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The communication of recorded administrative information in the Army in peacetime

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THE COMMUNICATION OF RECORDED ADMINISTRATIVE
INFORMATION IN THE ARMY IN PEACETIME

by

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SUMMARY

In peacetime, over 25% of the Army's work is administrative. Many of the tasks involve complying with rules and regulations produced by the Ministry of Defence and superior military headquarters. The amount of paper work is increasing, and already the volume is such that units merely store most of what they receive and only about a half of it is kept amended. Some of the excess can be attributed to the tendency for sponsors to try and specify how people should react in every eventuality, though this is a question of the degree of delegation of responsibilities and is therefore outside the terms of reference for this work. Duplication, and sometimes even contradiction, are liable to occur because the lack of standardisation in the indexing of military publications, combined with inadequate cross-referencing, mean not only that the sponsor may be unaware of material already published on the subject but also that he has no way of discovering what is in the course of preparation.

It is recommended that more attention should be given to the different methods now available for communicating information and there should be more thought about the intelligence quotient and attitude of the recipients. The present system lacks any form of organised feedback from the user to the originator and therefore the majority of the problems are perpetuated. As little is known about the cost of producing and distributing administrative information, it is not possible to compare the financial merits of the various methods of communication.

The difficulties arise from a lack of co-ordinated control at Ministry of Defence level : no person below the Permanent Under-Secretary is responsible for the flow of information in the Army. It is proposed that a Defence Administrative Information System (Army) be formed. The aim would be to provide the user with the information that he needs. It would study the philosophy of producing recorded administrative information, assist sponsors, progress printing and distribution, and provide the user with a reference retrieval service. The majority of the staff would come from existing sources.

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My grateful thanks go to the many branches of the Ministry of Defence who helped with the provision of information : in particular, Management Services (Organisation), Management Information (Army) and the Director of Work Studies (Army); also to the units and establishments visited during the course of this work, especially those who assisted with the trial described in Section 7 and the Army Library Service.

My thanks are also due to the authors of the publications I have cited or quoted and the members of Defence Secretariat 15a who helped with the administrative problems associated with my Defence Fellowship.

FOREWORD

This work has been completed during a one year Defence Fellowship at the Loughborough University of Technology. The author's past experience includes posts with field force units and static establishments in various parts of the world. He has been a Director of Studies at the Royal Military College of Science and more recently worked for the Procurement Executive of the Ministry of Defence.

The opinions expressed are those of the author and may not necessarily conform with official policy. A large number of people are concerned with the dissemination of information in the Army and there are conflicting ideas on the subject. It is hoped, however, that this work will be accepted as a constructive proposal for the definition of a system to improve administrative decision making.

This thesis will be read by persons of widely different experience in the academic and military professions. It has therefore been necessary to include a certain amount of essential background information to enable those who are not conversant with particular aspects to be able to appreciate the complete problem. These chapters are clearly annotated to prevent unnecessary reading.

The minimum security grading for a classified military document is RESTRICTED. This means that the information contained therein must not be communicated, either directly or indirectly, to the press or to any person not authorised to receive it. The result is that it has not always been permissible to quote from official publications. This limitation does not however detract from the arguments. Queen's Regulations (1) are available to the general public and consequently they are frequently quoted in examples.

1. INTRODUCTION

The object of this study as originally intended was as follows:-

'To examine the possibilities of making more use of information and of overcoming the inadequacies of retrieving information in military units and establishments (2)'.

The scope of the original specification was made wide in order that a study could be carried out to define the problem area which could be most usefully investigated in the time available. A brief summary of the reasons for restricting the work to the peacetime communication of recorded administrative information in the Army is given below.

Since the Second World War, some very advanced equipment has been developed and purchased which, together with the well established methods of surveillance, will provide large quantities of combat information and data. In order to enable commanders and their staffs to extract the appropriate facts from the mass of material available, the Army has decided to develop computer aids. It has also been found necessary to investigate other special operational information systems, such as a means by which the identity of suspects in Northern Ireland could be rapidly established. Details of these and other systems required for war or duties in aid of a civil power can be found in Ministry of Defence (Army), (MOD(A)) General Staff Requirements and other associated papers. They will not be discussed further.

We must always be in a state of readiness for war but we can reasonably assume that there will be many years of relative

peace. In peacetime we need information to keep us constantly prepared to move into action with a force which will meet the requirement. This information can be roughly divided into two parts: firstly that which is used for planning purposes in the MOD and, secondly that circulating elsewhere which is primarily concerned with the day to day control of the Army.

The MOD already uses advanced information systems for handling intelligence, finance, order of battle, equipment procurement, technical and stores information, and data etc. They are all essential to preparing for war but, apart from a few highly specialised printouts, are of no direct assistance to those serving outside Whitehall. The use of these systems by Government Departments is beyond the terms of reference quoted in the first paragraph and any reader who is interested should refer to the GRID 77 reports, published by the Management Computers Division of the MOD (3).

The major remaining area of interest is the information in the Army that is concerned with the state of readiness for war and other peacetime activities which, excluding strategy and tactics, is generally defined by the term administration. This category would also include items of a well documented, specialised nature, such as Electrical and Mechanical Engineering Regulations but, as these do not constitute a serious information retrieval problem and are not of general interest, neither they nor other highly technical material will be given detailed consideration.

In their report on management needs for the Army Board (4), the MOD (A) Management Information Study Team stated that, although it was outside their terms of reference, they must point out the necessity to examine management information needs at Army and lower formation headquarters. Operational aspects have been studied but little work has been done on the administrative requirements. The communication of administrative information between the policy makers and the units is largely achieved by the use of recorded material. It is the problems associated with this form of communication which have been examined in this study.

The first part of the work of designing the organisation necessary to administer the Army is to decide on the objectives. These are determined from the rôle of the Army as defined by Parliament. The next task is to specify the procedures needed to implement the policy and hence the information required. The level at which decisions are taken makes a considerable difference to the amount of information which has to be produced and the type of system required. Although this work is not concerned with the problems of delegating authority, the effects are considered to be of such importance as to deserve special mention. (Section 8.2).

Information systems are intended to improve efficiency. Most project studies show large potential savings in material costs, or a high degree of insurance against duplication of expensive research work. A report on the construction industry

(5) shows possible cost benefits of nearly £150 million per annum for an investment of less than 10% of this amount. Extracts from the interim and main reports on this study are given in Appendix '1'. Improved military administrative information handling could produce savings in material costs, though they would be more difficult to measure than in the case of the construction industry. The report described other less tangible benefits which could apply to the Army, such as the time saved performing a task, less duplication of effort, improved standardisation and reduced publication costs. It is a large and complex subject. A person's information requirements are directly related to his job specification. The 350,000 military and civilian personnel who serve the Army have a very wide variety of tasks to perform. Until more facts are available, it will not be practicable to produce a detailed specification for the ideal information system.

The reports mentioned in Appendix '1' recommended that any proposals should be introduced on a step by step basis. This approach to complex problems, which cannot be readily analysed in advance, has been common practice in the procurement of complicated Army equipment for some time. It can be a lengthy process but it enables the user to restructure his organisation during the development phase and hence obtain maximum benefit from the new system.

2. BRIEF NOTES ON THE BRITISH ARMY

This section is intended for those readers who have little or no knowledge of the tasks and organisation of the Army. A more comprehensive survey can be found in the publication:

'Notes on the British Army' (6).

2.1 Tasks

The Army is required to protect British interests anywhere in the world. It must therefore be able to participate in:

- (a) Cold war
- (b) Internal security operations
- (c) Limited war
- (d) General war.

2.2 Composition

The total strength of the regular Army is about 170,000 officers, warrant officers and soldiers. Although all are trained to fight, the complexity of modern warfare makes it necessary to use a proportion of them in a mainly supporting, rather than combatant, role. The Army is therefore divided into three basic parts as follows:

- (a) Those whose prime task is fighting. They are the Royal Armoured Corps, the infantry, the Royal Artillery and certain elements of the Royal Engineers. These, together

with the Royal Signals and the Army Air Corps, are sometimes referred to as the 'teeth arms'.

- (b) The administrative services, whose main task is to provide the materiel, physical and medical needs of the fighting troops. Examples of these are the Royal Corps of Transport, the Royal Army Ordnance Corps, the Royal Army Education Corps and the Royal Army Pay Corps.
- (c) The staff branches, who co-ordinate the complete system. These posts are filled by appropriate persons from either the fighting arms or the administrative services, who normally return to their specialist duties after two or three years serving on the staff. The staff's responsibilities are divided into three parts as follows:

- (1) The 'G' staff. Operations, intelligence, security, organisation of staff duties and combat training.
- (2) The 'A' staff. Manpower and personal administration.
- (3) The 'Q' staff. Supply and maintenance of equipment, accommodation and victualling.

In the lower formation headquarters, the 'A' and 'Q' staff are combined in order to obtain maximum efficiency from the administrative system.

Military personnel are held on the strength of units or establishments. The full definitions of those terms is given in the Joint Services Glossary (7). In general Army parlance, a unit is usually defined as a self contained body of men with a specific rôle, capable of operating anywhere in the world. A unit usually belongs to what is called the 'field force'. An example would be an airportable infantry battalion. The term establishment is generally applied to large static installations such as the Royal Armament Research and Development Establishment in Kent.

The problems of communicating administrative information affect those serving the Army wherever they are, both military and civilian. Although this work is primarily intended to be of assistance to those in the field force, much of what is said can also be applied to the large static establishments.

2.3 Organisation

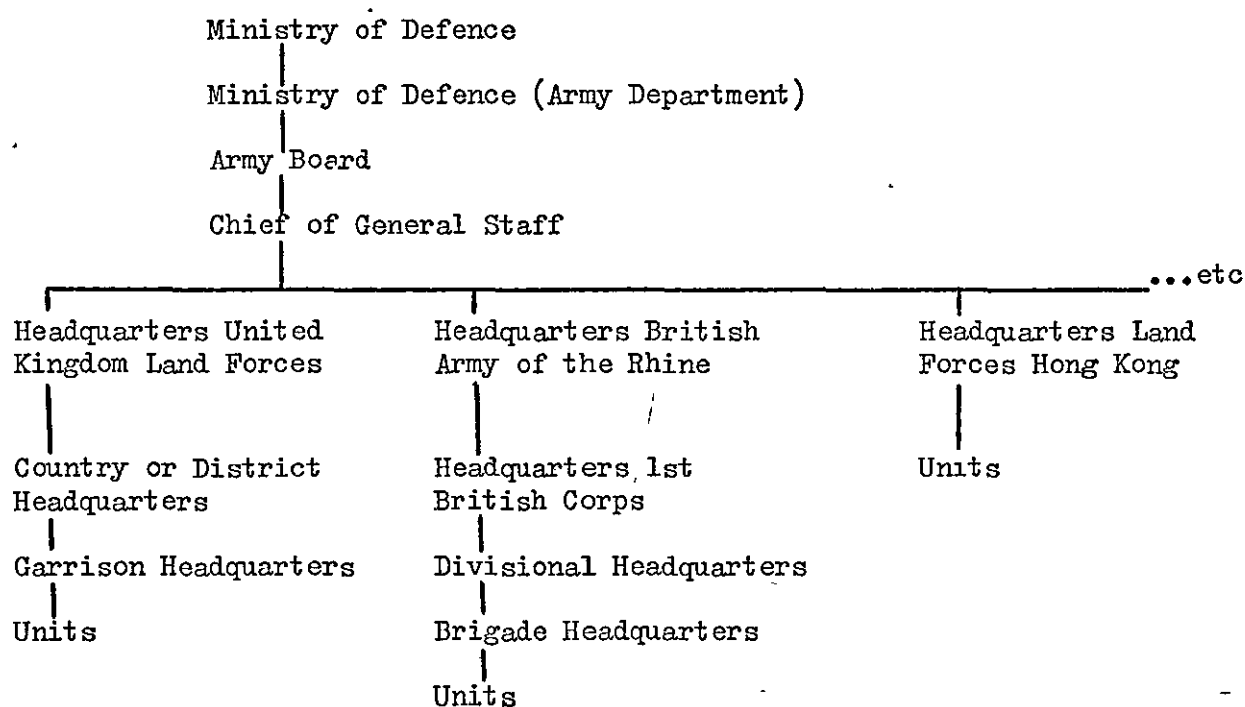
The Army is controlled by the MOD which is a Government Department. Within the Ministry, the Army Board exercises control via the Chief of the General Staff.

In the United Kingdom, there are large numbers of specialised organisations, often involving all three services, which together with the Army Department of the MOD. (MOD(A)) employ the majority of the Army Department's 170,000 civilians. Examples are the proof and experimental ranges, the central ordnance depots, the

base workshops and the royal ordnance factories. There are a small number of similar establishments overseas. In general they are controlled by the MOD.

The majority of the field force is deployed in West Germany. There is a reserve force in the United Kingdom and a very small percentage serve elsewhere in the world, some as part of the United Nations forces. Those at home are controlled by a geographical command structure, whereas their colleagues abroad operate on the normal wartime, hierarchical organisation. The simplified chain of command and control is shown in Figure 1 below.

Figure 1: Simplified military chain of command and control



For those who have no knowledge of the size or organisation of the Army's headquarters and units, examples can be found in Appendices 2, 3 and 4.

2.4 Principles of administration in the Army in peacetime

The publication: 'Administration in the Field' (8) provides a detailed description of the subject. Administration is defined in the Joint Services Glossary (7) as:

- a. The management and execution of all military matters not included in tactics and strategy; primarily in the fields of logistics and personnel management.
- b. Internal management of units.

The glossary defines logistics as: 'The science of planning and carrying out the movement of forces. In its most comprehensive sense, those aspects of military operations which deal with:

- (a) Design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of materiel.
- (b) Movement, evacuation and hospitalisation of personnel.
- (c) Acquisition or construction, maintenance, operations, and disposition of facilities.
- (d) Acquisition of services.

The aim of administration at all levels is to ensure that, by proper preparation and allocation of effort, the maximum value is obtained from the commander's resources. The following well tried principles are applied in order to achieve the aim:

- (a) Foresight
- (b) Economy
- (c) Flexibility
- (d) Simplicity
- (e) Co-operation

3. THE FUNDAMENTALS OF INFORMATION HANDLING

This section briefly describes the fundamentals of information and communication, language problems, general systems descriptions, means of measuring systems efficiency, indexing, storage, retrieval and systems design. Roger Meetham's book (9) is recommended to those readers who wish to obtain a broad survey at an elementary level.

3.1 Information and communication

Information is the collective or individual communication of ideas or facts. Communication is defined by the Oxford English Dictionary as:

'The imparting or exchange of knowledge, information and the like'.

Communication between human beings is a very complex subject. It is part of the science of cybernetics. Much has yet to be investigated, for example, there may be an unknown transmission medium which would explain the apparent phenomenon of telepathy. The research into this and other related topics may well affect the means by which the information is passed between persons. However, in the meantime, we are restricted to the more mundane methods of communication such as face to face conversation, telephone, teleprinter, wireless, closed circuit television and printed matter of various kinds.

The cardinal point is that, if all are to benefit, then the relevant information must be passed on. Many animals, including the human race, would be extinct by now if this had not happened in the past. Today, the failure to communicate information is likely to result in the waste of large sums of public money. An example is the case which is reputed to have occurred in America, where a team of ten mathematicians was employed for two years solving a military communication problem. They produced their findings and then discovered that the Russians had openly published the solution about the time that the Americans had started work. This could

easily happen during the development of one of our expensive equipments, and probably has, without anyone knowing it. The cost of running libraries and their associated information services, including means for translating material produced in a foreign language, may be high but the penalties for not providing such facilities can be very much greater.

3.2 Human problems of communicating information

A major difficulty is the human's inability to perceive what is actually there. The diverse descriptions of witnesses at a traffic accident is one example, another is when we 'read' what we think should be present on a piece of paper or fail to see something we do not expect to be there.

The means of communication is decided by such factors as the urgency of the message, the availability of the recipients and, for example, in military messages, the security classification of the item. Fundamentally the decision is between oral and written methods.

Communication with a computer has to be conducted in a precise manner or the machine will be unable to function. By comparison, conversations between human beings are inefficient and vague. Words, sometimes deliberately, do not delineate the intended meaning, pieces of information are frequently left out and the recipient is expected to guess what would have been included in a complete message. In the majority of conversations, the listener can assimilate the information more quickly than it is being transmitted, and may therefore think of irrelevant matters thereby lowering his concentration.

If information cannot be transmitted by word of mouth to those who have to be informed, then it has to be stored by some tangible means, such as paper, magnetic tape or film. The retrieval of such information can be hampered by language problems.

Semantics is the science of the meaning of words; a file can be a craftsman's tool or a device for storing paper. Another problem is to decide on the logical class to which an item belongs. An example which occurred in World War II was the dispute about whether the liquid in a flame thrower was a fuel or ammunition. Generics is the term given to a hierarchical chain of concepts. If items of information are to be retrieved, it is important that they be logically classified. The index to 'Queen's Regulations for the Army' (1) shows - 'Health of troops, preservation of'; the 'Handbook of Army Health' is not listed under this heading however, it is to be found elsewhere in the index under 'Sanitation'. A further problem is syntax, which concerns the meaning conveyed by the order of words. It is not a serious problem in military administration, though the practice of indexing the principal noun first may be a little confusing to those outside the service: in Army parlance, a 'roller, steam' is a steamroller and not a roller heated by steam.

3.3 Oral and written communication

H.H. Albers gives an excellent dissertation on the relative merits of communicating by the spoken and written word in his book: 'Principles of management' (10). He refers to a 'Fortune' poll (11) which showed that the majority of executives preferred to gather information about their business by verbal reports from subordinates; less than 25% choosing written briefs. In another study (12), 51 presidents of large corporations were requested to select the methods they preferred for the transmission of very important policy. They were asked to choose, from five alternatives, the two methods that were likely to get the best results. The replies were as follows:

- (a) Calling a meeting of management personnel and explaining orally - 44
- (b) Hold personal interviews with key personnel - 27

- (c) Announce policy in a management bulletin - 16
- (d) Explain the policy in an inter-office memorandum - 14
- (e) Explain the policy on the telephone or intercom - 1

Communication can only be achieved orally if the recipients can be easily contacted and information will not be needed for future use by those excluded from the original distribution. In general, however, military administrative information has to be widely distributed and frequently stored for subsequent reference. Also, for some types of information, legal complications can arise if written evidence is not available. The important point is that the means of communication should be frequently reviewed. In his article on 'The paper pushing fallacy', Denis Pym (13) states that:

'Great organisations rumble on, seemingly out of control, while their managements ignore the changing patterns of communication which make nonsense of many of their work procedures and activities'

3.4 Military information requirements

Information, as has been stated, is the collective or individual communication of ideas or facts. When deciding on a course of action, the soldier has been trained to define his objective, consider the relevant factors and make a plan. The knowledge contained in the factors is essential to the decision making process. The information must be available in time, it must be accurate, meaningful and complete. It should also be clear whether the information is mandatory or not. The fact that some information should be presented but is not available is useful knowledge in itself. Irrelevant information decreases the efficiency of the decision making process.

3.5 The range of information systems

The details fed into a processing system and the answers that come out are called data. The ability to retrieve or process data is not necessarily a function of an information system. Although there is often a requirement for actual data, an information system will usually only be able to tell the enquirer the name of the author and title details of references which may contain what he wants to know. Generally speaking, it is not at present a viable proposition to provide a complete question and answer service encompassing actual data as well as references that may contain desired data when physically located.

Information systems differ in scope from the simple reference book to the highly complex management system. Sherman Blumenthal devotes the second chapter of his book (14) to the problem of defining the management information system. The variety of systems is so wide that it is difficult to make general observations on the complete range. The device mentioned on page 1 for identifying suspects is an example of the simple system. The suspect's characteristics are compared with those of persons being sought and it can rapidly be established whether he is wanted or not. The combat information and MOD policy planning systems, referred to on pages 1 and 2 respectively, are management information systems; of these Ezra Glaser said (15):

'In principle, the manager never has all the information. There is an almost infinite variety and seemingly infinite amount of information the manager would seem to want to have in order to make important decisions. In many cases he asks questions, gets answers, and then is totally unhappy with both the answer and the question he asked. Often he resumes by asking a different line of questions. There are two prototype questions. Do I have a satisfactory answer for each question I have posed? Do I need additional questions or new kinds of questions?

3.6 Storage and retrieval

Information storage and retrieval can be depicted by Figures 2 and 3 shown below. The first task is to decide what information the user needs to formulate his decisions. This will define the input to the system and the procedures for recording and indexing the information and processing methods. Feedback from the user to the input closes the loop and provides the essential control which enables the system to adjust itself to meet the changing user requirements. Such a system is said to be output oriented: the design starts with a definition of the users' information profiles. The alternative method of storing large quantities of information, in the hope that it will contain what is required, can lead to failure due to sheer bulk problems; the user is unable to communicate efficiently and cannot find what pertinent information is available amongst the mass of material.

Figure 2: Information storage

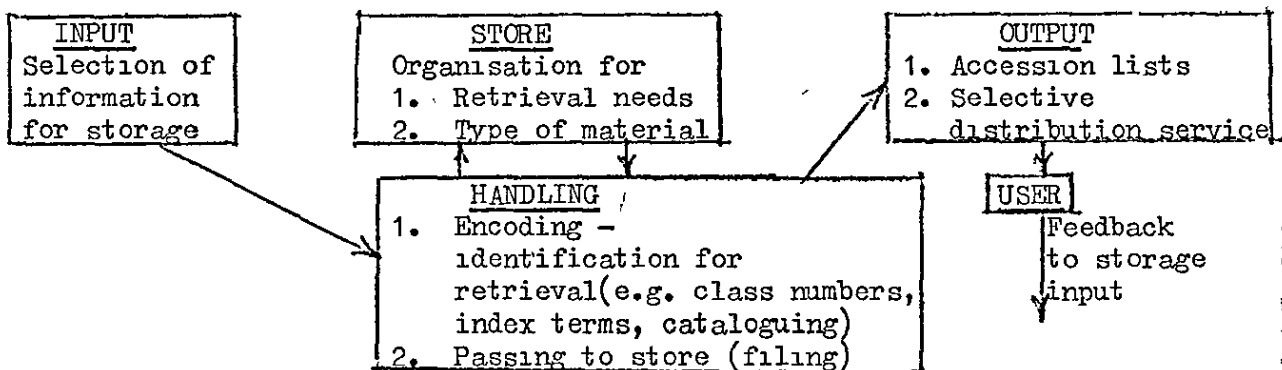
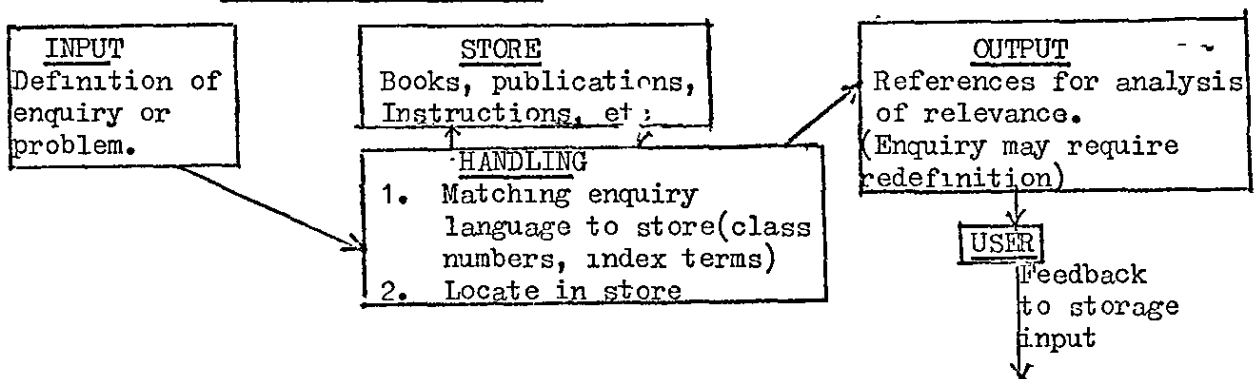


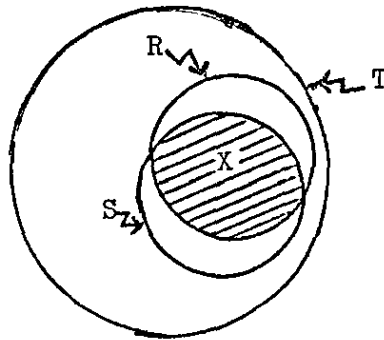
Figure 3 : Information retrieval



3.7 Systems criteria

Perry and Kent (16) use a Venn Diagram to express retrieval criteria as shown below.

