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4th Field Survey Squadron

Operation NASIKO 93

Operation Report

**An aerial photography operation
conducted in the Republic of
Vanuatu**

May - June 1993



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CONTENTS

	<u>Page</u>	<u>Para (s)</u>
COVER SHEET	i	
DISTRIBUTION LIST	ii	
CONTENTS	iii	
ANNEXES	v	
EXECUTIVE SUMMARY	vi	
INTRODUCTION	1	1
MISSION	1	2-3
AREA OF OPERATIONS	1	4
CONDUCT OF OPERATIONS	2	5-20
Timing of Operation	2	5
Outline Technical Plan	2	6-7
Reconnaissance	2	8
Issue of Orders and Instructions	2	9
Freight of Dangerous Cargo	2	10-11
Insertion of Force	3	12-13
Establishment of Main Base	3	14-15
Meteorological Information	3	16-17
Air Photo Operations	3	18
Technical Report	3	19
Extraction of Force	4	20
OPERATIONAL RESULTS	4	21-23
ADMINISTRATION AND LOGISTICS	4	24-47
Operation Manning	4	24
AIRSCAN Australia Support	4	25-30

	<u>Page</u>	<u>Para(s)</u>
Vehicles	5	31
Stores and Equipment	5	32
Accommodation	5	33-36
Medical	6	37-39
Morale and Discipline	6	40
Finance	6	41
Allowances	6	42
Banking	7	43
Mail	7	44
Rest	7	45
Diplomatic Clearances	7	46
Security	7	47
COMMAND AND SIGNAL	7	48-51
Command	7	48
Communications	8	49-51
CONCLUSIONS	8	52-53
Dates of Operation	8	52
Aircraft Support	8	53
RECOMMENDATIONS	8	54-55
Dates of Operation	8	54
Aircraft Support	9	55

ANNEXES

- A. Area of Operations
- B. Sequence of Events
- C. Vanuatu Contact Information
- D. Technical Report
 - Appendices: 1. Outstanding Runs of Photography
 - 2. Useable Photography and Photography Requiring Further Assessment
- E. Operational Manning
- F. Aircraft Usage

EXECUTIVE SUMMARY

1. Operation NASIKO 93 was conducted by 4 Fd Svy Sqn under direction from LHQ in the northern islands of the Republic of Vanuatu during the period 30 May - 17 Jun 93.
2. The aim of Operation NASIKO 93 was to acquire aerial photography suitable for 1:50 000 mapping as part of the Defence Co-operation Programme.
3. Three members of 4 Fd Svy Sqn and one civilian pilot deployed to Vanuatu and used a chartered aircraft to fly daily sorties over the area of operations.
4. Seasonal inclement weather prevented the completion of the mission with only 11% of the task being achieved. The season for air photo operations in Vanuatu should be limited to between August and early November, and not dictated by the availability of finance.
5. The aircraft hire contract needs to be reviewed to ensure that the specified ceiling can be achieved under all conditions.

OPERATION NASIKO 93
OPERATION REPORT

- References:
- A. DGOP-A Tasking Directive 1/91 - Survey Operations dated 19 Aug 91
 - B. LHQAUST OPORD 30/93 Operation NASIKO 93 dated 27 Apr 93
 - C. LHQ FAX K93-00297 dated 25 May 93
 - D. Specifications for Vertical Aerial Mapping Photography
 - E. Aircraft Contract - Standing Offer: PN 8260 dated 1 Oct 93

INTRODUCTION

1. In accordance with Reference A, 4 Fd Svy Sqn conducted an aerial photography operation in the northern areas of the Republic of Vanuatu. Operation NASIKO 93 was mounted by LHQ in accordance with Reference B. The Operation was conducted from 30 May to 17 Jun 93.

MISSION

2. 4 Fd Svy Sqn mission was to acquire aerial photography suitable for 1:50 000 mapping, in accordance with Reference A.

3. In addition to the mapping photography requirements, two building project sites on the island of Santo were photographed in accordance with Reference C, for use by 19 CE Wks.

AREA OF OPERATIONS

4. The AO ranged between latitudes S 13° 30' and S 15° 30', and longitudes E 166° 30' and E 168° 10'. It included the islands of Santo, Aoba and the Banks Group. An illustration of the AO is provided at Annex A.

