Reconnaissance Units

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24 February 2006

Outline

Thesis: Based on technological advances in recent years, the need for the human reconnaissance unit is not fading away it's only changing.

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Reconnaissance Units

Based on technological advances in recent years, the need for the human reconnaissance unit is not fading away it's only changing. We will discuss four different types of reconnaissance platforms: human reconnaissance, Intelligence, Surveillance, and Reconnaissance (ISR), Satellite, and Unmanned Aerial Vehicle (UAV). Human reconnaissance has been around longer than any other asset. ISR platforms have been around since man has learned to fly. The ISR platform that we will look at is the Joint Surveillance Tactical Attack Radar System (JSTARS). This platform is a joint venture with the United States Army and the Air Force. Satellite reconnaissance has been around since 04 October 1957 when Russia launched Sputnik 1. The United States launched Explorer 1 on 31 January 1958 ("The History of Satellites, Sputnik and The Dawn of the Space Age"). Since that time satellites have been used for a multitude of purposes including but not restricted to communications, various types of imagery, and intelligence gathering. UAVs have been used by the military since the early 90s but were being tested and developed in 1989. Since Operation Iraqi Freedom (OIF) UAVs have come into high demand. So much so that UAV units are being organized and manned down to the brigade combat team (BCT) level. The first reconnaissance platform we will look at is by far the oldest, ground reconnaissance.

The theory of ground reconnaissance, which originated from the First World War, encouraged the use of highly skilled individual scouts or small patrols to penetrate the enemy lines and get information. They fought only in self-defense and operated by stealth. Generally, present day patrols can be classed as one of two types: a patrol small enough to sneak, or a patrol large enough and strong enough to fight. Individual scouts and small lightly armed, reconnaissance patrols always have their uses but they also have limitations. The sneak patrol can only gain information by observing and listening. A three-man patrol is the minimum number that can provide all around observation and security for itself. Such a patrol team is easy to control and can maintain the necessary balance between speed and silence (Applegate 38).

Although a three-man team is the best size for a sneak patrol, such patrols can be larger. However, increases in size make them harder to control, harder to conceal, slower in progress and increase the difficulties of silent movement. When the enemy is silent and well concealed, such a patrol becomes an ineffective means of ground reconnaissance. Combat reconnaissance patrols may vary from only a patrol leader and a few men to a company or more. This wide variance in size is dependent upon the opposition expected and the nearness of contact with the enemy. On a fluid front where lines are not definitely established, the large heavily armed patrol can be sent ahead to an area where detailed reconnaissance is needed and there it will act as a base from which small sneak patrols are sent out (Applegate 46).

The use of large, well-armed patrols carrying a great amount of automatic firepower, for reconnaissance as well as for combat, is now standard procedure in all armies. This type of reconnaissance is a reconnaissance in force. This is a limited objective operation by considerable force to uncover and test the enemy's dispositions and strengths, or to develop other intelligence information. They fulfill a need that the small sneak patrol is not capable of meeting. Although this type of patrol sacrifices some of the advantages of concealment, stealth, and silent movement, which are inherent in the individual scout or small patrol, it is better able to operate in modern battle. In reconnaissance you can fight to get information, fight to protect it, and fight to get it back (Applegate 38).

The commander is still mainly dependent upon his own intelligence and ground reconnaissance agencies such as the photo-interpretation team, the interrogation team, and the counter-intelligence detachment. Often they are the only means of obtaining or confirming enemy information. The personnel of these intelligence sections and reconnaissance agencies must be trained in their duties (Applegate ix).

Ground reconnaissance is the best-known method of gaining tactical information. Army units that perform ground reconnaissance such as infantry, armor, and engineer elements, are best suited for patrolling. Armored cavalry reconnaissance units are excellent for reconnaissance missions deep in enemy areas. Using helicopters to deliver and retrieve patrols increases the depth at which patrols may operate. The ability of patrols to provide timely information depends on their mobility and communications for sending back information and receiving new instructions (Heymont 22).

