COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Record No. 1969 / 10

Programme for New Britain Crustal Study Project March - May, 1969

PROGRAMME FOR THE

NEW BRITAIN CRUSTAL STUDY PROJECT

March-May 1969

Records 1969/10

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES

&

DEPARTMENT OF TERRITORIES
TERRITORY OF PAPUA AND NEW GUINEA ADMINISTRATION

ORGANISING COMMITTEE

G.A.M. TAYLOR
Senior Geologist
Bureau of Mineral Resources
Canberra

W.A. WIEBENGA
Senior Geophysicist
Bureau of Mineral Resources
Canberra

A. RENWICK
Senior Resident Geologist
Territory of Papua and New Guinea
Port Moresby

LIST OF PARTICIPATING ORGANIZATIONS

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES
P.O. Box 378,
CANBERRA A.C.T.

DEPARTMENT OF TERRITORIES
ADMINISTRATION OF PAPUA AND NEW GUINEA

DEPARTMENT OF TRADE & INDUSTRY
MARINE DIVISION
PORT MORESBY

DEPARTMENT OF POSTS & TELEGRAPHS

DEPARTMENT OF LANDS, SURVEYS AND MINES

SURVEY DIVISION
PORT MORESBY & RABAUL

GEOLOGICAL & VOLCANOLOGICAL BRANCH
PORT MORESBY & RABAUL

UNIVERSITY OF HAWAII
HAWAII INSTITUTE OF GEOPHYSICS
HONOLULU

UNIVERSITY OF QUEENSLAND
DEPARTMENT OF GEOLOGY
ST. LUCIA

AUSTRALIAN NATIONAL UNIVERSITY
DEPARTMENT OF GEOPHYSICS
CANBERRA

UNIVERSITY OF NEW ENGLAND
DEPARTMENT OF GEOLOGY
ARMIDALE

PROGRAMME FOR THE

NEW BRITAIN CRUSTAL STUDY PROJECT

MARCH-MAY, 1969.

RECORDS 1969/10

Contents

INTRODUCTION

Objects of the Project

The 1967 project was centred on Rabaul and was designed to yield data on crustal structure and seismic velocities in the region with the chief aim of facilitating the work of local volcano and seismic surveillance institutions. The methods used were found to be effective and yielded a surprisingly large amount of information on the local characteristics of the crust and mantle.

To place these observations in a more meaningful context it is necessary to extend the area of study, intensify the detail in the caldera area and enlarge the parameters. This year once again most emphasis will be given to the deep seismic sounding technique which will be supplemented by gravity, magnetic and sonar boomer traverses. At the same time geological field parties working in the region will provide the broad framework for interpretation of the physical data and material for special petrological studies.

The Seismic Programme

The programme will be divided into four stages:-

Stage I An E-W traverse across the northern end of the Gazelle Peninsular extending east to Nissan Island and west to beyond Cape Lambert.

Stage II A westerly extension of the traverse to Bali to include crustal thicknesses along the north coast of New Britain and a southerly extension to include south coast data and thickness of the mountain roots in the centre of the island.

Stage III A NW-SE traverse through the Rabaul caldera.

Stage IV An E-W traverse through the Rabaul caldera.

A total of nineteen recording stations will be established for each stage together with a control station situated at the Rabaul Vulcanological Observatory. The five stations which comprise the vulcanological warning system will also be operating throughout the project.

Shots will be fired from the M.V. "Coral Queen" which will also act as a mobile recording station.

Each mobile station position and the position at shot-firing time, will be fixed by survey parties.

Each mobile station will be in wireless communication with Control and time signals will be broadcast continuously from the Rabaul Vulcanological Observatory during days shots are fired.

All participating organisations will be responsible for positioning their personnel and equipment at Rabaul in sufficient time for start of the Project. All transportation during the Project will be provided by the Commonwealth Government and the Territory Administration. Accommodation throughout the Project has been arranged and arrangements can be made for accommodation in Rabaul before and after the Project on request.

The organising Committee will be responsible for general leadership and control of the activities during the Project, and will arrange processing, interpretation and publishing of data and results after the fieldwork is finished.

In the authorship of the published material full acknowledgement will be given to the various participants and organisations.

COMPOSITION OF PARTIES AND LOCATIONS

Party	Type	Organization	Personnel	Stage I	Stage II	Stage III	Stage IV
1	Spread	B.M.R.	2 Polak Taylor	FENI	KANDRIAN	RALUANA	RALUANA
2	"	"	2 Whiteley Cifali	ULU	HOSKINS	NONGA	ATALIKLIKUN
3	"	A.N.U.	1 Doyle	PALMALMAL	PALMALMAL	WATOM	MATUPI
4	"	Q.Univ.	2 Webb	DOILENE	DOILENE	KABANGA	ULU
5	"	"	2	PONDO	PONDO	VULCAN	VULCAN
6	"	Hawaii Univ.	2 Furumoto	MANGA	TALASEA	KOKOPO	KILINWATA
7	"	"	2	ULAMONA	ULAMONA	BURMA RD.	BURMA RD.
8	"/2G	N.Eng.Uni.	1	KAMDARU	BIALLA	RAPOPO	RAPOPO
9	tape	Q. Univ.	1	KAVIENG	KAVIENG	VULCAN EMB.	VULCAN EMB.
10	willmore	B.M.R.	1 Paull	NATAVA	LINDENHAFEN	PRAED PT.	PRAED PT.
11	"	"	1 Brooks	RAPOPO	RAPOPO	RAPOPO	RAPOPO
12	"	"	1 Ciszek	MATANAKUNAI	MATANAKUNAI	CREDNER IS.	CREDNER IS.
13	"	"	1 Jones	BOANG	BALI	(RATANGOR)	(RATANGOR)
14	"	P.M.O.	1 Conally	NARUM	BULUMURI	NORDUP	NORDUP
15	"	"	1 Ripper or Wilkie	NISSAN TOL	CRA	TAVUI	TAVUI
16	"	R.O.	1 Heming	PAKIA	PAKIA	TOMA	TOMA
17	"	"	1 Mancini	AU'UNA	AU'UNA	VUNAKANAU	VUNAKANAU
18	"	Q.Univ.	1	LAMBOM	VITU	KURADUI	KURADUI
S/S	shooting ship	B.M.R.	3 Mann Morton Tarlington	SHOT LOCATIONS 1 to 12	SHOT LOCATIONS 13 to 27	SHOT LOCATIONS 28 to 40	SHOT LOCATIONS 41 to 48
HFS	Hifix Slaves (1)	Decca	2	KAMDA C.LAMBERT	C.LAMBERT C.BEECHEY		
"	" (2)	"	2	ULU HOSKINS	HOSKINS GASMATA		
SU	survey	Interior	3 Ingham Fuller Lamond	ON SHOOTING SHIP (Au'una & Pakia CRA	ON SHOOTING SHIP	ON SHOOTING SHIP WATOM etc.	ON SHOOTING SHIP
CO	control	B.M.R.	2 Wiebenga Taylor Jurello				

In addition, the fixed stations at Rabaul will operate under the supervision of G.W. D'Addario, R.O.

Organizations -

A.N.U.	- Research School of Physical Sciences, Australian National University, Canberra.
B.M.R.	- Bureau of Mineral Ressources, Geology and Geophysics, Canberra.
(HFS) Decca	- Decca Surveys, Sydney.
Hawaii Univ.	- Institute of Geophysics, University of Hawaii, Honolulu.
Interior	- Surveyor General, Department of the Interior, Canberra.
N. Eng. Univ.	- Department of Geology, University of New England, Armidale. N.S.W.
P.M.O.	- Geophysical Observatory, Bureau of Mineral Resources, Port Moresby, T.P.N.G.
Q. Univ.	- Department of Geology, University of Queensland, St. Lucia. Queensland.
R.O.	- Rabaul Vulcanological Observatory, Geological and Vulcanological Branch, Department of Lands, Surveys and Mines, Territory of Papua and New Guinea.

