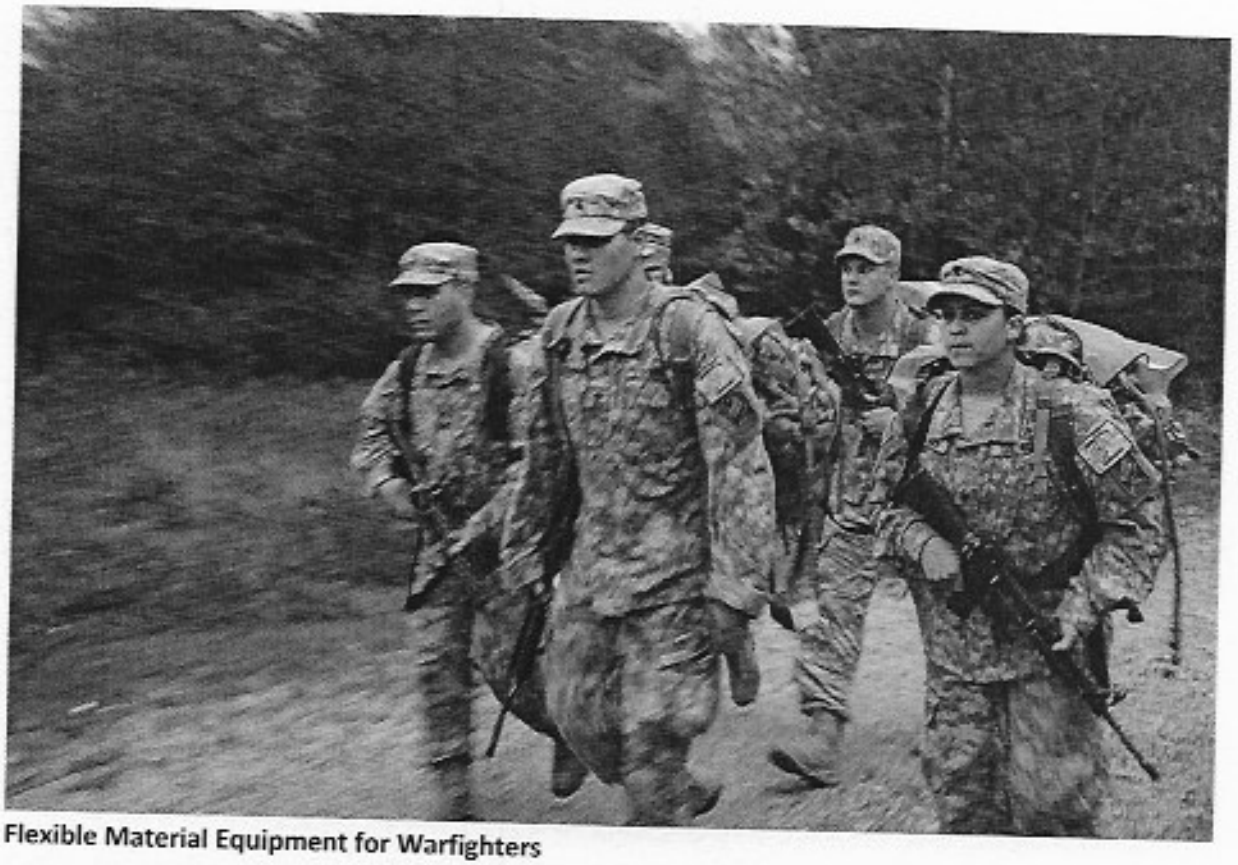


Flexible Material Equipment for Warfighters

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A team of scientists and engineers, the members of the US Air Force Research Laboratory's Flexible Materials and Processing Team, has been developing flexible material equipment for warfighters.

Exploiting the benefits of additive technology, nanomaterials, and autonomous research platforms while leveraging partnerships with industry and academia, the team masterminds a future-focused material research portfolio dedicated to ensuring the Air Force has the most advanced technology for the fight.

According to dvidshub.net, the diverse projects relate to three primary research themes. These are the human-machine interface, development of compliant and functional materials, and processing and novel device packaging and integration of materials for sensing, power and communications.

"We take a basic understanding of soft, flexible materials and use this as a foundation to build functional devices," said Dr. Benji Maruyama who leads the team. "These include flexible batteries, sensors, hybrid electronic devices and more. Much of what we're working on now the people in the field don't even know they need yet. We're building competencies for the future."

"We do a lot with the warfighter, trying to understand and anticipate the near and far-term needs. The interface between humans and machines is a big driver of our research," said Maruyama.

One focus in the human-machine interface arena is on the next-generation of wearable sensors for human performance monitoring. Commercial products, such as activity trackers and other smart watches, focus primarily on sensing movement and heartrate and have limited sensing modalities and durability, limiting their use in many challenging warfighter operational environments. The ability to sense physiological changes in a pilot's stress or fatigue levels through sweat or electrolytes

on the surface of skin, for example, can potentially eliminate harmful situations before they have a chance to occur in flight.

While much of the team's work focuses on basic research technologies for future applications, building a cadre of subject matter experts has enabled them to rapidly respond to some near-term Air Force needs as well. One of these successes is the transition of 3-D printed conformal antennas to enable Link-16 radio communication on the MQ-9 reaper platform in conjunction with the Air National Guard and other industry partners.