Once in contact with the enemy, the area must be kept under continuous observation and controlled by friendly patrols. Unfortunately, observation alone is not always enough. Too often, a particular area of enemy activity is hidden from even the best aerial photographs or ground observers. To confirm previous reports or to gain additional information, the scout or patrol must be used. Since enemy information will not always come easily, the commander must have scouts or patrols capable of going out to get the required information and bring it back (Applegate ix).

In the middle of the last century, battles were won or lost fighting from stationary positions using only binoculars as an aid to gain information. To save recon soldier lives, different techniques were developed to provide a variety of surveillance techniques. Today, these techniques aid in gaining critical, time sensitive information. In today's warfare there is no frontline. The front is all around you. The enemy is not wearing the traditional uniform and their appearance is such that they can blend with society and infiltrate our secure areas. There are no more enemy tanks, only concealed weapons in civilian cars. It has become an asymmetric battlefield.

Traditional recon methods should still be used and improved on as the enemy is ever changing their methods. We must adapt to this ever-changing battlefield environment and continue to gain information on the enemy. To win, recon units should have more of a covert mission method in today's battlefield. For example, telecommunications, TV or Internet companies and taxi drivers who work and gain information in unstable regions. These are units or individuals who openly work in a common environment to gain information. Today's recon should be more intelligence oriented. Imagine a man camouflaged on the streets of Baghdad gaining information. Instead of blending in he becomes a target. The spy and intelligence networks should be improved to use current technology. The enemy is always the enemy, and therefore there is information to be obtained. How he looks or how he acts is the imagination of tomorrow. The second reconnaissance platform we will look at is the Intelligence, Surveillance, and Reconnaissance (ISR) platform.

Intelligence, Surveillance, and Reconnaissance (ISR) activities focus upon two categories of information, which are data on terrain and weather, and data about the enemy order of battle and activities. For environmental information, reconnaissance units would gather data on road conditions, bridges, tunnels, passes, civilian and military structures of all sorts, soil trafficability, economic resources, potable water, obstacles, and significant terrain features such as lakes, mountains, forests, and deserts. Data for naval operations would include wind and tide information, weather conditions, the location of harbors and anchorages as well as shoal waters, and all sorts of landfall information ("Reconnaissance").

Reconnaissance technology continues to develop at a rapid pace. With that technology came the introduction of the Joint Surveillance Target Attack Radar System (JSTARS). This system would prove to be the most advanced in determining the enemy's order of battle and activities on the battlefield. JSTARS is a long-range, air-to-ground surveillance system designed to locate, classify and track ground targets in all weather conditions. The JSTARS system is designed to detect locate and track moving and stationary ground equipment targets located beyond the Forward Line Of Troops (FLOT). With a reported range of in excess of 155 miles, the radar can cover an estimated 386,100 sq miles within an eight hour sortie. JSTARS can maintain surveillance of a corps size area. The radar is capable of providing targeting and battle management data to all JSTARS operators, both in the aircraft and in the Common Ground Stations (CGS). These operators, in turn, can call on aircraft, missiles or artillery for fire support. Through advanced signal processing, JSTARS can differentiate between wheeled and tracked vehicles. By focusing on smaller terrain areas, the radar image can be enhanced for increased resolution display. This high resolution is used to define moving targets and provide combat units with accurate information for attack planning ("Joint Surveillance and Target Attack Radar System").

Synthetic Aperture Radar/Fixed Target Indicator (SAR/FTI) produces a photographic-like image or map of selected geographic regions. SAR data maps contain precise locations of critical non-moving targets such as bridges, harbors, airports, buildings, or stopped vehicles. The FTI display is available while operating in the SAR mode to identify and locate fixed targets within the SAR area. The SAR and FTI capability used in conjunction with Moving Target Indicators (MTI) and MTI history display allows for pre and post-attack assessments to be made by onboard or ground operators following a weapon attack on hostile targets. This is known as battle damage assessment (BDA) and change detection ("Joint Surveillance and Target Attack Radar System").

