DEFENCE FORCE JOURNAL

Board of Management

Air Commodore R. C. Rowell RAAF (Chairman)
Captain A. L. Beaumont RAN
Colonel F. P. Scott DSO
Group Captain J. M. Chesterfield RAAF
Mr R. H. Mills

Managing Editor

Mr M. P. Tracey

Illustrations by members of the Army Audio Visual Unit, Fyshwick.

Printed and published for the Department of Defence, Canberra, by Ruskin Press, North Melbourne.

Contributions of any length will be considered but, as a guide, 3000 words is the ideal length. Articles should be typed, double spacing, on one side of the paper and submitted in duplicate.

All contributions and correspondence should be addressed to:
The Managing Editor
Defence Force Journal
Building C Room 4-25
Russell Offices
CANBERRA ACT 2600
(062) 65 2682 or if unanswered 65 2935
Contents

3. Editor's Comment.

4. Letters to the Editor.

   LTCOL N.A. Jans RAA and LTCOL R.E. Thornley RAINF.

    Donald Ross Jender BSC Hons., M.A.S.

    Major G.L. Cheeseman R.A. Sigs.

33. Network analysis and the Training Officer.
    Captain B.D. Copeland RAAEC.

42. Surprise can be Achieved in War Despite Advances in Electronic Warfare and Surveillance Devices.
    Major D.M. Poynton RAINF.

53. Book Review

58. Index 1980.

Permission to reprint articles in the Journal will generally be readily given by the Managing Editor after consultation with the author. Any reproduced articles should bear an acknowledgement of source.

The views expressed in the articles are the authors' own and should not be construed as official opinion or policy.

Contributors are urged to ensure the accuracy of information contained in their articles: the Board of Management accepts no responsibility for errors of fact.

© Commonwealth of Australia 1980
HMAS *Adelaide* is pictured undergoing her builder's sea trials off the west coast of the United States.
The newly constructed All Saints Chapel, sited at the base of Mount Stuart in Lavarack Barracks, Townsville appears on the front cover of this issue.

The chapel was constructed by sappers of the 21st Construction Squadron, under the control of the 19th Chief Engineer Works.

* * * * *

The Secretary of the Department of Defence, Mr W. B. Pritchett, and the Chief of the Defence Force Staff Admiral Sir Anthony Synnot, have approved the awards of Defence Fellowships for 1981.

Captain Walter Samuel Bateman will study "The Strategic Importance of Australia's Overseas Trade". His research will be supervised at the University of New South Wales, Duntroon. Captain Bateman will soon become Director of Naval Force Development.

Major Wariek John Graco will study "Military Competence". His fellowship is tenable at the Strategic and Defence Studies Centre, Australian National University. Major Graco is currently employed at Headquarters, Training Command, Sydney.

Wing Commander Neville Charles Bleakley will prepare a paper at the Canberra College of Advanced Education entitled "Matching the Educational Attainment of Applicants to the Requirements of Technical Training in the Australian Defence Force". Wing Commander Bleakley is an Occupational Analyst in the Establishments Division of the Department of Defence.

The Defence Fellowship Scheme was introduced in 1978 to enable Service and Civilian members of the Department of Defence to undertake up to one year's study and research of defence-orientated subjects at a tertiary institution.

Brigadier M. B. Simkin, a retired senior Army officer has been appointed Honorary Colonel of the Australian Army Aviation Corps.

Brigadier Simkin is currently the Executive Director of the Royal Flying Doctor Service in Queensland.

The Army Aviation Corps was formed in 1968 and has its Operational Headquarters at Oakley in Queensland. Army aviation units are equipped with Bell light observation helicopters, and Pilatus Porter and Nomad fixed wing aircraft.

* * * * *

The Director of the Royal Australian Navy Nursing Service, Commander Patricia Vines, has retired after a 21-year association with Navy nursing.

Commander Vines began her nursing career as a civilian nursing sister at HMAS Cerberus, Victoria in 1959. She has served in a number of Navy establishments including HMAS Creswell, HMAS Leeuwin, HMAS Tarangan, on Manus Island in Papua New Guinea and HMAS Harman.

Commander Vines plans to retire at Mt Eliza, Victoria.

The new Director of Nursing Services in the Royal Australian Navy is Commander Jane Greenslade, who has been a nursing sister since 1964.

* * * * *

On behalf of the Board of Management and the Staff of the Army Audio Visual Unit, I wish you a Happy Christmas and a Prosperous New Year.
Dear Sir,

I found Air Commodore Funnell's research article both useful and tantalising. Tantalising because its frequent returns from the abstract to the familiar continually prevented me from putting it down. Useful — sarcasm aside — because it highlights a vexed and often emotional question — how should a military officer's skills be balanced to the greatest benefit of Australia's defence?

The writer has performed a valuable service in setting a scene which has become familiar to many of us — the military officer wrestling with a new task in a foreign environment.

Nevertheless one wonders whether the means of finding the solution is not more complicated than identifying the problem. Of course the lack of local research presents the first problem — may fortune stay us from the mistake of deriving policies from researches performed in other cultural and sociological environments!

Closer to home, if we are to identify the 'skills' a military officer must possess to operate effectively in a bureaucratic environment, we need to prepare our ground carefully. What, for instance, are the 'common' skills which, if inculcated in a junior officer, would ensure his fitting easily into any bureaucratic environment? What, for instance, are the appropriate non-military 'skills' common to, say, a serviceman formulating policy in Defence Facilities, a contingency planner in JMOP Division and an analyst in FDA? If such 'common' skills were identifiable and readily teachable, little major surgery would be needed to the existing career development programmes. This has not been performed — at least, not to the apparent satisfaction of the senior public servants who have placed themselves in judgement on these matters. This fact alone provides strong evidence that these 'common' skills might be either unidentifiable, or unteachable, or both.

I do not for one moment suggest that the bureaucratic postings visited upon military officers do not demand additional skills, beyond 'combat' skills. They most certainly do. I question only whether there is a clear solution, and if there is, whether it would carry less penalties than benefits.

Air Commodore Funnell has suggested the provision of a career pattern for officers who show potential, implying that the needed bureaucratic skills, even if not identifiable or teachable are perhaps attainable through experience. There is validity in this thesis, but the officers involved in such a plan would become members of a readily identifiable body. Would these officers form the new 'elite'? Would, on the other hand, the 'combat' officers assert their own elitism? Either course if likely to create problems for morale and efficiency — we have already had experience in this field. Furthermore, would a young officer, whose motivation for joining was 'combat' oriented, relish the advice that he was, as a recognition of his high abilities, to enter the bureaucratic stream? I do not know the answers to these questions, but answer them we must before we committed ourselves to such a career policy.

To return to the identification of common skills, it is apparent, of course, that the mechanical skills of communication, management, organization, and the broad understanding of political and strategic matters are needed for all bureaucratic appointments. But by and large, these skills and disciplines are already provided for within most service officers' careers, either formally or from experience. What, then, is the 'magic ingredient', which transforms combat oriented servicemen into effective bureaucrats?

This ingredient is, in my view (and this is based on hard experience) a state of mind; one which is not easy for everyone to achieve. It includes unending tact, patience and understanding. This for a serviceman is demanding enough in itself, but the most difficult task is at the same time to maintain the dogged determination which characterises the successful field officer. I suggest that it is this state of mind, when combined with those mechanical administrative skills, which are both identifiable and teachable, which should be the goal of the intendedly successful military bureaucrat.
This call for a ‘state of mind’ on the part of military officers raises, in my view, the least analysed and most difficult problem of all. We (the military), including myself and Air Commodore Funnell, have been raised from the beginning of the Bland era on one unshakeable article of faith (folk wisdom?): that the military bureaucrat, to be successful, must understand and even imitate the civilian bureaucrat. Not until quite recently has anyone seriously or publicly urged or sponsored an education programme designed to enable a defence civilian to work effectively in a military environment. (Australian servicemen outnumber Defence civilians by five to one at JSSC, for instance). Particularly disappointing in this regard is the unseemly rush, by those servicemen most vocal on these issues, to engage in sometimes strident debate which focusses almost exclusively on their colleagues’ alleged lack of vision, enlightenment and education. We are, I believe, all standing on the same side of a one-way mirror, talking only to each other and refusing to look through to the other side.

If it were true that military officers have been ‘permitted’ to serve at Russell Hill for their own advancement and not for the good of Australia’s defence, then perhaps there would be no obligation on civilian officials to adjust to their military colleagues. This is of course not true. The Department of Defence is a unique environment for the serviceman and public servant alike, because, respectively, of each others’ presence in the day to day work environment. Until we can understand that basic fact, no unilateral action on the part of the Services is likely to achieve a satisfactory adjustment. Indeed, Air Commodore Funnell politely acknowledges this problem in his thesis of the self-fulfilling nature of civilian criticism of servicemen. Undeniably, the most productively successful civilians in Defence are, for the greater part, those who have taken it upon themselves to understand the military mind. Why can this observation never be made in public? Are we somehow afraid to mention successes? Are successes poor material for scholastic study?

The problem, Air Commodore Funnell has suggested, is a problem of ‘the military in transition’. It is more than that. It is a problem of the Department of Defence in transition. It can be solved completely only by the Department of Defence, and not by the military alone.

I cannot pretend even to have addressed all the issues; let alone to have produced any workable solutions. There is, nevertheless, a need for frank, unemotional debate, not only on the question of the bureaucratization of the military but also on that of the ‘militarization of the bureaucracy’. If such an exchange can in any way cause the convergence of the civilian and military states of mind, then it might indeed contain the seeds of solution to the problem. These comments reflect only a personal view, but one which has been born of several years of experience and reflection. It represents only one speech in the debate. Our thanks are due to Air Commodore Funnell for a most comprehensive balanced and stimulating keynote address.

C. M. V. ROFF
Croup Captain.

THE R.O.D.C.

Dear Sir,

Major Cheeseman’s reply to Lt. Col. Robbins (DFJ No. 23, July/August 1980) smacks more of propaganda than academic objectivity. His assertion that the officer corps believes that national economic or political problems can be solved by the use of force is specious and his illustrations more fanciful than true.

Contrary to his assertion there is documentation to prove that the then CGS was not in favour of committing Australian forces to South Vietnam, but, as is expected of the military in a democracy, once the political decision had been made he made every effort to ensure that the army would efficiently carry out the task assigned to it.

General Andre Beaufre defined strategy as the art of applying force so that it makes the most effective contribution towards achieving the ends set by political policy. He also stated that political action must be designed to ensure the success of military action. It cannot be denied that in 1972 the military did make an effective contribution towards achieving the ends set by political policy but a military success was turned into a political defeat. It would also be reasonable to say that ‘liberal’ continued on page 14
IN PURSUIT OF EXCELLENCE
or
IDENTIFYING UNIT TRAINING NEEDS

BY LT COL N. A. JANS, ROYAL AUSTRALIAN ARTILLERY AND LT COL R. E. THORNLEY, ROYAL AUSTRALIAN INFANTRY

INTRODUCTION

Could military training be improved? Are we getting the most for our training dollars spent on collective (i.e. unit and higher) training? When we pat ourselves on the back for ‘another exercise well done’, how much balance is there, in such judgements, between objectivity and subjectivity?

Is our training concentrating on what is important, or is it constantly covering old ground which has been selected for traditional, rather than rational reasons? In short, just how good is Army training?

When some of these questions were asked of a large gathering of officers at Enoggera in April 1979 (among whom were commanding officers and sub-unit commanders of units of the 6th Task Force), their reaction was quite clear. There is, said these officers, much which needs to be improved in military training. Moreover, they added, a scheme advanced by the writers of this article would be of great help to commanders in planning and conducting military training (1). This article and another to be published in the next edition of this journal, are about this scheme.

The ideas discussed in their two articles are based on the philosophy of ‘the systems approach to training’ (2). The article show how the philosophy can be extended to collective training to guarantee an increase in the efficiency and effectiveness of formation and unit preparation for war. The scheme is similar to, and can be used in conjunction with, that of the ARTEP (The Army Training and Evaluation Programme) but adds extra dimensions to ARTEP.

The structure of the two articles is as follows:

- This article briefly presents the concept of a systems approach to training and covers the first step of the general outline of training shown in Figure 1. It describes a technique which enables a commander (at any level) to identify what he wants his command to be able to do.

- The next article (3) will describe what a commander should do once he has identified his training priorities and written the training objectives to be achieved. It covers the second, third, fourth and fifth of the steps shown in Figure 1.

A SYSTEMS APPROACH TO TRAINING

A systems approach to training is a particular approach to the design; management and conduct of training, aimed at ensuring that training gives maximum benefits to units at minimum cost. It involves five basic phases (Shown in Figure 1):

1. The training need is identified and analysed.
2. A specification is derived to describe the results which training must produce to support this need (i.e. the end-point of training).
3. Training is designed so as to achieve the need at minimum costs.
4. The training is conducted.
5. Information is gathered on the success of training and is used to pinpoint deficiencies. (This process is called ‘validation’).
A systems approach to unit training involves applying these five phases to the training of formed units. Although many of the procedures discussed have been employed for years, the manner in which they can be fitted together with increased precision, results in an innovative concept of training which deserves careful study by all those responsible for collective training.

**Why Adopt a Systems Approach to Unit Training?**

Inherent in every command decision is the need to provide the correct answers to three questions:
1. What results must I achieve? (or, what do I want to do?).
2. What is the present state? (or, how far am I from being able to achieve the desired results?).
3. How can I best bridge the gap between the present and desired situation?

When applied to unit training these three questions become:

**Question 1. What Should Units, Down to Section/Detachment Level, Be Able to Do in Order to be Successful in Their Roles in Peace and War?**

Given the recent changes in Army operational doctrine, the answer to this question is not as simple as might first appear. Left to individual unit or sub-unit commanders, there would almost certainly be undesirable differences in the ultimate goals which units set themselves. Figure 1 shows that the first step in a systems approach is to analyse the operational need, and as the second step, to derive precisely stated training objectives. By this means, a single standard is communicated to all members of the Army (be they regimental, staff, training or weapons research and doctrine) in terms of precisely what is required in each unit down to section level. While all inefficiencies will not disappear as a result, they will certainly be minimized because everyone in the Army will be working to achieve the same objectives. However, as will be shown in this article, a commander may choose to set standards which exceed this common level. Further, because success in combat roles is influenced by success in peace time preparation, commanders should give as much thought to what they need to be good at in this preparatory phase as they do to tasks for operations.

**Question 2. What are the Current Capabilities of Each Unit down to Section/Detachment Level?**

Training objectives produced by the systematic analysis of unit training will establish the criteria against which the current proficiency of each unit down to section level can be measured. In this way, training objectives used in the systems approach are expressed with sufficient precision to guarantee consistency and reliability of assessment: that is, so that there is little danger of an assessor forming the wrong con-
Conclusion about a unit’s present state of training as measured by that unit’s ability or lack of ability to achieve its training objectives.

Question 3: Within Available Resources, How Can Each Unit Down to Section/Detachment Level Bridge the Gap Between the Desired and Current Capabilities?

Training objectives, derived by the systems approach, have two major qualities which allow the commander to determine the most economical way to close any existing gaps in operational proficiency.

Firstly, by evaluating the present proficiency of the unit or its individuals against the required proficiency, one can determine where deficiencies in performance lie. Training can then be devoted to eliminating these deficiencies: that is, training corrects what is wrong and is not wasted on what is already correct.

Secondly, by breaking the unit objectives down into sub-unit, section and individual objectives (as will be shown in the next article), the commander sees precisely each of the intermediate stages which lead to ultimate proficiency. Further, a characteristic of any training objective is that once it is stated, the methods by which it should be taught are usually very apparent.

IDENTIFYING TRAINING NEEDS

It is the business of every commander, whatever the size of his command, to specify what he wants his command to be able to do and to achieve. We call this step the identification of training needs because, by such a specification, the commander implicitly establishes priorities for individual and collective training in his command.

In the recent past, the military profession has tended to overemphasize the conduct of training to the neglect of the identification of training needs. We have been too concerned with ‘doing things right’ rather than with ‘doing the right thing’. In making this assertion, it is not intended to belittle the value of imaginative and well run unit training programmes. Obviously, however, much of this value is eroded unless the programme is directed towards clearly established priorities and is appropriate to the organization’s present capabilities. The general neglect of the step of identifying unit training needs is reflected in the curricula of Army officer schools: the techniques of this important skill are not taught. This is a serious deficiency in the professional skill repertoire of the modern officer.

A QUESTION OF PHILOSOPHY — IN PURSUIT OF EXCELLENCE

It is assumed that every commander wishes his command to be better than average, or more than adequate. In key or critical areas, the commander would wish for excellence, but rarely has ‘excellence’ been defined, either by or for commanders. Without a precise definition of what constitutes ‘excellence’ it is difficult for commanders to recognize how far their command is falling short and precisely in what areas they are deficient.

In general ‘excellence’ can be defined by the commander in terms of a set of tasks which his officers and men must be able to achieve, each to be performed under specific and realistic conditions, and each to certain standards: in short, by specifying training objectives in the ‘performance — conditions — standards’ form used in the Army Training System. Examples of unit collective training objectives are shown in Figures 2 and 3. But from where are commanders to get their objectives?

One source of objectives is the unit ARTEP; the Army Training and Evaluation Program. These exist for many units already. The ARTEP is a document which specifies in training objective form, all of the important and frequently performed team tasks done in a particular kind of unit in selected Corps. One advantage of ARTEP is that all like units have a common benchmark in their important collective (team or group) tasks. Furthermore, a unit or sub-unit commander can analyse these objectives and derive individual training objectives using the process described in the next article. (4)
Collective Unit: Field Battery

**Performance.** Engage a target with indirect fire.

**Conditions.** A fully operational field battery:
- a. on any survey state;
- b. with FACE or FABS;
- c. guns calibrated;
- d. meteorological message available;
- e. With following ammunition per gun:
  1. 14 rounds (Quick).
  2. 5 rounds HE (MT).
  3. 3 rounds HE (CVT).
  4. 5 rounds (smoke), and
  5. 5 rounds (WP).
- f. FO party in position;
- g. a fire support requirement from the supported arm commander (who is not to display a knowledge of gunnery greater than that which could be expected);
- h. a simple tactical scenario that will result in a fire mission with the aims of complete or partial neutralization; and
- i. targets to be in the top traverse limits of the centre of arc.

**Standards**
- a. The fire for effect must meet the supported arm commander's requirements in terms of accuracy and tactical needs.
- b. The observer's plan for adjustment and fire for effect to be appropriate to the tactical and technical constraints of the mission, and the time taken to effectively engage the target must not be such as to prejudice the achievement of the aim of the mission.
- c. No action is to be taken which would prejudice the safety of our own troops.
- d. Speed of response is to be as follows:
  1. **Initial Round.** Receipt of target location in BCP to report of 'ready' or 'shot' — 60 seconds (FACE) or 90 seconds (FABS).
  2. **Corrections.** Receipt of correction in BCP to report of 'ready' or 'shot' — 30 seconds.
  3. **First Round of Fire for Effect.** Receipt of order in BCP to report of 'ready' or 'shot' — 45 seconds, or 80 seconds if ammunition is MT, CVT or Smoke.

Collective Unit: Rifle Section

**Performance.** Conduct a reconnaissance patrol.

**Conditions.** On foot, at night, given a reconnaissance patrol order which specifies information required and tactical situation. Objective is to be 5 to 10 km away from company location. Route is to be patrolled by 'enemy'.

**Standards.**
- a. **Time.** Patrol must leave within five minutes of specified time, and must return within the specified time.
- b. **Information.** In debrief, at least half the patrol members must report all information requirements specified in the patrol order. This information must be accurate to within the tolerance specified by the trainer(1).
- c. **Detection.** Patrol must complete its mission without sustaining excessive casualties, as judged by the DS. This will be accomplished by achieving at least the minimum acceptable score established for the problem scenario on patrol check list(2).

1. Tolerances are specified relative to the information required. Information might include size, activities, location and equipment of enemy; tolerances might be ±10% for size, within 100 metres for locations, etc. The commander will specify these according to his ultimate standards and those he feels will challenge his men's abilities at this stage of their training.

2. The ideal reconnaissance patrol is one which completes its mission undetected. However, the commander, in designating a realistic standard, determines criteria which answers the question: if detected, would the patrol have completed its mission in the time allowed and without sustaining excessive casualties? Some of the considerations which could be used to develop these criteria are:
- a. where the detection occurred (en route, at, or returning from the objective);
- b. why it occurred; and
- c. what the patrol did after detection.

