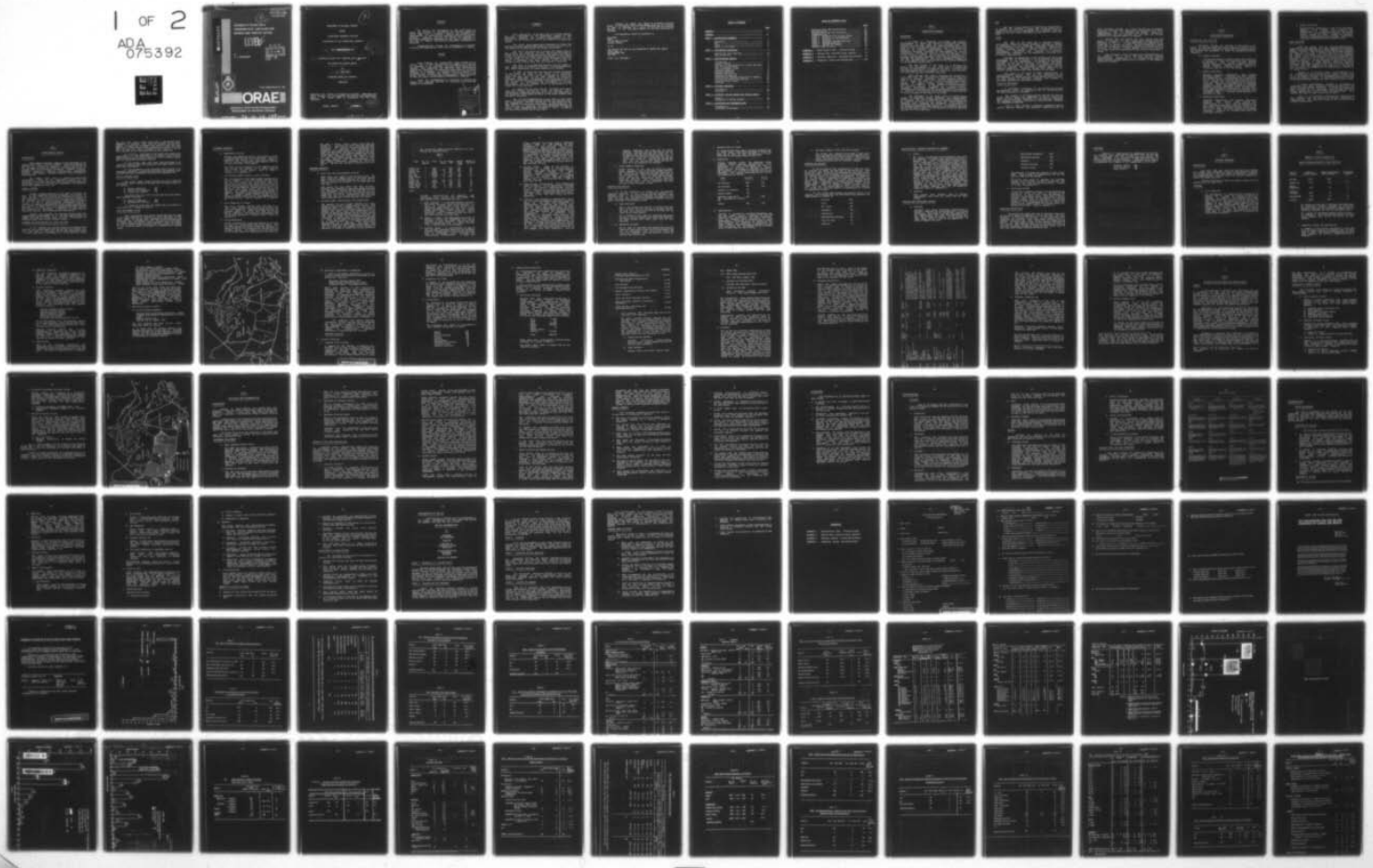
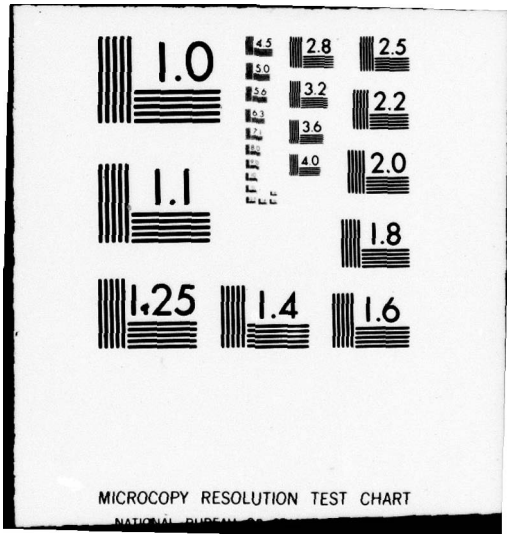
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(6) # FEASIBILITY STUDY ON A CANADIAN CIVIL SAR PLAN FOR SEARCH AND RESCUE DUTIES.

BY

(10) S.L. MILLIGAN

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ABSTRACT

The ability and willingness of the civil sector to assist the military in carrying out its statutory search and rescue (SAR) role is studied. Results are presented of a questionnaire to determine the available resources and general attitude. Existing civilian SAR groups are assessed to determine strengths and weaknesses of each type of organization. The role of federal and provincial government departments is explained.

Recommendations include the development of a national volunteer SAR organization, which can be implemented in stages.

RESUME

Nous étudions les possibilités et la volonté qu'a le secteur civil d'aider les militaires à accomplir les fonctions de recherche et de sauvetage qui leur sont imposees par les statuts. Nous présentons les résultats d'un questionnaire préparé pour identifier les ressources disponibles et l'attitude générale en ce domaine. Les groupes civils de recherche et de sauvetage sont étudiés pour établir les points forts et les points faibles de chaque type d'organisation. Nous expliquons le rôle que jouent les ministères provinciaux et fédéraux.

Parmi les recommandations, on retrouve la création par étapes d'un organisme national de recherche et de sauvetage composé de volontaires.

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FOREWORD

This publication is the main text of a report prepared for the Directorate of Air Operational Research of the Operational Research and Analysis Establishment by S.L. Milligan of the Society for the Aid and Promotion of Search and Rescue.

The report was prepared under Department of Supply and Services contract numbered 2SR5-0048, and titled "Study of Civil Involvement in Military Search and Rescue Activities".

The aim of the study was to acquire and compile data on the present and potential civilian SAR flying activities in Canada as an aid to the Canadian Forces SAR system, and propose a plan for organized civilian flying involvement. In the course of the study it was found that flying involvement could not easily be separated from other aspects of SAR, so that the outcome is more broadly based than was originally conceived.

The bulk of the researched material does not appear in this report which is primarily narrative. The working material will, where appropriate, be issued separately as Annexes.

It must be noted that the views and opinions expressed in the report are those of the author or of the people interviewed by the author, and do not necessarily reflect the views of ORAE, DND, or any other federal or provincial government department. The purpose of the study was in part to note the views of civilian individuals and organizations so that the extent of contribution and willingness of civilian participants could be assessed prior to any decision on the nature of a Civil SAR Plan.

It should also be noted that Ms. Milligan, quite apart from the research carried out under the contract, has a considerable background knowledge of civilian SAR organizations and operations, which makes the value of the report greater than the sum of its parts.

One of the recommendations of the report is that there should be greatly increased liaison between the Canadian Forces SAR Organization and Civil SAR Groups. In some cases this has been effected in the course of the author gathering material, so that the act of reporting has itself stimulated the desired action. Other recommendations, including e. and h. of page 55 are also being carried out at this time.

Finally, we expect the report to stimulate a certain amount of discussion, particularly among those who are affected or would be affected by a Civil SAR Plan and the proposed SAR-CAN. If you have some comments on the plan they would be welcomed.

Correspondence should be addressed to

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PART 1

INTRODUCTORY MATERIAL

BACKGROUND

A study to determine the present and possible contributions to Search and Rescue of a structured volunteer organization has been under way since September 1975. This two-part study is being carried out under the sponsorship of the Chief of Air Doctrine and Operations. Part 1, by Operational Research and Analysis Establishment, Directorate of Air Operational Research, examined CF requirements for such an organization, hereinafter referred to as Civil SAR Plan. Part 2, by civilian contract was to determine the availability of personnel and hardware resources in the civilian community for a civilian SAR organization. This report represents a summary of the data gathered and a distillation of the opinions expressed to the researcher during Part 2.

The main purpose of the study is to determine the ability and willingness of the civil sector to assist the military in carrying out its statutory SAR role. Civilians have long demonstrated their willingness to search for lost aircraft, but often they are more hindrance than help.

Many methods were used to determine the interest in a Civil SAR Plan, and the potential availability of resources. Contact by personal interviews, letters, telephone calls, or word of mouth was made with various government departments, flying clubs, flying schools, flying organizations, pilot associations, commercial flying companies, aviation councils, and individual pilots. By making use of in-house letters, bulletins, newsletters, magazine and newpaper articles, television news coverage, and two questionnaires it was possible to indicate to the aviation public the nature of the study and to elicit interest in and input to the study.

The knowledge of the broad array of aircraft types, levels of expertise, ground equipment, and organizational possibilities was used to generate a spectrum of capabilities. By studying existing civilian Search and Rescue Groups and assessing their strengths and weaknesses it was possible to determine various operational structures. By relating the facts and insights gained from these groups to the available resources and the indicated interest, it was possible to draw up practical options for a Civil SAR Plan.

AIM

The aim of this report is to present the acquired data on present and potential civilian SAR flying activities in Canada as an aid to the CF SAR System, and to propose a plan for organized civilian flying involvement in the form of a Civil SAR Plan.

SCOPE

The task of the study was to identify possible contribution levels of civilian resources. This was to include an examination of the resources in existance as well as the amount available for use in SAR activities. Resources of interest included aircraft, aircrew, civilian aid to the searchmaster, recruiting and training of spotters, organizational resources, and the examination of existing Civil Air Patrol Organizations.

Although by demarcation of the contract only SAR flying involvement was to be studied, it is not possible to keep SAR involvement in tidy categories. For example, in the coastal provinces on any search operation air, marine, and ground resources may be used. In fact many of the groups that already exist for civilian SAR involvement comprise more than one resource capability. Therefore groups with limited or non existent flying reserves have been included in the study.

The scope of the study included identification of non-quantifiable factors. This has been interpreted as the determination of reasons why the various options would or would not work because of attitudes, opinions, and concepts of government agencies and the aviation public.

LAYOUT OF THE REPORT

A preliminary discussion of the options for civilian participation levels is presented in Part 2. The method used for data collection is outlined.

The results of the questionnaires returned by aviation groups across Canada are summarized in Part 3. Details are given as to the overall interest in a Civil SAR Plan, personnel and hardware resources, availability, qualification, training, and compensation expected.

Part 4 lists national resources of personnel such as pilots, aviation groups, and government agencies as well as

their indicated interest in a Civil SAR Plan and of hardware including aircraft and communication facilities and their compatibility with the military SAR System. Details on communications are not included but the data can be made available in a separate Annex A on request.

Contact that the author had with various Civil SAR groups in existence in both Canada and the United States is described in Part 5. A brief description and summary of the categories of groups is given. The data pertaining to these civil SAR groups are presented by region in a separate Annex B available on request. A visual summary of Part 5, in the form of a map, shows the distribution of the civilian SAR groups in Canada.

Part 6 presents final discussion and recommendations for the structure of a Civil SAR Plan and the proposed implementation. Suggestions as to possible further areas of study indicated during research and as a result of the suggested option are included.

PART 2

PRELIMINARY DISCUSSION

OPTIONS FOR CIVIL SAR PLAN

Structural options are outlined at this point in the report so that the reader may better relate the results of the survey of available resources to potential contribution levels. The options are presented in order of increased structural complexity.

a. Present Structure

Civilian SAR exists in pockets across the country in a variety of forms and operating with varying effectiveness. This option includes existent limited government support which takes the form of limited liaison, training and/or payment of volunteers' gas and oil for SAR flying.

b. Lightly Structured

Strictly Volunteer Organization With Limited Government Support: A structure that would increase the communication, understanding, and co-operation between the existent civilian SAR groups and the CF would increase the effectiveness of the volunteer resources. This could be accomplished by increasing interaction among the groups by means of increased training sessions, workshops, shops, and exercises. Since these government resources are availble under the present system it would require allocation of an increased budget to increase these services to a satisfactory level.

c. Moderately Structured

Volunteer Organization With Moderate Government Support: This option would require the incorporation of a Civil SAR Plan administration into government departments that are related to SAR activities. This could mean federal or provincial EPC, or the RCMP. The field resources would remain volunteer. Training and guidance would come from government funding.

d. Highly Structured

Paid/Volunteer Organization with Total Government Support: This option would require the establishment of a separate Civil SAR Plan program similar to the structure of a Reserve. This would involve support of staff, offices, and equipment situated in designated areas of Canada. Most of the field work would be done by volunteer pilots.

DATA COLLECTION

Input was invited from all aviation organizations, commercial flying companies, and flying associations throughout Canada. They were contacted by letters, magazine and newspaper articles, and T.V. news coverage as well as through telephone and personal interviews. To obtain the data in a consistent and usable form a questionnaire was sent to the 689 companies and groups listed in the Directory of Canadian Commercial Air Services (1975) and in the 1975 Aviation Directory of Canada (Canadian Aviation). The questionnaire, a copy of which can be found in Appendix 1, asked specific questions regarding resources, and sought opinions on the need for a Civil SAR Plan in their area and suggestions for such a plan. The replies were to reflect the viewpoint of the executive or a reflection of company policy.

Because of the personal nature of the responses it is not intended that they be identifiable. However in many cases it is necessary to be aware of the geographical location from which the response is made. The responses grouped by Province or Territory have been listed in Annex C which is held in DAOR.

A second questionnaire, designed to be answered by individuals who have a background in aviation and/or SAR, was mailed to approximately 100 people. A further 400 copies were made available to any interested pilots through offices of Flying Associations, Traffic Control and Flying Clubs. These replies are found in Annex D also held by DAOR.

Data on the resources in aviation on a national basis were obtained from the Ministry of Transport, Department of Communications, and Statistics Canada as well as from various aviation publications.

PART 3

QUESTIONNAIRE RESULTS

INTRODUCTION

This chapter presents a summary of the responses to the questionnaire sent to aviation groups. Tabulated responses by question are presented in Appendix 2. However the replies do not necessarily follow the format of the questionnaire but are grouped into the following categories: General Interest, Personnel Resources, Resource Availability, Compensation Expected, Qualification Standard Expected, Form of Direction, and Structure.

The summary refers often to numbers of replies and percentages. Since not all respondents replied to each question, and in some cases more than one reply was given, the percentages given are of those who responded to the question, and do not necessarily total 100.

GENERAL INTEREST

Overall response measured by the number of returns was low. Of 689 companies and groups canvassed, 140 replied. Of these replies, five were letters not following the outline of the questionnaire and three arrived too late for inclusion in the analysis, so that the data base of questionnaire responses is 132, or 19% of those canvassed. Historically and for a variety of reasons a questionnaire survey generally commands a low return. In those parts of the country where media carried material on the study, pilots and companies felt more involved and receptive to interviews. Conversely in areas where no publicity occurred, less enthusiasm was encountered.

Despite the apparent low response, replies came from organizations representing 9% of the fixed wing aircraft in Canada and 36% of rotary wing aircraft. The replies also represent about 10% of pilot licence holders.

INTEREST IN PARTICIPATION IN A CIVIL SAR PLAN

If we consider the interest shown by the groups which returned the questionnaire then we see that the interest in a Civil SAR Plan is very high. 82% of the returns said "yes" they were interested in involvement in a Civil SAR Plan. While

18% said "no", some of these stated that it was because their companies or aircraft fleet were not suitable for low level search. It should not be assumed that those who said "no" were unwilling to contribute suitable resources but rather that they felt no need for such a program in their locality. Of the total replies 18% are satisfied with the way things are.

In follow-up interviews it was found that sending the questionnaire to the head-office of a company, which is often remote from the actual flying operations, did not always ensure that the appropriate personnel replied.

Of the groups that said "yes", 64% would want to be involved as group, with 27% saying tha individual members only would want involvement.

In the discussion of the responses which follows it is sometimes necessary to differentiate those who answered "yes" to Civil SAR Plan involvement from those who answered "no".

TYPE OF BUSINESS GROUP

The groups which showed interest in a Civil SAR Plan involvement were licenced to provide the following classes of air service.

a) Charter Commercial 63%
b) Flying Club Commercial 27%
c) Flying Club Pleasure 17%

The groups that said "no" to Civil SAR Plan involvement were licenced to provide

a) Charter Commercial 75%
b) Scheduled Air Service 25%

It should be noted that one company may be licenced to carry on up to 7 classes of service.

PAST INVOLVEMENT IN SAR

Past involvement with search activities does not seem to be a good indicator of interest in a Civil SAR Plan. Of the total number of groups that responded to the question, 64% indicated past involvement in SAR. The amount of involvement in search activity was not often explained. There is a great deal of difference between spotting for wild horses, and acting as the civilian search co-ordinator on a search for a company plane.

PERSONNEL RESOURCES

a. Membership of Group

Knowing the membership size of the groups is useful in determining the size of the operation. 55% or 51 companies who replied had fewer than 20 members. 13% or 12 groups, had 200 or more members, with two of these with over 1,000 members.

The "yes" replies represented 17,809 members and the "no" replies 957 members for a grand total of 18,766. For further details refer to Graph 1, question #4 in Appendix 2.

b. Contributing Member Skills to Civil SAR Plan

The contribution of the three highest categories of skills towards a Civil SAR Plan by both the "yes" and the "no" groups are as follows: 95% of the groups said they would have flying skills; 72% would have spotting resources; 53% said they would like to assist the searchmaster (S/M)during the search, and 45% said they would assist the S/M set up the search. The category to which the least number of companies responded is maintenance and servicing -- 40%. A category marked "Other" allowed for such offers as Ground Search Skills, Para-Jumping Skills, and Rescue Skills. Refer to question #7 in Appendix 2.

c. Pilot Resources of Groups

The pilot resouces replies show that 69% of the "yes" reply pilots held Private Pilot Licence, and 21% held Commercial. These two categories hold the greatest number of pilots with only 3% holding Senior Commercial, 2% holding Airline Transport and 3% holding Helicopter Licences (Refer Table #18 Appendix 2).

d. Flying Experience

Flying experience of pilots was queried in the form of types of flying rather than hours flown. This was done because the abilities that are required for search flying are not always gained through hours of straight flying. For example a pilot of 250 hours of tow flying, where his experience is slow and low,

may make a better visual search pilot than the 10,000 hr. executive jet pilot with high and fast experience. The ratings and experience that were considered of importance when considering the capability and effectiveness of civilian pilots are: night and IFR rating, and barren, mountain, and bush flying experience. The figures indicate that of the total pilot resources in the "yes" replies - 3,594 or 45% have Night Rating, and only 8% have Instrument Rating. Bush flying experience is the most common experience, indicated by 17% of the pilots. Barren and mountain flying both had only 9%.

HARDWARE RESOURCES

a. Fleet Size and Contributable Aircraft

Each group was asked to list its fleet size. The total aircraft numbers given for the "yes" replies were 1113, or 972 fixed wing and 141 rotor; and for the "no" replies 318 aircraft, or 210 fixed wing and 108 rotor.

Each group was also asked "How many aircraft, suitable for searching, would your group authorize for searching?" Replies indicate that 37% of "yes" fleet aircraft, or 413 out of 1134 aircraft would be authorized for search. Those groups that said they would not want to be involved in a Civil SAR Plan would authorize 25% of their aircraft for search.

b. Aircraft Types, Descriptions, and Capabilities

The replies did not always indicate the exact aircraft which could be authorized for search. Some companies said, for example, "Out of a fleet of twelve aircraft we would authorize four for search." Because the types could vary considerably it was decided to detail and analyse the total fleet rather than aircraft authorized for search. The "yes" and "no" reply aircraft have been categorized by type according to manufacturers in Table 12 of Appendix 2. There are 42 types of fixed wing aircraft made by 15 manufacturers and 10 types of helicopters manufactured by 5 companies. The Table gives details of number of seats, range cruise speed, high and low wing and the number of each aircraft in operation in Canada by commercial and all operators.

The eleven most common aircraft listed in the "yes" replies are indicated here:

TABLE 1

Type	No. of Engines	Wing	No. of Seats	Range NM	Cruise Speed KTS	Number of Aircraft
Cessna 177	1	High	4	450	120	65
Cessna 172	1	High	2-4	340	106	35
Cessna 185	1	High	6	933	147	29
Bell 47	1	Rotary	3	214	73	27
Bell 206	1	Rotary	5-7	313	130	22
DeHav Beaver Turbo	1	High	11	667	136	22
Cessna 180	1	High	4-6	470	141	21
Hughes 500	1	Rotary	5-7	125	125	19
Piper PA-28	1	Low	4	626	117	16
Piper PA-23	1	Low	6	720	180	14
Cessna 182	1	High	4	475	144	10
Total						280

Aircraft characteristics are important when considering civil aircraft for SAR tasking. The main characteristic considerations are:

1) Wing Position - A low wing aircraft restricts and limits the visual field of the spotters to a level so limited that these aircraft are considered unacceptable as low level visual search platforms, although they can be most effectively tasked for electronic VHF/DF searching. Table 13 Appendix 2 show that 61% of the "yes" aircraft are high wing.

2) Number of Seats - This determines the number of spotters, pilots and navigators that can be included in each aircraft. 47% of the "yes" reply aircraft have from 1 to 4 seats; 47% from 4 to 11; and 5% from 12 to 39 seats.

