Using Module Headers
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
• 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

Navigation and Ancillary Information Facility

- Procedure or subroutine name
- Brief abstract
- Disclaimer (legalese required for JPL code)
- Required Reading (names of any related SPICE technical reference documents)
- Keywords (single relevant words; not really used)
- Argument type declarations, or Include files (for C and Fortran toolkits)
- 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 Permutated Index document)
- Revision history (only in Fortran headers)

The source code goes here!

ICY and MICE headers contain only the items shown in blue; see the corresponding CSPICE header for full details.
Fortran Module Header Locations

- 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:
      - FURNSH, KTOTAL, KINFO, KDATA, KCLEAR, and UNLOAD

- HTML versions:
  - `<path to SPICELIB>/toolkit/doc/html/spicelib/index.html`
C Module Header Locations

• Plain text versions:
  – <path to CSPICE>/cspice/src/cspice/<name>_c.c

• HTML versions:
  – <path to CSPICE>/cspice/doc/html/cspice/index.html
• 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
Two sets of headers are provided

- Mice headers in HTML format:
  - \texttt{<path to Mice>/mice/doc/html/mice/index.html}
  - Also available using the \texttt{Matlab help} command, \texttt{e.g.:}
    - \texttt{help cspice_str2et}
- CSPICE headers, in text and HTML formats:
  - \texttt{<path to Mice>/mice/src/cspice/<name>._c.c}
  - \texttt{<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

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

<table>
<thead>
<tr>
<th>FORTRAN</th>
<th>C</th>
<th>IDL (Icy)</th>
<th>MATLAB (Mice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPKEZR</td>
<td>spkezr_c</td>
<td>cspice_spkezr</td>
<td>cspice_spkezr</td>
</tr>
<tr>
<td>STR2ET</td>
<td>str2et_c</td>
<td>cspice_str2et</td>
<td>cspice_str2et</td>
</tr>
</tbody>
</table>

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