

134

48



4th Field Survey Squadron

# Operation BELAMA 94

## *Operation Report*

An aerial photography operation  
conducted in the  
Solomon Islands and  
the Republic of Vanuatu

July - September 1994



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  - 2. Idents Achieved - New Georgia Group
  - 3. Idents Achieved - Malaita Group
  - 4. Ident Register
  - 5. Supplementary Photography of Honiara
- E. Sequence of Events
  - F. Solomon Island Mapping photography - current status
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## EXECUTIVE SUMMARY

1. Operation BELAMA 94 was an aerial photography operation conducted by 4 Fd Svy Sqn in the Solomon Islands and the Republic of Vanuatu during the period 31 Jul to 14 Sep 94. Operations were based out of Henderson Airport Honiara, situated on the northern coast of the island of Guadalcanal in the Solomon Islands. During operations in Vanuatu the aircraft was based out of Bauer Field Aerodrome, Port Vila.
2. The aim of Op BELAMA 94 was to acquire mapping and identification photography for the stereo compilation of 1:50 000 scale topographic maps.
3. The acquisition of mapping photography was restricted by consistent cloud cover and heavy haze for the duration of the deployment. Identification photography of targeted control points was successful due persistent exploitation of cloud gaps.
4. Operation BELAMA 94 gained little new coverage of mapping photography. Mapping coverage achieved and Ident Photography flown, combined with mapping coverage obtained in previous operations, provides useable photography for 27 new 1: 50 000 scale maps.

OPERATION REPORT  
OPERATION BELAMA 94  
JULY TO SEPTEMBER 1994

- References:
- A. HQADF Tasking Directive 1/1993 dated 21 Apr 93
  - B. LHQAUST OPORD 40/94 DTG 182340Z JUL 94
  - C. LHQ Op BELAMA 94 Mounting Instruction dated 19 Jul 94
  - D. DSvy-A Op BELAMA 94 Technical Directive dated 21 Jul 94
  - E. International Aircraft Transport Association - Dangerous Goods Regulations, 34th edition, effective 1 Jan 93
  - F. Aircraft Contract - Standing Order: PN 8260 dated 1 Oct 93
  - G. DSvy-A Specifications for vertical aerial mapping photography undated draft
  - H. Operational Instruction 1/93 Responsibility of aerial camera operators dated 22 Mar 93
  - I. Standing Operating Procedures for Assessment of Vertical Aerial Photography dated 24 Aug 93
  - J. DSvy-A Technical Instruction No. 305: Acquisition of Identification Photography
  - K. LHQ K91-00216 Minute I310/93 dated 26 Aug 93

INTRODUCTION

1. Operation BELAMA 94 was an aerial photography operation conducted in Solomon Islands and Republic of Vanuatu between 30 Jul 94 and 16 Aug 94. The Operation was conducted in response to References A, B and C.

MISSION

2. 4 Fd Svy Sqns' Priority One task was to acquire photography of Solomon Islands suitable for mapping at 1: 50 000 scale. Additional tasking, and of equal priority was the

acquisition of identification photography in the New Georgia and Malaita Island groups within Solomon Islands.

3. Second Priority Tasking. As stated in Reference D, mapping photography of the Republic of Vanuatu was a second priority task. This was a continuation of photography that had been attempted during Op's BELAMA 92, 93 and NASIKO 93.

#### AREA OF OPERATIONS

4. Solomon Islands. The Area of Operations (AO) for mapping photography extended over the entire Solomon Islands from the South-eastern tip of Bougainville Island, 6° 45' S, 155° 45' E, in a South-easterly direction to Fatutaka Island at 11° 55' S, 170° 12' E. This is illustrated at Annex A.

5. Identification Photography. Identification photography targets for the Solomon Islands were distributed throughout the Malaita and New Georgia Island groups as shown at Annex B.

6. Vanuatu. The AO for mapping photography in Vanuatu is depicted at Annex C.

#### CONDUCT OF OPERATION

##### Outline of Technical Plan

7. To achieve the technical tasks it was necessary to obtain aerial photography from flying altitudes between 4 000 and 41 000 feet. Different requirements for each tasking necessitated changes of lens, filters and film types. Processing of the aerial film was conducted at RAAF Amberley with assessment of the photography in the AO. Details are discussed in the Technical Report at Annex D.

8. Mapping photography, as defined in Reference D, was to be obtained to enable plotting of blocks or island groups at a scale of 1:50 000. Due to the combination of climate and terrain, some areas are virtually covered by cloud at all times. This can prevent an entire island group from being plotted due to a relatively small area not having been photographed.

##### Conduct

9. The operation was conducted according to the Sequence of Events shown at Annex E. Significant events are discussed in the following paragraphs.

### Reconnaissance

10. A reconnaissance of the AO was not conducted prior to deployment as similar operations, Op's BELAMA 92 and 93, had been previously been deployed to the same AO. Facilities utilised on those deployments had proven satisfactory. The Survey Technical Adviser to Solomon Islands, CAPT G. Ford, is based in the capital, Honiara. This contact was fully utilised for information and administration requirements.

### Issue of Orders and Instructions

11. The Operation Order (Reference B) and Mounting Instruction (Reference C) were issued on 18 and 19 Jul 94 respectively.

12. The Technical Directive (Reference D) was issued on 21 Jul 94.

### Insertion of Force

13. The aircraft required for Op BELAMA 94 was re-deployed direct from Op KUMUL 94 in Papua New Guinea (PNG) on 31 Jul 94.

14. Film processing equipment and chemistry was shipped by surface means from Adelaide to Honiara via Sydney. The equipment was received and stored by the Survey Technical Adviser.

15. CAPT Gray (Op KUMUL 94 Det Comd) and WO2 Shephard (Op BELAMA 94 Det Comd) arrived by civil air direct from PNG on 30 Jul 94. The camera aircraft and crew deployed on the 31 Jul 94, also from PNG.

16. A crew changeover had been planned for the KUMUL - BELAMA transition. Due to early extraction from Op KUMUL 94 Part 1, and subsequent early insertion for Op BELAMA 94 this was not affected until aircraft servicing and camera change in Brisbane during the period 8 - 13 Aug 94.

### Establishment of Base

17. Work areas were established at the Survey Lands Department offices in Honiara by 1 Aug 94.

### Aerial Photography

18. Operational photographic sorties commenced on 1 Aug 94.

19. Cameras, equipment, film types, processing and assessment of photography are covered within the Technical Report at Annex D. Most of the information within this Annex is

applicable to aerial mapping photography in general and not peculiar to this Operation. All activities were carried out IAW References G, H, I and J.

#### Extraction of Force

20. Extraction of the operational force was achieved by civil air for personnel returning to Australia and contracted aircraft for personnel re-deploying to PNG for the second phase of Op KUMUL 94.

21. The return of equipment to Australia was arranged via civil air and sea freight.

#### Problems Encountered

22. The following problems were encountered with the insertion and extraction phases of the operation.

23. Learjet. The Learjet was originally planned to deploy from Brisbane and arrive in Honiara on 13 Aug 94. Due to an early extraction from Op KUMUL 94 and rescheduled aircraft maintenance, the Learjet flew direct from PNG to Honiara. Crew and camera changeover was effected in Brisbane during the service period 9-13 Aug 94.

### OPERATIONAL RESULTS

#### Mapping Photography

24. Solomon Islands. A summary of the mapping photography achieved, classified in accordance with Reference G and I, during Op BELAMA 94 is:

- a. X 84 km, and
- b. Y 173 km.

25. Appendix I to Annex D depicts the individual lines and their classifications.

26. This coverage, combined with previous operational photography, allows total coverage of 27 x 1:50 000 map sheet areas within the Solomon Islands which are awaiting targeting or aerotriangulation.

27. The 27 map sheets are depicted at Annex F with outstanding Solomon Islands photography depicted at Annex G.

28. Republic of Vanuatu. Mapping photography achieved in Vanuatu during the three days that the aircraft was deployed there, consisted of only 'Z' class photography of the Banks Island Group.

### Identification Photography

29. Of the 84 identification targets tasked, 78 control points were photographed and classified in accordance with Reference J. The acquired control points are illustrated at Appendices 2 and 3 to Annex D. A tabulated Ident Register is at Appendix 4 to Annex D.

## ADMINISTRATION AND LOGISTICS

### Operation Manning

30. Personnel who participated in Op BELAMA 94 are listed at Annex H.

### Support

31. Army. Support by Army was as follows:

a. Army Svy Regt.

- (1) one camera operator for the duration of the operation,
- (2) one camera operator for the commencement of the operation,
- (3) prepared flight lines for all mapping photography, and
- (4) provided technical advice during the operation.

b. 1 Topo Svy Sqn.

- (1) stored and delivered equipment and boxes for camera installation/extraction; and
- (2) assisted with equipment refit at Maroochydore on 29 Aug 94.

c. School of Mil Svy.

- (1) one camera operator for commencement of operation, and
- (2) development of software for digitising of flight lines.

32. Australian High Commission - Honiara. Assistance was sought from Australian High Commission, Honiara in the mounting of the Operation. The utmost co-operation was gained, particularly from Svy Tech Adviser, CAPT G. Ford and Defence Cooperation Programme (DCP) staff at the High Commission. Assistance was provided in the form of:

- a. Surface transported stores received and delivered to Lands Dept.
  - b. Hire vehicle and accommodation bookings.
  - c. DCP house accommodation arranged.
  - d. Jet-A1 fuel for charter aircraft was organised with Shell Pacific for payment by SP21.
  - e. Immigration and customs staff were organised to be available at arrival and departure.
  - f. Extraction was assisted by arranging equipment return via ship to Australia.
33. Australian High Commission - Port Vila. For the three day period spent in the Republic of Vanuatu, assistance was provided by the Australian High Commission. Svy Tech Adviser, CAPT W. Jones was invaluable in the organisation of accommodation, hire vehicle, diplomatic clearances and fuel purchases.
34. RAAF. Support by RAAF was:
- a. 6 Sqn RAAF. 6 Sqn provided Versamat processing on:
    - (1) 10 Aug 94,
    - (2) 29 Aug 94,
    - (3) 5 Sep 94, and
    - (4) 14 Sep 94.
  - b. Central Photographic Establishment (CPE). CPE was responsible for post operation rewashing of films and archival storage.
35. Civilian. Reference F is a Standing Offer requiring Airscan Pty Ltd to supply a camera platform and pilots as requested by RA Svy. The company does not currently own a Learjet and one was subcontracted from Aeromill Aviation. This arrangement was the same as was used in 1992 / 1993 and once again proved satisfactory.
36. Solomon Islands Government. Department of Lands and Surveys provided work areas for the processing and assessing of photography.

POL

37. AVTUR (Jet - A1). Fuel for Learjet in both Solomon Islands and Republic of Vanuatu was purchased by the Commonwealth in accordance with Reference F. Fuel was paid for by SP21 form at each refill.

38. Fuel rationing applied during the period 2 - 8 Aug due to limited stock. Although VH-TPR was restricted to 1000 litres per day for the period, operations were not affected.

39. Prist. Prist is a fuel additive for the Learjet to prevent fuel icing at high altitudes and the incidence of bacterial growth in tropical climates. It is not generally available in Solomon Islands and all supplies required, had to be imported from Australia. It is classified in accordance with Reference E as Dangerous Cargo (DC) and there is some difficulty in transport arrangements. For this reason, requirements must be forecast well in advance.

40. Vehicle Fuel. Fuel for the hire vehicles was purchased through a local service station and paid in bulk by SP21.

### Vehicles

41. No DCP vehicles were available during the operation in the Solomon Islands. Two vehicles were hired from Budget Honiara and paid for with Australian Government Credit Card (AGCC).

42. Whilst in Vanuatu, an Avis hire vehicle was utilised. Payment for this was by AGCC.

### Stores and Equipment

43. Sufficient stores and equipment were taken to the AO.

44. The Metaform Print Processor sustained damage during transit from Adelaide to Honiara despite the addition of new shipping containers. This was repaired by Det personnel.