3) Aircraft Speed - It was difficult to come up with an exact comparison speed for the different aircraft because speed is affected by variables such as horsepower level, altitude, and undercarriage configuration. A "safe slow

flight envelope" is a better means of comparing aircraft speed for SAR tasking but this information is only available from aircraft manufacturer's specifications. Graph 3 in Appendix 2 shows figures for the fleet aircraft. These figures are ball-park figures only because it is unknown if the indicated speed is maximum cruising speed, or economy cruising speed at the altitude. Of the known speeds for 371 "yes" reply aircraft, again taken from Table 12 of Appendix 2, 24% have speeds between 110 and 120 kts, 18% between 140-150 kts, 1% over 200 kts, and 10% under 100 kts.

4) Aircraft Range - Range of the aircraft is determined by a number of variables such as optional long range fuel tanks, power setting, mixture richness, altitude, etc. Again ball-park figures are presented in Graph 4 Appendix 2 for aircraft range. Of the ranges known for 365 aircraft, 45% have a range of between 300 and 500 nm and 6% have a range of more than 1000 nm.

5) Undercarriage Configuration - This changes from season to season. It was impractical to attempt to list the aircraft undercarriage for this reason. According to a survey done in Canada in 1972 by Maclean Hunter Research Bureau it was determined that approximately 88% have wheels, 15% have floats, 23% have skiis, and 4% are amphibious.

6) Avionics - The responses to question #16, "Radio and nav aids and compasses (specify)" appear in Table 15. The three main categories are communication, navigation, and landing aids. Not much detail was obtained as to the exact types of radio communications units each group had. Likewise the reply "full IFR equipped" did not tell much because IFR equipment varies considerably. It was difficult, often impossible, to determine which aircraft had which avionics equipment. To get around this problem the equipment is listed according to what avionics resources each company had. For example a company may have listed both VHF and HF radio so they were listed in both columns, not by the number of aircraft that they had in their fleet with these particular radios but as one company with that capability. Only one

company mentioned that they had any Nordo aircraft. 46% said they had VHF radios, 18% had HF radios, and 23% said they were fully IFR. Of navigation aids the most common was ADF (that is LF/ADF and should not be confused with the ELT homer which is VHF/DF). 59% had ADF and 46% had VOR. The ILS was the most common Landing Aid with 7% of the companies so equipped.

c. Ground Support Resources

Ground support in the form of office and hangar space, equipment such as de-icing, Herman Nelsons, and servicing are resources that were mentioned in the questionnaire. 78% of the groups said they had office space that could be used, 64% had hangar space and 75% had maintenance and/or servicing resources available. Even those groups that gave "no" replies said they had resources they were willing to make available to SAR.

RESOURCE AVAILABILITY

It is not sufficient to merely list the possible resources available in the form of interest, personnel, and hardware unless it is further determined how available these resources will be. This section indicates how often, for how long, and under what situations the groups or members would be able or willing to participate in SAR.

a. Times Available

94% of the groups that replied to question #19 said their pilots would be willing to fly SAR missions, 3% said their pilots would not be willing, and the other 3% are undetermined.

Of a choice of four times for searching 86% marked anytime, (17% also marked after hours and weekends), 7% said during work hours only, and 6% said holidays.

b. Employers Attitude

68 or 83% of employers who answered the question "Would you give your pilots and other employees time off for searching?" said they would. 53% of the total who answered said they would do it with pay and 26% said without pay.

c. Response Time for Crews

Of those groups which gave a definite response time in which their crews would be ready to launch 34% said up to half an hour, 72% said up to 1 hour, about 40% of the replies gave no firm time.

d. Dedication

Initial response action and sustained search response require separate considerations. Work commitments or other requirements may make it impossible for civilians to maintain a lengthy search profile. Willingness to dedicate aircraft to SAR missions for a period of time met with varied responses. The replies from Questions #17 and #23 are summarized as follows:

Time	Aircraft	Pilots
As required	39%	27%
As available	18%	14%
Depends on situation	12%	
Charter basis	3%	
Specific time period eg. 1 hour/day to 3 days/6 mo	18%	49%
Others	10%	10%

e. Dependability

Flexible or variable or reasonably dependable were the most common replies to Question 24, with 23% feeling their availability was very dependable. Only 3% assessed their availability as being undependable. The groups were told to keep in mind, when answering the questions on dedication and launch times, the possibility of seasonal pay-load work precluding SAR involvement during the summer which is peak time for SAR activity.

f. Non-Owner Usage of Civil SAR Plan Aircraft

The groups and companies were asked if they would allow non-employee pilots who were registered with a Civil SAR Plan to fly their aircraft. 86% said they would only allow their own pilots. The most common explanation given was for insurance reasons.

COMPENSATION EXPECTED

It was anticipated that compensation of some form would be expected by those who take part in SAR activities. Each group was asked to specify the compensation they would expect for given areas. Table 9 Appendix 2 lists these categories and the replies given by 101 groups who answered. 16 companies, out of the total 101 companies who answered the question, did not specify exactly what they would expect as they marked either with a check mark or a comment such as "depends on the amount used", "breakeven basis", "reasonable", "cost", and/or "negotiable". These 16 companies, which include both the "yes", and the "no" groups make up 17% of the total replies. One company said they would expect no compensation as "helping is compensation enough".

Of the groups that answered the specific parts of the question the following show the percentages that expected full reimbursement in respect of:

Aircraft	28%
Pilot	10%
POL (Fuel)	15%
Insurance	8%
Instruction	3%
Maintenance/Servicing	8%
Time Off Work	7%
Spotting	1%

QUALIFICATION STANDARDS EXPECTED FOR MEMBERS

a. Pilots

The level of training and qualification that would be expected of pilots and spotters was asked in Question 28. Pilot licence level, ratings, hours flown, experience (e.g. mountain and bush flying), and SAR training were the indicated classes. Since this was a free form question it is difficult to summarize replies into percentages. Numerous groups said they wanted to see the highest level, equal to the military or a level accepted by them. Many groups said the pilots should have at least a Commercial Licence (only 1% said that a Private Licence was acceptable). The most common reply for hours flown was 500. For experience, most said the pilots should know the terrain and have taken a course in SAR. The replies to the question were dependent on the type of group replying. For instance the flying clubs in most cases listed a lower standard expected than did the commercial companies (Table 27, Appendix 2.)

b. Spotters

Most groups said spotters must be trained, experienced, have many air hours and be local people.

TRAINING AND PROFICIENCY RATINGS

a. Training

Questions were asked concerning receptiveness to courses, training, and the availability of training facilities. Five types of courses were suggested in the questionnaire and each was supported by more than 60% of those who replied. On the average each reply named three or four of the suggestions. In order of support they are:

SAR Flying Procedures	90%
SAR Indoctrination	81%
Survival	72%
Spotter Training	65%
Terrain Flying	61%

The frequency of courses was favoured at once a year (48%). Once a season was suggested by 26%, and 22% said one time only was enough.

Facilities that would be suitable for training courses were available by 60% of the groups. 20% indicated they had instructors available. (Tables 5, 6, and 7 of Appendix 2.)

b. Proficiency Rating

To provide an inherent provision for controlling the quality of pilots who wish to take part in SAR activities, it would most likely be necessary to provide a proficiency rating. This means a certain attained level would be designated as a minimum before allowing pilots to take part in various SAR missions. It is encouraging to note that 95% of the groups which answered said they were in favor of a proficiency rating. (Table 8, Appendix 2.)

DIRECTION WITHIN GROUP

The groups were asked what form of direction they would be willing to accept as members of a Civil SAR Plan: Civilian, Military, or both Civil and Military. It was considered, when composing the question, that some might prefer a civil or military direction year round which would be changed during search. In fact little or none of this tendency was shown in the replies where 82% said they want to see both military and civilian direction during the search and year round. Only 7% said they would accept civilian direction only.

STRUCTURE

Question 27 asked groups for suggestions for the type of structure they would want to see for a Civil SAR Plan and what relationship with the military they would expect. Few groups responded to the question. In some cases the reply to this question was included elsewhere. Responses cannot readily be summarized but a summary of the suggestions is as follows:

military control	37%
civilian control	18%
equal control	12%

PART 4

NATIONAL RESOURCES

INTRODUCTION

Any civil SAR plan which may eventually be proposed will have a wider population to draw on than those who replied to the questionnaire. For this reason the personnel, hardware, and communications resources within the aviation community of Canada are summarized here.

Figures presented are taken from public sources and are generally for the year 1975.

PERSONNEL

a. Pilot Resources

The distribution of Canadian Pilot Licences as of January 1975 is shown by province in Table 1 of Appendix 3. Because the organizations which responded positively to the survey may be the ones most likely to participate in a Civil SAR Plan, a summary of the national totals together with the numbers of those which answered "yes" to Civil SAR Plan is shown here as Table 2. An indication of the support shown within the different licence categories can be seen. The nature of the survey would make it extremely unwise to extrapolate any trends from the ratios.

TABLE 2

Numbers of Pilot Licences and Number Showing Interest in Civil SAR Plan

Type of Licence	Number of Licence Holders	Number Supporting CIVIL SAR Plan	Percentage Support
Private	31616	2496	7
Commercial	6114	787	12
Senior Commercial	876	110	12
Airline Transport	3999	82	2
Helicopter*	444	119	26
Totals	43049	3594	8

*It should be noted that a helicopter pilot may have an aeroplane licence endorsed for helicopter operation and that the helicopter category does not therefore represent the total of helicopter pilots.

For figures on instrument ratings, refer to Table 2 of Appendix 3. 8% of Canadian pilots are IFR rated which compares with 7% of IFR pilots in "yes" replies.

b. Companies, Groups, and Associations

A summary of the interest indicated in a Civil SAR Plan by types of group is presented here. For more details about individually mentioned groups, their aims, purposes and specific suggestions refer to Appendix 4.

1) Commercial Companies

The 1975 directory of Canadian Commercial Air Services lists 634 Canadian Commercial Air Carriers which are licenced to provide up to 9 classes of air service. 124 of these commercial companies or 19%, replied to the questionnaire. 80% of the replies said "yes", they would want to be a part of a Civil SAR Plan.

2) Aviation Councils

Some provincial aviation councils are more active than others. This appears to be because some are supported financially by government grants while others are not. Generally their purposes are to act as counsel between aviators of all levels and government agencies, as well as to promote aviation within their province. Safety and training seminars are common to most councils. The following lists the Canadian Aviation Councils:

British Columbia Aviation Council
Alberta Aviation Council
Manitoba Aviation Council
Ontario Aviation Council
Qebec Aviation Council
Northwest Territories Aviation Council

Two of the councils, B.C. and Manitoba, replied to the questionnaire. Their replies were "yes", B.C. for participation on an individual basis and Manitoba on a group basis.

Manitoba Aviation Council has, in fact, established an operating Air Patrol for SAR tasking within their province. The Alberta Aviation Council has been working for a number of years on a proposal to establish the same type of Air Patrol for their province.

3) Associations

Each of the following associations was approached and all indicated a positive attitude towards the study and the concept of a Civil SAR Plan. For specific responses refer to Appendix 4.

Air Cadet League of Canada
Air Transport Association of Canada (ATAC)
Canadian Air Line Pilots Association (CALPA)
Canadian Air Traffic Control Association (CATCA)
Canadian Business Aircraft Association (CBAA)
Canadian Flying Farmers
Canadian Owners and Pilots Association (COPA)
Experimental Aircraft Association of Canada (EAA)
Ninety Nines, Inc
Royal Canadian Air Force Association (RCAFA)
Royal Canadian Flying Clubs Association (RCFCA)

Three of the groups, ATAC, CALPA, and CATCA said they shared an interest in search and rescue activities but their organizations were probably not suited to a group membership in a Civil SAR Plan. Individual members within these groups, however, did express interest in individual membership in a Civil SAR Plan. The other 8 groups responded with "yes" replies. Five of these groups specifically stated group membership.

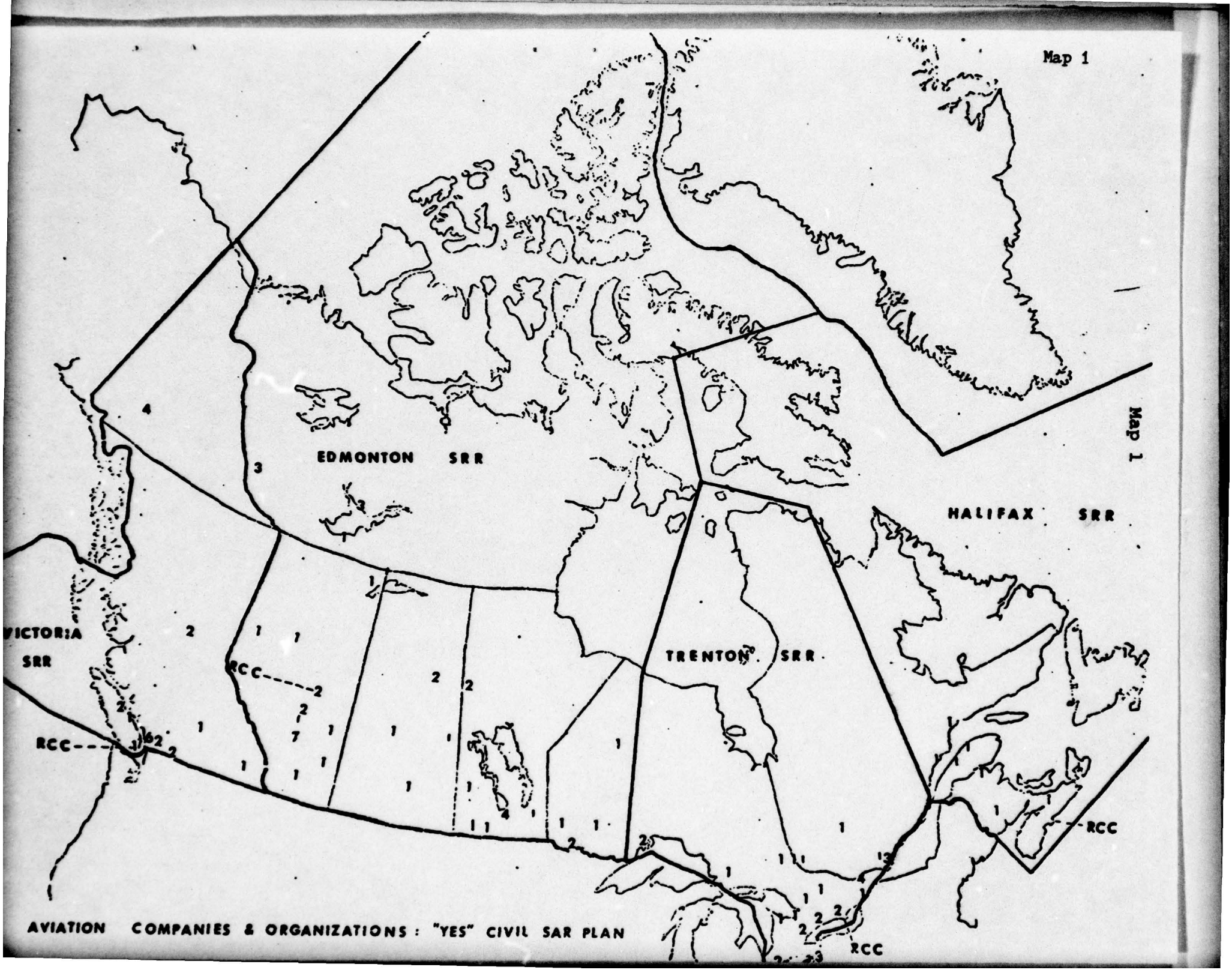
4) Speciality Groups or Clubs

Of the four groups contacted

Canadian Sport Parachuting Association (CSPA)
Lutheran Association of Missionaries and Pilots (LAMP)
Quarter Century Club
Soaring Club of Canada (SCC)

The only response was from L.A.M.P.. Their reply was "yes", as a group.

It is known that the Quarter Century Club supports the idea of a Civil SAR Plan. Although neither the CSPA nor the SCC replied, individual members who were interviewed expressed interest in belonging as individual members.


Map 1
EDMONTON SRR
HALIFAX SRR
TRENTON SRR
VICTORIA SRR
RCC
RCC
RCC
RCC
Map 1
AVIATION COMPANIES & ORGANIZATIONS : "YES" CIVIL SAR PLAN

5) Government Departments or Agencies:

A number of government agencies are involved in various related activities and oftentimes in SAR operations. They are:

Emergency Planning Canada (EPC)
Royal Canadian Mounted Police (RCMP)
Transport Canada - Telecommunications.

While none replied to the questionnaire specifically, they were most co-operative in allowing the researcher ample discussion and interview time with pertinent resource personnel. The results were that the researcher obtained an impression of a very positive attitude towards the concept of a Civil SAR Plan. EPC and RCMP on a provincial basis operate SAR tasking groups: Saskatchewan Emergency Measures Air Division, B.C. Provincial Emergency Programme, N.S. GSP, Auxiliary RCMP force. Transport Canada's involvement is by no means limited to interest and involvement in SAR only through their telecommunications branch, but that group provides the interface during a search operation. For details of the operations and activities of these groups refer to Appendix 4.

To summarize the various resources represented by "yes" replies, the following map has been included to give the reader an idea of the geographic locations of companies and organizations. The numbers on the map relate to numbers of organizations. Government departments or agencies are not included.

HARDWARE RESOURCES

a. Aircraft Resources.

1) Canadian Civil Aircraft

A summary of the registry of Canadian Civil Aircraft 1975 is shown in Table 3 of Appendix 3. Figures for the year 1974 have been shown for comparative purposes. 92% of the 16,435 aircraft were fixed wing, and 8% were helicopters. 81% of these aircraft held a valid

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Certificate of Airworthiness (C of A). The companies which responded to the questionnaire represent over 7 1/2% of the fixed wing aircraft in Canada and 20% of the rotary wing. The number of aircraft that could be authorized for searching comprises over 2% of the fixed wing and 16% of the helicopters.

2) Commercial Air Fleet

A summary of the aircraft that the commercial air services fleet comprises according to weight group is given in Table 4 of Appendix 3. The group with the largest percentage of aircraft (57%) is fixed wing not-greater-than 4,300 lbs. This group includes Cessna 120-336, PA 11-32, and Beechcraft Bonanza aircraft as examples. 88% of the helicoters were under 4,000 lbs. (Jet Ranger 206, Hiller 1100 and Alouette 2).

3) Flying Hours

An indication of the number of aircraft and the flying hours is given by region in Table 5 Appendix 3. It should be noted that aircraft are not necessarily flown primarily in the region where they are registered. For example, it is felt that the Yukon and Northwest Territories would have a much higher number of flying hours than is represented due to the fact that a large number of carriers, while situated and registered in one of the provinces, do a great deal of flying in the north -- especially in summer.

The following list shows the percentages of total Canadian flying hours by region:

Quebec	25%
Ontario	24%
British Columbia	18%
Alberta	13%
Manitoba	6%
Saskatchewan	4%
Northwest Territories	1%
Yukon Territory	1%
Atlantic Provinces	4%

b. Communications Resources

In researching what basic communications facilities are available, and what is required for compatibility with the Canadian Forces SAR system, it was found that almost every conceivable means of communication is used at some time or other during search. Thus the study cannot be limited to purely aviation communications.

A brief outline of the communication systems across Canada with the relevance to SAR operations follows. Details on networks, equipment, and frequency utilization are listed in Annex A (which is not included).

1) Facilities Available

Networks have been established across most of Canada by private, public, or government establishments. Telecommunication networks owned by common carriers consist of land lines, cables, high frequency (HF) radio links, microwave networks, and domestic satellite service. Map 2 is a visual display of the electronic highways of Canada. There are approximately 400,000 radio stations licenced in Canada to transmit and receive radio signals. In 1974/75 the following numbers were in effect:

Ship	11,955
Coast	82
Land	57,639
Mobile	202,847
Earth	75
Space	4
General Radio Service	113,836
Total	386,438

There were also 9,176 issued to United States licensees for a total of 395,614.

The major radio users in Canada (top 10) are listed as follows:

	LICENCES
General Radio Service (Citizens Band Radio-known as CB)	132,012
Building and Other Construction and Trades	21,709
Taxi Systems	19,692
Air Transport and Services	15,006
Amateur Experimental Service (Ham Radio)	14,713
Truck Transport	14,022
Ships and Water Transport Service	13,043
Police Services (Federal, Provincial, Municipal)	12,676
Other Federal, Provincial and Municipal Services	10,793

Civil Defence (EPC Services) come 33rd on the list with 1,187 licences.

The major telecomm systems employed by DOT Telecomm consist of two computer-based teleprint networks, two facsimile networks, an extended Air Traffic Control interphone network, and a vast amount of dedicated data, voice, and control circuitry. All-weather operation of air traffic has caused an increased reliance on and the sophistication of, electronic facilities. The following is a list of some of the more important facilities and equipment in use:

i) Communications Systems:

Includes air-to-air; ship-to-shore; point-to-point using standard VHF and UHF plus HF radio equipment.

ii) Radar Systems:

Weather radar; and traffic control radar.

iii) TACAN; GNS.

iv) Short Range Navigational Aids:

VOR, L/MF Radio Ranges, DME.

v) Approach and Landing Aids:

ILS/DME, MLS (Microwave Landing System).

vi) Automation Systems:

ATIS (Automatic Terminal Information Service). Long Range Navigational Aids:

The aeronautical fixed network makes provision for ground-to-air, and air-to-air radio contact. Along with the aeronautical fixed network the MOT Telecomm system, known as ADIS (Automatic Data Interchange System) provides 'in-house inter-phone', Radio Telegraph, Radio Telephone, and computer flight file and telegraph. They are used for flight control and SAR comm searching.

