SPICE Toolkit
Common Problems

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• Prevention
• Useful Documentation
• Reporting a Problem to NAIF
• 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 “old” 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 is one solution
  – Be sure the last line in your text kernel ends with an end of line termination
• Avoid common implementation problems
  – Verify use of the correct time system for your need
    » e.g., TDB (also called ET), 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 versus IAU_MOON?
    » e.g. IAU_Mars versus MARSIAU? (these are VERY different frames)
  – Check definitions of geometric quantities
    » e.g. Planetocentric vs. planetographic vs planetodetic coordinates
    » Oblate, spherical or DSK body shape
  – 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)
• NAIF has compiled a list of common problems, probable causes, and solutions:
  – 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:

• 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
• If you need help troubleshooting a programming or usage problem, you can send email to NAIF. Try to 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’re using, e.g. N0066 (also called N66)
  – Names of the kernel files being used
    » Include any meta-kernel you’re using
    » 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: https://naif.jpl.nasa.gov/naif/contactinfo.html