

Ultra-light Infantry

September 15, 2006

Foundation:	There is no substitute for boots on the ground to drive terrorists and militias from the communities they hijack from the legitimate government.
Recommended Action:	Add a dimension to constant presence with which insurgents and militias cannot compete. Attack the psychology and actions of militias by: - Reinforce ground troops by constantly occupying the airspace over militia areas with remotely piloted airships. - Respond to hostile actions without collateral damage at reduced risk to ground troops. Fill the gap in response between small arms and Hellfire missiles/automatic cannon fire. Coaxially mount cameras, sensors, laser target markers and sniper rifles so action can be taken to interdict "hostile actions". - Legally define "hostile actions" in the rules of engagement. - Scan for buried devices with MineSeeker technology.
Cost of Action:	Cost of specifying weapons, engineering camera interfaces, testing hardware, testing and documenting tactics, small ship purchase and full-size ship rental is about \$2 million and take 2 to 4 months. To cover a city the size of Baghdad in its current hostile condition will take an estimated 30 airships. Cost to field 30 full sized airships will average about \$5.5 million per ship. Equipment costs will average about \$2.5 million per ship. Manning requires a crew of about 4 people per ship. Long term, costs will drop as capacity is added. Capacity will be a problem. Payback outlined in Appendix C is estimated at less than 2 years.
Scope:	This document introduces airship operational psychology, survivability, stability, target acquisition, weapons, tactics and weather

parameters.

We have pulled together the expertise of nearly all North American companies in this industry so the long station time, low cost to operate and speed that matches ground forces can be applied to saving lives and injuries. The general consensus is that the mission and engineering are “doable”. Appendix B lists these companies. This document only introduces the expertise that will be made available.

Trials are needed to combine the industry expertise with field expertise.

As the author of this document (Bill James), some judgments are made. These opinions come from a combination of my opinion and consensus with others.

Situation:

Existing weapons systems are primarily designed for war with conventional forces. Weapons are too powerful to use among civilian populations to interdict militia actions; “swatting flies with a sledge hammer.”

Operating among civil population, militias are fairly secure from constant interdiction, protected by our need to limit collateral damage.

Recent actions in Lebanon by Israel illustrate that conventional force did not interdict Hezbollah from deploying or using Katyusha rockets. Bombardments of Lebanon without the complete destruction of Hezbollah, added to its political standing.

I believe we are or will face similar issues with insurgents and the Mahdi Army Iraq.

Problem:

In areas where militias and extremists mix with local populations, they operate, train and resupply relatively free from caution or harm:

- a. They are more armed and organized than the local population and police.
- b. Consequences of collateral damage constrain

operational options.

- c. Demonstrating power, militia's gain awe and recruits (Robin Hood Syndrome¹) by being able to reject legitimate authority.
- d. Show of force and policing actions require ground troops to regularly patrol these areas; subjecting them to sniper fire, buried devices and other hostile acts. Without justified fear of retribution local populations cannot aid or warn our troops.

Objective: Attack militias' sense that they can safely operate behind a human shield. Create a drag on morale, logistical and operational actions that grows into a depression affecting both operations and recruiting.

Concept: When deploying ground troops, deploy large numbers of airships with long station time, precision sniping capabilities to be ever present over areas where we are establishing the influence of the legitimate government.

Enforce the impression of constantly been watched. Demonstrate interdiction without collateral damage.

Deploy these ships in combined arms teams to meet operational realities. Airships should be under ground troop command supported by helicopters, Specter and other air assets.

Operational psychology: WWII the US Navy bought 168 airships for convoy protection for 3 million square miles of ocean. "Of the 89,000 ships escorted by airships, not one was lost to enemy action."



¹ http://www.hsdinstitute.org/clarify/asp_freeform_0001/user_documents/The_Robin_Hood_Syndrome.pdf#search=%22Robin%20Hood%20syndrome%22

One airship, K-74 was shot down by a U-boat. That U-boat was so badly damaged that it could not submerge and was later sunk by a British bomber..²

U.S. Army operational use of airships today is *directly parallel* to U.S. Navy operational use of airships in WWII. Then, 168 airships protected sea convoys. Now, a smaller fleet of airships will protect vehicle convoys on the streets of Baghdad.

WWI German bombing campaigns in England was not very destructive but had great psychological effects: "Trains would be forced to wait for hours, in the dark, with the threat of zeppelins in the area. 25 Whistling for taxis was prohibited, as was the chiming of town clocks. 26 Streetlights were dimmed, causing more accidents. 27 Previously consistent lighting on prominent streets were jumbled and even placed in Hyde Park to confuse the zeppelins. 28 Lighting on buses was reduced to the barest minimum required to collect fares. Outside lights for advertising were curbed. Air raid warnings, searchlights and anxious dashes to shelters became familiar. The sirens of ambulances and firetrucks became more frequent. "Blackouts" were haphazardly produced and enforced throughout the country - even in areas zeppelins could not reach."³

Civil War. Union tethered balloons disrupted Confederate operations. Confederate artillery officer E. P. Alexander said, "I never understood why the enemy abandoned the use of military balloons.... Even if the observers never saw anything, they would have been worth all they cost for the annoyance and delays they caused us in trying to keep our movement out of sight."⁴

As a Target:

Airships are likely to be effective and gain the same standing as Union balloons in the Civil War as "most shot at". Getting an enemy to commit

² http://www.centennialofflight.gov/essay/Lighter_than_air/Airships_in_WWII/LTA10.htm

³ <http://members.tripod.com/wcoentry0/id29.htm>

⁴ <http://www.espionageinfo.com/Ba-BI/Balloon-Reconnaissance-History.html>

and expose themselves against material that does not risk life is viewed as a positive. The more fire drawn away from ground troops and helicopters the more all resources will be able to remove the threat.

