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THE USE OF POLICE HELICOPTERS IN HIGH SPEED PURSUITS

by

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Abstract

High speed pursuits conducted by police have become a hazard to society. It is estimated that 350 people are killed each year in high speed pursuits and those killed are not always the suspect or the pursuing police officer. Too many times innocent civilians are killed or severely injured (National Highway Traffic Safety Administration, 2006). There are four variables suggested by Alpert which make a pursuit hazardous. These variables are: 1) the greater number of vehicles, the greater chance of injuries; 2) involvement of other police agencies; 3) high speed pursuits increased the chances of injuries compared to a low speed pursuit; and 4) chases conduced in residential areas resulted in more injuries than those conducted in nonresidential areas (Alpert, p. 3). By using a police helicopter to assist in pursuing fleeing suspects, police can remove some if not all the variables which make a pursuit hazardous. Not only can a police helicopter make a pursuit safer, they also have a very high arrest rate when used in conjunction with ground units during a pursuit (Alpert, 1998).

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Introduction

A family of four was driving to a basketball game in their mini-van. The parents were in the front talking about day-to-day activities while the two teen-age children were in the back seat talking and laughing while enjoying the ride; then came the dull thud. The mother doesn't recall what happened initially, however, after regaining consciousness about a minute later; she realized that she and her family had been in an accident. She looked over at her husband and he was unconscious while hanging upside down from his seat belt. Her son called out to her and wanted to know what had happened. She felt his body from the front seat and checked for injuries, there were minor ones but not too extensive. She then began to question the condition of her daughter Kristie. After calling out for Kristie several times and without a response from her daughter, the mother knew that there was something wrong[1]. The next event the mother remembers was the police officer opening the door and telling her that the accident wasn't "her fault." Repeatedly the officer tells her that the accident wasn't her fault and repeatedly the mother questions the officer about her daughter's condition. The condition of Kristie was not good and neither was her father's. They were both taken to a nearby hospital, her father was placed in intensive care and Kristie was immediately taken to the operation room. Kristie's father later recovered, however Kristie died seven days later from head injuries that she incurred during the accident.

This story is an example of how police that pursue a non-violent criminal at high speeds can result in a tragic outcome. The fleeing suspect was a fifteen year-old girl joyriding in her mother's car with her friends. Before being pursued by the police officer, she was not driving erratically, speeding or causing a threat to society. However, after being followed by a police officer utilizing the vehicle's emergency equipment (lights and siren), the fifteen year-old

decided to avoid being arrested and elected to "out-run" the police to augment her desires in eluding an arrest[2].

Unfortunately this story is true and happens much too often. According to Hill (2002, p. 4), 102 bystanders were killed in hazardous pursuits in 1994, 127 in 1995, 118 in 1996, 111 in 1997, and 114 in 1998. Kristie would be another figure added in 2002. Given the number of deaths of innocent bystanders, suspects and officers; the question that must be answered is why do police insist on engaging in high speed pursuits? In general, many police departments allow officers to engage in hazardous pursuits with little restrictions according to their department's pursuit policies. Some police departments are not conducting regular training on pursuit procedures or they have reduced the number of hours per year for their officers to receive pertaining to pursuits. However, some departments have made their department's policies stricter when it comes to pursuits and only allows them to pursue violent felons (an example is the Miami Police Department's policy which will be reviewed later). For example, ninety-one percent of the 436 studied agencies that Alpert researched on policy and training had written policies governing pursuits; however, many of them were implemented in the 1970s. Although many of the policies were outdated, forty-eight percent of the agencies were modified within the past two years and made more restrictive (Alpert, 1997).

The lack of proper pursuit training has also been cited as being an element that contributes to accidents in high speed pursuits. According to Alpert (1997):

> Many departments acknowledged taking only limited steps to train their officers on skills and procedures regarding pursuits. For example, although 60 percent of the agencies reported providing entry-level driving training at their academics, the average time devoted to these skills was estimated at less than 14 hours. Once in service, the amount of additional training offered averaged only slightly more than 3 hours per year and focused on the mechanics of defensive and/or pursuit driving rather than on issues that should be considered when deciding to continue or terminate pursuits. (p.2)

Although Alpert suggested that many police departments did not conduct enough training regarding high speed pursuits, Alpert also suggested that the training which was conducted

primarily involved the "how to" portion of the pursuit and failed to train the "when to" element of the pursuit. In other words, officers are getting the driving skills but they are not getting the decision skills needed prior to engaging in a high speed pursuit.

This is not always the case, some departments do not specify who their officers are to chase and who they are not; thus, some officers will engage into a hazardous pursuit with a non-violent felon and place himself/herself, the suspect and society in danger. In fact, most fleeing suspects are not violent felons. As the Commission for Public Complaints Against the RCMP states, "… the empirically correct and appropriate assumption is that an eluder is someone who is not a fleeing violent felon but one who is scared, irresponsible and afraid to face the consequences of his[/hers] problems or actions" (1999, p. 12).

The police have a job to protect society against those who endanger society…suspects that flee from the police are often assumed to pose a threat to society's safety. Suspects who elude police in dangerous pursuits cannot be allowed to continue their perilous method of escape and the police should have the latitude to pursue these criminals. However, the police must develop better alternatives to pursuing fleeing suspects and not "back off" the fleeing suspect when he/she encounters dangerous speeds or erratic driving. An alternative to continue pursuing the suspect and providing a lower risk to society, the officer and the suspect would be to use police helicopters to pursue the fleeing suspect. This alternative could be used to provide a safer environment during pursuits and also avoid giving the perception to fleeing suspects that if police officers, because of their department polices, "break-off" the pursuit that they will get away. As Forror (2001) states:

> High-speed pursuits are a real problem for communities… If you have a policy that you won't engage in such pursuits, then that sends the message to the criminals that all they have to do is speed up and the police will break off pursuit. You can't do that. Helicopters are a tool we can use to bring these high-speed pursuits to a safe conclusion. (p. 2)

The focus of this paper is to demonstrate the relative safety of utilizing police helicopters over ground vehicles in high speed pursuits. The research literature on high speed pursuits will illustrate how frequent these pursuits occur and their impact on society. Moreover, the effective use of helicopters in dangerous pursuits will be demonstrated as a safer alternative to utilizing ground vehicles alone. Lastly, examples of police helicopter experiences will be discussed to give an illustration of how well they have preformed thus far.

