SMM C/P   1989 DOY300   131 +/-   0 degrees

height = h + velocity*time   # data points =   4

Top of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

6.00

5.50

5.00

4.50

4.00

3.50

3.00

2.50

2.00

1.50

1.00

5.00   5.30   6.00   6.30   7.00   7.30   8.00
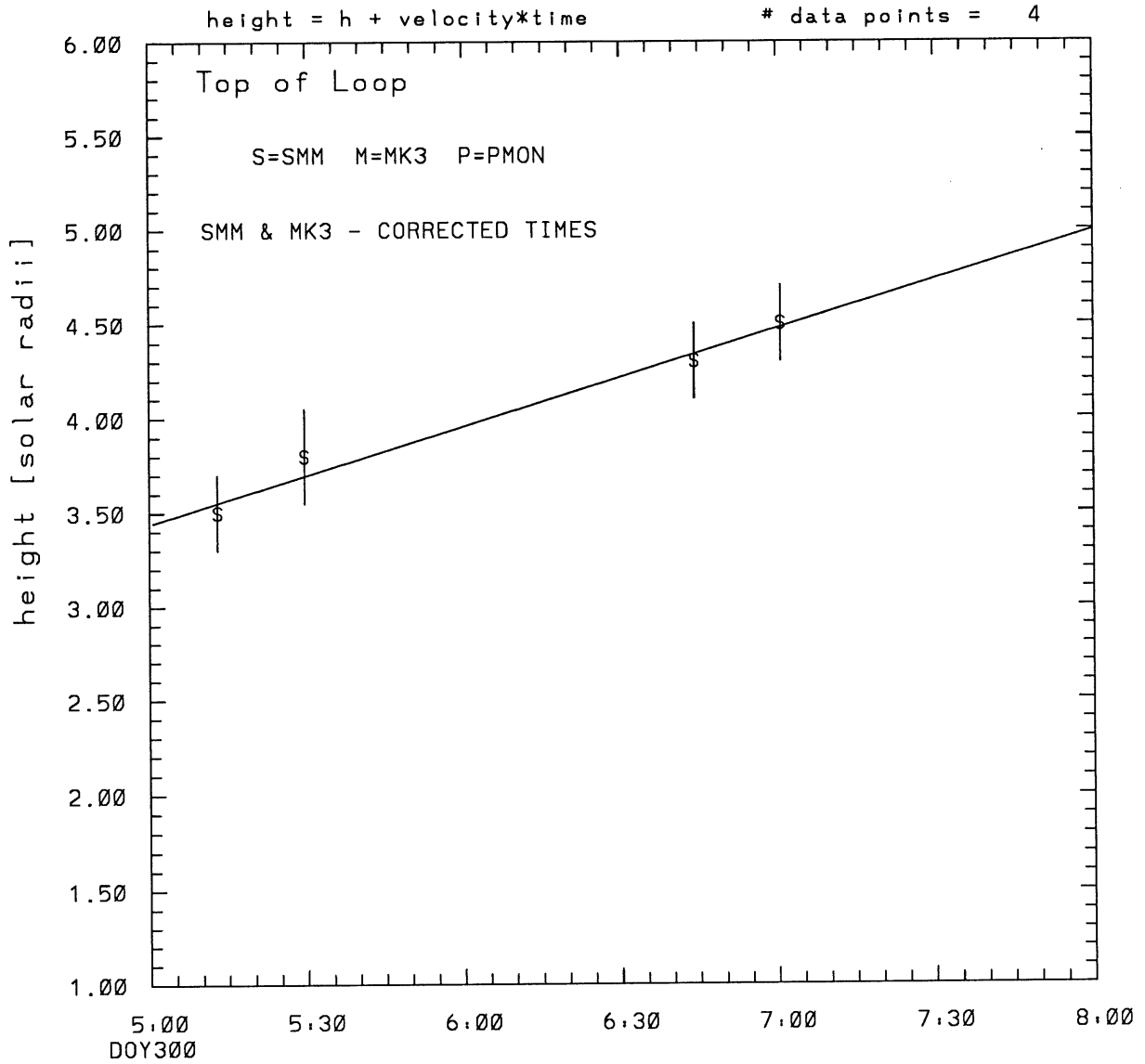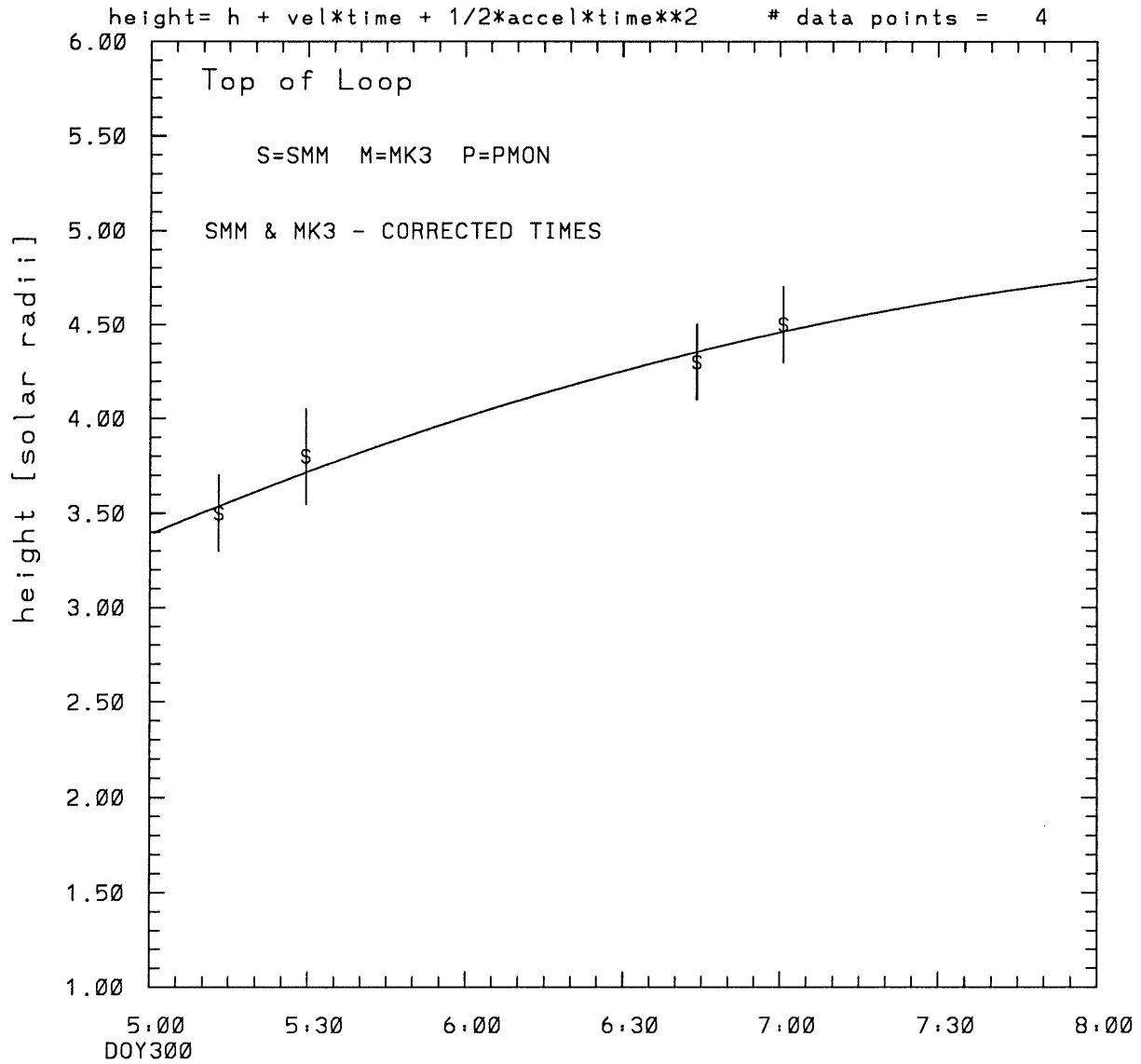DOY300

tstart=DOY300   0:17 +/-   11.7 [min.]
radial velocity= 100. +/-   8. [km/sec]

