



REPORT
of the Special Committee of the Senate on
NATIONAL DEFENCE

Military Air Transport

FEBRUARY 1986

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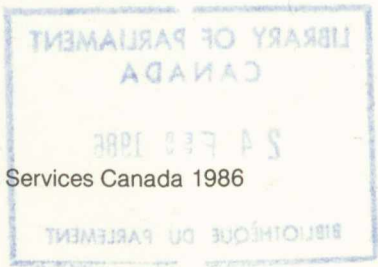
February 1986



REPORT
of the Special Committee of the Senate on
NATIONAL DEFENCE

Copies of this report as well as the Proceedings of the Committee are available upon request from the Clerk of the Special Committee of the Senate on National Defence, The Senate of Canada, Ottawa, Ontario, Canada K1A 0A4

Military Air Transport



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FEBRUARY 1986

MEMBERSHIP

The Honourable Paul C. Lafond, *Chairman*

The Honourable Jack Marshall, *Deputy Chairman*

and

The Honourable:

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Gildas L. Molgat

Hartland de M. Molson

*Duff Roblin, P.C.

Paul Yuzyk

* Ex officio members

Note: The Honourable Sidney L. Buckwold and Robert Muir also served on the Committee at various stages.

Order of Reference

Extract from the Minutes of Proceedings of the Senate, Tuesday, November 27, 1984:

The Honourable Senator Lafond moved, seconded by the Honourable Senator Thompson:

That a Special Committee of the Senate be appointed to hear evidence on and to consider matters relating to national defence;

That 12 Senators, to be designated at a later date, four of whom shall constitute a quorum, act as members of the Special Committee;

That the Committee have power to send for persons, papers and records, to examine witnesses, to report from time to time and to print such papers and evidence from day to day as may be ordered by the Committee;

That the Committee have power to adjourn from place to place within Canada, and to such places abroad where members of the Canadian Armed Forces may be stationed;

That the Committee have power to sit during adjournments of the Senate;

That the Committee be empowered to retain the services of professional and clerical staff as deemed advisable by the Committee; and

That the papers and evidence received and taken on the subject before the Committee during the Thirty-second Parliament be referred to the Committee.

After debate, and —

The question being put on the motion, it was —

Resolved in the affirmative.

Charles Lussier
Clerk of the Senate

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Recommendations

General

1. Until a new defence white paper is actually published, the Committee must reiterate its urgent call for this document, adding the earnest hope that it will be updated annually, as is the practice with several of our allies.
2. Similarly, a national mobilization plan must be completed without delay. The Committee welcomes the assurance of the Honourable Harvie Andre, Associate Minister of National Defence, that such a plan is close to being finalized and will be outlined for Committee members upon completion. Canadians should also be taken into the government's confidence and given all the information they need on the plan's aims and contents. If citizens are to be asked to contribute more to the defence of our country, at home or abroad, then they must be told why, how and when.

Air Transport Group (ATG)

Aircraft and equipment

3. Air transport and mobility are essential elements of our defence capabilities. Air Transport Group must have the aircraft required to discharge its responsibilities effectively, including protection of our northern and coastal areas as well as collective NATO defence. The most important and effective tool for this work is the C-130 Hercules, which should be acquired in the necessary numbers. All other aircraft holdings should be developed with this primary requirement in mind.
4. *The short term.* As well as the six Dash-8s now on order and the six additional Challengers being procured or transferred from the Department of Transport, Air Transport Group should acquire, by 1988, one additional Boeing-707 and seven additional Hercules. The 707 and some of the Hercules should have air-to-air refuelling capabilities. Two of the Hercules would be replacements for recent losses. The other five would bring the Hercules fleet up to 33, which is considered to be the minimum needed for purely peacetime operations.
5. *The medium term.* Because ATG faces block obsolescence in the 1990s, planning should be pushed ahead *now* for major replacement and life-extension programmes in the period 1989-2000. A clear, phased approach should be followed, with the aim of developing a balanced, modern fleet

capable of meeting the heavier demands of crisis periods and wartime as well as purely peacetime needs.

The total Hercules fleet should be increased to 45 by 1994 and the Dash-8 fleet to 20 by 1992. ATG should also acquire 20 new search and rescue helicopters by 1998.

Life extension and updating of all Boeing-707s and Hercules now on the inventory should be carried out. This should include re-engining the 707s and upgrading the Hercules engines.

All life-extended or newly acquired aircraft should be equipped with the necessary advanced systems, including modern avionics, electronic defences and inertial navigation systems.

The Dakotas must be retired. The Buffalos, Cosmopolitans and Labradors should be phased out at the end of their current lifespans.

6. *The long term.* At some point the government must choose whether it wants Air Transport Group to remain in the state passenger business or to focus on military airlift roles.

If it decides on the former, then the government will have to replace ATG's Boeing-707s by one of the long-range passenger aircraft available around the turn of the century.

The Committee recommends the latter option. Canada has a very competent national airline which could handle state representational and similar duties. Greater reliance could also be placed on charters from civil carriers for movement of DND personnel, civilians and dependents.

After the year 2000, the Canadian armed forces will require new military transport aircraft. In anticipation, the government should seek Canadian participation in the Future International Military Airlifter (FIMA) project as well as encourage development of the augmented-wing Hercules.

Budgets

7. The Committee strongly recommends that DND's budget should be for defence purposes only. When the Department is required to carry out additional duties beyond levels required for essentially military purposes, these should be covered by other funds.

Civil resources

8. Prompt action should be initiated to permit the requisitioning of civil aircraft in times of emergency and to encourage the participation of civilian air and ground crews in the common defence effort. New emergency legislation is urgently required, government management systems should be strengthened, and government-industry co-operation enhanced.

9. Noting the very limited number of large cargo aircraft available in Canada in the civilian sector, the Committee urges the government to encourage the development of such capability where it seems practical and cost-effective.
10. The government should pursue the current negotiations on Integrated Lines of Communication (ILOC) and Safe Haven arrangements with the aim of establishing effective bilateral or other agreements as soon as possible.

Personnel — Regular Force

11. ATG should always be kept at full establishment and steps should be taken to enhance the levels of training and experience of aircrew and ground personnel.

The Reserves

12. The Committee strongly believes that Canada's reserve forces must be revitalized, strengthened and re-equipped in the near future as recommended in its previous studies.
13. ATG needs strong back-up from reserve aircrew, maintenance technicians, loadmasters, air movements specialists and other personnel so as to meet the heavier demands that would be placed on it in crisis periods and wartime.
14. Air Reserve squadrons specializing in air transport and search and rescue should be equipped with modern aircraft, probably under twinning arrangements where each Reserve squadron is linked to a Regular squadron and the two fly the same aircraft.
15. An Air Transport Reserve should be established, to encourage the aircrew and ground personnel of the civil air transport industry to provide essential support for national airlift planning and operations.

Ten Tactical Air Group (10 TAG)

Helicopters

16. Three additional Chinook helicopters should be acquired immediately, to replace one lost earlier in an accident and bring total holdings to ten. The Committee urges the government to take up an option, available only until the end of March 1986, to acquire these three Chinooks from Boeing-Vertol for about \$75 million.
17. The 33 Twin Huey and 63 Kiowa helicopters now in the inventory should be replaced, in the next decade, with at least 35 new utility-transport helicopters and at least 60 new light observation helicopters. Future review of military doctrine may indicate a need for additional numbers.

Personnel

18. **Current shortages in 10 TAG's peacetime manning requirements should be made good promptly, by the addition of approximately 100 pilots, avionics technicians and other personnel.**

The Reserves

19. **The four Air Reserve squadrons equipped with Kiowa helicopters should be integrated as closely as possible with 10 TAG, so as to provide the strongest possible tactical helicopter support for Mobile Command.**

The European commitment

20. **444 Squadron with Canadian Forces Europe (CFE) should be brought up close to wartime requirements as soon as possible. In this way, 10 TAG's commitment to augment and reinforce CFE will not, in the event of international crisis or war, cripple the squadrons dedicated to support Mobile Command units in Canada.**

Foreword

The Committee's repeated calls for a government white paper on National Defence are about to be answered, judging by the assurances given by the Minister of National Defence and his Associate Minister in late 1985 and early 1986.

The Committee welcomes these assurances and looks forward to a clear and unequivocal statement of aims in defence policy from the Government of Canada. But a statement of aims must be accompanied by guidelines on the means to achieve them. The forthcoming white paper will thus have to be evaluated in tandem with the next estimates of expenditure on defence.

In the interim the Committee has continued its enquiries into those specific aspects of our defence capabilities which appear to require most immediate attention. Having studied the manpower situation in general terms, then Maritime Command and territorial air defence, we probed in 1985 into military air mobility, focusing on Air Transport Group and Ten Tactical Air Group.

The Committee recognized that modern military capabilities depend heavily on air mobility in inter-continental, territorial and theatre operations. It was also impressed by indications of strains on ATG and 10 TAG. For example, a recent edition of *Sentinel*, the magazine of Canada's armed forces, reported that a Chinook helicopter from Edmonton's 447 Squadron had set a world record for the highest rate flown in a 30-day period — 197.2 hours! ATG and 10 TAG air and ground crew are to be commended and admired for what they achieve with the equipment at their disposal, but the stress on personnel and machines is uneconomical in the long run and should be avoided.

In the course of its inquiry, the Committee confirmed what it had expected to find: Air Transport Group's fleet lacks numbers, is over-utilized and suffers from increasing obsolescence. The Dakota is so old that it should be retired from service as soon as possible. The Buffalos, Cosmopolitans and Labradors should be dropped from the inventory at the end of their current lifespans. And the Hercules and Boeing-707s in the inventory should undergo major modernization programmes. Additional new Hercules and Dash-8s should be acquired to strengthen the fleet.

The Hercules appears to be the obvious choice as the basic aircraft of the Canadian ATG fleet. It has transocean capacity for both cargo and personnel. If a number of KC-130H models were acquired, they could carry out air-to-air refuelling. The Hercules is excellent in air-drop (LAPES) operations, and it can function effectively on short or rough runways on the outer limits of Canadian territory.

Our present Hercules fleet is inadequate and aging. It needs to be almost doubled in size. Present holdings should be updated and life-extended to meet the various requirements they are likely to face in the next decade.

Some basic capability must also be retained for long-range transport, and at present this is provided by the Boeing-707. The current inventory should be updated and life-extended into the next century, and one additional aircraft acquired to enhance air-to-air refuelling and general capability.

The Committee believes that ATG should also lean much more on the civil airlines for the purely passenger role of transporting armed forces personnel and their dependents.

The same applies to the transport of supplies and equipment. The increased use on a regular basis of civil carriers would provide an incentive to increase a capacity that could be requisitioned in times of crisis.

With respect to administrative (government) flight services, at home or abroad, while the Committee does not question the requirement, it firmly believes these could be operated by non-DND agencies, whether Crown or commercial. DND should not be in the airline or air-taxi business. It is in the defence business. If the government insists on placing non-defence responsibilities on DND, it should make arrangements to assign the costs to accounts other than the defence budget.

In the 10 TAG inventory, the current helicopters appear adequate for the tasks they are now called upon to perform. However, they need additional avionics systems, and some increase in numbers of aircraft may be necessary.

The personnel resources of ATG and 10 TAG also need to be strengthened. In ATG's case, the main requirement is for a strong augmentation capability in a well structured, well manned Air Reserve. These augmentation personnel should be fully integrated with ATG, and assigned to and regularly trained on current ATG aircraft and other equipment. 10 TAG needs about 10 per cent more personnel, and should be protected against excessive drains on its resources resulting from dual tasking to both Mobile Command and Four Canadian Mechanized Brigade Group in Europe.

In its study on military air transport, the Committee's approach has been to seek effective, reasonable solutions to evident shortcomings, not a massive and costly build-up. It attempted to determine what should be done in the immediate future, by 1988, and then looked at phased acquisition programmes up to the turn of the century. Possible acquisition programmes beyond the year 2000 were also considered.

Our recommendations will unavoidably cost money because of the block obsolescence outlined in the report. But they are not excessively greater than the kind of expenditures DND itself is now contemplating for ATG and 10 TAG. The increments the Committee recommends are those it believes to be essential to developing a well-rounded and efficient military air transport capacity.

It would be possible to finance these expenditures, and all other urgent outlays, if the defence budget were to be increased to between 2.5 and 3 per cent of GNP, as recommended by this Committee in earlier reports.

Rebuilding Canada's armed forces remains an urgent need. This country must have adequate levels of military capacity if it is to protect the nation's sovereignty, honour its commitments and help maintain the deterrent to nuclear conflict.

The Committee wishes to express its gratitude to the Ministers of National Defence and senior officers of the armed forces, to senior civil servants, executives of various trade and professional associations, as well as learned experts and retired military officers, who so willingly accepted our invitation to appear before us to share their knowledge, experience and visions. Their names are listed in Appendix 5.

We also wish to make special mention of the officers of the armed forces and other DND personnel who helped maintain continual and effective liaison with the defence staff, ATG and 10 TAG.

A particular word of thanks is expressed for the unfailing support provided by the Clerk of the Committee, Mr. Patrick Savoie. We also wish to acknowledge the assistance of Mr. Roger Hill and Miss Nancy Pawelek of the Parliamentary Centre for Foreign Affairs and Foreign Trade, who organized our programme and research and under the Committee's direction gave form to this report.

A handwritten signature in black ink, appearing to read 'Paul C. Lafond', with a large, stylized initial 'P'.

Paul C. Lafond
Chairman

February 1986

Glossary of Acronyms and Abbreviations

ACE	Allied Command Europe
AMF (A)	ACE Mobile Force (Air)
AMF (L)	ACE Mobile Force (Land)
ATAC	Air Transport Association of Canada
ATCCU	Air Transport Communications and Control Unit
ATG	Air Transport Group
CACC	Civil Aviation Co-ordinating Committee
CALPA	Canadian Airline Pilots Association
CAST	Canadian Air/Sea Transportable brigade group
CFB	Canadian Forces Base
CFE	Canadian Forces Europe
CRAF	(U.S.) Civil Reserve Augmentation Fleet aircraft modification programme
DND	Department of National Defence
DoT	Department of Transport
ELE	Estimated Life Expectancy
FIMA	(European-American) Future International Military Airlifter project
FLU	French Language Unit
4 CMBG	Four Canadian Mechanized Brigade Group

ICAO 60/90 minute rule	International Civil Aviation Organization rule whereby an aircraft flying over water must be able to reach an airport within 90 minutes on a single engine from any point on its track; in the United States there is a 60- minute requirement
ILOC	Integrated Lines of Communication agreement, now under negotiation with the United States
INS	Inertial Navigation System
LAPES	Low-Altitude Parachute Extraction System
MAMs	Mobile Air Movement teams
MFO	Multinational Force and Observer peacekeeping mission in the Sinai
MOBILE COMMAND	The main command for Canadian land forces, designated FMC (Force Mobile Command)
NATO	North Atlantic Treaty Organization
NAVSTAR	Navigation Satellite Timing and Ranging system
NORAD	North American Aerospace Defence Command
OVERSIZE AND OUTSIZE MILITARY CARGO	<i>Oversize</i> cargo is bulky equipment that cannot be fitted into an aircraft with normal passenger configuration. For example, it includes the 2 1/2 ton truck, which can be fitted into a Hercules but not a normal Boeing-707. <i>Outsize</i> cargo cannot be fitted into medium-sized military transports, but only into the largest military aircraft such as the C-5 Galaxy. Main battle tanks, for example, are outsize military cargo.
SAR	Search and Rescue
SARCUP	Search and Rescue Capability Update Programme
SARSAT	Search and Rescue Satellite-Aided Tracking
STOL	Short Take-Off and Landing
STRATEGIC AND TACTICAL AIRLIFT	A working definition of these functions is that strategic airlift is between Canada and overseas theatres of operations, whereas tactical airlift is within theatres of operations.

SWINTER

Service Women in Non-traditional Environments and Roles programme

10 TAG

Ten Tactical Air Group

UN

United Nations

1. All that is stated in the report on the 1983-84 Canadian Budget will be stated.
2. In the case of writing this report, an agreement for Boeing Commercial Aircraft Company of the United States, to purchase a majority holding in an existing airline of Canada Ltd, was close to completion. The new name and structure of the company was not yet known, but it was expected to operate in operation as a Canadian company.
3. During the writing of the report, some important corporate changes were underway in the Canadian Air Transport Industry. Having acquired sole ownership of Eastern Air Lines Ltd, on 7 September 1984, CP Air Ltd announced that its own main base, Calgary, etc., would be used for Eastern's operations between 1985 and 1 January 1986. CP's Eastern Division's operations would continue to operate as the airline.
4. In addition to the report of CP Air was seeking to increase its control of National Air Lines and to acquire the remaining 50% of National as this project was still underway at the end of January.

Preliminary Notes

1. All cost figures quoted in this report are in 1985 constant Canadian dollars, unless otherwise stated.
2. At the time of writing this report, an agreement for Boeing Commercial Airplane Company, of the United States, to purchase a majority holding in de Havilland Aircraft of Canada Ltd., was close to completion. The new name and structure of de Havilland was not yet known, but it was expected to remain in operation as a Canadian company.
3. Also during the writing of the report, some important corporate changes were underway in the Canadian air transport industry. Having acquired sole ownership of Eastern Provincial Airways Ltd. on 7 September 1984, CP Air later announced that its own trade name, colours, etc., would be used for Eastern Provincial's medium-range flights after 1 January 1986. EPA's Hawker Siddeley 748 turbo-prop division would continue to operate as Air Maritime.

In addition, at the outset of 1986 CP Air was seeking to increase its control of Nordair from a majority shareholding to sole ownership. Discussions on this question were still underway at the end of January.

Chapter I

INTRODUCTION

1. Canada faces major defence decisions

Canada continues to face major defence decisions. The government has to continue grappling with reconstruction of the nation's defences and such problems as rebuilding continental aerospace defences, the continuation of NORAD, and President Reagan's Strategic Defence Initiative, while also endeavouring to protect its own sovereignty, play an effective role in NATO and contribute to the achievement of international peace and security.

New tanks, long-range patrol aircraft, interceptors, patrol frigates and other equipment have already been purchased or ordered, but there is still shortage and obsolescence in many areas which must be acknowledged and tackled as soon as possible. This will require increases in the defence budget unless the number of defence commitments is significantly reduced.

The Committee has said all this before. It has been calling for a new white paper since it began its work in 1980. The Honourable Harvie Andre, Associate Minister of National Defence, informed the Committee on 24 October 1985 that such a statement could be expected in a few months.

Over the past five years, the Committee has tabled reports on armed forces' manpower, Canada's maritime defence and Canada's territorial air defence. It turned, at the outset of this year, to a consideration of military air transport, a vital part of the forces' essential supply system. Reports on Canada-U.S. co-operation in the defence of North America and Canada's international relations are being prepared in other parliamentary bodies. Like them, this study on military air transport attempts to contribute to the development of effective Canadian foreign and defence policies for the remainder of this century. Military air transport is an essential element of both our commitments to our allies and our own territorial defence.

2. The importance of military air transport

The sheer size of Canada dictates that the armed forces must depend heavily on military air transport. This country is spread over more than 9 million square kilometers of land and almost as much of territorial seas and maritime economic zones, and maintains military installations from the Atlantic to the Pacific and as far North as Alert on Ellesmere Island. The first paved transcontinental highway across the southern parts of Canada was not completed until 1970, and even now

60 per cent of Canada's land mass is accessible only by air. This is a very different kind of country from most of the densely populated lands of Europe. Vast distances, long supply lines, difficult terrain and harsh climate are normal, and there are enormous areas where human activity is meagre and where it is difficult to maintain and promote the national presence. Air services are the normal mode of movement throughout these regions. Only military air transport would be capable of delivering troops and supplies to many points if lodgements or other incursions by foreign powers were ever made during crisis periods or wartime.

Even in southern Canada, air services are the predominant mode of transport for long-distance travel. People can fly from Halifax to Vancouver in one day: it takes virtually a week by train. Air fares are competitive with rail and road fares over any distance beyond four hundred kilometers, and the mass of business travel between Canada's major cities consequently takes place by air. This situation is paralleled in the armed forces, which have dockyards, bases, airfields, radar sites, command posts and other facilities spread across the country from St. John's in the East to Esquimalt on the West Coast and a host of other points elsewhere. Air transport is vital for command and control and for the movement of personnel and urgent supplies: it is the sinews which bind together the widely spread structure of the Canadian defence system.

Of course Canada's defence commitments extend far beyond this country's borders — to Germany, Norway, Denmark, Cyprus, the Middle East and elsewhere. Dedicated to the support of NATO and international peacekeeping missions as well as the defence of North America and the protection of Canada's own sovereignty, this country's armed forces have a wider range of tasks than those of almost any allied country except the United States. Military air transport is vital to the performance of these duties, whether for supply shipments and troop rotations in peacetime, the dispatch of special forces in crisis periods, or the forward movement of reinforcements in wartime. Modern defence strategies and arrangements no longer tolerate tenuous supply lines and uncertain communications, with armies thrown up, half-forgotten on some foreign shore: they require continual, regular, methodical contacts and flows of messages, personnel and materiel, which can be provided only by a communications and supply system encompassing a strong air transport component.

