

Lightweight Beacon System for UAS and Other Aviation Applications

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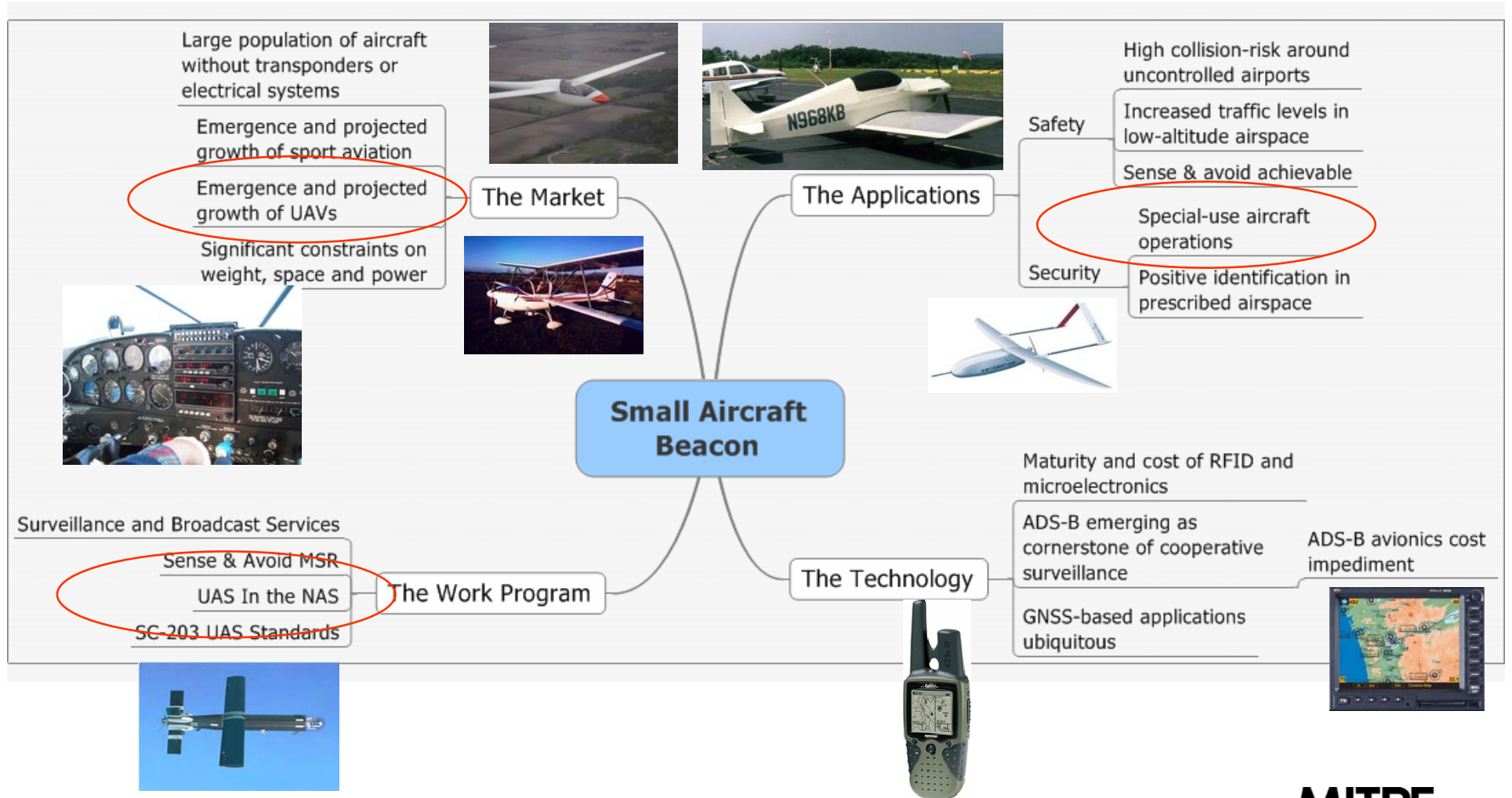
MITRE Sponsored Research



Problem

- **With the emergence of unmanned aircraft systems (UASs) and the sport aviation class aircraft, there is an increasing safety risk to these aircraft as well as others that may be operating in the same airspace.**
- **Current transponder and ADS-B units require aircraft electrical systems, are relatively heavy and costly for many aviation users to install, and probably won't be required in uncontrolled airspace.**
- **There is currently no technology available other than ADS-B to address this specific risk, but it must be affordable and usable on these special-use aircraft.**

