```
; S000131A.BSP LOG FILE
;
; Created 2000-02-22/13:56:21.00.
;
; BEGIN NIOSPK COMMANDS

LEAPSECONDS_FILE    = /usr/nav/traj/naif/mk98259a.tls
SPK_FILE            = S000131A.BSP
  SPK_LOG_FILE      = S000131A-GEM.log
  INCLUDE_TEXT_FILE = gem-comments.txt
  SOURCE_NIO_FILE   = sateph/sateph-jup120.nio
    BODIES          = 505 514 515 516
    BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = sateph/sateph-jup068.nio
    BODIES          = 506 507 508 509 510 511 512 513
    BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = orbiter/dpfil-980127-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
  SOURCE_NIO_FILE   = sateph/sateph.OD201.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
  SOURCE_NIO_FILE   = plneph/eph.OD185.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980328-od208-e14-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = sateph/sateph.OD208.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = orbiter/dpfil-980518-od212-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = sateph/sateph.OD212.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980720-od219-e16-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = sateph/sateph.OD219.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = plneph/eph.OD214.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = orbiter/dpfil-980925-od224-e17-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD224.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD224.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-981116-od229-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD229.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD229.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/post-GEM-990114.nio
```

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    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD233.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD232.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-990426-od241-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD241.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD238.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990629-od248-c21-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD248.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990813-od252-c22-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = sateph/sateph.OD252.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = orbiter/dpfil-990915-od256-c23-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD256.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-991010-od263-i24-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD263.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-991125-od271-i25-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD271.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-000102-od277-e26-enc.nio
    BODIES          = -77
```

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     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = sateph/sateph.OD277.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = orbiter/dpfil-000221-od281-i27-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = sateph/sateph.OD281.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184

; END NIOSPK COMMANDS

Note:  This is the final SPK file for the Galileo GEM mission.
       The designation is S000131A.BSP, ...XSP, ...BSP_LBL
                        GENERAL COMMENTS:

KEY TO FILE SEGMENTS:

01-DEC-1997 to 26-JAN-1998 Reconstruction for Orbit 12, OD201
26-JAN-1998 to 14-MAR-1998 Reconstruction for Orbit 13, OD208
14-MAR-1998 to 03-MAY-1998 Reconstruction for Orbit 14, OD212
03-MAY-1998 to 20-JUL-1998 Reconstruction for Orbit 15, OD219
20-JUL-1998 to 01-SEP-1998 Reconstruction for Orbit 16, OD224
01-SEP-1998 to 13-NOV-1998 Reconstruction for Orbit 17, OD229
13-NOV-1998 to 01-JAN-1999 Reconstruction for Orbit 18, OD233
01-JAN-1999 to 23-APR-1999 Reconstruction for Orbit 19, OD241
23-APR-1999 to 09-JUN-1999 Reconstruction for Orbit 20, OD248
09-JUN-1999 to 25-JUL-1999 Reconstruction for Orbit 21, OD252
25-JUL-1999 to 29-AUG-1999 Reconstruction for Orbit 22, OD256
29-AUG-1999 to 27-SEP-1999 Reconstruction for Orbit 23, OD263
27-SEP-1999 to 12-NOV-1999 Reconsturction for Orbit 24, OD271
12-NOV-1999 to 24-DEC-1999 Reconstruction for Orbit 25, OD277
24-DEC-1999 to 31-JAN-2000 Reconstruction for Orbit 26, OD281

This file is a compilation of reconstructed trajectory segments.
This file begins 1-DEC-1997 (DOY 97-335) and continues to the end of the
GEM tour (DOY 00-031).

The file for the primary tour is S980326A.BSP.  It is compiled of
reconstructed data only and ends on 1-JAN-1998 (DOY 98-001).

A similar file covering reconstructed segments for the interplanetary
trajectory can be found in a S970312A.BSP.  The final reconstruction
for the probe trajectory is provided separately in S960730A.BSP.

Amalthea is included for Orbit 22 of the GEM Mission.
Bodies included in this file and radii for Jupiter and the Jovian
satellites are:


     Name                  Body Number      Radius (km)

     Orbiter               -77
     Earth                 399               6378.14
     Earth barycenter        3
     Moon                  301               1737.40
     Sun barycenter         10
     Jupiter               599              71492.0
     Jupiter barycenter      5
     Io                    501               1821.3
     Europa                502               1565.0
     Ganymede              503               2634.0
     Callisto              504               2403.0
     Amalthea              505                 86.2  (GEM orbit C22 only)
     Himalia               506                 85.0
     Elara                 507                 40.0
     Pasiphae              508                 18.0
     Sinope                509                 14.0
     Lysithea              510                 12.0
     Carme                 511                 15.0
     Ananke                512                 10.0
     Leda                  513                  5.0
```

```
      Thebe                514                50.0
      Adrastea             515                10.0
      Metis                516                20.0

 NOTE:  The radii values were taken from the Report of the IAU/IAG/COSPAR
        Working Group on Cartographic Coordinates and Rotational Elements
        of the Planets and Satellites:  1994.
 Each segment listed has information under the following headings:
   COMMENTS
   TRAJECTORY BASIS/OD SOLUTION
   TIME SPAN
   SIGNIFICANT EVENTS
   INPUT FILES

 ET is used to denote ephemeris time; it differs from UTC (universal time
 coordinated) in which spacecraft events are usually given by the following:
   ET minus UTC = 63.184 sec (as of Jul. 1, 1997)
                = 64.184 sec (as of Jan. 1, 1999)
   SCLK is spacecraft clock string.

 Questions should be directed to:
   Joan Pojman (818 354-0264, Joan.Pojman@jpl.nasa.gov)
 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 12

 COMMENTS:  Reconstruction for Europa 12 encounter.

 TRAJECTORY BASIS/OD SOLUTION:  OD-201

 TIME SPAN:
                 BEGIN: 01-DEC-1997 00:01:03.184 ET   DOY:  97-335
                        01-DEC-1997 00:00:00.000 UTC  DOY:  97-335
                        1/04240645:13:3:3       SCLK
                   END: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                        25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                        1/04320397:90:8:7       SCLK

 SIGNIFICANT EVENTS:

   Europa 12 closest approach:
     16-DEC-1997 12:04:23.06 ET (12:03:19.87 UTC, 1/04262723:16:3:3 SCLK)
     Altitude:   201.0 km +/- 0.015 km
     Latitude:    -8.66 deg  +/- 0.003 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     16-DEC-1997 06:35:56.58 ET (06:34:53.40 UTC, 1/04262398:31:6:1 SCLK)
     Range to Jupiter from S/C:  629039.69 km (8.79874 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD196/sateph.OD201.nio
  Epoch file:         /usr/nav/od/deliveries/OD201/epoch
  GIN file            /usr/nav/eph/gin-0894.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/ref-traj/dpfil-980127-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 13

 COMMENTS:  Reconstruction for Phasing Orbit 13.

 TRAJECTORY BASIS/OD SOLUTION:  OD-208

 TIME SPAN:
                 BEGIN: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                        25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                        1/04320397:90:8:7       SCLK
                   END: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                        14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                        1/04387335:31:3:0       SCLK

 SIGNIFICANT EVENTS:

   Europa 13A closest approach:
     10-FEB-1998 17:58:35.67 ET (17:57:32.48 UTC, 1/04342827:35:6:1 SCLK)
     Altitude:   3557.2 km +/- 0.052 km
     Latitude:    -8.93 deg  +/- 0.0046 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     10-FEB-1998 23:10:17.78 ET (23:09:14.60 UTC, 1/04343135:60:8:0 SCLK)
     Range to Jupiter from S/C:  633063.38 km (8.85502 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD208/sateph.OD208.nio
```

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 Epoch file:         /usr/nav/od/deliveries/OD208/epoch
 GIN file            /usr/nav/eph/gin-0198.nio
 STOIC file          /usr/nav/od/stoic/ld980326.pt980606
 P-file              /usr/nav/traj/pfiles/dpfil-980328-od208-e14-enc.nio

 ------------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 14

 COMMENTS:  Reconstruction for Orbit 14
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-212

 TIME SPAN:
                 BEGIN: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                        14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                        1/04387335:31:3:0       SCLK
                   END: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                        03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                        1/04459730:90:2:3       SCLK
 SIGNIFICANT EVENTS:

   Europa 14 closest approach:
     29-MAR-1998 13:22:08.33 ET (13:21:05.14 UTC, 1/04409490:25:2:1 SCLK)
     Altitude:   1644.1 km +/- 0.015 km
     Latitude:    12.21 deg  +/- 0.001 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     29-MAR-1998 08:00:16.60 ET (07:59:13.41 UTC, 1/04409171:86:6:0 SCLK)
     Range to Jupiter from S/C:  631692.54 km (8.83585 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD212/sateph.OD212.nio
  Epoch file:         /usr/nav/od/deliveries/OD212/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/pfiles/dpfil-980518-od212-tour.nio

 ------------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 15

 COMMENTS:  Reconstruction for Orbit 15
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-219

 TIME SPAN:
                 BEGIN: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                        03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                        1/04459730:90:2:3       SCLK
                   END: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                        20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                        1/04569926:59:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 15 closest approach:
     31-MAY-1998 21:13:59.77 ET (21:12:56.59 UTC, 1/04499680:07:2:7 SCLK)
     Altitude:   2514.5 km +/- 0.0134 km
     Latitude:    15.00 deg  +/- 0.001 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-JUN-1998 02:35:44.77 ET (02:34:41.59 UTC, 1/04499998:26:8:0 SCLK)
     Range to Jupiter from S/C:  632696.58 km (8.84989 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD214/eph.OD214.nio
  Satellite eph file: /usr/nav/od/deliveries/OD219/sateph.OD219.nio
  Epoch file:         /usr/nav/od/deliveries/OD219/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980715.pt980925
  P-file              /usr/nav/traj/pfiles/dpfil-980720-od219-e16-enc.nio

 ------------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 16

 COMMENTS:  Reconstruction for Orbit 16
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-224

 TIME SPAN:
                 BEGIN: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                        20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                        1/04569926:59:8:6       SCLK
```

```
                  END: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                       31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                       1/04630868:46:3:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 16 closest approach:
     21-JUL-1998 05:04:47.95 ET (05:03:44.77 UTC, 1/04571354:49:1:1 SCLK)
     Altitude:   1834.2 km +/- 0.0123 km
     Latitude:   -25.65 deg  +/- 0.00039 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     21-JUL-1998 00:19:02.08 ET (00:17:58.89 UTC, 1/04571071:83:2:7 SCLK)
     Range to Jupiter from S/C:  632799.65 km (8.85134 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD224/eph.OD224.nio
  Satellite eph file: /usr/nav/od/deliveries/OD224/sateph.OD224.nio
  Epoch file:         /usr/nav/od/deliveries/OD224/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980917.pt981128
  P-file              /usr/nav/traj/pfiles/dpfil-980925-od224-e17-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 17

 COMMENTS:  Reconstruction for Orbit 17
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-229

 TIME SPAN:
                BEGIN: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                       31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                       1/04630868:46:3:4       SCLK
                  END: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                       12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                       1/04734833:36:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 17 closest approach:
     26-SEP-1998 03:55:23.02 ET (03:54:19.84 UTC, 1/04666705:65:7:6 SCLK)
     Altitude:   3582.4 km +/- 0.015 km
     Latitude:   -42.43 deg  +/- 0.0002 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     26-SEP-1998 08:27:30.34 ET (08:26:27.16 UTC, 1/04666974:77:7:7 SCLK)
     Range to Jupiter from S/C:  637028.58 km (8.91049 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD229/eph.OD229.nio
  Satellite eph file: /usr/nav/od/deliveries/OD229/sateph.OD229.nio
  Epoch file:         /usr/nav/od/deliveries/OD229/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981105.pt990116
  P-file              /usr/nav/traj/pfiles/dpfil-981116-od229-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 18