The requirement for military air transport would become especially acute in periods of international crisis. The armed forces would have to wait for political authorization before starting war preparations, and might find themselves scrambling to carry out necessary movements in a few days rather than the several weeks normally used for planning purposes. Even if an international crisis unfolded relatively slowly, there would still be a premium on military air transport which could carry the most urgently needed troops and materiel into danger zones while assisting in the evacuation of Canadian dependents and civilians.

NATO strategists now believe that a land war in Europe could conceivably last several months, and that massive amounts of supplies might have to be shipped from North America to Europe during that time. If that is the case, then Canadian military transport squadrons could find themselves involved in extensive in-theatre operations in Europe as well as heavy transatlantic duties and continuing requirements in all parts of Canada.

3. Outline

The Committee set out to examine the strategic and tactical airlift capabilities of the Canadian armed forces. It conducted hearings during most of 1985 and began drafting the present report towards the end of the year.

Chapter II of this study concentrates on Air Transport Group (ATG), the division of Air Command with primary responsibility for all air transport operations other than close battlefield support. Air Transport Group operates several squadrons of transports which supply Canadian forces across this country and in such overseas locations as Germany and Cyprus. It also carries out other missions, such as search and rescue (SAR) and training, and would provide the backbone of the country's military airlift capability in crisis periods and wartime.

The first section of Chapter II considers the role of Air Transport Group in conventional defence today, together with current structures, inventory, and equipment plans. The second discusses the future of ATG and what is needed to maintain and develop its capabilities. The third examines means of drawing on civil air resources, including aircraft, and aircrew and other personnel. Particular attention is given to new legislation and arrangements required for emergency operations.

Chapter III examines Ten Tactical Air Group (10 TAG), the part of Air Command responsible for close tactical air support of the army. 10 TAG's structure, equipment holdings and establishments are reviewed, and then its transport and other capabilities are considered, as are personnel requirements. The future development of the Group is also discussed.

Chapter IV sets out the main conclusions of the study, as they apply to both Air Transport Group and Ten Tactical Air Group.

AIR TRANSPORT GROUP (ATG)

1. ATG and conventional defence today

Some fundamentals

Canada's defence requirements and commitments determine Air Transport Group's role in the national defence effort. The white paper soon to be issued is intended to set out the basic objectives of Canada's defence policies and thus provide the framework for restating, and reviewing where necessary, the detailed military tasks of the armed forces.

The defence policy statements of the present government to date suggest that Canada is likely to continue its commitments to the protection of national sovereignty, the defence of North America, NATO, and peacekeeping, even though the priorities may be altered and some specific responsibilities might be questioned, amended, or put forward for renegotiation with our allies. ATG will have to continue operations across Canada and, almost certainly, in support of various Canadian forces assigned to NATO defences in Europe, peacekeeping, emergency relief operations and other occasional special missions around the world.

The greatest challenge facing ATG will continue to be that of preparing for the eventuality of emergency-period operations on Canadian territory and in Europe. Peacetime operations are vital for maintaining Canadian sovereignty and preserving the Western deterrent, but as an essential component of the armed forces, Air Transport Group is not an airline: it has to be ready to perform effectively its essentially military role in periods of tension or warfare.

The question then arises: how large should Air Transport Group be, and what kind of aircraft holdings should it have? This is the issue that needs to be examined carefully here, after taking into account the following basic considerations:

- (a) In crisis periods the crucial requirement is for effective national decision-making systems, emergency legislation, mobilization arrangements and management structures as well as a certain mass of military air transport. It is not possible to provide 100 per cent aircraft coverage for all the demands which could arise, almost simultaneously, during an international crisis: what is crucial is effective decision-making about priorities plus streamlined implementation systems and a relatively high level of available air power.

- (b) In wartime military transport aircraft would be employed where they would have the most effect: what counts is to have a powerful, flexible force which can be deployed to different theatres of operations as needs arise.
- (c) Air Transport Group would not operate in isolation either in crisis periods or in wartime. It would be assisted by civil aviation, land transport, maritime shipping and allied air forces. The best possible legislation and arrangements are needed to enable the Department of National Defence (DND) to draw on civil resources as necessary, and to encourage the civil sector to participate in the national defence effort.

Air Transport Group today: an overview

Air Transport Group is one of the six¹ major components of Air Command and accounts for about one-quarter of the Command's total strength. It is a vital part of this country's entire military structure, having responsibility for "providing operationally ready military air transport forces capable of operating anywhere in the world."² It is also charged with providing operationally effective search and rescue forces for Canada and surrounding waters.

The duties flowing from ATG's roles were described to the Committee by senior officers on 2 May 1985. They are to:

...provide airlift support for the defence of North America; airlift the Allied Command Europe, ACE, mobile force....contingents to the NATO north flank; provide logistic resupply and personnel reinforcement for the ACE Mobile Forces; airlift augmentation forces to Canadian Forces Europe; withdraw and redeploy Canadian Forces peacekeeping forces; deploy forces for internal security and post-strike operations; evacuate Canadian nationals, noncombatants and casualties from overseas areas; provide for and support search and rescue, humanitarian and medical evacuation operations; and provide secure airlift to senior government and military personnel.

In addition the transport force has the following peacetime tasks: maintenance of capability for wartime and emergency tasks; provide services of 'state aircraft' for state visits...; logistic support of northern outposts, such as Alert in the North-West Territories; airlift in support of national defence and other government activities...; national disaster responses...; and international humanitarian assistance...³

The functions flowing from these roles include the following:

First, for air transport: strategic airlift; air-to-air refuelling; tactical airlift; VIP [administrative flight services] airlift; scheduled airlift or service flights...; air ferry; aero-medical evacuation; and training. Secondly, for search and rescue:

¹ The six groups of Air Command are: Fighter Group; Ten Tactical Air Group; Maritime Air Group; Air Transport Group; Fourteen Training Group; and Air Reserve Group.

² *Defence 84*, (Ottawa, Department of National Defence), p. 57.

³ Senate of Canada, *Proceedings of the Special Committee of the Senate on National Defence*, (First Session, Thirty-third Parliament; hereafter referred to as *The Proceedings*), 2 May 1985, p. 2:7.

land and sea searches; land and sea rescues; the conduct of mercy flights; responding to major air disasters in the north;...and training.⁴

ATG's headquarters is at Trenton, Ontario. Its Commander is directly responsible for the operational readiness of 24 units across the country, including four transport squadrons, four transport and rescue squadrons, two transport training squadrons, one separate air rescue unit, and maintenance, air movements, communications and control, and other organizations. There are some 1,300 personnel in the Regular Force squadrons, plus 200 in four air movements units, and 3,000 support personnel at major airlift bases at Edmonton, Trenton, Ottawa and Lahr, Germany. In addition, two Air Reserve squadrons are dedicated to air transport and related roles, and they have complements of about 200 reservists.

At the time of the Committee's briefings on ATG's holdings, the Group's inventory of aircraft was as follows:⁵

Some changes in this fleet are already being implemented. The two Falcons have already been retired; one of the Dash-7s has been returned to de Havilland Aircraft of Canada Ltd.; and plans have been made to trade in the other Dash-7 by the end of 1986. The three Twin Hueys will be transferred out of the ATG fleet to other duties this year.

TABLE 1: The Air Transport Group Fleet
(on 2 May 1985)

<i>Fixed-wing aircraft</i>	
Hercules	26
Boeing-707s	5*
Buffalos	14**
Dakotas	9
Cosmopolitans	7
Twin Otters	8
Dash-7s	2
Challengers	2
Falcons	2
<i>Helicopters</i>	
Labradors/Voyageurs	14***
Twin Hueys	3
Total - all aircraft	92
* Including two equipped for air-to-air refuelling.	
** Including three on stand-by for UN or similar duties.	
*** The Labrador and Voyageur helicopters are essentially the same aircraft, and will be referred to as Labradors in the remainder of this text.	

⁴ *Ibid.*, p. 2:8.

⁵ Including Air Reserve aircraft. See testimony of LCol. W.A. Scott, Section Head, Air Operations and Training, Department of National Defence, *The Proceedings*, 2 May 1985 for most of the figures.

The government has also announced that its administrative flight services are being transferred from the Department of Transport to the Department of National Defence, with a completion date of 1 July 1986 (a questionable move that this report touches on later). ATG's holdings of Challengers are being increased from two to eight by the addition of two DoT Challengers and four new acquisitions. Meanwhile, the government has awarded a contract to de Havilland to supply six twin-engined Dash-8s to Air Transport Group by March 1988.

Mr. Andre indicated to the Committee on 24 October 1985 that replacements for two Hercules lost in an accident in Edmonton in Spring 1985, are top priority items, although the funds have not yet been allocated and the "priority" seems to be soft.

Current DND plans for Air Transport Group thus envisage a slightly increased fleet by 1988, mainly as a result of giving it enhanced responsibilities for administrative flight services. The additional Dash-8s will release four Hercules from mainly navigation training to wholly transport roles. This will provide some early relief from a very tight situation.

ATG squadrons and units

Long-range passenger flights are carried out mainly by 437 Squadron, which is located in Trenton and operates ATG's five Boeing-707s. The squadron flies approximately 8,000 hours annually, notably on scheduled services to Europe as well as across Canada. It also carries out regular supply runs in support of Canada's peacekeeping contingents in Cyprus and elsewhere, and devotes many hours each year to administrative flight services, air-to-air refuelling, training, and special missions such as emergency relief operations.

TABLE 2: Air Transport Group Projected Fleet, March 1988
(according to DND plans
now approved and funded)

<i>Fixed-wing aircraft</i>	
Hercules	26
Boeing-707s	5*
Buffalos	14**
Dakotas	9
Cosmopolitans	7
Twin Otters	8
Dash-8s	6
Challengers	8
<i>Helicopters</i>	
Labradors	14
Total - all aircraft	97
* Including two equipped for air-to-air refuelling.	
** Including three on stand-by for UN or similar duties.	

436 Squadron, equipped with 13 Hercules, is also located in Trenton. These aircraft flew more than 17,000 hours in 1984, to such destinations as Lahr, Goose Bay, Thule and Alert. Training flights are conducted to a wide range of locations around the world, and the squadron also participates in army exercises in the Arctic and elsewhere in Canada.

The third formation designated as a transport squadron is 435 Squadron, based in Edmonton. It operates nine Hercules aircraft which flew 11,000 hours in 1984 in strategic, tactical and SAR roles. The ATG Tactical Airlift School is located with 435 Squadron. In the SAR role, a Hercules is maintained on notice around the clock to respond to an emergency landing or crash by any of the commercial airliners transiting Canada on polar routes.⁶

The remaining four Hercules are operated by 429 Squadron in Winnipeg, which employs them for transport and, while the Dash-8s are being brought into service over the next three years, for navigator training. All four aircraft would go into active service in crisis periods and wartime.

Administrative flight services are mainly provided by 412 Squadron, based in Ottawa, which currently operates two Challengers, one Dash-7 and seven Cosmopolitans. The Dash-7 is assigned to Europe where it operates out of Lahr. Five of the Cosmopolitans are stationed in Ottawa, one is in Winnipeg, and another is assigned to NORAD in Colorado Springs. The main function of this squadron is to help provide secure and reliable transport services to royalty, the Governor-General, senior government officials and senior military commanders in peace and war. Six additional Challengers for administrative flight services will be assigned to this squadron, together with two of the Dash-8s now on order. By the end of 1986, the squadron's remaining Dash-7 will have been retired.

There are four search and rescue squadrons with some transport duties and one rescue unit in ATG, including the following: 424 Squadron in Trenton with three Twin Huey helicopters and five Buffalo aircraft; 440 Squadron operating six Twin Otter aircraft in Edmonton and two Twin Otters in Yellowknife; 413 Squadron in Summerside with three Buffalos and three Labrador helicopters; 442 Squadron in Comox operating three Buffalos and five Labrador helicopters; and the separate rescue unit in Gander with three Labrador helicopters. There are also three Labrador helicopters in reserve or under maintenance, which are now being activated. They will fill the gap which will be left by the reassignment of 424 Squadron's three Twin Hueys.

The transport squadrons of the Air Reserve are 402 and 418 Squadrons. The former operates out of Winnipeg, with Dakota aircraft. The latter is based in Edmonton and operates with the Twin Otter aircraft also assigned to 440 Squadron of the Regular Force.

426 Transport Training Squadron is located in Trenton, where it conducts almost all the operational training for aircrew and technical classifications. As *Defence 84*⁷ noted, there are 87 different courses on ATG aircraft including the

⁶ *Ibid.*, p. 2:12.

⁷ The fourteenth in a series of annual reviews published by the Department of National Defence, describing its programmes and activities.

Hercules, Boeing-707, Cosmopolitan and Buffalo, ranging from aero-engine technician to pilot conversion training.

Air movements units (AMUs) at Trenton, Ottawa, Edmonton and Lahr are under the operational direction of Commander ATG. They handle passenger and cargo assembled at each base for air shipment. Most of their work is connected with routine movements which see more than 250,000 passengers and more than 10 million kilograms of priority freight travelling by service air flights each year. They also prepare cargos for para-dropping during tactical airlifts and deal with unscheduled demands, such as emergency relief operations in Canada and overseas. Each AMU is ready to provide Mobile Air Movement teams (MAMs) to be located at points of arrival as required to support airlift on a worldwide basis.

In addition, Commander ATG has control of an Air Transport Communications and Control Unit (ATCCU) at Trenton, consisting of communications, air traffic control, and navigational aid equipment, together with operating personnel, for deployment on six hours notice anywhere in the world.

Trenton is the largest military transport base in Canada. It hosts a variety of military installations and groups in addition to ATG's headquarters and related squadrons and units. Trenton is the home of the Central Region (Ontario) headquarters of the Canadian Armed Forces, the command headquarters for the Canadian Forces Training System, one of the six communications groups of Communications Command, and one of four Rescue Co-ordination Centres.

Not the least of its tasks, Trenton also harbours the Canadian Mission Control Centre of the international Search and Rescue Satellite-Aided Tracking (SARSAT) project, which very successfully uses U.S. and Soviet satellites and related ground stations in those and other countries to locate aircraft and ships in distress.

2. ATG — capabilities and issues

The state of the fleet

Lifespans. A prime indicator of the state of the fleet is the dates on which the various types of aircraft will be phased out unless life-extension programmes are initiated. These dates are as follows:

Taken overall, the fleet is an aging but not obsolescent one. Planning needs to be pushed ahead now for major life extension and/or fleet replacement programmes in the next decade.

*Aircraft capabilities.*⁸ The capabilities of the various aircraft types in the ATG inventory also reveal a good deal about the state of the fleet:⁹

⁸ This section draws heavily on the testimony of Mr. Martin Shadwick, Research Associate, York University, (*The Proceedings*, 19 September 1985), as well as on information the Committee obtained during its visit to CFB Trenton, 22 May 1985.

⁹ See Table 4 for comparative aircraft characteristics.

**TABLE 3: Retirement Dates
for ATG Aircraft***
(excluding life extensions)

<i>Fixed-wing aircraft</i>	<i>Currently scheduled retirement date from ATG fleet</i>
Hercules	1995
Boeing-707s	1996
Buffalos	1992
Dakotas	1996
Cosmopolitans	1990
Twin Otters	2000
Dash-7	1986
Dash-8s	2010
Challengers	2005
<i>Helicopters</i>	
Labradores	1995
Twin Hueys	1986

* See testimony of Col. O'Blenis, Director, Air Requirements, Department of National Defence, *The Proceedings*, 9 May 1985, 8:17-24. See also Section 1 of this chapter.

- The Hercules (C-130) is the backbone of the air transport fleet and is a fine and highly versatile aircraft. It is a moderate-sized plane with medium range, payload and speed, but is often used on strategic airlift operations because it is capable of crossing the Atlantic. It can also land on relatively short, rough airstrips. ATG's present Hercules do not have air-to-air refuelling capability. They vary in age from two years to 21 years, and the older models lack modern avionics, navigation, communications and radar systems, which could be vital during wartime missions.
- The Boeing-707 has performed well as a transport-tanker over the years, but it was designed primarily as a civil passenger aircraft. It lacks rear-loading and wide side-loading facilities and cannot carry oversize or outsize military cargos. Only two of the aircraft are equipped for air-to-air refuelling, and all lack navigation systems which would enable them to operate independent of ground stations in crisis periods or wartime.
- The Buffalo is a robust and highly-maneuvrable aircraft with impressive short take-off and landing (STOL) capabilities. It also has rear-loading facilities which are a great advantage in tactical operations. However, it is no longer used in the tactical airlift role for which it was originally acquired but now serves in search and rescue or utility transport roles. It has some advantages in SAR operations because rescue personnel and equipment can be dropped from the rear door, but also some disadvantages, because its range is short and it is not pressurized.

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT

A. FIXED-WING AIRCRAFT — ON INVENTORY OR POSSIBLE ACQUISITIONS

TYPE	AIRCRAFT			PAYLOAD			
	MANUFACTURER	DESIGNATION	MODEL	TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED
1. Hercules	Lockheed	CC-130	Series H*	Maximum passengers: 92 troops, 64 paratroops, or 74 litters and 2 attendants	19,356 kg or up to 5 type 463L pallets**	With maximum pay- load: 3791 km With maximum fuel and 7081 kg payload: 7876 km	Cruising speed: 540 km/h
			Series E*	Maximum passengers: 92 troops, 64 paratroops, or 74 litters and 2 attendants	20,412 kg	With maximum pay- load: 3895 km With maximum fuel (including external tanks) and 9070 kg payload: 7560 km	Cruising speed: 520 km/h
			Series KC-130H tanker	Crew of 4 plus specialists	23,587 kg of fuel	In-flight refuelling mission radius: 1850 km	Cruising speed: 530 km/h
2. 707	Boeing	CC-137	B 707-320C* passenger/ freight convertible	Up to 170 passengers	Maximum payload: 38,550 kg	Maximum with passengers: 9444 km With maximum cargo: 4910 km	Cruising speed: 870 km/h
3. Buffalo	De Havilland	CC-115	DHC-5A*	41 troops, 35 paratroops, or 24 stretchers and 6 seats	5200 kg	With maximum payload: 740 km With maximum fuel: 2590 km	Cruising speed: 405 km/h

4.	Dakota	McDonnell Douglas	CC-129	DC-3*	20 passengers	3628 kg	With maximum payload: 556 km With maximum fuel: 1850 km	Cruising speed: 278 km/h
5.	Cosmopolitan	Canadair	CC-109	CL-66B*	Maximum: 38 passengers	5869 kg	With maximum passengers: 1996 km With maximum fuel: 3885 km	Cruising speed: 518 km/h
6.	Twin Otter	De Havilland	CC-138	Series 300*	Up to 20 in main cabin	1088 kg	With maximum payload: 555 km With maximum fuel: 1665 km	Cruising speed: 278 km/h
7.	Dash-7	De Havilland	CC-132	Series 100*	Up to 50 passengers	Maximum payload: 5130 kg	With maximum passengers: 1279 km With maximum fuel: 2775 km	Cruising speed: 407 km/h
8.	Dash-8	de Havilland	CC-142	Series 100*	33 passengers	4268 kg	With maximum payload: 912 km With maximum fuel: 4070 km	Cruising speed: 490 km/h
				Series 300 (under development)	50 passengers	5352 kg	With maximum payload: 850 km With long-range tanks and 50 passengers: 4000 km With long-range tanks and 35 passengers: 4375 km	Cruising speed: 525 km/h

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT (continued)

A. FIXED-WING AIRCRAFT — ON INVENTORY OR POSSIBLE ACQUISITIONS

	AIRCRAFT			PAYLOAD		RANGE	SPEED	
	TYPE	MANUFACTURER	DESIGNATION	MODEL	TROOPS/PASSENGERS			WEIGHT
9.	Challenger	Canadair	CC-144	CL-600*	8-12 passengers	Maximum payload: 2041 kg	With maximum passengers: 3330 km With maximum fuel: 4440 km	Cruising speed: 815 km/h
				CL-601*	9 passengers	Maximum payload: 2229 kg	With maximum passengers: 5180 km With maximum fuel: 5550 km	
10.	Falcon (retired in 1985)	Dassault-Breguet	CC-117	Series 20	10 passengers	Maximum payload: 2260 kg	With maximum passengers: 1700 km With maximum fuel: 2030 km	Cruising speed: 805 km/h

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT (continued)