ACCOMMODATION

Place	No. in Party	Messing Arrangements	Est. cost per day	Dates		
				Arr.		Depart.
Au'una (Mission)	2 (Party SU)	Take own food and bedding		D-5	to	D-2
	1 (Party 17)	Take own food and bedding		D-4	to	D+34
Palmalmal (Ptm)	1 (Party 3)	supplied	$4.50	D-4	to	D+35
	2 (Party SU)	"	$4.50		D-2	
	1 (Party 17)	"	$4.50		D+34	
	1 (Party 16)	"			D+34	
Pakia	1 (Party 16)	own to be supplied		D-4	to	D+34
Doilene (Ptn)	2 (Party 4)	Supplied	$4.50	D-4	to	D+36
Pondo (Ptn)	2 (Party 5)	Supplied	$4.50	D-4	to	D+36
Matanakumai	1 (Party 12)	own to be supplied		D-3	to	D+35
Ulamona (Mission)	2 (Party 7)	Supplied	$4.50	D-3	to	D+35
Ulu (Mission)	2 (Party 2)	Supplied	$4.50	D-4	to	D+13
	2 (Party 4)			D+43	to	D+47
Kamdaru (Ptn)	2 (Party 8)	Supplied	$4.50	D-4	to	D+13
Nissan (Mission)	1 (Party 15)	Supplied	$4.50	D-3	to	D+6
Boang (Mission)	1 (Party 13)	Supplied	$4.50	D-3	to	D+14
Feni (Ptn)	2 (Party 1)	Supplied	$4.50	D-3	to	D+14
Manga (Mission)	2 (Party 6)	Supplied	$4.50	D-3	to	D+14
Narum (Mission)	1 (Party 14)	own to be supplied		D-3	to	D+13
Lambom (School)	1 (Party 18)	Supplied	$4.50	D-3	to	D+13

Place	No. in Party	Messing Arrangements	Est. cost per day	Dates Arr.	Depart.
Rapopo (Mission)	1 (Party 11)	Supplied	$4.50	D-3	D+47
	1 (Party 8)	Supplied	$4.50	D+37	D+47
Natava (Ptn)	1 (Party 10)	Supplied	$4.50	D-2	D+13
Tol (Ptn)	1 (Party 15)	Supplied	$4.50	D+6	D+14
Bialla (Ptn)	1 (Party 8)	Supplied	$4.50	D+15	D+35
Lindenhafen	1 (Party 10)	Supplied	$4.50	D+15	D+34
Hoskins (gov. quarters)	2 (Party 2)	Supplied	$4.50	D+15	D+35
	12 (Party 15)	Supplied	$4.50	D+33	D+35
CRA	12 (Party 15)	own to be supplied	$4.50	D+15	D+33
Talasea (Club)	2 (Party 6)	Supplied	$4.50	D+15	D+35
	3 (Party 13,14, 18)	Supplied	$4.50		D+34
Kandrian (gov.quarters)	2 (Party 1)	Supplied ?	$4.50	D+15	D+35
Bulumuri	1 (Party 14)	own to be supplied	$4.50	D+15	D+34
Vitu (Ptn)	1 (Party 18)	Supplied	$4.50	D+15	D+34
Bali (Ptn)	1 (Party 13)	Supplied	$4.50	D+16	D+33
Kokopo	2 (Party 6)	Supplied	$4.50	D+36	D+43
Watom	1 (Party 3)	?		D+36	D+40
Credner Is.	1 (Party 12)	own to be supplied		D+38	D+47
Kabanga	2 (Party 4)	Supplied	$4.50	D+38	D+43
Ratangor	1 (Party 13)	?		D+38	D+47
Kilinwata	2 (Party 6)	Supplied	$4.50	D+43	D+47
Kurudui	1 (Party 18)	?		D+38	D+46

Place	No. in Party	Messing Arrangements	Est. cost per day	Dates Arr.		Depart.
Rabaul	3 CO			D-10	to	D+51
"	2 (Party 1)			D-8	to	D-3
"				D+14	to	D+15
"				D+35	to	D+51
"	2 (Party 2)			D-8	to	D-4
"	2 (Party 2)			D+13	to	D+15
				D+35	to	D+51
				D-7	to	D-4
"	1 (Party 3)			D+35	to	D+37
"	2 (Party 4)			D-7	to	D-4
				D+37	to	D+38
				D+47	to	D+51
"	2 (Party 5)			D-7	to	D-4
				D+37	to	D+51
"	2 (Party 6)			D-8	to	D-3
				D+14	to	D+15
				D+35	to	D+36
				D+47	to	D+51
"	2 (Party 7)			D-8	to	D-4
				D+35	to	D+36
				D+47	to	D+51
"	1 (Party 8)			D-7	to	D-4
				D+13	to	D+15
				D+35	to	37
				D+47	to	51
	(Party 9)					

Place	No. in Party	Messing Arrangements	Est. cost per day	Dates Arr.		Depart.
Rabaul	1 (Party 10)			D-8	to	D-2
				D+13	to	D+15
				D+36	to	D+51
"	1 (Party 11)			D-7	to	D-3
				D+47	to	D+51
"	1 (Party 12)			D-8	to	D-4
				D+37	to	D+38
				D+47	to	D+51
	1 (Party 13)			D-7	to	D-3
				D+35	to	D+38
				D+47	to	D+51
	1 (Party 14)			D-6	to	D-3
				D+13	to	D+14
				D+35	to	D+50
	1 (Party 15)			D-6	to	D-3
				D+14	to	D+15
				D+35	to	D+50
	1 (Party 16) 1 (Party 17)	local residents				D+36
	1 (Party 18)			D-7	to	D-3
				D+13	to	D+14
				D+35	to	D+38
				D+46	to	D+51

Survey Positions

Position	Shot Points to be fixed
On shooting ship	1, 2, 3, 4, 8 20, 21, 22 28, 29
Watom and North Daughter	30, 31
X Y	32, 33, 34, 35, 36, 37
on ship	38, 39, 40
on ship	41, 42, 43,
?	44
on ship	45, 46, 47

Hifix Positions

Position	Shot Points to be fixed
A, B	5, 5A, 6, 7
C, D	9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20 ?
E, F	23, 24, 25, 26, 27

EQUIPMENT

PERSONAL EQUIPMENT

All persons participating in the Project will be individually responsible for ensuring that they equip themselves with:-

- Clothing
- Toilet requisites
- Camp stretcher or air bed
- Sheets, small pillow and pillow slips
- Mosquito net
- Anti-malarial prophylactic
- First-aid essentials
- 24 hours dry rations
- Torch
- Wireless receiver (optional)
- Reading matter (")
- Camera and film (")

PARTY EQUIPMENT

Party Leaders will be responsible for ensuring that they are, in addition to their personal equipment, equipped with:

- Seismic and related equipment (see following schedules)
- Recording paper
- Developing materials and equipment
- Tentage for instrument station
- Water carrier
- Petrol carrier
- Data sheets for records (to be distributed by B.M.R.)
- Tape and compass

The following list shows the equipment which each participating party will use:-

CONTROL

Personnel — G.A.M. TAYLOR
W.A. WIEBENGA

Location: — Rabaul

Equipment:
- 1 P & T transceiver (high output)
- 1 AMT 150 transmitter
- 3 Collins transceivers spare
- 2 Traeger transceivers spare

Power supply: 2 regulated power supplies to charge batteries
15 6V 19 plate batteries

Crystal Clocks: one operating
one spare

One National taperecorder : to tape discussion

SHOOTING SHIP to be chartered

Personnel:
P.E. MANN
D. MORTON
D. TARLINTON
LOOP, foreman, Dept of Works
4 local labour, Dept of Works

Equipment:
1 Collins transceiver
1 Traeger "
1 A.W.A. receiver (time signal)
1 Crystal clock
1 shot signal generator
1 S.I.E. high voltage blaster
10 6V 19 plate batteries
1 battery charger (e.g., Replex 240V)

Recording Equipment:
1 12 channel daylight recorder (on loan from Eng. Geology Section)
1 24 magnetic recorder (on loan from Un. of Queensland)
1 Streamer (12 channels)
5 12V 11 plate batteries
1 Tape recorder
1 Portable oscilloscope (CRO)
1 Motor generator - 25 KVA (Elect. Comm. T.P.N.G.)
8 Sono bouys
4 Receivers
1 14000 Joules sonnarboomer equipment (2 capicitor banks)
1 Streamer
1 Sparker

Transport and magnetometer ship "Lahara"
(from Administration)

Personnel: G. HART - operating and navigating
radiotechnician - operating

Equipment: Elsec magnetometer with fish and recorder Echo sounder (or small sonarboomer unit). Temperature and salinity measuring and recording equipment
3 KVA generator for echo sounder 240 V Replex battery charger 6 12V 11 plate batteries
1 Traeger
1 Costa Romberg gravity meter
2 Precision barometers with tables

RECORDING STATIONS

Party 1 Personnel: E.J. POLAK
J. TAYLOR

Equipment:
1 S.I.E. 24 channel
15 2 cps geophones
5 geophone cables 2000 ft
interconnecting cables
1 Traeger transceiver
1 A.W.A. receiver
1 Motorgenerator
5 12V 11 plate batteries
1 Developing tent
1 Instrument tent

Party 2 Personnel: R. WHITELEY
G. CIFALI

Equipment:
1 S.I.E. 24 channel
15 x 4 (=60) 4½ cps geophones
5 geophone cables 2000 ft interconnecting cables
1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
5 12V 11 plate batteries
1 Developing tent
1 Instrument tent

Party 3 Personnel: A.N.U.

