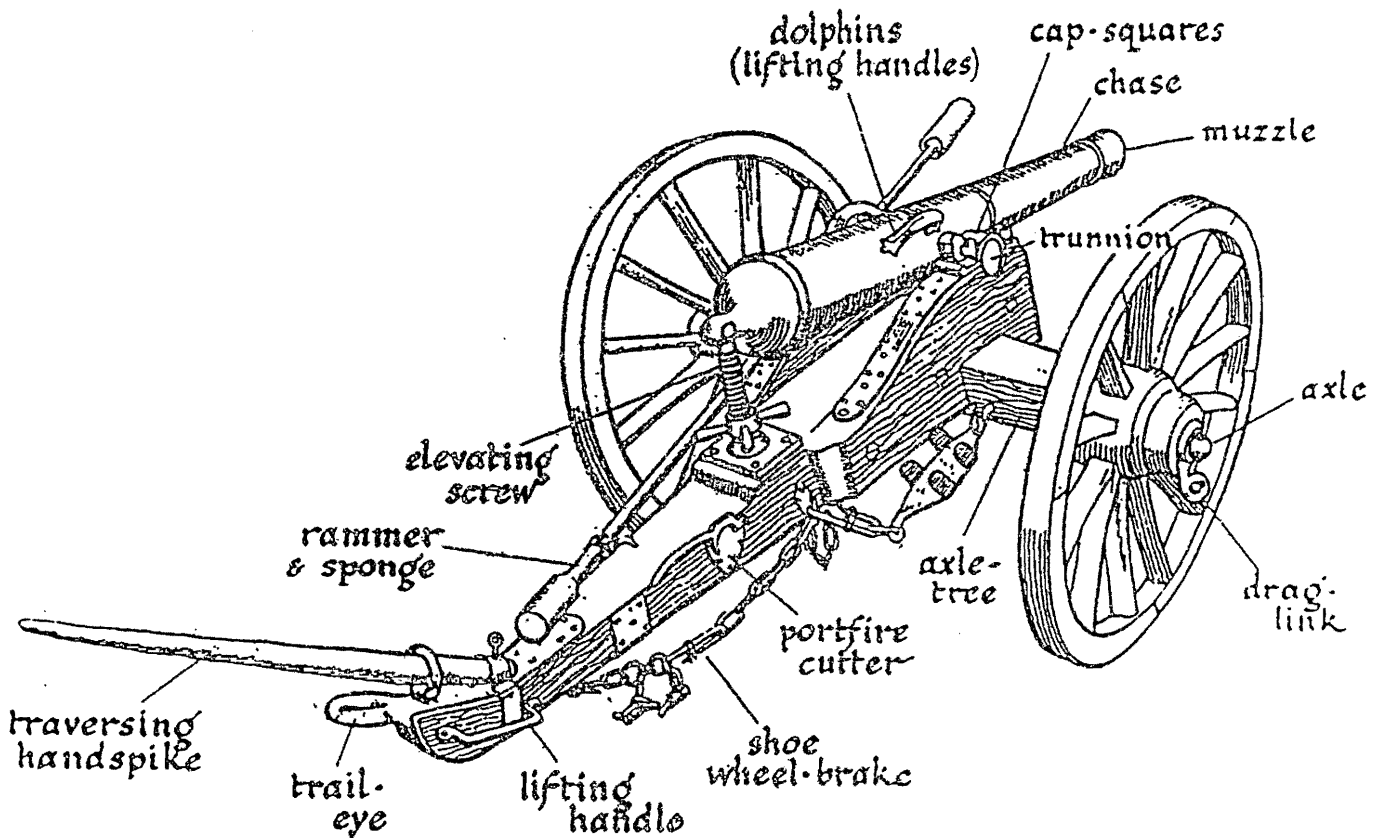




Royal Australian Artillery



Liaison Letter

RAA LIAISON LETTER

EDITION 2

1990

Distribution:

DARTY	400
HO LC Arty	3
HO 1 Div Arty	3
HO 2 Div Arty	3
1 Fd Regt	26
2/15 Fd/10 Mldm Rest	25
4 Fd Regt	21
5/11 Fd Regt	16
7 Fd Regt	16
8/12 Mdm Regt	21
16 AD Regt	21
23 Fd Regt	16
7 Fd Bty	5
16 Fd Bty	5
48 Fd Bty	5
131 Div Loc Bty	10
School of Arty	20
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A MESSAGE FROM THE DIRECTOR

Dear Fellow Gunners,

1990 has been a busy year for all Gunners particularly the second half of the year when Regimental Assessments were conducted in all ARA Regiments, three ARes Regiments and two independent Batteries; decisions announced on the amalgamation of Regiments in Victoria; the deployment of detachments from 16 Air Defence Regiment on HMAS Success; and the opening of the RAA National Museum at North Head.

The deployment of RBS 70 detachments on HMAS Success for duty in the Gulf involved considerable effort in the limited time available by 16 Air Defence Regiment and Land Command Artillery. The thoroughness and professionalism shown by unit members and Land Command Artillery was impressive in bringing the team to operational status in training and administration within 10 days. The next detachment is preparing to embark on WESTRALIA New Years Day and our thoughts and best wishes go with all 13 members on both ships on this important operation.

The amalgamation of the ARes Regiments in Victoria was caused by budgetary pressures, which also saw the demise of HO 3 Division, and 22 Construction Squadron and the amalgamation of Armoured units in Victoria. It is always sad to see units amalgamated, but all effective ARes members have been absorbed either in the new Regimental organisation or non-corps appointments. While some decisions have still to be taken the amalgamated Regiment is expected to be formed on 31 March 1991.

The Regimental assessments are a very busy time for units and the assessing teams drawn from 1 Division Artillery, Land Command Artillery and the Artillery Centre. Reports at the Corps Conference indicated that all units had performed well and were extremely competitive.

The Regimental Conference held in October discussed a number of issues raised in Land Command Artillery and Divisional Artillery Reports and presentations by Directorate Staff particularly on studies or reviews conducted this year. Staff papers on the Review of Field Artillery Officer Training, the centralised system of ARes Office Management, review of ammunition entitlements and amendments to RAA Standing Orders have since been staffed for comment with a view to implementation in 1991.

The RAA National Museum was opened by Sir Roden Cutler in an impressive ceremony conducted at North Head in conjunction with an Open Day on Sunday 2nd December 1990. An excellent crowd of more than 4,000 attended the Open Day and more than 1000 were able to watch the Opening Ceremony at North Fort. The Colonels Commandant represented their Military District at the Opening emphasising the National character of the RAA Museum. I have written to all Commanding Officers thanking them for their whole hearted support in providing work parties, who renovated the 9.2 inch gun emplacements, the tunnels and surrounds; the teams which competed in the races at the Open Day; and the Bands, Gun detachment and Guards for the Opening and Finale. Another feature was the 65-strong massed RAA Band which paraded at the Finale ceremony—a first!

There were many favourable compliments paid by members of the public and a number of donations of memorabilia have been promised. The Museum will open regularly for the general public from 2nd February and will open every

Saturday, Sunday and Wednesday from 10.00 am to 4 pm. If you have not seen the Museum, make the effort early next year, it is well worthwhile.

This year sees a large turnover of Commanders and RSM, with CDA and DASM 1 Div, CO and RSM 1 Fd Regt, CO and RSM 8/12 Mdm Regt, CO and RSM 16 AD Regt, CO/CI and RSM School of Artillery, CO and RSM 2/15 Fd Regt, CO 7 Fd Regt, RSM 5/11 Fd Regt and RSM 23 Fd Regt all departing in the December/January period. To them all I wish to express my thanks for their support and I offer my best wishes in their new appointments.

Our Senior Gunner Major General Ross Buchan is leaving the Army in March 1991 and hands over as GOC Trg Comd on 31 January. He will be farewelled from the Regimental Officer's Mess on Saturday 23 February 1991 where he will hand over the mantle of Senior or Gunner to Major General Steve Gower, who is promoted and appointed ACMAT-A from January 1991.

Finally, I sent congratulations on behalf of the Regiment to WO1 Peter Prewett who takes over as RSM of the Army on 14 December 1990.

To all members of the Regiment, especially those serving overseas I offer the Seasons greetings and best wishes for 1991.

Ubique

A handwritten signature in black ink, appearing to read 'R.V. McEVOY', written in a cursive style.

R.V. McEVOY

DIRECTORATE OF ARTILLERY
STAFF LIST

(AS AT DECEMBER 1990)

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S02 (S-S) (PLANS)	MAJ J.C. Platt	(02) 9761 273
S02 (AD)	MAJ G.G. Collinson	(02) 4761 272
S02 (Pers)	MAJ P.F. Appleton	(06) 2655 790
S03 (Pers)	CAPT R.C. Richards	(03) 2826 187
RMG	WO1 P.J. Bruce, OAM	(02) 9761 276
WO ASST ADMIN	WO1 M.L. Warren	(03) 2826 187
CCLK	SGT C.L. Bateman	(02) 9761 301
Typist	Miss M.T. Soueid	(02) 9761 301

NEW STAFF WEF JAN 91

S01 (ARTY)	LTCOL N.R. BAMFORD
S02 (AD)	MAJ I.P. HOSKING
S02 (PERS)	MAJ S.K. JOSKE
S02 (S-S) (OPS)	MAJ D.R. DAVIES
S03 (S-S)	CAPT R.C. GIBSON
WO2 (S-S)	WO2 P.J.V. COLE

HONOURS AND AWARDS

Congratulations are extended to the following members of the Regiment:

Captain W.H. Grimes - Defence Productivity award in the field of administrative computer programme creation.

Warrant Officer Class Two E.K. Bateman - Defence Productivity award in the field of artillery meteorology

Bombardier G.P. Black - CGS Commendation for meritorious actions involving the rescue of soldiers from a burning building.

A LETTER TO THE EDITOR
from
MR R.H.W. Harvey

Dear Sir,

I would like to offer some comments on the articles "The Development of Counter Battery Fire 1914-45" (Liaison Letter Edition 2 1989) and "The Future of Sound Ranging - Does it Have One?" (Liaison Letter Edition 1 1990).

While I commend both officers for their efforts in the preparation and submission of the articles, there are many aspects relating to counter battery fire and sound ranging that require clarification and further discussion.

Country Battery Fire

Captain Phelps in his article "The Development of Counter Battery Fire 1914-45" presents rather a gloomy picture on the effectiveness of counter battery fire. While this conclusion appears to have been reached from the analysis of limited number of example, there are plenty of cases during the period under discussion, where the successful outcome of the battle was due, in no small way, to a well planned and executed counter battery plan. I would like to illustrate this last statement by giving a brief description of the artillery aspects of a major battle in which the Australian Army played a major part.