Background



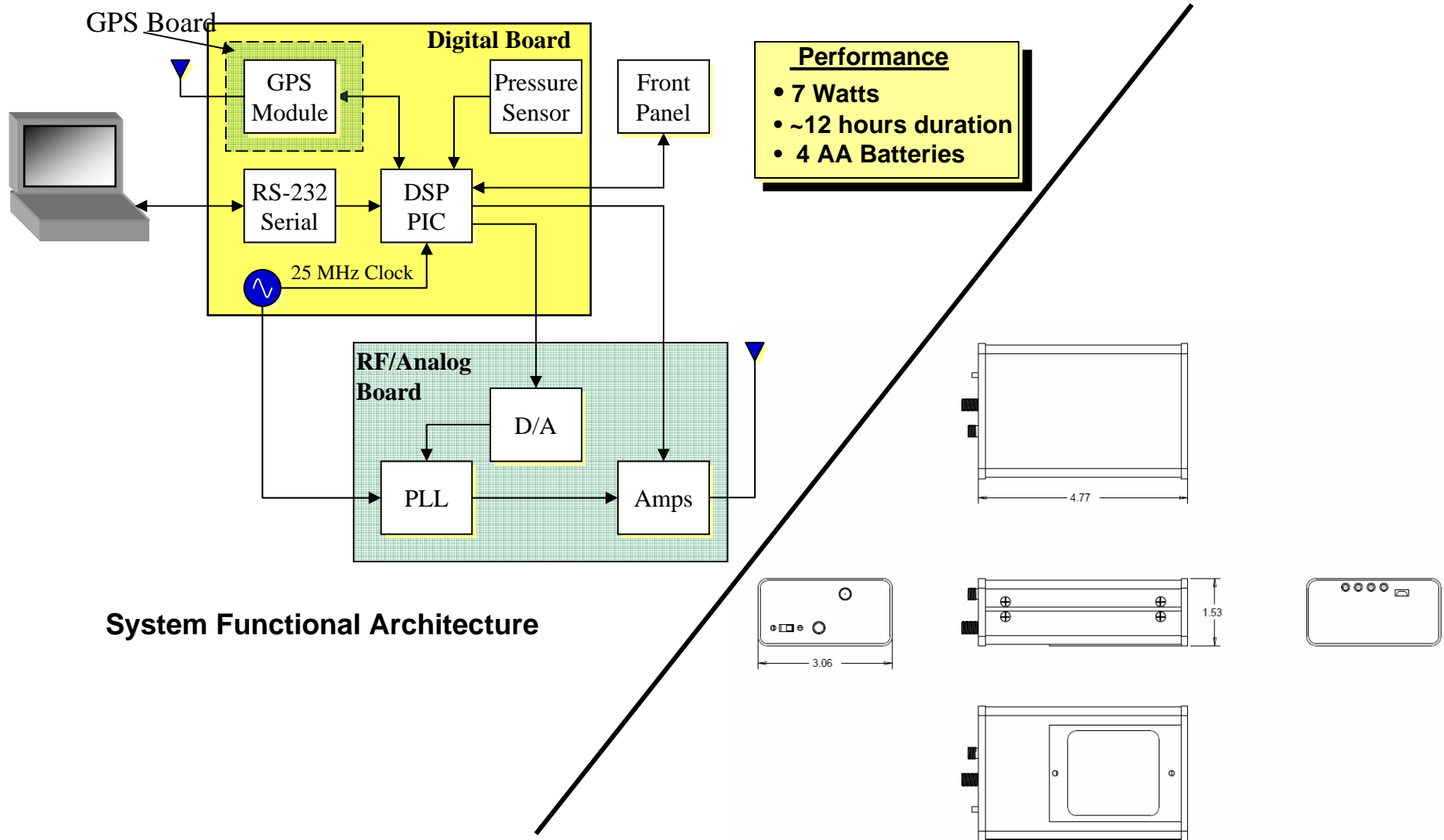
Objective

- **Demonstrate a small, low-powered transmitter capable of**
 - **Use on less-maneuverable or special-use aircraft**
 - **Operation in national airspace**
 - **Improving visibility to proximate aircraft**
- **Use MITRE-developed Universal Access Transceiver (UAT) waveform**
- **Employ a modular architecture to enable either:**
 - **Stand-alone unit**
 - **Integration with other aircraft electronics**

Activities

- **Proof-of-concept flight test**
 - **Demonstrate achievable operating goals**
- **Design and development**
 - **ADS-B radio transmitter compliant with aviation standards**
 - **Self-contained, battery-operated unit about the size of a personal digital assistant**
- **Flight tests and operational demonstrations on one or more UAS aircraft**

