

ground-based interference was determined to be constant for all the approaches. But often the interference source might as well be intermittent.

The achieved position accuracy was good (see figure 17), although the lower number of satellites due to the loss of the line-of-sight of low-altitude satellites to the east and to the west of the flown approach increased the error level. At a distance of 1.5 nautical miles from the runway threshold, a shadowing of one satellite by the aircraft caused a deviation in the along-track error.

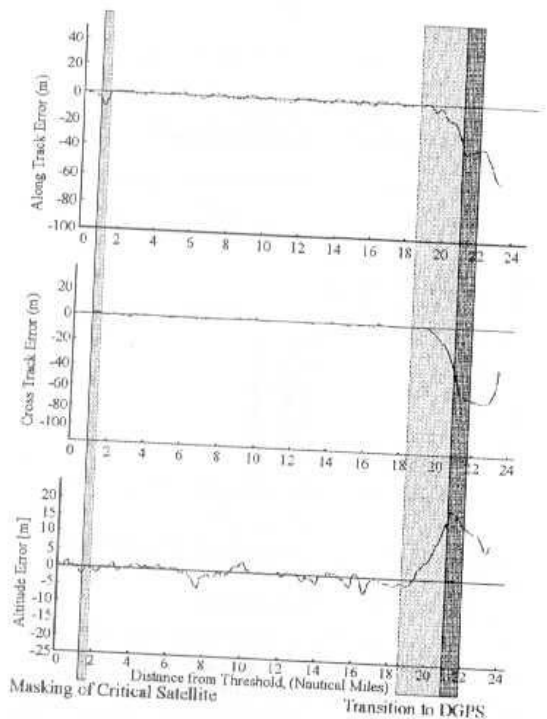


Figure 17: Accuracy during a typical approach

The number of satellites visible from the user station decreases as the aircraft descends toward the threshold. In this case, due to the positioning of the reference station, the number of satellites used for positioning after the transition to DGPS depends mainly on the number of corrections from the ground. Therefore the measurement redundancy needed to allow aircraft maneuvers with subsequent shadowing of further satellites is limited.

6.2 Integrity

6.2.1 Flight Tests

Since the integrity monitoring algorithms are evaluated using simulated errors that are introduced into the measurements, a part of

the flight path has to be chosen that contains at least six received satellites (i.e. the minimum requirement for RAIM).

The figure 18 illustrates the horizontal flight path and in figure 19 the height above ground of the particular flight test that is used for the evaluation of the integrity monitoring is displayed.

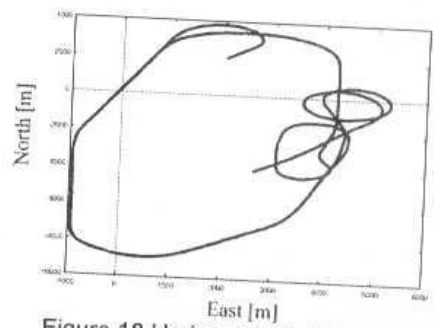


Figure 18 Horizontal Flight Path

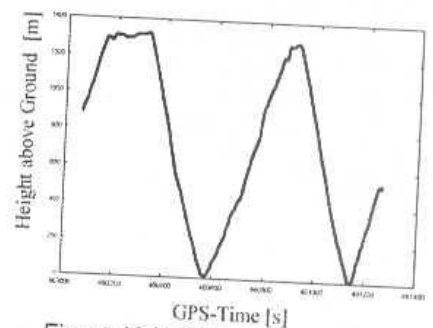


Figure 19 Height above Ground

The figure 20 displays the number of received satellites during that particular flight test. There is only a short time interval, in which six or more satellites are received. Only during this very short period, RAIM can be performed. Only a very small part of the flight test program is usable.

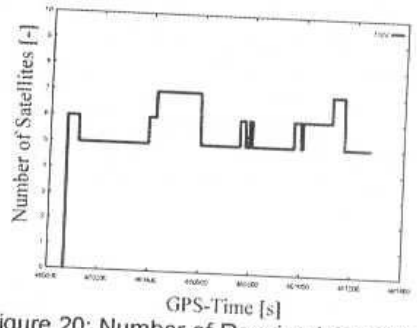


Figure 20: Number of Received Satellites

The errors that have been simulated onto the measured pseudoranges are selected according to the satellite constellation that is depicted in figure 21. The table 1 contains the parameters for the three simulations.