```
  Frequency L2                    >   10  <   >   32  <   >  224  <

Tolerance for Jump Detection                >  100  <   Microseconds
Sampling Interval                           >    0  <   Seconds
Offset to Full Minute                       >    0  <   Seconds
Default Wavelength Factor for L2            >    1  <   1 or 2
Highest Legal Record Type (0=no preamble test)>  0  <   0 or at least 21

Take First Four Characters for RINEX Filename  > YES <    (YES or NO)
Use Record Types 2/6/12, 1/10/11               > YES <    (YES or NO)
Use Bit 3 of Sync Flag for Test                > YES <    (YES or NO)

Antenna Height:                                             SST:
  Slant Height: Radial Offset                 > 0.000   <  m 0.233 Notches
  Vertical Offset to RINEX reference          > 0.000   <  m 0.063 Top GP
```

2.5.1.1.2	Trimble Rawdata Files to RINEX Files: Input 2	HELP

```
Signal to Noise Ratio: Frequency L1 / Frequency L2:
  The minimum/threshold/maximum values are used to compute the s/n
  stored into the RINEX files from the values found in the raw data files
  according to the scheme:

     minimum value (and smaller) --> RINEX s/n value: 1
     threshold                   --> RINEX s/n value: 5
     maximum value (and larger)  --> RINEX s/n value: 9

     (linear functions between 1 and 5 or 5 and 9, respectively, rounded
      to the nearest integer)

  The threshold value is the signal strength above which there is no
  doubt that the signal was strong enough to generate a good observation.
  It is translated into a 5 in the RINEX file.

  The values have to be adjusted according to the actual receiver (and
  maybe antenna) type. If you are unsure what values to use, run the
  converter program and observe the minimum and maximum values found
  in the raw data files that are printed in the program listing,
  modify the values in the data panel accordingly and rerun the program.

Tolerance for Jump Detection:
  The converter uses this value to decide if and when the receiver
  shifted the time scale by one millisecond or if there is a problem
  (odd jump) in the receiver clock offset. The converter may also
  look for event flags in the raw data to detect millisecond shifts
  (subrecord type 1 of record type 19).
  RECOMMENDED VALUE:  100 Microseconds

Sampling Interval:
  Used to decimate data. A sampling rate of 30 seconds will select
  data at epochs 00 and 30 seconds after each full minute.
  Sampling interval 0 will convert all observations found.
  RECOMMENDED VALUE:  30 Seconds

Offset to Full Minute:
  Used to shift the sampling epoch with respect to the full minute.
  RECOMMENDED VALUE:   0 Seconds

Default Wavelength Factor for L2:
  Used to flag squared phase data (value: 2).
  RECOMMENDED VALUE:   1  (for modern geodetic receivers)

Highest Legal Record Type (0=no preamble test):
  The converter decodes the header at the beginning of each raw
  data record. It will only decode the remaining record for known record
  types and not issue error messages for unknown record types. If you
  enter a value other than zero the program will try to skip the current
  and all subsequent records until it finds a valid preamble with a valid
  record type. This may be useful to re-synchronize the data input for
  corrupted raw data files.
  RECOMMENDED VALUE:  21 (unless future firmware versions will know
                          additional record types)
```

```
  Take First Four Characters for RINEX Filename:
    If YES the converter will propose RINEX file names using the first
    four characters of the site name found in the raw data file.
    RECOMMENDED VALUE:  YES

  Use Record Types 2/6/12, 1/10/11:
    If YES the converter collects additional site information from
    above record types.
    RECOMMENDED VALUE:  YES

  Use Bit 3 of Sync Flag for Test:
    If YES bit 3 of flag 1 is tested for valid lock point.
    RECOMMENDED VALUE:  YES

  Antenna Height:
    Slant Height: Radial Offset:
    Vertical Offset to RINEX reference:

      If not zero the antenna height is interpreted as slant height and
      reduced to the vertical using the radial offset.
      If not zero the vertical offset is used to reduce the vertical height
      to the RINEX Antenna Reference Point.

    RECOMMENDED VALUE:  Depend on the actual antenna type and the
                        measurement procedure in the field but see also
                        {X:\GEN\ANTENNA.GRA} and
             ftp://igscb.jpl.nasa.gov/igscb/station/general/antenna.gra

                                                                       WG
```

```
2.5.1.2 |     Trimble Navigation Files to RINEX Files  (Main Data Panel)

  CAMPAIGN      >          <         (blank for selection list)

 Name of File Containing List of Rawdata Files
  FILELIST      >                              <
                                     (blank: List has to be created)

 Device/Path to Rawdata Files
  RAWDATA       > X:\EUROCLUS\RAW\             <

 Extension of Rawdata Files
  RAWEXT        > EPH <
```

```
2.5.1.2 |Trimble Navigation Files to RINEX Files  (Main Data Panel)|  HELP

 General remarks:

  With this and the following panels you select the processing options for
  the program TRRINEXN. The main purpose of this program is the creation
  of RINEX navigation message files from Trimble raw data files.

  Before you run this program you should run TRRINEXO to create the special
  ephemeris file containing just the ephemeris records from the rawdata
  file.

 Name of File Containing List of Rawdata Files

  FILELIST:
    Full name (i.e. including path) of a file containing a list of the raw
    data file names (body of filenames plus extensions, no paths!).
    The list has to be left-justified, one filename per line.
    If the input field is left blank, the file list will be created
    interactively.
    RECOMMENDED VALUE: blank

 Device/Path to Rawdata Files
```

```
   RAWDATA:
     Path to the raw data files.
     EXAMPLE:  D:\TESTV34\RAW\

 Extension of Rawdata Files

   RAWEXT:
     Extension of the raw data filenames. Used to generate a selection
     list for the interactive generation of the file list.
     RECOMMENDED VALUE: RT3
     (RT3 is the extension of the files containing binary ephemeris records
      created by TRRINEXO)
                                                                            WG
```

```
2.5.1.2.1 |          Trimble Navigation Files to RINEX Files: Input 1

   Comments:
      > TRIMBLE TO RINEX                                             <
      >                                                              <
      >                                                              <

   Agency Running Program :                    > ANONYMOUS          <

   Automatic Filename Creation :               > NO  <     (YES or NO)
```

```
2.5.1.2.1 |      Trimble Navigation Files to RINEX Files: Input 1      |   HELP

   Comments:
     Up to three lines of comments that will be included into the headers
     of each generated RINEX file.

   Agency Running Program:
     Name of the agency/institution creating the RINEX files. Will be
     included into the RINEX headers.

   Automatic Filename Creation:
     If YES the converter will propose RINEX file names using the first
     four characters of the rawdata filename.
                                                                            WG
```

```
 2.5.2.1  |       Minimac Rawdata Files to RINEX Files  (Main Data Panel)

   CAMPAIGN       >          <         (blank for selection list)

 Name of File Containing List of Rawdata Files
   FILELIST       >                                 <  (blank: List has
                                                        to be created)

 Device/Path to Rawdata Files
   RAWDATA        > X:\EUROCLUS\RAW\                <

 First Character of Rawdata Files
   FIRST CHAR     > R <

 Satellite Clock File (Previously Created by Pgm. MCRINEXN) :
   SATCLOCK       > MCRINEXO.CLK                    <
```

```
2.5.2.1.1 |            Minimac Rawdata Files to RINEX Files: Input 1
```

```
  Comments:
     >                                                              <
     >                                                              <
     >                                                              <

  Agency Running Program   > ANONYMOUS          <

  Default Antenna  Type    > MACROMETER X-DIPOLE <
```

```
2.5.2.1.2            Minimac Rawdata Files to RINEX Files: Input 2

  Signal to Noise Ratio              Minimum    Threshold    Maximum
    Frequency L1                    >    1  <   >   10  <   >   30  <
    Frequency L2                    >    1  <   >   10  <   >   55  <

  Current Year                      >       <   (blank: Expanded Format)
  GPS minus UTC                     >    5  <   Seconds
  Sampling Interval                 >   30  <   Seconds
  Offset to Full Minute             >    0  <   Seconds

  Take First Four Characters for RINEX Filename  > YES <    (YES or NO)

  Use Station Name Abbreviation Table            > NO  <    (YES or NO)
```

```
2.5.2.2       Minimac Navigation Files to RINEX Files  (Main Data Panel)

  CAMPAIGN      >         <         (blank for selection list)

 Name of File Containing List of Navigation Files
  FILELIST      >                                  <   (blank: list has
                                                        to be created)

 Device/Path to Navigation Files
  RAWDATA       > X:\EUROCLUS\RAW\                 <

 First Character of Navigation Filenames
  FIRST CHAR    > B <

 Satellite Clock File
  SATCLOCK      > MCRINEXO.CLK                     <   (blank: do not
                                                        create)
```

```
2.5.2.2.1           Minimac Navigation Files to RINEX Files: Input 1

  Comments:
     >                                                              <
     >                                                              <
     >                                                              <

  Agency Running Program :                 > ANONYMOUS          <

  Automatic Filename Creation :            > NO  <     (YES or NO)
```

```
2.5.3.1        WM-102 PoPS SM-Files to RINEX Files  (Main Data Panel)
```

```
   CAMPAIGN       >          <         (blank for selection list)

 Name of File Containing List of Site Measurement Files:
   FILELIST       > SMLIST       <

 Coordinate Filename:
   COORD          > SITCOORD     <

 Device/Path to PoPS Files:
   RAWDATA        > X:\EUROCLUS\RAW\                 <
```

```
2.5.3.1.1            WM-102 PoPS SM-Files to RINEX Files: Input 1

   Comments:
      >                                                             <
      >                                                             <
      >                                                             <

   Agency Running Program   > ANONYMOUS           <

   Default Antenna  Type    > WM102               <
```

```
2.5.3.1.2            WM-102 PoPS SM-Files to RINEX Files: Input 2

   Signal to Noise Ratio             Minimum    Threshold    Maximum
     Frequency L1                   >   20  <   >   40  <   >   60  <
     Frequency L2                   >   20  <   >   40  <   >   60  <

   Sampling Interval                            >   30  <   Seconds
   Offset to Full Minute                        >    0  <   Seconds
   Antenna Height Correction                    >    0  <   mm

   Take First Four Characters for RINEX Filename  > YES <    (YES or NO)
   Write Extended RINEX Header                    > NO  <    (YES or NO)
```

```
 2.5.3.2        WM-102 PoPS SATNAV-Files to RINEX Files  (Main Data Panel)

   CAMPAIGN       >          <         (blank for selection list)

 Device/Path to SATNAV-Files
   RAWDATA        > X:\EUROCLUS\RAW\                 <
```

```
2.5.3.2.1              WM-102 SATNAV-Files to RINEX Files: Input 1

   Comments:
      >                                                             <
      >                                                             <
      >                                                             <

   Agency Running Program :                   > ANONYMOUS           <

   Automatic Filename Creation :              > NO  <     (YES or NO)
```

```
2.5.4.1 | Ashtech Rawdata Files to RINEX Files  (Main Data Panel)

  CAMPAIGN               >         <          (blank for selection list)

Rawdata Observation File:
  FILELIST       >                                 <  (blank: create list)
  PATH           > X:\EUROCLUS\RAW\                <
  FIRST CHARACTER            > B <

Output Files:
  LOG FILE       >                                 <  (blank: don't create)
  SUMMARY FILE EXTENSION    > SUM <                   (blank: don't create)
```

```
2.5.4.1 | Ashtech Rawdata Files to RINEX Files  (Main Data Panel) | HELP

General remarks:

  With this and the following panels you select the processing options for
  the program ASRINEXO. The main purpose of this program is the creation
  of RINEX observation files from Ashtech raw data files.

  The RINEX converter programs also run independently from the Bernese
  GPS Software. They use as primary options file a file called
  xxRINEXt.OPT (xx: 2-character program code, AS for Ashtech, t: RINEX
  file type, O=observation, N=navigation) which has to exist in the
  current or default directory.

  More informations about the RINEX converter programs can be found in the
  file PCRINEX.TXT which is distributed together with the converters. The
  most recent converters (at least the PC executables) can be downloaded
  from our anonymous ftp account (ubeclu.unibe.ch, cd aiub$ftp, cd pcrinex).

Rawdata Observation File:

  FILELIST:
    Full name (i.e. including path) of a file containing a list of the raw
    data file names (body of filenames plus extensions, no paths!).
    The list has to be left-justified, one filename per line.
    If the input field is left blank, the file list will be created
    interactively.
    RECOMMENDED VALUE: blank

  PATH:
    Path to the raw data files.
    EXAMPLE:  D:\TESTV34\RAW\

  FIRST CHARACTER:
    First character of the raw data filenames. Used to generate a selection
    a list for the interactive generation of the file list.
    RECOMMENDED VALUE: B

Output Files:

  LOG FILE:
    Full filename (path, body, extension) of a file that will contain
    all major components of the binary rawdata file written in ASCII.
    This file becomes very large and is meant to be used for debugging
    purposes only.
    RECOMMENDED VALUE: blank

  SUMMARY FILE EXTENSION:
    The RINEX converter program may create a summary file, the body of the
    filename is identical to the RINEX observation filename. It's extension
    may be selected here. An extension of the form %%S will be translated
    into yyS where yy is the two-digit year.
    To leave it blank will prevent the program from creating summary files.
    RECOMMENDED VALUE: %%S or blank
                                                                        WG
```

```
2.5.4.1.1  Ashtech Rawdata Files to RINEX Files: Input 1

Comments: >                                                    <
          >                                                    <
          >                                                    <

Agency Running Program                    > ANONYMOUS          <

Default Receiver Type:  Single Freq.      > ASHTECH L-XII      <
                        Dual   Freq.      > ASHTECH LD-XII     <
                        P-Code Receiver   > ASHTECH Z-XII3     <

Default Antenna Type :  Single Freq.      > MARINE/RANGE       <
                        Dual   Freq.      > GEODETIC L1/L2 L   <
                        P-Code Receiver   > GEODETIC L1/L2 P   <

Include Doppler Counts as Observations    > NO    <    (NO, L1, L1&L2)
Include S/N Counts as "Observations"      > NO    <    (NO, L1, L1&L2)
```

```
2.5.4.1.1  Ashtech Rawdata Files to RINEX Files: Input 1       HELP

Comments:
  Up to three lines of comments that will be included into the headers
  of each generated RINEX file.

Agency Running Program:
  Name of the agency/institution creating the RINEX files. Will be
  included into the RINEX headers.

Default Receiver Type
  Single Frequency:
  Dual   Frequency:
  P-Code Receiver:

Default Antenna  Type
  Single Frequency:
  Dual   Frequency:
  P-Code Receiver:

    Names for the receiver and antenna types that will be proposed to
    to the operator during execution of the RINEX converter program
    (provided the program runs in interactive mode, see next help panel).
    Depending on the type of the receiver (single or dual frequency
    receiver the converter program assumes to have detected) the program
    will propose the names in the "Single Frequency", "Dual Frequency"
    or "P-Code Receiver" input field. (The latter is most certainly the
    one that will be used for geodetic receivers).

    The final values will be included into the RINEX headers. They also
    have to agree with the values in the antenna phase center file (see
    e.g. {X:\GEN\PHAS_IGS.01}).
    RECOMMENDED VALUE: Use the values proposed by the International
                       GPS Service for Geodynamics (see
                       {X:\GEN\RCVR_ANT.TAB} and
         ftp://igscb.jpl.nasa.gov/igscb/station/general/rcvr_ant.tab)

Include Doppler Counts as Observations:
  If L1 or L1&L2 is specified the doppler counts found in the raw data
  files are stored as D1 or D1 and D2 observations into the RINEX files.
  RECOMMENDED VALUE:  NO

Include S/N Counts as "Observations":
  If L1 or L1&L2 is specified the raw signal strength values found in
  the raw data files are stored as S1 or S1 and S2 observations into
  the RINEX files.
  RECOMMENDED VALUE:  NO
                                                                     WG
```

```
2.5.4.1.2          Ashtech Rawdata Files to RINEX Files: Input 2

    Signal Strength       Minimum  Threshold  Maximum     Squared   P-Code
      Frequency L1        >  1  <   >  30 <   > 120 <    1:40:140  1:30:120
      Frequency L2        >  1  <   >  15 <   >  60 <    1:10: 40  1:15: 60

    Tolerance for Jump Detection                  >   50  <   Microseconds
    Sampling Interval                             >   30  <   Seconds
    Offset to Full Minute                         >    0  <   Seconds
    Minimum Validity Code                         >   21  <   (22,23,24)

    Take First Four Characters for RINEX Filename  > YES <    (YES or NO)
    Apply Smoothing Corrections to Pseudoranges    > NO  <    (YES or NO)

    Antenna Height:
      Slant Height: Radial Offset                > 0.0     <  m       (0.110)
      Vertical Offset to RINEX reference         > 0.0     <  m       (0.064)
```

```
2.5.4.1.2        Ashtech Rawdata Files to RINEX Files: Input 2          HELP

    Signal Strength: Frequency L1 / Frequency L2:
      The minimum/threshold/maximum values are used to compute the s/n
      stored into the RINEX files from the values found in the raw data files
      according to the scheme:

         minimum value (and smaller) --> RINEX s/n value: 1
         threshold                   --> RINEX s/n value: 5
         maximum value (and larger)  --> RINEX s/n value: 9

         (linear functions between 1 and 5 or 5 and 9, respectively, rounded
          to the nearest integer)

      The threshold value is the signal strength above which there is no
      doubt that the signal was strong enough to generate a good observation.
      It is translated into a 5 in the RINEX file.

      The values have to be adjusted according to the actual receiver (and
      maybe antenna) type. If you are unsure what values to use, run the
      converter program and observe the minimum and maximum values found
      in the raw data files that are printed in the program listing,
      modify the values in the data panel accordingly and rerun the program.

    Tolerance for Jump Detection:
      The converter uses this value to decide if and when the receiver
      shifted the time scale by one millisecond or if there is a problem
      (odd jump) in the receiver clock offset. The converter may also
      look for event flags in the raw data to detect millisecond shifts
      (subrecord type 1 of record type 19).
      RECOMMENDED VALUE:  100 Microseconds

    Sampling Interval:
      Used to decimate data. A sampling rate of 30 seconds will select
      data at epochs 00 and 30 seconds after each full minute.
      Sampling interval 0 will convert all observations found.
      RECOMMENDED VALUE:  30 Seconds

    Offset to Full Minute:
      Used to shift the sampling epoch with respect to the full minute.
      RECOMMENDED VALUE:   0 Seconds

    Minimum Validity Code:
      Might be used to exclude some observations where the receiver did
      not yet reach its maximum performance. Possible values: 21-24.
      The larger the number the more observations may be skipped.
      RECOMMENDED VALUE:  21

    Take First Four Characters for RINEX Filename:
      If YES the converter will propose RINEX file names using the first
      four characters of the site name found in the raw data file.
      RECOMMENDED VALUE:  YES
```

```
  Apply Smoothing Corrections to Pseudoranges:
    The raw data files (format version 3) contain a smoothing correction
    that can be applied to the raw pseudoranges.
    RECOMMENDED VALUE:  NO

  Antenna Height:
    Slant Height: Radial Offset:
    Vertical Offset to RINEX reference:

      If not zero the antenna height is interpreted as slant height and
      reduced to the vertical using the radial offset.