Research Question and Hypothesis

My research question for this paper is: *"Are hazardous pursuits a danger to society and the police officers who conduct them?* My hypothesis statement is: *Police helicopters are a safer option in high speed pursuits than the exclusive use of ground vehicles?"* For the purpose of this paper, a hazardous pursuit is defined as "…instances in which the driver has been signaled by the police to stop and has deliberately chosen to flee in order to avoid apprehension" (Commission for Public Complaints Against the RCMP, 1999, p. 3).

Pursuits Reviewed

For the purpose of this paper, a pursuit would begin when an officer signals a suspect to stop and the suspect refuses. However, it becomes high speed when the suspect decides to flee the officer at speeds higher than the posted speed limit. An officer may or may not decide to pursue the fleeing suspect based on his/her department's pursuit policy. Police departments nationwide have different polices regarding pursuits so it would be difficult to determine when an officer would pursue or when he/she would not. For the purpose of this paper, it would be assumed that the officer's department does not have a policy restricting him/her from pursuing only known violent felons. It is assumed that the officer is pursuing the fleeing suspect for refusing to stop when signaled.

The data used in this paper is provided by the Fatality Analysis Reporting System (FARS) and its content is primarily raw data gathered from forty-seven states on pursuit related

accidents. The data's importance should be noted because many pursuit related accidents do not get reported; therefore, this problem could be perceived as insignificant by many due to its low profile.

The National Highway Traffic Safety Administration's Fatality Analysis Reporting System will be used to support many of the statistics used in this paper. Before reviewing the statistical data, the agency which provides the data should be reviewed. The National Highway Traffic Safety Administration (NHTSA) "provides program planning… public information and education materials, … and occasionally some funding support to National Organizations representing … law enforcement, prosecutors, judges … and national coalitions, the automobile and insurance industries, employers, public and private service organizations and the traveling public" (National Highway Traffic Safety Administration, 2006). A tool that the NHTSA uses to record and distribute their data is the Fatality Analysis Reporting System (FARS). Much of the data used in this paper come from the FARS.

The National Highway Traffic Safety Administration (2006) reports that on average 350 per year die in crashes involving police in pursuits.[3] However, this figure could be much higher because there is no mandatory reporting system throughout the country to assist in gaining more accurate data (Hill, 2002, p. 2). "Typically, only 90 percent of states report pursuit fatality data to NHTSA. By extrapolating the 5-year totals …calculations would show an average of 375 deaths per year …researchers recalculate that actual number of fatalities between 400 to 500 deaths per year" (Hill, 2002, p. 2). Table 1 illustrates the number of innocent victims killed as a result of hazardous pursuits. It should also be noted that from 1993 until 2000, the number of innocent killed people during high speed pursuits increased (see Table 1).

Unfortunately, a pursuit is not a one-on-one competition between the police officer(s) and the criminal but it also includes many from society that wish not to participate; therefore, regrettably the non-participants become the innocent victims involved in high speed pursuits. Although the figures in table one are quite alarming, they are not the only statistics that suggest police pursuits are dangerous. The following statistics are startling to say the least:

> First, the majority of police pursuits involve a stop for a traffic violation. Second, one person dies every day as a result of a police pursuit. On average, from 1994 through 1998, one law enforcement officer was killed every 11 weeks in a pursuit, and 1 percent of all U.S. law enforcement officers who died in the line-of-duty lost their lives in vehicle pursuits. Innocent third parties who just happened to be in the way constitute 42 percent of persons killed or injured in police pursuits. Further, 1 out of every 100 high-speed pursuits results in a fatality (Hill, p. 2).

Pursuits have been found to be hazardous in other countries as well. For example, over a five-year period between 1991 and 1995, the Royal Canadian Mounted Police (RCMP) in Canada stated that 32% of their pursuits resulted in collisions, 14% resulted in injuries and 19 people were killed (Commission for Public Complaints Against the RCMP, 1999, p. 1). Like their Canadian counterparts, police in America are far too often getting themselves in a dangerous situation when they initiate into a high speed pursuit. However, the police officer does have a choice before entering into a dangerous pursuit, he/she may choose to or not to engage into the pursuit. This decision lies solely with the officer. It could be misunderstood that the suspect initiates the pursuit but unequivocally the pursuit cannot exist if the police officer does not make the decision to pursue the suspect.

It should be noted that police officers are obligated to make the determination on whether or not to pursue and place himself, the suspect and innocent members of society at risk. Alpert[4] conducted a report on 800 police agencies and studied their procedures and results of high speed pursuits. The report suggested that “forty percent [of the 800 agencies] reported that a pursuit in which they [the police] were driving the primary vehicle resulted in an accident” (Alpert, 1997, p. 5). These types of data should be part of the officer’s decision making process before he/she engages into a dangerous pursuit.

Law Enforcement Perspective on Hazardous Pursuits

To say that a police officer's life is in danger when he/she is conducting a high speed pursuit would be an understatement. Many police officers pursue criminals at high speeds and in less than ideal locations such as residential areas which can compound the risk of a pursuit. However, the police sometimes disregard this risk and continue the pursuit. It could be assumed that the fleeing suspect is a dangerous criminal; however, does he/she warrant a risky pursuit that puts society in danger? Evidence indicates that the majority of pursuits are not initiated by felons as commonly believed. For example, a 1992 Illinois State University study suggests "…both police officers and the public across North America tend to believe that individuals who flee the police have committed a serious offence for which they are attempting to avoid apprehension" (Commission for Public Complaints Against the RCMP, 1999, p. 11). This indicates that there is a misconception that if a person flees, he/she has committed a serious offense.

This is an unfortunate belief that police have towards fleeing suspects. Because of this credence, police officers (due to their bravado attitudes) are placing a suspect, society and the officer's life at risk unnecessarily. Unbeknownst to the officer,

> "…most suspects are fleeing the police to avoid apprehension because they are frightened and do not want to face the consequences of the minor charges that could be brought against them. Our data reveal that most of these suspects will reduce their speed and dangerous driving if the police permit them to feel safe. Further our data show, many suspects flee because they are afraid, or just making an irresponsible decision, not because they have committed a serious crime" (Commission for Public Complaints Against the RCMP, p. 12).

Many officers are oblivious to the fact that they are chasing, more times than not, a suspect who has only committed a misdemeanor offense. Sometimes officers will not admit that most fleeing suspects are not a serious threat to society or fail to understand that empirical evidence supports this concept. As an Illinois State University study found:

> Officers, like administrators, tend to misperceive or misjudge the initiating causes of most pursuits. If asked to guess, a majority of the officers said that pursuits were initiated most frequently for felony offenses. Yet, when asked to report on their own experiences, most officers indicated that at least three-quarters of their own pursuits were initiated for non-felonies (Commission for Public Complaints Against the RCMP, p. 11).