Communication coverage and facilities are not adequate in remote and developing areas of Canada. However, with the advent of Anik II the coverage has been increased in the north to include telephone communication for Air Traffic Control purposes.

2) Equipment

Most of the civil aviation communication is done on VHF/AM equipment with a limited amount done on HF equipment. A chart summary of the various types of radio equipment is included in Table 3. Some figures are an approximation only. Equipment quality and capability varies a great deal, so does the cost. (Navigation and landing equipment is omitted). Referring to the ADIS map it can be seen that there are many regions where distances are far greater than 200 miles from the nearest fixed network. The distance 200 miles was chosen because it is the maximum range of a VHF radio, and should a pilot experience difficulty outside that area no fixed installation would be able to receive his call. (There is always the possibility that another

aircraft may hear the call). That is the reason for the extensive use of HF Radio in the north. A pilot can talk right to his base of operations, often based in the south. Therefore the pilot is not hampered by the fact the VHF comm is not adequate for that area.

3) Equipment Reliability

Before the reader concludes that the use of HF radio in remote areas eliminates the problem of long distance comm, it should be pointed out that HF radio reception has often been called an "act of God" because of its unreliability. HF radio waves are sky waves that bounce off the ionosphere and by this means allow clear two way comm up to 2,500 miles under stable atmospheric conditions. Propagation characteristics vary through the day as well as from season to season, and depending on ultra violet radiation emitted from sunspot activity. The sunspot cycle of 11 years sees a change during that period from quiet radiation (about 50 sunspots) to intense radiation (about 400 sunspots yearly). During the intense periods HF reception is extremely unreliable.

Another drawback to the use of HF radio as a primary comm network is that many groups use only a twice daily call schedule. A vacuum in the comm network exists for the remainder of the day. SAR incidents require a more practical and continuous service.

Radio Equipment	User	Frequency Allocation (MHz)	Power (watts)	Range (miles)	Replacement Cost ($)	Comments
HF/AM	Military Civil Aviation Co's. Aeradio Oil Companies RCMP Gov't Agency (Fed & Prov) Native Groups Church Groups Oil Companies Marine	2-30	up to 100	up to 2500	50-500	National total HF "A/C Station": 1,173. Performance depends on propagation more than on power. Unreliable reception. HF radios used mostly in the north. Used even by Common Carriers such as CNT. Value to SAR - good only if manned but many HF are on a call schedule of 2X's/day. Every 11 yrs. sunspot cycle makes HF useless (totally unreliable) for a year - 1980 next.
HF/SSB	Military RCMP Oil Companies Aviation Co's. Gov't Agencies	2-30	50-1000	3000+	2000+500 for each Channel	Aircraft with SSB can also receive regular HF but not conversely. SSB radio are tunable to HF. Range is 8X's that of HF. National Total: 814.
VHF/AM	Military Civil Aviation Aeradio RCMP	116-149.95	2-3 for small radios usually less than 10	20-50 to 200/ab	600 average for one Channel	Line of sight - very reliable. The higher the altitude the farther the range. Not as good for low level search flying, especially in high ground. C.B. propagation variances. Nat'l total 1253.
VHF/FM	Military-GSP PRC 77 RCMP Provincial Police Coast Guard	30-75.95 140-170 30-50 150-170		to 50/gnd to 200/ab	500+	Line of sight - very reliable but limited range on ground.
UHF/AM	Military GSP Aeradio	255-400	10-100	40/gnd 200/ab	5000	Line of sight - very reliable but very expensive.
UHF/FM	Trucking Co's.			40/gnd 200/ab		Line of sight - very reliable.
VHF/DF	Military Civil Avtn Groups RCMP MOT Aeradio	121.5		to 40/gnd to 200/ab	150 to 30,000	Three kinds: Fixed, portable and hand held are all effective in homing-in on ELT signal at 121.5MHz. Most have only one to three channels. CONVERSION from LF/DF to VHF/DF costly $3,000. Used by military only.
UHF/DF	Military	243.0				
Amateur Radio	Can be VHF,HF,SSF,CW		3-20	up to world wide	50-1000	Each operator must be licenced, in addition to the regular station licence. Can span amazingly long distances with relatively little power.
Citizens	Can be VHF,SSB	26.96-27.28	3	20 1000 with "skip"	100-500	CB's very susceptible to 'skip' can receive up to 1000+ away but on a 'skip' basis only, but can control calls usually 5 to 20 miles away.

The reliable VHF network (and UHF by the military) also has its drawbacks. Reception is on a line of sight basis and pilots involved in low level SAR flying, or mountain SAR flying, often have to do without comm between themselves and other aircraft or SAR HQ. An aircraft equipped with VHF radio can receive and transmit only about 50 miles if the aircraft is flying at 2,000 feet altitude. Should a search aircraft locate the downed aircraft the pilot would be forced to climb to sufficient altitude to report the location and thus risk the danger of losing sight of the target.

4) Equipment Compatibility

Most radio equipment of one type is NOT compatible with that of another type. VHF radios, obviously, cannot receive either UHF, or HF radio transmissions because they operate on different frequency bands. HF/SSB radio can be switched to receive regular HF transmissions but the reverse is not true--HF only radios cannot receive SSB transmissions. Even radios of a similar type are not guaranteed to be compatible because radios licenced for different uses are assigned different frequencies*. For example HF frequencies assigned to the following categories are not only different but differ by regions as well.

Maritime, Government Agencies, Amateur, Public Commercial, Land, Common Carrier, Citizen Band, Industrial Commercial.

Each HF and VHF radio set, with the exception of tunable models, requires a different crystal for each frequency. Some sets have only one or two channels while others have 360 to thousands of channels.

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*Exact frequencies assigned to each individual group is not public knowledge.

It is possible that two aircraft equipped with the same type of radio would be unable to communicate with each other. Or if only 1 channel coincided, with for example a double channel simplex radio, they would be able to receive or transmit only.

The only widespread comm equipment that could be considered compatible is the VHF/AM or aeronautical equipment. VHF/AM equipment is the communication interface among the three: civil aircraft, military SAR aircraft, and ATC. The same could be said for HF networks,* except HF radios are not common on civil aircraft.

5) Network Compatibility

There appears to be no fully integrated interconnecting comm network among the co-operating agencies with the exception of the telephone which is common to all groups. All the groups listed are involved in emergency situations from time to time but there is an obvious lack of efficient and effective interconnecting networks. There is a great belief by those involved in communications that the Canadian comm capabilities will be maximized by the use of communication satellites.

It should be noted that strain is often put on comm capabilities when uncoordinated misuse of emergency frequencies occurs. Not everyone is convinced that these emergency frequencies are for emergency situations only.

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*The military SAR aircraft use HF/SSB radios. By this means they have direct contact with RCCs at all times. Each RCC has a Mobile Radio Kit that allows the Searchmaster to take HF capability with him to the SAR HQ in the field. Military SAR aircraft, while not required to have VHF comm capabilities, do so in order that they may contact civil aviators directly.

PART 5

EXISTING CIVILIAN SEARCH AND RESCUE GROUPS

GENERAL

A study was made of Canadian civil SAR groups that are in existence, and ones that for one reason or another have become inactive or have dissolved. By studying the strengths and weaknesses of these groups it is possible to design options for a national Civil SAR Plan that would be workable both for the civilians and the military. It was not possible to limit the study to groups that participated in SAR 'flying' only. It turned out that most groups were capable of, and in fact many searches require, air, ground, and marine SAR activity.

Observation of and discussion with most of the groups was accomplished through field trip visits. The author was able to observe the groups on a stand-by* or SAR exercise basis only, as no SAR operations coincided with the field trips. For the more advanced, or more specifically aeronautically oriented groups, numerous visits were made as it was felt that observations of a variety of activities, such as annual meetings, director's meetings, committee meetings, training exercises, SAR briefings, spotter training and survival training would accord a more accurate assessment. Personal interviews, equipment demonstrations and a study of scrap books and photographic collections proved to be a most valuable means of assessing the effectiveness of a group.

Although no missions were observed, in a number of cases searches had recently been completed and the details were still very fresh in everyone's mind so that a reconstruction of the activity and assessment of the operation was possible. In many ways this is a superior method because it took far less time to construct a scenario than it would if the operation itself were observed even though there is no replacement for on

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*Not 'Standby' as CF definition but rather in a state of readiness.

the spot observations. In an attempt to reconstruct the atmosphere and events that occurred during the search, interviews were made with a variety of persons who had some involvement -- RCMP, Aeradio operators, EPC, political leaders, local pilots, airport managers, provincial police, --- in addition to the members of the Civil SAR Groups.

CATEGORIES OF GROUPS STUDIED

The following five categories include the groups that were studied during field trips or through interview or correspondence.

a. Local Volunteer Groups

Operate in a small geographic area. Local citizens volunteer their skill, time, and often money to operate a SAR group for local search needs. Examples:

1) Lakehead Search and Rescue Unit.
2) Sault SAR Inc.
3) Chilliwack Volunteer Rescue.
4) Campbell River SAR.
5) Fort McMurray Air Patrol.
6) Coppermine SAR Committee.

b. Regional Volunteer Groups

Operate in a larger geographic area. Local citizens volunteer their time, skill, and finances to operate a SAR group for their regional search needs. Examples:

1) Yukon Air Patrol.
2) Rescue 15 - Queen Charlotte Island and area.

c. Provincial Volunteer Groups

Operate on a provincial basis. Citizens from all over the province volunteer their time, skills, and often finances to operate a SAR group for their provincial search needs. Examples:

1) Manitoba Air Patrol.
2) Civil Air Rescue Emergency Service (CARES) Alberta - in the planning stage.

d. Provincial Government Volunteer Groups

Operate within the structure of a provincial government department. Administrators are paid as employees of the government while the field workers are volunteer citizens from throughout the province. The volunteers provide their skills and time in exchange for training and some compensation. Examples:

1) Provincial Emergency Programme (PEP) - B.C.
2) Saskatchewan Emergency Measures Air Division (SEMAD).

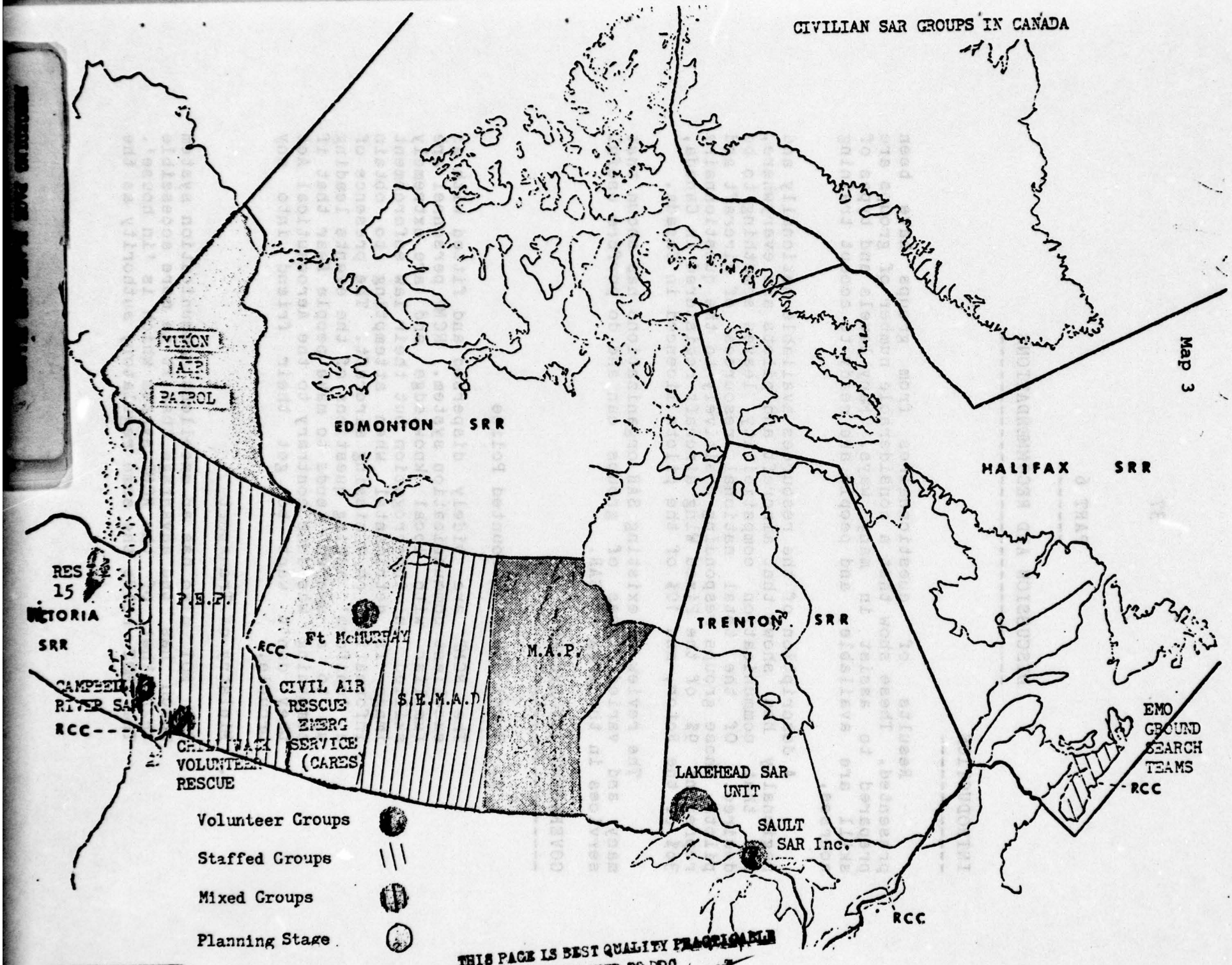
e. National Volunteer Groups

There are none of these groups in Canada so two groups were studied from the United States. They both have a national structure. Most of the effort involved in these groups is done by volunteers who give their skills, time, and often finances. The first group is the American primary search resource and it operates as an auxiliary to the USAF. The second is a resource group that aims to increase communication and the quality of SAR with all the various groups and agencies that also have a hand in SAR. Examples:

1) Civil Air Patrol.
2) National Association of Search and Rescue (NASAR).

As a visual summary of the location of the Canadian groups Map 3 has been included. It is evident that there is considerable scope for development of civilian involvement in SAR activities.

Details of these discussions and investigations are not included, but the data are available in a separate document on request (Annex B). However, the main points are incorporated in Part 6, particularly in the discussion of options.



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PART 6

DISCUSSION AND RECOMMENDATIONS

INTRODUCTION

Results of questionnaires from groups have been presented. These show that a considerable number of groups are prepared to assist in many ways. Many levels and types of skill are available, and people are ready to accept training courses.

A description of the resources available nationally and regionally has shown that aircraft and pilots are everywhere, but that communication compatibility leaves something to be desired. Of the total national resources of aircraft and pilots, those groups responding positively to the questionnaire represent 9% of the Fixed Wing aircraft registered in Canada, 36% of the Rotor, and 10% of the pilots licenced in Canada.

The review of existing SAR organizations has shown that many and varied types of groups can and do perform useful services in the area of SAR.

GOVERNMENT INVOLVEMENT

a. Royal Canadian Mounted Police

The RCMP are widely dispersed and fitted with an excellent communnication system. RCMP personnel are familiar with local knowledge and are extremely skilled in interrogation but their law enforcement image is detrimental when attempting to obtain information on a missing aircraft. The presence of a 'uniform' asking questions of the events leading up to a search tends to make people fear that if something was done contrary to the Aeronautical Act they don't want to get their friend into any trouble.

b. Ministry of Transport

The MOT also has an excellent communication system which has the advantage that it is more accessible than that of the RCMP system which is 'in house'. The MOT holds the same regulatory authority as the

RCMP and this generally makes them unpopular with pilots. Aeradio operators have increased their involvement in 'flight planning' with pilots and appear to have a good working relationship.

c. Department of National Defence

DND is already responsible for SAR and has the required equipment, communication, and structure. Although EPC is nominally an agency of DND it should be considered separately for the purposes of this study.

d. Emergency Planning Canada

While it has contingency plans to cover all types of disasters operationally EPC is not consistently compatible with aeronautical SAR especially its communication system. EPC has excellent training facilities.

Disasters occur too infrequently to keep personnel interest high especially for the more action oriented people.

Provincial EPC programs under various Provincial Ministers compare about the same as the Federal EPC.

NATURE OF CIVIL SAR ORGANIZATIONS

Attitudes within organizations affect the capability and performance of the groups. These attitudes can change rapidly, however, as a result of personnel changes, morale, and education. The findings mentioned here are not necessarily representative of specific organizations, nevertheless they are attitudes which have been encountered during the survey. Delineation of groups has been by degree of volunteerism as attitudes were genereally found to be similar within each type of group.

a. Strictly Volunteer

In these groups all personnel and resources are given voluntarily. Both administrators and workers donate their time and talents to the groups' operations. The equipment and budget are raised by soliciting support and donations from local service clubs, industries, and institutions. The members are often very ingenious in making the most of

little money. Careful study and purchase of only essential equipment brings them maximum value for their budget dollar.

These strictly volunteer groups are all locally established, or exist within a reasonably small geographic or sociographic area and thus they are able to maintain a highly visible posture. Because of this they gain immediate feed back as to the value of their services to the community. This visibility acts as an encouraging factor -- the Hawthorne Effect -- and helps to attract new members. The dedication and enthusiasm of old members seems to be a factor in weeding out those recruits who are not interested in a total commitment to the group or its activities.

The volunteers treat the group with special care.... "it's our baby".... constantly nurturing and protecting it from deteriorating and destructive forces. These groups expressed the desire to remain free from too much government involvement, particularly administrative involvement. They say that past experience has led them to equate government involvement with "string" so long that they eventually strangle the effectiveness and efficiency of the group. Even government grants are considered with great caution. It was explained that too much paper work and too much time was required for these grants. "We could earn the money ourselves and be using the equipment long before the time it takes to fill in the initial application forms, await approval, make the purchase according to government stipulations, and maintain follow-up reports". Government involvement for these groups is usually restricted to search interaction, training, and public relations activities.

b. Staffed Groups

Within these groups, structure exists as part of a government department with the administration paid as full or part time employees. The 'workers' volunteer their talents and time and are paid a certain amount for their travel and living expenses while on search or training. The equipment and operating budget is supplied by the government department.

There was often noted a definite feeling of estrangement between the administration and the

workers within these groups expressed in the form of "us and them", criticism of equipment, administration, and volunteer efforts. Administrators complain they have an extremely difficult time keeping the volunteers interested and dedicated at times other than search operation. "Volunteers tend to expect everything to be done for them --- sort of let the government do its job and we'll just drop in to do our flying at our convenience. If things are not running as smoothly as desired, the volunteers blame the government employees instead of saying we had better get busy and contribute more effort."

The 'volunteers' say they are given "only the dirty jobs while some guy who is getting paid sits in his office and tells us what to do." These workers say they lack a feeling of being important members of the group.

It appears that management problems occur because too many people are responsible to too many people. When a very active person who believes in getting things done in a rapid manner is under the direction of a person who does not believe in rocking the boat, then friction occurs, and often this dissention filters through the group.

It was noted that the more SAR activity and the greater the interaction and rapport with the Canadian Forces the higher the morale of the workers and the administration.

c. Mixed Volunteer and Staffed Groups

These groups exist as a mixture of the other two extremes. The members are volunteers but they get some form of government support or supply of equipment. The members seem to swing between a feeling of being grateful and content with the government involvement, and one of frustration over bureaucratic shortcomings.

Some of the groups that fall into this category could have had more government assistance but they chose to do the work and operate on their own making use of government sponsored equipment only. Other groups within this category find the workload so great that they would be unable to remain operational without government support. They reach a point where they are doing just too much work as

volunteers and feel that the Federal Government should support them financially since the group is doing a task that is not really their responsibility. These particular groups say that as things are now, there is a great difference between the promises of support and the actual resulting support. Over and over again these groups find they have to prove and re-prove their usefulness in an attempt to obtain a more workable operating budget.

GENERAL COMMENTS

The following comments are ones that seemed to be applicable to the groups in general.

a. The aim of all groups is to provide immediate search and rescue response for a variety of emergency categories.

b. All groups have the ability and resources to initiate a search, and in most cases willingly continue to search until completion even after the involvement or arrival of the legal authority.

c. Their aim is to fill a SAR resource vacuum within their area, not to take over the Federal government responsibility.

d. Each group has developed a tailor-made structure that fits the unique factors of their respective areas.

e. Each group has developed to a level of sophistication comparable to both the need in their area and the capabilities and dedication of the leaders.

f. The more search activity in the area the more enthusiastic the group.

g. The type of search object, not the time of the year, determines the response of the search teams -- a missing child draws an abundant search complement while a missing hunter usually draws a rather scanty response.

h. Most groups are diversified and take part in or direct ground search, marine, spotter, and/or aerial searching.

i. Training diversification of individual members increases the productivity of the whole group. If a member can slip from one task to another with ease and skill they feel far more confident.

j. Overall smoothness of operation of the group on a day and operational basis depends on the attitude of the individuals.

k. A large budget does not necessarily make a great group.

l. Groups that obtain and maintain their own equipment generally show more respect for the equipment than those that have the equipment supplied.

m. Groups that have budgets supplied by the government but spent at the discretion of the group seem to operate more effectively than those whose budgets are administratively controlled by government.

n. Groups with a high profile find that the enthusiasm of the old members attracts new members and financial support.

o. Disciplinary action is not necessary in groups with high morale since new members are automatically weeded out when the group realize they are unable to contribute as expected.

p. The more recognition the groups receive, from both the general public and DND, the greater the contribution of the individual members, and thus the higher the morale of the group.

q. The groups that had leaders with CF Searchmaster training had a greater understanding of military SAR needs and capabilities. This helped to eliminate any unrealistic expectation and aided in achieving a practical working relationship with the military.

r. Groups that encourage 'social activities for members and spouses' displayed a higher morale and a greater dedication to the group.

s. Groups that discouraged social or spouse involvement in group activities or training sessions displayed a higher degree of 'grouching' about 'out-of-pocket-expenses' and 'how demanding their duties were as volunteers'.