The commander could then compile a weighted checklist to evaluate the patrol (e.g. if detection occurs en route to the objective, lose 10 out of 100 points) depending again on the standards he wishes to impose at this stage of training.
ARTEP has already made an impact on collective training in the Army, and it will probably continue to do so. It is an excellent basis for collective training in units. However, there are some aspects of training in which ARTEP gives the unit commander little assistance:

- Important tasks which are non-operational (such as the function of 'training' itself) are not specified in ARTEP; and
- Standards for the ARTEP training objectives reflect a common corps standard which the individual commander may wish to exceed.

There is an alternative approach which, since it avoids both these deficiencies, is an excellent complement to ARTEP. For reasons which will become evident, it will be referred to as the 'Corporate Planning' approach to the identification of training needs.

### The 'Corporate Planning' Approach to the Identification of Training Needs

The 'Corporate Planning' approach to the identification of training needs is analogous to a simple military appreciation. It is adapted from a general method used by corporate planners in industry and commerce. The way the approach works in business will be first described, followed by its application in the military.

**Three Steps.** Many business planners do their planning in three steps:

1. **Mission.** The overall objective, aim or mission of the corporation is defined. For example:
   - to double last year's profits,
   - to make a 15 per cent return on investment,
   - to capture 30 per cent of the market or product, or
   - to attain industrial relations stability.

2. **Key Results Areas (KRA):** The KRA are identified. These areas of activity in which, to achieve the mission, it is essential that either:
   - excellent performance is achieved, or
   - poor performance is avoided.

   These are the key areas which require excellent results. They may be in production, marketing, industrial relations or research and development. These KRA will vary between corporations depending on their position in the market place, the structure of the firm and many other factors.

3. **Targets and Tasks Become Objectives.** The targets which must be met in each KRA are set, and the tasks which must be done to meet these targets are identified. These become the targets and tasks of specific teams and individuals within the corporation: eg., if the mission is 'to capture 25 per cent of the market', a target for the sales team may be 'increase sales by 50 per cent'. This in turn leads to targets for personnel departments (recruiting and training) for marketing, production, finance, etc. Each of these targets and tasks becomes an objective for a team or individual.

### Benefits

The use of this approach brings four major benefits:

- **Priorities.** Because the method is designed to identify the goals and areas of vital interest above all else, priorities tend to be clearly revealed.
- **Relevance.** The whole thrust of the corporation's tasks and activities will be directed towards achievement of the mission. A pyramid, or hierarchy, of objectives is formed, with the mission at the pinnacle and overlapping sets of targets and tasks at the lower levels.
- **Autonomy and Motivation.** The group objectives at a particular level become the individual objectives for the manager at that level. He will tend to have considerable autonomy because he is told what to achieve, not how to achieve it. This autonomy often enhances job involvement, motivation and efficiency.
- **Monitor Progress.** The objectives set at each level can be used to monitor progress at that level. In this way, problems are identified early, and timely remedial action is taken.

### The Analogy to Military Training Needs Analysis

The 'Corporate Planning' approach described above is easily adaptable to the military situation. In fact, the military commander applies the same steps as does the corporate planner:

**Mission.** The military commander, whether his command is at peace or war, must identify what it is he wants his command to be able to do. All activities are then directed towards the achievement of the mission,
training being one of these activities. The
mission may be very personal and subjective
or it may result from the directive of a
superior formation or unit headquarters.
Either way, and whether it is to be used in
the planning of training or not, the mission
must be stated. Some examples of missions
which a commander might select are:

1. For a field artillery regiment . . . ‘To
move, shoot and communicate better
than any other regiment in the Army’.
2. For a task force headquarters . . . ‘To
achieve the highest possible readiness for
operations’.
3. For a signals unit . . . ‘To provide
reliable communications on the next
major exercise’.
4. For any unit . . . ‘To win all inter-unit
sporting competitions’.

Each of these missions has pros and cons as a
statement of the commander’s intent. In the
first, the Commanding Officer of the regiment
has set a standard of implied excellence, ex­
cellence being judged relative to other units. In
the second mission, the standard is in terms of
feasibility — what is ‘possible’. In the third, the
unit commander has decided to concentrate on
a specific future task, and to direct his priorities
to achieving that task. In the fourth, he may
find that he has missed the point. There is no
hard and fast rule which determines the best ap­
proach, or philosophy — each commander
must make his own decision. The important
thing is that he does state an explicit mission,
and communicates this to those responsible for
planning his operations and training.

Key Results Areas (KRA) Having stated his
mission, the commander asks himself: in what
areas of activity is excellence essential if the
mission is to be achieved, or where poor per­
formance would be disastrous in terms of mis­
sion achievement? This helps him to identify his
KRA. Example KRA’s for infantry battalions
A and B are shown below:

<table>
<thead>
<tr>
<th>Infantry Battalion A</th>
<th>Infantry Battalion B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dress</td>
<td>Reconnaissance</td>
</tr>
<tr>
<td>Drill</td>
<td>Mobility</td>
</tr>
<tr>
<td>Sport</td>
<td>Firepower</td>
</tr>
<tr>
<td>Support to Charities</td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td>Morale</td>
</tr>
</tbody>
</table>

These areas become the unit’s priorities in
training. Anything else is of secondary im­
portance and must be treated as such. ‘Drill’,
for example, is of secondary importance in
Infantry Battalion B; its priorities lie elsewhere.
(Note, however, that such things as dress, drill
and sport may be adjuncts to the achievement
of other KRA — such as morale. However,
they should be seen in their correct perspective,
as adjuncts and as means to an end, not as ends
in themselves.)

Task and Objectives. Within key results
areas, a number of tasks will need to be achiev­
ed if the overall mission is to be accomplished.
These tasks will be identified by the com­
mander, using a combination of the following
methods:
• Examination of ARTEP task lists.
• Examination of doctrinal pamphlets, which
list the roles and tasks of the unit.
• Brainstorming, to identify tasks which:
  1. were done in previous campaigns or
     exercises, but are not given in pam­
     phlets;
  2. are not done now but, due to anticipated
     changes in the operational and
     technological environment, may be done
     in the future; and
  3. are non-operational tasks which are im­
     portant (see further discussion below).

From these tasks, training objectives are
derived. These are similar in format to those
contained in the unit ARTEP: they contain a
statement of the performance to be achieved,
the conditions under which it is demonstrated,
and the standards by which it will be judged.
However, very importantly, they differ from
the objectives given in ARTEP in two ways.
Firstly, tasks may be derived for individuals,
as well as for teams. ARTEP concentrates on
team tasks. However, within the unit, some in­
dividual tasks may be as important as team
tasks (the task of the commander in organizing
training, for example) and these deserve inclu­
sion in the list of vital functions in the unit.
These tasks may be non-operational tasks, as
outlined below. Secondly, in his pursuit of ex­
cellence, standards may be as tough as the com­
mander requires. This toughness can be
attained in two ways:

a. By increasing the difficulty of the conditions
   under which the task will be done. For exam­
   ple, the commander may require a task to be
   done using less than the usual equipment or
   personnel, or with vague information to
   start with, or by introducing external factors
   which increase the complexity or difficulty
of the task. As an example of this latter point, a field battery may be required to effectively engage a target with indirect fire whilst its perimeter is probed by enemy patrols.

b. By increasing the criteria by which the performance will be judged to be effective. For example, the commander may specify exacting standards of accuracy, response, clarity of communications, etc.

When the tasks have been written in training objective form, they are used to identify deficiencies in present unit performance, and as a consequence, training targets for the unit are set (as will be shown in the next article).

**Type of Tasks**

The question naturally arises: will this process result in anything which is significantly better than the way commanders presently assess their training needs? At first glance, it may appear that, after working through the ‘Corporate Planning’ approach, most formations and units would simply derive all the collective tasks which they presently perceive as comprising their role — so why bother?

The answer is that, whilst application of the approach is likely to derive most of the collective tasks which units presently attempt to do, and would be unlikely to devalue the importance of basic skills and procedures, such as appreciations, orders, patrolling, etc, it is likely to uncover four other types of tasks which are also important. The first are those tasks associated with different tactics and procedures to those presently used which are developed through consideration of Australia’s changed strategic and defence position. For instance Robert O’Neill and his colleagues at the Strategic and Defence Studies Centre at the Australian National University advocate the need for different operational groupings based on all three Services. The second type are those tasks associated with different tactics and procedures to those presently used which are developed through consideration of Australia’s changed strategic and defence position. For instance Robert O’Neill and his colleagues at the Strategic and Defence Studies Centre at the Australian National University advocate the need for different operational groupings based on all three Services. The second type are those tasks associated with different tactics and procedures which presently exist which may be done under significantly different conditions. In an artillery field regiment for example, the task of fire planning might be performed quite differently depending whether or not the unit was subjected to electronic warfare. The third and fourth types of tasks are non-operational but are still important. Consider the tasks which staff directorates, Army schools, and like organizations need to do to achieve their missions. In particular, staff directorates may have a less clearly defined or definable role, to use as their basis for action, than do field units. The application of the “mission-KRA-tasks/targets” sequence of the ‘Corporate Planning’ approach will be beneficial to these organizations in their organizational manpower planning. Finally, the approach is likely to highlight vital tasks which are done, or should be done, in units in peacetime (and often in war) but, since they are not covered by precise doctrine or direction, receive inadequate attention in training. One of these is the function of ‘training’ itself. Another is the recruitment and retention of personnel. This is particularly important in Army Reserve units, as a recent job analysis of the Army Reserve subalterns showed. A third example is ‘public relations’; not that kind which appears in the Army newspaper, Triad and similar publications, but that kind which is used to project a particular kind of unit image for various purposes.

In short, many tasks by which a unit becomes ‘excellent’ are not necessarily obvious from superficial examination. Reliance on tradition, that which is taught at Army schools, and that which is learned from personal experience is unlikely to provide the training answers that will enable the Army to achieve its corporate mission in peacetime.

**Likely Benefits**

The approach described above has obvious relevance to the planning of training. It is likely, however, that its application can be extended to other problems in the organizational and manpower planning area. The benefits which will accrue from use of the ‘corporate planning’ approach are:

- The early identification of priorities, and their ultimate expression in training objective form, gives the commander clear goals for training.
- The use of objectives — ‘what’ to achieve, not ‘how’ to achieve — is an aid to delegation and, consequently, to personal development.
- Using objectives permits concurrent training to be planned, lending to an efficient use of time. (This is discussed fully in the next article).
- The use of training objectives, which reflect the real priorities of unit and clearly show what is required of it, serves as the basis for
IN PURSUIT OF EXCELLENCE OR IDENTIFYING UNIT TRAINING NEEDS

fair and valid assessment of the unit and its officers.

- The emphasis on excellence leads to high standards and high morale.

Relationship of the "Corporate Planning" Approach to the ARTEP Approach

The "Corporate Planning" approach to the identification of training needs is not meant to replace the ARTEP approach, but the former does appear to have two advantages over the latter. Firstly, the "Corporate Planning" approach can embrace non-operational tasks. ARTEP has been deliberately designed to cover the operational tasks of units, and its standards are intended to be both universally achievable and uniform. The 'Corporate Planning' approach complements ARTEP by giving the commander a tool to identify important non-operational tasks or standards which go beyond the minimum acceptable. Further, since many units don't yet have an ARTEP document, the techniques described in this article can be used by commanders of such units until ARTEP becomes available. The basic content of ARTEP specifications can also be validated using these techniques.

Figure 4 shows how ARTEP and the 'corporate planning' approach could be used in concert.

CONCLUSION

This article has described an approach to the identification of collective training needs. It is a necessary prelude to the other steps of the systems approach to unit training, which are described in the next article in this series of two.

The approach borrows a concept developed for and used by corporate planners in business organizations. It requires the commander to establish quite clearly what he wants his command to achieve and the general areas of organizational activity which are vital in such achievement. It lends itself well to those commanders who are interested in achieving excellence. Whilst it can be used by units which do not yet have an ARTEP document, the approach is also a complement to ARTEP. It is a management technique which has been neglected in officer training in recent years and one which is sorely needed.
LETTERS TO THE EDITOR (see also pages 4 and 5)

intellectuals played a major part in the ensuing political debacle. It would be a matter of surprise if this situation was not ardent discuss by members of an officer corps who were personally involved but it is totally misleading to suggest that these officers believe that the answer to the problems in South Vietnam lay solely in military action.

Major Cheeseman also appears to be rather confused and out of touch with the world situation when he discusses war. Everyone is aware of the dangers of a major conventional conflict escalating into a nuclear conflict but, as the last thirty years have shown, this has not stopped the use of force to achieve political ends. It has not stopped wars; it has only limited them and each year has produced its annual quota of fighting. The reason for the existence of military forces is to deter other nations from using force to gain political objectives and where this fails, as a last resort, to fight. A military force incapable of fighting is a useless waste of the nation’s treasure and resources.

Any normal soldier who has experienced war has, if he did not have it before, a personal abhorrence of war and it may astonish Major Cheeseman to know some 2,400 years ago a combat commander, a primitive if you will, stated that to subdue the enemy without fighting is the acme of skill. He knew this was not always possible and he went on to state that should the recourse to armed force be necessary then it should be applied so that victory was gained in the shortest possible time, at the least cost in lives and effort and with the infliction on the enemy of the fewest possible casualties.

If Major Cheeseman had read Sun Tzu’s Art of War he would have realised that there has always been a need for military officers who are not constrained by undue conservatism. Indeed such officers have regularly appeared on the stage of history.

Whilst agreeing that the environment of Russell Hill is peculiar and there is a need for officers to be trained to cope with it we must guard against such officers becoming so bureaucratised as to assume the peculiar perspective of some of the denizens of that area.

It is difficult to realise that there is even one lone serving officer who believes that the basic requirements of a combat commander are gallantry and unquestioning obedience. Gallantry without stupidity certainly but unquestioning obedience? Perhaps for the organisation of coups, the production of martyrs or the indulgence in unthinking thuggery.

It must be admitted that Major Cheeseman has done the armed forces one great service: He has underlined the necessity for officers to become conversant with the specialised skills required to be able to operate effectively in the peculiar environment of Russell Hill. The continued on page 41
new capabilities, old and new problems

By Donald Ross Jender BSC Hon., M.A.S.

Introduction

A new class of weapons has entered defence planning — precision-guided munitions (or PGMs, also known as “smart weapons”). These represent only one facet of the impact of technological change on military affairs. PGMs have been seen as the saviour of a Western defence faced with numerically superior hostile forces in several areas. Enthusiasts portray PGMs leading to dramatic savings in U.S. military spending, through measures such as reducing U.S. military manpower from 2.1 million to 1.4 million, leaving a “prudent military structure”. U.S. Defense Department officials recognise the valuable “force multiplier” which advanced technology can represent, but are not so extravagant in their assessments of the economies which could result.

The virtues of PGMs have been widely discussed — less has been said about their deficiencies, and the complexities which advanced technology weapons have associated with them. These matters are the subject of this article.

The Important Technologies

Technological progress has always been a major factor in military affairs. Guided weapons are a relatively recent innovation dating from World War II. It is the combination of precision now achievable, and widespread application to air, sea and land missions which makes PGM development exciting, and probably revolutionary.

The modern PGM is a weapon which has benefited from advances in a number of technologies — microelectronics, guidance, sensors, warheads and propulsion. The “smartness” of “smart” weapons arises from the degree of computational and decision-making capability which large-scale integrated circuits can pack into the small space available in a tactical weapon.

The sensors which PGMs carry can home in on laser reflections, radar emissions and heat (infra-red radiation). Others are guided to target by a human operator using TV pictures, infra-red images or optical tracking. Human guidance can be communicated by signals sent along wires, or transmitted by radio. Single missiles of the appropriate type can destroy or disable aircraft, runways, radar stations, ships, bridges and tanks. Only targets which are very large, or designed to withstand nuclear attack, can resist a hit from a suitably chosen PGM.

The Weapon as Part of a System

There are good reasons for speaking of a weapon system, rather than thinking of the weapon alone. System in the management context is defined as

"a set of interrelated components that function together within constraints toward a common purpose." 4

Ensuring the efficient use of a modern weapon system requires major management efforts, from design to combat use.

Weapon system design requires attention to various factors:

- Intelligence about actual and projected target identification, characteristics, vulnerabilities, and possible enemy countermeasures.
- Knowledge of present weapon technology, research and development (R&D) directions, and possibilities for innovative approaches.
- Development of combat doctrine for weapon use.
- Training of users.
Logistic requirements of the weapon system and its users.

Optimal production and distribution in relation to threats and budget demands.

In the combat use phase, effective management involves the following:

- Surveillance of threat situations and enemy forces, and processing of this information, to provide warning of time and type of combat encounter.
- Communication systems for warning information and combat commands.
- Optimal choice of weapon for engagement postulated.

Not only is each of these elements important in itself, but also the effective integration of them into a smoothly functioning system. This places high demands on command, control and communications (C3) functions. The sequence of events which leads to destruction of an enemy target begins with target identification. U.S. forces are seeking to improve coordination of target information through development of the Battlefield Exploitation and Target Acquisition (BETA) project, and the Airborne Warning and Control Systems (AWACS). These systems produce processed information which is to be communicated to users over facilities such as the Joint Tactical Information Distribution System (JTIDS), a joint service effort to provide.

"jam-resistant, secure, integrated communications, position-fixing, and identification capabilities to tactical forces. It will be the primary tactical data distribution system for passing critical real-time information to large numbers and types of force elements."

This should have the effect of providing tactical forces with processed information relevant to their situations, to facilitate the best response to the threat detected. It is likely that as PGMs become more sophisticated, a need for faster, more advanced and expensive support systems will also emerge, to enable the capabilities of new PGMs to be fully realised.

Not Playing the Game

It is widely argued that PGMs will make a major, if not saving, contribution of the ability to the North Atlantic Treaty Organization (NATO) to defend against a Warsaw Pact attack. In particular, NATO anti-tank guided missiles (ATGMs) are portrayed as offsetting Warsaw Pact superiority in tank numbers, among other things. Although these assertions may have some substance, the full story is more complex.

In a NATO-Warsaw Pact war, the capabilities of Western (notably U.S.) PGMs could have the unfortunate effect of precipitating early Soviet use of chemical and/or tactical nuclear weapons. The considerations involved are analogous to those behind thinly veiled NATO threats to use tactical nuclear weapons to stop a Warsaw Pact armoured attack. Each side seeks to overcome an advantage thought to be held by the other (Soviet tanks, NATO PGMs) by resorting to the more destructive nuclear option. Chemical attack would be particularly disruptive to lightly protected troops armed with ATGMs. At present the Warsaw Pact has an advantage in both offensive and defensive chemical warfare capability.

The Soviet use of tactical nuclear weapons would initially cripple ATGM operations by mobile infantry and helicopter units in the immediate combat area, while having less effect on armoured units equipped and trained for operations in a nuclear environment. Even after nuclear explosions, radiation could still be dangerous to personnel, and dust may complicate the effective use of various ATGMs. Although NATO might prefer to fight a "clean" war, without chemical or nuclear weapons, this should not be translated into an assumption that the opposition has a similar preference, especially if this "clean" war scenario favours NATO technology and tactics.

Although this "not playing the game" argument has been developed in the NATO-Warsaw Pact context, it is applicable to any situation where the opponents have dissimilar forces or capabilities. Each will seek to fight on terms which most favour its strengths, and to avoid circumstances which enable the enemy to exploit its own strengths. For each side there is a delicate planning problem in ensuring that the enemy cannot or will not force the conflict into its favoured scenario. This is one difficulty involved in a heavy NATO reliance on a defence based on PGMs.

Countermeasures

Apart from unsporting use of nuclear or chemical weapons, an opponent can resort to an array of less dramatic actions to counter PGMs. There is great scope for action-reaction
situations, as typified by the electronic countermeasures (ECM)—electronic countercountermeasures (ECCM) example. Pursuing this line of development has advantages for technologically advanced countries, particularly the U.S., the world leader in electronic innovations. Electronic warfare (EW) equipment will greatly improve the effectiveness of a force. However, technological lead is not of military value until systems are deployed, and this takes time. As in other areas, a qualitative advantage may be offset by a superior quantity of less sophisticated equipment.

There is also reason to believe that competition in this area will be expensive. The technology is rapidly changing, as one development is checked by an opposing counterdevelopment. Such a situation is not conducive to economies in defence spending.

