

4th Field Survey Squadron



Operation ARIGHT 93

Operation Report

A field completion operation
conducted in the
Cape York region of
Northern Queensland

August - October 1993



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EXECUTIVE SUMMARY

1. Op ARIGHT 93 was a field completion survey operation conducted by 4 Fd Svy Sqn in the Cape York region of Queensland during the period 30 Aug to 8 Oct 93. 4 Fd Svy Sqn's mission was to field complete 78 x 1:50 000 scale line maps in the AO. Secondary tasks included the production of Photographic Interpretation Guides (PIGs) and the acquisition of Vital Asset Protection (VAP) photography.
2. Deployment to, and extraction from the AO was by road. Operations were conducted from a main base established at Weipa and forward bases at Strathgordon Outstation and Bamaga. AAAvn detachments in direct support of 4 Fd Svy Sqn comprised LOH and Nomad aircraft.
3. The mission was achieved with 78 maps being checked. All aircraft and vehicles performed without significant failure.

OPERATION REPORT

OPERATION ARIGHT 93

- References:
- A. LHQ SIC IEA/Z2Y, Op Order 54/93 - Op ARIGHT 93, of 100259Z AUG 93
 - B. LHQ K92-00812 1894/93, Op ARIGHT 93 Mounting Instruction, dated 11 Aug 93
 - C. Army Svy Regt Minute of 9 Aug 93: DSTO Task Plan 92/242
 - D. DSVY-A 00197/93 A92-26165, Technical Directive to OC 4 Fd Svy Sqn, dated 12 Mar 93
 - E. LHQ SIC IEA/Z2Y, Op ARIGHT 93 - VAP Photography, of 272321Z APR 93

INTRODUCTION

1. Op ARIGHT 93 was a field completion survey operation conducted by 4 Fd Svy Sqn in the Cape York region of northern Queensland during the period 30 Aug to 8 Oct 93. The Operation was conducted in accordance with instructions detailed in References A and B.

MISSION

2. 4 Fd Svy Sqn's mission was to field complete 78 x 1:50 000 scale maps within the Cape York region in accordance with References B and D.

3. In addition to the main task of field completion the following tasks, in order of priority, were undertaken:

- a. upgrade and/or produce photo interpretation guides (PIGs); and
- b. acquire vital asset protection (VAP) photography for 1 Topo Svy Sqn.

AREA OF OPERATIONS

4. The AO, which is illustrated at Annex A, was covered by the following 1:250 000 map areas:

- a. SC 54-07 BOIGU,
- b. SC 54-11 THURSDAY ISLAND,
- c. SC 54-12 CAPE YORK,
- d. SC 54-15 JARDINE RIVER,
- e. SC 54-16 ORFORD BAY,
- f. SD 54-03 WEIPA,
- g. SD 54-04 CAPE WEYMOUTH, and
- h. SD 54-11 STRATHGORDON.

CONDUCT OF OPERATIONS

General Outline

5. To achieve the mission the Operation was planned and conducted in three phases as follows:

- a. Phase 1 - Deployment to AO.
- b. Phase 2 - Commence Field Checking Bamaga, Strathgordon and Weipa.
- c. Phase 3 - Extraction from AO.

Sequence Of Events

6. A detailed sequence of events for the Operation is given at Annex B. Significant events are detailed in the following paragraphs.

Reconnaissance

7. A reconnaissance was conducted by the OPSO of 4 Fd Svy Sqn during 21-23 April 93.

Issue of Orders and Instructions

8. The Operation Order (Reference A) and the Mounting Instruction (Reference B) were issued on 10 and 11 Aug 93 respectively.

Phase 1 - Deployment To AO

9. Vehicles. The road trip from Adelaide to Weipa went smoothly except for a UNIMOG radiator leak and a landrover's oil leak from the gear box.

10. Routine. Daily routine started at 0530 hrs with reveille. Breakfast was at 0630 and the convoy moved out at 0700. A day's driving was typically 650 to 700 km which equated to roughly eight hours shared between two drivers. Three stops were usually planned for each day for morning tea, lunch and afternoon tea and coincided with any refuelling stops. Standard procedure was for the admin vehicle, containing the Det 2IC and cook, to move ahead of the convoy and conduct a reconnaissance of the overnight locality, carry out any shopping, and meet and marshal the main body into position.

11. Establishment of Base Camp. Base Camp was established on Mon 6 Sep 93. Facilities at B Coy 51 FNQR were adequate for all requirements. On the same day a number of local support agencies were visited. All contact information for the AO is included at Annex C.

Phase 2 - Commence Field Checking Weipa, Bamaga, And Strathgordon

12. Field Checking. Field checking in the Weipa area, involving the WEIPA / CAPE WEYMOUTH / ORFORD BAY / JARDINE RIVER map sheets, commenced on 7 September 93. On the same day two Forward Bases were established at Bamaga and Strathgordon Homestead. The field parties deployed to Bamaga commenced checking the BOIGU / THURSDAY ISLAND / CAPE YORK areas. The forward base personnel at Strathgordon commenced checking the HOLROYD area. Field parties deployed independently from the main base at Weipa for a period of up to five days after which it was necessary to return and carry out map corrections.

Phase 3 - Extraction

13. Base Camp at Weipa was packed up on 30 Sep 93. All elements departed by road on 1 Oct 93 and arrived in Adelaide on 8 Oct 93.

Hand-Held GPS

14. Hand-held GPS were used to assist with navigation and the positioning of remote, isolated features. With selective availability (S/A) in the Global Positioning System (GPS) active, it was accepted that errors in accuracy up to 180m may be encountered. For this reason GPS was only used for navigation and approximate positioning as a supplement to traditional methods. The GPS models used on this Operation were the Trimble ENSIGN, Trimble TRIMPAK and the Magellan NAV 5000 PRO all of which proved to be reliable and robust.

Support to DSTO

15. As per Reference C, 4 Fd Svy Sqn was tasked with supporting two Defence Science and Technology Organisation personnel accompanied by two Army Svy Regt advisors during their vegetation ground truthing exercise. Their mission involved field checking remotely sensed

information and caused them to be in the AO from 7 - 14 Sep 93. With Major A. Cordova (US Exchange Offr) acting as a liaison officer between the DSTO personnel and Det 4 Fd Svy Sqn, their mission was achieved in minimal time with little impact on 4 Fd Svy Sqn's primary objectives.

OPERATION RESULTS

16. Field Completion. The field completion task was successfully completed. A comprehensive report on field checking results is given in Annex D. A report on the technical aspects of the field corrections is provided at Annex E.

17. Aerial Photography. Supplementary photography was completed as tasked. A report is included at Annex F.

18. VAP Photography. VAP photography was procured during the Operation as per Reference E. Upon receipt of the VAP tasking requirements, it was obvious that the objectives to be photographed were little more than a selection of the cultural features detailed on the RASvy 1 : 250 000 maps of Cape York. For example, marine navigation beacons were marked as vital assets. A number of abandoned homesteads with no useable airstrips or facilities were also targeted. The photography of VAP tasks is outlined at Annex F.

19. Photo Interpretation Guides (PIG)s. PIGs were produced in accordance with current technical instructions.

ADMINISTRATION AND LOGISTICS

Operation Manning

20. Personnel who participated in Op ARIGHT 93 are listed at Annex G. All supporting units are thanked for releasing their members. All support personnel displayed great professionalism and gained valuable experience.

AAAvn Support

21. The following AAAvn support was provided by 1 Avn Regt:

- a. Kiowa LOH. 162 Recce Sqn was tasked with the provision of LOH support for the Operation. 162 Recce Sqn operated in the AO from 6 Sep 93 to 30 Aug 93 with three LOH; their report is included as Annex H. A total of 153.8 hrs were flown out of the 205 hrs provided.
- b. Nomad. One Nomad was provided by 173 Survl Sqn with 94.3 task hours being flown. Details of the Nomad's use are provided in the report at Annex I.

22. The professionalism of all AAAvn members and their willingness to help with other tasks contributed to the success of the Operation.

Land Clearances

23. Responsibility for obtaining land clearances lay with North Queensland Training Areas (NQTAs). Clearances to enter all properties in the AO were provided upon the signing of the Environmental Certificate of Compliance when the Det OC passed through Townsville. Leaving Adelaide without land clearances was cause for significant concern due to the Operation's dependence on station managers' co-operation.

24. Those land clearances that were available to 4 Fd Svy Sqn prior to deployment did not include information regarding the exact location of properties, with the result that specific instructions accompanying the land clearances could not be fulfilled.

25. Upon arrival in the AO the Detachment quickly became aware that many station managers had no knowledge of our mission and requirements. NQTA had notified land owners but not the station managers of our task. A vast majority of the land in Cape York is owned by syndicates located in central business districts around Australia meaning that in a lot of cases, the men and women actually on the land had not been informed of our intentions.

POL

26. Pre-Positioned Drummed Fuel. Pre-positioning of drummed fuel was carried out by 7 Log Coy in accordance with Reference A.

27. Fuel Drum Recovery. After recovering a number of drums from remote localities, as per Reference A, Det 4 Fd Svy Sqn was notified by the fuel contractors that refunds were not offered on either used or untouched drums. As a result unused drums were left in situ.

Vehicle Support

28. Vehicles used on the Operation were:
- a. nine L/R 110 Truck Survey panel FFR,
 - b. four truck cargo MC2 (UNIMOG),
 - c. one L/R 110 6X6 ERV, and
 - d. four 1/2 ton trailers.

29. All vehicles performed well during the Operation. The long distance to and from the AO meant that the maintenance of daily vehicle parades was paramount. The harsh environment in the AO placed a great strain on vehicles and drivers and resulted in significant aesthetic damage to the majority of the L/R 110's. One L/R 110 was rolled during the Operation. A report by the VM, including specific repairs, is given at Annex J.

Accommodation

30. Deployment/Extraction. Accommodation while driving to and from the AO was in caravan parks under personal shelters.

31. Cape York. Accommodation in the AO comprised:
- a. Main base - tentage at B Coy 51 FNQR Depot Weipa;

- b. Forward Base Bamaga - air conditioned rooms and working area at 73 EW Detachment;
- c. Forward Base Strathgordon - rudimentary housing at Strathgordon Homestead; and
- d. Photography Darkroom - COMALCO Production Building.

Messing

32. All food was purchased locally using Survey Party Ration Allowance (SPRA). The amount of SPRA set aside for the Operation was adequate. Purchases were made from local firms without problems.

Amenities

33. A colour television and video recorder were provided by B Coy 51 FNQR and was appreciated by all for evening entertainment. A limited canteen service was run during the Operation with the stock being transported with the Detachment.

