

MODS

Project Documentation Standards

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1 Introduction

1.1 Scope

This document describes procedures and standards for documentation for the MODS project. It is intended to extend to all documentation generated by the MODS project starting in July 2003.

1.2 Reference Documents

1. *MODS: A Multi-Object Double Spectrograph for the LBT*, Preliminary Design Review Document, 2001 June 11
(<http://www.astronomy.ohio-state.edu/LBT/MODS/PDR/pdr.pdf>)
2. *Data elements and interchange formats - Information interchange - Representation of dates and times*. (ISO8601). International Organization for Standardization (2002 Dec 12).
3. *Definition of the Flexible Image Transport System (FITS)*, NOST 100-2.0, NASA/Science Office of Standards & Technology, 1999 March 29

1.3 List of Abbreviations and Acronyms

CAD	Computer Aided Design
DWG	Vector drawing format (AutoDesk)
DXF	Drawing eXchange Format (AutoDesk)
EPS	Encapsulated PostScript (Adobe Systems Inc)
FITS	Flexible Image Transport System
GIF	Graphics Interchange Format (image format)
HTML	HyperText Markup Language
IAU	International Astronomical Union
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group (image format)
LBT	Large Binocular Telescope
LBTO	Large Binocular Telescope Observatory
LBTPO	Large Binocular Telescope Project Office
MODS	Multi-Object Double Spectrograph
MPEG	Moving Pictures Expert Group (video/audio format)
NASA	National Aeronautics and Space Administration (US)
NOST	NASA Office of Standards and Technology
OSU	The Ohio State University
PDF	Portable Document Format (Adobe Systems, Inc)
TIFF	Tagged Image File Format (image format)
Y2K	Year 2000

2 Specification of Dates and Times

Dates and times given in all MODS project documents shall use the ISO8601 standard format. This format has wide international acceptance and is designed to avoid regional variations and ambiguities, especially in writing shorthand numerical forms of calendar dates.

The IAU has officially adopted ISO8601 date/time specification.

2.1 Calendar Date Specification

Dates shall be given in one of two ISO8601 compliant formats:

Numerical Form:

CCYY-MM-DD

where:

CCYY is the year in Y2K form (e.g., 2001, 1998),
MM is the month number, 01-12, including leading zeroes, and
DD is the day of the month (01-31) including leading zeroes.

Example:

2003-06-15 = June 15, 2003

Hybrid Form:

CCYY Month Day#

where:

CCYY is the year in Y2K form (e.g., 2003, 1998)
Month is the unabbreviated English name of the month (e.g., January, February, etc.)
Day# is the day of the month without leading zeroes (e.g., 1-31)

Example:

2003 January 12

No exceptions to the date specification rules are permitted.

2.2 Time of Day Specification

Times shall be specified in standard 24-hour HH:MM(:SS) format including the time zone.

Examples:

12:14 EDT

19:27:15 UTC

The level of precision used will be as appropriate in context.

No time shall be given without an explicit specification of the time zone, although if many times are used in a document, the first appearance of a time should be accompanied by a note that all times in the document shall be specified in a particular time zone unless otherwise noted. Thus, if a document adopts Eastern Standard Time (EST), any UTC times should be quoted with the time zone included explicitly.

3 Official Project Documents

3.1 Document Composition

All MODS project official documents are to be composed using Microsoft Word, to be at least compatible with MSWord 2000 and later versions.

3.1.1 Standard Word Template

All MODS project documents shall use the MODS Project Document template, which defines the styles for section headings, paragraph spacing, numbered and bulleted lists, etc. This style also provides for a standard title page and tracking table format (see §3.2 for details). A copy of the MS Word template is available online at

<http://www.astronomy.ohio-state.edu/LBT/MODS/Docs/Templates/MODSTemplate.doc>.

This document was composed using the standard template.

3.1.2 Font and Type Size

All MODS project documents shall be composed in Times New Roman font with 12-point body text.

3.1.3 Table of Contents

All MODS project documents shall include a table of contents.

3.2 Document Serialization and Tracking

A simple document tracking system is used to give each document a unique serial number, track revisions and distribution. This document serial number is used to index the document on the project web page for electronic distribution.

