```
      - satellite antenna offsets

   Ambiguities, ionosphere model parameters, and local troposphere model
   parameters may not be manipulated by ADDNEQ and should therefore be
   pre-eliminated in GPSEST (see {DAT45248}) before saving the normal
   equations in a file. If still present in the NEQ files these parameters
   will be kept as they are (no stacking, no change of weights, ...).

   Some application examples for the program ADDNEQ:
     - multi-years solutions of permanent GPS arrays including
       velocity estimation
     - combination of campaigns, which are regularly observed
     - combination of overlapping networks (regional with global networks)
     - long arc applications (n-days-arcs based on n 1-day-arcs)
     - model changes: - change of the geodetic datum definition
                      - reduction of the number of troposphere parameters
                        per session
                      - change a priori weights for coordinates,
                        troposphere delays, orbit parameters, ERPs, ...
     - combination of baselines NEQs into daily network solution
       (parallel data processing possible - neglecting the inter-baseline
       correlations)
     - combination of results of different processing centers
       e.g. via the software independent exchange format SINEX and the
       program SNXNEQ (conversion SINEX --> Bernese NEQs, not supported
       by the menu).

Job Identification:
    If on a multitask system you would like to run more than one ADDNEQ
    program at the same time, you have to use different job identifica-
    tion characters to obtain unique input option files for the program
    ADDNEQ. Valid characters are A through Z and 0 through 9 and blank.
    If the field is non-blank it will automatically be changed to the
    next character in alphabetic order for the next run.
    RECOMMENDED VALUE: blank


Input Files:

  NORMAL EQUATIONS:
    Select the normal equation files to be used for the combination.
    (saved by GPSEST or ADDNEQ)
    RECOMMENDED VALUE: blank

  UPDATE CRD.:
    For the saving of the resulting combined coordinates you may specify
    an a priori coordinate file as a skeleton. The resulting coordinate
    file will then contain all the site coordinates estimated by ADDNEQ
    (coordinate flag M) and, in addition, all site coordinates of sites
    included in this "update" coordinate file (coordinate flag "blank")
    to obtain a complete set of coordinates for later use.
    RECOMMENDED VALUE: NO

  FIX ON SPEC. COORD.:
    Used to define special a priori site coordinates for the definition
    of the geodetic datum (fixing of sites, coordinates for system
    constraints).
    Example: the GPSEST runs were performed using a priori coordinates
             with an accuracy of, let us say, several centimeters.
             The selection of a new geodetic datum is then possible with
             this file: if you select sites to be fixed (not constrained!)
             for the ADDNEQ run, these selected sites will be fixed to
             the coordinate values specified in this special file and not
             to the a priori coordinates specified in the GPSEST run (the
             run you sued to save the normal equations).
    This special file may be used in connection with fixed sites and free
    network solutions to set up system constraints (e.g. no net rotation
    conditions).
    RECOMMENDED VALUE: NO

  A PRIORI VELOC.:
    This option has the same meaning as the option A PRIORI COORDINATES
    above, but with respect to the saving of velocity results.
    RECOMMENDED VALUE: NO

  FIX ON SPEC. VELOC.:
  a) The definition of the geodetic datum of the velocities is done with
```

```
     this file. Similar to the example for the option FIX ON SPEC.
     COORDINATES we can fix (not constrain) any velocity parameter to the
     value defined in this special file. The FREE option for velocities
     works also with this file (e.g. minimize the translation, and/or
     rotations with respect to the specified velocity model).
  b) Enables the possibility to introduce an a priori velocity model, e.g.
     for sites which do not have a long enough data span to estimate
     velocities -- usually shorter than 0.5 years --, or sites for which a
     good model is already known from other space techniques.
     In addition to the specification of a file name here, the option
     {DAT4811_ INTRODUCE VELOC} has to be set to "YES".
     A velocity estimation is nevertheless possible in addition to the
     introduction of an a priori model (relative to the a priori model).
     RECOMMENDED VALUE: NO

  PLATE TABLE NUVEL1:
    If you enter a file name here, this file will be use for the same
    purposes as the file "FIX ON SPEC. VELOC" (see above), but instead of
    any velocity values given in the file the NUVEL1 model velocities will
    be used. The format of this plate table file is the same as for the
    normal velocity file, but the 4-character abbreviation of the plate,
    on which a site is located, has to be included in the columns 77-80.
    RECOMMENDED VALUE: NO

  COV. COMPONENT INTRO:
    The normal equations of each NEQ file may be weighted individually
    (down-weighting of special normal equations for example).
    File path and file extension for this file type are given in
    menu 0.3.4 (see {DAT034__.PAN COVARIANCE COMPONENTS}).

    Application: Combination of results from different analysis centers.
    The program SNXNEQ may be used for the conversion from SINEX to NEQ.
    ADNNEQ is also able to derive approximate values for the covariance
    components. The formulas for a rigorous variance-covariance estimation
    with full (!) covariance information is implemented as a hidden
    option (source code changes necessary).
    Please contact the author of the program for more information.
    Example file: {X:\INX\EXAMPLE.WGT}
    RECOMMENDED VALUE: NO

  PRE-DEFINED BASELINES:
    A baseline definition file may be specified to select baselines
    for the analysis of baseline repeatabilities in north, east, up and
    baseline length. Such a file may be created using menu 1.5.2
    {DAT152__}. File path and file extension for this file type are given
    in menu 0.3.4 (see {DAT034__ BASELINE DEFINITIONS}).
    Example: {X:\INX\EXAMPLE.BSL}

    The option is essential to reduce the size of the program output
    in case that a lot of stations are involved. A wildcard (*) instead
    of station name is also allowed in the baseline definition file.
    RECOMMENDED VALUE: NO

  SITES FOR REPEATABIL.:
    A coordinate file may be specified here: only the sites which are
    included in this file will be used for the computation of the
    repeatabilities over all normal equation file (unweighted and
    weighted). The repeatability information is printed in the ADDNEQ
    program output.

    Free solutions: Only the sites available in the file are included in
                    the Helmert transformations (between the solutions
                    based on each individual NEQ file and the combined
                    solution).

    RECOMMENDED VALUE: NO (all sites are used for the computation of
                           the repeatabilities)

                                                                        EB
```

4.8.1-0	ADD NORMAL EQUATION SYSTEMS: OUTPUT FILES

```
  Output Files:
```

```
COORDINATES          > NO       <    (NO, if not to be saved)
VELOCITIES           > NO       <    (NO, if not to be saved)
SINEX (CRD+VEL+ERP)  > NO       <    (NO, if not to be saved)
ORBITAL ELEMENTS     > NO       <    (NO, file name)
TROPOSPHERE PARAM.   > NO       <    (NO, if not to be saved)
IONOSPHERE MODELS    > NO       <    (NO, if not to be saved)
COVARIANCES (COORD)  > NO       <    (NO, if not to be saved)
COVARIANCES (ALL)    > NO       <    (NO, if not to be saved)
COVARIANCE COMPON.   > NO       <    (NO, if not to be saved)
NORMAL EQUATIONS     > NO       <    (NO, if not to be saved)
EARTH ROTATION PARA. > NO       <    (NO, if not to be saved)
POLE IN IERS FORMAT  > NO       <    (NO, if not to be saved)
PLOT FILE            > NO       <    (NO, if not to be saved)
GENERAL OUTPUT       > NO       <    (NO, if standard name to be used)
```

4.8.1-0	ADD NORMAL EQUATION SYSTEMS: OUTPUT FILES	HELP

```
Output Files:

  COORDINATES:
    Enter a file name to save the resulting coordinates in a file.
    The flags written to the coordinate output file are "M" for the
    estimated mean coordinates, "F" for fixed sites, "W" for sites with
    heavy a priori constraints, and "N" for sites that were estimated
    and also used for the no-net rotation/translation conditions).
    File path and file extension are given in
    menu 0.3.4 (see {DAT034__.PAN COORDINATES}).
    (same meaning as in GPSEST {DAT450__})

  VELOCITIES:
    Enter a file name to save resulting velocities in a file.
    File path and file extension are given in
    menu 0.3.4 (see {DAT034__.PAN STATION VELOCITIES}).

  SINEX (CRD+VEL+ERP):
    Enter a file name to save results in the Software Independent Ex-
    change format SINEX V1.0.
    File path and file extension are given in
    menu 0.3.4 (see {DAT034__.PAN SINEX FORMAT (CRD,VEL,ERP)}).
    Version 4.0 of the program ADDNEQ does not save ERP's in the SINEX
    format.
    Pre-elimination of all other parameters than CRD and VEL is NOT
    necessary.

  ORBITAL ELEMENTS:
    Enter a file name to save results of the orbit estimation (up to 6
    Keplerian elements, up to 9 radiation pressure parameters for each
    arc, and the results of the pseudo-stochastic parameters) to a file.
    File path and file extension are given in
    menu 0.3.3 (see {DAT033__.PAN ORBITAL   ELEMENTS}).
    If normal equation files of different days are combined (e.g. to
    compute long arcs) a different orbital element file has to be saved
    for each day. In this case you have to use wildcard characters
    (either % or ?) in the output file name specified here. The wild-
    card characters are then replaced by the characters of the a priori
    standard orbit file name used to create the normal equation files.
    Example: Let us assume that the a priori standard orbit files used
    to generate 3 1-day normal equation files were named G1_96101.STD,
    G1_96102.STD, and G1_96103.STD and that you would like to create a
    3-day arc with the program ADDNEQ. If you specify "G3_%%%%%" for
    the orbital element output file name ADDNEQ will save the estimated
    orbital parameter for each day in the files G3_96101.ELE,
    G3_96102.ELE, and G3_96103.ELE.
    The orbital element file may be used in the program ORBGEN (see menu
    3.3) to create a new standard orbit file with the orbital parameters
    estimated in ADDNEQ.
    RECOMMENDED VALUE: NO

  TROPOSPHERE PARAM.:
    Enter a file name to save results of the troposphere estimation.
    File path and file extension are given in
    menu 0.3.4 (see {DAT034__.PAN TROPOSPHERE PARAMETERS}).
```

```
  (same meaning as in GPSEST {DAT450__}).

IONOSPHERE MODELS:
  Enter a file name to save results of the ionosphere estimation.
  Ionosphere parameters may not be estimated (stacked) with ADDNEQ,
  yet in Version 4.0. Therefore this option may not be used.

COVARIANCES (COORD):
  Enter a file name to save coordinate variance-covariance informa-
  tion (e.g. for the use in the program COMPAR, see menu 5.4.1,
  {DAT541__}). The normal equation manipulations possible with the
  program ADDNEQ are much more flexible than the combination of
  variance-covariance files in COMPAR. Therefore the output file to
  be specified here should mainly be used to "export" variance-
  covariance information (to be used in other software packages).
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__.PAN COVARIANCES}).
  (same meaning as in GPSEST {DAT450__}).
  RECOMMENDED VALUE: NO

COVARIANCES (ALL):
  Enter a file name to save all variance-covariance information of all
  parameters. Attention: the resulting file might be huge.
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__.PAN COVARIANCES}).
  (same meaning as in GPSEST {DAT450__}).
  RECOMMENDED VALUE: NO

COVARIANCE COMPON.:
  Estimated variance components for each solution derived
  from the comparison of the repeatabilities with the formal errors
  can be saved in a file.
  Example: Iterate the least squares estimates in case of processing
           NEQ files of different processing centers to find out the
           proper weighting of the individual NEQ files.
  Only useful, if an a priori covariance file has been specified in
  {DAT481__ COV. COMPONENT INTRO}.
  RECOMMENDED VALUE: NO

NORMAL EQUATIONS:
  Enter a file name to save the NEQs resulting from the combination of
  different input NEQ files. This option allows a hierarchical
  combination of NEQ (e.g. from single baseline or cluster NEQs, to
  daily NEQs, to weekly NEQs, and finally to multi-year solutions).
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__.PAN NORMAL EQUATIONS}).
  (same meaning as in GPSEST {DAT450__}).
  RESTRICTIONS:
  - In case of estimated velocity parameters do NOT use the saving
    option. Note, that this restriction is not valid for the saving
    of SINEX files.
  - NEQs from an ADDNEQ solution using the option
    {DAT481__ FIX ON SPEC. COORD.} together with the option
    {DAT4811_ FIXED STATIONS} should NOT be saved for further usage
    (numerical stability).

EARTH ROTATION PARA.:
  Enter a file name to save ERP's (X,Y,UT1-UTC drift, nutation) to a
  file. The format used is the BERNESE ERP format (example:
  {X:\INX\EXAMPLE.ERP}).
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__.PAN EARTH ROTATION PARAMETERS}).
  (same meaning as in GPSEST {DAT450__}).

POLE IN IERS FORMAT:
  Enter a file name to save ERP's (X,Y,UT1-UTC drift, nutation) to a
  file. The format used is the IERS ERP format (example:
  {X:\INX\EXAMPLE.IEP}).
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__.PAN IERS FORMAT ERP FILE}).
  (same meaning as in GPSEST {DAT450__}).

PLOT FILE:
  Residuals of the output file of each site can be stored in a
  data file.
  File path and file extension are given in
  menu 0.3.4 (see {DAT034__ PLOT FILES}).
```

```
      A graphical representation of the information has to be realized
      with help of a graphical tool which has to be written by each user.

    GENERAL OUTPUT:
      It is recommended to specify an output file name for the ADDNEQ
      program output if you want to give it a meaningful name. Normally
      the program output goes into a file named ADDNEQ.Lnn or ADDNEQ.nnn
      (see {DAT01___ DIGITS OF JOB OUTPUT NUMBER}). Having well-defined
      names for the ADDNEQ program output is also important if you want
      to obtain a summary files of an ensemble of ADDNEQ output files
      by running the ADDNEQ/GPSEST output extraction program with a
      corresponding wildcard in {DAT565__.PAN GENERAL OUTPUT FILE} to
      include exactly the files requested. Enter "NO" to handle the naming
      of the job output files as usual (generating ADDNEQ.Lnn or
      ADDNEQ.nnn).
      File path and file extension are given in
      menu 0.3.4 (see {DAT034__.PAN PROGRAM OUTPUT}).
      RECOMMENDED VALUE: NO

                                                                        EB
```

```
4.8.1-1 |           ADD NORMAL EQUATION SYSTEMS: INPUT 1

   TITLE    >                                                     <

  Coordinates:
   FIXED STATIONS      > NONE           <   (blank: sel.list, ALL, NONE,
                                             SPECIAL_FILE, $FIRST, $LAST)
   A PRIORI SIGMAS     > YES  <             (YES, NO)
   FREE SOLUTION COND. > NO  <              (YES, NO)

  Velocities:
   FIXED STATIONS      > NONE           <   (blank: sel.list, ALL, NONE,
                                             SPECIAL_FILE, $FIRST, $LAST)
   A PRIORI SIGMAS     > NO   <             (YES, NO)
   FREE SOLUTION COND. > NO  <              (YES, NO)
   INTRODUCE VELOC.    > NO  <              (YES, NO)
```

```
4.8.1-1 |           ADD NORMAL EQUATION SYSTEMS: INPUT 1          | HELP

  TITLE:
    Title for the ADDNEQ run; will show up in the program output file and
    in all other output files (coordinates, velocities, troposphere, etc.).
    RECOMMENDED VALUE: title, which describes the type of solution
                       as precisely as possible

  Coordinates - Definition of the geodetic datum

    FIXED STATIONS:
      This option has two different meanings:
      a) Fixing / heavily constraining of sites:
         Sites which should be constrained to the a priori coordinate
         values (the a priori coordinates specified when generating the
         normal equations with GPSEST !) may be selected with this option.
         FIXING in ADDNEQ always means heavily constraining with
         an a priori weight of 1.d-6 m.
         In the case that you enter the name of a special coordinate file
         in option {DAT481__ FIX ON SPEC. COORD.} the selected sites are
         constrained to the values given in this special "fix coordinate"
         file and NOT to the originally a priori coordinate values.

      b) In combination with the option FREE SOLUTION COND. (see below):
        If you set up free solution condition, then the selected sites are
        used for the no-net rotation and/or translation conditions.
        In the case that you specify a special fixing file
        (see {DAT481__ FIX ON SPEC. COORD.}) the no-net rotation and/or
        translation conditions are setup with respect to the coordinate
        values specified in this coordinate file and NOT based on the
```

```
    originally a priori coordinate values.

  NONE: No sites to be fixed at all.
  blank: To select from all possible sites.
  SPECIAL_FILE: Do the selection with the help of a special file.
    Useful for an automated processing using the BPE.
    This setting will cause the display of a new panel where you can
    specify the name of the special file (see {DAT48115}).
    File path and file extension are specified in
    menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).
    Such a special file may be created using menu 6.3.2.
    Example file: X:\INX\EXAMPLE.FIX - any sites with a priori weights
                  specified in this file are ignored. Only sites listed
                  in this file without giving any a priori weights
                  (blank) will be fixed.
  $FIRST: Use the first site coming from the normal equations
          (useful for example for baseline-wise processing).
  $LAST: Use the last site coming from the normal equations
  ALL: useful for the free solution conditions only. The a priori
       coordinates of all sites will in this case contribute to the
       definition of the geodetic datum.

  RECOMMENDED VALUE: NONE


A PRIORI SIGMAS:
  Possibility to constrain the coordinates with a priori weights.
  We recommend to use this option only for sites which you want to
  heavily constrain for the definition of the geodetic datum.
  Therefore do NOT specify weights of 1 cm or 10 m...
  Values of about 0.1 mm are reasonable to simulate the same effect of
  "fixing" a site to its a priori coordinates.

  The constraining does not work in combination with the
  FIX ON SPEC. COORD. option (see {DAT481__ FIX ON SPEC. COORD.}).

  If "YES", a new panel is displayed where you can select in which way
  you would like to specify the sigmas (see {DAT48117}).

  RECOMMENDED VALUE: YES

FREE SOLUTION COND.:
  Free solutions are possible with the following characteristics:
  - all coordinates are solved for
  - the definition of the geodetic datum is realized with the help
    system conditions (e.g. no net rotation, no net translation, ...)
    that may be specified in {DAT48111} and the selection of reference
    sites used to set up these system conditions (to be selected as
    fixed sites, see above).
    The resulting coordinate estimates are then "aligned" to the
    reference frame defined by the set of a priori coordinates of the
    selected reference sites (or if the FIX ON SPEC. COORD option is
    used in panel {DAT481__.PAN} to this coordinate set).
    Example: 3 Translation conditions used, 3 rotation conditions used.
             6 reference sites selected as "fixed" sites.
             --> The free coordinates show no translations and no
                 rotations with respect to the a priori coordinates of
                 reference sites.
  - the system constraints are setup in a local system (the origin is
    the mean value of the selected reference sites).

  Useful for:
  - problems of sites usually fixed may be detected.
  - all coordinates are solved for - only the minimum number of
    constraints are applied.

  Remark:
  The repeatability rms values in the ADDNEQ output are the residuals
  of a 7-parameters Helmert transformation using all sites of each
  sequential solution with respect to the combined solution in this
  case and not, as usual, the raw differences.

  Attention: The saving of normal equations with Version 4.0 is not
             possible for free solutions.

  RECOMMENDED VALUE: NO
```

```
 Velocities:

   FIXED STATIONS:
     Identical meaning as for the coordinates (see above)
     RECOMMENDED VALUE: NONE

   A PRIORI SIGMAS:
     Identical meaning as for the coordinates (see above)
     Attention: to estimate velocities it is mandatory to specify "YES"
     here. It is not enough to set the previous option to "NONE".

     RECOMMENDED VALUE: YES


   FREE SOLUTION COND.:
     Identical meaning as for the coordinates (see above)

   INTRODUCE VELOC.:
     An a priori velocity model may be applied independent of the fact
     whether velocities are solved for or not.
     The velocity file has to be specified in
     {DAT481__ FIX ON SPEC. VELOC.}.

