THIRTEENTH EUROPEAN ROTORCRAFT FORUM

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ROMEO RADAR

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THOMSON-CSF - FRANCE

September 8 - 11, 1987

ARLES - FRANCE

ROMEO is a radar for use on board helicopter which has been designed to ensure low altitude navigation safety by day and by night whatever the weather conditions.
The need of the best compromise between the equipment size, the propagation and the resolution aspect has led to choosing the millimeter waves domain.

A brief review of the characteristics of millimeter waves propagation. highlight the initial problem atmospheric attenuation. Its evolution
SLIDE 1 in according to the frequency are shown on the graph. The millimeter domain, on the left is characterized by areas improved visibility, in particular at 94 GHz.

Rain attenuation, is virtually constant from the millimeter to the visible waves. Where as fog attenuation increases very rapidly with
SLIDE 2 frequency to the domain of optical sensor.
In addition, for a given antenna size, shorter is the waves lenght the better the angular resolution.

ROMEO is based on continuous waves linear frequency modulated technic.
SLIDE 3 It is designed around 94 GHz solid state transmitter. Its characteristic gives ROMEO the require energy and resolution features for the detection of small obstacles.

Its angular and range resolution make it possible to detect and identify
SLIDE 4 cables and pylons. ROMEO will be able to detect trees, ground relief, building, antennas, OFF shore rigs, ship superstructure.

ROMEO explores a domain of 90° of azimut and 30° in elevation over a
SLIDE 5 range on 1 kilometer, depending on the solid state transmitter power. The scanning system and the processing allow to obtain a real time radar image.

First flight trials, at the beginning of 1987 validate ROMEO capability for detecting obstacles whatever the weather conditionS.
This picture represent a three damage display. Distances are represented
SLIDE 6 by varying colour, light colour corresponding to the maximum distance. The red color is used to highlight the obstacles such as aerial cables. The following pictures have been done during last flight trials. New flight trials are planned for September with an increased scanning rate.

VIDEO

(10') Conclusion

Presently ROMEO is not a final product. This is a THOMSON-CSF technology and know how. Further studies are being carried out to improves pictures interpretation and to match the operationnal requirements as part of military mission.