Medical

34. Medical facilities were provided by the Weipa Hospital. A number of minor ailments were treated.

Morale And Discipline

35. Morale throughout the Operation, despite the length and arduous nature of the task, was maintained at a good level.

Finance

36. Expenditure was as follows:

- a. Travel and Subsistence - \$8 940
- b. Freight and Cartage - \$1 608
- c. Petty Cash - \$490
- d. SPRA - \$18 113
- e. Site rental - \$542
- f. Repairs - \$9 982

Allowances

37. The following allowances were paid:

- a. Travelling Allowance (TA). TA was paid as follows:

- (1) Full TA was paid in advance to all AAAvn elements for insertion and extraction.
 - (2) The meals and incidental element of TA was paid in advance to all members who deployed to Horn and Thursday Islands.
- b. District Allowance. District allowance was paid in retrospect at the single member rate.
 - c. Field Allowance. Field allowance was paid in retrospect whilst not in receipt of travelling allowance.
 - d. Separation Allowance. After a 14 day qualifying period, separation allowance was paid in retrospect to Cat M members, whilst not in receipt of travelling allowance.
 - e. Flight Duties Allowance. Flight duties allowance was paid in retrospect to RASvy air camera operators.

Banking

38. Banking facilities in the AO consisted of a Commonwealth branch and EFTPOS access, both of which were in Weipa.

Mail

39. Mail was picked up from the post office daily in Weipa. Before leaving Weipa, instructions were left with B Coy 51 FNQR to forward mail.

Remote Locality Leave

40. All participants accrued remote locality leave at a rate of 7/12 days per completed month in the AO.

Rest

41. Members accrued rest days at a rate of one day for each weekend spent in the AO with a maximum of five days. These rest days were taken upon RTU.

Visits

42. The following personnel visited the Operation:

- a. MAJ A.B. McLeod, OC 4 Fd Svy Sqn - 13 to 17 Sep 93.
- b. CAPT G.C. Addison, OPSO 4 Fd Svy Sqn - 25 Sep to 1 Oct 93.

Public Relations

43. Despite potential for conflict due to the problems with Land Clearances, embarrassing incidents were avoided through a number of timely phone calls and a diplomatic approach by field parties.
44. The following PR activities took place:
- a. The Detachment OC was interviewed by a journalist from the Weipa Bauxite Bulletin resulting in articles published on 10 Sep 93 and 1 Oct 93.
 - b. A farewell BBQ was conducted at the B Coy Depot on 29 Sep 93 to thank those residents of Weipa who provided some assistance during the Operation.

COMMAND AND SIGNAL

Command

45. No problems were experienced with the command arrangements specified in Reference A.

Communications

46. Rear link. Rear link communications were via telephone and fax as provided by B Coy. All calls were charged to a telecard account.
47. Radio Net. 139 Sig Sqn provided one radio operator for communications support to the Operation who performed in a competent and professional manner. Communications between main base and field check parties were by RAVEN HF radio. Despite a large amount of trial and error, communications were not satisfactory at any stage of the Operation. Although field parties spoke to each other without problems, communications with the main base were less than adequate. Likewise, B Coy indicated they regularly had difficulties with incoming and outgoing communications for no apparent reason.
48. Squadron members were found to be inexperienced in antennae theory. A communications report is given at Annex K.
49. SITREPs. Weekly SITREPs were sent by fax.

CONCLUSIONS

50. Op ARIGHT 93 was a successful operation. 78 x 1:50 000 scale line maps were checked in a 4 week period. Supplementary and VAP photography was obtained during the Operation as instructed. The four week period spent field checking involved constant effort from the field parties under arduous conditions. Time constraints meant that no rest periods were available. Overall, personnel on the Operation performed very well and are to be congratulated.

51. The land clearances provided by NQTA were incomplete, inappropriate and overdue. Land Clearances were gained from the land owners but not the station managers who should also have been notified. The Land Clearances did not include an explanation of the property's location meaning specific requests could not be fulfilled. Det 4 Fd Svy Sqn deployed to the AO without knowing if Land Clearances would be available for the Operation. It is imperative that Clearances be available well before an operation's departure for the AO.

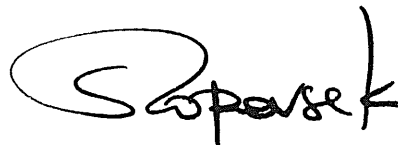


52. Knowledge regarding the use of HF radio communications was inadequate. Specifically, a sound background in antennae theory is of the utmost importance to good communications.

RECOMMENDATIONS

53. The following recommendations have resulted from Op ARIGHT 93 and are drawn from the body of the report and Annexes:

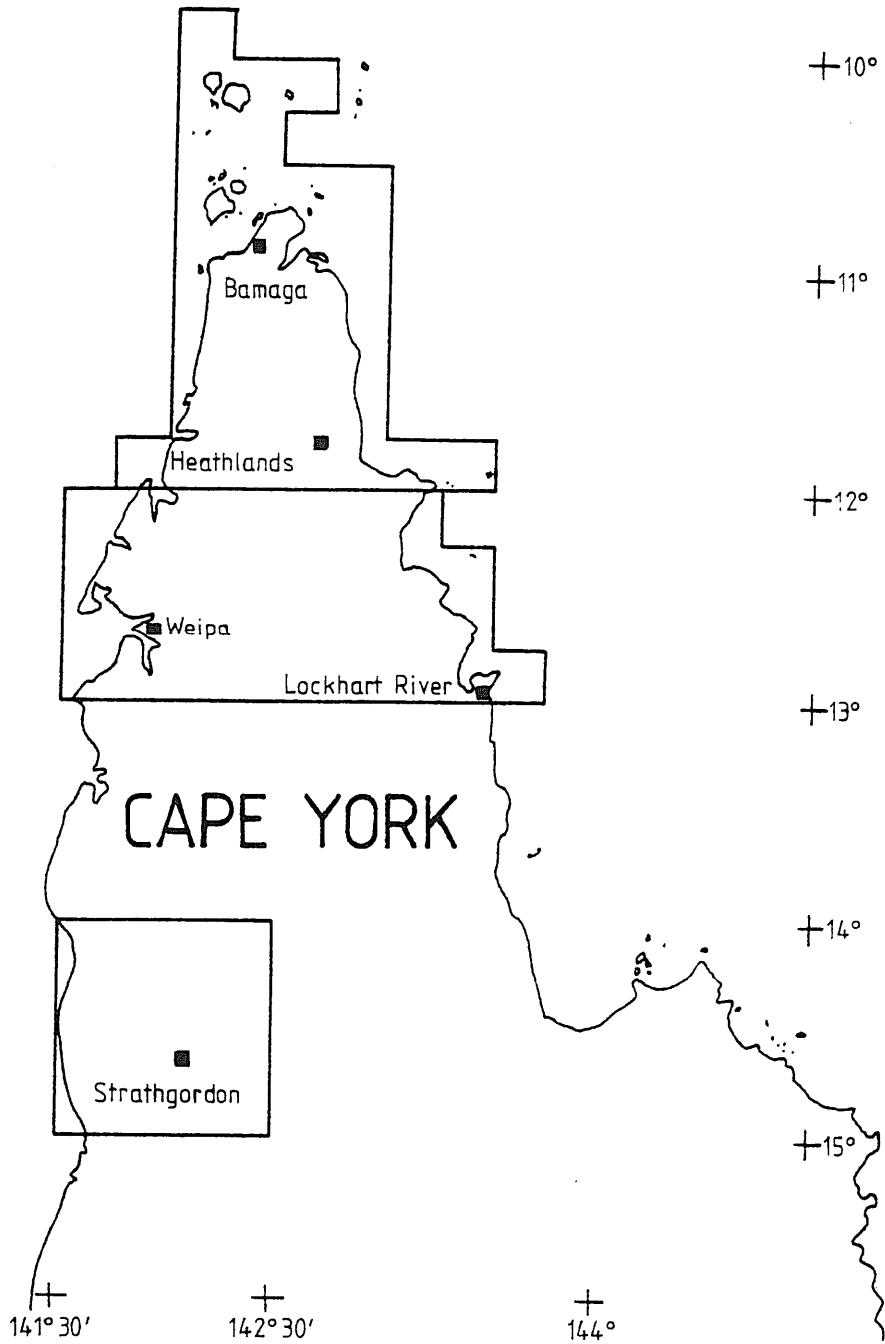
<u>Recommendation</u>	<u>Recommended Action By:</u>
a. A field completion SOP should be produced.	4 Fd Svy Sqn
b. Land Clearances should be completed prior to the Operation's initiation and include property locations.	NQTA
c. Requests for access to properties should be addressed to land owners with information copies to station managers.	NQTA
d. Cross country driver training should be conducted with the aim of broadening experience within the Unit.	4 Fd Svy Sqn
e. Comprehensive RAVEN training should be given to all unit personnel with an emphasis on antennae theory.	4 Fd Svy Sqn

10 December 1993


 A.B. McLEOD 
Major
Officer Commanding

ANNEX A TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

AO DIAGRAM



ANNEX B TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

SEQUENCE OF EVENTS

The following is a sequence of events for Op ARIGHT 93:

- a. 16 Aug 93 Pre-Operation training commenced.
- b. 23 Aug 93 Pre-Operation training completed.
- c. 30 Aug 93 Road party departed Adelaide (four truck cargo MC3 Unimog, nine LR 110, four 1/2 ton trailers, 26 pers).
- d. 4 Sept 93 LCPL Brett collected one ERV from Lavarack Barracks Townsville.
- e. 5 Sept 93 Field check parties for Strathgordon Station departed from main party at Musgrave to establish forward base (three LR 110, three 1/2 ton trailers, six pers).
Road party arrived Weipa (four truck cargo MC3 Unimog, six LR 110, two 1/2 ton trailers, one ERV, 20 pers).
- f. 6 Sept 93 Set up camp Weipa.
Field check parties departed Weipa for Bamaga to establish forward base (two LR 110, one 1/2 ton trailer, five pers).
AAAVN LOH support arrived in AO.
Attached ASR Camera Operators reported to 4 Fd Svy Sqn.
- g. 7 Sept 93 Commenced field completion at Strathgordon, Bamaga and Weipa.
Wild RC-10 camera fitted to Nomad in Adelaide.
Dr V. Shettigara and Mr G. Sumerling from the Defence Science and Technology Organization and liaison officers CAPT M.J. Kaye and MAJ W. Cordova (US exchange officer) arrived in Weipa.
- h. 11 Sept 93 AAAVN Nomad support arrived in Weipa.
- i. 13 Sept 93 Air camera tasks commenced.
OC 4 Fd Svy Sqn MAJ A.B. McLeod arrived in Weipa.
- j. 14 Sept 93 Defence Science and Technology Organization tasks completed and personnel departed.
- k. 17 Sept 93 MAJ A.B. McLeod departed.
Field check parties from Strathgordon moved to Weipa.

