



Navigation and Ancillary Information Facility

Using Module Headers

April 2023



Topics

Navigation and Ancillary Information Facility

- **Module* Header Purpose**
- **FORTRAN Module Header Locations**
- **C Module Header Locations**
- **Icy Module Header Locations**
- **Mice Module Header Locations**
- **Examine a Typical Header**

* “Module” = API, routine, subroutine, procedure, function



Module Header Purpose

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- **NAIF uses module “headers” to provide detailed information describing how to use the module**
 - In FORTRAN, C and MATLAB Toolkits the “headers” are comment blocks inserted in the source code
 - In IDL Toolkits, where there are (currently) no source code files, the “headers” exist as independent files
- **All Toolkit distributions include hyperlinked HTML versions of the module headers.**
 - All but ICY also include plain text versions
- **The next charts provide the header contents and locations**

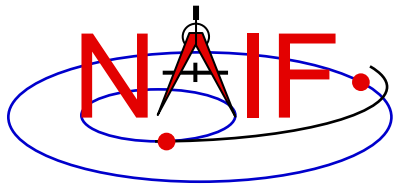


Module Header Contents

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- Procedure or subroutine name
- Brief abstract
- Disclaimer (legalese required for JPL code; in Fortran, C, and Matlab)
- Required Reading (names of any related SPICE technical reference documents)
- Keywords (single relevant words; in Fortran and C; not really used)
- Argument type declarations, or Include files
- Brief Input and Output descriptions
- Detailed Input descriptions
- Detailed Output descriptions
- Parameter definitions, if any
- Exceptions (what happens if a problem is detected)
- Descriptions of any files used
- Particulars (details about what the module does, how it works, any limitations)
- Code usage example(s)
- Restrictions in usage of the module
- Literature references
- Author
- Version
- Index entries (brief phrases used to generate entries for the Permuted Index document)
- Revision history (in Fortran)

The source code goes here!



Fortran Module Header Locations

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- **Plain text versions:**

- **<path to SPICELIB>/toolkit/src/spicelib/<name.f> or <name>.for**
- In most cases there is a single “header” at the top of the source code. For cases where a FORTRAN module has multiple entry points, there are additional “headers” at each entry point. For example:
 - » “keeper.f” has entries for:
 - FURNISH, KTOTAL, KINFO, KDATA, KCLEAR, and UNLOAD

- **HTML versions:**

- **<path to SPICELIB>/toolkit/doc/html/spicelib/index.html**



C Module Header Locations

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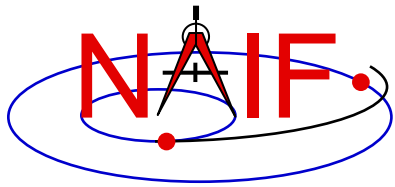
- **Plain text versions:**
 - [<path to CSPICE>/cspice/src/cspice/<name>_c.c](#)
- **HTML versions:**
 - [<path to CSPICE>/cspice/doc/html/cspice/index.html](#)



IDL Module Header Locations

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- **Two sets of headers are provided**
 - Icy headers in HTML format:
 - » `<path to icy>/icy/doc/html/icy/index.html`
 - CSPICE headers, in text and HTML formats:
 - » `<path to icy>/icy/src/cspice/<name>_c.c`
 - » `<path to icy>/icy/doc/html/cspice/index.html`
- **The information provided in an “Icy” header is minimal in some cases; the corresponding CSPICE header provides more detail**
 - A link to the corresponding CSPICE header is provided in the Icy header



Matlab Module Header Locations

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- **Two sets of headers are provided**
 - Mice headers in HTML format:
 - » **<path to Mice>/mice/doc/html/mice/index.html**
 - » Also available using the Matlab `help` command, e.g.:

```
>> help cspice_str2et
```
 - CSPICE headers, in text and HTML formats:
 - » **<path to Mice>/mice/src/cspice/<name>_c.c**
 - » **<path to Mice>/mice/doc/html/cspice/index.html**
- **The information provided in a “Mice” header is minimal in some cases; the corresponding CSPICE header provides more detail**
 - A link to the corresponding CSPICE header is provided in the Mice header



Examine a Typical Header

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- As example, look for and examine the headers for the modules named **spkezt** and **str2et**

FORTRAN	C	IDL (lcy)	MATLAB (Mice)
SPKEZR	spkezt_c	cspice_spkezt	cspice_spkezt
STR2ET	str2et_c	cspice_str2et	cspice_str2et

spkezt is the principal ephemeris access module
str2et is a key time conversion module