The capture of Bardia and Tobruk and the destruction of the Italian Army in Libya during the period December 1940 to February 1941 by the British and Australian Forces was achieved by exploiting some of the artillery lessons learned during the final battles fought in France during World War 1. In particular the aggressive use of artillery fire power was instrumental in overcoming the superiority that the Italians had in both men and guns.

The Italians had fortified Bardia and Tobruk at a great expense of labour, steel and concrete. They had dug a defensive line in the form of an arc around both towns. The posts in the front line were generally 700 metres apart and were protected by rows of barbed wire, a continuous anti-tank ditch and minefields. Within the perimetres were deployed at Bardia an estimated 110 guns of all calibres while at Tobruk this figure proved to be more than double.

The attack on both fortified areas, due to the nature of the defences and terrain and the limited infantry available - the third Brigade (19th) of 6th Australian Division was not available for the attack on Bardia - was to be made on a narrow front. For the attack to be successful, especially during the critical period of the "break-in", it would be necessary to destroy or neutralise the enemy guns that could bring effective fire onto the attacking troops. Consequently, a detailed target acquisition and counter bombardment plan was necessary. With the exception of survey (provided by Royal Engineers and Regimental parties) locating facilities such as sound ranging, were not available, so the fixing of the hostile batteries was carried out mainly from aerial photographs, registration by artillery fire using air observation, shelling connections, captured documents and the results obtained from ad hoc flash spotting bases set up by artillery regimental personnel. Accuracy of fixation was in most cases within 100 metres. Aerial reconnaissance sorties

were carried out by Lysander aircraft with fighter escort. Counter battery fire (flak suppression) was directed at selected anti-aircraft positions while the aircraft were over the area. Just prior to the attacks valuable last minute information, as to whether hostile batteriea were occupied or not, was obtained by a pilot flying at low altitude over the area. In the case of the attack on Tobruk, 24 hostile batteries were examined with 22 found to be occupied.

The batteries selected for the first part of the preliminary bombardment were those whose arcs of fire covered the "forming up" and break-through" areas. These were given an intense but short concentration. Just prior to the assault a concentration of the whole of the artillery allotted for counter battery fire was placed on the nearest two batteries to the "break-through" area, each battery being fired at separately. As more guns became available heavier concentrations were put onto other batteries whose arcs covered the "break-through" area. A sample of the results of the concentrations, compiled from inspections of the hostile battery positions after the battle, is listed in Table A. A total of 23 hostile batteries were engaged, the results of the remaining 17 not listed were of a similar nature. The artillery available to 6th Australian Division for both the CB and attack fire plans at Bardia is listed in Table B. A similar allotment was made available for the attack on Tobruk.

TABLE A
COUNTER BATTERY RESULTS - TOBRUK

Serial	Number and Type of Weapons	Description of Position	Results
1.	4 x 149mm hows	shallow pits	MPI on target, 3 direct hits one pit
2	4 x 120mm guns	well dug in pits	MPI on target, 2 direct hits on pits
3	4 x 75mm guns	shallow pits	MPI 50m plus
4	4 x 120mm guns	well dug in position	MPI on target. one direct hit on pit
5	4 x 149mm guns	permanent position with deep pits	MPI about 150m plus
6.	5 x 149mm guns	permanent pits connected by concrete tunnels	direct hit on No 4 gum, MPI between Nos 4 & 5

TABLE B
ARTILLERY UNITS AVAILABLE TO XII CORPS AT BARDIA

Unit Title	Number of Guns	Type of Gun
1st Field Regiment RHA	16	25 pounders
4th Field Regiment RHA	24	25 pounders
104th Field Regiment RHA	16	25 pounders
51st Field Regiment RHA	24	25 pounders
2/1st Field Regiment RAA	24	25 pounders
2/2nd Field Regiment RAA	12 and 12	18 pounders, 4.5 inch howitzers
6th Medium Regiment RA	16	4.5. inch guns
7th Medium Regiment RA		2 x 60 pounders, 8 x 6 howitzers and 8 x 6 inch guns

The accuracy of counter battery fire can only be improved by, firstly, improving the accuracy of the fixation of hostile batteries. As stated by Captain Phelps, considerable progress has been achieved in this area by the introduction of new locating devices, such as, radar, drones, RPVs, etc. The application of these devices, coupled with the improved data processing techniques have all helped to make reduce the probable errors in fixation.

Similar improvements have taken place in the overall performance of the gun and ammunition systems. Therefore it follows, from all of these improvements, that the accuracy and effectiveness of predicted artillery fire must have undergone dramatic changes since the end of World War 2. I am sure that present day "gunners" will not dispute this statement. However, these gains can only be exploited if the deployment of artillery resources and the fire is applied to counter the enemy threat.

Sound Ranging - Its Future

With regards to the future of sound ranging, I believe that the present system has very little potential, especially in mobile operations. The main reasons are:

- *The time required to deploy a base.
- *The vulnerability of the base to damage from own and enemy forces.
- *The fragile communication links between the microphones, advance

posts and the command post.

*The time required for processing the data and the inherent inaccuracies in the data processing system.

As stated in the article by Captain Smith, some action has been taken over the last two decades to overcome these disadvantages. However, progress has been very slow. During the late 1960s and early 1970s several research projects were initiated at ABCA level in an effort to improve the overall sound ranging system. Individual nations were to undertake the development of separate components of a new system. However, very little progress was made due to problems of standardisation and low priorities. Eventually, the major ABCA nations started their own research projects although exchange of information between nations was still available.

It was obvious that the main areas that required development were:

*The limitations imposed by the need to deploy microphones evenly spaced over a long base.

*The data processing system.

*The unreliable communication links.

An Australian research project to examine the first two of these areas was undertaken by the then Weapons Research Establishment in conjunction with the School of Artillery during the early 1970s. Using information gained from the development of sonar bouys, the project examined the feasibility of grouping microphones in circular clusters and the processing of data by mathematical computations by computer, rather than the antiquated graphical methods.

The employment of clusters offered the following advantages:

*A cluster (100 metres diameter) could be deployed in a secure area.

*Each cluster could cover a 360 degree arc.

*A minimum of three clusters were required to cover a particular zone, the limiting factor being the need for well conditioned triangles.

The results of the research, including some live firing trials at Holsworthy Range, indicated that considerable improvements in the accuracy of hostile battery locations could be achieved and the time taken to produce a result could be reduced to an acceptable level. As far as I am aware no follow up action was taken as a result of the research.

References

The information provided in the comments relating to counter battery fire was extracted from the following reference documents, at present held in the RAA Historical Society Library.

1. Australia in the War of 1939-45, Volume 1, To Benghazi, Gavin Long.

2. Lessons from Recent Operations by Brigadier E.F. Herring, Commander Royal Artillery, 6th Australian Division, dated 14 February 1941.

3. Counter Battery at Tobruk by Major M. Yates, RHA, CB Staff, Headquarters 6th Australian Division, dated 25 January 1941.
4. Report on Artillery Reconnaissance, Bardia and Tobruk 22 December 1940 to 21 January 1941, compiled by ALO, 210 AIL Section, 208 Squadron RAF.
5. Lessons from Recent Operations by Lieutenant Colonel L.E.S. Barker, Commanding Officer 2/1st Field Regiment RAA.
6. 6th Australian Division Artillery Task Tables, Barrage and Hostile Battery Traces, Bardia and Tobruk.
7. "Six Years in Support", Official History of 2/1st Field Regiment RAA.
8. Maps:
 - a. Bardia, 1:25000 with overprint of enemy positions 26 December 1940.
 - b. Tobruk, 1:50000 with overprint of the defences 12 January 1941

HEADQUARTERS 1ST DIVISION ARTILLERY

1. For HQ 1 Div Arty, 1990 is to be known as the year of the BIG WET. The year commenced with the Fort Lytton Artillery Display, held at the mouth of the Brisbane River in the Fort Lytton National Park. The event, billed as an Artillery Spectacular, was the Brisbane Gunners contribution to the Army Birthday 90. Unfortunately the event was cancelled on the day due to heavy seasonal rains.

2. In March the CDA and staff conducted the HQ 1 Div CPX - Overlord 90. The exercise is a warm up CPX for the Div HQ conducted annually.

3. After Overlord it was all go in preparing for IRON GAUNTLET 90, this year hosted by 16 Fd Regt RNZA at Papakura Barracks, NEW ZEALAND. The exercise which involved all 1 Div Arty units and 16 Fd Regt was visited by COMD 1 Div, MAJGEN A. FITTOCK, the Colonel Commandant 1 MD COL P.C. JONES and the NZDCGS - BRIG BIRCH. The CDA, COL O'Brien was more than happy with the results of the exercise and would not let anyone forget the Australian Gunners hattrick of:

Gun Race trophy winners
Gunner Rugby winners
and a successful CPX

Apparently they were not the only trophies scored and brought back home.

4. The Tasman Link exercises continued to be plagued by bad luck with this year's exercise being cancelled at the last moment due to extreme weather and unseasonable flooding in mid-Queensland.

5. In the latter half of the year th CDA conducted assessments on all the field and medium regiments. Much to the surprise of the ARA regiments, the assessments were not conducted along the traditional "ARTEP" lines. All levels within the regiments were tested including CO parties, Arty Tacs and echelons. Even the 'out of play' elements of 131 Div Loc Bty supporting each regiment, come under the team's eyes. The 1990 assessments confirmed the high standard of collective training being achieved within 1 Div Arty.

6. Throughout the year the HQ maintained its level of individual fitness and military skills by conducting BFT, CFT, range practices and a week for most at either Greenbank or LWC to refresh some otherwise lost military skills.

7. With the end of the year we say farewell to the CDA who is marching out to HQ Trg Comd and welcome COL B. Stevens. Others moving on include MAJ Bamford, the DASM (congratulations on commissioning), SGT (Tracker) Ratatagia and our Band Sergeant Major WO2 Duyzer.

RAA ASSOCIATION (QLD)

1. The showcase of the RAA Association QLD is the RAA Museum situated in the NPWS Fort Lytton National Park, at the mouth of the Brisbane River. The museum is supported by the Fort Lytton Guides, (members of the association who volunteer their time and service) and local gunner units. New additions to the museum this year includes a 25 pounder limber, 155mm Long Tom and an operational searchlight.
2. ANZAC Day 90 was remembered by the Association with returned service members marching in Brisbane and following up with a get together over lunch at Victoria Barracks.
3. The Brisbane Gunner Dinner was attended by 315 all ranks and hosted by 1 Fd Regt.
4. The Association wishes all the gunners the very best for Christmas and the New Year.

7 FIELD BATTERY, 3 FIELD REGIMENT

Without a shadow of a doubt the unit is in better shape than it was this time last year; numbers are increasing and better still the retention rate is improving steadily. The unit has received more than 50 recruits this year so learning curves all round, are steep.