Airships deployed in combined arms operations should result in the identification and reduction of hostile forces.

Survivability:

Remotely operated airships should be regarded as consumable, trading equipment for lives. The priority is to secure the safety of ground troops operating in areas exposed to buried devices and other militia operations while aiding in the suppression of those militias.

With air superiority and helium as the lifting gas, airships are fairly invulnerable from being shot down.

Civil War. "The Confederates' many attempts to shoot down Lowe's balloons, which earned him the title "most shot-at man in the war," illustrated the effect the balloons had on morale."⁴ No balloons were recorded shot down.

WWI.

" Bear in mind, when regarding the safety of the hydrogen used in these airships, thousands of animal skins were sewn into bags in which to store the hydrogen. Crewmembers were known to carry sewing kits to make repairs in flight. They walked along metal catwalks inside the ships framework and had to wear special shoes that reduced static charges. Yet, in spite of the crude nature of the construction, these early airships had remarkable safety records. The LZ 127 better known as the Graf Zeppelin completed over one million miles of travel including many trans Atlantic flights while navigating through lightning storms with complete safety. This same technology also proved quite safe in combat in World War I as many Zeppelins returned riddled with bullet holes. It was not until incendiary projectiles were used that operations in

combat were eliminated.”⁵

“By 1916, there were two generations of German airships employed in combat. The L-13 through L-24 were older ships, which made up the majority of any attack force. The newest ships were the L-30's, of which five had been built; the L-30, L-31, L-32, L-33 and L-34. High hopes were pinned to these latest vessels. They were far larger than the previous generation of zeppelin, with a hydrogen capacity of 1,589,000 cubic feet, which gave them a much greater bomb payload. They were however, only marginally faster and could climb no higher than their predecessors, something not considered necessary at the time. No attempt was made to anticipate the British reaction to being bombed with impunity. Since all past methods of destroying zeppelins involved shooting them full of holes, increased lifting capacity was considered to be an adequate solution. It would soon be discovered however, that Great Britain had found a way to ignite the flammable hydrogen gas which gave all zeppelins their lifting power.”⁶

WWI airships survived many bullet holes when filled with flammable hydrogen. Modern airships are filled with inert helium. Even with helium, airships should only be deployed in a combined arms team. They will become a target. As they come under fire support from Spectre, helicopters, ground forces and others will be needed to remove the aggressors.

Stability:

Airships float. Mechanical vibrations generated by propellers and engines required for powered flight in helicopters or airplanes are radically reduced. Airships are susceptible to flight path divergence by winds. The degree of this limits the operational capabilities of airships based on their size. Small ships are more susceptible to wind effects.

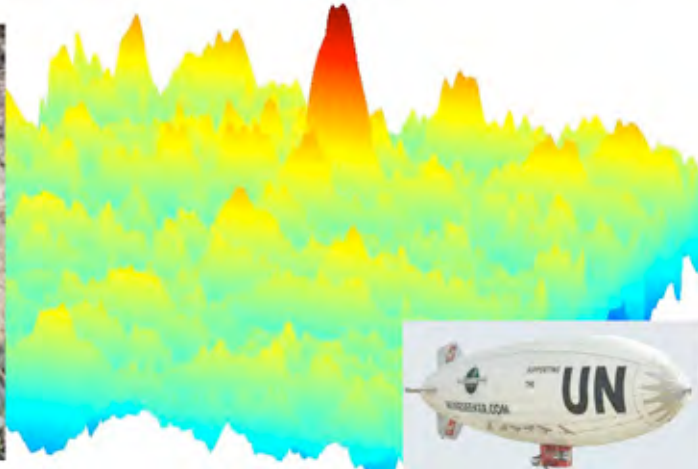
Appendix A list ships by size, operating wind, altitude capabilities.

⁵ http://www.fuelcellmarkets.com/article_default_view.fcm?articleid=9552&subsite=8291

⁶ http://www.richthofen.com/dark_autumn/

Mineseeker uses airships to locate old mine fields for 3 reasons:

- a. Vibration noise from other airframes exceeds the signals that allow them to identify old mine fields.
- b. Airships are low cost to operate.
- c. Airships require a much smaller logistical support crew and maintenance than powered flight vehicles.



The graph shows the captured signature of the mine to its left. This ship is capable of scanning 100 square meters per second for buried mines. It can distinguish between a coke can and a CBU bomblet.

It is recommended that this technology be included in at least some deployed airships to hunt buried devices.

Stability of coaxially mounted sniper rifles will be relative to the size of the airship. Specifics by size are listed in Appendix A. In general, airships are the only airframe capable of filming a golf ball in flight in support of golf broadcasting. We have not attached a rifle to such camera at this time but the ruggedness of the camera containers appears to be capable of supporting the weight and recoil from reasonable sized rifles.

Target Acquisition:

Target acquisition may in some cases be performed remotely. In general, the airship is viewed as an extension of small unit ground

force's eyes, ears and ability to act. This reflects the need to take back neighborhoods one at a time.