The Common Ground Station (CGS) is a Mobile Multisensor Imagery Intelligence (IMINT) tactical data processing and evaluation center. The CGS processes data from the JSTARS aircraft Commanders Tactical Terminals (CTT), Joint Tactical Terminal (JTT), and Unmanned Aerial Vehicles (UAV) and disseminates intelligence, battle management and targeting data to Army Command, Control, Communications and Intelligence (C3I) nodes via LAN wire or radio. This usually happens in a G2/J2 environment. This enables integrated battle management, surveillance, targeting, and interdiction plans to be developed or executed using near-real-time data ("Joint Surveillance and Target Attack Radar System").

A CGS system consists of a mission vehicle, lightweight multipurpose shelter containing mission equipment, support vehicle and two trailer mounted generators. The mission and support vehicles, which tow the trailers, are heavy variant HMMWVs. The CGS can deploy from movement to operation in 15 minutes, using only the six-crew members. The ground system has a price tag of 4 million dollars ("Joint Surveillance and Target Attack Radar System").

CGSs can function independently or may be interconnected to other CGSs over a fiber optic LAN allowing their multiple databases to be integrated. The CGS hardware and software architecture also facilitate Pre-Planned Product Improvements such as additional sensor interfaces, additional command and control interfaces, enhanced processing and display capabilities, and growth to other platforms via technology insertion ("Joint Surveillance and Target Attack Radar System").

The one thing reconnaissance technology cannot produce with confidence is insight concerning enemy intentions and plans, unless a reconnaissance unit captures knowledgeable prisoners or enemy documents and maps. During a ground battle, the JSTARS system will provide excellent information for the combatant commander and most likely provide the upper hand in winning that battle. In a linear battlefield JSTARS allows combatant commanders to see what possible enemy elements they may encounter on the battlefield, which allows them to plan accordingly. Technological advances certainly do make reconnaissance a safer, less labor-intensive mission in certain respects. After the linear battlefield diminished, the JSTARS platform created and implemented a new mission, radio relay and convoy support. With the communications array currently on JSTARS they are able to conduct various missions simultaneously supporting the combatant commander, ground and air assets, MEDEVAC, and the soldier. The third reconnaissance platform we will look at is the satellite or imagery intelligence (IMINT) platform ("Joint Surveillance and Target Attack Radar System").

A spy satellite or reconnaissance satellite is an Earth observation satellite or communication satellite deployed for military or intelligence applications. The satellite is capable of high-resolution photography, communications eavesdropping, covert communications, enforcement of nuclear test bans, and able to detect missile launches ("Military Reconnaissance Satellites (IMINT)").

The United States reportedly maintains at least six newer reconnaissance satellites that have been placed in orbit during a series of launches throughout the last decade, including Key Hole (KH) class Satellites, KH-11, KH12 (Improved Crystal), KH13, 8X, and LACROSSE ("Military Reconnaissance Satellites (IMINT)").

Key Hole-class satellites return images to Earth via an electronic link. The most advanced of these satellites has a resolution of around 10-15 centimeters, but cannot see through clouds, nor do they have the ability to maintain orbit over a specific location. Key Hole satellites closely resemble the Hubble Space Telescope, yet their optical and infrared sensors are much different. A series of satellites that costs around $1.5 billion, Key Hole enables identification of objects 6 to 8.5 inches across, although it is speculated that the actual resolution may even be as good as 4 inches ("Military Reconnaissance Satellites (IMINT)").

KH-11 satellites have a higher orbit than their predecessors. They have infrared imagery capability, including a thermal infrared imagery capability, and thus allow imagery in darkness. These advanced satellites can carry more fuel than the original models. Their life span may even be eight years ("Military Reconnaissance Satellites (IMINT)").

