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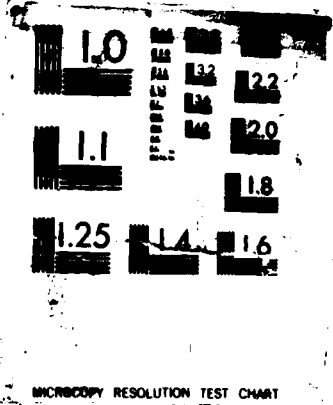
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LEADERSHIP AT ANTARCTIC STATIONS

BY

LIEUTENANT COLONEL J.R. GODWIN

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Research Report 1/87

LEADERSHIP AT ANTARCTIC STATIONS

by

Lieutenant Colonel J.R. Godwin

March 1987

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LTCOL B.J. HODGE  
Commanding Officer  
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## Abstract

Research Report 1/87 discusses the role of Officers-In-Charge (OICs) at Australia's Antarctic Stations. Using selected approaches from within the field of organizational behaviour, an analysis of the organizational system within which OICs have to operate is provided. Arguments are put forward on whether there is a "best" approach to leadership at an Antarctic Station and what leadership style may have the most to offer.

Officer-In-Charge (OIC) of an Australian Antarctic station is a demanding role that, in the writer's opinion, has received too little attention over the past few years. The positive outcomes to be gained from effective well-supported leadership on stations can easily be forgotten in the total effort dedicated to mounting Antarctic research and national presence. The Antarctic Division has significantly improved the selection system for OICs, but selection is only part of the process necessary to achieve effective leadership.

The rationale in writing this paper was to provide a stimulus for discussion amongst those involved in the selection, training and assessment of OICs, amongst those involved in personnel policy as it relates to OICs and their expeditioners, and amongst OICs themselves.

Leadership in Antarctica stirs images associated with names such as Scott, Shackleton and Mawson, of men personally involved in the planning and preparation of expeditions with exploration and scientific goals, and of man pitted against the environment in situations demanding courage, endurance and initiative.

Whilst conditions of isolation and confinement remain part and parcel of living in Antarctica, the leadership environment in which today's expedition leader (OIC) operates is quite different. OICs do not have the same autonomy as the leaders of pioneering expeditions and because of the Australian based supervision of current scientific and construction programmes and the long term nature of those programmes, OICs have little contribution to the formal planning and preparation of expeditions and are not personally identified with the goals of the expedition.

It could be argued that the OIC has a responsibility toward the achievement of expedition goals, rather than a responsibility for the achievement of those goals. In practical terms, the OIC's responsibility is expressed in terms of the requirement to develop, maintain and sustain the task orientation of a small group (20-30) living in a harsh climate in conditions of isolation and confinement. Responsibility for their safety and well-being is included in that requirement.

This paper attempts to look at the leadership environment from a psychological viewpoint, first, by considering the "system" within which the OIC has to operate, and second, by considering the application of leadership theory to the practical situation. It will not be argued that OICs, once selected, can be taught how to lead in the station environment, but rather, that by an analysis of the environment, OICs may be able to develop an understanding of the organizational system and where they fit into it, and may be more able to adapt their own skills, experience and personality to that system and its requirements.



### Australian Antarctic Stations

Australia operates three Antarctic stations - Casey, Davis, and Mawson, and one sub-Antarctic station - Macquarie Island. Station populations vary, but are usually between 20-30 for the continental stations and just under 20 for Macquarie Is. During summer the station population is increased by a sizeable construction contingent and by scientists engaged upon summer programmes. Expeditions are comprised predominantly of males, and currently have both scientific and construction goals. However, even without the construction goals, the scientific personnel on station are outnumbered by the support staff necessary to maintain and operate the station.

Selection commences in February of each year and is usually finalized by the end of August, when new expeditioners are taken on strength. Selection criteria cannot be adequately summarized in a few lines but centre upon task/professional ability, physical fitness, and emotional stability and social compatibility. There are no age, sex, marital status, or religious limitations and Australian expeditions have a long history of fostering an egalitarian ethic within station populations.

After approximately three months training, expeditioners depart from Hobart by ship during the November-February period, spending 12-15 months at their station. From March to October, the extensive pack ice off the Antarctic coast prevents the passage of ships to the three continental stations and Australia does not have the facilities to operate aircraft into its stations. Expeditioners are therefore isolated for about eight months of their time at the station.