45. Initial tests using the WAINCO film processor showed inconsistent processing speed and film scratching. This resulted in alternative processing arrangements being necessary.

46. Two Camera components required exchanging during the Operation. A detailed account of equipment performance and status is in the Technical Report at Annex D.

### Shipment of Stores

47. All shipment of stores, equipment and DC was by commercial shipping agent. As has been experienced with several commercial agents during 1993, delivery of all items at a specified time is not assured.

48. Freight to Honiara was achieved using the Australian High Commission address. Only two commercial flights arrive in Honiara each week from Australia, making urgent deliveries virtually impossible.

49. On extraction, a number of means were utilised:

- a. Charter aircraft. The charter aircraft with fitted camera system flew direct to PNG for operational re-deployment to Part 2 of Op KUMUL 94.
- b. Safe Hand. Processed film, Data Transfer Devices (DTD's) and associated documentation were carried safe hand to Australia.
- c. Shipping. Larger items such as the WAINCO processor and Metaform processor that were not required immediately in Australia were returned by surface shipping. These items are expected to arrive at 4 Fd Svy Sqn in late December.
- d. Air freight. Items that were required immediately in Australia such as camera CES, flight line diagrams and records were air freighted by TNT.

### Accommodation

50. Initial accommodation for all operation personnel was at Kitano Mendana Hotel, Honiara. A three bedroom house in the DCP compound was made available by the Australian High Commission for the period 9 Aug to 13 Sep 94. This proved to be satisfactory living quarters and saved substantial accommodation costs.

51. In Port Vila, the Windsor Hotel was utilised. The rooms were of a reasonable standard.

52. All commercial accommodation charges were paid by AGCC.

### Messing

53. Meals were available from hotels and several restaurants within the town. Payment for these was by individual members using Overseas Travelling Allowance issued prior to departure. Meals and selection were usually of a good standard.

### Medical

54. A main hospital is located in Honiara which includes operating and x-ray facilities. There are several medical practitioners within Honiara and one in particular, Dr Eric Pana was recommended. Medical standards are not equivalent to Australia and it was of the general opinion of Australians in the area that if any major medical treatment were required, medical evacuation to Australia would be recommended.

55. Prior to deployment, First Aid kits were prepared by Keswick Medical Centre. Some medications are not always available locally (Anti-biotics S3 and S4), and a letter stating the contents and purpose of the kits was obtained from the RMO.

56. The health of operational personnel was good.

57. Honiara is in a malarial zone. In accordance with Reference C, the Keswick Medical Centre supplied 4 Fd Svy Sqn personnel with the prescribed anti-malarial treatment appropriate for the area and duration of deployment. Army Svy Regt personnel obtained anti-malarial treatment from the Army Svy Regt RAP. Anti-malarial precautions for the pilots were their own responsibility.

58. Reference K specifies required medical precautions to be taken prior to, during and after a deployment to Solomon Islands.

#### Finance

59. Australian Government Credit Cards (AGCC). Det Comd and Det 2IC were each issued with AGCC prior to deployment with a limit of A\$400 000. Due to the deployment of some members from Australia and others from PNG it was necessary to have two cards within the detachment.

60. Order and Receipt for Supplies (Form SP21). SP21 form was used for all aviation fuel purchases in Solomon Islands and Vanuatu. Forms were issued at each refuel.

61. Hire vehicle fuel was paid in bulk by this method prior to extraction.

62. Due to the lack of credit card payment facilities at some agencies, two SP21 forms were issued to the Australian High Commission (Honiara). These were for reimbursement of the Detachments' telephone charges and return air freight costs.

63. Petty Cash. A cash advance of \$1000 was issued to Det 2IC in Adelaide and converted to travellers cheques prior to deployment. These were converted to Solomon British Dollars (SBD) for use as necessary.

64. Cost Codes. The cost codes for Op BELAMA 94 were issued on 7 Jul 94 with an advance of \$20 000 for stores and consumables issued at 12 May 94.

65. The \$20 000 issued for stores and consumables was to be expended prior to Jun 94. Cost codes were:

Req No	3339006CP
Cost Centre	543216
Account Code	64732
SLID/SLAC	G999

66. Cost Codes used in accordance with Reference B were:

Req No	4339003CP
Cost Centre	543216
Account Code	64732
SLID/SLAC	D001136

## Total Expenditure

67. Total costing. The total cost of Op BELAMA 94 was approximately \$ 362 000. 95% of all costs have been acquitted, some incountry costs which have not yet been presented for payment are included at a nominal exchange rate. A break down of the costings is as follows:

Aircraft Hire	\$ 232 268
Aircraft Fuel	\$ 39 713
RC 20 Hire	\$ 19 775
Pilots Allowances <sup>1</sup>	\$ 19 320
Accommodation <sup>2</sup>	\$ 4 876
Allowances (Military pers)	\$ 12 656
Civil Airfares	\$ 7 497
Hire vehicles/taxis	\$ 8 481
Phone/Fax	\$ 669
Freight and Cartage	\$ 11 699
Stores	\$ 4 054
Petty Cash	\$ 614

- Notes: 1 Pilots allowances contain both their meal and accommodation elements.  
2 Accommodation element is for military personnel only.

## Allowances

68. Allowances for military operation personnel were:

- a. Overseas Travelling Allowance (Solomon Islands). Allowance was paid in accordance with INDMAN 1, Vol 4, Instr 3601 at the rate of:
  - (1) 143.30 SBD per day for the first 28 days; and
  - (2) 124.75 SBD per day after 29 days.
- b. Overseas Travelling Allowance (Vanuatu). Allowance was paid in accordance with INDMAN 1, Vol 4, Instr 3601 at the rate of 8047 Vatu per day.
- c. Difficult Post Allowance. Following a continuous overseas detachment of 28 days, military members are entitled to a payment at a rate of \$ 207.76 per fortnight in accordance with INDMAN 1, Vol 3, Instr 3719.
- d. Flight Duties Allowance. Flight duties allowance of \$ 7.93 per day was paid post operation in accordance with INDMAN 1, Instr 0107. The allowance for each member is calculated from the flying days shown at Annex I.

69. The rate of Overseas Travelling Allowances was not considered sufficient to fully compensate members for the cost of living in Solomon Islands.

70. Pilots contracted under Reference F were entitled to meal and accommodation allowance of A\$ 210 per day. An advance of \$ 19 320 was made to Airscan Pty Ltd prior to deployment, pilots individual payments then being the responsibility of Airscan Pty Ltd. This proved to be an acceptable method of operation and the level of allowance was of an acceptable standard to the pilots.

#### Leave

71. Remote Locality Leave. As stated in INDMAN 1, Vol 3, Chap 26, Instr 2601, operation personnel are entitled to remote locality leave accumulated at the rate of 10/12 of a day per month whilst in the AO.

72. Flying Leave. Flying leave in accordance with INDMAN 1, Vol 3, Instr 2601, is to be calculated retrospectively according to the hours flown by individual members (shown at Annex I).

#### Passports and Visas

73. Official passports were issued to all military members of the detachment.

74. Diplomatic clearances for entry into Solomon Islands were arranged in advance by the Australian High Commission - Honiara.

75. Diplomatic clearances for those members who operated in the Republic of Vanuatu were arranged by the Australian High Commission - Port Vila.

#### Banking

76. Banking facilities in Honiara are provided by:

- a. ANZ,
- b. Westpac (Solomon), and
- c. National Bank of Solomon Islands (NBSI).

77. Each of these banks has affiliations with their Australian counterparts, but, Australian passbooks or accounts are not able to be used. Personal credit cards can be used to obtain cash advances, however, this requires a telephone call to Australia each time an advance is made and the cost of that call is charged to the customer.

78. Travellers cheques proved to be the best form of converting currency. NBSI do not charge fees to Australian High Commission staff and offered the same to Op BELAMA personnel.

### Mail

79. Mail rates to Australia were comparable to Australian overseas rates and delivery time to Australia varied between seven and ten days. All mail was addressed care of Australian High Commission which proved to be reliable.

### Contact Information

80. Contacts made within the AO that may be useful in mounting further operations in the area are contained at Annex J.

## COMMAND AND SIGNAL

### Command

81. Command arrangements specified in Reference C were both suitable and functional.

### Communications

82. Telephone/Facsimile. Initially, telephone and facsimile facilities were available through the Australian High Commission, Honiara. The facilities were available only during normal working hours. This was not convenient as contact with Australia and Vanuatu was often necessary after hours and at weekends.

83. A telephone/facsimile machine was hired and installed at the accommodation facility with records being kept for official and personal cost determination. An itemised phone account was obtained via the Australian High Commission and official calls were paid by SP21 as AGCC card facilities were not available.

84. Personal calls were paid by individual members.

85. Panel Team Communications. Contact between the Det and the Svy Tech Adviser during panelling operations was non existent. Radio phone messages could be left at provincial Police Stations, however these were not passed on. Weekly messages from the Svy Tech Adviser were left at the Lands and Survey Office Honiara.

86. Direct communications are required for target confirmation, aircraft tasking and photo confirmation.

## SITREP's

87. Weekly SITREP's were transmitted by facsimile to 4 Fd Svy Sqn. To reduce expenses, 4 Fd Svy Sqn then retransmitted the SITREP to Australian addressees.

## CONCLUSIONS

88. General. Op BELAMA 93 was a reasonably successful aerial photographic operation in that the photography achieved will allow production of 14 new 1: 50 000 map sheets to commence. The failure to achieve full photographic coverage can be attributed entirely to adverse weather conditions. On a task that requires perfect weather conditions, and in a country which is not conducive to such conditions, acquisition of acceptable aerial photography for mapping becomes more a fact of being in the right place at the right time and having both equipment and personnel ready to operate.

89. The local consensus is that later in the year (October) would provide better weather conditions for photography.

90. Manning. Manning for the operation was satisfactory.

91. Finance. The AGCC and SP21 methods of payment are adequate however some agencies in the Solomon Islands do not recognise the SP21 form or have no credit card facilities. Although this was overcome, the ability of a cash advance via AGCC or a detachment cheque book would be more versatile throughout the Pacific region and negate the requirement for petty cash issues.

92. Vehicles. Hire vehicles are very expensive, the purchase of a local vehicle for re - sale prior to extraction may be a cost effective alternative.

93. Shipment of Stores. The commercial shipping of DC and bulk stores requires a minimum of two months notice and is not compatible with a strict timetable.

94. Communications. Communications between aircraft camera personnel and remote panelling teams must be maintained for aircraft tasking and to negate revisiting suspect targets.


## RECOMMENDATIONS

95. As a result of the observations made throughout Op BELAMA 94 and the consequences and conclusions as detailed in this report, the following recommendations are made with respect to both Solomon Island and future aerial photography operations. Further recommendations are contained at Annex D.