Declassified KH-11 photographs that have been actively used in policy formulation and briefings include photographs of the Zhawar Kili Base Camp in Afghanistan, which housed training facilities for Osama Bin Laden's terrorist organization. Then-Secretary of Defense William Cohen and Gen. Henry R. Shelton used KH-11 material to brief reporters on the U.S. cruise missile attack on the facility in 1998. During the December 1998 Operation Desert Fox, KH-11 photographs were sent to the National Imagery and Mapping Agency (NIMA), where interpreters assessed damage caused by U.S. air strikes ("Military Reconnaissance Satellites (IMINT)").

The distinguishing difference between the KH-12 and its predecessor, the KH11, is the additional amount of fuel. The fuel-carrying capacity of the KH-12 is up to 7 tons of fuel. This contributes to a 4-ton increase in total weight over the KH-11 and also prolongs the operating life of the satellite and provides unique maneuver capability. The KH-12 can adjust its orbit to provide coverage of areas that are of particular interest, and can maneuver to avoid anti-satellite interceptors. About 4.5 meters in diameter, it is over 15 meters long and can be serviced, refueled, and launched by the Shuttle, although so far all have been launched by the Titan 3 expendable launch vehicle ("Military Reconnaissance Satellites (IMINT)").

This satellite has sophisticated optics that digitally enhances images before relaying them to Earth, and can provide full-spectrum IMINT data in real time. It passes over a given point at the same time each day. This makes it easier to detect changes taking place in the target area by comparing one day's photos to another. However, it also makes its arrival predictable to countries that possess good intelligence on U.S. satellite paths, leaving open the possibility of deception or simply "laying low" for a few minutes while the satellite passes overhead. One way to avoid this predictability is to use its on-board fuel to change its orbit or to reduce its speed temporarily ("Military Reconnaissance Satellites (IMINT)").

Optical sensors and electronic cameras provide real-time transmission of images to ground stations via Milstar relay satellites. These sensors operate in visible and near infrared light and they can also detect heat sources using thermal infrared. These sensors most likely use low-light-level image intensifiers to provide images during darkness. KH-12's have advanced infrared capability useful in detecting camouflage, looking at buried structures. By looking at temperature differences between objects, analysts can determine such things as which factories are operational or whether tank engines have been running recently. Its image resolution approaches 10 centimeters ("Military Reconnaissance Satellites (IMINT)").

KH13 is an electro-optical/IR satellite; it is an improved version of the KH12 that, unlike previous models, is undetectable by radar or infrared sensors as a safeguard against the possible use of anti-satellite weapons ("Military Reconnaissance Satellites (IMINT)").

The 8X was launched in May 1999 in the first of a likely series of 24 multi-function satellites that will eventually cover the globe, passing over any given spot of the planet every 15 minutes. Featuring superior optics, these satellites are typically sent into a high orbit, an elongated, elliptical path where the satellite's speed slows down dramatically at the apogee. Its high quality sensors compensate for the longer ranges resulting from its higher altitude. It also has an adjustable dwell capability, making it useful for real-time tactical battlefield observation. One of the drawbacks, however, is the less frequent, elliptical orbit, which means that a target will have a longer window of time in which people or vehicles can maneuver unobserved. The 8X carries significantly larger fuel tanks than the KH series and can be refueled by the Space Shuttle. Each adjustment to its orbit will burn up a large portion of fuel due to the satellite's enormous mass ("Military Reconnaissance Satellites (IMINT)").