With some exceptions, expeditioners spend most of their time at the station and, because of the harsh physical environment, movement beyond the confines of the station has to be rigidly controlled. Living conditions within the station are characterised by communal facilities and little personal space.

This very brief background serves to introduce the environment in which the OIC has to operate. A copy of the duty statement for OICs is attached as Appendix 1.

Those responsible for the selection of OICs are concerned with identifying those applicants unlikely to be able to lead in the expedition environment, whilst OICs themselves are perhaps more interested in "what is the best way to go about being an OIC in this situation?" Leadership theory and the contribution that it can make in answering these questions will be considered later in this paper, but it is suggested that a prior consideration should be the organizational system within which the OIC operates.

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1. The three continental stations are currently being rebuilt.

It is not the writer's intention to build a detailed model of the organizational system but to draw upon two 'systems approaches' from organizational psychology in order to illustrate some of the elements of the environment which could be argued to be pertinent to the role of the OIC.

#### Two "Systems Approaches" to Understanding Organizational Behaviour

Very broadly, a systems approach to organizational behaviour involves an analysis of the inputs to, processes within, and outputs from, an organization as a means of assessing the forces operating upon both the organization and its individual members.

The two approaches to be considered are those of the socio-technical systems theory (Hill, 1971; Kelly, 1978; Trist and Bamforth, 1971) and the Diagnostic Model (Glueck, 1982). It is emphasized that these approaches are used to highlight elements of the station system that are seen to be relevant to the role of the OIC.

#### Socio-technical Systems Theory

In the early 1950's the Tavistock Institute of Human Relations in the UK developed a socio-technical systems theory, following a series of industrial projects in the UK, India and Norway. In its early stages, the basic tenet of the theory was that performance in an organization was dependent upon the interaction of the social and technical systems operating within the organization and that effective performance depended upon jointly optimizing these two systems. Hill (1971, p.29) states that Tavistock's work showed "...that many of the problems affecting the people-side (or the social system as they termed it) had their roots in the technical system and in the actual tasks it required people to carry out".

The application of socio-technical systems theory, therefore, requires the consideration of both the social and technical system because task requirements and individual needs are argued to be inter-related, creating an interdependent social system (Pugh, 1971, p.214). A later development of the theory (Emery and Trist, 1965) proposed that an organization could not be seen as a closed system, but as an open system in constant interaction with its environment. Environment includes political, economic and cultural factors rather than simply the physical environment, although in the Antarctic station setting, the physical environment may have considerable impact.

What relevance does this approach have for the OIC of an Antarctic Station?

The social environment of the Antarctic station has long been held to be one of the major stressors of Antarctic life (Mullin, 1960; Palmi, 1968; Strange and Klein, 1973). This has tended to be seen as an outcome of the social system involved in an isolated small group living in communal conditions. Whilst task ability has been demonstrated to be a determinant of adjustment to the station (Gunderson, 1974; Owens, 1975), task demand (part of the technical system) and its interaction with the social system has received little attention.

The application of socio-technical systems theory suggests that four major technical systems may exist within the organization, these are:

- a. the scientific technical system, characterized by relatively high technology, data collection, responsibility to long term goals, sometimes irregular working routines, and generally little in the way of either immediate or tangible output;
- b. the construction technical system, characterized by traditional construction technology, responsibility for recognizable stage goals, and tangible output;
- c. the meteorological/communication technical system, characterized by routine collection and transmission of data, a perceived responsibility to other group members in the case of the communication system, and a routine output, less tangible than the construction programme; and
- d. the maintenance technical system, characterized by the need to maintain traditional technology equipment in cold weather climate, responsibility for station safety and equipment performance, and a constant requirement to maintain a tangible output.

The writer would argue that the OIC needs to consider the interaction of these four major technical systems with a social system that is itself created for a short term and constrained by the conditions of isolation and confinement. That, of course, is simply stated but it foreshadows a complex organizational climate.

The social system itself is potentially turbulent. Ostensibly, expeditioners come together in early September for Orientation week and Field Training but, inevitably, not all make it at that time, and the many training activities that take place between September and the departure time for the continent effectively mean that an expedition group may not finally come together as a group, on its own, until the last of the summer resupply ships and summer expeditioners depart from the station

in late February. Logistically this may be unavoidable, but it appears to the writer to work against the creation of a cohesive group and it is another difficulty with which OICs have to contend.