- i. 25 Sept 93 OPSO 4 Fd Svy Sqn CAPT G. Addison arrived Weipa.
- m. 29 Sept 93 Field completion of Weipa completed.
Field check parties from Bamaga moved to Weipa.
- n. 30 Sept 93 AAVN support departed AO.
Dismantled base camp and packed stores.
- o. 01 Oct 93 Road party departed Weipa for Adelaide (four truck cargo MC3 Unimog, eight LR 110, five 1/2 ton trailers, one FRV and 25 pers).
CAPT G. Addison departed.
LT P. Davies departed Weipa by civil air to return to Army Svy Regt Bendigo.
- p. 03 Oct 93 LCPL Brett and one FRV departed from road party at Townsville.
- q. 04 Oct 93 Wild RC-10 camera removed from Nomad in Adelaide.
- r. 05 Oct 93 Sig Jones departed from road party at Rockhampton and flew civil air to Brisbane to return to his unit.
- s. 08 Oct 93 Road party arrived Adelaide.
Attached Army Svy Regt personnel departed Adelaide to return to Bendigo.

ANNEX C TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

CONTACT INFORMATION IN THE AO

ARMY

1. Cairns
 - a. LTCOL R.J. Tink
 CO
 51 FNQR
 PO Box 818
 Cairns QLD 4870
 (070) 548 200

2. Weipa
 - a. Maj M.L. Elliot
 OC
 B Coy 51 FNQR
 (070) 699 350
 Answering Machine (070) 699 320
 Responsibility: Operations Weipa Area

3. Thursday Island
 - a. Maj B.R. Calwell
 OC
 C Coy 51 FNQR
 (070) 692 486
 Responsibility: Torres Strait and Bamaga

4. Bamaga
 - a. Det OC
 7 Signal Regiment (EW)
 (070) 693 100
 Responsibility: Signals Bamaga Area

- b. CAPT B. Smart
C Coy 8PL 51 FNQR
Bamaga
Compound (070) 693 231
Work (070) 693 164
Responsibility: 2IC for MAJ Calwell

5. Townsville

- a. WO2 Steve Fairbrass
BASC HQ
Lavarack Barracks
(077)717 447
Responsibility: Environmental Certificate of Compliance SO2-NQTA
- b. Linda Lowrie
BASC HQ
Lavarack Barracks
(077) 717 179
Responsibility: Land Clearances
- c. WO1 Pratt
Log Coy Townsville
(077) 717 762
Duty Room (077) 717 788
Responsibility: Repair and Recovery FNQ
- d. SGT Feeney
2Field Supply Battalion
(077) 717 801
Responsibility: Drum and Bulk Fuel delivery to AO

6. Civilian

- a. Mobil Weipa
(070) 697 120
Responsibility: Fuel and Repairs
- b. Paul Warren
Comalco
(070) 698 924
Responsibility: Senior Tropical Horticulturalist

- c. Chris Newman
Technical Officer
Comalco
(070) 698 978
Responsibility: Darkroom facilities
- d. Karen Patterson
Bauxite Bulletin
(070) 698 971
Responsibility: Editor

7. Horn Island

- a. Barbara Thelan
Skywest Horn Island
(070) 961 258
Responsibility: Skywest Receptionist

8. Cairns

- a. Nigel Hedgcock
QLD National Parks and Wildlife
(070) 519 811
Responsibility: Ranger
- b. Aboriginal and Torres Strait
Islander Commission
(008) 079 098

9. Coen

- a. Mike Delaney
QLD National Parks and Wildlife
(070) 601137
Responsibility: Ranger
- b. John Price
Strathgordon Outstation
(070) 603 249
Responsibility: Station Owner

10. Yorke Island

- a. Tim Marinov
Yorke Island (Torres Strait)
(070) 694 128
Responsibility: Administration

11. Cooktown

- a. David Forster
Charlotte Street
Cooktown Shire Council
(070) 695 4444
Responsibility: Property Boundaries

12. Lockhart River

- a. Ernie Stockham
Lockart Airstrip
(070) 607 121
Responsibility: Owner of Airstrip

13. Batavia Downs

- a. Greg Arnold
Batavia Downs
(070) 603 272
Responsibility: Station Manager

14. Edward River

- a. John Coleman
Pormpuraaw Aboriginal Community
(070) 604 175
Responsibility: Chairman

15. Mapoon

- a. Ricky Guivarre
Mapoon Aboriginal Community
(070) 909 124
Responsibility: Chairman

16. Moreton
- a. Bronwyn Bews
Moreton Telegraph Station
(070) 603 250
Responsibility: Occupant
17. Watson River
- a. Doreen Quartermaine
Watson River Homestead
(070) 603 267
Responsibility: Co Owner
18. Sudley
- a. Bob Paton
Sudley Station
(070) 603 068
Responsibility: Manager

FIELD COMPLETION REPORT

Report Area

1. Details of the report area are:
 - a. Coordinates of the area are:
 - (1) Cape York:

NE corner	10° 00'S	143° 00'E;
NW corner	10° 00'S	141° 45'E;
SW corner	15° 00'S	141° 30'E; and
SE corner	15° 00'S	142° 30'E:
 - (2) Holroyd:

NE corner	14° 00'S	142° 30' E;
NW corner	14° 00'S	141° 30'E;
SW corner	15° 00'S	141° 30'E; and
SE corner	15° 00'S	142° 30'E:
 - b. A diagram showing the 1:50 000 maps in area is at Annex A of the Operation Report.
 - c. The area covers approximately 40 880 km².
2. The AO is located approximately 2 000 km NNW of Brisbane and covers the majority of the Cape York Peninsula and numerous islands in Torres Strait.
3. The Holroyd area to the south is mostly flat with no major relief features. The major cultural features in the area are Pomppuraaw Aboriginal Community (Edward River) and Strathgordon Homestead. The Holroyd River, running east-west, is the major drainage feature with the area. It is subject to inundation in the wet season resulting in numerous swamps. Vegetation is mainly scattered with small areas of dense and medium. Mangrove exists in the coastal areas.
4. The area immediately around Weipa is dominated by the effects of Bauxite mining, with cattle grazing being the major land use further afield. Vegetation is mainly medium with numerous seismic lines around Weipa. Tropical rain forest can be found in the Great Dividing Range to the east. Major drainage features are the Wenlock, Mission and Ducie rivers.
5. The far north of the mainland is mostly Aboriginal land and as such there is no agricultural development. Some small aboriginal communities exist along the west coast, the largest of which is Bamaga. The terrain is mostly flat in the west rising to the Great Dividing Range along the eastern seaboard. Vegetation is mainly medium with large areas of tropical

rain forest in the central region and mangrove along the coast. The Jardine River is the major drainage feature flowing east-west.

6. To the north of Cape York there are numerous small islands, most of which are uninhabitable. Thursday Island is the major cultural centre in Torres Strait and is patronised by many tourists.

Task

7. The Task involved the field completion of the map sheets detailed in Annex E of the Operation Report.

Method

8. The area was field checked by seven survey parties using LOH and Nomad for the air checks, and Truck Panel Survey FFR Series 110 Landrovers for the ground phase. Both air and ground checks were completed in accordance with Reference F.

9. The main base was located at Weipa with forward bases at Bamaga and Strathgordon. The ground parties camped out for a total of 50 nights to reduce travelling time.

10. Hand held GPS were used with the understanding that the solutions gained were to be used in conjunction with traditional field check methods.

Duration

11. The task commenced on 6 Sep 93 and was completed on 28 Sep 93. Time spent in the area was:

- a. 583 hrs ground checking,
- b. 108 hrs air checking, and
- c. 278 hrs in the office, amending and updating the repromat.

Personnel

12. The parties which conducted the field check are listed at Annex G of the Operation Report.

Contacts

13. A list of contacts made in the field is at Annex C to the Operation Report.

Amendments/Comments

14. Cultural. The following amendments/comments apply:

- a. Some large termite mounds were plotted as buildings and have been deleted.

- b. As much of the area in the south of the AO is subject to seasonal flooding the position of some vehicle tracks may vary from year to year and season to season. Tracks were plotted as they were found.
- c. In the dry season some creek beds are used as access to swamps and water holes (e.g. 7268-1 G.R. 0086). These were plotted as tracks terminating at the creek bed.
- d. Scrubby Creek mining area was deleted as only a few remnants of the campsite remain and the lease has been revoked.
- e. Vehicle tracks have been formed along many seismic lines and should be portrayed as such (e.g. 7372-4 G.R. 2801).
- f. RAAF Base Scherger, 30 km east of Weipa, is currently under construction. The perimeter boundary is shown as a fence, with a 'buffer' boundary shown as a clear lane.
- g. The mining area around Weipa is subject to continual and dramatic change. Detail shown is current as at the time of field check.
- h. Many "Humpies" exist in the AO with concrete floors and a substantial framework. They are therefore shown as buildings (e.g. 7272-1 G.R. 9610).
- i. Some vehicle tracks through tropical rain forest did not appear on the preliminary maps. These were positioned using GPS, bearing and distances and labelled AP as they would not be visible on supplementary photography (e.g. 7376-2 G.R. 6003).

15. Drainage. The following amendments/comments apply:

- a. Drainage was generally well portrayed with only minor changes having to be made.
- b. All swamps with vegetation in them are tree swamps and should be portrayed as such.
- c. The classification of the Wenlock River was changed from intermittent to perennial.
- d. Several submerged reefs and rocks were deleted as they were not seen despite numerous attempts (e.g. 7476-4 G.R. 7634).

16. Relief. Relief detail was well portrayed with no changes being made.

17. Vegetation. The following amendments/comments apply:

- a. Vegetation was generally well portrayed with only minor changes needing to be made.

- b. Numerous average heights of vegetation were found to be erroneous and were adjusted (e.g. 7272-1 G.R. 0594).
- c. Some areas depicted as heathland have grown and are now the same as surrounding bush.
- d. In the mining areas there is a lot of regeneration using native plants. These will grow to medium density.
- e. Some areas of nipa and tropical rain forest were incorrectly plotted as mangrove.

18. Nomenclature. The following amendments/comments apply:

- a. Edward River Community changed to Pormuraaw Aboriginal Community;
- b. Nixon Homestead changed to Shelburne Station,
- c. correct spelling of 7272-4 is Duyfken Point,
- d. correct spelling of 7377-3 is Hawkesbury Island,
- e. 7476-2 should be renamed Shortland Reef,
- f. 7476-1 should be named Kagar Reef,
- g. 7477-1 should be renamed Warraber Islet,
- h. 7477-4 should be renamed Suarji Island,
- i. 7377-4 Mulgrave Island should be changed to Badu Island,
- j. Community of Cowal Creek has changed to Injinoo, and
- k. as there are three languages spoken in the various communities in Torres Strait, many islands have more than one name. The most common name should be used, and any other should be mentioned as a second name.

19. Joins. To assist field checking of southern joins, strip joins were flown and both existing southern maps and newly produced northern maps were amended. Most amendments were made to the published southern maps with only minor corrections required for the new products.

Supplementary Photography.

20. Supplementary Photography was flown as required. Details of this photography are attached at Annex F of the Operation Report.