CONDUCT OF OPERATIONS

Timing of Operation

5. The dates of the Operation were dictated by the availability of funds from IP Div and not according to the seasonal weather conditions that would be most favourable for aerial photography.

Outline Technical Plan

6. Mapping photography was acquired using a Cessna Titan 404 aircraft. The film was then developed and bromides produced by personnel at the Lands Department in Port Vila.

7. The Operation was conducted according to the sequence of events shown in Annex B. Significant events are discussed below.

Reconnaissance

8. No reconnaissance of the AO was conducted. Information on the facilities available and the conditions to be expected was provided by the Survey Adviser in Port Vila and individuals, including the pilot, who had operated in Vanuatu previously.

Issue of Orders and Instructions

9. The Operation Order and Mounting Instruction were issued on 27 April 93 and 19 May 93 respectively. There was sufficient time for the small number of personnel involved to make appropriate arrangements and carry out tasks.

Freight of Dangerous Cargo

10. Dangerous cargo (DC) and cumbersome goods were transported to the AO by surface shipping. Oxygen bottles required for high altitude flying were shipped to Sydney and subsequently off loaded due to technicalities involving DC regulations. Vee-H Aviation assumed responsibility for the bottles and arranged for them to be air freighted to Vanuatu.

11. DC in the form of unused chemicals remained in Vanuatu for use by the Lands Department. Cumberseome and heavy goods not required urgently for subsequent operations were returned to Adelaide by surface shipping.

Insertion of Force

12. Personnel left Adelaide for Canberra on 30 May 93 and left Canberra for Brisbane on 1 Jun 93. The aircraft was required in Canberra on 31 May 93 for maintenance.

13. On 2 Jun 93, Operation personnel travelled from Brisbane to Port Vila via Noumea in the Titan. Upon landing, Det 4 Fd Svy Sqn personnel were met by the Survey Adviser to Vanuatu.

Establishment of Main Base

14. Upon arrival in the AO working areas and a dark room were established at the Department of Lands. Stores were transported from the aircraft to the main base using a hire car. DC was confirmed as being held by customs and arrangements were made to have it delivered the following day.

15. Contact was established with the Bureau of Meteorology, Air Traffic Control Tower, Van Air maintenance staff and Australian High Commission. Contact information is attached at Annex C.

Meteorological Information

16. Meteorological information was provided by the Bureau of Meteorology. The dynamic nature of the weather prevented forecasters from providing an accurate estimate of the conditions to be expected over the AO. As a result, it was necessary to inspect the AO by flying over it even when the forecast was unfavourable.

17. The weather was a fundamental hindrance to the success of the Operation because of the cloud cover common to such tropical regions for the given time of year. Local opinion and information from the Bureau of Meteorology suggests ideal conditions for air photo operations can be found between August and early November.

Air Photo Operations

18. Air photo operations began on 4 Jun 93. The pilot's flight plan was faxed daily from the Bureau of Meteorology to the Air Traffic Control Tower - Port Vila Airport.

Technical Report

19. Minor problems were experienced with the technical equipment, descriptions of which are provided in Annex D.

Extraction of Force

20. On 16 June 93, Det 4 Fd Svy flew from Port Vila to Brisbane via Noumea. The following day they departed Brisbane for Adelaide.

OPERATION RESULTS

21. All Air Photo classification was in accordance with Reference D. Operation Nasiko was generally unsuccessful with only 40 out of a possible 373 line kilometres being photographed. The lack of successful photography taken during the Operation can be directly attributed to the location of the AO and the time of year the Operation was mounted.

22. Although Santo Run 1 was downgraded to "Z" class photography. This run gives Vanuatu Block 4 full photo coverage.

23. 35mm colour photography was taken of the Vanuatu Military Force and Police Barracks in Luganville as an opportunity task. The resulting photographs and negatives were forwarded to 19 CE Wks IAW Reference C.

ADMINISTRATION AND LOGISTICS

Operation Manning

24. Personnel who participated in Operation NASIKO 93 are listed at Annex E. All personnel displayed great professionalism and are to be commended for their enthusiasm in potentially frustrating circumstances.