It could be implied by some cautious thinkers that if the police were to "back-off" on high speed pursuits then the rate of crime particularly surrounding high speed pursuits would increase. However, this could be a misconstrued concept as well as is evidenced by Alpert's 1992 study on pursuits in the Miami-Dade Police Department. The Miami-Dade Police Department's pursuit policy has become stricter over the past few years to reduce the risk of its officers, suspects and the general public. The department now only engages into pursuits that involve suspects who have committed known violent felonies. Due to the change in departmental policy, Miami-Dade Police Department's pursuits have decreased by 82% (Commission for Public Complaints Against the RCMP, p. 13).

Miami-Dade Police Department's change in policy regarding chasing only violent felons counters the beliefs of some officers that if the police stop pursuing all fleeing victims then there will be more pursuits. This school of thought could be further supported by one of Alpert's pursuit myths, "One of them is that if police departments don't chase, then everyone's going to run. That's not true" (Rushton, 2005, p. 2). It is not inconceivable to believe that if police stop chasing suspects in high speed pursuits then more people would elude the police in their vehicles; however, there is not enough empirical evidence to support this claim. Alpert's study concluded that a restriction to chasing violent felony offenders only (in Miami-Dade) does not lead to an increase in the number of suspects fleeing from the police in this jurisdiction nor did it lead to an increase in crime rates (Commission for Public Complaints Against the RCMP, p. 13).

Though it may be assumed that the police have the unequivocal duty to protect society from criminals, at times these criminals may invite the police into a high speed pursuit. Aside the fact that the fleeing criminal is possibly a threat to society, the police has a greater duty to the public…their safety. Although many police agencies are changing their policies to become more restrictive (as mentioned earlier regarding the Miami-Dade Police Department) police departments such as the Los Angeles Police Department have, in the past, regarded the criminal as the primary source of liability for high speed pursuits. The following is an excerpt from the Los Angeles Police Department (LAPD); it illustrates the perception of fault for high speed pursuits on the fleeing criminal: "[1] The largest percentage of deaths, injuries and accidents resulting from pursuits are suffered by the suspect. Thus, fleeing from the police often results in self-injury. [2] In California, there is a 1 in 4,000,000 chance of being killed in a pursuit as a third party. You are 6.6 times more likely of being struck by lighting. [3] History has proven time and time again, when a vehicle gives chase, it is virtually always because there is a more serious crime involved. [4] LAPD does not initiate pursuits, criminals do." (Media Relations Section Office of the Chief of Police, 1999, p. 1).

The information above taken from the LAPD's Media Relations Section Office is not meant to generalize the perceptions of all officers or all police departments. Instead it is used as an example to highlight the perception that some departments have toward suspects in high speed pursuits. These departments' philosophies generally fault the suspect for the initiating of all pursuits. Although it could be agreed upon that without the suspect fleeing there would not be a high speed pursuit; however, this does not alleviate law enforcement's duty to protect society when pursuing a suspect. Another phenomenon that occurs during a high speed pursuit is that the pursuing officer's emotions can become

elevated in apprehending the fleeing suspect. Although it could be understood that a police officer's adrenaline is flowing and his/her emotions are heated during a high speed pursuit, the officer needs to regain his/her composure and conduct the arrest once the pursuit has ended in a professional manner. In fact, it is suggested that:

> Thirty-three percent [of officers] reported that from about one-fourth to one-half of all pursuits resulted in use of force to apprehend the suspect. Slightly more than half of the officers described those more likely to use excessive force as "aggressive" or "hotheaded" (Alpert, 1997, p. 5).

It should also be noted that police officers are willing to engage in high speed pursuits involving non-violent suspects before their supervisors are willing to approve the pursuits (see Tables 2 and 3). However, the aforementioned tables do illustrate that the more violent the suspect is, the more the officer and his/her supervisor agree with pursuing the suspect via high speed. These data from the tables are to support the assumption that more experienced officers with more responsibility are more likely to not engage in a high speed pursuit than the less experienced officers. Furthermore, officers that do decide to continue with a high speed pursuit should acknowledge the responsibility that accompanies the pursuit…it is an awesome responsibility that could have grave results if conducted precariously. The following quote is from an officer who describes the responsibility:

> As Peace officers, when you envision yourself in that position where you have to make a decision one day to perhaps take a human life, you don't often think about it being through a vehicle, but let's face it, you're driving around a big bullet, and it can kill. I never figured that I'd ever be involved in a situation as a police officer, contributing to someone's death in a chase. The hardest thing in this whole process was looking at his parents and thinking that they're still dealing with this everyday. To take a human life over a $40,000 vehicle? It's wrong for him to be there, it's wrong for him to be in the stolen vehicle, it was wrong for him not to stop when he was initially instructed to stop, but it cost him his life and it wasn't worth it. We lost in the situation, everyone came out as losers. The members who were involved are all scarred for life, the family certainly has a

> significant loss in their life, the vehicle we were trying to save – that was a write-off, so what did we gain from it – nothing (Commission for Public Complaints Against the RCMP, 1999, p. 26).

Society's View towards Hazardous Pursuits

In the past twenty years, citizens have become more aware of the hazards associated with driving. For example, until the late 1960s to early 1970s, automakers did not equip their cars with seatbelts but as more studies suggested that more lives could be saved due to use of seatbelt more drivers started to "buckle-up." Similarly, many motorists did not take Driving Under the Influence (DUI) seriously until the late 1980s when stiffer laws were passed as a result of studies that suggested that drivers are safer when not under the influence of alcohol or drugs. The same school of thought could be applied to police pursuits; that is, to increase awareness of the dangers involved with high speed pursuits. Like DUI awareness that began in the 1980s, high speed pursuits could be focused on and stricter penalties could be applied to those (officers) who engage in them when they are not warranted by their department's policy. According to the Commission for Public Complaints Against the RCMP (1999, p. 6), "…the risk of a fatality in a police pursuit is roughly 1,000 times greater than the risks of general driving." The general public is no longer tolerant of officers getting into accidents due to hazardous pursuits.

