Pacelab Flight Profile Optimizer

On-board economic decision making support

Pacelab Flight Profile Optimizer is an economic decision support aid which complements the functional scope of flight management systems with advanced flight profile optimization capabilities and enables flight crews to make informed decisions about the operational efficiency of their flights.

Every airline committed to reducing fuel burn, improving its fleet's operational efficiency and its profitability must aim to operate as closely to the optimum flight path as possible. For many airlines however, the bulk of flight profile optimization is performed hours before take-off when preparing the operational flight plan, which has a strong lateral focus. This carries the risk that some of the underlying assumptions may have changed: weather conditions may turn out differently than forecasted; the departure time may be rescheduled; the use of temporary reserved airspace (TRA) is cleared.

Onboard the aircraft, the flight management system offers only very basic means of re-optimizing vertical flight profiles, so that comprehensive, actionable information such as evaluations of the flight's overall efficiency or quantifications of the remaining optimization potential are not readily available.

The lack of adequate tools and methodologies means that pilots often have to rely on experience and "gut feeling" alone when dealing with operational efficiency issues, so that substantial savings potential is left untapped.
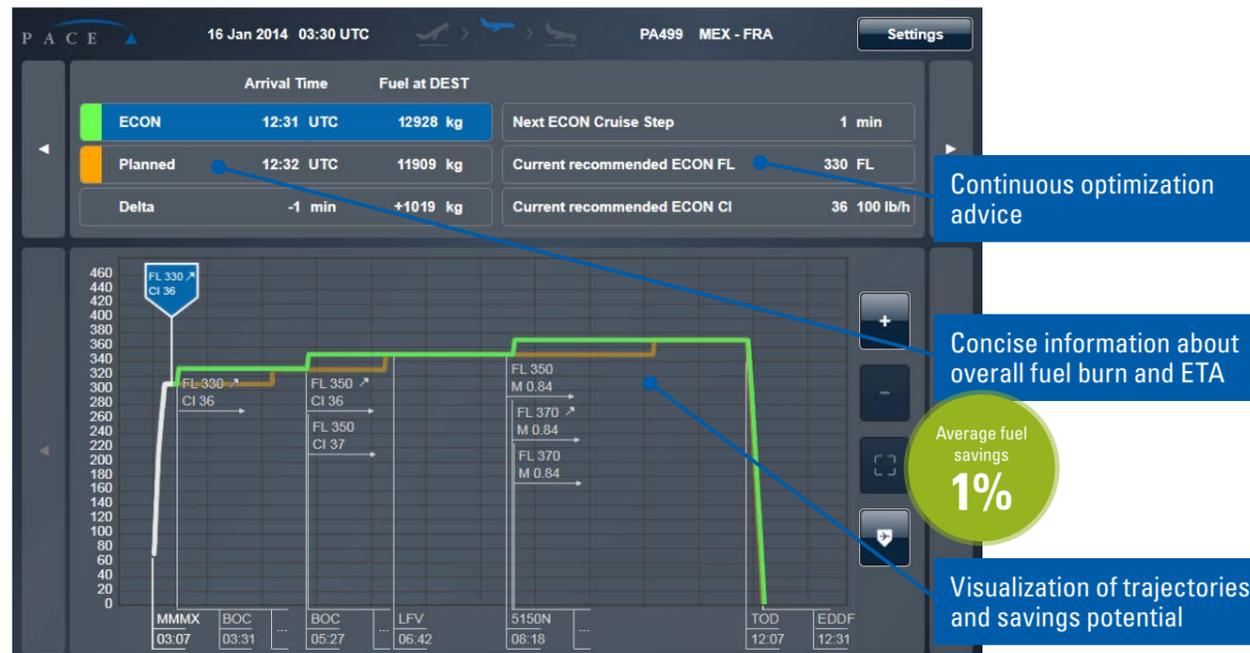
Continuous optimization advice

Pacelab Flight Profile Optimizer is an EFB Class 2 application which continuously determines the most cost-efficient flight trajectory for the remaining route to destination based on live aircraft and weather data and the best performance data available, providing flight crews with objective decision-making support in all phases of the operation.

