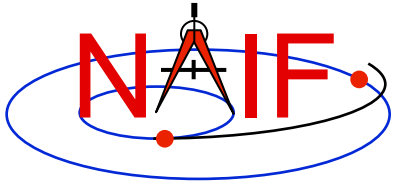


Navigation and Ancillary Information Facility

SPICE Toolkit Common Problems

April 2016



Topics

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- **Prevention**
- **Useful Documentation**
- **Reporting a Problem to NAIF**



Prevention - 1

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- **Get well set up to use SPICE**
 - Use a Toolkit obtained directly from NAIF and intended for your specific environment (platform/OS/compiler/compiler options)
 - » Be extra careful about **32-bit** versus **64-bit** hardware
 - Use a current Toolkit
 - » Newer Toolkits may have bug fixes and new features you need
 - Toolkits are always backwards compatible, so you should have no problem re-linking your application to the latest Toolkit
 - Read the pertinent documentation
 - » Tutorials, module headers, Required Reading technical reference documents, comments inside kernels
 - Use the correct kernels
 - » Often, but not always, this means the latest version
 - » Verify that contents, time coverage (if applicable) and intended use are suitable for your work
 - If you are using a Fortran Toolkit, be sure your text kernels all use the line termination appropriate for your platform.
 - » Unix/Linux/OSX use <LF>; PC/Windows uses <CR><LF>
 - » Using the BINGO utility from the NAIF website to make the change, if needed, is one solution



Prevention - 2

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- **Avoid common implementation problems**
 - **Verify use of the correct time system for your need**
 - » e.g., TDB, UTC, or SCLK?
 - **When using SCLK time tags, be sure to form your SCLK string to match the specification within the SCLK kernel**
 - » **Make sure the fractional part is in the form that is expected**
 - **Verify that correct reference frames are used**
 - » e.g., MOON_PA versus MOON_ME?
 - » e.g. use IAU_Mars or MARSIAU?
 - **Check definitions of geometric quantities**
 - » **Geodetic versus latitudinal coordinates**
 - » **Oblate versus spherical body shapes**
 - **Check aberration corrections**
 - » **Converged Newtonian light time + stellar aberration, light time + stellar aberration, light time only, or none?**
 - » **Target orientation corrected for light time?**
 - **Don't confuse an instrument reference frame ID with the ID of the instrument itself (the object ID)**



Useful Documentation

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- **NAIF has compiled a list of common problems, probable causes, and solutions encountered by users of the various SPICE Toolkits:**
 - Refer to `.../doc/html/req/problems.html` or `...doc/req/PROBLEMS.REQ`, both of which are provided in each Toolkit package. Or, access the HTML document corresponding to the supported language at:
 - » http://naif.jpl.nasa.gov/pub/naif/toolkit_docs/FORTRAN/req/problems.html
 - » http://naif.jpl.nasa.gov/pub/naif/toolkit_docs/C/req/problems.html
 - » http://naif.jpl.nasa.gov/pub/naif/toolkit_docs/IDL/req/problems.html
 - » http://naif.jpl.nasa.gov/pub/naif/toolkit_docs/MATLAB/req/problems.html
- **Some on-line tutorials (e.g. SPK and CK) include a common problems section near the end of the tutorial**
- **It may be useful to read these documents BEFORE embarking on extensive SPICE-based programming projects, since some problems are best solved early in the software development cycle**



Reporting a Problem to NAIF

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- **If you need help troubleshooting a programming or usage problem, you can send email to NAIF. At a minimum include these items in your email message:**
 - The SPICE or operating system diagnostic messages written to the screen or to log files
 - The name and version of the operating system you're using
 - The name and version of the compiler or programming environment (gcc, gfortran, ifort, clang, IDL, Matlab, etc.)
 - The Toolkit version you use, e.g. N0065 (also called N65)
 - Names of the kernel files being used
 - » You may need to provide the kernels themselves if these are not available to NAIF
 - Your inputs to the SPICE modules that signaled the error
 - If possible, a code fragment from where the error seems to occur
- **Send the email to only one person on the NAIF team**
 - It will get routed to the best person to provide an answer
 - Contact information: <http://naif.jpl.nasa.gov/naif/contactinfo.html>