3.2.1 Document Serial Numbering

All MODS documents will be assigned serial numbers in the format

OSU-MODS-CCYY-###

where CCYY is the year in Y2K compliant format, and ### is a sequence number starting with 001 for that calendar year. The exception is this document, which is assigned serial number OSU-MODS-2003-000.

Document serial numbers are assigned using a webform on the MODS online documentation webpage (<http://www.astronomy.ohio-state.edu/LBT/MODS/Docs/requestid.html>). This webform ensures that document serial numbers don't conflict. You can register ID numbers in advance of finishing the document.

3.2.2 Document Version Numbers

All documents shall be assigned version numbers, with the X.Y numbering convention, where X denotes major revisions, and Y denote minor (incremental) revisions. Basic usage:

0.Y = Rough (pre-release) drafts of a document are numbered

1.0 = First release version.

2.Y = Second major release, Y-th incremental release, etc.

The version number shall appear on the title page (in the Document Info block), in the Document Revision History table (page 2), and in the headings of odd-numbered text pages (starting with page 3).

The author of the document assigns version numbers. Authors have primary responsibility for keeping version numbers and internal tracking information updated in the document and on the online documentation database.

3.2.3 Distribution List

All documents shall include a distribution list appearing on page 2, that records insofar as known, the persons receiving official copies, their institution, and the number of copies distributed.

Document authors are responsible for tracking distribution of their document.

3.3 Electronic Distribution Format

All MODS project documents will be distributed electronically in Adobe PDF. MSWord, PowerPoint, etc. are only to be used for document composition. At present, PDF has emerged as the only stable multi-platform documentation standard, and has wide acceptance both within the astronomical community and on the World Wide Web.

An online documentation database for MODS has been setup that provides tools for requesting document serial numbers (§3.2.1), uploading new documents to the database, uploading revised versions of existing documents, and editing database entries. Complete instructions for using this database may be found on the MODS webpage at <http://www.astronomy.ohio-state.edu/LBT/MODS/Docs/Internal/docsub.html>. These tools allow all Team MODS personnel with access to a web browser to submit documents to the online document database.

4 Working and Presentation Documents

Working documents include memos, worksheets, and other “unofficial” documents for internal consumption. Presentation documents are formal presentations given to internal or external bodies (e.g., a PowerPoint presentation given as part of a project review). In both cases, the format is up to the individual, though we recommend use of a standardized MODS PowerPoint template, especially for official presentations.

4.1 PowerPoint Template

For official presentations, we recommend the use of a standard PowerPoint template file. A copy of this template is available online at

<http://www.astronomy.ohio-state.edu/LBT/MODS/Docs/Templates/PPTTemplate.ppt>

This template includes spaces for addition a document serial number (§3.2.1), the OSU Logo, and other features.

4.2 Document Serialization and Tracking

A serial number will be assigned when a version of the PowerPoint document is ready to be placed on the project website. A serial number may be obtained using the online request form

(see §3.2.1). Serial numbers for PowerPoint presentations are the same as those used for other Project documents (e.g., OSU-MODS-2003-001).

No version or distribution tracking is required for working/presentation documents that are not intended for posting on the online document website, although we encourage the posting of progress and technical reports by all Project personnel, as these provide a valuable record of the project, and are more often than not useful reference documents.

4.3 Electronic Distribution

Working and presentation documents shall be converted into PDF format for electronic distribution and posting on the online documentation website (see §3.33.2.1). No working or presentation document shall be distributed in raw (“original”) format; as such formats are not guaranteed to be portable, can unwittingly carry computer viruses, etc. PDF has emerged as the de facto international standard for electronic document exchange.

5 Mechanical and Optical Drawings

The MODS project has adopted AutoDesk’s AutoCAD 2000 and Mechanical Desktop v4.0 for all mechanical drawings, and has frozen our versions to eliminate upgrade conversion problems.

All MODS optics have been designed using Optical Research Associates Code-V optics design program.

5.1 Mechanical Drawings

5.1.1 Part and Assembly Drawings

Part and assembly drawings for MODS will be made in both AutoCAD 2000 DWG vector drawing format and DXF drawing exchange format files.

