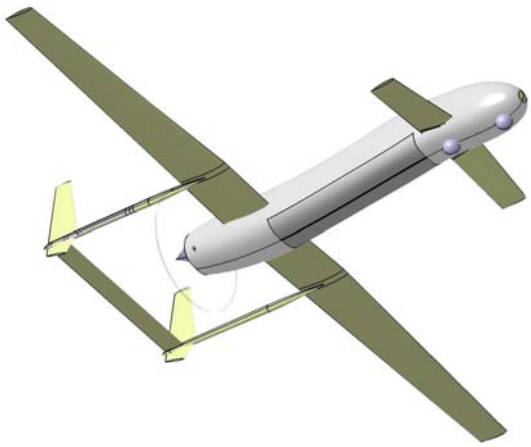
THE *MONGOOSE* MULTI-PURPOSE UAV FOR RELIEF/HUMANITARIAN MISSIONS

The concept of a single, scalable, multi-purpose UAV design family is referred to by *M3 Aviation* as the *Mongoose*. Extraordinary versatility can be applied to many present humanitarian missions, and also applied to missions not presently operated or even envisioned for various reasons. We believe the *Mongoose*, in whatever size, to be amazingly capable, flexible, remarkably competitive, unrivaled in performance, and providing for reduced life cycle costs and efficient, economical operation by both public agencies and non-government organizations (NGOs).



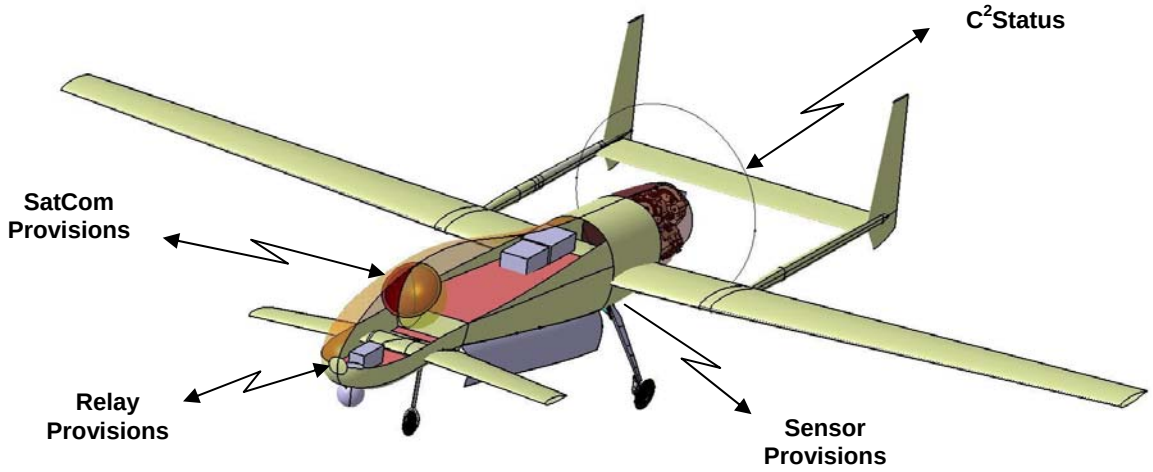
PRESENT *P.180* 3LSC AIRCRAFT (left); PROPOSED DEVELOPMENTAL *MONGOOSE* 3LSC UAV (right)

Each proposed *Mongoose* UAV utilizes a Three Lifting Surface Configuration (3LSC). The 3LSC is characterized by a canard forward wing, small main wing, and a conventionally-positioned horizontal tail. Canard configurations, however common in certain civil sectors, become the unique 3LSC when mated to a conventional horizontal stabilizing tail surface. The result is distinctive efficiency *and* stability despite potentially wide Center of Gravity (CG) excursions caused by large fuel weights variations during long flights, and by the inflight separation of heavy payloads/stores.

The 3LSC is integral to the claims in the US patent of 25 years ago awarded to inventor and aeronautical engineer Dr. Alessandro Mazzoni. The 3LSC has since demonstrated remarkably efficient daily operations with scores of *Piaggio P.180* aircraft worldwide, and been praised in many respected aeronautical journals.

In applying the 3LSC to the proposed UAV platform development, the *Mongoose* UAV family can achieve similarly remarkable performance and capability gains benefiting from the proprietary aeronautical computer code controlled exclusively by Dr. Mazzoni and available to *M3 Aviation* for this application.

A *Mongoose* feature unique among UAVs is the internal payload bay. This configuration eliminates the aerodynamic drag and icing penalties of external wing stores. The bay, located on the aircraft centerline, accommodates heavier stores than can be wing-mounted. The CG position of the 3LSC UAV approximates the CG location of the internal stores, thus minimizing pitching from inflight stores release. And with the central bay location, less supporting structure reduces aircraft operating weight and increases payload potential.



Each equipped *Mongoose*, alone or teamed, can facilitate/integrate in a net-centric, worldwide communications/command/control system, and facilitate searches.

The *Mongoose* can incorporate, internally and externally, the revolutionary, versatile, low maintenance, proprietary *Black Ram CSCARS* (Configurable Smart Carriage And Release System). The *Mongoose* could bay release various stores including sea markers, life rafts, MREs, or other rescue aids/humanitarian loads. The bay, even with extended-mission auxiliary fuel tanks installed, still retains ample capacity.

Using a modular payload system with standard cargo fittings, the *Mongoose* UAVs provide mission flexibility and capability as an 'airborne pick-up truck'. The bay of the small *Mongoose* is about 8 feet by 2 feet carries about ¼ ton; the bay of the larger *Mongoose* bay is about 16 feet by 4 feet could carry 1½ tons. All major spares components (engine included) of the UAV are transportable inside of the bay.

Unique UAV humanitarian role capabilities could include cargo delivery by air for use in regions too hostile to operate manned aircraft landing operations and can include aerial para-dropping. And for missions where external stores trade-offs are appropriate, the *Mongoose* designs provide wing hard points. This versatility, far exceeding that of existing UAVs, together with the bay sizes, provides superb load options. Other *Mongoose* capabilities could include operations integrated into the US National Airspace System, compatible with other users and compliant with FAA UAV standards.

Appropriate FAA engineering/design standards are intended for the *Mongoose* UAVs. Proven aeronautical materials typical of approved aircraft designs would be used with much of the airframe constructed of lightweight but durable composites such as GFRP/CFRP and supplemented appropriately with aircraft aluminum alloys.

The smaller *Mongoose* UAV is to be powered by a two-stroke, aero diesel engine with a constant speed prop while the larger *Mongoose* is powered by a conventional aircraft turboprop engine. The quick-release, modular engine assembly with associated systems eases servicing and reduce logistics space. Appropriate onboard systems provide for all-weather and autoland capability for the *Mongoose* UAV. Excellent aerodynamic stability and benign 3LSC stall characteristics will make this UAV design uniquely operator-tolerant compared with existing UAVs. A family of 3LSC *Mongoose* UAVs could minimize training and facilitate cross-qualification