AIRSCAN Australia Support

25. Aircraft. A Cessna Titan 404 was supplied by Vee-H Aviation with a total of 56.1 hrs being flown during the Operation. Aircraft usage is shown at Annex F. The POL requirements of the aircraft were the responsibility of the contractor as specified in Reference E.

26. The aircraft was a very stable and reliable platform which performed without fault for the duration of the Operation. However, the aircraft was not ideal in respect to its rate of ascent and overall speed. On occasions, parts of the AO were seen to be cloud free but the speed of the Titan meant that conditions deteriorated before the camera could be appropriately positioned.

27. Ceiling Altitude. During the air photo operations, it was necessary to replan a run to accommodate the limited height ceiling of the Titan 404. The ideal altitude for the run was 27 000 ft which was outside of the aircraft's capabilities given the temperature of the AC. This performance is contrary to the requirements of Reference E.

28. Air Camera. The aircraft was fitted with a PAV 10 camera mount in Canberra and the RC10 Aerial Camera, No. 2611 on arrival in Adelaide prior to the Air Camera Familiarisation Course (18 May - 28 May 93). The camera remained fitted until the completion of Operation NASIKO 93 when it was removed on 17 Jun 93 prior to the Titan's return to Canberra.

29. Communications. The microphone element of the oxygen masks provided was poor to the extent that rapid instructions could not pass between camera operators. This situation resulted in misunderstandings and subsequent failure to take advantage of limited opportunities as detailed in Annex D.

30. Pilot. The pilot, through his previous experience in survey operations, proved to be understanding of the requirements of mapping photography and hence, contributed significantly to the Operation.

Vehicles

31. A Commonwealth car was utilised for transport whilst in Canberra. An Avis Rent-a-Car was provided upon arrival in Port Vila and returned prior to departure. Vehicle fuel was purchased in Port Vila using petty cash as no MasterCard facilities were available for POL accounts.

Stores and Equipment

32. Sufficient stores and equipment were taken for the Operation and all were serviceable.

Accommodation

33. Whilst in transit within Australia, personnel were provided accommodation allowance.

34. Canberra. Operation personnel excepting the pilot stayed at the Capital Park Royal on the nights of 30 and 31 May 93. The pilot originates from Canberra and subsequently provided his own accommodation.

35. Brisbane. Operation personnel stayed at the City Travelodge on the night of 1 Jun 93 and at the City Park Royal on the night of 16 Jun 93.

36. Port Vila. Operation personnel stayed at Le Legon Resort whilst in Vanuatu. This accommodation was booked by the Survey Adviser to Vanuatu and paid for using Australian Government Credit Cards.

Medical

37. No medical problems occurred during the Operation.

38. Operation personnel were issued malaria tablets and underwent a malaria eradication programme upon return to Australia. Two of the three military personnel were issued an eradication programme of tablets which had surpassed their expiry date and had "Not to be issued to personnel returning from Vanuatu," printed on the container label.

39. Tap water in Vanuatu was not recommended for human consumption.

Morale and Discipline

40. Morale remained high throughout the Operation and there were no incidents requiring disciplinary action.

Finance

41.	Expenditure was as follows:	\$A
a.	Travel and Subsistence -Accommodation -	7 703.00
	Allowances -	8 698.41
b.	Freight and Cartage -	713.00
c.	Petty Cash -	124.18
d.	Aircraft Hire -Flying hours -	42 075.00
	Admin charges	950.00
	Standing charges -	28 000.00
e.	Hire Car/Taxi -	910.00
f.	Chemicals and Film -	3 928.90
g.	Stores -	106.95

Allowances

42. The following allowances were paid:

a. Travelling Allowance.

- (1) Full travelling allowance was paid in advance to all personnel for the time spent transiting to the AO.

- (2) Whilst in the AO, full travelling allowance, minus the accommodation element, was paid in advance to all personnel.
- b. Flight Duties Allowance. Flight duties allowance was paid in accordance with Annex F.
- c. Clothing Allowance. Clothing allowance for personnel deploying to a tropical area was paid in advance to all Operation personnel.