Much attention has been directed to the use of ATGMs, mainly in relation to the great number of Warsaw Pact tanks, and to the results of the 1973 Middle East war. The ATGM as a defensive weapon is at a disadvantage where the target is not visible until fairly close. This situation often obtains at night, in urban areas, in hilly, wooded country, and in areas where mist is common. Combat in northern Europe may involve any of these circumstances. Armoured forces can exploit these conditions by appropriate choice of time and place. They can also make the life of the ATGM user difficult by use of camouflage, smoke, and aggressive suppressing fire on actual or likely ATGM positions.

Systems to improve PGM capability can be developed, such as infra-red imaging and seeking systems for night use, and helicopter-mounted ATGMs for mobility. However, the helicopter is subject to attack by various anti-aircraft systems, some of which are themselves PGMs. Thus a dynamic situation will continue to exist in measure-countermeasure; this is not generally compatible with reducing military expenditures, a result claimed by some to follow from PGM deployment.

While the defensive applications of ATGMs are clear, their offensive utility is less obvious. If the best defence is a good offence, then a mobile attacking capability must be retained. This at present means tanks and aircraft to spearhead offensive missions. Both are expensive items. A combination of these, PGMs in large numbers, countermeasures and support systems will not be acquired cheaply.

The need for surveillance, intelligence, communications and management support for PGM systems has been noted earlier ("The Weapon as Part of a System"). The C^3 functions are important because they enable forces to be more effectively employed. However, "The force multiplier effect of modern, adaptable command and control systems is crucially dependent on reliable, rapid and flexible communications, powerful information processing capabilities to handle the massive flow of information needed to support military operations, and techniques which optimize the use of information to manage crisis and formulate decisions." If these associated functions are required in order to obtain the best use of existing forces and weapons, then it follows that enemy actions which disrupt these arrangements will have a powerful "force divider" effect. This accounts for the growing interest in "counter-C^3" capabilities. These take the form of EW to degrade communication systems, direct attack on critical points in a C^3 network, and battle tactics which emphasise high speed to outpace the decision-making apparatus of the opposition. Thus to preserve the effectiveness of PGM systems, it is necessary to defend or strengthen ancillary functions which become attractive targets. This means that the cost of the weapon component of a PGM system is only a part of the whole weapon system cost — the interlocking nature of a modern weapon system means that costs of peripheral items must also be taken into account before a meaningful statement about "more costly, less costly?" can be made.

The developing interest in counter-C^3 capabilities has implications for military doctrine. Soviet forces operate under a highly centralised command and control system. They can react to counter-C^3 threats by hardening facilities and employing redundant features (which they have done). An alternative or additional measure is to decentralise command and control (a notion to which Western forces are more disposed). It is impossible to say whether a heavily protected, redundant, centralised network will operate more effectively than a less protected, less centralised one. The increasing
sophistication and complexity of modern military systems increases uncertainty about their performance in a real battle. The definitive answer may only be known after that crucial real battle.

The Larger National Security Issue

Recent international events remind us again that some important national security problems do not have easy military solutions, regardless of the sophistication of one's weapon technology. Events such as the revolution in Iran, fluctuations in the supply of oil, and foreign intervention in distant parts, are governed more by traditional geographical, political, economic and diplomatic factors than by sophisticated military power. The litany of developments perceived as detrimental to U.S. interests grows ever longer — Angola, Iran, Afghanistan. To judge by remarks made in connection with the debate in the U.S. over the second Strategic Arms Limitation Treaty (SALT-II), important segments of U.S. opinion see these developments as highly relevant to U.S. national security. Nevertheless, no plausible suggestions have emerged as to how the force of U.S. arms could have turned these situations to U.S. advantage.

Vietnam was perhaps the outstanding example in which superior technology alone did not prevail, when coherent strategy and well thought out political objectives were absent. In Vietnam, social and political factors, and the style of enemy action combined to frustrate the successful application of undoubtedly superior U.S. military technology. That technology could produce impressive tactical successes, but did not overcome the broader disadvantages under which U.S. forces operated. Superior technology or numbers do not alone guarantee results favourable to one's national interest. Indeed, if a fascination with these factors leads to neglect of strategic, diplomatic, economic or political avenues of action, then technology can contribute to the development of a situation unfavourable to one's interests. An astute opponent will decline to fight "fairly" (where military technology and tactics are applicable), and will resort to more subtle manoeuvres (in areas where the U.S., institutionally and psychologically, seems less able to compete successfully).

Political Issues Connected with Weapon Technology

The military importance attributed to advanced technology weapons creates political dilemmas for suppliers and receivers, beyond those normally present in weapon procurement. Advanced weapons can be seen as a means of altering regional power relationships — either to achieve a balance, or to seek superiority (at times depending on one's point of view). Typically a nation seeks to offset numerical inferiority with technological superiority. A prominent example is Israel's effort to maintain its position relative to the more numerous Arab forces by acquiring advanced U.S. weapons, and by developing its own. This strategy has a venerable history, for the same considerations motivate the intense U.S. search for continual innovation and improvement in military technology. Some of the political complexities of weapon transfers are well illustrated in the U.S.-Israel case. Although the U.S. would seem to have the dominant position, political circumstances in the Middle East and in the U.S. limit the ability of a U.S. administration to impose its will on Israel.

There are many reasons why the capabilities of advanced technology weapons are emphasised (perhaps to excess). These weapons do have a major military impact. Beyond this, the need to justify their acquisition encourages enthusiastic descriptions of their value. A good image abroad makes foreign nations eager to buy them, and so may reduce acquisition costs for the producer nation's armed forces. The example of Israel notwithstanding, in certain circumstances the prospect of supply of these weapons is seen to give political leverage. For instance, it is reported that U.S. supply of conventional arms to Pakistan may be used as a means of discouraging Pakistani efforts to produce nuclear weapons. This is on the basis that the capabilities of conventional weapons should be sufficient to satisfy the security needs of Pakistan. It is unclear whether Pakistan shares this point of view.

As an additional consideration, the supplier of weapons has a continuing influence on the buyer through the latter's need for spare parts and ammunition. This dependency increases with the sophistication of the weapon system relative to the industrial capabilities of the receiver nation. Presumably the implications of
accepting U.S. weapons will be clear to Pakistan.

Conversely, there are situations where the purchaser has a continuing influence on the supplier. The new Iranian government has been hinting that it may consider selling some of its now unwanted advanced U.S. aircraft to parties other than the U.S. This is an endeavour to induce the U.S. to buy back the aircraft at a sufficiently high price. If (as in Iran) the supplier had an extensive personnel presence in the purchaser's country, these people could become implicit or explicit hostages in the event of trouble. This situation represents an additional potential complication in supplier-purchaser relations.

A curious political problem arises from one of the paradoxes of national security politics in the U.S. It is necessary to argue that the nation is well defended, while also justifying the need for further defence expenditures to resist growing opposition capabilities. Thus one is led to argue that a rough force balance exists in Europe because the technological superiority of NATO forces offsets Warsaw Pact numerical superiority in various categories. One effect of this is to stimulate opposition developments to counter this real or supposed technological lead. The argument also tends to undermine the Western case presented in the Mutual and Balanced Force Reduction (MBFR) talks, where the Western side justifies the need for greater Eastern reductions on the basis of greater Eastern numbers. The Eastern side naturally picks up Western statements about superior NATO technology and reads them back, as justification for the Eastern position. Thus Western statements about advanced military technology (representing a transitory situation, in many cases) undermine Western diplomatic positions.

PGMs and the NATO-Warsaw Pact Situation

Much interest focuses on the impact of PGMs on the NATO-Warsaw Pact force relationship. It is often argued that NATO PGMs serve to offset Warsaw Pact numerical advantages. Opinion on this is not unanimous. Even if NATO now enjoys some advantage in PGM capabilities, it is far from certain that this can be maintained. The Soviet Union has already deployed capable PGMs which capitalise on Soviet production strengths (even if these weapons are not as sophisticated as Western models). In the European theatre, the Warsaw Pact has the option of countering PGM forces in the ways discussed earlier ("Not Playing the Game" and "Countermeasures"). Perhaps of equal importance, the Soviet Union can elect to deploy more PGMs and countermeasure systems than NATO (this would be consistent with Soviet practice in the past). There comes a stage when most technological advantages will succumb to superior numbers. In the end, it is not technological advantage as such which wins battles, but real weapons, effectively employed.

Weapon Technology Issues for Small Nations

The design and manufacture of advanced technology weapons is the province of a comparatively few large, industrially advanced nations. However, for various economic and political reasons these producer nations are prepared to supply weapons to smaller states of lesser industrial capability. The implications of this for both supplier and receiver can be quite complex, especially in the longer term.

The U.S. often supplies weapons to others in the hope of creating a strong ally whose policies will be consistent with U.S. security objectives in the ally's area. This philosophy was a strong motivation in supplying the Shah of Iran with sophisticated military equipment. He, in addition to being the putative policeman in the Persian Gulf, was thought to be in a position to pay for his numerous acquisitions. The complication in this case, as in others, was that the allied government was not stable in the long run. As the example of Iran demonstrated, U.S. military technology is not always sufficient to overcome social and political upheavals. The consequence may be U.S. arms in unfriendly hands. This does not yet appear to be a major worry in the Iranian case, but the fall of Vietnam left the opposition in possession of a large arsenal of U.S. weapons (although not a very viable one in the long term, because of the deterioration of the equipment due to lack of maintenance and spare parts). The U.S. has been concerned about the consequences of Vietnam supplying its inherited U.S. weapons to third parties. The worst consequence of this type of development would be sophisticated military technology later being employed against its supplier (but probably
only as a last resort, unless spare parts and support were available elsewhere).

**Weapons and Alliance Cooperation**

When dealing with foreign nations who are military allies, and have indigenous arms industries, the vexed questions of standardisation and interoperability arise. This is of most concern in NATO, a number of whose members produce their own advanced technology weapons. There is conflict between the national desire to maintain indigenous industries (particularly technologically advanced ones), and the alliance need to lessen logistic problems through a degree of weapon standardisation. These complications extend to both weapons and support functions such as communication systems. The practical consequences of this for the U.S. and European NATO nations have been involved coproduction arrangements, and attempts to promote the adoption of one member’s weapon system by other members, preferably all (the so-called “two-way street”).

**Weapon Issues for Australia**

What are the circumstances of Australian defence which are relevant to a decision to acquire PGMs? The country is surrounded by water, has a large area (7.7 million square kilometres) and long coastline (36,835 kilometres). The population is small (14.2 million) and much of the land is sparsely inhabited or completely uninhabited. Neighbouring countries have far larger populations (e.g. Indonesia 139.3 million). Australia’s full-time military forces are small in number (Army 31,883; Navy 16,298; Air Force 21,689), but generally well paid and educated. Australia is a modern industrial nation, but lacks an indigenous production capability in the more sophisticated and exotic manufacturing areas. At present no South-East Asian country has the capacity to invade Australia. Further afield, Japan, China and to a lesser extent India could perhaps in time threaten Australia with long-range ballistic missiles, but have shown no interest in doing so, and, except for China, have no current capability in that area. In any event, an Australian defence against ballistic missile attack is ruled out on the grounds of the enormous cost involved.

Thus there are aspects of the Australian situation (geography, population, development, armed forces) which seem to favour acquisition of PGMs. In particular, a long-range stand-off naval missile would be of great value, since any significant invasion threat to the Australian mainland must necessarily come by sea. These considerations presumably underlie the decision to procure the U.S. Harpoon 60 nautical mile range anti-ship missile for Australian ships and aircraft.

The need for a surveillance capability to accompany PGMs has already been noted (“The Weapon as Part of a System”). For an anti-ship mission, the requirements are not as critical as in other situations, since ships are comparatively large and slow-moving. The development of a long-range surveillance system such as the Jindalee over-the-horizon (OTH) radar should be of value in monitoring the ocean area to the north of Australia. Technical means of surveillance, and an intelligence capability to provide strategic warning, will improve the capability of Australian Harpoon missiles in an anti-ship mission. One should not, however, become complacent about this, since the Normandy invasion of World War II shows that the activities of even a large sea-borne invasion force can be masked with uncertainty, given sufficient skill and effort. In addition, the technical measures available for confusion and countermeasure are now far more sophisticated.

**Australia’s Larger National Security Interests.**

It is worthwhile considering what are Australia’s national security interests, broadly defined, and how they might be threatened. A capability to destroy ships at sea is useful for an island continent, but does not assure national security if physical invasion is not the major threat. A fascination with military technology may be a manifestation of the perennial desire to prepare for the last war. Australian interests can be severely damaged by initiatives other than physical invasion.

Three possibilities merit consideration: interference with shipping (leading to disruption of trade); attack on shore installations from the sea; the landing of small special operations groups.

A campaign against merchant shipping in the Australian area would be less amenable to countering with PGMs than an invasion force.
since shipping incidents would be scattered in place and time. A small number of naval ships and aircraft, even with PGMs, would not be able to prevent losses caused, for instance, by hostile submarines. A convoy approach might enable the capabilities of PGM-equipped forces to be focused on defending a group of ships.

A defence against enemy submarines attacking coastal oil refineries with cruise missiles would be difficult to implement. The targets would be separated by large distances, and even the most sophisticated defending vessel can only be in one place at a time. Countering this type of threat would depend more on having a sufficient number of anti-submarine warfare platforms than on very exotic armaments.

An enemy strategy of landing small raiding parties (in a manner analogous to Palestine Liberation Organization operations against Israel) would not be checked by small Australian defence forces equipped with long-range PGMs. A defence would depend on more traditional military operations of search at sea, and neutralisation of any groups which land.

The point of these observations is that PGMs are a possible solution to only a small portion of conceivable Australian defence problems (and possibly not the most likely ones). For certain scenarios PGMs represent excessive firepower and expense compared with enemy capabilities. An enemy policy of dispersal, concealment and small operating units would render irrelevant much of the capability of PGMs (though support functions such as surveillance and C^3 would still be of great value). As has been found before, there are no panaceas in defence planning, and only rarely are great economies possible through technological change.

Finally, military technology offers no answer at all to the threat posed by non-military actions such as trade embargoes. Nations have been attracted to this option in recent times, and some of the successes enjoyed may make it a more popular tactic in the future.

Conclusions

Eight conclusions emerge from this article:

1. It is misleading to speak of PGMs as weapons alone. In battle they will be part of a weapon system whose effectiveness will be influenced by doctrine and employment tactics, and by the surveillance, intelligence and C^3 facilities which support it. Thus the real capabilities of PGMs in massed battle will not be known until there is a massed battle. Data on single round kill probabilities should be treated with circumspection.

2. PGM technology is presently very dynamic, but so is countermeasures development. As the limits of sensor and microelectronics technology are not yet in sight, the dynamism will continue, so the detriment of efforts to attribute a final advantage to offence or defence, tank, aircraft or missile.

3. A fascination with the technical capabilities of PGMs should not deflect attention away from the larger national security issues, some of which are of overwhelming importance, and not amenable to any military solution, regardless of technological sophistication.

4. The fate of present generation PGM systems in a nuclear or chemical war environment is uncertain. There is probably cause for some pessimism about PGM effectiveness in these situations.

5. There is debate over whether or not PGMs will result in military postures requiring less manpower, or less highly trained manpower. It would not be wise to count on economising in either area at present.

6. The weapon component of a PGM system, when considered alone, seems to give great capability at relatively modest cost. When all the relevant costs of a PGM system are counted, and the dynamic nature of technical developments taken into account, it seems more likely that the greater capability will be purchased only at a substantial price.

7. The most sophisticated, most capable PGMs can be produced by only a handful of industrially advanced countries, but may be operated by a considerably larger number. More modest weapons could be produced by middle rank industrial nations, and operated by far more. A country such as Australia has the geographic situation, industrial level and military structure to make acquisition of certain PGMs attractive.
8. As a final historical word of caution: "Rarely do the peacetime assessments of weapons technologies stand up to the test of war. If there is one major lesson from the historical perspective, it is this."  

NOTES
6. These and other U.S. tactical C3I (C and Intelligence) programs are described in Harold BROWN (U.S. Secretary of Defense), Department of Defense Annual Report, Fiscal Year (FY) 1979 (February 2, 1978) pp. 263-278.
13. For a succinct statement of why tanks are not obsolete (and why the U.S. Army wishes they were), see Percy A. PIERRE (U.S. Assistant Secretary of the Army (Research, Development and Acquisition)), Equipping the United States Army: A Statement to the Congress on the FY 80 Army RDTE and Procurement Appropriations, pp. 11-12.

BOOKS IN REVIEW
The following books reviewed in this issue are available in various defense libraries:
Shawcross, William, Sideshow: Kissinger, Nixon and the Destruction of Cambodia, Sydney, Hutchinson.
While the recent changes in Australia's strategic environment and the need for greater self-reliance in defence have been understood for some time, the translation of these fundamental changes into a coherent national strategy and new force structures has not occurred. Because of the difficulties involved in predicting either likely threats to the nation or an exhaustive range of contingencies which Australian forces could face, our present strategic policy does not provide sufficiently detailed guidance from which a preferred defence posture and its associated structures can be derived.

As a result of this lack of detailed guidance, the force structures that are currently in existence, and which in some cases are demonstrably unable to meet the defence objectives that have been identified, continue to be upgraded, and major equipments and weapons systems continue to be purchased without any substantive justification in terms of our strategic requirements. Under such conditions, the primary advantage of a 'no threat' environment, that of having time to devise and gradually implement a more appropriate national strategy with its attendant force structures, is being wasted. Furthermore, as decisions are made to purchase key replacement equipments and weapons systems, any subsequent attempt to adopt a new defence posture which excludes these equipments will be increasingly resisted.

One approach to the problem of force structure planning, which avoids the difficulties of having to consider specific contingencies or threat scenarios, is that suggested by Langtry and Ball which utilises the concept of disproportionate response in order to deter potential threats from developing. Such an approach would enable us to effectively control Australia's threat environment by forcing upon a potential aggressor lengthy lead times for the development of essential offensive capabilities and so give us time to prepare an appropriate defensive posture should it become necessary.

The essential aim of deterrence is to prevent a likely adversary from carrying out an action by making him believe beforehand that the cost of his action outweighs the likely gains that he may achieve. While more familiar as a strategic nuclear posture, the preventative principles underlying the theory of deterrence can also be applied to conventional warfare. The advantages of deterrence in conventional warfare however may not be as clear cut as in the nuclear case. As Langtry and Ball have noted:

"Deterrence strategies in this (conventional) situation require that closer attention be paid to the determination of likely costs and benefits from particular actions, of the value schedules of potential adversaries. This is a continuous task, necessitating accurate and timely intelligence collection and assessment, detailed contingency planning and flexible force development."

Because deterrence aims to influence an adversary's intentions, the basic strategic policy and force structures associated with it may be quite different to those used in the actual defence of the Australian mainland or its national interests. Since there is always a chance...
that deterrence will fail, however, the ultimate force posture that is selected will need to incorporate both deterrent and defence elements where the relative mix will be determined by factors existing at a particular time. In the context of our current strategic environment, Langtry and Ball have argued that:

"... the balance of a force posture could well be tilted in favour of deterrence at the first level, when the likelihood of threat is low and potential enemies lack the military capability to match their aggressive intentions. As threatening intentions are perceived to be reflected in the potential enemy's emerging force structure, however, then deterrent forces would have to be developed along more balanced lines to be credible in the context of Australia's defence." 6

Whether a deterrent or defensive posture is adopted as the basis of Australia's defence planning, there remains the complex task of collecting the mass of intelligence and other information that is needed to monitor potential adversaries and to establish and update the data bases required for contingency planning and the analysis and development of our own force options. In our future operational environment, with its complex rules of engagement and national consequences of error or miscalculation the command authority must also be able to forecast, with some certainty, the likely implications of a force deployment as well as to be able to co-ordinate a range of remotely located resources.

The magnitude of this task is illustrated by Figure 1 which shows the defence infrastructure that may be required if Australia's defence forces were re-organised to reflect an integrated approach to defence planning based on a deterrent and a continental defence element.7 For the infrastructure to perform efficiently, information will need to flow radially between superior headquarters and their peripherals as well as move laterally between different sectors. The direction of information flow, its mode of presentation and the required responses would all need to be specified for each component of the organisation for each contingency or level of threat.