B. OTHER FIXED-WING AIRCRAFT MENTIONED IN THE REPORT

	AIRCRAFT				PAYLOAD			
	TYPE	MANUFACTURER	DESIGNATION	MODEL	TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED
1.	GALAXY C-5	Lockheed	(no Canadian Forces designation)	Series B	Can carry up to 270 troops, although primarily a freighter/heavy logistics transport aircraft	Maximum payload: 118,388 kg or up to 36 standard type 463L load pallets; Capable of transporting tanks, outsize vehicles, missiles	With maximum payload: 5526 km	Cruising speed: 888-906 km/h
2.	C-17	McDonnell Douglas	(no Canadian Forces designation)	—	Up to 244 troops or 102 paratroops	Maximum payload: 78,110 kg; Outsize loads including tanks, jeeps and infantry fighting vehicles as well as helicopters	With maximum payload: 4445 km	Cruising speed: 855 km/h
3.	767	Boeing	(no Canadian Forces designation)	Series 200	Up to 211 passengers, depending on configuration	Maximum payload: 32,200 kg	6161 km	Cruising speed: 889 km/h
4.	DC-10	McDonnell Douglas	(no Canadian Forces designation)	Series 10	Maximum: 380 passengers	Maximum payload: 44,678 kg	With maximum payload: 4355 km	Cruising speed: 925 km/h
				Series 30 (extended range version)	Maximum: 380 passengers	Maximum payload: 48,330 kg	With maximum payload: 7413 km	Cruising speed: 908 km/h

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT (continued)

B. OTHER FIXED-WING AIRCRAFT MENTIONED IN THE REPORT

TYPE	AIRCRAFT			PAYLOAD			
	MANUFACTURER	DESIGNATION	MODEL	TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED
			Series 40 (extended range version)	Maximum: 380 passengers	Maximum payload: 46,243 kg	With maximum payload: 7505 km	Cruising speed: 922 km/h
5. KC-10	McDonnell Douglas	(no Canadian Forces designation)	KC-10A tanker/ transport	Three crew plus limited accommoda- tion for essential support personnel	Maximum cargo payload: 90,718 kg or, depending on configuration, 25 or 27 type 463L pallets; Capable of transporting wheeled vehicles	With maximum cargo: 7032 km In-flight refuelling mission radius: 3540 km	Similar to DC-10
6. MD-11	McDonnell Douglas	(no Canadian Forces designation)	—	320 passengers	Maximum payload: 54,280 kg	With maximum payload: 8980 km With maximum passengers: 12,400 km	Cruising speed: 870 km/h
7. TA-11	Airbus Industrie	(no Canadian Forces designation)	TA11-200 long-range passenger	250-260 passengers	(still under design)	12,600 km	(still under design)

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT (continued)

C. ROTARY-WING AIRCRAFT ON AIR TRANSPORT GROUP AND TEN TACTICAL AIR GROUP INVENTORIES

TYPE	HELICOPTERS			PAYLOAD				SPECIAL LIST CHARACTERISTICS
	MANUFACTURER	DESIGNATION	MODEL	CREW/TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED	
1. Labrador	Boeing Vertol	CH-113/113A	Model 107 twin turbine transport helicopter*	5 crew 15 passengers	3200 kg	With maximum fuel: 1100 km	Cruising speed: 222 km/h	3200 kg hook for external loads
2. Twin Huey	Bell	CH-135	Model 212 twin turbine utility helicopter*	3 crew and up to 11 passengers	977 kg	400 km	Cruising speed: 203 km/h	Optional cargo sling rescue hoist, emergency pop-out flotation gear
3. Chinook	Boeing Vertol	CH-147	CH-47C twin-engined medium transport helicopter*	4 crew and 33 to 42 troops or 24 litters plus 2 attendants	9090 kg	480 km	Cruising speed: 240 km/h	Up to 9090 kg can be carried on external hook
4. Kiowa	Bell	CH-136	Single turbo-shaft engine OH-58C light observation helicopter*	2 crew and 2 passengers	With 2 crew: 227 kg	370 km	Cruising speed: 185 km/h	—

D. ROTARY-WING AIRCRAFT ON MARITIME AIR GROUP INVENTORY (mentioned in the report)

TYPE	HELICOPTERS			PAYLOAD				SPECIAL LIST CHARACTERISTICS
	MANUFACTURER	DESIGNATION	MODEL	CREW/TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED	
Sea King	Sikorsky	CH-124(A)	SH-3D twin-engined multi-purpose helicopter	Pilot and co-pilot; 2 sonar operators in main cabin	3630 kg	1005 km	Cruising speed: 220 km/h	2300 kg hook for external loads

TABLE 4: CAPABILITIES OF VARIOUS AIRCRAFT (continued)

E. OTHER ROTARY-WING TYPES MENTIONED IN THE REPORT

HELICOPTERS				PAYLOAD				SPECIAL LIFT CHARACTERISTICS	
TYPE	MANUFACTURER	DESIGNATION	MODEL	CREW/TROOPS/PASSENGERS	WEIGHT	RANGE	SPEED		
1.	Super Purna	Aero-spatiale	(no Canadian Forces designation)	AS 332 twin turbine multi-role helicopter	One to three crew; up to 21 troops or 6 stretchers and 7 seated casualties	Maximum of 4500 kg on internally mounted cargo sling; maximum internal load: 9000 kg	Basic range: 635 km and, depending on number of reserve tanks: 1050-1720 km	Cruising speed: 280 km/h	—
2.	EH 101	EH Industries	(no Canadian Forces designation)	Three turbo shaft engines	Crew of three; up to 28 troops	Maximum payload: (in utility version): 6548 kg	Basic range: 1020 km Ferry range: 1850 km	Cruising speed: 296 km/h	—
3.	S-70	Sikorsky	(no Canadian Forces designation)	UH-60A twin turbine combat assault squad transport	Crew of 3; 11 to 14 troops	3630 kg	Basic range: 600 km Ferry range with maximum external fuel tanks: 2200 km	Cruising speed: 268 km/h	Cargo hook for external lift: 3630 kg Optional rescue hoist: 272 kg Designed to fit in a Hercules

Notes:

* Presently on ATG or 10 TAG inventory, or coming on inventory under current acquisition programmes.

** Standard pallet measuring 2.2 by 2.75 m, on which cargo can be loaded; "463L" refers to a particular loading system and not to any unit of weight.

General Information provided in this table represents approximations only, which may change depending on cargo and fuel loadings, numbers of passengers, altitudes of flight, weather conditions, etc. These figures are intended primarily to give some idea of comparative capabilities of aircraft.

Source: The main sources of information for aircraft not in the present inventory of the Canadian armed forces were Jane's All The World's Aircraft and the aircraft manufacturers.

- The Dakota is a remarkable aircraft which has now been in service for almost half a century. It is kept flying through the dedicated efforts of 402 Air Reserve Squadron, but it is now beyond obsolescence. The Air Reserve should be provided with more modern aircraft, notably Dash-8s and Hercules.
- The Cosmopolitan is an important component of the passenger service operated out of Ottawa by 412 Squadron. It is mainly used for medium-distance flights within North America. It is scheduled to be phased out at the end of this decade.
- The Twin Otter is deployed in two formations, the main squadron in Edmonton which is dedicated to SAR duties, and a two-aircraft detachment in Yellowknife which carries out multiple transport missions in the North. The Twin Otter is a versatile, economical aircraft, but it lacks the range, space and pressurization preferable for SAR duties. It is better attuned to general light transport duties in the North, where its ability to land on ice and water as well as airstrips is an important advantage.
- The Dash-8 is a Canadian-built STOL aircraft, with a capacity for carrying 33 passengers over medium distances. It could be used for many of the utility transport, training and SAR tasks. It does not have rear-loading capabilities and thus is not suited to air-dropping military equipment for tactical operations or heavier rescue equipment in SAR operations.
- The Challengers are the newest acquisition of the armed forces. ATG will be operating both the CL-600 and CL-601 versions, which have different engines.
- The Labrador is the backbone of ATG's SAR helicopter fleet. In the improved SARCUP (Search and Rescue Capability Update Programme) form, especially if automatic flight control and in-flight de-icing systems were added, it is an effective machine.

Commonality. Several witnesses drew attention to the problem of a lack of commonality in the ATG fleet, that is to say too many different types of aircraft in small numbers. This causes problems of servicing, personnel training and related costs. The logistics support requirement is also increased heavily, owing to the need for a multiplicity of spare parts for the different aircraft types. Most observers believe that efforts should be made to rationalize the fleet by concentrating on fewer models. However, in doing so, DND will have to bear in mind that some of the present aircraft have special capabilities which make them difficult to replace.

Numbers. The major problem with the ATG fleet at present is a lack of numbers. There are not enough aircraft to meet some of the main peacetime requirements, let alone crisis period or wartime demands. This question is discussed in more detail in the following section, on aircraft requirements.

Utilization rates. Because of Canada's extensive defence commitments and the relatively low numbers of ATG aircraft, utilization rates are high. ATG aircraft are operated at the kind of rates which many other air forces would regard as wartime levels. The ability to do so is a testimony to the efficiency of

maintenance crews as well as aircrews, but it takes a toll on equipment and personnel in the long run and undoubtedly increases operating costs. Aircraft age more quickly and spare parts are consumed more rapidly. Morale also suffers when maintenance crews have to work long hours, continuously, to keep available aircraft flying.

Cargo capabilities. Most of ATG's aircraft are able to transport some supplies, but only the Hercules and Buffalos have rear-loading capabilities. The Hercules alone is large enough to carry *oversize* military cargo such as a two-and-a-half ton truck. No Canadian military transport aircraft is capable of handling *outsized* military cargo such as tanks. (Long-range military transports capable of carrying heavy military cargo will not be needed for the time being if the ATG fleet is developed along the lines recommended in this report, notably in section three, *The future of Air Transport Group.*)

Tanker capabilities. Only two of ATG's aircraft are equipped for air-to-air refuelling. Both are Boeing-707s of 437 Squadron, which can be employed in either transport or tanker modes. Conversion from one role to the other takes about 12 hours, so these aircraft cannot be switched instantaneously from transport to tanker duties during operations. Additional tanker capability is urgently required.

Aircraft requirements for current situations

Peacetime. The evidence presented to the Committee suggests that ATG needs a number of additional aircraft in the immediate future to meet purely peacetime requirements.

- One additional Boeing-707 is required as soon as possible, with air-refuelling capability, to service CF-18 interceptors.
- There seems to be a broad consensus that a number of additional Hercules are needed for peacetime operations, notably for routine logistics missions, for air-to-air refuelling, and to support Mobile Command training exercises. For example, Mr. Martin Shadwick, Research Associate, York University, envisaged a force of at least 30 to 32 Hercules, which would require DND to purchase four to six more aircraft as well as moving the 429 Squadron from navigation training and transport missions to a purely transport role. Other testimony confirmed that a total of about 33 Hercules are needed to carry out all peacetime tasks. This would reduce utilization rates to more acceptable levels and strengthen that core group of transport squadrons which is vital for the movement of military units, equipment and supplies across Canada, to the Canadian North, to Norway, to Denmark and to Germany.
- One of the main advantages of acquiring some additional Hercules aircraft would be to strengthen Canada's national presence in the North. The Committee has long been concerned about this question, for example arguing in its first report, *Manpower in Canada's Armed Forces*, that: "The Canadian Forces must have the air transport capability needed to airlift a brigade of troops to any Northern or coastal points which may be threatened by disorders

or outside interference or incursion."¹⁰ A briefing on the military implications of commercial and strategic developments in the North by Dr. Harriet Critchley of the University of Calgary, together with the recent passage of a U.S. Coast Guard icebreaker through Canadian arctic waters, have confirmed the Committee in its belief that effective measures have to be taken as soon as possible to assert this country's sovereignty over its northern and frontier regions.

- Some of the Hercules acquired should be of the KC-130H tanker model, so as to strengthen the currently inadequate in-flight refuelling capability of the transport fleet. The KC-130H will be even better suited than the 707 to refuelling duties in the Arctic, owing to its ability to operate out of forward airfields in the North with limited support facilities. Six of these aircraft could be assigned to different CF-18 interceptor units, with the secondary task of assisting in general transport duties as needs arise.
- There does not appear to be a pressing need to increase the *overall* numbers of *other types* of aircraft in ATG's fleet beyond the levels currently planned. More SAR aircraft would surely be welcomed by the fishermen and others who depend on them, but present levels appear to be roughly adequate for purely defence purposes. If the government decides to expand SAR services for non-defence purposes, it should fund them separately from the DND budget. The same is true for administrative flight services if some need to be performed by DND for other government departments.
- Although the *overall* numbers of aircraft in the utility transport, light transport, administrative flight services, training, SAR and general service roles seem adequate, some changes in the *composition* of this part of the fleet do appear warranted as funds become available, obsolescence advances and retirements take place. For example, there is a particularly good case for buying more Dash-8s to replace some of the other aircraft by the early 1990s. (See section three, *The future of Air Transport Group*.)

Crisis periods. As Dr. George Bell, President, Canadian Institute of Strategic Studies, remarked: "In a period of rising tensions leading to the possibility of hostilities, Canada has commitments. We must, first of all, augment, then reinforce, and then go into a process of mobilization for the purpose of sustaining our forces. At the same time, we must conduct civilian evacuation from the danger points. We also have to deal with the continuity of government in Canada."¹¹

The situation facing ATG in an international crisis was outlined by LCol. W.A. Scott, Section Head, Air Operations and Training, DND, on 9 May 1985. "To list these in only one possible sequence," LCol. Scott stated, "we might deploy the following forces":

¹⁰ Standing Senate Committee on Foreign Affairs, Sub-committee on National Defence, *Manpower in Canada's Armed Forces*, (Ottawa, Supply and Services, 1982), pp. 27 and 28.

¹¹ *The Proceedings*, 27 June 1985, p. 7:6.

First, the Allied Command Europe Mobile Force (Air), AMF(A), one squadron of fighter aircraft to north Norway.

Then the Ace Mobile Force, Allied Command Europe Mobile Force (Land) Battalion Group, to north Norway or Denmark.

The Rapid Reinforcement Squadron is an additional squadron of fighter aircraft to be deployed to north Norway. This will require airlifts similar to that for the deployment of the AMF(A) — which, if already deployed, would also serve as a rapid reinforcement squadron.

Deployment of the Canadian Air/Sea Transportable Brigade Group, the CAST Brigade Group, to north Norway. The majority of the brigade's equipment will move by sea, with the personnel moving by air, to arrive at the same time as their equipment.

There is a need to move in advance command and reconnaissance elements, reception parties, and maintenance teams, requiring a number of Boeing and Hercules flights.

Next, the augmentation of Four CMBG to combat strength. At present, again for planning purposes, this strength is 6,500, all ranks, and will therefore call for the planning of 2,300 augmentation personnel.

Some of the activities just mentioned will be time-critical. Once ordered, they must be moved within a specific maximum time to congested arrival airfields. A good example of this is the deployment of the AMF(A) and the AMF(L).

Of course, at the same time as Canadian elements are being deployed to Europe, there is also a requirement to move some groups back to Canada. These include, first, the evacuation of patients from DND medical facilities in Europe, to make those facilities available for battle casualties.

Next will be non-combatants, including dependents and certain Canadian civilian employees, such as DND-employed school teachers, for a total of about 12,000. While not currently laid down in our plans, there could also be a requirement to evacuate other Canadian nationals from various locations throughout Europe, or elsewhere.

These latter requirements can be met, in part, by using the aircraft that brought in the reinforcements, but will undoubtedly also require additional allied or civilian passenger aircraft, depending upon the urgency of the situation.

The requirements for airlift called up by our current plans depend upon the priorities established by the government in response to the situation. It must be noted that a requirement to meet concurrent airlift tasks will exacerbate an already difficult problem.¹²

Simultaneously, protection of Canadian territory and maritime bases will have to be assured, as will civil mobility.

¹² *Ibid.*, 9 May 1985, pp. 8:10 and 8:11.

Some idea of the scope of the airlift required to carry out such tasks was provided, also by LCol. Scott, on 2 May 1985. "A strategic commitment of long standing is the deployment of Canada's contribution to the Allied Command Europe Mobile Force, or AMF," he stated.

It requires lifting approximately 1,200 troops and their vehicles and equipment to northern Norway, a distance of approximately 3,000 miles. Historically, this commitment has been regarded as the pacing factor in strategic airlift because of the requirement to generate on short notice the highest safe flying rate of which ATG is capable. This commitment requires the entire C-130 force for completion, and represents the generation of over 3,000 C-130 flying hours in approximately 10 days. There are factors which make it difficult to sustain this rate for extended periods of time. Of the factors involved, namely maintenance, manpower, aircrews and spare parts, spare parts is considered to be the most critical factor.¹³

While recognizing the unpredictability of crises, DND uses estimates such as those outlined by LCol. Scott to work out, under a normative programme study,¹⁴ total airlift requirements and the numbers of aircraft needed to meet them.¹⁵ Assessments are made of warning time, priorities, availability of civil aircraft, and similar factors, so that the most effective and economical responses can be developed, in case they are ever needed.

LGen. (Ret) K.E. Lewis, President, Aerospace Industries Association of Canada and a former Commander of Air Command and Air Transport Command, gave his views on the numbers of aircraft needed to meet current requirements when he appeared before the Committee on 20 June 1985. He indicated that ATG would not be able to carry out its commitments with present resources and argued for a substantial increase in long-range, medium-range and other capabilities. One of the options he advanced included recommendations for an increase in the number of Hercules from 28 to 44. Witnesses also recognized that ATG resources would need to be supplemented in crisis periods by civil airliners and aircrews, especially for some troop movements and evacuations.

Wartime. Until the mid-1970s, it was believed that a major East-West conflict would last less than 30 days and would be fought primarily by the forces-in-being at the time hostilities broke out. Many analysts estimated that a conventional war in Europe would in fact not last more than a few days. NATO forces would be pushed back to the Rhine in that time, they believed, and allied leaders would have to resort to nuclear weapons if Western Europe was not to be overrun. In such circumstances, Air Transport Group would have little impact once the battle started, since there would be no time to move up supplies or major reinforcements.

¹³ *Ibid.*, 2 May 1985, p. 2:9.

¹⁴ *Ibid.*, 9 May 1985, p. 8:18.

¹⁵ The normative programme study is a means of determining the organization and resources needed to meet current defence commitments and sustain the Canadian Forces in peacetime, crisis periods and wartime. The objective is to enable DND to determine how many troops, aircraft, ships, tanks, other equipment and other resources it needs to carry out its tasks under a variety of realistic conditions.

Now thinking has changed, and allied military planners believe that a major East-West conventional war could, conceivably, last six months or more. Mobilization of trained manpower, available equipment and other supplies would take place, and there would be a massive effort to move them by all available means of transport across the Atlantic. Military engagements could be expected on the Central Front and also in various other localities such as Norway, Denmark, on the Southern Flank, and at sea. Small lodgements or diversions on the mainland of North America would also have to be guarded against.

If all this transpired, the scale of reinforcement and supply would be enormous. Mr. C. Cowie, then Chairman, Civil Aviation Co-ordinating Committee (CACC), stated that: "It is no secret that NATO is planning on air-lifting from North America a million and a half troops in a short time plus 12 million tons of cargo."¹⁶

So far as Canada is concerned, however, this is looking to the future, perhaps sometime in the 1990s, because high Canadian reinforcement rates are not attainable at present. The principal constraining factor is not necessarily air transport but the sheer lack of available personnel in the Regular Forces or the Reserves. The absolute maximum number of reinforcements which might be derived from the present Regular and Reserve forces could not possibly exceed 25,000,¹⁷ and these could be transported to Europe, over a month-long period, by two civil Boeing-747 flights per day. Seven Hercules flights per day across Europe would take them close to the battlefield.

Another major constraining factor is equipment. Mr. Andre pointed out on 24 October 1985 that: "As has been the case for quite some period of time, the degree of mobilization is limited by our equipment or hardware situation. But there is a mobilization plan. When we can have a better degree of certainty as to the equipment that will be available, it will be updated accordingly."¹⁸

Whatever the actuality of wartime turned out to be, the responsibility for airlift would not fall on Air Transport Group alone. ATG's task would be to carry out priority military missions, not to try to perform the entire national air transport function by itself. At the outset of hostilities it would have to ensure that Mobile Command had enough air transport to move one or two battalion-sized battle groups with their equipment and air-portable facilities into the Canadian North or frontier regions, so as to carry out, if necessary, operations for the defence of Canada or the Canada-United States region. It would also be responsible for providing the CAST and ACE Mobile forces with immediate follow-on reinforcements, equipment and supplies. Subsequently, over a period of prolonged conflict, it would probably be called upon to perform such duties as in-theatre transport in Europe, urgent freight shipments across the Atlantic, and priority air transport operations within Canada. It would rely heavily on the civil air fleet to move troops across the Atlantic while maritime shipping and land transport carried most of the equipment and supplies. U.S. and other allied air

¹⁶ *Ibid.*, 16 May 1985, p. 3:23.