Recommended

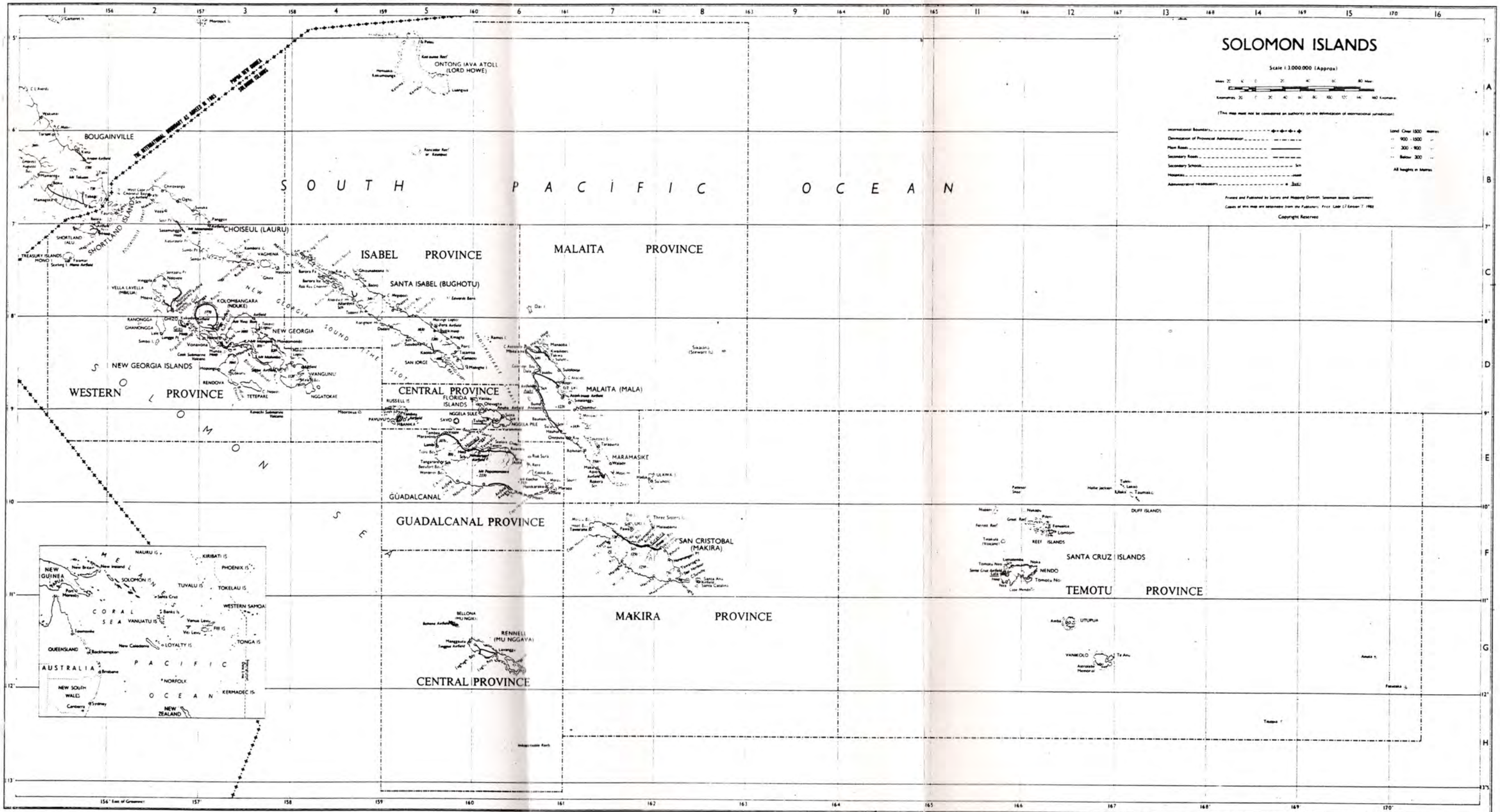
<u>Recommendation</u>	<u>Action by:</u>
96. <u>Timings.</u> An acceptable lead time be given to enable overseas operations to be properly coordinated.	IP Div DSvy-A LHQ
97. <u>Vehicles.</u> The possibility of vehicle purchase / resale in lieu of hiring on each overseas deployment should be investigated.	4 Fd Svy Sqn
98. <u>Finance.</u> A means of obtaining cash via the AGCC or the implementation of a cheque account for payments be investigated.	4 Fd Svy Sqn
99. <u>Communications.</u> Direct communication link between camera operators and panelling teams be maintained in future ops.	Svy Tech Adviser

21<sup>st</sup> December 1994

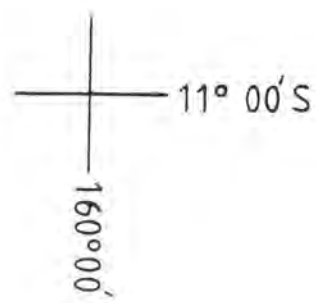
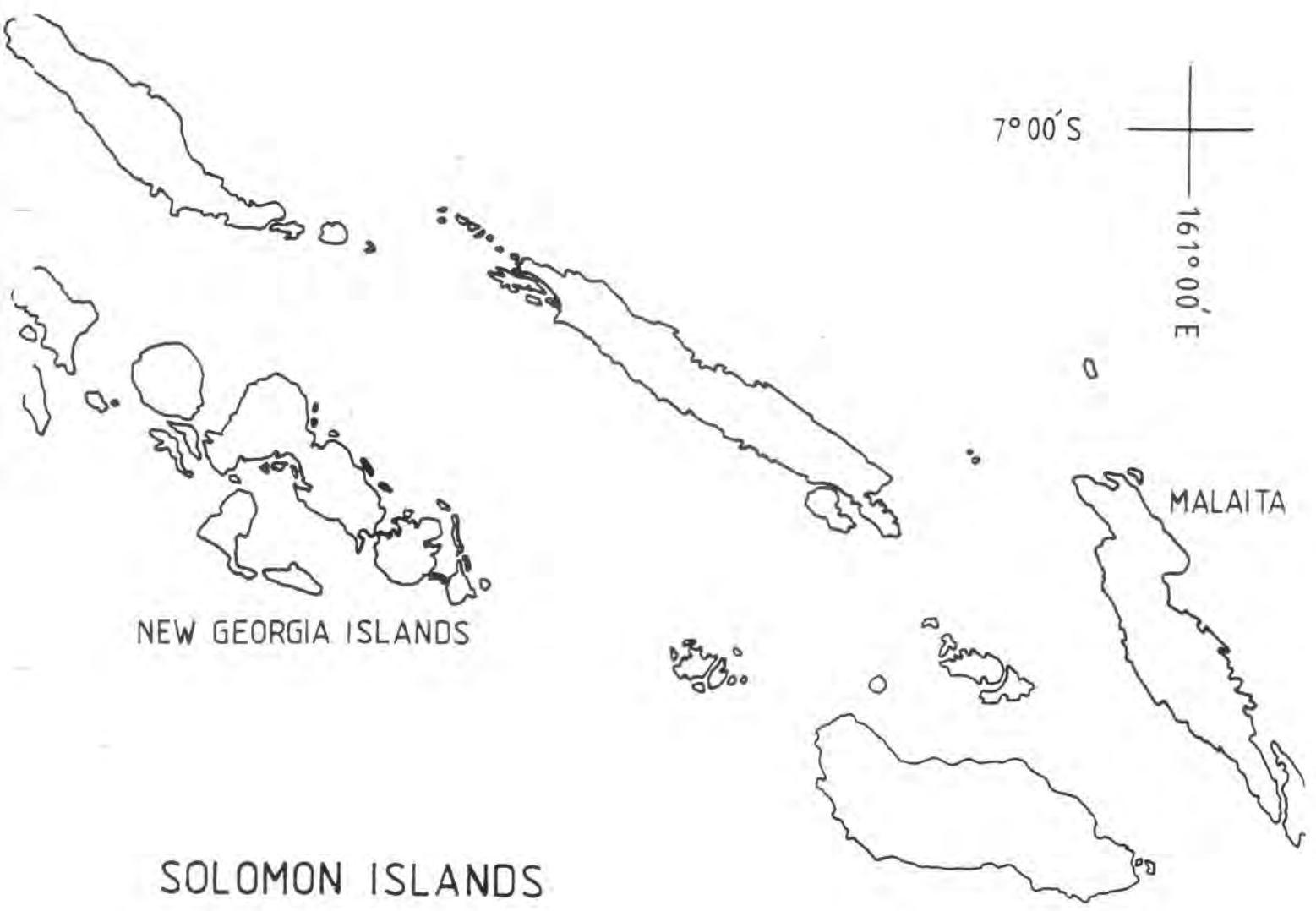
  
P.C. DEMAINE  
Major  
Officer Commanding

# SOLOMON ISLANDS MAPPING PHOTOGRAPHY AO

ANNEX A TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94

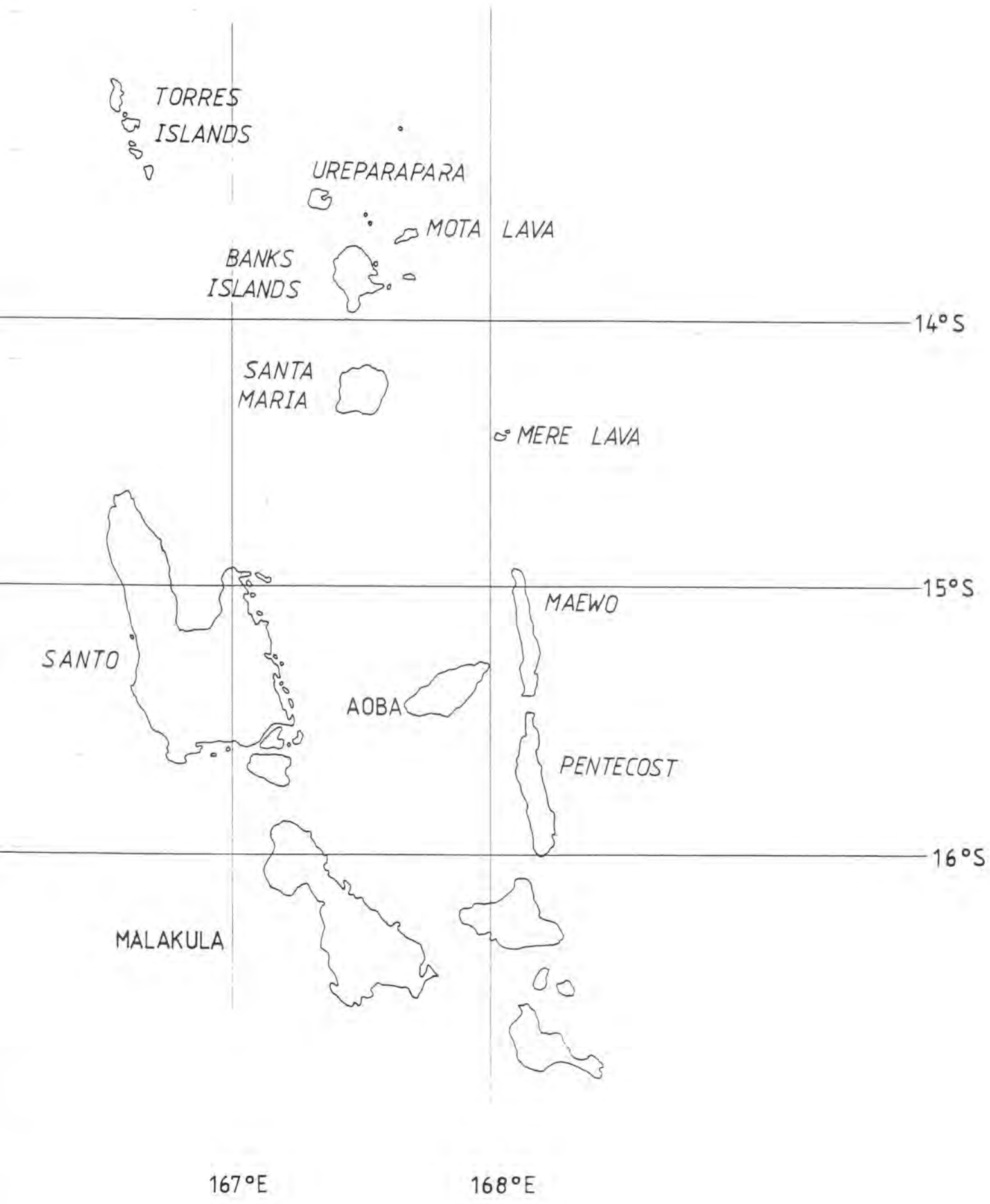


SOLOMON ISLANDS IDENTIFICATION PHOTOGRAPHY AO



REPUBLIC OF VANUATU  
MAPPING PHOTOGRAPHY AO

ANNEX C TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94



TECHNICAL AND EQUIPMENT REPORT  
OPERATION BELAMA 94  
31 JUL TO 16 SEP 1994

INTRODUCTION

1. Operation BELAMA 94 was an aerial photography operation conducted by 4 Fd Svy Sqn in the Solomon Islands and Vanuatu during the period 31 Jul 94 to 16 Sep 94.
2. The aim of the operation was to:
  - a. Complete the coverage of mapping photography of the Solomon Islands and obtain identification photography of targeted control points in the Malaita and New Georgia Island groups, as directed in References B and D.
  - b. Complete the coverage of mapping photography in Vanuatu as a second priority task, as directed at Reference D.
  - c. Acquire supplementary photography of Honiara, Port Vila and Luganville as detailed at References B and D.
3. The Areas of Operations are shown at Annex A, B and C.

