

## **A new service for road maintenance : ATMOROUTE on Personal Computer**

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### **Abstract**

ATMOROUTE is the outcome of a long collaboration and experimentation which began in 1986 between Meteo France, the Centres Techniques de l'Équipement, the road services of the Directions Départementales de l'Équipement and the French motorway companies; this new service proposed by M.F is now operational; it allows the road users to get small scale weather forecast on a PC, or 1000 km<sup>2</sup> areas with homogeneous climatic conditions, by 3 hours steps and at 36 hours' date.

This forecast, that may be real time consulted on Windows Personal Computer, French MINITEL or Fax is renewable every 3 hours with a continuous supervision, carried out by a previsionnist in the nearest center («département» or «région»). The easy use of the proposed system, and the quick understanding of the phenomena make the weather forecasts immediately usable by the manager of the road or motorways network in winter, of road works, human means, use of equipment, ...

The information appears as charts, meteograms, standing for the geographical zone treated by the user; it allows, for instance, to show the forecasted weather for a motorway section and for a set of relevant parameters to the user's activity :

- the main weather phenomenons : rain, snow, fog, ...
- the temperature under shelter
- the wind direction and force
- the clouds, etc...

The system suits the user's need and affords a great flexibility of use. For the winter 95/96, Atmoroute is available over half of France and is used by most of road managers of these régions.

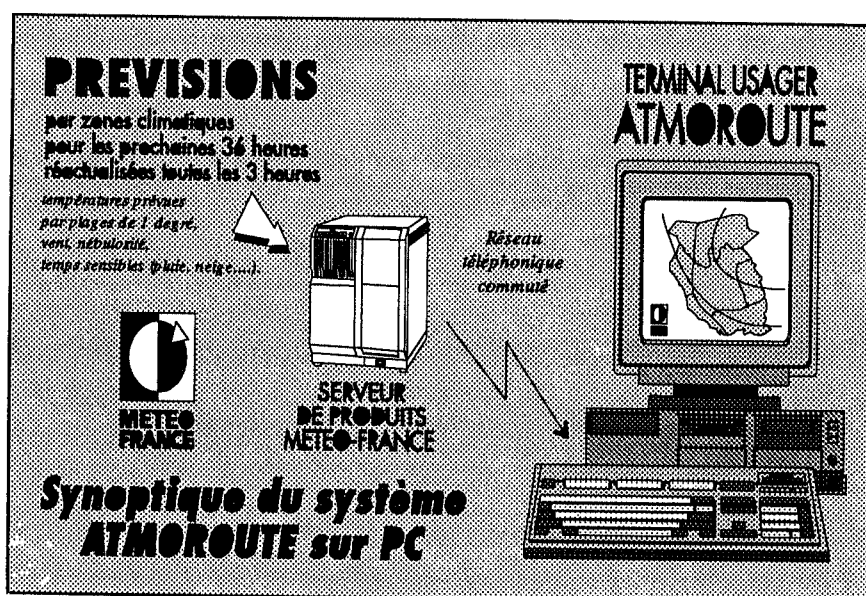
## 1. Atmoroute: A service of weather forecasts for better management of roads