Figure 4: Venn diagram method of expressing retrieval criteria



The area within the large circle 'T' represents the total number of items on every subject at a given time. The area within the circle 'R' represents the number of relevant items available on the selected subject. The area within the circle 'S' represents the items selected by the system in response to the request. The shaded area 'X' is therefore the number of relevant items selected. Criteria are expressed as follows:

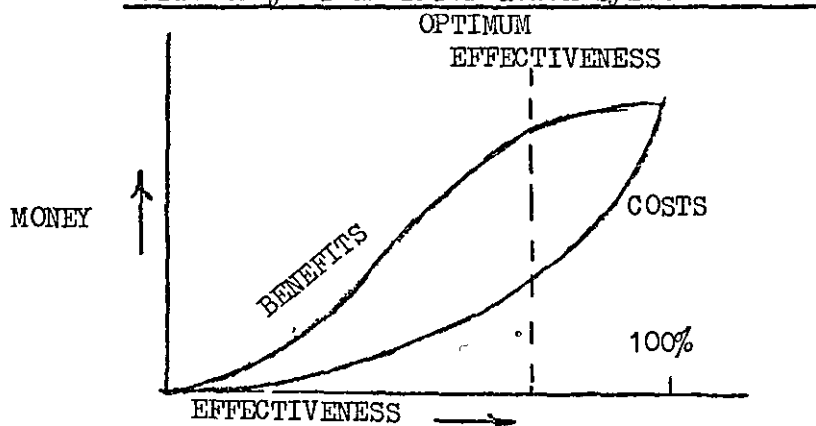
- (a) $\frac{X}{R}$ is called the recall factor
- (b) $\frac{X}{S}$ is called the pertinency factor
- (c) $\frac{S - X}{S}$ is the noise factor
- (d) $\frac{R - X}{R}$ is the omission factor

It is difficult to obtain accurate figures for the recall and omission factors because to do this would involve searching the entire store to discover the number of relevant items that had been omitted in the original search. It is possible to obtain a high recall factor by selecting a large number of items but this would lower the pertinency factor and give the user a considerable amount of work sifting out the

relevant material. Similarly by selecting a very small number of items which fully satisfied the search specification, a high pertinency factor could be achieved, but this might be at the expense of omitting relevant items. In the ideal system, the circles 'R' and 'S' will coincide. This is unlikely to be obtained in practice. During indexing, subjects are broken down into concepts. On retrieval, when the concepts are gathered in selected combinations and permutations, it is almost inevitable that some reference will be omitted and noise introduced.

The Industrial Education Institute show a method used to illustrate diagrammatically the financial efficiency of an information system (17) as follows:

Figure 5 : Diagrammatic representation of the financial efficiency of an information system



The system can have zero efficiency and cost nothing or 100% efficiency and cost an infinite amount. The optimum effectiveness occurs when the difference between the benefits and costs curves is a maximum. The costs curve is easy to predict: it is the sum of the expenditure on setting up the system and subsequently running it. The benefits curve is virtually impossible to forecast, and it is even hard to assess in retrospect. The problem is to decide on the value of a piece of information. A philosophical approach is often more appropriate. The objective of an information system is to improve efficiency and the degree

of this cannot be readily measured in monetary terms. One can only note examples of loss due to lack of information such as that quoted at the end of Section 3.1. Quantitatively it should be noted that, of the many information systems installed, few have failed.

Another important criterion is the user's attitude towards the system. Initially he may have to be convinced that a problem exists. The user will be reluctant to approach a system which he finds difficult to operate. Finally the system must produce the information in adequate time.

3.8 The amount of information available

The amount of information available is directly related to the complexity of civilisation. In the middle ages, a man could assimilate and remember all that was known about a wide range of subjects. This was in the era when students graduated at 17 years of age. Today it is not possible to comprehend even the abstracts of papers and patents published on some subjects. Bart E. Holm states that, since the middle of the 18th century, the number of scientific journals has increased ten fold every 50 years to a present day total of about 100,000. (18, page 9). Information on 100,000 new chemicals compounds is reported every year (18, page 11). Such growth rates have resulted in terms like the 'literature explosion' and 'information pollution'. It remains to be seen whether the situation can be brought under proper control before, as with other excesses, nature inevitably provides the solution, possibly to the great detriment of society. There is a tendency for organisations to store large quantities of information in the mistaken belief that it creates security. The problem is to decide on the relatively small amount of information that is going to be of use. In addition to the

difficulty of deciding which new items should be retained, it is also necessary to determine what can now be rejected.

If information is to be sent automatically to an individual, then his job specification must be clearly defined. It is then possible to construct his information profile and hence decide on the items appropriate to his work. There are penalties for not sending him the necessary information but, if he is given more than he can assimilate, whether applicable or not, then he will develop a resistance to being informed at all.

3.9 Indexing

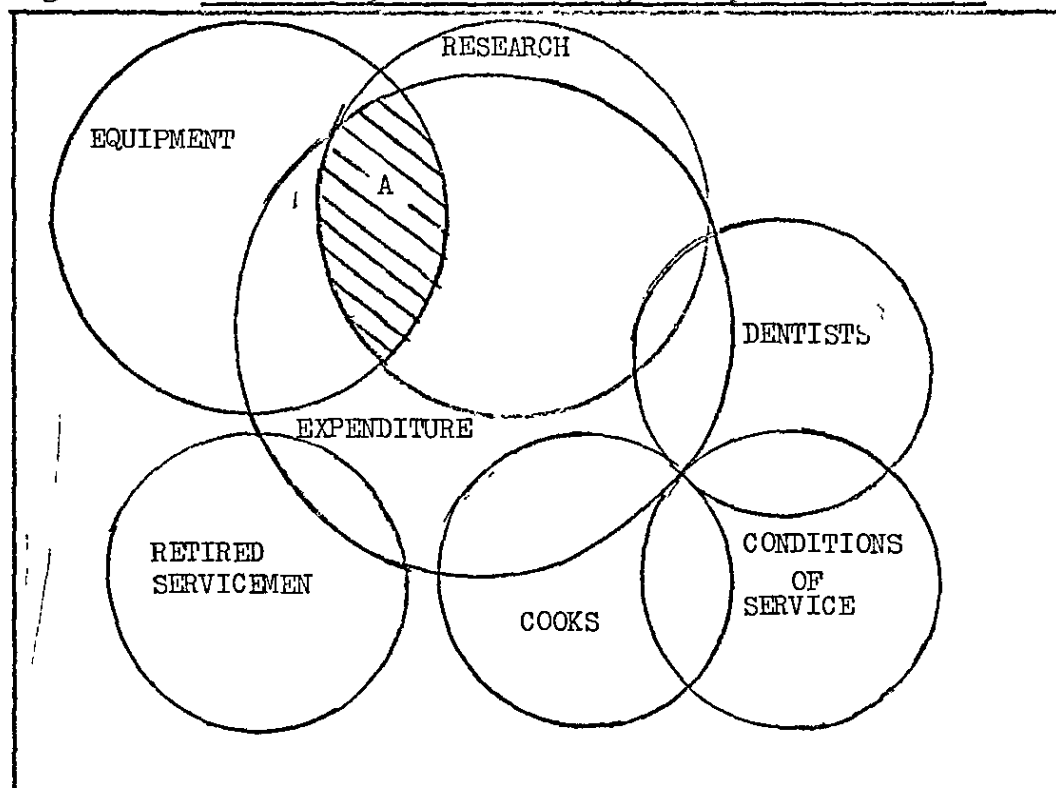
Having decided that there is a need for an item of information, written it and had it edited, the next important stage is indexing. This provides a means of identifying the item so that, after storage, it can be retrieved. Information systems may be designated according to the means by which they index the material. Gerald Jahoda's book (19) gives a comprehensive description of the various methods of indexing.

The most common methods are those which use alphabetical subject indexing, as in most bookshops, and the hierarchical, Universal Decimal Classification method utilised by the majority of special libraries. In both cases the problem is to describe or classify the material in a manner which will be logical to the majority of the users. Also, as the amount of information increases, the cross referencing becomes progressively more difficult. An alphabetical arrangement is obviously undesirable where there is a requirement to browse through subject segments of the collection.

Concept co-ordination is becoming an increasingly popular form of indexing. Item concepts are described by choosing terms from a

thesaurus. Each term has equal status. The method is illustrated by Figure 6 below.

Figure 6. A Venn diagram illustrating concept co-ordination



An item in the shaded area 'A' would be described by the terms - Expenditure, Equipment and Research. It is apparent that the problem of syntax is more pronounced than with the other methods of indexing previously described. The use of the three terms in co-ordination would cause the system to retrieve:

- (a) Expenditure on equipment research.
- (b) Research into expenditure on equipment.
- (c) Expenditure on research equipment, etc.

The problem can be reduced by either using pre-coordinated terms (such as Equipment Expenditure or Equipment Research) or by the use of links and roles. These apply restrictions to the number of items selected, thereby reducing the noise factor without necessarily degrading the recall ratio.

Concept co-ordination has the advantage that the other language problems of logical class, generics, and semantics can be dealt with separately, rather than improving in one area at the expense of another. The major problem is that co-ordinate systems are loosely structured and invariably require some form of mechanical or computer assistance for retrieval purposes. Optical coincidence card sets are limited to about 20,000 items, particularly if the contents have a high redundancy and computer systems are not, in general, cost effective for collections of less than 50,000 items.

3.10. Methods of storing information

The human brain is the most important storage and retrieval system. It rejects unnecessary information, such as the menu of some ordinary bygone meal, but it gives direct access to frequently used data such as mathematical tables. The brain, however, cannot rapidly assimilate large quantities of information and it has difficulty in retrieving the details of infrequently used items. Here more tangible means have to be employed, such as paper, tape, cards, film and computer storage. The problem is to decide on the optimum storage method and persuade people to use it. There is a natural reluctance to store information in a manner such as microform or magnetic tape which cannot be interpreted without the use of mechanical aids.

J.C.R. Licklider estimated (20) that in 1962, it would take 10^{15} binary digits (bits) to store the world's stock of different documents. This would be an impractical financial proposition at present but the situation may change if we can discover how to convert the spoken word directly into bits and perhaps produce cheaper machine readable storage by the use of lasers. Systems which only store those details which we

need to locate the required item of information, provide what is called reference retrieval. Producing details of the specialised source of a certain type of information is called referral retrieval.

3.11 Methods of retrieving information

Reference (and referral) retrieval can be achieved by manual or mechanised methods. Searching can be made serially, selectively or by browsing. As shown in Figure 3, the process starts by matching the requirements to the system language and then items considered to be relevant are produced for analysis. Continuous monitoring of efficiency factors makes it possible to initiate action to improve the system.

3.12 Guidelines for designing an information system

- (a) The minimum amount of information should be fed to each decision point in an organisation.
- (b) Information must be fed directly to decision points and not via other areas.
- (c) The more expensive the proposed system, the more necessary it is to produce factual information on life cycle costing. If a problem is complex, then it may be advisable to introduce a new system in stages. The experience gained at each stage would then permit a clearer definition to be made of what should be done next.
- (d) An information system should be designed to serve an organisation and not just a department. All levels of management should be persuaded to use it.
- (e) A system should be regularly examined to ensure that, as far as can be ascertained, it is providing the optimum service.

4. THE PRESENT SYSTEM OF PEACETIME ADMINISTRATION OF UNITS

The purpose of this section is to describe the existing administrative workload in the Army and, in brief, the generation and flow of the associated information. Although the emphasis is on the field force, many of the problems, for example personnel administration, are applicable throughout the service. Items of a well documented, specialist nature, which do not constitute a serious retrieval problem, and are not of general interest, will be excluded from detailed description.

4.1 The administrative workload in the Army

The Standing Committee on Army Organisation is responsible to the Army Board for administrative procedures within the Army. In 1969 they requested the Director of Work Studies (Army), (DWS(A)) to conduct a review of unit administration. The DWS(A) study report was published in 1971 (21). The Director of Army Staff Duties, (DASD) is co-ordinating the follow up action. The work was mainly comprised of a survey made in a selection of units in the field force, commanded by lieutenant colonels. The distribution of units by type and geographical location is given in Table 1 on page 3 of the report; this is reproduced as shown on the next page.

Table 2: The amount of effort spent on various administrative tasks based on results from 143 units (extracted from Annexure 2 of the DWS(A) report).

TASK	MAN HOURS PER YEAR	EQUIVALENT NUMBER OF MEN FULL TIME
Officer Admin. Effort	2,847,075	1,423
Audit Boards	71,287	36
Central Servicing	700,000	350
Civil Courts	11,256	6
Cleaning	2,588,228	1,294
Clerical	7,304,000	3,652
Clubs	535,512	268
Courts Martial	28,323	14
Debt Collection	17,243	8
Documentation	1,045,092	522
Extra Messing Duties	1,795,218	898
Garrison Duties	3,920,354	1,960
Messing	6,836,000	3,418
Salvage	256,686	128
Storekeeping	6,622,560	3,310
Supplement to Civil Labour	940,316	470
Vehicle Documentation	505,188	253
Welfare	40,252	20
TOTAL	36,064,590	18,030

Table 1: Type and location of units participating in DWS(A) review
of unit administration

TYPES OF UNIT	LOCATION			TOTAL UNITS
	UK	GERMANY	ELSEWHERE	
Armoured	7	13	-	20
Artillery	11	16	2	29
Engineers (RE)	5	6	-	11
Signals	3	9	2	14
Infantry and parachute regiments	31	14	9	54
Special Air Services	1	-	-	1
Transport	5	7	-	12
Medical	6	6	1	13
Ordnance	1	-	-	1
Engineers (REME)	1	2	-	3
TOTAL UNITS	71	73	14	158

The relative numbers of the types of units selected are roughly representative of the proportions which exist within the field force. The records from 15 of the units were not complete and had to be excluded from the report. The total number of man-hours worked by those who did participate is calculated to be 138,353,000 per year; this being equivalent to 69,180 men working full time with an average of 484 men in each unit.

Table 2 opposite, shows the amount of effort devoted to the various administrative tasks. By comparing these figures with those given in the previous paragraph, it would appear that the equivalent of over 25% of the field force is employed, full time, on administrative duties. Furthermore, the figures do not include the work done by the 20 or so civilians employed by the average unit on purely administrative work.

The majority of the effort shown in Table 2 is devoted to physical duties such as cleaning, cooking and the issuing of stores, which are not the subject of this report but each of the tasks involves information handling to a greater or lesser extent. For example, even the cook will be confronted with a problem such as finding out the authority for obtaining an excess issue of twenty-four ration packs, and every individual is interested in knowing his conditions of service.

The most time consuming item in Table 2 is clerical duties. The average unit in the survey was found to employ 25 clerks, this representing 5% of the unit's strength. The majority are employed in the unit headquarters and company offices where the information they handle is much greater in volume and of a more general nature than that used by their colleagues in the pay, stores and medical offices.

As cost is a very important factor, it is of interest to examine the 2.85 million manhours spent by the relatively highly paid officers, each year, on administrative tasks. Table 3, which is also taken from Annexure 2 of the DWS (A) report, shows an analysis of how certain officers allocate their time.

Table 3 : Percentage activity analysis for certain officers

ACTIVITY \ TYPE OF OFFICER	COMMANDING OFFICER	SECOND IN COMMAND	ADJUTANT	COMPANY COMMANDER
Operations, Training & Sport	28	35	13	41
Office Routine	39	46	61	33
Discipline & Interviews	10	4	12	10
Inspections & Visitors	12	9	9	10
Others	11	6	5	6

Unfortunately Table 3 does not show a more detailed breakdown of the time an officer spends at his desk. Some idea can however be obtained from William F. Williams's book (22) which gives the percentage activity analysis of another professional, the engineer. The details, which show that the engineer spends 6.9% of his time reading, are repeated in Appendix 5. Although the field force officer will be away from his office for longer periods than the engineer, he will devote less time to conferences and consequently he will spend about the same amount of time reading. A detailed activity analysis for the staff officer in a large headquarters would be expected to produce very similar results to those of the engineer.

As one moves up the hierarchical chain from the units investigated by the DWS(A) study to the lower formation headquarters and finally to the MOD(A), it will be found that an increasing proportion of the manpower effort is spent on administrative information handling and that it is undertaken by correspondingly higher ranks in the Army and the Civil Service.

4.2 The generation and flow of administrative information

Information is generated by factors affecting manpower, material and money. It is originated by those in the MOD and military headquarters in the form of verbal and written orders, regulations, instructions, bulletins, book and pamphlet publications, etc.. Some of these are transmitted directly to the subordinate formations and even individuals, while others go down the hierarchical ladder one step at a time.

Most of the factual information or data produced in lower

formations is caused by changes: a man decides to extend his military service, a vehicle is classified as being beyond local repair, or a soldier is paid removal expenses for transporting his family's belongings to a new duty station. This type of information is passed up the channels of command and control in the form of written unit orders, reports, returns and letters.

4.3 The originators of military information

The originators of administrative information in the Army range from the senior military and civilian officers in Whitehall to the junior clerks serving with the units. They belong to one or more of the following six classes:-

- (a) Those few who have a good knowledge of their particular area of the user's needs and are able to communicate with him individually, thus providing all that is required and no more. This results in a high recall factor; it is the situation which usually exists in specialised work where all the participants are known to one another.
- (b) The many who, although they may know the precise requirements of a particular user, are obliged to send comprehensive information to a wide circle of readers having different interests. This situation results in a high noise factor. It normally applies to administrative information originated by the MOD and senior formation headquarters.
- (c) Those who do not know of the user's needs. This causes a breakdown in communications and a zero recall factor.
- (d) Those who produce and distribute the large number of military books, papers, articles and reports which are not catalogued.

After a period of time, few people will know that the material exists and it will be omitted during a search.

- (e) Those authors who are aware of the user's needs but for some reason are unable to communicate with him. For example a feasibility study may have been published eighteen months ago on a new equipment but the situation has changed rapidly ever since and it has not therefore been possible to send a meaningful report to those who received the original.
- (f) The administrative officers and clerks who endeavour to comply with the rules regarding the submission of information to those who request it.

Ideally we would all like to receive our information from the first type of originator but this is not practicable. The problem is therefore to try and improve on the limitations imposed by those in the other categories. The Army endeavours to do this at present by:

- (a) frequently cross posting individuals between the MOD, headquarters and units.
- (b) sending personnel on staff courses.
- (c) Occasionally conducting surveys in units and establishments.

4.4 The acquisition of information

Communication is achieved by the post, telephone, teleprinter, wireless and closed circuit television. Almost all the administrative

information sent through the post consists of normal paperwork. Microform is used by the industrial suppliers of some military parts lists and trials are being conducted on selected specialised technical regulations.

Information is also acquired from courses, conferences and an individual's past experience. A regular Army officer can spend a half of the first fifteen years of his career on courses and specialised training. Army personnel move frequently and most have been employed on a wide variety of tasks. The average unit therefore possesses a wealth of information from the past experience of its members. The temptation is to use previously acquired knowledge without checking for the probable existence of more up to date information.

4.5 The information areas

The information with which a unit is concerned will be considered under the following headings:

- (a) Information entering the unit
- (b) Information required from the unit.
- (c) Information required by the user in the unit.

The amount of information will vary according to many factors, the main ones being the unit's size and role. No two organisations in the Army are the same. They vary in overall size, rank structure, and task. Some have unique holdings of manpower and material; even those with identical entitlements, such as the infantry battalions, will invariably be employed in different locations with dissimilar roles. However, as the field force units are the most numerous, and the most important, the information about them will be used to illustrate the problems. The argument will then be expanded to embrace the complete organisation.

5. MILITARY SPONSORED ADMINISTRATIVE INFORMATION ENTERING UNITS

This section gives a quantitative assessment of the amount of hard-copy information entering units, how much of it is retained, and the proportion which is kept amended. The information can be classified as follows:

- (a) Books, regulations, pamphlets, parts lists, etc., listed in the Catalogue of Army Publications (frequently referred to as the Army Catalogue (23)).
- (b) Books, pamphlets, etc., the existence of which is not catalogued by any centralised organisation.
- (c) Orders and instructions issued by the Ministry of Defence and military headquarters.
- (d) Letters, signals, etc.

The descriptive data in this section does not include Army General Administrative Instructions (AGAI's). These were introduced in late 1972 and consequently there are no figures available, at the time of writing, for the number produced in the first year of their existence. Unlike most instructions, AGAI's are intended to be of a semi-permanent nature. They do not represent a sudden increase in the amount of recorded military material being sent to units; basically they are replacing some of the Defence Council Instructions, (DCI's) described below.

A pullout, Figure 7 on page 38 summarises the main points in the written text.

5.1 Publications listed in the Army Catalogue

The majority of a unit's recorded administrative information arrives automatically in the form of books and pamphlets. There are six basic scales of issue ranging from one copy to each lieutenant colonel's command,

or self accounting unit, to one copy for every person down to the rank of corporal. Provided that the use of these publications is properly controlled, then the number of copies is usually more than adequate. Problems can arise however, for example, when a unit is temporarily detached or if people are studying for promotion examinations.

There are some 8,000 publications listed in Parts I - IV of the Catalogue of Army Publications (23); the distribution agencies estimate that the number is increasing at a rate of more than 10% per year. They contain information of a permanent nature on such subjects as pure administration (approximately 500 items), general staff training, makers' handbooks and joint Army/RAF publications which, for the purpose of this work, will also be included under the general term administration. Highly specialised, professional documents and publications with a security grading above RESTRICTED are not included. The size of the items ranges from large books to single page parts lists. The average word content is probably about 50,000. A diagram showing the 1972 distribution system is given in Appendix 6.

Some of the items listed in the Army Catalogue are issued, 'By Command of the Defence Council' and bear the facsimile signature of the Permanent Under-Secretary, while others may only show the reference of the directorate responsible for originating the publication. The reasons for the discrimination and its effect on the average recipient cannot readily be ascertained.

The responsibility for publishing these books and pamphlets is vested in a number of branches within the MOD. At present the work is largely unco-ordinated and the difficulties arising from this situation will be discussed in detail later.