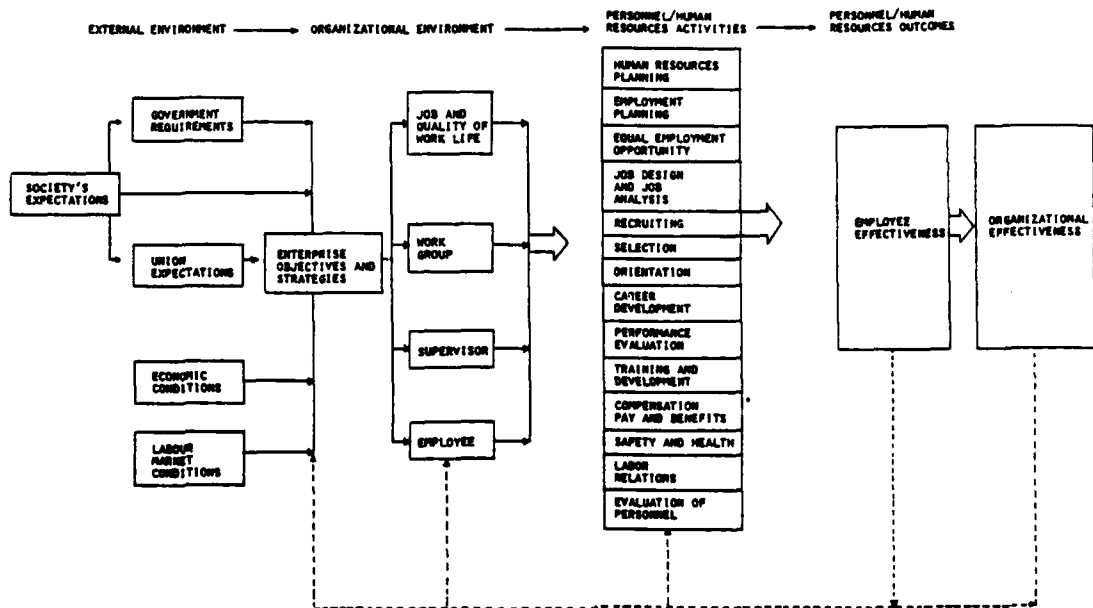
Whether socio-technical systems theory provides a basis for research opportunity and direction is not being considered here. What is being suggested is that leadership and management may benefit from a consideration of the relationship between technical and social systems such as the theory postulates. Further, it is argued that an appreciation of the organizational system is necessary to leadership in any situation and that the limited application of socio-technical systems theory, thus far, presents a useful basis for understanding the Antarctic station environment.

Socio-technical systems theory also emphasizes the need to see the organization as an open system, affected by forces in its external environment. This is also covered by the second systems approach and that will now be considered.

#### The Diagnostic Model Approach

Glueck (1982) has used a systems approach to develop a diagnostic model to identify the forces, both internal and external to the organization, which affect outcomes. The model is reproduced in Figure 1 and, for this paper, the OIC is considered to be the Supervisor.

Figure 1



In what could only be described as a most optimistic expression, Glueck states that "combining data on these factors with personal expertise and judgement, the manager diagnoses the situation and prescribes activities to achieve desired outcomes." (Glueck, 1982, p.7). The model, in fact, appears to overlook the technical system that is considered by the socio-technical systems theory and with which personnel resources have to interact to produce outcomes. It could also be argued that the relative positioning of some of the Personnel/human resources activities vis-a-vis Organizational environment is open to question. Nevertheless, in continuing the eclectic nature of this paper, there are some useful points that can be drawn from Glueck's model.

An attempt can be made to identify the forces in the external environment of the Antarctic Station, and it is necessary for OICs to take cognizance of these even if they cannot affect them. Experienced expeditioners will probably be able to expand upon the forces listed here but it is suggested that the major external forces would be:

- a. government policy/attitude toward the Antarctic programme;
- b. Antarctic Division operational policy and planning;
- c. Antarctic Division personnel policy and administration;
- d. events in family/friends environment in Australia; and
- e. events in Australia that may affect expedition and post-expedition expectations.