Cameras, radars, listening devices and other sensors may be part of the acquisition array.

Small units will have an understanding of the neighborhood; what is normal. They may know individuals and their activities. If they become engaged, they will be able to control which targets are best addressed by which members of their team (airship is part of their team).

Critical is containing the scope of work to what can be achieved on a low budget on a rapid schedule. It is expected that initial aiming and judgments of when to fire will be controlled by the sniper / sniper crew. It is possible for the safety to be managed by a different person / persons than the trigger.

The following images illustrate coaxially mounting 3 lasers with a camera and the airship that can lift it. This ship can mimic full-size, armed ships, draw fire so enemy locations can be identified, draw fire away from helicopters. Its only offensive capability would be able to lift a paint ball gun for crowd control and would only be accurate within 50 feet.



Camera and control harness. Camera rotates 360 degrees, elevates from straight down to 30 degrees from vertical.

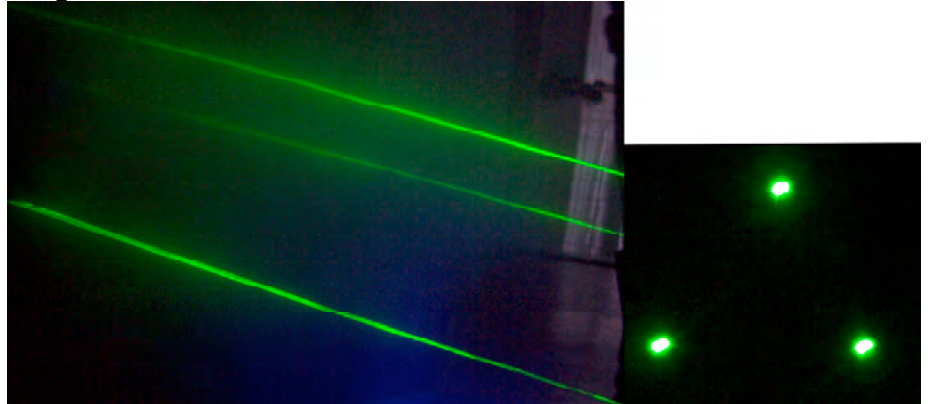
Example of how easy it is to handle such a ship.
www.jpods.com/airships/EagleEye.html



Three coaxially mounted lasers provide perspective to a sniper regardless of the zoom affect of a camera.

Laser pattern side view and view on target.

Multiple lasers provide perspective to a shooter regardless of camera zoom.



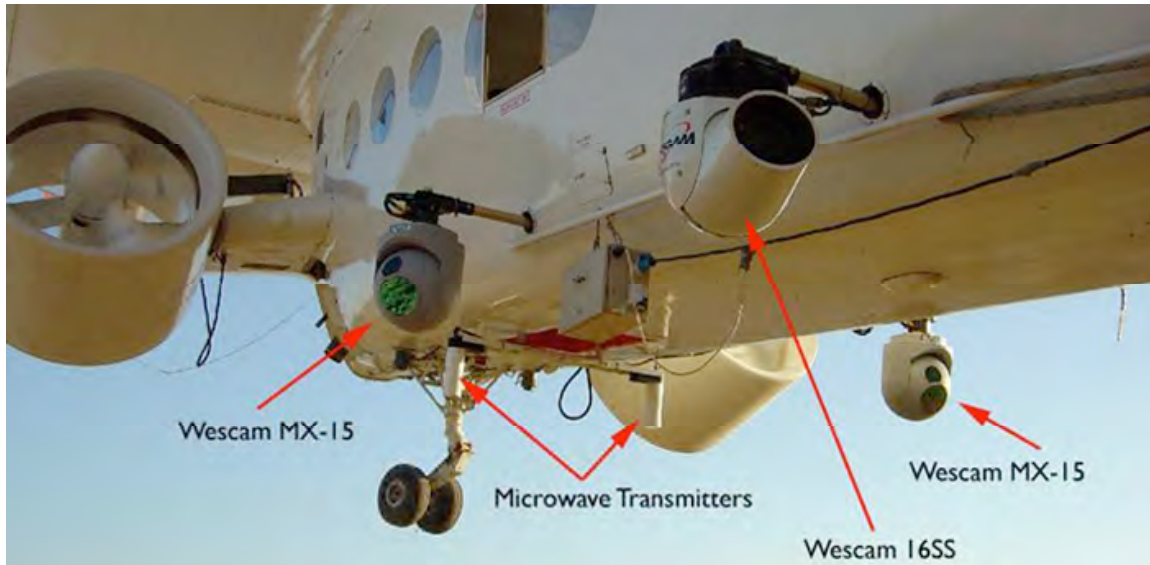
This pattern can be mimicked from very cheap party balloons to expand the psychological affects of being hunted.

Control is managed by the toggles to the right of the display hanging from the neck harness. Camera, rifle and lasers all move and track together.



The concept illustrated in our test setup can be scaled to match nearly any size weapon system. Airships can be scaled to support nearly any size weapons platform. As will firing from any vehicle or air frame, engineering is required to manage recoil, heat, exhaust, etc....

The cameras on this full-size airship are fundamentally the same as our test rig. Specifications and optic of the cameras is available at www.WesCam.com. Weapons mechanics will be sized to manage the characteristics and recoil effective weapons.