Equipment:
(provided by B.M.R.)

6 Channel vimal
4 Channel tape recorders
4 S.I.E. amplifiers
4 Low frequency seismographs
8000 ft plastiflex cable used as geophone cable
1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
4 12V 11 plate batteries
1 Instrument tent

Party 4 Personnel: UNIVERSITY OF QUEENSLAND

Equipment: Geophone spread provided by University

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
5 12V 11 plate batteries
1 Dark room tent
1 Instrument tent

Party 5 Personnel: UNIVERSITY OF QUEENSLAND

Equipment: Geophone spread provided by University

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
5 12V 11 plate batteries
1 Dark room tent
1 Instrument tent

Party 6 Personnel: UNIVERSITY OF HAWAII

Equipment: Geophone spread by University

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
5 12V 11 plate batteries
1 Dark room tent
1 Instrument tent

Party 7 — Personnel: UNIVERSITY OF HAWAII

Equipment: Geophone spread by University

B.M.R. : Same as Party 6

Party 8 — Personnel: UNIVERSITY OF NEW ENGLAND

Equipment: Geophone spread by University

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Developing tent
1 Instrument tent
5 12V 11 plate batteries

Party 9 — Personnel: UNIVERSITY OF QUEENSLAND

Equipment: Continuous Tape Recorder

B.M.R. : 1 Traeger
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 10 — Personnel: B.M.R. - E.P. PAUL

Equipment: 1 Willmore provided by Canberra
1 Carnegie attachment
1 two pen recorder
1 Traeger
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 11 — Personnel: B.M.R. - J. BROOKS

Equipment: Willmore Seismographs from Melbourne University

B.M.R. : Midwestern oscillograph
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
1 Developing tent
4 12V 11 plate batteries

Party 12 — Personnel: B.M.R. - M. CISZEK

Equipment: Willmore

B.M.R. : 1 Traeger
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
4 12V 11 plate batteries

Party 13 — Personnel: OBSERVATORY SECTION -

Equipment: Willmore seismograph provided by Mundaring Observatory

1 Traeger
1 A.W.A. receiver
1 Carnegie and attachment
1 two channel recorder
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 14 — Personnel: PORT MORESBY OBSERVATORY

Equipment: Willmore seismograph with pen recorder provided by Port Moresby Observatory

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 15 — Personnel: PORT MORESBY OBSERVATORY -

Equipment: Same as Party 14

Seismometer for A.N.U.

Party 16 — Personnel: RABAUL OBSERVATORY

Equipment: Willmore seismograph by Rabaul Observatory

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 17 Personnel: RABAUL OBSERVATORY

Equipment: Willmore seismograph by Rabaul Observatory

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Party 18 Personnel: UNIVERSITY OF QUEENSLAND

Equipment: Seismograph from University of Queensland

B.M.R. : 1 Traeger transceiver
1 A.W.A. receiver
1 Motor generator
1 Instrument tent
3 12V 11 plate batteries

Batteries — These will be supplied in Rabaul to all parties

Fuel — Arrangements will be made for fuel supplies for battery chargers at some stations, but Party Leaders are responsible for supplying a container for collecting needs from bulk supplies in each case. At most stations it will be practicable to purchase fuel from the local plantation or mission.

CONSIGNMENT OF EQUIPMENT

Participating organizations are responsible for consigning all equipment, which is not personally accompanied, IN ADVANCE to RABAUL.

All such equipment should be consigned to:-

REGIONAL STORES OFFICER,
STORES AND SUPPLY BRANCH,
RABAUL, NEW GUINEA

and cases should be marked -

SOS/VULCAN/RABAUL/RCSP

together with such other identifying marks as the consignor may require.

Cases will remain unopened until the arrival of the appropriate Party Leader who will be responsible for supervising the opening of the cases and the checking of contents.

Equipment should be insured in accordance with the normal practice of the participating organization. No responsibility can be accepted by the Government of the Commonwealth of Australia or by the Administration of the Territory of Papua and New Guinea for any loss, damage, or delay.

Notification of the despatch of equipment should be sent to the Volcanologist-in-Charge, Volcanological Observatory, Post Office Box 386, RABAUL, New Guinea. Bills of Lading and other documentation should be sent to the Regional Stores Officer, Stores and Supply Branch, Rabaul, New Guinea.

D-DAY DATED PROVISIONALLY FOR THE 20th MARCH, 1969.

DAY	SHOTS	PARTY NUMBER	GENERAL PROGRAMME MOVEMENTS									REMARKS
			BY AIR			BY SEA			BY ROAD			
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D-8 D-7 D-6		S/S										Coral Queen fitted with equipment and test run
D-5		SU	Rabaul Palmalmal	Palmalmal Au'una	Astec Helicopter							Briefing of all parties and loading of ships
D-4		17 16 3	Rabaul " "	Palmalmal " "	DC 3 or Aztec							
		17 SU 16 SU	Palmalmal Au'una Palmalmal "	Au'una Palmalmal Pakia "	Helicopter " " "							
		4 5 7 12				Rabaul " " "	Doilene Pondo Ulamona Matanakunai	Lahara " " "				
		2 8				Rabaul "	Ulu Kamdaru	Workboat "				
D-3		15 13 1 6 14 18 11	Rabaul " " "	Nissan Boang Feni Manga	Aztec Aztec Aztec Aztec	Rabaul "	Narum Lambon	Workboat "	Rabaul	Rapopo	Truck	
D-2		SU 9 10 S/S SU	Pakia Rabaul	Palmalmal Kavieng	Helicopter Aztec(?)	Rabaul	Nissan	"Coral Queen"	Rabaul	Natava	Truck	

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D- 1		SU ALL	Palmalmal	Rabaul	Aztec							Communication test
D	1											
D+ 1	2	ALL										Hifix party arrives Rabaul
D+ 2	3	ALL HFS				Rabaul	Ulu Kamdaru	Workboat "				
D+ 3	4	ALL S/S				Manga	Rabaul	"Coral Queen"				To pick up Hifix Master Party
D+ 4	5	S/S ALL				Rabaul	Ulu	C.Queen				Calibrates Hifix
D+ 5	5A	ALL										
D+ 6	6	ALL 15	Nissan	Tol	Aztec							
D+ 7	7	ALL HFS "				Kamdaru Ulu	Rabaul "	Workboat "				
D+ 8	8	ALL HFS HFS S/S	Rabaul	Hoskins	Aztec	Rabaul Jacq.Bay	C.Lambert	Workboat C.Queen				
D+ 9		S/S					C.Lambert	C.Queen				Calibrates HFS p m
D+10	9	ALL										
D+11	10	ALL										
D+12	11	ALL				Rabaul Rabaul	Kamdaru Narum	Lahara Workboat				and stand by overnight
D+13	12	ALL 14 18 S/S 10 8 2				Narum Lambon Open Bay Kamdaru Ulu	Rabaul Rabaul Rabaul Rabaul "	Workboat " C.Queen Lahara "	Natava	Rabaul	Truck	