Amendments are promulgated in the same manner as the original publication. In the Army, units are responsible for incorporating all

amendments. Some publications are re-issued every two years, others have a small number of major amendments and some are altered frequently. The current issue of Queen's Regulations (1) which was published in 1961, is an example of the last type mentioned; the 86th amendment was issued in January 1973.

In their review, the DWS(A) study team asked 142 units, how many of the publications listed in Parts I - IV of the Army Catalogue they held, and how many were kept amended. The replies are summarised in Annexure 13 of the report (21) which is repeated below as Table 4.

Table 4: A summary of the numbers of items listed in Parts I - IV of the Catalogue of Army Publications held by 142 units and the numbers kept amended.

TYPE OF UNIT	AVERAGE No. HELD PER UNIT	HIGHEST No. HELD	LOWEST No. HELD	% KEPT AMENDED
Armoured	590	1,511	108	82
Artillery	793	1,754	127	61
Engineers	1,232	2,863	157	55
Signals	576	2,362	169	89
Infantry	1,253	7,753	78	53
Transport	410	1,049	162	77
Others	191	437	76	81
All Units	838	7,753	76	61

Some of the higher figures of publications held, appear doubtful; one infantry battalion has claimed to have a copy of almost every publication. It is suggested that certain units may have mis-interpreted the question and counted all the copies of publications, not just the number of different titles. Clearly however, there is a wide difference in the number of items held by similar units and the figures for the percentages kept amended are, in general, inversely proportional to the holdings.

There is no record of any attempt being made to calculate how many publications a unit should hold.

The units were also asked the question, "How many different service publications are received which are not required?". The replies, which are also given in Annexure 13 of the report, are shown in a slightly revised form. in Table 5.

Table 5: The number of service publications received by 142 units but not required

REPLY	No. of UNITS	% OF UNITS
Nil	53	38
Few	8	5
Quantity from 2 to 320	56	40
Between 10 and 90%	10	7
Don't know / unaccountable	15	10

It would be of interest to know the unit's criteria for deciding that an item was not required. It appears that many publications are sent out by the MOD because it is thought that units might need them.

Table 5 shows that over half of the units consider that too many publications are received and when these figures are compared with the data shown in Table 4, it would seem that some units are acting without authority and disposing of items they consider to be superfluous. At the other extreme, there are the units who retain everything in case it is needed. This results in the bulk problem described in Sections 3.7 and 3.8, which decreases retrieval efficiency.

It would seem highly desirable to regularise the situation by, wherever possible, quoting destruction dates when documents are published and educating units on the criteria for disposing of other material.

5.2 Publications which are not catalogued

It has been estimated (21, Annex 13) that the average unit will hold over 500 different, semi-permanent, books and pamphlets which are

Table 6: The more important types of orders and instructions

SERIAL	TITLE	SUBJECT	REMARKS
1	Defence Council Instructions (General) Parts I-V	Matters concerning all three armed services	} See text
2	Part VI	Matters affecting civilians employed by all three armed services.	
3	Defence Council Instructions (Army) Part I	Administrative and general	
4	Part II	Service Personnel	
5	Part III	Operational and Training	
6	Part IV	Equipment, Stores and Servicing	
7	Part V	Books, Correspondence, Stores and Stationery	
8	Part VI	Civilian Personnel	
9	Part VII	Confidential subjects	
10	Part VIII	Miscellaneous Series	
11	Army Orders	Royal Warrants on policy matters. Honours and awards	Available to general public. Published monthly.
12	Command or Army Headquarters Orders	As for Serials 3 to 7 above	A general's own orders on matters affecting his area of operations.
13	a. District b. Divisional c. Brigade d. Garrison	As for serials 3 to 7 above	Command and control orders which amplify or modify foregoing serials to suit local conditions.
14	Unit Orders	Anything	The means by which a Lt. Col. controls his unit.

in addition to those shown in the Catalogue of Army Publications (23). These are items produced by military sponsors who consider that there is a need to communicate information without using formal MOD cataloguing procedures. The usual reason for doing this is to send items out quickly. The danger is that the sponsors of such material are more likely to either duplicate or contradict what has already been produced or is in the course of publication.

About half of the publications which are not catalogued will be the operational documents and special technical manuals which do not directly concern this treatise, but many of the remainder will be on the general administrative subjects dealt with by catalogued books. One typical example is 'The Military Secretary's guide to the preparation and processing of officers' confidential reports'; another, the School of Infantry pamphlet titled 'The air-portable battalion' which gives a detailed description of the allocation of manpower and equipment in that type of unit.

5.3 Orders and instructions

The majority of orders and instructions provide the day to day medium for the command and control of the Army. They modify and supplement the publications just described. In general, only those originated by the MOD, HQ UKLF and HQ BAOR, are periodically indexed. A list of the more important types is shown in Table 6 opposite and examples of typical extracts are given in Appendices 7, 8 and 9.

Defence Council Instructions, (DCIs), (General) and (Army), are distributed by the MOD each week, down to sub-unit level, in a manner similar to MOD sponsored publications. Details of the tri-service distribution system are given in Appendix 10. Military headquarters orders are issued at a frequency which increases to daily at the lower levels.

At the time of preparing this work, DCIs were being automatically cancelled after a period of three years, it being the intention that items of a more permanent nature would be incorporated in the publications listed in the Catalogue of Army Publications. As will be seen from Appendices 8 and 9, the types of items published in military headquarters' orders generally have a very short life and only a few are extant after three months.

The DWS (A) Review, Annexure 1, shows the results of asking units, "How many superior HQs send you administrative orders or instructions?" The answers are summarised in Table 7, below.

Table 7: The number of superior HQs per unit

NUMBER OF SUPERIOR HQs	NUMBER OF UNITS	NUMBER OF SUPERIOR HQs	NUMBER OF UNITS
1	2	6	29
2	5	7	17
3	18	8	4
4	29	9	5
5	33	11	1

Undoubtedly there is a degree of overlapping of orders caused by lower formations repeating extracts from those they have received, both versions then being sent to the unit. Interviews conducted by the author have shown that straightforward duplication only causes mild irritation in units, but attempts to repeat orders by rewording does cause a significant waste of time when the recipient compares both versions to see if there is any difference in detail.

The total amount of information produced increases every year, though this does not necessarily reflect in the number of entries or serials of various orders and instructions. Examples of numbers

of issues during the period 1969-1971 are given in Table 8 below:

Table 8: The numbers of certain orders and instructions
issued during the period 1969-1971.

ORDER/INSTRUCTION		NUMBER OF ENTRIES/SERIALS
DCI (General)	1969 Parts 1 - V	229
	1970 " "	235
	1971 " "	295
DCI (Army)	1969 Parts 1 - V	368
	1970 " "	328
	1971 " "	351
Army Orders	1969	85
	1970	75
	1971	71
Southern	1969	781
Command Orders	1970	750
	1971	732

In addition to the orders and instructions received from superior headquarters, units will also be sent special information such as pay and record office instructions.

5.4 Letters and Signals

The average infantry battalion receives about 50 letters and signals each day. Of these possibly five will be about matters of policy and may affect orders or publications. The remainder will be of a less important or specialist nature.

There is no standard filing system in the Army, it being generally considered that units should design their own to suit particular needs. The average infantry battalion has over 650 current files in which to store

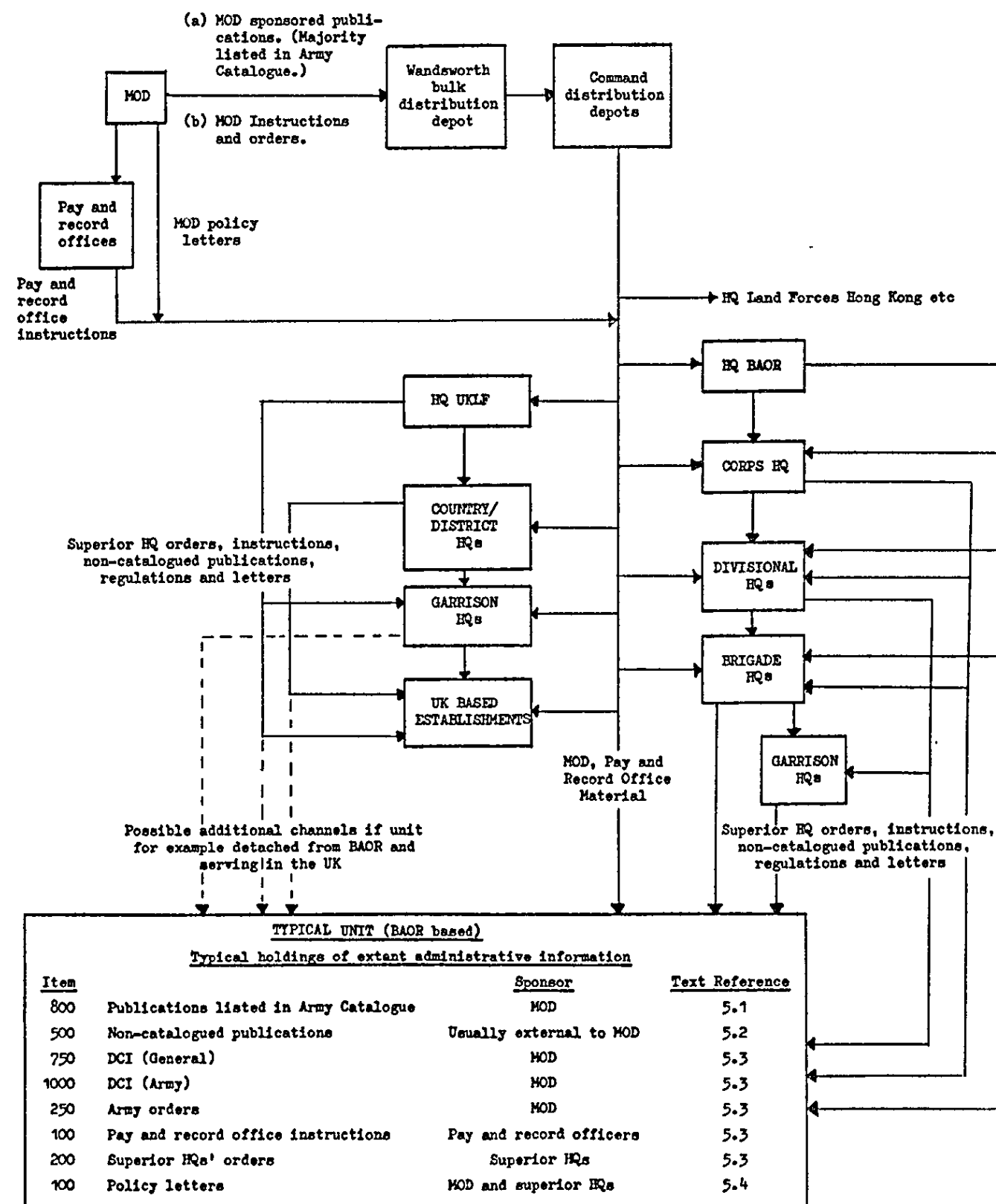
its correspondence. Only a few of the items they contain will be extant after three months.

5.5 The cost and value of publications

There is very little information available on the cost of producing and distributing military publications, orders or instructions. Queen's Regulations retails to the public at about $\frac{1}{2}$ p a sheet, which corresponds to approximately £2.25 per pound weight. Appendix 6 shows that the input to the Wandsworth bulk distribution centre is 490 tons per year. This comprises the publications listed in the Army Catalogue and MOD sponsored orders and instructions. If these items were also commercially priced at $\frac{1}{2}$ p a sheet, then the annual retail price would be about £2.5M ($2.25 \times 490 \times 2240 = 2.5\text{M}$). This sum is, of course, only an attempt to show the possible order of magnitude of the overall costs.

It is not possible to give any idea of the monetary value of the administrative information held by the MOD, distribution points, headquarters and units.

Figure 7: Simplified version of the system for distributing recorded administrative information to headquarters, units, and establishments, as at October 1972.



6. ADMINISTRATIVE INFORMATION REQUIRED FROM UNITS

Information is required from units so that action can be taken to deal with short term changes in manpower, materiel and finance, and to obtain details which will assist with making long term policy. The same event is frequently a factor in both short and long term planning. If a soldier decides to re-engage or resign, it can have an immediate effect on his pay; knowledge of his action would also be of use to those in Whitehall who change conditions of service in order to obtain optimum efficiency from manpower resources. Details of fuel and ammunition expenditure can be used as an indication that stocks need replenishing as well as providing evidence to support defence expenditure estimates for future years. The problem is to obtain all the information required from units with the minimum of effort on their part: units are an essential source of statistical data but this is only one of their minor functions. It is also of great importance that the person requesting the information should know precisely what he needs and that he makes it clear to the unit. Written information is received from units in the form of:

- (a) Returns.
- (b) Part II/III orders.
- (c) Letters and forms.

A pull-out, Figure 8 on page 44 summarises the flow of information from units.

6.1 Returns

DWS (A) defines a return as, "A statement in a pre-arranged form that is rendered at prescribed intervals in special circumstances, or on demand". This excludes certain types of financial statements, Part II/III Orders and forms submitted by units when indenting for materiel requirements, etc.

Annexure 11 of the 'Review of unit administration' (21) shows that in 1969 the average unit was submitting about 100 standard returns (of 30 different types) each year, their frequency ranging from monthly to annually. In addition, they were each forwarding 45 once only returns each year. The sponsor or senior recipient for standard returns is usually the MOD; once only returns tend to be requested by lower formation HQs.

In an attempt to prevent any effort being wasted on returns, the Director of Army Staff Duties requested DWS(A) to conduct a special study on the subject. The report was published in December 1972 (24).

It recommended that:

- (a) An MOD staff branch should be formed with sufficient powers to control the philosophy for the submission of returns.
- (b) Information should be obtained from those establishments whose function it is to hold it. (Examples of these are the MOD statistical branches and the Royal Army Pay Corps computer centre at Worthy Down). Only as a last resort should units be requested to provide the information.
- (c) The system should be such that units do not have to submit the same information more than once.

On the subject of using computers to reduce the overload, the report (24) said on page 3:

'The most suitable sources for returns on personnel and equipment

seemed to be the MOD computer systems. Many returns duplicated information currently held in computers. However there are two problems:

- a. At the present time the computers are programmed to produce information by corps(ie. by type of employment) rather than individual units.
- b. The general unwillingness to accept accurate 'cold' statistics from a machine rather than questionable 'hot' statistics from a unit.

The need for a computer to produce returns by units is now appreciated and steps are being taken to put this into effect through the medium of an ADP location code. A meeting at MOD F9(A) held on the 9th September 1971, chaired by the Chief Paymaster ADP, agreed that ADP Worthy Down would assist in any way possible to produce manpower returns for units, but stressed that this could not be expected to be in operation before 1974/75 .

Assistance with other returns on materiel and finance is. being considered by the MOD.

6.2 Unit Part II/III Orders

These are similar to returns in that they are submitted in a pre-arranged form in special circumstances. They are published whenever there is any change which affects a person's pay, conditions of service or personal documents. Part II Orders are issued for officers and soldiers of the same arm or regiment as the unit concerned. Part III Orders are

used for personnel from other arms and regiments, for example, REME tradesmen serving in an infantry battalion. Appendix 11 shows a typical Part II Order. Copies of these orders are sent to, amongst other places, the pay and record centres where, after scrutiny, much of the information is sent on to the Worthy Down computer system for storage. On average there are 10 Part II/III Order entries published for each person in the Army every year.

6.3 Letters and forms

The average unit in the field force despatches 40 letters each working day. These will include a small number on policy matters written by or on behalf of the commanding officer, either at the request of his superiors or because he wishes to draw attention to some particular point. These are the items which will most probably have to be retrieved at some later date. Provided that some of the people involved at the preparation stage are still serving in the same posts, then retrieval does not usually present a difficult problem. Alternatively, it may be necessary to search appropriate files to discover if items exist.

The bulk of the outgoing letters will be on relatively unimportant matters on such subjects as returning stores or messing and transport arrangements etc. Few of these items are ever referred to again; if retrieval is required it can be a laborious and sometimes unsuccessful task.

Annexure 9 to the DWS(A) report (21) states that there are over 400 administrative forms listed in the 'Catalogue of Army forms and books' (25) and to these must be added local proformae. Together they cover a

wide range of subjects from ammunition states to school childrens' visits. The Annexure does not state how many forms are completed by units but the annual consumption is approximately two forms for every soldier in the Army on each working day of the week. To this must be added all the local proformae. Even allowing for a very high wastage rate, it follows that the average unit will submit over 200 forms a day.

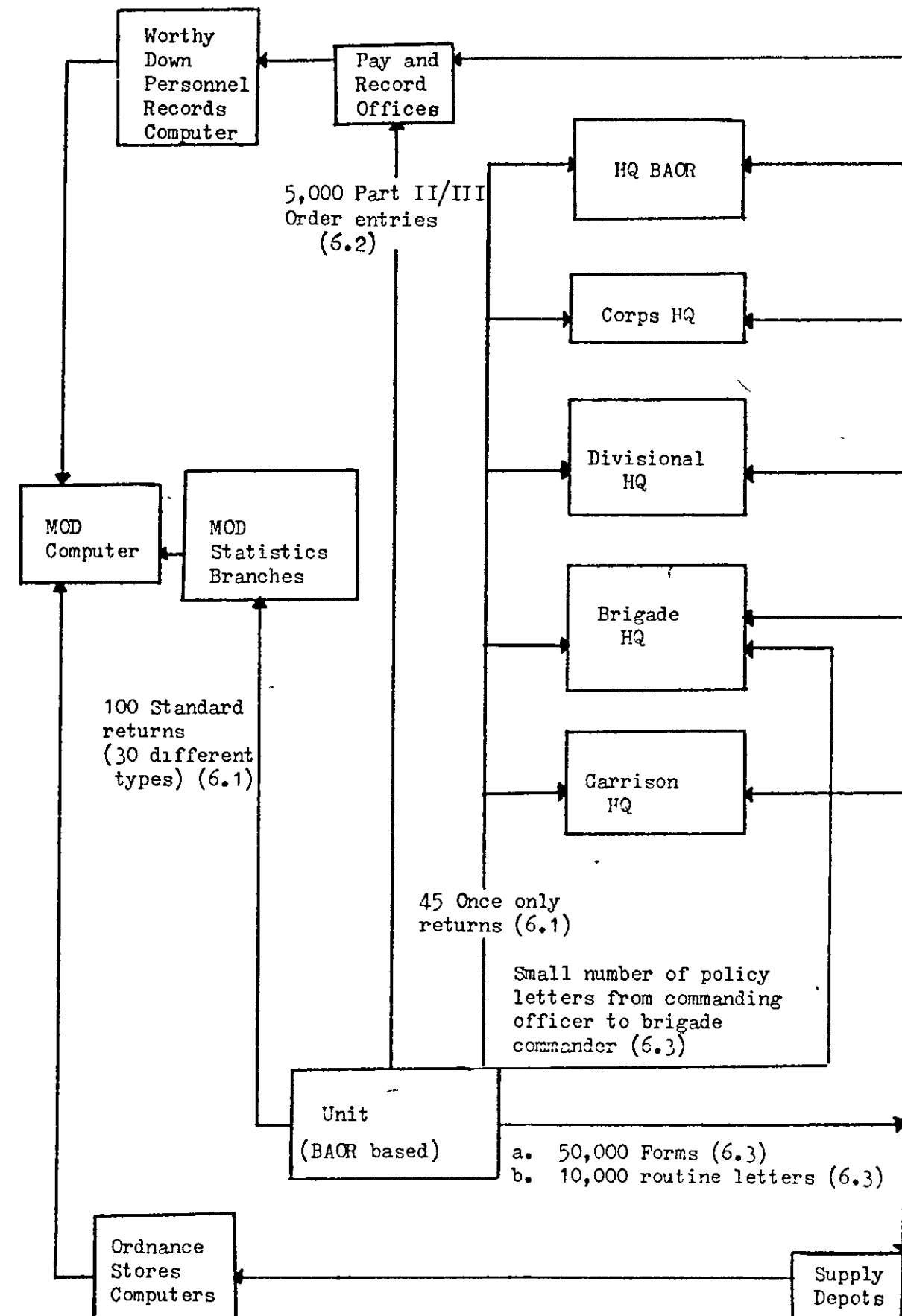
Many of the items which have to be completed on the forms are correlated, but this apparently wasted work is unavoidable because it is not cost effective for the Army to introduce an all embracing ADP system. As an example consider the Army Form 01771, which is issued to claim travel expenses. The following have to be inserted by the claimant: Army number, rank, name, regiment/corps, name of banker and bank account number. Given the person's Army number, the RAPC computer could produce the remainder of the information. Unfortunately the district officer who authorises the claim cannot be co-located with the computer, nor can he have on-line facilities at present.

6.4 Conclusion

.Units are involved in a considerable amount of tedious work communicating the information they have generated. The present manual systems frequently waste effort by duplicating the data transmitted. The work can be reduced by the use of automatic data processing and action will be taken to introduce the appropriate equipment when it becomes cost effective.

There are no fundamental problems to be solved before being able to reduce the amount of work required of units when originating information.

Figure 8: Simplified version of annual flow of information from a typical field force unit (Figures in brackets are text references).



Note: Estimates are based on 250 working days per year.

7. INFORMATION REQUIRED BY THE USER IN THE UNIT

As stated in Section 3, an information system should be output oriented, that is the design starts with a definition of users' needs. In fact, although we know much about the information which is sent to the user, little is known about the extent to which it meets his requirements. In order to establish a controlled system, it is necessary to close the loop by providing adequate feedback between the output and the input.