This general process of information collection and transfer constitutes the familiar command and control process that is utilised by a commander in the allocation and direction of his resources. In a modern warfare setting, while the principles of command and control remain unaltered, its implementation is more complex by the proliferation of information, complex rules of engagement and the range and complexity of available technologies and technological aids. For the system shown in Figure 1, for example, each major component could be expected to have one or a number of telephones, telegraph terminals, facsimiles, optical character readers, visual display units, mini-computers or main frame computers which can be connected by analogue or digital communications networks that may utilise one or more of a combination of high-frequency, line-of-sight or tropospheric scatter radio systems, satellite systems or underground cable systems.

The overall system of data collection, data execution, display, data processing and communications equipments and sub-systems that support a commander in the direction and utilisation of his resources is commonly known as a communications command and control, or C3, system. The importance of C3 systems at both the tactical and strategic level is reflected by the increasing amount of material that is written about them and the huge amount of money that is being spent overseas on their design and development. Despite the early proliferation of acronyms, abbreviations and ill-defined terms, C3 and its processes are now seen as being too fundamental, too pervasive and too important to be simply dismissed as a fad of the 1970's.

In Australia at present, while the build-up of our military forces is aimed at developing a modern, technology-intensive defence capability, the machinery for integrating individual weapons systems and other major equipments into a single system seems to be inadequate. There appears to be no single body within the Department of Defence which is vested with the responsibility for the overall implementation and coordination of communications, command and control. Rather, each service is following a 'bottom up' approach where command and control is viewed primarily from an individual weapons system of tactical command post level. The following sections of this article describe in greater detail, the need for C3 systems in Australia and why these systems should be automated, the way in which a
1. National Command
2. Maritime Defence Command
3. Continental Defence Command
4. Support Command

Figure 1
strategic C³ system could be established and some of the problems we could face in its design and development.

The need for Automated C³ Systems

The technological roller-coaster envisaged by Toffler and others¹⁰ is certainly at work in the military environment. An attempt to illustrate the way in which technological innovation can create its own demand is shown in Figure 2. On the one hand, a whole new range of active and passive surveillance devices are being developed which can be remotely deployed and which react to an increasing spectrum of stimuli. Target acquisition systems employing these devices now enable a commander to know more precisely where enemy targets are located as well as the disposition of his own forces.¹¹

The sheer volume of continuous data that is provided by these integrated surveillance and monitoring systems, together with information provided by more traditional means, can be systematically analysed, displayed and updated.¹²

At the same time, advances in technology are increasing the accuracy, reliability, range, speed of delivery and destructive power per unit weight and volume of weapons systems. These changes are having a significant impact on traditional force structures and operational procedures. The increased range and destructive power of weapons systems and their faster means of delivery, for example, require greater flexibility in the location and distribution of static forces and their support echelons. As a result, greater emphasis needs to placed on the dispersion, concealment and manoeuvrability of military forces as well as on the various methods of physical and electronic subterfuge employed against an enemy.
The impact of these broad changes will be felt as much by headquarters and logistics units as by combat units. In order to survive in a battlefield characterised by increased range and lethality of weapons and rapidity of combat action, headquarters will need to be small and highly mobile. Under these conditions, the problem of storing and analysing the snowballing mass of information arriving from automated surveillance and monitoring systems will depend on advances in circuit miniaturisation, magnetic storage devices and distributed processing techniques. These developments will in turn spawn more sophisticated weapons systems which will lead to a requirement for more extensive and timely data acquisition, changes in operational procedures and so on.

This cascading effect of technological innovation and development will lead to a commander and his staff being increasingly required to operate in circumstances where the framework for decision making is never static. In a highly mobile and fluid battle situation, where the advantages of terrain and darkness are reduced by electronic devices, there will be no let-up in the flow of information into and out of a command post. Such 'real-time' operation is further complicated by the need to properly manage an increasing range of resources made available to a commander by the same advances in technology. Efficient resource management has become one of the commander's prime concerns and new staff organisations, procedures and facilities have to be developed to exercise this function without increasing the size and vulnerability of the headquarters.

A further dimension in the consideration of the impact of technology on modern warfare is its cost, or, perhaps more appropriately, its cost effectiveness. Advances in technology are providing relatively inexpensive weapons which are fairly simple to operate, highly accurate over long distances and capable of enormous destruction. These so called 'smart' weapons or 'precision guided munitions' now offer the individual soldier or small teams of soldiers a high probability of destroying with one shot a formidable target such as a tank or an aircraft. Largely because of the PGM revolution, the cost of replacing conventional weapons systems, particularly those required to serve multiple functions, is escalating. Traditional weapons platforms are now required to be fitted with a range of increasingly elaborate defensive measures in order to counter capabilities provided by precision guided munitions. As the cost of producing small missile systems decreases, more sophisticated versions of traditional weapons platforms will eventually be seen as not worth their cost.

The lower cost potential of precision guided munitions can be offset however by a desire to build higher capabilities into individual weapons systems which can dramatically increase their unit cost, especially when only small numbers are produced. Even so, the absolute cost of precision guided munitions remains low when compared with modern tanks or fighter aircraft.

For Australia, an important consequence of new weapons technologies is that they provide the potential for giving a defender a decisive advantage over a numerically superior attacker who uses conventional armour and air forces. This potential to enhance our ability to either deter war or defeat an adversary without having to match him tank for tank, gives us the option of either providing our existing defence capability for less money or obtaining a greater capability for the same investment.

A final consideration in the cost of new technologies for Australia is that there is a marked divergence between the cost of precision guided munitions and the cost of conventional weapons systems, the overall cost of maintaining a modern military force is increasing, due primarily to increasing manpower costs and the requirement to utilize forces that comprise a mixture of high and low cost weaponry and their support systems. Under Australia's present and perceived political and economic climate, it is unlikely that spending on defence will increase substantially above present levels and so the actual number of weapons and their support systems that will be held by the Defence Forces will always be small.

The decreasing size of present day weapons inventories, coupled with the increasing destructive power that can be carried by conventional warheads, make it imperative that a selective response to an enemy provocation does not use more force or do more damage than is considered necessary. At the strategic level, the consequences to the nation of modern warfare, where armed conflict can result in a significant proportion of our population and resources being destroyed even if Australia was
fortunate enough to win such a conflict, means that we must not strike the wrong nation or commit an enemy to make a disproportionate response through our own inadvertence, ignorance or lack of control. At the tactical level, the high kill probabilities associated with modern weapons systems, the likelihood that operations would occur around the clock, the small size of Australia’s military resources and the long lead times required to replenish those resources increase the potential consequences of even minor errors by military commanders.

Faced with the dire consequences of making even a single error or miscalculation, the commander must, more than ever before, be able to make sound judgements on the existence, size and intent of an enemy. He must also be able to select a response that best fits the need and then be able to initiate and monitor that response. While the basic principles underlying this process of command and control have not changed, the steps comprising the process need to be adapted to enable the commander to arrive at his decision more quickly and more surely. In our future electronic environment these conflicting aims can only be achieved by using the processing power of modern digital computers and other advances in technology.

An examination of the basic command control process indicates that at least the analysis of information and options, and the issue of orders, could be supported by data processing functions (see Figure 3). The use of digital computers in these areas would relieve the commander and his staff of routine work, speed up the command and control process, improve command activities by storing and displaying up-to-date information and reduce the number of personnel required in the headquarters.

While the remaining functions of the command and control process would not be normally amenable to computerization, as they are human oriented and therefore dependent on the commander’s experience and professional intuition, this should not preclude the selective development of fully automatic command and control systems where all decisions are made by stored programme controlled computers with
humans simply monitoring and, if necessary, overriding the decisions that are made.

Although developments in technology seem to favour the introduction of centralised, automated C^3 systems, it should be recognised that such a decision is dependent on the chosen nation strategy and that not all force postures require a fully automated C^3 system. If Australia was to pursue a defence posture based on guerrilla warfare or the operation of independent territorial forces, for example, the use of an expensive strategic C^3 overlay would be a waste of resources. A further objection to automated C^3 systems could be that the concentration of command and control at the top increases the vulnerability of our defence forces to a selective enemy response. The potential for such an event occurring should be taken into account when planning C^3 systems, either by duplicating key elements to the system or by using microprocessor technology to distribute the data processing load downwards (vertical redundancy). It should also be remembered that system vulnerability is only critical during periods of conflict. In peacetime, under a deterrent force posture which aims to prevent conflict, the efficiencies and economies of scale of a centralised system of command and control may outweigh any increase in its vulnerability.

**Strategic C^3 Systems — Problems and Paradigms**

While the establishment of automated communications, command and control systems can be easily visualised at the individual weapons system or tactical command post level, the development of a national or strategic C^3 system introduces a number of problems both in its design and ultimate use.

A fundamental problem in introducing a strategic C^3 system is the difficulty in reconciling the different requirements of the centralised command with those of the individual services and functional commands. In modern warfare, this problem is compounded by the fact that the traditional boundaries of responsibility between individual services and elements within each service are becoming less relevant. Increasingly, the functions of intelligence, reconnaissance and the target acquisition will need to serve all three services. In the future, an Air Force sensor may detect a target which will be engaged by Army or Navy weapons systems. This emphasis on joint service operations and procedures applies particularly to Australia’s small defence forces which need to maintain sovereignty over Australian territories, coastal waters and adjoining economic zone as well as defend the Australian mainland and Australian interests against activities ranging from guerrilla incursions to outright invasion.

The difficulty of reconciling the different interests of the three services is further complicated by their unduly conservative and parochial attitudes to change, and by a lack of understanding of technology by their leaders. A common misconception on the part of the services, for example, is to see hardware as the crucial element in any military system; that individual hardware elements can be easily welded into an overall system which can be made to meet any contingency. Such an 'upward looking' approach to force structure planning will invariably lead to inefficiencies and cost penalties as tenuous interface mechanisms are established to enable one sub-system to operate to another and as other sub-systems are discarded because they become redundant or are too expensive to adapt.

It is far more important to look downwards, to view a system as a composite of software design, the hardware architecture that it uses and its various man/machine interfaces. The design of the system must be made flexible enough to cope with both its present operational load and future changes to each element of the system. For C^3 systems in particular, the main concern should not be with the treatment of individual sub-systems but with incorporating them into a single system and ensuring they proceed in unison.

In this regard, recent US experience is important where its initial approach, that of leaving each unified or specialised command in charge of its own C^3 systems design and development, has given way to a more centralised approach with the establishment of the World Wide Military Command and Control System (WWMCCS) and the establishment in 1977 of a C^3 office within the Office of the Under Secretary of Defense for research and Engineering. The C^3 office has responsibilities for the review of on-going programmes, the development of policy guidance and funding for intelligence, combat support, communications, information surveillance and warning and strategic and theatre command and control systems.
This trend towards centralized control highlights the importance of deriving the detailed operational requirements for a strategic C$^3$ system before defining the individual system and hardware requirements that would form the basis of the design and procurement specifications. The US has found to its cost, that the probability of implementing a truly cost effective C$^3$ system will be low unless adequate attention and resources are devoted to developing the operational definition at the outset, and particularly, prior to making decisions that would commit the user to major system elements.\textsuperscript{25}

A further problem in implementing a national C$^3$ system stems from the sheer cost of providing the data collection, execution, display, communications and central processing systems that constitute such a system. The increase in efficiency and total force capability that may result from the introduction of a C$^3$ system does not readily lend itself to quantifiable measurement. Thus 'extensive explanation and consequent understanding of what the project is all about will be an important issue in obtaining agreement, recognition and funding'.\textsuperscript{26}

Finally, it should be recognised that the development of a C$^3$ system is not just a communications problem.\textsuperscript{27} A strategic C$^3$ system involves the centralised co-ordination of a series of data collection, data execution, display, supervisory, communications network and central processing systems where each system could be a mini-C$^3$ system in its own right. Consequently, the design and development of the overall system will require the services of a number of specialists including operations research analysts, software systems analysts, system design engineers as well as the eventual users of the system.

### The Establishment of an Australian C$^3$ System

With regard to the design and implementation of a strategic C$^3$ system, the lessons from US experience at least are clear. First, a strategic C$^3$ system forms an integral part of the national defence posture and flexibility of the chosen system will either limit or enhance that basic strategy. Secondly, a top down approach to overall system design is required, involving the highest level of military and civilian advice. Third, C$^3$ systems are extremely complex and expensive and so can only be developed over an extended period of time. Finally, the detailed expertise that is required to develop a national C$^3$ system encompasses many specialist skills that are presently not catered for in the armed forces and may not even exist within the Defence Department itself.\textsuperscript{28} Taking these lessons into account, it would seem that the design and development of an Australian strategic C$^3$ system should take place within the existing Defence force development and equipment procurement framework but that much of the detailed analysis and design should be done by civilian contractors.

One approach that could be used to establish a strategic C$^3$ system is shown in Figure 4.\textsuperscript{29} The first stage in this process is the development of a management policy manifesto which outlines the desired system objectives, its overall scope and any basic postulates such as the required system reliability, flexibility or redundancy. The objectives of a strategic C$^3$ system could be similar to current objectives for the US, viz:

- a. to provide national decision-makers and military commanders with information for effective crisis management and control of conflict escalation;
- b. to provide for effective control of military forces;
- c. to support combined service operations and operations with allied forces; and
- d. to provide command and control systems that are effective under various levels of threat.\textsuperscript{30}

The scope and fundamental characteristics of the system would encompass the different contingency levels likely to be confronted by our armed forces, ranging from normal peace-time operations through limited tactical deployments to full scale conventional warfare, where the basic postulates would change as we moved from one contingency level to another. This Operational Program Specification would in turn provide the basis for a C$^3$ Master Plan which would detail the functional specification baseline of the proposed system, its implementation timetable, priority of acquisition of new sub-systems, budgetary forecasts, sub-system integration plans, interface requirements, system standards, and so on.

In Australia at present, the development of a Strategic C$^3$ system is impeded by the lack of any detailed strategic guidance and a preferred force posture. As a prelude to such an exercise
Therefore, a preferred force posture would have to be determined which would include guidelines on aspects like the role of industry and other civilian agencies, our dependence on allies for resupply and support, contingency categories, and so on. In the light of the difficulties described earlier in deriving an appropriate force posture, it would seem that at this time a dual approach should be followed where deterrence is used as the basis for planning for intermediate and high level threat situations while the military capabilities required to meet low level threats are derived from contingency assessments.

During this initial phase, the way in which the Services and the Department of Defence currently plan, specify and procure C³ systems should be reviewed in order to determine the most appropriate way of establishing a strategic C³ system. Given the importance of C³ systems and their all pervasive role in national defence, it would seem preferable that a single organisation within the Department be made responsible for overseeing all aspects of communications, command and control. Such an organisation could incorporate the policy development sections of existing intelligence, communications, force development and data processing organisations. It would be responsible for the preparation and development, with industry assistance where necessary, of the detailed C³ Operational Program Specification and the C³ Master Plan together with the preparation of detailed submissions required to be made to higher level Defence committees and to the Government. It would also be responsible for vetting other C³ and C³-related projects in order to ensure that they will be able to operate within the overall framework of the chosen strategic C³ system.

**Conclusion**

As a result of recent changes in our strategic environment, Australia must now assume the prime responsibility for the defence of the Australian mainland and her national interests. In the light of recent trends in technology, any force posture that is chosen for this task will need to incorporate an automated system of command and control which supports the national command authority in the effective allocation of its resources.

At present machinery required to address this fundamental component of force analysis and development is inadequate. Within the Department of Defence, there appears to be no single body vested with the responsibility for the overall implementation and co-ordination of C³ systems. Faced with poor or inadequate strategic guidance, each service is following a ‘bottom up’ approach to force structure planning and equipment acquisition where command and control is viewed primarily from an individual weapons system or tactical command post level.

The development and implementation of a strategic C³ system then would serve two purposes. It would not only provide an essential element to any future national strategy, but would also serve to provide an impetus for the systematic development of the preferred force posture and force capabilities that are required to meet Australia’s changing defence needs.
NOTES


5. J. O. Langtry and Desmond Ball, op cit, p. 12

6. Ibid, p. 23

7. The rationale for re-organising Australia's Defence Forces under a separate Maritime Defence Command, a Continental Defence Command and a Support Command is treated in more detail in Robert O'Neill's 'The Structure of Australia's Defence Forces' an address given to the Liberal Party of Australia, Queensland Division, on 28 April 1978.

8. Other common acronyms for C4I systems include C4I (communications, command, control and computer) systems and C'I (communications, command, control and intelligence) systems.


11. One example of such an acquisition system is the US computerised BETA (Battlefield Exploitation and Target Acquisition) system which uses satellite surveillance, airborne reconnaissance, side-looking airborne radar, moving-target acquisition systems, infra-red systems, thermal and acoustic sensors and night vision scopes to locate with precision anything that moves, emits heat or presents a discernible radar image. See E. D. Greinke, 'Tactical C4I Architecture' Signal, August 1979, p. 65.


17. The US is facing similar problems which are further compounded by the arms race with the USSR. See Morrison and Walker, op cit, p. 38.


26. Ibid, p. 52


Introduction
During this century, there have been massive changes in technology particularly in computer science and related areas. Project scheduling gained prominence during World War I due to the efforts of Brigadier General William Crozier, US Chief of Ordnance. He did much to facilitate effective economical management of war production. We may trace much of the success of Network Analysis to this source and to Henry Lawrence Gantt whose charts laid the basis of later advances of Critical Path Method (CPM) and Programme Evaluation and Review Technique (PERT). The US Navy developed the use of PERT as the means of planning and control of the Polaris programme. The technique was later taken up by the US Air Force.

From these beginnings has been developed a wide range of techniques to be used in planning, control and allocation of resources. It is crucial that all concerned in the fields of ‘Education’ and ‘Training’ are aware of the range of techniques currently available to facilitate effective development of skills in trainee personnel. Many training officers are unwilling to involve themselves with such techniques to the detriment of the organizations in which they operate. The fault may not always lie with the training personnel. Some organizations may contribute to such difficulties because of the inherent lack of flexibility and over-compartmentalization of functions within the operations of the organization.

Aim
The relevance of Network Analysis and the associated techniques will be discussed in relation to ‘Education’ and ‘Training’ in the Australian Defence Force.

Education and Training
Development of the individual’s skills is seen to be a common aim of those involved in ‘Education’ and ‘Training’, though there are
different means and ends. ‘Education’ relates to the development of the individual as a whole, in terms of his perceived needs. ‘Training’ involves bringing the individual or group to a level of skill to permit effective operation at a given level within an organization. ‘Training’ is defined as ‘the systematic development of the attitude/knowledge/skill patterns required by an individual in order to perform adequately a given task or job.’

Though we differentiate quite clearly between ‘Education’ and ‘Training’, we may recognize that there are areas of skill that overlap. The student is involved, in both areas, with the effective application of the skills of:

- logical thinking
- self organization
- creative thinking
- communication
- decision making

Systems

An organization like the Defence Force is large in size and has undergone increasing specialization of function. Each sub-system interlocks within the larger system. The organization exists to benefit the nation and to support within defined parameters the interests of those who work within the system. Systems are in a state of continuous development and this is intended to maximize the effectiveness of the organization in providing the services for which it was established. Inputs are made from both without and within the Defence Force.

People operate the processes at the various levels within the system. The most basic criterion for judging the effectiveness of any system, sub-system or process is: ‘Is the job completed in the most effective way?’

Types

There are three types of systems that may be identified.  

- The Determined System is completely predictable and involves processes comprising largely a mechanical component. B functions in a certain way because of the input of A and the result is C. If C does not occur then there must be a fault in either B or A or both.
- The Probabilistic System is predictable but involves a range of variables which allow for any of a number of ‘effects’ to come from a given ‘cause’. There is some risk involved in predicting the ‘causes’ and ‘effects’ in a probabilistic system.
- The Self Organizing System is developed as the result of human interaction and may involve an immense number of variables. There may not necessarily be quantitative or qualitative constancy in either input or output. Certain principles operate but these may still be subject to circumstance. The Self Organizing Systems may be explored through training in management and leadership.

Importance to the Training Officer

It is important that the Training Officer recognizes these three categories and is able to classify systems according to type. He should be able to relate these categories of systems to the requirements of particular courses. The Programme in Problem Solving (PIPS) focused upon the Determined and Probabilistic Systems perceived to be relevant to the PNG service environment.

Each system type involves different training objectives, methods of instruction and criteria of assessment.

The Problem Approach

Application of the Problem Approach (or Case Study Method) to Decision Making, requires a specific skill on the part of the Training Officer. He must be able to convert systems, sub-systems and processes to ‘problems’ relevant to the target personnel in training. There are varying degrees of convergent and divergent thinking involved in the solution of such problems. Both lateral and vertical thinking should be seen as integrated activities within the framework of the Problem Approach to Decision Making.