Probable Obsolescence Rate

21. The POR for each map sheet in the area is at Appendix 1.

General Comments

22. The following general comments apply:
- a. Some of the field check notes were very ambiguous which made it difficult to determine what needed to be checked (e.g. 7376-1 G.R. 5631).
 - b. The contents of field check packages while adequate was very inconsistent.
 - c. The colour of contours on the preliminary maps were too overpowering and tended to obscure other detail, particularly F/C notes which were the same colour.
 - d. The paper used for the preliminary maps did not absorb ink very well, which led to smudging and in some cases the demise of corrections.
 - e. Some problems were experienced with diesel fuel contamination. This was due to old drums being used.

Conclusions and Recommendations

23. As a result of completing the field check, this Unit concludes and recommends the following:
- a. Field check notes must be clear and concise. Lead arrows could be used more to avoid confusion.
 - b. A softer colour be used for contours on preliminary maps and that F/C notes be of a unique colour.
 - c. A thorough investigation be undertaken to determine the best type of paper for preliminary maps to eliminate smudging.
 - d. Effective filters be used with hand diesel fuel pumps to avoid contamination.
 - e. The use of GPS be extensively trialed to determine if it can be used as a stand alone method of positioning for future operations.
 - f. A note be added to the mining areas to make the user aware of the rapid changes.

Dec 93

D.J. COOK
SGT
FD PTY IC

Appendix:

1. Probable Obsolescence Rates

APPENDIX 1
TO ANNEX D
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

PROBABLE OBSOLESCENCE RATES

1. The Probable Obsolescence Rate for each map sheet in the AO is as follows:

7268-1 POR 3
2 3
3 3
4 3

7269-1 POR 3
2 3
3 3
4 3

7272-1 POR 1
2 1
3 1
4 1

7273-1 POR 1
2 1
3 2
4 3

7274-2 POR 2

7368-1 POR 3
2 3
3 3
4 3

7369-1 POR 3
2 3
3 3
4 3

7372-1 POR 3
2 2
3 3
4 1

7373-1 POR 3
2 3
3 3
4 3

7374-1 POR 3
2 3
3 3
4 3

7375-1 POR 3
2 3
3 3
4 3

7376-1 POR 1
2 2
3 3
4 3

7277-1 POR 3
2 4
3 4
4 3

7378-3 POR 3

7472-1 POR 3
2 3
3 3
4 3

7473-1 POR 3
2 3
3 3
4 3

7474-1 POR 3
2 3
3 3
4 3

7475-1 POR 3
2 3
3 3
4 3

7476-1 POR 4
2 4
3 3
4 3

7477-1 POR 4
4 4

7572-1 POR 3
2 3
3 3
4 3

7573-2 POR 4
3 3
4 3

7574-2 POR 4
3 3

7672-3 POR 3

TECHNICAL REPORT

BACKGROUND

Package Construction

1. Army Svy Regt plotted and produced field completion packages for map sheets in the following 1:250 000 areas:
 - a. SC 54-7 Boigu - 1 x 1:50 000;
 - b. SC 54-11 Thursday Island - 8 x 1:50 000;
 - c. SC 54-12 Cape York - 2 x 1:50 000 (plus 4 x 1:50 000 inserts);
 - d. SC 54-15 Jardine River - 9 x 1:50 000;
 - e. SC 54-16 Orford Bay - 10 x 1:50 000;
 - f. SD 54-3 Weipa - 16 x 1:50 000;
 - g. SD 54-4 Cape Weymouth - 15 x 1:50 000;
 - h. SD 54-11 Holroyd - 16 x 1:50 000;and
 - i. outside 1:250 000 map sheet areas - 1 x 1:50 000.
2. A list of the 1:50 000 scale map sheets is included at Appendix 1.

Source Data Provided

3. Source data consisted of:
 - a. 1:50 000 field completion packages,
 - b. 1:100 000 and 1:250 000 existing/published topographic mapping,
 - c. 1:80 000 scale photo mosaics,
 - d. hydrographic charts at various scales, and
 - e. COMALCO photo maps.

Field Completion Packages

4. Army Svy Regt produced field completion packages containing the following:
 - a. computer generated cultural, drainage, relief and vegetation (CDRV) composite colour paper plots as preliminary maps;
 - b. various sheets in assorted colour combinations for use in the production of the guides and to assist in checking specific detail;
 - c. enlargements for areas of clutter; and
 - d. CDRV composite film positives for use as field completion masters.

Field Completion Colour Guides

5. 4 Fd Svy Sqn produced the various colour guides for all 1: 50 000 map sheets prior to departure to the AO.

EXECUTIONGeneral Outline

6. The Operation was conducted by deploying seven field completion parties to the field. Two field completion parties were deployed from a forward base at Bamaga to complete the CAPE YORK OFFSHORE and the northern CAPE YORK areas. Simultaneously two parties were deployed from a forward base at Strathgordon to field complete the HOLROYD area. The remaining three parties, and on completion of the HOLROYD area a further two parties, were deployed from the main base at Weipa to field complete the WEIPA/WEYMOUTH and southern CAPE YORK areas.

Ground Verification

7. Ground verification was undertaken by two-man field parties who remained in the field for up to five days. On their return to base, corrections were applied to the master field check positives. Homestead owners/managers within the AO were visited and provided valuable assistance to the field parties regarding new development, positioning of detail and placement and verification of nomenclature.

Air Verification

8. At the completion of the ground verification, an aerial inspection was completed to resolve any outstanding queries and to verify any detail inaccessible by road. Where possible the air check was completed by the same personnel who carried out the ground verification.

Comments

9. Photography. The dates of plotting photography were as follows:
- a. CAPE YORK OFFSHORE - Block 1 - 19 runs 92, 3 runs 91, 2 runs 90 and 3 runs 75;
 - b. CAPE YORK OFFSHORE - Block 2 - all runs 91;
 - c. CAPE YORK - 17 runs 91, 11 runs 92 and 2 runs 74;
 - d. WEIPA/WEYMOUTH - all runs 91; and
 - e. HOLROYD - 7 runs 88 and 5 runs 92.
10. The large disparity between the time frame of the photography used caused few problems due to the slow rate of change in most areas. However, an area on the tip of Cape York had a long standing resort missing from the photography. This was subsequently captured by supplementary photography.
11. In future before contemplating the use of outdated photography, a thorough search of source data should be made to ensure no major development has occurred in that area.
12. Photo Interpretation. The photo interpretation was generally very good, the major problems being:
- a. Nipa palms and tropical rain forest was plotted as mangrove (Ducie and Wenlock Rivers);
 - b. Vegetation heights up to 20 metres in error (general throughout Cape York and Weipa/Weymouth blocks);
 - c. Incorrect drainage classification of Wenlock River; and
 - d. Termite mounds plotted as buildings(Holroyd).
13. This Unit will produce a PIG to clarify the problem highlighted in sub para 12a and forward it to the Army Svy Regt.
14. A detailed explanation of amendments and photo interpretation errors is included in the Field Completion report attached at Annex D.
15. Enlargements. Monochrome enlargements from digital source were provided for areas of dense or cluttered detail. However, in many instances the use of enlargements was inconsistent, with some communities (e.g. Thursday Island) having no enlargement and in other areas enlargements being produced for homesteads (e.g. Strathgordon). Enlargements in all cases are extremely useful and should be produced for all areas of clutter.
16. All enlargements that were utilised were compiled as per Compilation Specifications. The area covered by the enlargement was boxed on the composite positive with a notation indicating which enlargement was used.

17. Weipa Enlargement. Four 1:25 000 scale enlargements of the Weipa 1:50 000 area were also provided and proved to be excellent for field verification of extensive detail in this area. Enlargements of the township at 1:5 000 and 1:10 000 would have improved the package further still.
18. In some instances (around Weipa) other large scale source data was utilised in the same way as the enlargements.
19. All enlargements were included in the relevant Field Completion Package.
20. Source Data. Source data provided by the plotting agency was minimal and is detailed in para 3. The lack of source data hindered the Field Completion Operation as source data had to be collected, via 1 Topo Svy Sqn, by the completion agency.
21. Field check notes constantly queried information that should have been sourced prior to field completion. Examples of these are:
- a. 7477-1 Cape York (Offshore) GR 1371 "Reserved for the Benefit of the Torres Strait Islanders FC Accuracy of statement."
 - b. 7477-1 Cape York (Offshore) GR 0071 "FC Warraber Islet or Sue Islet."
 - c. 7475-3 McHenry River GR 6641 "FC Boundary of National Park."
 - d. 7572-2 Iron Range GR 5585 No Telecon Tower Height.
 - e. 7672-3 Cape Direction "FC to verify if offshore islands are part of aboriginal land area."
22. Hand Held GPS. Hand held GPS were used for checking information and positioning new data. Initial results showed 30m accuracy in most instances.
23. GPS in Differential Mode. Tests were carried out to determine the suitability of using GPS in differential mode to position complex linear features. Initial results show promise; a detailed report will be drafted separately.
24. Joins. All internal joins were completed in the field. The only external joins were with Hann River to the south of Holroyd. External join problems were logged on the relevant PD sheet.
25. Database Concept. This Unit followed the concept that it was field completing for a digital topographic database. This was distinct from previous Operations where field completion was carried out for the sole purpose of producing a 1:50 000 map. Therefore the following decisions were taken:
- a. All features with changed status have had that change annotated and where this change would normally preclude their inclusion onto the final product they have been marked for deletion. (This leaves the final decision, for inclusion or not, with the Army Svy Regt).
 - b. Features were only deleted (without annotation) if they were not visible from the ground or air.

- c. Where features were either visible from the air only or from the ground only they have been suitably annotated.
- d. Where possible, reasons for deletion have been annotated(e.g. cattle track only).

26. Where vehicle tracks and fences are coincident, the most significant feature has been shown and the feature of secondary significance has been indicated by annotation(e.g. track follows fence this side). If the order of significance is not kept when the data is entered into the database, the only way for the order to be established when a product is constructed, would be to refer to the field check master.

27. Nomenclature. Problems existed with verifying the nomenclature for the Torres Straight Islands due to the three different languages spoken as well as colloquialisms used by the different local communities. Major B.R. Caldwell (OC C Coy, 51 FNQR) will visit all relevant communities and solve all nomenclature queries for this area by identifying the most commonly used names.

28. Nomenclature listings will be completed and forwarded to the appropriate authority. Included in the listings will be recommendations to change the names of five map sheets.

Stereo Compilation Report

29. The Stereo Compilation Report compiled by the Army Svy Regt for CAPE YORK/CAPE YORK OFFSHORE proved extremely useful as a means of clearing up compilation queries. It is recommended that similar reports be compiled for all blocks prior to field completion.

Supplementary Photography

30. Supplementary photography was acquired for detail that could not be positioned accurately during the field completion. A full report on the aerial photography is attached at Annex F.

Vital Asset Protection (VAP)

31. VAP photography was acquired as an opportunity task from a request compiled by 1 Topo Svy Sqn. Target areas were given a priority according to their importance. All priority one tasks were completed. A full report on VAP photography is contained in Annex F.