 COMMENTS:  Reconstruction for Orbit 18
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-233

 TIME SPAN:
                BEGIN: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                       12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                       1/04734833:36:8:6       SCLK
                  END: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                       31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                       1/04804618:05:4:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 18 closest approach:
     22-NOV-1998 11:39:29.39 ET (11:38:26.21 UTC, 1/04748342:72:5:7 SCLK)
     Altitude:   2270.8 km +/- 0.013 km
     Latitude:    41.34 deg  +/- 0.0 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     22-NOV-1998 07:31:54.95 ET (07:30:51.76 UTC, 1/04748097:85:9:0 SCLK)
     Range to Jupiter from S/C:  639331.79 km (8.94270 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD232/eph.OD232.nio
  Satellite eph file: /usr/nav/od/deliveries/OD233/sateph.OD233.nio
```

```
 Epoch file:         /usr/nav/od/deliveries/OD233/epoch
 GIN file            /usr/nav/eph/gin-0198.nio
 STOIC file          /usr/nav/od/stoic/ld981229.pt990311
 P-file              /usr/traj1/post-GEM/990114/post-GEM-990114.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 19

 COMMENTS:  Reconstruction for Europa 19
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-241

 TIME SPAN:
                 BEGIN: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                        31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                        1/04804618:05:4:6       SCLK
                   END: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                        22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                        1/04964125:76:8:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 19 closest approach:
     01-FEB-1999 02:20:54.13 ET (02:19:49.94 UTC, 1/04848906:80:9:5 SCLK)
     Altitude:   1439.4 km +/- 0.0139 km
     Latitude:    30.52 deg  +/- 0.000 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-FEB-1999 05:03:14.45 ET (05:02:10.27 UTC, 1/04849067:40:4:4 SCLK)
     Range to Jupiter from S/C:  651211.84 km (9.10888 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD238/eph.OD238.nio
  Satellite eph file: /usr/nav/od/deliveries/OD241/sateph.OD241.nio
  Epoch file:         /usr/nav/od/deliveries/OD241/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld990415.pt990708
  P-file              /usr/nav/traj/ref-traj/dpfil-990426-od241-tour.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 20

 COMMENTS:  Reconstruction for Callisto 20
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-248

 TIME SPAN:
                 BEGIN: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                        22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                        1/04964125:76:8:4       SCLK
                   END: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                        08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                        1/05031062:13:3:6       SCLK
 SIGNIFICANT EVENTS:

   Callisto 20 closest approach:
     05-MAY-1999 13:57:22.30 ET (13:56:18.11 UTC, 1/04982044:12:2:3 SCLK)
     Altitude:   1321.4 km +/- 0.0151 km
     Latitude:     2.78 deg  +/- 0.0015 deg
                           (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     03-MAY-1999 17:01:15.21 ET (17:00:11.02 UTC, 1/04979377:58:4:5 SCLK)
     Range to Jupiter from S/C:  670009.42 km (9.37181 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD248/sateph.OD248.nio
  Epoch file:         /usr/nav/od/deliveries/OD248/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990624.pt990910
  P-file              /usr/nav/traj/pfiles/dpfil-990629-od248-c21-enc.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 21

 COMMENTS:  Reconstruction for Callisto 21
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-252

 TIME SPAN:
                 BEGIN: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                        08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                        1/05031062:13:3:6       SCLK
```

```
                  END: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                       25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                       1/05096575:30:1:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 21 closest approach:
     30-JUN-1999 07:47:53.87 ET (07:46:49.69 UTC, 1/05061432:55:7:7 SCLK)
     Altitude:   1048.1 km +/- 0.011 km
     Latitude:     -0.7 deg  +/- 0.0003 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     02-JUL-1999 05:05:56.36 ET (05:04:52.18 UTC, 1/05064120:71:6:6 SCLK)
     Range to Jupiter from S/C:  519747.15 km (7.27000 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD252/sateph.OD252.nio
  Epoch file:         /usr/nav/od/deliveries/OD252/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990729.pt991009
  P-file              /usr/nav/traj/pfiles/dpfil-990813-od252-c22-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 22

 COMMENTS:  Reconstruction for Callisto 22
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-256

 TIME SPAN:
                BEGIN: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                       25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                       1/05096575:30:1:1       SCLK
                  END: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                       29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                       1/05147132:49:5:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 22 closest approach:
     14-AUG-1999 08:31:55.94 ET (08:30:51.76 UTC, 1/05125564:10:2:7 SCLK)
     Altitude:   2299.3 km +/- 0.015 km
     Latitude:     -2.3 +/- 0.001 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     12-AUG-1999 10:59:35.66 ET (10:58:31.48 UTC, 1/05122861:72:7:2 SCLK)
     Range to Jupiter from S/C:  523080.41 km (7.31663 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD256/sateph.OD256.nio
  Epoch file:         /usr/nav/od/deliveries/OD256/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990909.pt991202
  P-file              /usr/nav/traj/pfiles/dpfil-990915-od256-c23-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 23

 COMMENTS:  Reconstruction for Callisto 23
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-263

 TIME SPAN:
                BEGIN: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                       29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                       1/05147132:49:5:1       SCLK
                  END: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                       27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                       1/05187780:83:6:4       SCLK
 SIGNIFICANT EVENTS:

   Callisto 23 closest approach:
     16-SEP-1999 17:28:06.00 ET (17:27:01.813 UTC, 1/05173092:19:8:6 SCLK)
     Altitude:   1052.4 km +/- 0.0118 km
     Latitude:    0.0986 deg. +/- 0.001 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     14-SEP-1999 19:58:41.02 ET (19:57:36.83 UTC, 1/05170392:72:2:5 SCLK)
     Range to Jupiter from S/C:  467972.00 km (6.54580 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD263/sateph.OD263.nio
```

```
 Epoch file:         /usr/nav/od/deliveries/OD263/epoch
 GIN file            /usr/nav/eph/gin-0198.v205.nio
 STOIC file          /usr/nav/od/stoic/ld990930.pt991211
 P-file              /usr/nav/traj/pfiles/dpfil-991010-od263-i24-enc.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 24

 COMMENTS:  Reconstruction for Io 24
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-271

 TIME SPAN:
                 BEGIN: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                        27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                        1/05187780:83:6:4       SCLK
                   END: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
 SIGNIFICANT EVENTS:

   Io 24 closest approach:
     11-OCT-1999 04:34:06.72 ET (04:33:02.53 UTC, 1/05207931:13:8:0 SCLK)
     Altitude:   611.3 km +/- 0.011 km
     Latitude:    4.507 deg. +/- 0.003 deg
                        (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     11-OCT-1999 02:03:41.50 ET (02:02:37.31 UTC, 1/05207782:34:9:4 SCLK)
     Range to Jupiter from S/C:  396600.93 km (5.54749 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD271/sateph.OD271.nio
  Epoch file:         /usr/nav/od/deliveries/OD271/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991121.pt000201
  P-file              /usr/nav/traj/pfiles/dpfil-991125-od271-i25-enc.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 25
 COMMENTS:  Reconstruction for Io 25
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-277

 TIME SPAN:
                 BEGIN: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
                   END: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
 SIGNIFICANT EVENTS:

   Io 25 closest approach:
     26-NOV-1999  04:06:25.06 ET (04:05:20.88 UTC, 1/05273415:80:7:5 SCLK)
     Altitude:    300.484 km +/- 0.412 km
     Latitude:    -76.383 deg. +/- 0.0025 deg.
                        (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     26-NOV-1999 02:09:53.86 ET (02:08:49.68 UTC, 1/05273300:58:9:5 SCLK)
     Range to Jupiter from S/C:  405572.12 km (5.67297 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD277/sateph.OD277.nio
  Epoch file:         /usr/nav/od/deliveries/OD277/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt000309
  P-file              /usr/nav/traj/pfiles/dpfil-000102-od277-e26-enc.nio

 ------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 26
 COMMENTS:  Reconstruction for Orbit 26
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-281

 TIME SPAN:
                 BEGIN: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
                   END: 01-FEB-2000 20:00:00.000 ET   DOY:  00-032
                        01-FEB-2000 19:58:55.816 UTC  DOY:  00-032
```

```
                        1/05369778:75:2:5       SCLK
 SIGNIFICANT EVENTS:

   Europa 26 closest approach:
     03-JAN-2000  18:00:46.77 ET (17:59:42.59 UTC, 1/05328359:72:2:3 SCLK)
     Altitude:    351.077 km +/- 0.015 km
     Latitude:    -47.345 deg. +/- 0.001 deg.
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     04-JAN-2000 03:33:54.78 ET (03:32:50.60 UTC, 1/05328926:57:2:6 SCLK)
     Range to Jupiter from S/C:  413330.37 km (5.78149 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD281/sateph.OD281.nio
  Epoch file:         /usr/nav/od/deliveries/OD281/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt0000309
  P-file              /usr/nav/traj/pfiles/dpfil-000221-od281-i27-enc.nio

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

 ; S000131A.BSP LOG FILE
 ;
 ; Created 2000-02-22/13:56:21.00.
 ;
 ; BEGIN NIOSPK COMMANDS

 LEAPSECONDS_FILE    = /usr/nav/traj/naif/mk98259a.tls
 SPK_FILE            = S000131A.BSP
   SPK_LOG_FILE      = S000131A-GEM.log
   INCLUDE_TEXT_FILE = gem-comments.txt
   SOURCE_NIO_FILE   = sateph/sateph-jup120.nio
     BODIES          = 505 514 515 516
     BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = sateph/sateph-jup068.nio
     BODIES          = 506 507 508 509 510 511 512 513
     BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = orbiter/dpfil-980127-tour.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
     END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
   SOURCE_NIO_FILE   = sateph/sateph.OD201.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
     END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
   SOURCE_NIO_FILE   = plneph/eph.OD185.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
     END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
   SOURCE_NIO_FILE   = orbiter/dpfil-980328-od208-e14-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
     END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
   SOURCE_NIO_FILE   = sateph/sateph.OD208.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
     END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
   SOURCE_NIO_FILE   = orbiter/dpfil-980518-od212-tour.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
     END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
   SOURCE_NIO_FILE   = sateph/sateph.OD212.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
     END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
   SOURCE_NIO_FILE   = orbiter/dpfil-980720-od219-e16-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
     END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
   SOURCE_NIO_FILE   = sateph/sateph.OD219.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
     END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
   SOURCE_NIO_FILE   = plneph/eph.OD214.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
     END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
   SOURCE_NIO_FILE   = orbiter/dpfil-980925-od224-e17-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
     END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
   SOURCE_NIO_FILE   = sateph/sateph.OD224.nio
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    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD224.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-981116-od229-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD229.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD229.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/post-GEM-990114.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD233.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD232.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-990426-od241-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD241.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD238.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990629-od248-c21-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD248.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990813-od252-c22-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = sateph/sateph.OD252.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = orbiter/dpfil-990915-od256-c23-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD256.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-991010-od263-i24-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD263.nio
    BODIES          = 501 502 503 504 599
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     BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
     END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
     END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
   SOURCE_NIO_FILE   = orbiter/dpfil-991125-od271-i25-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = sateph/sateph.OD271.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = orbiter/dpfil-000102-od277-e26-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = sateph/sateph.OD277.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = orbiter/dpfil-000221-od281-i27-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = sateph/sateph.OD281.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184