The Lacrosse radar imaging satellite is an active radar satellite optimized for tactical and strategic military targets partly due to a sophisticated imaging process that involves SAR, making it capable of resolving images to within 1 meter. Although the resolution is not as high as the KH series, Lacrosse is an all-weather, day-night satellite. It is able to detect and target large objects like ships and aircraft. Lacrosse also uses other radar emissions such as GMTI to track moving vehicles; locate field bunkers up to three meters underground and submerged submarines at periscope depth (40 to 50 feet). The National Reconnaissance Office (NRO) tries to keep two Lacrosse systems in orbit at all times, with one usually tasked for oceanic surveillance. Currently, Lacrosse 2, 3, and 4 are believed to be in orbit based on observations by amateur astronomers. Lacrosse satellites orbit the Earth 12-14 times a day and carry a modest amount of on-board propellant for orbit adjustments ("Military Reconnaissance Satellites (IMINT)").

The name "Onyx" is associated with the fourth Lacrosse, launched on Aug. 17, 2000. Most recently, the name "Vega" has been attached to the Lacrosse program. Vega missions have included providing imagery for bomb damage assessments of the consequences of Navy Tomahawk missile attacks on Iraqi air defense installations in September 1996, monitoring Iraqi weapons storage sites, and tracking troop movements. Vega photographed the Shifa Pharmaceutical Plant in Sudan that was hit in the U.S. retaliatory strikes after the Embassy bombings in 1998 ("Military Reconnaissance Satellites (IMINT)").

NIMA submitted a modernization plan with 225 recommendations that, if adopted, would require $4.7 billion in new funding over the next five years. The core comprised 77 "must do" recommendations estimated at $2.7 billion. Much of it is needed to fully exploit the TPED architecture and the coming Future Imagery Architecture (FIA) spacecraft. Last but not least, we will take a look at the Unmanned Aerial Vehicles (UAV) reconnaissance platform ("US to Boost Reconnaissance With Powerful New Birds").

The development of Unmanned Aerial Vehicles (UAVs) has become one of the more recent advances. UAVs are small remote controlled aircraft used to gather intelligence. Development of this technology began as far back as 1989 with several different models now available. The capabilities of these UAVs vary greatly while remaining completely adaptive to almost any situation. UAVs have evolved to the point that some now carry weapons capable of eliminating a target while controlled from half way around the world ("Hunter").

One of the many UAV platforms is the Hunter series produced by "Northrop Grumman and Israeli Aircraft Industries Malat Division"("Hunter"). Three possible configurations of the Hunter are the RQ-5A, MQ-5B, and MQ-5C. The RQ-5A is the smallest with a wingspan of 29 feet and a length of just under 23 feet. This UAV can stay airborne for 12 hours while carrying a

575-pound internal payload, which includes fuel. The RQ-5A has a flight ceiling of 15,000 feet and a cruising speed of 60 to 80 knots. The maximum distance that all three of these UAVs can operate from its control center is 200KM if relayed and 125KM under direct control ("Hunter").

The MQ-5B is slightly larger, with a wingspan just over 34 feet and a length of 23 feet. This UAV can stay airborne for 15 hours while carrying a 500-pound internal payload including fuel. It has the ability to carry external weapons; they are mounted under the wings and can support 130 pounds per wing ("Hunter").

The most advanced model in the Hunter series is the MQ-5C, the largest in the series with a wingspan just over 54 feet and a length just over 24 feet. This UAV can stay airborne for 30+ hours while carrying a 670-pound internal payload including fuel. The MQ-5C also has the ability to carry external weapons; they are mounted under the wings and can support 130 pounds per wing ("Hunter").

General Atomic produces at least five models of their UAV platform known as the GNAT. The first model made, the GNAT-750 Lofty View "has been flying since 1989" ("General Atomic"). Four other models they produce are the IGNAT-ER, RQ-1 Predator, MQ-1 Predator, and the MQ-9 Predator B Hunter / Killer. Two of these five models are capable of carrying weapons; the MQ-1 and MQ-9 can deliver munitions on a target. Similar to the Hunter platform the weapons are carried externally, under each wing ("General Atomic").

