



PATS Auxiliary Fuel Systems for the B737NG

A Product Line of ALOFT AeroArchitects

Why Install Aux Fuel?

PATS Aircraft Systems was rebranded in November of 2015 as ALOFT AeroArchitects. The rebranding was simply an evolution of a growing company which had outgrown its old moniker. ALOFT now offers a broad range of products and services including VIP Interior Completions, Aircraft Maintenance, Avionics Installation Systems, and Engineering, Certification and ODA Services. That said, the product line which is synonymous with the PATS name is our time-proven and ultra-reliable auxiliary fuel systems. And for that reason, ALOFT continues to produce and advance its expertise as the industry leader in this niche business with the legacy branded, PATS Auxiliary Fuel Systems.

The PATS Auxiliary Fuel Systems have roots dating back more than 40 years to the era when airliners were first being transitioned from commercial service to luxurious VIP aircraft. For the first time, purpose built commercial aircraft with seating for hundreds of paying passengers, were hauling small entourages, maybe 15 or 20 VIPs. This new market niche led to entrepreneurial engineers designing ways to enhance these aircraft for their new missions. During this era, the PATS founder, Harvey Patrick, began designing auxiliary fuel systems to extend the range of many of the most successful, mass-produced classic aircraft such as the B727, B737, Fokker 100, CRJ200, B757 and B767 aircraft platforms. Those early, and successful STCs are now giving way to the latest forthcoming iterations of the STC for the likes of the Boeing B737 MAX and the COMAC ARJ21 as well as applications for other commercial and special mission platforms. Over the decades the system has adapted and evolved as the aircraft have, and to the point that ALOFT is today support more than 250 aircraft in the field operating with extended range capability afforded by the PATS Auxiliary Fuel System.

The most interesting development in the recent 20 years, has been the use of the PATS Auxiliary Fuel System by commercial airline operators. Because the PATS Auxiliary Fuel System Supplemental Type Certificates (STCs) are full, turnkey installations onto factory delivered commercial aircraft configurations, they can be installed with ease and at any time during the aircraft life, and without restriction based on aircraft operating category.

The benefits for commercial operators using the PATS Auxiliary Fuel System can be numerous. Some of the benefits are obvious and some are surprising and nuanced.

The main purpose of auxiliary fuel is to gain additional range. While the PATS systems are modular for customized fuel volumes, the most extreme example of the range benefit occurs when a stock 737-800, outfit with an 8-tank PATS system can increase its range by 50%. Imagine the flexibility and opportunity afforded by taking an existing 737 in your fleet and enhancing it with the capability of flying hundreds of additional miles. Of course, this comes with a trade. The additional system components and tanks plus the additional fuel must be traded from the aircraft, typically in seats and passengers. The baggage area is also reduced by the space consumed by the extra fuel tanks. With flexibility and creativity in the business model, our customers have found the balance to leverage the benefits of the added range to achieve a unique purpose, create new markets, and/or provide a unique service.

The clear benefit of a 737 with additional range is the new potential city pairs that can be serviced without changing aircraft equipment in the fleet. Airlines can choose to test or build a new city pair market using existing equipment before committing to the route with a much more expensive wide body aircraft. Because the PATS AFS is modular and capable of deactivation or removal, the aux fuel system can also be used as a temporary means of new route exploration or even seasonal work hauling vacationers to exotic locations. In the most traditional model, an airline may choose to offer an increased level of service, like an all-business class configuration, to fly high frequency business travelers on long routes.

In our recent history, we have three unique examples of these applications at work.

Most recently, a very large, well known European airline successfully modified ten B737-900ER aircraft with a 2-tank PATS Auxiliary Fuel System that allowed them to test and grow new routes from hub cities into several test markets in underserved areas. These “pathfinder” aircraft allowed them to test and then grow the market, gain market share and transition the increased demand into the application of wide body aircraft. The ‘pathfinder’ is then targeted at the next set of test markets and the airline is able to grow its route structure with a less risk and cost commitment.

Our second case study saw an Asia-based carrier dedicating two B737’s on 9+ hour routes into India using all business class interiors to service a frequented business traffic route with relative small volumes. The service operated daily for a decade without technical issues and with very high customer satisfaction. The airline took and owned the small niche market which was perfectly small to not beg competition but significant enough to enable a dedicated sub-fleet for service.

A final example sees the mix of scheduled commercial service with the flexibility to also serve charter requirements with the same aircraft. In this case, PrivatAir, based in Europe, applied its own fleet of 737 aircraft, outfit with various PATS AFS configurations, to provide ‘white label’, full turnkey service to multiple airlines for unique scheduled routes and on-demand charter situations.

According to Paul De Salis, PrivatAir's Chief Commercial Officer:

With PrivatAir the PATS ALOFT system allowed us to exploit markets where traditional long haul aircraft could not operate profitably. This was driven by:

- a. Longer range*
- b. Great runway performance*
- c. Reliability of the PATS system*

PATS systems allow us to operate the only narrow body, long haul market such as Frankfurt to Punai. We are contracted long term to fly this route for Lufthansa whose standard fleet cannot operate profitably.

PATS legendary reliability and simple systems architecture is illustrated by the successful operation of over 6,000 flight hours per annum on our BBJ1 aircraft. With short turnaround times and very limited leeway for recovering delays, we relied upon the PATS system to never let us down serving our world class customers such as Swiss, KLM and Lufthansa.

PrivatAir has flown a significant number of the global hours of the world's BBJ fleet, and therefore the global PATS installations. We have tested the system in some of the most demanding operational (first commercial landing in Antarctica) and service environment (Lufthansa and Swiss). The system never let us down.



**Picture: First ever fully commercial landing in Antarctica
with 4-tank PATS Aux Fuel System onboard
Photo: Courtesy of Privatair**

Besides the obvious range enhancement, airlines also get assistance with managing seasonal headwinds on marginal routes and insure they have adequate minimums for approach fuel. In particular, the PATS AFS enables more serious consideration and application of the 737 on the trans-Atlantic routes. Both to increase city pair options but also to combat the serious seasonal

wind effect of the return trip from Europe... and avoiding the dreaded tech stop can be a win for the airline and its passenger perceptions.

An unintended consequence of the PATS aux fuel system can also be the optimization of the aircraft center of gravity and flight performance as a result. While this aspect will be unique to each carrier, it could mean that even when the system is not in use or deactivated, it could have some ongoing positive affect on operations.

As the competition in the market increases and the age of the assets grows older, the PATS Auxiliary Fuel System can be an ideal solution to extending value, expanding reach and enhancing operations for carriers for years to come.

We look forward to discussing how the PATS AFS can drive revenue for your operations too.

Find out more details at ALOFT's website at www.aloftaeroarchitects.com or visit our booth at the MRO show (Booth # 385) April 10-12, 2018 in Orlando, FL. John Eichten, Vice President, Sales & Marketing can be reached for more details at 302.253.6132 or John.Eichten@aloftmail.com