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DEFENCE IN THE 70s

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CANADA

WHITE PAPER ON DEFENCE

Donald S. Macdonald
Minister of National Defence

25-80562/37



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Donald S. Macdonald
Minister of National Defence

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Shortly after I became Minister of National Defence last September, work started on this White Paper. The Government had decided that a White Paper was needed to explain the changes taking place in defence policy.

In the White Paper we have indicated the main thrust of the Government's policy thinking for the years ahead. Change in technology and the quickening pace of arms control discussions make this a particularly difficult moment for long-range defence planning. It will be appreciated, therefore, that we have not resolved all outstanding questions. In particular, there are a number of equipment options for which analysis is not far enough advanced to permit decisions to be taken at this time.

These have not been easy times for members of the Armed Forces, although this situation is not unique to Canada. There has been increasing skepticism about the traditional roles of the Armed Forces as we move further and further from the last time the Forces were engaged in combat operations. Moreover, at a time when national social and economic needs are considerable, there is substantial pressure to cut defence expenditures.

In this White Paper the Government has established what it regards as the appropriate size and structure for the Canadian Armed Forces. I feel that this White Paper emphasizes to the Armed Forces the importance the Government places on their services to Canada. They continue to serve with pride and dedication.

Donald S. Macdonald

August, 1971

Minister of National Defence

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The Defence Review

Why Defence Policy was Reviewed

Important international and domestic changes have occurred since the review of defence policy which culminated in the White Paper issued in 1964. These changes have required a fundamental reappraisal of Canadian defence policy by the Government.

International Developments: The most significant changes on the international scene with consequences for Canadian defence policy have occurred in the nature of the strategic nuclear balance between the United States and the Soviet Union, and in the state of East-West political relations both in Europe and directly between the two super-powers. These changes, together with the emergence of China as a nuclear power and the growing economic strength of Europe and Japan, have resulted in a loosening of the bipolar international system. This trend is emphasized by the announcement that President Nixon of the United States will shortly be visiting the People's Republic of China, indicative of a major change in policy for both countries. On the other hand, the prospects for effective international peacekeeping, which were viewed with some optimism in 1964, have not developed as had been hoped.

National Concerns: There have been developments within Canada of particular importance to the employment of our defence forces. Defence responsibilities required re-examination as a result of Government decisions to regulate the development of the North in a manner compatible with environmental preservation, and with legislation enacted to prevent pollution in the Arctic and the Northern inland waters. Other relevant developments included the extension of Canada's territorial sea, the establishment of fisheries protection and pollution control zones on the Atlantic and Pacific coasts, and the heightened pace of exploration for offshore mineral resources. Finally, the threat to society posed by violent revolutionaries and the implications of the recent crisis—although the latter occurred well after the defence review began—merited close consideration in projecting Canadian defence activities in the 1970s.

Why this Paper was Produced

The Government began its major defence review in 1968 and indicated the broad lines of its thinking in the policy statement made by Prime Minister Trudeau on April 3, 1969. This statement presented a new orientation in defence policy, and in particular in priorities, to accord with changes on the international and national scenes.

The White Paper on Defence is intended to explain in greater depth the decisions outlined in this policy statement, to provide a policy framework for further decisions by the Government on questions of current force posture and strategy, and to indicate the future direction of policy.

The Paper concentrates on the main policy issues, defines the approach to be taken to them, emphasizes changes which are taking place, but does not attempt to cover all areas of defence activity. Certain subsidiary questions, together with other problems of an administrative nature, will be dealt with as required in separate statements by the Minister of National Defence. Such related statements will be based upon the principles set out in this paper.

The Basis for Defence Policy in the 1970s

Defence as Part of National Policy

Defence policy cannot be developed in isolation. It must reflect and serve national interests, and must be closely related to foreign policy, which the Government reviewed concurrently with defence. In the course of these reviews the principle that defence policy must be in phase with the broader external projection of national interests was underlined. In addition, internal aspects of national defence were also considered; these included aid of the civil power and assistance to the civil authorities in the furtherance of national aims.

National Aims: In the foreign policy review general national aims were defined as follows:

- that Canada will continue secure as an independent political entity;
- that Canada and all Canadians will enjoy enlarging prosperity in the widest possible sense;
- that all Canadians will see in the life they have and the contribution they make to humanity something worthwhile preserving in identity and purpose.

Policy Themes: To achieve these aims, the themes of Canada's national policy were more specifically defined as seeking to:

- foster economic growth,
- safeguard sovereignty and independence,
- work for peace and security,
- promote social justice,
- enhance the quality of life,
- ensure a harmonious natural environment.

The first concern of defence policy is the national aim of ensuring that Canada should continue secure as an independent political entity—an objective basic to the attainment of the other two national aims. In the policy themes flowing from the national aims, the Canadian Forces have a major

part to play in the search for peace and security and also have an important and growing role in safeguarding sovereignty and independence. Accordingly it is to these two themes of national policy that the activities of the Canadian Forces are most closely related. However, defence policy can and should also be relevant to the other policy themes, and the contribution of the Department of National Defence to national development will be examined in this context.

Peace and Security

The Changing Scene: One of the most important changes in international affairs in recent years has been the increase in stability in nuclear deterrence, and the emergence of what is, in effect, nuclear parity between the United States and the Soviet Union. Each side now has sufficient nuclear strength to assure devastating retaliation in the event of a surprise attack by the other, and thus neither could rationally consider launching a deliberate attack. There have also been qualitative changes in the composition of the nuclear balance. Of particular importance to Canada is the fact that bombers, and consequently bomber defences, have declined in relative importance in the strategic equation.

Greater stability in the last few years has been accompanied by an increased willingness to attempt to resolve East-West issues by negotiation,



Canada has contributed to all UN peacekeeping operations, including Cyprus.

although it is still too early to judge the prospects for success. Formal and informal discussions are in progress between the U.S. and the U.S.S.R. on a long list of subjects, involving problems around the globe. Of overriding importance are the current Strategic Arms Limitation Talks (SALT) where signs of agreement are emerging. Other negotiations of major importance are the Four Power Talks on Berlin in which the U.S. and U.S.S.R. are joined by Britain and France in an effort to resolve one of the main issues still outstanding from Second World War. The Federal Republic of Germany has initiated a series of negotiations fundamental to the future prospects for East-West relations, which have already yielded important agreements with the U.S.S.R. and Poland. In addition, the Government hopes it will be possible to open negotiations on Mutual and Balanced Force Reductions (MBFR) in Europe in the near future.

At the same time the nations of Western Europe are growing more prosperous and are co-operating more closely, and the likelihood has increased that the European Economic Community will be enlarged. The European members of the North Atlantic Treaty Organization (NATO) are now able to assume a greater share of the collective Alliance defence, particularly with respect to their own continent. The North Atlantic Alliance remains firm but within it there is now a more even balance between North America and Europe.

Change has been even more rapid in the Pacific area where Japan's phenomenal economic growth continues and where China's military and political power is substantially increasing. Primarily as a result of these developments in Europe and Asia, but also as a consequence of change in other parts of the world, there has been a return to a form of multi-polarity in the international system. Although the U.S. and the U.S.S.R. continue to have overwhelming military power, and in particular nuclear power, the relative ability of these two countries to influence events in the rest of the world has declined in recent years.

One other development in the international field of particular importance to Canada should be noted. In 1964 there was considerable optimism in this country concerning the scope for peacekeeping. In the intervening years the United Nations Emergency Force was compelled to leave the Middle East. Little progress has been made towards agreement on satisfactory means of international financing of peacekeeping forces. And amidst the tragedy of the Vietnam conflict, the effectiveness of the International Commission for Supervision and Control in Indo-China has further diminished. Additional observer missions were created and operated for a short time on the borders of West Pakistan and India following the border clash of 1965 and in Nigeria in 1969, but no substantial peacekeeping operation has been authorized since 1964 when the UN Force in Cyprus was established. For many reasons the scope for useful and effective peacekeeping activities now appears more modest than it did earlier, despite the persistence of widespread violence in many parts of the world.



CF-104 aircraft comprise Canada's air contribution to NATO forces in Europe.

Continuing Factors: A catastrophic war between the super powers constitutes the only major military threat to Canada. It is highly unlikely Canada would be attacked by a foreign power other than as a result of a strategic nuclear strike directed at the U.S. Our involvement would be largely a consequence of geography; Canada would not be singled out for separate attack. There is, unfortunately, not much Canada herself can do by way of effective direct defence that is of relevance against massive nuclear attack, given the present state of weapons technology, and the economic restraints on a middle power such as Canada.

Canada's overriding defence objective must therefore be the prevention of nuclear war by promoting political reconciliation to ease the underlying causes of tension, by working for arms control and disarmament agreements, and by contributing to the system of stable mutual deterrence.

Deterrence can be described in general terms as discouraging attack by demonstrating such a capability to retaliate—even after absorbing a massive surprise attack—that the possible gains of aggression would be outweighed by the losses the aggressor would sustain. The fearsome logic of mutual deterrence is clearly not a satisfactory long-term solution to the problem of preventing world conflict. But pending the establishment of a

better system of security, it is the dominant factor in world politics today. Because of Canada's obvious inability to deter major nuclear war unilaterally, the Government's policy is to contribute to peace by participating in collective security arrangements. These arrangements have as their purpose the prevention or containment of conflict.

Canada's military role in North American defence involves contributing to the stability of deterrence by assisting the U.S. in operating a comprehensive system of warning, and providing some active defence against bombers and maritime forces. Canada's military role in the part of the NATO area which extends beyond the immediate North American area also constitutes a contribution to deterrence. It helps to minimize the danger of world war arising from conflict in the sensitive European and North Atlantic areas, where the super powers' interests are involved and thus the overall balance is at stake.