Providing this trend continues, and there is no reason to suppose it will not man its full complement of guns next year and have close to full manning in the other areas, with the possible exception of drivers. That is the challenge that has been set. Then who knows what might be possible.

The unit has worked hard this year. We started with the BFT. Then there was the demanding IMT weekend in which the spotlight fell squarely on the heads of the Bombardiers and Lance Bombardiers in terms of exercising leadership skills. The quality of junior leaders in the unit has improved out of sight since the beginning of the year.

We had a very successful open day this year which involved our families attending a live firing demonstration, a BBQ in the Bush and unit activities on the Sunday. Our "Be a digger for a weekend" was another highlight which saw a number of new members join the unit. Thanks to DARR for his support of those activities.

Camp saw the culmination of a program designed to get the standard of our small arms shooting up to scratch. This year a vast improvement was recorded, with 70% of those attending returning satisfactory results. Subsequently the Bty finished overall third, with eleven teams competing, in the 13 Bde shooting competition; this included a first in the "falling plate" event.

There was the Bindoon phase involving teams competing around a set course and the live firing platoon ambush: All new and enjoyable activities.

Our second Pilbara patrol took place in October and was well received. During this exercise the Bty provided an enemy party for Pilbara Regt and several "interesting" exchanges took place across the breadth of the Pilbara.

On top of all this we were kept busy with trade courses live firing exercises and the preparation for and conduct of the Assessment during the AFX.

We went to camp with reduced numbers due to the priority for new members to undergo recruit training; and, despite the difficulty that caused and further reduction in our numbers due to injury, the standard achieved by the unit was satisfactory. We will be up to strength for the next assessment and a most difficult force to beat.

This year also marks our SMIG Chris Blight's final year in the Army. It is appropriate to pay tribute to Chris' service in the Battery. There is no doubt that he will be a hard act to follow. Under his guidance the Battery has achieved many positive things, and the standard of professionalism within the unit has improved markedly.

Thank you Chris. You will be missed. I know the entire cast join me in wishing you, Robyn and Trevor all the best in your new life as gentlemen farmers in Albany.

131 DIV LOCATING BATTERY

1990 has been a very busy year for 131 Div Loc Bty. Elements of the Battery have been deployed as far a field as the USA and NZ, supporting Divisional and Non Divisional units. During the year, the weapon locating troops have continued to refine their drills to ensure optimum use of equipment. The Meteorological Troop has explored the improved capabilities of AAMS and now can offer greater mobility and flexibility in its support role.

The year began on a damp note with an IMT exercise conducted at Singleton. Continuous rain nearly washed out the exercise, however, it did not dampen the spirits of most of the soldiers. After drying out, the Battery returned to Enoggera and commenced numerous support tasks until April.

April 1990 can be remembered as the 'Big Wet'. Not only were many country towns flooded, but SWBTA also had its wettest month in years. It just so happened, that 131 Div Loc Bty was conducting its Battery exercise 'Raging Dragon' at this time in SWBTA. The exercise became not only a test of operational capability, but a test of the units recovery capabilities.

In May 1990 the ODF elements of the battery were subjected to an ODF check. The check included preparations for an air move by GI30. It was the first ODF check for four years and the elements were found to be at a very high state of readiness.

In addition to meeting the challenges of all unit and support activities throughout the year, members of the Battery were exercised in NZ and Hawaii. Furthermore, some of the Kiwi bretheren attended the Battery exercise 'Raging Dragon'. On the sporting field the Battery had quite a successful year. The Battery won the minor unit's soccer, squash, cricket and touch football competitions and was well represented in other sports, including rugby. The unit also did well at AASAM 1990, winning the MG. pairs shoot and several members gained top ten per cent placings in their categories.

As the year draws to a close, 131 Div Loc Bty has begun a number of adventure training activities. The activities have included a skiing, climbing and rapelling exercise, two diving exercises and an exercise with the Queensland National Parks and Wildlife Service. This exercise included track clearing, Crown of Thorn starfish surveys and base camp establishment.

As the Battery enters the 1990s a positive and professional attitude exudes from its soldiers, living up to the motto of 'Training for War not Peace'.

PROOF AND EXPERIMENTAL ESTABLISHMENT

PORT WAKEFIELD

ANNUAL REPORT

HERE'S PROOF!

P&EE(PW) has once again had a demanding and challenging year. Since January 1990 we have completed 196 proof and trial tasks, firing 4000 rounds ranging in calibre from 40mm - 155mm. As usual, we decided not to bother with the smaller calibres, preferring to leave P&EE Graytown with at least a modicum of activity for the year. We have also maintained an active social and sporting calendar, hosted 274 visitors and escorted 10 bus-loads of local civic groups around the establishment.

Trials were many and varied, and ranged in duration from a few hours to several days or weeks. They included the Improved Mortar Project, aimed at the development of a more cost effective round, and the 5 in/54 Fire Control System (FCS). The latter trial was a data gathering exercise of major significance to the Naval on-board FCS, and contributed to the fact that some 47% of our tasking in the FY 89/90 was for Navy, accounting for over 50% of our workshop effort.

Proof work continued on all varieties of ammunition, both Army and Navy, and included further ordnance proofs of the Hamel Gun, bringing the total to 77. The value of such proofs is highlighted by the fact that a number of guns were returned for corrective action prior to acceptance into service. Support was also given to DSTO for various activities and to 16 AD REGT Rapier and RBS 70 live firings.

Always at the forefront of science from an operational point of view, the age of high technology is gradually pervading all facets of life at P&EE(PW). The past year has seen the arrival of such things as Auto Q, a purpose-built Instrumentation Building, DPCU and digital watches. The Weibel Doppler Radar has been deployed on all tasks in the current year, and has proven to be extremely accurate and reliable for projectile velocity measurement and trajectory analysis. Maximum use has also been made of standard and high-speed video to record all firings.

Old technology still has a place at the establishment of course, a recent example being the restoration of two obsolete Mk 12 40mm Bofors by our workshops. They have been converted into remote control camera platforms to track and film the in-flight operation and function of missiles. A case of old AD weaponry supporting the new.

An active year was rounded off with an Adventure Training exercise on the Murray River, during which we all got wet, and the usual round of OFFR/SNCO vs OR Sports Days, during which the ORs cheated. All personnel, both military and civilian, are considering a trip to P&EE Graytown for a well earned rest!

10 MEDIUM REGIMENT

ANNUAL REPORT

1990 has been a busy year for 10 Medium Regiment. In March, a combined courses camp was run at Puckapunyal with 2/15 Field Regiment. This was a most successful camp, with both units qualifying many soldiers and NCOs in IET and promotion subjects. Thanks to the efforts of the TDO (CAPT Tony Turner) and the TDWO (WO2 Blue Towns) from the School of Artillery and the Master Gunner Land Command (WO1 Kev Browning), the Courses Camp also resulted in a number of much-needed refinements to ARes course TMPs, which will benefit all ARes artillery units.

In June, we conducted a direct firing competition at Puckapunyal, to choose both the best direct firing detachment and the best No.1. In a close contest, 39 Bty took out the Best Detachment, and GNR (now LBDR) Stott beat some of the more favoured contenders to win the Best No.1 prize.

In July a combined exercise with 103 Bty, 8/12 Mdm Regt was conducted at Puckapunyal. Two composite batteries, containing members from 103 Bty and 37 and 39 Btys, were formed to provide support to Armd Regt. The exercise was a great success in terms of both training and Regular/Reserve relationships, and it is hoped more like it can be organised in the future.

In September, the Regiment sent a small party (BDRs Vicars and Serle, and GNRs Hey, Beames and Stevens) to Katherine in the NT as part of 3 Div's EX NORTHERN EXPLORER, which is a series of foot and vehicle mounted patrols aimed at giving members of 3 Div first hand experience of conditions in the north. Apart from learning a great deal, they all appreciated the opportunity to have a break from the normal cold and rainy Victorian winter.

On October 14 members of the Regiment including two officers (2LT Kevin Bennett and 2LT Steven Bright) joining 103 Bty, 8/12 Mdm Regt for 1 BDE's EX PREDATORS ADVANCE. We provided a complete gun detachment, with gun and gun tractor. This was a valuable experience for our soldiers, because it is not often they have the opportunity to participate in an exercise of this nature. Undoubtedly we will see some of 103 Bty's 'short cuts' appearing as SOPs on 10 Mdm Regt's gun line, as a result of what was learnt.

The Regiment has had two ceremonial activities during the year. In March, we supplied four gun detachments (using 2/15 Fd Regt's guns) to support Command and Staff College's annual Beating of the Retreat Ceremony and 812 Overture recital.

On November 10, the Regiment exercised its right to the Freedom of Entry of Geelong with a march through the City. The Parade was hosted by MAJGEN Stevenson, the Colonel Commandant in 3 MD and attended by COMD 3 DIV, MAJGEN Glenny, the Assistant Chief of the General Staff - Army Reserve MAJGEN Nunn, and Commandant C and SC BRIG Townley. The parade was a great success, particularly from the PR point of view, although the inevitable Victorian shower of rain and gust of wind managed to start about 30 secs before the 'eyes right' and finished about two minutes after.

The march has unintentionally turned out to be an historic one, because it was the last time the Regiment will perform such a ceremony under its current title. 10 Mdm Regt and 2/15 Fd Regt are being amalgamated in mid-1991, under a new, but not-yet-decided title.

As a result, this is the last Annual Report to the RAA Liaison Letter from 10 Mdm Regt. The 1991 Report will be written under the auspices of the amalgamated unit. We wish the new unit every success.

THE 155mm ULTRALIGHTWEIGHT FIELD HOWITZER
ENHANCED TACTICAL MOBILITY AT 4 TONNE

By MAJ P.N. Veretennikoff RAA

1. Content. The information presented in this article has been examined by VSEL to ensure accuracy and that there has been no inadvertent breaches of the Commercial in Confidence classification.

2. Scope. This article will cover a brief description and design principles involved in construction, physical and technical characteristics, a statement of perceived advantages and disadvantages and an assessment of its potential to the ADF.

GENERAL

3. Background. The 155mm Ultralightweight Field Howitzer (UFH) is a private venture developed by Vickers Shipbuilding and Engineering Limited (VSL) of Barrow-in-Furness in Cumbria, UK. It was produced in response to a market demand for an artillery equipment with comparable performance to modern 155mm field howitzers, yet sufficiently lightweight to allow air transportability by medium lift helicopters.

4. General Description. Despite its unconventional appearance, the UFH is simply a split trail, breech loading howitzer with a one man lay sighting system. For ease of explanation, UFH can be conveniently divided into 2 sections; the elevating mass and the carriage. The elevating mass consists of a slightly modified M109 HIP barrel, an M198 muzzle brake, a manual Welin Breech Screw and recoil mechanism. The recoil mechanism is based on a hydrogas system incorporating a combined recuperator and buffer configuration and forms the main frame of the elevating mass.