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+14		13 1 6 15	Boang Feni Manga Tol	Rabaul " " "	Aztec " " "							
		S/S										Loads explosive and refuels(Coral Queen)
		13 14 18				Rabaul " "		Lahara " "				Leaves for Bulumuri not later than 1500 hrs.
D+15		8	Rabaul	Bialla	Aztec							
		10	"	Gasmata	"	Gasmata	Linden-hafen	Mission Workboat				
		2 15 6 1 15	" " " " Hoskins	Hoskins " Talasea Kandrian CRA	DC 3 " " " Helicopter							
		14 18				Bulumuri	Bulumuri Vitu	Lahara Lahara				
D+16		S/S				Rabaul		C.Queen				Departs for shot location 13
		13				Vitu	Bali	Lahara				
		All										3-4 p m communication tests
D+17	13	All										
D+18	14	All										
D+19	15	All										
D+20	16	All										
D+21	17	All										
D+22	18	All										
D+23	19	All										
D+24	20	All										
						Rabaul	C.Lambert	Workboat				

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+25	21	ALL HFS				C.Lambert	Natava	Workboat				
								Lahara				Lahara arrives Jacquinot Bay and stands by at Palmalmal wharf
D+26		HFS				Natava	Rabaul	Workboat				
		HFS	Hoskins	Gasmata	Aztec	Gas.wharf	Gas.Is.	Workboat	Gas.Strip	Wharf	Truck	
		HFS		Jacq.Bay	Aztec				J.B.Strip	Wharf	Tractor	Loads on Lahara
D+27		HFS				Jacq.Bay	C.Beechey	Lahara				
D+28	22	ALL										Shot position by telluro-meters
		HFS S/S										Hifix at Gasmata calibrated from C. Queen pm.
						C.Beechey		Lahara				En route Bali
D+29	23	ALL										
D+30	24	ALL										
D+31	25	ALL										
D+32	26	ALL										
D+33	27	ALL										
		S/S				Loc.27	Gasmata	C.Queen				
		13 18				Bali Vitu	Vitu	Lahara "				En route Talasea via Bulumuri
		9	Kavieng	Rabaul	1st avail. service							
		15	CRA	Hoskins	Helicopter							

DAY			BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+34		HFS				Gasm.Is.	Lindenhafen	C.Queen				En route Rabaul
		10				Lindenhfn	C.Beechey					
		14				Bulumuri	Talasea	Lahara				Parties 13,18,14 disembark and equipment stays on ship
			Hoskins	Au'una	Helicopter							
		17	Au'una	Palmalmal	"							
		16	Pakia	"	"							
D+35		12				Talasea	Matanakunai	Lahara				Loads party 12's equipment
		HFS				C.Beechey		C.Queen				
		1	Kandrian	Rabaul	DC. 3							
		3	Palmalmal	"	ex Lae							
		16	"	"	"							
		17	"	"	"							
		2	Hoskins	"	DC. 3							
		15		"	ex Rabl							
		6	Talasea	"	"							
		13	"	"	"							
		14	"	"	"							
		18	"	"	"							
		7	Ulamona	"	Aztec							
		8	Bialla	"								
D+36		12				M'kunai	Pondo	Lahara				En route Rabaul
		5				Pondo	Doilene	"				
		4				Doilene		"				
		S/S					Rabaul	C.Queen				Unload Hifix slaves and party 10
		1							Rabaul	Raluana	Truck	
		3				Rabaul	Watom	W/boat				
		16							"	Toma	"	
		17							"	Vunakanau	"	
		2							"	Nonga	"	
		6							"	Kokopo	"	
		7							"	Burma Road	"	

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+37		10							Rabaul	Praed Pt	Truck	
							Rabaul	Lahara				Parties 12, 5, 4 disembark
		15 8							Rabaul "	Tavui Rapopo	Truck "	
D+38		12				Rabaul	Credner Is.	W/boat				
		5 4 9							Rabaul " "	Vulcan Kabanga Vulcan E.	Truck " "	
		S/S SU				Rabaul "	Locat.28 "	C.Queen "				
		13 14 18							Rabaul " "	Ratangor Nordup Kuradui	Truck " "	
D+39	28 29	ALL ALL										
		SU				Loon 29	Watom Is.	C.Queen				
		SU							Rabaul	N.Daughter	Truck	Observation pt may change
D+40	30 31	ALL ALL										
		SU				Watom	Rabaul	C.Queen				
		SU							N.Daughter	Rabaul	Truck	
		SU SU							Rabaul Rabaul	? ?	Truck Truck	Two new positions to be advised
D+41	32 33 34 35 36 37	ALL ALL ALL ALL ALL ALL										
		SU				Kokopo(?)	Loc.38	C.Queen				

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+42	38	ALL										
	39	ALL										
	40	ALL										
		S/S				Loc.40	Kabanga	C.Queen				
D+43		4				Kabanga	Ulu	C.Queen				
		6				Kokopo	Kilinwata	Lahara				
		2							Nonga	Atalik-likun	Truck	
		3				Watom	Rabaul	W/boat	R'bul	Matupi	Truck	
D+44												Setting up of spreads
D+45	41	ALL										
	42	ALL										
	43	ALL										
	44	ALL										
	45	ALL										
D+46	46	ALL										
	47	ALL										
	48	ALL										
		15							Tavui	Rabaul	Truck	
		14							Norduo	"	"	
		10							Braed Pt	"	"	
		16							Toma	"	"	
		17							Vuna-kanau	"	"	
		9							Vul-can E.	"	"	
		18							Kira-dui	"	"	
		S/S				Loc.48	Kilinwata	C.Queen				
						Rabaul	Ulu	Lahara				

DAY	SHOTS	PARTY NUMBER	BY AIR			BY SEA			BY ROAD			REMARKS
			FROM	TO	VEHICLE	FROM	TO	VEHICLE	FROM	TO	VEHICLE	
D+47		6				Kilinwata	Rabaul	C.Queen				
		4				Ulu	"	Lahara				
		12				Credner Is.	"	"				
		2							Ataliklikun	Rabaul	Truck	
		3							Matupi	"	"	
		13							Ratangor	"	"	
		7							Burma Rd			
		5							Vulcan	"	"	
		1							Raluana	"	"	
		11							Rapopo	"	"	
		8							"	"	"	
D+48 to D+50		ALL										Check and pack stores and final conference
D+51		ALL										Disperse

PREPARATION OF SITES

Wilmore sites will be selected and prepared by the party occupying the site.

Coastal flats and areas close to plantation or mission activity should be avoided where possible in the interests of low noise level.

The following geophone spread sites will be cleared by an advanced party - E.J. Polak and D. Tarlington, who will arrive in Rabaul on 10th February and visit the sites by the M.V."Lahara" -

Feni Island	Pondo
Manga	Ulamona
Kamdaru	Talasea
Ulu	Hoskins
Doilene	

The geophone spread sites on the southern side of New Britain will require very little attention and will be cleared by the parties on arrival.

TRANSPORT

Marine

The Bureau of Mineral Resources will be chartering the m.v. "Coral Queen" and a work boat. The Territory Administration is making available the m.v. "Lahara".

m.v. "Coral Queen" will be used as a shooting ship and for moving a few parties in the later stages of the Project. It will also be used for Sonar Boomer traverses. The workboat will be used for positioning parties.

m.v."Lahara"will be used for positioning parties and for magnetic and other observations whenever practicable.

Air

Many party movements will be by air. The Bureau of Mineral Resources will be chartering local aircraft as required and use will be made of a Jet Ranger helicopter to position the parties occupying sites in the central mountains.

Road

The largest call for road transport will be made in the Rabaul area where both transport from government and private sources will be used.

Administration assistance with transport has been requested for Hoskins, Talasea and Kandrian.

COMMUNICATIONS

GENERAL

The state Headquarters for the Project will be the Central Vulcanological Observatory at Rabaul. The address is:

VULCANOLOGIST-IN-CHARGE,
CENTRAL VULCANOLOGICAL OBSERVATORY,
POST OFFICE BOX 386,
RABAUL NEW GUINEA

Telephone: Rabaul 2162 Telegrams: VULCAN RABAUL

The Party Leader and co-ordinator for the Project (W.A. Wiebenga and G.A.M. Taylor) will be stationed at Control at the Observatory during all active phases of the Project and will be in radio contact with all parties.

All parties will be in radio contact with Control on a frequency of 4525 Khz. There will be a General Communication Schedule each day 30 minutes after the last shot for the day has been fixed. It is important that the correct wireless procedure be used at all times. Details are given in Section. .

