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BATHYMETRIC ATLAS OF THE NORTHWESTERN PACIFIC

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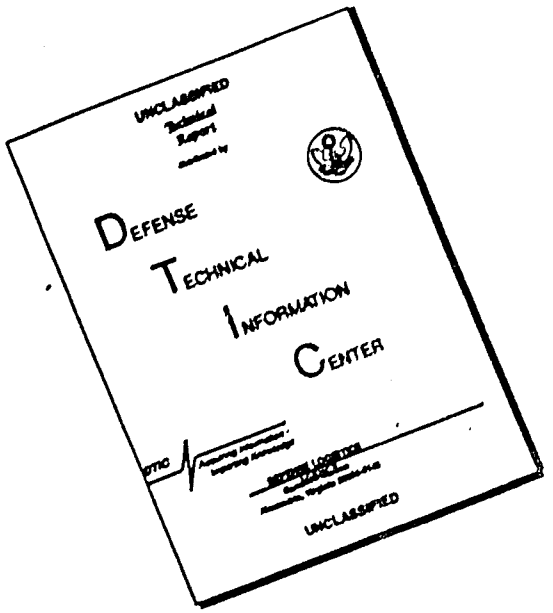

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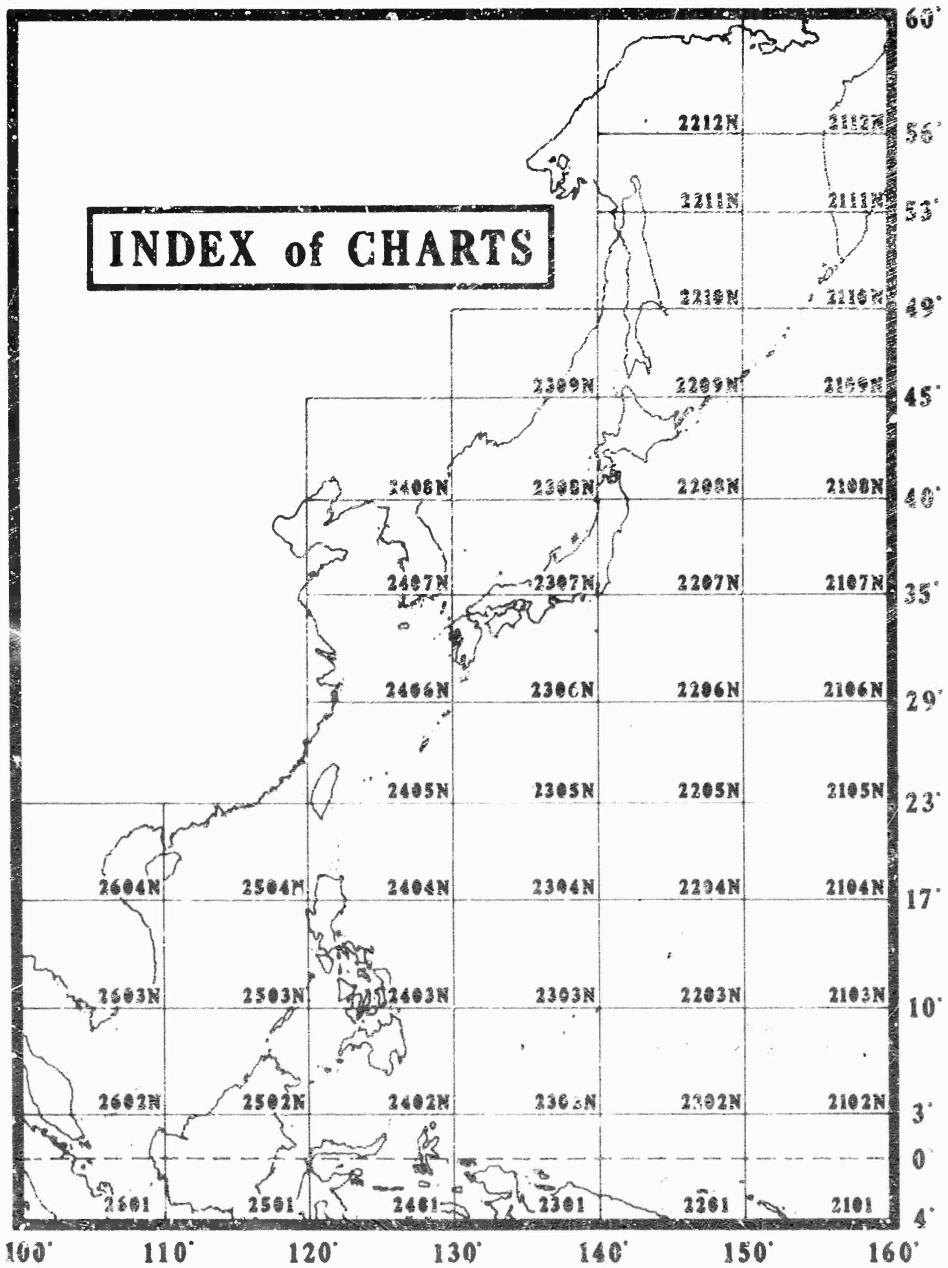
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FOR

U.S. NAVAL OCEANOGRAPHIC OFFICE

1969

Charts Compiled Under Direction of T.E. Chase and H.W. M

in Cooperation with

UNDERSEA SURVEILLANCE OCEANOGRAPHIC CENT

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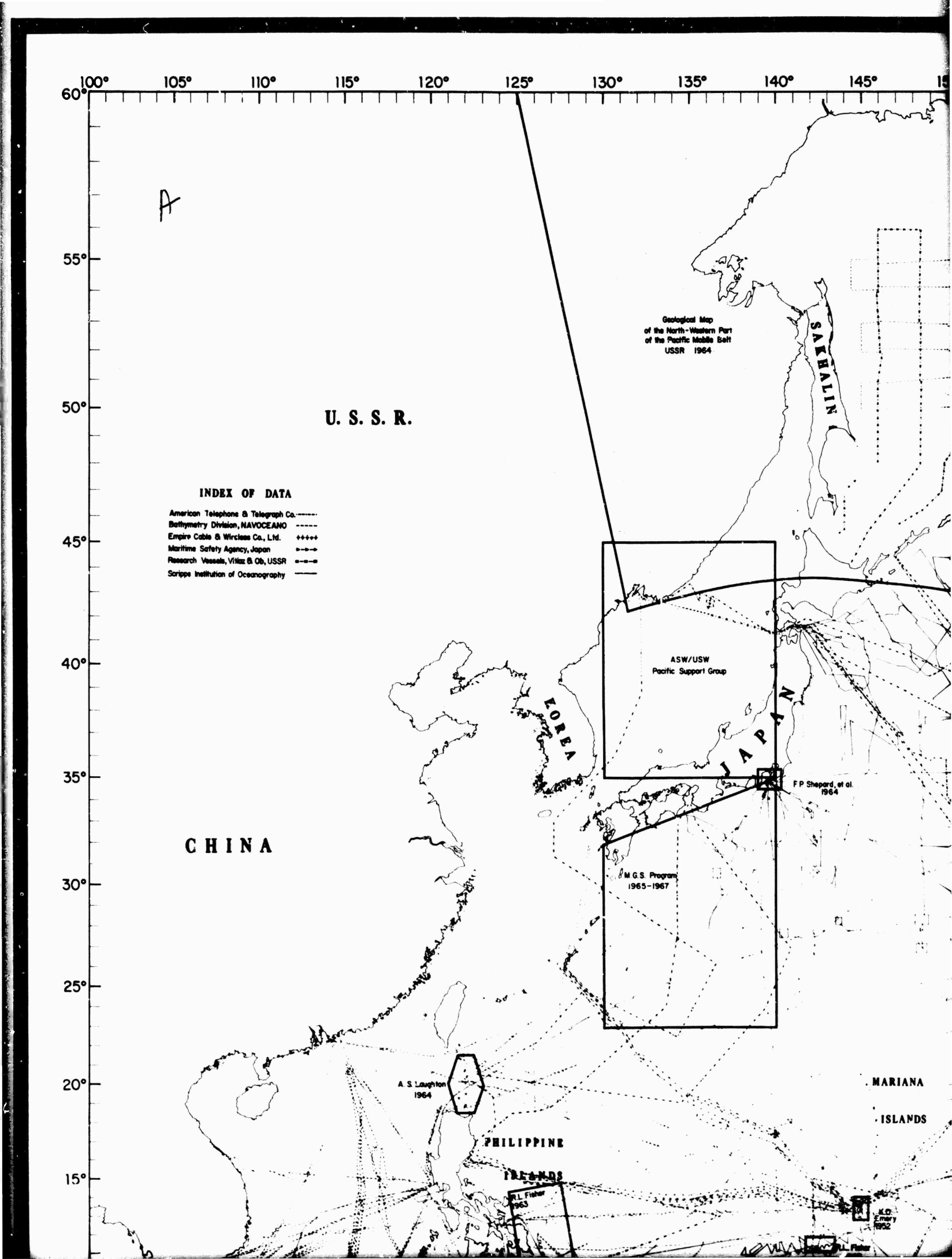
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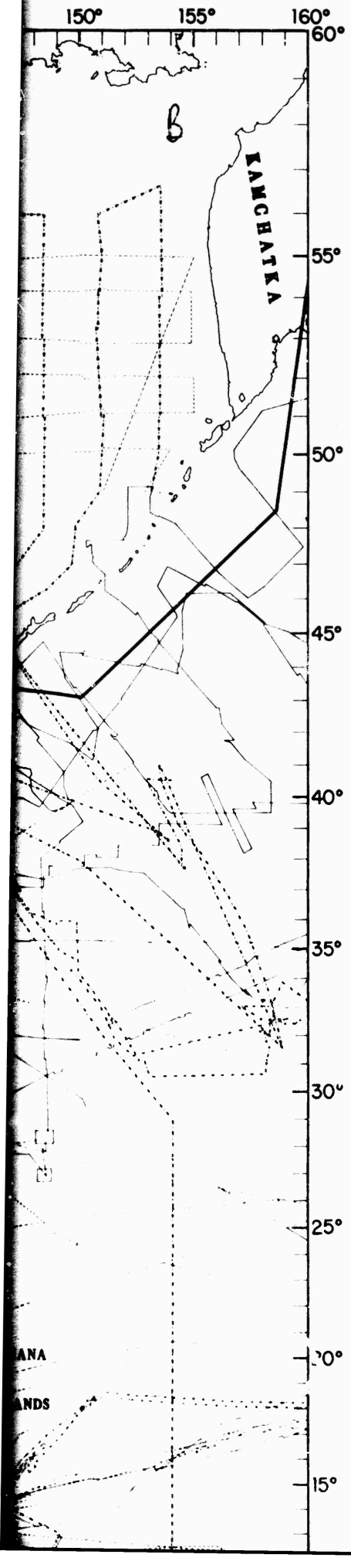

INTRODUCTION

The Scripps Institution of Oceanography, under a contract with the Undersea Surveillance Oceanographic Center, U.S. Naval Oceanographic Office, is preparing sea floor topographic charts of the North Pacific Ocean. Four series of charts are being produced: Physiographic charts (10 sheets); bathymetric contour charts (10 sheets); bathymetric contour charts at approximately 1:1,000,000 scale (160 sheets); and 3 atlases of bathymetric contour charts, of which this atlas is the first.

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Most of the existing bathymetric charts of the area lack sufficient detail, are of too small a scale, or are too out of date for use in many studies of sea floor structure and tectonics.

This atlas contains 49 bathymetric charts covering nearly 7½ million square miles of the North Pacific Ocean between 4°S. and 60°N. latitude and between 100°E. and 160°E. longitude, including the South and East China, Yellow, Japan, and Okhotsk Seas. It is an interpretation of the sea floor relief, based upon compiling and analyzing the best sounding data and contour charts available. The contour interval (200 fathoms) was selected to show the greatest detail consistent, over most of the area, with the quantity of available soundings and the navigational precision. However, the charts in this atlas are not designed for and should not be used for navigation. In addition to the basic contour interval of 200 fathoms the 100 fathom contour is shown as a dashed line and 20 fathom contours are included in regions having wide continental shelves. The contours represent depths uncorrected for variations in the velocity of sound in sea water from the assumed mean velocity of 4800 ft./sec (800 fm./sec).

The scale of the atlas charts is approximately 1:2,000,000 and are reductions of charts prepared at a scale of about 1:1,000,000. Names of most features on the charts conform to those approved by the U.S. Board of Geographic Names or recommended by the Naval Oceanographic Office. Those which have not been approved as yet are being submitted to the board.

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Two additional atlases are being prepared to complete coverage of the North Pacific Ocean; one for the North Central Pacific between 160°E. to 140°W. longitude, and the North Eastern Pacific between 140°W. longitude to the coasts of North and South America.

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The track chart shows the different sources of data used. The most useful was original echograms or soundings with high navigational quality.

J. C. Sylvester, Bathymetry Division (NAVOCEANO) supplied random soundings for each chart plus microfilm copies of original echograms and ships navigational tracks.

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The black-bordered areas are regions of detailed investigations by individual persons or institutions.

T. W. C. Hilde (ASW/USW Project) has been acquiring data in and studying the South China Sea for several years. His efforts were included throughout that region.

Echo sounding equipment used to gather data for the charts included the Edo Corporation Sonar Sounding Set AN/UQN-1B, Westrex Corporation Mark V, X, and XV Precision Depth Recorders (PDR), Thomas Gifft Company Depth Recorder (GDR) Alden Electronic and Impulse Recording Equipment Company, Inc, Precision Graphic Recorder (PGR), Alpine Geophysical Associates, Inc., Precision Echo Sounder Recorder (PESR), and Kelvin-Hughes Echo Sounder.

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All available data were evaluated for navigational precision and depth reliability. When original fathograms, or copies,

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ACKNOWLEDGM

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A. J. Henry, D. E. Karig, J. Mammerickx
W. L. Smith of Scripps Institution of
Busch and R. J. Van Wyckhouse of the
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and T. W. C. Hilde of the ASW/U
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EVALUATION OF DATA

All available data were evaluated for navigational precision

Basic knowledge of structural and tectonic conditions were used in the chart preparations. Where sounding data were not sufficient to give detailed portrayal, interpolation was extended to gain the best configuration.

CONCLUSIONS

The charts show many previously uncharted seamounts and trend determinations of other primary structural features, such as trenches and ridges, plus limits of large physiographic provinces.

The charts presented here do not represent the final definitive configuration of the seafloor. Many precise and detailed surveys will be needed throughout the world's oceans to give such complete coverage. It is felt, however, that the scale and contour interval used is sufficient to give as complete a seafloor portrayal as is possible commensurate with the data presently available and our current knowledge of submarine geologic structures and processes.

ACKNOWLEDGMENTS

The overall preparation of the charts was under the direction of T. E. Chase and H. W. Menard. Contouring was done by A. J. Henry, D. E. Karig, J. Mammerickx, D. A. Newhouse, and W. L. Smith of Scripps Institution of Oceanography, R. J. Busch and R. J. Van Wyckhouse of the Undersea Surveillance Oceanographic Center, NAVOCEANO, while assigned to S.I.O. and T. W. C. Hilde of the ASW/USW Project; Pacific Support Group, NAVOCEANO. Base charts were prepared by V. Moore and final drafting was done by L. Hydock, M. Schoenbechler, I. L. Taylor, C. L. Buffington, W. L. Crocker, L. J. Thomas, J. Pelegano, M. Loos, G. O. Peterson, B. Rooney and L. Mason.

S. M. Smith, G. F. Sharman, S. L. Ayer, J. E. Crouch and J. Troyer digitized the bathymetric and navigation data and developed computer programs to handle the data.

This project was funded by the U.S. Naval Oceanographic Office, Undersea Surveillance Oceanographic Center, under contract N62306-67-C-0224. Technical Officer: John K. Duncan

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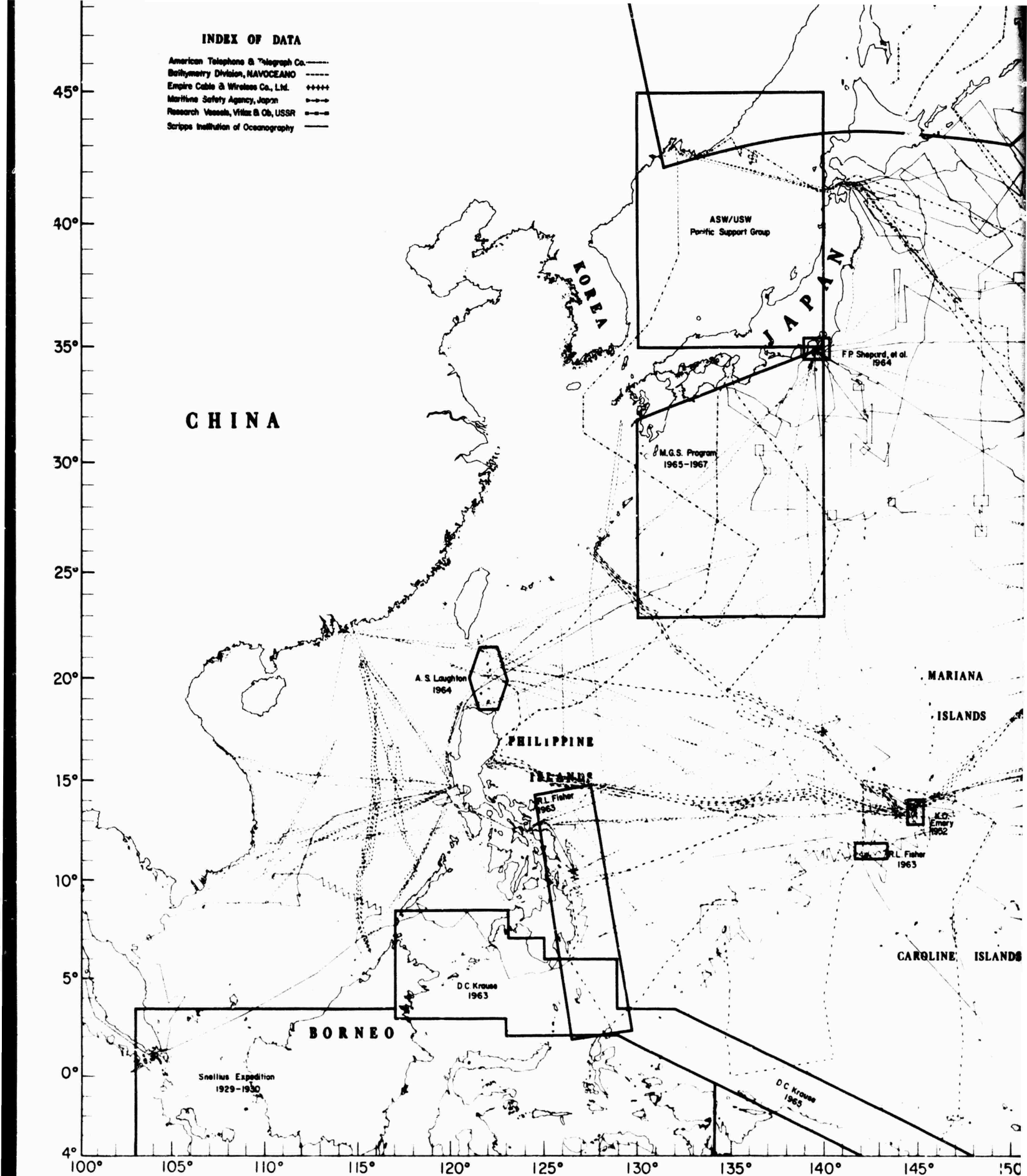
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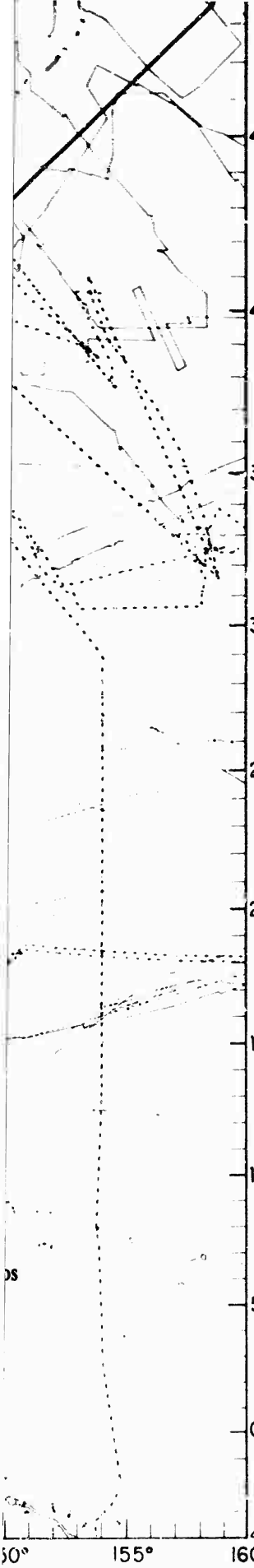

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EVALUATION OF DATA

All available data were evaluated for navigational precision and depth reliability. When original fathograms, or copies, could be examined, record quality and sufficiency of annotation were also included in the evaluation. From this evaluation certain high quality tracks were selected to form the framework or control to which the track data of poorer quality and random sounding were referenced. This technique is analogous to the manner in which geodetic data binds local land survey data to common references. Only when the original data were available for examination, and proved to be of the highest quality, were they digitized for the computer data bank.

A large amount of data was already in contoured chart form, but often in corrected or uncorrected meters. Precision contour overlays were made of these charts with conversions to uncorrected fathoms, utilizing Matthew's Tables, being made when applicable. Basically, the charts were compiled by standard cartographic techniques using the Naval Oceanographic Office H.O. 3000 series mylar plotting sheets as base charts. Extensive use of stable base materials was made throughout the compilation. Coastline configurations were taken from existing Naval Oceanographic Office navigation charts of various scales. All data evluation, selection, contouring and editing was done by marine geologists. Final drafting, data preparation, and data digitizing was accomplished by geological and computer technicians.

Oceanographic Center, NAVOCEANO and T. W. C. Hilde of the ASW/ Support Group, NAVOCEANO. Base V. Moore and final drafting was d Schoenbechler, I. L. Taylor, C. L. Buff J. Thomas, J. Pelegano, M. Loos, G. O. L. Mason.

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most of the area, with the quantity of available soundings and the navigational precision. However, the charts in this atlas are not designed for and should not be used for navigation. In addition to the basic contour interval of 200 fathoms the 100 fathom contour is shown as a dashed line and 20 fathom contours are included in regions having wide continental shelves. The contours represent depths uncorrected for variations in the velocity of sound in sea water from the assumed mean velocity of 4800 ft./sec (800 fm./sec).

The scale of the atlas charts is approximately 1:2,000,000 and are reductions of charts prepared at a scale of about 1:1,000,000. Names of most features on the charts conform to those approved by the U.S. Board of Geographic Names or recommended by the Naval Oceanographic Office. Those which have not been approved as yet are being submitted to the board.

The locations of the charts are shown in the index on the cover using the numbering system employed by the Naval Oceanographic Office in its Contour Position Plotting Chart (BC) series.

Two additional atlases are being prepared to complete coverage of the North Pacific Ocean; one for the North Central Pacific between 160°E. to 140°W. longitude, and the North Eastern Pacific between 140°W. longitude to the coasts of North and South America.

SOURCES OF DATA

The track chart shows the different sources of data used. The most useful was original echograms or soundings with high navigational quality.

J. C. Sylvester, Bathymetry Division (NAVOCEANO) supplied random soundings for each chart plus microfilm copies of original echograms and ships navigational tracks.

Marine Geophysical Surveys (NAVOCEANO) supplied original echograms of detailed surveys in the North Philippine Sea. The ASW/USW Project (NAVOCEANO) under Mr. W. T. Hammond supplied soundings of extensive surveys in the Sea of Japan. Published charts from the Maritime Safety Agency, Japan and the USSR gave detail in areas where soundings were sparse.

The black-bordered areas are regions of detailed investigations by individual persons or institutions.

T. W. C. Hilde (ASW/USW Project) has been acquiring data in and studying the South China Sea for several years. His efforts were included throughout that region.

Echo sounding equipment used to gather data for the charts included the Edo Corporation Sonar Sounding Set AN/UQN-1B, Westrex Corporation Mark V, X, and XV Precision Depth Recorders (PDR), Thomas Gifft Company Depth Recorder (GDR) Alden Electronic and Impulse Recording Equipment Company, Inc., Precision Graphic Recorder (PGR), Alpine Geophysical Associates, Inc., Precision Echo Sounder Recorder (PESR), and Kelvin-Hughes Echo Sounder.

EVALUATION OF DATA

All available data were evaluated for navigational precision and depth reliability. When original fathograms, or copies, could be examined, record quality and sufficiency of annotation were also included in the evaluation. From this evaluation certain high quality tracks were selected to form the framework or control to which the track data of poorer quality and random sounding were referenced. This technique is analogous to the manner in which geodetic data binds local land survey data to common references. Only when the original data were available for examination, and proved to be of the highest quality, were they digitized for the computer data bank.

A large amount of data was already in contoured chart form, but often in corrected or uncorrected meters. Precision contour overlays were made of these charts with conversions to uncorrected fathoms, utilizing Matthew's Tables, being made when applicable. Basically, the charts were compiled by standard cartographic techniques using the Naval Oceanographic Office H.O. 3000 series mylar plotting sheets as base charts. Extensive use of stable base materials was made throughout the compilation. Coastline configurations were taken from existing Naval Oceanographic Office navigation charts of various scales. All data evluation, selection, contouring and editing was done by marine geologists. Final drafting, data preparation, and data digitizing was accomplished by geological and computer technicians.

R. E. Boggs, Scripps Institution of Oceanography, R. J. Busch and R. J. Van Wyckhouse of the Undersea Surveillance Oceanographic Center, NAVOCEANO, while assigned to S.I.O. and T. W. C. Hilde of the ASW/USW Project; Pacific Support Group, NAVOCEANO. Base charts were prepared by V. Moore and final drafting was done by L. Hydock, M. Schoenbechler, I. L. Taylor, C. L. Buffington, W. L. Crocker, L. J. Thomas, J. Pelegano, M. Loos, G. O. Peterson, B. Rooney and L. Mason.

S. M. Smith, G. F. Sharman, S. L. Ayer, J. E. Crouch and J. Troyer digitized the bathymetric and navigation data and developed computer programs to handle the data.

This project was funded by the U.S. Naval Oceanographic Office, Underrea Surveillance Oceanographic Center, under contract N62306-67-C-0224. Technical Officer: John K. Duncan

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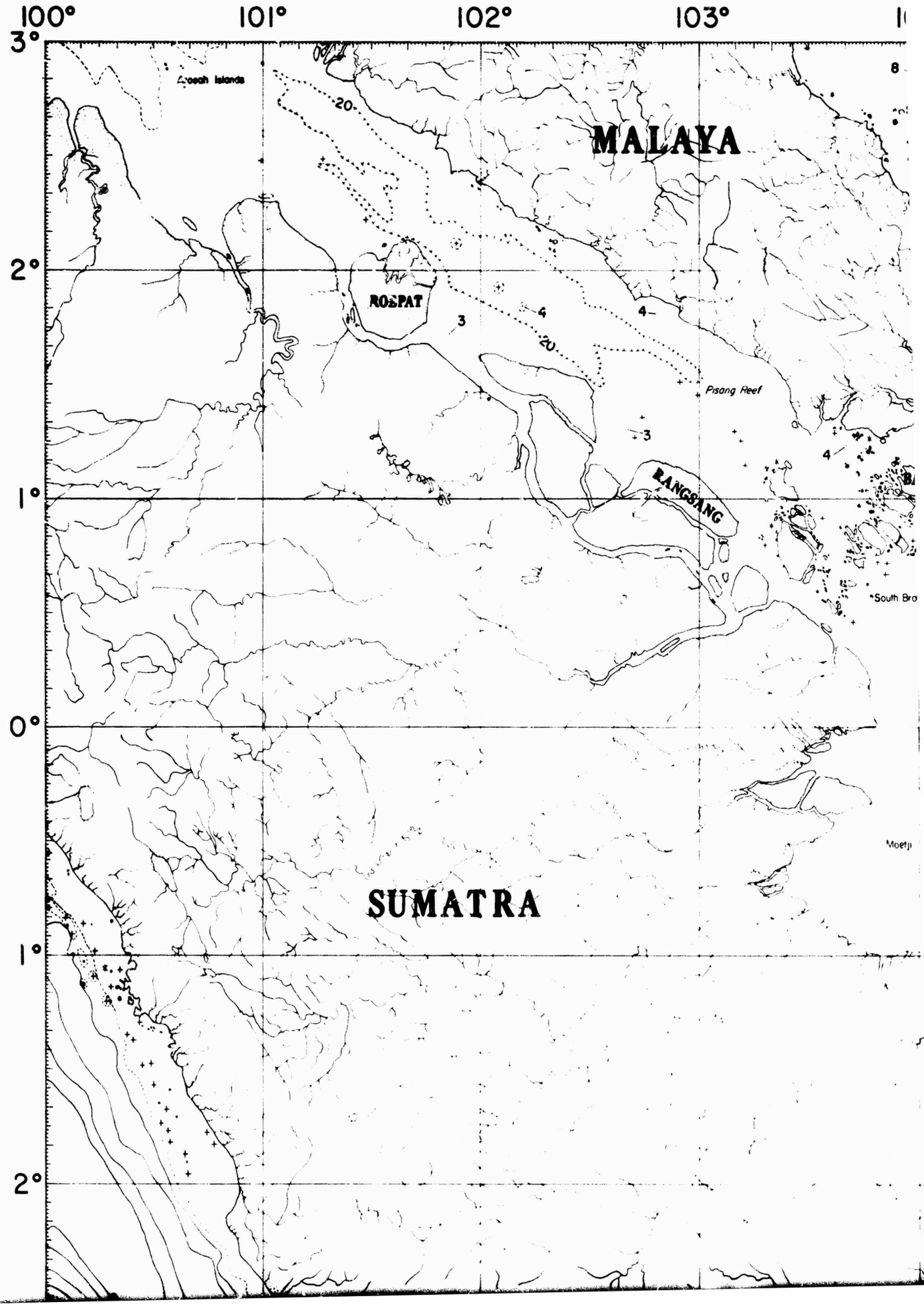
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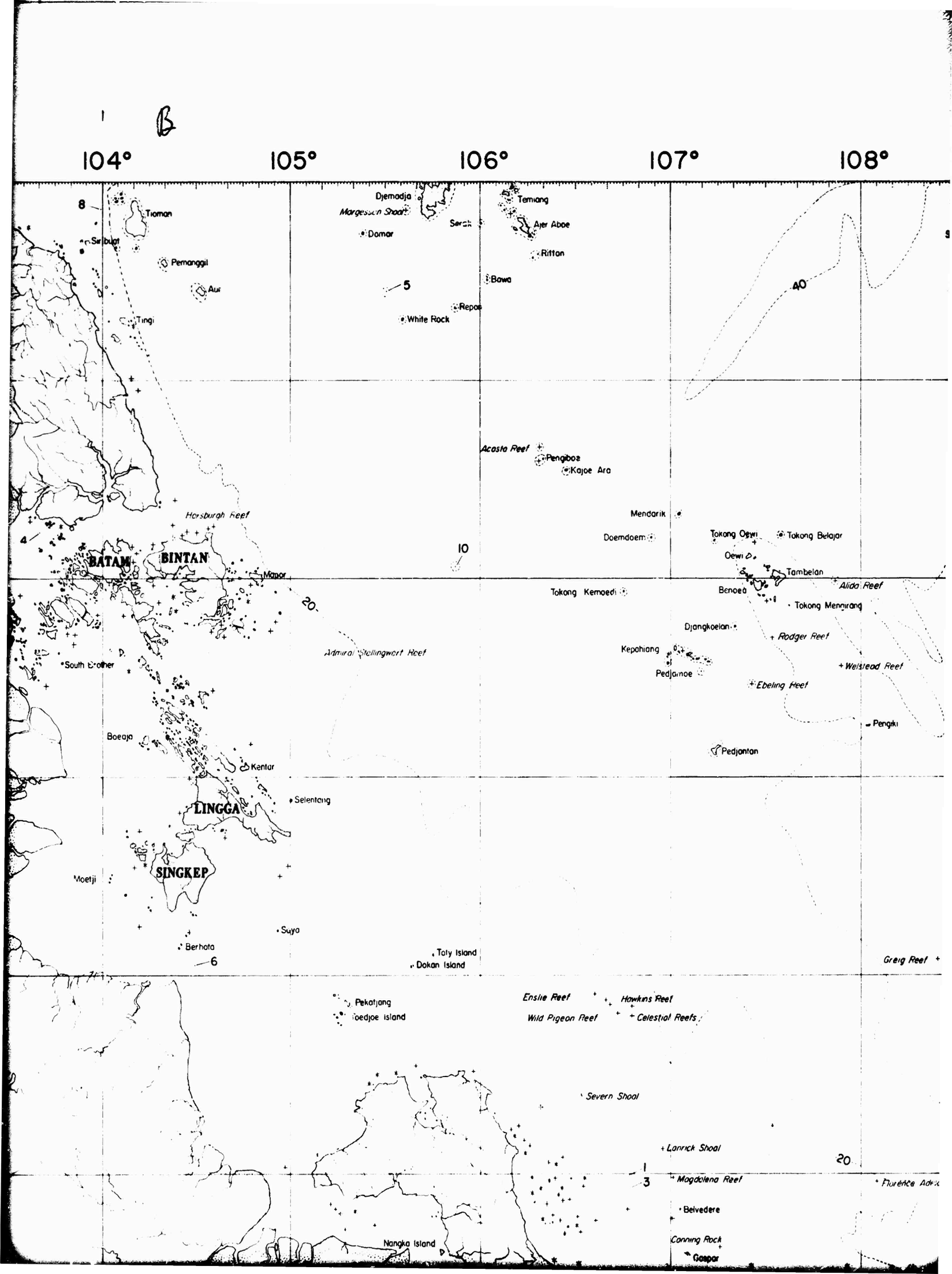
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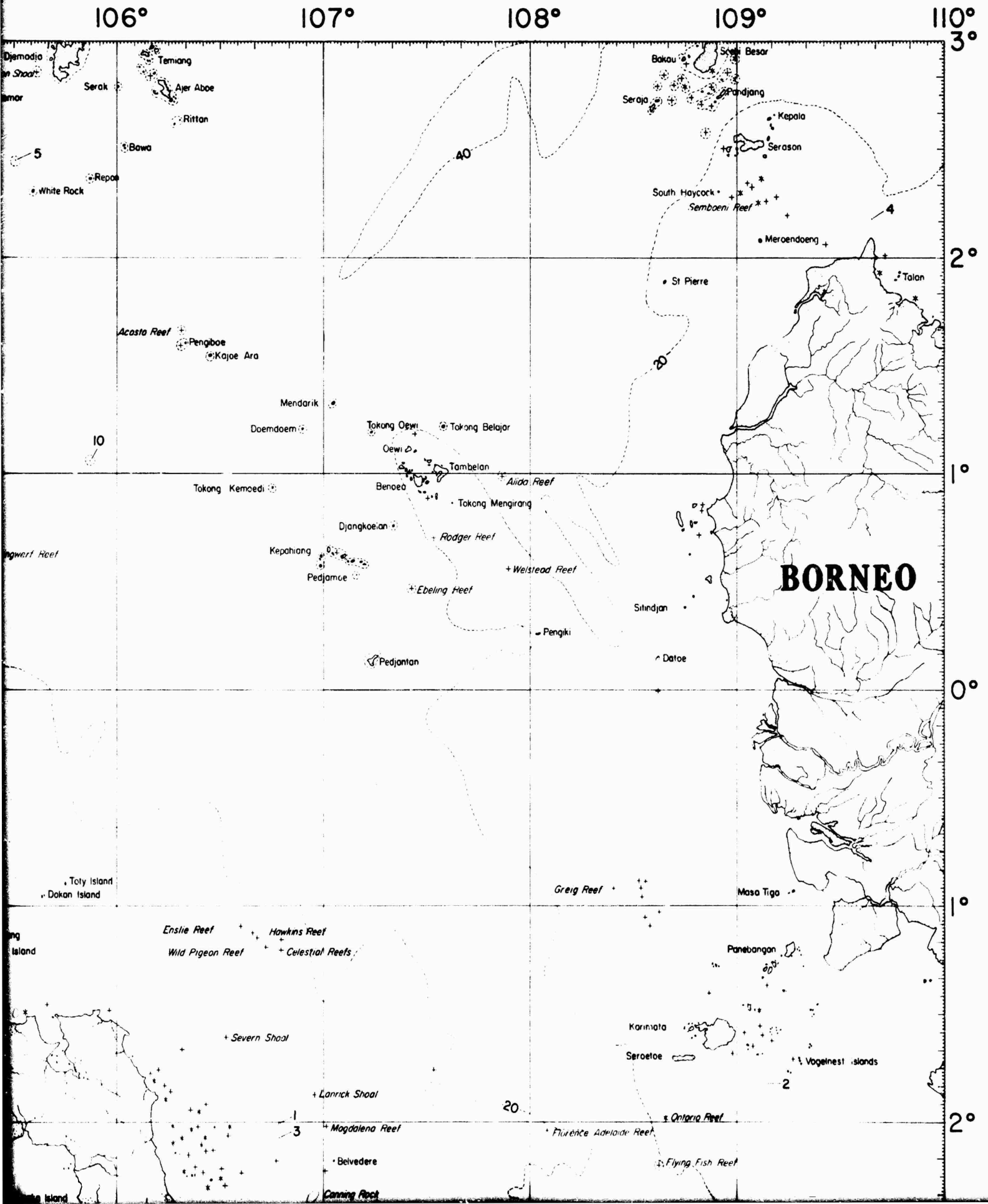
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Celestial Reefs
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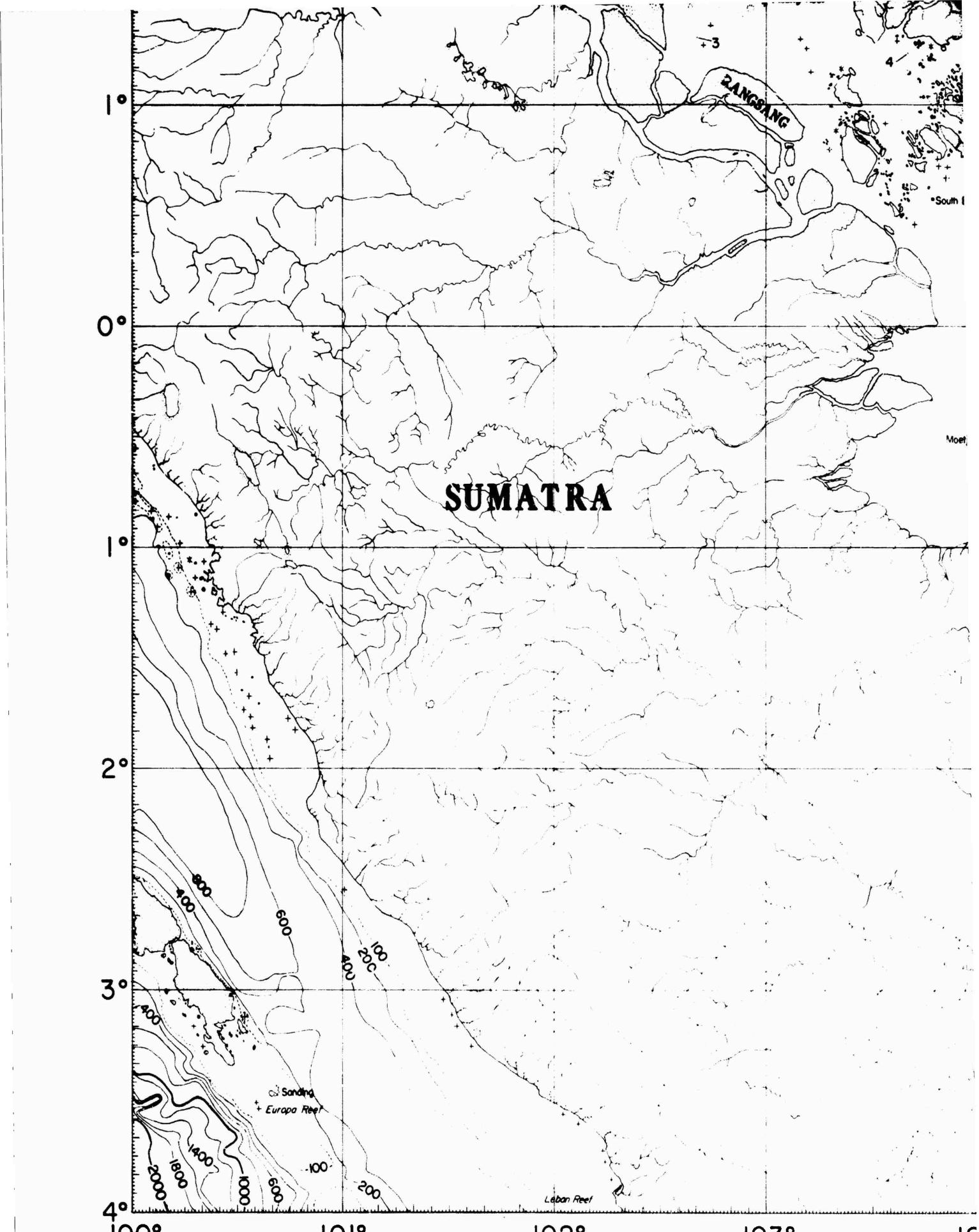

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Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

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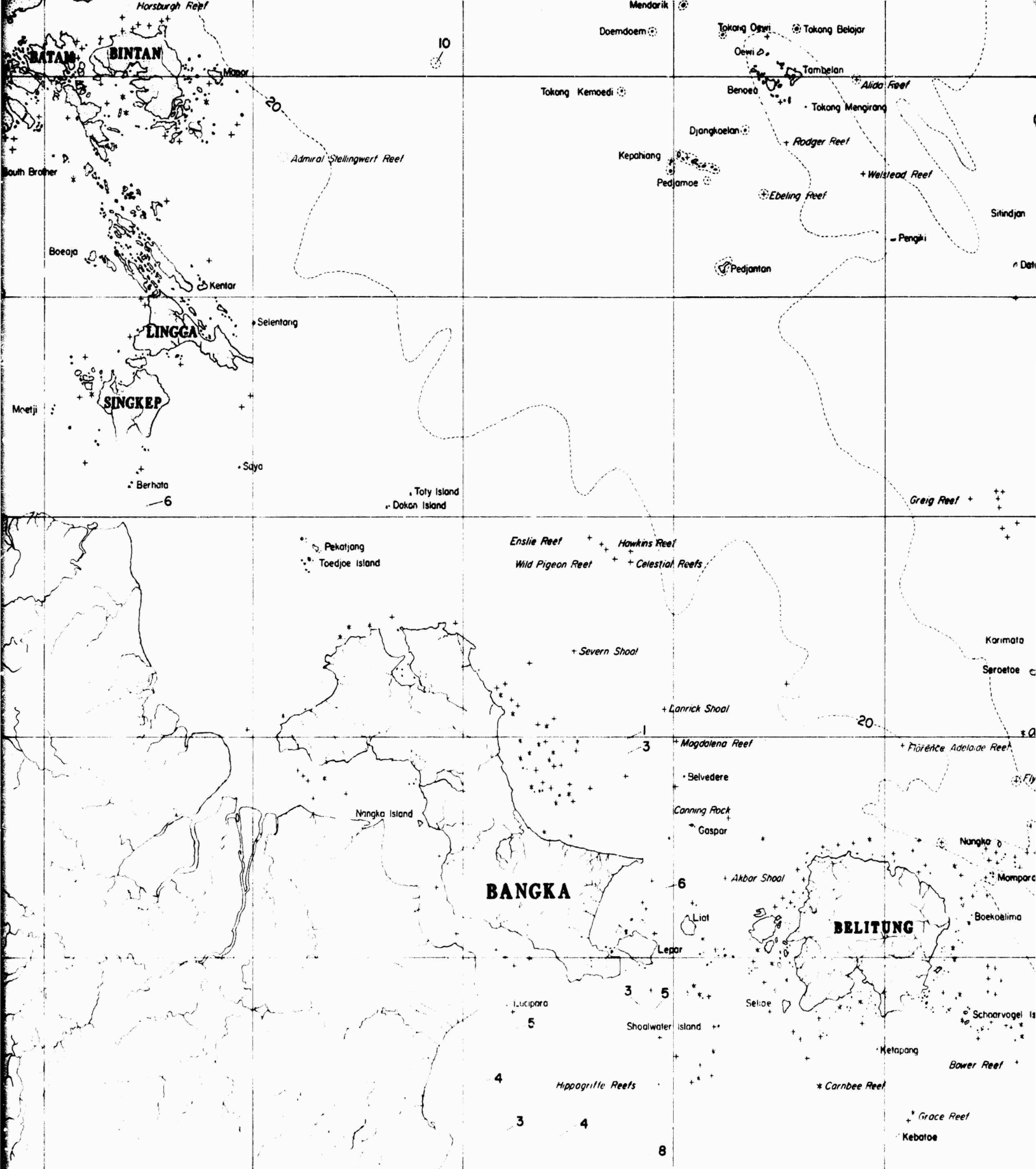

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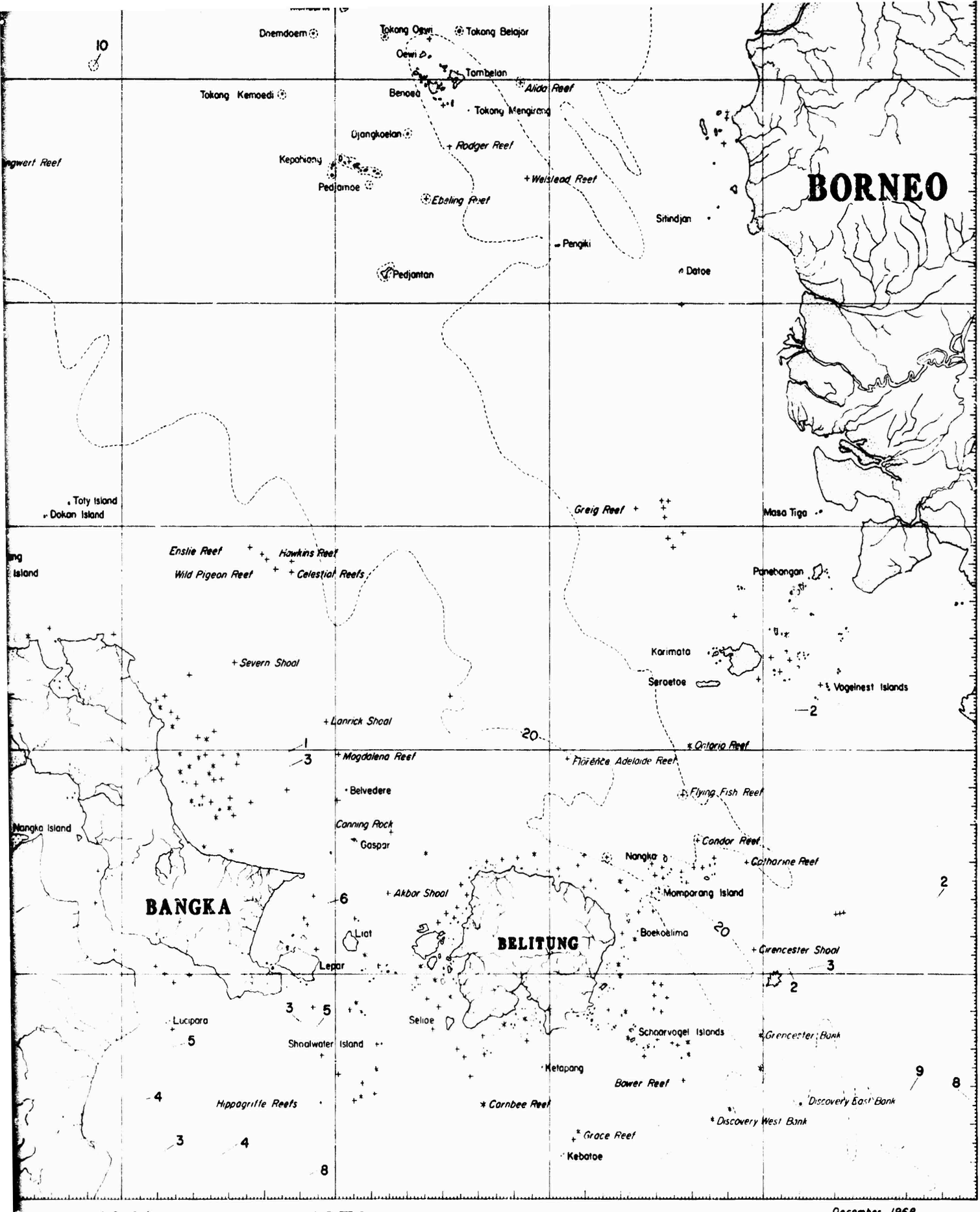