5. The carriage consists of a split trail, two forward facing stabilisers, cradle and the lower carriage section. Each trail and stabiliser is of one piece; the trail is extended from the stowed position to form a single length trail. Hydraulic locking dampers are fitted to each of the trails across the join between the carriage and trail and act to absorb some of the firing loads. The stabilisers swing out mechanically from their stowed position and act to counter muzzle preponderance. This muzzle preponderance or high static out of balance load, is used to counter balance the overturning moment generated by firing. The lower carriage is lowered to the ground and acts in a manner similar to a mortar base plate by transmitting the recoil forces directly to the ground.

6. Operation. On arrival at the firing position, UFH can be emplaced in less than 2 minutes. The sequence of events is as follows:

- a. Engage parking brake on each wheel.
- b. Erect front stabilisers and rear spades.
- c. Remove towing umbilical and unhook towing eye from the towing vehicle and support the muzzle.
- d. Lower the Howitzer body to the ground by opening the suspension vent valve.

- e. Raise the road wheels to the stowed position by releasing the suspension anchorage and lifting the wheels overcentre to lie back over the lower carriage.
- f. Remove the travel lock and open the breech.
- g. A further 2 mins may be needed to:
 - (1) Orientate the sights.
 - (2) Receive fire data.
 - (3) Load and lay the Howitzer.
 - (4) Fire the first round.

DESIGN PRINCIPLES

7. The UFH has been designed to possess an operational capability similar to current 39 calibre 155 mm howitzers (ie M198, FH70). To achieve this performance from a howitzer that is approximately 50% of the weight of the M198, the following design principles are fundamental:

- a. Lower recoiling forces.
- b. Lower Centre of Mass.
- c. The maximum use of lightweight high strength materials.

8. **Low Recoil Forces.** To achieve stability yet retaining lightness, the recoil forces are minimised by maintaining a relatively high recoiling mass coupled with a long stroke recoil system. A high efficiency muzzle brake has not been used since this would increase blast pressure and noise levels. The M198 muzzle brake has been used in the interests of commonality.

9. **Low Centre of Mass.** In concert with low recoil forces, overturning moments associated with firing are reduced by:

- a. Positioning the centre of mass well forward of the rear spades.
- b. Using the lower carriage in a manner similar to a mortar baseplate.
- c. Lowering trunnion height.

10. **Lightweight High Strength Materials.** To maintain high strength and stiffness and to meet the lightweight criterion, the UFH carriage, cradle, rear spades, trails stabilisers and wheels are made from extruded titanium alloy. Titanium alloy has been chosen over composites, metal matrix and glass reinforced plastics because of its toughness and resistance to corrosion as well as its good strength to weight ratio and mature technology. The barrel and breech block are a derivative of the standard M284 HIP barrel currently used in the M109 HIP and differs only in the location of some external locating surfaces and barrel profile. A number of other parts are made of aluminium (eg buffer and accumulator cylinders) whereas conventional steel has been used only where necessary (eg bearing surfaces).

PERFORMANCE

11. Physical Characteristics.

- a. Weight: - 3630 kg/8000 lbs (original concept).
 - 3955 kg/8700 lbs (actual at 4 Jun 90).
 - 3750 kg/8250 lbs (new target).
 - 2275 kg/5000 lbs (elevating mass).
 - 1680 kg/3700 lbs (carriage only).
 - 215 kg/ 475 lbs (trail. damper. spade)
- b. Towing Eye Load: - 140 kg/310 lbs.
- c. Length: Towed - 8.93m.
 - Stowed - 8.93m.
 - Firing - 9.78m.
- d. Width: Towed - 2.7m.
 - Stowed - 2.7m.
 - Firing - 4.1m.
- e. Height: Towed - 2.6m.
 - Stowed - 1.65m.
 - Firing - 1.444m.
- f. Trunnion Height: Firing - 0.65m.
- g. Ground Clearance: Towed - 0.665m.

12. Technical Performance.

- a. Calibre: - 155mm.
- b. Barrel Length: - 39 calibres.
- c. Barrel Life - 2500 EFC.
 - (CIEFC = L15A1 proj + L10 Al
 - ZONE 8 charge or M549 proj +
 - M203 Al charge).
- d. Elevation: Max - 1244 mils.
 - Min - (-) 89 mils.
 - 1 turn of hand wheel = 10 mils.
- e. Traverse: +/- 400 mils on-mount traverse.
 - +/- 338 mils with wheels down.
 - 1 turn of hand wheel = 10 mils.
- f. Max Range: M549A1 - 30000m (MV= 827 m/s).
 - (using charge L10 Al)

 - NR265 - 31500m (ERFB-BB +IM280 Base
 - Drag Reduction) (MV=790 m/s).
 - (charge BIS 14).

 - L15A1 - 24700m (MV= 827 m/s).
 - (charge L10 Al, cart3-Zone 8)

- M107 - 18100m (MV= 685 m/s).
(charge M119 A2 Zone 8).
 - g. Min Range: L15A1 - 3600m (MV= 255 m/s).
(High Angle) (charge L2 A1-cart 1 Zone 2)
 - M107 - 2900m (MV+ 230 m/s).
(charge M3 A1 Zone 2).
 - h. Rate of Fire at:
 - Intense - 4 rounds/min for
least 2 minutes
 - Sustained - 2 rounds/min for 60 minutes
 - i. Into/Out of Action Time: 4 and 2 mins respectively.
 - j. Assembly /Disassembly for Split load: 30 mins.
 - k. Detachment (excl dvr): - essential 7,
desired 8 (includes
1 coverer).
- 1. Accuracy: indirect fire - Unassisted proj
1 x PER = 0.25% r
1 x PE azimuth = 0.4 mils.
- direct fire - 90% hit probability of
attaining a first round hit by day
against a stationary tank size
target under battlefield
conditions with the range known.

13. Charge Restriction. The charge M203 A1 is not permitted to be fired at elevations less than 355 mils; this is due to problems with instability. This restriction is not applicable to charge M119 A1 which can be fired at all elevations.

14. Traverse Limits. As mentioned previously, the UFH traverse limits are 400 mils left and right. Should a requirement exist to leave the wheels in contact with the ground when their carriage is lowered to the ground then the traverse limits are reduced to 338 mils left and right. This is due to the elevating mass being obstructed by the wheels at low elevations.

15. VSEL claim that a quick shift in traverse through 3200 mils can be effected in less than 2 minutes by:

- a. Centring traverse and laying the UFH at an elevation between zero and 88 mils.
- b. Lower the road wheels to the ground manually.
- c. Support the muzzle and raise the howitzer body and rear spades just clear of the ground by hand pumping up the suspension on each roadwheel.

- d. Disengage the parking brake on the right hand roadwheel only and roll the howitzer round to the required traverse angle by pulling sideways on the muzzle. As the howitzer is rotated about the left roadwheel adjacent to the sighting system, reorientation is not required.
- e. Engage the right parking brake.
- f. Lower the howitzer to the ground by venting the suspension valves.
- g. Raise the roadwheels.

16. Weight. One of the basic tenets behind the concept of UFH was the ability to be air transportable by medium lift helicopters (ie Block 1 UH-60 Black Hawk). Whilst under the US target weight of 9000 lbs, the VSEL target of 8000 lbs has not been met although in its present state should be able to be lifted in 1 piece by the Improved Black Hawk. VSEL are 95% confident that they can reduce the present weight down to about 8250 lbs, however to achieve the target of 8000 lbs will be only possible financially for subsequent UFH. At this early stage, indications from VSEL are that the target weight will remain at 8000 lbs and design efforts will be directed at this target.

17. It is anticipated that weight savings will be made in the following areas:

- a. Thinner thicknesses of metal as a result of the minimal strain gauge readings during the US firing trials.
- b. Combining both wheel hydraulic pumps into one and incorporating the pump inside the carriage.
- c. The introduction of a semi automatic breech.

18. Coast. The UFH has been directed primarily at the US market; to this end performance criteria and cost have been tailored to compete favourably with the M198. The expected cost per UFH is the same as M198 based on the 1987 \$US value (ie approx \$US500,000).

MOBILITY

19. Land Mobility. VSEL claim that due to the lightness of the UFH, the hydrogas suspension and a compact towing configuration, has resulted in an all terrain mobility performance superior to the M198. The UFH is towed by its muzzle and by means of an air brake connector, the UFH will be able to be towed by the present Mercedes Benz 4 ton Unimog. In addition, UFH meets the NATO standard rail gauge envelope when mounted on railroad flat cars.

20. Air Mobility. The UFH has a split or multi piece lift capability (ie 2 or 3 piece) with the complete elevating mass being rapidly detachable from the carriage; trails can be removed if required (20 minutes work involved). Additionally, three UFH can be internally transported in the C-130 Hercules. VSEL claim that during the air portability trials in the US, the UFH was lifted in 1 piece by the UH-60M Black Hawk. This was done at 2000 ft, at a temperature of 70°F and for a radius of 40 Nautical miles.

MAINTAINABILITY

21. It is claimed that component and assembly changes to the UFH can be done under field conditions without the need for extensive specialist equipment or personnel. Battle damage to UFH is relatively straight forward to repair without significantly affecting structural homogeneity and can be carried out by suitably qualified argon /TIG welders. VSEL also claim that daily servicing and testing by the detachment is completed in less than an hour and that the UFH is equal to, or better than, the M198 in terms of reliability and maintainability. This claim is made with reference to the MIL-STD-407A and MIL-STD-785B.

ADVANTAGES

22. The UFH offers to the user the following advantages:
- a. Present 155mm performance for approximately half the weight as well as substantially reduced physical dimensions when compared to the M198.
 - b. The potential to be transported in one lift by MLH (eg. Blackhawk).
 - c. Greater strategic lift capacity using C-130 Hercules aircraft.
 - d. Potential cost savings and increased resource flexibility by the use of existing 4 tonne vehicles as gun tractors. Additionally, 3/4 ton Landrover type vehicles can be used to tow UFH for short distances eg to clear a LZ.
 - e. Reduced manning levels.
 - f. Greater tactical flexibility in the choice of gun positions and roads when compared to heavier conventional medium howitzers.
 - g. Compatibility with most 39 calibre barrels without the need for a major redesign; this includes sliding and screw breech blocks.
 - h. Ease of man handling and reduced maintenance.
 - i. Field workshop repair without the heavy reliance on specialist equipment or personnel.
 - j. Compatibility with existing stocks and natures of ammunition.