### 1.1. Forecasts in relation with your very activity

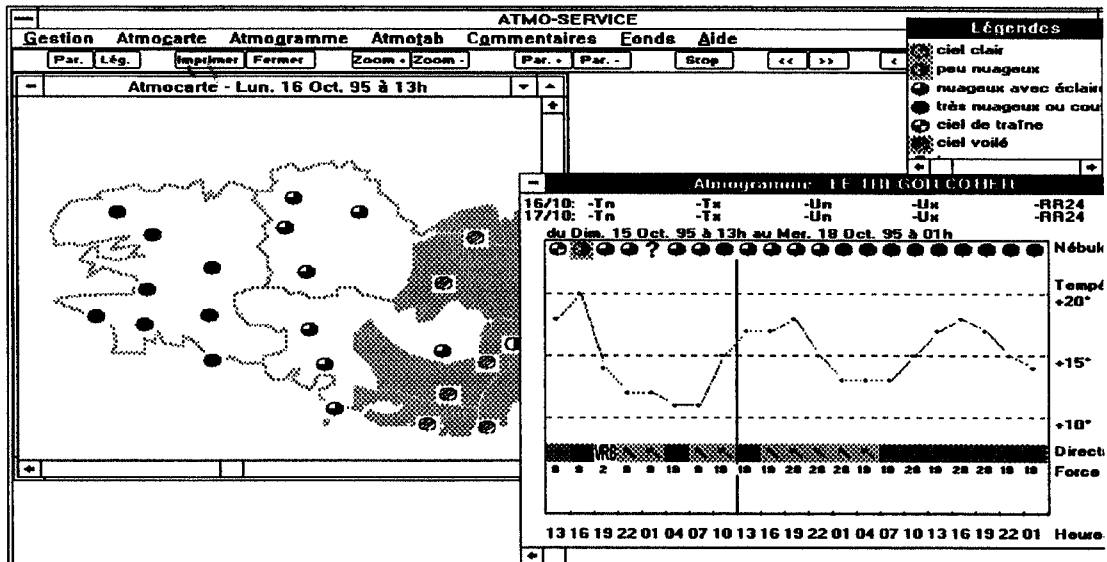
- ◆ Atmoroute is the outcome of a long collaboration between Météo France, the Centres Techniques de l'Équipement, the road services of the Directions Départementales de l'Équipement and the french motorway companies.
- ◆ This system is a complete and renewable service of forecasts, viewing the wole country and narrowly connected with the frame of the road and motorway network.
- ◆ The forecast which is adviewed at very low scale over around 1000 km<sup>2</sup> areas with homogeneous climatic conditions, is available by 3 hours steps and to the duration of next 36 hours; this allow the users to have a good vision of the weather of the day after.

### 1.2. A permanent gestion of the road network

- ◆ Immediatly usable, the information is achieved and renewed every 3 hours thanks to the constant supervision made by a previsionnist in the nearest center of Meteo France, departement or région; this one, is dotted with a good knowledge of the geographical aeras under his control; here is the technical principle:



- ◆ An easy use and a quick understanding due to the only need of a modem and of the telephone network, Atmoroute takes advantage from the typical ergonomics of Windows Soft; it gives a very clear amount of graphics informations, enhanced with the adequate explanation brought by an accurate previsionist.