                                                                    EB
```

```
4.8.1-1.1 |       ADD NORMAL EQUATION SYSTEMS: FREE COORDINATE SOLUTION


   Free Coordinate Parameters:
     TRANSLATION X       > YES <        (YES, NO)
     TRANSLATION Y       > YES <        (YES, NO)
     TRANSLATION Z       > YES <        (YES, NO)
     ROTATION X-AXIS     > YES <        (YES, NO)
     ROTATION Y-AXIS     > YES <        (YES, NO)
     ROTATION Z-AXIS     > YES <        (YES, NO)
     SCALE FACTOR        > YES <        (YES, NO)
```

```
4.8.1-1.1 |   ADD NORMAL EQUATION SYSTEMS: FREE COORDINATE SOLUTION   |  HELP

   Free Coordinate Parameters:

     For the definition of the geodetic datum of a "free" solutions
     you have to specify the transformation parameters to be used to
     define the minimum number of restrictions/constraints necessary to
     avoid singularities. The sites used to set up the system constraints
     have to be selected with the option {DAT4811_ FIXED STATIONS}.

     We recommend to select 3 translations and 3 rotations, which
     allows a 3-d translation and 3-d rotation of the estimated network
     with respect to the a priori coordinates.

     Setting one of the parameter to "NO" means that no system constraints
     are set up for this transformation parameter (e.g. the scale should
     not be constrained).

     Please note:
     The number of transformation parameters has to be smaller than the
     number coordinate components defining the system constraints.

                                                                    EB
```

```
4.8.1-1.2 |       ADD NORMAL EQUATION SYSTEMS: FREE VELOCITY SOLUTION
```

```
  Free Velocity Parameters:
    TRANSLATION X       > YES <        (YES, NO)
    TRANSLATION Y       > YES <        (YES, NO)
    TRANSLATION Z       > YES <        (YES, NO)
    ROTATION X-AXIS     > YES <        (YES, NO)
    ROTATION Y-AXIS     > YES <        (YES, NO)
    ROTATION Z-AXIS     > YES <        (YES, NO)
    SCALE FACTOR        > YES <        (YES, NO)
```

4.8.1-1.2	ADD NORMAL EQUATION SYSTEMS: FREE VELOCITY SOLUTION	HELP

```
  Free Velocity Parameters:

    For the definition of the geodetic datum of a "free" solution
    you have to specify the transformation parameters to be used to
    define the minimum numbers of restrictions/constraints necessary to
    avoid singularities. The sites used to set up the system constraints
    have to be selected with the option "FIXED STATIONS" (see
    {DAT4811_ Velocities}).

    We recommend to select 3 translations and 3 rotations, which
    allows a 3-d translation and 3-d rotation of the estimated network
    velocities with respect to the a priori site velocities.

    Not to open a parameter means to take this piece of information from
    GPS. In our example: Take the scale from GPS.

    Setting one of the parameter to "NO" means that no system constraints
    are set up for this transformation parameter (e.g. the scale should
    not be constrained).

    The real minimum number of parameters necessary for the definition
    of a velocity field is not really known. A selection of only 3
    parameters (equivalent with the fixing of 1 velocity vector) may
    not be sufficient to obtain reasonable results.

                                                                       EB
```

4.8.1-1.3	ADD NORMAL EQUATION SYSTEMS: A PRIORI SIGMAS FOR SITE COORD	HELP

```
  Specification of a priori weights for the site coordinates.

  You may modify, add, or delete entries. Press the F1 key to get help
  on the keys you may use to modify this table.

  We recommend to use this option only for sites which you would like to
  be heavily constrained for the definition of the geodetic datum.
  Therefore do NOT specify weights of 1 cm or 10 m...
  Values of about 0.1 mm are reasonable to simulate the same effect of
  "fixing" a site to its a priori coordinates.

  RECOMMENDED VALUE: .0001 for sites to be "fixed".
                                                                       EB
```

4.8.1-1.4	ADD NORMAL EQUATION SYSTEMS: A PRIORI SIGMAS FOR SITE VELOC	HELP

```
  Specification of a priori weights for the site velocities.

  You may modify, add, or delete entries. Press the F1 key to get help
  on the keys you may use to modify this table.

  IMPORTANT: You have to specify weights, if you want to solve for
```

```
           velocities.

  We recommend to estimate velocities with GPS only for the horizontal
  components. Only with a very long data span you may hope to detect any
  significant movements in the vertical. The height velocities are also
  about 2-3 times less accurately determined than the horizontal
  velocities.

  RECOMMENDED VALUE: 900 for the horizontal components
                     0.01 for the vertical components

                                                                      EB
```

```
4.8.1-1.5         ADDNEQ:  SELECTION OF SPECIAL FIXED STATION FILE

    STATIONS FILE     >          <  (blank for selection list)
```

```
4.8.1-1.5      ADDNEQ:  SELECTION OF SPECIAL FIXED STATION FILE       HELP

    STATIONS FILE:
      Specify a special station file to define the fixed sites.
      File path and file extension are specified in
      menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).
      A fix station file may be created using menu 6.3.2.
      Example file: X:\INX\EXAMPLE.FIX - any sites with a priori weights
                    specified in this file are ignored. Only sites listed
                    in this file without giving any a priori weights (blank)
                    will be fixed.

                                                                      EB
```

```
4.8.1-1.6         ADDNEQ:  SELECTION OF SPECIAL FIXED VELOCITIES FILE

    STATIONS FILE     >          <  (blank for selection list)
```

```
4.8.1-1.6     ADDNEQ:  SELECTION OF SPECIAL FIXED VELOCITIES FILE     HELP

    STATIONS FILE:
      Specify a special station file to define the sites with fixed
      velocities. File path and file extension are specified in
      menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).
      A fix station file may be created using menu 6.3.2.
      Example file: X:\INX\EXAMPLE.FIX - any sites with a priori weights
                    specified in this file are ignored. Only sites listed in
                    this file without giving any a priori weights (blank)
                    will be fixed.

                                                                      EB
```

```
4.8-1.1.7  ADD NORMAL EQUATIONS: A PRIORI SIGMAS: STATIONS AND DEFAULT SIGMA

    Station Selection:
       STATIONS    >                  <  (blank for selection list, SELECTED,
                                          SPECIAL_FILE, $FIRST, $LAST)
    Default Sigma per Coordinate:
       SIGMA              > 0.0001  <    (meters)
```

```
4.8-1.1.7 | ADD NORMAL EQUATIONS: A PRIORI SIGMAS: STATIONS AND DEFAULT | HELP

    Station Selection:
       Select the sites and the values, with which the coordinates should be
       constrained to their a priori values. Attention: the site coordinates
       are constrained to the values that were entered as a priori coordina-
       tes when creating the NEQ file(s) with the program GPSEST.
       Coordinates may not be constrained to the values given in the coordi-
       nate file {DAT481__ UPDATE CRD.} or {DAT481__FIX ON SPEC. COORD.}.

       REMARK:
       We recommend to use this option only for sites which you want to
       heavily constrain for the definition of the geodetic datum.
       Therefore do NOT specify weights of 1 cm or 10 m...
       Values of about 0.1 mm are reasonable to simulate the same effect of
       "fixing" a site to its a priori coordinates.

       STATIONS:

        blank: To select from all possible sites in the next panel.
        SPECIAL_FILE: Do the selection with the help of a special file.
          Useful for an automated processing using the BPE.
          This setting will cause the display of a new panel where you can
          specify the name of the special file (see {DAT48115}).
          File path and file extension are specified in
          menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).
          Such a special file may be created using menu 6.3.2.
          Example file: X:\INX\EXAMPLE.FIX - for each site in this file
                        sigma values have to be given. Otherwise no weights
                        will be setup for this site.
        $FIRST: Use the first site coming from the normal equations
                (useful for example for baseline-wise processing).
        $LAST: Use the last site coming from the normal equations

        RECOMMENDED VALUE: blank

    Default Sigma per Coordinate:

       SIGMA:
         This value is used in the next panel for all stations selected, but
         may be changed on a station by station basis later on (see
         {DAT48113}).
         RECOMMENDED VALUE: 0.0001 meters (to "fix" coordinates)

                                                                          EB
```

```
4.8-1.1.8 | ADD NORMAL EQUATIONS: A PRIORI SIGMAS: STATIONS, DEF. VELO. SIGMA

    Station Selection:
       STATIONS    >                  <  (blank for selection list, SELECTED,
                                          SPECIAL_FILE, $FIRST, $LAST)
    Default Sigma per Coordinate:
       SIGMA              > 0.1     <    (mm/year)
```

```
4.8-1.1.8 | ADD NORMAL EQUATIONS: A PRIORI SIGMAS: STATIONS, DEF. VELO. | HELP

    Station Selection:
       Select the sites and the values, with which the velocities should be
       constrained to their a priori values.
       IMPORTANT: You have to specify weights, if you want to solve for site
                  velocities.

       We recommend to estimate velocities with GPS only for the horizontal
       components. Only with a very long data span you may hope to detect any
       significant movements in the vertical. The height velocities are also
       about 2-3 times less accurately determined than the horizontal
```

```
    velocities.

    STATIONS:

     blank: To select from all possible sites in the next panel.
     SPECIAL_FILE: Do the selection with the help of a special file.
       Useful for an automated processing using the BPE.
       This setting will cause the display of a new panel where you can
       specify the name of the special file (see {DAT48116}).
       File path and file extension are specified in
       menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).
       Such a special file may be created using menu 6.3.2.
       Example file: X:\INX\EXAMPLE.FIX - for each site in this file
                     sigma values have to be given. Otherwise no weights
                     will be setup for this site.
     $FIRST: Use the first site coming from the normal equations
             (useful for example for baseline-wise processing).
     $LAST: Use the last site coming from the normal equations

     RECOMMENDED VALUE: blank

 Default Sigma per Velocity:

    SIGMA:
    This value is used in the next panel for all stations selected, but
    may be changed on a station by station basis later on (see
    {DAT48114}).
    RECOMMENDED VALUE: 900 (which means almost free)

                                                                       EB
```

```
4.8.1-2 |            ADD NORMAL EQUATION SYSTEMS: INPUT 2

 Statistics:
   A PRIORI SIGMA                     > 0.002  <     m

 Parameters:
   ORBIT ADJUSTMENT                    > NO   <   (YES, NO, ASIS)
   SITE-SPECIFIC TROPOSPHERE           > YES  <   (YES, NO, ASIS)
   EARTH ROTATION                      > NO   <   (YES, NO, ASIS)
   COORDINATES OF CENTER OF MASS       > NO   <   (YES, NO, ASIS)
   PARAMETER PRE-ELIMINATION           > NO   <   (YES, NO, ASIS)

 Special Options :
   INDIVIDUAL VAR-COVAR RMS ESTIMATION  > NO  <    (YES, NO)
   PROCESSING IN BASELINE MODE         > NO  <    (YES, NO)
```

```
4.8.1-2 |           ADD NORMAL EQUATION SYSTEMS: INPUT 2           | HELP

 Statistics:

   A PRIORI SIGMA:
     Specify the estimated value of the accuracy of an L1 zero difference
     phase observation.
     The meaning is the same as for the GPSEST input parameter
     (see {DAT452__ A PRIORI SIGMA}).
     RECOMMENDED VALUE: 0.002

 Parameters:

   ORBIT ADJUSTMENT:
     Solve for orbit parameters.
     Since the start of the IGS this option is not very important any
     for the general user. Only when processing data from the 'old days'
     (before mid of 1992, the start of IGS) it might be useful for larger
     regional networks to improve orbits with the data of the regional
     network. IGS orbits have a precision of below 10 cm.
     NO  : No estimation (if orbit parameters are stored in the input
```

```
         normal equations, these parameters are solved for without
         any constraints).
   YES : estimation of orbital parameters. More options may be defined
         in additional panels.
   ASIS: estimation of orbital parameters, using the options given in
         the orbit option panels without displaying them.
   RECOMMENDED VALUE: NO

 SITE-SPECIFIC TROPOSPHERE:
   If troposphere parameters are saved in the NEQs you are about to
   process, you can modify the
   number of parameters per day and the a priori weights to be used in
   a further input panel.
   NO  : No estimation (if troposphere parameters are in the NEQs,
         these parameters are solved for without any constraints).
   YES : estimation, more options in an additional panel
   ASIS: estimation, use the options given in the additional panel
         without displaying it.
   RECOMMENDED VALUE: YES

 EARTH ROTATION:
   If Earth rotation parameters are included in the NEQs you may modify
   various input options (to be specified in an additional input panel).
   NO  : No estimation (if Earth rotation parameters are included in the
         NEQs, these parameters are solved for without any constraints).
   YES : estimation, more options in an additional panel
   ASIS: estimation, use the options given in the additional panel
         without displaying it.
   RECOMMENDED VALUE: NO

 COORDINATES OF CENTER OF MASS:
   If center of mass parameters are included in the NEQs you may modify
   the a priori weights.
   NO  : No estimation (if center of mass parameters are included in the
         NEQs, these parameters are solved for without any constraints).
   YES : estimation, more options in an additional panel
   ASIS: estimation, use the options given in the additional panel
         without displaying it.
   RECOMMENDED VALUE: NO

 PARAMETER PRE-ELIMINATION:
   Any parameter type may be pre-eliminated. That means, that the
   parameters of this type are removed from the normal equation system
   taking into account the effect of these parameters on the parameters
   that remain in the NEQ system.
   In a special panel you may specify for each parameter type if you
   would like to pre-eliminate the parameter or not. In ADDNEQ
   the pre-elimination options are "BI" (before inversion) and "AI"
   (after inversion). On the NEQ level there is no epoch-wise
   pre-elimination possible.
   Applications for BI: advantage: reduces the total number of unknowns.
                        Handling of big NEQ systems !
                        disadvantage: the specified weights are
                        correctly applied, but the results will not
                        show up in output and cannot be saved in a file.
   Applications for AI: reduce for number of parameters for the saving
                        of the normal equations.
                        disadvantage: slightly longer processing time
                        advantage: only the important parameters may be
                        saved in a normal equation file.
   RECOMMENDED VALUE: YES

Special Options :

 INDIVIDUAL VAR-COVAR RMS ESTIMATION:
   Not implemented yet (or to be more accurate: only possible to
   activate through software changes).
   RECOMMENDED VALUE: NO

 PROCESSING IN BASELINE MODE:
   With this option some simplifications are performed, which make
   sense especially for the combination of baseline/cluster NEQs.
   - Normally a solution is computed for each individual NEQ file
     (apart from the combined solution). This individual solutions are
     NOT computed in the baseline mode.
   - No comparisons of the individual NEQ solutions with the combined
     solution are performed.
```

```
      - A parameter is not removed from the NEQ system if the NEQ diagonal
        element is zero (no observations for this parameter).
        (Exception: orbit parameters are kept even with zero diagonal
        to automatically force the set up of a new arc after a day with a
        satellite manoeuvre).
      RECOMMENDED VALUE: YES (for combination of baseline NEQs)
                         NO  (for network solutions)

                                                                        EB
```

```
4.8.1-2.0              ADD NORMAL EQUATION SYSTEMS: ORBITS

    Orbital Elements:                                (a priori sigmas)
      SEMI MAJOR AXIS      > YES <  (YES,NO)     > 0.000     <   m
      ECCENTRICITY         > YES <  (YES,NO)     > 0.0000000 <
      INCLINATION          > YES <  (YES,NO)     > 0.0000    <   arc sec
      ASCENDING NODE       > YES <  (YES,NO)     > 0.0000    <   arc sec
      PERIGEE              > YES <  (YES,NO)     > 0.0000    <   arc sec
      ARG. OF LATITUDE     > YES <  (YES,NO)     > 0.0000    <   arc sec

    Dynamical Parameters:                            (a priori sigmas)
      D0 estimation (P0)   > YES <  (YES, NO)    > 0.0D-09   <   m/s**2
      Y0 estimation (P2)   > YES <  (YES, NO)    > 0.0D-09   <   m/s**2
      X0 estimation        > NO  <  (YES, NO)    > 1.0D-09   <   m/s**2

    Periodic Dynamical Parameters:                   (a priori sigmas)
      Periodic D0 terms    > NO  <  (YES, NO)    > 1.0D-09   <   m/s**2
      Periodic Y0 terms    > NO  <  (YES, NO)    > 1.0D-09   <   m/s**2
      Periodic X0 term     > NO  <  (YES, NO)    > 1.0D-09   <   m/s**2

    Orbit combination:
      LONG ARCS            > YES <  (YES,NO)
      INDIVIDUAL DYN. PAR. > NO  <  (YES,NO)

    Stochastic Parameters: > YES <  (YES,NO)

    Block rotation of orbital planes:
      X-AXIS               > NO  <  (YES,NO)
      Y-AXIS               > NO  <  (YES,NO)
      Z-AXIS               > NO  <  (YES,NO)
```

```
4.8.1-2.0          ADD NORMAL EQUATION SYSTEMS: ORBITS                  HELP

    Orbital Elements:
      Specify the orbit parameters to be solved for together with a priori
      weights for these parameters.
      Same meaning as for GPSEST (see {DAT4523_})

                               1-3 day
                               network   baseline
      SEMI MAJOR AXIS:
        RECOMMENDED VALUE: YES   0.0        0.01
      ECCENTRICITY:
        RECOMMENDED VALUE: YES   0.0     0.0000001
      INCLINATION:
        RECOMMENDED VALUE: YES   0.0        0.001
      ASCENDING NODE:
        RECOMMENDED VALUE: YES   0.0        0.001
      PERIGEE:
        RECOMMENDED VALUE: YES   0.0        0.001
      ARG. OF LATITUDE:
        RECOMMENDED VALUE: YES   0.0        0.001


    Dynamical Parameters:
      D0 estimation (P0)
        RECOMMENDED VALUE: YES   0.0        1.0D-9
      Y0 estimation (P2)
```

```
      RECOMMENDED VALUE: YES   0.0        1.0D-9
    X0 estimation
      RECOMMENDED VALUE: YES   1.0D-9     1.0D-9

  Periodic Dynamical Parameters:
    Periodic D0 terms
      RECOMMENDED VALUE: YES   1.0D-9     1.0D-9
    Periodic Y0 terms
      RECOMMENDED VALUE: YES   1.0D-9     1.0D-9
    Periodic X0 term

  For arc lengths of more than 3 to 4 days it is necessary to open also
  the other parameters (estimation of all parameters without any weights).

  Orbit combination:

    LONG ARCS:
      If n, with n>1, NEQs from subsequent days are to be combined
      including orbit estimation, you have two possibilities:

      a) NO:  Keep the original arc definition (estimate for each NEQ
              an each satellite a set of orbit parameters: n NEQS and
              n satellite arcs)
              Use the option "BI" in panel {DAT48125.PAN ORBIT ELEMENTS} to
              pre-eliminate the orbit parameters if you have problems with
              the total number of unknowns and you are not interested in
              the orbital parameters themselves.
      b) YES: Long arc computation: All the n input NEQs are used to
              compute one n-day arc. The arc length is limited by the
              quality of the orbit model (actually not longer than 1 week)
              and by the total number of unknowns to be estimate.

    INDIVIDUAL DYN. PAR.:
      In the case of the long arc application you have the possibility to
      represent all n days by a unique set of Keplerian elements, but to
      allow for each day a different set of dynamical parameters (radiation
      pressure parameters).
      If "YES", an additional panel will be displayed where you may specify
      the satellites for which multiple dynamical parameters should be set
      up.
      RECOMMENDED VALUE: NO

  Stochastic Parameters:
    Stochastic parameters are important to try to absorb unmodeled effects
    for longer arcs.

    For 3-day solutions such parameters are usually set up every 12 hours.
    When estimating the full set of 9 radiation pressure parameters per
    satellite (and arc) the estimation of stochastic parameters might not
    be necessary for all satellites (e.g. only for eclipsing satellites).

    Select "YES" to estimate pseudo-stochastic orbit parameters and to
    specify more details concerning these parameters (e.g. which a priori
    weights should be used, the stochastic pulses to be set up at the day
    boundaries, etc.).
    RECOMMENDED VALUE: YES for long arc applications
                       NO in all other cases

  Block rotation of orbital planes:
    If radiation pressure parameters are estimated together with UT1-UTC
    this option may be used to block net rotation about the z-axis  to
    prevent a resulting drift in UT1-UTC. This option should only be used
    for test purposes at present.