OPERATIONAL RESULTS

4. Mapping Photography. All mapping photography obtained was assessed and classified in accordance with References G and I. Suitable mapping photography achieved during Op BELAMA 94 is illustrated at Appendix 1 to Annex D.
5. Total line kilometres of useable mapping photography obtained in the Solomon Islands is as follows:

Serial	ISLAND GROUP	X km	Y km	TOTAL km
(a)	(b)	(c)	(d)	(e)
(1)	Ontong Java	0	86	86
(2)	Santa Isabel	0	49	49
(3)	Indispensable Reefs	65	28	93

(4)	Santa Cruz	19	28	47
(5)	<b>TOTAL</b>	<b>84</b>	<b>191</b>	<b>275</b>

6. Persistent multi layer cloud and heavy haze conditions offered very little photographic opportunities throughout the AO during the whole period of the Operation. Cloud coverage was complete, not restricted to land mass, as is normally experienced in tropical areas.

7. Annex G depicts the photographic coverage required to complete tasking.

8. Ident Photography. The following Ident photography was obtained by persistent cloud gap exploitation:

- a. Malaita Group 24 of 27 panelled points were accepted.
- b. New Georgia Group 54 of 58 panelled points were accepted.

9. Appendices 2 & 3 to Annex D graphically depicts the Ident Photography achieved in each island group.

10. Control point list and panel configuration is included at Appendix 4 to Annex D.

11. At the conclusion of the Operation it became apparent that some panel teams, had not positioned the plastic around the designated ground marks due to:

- a. inability to locate ground mark, or
- b. obstructions around mark.

12. Panel points requiring co ordinates by the Svy Tech Adviser are:

- a. IFIB - a new point replacing NGY 2 (which was destroyed);
- b. NGX 4A - an alternative point established (after consultation with ASR) due to inaccessibility of NGX 4; and
- c. NGY 32 Ecce - a house on stilts was built over control point NGY 32.

13. Destroyed control points were panelled and identified by the letter 'A' on the end of the original name. These points require co ordination by Svy Tech Adviser:

- a. NGY 41 A,
- b. NGY 77 A,
- c. NGY 75 A,
- d. NGY 61 A,
- e. NGY 66 A, and

f. NGX 1 A.

14. The Svy Tech Adviser is requested to advise of any name changes for co ordinated points.
15. A panel station record was compiled at each control point. A copy of each record and a marked up bromide was supplied to ASR.
16. Supplementary Photography. Only one run of limited coverage due to cloud was obtained over Honiara.
17. Coverage obtained is detailed and illustrated at Appendix 5 to Annex D.

### PROCESSING AND PRINTING

18. All processing was carried out utilising RAAF Versamat facilities at Amberley. Printing was conducted in the AO and 4 Fd Svy Sqn by Det personnel using own facilities.
19. Initially test film was exposed and processed in the AO through the Wainco film processor which provided an excessively scratched and uneven negative, due to inconsistent film transport speed.
20. As the WAINCO was deemed unusable, RAAF Versamat facilities at Amberley were utilised for processing. Op BELAMA 94 provided replacement chemistry for RAAF processing equipment.
21. Printing was carried out in the AO by Detachment personnel utilising a KG30 contact printer and the METAFORM print processor. Post operation print production in Adelaide was carried out by KG30 and manual tray development.

### ASSESSMENT

22. Assessing of photography was carried out by Det personnel in the AO and at 4 Fd Svy Sqn IAW References G and I.

EQUIPMENTCAMERAS

23. Two different camera systems were utilised during Op BELAMA 94. The RC20 camera, hired for Op KUMUL 94, was used in the Solomon Islands prior to RC10 installation on the 9 Aug 94.

LEICA RC20

24. The LEICA RC20 camera No 5154 was hired from Aireserch during the period 26 May - 8 Aug 94. Due to scheduled aircraft servicing and unfavourable weather conditions the Learjet was redeployed to Op BELAMA early allowing RC20 operation upto the 7 Aug 94. All missions flown utilised the 88.5 mm f4 lens only.

25. The RC20 has Sercel GPS integration which provides co-ordinates for each camera exposure. The camera is self monitoring during operation and self diagnostic testing allows problems to be addressed quickly. The camera system is very reliable and user friendly.

26. The NF3 navigation sight does not have a rotating prism attached, forward view is provided by a 100 degree angle lens, positioned so that the terrain just below the forward horizon through to a point midway between the current and previous ground photo centre is observed.

27. The sight and controls are excellent once familiar with the view and the instantaneous control response.

28. The RC20 at power up, automatically transports a blank and an exposure in quick succession, this is an automatic system test. It is therefore advantageous to leave the camera on through out a mission or blanks and erroneous exposures will appear. A minimum of one blank must be placed after the test exposure or the test frame will become the first frame in a run.

29. All test frames were numbered and recorded as "test exposure" on flight reports to minimise confusion.

30. The raw Sercel GPS data recorded at each exposure is stored in a Toshiba T2200 notebook computer for differential processing with known ground station data recorded during each mission.

LEICA RC20 Problems

31. No Lens Identification data was exposed on Belama films due to a broken illumination diode which occurred during operations in PNG.

32. No further mechanical problems were encountered, however on inspection of films exposed over small island and reef areas, it was found that a 'ghost image', or faded 'second image' of the subject appeared in each frame.

33. No explanation as to the cause could be ascertained. The camera appeared to operate normally with no indicated errors (apart from the illumination error) and the clarity of the target and 'ghost' do not indicate film motion. Subject to further investigation, the missions flown during Op KUMUL Part One may have the same aberration which was not evident due to the land content in each frame.

#### Wild RC 10

34. Wild RC10 camera no 3294 was installed in the Learjet at Maroochydore on the 9 Aug 94 for use with SWA Lens Serial No. 2121 (calibrated focal length 87.98mm, 5 Apr 94) and WA Lens Serial No.1006 (calibrated focal length 151.755mm, 16 Feb 94).

35. The camera system, while functional, provided nuisance problems from the first operational day onwards. These problems are indicative of the age of the equipment.

36. The serviceability of the equipment is a major concern as they surpassed their Life Of Type (LOT) in 1992 and each camera system is an accumulation of parts from various cameras.

37. Uncommon problems are appearing which can only be attributed to length of service and as WILD no longer provide replacement parts, cannibalism and patchup servicing can only provide support for a limited time.

#### RC10 Problems

38. NF2 Controlled Levelling. NF2 levelling of the camera could not be used or relied upon. When engaged, the drift, tip and tilt servos described an agitator action within a one degree arc. The problem was attributed to aircraft power fluctuation. The problem was remedied by disengaging the servos and manually adjusting for tip and tilt aided by two spirit levels. Drift was set manually from navigators directions.

39. Navigation Sights. The NF2K was missing an integral part at installation (or was lost during operation) - namely the prism cam roller - which rotates the prism for forward view. Normal operation is smooth but this omission caused tight and erratic operation.

40. The NF2K is a shorter version of the NF2 Nav Sight and as such does not protrude as much below the aircraft belly. No retraction for takeoff and landing is available due to the tube length, this also causes interference with prism rotation action if the tube is not perpendicular, as the prism can touch the wall of the aircraft recess.

41. The heavy action of rotating the prism during flight eventually caused the linkage to break, which could only be rectified by a complete Nav sight replacement. This was effected at Maroochydore on 29 Aug as replacement required aircraft pressure testing.
42. Two NF2 replacements were supplied to Maroochydore due to previous experiences of component incompatibility - and true to form - one was not suited to Lear installation and the second was deficient the prism cam roller which had to be fabricated by Aeromech (the aircraft service technicians).
43. Although NF2 forward view was again functional, the material used to fabricate the cam roller was soft (mild steel) and later developed flat spots which caused stiff and sticking operation. Intermittent loss of forward view eventuated but did not hinder ident photography operations as the GPS was used to navigate the short run over targets.
44. Lens fiducial. On processing the film it was noticed that the SWA lens fiducial No. 4 was partly obscured by either a foreign object or by a misalignment of its' optical train. Cleaning did not remedy the situation. The centre mark of the fiducial was not affected and should not hinder fiducial measurements.

#### DHEL.S.

45. DHEL.S power problems became apparent at installation of the RC10 system in Brisbane on the 9 Aug 94. The problem was attributed to a faulty aircraft generator which was scheduled to be fixed during the maintenance service at Maroochydore on the 11 Aug 94. The Bourke test range was flown on the 10 Aug without DHEL.S data.
46. The DHEL.S failed to operate on the first operational sortie in the AO due to an intermittent power supply which appeared to be remedied after landing by checking all connections. On the second sortie power remained constant but height data was grossly in error and erratic. Aircraft power fluctuations was suspected as the aircraft circuit breakers were also tripped.
47. Although the camera functioned normally (apart from servo oscillations) the pilots attributed the problem to the hard wiring of the camera system into the aircraft circuitry, as no problems were evident prior to RC10 / DHEL.S installation and aircraft generators had been checked at service.
48. Again on landing connections were checked and power / equipment appeared operational. During the third sortie no power was available to the DHEL.S after take off. On landing connections were checked with a multimeter and constant aircraft power verified by an electrical engineer. All connections were also checked and proved OK.
49. The electrician monitored the circuitry the following day and the fault occurred during take - off, the DHEL.S camera display unit cable was identified as the problem causing intermittent contact when affected by "G" forces during rapid acceleration or banking. A replacement cable was ordered on the 19 Aug but not delivered until 30 Aug 94 due to the overnight shipment having been lost between Adelaide and Honiara.
50. All power supply and incorrect height problems were rectified by replacement cable.

Sercel GPS

51. The RC20 camera is used in conjunction with a SERCEL 103 GPS unit which provides raw co-ordinates for each camera exposure during a mission. The raw data is recorded directly onto a Toshiba notebook hard drive for post mission processing.
52. Two SERCEL 101 ground units, located at known co-ordinates were operating during all RC20 / SERCEL 103 photo missions and these units provide the signal deviation from the known for application to the mobile 103 data during post mission processing
53. The ground units were located at 2 new stations coordinated by Det 4 Fd Svy Sqn at the beginning of the Operation from a First Order station (GUY3) situated approx 1.5 km from Henderson Airfield.
54. The new stations were established for security and accessibility:
- a. Station HEN was situated beside the runway at Henderson Airfield, and
  - b. Station SVY was situated at the Lands and Survey offices - Honiara.
55. All ground station data recorded during successful photo missions was downloaded later to the mobile Toshiba notebook from the airborne unit. All observed data was compressed and duplicated on 2 sets of 3.5 floppy disks with a 3rd copy being stored on a Toshiba T4800CT.
56. Data files were labelled by:
- a. location\_date\_month (for ground unit files ie. SVY or HEN\_04\_8); and
  - b. mission no\_date\_month (for airborne unit files ie. 524\_04\_8).
57. The data was dispatched to Army Survey Regiment by safe hand at the personnel change over on 9 - 12 Aug 94.

Sercel GPS Problems

58. No problems were encountered with the GPS equipment.

Camera Platform

59. The camera platform used during Op BELAMA 94 was a contracted Gates 35A Learjet VH-TPR.
60. The aircraft is equipped with GARMIN GPS-100 Global Positioning System (GPS) for navigational purposes.

61. VH-TPR performed well, the speed, range and stability allows tasking flexibility in difficult conditions. Good communication between pilots and camera crew was effected by head sets, hot wired for hands off operation.