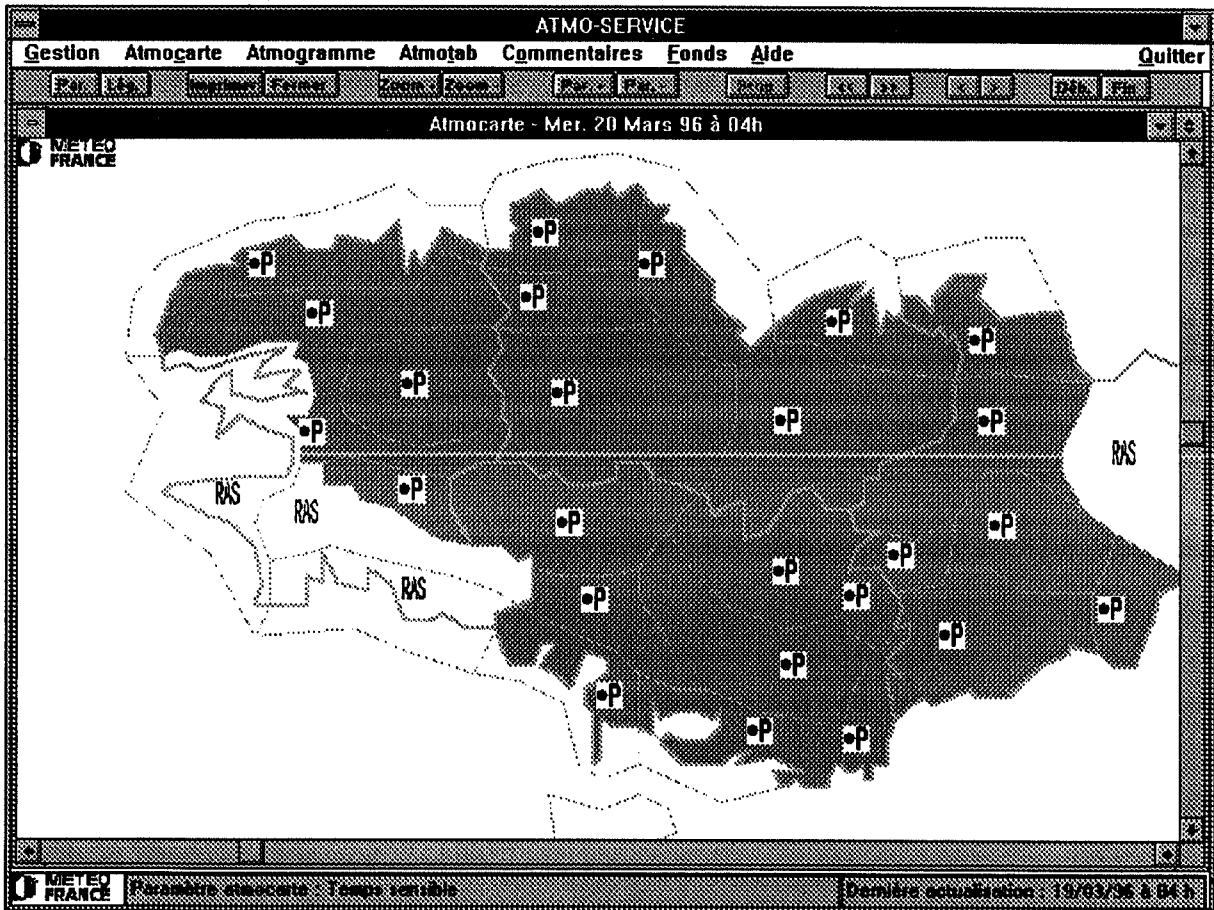
Example of copy screen with chart over Brittany and superposed meteogram over a geographical area.

- ◆ Atmoroute is available through a personal computer and also the French Minitel; the informations are also collected through the fax.
- ◆ A range of parameters suitable for each type of scheme :
  - ⇒ The temperature under shelter (in Celsius graduation)
  - ⇒ The wind force (in km/h)
  - ⇒ The wind direction (in compass card of 16 directions)
  - ⇒ The blasts of the wind (in km/h)
  - ⇒ The clouds
  - ⇒ The border rain/snow around the mountain areas (in meters)
  - ⇒ The peculiar meteorological phenomena, such as mist, fog, drizzle, rain, snow, hail, storm,...
  - ⇒ The lowest or highest temperatures per day (in Celsius graduation)
  - ⇒ The lowest or highest relative humidity per day (in percentage)
  - ⇒ The amount of precipitations per day (in millimeters)

- ◆ A service adaptable to many tests:
  - ⇒ The choice in the meteorological parameters
  - ⇒ The choice in the dates of forecasts
  - ⇒ The choice in the way of informations receptionning (micro-computer, French Minitel or fax)
  - ⇒ The choice in the duration of the availability of the service by the user (from an incidental ask to an annual subscription)
  - ⇒ The choice in the frequency of information receptionning (number of calls or of sendings required)

The informations available on Atmoroute PC appears as charts, meteograms or graphics:

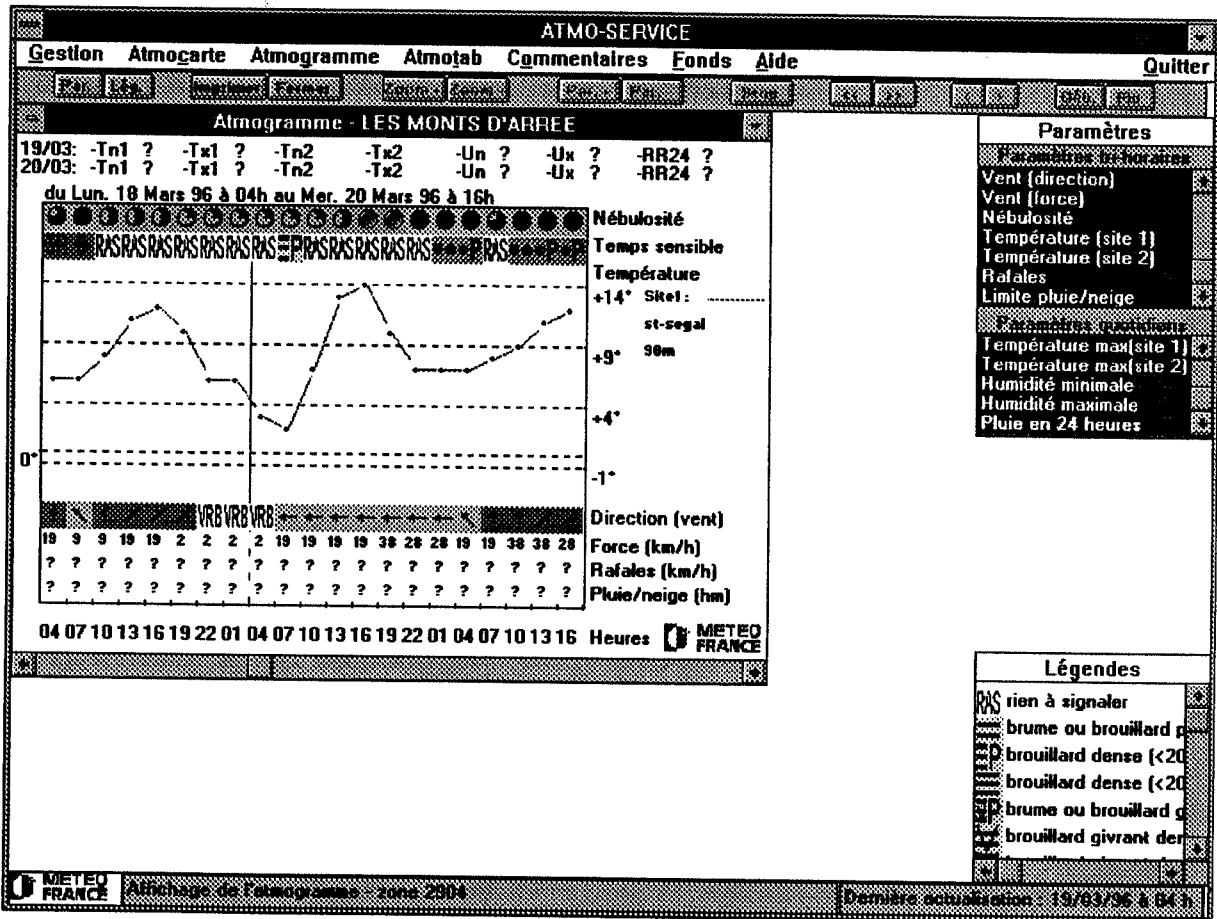
+ The ATMOCARTE provides the parameters studied and anticipated over a departement concerning a precise date; the system can achieve an animation over many dates; it can also superimpose backgrounds of maps such as roads and motorways networks or print the screens which are obtained.



Example of chart, named ATMOCARTE, delivering the weather prevailing over Brittany

+ The ATMOGRAMME presents the evolution within 36 hours trough steps of 3 hours and 6 parameters over a precise geographical area in a departement; it also describes the last 8 observations concerning the area.