SMM C/P 1989 DOY300 131 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   4

Top of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00

5:00   5:30   6:00   6:30   7:00   7:30   8:00
DOY300

tstart=DOY300 2:25 +/-   252.7 [min.]

radial acceleration= -0.0089 +/-   0.0198 [km/sec**2]

SMM C/P 1989 DOY300 131 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   4

Top of Loop

SMM & MK3 - CORRECTED TIMES

RADIAL velocity (km/sec)

135.
130.
125.
120.
115.
110.
105.
100.
95.
90.
85.
80.
75.
70.
65.
60.
55.
50.
45.
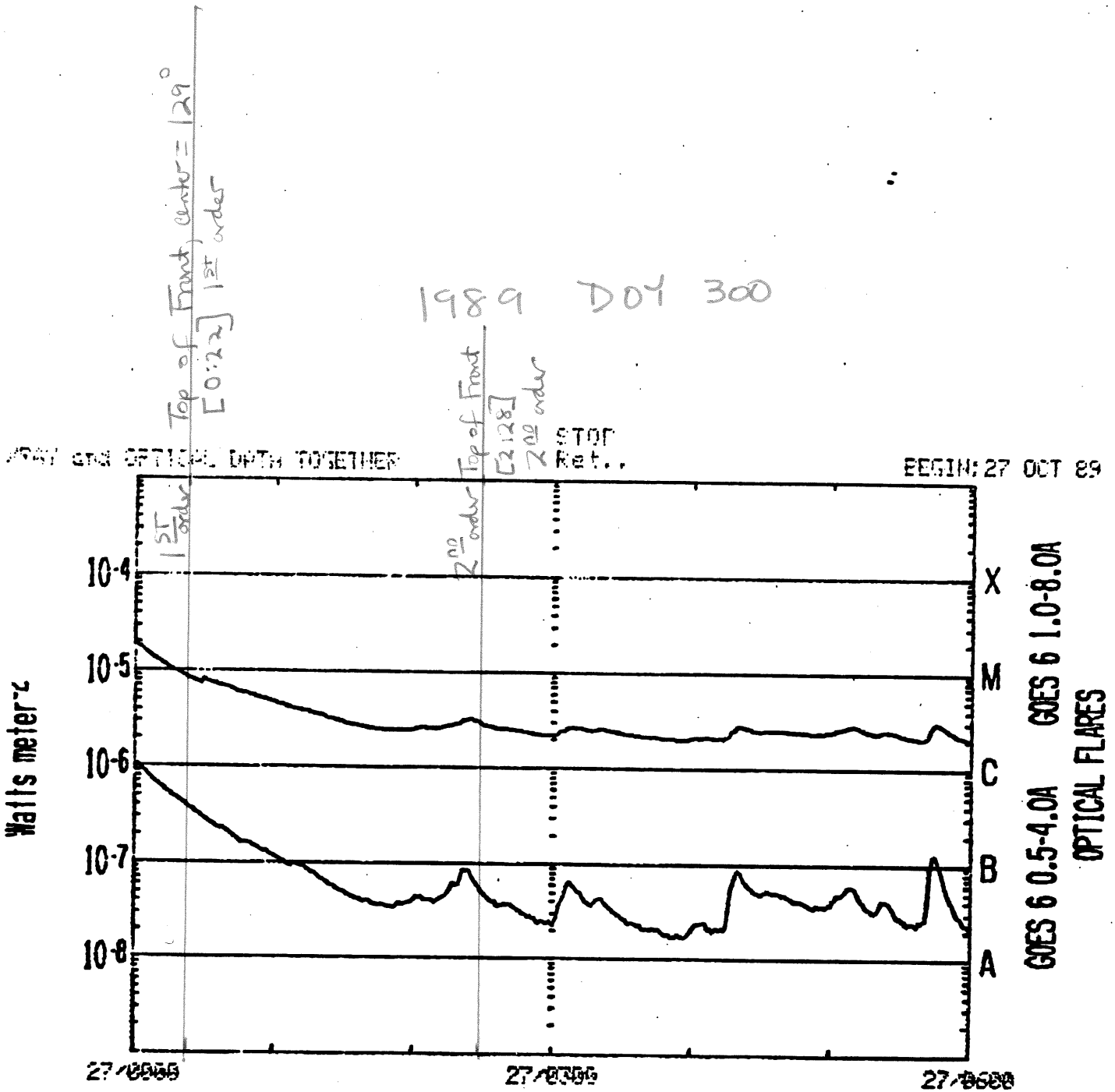40.
35.