Canada's military role in international peacekeeping helps to prevent the outbreak or spread of hostilities in other areas of tension, so that underlying political problems can be settled through negotiation or a process of accommodation, and so that the possibility of great power involvement is minimized.

It is in Canada's interest that war should be prevented, but if unavoidable that it should be halted before it can escalate into a broader conflict which could affect the security of Canada. The Government intends therefore to maintain within feasible limits a general purpose combat capability of high professional standard within the Armed Forces, and to keep available the widest possible choice of options for responding to unforeseen international developments.

The Department of National Defence maintains a program in arms control research to support the Department of External Affairs. This has contributed to Canada's ability to make an effective contribution to the consultations held over the last two years at NATO to prepare for SALT, and to the preparations by NATO for negotiations on MBFR. It has also contributed to various other arms control proposals being discussed at the Geneva disarmament conference, on such subjects as chemical and biological warfare and a proposed comprehensive test ban treaty. Canada also played a role in the negotiations surrounding the Non-Proliferation Treaty, and the treaties banning weapons of mass destruction from outer space and the seabed.

It should be stressed that a constant criterion for evaluating all aspects of policy is the determination to avoid any suggestion of the offensive use of Canadian Forces to commit aggression, or to contribute to such action by another state. Such a possibility would be unthinkable and unacceptable. With a view to ensuring the protection of Canada and contributing to the maintenance of stable mutual deterrence, Canada's resources, its territory, and its Armed Forces will be used solely for purposes which are defensive in the judgment of the Government of Canada.

Sovereignty and Independence

Canada's sovereignty and independence depend ultimately on security from armed attack. In this sense, the contribution of the Canadian Forces to the prevention of war is a vital and direct contribution to safeguarding our sovereignty and independence. Defence policy must, however, also take into account the possibility that other challenges to Canada's sovereignty and independence, mainly non-military in character, may be more likely to arise during the 1970s. They could come both from outside and from within the country, and to deal with them may in some ways be more difficult. While deterring war is not an objective Canada alone can achieve, and is therefore one which must be pursued through collective security arrangements, the other challenges to sovereignty and independence must be met exclusively by Canada. The provision of adequate Canadian defence resources for this purpose must therefore be a matter of first priority.

External Challenges: By assuming the general responsibility for surveillance and control over Canadian territory, waters and airspace, in conjunction with civil agencies, the Canadian Forces help safeguard sovereignty and independence. Challenges could occur through actions by foreign agencies or their nationals involving territorial violations or infringements of Canadian laws governing access to and activity within these areas. This is not a new role for the Canadian Forces, but its dimensions are changing.

The North, in a sense the last frontier of Canada, has a unique physical environment presenting special problems of administration and control. Modern industrial technology has in recent years stimulated a growth of commercial interest in the resource potential of the area, and contributed to a major increase in oil and gas exploration in the Territories, especially on the Arctic Islands. These activities, in which foreign as well as Canadian companies are involved, have brought with them a need to ensure that exploitation of the resources is carried out in accordance with Canada's long-term national interests. There is a danger that this increased activity with its inherent danger of oil or other pollution might disturb the finely balanced ecology of the region. The Government therefore decided to take special measures to ensure the environmental preservation of this uniquely vulnerable area, and to ensure that these measures are fully respected. Strict regulations governing land use and mineral exploration and exploitation are being brought into effect. Legislation provides for the exercise of pollution control jurisdiction in an area extending generally 100 miles from the mainland and islands of the Canadian Arctic.

Canada is a three-ocean maritime nation with one of the longest coastlines in the world, and a large portion of the trade vital to our economic strength goes by sea. The Government is concerned that Canada's many and varied interests in the waters close to our shores, on the seabed extending from our coasts, and on the high seas beyond, be protected.



Land-based Tracker aircraft carry out surveillance over our coastal waters.

The Government has taken decisions with respect to the limits of Canada's territorial sea and fishing zones off the East and West coasts. Modern fishing techniques have resulted in a concern for the conservation of fishing resources in these areas. Legislation has extended Canada's territorial sea from three to twelve miles, and the former nine-mile contiguous fishing zone has been incorporated within the extended territorial sea. At the same time, new and extensive Canadian-controlled fishing zones have been created in areas of the sea adjacent to the coast. An order-in-council has been promulgated establishing such fishing zones in Queen Charlotte Sound, Dixon Entrance and Hecate Strait on the West Coast, and the Gulf of St. Lawrence and the Bay of Fundy on the East Coast, a total area of 80,000 square miles. Against the possibility of potentially disastrous oil spills, pollution control is also to be exercised in these areas.

Exploration and exploitation of the resources of the continental shelf are regulated under the Oil and Gas Production and Conservation Act. This area extends to the limits of exploitability, which Canada interprets as comprising the submerged continental margin. Although less extensive off the West Coast, it extends hundreds of miles off the East Coast, and encompasses large areas off the Arctic mainland and islands. In recent years there has been a tremendous increase in technological capability for exploitation of this resource potential.



On a northern surveillance flight, an Argus flies over Baffin Island coast.

Departmental Responsibilities and Relationships: The Government's objective is to continue effective occupation of Canadian territory, and to have a surveillance and control capability to the extent necessary to safeguard national interests in all Canadian territory, and all airspace and waters over which Canada exercises sovereignty or jurisdiction. This involves a complex judgment on the challenges which could occur and on the surveillance and control capability required in the circumstances.

The Canadian Forces do not have sole responsibility for ensuring respect for relevant Canadian legislation but they do have a general responsibility for surveillance and control over land, sea and airspace under Canadian jurisdiction. In peacetime this role of the Forces is in many respects complementary to that of the civil authorities. The requirement for military assistance is generally greater, however, in more sparsely settled regions until a stage of economic and social development has been reached, justifying an expansion of civil agencies and resources. Similarly, where the Canadian Forces have the capability to meet a shortage in civil resources for the policing of waters off the coasts, their role can be expanded.

The area to be covered is vast. In certain regions facilities are limited and weather conditions are often adverse. The problem would perhaps be

simpler if it were restricted to the more traditional security threat of direct military attack from a predictable enemy. Instead, challenges could arise in more ambiguous circumstances from private entities as well as foreign government agencies. Incidents may involve, for instance, a fishing vessel, an oil tanker or a private aircraft. But the principle involved is well established. By creating a capability for surveillance and control which is effective and visible, the intention is to discourage such challenges.

Other departments of government already have specific responsibilities in many instances for regulating activity in Canadian territory, and these lead to requirements for carrying out surveillance and exercising control. National Defence has, however, ultimate responsibility to ensure that overall an adequate Canadian surveillance and control capability exists for the protection of Canadian sovereignty and security. Consequently the Government intends to establish Canadian Forces' operations centres on the East and West coasts which will work closely with the civil departments to co-ordinate surveillance and control activities. Where required by potential challenges to our interests the Canadian Forces will carry out surveillance and exercise control in those areas not covered by the civil departments, or in which the latter require assistance in discharging their responsibilities. Close consultation between National Defence and the civil departments concerned will be maintained on a continuing basis to ensure that surveillance and control is being exercised when, where, and to the extent necessary to satisfy the Government's requirements in the most economical way.

Internal Security: The Canadian experience over the last two years clearly indicates the necessity of being able to cope effectively with any future resort to disruption, intimidation and violence as weapons of political action. The three prime instances in which the Forces were used recently in this role were during the Montreal police strike, the political kidnapping crisis of last October and the Kingston Penitentiary riots. While civil disorder should normally be contained by the civil authorities, and the strength of municipal, provincial and federal police forces should be maintained at levels sufficient for the purpose, we must nevertheless anticipate the possibility that emergencies will again arise which will necessitate the Canadian Forces coming to the aid of the civil power. It is important that the latter should be able to rely upon timely assistance from the Forces. The Forces' role in such situations is important and could be crucial.

In addition to the possibility of future crises arising in Canada, there is also the possibility that violent events elsewhere could stimulate outbreaks in Canada. This problem is therefore one with clear international ramifications. Indeed, it appears that much of the world has already moved into an era which will see established order increasingly challenged by organized violence. These are times of confrontation when growing numbers of people appear to be prepared to resort to violence with a view to destroying the democratic process.

National Development

Although maintained primarily for purposes of sovereignty and security, the Department of National Defence provides an important reservoir of skills and capabilities which in the past has been drawn upon, and which in the future can be increasingly drawn upon, to contribute to the social and economic development of Canada. By their service and devotion to duty the members of the Armed Forces, and the civilians who support them, have made a significant contribution to preserving a democratic society in Canada against the threat of external challenges.

The Armed Forces make an important contribution to Canada's unity and identity in a number of ways. They bring together Canadians from all parts of the country, from all walks of life, from the two major linguistic groups and other origins, into an activity that is truly national in scope and in purpose. They are distinctively Canadian and this is symbolized by their new uniform. A career in the Armed Forces has enabled many Canadians to advance their education and skills, whether in university, in technical specialties or in a trade. The influence of the Forces is extended to young people through cadet and militia programs, and through the work of many individual members in youth organizations. The Department continues to view its support of such activities as a vital contribution to the well-being of the youth of our country.

The inherent characteristics of the Armed Forces combine effective command and organization, high mobility, great flexibility and a range of skills and specialties broader than that of any other national organization. These provide Canada with a resource which may be used to carry out essentially non-military projects of high priority and importance to national development. The objective will be to use the Forces primarily on projects which relate to their capabilities to respond efficiently and promptly to their basic defence roles.

The Forces will be called upon, therefore, in conjunction with other government departments, to assist development in the civil sector, especially in the remote regions where disciplined task forces with wide experience in adapting to unusual or challenging circumstances are required. Where possible, the Reserves will also be used in this role. A further objective of this policy will be to promote greater involvement of the military in the community, and to ensure that the community is aware of the ways in which the military sector contributes to achieving national aims and priorities.

