



SCUBA-2 FTS Project Office

University of Lethbridge
Physics Department
4401 University Drive
Lethbridge, Alberta
CANADA
T1K 3M4

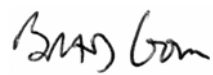
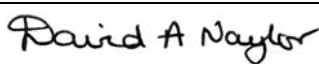

Tel: 1-403-329-2771
Fax: 1-403-329-2057
Email: brad.gom@uleth.ca
WWW: <http://research.uleth.ca/scuba2/>

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Document Prepared By:	B. G. Gom FTS-2 Project Manager	Signature and Date:	 07/11/06
Document Approved By:	D. A. Naylor FTS-2 Project Lead	Signature and Date:	 07/11/06
Document Released By:	J. Molnar Canadian Project Manager	Signature and Date:	 07/11/06

Change Record

Issue	Date	Section(s) Affected	Description of Change / Change Request Reference / Remarks
0.1	14/06/05	All	First draft version
1.0	22/06/05	All	PDR release version
2.0	7/11/06	All	CDR version.
2.1	7/11/06	All	Added commissioning column. Added notes

Executive Summary

This document presents the compliance matrix for the requirements for building a Fourier Transform Spectrometer (FTS) for use with the SCUBA-2 detector on the James-Clerk-Maxwell Telescope. The compliance matrix provides simplified view of the FTS-2 Functional and Performance Requirements (SC2/FTS/SRE/001), in order to show the level of compliance of the system design in its current state.

The level of compliance may vary from full compliance to partial, conditional or no compliance. It may turn out that during the development some requirements become obsolete or get replaced by another one, or that full compliance would make the design unnecessarily complex or unmanageable. Therefore the CM is updated for each major milestone and whenever a significant change occurs relative to an earlier approved document.

Compliance Matrix

The requirements for the FTS-2 system are described in the FTS-2 Functional and Performance Requirements document (SC2/FTS/SRE/001). The following table shows the progress towards meeting the requirements at each of the major project review milestones: PDR, CDR, and ARR.

The 'Comm' column indicates requirements for which compliance can only be fully tested during instrument commissioning.

Notes are given where compliance with the requirement is not obvious.

- TBD The requirement has not been (fully) defined yet.
- Des The requirement is met (or is implicit) in the current state of the design.
- Test Compliance has been tested (if applicable).
- CSA The requirement is met by CSA design and manufacturing procedures.
- TOC A table of contents has been prepared for this manual.
- Doc A (draft) document has been prepared.
- No The current state of the design does not meet the requirement.

Requirement	Description	PDR	CDR	ARR	Comm	Notes
REQ-BAS-001	Atmospheric correction	Des	Des		√	Met by dual-port design
REQ-BAS-002	Beam interference	Des	Des			Confirmed in optical modelling
REQ-BAS-003	Alignment	TOC	Doc			SC2/FTS/OPT/005
REQ-BAS-004	Calibration	TBD	TBD			Spectral calibration is yet TBD
REQ-BAS-005	Availability	Des	Des			
REQ-PER-001	Spectral resolution	Des	Des			See SC2/FTS/OPT/001
REQ-PER-002	FOV	Des	Des			See SC2/FTS/OPT/001
REQ-PER-003	Speed	Des	Test			Met by stage performance
REQ-PER-004	OPD accuracy	Des	Test			Met by stage performance
REQ-PER-005	Acquisition rate	Des	Test			Met by stage performance
REQ-OPE-001	Instrument control	Doc	Des			See SC2/FTS/SYS/005
REQ-OPE-002	Instrument status	TBD	Doc			Full list of diagnostic parameters still TBD.
REQ-OPE-003	Instrument testability	No	TBD			Will be integrated into control SW by ARR
REQ-OPE-004	Observation monitoring	Doc	Doc			See SC2/FTS/SOF/003
REQ-MEC-001	Alignment tools	TBD	Doc			SC2/FTS/OPT/005
REQ-MEC-002	Adjustable support	Des	Des			See mechanical design document
REQ-MEC-003	Feed optics alignment	Des	Des			See mirror mount test document
REQ-MEC-004	Mechanical tolerances	No	No			Will be incorporated into final framework design
REQ-MEC-005	Physical envelope	No	No			Envelope well defined and all internal part locations will allow framework to meet req.
REQ-MEC-006	Electrical connector access	No	No			Will be incorporated into final framework design
REQ-MEC-007	Optics access	Des	Des			
REQ-MEC-008	Mechanism safety	Des	Des			Integral to the mechanism design
REQ-MEC-009	Environmental cover	Des	Des			Cover will be simply attached to outer framework.
REQ-MEC-010	Instrument handling	Des	Des			
REQ-MEC-011	Drawing units	Des	Des			
REQ-MEC-012	Fastener units	Des	Des			
REQ-MEC-013	Alignment maintenance	TBD	TBD		√	Requires modeling and commissioning tests
REQ-MEC-014	Mechanism adjustment speed	Des	Des			Met by actuator performance
REQ-MEC-015	System configuration speed	Des	Des			
REQ-MEC-016	Configuration tolerance	TBD	Des			Still requires testing of PO unit positioning repeatability
REQ-OPT-001	Beam diameter	Des	Des			See optical design
REQ-OPT-002	Mirror finish	Des	Des			Included in mirror specs
REQ-OPT-003	Optical mount precision	Des	Test			See optical mount tests
REQ-OPT-004	Rooftop adjustability	Des	Des			See optical mount tests