Time signals will be broadcast from the Observatory continuously through the recording days of the Project on a frequency of 3164 or 6815 Khz.

Most parties will be near a Transceiver through which urgent messages can be passed at normal scheduled operating hours or, in an emergency, at any hour. In the event of a breakdown of a party's own Transceiver, details should be sent to the Observatory on the first available scheduled service.

MAIL

All mail for party members should be addressed as follows:-

(Name)
Party No.
C/- Central Vulcanological Observatory,
P.O. Box 386,
RABAUL.
(TELEGRAMS: NAME PARTY NO...VULCAN RABAUL)

Mail cannot be forwarded to parties in the field, but will be available to each party when it passes through Rabaul or when a ship is uplifting a party from one position to another.

Providing Control is given authority in advance, the text of telegrams received for party members will be relayed during the General Communication Schedule. Urgent replies may be sent by the same means.

SUPPLIES

Supplies which are the property of the Participating Organizations may be sent in advance to Rabaul in accordance with the directions given in respect of Equipment. Personal effects should accompany individual party members.

There are no arrangements for re-supplying parties during the Project except those outlined above in respect of mail.

PROCEDURES

SHOOTING PROCEDURES

The details of the shooting procedure, safety measures, etc., will be given in a separate instruction to be issued to those directly concerned.

The following schedule is intended for general information of Recording Parties.

Shot times

Unless altered, and all parties warned in advance, the first shot on each shooting day will be at 0810 hrs. The times of subsequent shots will be announced after the completion of each shot.

General procedure (H-hour is shot time)

TIME	EVENT
Whilst steaming to position	Explosives for the shot will be placed in a net on launching platform on the operations deck. 350 feet of nylon rope will be attached to the net and to the float. The following equipment and supplies will be checked: 2,000 feet shotline Shot firing instruments Batteries Chronometer Recorders 4 detonators will be removed from locker and kept by shooter
Before H-40 mins	Ship reaches shot position
H-40 mins	Shot time will be confirmed to Control (See Wireless Procedure)

TIME	EVENT
H-38 mins (approx)	RADIO SILENCE ON SHIP RADAR SWITCHED OFF Detonators will be inserted in the charge and the shotline connected. The float will be thrown overboard and tethered to ship. As ship goes slow ahead charge will be launched. and shotline and rope will be payed out. When end of rope is reached float will be released from ship. Streamer with hydrophones will be lowered as ship moves 2000 feet away from the charge.
H-15 mins	RADIO SILENCE LIFTED - RADAR SWITCHED ON Ship will confirm shot time (see Wireless Procedure). Shotline will be connected to blaster. Recorders and shot tone transmitter will be switched on. Float will be tracked by radar.
H-2 mins	Earthquake clearance from Control (see Wireless Procedure)
H-1 min.	Ship confirms shot time (see Wireless Procedure). Ship's position will be fixed by Survey or Hifix.
H	Shooter shoots RADIO SILENCE (except for shot tone Transmitter).
H+2 mins	RADIO SILENCE LIFTED - Announcement regarding shot (see Wireless Procedure) Shot line will be wound in and float recovered. Entries will be made in log. Ship will proceed to next Position.

WIRELESS PROCEDURE

Each Party will be equipped with Transceiver with which to communicate with CONTROL. There will not normally be any communication between Parties other than through Control.

Call signs are as follows:-

CONTROL: VL8WM CONTROL

PARTIES: VL8WM PARTY .....

The Procedure on Communication Testing Days and on Shooting Days will be different. Details of both are given below. The phrases used in routine communication must be as shown. General Communication messages must be as brief as possible.

Communication Testing Procedure

TIME	TRANSMIT STATION	RECEIVE STATION	MESSAGE
0705 and at 5 minutes past each hour until communication is established with each Party	CONTROL	EACH PARTY IN TURN (1-18)	VL8WM CONTROL CALLING VL8WM PARTY ..... How do you read me. Over
	EACH PARTY IN TURN	CONTROL	Party .... Read you Strength (1-5) over
	CONTROL	EACH PARTY IN TURN	Read you Strength (1-5) Out
	N.B. When communication has been established with a Party, that Party will not be called again during subsequent transmissions.		

Shooting Days Procedure

H is MOMENT OF SHOT FIRING:
9 min. 50 sec. after hour or half hour.

TIME	TRANSMIT STATION	RECEIVE STATION	MESSAGE
H-65 mins (normally 0705 hrs. for first shot of day)	CONTROL	SHIP	VL8WM CONTROL calling Ship How do you read me Over.
	SHIP	CONTROL	Ship Read you strength (1-5) Shot No.... on schedule/delayed will be fired at ... hrs. Over
	CONTROL	SHIP	Roger. Out
	CONTROL	Party 1 to 18 in turn	CONTROL Calling Party ... Shot No... on schedule/delayed will be fired at ..... hrs. Over
	PARTIES 1 to 18 in turn	CONTROL	Party... ROGER Read you strength (1-5) OUT
H-40 mins (normally 0730 hrs for first shot of day)	CONTROL	SHIP	VL8WM CONTROL calling Ship How do you read me. Over.
	SHIP	CONTROL	Party 3 Read you Strength (1-5). No... on schedule/delayed will be fired at .... hrs.
	CONTROL	SHIP	Roger. OUT
	CONTROL	Party 1 to 18 in turn	CONTROL calling Party ... Shot No... on schedule/delayed will be fired at ..... hrs
	PARTIES 1 to 18 in turn	CONTROL	Party ..... ROGER. OUT
H-15 mins (normally 0755 hrs for first shot of day)	REPEAT PROCEDURE FOR H-40		
H-2 mins (normally 0808 hrs for first shot of day)	CONTROL	SHIP	VL8WM CONTROL CALLING Ship Clear to Proceed OR Earthquake hold for .....minutes. Over
	SHIP	CONTROL	Ship ROGER. Procedding with Shot OR there will be a delay of .....minutes OUT.
H-1 min (normally 0809 hrs for first shot of day)	SHIP	CONTROL AND ALL PARTIES	VL8WM Shot will be fired in one minute (Tone sequence follows).
H to H+2 mins	RADIO SILENCE		

TIME	TRANSMIT STATION	RECEIVE STATION	MESSAGE
H+2 mins (normally 0812 hrs for first shot of day)	SHIP	CONTROL	Ship Calling Control That was Shot No.... Shot No..... will follow at .....hrs. OVER or Shot No..... was a misfire. It will be repeated at ..... Hrs (normally H+60 mins) OVER.
	CONTROL	SHIP	CONTROL. ROGER OUT
	CONTROL	PARTIES 1 to 18 in turn	VL8WM CONTROL Calling Party ..... (Repeats message re shot)
	PARTIES 1 to 18 in turn	CONTROL	Party ..... ROGER. OUT
In the event of a misfire, Procedures for H-40 onwards will be repeated.			
For subsequent shots, Procedures for H-65 onwards will be repeated.			

General Communication Procedure

TIME	TRANSMIT STATION	RECEIVE STATION	MESSAGE
H+30 mins after last shot of day	CONTROL	ALL PARTIES IN TURN	VL8WM CONTROL calling Party .... I have ..... message(s) for you. Message No. 1 is:"....."(and so on).
	ALL PARTIES IN TURN	CONTROL	Party.....ROGER. I have no messages for you OUT. OR I have ..... message(s) for you. Message No. 1 is"_____" (and so on) (Messages for other Parties should be prefaced by the words "For relaying to Party....) OVER
	CONTROL	TO ALL PARTIES IN TURN WHICH HAVE SENT MESSAGES	ROGER. OUT

N.B. at the end of the schedule. CONTROL may allow direct communication between any two Parties.

Procedure if Communication not established between any Party and Control.

TRANSMIT STATION	RECEIVE STATION	MESSAGE
CONTROL	ALL STATIONS IN TURN	VL8WM CONTROL calling all Parties. Reply when called. Do you read Party.... Does he acknowledge my signals. Party 1 OVER
PARTY 1	CONTROL	PARTY 1 Reads Party.... Strength (1-5) he does/does not acknowledge your signals. OUT. OR Party 1 Not reading Party....OUT
		PROCEDURE Repeated through all stations
CONTROL	PARTY receiving out of contact station most strongly	CONTROL calling Party.... Act as repeater for Party....(out of communication with CONTROL) OUT

REPEATER STATION WILL RELAY MESSAGES FROM OUT OF CONTACT PARTY TO CONTROL IMMEDIATELY HE RECEIVES THEM.
"PARTY.....RELAYING FOR PARTY.....
" _____ "

GENERAL

LOCAL CONDITIONS

These notes are not exhaustive and are intended only as a general guide to conditions and amenities which may affect parties working on the Project.