    RECOMMENDED VALUE: NO,NO,NO

                                                                        EB
```

```
4.8.1-2.1 |      ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS

Default values:
   Force Types (max. 3 types allowed):           A-priori Sigma

     (1)  RADIAL                                  > 1.D-10   <
     (2)  PERPENDICULAR TO (1), IN ORBIT PLANE    > 1.D-10   <
```

```
     (3)  NORMAL TO ORBIT PLANE                  > 1.D-10   <  (0 or blank:
     (4)  DIRECTION TO THE SUN                   >          <   don't take)
     (5)  Y-DIRECTION IN SATELLITE FRAME         >          <
     (6)  X-DIRECTION IN SATELLITE FRAME         >          <

List of Satellites (prn numbers, 99(=ALL), 98(=ECL)):
    (blank field = take default values)

     GROUP        SIGMA1           SIGMA2           SIGMA3

     > 23 <     >          <     >          <     >          <
```

```
4.8.1-2.1 | ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS | HELP

   This input panel allows to specify weights for all stochastic orbit
   parameters which are already contained in the normal equations.
   You have the possibility to handle different satellites in a
   different way.


   Force Types (max. 3 types allowed):
     The stochastic orbit parameters can be set up in 2 ways:

      a) RADIAL, PERPEND., AND NORMAL  (recommendation!)
      b) DIR. SUN, Y-BIAS-AXIS, X-AXIS

     In ADDNEQ it is not possible to change the representation of the
     stochastic orbit parameters coming from GPSEST. The mixing of different
     representations in GPSEST and ADDNEQ is not allowed !

                                                     >1 day      1 day
     (1)  RADIAL:
       RECOMMENDED VALUE:                            1.d-6       1.d-6
     (2)  PERPENDICULAR TO (1), IN ORBIT PLANE:
       RECOMMENDED VALUE:                            1.d-5       1.d-5
     (3)  NORMAL TO ORBIT PLANE:
       RECOMMENDED VALUE:                            1.d-9       1.d-9

     (4)  DIRECTION TO THE SUN:
       RECOMMENDED VALUE:                            blank       blank
     (5)  Y-DIRECTION IN SATELLITE FRAME:
       RECOMMENDED VALUE:                            blank       blank
     (6)  X-DIRECTION IN SATELLITE FRAME:
       RECOMMENDED VALUE:                            blank       blank

     Parameters with a value of "blank" or "0" for the a priori sigma are
     not estimated.

     The stochastic parameters can be weighted differently for each
     component and each satellite.
     The a priori sigmas specified in the first 6 fields of the panel are
     the default values.

     Special codes may be used for groups of satellites:
       99: All satellites with stochastic orbit parameters included in
           the NEQ files
       98: All eclipsing satellites with stochastic orbit parameters inclu-
           ded in the NEQ files

     Priorities of the requests: the first line precedes the second line,
                                 etc.

     Example:
     > 98 <     >    x1    <     >   x1     <     >    x1    <
     > 99 <     >    x2    <     >   x2     <     >    x2    <
     The result is: all eclipsing satellites are weighted with x1, all
                    others with x2.

       RECOMMENDED VALUE:
     > 99 <     >          <     >          <     >          <
                                                                          EB
```

```
4.8.1-2.2      ADD NORMAL EQUATION SYSTEMS: SITE-SPECIFIC TROPOSPHERE

    A priori Sigma:
       ABSOLUTE                          > 0.10  <    (meters)
       RELATIVE                          > 5.00  <    (meters)

    Modelling:
       CONTINUITY BETWEEN NEQS           > YES <      (YES, NO)
       NUMBER OF PARAMETERS PER DAY      > 0   <      (0: AS IN NEQ)
```

```
4.8.1-2.2    ADD NORMAL EQUATION SYSTEMS: SITE-SPECIFIC TROPOSPHERE    HELP

    A priori Sigma:
      A priori sigmas for the troposphere parameters may be defined in
      this panel.
      There are not as many options concerning the handling of troposphere
      parameters for ADDNEQ as there are for GPSEST. E.g. ADDNEQ does NOT
      allow that the troposphere parameters of different sites are handled
      differently.

      ABSOLUTE: Absolute troposphere weights may be set up to constrain
                each parameter to the value of the a priori model that was
                used in GPSEST (e.g. Saastamoinen).
      RELATIVE: Relative troposphere weights may be set up to constrain
                subsequent estimates of the same site (to reduce the size of
                the variations in time).

       A note concerning the troposphere weights:
       - all values > 0.10 are, for most applications, equivalent to a free
         estimation of the parameters
       - 0.001 - 0.01 : depending on the formal rms of the free troposphere
                        estimates (check the program output!) the troposphere
                        constraints start to become effective.
       - < 0.001 : heavy constraints

       RECOMMENDED VALUE:

       ABSOLUTE:   0.10
       RELATIVE:   5.00


      For a local network (< 50 km ) it might be necessary to estimate only
      N-1 troposphere parameters for N sites, because of the strong correla-
      tions between these parameters. ADDNEQ, however, does not yet support
      the option to constrain individual sites with different a priori
      sigmas. If you want to fix one site, you already have to do so in the
      program GPSEST (i.e. not set up any parameters for the specific site.
      Be aware of the fact, however, that fixing troposphere parameters may
      lead to small scale factors in the network.


    Modelling:

       CONTINUITY BETWEEN NEQS
         In GPSEST and ADDNEQ it is possible to use relative constraints
         between consecutive troposphere parameters of the same site.
         If you want to set up such constraints BETWEEN the parameters of
         subsequent NEQ files (e.g. between two days) you have to specify
         YES. NO means that no relative a priori sigmas are introduced
         between consecutive NEQ systems.
         YES is NOT possible, if the troposphere parameters are pre-elimi-
         nated before the inversion (of the combined NEQ) (see
         {DAT48125 SITE TROPOSPHERE}, option "BI").
         RECOMMENDED VALUE: NO

       NUMBER OF PARAMETERS PER DAY:
         It is possible to reduce the actual number of troposphere
```

```
        parameters per site.
        The reduction is not possible in all combinations.
        Example: - 12 troposphere parameters per day are saved in the NEQs
                 - reduction possible to 1,2,3,4,6 parameters/day
                 - only reductions to r parameters with mod(12,r)=0 are
                   allowed

        000: keep the original number of troposphere parameters.
        RECOMMENDED VALUE: 000
                                                                        EB
```

```
4.8.1-2.3      ADD NORMAL EQUATION SYSTEMS: EARTH ROTATION PARAMETERS

     Earth Rotation (ERP) and Nutation Parameters (NUT):
                  # of parameters        a priori sigma
                   per set (0-4)   1st request    following requests
       X-POLE           > 2 <       > 0.      <       > 0.      <     (mas)
       Y-POLE           > 2 <       > 0.      <       > 0.      <     (mas)
       UT1-UTC          > 2 <       > 0.000001  <     > 0.        <   (msec)
       DELTA EPSILON    > 2 <       > 0.0001  <       > 0.      <     (mas)
       DELTA PSI        > 2 <       > 0.0001  <       > 0.      <     (mas)

       CONTINUITY BETWEEN SETS      > ERP  <           (NO, ERP, NUT, BOTH)
       CONSTRAIN DRIFTS TO ZERO     > ERP  <           (NO, ERP, NUT, BOTH)

       SPEC. OPTIONS (0, 2: CONTIN.BETWEEN SETS, 3:CODE H3)    > 0   <
       CONSTRAIN DAILY RETROGRADE X-Y FREQUENCY TO ZERO (0/1)  > 0   <

     # of Values per Set Stored in Files:
       BERNESE POLE FILE      > 3  <       IERS POLE FILE      > 3  <
```

```
4.8.1-2.3    ADD NORMAL EQUATION SYSTEMS: EARTH ROTATION PARAMETERS      HELP

     Earth Rotation (ERP) and Nutation Parameters (NUT):


     OPTIONS:

       TOTAL NUMBER OF PARAMETER SETS:
       Number of Earth Orientation Parameter Sets (ERP,NUT) per session

       Earth Rotation Parameters (ERP) and Nutation Parameters (NUT)

       # of parameters per set: Number of polynomial coefficients used to
                                describe the selected parameter
                                (X-POLE,Y-POLE,UT1-UTC,DELTA EPS,DELTA PSI)
                                = polynomial degree + 1
                                If the NEQs contain for example n=2, you
                                can reduce it to 1 (offset only) by speci-
                                fying 1 (polynomial degree 0).
                                0 = no estimation, all parameters are
                                constrained to zero improvement.

       Default a priori sigma: a priori standard deviation used to constrain
                               each polynomial (set) to the a priori pole
                               information

       CONTINUITY BETWEEN SETS:
       Enforces continuity at the polynomial boundaries between subsequent
       sets.
       Accepted Options: NO, ERP, NUT, BOTH
                         ERP : only X-POLE,Y-POLE,UT1-UTC
                         NUT : only DELTA EPS, DELTA PSI

       CONSTRAIN DRIFTS TO ZERO:
       Constrains all polynomial coefficients of degree 1 to zero.
       Accepted Options: NO, ERP, NUT, BOTH
       Recommended setting: NO
```

```
Remark:
In contrast to the GPSEST menu program you cannot select different
a priori weights for each individual parameter set.
The simplification is done to make the input easier (similar to
the troposphere selection in ADDNEQ).
A difference is made between the first parameter set and further sets
to allow for example that the starting values can be constrained to
different a priori weights. This is necessary for UT1-UTC and
nutation!

RECOMMENDED VALUE:
X-POLE:          > 2 <       > 0.       <       > 0.       <     (mas)
Y-POLE:          > 2 <       > 0.       <       > 0.       <     (mas)
UT1-UTC:         > 2 <       > 0.000001  <      > 0.         <   (msec)
DELTA EPSILON:   > 2 <       > 0.0001  <        > 0.0001  <      (mas)
DELTA PSI:       > 2 <       > 0.0001  <        > 0.0001  <      (mas)
CONTINUITY BETWEEN SETS:     > BOTH <            (NO, ERP, NUT, BOTH)
CONSTRAIN DRIFTS TO ZERO:    > NUT  <            (NO, ERP, NUT, BOTH)


SPEC. OPTIONS (0, 2: CONTIN.BETWEEN SETS, 3:CODE H3):
  0: Continuity between parameter sets is specified in the option
     above.
  2: Continuity not only between the parameter sets of 1 NEQ file,
     but continuity also between subsequent NEQ files (G3 solution
     type).
  3: One common offset and one common drift for n days, constructed
     from subsequent 1 day NEQs with each containing an offset and a
     drift parameter (H3 solution type).
     Offset and drift are estimated in an absolute sense, not
     to the a priori values as in GPSEST (i.e. the absolute values
     are modeled by an offset and a drift). For UT1-UTC "absolute"
     means that an offset and drift are estimated for UT1R-UTC.
     Note: NEQ saving is NOT possible in this case.
  RECOMMENDED VALUE: 2

CONSTRAIN DAILY RETROGRADE X-Y FREQUENCY TO ZERO (0/1):
  If sub-daily ERPs are solved for together with the estimation of
  the satellite orbits, it is not possible to separate a retrograde
  diurnal x-y variation from a rotation of the orbital system in
  inertial space. To avoid this "singularity" you may block the
  retrograde diurnal periods of the pole coordinates with special
  constraints.
  RECOMMENDED VALUE: 0

# of Values per Set Stored in Files:
  Controls the number of records per set stored in the ERP output
  files. The estimated polynomial is evaluated at n equally spaced
  epochs.

  Two pole file formats are available:
  BERNESE POLE FILE .. Internal Bernese Software Pole Format
  IERS    POLE FILE .. Official Pole Format used by IERS and IGS

  RECOMMENDED VALUE: 3 (or n .. odd-numbered)

                                                                     EB
```

```
4.8.1-2.4 |    ADD NORMAL EQUATION SYSTEMS: COORDINATES OF CENTER OF MASS

  Coordinates of Center of Mass:

                     Estimate               a priori Sigma

    X-COMPONENT      > YES < (YES, NO)      > 0.0001   <
    Y-COMPONENT      > YES < (YES, NO)      > 0.0001   <
    Z-COMPONENT      > YES < (YES, NO)      > 0.0001   <
```

```
4.8.1-2.4 | ADD NORMAL EQUATION SYSTEMS: COORDINATES OF CENTER OF MASS | HELP

  Coordinates of Center of Mass:
    Allows to solve for center of mass coordinates.
    If center of mass parameters are saved in the NEQs, and you say NO,
    the a priori sigmas are automatically set to 1.d-6 m (i.e. the geocenter
    is fixed to coordinate system origin).
    To estimate freely estimate the geocenter coordinates you have to set
    the a priori sigmas to 0.0 or to a few meters.

    RECOMMENDED VALUES:
    X-COMPONENT:     > YES <               >   1.d-6  <
    Y-COMPONENT:     > YES <               >   1.d-6  <
    Z-COMPONENT:     > YES <               >   1.d-6  <

                                                                        EB
```

```
4.8-1.2.5 |                     PARAMETER PRE-ELIMINATION

  Parameters to be Pre-Eliminated: NO= No Pre-Elimination
                                   BI= Before Inversion of Normal Eq. System
                                   AI= After  Inversion of Normal Eq. System
                                   EP= After Each Epoch

    STATION COORD.    > NO <     SAT. ANT.OFF      > NO <   (NO, BI, AI, EP)
    RECEIVER CLOCKS   > NO <     EARTH POTENTIAL   > NO <   (NO, BI, AI, EP)
    ORBIT ELEMENTS    > NO <     HILL RESONANCES   > NO <   (NO, BI, AI, EP)
    AMBIGUITIES       > NO <     EARTH ALBEDO      > NO <   (NO, BI, AI, EP)
    REC.HEIGHT.CALIB. > NO <     CENTER OF MASS    > NO <   (NO, BI, AI, EP)
    SITE TROPOSPHERE  > NO <     DIFF. IONOSPHERE  > NO <   (NO, BI, AI, EP)
    LOCAL IONOSPHERE  > NO <     PHASE CENTER VAR. > NO <   (NO, BI, AI, EP)
    GM VALUE          > NO <     GLOBAL IONOSPHERE > NO <   (NO, BI, AI, EP)
    LOCAL TROPOSPHERE > NO <     SITE VELOCITIES   > NO <   (NO, BI, AI, EP)
    EARTH ROTATION    > NO <     KIN. COORDINATES  > NO <   (NO, BI, AI, EP)
    STOCH. ORBIT      > NO <                                (NO, BI, AI, EP)
```

```
4.8-1.2.5 |                  PARAMETER PRE-ELIMINATION                  | HELP

  Parameters to be Pre-Eliminated:

    NO:
      Parameters are not pre-eliminated.
    BI:
      Parameters are pre-eliminated before the inversion of the complete
      normal equation matrix, i.e. they are not contained in the solution
      vector and thus their estimates are not available for the user.
      Please note that all pre-eliminated parameters are internally included
      in the least-squares adjustment scheme.
      Parameters pre-eliminated with "BI" are not combined before the pre-
      elimination (e.g. troposphere parameters of the same site included in
      more than one NEQ file are pre-eliminated on a file by file basis
      before the combined NEQ system is formed.
    AI:
      Parameters are pre-eliminated after the inversion of the full normal
      equation matrix. This option is useful, if you want to save a reduced
      normal equation system and still have the possibility to verify the
      estimates of the pre-eliminated parameters in the program output.
    EP:
      NOT supported by ADDNEQ

    RECOMMENDED VALUE: NO

                                                                     EB/SS
```

```
4.8.1-2.A      ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS II

  Additional stochastic parameters at arc boundaries:
  Force Types                                  A-priori Sigma

    (1)  RADIAL                                  > 1.D-6    <
    (2)  PERPENDICULAR TO (1), IN ORBIT PLANE    > 1.D-5    <  (0 or blank:
    (3)  NORMAL TO ORBIT PLANE                   > 1.D-9    <   not used)

  LIST OF SATELLITES (svn numbers, ALL, STOCHastic, NONECLipsing):

  > STOCH                                                          <
```

```
4.8.1-2.A ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS II   HELP

  Additional stochastic parameters at arc boundaries:

    Additional stochastic parameter can be set up for any satellite.
    These options are only of relevance, if the option
    LONG ARC (see {DAT48120 LONG ARC}) is used.
    The same force types as those already present in the normal equations
    (if pseudo-stochastic orbit parameters have been set up there) have to
    chosen (see also {DAT48121}).

                                                       >1 day      1 day
    (1)  RADIAL:
      RECOMMENDED VALUE:                               1.d-6       1.d-9
    (2)  PERPENDICULAR TO (1), IN ORBIT PLANE:
      RECOMMENDED VALUE:                               1.d-5       1.d-9
    (3)  NORMAL TO ORBIT PLANE:
      RECOMMENDED VALUE:                               1.d-9       1.d-9

    (4)  DIRECTION TO THE SUN:
      RECOMMENDED VALUE:                               blank       blank
    (5)  Y-DIRECTION IN SATELLITE FRAME:
      RECOMMENDED VALUE:                               blank       blank
    (6)  X-DIRECTION IN SATELLITE FRAME:
      RECOMMENDED VALUE:                               blank       blank


  LIST OF SATELLITES (svn numbers, ALL, STOCHastic, NONECLipsing):
    Specify the satellites for which you would like to set up additional
    stochastic parameters at the day boundaries (between the consecutive
    NEQ files).

    svn numbers: any list of satellite numbers
    ALL        : all satellites present in the NEQs
    STOCH      : only those satellites for which stochastic pulses have
                 been included in the NEQs.
    NONECL     : Non-eclipsing satellites only.

    Attention  : If a priori weights are already specified in panel
                 {DAT48121}, the settings of the weights in this panel
                 are ignored. That guarantees, that a satellite gets
                 the same weights for all its stochastic parameters
                 independently of where it was set up.

    RECOMMENDED VALUE:  ALL

                                                                        EB
```

```
4.8.1-2.B      ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS III

  Individual dynamical parameters for each arc:

  LIST OF SATELLITES (svn numbers or ALL):
```

```
   >                                                                    <
```

```
4.8.1-2.B | ADD NORMAL EQUATION SYSTEMS: STOCHASTIC ORBIT PARAMETERS II | HELP

    Individual dynamical parameters for each arc:
      Instead of solving for 1 set of dynamical parameters (radiation
      pressure) over more than one day (long arc), it is also possible to
      solve for 1 set of Keplerian elements, but to estimate the dynamical
      parameters on a daily basis.
      This option is mainly for test purposes and was rarely used so far.

      This option is active only, if the options
      {DAT48120 INDIVIDUAL DYN. PAR.} and {DAT48120 LONG ARC} are both set
      to "YES".

    LIST OF SATELLITES (svn numbers or ALL):
      Specify the satellites:

      svn numbers: any list of satellites
      ALL        : all satellites included in the NEQs

      RECOMMENDED VALUE:  blank
                                                                         EB
```

B.7 Option and Help Panels for Menu 5 (Services)

```
 5.1                      SERVICES: OBSERVATIONS

   B - Browse Observation File        M - Mark Observations or Satellites
   E - Edit Observation File          D - Delete Observation File
   G - Graphic of Observations        C - Create File Table
   2 - Split Observation File         A - Add Files to the File Table
   H - Edit Header File only          R - Reorder Files in File Table
   X - Exit

   Option:                >   <       (blank: Select option in file list)

   CAMPAIGN            >          <   (blank for selection list)

 Input File:
   MEASUREMENT TYPE      > PHASE  <   (CODE, PHASE, BOTH /options C,A,R/)
   DIFFERENCES           > SINGLE <   (ZERO or SINGLE)
   OBSERVATION FILE    >          <   (blank for selection list)
```

```
 5.1                      SERVICES: OBSERVATIONS                     HELP

 General remarks:

   With this and the following panels you select the processing options for
   the program SERVOBS. The main purpose of this program is the display
   and manipulation of Bernese observation files (zero- and single-
   difference, phase and code).

   The program runs interactively, there is no separation between panel
   preparation program and actual processing program. You can either run the
   program through option 5.1 in the menu system or you can invoke it
   by typing OBS at command level whenever program panels are displayed.


 This panel can be used to tell the program

 - what file types to process
 - what file to process or
 - what (wild card) descriptor to take to create a file selection panel

 and optionally

 - what file manipulation to do

 Processing options:

   E - Edit Observation File

       The Bernese observation files are binary files. The program SERVOBS
       converts the binary files to ASCII, displays the ASCII intermediate
       file and, if changes have been made interactively, converts it
       back to binary.