Banking

43. Westpac and ANZ banking facilities exist in Port Vila. Operation personnel found travellers cheques to be the most convenient form of personal finance.

Mail

44. Mail was collected daily from the Australian High Commission - Port Vila.

Rest

45. Operation personnel were granted two days rest at the completion of the Operation.

Diplomatic Clearances

46. All military personnel were in possession of an official passport whilst the pilot carried a civilian passport. Visas for transit through Noumea were issued by the French Consulate. Diplomatic clearance for Vanuatu was organised by the Survey Adviser to Vanuatu through the Australian High Commission.

Security

47. A safe deposit box was provided by Le Legon Resort for the storage of travellers cheques, petty cash, passports and Australian Government Credit Cards.

COMMAND AND SIGNAL

Command

48. Det 4 Fd Svy Sqn was under operational command of LHQ for the duration of Op NASIKO 93. Technical Direction came from DSvy-A. All personnel were under command OC Det 4 Fd Svy Sqn, 455349 Lieutenant J. T. Bath. No problems were experienced with the command arrangements specified in Reference B.

Communications

49. Telephone. Phone facilities were available at the Lands Department but proved to be unreliable when making overseas calls.
50. Facsimiles. Facsimiles were sent using a machine at the Australian High Commission - Port Vila.
51. Sitreps. Sitreps were sent at 1200 hrs each Friday using the aforementioned facsimile machine.

CONCLUSIONS

52. Dates of Operation. The lack of successful photography taken on Operation NASIKO 93 can be attributed to poor weather that could have been avoided, had the Operation been mounted at a more appropriate time of year. As a result of the weather, only 11% of the mapping mission was achieved. Favourable conditions for air photo operations can be found between August and early November.
53. Aircraft Support. The Titan aircraft used on Op NASIKO 93 was inappropriate for the task at hand and should not be used in future for the following reasons:
- a. The Titan cannot respond quickly enough to dynamic weather conditions,
 - b. Contrary to Reference E, the Titan cannot operate at 30 000 ft in all conditions,
 - c. Internal communications in the Titan, when using oxygen masks, are inadequate.

RECOMMENDATIONS

- | | | Recommended
Action by: |
|-----|---|---------------------------|
| 54. | <u>Dates of Operation</u> . | |
| a. | Timings of air photo operations should be governed by climatic conditions and not by financial constraints. | IP Div |
| b. | Operations in Vanuatu should be conducted between August and early November. | IP Div,
DSvy-A |

Recommended
Action by:

55. Aircraft Support The aircraft contract DSvy-A (Reference E) should be reviewed to ensure the contractor supplies an aircraft capable of fulfilling the contractual obligations.