The Canadian Forces have made a major contribution to the development of the North. The Northwest Territories and Yukon Radio System, established in 1923, pioneered development of communications in the North. Both before Second World War and in the post-war years, the Forces carried out extensive aerial photographic and survey activities which played a key part in mapping the Arctic and in opening it up for air transportation.

The construction of defence installations in the North developed new techniques for dealing with permafrost and other Arctic conditions which

have been invaluable to subsequent northern development. Much has been done to understand and deal with the special problems of communications and navigation in the Arctic. An icebreaker operated by the Forces was the first large ship to navigate the Northwest Passage. The Forces, with the help of the Defence Research Board (DRB), have been in the forefront of the opening of the North and have pioneered in finding solutions to the problems of its development. This role will be enhanced in the future, particularly where National Defence engineering and construction resources can be utilized.

The Forces will make a major contribution to the preservation of an unspoiled environment and an improved quality of life by supporting the civil agencies in exercising pollution control in the North and off Canada's coasts. The Forces and the Canada Emergency Measures Organization will continue to play an important part in providing relief and assistance in the event of natural disasters or other civil emergencies, including those resulting from oil spills or other forms of pollution.

The work of the Armed Forces, in concert with DRB as part of the Ministry of Transport Task Force during the clean-up operations after the tanker Arrow went aground in Chedabucto Bay last year, illustrates their competence in this field. The Department of National Defence provided a wide range of services and skills, including a base vessel, skilled divers, an emergency communications centre, quick-reacting transportation, special



Canadian Forces provide expertise and practical help in pollution clean-up.

experience in civil and maritime engineering and necessary general scientific knowledge.

For many years the Forces have also assisted in flood control operations and in fighting forest fires, and have had major responsibilities for air-and-sea search and rescue activities.

The important contributions made by the Canadian Armed Forces following the recent earthquakes in Peru, their assistance in providing relief to Pakistan after the floods, and their current relief flights for the refugees in eastern India, all amply demonstrate their effectiveness in international relief operations. These operations gave support to Canadian foreign policy and enabled Canada to help the homeless and sick in vital disaster areas.

The Forces can also give further support to foreign policy objectives through increased assistance in economic aid programs. National Defence has capabilities to assist in such fields as engineering and construction, logistics policies, trades and technical training, advisory services, project analysis and air transport. The Department will work with the Canadian International Development Agency and the Department of External Affairs to study the possible use of military capabilities in support of specific aid programs or projects as the need arises.

Defence expenditure forms an important component of Federal Government expenditures and one which has considerable impact on Canada's economy. This expenditure, largely taking the form of salaries paid to military and civilian employees and of payments for goods and services, clearly has yielded important incidental benefits to economic growth.

Although the payroll to military and civilian employees is decentralized and has benefited the economies of every province in Canada, the purchases of military equipment and other supplies have tended to be concentrated in the more heavily industrialized centres. In the foreseeable future the largest volume of defence purchases will continue to be made in these industrialized areas, but to assist in the attainment of the Government's objective of regional economic equality, further decentralization of defence procurement into all regions of Canada will be encouraged whenever this can be done consistent with long-term economic efficiency.

The main economic benefits of defence activities have been scientific, technological and industrial. The requirements of the Armed Forces for effective modern equipment, and the rapid scientific and technological advances in such equipment since the Second World War, have acted as a catalyst to stimulate the introduction of new techniques into Canadian industry. The Canadian Armed Forces and the Defence Research Board have contributed many innovations, ranging from transportable housing and new methods of food processing, to navigational aids and space technology.

The Defence Industrial Research Program and programs of the Department of Industry, Trade and Commerce play an important role in maintaining a viable defence industrial base. Their financial assistance to industrial research is designed to ensure that Canadian companies can com-

pete for research, development and ultimately, production contracts in defence and civil markets. Examples include support in the fields of digital flight simulators, short and vertical take-off aircraft and airborne doppler radar.

Research in universities also receives considerable support from DRB grants. They have been allocated in many fields, including aviation medicine and upper atmosphere and aerospace research.

Projects with a defence orientation frequently lead directly to benefits in civil areas. A major breakthrough in gas lasers by DRB has placed Canada in the forefront of this rapidly expanding field. Two Canadian companies now have licences to develop lasers using this technology for commercial use, and the simplicity of this type of laser will make low cost, high energy instruments available to a wide range of users, including small industries and laboratories. Another example is the study of underwater life support systems which has led to the development of an analogue pneumatic decompression computer, which is being produced commercially with continuing technical assistance from DRB.

The Canadian satellite program was developed principally with defence resources and skills. This has permitted Canada to stay in the forefront of this area of technology and created a foundation for a satellite program which has now been transferred to the Department of Communication. Alouette I was designed and built completely within the Defence Research Telecommunication Establishment. With Alouette II and ISIS-A the opportunity was taken to bring industry in Canada into the satellite program. As a result, skills have either been introduced or strengthened in the companies involved, and these companies are now receiving foreign contracts.

Such successes depend on the maintenance of a high level of scientific and technical expertise. Science and technology advance at an ever increasing rate, and considerable effort is required to remain competitive. Canada's participation in the international field of defence research is considered essential. In certain areas, some of which are mentioned above, Canada has been able to contribute substantially; in many others we receive much more than we contribute.

To fulfill their assigned roles, the Armed Forces need highly sophisticated and costly equipment. Our experience in 1959 with the cancellation of the Arrow interceptor aircraft firmly established that, because of the costs and the small quantities involved, such development cannot be economically undertaken by Canada acting alone. Because of costs and complexity, and the need for relatively long production runs, most countries have now accepted the need for co-operative efforts in producing their major equipment needs.

A significant portion of the capital equipment budget is thus spent abroad, largely in the United States. To ensure that Canada obtains equivalent economic, industrial and technological benefits for these expenditures, and in order to maintain a domestic defence industrial base, arrangements

have been made with our allies for Canadian industry either to share in the production of equipment or to export a like value of defence products to our allies. Co-operation with the United States and other countries in development and production-sharing programs has been a significant factor in allowing the Canadian Armed Forces to purchase the best equipment at the most advantageous prices.

Priorities for Canadian Defence Policy

The policy announced by the Prime Minister on April 3, 1969, initiated the process of adjusting the balance between Canadian defence activities to ensure that priorities for defence were responsive to national interests and international developments. Four major areas of activity for the Canadian Forces were identified in summary form as follows:

- (a) the surveillance of our own territory and coast-lines, i.e. the protection of our sovereignty;
- (b) the defence of North America in co-operation with U.S. forces;
- (c) the fulfilment of such NATO commitments as may be agreed upon;
and
- (d) the performance of such international peacekeeping roles as we may from time to time assume.

This paper will next examine these four areas of defence policy in detail. Activity in each must be assessed in terms of the priorities which have been established, and of the cost-effectiveness and marginal return of various options. With the limited resources available for Canadian defence needs, it is desirable to have versatile forces and multi-purpose equipment rather than a high degree of specialization. Multiple tasking is also necessary in order to make the most efficient use of available resources.

Protection of Canada

Apart from aid of the civil power, which will be considered separately, the two principal aspects of this role for the Forces are surveillance and control. Surveillance requires detection and identification to obtain information on what is happening on Canada's land mass, in her airspace and on and under her coastal waters; control implies appropriate enforcement action to ensure that laws and regulations are respected.

Surveillance

Military surveillance is required for the protection of Canada and Canadian interests, but it is also an essential contribution to North American defence and, in the broader context, to the security of the North Atlantic region. In our collective security arrangements, surveillance is conducted to provide warning of potentially unfriendly acts by foreign military forces. But Canada also has a national requirement for certain surveillance activities to provide information on events of importance occurring on land, at sea and in Canadian airspace.

Air: Almost all identification of aircraft in the Canadian airspace which is under air traffic control is performed by comparing radar tracks with filed flight plans, or by ground-to-air communication through the active co-operation of the aircraft concerned. The communications network required to make flight plans available in time is of considerable complexity. Since the function of civilian air traffic control requires much of the same data as the function of identification for air defence, full civil-military co-operation is the most effective approach. There is already a considerable degree of integration and more will be possible in the future, with benefits in both areas.

Extensive surveillance systems are now operated as part of the North American Air Defence Command (NORAD) but they also serve national purposes in covering a portion of Canadian airspace. A number of radar installations, many of which were operated by the U.S., have been closed in recent years to effect economies as the bomber threat declined. The U.S.

earlier this year gave Canada notice of intention to close two radar stations it operated in Canada: Melville, near Goose Bay, Labrador, and Stephenville, Newfoundland. In order to continue the radar coverage in the Labrador area which is required for adequate surveillance as well as control on the East coast, the Government decided to operate Melville as a Canadian radar site.

Maritime and Land: A substantial capability for surveillance over Canada's waters in the temperate zone is currently available. Surveillance over Arctic land and waters can be carried out by long-range patrol aircraft but at present is limited by light and weather conditions. Surveillance by ships is restricted to ice-free periods of the year. Because of the areas involved, general ground surveillance by land forces is not practicable. The Department of National Defence is assessing the challenges that might be expected in the Canadian North and, if warranted, will increase surveillance.

Surveillance over maritime and land areas is currently available from the Argus long-range patrol aircraft which was designed and bought specifically to detect and track submarines. The Tracker aircraft has similar capabilities, although its range is much shorter. Both the Argus and Tracker could be operated at least to the end of the decade, and therefore the question of a new generation of this type of aircraft need not necessarily arise for several years. The Argus would, however, have to be overhauled to ensure continued air worthiness. A comprehensive systems analysis of the alternatives is being undertaken.