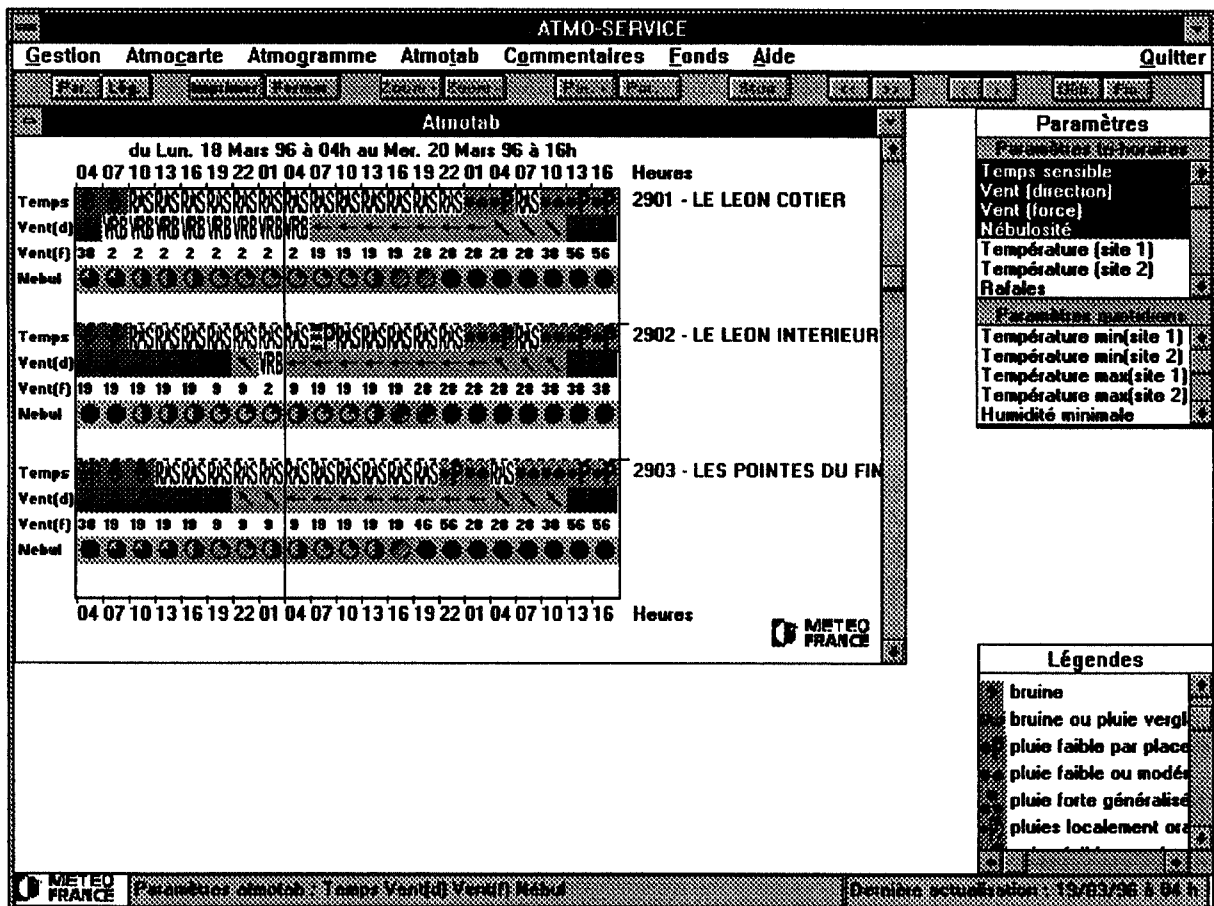
ATMOGRAMME gives to the user the opportunity to have a good cognition of the weather forecast over an area by mean of a glance.



Example of meteogram named « ATMOGRAMME » over a geographical area with , from the top to the bottom, the evolution of cloudiness, tangible weather, temperature and wind.

+ The ATMOTAB describes the evolution , within 36 hours through steps of 3 hours, of the parameters concerning many areas and dates; it also gives in a glance, a space an temporal view of the meteorological informations.

It allows the comparaison of the overseen variations of four parameters in the same time and on each area of the departement.



Example of graphic named ATMOTAB for the parameters : tangible weather, wind and cloudiness over a range of geographical areas of Finistere.

## 2. Future projects

- ◆ This service is for the time being available over half of France and is used by a large majority of the DDE and motorway companies of the départements which are concerned.
- ◆ The extension on the whole of France is being experimented..