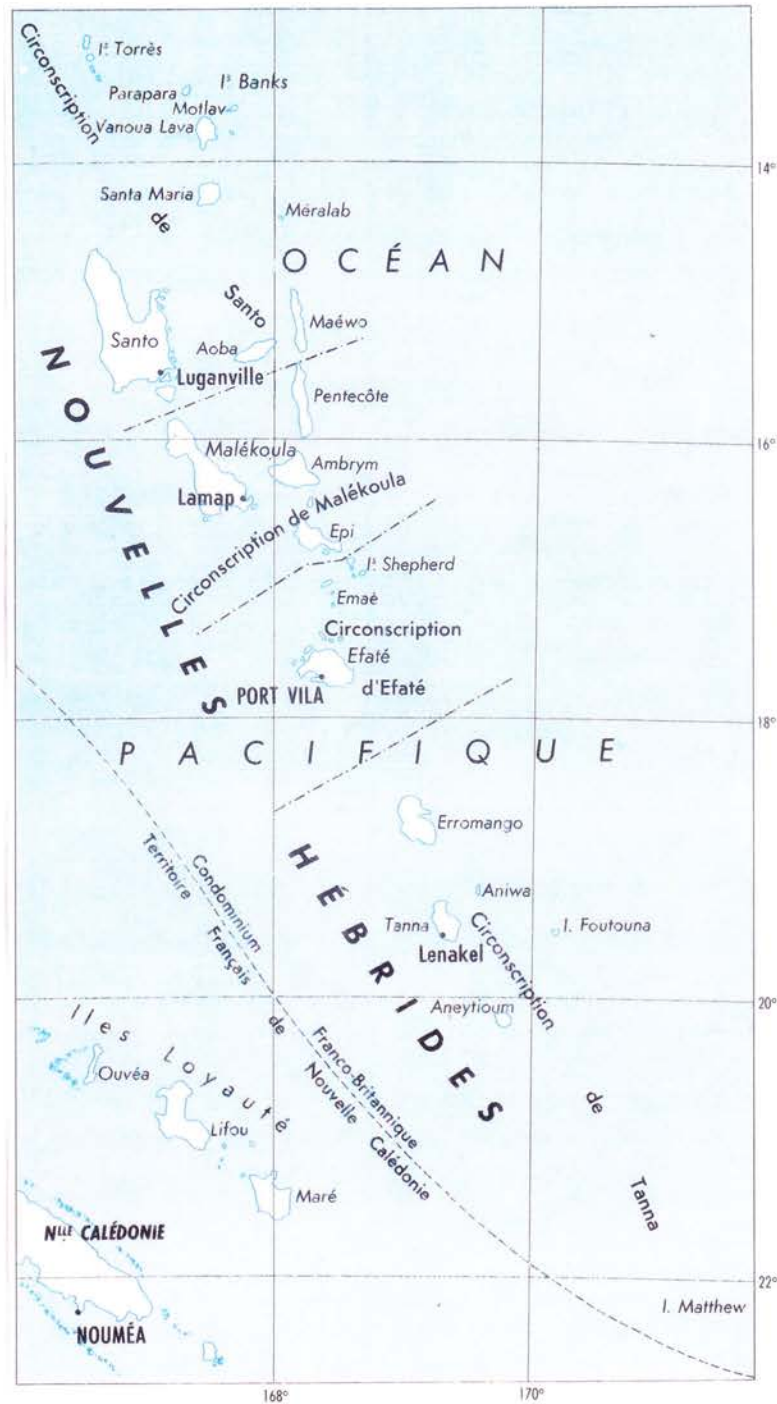
25

August 1993

authod

A.B. McLeod
Major
Officer Commanding

AREA OF OPERATIONS



Scale: 1: 1 000 000

ANNEX B TO
4 FD SVY SQN
OPERATION NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

OPERATION NASIKO 93
SEQUENCE OF EVENTS

<u>Serial</u>	<u>Date</u>	<u>Event</u>
<u>(a)</u>	<u>(b)</u>	<u>(c)</u>
1.	29 Apr 93	Stores for surface shipping packed and delivered to Adelaide Airport
2.	23 May	Bourke Test Range flown and proven.
3.	28 May	Film sent to Bendigo for fiducial testing.
4.	30 May	Transit Adelaide to Canberra, Chartered Titan
5.	31 May	Aircraft Service
6.	1 Jun	Transit Canberra to Brisbane (customs clearance).
7.	2 Jun	Transit Brisbane to Noumea(refuel) to Vanuatu. Picked up hire car.
8.	3 Jun	Established work areas. Pilots rest day. Confirmed arrival of oxygen.
9.	4 Jun	Flew and processed test strip.
10.	5 Jun	Flew Run 1 Santo.
11.	6 Jun	No photography due to cloud.
12.	7 Jun	No photography due to cloud.
13.	8 Jun	No photography due to cloud.
14.	9 Jun	Pilots rest day.
15.	10 Jun	No sortie due to cloud.
16.	11 Jun	No photography due to cloud.
17.	12 Jun	No photography due to cloud.
18.	13 Jun	Flew Run 4 Santo, Luganville construction sites and colour photography of Vanuatu Parliament House.
19.	14 Jun	No photography due to cloud.
20.	15 Jun	No photography due to cloud. Dismantled work areas.
21.	16 Jun	Transit Vanuatu to Brisbane via Noumea (refuel).
22.	17 Jun	Transit Brisbane to Adelaide. Unloaded Camera and stores from plane. Aircraft returned to Canberra.