DISADVANTAGES

23. UFH disadvantages or areas of concern are as follows:
- a. Reservations as to the structural rigidity of the Howitzer due to the recoil forces from the heavier elevating mass acting above the lighter carriage.
 - b. The excessive rearwards movement of the UFH during direct firing; this problem has been identified by VSEL and an improved rear spade design should solve this problem.
 - c. Loading of the UFH presents significant problems to the 2

loaders particularly at the higher elevation. Currently, the loading system incorporates a 2 man loading tray and hand rammer. The distance from the edge of the carriage to the breech is approximately 1.5 metres which poses problems with loading a 100lb projectile. This weakness has been identified and a number of design options are being explored. Ease of operation associated with the traversing and elevating wheels being taken into account for the next modification.

- d. Achieving the rates of fire specified at all elevations and charges.
- e. The uncontrolled rearward movement of the charge bag from the chrome lined chamber during loading at elevations greater than 930 mils.
- f. Future improvements to the UFH are limited in the following areas due to instability:
 - (1) Maximum barrel length of 39 calibres.
 - (2) Increasing the chamber size to 21 litres to accommodate future charge systems such as the unimodular charge may not be possible.
- g. Future increased range requirements may be restricted primarily to ammunition design options (eg ERFB-BB etc).

CURRENT STATUS

24. Two prototypes have been built and one is presently undergoing firing and mobility trials in the US for the Marine Corps and the US Army. As of the 14 Jul 90, approximately 560 rounds (20% of firing at charge M203 A1) have been fired from one of the UFH without incident. The other UFH is used by VSEL as a test bed for modifications and on going trials.

25. The current firing and mobility trials were completed on the 14 Jul 90 and will be followed by US user evaluation trials including field exercises and amphibious and air portability trials. VSEL will look at the user evaluation trial results to determine the design of the loading system modification. To complete the year, 1990 will end with climatic trials being conducted at the Aberdeen Proving Ground from mid Oct to mid Dec.

26. Firing Trial Results. During the firing trials designed to test M198 Firing Table compatibility, UFH and M198 were lined up side by side and 13 series each of 7 rounds were fired at various elevations and charges. VSEL claim that the UFH results were within the Probable Errors previously stated and that the UFH fared better than the M198 in 7 of the 13 series of rounds fired. In the other 6 series, UFH was out performed marginally by M198; details of the series conducted were unavailable. Pending detailed computer analysis, VSEL claim that the UFH is compatible with the existing M198 firing tables. During the firing trials, VSEL claim that the UFH did not have one mission failure; details were not available on the M198.

ASSESSMENT

27. The present design was produced to prove a concept and make the most

of market opportunities in a timescale of less than two years (from concept to prototype). Although there are a number of significant weaknesses with the current design, the solution to most of these should be relatively straightforward and come from well proven and low risk technology. However, should increased range beyond 30 kilometres be of prime concern, then the UFH may be limited in its potential to achieve these ranges.

28. It must be remembered that UFH is very much in its infancy, the design is revolutionary and unconventional and like most new and imaginative designs, it has its fair share of weaknesses. Most of these weaknesses have been identified by VSEL and should be addressed before the drawings are "frozen" and production initiated.

29. All in all, UFH offers exciting and promising potential presenting current 155mm performance at a significantly reduced weight. It is the potential of this reduced weight and the resultant savings that underline the real tactical and economic advantages when compared to current conventional towed medium artillery.

1ST FIELD REGIMENT

1. On 24 Aug 90, 1 FD REGT fired the last rounds through the M2A2 Howitzer. The regimental right mission marked the last occasion that an ARA unit would fire the M2A2.
2. 1990 itself started with less of a bang. To be precise, salutes, 1812 Overtures, Fort Lytton Day and the Army Birthday saw the Regimental fire more blank rounds than the live ammunition fired during the first phase of the regimental exercise. 101 FD BTY fired a salute marking the opening of the first Parliament under Queensland Labor for nearly two decades.
3. EX COLD START In March saw the Regiment deploy to Wide Bay on its first exercise for the year. Although mainly a Battery level exercise, the Regiment was able to identify what needed improvement upon during the year. In April the Regiment (less 104 FD BTY) travelled to Singleton to support the ROG Course in EX SOUTHERN SORTIE. 109 FD BTY was again raised for the duration of the exercise, as 104 FD BTY was unable to deploy. The exercise enabled Mr Allan Waite to paint a portrait of an M2A2 firing. Mr Waite's superb portrait of D Gun 101 FD BTY now hangs in the foyer of RHO and was made possible by a generous donation from RAA funds.
4. 101 FD BTY supported 131 DIV LOC BTY at Shoalwater Bay for EX RAGING DRAGON, followed by almost two weeks in Puckapunyal for EX EL ALAMEIN. The Battery enjoyed its time working with 8/12 MDM REGT and was pleased to win the Regimental Cross Country conducted at that time.
5. In June each BTY held their own exercise. 105 BTY in particular was able to participate in 8/9 RAR's Battalion exercise BX OTBO. Here soldiers gained valuable experience in firing in support of and participating in live Company attacks and the Battalion defensive battle. Both 101 and 105 BTY's during this period had the opportunity of fire splinter for the first time for some years.
6. 104 FD BTY was also very busy with almost every member of the battery attending a course camp early in the year. There was also the normaly battery; barracks training and live firing weekends at Wide Bay Training Areas.
7. In May members of HQ BTY and RAA rugby players travelled to New Zealand for EX IRON GAUNTLET, the 1 DIV ARTY CPX. In July, BC and FO partys, and the RCP flew to Hawaii for EX TROPIC LIGHTING. Stereos, golf clubs and computers came home with the participants, although one Captain showed his domesticity by returning wiht a frying pan.
8. Exercise NORTHERN PREMIER in August was the highlight to the training year, with the REGT deploying to Shoalwater Bay. Thew REGT participated in a live fire attack with 6 PAR, 2/14 LH (QMI) and a troop of tanks from 1 ARMD REGT. On a lighter note, during the exercise the REGT had the misfortune to drive through the BMA at dusk. One MP halted the REGT saying we were not to move and should stay put. After a terse discussion with the 2IC, MAJ Bassett, both parties agreed that fire support was a better option than standing to, and the REGT was allowed to deploy.
9. The CDA's assessment phase of the exercise went well including the air deployment on a budget to the Island of Hummock. The 1990 Assessment was

104 FD BTY's first assessment since being raised and its results were very pleasing.

10. With the receipt of the Hamel gun in September, the Regiment was busy with conversion training and the CP's trying to figure out which set of muzzle velocities to use and how to fire MBS. The REGT then journeyed back to Singleton in October to support the Subject 4 (WO) Course on EX SOUTHERN SORTIE II. Although it was good to finally use the Hamel gun, the Exercise was tragically marred by the accidental death of GNR Jason Cameron.

11. 105 FD BTY continued from Singleton to EX PREDATORS ADVANCE in Puckapunyal, while the remainder of the REGT returned to participate in Adventure Training in sailing, diving, surf life-saving, rapelling and white water rafting. 104 FD BTY again supported the FAI MMM 104 Skyshow which featured Gunners rapelling onto barges anchored in the Brisbane River. This event proved to be a great success.

12. The Regiment also had a successful sporting year, winning the SE OLD hockey, cricket and tennis competitions and coming runners up in the rugby, soccer and indoor cricket. Within the Regiment HQ BTY won the inter-battery soccer and swimming, while 101 FD BTY took out the remainder of the Regimental competitions winning the rugby, australian rules, cross-country, athletics and overall winter sports. After hard competition 101 defeated 105 to become REGT champions in the Gun Race.

13. 1990 was also a good year for individuals, with BC 104 MAJ Warrent Tapp being awarded a Prince of Wales Award to study in England. CAPT Greg Bilton was selected to attend the long locating course in England, while long-lookers LT Andrew Garrad and SGT 'Flash' Quick almost found themselves enroute to Saudi Arabia. BDR R.M. Cox was awarded the Turpie Award and GNR Steven Silver the Frank MacKaskill Prize.

14. 1 FD REGT looks forward to 1991 and wishes all Gunners the best for the new year.

7 FIELD REGIMENT ANNUAL REPORT - 1990

1. 1990 was another busy but highly successful year for 7 Field Regiment with activities covering both the operational and ceremonial aspects of service life.

2. In March, 28 members of the Regiment accompanied 23 Field Regiment on Exercise Tasman Reserve 90 - a reciprocal sub-unit exchange exercise between New Zealand Territorial Forces and the Australian Army Reserve. Our members received valuable training on the L118 guns as well as broadening their horizons as to how other countries' Reserves operate.

3. Exercise Northern Union was held at Singleton in June. The exercise was used to test the capability of the RAAF FA-18 to provide CAIRS at night using artillery illumination and white phosphorous ammunition to mark the targets. The Regiment fired 450 rounds of ammunition for 28 day and night sorties of FA-18s from 77 Squadron based at Williamstown. The exercise achieved all objectives and was a world first as no other Air force has attempted air strikes at night under artillery illumination with FA-18s.

4. On 29 July the Regiment was granted the Freedom of Entry to the City of Willoughby by the Mayor, Alderman Noel Reidy. After the granting of the Freedom of the City the Regiment exercised its right with a mounted parade through the heart of Chatswood. As 7 Field Regiment has been located in Willoughby for 60 years this was a memorable and moving occasion for many of the guests and public.

5. The Regiment's annual field exercise in October was a two phase operation. Phase one being the CDA's evaluation and phase two participation in 8 Brigades' Exercise Silent Shadow at Coonabarabran. The CDA's evaluation allowed the Regiment to demonstrate its high standard of proficiency in all areas. 8 Brigades' Exercise Silent Shadow provided experience for members as they were able to participate in activities in a Brigade setting as well as revising patrolling and the construction of field defences.

6. The 113 Field Battery shooting team has done exceptionally well this year. They managed to win the Army minor units shooting trophy and came fourth in the major units competition. This is especially pleasing considering the competition is Army wide and includes both ARes and ARA units. The team also competed in ASSAM '90. The team performed well with some good individual performances by WO2 A. Ward and SGT E.J. Sattler. In all the events entered all firers achieved places in the top 10% of the practices.

7. As the year draws to a close the Regiment will farewell the Commanding Officer, Lieutenant Colonel Rick Main not only from 7th Field Regiment but the Army. After 23 years of service Lieutenant Colonel Main is retiring. He will be sadly missed at the Regiment.