The following is a list of just a few lawsuits awarded to the plaintiffs filing suits against various police departments whose officers caused accidents while engaged in hazardous pursuits: (1) City reaches $11,000,000 settlement with man paralyzed after being struck by police vehicle while in cross walk – police not engaged in pursuit at time. Espinoza v. City of Los Angeles (Feb 1999); (2) City liability reduced to $8,200,000 to a man who suffered brain damage after being struck by police vehicle, which was not engaged in emergency assignment and $100,000 to wife for loss of consortium. Davis v. City of New York (May, 1998); (3) A $5,100,000 award against a Chicago police officer for death of one and injury to two others by vehicle fleeing the police. The officer said he did not have blue light or siren on because he was pacing the vehicle to determine its speed. Khouri v. Chicago (1998) (Avery, 2006).

These few examples suggest that the public is no longer accepting hazardous pursuits and is increasingly holding police department's liable for their officers' actions while engaged in pursuits. Moreover, the following suggests that society is no longer capable of tolerating the risks involved with high speed pursuits:

> In recent years, however, there has been increased public scrutiny and concern that the benefits of a police do not always outweigh the risks to public safety. In fact, many different jurisdictions have examined the issue over the years and have concluded that police pursuits are dangerous, and that limitations should be imposed on their use (Commission for Public Complaints Against the RCMP, p. 6).

Regarding the aforementioned by the Commission for Public Complaints Against the RCMP, it could be suggested that police departments should develop stricter policies regarding police pursuits. Policies should not only become stricter regarding police pursuits but their enforcement must also become stricter. The following study illustrates the importance of such policies.

In 1992 a study entitled "Police Pursuit in Pursuit of Policy: The Pursuit Issue, Legal and Literature Review and an Empirical Study" was conducted at Illinois Statue University. Fifty-one police departments were examined to help develop a database for government officials, police administrators and police personnel to help them make informed decisions regarding police pursuit legislation, policies and procedures.

In regards to police pursuit policies a 1992 Illinois State University study recommended that:

> [P]olice agencies should have well developed, highly restrictive and discouraging police pursuit policies, as well as clear and simple procedures for regulating pursuits. The policy should be extremely cautious of any pursuit, except in the most extreme circumstances where the risks of nonpursuit clearly outweigh the risks of pursuit. …This will help to avoid confusion under stressful circumstances, and allow for increased officer retention of procedures (Commission for Public Complaints Against the RCMP, 1999, p. 7).

The emphasis of this study would suggest that police departments should develop stricter policies and procedures used in police pursuits. Unequivocally, high speed pursuits would be

considered dangerous. Although stricter policies could possibly mitigate the risk involved with police pursuits, the intent of this paper is not to focus on stricter polices; moreover, the intent of this paper is to emphasize the hazards involved in a high speed pursuit and offer a safer alternative. The concentration of this paper will now center on a safer alternative to vehicular high speed pursuits …the use of the police helicopter in high speed pursuits.

History of the Police Helicopter

Los Angeles and New York were two cities that first started using an aviation unit to back-up their ground officers (Alpert, MacDonald, & Gover, 1993, p. 3). These departments used airplanes initially in the 1940s to assist with rescues, spot fires and pursue cars that were being chased. However, the helicopter became the choice of these police departments in the 1950s because of their maneuverability in the sky (Alpert et al., p. 3).

Shortly after their inception within the LAPD, the police discovered that during the riots in 1965, the police helicopter offered more than it was initially purchased for. It was capable of spotting problems throughout the city and informing officers on the ground where these problems were. Not long after this was the helicopter noted for its “effectiveness as an efficient tool in “unusual occurrences and discreet surveillance” (Alpert et al., p. 3).

Though the helicopter was admired for its contribution to “special” tactics, it appeared to be overly expensive to add to routine patrol duties. For this reason, the LAPD commissioned an aviation evaluation review conducted by Officer Jim Beal of the LAPD. Officer Beal discovered that the helicopter was expensive to operate on a day-to-day basis; however, he praised the helicopter for its uniqueness and ability to handle missions that were impossible for the ground officer to accomplish. He also noted that the helicopter offered a “panoramic” view that was helpful to the ground officers. Officer Beal is credited with the justification for police aviation units throughout the country (Alpert et al., p. 3).

Also noteworthy is that more than 600 police agencies operate helicopters today. It is suggested that cities larger than one million have a 75% likelihood of either owning or having

access to a police helicopter. Those cities that are larger than 500,000 have a seventy-one percent chance of either owning or having access to a police helicopter. Those cities that are between 250,000 to 499,999 in population have a forty-two percent chance of owning or having access to a police helicopter. Only a small percent of those cities that are less than 250,000 either own or have access to a police helicopter. Based on this information, it is apparent that the helicopter is considered an essential part of the police agency's mission (Alpert et al., p. 4).

Auxiliary Tools on Today's Police Helicopters

The police helicopter has seen a number of improvements since its first use in the 1950s. The early model helicopters that the police used were powered by reciprocating engines (piston driven) and they were limited severely by their lack of power. Many of the early models like the Bell 47 (the helicopter typically seen in the television show M.A.S.H.) could only carry two people and not much extra gear because of the lack of power. The max power on the Bell 47 was approximately 280 hp (Wikipedia, 2006).

Newer helicopters have developed over the years and with the addition of the turbine engine, they have been able to do more for police department than older models. A popular helicopter with many police departments is the Bell Jet Ranger and it various models. The Jet Ranger comes with the Rolls-Royce (formally Allison) 250-C20 turbine engine which offers approximately 317 shaft horsepower (SHP) at takeoff.[6]

One of the biggest differences between the reciprocating engine and the turbine engine is the power to weight ratio. Reciprocating engines typically weigh much more than a turbine engine and offers much less horsepower. The Bell Jet Ranger utilizes a turbine engine so it is designed to be lighter and offer a greater payload. The Jet Ranger is typically configured to carry five people although the stretch version of the Jet Ranger, Bell Long Ranger, is equipped to carry seven and is capable of housing the Rolls-Royce 250-C20P engine that would offer up to 650 SHP. Many police departments utilize the Long Ranger because of its spacious interior and

capability of housing a stretcher for medical evacuation (medivac) scenarios (Bell Helicopter, 2006).

Forward Looking Infrared (FLIR) is one of the tools that many police helicopter come equipped with today. FLIR is a night vision enhancement system. FLIR measures the amount of infrared energy emitted by various objects and life forms. In other words, it allows the user to "see" the amount of heat (or thermal energy) an object emits. Infrared energy is normally invisible to the human eye, but FLIR systems are able to detect and interpret emissions and provide the user with an image, even in complete darkness. (Regional Community Policing Training Institute, 2005, p. 1).