The OIC can have very little impact on any of these forces, particularly during the period of his own expedition, except perhaps in the implementation of administrative policy as it concerns individual expeditioners. OICs are taken on strength at the same time as other expeditioners and appear, to the outside observer at least, to have little formal responsibility until they actually arrive on station.

With regard to Organizational Environment, Enterprise Objectives and Strategies are largely decided before OICs are employed. OICs are reasonably expected to influence the Job and Quality of Work Life and the motivation, morale, cohesiveness etc of the Work Group but may have little opportunity to do so until expeditioners are finally together, on station.

Within the Personnel/human resources activities listed in Figure 1, it is again the case that the OIC has little opportunity to contribute. Those activities that he can affect are:

- a. Human resources activities (to the extent of allocating "informal" station positions only);

- b. Performance evaluation;
- c. Safety and health;
- d. Labour relations (in the sense of developing and maintaining a productive interpersonal climate and in managing relations with the Antarctic Division); and
- e. Evaluation of personnel.

It could, of course, be argued that, with so few things to be concerned with, the OIC has an easy task. However, it does not work out that way. The task of maintaining the task orientation and the morale of the group is obviously not one that can be prescribed, and yet it is seen to be crucial to both achievement, and group and individual well-being. OICs may not have a manual or professional skill that they can apply directly to produce a tangible output, and the duties of the OIC involve few tangible tasks that are regarded highly by expeditioners. To further confound the situation, the supervisory cum management climate appears to be a complicated arrangement involving direct supervision by project managers in Australia, particularly in relation to scientific and construction programmes, and limited supervision and management by OICs themselves<sup>2</sup>. It is a situation in which those being led have more than one leader, and where the remote leader in Australia has knowledge and decision-making power to which the OIC must refer and defer, sometimes to the detriment of his own position.

It is suggested that OICs have the responsibility of managing the intangibles such as motivation, morale and of resolving conflict and this, it is argued, may affect the "followers'" perceptions of the authority and the contribution of the OIC (See Byrt, 1978, pp.41 and 184) in a negative way.

The two systems approaches have been used to illustrate some of the factors operating within the system in which the station operates. Neither approach has been adapted to build a comprehensive model of the system but elements from both do allow a picture of the organizational climate to emerge; that picture is necessary to OICs, as they assess their role and the demands that may be placed upon them.

Supplementing the points drawn from the systems approaches with subjective assessments made from interviews, and observation, the writer offers the following summary of the organizational climate with which the OIC is faced:

- a. A complex socio-technical system arising from different goals and outputs for different groups, from a potentially turbulent social system that is given little opportunity to develop before being

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2. Such a system appears to contradict Duty No 1 of the OIC's Duty Statement.

placed in the operational environment, from a social system which is finite and from the conditions of isolation and confinement.

- b. A small group of qualified, ostensibly task-competent individuals, technically managed from "outside" (ie Australia) and, arguably, working toward task achievement independently of the OIC.
- c. A leadership role that allows little in the way of tangible output, which has little responsibility in planning for the expedition and its goals, limited organizational or structural power, and which has to rely heavily on conciliation and arbitration skills rather than disciplinary power.
- d. A leadership role in which a significant responsibility is the maintenance of motivation and morale, achievement of which is described by Macpherson (1977) as "...the most important basic difficulty facing those in any way involved in human adaptation in Antarctica..." (p.584).

#### Leadership Theory and the Practice of Leadership at Antarctic Stations

It is now appropriate to look briefly at selected writings on leadership in practical or applied situations. Macpherson (1977), a former base leader with the British Antarctic Survey, states that "An important factor affecting the cohesion or 'morale' of Antarctic groups is without doubt the factor of leadership" (p.584). Law (1960) also attests to the importance of leadership in the Antarctic station environment, whilst Radloff and Helmreich (1968), in reporting a study of leader performance at US Aircraft Control and Warning Stations in the Arctic, state that "...by far the overwhelming factor which stood out above all others the behaviour of the commander in setting the pace and determining the standards and the social atmosphere of the site."

Are there individuals with a collection of personal qualities that equip them for leadership in any situation or, does the Antarctic situation call for a specific style of leadership that may restrict the number of individuals who would be considered suitable?

