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MT INTRODUCES NEW OBSTACLE DATABASE

ALL OBSTACLES AT HAND

Until now especially the European rotorcraft sector lacked a complete and trustworthy obstacle database. Moving Terrain recently unveiled their approach to a long awaited solution.

The MT (Moving Terrain) VisionAir X Heli is a well known moving map system and impresses with its brilliant screen (1024x768 resolution) and perfect reproduction of the surrounding landscape. As standard with the Moving Terrain Moving Map systems the user has the choice between several modes: 2D/3D display, split screen and plan view or birds eye view. Another important feature is the independence from cockpit electronics: Batteries provide a complete redundancy in case of loss of the cockpit electronics and allow usage as stand-alone equipment outside the cockpit.

The pilot of a helicopter will find that the MT VisionAir X Heli is a state of the art moving map system! The helicopter's altitude is constantly shown in relation to the digital terrain model and dangerous terrain shows up on the display as an overlay over the basic map. Green, yellow or red colors mark the degree of hazard approaching. It is the very nature of things that mission profiles of helicopters are often located at lower altitudes and adverse weather conditions are often the cause that pilots have to fly at the lowest possible levels. These flight profiles pose the risk of a possible collision with obstacles. This even more the case because the existing representation of obstacles on maps currently used - to put it mildly - do not satisfy the requirements!

It was always the conviction of Moving Terrain AG, to display obstacles on its mov-

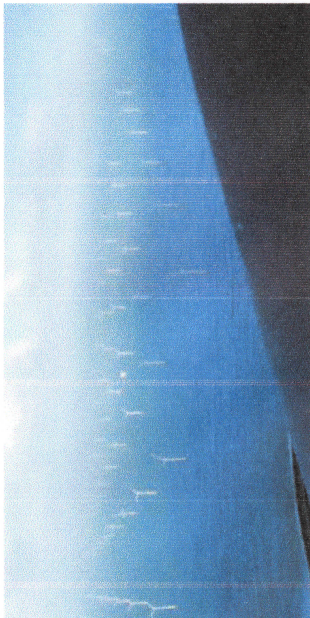
ing map systems. But the greatest obstacle to do so was the fact that there were no functional obstacle data base available!

REGULAR OBSTACLE INFORMATION APPEAR TO BE UNPRECISE

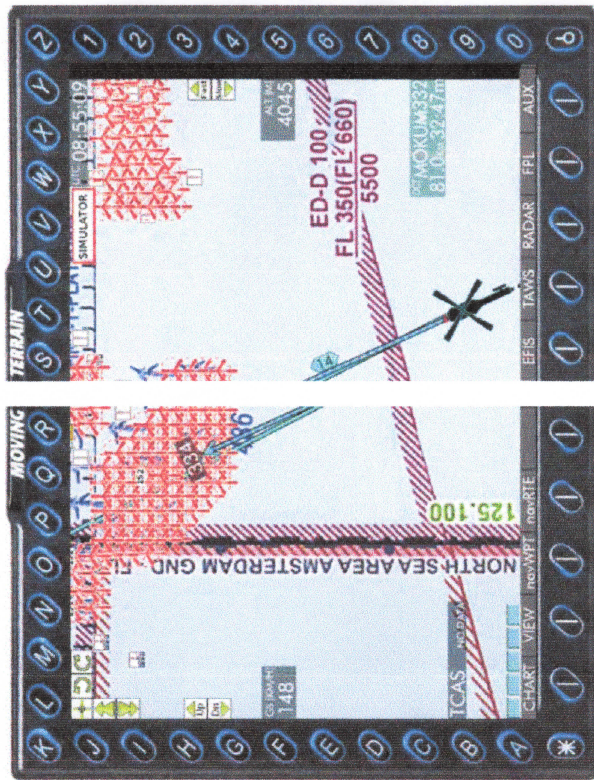
Engineers depend on different countries' Aeronautical Information Publications (AIPs). In Germany for example the AIP contains all obstructions to air navigation with a height of more than 328 ft (100 m) above GND. In addition, the list contains all obstructions with a height of 200 ft (61 m) GND known to the German Army Air Traffic Services Office. But that's the theory anyway! The commonly used ICAO 1:5000000 aviation chart depicts topographical characteristics, legal items, radio beacons and however it does not show power lines.

MT found a new situation in the neighbouring country Switzerland: The Swiss Army and the Federal Bureau for Civil Aviation (BAZL) created a database in a joint effort, meeting exactly these requirements. MT was the first company to integrate the Swiss obstacle database into their Navigation System.

One aim was to show obstacles early enough that the crew has enough time to acknowledge them and implement appropriate measures. The solution is to first show an obstacle when 5 nm away from it. At this distance a realistic and to-scale depiction is not necessary and any obsta-



WHAT YOU SEE IS WHERE YOU FLY
The 4ROTORS test took place over the North Sea, where offshore wind farms spread more and more. The windmills on the open water (right) equal in numbers and positions to the screen (below).



will be used. This ensures that no obstacle is left out and importantly that the official data is "on top". The archived obstacles have a height from down to 25m, with line-obstacles (power-lines, cables, cable-cars) it can be even lower.

Moving Terrain invited 4ROTORS again to be engaged in a demonstration flight. It was the intention of the company to demonstrate the evidence of the capacity of the newly developed and installed obstacle database to meet the requirements.

For this reason the selected routing ought to pass most different types of obstacles and furthermore prove the coverage of other countries beside Germany. Therefore a flight was scheduled on February 23rd with the point of departure being the airfield of Emden (EDWE). The area of Emden is ideal to show offshore windparks, onshore windmills, masts, antennas, powerlines, a selected transformer station and furthermore to show the indication of obstacles in the Netherlands.

EVERY KIND OF OBSTACLE A HELICOPTER CREW CAN EXPECT

The weather conditions for the flight gave exactly the right setting: Blue sky changing with a low cloud ceiling and at first good visibility deteriorating to poor visibility in heavy rain showers accompanied by strong gusts! As the moving map displays the waypoint, the course and distance, navigation is simple. Soon we discovered the first windmills: total height above water 148 m, height of hub 90 m and rotor diameter 116 m. We saw just about every

kind of obstacle a helicopter crew can expect during flight.

To summarize the findings of this flight it can be reported that, the obstacles are displayed exactly and their position on the display is congruent with its actual location. A legend of all symbols informs the crew what kind of obstacle they have to expect and the solution to display the obstacles in a two-way-approach - first indication at a distance of 5 nm, then a realistic representation when the distance drops below 1 nm - is practicable.

Moving Terrain has invested a lot of time, effort and money in setting-up something that had until then not existed: an obstacle database that covers Europe. Our demonstration flight showed that it actually works on the MT VisionAir X Heli with every kind of obstacle! The indication or warning takes place in time - this gives the crew the chance to take appropriate action. We had the opportunity to participate in a demonstration flight in the north-western part of Germany - as a result of our positive experience we can assume that we would face the same excellent findings when flying in Norway or Gibraltar or anywhere else.

At the yearly EASA Rotorcraft Symposium, we sadly learnt that the rate of helicopter accidents is still worrying high. The MT VisionAir X Heli with an integrated Moving Terrain obstacle database is an appropriate tool to prevent accidents caused by collisions with obstacles and is therefore a recommendable piece of equipment to improve flight safety for low flying helicopters.

WOLFGANG BERTHOLD