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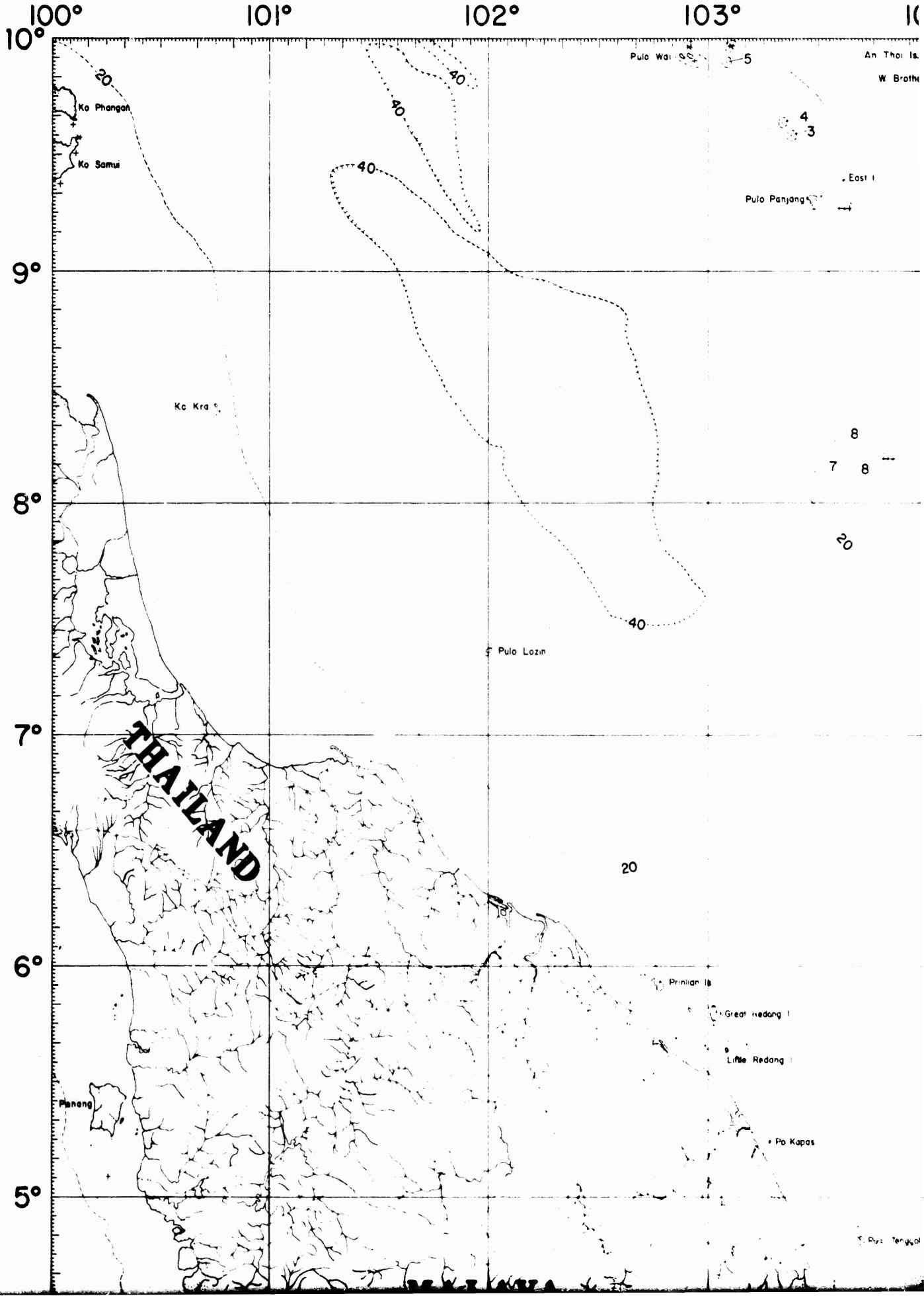
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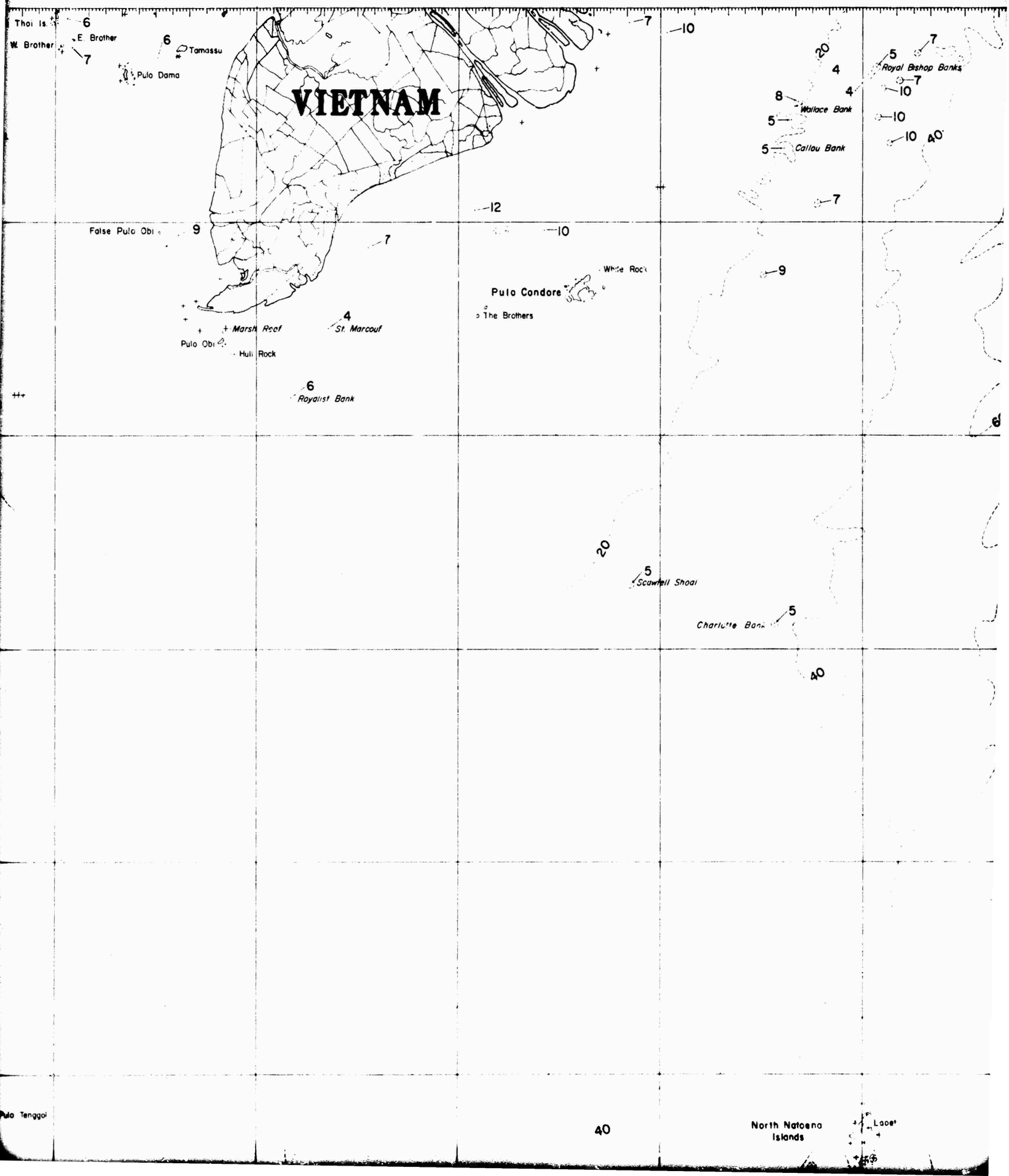
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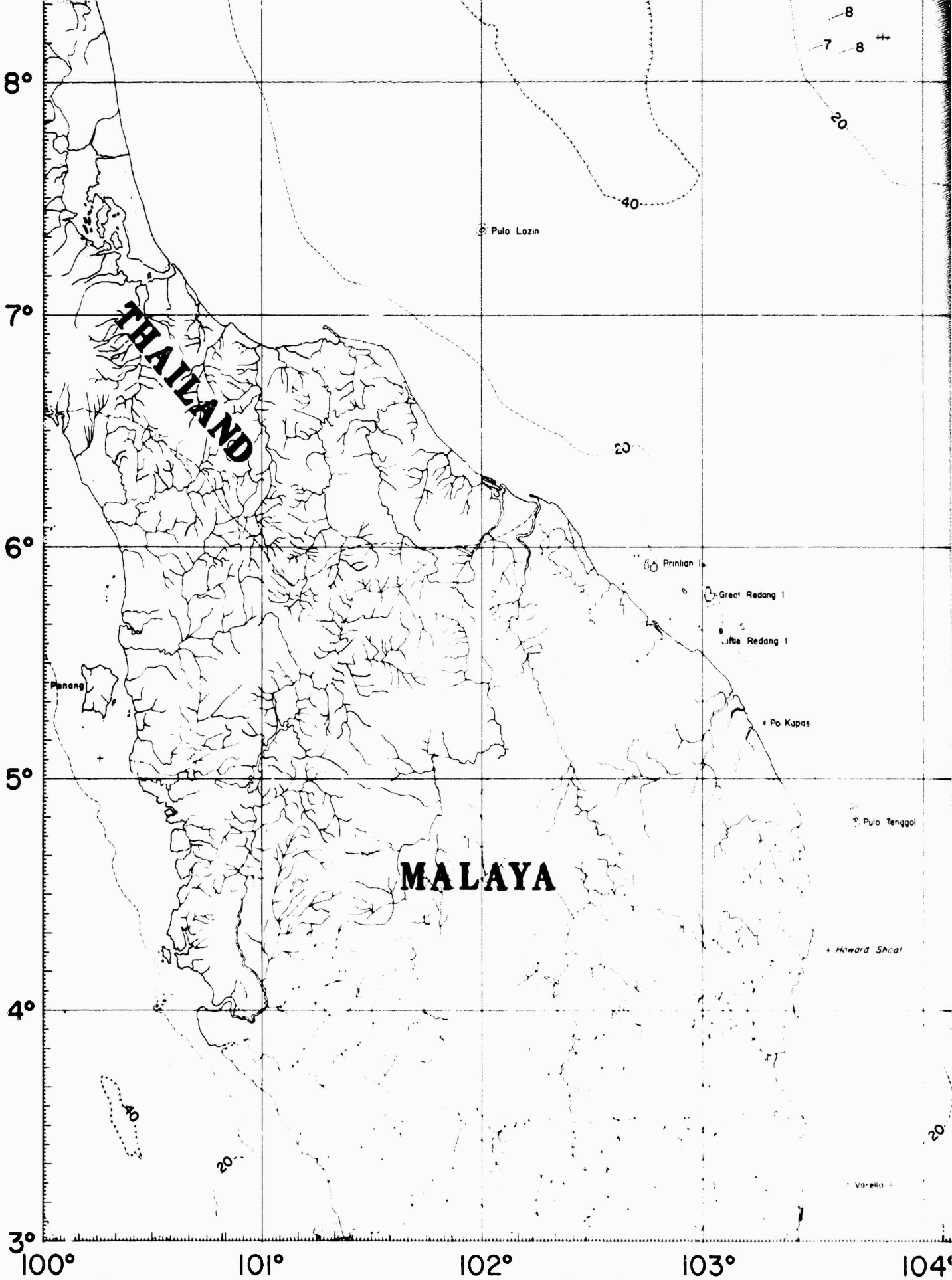

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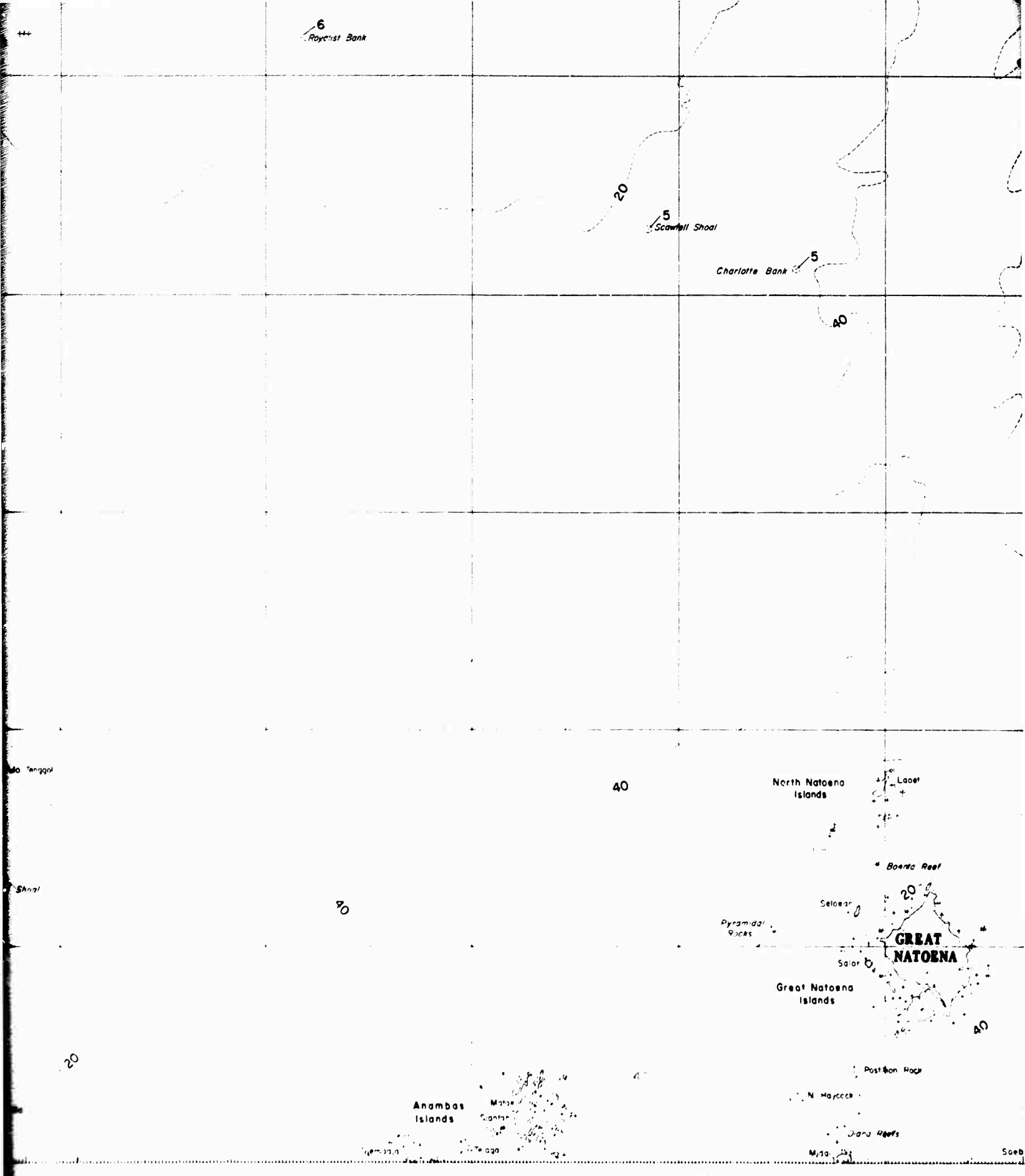

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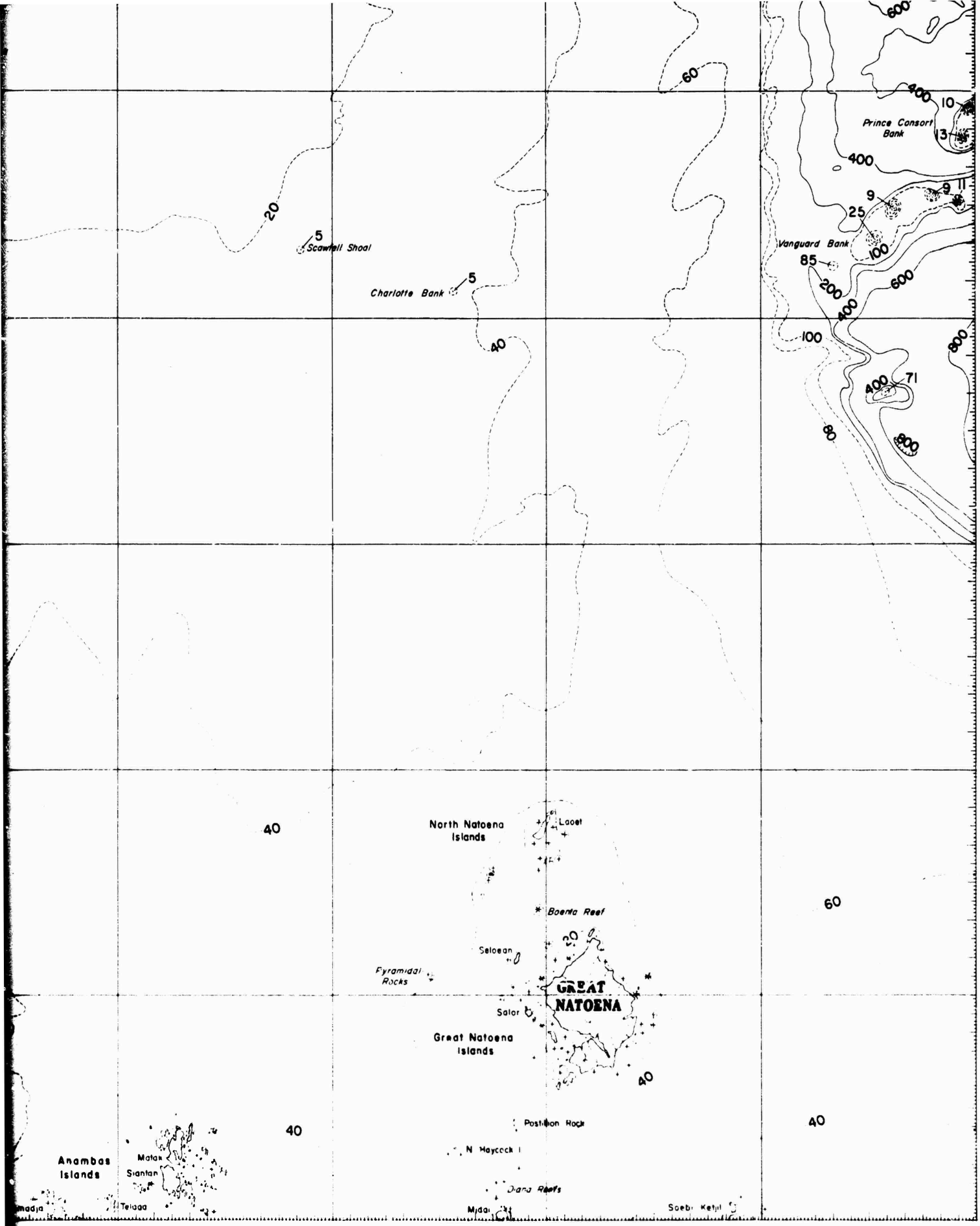

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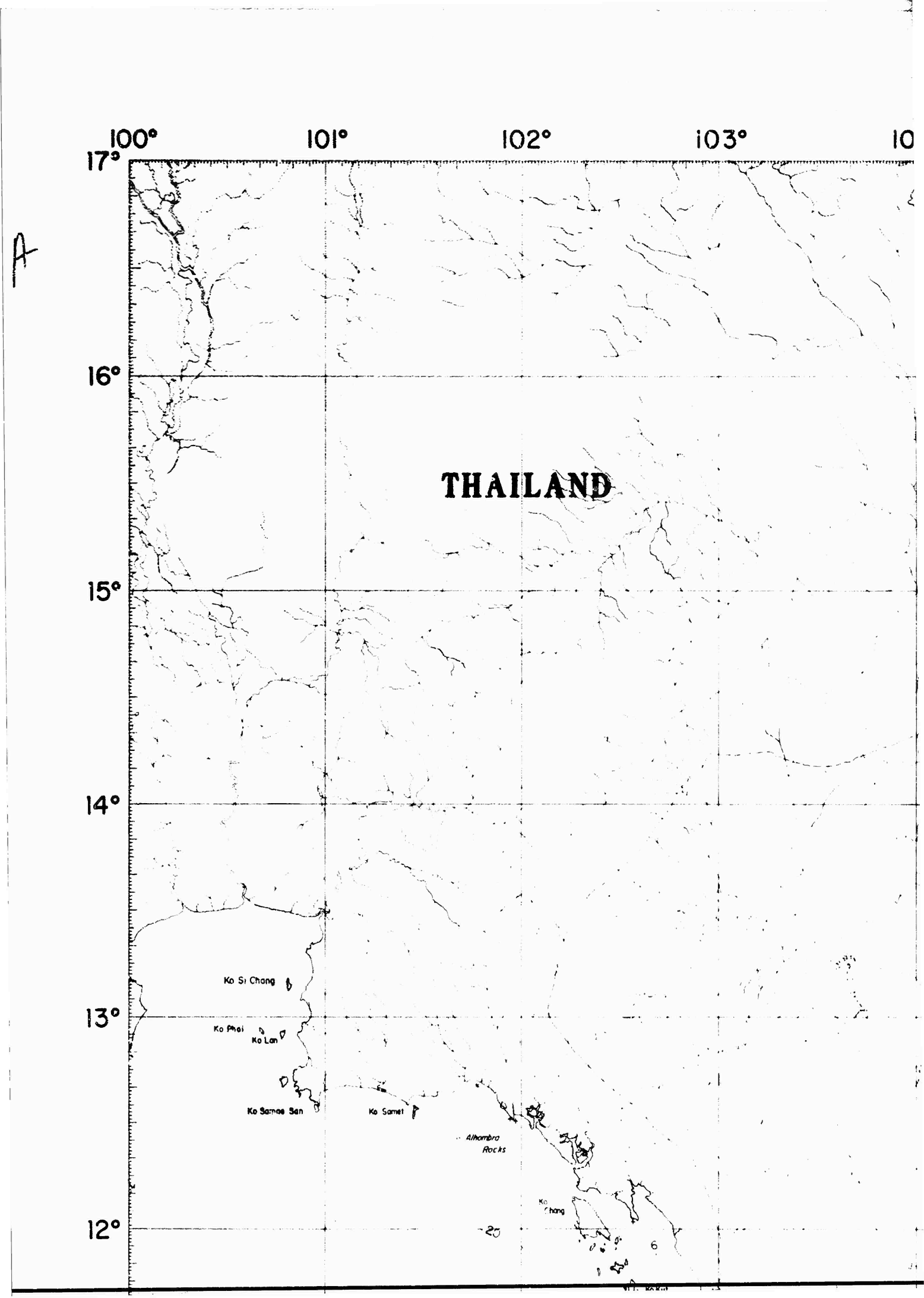
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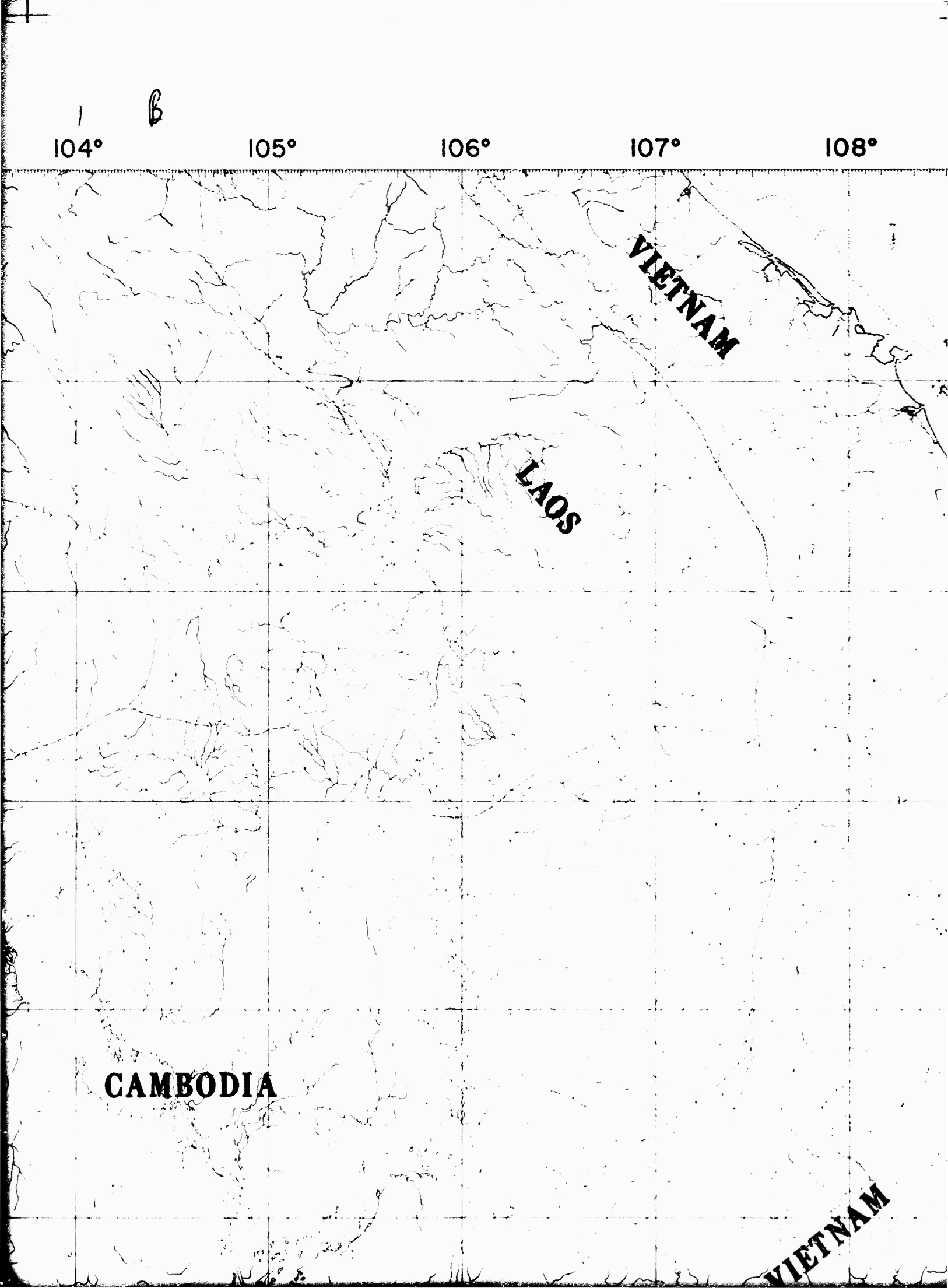
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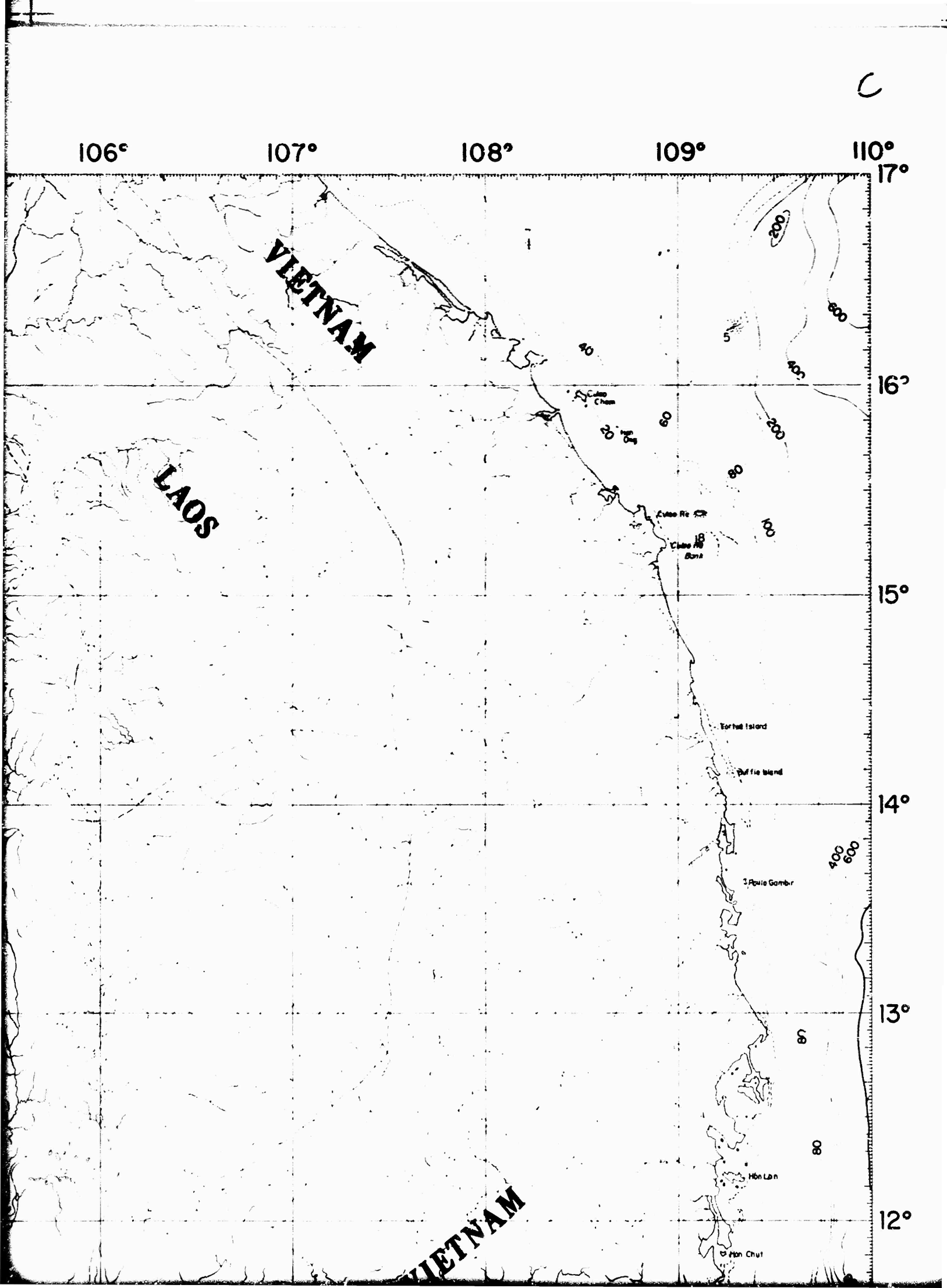
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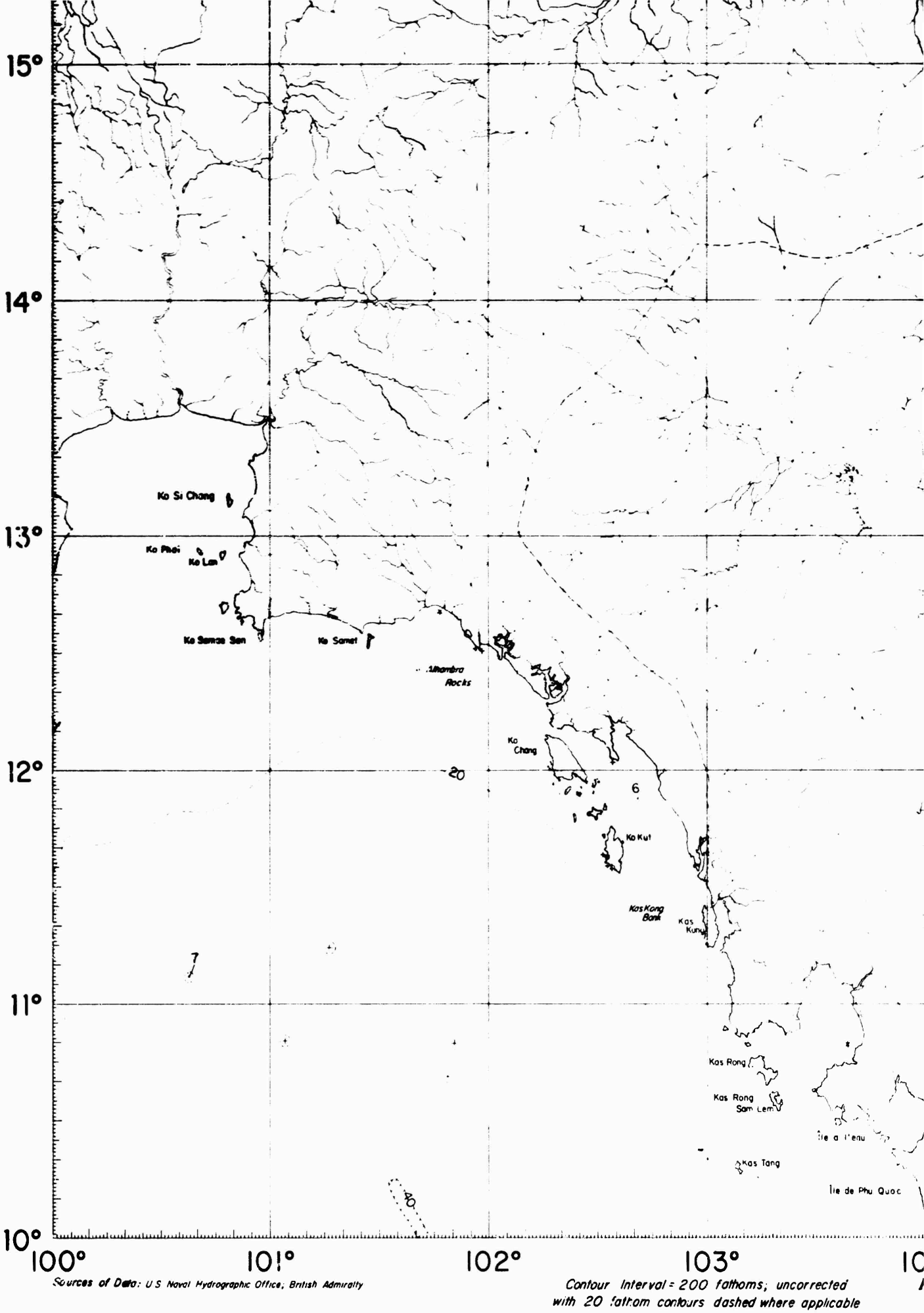

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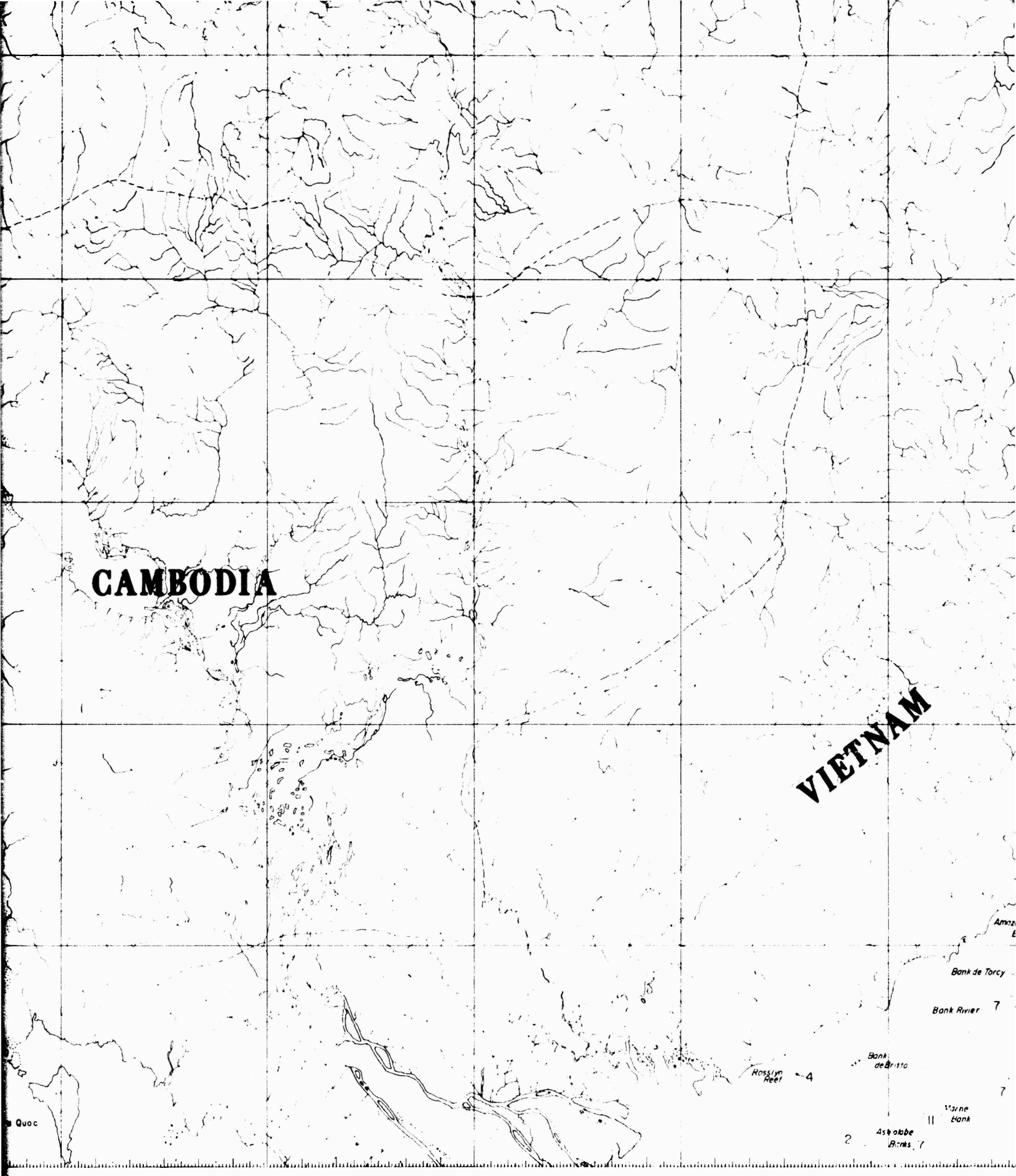

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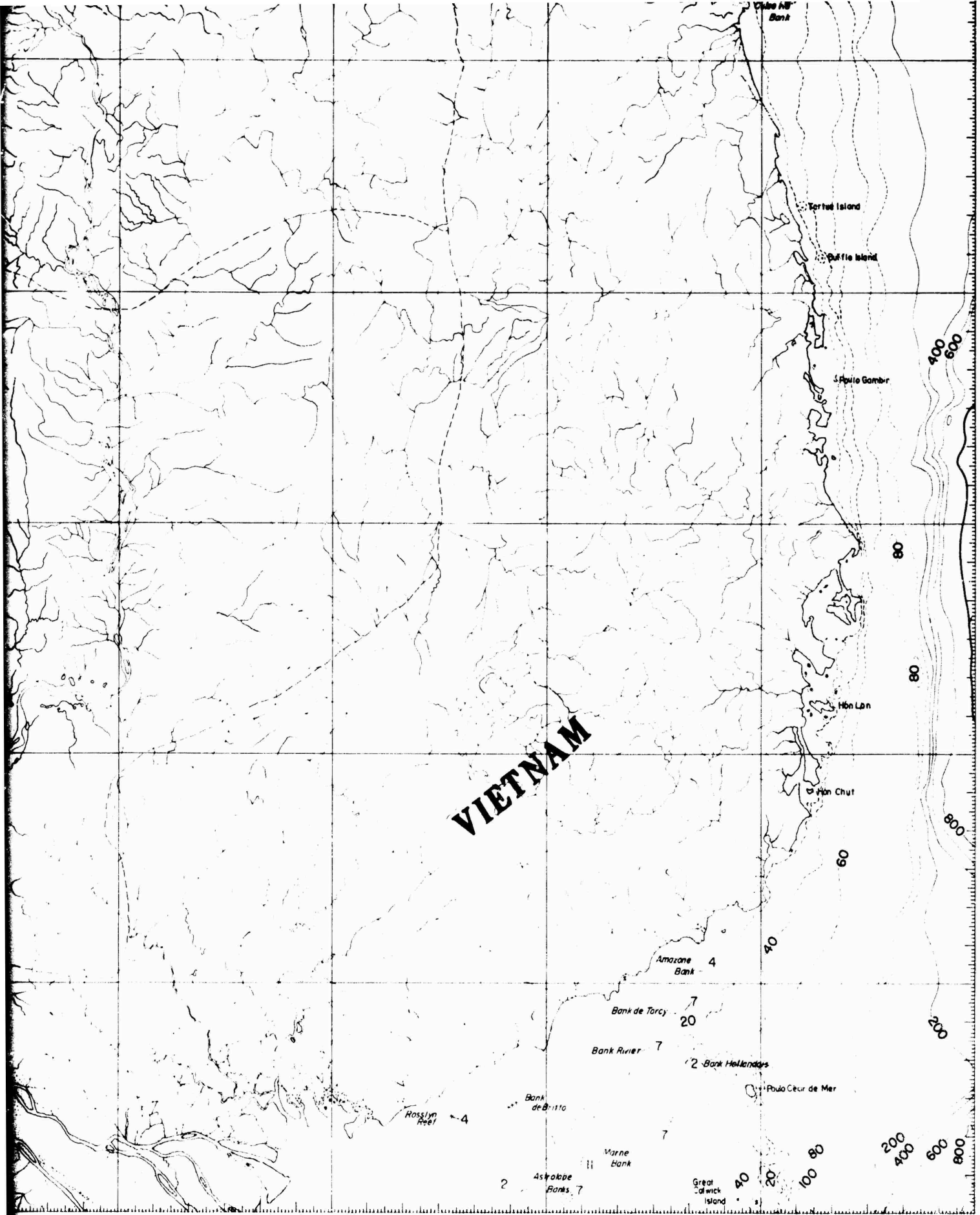

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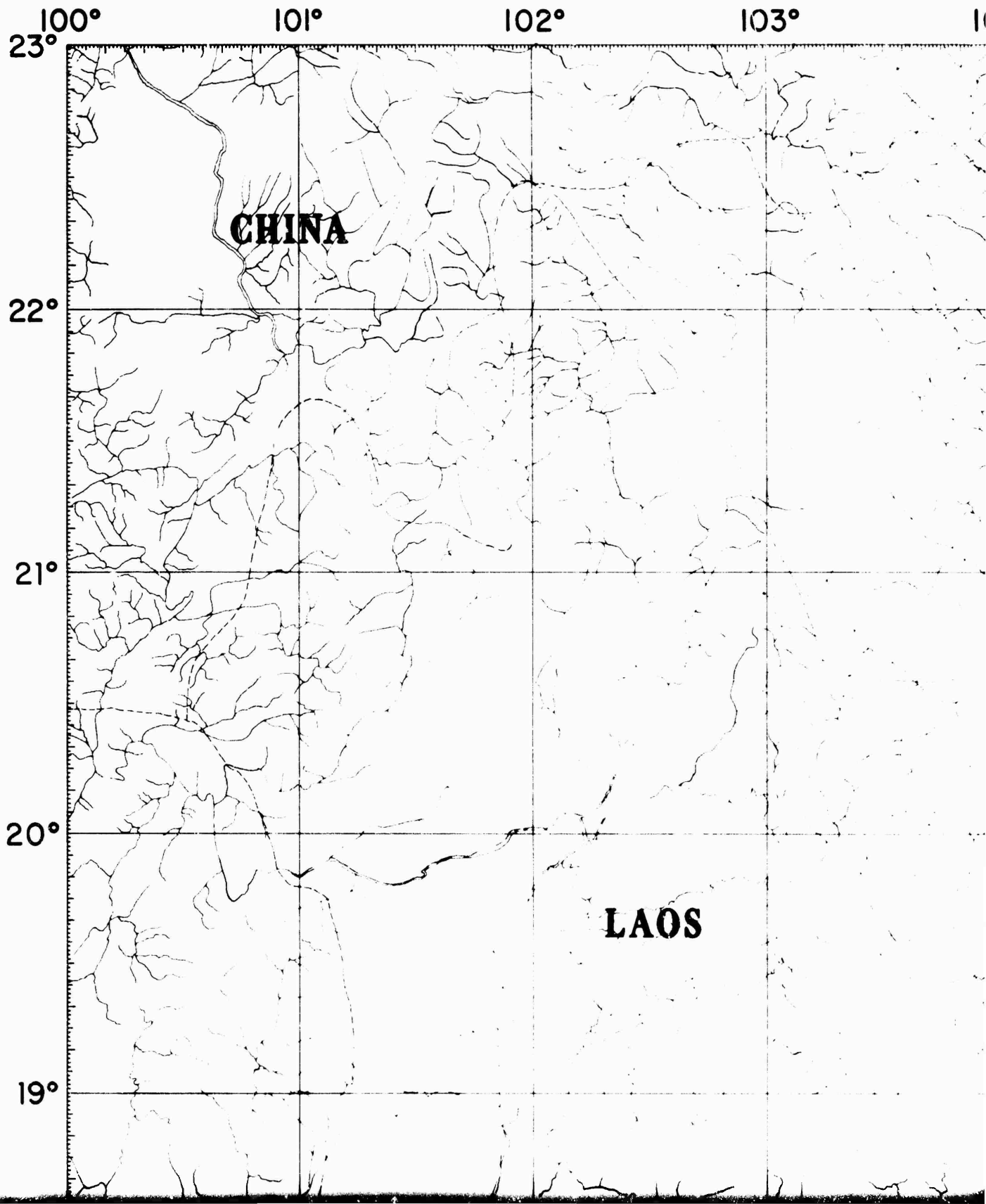

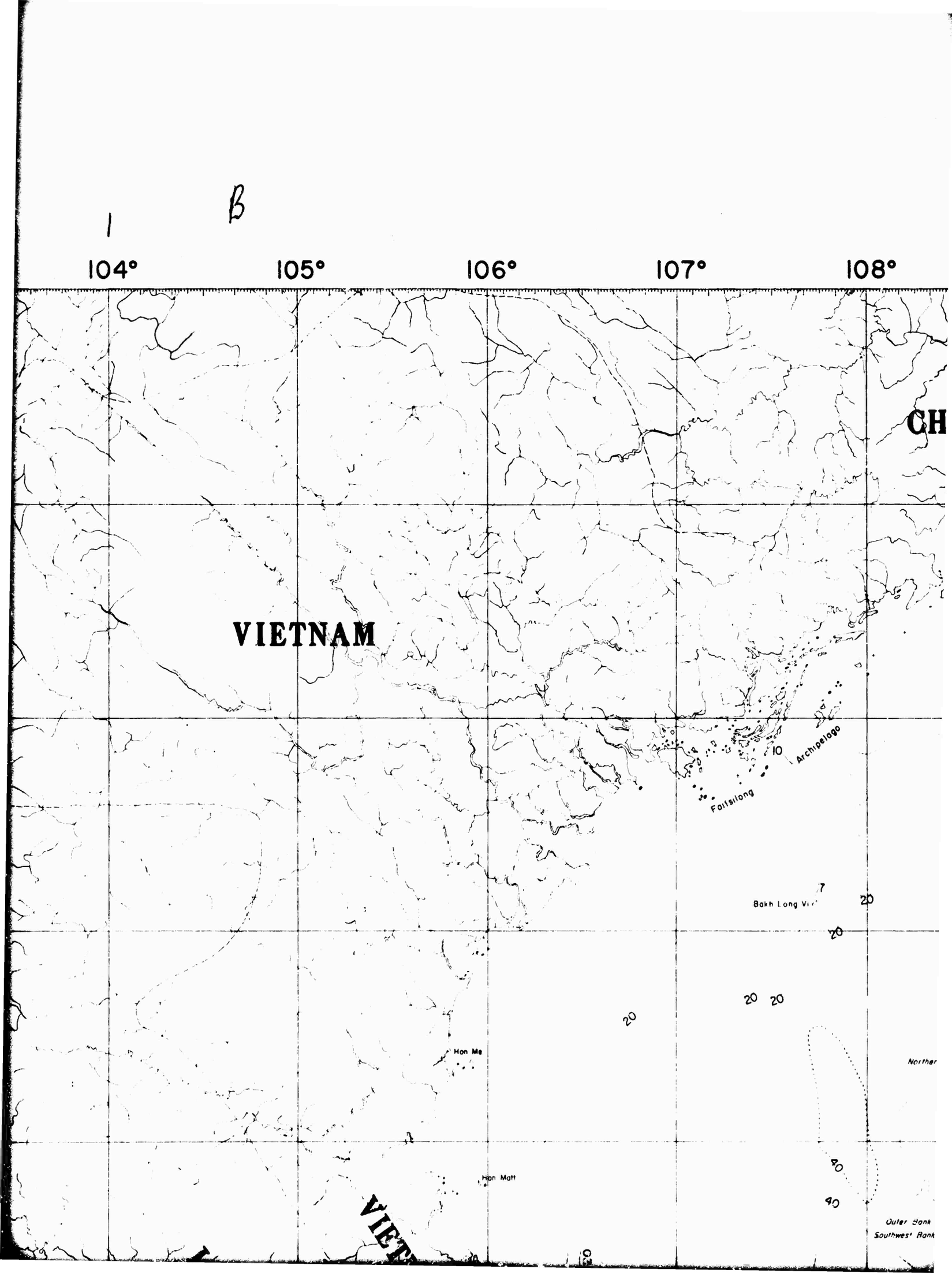
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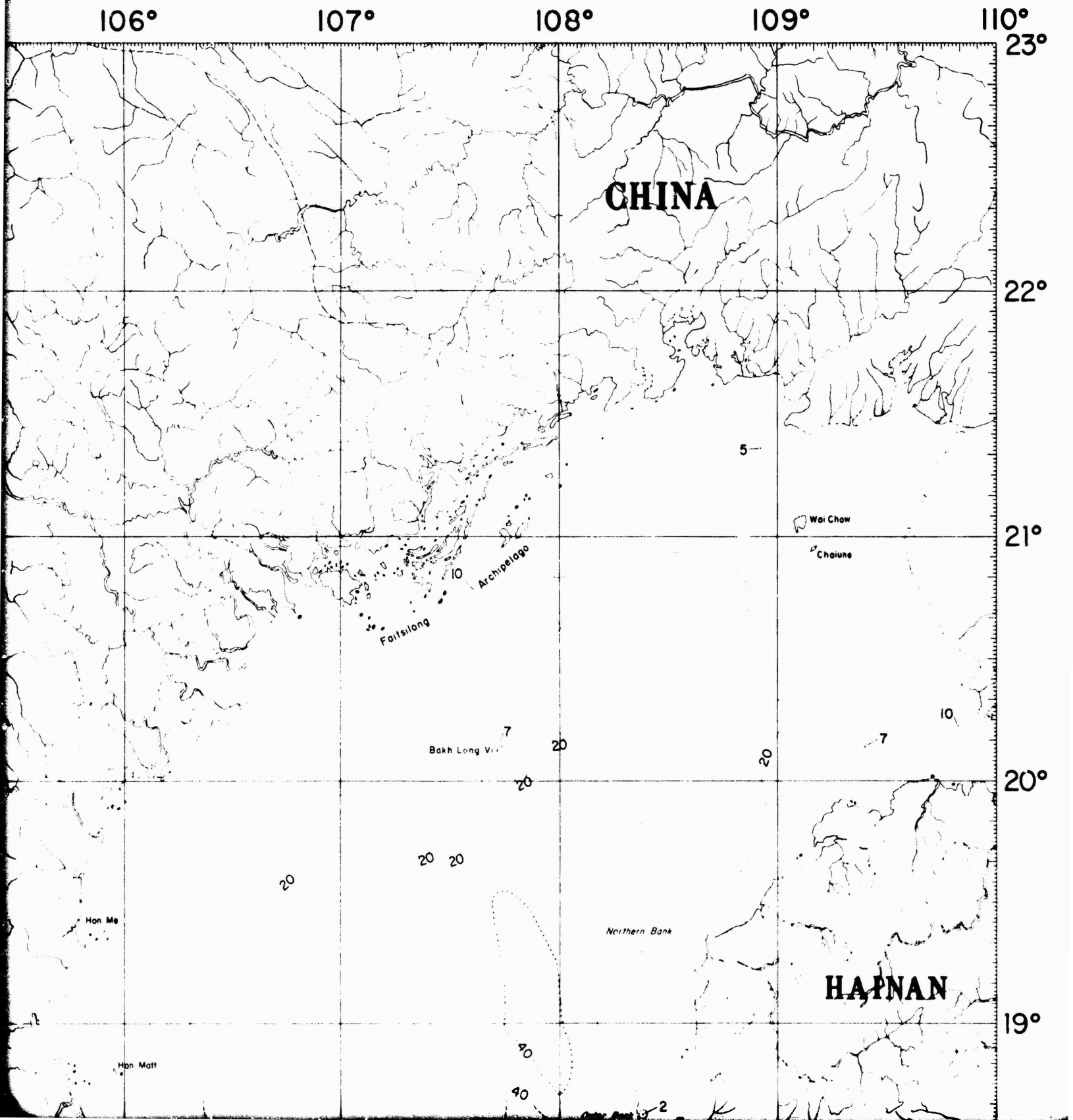
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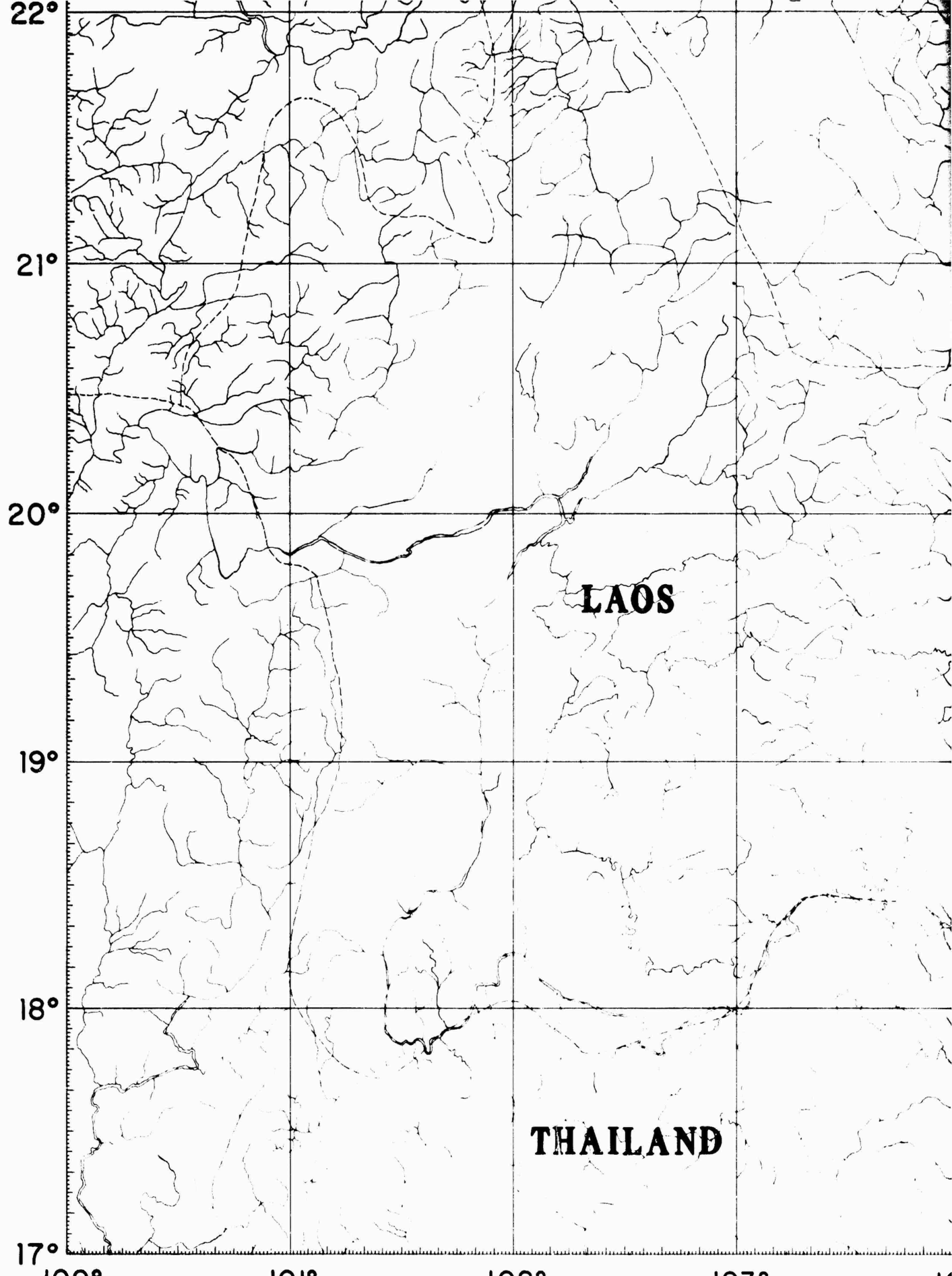