Photo Interpretation Guides (PIGs)

32. Photographs for the production of PIGs were taken by all field completion parties whilst in the AO, as stipulated in Reference D

CONCLUSIONS

33. Overall the photo interpretation by the compilation agency was of a high standard. However vegetation heights were inconsistent, and areas plotted as mangrove were often misinterpreted.

34. A number of initiatives developed by the compilation agency (e.g. enlargements and Stereo Compilation Reports) proved to be extremely beneficial.
35. A thorough source data check was not completed prior to the field completion operation and caused difficulties in the field.
36. Using the database concept for field completion could cause confusion in the future when data needs to be extracted to produce standard 1:50 000 map sheets.

RECOMMENDATIONS

37. The production of enlargements and the compilation of Stereo Compilation Reports should be continued and enhanced.
38. Source data should be collected by the compilation agency enabling as many compilation queries as possible to be solved prior to field completion.
39. That the Army Svy Regt investigate the implications of collecting data for a topographic database on the production of 1:50 000 map sheets and forward any recommendations on what is required by the completion agency to this Unit.

Dec 93

S.C. CAPP
WO2
Det OPSWO

Appendix:

1. 1 : 50 000 Scale Map Sheets Field Completed on Op ARIGHT 93

APPENDIX 1 TO
ANNEX E TO
OP ARIGHT 93
OPERATION REPORT
DATED 16 DEC 93

1:50 000 SCALE MAP SHEETS FIELD COMPLETED ON OP ARIGHT 93

The following 1:50 000 scale maps were field completed during Op ARIGHT 93

SC 54-7 BOIGU 1:250 000:

7378 3 MABUIAG ISLAND

SC 54-11 THURSDAY ISLAND 1:250 000:

7377 1 MOA
7377 2 TRAVERS
7377 3 HAWKESBURY ISLAND
7377 4 MULGRAVE ISLAND

7376 1 HORN ISLAND
7376 2 RED ISLAND POINT
7376 3 MUTEE
7376 4 THURSDAY ISLAND

SC 54-12 CAPE YORK 1:250 000:

7477 1 (2) CAPE YORK (off-shore)
7477 4 (1) CAPE YORK (off-shore)

7476 1 (3) CAPE YORK (off-shore)
7476 2 (4) CAPE YORK (off-shore)
7476 3 NEWCASTLE BAY
7476 4 CAPE YORK

SC 54-15 JARDINE RIVER 1:250 000:

7375 1 SANAMERE
7375 2 ELIOT CREEK
7375 3 DOUGHBOY RIVER
7375 4 VRILYA POINT

7374 1 COCKATOO CREEK
 7374 2 DULHUNTY
 7374 3 SKARDON RIVER
 7374 4 JACKSON RIVER

7274 2 MAPOON

SC 54-16 ORFORD BAY 1:250 000:

7475 1 USSHER POINT
 7475 2 ORFORD BAY
 7475 3 McHENRY RIVER
 7475 4 ESCAPE RIVER

7474 1 HANNIBAL ISLAND
 7474 2 SHELBURNE BAY
 7474 3 RICHARDSON RANGE
 7474 4 HORNET CREEK

7574 2 HOME ISLANDS
 7574 3 CAPE GRENVILLE

SD 54-3 WEIPA 1:250 000:

7273 1 PORT MUSGRAVE
 7273 2 ANDOOM
 7273 3 NOMENADE
 7273 4 PENNEFATHER CREEK

7373 1 CATFISH LANDING
 7373 2 NIMROD CREEK
 7373 3 CHARGER CREEK
 7373 4 AGNEW

7272 1 WEIPA
 7272 2 WINDA WINDA CREEK
 7272 3 PERA HEAD
 7272 4 DUYFKEN POINT

7372 1 COX CREEK
 7372 2 YORK DOWNS
 7372 3 KURRACOO CREEK
 7372 4 MISSION RIVER

SD 54-4 CAPE WEYMOUTH 1:250 000:

7473 1	HARMER CREEK
7473 2	GLENNIE
7473 3	MORETON
7473 4	BRAMWELL
7573 2	FAIR CAPE
7573 3	TEMPLE BAY
7573 4	OLIVE RIVER
7472 1	BRUNNER
7472 2	SIR WILLIAM THOMPSON
7472 3	EMBLEY RANGE
7472 4	BATAVIA DOWNS
7572 1	CAPE WEYMOUTH
7572 2	IRON RANGE
7572 3	TOZER
7572 4	PASCOE RIVER

SD 54-11 HOLROYD 1:250 000:

7269 1	SINCLAIR CREEK
7269 2	COLERIDGE
7269 3	HERSEY CREEK
7269 4	KNOX CREEK
7369 1	BRINSLEY
7369 2	BARING
7369 3	CROMER
7369 4	DUNNING
7268 1	CULROSS
7268 2	CYRIL
7268 3	EDWARD RIVER
7268 4	BALURGA CREEK

7368 1	FLYING FOX CREEK
7368 2	COLEMAN
7368 3	POWLETT
7368 4	STRATHGORDON

OUTSIDE 1:250 000 AREAS:

7672 3	CAPE DIRECTION
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AERIAL PHOTOGRAPHY REPORT

General

1. Supplementary and Vital Asset Protection (VAP) photography was flown during the period 12 Sep to 29 Sep 93 in the Cape York region.
2. Photography was acquired using a WILD RC10 Camera, Serial No. 1465 with a SWA lens, Serial No. 2006 with calibrated focal length of 88.013mm. The camera was mounted in a military N22 Nomad aircraft, A18-307.
3. Missions utilised during the operation were 4FDA 436 to 4FDA 447 (inc).

Tasking

4. Supplementary Photography. Approximately 1 400 line kms of supplementary photography was taken during the operation using 61.8 task hrs. The altitude of the photography was originally planned at approximately 7 300 ft giving a scale of approx 1:25 000, but due to the climatic conditions (notably cloud ceilings) prevalent in the AO, altitudes as low as 1 800 ft were flown. All missions were affected by either cloud or cloud shadow.
5. Photography was proved from the negative developed in situ, with paper prints being produced at 4th Fd Svy Sqn in Adelaide at the completion of the operation.
6. Appendixes 1 to 7 portray all supplementary photography flown.
7. Vital Asset Protection (VAP) Photography. A request for VAP photography of various towns, airstrips and other vital assets was received from 1 Topo Svy Sqn the day before the aircraft left Adelaide for the AO. Authority for this tasking was 1 Topo Svy Sqn's Cpl Librarian.
8. As the allocated aircraft hours did not take into consideration this tasking, priority one tasks only were attempted when the opportunity arose. In some cases sites not covered by specific VAP photography may be covered by supplementary photography.
9. It was noted that a great deal of the VAP sites were disused airstrips, many of which were strewn with 1.5m high termite mounds. It is inconceivable that these sites could be considered as being a vital asset to the nation's defence.
10. Appendix 8 details all VAP photography flown.

Personnel

11. The following personnel were involved:
- a. 223520 SSGT B.D. Hammond, Army Survey Regiment, Air Camera Operator;
 - b. 234855 CPL P.J. Austine, Army Survey Regiment, Air Camera Operator;
 - c. 238903 LT P. MacKenzie, 173 Surveillance Squadron, Pilot; and
 - d. 1102637 CFN M. Holland, 173 Surveillance Squadron, All Trades.

Processing

12. Film Processing. Film processing was carried out in Weipa utilising COMALCO's dark room facilities. These facilities proved to be excellent. An added bonus to this was that COMALCO was not utilising these facilities during this period, allowing for unrestricted access and the continuous set up of chemistry. COMALCO personnel were extremely helpful, notably Mr Chris Newman.

13. ZIESS FE 120 Development Tanks were used for film processing while the ZIESS Aerial Film Drier was used for the drying of negatives. The film drier was located at Main Base due to the limited room available in the dark room and the amount of noise the drier generates. No problems were encountered with either unit, though the use of the film drier was initially hampered due to the lack of an operators manual.

14. Paper Print Production. Paper prints were produced at 4 Fd Svy Sqn on the completion of the Operation using the ZIESS KG30 Contact Printer. Approx 1 250 paper prints were produced. The quality of these prints was affected by substantial tonal differences caused by cloud shadow. In many cases it was necessary to over expose part of the imagery to highlight the area of interest.

GPS Navigation

15. As an aid to navigation, a MAGELLAN GPS NAV 5000 PRO was used for the majority of sorties in the AO. No external antenna was fitted but the placement of the GPS receiver in the front of the aircraft proved suitable for two dimensional navigation.

16. The following method was used for navigation with the GPS:
- a. Flight lines were planned and their co-ordinates noted,
 - b. Co-ordinates of flight lines were allocated arbitrary way point codes,
 - c. Way points stored in GPS,
 - d. Navigation mode selected with pilot indicating to camera operator start and finish points, and

- e. Camera operator confirmed GPS position by air to ground navigation.

17. The use of GPS as a navigational aid proved to be instrumental in the operation being completed in the allocated hours. Correct use of GPS meant all allocated flying hours were used for photography, with minimal time spent confirming the location of photography targets.

WILD RC10 Aerial Camera - Serial Number 1465

18. The WILD RC10 aerial camera was bench tested in 4 Fd Svy Sqn prior to it being mounted in the aircraft at Adelaide Airport. During the bench testing and while on operation the following camera equipment became unserviceable or problems were encountered with them:

- a. Shutter Speed Control,
- b. PAV10 Camera Mount,
- c. NF2 Navigation Sight and Control Panel/Circuitary Unit Mounting Frames, and
- d. NF2 Navigation Sight Anti-vibration Mount.

19. Shutter Speed Control. During bench testing, it was noted that the shutter speed control could not be held steady. All three available control units tested had this problem to varying degrees. While in the AO this problem increased to a point where it was impossible to hold a desired shutter speed. All possible causes were checked.

20. Fortunately also operating in the AO was the Australian Land Information Groups camera team. Their control unit was tested on the camera system and operated correctly, hence identifying the cause of the problem to be within the control unit itself. A replacement control unit was subsequently sent from Adelaide. Although the replacement unit had problems holding the correct forward overlap, this was of minor concern considering the type of photographic missions being flown.

21. PAV10 Camera Mount. In attempting to mount the PAV10 Camera Mount into the supplied aircraft it was discovered that none of the PAV10 bolt holes aligned with the holes machined into the aircraft's body. This meant another PAV10 camera mount had to be acquired. As none of the supplied nuts and bolts were of the correct size, a six hour search of hardware stores was instigated to procure the appropriate items.

22. Due to mechanical problems, the Nomad was required to divert to 1 Aviation Regiment, Oakey QLD, to be inspected. During this stop it was noted that the Nomad provided for Op NERVOSE 93(A18-315) had a different camera mounting set up, that is, four threaded locating studs compared to the four holes of the supplied aircraft. It appears that each of the three Army Nomad aircraft modified to accept the RC10 camera have a different PAV10 mounting system.