REQ-OPT-005	Beamsplitter adjustability	Des	Des			Follows from optical mount tests
REQ-CON-001	Control PC	Des	Des			
REQ-CON-002	Control SW	Des	Des			
REQ-CON-003	Controlled mechanisms	Des	Des			
REQ-CON-004	Configuration time	TBD	TBD			Requires testing during integration
REQ-CON-005	Mechanism accuracy	Des	Des			
REQ-CON-006	Impact on scientific perf.	TBD	Des			Requires testing during integration
REQ-ELE-001	Power supply	Des	Des			
REQ-ELE-002	Grounding and shielding	TBD	TBD			Grounding scheme requires JAC input
REQ-ELE-003	Electrostatic discharge	Des	Des			All devices have shielded enclosures
REQ-ELE-004	Ventilation	Des	Des			
REQ-ENV-001	Transport altitude range	Des	Des			Environmental requirements met by all subcomponents
REQ-ENV-002	Storage altitude range	Des	Des			"
REQ-ENV-003	Operation altitude range	Des	Des			"
REQ-ENV-004	Operation temperature range	Des	Des			"
REQ-ENV-005	Storage temperature range	Des	Des			"
REQ-ENV-006	Humidity ranges	Des	Des			"
REQ-EXT-001	JCMT support structure	TBD	Des			pads incorporated into N1 framework
REQ-EXT-002	Optical feed	Des	Des			
REQ-EXT-003	Power interface	Des	Des			
REQ-EXT-004	Power connectors	TBD	TBD			Requires input from JAC
REQ-EXT-005	Network connectors	Des	Des			
REQ-EXT-006	RTS interface	Des	Des			
REQ-EXT-007	RTS cabling/connectors	TBD	TBD			Requires input from JAC
REQ-EXT-008	DV cabling/connectors	TBD	TBD			Signal conditioning TBD
REQ-DR-001	Data reduction speed	Des	Des			See DR document benchmarks
REQ-DR-002	DR calibration	TBD	TBD			Calibration techniques and schedule yet TBD
REQ-DR-003	DR file format	Des	Des			
REQ-DR-004	Processing modules	Des	Des			See DR engine document
REQ-SW-101	Display packages	Des	Des			
REQ-SW-102	HW status display	Doc	Doc			SC2/FTS/SOF/003
REQ-SW-103	QL display of obs progress	Doc	Doc			SC2/FTS/SOF/003
REQ-SW-104	Stripchart display	Doc	Doc			SC2/FTS/SOF/003
REQ-SW-105	QL refresh rate	TBD	TBD			Requires testing
REQ-SW-106	SED QL display	Doc	Doc			SC2/FTS/SOF/003
REQ-SW-107	Spectral Line QL display	Doc	Doc			SC2/FTS/SOF/003

REQ-SW-001	Software standards	Des	Des			
REQ-SW-002	JCMT workstation interface	Des	Des			
REQ-SW-003	SW interface standards	Des	Des			
REQ-SW-004	OCS communication	Des	Des			
REQ-SW-005	Engineering interface	TBD	TBD			Further specifications needed. Engineering interface will be developed before ARR
REQ-SW-006	Engineering capabilities	TBD	TBD			
REQ-SW-007	DRAMA mechanism control	Des	Des			
REQ-SW-008	Control SW overhead	TBD	TBD			Requires testing
REQ-SW-009	Mechanism control accuracy	TBD	Des			
REQ-SW-010	Software performance tests	TBD	TBD			
REQ-DOC-001	Documentation	No	No			All documentation requirements will be met for ARR
REQ-DOC-002	Users manual	No	No			"
REQ-DOC-003	Service/calibration manual	No	No			"
REQ-DOC-004	SW Maintenance manual	No	No			"
REQ-DOC-005	As-built drawings	No	No			"
REQ-DOC-006	Drawing standards	Des	Des			"
REQ-DOC-007	Drawing numbers	Des	Des			"
REQ-DOC-008	Drawing file system	No	No			"
REQ-DOC-009	Training	No	No			"
REQ-FPR-001	Downtime	TBD	TBD		√	Failure mode analysis needed
REQ-FPR-002	Spares	TBD	TBD			Required spares yet TBD
REQ-FPR-003	Continuous duty	Des	Des			Met by actuator selection
REQ-FPR-004	Standard components	Des	Des			
REQ-FPR-005	Modularity	Des	Des			
REQ-FPR-006	Access	No	No			Will be incorporated in final framework design
REQ-FPR-007	Optical alignment	No	No			Will be incorporated in final framework design
REQ-FPR-008	Equipment location	No	No			Will be incorporated in final framework design
REQ-FPR-009	Subassembly access	No	No			Will be incorporated in final framework design
REQ-FPR-010	Handling	No	No			Will be incorporated in final framework design
REQ-FPR-011	Ease of inspection	TBD	Des			Custom electronics may not be required
REQ-FPR-012	Lifetime	Des	Des			No conflicts identified
REQ-FPR-013	Toxic materials	Des	Des			
REQ-FPR-014	Magnetic fields	Des	Test			Confirmed by gaussmeter tests.
REQ-FPR-015	EMR generation	TBD	TBD			EMR tests will occur before ARR
REQ-FPR-016	EMR susceptibility	Des	Des			No conflicts identified

REQ-FPR-017	Workmanship	Des	Des			
REQ-FPR-018	Safety	Des	Des			
REQ-FPR-019	Human engineering	No	No			Will be incorporated in final framework design