Extensive experience with cameras and surveillance equipment is available within the group of companies contributing to this paper.

Weapons:

Airships could carry any weapons package currently deployed on any airframe. This document is limited to precision sniping weapons and airships that are currently in production.

The weapons can be tailored to the mission and the capability of the ground force.

Larger ships have a lift capacity of 1,000 to 3,500 pounds. These have the capacity to effectively carry multiple camera/rifles and can operate in a wide range of wind and weather conditions.

Exact weapons to employ on these ships needs to be determined with sniper experts and ground force commanders. The mechanics to mount, manage recoil, safely launch, operate and land an armed airship will need to be matched to the weapon and ship. Known sources of robotic skills or mechanical actuation can be employed to safely meet these needs. A budget has been allocated to achieve this need.

It will have to be determined if weapons must be zero'ed by each specific gunner; if gunners can adapt to the gun they are using; how altitude,

winds, weather affect shooting. It is possible for weather related factors to be added to the camera/display interface to give the gunner a recommended aim point.

In Phase 1 only light rifles will be used. In Phase 2, it is estimated that 20mm will be the largest weapon recommended. This would primarily be used to kill engines of suspicious vehicles without lethal force:

- A car speeding towards a checkpoint can be disabled, then determined if it is someone speeding to a hospital or a suicide-bomber.
- Suspicious car parked on the side of a road can be disabled then checked to see if the occupants are a threat or a farmer checking livestock.

Giving field forces the capacity to act without lethal force allows suspicious behavior to be suppressed without collateral damage; I believe over time this will peel away the use of human shields, creating a drag on insurgent logistics, operations and recruiting.

Smaller tethered balloons may only be able to lift a spy camera and targeting lasers. Once it is established that airships have the ability to target bad behavior, it may be that any laser pointing from a balloon will suppress that behavior.

Tactics:

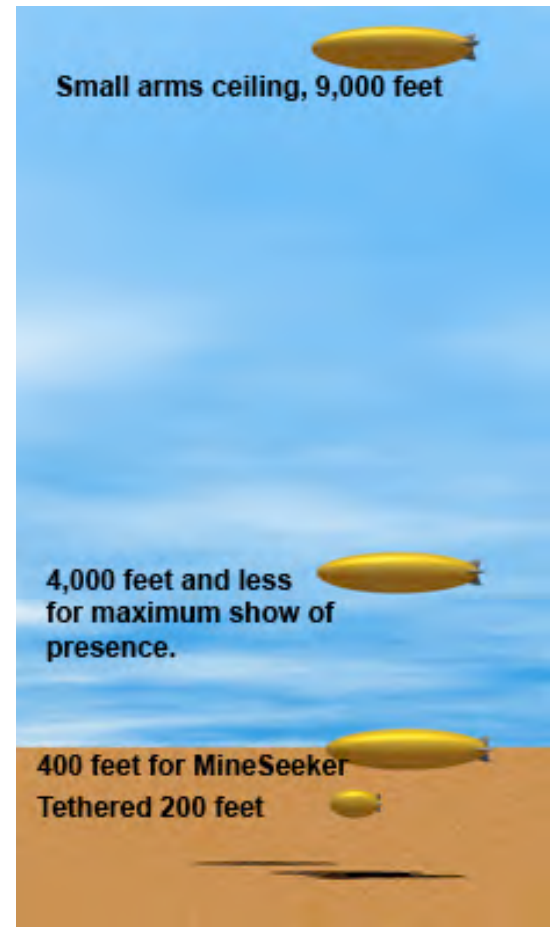
Thoughts on tactics pertain only to forces engaged in peacekeeping, operations against insurgents and illegitimate militias. No consideration is given to operations against conventional forces.

Even in fairly benign conditions, airships need to be deployed as part of a combined arms team. Just as tanks are not deployed without infantry, airships supporting ground operations should never be deployed without being under the command of the ground force commander.

In very hostile situations that support should include precision heavy response such as Spectre. Airships draw fire, all assets combine to reduce that hostility.

Tactics will vary relative to the need of the commander and hostile environment. In general the closer to the ground the airship operates the more damage it will have to absorb, the more consumable it will become and the more imposing it will be.

“Touch screen” capability will be investigated. Can bullets piercing one side be matched to exiting the other; training weapons on the attacker. Perhaps a “Blue-tooth” like, low-powered, local ballistic radar operating inside the airship can identify a path and direct targeting.



Soldiers patrol streets to suppress bad behavior. When hit by fire or explosive devices they respond. We can deploy unmanned assets to reinforce those soldiers' commitment to draw fire in support of the mission.

Deployment options will vary greatly depending on the size and shape of the airship. Size roughly equates to power and lift. Smaller airships will have very limited weather capability. All airships have weather limitations. For a consumable device, I believe all will have a disproportional psychological impact of impotence; the inability of

militias to compete, to respond in kind.

Unlike any other air or ground asset, airships have a history of taking beatings, limping home to be patched and returned. At a low cost, without loss of life or human injury, this aspect of airships is likely to be a most important characteristic; opening tactical options that have not yet even been conceived (author note, and I am a pretty out of the box guy).

Tactics for tethered devices should be limited in altitude so tethers do not exceed 2-4 times the diameter of the airship. We do not want helicopters or jets flying into cables where there is no visible cue.