Climate

The climate is neither unpleasant nor unhealthy. The average maximum and minimum temperatures at Rabaul in March and April are 90°F and 73°F. The mean rainfall for each of the two months is 1020 points and 1002 points respectively.

The dates of the Project have been chosen to coincide with the best sea conditions occurring in these waters during the year.

Population

Rabaul has a considerable European population and a large Chinese community in addition to the indigenous inhabitants.

English is widely spoken in the town, but in the country areas Pidgin is extensively used. However, there will be a number of English-speaking people at all the sites which are being used for Stations during the Project.

There is no racial discrimination in the Territory but this does not mean that those of different nationalities necessarily share all the same tastes or customs. Some natural segregation based on a mutual respect for each other's customs and way of life does, therefore, occur. The stranger need have no fear of causing offence if he observes the simple behaviour patterns adopted by the rest of the mixed community in which he finds himself. To avoid embarrassment it should be noted that tipping is not practiced in the Territory except as a reward for some special service; and it is equally important to remember that rates of pay for casual labour vary from place to place. It is best to enquire from the Mission, Plantation, or Government Station what the appropriate rate is for any casual help (such as personal service, line-cutting, carrying, etc.) which may be required.

Clothing

Shorts and short-sleeved shirts are common wear by day. In town these are accompanied by long stockings and shoes.

At night, long trousers and long-sleeved shirts are commonly worn as a protection against mosquitoes. In town, a tie is customarily worn in the evening, and in most hotels long trousers and tie are compulsory.

Shopping

Most everyday commodities are available in Rabaul, and in the smaller stations there is frequently a Trade Store where simple necessities can be purchased.

Entertainment

There are cinemas in Rabaul, but in the smaller places there is no formal entertainment available. The Australian Broadcasting Commission operates a service throughout the day on Station 9RB - Rabaul on a frequency of 810 Khz. This should be receivable throughout the area, but, reception may be poor at some sites, Short wave stations operating from Port Moresby can be received at most places.

Health

It is necessary to take an anti-malarial prophylactic throughout the time spent in the Territory and for at least one month after leaving it.

A good antiseptic should always be kept handy for the immediate treatment of minor cuts which otherwise go septic very easily.

ASSEMBLY

Party Leaders are responsible for ensuring that personnel assemble in Rabaul in time to prepare their equipment in readiness for the start of the Project.

Requests for the reservation of accommodation in Rabaul prior to the start of the Project, and after the return to Rabaul before dispersal, should be sent to the Vulcanologist-In-Charge at Rabaul by the end of ~~August~~. January

Parties from overseas should make through air bookings to RABAUL. All flights from Australia now terminate in Port Moresby, but there are connecting flights to Rabaul.

The Senior Resident Geologist, whose address is:

P.O. Box 778,
Port Moresby,
PAPUA and NEW GUINEA

Telephone PORT MORESBY 4128-9 TELEGRAMS: GEOLANDS PORT MORESBY

should be advised of travel arrangements. It must be noted that each individual must have an Entry Permit obtainable from the nearest Australian Embassy, or from the Department of Territories, Canberra, before he can embark on a flight to the Territory.

BRIEFING

A briefing will be held in RABAUL on Saturday, 15th March. All Party Leaders will be required to attend.

POST-PROJECT CONFERENCE

Details of this will be arranged at a later date, and Party Leaders will be informed. It will be held in Rabaul at some convenient time before dispersal.

DISPERSAL

Party Leaders will be responsible for packing and consigning all their equipment to their own establishments. They will also be responsible for making return travel reservations for all personnel. The staff of the Observatory will assist in both these matters as far as possible but cannot accept responsibility for the arrangements.

SUMMARY OF PARTY MOVEMENTS

			BMR	BMR	ANU	Q.U.	Q.U.	HAW	HAW	N. ENG.	Q.U.	BMR	BMR	BMR	BMR	BMR	P. Mo.	RAB	RAB	Q.U.		
	Survey	Shooting Ship "CORAL QUEEN"	P.1 POLAK	P.2 WHITELEY	P.3 DOYLE	P.4	P.5	P.6 FURUMOTO	P.7 CAMPBELL	P.8 NICOL	P.9 KAVIENG	P.10 PAULL	P.11 BROOKS	P.12 CISZEK	P.13 JONES	P.14 CONNALLY	P.15	P.16	P.17	P.18	Hifix	
D-8		Installation of Equipment																				
D-7 D-6																						
D-5	Rabaul → Palmalmal → Au'una Aztec and Helicop																					
D-4	Au'una Palmalmal Helicop.	Trial runs		Rab. → Ulu Work boat	Rab → Palmalmal DC 3 or Aztec	Rab → Doilene Lahara	Rab. → Pondo Lahara		Rab. → Ulamona Lahara	Rab. → Kamdaru Work boat				Rab. → Matanakunai Lahara				Rab. → Palmalmal Aztec or DC 3	Rab → Palmalmal Aztec or DC 3			
	Palmalmal Pakia Helicop.																	Palmalmal → Pakia Helicop.	Palmalmal → Au'una by Helicop			
D-3		Loading	Rab.→ Feni Aztec					Rab. → Manga Aztec					Rab → Rapopa Truck		Rab → Boang Aztec	Rab. → Narum Work boat	Rab. → Nissan Aztec			Rab. → Lambom Work boat		
D-2	Pakia → Palmalmal Helicop. Other party Embarks C Queen	Rab.→ Nissan									Rab → Kavieng Aztec	Rab. → Natava Truck										
D-1	Palmalmal → Rabaul Aztec	Communication test →																				
D		Shot 1																				
D+1		Shot 2																			Arrives in Rab.	
D+2		Shot 3																			Rab → Ulu Work boat	
D+3		Shot 4 Manga → Rabaul Pick up Hifix master																			Rab → Kamdaru	
D+4		Rab. → Ulu Calibrates Hifix Shot 5																				
D+5		Shot 5A																				
D+6		Shot 6															Nissan → Tol. Aztec					
D+7		Shot 7																			Kamdaru and Ulu → Rabaul work boat	
D+8		Shot 8 Jacquinot Bay → C.Lambert																			Rabaul → Hoskins Aztec	
D+9		Arrives C. Lambert Calibrates Hifix																			Rab. → C.Lambert Work boat	
D+10		Shot 9																				
D+11		Shot 10																				
D+12		Shot 11																				
D+13		Shot 12 Open Bay → Rabaul		Ulu → Rabaul Lahara						Kamdaru → Rabaul Lahara		Natava → Rabaul Truck				Narum → Rabaul Work boat				Lambom → Rabaul Work boat		
D+14		Loads explosives refuels	Feni → Rab. Aztec					Manga → Rab. Aztec							Boang → Rab. Aztec		Tol → Rab. Aztec					
D+15			Rab. → Kandrian DC 3	Rab. → Hoskins DC 3				Rab. → Tallasea DC 3		Rab → Bialla Aztec		Rab.→ Gasmata Aztec			Rab. → Bali Lahara	Rab. → C.Holman Lahara	Rab → Hoskins DC 3			Rab. → Vitu Lahara		
												Gasmata → Linden hafen Work boat				Arrives Bulumuri Lahara	Hoskins → CRA Helicop.			Arrives Vitu Lahara		
D+16		Departure Rabaul													Arrives Bali Lahara							
D+17		Shot 13																				
D+18		14																				
D+19		15																				
D+20		16																				
D+21		17																				
D+22		18																				
D+23		19																				
D+24		20																				
D+25		Shot 21																			C.Lambert → Natava Work boat	
D+26																					Natava → Rabaul Work boat	
																					Hoskins → Gasmata Aztec → Wharf – truck → Island Work boat	
																					Rab → Jacquinot B Aztec Strip → wharf tractor Loads on Lahara	
D+27																					To C Beechey by Lahara	
D+28		Shot 22 → Gasmata Calibrate Hifix																				
D+29		Shot 23																				
D+30		Shot 24																				
D+31		Shot 25																				
D+32		Shot 26																				
D+33		Shot 27 → Gas-mata									Kavieng → Rab air serv.				Bali → Talasea by Lahara		CRA → Hoskins Helicop			Vitu → Talasea by Lahara		
D+34												Lindenh → Gasm → Rab. C.Queen				Bulumuri → Talasea Lahara		Pakia → Palmalmal Helicop.	Au'una → Palmalmal Helicop.		Gasmata → Rab Coral Queen	
D+35		Coral Queen Rab.	Kandrian → Rab. DC 3	Hoskins → Rab DC 3	Palmalmal → Rab DC 3			Talasea → Rab. DC 3	Ulamona → Rab. Aztec	Bialla → Rab Aztec				Matanakunai → Rab Lahara	Talasea → Rab. DC 3	Talasea → Rab DC 3	Hoskins → Rab DC 3	Palmalmal → Rab. DC 3	Palmalmal → Rab. DC 3	Talasea → Rab. DC 3	C. Beechey → Rab. Coral Queen	
D+36		Refuels	Rab → Raluana Truck	Rab. → Nonga Truck	Rab. → Watom Is Work boat	Doilene → Rab. Lahara	Pondo → Rab. Lahara	Rab. → Kokopo Truck	Rab → Burma Rd Truck			Disembarks from C. Queen						Rab → Toma Truck	Rab → Vunakanau Truck		Disembark from Coral Queen	
D+37		Loads Explosives				Disembark from Lahara	Disembark from Lahara			Rab. → Rapopo Truck		Rab. → Praed Pt Truck		Disembark from Lahara			Rab → Tavui Truck					
D+38	Embarks on C.Queen	Rab. → location 28				Rab. → Kabanga Truck	Rab. → Vulcan Truck				Rab. → Vulcan Embayment Truck			Rab. → Credner Is Work boat	Rab. → Ratangor by Truck	Rab. → Nordup by Truck				Rab. → Kuradui by Truck		
D+39	Disembark Watom	Shot 28 Shot 29																				
	Rab. → North Daughter by Truck																					
D+40	Watom → Rab by C.Queen	Shot 30 Shot 31																				
	No. Daughter → Rab Truck																					
D+41	To new positions	Shot 32 33 34 35 36 37																				
	Embarks C.Queen at Kokopo ?																					
D+42		Shot 38 39 40 → Kabanga																				
D+43				Nonga → Atalikikun Truck	Watom → Rab Work boat	Kabanga → Ulu C.Queen		Kokopo → Kilinwata Lahara														
D+44					Rab → Matupi Truck																	
D+45		Shot 41 42 43 44 45																				
D+46		46 47 48 → Kilinwata									Vulcan → Rab. Truck	Praed Pt → Rab. Truck				Nordup → Rab. Truck	Tawui → Rab. Truck	Toma → Rab Truck	Vunakanau → Rab. Truck	Kuradui → Rab. Truck		
D+47			Raluana → Rab Truck	Atalikikun → Rab Truck	Matupi → Rab Truck	Ulu → Rab Lahara	Vulcan → Rab Truck	Kilinwata → Rab C. Queen	Burma Rd → Rab. Truck	Rapopo → Rab. Truck			Rapopo → Rab Truck	Credner → Rab. Lahara	Ratangor → Rab. Truck							
	SU	CORAL QUEEN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	HIFIX	