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Sources of Data: Naval Oceanographic Office, British Admiralty, World Aeronautical Charts, TWC Hilo

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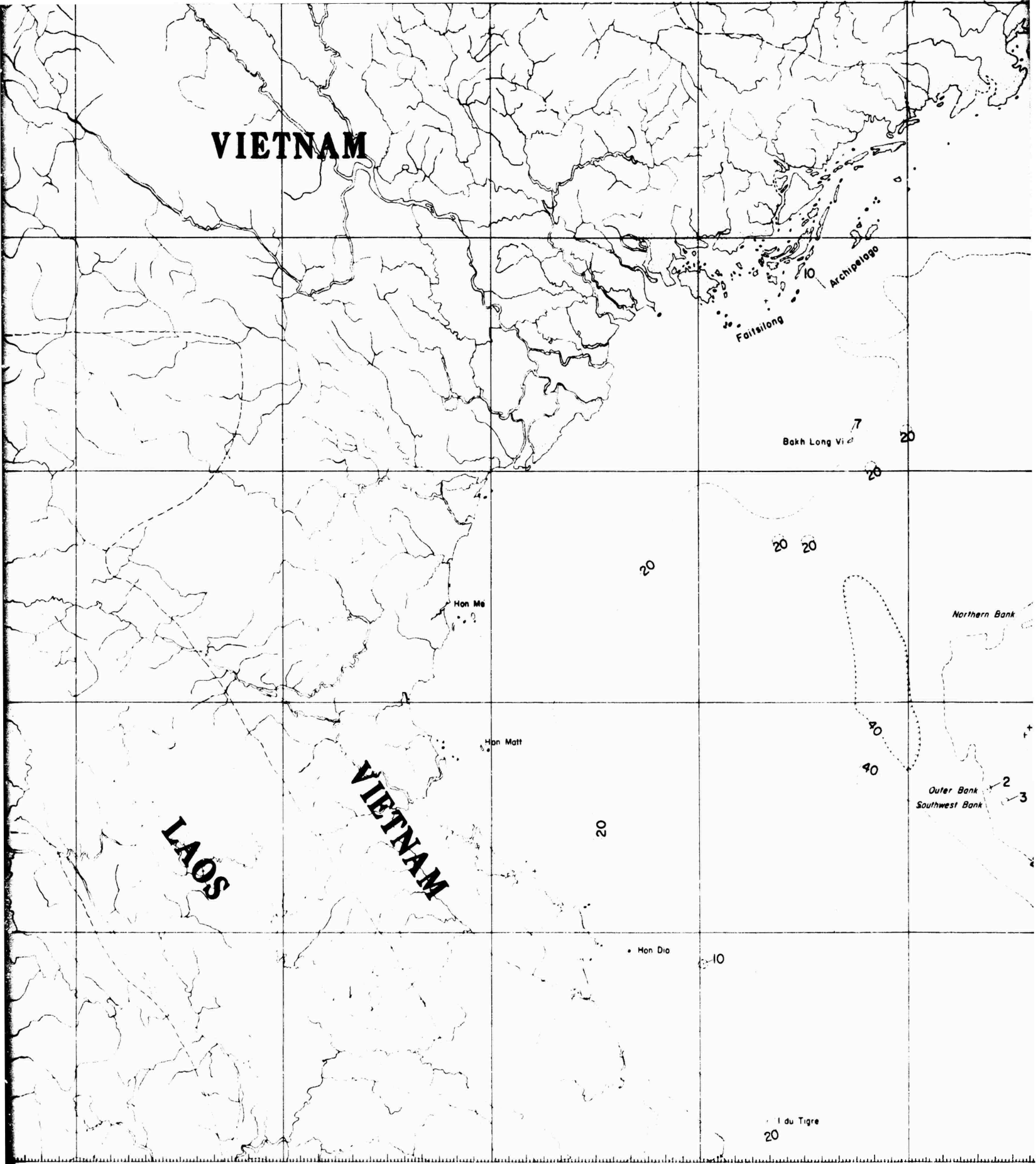

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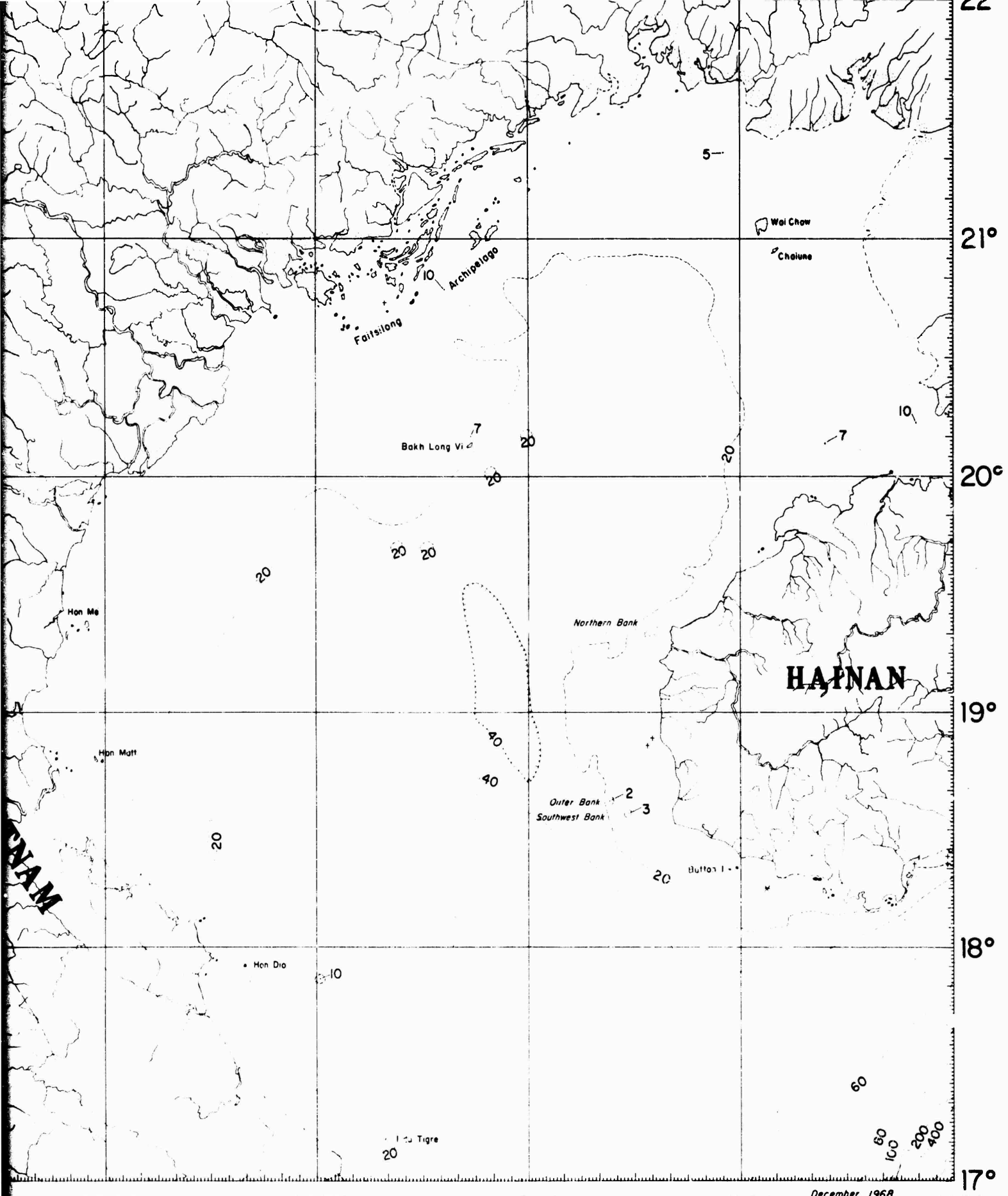

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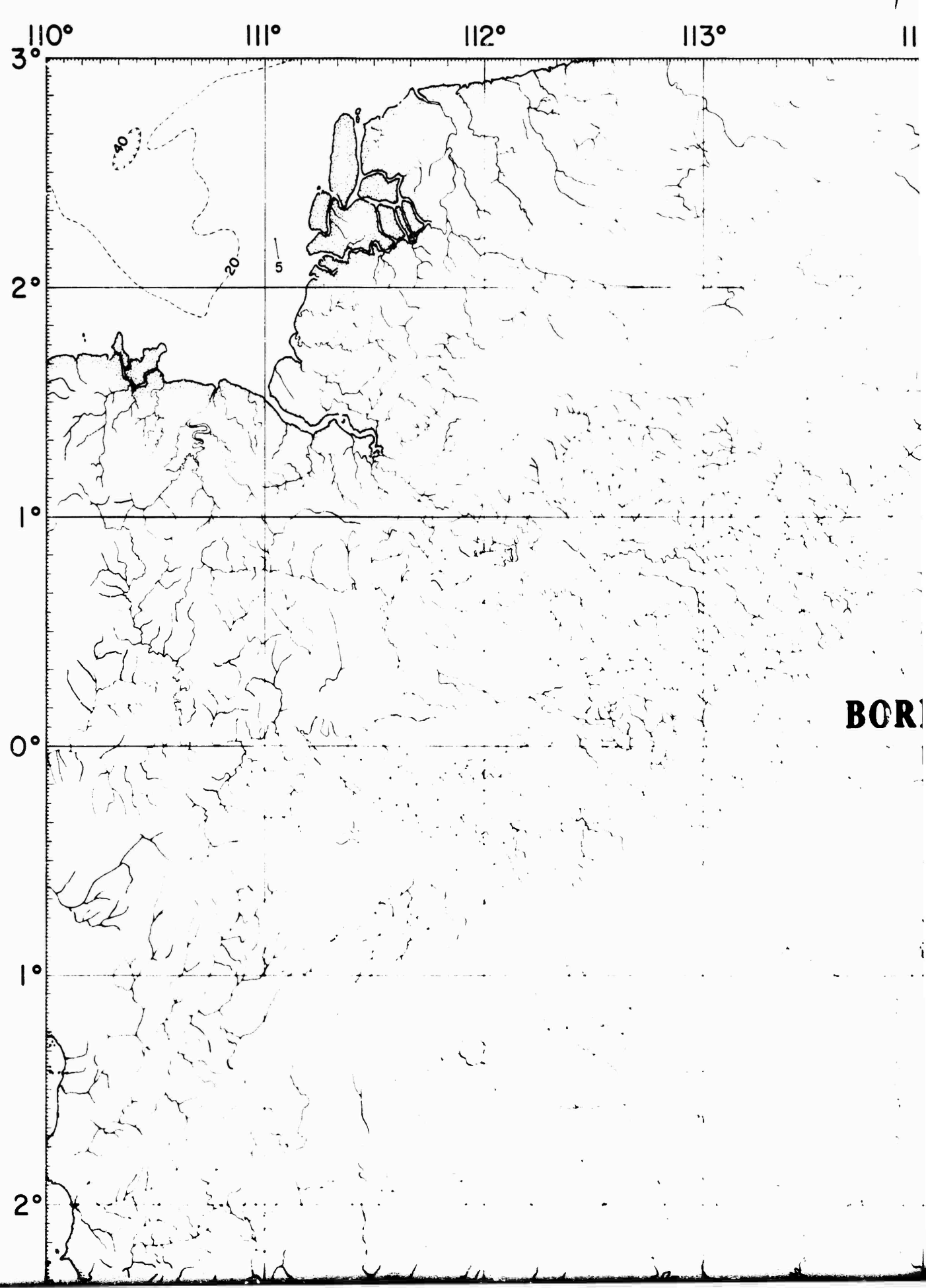
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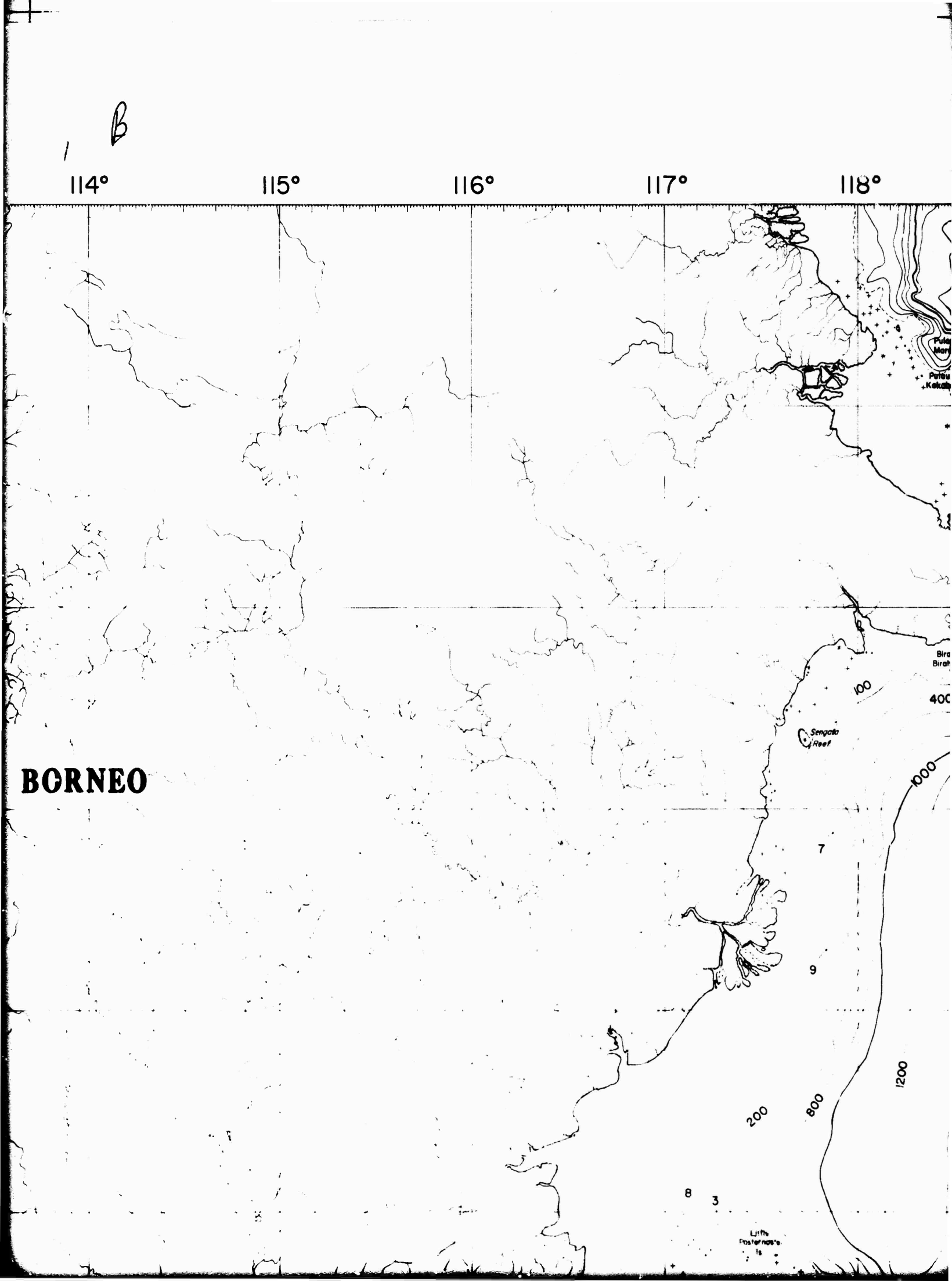
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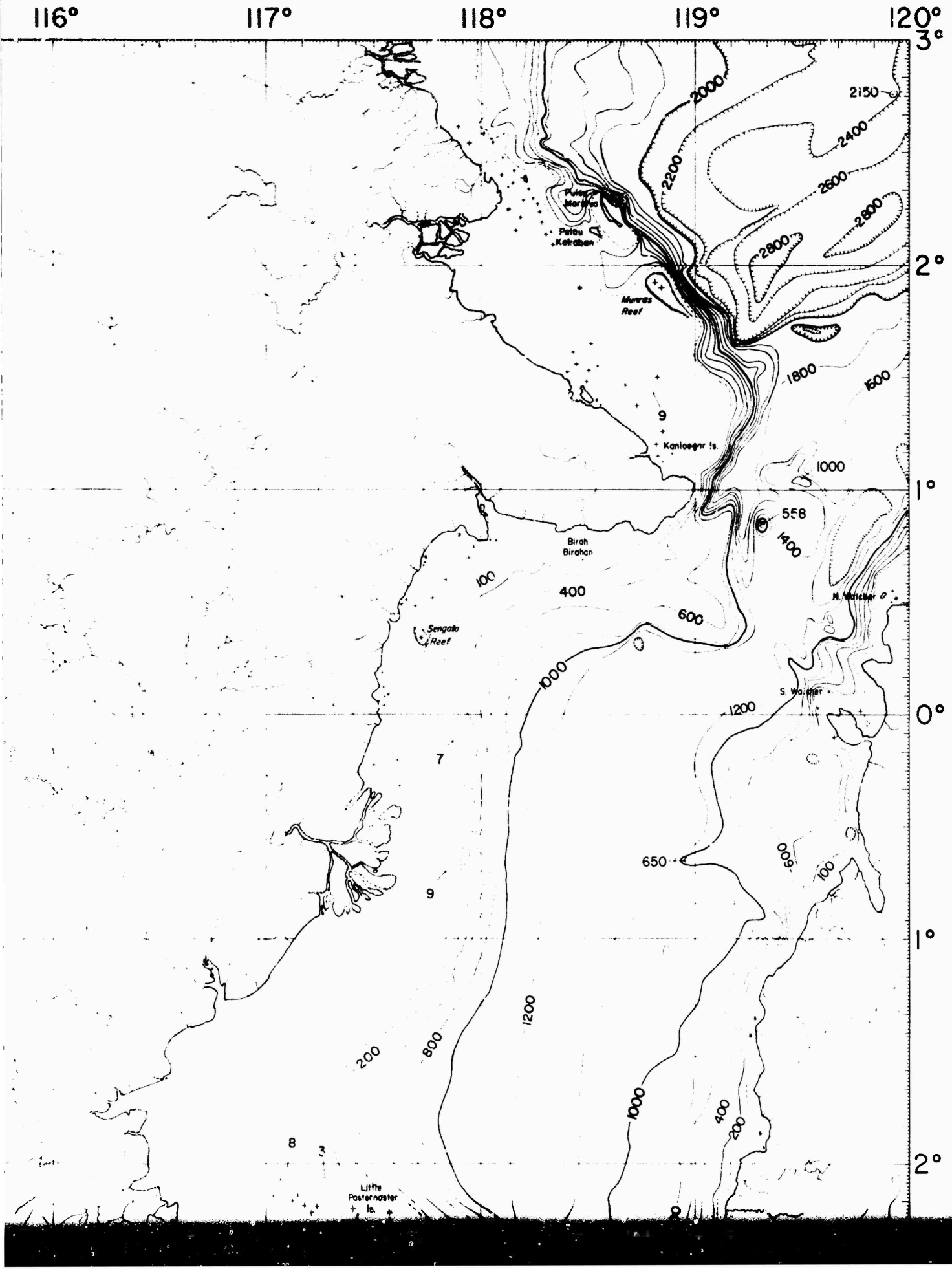
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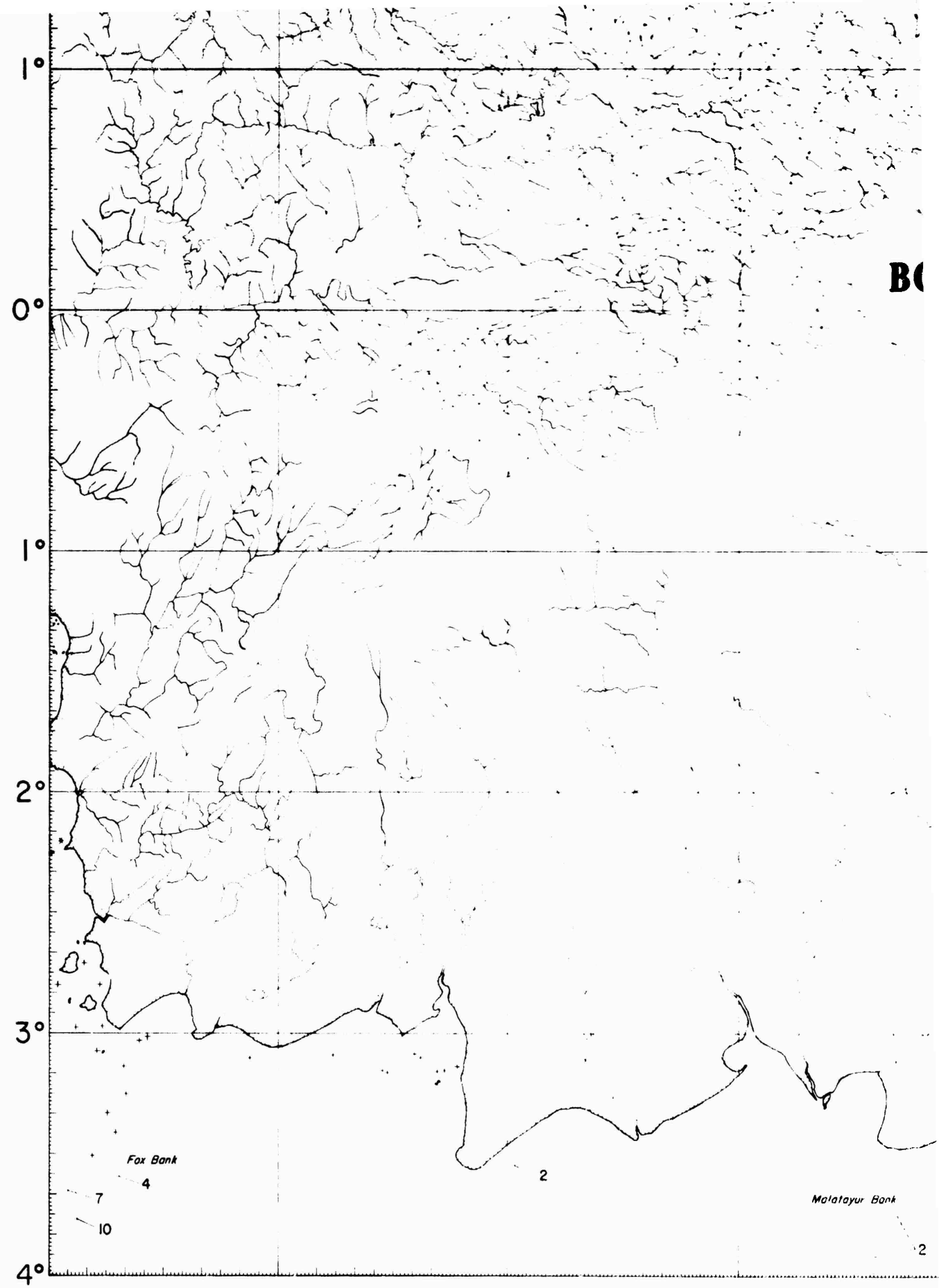
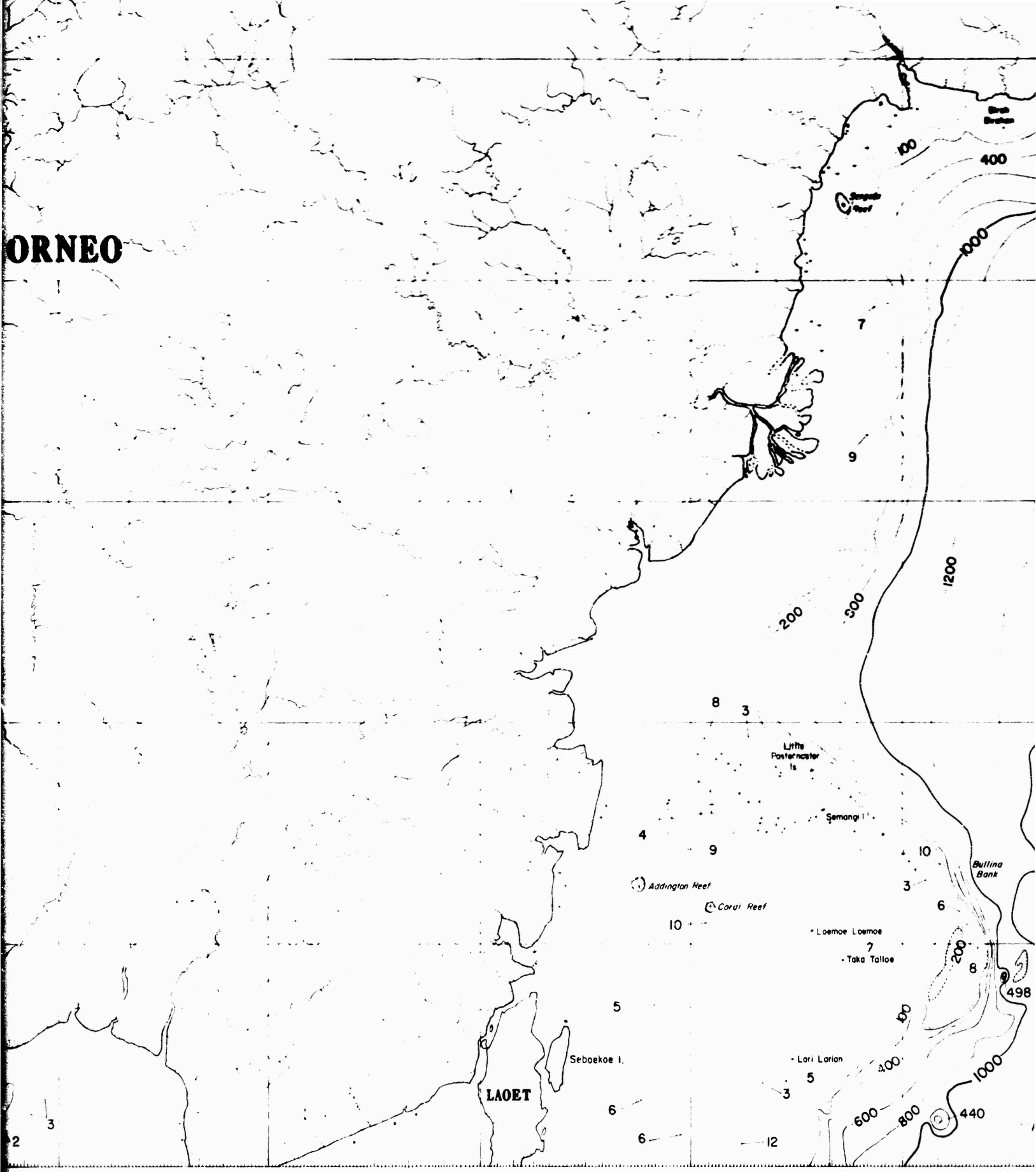
2800
2600
1800
1500
1000
558
1400
600
1000
1200
650
600
100
400
200
800
1200
1000
400
200
100
Pulau Marimbu
Pulau Kelraban
Murres Reef
Kanloegnr Is.
Birah Birahan
Sengata Reef
S. Walther
N. Walther
Little Pasternaster Is.
7
8
9
3



Sources of Data: U.S. Naval Oceanographic Office, British Admiralty, G.B. Udintsev, Snellius Expedition 1929-1930

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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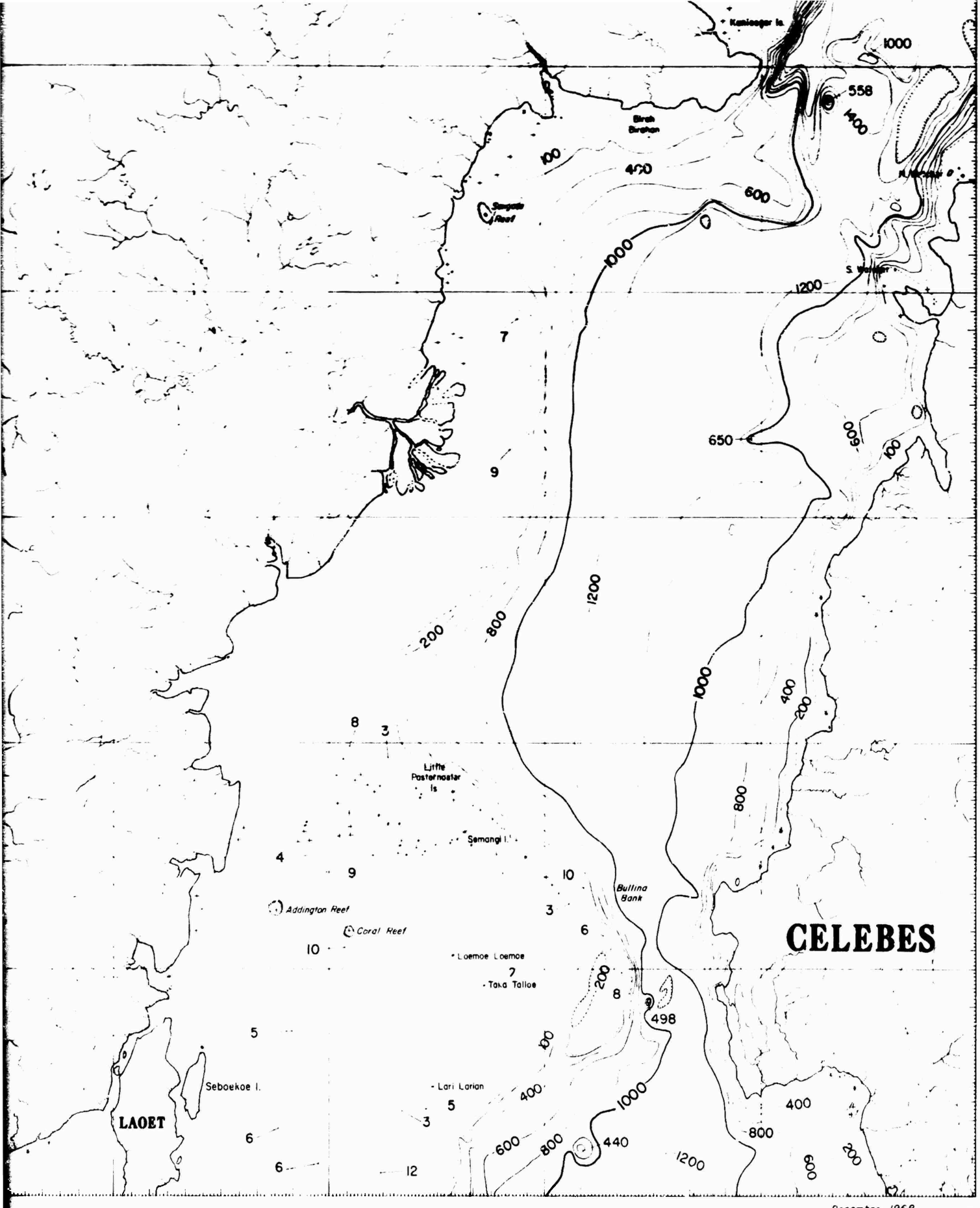
E


Kaniaeger Is.
1000
558
1400
Birch Bretton
100
400
600
Sangsite Reef
1000
S. Watcher
1200
0°
7
650
600
100
9
1°
1200
800
200
1000
400
200
8
3
2°
Little Postemaster Is
Semangi I.
4
9
10
Bullina Bank
Addington Reef
3
6
Coral Reef
CELEBES
10
Loemoe Loemoe
7
Taka Talloe
3°
200
8
498
5
100
Seboekoe I.
Lari Larian
400
1000
5
400
LAOET
3
800
6
600
800
440
1200
200
600
6
12
4°
116°
117°
118°
119°
120°
December, 1968
ANOGRAPHY
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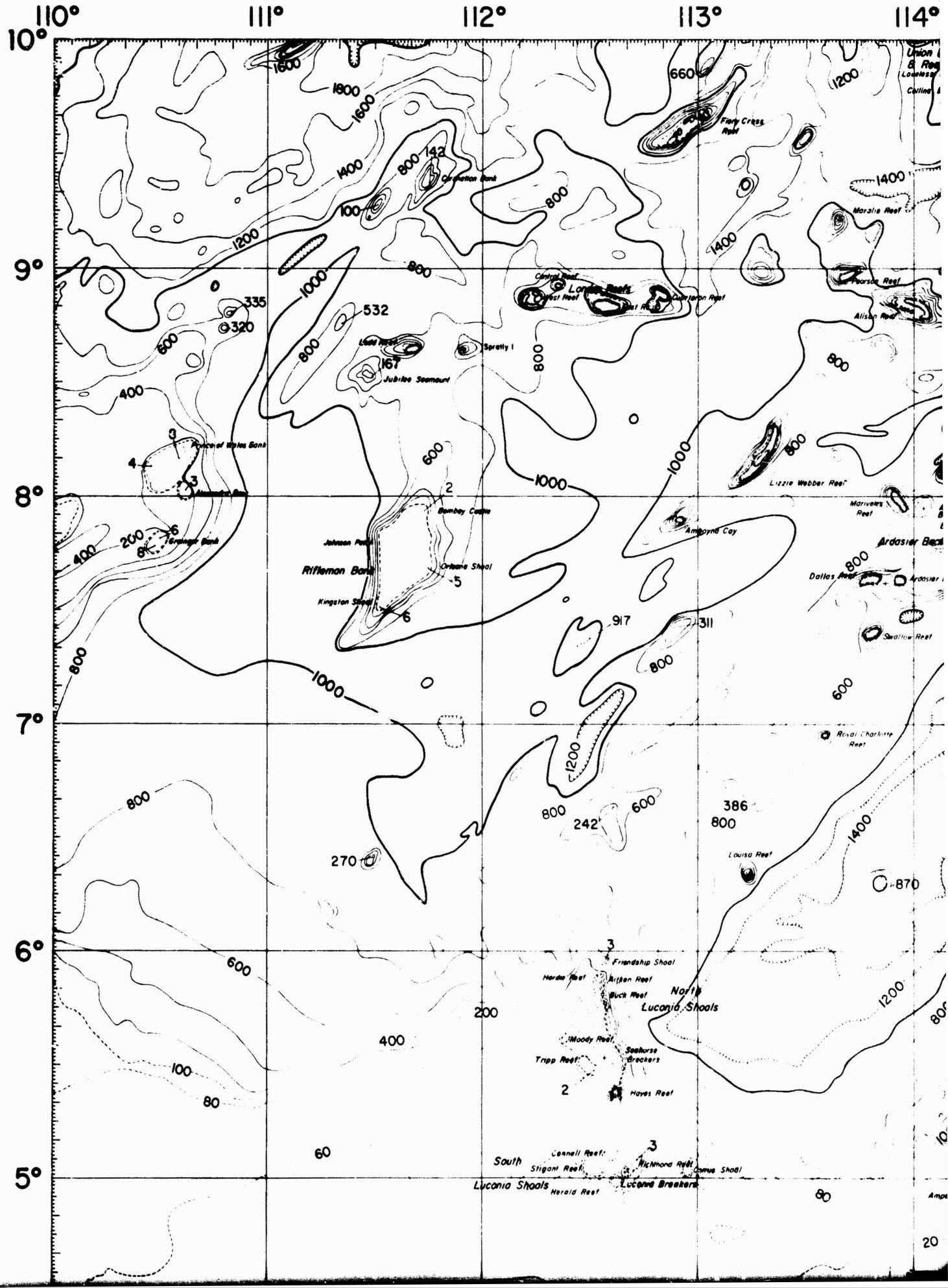
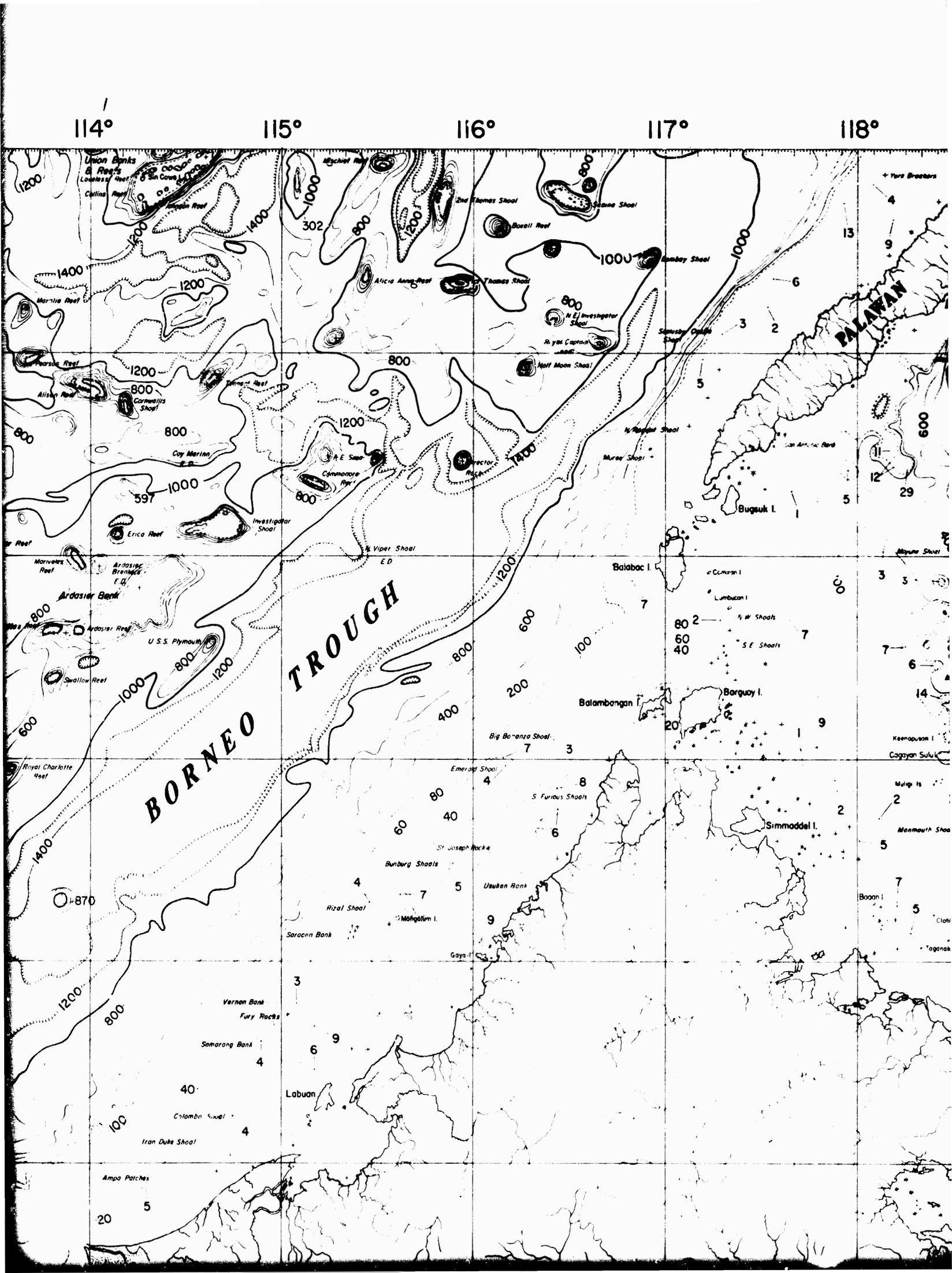
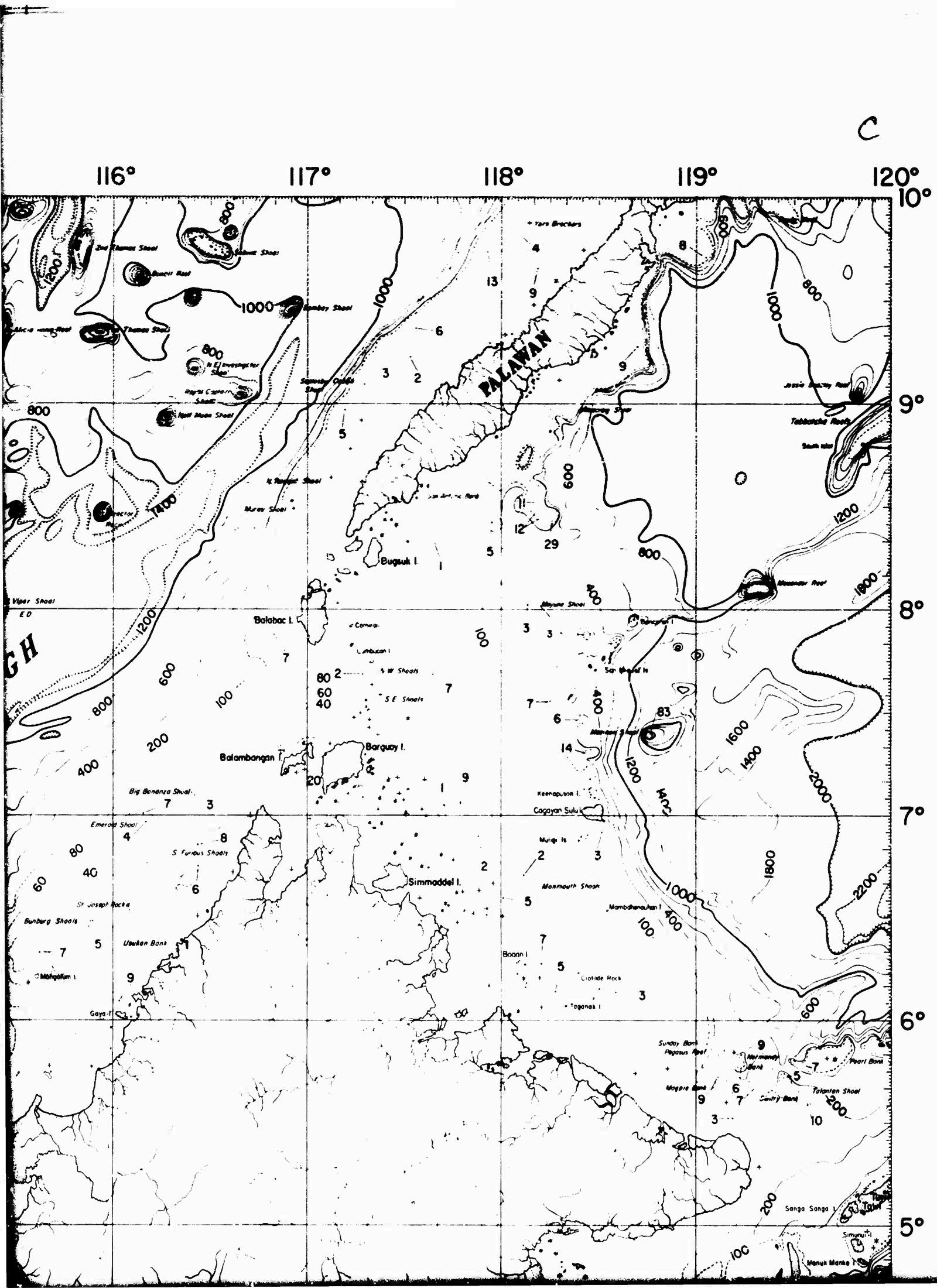
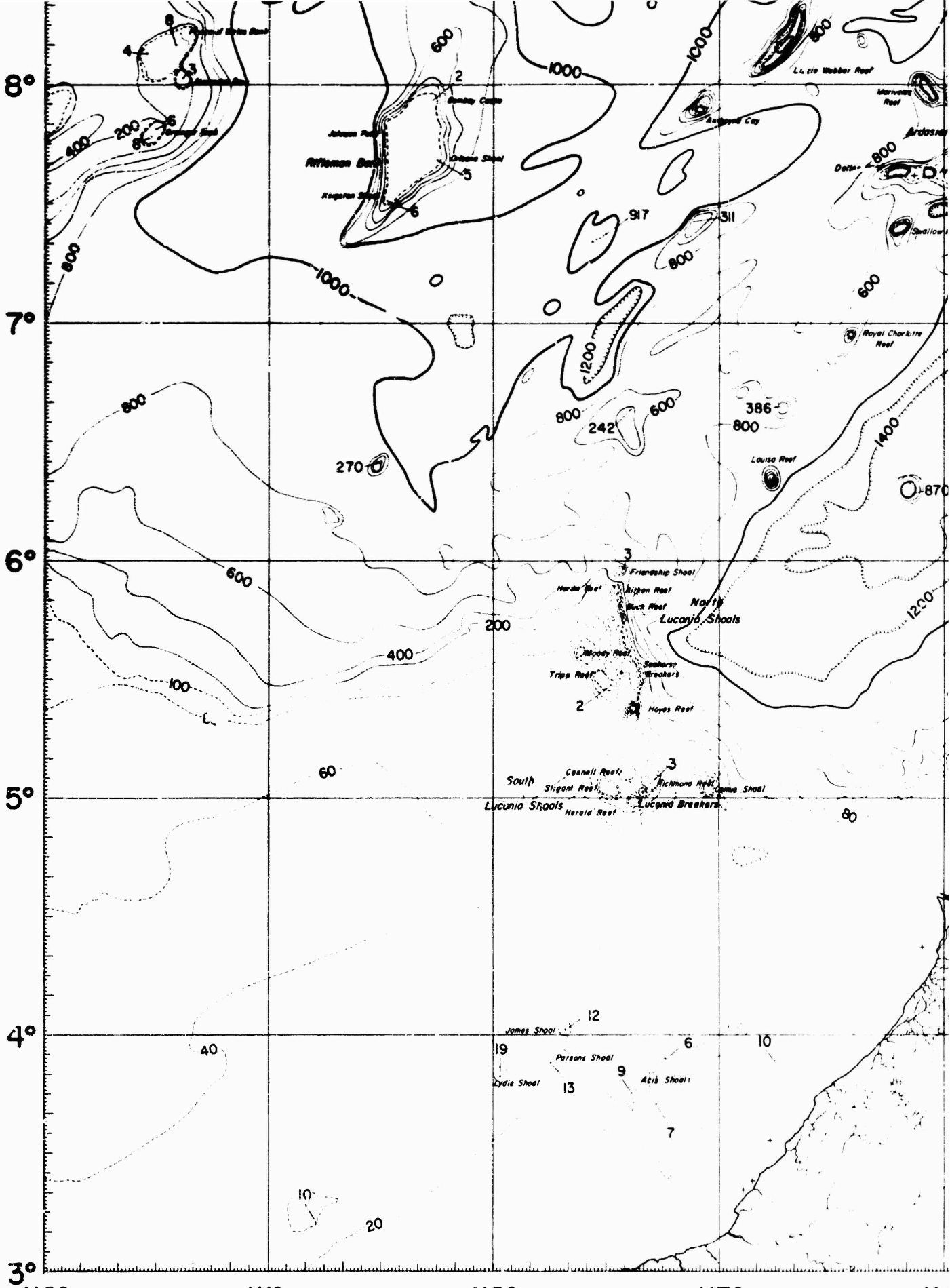
No. 2501
6

F

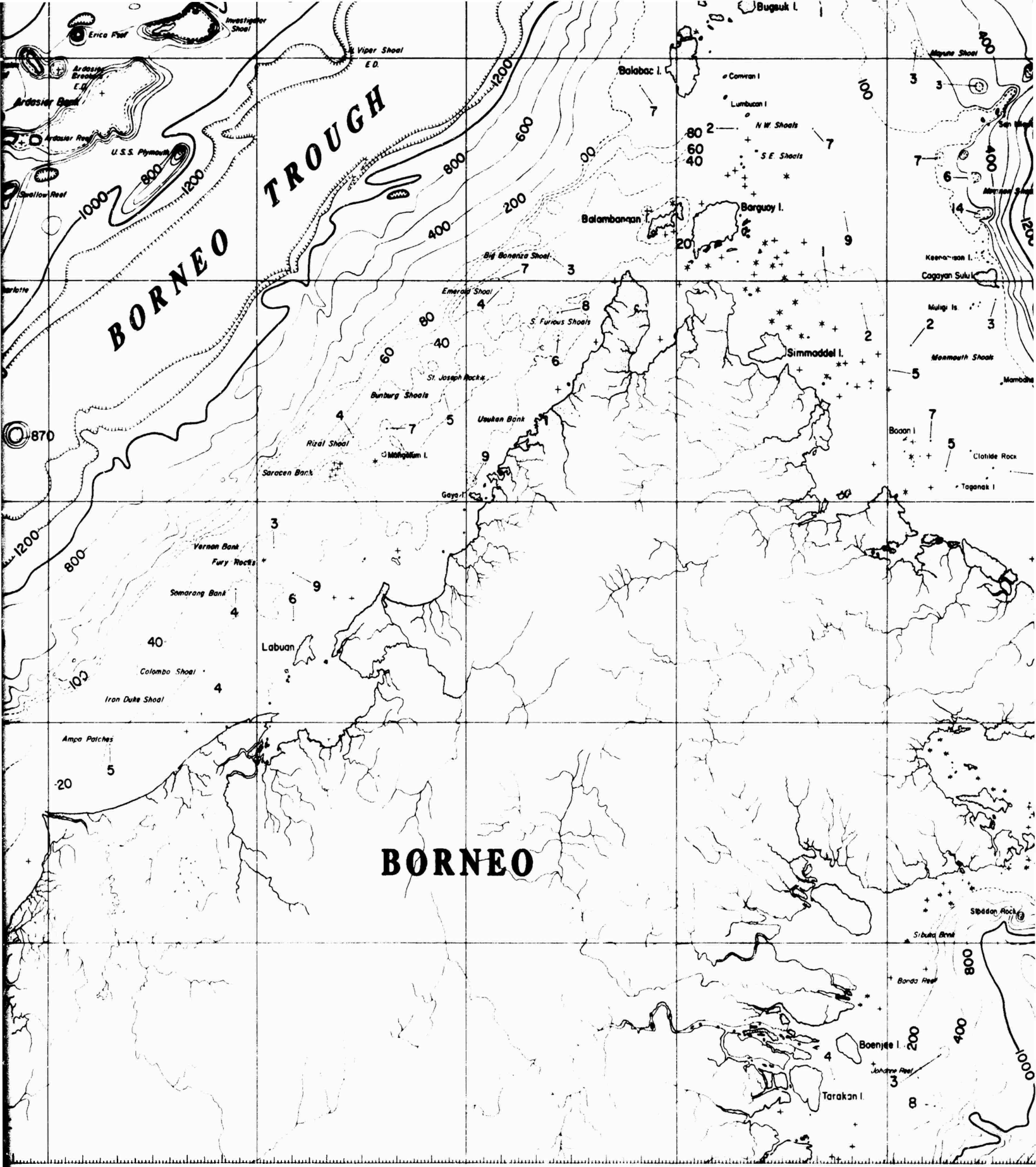

110°
111°
112°
113°
114°
10°
9°
8°
7°
6°
5°
Fiery Cross Reef
Carleton Bank
Moralie Reef
Pearson Reef
Alison Reef
Central Reef
West Reef
Quiberon Reef
Spratly I
Jubilee Seamount
Prince of Wales Bank
Bombay Castle
Johnson Reef
Rifleman Bank
Orleans Shoal
Kingston Shoal
Grainger Bank
Lizzie Webber Reef
Amboyna Cay
Dallas Reef
Swallow Reef
Louisa Reef
Friendship Shoal
Harda Reef
Jubilee Reef
Buck Reef
Lucania Shoals
Moody Reef
Seahorse Breakers
Tripp Reef
Hayes Reef
South Lucania Shoals
Stigant Reef
Herald Reef
Richmond Reef
Lucania Breakers
Comus Shoal


114°
115°
116°
117°
118°
Union Banks & Reefs
Lousiass Reef
Collins Reef
Mischief Reef
2nd Thomas Shoal
Boxall Reef
Alicia Annes Reef
Thomas Shoal
Investigator Shoal
Royal Captain Shoal
Half Moon Shoal
Cornwallis Shoal
Coy Marina
Commodore Reef
Director Rock
Erica Reef
Investigator Shoal
N. Viper Shoal
E.D.
Ardasier Bank
Ardasier Reef
U.S.S. Plymouth
Swallow Reef
Royal Charlotte Reef
BORNEO TROUGH
PALAWAN
Bugsuk I.
Balabac I.
Lumbucan I.
N.W. Shoals
S.E. Shoals
Balambangan I.
Barguoy I.
Big Bonanza Shoal
Emerald Shoal
S. Furious Shoals
St. Joseph Rocks
Bunburg Shoals
Usukan Bank
Rizal Shoal
Mongalum I.
Saracen Bank
Gaya I.
Simmoddel I.
Vernon Bank
Fury Rocks
Samarang Bank
Labuan
Iran Duke Shoal
Ampa Patches
Keenapuson I.
Cagayan Sulu I.
Muligs Is.
Monmouth Shoal
Bagan I.