ANNEX C TO
4 FD SVY SQN
OPERATION NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

VANUATU CONTACT INFORMATION

Survey Tech Adviser
Vanuatu

Lands Department - Port Vila
Ph 0011-678-22427

Bureau of Meteorology-
Port Vila

Ph 0011-678-22331

Aircraft Control Tower-
Port Vila

Ph 0011-678-22724

Australian High Commission-
Port Vila

Ph 0011-678-22777
Fax 0015-678-23948

TECHNICAL REPORT

- References:
- A. LHQAUST OPORD 30/93 OP NASIKO 93 dated 27 Apr 93
 - B. LHQ FAX K93-00297 dated 25 May 93

INTRODUCTION

1. Operation NASIKO 93 was an aerial photography operation conducted by the Det 4 Fd Svy Sqn in the northern areas of the Republic of Vanuatu during the period 30 May - 17 Jun 93.
2. The aim of the operation was to:
 - a. complete the photo coverage of Northern Vanuatu as described in Reference A. Appendix 1 to Annex D illustrates the outstanding runs of photography.
 - b. acquire photography of two building project sites on the island of Santo, in accordance with Reference B.

OPERATION RESULTS

3. A summary of results is detailed below:
 - (a) Santo. 120 line kilometres of mapping photography was aquired. Of this:
 - (1) 40 line kilometres was useable "Y" class photography,
 - (2) 80 line kilometres was "X" class photography that requires further investigation into its suitability for aerotriangulation and plotting.
 - b. Aoba. 61 line kilometres of mapping photography was required. Nil was achieved.
 - c. Banks Islands. 192 line kilometres of mapping photography was required. Nil was achieved.

- d. Santo Building Sites. The building sites were successfully photographed IAW with Reference B

4. Appendix 2 to Annex D illustrates the useable photography and photography which requires further investigation.

5. Technical Equipment A light table was provided by the Lands Department as well as an automatic print processor, the drying element of which was used for drying both films and prints. The developing and fixing elements of the machine were unserviceable due to a malfunctioning replenisher pump.

6. Processing of Aerial Film The manual rewind method was used for processing the aerial film in B5 tanks. No problems were experienced with photo production.

7. Paper Print Developing. A PRO PHOTO Portable Field Contact Printer MK2 was used for making work prints for photo assessment. Paper print developing was carried out manually in developing trays. The PRO Printer was left behind for use by the Lands Department as authorised by SO2 Equip DSVY-A. No problems were experienced with photo production.

8. Photo Assessment Photo assessment was carried out on each sortie after the completion of paper print production. The results were available prior to the next day's flying.

9. Equipment Problems Whilst flying at altitude, a technical problem was experienced with the camera misfiring when set on a low shutter speed (1/75"). Poor communications provided with the oxygen masks caused misinterpretation of subsequent instructions and significant delay. In the time it took to convey the appropriate message and realign the aircraft, cloud had formed over the run making it unsatisfactory for another attempt. The poor quality of internal communications provided with the oxygen masks resulted in the loss of a photography opportunity. The difficulty with the camera rectified itself for no apparent reason when the camera was placed on a higher shutter speed. During later sorties the camera functioned without failing at 1/75".

10. Aircraft Due to the temperature in the AO, the Titan 404 did not have the ability to climb to 27 000 ft in order to fly Aoba Run 1. The run was replanned at 25 000 ft to accommodate the ceiling of the Titan and the "Z" range requirements of a B8 stereo plotter.

11. The possibility of replanning runs at lower altitudes, with the view of adding more control was not viable due to the fact that the cloud base always started between 1500 and 2000 ft.

CONCLUSION

12. Op NASIKO 93, from a technical perspective, was an unsuccessful operation. This can be attributed to inclement weather conditions over the AO for the duration of the Operation.

13. The communications provided with the oxygen masks in the Titan were inadequate for the rapid passage of instructions.

RECOMMENDATIONS

14. It is recommended that:

- a. Future photography operations in the Republic of Vanuatu should be conducted between August and early November.
- b. An aircraft that can be pressurised should be chartered for further operations due to the unsatisfactory internal communications available in non-pressurised aircraft such as the Titan.
- c. Vanuatu Block 4, Run 1, being the only run in the block still outstanding, should be investigated to determine its useability for aerotriangulation.

*

Classified 2 due to cloud. Being reflight BEZAWA 93.