¹⁷ See *Manpower in Canada's Armed Forces* for figures and discussions of compositions of the Armed Forces' commands, availability of combat troops, etc.

¹⁸ *The Proceedings*, 24 October 1985, p. 12:6.

transport fleets would also play a role in the movement of Canadian personnel, equipment and supplies, under reciprocal arrangements.

The ATG fleet needs to be large enough and powerful enough to play a major role in a war effort. For this purpose it needs some long-range transports, a core of medium-range workhorses and a solid component of utility transports, SAR helicopters and other models.

General. Air Transport Group has to function effectively and economically in peacetime, but it also has to be ready to face the heavier demands of crisis periods and wartime. Based on the assessment carried out above, a well-rounded ATG fleet would appear, in current circumstances, to be one which includes six Boeing-707s and about 45 Hercules. The one additional Boeing-707 should be equipped for air-to-air refuelling, and at least six of the Hercules acquired in the early stages should be of the KC-130H type with air-refuelling capability. The Dash-8 component should also be expanded. The Boeing-707s must be replaced eventually by another long-range transport, as discussed below.

Personnel issues

Training and experience of personnel. ATG's ability to expand operations in crisis periods and wartime is limited not only by the lack of aircraft but also by the very limited supply of trained and experienced crews. In the meeting of 2 May 1985, LCol. Scott pointed to "the declining experience levels of our personnel caused by periods of fiscal restraint."¹⁹ The lack of commonality in the ATG fleet also causes personnel difficulties: there would be very little back-up for 429, 435, and 436 Squadrons, for example, in the event of a heavy demand on the Hercules, because very few of the other Regular Force aircrews are experienced on this aircraft. Air Reserve Augmentation Flights could provide a handful of trained personnel, but the Air Reserve transport squadrons are experienced on Dakotas and Twin Otters, not on the Hercules. Witnesses stressed the importance of developing a major augmentation capability in the Air Reserve and the Supplementary Reserve.

Female personnel. Comprising 8.9 percent of the Canadian Forces overall, female personnel serve as fully integrated members of ATG's aircrews, ground crews, and other divisions. The Committee was informed that there were 20 pilots, and between 40 and 50 trained female aircrew, across operations. Given the premium on skilled personnel in crisis periods and wartime, it would not be possible to replace them on the outbreak of hostilities without disrupting the entire airlift operation. Female personnel would be sent into danger zones as aircrew and as members of such logistics teams as air movements units and command, control, and communications groups. The SWINTER programme (Service women in non-traditional environments and roles) involves training female personnel as pilots, navigators, and flight engineers. A final report on that programme is expected soon.

Francophones. Mr. Andre informed the Committee that 15 to 20 per cent of ATG's air crew are francophone. 424 (Transport and Rescue) Squadron is

¹⁹ *Ibid.*, 2 May 1985, p. 2:14.

designated as a French language unit (FLU), which means that its members use French on a day-to-day basis and would be able to operate in both languages. Similar policies apply in 10 TAG.

Other capabilities and requirements

ATG's performance is affected not only by the state of the aircraft fleet and the personnel situation, but also by a range of equipment, management and other factors, including the following:

Special techniques. ATG's effectiveness is enhanced by using a number of special techniques for personnel, equipment and supply deliveries in varying operational environments. For example, major northern or overseas operations would entail the prompt dispatch of well-trained commando groups, advance parties or route activation teams, depending on the particular circumstances. One technique which particularly impressed the Committee was the Low-Altitude Parachute Extraction System (LAPES), which uses parachutes to draw equipment out of low-flying aircraft and deposit it safely in rugged terrain.

Equipment and similar requirements. True military transport aircraft should be able to operate in hostile environments. They should have STOL capabilities, rear-door loading, and also camouflage, electronic warfare systems for counter-acting enemy action, and inertial navigation systems (INS), which are designed to enable aircraft to fly long distances without extensive ground assistance. Dr. Bell also recommended that Canada use the NAVSTAR (Navigation Satellite Timing and Ranging) Global Positioning System — at present under development — to assist military transport aircraft in landing on forward airfields and similar tasks. He also advocated participating in a military satellite communications system, to ensure that the armed forces have effective communications when carrying out long-range, strategic movements of personnel and supplies.

Overseas SAR capability. The Air Force Officers Advisory Group argued that the search and rescue fleet should be exercised more often in probable overseas hostile operations. As BGen. (Ret) Lloyd Skaalen, a former commander of Air Transport Group, argued on 30 May 1985: "What we are attempting to point out is that the current organization of search and rescue is totally domestically oriented. ...[I]n times of crisis, if we are going to launch a significant operation to northern Norway, where we not only have strategic transport going in on a routine basis but also tactical transport of our own and other NATO allies operating from the strategic airhead out to the tactical locations, there will be a requirement for search and rescue."²⁰

Medical evacuation. When prolonged wars are envisaged, air transport commands have to be prepared to evacuate a continual, and possibly heavy, flow of casualties. LCol. Scott noted, on 2 May 1985, that: "Aeromedical evacuation provides for the movement of medical patients from forward-operating areas to fixed-medical facilities. This capability is exercised regularly in peacetime through formal training and in response to domestic and international humani-

²⁰ *Ibid.*, 30 May 1985, p. 4:15.

tarian taskings. Future aircraft purchases will include the capability to convert aircraft for stretchers where possible.”²¹

Prepositioning of equipment. The question of prepositioning equipment in Norway, Germany or elsewhere in Europe was discussed by several witnesses, all of whom recognized the complexity of the matter and the need to make the most cost-effective and politically sound decisions. Advantages include greater war-readiness in such regions as north Norway and reduced requirements for air transport in crisis periods; disadvantages include immobilization of expensive military equipment outside Canada and lowered flexibility in the face of a range of possible threats. This question is the subject of continuing discussions with the Norwegian authorities.

Airlift priorities, training and equipment types. The submission of the Air Force Officers Advisory Group included the following points:

- in peacetime operations, greater care must be exercised in the establishment of airlift priorities so that commanders understand the value of airlift and the need to maximize its utilization. Unless that discipline is well established there will be greater inefficiency in crisis and greater frustration for the operator and for the user;
- realistic training of air transport aircrews must take priority over discretionary airlift tasking such that it will be understood at all levels that, for example, it is more important that an aircraft operate on schedule through a high density air traffic area like London...rather than fly directly to Lahr for the convenience of a VIP;
- full advantage should be taken promptly of training technology which will permit realistic simulation of operational activities for all forms of air transport, not just cockpit activities;
- military air transport equipment should be as common and compatible with allied military forces as possible — the variety should be limited and the acquisition should be phased so that obsolescence is minimized;
- since equipment must be “versatile and ready”, it should be capable of surviving in the most threatening circumstances.

3. The future of Air Transport Group

Aircraft and equipment

A main determinant of ATG’s future will be its aircraft holdings, since these govern the ability to respond to the various tasks the Group is given. Aircraft and related acquisitions, retirements and inventories need to be looked at in three time-frames: the short-term, roughly to 1988; the medium-term, from 1989 through the 1990s; and the long-term, beyond the year 2000.

²¹ *Ibid.*, 2 May 1985, p. 2:11.

The short term. As noted earlier, the government is now adding six Challengers to the ATG fleet, increasing the total to eight. The one Dash-7 still in the inventory will be traded in this year. Six Dash-8s are to be acquired by 1988, for \$77.5 million.²²

One more Boeing-707, with air-to-air refuelling capability, is high on the Department's list of priorities. The Committee believes that such an addition must be made in the short-term period, for example this year.

A number of additional Hercules are urgently required for peacetime operations and to reduce some of the stress caused by the present excessive utilization rates. The two Hercules lost in the accident in Edmonton in Spring 1985 should be replaced this year, and then the Hercules fleet should be expanded to 33 by 1988. The schedule of acquisitions should be as follows: two new Hercules in 1986, three in 1987, and two in 1988.

The addition of the six Challengers involves expenditures for the Department of National Defence of about \$120 million (total programme costs for four new aircraft and modifications to them and for the two aircraft being transferred from the Department of Transport). The six Dash-8s, at \$77.5 million, are already funded. One additional used Boeing-707 in the tanker version would cost about \$20 million, while seven additional Hercules would cost about \$40 million each, or a total of \$280 million.²³ These are not altogether negligible expenditures and the Committee is well aware that the defence budget is tight. Nonetheless the Committee believes they are vital for the immediate and longer-term future of Air Transport Group, and can be made in the next three years without massively distorting DND's overall equipment acquisition plans.

The medium term. Most of the present ATG aircraft will reach the end of their scheduled lifespans in the period from the late 1980s to the year 2000, and the options will then be life-extension programmes or the acquisition of new types, depending on the size and model of ATG fleet we wish to develop.

Some factors bearing on this situation are as follows:

Hercules. Air Command now faces a choice between limping along with a military air transport fleet which is inadequate even for peacetime operations, and developing one which would constitute a solid military force capable of making a substantial contribution in peacetime, crisis periods and wartime. The Committee strongly believes that the latter course is the one that Canada should follow, and that this will imply, above all, building up the force of Hercules. Other aircraft holdings should be developed with this primary requirement for adequate numbers of Hercules in mind. The cost should not be outlandish if additions to the

²² *The Globe and Mail*, 10 October 1985, p. 137.

²³ This figure is for "programme costs", that is to say for the aircraft — U.S. \$20 million — plus exchange rates, U.S. sales tax, spare parts, modifications, etc. Programme costs, in Canadian dollars, for additional Hercules or Dash-8s, will be about *double* the basic aircraft cost in U.S. dollars. This would rise to about 2.5 times the basic aircraft cost if DND acquired *new types* of aircraft (owing to the need to invest in new infrastructure, etc.).

Hercules fleet are properly scheduled and false economies in other sectors are avoided.

As indicated earlier, the total Hercules requirement appears to be about 45, including some tanker versions as well as transports. Obviously the additional number could not all be purchased at once, but would have to be brought on stream over a period of years. One solution would be to add two per year from 1989, so that the total would be built up to 45 by 1994. The annual cost would be \$80 million, and the total programme cost would be \$480 million.

Before 1995, life-extension work and upgrading must be carried out on the 26 Hercules now in the ATG fleet. This would include upgrading of the engines, new avionics, INS and other navigation systems, all together costing about \$3 million per aircraft or \$78 million total.

Buffalos. The Buffalo is an excellent aircraft and could be continued, after life-extension work, beyond the currently scheduled retirement date of 1992. However, the Committee is of the view they should be phased out as scheduled and their tasks assigned to the augmented Hercules fleet.

The Committee's proposal calls for nineteen additional Hercules by 1994 and it has been established that they are more competent at a lower operating cost, and more versatile, than the aircraft they would replace. Homogeneity, maintenance and spare parts aspects of ATG's holdings would be improved in substantial degree.

The Dash-8 and its future roles. Dash-8s are now being procured for medium-range transport and training roles. They are suitable for most SAR duties, especially over land, where there is less need to drop heavy equipment such as inflated rafts and marine pumps.

A fleet of 20 Dash-8s could serve in the following ways: four to replace the Hercules now serving partly in training roles; two to replace the Dash-7s now or previously serving as passenger transports in Europe; six to replace the Twin Otters now operating as SAR aircraft out of Edmonton; and eight to replace the seven Cosmopolitans now providing medium-range passenger flights out of Ottawa. The Dash-8 is a slightly smaller aircraft than the Cosmopolitan, but with similar capabilities. It has modern avionics and remarkable STOL features which the Cosmopolitan does not have. The Committee believes that the government should purchase additional Dash-8s rather than practice false economy by investing in a life-extension programme for the Cosmopolitan.

In addition to the six Dash-8s now on order, the government could acquire another four in 1989, four in 1990, four in 1991, and two in 1992, at annual programme costs of about \$96 million for the first three years and \$48 million for the last year.

If this programme was carried out, six Dash-8s would be in operation by 1988, as now scheduled, and an additional eight Dash-8s by 1990 when the Cosmopolitans are due to be retired. The remaining six Dash-8s would replace six of ATG's Twin Otters by 1992. Some remaining Twin Otters would continue in operation out of Yellowknife, since they are more of a light transport than an

SAR aircraft and their ability to land on land, water and ice is especially valuable in the North.

Dakotas and their replacement. The Dakotas should be phased out as soon as other, more modern aircraft can be provided.

Helicopters. The Labrador helicopters are scheduled to remain in service until 1995, undergoing some improvements in the meantime, such as SARCUP programme updating and possible installation of automatic flight control and de-icing systems. Then they should be replaced, probably with about 20 new helicopters at a programme cost of around \$20 million each. Extensive testing and evaluation by the armed forces will be needed to determine which Labrador replacement suits their needs best, bearing in mind such factors as costs and the requirements of the navy, 10 TAG and other groups in addition to Air Transport Group. The possibility of involvement by Canadian industry must also be an important consideration.

Boeing-707 replacement. This is a special case. It may appear improvident and unwise to suggest, as we do here, the acquisition of a used Boeing-707 at a cost of \$20 million and then to spend \$50 million to modify it and extend its life, and to spend a similar amount for the same purposes on each of the five aircraft now in hand.

But the simple fact is that there is no moderately priced alternative available that could be acquired at the same time as we are building up the Hercules and helicopter fleets. Six used Boeing-747s would cost some \$900 million, six new passenger-type aircraft of a different model, about \$1,000 million, or six long range military transports, \$1,500 million.

The Boeing-707 programme would include new engines (\$20 million programme cost per aircraft), INS, avionics, electronic defence systems, modifications for refuelling operations where required, and installation of NAVSTAR Global Positioning system equipment when it becomes operational, as well as U.S. sales tax where applicable, foreign exchange, etc. The programme should be undertaken at an early stage because ATG's Boeing-707s lack the self-contained navigation systems required in times of tension and during hostilities. Also, the present engines are causing increasing difficulties for operations to various U.S. and international airports, some of which have stringent anti-noise regulations.

A Boeing-707 flight simulator is also required, because it is becoming increasingly difficult to obtain access to these simulators in the United States. A used Boeing-707 simulator would cost about \$7.5 million and should be obtained soon, by 1988.

The long term. In the long term, the government confronts a basic choice about Air Transport Group: is it to remain in the state aircraft and passenger business, or should it focus on military airlift roles? If the former is the case, then the Boeing-707 will have to be replaced by one of the long-range passenger airliners now available or under development such as the Boeing-767, the McDonnell Douglas MD-11, the Airbus Industrie TA-11 or a new Boeing or similar aircraft (the MD-11 is a follow-on to the McDonnell Douglas DC-10 while the

Airbus TA-11 is intended as a substitute for Boeing-707 or DC-8 type aircraft).²⁴ If ATG is to retain a substantial military airlift capability, then the C-17 or a similar military transport seems indicated.

During the hearings, the L-1011 TriStar, the KC-10 and an augmented-wing Hercules were also mentioned as possible replacements for the Boeing-707. However, the L-1011 is no longer in production, and so is not a realistic alternative. The KC-10 is a tanker-transport variant of the DC-10: it is not a heavy airlift model with rear-loading and STOL capabilities and it would involve programme costs of about \$175 million apiece. The augmented-wing Hercules may have a contribution to make in some role in the future, because it is intended to provide better STOL and cargo capabilities; but it is still an undeveloped model and could require development expenditures in the hundreds of millions of dollars. Work on it should be encouraged, but the government must be prudent in selecting a long-range aircraft for ATG when the Group's entire future is at stake.

As to the C-17, it is a long-range, military cargo aircraft which has now been approved for production by the U.S. Department of Defense. Plans call for the United States Air Force to procure 210 C-17 aircraft between 1992 and 1998, as complements to 50 C-5 Galaxies and other transport aircraft. The C-17 is 53.4 metres long, has a wingspan of 60.2 metres and a height of 16.8 metres, and can carry a double row of trucks, heavy tanks and helicopters. It has rear-loading facilities, can fly 4,445 kilometers with a load of 78,110 kilograms, and can land on an unpaved airstrip of 915 metres using its STOL capabilities. It can then fly to another destination 926 kilometers away.

The C-17 is a true military transport aircraft, which would greatly strengthen Canada's ability to carry out its defence commitments. A force of five to ten might be built up gradually in the first decade or so of the next century, if Canada's defence commitments and the state of international relations appear to warrant it. The programme cost per aircraft is high, at about \$250 million each, so it would have to be acquired as part of a long-term, phased acquisition programme.

Also, alternatives would have to be found to the present practice of using ATG's long-range aircraft partly for state representational and passenger purposes. The C-17 would be satisfactory for troop movements, but would not present the right kind of image for peaceful visits by the Governor-General or the Prime Minister. Additionally, it does not have the windows normally found in civilian passenger aircraft. As stated elsewhere in this report, Air Canada could carry out the state representational flights, since it is a government operation and its aircraft carry the national insignia.²⁵ Transfers of dependents could be carried out by regular charters. As MGen. (Ret) Claude LaFrance, a former commander of 10 TAG, remarked on 30 May 1985: "We believe that if the aircraft on DND inventory are specialized for the transport of military equipment and troops, then

²⁴ If DND decided to acquire one of these passenger-type aircraft, there would be advantages, for example in maintenance, in acquiring the same models as those in the Air Canada, Canadian Pacific and other Canadian commercial fleets.

²⁵ See also *The Proceedings*, 20 June 1985, p. 6:30, the exchange between Senator Molgat and General Lewis.

the peacetime transport of passengers, let us say families going overseas, could be done by contract with civilian airlines."²⁶

Eventual Hercules replacement. Sometime after the year 2000, the government will also need to start replacing the Hercules. One possibility mentioned by Mr. Shadwick is the Future International Military Airlifter (FIMA) project, which is now in the early stages of planning by Lockheed Corporation and some European associates. It is intended as a follow-on replacement for the Hercules, but it has not flown yet and the consortium still does not have a clear idea what it will look like. This would be a good time for Canada to seek some involvement. The augmented-wing Hercules may also be available in this period, especially if a number of countries including Canada can be persuaded to take an interest in completion of the development work.

Challengers, Dash-8s and new helicopters. ATG's Challengers and Dash-8s will not need replacing until well into the next century. The same is true for the new helicopters which should be purchased in the mid-1990s.

A path forward. The Committee believes that the considerations discussed earlier in this report point clearly to an ATG fleet equipped, by the second half of the next decade, with more Hercules, more Dash-8s, Challengers, new helicopters, and six re-engined and upgraded Boeing-707s. Most of the other models in the present inventory should disappear from the books, the only exception being the Twin Otters retained for northern and similar duties.

A path forward under this approach is set out in Table 5.

Personnel: training and other costs

As Table 5 indicates, there would be no major increase in numbers in the ATG fleet between 1986 and the year 2000. For this reason, the personnel establishment of ATG would not need to increase to any great degree (though the Regular Force needs to be supported by new Air Reserve augmentation units designated to provide much increased back-up whenever there are surges in demand during peak periods, crises or wartime). New training requirements would arise as air crews, loading crews, technicians and other personnel moved from one aircraft type to another — for example from Buffalos to Hercules — but these could probably be met without major expansion of ATG's long-term training programmes. Personnel management and maintenance costs would be reduced, meanwhile, as a result of having a fleet with six aircraft types rather than eleven.

Canadian aircraft and parts production

One of the advantages of acquiring Hercules is that they are still in production, and readily available, from Lockheed Corporation in the United States. Standard models can be obtained easily, while tankers and other specialized versions can also be obtained within a year or two of ordering. However, except for the proposed augmented-wing version mentioned by General

²⁶ *Ibid.*, 30 May 1985, p. 4:8.

TABLE 5

**ATG Inventory:
Holdings, Retirements and Acquisitions**

Year	Hercules	Boeing-707s	Buffalos	Dakotas	Cos-mopolitans	Twin Otters	Dash-7s	Dash-8s	Challengers	Falcons	Labradors	Twin Hueys	New Helicopters	Total in Fleet	Annual Retirements	Annual Additions
1985	26	5	14	9	7	8	2	-	2	<u>2</u>	14	3		92	-	-
1986	28*	<u>6</u>	14	9	7	8	<u>1</u>	2	<u>8</u>		14	<u>3</u>		100	3	11
1987	31*	6	14	9	7	8		4	8		14			101	4	5
1988	33*	6	14	9	7	8		6	8		14			105		4
1989	35*	6	14	9	7	8		10	8		14			111		6
1990	37*	6	14	<u>9</u>	<u>7</u>	8		14	8		14			117		6
1991	39*	6	14			8		18	8		14			107	16	6
1992	41	6	<u>14</u>			<u>8</u>		<u>20</u>	8		14			111		4
1993	43	6				2		<u>20</u>	8		14			93	20	2
1994	<u>45</u>	6				2		20	8		14			95		2
1995	45	6				2		20	8		<u>14</u>		5	100		5
1996	45	6				2		20	8				10	91	14	5
1997	45	6				2		20	8				15	96		5
1998	45	6				2		20	8				<u>20</u>	101		5
1999	45	6				2		20	8				20	101		-
2000	45	6				2		20	8				20	101		-
After 2000	(acquisition of new long-range aircraft and replacement for the Hercules)															

Notes:

* Including one KC-130H type acquisition per annum from 1986 to 1991 inclusive.