 ; END NIOSPK COMMANDS

 Note:  This is the final SPK file for the Galileo GEM mission.
        The designation is S000131A.BSP, ...XSP, ...BSP_LBL
                        GENERAL COMMENTS:

 KEY TO FILE SEGMENTS:

 01-DEC-1997 to 26-JAN-1998 Reconstruction for Orbit 12, OD201
 26-JAN-1998 to 14-MAR-1998 Reconstruction for Orbit 13, OD208
 14-MAR-1998 to 03-MAY-1998 Reconstruction for Orbit 14, OD212
 03-MAY-1998 to 20-JUL-1998 Reconstruction for Orbit 15, OD219
 20-JUL-1998 to 01-SEP-1998 Reconstruction for Orbit 16, OD224
 01-SEP-1998 to 13-NOV-1998 Reconstruction for Orbit 17, OD229
 13-NOV-1998 to 01-JAN-1999 Reconstruction for Orbit 18, OD233
 01-JAN-1999 to 23-APR-1999 Reconstruction for Orbit 19, OD241
 23-APR-1999 to 09-JUN-1999 Reconstruction for Orbit 20, OD248
 09-JUN-1999 to 25-JUL-1999 Reconstruction for Orbit 21, OD252
 25-JUL-1999 to 29-AUG-1999 Reconstruction for Orbit 22, OD256
 29-AUG-1999 to 27-SEP-1999 Reconstruction for Orbit 23, OD263
 27-SEP-1999 to 12-NOV-1999 Reconsturction for Orbit 24, OD271
 12-NOV-1999 to 24-DEC-1999 Reconstruction for Orbit 25, OD277
 24-DEC-1999 to 31-JAN-2000 Reconstruction for Orbit 26, OD281

 This file is a compilation of reconstructed trajectory segments.
 This file begins 1-DEC-1997 (DOY 97-335) and continues to the end of the
 GEM tour (DOY 00-031).

 The file for the primary tour is S980326B.BSP.  It is compiled of
 reconstructed data only and ends on 1-JAN-1998 (DOY 98-001).

 A similar file covering reconstructed segments for the interplanetary
 trajectory can be found in a S970312A.BSP.  The final reconstruction
 for the probe trajectory is provided separately in S960730A.BSP.

 Amalthea is included for Orbit 22 of the GEM Mission.
 Bodies included in this file and radii for Jupiter and the Jovian
 satellites are:


      Name                  Body Number      Radius (km)
```

```
      Orbiter              -77
      Earth                399              6378.14
      Earth barycenter       3
      Moon                 301              1737.40
      Sun barycenter        10
      Jupiter              599             71492.0
      Jupiter barycenter     5
      Io                   501              1821.3
      Europa               502              1565.0
      Ganymede             503              2634.0
      Callisto             504              2403.0
      Amalthea             505                86.2  (GEM orbit C22 only)
      Himalia              506                85.0
      Elara                507                40.0
      Pasiphae             508                18.0
      Sinope               509                14.0
      Lysithea             510                12.0
      Carme                511                15.0
      Ananke               512                10.0
      Leda                 513                 5.0
      Thebe                514                50.0
      Adrastea             515                10.0
      Metis                516                20.0

 NOTE:  The radii values were taken from the Report of the IAU/IAG/COSPAR
        Working Group on Cartographic Coordinates and Rotational Elements
        of the Planets and Satellites:  1994.
 Each segment listed has information under the following headings:
   COMMENTS
   TRAJECTORY BASIS/OD SOLUTION
   TIME SPAN
   SIGNIFICANT EVENTS
   INPUT FILES

 ET is used to denote ephemeris time; it differs from UTC (universal time
 coordinated) in which spacecraft events are usually given by the following:
   ET minus UTC = 63.184 sec (as of Jul. 1, 1997)
                = 64.184 sec (as of Jan. 1, 1999)
   SCLK is spacecraft clock string.

 Questions should be directed to:
   Joan Pojman (818 354-0264, Joan.Pojman@jpl.nasa.gov)
 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 12

 COMMENTS:  Reconstruction for Europa 12 encounter.

 TRAJECTORY BASIS/OD SOLUTION:  OD-201

 TIME SPAN:
                 BEGIN: 01-DEC-1997 00:01:03.184 ET   DOY:  97-335
                        01-DEC-1997 00:00:00.000 UTC  DOY:  97-335
                        1/04240645:13:3:3       SCLK
                   END: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                        25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                        1/04320397:90:8:7       SCLK

 SIGNIFICANT EVENTS:

   Europa 12 closest approach:
     16-DEC-1997 12:04:23.06 ET (12:03:19.87 UTC, 1/04262723:16:3:3 SCLK)
     Altitude:   201.0 km +/- 0.015 km
     Latitude:    -8.66 deg  +/- 0.003 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     16-DEC-1997 06:35:56.58 ET (06:34:53.40 UTC, 1/04262398:31:6:1 SCLK)
     Range to Jupiter from S/C:  629039.69 km (8.79874 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD196/sateph.OD201.nio
  Epoch file:         /usr/nav/od/deliveries/OD201/epoch
  GIN file            /usr/nav/eph/gin-0894.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/ref-traj/dpfil-980127-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 13

 COMMENTS:  Reconstruction for Phasing Orbit 13.

 TRAJECTORY BASIS/OD SOLUTION:  OD-208

 TIME SPAN:
                 BEGIN: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
```

```
                      25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                      1/04320397:90:8:7       SCLK
                END: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                      14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                      1/04387335:31:3:0       SCLK

 SIGNIFICANT EVENTS:

   Europa 13A closest approach:
     10-FEB-1998 17:58:35.67 ET (17:57:32.48 UTC, 1/04342827:35:6:1 SCLK)
     Altitude:   3557.2 km +/- 0.052 km
     Latitude:    -8.93 deg  +/- 0.0046 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     10-FEB-1998 23:10:17.78 ET (23:09:14.60 UTC, 1/04343135:60:8:0 SCLK)
     Range to Jupiter from S/C:  633063.38 km (8.85502 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD208/sateph.OD208.nio
  Epoch file:         /usr/nav/od/deliveries/OD208/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980326.pt980606
  P-file              /usr/nav/traj/pfiles/dpfil-980328-od208-e14-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 14

 COMMENTS:  Reconstruction for Orbit 14
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-212

 TIME SPAN:
                BEGIN: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                       14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                       1/04387335:31:3:0       SCLK
                  END: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                       03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                       1/04459730:90:2:3       SCLK
 SIGNIFICANT EVENTS:

   Europa 14 closest approach:
     29-MAR-1998 13:22:08.33 ET (13:21:05.14 UTC, 1/04409490:25:2:1 SCLK)
     Altitude:   1644.1 km +/- 0.015 km
     Latitude:    12.21 deg  +/- 0.001 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     29-MAR-1998 08:00:16.60 ET (07:59:13.41 UTC, 1/04409171:86:6:0 SCLK)
     Range to Jupiter from S/C:  631692.54 km (8.83585 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD212/sateph.OD212.nio
  Epoch file:         /usr/nav/od/deliveries/OD212/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/pfiles/dpfil-980518-od212-tour.nio

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                      RECONSTRUCTION FOR ORBIT 15

 COMMENTS:  Reconstruction for Orbit 15
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-219

 TIME SPAN:
                BEGIN: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                       03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                       1/04459730:90:2:3       SCLK
                  END: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                       20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                       1/04569926:59:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 15 closest approach:
     31-MAY-1998 21:13:59.77 ET (21:12:56.59 UTC, 1/04499680:07:2:7 SCLK)
     Altitude:   2514.5 km +/- 0.0134 km
     Latitude:    15.00 deg  +/- 0.001 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-JUN-1998 02:35:44.77 ET (02:34:41.59 UTC, 1/04499998:26:8:0 SCLK)
     Range to Jupiter from S/C:  632696.58 km (8.84989 Rj)
```

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 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD214/eph.OD214.nio
  Satellite eph file: /usr/nav/od/deliveries/OD219/sateph.OD219.nio
  Epoch file:         /usr/nav/od/deliveries/OD219/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980715.pt980925
  P-file              /usr/nav/traj/pfiles/dpfil-980720-od219-e16-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 16

 COMMENTS:  Reconstruction for Orbit 16
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-224

 TIME SPAN:
                 BEGIN: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                        20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                        1/04569926:59:8:6       SCLK
                   END: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                        31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                        1/04630868:46:3:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 16 closest approach:
     21-JUL-1998 05:04:47.95 ET (05:03:44.77 UTC, 1/04571354:49:1:1 SCLK)
     Altitude:   1834.2 km +/- 0.0123 km
     Latitude:   -25.65 deg  +/- 0.00039 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     21-JUL-1998 00:19:02.08 ET (00:17:58.89 UTC, 1/04571071:83:2:7 SCLK)
     Range to Jupiter from S/C:  632799.65 km (8.85134 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD224/eph.OD224.nio
  Satellite eph file: /usr/nav/od/deliveries/OD224/sateph.OD224.nio
  Epoch file:         /usr/nav/od/deliveries/OD224/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980917.pt981128
  P-file              /usr/nav/traj/pfiles/dpfil-980925-od224-e17-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 17

 COMMENTS:  Reconstruction for Orbit 17
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-229

 TIME SPAN:
                 BEGIN: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                        31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                        1/04630868:46:3:4       SCLK
                   END: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                        12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                        1/04734833:36:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 17 closest approach:
     26-SEP-1998 03:55:23.02 ET (03:54:19.84 UTC, 1/04666705:65:7:6 SCLK)
     Altitude:   3582.4 km +/- 0.015 km
     Latitude:   -42.43 deg  +/- 0.0002 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     26-SEP-1998 08:27:30.34 ET (08:26:27.16 UTC, 1/04666974:77:7:7 SCLK)
     Range to Jupiter from S/C:  637028.58 km (8.91049 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD229/eph.OD229.nio
  Satellite eph file: /usr/nav/od/deliveries/OD229/sateph.OD229.nio
  Epoch file:         /usr/nav/od/deliveries/OD229/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981105.pt990116
  P-file              /usr/nav/traj/pfiles/dpfil-981116-od229-tour.nio

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                      RECONSTRUCTION FOR ORBIT 18

 COMMENTS:  Reconstruction for Orbit 18
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-233

 TIME SPAN:
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                BEGIN: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                       12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                       1/04734833:36:8:6       SCLK
                  END: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                       31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                       1/04804618:05:4:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 18 closest approach:
     22-NOV-1998 11:39:29.39 ET (11:38:26.21 UTC, 1/04748342:72:5:7 SCLK)
     Altitude:   2270.8 km +/- 0.013 km
     Latitude:    41.34 deg  +/- 0.0 deg
                         (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     22-NOV-1998 07:31:54.95 ET (07:30:51.76 UTC, 1/04748097:85:9:0 SCLK)
     Range to Jupiter from S/C:  639331.79 km (8.94270 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD232/eph.OD232.nio
  Satellite eph file: /usr/nav/od/deliveries/OD233/sateph.OD233.nio
  Epoch file:         /usr/nav/od/deliveries/OD233/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981229.pt990311
  P-file              /usr/traj1/post-GEM/990114/post-GEM-990114.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 19

 COMMENTS:  Reconstruction for Europa 19
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-241

 TIME SPAN:
                BEGIN: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                       31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                       1/04804618:05:4:6       SCLK
                  END: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                       22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                       1/04964125:76:8:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 19 closest approach:
     01-FEB-1999 02:20:54.13 ET (02:19:49.94 UTC, 1/04848906:80:9:5 SCLK)
     Altitude:   1439.4 km +/- 0.0139 km
     Latitude:    30.52 deg  +/- 0.000 deg
                         (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-FEB-1999 05:03:14.45 ET (05:02:10.27 UTC, 1/04849067:40:4:4 SCLK)
     Range to Jupiter from S/C:  651211.84 km (9.10888 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD238/eph.OD238.nio
  Satellite eph file: /usr/nav/od/deliveries/OD241/sateph.OD241.nio
  Epoch file:         /usr/nav/od/deliveries/OD241/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld990415.pt990708
  P-file              /usr/nav/traj/ref-traj/dpfil-990426-od241-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 20

 COMMENTS:  Reconstruction for Callisto 20
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-248

 TIME SPAN:
                BEGIN: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                       22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                       1/04964125:76:8:4       SCLK
                  END: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                       08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                       1/05031062:13:3:6       SCLK
 SIGNIFICANT EVENTS:

   Callisto 20 closest approach:
     05-MAY-1999 13:57:22.30 ET (13:56:18.11 UTC, 1/04982044:12:2:3 SCLK)
     Altitude:   1321.4 km +/- 0.0151 km
     Latitude:     2.78 deg  +/- 0.0015 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     03-MAY-1999 17:01:15.21 ET (17:00:11.02 UTC, 1/04979377:58:4:5 SCLK)
     Range to Jupiter from S/C:  670009.42 km (9.37181 Rj)
```

