

AO-40 on 13. 12. 2000 at 11:20 UTC

by M. Kasal

We had two sets of KEPS:

1. by James R. Miller based on ranging after 1. burn Attempt #2 (12. 12. 2000):

```
AO-40
1 26609U 00072B 00346.67280000 .00000000 00000-0 00000-0 0 89
2 26609 6.4207 239.2459 8088586 192.0906 0.4805 1.25602300 521
```

2. by NORAD based on multiple tracking (20. 12. 2000)

```
AO-40
1 26609U 00072B 00354.78150463 .00000000 00000-0 00000-0 0 124
2 26609 6.2479 237.0656 8128421 195.4843 97.8395 1.26834511 611
```

From both sets (of course, in Norad case back in the time) the satellite position is the same at the time of incident (13. 12. 2000 at 11:20:28):

AO-40 J. R. MILLER

Time: 11:20:47
 MA = 68
 Subsatellite point:
 Long: 17°41'W
 Lat: 0°26'S
 Altitude: 49186 km
 P = 1146,476 min
 SMA = 36285,80 km
 Hp = 557,719 km
 Ha = 59257,89 km
 True anomaly f = 163,0539735 deg
 r = 55447,76 km
 V₁ = 1841,870 m/s
 α₁ = 43,82 deg

AO-40 NORAD

Time: 11:20:47
 MA = -187 (255 - 187 = 68)
 Subsatellite point:
 Long: 17°50'W
 Lat: 0°23'S
 Altitude: 49042 km
 P = 1135,338 min
 SMA = 36050,41 km
 Hp = 369,118 km
 Ha = 58975,69 km
 True anomaly f = 163,2907186
 r = 55226,18 km
 V₂ = 1838,055 m/s
 α₂ = 43,46 deg

Conclusion: The satellite velocity was changed $\Delta V = V_2 - V_1 = -3,82$ m/s. At the moment of incident the spacecraft has been influenced by vector $V_x = 12,17$ m/s in direction **108 deg** to the original velocity V_1 .