— Indicates end of build-up or retirement period.

General: Retirements are assumed to take place at year end.

Lewis, Hercules contain relatively little Canadian content. Buying them would be a case of the government deciding to purchase the aircraft most needed for ATG's military missions, irrespective of collateral considerations.

Acquisition of the Challengers and Dash-8s, however, is likely to be very advantageous for national industrial development. They are both produced in Canada, and the Dash-8 has very advanced STOL capabilities as well as a Pratt and Whitney engine designed and built in Montreal. Both aircraft are at the forefront of national technological achievement in the aeronautical field. Purchasing them not only represents direct expenditures with two of Canada's major aircraft manufacturers, Canadair and de Havilland, but also the promotion of Canadian industrial development and skilled employment.

Canadian industry may also be involved in the replacement programme for the Labrador helicopters. As the testimony indicated, several models may be contending when the selection time approaches, and Canadian helicopter manufacturers should be well placed to obtain a major role in the production. Canada has a sizeable helicopter-manufacturing industry, and promoting it should be a major goal when DND phases out the Labrador. Linkages to other helicopter replacement programmes, such as that for the Sea King, should be given particular consideration. (On Canada's requirement for Sea King helicopters, see the Committee's second report, *Canada's Maritime Defence*, May 1983, especially Chapter V.)

Whether it will be possible to obtain a substantial role for Canadian industry when the Boeing-707 is eventually replaced remains to be seen. There are no longer any manufacturers of large passenger or military aircraft in Canada, so the government will be obliged to turn elsewhere, probably to the United States but possibly also to Europe. The Canadian aerospace industry should be involved as much as possible in the design and production of components and parts. General Lewis noted that Canadian industry is participating in the production of the KC-10 and in the development of the augmented-wing Hercules, which might not only be suitable for ATG but may also find substantial markets abroad as rewinging and re-engining takes place in the world's Hercules fleets. Similar involvement in other projects should be promoted to the extent feasible.

The government should also encourage Canadian industry to associate itself with the FIMA project, especially since it would involve working on a design for an aircraft similar to the Hercules. This is now the backbone of the ATG fleet, but it will have to be replaced eventually, sometime in the next century. The Hercules is used widely around the world, and there could be extensive sales possibilities for a more advanced replacement.

On the general question of Canadian industrial involvement in the replacement of the ATG fleet, General Lewis remarked:

We do not make any of the heavy aircraft in Canada, but we do produce components mostly on a lot that involve Boeing, McDonnell Douglas, Lockheed and that type of aircraft. In the case of the McDonnell Douglas heavy airplanes, that work is fairly extensive amounting to approximately 25 per cent. In the case of the DC-9s and the MD-80 series, and as I mentioned, for the DC-10s and the KC-10s, it is the entire wing plus some other components.²⁷

²⁷ *Ibid.*, 20 June 1985, p. 6:11.

The schedule of costs

Estimated costs for the aircraft acquisitions and replacements suggested in Table 5 are set out in Table 6. This table also includes estimated costs of life-extension programmes and a Boeing-707 simulator.

The objective of Table 6 is to provide an overview of the type of expenditures required to maintain Air Transport Group over the next 15 years. The figures of course reflect the Committee's preferences about the approach to be followed and the type of fleet it would like to see developed, but it should be noted that no conceivable option will be cheap if Canada is to acquire an effective military air transport capability. Block obsolescence in the 1990s ensures that some heavy expenditures will have to be made: the only question is whether they can be made effectively, to produce the kind of military air transport fleet that will suit this country's pressing defence needs.

4. Drawing on civil air resources

General

In its second report, *Canada's Maritime Defence*, the Committee recommended: "that new legislation be presented to Parliament for early enactment to permit graduated government responses in crisis situations; to enable the government to draw on civilian capabilities in crisis situations short of war; and to authorize the mobilization of reserve forces and civilian capabilities as required by crisis situations or the outbreak of war".

In no area is this truer than in air transport. For crisis periods and wartime, ATG needs the support of the extensive pool of aircraft and trained personnel available in the civil aviation industry. New emergency legislation must be put in place as soon as possible to facilitate this.

Airlift requirements and responses

On 16 May 1985, the Committee heard a presentation by Mr. C. Cowie on airlift requirements and the role of the Civil Aviation Co-ordinating Committee in Canadian responses.

During peacetime, Mr. Cowie indicated, there are normal air operations, both domestically and internationally, and the only provision for DND to secure civil air transport is by chartering through the DND/Air Canada agreement, which gives the Department some priority. In peacetime, the Minister of Transport has the duty, under the Aeronautics Act, to supervise all matters connected with aeronautics. Air regulations and standards are in force, for example with respect to flight safety. The CACC functions as an inter-departmental planning committee, working on airlift co-ordination problems.

If the situation changes from peacetime to rising international tension, the Cabinet may decide to augment Canadian forces in this country and Europe, partly through a rapid transatlantic airlift. Troops will have to be flown to Europe

TABLE 6

Proposed Annual Expenditures on ATG Aircraft and Related Equipment

(in millions of constant 1985 Canadian dollars)

	New Aircraft (programme cost by numbers of aircraft)					Other Costs			Total Annual Equipment Cost	
	Hercules 2 or 3 p.a.	Additional Boeing-707	Dash-8s* 2 or 4 p.a.	Challengers** 4 aircraft	Labrador replacement	Total new aircraft cost	Life extension & upgrading Hercules	707s		707* simulator
1985				120		120				120
1986	80	20	26			126				126
1987	120		26			146				146
1988	80		26			106			8	114
1989	80		96			176		100		276
1990	80		96			176		100		276
1991	80		96			176		100		276
1992	80		48			128				128
1993	80					80	39			119
1994	80					80	39			119
1995					100	100				100
1996					100	100				100
1997					100	100				100
1998					100	100				100
1999					-	-				-
2000					-	-				-

After 2000 (additional annual costs for a new long-range aircraft and a Hercules replacement)

* Figures rounded upwards to nearest million dollar.

** Plus modifications.

or elsewhere in civil and military aircraft, and Canadian citizens and dependents will have to be repatriated, all without disrupting the flow of Canadian domestic and international commercial air traffic. Canada will also be involved in pooling long-range aircraft under a bilateral Integrated Lines of Communication (ILOC) agreement with the United States, and in providing refuge for other allied airliners under Safe Haven arrangements.²⁸ The CACC would act as a co-ordinating centre in this period.

In wartime, there would be a continual flow of reinforcements to the theatres of action, and the CACC would be available to play a key role in management of the airlift if so authorized by the government. Linking together members of all the key government agencies such as the Departments of National Defence, Transport, and External Affairs as well as the Privy Council Office and Emergency Planning Canada, it should be able, with its years of planning and experience, to contribute substantially to the national war effort.

After a war, Mr. Cowie suggested, when the world returned to more peaceful conditions, there could be a need to sustain standing military guards in various parts of the world. Some military forces might be left abroad to ensure that peace prevailed, and these would need to be supplied by air operations. Civil airplanes would be needed to bring troops home, and normal international civil air operations would commence once again. The CACC would return to an inter-departmental committee function.

The role of the CACC in crisis periods could be increased if emergency legislation so provided. It could be designated as a key government agency in the central direction and management of national airlift operations. This would be invaluable if the authorities decided to call up the Air Reserve and a new Air Transport Reserve, for example, to requisition aircraft, and to organize the movement of reinforcements, equipment and supplies to danger points in northern Canada, Europe and elsewhere.

Aircraft

Mr. Gordon E. Lindsay, Vice President, Government Affairs, Air Transport Association of Canada (ATAC), appeared before the Committee on 13 June 1985. His testimony indicated that the Canadian commercial fleet consists of about 4,000 fixed-wing aircraft, of which approximately 250 are large aircraft being operated by the major airlines. ATAC members have 54 passenger aircraft capable of crossing the Atlantic, and there are an additional 7 such aircraft in companies which are not members of the association. The total number of passenger seats available on aircraft capable of crossing the Atlantic exceeds 15,000.

An outline of ATAC members' fleets, projected to December 1985, was provided by Mr. Lindsay, and its contents are presented here in Table 7.

In addition, there are more than 18,000 commercial helicopters, private aircraft, ultra-light aircraft and state aircraft in Canada.

²⁸ ILOC and Safe Haven arrangements are described later in this section.

TABLE 7

The Canadian Commercial Aircraft Fleet
(December 1985 — ATAC members only)

Aircraft Type	Number of Seats	Carrier†								Total Aircraft	Total Seats
		Air Canada	CP Air	Wardair	Nordair	Quebecair	Pacific Western	Eastern Provincial	Northwest Territorial		
Boeing 747°	425	4*	4	4****						12	5,100
Lockheed L-1011°	240	16**								16	3,840
McDonnell-Douglas DC-10°	300		8***	2****						10	3,000
Boeing 727	130	36						1		37	4,810
Boeing 737	110		22		10	5	19	6		62	6,820
McDonnell-Douglas DC-9	100	35								35	3,500
McDonnell-Douglas DC-8°	250					2				2	500
McDonnell-Douglas DC-8° freight	6									6	—
Fokker 227	40				5					5	200
Boeing 767°°	200	12					2			14	2,800
Hawker Siddeley 748	40					4		5		9	360
Lockheed Hercules L100-30° freight									1	1	—
										Total Aircraft	30,930

Notes

- † See *Preliminary Notes* on corporate changes in the Canadian air transport industry.
 ° transatlantic capable
 °° transatlantic capable if IATA 60/90 minute rules are waived (see *Glossary*)
 * two are Combi-200, with larger doorframe, configured to carry both passengers and freight
 ** four are short-range aircraft
 *** three are short-range aircraft
 **** subject to radical change with substitution of short-range aircraft

Total seats
Seats on 54
transatlantic
aircraft: 15,240

30,930

15,240

The total numbers of Canadian aircraft in recent years are indicated in Table 8.

TABLE 8					
Aircraft Registered in Canada					
	1985*	1984	1983	1982	1981
Commercial					
Aeroplanes	4,550	4,575	4,360	4,268	4,853
Helicopters	1,003	1,030	1,093	1,148	1,174
Private	16,237	16,331	16,073	15,930	15,585
Ultra light	2,153	1,971	1,202	1,039	973
State	228	231	216	218	212

* 30 June 1985: Prior years at 31 December.

Source: Transport Canada: Summary of the Canadian Civil Aircraft Register, as taken from the 1985 *Annual Report and Membership Directory, Air Transport Association of Canada (ATAC)*, p. 10.

Mr. Lindsay and Mr. Cowie both stressed the importance of maintaining domestic air services in crisis periods and wartime. If reinforcement is to commence, Mr. Cowie indicated, "naturally our top priority would be DND, but we must also consider our other national priorities as we must support national interests and keep our commercial air routes open to other non-crisis areas. We cannot give all the airplanes to this priority so we would consider the smaller 737, DC-9s, etc., and give DND the long-range airplanes that they require."²⁹ Mr. Lindsay also said: "[W]e expect that the industry will be able to meet all significant requirements within Canada even in the absence of those 54 [transatlantic-capable] aircraft. I would expect that, in an emergency situation, pleasure travel would be severely curtailed, if for no other reason than want of fuel. As a result, many of the charters to which seats are committed now would not be operating. We feel there would be an adequate balance available to the Canadian public."³⁰ Essential civilian air services in Canada must be maintained even if an airlift to Europe or elsewhere is mounted. To a far greater extent than the European countries or even the United States, Canada does not have alternatives to air transport in many areas if air services are removed or too severely cut back.

Of course the composition of the commercial fleet alters over time in response to advances in technology and changes in fuel prices, other costs, consumer demands, government regulations and similar factors. At present there is a trend towards buying more medium-size aircraft so as to tap the growing demand for air transport within North America. The number of wide-bodied, long-range aircraft capable of participating in an airlift to Europe has consequently been decreasing in recent years.

²⁹ *Ibid.*, 16 May 1985, p. 3:6.

³⁰ *Ibid.*, 13 June 1985, p. 5:15.

Nonetheless, Tables 7 and 8 indicate that Canadian airlines have a substantial pool of aircraft which can assist the armed forces with personnel rotation and similar passenger traffic in peacetime, and play major roles in crisis periods and wartime. They can provide extensive assistance in the movement of troops throughout Canada and across the Atlantic, and in the evacuation of dependents and civilians to this country. For example, in the event of war, two Boeing-747 flights per day or their equivalents could transport 25,000 troops, in one month, to rear areas in Western Europe. Eight of these flights would be enough to move 100,000 personnel per month, if the troops were available.

The commercial fleet is not so well structured for freight operations, as several witnesses pointed out to the Committee. There is only one commercial Hercules, capable of carrying military equipment, operating in the country at present, and relatively little other cargo capacity for shipping supplies. As Mr. Lindsay noted: "Air Canada operates six DC-8 freighters. They have two 747s that are in combies, which can carry a certain amount of freight [in addition to passengers] and can be converted to pure freight, as necessary."³¹

Several witnesses discussed the question of paying government subsidies to encourage airlines to install reinforced floors and other freight-handling capabilities in their aircraft. The United States operates such a programme, designated the Civil Reserve Augmentation Fleet (CRAF) Aircraft Modification Program, but it appears that the U.S. experience has not been a very satisfactory one. Initial outlays per aircraft are high, for example \$15 million in some cases, and these have to be followed by compensation for the extra costs entailed in flying aircraft carrying additional weight.

Integrated Lines of Communication (ILOC). Another possible source of aircraft for the transport of Canadian troops, equipment and supplies is through international agreements now being negotiated, including the bilateral ILOC agreement with the United States. Col. I. Popowych, Director General Transportation, DND, described the ILOC agreement, on 10 October 1985, as "based on a sharing arrangement whereby we share transportation services, facilities and equipment. The key to note here," he continued, "is that the arrangement is based on the understanding that what we provide is based on 'within capability', which recognizes that national priorities will come first".³²

Safe Haven. Another arrangement is under continuing negotiation: the Safe Haven proposal. Mr. Lindsay commented on this on 13 June 1985, noting that: "At least one country so far has made a formal request that certain of their aircraft be accommodated in Canada when their own base becomes insecure. In principle, that has been accepted by the government, but, without becoming too specific, a lot more work has to be done on it. One of the conditions of accepting these aircraft is that they will become available to the fleet supporting Canada's emergency plans. In other words, if British Airways sends a 747 here, it is just as liable as Air Canada's 747s to be requisitioned to serve points in Germany."³³ On this same question, Mr. Cowie remarked:

³¹ *Ibid.*, p. 5:8.

³² *Ibid.*, 10 October 1985, p. 11:12.

³³ *Ibid.*, 13 June 1985, p. 5:24.

We are working on a deal with the U.K. where they are talking about basing 40 airplanes in Canada during a major crisis. We have said provided that they are used for the war effort that is fine, so we therefore increase the fleet. The European countries are agreeing to moving airplanes to North America for bases of operations because they do not want to leave them sitting on the ramp where they are subject to fighter attacks but on condition that they be used for the war effort. That is where we are getting the expanded North American air fleet.³⁴

Trained personnel: general

There are approximately 10,000 civil air pilots in Canada, including about 3,000 members of the Canadian Air Line Pilots Association (CALPA). This is the largest professional organization of pilots in the country, including personnel of the seven major, national airlines — Air Canada, CP Air, Pacific Western Airlines, Nordair, Eastern Provincial Airways, Québecair and Air Ontario.³⁵ Captain Normand J. Foster, CALPA's President, and Mr. John T. Keenan, its General Counsel, appeared before the Committee on 26 September 1985.

There are also about 5,500 other flight crew, 2,000 general management, 8,000 maintenance, 14,200 service and 7,100 other personnel working for airlines in Canada. Most of these are trained and highly skilled employees.

This is a very large body of people: but would they be available and willing to assist in the national defence effort if the need arose? Would improvements in legislation or strengthening the reserves help encourage aircrews and others to assist the armed forces?

Captain Foster said that there is little doubt in his mind that Canada's airmen would respond to their country's call in a time of crisis. "Should civilian pilots be required to operate charters of military personnel or goods," he stated, "there should be no lack of volunteers."³⁶ He and Mr. Keenan suggested, however, that if the government felt it was necessary, additional arrangements should be put in place to encourage civil airline pilots to volunteer for military assignments in time of need. But the government had never broached the issue of improved insurance coverage, legal status or other arrangements for CALPA's members in crisis periods or wartime, they indicated, so that the Association had never had any reason to inquire carefully into the matter or to seek the views of its members. They indicated they would be glad to do so if government planning for new emergency measures reached the point of thorough consultations with interested parties.

Mr. Lindsay gave his opinion on this question of air crew attitudes on 13 June 1985:

This was discussed, at some length, with the Canadian Airline Pilots Association several years ago. They felt, at the time, that there would not be a problem with crews. There is a certain amount of experience to fall back on. There was a heavy

³⁴ *Ibid.*, 16 May 1985, p. 3:25.

³⁵ See *Preliminary Notes* on corporate changes affecting CP Air, Nordair and Eastern Provincial Airways.

³⁶ *Ibid.*, 26 September 1985, p. 10:6.

civilian airlift involvement in the Congo, and a very large one in Vietnam. There was no time when they were prevented from flying flights because of crew refusals. I am sure there are some who might not wish to go into a potentially dangerous zone, but we feel fairly confident that there are enough who would go, that there would not be a problem in that regard.³⁷

There is also the question of peacetime arrangements. Since CALPA's appearance before the Committee there has been a tragic accident in Gander in which a commercial DC-8 chartered by the U.S. Armed Forces crashed, killing all crew and passengers. Although no Canadian military or civilian transport aircraft were involved, this event has apparently caused CALPA to raise questions about the application to peacetime military charters of Transport Canada's flight-duty limitation regulations. The Committee is not aware of any response yet to CALPA's concerns, but feels strongly that the issue should promptly be resolved.

Returning to the question of crisis and wartime operations, the Air Force Officers Advisory Group, in a written brief to the Committee, argued that "legislation will be required to identify the terms under which civil reserve manpower will be designated, trained and under which they will serve without detriment for the legal risks of life, limb and regular employment."³⁸ Another key concern was the fear that civil airline uniforms would not afford their wearers protection, under the Geneva Convention, from treatment as illegal belligerents.

The Committee strongly agrees with the establishment of arrangements for the protection of civilian air personnel serving in crisis periods or wartime, but these should not go so far as to provide treatment that will create a disincentive to joining an Air Transport Reserve subject to military discipline and regulations. A very delicate balance must be sought between the benefits and treatment accorded Regular Force, Reserve Force and civilian air transport personnel.

Trained personnel: the reserves

One means of encouraging airline pilots, other aircrew and ground staffs to come forward to assist in the national defence effort, several witnesses argued, would be to set up an Air Transport Reserve. This would consist of airline personnel who had indicated readiness to serve in danger zones in crisis periods or wartime. They would fly their own aircraft but carry a national Identity Card indicating their reserve military status. This, it was implied, would provide them with some protection under international law in case they were captured by hostile forces. There would be less danger of their being ill-treated or even executed for illegal belligerent acts. Membership in the Air Transport Reserve would encourage people to come forward when the occasion demanded, not oblige them to do so, and would constitute a form of volunteering rather than selective conscription.

Opportunities for civil air pilots and other skilled personnel to contribute to the national defence effort are also provided by the existing Air Reserve. In this

³⁷ *Ibid.*, 13 June 1985, p. 5:9.

³⁸ *Ibid.*, 30 May 1985, p. 4A:3, Appendix SCSND-1.

case, members serve on a part-time basis with Air Reserve squadrons or one of the Air Reserve Augmentation Flights. If crisis or wartime conditions develop, these personnel will join their designated Air Reserve or Regular squadrons, leaving behind their normal occupations with the civil airlines or in other walks of life and going to man the aircraft flown by the squadrons. For example, whereas an Air Transport Reserve crew might be instructed, during a crisis, to fly an Air Canada Boeing-747, with a force of troops, to Frankfurt or Heathrow, an Air Reserve pilot would leave his civil aircraft to join a Reserve or Regular Force squadron. Captain Foster noted that many of CALPA's members continue to be active in the reserves.

There are also aircrew in the Supplementary Reserve, including some 500 pilots, of whom approximately 300 retired from the Regular Force in the last five years.

The Committee received extensive briefings on the state of the Air Reserve during this enquiry and previous ones. It feels very strongly that the reserves have a major role to play in the whole national defence effort, in the air transport field as well as others, and that urgent action is needed to provide these forces with the roles, equipment and other resources they need to make a full contribution. The government must now go beyond well-meaning promises and good intentions, to build up reserve forces which are a solid and respected partner of the Regular Force in this country's total defence capability.