ASPIRATIONS

The following list of aspirations were common to most groups.

a. A desire for more training, or more specialized training.

b. The establishment of a Military Liaison Office to provide a contact between the DND SAR organisation and the group.

c. Recognition from government, especially from DND, for their contribution towards SAR.

d. Increased involvement between SAR Squadrons, RCCs and the groups. Only one group said they wanted nothing to do with DND now as they wouldn't help them in the past when they needed support. This attitude was not necessarily held by the newer members and it is hoped that through increased PR old wounds can be healed.

e. More finances. All groups, from the smallest to the largest, said they would like to have an increased budget. Most felt that the Federal Government should be the source but some only wanted this additional funding on the condition that it did not mean increased government administration involvement. They felt that the money should be more of a grant for past performance.

f. Upgrading of CF SAR Equipment. This concern was voiced by all groups. They felt empathy towards the SAR personnel as they are very aware of the difficulties inherent in the task of searching. They feel that DND SAR resources and equipment should be brought up to a more realistic level. (This particular observation was made by one particular group but it brought about emphatic agreement from all the groups).

PAST-OPERATIONS

FAILURES

Some of the reasons that have contributed to the lack of co-operation between the CF and the civilian SAR groups follows:

a. Unawareness

Until this study some SAR Squadron and RCC personnel knew little or nothing about some of the civilian SAR groups abilities, capabilities, and activities. In other cases they had heard only opinionated rumours, and so did not welcome these civilian groups' involvement in SAR operations. The civilian groups, on the other hand, were often unaware of the special requirements and procedures of the military SAR System.

b. Resentment

Many individual SAR personnel feel that civilians involved in similar activities are either trying to take over their area of responsibility or reflect an indication of dissatisfaction of CF SAR. At times the civilian SAR Groups are resentful if their volunteered services are not exuberantly accepted by the CF.

c. Contempt

Many military SAR personnel hold contempt for all civilian flying involvement in SAR. They do not trust the civilian aircraft, their equipment, their ability, training or discipline. Civilians often show contempt for the attitude of the military crews. They feel that the apparent casual attitude of the military pilots and S/M is one of irreverence and a lack of real concern for the missing pilot.

d. Hostility

Searchmasters are often overextended on long searches and find it most difficult to remain patient with persistent and often ill-informed civilians pestering him for information or the opportunity to fly in the primary search area. The

S/M has no way of knowing which of the civilians would be reliable, capable and disciplined. The loudest are not often the best.

e. Envy

Civilians, often envious of the CF sophisticated equipment and SAR training, make remarks like 'grid searching is useless in this country' or 'how could those high and fast CF pilots who always fly airways in their high powered aircraft know anything about flying low and slow in our area?'

f. Personnel Changes

Fractures often occur in an on-going relationship that has been established between both groups when key CF SAR personnel transfer. Groups often have to do a selling job all over again to convince the new personnel of their credibility.

SUCCESS

Although not reported by the press nor remembered with the same intensity as the failures, the past successes are many and varied.

a. Training Courses

The single most important civilian to receive CF SAR training is the civilian leader. Through his increased understanding of the military SAR requirements and procedures he is able to pass this information along to his crews in the form of directions and immediate instruction. Flying training for Civil SAR Groups not only gives the civilian searchers increased skills but also gives them more empathy towards CF SAR crews and their tasking. Defensive Flying, Survival and Spotter Training are the three most widespread courses now being presented to civilians across the country.

b. Workshops

Discussion and learning workshops have proven to be most beneficial in increasing the rapport between the groups and also in alleviating problem areas and areas of uncertainty. The social aspect of these functions is helpful.

c. Social Interaction

Socializing after workshops, lectures, and exercises helps to break down barriers. The civilians see that the military really are dedicated and sympathetic towards civilian groups, and the military discover that the civilian groups really do have some fine and capable resources. This improved interpersonal relationship continues into operations throughout the year.

d. Actual SAR Operations

Working in co-operation with, rather than in opposition to the civilian groups benefits both. One particular search in northern Canada inspired the CF to gather all involved civilians from the community to a town meeting where all facts and clues were discussed. The resultant increased working rapport and good community relations proved most beneficial.

e. CF SAR Extended Involvement

Those CF SAR Squadrons or RCC's whose personnel make individual contacts are able to increase the involvement of the CF with the Civilian SAR Groups and thus able to enjoy a higher degree of co-operation and support.

POSSIBLE CIVIL SAR PLAN STRUCTURES

Four main options are presented in comparative form listing structure, staff, support, volunteers, training, equipment, and attitudes. These are followed by the resulting recommended option which is a combination of Option 2 and Option 4.

TABLE 5

POSSIBLE CIVIL SAR PLAN STRUCTURES

OPTION 1 PRESENT STRUCTURE	OPTION 2 LIGHTLY STRUCTURED	OPTION 3 MODERATELY STRUCTURED	OPTION 4 HIGHLY STRUCTURED
STRUCTURE Mixture of existant civilian group structures across Canada. e.g. Lakehead SAR Unit, MAP, YAP, SEMAD, PEP.	**STRUCTURE** Tie together existing flying clubs, aviation councils, associations and existing SAR groups by increasing communication and interaction through an association made up of all these. e.g. NSAR (USA).	**STRUCTURE** Use existant government dept's that are semi related to SAR tasks. Either provincial or federal. e.g. SEMAD, PEP.	**STRUCTURE** Establish a new program with staff, and offices across the country at pre-determined and needed locations, that would exist as an auxiliary to another existant group. e.g. CAP (USA Auxiliary to USAF) Canadian Arctic Ranger proposed programs.
OFFICES AND STAFF Staff varies from volunteer leaders to paid government employees. Offices exist in a variety of places: homes, clubs, airports, and government offices.	**OFFICES AND STAFF** One national HQ office with small core of paid executive. Regional and local work done by members in existing offices or homes.	**OFFICES AND STAFF** Offices and staff exist to maintain the government department and would take on administrative tasks of civil SAR group.	**OFFICES AND STAFF** The offices could be set up in existing DND, for example, buildings. DND staff could do administative work and allow volunteers.
SUPPORT Various training courses exist and are given by DND, MOT etc.; liaison between groups; and in some cases equipment and financial support come from governments and service groups.	**SUPPORT** Training, liaison, and equipment or financial support could be gained from whatever sources are available -- private donations, service groups, government departments.	**SUPPORT** Operating budget comes from the existant government department. Includes compensation for travel, living while on search or training; instruction and training costs, plus office support.	**SUPPORT** Operating budget could come from within each group on a regional basis, or come from government budget.
VOLUNTEERS Most groups exist now on all volunteer labour and skills. Some are compensated for travel and living expenses on search or training.	**VOLUNTEERS** All members would be volunteer except the core executive, and one or two paid workers acting as liaison people at provincial or regional level.	**VOLUNTEERS** Flying and spotting done by volunteers.	**VOLUNTEERS** Flying, spotting, and local training could be done by volunteers.
TRAINING Varies from on-the-job to extensive 10 week training courses.	**TRAINING** Increase availability of already existant courses: DFL, Spotter training, Searchmasters course, etc.	**TRAINING** Use the established, fixed and transportable, training programs with visual aids; exams, and well designed outlines.	**TRAINING** Maintain a high proficiency ratings, supply extensive training at the local level so pilots and observers won't have to leave their own areas for training. Set up portable and fixed courses.
EQUIPMENT Some groups obtain all their own equipment, do their own repairs, others have equipment supplied by government departments.	**EQUIPMENT** Allow each group to obtain their own desired equipment and supply each with certain specialized equipment: VHF/DF, Standard Radios.	**EQUIPMENT** Supply existing government supplies to be used for SAR purposes. Supply storage, and meeting space plus all personnel and unit equipment.	**EQUIPMENT** Supply and maintain a high quality of equipment that is practical for the area and type of operation.
ATTITUDES Varies from group to group. Morale is extremely high in some, yet low in others. Some members have a great sense of belonging to a worthwhile group - others feel they are being badly used by their administrators and the government in general.	**ATTITUDES** Because everyone in the field is volunteer everyone is struggling with the same goal: to make it work. No one would have the feeling of being used, but instead that they are valuable members.	**ATTITUDES** Attitudes tend to polarize: 1) At best: although gov't often moves slowly, it has the expertise and budget and it does get things done in an orderly and well administered manner...show pride in belonging. 2) At worst: It is a bureaucratic monster that retains dead-head staff, who are un-initiating and afraid to rock the boat...gov't has so much money that they won't miss a few things here and there that I could use on my camping trips.	**ATTITUDES** A good "con-job" would have to be done on the volunteers so they would maintain a feeling of belonging as a valuable member. This could be done by giving them skills and training they would not be able to afford or obtain on their own, e.g. IFR training, proficiency ratings, opportunity to fly sophisticated equipment.

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RECOMMENDATIONS

OPTION RECOMMENDED

The option recommended by the author is for the development of a national volunteer SAR association. The name chosen to represent the suggested option and used for the duration of this report is the Canadian Association of National Search and Rescue, the word order chosen for the resulting acronym CAN-SAR.

OBJECTIVES OF CAN-SAR

The three main objectives would be as follows:

a. To provide structured opportunities for any and all SAR groups, government departments or agencies, and individuals that presently participate in SAR activities in Canada. This will allow common discussion of problems, ideas and suggestions. The result will be that all members and eventually all Canadians will have a more complete understanding of SAR in Canada.

b. To support or establish effective civilian SAR groups in all areas of Canada where civilian SAR groups exist or where latent interest is indicated. This would include standardization of qualifications, aircraft, training, and SAR search techniques.

c. To provide aircraft suitable for SAR for areas of Canada where immediate CF SAR coverage is inadequate. These aircraft would be flown by well trained, qualified civilian member pilots. This objective would require a quasi-military structure in order to keep tight control. This particular element of CAN-SAR could be called CAN-SAR Air Rangers.

STRUCTURE OF CAN-SAR

The following structural descriptions are very general.

a. Membership

CAN-SAR would encourage volunteer membership from all groups and agencies involved with SAR. They would include RCC, SAR Squadrons, ATC, Aeradio, federal EPC, provincial EPC, radio clubs, COPA, RCFCA, aviation councils, CALPA, commercial companies, flying schools, RCAFA, survival consultants, police, RCMP, private pilots, and civilian SAR groups. All members would have equal status within the association itself although under operating conditions one may hold authority over others.

b. Executive

Executive positions would be paid full time and all members of the association would have an equal opportunity to hold office. The Executive would run the operation of the association with each executive member being chairman of a committee - training, communications, equipment, etc.

c. Advisory Council

This would be made up of persons with a great deal of expertise in the SAR operations. Since most of these would be employed in their field of speciality they would be able to contribute their talents to the association on a meeting basis only, as advisors.

d. Member Participation

All members could participate on a variety of levels: as member of the executive, advisory council, regional leader, local worker, or as an Air Ranger pilot. They could do so from a variety of employments and backgrounds, such as the following:

1) Job Unrelated

These people could be self employed or working for others either on shift or 9 to 5. They would include dentists, homemakers, plumbers, etc.

2) Job Related

People in this group hold jobs that are already active, or could potentially be active, in SAR. They include pilots, radio operators, medical doctors.

3) SAR Background

These include retired or ex-SAR personnel -- pilots, RCC, air crews, Survival Training School, Ground Search Party. Their present job may or may not be related to SAR.

4) Resource Related Job

Members of this group could authorize resources for SAR tasking e.g. flying club instructors, commercial company operators, private aircraft owners.

5) Government Employees in Secondary SAR Job

These include: RCMP, ATC, Aeradio Operators, EPC. They could potentially contribute themselves and their resources to CAN-SAR tasking.

Participating members could be given a yearly retainer of a few hundred dollars as a token of good faith.

e. Financial Base

Since aviation SAR responsibility in Canada is the legal responsibility of the Federal Government, it is from there that the greatest part of the operating budget must be derived. A pro-rated amount would be expected from the various government departments which make up part of the CAN-SAR membership. Financial support would be separate from the resource support such as training facilities, instructors, etc.

f. Operating Costs

Expenses would include:

1) Executive salaries

2) Office expenses

3) Support in grant form to Civil SAR Group members

4) Newsletter or magazine.

g. Benefits

The actual benefits that would accrue to members would result from the following activities:

1) Meetings: national, regional and local meetings would be held for members to discuss problems, ideas, and activities.

2) Seminars: travelling seminars could include such topics as communication compatibility.

3) Workshops: travelling workshops could help a particular area with a number of topics.

4) Training: clinics and full courses such as Searchmasters, Survival, Ground search, DFL, ELT, Spotter training.

5) Exercises: using CF SAR Pilots as tutors give members field instruction through exercises.

6) Newsletter: some form of newsletter or magazine could be used to keep all members informed of happenings, developments and techniques. This would be of special benefit to those members who could not maintain an active participation.

h. Field Operations

Local members should be trained to enable them to do the initial search, including the first track crawl, and to make the necessary arrangement prior to the arrival of the S/M and SAR crews. The S/M would have final authority under the RCC but the local CAN-SAR leader would direct the local CAN-SAR pilots.

BENEFITS OF CAN-SAR TO CANADA

a. Channel all the diverse SAR energies into one group.

b. Eliminate duplication that now exists concerning SAR.

c. Increase the awareness and understanding of those involved in SAR and therefore minimize breakdown of interpersonal communication.

d. Support or supplement CF SAR System in a structured, disciplined, and practical way.

e. Recognize problems and bring about suitable solutions.

f. Supplement general aviation pilots with training and with this improved skill and awareness make better pilots in general, and more informed 'downed pilots' in the future. This in itself will make safer pilots and reduce SAR time.

g. Give additional boost to CF image by having CF interact with more civilians and thus become more visible.

RELATIONSHIP TO OTHER OPTIONS

The following are the factors contributing to a decision for the option CAN-SAR.

a. CAN-SAR would produce the least extreme transitional changes.

b. This option would be the least costly to Canada. Even taking no action towards any Civil SAR Plan would be more costly, perhaps not initially but eventually.

c. CAN-SAR could be implemented in stages, with each developing independently yet adjusting to and accommodating the other stages.

d. Immediate action could be taken for CAN-SAR implementation.

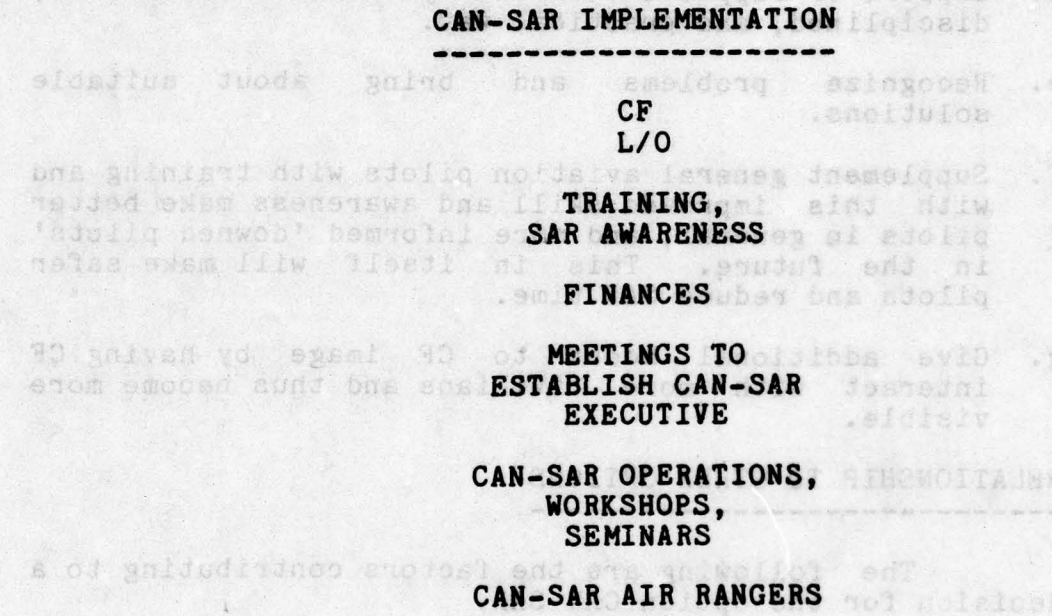
e. Existing Civil SAR Groups would continue to function and develop without interruption.

f. This option would have the least amount of government administrative control.

g. Co-operative effort on the part of the members would be a positive factor as no one would feel they were being put upon.

IMPLEMENTATION OF CAN-SAR

The structure of CAN-SAR could be implemented in six stages, implementing the final stage, the CAN-SAR Air Rangers, only when the time is right.



STAGE 1. ESTABLISH A CF LIAISON OFFICE

The most urgent need, and one that could be implemented immediately, is the establishment of a permanent liaison office to be involved with civilian SAR activities. The tasks assigned to the L/O would be to maintain contact with existing civilian SAR groups, encourage training and exercises involving the groups and SAR squadrons, encourage civilian initiative during first part of search. The L/O should be receptive to civilian involvement without appearing aggressive.

STAGE 2. TRAINING AND SAR AWARENESS

Expand the existing training courses to include Searchmaster training, SAR indoctrination, survival and ground search. Training would include operational training as well as leadership training so that civilian leaders can in turn train their members, and encourage civilian SAR exercises employing CF SAR crews as tutors to civilian students.

In an attempt to make those involved in SAR, civilian or CF groups, more aware of other group's operations a newsletter or magazine could be established at this stage. During the study the author noted that every group was most interested in knowing where other groups existed and how they operated. Even the SAR Squadrons admitted that they did not know as much about the various groups as they would like. The establishment of a newsletter at this stage would also act as a means of informing and gathering input for the further development of CAN-SAR.

STAGE 3. FINANCES

Up to the establishment of this stage expenses would be absorbed by existing DND operations. Once the financial aspects have been determined then the CAN-SAR operations can begin as a separate group. The advisory comittee would be established at this stage.

STAGE 4. ESTABLISH CAN-SAR EXECUTIVE

Following national and regional meetings chaired by DND, nominations and elections would establish the CAN-SAR executive. The executive would then choose or be assigned their committees and be provided with their offices and support staff.

STAGE 5. CAN-SAR OPERATIONS

The activities, approved by CAN-SAR, to carry out the aims and purposes of their constitution would begin. Workshops, training sessions, seminars and annual meetings would take shape.

STAGE 6. CAN-SAR AIR RANGERS

When it is indicated that the association is well enough established and has adequate numbers of skilled and proficient pilots this stage would be considered. This Ranger concept would be controlled by a committee of the CAN-SAR and not all members of CAN-SAR would belong to or take part in the CAN-SAR Air Ranger Element. A very close association would have to be established between the Air Rangers and the DND, with perhaps a joint parenting.

The attractiveness of this option is that it is long term and direct enough to have a definite goal yet flexible enough for the group input to decide the speed and final direction. Civilian enthusiasm, dedication, skill and resources will be harnessed in a workable structure. Marine, aerial and ground search resources will be combined rather than duplicated. All who belong to CAN-SAR will benefit. All persons involved in or encountering a SAR situation will benefit.

FURTHER STUDY OR ACTION

This study brought to light or reconfirmed the need for further study in a variety of areas. Included in the following list are also a number of suggestions by the author for further action.

a. DAOT take out membership on behalf of the Department of National Defence in the USA National Associaton of Search and Rescue. This association is most similar to the suggested CAN-SAR, and much could be learned from membership.

b. A number of CF top management personnel involved with SAR should make arrangements to attend the *NASAR Annual Conference*.

c. Continue to study in more detail the operations of NASAR to determine the pitfalls and successes they have experienced.

d. Review the report submitted by CF Northern Region in December 1971 on a proposal for Canadian Arctic Rangers as a starting place for CAN-SAR Air Rangers. (NR 1901-260/1 (Comd) NR 3185-4 Restricted).

e. Make arrangements for the distribution to the respective RCC and SAR Squadrons of information on Civil SAR Groups Groups now operating. This could be in the form of a handbook or directory.

f. Study the psychology of volunteerism as related to SAR and find out what makes a good volunteer, a good volunteer leader, and how to inspire volunteers to work for a group effort.

g. Study further the compatibility of communication systems in Canada, with specific reference to frequency allocation compatibility.

h. Consider the possibility of establishing a SAR Magazine in Canada, doing first a financial cost estimate.

i. Study Canadian geographic flying considerations in relation to civilian aircraft and SAR flying requirements.

j. Study further the possibility of expanding CF SAR resources.

APPENDICES

APPENDIX 1 Questionnaire Form - 'Aviation Group'.

APPENDIX 2 Tabular Data 'Aviation Group' Replies.

APPENDIX 3 National Figures - Pilots and Aircraft.

APPENDIX 4 Companies, Groups, and Associations.

APPENDIX 1
TO ORAE M87

Return to Susan Milligan
Site 4, Box 14,
Yellowknife, N.W.T.
X0E 1H0

CIVIL SAR PLAN QUESTIONNAIRE

For Aviation Organizations

1. Name of group:

2. Address: Telephone:

3. Total members: President's name:

4. Type of business or group:

☐ scheduled air service ☐ flying club commercial ☐ aerial application, survey, etc.

☐ charter commercial ☐ flying club pleasure ☐ aviation organization (e.g. provincial general aviation council) specify:

5. Does your group see a need in your region for:

☐ any involvement by civilians in SAR activities?

☐ more involvement than there is at present?

☐ an organized Civil SAR Plan?