23. NF2 Navigation Sight and Control Panel/Circuitary Unit Mounting Frames. The NF2 mounting frame and control panel/circuitary unit mounting frame were difficult to install

due to the incompatible nuts and bolts being supplied. Many of these were left over from when the Pilatus Porter was in service. The major problem resulting from this, was that the control panel/circuitry unit mounting frame could not be safely secured to the aircraft's floor. Cargo tie down straps were required to secure the mount.

24. Modifications to this mounting system were made during the stop over at 1 Aviation Regiment.

25. NF2 Navigation Sight Anti-vibration Mount. The NF2 Navigation Sight Anti-vibration Mount was broken beyond repair during the Operation. This occurred when the camera operator was thrown against the sight by turbulence while the sight was in the retracted position. The breakage occurred on the second last day of the operation and therefore did not effect photographic operations.

Army Aviation Support

26. Personnel. The success of the air photo aspect of this operation could not have been achieved without the assistance of Lt P. MacKenzie and Cfn M. Holland. Their professionalism and willingness to help in anyway was exemplary.

27. Nomad Aircraft A18-307. The aircraft operated without fault during its time in the AO. All problems that caused the aircraft to be grounded occurred while the aircraft was in transit to and from the AO. These problems were:

- a. taking on uncertified fuel from Adelaide Airport, grounding the aircraft at Richmond Air Force Base;
- b. defective left wing flap mechanism, grounding the aircraft at Oakey, QLD; and
- c. right engine chip detector warning light activated, grounding the aircraft at Moranbah, QLD.

Conclusions

28. All supplementary photography requests were completed in the allocated time. The majority of imagery taken was affected by either cloud or cloud shadow. Cloud also restricted the altitude of all photographic missions.

29. Approximately 35% of requested VAP photographic tasks were completed. If extra aircraft hours and time in the AO were allocated, all VAP tasking would have been completed.

30. The serviceability of all cameras and their components requires urgent attention if future photographic operations are to be conducted.

Recommendations

31. The following actions are recommended:

- a. All cameras and their associated components be serviced on a regular basis.
- b. Templates of the camera mounting systems of each of the modified Nomad aircraft currently in service be made and compared to the available PAV 10 camera mounts. From this comparison either:
 - (1) a specialised camera mounting platform be manufactured which will be able to fit any aircraft supplied and will be able to accept any PAV10 camera mount, or
 - (2) identify each PAV10 camera mount and the specific aircraft they are compatible with.
- c. If VAP photography is to be flown in conjunction with future operations of this nature:
 - (1) additional flying hours be allocated for these tasks,
 - (2) the tasking authority for VAP tasks originate at a higher lever thereby ensuring the validity of such tasking, and
 - (3) prior notification of such tasks be given.
- d. GPS receivers be used as a navigation aid to optimise allocated aircraft hours.

Dec 93

B.D. HAMMOND
SSGT
Air Camera Operator

Appendixes:

1. Supplementary Photography Overlay SC 54-11 THURSDAY ISLAND
2. Supplementary Photography Overlay SC 54-12 CAPE YORK
3. Supplementary Photography Overlay SC 54-15 JARDINE RIVER
4. Supplementary Photography Overlay SC 54-16 ORFORD BAY
5. Supplementary Photography Overlay SD 54-03 WEIPA
6. Supplementary Photography Overlay SD 54-04 CAPE WEYMOUTH
7. Supplementary Photography Overlay SD 54-11 HOLROYD
8. VAP Photography Summary

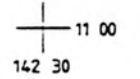
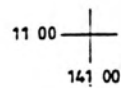
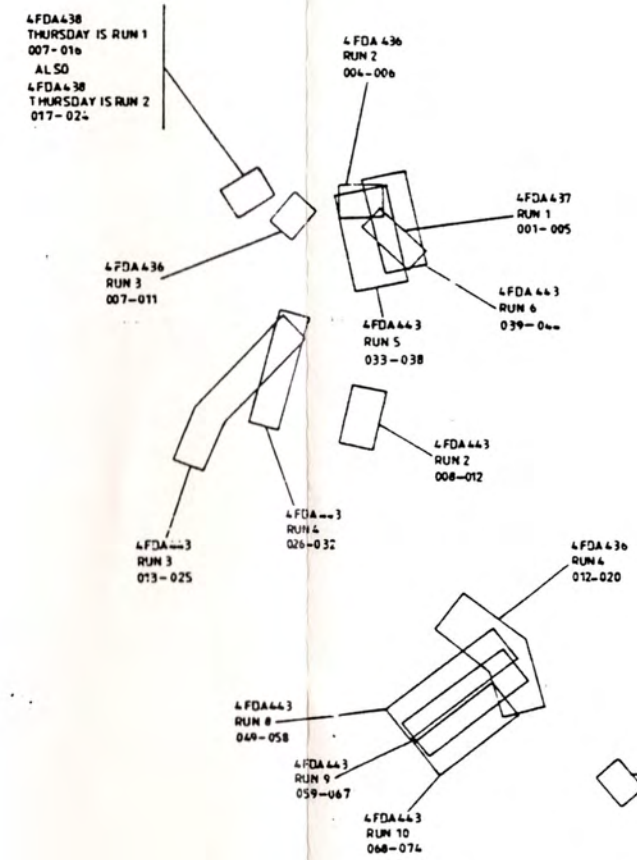
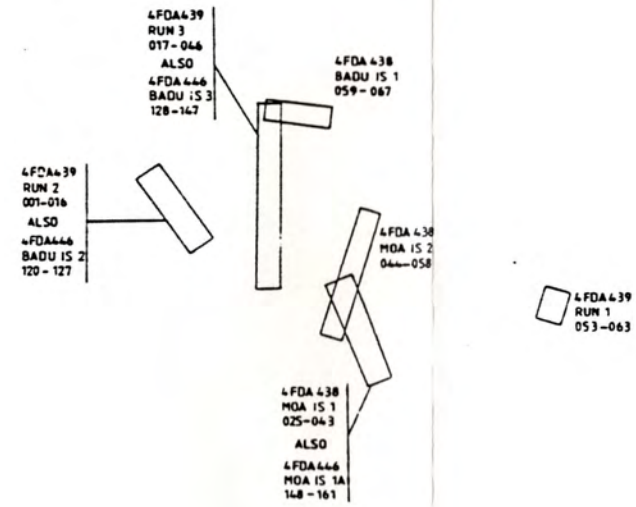
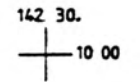
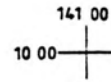
SC 54 11

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY

THURSDAY ISLAND

1 250 000

APPENDIX 1 TO
ANNEX F TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93



COMPILED: SSGT B HAMMOND

BH
3 Oct 93

SC 54 12

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY

CAPE YORK

1 250 000

APPENDIX 2 TO
ANNEX F TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

142 30
10 00

144 00
10 00

4 FDA 436
RUN 1
001-003

4 FDA 437
RUN 3
007-009
ALSO
4 FDA 437
RUN 4
010-012
ALSO
4 FDA 439
CAPE YORK RESORT
065-069

4 FDA 437
RUN 5
013-014

11 00
142 30

11 00
144 00

COMPILED: SSGT B HAMMOND

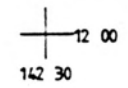
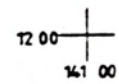
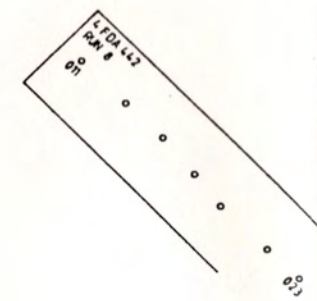
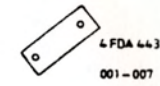
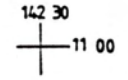
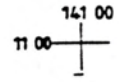
12/21
3 Oct 93

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY

JARDINE RIVER

1 250 000

SC 54 15



SC 54 16

142 30
11 00

144 00
11 00

4FDA437
RUN 6
015 - 016

4FDA437
RUN 7
017 - 019

4FDA446
ORFORD 5
077 - 089

4FDA 446
ORFORD 6
058 - 076

4FDA 446
ORFORD 4
090 - 112

4FDA-37
RUN 9
022-024

4FDA437
RUN 8
020-021

4FDA446
ORFORD 3
049-057

4FDA446
ORFORD 1
032-038

4FDA446
ORFORD 2
039-048

12 00
142 30

12 00
144 00

COMPILED SSGT B HAMMOND

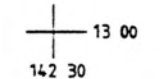
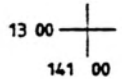
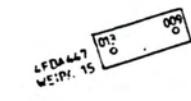
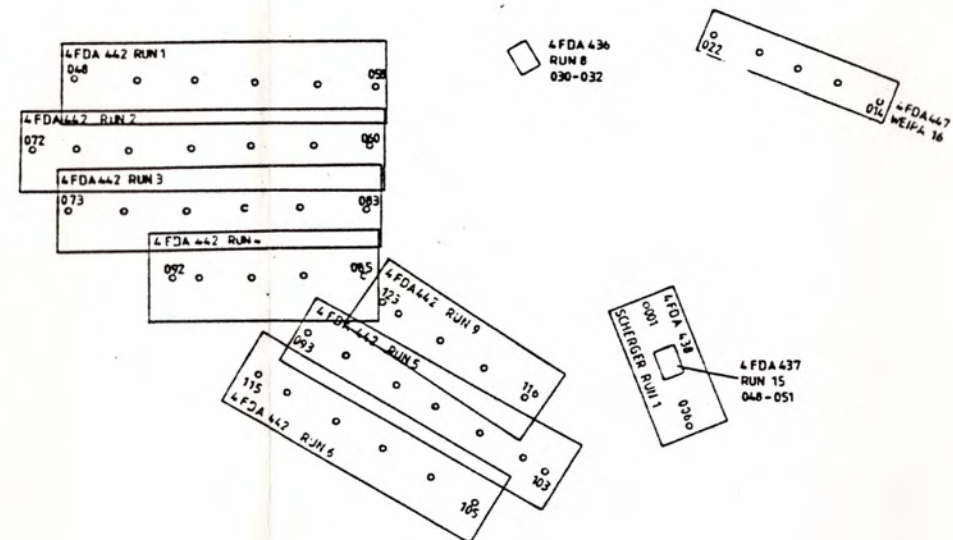
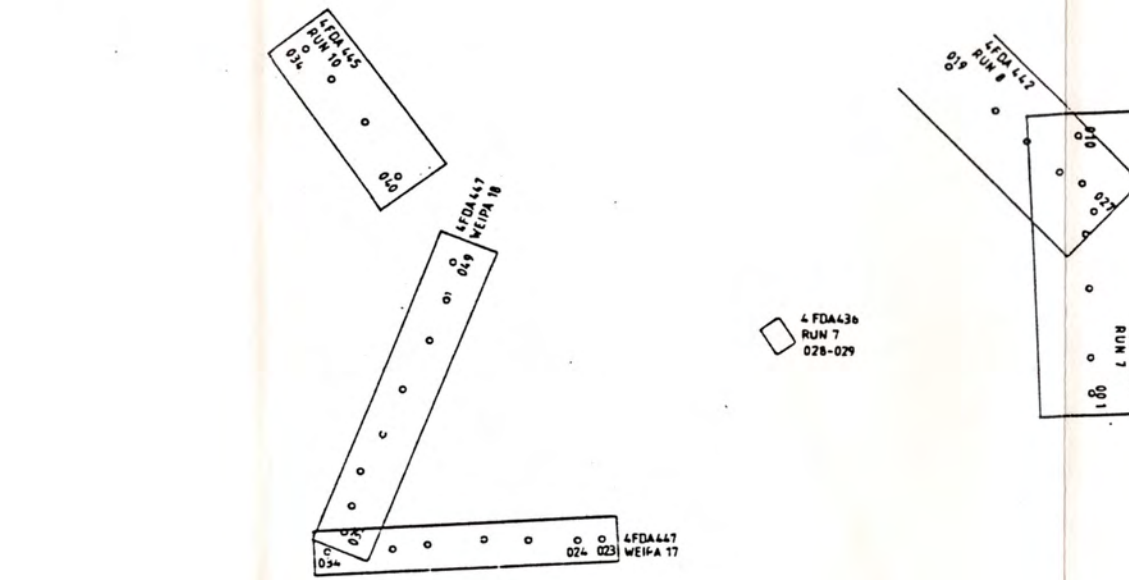
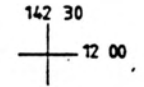
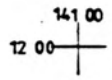
B. Hammond
3 Oct 93

