ESCORT OF CANADA'S *CHINOOK* HELICOPTER

by Lieutenant-Colonel Tom Kupecz

The Air Force mission is to control and exploit the aerospace environment for military purposes which contribute to Canadian security and national objectives. In support of this mission the Canadian Forces will introduce a medium-to-heavy lift helicopter (MHLH), the Boeing H-47 Chinook, *to its airlift capabilities.*[1] *This high-value asset will provide much needed capacity for domestic and foreign operations, but its employment will require new equipment and procedures to optimize its capabilities and minimize risks posed by natural and human factors. The Air Force will implement a systems approach involving a range of capabilities to deliver the desired effects at home and abroad.*[2]

DND photo

Chinook helicopter in flight.

Introduction

The purpose of this short study is to advance some issues involved with employment of the *Chinook* MHLH – specifically, the requirement for its escort, and the ways and means of performing this function. Although information is drawn from army doctrine, no attempt is made to suggest specific tactics. This study concentrates upon support to the Land Forces, but includes the principles of escort operations as they apply to heavy lift in littoral and maritime support operations, as well as with respect to Canadian domestic operations.

Doctrine

The doctrinal role of Tactical Aviation is to support Land Force operations through the provision of aerial firepower, reconnaissance, and mobility.[3] At one time, the 10th Tactical Air Group, operating helicopters and tactical fighters, was directly responsible to the army for air support. The ongoing doctrinal shift in the Canadian Forces (CF) to a joint command structure has led to the ability to include airborne assets from all applicable organizations in aerospace operations. This broadens the scope of air support, and it adds a variety of capabilities to provide surveillance, reconnaissance, airlift, and weapons support.

Air force doctrine uses the command function to coordinate the other functions – sensing and shaping the environment with moving and sustaining forces.[4] This concept is not tied to platforms such as helicopters or satellites, but includes all resources available to the operational commander.

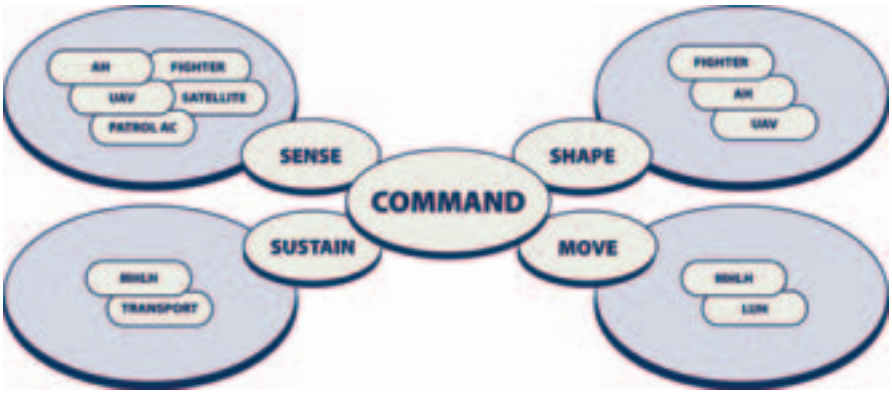

Figure 1 – Command

The Role of the Combat Helicopter

To perform its role domestically and internationally in the modern security environment, the CF must field a range of capabilities, and must ensure that the combat helicopter force is relevant, responsive, and effectively tailored to meet the support requirements of operational commanders. To achieve this aim, it will be necessary to organize its