62. The pilots proved to be experienced professionals who, having worked aerial survey missions previously, contributed significantly in weather liaison and interpretation as well as anticipating and reacting to changing weather conditions to maximise photo opportunities.

63. The GPS was used exclusively for navigation to / over ident targets and proved invaluable, particularly when forward viewing through NF2 sight was unavailable. Mapping runs require manual navigation as some existing maps in the AO do not show islands in their correct position with reference to Geographical co ordinates.

64. Aircraft cables and air hoses on the starboard cabin wall have been updated and interfere with camera movement when the 152 mm lens is fitted.

#### WAINCO Film Processor

65. The film processor provided unacceptable results from initial setup. The processor was painstakingly cleaned and prepared prior to the first job and this procedure was repeated prior to the second and third film tests.

66. Scratching and uneven processing speed provided an unacceptable risk to the ever increasing amount of film requiring processing, Exposed film stocks were eventually processed by Versamat Film Processor at RAAF Amberley.

#### METAFORM Print Processor

67. The METAFORM processor unit sustained damage during shipment to Honiara despite the addition of purpose built shipping containers. A large hole was evident in the wall of the development tank which was rectified by Det Personnel with a fibreglass repair kit.

68. The processor produced all the paper print requirements for Op BELAMA without fault.

#### Film

69. KODAK 2412 was used for mapping imagery and supplementary tasks, with KODAK 2402 used for ident photography. On two occasions due to time and weather constraints, 2402 was used for mapping photography. Results were acceptable in accordance with Reference G.

CONCLUSIONS

70. Op BELAMA 94 achieved little mapping photography due to persistent multi layer cloud coverage throughout the AO. Due to this consistent problem a concerted effort was given to acquiring ident photography to enable the aerotriangulation of two part blocks yielding 13 new 1: 50 000 map areas.
71. 92% of the total ident requirements were met by persistent cloud gap exploitation.
72. The major equipment items utilised on OP BELAMA 94 were the main area of concern.
73. The necessity for camera component replacement during operations is becoming normal practice and where operations are conducted back to back or concurrently, the limited pool of ageing components cannot be guaranteed to:
- a. meet demand, or
  - b. provide trouble free operation.
74. The WAINCO film processor has proven temperamental during past operations but has managed to provide reasonable results interspersed with an occasional destructive lapse. Contracted servicing and parts support has been disappointing, the turn around time taken for servicing and the supply of very expensive parts was not reliable.
75. The portability of the WAINCO is its main attribute, it is also the single largest operational administrative concern, as deployment by either RAAF aircraft or civil shipping is required. High transportation and servicing costs for inconsistent results are excessive when compared to the consistent results available for the relatively low cost of despatching a courier by civil air to utilise existing RAAF facilities.

RECOMMENDATIONS

	<u>Recommendation:</u>	<u>Recommended Action by:</u>
76.	A replacement camera with Image Motion Compensation (IMC) be purchased to replace current cameras.	DSvy-A
77.	All future operations commence no earlier than September.	DSvy-A / 4 Fd Svy
78.	Ontong Java double imaged photography Mission Nos 4FDS 524 and 525 be inspected for useability.	ASR

79. All film processing be conducted at a RAAF Versamat facility by safe hand courier.

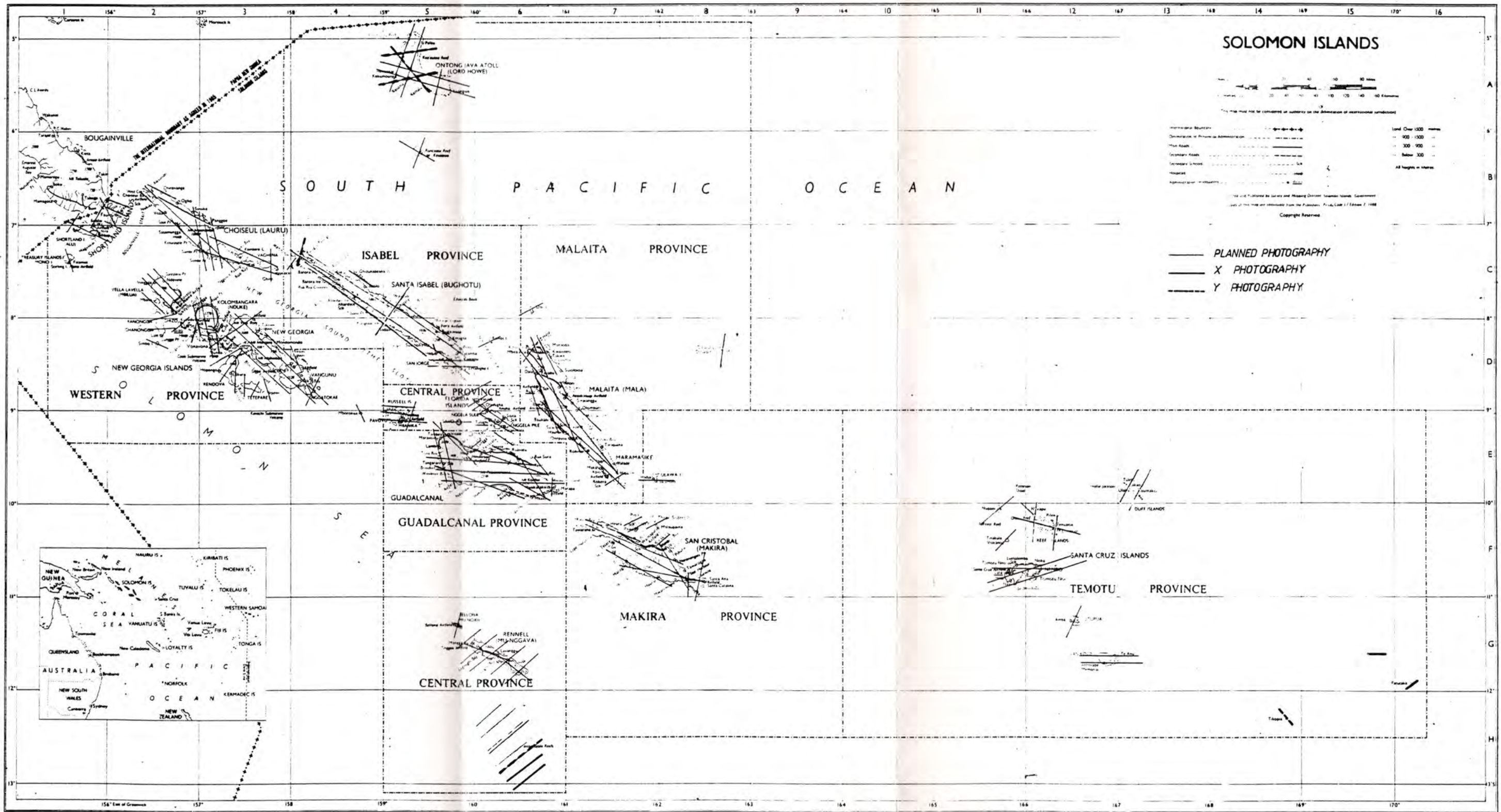
4 Fd Svy Sqn



P.D. LONGBOTTOM  
SGT  
DET 2IC

16 Dec 94

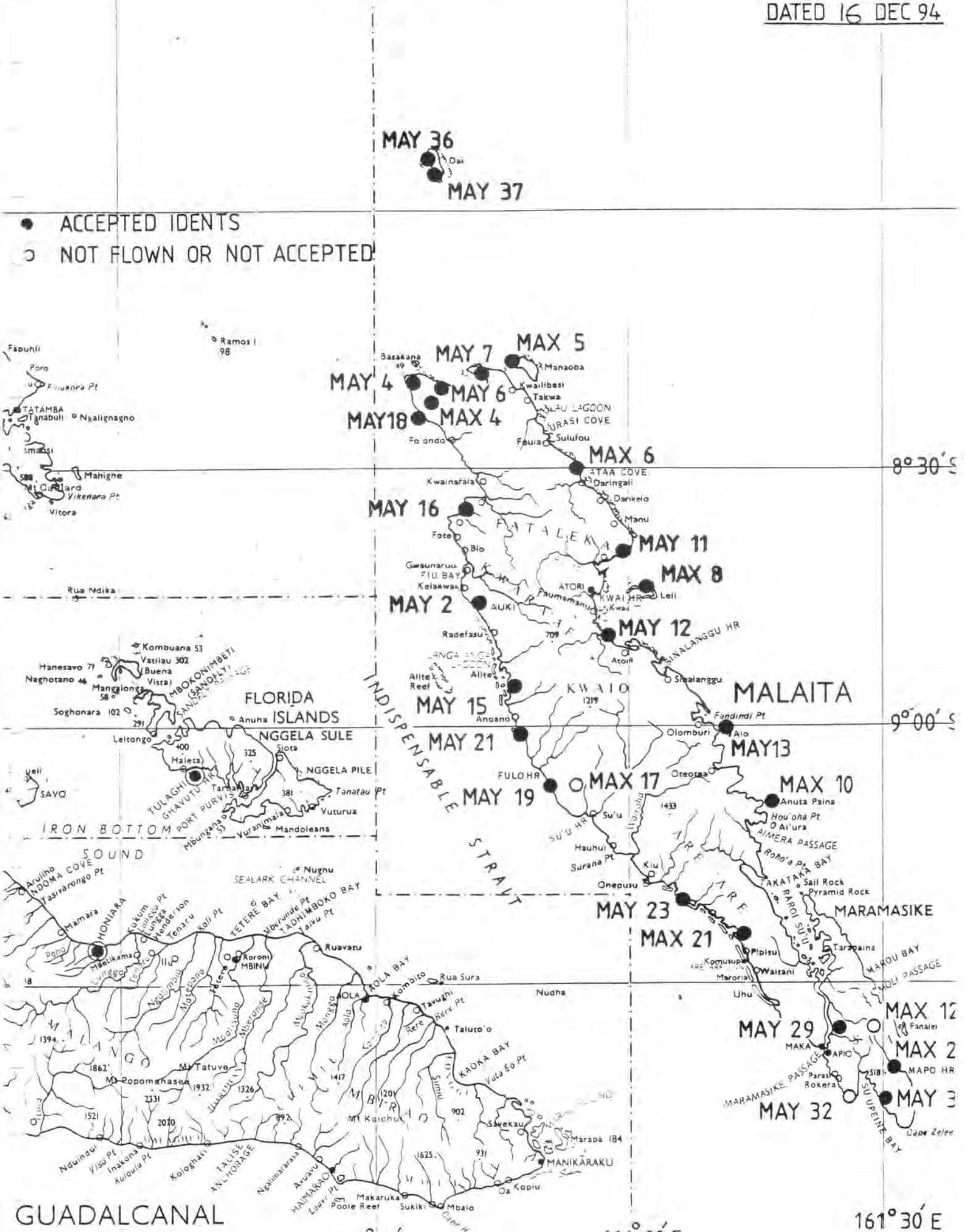
SOLOMON ISLANDS  
 PHOTOGRAPHY ACQUIRED DURING OP BELAMA 94





# IDENT PHOTOGRAPHY MALAITA

- ACCEPTED IDENTs
- NOT FLOWN OR NOT ACCEPTED



MAY 36  
 MAY 37

MAY 4  
 MAY 7  
 MAY 6  
 MAY 18  
 MAX 4  
 MAX 5

MAY 16  
 MAY 11  
 MAY 2  
 MAY 12  
 MAY 15  
 MAY 21  
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 MAY 17  
 MAY 10

MAX 6  
 MAX 8  
 MAY 12  
 MAY 13  
 MAX 10













MAY 23  
 MAY 29  
 MAY 32  
 MAY 3  
 MAY 2  
 MAY 3  
 MAY 2  
 MAY 3

APPENDIX 4 TO  
ANNEX D TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 6 DEC 94

