

Rapid Microwave Prototyping System (RaMPS)

AT A GLANCE

What is it?

RaMPS is an NRL patented mechanical and electrical hardware design 'toolkit' to modularize microwave circuit payloads for laboratory and deployed uses. Payload form factors can be non-standard interfaces or commercial standard formats such as ANSI/VITA 3UVPX

Modular Systems Development

RaMPS is a bolt-together hardware kit that leverages commercial microwave modular circuits to enable the rapid development and deployment of microwave systems. The RaMPS 'blank canvas' allows the engineer to assemble modular microwave circuits per their design on a common size, weight, power, communication platform.

From the Lab to the Field

RaMPS accelerates the development cycle and increases reusability, while reducing component costs, labor, and time associated with microwave payload development. A single payload, while prototyped in the lab setting, can easily transition to deployment.

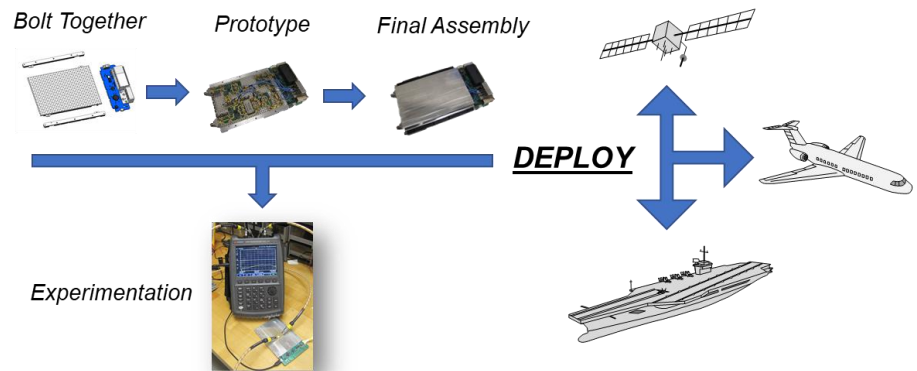
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RaMPS revolutionizes microwave system development, providing a platform that is flexible enough for laboratory development, but robust enough for fielding in a variety of environments

The Rapid Microwave Prototyping System (RaMPS) introduces a whole new paradigm of microwave system development.

Microwave system development generally starts with bulk components or evaluation boards strung together to create a prototype that meets the intended functions of the final subsystem. However, the final production-ready subsystem is the result of substantial engineering effort to transition to a monolithic printed circuit topology with surface mount components replacing the bulk components of the prototype. This engineering effort is done to optimize the performance, size, weight, power, and other engineering metrics. Therefore, in the traditional development process there is a large differential between the prototype and the production article. RaMPS allows a seamless transition from prototyping to production ("lab to fab"). Utilization of RaMPS minimizes the changes between the prototyping and production stages resulting in reduced labor, time, and components.

The RaMPS invention consists of mechanical, electrical, and software components. At a TRL level 6, all key components of RaMPS have been produced at scale for large systems. RaMPS assemblies have been demonstrated at levels ranging from bench/laboratory experiments of component technology, to high-fidelity payloads for systems on surface ships. The technology is advancing further with enhancements to form factor, command and control, and mechanical robustness. This expands the scope of how and where RaMPS technology can be used to include airborne or potentially space-borne platforms. Finally, the RaMPS technology allows the U.S. to keep pace with commercial technology, while still offering unique modularity, which no other commercial technology offers.

Fabrication data packages for all components in this technology are available with formal collaboration with the NRL Technology Transfer Office (nrltechtran@us.navy.mil)