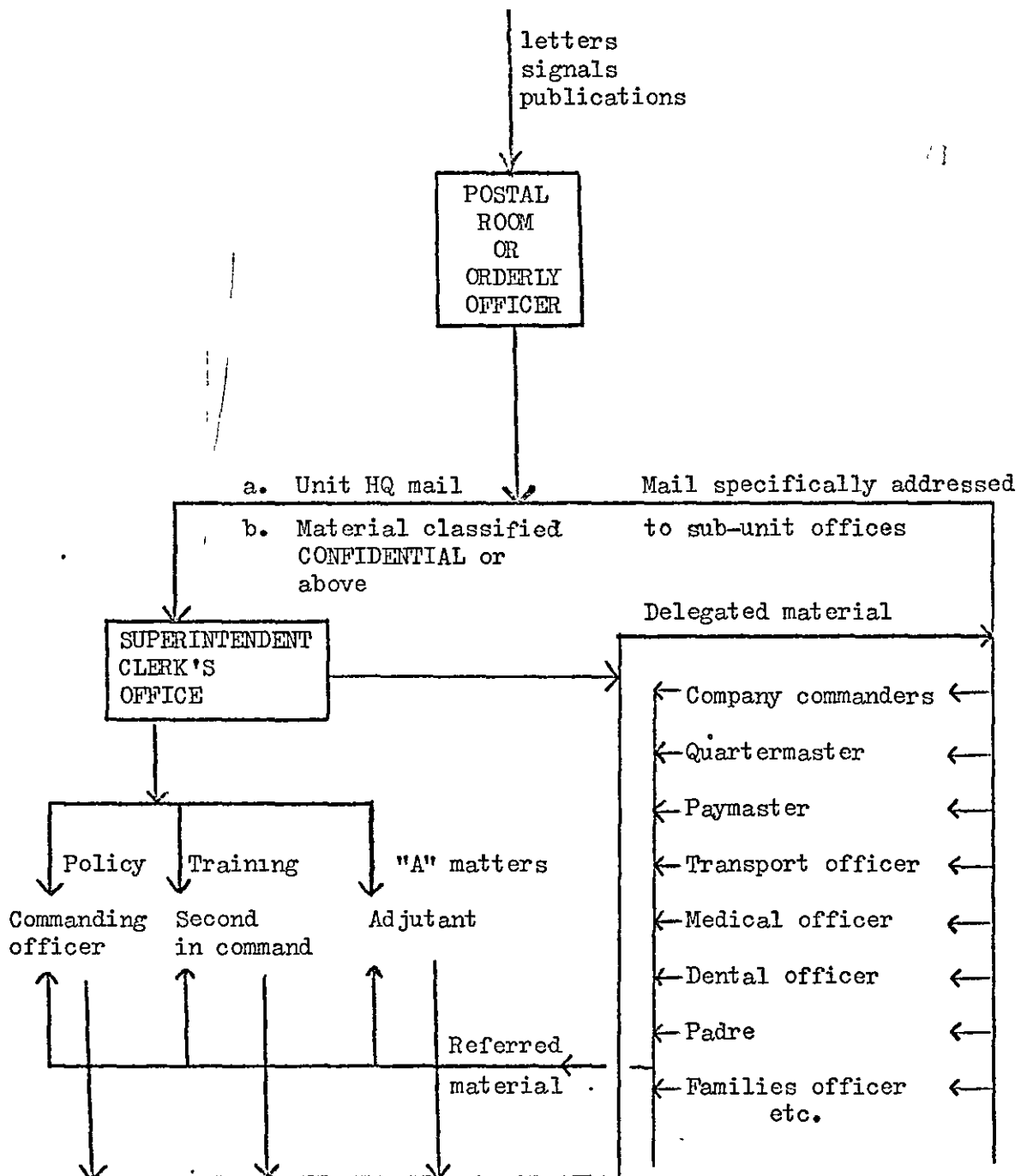
If a senior officer or a junior soldier is unable to find the information that he wants, then the query will most probably be referred to someone in the ranks of Major to Warrant Officer Class II (WOII) inclusive, or their civilian equivalent. It is these people who make most use of the written administrative information sent to units. If they cannot produce reasonably reliable information from within the unit, then assistance will probably be sought from external sources. The time delay and the cost of telephone calls, letters, etc. may be considerable, particularly if the request is passed along or outside the chain of command.

It was concluded in Section 5.1 that the majority of units think they are sent too many publications and probably dispose of some of those believed to be superfluous. This section considers information handling within the unit, how often administrative publications are used, and to what extent the available information contains the knowledge required.

7.1 Information handling within the unit

If the unit is not dispersed geographically, then personal

Figure 9: The distribution of recorded administrative material into the offices of a typical field force unit



visits, office intercommunication equipment, and the ease with which recorded information can be passed round by hand, make communication quick and reliable. If a person has any doubts about the interpretation of an item of unit information, then he can quickly query it with the originator.

The superintendent clerk is the unit's administrative information officer. These senior warrant officers have an average of about 20 years experience in the handling of military paperwork and they know the most efficient methods of using clerical resources and office equipment.

The flow of recorded administrative material into the offices of a typical field force unit is shown in Figure 9. The letters and signals will be kept on the HQ or sub-unit files; the publications being stored on office bookshelves. The clerical staff will be responsible for cross referencing, amending, general maintenance, and simple retrieval tasks.

The unit also holds its own internally generated material such as Part I Orders (an example of which is shown in Appendix 9), stores ledgers, accounts, equipment and personal record cards. As an example of the need for the last named item, and the action being taken to reduce unit work, there is frequently a requirement to discover who in a unit possesses particular qualifications. At present this means visually examining each of approximately 500 qualification and record cards. These large documents become so badly worn that a third of them have to be re-written each year. Documentation teams visit units to ensure that these and other records are correctly maintained. Ideas are being considered which will make the retrieval of personal data much faster by using edge notched cards that are produced periodically by the Worthy Down computer system. This

would reduce the units' clerical work and make the inspection teams available for other duties. Such proposals might seem obvious but they cannot be introduced at short notice for the cards have to be re-designed, superfluous information deleted, and new requirements added. Finally there is the major task of producing the computer programs. This type of work should not be rushed; it is essential to ensure that the user gets what he needs. Plans are well advanced for the installation of visual display units at pay and record offices. These will allow personnel information to be directly entered on to the Worthy Down files. Neither the MOD nor the author currently consider it cost effective to provide units with remote terminals: they move too frequently and are often geographically dispersed. The situation is different for the Royal Air Force, they operate from static stations and may be able to justify a proposal for operating on line to their computer systems.

An assessment will now be made of the extent to which persons make use of the recorded information made available from external sources.

7.2 Usage rates of information received from external sources

In October 1970, the Management Services (Organisation) Division of the MOD produced a report (26) on a survey they did into the usage of all types of official publications, both technical and non-technical, in the Royal Navy. In each case, an officer, a senior rating, and a junior rating were asked how frequently they used certain publications. Table 9 overleaf is an extract from paragraph 88 of the report.

Table 9. Frequency of usage of a selection of official books in the Royal Navy

Frequency of Use	Number Used (Expressed as a Percentage of the total)
Daily	2.7%
Weekly	8.9%
Monthly	11.6%
Less than monthly	28.3%
Never, but like to keep it handy	17.3%
Never, not needed	31.2%

It is suggested that, if such a survey were conducted into the usage of administrative publications in the Army, then the results would be very similar. The table shows that the proportion of books used each month is low and a large number are rarely, if ever, opened. The majority of decisions appear to be based on experience and common sense rather than the information contained in publications. This situation is not confined to the armed forces. When commenting on the results of a study done on decisions made in the petro-chemical industry, Denis Pym states (13), 'Only 9% of the events showed a major dependence on written media. Subsequent enquiries in two other firms found that, although written material may be used as background information, it does not figure prominently at the point of decision'. The reasons for not making more use of recorded information will be discussed in Section 8.

7.3 Reference retrieval outside the unit

As no records appeared to exist on the difficulties experienced by persons trying to obtain information, it was decided that a sample trial would be conducted on the subject as part of this work.

Statistically sound surveys in a large organisation like the

Army, where people are employed on a wide variety of tasks, are expensive and time consuming. Participation in surveys invariably involves those concerned with additional work and it is therefore incumbent on the organisers to ask for the minimum amount of information. It is usually impractical to continuously supervise the efforts of those taking part, but it is essential that the records show what actually happened and not what participants think should have occurred. Instructions have therefore to be precise and yet not tedious; they must encourage the disinterested and allay the fears of the suspicious. In this instance, because of limited resources, it was only possible to ask a small number of people to assist, and personal visits to those stationed outside the United Kingdom could not be justified. However, all participants were contacted regularly by telephone to ensure that the trial instructions were properly understood and, as far as possible, observed.

Twenty men in the ranks of Major to WOII and one civilian executive officer, were asked to help. As all Army personnel are involved with administrative problems of a general type, it was decided to include people in technical and specialist appointments. The object of this sample trial was to try and obtain some indication of the amount of effort which might be saved if a centralised retrieval system were made available which would tell an inquirer where and how to get the information he wanted. Participants were asked to record details of certain types of request that they made for information, outside their units, during the month of February 1973. Records were not required if the answer was found by making a single telephone call or if the request concerned highly specialised or purely local matters. Extracts from the trial instructions are given in Appendix 12.

A summary of the 19 results obtained from the trial is given in

Appendix 13. The following points should be borne in mind when considering the possible implications:

- (a) There are 25,000 men in the Army in the ranks Major to WOII inclusive. The number of other persons referring to military administrative publications is estimated to total at least 10,000. This figure is made up of civil servants, retired officers, appropriate ranks of the Women's Royal Army Corps and the other two services. The sample of 19 people was therefore taken from a total of 35,000.
- (b) The trial was conducted at a relatively quiet time of the year. A number of participants made the point that they would usually expect to make more requests of the type specified. This would indicate that the figures shown in the results are possibly low.
- (c) As far as can be ascertained, those assisting had been employed in that post for some time or possessed appropriate experience of the work involved. If the trial had included people recently appointed to the post without having had the benefit of similar employment in the past, then the effort expended seeking information sources would have been much higher.

The total time which it is estimated might have been saved by providing the 19 participants with a reference retrieval system during the trial period of four weeks is 1225 minutes. The cost of this time for 35,000 people working a 48 week year of 35 hours per week, at an average of £2,500 per annum is over £650,00 a year, and this would appear to be a conservative estimate, bearing in mind the pilot nature of the trials. Whilst it is agreed that these figures are based on an extremely small sample, the bias of the argument has been against placing too great a value on the estimated worth of the user's time. The sample

suggests that a reference retrieval system might save the average administrative user about 15 minutes each week. It would not be practical to hold a statistically sound survey using the method adopted for the February 1973 trial, the number of persons required to supervise the work would be too large. The only satisfactory method would be to establish a well advertised information centre and record requests for assistance.

7.4 Conclusions

The trial suggests that some time could be saved by providing a centralised information service and that the saving in the user's pay alone could be of the order of at least £650,000 per annum. It has been explained for various reasons, that the trial only provided a small amount of data and it is suggested that even a full trial of that type - were it possible - could not be regarded as reliable in any event. It is therefore concluded that the only means of obtaining a reasonably accurate measure of the user's problems is to establish a small information centre which would provide a retrieval service, and by studying requests for information, obtain a reliable indication of the user's problems. This centre, which is the forerunner of the one described in outline in Section 12.7 is the nucleus of a new system about to be proposed by the author.

Although the facilities for handling information within the unit are adequate and steadily improving as a result of studies into the application of modern methods, it is concluded that official publications are not used frequently. The reason may be that the information is of a type that is rarely needed, or the potential user cannot retrieve and understand what has already been produced.

8. PROBLEMS OF THE EXISTING SYSTEM

The fundamental problems concern the quantity and quality of the administrative information which is promulgated by the MOD and headquarters. Many of the difficulties stem from the fact that there is no form of centralised control of the publication of important information. This point was stressed in the Management Services (Organisation) Division report on, 'Written instructions to the Fleet' (26) and will, no doubt, be reiterated when they produce their paper on 'Editorial arrangements for MOD sponsored non-technical publications'.

8.1 Quantity of material to be read

By using the information contained in the earlier sections together with other facts obtained from those serving in the Army, it is possible to give a rough quantitative assessment of the time devoted to the reading of official paperwork. The details given in Appendix 14 show that the officer is only currently aware of about 4% of the contents of the catalogued books in his unit. This correlates with the figures given in Table 9 on the usage of books in the Royal Navy. Books are sometimes studied for promotion examinations, but apart from this, if they are used at all, it is only for reference purposes. It is not practicable to comply with paragraph 656 of Queen's Regulations (1) which states:

'Officers will acquaint themselves with regulations, orders and DCIs. Ignorance of published orders will not be accepted as an excuse for their non-observance'.

Rules are necessary for political and financial reasons but they must be produced in a manner which makes it possible to assimilate and obey them.

The main factors which affect the quantity of unnecessary information are:

- (a) the delegation of decision making.
- (b) the duplication of material.
- (c) the lack of information on when to destroy old or inappropriate material.

8.2 Decision making

The degree of freedom given to individuals to make decisions has a profound effect on the quantity of information which needs to be published. It is necessary to devote the correct amount of effort to the training of a person on how to make sound decisions and the production of instructions which will prevent him from making bad choices. Wrong decisions are costly and so are the results of producing voluminous quantities of instructions in the vain attempt to provide the answer to all possible problems. In the Army it is essential to accept the risk of someone making incorrect decisions. If a person has so many instructions available that he rarely needs to make a decision, then he will gradually lose the ability to do so. In peacetime the Army is training for war. In wartime, it is not possible to find the answers to operational problems in a book: people have to make decisions using whatever facts are available.

The question of whether or not to delegate decision making powers is frequently dependent upon financial considerations. In wartime, a second lieutenant will often make decisions which, if wrong, could jeopardise the lives of the forty men in his platoon and perhaps lose a battle. In peacetime, however, seemingly petty decisions are referred to the most senior officers. The following example is an extract from paragraph 542 of 'Regulations for supply, transport and barrack services' (27):

'The following circumstances will be regarded as exceptionally justifying the cleaning by contract at public expense...

c. When the General Officer Commanding in Chief certifies that it is necessary and in the interests of recruiting that the outsides of display windows of Army Information Centres and the wood or metal surrounds thereto should be cleaned by civilian contract'.

The lower down one's unit is in the hierarchical chain, the smaller are the monetary powers. A junior officer in a large formation headquarters may therefore be able to make a decision which a brigade commander could not. Financial control is essential but decision making should not be delayed by unnecessarily protracted procedures. There should be either more delegation of control or the financiers should be attached to the units in the field force. The well known firm of Marks and Spencer made considerable savings in their administrative costs by simplifying the existing system. When the Ministry of Defence organised their equipment procurement executive, they sought the assistance of Mr. Rayner of Marks and Spencer. His recommendations were primarily concerned with the delegation of financial powers to equipment project managers. Headquarters South East District produced a report on 'The delegation of authority below district headquarters level' (28). Paragraph 10 states:

'The key to successful delegation lies in increasing the trust, particularly that applicable to finance, which is placed on officers. They must be accepted as responsible people who equate to suitable counterparts in industry. The main reason why industry works with a relatively low staff establishment is the considerable financial powers given to subordinate executives. An efficient Army is cost effective'.

If someone does not have the authority to make a decision, then in general he should have direct access to at least the offices of the person who has the necessary powers. Passing the request through intermediate stages delays the process and wastes the time of those who should be employed on more useful work.

8.3 Duplication

As already stated in section 5.3, subordinate HQs often repeat orders given by their superiors, knowing that the unit will receive both documents. Higher formation headquarters' orders frequently contain the remark - 'To be repeated in unit orders'. It is time wasting and irritating to those serving at the bottom of the hierarchical chain if their superiors try to ensure that as many people as possible are informed of the item by repeating it in numerous forms. It is admitting that the system does not work and has the effect of reducing the total amount of useful information absorbed by the recipients. A more difficult problem exists with MOD orders, publications and policy letters. It is frequently not known what has already been written on a particular subject. This is because:

- (a) the same subject can be included in a wide variety of publications, regulations, instructions, etc., some of which are catalogued and some not, and poor cross referencing makes it difficult to discover all that are pertinent.
- (b) lack of common standards of indexing.
- (c) poor standard of presentation of some materials.

During the February 1973 trial on information required by the user (Section 7.3) an experienced technical quartermaster wrote:

'I consider that there are too many sources of information. For example, instructions on equipment accounting can be found in many publications and letters. This is unnecessarily confusing and time wasting. Equipment Regulations, Pamphlet No. 3, should be the repository of all knowledge on equipment accounting. In fact, the pamphlet has not been amended for over two years and consequently is well out of date'.

One of the reasons why there are so many sources of information on one subject is that the sponsor will decide on the communication method to be used according to the urgency of the message and the breadth of circulation he wishes to achieve. He will therefore send a signal, write a letter or have a notice published in the weekly issue of DCIs. He is invariably unable to wait for the two to six months that it currently takes to amend a publication. His message will often contain the statement that 'The appropriate publications will be amended in due course' but frequently this does not happen. As the quartermaster went on to write:

'Pamphlet 3 of Equipment Regulations is only one example. Vague promises that certain regulations are being re-written have been heard for years. Unfortunately, until regulations are brought up to date and kept there by amendments, information retrieval in the Army will be more difficult than it need be'.

Occasionally there are examples of seemingly irrelevant items in publications. Queen's Regulations (1) are the medium by which Her Majesty defines royal policy for the Army. It is surprising therefore to find in the index the heading 'Vehicles - armoured fighting, inspection of, after firing ball ammunition'. Such information should be confined to technical publications.

Having somehow or other amassed the catalogued and uncatalogued publications, orders, instructions and all other material which it is thought might be appropriate to a selected subject, the next problem is to use each index, if available, to verify that the item can be found.

8.4 Indexes

Indexing is the keystone to an information retrieval system. The Army does not have serious difficulties with semantics or syntax but there are problems within the armed forces as a whole. The main difficulty in the Army is the lack of standardisation in indexing. As an example consider the subject of officers' confidential reports. In Queen's Regulations (1) these are indexed under 'Officers - reports, confidential, paragraphs 269, 318, Appendices XVII, XXI'. In Defence Council Instructions, one would have to look under 'Documentation: Confidential reports - Officers'. Returning to the Queen's Regulations index, it will be seen that, under the heading 'Documents', which is the nearest synonym to documentation, there is no mention of officers' confidential reports. Incidentally, soldiers' confidential reports are indexed in Queen's Regulations under the heading 'Confidential Reports'.

When Management Services (Organisation) asked a selection of ship and shore establishments the question:

"Should more resources be devoted to the improving of the indexing of the Navy's publications?". The votes were

(26. para 68) :

Yes	60%
No	10%
Don't know	30%

They quote the following example (26, para 72) :

'To find a book on hot water urns, one must enter Book of Reference 1941 under 'Galley Equipment' and Technical Publications 759 under 'Food Preparing Machinery'. The only DCI on the subject (DCI 481/68) is indexed under 'Fires and Fire Fighting - Urns, hot water in HM Ships - fire precautions - introduction of new cut out'.

Orders and instructions issued below Army HQ level are rarely indexed. The only means of retrieving information therefore is to search through everything they have published or ask someone who might know.

Having found an appropriate item of information, the next point is to decide whether it is likely to be up to date. This depends on the time it has taken to publish and if it has been kept amended.

8.5 Publishing time

Before an MOD sponsored publication can be ready for use, it may have to be processed through as many as fourteen different stages. These range from obtaining approval to write, to distributing and cataloguing. A complete list is given in Appendix 15. The shortest time to complete this process is two months and with the larger books it is likely to take two or even three years. A draft of the new edition of Queen's Regulations for the Army was circulated for comment in March 1973, and it will not be issued to units until sometime in 1974 at the earliest. During the interval between deciding that a new publication is required and distributing it, those concerned cannot be complying with the latest policy and, particularly where a large range of items is involved, there is a risk that some other author will produce another publication which will conflict with the first.

The value of an item depreciates with time until it becomes a worthless piece of information which should be removed from the system in order to avoid impairing efficiency. Unless an item is kept amended, it probably becomes valueless within three years of being written. Most information depreciates more rapidly soon after being published but, even assuming a linear decay, there are appreciable advantages to be made if the time to promulgation can be reduced.

8.6 Amendments

Table 4 showed that the average unit claimed to keep 61% of its publications fully amended. A sample survey was taken during the February 1973 trial and, as would be expected, it was the more commonly used publications which were found to be fully amended. One cannot generalise on the value of amendments because they differ widely in size and content. A criticism of the contents is that they do not have a supporting sheet which summarises the effect of the alteration.

Problems arise with the workload caused by having to insert amendments at unit level. Books are issued complete with amendments, it being the recipient's responsibility to insert them. An example given earlier showed that by December 1972, there had been 86 amendments to Queen's Regulations. It is understood that, on mobilisation, the Territorial and Army Volunteer Reserve would be issued with publications that would require amending.

Even if it has been possible to provide a person with all the up to date, relevant information required, problems can arise from the contents. These will be described under the following headings:

- (a) Obligation to obey
- (b) Readability and comprehension

8.7 Obligation to obey

Military personnel regard an operational order as something which must be obeyed. Even in exceptional circumstances, failing to comply with a command is likely to have severe consequences. Such orders are concise and clear. They are usually given verbally to the individual so there is no problem of having to assimilate large quantities of written material. Off the battlefield and particularly in peacetime, he is expected, in theory, to comply with a quite different situation. As has been seen (Section 8.1), it is not practicable to read more than a small fraction of the orders, instructions, bulletins, and publications which one receives. It can only be concluded that very few will be obeyed in all circumstances. The sponsors of those which appear to be mandatory do not always realise that their messages take preference in the precious reading time available to the recipient; they are inevitably read at the expense of something else. In their report on the delegation of authority, South East District HQ said (28, para 7):

'The complexity and frustrations of current regulations must be simplified. Whenever possible they must be written in terms of guidance and advice rather than inflexible rules and should allow the recipient to interpret them to his own set of circumstances'.

The direct order to take a particular action is still necessary on the battlefield, on its training ground - the barrack square, and when dealing with the insubordinate; but its needless use in every day life causes it to lose effect.

8.8 Readability and comprehension

Leadership is the art of choosing the correct method of persuading a person to do what is required. The choice varies according to the

resources available, the number and character of the subordinates and the action to be taken. In 1973 an ex-sergeant major was guarding a large sum of money when he was attacked by a gang of armed men. The old soldier shouted and swore at the raiders so effectively that they ran off empty handed. Commanding officers readily adapt themselves to the rapid changes of modern day society and know just how to get the best out of their men. Although the soldier is a member of a highly organised fighting arm, he is an individualist and like other people nowadays he wants to have his ability acknowledged. In this respect, books, regulations and some instructions lag behind modern practice. In sub-paragraph 7b, the DWS(A) Study report (21) states:

'The firm (Marks and Spencer) had excellent communications with their staff so that boardroom decisions were disseminated quickly throughout the organisation. The Army is greatly in need of similar communications, as the present method of communicating this type of information by DCIs and MOD letters is much too cold and impersonal. No soldier in any unit would become motivated by reading the cold print of a DCI. It is essential that some form of dynamic publicity be created to stir the imagination and obtain the goodwill of units and the men in them'.

Having said that people are susceptible to the manner in which information is presented to them, it is necessary to follow this by saying that people of different intelligence quotients require the same item of knowledge to be shown in different ways. Although the adjutant may have a Bachelor of Arts degree, 75% of the newly joined soldiers in his unit do not possess any educational certificate. The officers and administrative staff of the unit have to tell the remainder what they think they should know or alternatively they have to answer any questions. Good morale is essential to a soldier. The factors which can affect this include his conditions of service, future career prospects, and military current

affairs which show his contribution to the system. Most commanding officers will try and ensure that their soldiers are fully informed of such matters but it is not always possible to do this verbally and, as has been said, the average soldier will not bother about trying to find out what he ought to know in the material at present available.

Written information generated in the field force is often terse and sometimes ungrammatical, but the message is usually simple and hence can be understood by people of widely differing intellects. Much of that originated in Whitehall is too verbose for the needs of the field force: sentences contain too many words and structural ties. The following is taken from, 'Local purchase regulations for the Army' (29) paragraph 171:

'Termination of Local Running Contracts

171. A running contract placed locally (ie. contracts under which demands may be placed on the contractor periodically or as required during the period of the contract) may, subject to the approval of the District Secretary where appropriate, be terminated locally under the terminating conditions, unless the need for termination is due to unsatisfactory execution of the contract (when the case must be referred to the Director of Army Contracts)'. .

A message of this type may be necessary when the contract is being signed by the MOD representative and the civilian firm, but its verbiage decreases the efficiency of handling information in the field force. The length of the above quoted message could be cut by 75%. The saving in publication costs and the reader's time would far outweigh the extra effort required by the sponsor in producing a more concise, lucid instruction for wide scale distribution in the Army.

Some publications, where attempts are made to describe in words a series of decisions, are particularly tedious to comprehend. An example well known to those serving in the Army concerns disturbance allowance. It states how much money can be paid to a person on being

posted to a new unit. The very large number of conditions contained in this publication makes it very difficult for the soldier to predict his entitlement.

