

Description of the keywords of control language

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Abstract

This document provides detailed description of syntax of the language used for specification of control files for software.

1 \$SETUP

This section determines the solution's general characteristics.

1.1 SOLUTION

SOLUTION [INDEPEND or GLOB]

The SOLUTION keyword specifies the solution's type.

INDEPEND - single session solution

GLOB - global solution

1.2 QUALCODE_LIMIT

QUALCODE_LIMIT number

The QUALCODE_LIMIT keyword specifies the data quality.

number - the quality number, can be from 0 to 9

1.3 WEIGHT

WEIGHT [NO or IN or BL]

The WEIGHT keyword specifies the weight mode.

NO - means no corrections to weights will applied.

IN - means that corrections to weights kept same in database.

BL - means that baseline-dependent correction to weights will be generated.

1.4 VGOSDB

VGOSDB file_name

The VGOSDB keyword specifies the data path.

file_name - the data path

2 \$FLAGS

This section specifies parameters to be estimated.

2.1 CLOCKS

CLOCKS interval_in_minutes

The CLOCKS keyword determines how the clock parameters are estimated.

2.2 ATMOSPHERES

ATMOSPHERES interval_in_minutes

The ATMOSPHERES keyword determines how the atmosphere path delay in zenith direction parameters are estimated.

2.3 GRADIENTS

GRADIENTS [NO or YES] interval_in_hours

The GRADIENTS keyword determines how the atmosphere gradients.

NO - does not estimate atmosphere gradients for any station

YES - estimate as a linear spline for all stations

2.4 BL_CLOCK

BL_CLOCK [NO or IN]

The BL_CLOCK keyword determines whether to estimate baseline dependent clocks.

NO - does not estimate baseline dependent clocks

IN - estimate baseline dependent clocks which were selected in database

2.5 UT1/PM

UT1/PM (POLY OFFSET pu_comp RATE pu_comp [MIDNIGHT or NOON or MIDDLE]) or
(SEGMENT INTERVAL int_in_minutes PM_RATE_CONSTR constraint_pm
UT1_RATE_CONSTR constraint_ut1)

The UT1/PM keyword determines how estimates UT1 and polar motion(X- and Y-wobble).

POLY - estimate parameter of polynomial coefficient of earth orientation

OFFSET - determines whether to estimate coefficients of the zeroth order polynomial

pu_comp - is a two-letter line. it is Y or '- ' for either component(if first letter is set Y, means estimate parameter for X and Y pole coordinate, if second letter is set Y, means estimate for UT1, '- ' means don't estimate component)

RATE - determines whether to estimate coefficients of the first order polynomial.

pu_comp - has the same meaning as above.

MIDNIGHT - time epoch of earth orientation offset is 0 hours.

NOON - time epoch of earth orientation offset is 12 hours.

MIDDLE - time epoch of earth orientation offset is middle of session.

SEGMENT - estimate parameter as continue piece-wise line offset of earth orientation

INTERVAL - specifies length of the interval in minutes

int_in_minutes - duration of the interval (integer number)

PM_RATE_CONSTR - specifies sigma of constraints to be imposed on polar motion

constraint_pm - sigma of constraint. Units are mas/(INTERVAL).

UT1_RATE_CONSTR - specifies sigma of constraints to be imposed on UT1

constraint_ut1 - sigma of constraint. Units are ms/(INTERVAL).

Examples:

- UT1/PM POLY OFFSET YY RATE YY MIDDEL, means to estimate the offset and rate for polar motion, estimate the offset and rate for UT1. Offsets are referred to middle time of session.
- UT1/PM SEGMENT 60 PM_RATE_CONSTR 3 UT1_RATE_CONSTR 1, means to estimate polar motion and UT1 as cpwlo, the interval is 60 minutes, constraints on the rate of change between adjacent nodes are 3mas/60minutes and 1ms/60minutes are imposed.

2.6 NUTATION

NUTATION [NO or XY_OFFSET]

The NUTATION keyword determines how to estimate the nutation parameters.