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY

WEIPA

1 250 000

SD 54 3



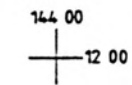
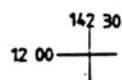
BH
3 Oct 93

SD 54 4

CAPE WEYMOUTH

1 250 000

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY



0020 0310 4FDA446
WEYMOUTH 11
020-031

028 032
4FDA442
WEYMOUTH 1
028-032

033 036
4FDA442
WEYMOUTH 1A
033-036

4FDA437
RUN 14
046-047
0038
WEYMOUTH 2 0470

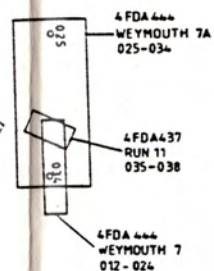
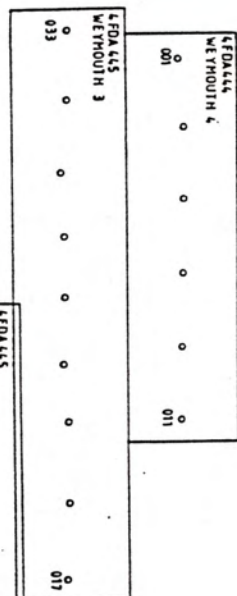
4FDA444
0035 0420
WEYMOUTH 6

010 014
4FDA446
WEYMOUTH 10
014-019

0080
4FDA447
WEYMOUTH 5
001-008

013 016
4FDA446
WEYMOUTH 9
008-013

001 007
4FDA446
WEYMOUTH 8



4FDA437
RUN 12
039-043

13 00
142 30

13 00
144 00

COMPILED SSGT B HAMMOND
3 Oct 93

SD 54 11

OP ARIGHT 93 SUPPLEMENTARY PHOTOGRAPHY

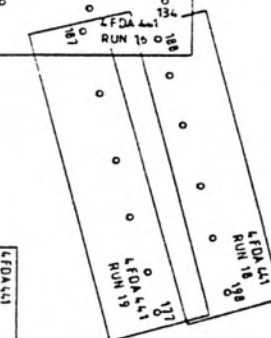
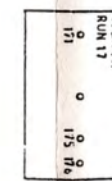
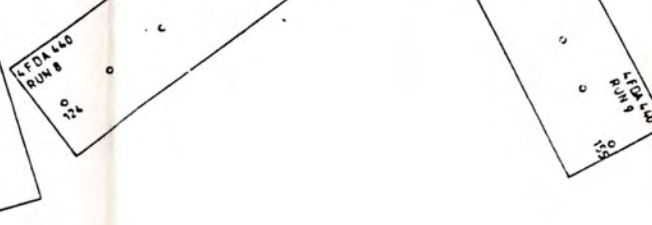
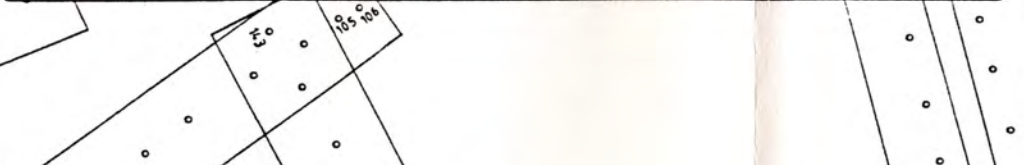
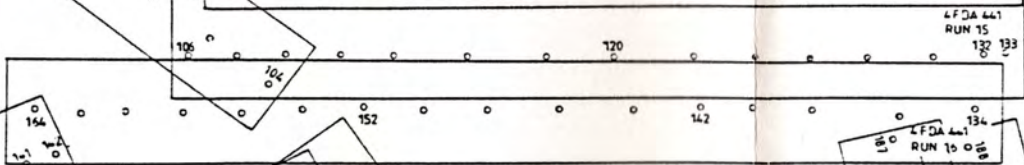
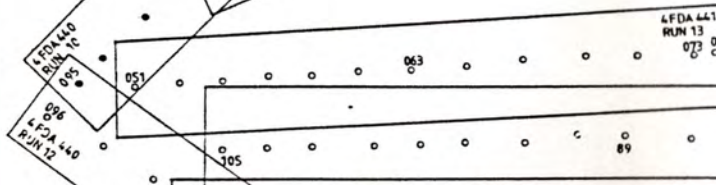
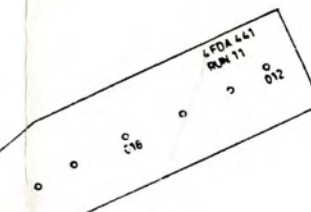
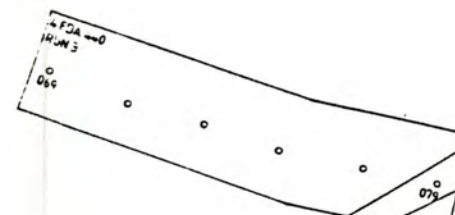
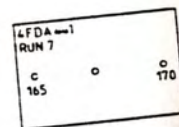
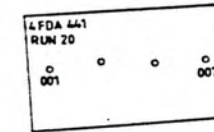
HOLROYD

1 250 000

APPENDIX 7 TO
ANNEX F TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

141 00
14 00

142 30
14 00



15 00
141 00

15 00
142 30

COMPILED SSGT B HAMMOND

[Signature]
3 Oct 93

VAP PHOTOGRAPHY SUMMARY

1. The following VAP photography was flown:

Locality	Mission	Frames
Warraber Is / Airfield	4FDA 436	001-003
Horn Is Airfield	4FDA 436	004-006
Horn Is / Wasaga	4FDA 436	007-011
Seisa to Bamaga	4FDA 436	012-020
Bamaga Airfield	4FDA 436	021-025
Cullen Point / Airfield	4FDA 436	026-027
Agnew Airfield	4FDA 436	028-029
Myerfield Airfield	4FDA 436	030-032
OK Village Airfield	4FDA 437	013-014
Captain Billy Landing	4FDA 437	015-016
Heathlands Airfield	4FDA 437	017-019
Nixon Homestead	4FDA 437	020-021
White (Wolona) Point	4FDA 437	022-024
Lockhart River	4FDA 437	035-038
Lockhart River Airfield	4FDA 437	039-043
Batavia Downs Airfield	4FDA 437	044-045
Moreton Telegraph Station Airfield	4FDA 437	046-047
Thursday Is	4FDA 438	007-016
Thursday Is	4FDA 438	017-024
Moa Is / St Pauls Mission	4FDA 439	053-062

2. Insufficient flying hours were available for the additional VAP requests.

ANNEX G TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

OPERATION MANNING

1. 4 Fd Svy Sqn:

455349	LT	J.T. Bath	Det OC
313339	WO1	G.E. Timmins	ADMINO
226680	WO2	S.C. Capp	OPSWO
424848	WO2	S.M. Clark	SQMS
1204137	SSGT	B.W. Collings	Editor
317729	SGT	D.J. Cook	FC Party IC
455113	CPL	S.G. Adrain	FC Party IC
7338	CPL	I.R. Brown	FC Party IC
F182350	CPL	S.M. Kluver	FC Party
323320	CPL	G.T. Weatherell	FC Party IC
555964	CPL	S. Wegener	FC Party IC
455498	L/CPL	J.P. Archer	FC Party
555441	SPR	I.D. Baldwin	FC Party
F6800034	SPR	F.A. Calvert	FC Party
455501	PTE	G.R. Clark	GD/Q
3804924	SPR	D.K. Miller	FC Party
3804881	SPR	C.V.R. Pearse	FC Party
37807	SPR	A.G. Santo	FC Party
3804882	SPR	M.D. Sinderberry	FC Party
3168177	LCPL	N.A. Smith	Cook

2. Army Svy Regt:

421885099	MAJ	W. Cordova	LO(US)
182387	CAPT	M.J. Kaye	LO
329605	LT	P.A. Davies	FC Party
223520	SSGT	B.D. Hammond	Camera Operator
440013	SGT	N.J. Houston	FC Party IC
234855	CPL	P.J. Austine	Camera Operator
554922	CPL	I.J. Read	FC Party IC
38041918	SPR	K.V. Baker	GD/FC Party
	Dr	V. Shettigara	DSTO
	Mr	G. Sumerling	DSTO

3.	<u>139 Sig Sqn:</u>			
	330924	SIG	L.T. Jones	Sig
4.	<u>5 Avn Regt Wksp:</u>			
	183437	LCPL	S.J. Brett	Veh Mech
5.	<u>162 Recce Sqn (LOH):</u>			
	234418	CAPT	M.T. Hammond	Pilot
	324526	CAPT	P.C. Hogan	Pilot
	557443	LT	B.F. Doe	Pilot
	557246	LT	D.H. Percy	Pilot
	231549	LT	B.J. Walton	Pilot
	186164	CPL	G.T. Elvin	All Trades
	65274	LCPL	G.H. VanLicrop	All Trades
	555379	CFN	J.R. Still	All Trades
	1107684	TPR	R.O. James	All Trades
6.	<u>173 Survl Sqn (Nomad):</u>			
	238903	LT	P. McKenzie	Pilot
	1102637	CFN	M. Holland	All Trades

Total: 43

ANNEX H TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

AAAVN REPORT - 162 RECCE SQN

Introduction

1. Op ARIGHT 93 was conducted in Sep 93 in the Cape York area, based at Weipa. 162 Recce Sqn provided avn spt for the Op from 6 Sep - 1 Oct.

Tasking

2. Op ARIGHT 93 involved field completion of 1:50000 scale maps by road and by air. Inaccessible areas were checked by LOH. The air checking of each map took 1 -2 hours to complete. Op personnel worked well with the aircraft, from pre-mission planning/briefing to assisting with refuelling.