Helicopters operating with airships will have to recognize that airships are not as maneuverable or fast as helicopters. Jets are completely in a different frame. Controls for airships can automatically feed AWACS or other flight controllers with key information (radar signal for airships can be quite small).

On the whole, I believe airships will be a helicopter pilot's best friend; drawing fire away from helicopters and ground troops.

Navy airships in WWII did not lose a single surface vessel under their watch. With regret and as an infantry veteran, I accept that is not possible for ground troops; however, I do believe airships can provide a level of cover and support that has yet to be exercised.

There will be a many tactical trade-offs to be discovered.

Capacity:

Manufacturing capacity is very limited. What I believe is necessary (30 airships immediately) will take 2-3 times the world's current yearly capacity.

To resolve this and gain as much expertise as possible we have created a collaboration of

companies in the industry. This brings expertise that would normally be shielded by proprietary interests into collaboration to benefit our committed troops.

Reference Videos:

Very good summary video for deployment and acquisition:

<http://www.aerosml.com/Aeros%20Surveillance.wmv>

Illustration of very small ship:

http://www.jpods.com/downloads/airships/Eagle_Eye_256_DSL_03.wmv

Appendix A:

Characteristics

Key characteristics depend on size. Each size is listed with some of its characteristics.

Mimics. These can be as cheap as large party balloons costing pennies. When perceived as a threat they may draw fire letting ground forces locate and react to hostile forces.

Camera-only (<30 feet). Camera only ships are generally tethered and are not very stable. Can capture images and sometimes provide video. Can provide perspective, mimic larger ships and draw fire.

Small Free Flying Ships (30 – 60 feet long). These ships are capable of operating independent of tethers and can carry one camera/rifle/laser package. They can operate in low wind conditions.

Mid-size ships (90 – 200 feet long). These are the largest of the commercially available ships today. They have a payload of 900 – 3,500 pounds and can operate in sustained winds from 15 to 45 mph.

Large ships (>600 feet) are not available.

Appendix A

Length	Cost	Crew	Winds	Lift (pounds)	Weapons	Sensors	Power	Max Attitude, feet	
18 feet	20,000	1	< 7 mph	8	none	camera	tether	<200	
30-50 feet	25,000 to 50,000	2	<12 mph	24	1 rifle	camera	engines	<1000	
200 feet	5,500,000	4 if operating independently. If 30 ships are located at 3 bases the total man power could be as low as 30 people.	< 45 mph	900-3500		WesCam	engines	3,000 to 15,000	
Large	Not available	10	< 60 mph	very heavy	anything	WesCam	engines	< 70,000	

Appendix B

List of supporting airship manufacturers.

Advanced Hybrid Aircraft
Email: bnb@ahausa.com
Telephone: +1 (604) 541-8064
Facsimile: +1 (604) 541-8064
Mailing Address:
PO Box 144
Eugene, OR 97440
<http://www.ahausa.com/>

Aeros
Fred Edworthy
6005 Yolanda Avenue,
Tarzana, Ca. 91356
<http://www.aerosml.com/main.htm>

Airship Management Services, Inc.
Two Soundview Drive
Greenwich, CT 06830 USA
(203) 625-0071 FAX: (203) 625-0065
<http://www.airshipman.com/ourairships.htm>

Blimp Guys
20 Ryan Place, Unit #2
Brantford, ON N3S 7S1
519.756.1110
<http://www.blimpguys.com/outdoorRC.htm>

Eagle Eye Photography
1519 Elliot Ave S, Minneapolis, MN 55404
952.882.8570
<http://www.blimpguy.com>

Intelligent Transportation
Bill James, 612.414.4211
www.IntelligentTransportation.com

MineSeeker Foundation
44(0)1746 767000
www.mineseeker.com

TechSphere Systems International, Inc.
& 21st Century Airships Inc.
Mike Lawson
706.256.2700
2055 Phillips Drive, Columbus, GA 31903
<http://www.techspheresystems.com/Default.aspx?TabId=23>
<http://www.21stcenturyairships.com/>

US-LTA CORP.
c/o 4259 W 5th Ave., Eugene, OR, 97402
(541) 868 0666
Contact: Joe Olma, Vice President
<http://www.us-lta.com/model138.html>

Appendix C
Mission:

Payback

The greatest payback from fielding an airships fleet in support of ground troops is expected to be mission effectiveness.

It is impossible for airships escorting ground forces to have the perfect “no loss” record of the 168 US Navy airship of WWII.

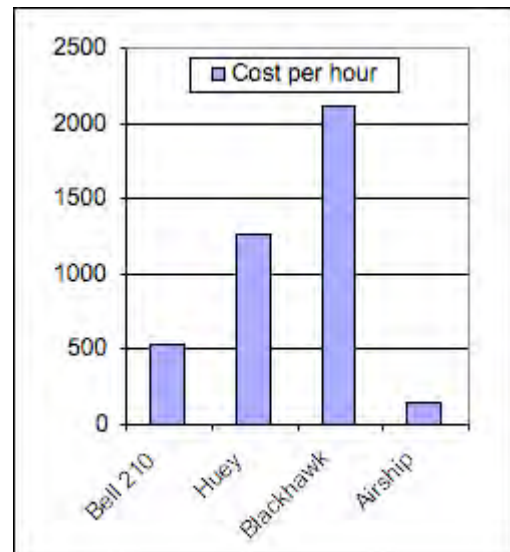
It is expected they will:

- Save lives and material.
- Give field forces the ability to attack suspicious behavior with non-lethal force opening possibilities to suppressing bad behavior. Fear of making a mistake; even making the right decision when the consequences are ugly is repugnant to the ethics of military people.
- Remove from insurgents the sanctuary of operating behind a human shield.