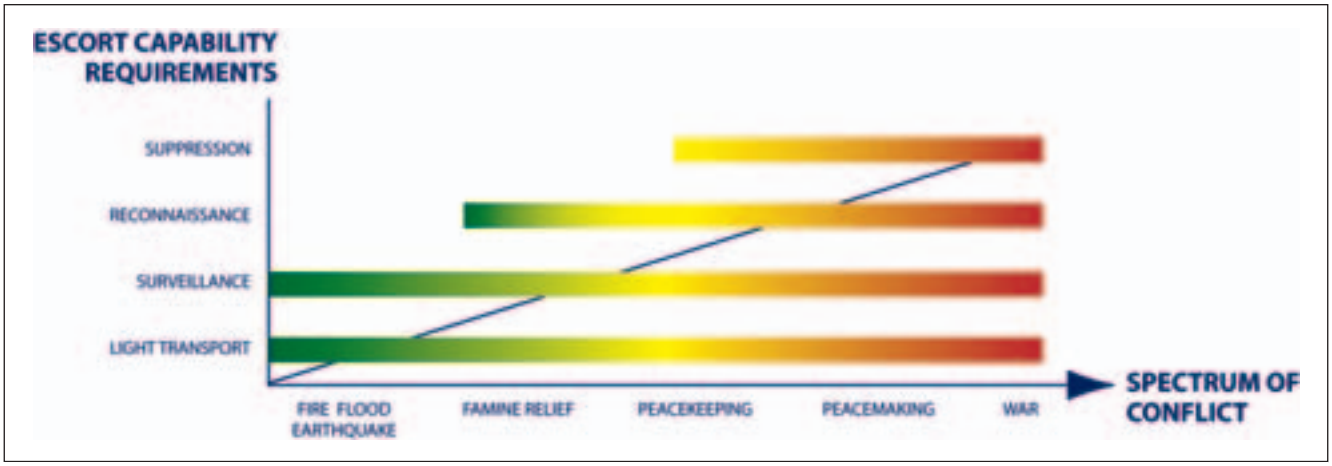

Figure 2 – Spectrum of Conflict/Escort Capability Requirements

forces to conduct operations as joint, all-arms teams. This will mean being able to provide the functions of *sensing, shaping, moving,* and *sustaining* across the full spectrum of conflict, in conjunction with other relevant platforms.

Four distinct types of tactical helicopters have evolved: attack, reconnaissance, utility, and transport.[5] These are specialized by role, and they have only limited ability to perform missions outside these roles. The exception is the utility configuration, which can be crewed by personnel trained in the different skills required, and fitted with specialized equipment and weapons. The configuration and employment of many utility helicopters in service today illustrates this, the *Lynx* helicopter being a good example, with variants performing anti-armour, reconnaissance, and utility missions. It is also adaptable to the maritime environment, serving with many navies in antisubmarine and anti-shipping missions.[6]

The *Chinook's* Mission

Tactical helicopter missions span the spectrum of conflict, from war to peace. Canadian Forces Tactical Helicopter Operations doctrine describes these missions in detail.[7] Table 1, drawn from this manual, provides a summary, showing those missions in which the *Chinook* will be employed. It will be involved in direct combat, in support to combat operations, and in the wide range of activities termed 'operations other than war.'

TACTICAL HELICOPTER MISSIONS (MHLH missions highlighted)

COMBAT	COMBAT SUPPORT	COMBAT SERVICE SUPPORT	OPERATIONS OTHER THAN WAR
AIR MOBILE OPERATIONS	CASUALTY EVACUATION	AEROMEDICAL EVACUATION	AID TO THE CIVIL POWER
ANTI-ARMOUR/ATTACK OPERATIONS	COMMAND & LIAISON	LOGISTICAL TRANSPORT	COUNTER-DRUG OPERATIONS
DIRECTION AND CONTROL OF FIRE	TACTICAL TRANSPORT		COUNTER-TERRORISM
RECONNAISSANCE AND SURVEILLANCE			HUMANITARIAN ASSISTANCE
SPECIAL OPERATIONS			PEACE SUPPORT

Table 1 – Tactical Helicopter Missions

Risk Assessment

The *Chinook* will provide the ability to move significant amounts of personnel and equipment, but it is a scarce and expensive resource. The loss of an aircraft would be significant in terms of lost capability and personnel. It must be protected to the extent consistent with the role of a combat aircraft – which means minimizing risk through whatever means are available, while accepting that risk in the performance of the mission. Part of the protection will be provided by ancillary support platforms across the spectrum of conflict.