Flying Rate

3. Flying occurred in short bursts of activity rather than as a continuous effort, which is the nature of such operations. 157 task hours were flown out of the 205 hours allocated for the task. The Op was spt by three LOH, two on-line and one maintenance spt, which was more than adequate. It is usual when a large number of hours are allocated to a task, or the AO is a considerable distance from Townsville, to provide maintenance spt acft to ensure continuity of spt. However, Weipa is within one days turnaround of Townsville and the Op could have been spt without the allocation of a maintenance spt acft.

Maintenance

4. During the Op numerous minor services were carried out on the acft. An engine change was also carried out during the Op. Acft maintenance, while requiring some management, did not interfere with survey ops.

Administration/Logistics

5. Positioning of fuel by 4 Fd Svy Sqn was satisfactory and assisted in efficient use of acft hours. However, more detailed liaison with the Avn elm may have reduced the over supply of drum stock in some areas. All aspects of camp administration and logistics was a credit to Det 4 Fd Svy Sqn.

Conclusion

6. It was a pleasure to provide spt to a unit that tasks acft effectively. Aircrew gained valuable experience operating in a possible future AO and gained an insight into svy ops.

Recommendations

7. It is recommended that:
- a. more detailed liaison regarding the positioning of fuel take place prior to the Op, and
 - b. 4 Fd Svy Sqn requests flying hours and task acft, but allows the Avn unit to decide if a maintenance spt acft is required. This allows for a more efficient use of a limited resource across the Army.

Dec 93

P.C. HOGAN
CAPT
AAAvn Det Comd
162 Recce Sqn

ANNEX I TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

AAAVN REPORT - 173 SURVL SQN

Introduction

1. Op ARIGHT 93 was an aviation bid by 4 Fd Svy Sqn FY 93/93. The task bid was accepted and 120 Nomad hours were allocated for supplementary photography, VAP and Op Spt tasking.

Execution of Task

2. Nomad 307 departed Oakey for Adelaide to pick up the RC 10 camera and crew on 6 Sep 93 with Capts Tierney and O'Neill as aircrew. After some minor maintenance problems encountered at Adelaide concerning uncertified fuel, the aircraft returned to Oakey via Richmond where it was planned to carry out a secondary filming task. The Nomad then departed Oakey again on 11 Sep 93 for the Cape York AO. Tasking commenced on 12 Sep 93 and continued until 29 Sep 93, returning to Oakey the following day. The final tasking consisted of returning the RC 10 camera and crew to Adelaide on 01 Oct 93 and then returning to Oakey on 02 Oct 93.

Flying Rate

3. A total of 94.3 task hrs were flown, with 12.4 hours travel from Oakey to Adelaide and return. This made a total of 106.7 hrs over 27 days.

Logistics

4. Fuel. No drum stock was required due to the AO being within range of bulk fuel stocks at Weipa, Horn Island, Coen and Lockhart River,

5. Repair Parts. Some minor repair parts were obtained from the 162 Sqn detachment also located at Weipa, but no major maintenance action was required, either in the AO or enroute to Adelaide.

Administration

5. All task administration was handled extremely well by the 4 Fd Svy Sqn detachment with no problems arising. The use of B Coy's phone and fax facilities was also helpful.

Conclusion

6. This task ran smoothly and efficiently as do most Survey tasks. The 173 Surv/ 4 Fd Sqn working relationship continues to strengthen with experience evident on both sides. The 4 Fd Svy Sqn's extensive and varied use of the AAAvn asset is appreciated.

Dec 93

P. MACKENZIE
LT
Det Comd
173 Survl Sqn

RAEME (VEH MECH) TECHNICAL REPORT

Deployment

1. The road party consisted of:
 - a. nine L/R 1 IO survey panel FFR,
 - b. four Truck Cargo MC2 Unimog,
 - c. four 1/2 ton trailers, and
 - d. one L/R 1 IO 6x6 ERV.
2. All vehicles were classified task worthy prior to leaving Adelaide except the ERV which was picked up in Townsville in a task worthy condition.
3. All vehicles had first and last parade checks performed on them on each day of use. In addition, regular checks of fluid levels in gearboxes, differentials, transfer cases and swivel pin housings were carried out, as was the cleaning of air filters and radiators.

Specific Repairs

4. Details of specific repairs to the vehicles are listed at Appendix 1. All documentation (TGM 146 and TGI 41) for inspection and/or repairs to the vehicles by Adelaide Logistics Battalion(ALB) have been raised and submitted.

Parts Availability

5. Minimal vehicle parts were carried by RAEME Support. Parts not held were obtained through local purchase, 4 Fd Svy Sqn, or Townsville. This caused a considerable delay in the arrival of parts, despite the fact that they were dispatched by the fastest possible means. These delays caused only minor problems though with most grounded vehicles taskworthy within a couple of days.

Comments and Recommendations

6. Several consistent faults were experienced in the AO, these were as follows:

- a. rear door locks failure due to ingress of dust,
- b. hub bolts coming loose,
- c. hub cap failure,
- d. tyre failure due to being gashed,
- e. front differentials cracking,
- f. gearbox failure, and
- g. extensive vehicle panel damage.

7. Most of the work generated in the AO was the result of the harsh natural conditions that the vehicles had to operate in. However driver inexperience and speed were the main reasons that the harsh natural conditions caused such a high attrition rate.

8. Future operations of this nature should have a much more comprehensive parts list prepared for it. This would alleviate the problems of obtaining the parts in the AO or having to wait for them to be sent and will subsequently, greatly reduce vehicle downtime.

9. A much more thorough and extensive period of driver training should see that a repeat of the vehicle damage experienced on this operation does not occur again.

Dec 93

S.J. BRETT
CPL
VEH MECH

Appendix:

1. Specific Repairs

APPENDIX 1 TO
ANNEX J TO
OP ARIGHT 93
OPERATION REPORT
DATED 10 DEC 93

SPECIFIC REPAIRS

49169

Replace Clutch	Locally purchased
Repair winch engagement	No parts required
Adjust brakes	No parts required
Reseal both front hubs	Loctite 510
Freed up back door	No parts required

49170 LR 110 FFR

Replace both front and rear Transfer seals	Parts ex 4 Fd Svy Sqn
Replace rear diff pinion seal	Part carried
Fixed 100 Amp Alternator	No parts required
Freed up back door	No parts required
Weld up front diff	Rover dealer in Weipa
Rebuilt Gear Box	Rover dealer in Weipa
Replace R/EI/R Hub cap	Carried part
Resealed RIHIR hub	Loctite 510

49171 L/R 110 FFR

Re-welded front diff	Service Centre Bamaga
Resealed rear hubs	Loctite 510
Repair clutch and slipping	Rover dealer Weipa
Freed up rear door	No parts required
Replaced both rear wheel cylinders	Parts ex Townsville

49172 LR 110 FFR

Repaired fuel filter mounting	Parts required
Resealed both rear hubs	Loctite 510
removed air conditioner Compressor. All gas had leaked out. Mount cracked.	No parts required.

49173 LR 110 FFR

Replace Fuel Filter	Parts carried
Replace Rear T case seal	Parts ex Townsville

Bled and adjusted brakes
Welded up front diff

No parts required
Rover dealer Weipa.

49174 LR 110 FFR

Resealed R/H/R hubs
Replaced hub cap
Freed up rear door
Reposition Steering wheel
Fixed indicators. Not canceling.
Replace R/H Mirror Head

Loctite 5 10
Parts ex 4 Fd Svy Sqn
No parts required
No parts required
No part required
Part carried.

47179 LR 110 FFR

Resealed R/H/F hub
Adjusted brakes
Bled Brakes
Freed up rear door

Loctite S 10
No part required
No part required
No parts required

49180 LR 110 FFR

Resealed L/H/R hub
replace hub cap
Replace front Parking Light Lens
Weld front diff
Replace R/H Mirror head

Loctite 5 10
Part ex 4 Fd Svy Sqn
Part carried
Rover dealer Weipa
Part carried

49181 LR 110 FFR

Replace R/H mirror Head
Replace rear T case seal
Adjust brakes
Adjust steering
Freed up rear door

Part carried
Parts ex 4 Fd Svy Sqn
No parts required
No parts required
No parts required

49198 LR 110 FFR

Freed up rear door
Resealed L/H/F hub leak
Welded up front diff

No parts required
Loctite 5 10
Rover dealer Weipa

38898 Unimog Cargo MC2

Replace batteries

Locally Purchased

46370 Unimog Cargo MC2

Repaired oil leak from Turbo
oil feed line.
Repair radiator

Weipa Service Centre
Coen Service Centre

46372 Unimog Flat Top MC2
Replace rear light assembly

Part carried

COMMUNICATION REPORT

INTRODUCTION

1. 139 Sig Sqn was tasked to provide communication support 4 Fd Svy Sqn in the Cape York Peninsula for the period 30 Aug 93 to 8 Oct 93.
2. The main base was located at an army compound in Weipa. The forward bases were located at both Strathgordon, south of Weipa, and Bamaga, north of Weipa.

EXECUTION

3. The network consisted of a Net work Control Station(NCS), and up to eight survey parties. The parties were to deploy throughout Far north Queensland. The NCS were able to maintain communications indirectly via the relay procedure. On 12 Sep 93, the Strathgordon parties departed their location and returned to Weipa. The Strathgordon survey parties were to work on the eastern side of the peninsula. To establish communications with these survey parties the main base was required to turn the antenna to point east. It was not possible to establish communications with the survey parties at Bamaga for reasons unknown. Telephone became the primary method of communication.

MANNING

4. The signals detachment consisted of one signal person being Sig Jones. The manning was sufficient for the task.

EQUIPMENT

5. The following equipment was used:
 - a. RT-F100 (RAVEN),
 - b. RAVEN high current power supply,

- c. CLARK mast,
- d. RAVEN broad band antennae, and
- e. RAVEN antennae lightweight.

EQUIPMENT PROBLEMS

6. No equipment problems were experienced.

COMMUNICATIONS PROBLEMS

7. Problems occurred all the way through the operation. The field check parties were able to hear the main base at all times however the main base was unable to receive most of the transmissions from the parties. There are a number of reasons that can contribute to this problem, the first being that the placement of the main base was not ideal for communications. The placement of the main base was close to two power lines, a microwave tower and a talcum antenna farm. In some of the areas that the parties were in, communications were virtually impossible to achieve. This problem may have been rectified by simply moving to a better position.

ADMINISTRATION

10. There were no administration problems encountered.

CONCLUSION

11. It appears that the importance of communications in that type of situation needs to be instilled into all members involved in the Operation. It was concluded that the horizontal dipole was the most efficient antenna for the area and that it is important to have the antenna as highly elevated as possible due to the amount of bauxite in the ground.

12. It is recommended that prior to deployment all members involved participate in a short basic course on radios and ratel procedure to minimize any problems in the future.

Dec 93

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