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 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD248/sateph.OD248.nio
  Epoch file:         /usr/nav/od/deliveries/OD248/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990624.pt990910
  P-file              /usr/nav/traj/pfiles/dpfil-990629-od248-c21-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 21

 COMMENTS:  Reconstruction for Callisto 21
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-252

 TIME SPAN:
                 BEGIN: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                        08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                        1/05031062:13:3:6       SCLK
                   END: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                        25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                        1/05096575:30:1:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 21 closest approach:
     30-JUN-1999 07:47:53.87 ET (07:46:49.69 UTC, 1/05061432:55:7:7 SCLK)
     Altitude:   1048.1 km +/- 0.011 km
     Latitude:     -0.7 deg  +/- 0.0003 deg
                      (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     02-JUL-1999 05:05:56.36 ET (05:04:52.18 UTC, 1/05064120:71:6:6 SCLK)
     Range to Jupiter from S/C:  519747.15 km (7.27000 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD252/sateph.OD252.nio
  Epoch file:         /usr/nav/od/deliveries/OD252/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990729.pt991009
  P-file              /usr/nav/traj/pfiles/dpfil-990813-od252-c22-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 22

 COMMENTS:  Reconstruction for Callisto 22
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-256

 TIME SPAN:
                 BEGIN: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                        25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                        1/05096575:30:1:1       SCLK
                   END: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                        29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                        1/05147132:49:5:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 22 closest approach:
     14-AUG-1999 08:31:55.94 ET (08:30:51.76 UTC, 1/05125564:10:2:7 SCLK)
     Altitude:   2299.3 km +/- 0.015 km
     Latitude:     -2.3 +/- 0.001 deg
                      (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     12-AUG-1999 10:59:35.66 ET (10:58:31.48 UTC, 1/05122861:72:7:2 SCLK)
     Range to Jupiter from S/C:  523080.41 km (7.31663 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD256/sateph.OD256.nio
  Epoch file:         /usr/nav/od/deliveries/OD256/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990909.pt991202
  P-file              /usr/nav/traj/pfiles/dpfil-990915-od256-c23-enc.nio

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                      RECONSTRUCTION FOR ORBIT 23

 COMMENTS:  Reconstruction for Callisto 23
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-263

 TIME SPAN:
```

```
                BEGIN: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                       29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                       1/05147132:49:5:1       SCLK
                  END: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                       27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                       1/05187780:83:6:4       SCLK
 SIGNIFICANT EVENTS:

   Callisto 23 closest approach:
     16-SEP-1999 17:28:06.00 ET (17:27:01.813 UTC, 1/05173092:19:8:6 SCLK)
     Altitude:   1052.4 km +/- 0.0118 km
     Latitude:    0.0986 deg. +/- 0.001 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     14-SEP-1999 19:58:41.02 ET (19:57:36.83 UTC, 1/05170392:72:2:5 SCLK)
     Range to Jupiter from S/C:  467972.00 km (6.54580 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD263/sateph.OD263.nio
  Epoch file:         /usr/nav/od/deliveries/OD263/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990930.pt991211
  P-file              /usr/nav/traj/pfiles/dpfil-991010-od263-i24-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 24

 COMMENTS:  Reconstruction for Io 24
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-271

 TIME SPAN:
                BEGIN: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                       27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                       1/05187780:83:6:4       SCLK
                  END: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                       12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                       1/05253293:04:1:1       SCLK
 SIGNIFICANT EVENTS:

   Io 24 closest approach:
     11-OCT-1999 04:34:06.72 ET (04:33:02.53 UTC, 1/05207931:13:8:0 SCLK)
     Altitude:   611.3 km +/- 0.011 km
     Latitude:    4.507 deg. +/- 0.003 deg
                         (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     11-OCT-1999 02:03:41.50 ET (02:02:37.31 UTC, 1/05207782:34:9:4 SCLK)
     Range to Jupiter from S/C:  396600.93 km (5.54749 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD271/sateph.OD271.nio
  Epoch file:         /usr/nav/od/deliveries/OD271/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991121.pt000201
  P-file              /usr/nav/traj/pfiles/dpfil-991125-od271-i25-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 25
 COMMENTS:  Reconstruction for Io 25
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-277

 TIME SPAN:
                BEGIN: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                       12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                       1/05253293:04:1:1       SCLK
                  END: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                       24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                       1/05313762:24:5:7       SCLK
 SIGNIFICANT EVENTS:

   Io 25 closest approach:
     26-NOV-1999  04:06:25.06 ET (04:05:20.88 UTC, 1/05273415:80:7:5 SCLK)
     Altitude:    300.484 km +/- 0.412 km
     Latitude:    -76.383 deg. +/- 0.0025 deg.
                         (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     26-NOV-1999 02:09:53.86 ET (02:08:49.68 UTC, 1/05273300:58:9:5 SCLK)
     Range to Jupiter from S/C:  405572.12 km (5.67297 Rj)

 INPUT FILES:
```

```
 Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
 Satellite eph file: /usr/nav/od/deliveries/OD277/sateph.OD277.nio
 Epoch file:         /usr/nav/od/deliveries/OD277/epoch
 GIN file            /usr/nav/eph/gin-0198.v205.nio
 STOIC file          /usr/nav/od/stoic/ld991228.pt000309
 P-file              /usr/nav/traj/pfiles/dpfil-000102-od277-e26-enc.nio

------------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 26
COMMENTS:  Reconstruction for Orbit 26
           ET minus UTC is 64.184 seconds as of January 1, 1999.

TRAJECTORY BASIS/OD SOLUTION:  OD-281

TIME SPAN:
                BEGIN: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                       24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                       1/05313762:24:5:7       SCLK
                  END: 01-FEB-2000 20:00:00.000 ET   DOY:  00-032
                       01-FEB-2000 19:58:55.816 UTC  DOY:  00-032
                       1/05369778:75:2:5       SCLK
SIGNIFICANT EVENTS:

  Europa 26 closest approach:
    03-JAN-2000  18:00:46.77 ET (17:59:42.59 UTC, 1/05328359:72:2:3 SCLK)
    Altitude:    351.077 km +/- 0.015 km
    Latitude:    -47.345 deg. +/- 0.001 deg.
                        (Europa-centered, Europa True Equator of Date)
  Jupiter Periapsis:
    04-JAN-2000 03:33:54.78 ET (03:32:50.60 UTC, 1/05328926:57:2:6 SCLK)
    Range to Jupiter from S/C:  413330.37 km (5.78149 Rj)

INPUT FILES:
 Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
 Satellite eph file: /usr/nav/od/deliveries/OD281/sateph.OD281.nio
 Epoch file:         /usr/nav/od/deliveries/OD281/epoch
 GIN file            /usr/nav/eph/gin-0198.v205.nio
 STOIC file          /usr/nav/od/stoic/ld991228.pt0000309
 P-file              /usr/nav/traj/pfiles/dpfil-000221-od281-i27-enc.nio

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

; S000131A.BSP LOG FILE
;
; Created 2000-02-22/13:56:21.00.
;
; BEGIN NIOSPK COMMANDS

LEAPSECONDS_FILE    = /usr/nav/traj/naif/mk98259a.tls
SPK_FILE            = S000131A.BSP
  SPK_LOG_FILE      = S000131A-GEM.log
  INCLUDE_TEXT_FILE = gem-comments.txt
  SOURCE_NIO_FILE   = sateph/sateph-jup120.nio
    BODIES          = 505 514 515 516
    BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = sateph/sateph-jup068.nio
    BODIES          = 506 507 508 509 510 511 512 513
    BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = orbiter/dpfil-980127-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
  SOURCE_NIO_FILE   = sateph/sateph.OD201.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
  SOURCE_NIO_FILE   = plneph/eph.OD185.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980328-od208-e14-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = sateph/sateph.OD208.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = orbiter/dpfil-980518-od212-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = sateph/sateph.OD212.nio
```

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    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980720-od219-e16-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = sateph/sateph.OD219.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = plneph/eph.OD214.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = orbiter/dpfil-980925-od224-e17-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD224.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD224.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-981116-od229-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD229.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD229.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/post-GEM-990114.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD233.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD232.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-990426-od241-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD241.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD238.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990629-od248-c21-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD248.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990813-od252-c22-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = sateph/sateph.OD252.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
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     BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
     END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
   SOURCE_NIO_FILE   = orbiter/dpfil-990915-od256-c23-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
     END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
   SOURCE_NIO_FILE   = sateph/sateph.OD256.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
     END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
   SOURCE_NIO_FILE   = plneph/eph.OD248.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
     END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
   SOURCE_NIO_FILE   = orbiter/dpfil-991010-od263-i24-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
     END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
   SOURCE_NIO_FILE   = sateph/sateph.OD263.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
     END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
     END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
   SOURCE_NIO_FILE   = orbiter/dpfil-991125-od271-i25-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = sateph/sateph.OD271.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
     END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
   SOURCE_NIO_FILE   = orbiter/dpfil-000102-od277-e26-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = sateph/sateph.OD277.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
     END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
   SOURCE_NIO_FILE   = orbiter/dpfil-000221-od281-i27-enc.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = sateph/sateph.OD281.nio
     BODIES          = 501 502 503 504 599
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = plneph/eph.OD261.nio
     BODIES          = 3 5 10 301 399
     BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184

 ; END NIOSPK COMMANDS

 Note:  This is the final SPK file for the Galileo GEM mission.
        The designation is S000131A.BSP, ...XSP, ...BSP_LBL
                        GENERAL COMMENTS:

 KEY TO FILE SEGMENTS:

 01-DEC-1997 to 26-JAN-1998 Reconstruction for Orbit 12, OD201
 26-JAN-1998 to 14-MAR-1998 Reconstruction for Orbit 13, OD208
 14-MAR-1998 to 03-MAY-1998 Reconstruction for Orbit 14, OD212
 03-MAY-1998 to 20-JUL-1998 Reconstruction for Orbit 15, OD219
 20-JUL-1998 to 01-SEP-1998 Reconstruction for Orbit 16, OD224
 01-SEP-1998 to 13-NOV-1998 Reconstruction for Orbit 17, OD229
 13-NOV-1998 to 01-JAN-1999 Reconstruction for Orbit 18, OD233
 01-JAN-1999 to 23-APR-1999 Reconstruction for Orbit 19, OD241
 23-APR-1999 to 09-JUN-1999 Reconstruction for Orbit 20, OD248
 09-JUN-1999 to 25-JUL-1999 Reconstruction for Orbit 21, OD252
 25-JUL-1999 to 29-AUG-1999 Reconstruction for Orbit 22, OD256
 29-AUG-1999 to 27-SEP-1999 Reconstruction for Orbit 23, OD263
 27-SEP-1999 to 12-NOV-1999 Reconsturction for Orbit 24, OD271
 12-NOV-1999 to 24-DEC-1999 Reconstruction for Orbit 25, OD277
```

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24-DEC-1999 to 31-JAN-2000 Reconstruction for Orbit 26, OD281

This file is a compilation of reconstructed trajectory segments.
This file begins 1-DEC-1997 (DOY 97-335) and continues to the end of the
GEM tour (DOY 00-031).

