

## BLACK KNIGHT TURBODYNE-01

Battlefield Transport  
Border Patrol  
Disaster Relief  
High Speed  
Long Range  
Stealth Approach  
Good Load (10+ tons)  
VTOL/STOL  
Armed Gunship  
Competitive Purchase Cost

Inspired by the remarkable world-leading design of the Fairy Rotodyne from the 1950s. An advanced all-British battlefield transport and support aircraft for all missions in peace and war.

Fully VTOL (Vertical Take-Off & Landing) logistic transport combined with hot battle zone combat capability. Flight operation includes stealth approach with minimum engine noise.

Effective speed and range may be up to 150% greater than conventional helicopters.

Offering full fire support to ground troops entering or evacuating all but the most extreme battlefields.

Equipped with a minimum of two ground support heavy machine guns for fire support while entering and leaving any landing zone under fire. Also provides all ground troops with orbiting gunship capability for continuous and highly effective directed fire support.

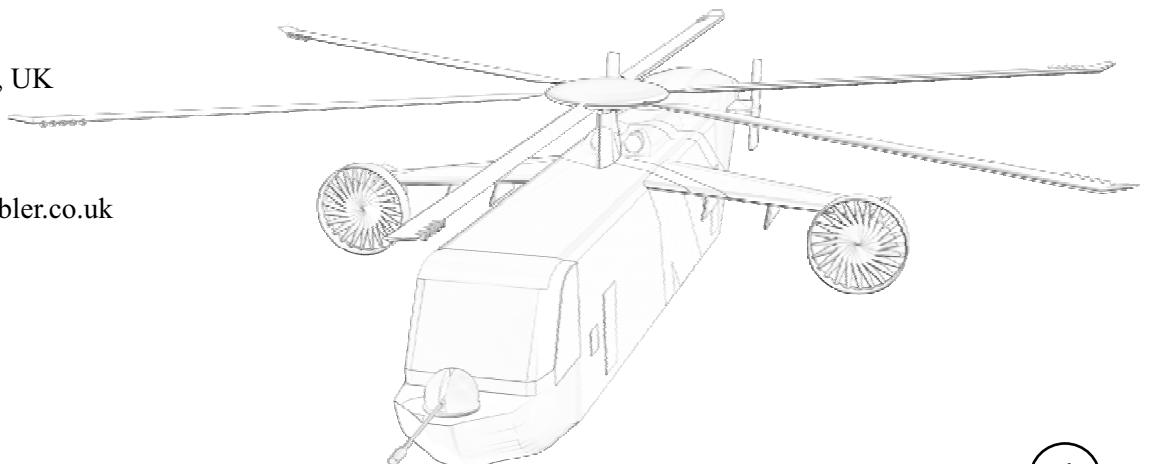
Troop lift includes a minimum of one heavy infantry/commando platoon or any variation of light vehicles, towed light artillery, underslung cargo and similar loads up to ten tons, along with an external combat ordnance load of three tons for the most intense battlefields.

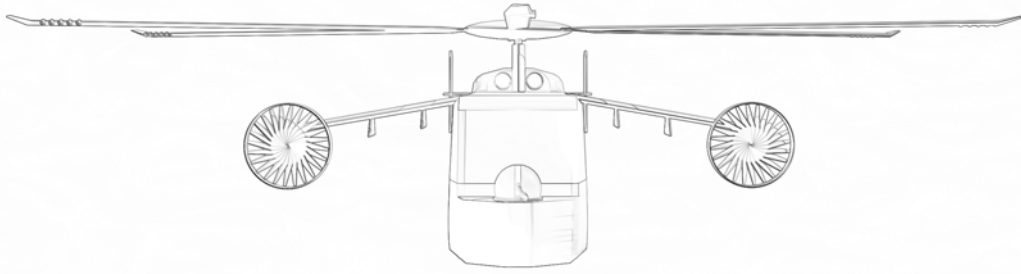
Extremely price competitive to inferior non-British products.