       The display programs are taken from your system, i.e. some ASCII
       editor you defined in the source include file I:INCL_P.FOR (or .f).

   B - Browse Observation File

       Browse should use a program for file display that does not allow
       to change the contents of the file

   H - Edit Header File only

       If you are only interested in viewing the Header File, select
       option H to gain time.

   M - Mark Observations or Satellites
```

```
      You can insert special flags into the files to prevent the
      processing programs to process these marked observations.
      See also {DAT511__}.

  G - Graphic of Observations

      To create a graphic display of the available observations and
      satellites. The display is created using standard ASCII characters
      only. You can store the display also into a file.
      See also {DAT513__}.

  2 - Split Observation File

      Split the observation file into two files at a certain epoch.
      See also {DAT512__}.

  C - Create File Table
  A - Add Files to the File Table

      The Bernese GPS Software automatically creates and maintains tables
      containing some information about the observation files (one table
      for each file type: zero and single diff, both for code and phase)
      when you run the programs RXOBV3 (RINEX-->Bernese) and SNGDIF
      (creation of single difference files).

      You can also (re-)create or update the tables "manually" using the
      options C and A, e.g. when you changed respective information in
      the files, such as station name, antenna height or receiver and
      antenna types.

  R - Reorder Files in File Table

      Usually the files are ordered in the file table alphabetically,
      i.e. first after the session number, then the station (code)
      and (if appropriate) after the file sequence number.
      You could change this order using option R.
      See also {DAT514__}.

  D - Delete Observation File

      Option D will remove the files from the file table and from the
      disk. If the option {DAT01___ CONFIRM DELETE} in menu 0.1 is set
      to "YES", the program will ask for a confirmation before deleting
      any file.

  X - Exit

If you leave the option blank you may select it later in the selection
list of the file selection panel by selection the files with the
corresponding character (instead of "S").
                                                                      WG
```

```
5.1-1                  SERVICES: MARK OBSERVATIONS

OPTION               >   <      (X: exit, Q: quit, N: goto next file
                                 A: execute all remaining files
                                 blank: execute current file)

  EDITINFO FILE   > NO       <   (NO: Take info from this panel,
                                 blank for selection list)
  TYPE OF CHANGE    > MARK  <    (MARK, RESET, ELIMInate)
  FREQUENCY         > BOTH  <    (L1,L2 or BOTH)
  SATELLITE(S)      > 29                                           <
                                 ( * : All satellites)
  FROM              >       <    (blank for first obs.number)
  TO                >       <    (blank for last obs.number)

  Time Window:  FROM                         TO
        yy mm dd     hh mm ss        yy mm dd     hh mm ss
      > 93 09 06 < > 00 00 00 <    > 93 09 07 < > 00 00 00 <
```

```
5.1-1 | SERVICES: MARK OBSERVATIONS | HELP

General remarks:

  With this panel you select the processing options for the MARK option of
  the program SERVOBS. The main purpose of this option is to mark
  observations in Bernese observation files to prevent subsequent
  processing programs from processing these marked observations. Marked
  observations can again be unmarked using the corresponding option.
  You can also actually remove observations from the files.

OPTION:

  - You can process the same observation file again and again by leaving
    this option field blank.
  - N will proceed to the next file you previously selected in the file
      selection panel.
  - A will process all remaining files previously selected without
      further interaction
  - Q will exit this part of the program and go back to the file selection
      list or the primary panel of SERVOBS.
  - X will exit SERVOBS.

  EDITINFO FILE:

    Instead of manually informing SERVOBS which observations to MARK you
    can use a file containing all necessary information to allow SERVOBS
    to do this without any further interaction. Such a file can be prepared
    by the program RESRMS (see {DAT532__}) if you want to mark all
    observations with residuals larger than a certain size. (RESRMS reads
    the residual files generated by GPSEST or MAUPRP, generates a
    statistics of the residuals and prepares a file that can be used as
    input file for SERVOBS).
    Example of an edit file: {X:\INX\EXAMPLE.EDT}

    In case you use this option, all remaining input fields in this panel
    are of no importance.

  TYPE OF CHANGE:

    Mark (MARK), unmark (RESET) or completely remove (ELIMI) the
    observations.

  FREQUENCY:

    Select which observations you want to process (L1, L2, or both).

  SATELLITE(S):

    Give a list of the satellite numbers (prn) you want to process
    (separated by blanks or commas).
    Write an asterisk (*) into the field if you want to process the
    observations of all satellites. A blank field will not process any
    observations!

    You can further specify an interval in which the observations are
    processed, either by specifying the first and last observation numbers:

  FROM:  First observation number (blank: from the very first in the file)
  TO:    Last  observation number (blank: up to the very last in the file)

    or by specifying a first and last epoch:

  Time Window:  FROM:  TO:

    (Two-digit year, month number, day, hour, minute, second. Hours,
     minutes, and seconds are optional, they default to zero.)
                                                                        WG
```

```
5.1-2 | SERVICES: SPLIT OBSERVATION FILE
```

```
 2nd Split File:
   OBS.FILE or LAST CHAR.  > A        <   (1 char. entered: defines
                                           last char. for new file name)
 Split Obs.Number:
   OBSERVATION NUMBER        > 330  <

 Split Time: (only used if observation number blank)
   DATE                    >         <   (yy mm dd)
   TIME                    >         <   (hh mm ss)

 Reference Satellite:
   KEEP REF. SATELLITE       > NO   <     (YES or NO)
```

```
5.1-2          SERVICES: SPLIT OBSERVATION FILE          HELP

General remarks:

  With this panel you select the processing options for the SPLIT option of
  the program SERVOBS. The main purpose of this option is to split a
  Bernese observation file into two files, to create a header file for
  the second observation file and to modify the first header file
  accordingly.

 2nd Split File:

   OBS.FILE or LAST CHAR.:

     You can either select a full new name for the second observation
     (and header) file or just a new 8th character of the new filename
     (characters 1 to 7 will be taken from the existing filename).

     The file containing the first part of the observations will keep the
     original filename in any case.

     RECOMMENDED VALUE:  Select a new 8th character only.

 Split Obs.Number:

   OBSERVATION NUMBER:

     You can define the epoch where to split the file either through the
     observation number (to find out the observation number you can e.g.
     previously BROWSE the file) or

 Split Time: (only used if observation number blank)

   DATE:
   TIME:

     by explicitly indicate the precise date and time. (Time is optional,
     default time is 00 00 00).

     All observations with epochs equal or larger than the selected
     observation number or date/time will be stored into the second (new)
     file.

 Reference Satellite:

   KEEP REF. SATELLITE:

     You have to tell the program if the reference satellite for the
     ambiguities in the second file should be the same as in the first
     file or if the program should determine a new (best suited) reference
     satellite.

     RECOMMENDED VALUE:  NO
                                                                        WG
```

```
5.1-3               SERVICES: GRAPHICAL DISPLAY
```

```
  Display Options:
    FREQUENCIES          > L3    <    (L1, L2, L3 or BOTH)
    NUMBER OF CHAR.       > 80  <     (max. 255)

  Time Window:      FROM                         TO
            yy mm dd     hh mm ss        yy mm dd     hh mm ss
          >          < >         <   >          < >          <

  Output:
    OUTPUT FILE        >         <   (blank: output to screen)
```

```
5.1-3                    SERVICES: GRAPHICAL DISPLAY                    HELP

General remarks:

  With this panel you select the processing options for the GRAPHIC DISPLAY
  option of the program SERVOBS. The main purpose of this option is to
  graphically display the contents of a Bernese Observation File.

  ASCII characters only are used to generate the display, so that it is
  independent from the terminal or computer system.

  The vertical axis of the plot contains the list of PRN numbers for the
  satellites. The horizontal axis is the time axis exactly covering the
  length of the file. The time period in which the receiver tracked each
  satellite is represented on the specific satellite lines.

  Display Options:

    FREQUENCIES:

      Whenever L1 (option L1), L2 (option L2), or both L1 and L2 (option
      L3) data from a satellite have been collected, a "*" is placed in the
      appropriate place of the plot. To indicate marked observations a "-"
      is used. Option BOTH will produce a separate line for L1 and L2
      data. The numbers along the horizontal axis are observation numbers
      whenever the scenario changes.

    NUMBER OF CHAR.:

      You can select the width of the plot, depending on the screen used
      or the requested resolution.

  Time Window:      FROM                         TO

      You can extract a part of the file only by defining a time window.
      The plot scale is changed accordingly.

  Output:

    OUTPUT FILE:

      You can output the plot to a file instead of the screen. The file
      extension will be added automatically to the filename, the file will
      be stored into the campaign sub directory, both according to the
      PROGRAM OUTPUT parameters defined in Menu 0.3.4
      (see {DAT034__ PROGRAM OUTPUT}).
                                                                          WG
```

```
5.1-4               SERVICES: REORDER OBSERVATION FILE LIST

  Sequence Order:
    SESSION               > 1 <      (1, 2, 3)
    STATION               > 2 <      (1, 2, 3)
    FILE NUMBER           > 3 <      (1, 2, 3)
```

```
5.1-4    SERVICES: REORDER OBSERVATION FILE LIST    HELP

      Usually the files are ordered in the file table alphabetically,
      i.e. first after the session number, then the station (code)
      and (if appropriate) after the file sequence number.

  Sequence Order:

    SESSION:
    STATION:
    FILE NUMBER:

      You can change this order by specifying which item should have the
      highest priority (select 1), the second (2) and third (3) priority.

      RECOMMENDED VALUES:   1 (SESSION)
                            2 (STATION)
                            3 (FILE NUMBER)
                                                                        WG
```

```
 5.2     SERVICES: CHANGE CONTENTS OF OBS.FILE HEADERS

  CAMPAIGN         >          <     (blank for selection list)

Input Files:
   MEASUREMENT TYPE     > PHASE  <     (CODE, PHASE, BOTH)
   DIFFERENCES          > SINGLE <     (ZERO or SINGLE)
   HEADER FILES        >         <     (blank for selection list)
```

```
 5.2     SERVICES: CHANGE CONTENTS OF OBS.FILE HEADERS    HELP

General Remark:
  This program allows the modification of header files without having to
  edit each individual file in menu 5.1 .

Input Files:

   MEASUREMENT TYPE:
     With this option you select which observation header type(s) you want
     to modify. You may select phase or code header files or both at the
     same time.

   DIFFERENCES:
     You may select zero- or single-difference header files for your header
     file modifications.

   HEADER FILES:
     Enter the file name of the header file you want to change or blank
     to obtain a selection list of the file type(s) defined in the previous
     two options. Wildcards are allowed.
                                                                        MR
```

```
5.2-1    HEADER CHANGES: INPUT PANEL 1

          Option                          New Line

  TITLE  > NO   <   >                                                    <

Other Changes:       Option           From                    To

  CAMPAIGN NAME     > NONE <   >          <           >          <
```

```
STATION NAME      > NONE <   >                 <   >                   <
RECEIVER TYPE     > NONE <   >                 <   >                   <
ANTENNA TYPE      > NONE <   >                 <   >                   <
OPERATOR NAME     > NONE <   >                 <   >                   <

SESSION IDENT.    > NONE <   >      <              >      <
SESS. FILE CHARA. > NONE <   >     <               >   <
```

```
5.2-1        HEADER CHANGES: INPUT PANEL 1        HELP

Title Option:

  TITLE:
    In the first field "Option" you may enter "YES" or "NO" to change
    the title line in the observation header file or to leave it unchanged.
    YES:
      Change title to the value given in the "New Line" field for all
      selected files.
    NO:
      No modifications done to the title line.

Other Changes:
  For these fields you have the following possibilities to fill in the
  first field of a line: NONE, 1ST, 2ND, or BOTH.
  NONE:
    No change is done to this header item.
  1ST:
    Only the information belonging to the first station in the zero- or
    single-difference file(s) is affected.
  2ND:
    Only the information belonging to the second station in the single-
    difference file(s) is affected. Using "2ND" does not make sense for
    zero-difference files.
  BOTH :
    The information of either one or both stations is affected.

  Changes are done if the "From" field exactly matches the value in the
  observation file or if you write "ANY" into the "From" field. The value
  in the "To" field is written to the file in these cases.

  "BOTH" (first field) together with "ANY" (second field) is not allowed
  for some fields (e.g. station name).

  "2ND" or "BOTH" are not allowed at all for some fields (e.g. session
  identification).

  STATION NAME:
    Fields to change the station name.

  RECEIVER TYPE:
    Fields to change the receiver type. Keep in mind to make only changes
    that are consistent with your antenna phase center correction file
    (see e.g. {X:\GEN\PHAS_IGS.01}). Standard receiver and antenna names
    as defined by the IGS may be found in {X:\GEN\RCVR_ANT.TAB}.

  ANTENNA TYPE:
    Fields to change the antenna type. See also the description of the
    previous option.

  OPERATOR NAME:
    Change of the operator name.

  SESSION IDENT.:
    Change of the session identification. Starting with version 4.0 of the
    software the session identification has a lengths of 4 characters.
    Both, numbers and characters may be used. The naming of the sessions
    should be consistent with the session definition table of the campaign
    (see {X:\INX\DAT132__.PAN}).

  SESS. FILE CHARA.:
    Change of the session file characterization. Usually this character is
    set to "1". Subsequent files of the same session might be numbered "2",
```

```
    "3", ... . Normally there should be just one file per station (or base-
    line) and session. This can be achieved with the RINEX file concatena-
    tion program CCRINEXO {DAT2561_}.
                                                                         MR
```

```
5.2-2                  HEADER CHANGES: INPUT PANEL 2

Other Changes:           Option        From           To

  RECEIVER NUMBER      > NONE <    >          <   >          <
  ANTENNA  NUMBER      > NONE <    >          <   >          <
  REMARK NUMBER        > NONE <    >          <   >          <
  OBSERV. INTERVAL     > NONE <    >          <   >          <

  POS.ECCENTR. NORTH   > NONE <    >          <   >          <
  POS.ECCENTR. EAST    > NONE <    >          <   >          <
  POS.ECCENTR. UP      > NONE <    >          <   >          <
```

```
5.2-2                HEADER CHANGES: INPUT PANEL 2                HELP

Other Changes:
  You have the following possibilities to fill in the first field: NONE,
  1ST, 2ND, or BOTH.
  NONE:
    No change is done to this header item.
  1ST:
    Only the information belonging to the first station in the zero- or
    single-difference file(s) is affected.
  2ND:
    Only the information belonging to the second station in the single-
    difference file(s) is affected. Using "2ND" does not make sense if you
    selected zero-difference files.
  BOTH :
    The information of either one or both stations is affected.

  Changes are done if the "From" field exactly matches the value in the
  observation file or if you write "ANY" into the "From" field. The value
  in the "To" field is written to the file in these cases.

  "BOTH" (first field) together with "ANY" (second field) are not allowed
  for some fields (e.g. receiver number).

  "2ND" or "BOTH" are not allowed at all for some fields (e.g. observation
  interval).

  RECEIVER NUMBER:
    Change of the receiver serial number. Receiver serial numbers have to
    be integers.

  ANTENNA  NUMBER:
    Change of the antenna serial number. Antenna serial numbers have to be
    integers.

  REMARK NUMBER:
    Change of the remark number in the observation file(s). The remark
    is an integer.

  OBSERV. INTERVAL:
    Change of the nominal observation interval. This option should be used
    with care. If you change the observation interval to a value smaller
    than the actual sampling in the file, unpredictable results may be
    produced by other programs! The observation interval is given in
    integer seconds. The observation interval is used for the observation
    numbering and these observation numbers have to be unique.

  POS.ECCENTR. NORTH:
    Change of the north component of the antenna positioning eccentricity,
    the vector between antenna reference point (see {X:\GEN\ANTENNA.GRA})
```

```
    and the station marker. The units are meters. Values may be given to
    the tenth of a millimeter (e.g. 0.0023).

  POS.ECCENTR. EAST:
    Change of the east component of the antenna positioning eccentricity.
    See remarks on the north component above.

  POS.ECCENTR. UP:
    Change of the antenna height. Units are meters. Values may be given to
    the tenth of a millimeter. The antenna height is defined as the height
    difference between the antenna reference point (ARP) and the marker.
                                                                        MR
```

```
5.3.1                        RESIDUALS: DISPLAY

  CAMPAIGN        >         <     (blank for selection list)

Input File
  RESIDUAL FILE   >         <     (blank for selection list)

Output File
  RESIDUAL FILE   > NO      <     (NO if not used)
```

```
5.3.1                        RESIDUALS: DISPLAY                       HELP

General Remarks:

  With this program you can look at the residuals that have been written
  by one of the following programs: CODSPP, ORBGEN, MAUPRP, GPSEST, IONEST.
  You also have the possibility to generate an output file. If an output
  file is specified no output will be sent to the screen.

Input File

  RESIDUAL FILE:
    Selection of the residual file to be "browsed". Only one file may be
    selected at a time.

Output File

  RESIDUAL FILE:
    Specification of an output residual file in a readable format.
    RECOMMENDED VALUE: NO

                                                                        TS
```

```
5.3.2                        RESIDUALS: CHECK

  CAMPAIGN            >          <     (blank for selection list)

Input File
  RESIDUAL FILE       >          <     (blank for selection list)

Output Files
  SUMMARY FILE        > RESSUM   <     (NO if not to be created)
  MAXIMAL RESIDUALS   > RESMAX   <     (NO if not to be created)
```

```
5.3.2                        RESIDUALS: CHECK                         HELP
```

```
General Remarks:

  This program can be used to look for outliers in the residual files.
  As output it will create a summary of the residual and a so-called
  edit file. The edit file contains the list of points which were
  identified as outliers by the program. This edit file can be used with
  the "MARK" option of the program SERVOBS (menu 5.1, see {DAT511__}), to
  mark these outliers in the observation files.

Input File:

  RESIDUAL FILE:
    Selection of the input residual file(s). Normally only GPSEST
    residual files are used here. However MAUPRP and CODSPP residual
    files can also be used.

Output Files:

  SUMMARY FILE:
    Output file giving a nice overview per baseline and per satellite
    of the rms of the residuals.

  MAXIMAL RESIDUALS:
    The so-called edit file which can be used in "SERVOBS" to mark the
    detected outliers in the observation files. For an example of an edit
    file see {X:\INX\EXAMPLE.EDT}.
                                                                       TS
```

```
5.3.2.1                    RESIDUAL CHECK: INPUT

  TITLE    >                                                   <

Frequency to be checked:
  FREQUENCY                               > L3 <  (L1,L2,L3,L4,L5)

Residual level
  DETECT RESIDUALS LARGER THAN            >  0.030 <  M

Sampling
  SAMPLING USED TO CREATE RESIDUAL FILE(S)  > 30     <  SEC

Delete small data pieces
  DELETE DATA PIECES SMALLER THAN         > 300    <  SEC
```

```
5.3.2.1                  RESIDUAL CHECK: INPUT                    HELP

  TITLE:
    Title line to be used in the edit file.

Frequency to be checked:

  FREQUENCY:
    Observation frequency to be checked. Here you have to specify which
    frequency you used in the actual processing. Normally with GPSEST
    this will be L3.

Residual level:

  DETECT RESIDUALS LARGER THAN:
    Maximal residual level. Residual larger than this value will be
    considered as outliers and will be written to the edit output file.
    RECOMMENDED VALUE: 0.030

Sampling:

  SAMPLING USED TO CREATE RESIDUAL FILE(S):
    Selection of the sampling which was used in the actual processing.
```

```
Delete small data pieces:

  DELETE DATA PIECES SMALLER THAN:
    Marking outliers can result in small (few epochs) observation pieces.
    To avoid the use of these small, and maybe erratic, data pieces here
    a limit can be set. This is similar to the option in MAUPRP.