8.9 Conclusion -

The fundamental problems of peacetime general administrative information concern the quantity and quality of information at present being produced by the MOD and superior headquarters which, if allowed to continue unchecked, will cause the system to become progressively less efficient, and consequently have an adverse effect on our state of readiness for war. Until these basic difficulties are surmounted, it is not possible to describe the solution, which would probably provide all three services with a comprehensive information system for all types of administrative information, including specialised technical material.

The first step in developing the ideal system is to provide the user with efficient facilities for recovering the information that exists on a given subject, and if this does not satisfy his requirement, the means by which he may find the answer to his problem. The requests for administrative information are for references, not management information: commanders make decisions on operational matters, but their powers are frequently restricted in administrative affairs. The initial requirement is therefore for a reference system, supplemented by referral facilities, which will tell the inquirer details of the sources of different types of information. The system is the responsibility of the principal policy maker, the MOD.

Action is required to provide imaginative, co-ordinated control, which will monitor the users' requirements and provide the information that he needs in an efficient manner. Elements of such a system do exist and some proposals have been made to improve them. These are described in the next section.

9. THE EXISTING SYSTEM FOR THE PRODUCTION AND DISTRIBUTION OF GENERAL ADMINISTRATIVE MATERIAL

The majority of material promulgated outside the MOD is edited, published, and distributed, by local arrangements. The Royal School of Artillery, for example, may produce a pamphlet on the equipment scales for regiments operating as part of the strategic reserve. Such a publication could be printed and duplicated locally, and then sent out on a distribution list decided by the school. Publications of this type are rarely included in any general catalogue. Policy letters, including those written in the MOD, are promulgated in the same manner. There is no logical way of finding out what has been produced.

The outline organisation for the production and distribution of MOD sponsored military instructions, orders, publications, etc., is shown in Appendix 16. These are the items whose existence is normally recorded in the Catalogue of Army Publications (23) or periodical indexes such as those issued for DCIs. Some of the branches have tri-service responsibilities. Management Services (Organisation), Management Information (Army) and the Army Department Regulations Revision Staff are concerned with the philosophy of publications, C3 (AD) and the Director of Army Training do most of the military editorial work. Material is printed and distributed under the control of Office Services. The Library (MOD and Army) stocks some of the military material mentioned above. These organisations are described in more detail below, together with current proposals for reorganisation.

9.1 Management Services (Organisation) Division

This organisation is responsible for tri-service assignments in defence staff directorates. They have produced several reports on administrative matters, 'Written instructions to the Fleet' (26) is typical.

9.2 Management Information (Army)

Their task is the development of MOD (A) management information systems. They are currently preparing a management information directory which will give details of the functions of branches within the Army Department of the MOD. There are corresponding branches for the Royal Navy and Royal Air Force.

9.3 Army Department Regulations Revision Staff

They report through the Director of Army Staff Duties to the Army Board. Initially they were concerned with the re-organisation of the Army command structure in the United Kingdom. As part of their current work, they are organising the re-writing of some of the larger publications, such as Queen's Regulations.

9.4 C3(Army Department)

C3 are responsible for the majority of the Army's editorial work. They also have some responsibilities for the other two services. They edit DCIs, MOD Office Memoranda, Army Regulations, Army Lists, many of the items listed in the administrative section of the Catalogue of Army Publications (23), and some technical material.

9.5 Director of Army Training

A small branch which edits general staff and military training publications.

9.6 Office Services

This is a large tri-service organisation whose main task is to arrange for the printing, duplicating and distributing of the forces publications, orders and instructions. Much of the printing is done by

Her Majesty's Stationery Office. Office Services (Stationery and Reproduction) responsibilities include editorial tasks for the Royal Navy and the Royal Air Force and the control of the bulk distribution depot at Wandsworth.

9.7 Library (MOD and Army)

This particular library is located in Whitehall. It contains a large variety of books on military subjects, ranging from scientific to historical. One section provides a loan service for military sponsored publications including many of those listed in the Army Catalogue (23). It does not, however, provide a means for retrieving information on selected administrative subjects and no proper facilities exist for amending the material held.

9.8 Current Proposals

The report on 'Written instructions to the Fleet' (26) concerned the main types of publications used by the Royal Navy and proposed a central organisation which would not only co-ordinate the policy and standards associated with how best to disseminate written instructions directed towards the Royal Navy, but would also control the various stages of their production and despatch. It also made proposals to secure the cataloguing of those publications in a way which would meet the Navy's retrieval requirements. To date there is no information about these proposals being adopted.

Management Services (Organisation) are understood to have recently completed a further report on the possibility of combining the editorial work for all three services on non-technical publications.

Comments on these two ideas are given in Section 10.

10. GENERAL DESCRIPTION OF A DEFENCE ADMINISTRATIVE INFORMATION SYSTEM (ARMY)

The user would like to have an on line terminal to a system which would tell him precisely what he needs to know. The minimum amount of user effort would be required, communication being achieved by the use of natural language. However, as stated in Section 3.10, such a proposal would be prohibitively expensive at present.

Improvements can be made now, however, to save money and improve efficiency, the difficulty being to decide what can best be done.

10.1 Principles affecting proposals to improve the existing situation

The existing arrangements have been built up over a period of many years, instructions, regulations, etc. being laid down layer upon layer. The people responsible for maintaining the system are already overworked; additional staff would be required to develop entirely new methods and material. The user also would prefer a gradual change rather than a sudden attempt to adopt new and possibly inadequate, methods. Systems do not readily respond to rapid changes.

It is necessary to recognise the orientation of defence organisations. Office Services are designed to do a wide variety of work for a large section of the forces; neither the personnel nor their expensive equipment can be divided and allocated to work directly for any of the departments they serve.

Unless there is a convincing case that a new arrangement would cost less and be more effective, the Inspector of Establishments will rigorously oppose changes which include staff increases. Ideas which involve running systems in parallel during a changeover and proposals which might reduce efficiency elsewhere, are particularly vulnerable to being rejected.

Another important factor to be considered when proposing a new system is the need to minimise dictatorial changes. For example, there are considerable differences in the methods by which the three services operate and the terminology they use. The Joint Services Glossary (7), produced by the Standard Language Authority of Management Services, is not a comprehensive list of definitions, difficulties will inevitably arise when any attempt is made to index, store and retrieve material on a tri-service basis. Enforced changes cause resentment and a lack of the co-operation which is essential to the efficient functioning of new systems.

10.2 Comments on existing official proposals

These were mentioned in Section 9.8. The report on 'Written Instructions to the Fleet' (26) made recommendations which would undoubtedly improve the existing arrangements. However, the proposed system is very dependent upon the early re-writing of current material and the need to have direct control of newly equipped printing and distribution facilities. Such suggestions are contrary to the first three principles mentioned in the previous sub-section.

The suggestion that the editorial staffs of the three services should be combined, is considered to be premature for the reasons given in the last paragraph of section 10.1; more work should first be done on the production of a complete joint services glossary.

10.3 Outline of the author's proposals

The object is to make proposals which will give the maximum benefit for the minimum investment and then convince those concerned that there are valuable, tangible savings to be made.

As stated in the conclusion to Section 8, the fundamental difficulties which do not appear to be undergoing active study concern

the quantity and quality of information flowing to the units from the MOD and superior headquarters. The tendency is to push the problems down the hierarchical chain and leave those at the bottom to resolve them. This is most inefficient in manpower, material, money and time. Until these basic difficulties are solved, then it is not possible to describe the ultimate system. The situation arises from the fact that there is no centralised direction for those producing and using administrative information. It is incumbent upon the MOD to control the information which is required to implement their policy.

The principal recommendation of this study is for the formation of a central organisation which, although it cannot dictate what will be produced, will give firm guidance on the preparation of military administrative material and assist with the retrieval of items already in existence or in the process of publication.

As mentioned in Section 7.4, the first action would be to establish an experimental information centre to confirm the conclusions reached from the 1973 trial. The centre could operate in the Old War Office Building, Whitehall, using the MOD Library military publications facilities described in Section 9.7. A professionally qualified librarian or information officer, working in collaboration with a retired officer experienced in administrative communication problems, would provide a suitable experimental nucleus service. The object would be to obtain a more reliable measure of users' problems. This would be achieved by advertising the centre and trying to assist administrative users with their difficulties. A record of the requests received would provide the evidence required to substantiate the findings of the February 1973 trial. The next step would be to start developing the complete central system using the following description as a guide;

the experimental information centre being expanded to fulfil the role shown in Section 12.7. The first stage in full development would be the Defence Administrative Information System (Army), (DAIS(A)). As its name implies, DAIS(A) would only be designed for the needs of the military user but it would be capable of expansion to meet the requirements of the other two services and the handling of technical and highly specialised information. From the beginning it would provide an interface with all other sources which could be of assistance to those serving the Army.

10.4 DAIS(A) terms of reference

These would be as follows:

- (a) To control the mode of presentation of information (excluding that which is operational, specialist or highly technical).
- (b) To be the MOD policy maker on the physical form of presentation of administrative publications, books, instructions etc.
- (c) In conjunction with Management Information (Army) to collate, publish and maintain a glossary of military terms which can help build up an indexing vocabulary.
- (d) To advise on the preparation of administrative items generally. To edit contents lists, alphabetical indexes, code, store and retrieve administrative policy material.
- (e) To maintain the 'Catalogue of Army Publications' (23) and to produce catalogues of other stored information.
- (f) To maintain an index of military and civilian sources which may be of use to those serving the Army.
- (g) To arrange for the printing and distribution of material as requested.
- (h) To cost the production of any material stored by DAIS (A).

- (j) To assist with the training of personnel on information handling in the Army.
- (k) To provide facilities whereby persons can be given references to stored information and to record details of such requests.
- (l) If cost effective, to provide a reference library service with copying facilities.

10.5 Control of DAIS(A)

As will be seen from Appendix 16, the proposed terms of reference for DAIS(A) cover tasks which are at present the responsibility of the Chief of the General Staff and two Deputy Under-Secretaries. In addition to his commitments as shown in the Appendix, the Deputy Under-Secretary (Civilian Management) controls the editorial branches for RN and RAF publications via the Head of Office Services (Stationery and Reproduction). Initially it is not intended that DAIS(A) should have its own printing and binding facilities, these being controlled by the Head of Office Services (Printing and Binding). It seems appropriate therefore that DAIS(A) should be the responsibility of the Head of Office Services (Stationery and Reproduction). This would mean transferring the editorial duties of ATI and ADRRS from the control of the Chief of the General Staff, and C3(A) from the Deputy Under-Secretary (Personnel and Logistics).

10.6 Information to be handled

Table 10, overleaf, shows the number of administrative and associated items which are estimated to be currently extant and for which DAIS(A) would provide reference information. The estimates of annual changes are based on the fact that orders, instructions and letters tend to be superseded or automatically cancelled at the end of three years. The same remark applies to much of the work produced outside the Ministry

of Defence. Publications listed in the Catalogue of Army Publications (23), however, usually have a longer life. Re-organisations within the MOD cause fairly frequent changes in the roles and locations of military sponsors.

The figures in Table 10 do not take into account changes in the total number of items each year. These will fluctuate if proposals for changing the contents are applied (Section 11.2). DAIS(A) should, however, have the effect of at least slowing down any further increase in the total quantity of the contents.

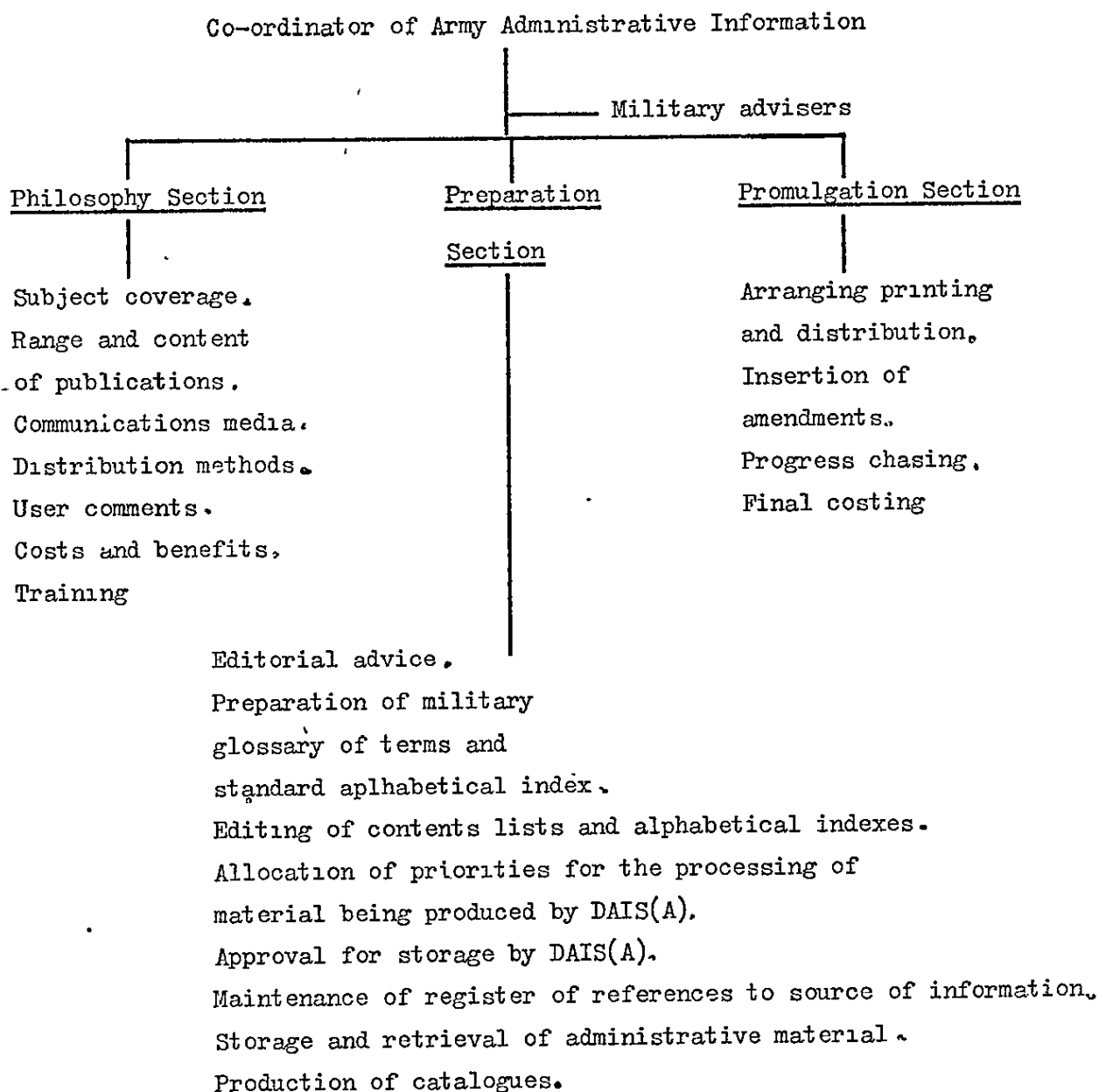
Table 10: A summary of the items for which DAIS(A) would provide reference information

Item	Estimated number currently extant	Estimated number replaced or substantially amended each year
MOD Instructions and Orders.	3,000	1,000
MOD Policy letters.	1,000	500
Publications listed in Army Catalogue,	8,000	150
Items produced by external military sources.	8,000	2,000
Items in course of preparation and publication.	500	1,500
References to information sources (including MOD Branches)	5,000	1,500

10.7 Outline organisation of DAIS(A)

The outline organisation which, it is suggested, would meet the terms of reference for the material listed in Table 10 is shown in Figure 10 below. The functions of the various parts of the organisation are described in detail in the following sections. The provision of manpower is discussed in Section 14.

Figure 10: Proposed Defence Administrative Information System (Army)-
Organisation and tasks



11. PHILOSOPHY SECTION OF DAIS(A)

Military publications have been compiled over a long period of time, and some of those listed in the Catalogue of Army Publications (23) are more than 40 years old. On account of the need to keep pace with rapid changes in the Army's role and organisation, the majority have had to be amended and many re-written. As stated in Section 10.1, it is neither desirable nor indeed feasible to make sudden major changes to the existing arrangements, but the system should not be perpetuated without any form of centralised control of the philosophy. Recommendations are required for the introduction of modern methods and a careful appreciation of the requirement will indicate what should be done and when. Such studies have to take full account of the costs and benefits.

The philosophy section of the proposed DAIS(A) would be responsible for:

- (a) Examining the information which is held by units, deciding on under and over subscribed topics, and hence making suggestions to sponsors.
- (b) Deciding on the range and contents of books and instructions.
- (c) Philosophy for the destruction of material.
- (d) Examining methods of communicating information eg. paper, microform, magnetic tape, etc., and deciding which is the most appropriate method for a particular type of information.
- (e) Studying requests made for information to the storage and retrieval cell and any other details which would give an indication of the extent to which the system is satisfying the user.
- (f) Costs and benefits.

- (g) Assisting training establishments and units with the education of personnel on information handling.

11.1 Subject coverage

Section 8 stated the need for a general reduction in the amount of information being published, however, there are some areas in which information is lacking. For example, as mentioned in paragraph 2 of Section 8.8, there is probably a need for every soldier to be given a small booklet which clearly summarises, with references, the conditions of service and prospects appropriate to his trade, welfare facilities, and military concessions. It is agreed that the commanding officer should keep his men properly informed about such matters but this is not always practicable and the ill-informed soldier will make irrational decisions.

11.2 Range and contents of books and instructions

The philosophy section would endeavour to reduce the amount of duplication by trying to place all closely related subjects in one book, (or perhaps on one microfilm) and as far as possible amend that item directly instead of using other means of notifying changes. This proposal would be very difficult to put into practice because, as has already been stated, the existing system is firmly established. Sponsors would have to be persuaded that good cross referencing is much more preferable than duplication, and if changes have to be notified by letter, or signal, etc. then the book must be amended as quickly as possible. This idea is not new; Management Services (Organisation) proposed such a scheme for the Royal Navy (26) consisting of ten groups of books, half of which contained several parts. The outline framework is shown in Appendix 17. Again it must be stressed that, although it may be a good idea, its introduction would take a long time, but if, for example, Queen's

Regulations are to continue in their present form, then there would inevitably be considerable duplication between that item and the others which amplify Her Majesty's Regulations.

11.3 Philosophy for the destruction of material

When an item is originated it is frequently possible to predict how long it should be retained by those on the distribution list. Authors, however, are reluctant to quote a destruction date because they think that circumstances might change and increase the useful life of their material. This policy results in many highly paid officers exercising judgement on the need to keep items. If the sponsor would be more willing to accept the responsibility of saying when his products can be destroyed, then clerks could readily keep the stored information under control. In the event of an item acquiring a new lease of life then the sponsor could write to those on the distribution list cancelling the predicted destruction date and substituting a new one. The foregoing may be considered an over-simplification of the facts but significant savings could be made if sponsors would pay more attention to the complete life cycle of the item they produce.

11.4 Methods of communicating information

The section would carefully consider the use of alternative methods for transmitting information. These include the Forces Broadcasting Services deployed outside the United Kingdom, tape recordings, and microforms. Taking the last medium as an example, the main objection to the use of microforms is the cost of viewing machines and facilities for making full size copies. Modern industry, however, is publishing such items as military vehicles parts lists in microform and it is therefore becoming necessary for units to acquire viewing and copying equipment. Some of the larger less frequently used publications could be made available more cheaply in microform and viewed on the unit's technical equipment if required. Some notes on the use of microforms for

military administrative purposes are given in Appendix 18. The following quotation is taken from DCI S27/72:

'The growing number of microcopying applications in industrial and commercial fields has inevitable repercussions for the Ministry of Defence and the Services'.

The section would also study the modes of presenting information in order to improve readability and comprehension. Decision trees and tables should be more widely used and an author should appreciate that the few extra minutes he spends making a publication more concise and easier to understand will save much more of his readers' time.

11.5 Users' comments

The section would collect details from any source which would give an indication of the degree to which the information was satisfying the users. Feedback would be obtained internally from the requests for information received by the DAIS(A) storage and retrieval cell and the military advisers. Should further trials be required these would be arranged by the philosophy section and the military advisers.

11.6 Costs and benefits

The section would take full account of the financial factors involved in all aspects of producing information, including the facilities provided by DAIS(A). Particular attention would be paid to the benefits which might be achieved by automation.

11.7 Education in information handling

At appropriate stages in a person's career, for example basic training, clerks' courses and officers' staff courses, instruction should be given in information handling in the Army. The philosophy section would assist by providing advice to training establishments, giving lectures, and producing a publication on the facilities provided by DAIS(A). The object would be to improve on the standards and methods used for preparing and handling administrative information in the Army as a whole.

12. PREPARATION SECTION OF DAIS(A)

This is the largest section of the proposed system. It would give advice on the preparation and handling of any administrative material, regardless of whether or not it was intended for subsequent storage in DAIS(A). Its main function, however, would be to assist in the preparation and storage of administrative policy items which might be of future use. Sponsors would be encouraged to make use of the editorial facilities and, if necessary, DAIS(A) would provide assistance with printing and publishing. A pullout, Figure 13 on page 85, shows a flowchart for the processing of information by the sponsor and the preparation section.

The sections responsibilities would be as follows:

- (a) Editorial advice, including obtaining special authority to publish.
- (b) Production of a military glossary of terms and standard alphabetical index.
- (c) Editing of contents lists and alphabetical indexes of those items to be stored.
- (d) Deciding priorities for the processing of material being produced under the control of DAIS(A).
- (e) Maintenance of a register of references to sources of information.
- (f) Approval for storage of material.
- (g) Storage and retrieval of selected material.
- (h) Production of catalogues.

12.1 Editorial advice

The sponsor is the person who knows what information has to be transmitted. In general the editor would only have the authority to make recommendations about the contents of the material, but where approval for

publication was required to be given by some senior official, then dictatorial powers may be delegated to the editor. The editor would have the right to alter the contents lists and alphabetical indexes of material stored by DAIS(A), see section 12.4.

The editor would try to have the information presented in a manner which would be readily acceptable to the recipient: the busy executive dislikes verbiage, while the soldier is averse to the dull authoritative message. It should be clear whether the item is mandatory or not, and whether it is for study or reference. The editor must endeavour to have the material communicated in the most efficient manner; costs and publication dates would affect his choice.

A major problem is to ensure that the sponsors make sensible use of the editorial facilities available. Editorial processing must not cause significant delays; certain items, such as policy letters, will first be seen by DAIS(A) when they arrive for storage. Sponsors of large publications should keep DAIS(A) informed of the progress of processing so that others can be told about what is happening, thus avoiding the risk of duplication or contradiction with material which is being produced concurrently.

Policy letters, and other short lived items not registered in the 'Catalogue of Army Publications' (23), would normally be required to show the date that they could be automatically cancelled unless renewed by the sponsor.

Where possible DAIS(A) would give limited editorial advice on the more general types of technical publications. Initially, no assistance could be given with highly specialised material such as the Electrical and Mechanical Engineering Regulations for the repair of the 920B computer.

Such work must be done by technical editors working on a limited subject area and it would not be necessary to incorporate such specialists into a general administrative system.