The CF-5 aircraft was acquired for the non-nuclear tactical support role and will normally work with the land forces. The CF-5s will also be employed to provide a quick-response photographic reconnaissance capability in Canada and over the waters off Canadian shores. In addition, some of the CF-5s will be employed in the advanced training role now being carried out by the T-33 aircraft, thus obviating the need to acquire a new aircraft for this purpose.

Although Canada has a good capability to detect submarines in its waters in the temperate zone, it has only very limited capability to detect submarine activity in the Arctic. It might be desirable in the future to raise the level of capability so as to have subsurface perimeter surveillance, particularly to cover the channels connecting the Arctic Ocean to Baffin Bay and Baffin Bay to the Atlantic. The Government is therefore undertaking research to determine the costs and feasibility of a limited subsurface system to give warning of any unusual maritime activity. The Defence Research Board is playing an important role in these studies. If found to be desirable, the system could be operated as part of the overall surveillance of North America against unknown submarines.

The Forces already operate one submersible or miniature submarine. Submersibles could have an important role in research, and in continental shelf and seabed surveillance. In co-operation with civil agencies, the Forces and DRB will develop an undersea program of national benefit.

Assistance to the Civil Authorities: The general surveillance of Canadian airspace and waters required for national security will permit greater support to other departments. Initial consultations with the civil departments responsible by legislation for the protection of various specific interests have already indicated several areas where a greater contribution by the Armed Forces will be necessary. They will be kept under review to ensure that the total national effort is both effective and efficient in the use of available resources to meet the Government's requirements.

Some of the activities identified are:

- (a) general area surveillance of foreign fishing fleets off the coasts;
- (b) specific reconnaissance missions on a quick-response, short-term basis to locate those fishing fleets when they move and fail to appear where expected;
- (c) area surveillance of offshore waters to detect and report suspected illegal seismic and other exploratory activities;
- (d) assistance in ice reconnaissance operations;
- (e) surveillance when needed of Canadian waters off the East and West coasts and in the North to detect pollution at sea;
- (f) surveillance of Canadian territorial waters to detect and report foreign vessels illegally present therein;
- (g) surveillance of sites of mineral exploration and exploitation projects in the North when verification of their location and status is required; and
- (h) during the appropriate seasons, provision of observer space on aircraft engaged in northern surveillance operations to permit wild-life observation.



Regulars and Reserves are often called upon to assist the civil authorities.

Control

In addition to the requirements for surveillance a military capability for control is required as an adjunct to the other measures necessary for the protection of Canada and Canadian interests. This should include an ability to enforce these measures should laws not be respected. Such efforts to protect national interests are fully consistent with Canadian involvement in collective security against foreign military attack.

Air: Our national airspace regulations are normally enforced by taking action against the pilot or owner of an offending and non-co-operating aircraft after it lands. Occasionally, however, an aircraft is detected by radar and cannot be identified by flight plan correlation or by communication. If such aircraft cannot be identified as legitimate civil or military traffic, an interceptor aircraft must be sent up to identify it and, if necessary, force it to land.

The Government intends to use its air defence resources to the best advantage to ensure that Canadian aircraft are able to intercept and identify intruders in Canadian airspace over as wide an area as possible. At present, identification of aircraft is confined to that part of Canadian airspace covered by radar.

CF-101 (Voodoo) interceptor aircraft are operated by the Canadian Armed Forces at Chatham, New Brunswick, Bagotville (with a detachment at Val d'Or), Quebec, and Comox, British Columbia. Under the NORAD plan the air defence needs are adequately met in areas where Canadian aircraft are not deployed, largely by interceptors flown from U.S. bases. Although from a strictly air defence point of view it may make little difference whether the aircraft is Canadian or U.S., from a national point of view the Government believes that normal peacetime identification should be performed by Canadian aircraft.

The Government has therefore decided that Canadian CF-101s should at all times be able to conduct interception and identification missions in the approaches to Eastern Canada, and appropriate arrangements will be made. The Government has decided as well to utilize CF-104 aircraft already based at Cold Lake, Alberta, in the Operational Training Squadron, so that Canada will have its own interception and identification capability in the Prairie area.

The Government will keep under review the options available for using mobile surveillance radars, either airborne or air portable, so that airspace control can be instituted where and when needed. For example, protection of Canadian interests may, in the future, require air-traffic-controlled airspace in certain parts of the North.

Maritime: Canada's sea and air maritime forces possess a considerable capability for exercising control in the territorial seas, in the fishing and pollution control zones, and in the waters above the continental shelf. It is through continuous operations and co-ordinated team efforts, often in co-operation

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with units of other government departments, that the necessary degree of control can be achieved. Although the present naval ships cannot operate safely in ice-covered waters, or above 65° N latitude at any time of the year, they are being employed in northern waters to a greater extent during the summer months.

The Canadian Forces are conducting an extensive test program on the hydrofoil craft, Bras d'Or, which was designed and built in Canada. A decision on procuring hydrofoil craft for surveillance and control will be



Canadian destroyers from Maritime Command on NATO exercise in the Atlantic.

based on a cost-effectiveness study. It will determine the optimum performance characteristics for this particular role, and will examine alternatives such as fast patrol boats of a normal displacement design. The study will have to be concerned with the weapons system for such craft, given their primary role of surveillance and control, and the possibilities of equipment packages to provide flexibility to meet a number of other roles. Air-cushion vehicles which might have a military role in the Arctic are being kept under review and will be considered in this study.

The possibility of the Department of National Defence providing increased support to other departments in control activities has been studied, and the results indicate a need for:

- on-call support by naval vessels on both East and West coasts to deal with incursions by fishing fleets in the Canadian territorial sea or fishing zones;
- occasional arrest within territorial waters and pollution control zones of foreign ships in breach of Canadian anti-pollution regulations.

The Forces will be prepared to respond when called upon by the appropriate authorities in such situations.

Land: The current capabilities of the Canadian Forces are generally adequate for surveillance and control. The three combat groups within Canada are air transportable and the Canadian Airborne Regiment provides a parachute-drop capability well suited for operations in the North. In the event of a requirement to defend the land mass of North America, a mutual support arrangement exists with the United States.

More emphasis is being placed on training the Armed Forces to live and operate in the Arctic. A Northern Region Headquarters has been established at Yellowknife, and there is a military liaison staff at Whitehorse. Consideration will be given to establishing other small bases in the North, particularly in the Arctic Islands, and to the desirability of reconstituting the Canadian Rangers. National Defence is also examining the desirability of establishing a special training school for all personnel assigned to the North. The adequacy of existing equipment is also being studied, with particular emphasis on over-snow vehicles.

Aid of the Civil Power

The Canadian Armed Forces, and in particular the land element, have always had a responsibility to aid the civil power whenever required, and the events of last year have shown how important this role can be. One of the tasks assigned to the three combat groups and the Airborne Regiment is to assist in internal security operations if required. Additional land forces could be made available in an emergency from the Reserves and from forces engaged in other roles. Normal military training prepares the Canadian soldier exceptionally well for this role. Discipline and restraint, which are vital when acting in such a role, are an essential part of military training.

The Defence of North America

The Nuclear Deterrent System

The only direct external military threat to Canada's national security today is that of a large-scale nuclear attack on North America. So long as a stable strategic balance exists, the deliberate initiation of nuclear war between the U.S.S.R. and the U.S. is highly improbable; this constitutes mutual deterrence. It is far from being the theoretically ideal means of maintaining peace, but the Government, while continuing to participate in the arms control deliberations, remains convinced that there is nothing to replace it at present. Therefore, Canada must do what it can to ensure the continued effectiveness of the deterrent system.

In the defence of North America, Canada is inevitably closely associated with the United States. Even if no warheads actually landed on Canada in the event of general nuclear war, a strategic attack on the U.S., which could leave over 100 million dead, would have cataclysmic consequences for this country.

From a potential enemy's point of view, however, North America can only logically be seen as one set of targets. Canada's centres of population and industry logically form part of the major target plan for a strategic nuclear attack on North America. Most are concentrated along the St. Lawrence and in the lower Great Lakes regions, virtually all are close to the Canadian-U.S. border, and the Canadian and U.S. economies are highly integrated. Regardless of the circumstances leading up to such an attack, logically, for geographical reasons if for no other, we must plan on the basis that we shall inevitably be gravely affected.

The Government concluded in its defence review that co-operation with the United States in North American defence will remain essential so long as our joint security depends on stability in the strategic military balance. Canada's objective is to make, within the limits of our resources, an effective contribution to continued stability by assisting in the surveillance and warning systems, and in the protection of the U.S. retaliatory capability as necessary. Co-operation between Canada and the U.S. in the joint defence of North America is vital for sovereignty and security.

Canada's Contribution

This paper indicates what in the Government's view would be the most appropriate and effective contribution, taking into account political, strategic, economic and military factors. Given the resources available for defence, and the almost limitless demands on them, this contribution will be directly related to the surveillance and control role for the Forces.

In air defence, Canada's part in the past has been one of contributing to the provision of interceptor aircraft, surface-to-air missiles, radars, communications and associated headquarters. These activities, conducted since 1958 under the NORAD agreement, have had three main benefits for Canada:

- they have helped to assure the protection of the U.S. deterrent against what was at one time the main threat, that of Soviet bomber attack;
- they have provided for a defence which would take place beyond the settled areas of Canada; and
- they have enhanced Canada's control over its own territory.

In maritime defence, Canada contributes forces through arrangements with the United States and assumes responsibility for ocean areas adjacent to Canada's shores. These arrangements have had two main benefits for Canada:

- they have provided surveillance over contiguous ocean areas against surface and subsurface vessels, and provided warning of a build-up of potentially hostile forces; and
- they have provided the capability necessary to cope with hostile activity.

