

Lior Perez, Météo-France, Toulouse, France *
Pascal Venzac, Météo-France International, Toulouse, France

1 INTRODUCTION

Meteo-France has been developing over the last few years Aeroweb, a meteorological Internet service for flight preparation for aeronautical users.

Recently, Web 2.0 has profoundly changed information access habits: users expect more customized and ergonomic websites. At the same time, new certification and traceability requirements now apply to flight documentation provided via Internet. To meet these new expectations, Meteo-France has developed a new release of its aeronautical system Aeroweb based on a Service-Oriented Architecture.

The new Aeroweb service makes meteorological flight documentation available to light-aviation users in less than a minute, by leveraging automatic calculation features and user-favorite settings. Commercial-aviation users also benefit from specific configuration features and scheduled email transmission.

2 A CUSTOMIZABLE MET WEBSITE FOR FLIGHT PREPARATION

2.1 For light aviation: one-click flight documentation

Light-aviation users are often in a leisure approach. They want their flight preparation to be as easy as possible. As a Weather Agency, Meteo-France's goal is to provide these users with a tool that can generate the official meteorological flight documentation quickly and easily.

Aeroweb¹, Meteo-France's met website for flight preparation, has been designed to achieve this

* *Author address:* Lior Perez, Météo-France,
Direction de la Production, 42 av. Gaspard Coriolis,
31057 Toulouse, France
+33 5 61 07 84 82; e-mail: lior.perez@meteo.fr

¹ <https://aviation.meteo.fr>

goal (Fig. 1). It encompasses many functionalities that allow aviation users to get their documents in one click:

- Users can get an automatic flight documentation by providing their departure and arrival airports. The automatic flight documentation contains all meteorological data produced by airports located within 40 miles around the route (METAR, TAF, SIGMET...), the Significant Weather charts and the Wind-Temperature charts according to user preferences.
- A system of bookmarks and recent flights allows users to get in one click flight documentation for their favorite routes.

The flight documentation can be viewed on screen or converted to pdf for printing.

The Aeroweb website provides other functionalities to make life easier for light-aviation users:

- View of airport observations and forecast on a map
- Permanent view of the METAR, TAF and SIGMET data for the user preferred airport
- Forecast dedicated to visual flights
- Meteorological information for gliders

2.2 For commercial aviation: fully customizable flight documentation

Airline companies have needs that differ considerably from those of light-aviation users. Although these companies need the same kind of official meteorological data that light users need, airline companies have scheduled flights and need the flight documentation to be automatically generated at the scheduled time.

In order to meet these additional needs, Météo-France has developed a different version of Aeroweb, dedicated to commercial-aviation users.

Commercial-aviation users can choose, for each flight:

- Met flight documentation contents
 - o List of ICAO codes for METAR, TAF, SIGMET and similar messages
 - o Domains and validity times for WINTEM and SIGWX charts
- The scheduled time for automatic production and printing

Once the commercial-aviation user has entered his schedule in Aeroweb, he/she no longer needs to refer to the Aeroweb website. Before each flight, he/she will automatically receive the meteorological flight documentation by email or in a printed form via a dedicated software.

3 SERVICE ORIENTED ARCHITECTURE (SOA)

3.1 A web service for third-party information systems

Aeroweb also provides a web service for third-party information systems. This service is available for all aviation users that need meteorological data for their own information systems: airline companies, aeronautical providers, flight schools, Civil Aviation Authority.

This web service enables users to get the following information:

- Met Airport Reports and Forecast (METAR, SPECI, TAF, SIGMET...)
- Significant Weather charts, Wind and Temperature charts (SIGWX, WINTEM)

Users can then merge the provided information into a flight documentation that contains non-meteorological data and display the resulting document on their website (Fig. 2) or other media.

The web service is available through an http request. For instance:

```
https://www.meteofrance.com/FR/aviation/  
serveur_donnees.jsp?  
ID=user_code  
&TYPE_DONNEES=OPMET (data type)  
&LIEUID=LFPG|LFPO (location codes)  
&METAR=yes  
&TAF=no
```

The answer is given in XML format.

3.2 Generation of official aeronautical met data with the Synergie server

One of the important issues when making a flight documentation is to ensure that the met data is valid and up to date. In order to do this, two kinds of operations are required:

- Decode METAR and TAF data according to ICAO amendment 74²
- Generate the WINTEM and SIGWX charts, based on official GRIB and BUFR data

Aeroweb does these operations with the Synergie server. Synergie is a software developed by Meteo-France for its weather forecasters. The Synergie software focuses on weather forecast. This enables the Aeroweb team to concentrate on web developments, and not on generating aeronautic charts. The link between Synergie and the web servers is done via a web service.

The met data are transmitted on a real-time basis by the Transmet messages switching system. For instance, an amendment to a TAF is immediately transmitted and provided to Aeroweb users within a few seconds.