The literature (e.g. Adair, 1968, 1979; Byrt, 1978; Funnell, 1982) refers to the failure of trait theories to adequately explain the performance of good leaders. Similarly, style theories are argued not to be able, alone, to adequately explain or produce effective leadership (Funnell, 1982; Stogdill, 1974, p.418)<sup>3</sup> although it appears to the writer that some

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3. Cited in Funnell (1982).

proponents of leadership style (e.g. Blake and Mouton, 1968) do recognize that situation can influence leadership style and that style does not operate in a vacuum.

Byrt (1978) claims that "...the effectiveness of leadership is contingent upon the situation in which it is exercised" (p.69), and this is supported by Adair (1968, p.14) who argues that leadership involves a relationship between the leader and the situation and that it is important that the leader possess "... the appropriate technical or professional knowledge required in the given situation".

Both Byrt and Funnell favour contingency theory approaches in translating leadership theory into terms of utility for applied situations and both seem to be expressing a similar approach to Adair's (Adair, 1968, 1979; Scott, 1971) functional approach to leadership.

Adair does not have a definition of leadership but presents an "understanding" of leadership upon which he bases a system of leadership training and states, "That understanding would include the following points: the leader must have the personality and the appropriate technical knowledge to guide a group to the achievement of its task and to hold it together as a working team." (Adair, 1979, p.10). The functional approach adopted by Adair identifies three overlapping needs - Task, Group Maintenance and Individual - which the leader must try to satisfy in exercising leadership in any situation.

Adair's approach acknowledges that a team or group is formed in order to achieve certain goals and that the first need of the group is to achieve those goals (task needs). Achievement of the goals is dependent upon the maintenance of effective co-operation, cohesion and morale (group maintenance needs). Finally, individual members of the group have their own needs, either existing before joining the group or arising from the nature of the group, and these too, have to be recognized and met, to ensure the individual's effective contribution to the group (individual needs).

For Adair, it is the role of the leader to see that these three interdependent areas of need are met. According to Adair, it is not what the leader is (in terms of qualities) or what he knows (in terms of skills or knowledge), but what he does in adapting his qualities and skills in meeting the areas of need of the group of which he is leader. The functional approach "...stresses that leadership is essentially an interaction between leader, group members, and the situation." (Adair, 1968, p.19).

Obviously, Adair is less concerned with theory than with providing leaders with a working model relevant to their role and, in the writer's opinion, it is a model which is of use to the small group situation. Although, in itself, it does not specify how leaders should set about implementing the model, it does provide a structure for their leader-behaviour.



Before discussing the implementation of such a model to the Antarctic station situation the question of the OICs relationship to the expedition goals is again raised. It has been argued previously that the expedition has diverse goals, managed and directed more from Australia than by OICs on station, and that, in most cases, expeditioners may perceive that OICs have little to offer toward the achievement of their specific goals. In other words, it is suggested that the organizational climate, itself, may make it difficult for OICs to contribute to a necessary element of a leader's role. This will be discussed further at a later stage in this paper.

Inevitably the question "Is there a 'best way' to lead in the station situation?" must be faced. In discussing an "answer" to that question, the writer would argue that there can be no one leadership method, style or approach that could be universally and rigidly applied to the many leadership decision situations likely to face OICs in any expedition. However, from the analysis of the organizational climate in the first part of this paper and from the literature consulted, a leadership style that is consultative and participative, rather than one that is remote, authoritative, and directive, is suggested.

Macpherson (1977, p.584) argues that "a close, personal style of leadership is required"; this style would allow an OIC to keep abreast of group maintenance and individual needs and be in a position to anticipate needs rather than react to presenting problems.

Byrt (1978, Ch.10) refers to the growing acceptance of "collegial leadership", by which he means leadership which is shared among colleagues rather than imposed by a leader upon his subordinates. Given the egalitarian ethic that is fostered within Australian Antarctic stations, it may be that OICs have little choice but to share their leadership, but the important points are, first, that they know that that is what they may have to do, and second, that they be prepared to control, or even manipulate, their sharing. Emergent, or "natural", leaders in the expedition are not necessarily a threat to an OIC, unless it is perceived that their activities are counter-productive to the three areas of need identified by Adair.

