ASSAULT ATRB 04-1

PMA-257 AV-8B Harrier

PMA257 supports AV-8B Harrier in the US, Italy, and Spain. In the post-production environment sustainment and combat effectiveness remains the focus. All technologies related to these areas are of interest to PMA257, specifically:

1. Readiness. There is a concern about Obsolescence of avionics devices that cannot be fixed internal to the government via DLA and NAVICP. Industry solutions such as production of a micro-switch that is form fit and function or system on a chip technology that can run legacy software on a single device.

2. Data Link (JTRS link IG, JTRS UHF/VHF, VMF digital CAS, TCDL). Technologies to improve information sharing among platforms MUST BE interoperable throughout NAVAIR.

3. Improved techniques in Self Defense / Escort to enhance survivability.

4. Technologies to improve training devices to specific aircraft configuration (OFP) that can decrease time between simulator upgrades and increase pilot proficiency in OFP upgrades.

5. Enhancements in IR/RF susceptibility.

6. Small Smart Weapon (Weight issues, collateral damage / close-air support concern, size proportional to accuracy)

PMA-261 H-53 Heavy Lift Helicopters

PMA-261 Heavy Lift Helicopters Program is dedicated to supporting the Navy and Marine Corps fleet of Legacy H-53 helicopters: the CH-53D, CH-53E, and MH-53E. The USMC CH-53D and E's primary mission is assault support, while the MH is counter-mine detection and vertical on-board delivery. In addition, PMA-261 is the managing the design and development of the next generation heavy lift helicopter, the CH-53X. The following technologies are listed in order of interest to this program office:

1. Improved helicopter dynamic component reliability, specifically for bearings, swash plates, blades and gearboxes with unlimited life components tied to a diagnostic/ prognostic monitoring system.

2. Improved ballistic tolerances technology that can specifically be used to increase the survivability of flight critical components such as rotor heads, drive shafts, and gearboxes without negatively impacting performance (i.e. light weight and protective).

3. Corrosion prevention and corrosion treatment technologies, either through the development of materials that are more resistant to maritime corrosion, or through cleaning technologies that are more effective, easier, cheaper, and environmentally friendly.

4. Technologies to improve internal load embarkation, lockdown, and offload, in order reduce manpower requirements, time on deck, and improve safety.

5. Technologies to improve crash-load management to mitigate potential for aircraft weight growth.

6. Improved tracking technologies that are integrated into the concept of Focused Logistics information, for the capability to reliably track internal and external loads.

7. Improved aircraft survivability equipment, to include active and passive IR countermeasures, RF countermeasures, Laser weapon warning, detection, and protection, able to be integrated as an easy to use ASE suite.

8. Large scale, economical development of composite materials that are more durable, lighter weight, with improved ballistics and corrosive protection, and easily repairable.

9. Force tracking software that can be common to all platforms, all services, and can be used for planning, in-flight mission updates, blue force tracking, real time situational awareness, and is accessible to flight crew, higher headquarters, and on-board small unit commanders. Must be easy to use in a dynamic environment.

10. Aircraft radio technologies that decrease system physical volume, power consumption or antenna footprint while surpassing current performance levels (i.e. increased waveforms, range, power output) while being common enough to reflect a significant economy of scale.

11. Improved techniques for the use of RF bandwidth to increase throughput efficiencies for the transmission of imagery, tactical data networks, voice networks, and video, with a commonality for ease of maintenance and economy of scale.

PMA-274 Presidential Helicopter Program Office

Technology areas of interest to PMA274:

1. Aircraft radio technologies that decrease system physical volume, power consumption or antenna footprint while maintaining current performance levels (i.e. waveforms, range and power out).

2. Aircraft antenna technologies including low cost, wide bandwidth, interference canceling and adaptive, sectorized antennas (omni directional receive, but blank out transmitting to a sector) that can be used simultaneously by different on-board systems.

3. Helicopter wire detection sensor technologies.

PMA-275 V-22 Program Office

V-22/ATRB Technology Needs List (not prioritized)

1. LPI/LPD Terrain Following/Terrain Avoidance waveforms that incorporates featureless waveform technology. Technology development is required for both hardware and software.

2. Aerodynamic Hover Performance Upgrades/Weight Reduction to provide capability to hover at high altitudes, increase lift and range, and allow for weapon system mission growth.