NO - does not estimate nutation offsets

XY_OFFSET - estimate daily offsets of nutation in X and nutation in Y within IAU2006A model

2.7 SOURCES

SOURCES [NO or YES] EXCEPT (source ...)

The SOURCES keyword determines whether estimates source coordinates.

NO - don't estimate any source's coordinates

YES - estimates source's coordinates

EXCEPT - exception list

Examples:

- SOURCES NO EXCEPT 3C345, means to estimate right ascensions and declination of 3C345 only
- SOURCES YES, means to estimate right ascensions and declination of all sources
- SOURCES YES EXCEPT 3C345, means to estimate right ascensions and declination of all sources, except 3C345

2.8 STATIONS

STATIONS [NO or YES] [EXCEPT (station ...)]

The STATIONS keyword determines whether estimates station positions.

NO - don't estimate any station positions

YES - estimates station positions

EXCEPT - exception list

Examples:

- STATIONS NO EXCEPT CRIMEA, means to estimate XYZ coordinates of CRIMEA only
- STATIONS YES, means to estimate XYZ coordinates of all stations
- STATIONS YES EXCEPT CRIMEA, means to estimate XYZ coordinates of all stations, except CRIMEA

2.9 VELOCITIES

VELOCITIES [NO or YES]

The VELOCITIES keyword determines whether estimates station velocities.

NO - don't estimate any station velocities

YES - estimates station velocities

3 \$DATA

This section determines which data is included in the solution.

3.1 SOURCE

SOURCE [NO or YES] {EXCEPT (source ...)}

The SOURCE keyword specifies which sources may be included in the solution.

NO - excludes all sources except any listed in the EXCEPT clause

YES - includes all sources except any listed in the EXCEPT clause

3.2 STATIONS

STATIONS [NO or YES] {EXCEPT (station ...)}

The STATIONS keyword specifies which stations may be included in the solution.

NO - excludes all stations except any listed in the EXCEPT clause

YES - includes all stations except any listed in the EXCEPT clause

4 \$GLOBAL

Some parameters can be treated either as global or as session parameters. This section tells to software how to treat these parameters.

4.1 SOURCE

SOURCE [NO or YES] {EXCEPT [(source ...) or file_name]}

The SOURCE keyword specifies which sources may be included in the global solution.

NO - excludes all sources except any listed in the EXCEPT clause

YES - includes all sources except any listed in the EXCEPT clause

file_name - the file contain source list

4.2 STATIONS

STATIONS [NO or YES] {EXCEPT [(station ...) or file_name]}

The STATIONS keyword specifies which stations may be included in the global solution.

NO - excludes all stations except any listed in the EXCEPT clause

YES - includes all stations except any listed in the EXCEPT clause

file_name - the file contain station list

5 \$MAPPING

This section replaces a priori calculated from a standard theoretical model and read from the sessions' superfiles with alternate a priori. This process is called mapping.

5.1 STATIONS

STATIONS file_name

Determines a priori file of station positions and velocities used in solution.

file_name - file, a priori positions and velocities are read from

5.2 SOURCE

SOURCE file_name

Determines a priori file of source coordinates used in solution.

file_name - file, a priori source coordinates are read from

5.3 EARTH_ORIENTATION

EARTH_ORIENTATION file_name

Determines a priori file of earth orientation parameters used in solution.

file_name - file, a priori earth orientation parameters are read from, can be C04 or USNO eop file

5.4 EPHEM

EPHEM *file_name*

Determines a priori file of ephemeris used in solution.

file_name - file, a priori ephemeris are read from

5.5 HLFREQ_EOP

HLFREQ_EOP [NONE or MODEL]

Determines which high frequency model of pole and UT1 used in solution.

NONE - not include high frequency correction in pole and UT1

MODEL - the high frequency model, can be one of the following

Conven - IERS convention model

Desai - Desai model

6 \$CONSTRAINTS

This section constrains specific parameter estimates.