Ballistic Missile Warning and Defence

Warning of attack on North America by intercontinental ballistic missiles (ICBMs) is provided by a variety of surveillance systems. Although none of these is located in Canada, the communications for the Ballistic Missile Early Warning System (BMEWS) pass through Canada to the joint Canada/United States NORAD headquarters at Colorado Springs. Improvements to this system are being considered by the U.S., but none involve more extensive use of Canadian territory. The Canadian Forces also operate a Baker-Nunn camera facility at Cold Lake as part of the U.S. Space Detection and Tracking System (SPADATS).

Concern has been expressed by Canadians about the consequences of U.S. based anti-ballistic missiles (ABMs) intercepting missiles over Canadian territory. It should be understood, however, that an ABM defence in the U.S. would function only during a nuclear onslaught on North America. In these circumstances, whether interceptions took place over Canadian territory or not would make relatively little difference to the Canadian public with respect to fallout or other effects. In fact, if interceptions took place over Canada,

the effects on the Canadian population would almost certainly be less than if the missiles reached their targets in the United States. The system is designed to ensure that the Spartan and Sprint missiles will not cause significant damage on the ground below the point of burst. Moreover, under current deployment plans, only the Spartan missile could carry out interceptions over Canada, and these would take place outside the atmosphere.

While the ABM question is one of obvious importance to Canada and has been closely followed by the Government, the U.S. does not depend on Canadian territory for its ABM system as it did in the 1950s and 1960s for the anti-bomber defence system, and has not requested or suggested Canadian participation.

The Strategic Arms Limitation Talks are making progress as exemplified by the fact that the U.S. and the U.S.S.R. announced an understanding on May 20, 1971, to concentrate on achieving this year an agreement on limiting deployment of ABMs. They will also agree on certain measures with respect to the limitation of offensive strategic weapons. The Canadian Government shares the conviction expressed by the two sides that this course of action will create more favourable conditions for further negotiations to limit all strategic arms. An agreement if attained would amount to an historic turning point in efforts to curb the nuclear arms race, and to enhance national and international security through nuclear arms control.

Maritime Warning and Defence

Canada's maritime forces can detect and monitor potentially hostile maritime operations in waters off Canada's coasts. As in air defence, this constant surveillance contributes to international stability by demonstrating an ability to detect any build-up by a potential aggressor. In fact, most of Canada's maritime forces have a high degree of flexibility in the sense that they can be employed either for North American defence or for the protection of Canada's maritime interests through surveillance and control.

The last decade has witnessed a rapid expansion in, and a global deployment of, Soviet naval power. The Soviet missile-firing submarine force in particular has increased substantially in both numbers and capability.

In 1965 the Government decided to acquire four helicopter-carrying destroyers (DDH 280 class), two of which will be available in late 1972, and a further two in 1973. These vessels were judged to be necessary as a replacement for some of the ships then in service which were becoming obsolescent. The new destroyers have a general purpose capability and will be more flexibly employed than any of the destroyers currently in service. They will be better able to support the activities which evolve from the new defence priorities.

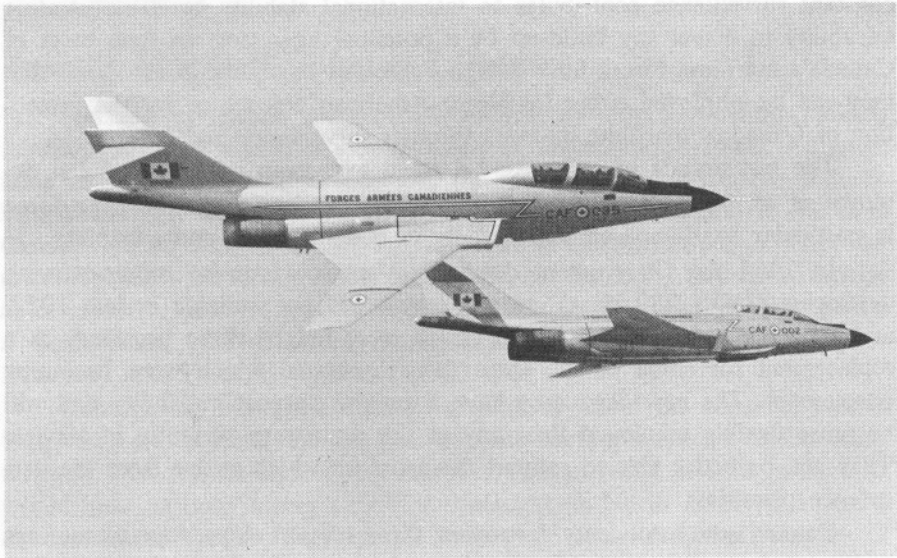
Canada now has twenty destroyers, three support ships, four submarines and several squadrons of Argus and Tracker aircraft. While this force has considerable versatility, which will be enhanced by the four new DDHs,

it was designed as a highly specialized force to operate against submarines. Although an anti-submarine warfare (ASW) capability will be maintained as part of the general purpose maritime forces, the present degree of emphasis on anti-submarine warfare directed against submarine-launched ballistic missiles (SLBMs) will be reduced in favour of other maritime roles.

The Government believes Canada's maritime forces must be reoriented with the long term objective of providing a more versatile general purpose capability. Versatility is required because it is not possible to be certain precisely which maritime activities will be required and which will not in the years ahead. It is therefore sensible to design a general purpose capability for Canada's maritime forces. This policy will take a long time to implement fully because of the life of current equipment, but it will govern both the acquisition of new equipment for the maritime force, and where applicable, modifications to existing equipment. This policy will also govern training for the maritime forces.

Bomber Warning and Defence

If a nuclear attack ever occurred, it is most probable that Soviet nuclear forces would probably be launched in a concerted program with minimal warning to achieve maximum surprise. Soviet strategic bombers, of which there are now about 150, would have a follow-on role. This is largely because of the effectiveness of NORAD's warning system. Bombers would probably be dispatched simultaneously with missiles but would reach North America



Canadian Air Defence Command Voodoos contribute to NORAD continental defence.

several hours later, presumably to strike targets which did not require immediate attack, or which the missiles had not successfully attacked. Given this situation, the question is how much priority should be given by Canada in the future to bomber defence.

Up-to-date surveillance systems will continue to be required since, if they were not employed, bombers could approach North America undetected and add very substantially to the weight of the attack. The surveillance systems in Canada contribute to deterrence by inhibiting the Soviets from launching their bombers against North America before their missiles. This is because the NORAD detection system would signal impending attack and could invite a pre-emptive and devastating U.S. missile strike.

The time has passed, however, when a full, active anti-bomber defence is essential for the protection of the U.S. deterrent capability. The U.S.-assured destruction or retaliatory capability now resides largely in the ICBM and SLBM force. The principal threat to that force is the Soviet land-based missile force, in particular the very large SS-9 type missile.

The BOMARC missiles sited in Canada were a relatively important contribution in the days when a full anti-bomber defence existed to defend urban-industrial targets as well as to protect the deterrent which consisted largely of the U.S. bomber force. The deployment by the U.S.S.R. of a missile force numbering in the thousands has altered considerably the strategic situation. The BOMARCs have become highly vulnerable to missile attack since they cannot be dispersed like aircraft. Moreover, the Canadian BOMARCs are sited to defend the eastern part of North America whereas the preponderance of the U.S. land-based strategic retaliatory forces is located in the mid-west. Since no comprehensive defence of population against missile attack is likely to be available in the foreseeable future, the Government has concluded there is no longer sufficient reason to continue to deploy BOMARCs in Canada, and this system will therefore be retired. Arrangements will be made to minimize the economic effects of this decision.

Canada will maintain the number of interceptor aircraft at the current level to contribute to stability since Soviet bombers could considerably augment follow-on attacks on North America. The Soviets might also be tempted to rebuild their long-range bomber force if they believed there would be absolutely no defences against them. Moreover, interceptor aircraft are required for peacetime identification and sovereign control of airspace. Canadian interceptors are located so as to maximize the possibilities for conducting a defence north of heavily populated areas.

To provide effective deterrence, at the present time there is a continuing need for the integrated operational control over forces made available for the air defence of Canada and the U.S. as provided by the NORAD agreement which was signed in 1958 and renewed in 1968. The agreement does not specify any level of forces, equipment or facilities, so the nature and extent of Canada's contribution continues to be a matter for decision by the Canadian Government. The NORAD agreement will be up for renewal in 1973.

The policy of the Government at that time with respect to the agreement and the interceptor force posture required will depend upon the strategic situation extant, including progress in SALT.

The Canadian Government is not therefore prepared to devote substantial sums to new equipment or facilities for use only for active anti-bomber defences in the future. Over the last decade the anti-bomber defences available to NORAD have been substantially reduced as a result of changes in the threat. Unless the strategic situation changes, the Government intends to update its contribution to the active anti-bomber defences of North America only to the extent that this is required for the general control of Canadian airspace.

Two systems are being developed in the U.S. primarily for the purposes of North American anti-bomber defence. They are the Over-The-Horizon (OTH) radar and the Airborne Warning and Control System (AWACS). It is possible that operating together they could replace some of the existing fixed radars and reduce the vulnerability of the system. Present indications are, however, that neither will be operational until the latter part of the decade.

The OTH radar may in the future be able to provide a surveillance capability against intruding aircraft for a large part of Canadian airspace not covered by existing radar. DRB, in co-operation with its U.S. counterpart, will be testing the operation of OTH radar in Northern Canada. The AWACS has two primary functions—warning, including surveillance, and control in terms of guidance of interceptors. It could therefore be used for patrols on a random or fixed basis, and to control intercepts if suitable aircraft were within range. The Government will keep both systems under review since they could in the future fulfill an important role in the surveillance of Canadian airspace in the North American defence context.

