21st Century Aviation Propulsion and Persistent Flight Using the BARP System

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Twenty-seven years after the internal combustion gasoline engine (ICE) was developed two brothers from Ohio mounted an ICE of sixteen horse power to a frail 605 pound aircraft which altered the course of modern human history. The ICE used that first day of human flight was an aluminum block horizontal four-cylinder engine weighting in at some 152 lbs. This diminutive hand made engine developed 1,200 rpm powering the propellers pushing 'The Flyer' at thirty miles per hour for three minutes burning less than a quart of gasoline.

Six years after the Wright Brothers Flyer took to the air over a North Carolina beach a Frenchmen named Bleriot flew his airplane 22 miles at forty-seven mph before running out of fuel becoming the first person to cross the English Channel by air. An English periodical wrote at the time "*The chief difficulty to be overcome in aviation is that of renewing supplies of petrol while in the air*". This innocuous comment of hundred and three years ago has become prophetic for "unmanned" aviation for the nascent years of the *21st* century.

The BARP system is a technology able to answer a century old question for aviation. BARP is able to use several different sources of hydrocarbon fuels to effectively and efficiently recharge electrically operated propulsion systems for 'persistent' flight. Further the BARP system will be able to supply the growing need for electrical power too operate ever growing payloads being carried by growing fleets of unmanned aircraft systems (UASs) requiring electrical power for sub-systems. It is such sensor system payloads combined with the ability of the UASs to be operated for extended periods of time which BARP stands out against all other flight and power support systems.

The BARP technology allows for far lower costs to obtain the 'persistent' flight times now demanded by Department of Defense (DOD) for their UASs. The BARP system allows the use of multiple different power systems to be used by for the shift of military aviation resources for geo-political policies in the defense of the nation facing global turbulent waters.

General aviation (GA) aircraft engine is not much different in operation than an engine designed and used some hundred ten years ago. Aviation of the 21st century will require AMERICAN businesses to step up with devices, methods, products, services and new technologies able to provide the needed power to maintain persistent flight for aviation (military/civilian) being challenged by the ever growing high costs of manned aircraft. The new F-35 has costs approaching $110 million per fighter with the F-22 'Raptor' costing $446m per copy. The F-35 'Lighting II' consumes over 500 gallons ($1,550) of fuel per hour requiring refueling every four hours the Raptor in turn costs some $50k per flight hour. The unmanned MQ-9 'Reaper' costs the American taxpayer $12.5m burning less than 50 gallons per hour ($155) carrying 3000 lbs. of ordnance for twenty hours before needing refueling. The author P.W. Singer wrote in his book on unmanned vehicles (Wired for War) "the unmanned vehicle will become a billion times smarter in twenty-five years." The U.S. military spent $250m annually in 2001 on UASs; DoD spending in this last year on UASs $5.5 billion a number which is *growing*. Spending for UASs the coming decade some $65 billion.

New power technologies are required to sustain flight, power sub-systems internally or externally to an ever growing verity of airframes of all sizes of UASs being flown by Defense of Defense (DoD) and globally. Power for the new age of energy weapons and aviation intelligence gathering devices carried by UASs will be needed. The internal combustion and turbine engine are inadequate and antiquated in providing for reduced operational costs, reduced fuel consumption, increased endurance and stealth to defend the nation facing ever growing threats from insurgent vectors, terrorists and the new age dogs of war.

The new era of the autonomous UASs offers militaries and civilian operators many different sizes and verities to meet a range of mission. Such an unmanned aviation cornucopia of platforms will demand new energy power systems providing power for new sensors and weapons. The BARP technology allows for increase levels of power for mission flexibility for military UASs operations facing the challenges of instability.

Aviation is facing an era of budget cutbacks and transfer of technologies occurring over a far broader use of platforms, products and services for both civilian and military use. The BARP system games changes how aviation will power such diverse flight platforms for the 21st *unmanned* century at costs which are maintainable, sustainable and obtainable by taxpayers here and around the world.