    RECOMMENDED VALUE: 240

                                                                    TS
```

```
5.3.3                      RESIDUALS: GRAPHIC TOOL

  CAMPAIGN        >          <     (blank for selection list)

Input Files:
  RESIDUAL FILE   >          <     (blank for selection list)

Output File:
  EDIT FILE       > NO       <     (NO if not used)
```

```
5.3.3                   RESIDUALS: GRAPHIC TOOL                 HELP

General Remarks:

  The graphic tool (GT) will enable you to look at residual files
  graphically. You will also have the possibility to correct cycle slips,
  to add ambiguities, and to remove outliers. Cycle slips, ambiguities,
  and outliers will be written to a so-called edit file which can
  be used with the program SERVOBS (menu 5.1, see {DAT511__}).
  At present GT is unfortunately only working on UNIX platforms.
  Connect Chris Rocken or Jim Johnson at UCAR/UNAVCO for more information:
  rocken@unavco.ucar.edu or jjohnson@unavco.ucar.edu .

Input Files:

  RESIDUAL FILE:
    Selection of the input residual file.

Output File:

  EDIT FILE:
    Output edit file to be used with the program SERVOBS (menu 5.1)
    to mark the outliers in the residual files and to add ambiguities.
    For an example of an edit file see {X:\INX\EXAMPLE.EDT}.
                                                                    TS
```

```
5.4.1                  SERVICES: COORD. COMPARISON

  CAMPAIGN           >          <    (blank for selection list)

Input Files:
  COORDINATES        >          <    (blank for selection list)
  COVARIANCES        > NO       <    (NO, SAME, blank for selection list)
  A PRIORI COORD     > NO       <    (NO, blank for selection list)
  BASEL. DEFINITIONS > NO       <    (NO, blank for selection list)

  Use Plot Skeleton    > NO  <       (YES or NO) Name: U:\INP\COMPARP.INP

Output Files:
  COORDINATES        > NO       <    (NO, if not to be created)
  COVARIANCES        > NO       <    (NO, if not to be created)
  PLOT FILE          > NO       <    (NO, if not to be created)
```

```
  WEEKLY SUMMARY     > NO       <    (NO, if not to be created)
```

5.4.1	SERVICES: COORD. COMPARISON	HELP

```
  General Remarks:
    The program COMPAR allows a comparison of two and more coordinate
    sets including the following:
    - estimation of repeatability rms values for each site
    - detection of problems in one of the coordinate files
    - computation of a mean coordinate set and save the result in a new
      coordinate file
    - computation of a combined solution by specifying also the corres-
      ponding covariance information (variance-covariance files).
      We refer to the program ADDNEQ (menu 4.8.1) for more flexible combi-
      nation procedures as e.g. the change of the geodetic datum of the
      solution, solving for site velocities, etc.
    - display baseline statistics in the north, east, and up components,
      and in baseline length.

Input Files:

  COORDINATES:
    Use blank to get a selection list of all coordinate files. Wildcards
    are allowed, too. In the next panel you will have the possibility to
    specify which sites in the files should be included in the comparisons
    ({DAT5411_}). Please note that the coordinate files should refer to
    approximately the same epoch: a velocity model cannot be applied.
    RECOMMENDED VALUE: blank

  COVARIANCES:
    Possibility to specify the variance-covariance file(s) belonging to
    the coordinate file(s) selected above. Such variance-covariance files
    may be saved in GPSEST see {DAT45___} or in ADDNEQ {DAT481__}), or may
    have been produced by a previous run of this program COMPAR.

    IMPORTANT: In this case the individual solutions have to refer to the
               same geodetic datum definition! It is e.g. not possible to
               combine coordinate sets in which different sites were fixed
               or heavily constrained. Use ADDNEQ {DAT481__} to compute
               combined solutions, where the constraints on site coordi-
               nates have to be changed.

    If no datum changes are necessary, the combined results are identical
    (the coordinates as well as the rms estimates) to those obtained by the
    corresponding ADDNEQ solution.

    Use SAME to automatically select the variance-covariance files with
    the same names (but a different extension) as the coordinate files
    already selected in the previous input field.
    No variance-covariance information is used if you specify "NO".
    RECOMMENDED VALUE: NO

  A PRIORI COORD:
    When saving the resulting (mean) coordinates in a file you may specify
    an a priori coordinate file as a skeleton. The resulting coordinate
    file will then include all the coordinates estimated in this COMPAR run
    and, in addition, all the coordinates of the sites that are listed in
    the a priori coordinate file (to obtain a complete list of site
    coordinates even if not all sites were part of the combination).
    RECOMMENDED VALUE: NO

  BASEL. DEFINITIONS:
    A baseline definition file can be specified to select baselines
    for the analysis of baseline repeatabilities in the north, east, and up
    components, or in geocentric X,Y,Z components, and in baseline length.
    Such a baseline definition file may be created using menu 1.5.2 (see
    {DAT152__}. The path and file extension are specified in menu 0.3.4
    (see {DAT034__.PAN BASELINE DEFINITIONS}). Example of a baseline defi-
    nition file: {X:\INX\EXAMPLE.BSL}.

    This option helps to reduce the output volume in the case you have a
    lot of stations involved.
```

```
    In the panel {DAT5411_.PAN} the repeatability option "GEO" or "LOCAL"
    has to be set.
    RECOMMENDED VALUE: NO

  Use Plot Skeleton:
    A plot skeleton file may be specified containing two parts, a header
    section and a tail section. These sections will automatically be copied
    in front and after the plot values to be saved in the plot file.
    The file name of this skeleton file is: U:\INP\COMPARP.INP. An example
    of a plot skeleton (for the SAS graphic package) may be found in
    {X:\SKL\COMPARPS.SKL}.
    Only of interest, if a plot file is saved.
    RECOMMENDED VALUE: NO


Output Files:

  COORDINATES:
    File name to save the resulting mean/combined site coordinates.
    RECOMMENDED VALUE: NO

  COVARIANCES:
    File name to save the resulting variance-covariance information.
    The variance-covariance matrix of the combined solution is only
    available if input variance-covariance files were specified.
    RECOMMENDED VALUE: NO

  PLOT FILE:
    Residuals of the individual coordinate sets compared to the combined
    solution for each site can be stored in a plot file.
    Path and file extension are taken from menu 0.3.4 (see
    {DAT034__.PAN PLOT FILES}).
    The plot commands have to be given in a plot skeleton file (see option
    above). You have to write your only plot skeleton to obtain a plot
    file that may then easily be plotted by your own plot tool.

  WEEKLY SUMMARY:
    A short statistics (the sites available and a summary of the repeata-
    bilities) can be saved to a file.
    Path and file extension are taken from menu 0.3.4 (see
    {DAT034__.PAN SUMMARY OUTPUT FILE}).
    IDEA: Creation of a summary file for the weekly report of a regional
          analysis center.
    If you specify more than 7 input coordinate files, all files after the
    7th file will be disregarded. If less than 7 input files are selected
    only as many columns as files are reported in this summary.

                                                                          EB
```

```
5.4.1-1 |                 COORD. COMPARISON: INPUT

  Title for Plot File:
    TITLE    >                                                        <

  Coordinate Flags:
    FLAG     > NON <      (ALL, NONblank or Flag)
    FLAG     >     <
    FLAG     >     <
    FLAG     >     <
    FLAG     >     <
    FLAG     >     <
    FLAG     >     <

   Repeatability Option:
    OPTION   > LOCAL <    (NO, LOCAL, GEOcentric)
```

```
5.4.1-1 |              COORD. COMPARISON: INPUT              | HELP
```

```
 Title for Plot File:
   Title for the COMPAR run; will show up in the program output, the
   coordinate output file, and the plot output file.

 Coordinate Flags:
   You have the possibility to specify the sites in the coordinate files
   which should be included in the comparisons.
   - NONblank means: use all sites with non-blank flags.
   - ALL      means: use all site coordinates, even if they were not pro-
                     cessed (no flag)
   - you have several fields to specify special flags:
     Examples of flags: P (GPSEST estimates), M (estimated by COMPAR or
                        ADDNEQ), C (CODSPP estimates), F (fixed sites),
                        R (RINEX coordinates), E (Eccenter points).
    RECOMMENDED VALUE: NON

  Repeatability Option:
    Specify if baseline statistics should be computed (each baseline with
    with each other).
    If no baseline definition file is given (see {DAT541__.PAN}) all base-
    line combinations are analysed. If a file is specified, only the
    baselines listed in this file are considered. (A wildcard (*) is not
    allowed in the baseline definition file for the program COMPAR).

    NO means: no baseline statistics at all.
    LOCAL   : baseline residuals displayed in local north, east, up system.
    GEO     : baseline residuals displayed in geocentric x,y,z system.

    RECOMMENDED VALUE: NO

                                                                        EB
```

```
 5.4.2  |                SERVICES: HELMERT TRANSFORMATION

    CAMPAIGN          >          <     (blank for selection list)

 Input Files:
   COORDINATES 1      >          <  Ref. Coo. (blank for selection list)
   VELOCITIES  1      > NO       <  Ref. Vel. (NO, blank for selection list)
   COORDINATES 2      >          <  Comp.Coo. (blank for selection list)

   USE STATION LIST   > NO       <     (NO: not used, blank: sel.list)

 Output File:
   HELMERT            > NO       <     (NO, if not to be created)
   TRANSFORMED COO. 2 > NO       <     (NO, if not to be created)
                                       (only for Coord. System GEOCENTRIC)
```

```
 5.4.2  |             SERVICES: HELMERT TRANSFORMATION              | HELP

  General Remarks:
    With this and the following data panels you can select two coordinate
    files which will be compared by allowing Helmert parameters
    (translation, rotation and/or scale) between both coordinate systems.

    Output is: - the transformation parameters
               - the residuals in the local N-E-U system

    The mathematical formulation of the transformation equations is given
    the help panel {DAT5421_} to the next input panel.

  Input Files:

    COORDINATES 1:
       First coordinate set. All sites with a non-blank flag (in the
       coordinate file) participate in the determination of the transform-
       ation parameters. This file can be looked at as a reference
       coordinate file.
```

```
      Only one file can be selected from the selection list.

   VELOCITIES  1:
      If the reference coordinate set is referring to a different
      reference epoch than coordinate file 2, we can propagate the
      coordinates of the first file with a velocity field to the epoch
      of the second coordinate file.
      Example: ITRF93 (coordinate 1) given at Epoch 1993.0
               and ITRF93 (velocity 1) are necessary to compare
               the ITRF coordinates with a coordinate set 2 given at
               an arbitrary observation epoch.

   COORDINATES 2:
      Second coordinate set. All sites with a non-blank flag that are
      also available in the first coordinate set with a non-blank flag
      are taking part in the comparison.
      In the site list displayed later you have the possibility to mark
      (M) or to eXclude (X) sites. If a site is marked, its coordinates
      are not contributing to the estimation of the transformation
      parameters, but the residuals are available for checks.
      If a site is excluded, it doesn't show up at all.
      Only one file can be selected from the selection list.

  USE STATION LIST:
      A file with a list of sites can be specified to select the sites
      to be compared without further interaction.
      This option is very useful in an automatic processing mode (e.g.
      using BPE) or if comparisons involving many sites have to be
      repeated many times with the same selection of sites.
      The extension and the path of such a station list file are defined
      in menu 0.3.4 (see {DAT034__.PAN SPECIAL FIXED STAT FILE}).

 Output File:

   HELMERT:
      "NO" means that the results are displayed to you (written to a
      scratch file which is automatically removed after you browsed
      through it).
      To save the results you have to specify a file name.
      The extension and the output directory are defined in menu 0.3.4
      (see {DAT034__.PAN OUTPUT FILES}).

   TRANSFORMED COO. 2:
      You have the possibility to save in a new coordinate file
      the coordinates of file 2 transformed into the system of coordi-
      nate file 1 using the estimated transformation parameters.
      A file is only written, if a file name is specified here AND the
      transformation is done in the GEOCENTRIC coordinate system.
      The extension and the output directory is defined
      in menu 0.3.4 (see {DAT034__ COORDINATES}).
      Result: - Helmert transformation of this file with the original
                coordinate file 2 shows zero residuals.
              - Helmert transformation of this file with coordinate file 1
                shows the same residuals as the transformation of coordi-
                nate file 2 and coordinate file 1, but the transformation
                parameters are now zero.

                                                                        EB
```

```
5.4.2-1 |          HELMERT TRANSFORMATION: SELECTION OF PARAMETERS

   Option:                >   <          (X: Exit)

   Parameters:
     TRANSLATION         > YES <         (YES or NO)
     ROTATION X-AXIS     > YES <         (YES or NO)
     ROTATION Y-AXIS     > YES <         (YES or NO)
     ROTATION Z-AXIS     > YES <         (YES or NO)
     SCALE FACTOR        > YES <         (YES or NO)
     COORD.SYSTEM        > LOCAL      <  (LOCAL or GEOCENTRIC)

   Residuals (N/E/Up):
     UNITS               > MM  <         (M: Meters or MM: Millimeters)
```

5.4.2-1	HELMERT TRANSFORMATION: SELECTION OF PARAMETERS	HELP

```
     Option:

       Enter X to exit the program. Leave the field blank to continue with
       the next panel.

     Parameters:

       TRANSLATION:

         3 shifts along the X, Y, and Z axes

       ROTATION X-AXIS:
       ROTATION Y-AXIS:
       ROTATION Z-AXIS:

         3 rotations around the X,Y,and Z axes

       SCALE FACTOR:

       COORD.SYSTEM:

         Either GEOCENTRIC or LOCAL. It specifies the coordinate system
         to which the transformation parameters refer.

         A description of the transformation formulae may be found
         below!

     Residuals (N/E/Up):

       UNITS:   Either Meters (M) or Millimeters (MM).


Mathematical Model of the Transformation
========================================

Given:      A number of sites  with a set U of coordinates (first file)
            The same sites but with a set W of coordinates (second file)

Option GEOCENTRIC
-----------------

Compute up to 7 transf.parameters: scale, a , a , a , U (1), U (2), U (3)
                                           3   2   1   0      0      0

            W' = (scale) * R(a ) * R(a ) * R(a ) * (U - U )
                               3 3     2 2     1 1         0
such that
                                **2
            Sum of all (W - W')    = min

R (a ) is the rotation matrix around the 3rd axis (z) for an angle of a .
 3  3                                                                 3

R (a ) is the rotation matrix around the 3rd axis (y) for an angle of a .
 2  2                                                                 2

R (a ) is the rotation matrix around the 3rd axis (x) for an angle of a .
 1  1                                                                 1

U  is the vector of the three small translations along the three axes x,y,z
 0

In case no translation parameters are estimated the two sets of coordinates
are first reduced to there respective baricenters.

Option LOCAL
------------

Both sets of coordinates are first reduced by the baricenter of the second
```

```
(W) set of coordinates:

           B    =  (sum of W) / n
            W
                  n: number of those sites actually used for the parameter
                     estimation

           U    =  U  - B   ;  W    =  W - B
            red          W      red         W

Both sets are then rotated into (N,E,Up) coordinates using the W baricenter
as new origin (phi: latitude, lambda: longitude of W baricenter)

           U    =  K * R (phi-90) * R (lambda-180) * U
            rot         2             3                red

           W    =  K * R (phi-90) * R (lambda-180) * W
            rot         2             3                red

                      (1  0  0)
                  K = (0 -1  0) to convert to left-handed system (N,E,Up)
                      (0  0  1)

and
           W'    = (scale) * R(a ) * R(a ) * R(a ) * (U   - U )
            rot                  3 3     2 2     1 1      rot   0

                                                                         WG
```

```
5.4.5                  SERVICES: MERGING COORDINATE FILES

  CAMPAIGN            >          <    (blank for selection list)

 Input Files:
  MASTER COORDINATES  >          <    (blank for selection list)
  MERGE COORDINATES   >          <    (blank for selection list)

 Output Files:
  COORDINATES         > CRDMERGE <
```

```
5.4.5                SERVICES: MERGING COORDINATE FILES                HELP

 General Remarks:
  This program allows the merging of coordinate files into one complete,
  optimum set of coordinates. The so-called master coordinate file is
  updated with the information contained in the individual "merge" coordi-
  nate sets and the resulting set is written to an output coordinate file.
  Whether the coordinates of a specific site in the master coordinate set
  are updated depends on the coordinate flags in the master file and in the
  coordinate file to be merge. The coordinates with a flag of higher
  quality will be saved.

  The following coordinate flags are officially used in the Bernese GPS
  Software 4.0 and are ordered here with increasing quality:

    blank: site not used, not estimated
    R    : Coordinates from the RINEX files (program RXOBV3, menu 2.7.1)
    C    : Coordinates from a code solution (program CODSPP, menu 4.2)
    T    : Coordinates from a triple difference solution (program MAUPRP,
             menu 4.4.2)
    P    : Coordinates from a phase double-difference solution (program
             GPSEST, menu 4.5)
    M    : Mean coordinates from several phase solutions (program COMPAR,
             menu 4.8.2)
    G    : High quality GPS coordinates (e.g. from a multi-day GPS solution)
    I    : ITRF coordinates

    The flags "E" and "F" are handled in a special way:
```

```
    E    : Eccenter site coordinates (various programs, when using a
             station eccentricity file).
    F    : Station that was fixed in the solution (various programs, e.g.
             MAUPRP, GPSEST, ADDNEQ)

    "E" will be changed to the lowest quality flag appearing in the merge
    coordinate file before the merging process.
    "F" will be handled like a station with a flag "blank".

Input Files:

  MASTER COORDINATES:
    Selection of the master coordinate file to be updated with the "merge"
    coordinate set(s). Only one master coordinate file may be selected.

  MERGE COORDINATES:
    One or more coordinate files to be merged with the master coordinate
    set may be selected.

Output Files:

  COORDINATES:
    In this field you specify the output coordinate file name that will
    contain the complete, optimum set of coordinates resulting from the
    merging process.
                                                                       MR
```

```
5.4.5-1        COORDINATE MERGE : INPUT OPTIONS

  REPLACE SAME FLAGS   > NO  <      (YES or NO)
```

```
5.4.5-1        COORDINATE MERGE : INPUT OPTIONS                      HELP

  REPLACE SAME FLAGS:
    This option defines whether sites that have the same coordinate
    flag in the master coordinate file and in the coordinate file to be
    merged should be taken from the master or the merge coordinate file.
    YES:
      The output coordinate file will contain the coordinates of the file
      to be merged.
    NO:
      The output coordinate file will contain the coordinates of the master
      coordinate file.
                                                                       MR
```

```
 5.5.1                  POLE: UPDATE POLE FILE

Input Files:
  POLE FILES BERNESE FORMAT      > NO       <  (blank: selection list,
                                                NO   : not used)
  POLE FILES FOREIGN FORMAT      >          <  (blank: selection list,
                                                NO   : not used)

Output File:
  OUPUT FILE NAME                > POLETST  <
```

```
 5.5.1                 POLE: UPDATE POLE FILE                        HELP
```

```
General Remark:
  This program creates or updates a file containing the Earth Rotation
  Parameter information (ERP). The information is taken from one or more
  input files given in almost any format (e.g. Bernese format, IERS
  Bulletin A or B format, etc.) and is written to the output file specified
  in one of the entry fields below.

Input Files:

  POLE FILES BERNESE FORMAT:
    This entry field defines the input files written in Bernese format (see
    {X:\INX\EXAMPLE.ERP}).
    You may specify one of the following four values:
      a) leave this field blank: the menu system will show you a
         selection list of ERP files. You can then select one or more than
         one of these files.
      b) enter the name of an Earth Rotation Parameter file. The menu
         system then automatically will take the values given in this file.
         RECOMMENDED VALUE: file name without extension.
      c) enter SELECT: The menu system then automatically takes the files
         you selected in the previous run.
      d) enter NO to tell the menu system NOT to use any ERP files in
         Bernese format.

  POLE FILES FOREIGN FORMAT:
    This entry field defines the input files written in a foreign format
    (see {X:\INX\EXAMPLE.IEP}).
    You may specify one of the following four values:
      a) leave this field blank: the menu system will show you a
         selection list of ERP files. You can then select one or more than
         one of these files.
      b) enter the name of an Earth Rotation Parameter file. The menu
         system then automatically will take the values given in this file.