Many FLIR systems come equipped to videotape what the observer (one who operates the FLIR) sees. This videotaping capability can be a useful tool in aiding prosecution against drivers that flee from police because it can prove that the driver was actually driving the vehicle. The videotape can also support police departments in providing confirmation that appropriate force was used to apprehend a fleeing suspect, thus limiting potential liability (Regional Community Policing Training Institute, 2005, p. 2). Also according to the Regional Community Policing Training Institute (p. 3), "FLIR systems make pursuit and search operations more efficient and … safer."

Nightsun is another feature used on most police helicopters. Nightsun SX-16 is a 1600 watt, 40 million candlelight searchlight that is used on aircraft to light a fleeing vehicle. The Nightsun can light an area for a police officer who is on foot tracking a fleeing suspect or light a dark environment for a ground officer to aid in his safety (Spectrolab, 2006).

Night Vision Goggles (NVG) are one of the newest features to aviation crews that police departments are using. NVGs offer the pilot and/or observer the ability to see in almost complete darkness. NVGs are worn on the helmet of the pilot/observer and are better suited for flying at night than FLIR, however, NVGs cannot see heat but it can see near infrared. Typically a pilot flying at night has at best 20/200 vision if the pilot's vision is 20/20 in lighted areas. 20/200 is considered being legally blind by most states, therefore, before NVGs, pilots have been "flying

blind" at night. This new addition to aviation is greatly appreciated by helicopter aviators due the low altitudes that helicopters typically fly. As technology has advanced in recent years so has the effectiveness of NVGs. Today's NVGs can increase, for the user, ambient light sources up to 2000 to 3500 times more than without wearing NVGs (United States Army Aviation Center, 1999, p. D-9). This not only adds to the flight crew's safety but also aids the crew in tracking a vehicle that is fleeing in low-lit areas or suspects that "bail out" of their vehicles and proceed on foot.

The basic concept will be demonstrated to get a better understanding of the operation of the NVG (see Figure 2). First light enters the object lens, because it is a lens, the object is inverted 180 degrees onto the photocathode. The photocathode then takes light energy (photons) and converts them into electrical energy (electrons). The newly converted electrons then pass through the micro-channel plate (MCP). The MCP is composed of approximately 6 million tiny tubes angled at eight degrees. The electrons pass through the MCP and strike the specially coated walls within the MCP and create a secondary emission. Every time an electron strikes the wall, another electron is formed. This procedure continues until approximately 30,000 electrons exit the MCP. After leaving the MCP, the electrons then pass through a phosphor screen where they are reconverted back into photons. The photons then pass through a fiber optic converter that is twisted 180 degrees to compensate for the 180 degree inversion that initially occurred at the objective lens. Once through the fiber optic inverter, the photons (light) pass through the eyepiece lens to then be adjusted for a pilot's eye[7] (United States Army Aviation Center, 1999).

Unequivocally, the helicopter's greatest advantage is its agile airborne supported platform. It offers airborne officers, a pilot and usually an observer, the advantage of viewing a greater picture of the crime event in progress or area that has been deemed subject to search. The officers can view the area from an altitude as low as 200 to 300 feet above the ground to an altitude that environmental or aviation constraints will allow. This aerial view is critical in high speed pursuits because it can allow the pilot/observer to view the road conditions that a fleeing

subject is traveling or if necessary, it can illuminate the road for safety of the fleeing criminal, the chasing officer(s) or the innocent travelers on the road (Alpert & MacDonald, p. 7).

The Police Helicopter Making Pursuits Safer

Jeremy Travis, Director of National Institute of Justice, suggested using helicopters in pursuit operations. Travis' comments are used to signify the effectiveness of the police helicopter in today's modern police departments.

> Advancements in helicopters and onboard auxiliary equipment have improved the ability of police departments to fight crime and maintain public safety. Helicopters assist police activities by providing support and a presence in the air. They serve an important part in the advancement of law enforcement strategies and tactics (Travis, 1998).

A helicopter's airborne presence is one of its greatest distinctiveness that adds to mitigating the hazards of a high speed pursuit. However, it would appear that initially the helicopter could not complement much to a pursuit because it cannot actually "pull over" the fleeing vehicle. It is suggested by Travis that they actually play a strong role in making high speed pursuits safer and more effective. According to Travis (1998):

> From their observational vantage point, the helicopter pilot or observer can monitor a vehicle safely and provide pertinent information to ground pursuit officers allowing them to: 1) Remain in close proximity to the suspect while tracking the location and direction without being noticed, enabling officers on the ground to take action once the suspect has stopped or exited the vehicle; 2) Assist with a call involving an officer in trouble by providing directions and if necessary a show of force; and 3) Report on traffic or environmental conditions (p. 1).

In 1998, a Pursuit Management Task Force (PMTF) was commissioned by the National Institute of Justice's (NIJ) Office of Science and Technology in Washington, D.C. to gather information on how to make high speed pursuits safer. Although many different methods were studied and many different technologies were tested; the helicopter was found to be an important

tool in reducing the risks involved with high speed pursuits. Police departments that utilized a helicopter for their high speed pursuits were found to have "great success in pursuits" (National Law Enforcement and Corrections Technology Center, 1998). In addition, the PMTF found that safety was added because "…with a helicopter overhead, ground units may, in some cases, no longer need to engage in a pursuit; the helicopter does it for them (National Law Enforcement and Corrections Technology Center). The PMTF also noted that when a helicopter arrives on the scene, the officer can "break away" from the pursuit and this in return allows the suspect to slow down. The following is a good example of how a pursuit was "handed off" to the helicopter from the ground units and it had a successful ending.

> On November 5, 1996, Los Angeles County Sheriff's deputies were in pursuit of a stolen vehicle, traveling through several adjacent cities. Upon the arrival of the helicopter, ground units stopped their pursuit. Shortly afterward, the stolen car drove into a shopping center and stopped. The helicopter observer directed ground units to the suspect, who was arrested (National Law Enforcement and Corrections Technology Center).

The PMTF suggests that "its empirical knowledge indicates that collision hazards from pursuits are greater in more populated areas" (National Law Enforcement and Corrections Technology Center). They also recommend that because helicopters perform better in congested areas, the Federal and State governments should seek options for providing a helicopter in populous cities and counties (National Law Enforcement and Corrections Technology Center).