Environmental risk. The environment will always pose risk, from weather and terrain to unknown conditions, encountered both enroute, and at destination. The information provided by meteorological and cartography services are adequate where such are readily available, but local conditions can be unknown in remote or distant locations. The condition of the destination may be unknown, and it may require some preparation before being useable. Because of its size and weight, the *Chinook* has limited manoeuvrability, and, when carrying cargo, it may be operating at its limit of range or endurance. A lighter and more manoeuvrable aircraft that can scout routes and land advance parties to prepare landing areas would provide an appreciable margin of safety.

Human opposition. Where human opposition is a possibility, the *Chinook* is particularly vulnerable, due once again to its size and lack of manoeuvrability. It can mitigate some of the risk through self-protection equipment, such as electronic and infrared counter-measures, but could avoid unguided missiles and small arms fire only by favourable usage of altitude, or by

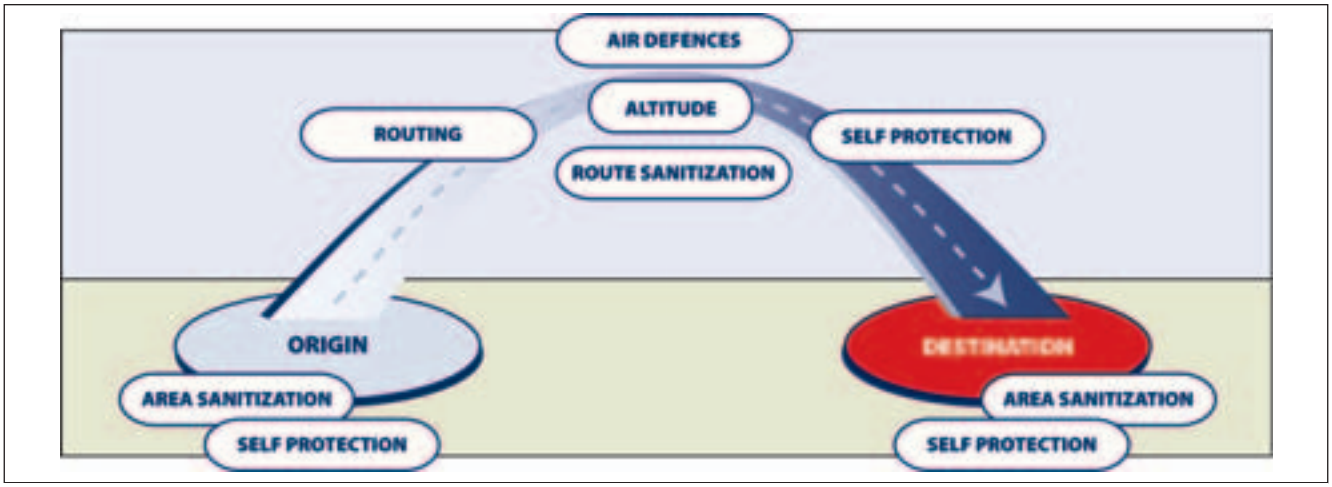

Figure 3 – Force Protection

route selection. On a combat mission, this is not often possible. An escort aircraft with sensors and armament would provide essential protection.

Protection of a Scarce Resource

Whatever the risk environment, the *Chinook* will be best employed when it has:

- Ancillary light transport to balance its lift capability;
- Surveillance to determine optimum routing;
- Reconnaissance to detect threats; and
- Force protection to suppress threats where they cannot be avoided.

Ancillary light transport. For tactical airlift operations, whether the operating environment involves human opposition, or simply the forces of nature and geography, a fleet possessing a mix of load-carrying capacities provides the most efficient and effective capability. While the *Chinook* can carry a large range of payloads, it would be misused if it were not loaded to capacity. A task force of *Chinooks,* supported by a more numerous, agile, and economical light carrier, would be much more responsive in most situations, both domestic and foreign. This concept has been implemented widely in commercial 'hub-and-spoke' configurations, and in the use of 'communications' assets for frequent light transport duties, such as for the transport of key individuals.