5:00   5:30   6:00   6:30   7:00   7:30   8:00
DOY300
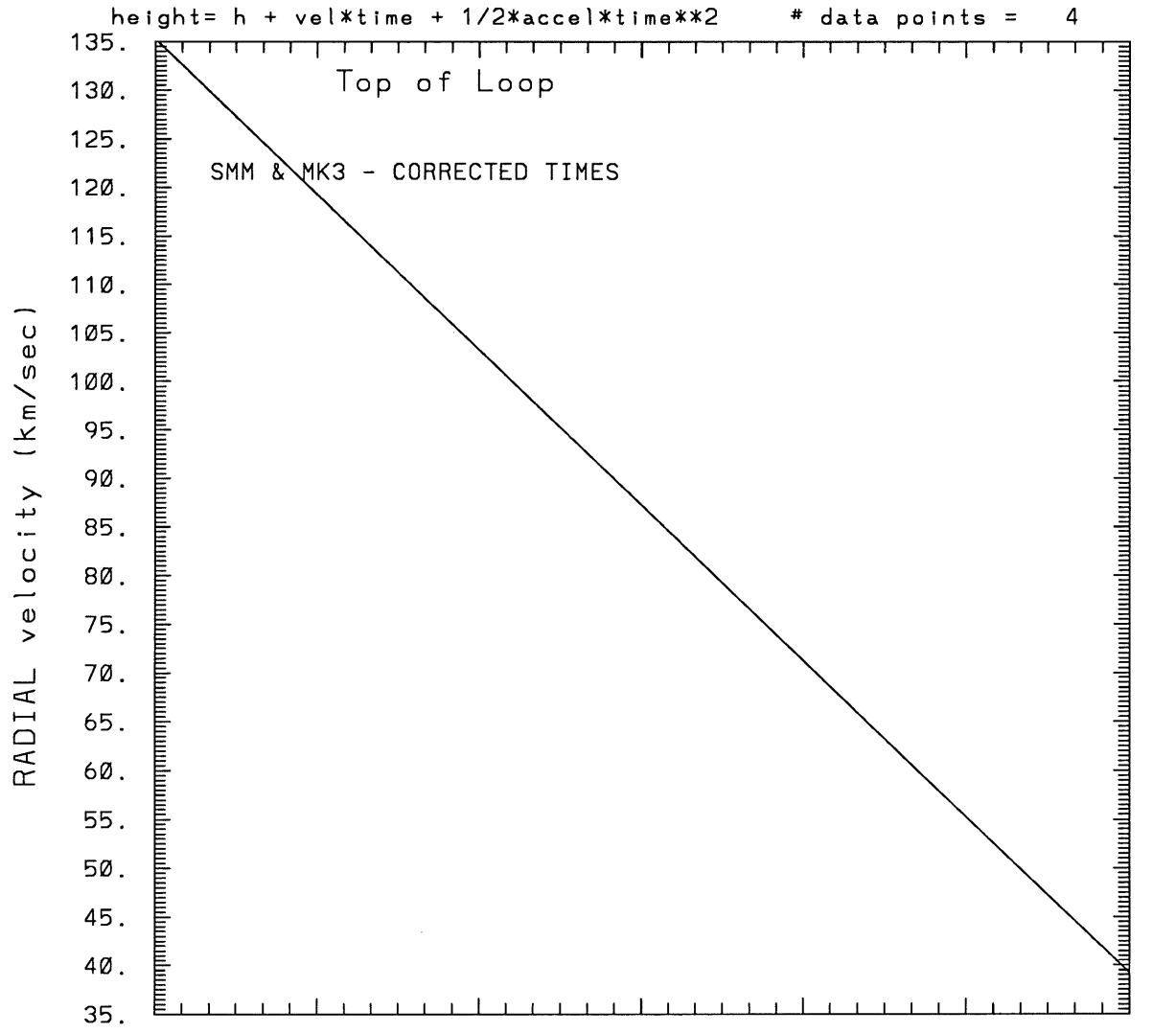
tstart=DOY300   2:25 +/-   252.7 [min.]