Mission success will have to be measured by experience. It is possible to quantify a financial payback.

Savings per Hour:

At 1/16th the operating cost per hour of a Blackhawk helicopter⁷, substituting airships for helicopters where mission permits will create a measurable payback.



Equipment Savings:

If airships reduce helicopter and Humvee losses by 10% the fleet will pay for its self every 2 years.

Lives:

If a 10% reduction of wounded and killed is achieved it is priceless.

⁷ <http://www.globalsecurity.org/military/systems/aircraft/luh.htm>

Intelligent transportation Corp. (IT-Corp) is pleased to offer Phase 1 of a comprehensive program to develop and supply mobile, remotely controlled surveillance and attack airships. These airships carry sufficient engines, optics, weaponry, electronics and detectors to find the enemy and his hidden explosive devices. Once identified, it can take the attack to the enemy without endangering friendly personnel.

Phase 1 is 2-4 months long and is intended to prove and document concepts for use of airships.

Phase 2 is for full-scale production of at least 30 full-sized airships is not part of this proposal. It is recommended as soon as concepts looks justified, that Phase 2 be released. Production capacity is a limiting factor.

Phase 1 price is \$2,127,734.

Phase 1 deliverables:

Supply of six small (30 foot) airships and develop tactics. Airships will be equipped with engines, fuel tanks, radio remote controls, electronics and communications. Weapons for testing will be light weapons and paint balls guns. The Army should provide weapons if they are standard in the arsenal.

Documentation on

- Field-testing and tactics developed using the six small airships.
- Demonstration to and survey of selected field units.
- Tactical mix for airship sizes and capabilities.
- Support details for contractors and soldiers to deploy and operate an air fleet.
- Designs and/or recommendations for weapons platforms, sensor packages and optics.
- Field tests and demonstration of the MineSeeker technology.
- Payback for fielding some number of (30 estimated) full-sized airships.

Progress payments

Payments schedule is to be as follows:

60% with purchase order placement	\$1,270,000
Industry is generally not flush with cash. Dedication and diverting resources requires payment at the time of action.	
20% upon delivery of six aircraft	\$846,542
20% upon completion of testing a submittal of test report	\$211,636

Detailed Spreadsheet attached.

Questions: Bill James, 612.414.4211, bill.james@jpods.com

CHRIS J SAMPLE

USMC Reserve Intelligence Officer; System Engineering Support Lead for a defense contractor firm in Northern Virginia

RE: Comments on White Paper "Ultra-Light Infantry" dtd 12 August 2006, by Bill James

Note: Relevant past experience includes:

1996: Graduate USMC Sniper Employment Officer's Course (Quantico, VA)

1997-1998: USMC Scout Sniper Platoon Commander 3rd Bn 2d MAR (Camp Lejeune, NC)
(26th MEU LF6F Deployment; Dynamic Response SFOR Bosnia)

1998: Graduate USMC Amphibious Reconnaissance Course (Ft Story, VA)

1998-1999: H&S Executive Officer, Battalion Intelligence Officer 2d Reconnaissance Bn (Camp Lejeune, NC)
(Battle Griffin Norway)

After reviewing the White Paper on use of airships in today's Stability and Support Operations (SASO) environment, I believe it is an idea worth pursuing from multiple aspects. Multiple integrated sensors on a tethered and/or non-tethered airship has strong potential in the current challenges of the Global War on Terrorism (GWOT). Airships could provide a means to establish persistent aerial Intelligence Surveillance and Reconnaissance (ISR) over a wide area of operations and provide good overhead coverage of large urban environments such as in the Iraqi Theater of Operations. Importantly, this persistent ISR is provided in an unmanned configuration, thus enhancing force protection while maintaining the advantages of enhanced situational awareness for ground component commanders.

Can Airships become a reasonable enough alternative for missions traditionally calling for Snipers?

The Marine Corps Scout/Sniper is a Marine highly skilled in field craft and marksmanship who delivers long range, precision fire at selected targets from concealed positions.

The primary mission of a sniper in combat is to support combat operations by delivering direct fire on selected targets from concealed positions. The sniper also has a secondary mission of providing an organic surveillance and reconnaissance capability for an infantry battalion through the gathering of information for intelligence purposes.

I believe that an Airship employed in an ISR role would achieve much greater impact and relevance to supported commanders vice in a precision direct fire role. However, both roles could be satisfied by this type of platform.

In terms of accomplishing the Primary Mission, can the Airship become a stable enough platform for precision shooting? Can it be a stable enough platform for long-range optics? Night vision? Thermals? At any altitude?

During work-ups and exercises throughout our MEU deployments we trained regularly on firing precision weapons from an airborne helicopter. We created our own self-made harnesses to fire both the M82A1 SASR and the M40A1 Sniper rifle. In terms of accuracy and control we achieved greater success with the M40A1 vice the M82A1 due mainly to the caliber and physical recoil differences of these weapons. Having personally experienced the difficulty of firing these weapons in an aerial platform, and knowing the level of training we had to conduct to achieve a desired accuracy; I believe this role would become a hard sell to ground commanders. However, setting objective and threshold accuracy requirements from the operational forces would provide a means to demonstrate a proof of concept that maintains those set accuracy limits.