         RECOMMENDED VALUE: file name without extension.
      c) enter SELECT: The menu system then automatically takes the files
         you selected in the previous run.
      d) enter NO to tell the menu system NOT to use any ERP files in
         Bernese format.

Output File:

  OUPUT FILE NAME:
    Enter the name of the Earth Rotation Parameter file you want to
    create or update. The results are written in the Bernese ERP format
    (example {X:\INX\EXAMPLE.ERP}).
    RECOMMENDED VALUE: file name without extension.
                                                                         SF
```

```
5.5.1-1            POLE: UPDATE POLE FILE: GENERAL OPTIONS

Header information:
  TITLE    >                                                              <
  NUTATION MODEL           > NO       <    (NO, OBSERVED, HERRING)

Bulletin B as input:
  USE 1 OR 5 DAY VALUES    > 1        <    (1: one day values,
                                            5: five day values)
Pole offsets:
  USE POLE OFFSET FILE       > YES <       (YES: Automatic,
                                            NO: add no pole offset)
Window:
  USE WINDOW                 > NO  <       (YES,NO)

  FROM/TO             yyyy mm dd hh.hh      yyyy mm dd hh.hh
                      ---- -- -- -----      ---- -- -- -----
                    > 1993 01 01 00.00 <  > 1995 01 01 00.00 <
```

```
5.5.1-1 |           POLE: UPDATE POLE FILE: GENERAL OPTIONS           |   HELP
-------------------------------------------------------------------------------

 Header information:

   TITLE:
     Enter a title of your choice. This title then will be written into the
     new/updated pole file. This title is just an information for you and
     will not be used by any part of the software.
     RECOMMENDED VALUE: Any information of your choice.

   NUTATION MODEL:
     You can specify the type of nutation model you want to write into the
     Earth rotation parameter file. This model will then be used to correct
     the IAU Nutation model (1980).
     You have three valid entries:
       HERRING : The nutation corrections in this pole file are computed
                 using the HERRING model.
       OBSERVED: The nutation corrections are estimated values and are taken
                 from the columns DE-CPO and DP-CPO in the ERP file (see
                 {X:\INX\EXAMPLE.ERP}).
       NO      : The IAU nutation model is used (no corrections).
     RECOMMENDED VALUE: NO

 Bulletin B as input:

   USE 1 OR 5 DAY VALUES:
     In the case you use the values of IERS Bulletin B you can select
       whether you want to use the daily Earth Rotation Parameters or the
       values given in a five day interval.
     Enter 1 to select the daily values and 5 to select the five day values.
     This field is only used if you specify Bulletin B as input.
     RECOMMENDED VALUE: 1

 Pole offsets:

   USE POLE OFFSET FILE:
     Specify if you want to correct for the pole offsets or not. The pole
     offsets and drifts are published in the IERS Annual Reports (e.g.
     Table II-3 in the 1993 IERS Annual Report). They are used to transform
     the pole and UT1-UTC values into the reference frame defined by the
     ITRF coordinates and velocities at the epoch of the observations.
     For more information see {DAT031__ POLE OFFSET COEFF} and
     {X:\GEN\POLOFF.}.
     You have two possibilities:
     YES: The pole offset values will be added automatically. This means
          that the offsets are applied depending on the type of ERP input
          files e.g.
          input = Bulletin B    --> add pole offsets.
          input = Bernese files --> do not add pole offsets.
     NO: The pole offset values will NOT be added
     RECOMMENDED VALUE: YES

 Window:

   USE WINDOW:
    Specify whether you want to select a time interval or if you want to
    use the total time span covered by the input file(s).
    You have two possible entries:
    YES: You have to specify the starting end ending epoch of the
         time interval using the two entry fields below.
    NO:  Take all available values.
    RECOMMENDED VALUE: NO.

   FROM/TO              yyyy mm dd hh.hh      yyyy mm dd hh.hh

                        ---- -- -- -----      ---- -- -- -----

    Example:          > 1993 01 25 21.50 <  > 1995 01 01 00.00 <

    Specify the time interval you want to include in the output ERP file.
    Values in the ERP input files outside the time interval will not be
    stored in the ERP output file.
    You have to use the following format (see example above):
    yyyy = year                                  e.g. 1993
    mm   = month  (01= January,..,12=December)   e.g. 01
    dd   = day of month                          e.g. 25
```

```
    hh.hh= hour and decimals of hours            e.g. 21.50 (= 21h 30min)
    The first entry field specifies the starting time and the second
    entry field the end time of the interval.
                                                                        SF
```

```
5.5.2   |                 POLE: EXTRACT POLE INFORMATION

  CAMPAIGN           >         <    (blank for selection list)

Input Files:
  POLE FILES (IERS)  >         <    (blank for selection list)
  A PRIORI POLE      >         <    (blank for selection list)
  PLOT SKELETON FILE > NO      <    (NO, if not used; blank for sel.list)

Output Files:
  POLE IERS FORMAT    > POLETST  <    (NO, if not to be saved)
  POLE BERNESE FORMAT > POLETST  <    (NO, if not to be saved)
  PLOT FILE           > NO       <    (NO, if not to be saved)
```

```
5.5.2   |             POLE: EXTRACT POLE INFORMATION              | HELP

General Remarks:
  This program may be used to extract earth rotation parameter (ERP) infor-
  mation from a list of consecutive pole files in the IERS format (see
  {X:\INX\EXAMPLE.IEP}). In the next panel {DAT5521_} the user may specify
  which records in the original pole files should be extracted and from
  which records the UT1-UTC values are integrated into a continuous series.

Input Files:

  POLE FILES (IERS):
    Selection of the pole files (e.g. consecutive daily or 3-day solutions)
    from which a series of earth rotation parameters should be extracted.
    Wildcards may be used and "blank" gives a full selection list.
    The files selected have to be ordered in time and it is not allowed to
    have gaps in the pole file series (because of the integration of UT1-
    UTC).

  A PRIORI POLE:
    You may select an a priori pole file for comparison purposes. The ERPs
    of the extracted/integrated series will be compared to the ERPs in the
    a priori pole file and both values will be written to the output plot
    file.

  PLOT SKELETON FILE:
    If you would like to get a plot file you may enter the name of a plot
    skeleton file here. An example of a plot skeleton file for SAS plots
    is given in {X:\SKL\POLXTRPS.SKL}. Other plot packages are not
    supported at present.

Output Files:

  POLE IERS FORMAT:
    Enter the name of the output pole file (IERS format) in this field to
    save the extracted ERP information. With "NO" no output IERS pole file
    will be written. An example of the IERS pole format may be found in
    {X:\INX\EXAMPLE.IEP}.

  POLE BERNESE FORMAT:
    Enter the name of the output pole file (Bernese format) in this field
    to save the extracted ERP information. With "NO" no output IERS pole
    file will be written. An example of the Bernese pole format may be
    found in {X:\INX\EXAMPLE.ERP}.

  PLOT FILE:
    To write a plot file (SAS) you have to enter the name of the plot file
    in this field. Setting this option to "NO" makes sure that no plot file
    is created.
```

```
                                                                        MR
```

```
5.5.2-1                  POLE EXTRACTION: INPUT

  Title for Output Files:
    TITLE  >                                                             <

  Record Numbers to be used:         Defaults:  1-day    3-days
    UT1-UTC INTEGRATION 1   > 1  <            (   1        2    )
    DAILY DRIFT 1           > 1  <            (   1        4    )
    X,Y POLE VALUES         > 2  <            (   2        5    )
    DAILY DRIFT 2           > 3  <            (   3        6    )
    UT1-UTC INTEGRATION 2   > 3  <            (   3        8    )
```

```
5.5.2-1                 POLE EXTRACTION: INPUT                      HELP

  Title for Output Files:

    TITLE:
      The title line given here will be written as header line into all the
      output files. It is important to set this title for documentation
      purposes. The title line will also appear on the plot.

  Record Numbers to be used:         Defaults:  1-day    3-days
    The records in the IERS pole file (excluding any header lines) are
    numbered sequentially for references below. The RECOMMENDED VALUES for
    the extraction of 1-day and 3-day solutions are given in parentheses.

    UT1-UTC INTEGRATION 1:
      The UT1-UTC value in the record number entered here will be used
      together with the value in the record number given in the field
      "UT1-UTC INTEGRATION 2" to compute the UT1-UTC drift and to do the
      integration of UT1-UTC.

    DAILY DRIFT 1:
      The daily drifts in the pole coordinates and in UT1-UTC given in the
      IERS pole format are computed from the two records given in this field
      here and the field "DAILY DRIFT 2" below.

    X,Y POLE VALUES:
      The x,y pole values in the resulting series are taken from the record
      entered here.

    DAILY DRIFT 2:
      See option "DAILY DRIFT 1".

    UT1-UTC INTEGRATION 2:
      See option "UT1-UTC INTEGRATION 1".
                                                                        MR
```

```
 5.6.1          EXTRACTIONS: EXTRACTION FROM CODSPP OUTPUT

     CAMPAIGN          >         <       (blank for selection list)

   Input File:
     CODSPP OUTPUT NUMBER  >     <         (blank for selection list)
```

```
 5.6.1           EXTRACTIONS: CODSPP OUTPUT SUMMARIES               HELP
```

```
General Remarks:

  This extraction program extract the most important information
  from one or more CODSPP program output files (see menu 4.2) and writes a
  comprehensive summary file.
  The output of this extraction program goes to the normal "JOB" output.
  It can be viewed with "JOB" (menu 5.9)

  Input File:
    CODSPP OUTPUT NUMBER:
      Selection of CODSPP output file(s) as input for the extraction
      program. Depending on the setting of the option {DAT01___.PAN DIGITS}
      either output numbers in the form "nn" or in the form "nnn" (e.g. for
      CODSPP.L01 or CODSPP.001 resp.) are accepted.

                                                                        TS
```

```
5.6.2              EXTRACTIONS: DEFSTD OUTPUT SUMMARIES

    CAMPAIGN           >          <    (blank for selection list)

  Input Files:
    DEFSTD OUTPUT NUMBER  >     <      (blank for selection list)

  Output Files:
    OUTPUT SUMMARY     > DEFXTR   <    (output file required)
    WEEKLY SUMM. FORM. > DEFWKS   <    (NO, if not to be created)
```

```
5.6.2             EXTRACTIONS: DEFSTD OUTPUT SUMMARIES              HELP

General Remarks:

  This extraction program extracts the most important information
  from an ORBGEN program output file (see menu 3.3) and writes a
  comprehensive summary file.

  Input Files:

    DEFSTD OUTPUT NUMBER:
      Selection of DEFSTD output file(s) as input for the extraction
      program. The extensions of the DEFSTD output file(s) may have the
      form "nn" or "nnn" depending on the setting of the option
      {DAT01___.PAN DIGITS}.

  Output Files:

    OUTPUT SUMMARY:
      Output name of the summary. This summary includes the DEFSTD output
      file name, the day of year, number of satellites, number of eclipsing
      satellites, and the number of minutes in eclipse; the maximum rms,
      and the corresponding satellite.
      Output example:
DEFSTD.L92      # Sat.:  24 , # Eclipsing  4 , Max. Rms.:  0.14 for sat.: 15
(DOY: 341)      Eclips. Sat. :    4  15  17  24
                Min in eclips:   55  55  54  55
                Rms          :    7  14   6   9

    WEEKLY SUMM. FORM.:
      An other output summary. This is a one line summary which lists
      first the day of year followed by the DEFSTD rms for each individual
      satellite.
      Output example:
341   3  8  7  9  8  5  9  5 14  5  6  3  8  9  4  9  2  9  7  5  8  8  4  8

                                                                        TS
```

```
5.6.3        EXTRACTIONS: INFORMATION EXTRACTION FROM MAUPRP OUTPUT

    CAMPAIGN            >          <       (blank for selection list)

  Input File:
    MAUPRP OUTPUT NUMBER  >     <          (blank for selection list)

  Output Files:
    MAUPRP SUMMARY FILE > MPRXTR   <       (NO, if not to be saved)
    FILE DELETION LIST  > MPRXTR   <       (NO, if not to be saved)
    NEW BASELINE DEF.   > MPRXTR   <       (NO, if not to be saved)

  Deletion File Option:
    INCLUDE IN DEL.FILE  > BOTH   <        (SINGLE diff. only or BOTH, zero
                                            and single diff. files)
```

```
5.6.3     EXTRACTIONS: INFORMATION EXTRACTION FROM MAUPRP OUTPUT     HELP

General Remarks:

  This extraction program extracts the most important information
  from one or more MAUPRP program output files (see menu 4.4.2) and writes
  a comprehensive summary file.

  Input File:

    MAUPRP OUTPUT NUMBER:
      Selection of MAUPRP output file(s) as input for the extraction
      program. Specify a number in the form "nn" or "nnn" depending on the
      option set in {DAT01___.PAN DIGITS}.

  Output Files:

    MAUPRP SUMMARY FILE:
      MAUPRP summary output using one line for each baseline. More than
      one baseline may be included in one MAUPRP output file.

    FILE DELETION LIST:
      If any baseline and/or station was identified as bad it is
      listed in this file. This file can be used with the "DELFIL_P"
      menu program (menu 5.8) to delete the listed file(s).

    NEW BASELINE DEF.:
      If a certain station was identified as "bad" this file indicates
      which baseline(s) should be (re)created to obtain again a complete
      network.

  Deletion File Option:

    INCLUDE IN DEL.FILE:
      Option to identify if only bad baselines (single difference files)
      should be listed in the file deletion list or also bad stations (zero
      difference files).
      RECOMMENDED VALUE: BOTH

                                                                        TS
```

```
5.6.4           EXTRACTIONS: COORD. EXTRACTION FROM GPSEST OUTPUT

    CAMPAIGN           >          <        (blank for selection list)

  Input File:
    GPSEST OUTPUT NUMBER  >     <          (blank for selection list)
```

```
5.6.4 | EXTRACTIONS: COORD. EXTRACTION FROM GPSEST OUTPUT | HELP

General Remarks:

  This extraction programs extracts the most important coordinate infor-
  mation from one or more GPSEST program output files and writes a
  comprehensive summary file.
  The output of this extraction program goes to the normal "JOB" output.
  It can be viewed with "JOB" (menu 5.9).

    GPSEST OUTPUT NUMBER:
      Selection of GPSEST output file(s) as input for the extraction
      program.

                                                                       TS
```

```
5.6.5 |             EXTRACTIONS: GPSEST/ADDNEQ GENERAL SUMMARY

    CAMPAIGN              >          <   (blank for selection list)

  Input Files:
    GPSEST OUTPUT NUMBER  >     <        (NO, or blank for selection list)
    ADDNEQ OUTPUT NUMBER  > NO  <        (NO, or blank for selection list)
    GENERAL OUTPUT FILE   > NO       <   (NO, or blank for selection list)

  Output Files:
    OUTPUT SUMMARY        > NO       <   (NO, if not to be created)
    COORDINATE SUMMARY    > NO       <   (NO, if not to be created)
    GIM SUMMARY           > NO       <   (NO, if not to be created)
    QIF SUMMARY           > NO       <   (NO, if not to be created)
    AMBIGUITY FRACTIONALS > NO       <   (NO, if not to be created)
    CAMPAIGN SUMMARY      > NO       <   (NO, if not to be created)
    WEEKLY SUMMARY        > NO       <   (NO, if not to be created)
    POLE OUTPUT           > NO       <   (NO, if not to be created)
```

```
5.6.5 |          EXTRACTIONS: GPSEST/ADDNEQ GENERAL SUMMARY          | HELP

General Remarks:

  This extraction program extracts the most important information from the
  parameter estimation programs GPSEST/ADDNEQ and writes several possible
  summary files.

  Input Files:

    GPSEST OUTPUT NUMBER:
      Selection of GPSEST output file(s) as input for the extraction
      program. Specify an output number in the format "nn" or "nnn"
      depending on the setting of the option {DAT01___.PAN DIGITS} or
      leave the field blank to get a selection list.

    ADDNEQ OUTPUT NUMBER:
      Selection of ADDNEQ output file(s) as input for the extraction
      program. See also previous option description.

    GENERAL OUTPUT FILE:
      Selection of GPSEST/ADDNEQ output file(s) which are specially named
      using {DAT450__ GENERAL OUTPUT} or {DAT4810_ GENERAL OUTPUT}. Note
      that GPSEST and ADDNEQ output files can be specified simultaneously.
      RECOMMENDED VALUE: wildcard

  Output Files:

    OUTPUT SUMMARY:
      Normal extraction summary.
```

```
    COORDINATE SUMMARY:
      Extraction of coordinate corrections (new - a priori).

    GIM SUMMARY:
      Summary concerning Global Ionosphere Models.

    QIF SUMMARY:
      Statistics on the baseline-wise QIF ambiguity resolution.

    AMBIGUITY FRACTIONALS:
      List of fractionals of resolved ambiguities when using the QIF
      strategy.

    CAMPAIGN SUMMARY:
      One-line summary in special format.

    WEEKLY SUMMARY:
      One-line summary in special format.

    POLE OUTPUT:
      Special extraction containing only estimated Earth Orientation
      Parameters. A special pole output file will only be written if the
      pole option (see next panel {DAT5651_} is set to "0". In all other
      cases the pole estimates are printed to the normal extraction
      summary.
      RECOMMENDED VALUE: NO

                                                                      TS
```

```
5.6.5-1 |            EXTRACTIONS: GPSEST/ADDNEQ SUMMARY OPTIONS

  Pole Option:
    POLE VALUES FOR WHICH DAY > 1 <    (1,2,3 or 0 for all)
```

```
5.6.5-1 |         EXTRACTIONS: GPSEST/ADDNEQ SUMMARY OPTIONS        | HELP

  Pole Option:

    POLE VALUES FOR WHICH DAY:
      Selection of which Earth Orientation Parameter estimates should be
      extracted. Only active if a pole output name is specified. In case
      a "0" is selected the pole output will actually be written into the
      pole output file. In all other cases the pole output will be written
      in the normal extraction summary.
      RECOMMENDED VALUE: 0

                                                                      TS
```

```
 5.6.7  |                ORBIT WEIGHTS: INPUT INFORMATION

  CAMPAIGN          >         <    (blank for selection list)

 Input Files:
  PRECISE ORBITS    >         <    (blank for selection list)
  ORBIMP LIST FILE  >         <    (blank for selection list)

 Output Files:
  PRECISE ORBITS    >         <    (blank for same names as input orbit)
```

```
5.6.7-1 |                   ORBIT WEIGHTS: INPUT

 Title for Output Files:
   TITLE  >                                                            <

 Residual levels for precise weight codes (P0 = 5):
   P = P0 + 1 : RESIDUAL LARGER THAN   > 0.090  < M  ( 0.140)
   P = P0 + 2 : RESIDUAL LARGER THAN   > 0.140  < M  ( 0.190)
   P = P0 + 3 : RESIDUAL LARGER THAN   > 0.200  < M  ( 0.300)
   P = P0 + 4 : RESIDUAL LARGER THAN   > 0.300  < M  ( 0.500)
   P = P0 + 5 : RESIDUAL LARGER THAN   > 0.500  < M  ( 0.700)
   P = P0 + 6 : RESIDUAL LARGER THAN   > 0.750  < M  ( 1.100)
   P = P0 + 7 : RESIDUAL LARGER THAN   > 1.000  < M  ( 1.500)
   P = P0 + 8 : RESIDUAL LARGER THAN   > 1.500  < M  ( 5.000)
   P = P0 + 9 : RESIDUAL LARGER THAN   > 5.000  < M  (      )
```

```
5.7.1   |               OBSFMT: CREATE FORMATTED OBS.FILES

  CAMPAIGN            >          <     (blank for selection list)

Input File:
  MEASUREMENT TYPE    > PHASE    <     (CODE or PHASE)
  DIFFERENCES         > ZERO     <     (ZERO or SINGLE)
  OBSERVATION FILE    >          <     (blank for selection list)

Output File:
  FORMATTED OBS.FILE  >          <     (blank for same name as obs.file)
```

```
5.7.1   |           OBSFMT: CREATE FORMATTED OBS.FILES           | HELP

General Remarks:
  Use this program to convert binary Bernese observation files into
  formatted ASCII versions of the same files. If you would like to look at
  just one or a few observation files you may use menu 5.1 to easily browse
  or edit the files. This program here allows the conversion of many obser-
  vation files in one run and is mainly used for observation file transfer
  between different computer systems using different binary formats: the
  files are first converted to ASCII, then transferred to the target
  computer, and finally the files are re-converted from ASCII into binary
  using menu 5.7.2 (see {DAT572__}).