IDENT REGISTER


















OPERATION BELAMA 94

Station Name/No	Mission No	Frame No	Flying Height	Date	Target Configuration
NGY25	4 FD S 529	0001	11 000'	21 Aug 94	+
NGY 39	4 FD S 529	0008	12 000'	21 Aug 94	+
NGY38	4 FD S 529	0011	12 000'	21 Aug 94	+
NGY43	4 FD S 529	0013	12 000'	21 Aug 94	+
NGY44	4 FD S 529	0021	12 000'	21 Aug 94	+
NGY76	4 FD S 529	0025	12 000'	21 Aug 94	+
NGX18	4 FD S 529	0031	10 000'	21 Aug 94	+
NGY63	4 FD S 529	0034	10 000'	22 Aug 94	X
NGY66	4 FD S 529	0037	10 000'	22 Aug 94	+
NGX19	4 FD S 529	0041	7 500'	22 Aug 94	∧
NGX74	4 FD S 529	0042	7 500'	22 Aug 94	∧
NGY1	4 FD S 529	0048	11 000'	22 Aug 94	∠
NGY3	4 FD S 529	0053	12 000'	22 Aug 94	X
NGY7	4 FD S 529	0054	11 000'	22 Aug 94	+

Station Name/No	Mission No	Frame No	Flying Height	Date	Target Configuration
NGY6	4 FD S 529	0057	11 000'	22 Aug 94	
NGY31	4 FD S 529	0061	11 000'	22 Aug 94	
NGY46	4 FD S 529	0064	11 000'	22 Aug 94	
NGX14	4 FD S 529	0070	11 000'	22 Aug 94	
NGY41	4 FD S 529	0078	12 000'	22 Aug 94	
NGY73	4 FD S 529	0081	12 000'	23 Aug 94	
NGY55	4 FD S 529	0087	5 000'	23 Aug 94	
NGY55	4 FD S 529	0174	11 000'	25 Aug 94	
NGY87	4 FD S 529	0093	13 000'	23 Aug 94	
NGY42	4 FD S 529	0096	11 000'	23 Aug 94	
NGY61	4 FD S 529	0099	10 000'	23 Aug 94	
NGY64	4 FD S 529	0105	11 000'	23 Aug 94	
NGY65	4 FD S 529	0108	11 000'	23 Aug 94	
NGY67	4 FD S 529	0118	10 000'	24 Aug 94	
NGY70	4 FD S 529	0136	11 000'	24 Aug 94	
NGY50	4 FD S 529	0150	11 000'	25 Aug 94	
NGX3	4 FD S 529	0153	12 000'	25 Aug 94	

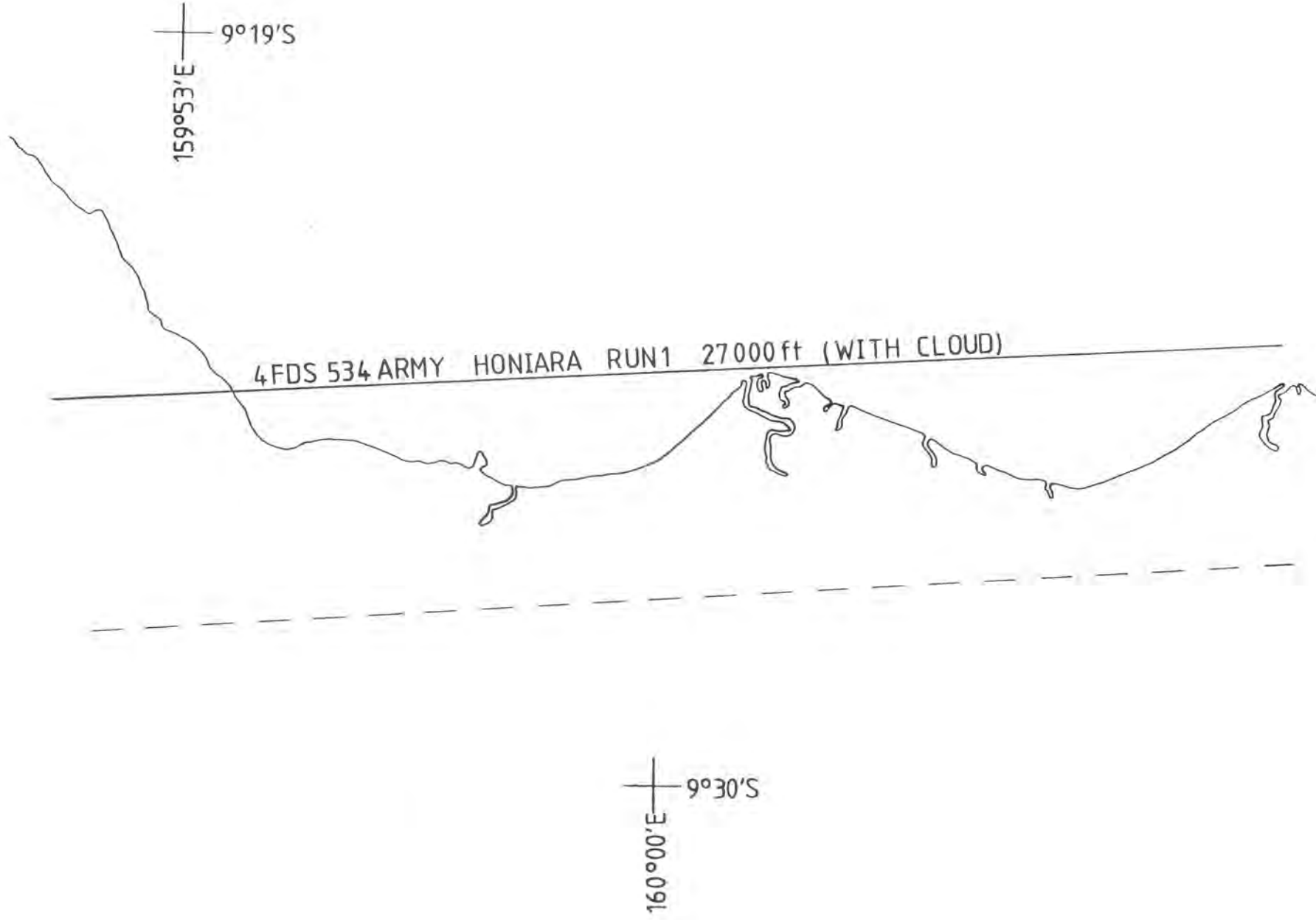
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NGY32	4 FD S 529	0169	11 000'	25 Aug 94	
NGY21	4 FD S 529	0172	11 000'	25 Aug 94	
MAY15	4 FD S 529	0177	12 000'	26 Aug 94	
MAY15	4 FD S 530	0067	12 000'	31 Aug 94	
MAY23	4 FD S 529	0185	12 000'	26 Aug 94	
MAX10	4 FD S 529	0192	12 000'	26 Aug 94	
MAY13	4 FD S 529	0195	12 000'	26 Aug 94	
MAY2	4 FD S 530	0003	12 000'	30 Aug 94	
MAY16	4 FD S 530	0005	12 000'	30 Aug 94	
MAY36	4 FD S 530	0011	13 000'	30 Aug 94	
MAY37	4 FD S 530	0018	13 000'	30 Aug 94	
MAY 6	4 FD S 530	0022	12 000'	30 Aug 94	
MAY 4	4 FD S 530	0026	12 000'	30 Aug 94	
MAX 4	4 FD S 530	0030	12 000'	30 Aug 94	
MAY 7	4 FD S 530	0037	12 000'	30 Aug 94	
MAX 5	4 FD S 530	0039	12 000'	30 Aug 94	

Station Name/No	Mission No	Frame No	Flying Height	Date	Target Configuration
MAX8	4 FD S 530	0046	12 000'	31 Aug 94	
MAY21	4 FD S 530	0063	12 000'	31 Aug 94	
MAY18	4 FD S 530	0074	12 000'	31 Aug 94	
NGY51	4 FD S 530	0085	11 000'	31 Aug 94	
NGY18	4 FD S 530	0086	11 000'	31 Aug 94	
NGY2	4 FD S 530	0095	11 000'	1 Sep 94	
NGY40	4 FD S 530	0103	10 000'	2 Sep 94	
NGY77	4 FD S 530	0106	10 000'	2 Sep 94	
NGY57	4 FD S 530	0115	11 000'	2 Sep 94	
NGX16	4 FD S 530	0124	12 000'	2 Sep 94	
MAX22	4 FD S 533	0002	12 000'	8 Sep 94	
MAY34	4 FD S 533	0010	12 000'	8 Sep 94	
MAY29	4 FD S 533	0019	12 000'	8 Sep 94	
MAY12	4 FD S 533	0029	12 000'	8 Sep 94	
MAX6	4 FD S 533	0035	12 000'	8 Sep 94	
MAY11	4 FD S 533	0032	12 000'	8 Sep 94	
MAY11	4 FD S 533	0038	12 000'	8 Sep 94	

Station Name/No	Mission No	Frame No	Flying Height	Date	Target Configuration
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NGX8	4 FD S 533	0044	13 000'	8 Sep 94	
NGX7	4 FD S 533	0048	12 000'	8 Sep 94	
NGY75	4 FD S 533	0054	11 000'	8 Sep 94	
NGY23	4 FD S 533	0063	11 000'	8 Sep 94	
MAX21	4 FD S 533	0067	12 000'	9 Sep 94	
NGY4	4 FD S 533	0073	11 000'	9 Sep 94	
NGX10	4 FD S 533	0079	11 000'	9 Sep 94	
NGY69	4 FD S 533	0058	11 000'	8 Sep 94	
NGY69	4 FD S 533	0100	5 000'	9 Sep 94	
NGY45	4 FD S 533	0104	11 000'	10 Sep 94	
NGY45	4 FD S 533	0144	11 000'	10 Sep 94	
NGY20	4 FD S 533	0107	11 000'	10 Sep 94	
NGY84	4 FD S 533	0113	11 000'	10 Sep 94	
NGX4A	4 FD S 533	0116	11 000'	10 Sep 94	
NGX12	4 FD S 533	0132	11 000'	10 Sep 94	
NGY68	4 FD S 533	0138	11 000'	10 Sep 94	
MAY19	4 FD S 534	0083	12 000'	12 Sep 94	

APPENDIX 5 TO  
ANNEX D TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 15 DEC 94