Keep in mind that a round is impacted the moment it begins its path inside the weapon. One difficulty in firing from elevated platforms or aerial platforms is that wind impacts are often vastly different from the shooter to the target. This impact is magnified in an urban environment as Mark accurately describes. "Winds in an urban environment are notoriously unpredictable, especially in and around taller buildings, and urban shooting can challenge even an experienced Sniper. Many cities create natural canyons when it comes to wind direction and speed." These impacts will be very difficult to account for from an airship platform without the benefit of sensors to measure at least the impacts from the shooter position.

I agree with Mark that this is achievable given the full complement of these sensors mentioned below:

1. Laser range finder
2. Variable power optics
3. Temperature gauge
4. Wind meter

FEW SNIPERS TO FILL THE DEMAND:

I also concur that the Marine Sniper community is relatively small and the attrition rate for Marines seeking Marine Occupational Specialty 8541 (Scout/Sniper) status is quite large. However, the principle problem in sniper employment is not one of numbers, but rather one of will. Many ground component commanders during my time did not believe in the psychological advantages of employment of snipers in their primary mission role. Most commanders relegated their employment of scout snipers to that of our secondary mission. However, the last four years of the GWOT has proven many of those ground commanders wrong. I had many friends in the fight during the second round of Fallouja, and the fact of insurgents begging to have the Marine Snipers pulled back is absolutely true. Airship employment in a sniper role would indeed widen that psychological effect. However, we must also consider the Support portion of a SASO environment and sometimes a persistent airship that is hovering 24/7 can have a negative psychological effect of an ever-watchful/over-bearing occupational force. The argument against a larger utilization of airships is due to that negative psychological effect as described.

AIRSHIPS IN COUNTERSNIPER ROLE:

I think sensors with similar technology to counter battery fire are the most value to fill this role. There are sensors today that can triangulate off of smaller acoustic events such as rifle fire. Obviously, these types of sensors would need to be in place at a lower altitudes, but could prove very effective in providing near-real time target identification/direction.

PERSISTENT ISR:

I believe the strongest argument for airships is the ability to provide a platform that has multiple integrated sensors that can provide information over a designated area of operations on a continual basis. Along our southern border, this country utilizes airships to monitor the border regions not only for illegal immigrant movements, but mainly to control the smuggling of illegal drugs. During my intelligence training at Ft Huachuca, AZ we visited the airship harboring location in the area to get a small brief on the challenges of monitoring a border region, which was referred to as "Cocaine Alley". As a result, we have an established history and expertise on the employment of these platforms for similar roles.

Multiple sensors to include imagery, geospatial, acoustic, electronic protection and electronic attack etc could be utilized to provide a rich picture of the battlespace. We could take long segments of video and run those segments through change detection software to provide indicators or possible threats. Knowing and seeing these "eyes in the sky" would go a long way in preventing IED emplacement. The Joint IED Defeat Organization (JIEDDO) has looked

extensively at the utilization of airships in the Counter-IED role. However, the concept continually gets disallowed due to upfront costs to purchase and employ, the costs associated with upkeep, and the perceived negative effect of a constant overhead platform.

CONCLUSIONS:

In my opinion Persistent ISR is your best sell for the employment of these airships. I especially think that the CIED role is an excellent fit for these platforms. The key points to drive home for the CIED mission are the potential capabilities for change detection and multiple/combined sensor integration packages. JIEDDO has described that to date we have responded to the IED threat mainly in a defensive and reactive manner. Current focus of the organization is to conduct research and development on tools and systems that defeats the system and not just the device. They term this their "left of the Boom" strategy, i.e. prior to emplacement or prior to an attempted detonation. Airships could provide an excellent means to deliver persistent tools and sensors to accomplish this strategy.

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RE: Comments on White Paper "Ultra-Light Infantry" dtd 12 August 2006, by Bill James

Note: the following comments are based on my personal experience and past training, and do not reflect the official position or views of the Federal Bureau of Investigation (FBI) and should not be considered an official endorsement of that agency. Relevant past experience includes:

1997: Scout Platoon Leader, 2nd, 2nd IN (Operation Joint Guard II, Bosnia)
1999: Sniper Section OIC, 2/2 IN, 3rd BDE, 1st ID (Vilseck, Germany)
2001: Graduate, U.S. Army Sniper School (USASS)
2001-2002: Commander, C CO, 2nd, 29th IN (USASS)
2004: Sniper/Assaulter, FBI Los Angeles (LA) Special Weapons and Tactics (SWAT)
 : Sniper Training Coordinator, FBI LA SWAT
2006: Graduate, FBI Basic Sniper/Observer Course
2006: Graduate, FBI Enhanced Sniper/Observer Course

After reviewing the White Paper on use of airships in what used to be termed low-intensity conflicts, I believe it is an idea worth pursuing. Utility in the current situation in the Middle East and the high probability of fighting terrorists or insurgents in the future are two immediately obvious deployment options to me. Airships seeded over a target location will be able to greatly assist the commander (or whatever level operational control is chopped down to) in identifying threats and reconnoitering an area without threat to U.S. soldiers.

I assume that the Airships will have some sort of video capability able to be monitored at a distance, are able to be precisely controlled from a TOC location and possess sensitive enough controls and precise altitude and speed adjustments.