Highlight: System Overview

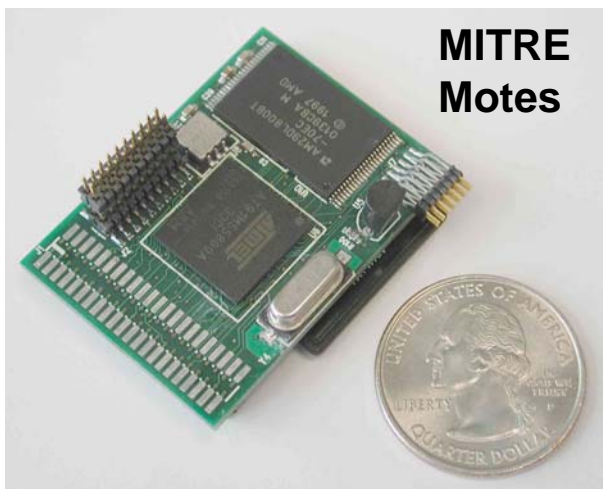
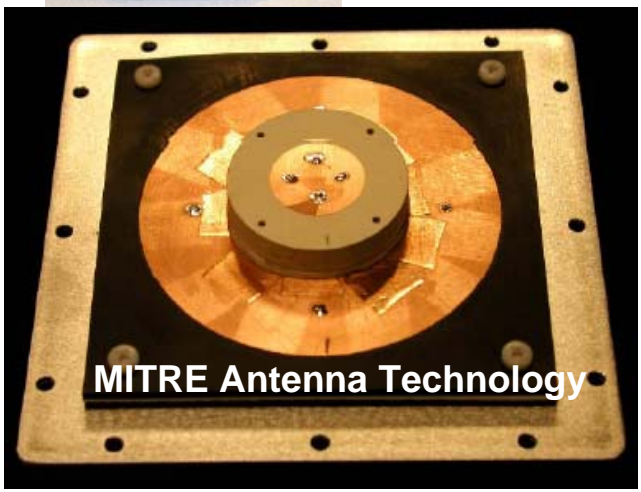
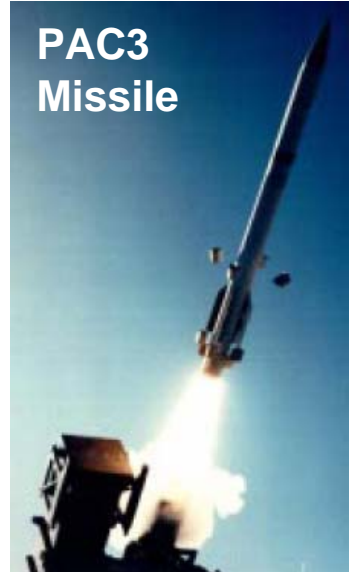
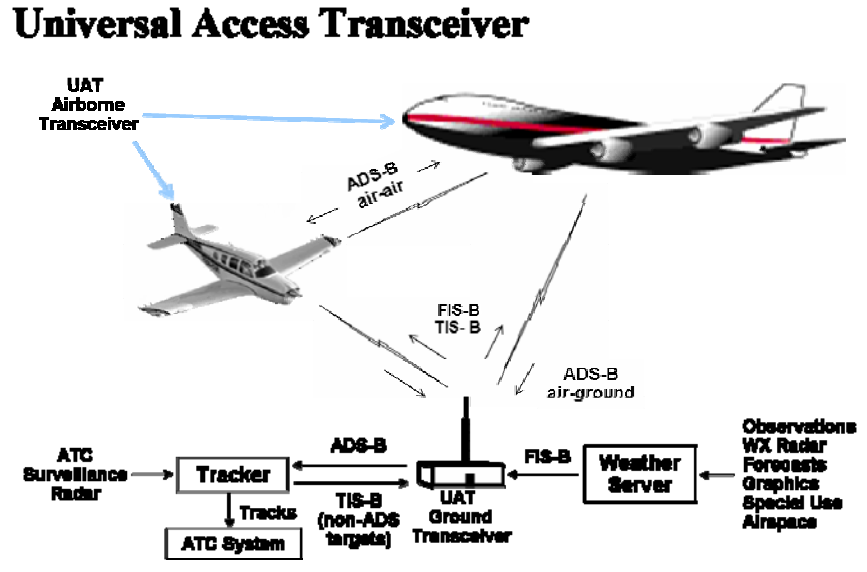


Packaging

MITRE

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Highlight: System Lineage



Impacts

- **Affordable cooperative surveillance beacon available on all manned/unmanned aircraft**
- **Enhance general aviation safety through shared situational awareness among pilots**
- **Accelerate implementation of the ADS-B system**
- **Assist in identifying and tracking suspicious aircraft**
- **Facilitate integration of unmanned aircraft in civil airspace**

Future Plans

- **Technology transfer of radio design to industry**
- **Investigate the addition of a receiver**
- **Investigate the integration of the beacon technology with basic collision avoidance logic**
 - **Enable aircraft to perform electronic “see-and avoid”**