48 FIELD BATTERY 6/13 FIELD REGIMENT

1. 1990 was an unexpected change in key personnel when the BC MAJ Ian Adlam elected to go on full time service in Jan. He was replaced by MAJ Stefan Landherr who had previously served in the Bty. This change coincided with the normal change over of Training Officers as CAPT Shane Amor replaced CAPT Rob Manton who was posted to UNTSO.
2. Due to the decision by HQ 9 Bde to conduct AFT in the latter half of the year, no AFT was conducted during TY 89/90. The first live firing was conducted in Feb at Cultana when 73 personnel deployed for a four day FMX. The Bty was able to field 3 guns, as 54 ARes personnel attended. This was conducted as a four day exercise (Thur-Sun) as in previous years but it was not considered a roaring success due to the low numbers, however the direction for further training was determined.
3. Over the period 28 Apr - 6 May 90 the Bty deployed for a nine day FMX at Cultana which included small arms practices and five days of fire and movement. This exercise was successful despite low attendance (61 personnel and only three guns being manned. Training standards achieved were acceptable, with many personnel being exercised in 'One - up' positions.
4. The Bty's major activity for 1990 was AFT at Cultana Trg Area (from 24 Aug - 8 Sep 90) as part of exercise Rhino Alpha, the 9 Bde concentration of SA based units. This exercise included the Bty's biennial assessment by CLCA. 81 personnel attended the exercise, including 75 ARes. The Bty took all six guns to the exercise as the introduction to MVME gave the opportunity to calibrate the guns. Four guns were deployed during the exercise phase. The exercise was very successful and a good level of skills were displayed. The Bty was happy with its performance during assessment as were CLCA staff. All six guns were claibrate charge four and six. The exercise did highligh the problems of exercising in a Bde environment without an Artillery component at Bde HQ, but an ex BC (MAJ Kevin Noell) of the Bty was seconded as Director of Practice and his good efforts allowed the Bty to exercise freely without too much disruption from other Bde units. The Bty also participated in a Bde Weapons Demonstration.
5. On 26 - 28 Oct the Bty conducted a live firing activity at Murray Bridge which include a "Bring a Buddy" recruiting and a visit from the RAA Association of SA. A total of 11 potential recruits and 18 RAA Association personnel attended. Bty attendance was 73. This exercise was a tremendous success with half of the "Buddies" being recruited, but in particular by the strong interest shown by members of the RAA Association.
6. Current manning is 101 ARes personnel which is 31 short of the 6/13 FD Regt ARes manpower entitlement. Deficiencies are mainly drivers and signallers.
7. 1990 has proved to be a successful year for 48 FD Bty. Solid performances throughout the year and particularly good AFT at Cultana have provided the foundation for further development of unit skills.

4TH FIELD REGIMENT ANNUAL REPORT

1990 started at a gallop some members not even completing their BRL before being required to report for work. Whilst the Regiment was taking a well deserved break the civil unrest on Bouganville had come to head and the ODF Battalion group was placed on a reduced notice to move in late January for Operation Defence. These first couple of weeks were to set the scene for the remainder of the year.

Once things had settled down individual and sub-unit training commenced with both 107 and 108 Fd Btys taking to High Range of exercises. It was during these rain plagued exercises that the art of recovery came to the fore with soldiers being told not to stand in one place for too long or they would sink. This training for recovery during the support to the ROBC during another wet exercise.

One of the highlights for the Regt in 1990 occurred in April when the Gun Race team travelled to New Zealand, as part of the Ex Iron Gauntlet contingent, and successfully defended the ANZAC Trophy. The team led by SGT Thompson and made up of members of 108 Fd Bty and HQ Bty were chosen to represent the RAA in this most prestigious event.

Hawaii was the destination this year for 107 Fd Bty as part of Ex Pacific Bond with the Regt hosting A Bty 7th Bn 8 Fd Arty Regt. The exchange was most successful with both countries learning much about inter-operability, procedures and not the least of all each others culture much to the chagrin of the local men the Americans were very popular with the local girls. The highlight for both Btys involved in the exchange was undoubtedly the LFXs which were the culmination of the month's training.

107 and 108 Fd Btys supported 1 RAR and 2/4 RAR respectively during the June/July period. During the battle runs with advance training safe distances they once again clearly demonstrated to the supported arm the effect and capabilities of artillery. The CDA's assessment was held in August with the Regt displaying an operational capability consistent with its ODF role. The simulated air move whilst unexpected was successfully conducted and once "on the ground" the Regt displayed a high degree of technical proficiency. During its work up exercise the Regiment deployed the Btys into a gun position where Modified Safety was used for shooting. This was an interesting and well received experience.

Ex Swift Eagle 90 provided a unique opportunity for the Regt this year when the Bde attack was supported by the Regt live firing also with advanced training safe distances. The realism ensured that the maximum training value was received by all involved. The gunlines fired timely and accurately and the RCP provided tight control over what was a lengthy fireplan. The fire power demonstration at the conclusion of the Bde attack was very successful and clearly showed all in attendance the characteristics of fire and flexibility of Fd Regt.

On the sporting field the Regt had mixed success. There were a number of fine performances notably the Heavy weight tug-war team that took out the Bde competition and the Rugby Team who made the finals after not

winning a game during the 1989 season. The Australian Rules, Soccer, Cricket and Water Polo teams also made the finals.

Ceremonial activities as usual played a major role in the life of the Regt in 1990. 108 Fd Bty marched through the streets of Thuringowa on ANZAC day and the Regt paraded on 4th May to celebrate the Regt's birthday. This year the Regt was honoured to have the Representative Colonel Commandant MAJ GEN J.D. Stevenson AO, CBE, RETD in attendance as the reviewing officer. The birthday parade was followed by a dining-in night hosted by the SGT's mess which turned out to be a memorable occasion for all.

In summary 1990 was a year that was typical for the ODF Regiment in the intensity, structure and variety of its training and commitments. However it was also unique in the extent of overseas travel involved and the visit by the US Bty from Hawaii.

16TH FIELD BATTERY 6/13 FIELD REGIMENT

1. January 1990, the new training staff had arrived. February soon provided the new RAA staff with an idea of the battery's strengths and weakness, during the Annual Field Exercise "Summer Run" 3 - 11 Feb 90. The exercise was a pilot to test the concept of 9 days training as compared with the traditional 14 day AFX. It was apparent that attendance and morale were higher than the previous 14 day AFX and the arrangement more suitable to students. The exercise included training at individual, detachment and unit level. Fire and movement and some technical shooting to support OCTU was also conducted. The battery was able to consistently man three guns and one effective command post. Debriefing points on each activity were raised immediately by training staff to ensure the pertinent points were made and could be corrected for further activities. The exercise was a success, with many aspects of training which were initially poor, being corrected in subsequent training.
2. The battery also had become the sponsor unit for 62 Regimental Cadet Unit (62RCU). A Cadet Unit Liaison Officer was appointed and the battery provided support where possible. Cadets have attended exercises with the battery and the unit is viewed as a potential recruiting base.
3. In April the annual small arms weekend was conducted with soldiers firing practices using SLR, F1, Pistol and 84mm SRAAW. A special release of 7.62mm link was obtained and all soldiers fired an introductory shoot on the GPMGM60. The May LFX concentrated on technical shooting and was used to assess two students completing the non-continuous Subject 4 Bdr OPCP Course. The CLCA also visited the battery during this exercise. Infantry-Artillery co-operation also continued during the month with two members attending the 12/40 Bn PL shoot at Buckland. The FO acks gained much from the adjustment of mortar rounds and from shooting in difficult terrain.
4. The battery had a successful parade through the streets of Launceston exercising its privilege of Freedom of Entry. The parade was held on the 2 June 90. The morale of the battery received a boost and good public relations was gained within the community. Importantly, relations between the City of Launceston and the battery were reaffirmed. Other activities to celebrate 130 years of volunteer artillery in Launceston were held and included ceremonies in City Park, Queen Victoria Museum and Art Gallery, and Launceston Church Grammar School, the latter also involving good PR exposure.
5. The IET Courses Camp conducted 6 - 15 Jul 90 included Guns, Sigs and OPCP and was a resounding success, with a total of 30 students qualifying. This included four soldiers from 2/15 Fd Regt. The standard of instruction was high as was the level of student interest and motivation. Instructor support was provided by the School of Artillery to assist the Sig Arty Course, and was greatly appreciated. The merits of a continuous course are many and the battery now has a sound base of training on which to build.
6. Eleven members from the battery were involved in Exercise Northern Explorer (Darwin) in August. All reports were that the exercise although enjoyable, highlighted the difficult conditions under which we could be expected to operate. It provided excellent Junior NCO training for our members.
7. The LFX conducted in August was a confirmation of the majority of

instruction conducted during the IET Course Camp in July. The September LFX concentrated on deployment skills and also incorporated Fire Planning into the weekend.

8. The battery competed in the annual Rowallan Trophy (IMT) in October and although did not win, gained valuable experience. Further IMT training emphasis on gun line local defence will be conducted during November.

9. Other activities to complete the year will consist of the Anniversary Concert on 2 Dec 90, supplying 4 guns for the 1812 Overture at Anglesea Barracks and a parade on 15 Dec to celebrate the George Town Ferry festival on the launch of the new Sea Cat. Also during December a total of 21 battery members will be attending the 6 Trg Gp Courses Camp from 1 - 16 Dec 90. (7 support, 14 promotional/trade courses).

10. All in all, 1990 has proved to be a most successful year with the main thrust preparing for the CLCA's assessment in March 91 and ensuring the Mount Schanck Trophy is returned from our sister battery and secured in our armoury. We wish Gunners everywhere all the best for the New Year.

16TH AIR DEFENCE REGIMENT

1. 1990 was an extremely successful year for the Regiment, a year of basics and consolidation. A year that saw members of the Regiment spread throughout Australia and as far afield as the Persian Gulf. It was the year that finally saw the issue of DPCUs and the completion of the issue of Perentie vehicles.

Despite a heavy commitment to collective training this year the Regiment conducted the following courses:

- a. Subject 4 Bombardier (Missile Number) Course;
- b. ECN 109-1 Unrestricted Drivers' Course;
- c. IET ARes Course (Missile Number/Artillery Signaller);
- d. ECN 109 Mack Conversion Course; and
- e. Subject One Corporal Course.

3. ANZAC DAY. The Regiment paraded The Queen's Banner with a marching contingent of 200 in the Adelaide Anzac Day March. The Regiment also provided transport during the march for incapacitated veterans.

4. EX PITCH BLACK 90. 185 personnel deployed to the Darwin/Tindal area from 7 Jul - 3 Aug 90. The deployment to the exercise consisted of road convoy, medium range air transport and civilian contract road haulage. The Regiment exercised in a joint force setting, including operating with elements of Singaporean Air Defence Artillery (SADA). The exercise was a great success, enabling the unit to integrate into the National Air Defence and Airspace Control System and obtain valuable experience not normally obtainable on sub-unit or Regimental exercises.

5. EX IRON MONARCH. This Regimental exercise was conducted in the Puckapunyal Training Area over the period 29 Sep - 12 Oct 90. The exercise demonstrated the success of our 'back to basics' 1989-90 period, and provided an excellent opportunity for the Commander Land Command Artillery to assess the unit. The Regiment deployed on standard organisational lines rather than the ad hoc arrangements necessary in recent times.