Input File:

  MEASUREMENT TYPE:
    With this option you select which observation file type you want to
    convert to ASCII. You may select either phase or code observation
    files.

  DIFFERENCES:
    You may select either zero- or single-difference observation files for
    the conversion.

  OBSERVATION FILE:
    Enter the name of the observation file you want to convert or use wild-
    cards or "blank" to get a selection list. More than one file may be
    selected here.

Output File:

  FORMATTED OBS.FILE:
    If "blank" is specified in this field the formatted output files will
    get the same name as the original binary files, but a different
    extension (see {DAT032__} for the default extensions used). An output
    filename may only be entered if exactly ONE binary observation file was
    selected as input.
                                                                         MR
```

```
5.7.2                  FMTOBS: CREATE BINARY OBS.FILES

  CAMPAIGN            >          <     (blank for selection list)

Input File:
  MEASUREMENT TYPE    > PHASE    <     (CODE or PHASE)
  DIFFERENCES         > ZERO     <     (ZERO or SINGLE)
  FORMATTED OBS.FILES >          <     (blank for selection list)

Output File:
  BINARY OBS.FILES    >          <     (blank for same name as input file)
```

```
5.7.2                 FMTOBS: CREATE BINARY OBS.FILES                HELP

General Remarks:
  Use this program to convert formatted ASCII Bernese observation files
  back into binary observation files. This program here allows the con-
  version of many observation files in one run and is mainly used for
  observation file transfer between different computer systems using
  different binary formats: the files are first converted to ASCII using
  menu 5.7.1 (see {DAT571__}), then transferred to the target computer, and
  finally the files are re-converted from ASCII into binary using this
  program here.

Input File:

  MEASUREMENT TYPE:
    With this option you select which ASCII observation file type you want
    to convert to binary. You may select either phase or code observation
    files.

  DIFFERENCES:
    You may select either zero- or single-difference observation files for
    the conversion.

  FORMATTED OBS.FILES:
    Enter the name of the ASCII observation file you want to convert or use
    wildcards or "blank" to get a selection list. More than one file may be
    selected here.

Output File:

  BINARY OBS.FILES:
    If "blank" is specified in this field the binary observation output
    files will get the same name as the ASCII input files, but a diffe-
    rent extension (see {DAT032__} for the default extensions used). An
    output filename may only be entered if exactly ONE binary observation
    file was selected as input.
                                                                        MR
```

```
5.7.3          STDFMT: CREATE STANDARD ORBIT AND RPR FILES IN ASCII

  CAMPAIGN            >          <     (blank for selection list)

Input Files:
  STANDARD ORBITS     >          <     (blank for selection list,
                                        NO, if not to be converted)
  RAD.PRESS.COEFF     > NO       <     (blank for selection list,
                                        NO, if not to be converted,
                                        SAME for same as stdorb files)

Output Files:
  ASCII STD.ORBITS    >          <     (blank for same name as input file)
  ASCII RPR COEFF     >          <     (blank for same name as input file)
```

```
5.7.3   STDFMT: CREATE STANDARD ORBIT AND RPR FILES IN ASCII   HELP

General Remarks:
  Use this program to convert binary standard orbit files into formatted
  ASCII versions of the same files. The program allows the conversion of
  many standard orbit files in one run and is mainly used for standard
  orbit file transfer between different computer systems using different
  binary formats: the files are first converted to ASCII, then transferred
  to the target computer, and finally the files are re-converted from ASCII
  into binary using menu 5.7.4 (see {DAT574__}).

Input Files:

  STANDARD ORBITS:
    Enter the name of the standard orbit file you want to convert or use
    wildcards or "blank" to get a selection list. More than one file may be
    selected here.

Output Files:

  ASCII STD.ORBITS:
    If "blank" is specified in this field the formatted output files will
    get the same name as the original binary files, but a different
    extension (see {DAT033__} for the default extensions used). An output
    filename may only be entered if exactly ONE binary standard file was
    selected as input.
                                                                         MR
```

```
5.7.4         FMTSTD: CREATE BINARY STANDARD ORBIT AND RPR FILES

  CAMPAIGN            >           <     (blank for selection list)

Input Files:
  ASCII STD.ORBITS    >           <     (blank for selection list,
                                         NO, if not to be converted)
  ASCII RPR COEFF     > NO        <     (blank for selection list,
                                         NO, if not to be converted,
                                         SAME for same as stdorb files)

Output Files:
  STANDARD ORBITS     >           <     (blank for same name as input file)
  RAD.PRESS.COEFF     >           <     (blank for same name as input file)
```

```
5.7.4     FMTSTD: CREATE BINARY STANDARD ORBIT AND RPR FILES      HELP

General Remarks:
  Use this program to convert ASCII standard orbit files back into binary
  standard orbit files. The program allows the conversion of many ASCII
  standard orbit files in one run and is mainly used for standard orbit
  file transfer between different computer systems using different binary
  formats: the files are first converted to ASCII using menu 5.7.3 (see
  {DAT573__}), then transferred to the target computer, and finally the
  files are re-converted from ASCII into binary using this program here.

Input Files:

  ASCII STD.ORBITS:
    Enter the name of the ASCII standard orbit file you want to convert or
    use wildcards or "blank" to get a selection list. More than one file
    may be selected here.

Output Files:

  STANDARD ORBITS:
    If "blank" is specified in this field the binary standard orbit output
    files will get the same name as the ASCII input files, but a diffe-
```

```
rent extension (see {DAT033__} for the default extensions used). An
output filename may only be entered if exactly ONE binary standard
orbit file was selected as input.
                                                                  MR
```

```
5.8                       BPE SERVICES: DELETE FILES

  CAMPAIGN                 >          <   (blank for selection list)

Files to Delete:
  DELETION FILE LIST       > NO       <   (blank for selection list; NO, if
                                           not used)
  FILE TYPE                >          <   (blank for selection list)
  FILE NAMES               >          <   (blank for selection list; only
                                           if deletion file list not used)

Confirm delete:
  CONFIRM DELETE           > YES <        (YES or NO)
```

```
5.8                   BPE SERVICES: DELETE FILES                     HELP

 General remark:
   This program is a tool to automatically delete campaign-specific
   files (e.g. observation files, orbit files, ...).
   This tool is very powerful when processing data using the BPE but is
   rarely used in interactive work.

Files to Delete:

  DELETION FILE LIST:
    Specifies the file containing all the file types you want to delete
    automatically.  See {X:\INX\EXAMPLE.DEL}. The first row of the file
    list contains the file name and the second row the corresponding
    file type identifier (see {DAT581__}). The file names can be specified
    using wildcards and file name parameters ($-variables, see {DAT151__}).
    Three different options are possible:
      a) leave this field blank: The menu system will show you a
         selection list of possible deletion file lists. You then can
         select one of these files.
      b) enter the name of a deletion file list. The menu system then
         automatically will select the corresponding file.
      c) enter "NO". In this case you have to use the next two entry
         fields to define the files to be deleted (FILE TYPE and FILE
         NAMES).

  FILE TYPE:
    (Only to be set if option NO is selected in the DELETION FILE LIST).
    Specify the file type identifier of the files you want to delete
    (observation files, orbit files, station files ..., see {DAT581__}).
    Two different options are possible:
      a) leave this field blank: The menu system will show you a
         selection list of all possible file types. You can then select one
         or more of these file types.
      b) enter the name of a file type identifier. The menu system then
         automatically selects this file type for file deletion.

  FILE NAMES:
    (Only to be set if option NO is selected in the DELETION FILE LIST).
    Specify the names of the files you want to delete.
    Two different options are possible:
      a) leave this field blank: The menu system will show you a
         selection list of possible file names. You then can select one
         or more of these files. Wildcards are allowed, too.
      b) enter the name of a file. The menu system will then automatically
         delete this file.

Confirm delete:
```

```
  CONFIRM DELETE:
    Specify whether you want the menu system to ask if you really want
    to delete the selected files (YES) or not (NO). On multiuser systems
    it may be impossible to recover deleted files.
    RECOMMENDED VALUE: YES when processing interactively
                       NO  when using Bernese Processing Engine (BPE)
                                                                      SF
```

```
 5.8.1  |                FILE TYPE: DEFINITION OF NAMES

 Filetype    Keywrd Ext. Keywrd Path  Panel       Comment

> CZHED    <> CODHED   <> OBSPATH  <> DAT032__ <> ZERO DIFF CODE HEAD      <
> CZOBS    <> CODOBS   <> OBSPATH  <> DAT032__ <> ZERO DIFF CODE OBS       <
> CZERO    <> CODOBS   <> OBSPATH  <> DAT032__ <> ZERO DIFF CODE HEAD+OBS  <
> PZHED    <> PHAHED   <> OBSPATH  <> DAT032__ <> ZERO DIFF PHASE HEAD     <
> PZOBS    <> PHAOBS   <> OBSPATH  <> DAT032__ <> ZERO DIFF PHASE OBS      <
> PZERO    <> PHAOBS   <> OBSPATH  <> DAT032__ <> ZERO DIFF PHASE HEAD+OBS <
> BZERO    <> PHAOBS   <> OBSPATH  <> DAT032__ <> ZERO DIFF CD+PH HEAD+OBS <
> CSHED    <> SDCHED   <> OBSPATH  <> DAT032__ <> SNGL DIFF CODE HEAD      <
> CSOBS    <> SDCOBS   <> OBSPATH  <> DAT032__ <> SNGL DIFF CODE OBS       <
> CSING    <> SDCOBS   <> OBSPATH  <> DAT032__ <> SNGL DIFF CODE HEAD+OBS  <
> PSHED    <> SDPHED   <> OBSPATH  <> DAT032__ <> SNGL DIFF PHASE HEAD     <
> PSOBS    <> SDPOBS   <> OBSPATH  <> DAT032__ <> SNGL DIFF PHASE OBS      <
> PSING    <> SDPOBS   <> OBSPATH  <> DAT032__ <> SNGL DIFF PHASE HEAD+OBS <
> BSING    <> SDPOBS   <> OBSPATH  <> DAT032__ <> SNGL DIFF CD+PH HEAD+OBS <
> CODFMT   <> CODFMT   <> OBSPATH  <> DAT032__ <> FORMATTED CODE OBS       <
> PHAFMT   <> PHAFMT   <> OBSPATH  <> DAT032__ <> FORMATTED PHASE OBS      <
> BRDCAST  <> BRDCAST  <> PATHORB  <> DAT033__ <> BROADCAST EPHEMERIS      <
> TABORB   <> TABORB   <> PATHORB  <> DAT033__ <> TABULAR EPHEMERIS        <
> STDORB   <> STDORB   <> PATHORB  <> DAT033__ <> STANDARD ORBITS          <
> RPRCOE   <> RPRCOE   <> PATHORB  <> DAT033__ <> RADIATION PRESSURE COEFF <
> ORBELE   <> ORBELE   <> PATHORB  <> DAT033__ <> ORBITAL ELEMENTS         <
> PRECISE  <> PRECISE  <> PATHORB  <> DAT033__ <> PRECISE EPHEMERIS        <
> STDASCII <> STDASCII <> PATHORB  <> DAT033__ <> STANDARD ORBITS (ASCII)  <
> RPRASCII <> RPRASCII <> PATHORB  <> DAT033__ <> RAD PRESS COEFF (ASCII)  <
> COORD    <> COORD    <> COOPATH  <> DAT034__ <> STATION COORDINATES      <
> VELOCITY <> VELOCITY <> VELPATH  <> DAT034__ <> STATION VELOCITIES       <
> ECCENTER <> ECCENTER <> ECCPATH  <> DAT034__ <> STATION ECCENTERS        <
> STANAM   <> STANAM   <> STNPATH  <> DAT034__ <> STA NAM TRANSLATION      <
> ANTHGT   <> ANTHGT   <> HGTPATH  <> DAT034__ <> ANT HEIGHT TRANSLATION   <
> FIXSTAT  <> FIXSTEXT <> FIXSTPTH <> DAT034__ <> SPECIAL FIXED STATIONS   <
> FTPSTAT  <> FTPSTEXT <> FTPSTPTH <> DAT034__ <> SPECIAL STATION FTP      <
> TROPSIG  <> TRSIGEXT <> TRSIGPTH <> DAT034__ <> TROPOS. APRIORI SIGMAS   <
> BASELINE <> BSLFILE  <> BSLPATH  <> DAT034__ <> BASELINE DEFINITIONS     <
> CLUINP   <> CLIEXT   <> CLIPTH   <> DAT034__ <> CLUSTERS DEF. INPUT      <
> CLUOUT   <> CLOEXT   <> CLOPTH   <> DAT034__ <> CLUSTERS DEF. OUTPUT     <
> METEO    <> METEO    <> METPATH  <> DAT034__ <> METEO DATA               <
> IONOS    <> IONOS    <> IONPATH  <> DAT034__ <> IONOSPHERE MODELS        <
> IONEX    <> IONEX    <> INXPATH  <> DAT034__ <> IONOSPHERE MAPS (IONEX)  <
> TROPOS   <> ITRFILE  <> ITRPATH  <> DAT034__ <> TROPOSPHERE PARAMETERS   <
> CLOCKS   <> CLOCKS   <> CLKPATH  <> DAT034__ <> REC/SAT CLOCKS           <
> RESIDUAL <> RESIDUAL <> RESPATH  <> DAT034__ <> RESIDUALS                <
> COVAR    <> COVAR    <> COVPATH  <> DAT034__ <> COVARIANCES              <
> NOREQU   <> NOREQU   <> NEQPATH  <> DAT034__ <> NORMAL EQUATIONS         <
> PGMOUT   <> PGOUTEXT <> PGOUTPTH <> DAT034__ <> PROGRAM OUTPUT           <
> OUTPUT   <> OUTFILE  <> OUTPATH  <> DAT034__ <> OUTPUT FILES             <
> PLOT     <> PLTFILE  <> PLTPATH  <> DAT034__ <> PLOT FILES               <
> POLE     <> ERPFILE  <> ERPPATH  <> DAT034__ <> EARTH ROTATION PARAMS    <
> IERS     <> IEPFILE  <> IEPPATH  <> DAT034__ <> IERS FORMAT ERP FILES    <
> SINEX    <> SNXFILE  <> SNXPATH  <> DAT034__ <> SINEX FORMAT OUTPUT FILE <
> COVCOMP  <> WGTFILE  <> WGTPATH  <> DAT034__ <> COVARIANCE COMPONENT FILE<
> SATMARK  <> EDTFILE  <> EDTPATH  <> DAT034__ <> SATMARK EDIT INFO FILES  <
> DELETE   <> DELFILE  <> DELPATH  <> DAT034__ <> FILE DELETION FILES      <
> SUMMARY  <> SUMAFIL  <> SUMAPTH  <> DAT034__ <> SUMMARY OUTPUT FILES     <
> SUMXYZ   <> SUMMXYZ  <> SUMPATH  <> DAT034__ <> JOB OUTPUT SUMMARY (XYZ) <
> SUMELL   <> SUMMELL  <> SUMPATH  <> DAT034__ <> JOB OUTPUT SUMMARY (ELL) <
```

```
 5.8.1  |               FILE TYPE: DEFINITION OF NAMES               | HELP
```

```
 General remark:
   This table contains the list of all possible file types of the Bernese
   GPS Software. The first column of this table contains the file type
   identifier that uniquely identifies the type of files you want to delete.
   The second, third, and fourth columns contain the information the menu
   system needs to find the path and extension information of the corres-
   ponding files.
   The last column contains a comment that is not used by the menu system
   but helps you to understand the meaning of the value in the first column.
   Example:

 Filetype    Keywrd Ext. Keywrd Path  Panel       Comment

> CZHED    <> CODHED   <> OBSPATH  <> DAT032__ <> ZERO DIFF CODE HEAD      <

   The values of this example line can be interpreted as follows:
   The ZERO DIFFerence CODE HEADER files can be specified using the file
   keyword CZHED. The extension of this file type is associated with the
   keyword CODHED in panel {DAT032__} and the path with the keyword OBSPATH
   in the same panel.
                                                                          SF
```

```
 5.9                          JOB OUTPUT UTILITIES

   B - Display Output                   F - Create Output File
   E - Edit  Job Output                 D - Delete Job Output
   P - Print Job Output                 C - Execute Command With Job Listing
   X - Exit                             N - Set Next Job Output Number

 Option:            > B <

 Job:
   CAMPAIGN         >          <     (blank for selection list)
   PROGRAM NAME     > GPSEST   <     (blank for selection list, *: all)
   OUTPUT NUMBER    > L   <          (L:Last, blank for selection list)

 Output File:
    JOB OUTPUT        >                                <   (Option "F")
    COMMAND TO EXECUTE >                               <   (Option "C")
```

```
 5.9                          JOB OUTPUT UTILITIES                     HELP

   General remark:
     This menu program is a job/program output handling tool. It supports
     the following options:
     B - Display Job Output             F - Create Output File
     E - Edit    Job Output             D - Delete Job Output
     P - Print   Job Output             C - Execute Command With Job Listing
     X - Exit                           N - Set Next Job Output Number

 Option:
   Select one of the options given above if you want to "process" exactly
   one job output or leave it blank if you want the menu system to show
   a selection list of all the job outputs (see also the entry field named
   "OUTPUT NUMBER").
   B: Displays the job output using a browser. You will not have the
      possibility to change the output file.
   E: Edit the job output. Using this option it is possible to change the
      content of the output file.
   P: Print a job output. The file will be printed using the command
      "PRINT filename". To print on the correct printer or printer queue
      you may have to set a symbol or environment variable in the LOADGPS
      script/command file containing the appropriate, full print command.
   X: Exit this job output utility
   F: Create output file. You can use this option to save the job output
      in a different file. You have to specify an output file name in the
```

```
      field "JOB OUTPUT" (see below) if you choose this option.
   D: Delete a job output file.
   C: Execute the command given in "COMMAND TO EXECUTE" (see below) using
      the job output file name as parameter of the command.
   N: This option allows you to set the next job output number that will be
      used. The convention of the output file name extension is Lnn with
      nn= 00, 01, .. ,99 or nnn with nnn= 000, 001, ..., 999. Whether the
      extension Lnn or nnn is used depends on the setting of the option
      {DAT01___.PAN DIGITS}. The numbers nn and nnn, respectively, are
      automatically increased by one every time a new job output is written
      to disk. Using the option "N" you can e.g. re-initialize the job
      output number to 01 or 001.

 Job:

   PROGRAM NAME:
     Specifies the name of the program output file (without extension).
     The menu system automatically sets the name of the program you run
     the latest into this field.
     Three different options are possible:
       a) leave this field blank: The menu system will show you a
          selection list of possible program names. You can then select
          one of these files.
       b) enter the name of a program. The menu system will then
          automatically select this program.
       c) enter an asterisk (*) to select all possible program names.
       RECOMMENDED VALUE: Program name or blank.

   OUTPUT NUMBER:
     Specify the number of the job output you want to "process" according to
     the option given below. The menu system automatically sets the output
     number of the latest run into this field.
     Three different options are possible:
       a) leave this field blank: The menu system will show you a selection
          list of possible job outputs. You can then select one or more
          of these files.
       b) enter the job output number you want to work with.
       c) enter "L" to automatically select the latest job output.

 Output File:

    JOB OUTPUT:
      (Only to be set if option "F: Create output file", has been selected).
      Specify the path and name of the file that has to be created as
      job output.
      Example: Assume you selected the option "F" together with the
               program name DEFSTD and the job output number 24.
               Assume furthermore that the entry "OUTPUT.TXT" has been
               specified in the "JOB OUTPUT" field. The menu system will
               then create a file OUTPUT.TXT containing the job output of
               DEFSTD.L24.
      RECOMMENDED VALUE: a file name.

    COMMAND TO EXECUTE:
      (Only to be set if option "C: Execute command with job output
      listing" has been selected).
      Specify any command accepted by the operating system that you want to
      apply to the job output file selected above. The command has to take
      the output file name as parameter.