6.1 ATMOSPHERES

ATMOSPHERES *constraint.in.cm*

Imposes constraints on the coefficients of linear spline modeling atmosphere zenith path delay for each station

6.2 CLOCKS

CLOCKS *constraint.in.cm*

Imposes constraints on the coefficients of linear spline modeling clock function for each station

6.3 GRADIENTS

GRADIENTS *constraint.in.cm*

Imposes constraints on the estimates of atmosphere path delay gradients

6.4 UT1/PM

UT1/PM *xy_s_mas ut1_s_ms xy_s_mas/day ut1_s_ms/day*

Imposes constraints on the estimates of earth orientation parameters.

xy_s_mas - the constraints on the offset of pole coordinates in mas

ut1_s_ms - the constraints on the offset of UT1 in ms

xy_s_mas/day - the constraints on the rate of pole coordinates in mas/day

ut1_s_mas - the constraints on the rate of UT1 in ms/day

6.5 NUTATION

NUTATION *constraint_in_mas*

Constraints on the estimates of daily offsets of nutation angles.

6.6 STATIONS

STATIONS [NO or YES] {SIGMA *xyz_in_meters*}

Impose constraints on station positions.

SIGMA - specifies sigma of constraint

xyz_in_meters - sigma of constraint in meters

6.7 SOURCES

SOURCES [NO or YES] {SIGMA *rade_in_rad*}

Impose constraints on source positions.

SIGMA - specifies sigma of constraint

rade_in_rad - sigma of constraint in rad

6.8 NNT_POSITION

NNR_POSITION [NO or YES] {SIGMA *value_in_meters*} {EXCEPT [(station...) or file_name]}

Impose no net translation constraints applied to station position.

6.9 NNR_POSITION

NNR_POSITION [NO or YES] {SIGMA *value_in_meters*} {EXCEPT [(station...) or file_name]}

Impose no net rotation constraints applied to station position.

6.10 NNR_SOURCE

NNR_SOURCE [NO or YES] {SIGMA *value_in_rad*} {EXCEPT [(source...) or file_name]}

Impose no net rotation constraints applied to source position coordinates.

7 \$ARC

This section lists the session names which are to participate in the solution.

7.1 ARCFILE

ARCFILE *file_name*

Specifies filename of the arc-list

7.2 DBNAME

DBNAME version AC

DBNAME - the name of the session, should start from \$, like \$21APR01XA

version - the session's version number, should be select from 1 to ...

AC - analysis center, like IVS

Examples:

- \$21APR01XA 4 IVS, means to analysis 21APR01XA session, it will load 21APR01XA.V004.iVS_kall.wrp.

8 \$TIE

(station_list1...)

(station_list2...)

Imposes strong constraints on the difference between velocities of stations. As a result each group of stations listed in this will effectively have the same velocity.

Examples:

- HOBART26 HOBART12, means to HOBART26 and HOBART12 has same velocity.

9 \$OUTPUT

This section determines what output produces.

9.1 RESIDUAL

RESIDUAL [NO or YES] file_name

Specifies the residual figure out path

9.2 SNX

SNX [NO or YES] file_name param_to_write

Specifies the sinex out path.

param_to_write - specifies which the parameter will be write in sinex, can be blank (means to save eop, station and sou in sinex) or some of (zwd, gradient, xyz, eop, sou)

Examples:

- SNX YES /data/snx, means to save the sinex to /data/snx, which contain eop, station and source if these parameters are estimate.
- SNX YES /data/snx zwd, means to save the sinex to /data/snx, which contain wet delay in zenith direction.

9.3 REPORT

REPORT [NO or YES] file_name

Specifies the spool file path.

9.4 EOP

EOP [NO or YES] file_name [w or a] file_format

Specifies the EOP out file path.

w - write the eop to file_name

a - append the eop to file_name

file_format - which format of eop to write, it can be simple (eop simple format) or standard (IVS format)

Examples:

- EOP YES /data/eop/test.txt w, means to write the eop result to /data/eop/test.txt in simple mode
- EOP YES /data/eop/test.txt a standard, means to append the eop result to /data/eop/test.txt in standard mode

References