☐ or are you satisfied with the way things are operating at present?

6. Would your group want to be actively involved in a Civil SAR Plan? ☐ Yes ☐ No

☐ as a group?

☐ individual members only? How many?

Note. If the answer is "No" then skip ahead to questions numbered 14 18, 25 - 31.

7. Do you have members who would be willing to contribute their skills at the following levels?

(Indicate the number of members for each):

☐ flying _____

☐ managerial _____

☐ maintenance _____

☐ spotting (observing) _____

☐ assisting the searchmaster (S/M) by setting up search H.Q. _____

☐ assisting S/M during the search _____

☐ other _____

8. Would these members be willing to take courses or training in the following:

☐ SAR indoctrination (the basics of running a search)

☐ SAR flying procedures and techniques

☐ spotter training

☐ terrain flying

☐ survival

9. How often for these courses:

☐ once only

☐ once a year

☐ once a season

☐ once a month

☐ weekly

APPENDIX 1 Cont'd

10. Would your group have training facilities available:

☐ Yes ☐ no what ? _____ ☐ Instructors

11. Would those members interested in involvement in a Civil SAR Plan be willing to submit to proficiency ratings? ☐ Yes ☐ No

12. What compensation would you expect to receive for:

a) pilot flying time _____ f) ground servicing _____

b) aircraft flying time (by HP) _____ g) maintenance _____

c) POL _____ h) time off work _____

d) insurance _____ i) spotting _____

e) flying or course instruction (as instructor) _____

13. Does your group have ground support resources that could be used during SAR activities?

☐ hangar space (amount) _____ ☐ portable ADF equipment _____

☐ office space _____ ☐ Herman Nelsons _____

☐ servicing & maintenance facilities _____ ☐ marine rescue facilities (Does your community have ?) _____

☐ de - icing equipment _____

14. State the fleet size of your organization.

15. How many aircraft, suitable for searching, would your group authorize for searching ? _____

16. Of these aircraft give the number of aircraft plus description for the following:

a) Type aircraft _____

b) fixed wing _____

c) rotor _____

d) cruise speeds _____

e) undercarriages _____

f) high wing aircraft _____

g) low wing aircraft _____

h) seating (give number of seats including pilots) _____

i) radio and nav aids and compasses (specify) _____

k) other (specify) _____

17. How long at one time, or how often would you be willing to dedicate these aircraft ?

(e.g. 1 hour a day for 3 weeks, or 3 consecutive days every 3 months ..... just examples.)

18. State the pilot resources within your group:

a) private _____ f) flying instructor _____

b) commercial _____ g) night rated _____

c) senior commercial _____ h) IFR rated _____

d) helicopter _____ i) barren land flying experience _____

e) airline transport _____ j) mountain flying _____

k) bush _____

APPENDIX 1 Cont'd

19. Would your pilot members be willing to fly SAR missions: ☐ Yes ☐ No

☐ during work hours only ☐ holidays

☐ after hours & weekends ☐ anytime

20. For employers only. Would you give your pilots and other employees time off for searching?

☐ yes ☐ no ☐ with pay ☐ without pay how often _____

21. Would you allow Civil SAR Plan Registered Pilots (those certified and qualified on aircraft type and SAR mission) to fly your aircraft on search activities?

☐ yes ☐ no ☐ your own pilots only

22. What launch time in hours would your crews be able to offer?

23. How long at one stretch could your crews be dedicated to SAR?

a) pilots _____ b) spotters _____ c) maintenance & servicing _____

24. How dependable would these times be? Remember the possibility that seasonal pay load work could preclude SAR involvement during the summer which is time of peak SAR activity.

25. Has your group been involved in search activities in the past? Specify.

26. Would you have suggestions for the improvement of SAR operations?

27. Outline your suggestions for the type of structure you would want to see for a Canadian Civil SAR Plan. Mention what relationship with the military you would expect.

28. State the level of training & qualifications you would expect of pilots and spotters.

29. Under a Civil SAR Plan what form of direction would your group or members be willing to accept ?

☐ civilian direction only	☐ year round	☐ during search
☐ military direction only	☐ year round	☐ during search
☐ both civil & military	☐ year round	☐ during search

30. Under a Civil SAR Plan what chain of command or lines of communication would you want ?

31. What support, other than compensation, would you expect from the military. This includes things like instruction, equipment modification & specialization etc.

Letter that covered questionnaire.

THE ORGANIZATION FOR THE AID AND PROMOTION OF SEARCH AND RESCUE

Site 4, Box 14,
Yellowknife, N.W.T.
X0E 1H0
Phone (403)873-2582

Civilian involvement in search and rescue (SAR) has been discussed a great deal over the years. So it should not surprise you to learn that a study to collect data on the "actual and potential civilian SAR flying in Canada" has been contracted by National Defence. The 12 month study, which began in September, is being carried out by this organization.

The purpose of the study is to propose a plan for organized civilian SAR flying involvement as an aid to the Canadian Forces' SAR System. This plan shall be referred to as the Civil SAR Plan during the study so it will not be confused with Civil Air Patrols.

All flying clubs and companies, and aviation organizations in Canada will be contacted for their input and suggestions. The amount of interest shown will in turn determine the direction of a Civil SAR Plan.

Your group can contribute to the study by completing and returning this questionnaire. Make your answers reflect the views of the group. Should any members wish to contribute their own ideas separately, include their names and addresses when you send in your reply and a questionnaire for individuals will be sent to them. Add extra sheets of paper for any long answers so you can make them as detailed as you like. Return your questionnaire as soon as possible so the tabulation can begin. Thank you.

Susan Milligan

Susan Milligan,
Principal Investigator.

APPENDIX 2
TO ORAE M87

RESPONSES TO QUESTIONS ON THE AVIATION GROUP QUESTIONNAIRES

This Appendix tabulates the responses to the 'aviation group' questionnaire which is Appendix 1. Only the questions with a standard format reply can be tabulated.

Because not all questions were answered by each organization the numbers of responses to the questions differ substantially. The basic subject matter of this report is a Civil SAR Plan and because of this the replies have been categorized by groups in favor of and those against involvement in a Civil SAR Plan.

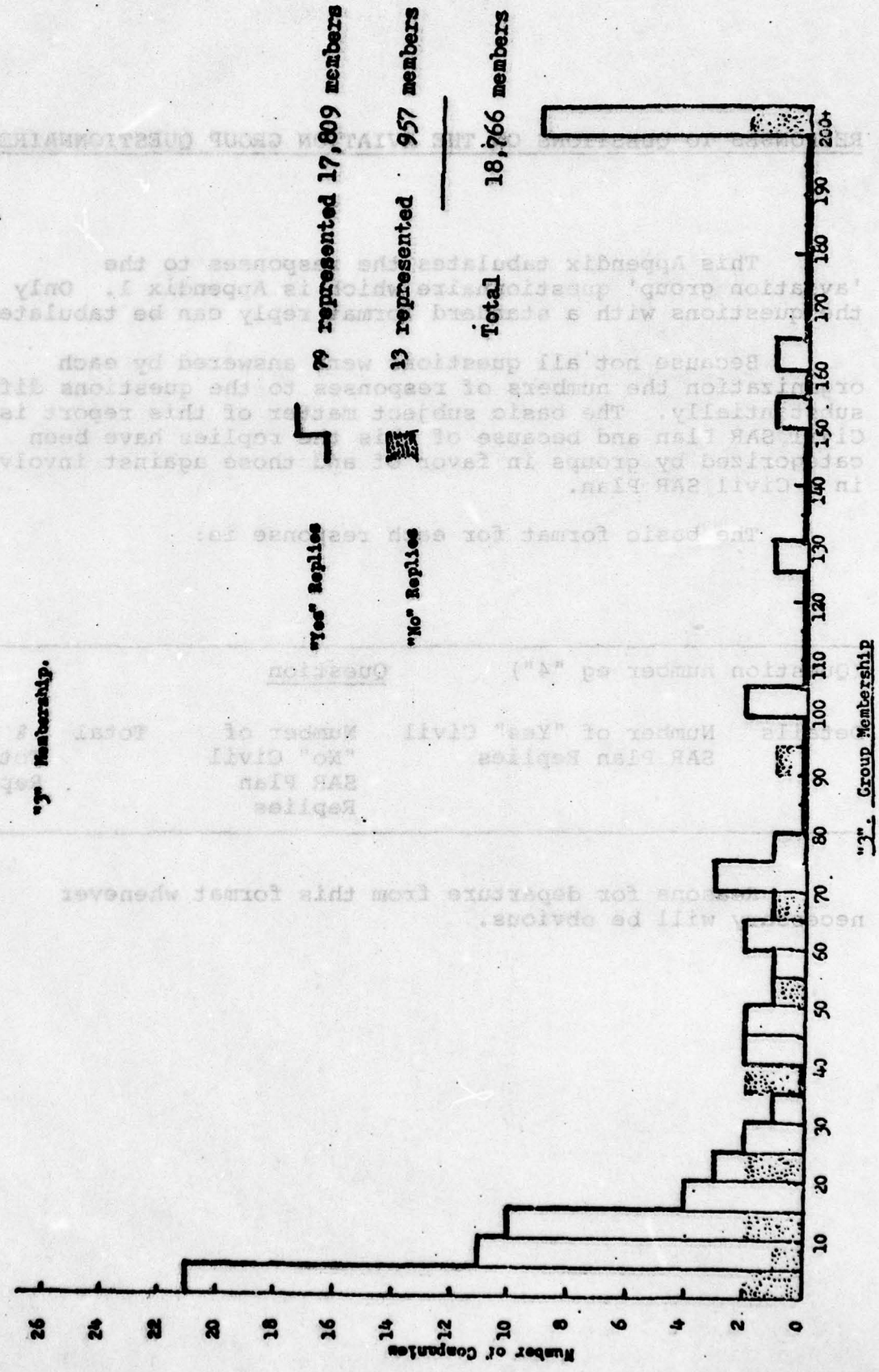
The basic format for each response is:

(Question number eg "4") Question

Details	Number of "Yes" Civil SAR Plan Replies	Number of "No" Civil SAR Plan Replies	Total	% of Total Replies

Reasons for departure from this format whenever necessary will be obvious.

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"y" Membership.
"Yes" Replies
79 represented 17,809 members
"No" Replies
13 represented 957 members
Total 18,766 members
Number of Companies
"3". Group Membership

GRAPH 1

Table 2

"5". Does Your Group See a Need in Your Region For:

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
Any involvement by civilians in SAR?	40	4	44	33.3
More involvement than there is?	45	0	45	34.0
Organized Civil SAR Plan?	68	4	72	54.5
Are you satisfied the way things are?	8	15	23	17.4
Number answered question	108	24	132	

Table 3

"6". Would Your Group Want to be Actively Involved In a Civil SAR Plan?

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
Yes	108	0	108	81.8
No	0	24	24	18.2
As a group	70	0	70	53.0
Individual members only	30	1	31	23.3
Number answered question	108	24	132	

Table 4

"7". Do You Have Members Who Would Be Willing to Contribute Their Skills At the Following Levels?

Details	Yes Civil SAR Plan			No Civil SAR Plan			Combined Totals	
	No. of Replies	*	No. of People	No. of Replies	No. of People	Total Replies	Total People	% Total Replies
Flying Skills	99	36	657	2	5	101	698	95.2
Managerial	48	12	76	1	1	49	89	46.2
Maintenance	43	13	71	0	0	43	84	40.5
Spotting (Observing)	73	36	883	3	67	76	986	71.6
Assisting S/M set up	48	24	172	0	0	48	196	45.2
Assisting S/M during	53	27	201	3	4	56	232	52.8
Other	6	6	0	0	3	6	6	5.6
Number answered	103			3		106		

* This column indicates the number of replies that just put a mark, either a check mark, or line to indicate a YES they have these skills but they did not indicate a definate number.

Table 5

"8". Would These Members Be Willing To Take Courses or Training In The Following:

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
SAR Indoctrination	83	2	85	80.9
SAR flying procedure	92	2	94	89.5
Spotter training	67	1	68	64.7
Terrain flying	63	1	64	60.9
Survival	72	4	76	72.3
Answered Question	101	4	105	

Table 6

"9". How Often For These Courses

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
Once only	19	3	22	22.4
Once a year	46	1	47	47.9
Once a season	25	0	25	25.5
Once a month	6	0	6	6.1
Weekly	1	0	1	1.0
Answered Question	94	4	98	

Table 7

"10". Would Your Group Have Training Facilities Available

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
Yes	60	2	62	59.6
No	40	1	41	39.4
Instructors	20	1	21	20.1
Answered Question	102	3	104	

Table 8

"11". Would Those Members Interested in Involvement in a Civil SAR Plan Be Willing to Submit to Proficiency Ratings?

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
Yes	89	3	92	94.8
No	5	0	5	5.1
Number Answered	94	3	97	

Table 9

"12" What Compensation Would You Expect To Receive

Details	Civil SAR Plan Yes	No	Total	% Replies Each Category	% Total Replies
Answered Question	96	5	101		
GENERAL COMPENSATION REPLIES					
Companies replied with check mark or general comment "reasonable", "breakeven", "whatever allowed",etc.	16		16		16.6
Number of co's put "?"	2	0	2		2.0
Number co's put "no compensation"	1		1		1.0
SPECIFIC REPLIES					
AIRCRAFT					
Full Payment- "Tariff rate"(6), "Rental" (2),"Charter "Charter" (8),"co. rates" (1), "Hourly rate" (1), "Standard" (1) "Going rate" (5)	24	5	29	42	28
Partial Payment - "Cost" (11),"Cost +5%"(1),"60%"(1), "Commercial rate less 20%" (1); "Charter 80%"(1),"Charter 75%"(2)	17		17	25.0	16.8
Minimum Payment - "Fuel", "some"	2		2	2.9	1.9
Exact Rates Detailed - "10¢ HP/h", "16¢/hHP","20¢hHP"(2) "25¢ HP/h", "35¢ HP/h", "12¢/$18 HR", "$3/HP","$18/HR"(2),"$25/HR"(2), "$29/HR","$30/HR", "$55/HR(a/c+pilot), "$175/HR", $280/HR","180HP-$30/HR", "100 HP/$20/HR"	19		19	27.9	18.8
Nil	1		1	1.4	1.9
Sub Total	63	5	68		
PILOT					
Full Payment - "Wage scale"(3), "Standard Going Rate" (5)	8	2	10	20.4	9.9
Partial Payment - "Cost"(3)"75%", "Depends on Pilot Licence", "Negotiable" "Expenses"	8		8	16.3	7.9
Exact Rates Detailed - " $5/h", "$6/h", "$7/h", "$8/h", "$10/h", "$12/h","$15/h", "$20/h"	11		11	22.4	10.8
Nil - "Included in a/c rate" (3)	20		20	40.8	19.8
Sub Total	47	2	49		
POL (FUEL)					
Full Payment - "Cost"(4), "Co. rates"	15		15	60.0	14.8
Partial Payment -					
Exact Rates Detailed - "$6.50/h"	1		1	4.0	.9
Nil - "Included in a/c rate"(6)	7		7	28.0	6.9
"?"	1		1	4.0	.9
N.A.	1		1	4.0	.9

Table 9 - Continued

Compensation Expected

	Civil SAR Plan		Total	% Replies Each Category	% Total Replies
INSURANCE	Yes	No			
Full Payment - "Liability","Co. rates", "Cost" (4), "Premium costs",	9		9	39.1	7.9
Partial Payment	0		0	-	-
Exact Payment - "$3/h"	1		1	4.3	.9
Nil - "Included in aircraft rate"(6)	12		12	52.1	11.8
N.A.	1		1	4.3	.9
Sub Total	23	0	23		
INSTRUCTION					
Full Payment - "Standard rate" (3)	3		3	13.0	2.9
Partial Payment - "Cost"(3), "Negotiatable"(2),	5		5	21.7	4.9
Exact Payment - "$5/h", "$8/h", "$10/h"(2), "$15/h"(3), "$20/h",	8		8	34.7	7.9
Nil	5		5	21.7	4.9
N.A.	2		2	8.6	1.9
Sub Total	23	0	23		
MAINTENANCE & SERVICING					
Full Payment - "Going rate"(3), "Co. rate", "Paid"(2), "Standard"(2)	8		8	28.5	7.9
Partial Payment - "Some", "Cost"(6)	7		7	25.0	6.9
Exact Rate Detailed - "$5/h"(2), "$10/h" "$14/h"(2), $15/h"(3)	8		8	28.5	7.9
Nil - "Included in a/c rate"(2)	5		5	17.8	4.9
Sub Total	28	0	28		
TIME OFF WORK					
Full Payment - "Full", "Standard", "Cost"(2), "Normal"	7		7	33.3	6.9
Partial Payment - "Some"(2), "Depends"	3		3	14.2	2.9
Exact Rate Detailed - "$5/h"	1		1	4.7	.9
Nil - "Included in a/c rate"(6)	8		8	38.0	7.9
"?"	1		1	4.7	.9
N.A.	1		1	4.7	.9
Sub Total	21	0	21		
SPOTTING					
Full Payment - "Workmen's wage"	1		1	4.3	.9
Partial Payment -"Training", "Costs"(2)	3		3	13.0	2.9
Exact Rate Detailed - "$25/d, "$3/h","$5/h"	3		3	13.0	2.9
Nil - "Going rate" (1)	16		16	69.5	15.8
Sub Total	23	0	23		

Table 10

"13". Does Your Group Have Ground Support Resources That Could be Used During SAR Activities.

Details	Civil SAR Plan Yes	% of Replies	Civil SAR Plan No	TOTAL	% of Total Replies
Hangar Space	52	64.1	5	57	66.2
Office Space	63	77.7	3	66	76.7
Servicing and/or maint.	61	75.3	5	66	76.7
De-icing Equipment	18	22.2	2	20	23.2
Herman Nelson	46	56.7	3	49	56.9
Marine Rescue Facilities	11	13.5	0	11	12.7
Number Answered Question	81		5	86	

Table 11

"14". State the Fleet Size of Your Organization.

Details	Civil SAR Plan Yes		Civil SAR Plan No		Total	
	Aircraft	No. of Replies	Aircraft	No. of Replies	A/C	No. of Replies
Fixed Wing	972	91	210	11	1182	102
Rotor	141	20	108	9	249	29
Total	1,113		318		1431	
No. Answered the Question		104		17		121

Table 12

TOTAL AIRCRAFT BY TYPE OF FLEET (QUESTION 14)
PLUS TOTAL AIRCRAFT BY TYPE IN OPERATION BY
COMMERCIAL AND ALL OPERATORS IN CANADA
(AS OF JUNE 30, 1974)

MANUFACTURER MODEL	# of A/C CIVIL SAR Yes	SAR No	NO. & TYPE OF POWER PLANT	HIGH LOW WING	# OF SEATS	NO. IN OPERATN COM. OPERTRS	NO. IN OPERATN ALL OPERATR	RANGE	CRUISE SPEED
Fixed Wing									
AERONCA									
Scout	2		1 P	H	2	0	20	217 nm	104 kts
BEECH AIRCRAFT CORP									
55 Baron	1		2 P	L	4/6	1	4	792 nm	196kts
35-36 Bonanza	5		1 P	L	4/6	3	120	800 nm	170 kts
18 Expeditor/Twin Beech	4		2 P	L	11	44	56	1328 nm	182 kts
95A Travelair	2		2 P	L	4/5	21	63	900 nm	170 kts
BRITTEN-NORMAN									
BN & BN2 Islander	2		2 P	H	10	13	15	960 nm	139 kts
CALLAIR									
A9A	1		1 P	L	2	7	11	396 nm	97 kts
CESSNA									
150	35		1 P	H	2/4	496	1069	340 nm	106 kts
172 Skyhawk	65		1 P	H	4	310	1251	450 nm	120 kts
177 Cardinal	5		1 P	H	4	26	121	535 nm	136 kts
180 Skywagon	21		1 P	H	4/6	264	815	470 nm	141 kts
182 Skylane/Super	10		1 P	H	4	33	277	475 nm	144 kts
185 Skywagon	29	2	1 P	H	6	193	440	933 nm	147 kts
188 Agwagon	2		1 P	L	1	20	25	339 nm	97 kts
206 Super Skywagon	5		1 P	H	6	46	129	695 nm	142 kts
207 Skywagon	1		1 P	H	7	1	2	508 nm	137 kts
210 Centurion	1		1 P	H	6	4	50	664 nm	163 kts
310 Twin Cessna	3		2 P	L	6	29	82	920 nm	166 kts
320 Skyknight	1		2 P			6	12		
337 Super Skymaster	6	2	2 P	H	6	44	82	545 nm	160 kts
402 Businessliner	1		2 P	L	7	13	15	425 nm	189 kts
411	1		2 P	L	8	2	5	1100 nm	230 kts
CHAMPION									
Citabria (7 series)	1		1 P	H	2	22	336	630 nm	102 kts
DE HAVILLAND									
DHC-2 Beaver/Turbo	22	1	1 P/T	H	11	230	324	667 nm	136 kts
DHC-3 Otter	9	3	2 P	H	12	95	118	759 nm	115 kts
DHC-6 Twin Otter	2	10	2 T	H	22	64	101	958 nm	182 kts

Table 12 - Continued

MANUFACTURER MODEL	# OF A/C CIVIL	# OF A/C SAR	No. & TYPE POWER PLT	HIGH LOW WING	# OF SEATS	NO. IN OPERATN COM. OPERATRS	NO. IN OPERATN BY ALL OTHRS	RANGE	CRUISE SPEED
Fixed Wing- Continued	Yes	No							
DOUGLAS									
DC3 Dakota	2	1	2 P	L	39	88	113	1310 nm	168 kts
GRUMMAN									
G21 Goose	1		2 P	H	12	16	22	1389 nm	205 kts
HELIO									
E391 Courier	1	1	1 P	H	6	4	5	573 nm	143 kts
LAKE									
LA4 Buccaneer	1		1 ?	H	4	2	83	735 nm	130 kts
MAULE									
M5	1		1 P	H	4	1	4	835nm	149 kts
NORSEMAN									
Unknown which model	2		1 P	H	8	40	49	404 nm	121 kts
PIPER AIRCRAFT									
PA-3 Cub Trainer	1		1 P			14	437		-100 kts
PA-11 Cub Special	2		1 P			2	109		-100 kts
PA-18 Super Cub	1		1 P	H	2	51	404	400 nm	100 kts
PA-23 Apache/Aztec	14		2 P	L	6	176	318	1035 nm	180 kts
PA-24 Comanche	2		1 P	L	4	6	132	638 nm	104 kts
PA-28 Cherokee	16		1 P	L	4	295	728	626 nm	117 kts
PA-30 Twin Comanche	2		2 P	L	4	25	79	946 nm	172 kts
PA-34 Seneca	3		2 P	L	7	14	19	1007 nm	140 kts
PA-31 Navajo	3		2 P	L	8/9	17	36	963 nm	220 kts
PA-32 Cherokee Six	2		1 P	L	6/7	12	45	495 nm	139 kts
STINSON									
ST10 Stinson	1		1 P	H	4	6	17		104 kts
TOTAL -Fixed Aircraft	292	20				2746	8143		

APPENDIX 2 Cont'd

Table 12 - Continued

MANUFACTURER MODEL	# of A/C CIVIL	SAR	NO & TYPE OF ENGINES	HIGH LOW WING	# OF SEATS	NO. IN OPERATION COMMERCIAL	BY ALL OPERATORS	RANGE	CRUISE SPEED
Helicopter									
AEROSPATIALE									
Gazelle HR30	3		1 T	R	5	7	10	425 nm	141 kts
BELL									
212 Iroquois	3		1	R	15	4	9	251 nm	100 kts
204 Iroquois	2		1 T	R	12/15	14	14		125 kts
214Bl	1		1 T	R	15		not listed	173 nm	140 kts
206 Jet Ranger	22	16	1 T	R	5/7	217	268	313 nm	130 kts
47 Series Trooper/Ranger	27	1	1 P	R	3	241	289	214 nm	73 kts
HILLER									
12 Raven	3		1 P	R	3	27	31	196 nm	94 kts
HUGHES									
269	1		1 P	R		25	38	nm	kts
500	19		1 T	R	5/7		not listed	300 nm	125 kts
SIKORSKY									
355		1	1 T	R		13	15		
TOTAL - Helicopter	81	18				548	674		
TOTAL - Fixed Wing	292	20				2746	8143		
GRAND TOTAL	373	38				3294	8817		

Source: a. Canadian Aviation General Aviation Aircraft Buyers Guide, February 1976. Range and Cruise speeds.

b. Janes' Pocket Book of Commercial Transport Aircraft Edited by John W. R. Taylor 1974. Range and cruise speeds.