The file for the primary tour is S980326A.BSP.  It is compiled of
reconstructed data only and ends on 1-JAN-1998 (DOY 98-001).

A similar file covering reconstructed segments for the interplanetary
trajectory can be found in a S970311A.BSP.  The final reconstruction
for the probe trajectory is provided separately in S960730A.BSP.

Amalthea is included for Orbit 22 of the GEM Mission.
Bodies included in this file and radii for Jupiter and the Jovian
satellites are:


     Name                  Body Number      Radius (km)

     Orbiter               -77
     Earth                 399               6378.14
     Earth barycenter        3
     Moon                  301               1737.40
     Sun barycenter         10
     Jupiter               599              71492.0
     Jupiter barycenter      5
     Io                    501               1821.3
     Europa                502               1565.0
     Ganymede              503               2634.0
     Callisto              504               2403.0
     Amalthea              505                 86.2  (GEM orbit C22 only)
     Himalia               506                 85.0
     Elara                 507                 40.0
     Pasiphae              508                 18.0
     Sinope                509                 14.0
     Lysithea              510                 12.0
     Carme                 511                 15.0
     Ananke                512                 10.0
     Leda                  513                  5.0
     Thebe                 514                 50.0
     Adrastea              515                 10.0
     Metis                 516                 20.0

NOTE:  The radii values were taken from the Report of the IAU/IAG/COSPAR
       Working Group on Cartographic Coordinates and Rotational Elements
       of the Planets and Satellites:  1994.
Each segment listed has information under the following headings:
  COMMENTS
  TRAJECTORY BASIS/OD SOLUTION
  TIME SPAN
  SIGNIFICANT EVENTS
  INPUT FILES

ET is used to denote ephemeris time; it differs from UTC (universal time
coordinated) in which spacecraft events are usually given by the following:
  ET minus UTC = 63.184 sec (as of Jul. 1, 1997)
               = 64.184 sec (as of Jan. 1, 1999)
  SCLK is spacecraft clock string.

Questions should be directed to:
  Joan Pojman (818 354-0264, Joan.Pojman@jpl.nasa.gov)
------------------------------------------------------------------------------
                     RECONSTRUCTION FOR ORBIT 12

COMMENTS:  Reconstruction for Europa 12 encounter.

TRAJECTORY BASIS/OD SOLUTION:  OD-201

TIME SPAN:
                BEGIN: 01-DEC-1997 00:01:03.184 ET   DOY:  97-335
                       01-DEC-1997 00:00:00.000 UTC  DOY:  97-335
                       1/04240645:13:3:3       SCLK
                  END: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                       25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                       1/04320397:90:8:7       SCLK

SIGNIFICANT EVENTS:

  Europa 12 closest approach:
    16-DEC-1997 12:04:23.06 ET (12:03:19.87 UTC, 1/04262723:16:3:3 SCLK)
    Altitude:   201.0 km +/- 0.015 km
    Latitude:    -8.66 deg  +/- 0.003 deg
                        (Europa-centered, Europa True Equator of Date)
  Jupiter Periapsis:
```

```
     16-DEC-1997 06:35:56.58 ET (06:34:53.40 UTC, 1/04262398:31:6:1 SCLK)
     Range to Jupiter from S/C:  629039.69 km (8.79874 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD196/sateph.OD201.nio
  Epoch file:         /usr/nav/od/deliveries/OD201/epoch
  GIN file            /usr/nav/eph/gin-0894.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/ref-traj/dpfil-980127-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 13

 COMMENTS:  Reconstruction for Phasing Orbit 13.

 TRAJECTORY BASIS/OD SOLUTION:  OD-208

 TIME SPAN:
                 BEGIN: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                        25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                        1/04320397:90:8:7       SCLK
                   END: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                        14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                        1/04387335:31:3:0       SCLK

 SIGNIFICANT EVENTS:

   Europa 13A closest approach:
     10-FEB-1998 17:58:35.67 ET (17:57:32.48 UTC, 1/04342827:35:6:1 SCLK)
     Altitude:   3557.2 km +/- 0.052 km
     Latitude:    -8.93 deg  +/- 0.0046 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     10-FEB-1998 23:10:17.78 ET (23:09:14.60 UTC, 1/04343135:60:8:0 SCLK)
     Range to Jupiter from S/C:  633063.38 km (8.85502 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD208/sateph.OD208.nio
  Epoch file:         /usr/nav/od/deliveries/OD208/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980326.pt980606
  P-file              /usr/nav/traj/pfiles/dpfil-980328-od208-e14-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 14

 COMMENTS:  Reconstruction for Orbit 14
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-212

 TIME SPAN:
                 BEGIN: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                        14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                        1/04387335:31:3:0       SCLK
                   END: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                        03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                        1/04459730:90:2:3       SCLK
 SIGNIFICANT EVENTS:

   Europa 14 closest approach:
     29-MAR-1998 13:22:08.33 ET (13:21:05.14 UTC, 1/04409490:25:2:1 SCLK)
     Altitude:   1644.1 km +/- 0.015 km
     Latitude:    12.21 deg  +/- 0.001 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     29-MAR-1998 08:00:16.60 ET (07:59:13.41 UTC, 1/04409171:86:6:0 SCLK)
     Range to Jupiter from S/C:  631692.54 km (8.83585 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD212/sateph.OD212.nio
  Epoch file:         /usr/nav/od/deliveries/OD212/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/pfiles/dpfil-980518-od212-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 15

 COMMENTS:  Reconstruction for Orbit 15
            ET minus UTC is 63.184 seconds as of July 1, 1997.
```

```
 TRAJECTORY BASIS/OD SOLUTION:  OD-219

 TIME SPAN:
                BEGIN: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                       03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                       1/04459730:90:2:3       SCLK
                  END: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                       20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                       1/04569926:59:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 15 closest approach:
     31-MAY-1998 21:13:59.77 ET (21:12:56.59 UTC, 1/04499680:07:2:7 SCLK)
     Altitude:   2514.5 km +/- 0.0134 km
     Latitude:    15.00 deg  +/- 0.001 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-JUN-1998 02:35:44.77 ET (02:34:41.59 UTC, 1/04499998:26:8:0 SCLK)
     Range to Jupiter from S/C:  632696.58 km (8.84989 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD214/eph.OD214.nio
  Satellite eph file: /usr/nav/od/deliveries/OD219/sateph.OD219.nio
  Epoch file:         /usr/nav/od/deliveries/OD219/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980715.pt980925
  P-file              /usr/nav/traj/pfiles/dpfil-980720-od219-e16-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 16

 COMMENTS:  Reconstruction for Orbit 16
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-224

 TIME SPAN:
                BEGIN: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                       20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                       1/04569926:59:8:6       SCLK
                  END: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                       31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                       1/04630868:46:3:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 16 closest approach:
     21-JUL-1998 05:04:47.95 ET (05:03:44.77 UTC, 1/04571354:49:1:1 SCLK)
     Altitude:   1834.2 km +/- 0.0123 km
     Latitude:   -25.65 deg  +/- 0.00039 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     21-JUL-1998 00:19:02.08 ET (00:17:58.89 UTC, 1/04571071:83:2:7 SCLK)
     Range to Jupiter from S/C:  632799.65 km (8.85134 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD224/eph.OD224.nio
  Satellite eph file: /usr/nav/od/deliveries/OD224/sateph.OD224.nio
  Epoch file:         /usr/nav/od/deliveries/OD224/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980917.pt981128
  P-file              /usr/nav/traj/pfiles/dpfil-980925-od224-e17-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 17

 COMMENTS:  Reconstruction for Orbit 17
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-229

 TIME SPAN:
                BEGIN: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                       31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                       1/04630868:46:3:4       SCLK
                  END: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                       12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                       1/04734833:36:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 17 closest approach:
     26-SEP-1998 03:55:23.02 ET (03:54:19.84 UTC, 1/04666705:65:7:6 SCLK)
     Altitude:   3582.4 km +/- 0.015 km
     Latitude:   -42.43 deg  +/- 0.0002 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
```

```
     26-SEP-1998 08:27:30.34 ET (08:26:27.16 UTC, 1/04666974:77:7:7 SCLK)
     Range to Jupiter from S/C:  637028.58 km (8.91049 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD229/eph.OD229.nio
  Satellite eph file: /usr/nav/od/deliveries/OD229/sateph.OD229.nio
  Epoch file:         /usr/nav/od/deliveries/OD229/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981105.pt990116
  P-file              /usr/nav/traj/pfiles/dpfil-981116-od229-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 18

 COMMENTS:  Reconstruction for Orbit 18
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-233

 TIME SPAN:
                 BEGIN: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                        12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                        1/04734833:36:8:6       SCLK
                   END: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                        31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                        1/04804618:05:4:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 18 closest approach:
     22-NOV-1998 11:39:29.39 ET (11:38:26.21 UTC, 1/04748342:72:5:7 SCLK)
     Altitude:   2270.8 km +/- 0.013 km
     Latitude:    41.34 deg  +/- 0.0 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     22-NOV-1998 07:31:54.95 ET (07:30:51.76 UTC, 1/04748097:85:9:0 SCLK)
     Range to Jupiter from S/C:  639331.79 km (8.94270 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD232/eph.OD232.nio
  Satellite eph file: /usr/nav/od/deliveries/OD233/sateph.OD233.nio
  Epoch file:         /usr/nav/od/deliveries/OD233/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981229.pt990311
  P-file              /usr/traj1/post-GEM/990114/post-GEM-990114.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 19

 COMMENTS:  Reconstruction for Europa 19
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-241

 TIME SPAN:
                 BEGIN: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                        31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                        1/04804618:05:4:6       SCLK
                   END: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                        22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                        1/04964125:76:8:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 19 closest approach:
     01-FEB-1999 02:20:54.13 ET (02:19:49.94 UTC, 1/04848906:80:9:5 SCLK)
     Altitude:   1439.4 km +/- 0.0139 km
     Latitude:    30.52 deg  +/- 0.000 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-FEB-1999 05:03:14.45 ET (05:02:10.27 UTC, 1/04849067:40:4:4 SCLK)
     Range to Jupiter from S/C:  651211.84 km (9.10888 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD238/eph.OD238.nio
  Satellite eph file: /usr/nav/od/deliveries/OD241/sateph.OD241.nio
  Epoch file:         /usr/nav/od/deliveries/OD241/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld990415.pt990708
  P-file              /usr/nav/traj/ref-traj/dpfil-990426-od241-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 20