12.2 Military glossary of terms

Clear definitions of terms are essential for the communication of information, its storage, and subsequent retrieval. Unfortunately, it is not as yet practicable to obtain full agreement between the three services on the definition of a complete range of terms. It is for this reason that, initially, DAIS would only be designed to meet the military requirement. The existing Joint Services Glossary (7) would, however, provide a very useful base for the construction of a much needed comprehensive military version. There would be liaison with Management Services (Organisation) Division.

12.3 Standard military alphabetical index

The examples quoted in Section 8.4 illustrate the need for a standard military alphabetical index. This would be compiled by the preparation section and used for all military publications, regulations, orders, instructions, etc. The index should be based on the system most commonly used in the Army today, namely the nouns are placed in order of importance as descriptors, followed by the adjectives in similar precedence. An example would be, forks-fish-wooden handled. Some cross references will be necessary but the problems are small compared with the construction of a general purpose index to be used by a large number of people having different experience and interests.

12.4 Editing of contents lists and indexes

The editor would have the prerogative to alter the contents lists and alphabetical indexes of any material which was to be stored

by DAIS(A). The reason for this is that he would have more knowledge of the user's approach to the indexing of material than would the sponsor. Ideally this editing would be done before the item was published, but if necessary, DAIS(A) would produce a separate contents list and index as an addendum for internal storage and retrieval purposes. As mentioned at the end of Section 12.1, work on technical publications would be limited according to the experience of the editorial staff.

12.5 Register of sources of information

This would show the terms of reference, address and telephone number, of all sources of information, both military and civilian, that are of use to those serving the Army. It would include details of organisations such as the Defence Research Information Centre at St Mary Cray and the Institution of Mechanical Engineers, as well as those of the military sponsors. Much of the information on MOD sources could be derived from the management information directory being produced by Management Information (Army), see Section 9.2. The storage and retrieval of this information is described in Section 12.7.

12.6 Approval for storage of material

Items of the type included in the Catalogue of Army Publications and material concerning administrative policy would normally be stored by DAIS(A). It would not be possible to store information on every item that might be of future interest; information about relatively unimportant material could be obtained by referring to the appropriate authority listed in the register of sources of information. The policy for storing material would be made by the Deputy Under-Secretary and detailed decisions would be resolved between the editorial staff and the sponsor concerned.

As already mentioned, a pre-requisite for storage would be that items would normally show a date on which they could be destroyed. This could subsequently be revised by the sponsor or some appropriate authority.

12.7 Information storage and retrieval centre

This important part of DAIS(A) would initially be created, in a simplified form, to confirm the conclusions of the February 1973 trial, see Section 7.4. In its fully developed state, it would store and when requested, retrieve the material approved by the editorial staff. The estimated numbers of different types of items is given in Table 10. Of a total of 25,500, it is expected that 6,650 would be replaced or substantially amended, each year. The particular problems are that, unlike many library systems, a knowledge of the author's name is of little assistance and some of the items contain information on 2,000 of a total estimated number of 12,000 subjects.

The system specification would be as follows:

(a) Essential:

- (1) Reference retrieval of the 12,000 subjects contained in 25,500 items.
- (2) Access speed to references to be compatible with answering queries on the telephone.
- (3) Updating capability.
- (4) Minimum cost.

(b) Desirable:

- (1) Document retrieval.
- (2) Small storage space.
- (3) Continuous service.

Figure 11: An example of an item index card(some details fictitious)

REPORTS OFFICERS CONFIDENTIAL		Item Card No 1078	
Item	Sponsor	Item Code	Loc
QR pr 269,318. AP XVII XXI	MS(CR)	U/13206/A(X)U	B32
AA Sec 180	JAG	U/14470/A(X)U	B39
DCI(A)S57/72	MS(CR)	R/X/A(7.75)R	B16
DCI S67/72	MS(CR)	R/X/A(8.75)R	B19
DCI S63/72	MS(CR)	R/X/A(6.75)R	B11
MS Guide to preparation and processing of officers' confidential reports.	MS(CR)	R/X/S(X)R	E36
MS ltr 2345/6 dtd 25 Feb 73	MS(CR)	C/X/S(2.75)F	NH
Draft CR	ADRRS		NH R3468
Main contact	MS(CR)		R2956
<u>Amendments to this card can affect</u>		Item cards - 2345, 5432	

Referral cards- 2956, 3468

Description

The entries in the item and sponsor columns are self explanatory. The locations are either DAIS(A) shelf letters and references or sponsor referral card numbers. NH meaning not held by DAIS(A).

The item code is made up as follows:

- The initial letter indicates the current security classifications. 'S' for SECRET, 'R' for RESTRICTED etc.
- The number between the obliques is the catalogue number. An 'X' means that the item is not catalogued.
- The letter which follows the catalogue number would indicate the distribution scale for example 'A' could be one copy for each Lt Col's command and each independent self-accounting unit, 'S' would indicate special distribution.
- The figures in brackets show the month and year the item may be cancelled. An 'X' means that the date is not known.
- The last letter shows the sponsor's instructions about who may be given a copy of an extract from the material. 'U' means that the general public may be given copies while an 'F' could mean that the sponsor must be consulted before a copy can be despatched.

Figure 12

Examples of referral index cards (some details fictitious)

- Assistant Chief of General Staff (Operational Requirements)R2468
ACGS(OR). Introduction of a new military equipment into service (excluding personal equipment). Progressing during development and production. Allocation to units. Production finance.
MOD Main Building, Whitehall, SW14 2FB
Tel: 01-930-8033 Enquiries ext 1234 or 4321
- Institution of Electrical Engineers R8642
IEE. All civil electrical engineering matters. INSPEC SDI service, Physics, Electrical and Electronic Engineering. Computers and Control.
Savoy Place WC2B 0BL
Tel: 01-234-5678

The number of items and the amendment rate are too large for a mechanical co-ordinate indexing system and too small to justify computer assistance. The large subject coverage of some items precludes the use of conventional grouping of items or index cards. When the centre is first formed, the optimum solution would be to use a subject card index. The cards would show references to the sources of relevant information; typical cards are illustrated in Figures 11 and 12. The selected system is not ideal; it has the disadvantage of terminology problems, particularly that of selecting the logical class, and access speeds are not good. However, the production of the standard military glossary of terms and the alphabetical index (Sections 12.2 and 12.3), should alleviate these problems, and maximum use of handling aids such as colour coding and roll out trays should make the access time compatible with answering queries on the telephone. The cards can be updated and the equipment and staff costs would be the minimum of any proposals: the selected system fulfils the essential requirements.

The disadvantages of providing document retrieval are the costs of additional floor space and the labour for maintaining the material. The advantages are that it would provide the staff of DAIS(A), and any other person in the geographical area, with a valuable library service. Also, items have to be sent to DAIS(A) for approval prior to storing reference details and in the majority of cases it would be uneconomical to return them. On balance therefore, it is proposed that the documents should be stored and their locations be included on the index cards.

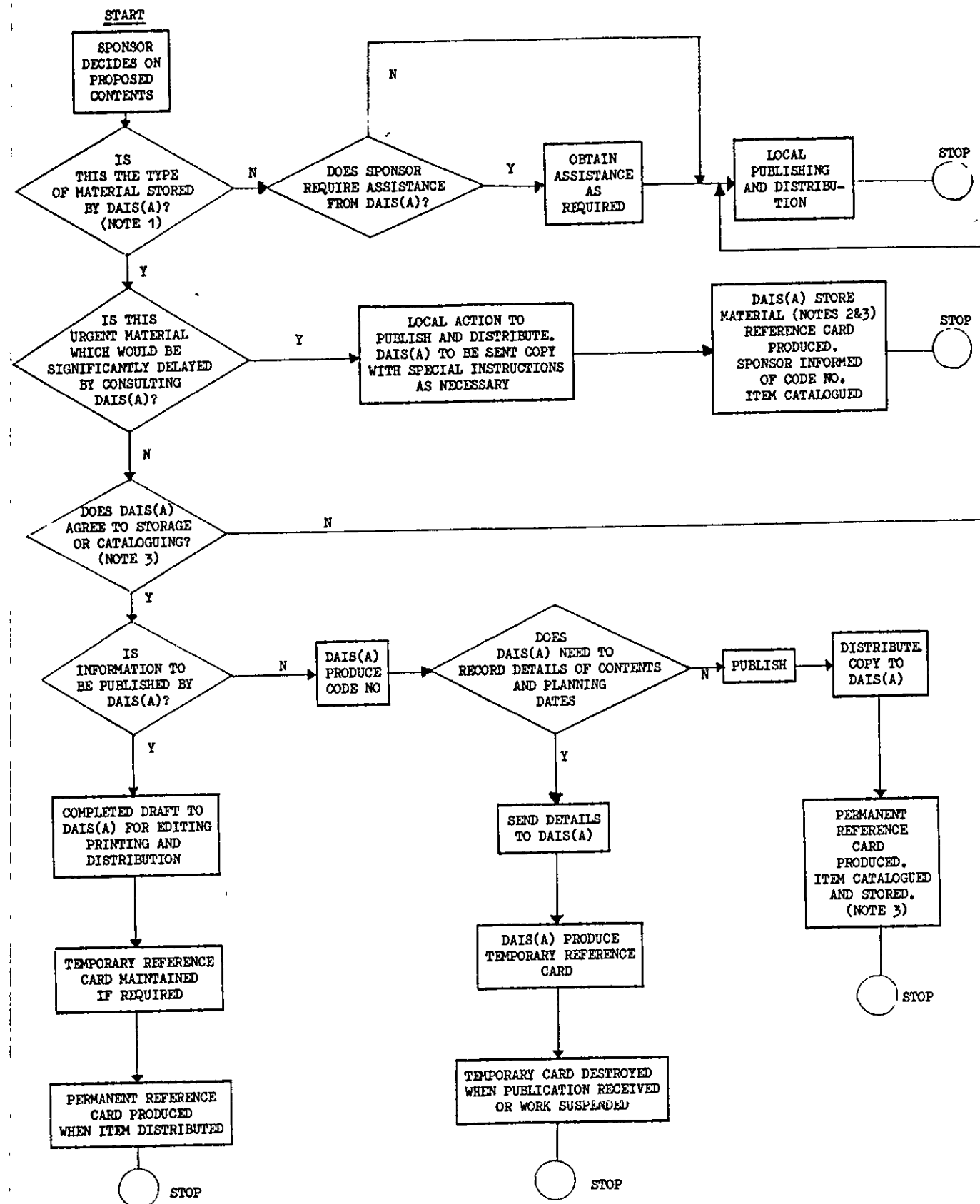
Spare copies of some of the more frequently used items might be available for loan purposes but in general the arrangement would be

to make a copy of the relevant piece of information.

The high transience of the items would make it uneconomical to convert written material to microform to reduce storage space and assist retrieval.

Ideally it would be preferable to operate a continuous service; the system could then be used by orderly officers and others who work outside normal UK hours. However, few administrative problems require an immediate answer and the working hours of persons serving in Germany almost coincide with those in the United Kingdom. An automatic telephone answering device would be justified. This would record requests made outside working hours and during peak periods when the staff were dealing with other queries. The backlog of work could then be dealt with when the opportunity arose.

The remaining task for the storage and retrieval cell is the preparation and maintenance of catalogues. Two types are required, one similar to the existing 'Catalogues of Army Publications' (23) which would contain details of the more permanent items, and the other for short life material. They would show the Army Code numbers for the publications, distribution details and any special remarks. Unlike the current catalogues, they should also contain unclassified or RESTRICTED information on highly classified documents. The cancellation date for short life items should be shown in the catalogue, this would act as a reminder to the sponsors and others concerned that action is required if the material is to remain extant.



- NOTES:
1. Administrative policy material excluding highly specialised.
 2. Types of information to be stored decided by FUS; details by DAIS(A).
 3. Material classified higher than RESTRICTED to be returned to sponsor or destroyed.

13. PROMULGATION SECTION OF DAIS(A)

This part of the system would be responsible for arranging the printing, binding and distribution of items according to the priorities decided by the DAIS(A) editorial staff. These facilities are at present provided on a tri-service basis by Office Services and, as stated in Section 10.2, it would be uneconomical to alter this arrangement until the proposed information system also had responsibilities for the RN and RAF. It will therefore be necessary for the promulgation section to co-operate fully with the existing branches of Office Services, monitor progress and, if necessary, consult the editorial staff and the sponsors about any delays.

The section would try and arrange for published amendments to be incorporated in material prior to issue, arguing that if this is done centrally then it may be cost effective to use mechanical handling devices; the alternative being to use expensive labour in the field force.

The section would also co-operate fully with the distribution services on any suggestions for automation or other means of reducing the work load in Office Services.

Items would be finally costed and the details given to the philosophy section.

14. COSTS AND BENEFITS OF DAIS(A)

Unless there is an obvious increase in the workload or proven costs benefits, then it is very difficult to obtain approval for additional expenditure on administration. The argument for creating DAIS(A) is based on the fact that, by co-ordinating the facilities already in existence and applying a little more effort to the production of administrative material and its retrieval, there can be a large saving

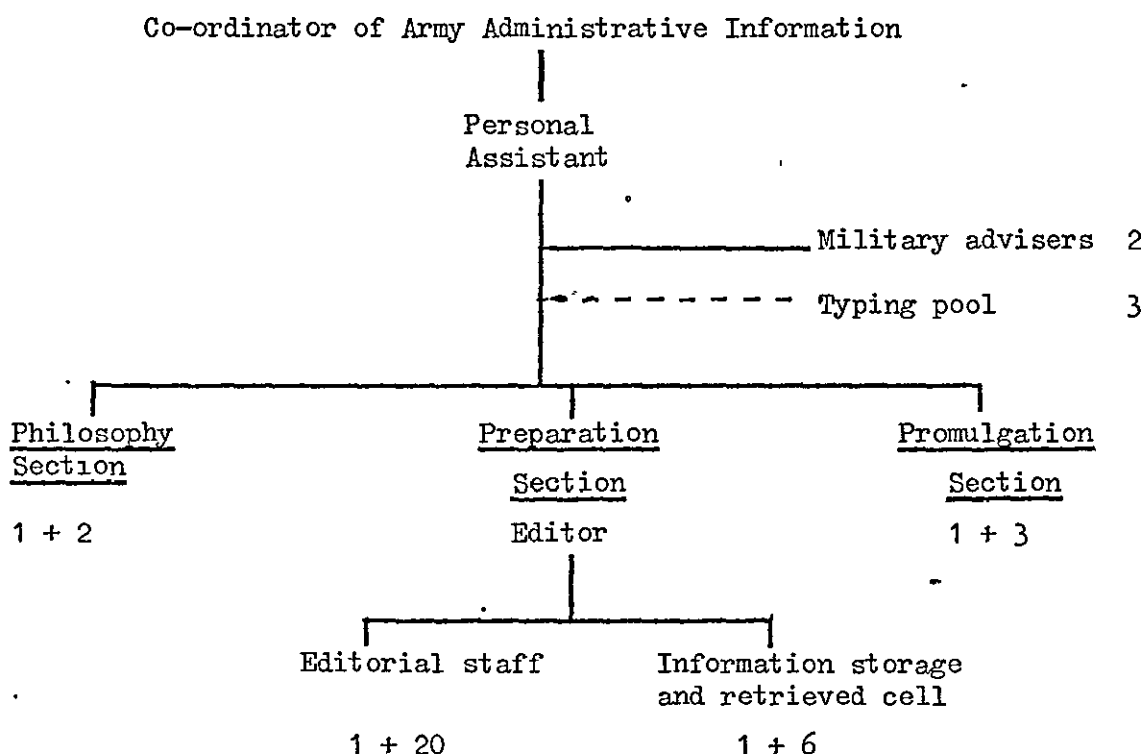
in the effort at present expended on information handling throughout the Army. Furthermore, as the complexity of the Army continues to grow, any improvement will produce greater nett benefits in the future.

14.1 Establishment and cost of DAIS(A)

Figure 14 below shows a total staff of 40, with access to three typists. The majority of these persons would come from the elements of existing organisations which would be incorporated in DAIS(A). These are described in Section 9, the principal ones being:

- (a) Military editorial staff from C2/3 branches.
- (b) Appropriate DAT editorial staff.
- (c) ADRRS.
- (d) That part of the MOD and Army Library responsible for military publications of the type controlled by DAIS(A).

Figure 14: Outline establishment of DAIS(A)



The new tasks, which would require additional staff are as follows:

- (a) System co-ordination and analysis of user comments.

- (b) Costing.
- (c) Central storage of additional administrative publications, policy material, and references to sources of information.
- (d) Retrieval facilities for stored items.

It is estimated that it would require a maximum of an extra 15 people to perform these duties and that their salaries, associated benefits, equipment and accommodation, would cost less than £200,000 per year.

14.2 Benefits of DAIS(A)

DAIS(A) could:

- (a) reduce the time spent by users seeking information either inside or outside their units.
- (b) reduce the amount of unnecessary material being produced and hence cause savings in:
 - (1) authors' time.
 - (2) readers' time.
 - (3) publication time and costs.
 - (4) distribution costs.
 - (5) storage costs.
- (c) ensure that those serving the Army are given all the information they need in the most efficient manner.

It was suggested in Section 7.3 that an administrative storage and

retrieval cell, of the type described for DAIS(A), could save over £650,000 worth of administrative users' time each year by assisting those who could not find the information they required, inside their own unit. This alone is three times the conservative estimate for having DAIS(A). Savings produced by making it easier to retrieve information in the unit would be additional. Of course, this does not mean that the establishment of fighting units would be reduced but rather that the individuals concerned could devote more time to gainful employment. It is possible, however, that actual cuts could be made further up the chain of command and control.

The tangible financial savings caused by eliminating unnecessary material could be much larger than those mentioned in the previous paragraph, but the lack of data on present costs makes it difficult to estimate the amount. Similarly the absence of information on current expenditure means that it is not possible to compare different media properly. There is no doubt, however, that DAIS(A) would save money by comparing the different methods of transmitting various types of information.

The benefits of improving the quality of information and keeping people better informed cannot be assessed in monetary terms.

15. CONCLUSIONS

In war, the predominant factor is the need to defeat the enemy: financial problems have to be relegated. War involves the making of quick operational decisions based on military intelligence information; it is not possible to produce the solution to the majority of problems in advance. The commander requires timely information about the enemy and the limitations of his own resources. The system has to produce the information in the form required; the commander then exercises his judgement and decides on the action to be taken. This is a complex management information problem to be solved by the use of computer aids and advanced peripheral equipment, such as automated map displays.

In peace, finance becomes the predominant factor. The reasons why the MOD is reluctant to let the Army copy industry and cut administrative costs by delegating financial and other administrative powers are outside the scope of this work. The results of this policy, however, greatly affect the design of the information system required: regulations have to be produced in advance to show how one should react in a wide variety of circumstances. The problem with peacetime administrative information is therefore to recover what exists rather than to discover the optimum solution to a situation. This is the difference between the simple information system required by the Army for peacetime administration and the complicated management 'tool' used on military operations. The approach to this work has therefore been to propose the initial stage in the development of a possibly more efficient system based on the fact that the MOD will continue to promulgate detailed rules and regulations.

In order to make viable proposals, it has been necessary to examine the type of administrative system which already exists, what changes are proposed, what appears to have been ignored, and what appears to be in conflict with modern practice. The information provided by the Director of Work Studies (Army), Management Services (Organisation), and the author's studies shows that there are fundamental problems concerning the quality and quantity of material produced by the MOD and superior formation headquarters and that these cause difficulty in retrieving what has already been published. It is concluded in Section 8 that these problems stem from a lack of co-ordinated control in the MOD, which causes an unnecessary amount of work to be referred to those serving in the field force. By investing a small amount of extra effort in the MOD, increasingly larger savings could be made as one moves down the hierarchical chain of command and control. There is no existing system as such but rather a series of disjointed elements. If there is no co-ordination at the top of the organisation, then it follows that there cannot be efficiency at the bottom. The following words by Herbert Spencer are appropriate:

"When a man's knowledge is not in order, the more he has of it, the greater will be his confusion".

The conclusions are therefore as follows:

- (1) It is considered that a Defence Administrative Information System is required to gradually improve the present state of affairs. The majority of the staff could come from existing resources. The first action would be to establish the nucleus of the system, namely a small information centre, and test the theories put forward as

a result of the February 1973 trial which were discussed in Section 7.

- (2) No information is available on the cost of the existing services and, consequently, there are no factual standards against which one can compare different methods. However, the appraisal in Section 4 does suggest that financial benefits could accrue with the formation of DAIS(A) as well as improvements in decision making.
- (3) Initially the lack of standardisation in terminology would preclude the formation of a tri-service organisation and this in turn means that printing and distribution services could not be directly controlled from the beginning. In the future it may be possible to extend the system to meet the requirements of the RN and RAF, and also to include the handling of all highly specialised service material. However, the viability of an all embracing system and its design cannot be decided until DAIS(A) has been tested.
- (4) A fully automated system may be justified either for tri-service administration or for a purely military system incorporating specialist technical literature but, at least until DAIS(A) has quantified the problem, it would appear to be uneconomical.

REFERENCES

1. MOD The Queen's Regulations for the Army 1961.
Army Code No. 13206.
2. MOD Defence Council Instruction (GENERAL)
T35/72. (RESTRICTED circulation).
3. MOD Initial Report. D/Man C/6/29/8 dated May 1970.
(RESTRICTED circulation).
4. MOD Report of the Army Department Management
Information Study Team. A/20/MISC/5493 dated
June 1970. Annexure 'J'.
5. DOE An Information System for the Construction
Industry. HMSO, October 1971.
6. MOD Notes on the British Army. Army Code No. 9696
(Revised 1968). (RESTRICTED circulation).
7. MOD Joint Services Glossary. Joint Service Publication
No. 110(1972).
8. MOD Administration in the Field. Army Code No. 70182.
(RESTRICTED circulation).
9. MEETHAM, R. Information Retrieval. Aldus Books, 1969.
10. ALBERS, H.H. Principles of Management. Wiley, 1969. p 447 et seq.
11. Fortune, Vol. 34, No.4 October 1946. p 14.
12. LULL, P.E. FUNK, F.E. and PIERSOL, D.T. What Communications Mean
to the Corporation President. Advanced Management, Vol.
20, No 3, March 1955, pp 17-18.
13. PYM, D. The Paper Pushing Fallacy. Management Today,
September 1972, p 109 et seq.
14. BLUMENTHAL, S.C., Management Information Systems.
Prentice-Hall, 1969
15. HOUKES, J.M. Proceedings of a Symposium on Management
Information Systems and the Information Specialist,
12-13 July, 1965. Purdue University, Lafayette,
Indiana, 1965, pp 28-29.