Surveillance and reconnaissance. Where routes or a destination are not well established, or where opposition is unknown, there is a need for overall surveillance, and for detailed reconnaissance. Surveillance provides general information for route planning and monitoring of the security environment. Reconnaissance provides details on specific areas of interest, such as enroute hazards and landing zones. Regardless of the platform/sensor package, the critical element in this capability is the dissemination of information. If the data is provided from remote sources, there is a requirement

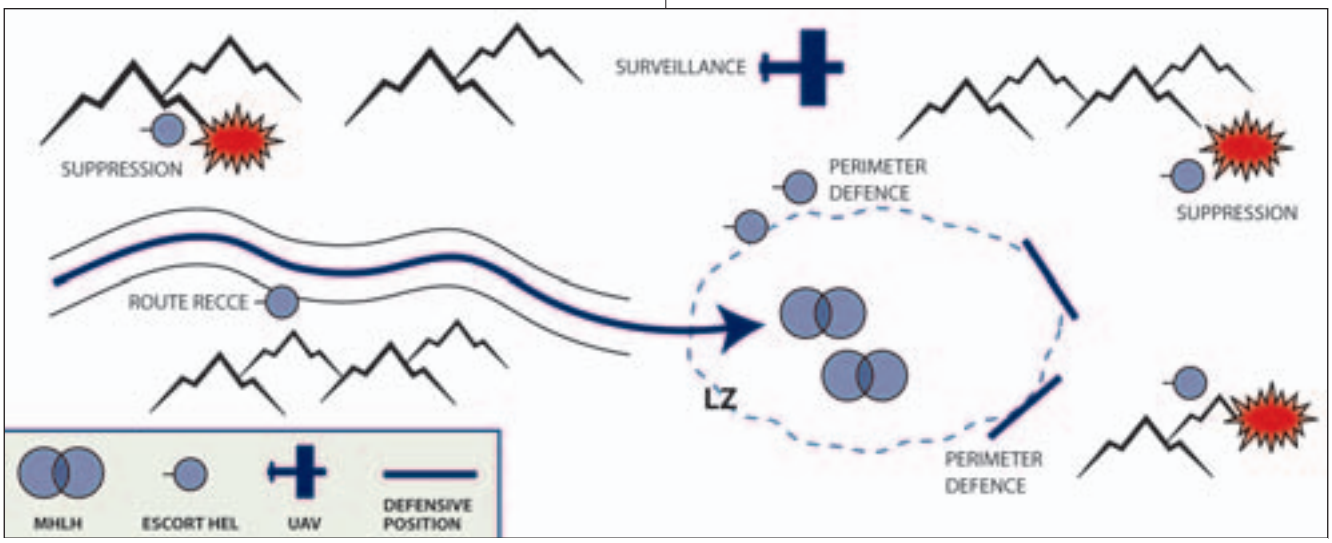

Figure 4 – Reconnaissance to a Landing Zone (LZ).

for real-time data links to operations and planning staffs, as well as for operators engaged in missions. Without the ability to process information in 'real' or 'near-real' time, the intelligence derived is largely of historical value only. Canadian Army research shows a need for armed reconnaissance helicopters integrated into a command system in order to provide effective battlefield support.[8]

Force protection in a high threat environment. Deployed *Chinooks* will face a wide variety of conventional threats, primarily from small arms and from man-portable missiles. Less common but more lethal threats consist of fixed or mobile infrared or radar-directed anti-aircraft artillery and missiles. While the *Chinook* can and *should* be equipped for self-protection against ground threats, there are other ways to mitigate risk. This requires attention to the three basic phases of a given mission: point of origin, enroute, and destination. The approach to security is different in each case, based upon the degree of control that exists over the environment as well as the opposition encountered or anticipated. Figure 3 illustrates the concept.