      If not zero the vertical offset is used to reduce the vertical height
      to the RINEX Antenna Reference Point.

    RECOMMENDED VALUE:  Depend on the actual antenna type and the
                        measurement procedure in the field but see also
                        {X:\GEN\ANTENNA.GRA} and
                ftp://igscb.jpl.nasa.gov/igscb/station/general/antenna.gra

                                                                        WG
```

```
2.5.4.2 |     Ashtech Navigation Files to RINEX Files  (Main Data Panel)

  CAMPAIGN       >          <         (blank for selection list)

 Name of File Containing List of Rawdata Files
  FILELIST       >                                 <
                                      (blank: List has to be created)

 Device/Path to Rawdata Files
  RAWDATA        > X:\EUROCLUS\RAW\                <

 First Character of Raw Ephemerides Filename
  FIRST CHAR     > E <
```

```
2.5.4.2 |Ashtech Navigation Files to RINEX Files  (Main Data Panel) |  HELP

 General remarks:

   With this and the following panels you select the processing options for
   the program ASRINEXN. The main purpose of this program is the creation
   of RINEX navigation message files from Trimble raw data files.

 Name of File Containing List of Rawdata Files

   FILELIST:
     Full name (i.e. including path) of a file containing a list of the raw
     data file names (body of filenames plus extensions, no paths!).
     The list has to be left-justified, one filename per line.
     If the input field is left blank, the file list will be created
     interactively.
     RECOMMENDED VALUE: blank

 Device/Path to Rawdata Files

   RAWDATA:
     Path to the raw data files.
     EXAMPLE:  D:\TESTV34\RAW\

 First Character of Raw Ephemerides Filename

   FIRST CHAR:
     Used to generate a selection list for the interactive generation of the
     file list.
     RECOMMENDED VALUE: E
                                                                         WG
```

```
2.5.4.2.1 | Ashtech Navigation Files to RINEX Files: Input 1

  Comments:
    >                                                            <
    >                                                            <
    >                                                            <

  Agency Running Program :                    > ANONYMOUS        <

  Automatic Filename Creation :               > NO  <     (YES or NO)
```

```
2.5.4.2.1 | Ashtech Navigation Files to RINEX Files: Input 1 | HELP

  Comments:
    Up to three lines of comments that will be included into the headers
    of each generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Automatic Filename Creation:
    If YES the converter will propose RINEX file names using the first
    four characters of the rawdata filename.
                                                                       WG
```

```
2.5.5.1 | Rogue Rawdata Files to RINEX Obs.Files  (Main Data Panel)

  CAMPAIGN       >          <         (blank for selection list)

 Rawdata Observation File:
  FILELIST       >                             <  (blank: create list)
  PATH           > X:\EUROCLUS\RAW\            <
  FILE EXTENSION            > *   <

 Output Files:
  EPHEMERIS FILE EXTENSION  > EPH <                  (blank: don't create)
  SUMMARY FILE EXTENSION    > %%S <                  (blank: don't create)
```

```
2.5.5.1 | Rogue Rawdata Files to RINEX Obs.Files  (Main Data Panel) | HELP

 General remarks:

  With this and the following panels you select the processing options for
  the program RGRINEXO. The main purpose of this program is the creation
  of RINEX observation files from Rogue raw data files.

  The RINEX converter programs also run independently from the Bernese
  GPS Software. They use as primary options file a file called
  xxRINEXt.OPT (xx: 2-character program code, RG for Rogue, t: RINEX
  file type, O=observation, N=navigation) which has to exist in the
  current or default directory.

  More informations about the RINEX converter programs can be found in the
  file PCRINEX.TXT which is distributed together with the converters. The
  most recent converters (at least the PC executables) can be downloaded
  from our anonymous ftp account (ubeclu.unibe.ch, cd aiub$ftp, cd pcrinex).

 Rawdata Observation File:
```

```
  FILELIST:
    Full name (i.e. including path) of a file containing a list of the raw
    data file names (body of filenames plus extensions, no paths!).
    The list has to be left-justified, one filename per line.
    If the input field is left blank, the file list will be created
    interactively.
    Raw data files are files containing data in CONAN ASCII standard format.
    The CONAN binary files have first to be converted into ASCII using
    the JPL program DCR.
    RECOMMENDED VALUE: blank

  PATH:
    Path to the raw data files.
    EXAMPLE:  D:\TESTV34\RAW\

  FILE EXTENSION:
    Extension of the raw data filenames. Used to generate a selection
    list for the interactive generation of the file list.
    Wildcards can be used, too.
    NO RECOMMENDED VALUE (depends on the raw data file naming scheme)

Output Files:

  EPHEMERIS FILE EXTENSION:
    RGRINEXO may copy all navigation message lines from the raw data
    file into a separate file (body of the filename identical to the
    raw data) that can later be accessed by the RGRINEXN program.
    These files HAVE TO BE GENERATED if RGRINEXN will be run.
    To leave the field blank will prevent the program from creating these
    files.
    RECOMMENDED VALUE: EPH

  SUMMARY FILE EXTENSION:
    The RINEX converter program may create a summary file, the body of the
    filename is identical to the RINEX observation filename. It's extension
    may be selected here. An extension of the form %%S will be translated
    into yyS where yy is the two-digit year.
    To leave it blank will prevent the program from creating summary files.
    RECOMMENDED VALUE: %%S or blank
                                                                         WG
```

```
2.5.5.1.1          Rogue Rawdata Files to RINEX Obs.Files: Input 1

 Comments:
    >                                                              <
    >                                                              <
    >                                                              <

 Agency Running Program                       > ANONYMOUS          <

 Default Receiver Type                        > ROGUE SNR-8000     <
 Default Antenna  Type                        > DORNE MARGOLIN T   <

 Include S/N Counts as "Observations"         > L1&L2 <   (NO, L1, L1&L2)
```

```
2.5.5.1.1       Rogue Rawdata Files to RINEX Obs.Files: Input 1        HELP

  Comments:
    Up to three lines of comments that will be included into the headers
    of each generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Default Receiver Type
    Single Frequency:
    Dual   Frequency:
```

```
    Default Antenna  Type
      Single Frequency:
      Dual   Frequency:

        Names for the receiver and antenna types that will be proposed to
        to the operator during execution of the RINEX converter program
        (provided the program runs in interactive mode, see next help panel).
        Depending on the type of the receiver (single or dual frequency
        receiver the converter program assumes to have detected) the program
        will propose the names in the "Single Frequency" or "Dual Frequency"
        input field.
        The final values will be included into the RINEX headers. They also
        have to agree with the values in the antenna phase center file (see
        e.g. {X:\GEN\PHAS_IGS.01}).
        RECOMMENDED VALUE: Use the values proposed by the International
                           GPS Service for Geodynamics (see
                           {X:\GEN\RCVR_ANT.TAB} and
             ftp://igscb.jpl.nasa.gov/igscb/station/general/rcvr_ant.tab)

    Include S/N Counts as "Observations":
      If L1 or L1&L2 is specified the raw signal strength values found in
      the raw data files are stored as S1 or S1 and S2 observations into
      the RINEX files.
      RECOMMENDED VALUE:  NO
                                                                          WG
```

```
2.5.5.1.2          Rogue Rawdata Files to RINEX Obs.Files: Input 2

    Signal to Noise Ratio              Minimum    Threshold    Maximum
      Frequency L1                    >    0  <   >   40  <   >  510  <
      Frequency L2                    >    0  <   >    4  <   >  255  <

    Sampling Interval                             >   30  <   Seconds
    Offset to Full Minute                         >    0  <   Seconds
    GPS time - UTC time                           >    0  <   Seconds
    (set to 0 if receiver runs in GPS time!)

    Take First Four Characters for RINEX Filename  > YES <    (YES or NO)
```

```
2.5.5.1.2       Rogue Rawdata Files to RINEX Obs.Files: Input 2         HELP

    Signal Strength: Frequency L1 / Frequency L2:
      The minimum/threshold/maximum values are used to compute the s/n
      stored into the RINEX files from the values found in the raw data files
      according to the scheme:

         minimum value (and smaller) --> RINEX s/n value: 1
         threshold                   --> RINEX s/n value: 5
         maximum value (and larger)  --> RINEX s/n value: 9

         (linear functions between 1 and 5 or 5 and 9, respectively, rounded
          to the nearest integer)

      The threshold value is the signal strength above which there is no
      doubt that the signal was strong enough to generate a good observation.
      It is translated into a 5 in the RINEX file.

      The values have to be adjusted according to the actual receiver (and
      maybe antenna) type. If you are unsure what values to use, run the
      converter program and observe the minimum and maximum values found
      in the raw data files that are printed in the program listing,
      modify the values in the data panel accordingly and rerun the program.

    Sampling Interval:
      Used to decimate data. A sampling rate of 30 seconds will select
      data at epochs 00 and 30 seconds after each full minute.
      Sampling interval 0 will convert all observations found.
```

```
    RECOMMENDED VALUE:  30 Seconds

  Offset to Full Minute:
    Used to shift the sampling epoch with respect to the full minute.
    RECOMMENDED VALUE:   0 Seconds

  GPS time - UTC time:
    Earlier Rogue versions ran on UTC time, so this was the place where
    the necessary correction to the time tags could be specified.
    RECOMMENDED VALUE:   0 Seconds

  Take First Four Characters for RINEX Filename:
    If YES the converter will propose RINEX file names using the first
    four characters of the site name found in the raw data file.
    RECOMMENDED VALUE:  YES
                                                                      WG
```

```
2.5.5.2 |     (Created) Rogue Eph.Files to RINEX Files  (Main Data Panel)

  CAMPAIGN       >          <         (blank for selection list)

 Name of File Containing List of Rawdata Files
  FILELIST       >                                <
                                      (blank: List has to be created)

 Device/Path to Rawdata Files
  RAWDATA        > X:\EUROCLUS\RAW\               <

 Extension of Created Eph.Files
  RAWEXT         > EPH <
```

```
2.5.5.2 |(Created) Rogue Eph.Files to RINEX Files  (Main Data Panel)| HELP

 General remarks:

  With this and the following panels you select the processing options for
  the program RGRINEXN. The main purpose of this program is the creation
  of RINEX navigation message files from Rogue raw data files.

  Before you run this program you have to run RGRINEXO to create the
  special ephemeris file containing just the ephemeris records from the
  rawdata file.

 Name of File Containing List of Rawdata Files

  FILELIST:
    Full name (i.e. including path) of a file containing a list of the raw
    data file names (body of filenames plus extensions, no paths!).
    The list has to be left-justified, one filename per line.
    If the input field is left blank, the file list will be created
    interactively.
    RECOMMENDED VALUE: blank

 Device/Path to Rawdata Files

  RAWDATA:
    Path to the raw data files.
    EXAMPLE:  D:\TESTV34\RAW\

 Extension of Created Eph.Files

  RAWEXT:
    Extension of the raw data filenames. Used to generate a selection
    list for the interactive generation of the file list.
    RECOMMENDED VALUE: EPH
    (The value has to be identical with the corresponding value of the
     program RGRINEXO)
                                                                      WG
```

```
2.5.5.2.1         (Created) Rogue Eph.Files to RINEX Files: Input 1

   Comments:
     >                                                          <
     >                                                          <
     >                                                          <

   Agency Running Program :                   > ANONYMOUS         <

   Take First 4 Char for Filename Creation :   > YES <     (YES or NO)
```

```
2.5.5.2.1      (Created) Rogue Eph.Files to RINEX Files: Input 1       HELP

   Comments:
     Up to three lines of comments that will be included into the headers
     of each generated RINEX file.

   Agency Running Program:
     Name of the agency/institution creating the RINEX files. Will be
     included into the RINEX headers.

   Take First 4 Char for Filename Creation:
     If YES the converter will propose RINEX file names using the first
     four characters of the rawdata filename.
                                                                         WG
```

```
2.5.6.1        Concatenate RINEX Observation Files  (Main Data Panel)

   CAMPAIGN              >         <          (blank for selection list)

 Input Files:
   RINEX FILENAME        >         <          (blank for selection list)
   RINEX FILE EXTENSION    > ??O  <
   PATH TO RINEX FILES     >      <           (blank for default path)

 Output Files:
   PATH                    >      <           (blank for default path)
```

```
2.5.6.1     Concatenate RINEX Observation Files  (Main Data Panel)     HELP

 General remarks:

   With this and the following panels you select the processing options for
   the program CCRINEXO. The main purpose of this program is to concatenate
   several RINEX observation files of the same station into one file only.
   You can also use it to extract the observations (of one or more files)
   of a specified time interval.

   The RINEX concatenation programs also run independently from the Bernese
   GPS Software. They use as primary options file a file called CCRINEXO.OPT
   which has to exist in the current or default directory.

   More informations about the RINEX converter programs can be found in the
   file PCRINEX.TXT which is distributed together with the converters. The
   most recent converters (at least the PC executables) can be downloaded
   from our anonymous ftp account (ubeclu.unibe.ch, cd aiub$ftp, cd pcrinex).

 Input Files:

   RINEX FILENAME:
```

```
    Name of the RINEX file(s) to concatenate / cut. They are expected to
    be in the rawdata campaign subdirectory (usually called RAW, see
    {DAT032__}). If not: Specify name of campaign subdirectory below.
    RECOMMENDED VALUE: blank to get a selection list.
                       If necessary use a wildcard spec or a filename
                       parameter to limit the number of files in the
                       selection list.

  RINEX FILE EXTENSION:
    Extension of the RINEX observation files.
    RECOMMENDED VALUE: ??O  or  yyO (where yy = two-digit year)

  PATH TO RINEX FILES:
    Name of the actual campaign subdirectory where the RINEX observation
    files can be found. If blank, the subdirectory according to menu 0.3.2
    is assumed (see {DAT032__}).

Output Files:

  PATH:
    Name of the actual campaign subdirectory where the concatenated files
    will be stored. If blank, the subdirectory according to menu 0.3.2 is
    selected (see {DAT032__}).
                                                                        WG
```

```
2.5.6.1.1            Concatenate RINEX Observation Files: Input 1

  Comments:
      >                                                            <
      >                                                            <
      >                                                            <

  Agency Running Program         > ANONYMOUS           <

  Automatic Filename Creation    >  YES  <     (YES or NO,
                                                ASIS = no interaction)
  Sampling Interval              >  30   <      Seconds
  Offset to Full Minute          >    0  <      Seconds

  Time Window:
                      yy mm dd     hh mm             yy mm dd     hh mm
     FROM           >          < >      <    TO    >          < >      <
   or
     SESSION NUMBER   >      <              YEAR     >      <
```

```
2.5.6.1.1        Concatenate RINEX Observation Files: Input 1        HELP

  Comments:
    Up to three lines of comments that will be included into the headers
    of each generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Automatic Filename Creation:
    If YES, the converter will propose a RINEX file name using the first
    four characters of the first RINEX input file used, the date of the
    first observation record in the concatenated file and a file sequence
    number of 0. (See also under "Time Window" below).
    If ASIS there will be no interaction at execution time at all.
    RECOMMENDED VALUE:  YES

  Sampling Interval:
    Used to decimate data. A sampling rate of 30 seconds will select
    data at epochs 00 and 30 seconds after each full minute.
    Sampling interval 0 will convert all observations found.
    RECOMMENDED VALUE:   0 Seconds
```

```
  Offset to Full Minute:
    Used to shift the sampling epoch with respect to the full minute.
    RECOMMENDED VALUE:   0 Seconds

  Time Window:

     FROM:                                     TO:
   or
     SESSION NUMBER:                          YEAR:

   Possibility to include observations from a given time window only.
   The window can either be explicitly given or defined through a
   session number and the previously defined session panel (menu 1.3).

   Filename parameters can be used in the SESSION NUMBER and YEAR fields.

   In case where wildcard definitions in the session panels do not include
   the year it has to be given here as well (see {DAT132__}. Blank else.

   In case of 4-character session numbers the 4th character is used as
   file sequence number.
                                                                        WG
```

```
2.5.6.2        Concatenate RINEX Navigation Files  (Main Data Panel)

  CAMPAIGN                >          <           (blank for selection list)

 Input Files:
  RINEX FILENAME          >          <           (blank for selection list)
  RINEX FILE EXTENSION      > ??N  <
  PATH TO RINEX FILES       >      <             (blank for default path)

 Output File:
  FIRST FOUR CHARACTERS     > BRDC <
  PATH                      >      <             (blank for default path)
```

```
2.5.6.2    Concatenate RINEX Navigation Files  (Main Data Panel)      HELP

 General remarks:

   With this and the following panels you select the processing options for
   the program CCRINEXN. The main purpose of this program is to concatenate
   several RINEX navigation message files of the same station or of
   different stations into one file only. You can also use it to extract the
   messages (of one or more files) of a specified time interval. Redundant
   messages are not retained.

   The RINEX concatenation programs also run independently from the Bernese
   GPS Software. They use as primary options file a file called CCRINEXN.OPT
   which has to exist in the current or default directory.

   More informations about the RINEX converter programs can be found in the
   file PCRINEX.TXT which is distributed together with the converters. The
   most recent converters (at least the PC executables) can be downloaded
   from our anonymous ftp account (ubeclu.unibe.ch, cd aiub$ftp, cd pcrinex).

 Input Files:

   RINEX FILENAME:
     Name of the RINEX files to concatenate / cut. They are expected to
     be in the rawdata campaign subdirectory (usually called RAW, see
     {DAT032__}). If not: Specify name of campaign subdirectory below.
     RECOMMENDED VALUE: blank to get a selection list.
                        If necessary use a wildcard spec or a filename
                        parameter to limit the number of files in the
                        selection list.
```

```
  RINEX FILE EXTENSION:
    Extension of the RINEX observation files.
    RECOMMENDED VALUE: ??N  or  yyN (where yy = two-digit year)

  PATH TO RINEX FILES:
    Name of the actual campaign subdirectory where the RINEX observation
    files can be found. If blank, the subdirectory according to menu 0.3.2
    is assumed (see {DAT032__}).

Output Files:

  FIRST FOUR CHARACTERS:
    The code 'cccc' to use for the proposed output filename.
    Default naming scheme:

      ccccdddf.yyN

                     ddd:  day of the year
                       f:  file sequence number (0 for concatenated file)
                      yy:  two-digit year

  PATH:
    Name of the actual campaign subdirectory where the concatenated files
    will be stored. If blank, the subdirectory according to menu 0.3.2 is
    selected (see {DAT032__}).
                                                                         WG
```

```
2.5.6.2.1 |           Concatenate RINEX Navigation Files: Input 1