116°
117°
118°
119°
120°
10°
9°
8°
7°
6°
5°
PALAWAN
Bugsuk I.
Balabac I.
Balambangan
Barquay I.
Big Bonanza Shoal
Emerald Shoal
S. Furious Shoals
Simmaddel I.
St. Joseph Rocks
Bunburg Shoals
Uwakan Bank
Mohgolum I.
Gaya I.
Boogan I.
Taganak I.
Monmouth Shoal
Mambahanauhan I.
Cagayan Sulu I.
Keenapuson I.
Sandbar Is.
Tubbataha Reefs
Sunday Bank
Pegasus Reef
Natmango Bank
Pearl Bank
Magpie Bank
Talantan Shoal
Sanga Sanga I.
Simunul I.
Manuk Manka I.
Viper Shoal
Thomas Shoal
Investigator Shoal
Mayne Shoal
Murray Shoal
Lumbucan I.
S.E. Shoals
Yara Breakers


8°
7°
6°
5°
4°
3°
110°
111°
112°
113°
600
1000
800
400
200
100
1200
1400
917
311
386
242
270
870
Royal Charlotte Reef
Louisa Reef
Friendship Shoal
Horse Reef
Lizzie Reef
Duck Reef
North Lucania Shoals
Moody Reef
Seahorse Breakers
Tripp Reef
Hayes Reef
South Lucania Shoals
Connell Reef
Stigant Reef
Richmond Reef
Lucania Breakers
Herald Reef
James Shoal
Parsons Shoal
Lydia Shoal
Abra Shoals
Ardasier
Sources of Data: U.S Naval Oceanographic Office, T.W.C. Hilde, Snellius Expedition, British Admiralty
Contour Interval = 200 fathoms, uncorrected with 20 fathom contours dashed where applicable

D



114° 115° 116° 117° 118°

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Assisted by [illegible]

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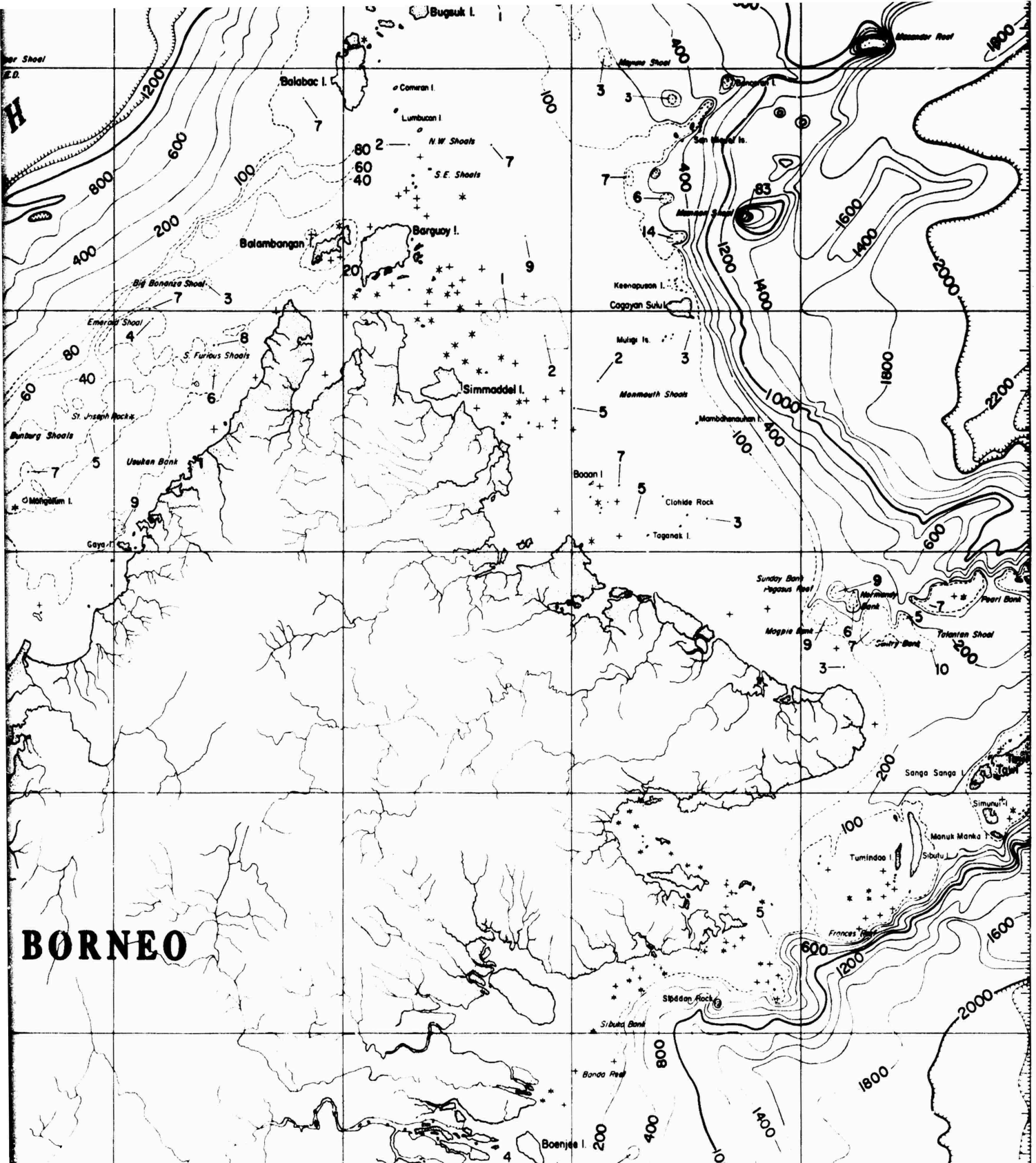
1 E



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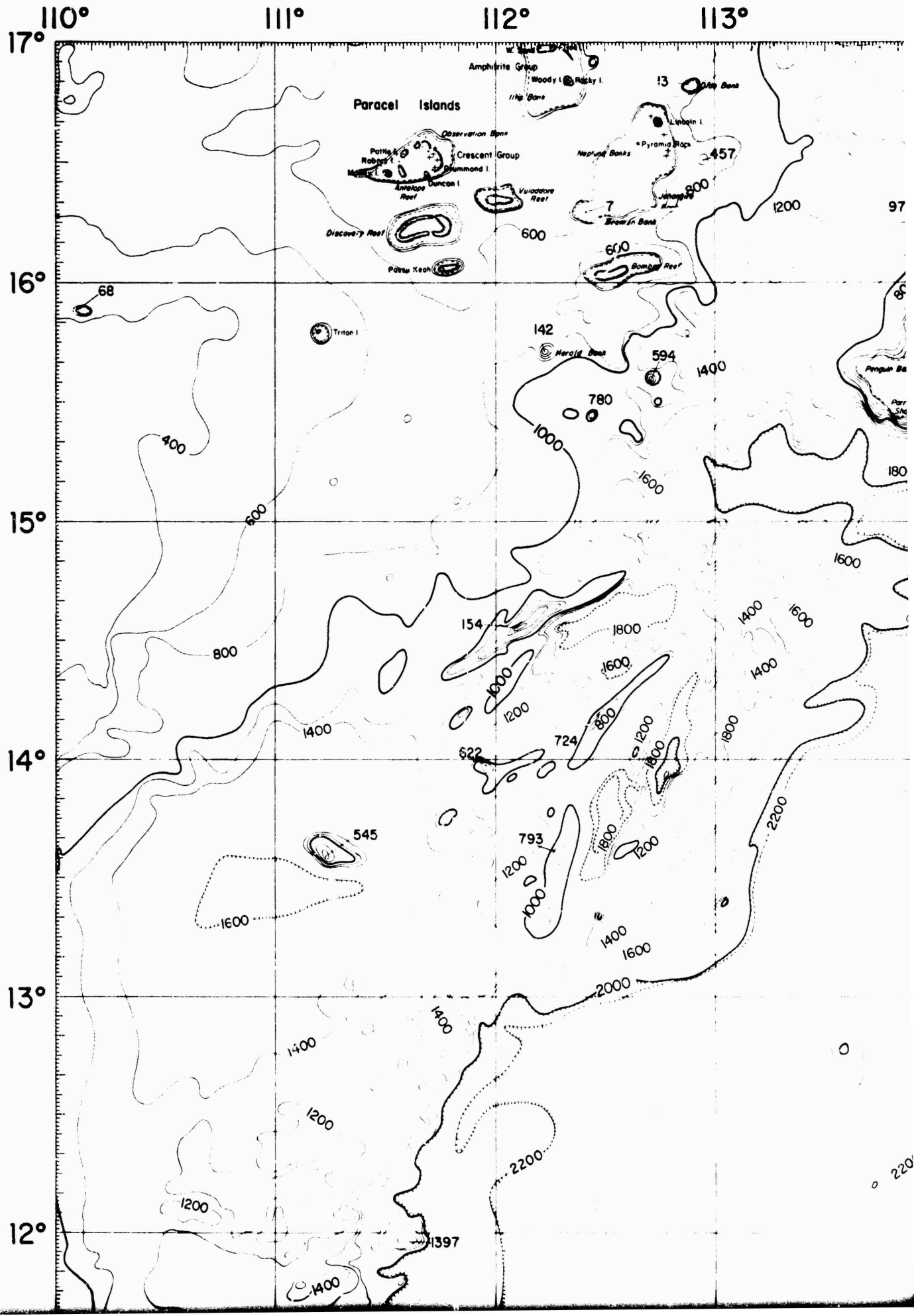
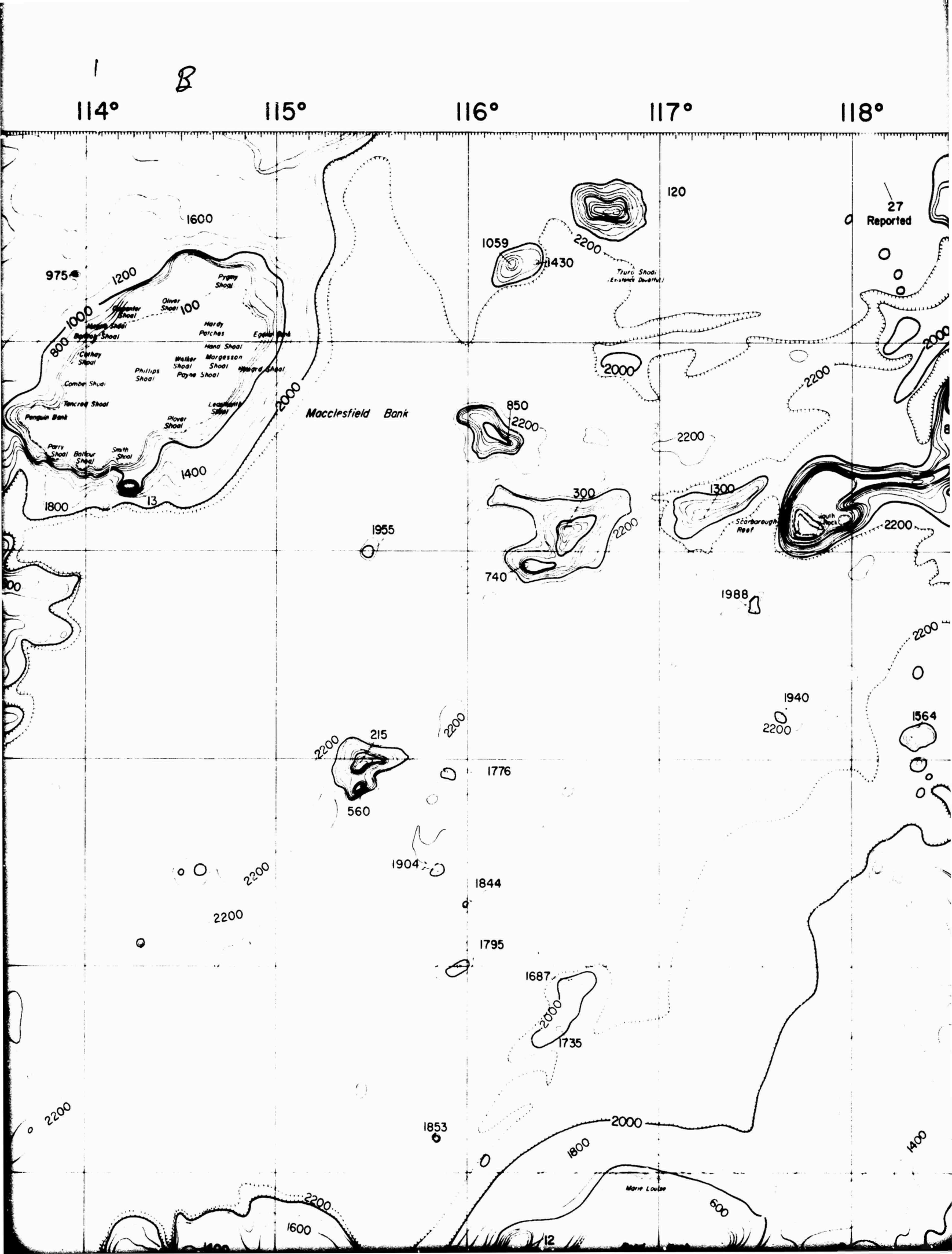
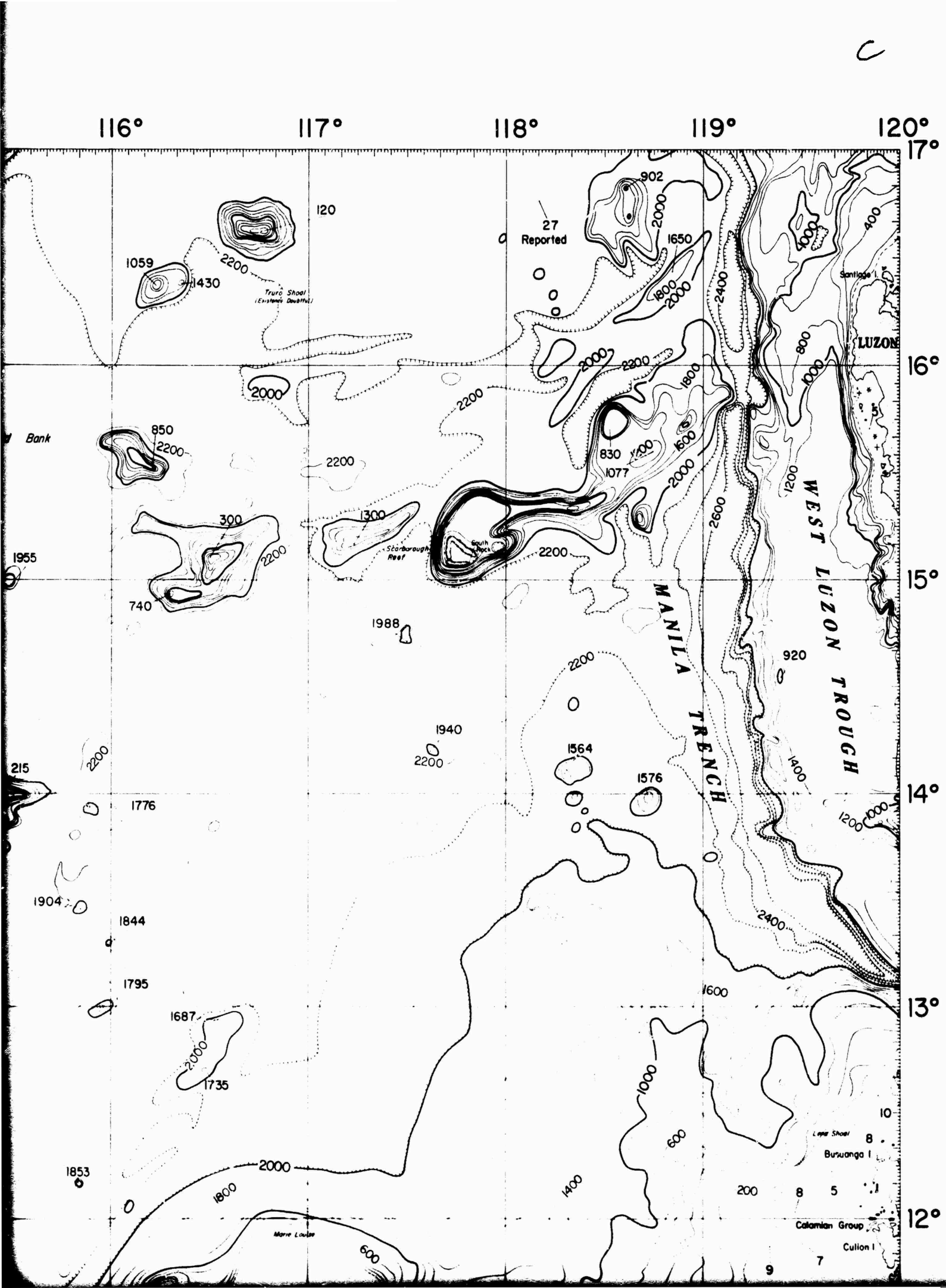
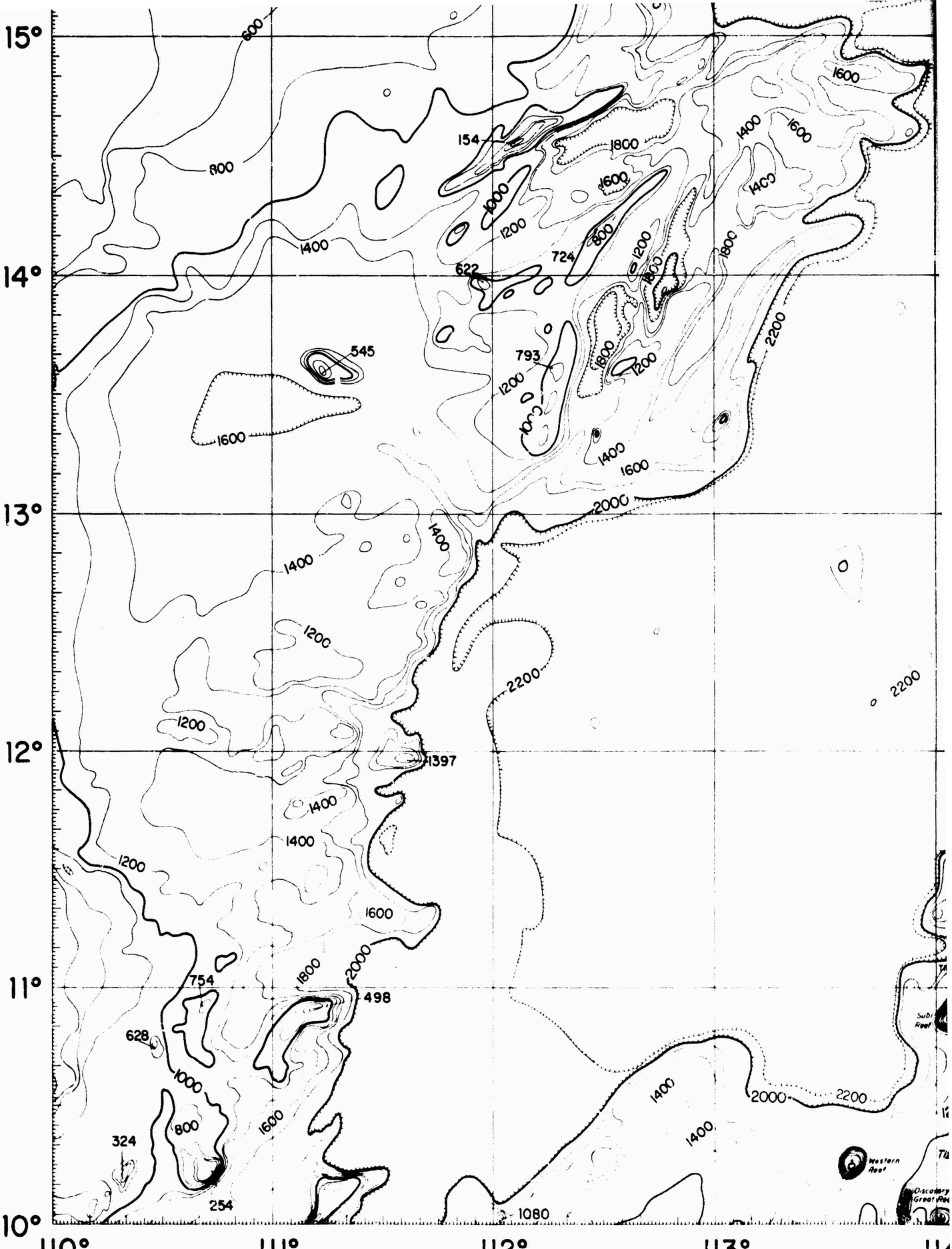

110°
111°
112°
113°
17°
16°
15°
14°
13°
12°
Paracel Islands
Amphitrite Group
Woody I.
Rocky I.
Observation Bank
Crescent Group
Pattle I.
Robert I.
Drummond I.
Antelope Reef
Duncan I.
Vuladore Reef
Discovery Reef
Passu Keah
Triton I.
Lincoln I.
Pyramid Rock
Neptune Banks
Bombay Reef
Herald Bank
68
142
594
780
457
800
600
1200
1400
1000
1600
400
180
154
1800
1200
724
622
545
793
2200
2000
1397


1
B
114°
115°
116°
117°
118°
1600
975
1200
1000
800
100
Pygmy Shoal
Oliver Shoal
Hardy Patches
Hand Shoal
Walker Shoal
Margesson Shoal
Payne Shoal
Phillips Shoal
Combe Shoal
Penguin Bank
Plover Shoal
Parry Shoal
Balfour Shoal
Smith Shoal
13
1400
1800
2000
Macclesfield Bank
1059
1430
2200
120
Truro Shoal (Existence Doubtful)
27
Reported
2000
2200
3000
850
2200
300
740
1955
1300
Scarborough Reef
South Rock
1988
1940
1564
215
560
1776
1904
1844
1795
1687
1735
1853
1800
600
Marie Louise
1600
12

C

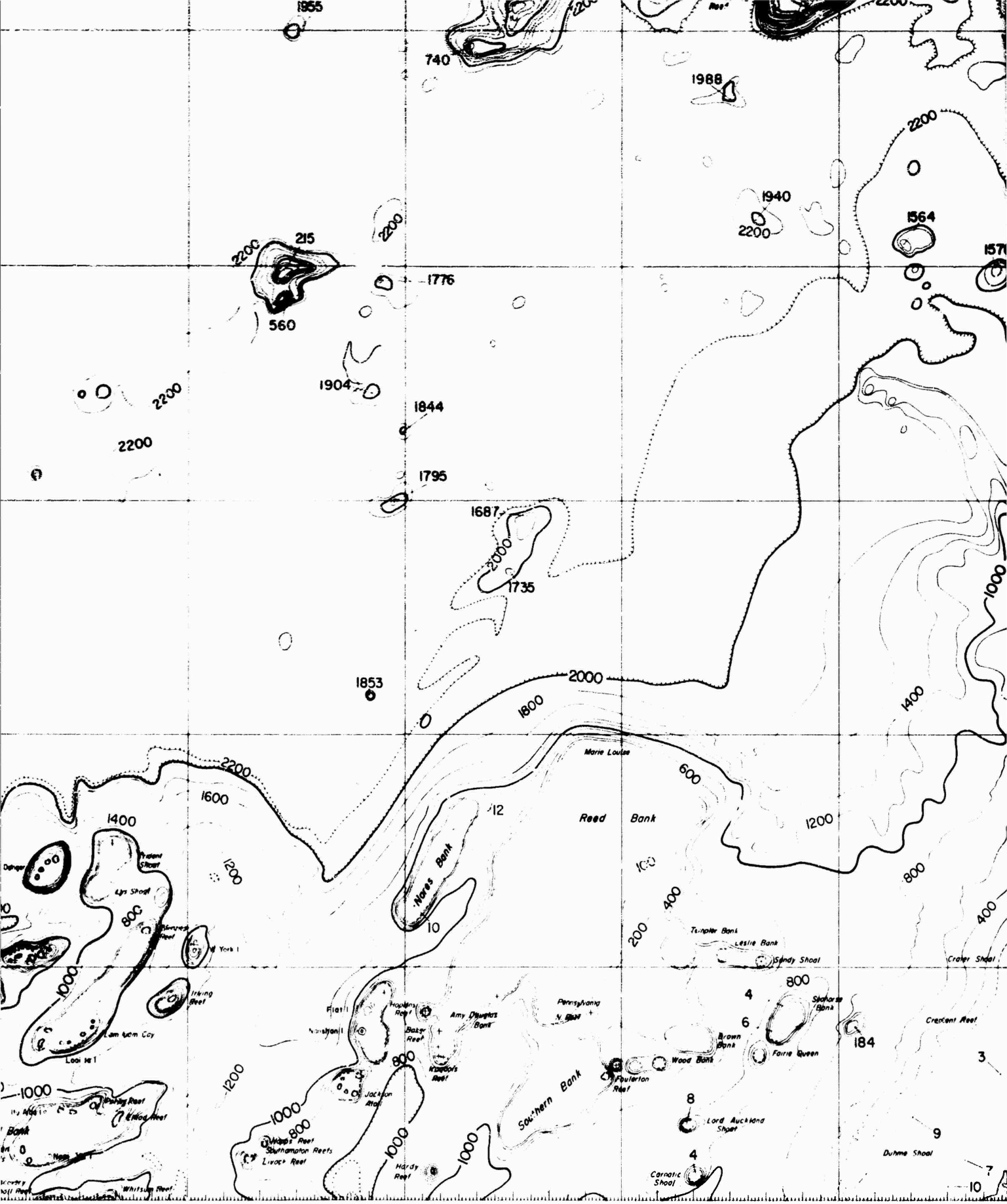

116°
117°
118°
119°
120°
17°
16°
15°
14°
13°
12°
LUZON
WEST LUZON TROUGH
MANILA TRENCH
Bank
Truro Shoal
(Existence Doubtful)
27
Reported
Scarborough
Reef
South
Rock
Santiago I.
Lapa Shoal
Busuanga I.
Calamian Group
Culion I.
Marie Louise
902
1650
1059
1430
850
830
1077
1955
740
1988
920
1940
1564
1576
215
1776
1904
1844
1795
1687
1735
1853
2000
2200
1800
1600
1400
1200
1000
800
600
400
200



Sources of Data Naval Oceanographic Office, British Admiralty, Scripps Institution of Oceanography, TWC Hilo Empire Cable and Wireless

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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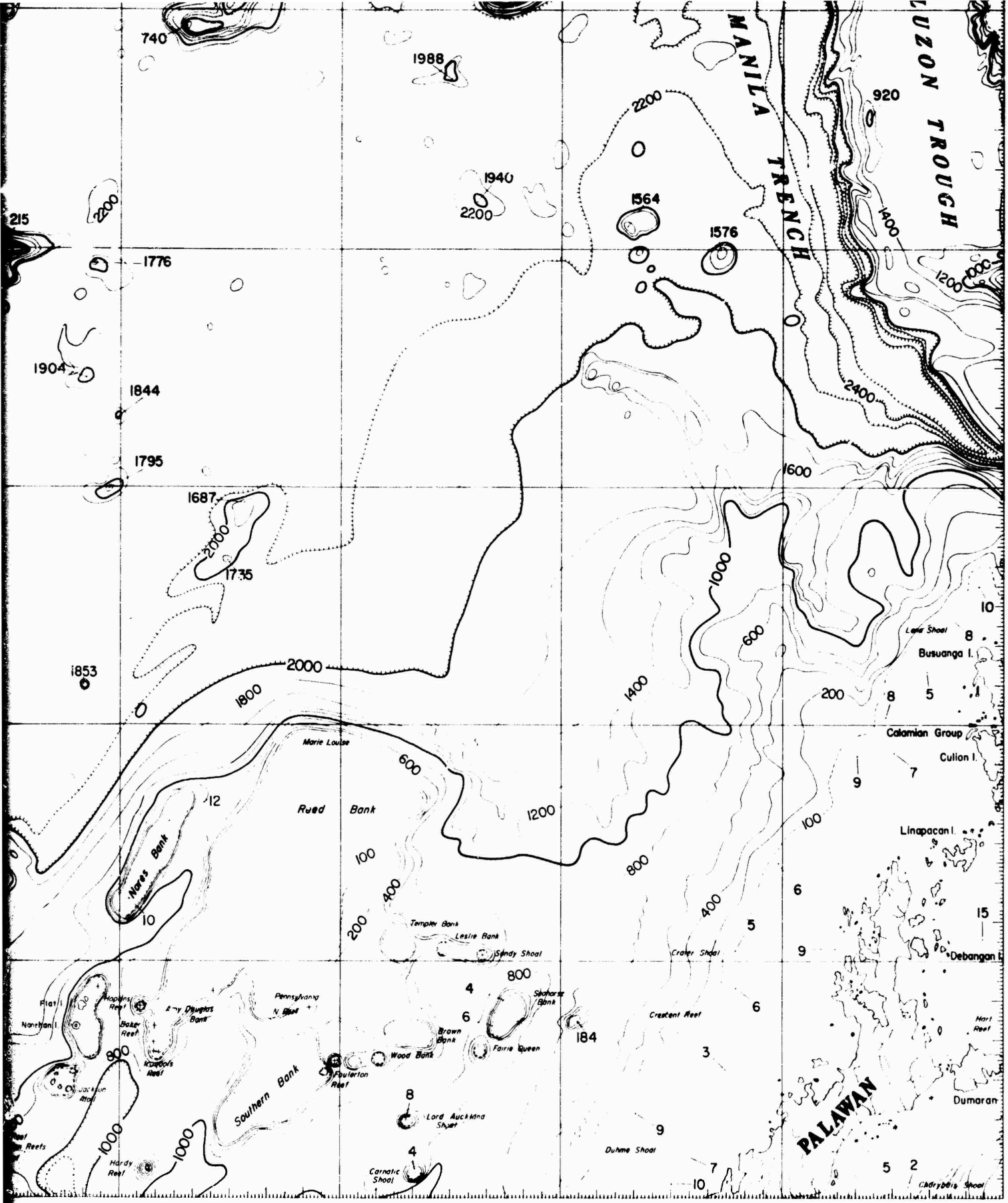

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Assisted by [illegible]

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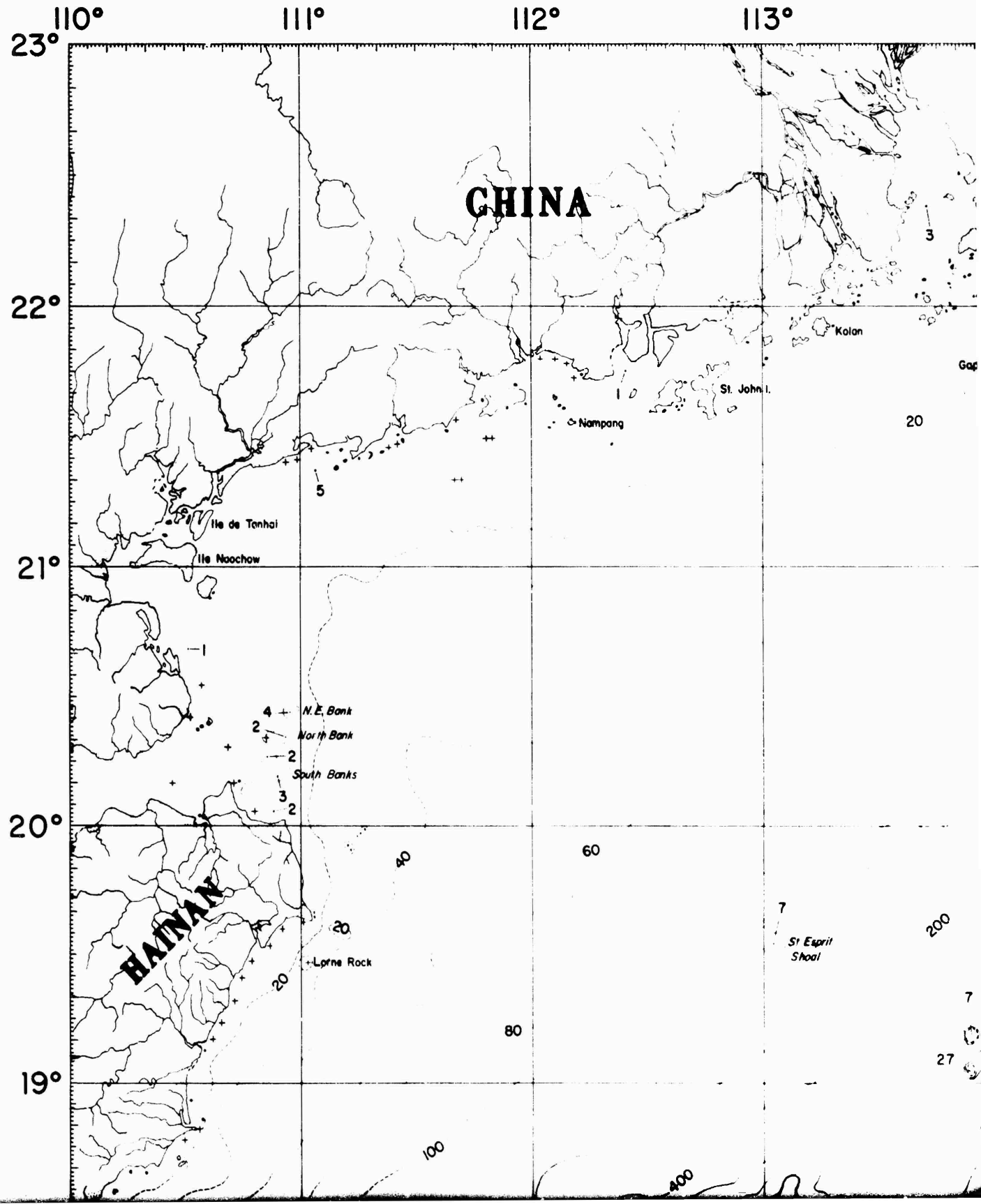
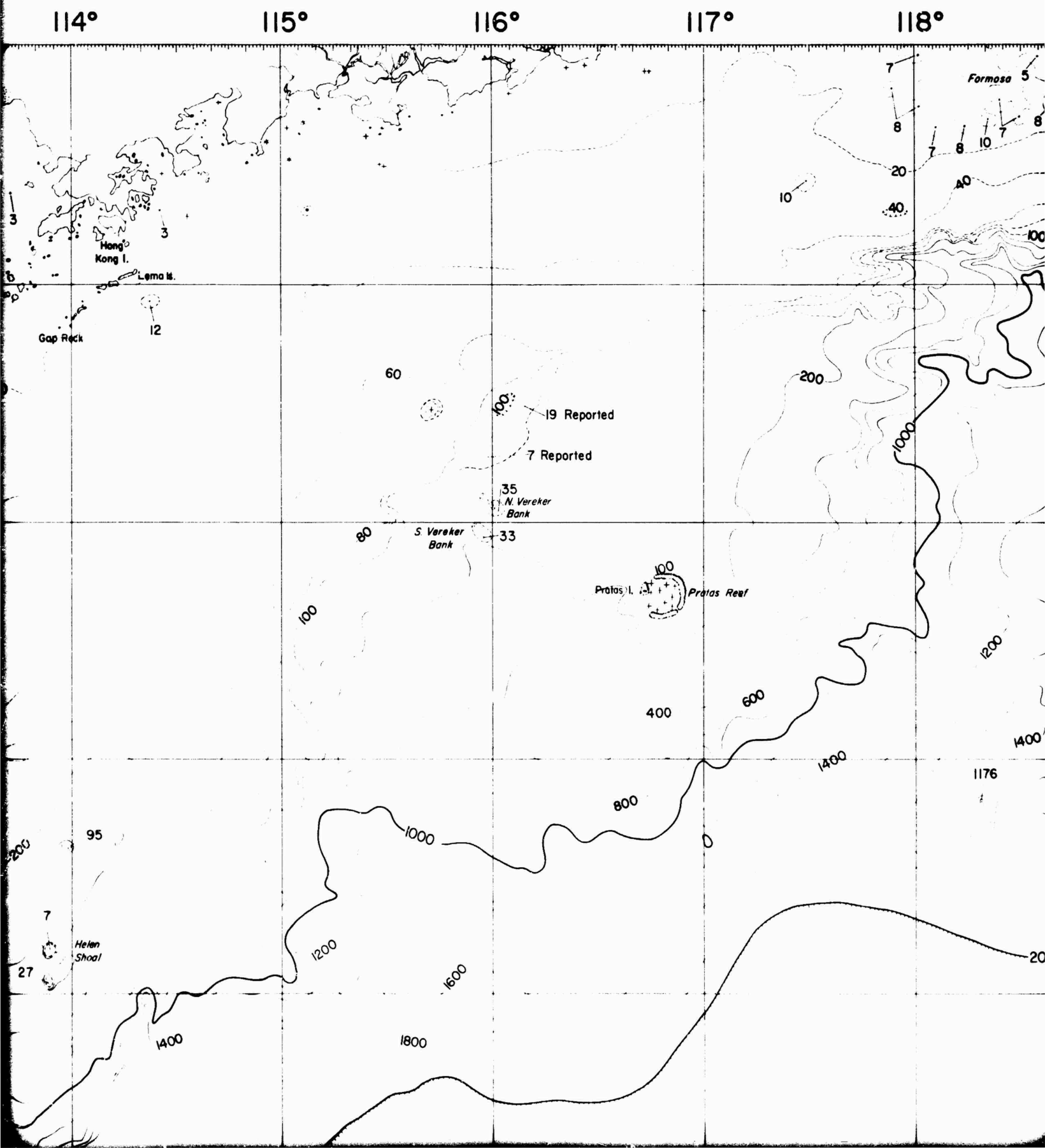
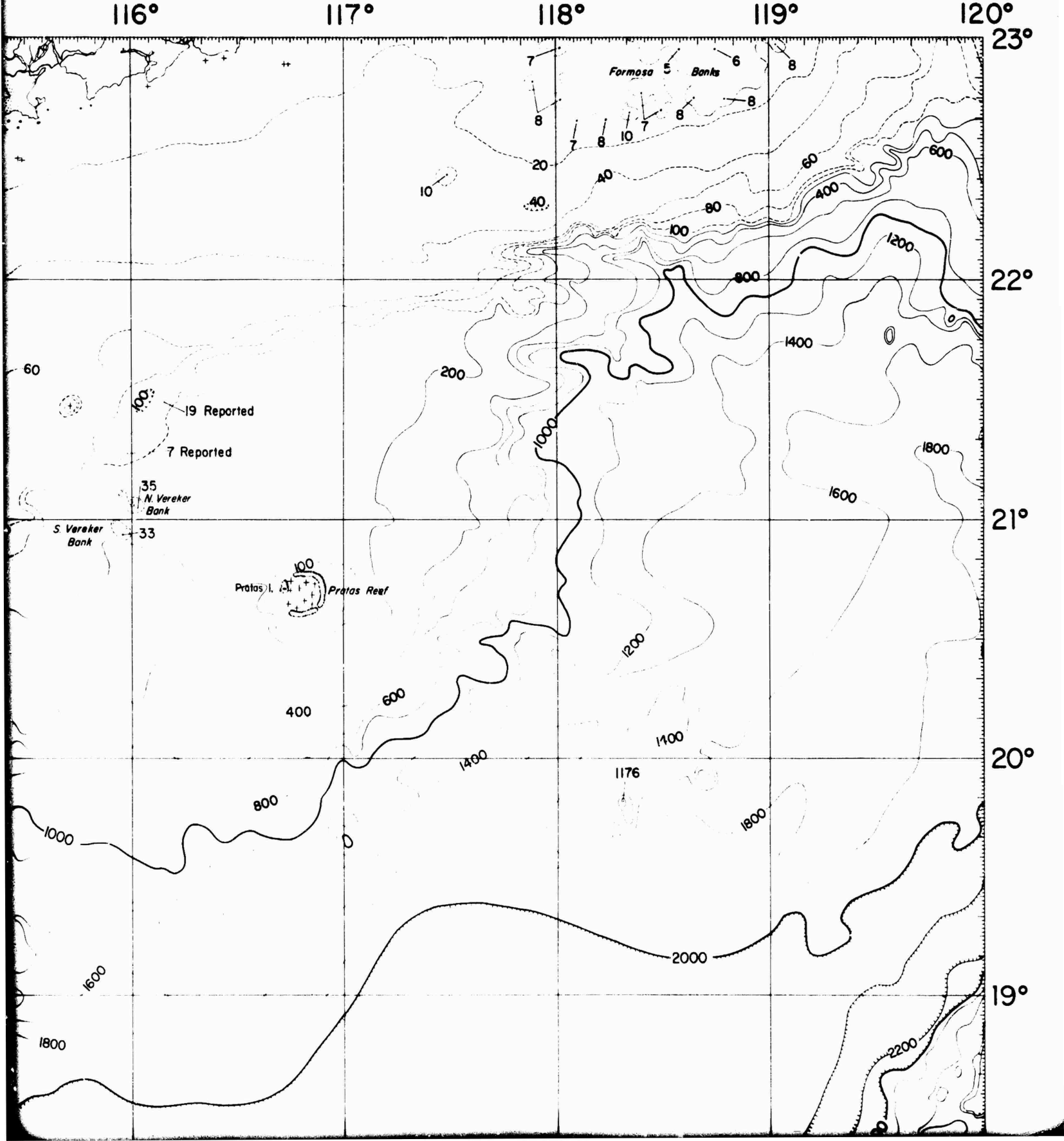
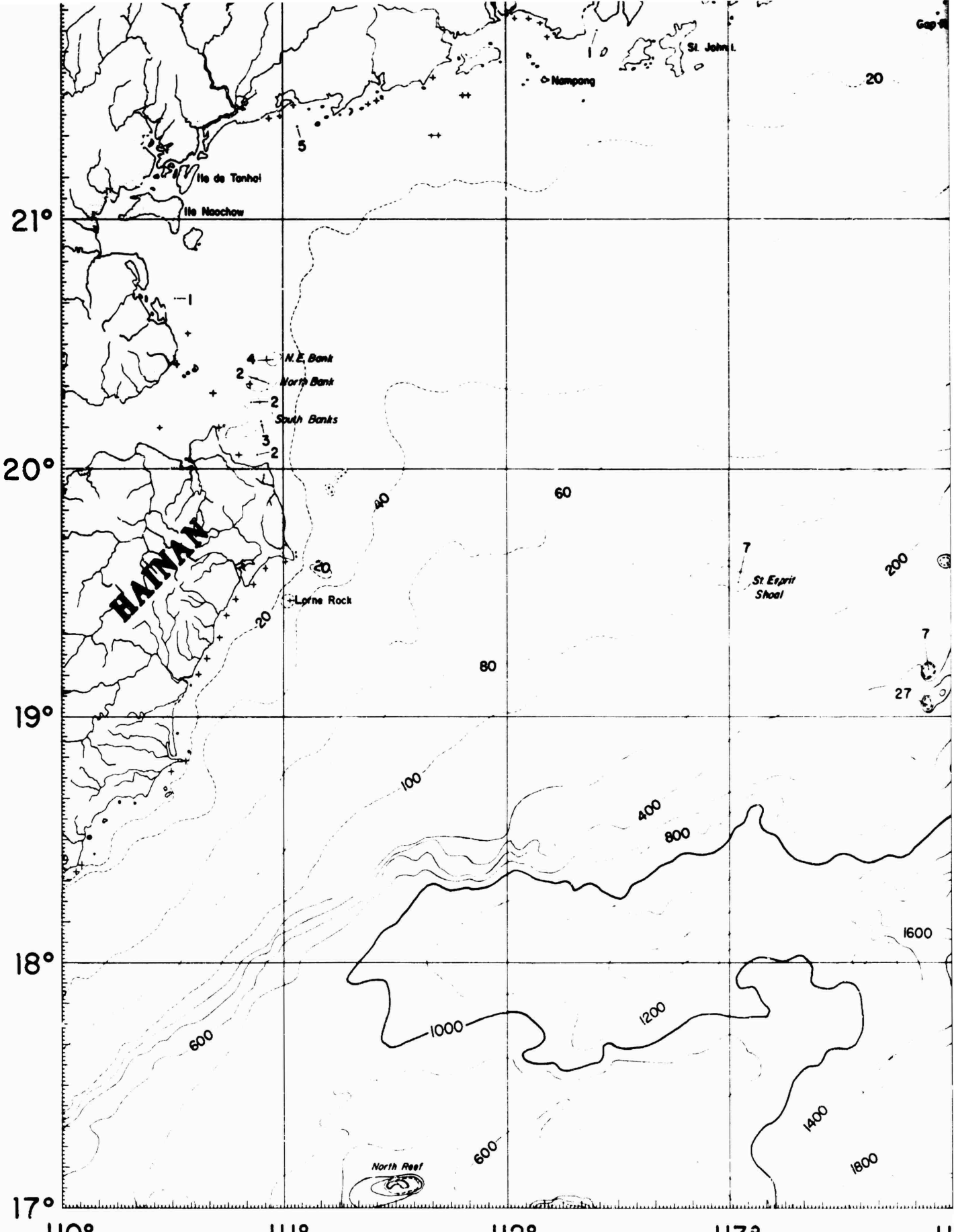

110°
111°
112°
113°
23°
22°
21°
20°
19°
CHINA
HAINAN
Kolan
St. John I.
Nampang
Ile de Tonhai
Ile Naochow
N.E. Bank
North Bank
South Banks
Lorne Rock
St Esprit Shoal
3
5
1
4
2
2
3
2
20
40
60
20
20
80
7
200
7
27
100
400

B


114°
115°
116°
117°
118°
Formosa
Hong Kong I.
Lema Is.
Gap Rock
19 Reported
7 Reported
N. Vereker Bank
S. Vereker Bank
Pratas I.
Pratas Reef
Helen Shoal
1176