*Alvance
9 Sep 93*

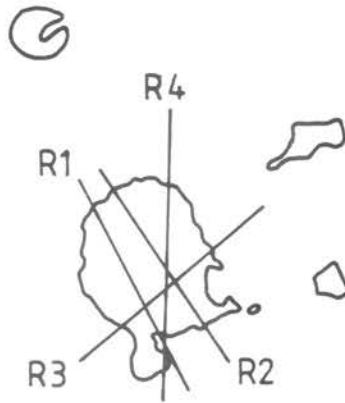
25 August 1993

P.D. Longbottom
Sergeant
Camera Operator

- Appendices:
1. Outstanding Runs of Photography
 2. Useable Photography and Photography Requiring Further Assessment

APPENDIX 1 TO
ANNEX D TO
OP NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

NORTHERN
REPUBLIC OF
VANUATU



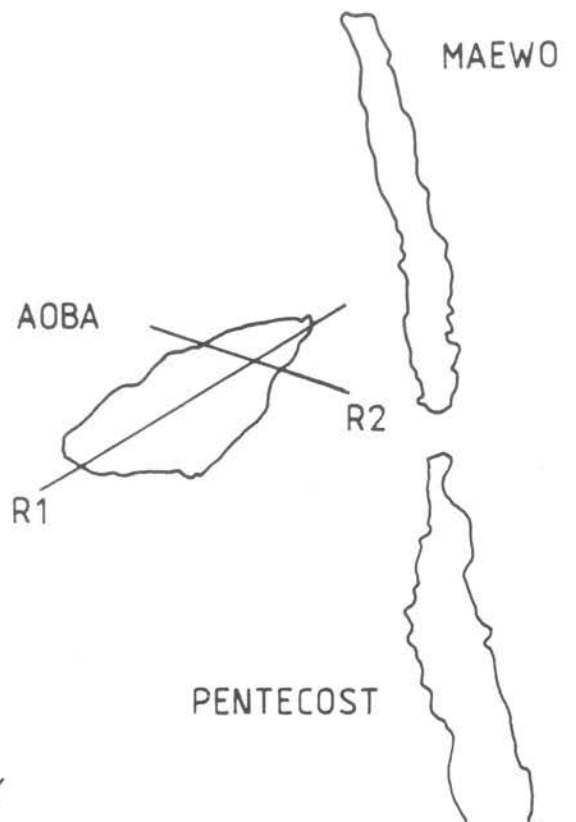
BANKS ISLAND GROUP



SANTO

R1

R4



MAEWO

AOBA

R1

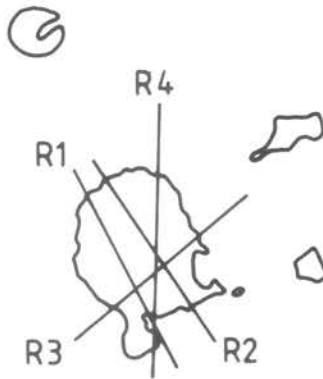
R2

PENTECOST

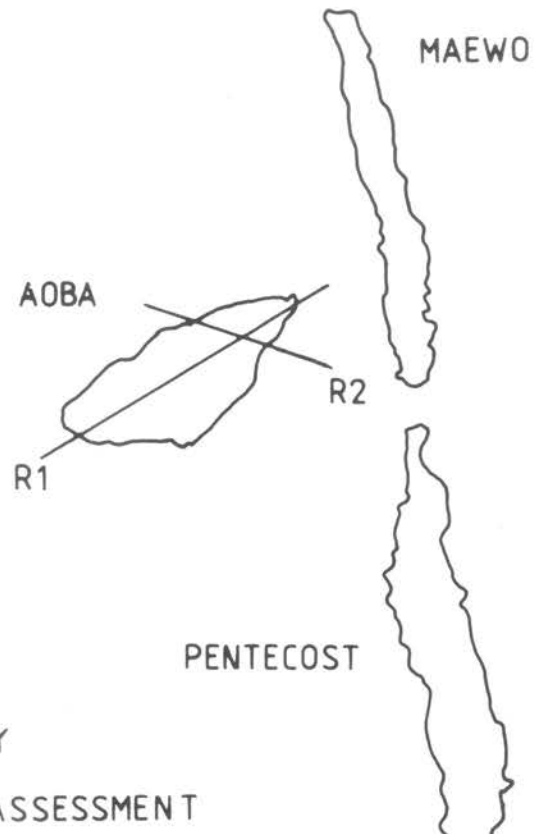
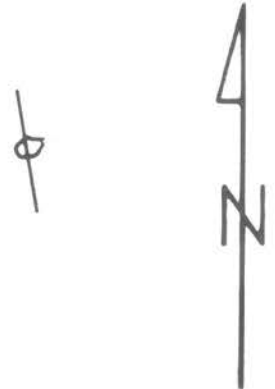
SCALE 1:1,000,000
OUTSTANDING RUNS OF PHOTOGRAPHY