### Contact:-

Mr Michael Bond  
c/o Rumbler Cars  
STOCKPORT  
Cheshire, SK5 6LT, UK

url: [www.Rumbler.co.uk](http://www.Rumbler.co.uk)





# BLACK KNIGHT TURBODYNE-01

## BACKGROUND

In August/September 2009 there was substantial concern in the UK media about a lack of good quality helicopter support for the Army in Afghanistan.

Having already begun work on a new financial model for the procurement of goods and services at low cost I drew up a design model for a new aircraft using a mix of proven technology and financial model for the MoD that would substantially reduce net effective cost of procurement, possibly by as much as 30-40% over foreign alternatives.

## Historic Design, New Concept

At the heart of this design is earlier work in the successful but cancelled Fairy Rotodyne from the 1950s. Remarkable in creating one of the fastest, high capacity rotary vertical take-off aircraft in the world with innovations that would not be adopted by the rest of the aerospace industry for another thirty years, I believe this offers an exceptional opportunity to create a revived, state-of-the-art aircraft combining robust engineering with modern performance.

This gave birth to the Black Knight concept.

## Politics

Unfortunately the difficulty in reaching through the political system and my own lack of resources prevented any further

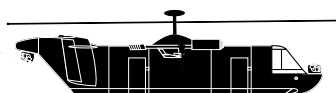
action than these conceptual drawing and the financial plan to deliver 300 aircraft.

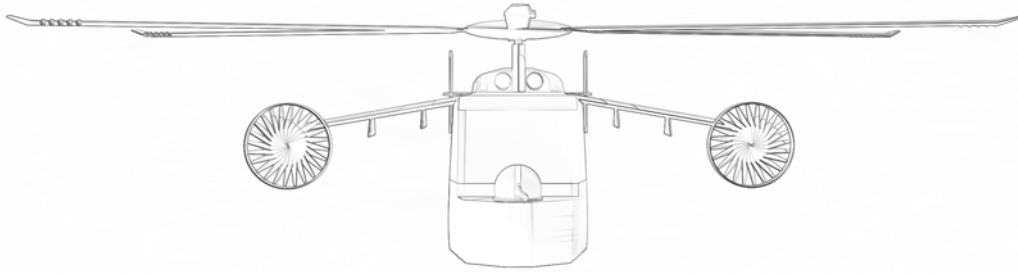
## Superior Aircraft Technology & Design

The concept behind this aircraft is to create a technically and tactically superior form of battlefield assault transport.

This is NOT a regular transport aircraft. By making use of the fundamental design features of a Rotodyne - a compound gyrocopter, with a range of combat equipment, this aircraft can offer a far wider range of practical uses in many battlefield, peace-keeping/counter-insurgency and civil aid conditions:-

- Higher speed - potentially twice the speed of a Chinook helicopter.
- Conventional take-off runs for higher lifting capacity. VTOL is not vital for its take-off, permitting greater loads.
- Full VTOL when required, with load potential in excess of 10 tons.
- Higher internal capacity if required to lift bulkier/heavier loads than current transport aircraft such as the Chinook or Osprey.
- Higher reliability - this is a proven technology with less chance of hitting hillsides or flipping over in a strong wind.
- Weapons load including stabilized long range machine guns and external ordnance points for all forms of combat gunship roles.
- Stealth orbit, approach, glide option by pitching the main rotor backwards in





# BLACK KNIGHT TURBODYNE-01

free rotation, in the style of a gyrocopter, the aircraft can thus perform as high altitude surveillance patrol, make low level “quiet” passes over suspect targets in counter-insurgency operations, and perform glider landing runs on short airstrips.

- Option for amphibious landings, in support of maritime operations, air-sea rescue, etc.
- Bomb-drop and strike operations, making use of its overall 10+ ton load to mount, launch and guide tactical weapons from remote stand-off positions.
- Advanced information-gathering, surveillance and directed weapons control through an array of high definition 3D cameras and other technologies mounted principally on the nose and tail gun turrets.
- Superior tactical support of troops on the ground through its weapons mounts, including: a) directed fire support on the ground while troops/material are being embarked/disembarked, without obstructing the weapons’ action; b) provision of airborne fire support in approach to or departure from a landing zone; c) provision of gunship air support while orbiting over a patrol/combat area; d) other goodies to be improvised/invented as required.