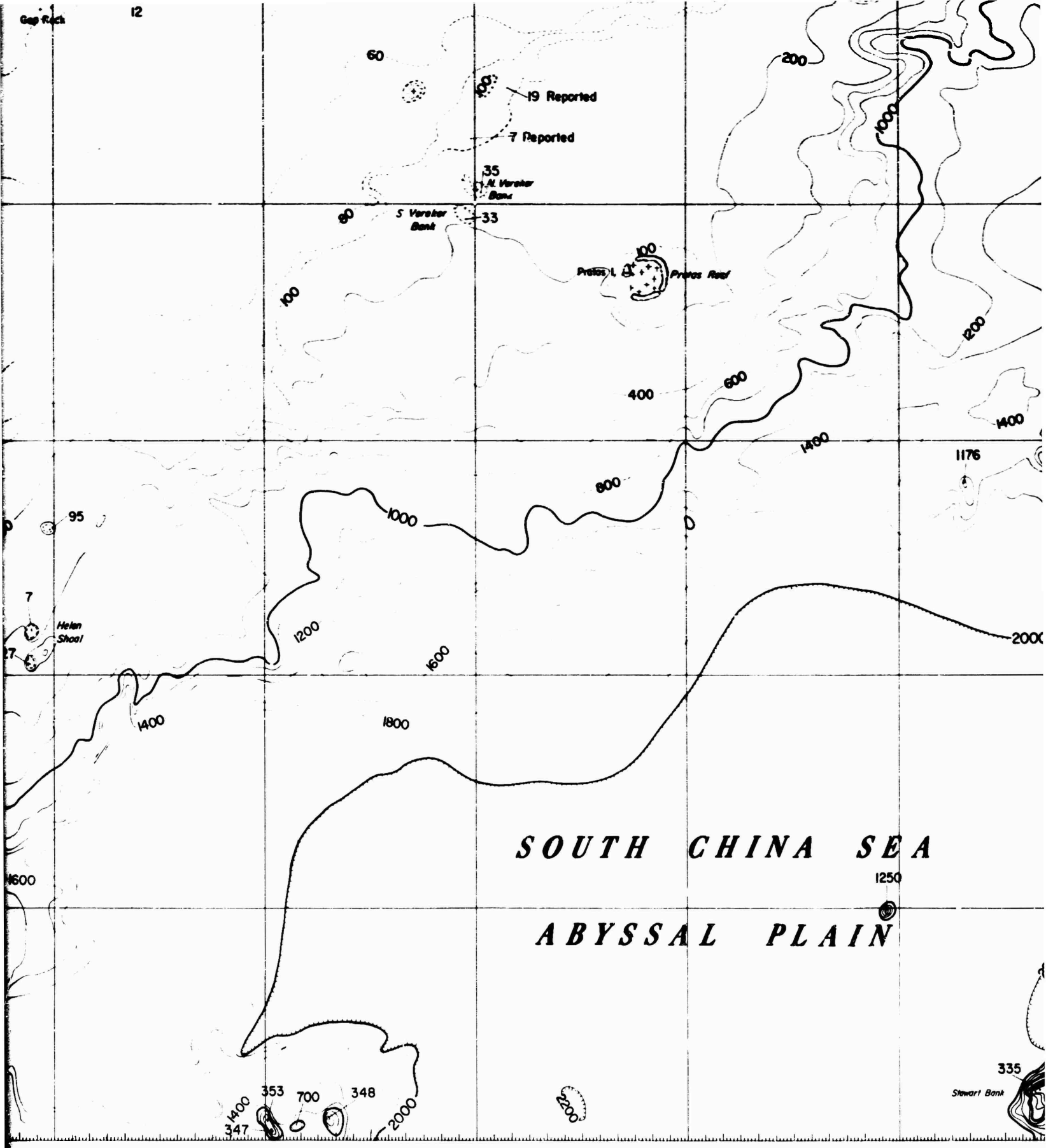
C


116°
117°
118°
119°
120°
23°
22°
21°
20°
19°
Formosa Banks
19 Reported
7 Reported
35
N. Vereker Bank
S. Vereker Bank
33
Pratas I.
Pratas Reef
1176
2000
2200



Sources of Data: U.S. Naval Oceanographic Office; British Admiralty; G.B. Udintsev

Contour Interval = 200 fathoms; uncorrected with 20 fathom contours dashed where applicable


Gap Rock
12
60
100
19 Reported
7 Reported
35
N. Vereker Bank
S Vereker Bank
33
80
100
Pratas I.
Pratas Reef
200
1000
1200
400
600
1400
1400
1176
800
95
1000
7
Helen Shoal
27
1200
1600
1400
1800
SOUTH CHINA SEA
1600
1250
ABYSSAL PLAIN
335
Stewart Bank
1400
353
700
348
347
2000
2000
114°
115°
116°
117°
118°
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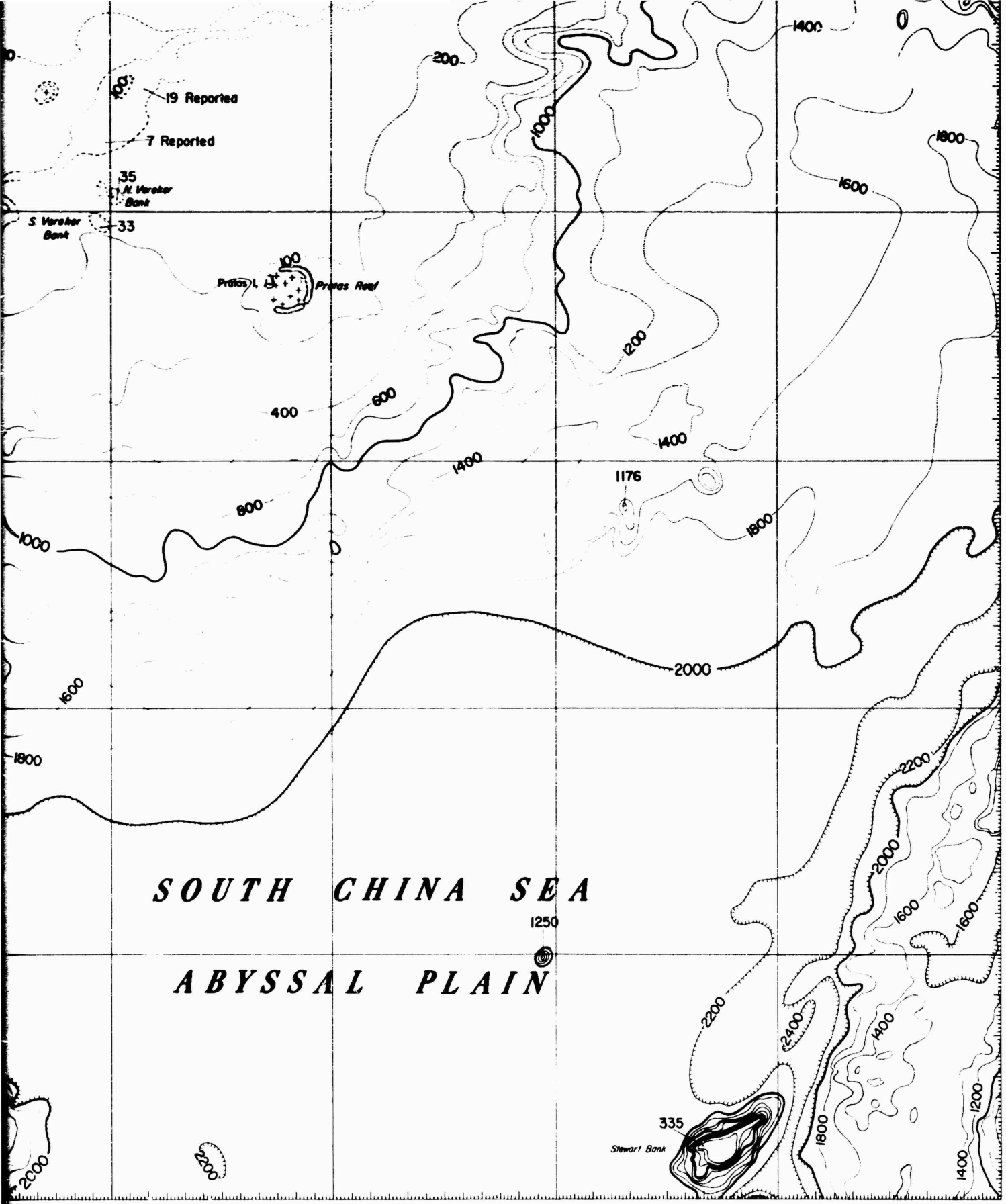
1



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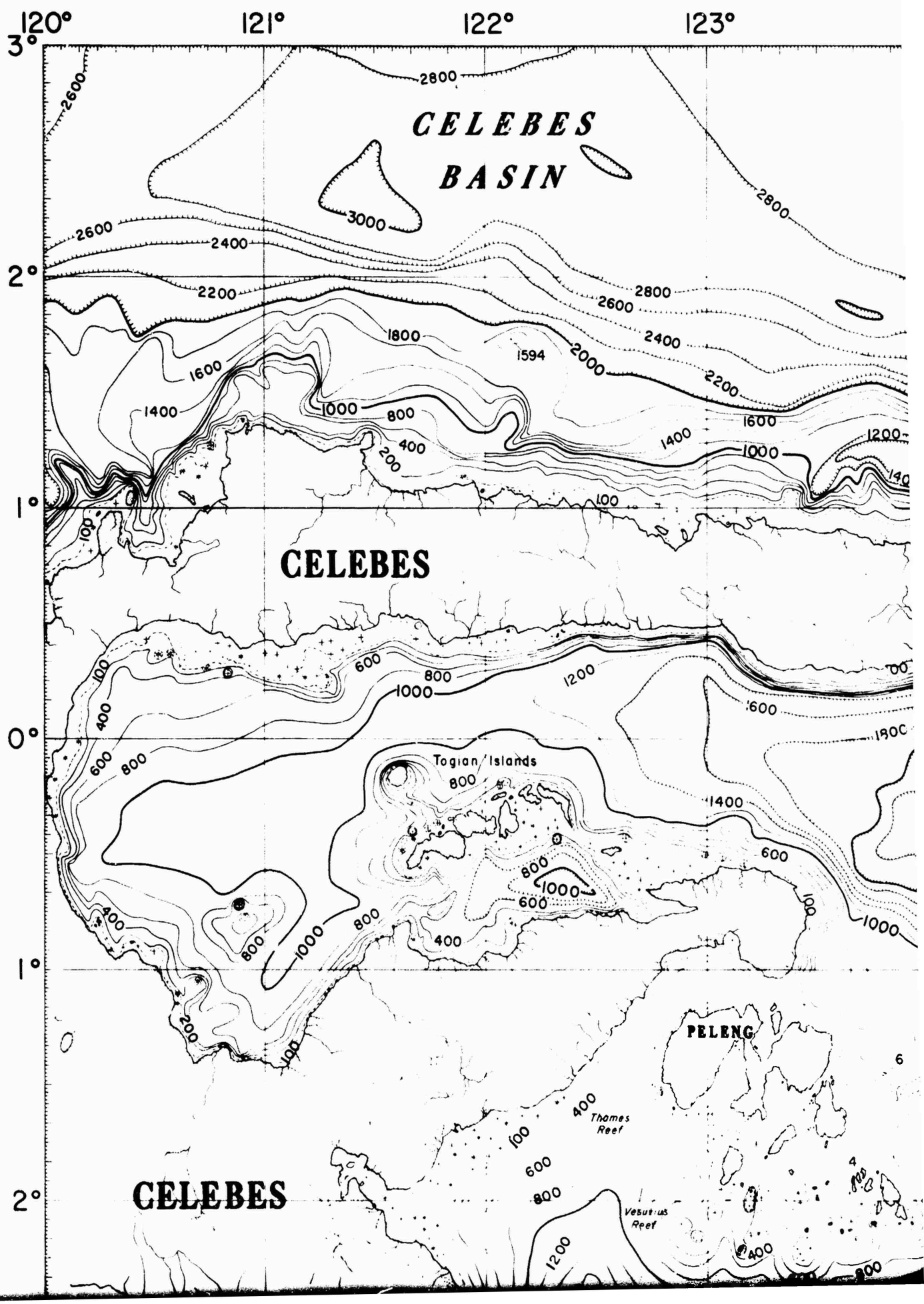
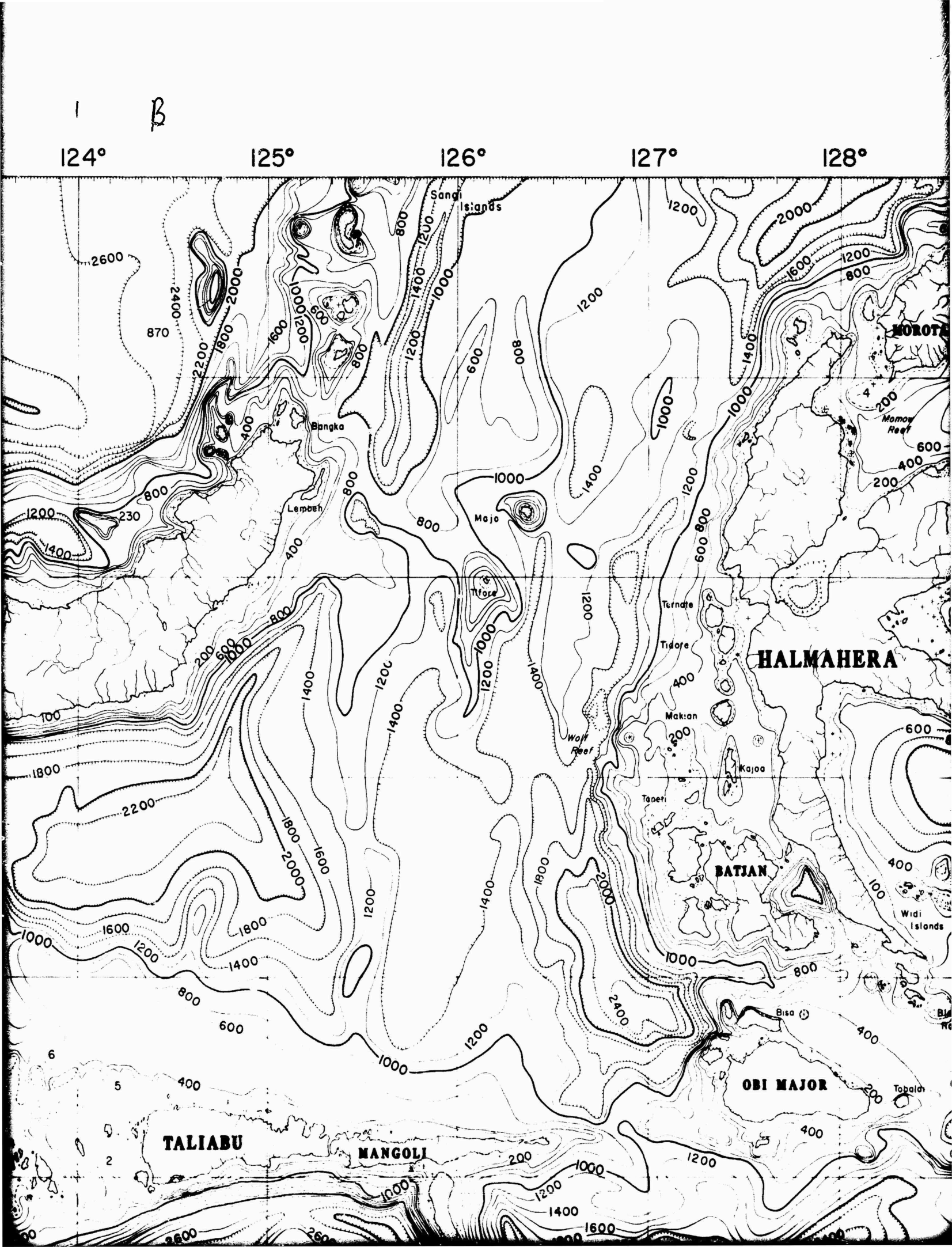
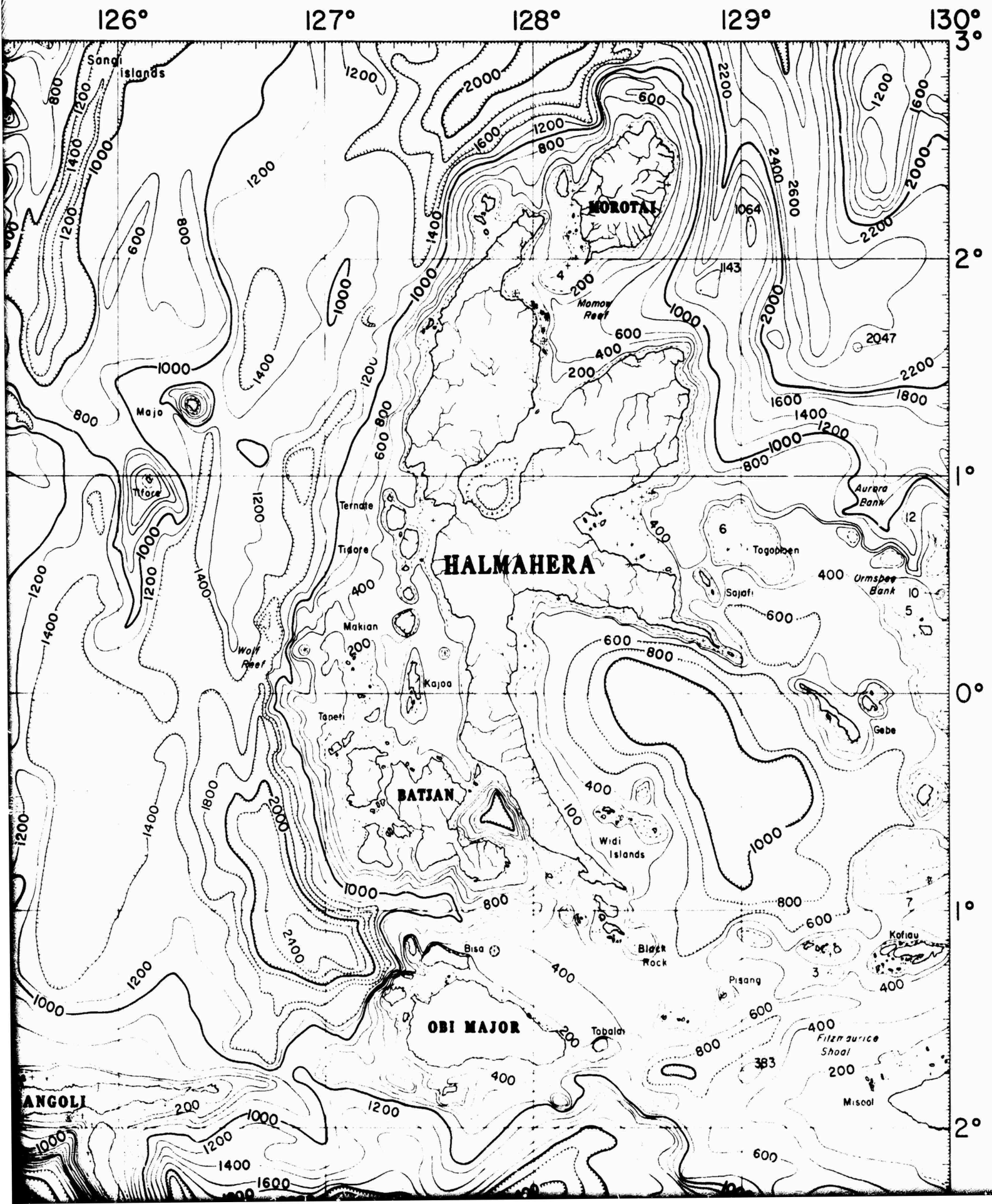
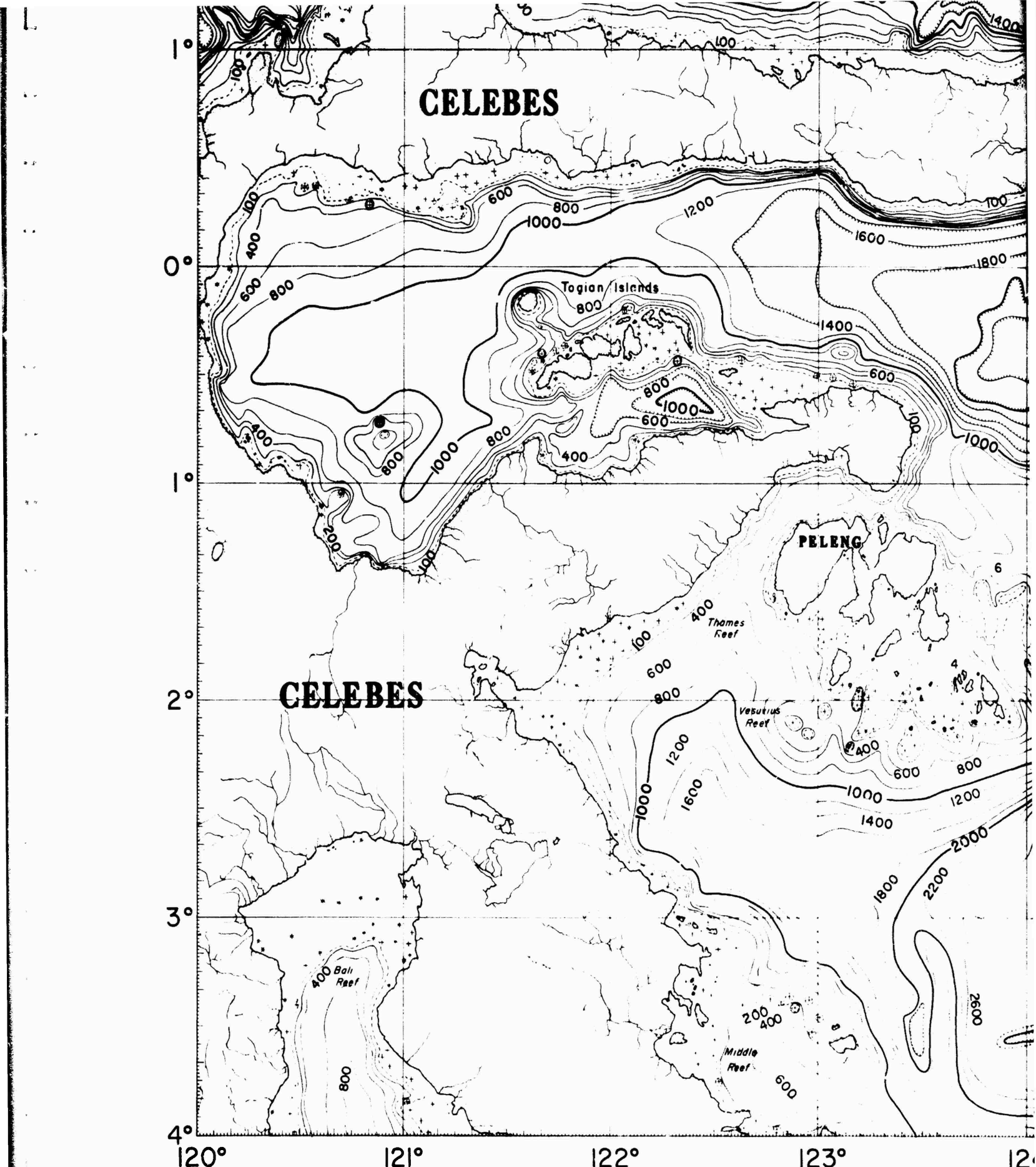

120°
121°
122°
123°
3°
2°
1°
0°
1°
2°
CELEBES
BASIN
CELEBES
CELEBES
Togian Islands
PELENG
Thames
Reef
Vesuvius
Reef
2800
2600
2400
2200
3000
1800
1600
1400
1594
2000
1200
1000
800
600
400
200
100


124°
125°
126°
127°
128°
Sangi Islands
Bangka
Lembeh
Majo
Tifore
Ternate
Tidore
HALMAHERA
Makian
Kajoa
Taneti
Wolf Reef
Momoy Reef
BATJAN
Widi Islands
Bisa
OBI MAJOR
Tobalai
TALIABU
MANGOLI

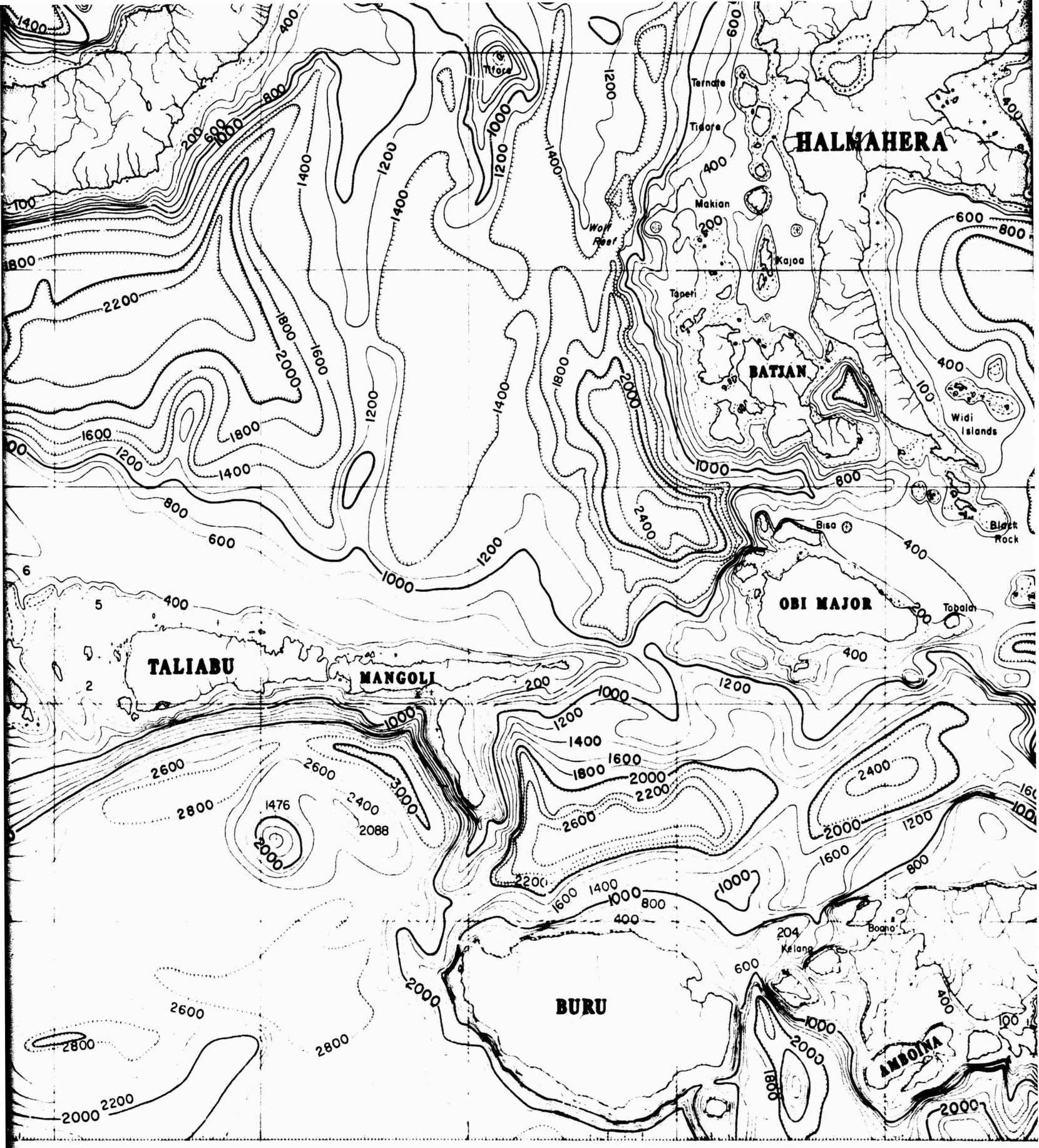
C


126°
127°
128°
129°
130°
3°
2°
1°
0°
1°
2°
Sangi Islands
MOROTAI
HALMAHERA
BATJAN
OBI MAJOR
ANGOLI
Momoy Reef
Majo
Ternate
Tidore
Makian
Kajoa
Taneti
Wolf Reef
Togoboen
Sajafi
Aurora Bank
Urmspee Bank
Widi Islands
Black Rock
Bisa
Tabalai
Pisang
Kofiau
Filzmaurice Shoal
Misool
Gebe
1064
1143
2047
383



Sources of Data: US Naval Oceanographic Office, British Admiralty, Snellius Expedition, GB Udintsev, DC Krause, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable



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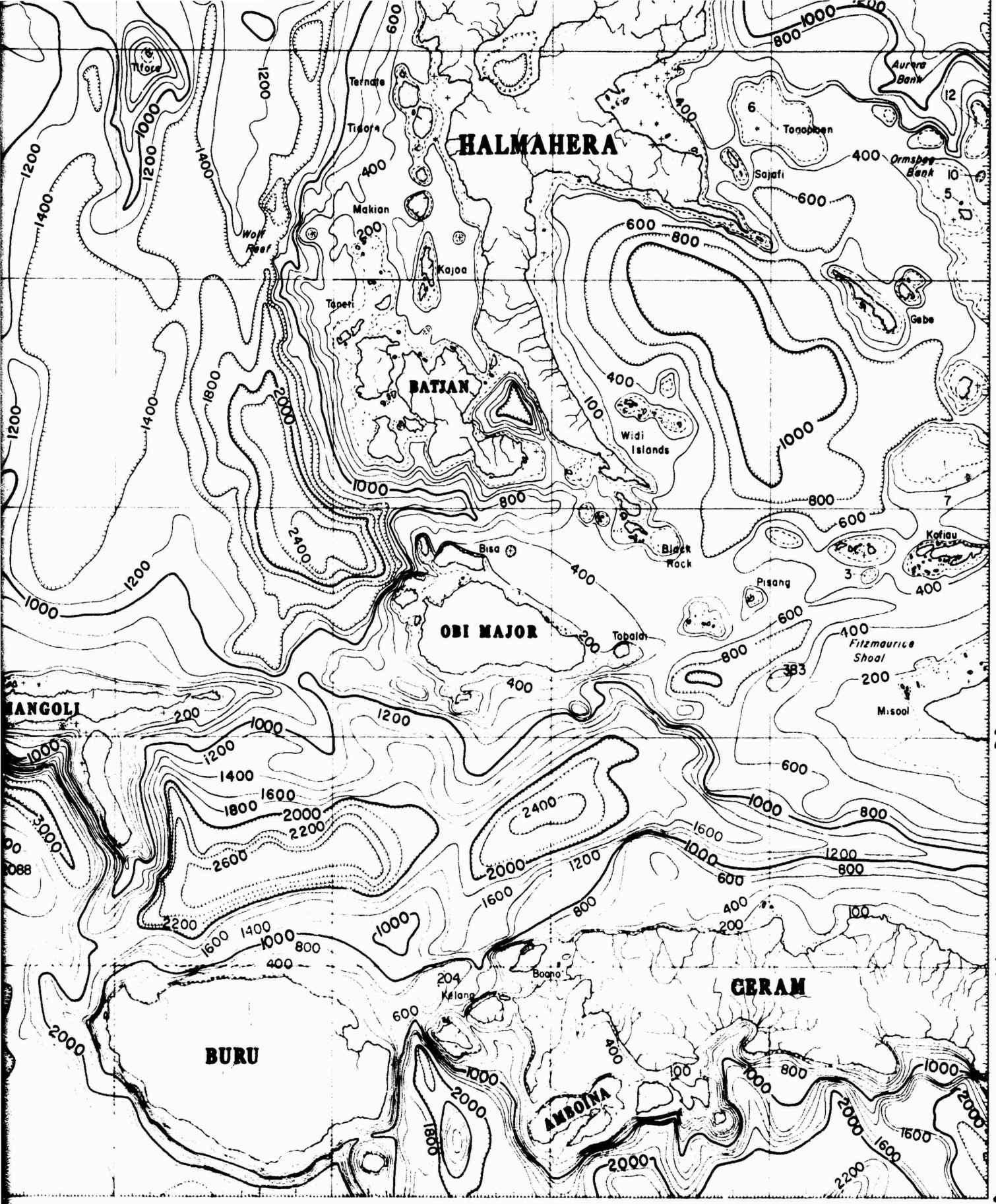
1 E



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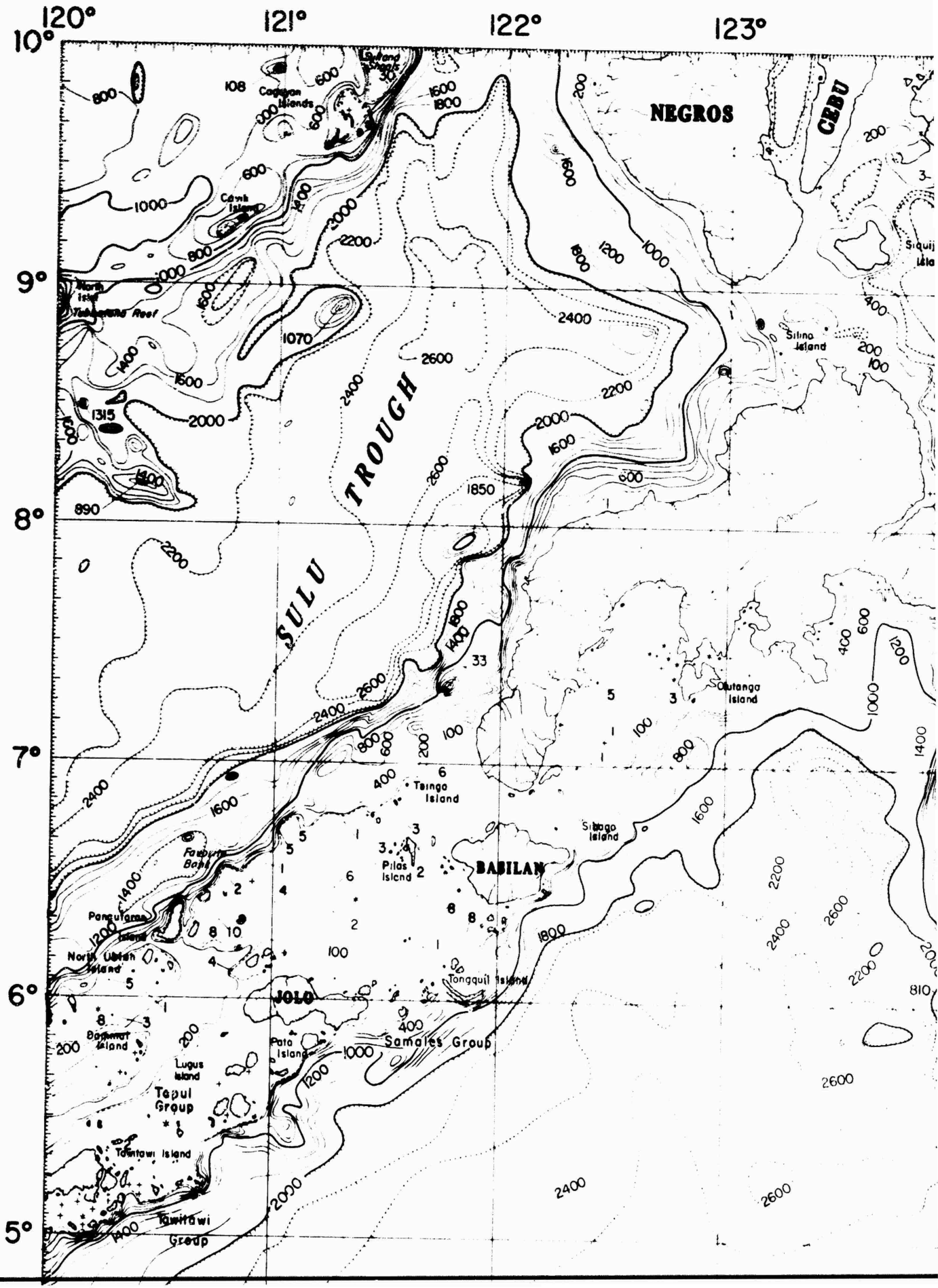
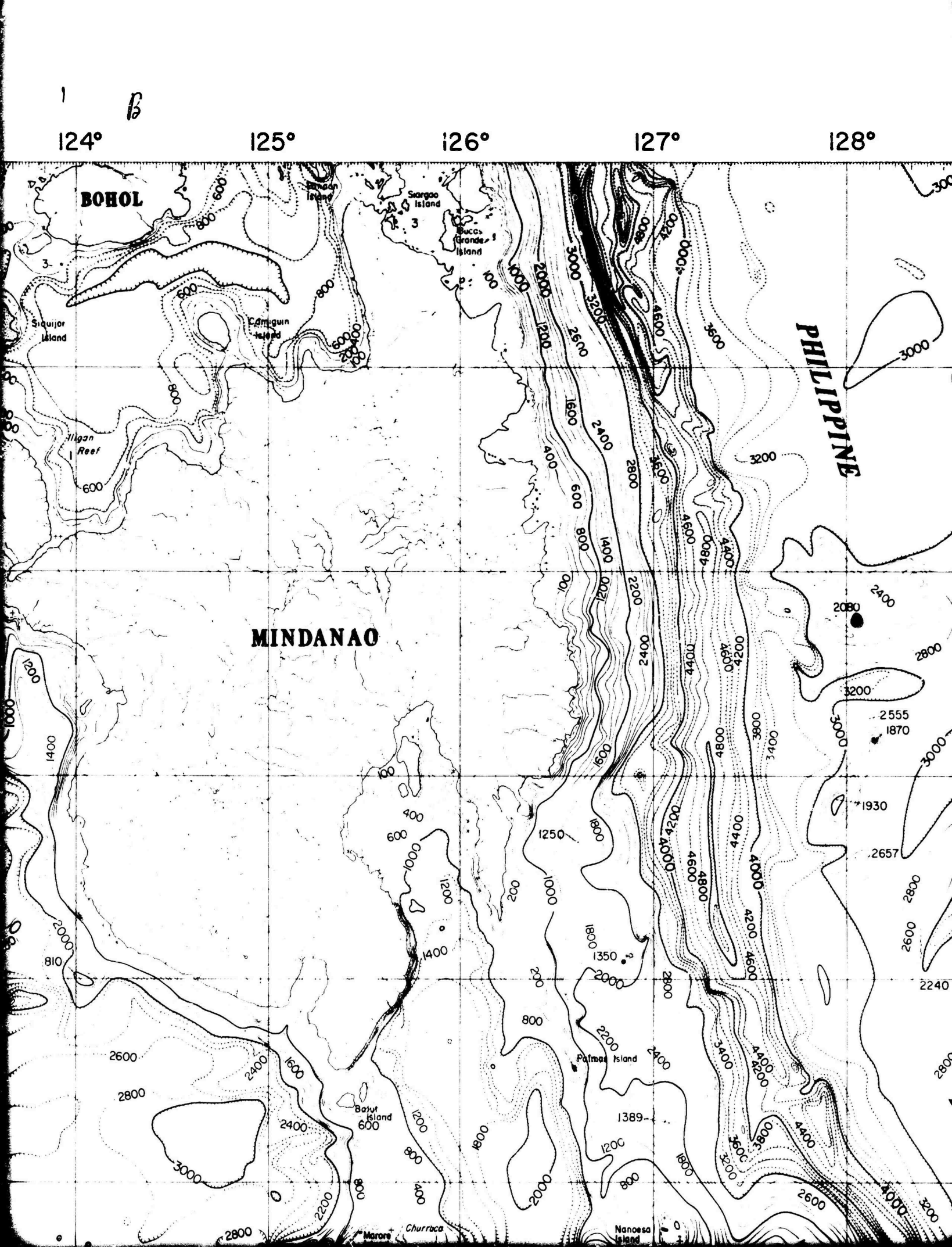
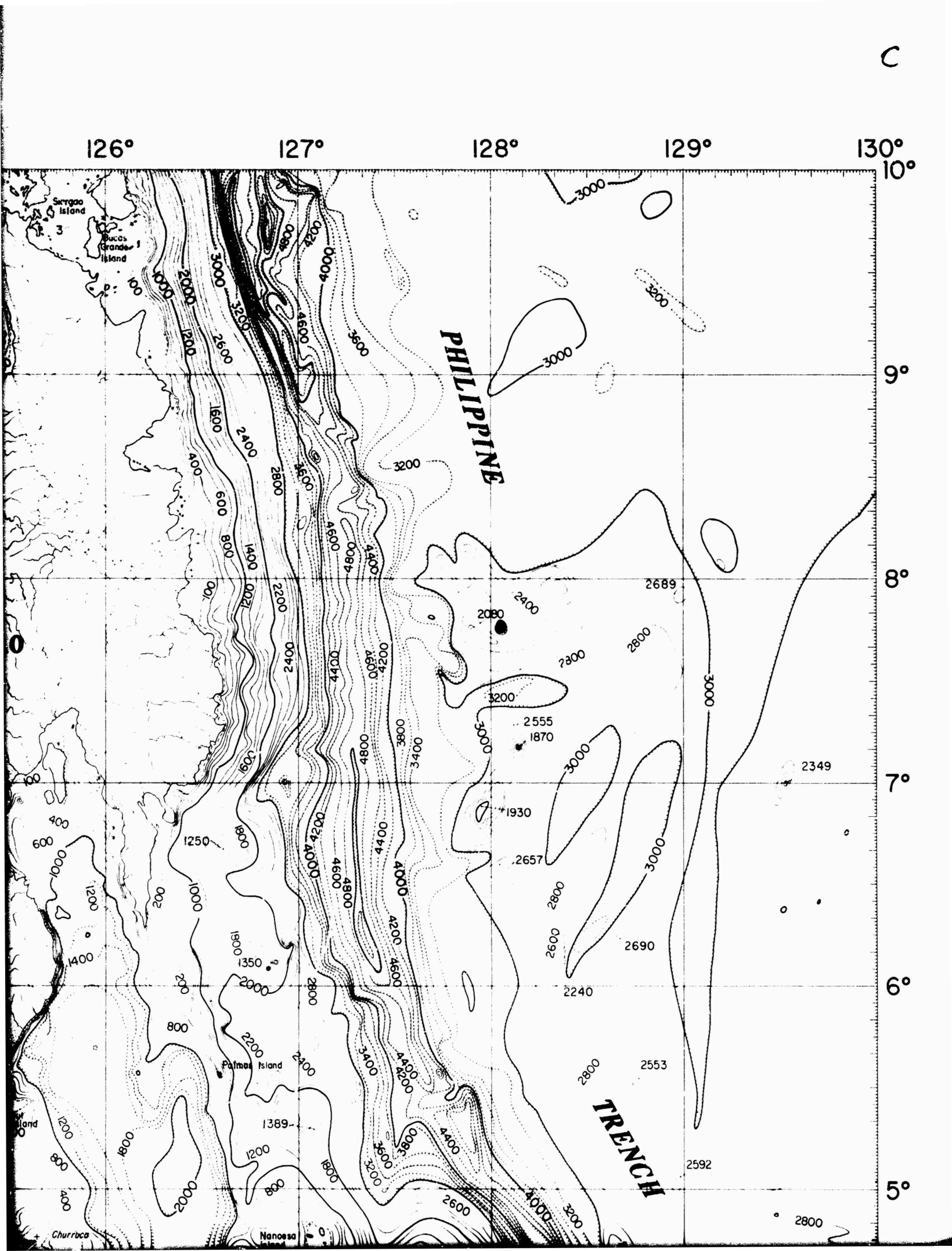
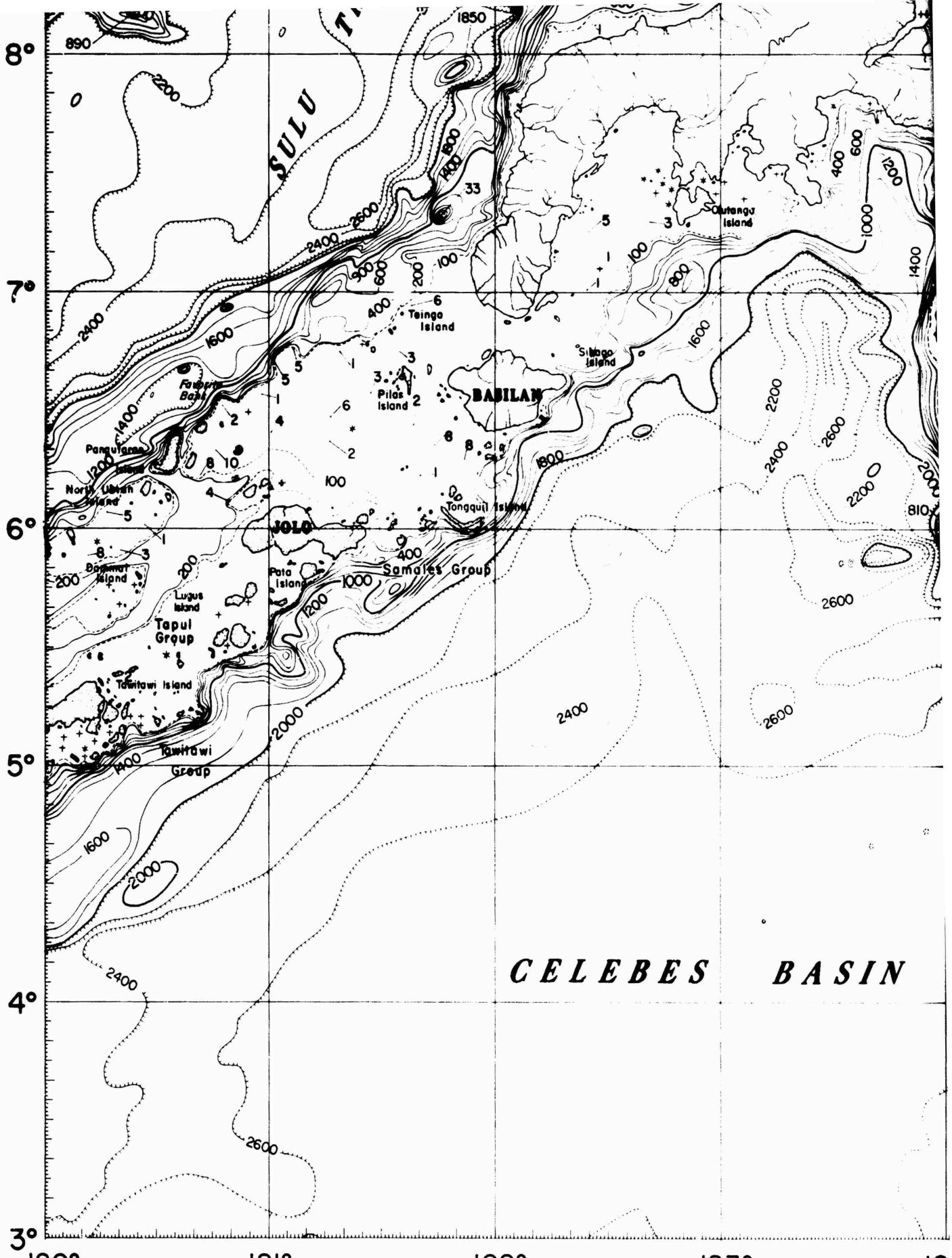

120°
121°
122°
123°
10°
9°
8°
7°
6°
5°
NEGROS
CEBU
SULU TROUGH
SULU
BASILAN
JOLO
Cagayan Islands
Cuyo Islands
North Islet
Tubbataha Reef
Siquijor Island
Siloo Island
Olutanga Island
Tarigo Island
Sibago Island
Pilas Island
Panguiama Island
North Ubian Island
Tongquil Island
Pata Island
Samales Group
Bongao Island
Lugus Island
Tapul Group
Tawitawi Island
Tawitawi Group

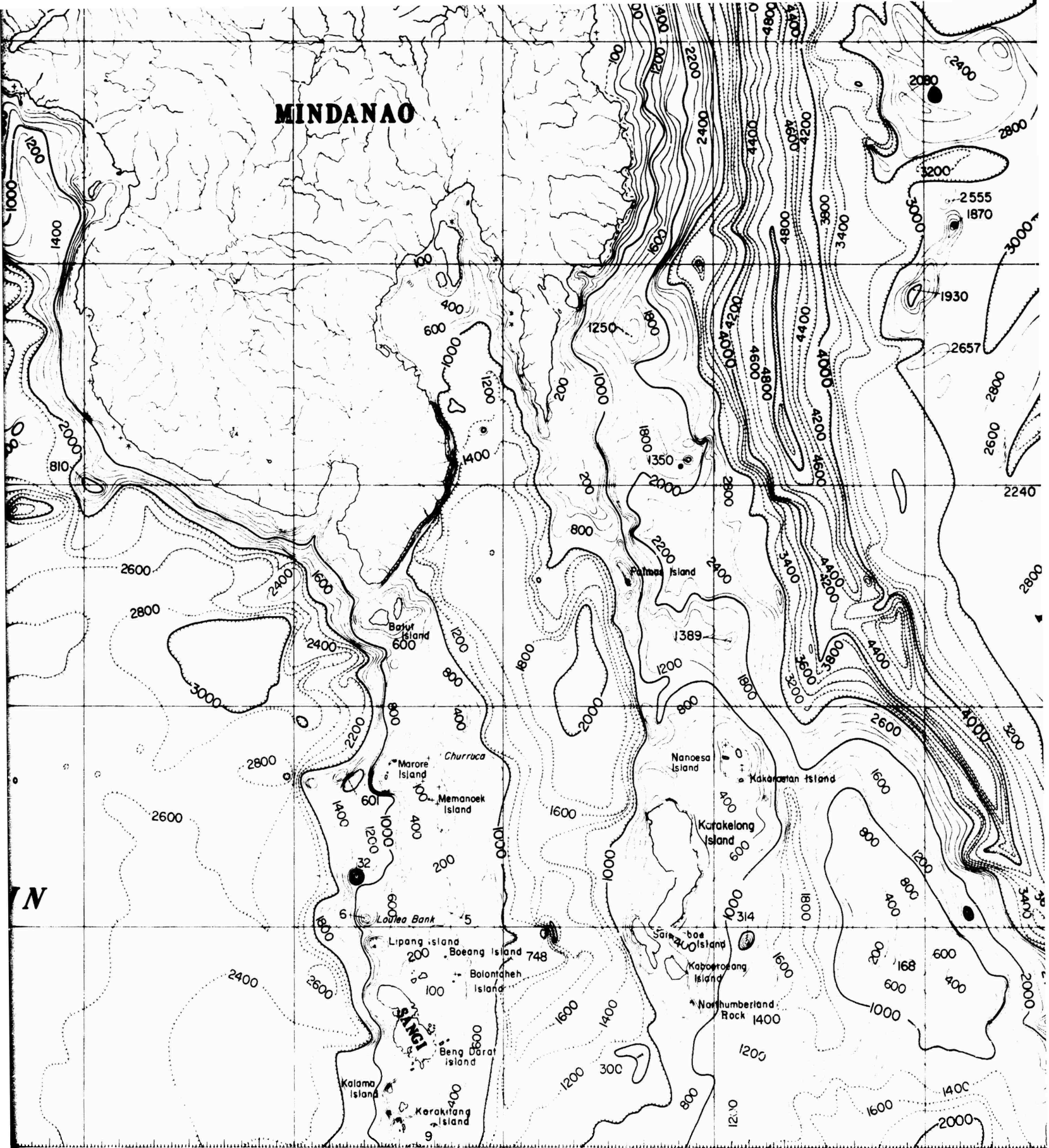

124°
125°
126°
127°
128°
BOHOL
Siquijor Island
Camiguin Island
Siargao Island
Bucas Grande Island
Illigan Reef
MINDANAO
PHILIPPINE
Palmas Island
Batut Island
Marore
Churroca
Nanoesa Island
2555
1870
1930
2657
2240
1389
1350
2080


126°
127°
128°
129°
130°
10°
9°
8°
7°
6°
5°
PHILIPPINE
TRENCH
Sarrgao Island
Bucas Grande Island
Palmas Island
Nancesa
Churruca
2689
2080
2555
1870
2349
1930
2657
2690
2240
2553
2592
1389
1350
1250



Sources of Data: U.S. Naval Hydrographic Office, Snellius Expedition, World Aeronautical Charts, R.L. Fisher, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable



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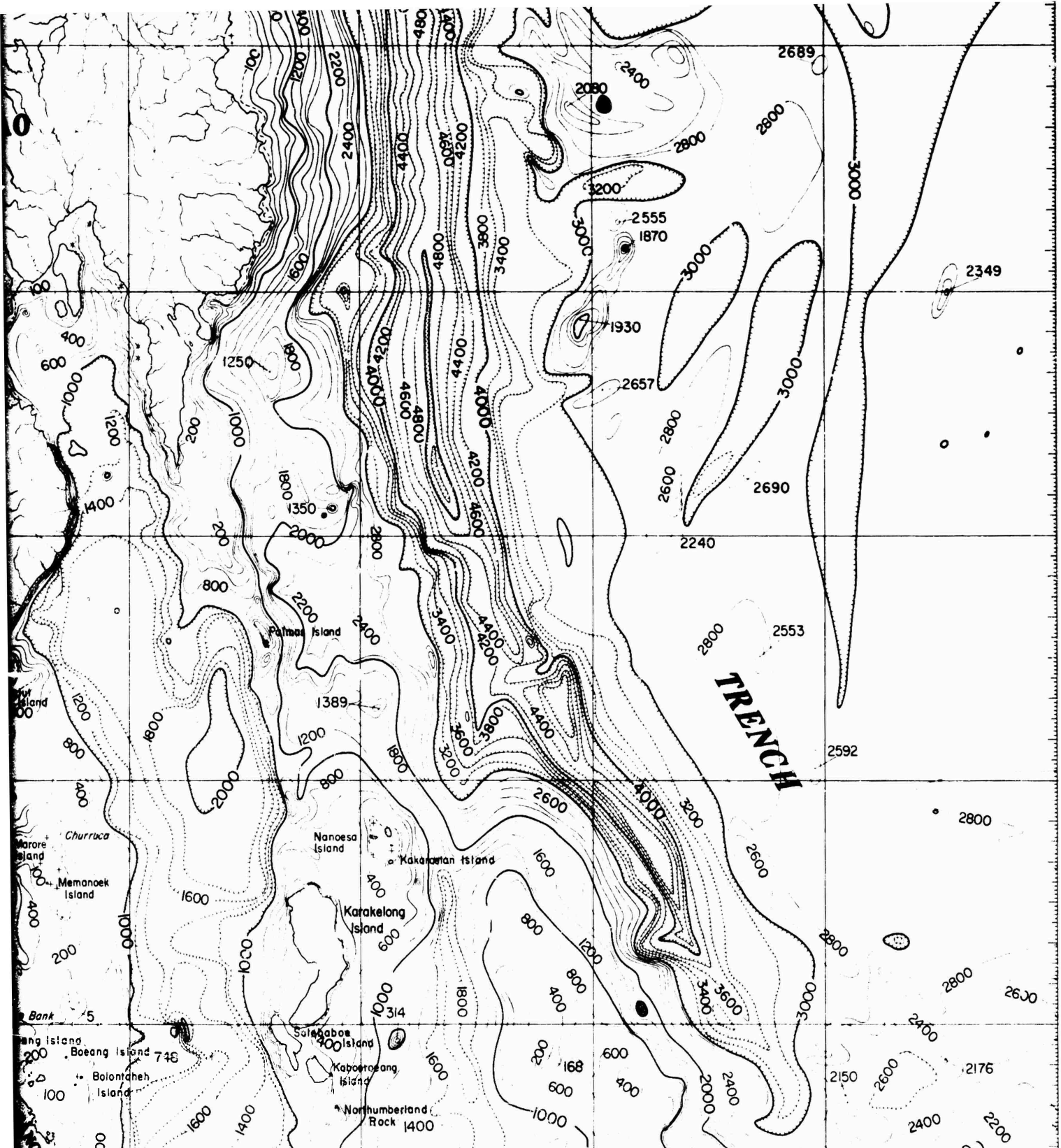
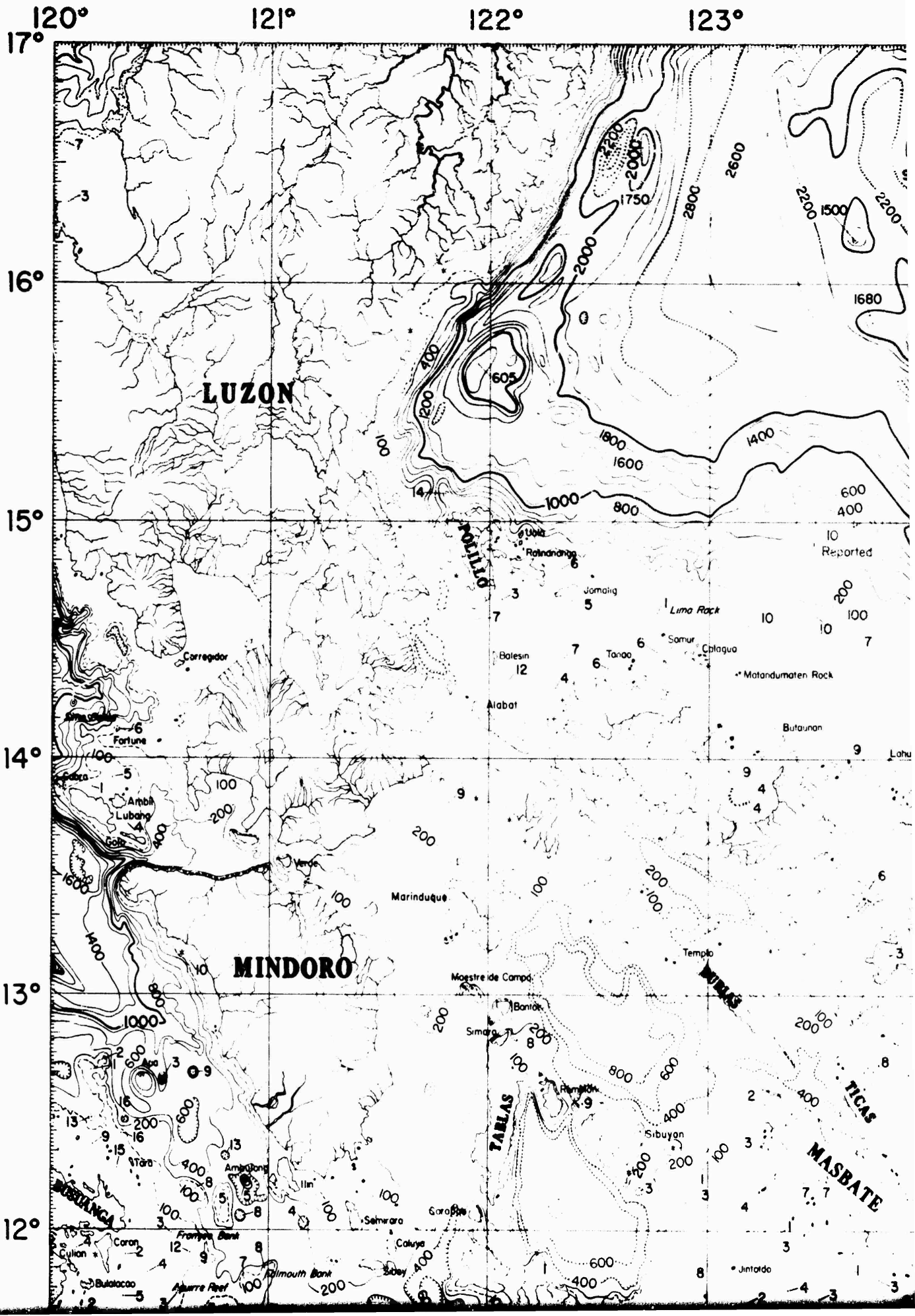
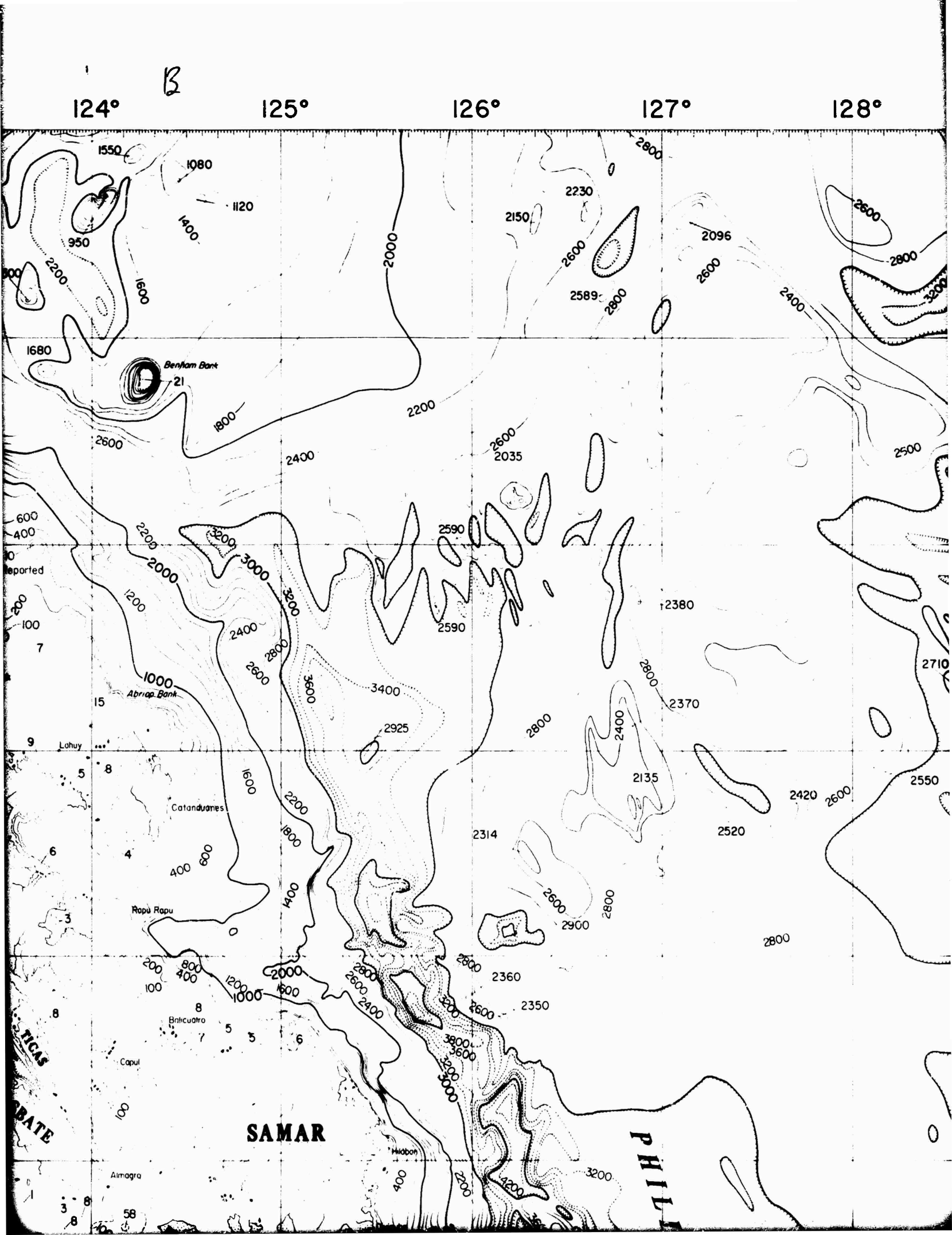

8°
7°
6°
5°
4°
3°
126°
127°
128°
129°
130°
TRENCH
Palmas Island
Nanoesa Island
Kakaretan Island
Karakelong Island
Memanoek Island
Boeang Island
Bolontaheh Island
Kaboeroeang Island
Northumberland Rock
Beng Darat Island
Karakitang Island
Churruca
2689
2080
2555
1870
2349
1930
2657
2690
2240
2553
2592
1389
1350
1250
314
168
2150
2176
2630
December, 1968
Do Not Use For Navigation
No. 2402 N


120°
121°
122°
123°
17°
16°
15°
14°
13°
12°
LUZON
MINDORO
POLILLO
TABLAS
TICAS
MASBATE
BISLIANGA
Corregidor
Fortune
Cabra
Ambil
Lubang
Golo
Verde
Marinduque
Alabat
Balesin
Tanao
Samur
Catagua
Matandumaten Rock
Butauanon
Lahu
Jomalig
Lima Rock
Ubula
Ratinandaya
Templo
Maestre de Campo
Bantok
Simara
Pamplona
Sibuyan
Jintotdo
Tara
Ambulong
Ilin
Semirara
Caluya
Coron
Culion
Frampton Bank
Dilmouth Bank
Apurre Reef
Reported
1680
1750
1500
605

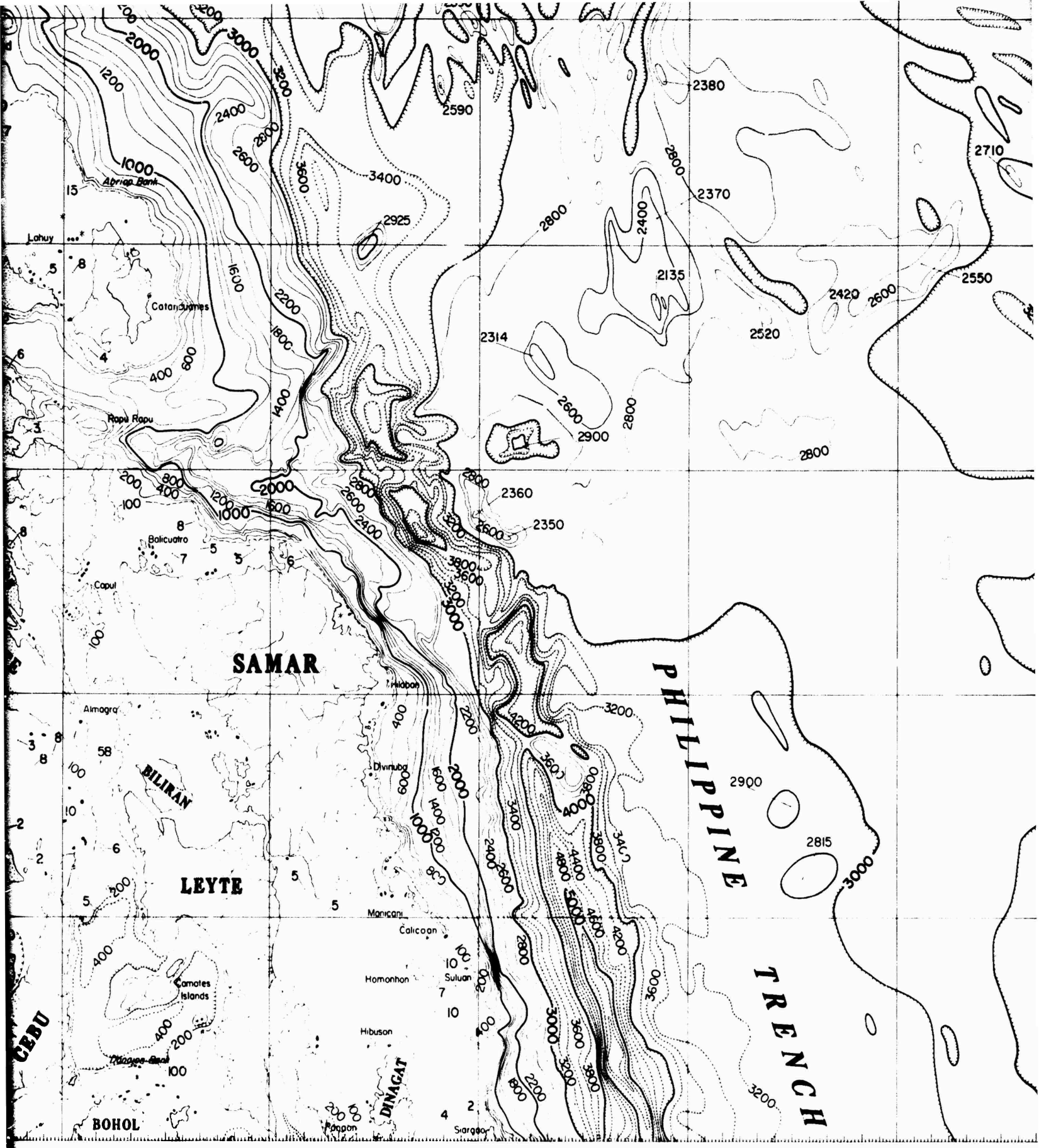

B
124°
125°
126°
127°
128°
Benham Bank
Abriqa Bank
Lahuy
Catanduanes
Rapu Rapu
Batcuatro
Capul
SAMAR
Hilabon
Almagra
PHILI
TICAS
BATE

126°
127°
128°
129°
130°
17°
16°
15°
14°
13°
12°
PHILIPPINE

Sources of Data U S Naval Oceanographic Office, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D



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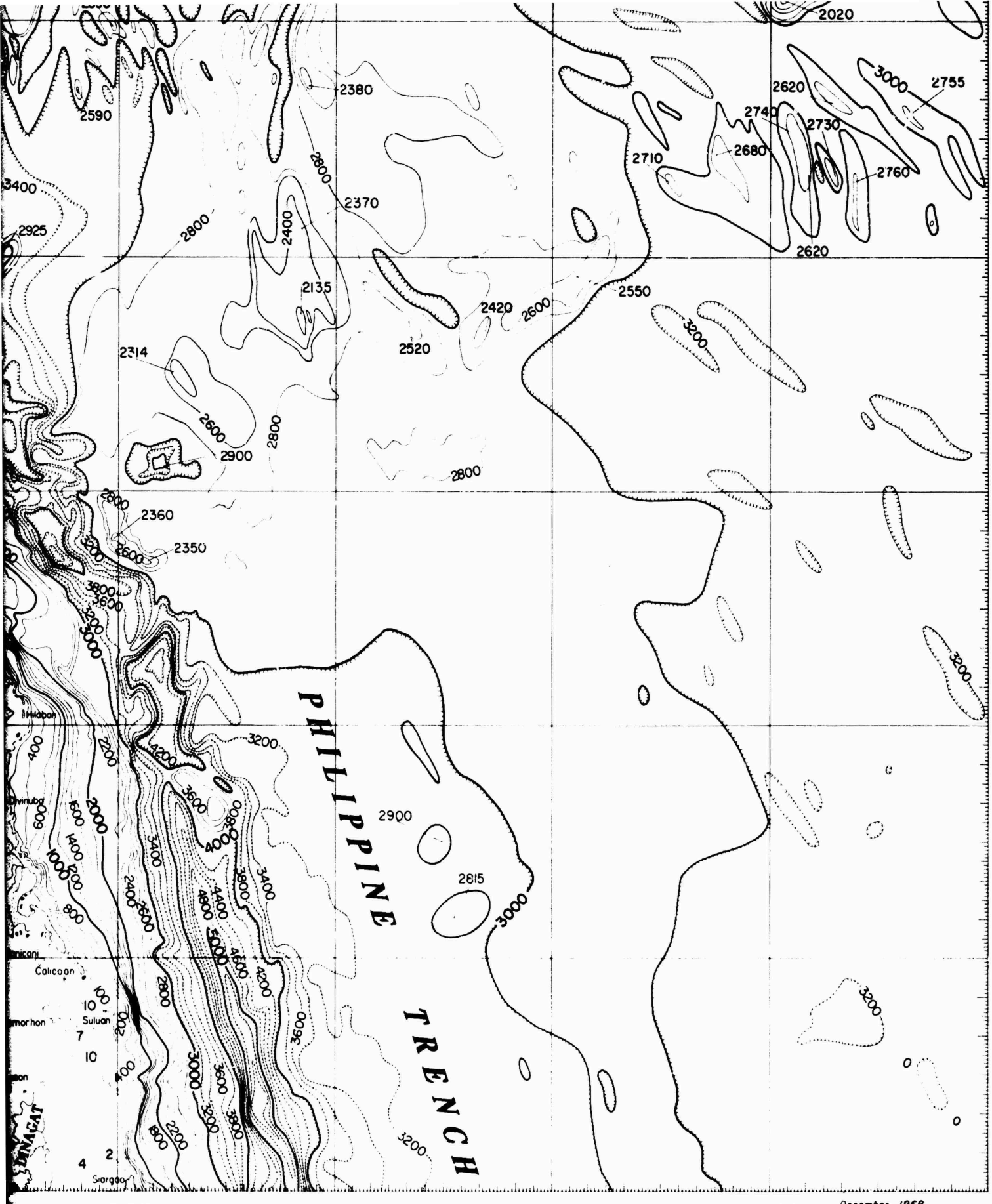
1 E



December, 1968

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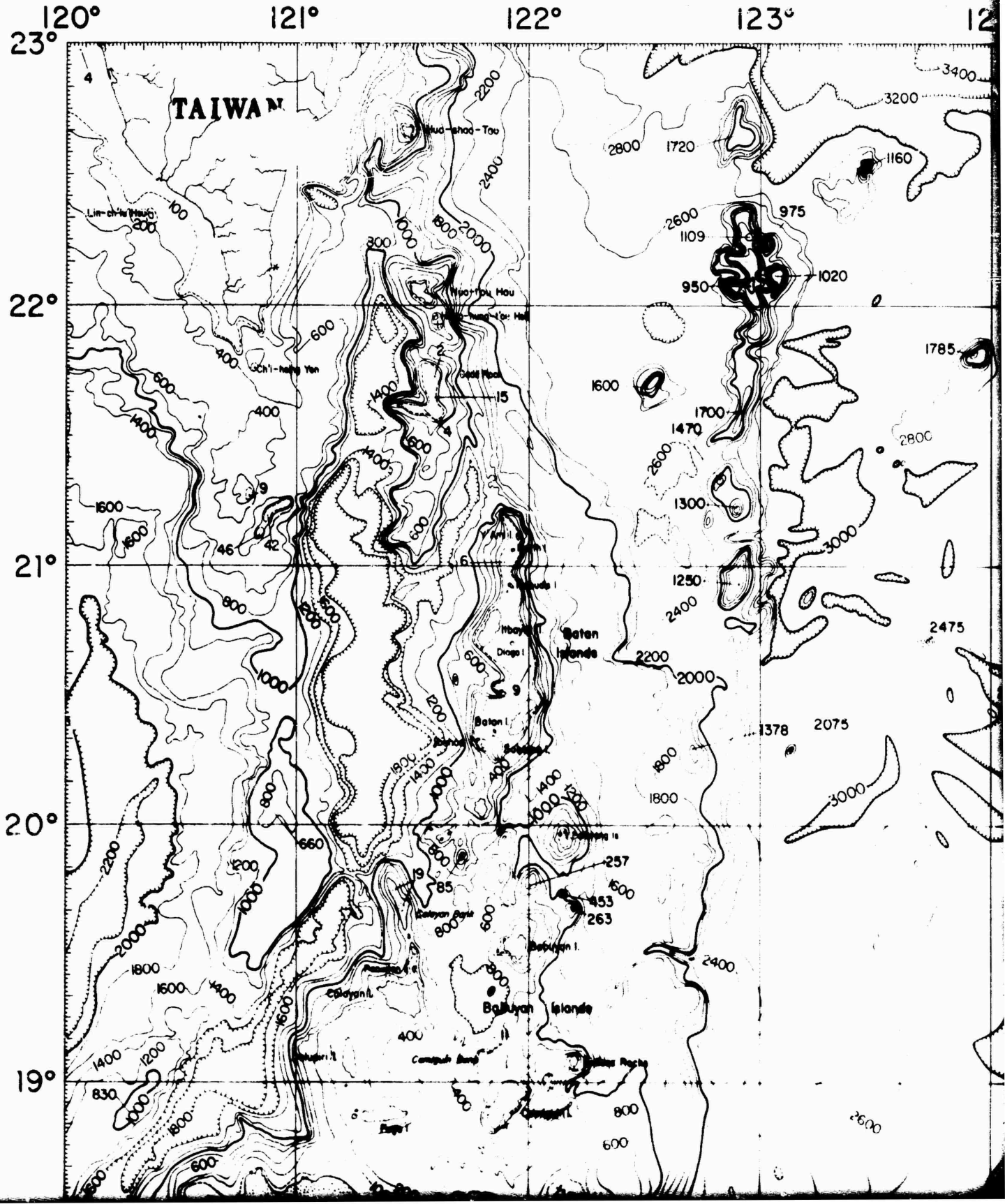
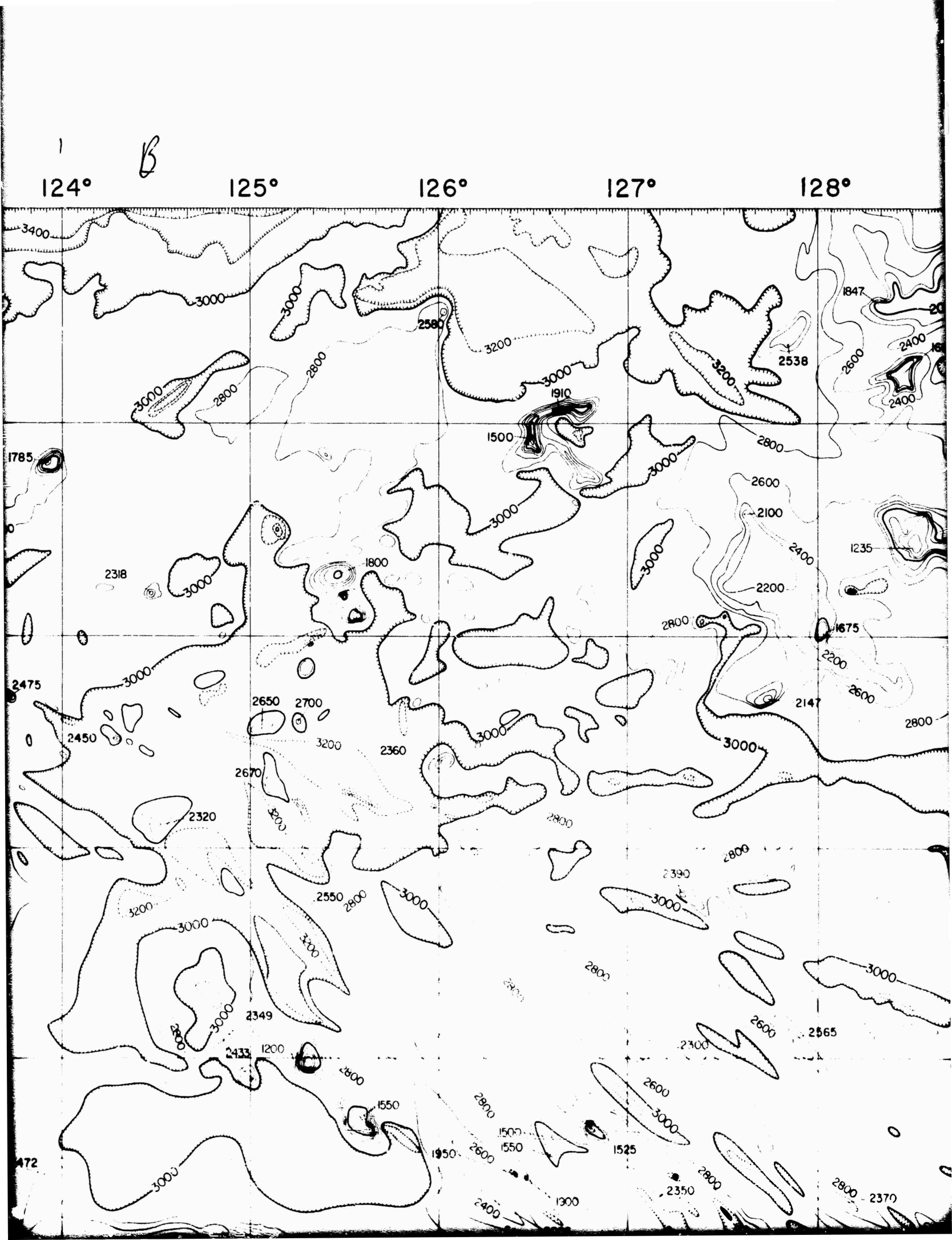
No. 2403 N 12

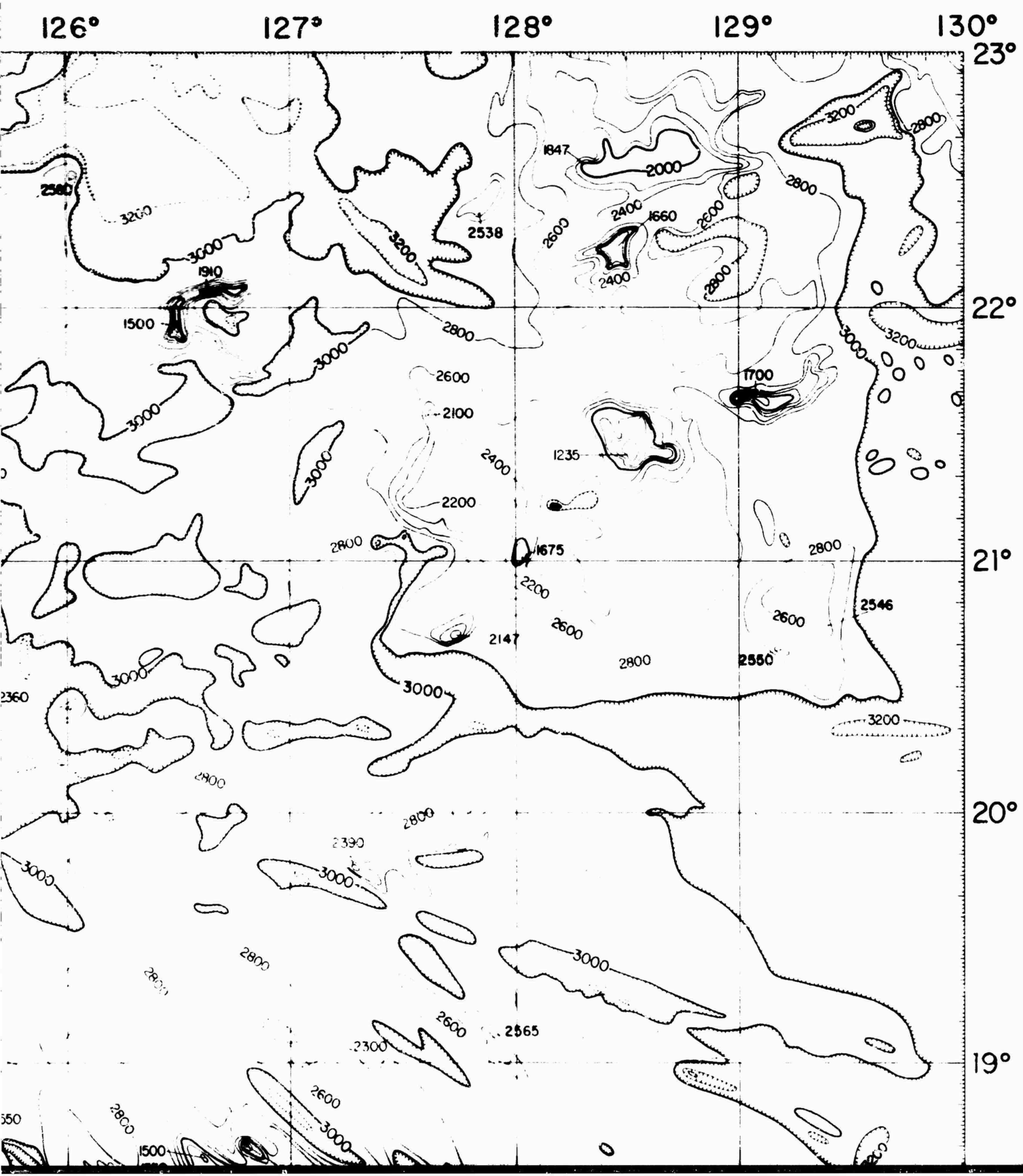
F

A


120°
121°
122°
123°
23°
22°
21°
20°
19°
TAIWAN
Hsiao-Liu Hau
Beten Islands
Babuyan Islands
Babuyan I.
Calayan I.
Camiguin Group
Dalupiri I.
Didicas I.
Dibuluan Pt.
Palaui I.
Palaui Pt.
Fuga I.
Grand Rock
Dibuluan Bay
Palaui Bay
Lin-ch'i Hsü
Ch'i-hsing Yen
Mud-shad-Tou
Diadi Rock
Itbayat I.
Dinapa I.
Batan I.
Mavulis I.
Y Ambang Is
Balintang Is
Balintang Pt.
Balintang Channel
Babuyan Pt.
Babuyan Rocks
Calayan
Fuga
Dibuluan
Palaui
Babuyan
Balintang
Channel


124°
125°
126°
127°
128°
3400
3000
2800
3600
2580
3200
1910
1500
1847
2538
2400
2600
1785
2318
1800
2100
1235
2200
1675
2475
2650
2700
2450
2360
2670
2320
2147
2390
2550
2349
2433
1200
1550
2565
2300
1525
1950
1300
2350
2370
472

c


126°
127°
128°
129°
130°
23°
22°
21°
20°
19°
1847
2000
2538
2600
2400
1660
2800
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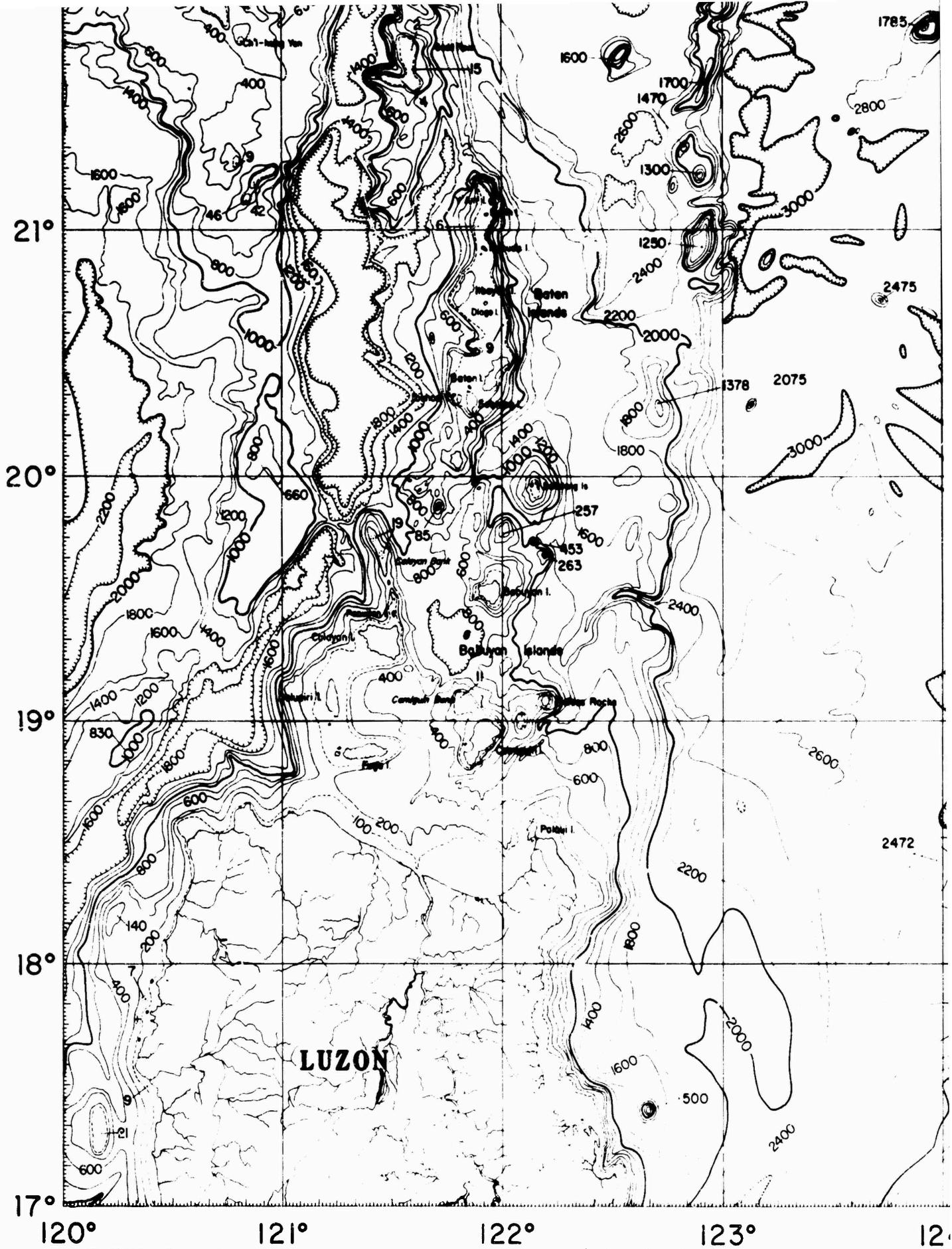
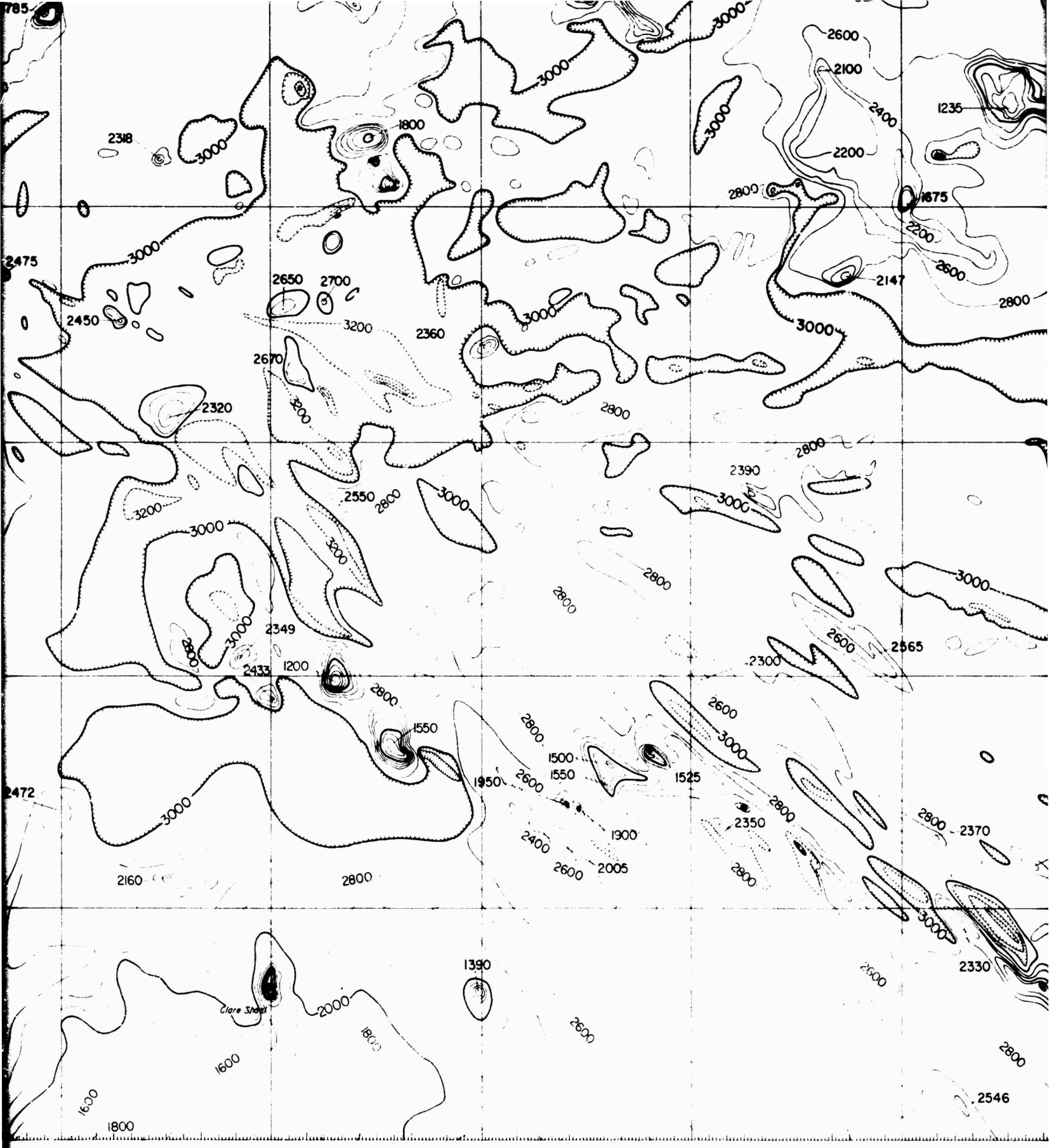
2360
2390
2565
2300
1500


21°
20°
19°
18°
17°
120°
121°
122°
123°
LUZON
Baten Islands
Babuyan Islands
Babuyan I.
Calayan I.
Camiguin Rocks
Dalupiri I.
Fuga I.
Palaui I.
Sabtang I.
Diogo I.
Mavulis I.
Batan I.
Itbayat I.
Y'Ami I.
Botel Tobago Is
Orchid I.
Kelung Yen
Sources of Data: U.S. Naval Hydrographic Office - H.O. 14,705,
U.S. Naval Oceanographic Office, Empire Cable and Wireless Survey
Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable



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Assisted by [illegible]

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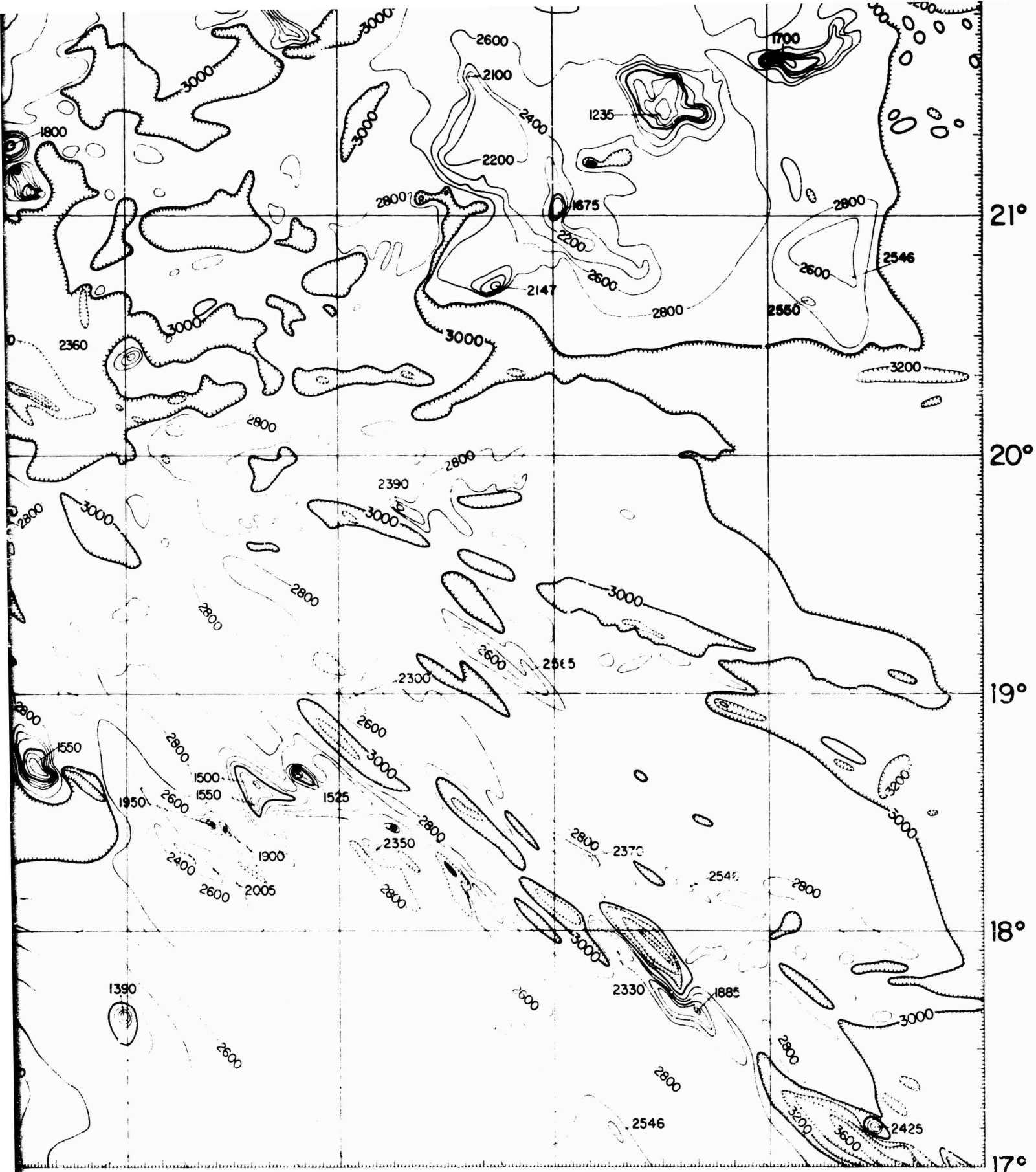
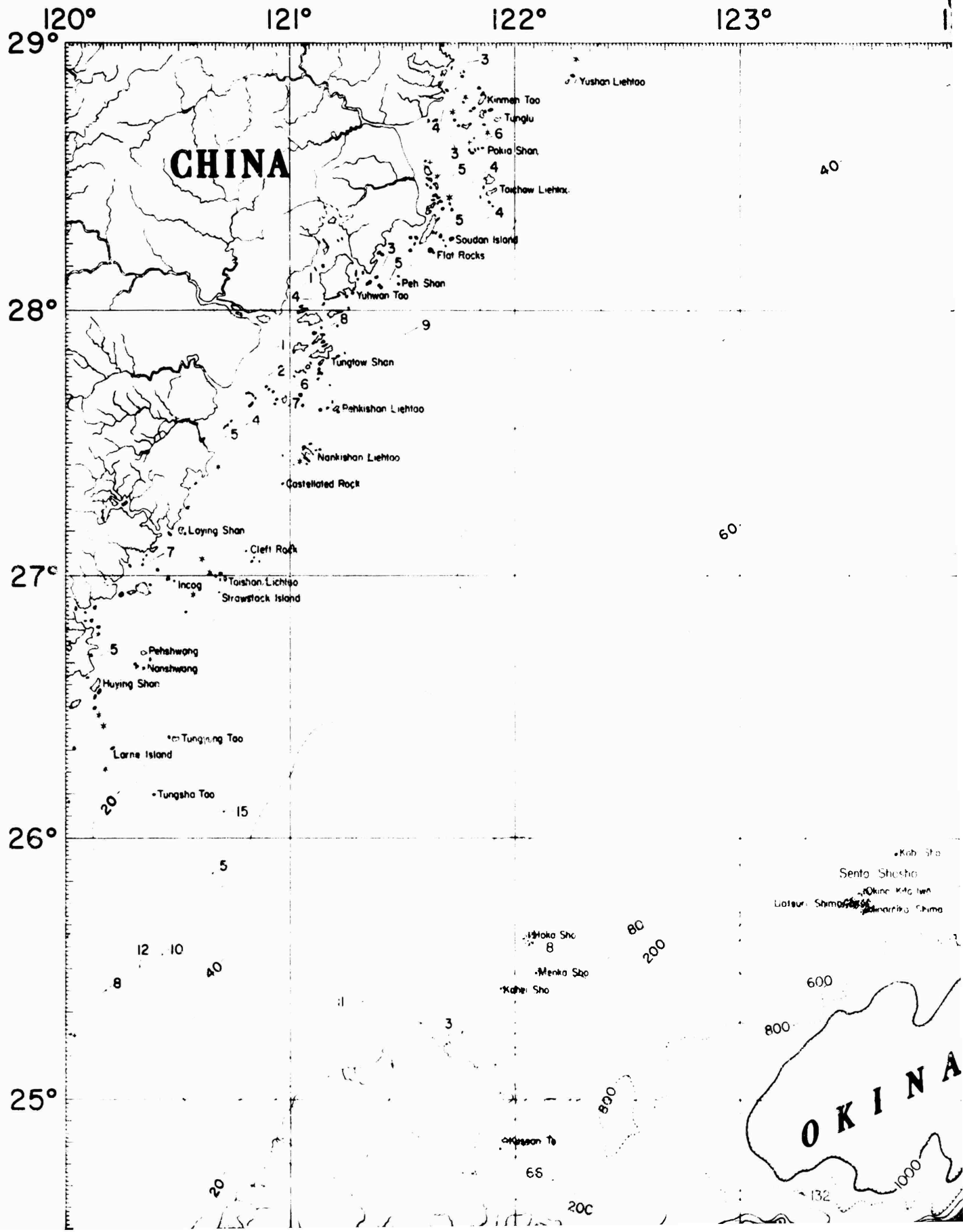
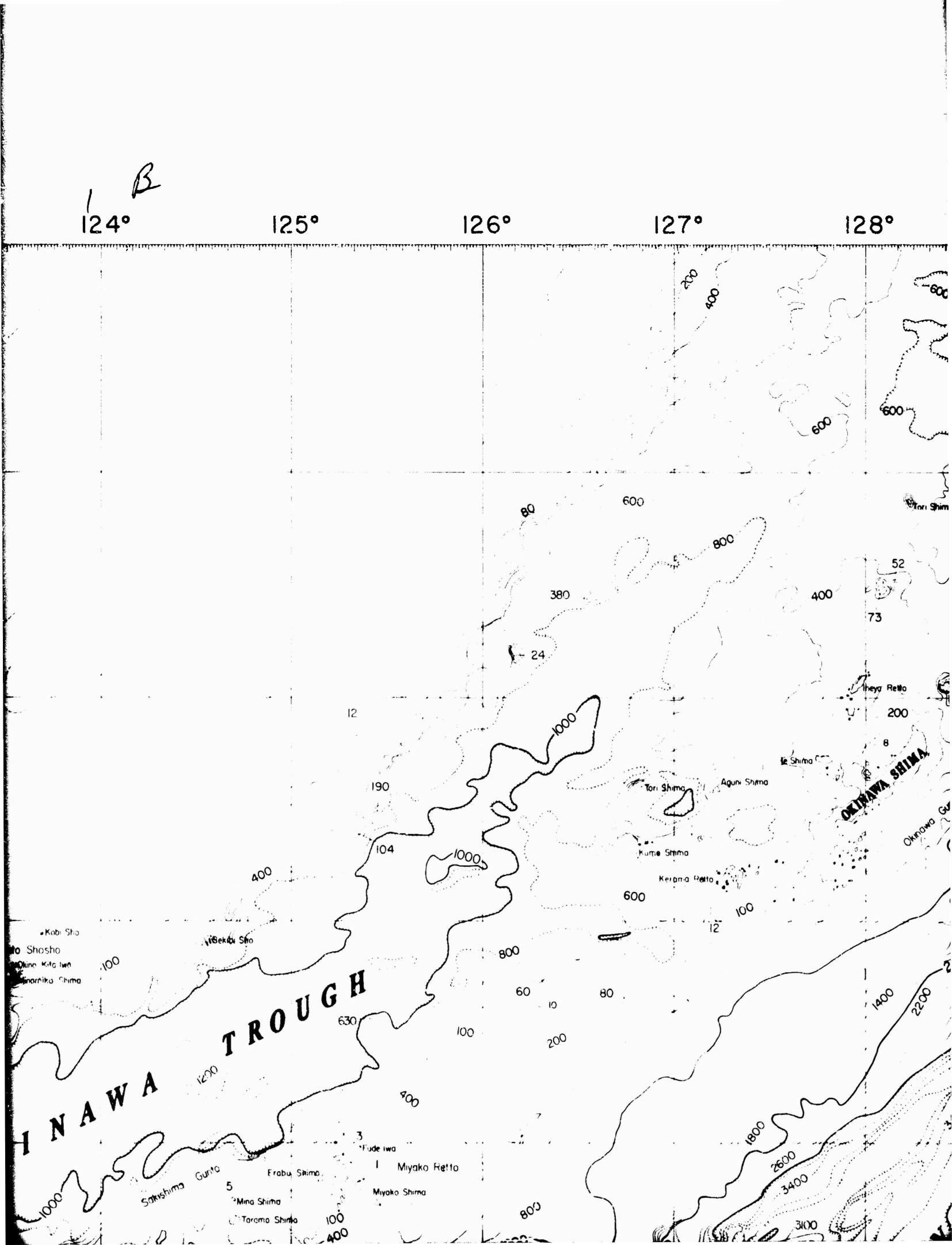
1 E