  Comments:
      >                                                              <
      >                                                              <
      >                                                              <

  Agency Running Program         > ANONYMOUS           <

  Automatic Filename Creation    >  NO   <     (YES or NO,
                                                ASIS = no interaction)
  Time Window:
                     yy mm dd     hh mm               yy mm dd     hh mm
     FROM          >          < >      <    TO    >          < >      <
   or
     SESSION NUMBER   >      <              YEAR     >      <
```

```
2.5.6.2.1 |        Concatenate RINEX Navigation Files: Input 1        | HELP

  Comments:
    Up to three lines of comments that will be included into the headers
    of each generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Automatic Filename Creation:
    If YES the converter will propose a RINEX file name using the first
    four characters given in the previous panel, the date of the first
    navigation record in the concatenated file and a file sequence
    number of 0.
    If ASIS there will be no interaction at execution time at all.
    RECOMMENDED VALUE:  YES

  Time Window:

     FROM:                                TO:
   or
     SESSION NUMBER:                     YEAR:
```

```
Possibility to include observations from a given time window only.
The window can either be explicitly given or defined through a
session number and the previously defined session panel (menu 1.3).

Filename parameters can be used in the SESSION NUMBER and YEAR fields.

In case where wildcard definitions in the session panels do not include
the year it has to be given here as well (see {DAT132__}). Blank else.
                                                                      WG
```

```
2.5.6.3        Concatenate Precise Orbit Files (Main Data Panel)

  CAMPAIGN                > 	       <           (blank for selection list)

 Input Files:
  ORBIT FILENAME          >            <           (blank for selection list)
  ORBIT FILE EXTENSION      > PRE  <
  PATH TO ORBIT FILES       >      <               (blank for default path)

 Output File:
  FIRST FOUR  CHARACTERS    > PREC <
  OUTPUT FILE EXTENSION     > PRE  <
  PATH                      >      <               (blank for default path)
```

```
2.5.6.3      Concatenate Precise Orbit Files (Main Data Panel)      HELP

 General remarks:

  With this and the following panels you select the processing options for
  the program CCPREORB. The main purpose of this program is to concatenate
  several precise ephemeris files into one file only.

 Input Files:

  ORBIT FILENAME:
    Name of the precise ephemeris files to concatenate. They are expected
    to be in the orbit file campaign subdirectory (usually called ORB, see
    {DAT033__}). If not: Specify name of campaign subdirectory below.
    RECOMMENDED VALUE: blank to get a selection list.
                       If necessary use a wildcard spec or a filename
                       parameter to limit the number of files in the
                       selection list.

  ORBIT FILE EXTENSION:
    Extension of the precise ephemeris files.
    RECOMMENDED VALUE: PRE

  PATH TO ORBIT FILES:
    Name of the actual campaign subdirectory where the precise ephemeris
    files can be found. If blank, the subdirectory according to menu 0.3.3
    is assumed (see {DAT033__}).

 Output File:

  FIRST FOUR CHARACTERS:
    The code 'cccc' to use for the name of the concatenated precise
    ephemeris file.
    Filename parameters can be used in this field.

  OUTPUT FILE EXTENSION:
    The file name extension to use for the output filename.
    RECOMMENDED VALUE: PRE  (no default value exists!)

    File naming scheme:

      ccccddds.ext    with  cccc = code
                             ddd = day of the year of first ephemeris
                               s = file sequence number (0)
```

```
                           ext = extension

  PATH:
    Name of the actual campaign subdirectory where the concatenated files
    will be stored. If blank, the subdirectory according to menu 0.3.3 is
    selected (see {DAT033__}).
                                                                       WG
```

```
2.5.6.3.1          Concatenate Precise Orbit Files: Input 1

  Comments:
      >                                                              <

  Agency Running Program        > ANONYMOUS          <

  Automatic Filename Creation    >  NO   <     (YES or NO,
                                                ASIS = no interaction)
  Time Window:
                      yy mm dd     hh mm              yy mm dd     hh mm
     FROM           >          < >       <    TO    >          < >       <
   or
     SESSION NUMBER   >      <              YEAR     >      <
```

```
2.5.6.3.1          Concatenate Precise Orbit Files: Input 1          HELP

  Comments:
    Up to three lines of comments that will be included into the generated
    program protocol.

  Agency Running Program:
    Name of the agency/institution creating the ephemeris files. It will
    be included into the header of the concatenated orbit file.

  Automatic Filename Creation:
    If YES the converter will generate a file name using the first
    four characters given in the previous panel, the date of the first
    ephemeris record in the concatenated file and a file sequence
    number of 0.
    RECOMMENDED VALUE:  YES

  Time Window:

     FROM:                                  TO:
   or
     SESSION NUMBER:                        YEAR:

   Possibility to include ephemerides from a given time window only.
   The window can either be explicitly given or defined through a
   session number and the previously defined session panel (menu 1.3).

   Filename parameters can be used in the SESSION NUMBER and YEAR fields.

   In case where wildcard definitions in the session panels do not include
   the year it has to be given here as well (see {DAT132__}). Blank else.
                                                                       WG
```

```
 2.5.7             Split RINEX Observation Files  (Main Data Panel)

  CAMPAIGN               >         <          (blank for selection list)

 Input Files:
  RINEX FILENAME         >         <          (blank for selection list)
  RINEX FILE EXTENSION     > ??O  <
```

```
2.5.7     Split RINEX Observation Files  (Main Data Panel)     HELP

General remarks:

  With this and the following panels you select the processing options for
  the program RNXSPLIT. The main purpose of this program is to split a
  RINEX observation file containing portions collected on several stations
  into one file per station. Data collected during kinematic phases are
  skipped. The primary application is to process files collected in rapid
  static or similar modes.

Input Files:

  RINEX FILENAME:
    Name of the RINEX files to split. They are expected to be in the
    rawdata campaign subdirectory (usually called RAW, see {DAT032__}).
    RECOMMENDED VALUE: blank to get a selection list.
                       If necessary use a wildcard spec or a filename
                       parameter to limit the number of files in the
                       selection list.

  RINEX FILE EXTENSION:
    Extension of the RINEX observation files.
    RECOMMENDED VALUE: ??O  or  yyO (where yy = two-digit year)
                                                                          WG
```

```
2.5.7.1          Split RINEX Observation Files: Input 1

  Comments:
      >                                                         <
      >                                                         <
      >                                                         <

  Agency Running Program        > ANONYMOUS           <

  Automatic Filename Creation                 > NO  <   (YES or NO)
  Sampling Interval                           > 0   <   Seconds
  Offset to Full Minute                       > 0   <   Seconds
```

```
2.5.7.1        Split RINEX Observation Files: Input 1          HELP

  Comments:
    Up to three lines of comments that will be included into the headers
    of each generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Automatic Filename Creation:
    If YES, the converter will propose RINEX file names using the first
    four characters of the station name, the date of the first observation
    record in the output file and a sequence number of 1.
    RECOMMENDED VALUE:  YES

  Sampling Interval:
    Used to decimate data. A sampling rate of 30 seconds will select
    data at epochs 00 and 30 seconds after each full minute.
    Sampling interval 0 will convert all observations found.
    RECOMMENDED VALUE:   0 Seconds

  Offset to Full Minute:
    Used to shift the sampling epoch with respect to the full minute.
    RECOMMENDED VALUE:   0 Seconds
                                                                          WG
```

```
2.5.9                    Creation of RINEX Met.Files

  CAMPAIGN                      >          <  (blank for selection list)

  Comments:
     >                                                            <

  Agency Running Program          > ANONYMOUS            <

  Input Data:
    Units:  Pressure              > MM_HG <   (MBAR   or MM_HG)
            Temperature           > DEG_C <   (DEG_C  or DEG_F)
            Humidity              > REL_H <   (REL_H  or WET_T)
    Order of Input                > PTH   <   (PTH, PHT or TPH)
    Time Increments               >   30  <   Seconds
    Epoch Correction to           >    0  <   Hours

  Take First Four Characters for RINEX Filename  > YES <    (YES or NO)
```

```
2.5.9                  Creation of RINEX Met.Files                 HELP

General remarks:

  With this panel you select the processing options for the program
  RXMETEO. The main purpose of this program is to create RINEX
  meteorological data file from manually entered surface met data.

  This RINEX converter program also runs independently from the Bernese
  GPS Software. It uses as primary options file a file called
  RXMETEO.OPT which has to exist in the current or default directory.

  More informations about the RINEX converter programs can be found in the
  file PCRINEX.TXT which is distributed together with the converters. The
  most recent converters (at least the PC executables) can be downloaded
  from our anonymous ftp account (ubeclu.unibe.ch, cd aiub$ftp, cd pcrinex).

  Comments:
    One line of comments that will be included into the headers of each
    generated RINEX file.

  Agency Running Program:
    Name of the agency/institution creating the RINEX files. Will be
    included into the RINEX headers.

  Input Data:
    Units:  Pressure:     Millibar or millimeter mercury
            Temperature:  Degrees Celsius or Fahrenheit
            Humidity:     Relative humidity (percents) or wet temperature
    The data will be converted to millibars, degrees Celsius, and percents
    if necessary.

    Order of Input:
      The order in which you will enter the surface met data:
         Pressure   - Temperature - Humidity      (PTH)
         Pressure   - Humidity    - Temperature   (PHT)
         Temerature - Pressure    - Humidity      (TPH)

    Time Increments:
      The program will propose the time tag of the next met value
      automatically

    Epoch Correction to UTC:
      If the time tags are not given in UTC, you can have the correction
      done by the program.

  Take First Four Characters for RINEX Filename:
    If YES the converter will propose RINEX file names using the first
    four characters of the station name, the date of the first met data
    in the output file and a sequence number of 1.
                                                                        WG
```

```
 2.6.1   |           TRANSFER: BERNESE OBS. to  RINEX  (Main Data Panel)

   CAMPAIGN       >          <      (blank for selection list)

 Input Files:
   PHASE          >          <      (NO, if not used; blank for sel.list)
   CODE           >          <      (NO, if not used; blank for phase names)
   COORDINATES    >          <      (blank for selection list)

 Output Files:
   RINEX          >          <      (blank for same names as phase files)
   EXTENSION         > 960 <
```

```
 2.6.1   |     TRANSFER: BERNESE OBS. to  RINEX  (Main Data Panel)    |  HELP

 General remarks:

   With this and the following panel you select the processing options for
   the program BV3RXO. The main purpose of this program is to convert
   Bernese Observation Files into the corresponding number of RINEX files.
   If there are phase and code files you can specify them both to generate
   RINEX files containing both, phase and code observations.

 Input Files:

   PHASE:
     Name of the Bernese Phase Observation Files to be converted or
     file specification to create a file selection panel.
     If necessary use a wildcard spec or a filename parameter to limit
     the number of files in the selection list.

   CODE:
     If you leave the field blank, filenames identical to the phase files
     are used. NO does not use any code files.

   COORDINATES:
     A coordinate file where the station coordinates are extracted to be
     put into the RINEX file header.

 Output Files:

   RINEX:
     If you convert one file only, you can specify the name of the RINEX
     output filename. The default names (leave the field blank) are the same
     as the Bernese files (but a different extension).

   EXTENSION:
     Extension of the RINEX filename. There is no default value. Filename
     parameters may be used.
                                                                          WG
```

```
 2.6.1-1 |                      BERNESE OBS.: INPUT


  Processing Options:
    ADD CAMPAIGN/TITLE AS COMMENT           > YES <     (YES or NO)


  Comment Lines:
    LINE 1  >                                                             <
    LINE 2  >                                                             <
    LINE 3  >                                                             <
```

```
2.6.1-1 | BERNESE OBS.: INPUT | HELP

 Processing Options:

   ADD CAMPAIGN/TITLE AS COMMENT:
     If YES, the campaign name and title will be added as comment line to
     the RINEX headers.

 Comment Lines:

   LINE 1:
   LINE 2:
   LINE 3:
     Up to three comment lines to be included into the RINEX headers.

                                                                        WG
```

```
2.6.2 | TRANSFER: BERNESE BRD. to  RINEX  (Main Data Panel)

  CAMPAIGN       >          <      (blank for selection list)

Input Files:
  BROADCAST      >          <      (blank for selection list)

Output Files:
  RINEX          >          <      (blank for same names as brd. files)
  EXTENSION         > 96N <
```

```
2.6.2 | TRANSFER: BERNESE BRD. to  RINEX  (Main Data Panel) | HELP

General remarks:

  With this panel you select the processing options for the program BV3RXN.
  The main purpose of this program is to convert Bernese Broadcast Files
  into the same number of RINEX Navigation Message Files.

Input Files:

  BROADCAST:
    Name of the Bernese Broadcast Files to be converted or
    file specification to create a file selection panel.
    If necessary use a wildcard spec or a filename parameter to limit
    the number of files in the selection list.

Output Files:

  RINEX:
    If you convert one file only, you can specify the name of the RINEX
    output filename. The default names (leave the field blank) are the same
    as the Bernese files (but with a different extension).

  EXTENSION:
    Extension of the RINEX filename. There is no default value. Filename
    parameters may be used.
                                                                        WG
```

```
2.7.1 | TRANSFER: RINEX OBS. to BERNESE  (Main Data Panel)
```

```
  CAMPAIGN         >          <  (blank for selection list)

Input Files:
  RINEX            >          <  (blank for selection list)
  RINEX EXTENSION  > %%O <       (Wildcards allowed)
  COORDINATES      > APRIORI  <  (NO, if no update; blank for sel.list)

Translation Tables:
  STATION NAMES    > ITRFCODE <  (NO, if not used; blank for sel.list)
  RCVR / ANTENNA   > ITRFCODE <  (NO, if not used; blank for sel.list)
  ANTENNA HEIGHTS  > ITRFCODE <  (NO, if not used; blank for sel.list)
  STA.NAMES: STOP  > YES <       (NO or YES, yes=stop if station not found)
  ANT.HGT. : STOP  > YES <       (NO or YES, yes=stop if ant.hgt not found)

Output Files:
  CODE/PHASE/RANGE >          <  (blank: def.name; NO: do not create)
  RANGES (SLR)     > NO  <       (NO or YES)
```

```
2.7.1 | TRANSFER: RINEX OBS. to BERNESE  (Main Data Panel) | HELP

General Remarks:
  This program converts the RINEX observation files into the Bernese
  format.

Input Files:

  RINEX:
    Select the RINEX files to be converted to Bernese. Several files (even
    from different sessions) may be processed  in one program run. For each
    RINEX file a Bernese zero-diff. code and a zero-diff. phase file will
    be created. If you would like to concatenate or split up RINEX files
    use the program CCRINEXO (see menu 2.5.6.1) before transferring the
    data into the Bernese observation file format.

  RINEX EXTENSION:
    The extension of the RINEX observation files you want to process must
    entered in this field. The official RINEX extension for observation
    files is "yyO" where yy is the year and "O" stands for "Observations".
    You may use wildcards for this extension, e.g. ??O or %%O.
    RECOMMENDED VALUE: %%O

  COORDINATES:
    If you enter a coordinate file name here the site coordinates in the
    RINEX file(s) will be saved in this coordinate file. If at the beginn-
    ing of a campaign processing you do not have any good a priori coordi-
    nates you may use this option to obtain a coordinate file containing
    the RINEX coordinates (coordinate flag "R"). You may not enter the name
    of a coordinate file that does not yet exist. The file must already
    exist, although it may only contain the file header (no coordinates or
    station names). Such a file may be created using menu 1.4.1 (see
    {DAT141__}).
    Setting the option to NO means that no coordinate file will be updated.

Translation Tables:

  STATION NAMES:
    You may use a station name translation table to make sure that in the
    Bernese observation files you will have correct station names. An
    example of such a translation table is given in {X:\INX\EXAMPLE.STN}.
    You may create a translation table of your own using menu 1.4.2 (see
    {DAT142__}). Wildcards may be used in the translation table.
    With "NO" the station names will be taken from the RINEX file(s) with-
    out any check or translation.

  RCVR / ANTENNA:
    You should make sure that you use -- whenever possible -- official
    receiver and antenna names in the Bernese software. It is therefore
    useful to have the option of a translation table for receiver and
    antenna names. By specifying a translation table here the receiver
    and antenna names in the RINEX files will be translated. An example
    of such a translation table (using also wildcards) is given in
```

```
    {X:\INX\EXAMPLE.TRN}. The official receiver/antenna names used within
    the IGS may be found in {X:\GEN\RCVR_ANT.TAB} and corresponding antenna
    sketches in {X:\GEN\ANTENNA.GRA}. You should also make sure that the
    receiver/antenna names you are going to use within the Bernese software
    are consistent with the names in the antenna phase center correction
    file (see e.g. {X:\GEN\PHASITRF.}). A receiver/antenna name translation
    table may be created using menu 1.4.5 (see {DAT145__}).
    With "NO" no translation takes place and the names given in the RINEX
    files are written into the Bernese files.

  ANTENNA HEIGHTS:
    Here a translation table for antenna heights may be specified. Instead
    of the RINEX antenna height the height given in the translation table
    is written into the Bernese observation files. For an example of such
    a translation table see {X:\INX\EXAMPLE.HTR}.
    With "NO" the antenna height given in the RINEX file will be used.

  STA.NAMES: STOP:
    This option defines whether the program should stop if the station in
    the RINEX file is not present in the station name translation table or
    whether it should continue, just using the RINEX station name without
    translation.

  ANT.HGT. : STOP:
    If "YES" is entered the program will stop if an antenna height is found
    that is not present in the antenna height translation table, else the
    program will continue and write the RINEX antenna height into the
    Bernese observation header files.

Output Files:

  CODE/PHASE/RANGE:
    Definition of the Bernese observation output file names. The usual
    setting is "blank": the output file names are then generated automati-
    cally using the station name abbreviation table (see menu 1.4.3) and
    the session table (see menu 1.3.2). Examples of an abbreviation table
    and a session table are available in {X:\INX\DAT143__.PAN} and
    {X:\INX\DAT132__.PAN}.
    "NO" means that no output files are created.

  RANGES (SLR):
    This option has to be set to "YES" ONLY if RINEX files containing SLR
    data are converted into the Bernese observation file format. The path
    and extension of the Bernese output files are then taken from the
    default setting for range observation files given in {DAT032__}.

                                                                          MR
```