16. PERRY, J.W. and KENT, A. Documentation and Information Retrieval. An Introduction to basic Principles and Cost Analysis. Western Reserve University Press, 1957, p 26 et seq.
17. DYKE, F.H. Jr. Storing, retrieving, and correlating information and technical data. Proceedings of a Seminar Presented at the Industrial Education Institute, 1961, p 1.
18. HOLM, B.E. How to Manage your Information. Rheinhold, 1969.
19. JAHODA, G. Information Storage and Retrieval Systems for Individual Researchers. Wiley-Interscience. 1970.
20. LICKLIDER, J.C.R. Libraries of the Future. M.I.T. Press, 1968.
21. MOD Review of Unit Administration, MOD(A) DASD letter A/20/Gen/7411 dated 26 February 1971. (RESTRICTED circulation).
22. WILLIAMS, W.F. Principles of Automated Information Retrieval. The Business Press (Illinois), 1965, p 47.
23. MOD Catalogue of Army Publications. Part 1, Army Code No. 12123, 1971. Part II, Army Code No. 9724, 1971. Part III, Army Code No. 60098, 1970. Part IV, Army Code No. 14990, 1970. (All parts have a RESTRICTED circulation).
24. MOD Unit Returns. Army Work Study Group Report 28/1972. December 1972. Sponsored by DASD.
25. MOD Catalogue of Army Forms and Books. Army Code No. 60007. 1970.
26. MOD Written Instructions to the Fleet. Management Services (Organisation) Division Report No. Org 80. D/Man S Org/30/11/13. October 1970. (RESTRICTED circulation).
27. MOD Regulations for Supply, Transport and Barrack Services, Part 5, Army Code No. 12881.
28. MOD Delegation of Authority below District HQ level. HQ South East District Report 24014/20 G(SD) dated December 1972.
29. MOD Local Purchase Regulations for the Army. Army Code No. 60091.
30. DOE The Use of Information in the Construction Industry-- A Study of 25 Firms. Research and Development Report, 1971 (reprint date).

ADDITIONAL BIBLIOGRAPHY

The following items were consulted in addition to those listed in the references,

- ALLEN, R.L. Decision Tables. British Army Review No. 33
December 1969.
- BLACKNEY, A.B. and SCATCHERD, M. A Survey of Information Projects.
2nd ed. Ministry of Technology, March 1969.
- BLACKNEY, A.B. The Design of an Engineering Centre for the
Royal Air Force. Cambridge University, May 1969.
- BLACKNEY, A.B. and SCATCHERD, M. Report on Information Retrieval
in the U.S.A. Ministry of Technology, January 1970.
- BLAGDEN, J.F. Management Information Retrieval: a New Indexing
Language. John B. Reed Ltd., June 1969.
- BRAY, W.J. International Telecommunication Development.
Electronics and Power, March 1973, pp 73 - 76.
- CHACKO, G.K. Today's Information for Tomorrow's Products:
an Operations Research Approach. Thomson Press Ltd., 1967.
- CIVIL SERVICE DEPARTMENT. Computers in Central Government Ten Years
Ahead. Civil Service Department Management Studies
No. 2 HMSO., 1971.
- DONALD, A.G. Management, Information and Systems.
Pergamon, 1967.
- EMERY, J.C. Can we develop cost-effective information systems?
Management Information, Vol 1, No. 6, 1972, pp 243-249.
- GAWLIK, H.J. and BRAZELL, G. On the Storage of Information by Computers
and a Method for Fast Retrieval. Royal Armament
Research and Development Establishment, Basic
Techniques Division. Report No. 1/70.
- HALL, P.D. Decision Analysis and its Application to Defence
Decisions. MOD Defence Fellowship Report, July 1970.
- I.S.I.S. A General Description of an Approach to Computerised
Bibliographic Control. ISIS, International Labour
Office (Geneva), 1971.
- KELLY, W.F. Management through Systems and Procedures:
the Total Systems Concept. Prentice Hall, 1969.
- LANCASTER, F.W. Information Retrieval Systems:
Characteristics, Testing and Evaluation. Wiley, 1968.
- MOD Ministry of Defence Management Services
Thesaurus. MOD Man TI, June 1971.
- O.E.C.D. Does Your Firm Need its Own Information Service?
an Inquiry into the Economic Advantages of an
Information Service in Small and Medium-sized Firms.
O.E.C.D. (Paris), 1961.

INSTITUTE OF PETROLEUM Information and Its Dissemination. Report
of the Summer Meeting of the Institute of Petroleum,
held at Harrogate 7-10 June 1961.
Institute of Petroleum, 1961.

SMITH, G. and LYNCH, J. Information by the Yard. New Scientist
and Science Journal, April 1971, pp 32 - 34.

..... The proceedings of a symposium on, 'Equipment
Publications in the Emerging Integrated Logistics
Support Environment, 24-26 June 1970 and 22-24
July 1970. U.S. Army Materiel Command in
affiliation with National Security Industrial
Association.

WALL, R.A. Computer Output Microfilm Peek-a-boo (COMP)
Library Association Record, Vol 74, No 3,
March 1972, p 44.

WALL, R.A. Retrieval of Multimedia Information:
Simulation of a proposed system, Loughborough
University of Technology, October 1972.
(PhD Thesis).

WALKER, D.W.R. Thoughts on Communications, Journal of the
Royal Electrical and Mechanical Engineers No. 23,
April 1973.

WHITEHOUSE, F. Systems Documentation, Business Books Ltd., 1973.

RAPPAPORT, A. Information for Decision Making. Prentice Hall
1970.

APPENDIX 1

EXTRACTS FROM REPORTS OF AN INFORMATION SYSTEM FOR THE CONSTRUCTION INDUSTRY AND COMMENTS THEREON

A working party on data co-ordination was established by the National Consultative Council of the Ministry of Public Buildings and Works in late 1968. In 1969 it was given the tasks of making proposals for the improvement of information flow in the Construction Industry. The final report (5) was published in October 1971. The following are extracts from an interim report (30). They are considered to be typical of any large organisation which has not applied sufficient effort to its information services:

- (a) Comment by the Director of a large firm. "I try to scan through these technical journals and to scan through the heaps and heaps of stuff that comes through the post. Some of this I keep, the majority goes in the waste paper basket. If we kept everything that came in it would take up all the available space in the filing cabinets and the bulk of it would never be used again".
- (b) General comment on time. "The lack of opportunity to read information during the day and the reluctance to let it intrude on leisure time results in reading only when necessary and not as a general rule. There is a feeling even in professional offices that you cannot afford to pay money for men just to sit around reading".
- (c) General comment on resistance to being informed. Because most of the men in the building industry are craft trained, there is a tendency to say, "I have just been trained and therefore do not need to read the book". Alternatively, "I have been in the trade for so long I must know all about it". A senior partner of a large firm of quantity surveyors said, "I think that books are dangerous things and you are better off without them".
- (d) Comment on communications. "In the building industry there is a big communication problem with those working on the site. The employees on the site rarely go to see the firm's collection of literature and in fact are often quite unaware of its existence.

There is a wide spread tendency to use experience to solve a problem and only look in the literature if a fault occurs". The owner of a roofing firm said that, "The only way that you can get a man to do something different to what he has been used to, is to go and stand over him and show him how to do it".

The following are extracts from the final report:

- (a) 'The construction industry has an information system now. It has conventions for classifying, arranging and transmitting. It has information stores and information flows between participants in the process. The system is uncertain in its quality and inefficient in the use it makes of resources. We consider that it can be improved by a process of guided evolution over a period of years to form an effective and co-ordinated system'.
- (b) Costs and benefits of data co-ordination. 'Apart from the benefits that would accrue, we had uppermost in our minds the likely costs of developing a co-ordinated system and the time it would take to implement'.

The report estimated that, in very broad terms, the savings to the industry on new works only, 'could not be less than £30 million a year'. A more detailed study carried out by consultants put the measurable annual potential benefits to the industry in the range of £150 million and the annual indirect benefit to the community at large at some £20 million. Against this, costs would be about £12 million in the first year, falling to £5 million a year after fifteen years. Full benefit would be unlikely to come in less than ten to fifteen years.

DIVISIONAL HEADQUARTERS - ORGANISATION

General Officer Commanding

Aide de camp

General Staff (G)

Administrative Staff (A&Q)

Signals Regiment

Headquarters Local
Defence and Services

Attached

Functions:

- a. Operations generally
- b. Intelligence
- c. Staff duties
- d. Training
- e. Security
- f. Artillery
- g. Army aviation

(20 officers + 30 men)

Functions:

- a. Quartering
- b. Transport
- c. Discipline
- d. Supplies
- e. Recovery and repair
- f. Medical
- g. Pay
- h. Education
- j. Religion

(20 officers + 30 men)

Function is to
provide communications
with lower and higher
formation headquarters

(30 officers + 515 men)

Comprises:

- a. Defence platoon
- b. Intelligence platoon
- c. Army Air Corps flight
- d. Tradesmen

(8 officers + 100 men)

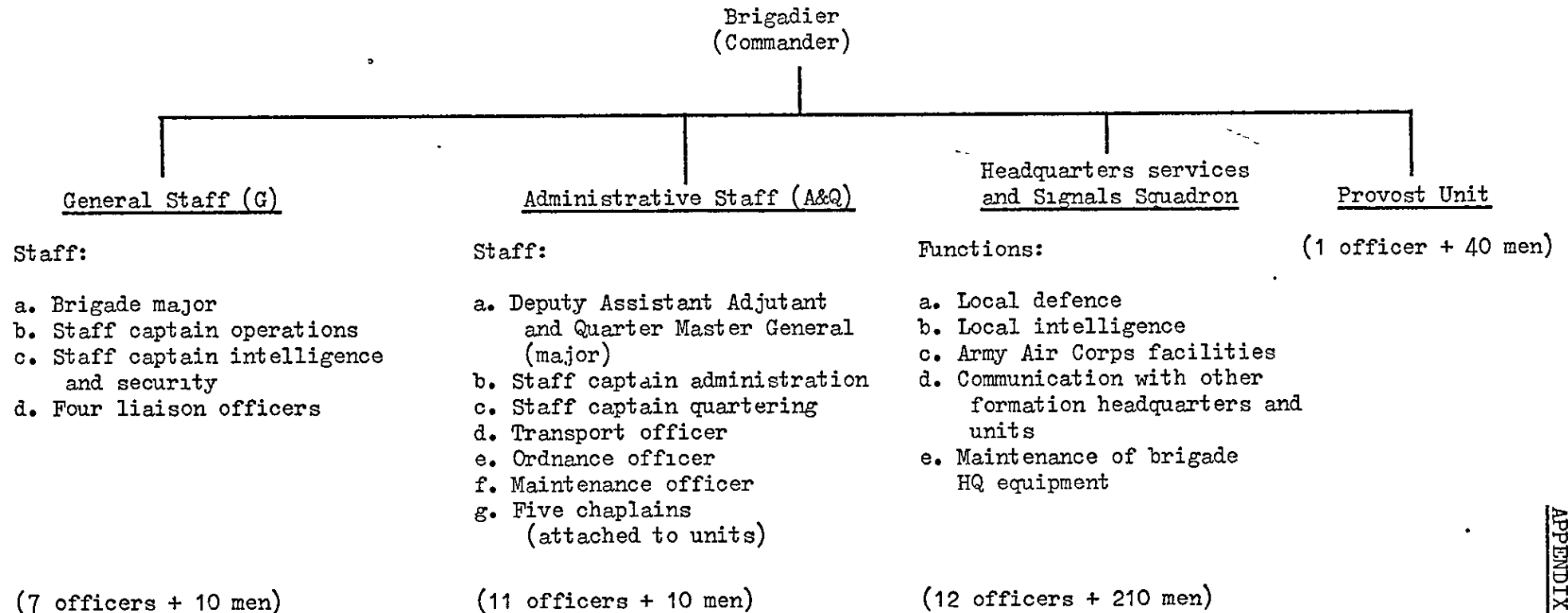
- a. Royal Engineers
- b. Transport platoon
- c. Provost unit
- d. Postal unit

(25 officers +
175 men)

Totals:

a. Officers	105
b. Men	850
c. Helicopters	10
d. Vehicles	270
e. Trailers	180

BRIGADE HEADQUARTERS - ORGANISATION



Totals:	a.	Officers	32
	b.	Men	270
	c.	Helicopters	6
	d.	Vehicles	85
	e.	Trailers	50

INFANTRY BATTALION - ORGANISATION

Lieutenant Colonel
(Commanding Officer)

Battalion Headquarters
(5 officers + 5 men)

Command Company

Functions:

- a. Communications
- b. Reconnaissance
- c. Headquarters defence
- d. Intelligence
- e. Medical services

(7 officers + 100 men)

Support Company

Comprises:

- a. Mortar platoon
- b. Assault pioneer platoon
- c. Anti-tank platoon

(3 officers + 100 men)

Administrative Company

Comprises:

- a. Quartermaster platoon
- b. Pay section
- c. Transport platoon
- d. Catering platoon

(5 officers + 100 men)

Rifle Company

(6 officers +
135 men)

Rifle Company

(6 officers +
135 men)

Rifle Company

(6 officers +
135 men)

Totals:

a. Officers	39
b. Men	710
c. Vehicles	60
d. Trailers	50

APPENDIX 5

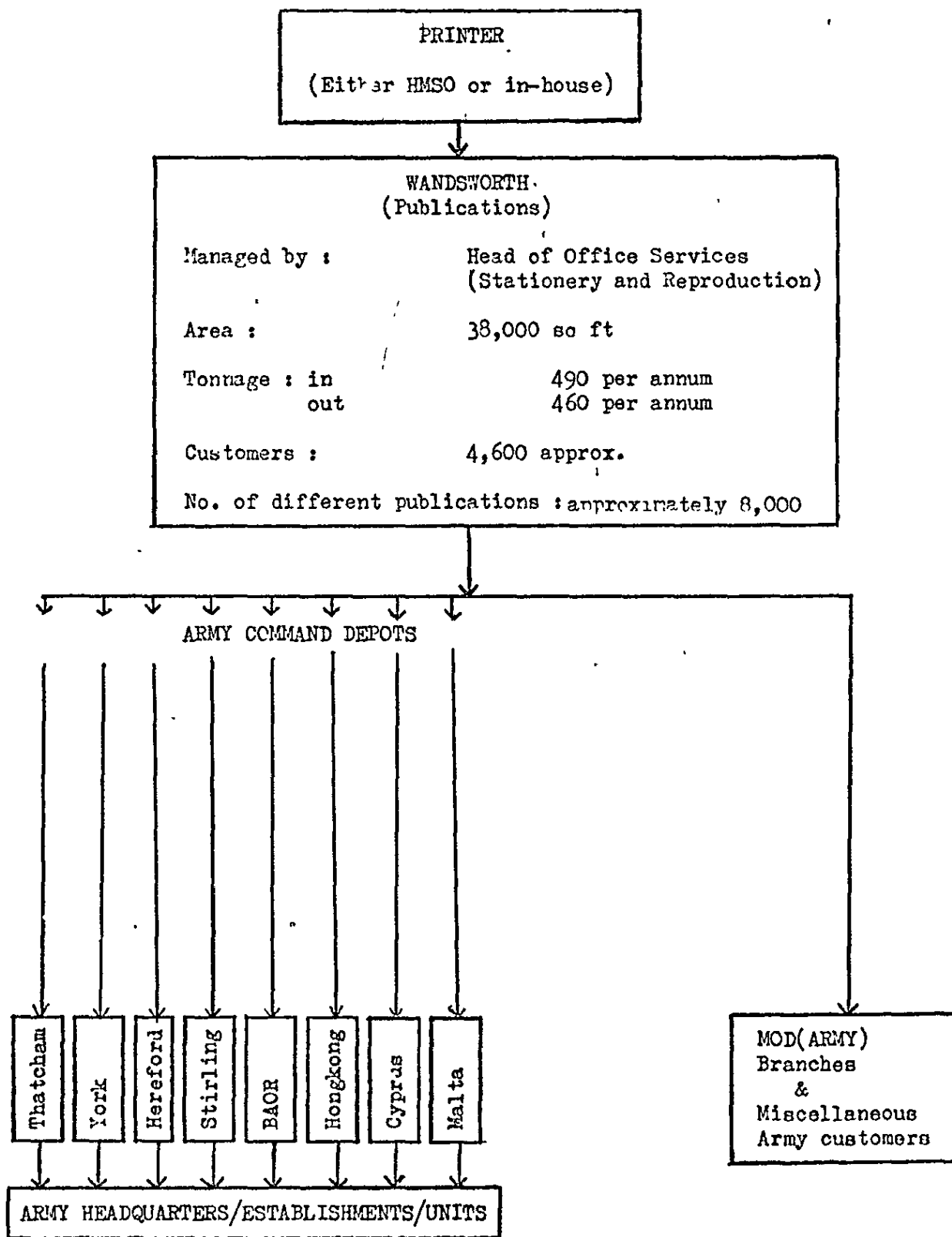
THE ACTIVITY ANALYSIS OF A PROFESSIONAL ENGINEER

The following information is reproduced from William F. William's book
'Principles of automated information retrieval' (22, p 47)

ACTIVITY		PERCENTAGE OF TIME
1.	Working alone problem solving	
	Reading	6.9
	Inspection or observation	0.4
	Thinking	1.1
	Reading blueprints	0.3
	Calculating	5.2
	Operating equipment	0.8
	Sub-total	14.7
2.	One way transmittal of ideas etc.	
	Writing	10.0
	Dictating	1.1
	Sketching	1.9
	Sub-total	13.0
3.	Exchange of information	
	Telephoning	5.3
	Conference (1 or 2 others)	26.0
	Discussion (4 or more)	9.7
	Sub-total	41.0
4.	Business away from building	
	Plant visits	21.6
5.	All other activities	
	Walking	1.6
	Paper handling	3.0
	Personal	5.1
	Sub-total	9.7

APPENDIX 6

THE DISTRIBUTION OF MOD(ARMY) SPONSORED PUBLICATIONS (COMPRISES BOOKS LISTED
IN THE ARMY CATALOGUE, MOD INSTRUCTIONS AND ORDERS)



APPENDIX 7

TYPICAL EXAMPLE OF DEFENCE COUNCIL INSTRUCTION (ARMY)
CONTENTS SHEET

DCI (Army) No.		Page No.
	PART I - ADMINISTRATIVE AND GENERAL	
246	Classification and roles of RAOC units	4
	PART II - SERVICE PERSONNEL	
247	Documentation - Next of kin	4
248	Family Income Supplements	4
249	Elections - 1974. Register of Electors - Registration of service voters	5
	PART III - OPERATIONAL AND TRAINING	
250	Royal Institute of International affairs- Short course.	11
251	Army Aircraft Tactical Development Unit - Tasks ...	17
	EQUIPMENT STORES AND SERVICING	
252	Documentation - Driver Training. Record Card - AF A 7643 (Revised).....	19
	PART V - BOOKS, CORRESPONDENCE, FORMS AND STATIONERY	
253	Publications issued, amended and cancelled	19

APPENDIX 8

TYPICAL SERIALS FROM A DISTRICT ORDER

(details fictitious)

ADMINISTRATIVE STAFF

146. DRESS - SHIRT SLEEVE ORDER

Reference : 'A' District Routine Order 97/73

I. Reference 'A' is cancelled wef 20 Sep 73

147. ROAD SAFETY PRECAUTIONS

Reference : 'A' Army Department Road Transport Regulations
(Army Catalogue of Publications Code No. 66775)

I. Five serious accidents have occurred in the last six months involving military drivers on the Continent of Europe.

2. Chapter 6 paragraph 399 of Reference 'A' clearly defines the precautions which are to be taken when Army vehicles are being used at night on roads in Belgium, Holland and West Germany.

154. LOST PROPERTY - DETECTOR MINE No. 5

I. A Detector Mine No. 5 was recently found near the railway station at Shrivenwick. Grid Reference NW 764579, Cumberland. It is currently in the keeping of HQ Eastern Command.

2. Identification Marks are as follows:

Probe - No 576

Power Unit - No 78

3. If any unit has lost the item of equipment, contact should be made direct to the Staff Captain 'Q' HQ Eastern Command. Tel. No. Colchester Mil (Colchester 465754)
Ext 358.

APPENDIX 9

TYPICAL EXAMPLE OF A PART I ORDER

BY

LIEUTENANT COLONEL J G GREEN OBE MC RAOC

COMMANDING

5 TRAINING BATTALION RAOC

Serial No 309

15 Nov 71

1. Duties

Battalion Field Officer 15 Nov to 19 Nov Maj B Adams RAOC

Battalion Orderly Officer Tue 16 Nov Lt O M Friend RAOC

Wed 17 Nov 2 Lt B Abrahams RAOC

Battalion Orderly Sergeant Tue 16 Nov Sgt Allen

Wed 17 Nov Sgt Andrews

Main Guard

Tue 16 Nov Sgt Harding

Wed 17 Nov Sgt Philips

2. Appointments Capt B D Smyth RAOC is appointed Unit Records Officer with effect from 15 Nov 71.

3. Junior NCOs Club Meeting A Junior NCOs Meeting will be held at 1745 hrs on Fri 19 Nov 71 in the Dining Hall, Maxwell Camp. All members not on Regimental Duties are to attend.

4. Discipline - Crash Helmets for Motor Cyclists Soldiers in uniform or plain clothes must always wear crash helmets when riding military or civilian motor cycles, or being carried as pillion passengers.

5. Congratulatory The following message has been received from GOC East Midlands Dist:

"For CO from GOC. My heartiest congratulations to all ranks concerned in winning six trophies including Coup des Dames. A splendid effort and a good example of driving ability for the rest of the Army".

6. Discipline - Complaints Personnel of this unit who wish to bring a grievance to the notice of the Inspecting Officer at the Annual Administrative Inspection on Tue 23 Nov 71 are to report to their Coy Comd by 1200 hrs Mon 22 Nov 71. Coys are to inform the Adjt as soon as any grievance is reported.

7. Board of Inquiry A Board of Inquiry composed as under will assemble at a time and place to be decided by the President to investigate the illegal absence and deficiencies of kit, if any, c 23549338 Pte Richardson M RAOC.

President - Capt B H Lightfoot MC RAOC

Members - Two subalterns to be detailed by OC A Coy.

Evidence is to be taken on oath. The attention of the Board is directed to MML, Board of Inquiry (Army) Rules and QR paras 784 and 785. Proceedings on AF A2 are to be forwarded to Bn HQ by Fri 12 Nov 71.

M POPPINS

Capt

Adjt

NOTICES

1. Army Rugby Union Cup Competition. In the second round of the above competition the Battalion defeated RE 4 Div 8 points to 3 points.