This is NOT just a transport aircraft, it is Gunship, Surveillance, Airborne Intelligence/Control, Heavy Lift Transport, Air/Sea Rescue/Transport.

## Performance - Bigger, Faster, Farther

A Rotodyne/Turbodyne is NOT A HELICOPTER. Driven by its outboard rotors/fans (see illustrations) it attains a higher speed, greater potential load and longer range with fuel economy over a standard helicopter.

With some development there is potential to equal or even exceed US tilt-rotor designs.

## Reducing Financial Risk

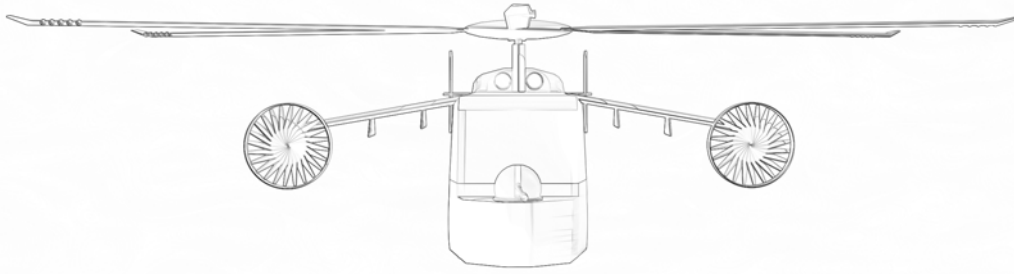
Firstly, the Rotodyne is a proven albeit old technology. With modern engines and materials a far tougher, lighter, faster aircraft will be a viable aircraft to meet current and near-future needs.

Secondly, the use of a private-sector financial model that substantially reduces effective costs and will cut financial risk to Treasury/MoD.

This will allow rapid development of an existing up-dated design and payment through private sector channels to permit acquisition of a substantial stock of equipment at lower cost and risk to government departments.

The original planning is for a delivery stock of 240 operational aircraft and 60 reserve/training aircraft, a full fleet of 300. Should the government not wish to obtain a full stock the balance will be stored until needed.





# BLACK KNIGHT TURBODYNE-01

## Other Military Applications

The core technology for this aircraft may be applied in a stripped-down variant, with new fuselage, for a limited crew of 3-4.

This creates a dedicated gunship for Army deployment as a tougher, heavier longer range, faster alternative to helicopter alternatives.

## Civilian Market Spin-offs

There is a huge civil market rising around the world, for shorter range but higher speed commuter and Executive aircraft that will take advantage of this technology.

Potentially there is a market for up to 50,000 units around the world likely to attract up to £100,000 million in export revenue and job creation for the UK economy and potential income to the Treasury.

## Treasury Income

Indirectly, through normal tax on the economy, the Treasury can expect to earn typically up to 35% of the cashflow for

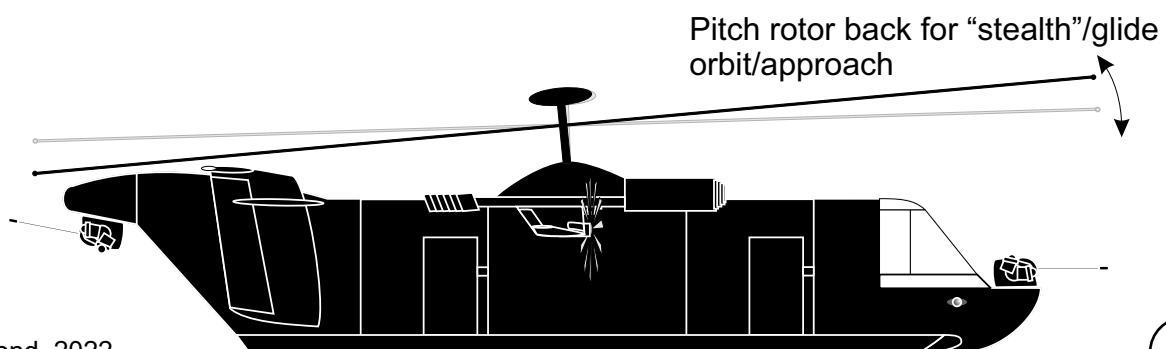
any products acquired through this. Thus the effective net cost to Treasury is only around 65% of the money paid out as long as all goes into the UK economy and not foreign suppliers. With the effect of the private sector discounting the overall effect to Treasury may be in excess of a 50% discount, including tax clawback, over foreign competitors.