 COMMENTS:  Reconstruction for Callisto 20
            ET minus UTC is 64.184 seconds as of January 1, 1999.
```

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 TRAJECTORY BASIS/OD SOLUTION:  OD-248

 TIME SPAN:
                BEGIN: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                       22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                       1/04964125:76:8:4       SCLK
                  END: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                       08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                       1/05031062:13:3:6       SCLK
 SIGNIFICANT EVENTS:

   Callisto 20 closest approach:
     05-MAY-1999 13:57:22.30 ET (13:56:18.11 UTC, 1/04982044:12:2:3 SCLK)
     Altitude:   1321.4 km +/- 0.0151 km
     Latitude:     2.78 deg  +/- 0.0015 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     03-MAY-1999 17:01:15.21 ET (17:00:11.02 UTC, 1/04979377:58:4:5 SCLK)
     Range to Jupiter from S/C:  670009.42 km (9.37181 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD248/sateph.OD248.nio
  Epoch file:         /usr/nav/od/deliveries/OD248/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990624.pt990910
  P-file              /usr/nav/traj/pfiles/dpfil-990629-od248-c21-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 21

 COMMENTS:  Reconstruction for Callisto 21
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-252

 TIME SPAN:
                BEGIN: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                       08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                       1/05031062:13:3:6       SCLK
                  END: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                       25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                       1/05096575:30:1:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 21 closest approach:
     30-JUN-1999 07:47:53.87 ET (07:46:49.69 UTC, 1/05061432:55:7:7 SCLK)
     Altitude:   1048.1 km +/- 0.011 km
     Latitude:     -0.7 deg  +/- 0.0003 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     02-JUL-1999 05:05:56.36 ET (05:04:52.18 UTC, 1/05064120:71:6:6 SCLK)
     Range to Jupiter from S/C:  519747.15 km (7.27000 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD252/sateph.OD252.nio
  Epoch file:         /usr/nav/od/deliveries/OD252/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990729.pt991009
  P-file              /usr/nav/traj/pfiles/dpfil-990813-od252-c22-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 22

 COMMENTS:  Reconstruction for Callisto 22
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-256

 TIME SPAN:
                BEGIN: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                       25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                       1/05096575:30:1:1       SCLK
                  END: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                       29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                       1/05147132:49:5:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 22 closest approach:
     14-AUG-1999 08:31:55.94 ET (08:30:51.76 UTC, 1/05125564:10:2:7 SCLK)
     Altitude:   2299.3 km +/- 0.015 km
     Latitude:     -2.3 +/- 0.001 deg
                         (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
```

```
     12-AUG-1999 10:59:35.66 ET (10:58:31.48 UTC, 1/05122861:72:7:2 SCLK)
     Range to Jupiter from S/C:  523080.41 km (7.31663 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD256/sateph.OD256.nio
  Epoch file:         /usr/nav/od/deliveries/OD256/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990909.pt991202
  P-file              /usr/nav/traj/pfiles/dpfil-990915-od256-c23-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 23

 COMMENTS:  Reconstruction for Callisto 23
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-263

 TIME SPAN:
                 BEGIN: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                        29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                        1/05147132:49:5:1       SCLK
                   END: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                        27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                        1/05187780:83:6:4       SCLK
 SIGNIFICANT EVENTS:

   Callisto 23 closest approach:
     16-SEP-1999 17:28:06.00 ET (17:27:01.813 UTC, 1/05173092:19:8:6 SCLK)
     Altitude:   1052.4 km +/- 0.0118 km
     Latitude:    0.0986 deg. +/- 0.001 deg
                          (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     14-SEP-1999 19:58:41.02 ET (19:57:36.83 UTC, 1/05170392:72:2:5 SCLK)
     Range to Jupiter from S/C:  467972.00 km (6.54580 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD263/sateph.OD263.nio
  Epoch file:         /usr/nav/od/deliveries/OD263/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990930.pt991211
  P-file              /usr/nav/traj/pfiles/dpfil-991010-od263-i24-enc.nio

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                      RECONSTRUCTION FOR ORBIT 24

 COMMENTS:  Reconstruction for Io 24
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-271

 TIME SPAN:
                 BEGIN: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                        27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                        1/05187780:83:6:4       SCLK
                   END: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
 SIGNIFICANT EVENTS:

   Io 24 closest approach:
     11-OCT-1999 04:34:06.72 ET (04:33:02.53 UTC, 1/05207931:13:8:0 SCLK)
     Altitude:   611.3 km +/- 0.011 km
     Latitude:    4.507 deg. +/- 0.003 deg
                          (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     11-OCT-1999 02:03:41.50 ET (02:02:37.31 UTC, 1/05207782:34:9:4 SCLK)
     Range to Jupiter from S/C:  396600.93 km (5.54749 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD271/sateph.OD271.nio
  Epoch file:         /usr/nav/od/deliveries/OD271/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991121.pt000201
  P-file              /usr/nav/traj/pfiles/dpfil-991125-od271-i25-enc.nio

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                      RECONSTRUCTION FOR ORBIT 25
 COMMENTS:  Reconstruction for Io 25
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-277
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 TIME SPAN:
                 BEGIN: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
                   END: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
 SIGNIFICANT EVENTS:

   Io 25 closest approach:
     26-NOV-1999  04:06:25.06 ET (04:05:20.88 UTC, 1/05273415:80:7:5 SCLK)
     Altitude:    300.484 km +/- 0.412 km
     Latitude:    -76.383 deg. +/- 0.0025 deg.
                          (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     26-NOV-1999 02:09:53.86 ET (02:08:49.68 UTC, 1/05273300:58:9:5 SCLK)
     Range to Jupiter from S/C:  405572.12 km (5.67297 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD277/sateph.OD277.nio
  Epoch file:         /usr/nav/od/deliveries/OD277/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt000309
  P-file              /usr/nav/traj/pfiles/dpfil-000102-od277-e26-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 26
 COMMENTS:  Reconstruction for Orbit 26
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-281

 TIME SPAN:
                 BEGIN: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
                   END: 01-FEB-2000 20:00:00.000 ET   DOY:  00-032
                        01-FEB-2000 19:58:55.816 UTC  DOY:  00-032
                        1/05369778:75:2:5       SCLK
 SIGNIFICANT EVENTS:

   Europa 26 closest approach:
     03-JAN-2000  18:00:46.77 ET (17:59:42.59 UTC, 1/05328359:72:2:3 SCLK)
     Altitude:    351.077 km +/- 0.015 km
     Latitude:    -47.345 deg. +/- 0.001 deg.
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     04-JAN-2000 03:33:54.78 ET (03:32:50.60 UTC, 1/05328926:57:2:6 SCLK)
     Range to Jupiter from S/C:  413330.37 km (5.78149 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD281/sateph.OD281.nio
  Epoch file:         /usr/nav/od/deliveries/OD281/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt0000309
  P-file              /usr/nav/traj/pfiles/dpfil-000221-od281-i27-enc.nio

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

 ; S000131A.BSP LOG FILE
 ;
 ; Created 2000-02-22/13:56:21.00.
 ;
 ; BEGIN NIOSPK COMMANDS

 LEAPSECONDS_FILE    = /usr/nav/traj/naif/mk98259a.tls
 SPK_FILE            = S000131A.BSP
   SPK_LOG_FILE      = S000131A-GEM.log
   INCLUDE_TEXT_FILE = gem-comments.txt
   SOURCE_NIO_FILE   = sateph/sateph-jup120.nio
     BODIES          = 505 514 515 516
     BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = sateph/sateph-jup068.nio
     BODIES          = 506 507 508 509 510 511 512 513
     BEGIN_TIME      = CAL-ET 1999 SEP 27 23:02:05.247
     END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
   SOURCE_NIO_FILE   = orbiter/dpfil-980127-tour.nio
     BODIES          = -77
     BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
     END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
   SOURCE_NIO_FILE   = sateph/sateph.OD201.nio
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    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 JAN 26 00:01:03.184
  SOURCE_NIO_FILE   = plneph/eph.OD185.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1997 DEC 01 00:01:03.183
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980328-od208-e14-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = sateph/sateph.OD208.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JAN 26 00:01:03.184
    END_TIME        = CAL-ET 1998 MAR 14 00:01:03.186
  SOURCE_NIO_FILE   = orbiter/dpfil-980518-od212-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = sateph/sateph.OD212.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAR 14 00:01:03.186
    END_TIME        = CAL-ET 1998 MAY 03 20:01:03.185
  SOURCE_NIO_FILE   = orbiter/dpfil-980720-od219-e16-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = sateph/sateph.OD219.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = plneph/eph.OD214.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 MAY 03 20:01:03.185
    END_TIME        = CAL-ET 1998 JUL 20 05:01:03.183
  SOURCE_NIO_FILE   = orbiter/dpfil-980925-od224-e17-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD224.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD224.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 JUL 20 05:01:03.183
    END_TIME        = CAL-ET 1998 SEP 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-981116-od229-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD229.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD229.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 SEP 01 00:00:00.000
    END_TIME        = CAL-ET 1998 NOV 12 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/post-GEM-990114.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD233.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD232.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1998 NOV 12 23:59:59.999
    END_TIME        = CAL-ET 1999 JAN 01 00:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-990426-od241-tour.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD241.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD238.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JAN 01 00:00:00.000
    END_TIME        = CAL-ET 1999 APR 22 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990629-od248-c21-enc.nio
    BODIES          = -77
```

```
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD248.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 APR 22 23:59:59.999
    END_TIME        = CAL-ET 1999 JUN 08 23:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-990813-od252-c22-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = sateph/sateph.OD252.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUN 08 23:59:59.999
    END_TIME        = CAL-ET 1999 JUL 25 00:01:04.183
  SOURCE_NIO_FILE   = orbiter/dpfil-990915-od256-c23-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD256.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD248.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 JUL 25 00:01:04.183
    END_TIME        = CAL-ET 1999 AUG 29 11:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-991010-od263-i24-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = sateph/sateph.OD263.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 AUG 29 11:59:59.999
    END_TIME        = CAL-ET 1999 SEP 27 01:00:00.000
  SOURCE_NIO_FILE   = orbiter/dpfil-991125-od271-i25-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = sateph/sateph.OD271.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 SEP 27 01:00:00.000
    END_TIME        = CAL-ET 1999 NOV 12 00:59:59.999
  SOURCE_NIO_FILE   = orbiter/dpfil-000102-od277-e26-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
    END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
  SOURCE_NIO_FILE   = sateph/sateph.OD277.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
    END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 NOV 12 00:59:59.999
    END_TIME        = CAL-ET 1999 DEC 24 12:01:04.183
  SOURCE_NIO_FILE   = orbiter/dpfil-000221-od281-i27-enc.nio
    BODIES          = -77
    BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = sateph/sateph.OD281.nio
    BODIES          = 501 502 503 504 599
    BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184
  SOURCE_NIO_FILE   = plneph/eph.OD261.nio
    BODIES          = 3 5 10 301 399
    BEGIN_TIME      = CAL-ET 1999 DEC 24 12:01:04.183
    END_TIME        = CAL-ET 2000 FEB 01 20:01:04.184

; END NIOSPK COMMANDS
```

```
 Note:  This is the final SPK file for the Galileo GEM mission.
        The designation is S000131A.BSP, ...XSP, ...BSP_LBL
                        GENERAL COMMENTS:

 KEY TO FILE SEGMENTS:

 01-DEC-1997 to 26-JAN-1998 Reconstruction for Orbit 12, OD201
 26-JAN-1998 to 14-MAR-1998 Reconstruction for Orbit 13, OD208
 14-MAR-1998 to 03-MAY-1998 Reconstruction for Orbit 14, OD212
 03-MAY-1998 to 20-JUL-1998 Reconstruction for Orbit 15, OD219
 20-JUL-1998 to 01-SEP-1998 Reconstruction for Orbit 16, OD224
 01-SEP-1998 to 13-NOV-1998 Reconstruction for Orbit 17, OD229
 13-NOV-1998 to 01-JAN-1999 Reconstruction for Orbit 18, OD233
 01-JAN-1999 to 23-APR-1999 Reconstruction for Orbit 19, OD241
 23-APR-1999 to 09-JUN-1999 Reconstruction for Orbit 20, OD248
 09-JUN-1999 to 25-JUL-1999 Reconstruction for Orbit 21, OD252
 25-JUL-1999 to 29-AUG-1999 Reconstruction for Orbit 22, OD256
 29-AUG-1999 to 27-SEP-1999 Reconstruction for Orbit 23, OD263
 27-SEP-1999 to 12-NOV-1999 Reconsturction for Orbit 24, OD271
 12-NOV-1999 to 24-DEC-1999 Reconstruction for Orbit 25, OD277
 24-DEC-1999 to 31-JAN-2000 Reconstruction for Orbit 26, OD281

 This file is a compilation of reconstructed trajectory segments.
 This file begins 1-DEC-1997 (DOY 97-335) and continues to the end of the
 GEM tour (DOY 00-031).

 The file for the primary tour is S980326B.BSP.  It is compiled of
 reconstructed data only and ends on 1-JAN-1998 (DOY 98-001).

 A similar file covering reconstructed segments for the interplanetary
 trajectory can be found in a S970312A.BSP.  The final reconstruction
 for the probe trajectory is provided separately in S960730A.BSP.

 Amalthea is included for Orbit 22 of the GEM Mission.
 Bodies included in this file and radii for Jupiter and the Jovian
 satellites are:


      Name                  Body Number      Radius (km)

      Orbiter               -77
      Earth                 399               6378.14
      Earth barycenter        3
      Moon                  301               1737.40
      Sun barycenter         10
      Jupiter               599              71492.0
      Jupiter barycenter      5
      Io                    501               1821.3
      Europa                502               1565.0
      Ganymede              503               2634.0
      Callisto              504               2403.0
      Amalthea              505                 86.2  (GEM orbit C22 only)
      Himalia               506                 85.0
      Elara                 507                 40.0
      Pasiphae              508                 18.0
      Sinope                509                 14.0
      Lysithea              510                 12.0
      Carme                 511                 15.0
      Ananke                512                 10.0
      Leda                  513                  5.0
      Thebe                 514                 50.0
      Adrastea              515                 10.0
      Metis                 516                 20.0

 NOTE:  The radii values were taken from the Report of the IAU/IAG/COSPAR
        Working Group on Cartographic Coordinates and Rotational Elements
        of the Planets and Satellites:  1994.
 Each segment listed has information under the following headings:
   COMMENTS
   TRAJECTORY BASIS/OD SOLUTION
   TIME SPAN
   SIGNIFICANT EVENTS
   INPUT FILES

 ET is used to denote ephemeris time; it differs from UTC (universal time
 coordinated) in which spacecraft events are usually given by the following:
   ET minus UTC = 63.184 sec (as of Jul. 1, 1997)
                = 64.184 sec (as of Jan. 1, 1999)
   SCLK is spacecraft clock string.

 Questions should be directed to:
   Joan Pojman (818 354-0264, Joan.Pojman@jpl.nasa.gov)
 ------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 12
```

```
 COMMENTS:  Reconstruction for Europa 12 encounter.

 TRAJECTORY BASIS/OD SOLUTION:  OD-201

 TIME SPAN:
                BEGIN: 01-DEC-1997 00:01:03.184 ET   DOY:  97-335
                       01-DEC-1997 00:00:00.000 UTC  DOY:  97-335
                       1/04240645:13:3:3       SCLK
                  END: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                       25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                       1/04320397:90:8:7       SCLK

 SIGNIFICANT EVENTS:

   Europa 12 closest approach:
     16-DEC-1997 12:04:23.06 ET (12:03:19.87 UTC, 1/04262723:16:3:3 SCLK)
     Altitude:   201.0 km +/- 0.015 km
     Latitude:    -8.66 deg  +/- 0.003 deg
                         (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     16-DEC-1997 06:35:56.58 ET (06:34:53.40 UTC, 1/04262398:31:6:1 SCLK)
     Range to Jupiter from S/C:  629039.69 km (8.79874 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD196/sateph.OD201.nio
  Epoch file:         /usr/nav/od/deliveries/OD201/epoch
  GIN file            /usr/nav/eph/gin-0894.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/ref-traj/dpfil-980127-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 13

 COMMENTS:  Reconstruction for Phasing Orbit 13.

 TRAJECTORY BASIS/OD SOLUTION:  OD-208

 TIME SPAN:
                BEGIN: 26-JAN-1998 00:00:00.000 ET   DOY:  98-026
                       25-JAN-1998 23:58:56.815 UTC  DOY:  98-026
                       1/04320397:90:8:7       SCLK
                  END: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                       14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                       1/04387335:31:3:0       SCLK

 SIGNIFICANT EVENTS:

   Europa 13A closest approach:
     10-FEB-1998 17:58:35.67 ET (17:57:32.48 UTC, 1/04342827:35:6:1 SCLK)
     Altitude:   3557.2 km +/- 0.052 km
     Latitude:    -8.93 deg  +/- 0.0046 deg
                         (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     10-FEB-1998 23:10:17.78 ET (23:09:14.60 UTC, 1/04343135:60:8:0 SCLK)
     Range to Jupiter from S/C:  633063.38 km (8.85502 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD208/sateph.OD208.nio
  Epoch file:         /usr/nav/od/deliveries/OD208/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980326.pt980606
  P-file              /usr/nav/traj/pfiles/dpfil-980328-od208-e14-enc.nio

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                      RECONSTRUCTION FOR ORBIT 14

 COMMENTS:  Reconstruction for Orbit 14
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-212

 TIME SPAN:
                BEGIN: 14-MAR-1998 00:01:03.186 ET   DOY:  98-073
                       14-MAR-1998 00:00:00.001 UTC  DOY:  98-073
                       1/04387335:31:3:0       SCLK
                  END: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                       03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                       1/04459730:90:2:3       SCLK
 SIGNIFICANT EVENTS:

   Europa 14 closest approach:
     29-MAR-1998 13:22:08.33 ET (13:21:05.14 UTC, 1/04409490:25:2:1 SCLK)
     Altitude:   1644.1 km +/- 0.015 km
```