Pacelab Flight Profile Optimizer thus complements the functional scope of aircraft FMS with state-of-the-art flight profile optimization technology and supplies highly exact vertical profiles, which can be fed into the FMS.

BENEFITS

» Improves operational efficiency and on-time performance
» Unlocks substantial fuel savings from accurate performance, wind and temperature data
» Promotes cost/efficiency awareness of flight crews
» Complements the functional scope of FMS/FMC

	Arrival Time	Fuel at DEST	
ECON	12:31 UTC	12928 kg	Next ECON Cruise Step · 1 min
Planned	12:32 UTC	11909 kg	Current recommended ECON FL · 330 FL
Delta	-1 min	+1019 kg	Current recommended ECON CI · 36 100 lb/h

Continuous optimization advice

Concise information about overall fuel burn and ETA

Average fuel savings **1%**

Visualization of trajectories and savings potential

Using the ECON trajectory (shown in green) as a point of reference, Pacelab Flight Profile Optimizer quantifies the currently available cost-saving potential in real time and provides concise information about overall fuel burn and ETA.

Advanced flight profile optimization

In addition to highly accurate performance data and live weather and operational data, Pacelab Flight Profile Optimizer also takes into account aircraft data such as gross weight and center of gravity as well as airline-specific cost indices and LTOP times to avoid misconnections. ECON calculations with Pacelab Flight Profile Optimizer automatically respect the scheduled in-block time and other constraints provided with the briefing package including RVSM airspaces and available flight levels.

Users can also define segment-based constraints regarding altitude or speed (to reflect ATC instructions, for example) and delay acceptances, which modify the time constraint imposed on the optimization.

Optimization calculations with Pacelab Flight Profile Optimizer aim to minimize the overall cost, i.e. are always performed for the remaining route to destination. And unlike most commercial flight planning systems, Pacelab Flight Profile Optimizer is capable of optimizing step climbs and step descents independently of waypoints.

Significant fuel savings and increased profitability

More accurate input data, the tool's sophisticated optimization engine and its making full use of the computational power of state-of-the-art onboard technology combine to deliver average fuel savings of 1 percent. Given the large impact of fuel cost on airline EBIT, this translates into a 5 to 10 percent increase in earnings per flight, depending on the profitability of the individual airline.

High usability and learner-friendliness

For safe and comfortable operation on board, Pacelab Flight Profile Optimizer provides an EFB-optimized touch screen interface, which supports both landscape and portrait mode. To minimize the workload, the software automatically imports input such as eOFP or weather data and validates manually entered data.

To maximize your software investment, a computer-based training for Pacelab Flight Profile Optimizer is available. Our CBTs are AICC-compliant and can be seamlessly integrated into web-based learning management systems or installed directly on EFB devices.

Pacelab Flight Profile Optimizer achieves significant fuel savings and operational efficiency gains by drawing on:
» More accurate input data
» Sophisticated optimization algorithms
» State-of-the-art hardware / computational power

High-fidelity performance data

Calculations with Pacelab Flight Profile Optimizer are based on 1st principles performance data, that is, the most accurate performance data available. This sets it apart from ground-based flight planning systems and the flight management computer, which typically must rely on simplified data.

Escaping the accumulative inaccuracies of data interpolation and conservative safety margins helps to unlock small individual improvements, which quickly amount to sizable savings across the entire fleet.

Live weather and operational data

The same is true for using the actual operational aircraft data and current temperature and wind information instead of simplified models such as ISA temperature distributions.

Pacelab Flight Profile Optimizer continuously reads aircraft position, altitude, weight, speed and other operational data from the ARINC 429 avionics bus (via ARINC 834 middleware) to track and display the vertical flight profile executed so far and to quantify the current savings potential. In addition, the software uses live wind and temperature data from both aircraft and ground sources for ECON calculations en route.

All live data are also recorded to enable flight crews to review the executed trajectory and to get instant economic feedback after completing the flight.

» Best available performance data
» Live weather data
» Real-time A/C data

High-fidelity input data

Superior optimization algorithms

» Continuous determination of most cost-efficient flight trajectory
» Instant economic feedback

Increased operational efficiency

Quality in, quality out: State-of-the-art software and hardware allow processing complex, non-linearized data

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