The PMTF found that helicopters work exceptionally well in congested areas, moreover, Alpert suggests that more suspects escape apprehension in congested areas than in non-congested areas. The helicopter could possibly turn the arrest rate around in congested areas where it is normally considered a higher risk for conducting pursuits (Alpert, 1997, p. 3). In fact, Alpert suggests that there are four variables that contribute to an increase in injuries involving police pursuits. These four variables are 1) the greater number of vehicles, the greater chance of

injuries; 2) involvement of other police agencies; 3) high speed pursuits increased the chances of injuries compared to a low speed pursuit; and 4) chases conduced in residential areas resulted in more injuries than those conducted in nonresidential areas (Alpert, p. 3).

It is conceivable to believe that a helicopter could be used to remove some or possibly all of the variables that would contribute a high risk to injury. That is, a helicopter surely could replace numerous vehicles involved in a pursuit and it can eliminate the involvement of different police agencies following a suspect. In addition, the involvement of a helicopter can allow ground vehicles to terminate a pursuit which in turn will enable the high speed pursuit to transition to a low speed pursuit. Lastly, with a ground pursuit terminated in a residential area, a suspect is more likely to slow down, therefore, providing a safer environment for the residents.

Typically agencies like the Miami-Dade Police Department will terminate a pursuit if it becomes high speed and poses a danger for society. Terminating a pursuit involves slowing down and turning off emergency equipment (i.e., lights and siren). However, the police still remain in the vicinity but out of the suspect's view. The ground crews turn over the pursuit to the helicopter which will follow the suspect and relay information via radio to the ground units on the whereabouts of the fleeing suspect. The ground vehicle, based on the information provided by the helicopter, can still follow a pursuit at a safe distance and stay out of observation from the suspect. A helicopter can follow a suspect until he/she stops and exits the vehicle or comes to a dead end where a successful arrest can be made by the ground vehicle still in the vicinity. However, fleeing suspects do sometimes create a dangerous pursuit even when the ground vehicle terminates the pursuit. When this happens, the helicopter has three options that it may perform.

This includes 1) communicate to the ground units that the subject is accelerating fleeing activity; 2) make the suspect aware of the helicopter's presence in hope that the suspect will cease fleeing; and 3) use the searchlight to illuminate the suspect's position during night pursuits (Alpert, p. 2).

Showing an "aerial presence" during a pursuit can be pay huge dividends by using an intimidation factor. Gardner (1995, p. 9) suggests that, "[w]hen suspects become aware that they are under aerial surveillance, they frequently stop voluntarily and surrender." The searchlight can actually perform two tactics simultaneously. The first tactic is showing a presence at night and the second is adding safety to the pursuit. Suspects sometimes turn their headlights off to avoid detection of the ground units. This could cause a hazard for drivers on the same road that the pursuit is being conducted. The searchlight not only lights the vehicle for police to follow but it also "light[s] an area to alert civilian motorists of an oncoming danger" (Alpert & MacDonald, 1997, p. 10). It should be noted that in accordance with Alpert and MacDonald (p. 10), the searchlight is not used to blind the driver of the fleeing vehicle. It serves no law enforcement purpose and it could create a greater hazard. If the suspect is "blinded" he/she could possibly cause an accident and destroy property or injure someone.

The powerful searchlight that the helicopter uses doesn't create a hazard when used properly. It, as previously discussed, is not shined in the front of the fleeing vehicle but instead from behind or on top of it. Also, the searchlight may be annoying; however, it is not detrimental to the driver. Actually it is not as troublesome as having a searchlight from a ground vehicle reflecting off the rearview and side mirrors (Alpert & MacDonald, p. 11).

The Police Helicopter Making Pursuits More Effective

Unfortunately there is not a lot of empirical research on the effectiveness of police helicopters used in pursuits. There is, however, data obtained by Dr. Alpert gathered on two

cities' police departments, these two cities were Baltimore, MD and Miami-Dade, FL. The data gathered on both cities was from a period between July 1995 and December 1996; furthermore, Alpert observed the data from 43 pursuits in Miami-Dade and 89 pursuits in Baltimore. The conclusive data gathered from both cities suggested that the arrest rate in a pursuit when a helicopter is involved is high (See table 4) (Alpert, p. 2). The data also suggested that the majority of the pursuits in both cities were on a stolen vehicle. The reasons for the pursuits in the two cities varied (See table 5). Also, noteworthy was that at least fifty percent of the pursuits were conducted at night in both cities.

The majority of the pursuits involved in Alpert's research were chasing vehicles where one or more suspects "bailed out" of the vehicle. There were numerous pursuits that did not involve a ground vehicle until the suspect actually stopped and fled from the pursued vehicle. However, Alpert's data suggests that when the helicopter became involved with the pursuit, the most likely outcome of the pursuit was an arrest (Alpert, p. 3).

Although, Alpert points out that there is an approximate seventy-five percent chance that ground vehicles will apprehend a fleeing suspect. Seventy-five percent could be considered fair or marginal on rating scale if asked by the public, however, the helicopter's arrest rate in Miami-Dade was ninety-one percent and in Baltimore it was eighty-three percent (Alpert, p. 2). The helicopter's figures were substantially better than just the ground vehicles…and it can be done safer.

The Efficiency of the Police Helicopter

There is no doubt that helicopter operations can be costly. A cost benefit analysis on various police departments can determine the future expenditures of helicopter operations; furthermore, much of the cost vs. benefit would relay upon what type of helicopter that the department operates and how long they fly the aircraft per day. Two typical helicopters that

many police departments use are the Bell Jet Ranger and the Robinson R44. As previously stated, the Bell Jet Ranger utilizes a turbine engine. The R44 utilizes a reciprocating engine. Having studied both helicopters over the years and also having flown the Bell Jet Ranger, the cost per hour to operate the R44 is approximately $125.00. The cost per hour to operate the Jet Ranger is approximately $225.00. Both helicopters can carry the same amount of people (based on environmental conditions for the R44). However, the R44 is severely underpowered compared to the Jet Ranger. Also, the operating costs per hour should not be taken as the overall cost for operations. The R44 requires frequent oil changes and the Jet Ranger does not (due to its turbine engine). Also, the R44 is required to have an engine overhaul every 2,200 hours and the turbine on the Jet Ranger is not required an inspection until 3,600 hours (an inspection, not a complete overhaul is required). The lower operating costs and cheaper purchase price of a helicopter should not be a deciding factor when a department considers purchasing/leasing a helicopter. Instead, which helicopter is better suited to meet the mission demands is what should be considered and also the overall operating costs in the long run should be discussed.