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     Latitude:    12.21 deg  +/- 0.001 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     29-MAR-1998 08:00:16.60 ET (07:59:13.41 UTC, 1/04409171:86:6:0 SCLK)
     Range to Jupiter from S/C:  631692.54 km (8.83585 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD185/eph.OD185.nio
  Satellite eph file: /usr/nav/od/deliveries/OD212/sateph.OD212.nio
  Epoch file:         /usr/nav/od/deliveries/OD212/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980430.pt980711
  P-file              /usr/nav/traj/pfiles/dpfil-980518-od212-tour.nio

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                      RECONSTRUCTION FOR ORBIT 15

 COMMENTS:  Reconstruction for Orbit 15
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-219

 TIME SPAN:
                 BEGIN: 03-MAY-1998 20:01:03.186 ET   DOY:  98-123
                        03-MAY-1998 20:00:00.000 UTC  DOY:  98-123
                        1/04459730:90:2:3       SCLK
                   END: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                        20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                        1/04569926:59:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 15 closest approach:
     31-MAY-1998 21:13:59.77 ET (21:12:56.59 UTC, 1/04499680:07:2:7 SCLK)
     Altitude:   2514.5 km +/- 0.0134 km
     Latitude:    15.00 deg  +/- 0.001 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-JUN-1998 02:35:44.77 ET (02:34:41.59 UTC, 1/04499998:26:8:0 SCLK)
     Range to Jupiter from S/C:  632696.58 km (8.84989 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD214/eph.OD214.nio
  Satellite eph file: /usr/nav/od/deliveries/OD219/sateph.OD219.nio
  Epoch file:         /usr/nav/od/deliveries/OD219/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980715.pt980925
  P-file              /usr/nav/traj/pfiles/dpfil-980720-od219-e16-enc.nio

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                      RECONSTRUCTION FOR ORBIT 16

 COMMENTS:  Reconstruction for Orbit 16
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-224

 TIME SPAN:
                 BEGIN: 20-JUL-1998 05:01:03.186 ET   DOY:  98-201
                        20-JUL-1998 05:00:00.000 UTC  DOY:  98-201
                        1/04569926:59:8:6       SCLK
                   END: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                        31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                        1/04630868:46:3:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 16 closest approach:
     21-JUL-1998 05:04:47.95 ET (05:03:44.77 UTC, 1/04571354:49:1:1 SCLK)
     Altitude:   1834.2 km +/- 0.0123 km
     Latitude:   -25.65 deg  +/- 0.00039 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     21-JUL-1998 00:19:02.08 ET (00:17:58.89 UTC, 1/04571071:83:2:7 SCLK)
     Range to Jupiter from S/C:  632799.65 km (8.85134 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD224/eph.OD224.nio
  Satellite eph file: /usr/nav/od/deliveries/OD224/sateph.OD224.nio
  Epoch file:         /usr/nav/od/deliveries/OD224/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld980917.pt981128
  P-file              /usr/nav/traj/pfiles/dpfil-980925-od224-e17-enc.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 17
```

```
 COMMENTS:  Reconstruction for Orbit 17
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-229

 TIME SPAN:
                 BEGIN: 01-SEP-1998 00:00:00.000 ET   DOY:  98-244
                        31-AUG-1998 23:58:56.818 UTC  DOY:  98-243
                        1/04630868:46:3:4       SCLK
                   END: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                        12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                        1/04734833:36:8:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 17 closest approach:
     26-SEP-1998 03:55:23.02 ET (03:54:19.84 UTC, 1/04666705:65:7:6 SCLK)
     Altitude:   3582.4 km +/- 0.015 km
     Latitude:   -42.43 deg  +/- 0.0002 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     26-SEP-1998 08:27:30.34 ET (08:26:27.16 UTC, 1/04666974:77:7:7 SCLK)
     Range to Jupiter from S/C:  637028.58 km (8.91049 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD229/eph.OD229.nio
  Satellite eph file: /usr/nav/od/deliveries/OD229/sateph.OD229.nio
  Epoch file:         /usr/nav/od/deliveries/OD229/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981105.pt990116
  P-file              /usr/nav/traj/pfiles/dpfil-981116-od229-tour.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 18

 COMMENTS:  Reconstruction for Orbit 18
            ET minus UTC is 63.184 seconds as of July 1, 1997.