3. Sensor system to detect and identify and quantify NBC contamination external to the aircraft

4. Standoff System to detect and identify to the crew NBC contamination prior to encounter.

5. Radar Anti-Ice system that does not degrade power of radar transmission due to the system activation.

6. Standardized tracking system for location of friendly forces.

7. Open Systems hardware and software Architecture technologies for Avionics including mission management, communication management, navigation management and situational awareness functions.

8. Active helicopter wire and obstacle detection/avoidance system.

9. Cost effective Mass Memory (hundreds of gigabytes) improvements for Digital Map and other avionics systems capable of higher speed data transfer, compatible with helicopter airborne environmental conditions

10. System to allow flight plan re-routing based on parameters such as terrain, threat, distance, fuel, and time on target.

11. Stronger, lightweight ramp and cabin flooring systems.

12. Multi-function, low-drag VHF, UHF, and UFH SATCOM antenna

13. More efficient and lower weight power storage, control, conditioning, regulating, and conversion systems.

14. Sand and dust penetrating radar providing navigation video in brownout, dust-out visibility areas.

15. Helo-mode, low airspeed indication system.

16. Improved, low cost, low weight environmental control systems to maintain suitable cooling of crew and electronics.

17. Develop a scalable, light weight, cost effective, RF cosite interference canceling system to eliminate VHF and UHF RF cosite interference between multiple radio systems

18. Manufacturing/assembly process and maintenance improvements for unit and life cycle cost reduction.

19. Protection for aircrew and electro-optics against low to medium powered multi-spectral lasers.

20. Composite structure and titanium tubing damage detection and maintenance systems. Include methods to determine damage limits.

21. Lightweight defensive weapon system.

22. Small, non-extensible fuel cells.

PMA-299 H-60

A. Helicopter

1. Weight Reduction
2. Reliability / Maintainability of legacy systems
3. Integrated mechanical diagnostics / health, usage and monitoring
4. Life limited component life improvements
5. Aircraft IR and radar cross section reduction
6. Occupancy crash survivability
7. Wire and obstacle detection / avoidance
   (Light weight, LPD (Low Probability of Detection), eye safe sensor system for performance enhancement and safety aid down to a goal altitude of 50' and operating within a 90 to 120 knots speed range)
8. Corrosion protection
9. Non-halon fire suppression systems
10. Manufacturing cost reduction
11. Engine durability improvement
12. Airframe vibration reduction
13. Improved dynamic analysis/vibration prediction
14. Improved environmental control system
15. Reduction of Vibrational Environment
16. Advanced Engine Technology (reduce SFC and weight

B. Assault

1. Weight Reduction
2. Emitter identification / threat classification (RF, IR, Radar)

C. Weapons

1. Weight Reduction
2. Standoff targeting / weapons capability
3. Improved Anti-Surface weapons
4. Commonality / Interoperability
5. Helmet Mounted displays

PMA-207 C/KC-130 Division

PMA207.6 C/KC-130 division provides acquisition and support for all type/model/series Navy and Marine Corps C/KC-130 aircraft. The focus of this needs statement is the KC-130 aircraft used by the US Marine Corps in the assault support role. Specifically, in this assault support role is the mission of aerial refueling both helicopters and fixed-wing aircraft. The speed ranges associated with these two independent aircraft types currently necessitate two different para-drogue assemblies on the refueling hoses. The differing

para-drogue size and associated speed limitations force the fleet user to perform extra maintenance when missions change, maintain a separate supply system for each of the two drogues and most importantly, limit the operational usage of the aircraft once it has launched since airborne changing of the drogues is impossible thereby forcing the KC-130 to land, change the drogue and re-launch – forcing time delays and potentially missing missions.

In summary, the need is for a *variable speed drogue* that can handle a speed range from 105 to 250 KNOTS. This capability has long been desired and is a formal requirement in the KC-130J Initial Capability Document dated 24 July 1994 and in the KC130J Tactical Aerial Refueler Operational Requirements Letter dated 29 July 2003. Obtaining this ability will give the Marine Corps Combatant Commanders increased operational flexibility to support helicopter and fixed wing refueling operations with the same aircraft in the same sortie. This flexibility becomes increasingly important as the V22 enters IOC and the Corps' refueling requirements increase dramatically.