SUPPLEMENTARY PHOTOGRAPHY  
OF HONIARA



ANNEX E TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94

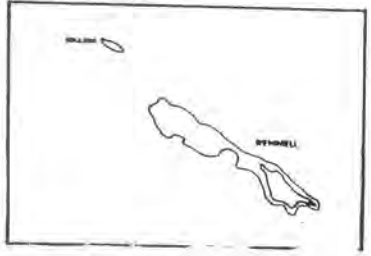
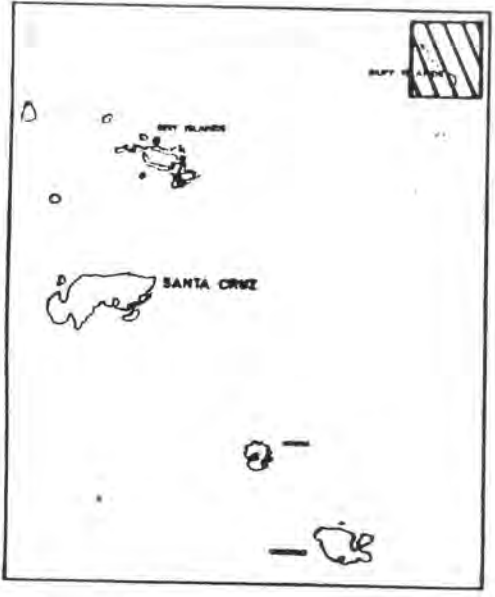
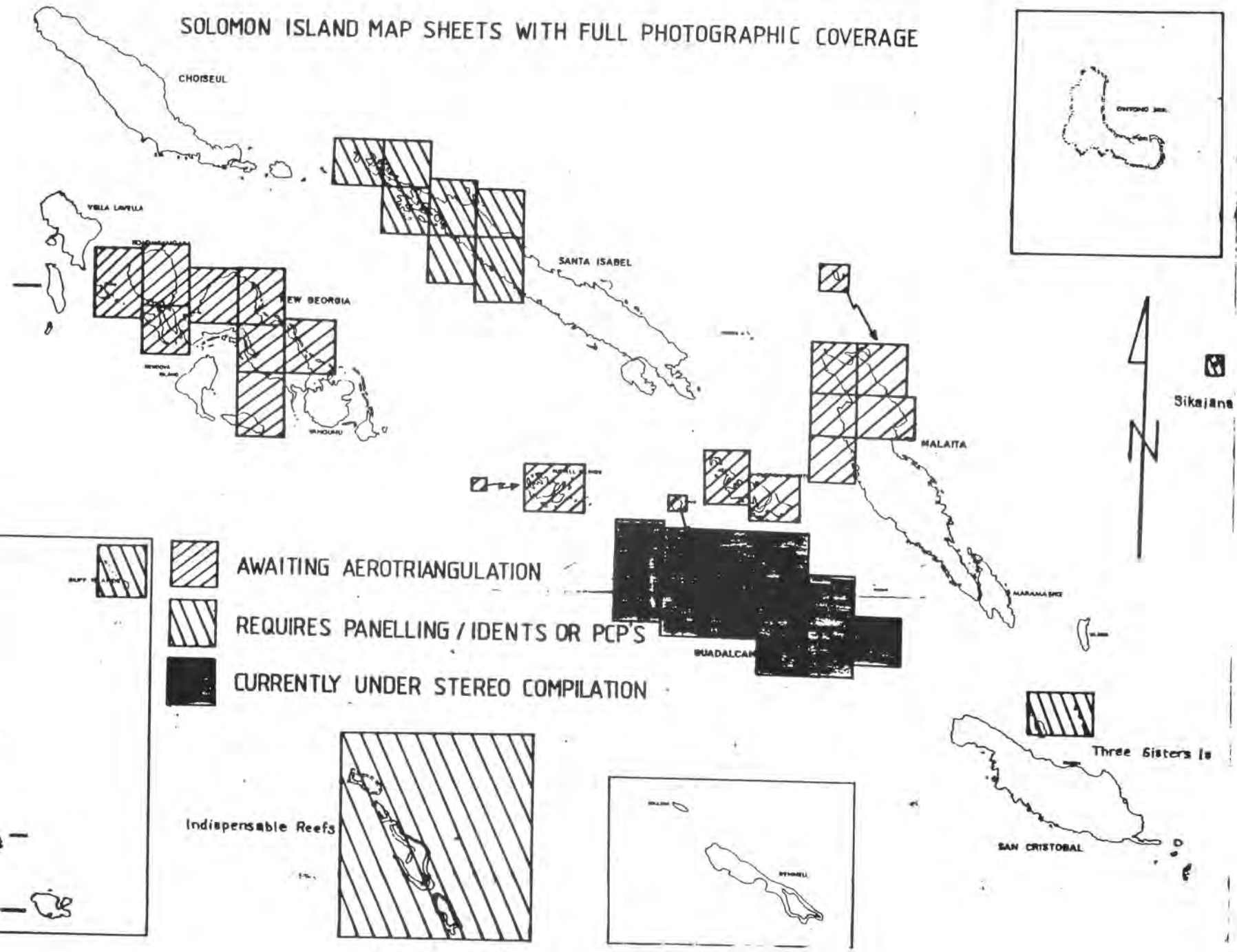
SEQUENCE OF EVENTS

Serial	Date	Event
(a)	(b)	(c)
1	12 May 94	Funds for stores issued
2	12 May 94	Stores ordered
3	20 May 94	Stores dispatched to Sydney for shipping
4	23 May 94	Concept of Operations issued
5	16 Jun 94	Stores depart by ship for AO
6	7 Jul 94	Operational funding allocated
7	12 Jul 94	Stores arrive in Honiara
8	18 Jul 94	Operation Order issued
9	19 Jul 94	Mounting Instruction issued
10	21 Jul 94	Technical directive issued
11	27 Jul 94	Amended insertion date
12	30 Jul 94	CAPT Gray & WO2 Shephard civ air Madang-Honiara
13	31 Jul 94	Learjet Madang-Port Moresby - Honiara with SGT Brinsmead and SGT Langeberg
14	1 Aug 94	Commence aerial photography operations
15	6 Aug 94	Svy Tech Adviser deploys for paneling operations CPL Crawford transits Darwin - Brisbane from Op NERVOSE
16	8 Aug 94	Lear departs AO for Brisbane with SGT Brinsmead & SGT Langeberg
17	9 Aug 94	Capt Gray departs Honiara for Brisbane by civil air Remove RC20 / install RC10 camera in Learjet at Brisbane
18	10 Aug 94	Capt Gray, SGT Brinsmead and SGT Langeberg RTU civil air SGT Longbottom Adelaide-Brisbane SGT Tuddenham Bendigo-Brisbane Fly Bourke test range with RC10 and process film at RAAF Amberley Lear transits to Maroochydore for service Test film dispatched to Army Svy Regt for assessment
19	11-12 Aug 94	Learjet servicing at Maroochydore Army Svy Regt approve test film

Serial	Date	Event
(a)	(b)	(c)
20	13 Aug 94	Learjet Brisbane-Honiara with SGT Tuddenham and CPL Crawford SGT Longbottom transits Brisbane to Honiara by civil air
21	14 Aug 94	Aerial photography continues - several minor camera component problems evident (DHELs, PAV mount and Nav Sight)
22	16 Aug 94	WAINCO film processor results cause concern
23	19 Aug 94	DHELs replacement parts requested
24	22 Aug 94	WAINCO results still unacceptable initiate contingency processing plan
25	29 Aug 94	Lear transits Honiara - Brisbane - Maroochydore for film processing and Navigation sight replacement
26	30 Aug 94	Lear returns to AO DHELs parts arrive Paneling teams return to Honiara
27	4 Sep 94	Paneling teams redeploy SGT Longbottom departs civil air for processing at RAAF Amberley
28	5 Sep 94	Lear transits to Port Vila - operational sorties enroute SGT Longbottom returns to AO by civil air
29	6-7 Sep 94	Operations in Vanuatu
30	8 Sep 94	Lear returns to Honiara - operational sorties enroute
31	11 Sep 94	Cpl Crawford departs Honiara for Brisbane via civil air
32	12 Sep 94	Ops normal Pack stores for return surface shipping
32	13 Sep 94	Dispatch air freight for RTU SGT Longbottom and SGT Tuddenham transit civil air to Brisbane
33	14 Sep 94	Film processing at RAAF Amberley Lear and WO2 Shephard redeploy to PNG for Op KUMUL 94 Part 2
34	16 Sep 94	SGT Longbottom and Cpl Crawford civil air to Adelaide to complete assessing at 4 Fd Svy Sqn SGT Tuddenham civil air to Melbourne for RTU by unit transport
35	Nov 94	Stores dispatched from Honiara by ship
36	Dec 94	Stores returned to 4 Fd Svy Sqn

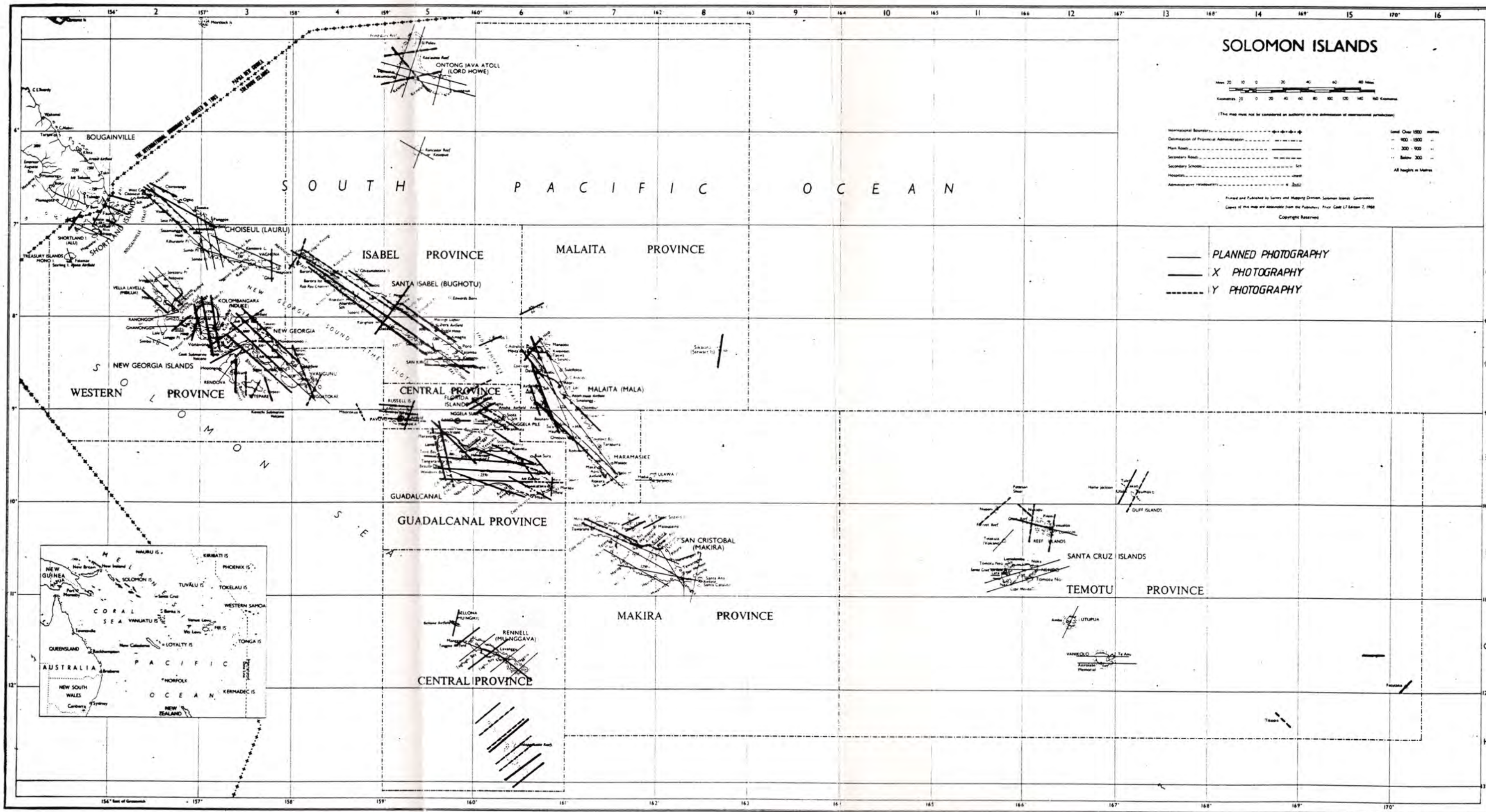
ANNEX F TO  
 OP BELAMA 94  
 OPERATION REPORT  
 DATE 21 DEC 94

SOLOMON ISLAND MAP SHEETS WITH FULL PHOTOGRAPHIC COVERAGE



# SOLOMON ISLANDS OUTSTANDING PHOTOGRAPHY

ANNEX G TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94



ANNEX H TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94

OPERATIONAL MANNING

1. 4 Fd Svy Sqn.

5104899	CAPT R.L. Gray	Visitor	30 Jul - 10 Aug 94
46446	WO2 W.J. Shephard	Det Comd	30 Jul - 14 Sep 94
49654	SGT P.D. Longbottom	Det 2IC	10 Aug - 16 Sep 94
454834	CPL R.C. Crawford	Camera Op	6 Aug - 16 Sep 94
  
2. Army Svy Regt.

4401491	SGT P. Langeberg	Camera Op	31 Jul - 10 Aug 94
555573	SGT P. Tuddunham	Camera Op	10 Aug - 16 Sep 94
  
3. School of Mil Svy

180845	SGT N. Brinsmead	Camera Op	31 Jul - 10 Aug 94
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4. Airscan Pty Ltd.