2.7.1-1	RINEX OBS.: INPUT

```
Title Line:
  TITLE        >                                      <

Signal Strength Requirements:
  MINIMUM SIGNAL STRENGTH              > 1   <    (0-9)
  ACCEPT  SIGNAL STRENGTH = 0          > YES <    (YES or NO)

Sampling:
  SAMPLING INTERVAL                    >     <    (sec; blank: take all obs)
  SAMPLING OFFSET TO FULL MINUTE       > 0   <    (sec)

Session Numbering:
  LENGTH OF SESSION NUMBERS             > 4 <     (3 or 4 characters)
```

2.7.1-1	RINEX OBS.: INPUT	HELP

```
Title Line:
```

```
  TITLE:
    This title line will be included into the Bernese observation file
    header. Together with this title also the campaign name will be saved.
    This title line here should contain a very short description of the
    campaign and should be the same for all files of the same campaign.

Signal Strength Requirements:

  MINIMUM SIGNAL STRENGTH:
    This option can be used to eliminate data with a low signal/noise
    ratio. According to the RINEX format definition the signal/noise
    ratio is mapped into values from 0 to 9. By setting this option e.g.
    to 1 you can remove any data with signal/noise values of 0.
    Some RINEX converters use a value of 0 to mark bad observations.
    RECOMMENDED VALUE: 1

  ACCEPT  SIGNAL STRENGTH = 0:
    In addition to the option above you may specify whether data with a
    signal strength of 0 should be kept. "YES" means that observations with
    a signal strength of 0 are kept and written to the Bernese files.
    RECOMMENDED VALUE: YES

Sampling:

  SAMPLING INTERVAL:
    The original RINEX observations may be sampled using this option. If
    this option is left "blank" all the observations in the original RINEX
    files will be transferred to the Bernese format.
    If you specify a sampling rate in seconds, the observations will be
    decimated accordingly.
    RECOMMENDED VALUE: blank

  SAMPLING OFFSET TO FULL MINUTE:
    If you are sampling the data you may specify an offset to the full
    minute for the observations to be taken. E.g. if you sample your
    original 10 sec data at 60 seconds, you might specify an offset of
    10 seconds to the full minute. The observation epochs of the resulting
    Bernese observation file will then be 10 sec, 70 sec, 130 sec, ... .
    RECOMMENDED VALUE: 0 sec

Session Numbering:

  LENGTH OF SESSION NUMBERS:
    In the older versions of the Bernese GPS Software (Version 3.5 and
    older) the session numbering was done with 3 digits. Starting with
    version 4.0 session have now 4 characters and may indeed contain
    characters and not only numbers. Depending on whether 3- or 4-character
    sessions were used in the session table (see menu 1.3) you should
    specify 3 or 4 here.
                                                                        MR
```

```
2.7.2          TRANSFER: RINEX NAV. to BERNESE  (Main Data Panel)

  CAMPAIGN      >         <        (blank for selection list)

Input Files:
  RINEX         >         <        (blank for selection list)

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

Output Files:
  BROADCAST     >         <        (blank for same names as Rinex files)
```

```
2.7.2       TRANSFER: RINEX NAV. to BERNESE  (Main Data Panel)        HELP

General Remark:
  This program is used to transfer RINEX Navigation files into the Bernese
```

```
  broadcast file format.

Input Files:

  RINEX:
    Selection of RINEX navigation files. Several files may be selected in
    the same program run. One Bernese broadcast file will be created for
    each RINEX navigation file. To concatenate RINEX navigation files use
    the program CCRINEXN (see menu 2.5.6.2) before starting this transfer
    program here.

Extension of Input Files (Wildcards allowed):

  EXTENSION:
    Specification of the RINEX navigation file extension. Wildcards are
    allowed. The official RINEX navigation file extension is "yyN", where
    yy stands for the year and "N" for "Navigation".
    RECOMMENDED VALUE: %%N

Output Files:

  BROADCAST:
    You may enter the broadcast output file name here. Usually you will
    leave this field blank, so that the Bernese broadcast file obtains the
    same name as the RINEX navigation file (but a different extension).
                                                                        MR
```

```
2.7.3 |        TRANSFER: RINEX MET.FILES to BERNESE  (Main Data Panel)

  CAMPAIGN        >          <    (blank for selection list)

Input Files:
  RINEX MET.FILE   >          <    (blank for selection list)
  STATION NAMES    >          <    (NO, if not used; blank for sel.list)
  STA.NAMES: STOP  > YES <         (NO or YES, yes=stop if stat. not found)

Extension of RINEX Input Files:
  EXTENSION          > ??M <       (Wildcards allowed)

Output File:
  NEW/APPEND       > NEW      <    (NEW, APPEND)
  BERNESE MET.FILE >          <    (blank for selection list [APPEND] or
                                    for same name as 1st RINEX file [NEW])
Title Line:
  TITLE           >                                      <
```

```
2.7.3 |   TRANSFER: RINEX MET.FILES to BERNESE  (Main Data Panel)  | HELP

General Remark:
  Use this program to transfer RINEX meteorological files into the Bernese
  meteo file format.

Input Files:

  RINEX MET.FILE:
    Selection of RINEX meterological files. More than one file may be
    selected per program run, but only files of ONE site may be combined
    in the same run.

  STATION NAMES:
    In this input field you may supply the name of a station name trans-
    lation table. The station names will then be translated before being
    written to the Bernese meteo file. An example of a station translation
    file is given in {X:\INX\EXAMPLE.STN}. With "NO" no translation takes
    place and the site name given in the RINEX file(s) will be used also
    in the Bernese format.

  STA.NAMES: STOP:
```

```
    This option defines whether the program should stop if the station in
    the RINEX file is not present in the station name translation table or
    whether it should continue, just using the RINEX station name without
    translation.

Extension of RINEX Input Files:

  EXTENSION:
    Enter here the extension of the RINEX meteorological files you want to
    process. The official RINEX extension for meteorological files is "yyM"
    where yy is the year and "M" stands for "Meteo". You may use
    wildcards for this extension, e.g. ??M or %%M.
    RECOMMENDED VALUE: %%M

Output File:

  NEW/APPEND:
    This option defines whether the RINEX meteo data should be appended
    to an already existing Bernese meteo file (APPEND) or whether a new
    Bernese meteo file should be created (NEW).

  BERNESE MET.FILE:
    In this field you enter the Bernese meteo output file name. If APPEND
    has been specified in the previous field "blank" will give you a selec-
    tion list, whereas if NEW was entered in the previous field, "blank"
    means that the name of the first RINEX meteo file will be used as
    output name.

Title Line:

  TITLE:
    The title entered here will be the title line for the Bernese meteo
    output file.
                                                                         MR
```

```
2.7.4   |         TRANSFER: Create Pseudographics of RINEX Obs.file

  CAMPAIGN         >          <   (blank for selection list)

Rinex Input Files:
  RINEX            >          <   (blank for selection list)
  MEASUREMENT TYPE > PHASE  <     (CODE, PHASE)
  FREQUENCIES      > BOTH <       (L1,L2,BOTH)
  EXTENSION        > ??O <

Translation Tables:
  STATION NAMES    > NO       <   (NO, if not used; blank for sel.list)
  STA.NAMES: STOP  > NO  <        (NO or YES, yes=stop if stat. not found)

Output Files:
  SUMMARY FILE     > RXGRSUM  <   (NO, if not to be created)
```

```
2.7.4   |      TRANSFER: Create Pseudographics of RINEX Obs.file      |  HELP

General Remark:
  Use this program to generate a simple ASCII graphic file with information
  about the satellites and satellite windows. The output file gives you
  a summary of the observation material available in the selected RINEX
  files.

Rinex Input Files:

  RINEX:
    Selection of one or more RINEX observation files. The RINEX files you
    select should not cover more than one day of data and should all
    belong to the same session.

  MEASUREMENT TYPE:
```

```
      In this field you enter the measurement type you would like to get
      statistical information about.

    FREQUENCIES:
      Select the frequency or frequencies you would like to get a summary of.
      With the option "BOTH" the information will be displayed for both
      frequencies.

    EXTENSION:
      The extension of the RINEX observation files you want to process.
      The official RINEX extension for observation files is "yyO"
      where yy is the year and "O" stands for "observations". You may use
      wildcards for this extension, e.g. ??O or %%O.
      RECOMMENDED VALUE: %%O

  Translation Tables:

    STATION NAMES:
      You may use a station name translation table to make sure that in the
      graphic output file you will have correct station names. An example
      of such a translation table is given in {X:\INX\EXAMPLE.STN}.
      Wildcards may be used in the translation table.
      With "NO" the station names will be taken from the RINEX file(s) with-
      out any check or translation.

    STA.NAMES: STOP:
      This option defines whether the program should stop if the station in
      the RINEX file is not present in the station name translation table or
      whether it should continue, just using the RINEX station name without
      translation.

  Output Files:

    SUMMARY FILE:
      Enter the name of the summary output file in this field. If you enter
      "NO" here, no summary file will be created. The summary file contains
      a table telling how many stations observed each satellite and a table
      on how many satellites were observed by each station.
                                                                            MR
```

```
  2.7.5         TRANSFER: Check Phases Using Melbourne/Wuebbena Combination

    CAMPAIGN         >          <   (blank for selection list)

  Rinex Input Files:
    RINEX            >          <   (blank for selection list)

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

  Extension of Rinex Output Files (Wildcards not allowed; Overwrite Files if
    EXTENSION          > ??O <    blank or same extension as Input Files)

  Translation Tables:
    STATION NAMES    > NO       <   (NO, if not used; blank for sel.list)
    STA.NAMES: STOP  > NO  <        (NO or YES, yes=stop if stat. not found)

  Output Files:
    RESIDUALS        > NO       <   (NO, if not used)
```

```
  2.7.5    TRANSFER: Check Phases Using Melbourne/Wuebbena Combination   HELP

  General remarks:

    The program checks the phase observations for cycle slips based on the
    phase L1 and L2 observations AND the pseudo-range observations P1 and P2.

    The Melbourne/Wuebbena linear combination of phase and code observations
```

```
  allows the determination of the N5 widelane ambiguity independent of the
  ionosphere, troposphere, and geometry (coordinates, orbits, and clocks).
  If a cycle slip in N5 is detected a cycle slip flag is set in the RINEX
  file.

  Narrow lane ambiguities are not checked!

  A simple data cleaning is also possible (see next panel).

  ATTENTION: Data collected under AS conditions should not be screen with
             this program because the pseudo-range observations are too
             noisy to reliably detect cycle slips on the 0.86 m level.

  Idea: Pre-processing on the zero-difference level without relying on the
        flags given in the RINEX file.

        The ambiguity flags set by RNXCYC will be kept when forming single-
        difference files (program SNGDIF, menu 4.3) and may be used by the
        program MAUPRP (menu 4.4.2) as a priori information.

  Principle:

     given : observations L1, L2, P1, P2 in  the RINEX format

     computed : for each epoch, each satellite:

             1
     N    = ------ * (L   - P )
       5    Lambda     5     5
                 5
    with

      Lambda    = 0.86 m
            5

       L        =  (f  L   -   f   L  )  / (f    - f  )
        5            1   1       2   2         1     2

       P        =  (f  P   +   f   P  )  / (f    + f  )
        5            1   1       2   2         1     2


       f   , f   :  Frequencies 154 * 10.23 MHz, 120 * 10.23 MHz
         1    2
                    (19.0 cm, 24.0 cm)



Rinex Input Files:

  RINEX:
    Selection of RINEX files. Several files may be processed in the same
    program run.

Extension of Rinex Input Files (Wildcards allowed):

  EXTENSION:
    The extension of the RINEX observation files you want to process must
    entered in this field. The official RINEX extension for observation
    files is "yyO" where yy is the year and "O" stands for "Observations".
    You may use wildcards for this extension, e.g. ??O or %%O.
    RECOMMENDED VALUE: %%O

Extension of Rinex Output Files (Wildcards not allowed):

  EXTENSION:
    Leave the field blank to store the screened RINEX files with the same
    extension as the original file (overwrite !). If you specify a
    different extension the original file will not be overwritten. The
    screened files will be written to files with the same name but with
    extension you specify here.

Translation Tables:

  STATION NAMES:
    You may use a station name translation table to translate the station
    names given in the RINEX files to the names given in the translation
```

```
    table. Only the station names printed in the program output file will
    be changed by specifying a translation table. An example of a
    translation table is given in {X:\INX\EXAMPLE.STN}.
    You may create a translation table of your own using menu 1.4.2 (see
    {DAT142__}). Wildcards may be used in the translation table.
    With "NO" the station names will be taken from the RINEX file(s) with-
    out any check or translation.

  STA.NAMES: STOP:
    This option defines whether the program should stop if the station in
    the RINEX file is not present in the station name translation table or
    whether it should continue, just using the RINEX station name without
    translation.

Output Files:

  RESIDUALS:
    Residual file to verify the quality of the observations
    The residual file may be screened with the program REDISP (menu 5.3).

                                                                        EB
```

```
2.7.5-1 |          Check Phases Using Melbourne/Wuebbena Combination

  TITLE  >                                                            <

  Detection Boundaries:

    LOW LEVEL VARIATIONS                      > 0.60 <      L5 cycle
    CYCLE SLIP DETECTION LEVEL                > 0.80 <      L5 cycle
    SIGMA OF WUEBBENA-MELBOURNE COMBINATION   > 0.30 <      L5 cycle

  Delete Options  (0: do not use)

    MAXGAP: Delete bad connected data if gap
            (before or behind) is larger than  > 0    <      sec
    MINEPO: Minimum interval with good data    > 120  <      sec
```

```
2.7.5-1 |      Check Phases Using Melbourne/Wuebbena Combination      | HELP

  Title:
    The title will be printed as header information in
    the program output. The title may help you to remember what options
    you used for a specific program run.

  Detection Boundaries:
     Options for the detection of cycle slips.

    LOW LEVEL VARIATIONS:
      Differences allowed in the Melbourne/Wuebbena linear combination (LC)
      between the current epoch and the mean value of all the previous
      epochs, where no cycle slips occurred.
      Values larger than 1.0 should not be specified, because in that case
      a cycle slip (of one cycle) cannot be detected.
      Values smaller than 0.6 may result in the detection of a lot of
      (seeming) cycle slips.
      RECOMMENDED VALUE: 0.6

    CYCLE SLIP DETECTION LEVEL:
      Detection level for cycle slip. If the difference in the Melbourne/
      Wuebbena LC between the current epoch and the mean of the previous
      epochs is larger than this detection level, a flag is setup in the
      first iteration of the program. A second iteration then decides if
      this value is due to a noisy data point, or if a cycle slip occurred.
      RECOMMENDED VALUE: 0.80

    SIGMA OF WUEBBENA-MELBOURNE COMBINATION:
      The assumed RMS of the Melbourne/Wuebbena combination in
```

```
      units of L5. This value is used to compute the rms of the
      mean value of several Wuebbena-Melbourne values only.
      There is no effect on the decision whether a cycle slip occurs.
      RECOMMENDED VALUE: 0.30


  Delete Options  (0: do not use)
    Enables -- in addition to the cycle slip detection --  a simple
    data cleaning. A bad observation is marked by setting the signal
    strength to 1 in the RINEX file.
    In the program RXOBV3, converting RINEX files into BERNESE format,
    you may specify whether you want to accept observations with a signal
    strength of 1 and thus remove these observations or not (see
    {DAT2711_}).

    MAXGAP: Mark bad connected data if gap
      To delete isolated observations
      RECOMMENDED VALUE: 0  sec (which means no deletions)

    MINEPO: Minimum interval with good data
      Minimum time interval of continuous observations with no cycle
      slip. Shorter pieces of continuous data will be marked.
      RECOMMENDED VALUE: 180  sec

                                                                       EB
```

```
2.7.5-2 |        Check Phases Using Melbourne/Wuebbena Combination

  Cycle slip flags in Rinexfile
   - KEEP ALL RINEX FLAGS                               > ALL <  (ALL, L5)
   - KEEP ONLY IF PROGRAM DETECTS L5-SLIP

  Correction of L1,L2 (small L4 cycleslips may remain)  >  NO <  (YES or NO)

  Use of Data with SNR=1 (deleted in first run)         > YES <  (YES or NO)
```

```
2.7.5-2 |     Check Phases Using Melbourne/Wuebbena Combination     | HELP

  Cycle slip flags in Rinexfile
    KEEP ALL RINEX FLAGS:
      Possibility to keep all cycle slip flags that were originally in the
      RINEX files (option ALL).
      Option "L5" only flags the observations where a problem in the
      Melbourne/Wuebbena LC was detected.
      RECOMMENDED VALUE: ALL

  Correction of L1,L2 (small L4 cycle slips may remain):
    Option "YES" corrects L1 and L2 for detected cycle slips (not only L5).
    That is in principle not necessary, because an additional unknown
    ambiguity is setup for these observations in any case.
    Option "NO" leaves the values unchanged and sets flags only.
    RECOMMENDED VALUE: ALL

  Use of Data with SNR=1 (marked in first run):
    This option gives the possibility to ignore data in the RINEX file
    with SNR=1 (Option "NO").
    If the program RNXCYC is run more than once, all observations marked
    by setting the signal strength to 1 (SNR=1) may be excluded from an
    additional data check (see previous panel {DAT2751_}).
    Option "YES" means that all observations are checked independent of
    the SNR value.
    RECOMMENDED VALUE: YES

                                                                       EB
```

