

## 4: EGNOS DEMONSTRATES POTENTIAL ENVIRONMENTAL BENEFITS FOR CITY AIRPORTS

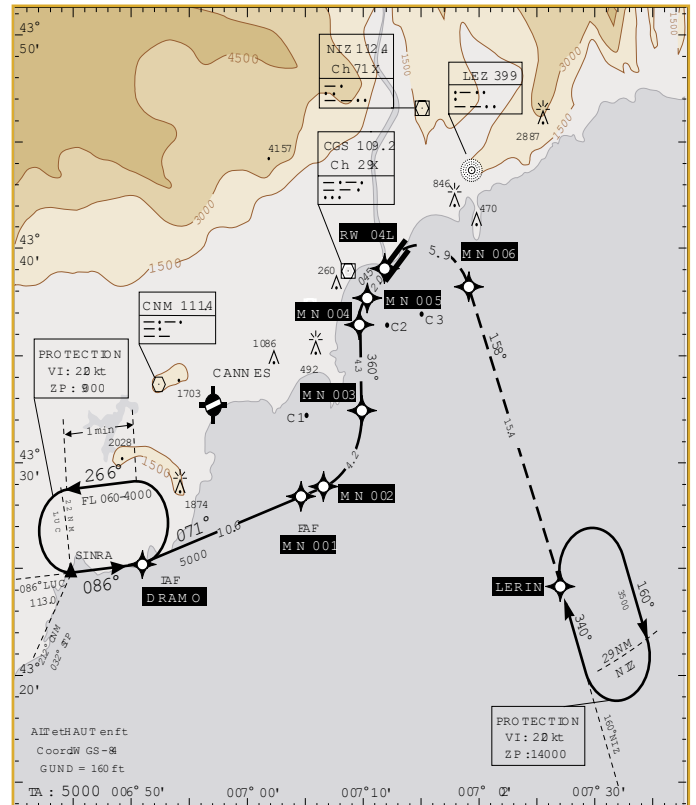
**E**UROCONTROL conducted flight trials at Nice in September 2001 that demonstrated how EGNOS could facilitate curved approaches, improving safety and reducing aircraft noise for local inhabitants.

Today, aircraft have a choice when approaching Nice airport: they either choose a visual approach along the Cap d'Antibes peninsula followed by a sharp unguided turn - a complex manoeuvre; or, under poor visibility, they choose an ILS Cat-I approach straight over the peninsula - raising many noise complaints from local residents.

Hence, EUROCONTROL considered this to be an ideal opportunity to test an EGNOS-based curved approach with vertical guidance as part of its operational validation activities.

Working together with the French DGAC, they designed a bespoke curved approach procedure for Nice based on draft and existing design criteria (see right). There are curves in this that can only be flown by aircraft with state-of-the-art Flight Management Systems (FMS), and vertical guidance is required all along the approach path from a high integrity navigation aid such as EGNOS.

This approach was tested initially using a commercial transport aircraft simulator. Two scenarios were studied: firstly, GPS alone with baro-altimeter to capture the ILS that is then used to land the aircraft; and secondly, EGNOS for the complete procedure. During the tests, it quickly became apparent that the former was not



Experimental Curved Approach Procedure to Nice Airport

possible because the final straight approach was too short to acquire the ILS. Only a navigation aid providing continuous guidance along the approach would allow the Nice procedure to be flown.

The flight-tests took place on 26<sup>th</sup> and 27<sup>th</sup> September 2001 using NLR's Cessna Citation II research aircraft. EGNOS was investigated in two different ways: firstly by applying the ESTB position and integrity data to support flying curved approach procedures; and secondly, by providing ILS look-alike ESTB guidance to fly the standard straight-in approach to Nice over the Cap d'Antibes. The results were processed using real-time kinematic GPS as the truth. From these, it was concluded that the ESTB met the demanding integrity and accuracy requirements for APV II precision approach. Most importantly, the pilots themselves were very complimentary ... "Basically it was easy to fly the curved approaches using guidance from the ESTB ... in general



NLR's Cessna Citation II Research Aircraft

we were very impressed with the guidance from the ESTB system".

EGNOS will facilitate such curved approaches, bringing benefits to pilots and the environment. When EGNOS is fully operational in 2004 it should be possible for suitably equipped aircraft to choose a controlled curved-approach, improving safety and reducing aircraft noise for local inhabitants.also promote competition among receiver manufacturers and product developers.