- At origin, established security forces provide security of operations out to an established perimeter, and arrival and departure procedures provide risk avoidance.

- Enroute, the selection of route and altitude avoids known threats and lessens the need for suppression of threats. Where threats must be met, there are two basic methods of escort – convoy with active defence, in which escorts accompany the transports to ward off attack, and route sanitization, where the escorts clear a path over which the transports can travel in safety. In both cases, there is a requirement for advance and reserve forces with both reconnaissance and armament capabilities. Where there is an air-to-air threat, dedicated air defences must be available. Otherwise, the mission risk will be unacceptably high.

- At destination, where personnel and equipment are exposed and stationary, security would require advance reconnaissance by specialized sensors, and the establishment of a perimeter by troops on the ground. This could require inserting troops and defensive equipment, and supporting them from the air before the main force arrives.

In special operations forces operations, where stealth and the need for speed are key requirements, the escort package could serve tactically for reconnaissance, or as a decoy, as well as for armed cover, if needed.

Force protection in a low threat environment. In non-combat situations, the armed capabilities of escort platforms would not be required, but escort of the *Chinook* could greatly enhance its efficiency and effectiveness. Another platform provided expressly for the purpose, or available from an associated mission, would provide flexibility in route selection, landing zone preparation, communications, and light maintenance support, while concurrently conserving fuel and time.

Types of Helicopters

PLATFORM	CAPABILITY				
	SURVEILLANCE	RECCE	POINT DEFENCE	ASSAULT TRANSPORT	LIGHT TRANSPORT
SATELLITE	GOOD	GOOD			
HALE	GOOD	GOOD			
PATROL AIRCRAFT	GOOD	GOOD	LIM ARMAMENT		
MALE	GOOD	GOOD	LIM ARMAMENT		
MULTI-PURPOSE HEL	LOW ALT	LIM SENSORS	LIM ARMAMENT	GOOD	GOOD
ATTACK HEL	LOW ALT	GOOD	GOOD		
LIGHT UTILITY HEL	[illegible]	[illegible]		GOOD	GOOD
FIGHTER	LIM ENDURANCE	GOOD	GOOD		
TUAV	LIM RANGE, ENDURANCE	GOOD	LIM ARMAMENT		

Table 2 – Platform/Capability

A Systems Approach

In a systems approach to tactical airlift escort, platforms such as patrol aircraft, unmanned aerial vehicles (UAVs),[9] or satellites, operating in unison, can provide the range of capabilities required by a situation – be it domestic or foreign, combat or non-combat. Each platform has its own characteristics, capabilities, and limitations. It will be most effective to use different platforms that have complementary characteristics. For example, low-level reconnaissance by a UAV could be directed by satellite surveillance, and point suppression of a threat by armed helicopter could be assisted by weapons delivered from fighter and patrol aircraft.

In all cases, where mission success depends upon the escort function, it is essential to have platforms that will be available when the *Chinook* is able to operate. The strength of a helicopter escort is that it can operate with the *Chinook* as an integrated force, possessing much the same speed and range capabilities, and using the same support facilities. Fighter, patrol, and UAV assets can provide valuable capabilities when conditions permit, but they may be based separately, and they may not be available when needed.

Of the platform types mentioned in Table 2, the attack helicopter provides the best capabilities for locating and suppressing hostile forces, especially armoured vehicles, but it is *limited* to that task. Specialized for carrying sensors and weapons, it cannot transport supporting troops or other materiel. The other platforms can provide elements of the task list, but they have limitations in capabilities, and, more importantly, they may have serious deficiencies with respect to availability.