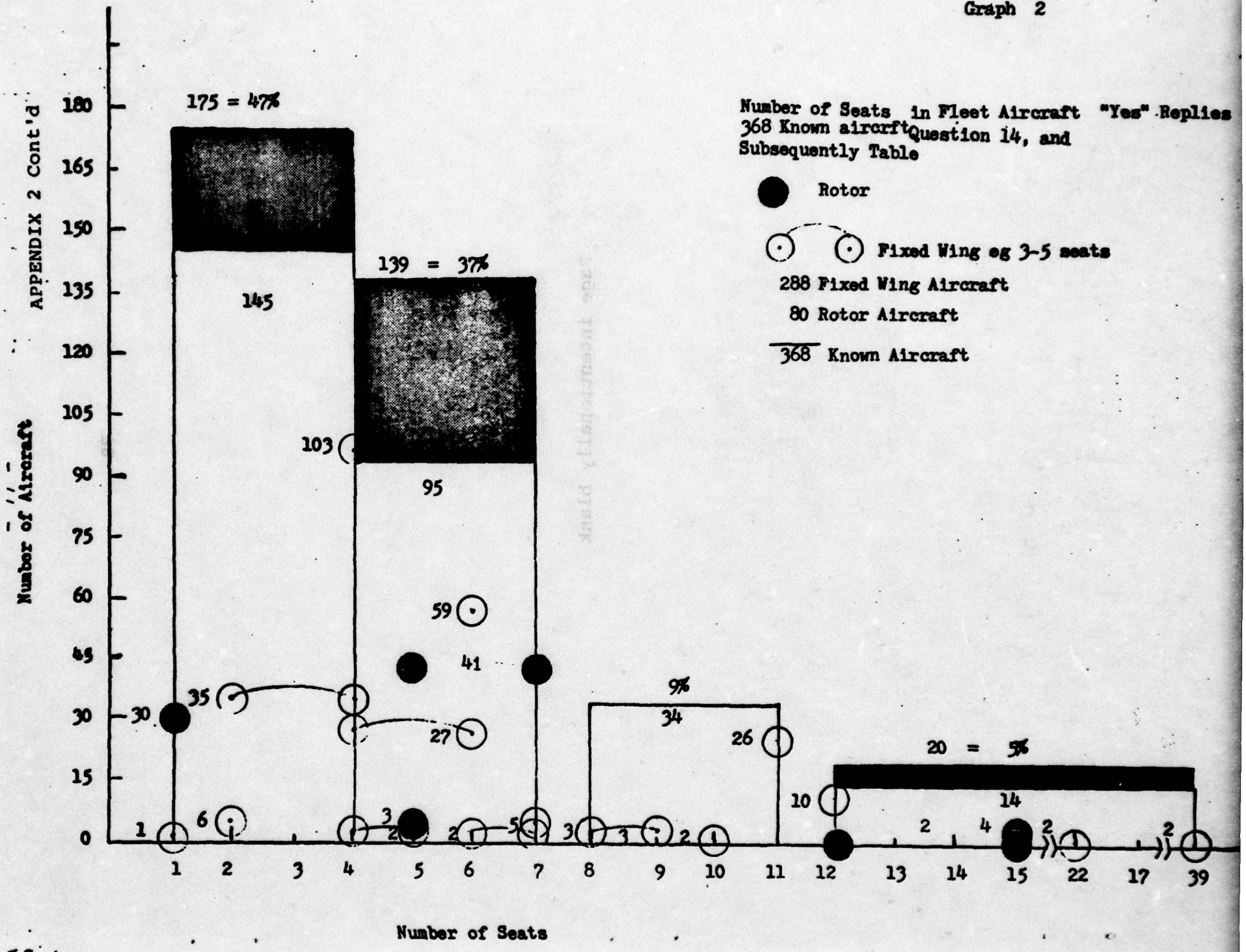
c. Jane's All the World's Aircraft. Range and cruise speeds.

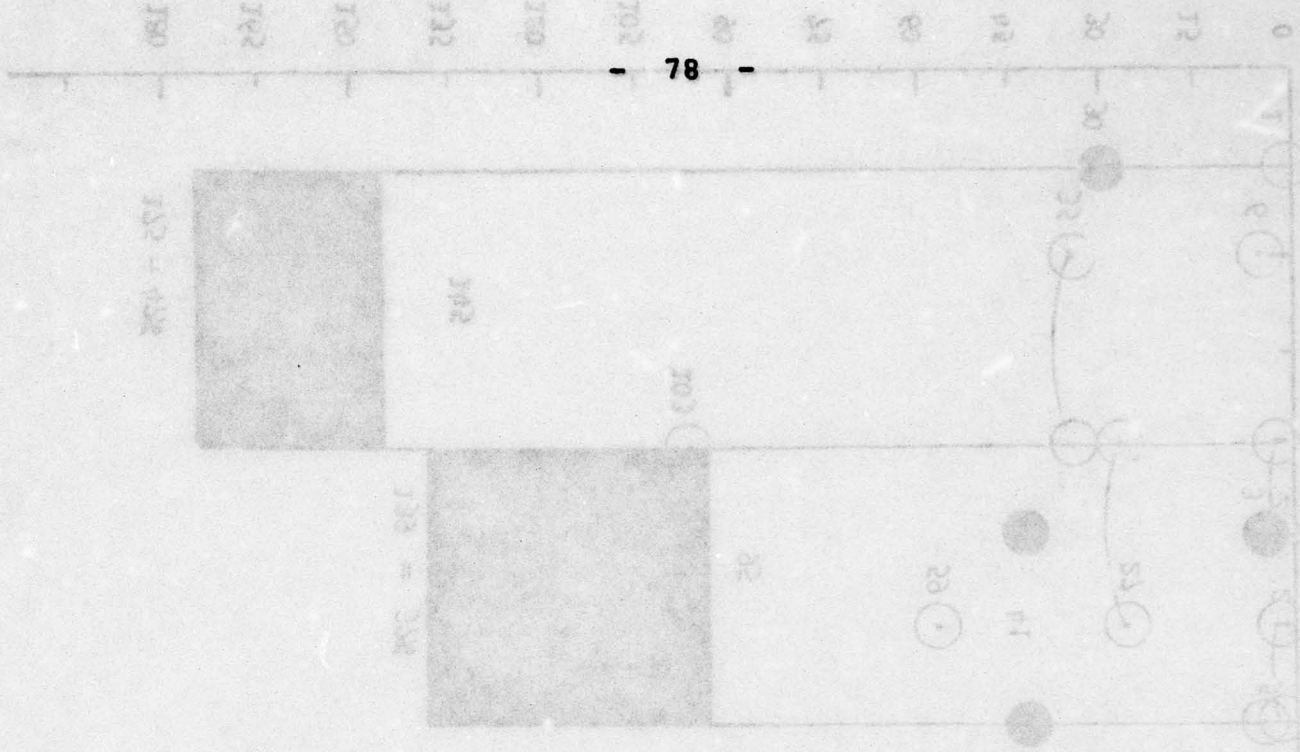
d. Maclean-Hunter Canadian Aviation Report 1974-75. Numbers of aircraft in operation, commercial and all operators.

e. Questionnaires - "Group Replies". Question 14 -- fleet size.

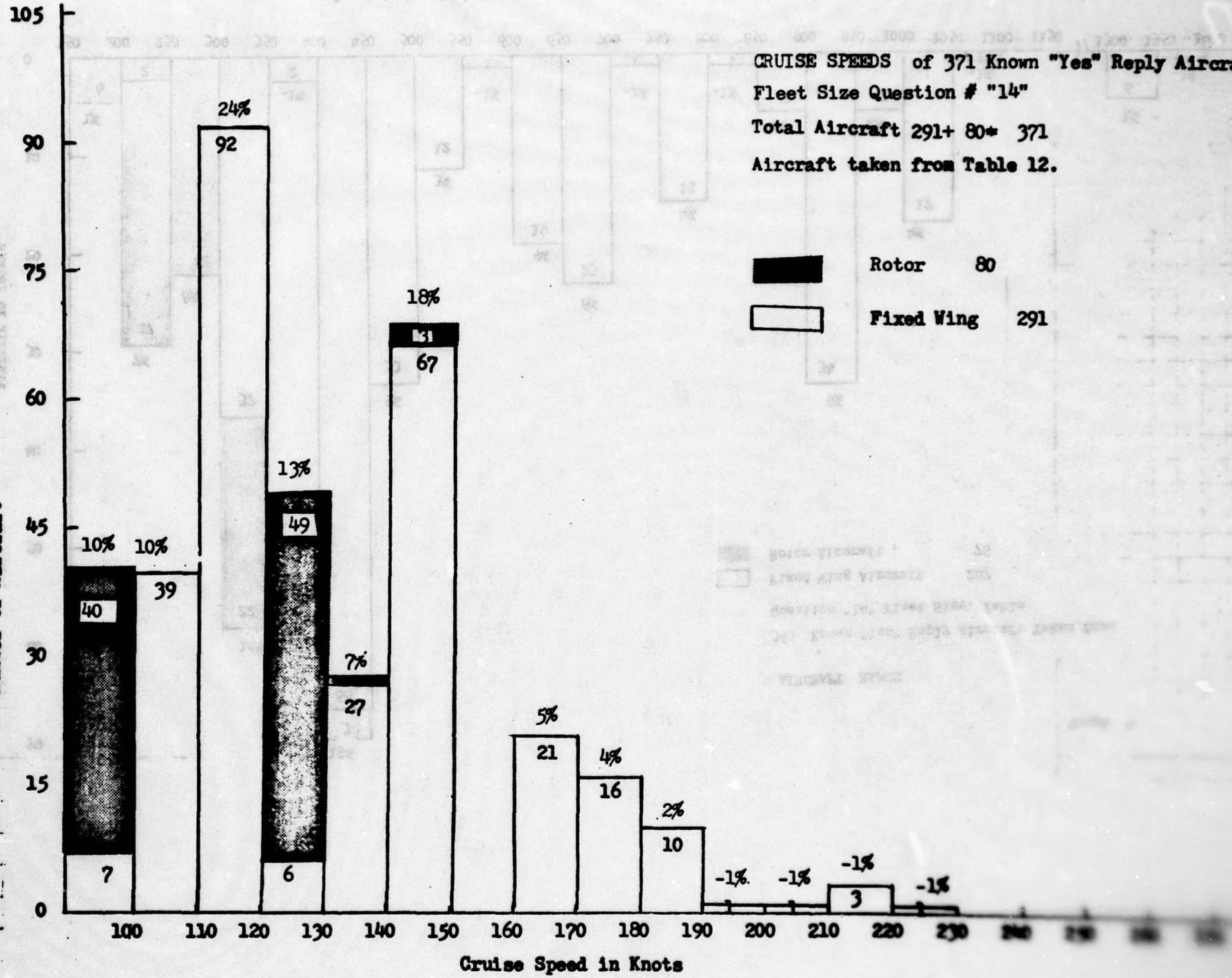
Graph 2

APPENDIX 2 Cont'd





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CRUISE SPEEDS of 371 Known "Yes" Reply Aircraft.
Fleet Size Question # "14"
Total Aircraft 291+ 80* 371
Aircraft taken from Table 12.
Rotor 80
Fixed Wing 291
Number of Aircraft
105
90
75
60
45
30
15
0
10%
40
7
10%
39
24%
92
13%
49
6
7%
27
18%
67
5%
21
4%
16
2%
10
-1%
-1%
-1%
3
-1%
100
110
120
130
140
150
160
170
180
190
200
210
220
230
Cruise Speed in Knots

Graph 3

APPENDIX 2 Cont'd

Graph 4

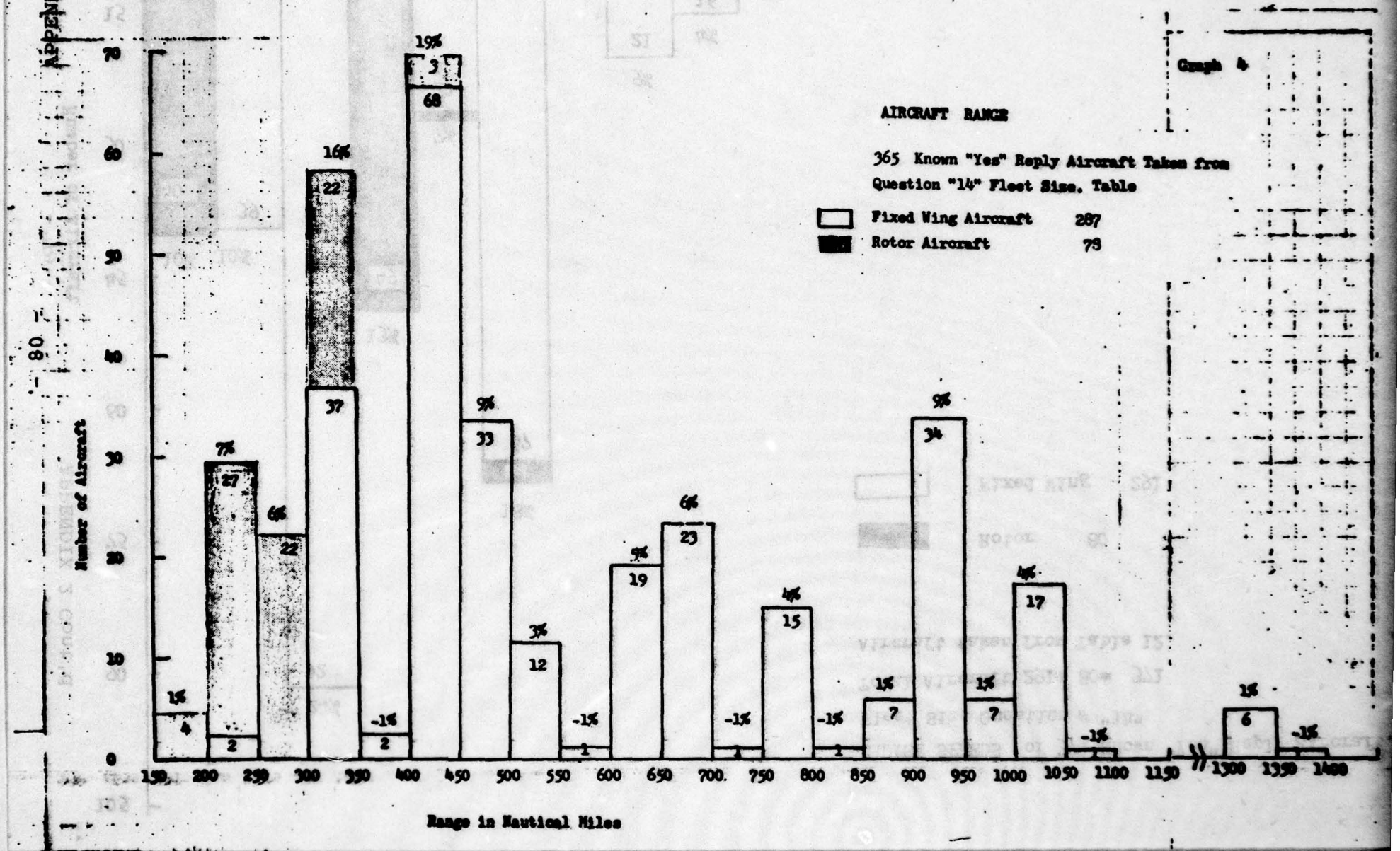


Table 13

"14" WING POSITION & NUMBER OF ENGINES

Taken From DATA in Table

Details	Civil SAR Plan Yes Number of Aircraft	Total	% Total	Civil SAR Plan No No. of Aircraft
FIXED WING				
High Wing - 1 Engine	204			4
- 2 Engine	20	224	60.7	15
Low Wing - 1 Engine	28			
- 2 Engine	36	64	17.3	1
ROTORY - 1 Engine	81			18
- 2 Engine	0	81	21.9	
UNKNOWN	4	4		
TOTAL	373	373		38

Table 14

"15"&"16" How Many Aircraft, Suitable for Searching, Would Your Group Authorize for Searching.

	Yes Civil SAR Plan		No Civil SAR Plan		Total	
Details	Aircraft	No. of Yes	Aircraft	No. of No	Aircraft	% Number of No Replies
Fixed Wing	343	85	14	4	357	89
Rotor	70	15	68	5	138	20
Total	413		82		595	
Answered Question		104		13		117

Table 15

"16" Radio and Nav Aids

Details	Yes Civil SAR Plan No. Replies	% of Total Replies	No SAR Plan	Total	National "Aircraft Station Data"*
COMMUNICATIONS					
Nordo	1	1.2		1	
"Aircraft VFR Equipped"	5	6.0	2	7	
"IFR-All, Complete, Full"	19	22.8	1	20	
VHF/AM	38	45.7		38	12,532
HF (6 SSB)	15	18.0		15	1,987
"(?)/FM"	2	2.4		2	
Com	5	6.0		5	
NAVIGATION					
Nav/Com	10	12.0	1	11	
Radio Range	1	1.2		1	
VOR	38	45.7		38	
LOC (Localizer)	2	2.4		2	
Transponder	12	14.4		12	3,469
DME (Distance Measuring)	5	6.0		5	1,331
ADF (Direction Finding-LF)	49	59.0	1	50	6,241
"Compass"	14	16.8	1	15	
"Gyro"	9	10.8		9	
"D.G."(Directional Gyro)	2	2.4		2	
GNS (Global Nav)	1	1.2		1	
Radar (Weather)	1	1.2		1	606
"VHF Homer" (probably means VHF/DF as a VHF Homer is ground equipment.)	1	1.2		1	
LANDING AIDS					
ILS (1 marked "LS" probably means Landing System)	6	7.2		6	
Marker Beacon	3	3.6		3	
Number of Companies Answered Question	83		4	87	

* DOC July'76 Computer-print-out Summery of Aircraft Station Data.