B.5 Option and Help Panels for Menu 3 (Orbits)

```
3.1.1                    ORBITS: MANUAL BROADC. CHECK

  CAMPAIGN         >          <     (blank for selection list)

Input File
  BROADCAST EPH.   >          <     (blank for selection list)

Output File
  NEW BROAD.EPH.   >          <     (blank for same name as Broadcast
                                        Input File)
```

```
3.1.1                  ORBITS: "MANUAL" BROADCAST CHECK                HELP

General Remarks:

  With this and the next panel you select the processing options for
  the program BRDCHK. The program allows you to detect and remove "bad"
  broadcast ephemerides. The program BRDTST serves the same purpose,
  but without manual interaction. We recommend to use the automatic
  program BRDTST rather than this interactive version BRDCHK.

Input File

  BROADCAST EPH.:
    Selection of broadcast ephemeris file(s) (Bernese format)

Output File

  NEW BROAD.EPH.:
    Screened broadcast ephemerides (Bernese format). If left blank the
    input file will be overwritten (replaced by the screened file).
    RECOMMENDED OPTION: Overwrite file, leave file name blank.

                                                                      TS,GB
```

```
3.1.2                    ORBITS: AUTOM. BROADC. CHECK

  CAMPAIGN         >          <     (blank for selection list)

Input File
  BROADCAST EPH.   >          <     (blank for selection list)

Output File
  NEW BROAD.EPH.   >          <     (blank: same name as input file,
                                     NO: not to be created)
```

```
3.1.2                  ORBITS: AUTOMATIC BROADCAST CHECK               HELP

General Remarks:

  With this and the next panel you select the processing options for
  the program BRDTST. This program automatically removes "bad" broadcast
  ephemerides.

Input File

  BROADCAST EPH.:
```

```
    Selection of broadcast ephemeris file(s) (Bernese format)

Output File

  NEW BROAD.EPH.:
    Screened broadcast ephemerides (Bernese format). If left blank the
    input file will be overwritten (replaced) by the screened file.
    RECOMMENDED OPTION: Replace file, leave file name "blank".

                                                                  TS,GB
```