APPENDIX 2 TO
ANNEX D TO
OP NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

NORTHERN
REPUBLIC OF
VANUATU



BANKS ISLAND GROUP



SCALE 1:1,000,000

- OUTSTANDING RUNS OF PHOTOGRAPHY
- USABLE PHOTOGRAPHY
- - - - - PHOTOGRAPHY REQUIRING FURTHER ASSESSMENT

ANNEX E TO
4 FD SVY SQN
OPERATION NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

OPERATION NASIKO 93
OPERATIONAL MANNING

Tabulated below are all personnel who were involved in
Operation NASIKO 93:

Regt No	Rank	Name	Appoint	Unit
(a)	(b)	(c)	(d)	(e)
455349	LT	J.T. BATH	IC DET	4 FD SVY SQN
46446	SSGT	W.J. SHEPHARD	2IC DET/ CAMERA OPERATOR	4 FD SVY SQN
49654	SGT	P.D. LONGBOTTOM	CAMERA OPERATOR	4 FD SVY SQN
CIVILIAN	MR	M.N. JUELG	PILOT	AIRSCAN

ANNEX F TO
4 FD SVY SQN
OPERATION NASIKO 93
OPERATION REPORT
DATED 25 AUG 93

AIRCRAFT USAGE

Serial	Date	Personnel Involved	Base	Flying Hrs	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1.	30 May 93	Juelg, Bath, Longbottom, Shephard	Adelaide	2.7	Transit to Canberra
2.	31 May 93		Canberra	Nil	Aircraft service
3.	01 Jun 93	Juelg, Bath, Longbottom, Shephard	Canberra	3.6	Transit to Brisbane
4.	02 Jun 93	Juelg, Longbottom, Shephard	Brisbane	6.7	Transit to Port Vila
5.	03 Jun 93	Juelg, Bath, Longbottom, Shephard	Port Vila	Nil	Establishing work base
6.	04 Jun 93	Juelg, Longbottom, Shephard	Port Vila	4.2	
7.	05 Jun 93	Juelg, Longbottom	Port Vila	3.2	
8.	06 Jun 93	Juelg, Longbottom	Port Vila	2.5	
9.	07 Jun 93	Juelg, Longbottom, Shephard	Port Vila	2.7	
10.	08 Jun 93	Juelg, Longbottom, Shephard	Port Vila	1.4	
11.	09 Jun 93		Port Vila	Nil	Pilot rest day
12.	10 Jun 93		Port Vila	Nil	No sortie due to inclement weather
13.	11 Jun 93	Juelg, Bath, Longbottom, Shephard	Port Vila	1.8	
14.	12 Jun 93	Juelg, Longbottom, Shephard	Port Vila	2.7	
15.	13 Jun 93	Juelg, Bath, Longbottom, Shephard	Port Vila	4.0	
16.	14 Jun 93	Juelg, Longbottom, Shephard	Port Vila	2.9	
17.	15 Jun 93	Juelg, Bath, Shephard	Port Vila	2.6	
18.	16 Jun 93	Juelg, Bath, Longbottom, Shephard	Port Vila	6.6	Transit to Brisbane
19.	17 Jun 93	Juelg, Bath, Longbottom, Shephard	Brisbane	5.9	Transit to Adelaide
20.	17 Jun 93	Juelg	Adelaide	2.6	Transit to Canberra