal has moved into manufacturing the final product. Based on the successful prototype, Greg Tompkins and Nathan Fitzpatrick have designed a board layout for the clock counter. The board has been milled and verified.
- Tests have been performed to determine the flow rate of dry air necessary to dry out the Test Facility FTS. A flow rate of four litres of dry air per minute has proven to be sufficient to keep the inside of the Test Facility FTS at a level below 1%RH at an ambient relative humidity of 20 – 30 %RH.

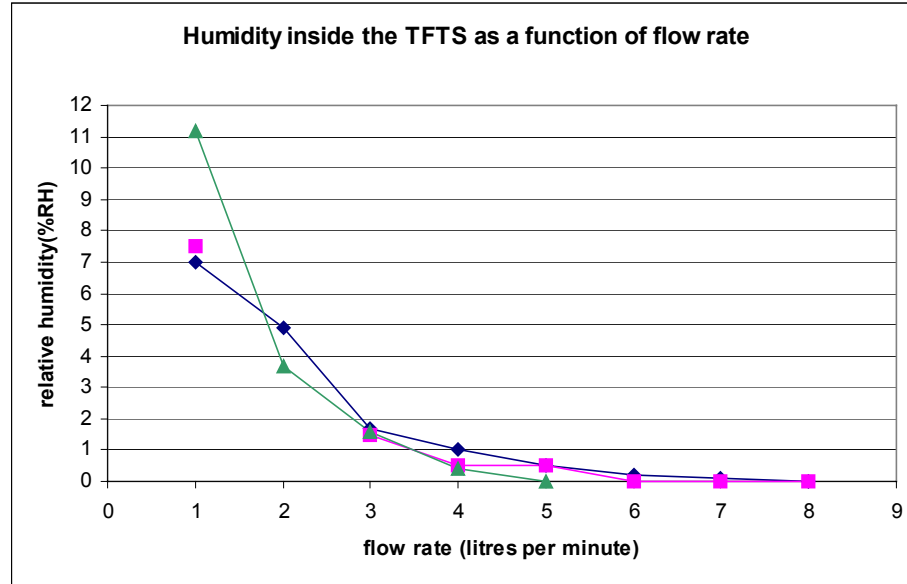


Figure 2: Drying out the Test Facility FTS with dry air

- Darrel Hensing has started to build an automatic weather station to log air temperature, pressure, and humidity. These parameters are necessary input parameters for the atmospheric model that defines the expected spectrum during tests at RAL.
- A final set of tests has been performed on the control software. The control software has been successfully used to collect data overnight. Development is now virtually finished. The next step is to test the integration of the control software with SCOS.
- Trevor Fulton has created a first draft of a User Manual for the control software. Samuel Ronayette, and the two grad students, John Lindner and Locke Spencer, have provided a first round of feedback that will be integrated into the next version.
- Ian Schofield has prepared version 1.2 of the Test Facility FTS Data ICD (SPIRE-UoL-PRJ-001452) which has been approved by CSA, signed by Canadian staff, and submitted to the SPIRE project.

Task 3.2: Provide SPIRE Data Analysis Software

- Trevor Fulton has prepared sample data that simulates stage behavior with a noise in the scanning speed of the linear translation stage that is dominated by a (1) Gaussian jitter, (2) a sinusoidal variation, (3) a combination of both. This test data will serve to determine which interpolation routine will be most effective at merging the raw data from the detector and the Test Facility FTS.
- A number of Java libraries, approved by the Herschel software development team, have been identified that will be used for the data processing routines. JNumeric is the most promising candidate for mathematical operations. However, it provides only limited support for efficient FFT routines. We are looking into using optimized FFT routines developed at MIT.

Task 3.3: Canadian SPIRE Team Support

- The first newsletter for the Canadian Science Steering Committee has been issued.
- A protected section has been added to the Canadian SPIRE website to provide information on the project's progress for the Associate Scientists:
http://research.uleth.ca/spire/assoc_scientists/assoc_scientists.html, login: spire, password: fts
- Registration for the consortium meeting in October is on-going. Two of the five Associate Scientists have indicated their interest to attend so far.

Task 3.4: SPIRE ITT and ICC Support

- Samuel Ronayette, has published a document on Livelink, detailing the Functional Test Specifications for SPIRE (SPIRE-RAL-DOC-001652).
- The IR laser bench in the cryo-lab has been aligned successfully for tests.
- Samuel has arrived in Lethbridge for a two-week visit. He has given a presentation on his work at RAL and he is preparing a report on the Test Facility FTS based on analyses with Zemax©.