In its consideration of the Reserve Force, the Committee has benefitted particularly from the views of BGen. J.R. Neroutsos, Commander, Air Reserve Group, who briefed the Committee during its visit to Air Command Headquarters in Winnipeg in February 1984. He also commented extensively on Air Reserve's role in military air transport in a written submission of 6 November 1985, which emphasized the support that the reserves provide to the Regular Force and discussed the legislative and organizational requirements of an effective airlift policy.

The Air Force Officers Advisory Group submitted a number of specific proposals concerning the reserves, including the following:

- there should be a strong civil reserve organization to augment the military's strategic airlift capability....[T]hat organization should be integrated into routine military operations and also should be exercised regularly in national and NATO manoeuvres;
- the tactical airlift fleet should be increased by two Air Reserve squadrons with the same type of equipment as the Regular Force, one squadron on fixed-wing C-130 type aircraft and one on rotary-wing CH-47 type aircraft [Chinooks]. This will permit the deployment of Regular squadrons to the area of conflict while leaving in Canada the manpower equivalent of six squadrons for internal airlift and augmentation of overseas units as required;
- the air movements organization should be augmented by the Air Reserve and civil reserve so that both hostile area and domestic airlift operations will have adequate ground support;

- there should also be an Air Reserve and civil reserve capability to augment the aircraft maintenance organizations such that those deployed overseas could be brought up to strength by Air Reservists while the home base establishments, such as for air training, could be manned by the civil reserve.³⁹

The Committee endorses the general thrust of these proposals.

Though recognizing that major improvements in the Air Reserve will depend largely on the provision of up-to-date equipment, the Committee welcomed the assurance of Mr. Andre, on 24 October 1985, that the whole question of the reserves is very much under active discussion now in the context of the white paper, and also the statement of BGen. R.P. Beaudry, Director General Reserves and Cadets, DND, on the work being carried out in the Department on a Reserve Force Development Plan. This, General Beaudry indicated, is examining the future structure, organization, training and equipment of the Air Reserve and other reserve formations. It already "indicates a requirement for a marked increase in Air Reserve activity and size. The results will identify a total Air Reserve requirement. It will be proposed that growth should take place through an increase in the number of squadrons, air reserve augmentation flights and training depots."⁴⁰ The Committee believes that the Air Reserve transport squadrons, in particular, must be re-equipped soon with modern aircraft such as the Hercules and the Dash-8, for example under twinning arrangements with Regular Force ATG squadrons located at the same air bases.

The Committee looks forward to receiving full briefings on the results of these studies and plans to enhance the Air Reserve. In the interim it cautions that such enhancement should extend in appropriate numbers to skilled and trained ground personnel.

New emergency legislation and arrangements

Since the Committee began its work in 1980, one witness after another has called for action to put new laws in place and to develop the necessary arrangements and plans for drawing on civil resources as required in times of emergency.

On 24 October 1985, Mr. Andre informed the Committee that the government is committed to the development of new emergency legislation that recognizes that there are different degrees of emergencies, including the following four main categories:

1. public safety and security emergencies — caused by natural phenomena such as accidents or earthquakes;
2. emergencies affecting the public order in Canada, such as terrorist activities;
3. international crises which require Canada to take emergency action such as moving to higher levels of alert or deploying troops outside this country;

³⁹ *Ibid.*, pp. 4A:1 and 2, Appendix SCSND-1.

⁴⁰ *Ibid.*, p. 4:19.

4. war itself.

Mr. Andre agreed, in response to questions, that such legislation would apply to civil aircraft and aircrews, making it easier to call on them in crisis periods and wartime.⁴¹

The Committee sees this development as fundamental to the continuing effort to prepare Canada to meet any emergencies or threats which may confront this country, believing that the nation's defence will be greatly strengthened if commitments for the coming years are clearly indicated and the armed forces are placed in a position to draw on the resources and expertise of the whole Canadian people rather than having to rely on their own capabilities alone. Such powers must be accorded in a careful and selective manner, of course, controlled by Parliament, and be in accordance with the Canadian Charter of Rights and Freedoms and other statutes protecting the rights of individual Canadians. The Committee believes that new emergency legislation is as necessary to protect individual rights as it is to provide a sound basis for emergency planning, and therefore wholeheartedly endorses the government's stated intention to move rapidly in this direction.

The Committee believes that new emergency legislation should include the following provisions relevant to military air transport:

- provisions to permit graduated government responses in crisis situations, including moving to higher states of military alert, carrying out movements of personnel and equipment, and calling out the reserves, including those responsible for air transport duties;
- provisions to encourage civilian aircrew and ground personnel to volunteer for service in national airlift planning and operations;
- provisions to insure such persons against injury or loss of life resulting from service in national airlift and to protect their positions, seniority, pay and employment benefits;
- provisions to allow the government to send civilian aircraft and aircrews into hostile environments;
- provisions to establish beyond any doubt that civil airline crews have protected status under the Geneva Conventions;
- provisions for requisitioning commercial aircraft;
- provisions to compensate airlines for any costs incurred in national airlift operations and to insure them against damage to, or loss of, their aircraft;
- provisions to allow airlines to break leases, charters and other agreements and to guarantee existing charter and route rights;

⁴¹ See *Ibid.*, 24 October 1985, Issue No. 12 for Mr. Andre's testimony.

- provisions to allow for the modification of aircraft and their subsequent restitution, following service, to their original state;
- provisions clarifying the status of civil airline flights, during airlifts, under the Chicago, Tokyo, the Hague and Montreal Conventions.

In addition to legislation, the nation's capacity to respond to crises and threats of war will depend on decision-making and planning mechanisms within the federal government, and structures for co-ordinating the efforts of government, industry, employees associations and others, in the national defence effort. Looking into these issues with particular reference to air transport, the Committee held an *in camera* meeting with Mr. W.J. Yost, Planning Co-ordinator for Civil Mobilization, Emergency Planning Canada, to learn about the central crisis-management systems of the federal authorities; and received a presentation from Col. Popowych on national decision making in international crises and the role of National Defence headquarters in peacetime, emergency, and wartime air movements. As indicated earlier, it was also briefed by Mr. Cowie on the work of the CACC.

A special issue: use of commercial passenger and freight aircraft

Commercial airlines assist ATG in providing passenger services in peacetime. The recent tragic accident in Gander, Newfoundland, drew attention to the fact that the U.S. armed forces rely on commercial services to an even greater degree.

Such a policy has significant economic advantages for the state and provides commercial carriers with incentive to maintain capacity which can be requisitioned in times of military emergency. Greater use of this practice should be considered by Canadian authorities. Safety factors as prescribed and applied by Canadian carriers are stringent, and do not give cause for concern. The carriers for their part would welcome the opportunity.

Similar policies could be applied for the transport of cargo. Economic and military development in the Arctic, for example, notably in connection with the construction of the new North Warning System, will involve heavy air transport requirements. This should be provided by Canadian carriers, since it certainly would not be desirable for civilian, military or government groups or agencies to have to call on foreign carriers to supply the services required.

On the basis of evidence received, the Committee has developed the conviction that the Hercules is the aircraft best suited for these tasks on our territory. Yet, amazingly, only one such aircraft is operated commercially at this time.

The Committee has been informed that one serious proposal for a Hercules general transport service has been made by a new air-cargo firm which would require a minimal commitment of a number of hours of annual use to start operations.

This appears to the Committee to be an avenue deserving the most serious consideration by the government. Six, eight or ten Hercules, commercially

operative in Canada, would certainly constitute a significant enhancement of this country's airlift capabilities.

The Committee also believes that administrative flight services, internally or abroad, should be kept to a minimum and replaced by commercial carriers to the extent possible. For example, the government could follow a policy similar to that of many other countries with respect to state representational visits, using a national flag carrier, in our case Air Canada, to carry out this task, rather than ATG. This would reduce ATG's "airline tasks" and would probably also prove more economical.

[The following text is extremely faint and largely illegible. It appears to be a list of recommendations or a detailed report section.]

Chapter III

TEN TACTICAL AIR GROUP (10 TAG)

1. 10 TAG and conventional defence today

Some fundamentals

Equipment and roles. Helicopters play a crucial role in modern, conventional military operations on land or at sea. As the Falklands operation clearly demonstrated, they are vital for airlift of personnel and supplies within fields of operations, and for reconnaissance, observation, fire direction, liaison and similar missions on the battlefield.

In the Canadian armed forces, 10 TAG is responsible for these tactical air support operations. When Air Transport Group or other agencies have delivered reinforcements and materiel as close to forward units as terrain, weather and other conditions will allow, it is the responsibility of 10 TAG to carry out any remaining part of the air transport function, up to brigade or battalion supply points and then to the troops in the field. At the same time, 10 TAG will be carrying out its other major tasks, including the tactical airlift of troops and equipment within the battlefield, airmobile actions, air assault operations, and the location and designation of battlefield targets.

To carry out these various missions, 10 TAG is equipped with the following three types of helicopters:

CH-135 Twin Hueys. The Twin Huey is the main battlefield, tactical utility transport aircraft of the Canadian armed forces, with a capacity for carrying up to 11 troops in addition to the crew. It can attain speeds of 203 kilometers per hour and has a range of up to 400 kilometers.

CH-147 Chinooks. The Chinook is a medium transport helicopter dedicated to rear-area logistics operations and having a capacity, in addition to the crew, of 33 to 42 troops. Alternatively, it can carry externally 9,090 kg of freight. Maximum speed is close to 240 kilometers per hour and the Chinook has a range of about 480 kilometers.

CH-136 Kiowas. The Kiowa is a light observation helicopter with a range of about 370 kilometers and speeds of up to 185 kilometers per hour. There is room for pilot and co-pilot/observer, plus two passengers.

10 TAG and the army. The prime user of tactical military air support in war is the army. The overall requirement for transport or other helicopters thus

depends on the types of actions envisaged for the land forces and the amount of mobility they need to carry them out. Specialization within an army also affects the requirement for tactical air support; some units are designated as air-mobile and require strong support from helicopters or STOL aircraft.

Today there is uncertainty about Canada's doctrines of army operations and thus about the equipment requirements of 10 TAG. Canadian military concepts and structures have changed over time — first to a highly flexible doctrine of operations at the time of the 1964 white paper, and then gradually back to more reliance on heavy weapons since then. At present, there is a need to clarify policy, and then to develop the systems and tactics required to implement it. The prevailing ambiguity was reflected in the differences of opinion about 10 TAG among the witnesses before the Committee, some advocating only marginal increases to the Group's inventory whereas others obviously felt that substantial increases are necessary.

10 TAG in the military structure. The location of 10 TAG within the armed forces command structure is also a matter of fundamental importance to its functioning. The Group is one of the six main divisions of Air Command, but its closest operational relationship is with Mobile Command. It would be directly involved in most Mobile Command actions in Canada or such overseas locations as northern Norway. In addition, 10 TAG, like Mobile Command, has a major responsibility for augmenting and reinforcing Canadian Forces Europe (CFE) in the event of a major international crisis or war. Some of its personnel and equipment would go over to Germany to strengthen the tactical helicopter squadron there, 444 Squadron of Four Canadian Mechanized Brigade Group (4 CMBG). Finally, 10 TAG has a role in Canadian peacekeeping operations around the globe. Small detachments of helicopters have served over the years in such areas as Kashmir, Cyprus and Lebanon. Now a force of nine Twin Hueys is to be sent to Sinai in April 1986 to serve with the Multinational Force and Observers (MFO) peacekeeping mission there.

The scope of the enquiry. This study is limited to the capabilities and requirements of 10 TAG itself. Assessments of 4 CMBG and 444 Squadron require a separate, in-depth study. 444 Squadron has 13 Kiowa helicopters but no transport helicopters or fixed-wing aircraft at this time.

Description

10 TAG is one of the six main groups of Air Command, and has its headquarters at St. Hubert, Quebec. The Group now has about 1,000 Regular Force personnel and 90 helicopters. There are also about 500 personnel in the tactical air support squadrons of the Air Reserve. 10 TAG units and aircraft are listed below.

*Tactical helicopter squadrons.*⁴² 10 TAG has three tactical helicopter squadrons, equipped with Twin Huey and Kiowa helicopters (the number

⁴² The information on squadron and unit roles and aircraft holdings is derived mainly from *Defence 84* and Martin Shadwick, "Tactical Helicopters, keeping pace with technology," *Aerospace Canada International* (January/February 1985), pp. 26-29.

assigned to each varying according to its responsibilities and the Mobile Command formation it supports). The three squadrons are:

- the 408 Tactical Helicopter Squadron, based at CFB Edmonton, which supports One Canadian Brigade Group whose units are located at Calgary, Winnipeg and Victoria. This squadron has ten Twin Hueys and eight Kiowas.
- the 427 Tactical Helicopter Squadron, based at CFB Petawawa, Ontario, which supports the Special Service Force at that location. Aircraft holdings consist of six Twin Hueys and eight Kiowas.
- the 430 Tactical Helicopter Squadron, based at CFB Valcartier, Quebec, which supports Five Canadian Brigade Group whose units are located at Valcartier, Quebec, and Gagetown, New Brunswick. Like 427 Squadron, this formation has six Twin Hueys and eight Kiowas.

Medium transport helicopter squadrons. 10 TAG has two medium transport helicopter squadrons, equipped with a total of seven Chinooks. The two squadrons are: 447 Transport Helicopter Squadron, CFB Edmonton; and 450 Transport Helicopter Squadron, CFB Ottawa.

Operational training unit. The 10 TAG operational training unit is 403 Helicopter Operational Training Squadron, based at CFB Gagetown. It provides training for all tactical helicopter aircrews, support for Mobile Command training, and advanced courses in offensive air support and tactical aviation. It has eleven Twin Hueys and ten Kiowas.

Technical training. 10 TAG helicopter technicians and aircrew receive specialized technical training on Kiowa, Twin Huey and Chinook helicopters at Three Field Technical Training Unit, CFB Chatham.

Air traffic control flight. Because helicopter units are not located on regular airfields, 403 (Gagetown), 427 (Petawawa) and 430 (Valcartier) Squadrons each require the services of an Air Traffic Control Flight at their respective operating sites.

Other helicopter holdings. In addition to the helicopters in the main squadrons and units of 10 TAG, there are the following aircraft designated for tactical support roles: the 13 Kiowa helicopters with 444 Squadron in Germany; and a further 16 Kiowas with 400 and 411 Air Reserve Squadrons in Toronto and 401 and 438 Air Reserve Squadrons in Montreal (flying out of St. Hubert).

The overall inventory is indicated in Table 9.

2. Capabilities and issues

The current state of the 10 TAG fleet

Several witnesses commented on the current state of the 10 TAG fleet, including the following:

TABLE 9

Canadian Forces' Tactical Helicopters

Units	CH-135 Twin Hueys	CH-147 Chinooks	CH-136 Kiowas	Total
10 TAG				
408 Squadron	10		8	18
427 Squadron	6		8	14
430 Squadron	6		8	14
447 and 450 Squadrons		7		7
403 Squadron	11		10	21
AIR RESERVE 400, 401, 411, and 438 Squadrons			16	16
CANADIAN FORCES EUROPE 444 Squadron			13	13
TOTAL	33*	7	63	103

* Out of this number, nine CH-135 Twin Hueys will be serving in Sinai from April 1986.

- LGen. François J. Richard, then Deputy Chief of the Defence Staff, remarked, on 9 May 1985, that each Mobile Command Brigade in Canada has a squadron of Twin Huey helicopters, "[s]o we are not hurting in terms of numbers in the short term". In the case of our task in the Sinai, he added, "we will withdraw from the brigades the necessary helicopters we need to do the task."⁴³
- General LaFrance said, of the army's tactical helicopters: "That area is particularly weak. Not only is it weak, but it has a particular significance in terms of army operational capabilities. I am sure that the serving soldiers today would be able to substantiate my point."⁴⁴
- In an exchange with Committee members, General LaFrance made the following points:

Senator Molgat: General LaFrance, when you said earlier that in your opinion 10 TAG's airlift capability is sadly deficient, were you referring to types of aircraft or number of aircraft?

⁴³ *The Proceedings*, 9 May 1985, pp. 8:15 and 16.

⁴⁴ *Ibid.*, 30 May 1985, p. 4:8.

Gen. LaFrance: Mainly the number of aircraft, Senator. The Huey helicopter is a twin-engine and it is designed specially for this work. I imagine one day it will have to be replaced by an improved machine, but for the moment it meets our needs very well. But we do not have enough of them to move the number of men that would be required from one place to another, within a theatre of operations, and at the same time to fly men out in the required numbers.

Any soldier responsible for combat operations will tell you that it is important not to put troops into the field in dribs and drabs, because of course they can be picked off. He has to be able to put in the number of troops required for his operational needs.

We do not have enough helicopters to do this, as I said, either in training or for operational requirements.

Senator Lafond: The same is true for the Chinook.

Gen. LaFrance: Yes, that's right, there are very few of them. The insufficiency is perhaps more dramatic with respect to the Huey. We don't have enough of them.

Senator Molgat: The helicopters that we have were a good choice?

Gen. LaFrance: Yes indeed.

Senator Molgat: With respect to the other aircraft, as I understand it 10 TAG doesn't have any standard aircraft, like the Buffalo for example. In your opinion, does 10 TAG need this type of aircraft in addition to its helicopters?

Gen. LaFrance: The army continues to need traditional air transport, and this is provided by Air Command's Air Transport Group. We have not had, or noticed, any problems with this system, that is, Air Command providing a service to the army. In some cases this service could be provided by 10 TAG and in others by the Air Transport Group.

However, if you examine the number of aircraft and their transport capability, you will see that it is not adequate. The army would need greater air transport capability in practically every area.⁴⁵

- At another point, General LaFrance remarked:

Finally, I would particularly invite your attention to the tactical helicopter air lift capability in support of the army. We believe it is sadly deficient in numbers. Modern armies must be very mobile. This means air transport and, near the battlefield, it means helicopter lift. These operational capabilities can only be achieved by teams of airmen and soldiers fully equipped and trained for these activities. In our view, there are not enough army support tactical helicopters to meet the training needs, let alone the operational requirements.⁴⁶

- Mr. Shadwick commented on the Twin Hueys, saying that:

The major problem there is lack of numbers, because attrition has whittled the fleet down. Some of the Twin Hueys have gone off to the navy and the air force

⁴⁵ *Ibid.*, pp. 4:11 and 12.

⁴⁶ *Ibid.*, pp. 4:6 and 7.

for various other missions, and, of course, the peacekeeping operation in the Sinai, which we are getting involved with next year, will draw nine more aircraft out of the inventory. Being slightly more than 20 per cent of the entire Twin Huey fleet, that will have a significant impact on the day-to-day operations of 10 Tactical Air Group. That is not a criticism of our participation in the MFO. It is simply to point out the impact that peacekeeping can have on a small defence establishment.⁴⁷

Fleet development

The short-term. Mr. Shadwick had the following to say about the Chinook helicopter:

It is a relatively new aircraft, certainly not in immediate need of an update program or replacement...although I assume that in due course we will want to put them through the re-manufacturing program that the U.S. army has for its Chinooks. But we certainly do not have to move quickly on that. The major problem here is numbers. We have seven aircraft of this type, and they are divided between two squadrons, which in one case produces a squadron with all of three airplanes....[T]hree is uncomfortably close to gutting that squadron. There is not much flexibility there at all. I would suggest that perhaps a force level of 10 aircraft might make more sense.⁴⁸

The medium-term. The Twin Hueys and Kiowas are due to be replaced in the mid-1990s. As indicated previously, the exact numbers to be acquired will depend on the doctrine of army operations to be worked out. What one can say at this stage is that 10 TAG will need, *at the very least*, as many utility and light reconnaissance and observation helicopters as it has now, i.e., about 35 replacements for the Twin Hueys and 60 for the Kiowas.

Personnel

The information received by the Committee indicates that 10 TAG is about 10 per cent below peacetime manning requirements. It recommends that this shortage, in the required categories, should be made up as soon as possible, adding about 100 more Regular Force personnel to 10 TAG's complement at an annual cost of about \$5 million (including the personnel, operations and maintenance costs associated with about 40 additional aircrew and 60 maintenance crew).

The four Air Reserve squadrons equipped with Kiowa helicopters constitute a substantial pool of about 500 trained personnel. They should be integrated as closely as possible with 10 TAG, so as to provide the strongest possible support for Mobile Command.

Another major problem for 10 TAG is that its personnel are designated to augment and reinforce 444 squadron in Europe in crisis periods and wartime. That could drain away several hundred of 10 TAG's scarce complement precisely when they were most urgently needed to support the Mobile Command units now in Canada. Consequently, the Committee also believes that 444 Squadron in

⁴⁷ *Ibid.*, 19 September 1985, pp. 9:13 and 14.

⁴⁸ *Ibid.*, p. 9:14.