Network Analysis

Network Analysis is a most effective technique in providing personnel with ‘a well-organized and visible plan’ for mapping out the flow of processes involved in planning, management and operation and training. Thus the workings of an organization can be related specifically to a particular training programme. Personnel become skilled in the tasks related to their level within the organization. At the same time, they become aware of how their tasks fit into the ‘whole’ process, sub-system or system. Network
techniques allow for effective sub-division of work. This applies equally among managers, planners, operators and training personnel. With the completion of the network analysis of an organization, a group of training personnel could sub-divide the operations to produce a range of inter-locking courses designed for the range of levels of labour. Such an approach sets the perspective for the organization of collective training in relation to individual training. It is important for those involved in collective training to proceed from the ‘whole’ to the ‘part’, from the system to the sub-system and process. Alsaker sums up the network model and makes it directly applicable to the training process. He states:

‘A Network Model is essentially a graphic, mathematical plan of action and provides an intelligible visual picture of the goals to be achieved and their relationships.’

Problems
The application of network methodology within any organization is fraught with many problems. The effectiveness of such a technique depends very largely on the quality and motivation of those personnel involved in management, planning, control and training. There are those who will set up barriers by ‘over-complicating’ and ‘over-sophisticating’ processes that are simple in operation. The skills of network analysts should be used competently and be complementary to, not substitutes for, managerial skills. Network Analysis encourages the discipline of logical thought among those involved but can cause fear and frustration among those who are not project-oriented. The task of implementing Network Analysis requires co-operation among management, production and training personnel.

Network Analysis is a technique that has evolved from a mixture of simple, commonsense ideas. In training, it should be presented not as a new, superior mode of operation but more as a tool incorporating many of the devices that we have already used but which have been honed to a fine point through successful, continued usage in private enterprise and government.

Objectives
A network of processes exists within a working system. We may assume that these processes have been progressively ‘de-bugged’ and that the mechanism has been set up to permit continual modifications as problems arise and new solutions are found.

Within any course there is a standard range of possible objectives. These will vary across a range of courses in terms of the particular category of system involved and the number of techniques that the Training Officer is prepared to use to achieve the objectives. Generalizing, we may state that at the end of any course, the student should be able to:

- identify the operation of the system, sub-system or process at least to the level at which he is to operate.
- identify the components of the system and the place of each component within the working ‘whole’.
- identify the basic elements of the methodology of decision-making.
- apply the techniques of ‘decision-making’ to ‘problems’ taken from the level at which the member is to operate.
- demonstrate the ability to assemble processes from the available range of component parts and goals to be achieved.
- demonstrate the ability to represent processes in graphic form using accepted techniques.
- demonstrate the ability to explain a process to a second person.
- demonstrate the ability to locate a fault in a system, sub-system or process.
- demonstrate the ability to assess the effectiveness of a given system, sub-system or process in fulfilling a given role.
- demonstrate the ability to operate effectively at the required level in the system.

Task Areas
Both ‘Education’ and ‘Training’ provide the means by which the organization passes competence to those members selected for given roles. The Regular Officer Development Committee (RODC) listed a range of inter-related skills that officers from 2LT to LTCOL believed they ‘most needed’ or ‘needed on job’. The skills are those developed in both ‘Education’ and ‘Training’. The skills identified included:

- written communications skills
- oral communications skills
- techniques of logical thinking
- techniques of creative thinking
• problem solving techniques
• instructional techniques
• the Systems Approach to Training
• management theory and techniques
• how to use management systems—objectives
• how to design jobs and organizational structures.

All such areas combine to provide the officer with a broad basis for the tasks of planning, allocating resources, co-ordinating processes, influencing and evaluating. Network Analysis provides an ideal communications medium, a means of providing an easily understood picture of the ‘whole’ and a means of bridging any gaps between operator and trainer. In the modern world, the knowledge explosion has meant that ‘there is a growing requirement for greater academic and military specialization’. At the same time, we must place this in the context of the increasing need in industry for managers, planners and training personnel to take a multi-disciplinary approach to the solution of problems. McHugh points out that:

‘Today, we have an urgent need in our industry for personnel to take an interest in the total project while solving their own problems.’

Techniques

Different ‘problem’ types require different techniques. Problems of the ‘Determined System’ type permit the use of Flow Charts, Arrow Diagrams, Precedence Diagrams and Critical Path Charts. As the ‘problems’ become more long-range with more variables there is the need for a technique such as PERT. Each of the techniques is described further in subsequent paragraphs.

Flow Charts are used in computer based tasks and in setting down processes in graphic form for use in planning, administration and training. Processes can vary from simple to complex. In training and education Flow Charts could be used for the graphic illustration of:

• data processing and data retrieval.
• indenting for, receipt of, and accounting for stores.
• operation of administrative processes — completion of ration returns, maintaining of books of account, conduct of audit, administration of pay.
• operation, maintenance and repair of equipment.
• planning of tactics.
• all processes involved in training — systems approach to training, mastery learning, methods of instruction.
• processes involved in the curricula of commercial principles, economics, science, mathematics, geography and Social Sciences.

![FIG. 1 FLOW CHART](image-url)
Arrow Diagrams and Precedence Diagrams provide techniques that may be used in all technical, administrative, tactical, training and educational areas. A sequence of activities is to be planned and implemented. Each activity is to be completed within a certain time frame and sequence. These techniques, like all such techniques, have been devised to fulfill specific needs and to overcome specific planning difficulties. For this reason both the planner and training officer could do well to determine how their needs may well be met by one or more of the techniques available.

Gantt Charts provide for the tasks in a process to be set down in sequential, tabular order. A series of steps is established and listed in the left hand column. Each week occupies an additional column up to the time of the expected completion of the task. The expected completion time of each activity is set down in the respective columns, week by week. Activities may overlap in time and there may be inter-dependency between some activities. Gantt Charts enable a scheduling of steps but stop short of showing how the completion of inter-dependent activities is to be carried out. The following activities may be scheduled both for operational use and training purposes:
- training exercises
- stock-takes
- mess functions
- yearly activities of an organization
- graphic supplements to job statements
- equipment maintenance
- construction schedules
- administrative schedules
- operational schedules
- personal organization — diary

Organization Charts summarize structures rather than processes. These may be used extensively in many organizational contexts to represent graphically the ‘whole’ structure and the component ‘parts’. Organization Charts may be used to set down the following:
- organizations and departments
- items of equipment and components
- duties of personnel within a hierarchy
- categories of items as in an ordnance structure

Critical Path Method and Programme Evaluation and Review Technique provide a valuable range of tools for short-term and long-term projects. CPM is used to plan and control processes in which variables are sufficiently constant to enable a precise estimate of time. For activities in which this is not possible, PERT permits the forecasting of earliest expected times and latest allowable times. Like all techniques, these should be used as aids not as whips.

Principals of Instruction
Effective instruction takes place when the instructor is able to promote a range of skills in a student in a given context and in terms of particular criteria. In the long-term the success is determined by observation of the degree to which former students reflect a desired behaviour change. Certain basic principles apply to the instructor’s effort.
- He must proceed from the ‘whole’ to the ‘part’. The individual student gains much benefit if he is able to view the ‘big picture’ even if in general terms only. From this starting point, he is able to view more clearly the relationships of the parts. Network Analysis gives the instructor the required perspective and techniques.
<table>
<thead>
<tr>
<th>TIME ACTIVITIES</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cleared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations dug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations laid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walls erected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plumbing completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walls completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewerage connected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fittings completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yard cleaned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscaping completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIG. 3 GANTT CHART**

```
HQ

ADMIN COY

SPT COY

RIFLE COY

RIFLE PLATOON
```

**FIG. 4 ORGANIZATION CHART**
• He must proceed from the 'concrete' to the 'abstract'. Network Analysis requires graphic presentation of systems, sub-systems and processes. We know the old saying that 'a picture is worth a thousand words!' So too the logic chart is much more readily understood than the same material in narrative form.

• He must proceed from the student's 'known' to the 'unknown'. All individuals have accumulated a wide range of perceptions. An instructor must be constantly aware of the need to use the student's stock of knowledge and to frame courses to promote in the student the ability to 'apply insight gained from the solution of one problem to the solution of a similar problem in a different context'.

There are basic similarities, for example, between the processes of fault-finding in a car, a radio, an administrative process. All of these processes are of Determined System type. The process of making comparisons involves certain techniques currently used in 'creative thinking'. Network Analysis should assist the instructor in his effort to proceed from 'known' to 'unknown' systems. The instructor becomes a student of system types and is able to draw upon a bank of related 'problems'.

The Systems Approach to Training

Closely related to Network Analysis is the Systems Approach to Training. The 'training loop' involves the effective translation of the requirements of a job into related skills for the benefit of the trainee. With the advances in technology and the increasing specialization of personnel, there has long been the need for a systematic approach to training. This ensures that training is sound and that the mechanism is set up for adjustments to be continually made for the improvement of the system.
Related Techniques
Other processes may be used in conjunction with Network Analysis and the Systems Approach to Training. For example, statistical method provides techniques of collecting, classifying, illustrating and interpreting of data. Validation of training involves many such techniques.

Conclusion
There is much to be learned from the application of the techniques of Network Analysis. Accordingly, many of the defects presently found in training programmes, may be eliminated. For the Training Officer and Education Officer to come to terms with Network Analysis, he has to recognize his own strengths and weaknesses and to see himself as part of a team comprising both training personnel and operational staff. Network Analysis, if properly used, could provide continued excellence within a given organization. Without such a tool, training programmes run the risk of being an accumulation of the mediocre.

REFERENCES
5. ibid. P 37.
6. ibid. P 12.
LETTERS TO THE EDITOR (see also pages 4, 5 and 14)

situation is bad enough now but can one imagine the effects of a Russell Hill inhabited by Cheeseman clones. The mind boggles.

It is perhaps appropriate to close with the advice given by one, Wang Hsi who, if not a 'liberal intellectual', was a scholar and a government official in ancient China. He said "If one ignorant of military matters is sent to participate in the administration of the army, then in every movement there will be disagreement and mutual frustration and the entire army will be hamstrung". This advice is just as applicable today as it was over a thousand years ago but, perhaps I am being too conservative.

E. M. MCCORMICK
Lieutenant Colonel

AUTHOR'S REPLY

Dear Sir,

I would like to make two comments on Lieutenant Colonel McCormick's letter. First, his assertion that "political action must be designed to ensure the success of military action" and his belief that military efficiency is "hamstrung" by the participation of those "ignorant in military matters", would seem to indicate that he is a proponent of military autonomy wherein the Services remain isolated from society and stress only traditional military values and ideals. Such a view is not only inconsistent with Australia's developing social and political environment (here I would commend Lieutenant Colonel McCormick to read Air Commodore Funnell's "academically objective" article "The Professional Military Officer in Australia" which appeared in the same issue of the Defence Force Journal as my letter) but also, in my view, more readily predisposes the military elite to engage in the "organisation of coups" or to acquiesce in "unthinking thuggery" than it would do so under a liberal model of civilian control.

My second point is that while certain principles of war may remain unchanged over time, the environment in which armies must operate will, and so, as Lieutenant Colonel McCormick has himself acknowledged in his DFJ article, "The Future of Infantry: Another Letter", the continued importance of particular principles can change in the light of these wider environmental changes. In this context, it would seem to me that the notion of "victory" in an age of nuclear weapons and other modern armaments may not be equivalent to its ancient Chinese interpretation. It could also be argued that under the changing nature of warfare, we can no longer afford the luxury of the fortuitous appearance "on the stage of history" of military officers who are not constrained by undue conservatism.

G. L. CHEESEMAN
Major
SURPRISE CAN BE ACHIEVED IN WAR DESPITE ADVANCES IN ELECTRONIC WARFARE AND SURVEILLANCE DEVICES

By Major D. M. Poynton, Royal Australian Infantry

FROM the wooden horse at Troy to the Egyptian crossing of the Suez Canal in 1973, 'surprise and deception have always been important in war'. However, surprise is not an end in itself, as General Erfurth points out: 'Surprise alone can never be effective, it is only a condition of success, not the success itself'. He goes on to say that victory is possible only when superiority of force is concentrated at the decisive point and, following Clausewitzian dicta, that superiority is only achievable if the enemy is first surprised. However, decisive results will be gained only if the advantage accruing from surprise is exploited. Consequently it follows that surprise must be planned so the advantage can be fully exploited. This point has not always been recognized. General Erfurth states: 'It was sometimes supposed that surprise could not be prepared but was simply a welcome by-product of other military measures'. Surprise may occur without being planned but the opportunity created is of short duration. Unless forces are available and ready that opportunity will be lost. One example is sufficient to illustrate the point.

During World War I the Germans developed poison gas. Before it was used for the first time its inventor, Professor Haber, begged the General Staff to hold large forces in reserve to exploit the surprise he felt sure would follow. All requests were denied. On 22 April, 1915, 'a gap in the front over four miles wide' had been opened along the Ypres salient as a result of gas attack. 'Yet the Germans missed their chance because no German forces were ready for immediate action'.

To return to the main point, it is clear that effective planning is based on intelligence. 'Intelligence provides the commander with information and conclusions primarily about enemy locations, capabilities, weaknesses and intentions and about the area of operations'. This information is needed 'to make best use of available combat power and to maintain the security of the force'.

In war both sides will use all available means to gain intelligence while denying information to the other side. Each will plan, using available information, to achieve surprise. Therefore it is important to interrelate intelligence and security so that in planning to surprise the enemy, adequate measures are also planned and implemented to ensure that the enemy does not surprise our forces.

Before the advent of modern warfare surprise was often achieved despite the paucity of information provided by spies, deserters, prisoners and cavalry patrols. The beginning of modern warfare was heralded by two major technological developments: the railway and the telegraph. The telegraph provided a means to pass information quickly to commanders. This fact led to a serious questioning of the possibilities of achieving surprise in the future. G. F. K. Henderson noted: 'It is repeated ad nauseam that in consequence of the vastly improved means of transmitting information, sur-

Major Poynton graduated from OCS in 1966. He has held several appointments since, including service in Vietnam. He is currently Staff Officer, Overseas Allowance Centre, Directorate of Service Conditions, Defence Central.

This article first appeared in the Fort Queenscliff Papers.
prise on a large scale is no longer to be feared'. He disagreed with this contention and argued that surprise will be possible because troops can be concentrated more quickly using the railway; the telegraph provides a means for deception, and generals who think seriously about the problem will find means of achieving it. Henderson's views were substantiated by events in subsequent wars.

World War I saw the employment of radio on the battlefield on a large scale for the first time. Interception of radio traffic became a new means of acquiring information. On the Eastern Front, the Russians persisted in sending messages without enciphering them. These messages were intercepted and they 'gave the German leaders a clear picture of how the enemy viewed the situation and what (the Russians) intended to do.' The Germans exploited their knowledge to achieve surprise, notably at the Battle of Tannenberg. Electronic warfare was born.

Electronic warfare was an invaluable source of information in World War II. Radar, direction finding and navigational aids as well as radio became important targets for destruction, jamming and deception. German High Command signal traffic was intercepted and decoded using a British developed machine known as Ultra. As the war progressed and Hitler took more and more direct control of operations, Ultra provided the Allied Forces with detailed intelligence on the German intentions and plans. This ensured that the Germans did not achieve surprise except for the launching of their last desperate counter offensive through the ardennes in December 1944. This surprise was achieved because strict secrecy had been observed and no signal traffic concerning it had been transmitted.

The Luftwaffe failed to achieve surprise in their own attacks during the Battle of Britain because they were detected by radar as they concentrated over France. The allies, on the other hand, ensured surprise at the Normandy landing, in part, by using an electronic deception plan. A few days before the invasion German coastal radars were bombed. Most of the sites on the Normandy coast were destroyed but a number were left intact around Pas de Calais. Just prior to the invasion fleet sailing, the remaining radars were jammed; completely at Normandy; less intensely at Calais. Aircraft circling at low level opposite Calais released 'window' which simulated a large invasion fleet on the move. This reinforced Hitler's belief that the main invasion would be a Calais and delayed the movement of forces to Normandy.

Since World War II technological developments in both electronic warfare and surveillance have accelerated. Present surveillance technology provides detailed and timely information 'anywhere, at any time, day or night, independent of light or visibility consideration, close to the front or in the depth of the enemy's territory' Surveillance, coupled with electronic warfare, particularly that subdivision known as Electronic Support Measures, precludes the possibility of remaining undetected on the modern battlefield. Both sides in a war can be expected to deploy sophisticated surveillance and electronic warfare resources. Therefore, it can be argued, as each side will have detailed information on the dispositions, equipment and movement of the other, surprise cannot be achieved. Or can it?

The aim of this article is to show that surprise can be achieved despite advances in electronic warfare and surveillance.

The proposition will be argued on general lines. However, so that it will have some application to the Australian Army, the implications for Australia will be addressed.

No distinction will be made between surprise in strategy and tactics. The article discounts Clausewitz's assertion that: 'basically surprise is a tactical device'. The true aim of strategy is 'to diminish the possibility of resistance . . . by exploiting the elements of movement and surprise'. Australian doctrine states that 'military strategy is not concerned with the actual fighting which is the realm of tactics, although there is no clear line of demarcation between the two'. It goes on to say that the principles of war of which surprise is one, apply to both strategy and tactics.

**DEFINITION OF SURPRISE**

Australian Army doctrine lists surprise as a principle of war, states that it is important and repeatedly advises commanders to strive to achieve it. However, it is not defined. Statements on surprise which are contained in Australian Army Training Pamphlet provide a number of key points against which any proposed definition should be assessed. The points include:
creating a situation for which the enemy is unprepared,
• forcing the enemy into hurried or unconsidered action,
• dislocating or dispersing him,
• deploying in unexpected strength,
• assault from an unexpected direction,
• use of unexpected timings,
• manoeuvre or assault in an unexpected place, and
• use of unexpected speed.

It is proposed to determine a definition by assessing formulated definitions against the key points in Australia doctrine. The Shorter Oxford English Dictionary defines surprise as:

To assail or attack suddenly and without warning; to take or capture in this way.

Suddenness and lack of warning do not necessarily mean the enemy will be unprepared, although it is likely. This definition lacks consideration of the enemy's reaction and contains no indication of other important factors: strength, speed, direction, timing, location which is unexpected. Therefore this definition is inadequate.

The Union of Soviet Socialist Republic doctrine states:

Surprise consists of the attempt to begin and conduct military operations unexpectedly against the enemy with the most expeditious grouping of combat effective troops against the weakest or the strongest but poorly trained enemy groupings, and at that time when they least expect it, making them incapable of offering organized resistance and forcing them to fight in an extremely unfavourable situation.

This definition contains most of the key points: unpreparedness, unexpectedness, timing, grouping, location and reaction. It provides a useful definition but one expressed in simpler language would be preferable.

The United States Army defines surprise as:

Striking an enemy at a time and place and in a manner for which he is unprepared. It is not essential that the enemy be taken unaware, but only that he becomes aware too late to react effectively.

This definition combines the key points expounded in Australia doctrine. It is important to note the second part of the definition, namely, that surprise can also be achieved although the enemy is aware of what is happening if he cannot take effective countermeasures. This concept was first recognized by Jomini in the Nineteenth Century. For the purpose of this article the United States' definition will be used.

THE EFFECT OF SURPRISE

Clausewitz concluded that there were two universal desires in war: firstly, to achieve numerical superiority at the decisive point; secondly, to take the enemy by surprise. Surprise has a bearing on both desires because of its effects. Clausewitz states that there are two effects: firstly, without (surprise) superiority at the decisive point is hardly conceivable; secondly, it confuses the enemy and lowers his morale.

Modern warfare has not invalidated Clausewitz's assessment of the effects of surprise. Most armies continue to emphasise the need for surprise. The Soviet Union places particular emphasis on surprise, especially when using nuclear weapons, because:

The unexpected employment of nuclear weapons . . . would make it possible to inflict heavy losses on the enemy, crush the morale of his troops and disorganize them, sow confusion, disrupt control, and thus successfully accomplish one's mission.

However, the Soviet writers emphasize that surprise should be specifically directed at the mind and will of the enemy commander rather than the troops. The reason for this is that if it is successful it paralyses the commander's will with the inevitable result that the 'commanders and staffs are incapable of organizing timely and effective countermeasures'. Liddell-Hart espoused the same idea in his book, Strategy: The Indirect Approach.