In air combat there is at present no alternative to equipping the CF-101s with nuclear warheads held in Canada by the U.S. under existing storage and custody arrangements. The CF-101s have a conventional air-to-air capability and are operated in this mode for peacetime interception and identification. However, to play an effective role in the defence of North America against the threat of massive nuclear attack, they require nuclear-tipped air-to-air weapons. Only with such weapons would they have a reasonable prospect of destroying attacking bombers and their nuclear weapons before the latter were released.

This means that the only system still in the Canadian Forces requiring nuclear weapons will be the CF-101 Voodoo aircraft based in Canada. The Honest John surface-to-surface missile battery has been disbanded, the CF-104 will drop the nuclear strike role in Europe at the end of this year, and the BOMARC will be retired shortly.

The Government has decided that in normal peacetime circumstances the guiding principle should continue to be that, to the greatest extent

feasible, defence activities on Canadian territory will be carried out by members of the Canadian Armed Forces. During periods of international crisis, however, special arrangements are required to enhance the protection of North America and contribute to the maintenance of stable mutual deterrence.

The Government is therefore prepared to continue to allow U.S. Strategic Air Command (SAC) refuelling tankers to use Goose Bay; and SAC bombers will continue to be permitted to overfly Canada on airborne alert in times of crisis, as determined by the Government. This co-operation also includes continued training flights in Canadian airspace in peacetime by SAC bombers not carrying nuclear weapons.

In addition, the Government is prepared to respond to the U.S. proposal to open negotiations with the objective of allowing U.S. interceptor aircraft to disperse to selected bases in Canada in times of crisis, as determined by the Government, if this would maximize the effectiveness of the residual anti-bomber defences. The Government is also prepared to open negotiations as proposed by the U.S. for SAC refuelling tankers to be dispersed to selected bases in Canada, should the international situation, in the Government's view, require such action.

This overall co-operation strengthens the U.S. retaliatory capability, and hence deterrence, by increasing the survivability and effectiveness of the U.S. bombers in their second strike role. Such operations bear no relationship to a first strike capability for the same reason that the Soviet bombers would not be used as a first strike weapon against the U.S. In both cases, the movement of large numbers of aircraft would be detected and would thus risk a pre-emptive missile response by the other side.

The North Atlantic Treaty Organization

Canada is one of only two partners in the NATO Alliance which station forces outside of their own continent. It is also one of only six of the 15 member nations which station forces outside their national borders for NATO purposes. It is apparent from these facts that NATO's collective defence rests primarily on defence of national homelands. An understanding of this situation is important to put in proper perspective the change in Canadian force deployment announced in April, 1969. This understanding will also dispel a widespread misconception that only the stationing of Canadian Forces in Western Europe constitutes a contribution to NATO's collective defence.

There were two main reasons for the decision to review the level of our force contribution in Europe. Economic circumstances in Europe had undergone a marked change in the nearly twenty years since Canada first stationed peacetime forces in Europe. Under the protective shield of NATO, Western Europe had succeeded in transforming the shattered economies of 1945. Since then its GNP has grown to about \$600 billion per year for a population which exceeds 300 million people, and in many countries there is a high level of employment. In considering the defence implications of this phenomenal recovery, Canada concluded that its European partners were now able to provide a greater proportion of the conventional forces needed for the defence of their own region of the Alliance.

The second reason for review was that other national aims—fostering economic growth and safeguarding sovereignty and independence—dictated increased emphasis on the protection of Canadian interests at home. In addition, Government-wide financial restraints, and the resulting need for compatibility of roles and equipment for our home and overseas-based Armed Forces, dictated the need for some adjustment.

The Government reaffirmed Canada's adherence to the concept of collective security, and announced that Canada would continue to station significant though reduced forces in Europe as part of the NATO integrated force structure. Forces based in Canada for emergency deployment to



Backed up by an armoured personnel carrier, Canadian troops train in winter.

Europe were not reduced. The Government reached its decision after an exhaustive examination of all factors bearing on national security. The decision did not suggest an overall reduction in NATO-wide defence, although Canada hopes that East-West negotiation will render this possible in the future. What Canada was seeking was a redistribution of effort for the defence of the European part of the Treaty area. The reductions were preceded by full consultations and implemented over a two-year period to permit internal adjustments to be made by members of the Alliance.

The decision reflected the Government's judgment that Canadian security continues to be linked to Western Europe and that Europe is still probably the most sensitive point in the East-West balance of power. It is the area from which any conflict, however limited, might most readily escalate into all-out nuclear war engulfing Canadian territory.

Western Europe has enjoyed total freedom from conflict for twenty-five years. This bears witness to the success of NATO, as does the fact that deliberate attack on Western Europe appears improbable today. Hostilities could, however, still occur there involuntarily from miscalculation in and around Berlin, or from accidental spill-over from unrest in Eastern Europe. It is in the interest of international peace, and ultimately of Canada's own security, that measures be maintained to discourage deliberate aggression in Europe, and to contain quickly any hostilities which might nevertheless occur. Canada's decision to continue to station forces in Europe, and to

designate other forces in Canada for Europe in the event they should be required there, constitutes a tangible expression of Canadian support for the principle of collective security in the North Atlantic area.

Canada's military contribution in Europe reinforces its political role in the important negotiations in progress, or in prospect, designed to lead to a resolution of some of the tension-producing issues which persist from the Second World War. It would be wrong to believe that the situation in Europe is frozen or to conclude that there is no prospect of altering the NATO/Warsaw Pact military confrontation. Success in any of these initiatives, however, ultimately depends on the receptiveness of the other side.

The Strategic Arms Limitation Talks are extremely significant in this context, and Canada continues its efforts through consultations in NATO to provide all possible encouragement to these talks.

In addition, NATO proposed over three years ago the negotiation of an agreement on mutual and balanced force reductions (MBFR) in Europe. Finally, in the spring of this year the U.S.S.R. responded in a way which suggested that there was now a possibility of serious discussions between the two sides. Members of the Alliance are currently exploring this possibility and developing substantive and procedural approaches for force reduction talks. Canada has played an active part in the preparation and promotion of this proposal, designed to reduce tensions in Europe and to preserve present security at lower levels of manpower and cost.

NATO is the sole Western forum for consideration of all these critical political and military developments, and Canada is dependent on its membership in the Alliance for access to them.

Canadian membership in NATO can thus be justified solely on security and political grounds. Canada has in addition a direct interest in the economic well-being of Western Europe and in the preservation of trading relations with this second ranking Canadian market. In connection with the further development and probable enlargement of the European Economic Community (EEC) Canada is engaging in important negotiations with certain of our allies who are current and prospective members of the EEC. The community of interest we share with these countries through common NATO membership should be a positive factor in these negotiations.

Forces Stationed in Europe

The reduction in the strength of the Canadian Forces assigned to Allied Command Europe forecast in April, 1969, has now been effected. The land element has been co-located with the air element in Southern Germany, with headquarters in Lahr, giving our forces in Europe a distinctive Canadian identity. Their combined strength is approximately 5,000 instead of the 10,000 formerly stationed in Europe. The Government has no plans for further reductions.

Land Component: The Canadian Government has been giving careful attention to the type of forces that should be stationed in Europe. The Government's decision in the spring of 1969 was that the land force component should be compatible with the forces based in Canada. Accordingly a number of options have been reviewed by the defence staff in consultation with the appropriate NATO authorities.

The Government has decided that the land force should be reconfigured to give it the high degree of mobility needed for tactical reconnaissance missions in a Central Region reserve role. The Centurion medium tank will be retired, since this vehicle is not compatible with Canada-based forces and does not possess adequate mobility. In its place a light, tracked, direct-fire-support vehicle will be acquired as one of the main items of equipment. This vehicle, which is air portable, will be introduced later into combat groups in Canada. The result will be enhanced compatibility of Canadian and European based forces, and a lighter, more mobile land force capable of a wide range of missions.

Air Component: The Canadian air element in Europe was reduced from six to three squadrons of CF-104s in 1970, one in the reconnaissance and two in the nuclear-strike role. The nuclear-strike role will be terminated in January, 1972. It had been planned that the two nuclear-strike squadrons would be tasked to conventional attack, with the other remaining in the reconnaissance role. Because of the need for a substantial conventional ground-support capability in Europe, a major element in ensuring that any hostilities could be contained without escalation to nuclear war, the plan has been changed.

The Government, after consultation with NATO, intends to employ all three squadrons in the conventional attack role in which the CF-104 is an effective aircraft. This role involves providing the tactical ground support for NATO forces in the area. The intention to task all three squadrons in this role will require minor modifications to the aircraft.

Forces in Canada for Employment in Europe

Canada has been committed for some time to send by air a battalion group to Allied Command Europe's Mobile Force Land (AMF(L)) if the latter is deployed to Denmark or Norway. The AMF(L) is a multi-national, quick-reaction, air-transportable force designed to act as a demonstration of allied solidarity in times of tension on the flanks of the Treaty area. Canada's battalion group commitment to the northern flank will continue. The further commitment to send the balance of an air/sea transportable combat group from Canada to the north flank in the event of an emergency will also be maintained.

Extensive trials of the CF-5 aircraft in Europe in the past year have confirmed its suitability for operational use in that theatre, particularly on the Northern flank. The Government is prepared to commit two squadrons



A CF-5 flies over Frobisher Bay on a long-range deployment exercise in Arctic.

of these aircraft to Allied Command Europe in photographic reconnaissance and ground-support roles. They would be Canada-based and flown across the Atlantic using the Forces' jet transports for in-flight refueling. One squadron would be available for the AMF(Air) in the north; the other would be in support of the Canadian air/sea transportable combat group committed to the same region. This decision will enhance NATO's deterrent strength and add to its ability to carry out the strategy of flexibility in response, which requires emphasis on conventional capability.