Germany should be augmented close to wartime requirements, so that it will serve its own functions better and not cripple 10 TAG units at home if an international crisis occurs or war breaks out. Specification of the extra numbers needed in 444 Squadron is beyond the scope of the present study; it should be addressed as soon as possible.

Industrial possibilities

Mr. Shadwick and General Lewis both drew attention to the possibilities for Canadian industry when replacements for present tactical transport and other helicopters are authorized. Their comments were contained in the following points:

- Mr. Shadwick:

In the light helicopter, the observation helicopter replacement for the Kiowa, one can safely assume that that contract will go either to the Bell operation at Mirabel or MBB.⁴⁹

In terms of transport helicopters, we do not have any existing capability, but the Sea King replacement program is very interesting. If we could adopt the same basic aircraft to replace the navy's Sea Kings; the army's Twin Hueys; the tactical transport helicopter; and the search and rescue helicopters, the big Labradors and Voyageurs, we are looking at a production run of potentially 100 to 120 airplanes with Canadian-built engines. With those sorts of numbers, presumably, we would want to have substantial Canadian content on the airframe. We may not get complete licence (to) manufacture, but we should, at least, get the assembly of major components, or outfitting airframes that were built elsewhere and brought to Canada for final outfitting and equipping, and so on.⁵⁰

- General Lewis:

On the helicopter side, the Canadian forces are also under-equipped. I will not speak further to that requirement except to remind you that Canada now has two helicopter manufacturers, Bell and MBB, and Boeing Helicopter is expanding its capability at the Arnprior plant.

These proposals, both in the heavy, medium and light airlift area and in helicopter acquisition, would have to be shoehorned into a very congested defence capital program, and that highlights, once again, the need for larger defence budgets. That need not be as painful as it might appear if the money could be spent mostly in Canada. The positive impact on employment, including the multiplier effect, increased tax revenue, reduced unemployment insurance payments, and other returns to the economy need no elaboration.⁵¹

⁴⁹ MBB Helicopter Canada Ltd., of Fort Erie, Ontario (a subsidiary of Messerschmitt-Bölkow-Blohm, Munich).

⁵⁰ *Ibid.*, p. 9:24.

⁵¹ *Ibid.*, 20 June 1985, pp. 6:9 and 10.

3. A path forward

The short term

The first requirement of 10 TAG is for immediate replacement of a Chinook lost earlier in an accident. Two additional Chinooks should also be acquired, to bring the total to ten.

Although no formal testimony has been received on this point, the Committee has learned that the Canadian government retains an option, expiring at the end of March 1986, to acquire three Chinooks from Boeing-Vertol at a programme cost of about \$75 million. In keeping with its other recommendations the Committee strongly urges the government to take up this option immediately, since the three Chinooks now available for purchase are the only ones left of the type now in service with 10 TAG. If this opportunity is not seized, DND will have to turn to other models of the Chinook, at costs that will undoubtedly be significantly greater.

10 TAG's personnel should be brought up to peacetime manning requirements. This will entail adding about 100 additional pilots, avionics technicians and others over the next ten years, at a cost of about \$5 million per annum.

The medium term

In the mid-1990s, 10 TAG will need to acquire *at least* 60 light observation and reconnaissance helicopters at a programme cost per aircraft of about \$15 million and a total cost of about \$900 million.

Immediately afterwards, acquisition of about 35 new utility transport helicopters, *at least*, will have to begin, to replace the Twin Hueys. The programme cost for these new helicopters is likely to be about \$20 million each, and the total cost about \$700 million.

A schedule of expenditures

A schedule of short-term and medium-term expenditures on new helicopters and additional personnel for 10 TAG could be as follows:

4. Support from the civilian sector

Canada has a large number of civilian helicopters, and the armed forces are now in the early stages of studying the support that this resource could provide to 10 TAG. They might for example be used for logistics support operations in Canada or in rear areas in Europe.

So far, however, DND has not reached the point of approaching the civilian sector about support possibilities. As Mr. Lindsay remarked during the hearings:

- There has never been any interest expressed by the military as far as assistance of that sort, other than, from time to time, and as need dictates, a straight commercial

TABLE 10

Proposed Expenditures on 10 Tag
(in millions of 1985 Canadian dollars)

Year	Utility transport (Twin Huey replacement, at \$20 million each)	Chinooks (3 units)	Light helicopter (Kiowa replacement, at \$15 million each)	Total Aircraft	Manpower (100 additional personnel)	Total
1986		75		75	5	80
1987					5	5
1988					5	5
1989					5	5
1990					5	5
1991					5	5
1992			300	300	5	305
1993			300	300	5	305
1994			300	300	5	305
1995	300			300	5	305
1996	300			300	5	305
1997	100			100	5	105
1998					5	5
1999					5	5
2000					5	5
After 2000	(Eventual replacement for the Chinooks)					

charter request. There has been no planning to make helicopters available from the civil community.

As to the capabilities of civilian helicopters, Mr. Lindsay commented:

- What could be done is relatively limited. Civil helicopters do not have the avionics and communications equipment required to integrate those helicopters into a military operation. They could provide a straight point-to-point transport of people and materiel. As I said, to date there has been no interest expressed.⁵²

Mr. Lindsay also stated that it would be very costly to convert civilian helicopters for military use. In many cases it would not be possible at all.

⁵² *Ibid.*, 13 June 1985, p. 5:21.

Chapter IV

CONCLUSIONS

Continuing its enquiry into the state of the armed forces, the Committee has once again met a body of dedicated men and women carrying out demanding tasks with inadequate equipment and resources. Air Transport Group and Ten Tactical Air Group provide our country with excellent service, but they are overcommitted, short of aircraft, at minimal or inadequate manning levels, and operate fleets which must be renovated and strengthened over the next fifteen years.

The forthcoming white paper on defence will be fundamental to tackling this precarious situation. It should spell out the commitments these two groups are to meet and provide the military with a new starting point for revising operational doctrines which are crucial to determining equipment requirements.

With an updated, strengthened and rationalized fleet, ATG would be in a position to achieve much higher levels of performance. ATG's capabilities should also be supplemented by greater reliance on civil air resources, for example for movements of personnel and dependents in peacetime or troops during emergencies. 10 TAG's inventory needs rounding out and modernizing over the next decade so as to provide stronger support for Mobile Command. Reserve organizations also need revitalizing, strengthening and re-equipping.

In this field, as in others, the Committee feels that it cannot do better than to restate a well-known maxim: avoid false economies. Canada's military air transport fleets must be developed into stronger, flexible instruments attuned to the tasks they face and provided with the best of modern equipment. This cannot be done through patchwork expedients or piecemeal programmes.

What is required is the pursuit of well laid, long-range plans, and the commitment of that extra amount of funds which so often makes all the difference in the effort to transform a limited, over-extended organization into a well-rounded, efficient one.

More money has to be put into defence: there is no escaping this, even if some current commitments are modified or renegotiated.

The Committee has stressed this in each of its previous reports. In *Manpower in Canada's Armed Forces*, of June 1982, it envisaged defence expenditure increasing from 1.7 to 1.9 per cent of GNP. In *Canada's Maritime Defence*, May 1983, it contemplated a defence budget expanding from 2 to 2.3 per cent of national output. In *Canada's Territorial Air Defence*, January 1985, it examined

a range of options which could have pushed up defence spending from 2.16 per cent to between 2.22 and 2.3 per cent of GNP.⁵³ It also recognized that other shortages were likely to be encountered as it continued its enquiries, and foresaw a need to raise overall, annual defence expenditures to between 2.5 and 3 per cent of GNP.

The present report continues in the same vein. Its recommendations are substantial, reflecting the analysis carried out in the text. The costs of re-equipping and modernizing ATG and 10 TAG are set out in Table 6 and Table 10 and then summarized in Appendix 1. The expenditures envisaged are certainly heavy, but would be phased in over fifteen years and are thus tolerable.

Much of the cost of the Committee's recommendations to date, in this report and the three previous ones, is already covered by DND's allocations and projections. The *additional* annual expenditures over the next 15 years would be about 0.27 per cent of GNP, as indicated in Appendix 3. This year's actual level of defence expenditures of 2.06 per cent would be pushed up to 2.33 per cent of GNP in 1986/87. The Committee therefore continues to believe that the complete re-equipment and modernization of this country's armed forces could be accomplished by defence expenditures of between 2.5 and 3 per cent of GNP.

The increases proposed by the Committee since 1982 are realistic and can be afforded without endangering Canada's other obligations.⁵⁴

Instead of the fits and starts to which defence expenditures have been subjected in the last 20 years, it appears to this Committee that a firm programme of re-equipment, manpower consolidation and reserve force augmentation up to the year 2000 would reach its objectives comfortably if reasonable increases in defence expenditure were decided upon, firmed up, accepted, and fire-proofed against political pressures and annual interventions by the federal government's central financial agencies.

The essence of a sound policy for recovering our defence capability and credibility is not a massive increase in dedicated resources, but necessary expenditures and rational, phased programming such as the Committee has always advocated.

⁵³ See Appendix 3 below for detailed figures, what they contain, and their relationship to each other and to DND expenditures.

⁵⁴ See Appendix 4 for a comparison of Canadian defence expenditures with those of other NATO countries.

APPENDICES

APPENDIX 1

**COSTS OF ATG AND 10 TAG DEVELOPMENT:
CONSOLIDATED TABLE**
(in millions of constant 1985 Canadian dollars)

Year	Proposed annual expenditures on ATG aircraft and related equipment (from Table 6)	Proposed annual expenditures on 10 TAG new aircraft plus an additional 100 personnel (from Table 10)	Total
1985	120	—	120
1986	126	80	206
1987	146	5	151
1988	114	5	119
1989	276	5	281
1990	276	5	281
1991	276	5	281
1992	128	305	433
1993	119	305	424
1994	119	305	424
1995	100	305	405
1996	100	305	405
1997	100	105	205
1998	100	5	105
1999	—	5	5
15-year totals	2,100	1,745	3,845
After 2000	(additional annual costs for a new long-range aircraft and a Hercules replacement)	(eventual replacement for the Chinooks)	

APPENDIX 2

DND/AIR CANADA AGREEMENT

Memorandum of Agreement made in duplicate

BETWEEN

HER MAJESTY THE QUEEN in right of Canada, represented by the Minister of National Defence, (hereinafter referred to as "DND")

AND

AIR CANADA, represented herein by its duly authorized officers, (hereinafter referred to as "Air Canada").

WITNESSETH THAT:

- A. WHEREAS it may be necessary from time to time for DND to charter aircraft operated by air carriers;
- B. WHEREAS the aircraft so chartered can be provided by Air Canada or by other air carriers in accordance with their operating authority and the type of equipment required by DND;
- C. WHEREAS circumstances may make it necessary that chartered aircraft be provided before all administrative and financial details have been resolved;
- D. AND WHEREAS it would be expedient and in the interest of DND that Air Canada act as the sole agent and representative of DND in all dealings with other air carriers.
- E. NOW THEREFORE, in consideration of the mutual covenants and obligations hereinafter set forth, the parties hereto mutually agree as follows:

PREAMBLE

1. The foregoing recitals form part of this Agreement.

TERM

2. This Agreement shall be effective from the 14th day of May, 1981 and shall continue in force and effect until terminated in accordance with the provisions of Article 38. This Agreement shall supercede any and all previous arrangements between the parties.

DEFINITIONS

3. In this Agreement, "air carrier" means a duly licensed air carrier authorized to operate commercial air services; "operation" means any carriage by air pursuant to a request made by DND under this Agreement.

PURPOSE AND SCOPE OF AGREEMENT

4. DND, whenever it considers it to be in the public interest to do so, shall make a request to Air Canada for the provision of aircraft with crews and other facilities for the carriage by air, wholly within Canada, wholly outside Canada or partly within Canada and partly outside Canada, of passengers, cargo or both.

Such aircraft with crews and other facilities shall be either provided by Air Canada or shall be hired from other air carriers acceptable to DND by Air Canada acting as an agent for DND, and shall be for the exclusive interest of DND. Unless circumstances dictate otherwise, when acting as agent for DND, Air Canada shall first offer any hiring to be made under this Agreement to Canadian air carriers licensed to perform the required services, and acceptable to DND.

5. Chartered aircraft shall be provided by Air Canada in accordance with the conditions contained herein, and the procedures established by this Agreement shall be followed so as to ensure that such chartered aircraft are made available to DND when so required in the shortest possible time.
6. All requirements of DND for any air carrier to provide chartered aircraft having a maximum take-off weight on wheels of 50,000 lbs., or greater for the carriage by air of passengers, cargo or both shall be subject to this Agreement.

Notwithstanding the foregoing, movements of

- (a) Army, Navy and Air Cadets;
- (b) Regular Officer Training Plan Cadets (ROTP); and
- (c) Militia, Naval and Air Reserves

shall only be subject to this Agreement at the specific request of the DND.

7. An aircraft chartered under this Agreement shall remain at all times under the direction and control of the air carrier that provides it.

REQUEST AND RESPONSE

8. A request by DND under this Agreement shall be made by or under the authority of the Minister of National Defence to the Senior Director, Payload & Operations Control, Air Canada, or his authorized deputies.
9. The Minister of National Defence shall advise Air Canada by letter of the appointment of persons from time to time authorized to make a request under his authority, and Air Canada shall identify those persons who are from time to time authorized deputies of the Senior Director, Payload & Operations Control, Air Canada, by letter to the Minister of National Defence.
10. A request by DND
 - (a) may, having regard to the time within which an operation is to commence, be made by letter, telegram or telephone, but a request made by telephone shall be immediately confirmed by telegram; and
 - (b) shall state
 - (i) all the known particulars required to permit the operation to be conducted in a safe and proper manner,
 - (ii) the time within which the operation is to be conducted and
 - (iii) the time by which acceptance of the request by Air Canada is required.
11. When a request is received by Air Canada from DND,
 - (a) Air Canada shall determine which air carrier or carriers, including Air Canada, has or have the appropriate operating authority to perform the services requested by DND and if the aircraft, crews and other facilities of such air carrier or carriers are available and,
 - (b) subject to such determination, Air Canada shall:
 - (i) itself provide such aircraft, crews and other facilities as may be necessary to perform carriage by air of passengers, cargo or both as stated in the request; or
 - (ii) as agent for DND, take all necessary steps to have another air carrier or other carriers acceptable to DND, provide such aircraft, crews and other facilities as may be necessary to perform the carriage by air of passengers, cargo or both, as stated in the request.

If DND requests a specific air carrier for the performance of an operation, subject to such carrier having or obtaining the appropriate operating authority, Air Canada shall, as agent for DND, request that air carrier to perform the services requested.
12. Air Canada shall have due regard to the operating authority and the ability and capacity of other air carriers to perform the services requested by DND.

13. When a request has been received from DND, Air Canada shall advise DND in the same manner as the request was made, of the extent to which the aircraft, crew and other facilities requested can be provided by Air Canada alone, by other air carriers alone, or by both, and Air Canada shall immediately take or cause to be taken any action necessary to fulfill the request, but when Air Canada advises DND that the request can only be performed in part, DND may either rescind the original request or agree to the partial performance that Air Canada indicates can be undertaken. Except as Air Canada may be advised by DND before or at the time a request is processed under this paragraph, any other air carrier shall be deemed acceptable to DND.
14. In the event that a request under this Agreement would result in a major interruption of air services, the parties to this Agreement shall consult with the authorities designated by the Minister of Transport and the President of the Canadian Transport Commission in respect to the source and utilization of aircraft.

OPERATION

15. Before an operation commences, DND shall deliver or cause to be delivered to the air carrier providing the aircraft, all necessary documents and other information requested by Air Canada or considered necessary by DND.
16. When normal civil procedures are suspended, DND shall sponsor or obtain all civil and military flight clearances required for the safe and proper performance of the operation.
17. DND, when requested by Air Canada at any time during an operation, shall provide all practicable support and assistance for the safe and proper performance of any operation.

SUPPORT

18. DND shall notify all Canadian Forces and other allied bases, units or other elements that it considers likely to become involved in an operation under this Agreement, and shall establish procedures to permit free access and egress by the air carrier to and from Canadian defence establishments for the purpose of carrying out an operation when it is necessary for civil aircraft performing an operation to fly to or from a Canadian defence establishment.
19. DND shall advise Air Canada of all notices given and all procedures established pursuant to paragraphs 17 and 18.

GROUND SUPPORT

20. Except as provided in paragraph 21, or when DND has required that an air carrier performing an operation use such ground support services as may be provided by DND at any point involved in an operation, the air carrier performing an operation shall arrange for the necessary ground support to ensure completion of the operation.

21. When the air carrier performing an operation is unable to obtain any necessary ground support services or fuel for an operation, or where it would be impracticable for the air carrier to do so, DND shall, with all due diligence, perform or cause to be performed such ground support services or obtain such fuel as may be agreed to by the air carrier and DND before the operation is commenced.
22. Where ground support services and fuel are furnished by or at the expense of DND, the costs of any material and services provided to the air carrier shall be billed directly to and paid by the air carrier.

INDEMNIFICATION

23. DND shall
 - (a) waive any and all claims, rights of action or demands as against Air Canada or any other air carrier performing an operation hereunder, their officers, employees and agents or both Air Canada and such other carrier, for loss of or damage to any and all property belonging to DND, or in which DND may have an interest howsoever;
 - (b) renounce as against Air Canada or any other air carrier performing an operation hereunder, their officers, employees, and agents or both Air Canada and any other such air carrier, any right or rights DND may have under any conventional or legal subrogation further to an injury including the death of or the loss of or damage to the property of an officer, servant, employee or agent of DND or of the Canadian Armed Forces; and
 - (c) indemnify and hold harmless Air Canada or any other air carrier performing an operation hereunder, their officers, employees and agents from and against any and all manner of loss, cost, damage or liability to anyone by reason of property damage including damage to the property of Air Canada or of any other air carrier performing an operation hereunder, or personal injury of whatsoever nature or kind including death arising out of or as a result of, or in connection with anything done or not done under, or as a result of this Agreement which, were it not for this Agreement, would not be done or done and which is not covered or ceases to be covered because of an operation hereunder by any insurance policy under which Air Canada or any such other air carrier performing an operation hereunder, is named as the insured and which was in effect at the time of the commencement of an operation under this Agreement.

This above waiver, renunciation, indemnification and holding harmless shall also benefit Air Canada and any other air carrier performing an operation hereunder, their officers, employees and agents where, with respect to the respective circumstances enunciated above, the loss, damage or injury including death is not fully recoverable from the insurer or insurers but only to the extent that such loss, damage or injury including death is not recoverable from such insurer or insurers.

INSURANCE

24. Air Canada shall obtain such additional insurance coverage as may be available to cover any risks inherent to anything performed in accordance with this Agreement and which risks are not already covered by, or cease to be covered because of an operation hereunder, by insurance policies in effect at the time of the commencement of an operation including damage to Air Canada's own property, the property of others and personal injury of whatsoever nature or kind including death, or shall cause any other air carrier performing any operation pursuant to this Agreement, to obtain such additional insurance coverage and DND shall pay the cost of such additional insurance coverage.

AGENCY OF AIR CANADA

25. For all operations under this Agreement involving other air carriers, dealings with such other air carriers shall be made by DND through Air Canada and in so doing, Air Canada shall act as sole and exclusive agent of DND.
26. As agent for DND, Air Canada is hereby authorized:
- (a) to do any act that is necessary in accordance with good business practices for the proper performance of any operation; and
 - (b) to bind DND to any conditions that are similar to those provided for hereunder or that are reasonably required in the circumstances to ensure successful completion of an operation.
27. DND shall indemnify and hold harmless Air Canada, its officers and employees from and against any and all manner of loss, cost, damage, expense or liability arising out of, or as a result of, or in connection with any act or omission that occurs when Air Canada is acting as agent for DND, or when Air Canada purports to act as agent for DND, unless such acts or omissions are caused by negligence.
28. For the performance of the agency services required by this Agreement, DND shall pay Air Canada an amount equivalent to 5% of the cost of any air carriage arranged by Air Canada as agent for DND, but no agency fee is payable for any portion of an operation that is performed by or with aircraft, crews, or other facilities of Air Canada.

CHARGES

29. The total charge to be paid by DND as consideration for the performance of each operation hereunder will fall into either one of the following categories:
- (i) when there is prior agreement with DND on the total charge to be made to DND for the operation; or
 - (ii) when there has not been prior agreement with DND on the total charge to be made for the operation;
- each as hereinafter provided.