Theoreticians are agreed on the effects of surprise but are these effects produced in actual combat? The United States Historical Evaluation and Research Organization (HERO) developed a model — The Quantified Judgement Method of Analysis of Historical Combat Data — which can 'provide systematic, validated analysis of modern combat data, with reliable predictions of postulated future combat situations'.

During development of the model sixty engagements from World War II were analysed. A simple but lengthy formula was developed in which the various factors were recorded numerical values. The sixty engagements were graphed with the combat
power ratios on one axis and the result of the engagement on the other axis. This resulted in what HERO called a ‘normal battle line’. However, its was found that a significant number of the engagements plotted fell a considerable distance from the ‘normal battle line’. The validity of the model was in doubt because the variations were statistically significant. Closer examination of historical data showed that a measure of surprise had occurred in all engagements which deviated markedly from the ‘normal battle line’. From this base HERO analysts discovered that surprise had a ‘consistent, measurable effect upon the normal, relative combat capabilities of the opponents. The effect could be represented by factors modifying the mobility and vulnerability characteristics of the opponents. The effect varied, of course, depending upon whether the surprise was complete or less than complete’.

Using data from the 1967 and 1973 Middle East Wars, HERO achieved a 100 per centum correlation between the results using the model and the actual outcomes of the engagements. HERO research proves that surprise is an important factor in war and its real effects largely correspond to the theoretical ones.

The effect of surprise and its importance raises obvious implications for Australia’s defence. It is essential that adequate measures are taken at the national and strategic level to ensure that Australia is not surprised. This demands a comprehensive intelligence and surveillance network. Although the 1976 White Paper on Defence states that we have access to intelligence from both the United States and Britain, total reliance should not be placed on outside sources. An independent capability must be maintained and developed. Equipment and personnel must be dedicated to the task.

On the other hand, should Australia be again involved in war, it is essential that its forces and particularly the commanders be trained and dedicated to the idea of achieving surprise. Our forces are likely to be numerically inferior and also will have to be self reliant. Surprise is a primary means of providing opportunities for decisive action with the least likelihood of major losses in men and material. However, to do this, commanders must be trained at all levels to consider surprise. ‘Every military plan and its execution should be conceived in view of the necessity of surprise’.

The factor of intelligence will be considered first. Clausewitz wrote: ‘By intelligence we mean every sort of information about the enemy and his country — the basis, in short, of our plans and operations’. He went on to say: ‘Many intelligence reports in war are contradictory; even more are false, and most are uncertain’. This first proposition holds good today, while his second has been rendered inaccurate by the proliferation of technically sophisticated intelligence collection sources — surveillance devices and electronic warfare. Facts on enemy dispositions, weapons and equipment, and movements, are readily available. However, in one realm, Clausewitz’ second proposition remains valid: knowledge of the enemy’s intentions. It is because assessments of intention are subjectively deter-
mined by evaluation of other 'facts' that errors are often made and thereby surprise is achieved. Notwithstanding this, the greater the data base of facts, the more it is likely that possibilities and probabilities of intent can be determined and a more accurate assessment of intention may be made. However, surprise may still be achieved if psychological factors, which are considered later in the article, preclude objective assessment.

The elements of secrecy and deception will be considered together. 'Every operational plan must include measures to deceive the enemy and so gain surprise'. Deception and secrecy are two sides to the one coin. Real plans must be kept strictly secret; deception plans must be apparently secret (but the fact that there is a deception plan must be secret).

Deception should operate on two levels: physical, by the concealment of the real and display of the false; and electronic, by means of imitative and manipulative deception. Both forms of deception, to be effective, must be plausible to the enemy by being both factually and administratively sound. The enemy must be given time to assess the plan and act on it. Finally the deception must be co-ordinated at the highest level to ensure it does not compromise other operations.

Speed is the fourth element to be discussed. Speed is being quicker than the enemy and is related to actions in time and space. Means of movement are components of speed and must be combined with detailed, timely planning and efficient execution. Factors which influence speed are: movement agencies, simplicity of plans, effective battle procedure, sound administrative arrangements, efficient traffic control, workable communications, and dissemination of orders to all ranks. Speed also operates in the psychological sphere which implies quick reaction and ability to take advantage of errors by the enemy.

**MODERN SURVEILLANCE EQUIPMENTS**

For the purpose of this article surveillance equipments will be categorized under two broad headings: strategic and battlefield. The categories are not mutually exclusive and many equipments can be used in either role.

Strategic surveillance is directed against the enemy home base. It is designed to provide information on major bases, particularly missile sites in the case of the Soviet Union and the United States, troop concentrations, exercises and manoeuvres, and new weapons and material. Photography including infra-red and thermal, television and radar is extensively used by the superpowers in satellites, aircraft and surveillance drones. The use of Side-Looking Radar provides coverage of areas otherwise obscured by cloud. Infra-red equipments operate effectively independent of light conditions. Aircraft, ships and ground stations throughout the world continuously monitor electro-magnetic radiations.

Despite the sophistication and proliferation of equipments information is not always obtained. 'In 1968 the Warsaw Pact forces carried out a large-scale invasion of Czechoslovakia. This massive movement of ground and airborne units went virtually undetected by the NATO alert nets, however, owing to a vast electronic blanket of chaff and jamming set up along the Czech border by the invaders'.

Battlefield surveillance includes target acquisition and is used to locate tactical dispositions, weapons, bases, movement and concentrations. It is the basis of battle planning and the need is for detailed, accurate and timely information. Equipments range from night vision devices, sensors, thermal imagery and tactical radar of short to medium-range to long-range drones and Remotely Piloted Vehicles (RPV) with Low-Light Level TV, Forward-Looking Infra-Red and thermal cameras. Unattended ground sensors automatically report magnetic, acoustic, seismic and thermal activations by radio signal. Some airborne sensors relay photographic reports by radio to achieve a near 'real-time' information input. Monitoring of electro-magnetic emissions is widely used and is a major source of battlefield intelligence.

'While our old classic sources of combat intelligence such as patrols, clandestine operations, signal intelligence, documents and prisoner of war interrogation have lost none of their importance, technological advances in the fields of aircraft, electronics and photography, have greatly enhanced the roles of combat surveillance and target acquisition as contributors to combat intelligence'. It can be anticipated that future developments will further enhance the capabilities and therefore the importance of surveillance and electronic warfare.

However, despite these developments major limitations to the effectiveness of these devices
exists. The primary limitation is that nearly all equipments in one form or another emit an electro-magnetic radiation. This enables them to be detected and once detected they can be destroyed, jammed or left in operation and used by the enemy for deception. Technical limitations such as the inability to penetrate camouflage, bad weather, heavy vegetation and difficult terrain, and inability to distinguish between real and dummy may be overcome in time. This will increase their effectiveness but the primary limitation will still exist.

**METHODS OF ACHIEVING SURPRISE IN FUTURE WARS**

The definition, importance and elements of surprise along with the present surveillance and electronic warfare environment have been discussed. It has been assumed that advances in technology will increase the level of information obtainable from electronic and surveillance sources. How then will surprise be achieved in future wars? Three ways will be examined:

- technical and tactical innovation,
- use of speed, and
- exploitation of psychological factors by deception.

Intelligence provides detailed information on the technical capabilities of weapons and equipments as well as the tactics and techniques of employment. This information is gathered in peace-time as well as in war and therefore it would not be reasonable to expect great differences between the armaments of the major powers. Yet special progress in technical inventions is always possible'.

Although General Erfurth wrote that statement during the 1930s it is perhaps more applicable today than when first written. Technology is so complex today that even if a major breakthrough is known by the enemy he will require time to develop either an equivalent capability or countermeasure. Until he has achieved either of these he can be surprised, not because he is caught unawares but because he knows he cannot react to it effectively.

There is a technological war being carried on, according to two American researchers, Possony and Pournelle, between the super-powers.

The purpose of this war is to 'search for new concepts that can find expression in hardware and tactics'.

Weaponry is a primary determinant of tactics and techniques. Therefore, a technical advantage used in a weapon system can be used to develop a tactical advantage. The technical advantage could be a surprise per se but that surprise will have greater impact, particularly psychologically, if employed in conjunction with a new tactic or technique.

Small performance improvements in equipments in such areas as speed, range, accuracy, reliability and lethality can be of great significance. It is unlikely that a major weapon system could be kept secret from an enemy in wartime; in peacetime it is even harder. Therefore, technical surprise will be on a tactical level and based on performance characteristics which can be kept secret from the enemy. Deception in matters of science and technology is vital to gain and maintain an advantage. 'This includes deception about the general state of excellence, the level of progress in a given aspect of science, and the application of science to specific weapon and component development'.

Tactical innovation can be used to achieve surprise. It may be in conjunction with a technically advanced equipment or without. The enemy will determine normal tactics and techniques and is psychologically conditioned to expectations that you will continue to operate in the same way. His plans are based on this assumption. Therefore, any change will prove his basic assumption false and he will take time to readjust his thinking to react effectively. In other words he will be surprised.

The 1973 Middle East war provides a recent example of surprises through technical and tactical innovation. The Israelis based their plans on the assumption that the Egyptians would operate as they did in the Six Day War of 1967. The Israelis also knew that the Soviet Union had re-equipped Egypt with air defence and anti-tank missiles and trained the Egyptians to employ them. When war came, Israel was surprised by three things. Firstly, the Egyptians were resolute, efficient and reasonably well led'.

Secondly, the SA-6 air defence missile was unaffected by electronic counter measures (until new pods were acquired from the United States).

Thirdly, anti-tank missiles were used in unexpected numbers and caused heavy Israeli tank losses.

The examples from the Yom Kippur War show the possibilities of technical and tactical innovation for achieving surprise. This area can readily be exploited by Australia. The Defence
Science Organization maintains a data bank of emerging defence technology from leading overseas countries. It also develops equipments which are in the forefront of technology. Project Jindalee, a long-range over the horizon radar; Mulloka, an active sonar system; Barra; an airdroppable sonobuoy, are examples of Australia technical innovation. This capability must be maintained. In the tactical field emphasis should be place on testing new procedures, techniques and tactics. This aspect will be covered later in the article.

The second means of achieving surprise is the use of speed. War is fought within the dimensions of time and space. Time is the more critical factor, for as Napoleon commented: 'space we can recover, lost time never'. Speed is a determining factor in the dimension of time. Movement is inherent in speed but other factors, discussed previously, impinge on it. Movement, however, can and will be detected so the potential surprise will be negated. Or will it? Liddel-Hart wrote: 'movement generates surprise, and surprise gives impetus to movement. For a moment which is accelerated or changes direction inevitably carries with it a degree of surprise, even though it be unconcealed'.

Mobility becomes the decisive element of speed once movement has begun. It must be assumed that the enemy will discover the movement. Therefore, it is essential that he be given the least amount of time to react. This can only be achieved if the fastest means of movement are used. United States doctrine emphasises this, stating: 'The mobility of armoured, mechanized, airborne and aviation and tactical airpower, permit the commander to re-dispose rapidly, and so achieve surprise'.

A post-exercise report from an Australian Task Force exercise has similarly emphasized the value of speed. It stated: 'Mechanization enhances speed in two ways. Firstly movement between incidents is greatly accelerated and secondly the flexibility provided by communications couple with the responsiveness of vehicle mounted soldiers reduce reaction time. The speed and violence of reaction caught the enemy and controllers by surprise on several occasions'.

The lessons from this exercise should be borne in mind. While it is not advocated that the Australian Army become fully mechanized, it is stressed that our development of techniques and battle procedures must reflect the demand for speed as a means of achieving surprise. The available resources must be utilized to best advantage to provide fast movement of balanced forces to the point of decision. The enemy will know we are coming; if we are slow he will counter our moves; if we are fast he may not be able to.

General Erfurth sums up the lesson to be learnt by saying: 'If secrecy cannot be maintained, speed must be increased; if speed is not practical, the enemy must be kept wholly ignorant of the impending operations, otherwise surprise can never be achieved'. History is littered with examples of surprise being affected although the opposition were in possession of the full intelligence picture. Norman Dixon, psychologist and former officer, has examined the psychology of military blunders and it is not proposed to restate his case. However, in the course of his thesis he identified a number of factors which are involved in the 'incompetency syndrome' which are pertinent to this study. These are:

- ignoring or misusing military intelligence, and
- underestimating the enemy and stereotyping him as stupid.

Two examples will illustrate these points. The first example is taken from the French Indo-China War.

General Navarre, Commander-in-Chief, French Indo-China, decided to garrison Dienbienphu after estimating that the Vietminh would concentrate no more than a reinforced division without artillery in that area. When his Chief of Intelligence advised that confirmed reports showed that four Vietminh divisions plus artillery were converging on Dienbienphu, Navarre refused to accept the reports and called his Chief of Intelligence unduly pessimistic. At Dienbienphu no preparation had been made to withstand artillery bombardment in the belief that no artillery would be brought in range and even if it were, the French guns would destroy it or the Vietminh would be unable to sustain the resupply of ammunition. After fifty six days the French surrendered, General Giap having the last word: '[the French force] was tactically surprised because we had succeeded in solving the problem of concentrating our forces, our artillery and our supplies'.

[48] DEFENCE FORCE JOURNAL No. 25. NOV./DEC. 80
The second example is from the War of Yom Kippur, 1973. Prior to October, 1973, the Israeli Intelligence Branch collected detailed information on the buildup of forces on the Egyptian side of the Suez Canal. Their own resources were supplemented by United States intelligence from their electronic surveillance in Iran and from photographs from a SAMOS satellite. When the Egyptians assaulted across the canal on 14 October 1973, the Israeli forces were completely surprised as were the Americans. This was in spite of a statement by Secretary of State Kissinger that: 'nobody made any mistakes about the facts'. But interpretation of those facts proceeded from the premise that the Egyptians would be incapable of offensive action for at least another two years. In other words, the Israelis had underestimated their enemy.

The implication for Australia is clear. Our defence is based on maintenance of a force-in-being which will be expanded as threats are perceived. However, if underestimation of potential enemies is a common psychological trait, as Norman Dixon suggests, the decision to expand may not be taken or may be taken too late to be effectively implemented because the actuality of the threat is not perceived as such owing to our underestimation of the enemy capabilities and intentions.

In psychological parlance, each individual selectively organizes his ideas about persons and things — his cognitive world. Individual cognition is selective because only certain objects, among the total available, are organized into that individual's cognitive world. Even those 'selected objects' may be perceived in a way which differs markedly from a veridical cognition. 'The individual's cognitive world is the product of the following determinants: his physical and social environments, his psychological structure, his wants and goals, his past experiences'.

Individual cognitive systems can be changed but the direction of that change appears to move always towards a more consonant structure. Frenkel-Brunswick proposed that individuals find it difficult (the degree varies in each person) to tolerate or manage cognitive ambiguities, inconsistencies and surprises. One result of this is that individuals may 'create, invent or distort facts' so they support and are congruent with existing cognitions.

Progressing further, Leon Festinger developed his Theory of Cognitive Dissonance. The theory asserts that an individual experiences psychological discomfort when he holds logically inconsistent cognitions and thus he is motivated to try to reduce dissonance and achieve consonance. The method of achieving consonance may be either rejecting subsequent information or interpreting that information in a way which fits into pre-existing cognitive structure.

It is pertinent to ask what psychological theory has to do with the effect of modern surveillance on surprise. The answer is that it has a great deal to do with it. Surveillance and electronic warfare provide facts on which concepts of operations are built and plans made. However, the assessment of intentions, except in exceptional circumstances, will remain subjective. Psychological makeup has a decided influence on the way that assessment is made. Therefore, calculated exposure of 'facts' combined with subtle psychological deception provide opportunities to mislead the enemy and thereby create a situation in which surprise can be achieved. A recent example may illustrate this point more clearly.

After their disastrous defeat in 1967, the Egyptians were re-equipped and re-organized by Soviet advisers. Once President Sadat decided to go to war he set a long term deception plan in motion. Periodic call-up of reservists and deployments along the Suez Canal became a common feature. Partial Israeli mobilizations were economically disastrous and discouraged precipitous assumptions as to likelihood of war. Sadat kept the date of the invasion secret. Israel was aware of the build-up in September-October 1973 along the canal but assessed it as another 'demonstration'. They were also distracted by the Schoenau affair which, if not organized by the Arabs, certainly helped their deception. The deception worked as the Israelis failed to estimate the Egyptian intentions from the detailed facts available. The Egyptians achieved surprise.

General Haim Bar-Lev summed up the situation after the war, saying: 'Ante-factum the evaluation is subjective, and is influenced by viewpoint, faulty basic assumption, exaggerated self-confidence, personal ambition, suspicion and fear, and other non-objective influences which tie men to unrealistic conceptions. Any addi-
tional information and phenomena which point to real intentions will be adapted to fit the grid built in accordance with the misconception.\(^{(55)}\)

There is a secondary aspect arising from this example which should be noted because it has implications for Australia. The United States, through its intelligence agencies, was closely monitoring the Middle East situation. She was aware of the same facts as Israel. However, instead of assessing the available information, the United States unquestioningly accepted the assessments presented by Israel. The result was that the United States was also surprised by the outbreak of war.

The 1976 White Paper on Defence 'affirms the need for a highly effective intelligence system (for) intelligence monitoring and assessment of international events'. But elsewhere it states that the United States provides Australia with intelligence while 'Britain is an important source of intelligence and assessment'.\(^{(56)}\)

Dr. Mediansky, in his critical review of the White Paper, argues that acceptance of information on which Australian intelligence personnel make an assessment is far preferable to accepting assessments made by others. He says: 'the problem lies in making use of other people's assessments rather than from using their raw inputs'.\(^{(57)}\) Australia has a competent national intelligence capability and it should be used to assess information in the context of Australia's requirements.

### TRAINING FOR SURPRISE

'In war it is the unexpected which triumphs. And yet in preparing for war the unexpected is never given its proper weight'.\(^{(58)}\) Liddell-Hart presented one theory of why in training surprise is not given the attention it deserves:

The training of armies is primarily devoted to the developing efficiency in the detailed execution of the attack. This concentration on tactical techniques tends to obscure the psychological elements. It fosters a cult of soundness, rather than of surprise. It breeds commanders who are so intent not to do anything wrong, according to 'the book', that they forget the necessity of making the enemy do something wrong.\(^{(59)}\)

General Erfurth provides another view:

In peacetime military training ... military operations are only too often represented as a mechanical development which is neither materially nor intellectually influenced by surprise. Mobile manoeuvre strategy frequently interferes with the intentions of the officer in charge of the manoeuvre. If the manoeuvre is planned beforehand, the commanders of the different parties have no liberty left. Of course, the conduct of manoeuvres is made considerably more difficult if the commanders are free to do whatever they like, and, in particular, to attempt surprises.\(^{(60)}\)

In view of the difficulties, can surprise be included in peacetime training? Before addressing this question it must be remembered that two aspects must be looked at: firstly, training to surprise the enemy; secondly, training to ensure our forces are not surprised. The primary measures used to achieve both aspects are deception and security. Both these measures can be incorporated into training and must be incorporated if surprise is to be given its proper weight. Further, training must be designed to allow subordinates to exercise their initiative and develop originality and boldness.

Some measures which could be incorporated into training to develop the capacity and ability to achieve surprise are:

- the development and implementation of deception plans, including electronic deception, during exercises;
- the encouragement of testing of new tactical concepts rather than mechanically repeating 'by the book' techniques;
- the refinement of Tactical Exercises Without Troops by presenting realistic situations and demanding quick decisions;
- the representation of a realistic electronic battlefield in exercises; and
- the cultivation of the attitude of speed of reaction and exploitation without awaiting detailed orders from senior headquarters.

Surprise must be planned, and planning requires intelligence about the enemy. Surveillance and electronic warfare provide detailed information on weapons and equipments, locations, movements, supplies, and may provide some indication of intention. Despite the volume of information available, there will still be gaps in our knowledge of the enemy. The enemy, on the other hand, will be using his devices to acquire information for his own planning.

Both sides will be trying to achieve surprise, and, at the same time, guard against being sur-
prised. Surveillance and electronic warfare assist in both aspects. However, despite the amount of information acquired, surprise can still be achieved. Irrespective of further advances in technology, the stage will never be reached where all information desired will be available.

Surprise will be achieved by use of technical and tactical innovations, by the use of speed of action and reaction; and by exploitation of the psychological influences affecting decision making. In all these areas effective deception measures play an important part.

Training must include measures to gain surprise and prevent our forces being surprised. Although this is difficult it is essential that it be done so commanders and troops understand the requirements and are capable of implementing them in a combat situation.