The GNAT-750 Lofty View has a wingspan of just over 35 feet and a length of 16 feet. This UAV can stay airborne for 48 hours while carrying a 330-pound internal payload, which includes fuel. The CIA operated an advanced version of this UAV called the GNAT-750-45. This improvement reportedly gave the UAV the ability to carry a 450-500 pound payload ("General Atomic").

The next UAV in the GNAT series is the IGNAT-ER, with a wingspan just over 58 feet and a length of just over 28 feet. This UAV can stay airborne for more than 40 hours while carrying a 450-pound internal payload in the nose of the airframe. The IGNAT-ER adds the ability to carry external weapons; they are mounted under the wings and can support 143 pounds per wing. The maximum distance that this UAV can operate from its control center is 150 miles for direct control ("IGNAT-ER").

The final three models are all versions of the predator. The RQ-1 and MQ-1 have the same basic dimensions; their wingspan is just under 49 feet and a total length of 27 feet. The airtime endurance is 40 hours with a maximum altitude of 25,000 feet. These two models can cruise at 70 knots with a maximum range of 400 nautical miles. The maximum internal payload is 450 pounds; the external weight limit for the MQ-1 was not listed. The MQ-1 can carry an external weapons payload capable of launching missiles ("PREDATOR").

The largest of this group is the MQ-9, also called the Predator B Hunter/Killer. The MQ-9 has a much larger wingspan; it is 66 feet and has a total length of 36 feet. This UAV can stay airborne for 30 hours while carrying an 800-pound internal payload in the nose of the airframe. The MQ-9 has the ability to carry external weapons; they are mounted under the wings and can support a total of 3000 pounds. The MQ-9 has a flight ceiling of 50,000 feet and top speed of 220 knots. The maximum distance that this UAV can operate from its control center is 400 nautical miles for direct control ("PREDATOR").

The main function of all the UAVs described here is reconnaissance, although some have an additional function of interdiction. All of the platforms have a variety of payloads that they are fitted with depending on mission requirements. The payloads consist of information gathering technology, and are configured many different ways. Some of the items carried are Forward

Looking Infrared (FLIR), Multi Mission Optronic Payload (MOSP), VHF/UHF Radio, Global Positioning System/Inertial Navigation System (GPS/INS), Multi-Spectral Targeting System (MTS), and Lynx SAR. This technology combined with the UAVs is capable of providing realtime information half way around the world if needed. The information combined with visual products assist a commander in making vital dessissions. These systems provide important reconnaissance without having to put personnel directly into a hostal environment. Information gathered is still reviewed by senior leaders and interpreted by the proper analysts ("PREDATOR").

The secondary function of some of the UAVs is interdiction. Interdiction is a secondary function to reconnaissance or surveillance and is accomplished in several ways. The information gathered by the technology payload is fed in real time to the controller and a decision is made. Several models of UAVs can carry weapons that may be deployed on command by the controller. The weapons that are currently available are Hellfire II Anti-Armor Missiles, Paveway II (GBU-12) Laser Guided Bombs, and the Northrop Grumman Brilliant AntiTank (BAT) submunition. The commander can make realtime decisions on how to respond to reconnaissance information without losing the opportunity to act ("Hunter").

Manning requirements of UAVs are relatively low and can be accomplished with personnel that require only technical training. Personnel trained to operate UAVs do not need real flight training, the job is actively compared to playing a video game. Current advances in the technology are making it possible for the aircraft to land unassisted. The launch crew consists of only two or three personnel, a flight technician, and two operators that monitor the information feed from the UAV. This manning however, requires support from other sources. That support includes communication, transportation, maintenance, weather, and airtraffic control to name a few.

UAV information can be gathered fast and viewed in real time in multiple locations. Human reconnaissance can be gathered fast, but not nearly as fast as it can with a UAV. Both forms of reconnaissance produce quality usable information, but technology has given us a way to gather information fast, risk less human life, and track targets from a greater distance. The cost in human life alone makes the use of UAVs preferable to that of human reconnaissance whenever possible.