The "close, personal style" of leadership referred to by Macpherson (op. cit.) is not necessarily a requirement unique to the Antarctic station and several of the leadership training approaches presented in Smith and Farrell (1979) concentrate on a human resources orientated, participative approach to leadership in small groups. Such an approach is also basic to the leadership course prepared by Harlos (1981). Central to these approaches, particularly those of Adair (1979) and Harlos (op. cit.), is the argument that participative leadership is more likely to utilize all the human resources available to the leader and that a group decision is more likely to produce a greater commitment to that decision. It is emphasized that "participative" is not used as a synonym for "permissive".

A more theoretical evaluation of participative management is available in Vroom (1976) and, whilst that writer considers that research and evaluation evidence does not overwhelmingly support the value of participative management, his consideration takes into account a much broader management field than that of the Antarctic station.

If it is accepted that OICs will be concerned primarily with group maintenance and individual needs, because they themselves have a limited role in the supervision of task achievement, then it can be argued that a participative approach is best suited to the needs arising from those two areas. If it is intended that OICs influence directly the achievement of task goals, then it is suggested that it would be necessary to increase the level of the OIC's responsibility and involvement in task achievement.

Adair (1968), the papers represented in Smith and Farrell (1979), and the course presented in Harlos (1981), all argue that training can help individuals develop skills that can assist them to adapt their own personality and abilities to group leadership based broadly on a participative style. However, Farrell (1979) suggests that such training may introduce a "way of talking", best described as a common or shared communication style, which itself contributes to leadership and group effectiveness and, therefore, it may be necessary for the whole group to undergo training, rather than the leaders alone. It is not intended to pursue the issue of training in this paper, rather, the paper has sought to identify, inter alia, issues that may eventually be able to be taken up by the training cycle associated with expeditions.

#### Conclusion

This paper has been written primarily as a means of generating discussion on the role of OICs at Australia's Antarctic Stations.

Using selected approaches from within the field of organizational behaviour, an attempt has been made to provide a useful analysis of the organizational system within which OICs have to operate. That analysis suggests that OICs are faced with a quite difficult situation and that there are elements of the organizational environment that could be argued to work against effective leadership, assuming that leadership is expected of OICs.

In considering the contentious issue of whether there is a "best" approach to leadership at an Antarctic station, the writer has argued that a participative leadership style may have the most to offer. Positive support for that argument is derived from the functional approach to leadership as expressed by Adair (1968, 1979) and the perceived advantages of involving group

members in the decision-making process within such an environment. However, given the perceived lack of structural support, in terms of organizational structure, for the OIC's position, and the areas in which OICs are able to exercise influence directly, there may be little alternative to a participative style.

Finally, if this paper provides stimulus for further discussion then it will have made some contribution to the role of the OIC.

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# DUTY STATEMENT

Appendix 1 to

Research Report 1/87 Form PSS 100

Date AUG 80		Chart No. Sheet... of...	Seq. No. 1	Pos. No. 251	PSS use
Designation and classification					
PSS use	State TASMANIA	Central Office Yes/No	OFFICER IN CHARGE CLASS 8		
Department SCIENCE AND TECHNOLOGY			Local designation STATION OIC		
Division ANTARCTIC			PSS use	Raising authority	
Branch OPERATIONS AND POLAR TECHNOLOGY				Removing authority	
Section OPERATIONS			Cert. No.	V31/4	
Sub-section STATIONS			Date	15/1/81	
Perm./Temp.	Division	No. of subordinates	File No.		
850	3				
Immediate supervisor CLERK CLASS 10		Pos. No. 102	Highest subordinate		Pos. No.

Duty No.	Duties	Per cent
1.	Control all aspects of the Expeditions activities, both at the station and in the field. Ensure that established safety requirements are observed by expeditioners at all times.	
2.	Oversight the preparation for and supervise the activities of expeditioners engaged on major traverses and field programs.	
3.	Maintain the morale and efficiency of the expeditions.	
4.	Perform the duties of coroner and justice of the peace in the A.A.T, as required according to the Australian Capital Territory Coroners Ordinance Act of 1956 and the (ACT) Seat of Government (administration) Ordinance of 1930.	
5.	Liaise with Antarctic expeditions of other nations as directed.	
6.	Supervise the conduct of station stocktakes and the reorder of supplies for the following year.	
7.	As an Inspector supervise the application of the Antarctic Environment Protection Act.	

Duty representing highest function—No.	Most time-consuming duty—No.	PSS use
Qualifications and experience other than prescribed		
Delegations		

END

DATE  
FILMED

9-87