6. OPERATION DAMASK. 1990 will always be remembered by 'Air Defenders' as the year the 'Magnificent Eight' departed on operational service aboard HMAS SUCCESS. The seven members of 111 AD Bty (Lt) and one member from the Workshop departed HMAS Stirling in W.A. on 22 Aug 90; eleven days after the original notice to move was received. In those eleven days the Regiment was supported by every possible organisation. It was a great lesson to all involved at the Regiment in what can be achieved with the right support behind you. The second contingent is due to depart Australia aboard HMAS Westralia in late December.

7. EX NULLA NULLA II. This exercise was a Singapore Armed Forces (SAF) Rapier live firing exercise conducted at P and EE, Port Wakefield in November. The Regimental provided extensive support to the firings and hosted the seventy Singaporeans throughout.

8. Minor Activities. Throughout the year the sub-units have conducted several small arms practices and IMT exercises at the Murray Bridge range complex. The two missile batteries have conducted several successful live firings at both Woomera and Port Wakefield. The last firing, Ex Sonic Thistle, was particularly successful and served to reinforce confidence in the Rapier SAGW. All sub-units conducted deployment exercises throughout the various training areas within S.A.

9. 1990 was a busy year for representational tasks with the Regiment once again providing a Victoria Barracks Guard and an Australia Day Guard in Adelaide. Individuals attended overseas exercises such as the IADS ADEX in Singapore and Malaysia, COPE THUNDER in the Philippines and LONG LOOK in the UK and BAOR. In addition an officer attended the IADS Command and Control Course providing unique opportunities to study an operational Air Defence system at close hand.

10. Sport. 1990 was also the year for success on the sporting fields. The Regiment won 4MD competitions in ten pin bowling, rugby union, touch football, swimming and cross country running. The unit also won the "Commanders Trophy" at the annual 4MD Rifle Shooting competition. The interbattery sporting competitions in 1990 were shared amongst all the batteries, with no particular battery dominating the sporting fields. Members of the Regiment provided the greater percentage of personnel for all MD representative teams in 1990.

11. Visits to Woodside Barracks. Once again the Regiment has hosted several visits this year. The 15th Quadripartite Working group (QWG) Air Defence was held at Woodside in early May, the 1/90 RAAF Intelligence Officers' Course visited the unit in April, and the Industrial Mobilization Course was hosted by the unit in June. The unit also hosted various ex-service associations and clubs for their annual reunions.

12. Conclusion. 1990 has been a very successful and enjoyable year for 16th Air Defence Regiment. Operation Damask has given the Regiment the exposure it deserves, and has had an amazing impact on the unit's esprit de corps. The Regiment now looks forward to 1991 with the hope of continued support to the middle East and finally being issued with the new family of small arms.

PROOF AND EXPERIMENTAL ESTABLISHMENT
GRAYTOWN

Hello to all Gunners from those who supposedly practice the "black art" at P & EE Graytown

The beginning of the year saw some new faces in the unit, they are CAPT Colin Wardrop as Assistant Proof Officer and Dick Chaney our new Master Gunner. This also was the farewell from the Army of WO1 Dave Raymond who was posted to Log Comd prior to his discharge. - WO1 Raymond had 20 years service on discharge.

The year began slowly for all concerned within the unit. There were only two major trials for the unit in the first six months. The trials conducted were Vertical Recovery (VR) for the Singaporeans, and Reactive Armour (RA). I will describe the basic procedure of VR for the uninitiated, as we all would have a concept on how RA works.

VR is a means of testing fuzes, particularly proximity fuzes at extremes of spin and exerted G force to ensure that they function at the gun end. Basically the fuze that is to be tested is attached to a 25 pdr projectile. This projectile is then fired vertically into the air to height of about 20,000 feet. The fuze function is tested under the extremes of spin and resultant G force applied. The projectile will reach its max ord where it plunnets to the ground base first and is recovered. The recovery is the "black art" which was described earlier. The unit has perfected the technique of locating the projectiles when they strike the ground by using seismic transducers which detects the shock wave produce when the projectile strikes the ground. This technique was greatly enhanced by the use of AN/TPO 36 Mortar Locating radar tracking in the friendly mode at OEs ranging from 1570 to 1590 mils. The software does not allow for this type of track, but this has been disproved on three VR firings this year. The most recent firing gave results that highlighted the accuracy of the track where comparisons of range/bearing from the firing point by the radar and survey differed by a maximum of 30 metres for range and 40 mils for line. The boffins at P & E Group said it wouldn't work.

The remainder of the first six months was the on going proof and inservice surveillance of munitions and equipments particularly 105MM Tank and Hamel Barrels.

The second half of the year again began slowly, but now we have a dramatic increase in work. This workload is such that on a number of occasions we are firing twice a day, and firing five days a week. The unit did have a respite. We were invaded by elements of 1 Bde and 1 Fd Regt from 20 Oct - 5 Nov for Exercise "Predators Advance".

On the sporting side the unit has fared very well. We were runners up to 21 Const Sqn in the Puckapunyal-Bendigo Touch Association Grand final. We should have won, but as all good touch players know it is a sin to call a "PHANTOM". The unit entered a team in the Trans Australia bike race from Perth to Melbourne. We came a very credible second with only 40 minutes separating first from second. The race was over a total distance of 3,700 kms where the riders averaged 34 km/h. On one stage outside of Melbourne our rider riding through the Pentland hills was clocked at 95 km/h.

The unit debating team verbally ravaged all comers throughout the year. The Ethnic dancing troupe and Turkish Wrestling team have performed to standards which leaves one scrambling for superlatives.

Our Range WO WO2 Gordon (Don't you call me that) "Mitch" Mitchell is in England on Exercise "Long Look" while his replacement as normal has seen more of Australia than the majority of Australians.

The JNCOs and diggers attended an MT exercise over the period 2 - 9 Nov 90 to brush up on those skills that may have stagnated throughout the year. The exercise was conducted by DSG Puckapunyal, and the Field Force experience of the Graytown personnel was evident from day one. Their experience was very helpful in all aspects of the exercise.

The unit will complete its firing tasks by 17 Dec 90, and recommence on 19 Jan 91. The first week back at work will incorporate an orientation programme for all the new "chums". The orientation revolves around all firing aspects at the range.

The unit has suffered a manpower shortage which has made our task at times hard, but fortunately there is a saviour. Our saviour is the blessed boys from SGMA who have assisted us greatly by ensuring that we start the new year with a full establishment. We hope that the manpower shortage prevailing throughout the corps can be addressed as quickly as ours has.

In closing we wish all our fellow Gunners throughout the Corps a very Merry Christmas and a Happy New Year.

The Reactive Armour trials that scientists from Material Research Laboratories (MRL) are conducting on a par with experiments overseas in the same area. One of the experiments conducted charged the German way of thinking in relation to shaped charges and the jets that they produce.

8TH/12TH MEDIUM REGIMENT

1990 proved to be no exception to the rule for 8/12 Medium Regiment. Our response and resources were tested by all levels, including mother nature. Earthquakes, floods and the farewell to the M2A2 - handover of Hamel gun, provided extra challenges to what is normally a busy training year.

December/January standdown will be remembered as the period that Newcastle was devastated by an unexpected and tragic earthquake. 8/12 Medium Regiment was at that time on standby as the Defence Aid to the Civil Community Response Force and reacted immediately by deploying to the area for relief and assistance to the civil infrastructure. Hard work by all concerned received heartfelt praise from the community for a job well done. Little did we know, however, that our experience was to put us in good stead for another commitment in the not too distant future.

The Regiments' training year kicked off with School of Artillery support shoots, ceremonial salutes, support to Training Command and RMC with Exercise Bardia, support to 1st Brigade CPX's swimming carnivals, athletics carnivals and a number of battery training exercises.

Of particular note was the support to the 1st Brigade Open Day. After much preparation and a full day rehearsal the Regiment participated in the Open Day by providing static displays and mock battle runs. All were coordinated to provide a window to the public on the role and ability of its Defence Force. The scope of the activity provided a unique challenge to the members of the Regiment and all agreed it was a resounding success.

Other displays throughout the year include the Easter Show, and the mock battle arena display at the rugby State of Origin final.

Exercise Predators Advance, the largest Brigade exercise since Exercise Drought Master in 1981, loomed in the distance and all Regimental training began to focus on that objective. Prior to meeting this challenge in October, however, much was to be done. School supports continued, continuation training progressed, and our preparations for Hamel conversation and the introduction date of the new equipment drew closer. The Regiment was to be ready for the transition by August.

Exercise Georges Thunder, a Regimental exercise at Puckapunyal in June, was our main activity to assess our performance prior to the CDA's assessment in September. The CO was happy with the level of training observed, but there were the inevitable rough edges that needed working on. School supports progressed and adventure training activities to the show and white water areas of NSW provided an opportunity for strenuous training of a different nature.

Unfortunately mother nature played her hand again in August and the Regiment was called out to support the flood stricken area of Warren.

Warren was threatened by impending flood waters from the north and required immediate assistance in the construction of a 1.5m levy bank to save the town. Hard work and determination proved successful and fortunately Warren was saved from the same fate inflicted on Nyngon only months earlier. Once again the Regiment felt proud to have supported a community in dire straits, and the praise from the townsfolk soon overwhelmed aching muscles and memories of hours of toil on the levy bank.

The final months of the year, as always, flew by. The Hamels are now secure in A Field Battery and 103 Medium Battery gun bays. Exercise Rolling Thunder - the CDA's assessment, and Exercise Predators Advance - the Brigade exercise have passed and are now being reviewed in order to consolidate training in 1991.

Who can forget the sojourn to New Zealand for Exercise Iron Gauntlet where once again our Kiwi brethren were decisively downed in the annual gun race and rugby match. On the Regimental front, A Field Battery scooped the pool in all major trophy competitions, and our Regimental sporting teams will remember the year for hard fought wins and agonizingly taxing catchup games. Unfortunately the Regiment rugby team lost to 5/7 RAR in a memorable and hard fought grand final, but our cricket team is yet to be defeated. (Here's hoping).

As the year drew to a close our attention turned to the normal end of year wind up activities. These were marked by the farewell of our Commanding Officer Lieutenant Colonel Peter Lawrence, and the Farewell Parade to the M2A2 and departing members of the Regt. Next year is seen as a year that will be just as busy, let us pray that mother nature takes a well earned rest also.

8/12 Medium Regiment wishes all regiments and units the best for 1991.

FIRST AUSTRALIAN NAVAL BOMBARDMENT GROUP RAA

A number of members of the Regiment during the period from our formation in May 1940 to cessation of hostilities on 15th August, 1945 were transferred or seconded to other army units and some even to the Navy and Airforce.

This is a brief history of one such group.

In June 1944, four members of the Regiment, Lieuts Lloyd McElroy and Glyn Stark and Bdr Jim Fitzsimons and one other NCO were seconded to the 1 Aust Naval Bombardment Group (referred hereafter as LANBG).

