

# Autonomous approach landing capability (AALC)

## Multi-spectral system enables low-visibility landing in a variety of conditions

The Autonomous Approach Landing Capability (AALC) system is a multi-spectral enhanced vision system that enables landing and takeoff in extremely low-visibility conditions, down to zero ceiling, zero visibility.

The AALC system provides the pilot with a clear image of the runway and its environment in a head-up display. Based on an imaging millimeter-wave radar with real-time fusion to electro-optical sensors, this truly autonomous system requires no ground infrastructure, allowing operations at austere locations — including semi-prepared airfields.

### Previous test experience includes:

- Original AALC technology developed by AFRL for the DARPA/AFRL dual-use program
- United Airlines B727 and Air Force Speckled Trout
- More than 150 hours of flight testing

### AMC/AFSOC C-130 flight test

- Independent test conducted by 418<sup>th</sup> TS, AFFTC
- Cleared by USAF to O/O conditions
- Demonstrated precision and non-precision approaches in near O/O conditions and at semi-prepared airfields
- Demonstrated runway incursion detection capability

### Air Mobility Battlelab Demonstration

- Testing at Wright-Patterson tower and White Sands Missile Range
- Demonstration of sensor fusion capability, MMWR, and long-wave (8-12 micron) IR
- Successfully demonstrated obscurant penetration (dust, smoke, sand)
- Demonstrated obstacle detection capabilities with numerous targets
- Demonstrated low probability of intercept/detection characteristics

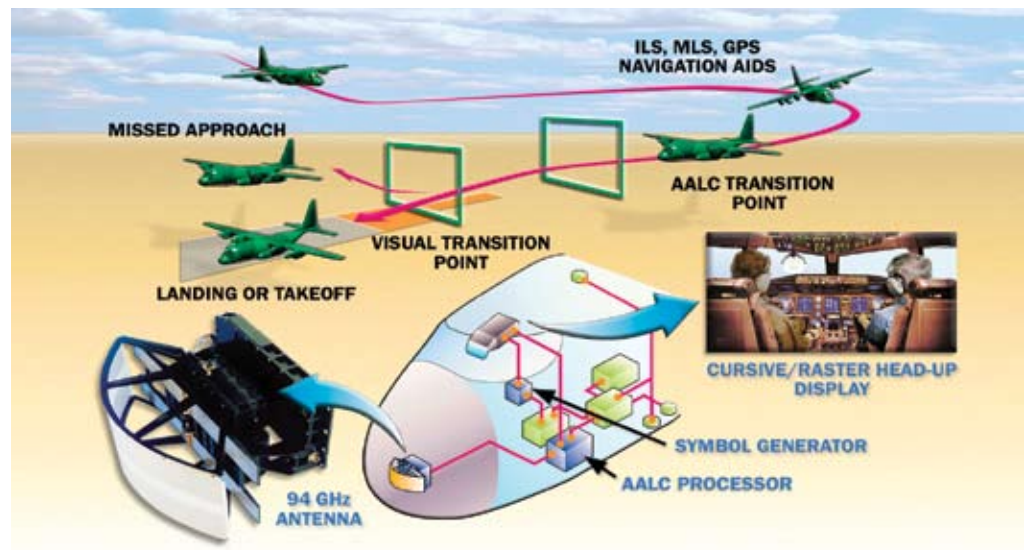
### Autonomous Approach Landing Capability (AALC)

Increased operational capability in low-visibility weather conditions due to fog, dust, and other obscurants — demonstrated in government testing

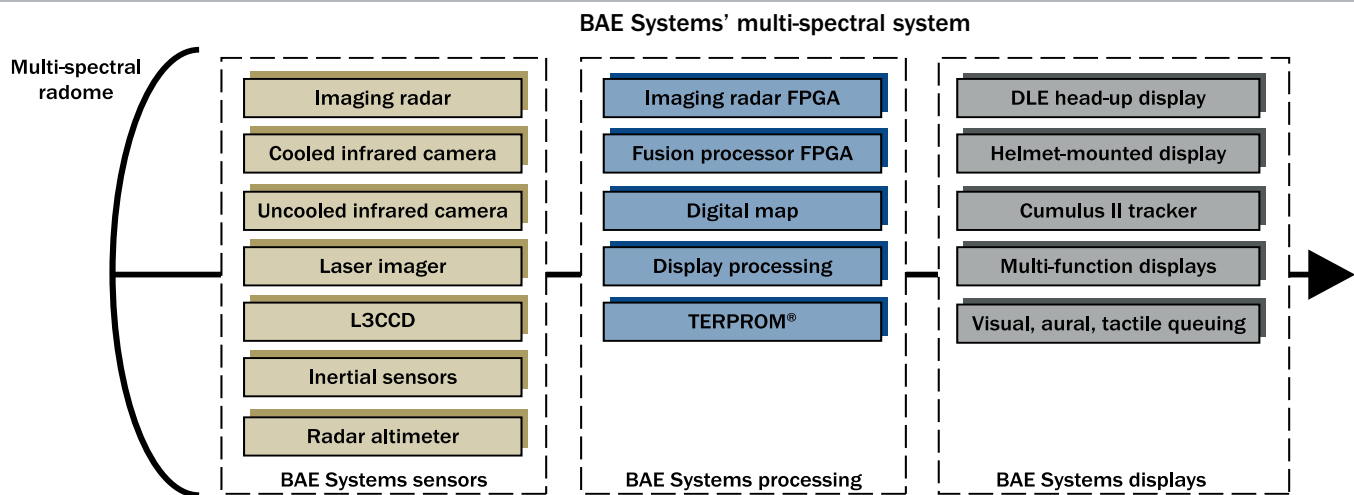
Improved safety in landing and takeoff situations with regard to incursions, CFIT, and other aircraft or vehicles on the runway

Reduced dependence on airport infrastructure

Enhanced cockpit situational awareness



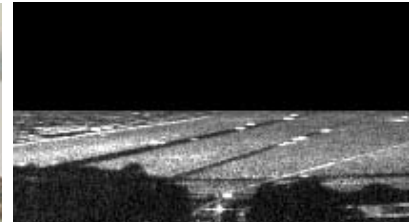
# Autonomous approach landing capability (AALC)



## Operational advantages

- Identify obstacles and incursions on the runway that jeopardize safe landing
- Avoid controlled flight into terrain with identification of runway environment coupled with HUD guidance (flight path marker and flare cue)
- Overall improved safety of flight due to enhanced situational awareness, with the ability to operate head-up/head-down throughout the full regime of approach, landing, rollout, and takeoff in IMC conditions

## WPAFB tower test images



Radar is able to discern runway environment and obstacles.

## Oakland Airport images



Even in dense fog, AALC allows the pilot to see the runway image for landing.

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