In efforts to provide some of the capabilities of attack helicopters, NATO is exploring the concept of the multi-purpose helicopter, a light or medium lift helicopter capable of being equipped with sensors and armament.[10] The armed *Griffon* Concept[11] describes such a platform that would be versatile and readily obtainable. Other solutions have been proposed, such as the *Lynx* Multi-Mission Helicopter, and the Sikorsky *Battlehawk.*[12]

A Balanced Fleet

A review of the helicopter fleets of allied nations in *Janes*[13] shows that even relatively small nations tend to maintain balanced helicopter fleets of attack, (medium or heavy) transport, and utility helicopters. The US Army is restructuring to create Multi-Function Aviation Brigades that possess the full spectrum of capabilities. Structured as heavy, medium, or light organizations, they all include attack and reconnaissance helicopters as an essential part of the mix.[14]

Although the scope of this study does not permit examination of the underlying doctrine that led to these balanced fleets, it is evident that Canada alone has tried to provide tactical aviation support with a single fleet. The result has been that capabilities are lacking, and we have borrowed or rented from our allies, with varying degrees of success. The acquisition of the *Chinook* goes a long way towards addressing the situation, but the fleet is still far from balanced without attack and reconnaissance helicopters.

Conclusions

For operational missions assigned to the *Chinook,* an escort function is needed to realize the full utility of the fleet, and to protect it from loss due to environmental or human factors.

The Canadian Forces should plan to make use of all its aerospace and surface-based capabilities in providing escort to the *Chinook* aircraft. These capabilities cover the functions of area surveillance, reconnaissance, suppression of opposition, and light transport capabilities.

The most reliable and available of platforms would be rotary-winged, because they would share basing and operating requirements with the *Chinook.* The Canadian Forces should plan to field two rotary-wing escort fleets, because:

- in unopposed operations, a light utility helicopter provides most of the escort capabilities required; and
- where armed opposition exists, an attack helicopter provides the best capabilities for locating and suppressing threats.

No single platform can supply the full range of capabilities needed. A system of complementary platforms provides the most reliable support, furnishing response options to problems attributable to weather, range, endurance, basing issues, or human opposition. The Canadian Forces should continue to plan for the acquisition of a full range of UAV, satellite, patrol, reconnaissance, fighter, and helicopter capabilities.

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NOTES

1. CANAIRGEN 026/06 CAS 043
2. Canada, DND, *A-GA-007, The Aerospace Capability Framework* (Ottawa: Canadian Forces Headquarters, 2003), p. 53.
3. Canada, DND, *B-GA-440, CF Tactical Helicopter Operations* (Ottawa: Canadian Forces Headquarters, 1998), p. 1.
4. Canada, DND, *B-GA-400, Canadian Forces Aerospace Doctrine* (Ottawa: Canadian Forces Headquarters, 2006), p. 37.
5. *B-GA-440,* p. 1.
6. *Ibid.,* p. 2.
7. *Ibid.,* p. 13.
8. Canada, DND, *Future Army Experiment – Operations in the Expanded Battlespace* (Ottawa: Canadian Forces Headquarters, 2001)
9. UAV – Unmanned Aerial Vehicles are designed for specific roles. They are sometimes referred to as *Uninhabited* Aerial Vehicles, to emphasize that a large support staff, in fact, mans them. Each type has characteristics of size, speed, and range optimized, for single-purpose missions, and each has its own unique ground support organization. UAVs are generally classified as High Altitude/Long Endurance (HALE) for surveillance, Medium Altitude/Long Endurance (MALE) for reconnaissance and targeting, and Tactical UAV (TUAV) for short-range reconnaissance and attack.
10. NSA.81 NATO Helicopter Interservice Working Group (HISWG).
11. Canada, DND, Armed *Griffon* Concept, (Kingston, 1 Wing, 2002).
12. Sikorsky Newsletter, 3rd Quarter 2006.
13. *Jane's* Publications on-line, at <http://janes.mil.ca/>.
14. Canada, DND, *2525-8 (CFLO AVN) Visit Report to AAAA Convention* (Ottawa: Canadian Forces Headquarters, 24 May 2005).

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