NATO's Maritime Forces

The maritime defence of the Alliance involves employment of Canadian Forces over the Atlantic ocean areas. These operations include the sea approaches to the coast of Canada and therefore relate directly to our national security. The Canadian Government will continue to contribute to the maritime defence of the Alliance, and to earmark ships, aircraft and submarines for assignment to NATO in the event of an emergency.

In time of peace, the collective maritime power of the Alliance contributes to deterrence and thus to the security of each nation in the Alliance. This collective maritime power is embodied in various multi-national forces which reflect the solidarity and resolve of NATO. One such force is the

Standing Naval Force Atlantic (STANAVFORLANT) which operates continuously under the control of the Supreme Allied Commander Atlantic (SACLANT) and Canada will continue to contribute ships to this multinational force. This force enhances NATO's ability to respond rapidly and at an appropriate level to any developing situation.



Air drop by Canadian Airborne Regiment demonstrates mobility of the Forces.

Training Forces of Other Countries in Canada

There has been a long history of training of forces from other countries in Canada. Notable examples were the Commonwealth Air Training Plan during the Second World War, and the NATO aircrew training in the 1950-60 period. The Canadian Forces are now conducting training programs for a small number of Danish pilots, and an agreement was recently signed with The Netherlands to conduct a pilot-training program for their Air Force beginning in late 1971.

Canada has reached an agreement with Great Britain, and is discussing with Germany the possibility of making a similar agreement, for the use of training facilities and areas in Canada. The Government believes that Canada, by providing these facilities, can make an additional valuable contribution to the effectiveness of NATO. Negotiations for such an agreement are based on the principle that the cost should be borne by the user country.

International Peacekeeping

Among the more significant achievements of the international community since the Second World War has been the development of the concept of "peacekeeping"—the use of truce supervisory bodies, military observers, or larger military forces to prevent or control conflict among nations. The concept evolved in a pragmatic and *ad hoc* fashion. Soon after the establishment of the United Nations, it became clear that fundamental political differences among great powers would preclude close co-operation among them to maintain international peace and security. In particular, these differences would prevent implementation of the collective security system based on the Security Council, foreseen in Chapter VII of the United Nations Charter. Moreover, situations detrimental to world peace arose which did not lend themselves to resolution under the terms of Chapter VII, but in which the involvement of the United Nations or other international machinery was necessary if peace was to be restored.

In these circumstances, peacekeeping techniques were developed as a means of enabling the international community, with full consent of the governments directly concerned, to take positive action in disputes threatening international peace and security. Since 1945, Canada has participated in ten United Nations peacekeeping operations. It has also been a member of the International Commissions for Supervision and Control in Indochina, which were established outside the framework of the United Nations. At the present time, approximately 625 Canadian Armed Forces personnel are serving with the United Nations Force in Cyprus, the United Nations Truce Supervision Organization (Middle East) and the United Nations Military Observer Group in India and Pakistan. Also, Canadian military and civilian personnel continue to serve with the International Commissions in Vietnam and Laos.

Canada's experience has provided it with an exceptional insight into the successes and failures of past and present international peacekeeping practices. The experience has all too often been frustrating and disillusioning. Some operations have been severely hampered by inadequate terms

of reference and by a lack of co-operation on the part of those involved. Other detrimental factors have been the absence of political support of some of the great powers, and insufficient international logistic and financial resources. Certain operations have tended to become "open-ended" in the absence of a political settlement between the parties to a dispute.

Benefit can be derived from these efforts, regardless of how disappointing some of them may have been. The Government continues to support the concept of peacekeeping and will seek to utilize Canada's experience, to develop guidelines, within the United Nations and elsewhere for effective peace-keeping operations. The Government will consider constructively any request for Canadian participation in peacekeeping ventures when, in its opinion, based on the lessons of the past and the circumstances of the request, an operation holds the promise of success and Canada can play a useful role in it.

It is, of course, impossible to predict when a request will next be made and to foresee the size and scope of any future operations. Many of the conflicts likely to arise in this decade will have their roots in subversion and insurgency, and will not therefore lend themselves easily to resolution through the use of internationally constituted peacekeeping bodies.

Indo-China and the Middle East are two areas where the establishment of some kind of peacekeeping or truce supervisory operation might form part of an eventual settlement. If asked to participate in such an operation, a major factor affecting the Government's decision would be the existence of realistic terms of reference. They would have to reflect a consensus by all parties on the purposes which the operation was intended to serve and the manner in which it was to discharge its responsibilities.

A new requirement may also develop for the supervision of arms control agreements, involving the use of specialized personnel capable of inspecting, for example, installations on the seabed or the deployment of military forces.

In keeping with the Government's intention to give positive consideration, when warranted, to requests for Canadian participation in international peacekeeping, the Government intends to maintain its capability to respond quickly. A battalion group of the Canadian Armed Forces will remain on stand-by, and Canadian Forces personnel will continue to receive training to prepare them for service within peacekeeping bodies.

The Defence Department

Defence Budget

A decision on the appropriate size of the defence budget can be made only in the context of the Government's national priorities and in the light of its consequent programs.

This Paper has set out the various ways the Canadian Forces can contribute to the fulfillment of our national aims. Properly equipped and trained, components of the Forces can be multi-tasked to several of the priorities of our defence policy.

It is not possible simply to state "defence requirements", and call that the defence budget. There is no obvious level for defence expenditures in Canada. Other countries, confronted with similar problems, attempt to allocate a certain fixed percentage of their Gross National Product for defence. The Canadian Government believes a judgment must be made on proposed defence activities in relation to other Government programs.

The Government believes that the activities described in this White Paper constitute an appropriate defence policy for Canada. Although defence expenditures will continue to be curtailed, as reflected in continuing manpower cutbacks and constraints on equipment acquisition, the Government has decided that some increase will be necessary to accommodate the following:

- (a) the continued operation of the Tracker maritime patrol aircraft;
- (b) the continued operation of the Melville radar site and associated Goose Bay facilities;
- (c) Canada's contribution to the NATO Integrated Communications System; and
- (d) the additional roles outlined in this Paper for the CF-5 aircraft.

Even with this increase, the Department's budget will remain within approximately 1% of the present ceiling. During the Fiscal Year 1972/73, the reduction of military manpower will continue down to a level fixed at 83,000.



Women fill key jobs in the land, sea and air elements of Canadian Forces.

The defence budget for the years 1973/74 and beyond will be established on the basis of program forecasts and estimates in accordance with the practice followed by other Government Departments.

Conditions of Service

With a view to improving service conditions for members of the Forces, the Department of National Defence has been conducting a comprehensive study on all aspects of service life, including recruiting practices, grievance procedures, promotion and posting policies, and other factors which can affect the Forces' retention rate. One of the consequences of these studies is that the Government has concluded that career opportunities for members of the Forces should be enhanced by expanding career integration with the Public Service. The Government believes this will be to the advantage of both the members of the Forces and participating civil departments.

Organization and Management

To ensure maximum effectiveness, the Minister of National Defence has appointed a Management Review Group to examine the organization and management of the entire Department. This Group has taken over the study of ship procurement which was announced last February.

The Management Review Group is evaluating the present relationships between the military, civil and research organizations of the Department and

will make recommendations to ensure there exists effective planning and control. Other areas which will be evaluated include: the relationship between Canadian Forces Headquarters and its subordinate commands; logistics and acquisition policies and associated practices in relation to time, cost and performance objectives; and the proportion of defence resources devoted to support activities.

The Group will also examine areas of inter-related responsibility with other government departments, including those of the new Department of the Environment, the Department of Supply and Services and the Department of Industry, Trade and Commerce. It is particularly important that proper arrangements exist within the Government as a whole for the Department of National Defence to exercise its responsibility for ensuring adequate surveillance and control of Canadian territory.

The Management Review Group will report directly to the Minister of National Defence. It is expected that the review will be completed during the summer of 1972, with interim progress reports being submitted periodically.

Air Transport

The Canadian Forces' long-range, air transport component consists of Boeing 707s, and Hercules turbo-prop aircraft. In mid-1970, the Forces received the first of five Boeings now in the fleet, which replace 12 Yukon turbo-prop aircraft.

While the Forces' aircraft provide an adequate long-range air capability at this time, the requirement will be kept under review so that the sufficient



Forces play major role in Canada's international emergency relief operations.

capability to meet Forces' commitments is maintained. There may arise a need during periods of national and international emergency to mobilize some part of the national civil airlift resource. Accordingly, during the months ahead steps will be taken to ensure that this potential is taken into account in dealing with the airlift problem.

In addition to their long-range aircraft, the Forces have a good transport capability in a range of other aircraft including Buffaloes, Twin Otters, and transport helicopters.

Protection Against Chemical and Biological Warfare

Methods of protection against chemical and biological weapons are subjects about which no country can risk being uninformed. Concern has, however, sometimes been expressed about the nature of Canadian participation in protection against chemical and biological agents. In 1946 Canada destroyed its stocks of lethal chemical warfare weapons and they have never been replaced. The Canadian Forces have never possessed biological weapons.

There is a distinction between chemical and biological agents in that the former can be used with some effectiveness as military weapons whereas the latter are not so adaptable to military purposes since the effects created are much less predictable. Recent discussions in the UN Disarmament Conference give reason to hope that an effective international regime may be created to control biological weapons. If Canada is to be able to play an effective role in these disarmament negotiations, and in any verification system which may result, then a minimal Canadian expertise in this field will continue to be required.

Chemical weapons pose a rather different problem for the Canadian Armed Forces. Chemical agents have been used on a number of different occasions during this century in direct support of military operations. So long as these weapons remain in the inventory of other states, then Canadian Forces should be trained in procedures and supplied with equipment to protect them against the use of these weapons.

No change will be made in the policy of not supplying the Canadian Forces with lethal chemical weapons. But the facility maintained by the Defence Research Board to advise the Forces on training and equipment needed to protect the troops against chemical agents will be continued. So long as our Forces may again be involved in operations where the opposing forces have substantial stocks of chemical weapons, it is essential that their survivability should not be jeopardized by lack of adequate preparedness.

