spool2eop utility

John Gipson

2022-06-30

*spool2eop* will read a spool file and output an eop file in the new eop v3.0 format. Syntax

spool2eop control\_file

Some key features:

1. The program compiles under gfortran.
2. The program uses a control-file to specify inputs. The control file consists of Keyword Value(s) pairs.
3. The directory *example* has a few example control files and output.
4. The directory *data* contains data used in some of the example control files.
5. The directory *output* contains some output which uses the example control file.

*spool2eop* will read through the spoolfile and extract the eop information. It will look at the control file section of the spool file find information about what EOP parameters were estimated and what the constraints were. It will also read the $MAPPING section of the control file to determine what a priori models were used. These filenames will be included in the output file.

For example, suppose the $MAPPING section of the control file included the lines:

|  |
| --- |
| SOURCES /sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v1.src  STATIONS /sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v2\_mcg.pos  VELOCITIES /sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v2\_mcg.vel  EARTH\_ORIENTATION /sgpvlbi/apriori/calc/usno\_finals.erp SPL UT1S |

Then the eop output file contain lines that look like this:

|  |
| --- |
| EOP\_APRIORI /sgpvlbi/apriori/calc/usno\_finals.erp  CRF\_APRIORI /sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v1.src  TRF\_APRIORI Position= /sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v2\_mcg.pos Velocity=/sgpvlbi/projects/jgipson/2021c\_csolve\_jmg/models/2021c\_v2\_mcg.vel |

Some information, such as the name of the Analysis Center, or the contact information, is not present in the spoolfile. Spool2eop gets this information from the control-file.

In addition, information in the control file will override information from the spool file. For example, you might want to use a different description then that in the control file, or you may want to replace the a priori files by a description instead of a file. (e.g., 2021c\_source for the source position).

The following page gives a complete list of keywords.

Comments/questions/suggestions are welcome.

[John.Gipson@nviinc.com](mailto:John.Gipson@nviinc.com)

The following tables lists all of the current keywords and gives a description of their function.

|  |  |
| --- | --- |
| Required Keywords  These keywords formation required. | |
| ANALYSIS\_CENTER | Institute responsible for producing this file. |
| CONTACT | Who to contact with questions |
| LEAP\_SECOND\_FILE | Path to leap second file. |
| EOP\_FILE | Output file |
| MASTER\_DIR | Directory where all masterfiles are store, e.g. master79.txt, etc. |
| NSCODES\_FILE | Path to of ns-codes file. |
| NUTATION\_TYPE | One EQUINOX-BASED or CIO-BASED.  This keyword is not strictly required. If absent we assume CIO-BASED  Note that EQUINOX based is with respect to Wahr. |
| SPOOL\_FILE | Spool file to process |

|  |  |
| --- | --- |
| Override Keywords  Spool2eop tries to extract some information from the spool file.  If these keywords are present, then these values are overridden. | |
| AGENCY | Three letter code |
| DESCRIPTION | Description of solution. If absent, pulled from control file. |
| CRF\_APRIORI | If absent, uses path to source mod-file. |
| TRF\_APRIORI | If absent, uses path to position and velocity mode file. |

The following tables lists all of the current keywords and gives a description of their function.

|  |  |
| --- | --- |
| Sigma Threshold Keywords  If any of the sigmas is larger than the corresponding value then all eop values are ignored for the session.  All values are in micro-arcseconds OR micro-time-seconds | |
| XWOB\_SIG\_MAX  XPOLE\_SIG\_MAX | Maximum sigma for x-pole |
| YWOB\_SIG\_MAX  YPOLE\_SIG\_MAX | Maximum sigma for y-pole |
| UT1\_SIG\_MAX | Maximum sigma for UT1 |
| NUT\_DPSI\_SIG\_MAX  NUT\_DX\_SIG\_MAX | Maximum sigma for nutation Psi or DX |
| NUT\_DEPS\_SIG\_MAX  NUT\_DY\_SIG\_MAX | Maximum sigma for nutation Eps or DY |

Example Control File 1

|  |
| --- |
| !This is an example control file for spool 2 eop.  !  ! Comment line start with "!" and are ignored.  ! Any values here override what is found in the spoolfile  MASTER\_DIR data/  SPOOLFILE data/2021c\_v3\_mcg\_bak.spl  NSCODES\_FILE data/ns-codes.txt  LEAP\_SECOND\_FILE data/ut1ls.dat  EOP\_FILE example/example1.eop  CONTACT John.M.Gipson@nasa.gov  ANALYSIS\_CENTER NASA Goddard Spaceflight Center  ! If below is commented out, take description from spool file  !DESCRIPTION This is a test  ! Specify the type of nutation to extract. The spool file contains both. If none is specified use CIO\_BASED  NUTATION\_TYPE CIO\_BASED !This is default. Alternative is EQUINOX\_BASED  !  ! Other possible keywords follow.  !TRF\_APRIORI Fantastic  !CRF\_APRIORI Elastic  !EOP\_SUBDAILY Spastic  !AGENCY FBI !3-letter agency code |

Example Control File 2

|  |
| --- |
| This is an example control file for spool 2 eop.  !  ! Comment line start with "!" and are ignored.  ! Any values here override what is found in the spoolfile  MASTER\_DIR data/  SPOOLFILE data/2021c\_v3\_mcg\_bak.spl  NSCODES\_FILE data/ns-codes.txt  LEAP\_SECOND\_FILE data/ut1ls.dat  EOP\_FILE example/example2.eop  CONTACT John.M.Gipson@nasa.gov  ANALYSIS\_CENTER NASA Goddard Spaceflight Center  ! Use the description below instead of what is in the spool file  DESCRIPTION This is a test illustrating different keywords.  ! Specify the type of nutation to extract. The spool file contains both. If none is specified use CIO\_BASED  NUTATION\_TYPE EQUINOX\_BASED  !  ! Other possible keywords follow.  TRF\_APRIORI Fantastic  CRF\_APRIORI Elastic  EOP\_SUBDAILY Spastic  AGENCY FBI !3-letter agency code  ! Some keywords that limit the maximum EOP written out. All values are micro-arcseconds or microseconds  ! If a session has an eop sigma larger than below, it is not written out.  ! If a value is 0, or not specified, then no filtering is done.  UT1\_SIG\_MAX 4 !  XWOB\_SIG\_MAX 200 ! Also called XPOL\_SIG\_MAX  YWOB\_SIG\_MAX 200 ! Also called YPOL\_SIG\_MAX  NUT\_DPSI\_SIG\_MAX 500 ! Could also have NUT\_DX\_SIG\_MAX  NUT\_DEPS\_SIG\_MAX 500 ! Could also have NUT\_DY\_SIG\_MAX |