NOTES

3. Erfurth, p 186.
15. Jomini H. Art. of War. Stackpole Books, Harrisburg, Pa., 1965, p 117. 'To surprise an army it is not necessary to take it entirely unawares . . . it is sufficient to attack . . . before preparations can be made to meet the attack'.
17. Savkin, p 85.
18. Savkin, p 86.
21. Dupuy, p 44.
24. Savkin, p 89.
27. Savkin, p 89.
28. Clausewitz, p 117.
32. Erfurth, p 191.
34. Possony and Pournelle, p 99.
41. Field Manual 100-5. pp 4-3ff.
42. Erfurth, p 39.
46. Insight Team of the Sunday Times. Insight on the Middle East War. Angus and Robertson, Melbourne, 1974, p 49.
50. Krich et al. p 46.
51. Krich et al. p 189.
53. Schoenau Castle was a transit camp for Jewish emigration from the Soviet Union. It was closed by the Austrians just prior to the Yom Kippur War.
60. Erfurth, pp 196-197.

BIBLIOGRAPHY

Books

Insight Team of the Sunday Times. ‘Insight on the Middle East War’. Angus & Robertson, Melbourne, 1974.

Articles

Cecil Gerald T. ‘“Airborne — All the Way”’. Army, August 1977.

Government Papers


Training Manuals


AWARD: ISSUE NO. 24 (SEPTEMBER/OCTOBER 1980)

The Board of Management has awarded the prize of $30 for the best original article in the September/October 1980 issue (No. 24) of the Defence Force Journal, to Major R. A. Hall for his article Aborigines in the Army.
Reviewed by Brigadier F. W. Speed RL.

The width of vision of this Belgian General, onetime Director of Studies of the NATO Defence College, is extraordinary.

Looking at the dustcover, one is sceptical of the phrase ‘48 Hours That Could Change The Face of the World’. It suggests a formula for a super blitzkrieg, a nuclear-lightning campaign. Reading on, however, it emerges that there is good reasoning behind the figures ‘48’ which, if that timing were not in fact achieved, would mean the failure of a superbly planned non-nuclear thrust, and the dire retribution that would result.

The theme is the weakening of NATO and the opportunity that offers for Russia to mount a major invasion, with comparatively little observable preparation, which would overwhelm the Alliance.

To some, this is a prosaic proposition not sustainable by the facts; to many Australians and New Zealanders it is only a scare to do with the European Community on the other side of the world, into which we are no longer likely to be drawn, if indeed it should happen.

What lifts this book from the ruck is a series of analyses of the defence policies of Britain, France, West Germany, and the other Europeans, and of related specific problems, that are succinct and yet satisfying. The reader is not bound to agree with the author’s conclusions, but if he does take a contrary view, his own analysis will have to be supported by cogent argument. General Close does not thrust his opinions on the reader, he relies on the credibility of his words.

Of the contentious 48-hour proposition, he says ‘Technological progress, conquest of the third dimension (chiefly by helicopters), and the weakening of our fronts due to dwindling troops numbers, (their) fire power, and the instantaneousness of decisions supported by an immense communications network make a light-operation both possible and probable’; he then goes on to a thoughtful proof of his thesis.

To the question: Given that Russia may have the capacity to make a pre-emptive attack on Western Europe, has it really the will? General Close is less convincing. He examines Russia’s past record, notes that there were changes under Khruschev, and states that Brezhnev, under cover of detente, is to pursue unceasingly the achievement of nuclear parity and the building of a powerful fleet, while at the same time continuing to improve the conventional forces both quantitatively and qualitatively. But Close does not produce evidence, hard or otherwise, that this action is offensive rather than defensive.

And while one is carping, there is a small matter. It might be observed that while the publisher’s editor, in preparing the manuscript for publication in America, justifiably used the spelling ‘defense’, he/she might have troubled to read the proofs. This English translation is dappled with compositor’s errors.

The book should be of substantial value to officers preparing for entry into any of the international defence colleges. It presents a full yet succinct picture of the political and military problems of Europe, which will save them hours of research. It should also be very useful in places of tertiary education concerned with Europe Today, and with the aims of Russia and Russian Communism. Further, dare one say it, these chapters might be helpful to all involved in Australia and New Zealand’s foreign affairs.

Nor is the book wholly critical or negative in its approach. It offers a very practical solution which would enable the Atlantic Alliance to strengthen its European bastion. Whether it is the right solution is not the point; at the least it offers a real basis for informed debate which, given a sufficient degree of goodwill, could lead to a formula for Alliance success.

There will be many who take the view that Russia is not a threat to Western Europe — if the Russians can be convinced the USA does not have designs on the Russian empire. To these the book will offer material for even sharper controversy.
THE political life of Billy Hughes spanned almost sixty years during which he was at the centre of a variety of important political events. A biography of his life, therefore, brings the reader in touch with almost every important development in Australia's political history from 1890 to 1950. L. F. Fitzhardinge encompassed Hughes' life to 1914 in the first volume and we now have the long awaited second and final volume of this amazing man's political life.

The author adopts the title of 'Little Digger' for this second volume which is quite appropriate given that Hughes' greatest impact on Australian history was made during the first World War. This is why almost two-thirds of the book is devoted to these years and those immediately following.

Billy was a small man and because he was a little over five feet tall and weighed less than seven stone he was often referred to as "that bag of bones". He was partly deaf having caught an ear infection while sleeping on the ground during his days as a drover in Queensland. Despite these physical defects, or perhaps because of them, Billy battled through an exciting political life and helped build many of the Australian political institutions that we are familiar with today. He helped establish the Labor Party in New South Wales as well as its institutions such as the method of caucus, the electoral pledge and the extra-Parliamentary Labor Party: all very necessary devices to hold together a new and radical political party.

While a Member of Parliament he established the Waterside Workers' Federation not an easy task given that stevedoring was then an unskilled and casual type of work and that the waterfront and shipping firms were powerful in the economy of those days.

Billy also studied law part-time and was admitted to the New South Wales Bar in 1903 after he had been elected to the Federal Parliament. Consequently he served as Attorney-General in the coalition Governments and independent Labor Governments that were formed before the war.

Hughes firmly believed in building up the defence forces of Australia. He had served in the Queensland Army for a short time, but this did not seem to be a determining factor in his attitude on this matter. He believed that the remoteness of Australia from Britain would weaken any British intention of coming to Australia's aid in the case of an invasion from Japan. Hughes argued frequently for compulsory military service for young men and although Labor was in the Opposition when the Deakin Government introduced such a measure, Hughes defended the proposal against those attacking it. The establishment of an Australian Navy had also been an aim of Hughes and the election of the first Labor Government in 1910 allowed the legislation to be passed leading to the financing of the new Navy.

Soon after the war commenced Hughes became the leader of the Party and Prime Minister as well as remaining as Attorney General. A lesser man would have been overwhelmed by the cares of office in such extreme times, but Hughes flourished during these years. He set about extending to the limit the powers of the national Government with war-time legislation and there was little the State righters could do about it although they did raise High Court challenges. At the stroke of a pen he and Sir Robert Garran, the Solicitor General could validate a method of war-time regulations from controlling the price of bread to establishing a national shipping line.

Hughes in these war years was at the very centre of power in Australia and his visit to Britain in 1916 introduced him to the centre of the war-time power in Britain. He was not the first nor indeed the last of our Australian Prime Ministers to succumb to being duchessed by the British establishment and this must have been an important element in his determination to introduce conscription on his return to Australia.

His earlier attraction to compulsory military service, the need for reinforcements to feed that devouring war machine in France and Billy's own "can-do" philosophy led him to push a reluctant Labor Party towards conscription. The Party balked at this and a national referendum was adopted as a type compromise.

Foolishly, Billy ordered the call-up of eligible men before the Referendum and many, who were clearly unprepared to enlist, appealed to
the courts, but in most cases they lost their appeals. These events frightened many Australians who may have otherwise supported the referendum and they together with the Australian farmers who feared losing their sons from the farm ensured the defeat of the referendum.

In calmer moments Billy would have reviewed his situation and that of the Party after such a defeat, but Billy was not the humble type. He seemed to be deeply impressed with his role as founding father of the Party and the main architect of its policies. He saw himself as a close confidant of British Prime Ministers and Generals and he appeared to have lost the political rationality he once displayed. He became a type of one-man-band who was unwilling to brook any criticism of himself or his policy.

He stormed out of the Caucus meeting held after the referendum defeat and joined with his opponents of the Liberal Party to form the “Win-the-War Party” or Nationalist Party. His success in the 1917 elections vindicated what he believed to be the correct stance in the matter and he decided to hold another conscription referendum which he lost again, but by a larger margin.

The magic of the power centre in Britain attracted him again to London in 1918 to which he travelled via Washington where he stopped off to give the aloof and icy President Wilson the benefit of his opinions. Billy’s arrival in Britain was well timed because soon after Germany agreed to an armistice and Hughes was on the spot to attend the succeeding Peace Conference.

Jospeh Cook, Sir Robert Garran and John Latham accompanied Hughes and these men were all given tasks in the various committees associated with the Peace Conference. Billy demanded and got individual representation for the British Colonies at the Conference and he was made Chairman of a committee of the Imperial War Cabinet to make recommendations on the reparations that should be demanded of Germany.

It was useless exercise because if Germany were to pay the Allies in goods and services for the cost of the war the economies of the Allies would have been undermined by the inflow of cheap German manufactures. Hughes could not appreciate this very obvious fact and did not disagree with the recommendation that Germany be asked to pay the ridiculous figure of 24,000 million. He later defended this stance at the Commission on Reparations where he clashed with John Forster Dulles from the U.S.A. Under pressure from President Wilson the final decision was realistically milder, much to the chagrin of Hughes who seemed to have lost all reason in this matter.

Hughes failed to see that Lloyd George wanted a recommendation for a heavy indemnity because he wished to win his post-war election with promises of making Germany pay for the whole war. Lloyd George knew himself that the plan was unrealistic, but this policy was an ideal vote winner. Hughes obligingly delivered him the recommendation and Lloyd George was returned as Prime Minister. Hughes was not the last Australian Prime Minister to be manipulated by the British establishment.

In the post-war years Hughes increased rather than reduced his tendency to act as a one-man-band. Being now in complete control of the Government, he pushed ahead with his visionary plans for expanding the Australian Government’s economic powers by referendum, establishing a government supported oil industry (Commonwealth Oil Refineries) and a similarly supported radio manufacturing industry (Amalgamated Wireless of Australia). He had already established the Commonwealth Shipping Line and many of the Nationalist Party members began to wonder if they were not supporting a government more socialistic than the Labor Party.

The newly emerged Country Party under Dr Earle Page adopted an anti-Hughes policy and at the 1922 elections John Latham was elected as the anti-Labor member for the seat of Kooyong on the promise that he would toss Hughes out of the Party leadership. The outcome was that Hughes had to resign as leader and Bruce and Page, with Latham’s support, formed the first of many enduring coalition Governments.

Billy was to get his revenge, however, when in 1929 he led a group which defeated the Government over its plan to abandon industrial arbitration to the States. The Scullin Labor Government was elected to office and Hughes established the short-lived Australia Party with his supporters. By 1934 Latham had moved to the High Court and Hughes was back in the Ministry in the Lyons-Page Government and in 1939, after Lyons died, Hughes and R. G. Men-
gies contested for leadership with Menzies becoming leader and Hughes his deputy. He became Attorney-General in 1940 and when the Curtin Labor Government was formed in 1941 Hughes became leader of the United Australia Party while Menzies sat in the background.

The most amazing in-fighting broke out among the anti-Labor forces caused mainly by Hughes and Fadden, Leader of the Country Party, supporting the Labor Government in its policy of removing taxing powers from the States. Menzies regarded this as doctrinal desertion and, with the South Australian Liberal and Country Party, established the National Service Group within the U.A.P. After the 1943 general elections Menzies became leader again with Hughes as his deputy, but by April 1944 Billy was again tossed out of the Party because he chose to remain in the Labor Government’s War Advisory Council after most U.A.P. members had resigned from it. He later supported the Labor Government in the 1944 referendum to enlarge the powers of the Australian Government which did not endear him to the Menzies-led opposition. When Menzies formed the Liberal Party as the main anti-Labor force in Australia, Hughes joined it in 1945. Hughes remained the antithesis of the party hack and in 1952 condemned Menzies and his ministry for selling the Government’s share of the Commonwealth Oil Refinery. A few weeks later he was dead at ninety years of age.

L. F. Fitzhardinge, like most biographers, sees his subject in the best light and by mostly using the papers that Hughes left behind, after careful culling, he does not see Hughes’ authoritarianism in full flight. Numerous examples of this are to be seen in the files of Defence Department and Attorney-General’s Department during the First World War and held in the Australian Archives. We can see Hughes ordering the arrest and deportation to Chile, of all places, of the left wing radicals in the Industrial Workers of the World in 1917. This is matched decades later by Hughes ordering the various sections of the Communist Party to be banned and its members arrested in 1940.

The years of discord with Page and Sir John Latham, his readmission to the ministry of Lyons and his deep conflict with Menzies are all rapidly skipped through without much light being cast upon these important episodes in non-labor politics. The book, however, is a highly useful contribution to twentieth century Australian history and it will remain a work of reference for all interested in the history of our nation as well as giving a deep insight into one of our most enduring political figures.

"SIDESHOW, — KISSINGER, NIXON, AND THE DESTRUCTION OF CAMBODIA", by William Shawcross. 467 pages, Hutchinson (Australia)

Reviewed by Major Bruce Cameron, RAAC

BANGKOK — Pol Pot’s ousted Kampuchean government had dismissed him it was reported here. The Bangkok Post Newspaper said he had been replaced by Khieu Samphon. The newspaper said the dismissal was planned to improve the Kymer Rouge’s tarnished image”.


William Shawcross makes no such prediction in his book “Sideshow”. It is a disappointment that the author does not use the benefit of his vast research to consider the future of Kampuchea and its likely involvement with other countries in the region. The book describes ‘the destruction of ‘Cambodia’ up until the ousting of the Kymer Rouge government by the Vietnamese in December 1978. As events during 1979 have shown however, the ‘destruction’ continued under the new regime (only being averted to a small degree by massive international relief aid), and future stability along the Kampuchean/Thai border is doubtful. Although Shawcross provides no forecast, the benefit of his comprehensive and detailed account is that of enabling the reader to be capable of evaluating these ‘likely courses’ himself.

In relation to Khieu Samphon for example, he is mentioned frequently (being the former Commander-in-Chief of the Kymer Rouge, and Head of State of Democratic Kampuchea). In addition four pages are devoted to outlining his early personal history and political influences. With regard to a new Kymer Rouge ‘image’, it is mentioned that in 1962 Samphon lost his position in Sihanouk’s government because he “refused to accept the bribe of a Mercedes in exchange for issuing a trading licence”.

Cambodia is not however, the book’s only subject. As the full title suggests, Shawcross couples the ‘result’ with the ‘cause’ — in this
case, Kissinger and Nixon. Although an English journalist, the author became involved with American politics when he worked on Capitol Hill (under scholarship arrangements) in 1973. As a result of this experience he later co-authored "Watergate: The Full Inside Story". It would probably have been impossible therefore, for Shawcross not to have been influenced by preconceived personal opinions when dealing with Kissinger and Nixon.

In his Foreword the author explains "This book is an attempt to examine the Nixon administration's uses of power". Abuses of power would seem a more appropriate phrase. Shawcross does not conceal his contempt for what John le Carre describes as the "surreal world of high politics where deceit masquerades as virtue". It is almost with the vindictive attitude of an American describing his country's betrayal, that the intimate process of White House decision making is revealed. It is not a surprise that the forward simply states "Dr Kissinger declined to see me".

It is the author's familiarity with 'Capitol Hill' however, that makes "Sideshow" so absorbing. The disregard of the constitution in the ordering of B-52 strikes, the subsequent inducement of Cambodia into a direct conflict with the Vietnamese, and then the denial of responsibility for the disastrous outcome, provide frightening reading. The involvement is summed up well; "Statesmen must be judged by the consequences of their actions. Whatever Nixon and Kissinger intended for Cambodia, their efforts created catastrophe." "Cambodia was not a mistake, it was a crime."

The material that the author assembled is well presented. He was aided by the American 'Freedom of Information Act' which provides access to classified information without being subject to the all-encompassing 30 years ban which frustrates historians in other countries. Provided to help the reader are a 'Cast of Characters', a 'Short Chronology', and a detailed 'Bibliography'. In addition a well chosen series of photographs illustrate the events described. The only shortcoming that this reader found was that, although the 'Notes' are well assembled at the end of the book, no reference to them is provided in the text.

For many the events leading to the present situation in Kampuchea will not be clearly understood — not because of apathy, but because for so long world attention was focused on Vietnam. 'Sideshow' is the most complete record of this brutal conflict yet published. It needs to be read.


Reviewed by K. I. Taylor
Former Managing Editor, Defence Force Journal.

THIS is not a 'coffee table' book. Its contents are far too harrowing, unrelieved by touches of humour found in many books of war photographs. There is no attempt to glamorize war. Missing are those well-remembered photographs of laughing landgirls with their strong arms round smiling sailors. Some old familiar pictures are there: the dome of St Paul's amidst the smoke and flame of the Blitz; a thoughtful and defiant Churchill viewing the ruins of the House of Commons; the blood-smeared baby in Shanghai, the stricken gunner in helicopter Yankee Papa 13 over Vietnam.

The wars range over the whole history of Life Magazine (first incarnation) from the Spanish Civil War, through the Sino-Japanese war and World War II to Korea, Algeria, Cyprus, Northern Ireland, Biafra, the Arab-Israeli Conflicts and Vietnam. The photographers' names are world famous: Robert Capa, reported dead on D-day, then killed in Vietnam; Larry Burrows, missing presumed dead in Vietnam; Briton, George Rodger; New Zealander, George Silk; Margaret Bourke-White, Life's first woman combat reporter. Five of twenty-one were wounded in World War II, miraculously none killed; yet four died in later conflicts.