Reason for Formation of LANBG

The AIF had experienced in Syria the use of shore bombardment from Naval Ships, when a RN Destroyer had bombed targets near the Litani River and the 2/4 Field Regiment had been shelled by a Vichy French Ship. Artillery Officers had also in the Middle East attended courses on Naval Bombardment. One such officer was Major Doug Rickard of 2/1 Field Regiment who was certain of the tactical use of Naval gunfire to support amphibious and coastal operations in the NSW Pacific.

He was successful after considerable lobbying with the brass of the Navy and the Army to convince them of the need for such a unit and in 1943 instructions were given to form the LANBG.

Role

The role of the unit broadly was to liaise with the army and navy in planning the use of naval bombardments in the prelanding period and after landing to provide supporting fire to the assault troops prior to the field guns getting to shore and occupying gun positions. Subsequent to this stage navy guns could be used to engage targets which could withstand the lighter field gun shells, or which were out of range of the field guns.

The naval gun was primarily designed for ship to ship engagement, where it was necessary to hit the enemy ship as quick as possible with maximum concentration and weight of shells. Consequently they had very different characteristics to that of a 25 pounder these being - high muzzle velocity, a flatter trajectory, greater shell weight and greater penetration of target. Close targets, particularly where there was also tall timber were not suitable for naval gunfire, although ships had the ability to change firing stations (positions) and enfilade targets.

Composition of Group

The LANBG was an Army unit. The Officers in the main had completed a two weeks course at Flinders Naval Depot. The nucleus of the unit comprised two officers (Major or Captain), and two NCOs from each of the fifteen Field Regiments except 2/10 and 2/15 of 8 Div who couldn't get leave to attend the course. The ORs were posted from disbanded artillery regiments. The unit was raised at Flinders Naval Depot and was commanded by a Chief Bombardment Liaison Officer (Lt. B. Watchorn), two Senior Bombardment Liaison Officers, Major Doug Rickard and Norm Vickery (2/1 Regt) and ten bombardment liaison officers, whose role was to assist the gunnery officer on a bombarding whip. The BLO had a BDR Technical Assistant and two signallers. Well of course what

was now required was some persons to direct gun fire. So two Troops were formed, each comprising five Shore Fire Control Parties (SFCP). Each Troop was commanded by a Major Naval Bombardment Liaison Officer (NBLO).

Each SFCP comprised a Captain, Sig SGT, Sig BDR tech asst, and 6 OR's (4 sigs two drvs). Equipment was two jeeps and one wireless set the latter being a TBX2 issued to US Marines, a far superior set to those used by the RAA-more portable and no wet cell batteries (transmitting output from hand operated generator).

When one thinks of what a Troop Comdr had to do and be responsible for, this command was a breeze, particularly when my Sergeant Jin Hern from 2/8 Fd Regt was an experienced and first rate NCO in every respect.

The composition of the Group provided for the support of two assault Divisions. This worked very well in the Borneo operations with A Trp in support 7 Div and B Trp in support of 9 Div. The CBLO's party were on the HQ Command ship prior to and subsequent to the landing with SBLO's on HQ ship or wherever they could be most advantageously deployed.

Lloyed McElroy was posted to A Troop which was in support of 7 Div for the Balikpapan landing (OBOE 2), whilst I was with B Troop in support of 9 Div and took part in the Tarakan and Brunei Bay landings. Jim Fitzsimmons was posted to one of the BLO parties and was at one time on the USS "Phoenix". The "Phoenix" and her sister ships the "Boise" and "Nashville", really had some fire power, 5 Triple mounted 6 inch guns (each shell weighed about one hundred lbs). They were the most heavily armed 6 inch cruisers in any navy I believe.

Lloyd McElroy reports that the five parties of "A" Troop left Flinders to train with 6 and 7 Divs for about two months on the Tablelands. They spend about a month with each Bn. They were also responsible for training 4 A.C. Squadron (the "depot Battery" of the famous 5 squadron) in naval procedures.

The parties went by ship to Morotai and embarked for 7 Division's landing at Balikpapan - most landing in the third were with the Bns.

There were American, Dutch and Australian cruisers and destroyers with B.L.O parties aboard supporting the Bns through the SFCP's.

Opposition on the landing beaches had been very effectively neutralised by the Frogmen and substantial bombing and bombardment and the use of Rocket ships before H Hour. However, as soon as the infantry deployed they met resistance and 2/5th and the Spotters got some shooting. A 25 Pdr from 2/5th had the distinction of knocking out a 5" Jap naval gun in a concrete beehive on the edge of Mangar airstrip over open sights after direct fire from the warships and a 6 pdr (of I think 2/2 Tank Attack) had failed to subdue it. At Mangar one Spotter had the pleasure of shooting 1 US cruiser and 5 destroyers (from various navies) at the one time, quite a lot of bricks. The cruiser had the fire power of two Field Regts. The Army CO-Op Squadron flew a number of officers from 2/5th and 2/6th and some of the Spotters who carried out air shoots. Towards the end HMAS Shropshire arrived from Leyts on its way to Australia to be decommissioned, seeking a piece of the action at Mangar. Its eight, 8 inch guns let go one ton of metal each broadside.

The Tarakan landing (Oboe 1) was carried out by 26 Bde (2/23), 2/24 and 2/48 Bns) and support troops. Field arty support was from 2/7 Regt. My party had trained with 2/48 with whom we were to land but I was made acting NBLO commanding 3 SFCP's and attached to 26 Bde HQ. Tarakan, being an island was

bitterly contested operation in which Corporal Mackey of 2/3 Pioneer Bn won a posthumous VC and LT. "Diver" Dereck VC, DCM 2/48 Bn died of wounds. After about 7 days two of the SFCP's were recalled to Morotai, leaving my party and one SFCP commanded by Capt Ken Everett ex 2/7 Fld Regt. Until D+20 Ken's party and mine swapped around duties of Spotter (OPO) with the infantry, Air O.P. or BLO on the bombarding ship.

Three Austers had been landed and on the first day one had attempted to talk off from a roadway, crashing and killing both the pilot and Air liaison Officer. Several days later Brigade HQ required a strike by B 25's and Naval gunfire onto Sadi Feature. A suitable strip had not been prepared for the Austers so they brought in a Catalian flying boat from which I was able to carry out a successful shoot onto Sadie. A few days later an Auster was available from which I carried out a shoot onto Tarakan Hill.

All the Naval gunfire which we directed were from 5 inch USN Destroyers.

By D+20 all SFCP's were recalled to Morotai. Thereafter Naval gunfire was still directed from the USN Navy Ships by OPO's of the 2/7th Regt. This I believe reflects great credit to officers such as Majors Doug Rickard and Norm Vickery who in consultation with the RAN and USN devised and simplified procedures such as "Calls for Fire" and also to the training and experience of the AIF Field Regt.

The next operation in which I took part was the landings on Labuan and Brunei Bay with the other two brigades of 9 Div. The 20th Bde (2/13, 2/15 & 2/17) were to land on the southern part of Brunei Bay and the 24th Brigade (2/28 & 2/32 & 2/43) were to land on Labuan Island and Northern foreshores of Brunei Bay. My party had trained with the 2/17th Bn, commanded by LTCOL John Broadbent. Shortly after 9am on the 10 June 1945 we landed with the third wave of the Btn. We met with no opposition and sustained the record established by the Group, by being the first to report the success of the landing near Brooketon, to the command ship "Rocky Mount".

The Japanese were apparently unaware of our landing and the first night a truck, containing 8 Japanese drove into the forward position of the 2/17th where a machine gun was sited - finish Nips. Japanese opposition here was entirely different from that at Tarakan or BunaGona, for here the Japanese had ample opportunity to retreat along the coast or into the hinterland. Brunei was taken with little opposition and the Btn rapidly advanced along the track to the coast to Tutong and then to Seria where there were oil fields. When we arrived at Seria there were about 30 oil fires which had been set alight by the retreating Japanese. It was quite a spectacular sight and at night it was quite easy to read a newspaper at a distance of 300 yards from the fires. During the advance to Seria which took about 4 days I did not get any observed shooting, but put on a demonstration shoot for the CO. I also carried out several predicted shoots with quite satisfactory results. The ship engaged targets whilst at anchor and the accuracy of the fire was quite amazing.

After about a week in Seria my party then went down to Miri oil fields further south in support of the 2/13 Bn. From here I did one sortie in an Auster Air OP and engaged several targets which appeared to have little tactical importance.

From Miri we returned to Seria by DUKW which meant that we were not impeded by river crossings.

Quite an acceptable surf used to roll onto the beach at Seria so some hours

were spent in that pursuit and also aquaplaning using a jeep to tow along the beach a door attached with sig wire. During this time 2/17 Bn conducted a surf carnival.

We were called back to Labuan where we spent part of July then in August embarked on a Liberty Ship for return to Morotai. We were in the harbour of Zamboanga, the southern tip of the Phillipines on the 15th August when Victory in the Pacific was declared. It was intended that on my return to Morotai I would be posted to a ship in the British Pacific Fleet.

On returning to Morotai we formed part of the troops assembled for the formal surrender of the 2nd Japanese Army to General Sir Thomas Blamey.

From then on the troops occupied their time by building water craft from belly tanks, swimming, sailing and generally taking advantage of the fact that we were encamped by the water.

Swimming trunks were practically non-existent but who needed them anyhow. But wait - if you owned a pair of trunks then - you were allowed to swim down at the AGH - with the pokies. I cracked it for a pair in a raffle - very propitious for whilst dunking the body at the AGH beach I met up with an RAAF pilot, who was leaving the next day for Aussie, flying the Beaufort transport kite for a Beaufighter Squadron. "Any room for an old dig" I asked? "Sure" he said "providing if I have any problems, I shall open the bomb bay and you can kiss your gear goodbye". "OK" I said "it's a deal". And that's the way it was. Landings at Biak, Jacky, Townsville (closed in by weather) and Dalby (a few days - the pilot's home). "Where would you like to get off?" he asked "Richmond would be fine" I said. I landed at Richmond on a Sunday afternoon, humped my gear over to Clarendon Station and walked in on my oldies at Blakehurst - surprise, surprise! Finish War!

GLYN STARK.

The Author

Glyn Stark commenced his Army Career when he joined 7 Field Brigade RAA(M) at the Willoughby Depot in 1936. In 1940/41 he saw service in the Middle East with 2/6 Australian Field Regiment (equiped with 25 Pdrs). After returning to Australia in Feb 42 with 7 Div, his Regiment was then deployed to New Guinea. Glyn served with 2/6 and 2/5 Field Regiments in New Guinea and Borneo and was seconded to 1 Australian Naval Bombardment Group in June 44.

After the war, Glyn served with 4 Amphibous Observation Regiment and was appointed a Battery Commander. Glyn is currently the President of the Collaroy sub Branch of the RSL and is a Director of a Real Estate and Property Consultant business.