3.2	ORBITS: CREATE TAB.ORBITS

```
  CAMPAIGN         >          <     (blank for selection list)

Input File
  EPHEMERIS TYPE   > PRECISE   <    (BROADCAST or PRECISE orbits)
  BROAD./PRECISE   >          <     (blank for selection list)

Output Files
  TAB. ORBIT       >          <     (blank for same names as input orbit
                                     files)
  SATELLITE CLOCKS >          <     (NO for none, with precise orbits only)

Input Options
  REFERENCE SYSTEM  > J2000 <       (B1950 or J2000)
```

3.2	ORBITS: CREATE TABULAR ORBITS	HELP

```
General Remarks:

  With this and the next panel you select the processing options for
  the program BRDTAB or PRETAB. Program BRDTAB transforms the broadcast
  ephemerides file (Bernese format) into the so-called tabular orbit format,
  which is a purely internal (Bernese) format. Program PRETAB transforms
  so-called precise orbits, which are given in either the SP1 or SP3
  format, into the tabular orbit format.

Input Files:

  EPHEMERIDES TYPE:
    Here the type of input format is defined, BROADCAST or PRECISE. Here
    you select which program (BRDTAB or PRETAB) will be used.

  BROAD./PRECISE:
    Selection of the input orbit files (broadcast or precise).

Output Files:

  TAB. ORBIT:
    Selection of the output orbit files. If left blank, the output names
    will be the same as the input names except for the extension.
    RECOMMENDED VALUE: blank

  SATELLITE CLOCKS:
    Request satellite clock information to be output to a file. This only
    works for PRECISE orbits! Another program has to be used to create a
    file containing broadcast clock information (see program SATCLK, menu
    3.8). If you want to be completely independent of broadcast ephemerides
    or if you do not have broadcast ephemerides available, you HAVE TO
    generate a satellite clock file here for later use in program CODSPP.
    RECOMMENDED VALUE: a file name

Input Options:

  REFERENCE SYSTEM:
    Selection of the inertial reference system of the tabular orbit file.
    RECOMMENDED VALUE: J2000
```

```
                                                              TS,GB
```

```
3.2-1   |           PRETAB: CREATE SATELLITE CLOCK FILE
---------------------------------------------------------------------

TITLE  >                                                            <

                              hh mm ss
INTERVAL FOR POLYNOMIALS    > 24 00 00 <

POLYNOMIAL DEGREE              > 2  <
```

```
3.2-1   |         PRETAB: CREATE SATELLITE CLOCK FILE        | HELP
---------------------------------------------------------------------

General Remarks:

  Satellite clock information may be available in precise ephemerides
  files. In this case you have to create a satellite clock file for
  later use, in particular for program CODSPP (menu 4.2). (Alternatively
  you would have to use the clock information from broadcast files).
  We make the distinction between "normal" and "special" use of the
  clock information. In the "normal" case, the clock information in the
  precise ephemerides file is used to generate clock polynomials for
  each satellite (time INTERVALs and POLYNOMIAL DEGREEs to be defined
  below), in the "special" case only the clock values at the epochs
  of the precise ephemeris (usually 15 min) is written into the file.
  CODSPP may access the precise clock information if the "special" option
  is selected in this panel. The IGS high accuracy satellite clock infor-
  mation (1ns), if used in program CODSPP together with IGS orbits and
  ERPs, leads to single point coordinates accurate to about 50 cm.

  For such "special" use of program CODSPP you have to set both, the
  POLYNOMIAL INTERVAL and DEGREE to 0 in this panel. Keep in mind that
  the resulting "special" clock file CANNOT be used for "normal"
  runs of program CODSPP because IGS precise clock files contain clock
  (and orbit) information "only" every 15 minutes.

TITLE:
  Set a title to be used in the satellite clock output file.

INTERVAL FOR POLYNOMIALS:
  Selection of the time interval for the clock polynomials. For "normal"
  use a time interval of 12-24 hours will be sufficient.
  RECOMMENDED VALUE: 12 00 00 (hours, minutes, seconds) for "normal" use,
  RECOMMENDED VALUE: 00 00 00 (hours, minutes, seconds) for "special" use.

POLYNOMIAL DEGREE:
  Selection of the polynomial degree used for the clock polynomials. For
  "normal" use a degree of 1-3 will be fine.
  RECOMMENDED VALUE: 2 for normal use,
  RECOMMENDED VALUE: 0 for special use.

                                                              TS,GB
```

```
 3.3    |              ORBITS: GENERATE STD.ORBITS
---------------------------------------------------------------------

  CAMPAIGN           >          <     (blank for selection list)

Input File
  TABULAR ORBITS     >          <     (NO in case of orbit update,
                                       blank for selection list)
  IMPROVED ORBIT ELE. > NO      <     (NO in case of orbit fit,
                                       blank for selection list)
```

```
Output File
  STANDARD ORBITS     >          <     (NO, if not to be saved)
  RAD.PRESS. MODEL    >          <     (NO, if not to be saved)
  RESIDUALS           > NO       <     (NO, if not to be saved)
```

```
 3.3                    ORBITS: GENERATE STANDARD ORBITS                 HELP

General Remarks:

  With this and the next panel you select the processing options for
  the program ORBGEN. With this program you generate a so-called standard
  orbit and a so-called radiation pressure coefficient file. The orbit will
  be generated starting from either tabular orbit file(s) or a single orbit
  element file.

Input File:

  TABULAR ORBITS:
    Selection of the input tabular orbits. More than one file may be
    selected. If you select files here you are not allowed to select
    element files (next option).

  IMPROVED ORBIT ELE.:
    If you did not select tabular orbit files you have to select an orbit
    element file. The elements which are generated either by GPSEST or by
    ADDNEQ, contain two sets of orbits. The first one is the a priori
    set which was used as reference in the parameter estimation program.
    The second orbit is the improved orbit as estimated by GPSEST or ADDNEQ.

Output File:

  STANDARD ORBITS:
    Name of the resulting standard orbit file.
    RECOMMENDED VALUE: a file name

  RAD.PRESS. MODEL:
    Name of the resulting "RPR" file. An "RPR" file is only needed if you
    intend to an orbit improvement in GPSEST or ADDNEQ.
    RECOMMENDED VALUE: NO or same name as standard orbit file, if orbit
                       estimation will be performed (extension will be
                       *.STD in the first, *.RPR in the second case)

  RESIDUALS:
    Name selection for output residual file. Only possible if tabular
    files are selected. The binary output file contains the differences
    between the tabulated orbit positions and the generated orbit. The
    residual file may be look at using program REDISP (menu 5.3.1).
    RECOMMENDED VALUE: NO

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```

```
3.3-1                   GENERATE STD.ORBITS: INPUT

General Options:
  # OF ARCS             > 1   <
  PRINT RESIDUALS       > NO  <     (NO, ALL Iterations, Iteration #)
  ORBIT PREDICTION      > NO  <     (NO, # Days)

Numerical Integration:
  # OF ITERATIONS       > 2   <
  POLYNOMIAL DEGREE     > 10  <
  LENGTH OF INTERVAL    > 1.0 <     (hours)

Representation of Variational Equations:
  POLYNOMIAL DEGREE     > 12  <
  LENGTH OF INTERVAL    > 6.0 <     (hours)
```

```
 Earth Potential and Time Frame:
   MAX.DEGREE OF EARTH POTENTIAL    > 8   <
   TIME FRAME OF TABULAR ORBITS     > GPS <    (GPS or UTC)
   APPLY ANTENNA OFFSET TO TAB POS  > NO  <    (YES or NO)
```

```
3.3-1              GENERATE STANDARD ORBITS: INPUT                   HELP

 General Options:

   # OF ARCS:
     Selection of the number of arcs to be contained in the standard orbit
     file. Only possible when using tabular files as input.
     If you want to include the orbits of several days into one standard
     orbit file, you should set up one arc for each day.
     RECOMMENDED VALUE:  1

   PRINT RESIDUALS:
     Select whether or not you want to print residuals into the output file.
     Printing is possible after each iteration step.
     Only possible when using tabular files as input.
     RECOMMENDED OPTION:  NO

   ORBIT PREDICTION:
     This option may be used to extend the arc length. When using tabular
     files the start and end times of the tabular orbits are used to
     define the start and end time of the resulting standard orbit.
     If a number is specified in this field the end time will be increased
     by this number of days. The effect is that the orbit will be predicted.
     When using an element file as input the orbit length will be set to
     1-day because the element file does not contain arc-length information.
     RECOMMENDED OPTION:  NO

 Numerical Integration:

   # OF ITERATIONS:
     Selection of the number of iterations.
     Only possible if using tabular files as input.
     RECOMMENDED VALUE:   2

   POLYNOMIAL DEGREE:
     Selection of polynomial degree to be used for the orbit representation.
     RECOMMENDED VALUE:  10

   LENGTH OF INTERVAL:
     Selection of interval length to be used for one set of polynomial
     coefficients.
     RECOMMENDED VALUE:  1.0  (hours)


 Representation of Variational Equations:

   POLYNOMIAL DEGREE:
     Selection of polynomial degree to be used for the partial derivatives
     representation.
     RECOMMENDED VALUE:  12

   LENGTH OF INTERVAL:
     Selection of interval length to be used for one set of polynomial
     coefficients.
     RECOMMENDED VALUE:  6.0  (hours)


 Earth Potential and Time Frame:

   MAX.DEGREE OF EARTH POTENTIAL:
     Selection of the degree of the Earth gravitational potential
     RECOMMENDED VALUE:  8
     ATTENTION: DO NOT CHANGE VALUES FOR THE SAME PROJECT !