Mr M. Juelg	Pilot	31 Jul - 14 Sep 94
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5. Aeromill Pty Ltd.

Mr B. Ney	Pilot	31 Jul - 8 Aug 93
Mr J. Farson	Pilot	10 Aug - 14 Sep 93

ANNEX I TO  
OP BELAMA 94  
OPERATION REPORT  
DATED 21 DEC 94

FLYING HOURS

Serial	Date	Pilots	Crew	Hours
(a)	(b)	(c)	(d)	(e)

(1)	1 Aug 94	Mr M. Juelg Mr B. Ney	SGT N. Brinsmead SGT P. Langeberg	2.1
(2)	2 Aug 94	Pilots rest day		Nil
(3)	3 Aug 94	Mr M. Juelg Mr B. Ney	WO2 W. Shephard SGT N. Brinsmead	1.5
(4)	4 Aug 94	Mr M. Juelg Mr B. Ney	CAPT R. Gray SGT P. Langeberg	4.1
(5)	5 Aug 94	Mr M. Juelg Mr B. Ney	WO2 W. Shephard SGT N. Brinsmead	2.2
(6)	6 Aug 94	Mr M. Juelg Mr B. Ney	SGT N. Brinsmead SGT P. Langeberg	2.4
(7)	7 Aug 94	Mr M. Juelg Mr B. Ney	SGT N. Brinsmead SGT P. Langeberg	2.1
(8)	8 Aug 94	Mr M. Juelg Mr B. Ney	SGT N. Brinsmead SGT P. Langeberg	2.8
(9)	9 Aug 94	Pilots rest day		Nil
(10)	10 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom CPL R. Crawford	2.6
(11)	11 Aug 94	Aircraft servicing		Nil
(12)	12 Aug 94	Aircraft servicing		Nil
(13)	13 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	2.7
(14)	14 Aug 94	Pilots rest day		Nil
(15)	15 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	1.8
(16)	16 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom CPL R. Crawford	2.3
(17)	17 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	1.8

Serial	Date	Pilots	Crew	Hours
(a)	(b)	(c)	(d)	(e)
(18)	18 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom CPL R. Crawford	2.6
(19)	19 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	1.6
(20)	20 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	1.4
(21)	21 Aug 94	Pilots rest day		Nil
(22)	22 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom CPL R. Crawford	3.3
(23)	23 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	3.9
(24)	24 Aug 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	3.3
(25)	25 Aug 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	2.8
(26)	26 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	2.8
(27)	27 Aug 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	2.1
(28)	28 Aug 94	Pilots rest day		Nil
(29)	29 Aug 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard SGT P. Longbottom	3
(30)	30 Aug 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard SGT P. Longbottom	3
(31)	31 Aug 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	2.5
(32)	1 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	2.9
(33)	2 Sep 94	Mr M. Juelg Mr J. Farson	SGT P. Tuddenham CPL R. Crawford	2.5
(34)	3 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	2.2
(35)	4 Sep 94	Pilots rest day		Nil
(36)	5 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	3.8
(37)	6 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	3.7
(38)	7 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	3.3

<b>Serial</b>	<b>Date</b>	<b>Pilots</b>	<b>Crew</b>	<b>Hours</b>
(a)	(b)	(c)	(d)	(e)
(39)	8 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard CPL R. Crawford	3.5
(40)	9 Sep 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom CPL R. Crawford	3.4
(41)	10 Sep 94	Mr M. Juelg Mr J. Farson	CAPT G. Ford SGT P. Tuddenham	3
(42)	11 Sep 94	Mr M. Juelg Mr J. Farson	SGT P. Longbottom SGT P. Tuddenham	2.5
(43)	12 Sep 94	Mr M. Juelg Mr J. Farson	CAPT G. Ford SGT P. Tuddenham	3.7
(44)	13 Sep 94	Mr M. Juelg Mr J. Farson	CAPT G. Ford SGT P. Longbottom	2.2
(45)	14 Sep 94	Mr M. Juelg Mr J. Farson	WO2 W. Shephard	2.7
(46)	15 Sep 94	Pilots rest day		Nil

CONTACTS IN THE AO

International telephone and facsimile access is:

To Solomon Islands from Australia:  
Tel: 0011 677 XX XXX  
Fax: 0015 677 XX XXX

To Vanuatu from Australia:  
Tel: 0011 678 XX XXX  
Fax: 0011 678 XX XXX

From Solomon Islands to Australia:  
Tel: 00 61 X XXX XXXX  
Fax: 00 61 X XXX XXXX

From Vanuatu to Australia:  
Tel: 00 61 X XXX XXXX  
Fax: 00 61 X XXX XXXX

MILITARY

Defence Attaché to the Solomon Islands - Commander K. Eglan      Tel:      20 386

Survey Adviser to the Solomon Islands - CAPT G. Ford      Tel:      20 494  
Fax:      20 893

Survey Adviser to Vanuatu - CAPT W. Jones      Tel:      22 427  
Fax:      23 948

AUSTRALIAN GOVERNMENT

Australian High Commission - Solomon Islands      Tel:      21 561  
Fax:      23 691

Australian High Commission - Vanuatu      Tel:      22 777  
Fax:      23 948

SOLOMON ISLANDS GOVERNMENT

Meteorological Service Division  
Henderson Ops Section Tel: 30 270

Control Tower - Henderson Airfield Tel: 30 567

VANUATU GOVERNMENT

Bureau of Meteorology - Port Vila Tel: 22 331

Control Tower - Bauer Field Aerodrome Tel: 22 724

CIVILIAN

Shell Petroleum (Solomon Islands)  
Aviation Fuels Manager - Mr Jesse Ramu Tel: 21 838

Mendana Hotel  
PO Box 384 - Honiara Tel: 20 071  
Fax: 23 942

Solomon Airlines  
International and domestic Tel: 20 031  
Fax: 23 992

National Bank of Solomon Islands Tel: 21 874



AUSTRALIAN ARMY  
Defence Cooperation Program



## MINUTE

822/7/8

4 Fd Svy Sqn (Ops)

For Information:

DSvy-A (S03 Ops Spt)

Army Svy Regt (Ops Cell)

### OPERATION BELAMA 94 - SURVEY CONTROL

1. Enclosed, as Annex A, find survey control for seven photo control points established in lieu of points required for identification photography. All points are in Western Province, as detailed in Annex B.
2. Control was established using GPS observations for a minimum of one hour from adjacent control points, all less than 15 km from each new point. Observations were processed using GPPS and FILLNET.

*Ford*  
G. FORD  
CAPT  
SVY TECH ADVISER

6 Jan 95

- Annexes: A. Control for New Panel Points, Western Province
- B. Location Diagram for new control points

ANNEX A TO  
822/7/8  
DATED 6 JAN 94

Control for New Panel Points, Western Province

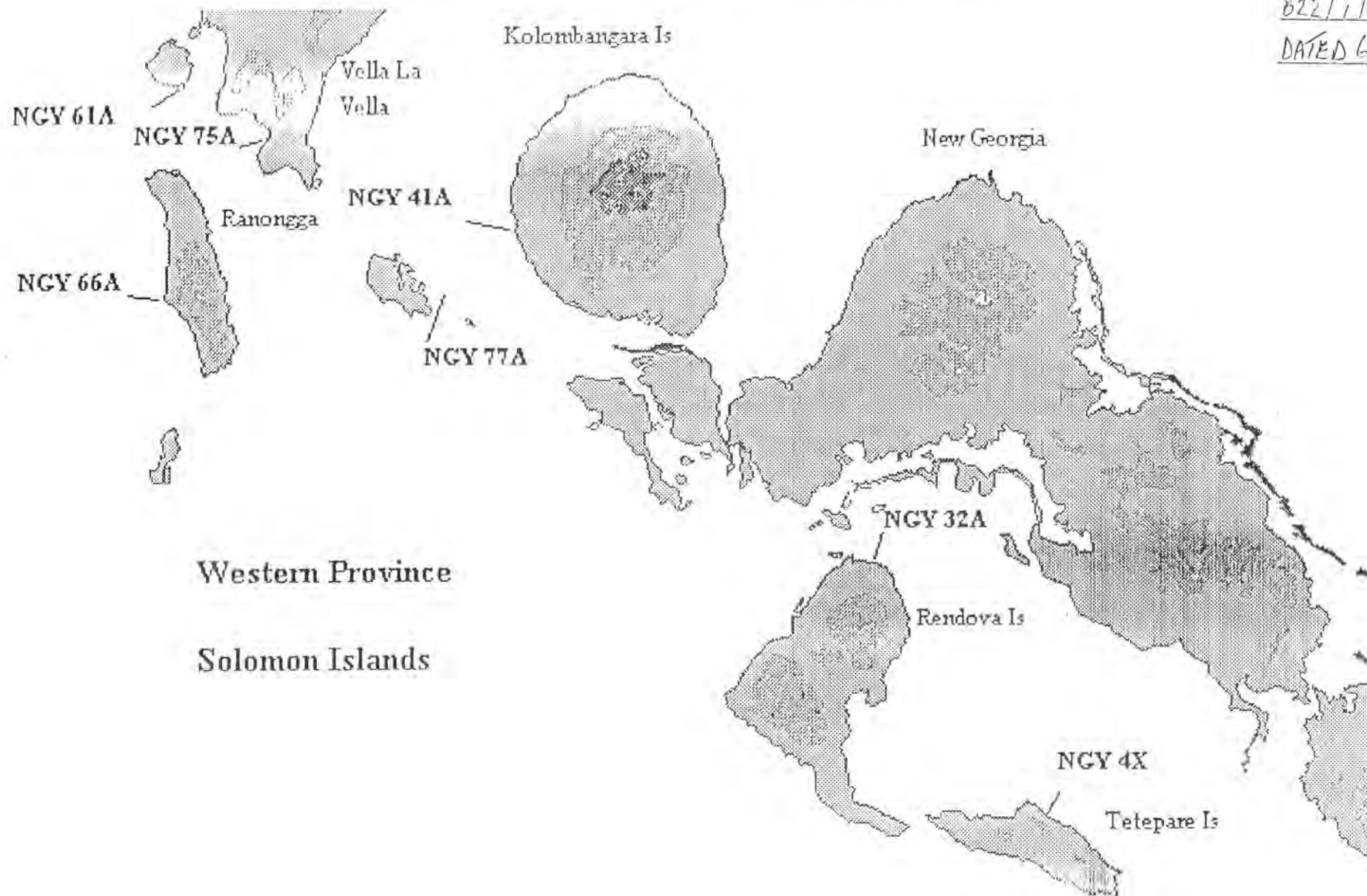
<u>PCP</u>	<u>Location</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Height</u>	<u>Easting</u>	<u>Northing</u>
NGX 4A	TetePari	S8 42 42.14851	E157 34 17.65397	15.910	342 857.657	9 036 723.608
NGY 32A	Egolo Village	S8 24 44.70149	E157 22 38.26425	2.774	321 340.592	9 069 738.140
NGY 61A	Mbava Island	S7 50 37.43052	E156 33 5.87293	0.912	230 010.370	9 132 190.284
NGY 75A	Varese Village	S7 53 49.36404	E156 39 17.3802	2.493	241 429.561	9 126 356.532
NGY 66A	Kundu Village	S8 5 23.31565	E156 31 56.12495	49.809	228 035.256	9,104 948.922
NGY 77A	Tinge Tange Is	S8 4 45.52560	E156 51 43.44729	0.997	264 394.592	9 106 315.993
NGY 41A	Kukundu Village	S8 1 29.85153	E156 56 43.32832	4.167	273 548.162	9 112 375.900

Location Diagram for new control points

ANNEX

822/11E

DATED 6 JAN 95



Western Province  
Solomon Islands

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