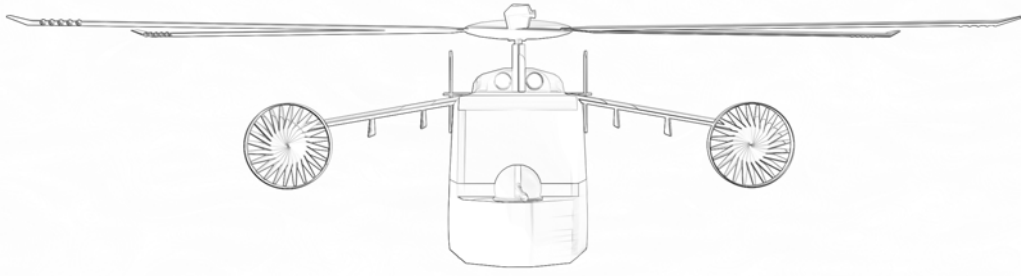
## CONCLUSION

This was a solution drawn up in 2009. It remains viable and available for rapid development and deployment to the UK Armed Forces.

There is a lower financial risk to the government as some of the programme is paid for directly and indirectly through private sector income.

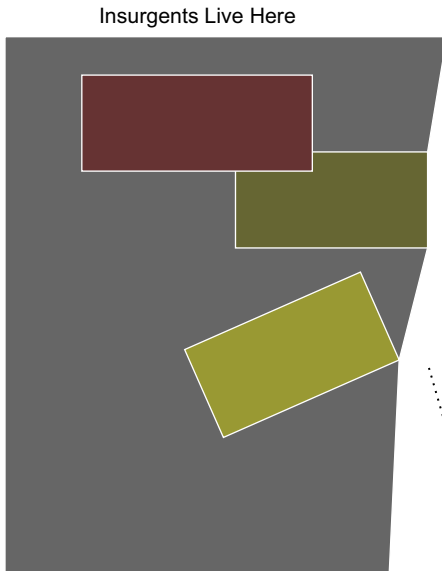
A substantial opportunity exists to promote British science, technology and engineering in the military and civil markets, to revive the floundering UK aerospace industry (which hasn't produced a new aircraft of this scale or greater for over fifty years) and kick-start the revival of the UK industrial/scientific/high technology manufacturing economy.





# BLACK KNIGHT TURBODYNE-01

## Sample Tactical Application - Counter-Insurgency



### Scenario 1:

Having landed a patrol force the aircraft orbits the patrol zone to support troops on the ground with direct fire from its two cannon.