   TIME FRAME OF TABULAR ORBITS:
     Some older receivers used UTC as observation time. Nowadays every
     receiver uses GPS time. Therefore GPS should ALWAYS be selected here.
```

```
    RECOMMENDED VALUE:  GPS

  APPLY ANTENNA OFFSET TO TAB POS:
    Normally the orbit positions are given as center of mass positions.
    However, there are cases where the phase center of the satellite
    antenna is given.
    Only in those, very rare, cases one should select "YES".
    RECOMMENDED VALUE:  NO

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```

```
3.3-2              GENERATE STD.ORBITS: INPUT

 Orbit Model Options:
   PARTIAL DERIV.        > ALLPAR <  (NONPER, DYNALL, ALLPAR)

 Parameter selection:
   D0 estimation (P0)    > YES <     (YES, NO)
   Y0 estimation (P2)    > YES <     (YES, NO)
   X0 estimation         > NO  <     (YES, NO)

 Periodic Parameter selection:
   Periodic D terms      > NO  <     (YES, NO)
   Periodic Y terms      > NO  <     (YES, NO)
   Periodic X terms      > NO  <     (YES, NO)
```

```
3.3-2              GENERATE STANDARD ORBITS: INPUT                 HELP

 Orbit Model Options:
   The selection made here is only necessary if tabular files are
   used as input. When using an element file this information will be
   taken from the element file itself.

   PARTIAL DERIV.:
     Selection of which partial derivatives should be set up during the
     orbit integration. Always select ALLPAR! The other options are for
     test purposes only.
     RECOMMENDED VALUE:  ALLPAR

 Parameter selection:
   Selection of the radiation pressure parameters which will be estimated
   to fit the tabular ephemerides (together with the osculating elements).
   The radiation pressure model is defined as follows:

              D = D0 + DC*COS(U) + DS*SIN(U)
              Y = Y0 + YC*COS(U) + YS*SIN(U)
              X = X0 + XC*COS(U) + XS*SIN(U)

   "D" stands for the direct solar radiation pressure (direction sun-->sat),
   "Y" refers to the "y-bias" (direction of satellite's solar panel axis),
   "X" is an acceleration perpendicular to the "D" and "Y" directions.

   The "classical" GPS orbit model only knows the D0 and Y0 terms.
   GPS orbit accuracies have reached a level which made the use of a more
   elaborate radiation pressure model necessary.
   We recommend that only the constants D0 and Y0 are estimated. However,
   if you are using precise (IGS) orbits and are NOT planning to improve
   orbits you want to obtain the best possible orbital fit of the tabular
   files. In this case we strongly recommend to use the full set of rpr
   parameters.

 Parameter selection:
   D0 estimation (P0):
     RECOMMENDED VALUE:  YES

   Y0 estimation (P2):
     RECOMMENDED VALUE:  YES
```

```
  X0 estimation:
    RECOMMENDED VALUE:  NO, for orbit improvement work,
    RECOMMENDED VALUE:  YES, if orbits will NOT be improved

Periodic Parameter selection:
  Periodic D terms:
    RECOMMENDED VALUE:  NO, for orbit improvement work,
    RECOMMENDED VALUE:  YES, if orbits will NOT be improved

  Periodic Y terms:
    RECOMMENDED VALUE:  NO, for orbit improvement work,
    RECOMMENDED VALUE:  YES, if orbits will NOT be improved

  Periodic X terms:
    RECOMMENDED VALUE:  NO, for orbit improvement work,
    RECOMMENDED VALUE:  YES, if orbits will NOT be improved

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```

```
3.3-2.1 |              GENERATE STD.ORBITS: INPUT

 Selection of orbital elements:  > NEW <  (NEW or OLD)
```

```
3.3-2.1 |              GENERATE STANDARD ORBITS: INPUT        | HELP

 Selection of orbital elements:
     The element file, which was generated either by program GPSEST or
     ADDNEQ contains two orbit sets, the "a priori" orbit used in the GPSEST
     or ADDNEQ parameter estimation programs, and the "improved" or
     "estimated" orbit sets as established by GPSEST or ADDNEQ.
     Here you select which of these two sets of elements you want to use.
     Normally you will use the improved elements!
     RECOMMENDED VALUE:  NEW

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```

```
  3.6   |               ORBITS: STANDARD ORBIT DIFFERENCES

   CAMPAIGN           >          <     (blank for selection list)

 Input Files:
   STANDARD ORBITS 1   >          <     (blank for selection list)
   STANDARD ORBITS 2   >          <     (blank for selection list)

 Output File:
   PLOT FILE           > NO       <     (NO, if not to be saved)
```

```
  3.6   |          ORBITS: STANDARD ORBIT DIFFERENCES         | HELP

 General Remarks:
   This program compares two standard orbits in an interactive mode.
   It will list the differences in the radial, along and cross-track
   directions. If requested a plot file will be generated, too.

 Input Files:

   STANDARD ORBITS 1:
     Selection of the first standard orbit to be used in the comparison.
```

```
  STANDARD ORBITS 2:
    Selection of the second standard orbit to be used in the comparison.

Output File:

  PLOT FILE:
    Optional output file. Contains the same information as that given
    on the screen. The plot file may be used by the SAS graphics program
    tool.
    RECOMMENDED VALUE: NO

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```

3.7	ORBITS: CREATE PRECISE ORBITS

```
  CAMPAIGN            >          <     (blank for selection list)

Input File:
  STANDARD ORBITS     >          <     (blank for selection list)
  ELEMENT FILE        >          <     (NO, blank for selection list)
  SATELLITE CLOCKS    >          <     (NO, blank for selection list)

Output File:
  PRECISE EPHEM.      >          <
```

3.7	ORBITS: CREATE PRECISE ORBITS	HELP

```
General Remarks:
  With this program you may transform the Bernese standard orbit files
  into the precise orbit format. You may use either the SP1 or SP3 format.
  Nowadays, the SP3 format is mostly used because it may contain
  satellite clock information. If you estimated/improved orbits and at
  the same time estimated earth orientation parameters you might want
  to use your own EOP values when running this program!

Input File:

  STANDARD ORBITS:
    Selection of the input standard orbit file. If you estimated/improved
    orbits you have an element file available. You had to use this file
    in an orbit update step generating a new standard orbit (program
    ORBGEN). This is the standard orbit file you should use here.

    You may also wish to use this program to make sure that a colleague
    is using exactly the same orbit information as you do: You generate
    a precise file with one of your standard orbit files. If you give
    your colleague your ERP-series (used in this program as well), you
    are sure that he is using the same orbits as you.

  ELEMENT FILE:
    Selection of the input element file. Here you have to select the
    element file which you used to generate the selected standard orbit.
    This is only necessary if you want to have accuracy codes in the
    output precise file.
    RECOMMENDED VALUE: NO

  SATELLITE CLOCKS:
    Selection of the input satellite clocks. If you want to generate a
    precise file in the SP3 format including clock information you have to
    specify a satellite clock file here.
    RECOMMENDED VALUE: NO

Output File:

  PRECISE EPHEM.:
    Selection of the name of the resulting precise output orbit file.
```

```
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```

```
 3.7-1                  CREATE PRECISE ORBITS: INPUT

   Type of Precise Ephemerides File:
     FORMAT TYPE                   > SP3 <      (SP1: Old format (pos)
                                                 SP2: Old format (pos+vel)
                                                 SP3: New format (pos) )
   Time Window:
               yy mm dd     hh mm ss              yy mm dd     hh mm ss
      FROM    > 95 03 27 < > 00 00 00 <    TO   > 95 03 27 < > 23 45 00 <
    or
      SESSION   >      <                YEAR    >      <

   Tabular Interval:
     TABULAR INTERVAL              > 900  <     sec
```

```
 3.7-1               CREATE PRECISE ORBITS: INPUT                   HELP

   Type of Precise Ephemerides File:

     FORMAT TYPE:
       Selection of the format for the output file. SP1 is the older format,
       SP3 the younger. The main difference between SP1 and SP3 is that
       satellite clock information may be included in the SP3 format.
       Moreover there are more digits for the satellite information.
       RECOMMENDED OPTION: SP3

   Time Window:
       The time window may be specified in two ways. Either using the
       classical "yymmdd hhmmss" format or a Bernese format using the
       session and the year. The precise file will NOT contain
       satellite positions for epochs outside the arc length of the
       standard orbit, however.

   Tabular Interval:

     TABULAR INTERVAL:
       The interval between subsequent satellite positions in the output
       file. Within the IGS the tabular interval was agreed to be 15 minutes
       (900 sec).
       RECOMMENDED VALUE: 900

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```

```
 3.7-2               CREATE PRECISE ORBITS: OLD FORMAT TYPE

  Auxiliary Information:

     REFERENCE SYSTEM             > 93 <         (e.g. 72, 84, 90)

     AGENCY                      >     <

     ORBIT TYPE                    > F <         (F: for "fit"
                                                  B: for "broadcast"
                                                  E: for "extrapolated")
```

```
 3.7-2          CREATE PRECISE ORBITS: OLD FORMAT TYPE              HELP
```

```
General Remarks:
  The options in this panel are only used if you decided to select
  the SP1 precise orbit format.

 Auxiliary Information:

    REFERENCE SYSTEM:
      Identification of the Terrestrial Reference Frame for the orbits.
      If you fixed stations on their e.g. ITRF'93 coordinates the
      reference frame of the orbits would be 93.

    AGENCY:
      Identification of the institute which created this precise file.
      For files created by the Astronomical Institute in Berne we use AIB.

    ORBIT TYPE:
      Identification of the orbit solution type.

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```

```
3.7-3                    CREATE PRECISE ORBITS: INPUT

 Auxiliary Information:

    TITLE 1    >                                                       <
    TITLE 2    >                                                       <
    TITLE 3    >                                                       <
    TITLE 4    >                                                       <

    REFERENCE SYSTEM              > ITR93 <   (e.g. ITR90, WGS84)

    AGENCY                        >      <

    ORBIT TYPE                    > FIT <

    DATA DESCRIPTION              > P   <     (P:Phase, C:Code, P&C:both)
```

```
3.7-3                 CREATE PRECISE ORBITS: INPUT                 HELP

General Remarks:
  The options in this panel are only used if you decided to select
  the SP3 precise orbit format.

 Auxiliary Information:

    TITLE 1:
    TITLE 2:
    TITLE 3:
    TITLE 4:
      The SP3 format allows for 4 title lines.

    REFERENCE SYSTEM:
      Identification of the Terrestrial Reference Frame for the orbits.
      If you fixed e.g. stations on their ITRF'93 coordinates the
      reference frame of the orbits would be ITR93.

    AGENCY:
      Identification of the institute who created this precise file.
      For files created by the Astronomical Institute in Berne we use AIB.

    ORBIT TYPE:
      Identification of the orbit solution type using three characters
      Some possibilities are e.g. FIT, PRD, BRC for orbital fit,
      orbit prediction, and broadcast orbit respectively.
      RECOMMENDED VALUE: NO

    DATA DESCRIPTION:
```

```
Identification of the observations used to generate the orbit.
Only phase observations: P, Only code observations: C,
both phase and code observations P&C

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```

```
 3.8   |               ORBITS: SATELLITE CLOCKS
--------------------------------------------------------------

  CAMPAIGN        >         <      (blank for selection list)

 Input File
  BROADCAST EPH.  >         <      (blank for selection list)

 Output File
  SATELLITE CLOCKS >        <
```

```
 3.8   |               ORBITS: SATELLITE CLOCKS         | HELP
--------------------------------------------------------------

 General Remarks:

  With this program you extract the satellite clock information from
  the broadcast orbit file. Normally you will not have to do this.
  CODSPP is the only program which needs satellite clock information, but
  because CODSPP may access the broadcast orbit file it automatically has
  access to the satellite clock informations. Only if you want to create
  a precise orbit file in the SP3 format including broadcast satellite
  clock information you will have to use this program.

 Input File

  BROADCAST EPH.:
    Selection of the input broadcast orbit file (Bernese format)

 Output File

  SATELLITE CLOCKS:
    Selection of the output satellite clock file

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```

```
 3.8-1 |              SATELLITE CLOCKS: INPUT
--------------------------------------------------------------


   TITLE  >                                                    <

              WINDOW START               WINDOW END
           yy mm dd     hh mm         yy mm dd     hh mm

          >          < >       <      >          < >       <
```

```
 3.8-1 |              SATELLITE CLOCKS: INPUT           | HELP
--------------------------------------------------------------

   TITLE:
     Selection of a title to be used in the satellite clock output.

   TIME WINDOW:
     Selection of the start and end times for the satellite clock output.

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```

```
 3.9.1                    ORBITS: CREATE STD.ORBITS  (NEW RPR MODEL)

   CAMPAIGN            >          <     (blank for selection list)

 Input File
   TABULAR ORBITS      >          <     (blank for selection list)
   RAD. PRESS. MODEL   >          <     (NO, if no a priori file)

 Output File
   STANDARD ORBITS     >          <     (NO, if not to be saved)
   RAD.PRESS. MODEL    >          <     (NO, if not to be saved)
   RESIDUALS           > NO       <     (NO, if not to be saved)
```

```
 3.9.1            ORBITS: CREATE STD.ORBITS  (NEW RPR MODEL)          HELP

 Input File

   TABULAR ORBITS:
     Here you specify the tabular orbits containing the positions of the
     satellites in space-fixed reference frame. These positions are used as
     (pseudo-) observations for the computation of the standard orbits.
     The standard orbits are fitted through these positions using the least-
     squares method. In the standard orbit files the orbits are expressed
     using the equation of motion of the satellite and its initial condi-
     tions. The solution of this differential equation system is approxima-
     ted by polynomials. The number of polynomials (the interval of the
     validity of one polynomial) and their degree are input options of this
     program. You may specify more than one tabular file.