While no technical reconnaissance capability will ever be better than emplacing a trained soldier, can Airships become a reasonable enough alternative for missions traditionally calling for Snipers?

The primary mission of the Army Sniper is to ***deliver long-range precision fire to engage key select targets and targets of opportunity***. The secondary mission of the Army Sniper is to ***collect and report battlefield information***.

In terms of accomplishing the Primary Mission, can the Airship become a stable enough platform for precision shooting? Can it be a stable enough platform for long-range optics? Night vision? Thermals? At any altitude? Any Sniper who has tried to shoot from a helicopter or firing an M82A1M .50 cal with a 25x scope will tell you how difficult certain aspects of that shooting can be.

Winds in an urban environment are notoriously unpredictable, especially in and around taller buildings, and urban shooting can challenge even an experienced Sniper. Many cities create natural canyons when it comes to wind direction and speed.

I believe an airship can be effective in this role, equipped with the following, at a minimum:

1. Laser range finder
2. Variable power optics
3. Temperature gauge
4. Wind meter

FEW SNIPERS TO FILL THE DEMAND:

Snipers are immensely valuable in all types of military operations in all terrain, but the problem has always been creating enough of them. The Army Sniper School at Fort Benning had a maximum of six classes per year on ATRRS and 32 students per class, at full enrollment. This ensured a 4:1 student/instructor ratio. Even with nearly individual attention from the instructors, the graduation rate averaged about 50%. In fact, a study of the USMC Scout/Sniper School, the British Army Sniper School, the Canadian Army Sniper School and the German Army Sniper School conducted in late 2001 revealed an average graduation rate of 50%. The mental abilities and abstract thinking skills required for a Sniper will simply not be found in a large majority of otherwise qualified soldiers. In addition, all prospective USASS students must enroll with a signed "permission" from an Army psychologist qualifying the student mentally for the job as Sniper: not only to weed out potential students with latent psychosis, but also to ensure the prospective student can emotionally handle the demands of the job. In deference to their unique skills, all Sniper graduates are enrolled into a database maintained by the U.S. Secret Service.

With so few qualified Snipers and such high demand for their skills, Airships would allow the commander to drastically expand his "sniper" capabilities in theater. Multiple airships could be controlled and monitored via the TOC and included in the R & S plan. In fact, a Sniper-qualified senior NCO could be assigned as NCOIC of the Airship section out of the S-2 Shop and be able to direct the deployment of the Airships as well as approving and, if necessary, pulling the trigger. In fact, the "video game" aspect of Airship deployment and subsequent killing would allow the majority of soldiers, already "trained" in violent "first-person shooters", the necessary emotional detachment to do a job they may otherwise not be able to do.

AIRSHIPS IN COUNTERSNIPER ROLE:

One of the most dangerous adversaries on an urban battlefield is the school-trained Sniper. When a massive amount of collateral damage is not an option, another Sniper is generally the best tactic for flushing him out and discovering his location. However, Airships controlled by a qualified Sniper can be used to in the same role, without the risk to soldiers.

PSYCHOLOGICAL ROLE OF SNIPERS:

A common military axiom is that morale is three times as important as the physical. One of the biggest force multipliers for Snipers is their ability to affect the enemy's morale with long-range, unseen death. See the recent USMC attack on Fallouja where the insurgents called for Marine snipers to pull back as a condition of surrender. Airships would have much the same effect. The enemy would have very little place to hide, and a rifle shot could come from any one of the Airships hovering in the battlespace.

ROUTE SELECTION:

A classic scout platoon mission is route reconnaissance, leading the parent infantry battalion on the correct Axis of Advance. However, motorized scout platoons are vulnerable to IEDs and ambushes. In fact, the smart enemy will channel the scout platoon and wait to attack the battalion main body. Airships, above the battlefield, would be able to aid the battalion S-3 in choosing the best route for his subordinate units. The enemy, even knowing the Airships were deployed, would be unable to determine exactly what route the U.S. was going to take, like they would by surveilling a ground-based scout platoon.

LAW ENFORCEMENT USE:

Many of the roles undertaken by an occupation Army, or an Army in a counterinsurgency role, resembles that of traditional law enforcement. Recording of Airship video would allow commanders the ability to review past events to note common occurrences, i.e. the same vehicle

in the location of attacks, identification of insurgents planting IEDs, kidnappings, etc. An excellent example is the British law enforcement use of video camera footage in identifying the perpetrators of the July 7, 2005 bombing of the London Underground. Arming of Airships with non-lethal munitions, such as pepper balls or CS gas, would also make Airships helpful in breaking up demonstrations.

CONCLUSIONS:

Common comments from friends in the military and in the intelligence community indicate that the U.S. is on the defensive, reacting to the insurgents rather than having the enemy react to us, that the drawn-out counterinsurgency has caused us to lose momentum. Some friends have even complained about the restrictive rules of engagement. A UAV armed with a Hellfire is an excellent option, but a Sniper is a precision weapon, more useful when wanting to avoid unnecessary civilian casualties, especially in a politically sensitive environment. Since Snipers are not plentiful, Airships would be a great way to artificially increase the amount of sniper coverage in an Area of Operations and, therefore, increase every force multiplier a Sniper brings: precision shooting, superior observation skills, target detection, psychological effect, and reconnaissance. Possible technical issues aside in the development, I feel the concept of Airship deployment as a Sniper and Observation platform should be researched by the Army.