Despite the high costs of operating a helicopter unit, data suggests that this costly expenditure can be more beneficial to an agency's mission. According to Whitehead (2004, p. 18), apprehension rates with a helicopter involved in assaults were 36% vs. 22%; in weapons 46% vs. 13%; missing persons 28% vs. 2%; residential break and enter 29% vs. 6%. Also, "[a]pprehensions were more likely to occur with respect to the following: disturbance 25% vs. 13%; suspicious persons 33% vs. 5%; and suspicious vehicles 41% vs. 4%" (Whitehead, p. 19).

Police helicopters, due to their speed and vast area of coverage, was able to save the city of London, Ontario 1,320 police hours. These working hour reductions saved the city $90,014 (Whitehead, p. 19). However, the operating costs of the helicopter for the year studied were $354,344 and the money that it saved the city in hours worked was only 23.4% of its total

operating cost. It should be noted that during this study conducted by Whitehead, there were many restrictions placed on the operation of the helicopter. Whitehead (p. 19) does suggest that when the restrictions are released and the unit learns when and where to operate the helicopter more efficiently, its "efficiency and effectiveness could reach $138,463 or 42% of the cost."

Despite the benefits noted above, some limitation to operating a helicopter in a city is its noise pollution, operating costs and pilot training. It should be noted, however, that most modern helicopters are operating quieter than those of the Vietnam era (Gardner, 1995). The operating costs can be pricey but much will depend on how often the helicopter(s) are used. It should be assumed that the more the helicopter(s) are used the more costly they will be. Notably as well, it cost money to train a pilot to operate a helicopter safely and effectively. However, the costs to train a pilot could be offset by hiring an officer(s) that is a licensed helicopter pilot with proven experience. With respect to the limitations of operating a helicopter unit, the advantages of the helicopter's speed and safety in searching areas like roof tops and rail road tracks outweigh the limitations (Whitehead, p. 19).

Examples of Successful Police Helicopter Pursuits

Example 1:

In 1996 a helicopter began pursuing a fleeing suspect that was accused of killing two people. The helicopter followed the vehicle until it stopped and then followed the suspect as he fled into a dark wooded park trying to avoid detection from the police. However, the helicopter was equipped with FLIR and was able to find the fleeing suspect behind a bushy area that he was using as cover. Shortly after finding the suspect, the helicopter placed the Nightsun searchlight on the suspect to confirm his refuge had been compromised. Once spotted, the suspect ran away from the bushes and fired a shot at a nearby officer which narrowly missed him; however, the suspect received a fatal gunshot from another officer that saw him "spotlighted" by the

searchlight (Alpert and MacDonald, 1997, p. 13). This example illustrates the safety that the helicopter can provide for the ground officers.

Example 2:

A police officer called in the license plate of a vehicle that he observed in front of a pizza restaurant; two men got into the vehicle (one carrying a box of pizza). The dispatcher reported the car stolen. The officer then turned on his emergency lights, the two men fled on foot carrying the pizza with them. The officer immediately called for helicopter back-up. Shortly after arriving on the scene, the helicopter was able to find the two suspects walking down the street still carrying the pizza. Ground units were then instructed by the helicopter where the two men were and then they followed the instructions to the site where an arrest was made. The ground officer confirmed that these two men were the two who had fled at the restaurant by comparing the address on the pizza box with the address of the restaurant. The ground officer also radioed the helicopter that the pizza was still warm (Alpert and MacDonald, 1997, p. 13). This example would illustrate the expedient performance that a helicopter can provide during pursuits.

Example 3:

A suspect was alluding arrest after a commercial robbery. The suspect fled through town, the police were able to block traffic from interfering with the suspect's path. Eventually the suspect lost control of his vehicle and bailed-out. The helicopter crew observed the suspect retrieve a gun from the car before fleeing on foot. The helicopter radioed the location of the suspect and that he had retrieved a gun from his car. The ground officers were able to subdue the suspect; however, there was no gun found on the suspect. Because the helicopter was able to witness the entire pursuit from the air, the aircrew was able to inform the ground officers where the gun was dumped. Upon reaching the location where instructed to go, the ground officers found the gun and was able to make a successful arrest (Alpert and MacDonald, 1997, p. 14). Because of its platform suspended at 500 feet above the pursuit, the police helicopter is able to

give detailed descriptions of the pursuit as it occurs. Alpert and MacDonald (p. 10) also state that an observer in a police helicopter equipped with a camera can also take pictures that would support prosecution following a pursuit.

Conclusion

The hazards that surround a high speed pursuit have been discussed. Unlike the glamour that is associated with them in movies, they have a very dark side. The National Highway Traffic Safety Administration reports that an average of 350 people per year die as a result of high speed pursuits (National Highway Traffic Safety Administration, 2006). Moreover, because there is no mandatory reporting system for high speed pursuit crashes; the exact amount of deaths caused by high speed pursuit crashes cannot be determined. However, it is estimated that the 350 people per year figure is conservative (Hill, 2002). It is also suggested by the Commission for Public Complaints Against the RCMP that "40% reported that [during] a pursuit in which they [the police] were driving the primary vehicle resulted in a accident" (Alpert, 1997, p. 5).

Society also has a lack of tolerance for high speed pursuits today. A 1992 Illinois State University study found that "in recent years…there has been increased public scrutiny and concern that the benefits of a police do not always outweigh the risks to public safety" (Commission for Public Complaints Against the RCMP, 1999, p. 6). The study also recommended that "police agencies should have well developed, highly restrictive and discouraging police pursuit policies, as well as clear and simple procedures for regulating pursuits" (Commission for Public Complaints Against the RCMP, p. 7).

Clearly there is a need for an alternative to vehicular pursuits and police helicopters appear to be an effective supplement to ground based vehicles. Police helicopters appear to be a safer alternative to the police cruiser alone. This paper presented different types of helicopters as

possible candidates for police service regarding pursuits. Different types of auxiliary tools on helicopters such as FLIR, NVGs, etc…were reviewed as an aid to assist officers in pursuing vehicles from the air. Also examined was how helicopters make pursuits safer. As well as mitigating the risks in a high speed pursuit, a police helicopter also makes a very effective tool for arrests. Alpert's study in Baltimore and Miami concluded that when a helicopter was involved in a pursuit there would be a greater than 80% chance of a successful arrest. Alpert's study also concluded that the average arrest rate with using only ground vehicles was much lower (Alpert, 1998).