radial acceleration=-.889E-02 km/sec**2

GOES-6 1 MIN DATA: OPTICAL FLARE DUR. IMP. REGION

```
*********************
 This is a 1 order run
*********************

*******
 INPUT:
*******
```

```
                                   error in      error in
    year doy     time     radii   radius      angle    angle    datatype
    1989 300   5:13: 3   3.50 +/- 0.20     131.0 +/-  1.0       SMM
    1989 300   5:29:33   3.80 +/- 0.25     131.0 +/-  1.0       SMM
    1989 300   6:44: 9   4.30 +/- 0.20     131.0 +/-  1.0       SMM
    1989 300   7: 0:39   4.50 +/- 0.20     131.0 +/-  1.0       SMM
```

```
*****************************************
 Structure being measured:
Top of Loop
*****************************************

********
 OUTPUT:
********

START TIME:
```

Event began at t = 0 + -0.283E+03 +/- 0.117E+02 [minutes]
In more convenient units:
Event began at DOY 300   0:17 +/- 0.117E+02 [minutes]

Origin defined at DOY300 5: 0

RADIAL INFORMATION:

RADIAL VELOCITY =   100. +/-   8. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

```
  c(1) =     0.344E+01 +/-    0.590E-01 [solar radii]
  c(2) =     0.862E-02 +/-    0.696E-03 [radii/min]
  c(2) =     0.100E+03 +/-    0.808E+01 [km/sec]
  c(3) =     0.000E+00 +/-    0.000E+00 [radii/min**2]
  c(3) =     0.000E+00 +/-    0.000E+00 [km/sec**2]
```

The computed ERRORS in coefficients [BEVINGTON] are:

```
              error in c(1)=  0.77863E-01 [radii] see Bevington pg. 114
              error in c(2)=  0.95757E-03 [radii/min] see Bevington pg. 114
```

ANGULAR INFORMATION:

ANGULAR VELOCITY = 0.0000E+00 +/-   0.0000E+00[radians/sec]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

```
  a(1) = 131. +/-    0. [degrees]
  a(2) =     0.000E+00 +/-    0.000E+00 [degrees/min]
  a(2) =     0.000E+00 +/-    0.000E+00 [rad/sec]
  a(3) =     0.000E+00 +/-    0.000E+00 [degrees/min**2]
  a(3) =     0.000E+00 +/-    0.000E+00 [rad/sec**2]
```

The RADIAL velocity at 5:13 =   100. km/sec

The RADIAL velocity at 5:29 =   100. km/sec

The RADIAL velocity at 6:44 =   100. km/sec

The RADIAL velocity at 7: 0 = 100. km/sec

****
 The following info is for estimating goodness of the fit
****

Fit is ok [ier=1]

Standard Deviation in the height = 0.46
Standard Deviation in start time measurement =   0.463E+02
Error in time =   0.14547E+02 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.428E-02
Reduced Chi Squared = 0.155E-01
Chi Squared = 0.310E-01
The probability for exceeding chi square = 0.996E+00