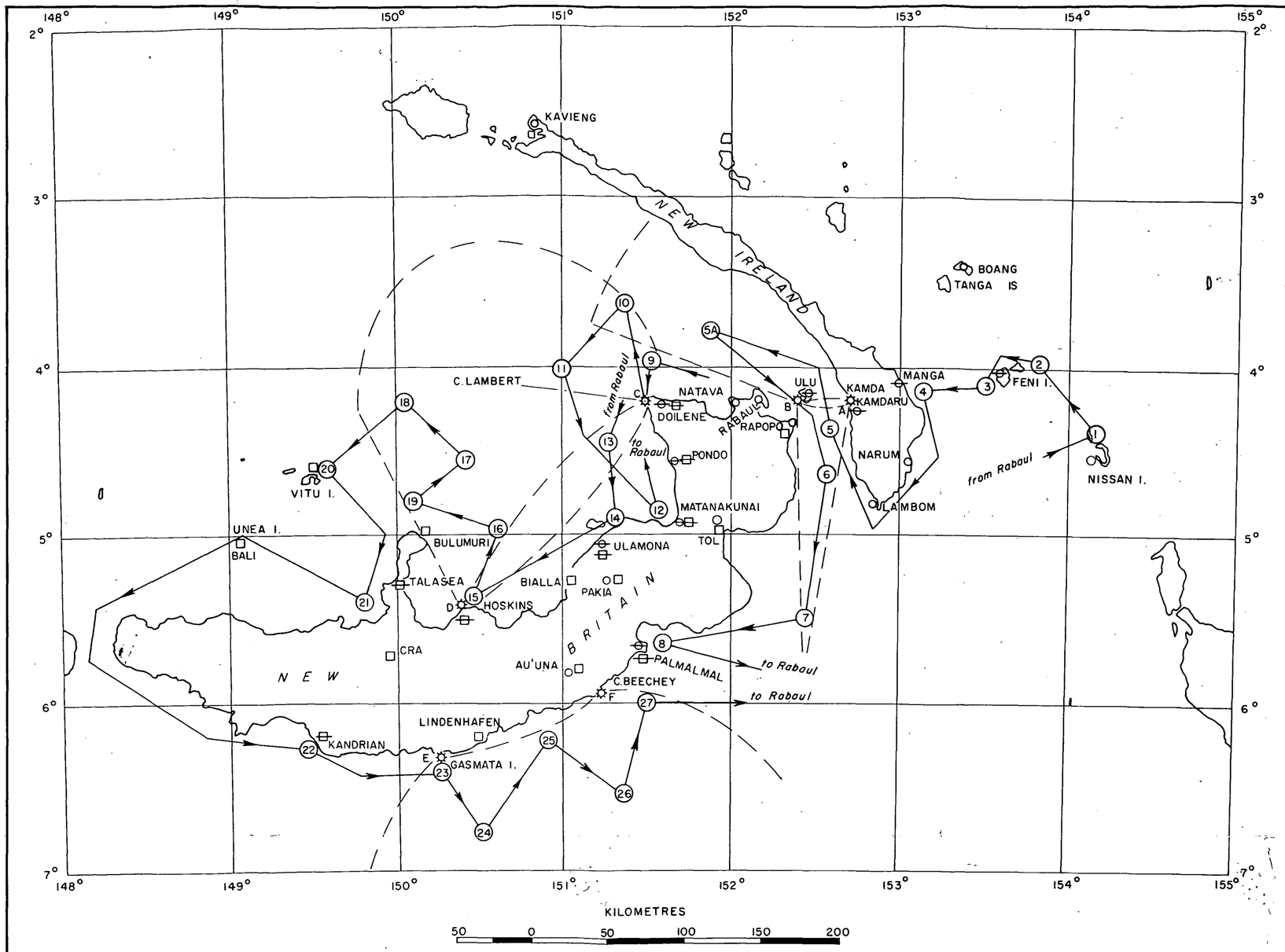
Stage 1 and 2

Stage 3 and 4

NEW BRITAIN CRUSTAL INVESTIGATION 1969

SHOT POINTS AND STATION SITES

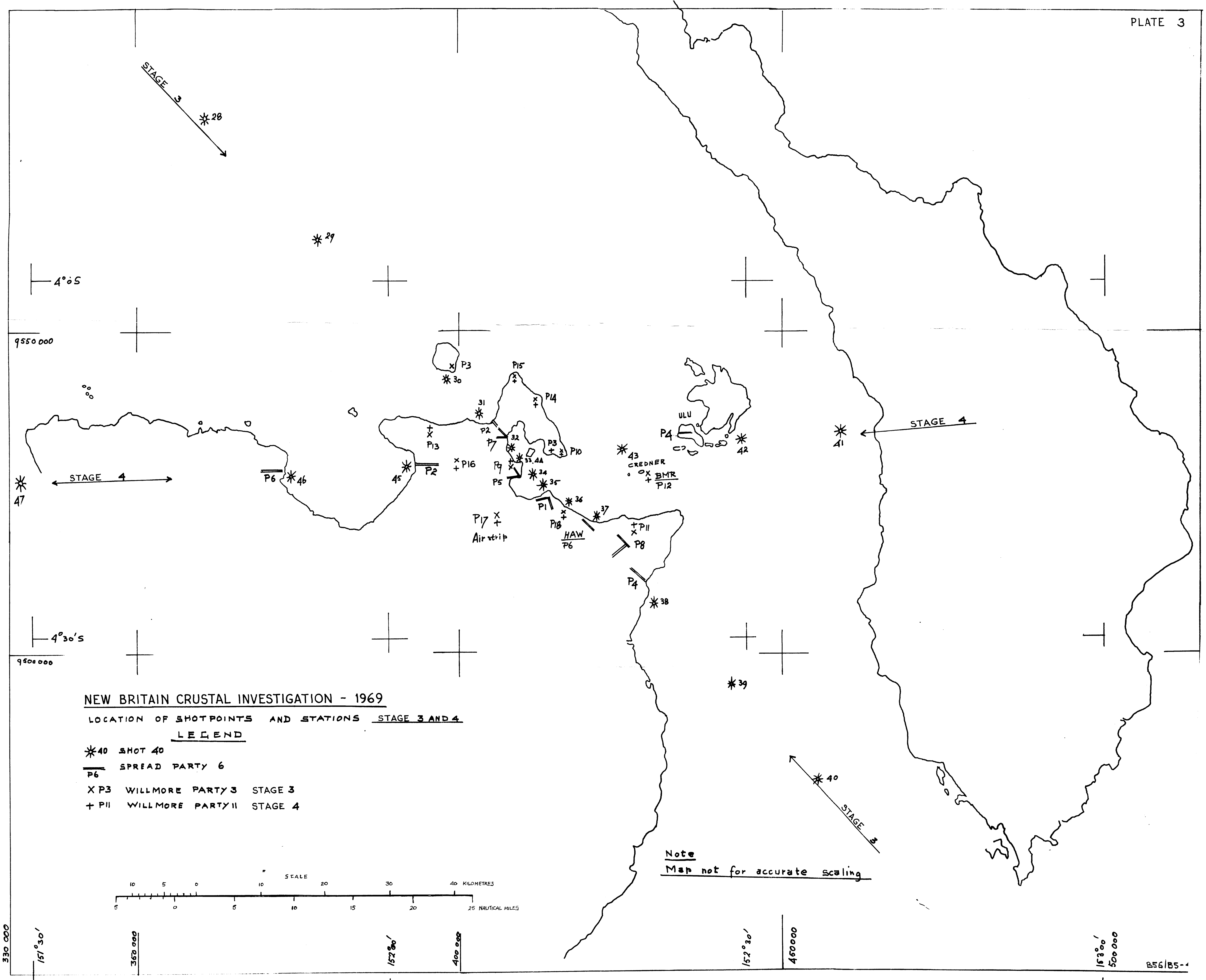
STAGE I AND II



LEGEND

- Spread Seismic stage 2
- Spread Seismic stage 1
- Station WILLMORE stage 2
- Station WILLMORE stage 1
- (8) (Marine) shotpoint 8
- Ship's track
- E ✡ HI Fix station E
- Limit O of HI Fix coverage

PLATE 3


NEW BRITAIN CRUSTAL INVESTIGATION - 1969
LOCATION OF SHOTPOINTS AND STATIONS STAGE 3 AND 4
LEGEND
40 SHOT 40
P6 SPREAD PARTY 6
X P3 WILLMORE PARTY 3 STAGE 3
+ P11 WILLMORE PARTY 11 STAGE 4
STAGE 3
STAGE 4
4°0'S
4°30'S
9550 000
9500 000
ULU
CREDNER
BMR
HAW
Airstrip
Note
Map not for accurate scaling
SCALE
KILOMETRES
NAUTICAL MILES
330 000
151°30'
350 000
152°00'
400 000
152°30'
460000
153°00'
500 000
B56/B5-4

SUMMARY OF SHIP MOVEMENTS

PLATE 4

DAY	"LAHARA"	WORKBOAT	"CORAL QUEEN"
D-8			
D-7			
D-6			
D-5			
D-4	RABAUL → DOILENE	(P2, P8) RABAUL → ULU → KAMDARU RETURN → RABAUL AT NIGHT	TEST RUNS
D-3	(P4,P5,P7,P12) DOILENE → PONDO → → MATANAKUNA → ULAMONA	(P14,P18) RABAUL → NARUM and LAMBON	
D-2	RETURN → RABAUL	RETURN → RABAUL	(SU/SS) RABAUL → NISSAN
D-1			
D			Shot 1
D+1			Shot 2
D+2		(Hifix) RABAUL to ULU and KAMDARU RETURN → RABAUL	Shot 3
D+3			Shot 4 MANGA → RABAUL
D+4			RABAUL → ULU Shot 5
D+5			Shot 5 A
D+6			Shot 6
D+7		(Hifix) KAMDARU → ULU and RABAUL	Shot 7
D+8		(Hifix) RABAUL → C. LAMBERT	Shot 8 JACQUINOT BAY → C. LAMBERT
D+9			CALIBRATES
D+10			Shot 9
D+11			Shot 10
D+12	RABAUL → KAMDARU	RABAUL → NARUM	Shot 11
D+13	KAMDAR → ULU and RABAUL (P8,P2)	NARUM → LAMBON and RABAUL (P14,P18)	Shot 12 RETURN → RABAUL