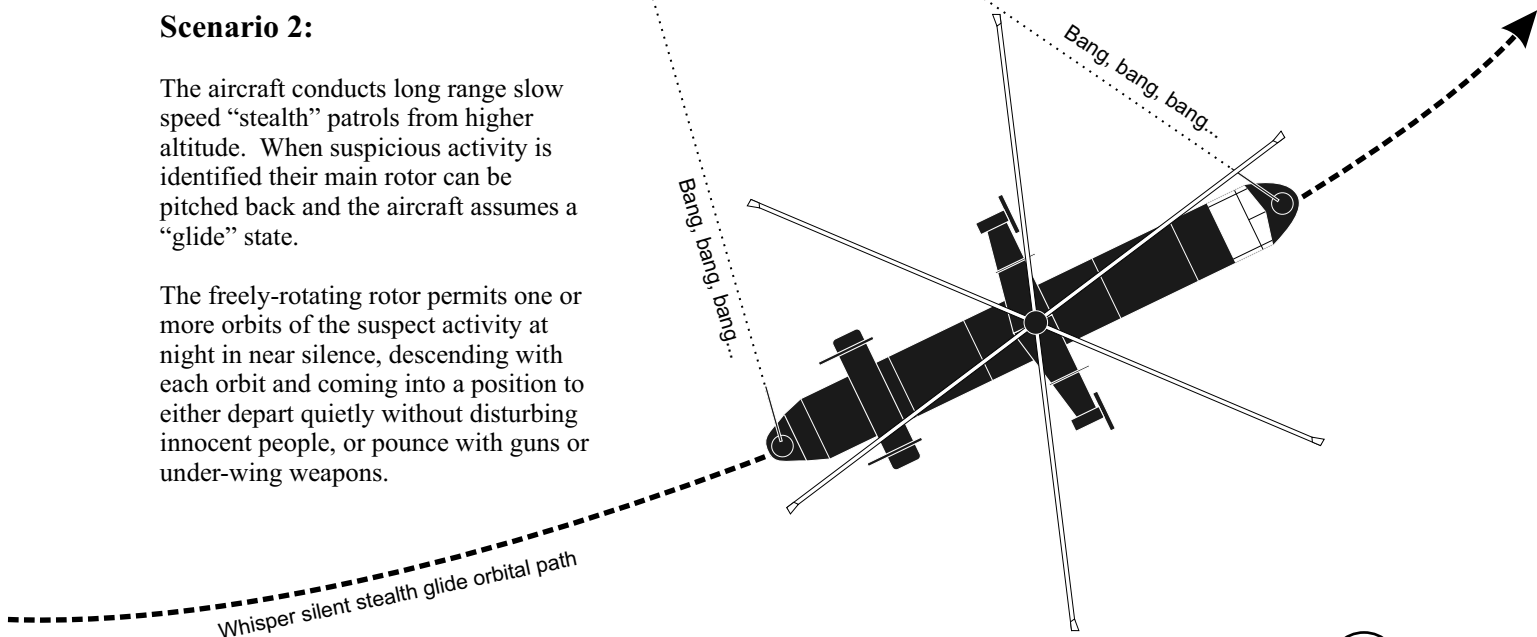
Triangulation systems on the guns and stabilisers provide maximum accuracy at range allowing both guns to converge on a single point of contact.

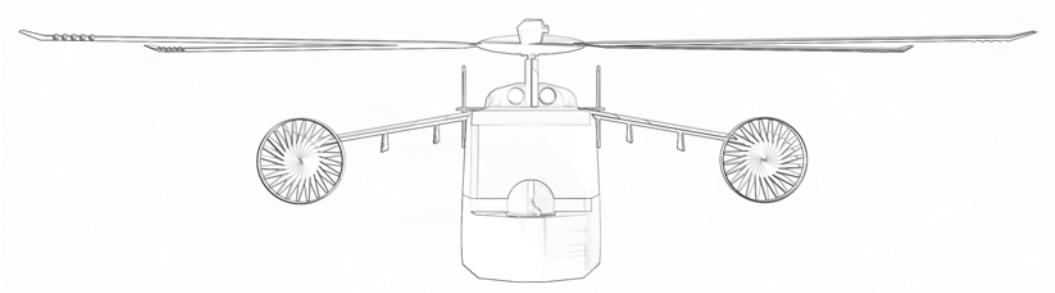
High definition 3D camera systems on the turrets permit air crew to co-ordinate attacks and observation with the ground patrol, notifying the patrol of enemy movement, strength and other information.

### Scenario 2:

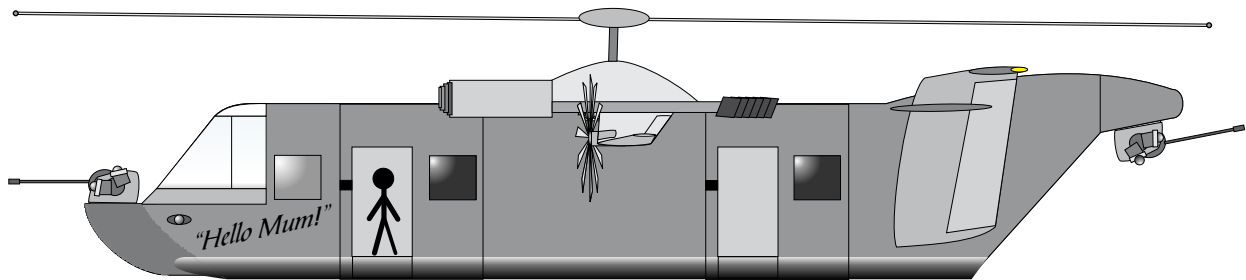
The aircraft conducts long range slow speed "stealth" patrols from higher altitude. When suspicious activity is identified their main rotor can be pitched back and the aircraft assumes a "glide" state.