30. When, before the commencement of an operation, DND and Air Canada have agreed on a specific total charge for the performance of that operation by Air Canada, the total charge so agreed shall be paid by DND to Air Canada. If the operation is to be performed by another air carrier, and a specific total charge has been agreed to with the other air carrier before the commencement of that operation, the total charge so agreed to with the other air carrier shall be paid by DND through the agency of Air Canada, to the other air carrier. In any event, the specific total charge so agreed shall be derived from charter tariffs filed with the appropriate Governmental regulatory authority by Air Canada or by the other air carrier performing the operation and which tariffs are in effect at the time the operation is performed.
31. When, because of lack of time or other reasons, similar or otherwise, there has not been before the commencement of an operation, agreement with DND on a specific total charge for the performance of that operation, the total charge to be paid by DND to either Air Canada or to the other air carrier through the agency of Air Canada shall be as established in the charter tariffs filed with the appropriate Governmental regulatory authority by Air Canada, if the operation is performed by Air Canada, or by the other air carrier if the operation is performed by such other air carrier and which tariffs are in effect at the time the operation is performed. In addition, DND shall pay to whomsoever performed the operation an amount sufficient to cover any ascertainable additional direct costs not provided for in the tariffs and a mark up of 15% of those additional direct costs and a further amount equal to any documented net loss of revenue attributable to the performance of the operation in the circumstances.
32. In any case where Air Canada or another air carrier performing an operation hereunder, receives any revenue from other sources on what was to have been a ferry flight section of the operation or any part thereof, the ferry charge to be paid by DND shall be reduced by fifty percent (50%) of the revenue so received or, if fifty percent (50%) of the revenue equals or exceeds the ferry charge, no ferry charge shall be payable.
33. When a request made by DND under this Agreement is cancelled before the intended operation is performed, DND shall pay an amount equal to the financial loss incurred by Air Canada or any other air carrier requested by Air Canada as agent to comply with the request, as a result of anything done before the cancellation by Air Canada or by such other air carrier, to comply with the request.
34. DND shall pay interest charges on any amount remaining unpaid sixty days after billing of an invoice from Air Canada at a rate of 21% per annum, and the invoice submitted by Air Canada shall clearly state this charge for interest.
35. Air Canada shall keep and maintain proper accounts and records of the cost to Air Canada, in respect of each operation, of the services performed by Air Canada and of any expenditure or commitment made by Air Canada in connection therewith, together with the invoices, receipts and vouchers

relating thereto, and the accounts, records, receipts and vouchers shall be made available for audit and inspection by an authorized representative of DND where, in the opinion of DND, the cost of an operation appears to be excessive or unwarranted.

36. As agent for DND, Air Canada shall require any other air carrier that has agreed to perform an operation hereunder to keep, maintain and provide proper accounts and records of costs to such other air carrier, as provided for in Clause 35 above.

OPERATING PROCEDURES

37. The parties or authorized representatives hereto shall, by mutual agreement, develop operating procedures, which shall be deemed to form a part of this agreement, to give effect to the provisions of this Agreement in relation to the following subjects:

- (a) any additional information that shall be furnished by DND when a request is made pursuant to paragraph 10;
- (b) the documents and other information to be supplied by DND to the air carrier in accordance with paragraph 15;
- (c) the support and assistance to be provided pursuant to paragraph 17;
- (d) the ground support services to be provided by DND pursuant to paragraph 21;
- (e) any requirements for insurance as provided in paragraph 24; and
- (f) any other matters necessary to give effect to this Agreement.

TERMINATION

38. Either of the parties hereto may terminate this Agreement by giving to the other at least ninety (90) days' prior written notice of its intention to terminate, but in any case, where there is continuous negligent or deliberate non-compliance with or non-performance of any of the terms and conditions herein by Air Canada, this Agreement may, at the discretion of DND be terminated forthwith upon written notice to that effect given to Air Canada, and Air Canada shall not be entitled to recover any compensation from DND as a result of such termination.
39. Neither Air Canada nor any air carrier engaged under this Agreement shall, under this Agreement, be responsible or liable for any damage caused by its inability to perform wholly or partly any of its obligations hereunder provided such inability is due to causes reasonably beyond the practical control of Air Canada or other air carrier and not occasioned by the fault or negligence of Air Canada or such other air carrier including but not restricted to force majeure, act of God or the common enemy, war, civil commotion, riot, insurrection, embargo, fire, explosion, earthquake, lightning, flood or other major action and the elements of other catastrophe, legislation, any act, order or regulation of any governmental or other constituted authority, strike or other labour trouble.

40. No member of the House of Commons shall be admitted to any share or part of this agreement or to any benefit to arise therefrom (Senate and House of Commons Act, R.S.C. 1970, Chapter S-8, Section 20(1)).

IN WITNESS WHEREOF, this Agreement has been executed by the Deputy Minister of National Defence on behalf of the Minister of National Defence representing Her Majesty the Queen in right of Canada, any by Air Canada by the affixing hereto of its corporate seal attested by the hands of its officers duly authorized in that behalf, this 13th day of May 1981.

SIGNED, SEALED AND DELIVERED on behalf of Her Majesty the Queen in right of Canada, in the presence of:

DEPARTMENT OF NATIONAL DEFENCE

.....
(Witness)

.....
J.R. Killick
Chief of Supply

AIR CANADA

.....
R.T. Vaughan

.....
Secretary of the Company

APPENDIX 3 PROPOSALS OF THE COMMITTEE'S FOUR STUDIES

PART A: MAIN RECOMMENDATIONS AND COSTS

	<u>Manpower in Canada's Armed Forces, January 1982.</u>	<u>Canada's Maritime Defence, May 1983.</u>	<u>Canada's Territorial Air Defence, January 1985.</u>	<u>Military Air Transport, February 1986.</u>
Year	<u>Main proposals. Increase Regular Force from 79,000 to 92,000 by 1987. Strengthen Reserves.</u>	<u>Main proposals. Increase the maritime force to the following by 1996: 15 surface ASW plus 2 building; 20 submarines; 3 operational support ships; 1 diving support ship; 4 minehunters; 9 minesweepers; 12 fast patrol boats; 36 long-range patrol aircraft; 18 coastal patrol aircraft; 45 ASW helicopters; 3 escort merchant ships; and Harpoon missiles for 84 CF-18 interceptors to be stationed in Canada.</u>	<u>Main proposals. Participate with United States in building new North Warning System & coastal radars; upgrading Northern airfields; upgrading communications, command and control, and support systems. Share of 3 AWACs aircraft. Acquire an additional 20 CF-18 interceptors. Establish and develop a Canadian national military space programme of warning, surveillance and communications systems. Discontinue the Pinetree Line.</u>	<u>Main proposals. Build up Air Transport Group fleet, by the mid-1990s, to 45 Hercules, 6 Boeing 707s, 20 Dash 8s, 8 Challengers, 2 Twin Otters and 20 replacements for the Labrador. Retire all Buffalos, Cosmopolitans, etc. Life-extend the Hercules and the 707s, but acquire replacements for them after the year 2000. For Ten Tactical Air Group, acquire an additional 3 Chinook helicopters; replace the Twin Hueys and the Kiowas, in the mid-1990s, on at least a one-for-one basis.</u>
	<u>Annual costs in millions 1981 \$s (additional to existing DND plans)</u>	<u>Annual costs in millions 1983 \$s (additional to existing DND plans)</u>	<u>Annual costs in millions 1984 \$s (additional to existing DND plans)</u>	<u>Annual costs in millions 1985 \$s (additional to existing DND plans)</u>
		<u>Capital expenditures</u>	<u>P, O & M*</u>	
1982/3	100			
1983/4	350			
1984/5	350	300	80	
1985/6	350	300	80	
1986/7	350	300	80	
1987/8	350	300	80	100
1988/9	350	300	80	50
1989/90	350	300	80	50
1990/1	350	300	80	50
1991/2	350	300	80	100
1992/3	350	300	80	100
1993/4	350	300	80	100
1994/5	350	300	80	100
1995/6	350	300	80	100
1996/7	350	120	80	100

1997/8	350	120	80	250	100
1998/9	350	120	80	250	
1999/2000	350	120	80	250	
2000/2001	350	120	80	250	
TOTALS	6,400	4,200	1,360	4,360	1,000

NOTES:

1. The above figures represent the additional costs, beyond existing DND plans, of implementing the recommendations of the Committee's four reports:

- (a) In Manpower in Canada's Armed Forces, the entire costs of the recommendations were additional, i.e., for personnel increases beyond the small build-up already authorized by the government. In the figures above for that report, there were some allowances for equipment and infrastructure in addition to personnel, operations and maintenance costs. The Committee's projections were to 1990/91 but similar annual expenses would be incurred afterwards if the armed forces were stabilized at that point.
- (b) In Canada's Maritime Defence, the Committee recommended that the navy should be expanded by acquiring additional ships, aircraft and other equipment at a cost of \$6.6 billion.

This was about \$3.6 billion more than envisaged by DND under its Long Range Plan for defence spending (See Figure 3, page 59, Canada's Maritime Defence).

This \$3.6 billion of extra expenditure proposed by the Committee would cost \$300 million per annum for 12 years, up to 1995/96, as shown above.

Afterwards, there would be continuing costs associated with maintaining this extra \$3.6 billion of naval vessels and aircraft (about \$120 million per year for 30 years, the lifespans of such equipment).

The report also listed \$80 million per annum for added personnel and related costs. These are related to the expanded fleet proposed by the Committee, and thus are additional to the allocations recommended in Manpower in Canada's Armed Forces. In the report on Canada's Maritime Defence, they were projected to 1995/96, but would of course continue each year after that.

- (c) In Canada's Territorial Air Defence, some of the Committee's proposals were more far reaching than subsequent government decisions. The Committee proposed that Canada should not only negotiate an upgrading of northern radars and related communications systems, airfields, etc., but also acquire a one-third share in 3 AWACs (for \$200 million), acquire an additional 20 CF-18 interceptors (for \$660 million) and launch a national military space programme (starting with R and D costs of \$750 million over 5 years). These additional, more far-reaching proposals, would have cost \$1,610 million, or \$322 million per year for 5 years, as indicated in Part A above. In addition, the Committee recommended further development and deployment of a national military space programme devoted to warning, surveillance and communications functions, at net annual costs of \$250 million.
- (d) In Military Air Transport, the Committee estimates that its proposals for Air Transport Group and 10 TAG will cost about \$4 billion over fifteen years (see Appendix 1 for proposed annual expenditures). This is about \$1 billion more than now specified for funding these two groups under DND's long-term projections. The additional expenditures could, for example, start with \$100 million in 1986/87 (including \$75 million for 3 Chinook helicopters), continue at \$50 million for the next four years, and then at \$100 million per annum to 1997/98.

2. Calendar years were used in the studies on Canada's Territorial Air Defence and Military Air Transport. In both cases the figures have been listed in the closest financial year.

* Personnel, Operations and Maintenance costs.

PART B: ADDITIONAL COSTS OF COMMITTEE RECOMMENDATIONS

	Manpower in Canada's Armed Forces	Canada's Maritime Defence		Canada's Territorial Air Defence	Military Air Transport	Totals
		Capital	P, O & M			
Total additional costs 1982/83 to 2000/2001 in millions current dollars (from Part A)	6400	4200	1360	4360	1000	-
Inflation factor (current to 1985/86 dollars)	1.32	1.15	1.11	1.06	1.00	-
Total 1982/83 to 2000/2001 costs in millions 1985/86 dollars	8448	4830	1510	4622	1000	20,410
Total for fifteen years, 1985/86 to 1999/2000 in millions current dollars	5250	3780	1200	4110	1000	-
SAME TOTAL in 1985/86 dollars	6930	4347	1332	4357	1000	17,966

Note: Inflation factors were based on Department of National Defence calculations for a range of defence expenditures. The rates for capital equipment, personnel and other factors vary, as indicated by the two different figures for the recommendations of Canada's Maritime Defence.

PART C: FIFTEEN YEAR AVERAGES, DEFENCE EXPENDITURES AND THE GROSS NATIONAL PRODUCT

1.	Average annual cost of the Committee's proposals:	
a)	Total additional cost of the Committee's recommendations for 1985/86 to 1999/2000 (from Part B above in 1985/86 dollars)	\$ 17,966 million
b)	Average annual cost of increase	\$ 1,198 million
2.	Estimated annual increase in present defence budget:	
a)	Total 1985/86 defence appropriations (from main Defence Estimates)	\$ 9,383 million
b)	Increase needed to meet recommendations of the Committee's four reports	\$ 1,198 million
c)	Estimated annual defence budget including Committee's recommendations	\$ 10,581 million
d)	Increase as percentage of the defence budget. (This increase is over and above the 3 per cent increase in real terms committed under a NATO agreement.)	12.8%
3.	Effects on defence expenditure as percentage of Gross National Product:	
a)	Approximate Gross National Product in 1985/86 (April 1985 estimate)	\$455,000 million
b)	Defence expenditure in 1985/86 as % GNP	2.06%
c)	Committee's recommendations as % GNP (annual)	2.33%
d)	Annual increase resulting from the proposals of the Committee's four reports	0.27%

NOTE:

Further studies by the Committee are likely to identify additional requirements in other areas, such as Mobile Command, reinforcing the Committee's belief, stated in its previous reports, that defence expenditures need to rise to somewhere between 2.5 per cent and 3 per cent of GNP.

APPENDIX 4

NATO COUNTRIES' DEFENCE EXPENDITURES AS PERCENTAGE OF GROSS DOMESTIC PRODUCT

Country	Average 1975- 1984	1980	1981	1982	1983	1984	1985*
Belgium	3.3	3.4	3.5	3.4	3.3	3.2	3.3
Canada	1.9	1.8	1.8	2.1	2.0	2.2	2.2
Denmark	2.4	2.4	2.5	2.5	2.4	2.3	2.3
France	4.0	4.0	4.2	4.1	4.2	4.1	4.1
Germany	3.4	3.3	3.4	3.4	3.4	3.3	3.3
Greece	6.6	5.7	7.0	6.9	6.3	7.2	7.1
Italy	2.5	2.4	2.5	2.6	2.7	2.7	2.7
Luxembourg	1.1	1.2	1.2	1.2	1.2	1.2	1.2
Netherlands	3.2	3.1	3.2	3.2	3.2	3.2	3.1
Norway	3.0	2.9	2.9	3.0	3.1	2.8	3.2
Portugal	3.6	3.5	3.5	3.4	3.4	3.3	3.2
Turkey	5.0	4.3	4.9	5.2	4.8	4.4	4.4
United Kingdom	4.9	5.0	4.8	5.0	5.3	5.3	5.4
United States	5.9	5.5	5.8	6.4	6.6	6.5	6.9

* Estimate only.

These figures are for defence spending in relation to Gross *Domestic* Product, not Gross *National* Product. Because Canada's GNP in 1985 was about 8 per cent larger than the GDP, defence spending amounted to 2.06 per cent of GNP or 2.22 per cent of GDP. This table is used because it gives the latest figures available and because it is intended essentially for comparative purposes, between one NATO country and another.

In *Canada's Maritime Defence*, May 1983, comparative defence expenditures were related to GNP, the measure used in the source, *The Military Balance 1982-1983* (International Institute for Strategic Studies, London). However, the latest edition of this publication, *The Military Balance 1985-1986*, gives some national expenditures in relation to GNP but others in relation to GDP. Also, the last year covered is 1983.

Source

Financial and Economic Data Relating to NATO Defence, Press Release M-DPC-2 (85) 25, NATO Press Service, Brussels.

APPENDIX 5

List of persons who appeared before the Committee, showing the issue number and date of the proceedings in which their evidence appeared.

First Session of the Thirty-third Parliament, 1984-86

Name	Issue No.	Date
The Honourable Harvie Andre, P.C., M.P. Associate Minister of National Defence	12	October 24, 1985
Lieutenant-Colonel Mike Angelsey Commander, 424 Squadron CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Major-General L.A. Ashley Chief, Air Doctrine and Operations Department of National Defence	2 8 12	May 2, 1985 May 9, 1985 October 24, 1985
Brigadier-General R.P. Beaudry Director General Reserves and Cadets Department of National Defence	4	May 30, 1985
Brigadier-General (Retired) George Bell, Ph.D. President Canadian Institute of Strategic Studies	7	June 27, 1985
Lieutenant-General Charles H. Belzile Commander Mobile Command CFB St. Hubert, Quebec	<i>in camera</i>	May 29, 1985
Lieutenant-Colonel L.J. Bourgeois Base Operations Officer <i>on behalf of</i>	<i>in camera</i>	May 22, 1985
Colonel Gary King Base Commander CFB Trenton, Ontario		

Lieutenant-Colonel J.C. Brace Commander, 437 Squadron CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Brigadier-General A.C. Brown Director General Military Plans and Operations Department of National Defence	8	May 9, 1985
Colonel Georges Chiasson Comptroller CFB St. Hubert, Quebec	<i>in camera</i>	May 29, 1985
Brigadier-General J.R. Chisholm Commander 10 Tactical Air Group (TAG) CFB St. Hubert, Quebec	<i>in camera</i>	May 29, 1985
Major A.L. Combs Staff Officer Maintenance (ATG HQ) CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Mr. C.A. Cowie Chairman, Civil Aviation Co-ordinating Committee Transport Canada	3	May 16, 1985
Dr. Harriet Critchley Political Science Department University of Calgary	6	June 20, 1985
Lieutenant-Colonel Gordon Diamond Senior Staff Officer CFB Winnipeg, Manitoba	<i>in camera</i> <i>in camera</i>	May 22, 1985 May 29, 1985
Mr. Jacques A. Forest NATO Planning and Operations Officer Air Operations Contingencies Air Navigation Directorate Transport Canada	3	May 16, 1985
Captain Normand J. Foster President The Canadian Air Line Pilots Association (CALPA)	10	September 26, 1985
Lieutenant-Colonel Bob R. Fraser Aircraft Maintenance Officer CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Mr. Peter Hypher Operational Research Adviser (ATG HQ) CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985

Lieutenant-Colonel J.E. Jotham Commander, 436 Squadron CFB Trenton, Ontario Directorate, Air Operations and Training Department of National Defence	<i>in camera</i>	May 22, 1985
	10	September 26, 1985
Mr. John T. Keenen General Counsel The Canadian Air Line Pilots Association (CALPA)	10	September 26, 1985
Major Ted King Officer in Charge Canadian Missions Control Centre CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Major-General (Ret'd) Claude LaFrance Chairman Air Force Officers Advisory Group*	4	May 30, 1985
Lieutenant-General (Ret'd) K.E. Lewis President Aerospace Industries Association of Canada	6	June 20, 1985
Mr. Gordon E. Lindsay Vice President Government Affairs Air Transport Association of Canada	5	June 13, 1985
Brigadier-General T. Liston Commanding Officer 5 Canadian Brigade Group Department of National Defence	<i>in camera</i>	June 6, 1985
Lieutenant-General Paul D. Manson Commander, Air Command CFB Winnipeg, Manitoba	<i>in camera</i>	May 22, 1985
Major Jim Macdutosh Staff Officer Airlift Planning Air Transport Operations Centre CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Lieutenant-Colonel D.A. Noble Directorate Military Plans Coordination Department of National Defence	8	May 9, 1985

* The Air Force Officers Advisory Group consists of some forty retired senior air force officers. It maintains a close liaison with the RCAF Association and its objective is to place their considerable experience of military aviation at the service of Canada.

Colonel J.D. O'Brien Director Air Requirements Department of National Defence	8	May 9, 1985
Colonel G.J. O'Connor Director Mobilization and Planning Department of National Defence	8	May 9, 1985
Lieutenant-Colonel Larry Olson Commander, 402 Squadron CFB Winnipeg, Manitoba	<i>in camera</i>	May 22, 1985
Mr. G.S. Parslow Executive Officer Air Operations Contingencies Civil Aeronautics Transport Canada	3	May 16, 1985
Colonel I. Popowych Director General, Transportation Department of National Defence	11	October 10, 1985
Lieutenant-Colonel J.R.B. Proulx Commander, 426 Squadron CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Lieutenant-General François J. Richard Deputy Chief of the Defence Staff Department of National Defence	2 8	May 2, 1985 May 9, 1985
Mr. Gerald Riley Director Plans, Coordination and Development Emergency Planning Canada	<i>in camera</i>	June 27, 1985
Lieutenant-Colonel W.A. Scott Section Head Air Operations and Training Department of National Defence	2 8 <i>in camera</i> <i>in camera</i>	May 2, 1985 May 9, 1985 May 22, 1985 June 6, 1985 June 13, 1985
Mr. Martin Shadwick Research Associate Research Program in Strategic Studies York University	9	September 19, 1985
Brigadier-General K.O. Simonson Commander of ATG CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Dr. Eric L. Shipley Director General (Plans) Emergency Planning Canada	12	October 24, 1985

Major-General (Ret'd) Lloyd Skaalen Vice-Chairman Air Force Officers Advisory Group	4	May 30, 1985
Colonel Marc Terreau Deputy Commander, ATG CFB Trenton, Ontario	<i>in camera</i>	May 22, 1985
Major-General D.P. Wightman Commander Canadian Forces Europe	<i>in camera</i>	June 6, 1985
Mr. W.J. Yost Planning Coordinator for Civil Mobilization Emergency Planning Canada	<i>in camera</i>	June 27, 1985