   RAD. PRESS. MODEL:
     You may specify a file with the a priori values of the radiation pre-
     ssure parameters. Usually no a priori values are necessary for this
     program.
     RECOMMENDED VALUE: NO

 Output File

   STANDARD ORBITS:
     Here you specify the file where the standard orbits (see above) will be
     stored. The standard orbits are necessary for further processing steps.
     RECOMMENDED VALUE: filename

   RAD.PRESS. MODEL:
     Here you specify the file where the radiation pressure parameters will
     be stored. If you are not going to improve the orbits using the GPS
     observations, you do not need this file
     RECOMMENDED VALUE: NO

   RESIDUALS:
     The residuals after the best fitting through the positions of the sa-
     tellites from the tabular orbit files may be saved. Usually it is not
     necessary to look at these residuals.
     RECOMMENDED VALUE: NO
                                                                        LM
```

```
 3.9.1-1                  CREATE STD.ORBITS: INPUT  (NEW RPR MODEL)

 General Options:
   # OF ARCS             > 1   <
   # OF PARAMETERS       > 9   <     (6 to 9)
   PRINT RESIDUALS       > NO  <     (NO, ALL Iterations, Iteration #)
   ORBIT PREDICTION      > NO  <     (NO, # Days)

 Numerical Integration:
   # OF ITERATIONS       > 4   <
   POLYNOMIAL DEGREE     > 10  <
```

```
  LENGTH OF INTERVAL    > 1.0 <     (hours)

Earth Potential and Time Frame:
  MAX.DEGREE OF EARTH POTENTIAL    > 12  <
  TIME FRAME OF TABULAR ORBITS     > GPS <    (GPS or UTC)
  APPLY ANTENNA OFFSET TO TAB POS  > NO  <    (YES or NO)
```

```
3.9.1-1          CREATE STD.ORBITS: INPUT  (NEW RPR MODEL)          HELP

General Options:

  # OF ARCS:
    Each standard orbit file may contain several arcs. Each arc is defined
    by other solution to the equations of motion of the satellites. Usually
    we use one standard orbit file for one session. The session is usually
    not longer than 24 hours. It has no sense to divide the orbit
    information into several arcs. Usually we use one arc.

  # OF PARAMETERS:
    It is necessary to estimate at least 6 unknown parameters for each sa-
    tellite and each arc. These six parameters are the initial conditions
    of the equation of motion. Up to 2 further unknown parameters for the
    radiation pressure model may be estimated. It is recommended to esti-
    mate at least 6+2=8 parameters.

  PRINT RESIDUALS:
    The residuals after the fit may be printed in the program output.
    RECOMMENDED VALUE: NO

Numerical Integration:

  # OF ITERATIONS:
    It is necessary to make an iteration over the fitting process. Usually
    already the second iteration gives sufficient accuracy.
    RECOMMENDED VALUE: 3

  POLYNOMIAL DEGREE:
    Here you specify the degree of the polynomial function which approxima-
    te the solution of the equation of motion.
    RECOMMENDED VALUE: 10

  LENGTH OF INTERVAL:
    The solution of the equation of motion is approximated by several poly-
    nomials. Each polynomial is valid within specified time interval. Here
    you specify the length of the interval.
    RECOMMENDED VALUE: 1.0 hour

Earth Potential and Time Frame:

  MAX.DEGREE OF EARTH POTENTIAL:
    Here you specify the maximal degree of the development of the earth
    gravity potential into the series of spherical harmonics.
    RECOMMENDED VALUE: 8

  TIME FRAME OF TABULAR ORBITS:
    Here you should specify either GPS or UTC according to the time frame
    you used in the tabular orbits (see menu 3.2). Usually GPS time is used.
    RECOMMENDED VALUE: GPS

  APPLY ANTENNA OFFSET TO TAB POS:
    The positions of the satellites given by the tabular files are usually
    computed for the center of mass of the satellite. Some precise ephe-
    merides (and therefore the tabular files created from these precise
    ephemerides) contain the positions of the satellite antenna phase
    center instead of the center of mass. In that case it is necessary to
    specify YES here.
    RECOMMENDED VALUE: NO
                                                                          LM
```

```
3.9.2              UPDATE STANDARD ORBITS (RPR MODEL 93)

  CAMPAIGN            >          <     (blank for selection list)

Input Files:
  A PRIORI RPR MODEL  >          <     (NO, if no a priori model)
  ORBITAL ELEMENTS    >          <     (blank for selection list)

Output Files:
  STANDARD ORBITS     >          <
```

```
3.9.2              UPDATE STANDARD ORBITS (RPR MODEL 93)              HELP

 General Remarks:

   With this and the following panel you select the processing options for
   the program UPDO93. This program uses an input file containing the
   improved orbit parameters (see ORBITAL ELEMENTS below) and generates an
   output standard orbit. A priori values for the radiation pressure model
   may be read from an optional input file.

Input Files:

  A PRIORI RPR MODEL:
    Here you select the a priori radiation pressure model. If you specify
    NO zero a priori values will be used.

  ORBITAL ELEMENTS:
    Here you specify the name of file which contains the orbital elements.
    This file is usually the result of the previous run of the program
    GPSEST (if you have estimated the orbits in GPSEST and stored the
    elements).

Output Files:

  STANDARD ORBITS:
    The name of the output file has to be specified.
                                                                          LM
```

```
3.9.2-1            UPDATE STANDARD ORBITS (RPR MODEL 93)

  Arc Start Date:                  Arc End Date:
    yy mm dd     hh mm ss            yy mm dd     hh mm ss
  >         < >         <        >         < >         <

       Earth Potential:
         MAX.DEGREE OF EARTH POTENTIAL    > 12 <

       Numerical Integration:
         POLYNOMIAL DEGREE               > 10  <
         LENGTH OF INTERVAL              > 1.0 <     (hours)
```

```
3.9.2-1            UPDATE STANDARD ORBITS (RPR MODEL 93)              HELP

  Arc Start Date, Arc End Date:
    Here you have to specify the orbit arc. One arc is characterized by six
    initial conditions of the corresponding equation of motion (osculating
    elements) and by several parameters of the solar radiation pressure.
    Usually we do not use arcs longer than three days. One-day arcs are
    recommended.
```

```
  Earth Potential:

  MAX.DEGREE OF EARTH POTENTIAL:
    Here you specify the maximal degree of the development of the earth
    gravity potential into the series of spherical harmonics.
    RECOMMENDED VALUE: 8

  Numerical Integration:

  POLYNOMIAL DEGREE:
    Here you specify the degree of the polynomial function which approxima-
    te the solution of the equation of motion.
    RECOMMENDED VALUE: 10

  LENGTH OF INTERVAL:
    The solution of the equation of motion is approximated by several poly-
    nomials. Each polynomial is valid within specified time interval. Here
    you specify the length of the interval.
    RECOMMENDED VALUE: 1.0 hour
                                                                          LM
```

```
3.9.3            ORBITS IMPROVEMENT USING PRECISE FILES

  CAMPAIGN            >          <     (blank for selection list)

 Input File
  STANDARD ORBITS     >          <     (blank for selection list)
  PRECISE FILES       >          <     (blank for selection list)
  RAD. PRESS. MODEL   >          <     (NO, if no a priori file)

 Output File
  RAD. PRESS. MODEL   >          <     (NO, if not to be saved)
  OSCULATING ELEMENTS >          <     (NO, if not to be saved)
  RESIDUALS           >          <     (NO, if not to be saved)
  SUMMARY FILE        >          <     (NO, if not to be saved)
```

```
3.9.3              ORBITS IMPROVEMENT USING PRECISE FILES             HELP

 General Remarks:

   With this and the following panel you select the processing options for
   the program ORBIMP. This program uses the precise orbit files as input.
   The precise orbit files contain the positions of the satellites (usually
   in ITRF). ORBIMP transforms the positions into the celestial reference
   frame and fits an orbit arc through these positions. An orbit arc is
   defined by the equation of motion and its initial conditions. Forces
   acting on the satellite are known a priori with the exception of the
   solar radiation pressure which has to be modeled by several unknown
   parameters. These parameters and six initial conditions of the
   differential equation of motion has to be estimated using the least-
   squares method.

 Input File

 STANDARD ORBITS:
   A standard orbit file is used as a priori information about the satellite
   orbit. This file has to cover the entire time interval used in precise
   orbit files.

 PRECISE FILES:
   Here you specify the precise orbit files which contain the positions of
   the satellites. These positions are used as (pseudo-) observations
   during the least-squares fitting. You may specify several precise orbit
   files. These files may or may not cover the same time interval.

  RAD. PRESS. MODEL:
    Here you select the a priori radiation pressure model. If you specify
    NO the zero values will be used.
```

```
 Output File

   RAD. PRESS. MODEL:
     Here you specify the name of file which contains the values of the
     solar radiation pressure parameters.

   OSCULATING ELEMENTS:
     Here you specify the name of file which contains the values of the
     osculating keplerian elements. These elements represent the initial
     conditions for the equation of motion.

   RESIDUALS:
     Here you have the possibility to save the residuals after the fitting
     of an orbit arc through the precise orbit files.

   SUMMARY FILE:
     If you specify a filename here, the program will write a short summary
     about its run. E.g. mean residuals for all satellites will be listed.
                                                                         LM
```

```
 3.9.3-1 |            ORBITS IMPROVEMENT USINGS PRECISE FILES

   TITLE    >                                                      <

   USE FILE SPECIFIC WEIGHT FILES   > NO  <    (YES or NO)
   USE FILE SPECIFIC POLE FILES     > NO  <    (YES or NO)
   USE FILE SPECIFIC SATCRUX FILES  > NO  <    (not yet implemented)
```

```
 3.9.3-1 |            ORBITS IMPROVEMENT USING PRECISE FILES            | HELP

   TITLE:
     This title will appear in program output files.

   USE FILE SPECIFIC WEIGHT FILES:
     The satellite positions in the precise orbit files represent the pseudo-
     observations for the least-squares adjustment. If you specify YES here
     the different weights for different precise files will be used. The
     weights will be read from files which have the same name as the
     corresponding precise file but different extension (the default
     extension for the weight files is .WGT)

   USE FILE SPECIFIC POLE FILES:
     In the first step the program ORBIMP transforms the satellite positions
     into the celestial reference frame. It is possible to transform each
     precise orbit file using different pole information. If you specify
     YES here the pole information will be read from the file with the same
     name as the corresponding precise file but different extension (the
     default extension is .ERP)

   USE FILE SPECIFIC SATCRUX FILES:
     This option has not been yet implemented.
                                                                         LM
```

```
 3.9.4   |          COMPARISON OF THE OSCULATING ELEMENTS

   CAMPAIGN           >          <     (blank for selection list)

 Input File(s)
   STANDARD ORBITS    >          <     (blank for selection list)
```

```
3.9.4            COMPARISON OF THE OSCULATING ELEMENTS            HELP

  General Remarks:

    With this and the following panel you select the processing options for
    the program which compares the positions, velocities and osculating
    elements stemming from different standard orbit files. The program
    assumes that you specify two standard orbit files, each containing one
    orbit arc. The first arc covers the time interval <t1,t2> the second arc
    (from the second standard orbit file) covers the time interval <t3,t4>.
    The program compares the positions, velocities and osculating elements
    at time (t2+t3)/2 if t1 <= t3 or (t4+t1)/2 if t1 > t3.

 Input File(s)

   STANDARD ORBITS:
     Here you should specify two standard orbit files.
                                                                          LM
```

```
3.9.4-1          COMPARISON OF THE OSCULATING ELEMENTS

   TITLE    >                                                       <

   USE FILE SPECIFIC POLE FILES     > NO  <    (YES or NO)
```

```
3.9.4-1          COMPARISON OF THE OSCULATING ELEMENTS            HELP

   TITLE:
     This title will appear in program output files.

   USE FILE SPECIFIC POLE FILES:    > NO  <    (YES or NO)
     In the first step the program transforms the satellite positions into
     the terrestrial reference frame. It is possible to transform each
     standard orbit file using different pole information. If you specify
     YES here the pole information will be read from the file with the same
     name as the corresponding standard orbit file but different extension
     (the default extension is .ERP)
                                                                          LM
```

B.6 Option and Help Panels for Menu 4 (Processing)

```
4.1      PROCESSING: CODE CHECK

     CAMPAIGN    >         <            (blank for selection list)

   Input File:
     CODE        >         <            (blank for selection list)
```

```
4.1      PROCESSING: CODE CHECK                                  HELP

General Remarks:
  This program is used to check code zero-diff. observation files for
  outliers. Usually this program is executed before running the program
  CODSPP (see menu 4.2).

  Input File:

    CODE:
      Selection of code zero-difference files. One or more files may be
      processed together (sequentially). The selected files may even stem
      from different sessions.
                                                                       MR
```

```
4.1-1    CODE CHECK: INPUT

    Observation Flags:
      USE FLAGS IN FILES       > NO  <       (YES or NO)
      SAVE FLAGS IN FILES      > YES <       (YES or NO)

    Polynomial Screening:
      PRINT EXTENDED INFO      > NO  <       (YES or NO)
      POLYNOMIAL DEGREE        > 2   <
      MAX. FIT INTERVAL        > 3   <        MIN

    Rms of Code Observation:
      RMS OF CODE OBS.        > 20.000 <      M
```

```
4.1-1    CODE CHECK: INPUT                                       HELP

Observation Flags:

  USE FLAGS IN FILES:
    The code zero-difference observation files selected to be processed
    may already contain marked observations (e.g. marked by a previous
    run of this program or using menu 5.1). This input field defines the
    handling of these marked observations
    YES:
      The observations already marked in the observation files will be kept
      marked. They will not be checked any more.
    NO:
      All observations already marked will be reset before the checking,
      i.e. the observation file(s) will be processed as if no markings
      existed at all in the file(s).
    RECOMMENDED VALUE: NO

  SAVE FLAGS IN FILES:
```