

# **Proposal for the Personnel Accountability and Tracking System**

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## **Background**

Personnel accountability systems (PAS) have been in use by many groups, ranging from civilian to military applications. Their primary charge is to maintain an accurate count of personnel attendance at a given incident along with their operational status. An example highlighting the importance of PAS, The United States Navy experiences over fifty man-overboard situations per year—sometimes realizing that a sailor is missing only when performing a scheduled roll call.<sup>i</sup> PAS have long been used in firefighting applications to track “personnel at an incident, especially those entering and leaving an [immediately dangerous to life and health] (IDLH) area; intended to permit rapid determination of who may be at risk or lost during sudden changes at the scene.”<sup>ii</sup> However, many of the current PAS are manually operated; implemented as bulletin board systems at a fire scene or roll call type systems in the military, both of which can be error-prone and time consuming. It may take hours to realize individuals are missing or are in distress, let alone pinpointing a location where they went missing.

In addition to personnel accountability, the need for situational awareness increases in time-sensitive situations where life is at stake. In a vast array of scenarios, people are required to go into potentially dangerous environments to achieve mission critical objectives. Endless applications such as maritime search and rescue, firefighting, military operations, and disaster response would benefit from knowing the exact location of all parties involved in a coordinated operation. Current tracking systems include querying personnel for their whereabouts. While current technologies are available for personnel tracking, such as those implemented in retirement homes, these technologies do not provide a rugged, scalable solution for environmentally demanding applications.

## **Problem Statement**

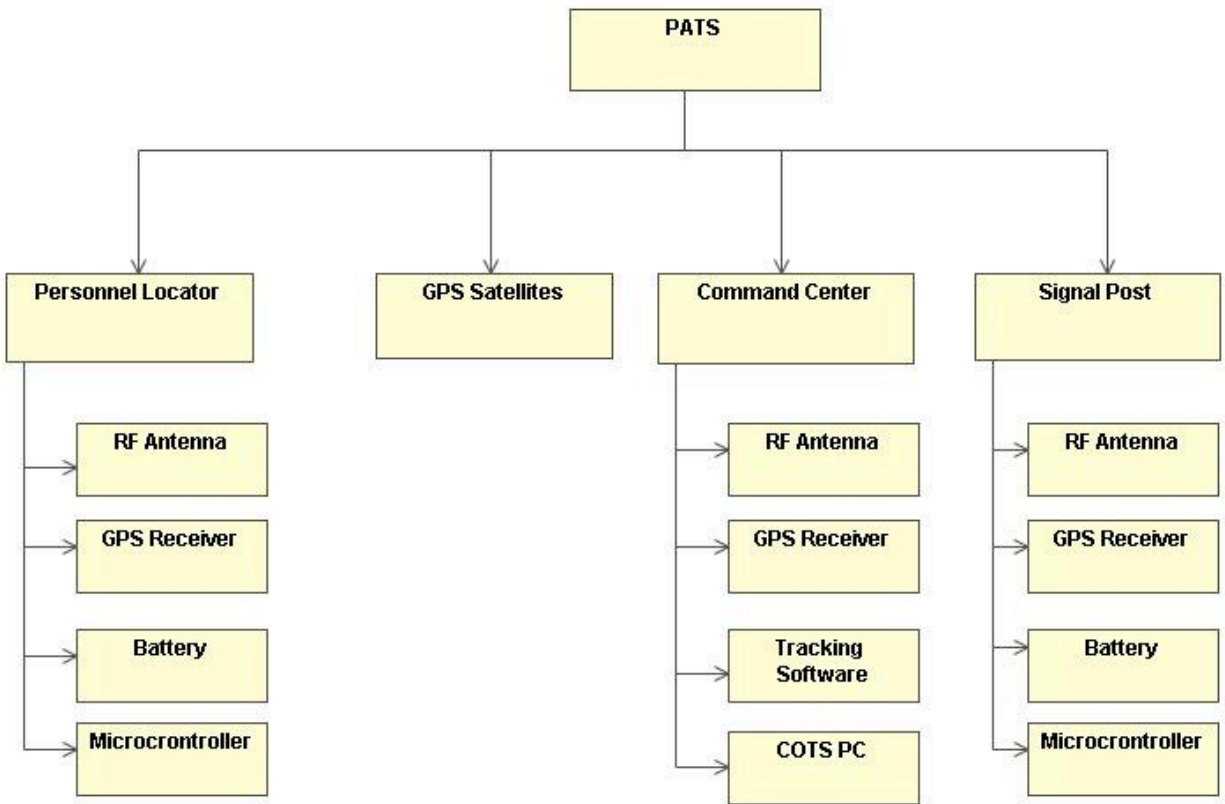
A system with the capability of tracking multiple assets and locating them with pinpoint GPS precision and accuracy provides real-time situational awareness. This level of awareness is necessary to make informed decisions with the best information available. Having this information available would offer an increased level of personnel and asset protection by reducing the response time associated with locating them. The development of the Personnel Accountability and Tracking System (PATs) is necessary to achieve this ability.

Currently available technology does not provide the capability of creating ad hoc networks. This feature would be pivotal in tracking assets from agencies using different equipment. Ad hoc compatibility ensures that minimal time is spent establishing the tracking network which would allow more focus to be placed on completing the mission. Additionally, a system that can withstand severe shock and vibration, extreme temperatures, and other intense factors is necessary to be reliable in the types of situations in which PATs is likely to be used. This level of durability is necessary in order to ensure the system’s operational availability, which will exceed the capabilities of currently available technology that is unable to withstand extreme environments. The lives of the people that PATs will be used to track are the most important assets, so a system with proven and tested reliability is essential to mission success.

## **System Overview**

Through the use of existing GPS technologies, combined with an application specific backup radio frequency (RF) triangulation system, PATS will provide a durable, ad hoc scalable, real-time tracking and accountability system. The main function components are a Personnel Locator which is carried by the person to be tracked, a Command Center which provides situational awareness through the display of personnel accounting and tracking information, GPS satellites for global coordinate location information, and Signal Posts that provide a RF-based tracking system as a backup to the GPS system. A system overview diagram is available as Figure 1 in the appendix.

## Appendix



**Figure 1:** PATS Physical Architecture

<sup>i</sup> "Message Center » Mil Tech — Personal Man-Overboard System." *MOAABlogs.org - Blogs published by Military Officers Association of America*. Web. 11 Sept. 2009.

<<http://moaablogs.org/message/2009/03/mil-tech-%E2%80%94-personal-man-overboard-system/>>.

<sup>ii</sup> Glossary of firefighting. (2009, June 29). In *Wikipedia, The Free Encyclopedia*. Retrieved 20:29, June 29, 2009, from [http://en.wikipedia.org/w/index.php?title=Glossary\\_of\\_firefighting&oldid=299377560](http://en.wikipedia.org/w/index.php?title=Glossary_of_firefighting&oldid=299377560)