The main impression one gets from this book is of the faces of those war has touched. There is little defiance, almost no joy. Horror, despair, fear and resignation are all etched there, whether those faces be young or old, black, white or yellow, male or female. George Silk once said, "...perhaps, if people got a good rough look at how wars are fought, they might stop future wars." It is a tragedy that this book is unlikely to be seen by those people most likely to start the next war — and the one after that.
# INDEX

## 1980

No. 20 January/February 1980 — No. 25 November/December 1980

## Part 1 — TITLE INDEX

<table>
<thead>
<tr>
<th>TITLE</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aborigines and the Army</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Advanced Technology Conventional Weapons New Capabilities, Old and</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>New Problems</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Ambrosia and the Lotus Eater</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Bayonet and Baton (Part 1)</td>
<td>21</td>
<td>50</td>
</tr>
<tr>
<td>Bayonet and Baton (Part 2)</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Congested ‘In’ Tray, The</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Counter Armour Operations: A Concept for Australia in Mid and High Intensity Operations</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>C3 and the Defence of Australia</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Defence Sales: Pith and Potential</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Enemy, The-Who is He?: A letter to a Friend</td>
<td>23</td>
<td>40</td>
</tr>
<tr>
<td>Family Background of Lieut. General Sir John Moore, The</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>Forgotten War in North Russia, The</td>
<td>20</td>
<td>36</td>
</tr>
<tr>
<td>Functions of a Design Authority, The</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Gandhian Mode of Revolt, The</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Initial thoughts of an Australian Land Surveillance Force</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>TITLE</td>
<td>ISSUE</td>
<td>PAGE</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>In Pursuit of Excellence or Identifying Unit Training Needs</td>
<td>25 Nov/Dec</td>
<td>5</td>
</tr>
<tr>
<td>Lies Statistics and Military History</td>
<td>22 May/Jun</td>
<td>15</td>
</tr>
<tr>
<td>Logex in Retrospect</td>
<td>23 Jul/Aug</td>
<td>55</td>
</tr>
<tr>
<td>Major-General Sir Neville Howse, V.C.</td>
<td>22 May/Jun</td>
<td>54</td>
</tr>
<tr>
<td>Man: The Measure of Most Things</td>
<td>20 Jan/Feb</td>
<td>6</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Outline of the Australian Military Involvement in Vietnam, An</td>
<td>24 Sep/Feb</td>
<td>42</td>
</tr>
<tr>
<td>Practicabilities of Maritime Boundaries, The</td>
<td>22 May/Jul</td>
<td>50</td>
</tr>
<tr>
<td>Professional Military Officer in Australia, The</td>
<td>23 Jul/Aug</td>
<td>23</td>
</tr>
<tr>
<td>Rapier. Should it be reserved for the Field Army?</td>
<td>22 May/Jul</td>
<td>9</td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 Jul/Aug</td>
<td>7</td>
</tr>
<tr>
<td>RODC, The: Its Not Too Late to Change</td>
<td>20 Jan/Feb</td>
<td>23</td>
</tr>
<tr>
<td>Role of Air Power in the Defence of Australia, The</td>
<td>21 Mar/Apr</td>
<td>44</td>
</tr>
<tr>
<td>Role of the Planning Balance Sheet, The</td>
<td>23 Jul/Aug</td>
<td>47</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jul</td>
<td>18</td>
</tr>
<tr>
<td>Sino-Viet Conflict, The</td>
<td>23 Jul/Aug</td>
<td>17</td>
</tr>
<tr>
<td>Spirit of Anzac, The</td>
<td>22 May/Jul</td>
<td>7</td>
</tr>
<tr>
<td>Surprise can be Achieved in War Despite Advances in Electronic Warfare and Surveillance Devices</td>
<td>25 Nov/Dec</td>
<td>42</td>
</tr>
<tr>
<td>Tanks, Shellfire and a Dazzling Torch</td>
<td>20 Jan/Feb</td>
<td>29</td>
</tr>
<tr>
<td>Teddy Roosevelt: America's Greatest Statesman?</td>
<td>24 Sep/Oct</td>
<td>54</td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
</tbody>
</table>

**BOOK REVIEWS**

Abbreviations Dictionary                                                                 24 Sep/Oct       62
Australian Army Cadet Unit 1945-1977, An: Dismissal and Reveille                          24 Sep/Oct       64
Australia in Peace and War                                                                22 May/Jun       63
Battle Dress                                                                            20 Jan/Feb        61
Caesars Invasion of Britain                                                               21 Mar/Apr        61
Chinese Military System, The                                                              22 May/Jun        64
Combat Aircraft of World War Two                                                          21 Mar/Apr        58
Controlling Australia's Threat Environment: A Methodology for Planning                    23 Jul/Aug        60
Australian Defence Force Development                                                      24 Sep/Oct        58
Controlling Australia's Threat Environment: A Methodology for Planning                    24 Sep/Oct        58
Australian Defence Force Development                                                      23 Jul/Aug        60
Crisis of Command                                                                        20 Jan/Feb        62
DUKW 2½ Ton 6x6 Amphibian                                                                  24 Sep/Oct        63
Elusive Victory: The Arab-Israeli Wars 1947-1974                                          20 Jan/Feb        61
Europe Without Defence                                                                    25 Nov/Dec        53
Forgotten War, The                                                                       21 Mar/Apr         63
Front Line Theatre                                                                       23 Jul/Aug         64
German Military Uniforms and Insignia 1933-1945                                          21 Mar/Apr         59
Gunners, Game and Gardens: An Autobiography                                              22 May/Jun        62
Hurricane Squadron: Yeoman Goes to War                                                   21 Mar/Apr         60
Kesselring: The Making of the Luftwaffe                                                   20 Jan/Feb         60
Life at War                                                                              25 Nov/Dec         57
Man O'War                                                                                21 Mar/Apr         64
Organizational Transitions: Managing Complex Change                                       24 Sep/Oct         59
Pacific War, The: World War II and the Japanese 1931-1945                                24 Sep/Oct         60
Sideshow: Kissinger, Nixon, and the Destruction of Cambodia                               25 Nov/Dec         56
Warning and Response: A Study of Surprise Attack in the 20th Century and an Analysis of its Lessons for the Future | 23 Jul/Aug | 63 |
Winners and Losers                                                                       21 Mar/Apr         62
# SUBJECT INDEX

<table>
<thead>
<tr>
<th>ADMINISTRATION</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congested 'In' Tray, The</td>
<td>21 Mar/Apr</td>
<td>18</td>
</tr>
<tr>
<td>Functions of a Design Authority, The</td>
<td>20 Jan-Feb</td>
<td>36</td>
</tr>
<tr>
<td>In Pursuit of Excellence: Identifying Unit Training needs</td>
<td>25 Nov/Dec</td>
<td>6</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Professional Military Officer in Australia, The</td>
<td>23 Jul/Aug</td>
<td>23</td>
</tr>
<tr>
<td>R.O.D.C., The: It's not too late to change</td>
<td>20 Jan/Aug</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AIR MATTERS</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Defence Sales: Pith and Potential</td>
<td>24 Sep/Oct</td>
<td>25</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr</td>
<td>38</td>
</tr>
<tr>
<td>Rapier: Should it be reserved for the Field Army?</td>
<td>22 May/Jun</td>
<td>9</td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 July/Aug</td>
<td>7</td>
</tr>
<tr>
<td>Role of Air Power in the Defence of Australia, The</td>
<td>21 Mar/Apr</td>
<td>44</td>
</tr>
<tr>
<td>Role of Planning Balance Sheet in the Location of Air Force Bases in Australia, The</td>
<td>23 Jul/Aug</td>
<td>47</td>
</tr>
<tr>
<td>Surprises can be achieved in War Despite Advances in Electronic Warfare and Surveillance Devices</td>
<td>25 Nov/Dec</td>
<td>42</td>
</tr>
<tr>
<td>Why tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANZAC</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major General Sir Neville Howse V.C.</td>
<td>22 May/Jun</td>
<td>54</td>
</tr>
<tr>
<td>Spirit of Anzac, The</td>
<td>22 May/June</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOK REVIEWS</th>
<th>See Title Index</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CHINA</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sino-Viet Conflict, The: A Background</td>
<td>23 Jul/Aug</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSCRIPTION</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HISTORY</th>
<th>ISSUE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>Bayonet and Baton, (PART 1)</td>
<td>20 Jan/Jan</td>
<td>50</td>
</tr>
<tr>
<td>Bayonet and Baton, (PART 2)</td>
<td>21 Mar/Apr</td>
<td>50</td>
</tr>
<tr>
<td>Family Background of Lieut. General Sir John Moore, KB, The</td>
<td>23 Jul/Aug</td>
<td>40</td>
</tr>
<tr>
<td>Forgotten War in North Russia, The</td>
<td>22 May/Jun</td>
<td>31</td>
</tr>
<tr>
<td>Gandhian Mode of Revolt, The</td>
<td>20 Jan/Feb</td>
<td>17</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr</td>
<td>38</td>
</tr>
<tr>
<td>Lies, Statistics and Military History</td>
<td>22 May/Jun</td>
<td>15</td>
</tr>
<tr>
<td>Major-General Sir Neville House V.C.</td>
<td>22 May/Jun</td>
<td>54</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jun</td>
<td>18</td>
</tr>
<tr>
<td>Spirit of Anzac, The</td>
<td>22 May/Jun</td>
<td>7</td>
</tr>
<tr>
<td>Tanks, Shellfire and a Dazzling Torch</td>
<td>20 Jan/Feb</td>
<td>29</td>
</tr>
<tr>
<td>Teddy Roosevelt, America’s Greatest Statesman?</td>
<td>24 Sep/Oct</td>
<td>54</td>
</tr>
<tr>
<td>TITLE</td>
<td>ISSUE</td>
<td>PAGE</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td><strong>HUMAN BEHAVIOUR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man: The Measure of Most Things</td>
<td>20 Jan/Feb</td>
<td>6</td>
</tr>
<tr>
<td><strong>INTERNATIONAL POLITICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Defence Sales: Pith and Potential</td>
<td>24 Sep/Oct</td>
<td>25</td>
</tr>
<tr>
<td>Gandhian Mode of Revolt, The</td>
<td>20 Jan/Feb</td>
<td>17</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr</td>
<td>38</td>
</tr>
<tr>
<td>Practicalities of Maritime Boundaries, The</td>
<td>22 May/Jun</td>
<td>50</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jun</td>
<td>18</td>
</tr>
<tr>
<td>Sino-Viet Conflict, The: A Background</td>
<td>23 Jul/Aug</td>
<td>17</td>
</tr>
<tr>
<td>Teddy Roosevelt, America's Greatest Statesman?</td>
<td>24 Sep/Oct</td>
<td>54</td>
</tr>
<tr>
<td><strong>LOGISTICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Thoughts of an Australian Land Surveillance Force</td>
<td>21 Mar/Apr</td>
<td>24</td>
</tr>
<tr>
<td>Logex in Retrospect: Logistic Problems</td>
<td>23 Jul/Aug</td>
<td>55</td>
</tr>
<tr>
<td><strong>MANAGEMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congested 'In' Tray, The</td>
<td>21 Mar/Apr</td>
<td>18</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Functions of a Design Authority, The</td>
<td>20 Jan/Feb</td>
<td>36</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Professional Military Officer in Australia</td>
<td>23 Jul/Aug</td>
<td>23</td>
</tr>
<tr>
<td>R.O.D.C., The: It's not too late to change</td>
<td>20 Jan/Feb</td>
<td>23</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jun</td>
<td>18</td>
</tr>
<tr>
<td><strong>MEDICAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Family Background of Lieut. General Sir John Moore, KB, The</td>
<td>23 Jul/Aug</td>
<td>40</td>
</tr>
<tr>
<td>Major-General Sir Neville Howse V.C.</td>
<td>22 May/Jun</td>
<td>54</td>
</tr>
<tr>
<td>Man: The Measure of Most Things</td>
<td>20 Jan/Feb</td>
<td>6</td>
</tr>
<tr>
<td><strong>MILITARY PROFESSIONALISM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enemy, The: Who is he? A Letter to a Friend</td>
<td>21 Mar/Apr</td>
<td>35</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Professional Military Officer in Australia, The</td>
<td>23 Jul/Aug</td>
<td>23</td>
</tr>
<tr>
<td>R.O.D.C., The: It's not too late to change</td>
<td>20 Jan/Feb</td>
<td>22</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jun</td>
<td>18</td>
</tr>
<tr>
<td><strong>NAVAL MATTERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>Defence Sales: Pith and Potential</td>
<td>24 Sep/Oct</td>
<td>25</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr</td>
<td>38</td>
</tr>
<tr>
<td>Practicalities of Maritime Boundaries, The</td>
<td>22 May/Jun</td>
<td>50</td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 Jul/Aug</td>
<td>7</td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
<tr>
<td>ORGANIZATION</td>
<td>ISSUE</td>
<td>PAGE</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>Congested ‘In’ Tray, The</td>
<td>21 Mar/Apr</td>
<td>18</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Enemy, The: Who is he? A Letter to a Friend</td>
<td>21 Mar/Apr</td>
<td>35</td>
</tr>
<tr>
<td>Functions of a Design Authority, The</td>
<td>20 Jan/Feb</td>
<td>36</td>
</tr>
<tr>
<td>In Pursuit of Excellence: Identifying Unit Training Needs</td>
<td>24 Nov/Dec</td>
<td>6</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Professional Military Officer in Australia, The</td>
<td>23 July/Aug</td>
<td>23</td>
</tr>
<tr>
<td>R.O.D.C., The: It’s not too late to change</td>
<td>20 Jan/Feb</td>
<td>23</td>
</tr>
<tr>
<td>Service Dedication in Peace</td>
<td>22 May/Jun</td>
<td>18</td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLANNING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambrosia and the Lotus Eater</td>
<td>21 Mar/Apr</td>
<td>21</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>Congested ‘In’ Tray, The</td>
<td>21 Mar/Apr</td>
<td>18</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Enemy, The: Who is he? A Letter to a Friend</td>
<td>21 Mar/Apr</td>
<td>35</td>
</tr>
<tr>
<td>Functions of a Design Authority, The</td>
<td>20 Jan/Feb</td>
<td>36</td>
</tr>
<tr>
<td>Lies, Statistics and Military History</td>
<td>22 May/Jun</td>
<td>15</td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec</td>
<td>33</td>
</tr>
<tr>
<td>Professional Military Officer in Australia, The</td>
<td>23 Jul/Aug</td>
<td>23</td>
</tr>
<tr>
<td>R.O.D.C., The: It’s not too late to change</td>
<td>20 Jan/Feb</td>
<td>23</td>
</tr>
<tr>
<td>Role of the Planning Balance Sheet in the Location of Air Force Bases in</td>
<td>23 Jul/Aug</td>
<td>47</td>
</tr>
<tr>
<td>Australia, The</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECONNAISSANCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Initial Thoughts of an Australian Land Surveillance Force</td>
<td>21 Mar/Apr</td>
<td>24</td>
</tr>
<tr>
<td>Surprise can be achieved in War Despite Advances in Electronic Warfare and</td>
<td>25 Nov/Dec</td>
<td>42</td>
</tr>
<tr>
<td>Surveillance Devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.O.D.C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.O.D.C., The: It’s not too late to change</td>
<td>20 Jan/Feb</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SECURITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr</td>
<td>38</td>
</tr>
<tr>
<td>Initial Thoughts of an Australian Land Surveillance Force</td>
<td>21 Mar/Apr</td>
<td>24</td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 Jul/Aug</td>
<td>7</td>
</tr>
<tr>
<td>Surprise can be achieved in War Despite Advances in Electronic Warfare and</td>
<td>25 Nov/Dec</td>
<td>42</td>
</tr>
<tr>
<td>Surveillance Devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRATEGY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec</td>
<td>15</td>
</tr>
<tr>
<td>Ambrosia and the Lotus Eater</td>
<td>21 Mar/Apr</td>
<td>21</td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr</td>
<td>6</td>
</tr>
<tr>
<td>Concept for Australia in Mid and High Intensity Operations, A</td>
<td>24 Sep/Oct</td>
<td>6</td>
</tr>
<tr>
<td>C³ and the Defence of Australia</td>
<td>25 Nov/Dec</td>
<td>23</td>
</tr>
<tr>
<td>Enemy, The: Who is he? A Letter to a Friend</td>
<td>21 Mar/Apr</td>
<td>35</td>
</tr>
<tr>
<td>TITLE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr 38</td>
<td></td>
</tr>
<tr>
<td>Initial Thoughts of an Australian Land Surveillance Force</td>
<td>21 Mar/Apr 24</td>
<td></td>
</tr>
<tr>
<td>Lies, Statistic and Military History</td>
<td>22 May/Jun 15</td>
<td></td>
</tr>
<tr>
<td>Role of Air Power in the Defence of Australia, The</td>
<td>21 Mar/Apr 44</td>
<td></td>
</tr>
<tr>
<td>Surprise can be achieved in War Despite Advances in Electronic Warfare and Surveillance Devices</td>
<td>25 Nov/Dec 42</td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb 43</td>
<td></td>
</tr>
<tr>
<td><strong>SURVEILLANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec 15</td>
<td></td>
</tr>
<tr>
<td>Ambrosia and the Lotus Eater</td>
<td>21 Mar/Apr 21</td>
<td></td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr 6</td>
<td></td>
</tr>
<tr>
<td>C3 and the Defence of Australia</td>
<td>25 Nov/Dec 23</td>
<td></td>
</tr>
<tr>
<td>Initial Thoughts of an Australian Surveillance Force</td>
<td>21 Mar/Apr 24</td>
<td></td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 Jul/Aug 7</td>
<td></td>
</tr>
<tr>
<td>Surprise can be Achieved in War Despite Advances in Electronic Warfare and Surveillance Devices</td>
<td>25 Nov/Dec 42</td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb 43</td>
<td></td>
</tr>
<tr>
<td><strong>TECHNICAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Technology: Conventional Weapons</td>
<td>25 Nov/Dec 15</td>
<td></td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr 6</td>
<td></td>
</tr>
<tr>
<td>Concept for Australia in Mid and High Intensity Operations, A</td>
<td>24 Sep/Oct 6</td>
<td></td>
</tr>
<tr>
<td>C3 and the Defence of Australia</td>
<td>25 Nov/Dec 23</td>
<td></td>
</tr>
<tr>
<td>Defence Sales: Pith and Potential</td>
<td>20 Jan/Feb 36</td>
<td></td>
</tr>
<tr>
<td>Functions of a Design Authority</td>
<td>20 Jan/Feb 36</td>
<td></td>
</tr>
<tr>
<td>Practicalities of Maritime Boundaries, The</td>
<td>22 May/Jun 50</td>
<td></td>
</tr>
<tr>
<td>Rapier: Should it be reserved for the Field Army?</td>
<td>22 May/Jun 9</td>
<td></td>
</tr>
<tr>
<td>Remote Monitoring via Satellite</td>
<td>23 Jul/Aug 7</td>
<td></td>
</tr>
<tr>
<td>Tanks, Shellfire and a Dazzling Torch</td>
<td>20 Jan/Feb 29</td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb 43</td>
<td></td>
</tr>
<tr>
<td><strong>TRAINING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aviation Support for the Australian Army</td>
<td>21 Mar/Apr 6</td>
<td></td>
</tr>
<tr>
<td>Network Analysis and the Training Officer</td>
<td>25 Nov/Dec 23</td>
<td></td>
</tr>
<tr>
<td>Why Tracks, Helicopters and Frigates?</td>
<td>20 Jan/Feb 43</td>
<td></td>
</tr>
<tr>
<td><strong>VIETNAM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sino-Viet Conflict, The: A Background</td>
<td>23 July/Aug 17</td>
<td></td>
</tr>
<tr>
<td><strong>WORLD WAR I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept for Australia in Mid and High Intensity Operations, A</td>
<td>24 Sep/Oct 6</td>
<td></td>
</tr>
<tr>
<td>Lies, Statistics and Military History</td>
<td>22 May/June 15</td>
<td></td>
</tr>
<tr>
<td>Major-General Sir Neville Howse V.C.</td>
<td>22 May/June 54</td>
<td></td>
</tr>
<tr>
<td>Spirit of Anzac, The</td>
<td>22 May/June 7</td>
<td></td>
</tr>
<tr>
<td><strong>WORLD WAR II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aborigines and the Army</td>
<td>24 Sep/Oct 28</td>
<td></td>
</tr>
<tr>
<td>Concept for Australia in Mid and High Intensity Operations</td>
<td>24 Sep/Oct 6</td>
<td></td>
</tr>
<tr>
<td>Historical Approaches to Pearl Harbor, The</td>
<td>21 Mar/Apr 38</td>
<td></td>
</tr>
<tr>
<td>Lies Statistics and Military History</td>
<td>22 May/June 15</td>
<td></td>
</tr>
<tr>
<td>Spirit of Anzac, The</td>
<td>22 May/June 7</td>
<td></td>
</tr>
<tr>
<td>Tanks, Shellfire and a Dazzling Torch</td>
<td>20 Jan/Feb 29</td>
<td></td>
</tr>
<tr>
<td>AUTHOR</td>
<td>TITLE</td>
<td>ISSUE</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>AUSTIN, Brigadier M. (RL)</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>AUSTIN, Brigadier M. (RL)</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>BLOWERS, Flight Lieutenant K.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>BURNESS, Mr Peter</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>CAMERON, Major Bruce</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>CHEESEMAN, Major G. L.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>CHEESEMAN, Major G. L.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>CHRISTENSEN, Mr R. E.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>CLARK, Lieutenant Colonel M. C.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>CLARSEN, Major W. J.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>COLEMAN, Major P. M.</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>COOPER, Commodore A. H.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>COPELAND, Captain B. D.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>De HAAS, Captain Peter</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>EDWARDS, Wing Commander J. D. M.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>EGAN, Flight Lieutenant L. J.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>FUNNELL, Air Commodore R. G.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>HALL, Major R. A.</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>HALL, Lieutenant Colonel R. J. G.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>JAMES, Brigadier W. B.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>JANS, Lieutenant Colonel N. A.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>JEFFREY, Colonel P. M.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>JENDER, Donald Ross</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>JIESMAN, Lieutenant S. R.</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>McNEILL, Major Ian</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>MANLEY, Lieutenant Colonel R. D.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>MIDDLETON, Major G. G.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>MIDDLETON, Major G. G.</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>NORRIS, Major-General Sir Kingsley</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>PERRY, Captain B. H.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>POUND, Major G. G.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>POYNTON, Major D. M.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>REID, Major D. J.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>SHAW, Major M. P. S.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>STACEY, Lieutenant K. N.</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>STEPHENS, Wing Commander A. W.</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>STEVENSON, Major General J. D.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>THORNLEY, Lieutenant Colonel R. E.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>VERSO, Captain M. L.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>WEBB, Dr. G. R.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>WOOD, Colonel J.</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>