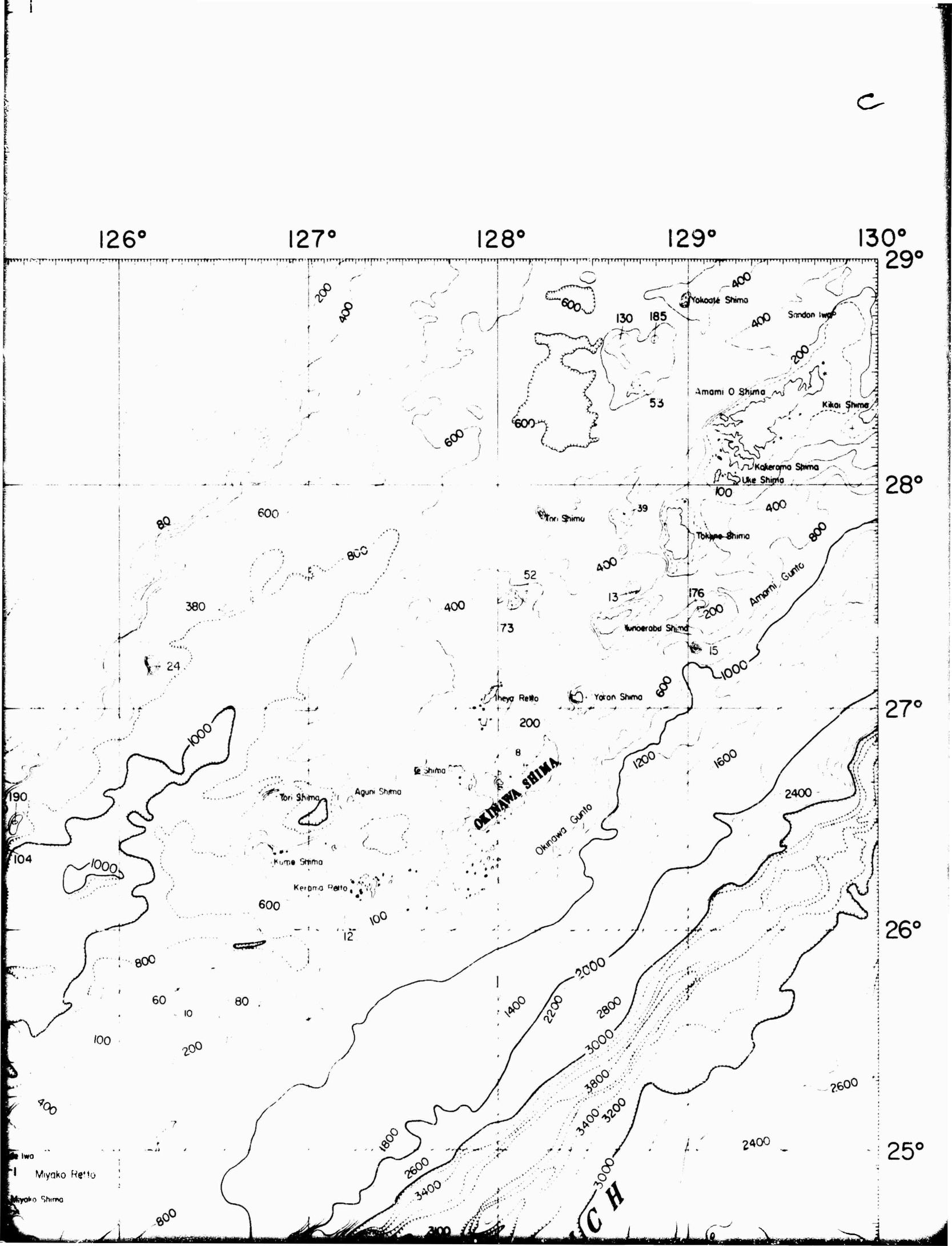

21°
20°
19°
18°
17°
126°
127°
128°
129°
130°
December, 1968
Do Not Use For Navigation
No. 2404N

F

A

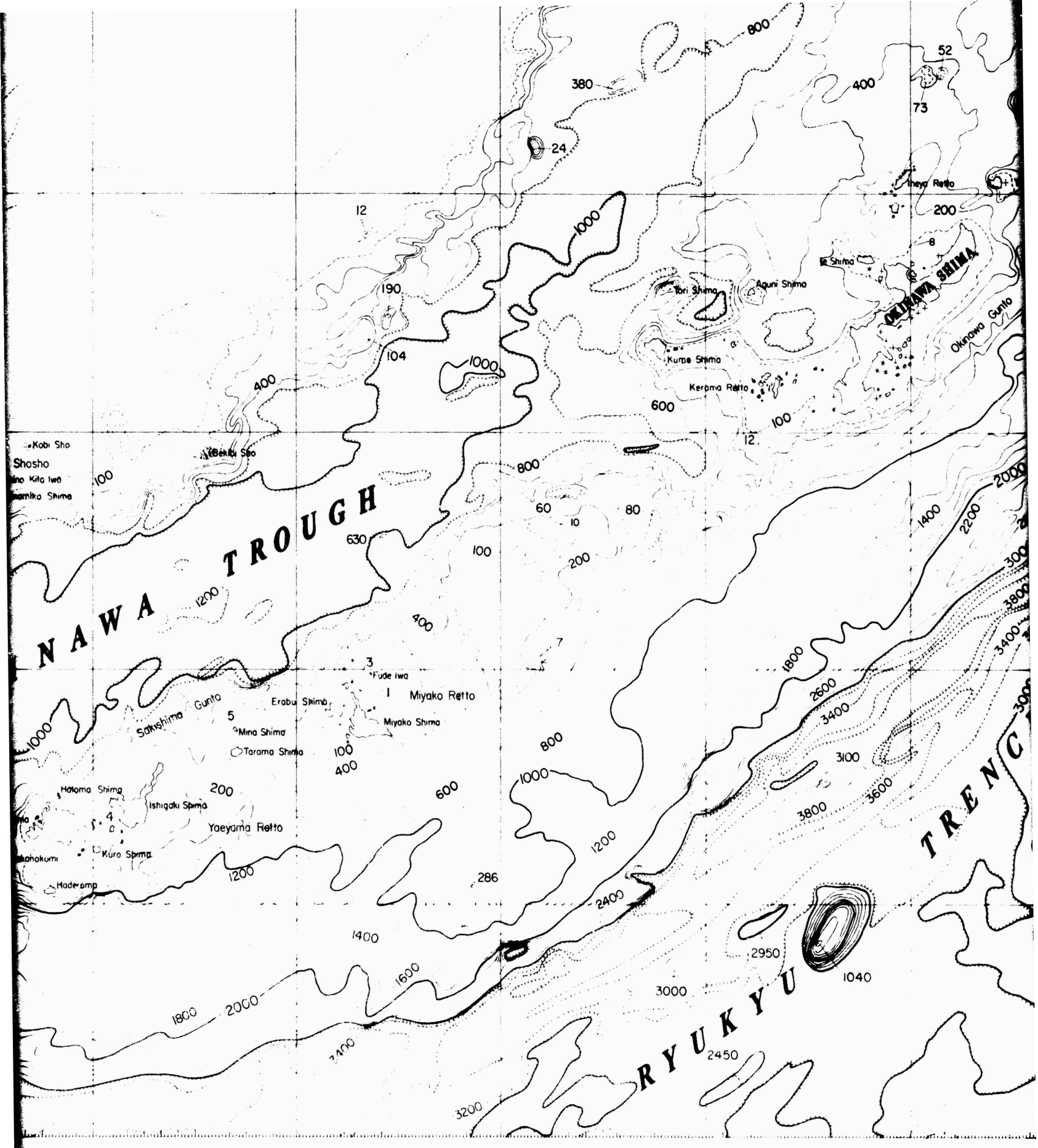

120°
121°
122°
123°
29°
28°
27°
26°
25°
CHINA
Yushan Liehtao
Kinmen Tao
Tunglu
Pokia Shan
Taichew Liehtao
Soudan Island
Flat Rocks
Peh Shan
Yuhwan Tao
Tungtow Shan
Pehkishan Liehtao
Nankishan Liehtao
Castellated Rock
Loying Shan
Cleft Rock
Incog
Taishan Lichtao
Strawstack Island
Pehshwang
Nanshwang
Huying Shan
Tungying Tao
Larne Island
Tungsha Tao
Hoka Sho
Menka Sho
Kahei Sho
Sento Shosho
OKINA
40
60
80
200
600
800
1000
20C


1 B
124°
125°
126°
127°
128°
OKINAWA TROUGH
OKINAWA SHIMA
Tori Shima
Aguni Shima
Kume Shima
Kerama Retto
Iheya Retto
Miyako Retto
Miyako Shima
Fraba Shima
Mina Shima
Taroma Shima
Fude Iwa
Sakishima Gunto
Shosho
Okino Kita Iwa
Yonaguni Jima
Kabi Sho
Sekibi Sho
Okinawa
1000
800
600
400
200
100
80
60
52
73
24
12
8
3
5
1
2200
1400
1800
2600
3400
3100


126°
127°
128°
129°
130°
29°
28°
27°
26°
25°
Yokoate Shima
Sandon Iwa
Amami O Shima
Kikai Shima
Kakeroma Shima
Uke Shima
Tori Shima
Tokuno Shima
Amami Gunto
Yunoerabu Shima
Yoron Shima
Okinawa Shima
Okinawa Gunto
Aguni Shima
Kume Shima
Kerama Retto
Miyako Retto
Miyako Shima
CH

Sources of Data: U.S. Naval Oceanographic Office
Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable



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Assisted by [illegible]

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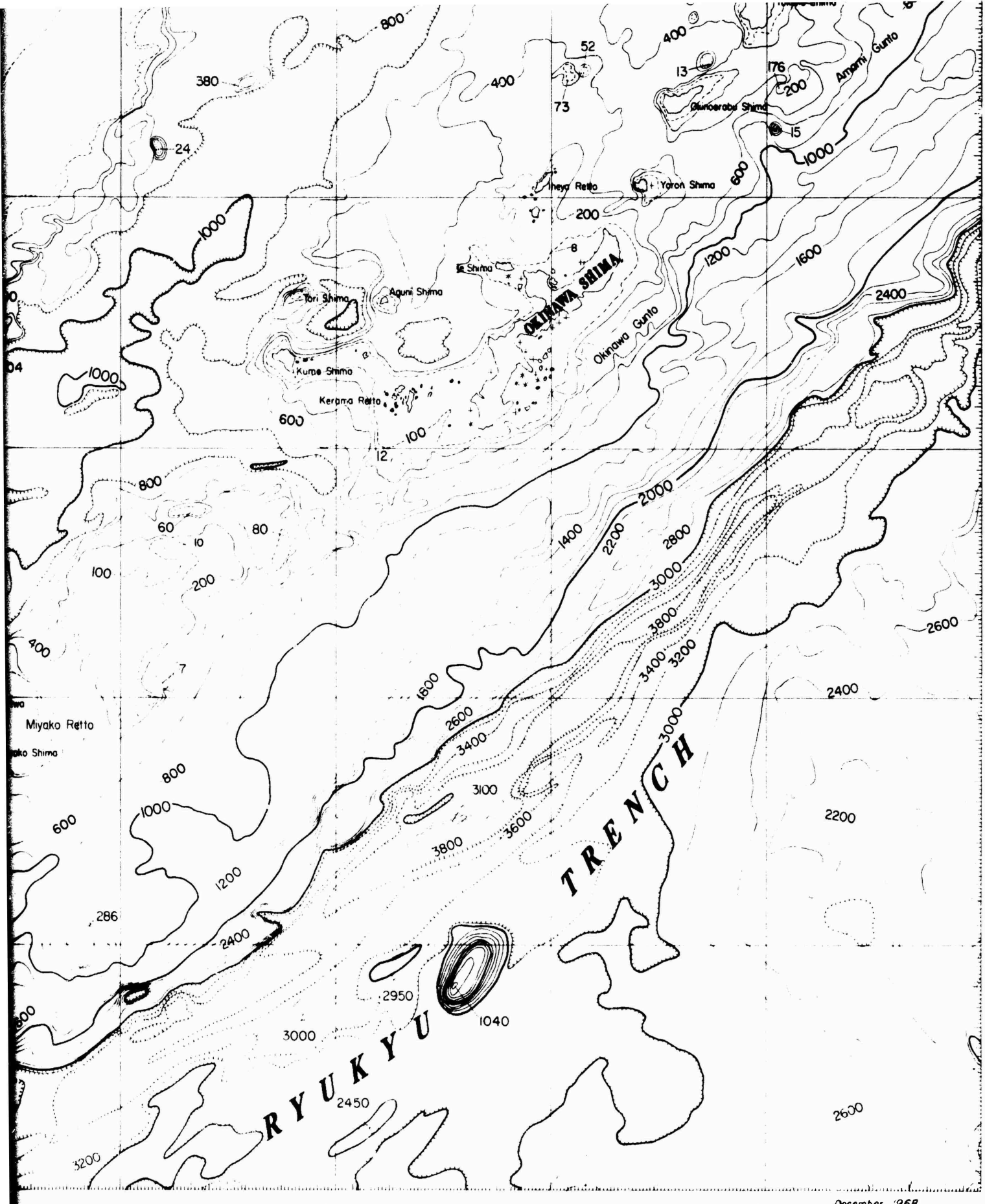
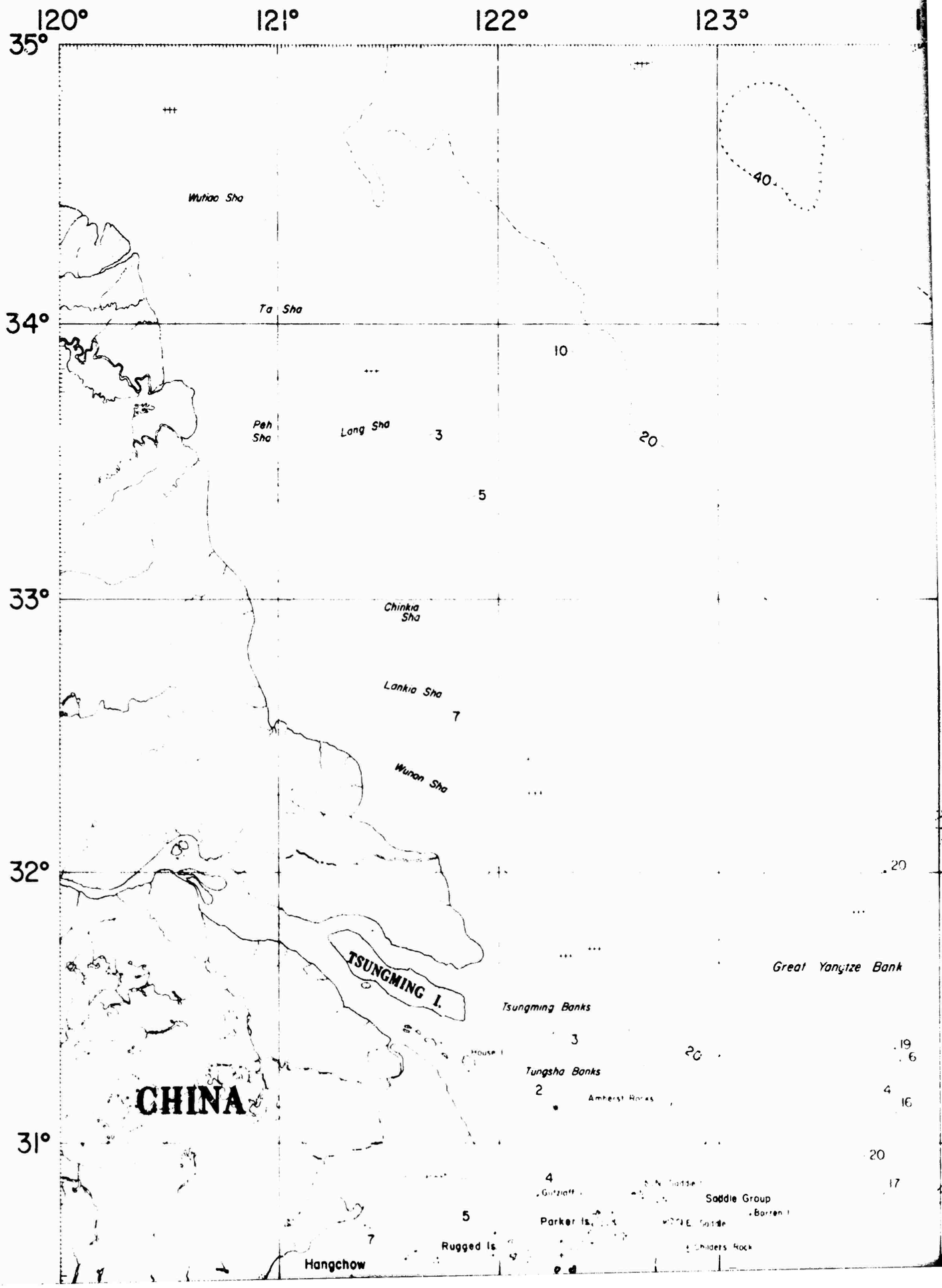
E


OKINAWA SHIMA
Okinawa Gunto
Amami Gunto
Yoron Shima
Iheya Retto
Aguni Shima
Tori Shima
Kume Shima
Kerama Retto
Miyako Retto
RYUKYU TRENCH
27°
26°
25°
24°
23°
126°
127°
128°
129°
130°
December, 1968
Do Not Use For Navigation
No. 2405N 14

F


120°
121°
122°
123°
35°
34°
33°
32°
31°
Wutiao Sha
Ta Sha
Peh Sha
Lang Sha
Chinkia Sha
Lankia Sha
Wunan Sha
TSUNGMING I.
CHINA
Tsungming Banks
Tungsha Banks
Great Yangtze Bank
Amherst Rocks
Saddle Group
Parker Is.
Rugged Is
Hangchow
40
10
20
5
3
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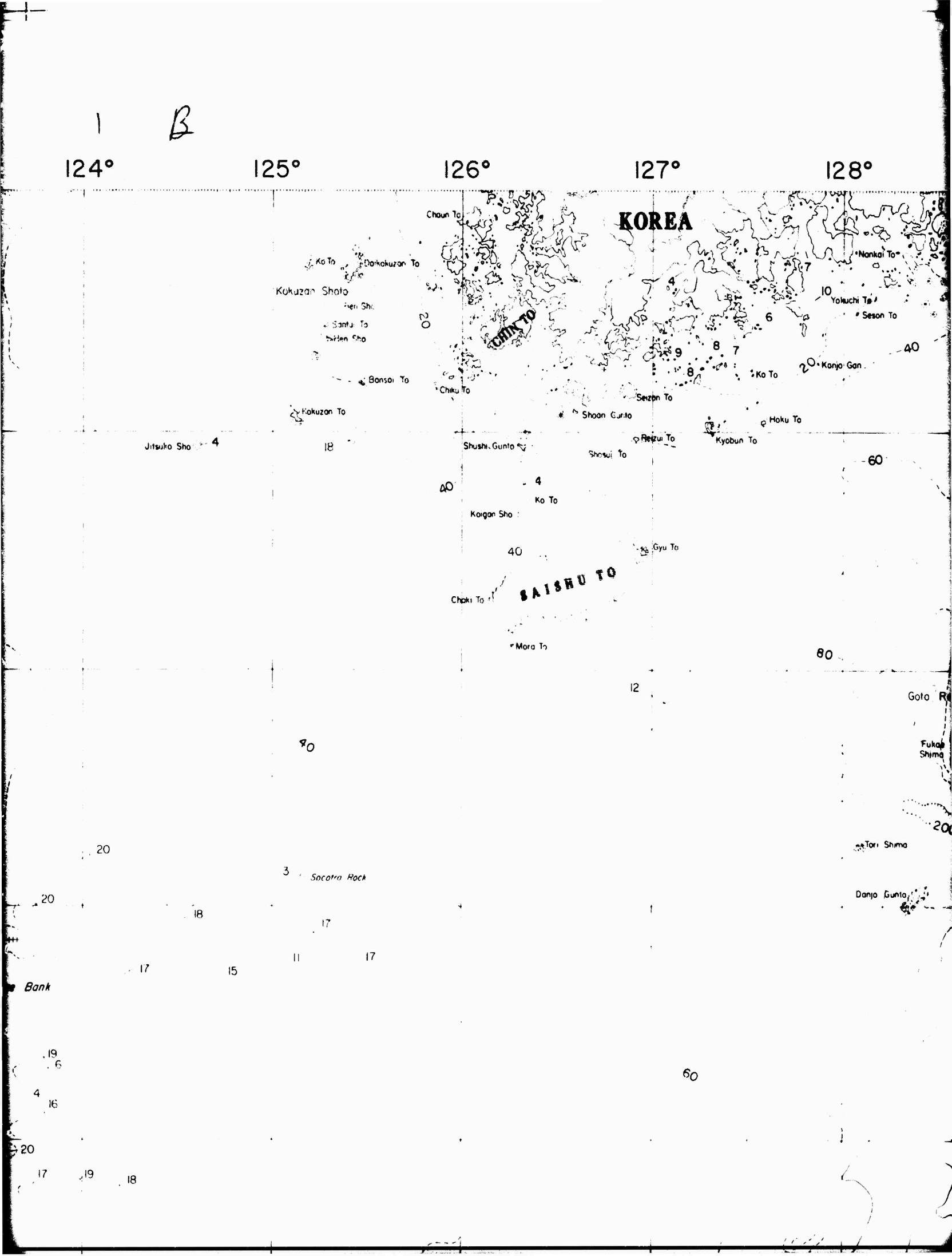
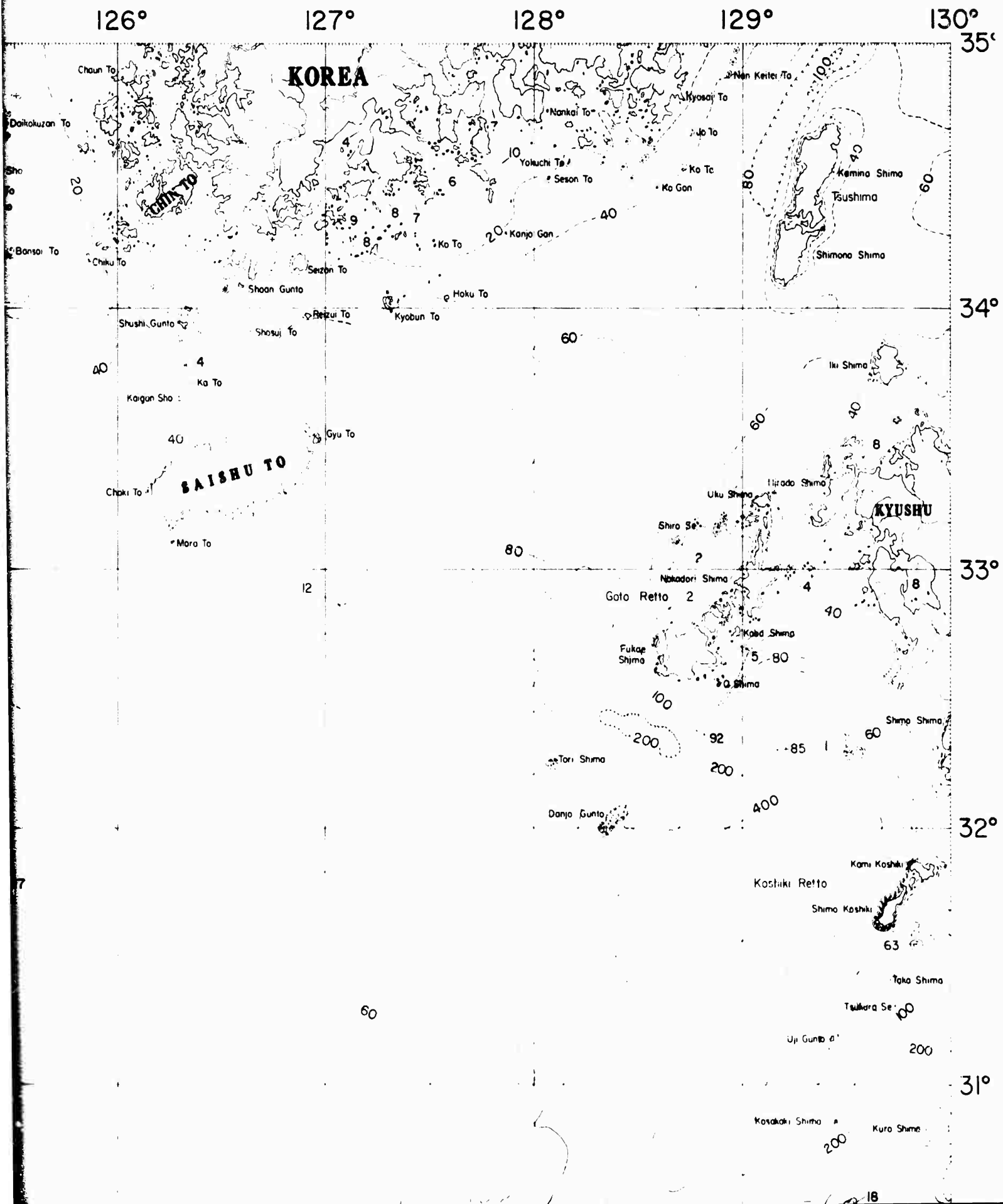
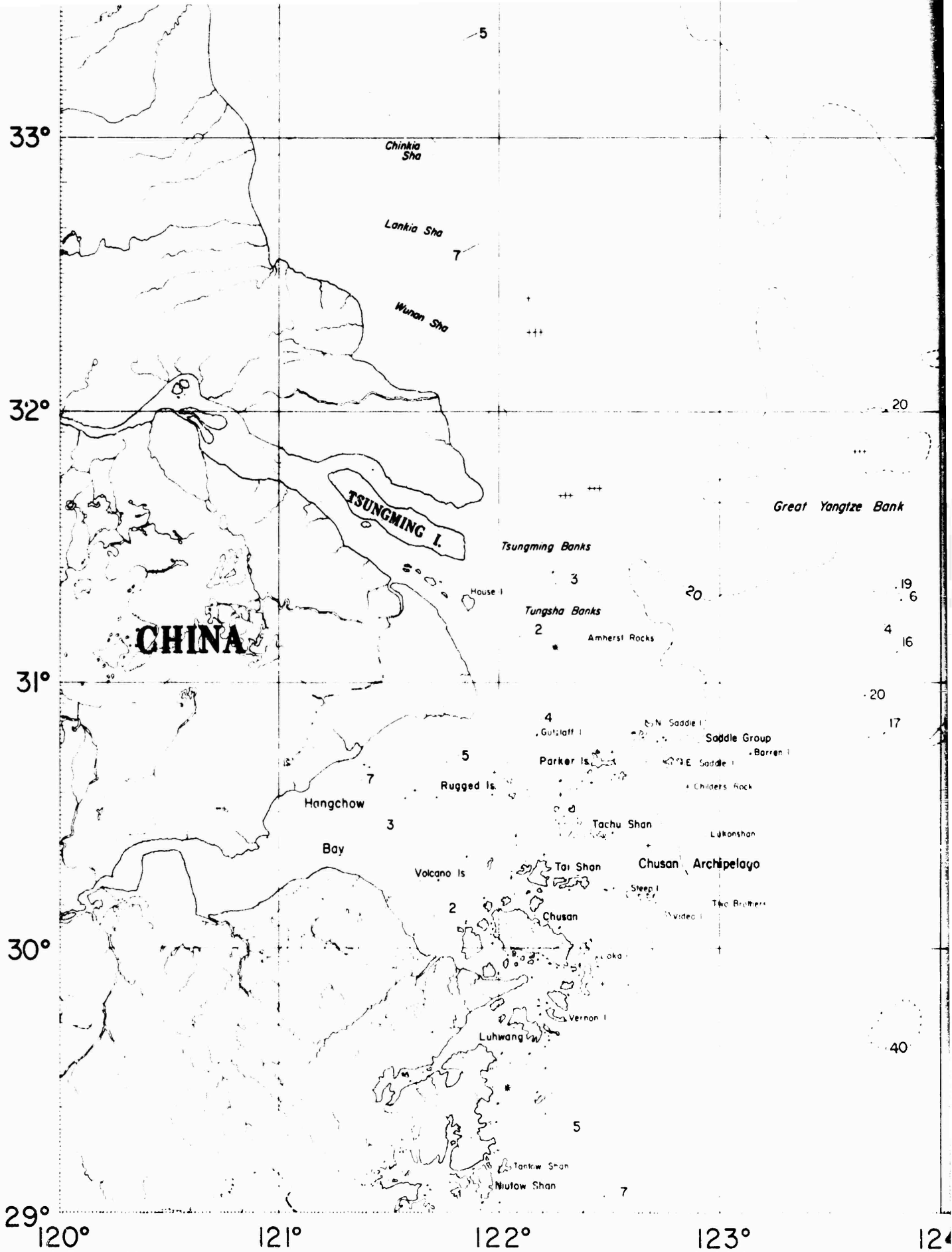
16
17
19
6

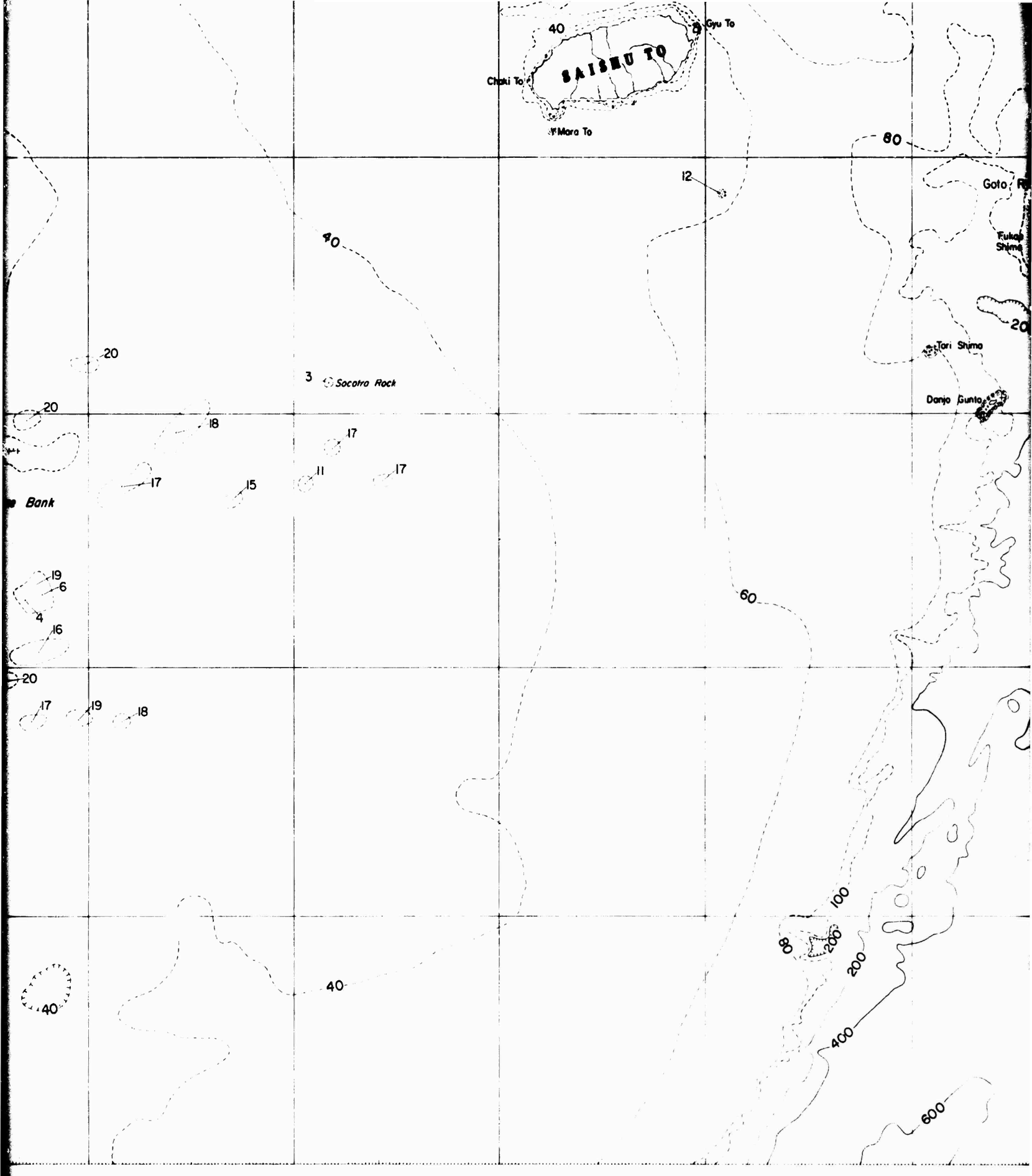

1 B
124°
125°
126°
127°
128°
KOREA
Chaun To
Ko To
Dankokuzan To
Kokuzan Shoto
Santu To
Bansai To
Chiku To
Kokuzan To
Jitsuko Sho
Shushi Gunto
Ko To
Korgan Sho
CHIN TO
Shoan Gunto
Seizan To
Reizui To
Shosui To
Kyobun To
Ko To
Hoku To
Kanjo Gan
Yokuchi To
Seson To
Nankai To
SAISHU TO
Chaki To
Mara To
Gyu To
Goto R
Fuka Shima
Tori Shima
Danjo Gunto
Socotra Rock
Bank


126°
127°
128°
129°
130°
35°
34°
33°
32°
31°
KOREA
CHIN TO
SAISHU TO
KYUSHU
Chaun To
Daikokuzan To
Sho
Bonsoi To
Chiku To
Shoan Gunto
Shushi Gunto
Shosui To
Reizui To
Kyobun To
Seizon To
Hoku To
Ka To
Kaigun Sho
Gyu To
Chaki To
Mora To
Nankai To
Yokuchi To
Seson To
Ko To
Kanjo Gan
Ko Gan
Kyosai To
Jo To
Nan Keiten To
Kemino Shima
Tsushima
Shimono Shima
Iki Shima
Hirado Shima
Uku Shima
Shiro Se
Nakadori Shima
Goto Retto
Kabe Shima
Fukae Shima
Shimo Shima
Tori Shima
Danjo Gunto
Kami Koshiki
Kashiki Retto
Shimo Koshiki
Taka Shima
Tsuiara Se
Uji Gunto
Kosakaki Shima
Kuro Shima
18



Sources of Data: U.S. Naval Oceanographic Office, U.S. Naval Hydrographic Office, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable



124° 125° 126° 127° 128°

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Contoured by: [illegible]

Assisted by: [illegible]

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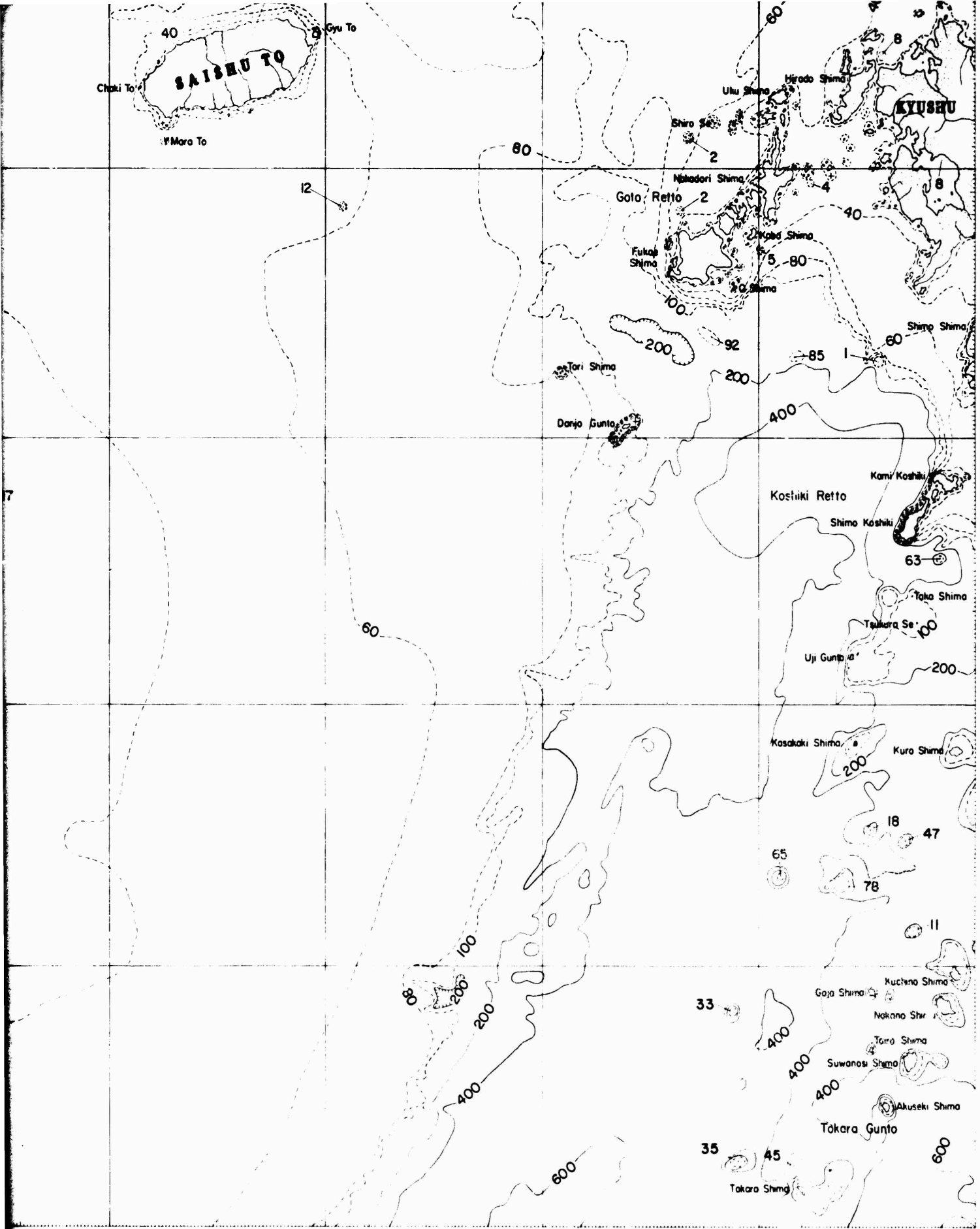
1 E

CQ2



December, 1968

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Contoured by: [illegible]

Assisted by: [illegible]

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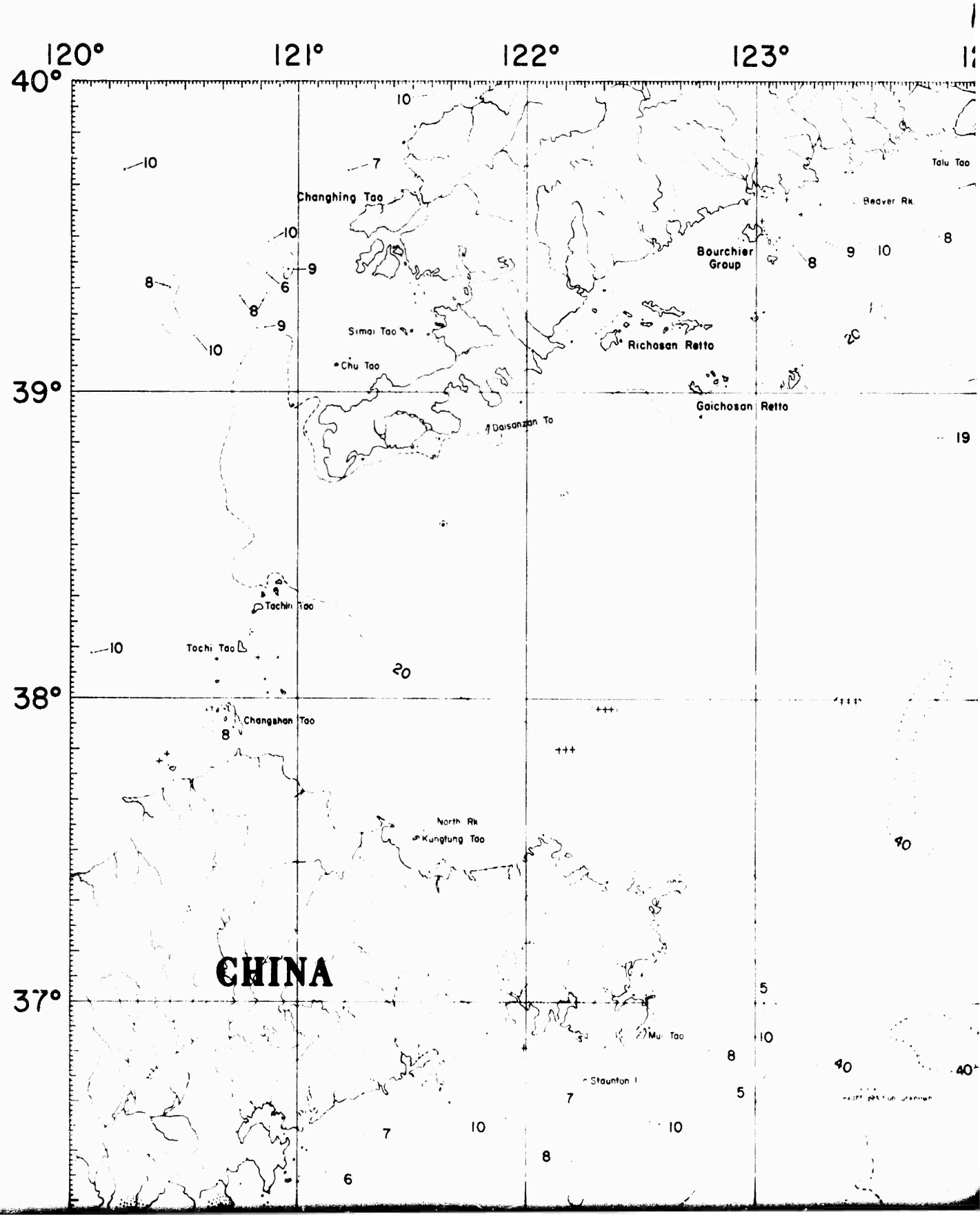
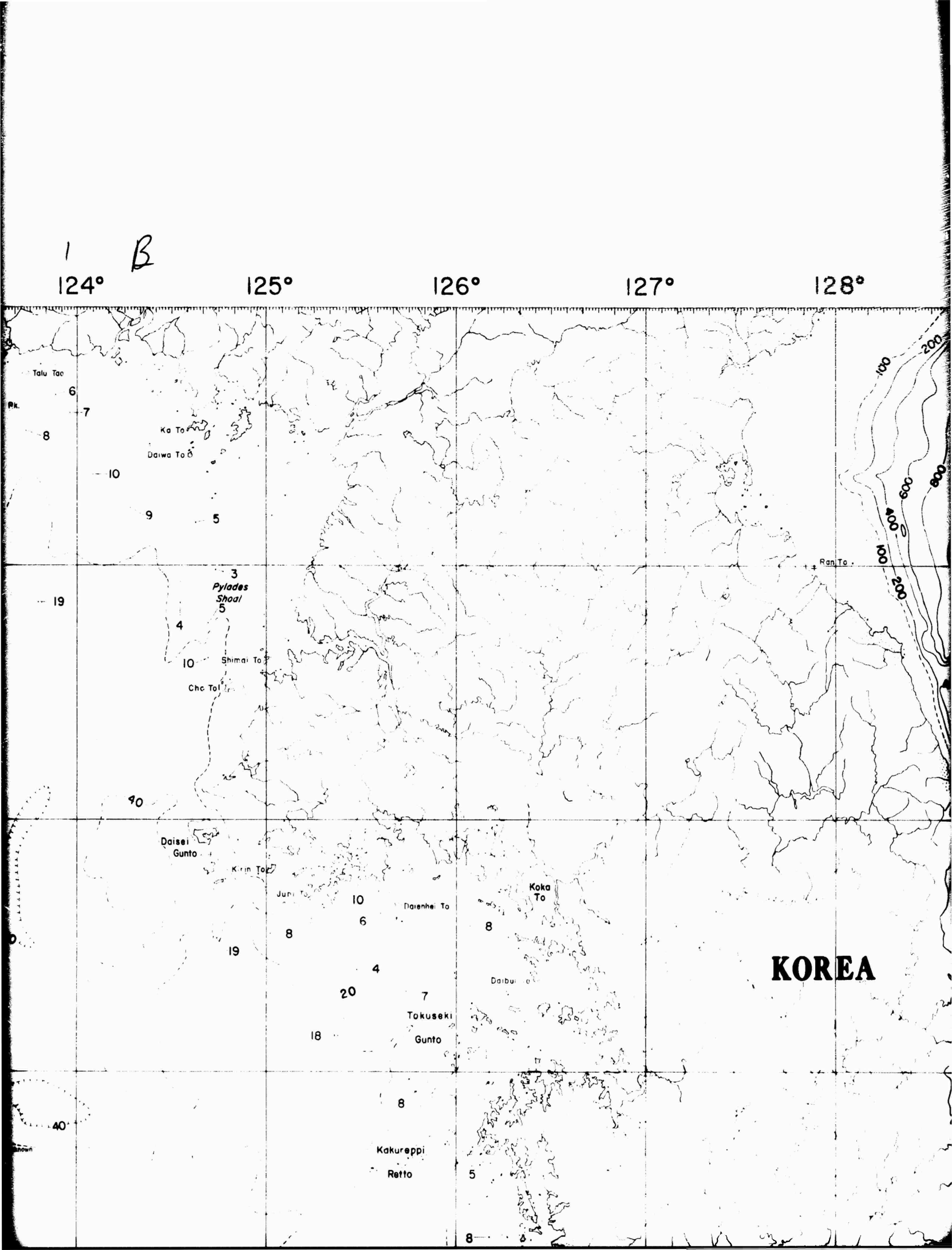
No. 2406N 15

F


120°
121°
122°
123°
40°
39°
38°
37°
Changhing Tao
Talu Tao
Beaver Rk
Bourchier Group
Richosan Retto
Gaichosan Retto
Simai Tao
Chu Tao
Daisanzan To
Tachin Tao
Tachi Tao
Changshan Tao
North Rk
Kungtung Tao
Mu Tao
Staunton I
CHINA


1 B
124°
125°
126°
127°
128°
Talu Tao
Pk.
Ka To
Daiwa To
Pylades Shoal
Shimai To
Chc Tol
Ran To
Daisei Gunto
Kirin To
Juni To
Darenhei To
Koka To
Daibutsu
Tokuseki Gunto
Kakureppi Retto
KOREA
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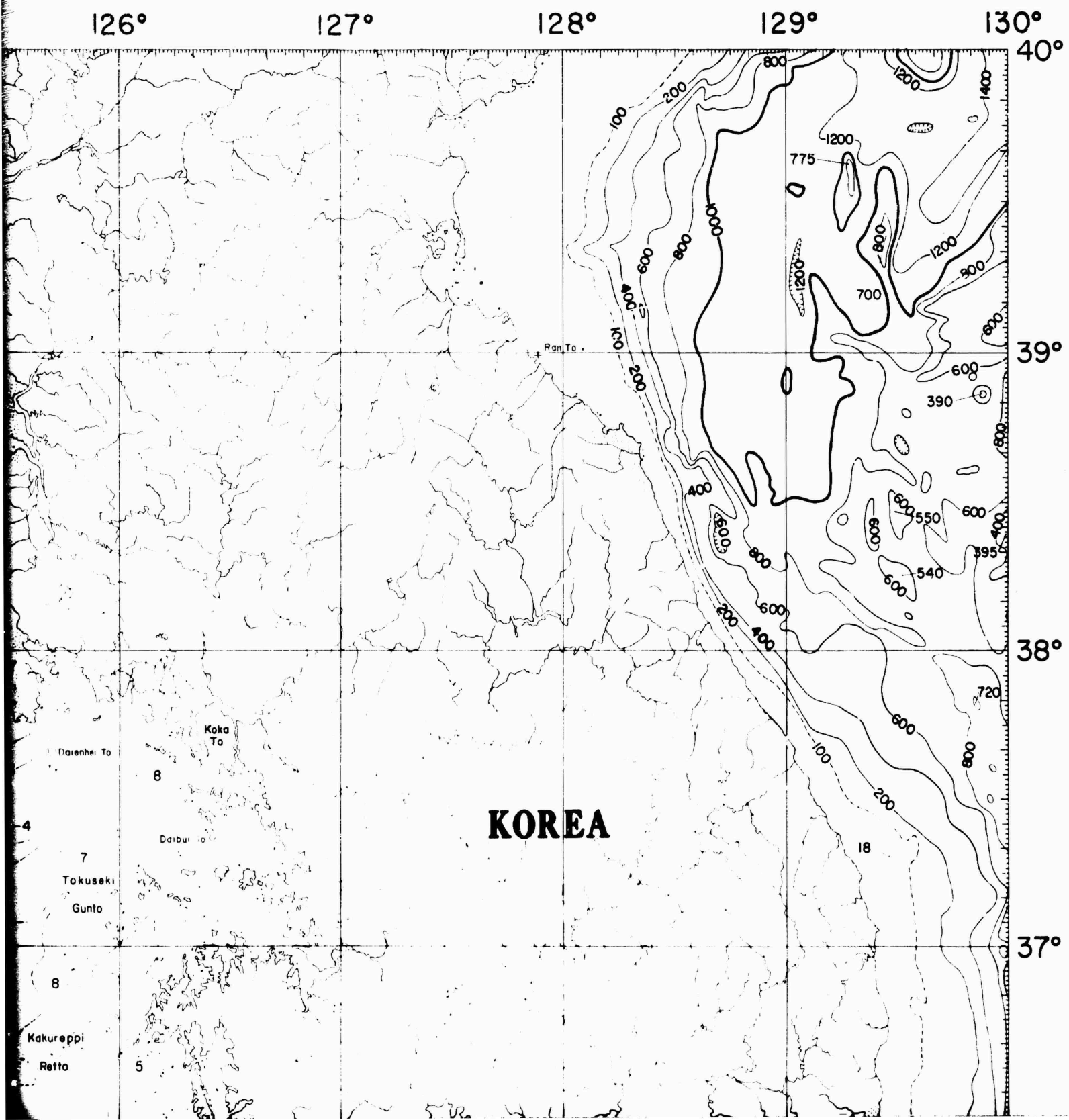
800
1000
2000
unknown