The correlation coefficient =   0.988E+00
The probability that no LINEAR correlation exists between the variables =   0.1212]
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

```
      **********************
       This is a 2 order run
      **********************

      *******
       INPUT:
      *******


                                  error in       error in
      year doy      time    radii   radius      angle   angle   datatype
      1989 300    5:13: 3   3.50 +/- 0.20      131.0 +/-  1.0     SMM
      1989 300    5:29:33   3.80 +/- 0.25      131.0 +/-  1.0     SMM
      1989 300    6:44: 9   4.30 +/- 0.20      131.0 +/-  1.0     SMM
      1989 300    7: 0:39   4.50 +/- 0.20      131.0 +/-  1.0     SMM


      ******************************************
       Structure being measured:
      Top of Loop
      ******************************************

      ********
       OUTPUT:
      ********

      START TIME:

       Event began at t = 0 + -0.157E+03 +/-  0.253E+03 [minutes]
       In more convenient units:
       Event began at DOY 300  2:25 +/-  0.253E+03 [minutes]

       Origin defined at DOY300  5: 0

      RADIAL INFORMATION:

      RADIAL ACCELERATION = -0.889E-02 +/-  0.198E-01 km/sec**2

      The computed RADIAL coefficients and errors FROM NLLST2 are:

       c(1) =     0.339E+01 +/-     0.130E+00 [solar radii]
       c(2) =     0.117E-01 +/-     0.683E-02 [radii/min]
       c(2) =     0.135E+03 +/-     0.792E+02 [km/sec]
       c(3) =    -0.230E-04 +/-     0.512E-04 [radii/min**2]
       c(3) =    -0.889E-02 +/-     0.198E-01 [km/sec**2]

       The computed ERRORS in coefficients [BEVINGTON] are:

          Approximate error in c(1) =  0.20481E+00 [radii] Bevington pg 154 (8-30)
                Exact error in c(1) =  0.77045E-01 [radii] Bevington pg 154 (8-28)
          Approximate error in c(2) =  0.10314E-01 [radii/min] Bevington pg 154 (8-30)
                Exact error in c(2) =  0.47588E-02 [radii/min] Bevington pg 154 (8-28)
          Approximate error in c(3) =  0.76577E-04 [radii/min**2] Bevington pg 154 (8-30)
                Exact error in c(3) =  0.35899E-04 [radii/min**2] Bevington pg 154 (8-28)

      ANGULAR INFORMATION:

      ANGULAR ACCELERATION=  0.0000E+00 +/-   0.0000E+00[radians/sec**2]

      The computed ANGULAR coefficients and errors FROM NLLST2 are:

       a(1) = 131. +/-    0. [degrees]
       a(2) =    0.000E+00 +/-     0.000E+00 [degrees/min]
       a(2) =    0.000E+00 +/-     0.000E+00 [rad/sec]
       a(3) =    0.000E+00 +/-     0.000E+00 [degrees/min**2]
       a(3) =    0.000E+00 +/-     0.000E+00 [rad/sec**2]

      The RADIAL velocity at  5:13 =  128. km/sec
```

The RADIAL velocity at 5:29 = 120. km/sec

The RADIAL velocity at 6:44 =   80. km/sec

The RADIAL velocity at 7: 0 =   71. km/sec


```
**********************************************************
 The following info is for estimating goodness of the fit
**********************************************************
```

Fit is ok [ier=1]

Standard Deviation in the height = 0.46
Standard Deviation in start time measurement =   0.463E+02
Value of reduced Chi Squared returned from nllst2 = 0.583E-02
Reduced Chi Squared = 0.310E-01
Chi Squared = 0.310E-01
The probability for exceeding chi square = 0.939E+00

For a second order fit 3 correlation coefficients are given:
  (Using equation of motion: $r = a + bt + at^2$)
The correlation between the data and the term linear in time =   0.1007E+01
The correlation between the data and the time**2 term =   0.9851E+00
The correlation between the data and the complete equation of motion=0.9836E+00
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]