4 CERTIFICATION AND TRACEABILITY REQUIREMENTS

New certification and traceability requirements now apply to flight documentation provided via Internet. ICAO has released a list of Guidelines on the Use of the Public Internet for Aeronautical Applications³. In addition, the European Community has recently increased the certification requirements for all the aeronautical providers, by a legislative approach: the Single European Sky (SES) initiative. All these actions are meant to provide a uniform and high level of safety over the skies, and are necessary to meet future capacity and safety needs.

4.1 Certification

Every Aeroweb component is regularly audited, for compliance with ICAO norms and recommendations:

² Amendment 74 on ICAO Annex 3 defines changes in METAR and TAF syntax and validity rules.

³ *Guidelines on the Use of the Public Internet for Aeronautical Application*,. International Civil Aviation Organisation, document 9855. 1st edition – 2005.

- The Synergie software has been audited by the ICAO World Area Forecast Centre of London for WINTEM and SIGWX generation
- An internal audit checks the entire Aeroweb infrastructure every year

4.2 Traceability

All flight documentation provided by Aeroweb is archived for at least 30 days to comply with ICAO requirements. In case of accidents, the French Civil Aviation Authority can access the archive for inquiry.

5 CONCLUSION

We believe that Aeroweb will encourage the migration of aeronautical culture from traditional tools towards web technologies. The one-click flight documentation fits the needs of light-

aviation users who want fast flight preparation while the flight scheduling service is very practical for commercial-aviation users. The Internet allows fast and accurate access to aeronautical meteorological data from almost anywhere in the world and is likely to become the future of the diffusion of meteorological flight documentation.

6 GLOSSARY

ICAO : International Civil Aviation Organization

METAR : METeoroological Airport Report (alphanumeric)

SIGMET : SIGNificant METEorological Information (alphanumeric)

SIGWX : Significant Weather charts

TAF : Terminal Aerodrome Forecast (alphanumeric)