5.1.2 Solid Models

Solid models of MODS mechanical and optical components will be made available in Mechanical Desktop v4.x compatible DWG files.

5.2 Optical Designs

All MODS optical design specifications will be stored in ASCII format as Code-V compatible .seq macro files.

5.3 Electronic Drawings

Electronic drawings refer to all MODS electronic components that are built custom, and excludes commodity units incorporated into the MODS system. This includes schematics of custom circuitry and power systems, printed circuit boards, and other electrical or electronic systems (e.g., enclosures, mountings, etc.).

5.3.1 Schematics and Assembly Drawings

Circuit schematics and module assembly drawings (e.g., enclosures containing couplings, mounting points for boards, etc.) will be made in AutoCAD 2000 DWG vector drawing format files.

5.3.2 Printed Circuit Boards

All custom printed circuit boards designed for MODS are created using PADS (Mentor Graphics Inc). PADS uses its own internal format, which is a generally implemented industry standard for the creation of complex printed circuit boards.

6 Digital Images and Movies

Electronic images include the following categories of still and moving images:

1. Digital photographs acquired ab initio with a digital camera
2. Film photography that has been digitized from negative or print sources.
3. Computer-generated graphics (e.g., renderings from AutoCAD).
4. Reproductions of instrument data images (e.g., taken with the science detectors, acquisition/guide cameras, or wavefront sensor arrays).
5. Digitized movies of physical scenes (e.g., a movie of a filter wheel test).
6. Computer-generated animations.
7. Raw science, guiding, or wavefront sensor images.

6.1 Still Image Formats

All electronic still images used in project documentation shall be in one of 3 standard formats:

1. JPEG
2. GIF
3. TIFF

The use of these formats should be informed by these guidelines:

1. JPEG is preferred for all “scenes” in which detailed pixel data do not need to be retained.
2. GIF is preferred for electronic versions of line drawings or diagrams
3. TIFF is reserved for images where the full pixel fidelity is required.

All other formats are specifically deprecated.

6.2 Moving Image Formats (Video and Animations)

Digital versions of moving images used for MODS project documentation shall be made in one of two formats:

1. MPEG
2. QuickTime

Both formats have wide acceptance. All other formats (AVI, animated GIF, etc.) are deprecated. Movies may or may not include soundtracks.

6.3 Optional Image Format Issues

Where appropriate, the following parameters shall be observed for the various image formats

1. GIF: non-interlaced and no transparency.
2. TIFF: MS-word format, no Macintosh or LZW compression.
3. JPEG: compression appropriate to the scene being depicted
4. MPEG: use of standard CODECs should be observed.
5. QuickTime (MOV): no Macintosh-specific CODECs or compression.

6.4 Raw instrument data images

All MODS project raw instrument data shall be in a format compliant with the FITS standard adopted in 1999 and defined by NOST Standard document 100-2.0. This is the version of the FITS standard adopted by the IAU. This includes data from the science, guiding, and wavefront sensing arrays.

7 Software Documentation

All software will be documented internally (comments embedded in the source code and supporting files), as well as externally, in the form of HTML documents available online, or converted into PDF for hardcopy distribution. In addition, the MODS project will also create Users Manuals and Design Documents.

7.1 Source Code Documentation

All C/C++ code written for MODS will use the Doxygen document generation system (www.doxygen.org), the same standard adopted by the LBTP0. All source code modules shall use standard Doxygen embedded comment markup to provided for both internal and generated external source code document generation. The MODS project has adopted Qt-style markup, though variations as it suits the needs of the developer may be used, but no external stylesheets or other auxiliary files not easily exported shall be used to ensure portability.

Doxygen output will be in the form of HTML and LaTeX, the latter setting the USE_PDFLATEX option to YES to ensure that LaTeX can generate high-quality PDF files.

7.2 User Manuals

All user manuals for MODS software systems will be written HTML and made available online at OSU and at LBTO mirror sites. Hardcopies in PDF format, generated from the HTML source, will also be created.

7.3 Software Design Documents

All software design documents will be composed in Microsoft Word using the standard MODS document template (§3.1.1), and converted to PDF for online distribution. Supplementary documents composed with other programs (e.g., PowerPoint presentations) must be converted into PDF for distribution on the project website.