

## Range Extension for the BAe 146/RJ

...bringing further destinations within your reach



### Cranfield Aerospace Ltd (CAe) is uniquely positioned to provide:-

- Customised range extension solutions for your aircraft
- Designed and certified to EASA/CAA approved standards
- Aftermarket support in conjunction with BAe Systems
- Installation by any approved organisation worldwide

### Specification Options:-

CAe will tailor the modification to meet your needs including:-

- VIP/Other role 'fit' requirements
- Passenger numbers and location
- Baggage handling considerations
- Refuelling time & ground handling
- Operational considerations
- Technical publications

CAe is an approved organisation (EASA and MoD) based in the UK and has the authority to design, build and manufacture modifications (minor and major) for both military and commercial aircraft. CAe has many years of experience in working closely with its customers from initial requirements capture to aircraft survey, through to design and certification of bespoke modifications. When required, CAe can also utilise its own hangar facilities under its Part 145 Maintenance Organisation approvals, to provide installation services, maintenance and ongoing support.



### Benefits of utilising CAe for Aircraft Range Extension

- Many years experience of modifications (based on BAe 146-200 & 300) with continuing operational experience with the BAe 146 Atmospheric Research Aircraft
- Familiarity with many aircraft types and the ability to provide a customised approach for meeting a very wide range of requirements
- Considerable experience in implementing range extension modifications and based on a proven 'route to certification' (CAA/EASA)
- Experienced in-house project management working both with the operator and operator's preferred installer/modification provider when necessary.

**Middle East to major European cities in a single sector**



# Technical Overview

A modular combination of underfloor fuel tanks allows their location to be optimised, thus maintaining the balance between the required range and aircraft payload.

Our solution ensures that the tanks will fill concurrently with the wing tank refuelling through a connection to the LH wing fuel line. The fuel is subsequently transferred to the standard fuel tanks at an early stage of flight and together with the range extension modifications ensures that fuel fill time generally lies within normal commercial operating limits, typically 30-40 minutes.

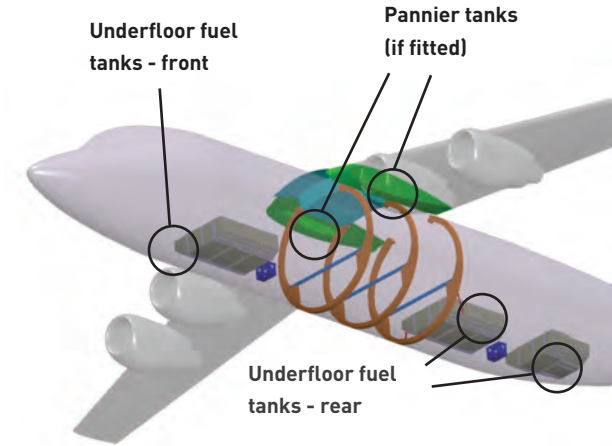
The fuel transfer system proposed will also keep the aircraft within the acceptable C of G limits at all times, throughout the flight of the aircraft.

**Graham Campion**  
Business Development Manager  
Cranfield Aerospace Limited

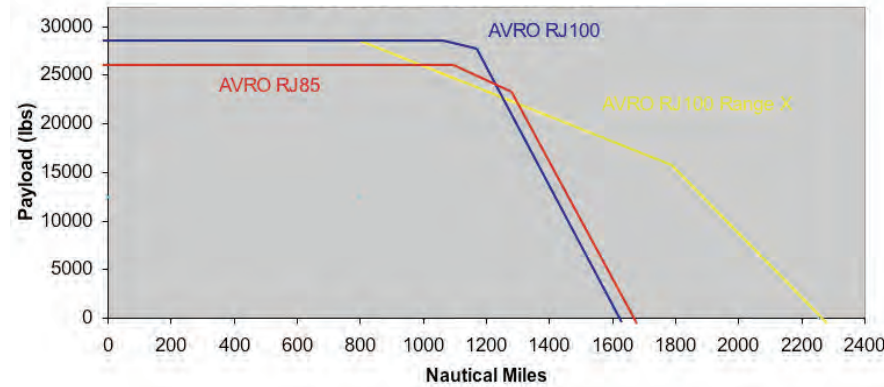
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## Additional fuel availability with different tank configurations

Tank Location	Tank size A (142 US Gallons)	Tank Size B (126 US Gallons)	Total Additional Usable Fuel	Maximum A/C Fuel		Total Usable Fuel
				Basic A/C	Pannier Tanks	
Rear Bay + Pannier Tanks	4	1	694 US Gallons	3,098 US Gallons	308 US Gallons	4,100 US Gallons
Front and Rear Bays + Pannier Tanks	7	1	1,120 US Gallons	3,098 US Gallons	308 US Gallons	4,526 US Gallons

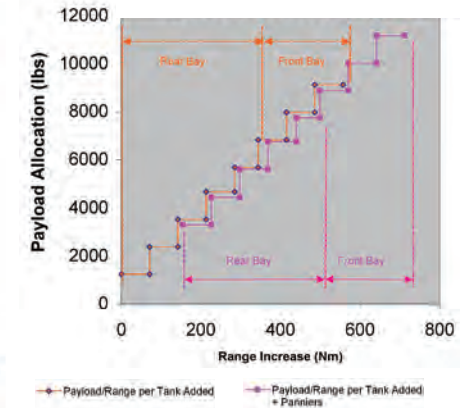


## Payload versus range trade-off



N.B. Numerical values are for indicative purposes only

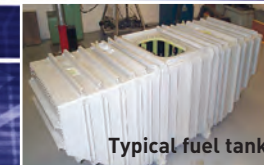
## Impact of additional fuel tanks



Each step shows the additional incremental payload & incremental range made available for each additional single fuel tank



Other aircraft



Typical fuel tank



Atmospheric Research Aircraft (ARA)

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