 TRAJECTORY BASIS/OD SOLUTION:  OD-233

 TIME SPAN:
                 BEGIN: 13-NOV-1998 00:00:00.000 ET   DOY:  98-317
                        12-NOV-1998 23:58:56.817 UTC  DOY:  98-316
                        1/04734833:36:8:6       SCLK
                   END: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                        31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                        1/04804618:05:4:6       SCLK
 SIGNIFICANT EVENTS:

   Europa 18 closest approach:
     22-NOV-1998 11:39:29.39 ET (11:38:26.21 UTC, 1/04748342:72:5:7 SCLK)
     Altitude:   2270.8 km +/- 0.013 km
     Latitude:    41.34 deg  +/- 0.0 deg
                          (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     22-NOV-1998 07:31:54.95 ET (07:30:51.76 UTC, 1/04748097:85:9:0 SCLK)
     Range to Jupiter from S/C:  639331.79 km (8.94270 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD232/eph.OD232.nio
  Satellite eph file: /usr/nav/od/deliveries/OD233/sateph.OD233.nio
  Epoch file:         /usr/nav/od/deliveries/OD233/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld981229.pt990311
  P-file              /usr/traj1/post-GEM/990114/post-GEM-990114.nio

 ------------------------------------------------------------------------------
                      RECONSTRUCTION FOR ORBIT 19

 COMMENTS:  Reconstruction for Europa 19
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-241

 TIME SPAN:
                 BEGIN: 01-JAN-1999 00:00:00.000 ET   DOY:  99-001
                        31-DEC-1998 23:58:56.817 UTC  DOY:  98-365
                        1/04804618:05:4:6       SCLK
                   END: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                        22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                        1/04964125:76:8:4       SCLK
 SIGNIFICANT EVENTS:

   Europa 19 closest approach:
     01-FEB-1999 02:20:54.13 ET (02:19:49.94 UTC, 1/04848906:80:9:5 SCLK)
     Altitude:   1439.4 km +/- 0.0139 km
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     Latitude:    30.52 deg  +/- 0.000 deg
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     01-FEB-1999 05:03:14.45 ET (05:02:10.27 UTC, 1/04849067:40:4:4 SCLK)
     Range to Jupiter from S/C:  651211.84 km (9.10888 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD238/eph.OD238.nio
  Satellite eph file: /usr/nav/od/deliveries/OD241/sateph.OD241.nio
  Epoch file:         /usr/nav/od/deliveries/OD241/epoch
  GIN file            /usr/nav/eph/gin-0198.nio
  STOIC file          /usr/nav/od/stoic/ld990415.pt990708
  P-file              /usr/nav/traj/ref-traj/dpfil-990426-od241-tour.nio

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                      RECONSTRUCTION FOR ORBIT 20

 COMMENTS:  Reconstruction for Callisto 20
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-248

 TIME SPAN:
                 BEGIN: 23-APR-1999 00:00:00.000 ET   DOY:  99-113
                        22-APR-1999 23:58:55.814 UTC  DOY:  99-112
                        1/04964125:76:8:4       SCLK
                   END: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                        08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                        1/05031062:13:3:6       SCLK
 SIGNIFICANT EVENTS:

   Callisto 20 closest approach:
     05-MAY-1999 13:57:22.30 ET (13:56:18.11 UTC, 1/04982044:12:2:3 SCLK)
     Altitude:   1321.4 km +/- 0.0151 km
     Latitude:     2.78 deg  +/- 0.0015 deg
                        (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     03-MAY-1999 17:01:15.21 ET (17:00:11.02 UTC, 1/04979377:58:4:5 SCLK)
     Range to Jupiter from S/C:  670009.42 km (9.37181 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD248/sateph.OD248.nio
  Epoch file:         /usr/nav/od/deliveries/OD248/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990624.pt990910
  P-file              /usr/nav/traj/pfiles/dpfil-990629-od248-c21-enc.nio

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                      RECONSTRUCTION FOR ORBIT 21

 COMMENTS:  Reconstruction for Callisto 21
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-252

 TIME SPAN:
                 BEGIN: 09-JUN-1999 00:00:00.000 ET   DOY:  99-160
                        08-JUN-1999 23:58:55.815 UTC  DOY:  99-159
                        1/05031062:13:3:6       SCLK
                   END: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                        25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                        1/05096575:30:1:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 21 closest approach:
     30-JUN-1999 07:47:53.87 ET (07:46:49.69 UTC, 1/05061432:55:7:7 SCLK)
     Altitude:   1048.1 km +/- 0.011 km
     Latitude:     -0.7 deg  +/- 0.0003 deg
                        (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     02-JUL-1999 05:05:56.36 ET (05:04:52.18 UTC, 1/05064120:71:6:6 SCLK)
     Range to Jupiter from S/C:  519747.15 km (7.27000 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD252/sateph.OD252.nio
  Epoch file:         /usr/nav/od/deliveries/OD252/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990729.pt991009
  P-file              /usr/nav/traj/pfiles/dpfil-990813-od252-c22-enc.nio

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                      RECONSTRUCTION FOR ORBIT 22
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 COMMENTS:  Reconstruction for Callisto 22
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-256

 TIME SPAN:
                 BEGIN: 25-JUL-1999 00:01:04.184 ET   DOY:  99-206
                        25-JUL-1999 00:00:00.000 UTC  DOY:  99-206
                        1/05096575:30:1:1       SCLK
                   END: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                        29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                        1/05147132:49:5:1       SCLK
 SIGNIFICANT EVENTS:

   Callisto 22 closest approach:
     14-AUG-1999 08:31:55.94 ET (08:30:51.76 UTC, 1/05125564:10:2:7 SCLK)
     Altitude:   2299.3 km +/- 0.015 km
     Latitude:     -2.3 +/- 0.001 deg
                          (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     12-AUG-1999 10:59:35.66 ET (10:58:31.48 UTC, 1/05122861:72:7:2 SCLK)
     Range to Jupiter from S/C:  523080.41 km (7.31663 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD248/eph.OD248.nio
  Satellite eph file: /usr/nav/od/deliveries/OD256/sateph.OD256.nio
  Epoch file:         /usr/nav/od/deliveries/OD256/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990909.pt991202
  P-file              /usr/nav/traj/pfiles/dpfil-990915-od256-c23-enc.nio

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                      RECONSTRUCTION FOR ORBIT 23

 COMMENTS:  Reconstruction for Callisto 23
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-263

 TIME SPAN:
                 BEGIN: 29-AUG-1999 12:00:00.000 ET   DOY:  99-241
                        29-AUG-1999 11:58:55.817 UTC  DOY:  99-241
                        1/05147132:49:5:1       SCLK
                   END: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                        27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                        1/05187780:83:6:4       SCLK
 SIGNIFICANT EVENTS:

   Callisto 23 closest approach:
     16-SEP-1999 17:28:06.00 ET (17:27:01.813 UTC, 1/05173092:19:8:6 SCLK)
     Altitude:   1052.4 km +/- 0.0118 km
     Latitude:    0.0986 deg. +/- 0.001 deg
                          (Callisto-centered, Callisto True Equator of Date)
   Jupiter Periapsis:
     14-SEP-1999 19:58:41.02 ET (19:57:36.83 UTC, 1/05170392:72:2:5 SCLK)
     Range to Jupiter from S/C:  467972.00 km (6.54580 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD263/sateph.OD263.nio
  Epoch file:         /usr/nav/od/deliveries/OD263/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld990930.pt991211
  P-file              /usr/nav/traj/pfiles/dpfil-991010-od263-i24-enc.nio

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                      RECONSTRUCTION FOR ORBIT 24

 COMMENTS:  Reconstruction for Io 24
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-271

 TIME SPAN:
                 BEGIN: 27-SEP-1999 01:00:00.000 ET   DOY:  99-270
                        27-SEP-1999 00:58:55.818 UTC  DOY:  99-270
                        1/05187780:83:6:4       SCLK
                   END: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
 SIGNIFICANT EVENTS:

   Io 24 closest approach:
     11-OCT-1999 04:34:06.72 ET (04:33:02.53 UTC, 1/05207931:13:8:0 SCLK)
     Altitude:   611.3 km +/- 0.011 km
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     Latitude:    4.507 deg. +/- 0.003 deg
                        (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     11-OCT-1999 02:03:41.50 ET (02:02:37.31 UTC, 1/05207782:34:9:4 SCLK)
     Range to Jupiter from S/C:  396600.93 km (5.54749 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD271/sateph.OD271.nio
  Epoch file:         /usr/nav/od/deliveries/OD271/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991121.pt000201
  P-file              /usr/nav/traj/pfiles/dpfil-991125-od271-i25-enc.nio

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                      RECONSTRUCTION FOR ORBIT 25
 COMMENTS:  Reconstruction for Io 25
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-277

 TIME SPAN:
                 BEGIN: 12-NOV-1999 01:00:00.000 ET   DOY:  99-316
                        12-NOV-1999 00:58:55.817 UTC  DOY:  99-316
                        1/05253293:04:1:1       SCLK
                   END: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
 SIGNIFICANT EVENTS:

   Io 25 closest approach:
     26-NOV-1999  04:06:25.06 ET (04:05:20.88 UTC, 1/05273415:80:7:5 SCLK)
     Altitude:    300.484 km +/- 0.412 km
     Latitude:    -76.383 deg. +/- 0.0025 deg.
                        (Io-centered, Io True Equator of Date)
   Jupiter Periapsis:
     26-NOV-1999 02:09:53.86 ET (02:08:49.68 UTC, 1/05273300:58:9:5 SCLK)
     Range to Jupiter from S/C:  405572.12 km (5.67297 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD277/sateph.OD277.nio
  Epoch file:         /usr/nav/od/deliveries/OD277/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt000309
  P-file              /usr/nav/traj/pfiles/dpfil-000102-od277-e26-enc.nio

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                      RECONSTRUCTION FOR ORBIT 26
 COMMENTS:  Reconstruction for Orbit 26
            ET minus UTC is 64.184 seconds as of January 1, 1999.

 TRAJECTORY BASIS/OD SOLUTION:  OD-281

 TIME SPAN:
                 BEGIN: 24-DEC-1999 12:01:04.184 ET   DOY:  99-358
                        24-DEC-1999 12:00:00.000 UTC  DOY:  99-358
                        1/05313762:24:5:7       SCLK
                   END: 01-FEB-2000 20:00:00.000 ET   DOY:  00-032
                        01-FEB-2000 19:58:55.816 UTC  DOY:  00-032
                        1/05369778:75:2:5       SCLK
 SIGNIFICANT EVENTS:

   Europa 26 closest approach:
     03-JAN-2000  18:00:46.77 ET (17:59:42.59 UTC, 1/05328359:72:2:3 SCLK)
     Altitude:    351.077 km +/- 0.015 km
     Latitude:    -47.345 deg. +/- 0.001 deg.
                        (Europa-centered, Europa True Equator of Date)
   Jupiter Periapsis:
     04-JAN-2000 03:33:54.78 ET (03:32:50.60 UTC, 1/05328926:57:2:6 SCLK)
     Range to Jupiter from S/C:  413330.37 km (5.78149 Rj)

 INPUT FILES:
  Planetary eph file: /usr/nav/od/deliveries/OD261/eph.OD261.nio
  Satellite eph file: /usr/nav/od/deliveries/OD281/sateph.OD281.nio
  Epoch file:         /usr/nav/od/deliveries/OD281/epoch
  GIN file            /usr/nav/eph/gin-0198.v205.nio
  STOIC file          /usr/nav/od/stoic/ld991228.pt0000309
  P-file              /usr/nav/traj/pfiles/dpfil-000221-od281-i27-enc.nio

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