The Reserve Force

Historically, the reserve forces have always made a significant contribution to the total strength of Canada's Armed Forces, and have played an important role in many military endeavours in both peace and war. Members

of Canada's reserves have demonstrated a willingness to undergo training in peacetime to prepare themselves for active duty when called upon. The Government intends to maintain the Reserve Force at the current authorized size and to continue to depend upon it for an appropriate share of the manpower needs of the Armed Forces.

The present Reserve Force has been designated as part of the "forces in being". Therefore the composition must be adjusted from time to time to keep pace with changes in overall force manpower, and cannot be considered in isolation from the Regular Force. In addition, many members of the Reserve Force, by virtue of their civilian occupations, will not always be immediately available in time of emergency. Furthermore, only the Regulars



The cadets find adventure as well as citizenship training in their program.

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have adequate time to train for the more sophisticated activities, and consequently the ratio of Regular to Reservist must be much higher than it has been at other times in our history.

Generally speaking, the role of the Reserves is to support the Regular Force. In particular, the Reserves provide trained officers and men for augmentation and reinforcement, and they have a particularly important role in internal security contingency plans. The Reserves also provide a base which could be expanded in an emergency. In addition to these tasks, which apply to all environments, the Naval Reserve maintains a control-of-shipping organization for operation and expansion in time of emergency. The Militia provides trained personnel for augmenting civil emergency operations, and the Air Reserve provides light, tactical air transport.

During the past year, units from all environments of the Reserves were placed under the appropriate functional commands. The Militia and Air Reserves became the responsibility of the Commander, Mobile Command, and the Naval Reserve became the responsibility of the Commander, Maritime Command. This will present more realistic and challenging training to the Reserve Force and thus increase interest and capabilities. The Reserves will be provided with the equipment they need to train adequately for their assigned tasks.

The Reserves make an important contribution to our national life by developing leaders among the young people of Canada. The Reserve training program will continue, therefore, to emphasize citizenship and leadership training.

Summer Training for Students

In the past the Militia has conducted limited student training programs during the summer months. These programs were worthwhile, not only because of the valuable training received by the students, but also because they created a pool of young men whose training would make them extremely useful to the country in time of emergency. The Department of National Defence is willing to continue this type of training for even larger numbers should the demand dictate, and is willing to continue this program to encompass all three environments of the Forces.

Bilingualism in the Armed Forces

The Canadian Forces have a major role to play in promoting national unity. It is essential therefore that they reflect the bilingual and bicultural nature of the country. The Government realizes that although progress is being made further improvements are necessary.

The Royal Commission on Bilingualism and Biculturalism made a comprehensive study of the changes required in the Armed Forces, and the Government is in general prepared to accept their recommendations. The objectives include that the French language should increasingly become a

language of the Armed Forces, in order that the military may better represent the linguistic and cultural reality of Canadian society, and that Canadians whose mother tongue is French should be adequately represented in the Armed Forces in numbers and responsibility.

The Prime Minister stated in the House of Commons on June 23, 1970, that ". . . equal opportunity is closely related to the merit principle which cannot be said to be fully operative unless it extends to qualified francophones, with little or no knowledge of English, a recognition equal to that which it accords to anglophones whose knowledge of French is similarly limited." The arrangements for full participation in the Armed Forces of both anglophones and francophones will be in accordance with the merit principle for recruitment and promotion.

The Armed Forces have taken steps to meet the bilingualism and biculturalism aims. Twenty-eight percent of the Canadian Forces establishment is being designated as francophone. This policy applies at all levels and in all areas of responsibility. The designation of a number of operational units as French-speaking has widened the scope of satisfactory service for francophones, while increasing the opportunity for anglophones to serve in a bilingual atmosphere. It is intended to extend this to certain headquarters units. The objective in these units will be to create eventually an environment in which members of each official language group can work in their own language.

All French-speaking recruits joining the Forces today have the opportunity of taking their basic training in the French language. Moreover, an increasing number of trades' training courses are being conducted in French, thus enhancing the career opportunities of francophones. While most notices, regulations, directives, orders and forms are now issued simultaneously in both official languages, this will be extended to other documents wherever feasible. Bilingualism objectives will also apply to the Reserves.

The mobility of serving personnel and the geographical location of military establishments present educational and linguistic problems for certain families. Among the more serious problems is the cultural readjustment required of children who are moved to other parts of the country where their first language is not generally spoken. This problem applies to both language groups, although it is more frequently felt by French-speaking children who cannot find schooling in their mother tongue outside the Province of Quebec. Under a revised Department of National Defence educational policy, an educational allowance of up to \$1,700 a year is now available to allow parents or guardians to send their children away from home to study in French or English when schooling in their mother tongue is not available on or near a military base.

The Future of the Armed Forces

This White Paper has set out defence activities for the Canadian Forces in the years ahead. The Government is confident that the men and women

of our Forces, Regular and Reserve, and the Cadets will respond with the same dedication, effectiveness and skill as in the past to the challenges posed to them.

For its part, the Government will ensure that Canada shall have a highly trained and well-equipped force capable of responding to the variety of challenges discussed in the Paper.



Search and Rescue continues to be an important function of Canadian Forces.

Glossary of Terms

Strategic

Strategic nuclear balance: The complex relationship between the offensive and defensive capabilities of the U.S.A. and the U.S.S.R. with respect to direct nuclear attack of homeland territories.

Stable mutual deterrence: A situation in which neither side could logically see any gain in attacking the other. Stability in this context has three dimensions: first, that it is unlikely that the balance could be altered to the point that one side believed a deliberate attack would be profitable; second, that massive nuclear exchange would not develop as a result of hasty, ill-founded or desperate decisions during a crisis; and third, that the maintenance of mutual deterrence does not require a competitive resource-consuming arms race.

First Strike: A deliberate nuclear attack designed to result in a net strategic advantage to the attacker. Logically, a first strike would either have to include destruction of almost all of the other side's retaliatory capability, or be launched from behind a defensive shield of assured high effectiveness.

Second Strike: The launching of nuclear weapons in retaliation to a first strike. Since most of the offensive capability of the initial attacker would already have been used, a second strike would probably include attack of cities.

Pre-emptive Strike: A nuclear attack designed to destroy as much as possible of the other side's offensive weapons in the belief that he had begun, or was about to begin, launching a first strike.

ICBMs — Intercontinental Ballistic Missiles: Nuclear-tipped rockets which are capable, after an initial short boost to a high velocity, of "coasting" to a target about 6,000 miles or more away.

SLBMs — Submarine Launched Ballistic Missiles: Similar rockets of shorter range, capable of being launched from a submerged submarine.

ABM — Anti-Ballistic Missile: A rocket capable of intercepting and destroying an in-coming ballistic missile warhead.

SALT — Strategic Arms Limitation Talks: Negotiations being conducted by the U.S.A. and the U.S.S.R. to reach agreement on mutual limitations in their holdings of strategic weapons.

Continental Defence

NORAD Treaty — North American Air Defence Treaty: A treaty between Canada and the United States setting up a joint operational command arrangement for air defence forces.

DEW Line — Distant Early Warning Line: A chain of air defence surveillance radars spanning the North American continent just inside the Arctic Circle.

BMEWS — Ballistic Missile Early Warning System: A relatively small number of very long range radars (none of them located in Canada) capable of midcourse detection of ICBMs on a northern trajectory between the Eastern and Western Hemispheres.

ASW — Anti-Submarine Warfare: Operations directed against submarines, including surveillance, tracking, localization or destruction.

NATO

NATO — *North Atlantic Treaty Organization*: The political and military organizational structure operated by the fifteen nations party to the North Atlantic Treaty. Combat forces come under operational NATO military command only when authorized by individual countries during an emergency.

ACE — *Allied Command Europe*: The area in which SHAPE (Supreme Headquarters Allied Power Europe) would assume command of NATO military forces in an emergency.

SACLANT — *Supreme Allied Commander Atlantic*: The military commander of the structure which would take operational command of assigned naval forces in the North Atlantic during an emergency.

AMF(L), *AMF(A)* — *ACE Mobile Force (Land) and (Air)*: Multi-national forces which have been designated for rapid assembly for employment on the flanks of NATO (Denmark and Norway in the North, Greece, Turkey and Italy in the South) at times of increased international tension.

STANAVFORLANT — *Standing Naval Force Atlantic*: A small multi-national naval force organized and assembled in peacetime which, when authorized by the North Atlantic Council and the nations contributing ships, can respond rapidly to maritime emergencies.

MBFR — *Mutual and Balanced Force Reductions*: A proposal by NATO to engage in negotiations with the Warsaw Pact nations with the aim of reducing military forces in Europe while preserving security on both sides.

National

Surveillance: Activity directed at the collection of information on what is happening in Canada's land, air, and waters.

Control: Enforcement action to ensure that Canadian laws and regulations are respected.

Continental Shelf: That portion of the seabed extending from the coast which, because of its geological characteristics, is more properly considered as part of the continental mass than as part of the deep ocean seabed.

Territorial Sea: A region of the sea extending twelve miles from straight baselines drawn from headland to headland along the coast, where Canada has full sovereignty over the seabed, the waters, and the air-space above.

Fisheries Protection or Control Zones: Regions of the sea, which can extend beyond the territorial sea, where Canada regulates and controls the exploitations of fisheries resources.

Pollution Control Zones: Regions of the sea, which can extend beyond the territorial sea, where Canada regulates and controls activities with respect to possible pollution hazards.

Cost-Effectiveness: The relationship between the benefits realized from a particular activity and the resources consumed.

Marginal Return: The incremental increase in benefits in relation to their incremental cost.