The freely-rotating rotor permits one or more orbits of the suspect activity at night in near silence, descending with each orbit and coming into a position to either depart quietly without disturbing innocent people, or pounce with guns or under-wing weapons.





# BLACK KNIGHT TURBODYNE-01



## Technical Features

A typical crew of up to six includes two flight crew, two weapons/observer crew and one or two cabin crew and medic for casualty evacuation, air/sea rescue/humanitarian work.

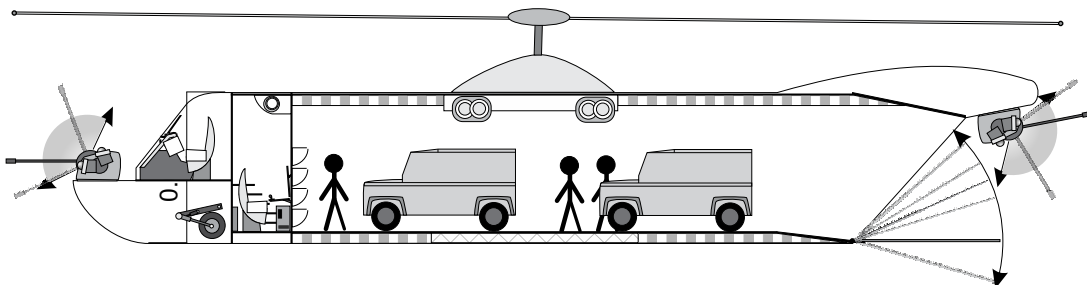
As can be seen clearly the main weapons are well away from passenger, load and crew access, at the nose and over the rear tail ramp. This way the weapons turrets give the widest angles of covering support fire out to maximum range and no entrance is obstructed. Unlike door mounted weapons both turrets can rotate to both sides of the aircraft to provide covering fire to the ground.

Placing the turrets at the far ends of the fuselage also means they have a greater clear angle of

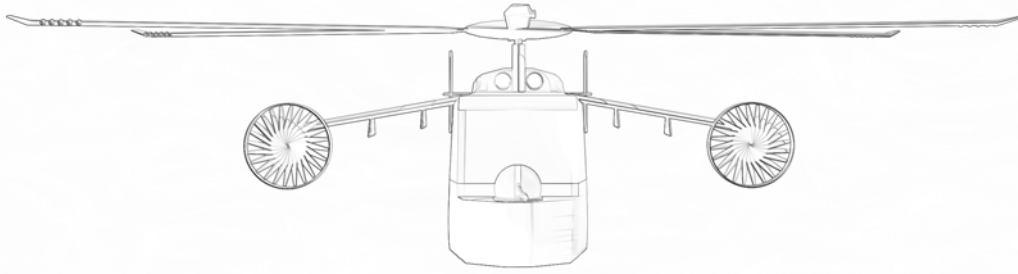
elevation up past the tip of the rotors.

Cabin space is sufficient for at least two substantial light vehicles such as Land Rovers and personnel, and plenty of space for a well-equipped platoon.

With modifications to the lower side structure suitable floats and landing gear may permit amphibious operation of the aircraft, although this may reduce the facility to carry weapons under the wings.







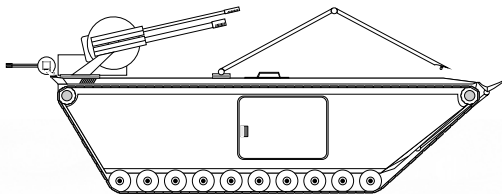
# BLACK KNIGHT TURBODYNE-01

## New Notes & Features - 2022

The original draft concept was prepared in 2009 as part of a strategy to reboot the UK aerospace manufacturing economy, including a rescue plan for Woodford Aerodrome in Cheshire as a new centre of excellence for the aerospace industry.