WINTEM : Wind and Temperature charts

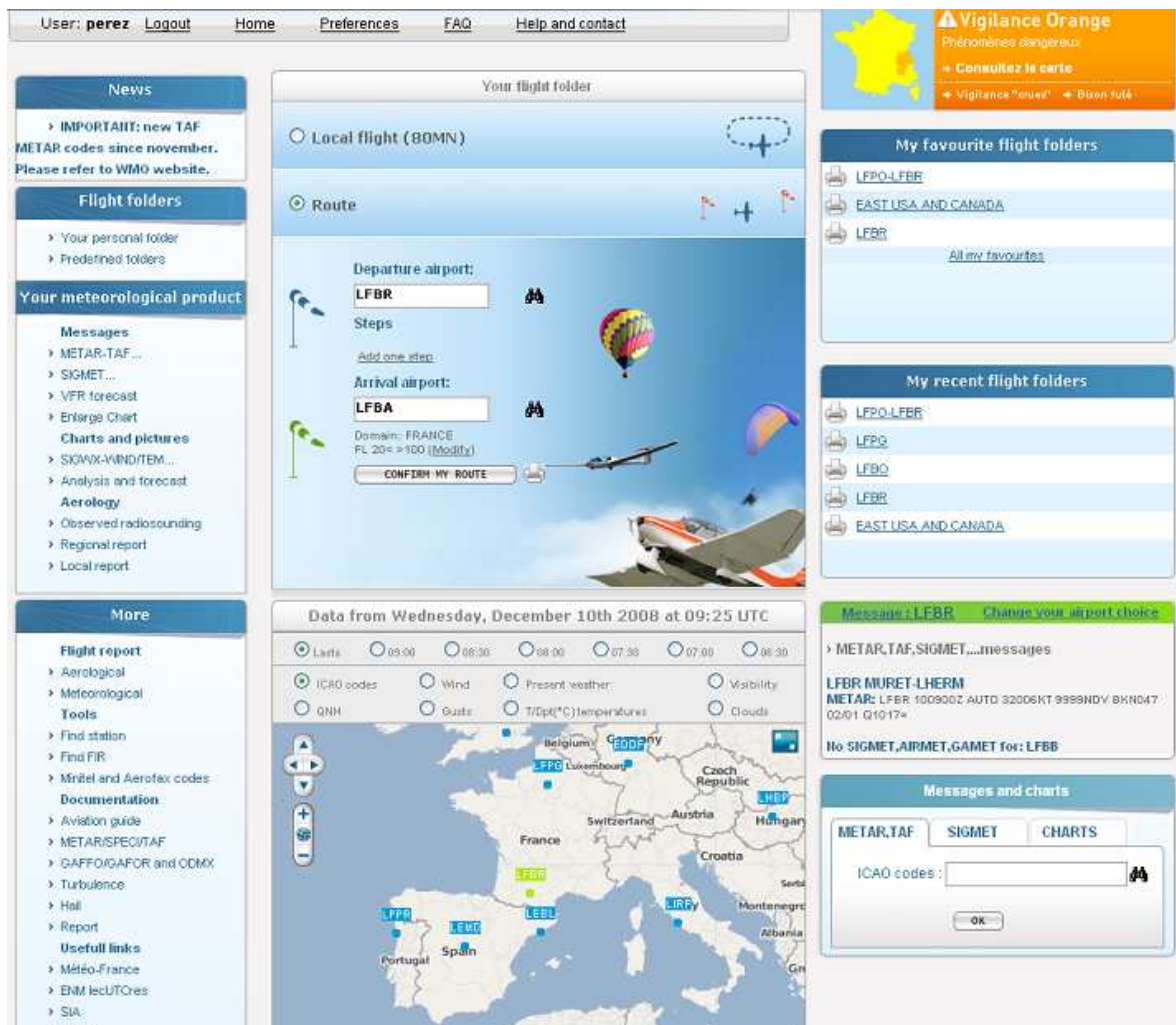



Figure 1 - Aeroweb Home Page for Light-Aviation Users

http://www.aeroclub-clementader.org/index.php?option=com_wrapper&Itemid=39

Qui est en ligne ?
Il y a actuellement 3 invités en ligne



Dossier Météo

Voici les messages météo des plate-formes voisines de Muret, ainsi que les cartes TEMSI et WINTEM. Pour toutes informations complémentaires, et en particulier pour vos navigations plus lointaines, vous pouvez consulter [Aéroweb](#) de Météo-France.

Dossier de vol : GRAND TOULOUSE
Dossier complet en format PDF (pour imprimer)

Cartes

TEMSI-FRANCE-09 UTC
WINTEM-FL020/FL050/FL100-FRANCE-09 UTC
WINTEM-FL020/FL050/FL100-FRANCE-12 UTC
WINTEM-FL020/FL050/FL100-FRANCE-15 UTC

Messages d'aérodrome

AGEN LA GARENNE - LFBA
METAR : METAR LFBA 120900Z 09004KT 9999 OVC018 03/01 Q1018 TEMPO RA=
TAF court : TAF LFBA 120800Z 1209/1218 11005KT 9000 OVC020 TEMPO 1209/1212 6000 RA SCT015 OVC020 BECMG 1212/1214 9999 SCT035=

TOULOUSE FRANCAZAL - LFBF
METAR : METAR LFBF 120830Z 20002KT 5000 BKN020 03/02 Q1018=
TAF court : TAF LFBF 120800Z 1209/1218 VRB02KT 8000 BKN025 BKN035 TEMPO 1209/1212 4000 BR SCT010 BKN015=

TOULOUSE BLAGNAC - LFBO
METAR : METAR LFBO 120900Z 00000KT 9999 BKN020 04/00 Q1018 NOSIG=
TAF long : TAF LFBO 120500Z 1206/1312 VRB02KT 8000 FEW011 BKN025 TEMPO 1207/1215 4000 BR BKN013 BECMG 1218/1221 4000 BR BKN005 PROB40 1221/1306 0400 FG VW/// BECMG 1309/1311 14010KT 9999 NSW SCT008=

PAU PYRENEES - LFBP
METAR : METAR LFBP 120900Z 14002KT 9999 SCT016 BKN029 06/03 Q1017 NOSIG=
TAF long : TAF AMD LFBP 120753Z 1207/1306 13004KT 9999 BKN016 BKN033 TEMPO 1208/1215 BKN012=

MURET L'HERM - LFBR
METAR : METAR LFBR 120830Z AUTO 00000KT 9999NDV BKN018 OVC047 03/00 Q1017=

TARBES LOURDES PYRENEES - LFBT
METAR : METAR LFBT 120900Z 20007KT 9999 BKN015 OVC028 05/02 Q1017 NOSIG=
TAF long : TAF LFBT 120500Z 1206/1306 18005KT 9999 BKN050 BECMG 1206/1208 26005KT=

SAINT GIRONS ANTICHAN - LFCC
METAR : METAR LFCC 120804Z 18003KT 130V210 CAVOK 00/00 Q1016=

CASTRES MAZAMET - LFCK
METAR : METAR LFCK 120900Z 33004KT 9999 BKN038 02/M03 Q1017=

RODEZ MARCILLAC - LFRC
METAR : METAR LFRC 120830Z AUTO 00000KT 9999NDV NSC M04/M05 Q1015=
TAF long : TAF LFRC 120500Z 1206/1306 32005KT CAVOK BECMG 1220/1222 1500 01000 SCT005 PROB40 1225/1226 01000 BKN010 1226/1227 01000 BKN010=

Menu principal
Accueil
Flotte et tarifs
Baptêmes de l'Air
Apprendre à piloter
Nous contacter
Accès

Menu Club
Réservation OpenFlyers
Dossier Météo
Docs avions
Formation
Sécurité des Vols
La Vie du Club
Photos - Navigations
Liens utiles
Google Maps

Espace Membres
Nom d'utilisateur
Mot de passe
 Se souvenir de moi
Se connecter
Mot de passe oublié ?

Actualités

Air Traffic Control
Select
Tune It

Figure 2 - Flight Documentation on a Flight School Website (via Aeroweb web service)