Table 16

"17". How Long At One Time, Or How Often Would You Be Willing To Dedicate These Aircraft

Details	Civil SAR Plan Yes	Civil SAR Plan No	Total	% of Total Replies
As Required				
"Anytime", "when needed", "full time", "Flexible", "as required".	35	0	35	39.3
As Available				
"Anytime available", "depends on amount available"	16	0	16	17.9
Depends on Situation	11	0	11	12.3
"Compensation or charter basis"	3	0	3	3.3
"Negotiable"	1	0	1	1.1
Specific Times				
"4 a/c at any one time"	1	0	1	1.1
Hours/Day "1 h/d for 3 wks", 2-3h/d for 3 days", 3h/d any one day-max 10h/wk"."3-4 h/d", "4 h/d	8	0	8	8.9
Hours/Month "4h/mo	1	0	1	1.1
Days/Week "Several days", 3-5timed in one week", "2 d/wk"	3	0	3	3.3
Days/Month "3 d/m", "3 d/every 3 mo." " 3 days/6 mo."	5	0	5	5.6
Unknown "?"	5	0	5	5.6
N.A.	1	0	1	1.1
Number Answered Question	89	0	89	

Table 17

"18". State the Pilot Resources Within Your Group

Details	Yes Civil SAR Plan					No Civil SAR Plan				Totals			
	No. of Replies	% of Total Replies	No. of Pilots	*	Total of Pilot + *	% of Total	No. of Replies	No. of Pilots	*	Total P + *	No. Re-plies	No. Pilot	*	Total Pilot +
Private	47	46.0	2,484	+ 12 =	2,496	69.4	3	475	+ 0 =	475	50	2959	+ 12 =	2971
Commercial	89	87.2	760	+ 27 =	787	21.8	16	154	+ 5 =	159	105	914	+ 32 =	946
Senior Commercial	45	44.1	93	+ 17 =	110	3.0	8	19	+ 2 =	21	53	112	+ 19 =	131
Airline Transport	40	39.2	69	+ 13 =	82	2.2	5	38	+ 1 =	39	48	107	+ 14 =	121
Helicopter	32	31.3	108	+ 11 =	119	3.3	8	42	+ 3 =	45	37	150	+ 14 =	164
Total			3,514	+ 80 =	3,594			728	+11 =	739		4242	+ 91 =	4333
Answered question	102						21				123			

* This column indicates the number of replies that indicated a Yes reply for the various pilot level but did not indicate an exact number. These types of replies are taken to be one pilot for each mark.

Table 18.

"18" Pilot Flying Experience and Ratings

Details	Yes Replies No. of Pilots *	Pilots + *	No. of Replies	% Pilots Total Pilots 3,594
Ratings				
Night	1609 + 23 =	1632	79	45.4
IFR	264 + 15 =	279	63	7.7
Experience				
Barren Land Flying	302 + 21 =	323	65	8.9
Mountain Flying	304 + 15 =	319	64	8.8
Bush Flying	576 + 26 =	602	83	16.7
Totals	3055 + 100 =	3155		87.7
Answered question			102	

Table 19 Appendix 2 Cont'd

"19". Would Your Pilots Members Be Willing to Fly SAR Missions.

Details	Yes Civil SAR	No Civil SAR	Total	% of Total Replies
Yes	97	5	102	93.5
No	3	0	3	2.7
During Work Hours Only	7	0	7	6.8
After Hours and Weekends	17	1	18	16.5
Holidays	7	0	7	6.8
Anytime	89	5	94	86.2
Answered Question	103	6	109	

Table 20

"20". For Employers Only. Would You Give Your Pilots and Other Employees Time Off For Searching?

Details	Yes Civil SAR Plan	No Civil SAR	Total	% of Total Replies
Yes	68	4	72	83.7
No	4	0	4	4.6
With Pay	45	1	46	53.4
Without Pay	21	1	22	25.5
Answered Question	81	5	86	

Table 21

"21". Would You Allow Civil SAR Plan Registered Pilots To Fly Your Aircraft On Search Activities

Details	Yes Civil SAR Plan	No Civil SAR	Total	% of Total Replies
Yes	20	2	22	22.6
No	36	4	40	41.2
Your Own Pilots	74	5	79	81.4
Answered Question	91	6	97	

Table 22

"22". What Launch Time in Hours Would Your Crews Be Able to Offer.

Details	Yes Civil SAR Plan	No Civil SAR	Total	% of Total Replies
0 - :30	15	2	17	20.9
:30 to 1:00 hour	4		4	4.9
1:00 hour	14	1	15	18.5
1:00 - 2:00 hours	2		2	2.4
2:00 hours	7		7	8.6
2:00 - 3:00 hours	1		1	1.2
3:00 hours	1		1	1.2
4:00 hours	1		1	1.2
6:00 hours	2		2	2.4
Sub Total	47	3	50	
Daylight; Only VFR	5		5	6.1
Depends; Variable; To see	13		13	16.0
As needed; Anytime	7		7	8.6
"?"	6		6	7.4
Number Answered Question	78	3	81	

Table 23

"23". How Long at One Stretch Could Your Crews be Dedicated to SAR?

	PILOTS				SPOTTERS				MAINTENCE/SERVICING			
	Yes	No	Total	%*	Yes	No	Total	%	Yes	No	Total	%*
Specific Times												
1 hr -	1		1	1.1	1		1	1.6	1		1	2.5
2 hr -	3		3	3.4	1		1	1.6				
3 hr -	4		4	4.6	2		2	3.3				
4 hr -	5	1	6	6.9	3		3	5.0				
5 hr -	1		1	1.1	3		3	5.0				
7 hr -	1		1	1.1	1		1	1.6				
8 hr -	5		5	5.8	3		3	5.0	3		3	7.6
10 hr -	2		2	2.3	2		2	3.3	2		2	5.1
12 hr -	1		1	1.1					1		1	2.5
14 hr -	1		1	1.1	1		1	1.6				
15 hr -	1	1	2	2.3		1	1	3.6				
Days												
1 day -	3		3	3.4	1		1	1.6	1		1	2.5
All day	3		3	3.4	2		2	3.3	2		2	5.1%
2 days	1		1	1.1	1		1	1.6				
Several Days	1		1	1.1	1		1	1.6				
Approx. 50 hrs	2		2	2.3					1		1	2.5
3 days	2		2	2.3	1		1	1.6	1		1	2.5
5 days	1		1	1.1	1		1	1.6	1		1	2.5
Weeks												
1 week	1		1	1.1								
2 weeks	2		2	2.3	1		1	1.6	1		1	2.5
Variable												
"As required", "Anytime"	22	1	23	26.7	17		17	28.3	12	2	14	35.8
"As available", "Depends"	12			13.9	10		10	16.6	2		2	5.1
N.A., Nil					1		1	1.6	4		4	10.2
"?"	8		8	9.3	5		5	8.3	3		3	7.6
Number Answered Question	83 + 3 = 86				59 + 1 = 60				37 + 2 = 39			

* Note: The %'s are of the total number of companies that answered each section of the question.

Appendix 2 Cont'd

Table 24

"24". How Dependable Would Those Times Be?

Details	Yes Civil SAR	No Civil	Total	% of Total Replies
Dependable "very", "always"	14	0	14	23.3
Reasonably: "during week", 100% for 1st 48 hrs then 50%"	5	0	5	8.3
Depends "flexible", "variable"	15	0	15	25.0
Fairly Dependable	4	0	4	6.6
Off Season Only "no summer", "no winter"	4	0	4	6.6
75% Available	2	0	2	3.3
50% Available	3	0	3	5.0
Undependable, Very questionable	1	1	2	3.3
Impossible to forecast: "10%", "some"	5	0	5	8.3
N.A.	1	0	1	1.6
"?"	5	0	5	8.3
Number Answered Question	59	1	60	

Table 25

"25". Has Your Group Been Involved in Search Activities in the Past?

Details	Yes Civil SAR Plan	%	No Civil SAR Plan	%	Total	%
Yes	64	65.3	11	57.8	75	64.1
No	34	34.6	8	42.1	42	35.8
Answered question.	98		19		117	

APPENDIX 2 Cont'd

Table 26

Would Want to See for a Canadian Civil SAR Plan. Mention What Relationship with the Military You Would Expect

Details	Civil SAR Plan Yes	No	Total	% of Total Replies
MILITARY CONTROL				
"Military direction","Supervision","Advice", "Coordination", "guidance"; with "civil assistance" "civil supplement", "augmentation", "civil subservient to military, but funded"	23	2	25	36.7
EQUAL CONTROL				
"Cooperate with Military", "integrate with Mil", "work along with military", "Civil and military equal under RCC", "half and half"	8	0	8	11.7
CIVILIAN CONTROL				
"Conduced by Bush pilots", "backed by military if required", "civil aircraft with military coordinating search", "Initial search by civilians until the military arrive". ("Yes" 5,"No" 1)	11	1	12	17.6
COMMENTS				
"More liaison between military and civilian"	8	0	8	11.7
"Federal Structure"	1	0	1	1.4
"Regional Structure"	3	0	3	4.4
"Quasi-Military", "Reserve" Structure	3	0	3	4.4
"Tied in with Emergency Plan of Province"	2	0	2	2.9
"Strict Program"	1	0	1	1.4
"Loose Structure: "when available", "simple", "locally", "any way we can help"	6	0	6	8.8
"Civilians not suited"	0	3	3	4.4
"Military adequate"	1	3	4	5.8
Answer not usable: "?", "no comment" etc.	7	0	7	10.2
Number Answered Question	59	9	68	

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FEASIBILITY STUDY ON A CANADIAN CIVIL SAR PLAN FOR SEARCH AND R--ETC(U)
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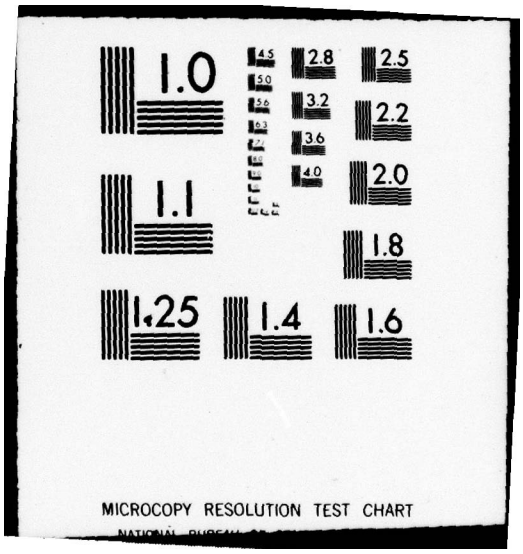

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART

Table 27

28. STATE THE LEVEL OF TRAINING AND QUALIFICATION YOU WOULD EXPECT OF PILOTS AND SPOTTERS.

	YES CIVIL SAR PLAN	NO CIVIL SAR	TOTAL	% of Total Replies
PILOT LEVEL				
Level accepted by SAR	5	1	6	8.3
Equal to military	3		3	4.1
Highest level	5	1	6	.3
Bush pilots	2		2	2.7
Our company pilots	2		2	2.7
Adequate level	1		1	1.3
LICENCE				
Commercial	17	1	18	25.0
IFR	4	1	5	6.9
Night rated	2		2	2.7
Twin rated	1		1	1.3
Private		1	1	1.3
HOURS				
1000 hours	1		1	1.3
500 hours	5		5	6.9
300 hours	1		1	1.3
250 hours	3		3	4.1
200 hours	2		2	2.7
150 hours	1		1	1.3
EXPERIENCE				
Experienced	3		3	4.1
Proficient	4	1	5	6.9
Knowledge of terrain	5		5	6.9
Briefed	1	1	2	2.7
Course on SAR	8	2	10	13.8
Exercise	4		4	5.5
Navigation	4		4	5.5
Survival	3		3	4.1
Mountain flying	3		3	4.1
SPOTTERS				
Trained	7	3	10	13.8
Experienced	3		3	4.1
Many air hours: mature	2		2	2.7
Locals	1	1	2	2.7
Pilot	1		1	1.3
Briefed		1	1	1.3
Unable to demand or ask a level,	3		3	4.1
Misc: unfair, NOT civilians	2	1	3	4.1
"?"	2		2	2.7

Table 28

"29". Under a Civil SAR Plan What Form of Direction Would Your Group Be Willing To Accept?

Details	Yes Civil SAR Plan	No Civil SAR Plan	Total	% of Total Replies
Civilian Direction Only	7	0	7	7
Year round	4	0	4	4
During search	5	0	5	5
Military Direction Only	10	2	12	12
Year round	4	0	4	4
During search	6	1	7	7
Both Civil and Military	78	4	82	82
Year round	41	1	42	42
During search	55	5	60	60
Answered Question	93	7	100	

APPENDIX 3
TO ORAE M87

NATIONAL RESOURCES - PERSONNEL AND AIRCRAFT

Table 1	Canadian Pilot Licences by Provinces 1975.
Table 2	Summary of Personnel Licences 1975.
Table 3	Canadian Civil Aircraft Summary 1975.
Table 4	Canada's Commercial Aircraft Fleet by Group 1974.
Table 5	Flying Hours - Civil and Private Aircraft by Province 1974.

TABLE 1

CANADIAN PILOTS LICENCES

January '75

PROVINCE	PRIVATE	COMMERCIAL	SENIOR COMMERCIAL	AIRLINE TRANSPORT	HELIO (PRI & COM)	TOTAL
B.C.	5,131	1,299	299	878	56	7,593
YUKON	122	53	4	10	14	203
ALBERTA	4,184	745	53	371	32	5,385
SASK	2,104	313	13	58	2	2,490
MANITOBA	2,074	371	56	285	10	2,796
NWT	188	90	13	38	9	338
ONTARIO	12,038	1,779	270	1,183	193	15,463
QUEBEC	3,939	1,019	173	956	78	6,165
ATLANTIC PROVINCES	1,518	340	39	142	17	2,056
OTHER *	318	105	26	78	33	560
TOTAL	31,616	6,114	876	3,999	444	43,049

* Canadian Pilot Licence Holders residing outside of Canada

SUMMARY OF PERSONNEL LICENCES
SOMMAIRE DES LICENCES DU PERSONNEL

TYPE OF LICENCE – TYPE DE LICENCE			IN FORCE / EN VIGUEUR 31/12/74	IN FORCE / EN VIGUEUR 31/12/75	Issued 12 Mths Ending / Délivrées pour les 12 mois se terminant le 31/12/74	Issued 12 Mths Ending / Délivrées pour les 12 mois se terminant le 31/12/75	Issued 3 Mths Ending / Délivrées pour les 3 mois se terminant le 31/12/74	Issued 3 Mths Ending / Délivrées pour les 3 mois se terminant le 31/12/
GLIDER PILOTS	– PILOTES DE PLANEUR		1,821	2,054	459	457	89	4
PRIVATE PILOTS	– PILOTES PRIVÉS		31,656	33,015	5,381	6,403	1,301	1,55
COMMERCIAL PILOTS	– PILOTES PROFESSIONNELS		6,522	6,705	1,454	1,498	301	31
SENIOR COMMERCIAL PILOTS	– PILOTES PROFESSIONNELS 1ère CLASSE		876	826	387	275	110	5
AIRLINE TRANSPORT PILOTS	– PILOTES DE LIGNE		3,999	3,593	509	232	134	5
FLIGHT NAVIGATORS	– NAVIGATEURS AÉRIENS		186	150	2	2	1	
AIR TRAFFIC CONTROLLERS	– CONTRÔLEURS DE LA CIRCULATION AÉRIENNE		1,818	1,696	202	135	47	2
FLIGHT ENGINEERS	– MÉCANICIENS NAVIGANTS		141	133	26	25	8	
AIRCRAFT MAINTENANCE ENGINEERS	– MÉCANICIENS D'ENTRETIEN D'AÉRONEFS		4,009	4,318	303	364	60	8
GYROCOPTER PILOTS	– PILOTES D'AUTOGYRES		6	6	0	0	0	
TOTAL			51,034	52,496	8,723	9,391	2,051	2,12
INSTRUMENT RATINGS CLASS I / QUALIFICATIONS DE VOL AUX INSTRUMENTS CLASSE I	PRIVATE	– PRIVÉ	57	64				
	COMMERCIAL	– PROFESSIONNEL	346	415				
	SENIOR COMMERCIAL	– PROFESSIONNEL 1ère CLASSE	254	287				
	AIRLINE TRANSPORT	– DE LIGNE	3,321	2,941				
	TOTAL		3,978	3,707				
INSTRUMENT RATINGS CLASS II / QUALIFICATIONS DE VOL AUX INSTRUMENTS CLASSE II	PRIVATE	– PRIVÉ	129	133				
	COMMERCIAL	– PROFESSIONNEL	532	516				
	SENIOR COMMERCIAL	– PROFESSIONNEL 1ère CLASSE	161	105				
	TOTAL		822	754				
INSTRUCTOR RATINGS / QUALIFICATIONS D'INSTRUCTEUR	AEROPLANES / AVIONS	CLASS I – CLASSE I	120	109				
		CLASS II – CLASSE II	452	475				
		CLASS III – CLASSE III	603	690				
	HELICOPTERS	– HÉLICOPTÈRES	81	103				
	GLIDERS	– PLANEURS	372	426				
	TOTAL		1,628	1,803				
HELICOPTER ENDORSEMENTS / ANNOTATIONS POUR HÉLICOPTÈRES	PRIVATE	– PRIVÉ	292	310				
	COMMERCIAL	– PROFESSIONNEL	2,047	1,981				
	SENIOR COMMERCIAL	– PROFESSIONNEL 1ère CLASSE	370	342				
	AIRLINE TRANSPORT	– DE LIGNE	406	352				
	TOTAL		3,115	2,985				
STUDENT PILOT PERMITS / PERMIS D'ÉLÈVE-PILOTE			NOT AVAILABLE		10,105	11,440	2,677	2,740

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TABLE 3
Summary of Canadian Civil Aircraft
Register - March 31, 1975

Details	PRIVATE	COMMERCIAL	STATE	EXPERIMENTAL	ULTRA LIGHT	TOTAL	% of 1975
TOTAL A/C ON REGISTER Dec 74	10773	4328	270	29	749	16149	
TOTAL A/C ON REGISTER DEC 75	10976	4405	269	31	754	16435	
AEROPLANES	10571	3710	221	22	599	15123	92
HELICOPTERS	112	695	48	5	0	860	5
OTHERS (Gliders, Gyroplane, Balloons)	293			4	155	452	3
TOTAL A/C WITH VAILD C of A OR FLIGHT PERMIT	9054	3632	250	23	489	13448	81
AIRCRAFT WITH SINGLE ENGINE	9988	3255	130	15	689	14077	85
TWIN ENGINE AIRCRAFT	680	1004	132	9	0	1825	11
THREE ENGINE AIRCRAFT	6	26	0	0	0	26	41
AIRCRAFT WITH FOUR OR MORE	16	120	7	4	0	147	41

Table 4

Canada's Commercial Aircraft Fleet by Type of Aircraft 1974

Details	Number of Aircraft	% of Aircraft By Fixed or RW
FIXED AIRCRAFT		
Group A 4,300lbs or less eg. Yankee AA1, Aeronca 058, Callair A9, Cessna 120-336, PA11-32,	1,721	57
Group B 4,301 to 7,000 lbs eg. Commander 560, Islander BN2, Widgeon, DHC2, Cessna 337,421.	521	17
Group C 7,001 to 18,000 lbs eg. Otter, Twin Otter, Learjet L24, Mooney MU2, Merlin SW2	370	12
Group D 18,001 to 35,000 lbs eg. Canso-285A, Dakota, Mitchell B25	133	4
Group E 35,001 to 75,000 lbs eg. Viscount 700/800, Gulfstream II	73	2
Group F 75,001 to 150,000 lbs eg. Electra, DC6, DC7, DC930	98	3
Group G 150,001 to 350,000 lbs eg. Boeing 707/727, Hercules, DC8	66	2
Group H 350,001 lbs or more eg. Lockheed 1011, Boeing 747	16	<1
SUB TOTAL	2,998	
ROTOR WING		
Group A-RW 4,000 lbs and under eg. Alouette 2 SE3130/3180, Gazelle SA341, Jet Ranger 205, Hiller 1100, Hughes 369/500	489	88
Group B-RW 4,001 to 7,500 lbs eg. Alouette 3, Sikorsky S55T	19	3
Group C-RW 7,501 to 18,000 lbs eg Bell Iroquois 205, Sikorsky S62	43	7
Group D-RW 18,001 to 35,000 lbs	4	<1
SUB TOTAL	555	

APPENDIX 4 TO
ORAE MEMORANDUM M87

COMPANIES, GROUPS AND ASSOCIATIONS

A. COMPANIES

Table 1. Canadian Air Service Licences 1974.

B. AVIATION COUNCILS

British Columbia Aviation Council.
Alberta Aviation Council.
Manitoba Aviation Council.
Ontario Aviation Council.
Quebec Aviation Council.
Northwest Territories Aviation Council.

C. ASSOCIATIONS

Air Cadet League of Canada
Air Transport Association of Canada (ATAC).
Canadian Air Line Pilots Association (CALPA).
Canadian Air Traffic Control Association (CATCA).
Canadian Business Aircraft Association (CBAA).
Canadian Flying Farmers - Alberta Flying Farmers.
Canadian Owners and Pilots Association (COPA).
Experimental Aircraft Association of Canada (EAA).
Ninety-Nines, Inc.
Royal Canadian Air Force Association (RCAFA).
Royal Canadian Flying Clubs Association (RCFCA).

D. SPECIALTY GROUPS OR CLUBS

Canadian Sport Parachuting Association.
Lutheran Association of Missionaries and Pilots (LAMP).
Quarter Century Club.
Soaring Association of Canada.

E. GOVERNMENT DEPARTMENT/AGENCIES

a. Emergency Planning Canada.

b. Royal Canadian Mounted Police (RCMP). Table 2. RCMP Fleet by Geographic Area.

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APPENDIX 4 TO
ORAE MEMORANDUM M87

TABLE 1

Canadian Licences by Classification

April 1974

Details Class #		Number of Canadian Carriers
1	Scheduled commercial air service	23
2	Regular specific point commercial air service	42
3	Specific point commercial air service	106
4	Charter commercial air service	614
5	Contract commercial air service	6
6	Flying club commercial air service	59
7	Specialty commercial air service (aerial: application, distribution, control, inspection, reconnaissance, photography, survey, flying training and recreational flying)	1,507
8	International scheduled commercial air service	21
9	International regular specific point, specific specific point, charter and contract commercial air service	262
	TOTAL	2,640

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B. AVIATION COUNCILS

British Columbia Aviation Council: Vancouver.

Membership: 548. It fosters and promotes air safety through committee work and seminars.