The benifits of UAVs are debated a great deal within the military. The continued development of these systems and its technology is very expensive. Technological revolutions are always difficult to manage. The extent of the coming revolution represents one of the greatest challenges to confront the leadership of the Army in peacetime. To prepare for this revolution, the Airborne Systems Panel recommends the following action: The Army should restructure its long-range R&D programs to facilitate an orderly transition to providing RISTA from unmanned aircraft and using seperate stand-off weapons to attack targets (National Research Council 12). The council states it very clearly that they believe the need is great and that we should continue to develop the technology.

We have looked at different types of reconnaissance assets. All of the above mentioned platforms compliment the intelligence gathering effort. Lets take a look at the cost of these platforms. First, human reconnaissance has low equipment and operational costs, but places personnel directly in harms way. Second, ISR platforms are very expensive; one JSTARS air platform costs approximately 325 million dollars. Operational costs are high and a crew of 38 that has to be trained is not cheap. Third, satellites initially are expensive, but generally are low maintenance with a high yield on their return with a minimum human factor. Fourth, UAVs are comparatively inexpensive to produce for what you get. One "bare bones" UAV costs around 100 thousand dollars. The aforementioned reconnaissance platforms require the human element to some extent. Whether it is maintenance, monitoring satellite orbits, flying the plane remotely, or a crewmember of a highly sophisticated airborne platform.

The need for human reconnaissance will never fade as technology advances. This is due to the fact that the human element is needed to operate and maintain reconnaissance platforms. The human reconnaissance element can use information gathered from other reconnaissance sources to better compliment their mission. This allows our force to eliminate the unknown factor by creating an environment which breeds' success. The recent global war on terrorism is proving to be a different kind of war that demands the human element for special reconnaissance units. For example, right now in Iraq, there is a need to win over the hearts and minds of the Iraqi people within the villages to gain their support to weed out the insurgents.

"Our technical dominance has made us overly reliant on technical and quantifiable intelligence collections means. There is institutional failure to account for the most critical dimension of the battlefield, the human one" (Cordesman 190).

The need for reconnaissance units and their place in the structure of the future force is a constant issue. The discussion about the utility of reconnaissance units centers around three key issues: the increasing capability of alternate means of reconnaissance and surveillance, high-level commanders' concern for the battlefield survivability of reconnaissance units, and the age-old problem of resources. In the case of reconnaissance units, the resource problem is aggravated by the long-standing split doctrine between Infantry and Military Intelligence branches. Since the Vietnam era, reconnaissance units were used to fill gaps not covered by technical means, confirm information derived from technical means, or to deliver and service the technical means. Reconnaissance units used in this way were not competing with technology but rather complimenting it. No matter how well trained and physically fit reconnaissance units are, they have never replaced technology, neither should technological means alone be viewed as the sole provider of timely and accurate battlefield reconnaissance and surveillance (Gebhardt 158).

"OIF presented the intelligence community with an extremely robust collection architecture. There was near comprehensive imagery intelligence (IMINT), measurement and signatures intelligence (MASINT), and signals intelligence (SIGINT) coverage of the battle space, but there was very little human intelligence (HUMINT) available to provide insight into the human dimension of the battlefield. Advances in technology and the mature collection environment in the theater made for a great profusion of intelligence on the enemy. We had an unprecedented level of resolution on the disposition of the enemy equipment and near instant warning of activation of electronic systems or artillery fires. In many cases we maintained virtual surveillance of selected enemy forces (Cordesman 189).

Now in the 21st century the technical means exist to the point that one could say that we "the human race" have become so technologically advanced that the need for the human reconnaissance unit is antiquated. Everything that was accomplished by a human reconnaissance unit during the Vietnam era can be accomplished on today's battlefield by a machine with the operator being placed hundreds or even thousands of miles out of harms way. With today's technology some say that we are phasing out the human reconnaissance unit and replacing them with sensors.

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