                                                                          SF
```

B.8 Option and Help Panels for Menu 6 (BPE)

```
6.0                          BPE: PANEL UPDATING

Master Panels:
  PANEL DIRECTORY   > X:\PAN\              <
  MASTER PANEL      >          <               (blank for selection list)

Panels to be Updated:
  PANEL DIRECTORY   > U:\PAN\              <   (NO or full directory name)
    or
  DIRECTORY LIST    > NO       <               (NO, blank for sel. list)

Update Options:
  UPDATE/COPY       > UPDATE   <        (UPDATE or COPY)
  EXISTING/ALL      > EXISTING <        (EXISTING panels only, ALL panels)
```

```
6.0                       BPE: PANEL UPDATING                      HELP

General Remarks:
  This program is used to distribute and update modified or new panels.
  Mainly because of the many option directories used by the BPE such a
  program is needed to update panels after e.g. adding a new panel option.
  This program should therefore only be run by users that are actually
  modifying the software (menu programs, panel, ...).

Master Panels:

  PANEL DIRECTORY:
    This field defines the directory in which the master panels are
    located. The panels in this master directory will serve as skeletons
    to update the user-specific and/or BPE-specific panels. All the text,
    frames, field indicators, and keywords are taken from the master panel
    whereas the values in the fields are kept as specified in the panel(s)
    to be updated. New options (keywords) are added to the "old" panel(s).
    RECOMMENDED VALUE: X:\PAN\

  MASTER PANEL:
    Field for the selection of the master panels to be distributed. A
    single panel name may be entered or wildcards or "blank" can be
    specified to get a selection list. Neither the menu panels starting
    with "PAN....." nor the panels DAT11___.PAN (campaign table) and
    DAT581__.PAN (file type definitions) should be distributed to user-
    specific directories with this program.

Panels to be Updated:
  There are two possibilities to define the directories, where panels
  should be updated: enter a single directory name in the next option
  field or specify a file containing a list of directories to be updated
  in the next but one field. If the name of a directory to be updated
  (including all the path) ends with the lowest level directory being
  OPT (e.g. U:\OPT\ or X:\TEST\NEW\OPT\), all the subdirectories
  of OPT will automatically be updated. This feature is important to be
  able to update all the BPE option panels (organized in subdirectories
  of the directory U:\OPT\) in one step.

  PANEL DIRECTORY:
    If you want to update panels in just one directory you can enter the
    full directory name in this field (including the path). If "NO" is
    given here, the next field may not be set to "NO", too, and vice
    versa.
    Examples: U:\PAN\ or U:\OPT\

  DIRECTORY LIST:
    In this field you may enter the name of a file containing a list of
    directory names to be updated (see {X:\INX\EXAMPLE.UPD}) for an
    example). Such a file containing directory names has to be located in
    X:\SKL\ and should have the extension ".UPD" unless otherwise speci-
    fied in menu 0.3.1 (see {DAT031__}). Only one file name may be entered
```

```
     or selected. "Blank" gives you a selection list. If you enter a name
     here the previous option has to be set to "NO".

 Update Options:

   UPDATE/COPY:
     The panels may be updated in two ways:
     UPDATE:
       The values in the panels to be updated are not changed. Therefore
       the options stay the same.
    COPY:
      The panel(s) are copied from the master directory to the directory
      or directories specified above (see "PANEL DIRECTORY" or "DIRECTORY
      LIST"). The panels in these directories are overwritten including
      the values in the panel fields.
      RECOMMENDED VALUE: UPDATE

   EXISTING/ALL:
     This option decides whether a panel should only be updated, if it
     already exists in the target directory (option "EXISTING") or whether
     the panel should be copied from the master to the target directory,
     if the panel is not yet present in the target directory (option
     "ALL"). When updating BPE option panels the option "EXISTING" should
     be used whenever possible to avoid the distribution of a panel into
     ALL the BPE option directories.
     RECOMMENDED VALUE: EXISTING
                                                                         MR
```

```
 6.1  |                     BPE: SELECT PCF FILE

Input Files:
  PROCESS CONTROL FILE  >          <    (blank for selection list)

Input Option:                    (NEW, FIX, UPDATE or COPY existing Options)
  IOPT                 > FIX      <    (NEW, FIX, UPDATE, or COPY)
```

```
 6.1  |                  BPE: SELECT PCF FILE                      | HELP

General Remarks:
  This tool is used to set and modify the options in the BPE option panels
  for a specific PCF (process control file). The program searches through
  all the scripts listed in the PCF to find all the GPS programs called by
  these scripts. The list of all programs is then displayed to you and you
  may selected the programs the options of which you would like to see or
  modify. A list of all the panels used by the selected program will then
  be displayed and you may selected the panels you are interested in.
  After having browsed/modified these panels you will return back to the
  panel selection (in case you forgot some panels). Use "q" to quit the
  current program and to proceed with the next.

Input Files:

  PROCESS CONTROL FILE:
    Enter the name of the PCF (process control file) for which you want to
    change some of the option panels.

Input Option:                    (NEW, FIX, UPDATE or COPY existing Options)

  IOPT:
    You have several options how the program handles the BPE option
    panels:
    NEW: The program assumes that you want to create new option panels for
      the PCF, i.e. that the option directories in U:\OPT\ do not yet
      exist. It will create the directories and copy the necessary panels
      from a master panel directory, the name of which you may specify
      later on, too. Do not forget to put an "s" before the corresponding
      later on, too. Do not forget to put an "s" before the corresponding
      later on, too. Do not forget to put an "s" before the corresponding
```

```
    program to select the directory to be created.
    Use this option only, if you put together a new PCF of your own.
  FIX: All the option directories already exist and you only want to
    modify some of the options set in the panels.
  UPDATE and COPY: These options may be performed with menu 6.0 and
    should not be used here.

                                                                    MR
```

```
6.1-1  |                 BPE PROGRAM NAME SELECTION                | HELP

 This panel displays a list of the GPS programs found in the various
 scripts of a PCF (process control file). Apart from the program name
 the BPE panel option directory used by this program is listed in the
 column "New Directory". If the option "NEW" was set in the previous panel
 {DAT61___} the column "Old Directory" will contain the directory name from
 which the master panels will be copied. Make sure that these "old
 directories" are correctly set and exist. To go on in the process you
 need to select at least one program with an "s" in the first column.

                                                                    MR
```

```
6.2    |                  BPE RINEX HEADERS: CHECK

  CAMPAIGN                > 	       <   (blank for selection list)

Input Files
  RINEX FILE              >           <   (blank: sel. list)
  A PRIORI COORDINATES    > NO        <   (blank: sel. list, NO: not used)
  ECCENTRICITY FILE       > NO        <   (blank: sel. list, NO: not used)

Translation Tables
  STATION NAMES           > NO        <   (blank: sel. list, NO: not used)
  RCVR / ANTENNA          > NO        <   (blank: sel. list, NO: not used)
  ANTENNA HEIGHTS         > NO        <   (blank: sel. list, NO: not used)

Extension of Rinex Input Files (Wildcards allowed):
  EXTENSION               > *O* <

Summary File
  SUMMARY FILE            > NO        <   (NO: default name )
```

```
6.3.2  |     BPE SPECIAL FILES : Prepare fixed/constrained Station File

  CAMPAIGN                >           <   (blank for selection list)

Input Files:
  RINEX OBSERVATIONS      >           <   (blank for selection list)
  RINEX EXTENSION         > ??O   <       (Wildcards, compr. files allowed)
  A PRIORI COORDINATES    > NO        <   (blank: sel. list, NO: not used)
  STATION TRANSL. TABLE   > NO        <   (blank: sel. list, NO: not used)

Output File:
  FIX/CONSTR. STATION FILE > STAFIX   <
  MODE OF MODIFICATION    > REPLACE   <   (NEW, APPEND, or REPLACE )

                             North      East        Up      (meters)
A Prori Constraints         *.****     *.****     *.****
 RINEX HEADER             > 0.0500 < > 0.0500 < > 0.1500 <  (zero : free;
 COORDINATE FILE          >        < >        < >        <   blank: fix)
```

```
6.4.1 | BPE: SESSION PROCESSING

  CAMPAIGN              >          <    (blank for selection list)

 Job Identification:
  JOB CHARACTER            >   <        (blank, or A..Z, 0..9)

Input Files:
  PROCESS CONTROL FILE  >          <    (blank for selection list)
```

```
6.4.1 | BPE: SESSION PROCESSING | HELP

 General Remarks:

   With this and the following panels you select the options for the pro-
   cessing of one or several sessions using the BPE (Bernese Processing
   Engine) or more precisely the process control script PCS.

 Job Identification:

   JOB CHARACTER:
     If on a multitask system you would like to run more than one BPE job
     at the same time, you have to use different job identification cha-
     racters to obtain unique input option files for the PCS script.
     Valid characters are A through Z and 0 through 9 and blank.
     If the field is non-blank it will automatically be changed to the
     next character in alphabetic order for the next run. If you process
     the same session more than once at the same time you also have to
     enter a different TASK ID for the different BPE runs in the next
     panel {DAT6411_}.
     RECOMMENDED VALUE: blank

Input Files:

   PROCESS CONTROL FILE:
     Selection of the process control file the BPE should follow. Only one
     file may be selected.
                                                                        MR
```

```
6.4.1-1 | BPE SESSION PROCESSING: INPUT OPTIONS

  Sessions Information:
    SESSION (START)      >      <
    YEAR (START)         >      <
    NUMBER OF SESSIONS   >      <      (if negative: processing backwards)

  Task Identification:
    TASK IDENTIFICATION  >    <        (blank: 00)

  CPU/QUEUE Specification:
    CPU / BATCH QUEUE    > NO       <  (NO, or blank for selection list)

  Special Options:
    SPECIAL PARAMETERS   > NEW  <      (OLD.. NEW.. or ASIS)
    SKIP PROCESSES       > NO   <      (YES..  NO,  or ASIS)
    REMOTE SUBMIT        > NO   <      (YES..  NO,  or ASIS)
    DEBUGGING OPTIONS    > NO   <      (YES..  NO,  or ASIS)
```

```
6.4.1-1 | BPE SESSION PROCESSING: INPUT OPTIONS | HELP
```

```
Sessions Information:

  SESSION (START):
    Enter the 4-character identification of the session the processing
    should start with. The session selected as well as subsequent ses-
    sions, if more than one session is processed, have to be defined in
    the session table (use menu 1.3 to define sessions).

  YEAR (START):
    Year of the starting session (two digits are sufficient).

  NUMBER OF SESSIONS:
    This option specifies the number of session to be processed one after
    the other using the same PCF (process control file) and the same
    options. If this number is negative, the sessions will be processed
    backwards in time.

Task Identification:

  TASK IDENTIFICATION:
    The task identification is used to uniquely identify protocol files
    created by the BPE (e.g. the process protocol files or the process
    log files named xxyyssss.ppp and xxyyssss.Lpp for non-parallel pro-
    cesses, where xx = task id, yy = year, ssss = session, ppp = process
    id, pp = last two digits of process id). The task identification
    needs to be changed only from the default value (blank), if several
    BPE runs are processing the same session in parallel (e.g. using a
    different PCF (process control file)).
    If you set the task identification to blank, it will be set to "00".
    RECOMMENDED VALUE: blank

CPU/QUEUE Specification:

  CPU / BATCH QUEUE:
    This input field allows the specification of the name of a dedicated
    CPU resp. batch queue to be used for the scripts started by the BPE.
    Normally the process control script of the BPE automatically selects
    the CPUs on which BPE processes are to be run from the file
    {U:\WORK\PCFCTL.CPU} in the user working directory and no special
    name has to be given here.
    RECOMMENDED VALUE: NO

Special Options:

  SPECIAL PARAMETERS:
    This option allows you to specify where the special parameters (de-
    fined in the PCF file), which are passed by the BPE (the PCS) to the
    individual scripts, are coming from and whether you want to change
    them.
    OLD:
      A special panel {DAT64113} will be displayed to you where you can
      modify the values of the special parameters. The parameter values
      will be the same as when you left the panel the last time.
    NEW:
      The special panel {DAT64113} will be displayed to you as with
      option "OLD", but the values of the special parameters are taken
      from the defaults given in the PCF (process control file).
    ASIS:
      Same as option "OLD", but the panel {DAT64113.PAN} is not displayed
      to you (option to skip the display of panel DAT64113).

  SKIP PROCESSES:
    Option to define the process id in the PCF the BPE should start with
    or to define processes that should be skipped.
    NO:
      The BPE starts with the first process in the PCF, that can be
      started (that does not have to wait for an other process).
      No processes are skipped.
    YES:
      With this option an additional panel will be displayed where
      you may select the process to start with and enter the process(es)
      to be skipped.
    ASIS:
      The BPE will start with exactly the same process and skip exactly
      the same processes as you defined the last time you chose "YES"
      here.
```

```
    REMOTE SUBMIT:
      This option allows you to submit the processes to a remote machine
      with a different user and password. It is mainly thought to be for
      VAX/VMS machines. It should normally not be set because all BPE pro-
      cesses will then go to the same machine independent of the CPU names
      given in the PCF (and the {U:\WORK\PCFCTL.CPU}).
      NO:
        No remote submit. Jobs are submitted according to the PCF.
      YES:
        A panel will be displayed to enter user id and password for the
        remote submit.
      ASIS:
        Use the same user id and password as the last time the remote
        option was used.
      RECOMMENDED VALUE: NO

    DEBUGGING OPTIONS:
      Special debugging output and messages may be printed using this
      option. An additional panel will ask for the details.
      NO:
        No debugging messages. Temporary files are deleted after usage.
      YES:
        An additional panel allows you to set the details of this debugging
        option.
      ASIS:
        The debugging options are activated as the last time.
      RECOMMENDED VALUE: NO
                                                                          MR
```

```
6.4.1-1.1          BPE SESSION PROCESSING:  SKIP PROCESSES

   Skipping of Processes:
     START PROCESS ID   > 001 <     (blank for selection list)
     SKIP  PROCESS ID   > 000 <     (blank for selection list, 000: no skip)
```

```
6.4.1-1.1          BPE SESSION PROCESSING:  SKIP PROCESSES         |  HELP

   Skipping of Processes:

     START PROCESS ID:
       Enter the process id (defined in the process control file (PCF)) of
       the process you would like to start with. Processes that would have
       executed before this starting process will be skipped. Leaving the
       field blank you get a selection list of all the processes in the PCF.

     SKIP PROCESS ID:
       One or more process steps may be skipped. You may either enter one
       process id to be skipped directly into this field or select the pro-
       cess(es) to skip from a selection list that will be displayed if you
       leave the field blank.
       000:
         No processes are skipped.
                                                                          MR
```

```
6.4.1-1.2          BPE SESSION PROCESSING:  REMOTE SUBMIT

   Remote Submit Options:
     USER NAME / LOGIN    >                   <
     LOGIN PASSWORD       >                   <
```

```
6.4.1-1.2 |          BPE SESSION PROCESSING:  REMOTE SUBMIT          | HELP

    Remote Submit Options:

      USER NAME / LOGIN:
        Enter the login name or user name in this field. The remote submit
        will then create a job under this user name.

      LOGIN PASSWORD:
        If you need a password to submit a job under the user id given above
        you have to enter the password here.
                                                                          MR
```

```
6.4.1-1.3 |        BPE SESSION PROCESSING:  SPECIAL PARAMETERS       | HELP

   Special Parameter Setting:
     These parameters are special parameters belonging to the process control
     file (PCF) you want to run. Default values for these parameters are
     specified in the PCF file and are put into the fields, if the option
     "SPECIAL PARAMETERS" was set to "NEW" in a previous panel (see
     {DAT6411_ SPECIAL PARAMETERS}).
     Each special parameter line in the panel contains the parameter descrip-
     tion, the parameter name (in quotes) and the input field to enter the
     parameter value. These special parameters may be quite different for
     different PCF files (processing strategies).

     The special parameters named "O","U","V","W","X", and "Z" , if listed,
     are put into the corresponding fields in the panel {DAT151__} (e.g.
     $O for the value of "O") by the BPE and and are thus available for
     the setting of BPE panel options (in menu 6.1).

     The special parameters "MINUS" and "PLUS" are added to the session
     specifications in panel DAT151__.PAN as "plus-minus" parameters (see
     {DAT151__} for more details).

     All special parameters are also available in each individual process
     script in the PCF as environment variables with the name of the variable
     preceeded by "V_", e.g. the value of the special parameter "O" will be
     available in the environment variable "V_O" and may thus be used by the
     process script to set certain processing options.

   Control Process:

     SLEEP TIME:
       After having submitted all the processes that may be started the
       control process waits for the integer number of seconds specified in
       this field before checking again, whether new processes may be
       started. When "0" is entered the default value of 30 seconds is used.
       If the individual processes are running for a long time, the sleep
       might be increased, because there is no reason to spend CPU time for
       the control process that could be used by the actual process(es).
       If on the other hand the individual processes are only running for
       a time interval similar to the sleep time, the sleep time could be
       reduced to minimize the "dead" times (no process running and the
       control process sleeping). If many control processes are run at the
       same time, it might also make sense to increase the sleep time.
       RECOMMENDED VALUE: 30 seconds
                                                                          MR
```

```
6.4.1-1.4 |          BPE SESSION PROCESSING:  DEBUGGING OPTIONS

    Debugging Options:
      PRINT PROCESS STEPS      >     <      (YES or NO)
      PRINT ALL                >     <      (YES or NO)
      DO NOT CLEAN UP FILES    >     <      (YES or NO)
```

```
6.4.1-1.4 | BPE SESSION PROCESSING:  DEBUGGING OPTIONS          | HELP

   Debugging Options:

     PRINT PROCESS STEPS:
       The various steps of the BPE processing are printed so that you may
       follow its actions.

     PRINT ALL:
       This option activates all possible debugging output. The debugging
       messages are printed to the log files in the directory T:\AUTO_TMP\.

     DO NOT CLEAN UP FILES:
       Normally temporary files are deleted as soon as they are no longer
       needed (option"NO"). If you select "YES", these files will be kept
       and you may have a look at them for debugging purposes.
                                                                          MR
```

```
 6.5.1    |                    COORDINATES: CHECK

   CAMPAIGN                 >          <   (blank for selection list)

 Input Files
   ZERO DIFFERENCES PHASE   >          <   (blank: sel. list, NO: not used)
   ZERO DIFFERENCES CODE    > NO       <   (blank: sel. list, NO: not used)
   A PRIORI COORDINATES     >          <   (blank: sel. list)
   ECCENTRICITY FILE        > NO       <   (blank: sel. list, NO: not used)

 Output File
   BASELINE LIST FILE       > NO       <   (NO if not to be created)
```

```
 6.5.1.1  |                    COORDINATE CHECK: INPUT

 Coordinate Differences:
   MAX. DISTANCE TO REFERENCE SITE    > 2000       <  M

 Coordinate Flags:
   MINIMUM FLAG FOR COORDINATES       > P <      Order: blank,R,C,T,P,M,G,I
   MINIMUM FLAG FOR REFERENCES        > R <      Order: blank,R,C,T,P,M,G,I
```

```
 6.5.2    |                 RINEX COORDINATES: CHECK

   CAMPAIGN                 >          <   (blank for selection list)

 Input Files
   RINEX FILE               >          <   (blank: sel. list)
   A PRIORI COORDINATES     > NO       <   (blank: sel. list)
   ECCENTRICITY FILE        > NO       <   (blank: sel. list, NO: not used)
   TRANSLATION TABLE FILE   > NO       <   (blank: sel. list, NO: not used)

 Extension of Rinex Input Files (Wildcards allowed):
   EXTENSION                > %%O <

 Output File
   STATION LIST FTP FILE    > NO       <   (NO if not to be created)
```

```
6.5.2.1 |                RINEX COORDINATE CHECK: INPUT

 Coordinate Differences:
   MAX. DISTANCE TO REFERENCE SITE    > 2000       <  M

 Coordinate Flags:
   MINIMUM FLAG FOR COORDINATES       > P <      Order: blank,R,C,T,P,M,G,I
   MINIMUM FLAG FOR REFERENCES        > R <      Order: blank,R,C,T,P,M,G,I
```