Response:

They would want to participate in a Civil SAR Plan on an individual member basis only, supplying pilots with a variety of qualifications and spotters, but no aircraft. (Individual members do have a/c that could be available). They would want to take SAR indoctrination, SAR flying, and survival training. They endorse the structures of the present systems of both CF SAR and B.C.'s Provincial Emergency Programme but feel that increased financial support is required for both. They want direction from both civilian and military. Expected compensation would include "cost recovery" and CF support in form of instruction in the use of equipment and techniques.

Alberta Aviation Council: Edmonton.

Membership: 516. It promotes aviation safety by arranging defensive flying presentations, training seminars. It is working for improved search and rescue capability, better accident investigation and reporting, and promotion of an Alberta Civil Air Patrol.

Response:

The executive of the AAC did not return the questionnaire but the author interviewed a number of AAC members who have been working to promote the idea of an Air Patrol for Alberta and it appears that the interest is there.

Manitoba Aviation Council: Winnipeg.

Membership: 259. The aim is to promote, encourage and advance air safety and the adoption of safety measures in the care, maintenance and operation of aircraft. MAC operates the MAC Air Patrol within the province and would like to be part of a national SAR Plan.

Response:

For a National Plan they would like to see a "Quasi military organization trained to the CF SAR operating

techniques; sectors in selected locations around the Province; co-ordinated into provincial EPC program; and military and EPC support for flight training, operational logistics, training guidance."

Ontario Aviation Council: Buttonville.

Membership: 15. To represent the best interests of the communities in aviation affairs, and to assist governments in aviation policy and planning are its aims.

Response:

They did not respond to the survey.

Quebec Aviation Council: Montreal.

Membership: 100. This council has been inactive over the past few years due to lack of financial backing.

Response:

During an interview the president explained their inactivity and thus no reply to the questionnaire.

Northwest Territories Aviation Council: Yellowknife.

Membership: This council has also become inactive. Apparent lack of interest and finances are the reasons given.

Response:

No reply to the survey.

C. ASSOCIATIONS

A great variety of associations have developed in Canada with the purpose of promoting the interests of their members. As was done with the Aviation Councils each association will be listed with a brief description of any activity that could be relevant to search and rescue or a Civil SAR Plan.

Air Cadet League of Canada: Ottawa.

30,000 cadets and approximately 7,400 adult volunteers. Through their aim of developing the youth into good citizens and leaders they also stimulate the interest of youth in the air element of the CF.

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Response:

Although the provincial committees of the Air Cadet League did not respond to the questionnaire, (each seemed to be waiting for a policy from HQ), the idea of involvement in a Civil SAR Plan was well received by head office. They could see their role, not as flying aid, since their aircraft and flying is of a local nature (gliding mostly), but as a spotter and ground resource. They are eager to get the cadets involved in any activity that brings them closer to aviation and provides a community service.

Air Transport Association of Canada: Ottawa.

285 members. Through cooperation with government authorities they work for the advancement of communications relating to commercial air service. They promote sound practices and high professional standards amongst the members. This association maintains a bureau of information pertaining to all aspects of aviation.

Response:

This association expressed interest in the study during an interview with the president. They were particularly interested in policy on compensation for search and rescue flying activity. Their SAR Committee, (disbanded October 1974 because it was felt to be redundant), had attended meetings with National Defence dealing with that subject. Many individual company members responded to the questionnaire with a "Yes" reply.

Canadian Air Line Pilots Association: Dorval.

CALPA is the certified bargaining agent for Air Canada, CP Air, Nordair, Airtransit (now defunct), Eastern Provincial Airways, Transair, Pacific Western Airlines and Great Lakes Airlines.

Response:

Through a letter from Air Safety Division it was said that although the questionnaire does not address itself to their type of organization they do, in fact, have an interest and concern in the entire matter of SAR. Many of their member pilots do, it is rumoured, continuously monitor and report any ELT signals picked up on 121.5mz. It is not required that pilots do this but many do.

Canadian Air Traffic Control Association: Ottawa.

Membership 2,200. To promote safety and efficiency in the control of air traffic.

Response:

Through a letter from their president they state that their organization shares with this study the goals of there being a continuing, efficient, and well organized search and rescue network in Canada. There was no specific response to the questionnaire from the executive level but "Individual Questionnaire" replies included 4 from air traffic controllers.

Canadian Business Aircraft Association: Mississauga.

95 members. They encourage the highest degree of operational efficiency and safety in connection with aircraft used with the members businesses. The western sector, Calgary, have pushed for involvement in the SAR notification system with RCC Edmonton.

Response:

Although there was no specific reply to the questionnaire the Western Section of the CBAA has in the past sent a written proposal to Transport Canada suggesting their desire to actively participate within the SAR System.

Canadian Flying Farmers: 4 Provinces have sectors.

The Alberta Flying Farmers were the only group to reply to the questionnaire. The 275 members said they would want to be involved in a Civil SAR Plan as a group with pilots (75% are privately licenced); 75 aircraft, and spotters available for as long as required. They assessed themselves as being "fairly dependable" because of the nature of their work. Their members would want to take all the available courses once with a proficiency set as required. They gave no suggestion for a structure of the plan but said they would want to see both civilian and military direction year round and during search. They would expect to have their "costs" covered.

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Canadian Owners and Pilots Association: Ottawa.

12,500 members. One of the associations aims is to encourage its members to improve their flying skills. They do this through seminars and workshops, and by sending out a monthly safety bulletin. They also offer group insurance plans for their members.

Response:

In the past COPA members have suggested and pushed for the establishment of an "Air Patrol" based on the lines of the USA CAP. But at present the general consensus amongst their members is that they are very reluctant to propose to National Defence a plan whereby COPA or any other civilian group take over the SAR duties. They do want the type of structure that would allow full participation on their part when possible. They feel that they can be and are in the search area for initial searching often before the CF, and at times know the local flying conditions better than the CF SAR pilots. Because they feel that no civilian groups would be as well equipped or as well trained as the military SAR, they wish to add to the SAR System, rather than replace it.

Experimental Aircraft Association of Canada: Scarborough.

2,000 members. They promote all aspects of aviation education.

Response:

Calgary Ultra-Light Aircraft Association (Chapter 318 of the EAA) was the only Chapter to reply to the questionnaire. This group explained that their membership is a very diverse group whose only common interest is the building and flying of experimental aircraft. They did say that they would be willing to appoint one of their members to work with any committee organized to coordinate search and rescue planning. They said about 10 of their 50 membership would want to be involved in a Civil SAR Plan as pilots and spotters, and a/c. They would want the training courses and would expect 10 cents/hr/HP for the use of their aircraft. They would want to see a minimum of 500 hours for pilots on a variety of flying experiences. They would want direction from both civilian and military during the search -- with the civilian being in charge of the

civilians and with the equal status of the military Searchmaster.

The Ninety-Nines, Inc: Canadian members 210.

Their goal of providing a close relationship among women pilots carries over into any movement that may be for their benefit or that of aviation in general.

Response:

The Vice Chairman of the First Canadian Chapter expressed personal interest in SAR seminars and the possibility of civilian participation for Ninety-Nine members. A response from the questionnaire came from the Eastern Section. Their 128 members would like participation as a group and on an individual membership basis. Their full membership would like to be able to help as pilots, spotters, assistant to the S/M setting up and during the search. They would like to take all training courses once a season. Although their fleet size changes it is made up of single and twin engine aircraft, and would want compensation for gas and oil as well as aircraft rental fees. The pilots and spotters could search anytime and would expect to be proficient. They would expect direction from both civilian and military personnel year round, and instruction, and equipment modification from the military.

Royal Canadian Air Force Association: Ottawa.

Membership 10,000. Two of the associations aims are to promote and encourage an adequate and effective aviation component to meet the needs of National Defence; and to promote and encourage responsible citizenship among Canadians.

Response:

The R.C.A.F. Association want to be involved in a Civil SAR Plan as a group -- supplying managerial, spotting assistance to the S/M, public information and possibly pilot resources. They would like to take courses on SAR indoctrination, spotting and survival. They feel that pilots should have at least IFR rating and if VFR only then must have at least 200 hours. They would probably want compensation for time off work, and military supported instruction, food and admin expenses plus limited equipment support. The structure they suggested should be a regionalized Civil SAR Plan across Canada with appropriate mutual support/advice/information

links: including toll free phone nets and Citizen's Band radio hookups; and longer range radio setups in remote areas. Liaison bodies are needed at strategic sites. The direction should come from both civil and military on a year round basis with chain of command going from local to regional to national. The national link on admin and policy direction link only. Local and regional joint bodies for planning and execution of searches and training are essential.

Royal Canadian Flying Clubs Association: Ottawa.

39 members. One aim is to represent flying clubs in Canada and to disseminate information, to provide logical steps by which newly licenced pilots can upgrade their experience and proficiency.

Response:

Many of the member flying clubs replied with their own responses plus the executive returned the questionnaire with as many of the questions as possible answered. They would like to participate as a group and could supply pilots and spotters. They wish all the training courses available but did not know what compensation they would expect for their resources. They would have approximately 200 a/c available - most of them training aircraft. The pilots hold a variety of licences and ratings and could launch on a search almost immediately. No suggestions were given for structure, direction or qualifications.

D. SPECIALITY GROUPS OR CLUBS

Some groups, while not necessarily considered as a flying support resource, can be considered for certain other resource areas. For example, sport parachutists since they are accustomed to spotting for a small landing marker, are often a valuable spotter resource on search. The following groups were contacted some for flying support and others as alternate support.

Canadian Sport Parachuting Association: Burlington.

Membership 3,000. Aim: To promote the sport of parachuting competitively and for recreation for all interested Canadians.

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Response:

Although there was no reply to the questionnaire a number of sport parachutists talked with indicated an interest in such involvement probably on an individual basis only.

Lutheran Association of Missionaries and Pilots: Edmonton.

This is an international association that makes the pastors airborne for the work they do in inaccessible areas.

Response:

Although it is unknown exactly how many pilots and aircraft LAMP has in Canada one pastor did reply to the questionnaire. The Northwest Territories is covered by one aircraft, a Cessna 1800, two pilots. They would like participation as a group and could supply flying as well as spotter resources. (Parishioners as spotters). They want courses in SAR flying, spotter, and survival training -- once only. They would expect compensation to cover operating cost of the aircraft ($18/hr), could launch almost immediately and would be able to dedicate the aircraft to search for several consecutive days. They would want direction during search only and coming from both civil and military.

Quarter Century Club: Vancouver.

Membership 212. One of their purposes is to engage in activities which are in accordance with the best interest of aviation.

Response:

Although they did not respond to the questionnaire it is known that the Edmonton Chapter has written letters in support of the Alberta Aviation Council's proposed plan for establishing a civilian search program.

Soaring Association of Canada: Ottawa.

48 club members. Their aim is to foster motorless flight.

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Response:

No response was received from this group.

E. GOVERNMENT DEPARTMENTS/AGENCIES

a. Emergency PLANNING Canada: The appellation for emergency planning has changed the span of the years and from province to province. 'Civil Defence', 'EMO', 'Canada Emergency Measures Organization', and 'Emergency Planning Canada' are all terms that have been or still are used. Each province has its own plan as well as being part of the National Plan. The Federal Agency originally named Emergency Measures Organization -- was created within the Privy Council Office in 1957 for the following purposes:

1) Planning for the provision of government leadership, services, and resources management in an emergency, and

2) To ensure a Canadian contribution to NATO civil emergency planning.

Responsibility for the organization has shifted over the years from the Prime Minister, to the Minister of Industry, and finally in 1968 to the Minister of Defence. There has been a change from the original 'thermonuclear-war-threat' to 'peace-time disaster' planning. The agency, now called, Emergency Planning Canada, has no direct control over individual provinces or territorial Emergency Measures Organizations. They consider themselves as "facilitators" -- they can only make suggestions. At Arnprior, Ontario, they have facilities and have the budget for meetings and courses. Whenever an issue arises they invite representatives from various levels and departments from across the country to come and discuss the issue or problem.

In the 1970's, the Emergency Planning Department saw the need for a National 'Disaster Preparedness Plan' whereby everyone, including the CF SAR, would know exactly who to go to in an emergency. They wanted to devise a prototype and then each province match the format. Seminars were held, since 1974, to develop such an Emergency Plan that would specifically cover the contingency of 'Urban Air Disasters', 'Air Crashes in the Vicinity of Airports', and 'Air Crashes in Remote Areas'.

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Following some of the meetings the provincial representatives returned home, some to instigate a plan, some to make a few changes, and some to do nothing. Not all provinces wanted to subscribe to the plan. An Inter-Provincial Council on Civil Emergency Measures was set up as a "close working session aimed at bringing together the EPC from the nine member provinces to compare disaster programs and carve recommendations to carry back to their respective governments" (Calgary Herald: "Alberta Has Best Emergency System -- Official Praises Province"; 13 August 1976.)

It has been established over the years that there are a number of grey areas when considering search and rescue, air crashes, missing persons and who is responsible for what. A few examples of the inconsistencies that were noted when considering emergency planning across Canada as a whole are listed as follows:

1) Provincial EPCs are under the responsibility of a variety of Provincial Ministers. For example Manitoba's is under the Minister of Urban Affairs, B.C.'s is under the Provincial Secretary and Minister of Recreation and Tourism, and Quebec's is under the Provincial Solicitor General. Page ?? shows this list.

2) Some provinces have active and vital EPC programs while others do not. It appears to be dependent on the individual Minister in charge of the Department.

3) Some provinces have one organized 'coordinating agency' for disasters and emergencies while others have several.

4) Each police department in Canada, Federal RCMP, Provincial RCMP, OPP, QPP, CN Police, city and municipal police all have their own 'disaster plans.'

5) Two provinces, Saskatchewan and British Columbia, have Air Divisions for SAR tasking. It is worth noting that around 1954 the Federal Government financed an Emergency Air Service set up for war purposes but also it took care of many situations SAR being only one. When the finances were taken away this particular Air Emergency Corps disbanded.

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6) Almost every federal agency has a right to be involved by some jurisdiction in all air crashes yet the provinces or territory where the event occurs have no legal basis for tasking. The provinces feel because of the theory of residual responsibility and after an examination of the relevant statutes and agreements that air crashes are a Government of Canada responsibility no matter where the event occurs. (Taken from Interprovincial Council on Civil Emergency Measures discussion paper, August 1976.)

7) There appears to be an uneven distribution of disaster resources and equipment and some municipalities have attempted to do away with local EPC organizations saying it costs too much money and they feel it is a provincial responsibility.

8) GSP and SAR capabilities vary considerably from province to province.

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PROVINCIAL MINISTERS
RESPONSIBLE FOR CIVIL EMERGENCY MEASURES

The Honourable T. Alex Hickman,
Minister of Justice and Minister responsible for EMO,
ST. JOHN'S, Newfoundland.

The Honourable Gilbert Clements,
Minister of Environment and Tourism,
P.O. Box 2000,
CHARLOTTETOWN, Prince Edward Island.

The Honourable John Hawkins,
Minister of Environment and Minister i/c EMO,
P.O. Box 2107,
HALIFAX, Nova Scotia.

The Honorouble Horace B. Smith,
Minister of Municipal Affairs and Provincial EMO,
FREDERICTON, New Brunswick.

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The Honourable Fernand Lalonde,
Solicitor General,
Parliament Buildings,
QUEBEC, Quebec.

The Honourable John MacBeth,
Secretary for Justice Solicitor General,
Ministry of the Solicitor General,
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25 Grosvenor Street,
TORONTO, Ontario, M7A 1Y6.

The Honourable Saul Miller,
Minister of Urban Affairs,
Government of Manitoba,
WINNIPEG, Manitoba.

The Honourable Gordon MacMurchy,
Minister of Municipal Affairs,
REGINA, Saskatchewan.

The Honourable Hugh M. Horner, (M.D.),
Deputy Premier Minister i/c Alberta Disaster Services,
Province of Alberta,
300 Legislative Building,
EDMONTON, Alberta.

The Honourable Grace McCarthy,
Provincial Secretary Minister of Recreation and Tourism,
Province of British Columbia,
VICTORIA, British Columbia.

Mr. John H. Parker,
Deputy Commissioner, Northwest Territories,
YELLOWKNIFE, Northwest Territories.

Mr. Peter Gillespie,
Assistant Commissioner (Executive),
Government of Yukon Territory,
P.O. Box 2703,
WHITEHORSE, Yukon Territory,
Y1A 2C6.

b. Royal Canadian Mounted Police: The RCMP, under the responsibility of the Solicitor General, is enpowered to enforce all federal statutes in Canada. In addition to undertaking security services for the federal government it assists many departments in their administrative duties. For example in the 'uncertainty phase' for a missing aircraft the RCMP often take part in the

'communication check' and does any required interrogation for the Rescue Coordination Centre.

The RCMP has responsibility for law enforcement in the Yukon and Northwest Territories and have signed agreements for enforcement of Provincial laws with 8 provinces. (Ontario and Quebec have their own Provincial Police). They have also entered into separate policing contracts in some 169 cities, municipal districts, towns and villages.

The 'Air Directorate' maintains in Canada 25 aircraft, (including 4 helcopters) at 20 locations, 49 pilots and 38 engineers. The pilots have at least Commercial Licences and most have Airline Transport Licences. All except very junior pilots have Instrument Ratings. The aircraft are used for rescue work, travel in and to remote areas, and surveillance. Refer to Table 2 for details of the fleet and locations.

Explicit instructions for search and rescue duties are defined in the RCMP operational manual. The book is used more or less as a guideline as search is often a common sense thing and each incident is unique.

RCMP Functions in SAR: There are a variety of situations for which the RCMP are or may be involved in SAR. The following list indicates some of the more common ones:

1) Most SAR involvement by RCMP aircraft occurs when circumstances arise that make it much more expedient to use those aircraft than bringing in military aircraft.

2) When the crash site is located the RCMP must, along with the Coroner, identify the apparent cause of death. These reports are also used by the Accident Investigation Teams of the Ministry of Transport.

3) They must identify the dead.

4) If the incident involved a private aircraft the RCMP or Provincial Police must notify the next of kin. For commercial and military aircraft the responsibility lies with the CF. This is subject to circumstance.

5) The RCMP is responsible for determining if any aeronautical regulations or nagivation orders have been broken. Very often the evidence is not at the

scene of the accident but rather back at the operations base.

6) If the survivor leaves the scene of the crash or forced landing the co-operation of the RCMP or Provincial Police is sought by the CF when required. This does not alter the military responsibility for searching for and rescuing the POB from a missing aircraft. When this situation occurs and the person is not located after an extensive search by the military they then hand the case over to the RCMP as a 'missing person' case.

7) Search for missing or lost persons on the ground or water has long been an assumed Police function. Any civil Ground Search or Air Search units act in support of and under the police authority.

8) If the location of the crash site is known and it is outside airport boundaries the RCMP is responsbible for coordination and control of rescue operations, identification of the dead, and security and access to crash site.

Auxiliary Police in three Provinces, B.C., N.B. and N.S., have been established by the RCMP. These members carry no side arms but in other ways perform the same duties as the regular members. They are often used for traffic control and ground search duties.

The RCMP pilots have been most cooperative in search activities. They seem to make a special effort in most locations to become part of the local flying fraternity. In fact they are involved in the majority of searches within their areas even if in an unofficial capacity. With the addition of the 4 helicopters, a Bell 206 at Fort McMurray; Bell 206B at Comox; Bell 206B at Victoria; and one Bell 212 at St. John's they have an increased rescue capacity. All the aircraft located in the north are equipped with VHF/DF and therefore can do electronic searches. Originally these radio DF were installed to home-in on the Eskimo hunting parties between Baffin Island and Greenland who used VHF radios to keep in touch with their home bases. From that it developed into ELT homing and has proven a most valuable capability.

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TABLE 2

RCMP Fleet Distribution

Air Detachments	Number Wing	Aircraft Type	Undercarriage
WEST			
Victoria	1 F-W	Bell 206B	skid
	1 F-W	King Air 200	wheels
Comox	1 R-W	Bell 206B	skid
Prince George	1 F-W	Turbo Beaver	amphib/ski
Prince Rupert	1 F-W	Grumman Goose	amphib
Kamloops	1 F-W	Beaver	ski/wh/fl
Edmonton	1 F-W	Beaver	wheels
	1 F-W	Twin Otter	wheels
Fort McMurray	1 R-W	Bell 206B	skid
Peace River	1 F-W	Turbo Beaver	wheel/ski
Prince Albert	1 F-W	Otter	amphib/ski
Regina	1 F-W	Twin Otter	wheel
	1 F-W	Beaver	wheel/ski
Whitehorse	1 F-W	Twin Otter	wheel
Inuvik	1 F-W	Twin Otter	wheel
Yellowknife	1 F-W	Twin Otter	wheel
	1 F-W	Otter	amphib/ski
EAST			
Winnipeg	1 F-W	Otter	amphib/ski
Thompson	1 F-W	Twin Otter	wheels
	1 F-W	Otter	amphib/ski
Ottawa(Uplands)	1 F-W	Beech King A90	wheels
Moncton	1 F-W	Beaver	wheel/ski
Goose Bay	1 F-W	Otter	amphib/ski
St. John's	1 R-W	Bell 212	skid
Frobisher	1 F-W	Twin Otter	wheels

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13. ABSTRACT

The ability and willingness of the civil sector to assist the military in carrying out its statutory search and rescue (SAR) role is studied. Results are presented of a questionnaire to determine the available resources and general attitude. Existing civilian SAR groups are assessed to determine strengths and weaknesses of each type of organization. The role of federal and provincial government departments is explained.

Recommendations include the development of a national volunteer SAR organization, which can be implemented in stages.

KEY WORDS

Search and Rescue
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