Several examples were given to demonstrate ways in which the police helicopter can add safety and speed to a pursuit and assist the police in prosecution. These examples should only represent a small portion of the benefits that a police helicopter can add to a police department's patrol division. It should also be concluded that a police helicopter can be used as a force multiplier within a police department and if used correctly, it can reduce much of the inherent risks involved with high speed pursuits.

Footnotes

[1]Used with permission from Candy Priano, Kristie's mom.

[2] The complete story can be found at http://www.krisiteslaw.org/indexhome.htm. This website supports the cause to increase awareness on the dangers of hazardous pursuits.

[3]This figure came by averaging the nine year total from 1993 until 2001.

[4] Dr. Geoffrey Alpert is considered an expert on police pursuits. Dr. Alpert is a professor of Criminal Justice at the University of South Carolina and has been awarded grants for NIJ projects such as *Police Pursuit: Policies and Training* and *Helicopters in Pursuit Operations.*

[5]Risk was defined by level of traffic congestion, weather conditions, type of road (e.g., whether surface street, highway, or intestate), and area of pursuit (e.g., whether urban, rural, or commercial).

[6] The author's experience in flying the Bell Jet Ranger is recognized.

[7] The author's experience as an instructor pilot on NVGs is recognized.

Table 1

Fatalities in Crashes Involving Police in Pursuit

Year	Occupant of Police Vehicle	Occupant of Chased Vehicle	Occupant of Other Vehicle	Non-Occupant	Total
2001	4	221	119	21	365
2000	7	185	103	10	305
1999	3	212	99	5	319
1998	2	201	105	14	322
1997	1	193	100	11	305
1996	5	267	109	9	390
1995	10	249	117	10	386
1994	3	284	93	12	392
1993	1	284	57	5	347

Note. A staggering observation from this table is the amount (approximately 1/3) of innocent people that are killed by hazardous pursuits.

Adapted from National Highway Traffic Safety Administration. (2001). “Fatality Analysis Reporting System.”

Table 2

When Police officers Say They Would Engage in Pursuits

Violation	Level of Risk[5]	
Traffic Violation	43%	10%
Property Crime: Misdemeanor	42%	17%
Property Crime: Felony	64%	34%
Stolen Vehicle	65%	37%
DUI	70%	43%
Violent Felony: No Death	87%	80%
Violent Felony: With Death	96%	95%
Officer Shot	96%	95%

Note. From “Police Pursuit: Policy and Training” by G.P. Alpert, 1997, Research in Brief, NCJ 164831, p. 4. Adapted with permission.

Table 3

When Supervisors Say They Would Approve Pursuits

Violation	Level of Risk[5]	
Traffic Violation	31%	7%
Property Crime: Misdemeanor	38%	13%
Property Crime: Felony	59%	27%
Stolen Vehicle	59%	23%
DUI	71%	38%
Violent Felony: No Death	91%	77%
Violent Felony: With Death	98%	94%
Officer Shot	97%	96%

Note. From "Police Pursuit: Policy and Training" by G.P. Alpert, 1997, Research in Brief, NCJ 164831, p. 5. Adapted with permission.

Table 4

Pursuits Involving Helicopters

Site	Year	Number	Arrested	% Success
Baltimore	1995-96	89	74	83
Miami-Dade	1996	43	39	91

Note. From “Helicopters in Pursuit Operations” by G.P. Alpert, 1998, Research in Brief, NCJ 171695, p. 2. Adapted with permission.

Table 5

Reasons for Helicopter-Initiated Pursuits

Reason	Site	
	Miami-Dade	Baltimore
Stolen Car	21	38
Robbery	10	9
Traffic	2	12
Other	10	22
Unknown	0	8

Note. From “Helicopters in Pursuit Operations” by G.P. Alpert, 1998, Research in Brief, NCJ 171695, p. 2. Adapted with permission.

Figure 1

Illustration to Indicate the Number of Innocent People Killed in Pursuits

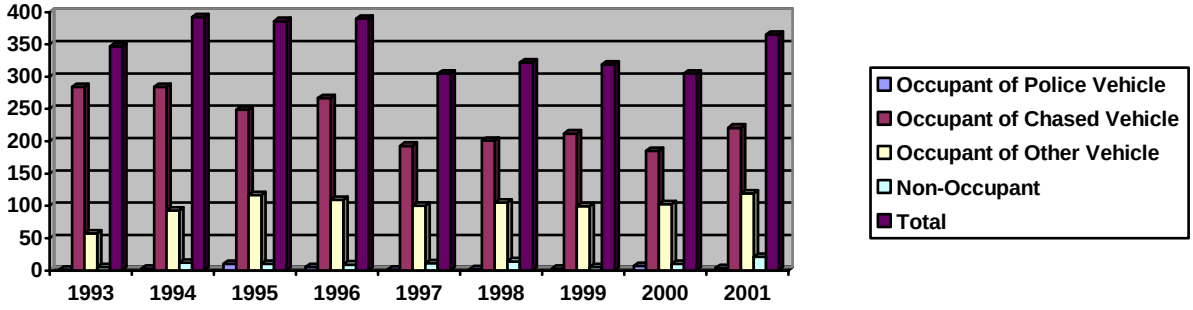
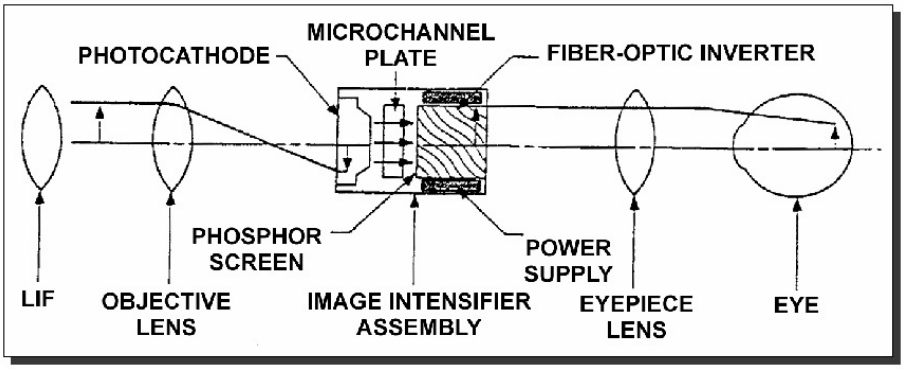


Figure 2

Principle Operation of NVGs



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