D+14	(P13,P14,P18) RABAUL → BULUMURI befor 1500 hrs		
D+15	BULUMURI → VITU (P18)	(P10) GASMATA → LINDENHAFEN	
D+16	VITU → BALI (P13)		RABAUL → Shot 13 LOCATION
D+17			Shot 13
D+18			Shot 14
D+19			Shot 15
D+20			Shot 16
D+21			Shot 17
D+22			Shot 18
D+23			Shot 19
D+24		RABAUL → C. LAMBERT	Shot 20
D+25	Lahara arrives in JACQUINOT BAY — PALMALMAL	C. LAMBERT → NATAVA (Hifix)	Shot 21
D+26		NATAVA → RABAUL (Hifix) GAS. WHARF → GAS. IS (Hifix)	
D+27	JACQ. BAY → C. BEECHEY (Hifix)		
D+28	C. BEECHEY → BALI (4 days magnetic work)		Shot 22 → GASMATA → CALIBRATES
D+29			Shot 23
D+30			Shot 24
D+31			Shot 25
D+32			Shot 26
D+33	BALI → VITU → BULUMURI (P13, P18)		Shot 27 → GASMATA
D+34	BULUMURI → TALASEA (P13,P14,P18 disembark) (P14)		GASMATA IS. → LINDENHAFEN (P10) LINDENHAFEN → C. BEECHEY
D+35	TALASEA → MATANAKUNAI		C. BEECHEY → RABAUL
D+36	(P12) MATANAKUNAI → PONDO PONDO (P5) → DOILENE (P4) → RABAUL	RABAUL → WATOM (P3)	RABAUL
D+37	RABAUL (P12,P5,P4 disembark)		
D+38		RABAUL → CREDNER IS (P12)	RABAUL → LOCATION 28 (SU)
D+39			Shot 28 LOCATION 29 → WATOM IS. (SU) Shot 29
D+40			Shot 30 WATOM → RABAUL Shot 31 (SU)
D+41			Shots 32, 33, 34, 35, 36, 37 KOPOKO → LOCATION 38
D+42			Shot 38 LOCATION 40 → KABANGA Shot 39 Shot 40
D+43	KOKOPO → KILINWATA (P6)	WATOM → RABAUL (P3)	KABANGA → ULU (P4)
D+44			
D+45			Shots 41, 42, 43, 44, 45
D+46	RABAUL → ULU		Shots 46, 47, 48 → KILINWATA
D+47	ULU → CREDNER IS. → RABAUL (P4,P12)		KILINWATA → RABAUL (P6)
D+48			*LOADING SONAR BOOMER*
D+49			
D+50			
D+51			*MOVEMENT AS REQUIRED*

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