Since then further possibilities have arisen, new thoughts, new technical aspects, new opportunities, to enhance the Black Knight.

It is certainly possible to enlarge the aircraft, to make a wider-bodied fuselage and slightly higher cabin space to take a more spacious load. One possibility is the Battleaxe light tank concept drafted late 2022.



This lightweight two-man reconnaissance tank should weight under the 10-ton limit likely for the

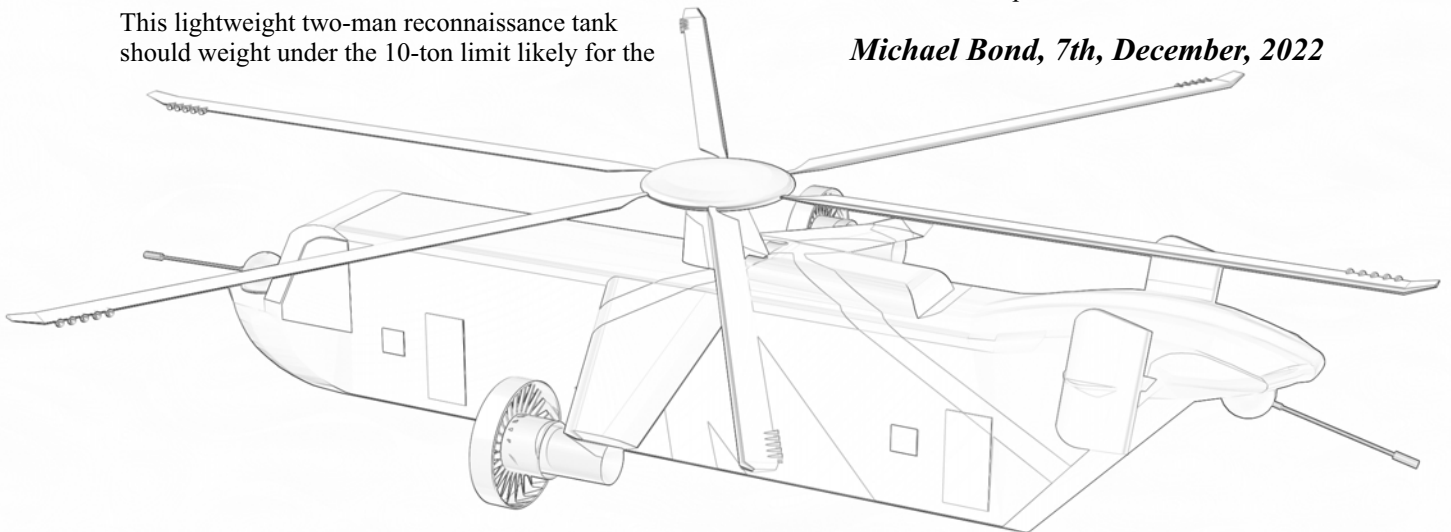
Black Knight. The Battleaxe requires a clear cabin space of around 13 foot width and a ceiling of about 9-10 feet. There ought to be sufficient space if the main fuselage is swept out, forming a more curved, streamlined shape to give such room inside from the ramp to the front side doors. Meanwhile the Battleaxe style of major ball turret may be adopted for the Black Knight nose and tail.

Stealth approach for the aircraft is hampered by the large ducted fans being exposed to ground radar. This may be reduced by certain dampening arrangements and radar cancellation features.

Amphibious features have recently been explored for other light bush aircraft, with new forms of amphibious landing gear, and this may be adopted for the Black Knight.

The Black Knight has a range of benefits for the end users, British Army and RAF. It may not pack easily into a conventional Royal Navy aircraft carrier, but there is a way to create new forms of carrier capable of mounting this aircraft, see the SWARM carrier concept.

*Michael Bond, 7th, December, 2022*



## THE END... of A Beginning?