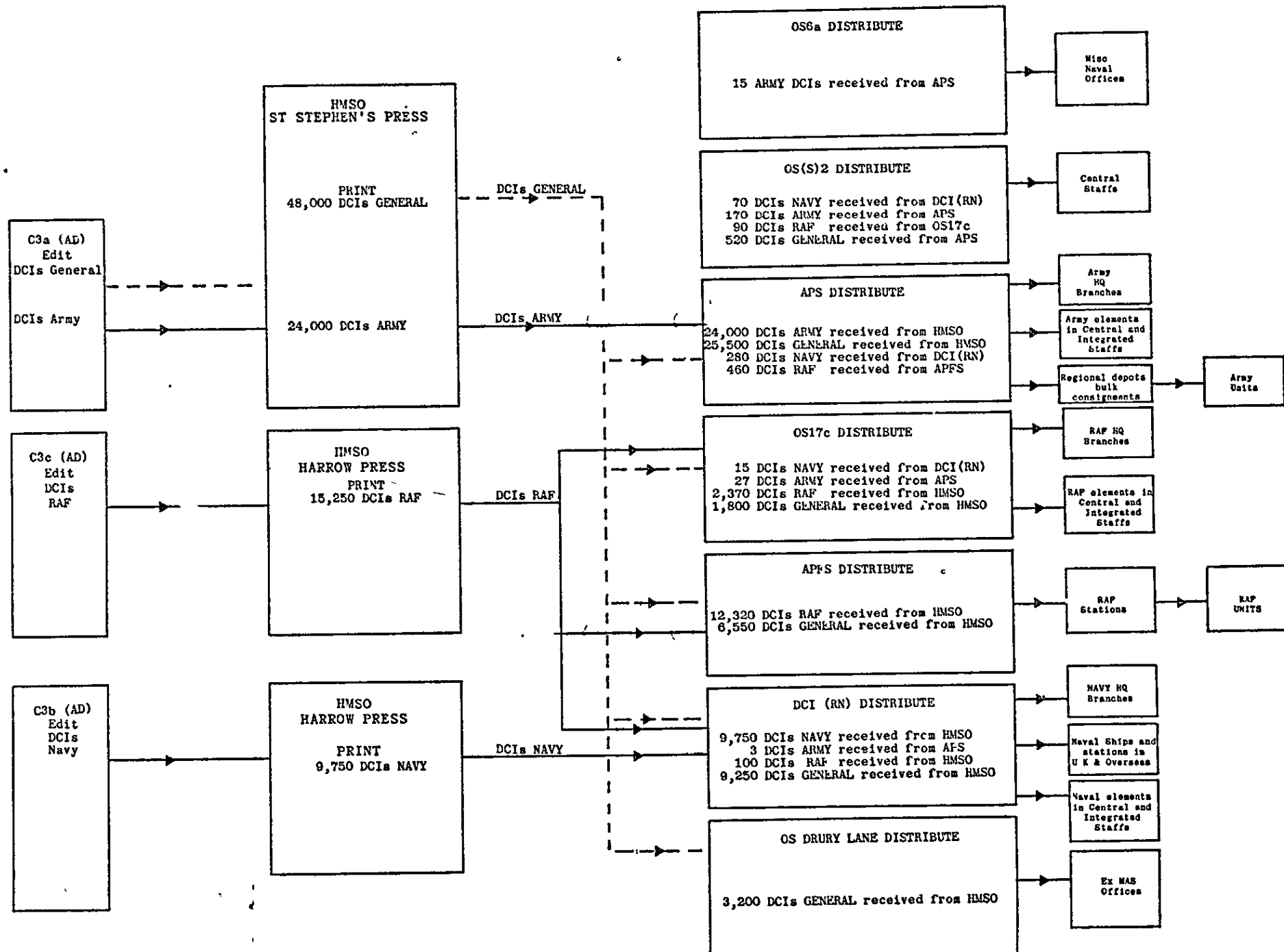
2. Dance. A grand dance will be held in the unit dance hall, Maxwell Camp on Wednesday 17 Nov at 2000 hrs. Dancing to "BENNY BALL'S JAZZMEN". Bar. Refreshments. Prizes.

Admission: 20p. Ladies 15p.

Transport leaves Town Hall 1930 hrs.

Return Transport leaves 0015 hrs.

THE DISTRIBUTION OF NAVY, ARMY, RAF AND GENERAL DCIs



TYPICAL EXAMPLE OF A PART II ORDER (SOLDIERS)

UNIT, ADDRESS & TELEPHONE No. 1 SKYEORIE Victoria Barracks WINCHESTER Hants Tel 98765				PART II ORDERS (SOLDIERS)										DATE 50 55 18 Oct 70		ISSUE 56 60 77		RAPUNO 67 72 C13162		SHEET 1 last			
1	8	9	24		25	43										44	49	61	66	73	78		
ARMY No.		RANK		NAME & INITIALS		P30		LEAVE BLANK										EFFECTIVE DATE					
2225418		CPL		WHITE A B														16 Oct 70					
Grant Lodging Allowance AF W4064 att'd																							
2374243		Pte		GREEN C H														17 Oct 70					
108 from 2 SKYEORIE																							
24195731		Sgt		BROWNING A														5 Oct 70					
27814322		Sgt		AMIE T G																			
From S Sgt Auth Inf(M) From 1423																							
22117653		Pte		SMITH D S B														1 Aug 74 17 Oct 70					
Waived term right. Option date AF B2139 signed																							
A T ATKINS																							
CPT																							
ADJT																							
THE PERSON WHOSE DUTY IT IS TO MAKE THE ABOVE RECORDS																							

APPENDIX 12

EXTRACTS FROM TRIAL INSTRUCTIONS ON REQUESTS MADE FOR INFORMATION FROM OUTSIDE UNITS (Author's MOD letter A/BR/1255 dated 5th JANUARY 1973)

Instructions for the Trial

4. During the month of February 1973, or for a period of 28 days starting on a date more suitable to yourself, you are asked to record the details of requests you make for information from outside the unit by telephone, letter or any other means, which satisfy the following conditions:

- a. You initiate the request for information during the period 0001 hrs on a Monday to 2359 hrs on a Friday.
- b. You are neither on operations nor on a training exercise.
- c. The security grading of the request and the answer are UNCLASSIFIED or RESTRICTED. (If the answer is subsequently found to have a different security grading the record should be deleted).
- d. The request is of a general as opposed to a highly specialised or local nature. (The type of request which might be asked by other units outside the local area should be recorded but those on professional medical, specialist repair etc. matters and local Brigade or Garrison information should not be included).
- e. If you contact the person whom you consider to be appropriate in your superior or subordinate headquarters/formation directly (eg. by telephone, teleprinter or wireless) and they are unable to give you the answer during the course of that conversation, (if the person you called was out or otherwise not available, details would be required).
- f. If you contact the local authorities about something which is not a purely local matter and they are unable to give you the answer during the course of that conversation.
- g. The request is not concerned with this trial.

5. If there is any doubt, the details of the request should be recorded. A list of typical requests for information is attached at Annexure 'A' showing which should be recorded, which should not and why.

Details to be Recorded

6. On each occasion when details are required, please answer the following questions concisely and legibly:

- a. The date you were requested to find the information.
(Or the date you decided you needed information to solve one of your own problems.)
- b. The information required.
- c. The date you started to try and get the information.
- d. The person (by appointment) and the unit/establishment from whom you requested the information.
- e. The means by which you requested the information
(telephone, signal, letter etc.)
- f. The date you received the required information.
- g. The means by which you received the required information.
- h. If you subsequently discovered that the information you had been given was incorrect, what was the effect?
- j. If the information was not received in time, what was the effect?
- k. Estimate the total nett working time, in minutes, that it took you to get the information. This would include such activities as:

- (1) Thinking about how to get the answer.
- (2) Searching in unit books, instructions etc.
- (3) Asking other people in the unit.
- (4) The time spent using the telephone.
- (5) The time you spent drafting, typing, checking letters, signals etc; requesting the information.
- (6) The time you spent on subsequent action looking in books, files etc.
- (7) The time you spent on other activities directly associated with obtaining the information.

Do not include time spent taking action on the information obtained.

- 7. Notes or copies of letters etc. should be attached if you consider that they will help to clarify the record.

TYPICAL EXAMPLES OF REQUESTS FOR INFORMATION WHICH COULD BE RECORDED

Manpower Examples

1.
 - a. Smith, who served with your unit in Hong Kong, has now left the Army. Prior to leaving Hong Kong, orders were published stating that anyone who left owing sums of money to local traders would be court-martialled. Smith did this. What action can be taken against Smith?
 - b. Is there a special form for applying for indulgence passages to Cyprus?
 - c. Brown states that he received disturbance allowance when serving with your unit in BAOR on a previous tour. Jones wants to know why he cannot get it in similar circumstances now.
 - d. As district staff officer responsible for a large number of units, you are required to produce a list of the Commanding Officers, their Christian names, marital status and numbers of children. (This could not be answered by a single telephone call.)

Training and Education Examples

2.
 - a. The CO wants you to organise an exercise which involves booking shipping space for heavy vehicles and trailers on cross channel ferries, driving APCs on low lying roads in Holland, and using the German autobahn on Boxing Day. (This involves several requests for information and each one would have to be treated separately).
 - b. The CO intends to practice a river crossing. He wants to know what historical information exists about opposed river crossings at night.
 - c. A lecturer is required to talk about supply problems in extremely cold conditions. (This is the type of question which would be referred to a 'Q' staff officer. He is unlikely to be able to answer it directly and will probably offer to find out or refer you to someone else. In these circumstances the details would therefore be recorded).
 - d. The titles of recommended books to be studied prior to taking the unit to Northern Ireland.
 - e. You particularly wish to send a man on a course but on telephoning Brigade/Garrison you discover that although their courses are fully booked, it might be possible to get on one elsewhere in the country.

Equipment Examples

3.
 - a. You urgently require information which might be given in an equipment schedule or user handbook but your unit does not possess these publications.
 - b. You are planning to move the unit overseas and need to know the range versus load details of a new aircraft which is coming into service.

- c. How many crates containing Stalwart gear boxes can you carry in a Stalwart?
- d. Who has the power to authorise you to spend £10 out of the CO's fund if you have already used your money for the year?
- e. What are the regulations concerning the storage of twenty gallons of luminous paint?
- f. By what means can you move a Chieftain tank from Naples to Rome?
- g. What are the addresses of the units and establishments that use the EVA radar?

General Examples

- 4.
 - a. The temporary messing officer has allowed the unit's consumption of meat to greatly exceed that permitted. What can be done to get more meat?
 - b. Military telephone numbers and extensions that have to be obtained from sources other than military or civilian telephone exchanges.
 - c. A claim by civilian workers for an additional bonus payment on account of the fact that others elsewhere are reputed to be getting one.

TYPICAL EXAMPLES OF REQUESTS FOR INFORMATION WHICH WOULD NOT BE RECORDED

- 5.
 - a. Information on the drugs to be used to counter an unidentifiable skin disease. (This is a highly specialised question which the medical officer would refer directly to a skin specialist).
 - b. The possible reason why the line scan on a radar equipment automatically switches off as the set warms up. (This is a highly technical problem which would be referred directly to the appropriate authority).
 - c. The CO asks you on a Saturday to find out the decorations of the American visitor he will be entertaining that night. (This request would not be recorded because you would have to initiate action outside the period 0001 hrs Monday to 2359 hrs on Friday).
 - d. Cpl Brown wants to go on the Brigade MTC1 course in December. Will that be possible? (This is purely a local matter).

IF IN DOUBT PLEASE RECORD DETAILS OF THE REQUEST

SUMMARY OF RESULTS FROM TRIAL MADE ON REQUESTS
FOR INFORMATION FROM OUTSIDE UNITS

SERIAL	APPOINTMENT	ESTIMATED TOTAL TIME SPENT ON REFERENCE RETRIEVAL IN FOUR WEEKS (MINUTES)	ESTIMATED TIME WHICH WOULD BE SAVED BY REFERENCE INFORMATION SERVICE (MINUTES)	COMMENTS
1	Captain Administrative post. Field Squadron RE	75	45	Probably typical for a junior administrative officer at a relatively slack time of the year.
2	Warrant Officer. Chief Clerk in an Engineer Regiment	0	0	Although many queries arose, they concerned personnel data and returns, not requests for references. Much of the information recorded is useful but not within limits specified by trial instructions.
3	Major. Officer Commanding Squadron RE	0	0	This officer commanded an independent unit. His position is similar to that of more senior officers and like them he would refer administrative queries to his second in command.
4	Major. Technical Quarter- master. Royal Artillery Regiment	300	200	An officer with many years of experience of his type of work. Requests for information from outside units varied from the authority needed to use additional quantities of paint to the intended use of items of equipment on automatic issue.

SERIAL	APPOINTMENT	ESTIMATED TOTAL TIME SPENT ON REFERENCE RETRIEVAL IN FOUR WEEKS (MINUTES)	ESTIMATED TIME WHICH WOULD BE SAVED BY REFERENCE INFORMATION SERVICE (MINUTES)	COMMENTS
5	Regimental Quarter- master Sergeant. Royal Artillery Regiment	40	20	Queries mainly concerned with equipment disposal instructions.
6 & 7	Two Captains. Administrative posts Royal Artillery	0	0	The lack of requests for information by officers employed on this type of work was surprising. Queries did arise but they were answered within the Regiments concerned.
8	Major Administrative officer in Brigade Headquarters	70	50	1. During the period of the trial three of the Brigade's major units were in Ireland. 2. The figures for the Major have been adjusted to allow for his being absent for half the trial.
9	Captain. Training officer in Brigade Headquarters	0	0	
10	Captain. Corps Headquarters' Staff Officer	0	0	These results are to be expected since the officer had direct access to the relevant policy makers and in particular those with the necessary financial powers.

SERIAL	APPOINTMENT	ESTIMATED TOTAL TIME SPENT ON REFERENCE RETRIEVAL IN FOUR WEEKS (MINUTES)	ESTIMATED TIME WHICH WOULD BE SAVED BY REFERENCE INFORMATION SERVICE (MINUTES)	COMMENTS
11	Warrant Officer Master Artificer. Army Apprentices College	180	150	Although he was primarily concerned with highly technical matters, this warrant officer had some responsibilities for general training.
12	Warrant Officer Superintendent clerk. Army Apprentices College	0	0	This warrant officer had been in the appointment for three years. He was very senior and possessed a wealth of experience. He stated that the only time he had difficulty finding the appropriate authority is when in direct contact with the MOD.
13	Equipment warrant officer. Military College	15	5	
14	Executive officer. Personnel Administration. Military College	250	180	This civil servant had to answer a very wide range of administrative questions including some on, for example, pay and allowances for foreign students. This type of job is unique and requires a thorough knowledge of publications, orders, general information sources and decision points.

SERIAL	APPOINTMENT	ESTIMATED TOTAL TIME SPENT ON REFERENCE RETRIEVAL IN FOUR WEEKS (MINUTES)	ESTIMATED TIME WHICH WOULD BE SAVED BY REFERENCE INFORMATION SERVICE (MINUTES)	COMMENTS
15	Major. Security Officer in Military School	0	0	The majority of the information being handled was purely local and classified higher than RESTRICTED or highly technical.
16	Major. Technical Officer in Military School	25	15	
17	Retired Officer. Staff Officer Appointments and discipline. District Head- quarters.	175	30	An experienced person who almost invariably refers queries to the Judge Advocate General's Office.
18	Major. District Staff Officer. Co-ordination and equipment management	700	530	This officer's time is mainly used up in dealing with a succession of queries on scales of issue, use of transport, duties in aid of a civil power and miscellaneous administrative schemes.
19	Retired Officer Staff Captain. Medical Services. District Head- quarters.	0	0	His problems concerned data retrieval, much of which is contained in the Worthy Down system but at present it has to be obtained from the units and headquarters.

APPENDIX 14

AN ANALYSIS OF THE USAGE OF BOOKS LISTED IN THE CATALOGUE OF ARMY PUBLICATIONS

- (a) Table 3 shows that officers, such as the second-in-command and adjutant, who are employed on mainly administrative tasks, spend approximately 50% of their working hours on office routine.
- (b) Table 3 does not take into account leave or sickness. An officer is entitled to 42 days privilege leave each year and in addition he will probably be given a total of 60 days at weekends and bank holidays. He therefore spends the equivalent of $\frac{1}{2}(365-42-60) = 132$ working days in his office, each year.
- (c) Appendix 5 shows that the engineer spends 6.9% of his total working time reading. This corresponds to about 10% of the time he is in the office. An Army officer is also a professional man and we will assume that he spends the same proportion of office time reading as does the engineer. This corresponds to 45 minutes a day.
- (d) The officer will spend at least half of the 45 minutes each day reading:
 - (1) Ten incoming letters and signals. See Section 5.4
 - (2) About ten letters written by other people the previous day. See Section 6.3.
 - (3) Newly arrived DCIs, Army, District, Garrison and unit orders.
 - (4) Special to arm and other publications which are not listed in the Army Catalogue.
 - (5) Letters of his own that have been for typing.
 - (6) Checking for errors in important letters that will be presented to his superiors for signature.
- (e) The remaining 20 minutes could be devoted to reading publications which are included in the Army Catalogue and to comprehending the effects of new amendments. Assuming a comprehension rate of 300 words per minute, the number of words read each year could therefore be $20 \times 300 \times 132 = 792,000$.
- (f) Table 4 showed that the average unit held 838 of the publications listed in the Army Catalogue and it was estimated (Section 5.1) that each contained an average of 50,000 words. Because of the amendment rate and the brain's inability to retain rarely used knowledge for long periods of time, it would be necessary for each publication to be read once every two years. This would mean reading $\frac{1}{2} \times 838 \times 50,000 = 20,950,00$ words a year.
- (g) A comparison between (e) and (f) above, shows that the officer can only be aware of about 4% of the detailed contents of the publications listed in the Army Catalogue that are sent to his unit.

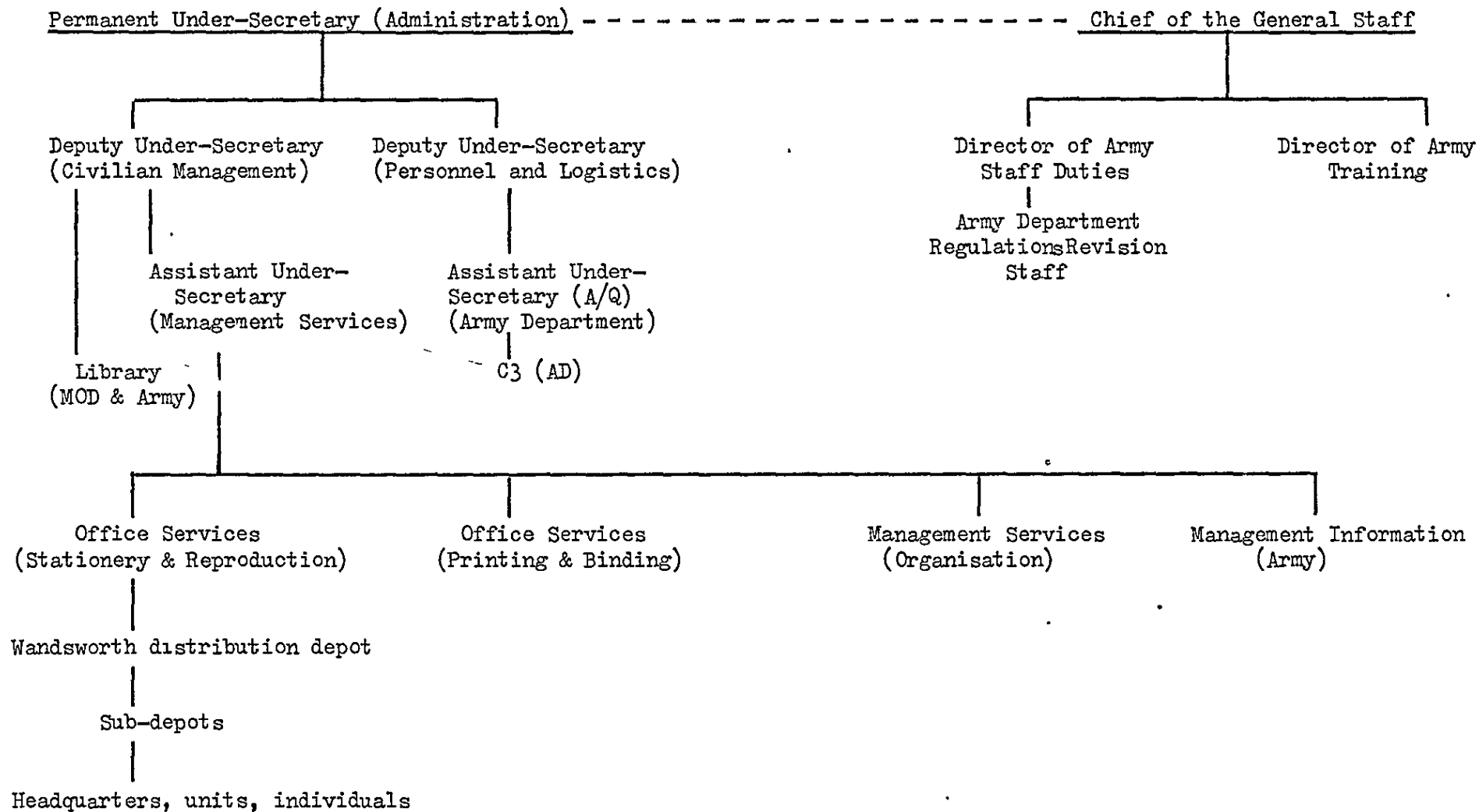
APPENDIX 15

THE MAIN STAGES IN PUBLISHING A MOD SPONSORED PUBLICATION

Before a MOD sponsored publication can be ready for use, it will have been through some or all of the following main stages:

- (a) Approval to write given.
- (b) Scale of distribution established.
- (c) Financial provision.
- (d) Advice sought on preparation of manuscript as regards format, indexing, illustrating and printer's requirements.
- (e) Allocation of identification number.
- (f) Preparation of material. If more than one author involved, a sponsor branch will probably be nominated to co-ordinate.
- (g) Clearance of copyright and security matters.
- (h) Completed manuscript edited.
- (j) Approval to print and promulgate given. Where appropriate, this includes obtaining permission to use the Permanent Under-Secretary's facsimile signature.
- (k) Manuscript to printers.
- (l) Proof reading and associated tasks.
- (m) Printing.
- (n) Promulgation and distribution.
- (o) Cataloguing.

OUTLINE ORGANISATION FOR THE PRODUCTION AND DISTRIBUTION OF MOD (A) SPONSORED ADMINISTRATIVE MATERIAL



APPENDIX 17

THE PROPOSED FRAMEWORK FOR BOOKS AND ADMINISTRATIVE AND GENERAL TOPICS IN THE ROYAL NAVY

The following is an extract from Annexure G of Man S (Org) Report No 80 (26)

'The outline framework is as follows:

- a. Group A - Queen's Regulations for the Royal Navy. Five multi-part volumes.
- b. Group B - Instructions and Information for the Welfare of Naval Personnel and Families. One volume of eight parts. .
- c. Group C - Messing, Canteen and Trading Facilities. One volume of seven parts.
- d. Group D - Naval Guide to Relations with Non-Service Organisations. One volume of five parts.
- e. Group E - Instructions for Obtaining Works and Related Services in Fleet Establishments. One volume of three parts.
- f. Group F - Royal Naval Ceremonial Handbook. A one-part volume.
- g. Group G - Handbook of Honours, Awards and Prizes. A one-part volume.
- h. Group H - Naval Meteorological Handbook. A one-part volume.
- j. Group J - Naval Expedition Training. A one-part volume.
- k. Group K - Handbook of Miscellaneous Legal Matters. Provisionally a one-part volume.'

APPENDIX 18

SOME NOTES ON THE USE OF MICROFORM FOR MILITARY ADMINISTRATIVE MATERIAL

The ideal application is one where viewing equipment costs can be relatively low. This occurs if a large amount of material is sent to a small number of addresses. As was stated in the main text however (Section 11.4), the Army is having to obtain equipment to interpret commercial microforms and this could also be used for reading some administrative material, a typical example might be the MOD Telephone Directory.

Comments on the usual criticisms of microform are as follows:

- (a) Power supply problems - there is no problem when working in an office.
- (b) Handviewers cause eyestrain - they need not normally be used on administrative work.
- (c) Destruction or loss of microforms when operating in the field - not normally applicable in peacetime.
- (d) Browsing is difficult - as stated in the main text (Section 8.1) the quantity of material is such that the majority will have to be used for reference, not general reading.

The advantages of microforms as compared with paper are:

- (a) Approximately 97% saving in storage space.
- (b) Small storage space makes items more accessible and hence easier to retrieve than when using conventional paper methods.
- (c) Studies show that it is frequently more cost effective to use microforms than paper publications.
- (d) Distribution is quicker and cheaper.