C


126°
127°
128°
129°
130°
40°
39°
38°
37°
KOREA
Rgn To
Koka To
Darenhei To
Tokuseki Gunto
Kakureppi Retto
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5
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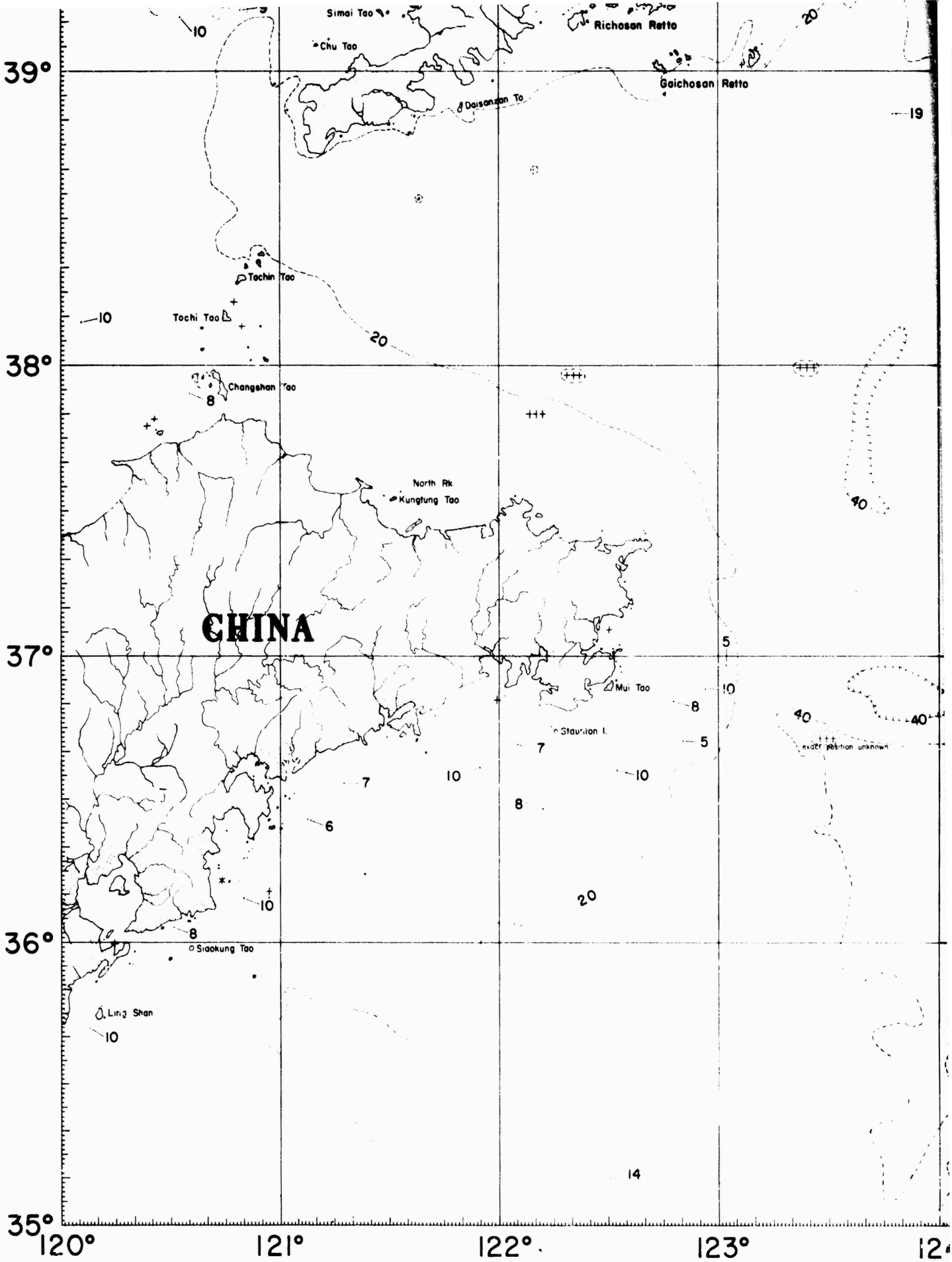
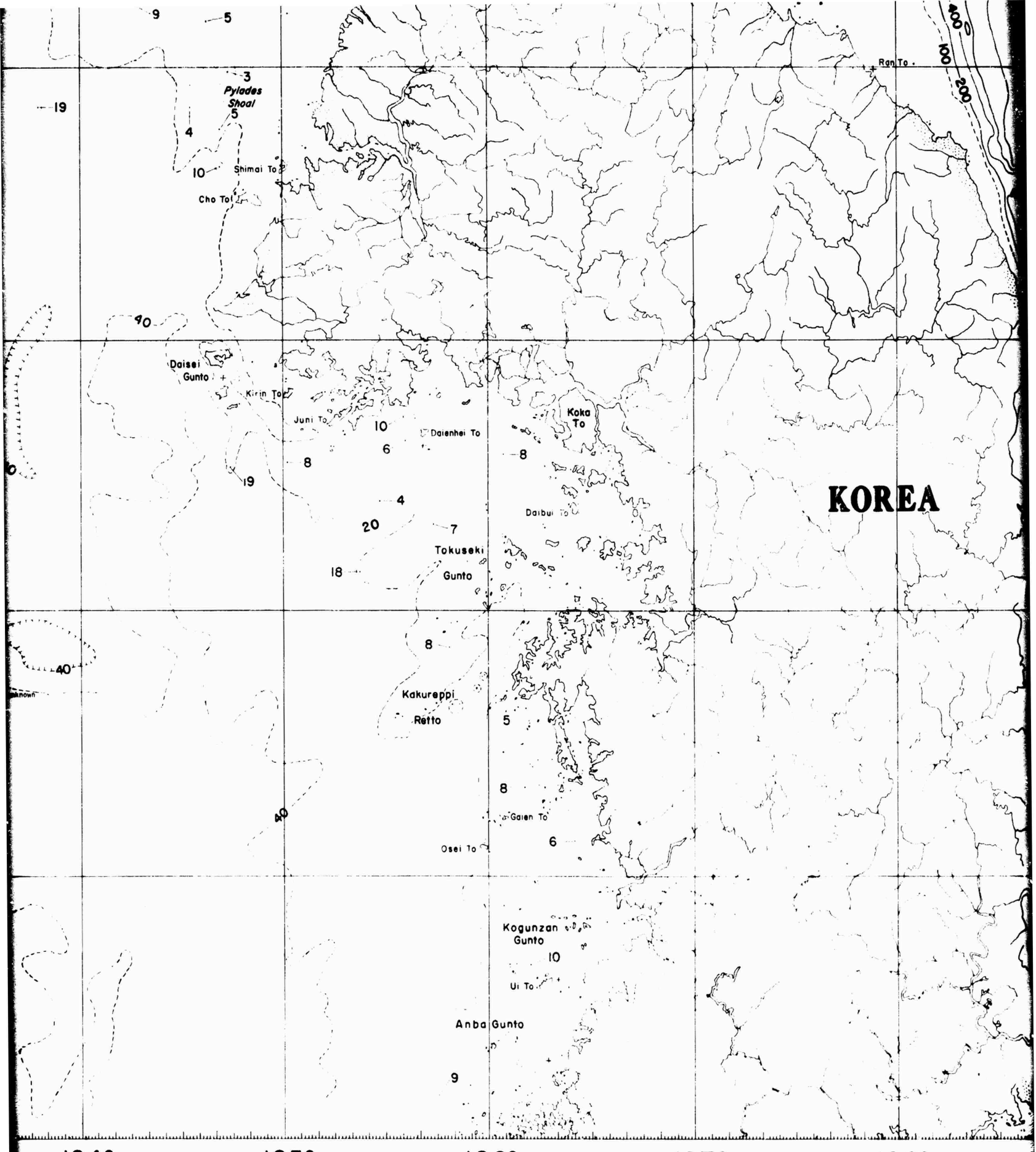


Sources of Data: U S Naval Oceanographic Office, Maritime Safety Agency, Japan, World Aeronautical Charts, Pacific Support Group ASW/USW

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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Contoured by: [illegible]
Assisted by: [illegible]

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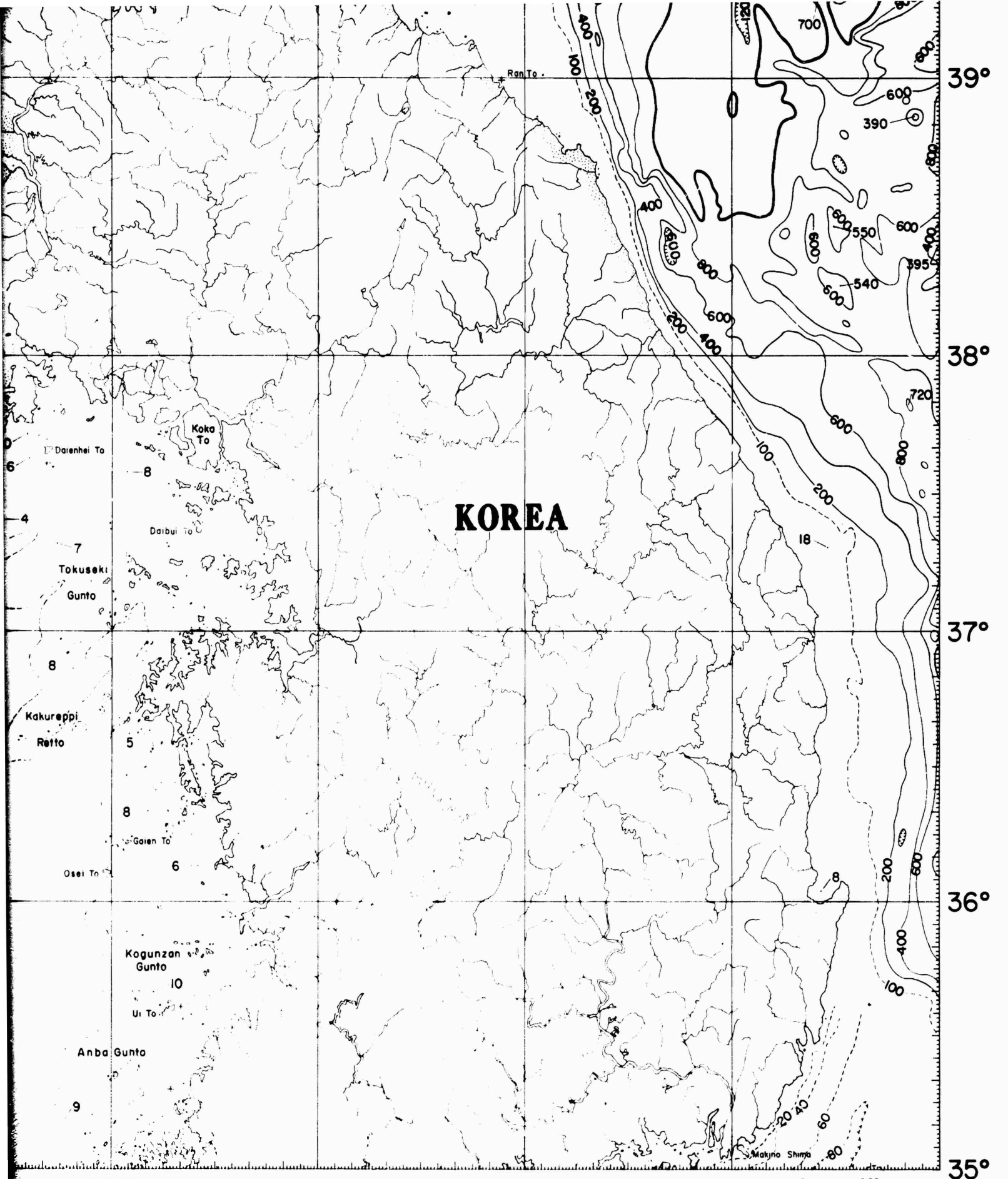

December, 1968

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Contoured by:

Assisted by:

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No. 2407N 16

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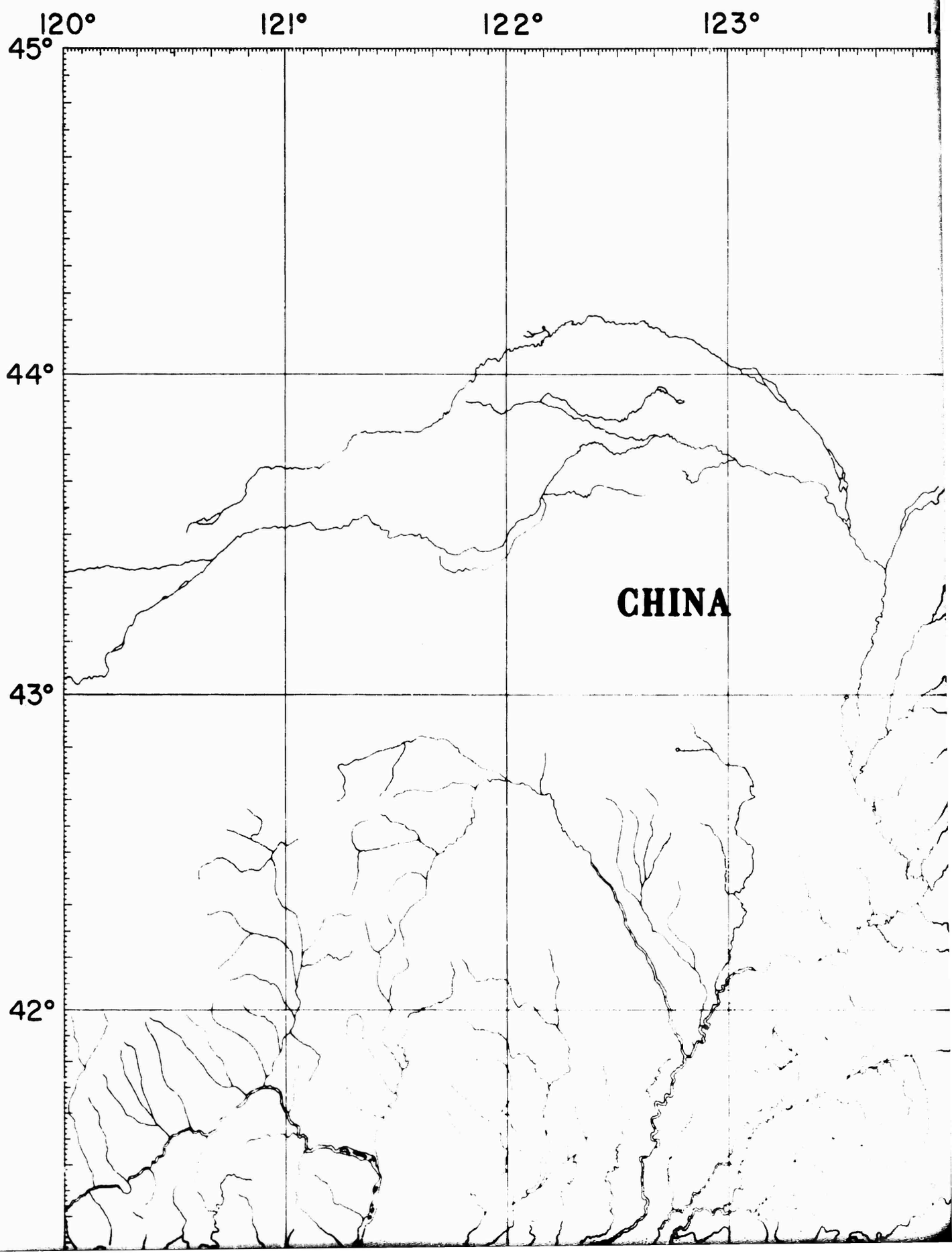

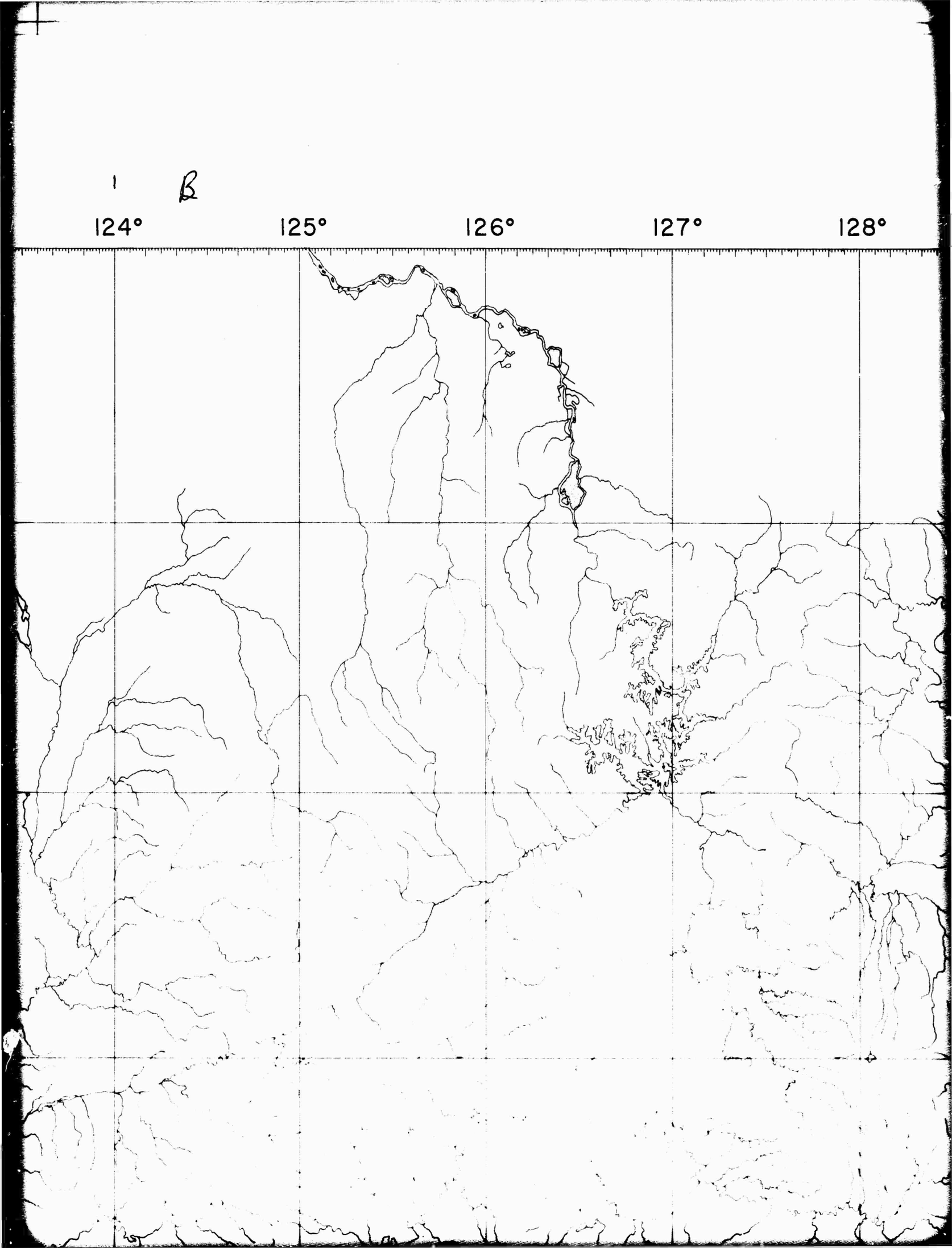
1
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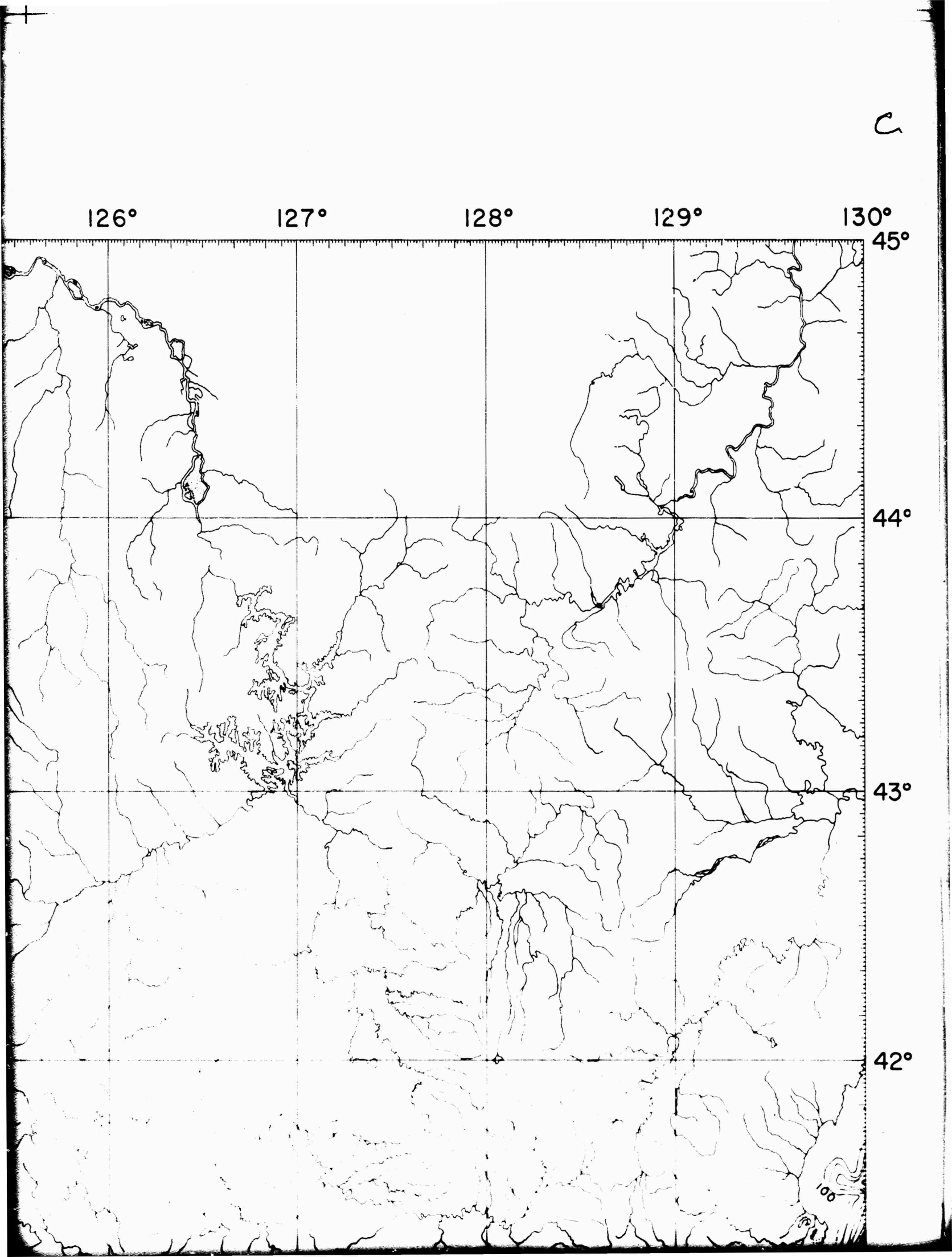
126°
127°
128°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129°
130°
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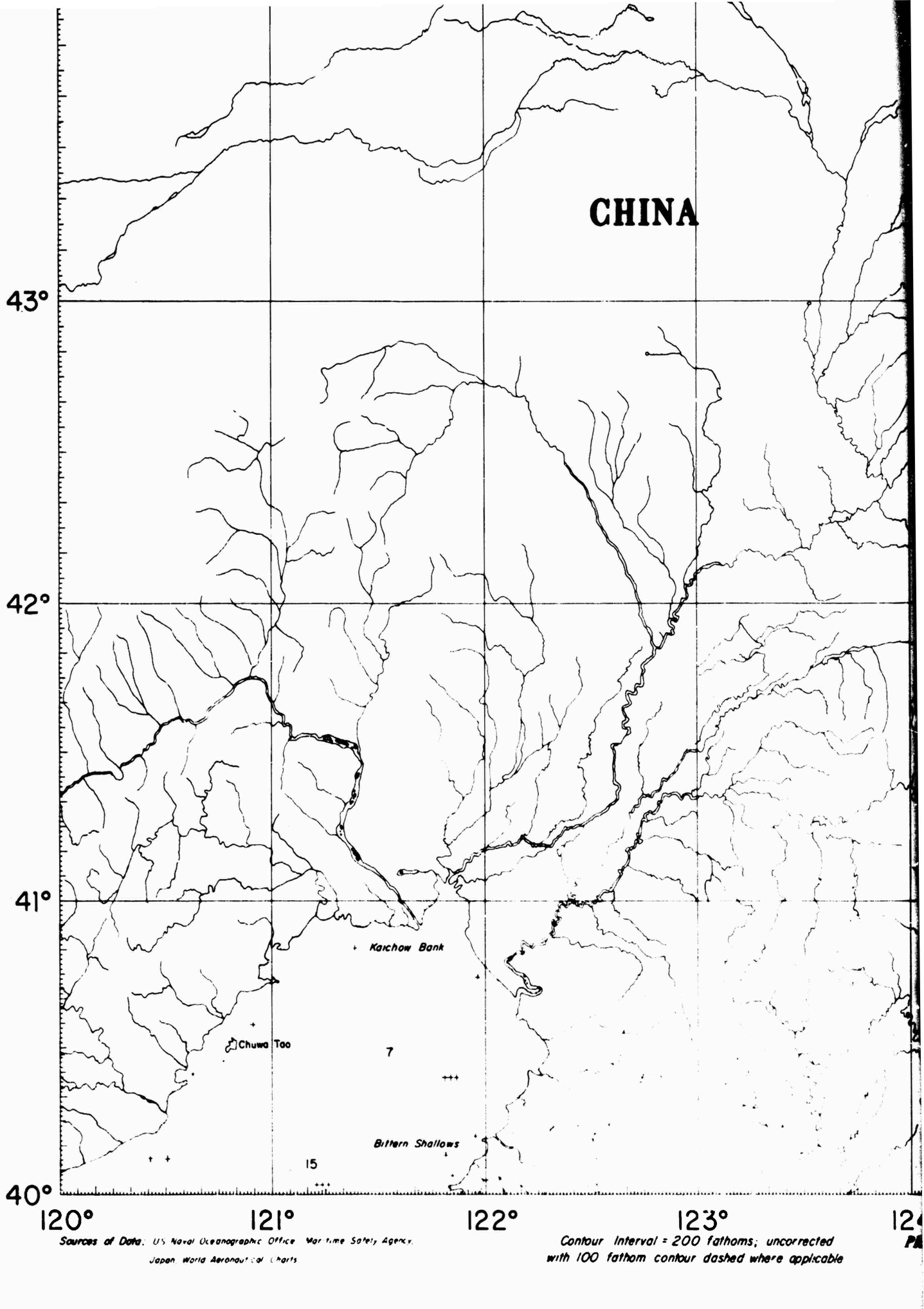
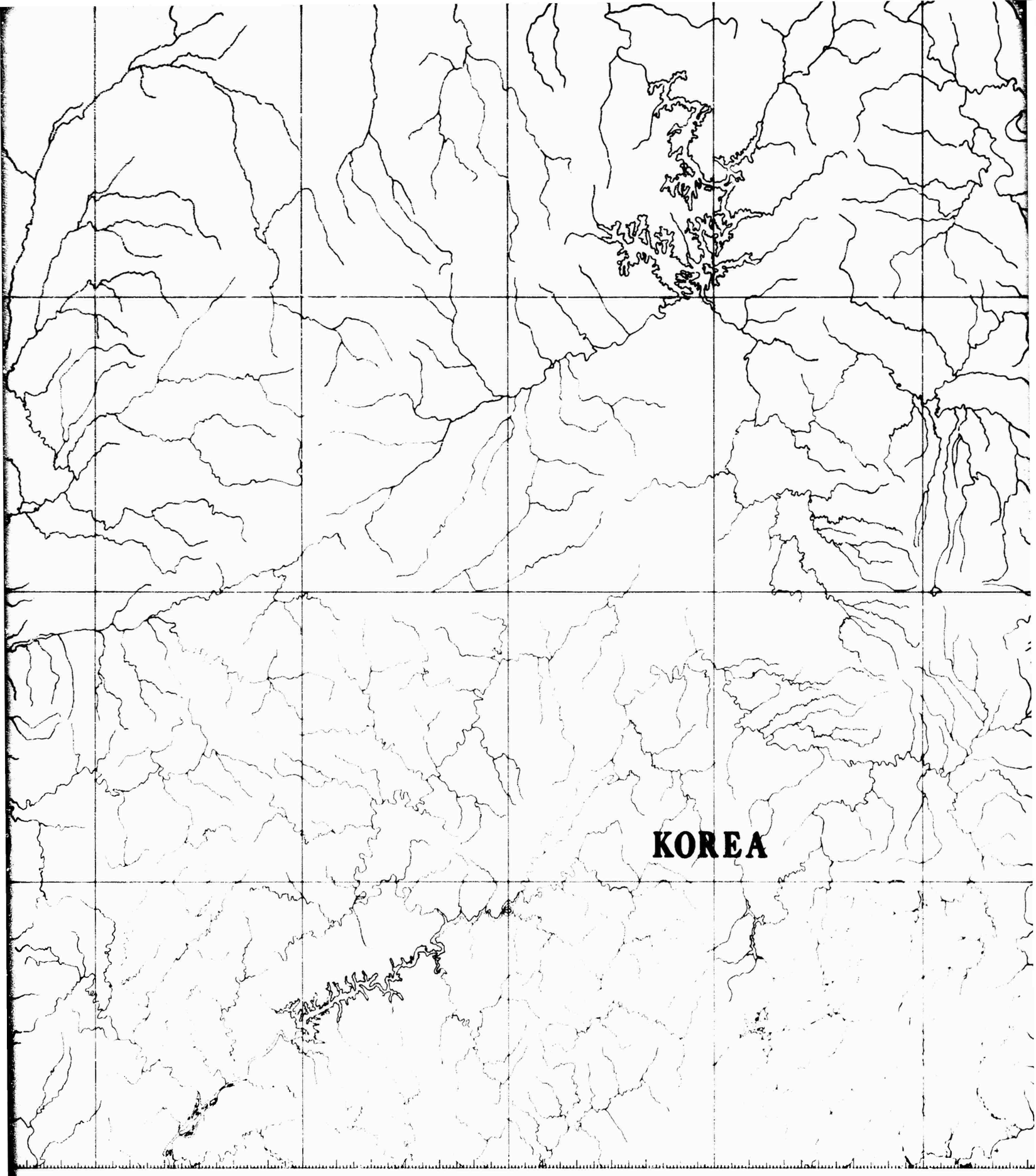
43°
42°
100



Sources of Data: US Naval Oceanographic Office, Maritime Safety Agency, Japan, World Aeronautical Charts

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by:

Assisted by:

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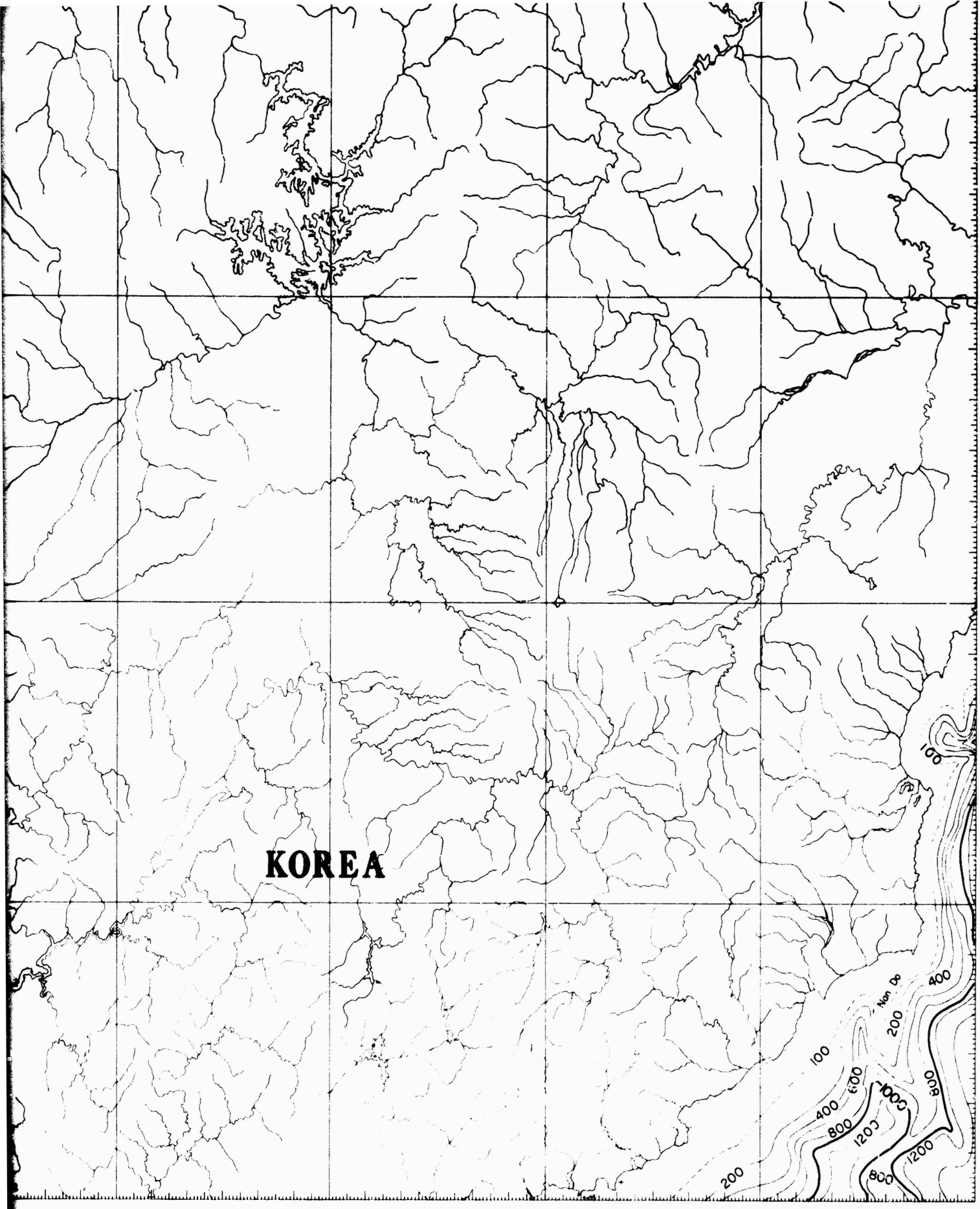
1 E



December, 1968

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No. 2408 N

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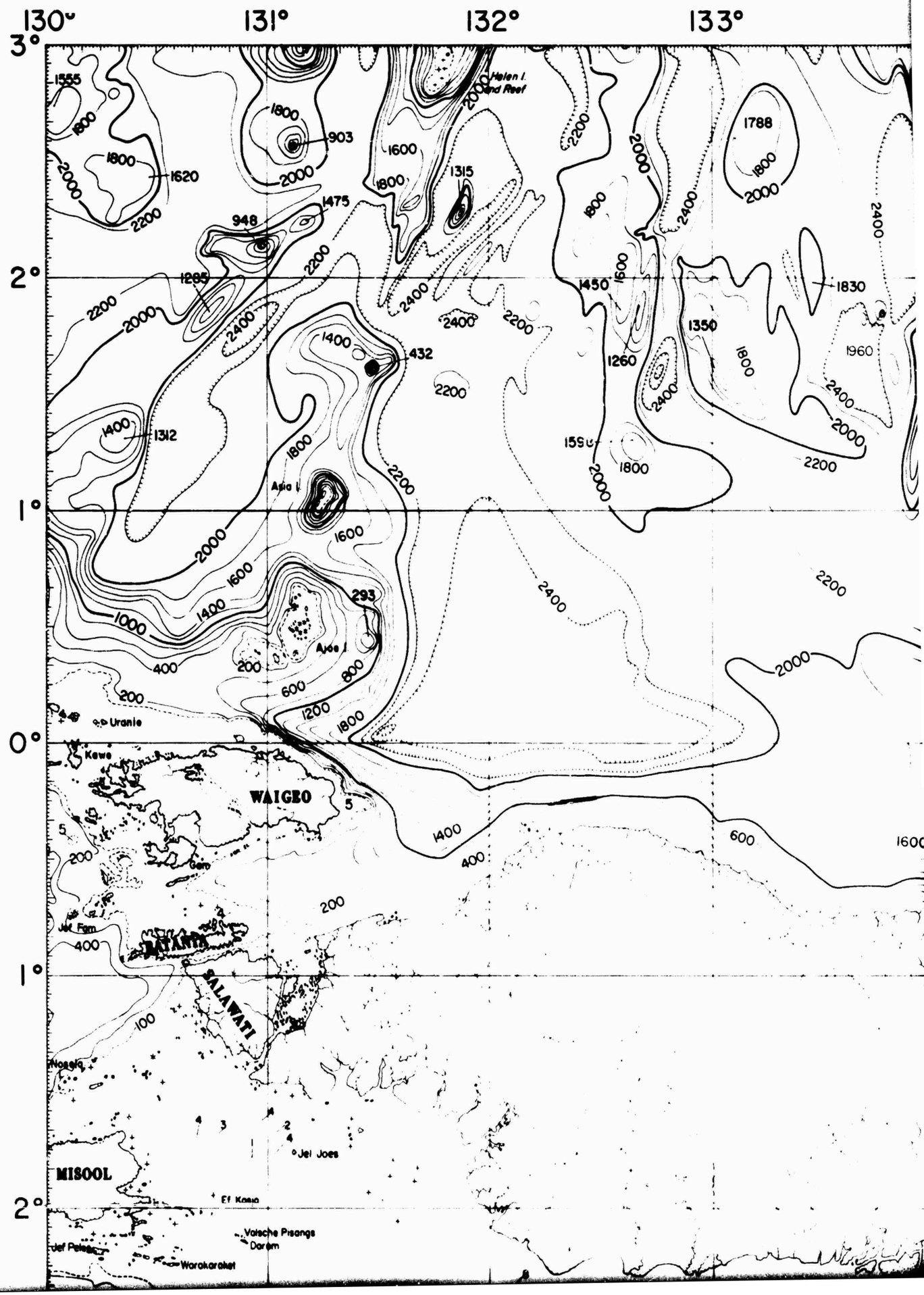
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131°
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1555
1800
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903
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1315
Helen I.
and Reef
2000
2200
1788
1800
2000
2400
1475
948
1285
2200
2000
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2200
2400
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1600
1450
1830
1350
1960
1800
1260
2400
2000
2200
1400
432
2200
1400
1312
1800
2200
1595
1800
2000
2200
Asia I.
1800
1600
2000
1600
1400
1000
293
2400
2200
2000
Ayau I.
400
200
0
600
800
1200
1800
200
Urania
Kawe
WAIGEO
5
5
1400
600
1600
400
200
200
Gam
Jel Fam
400
BATANTA
SALAWATI
100
Nosoja
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Jel Joes
MISOOL
Ef Kasia
Valsche Pisangs
Dorom
Jef Pelesa
Warakaraket

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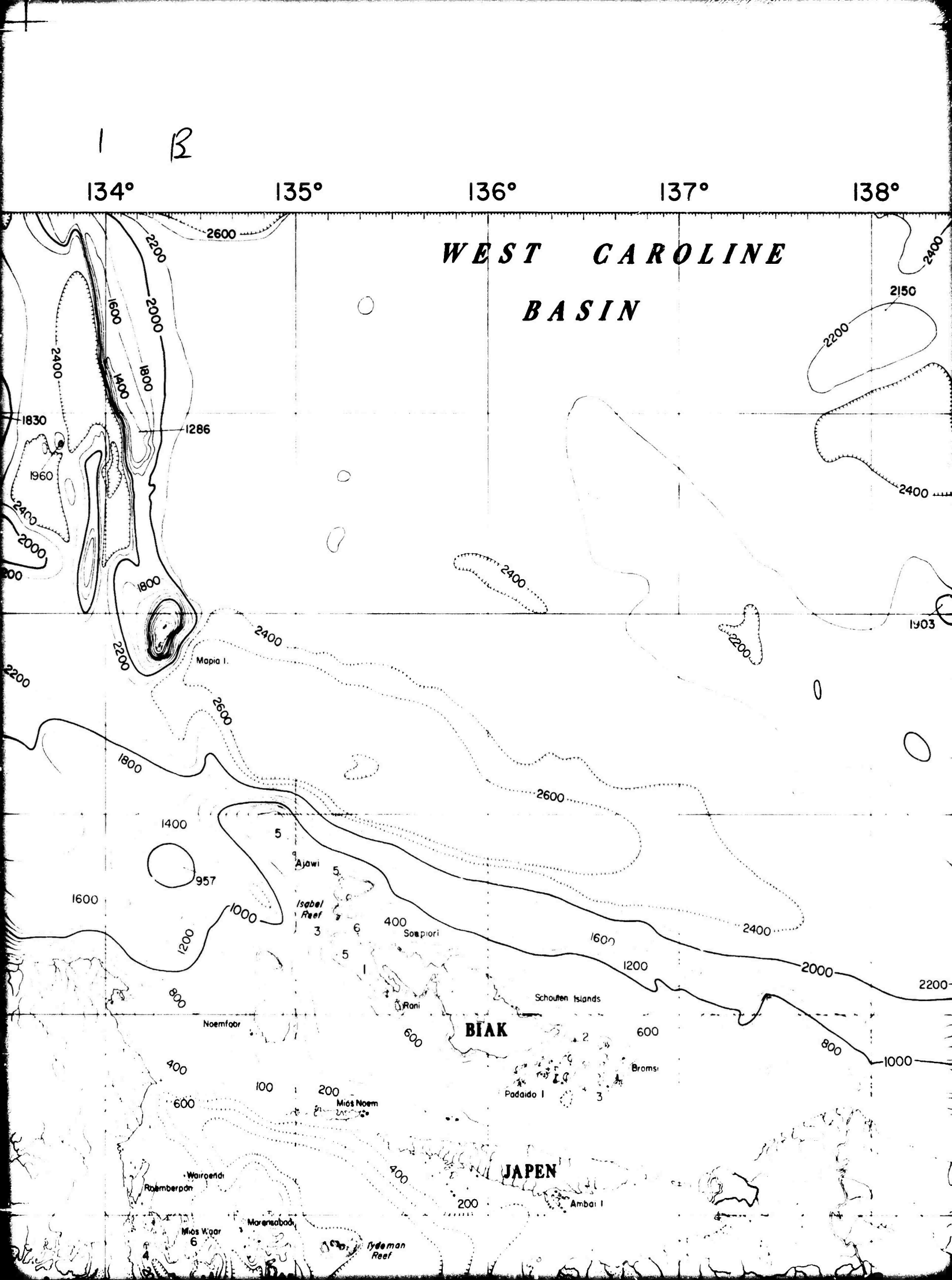
134°
135°
136°
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138°
WEST CAROLINE
BASIN
2600
2200
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1600
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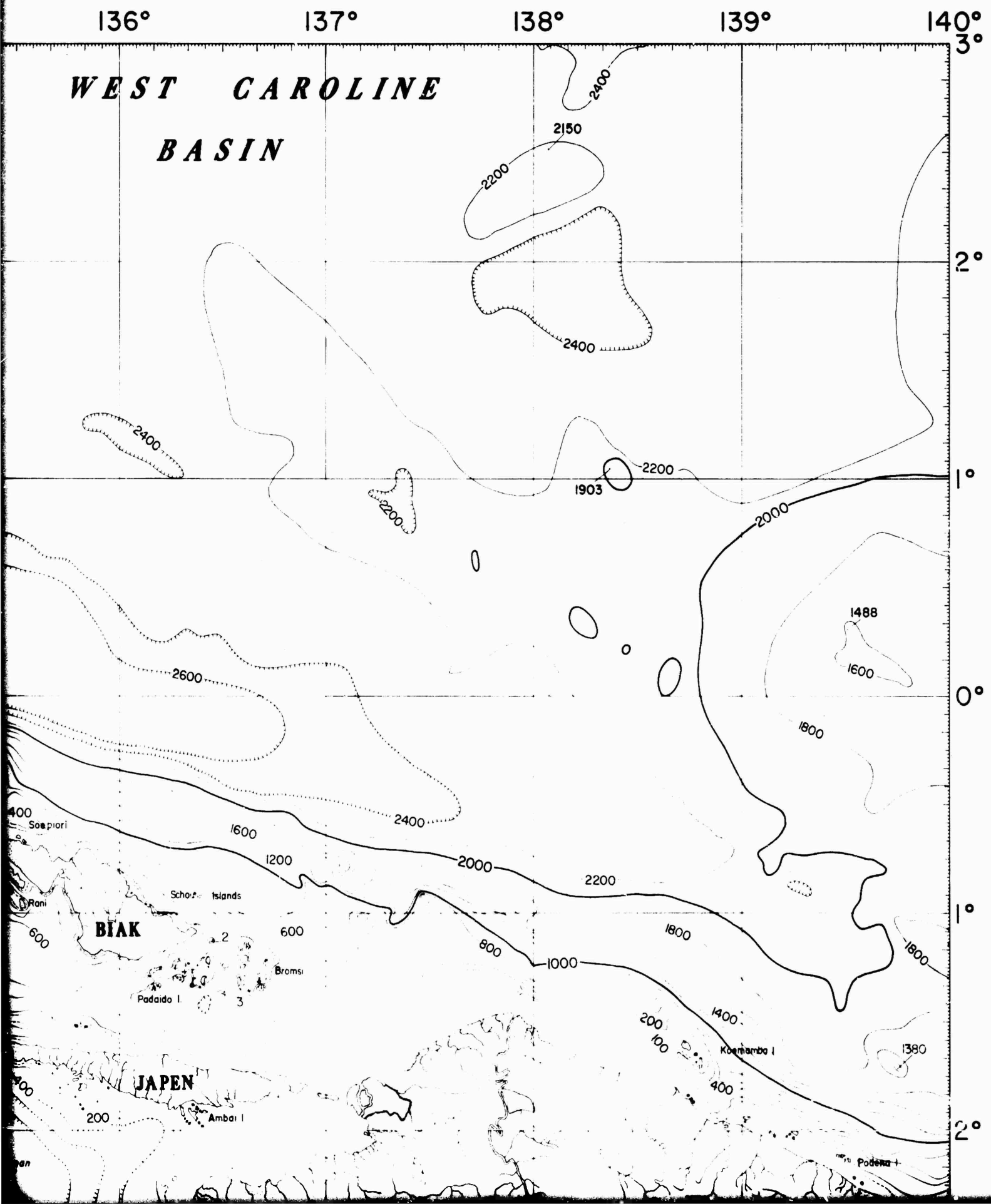
1400
1830
1286
1960
2000
1903
Mapia I.
957
Ajawi
Isabel Reef
Soepiori
Rani
Schouten Islands
BIAK
Noemfoor
Padaido I
Bromsi
Miós Noem
JAPEN
Ambai I
Wairoendi
Roemberpon
Marensabadi
Miós Waar
Tydeman Reef

C


136°
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WEST CAROLINE
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2200
2000
1488
1600
2600
1800
400
Soepiori
1600
2400
1200
2000
2200
Roni
Schouten Islands
BIAK
600
600
2
800
1000
1800
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Bromsi
Padaido I
3
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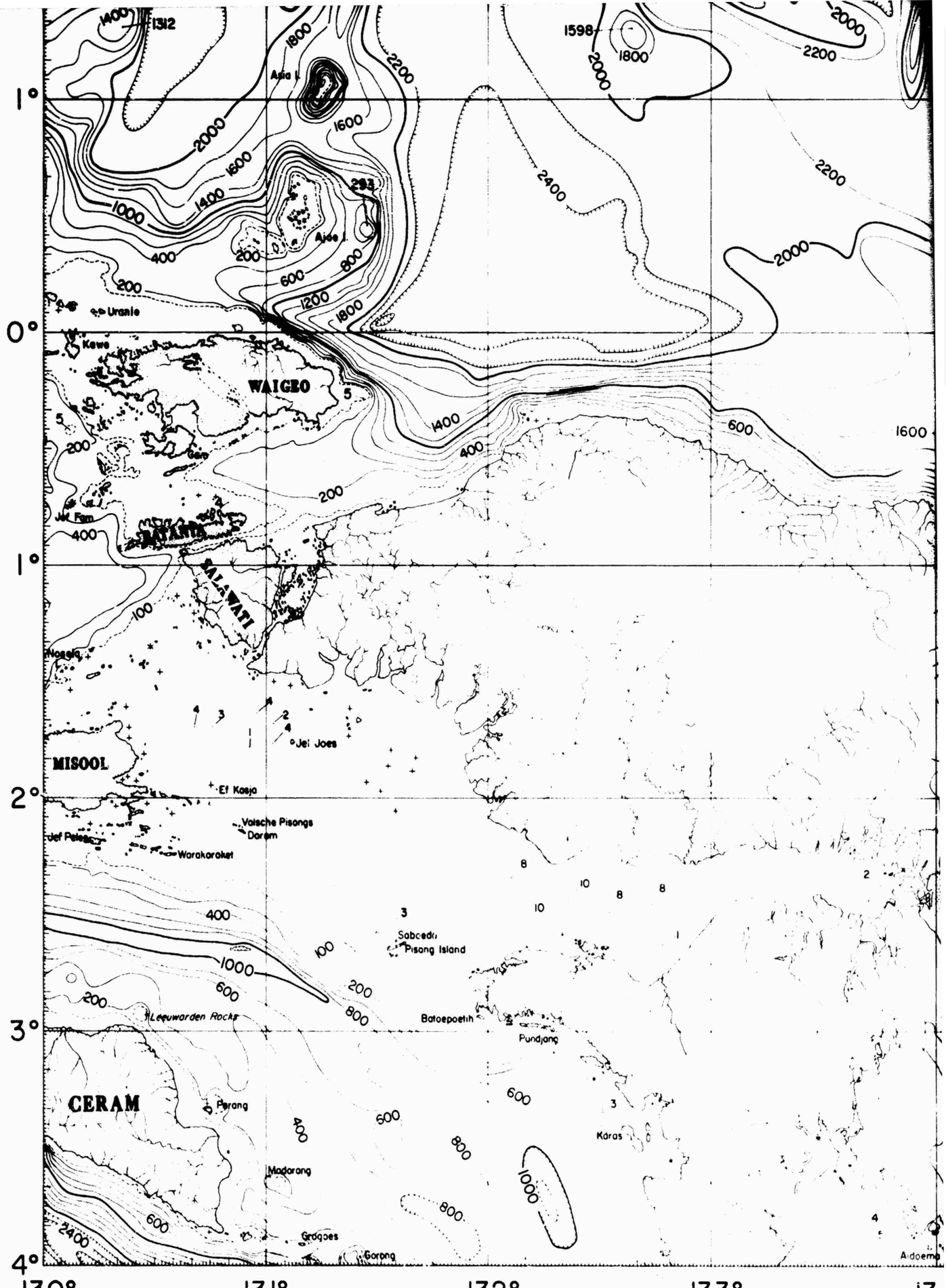
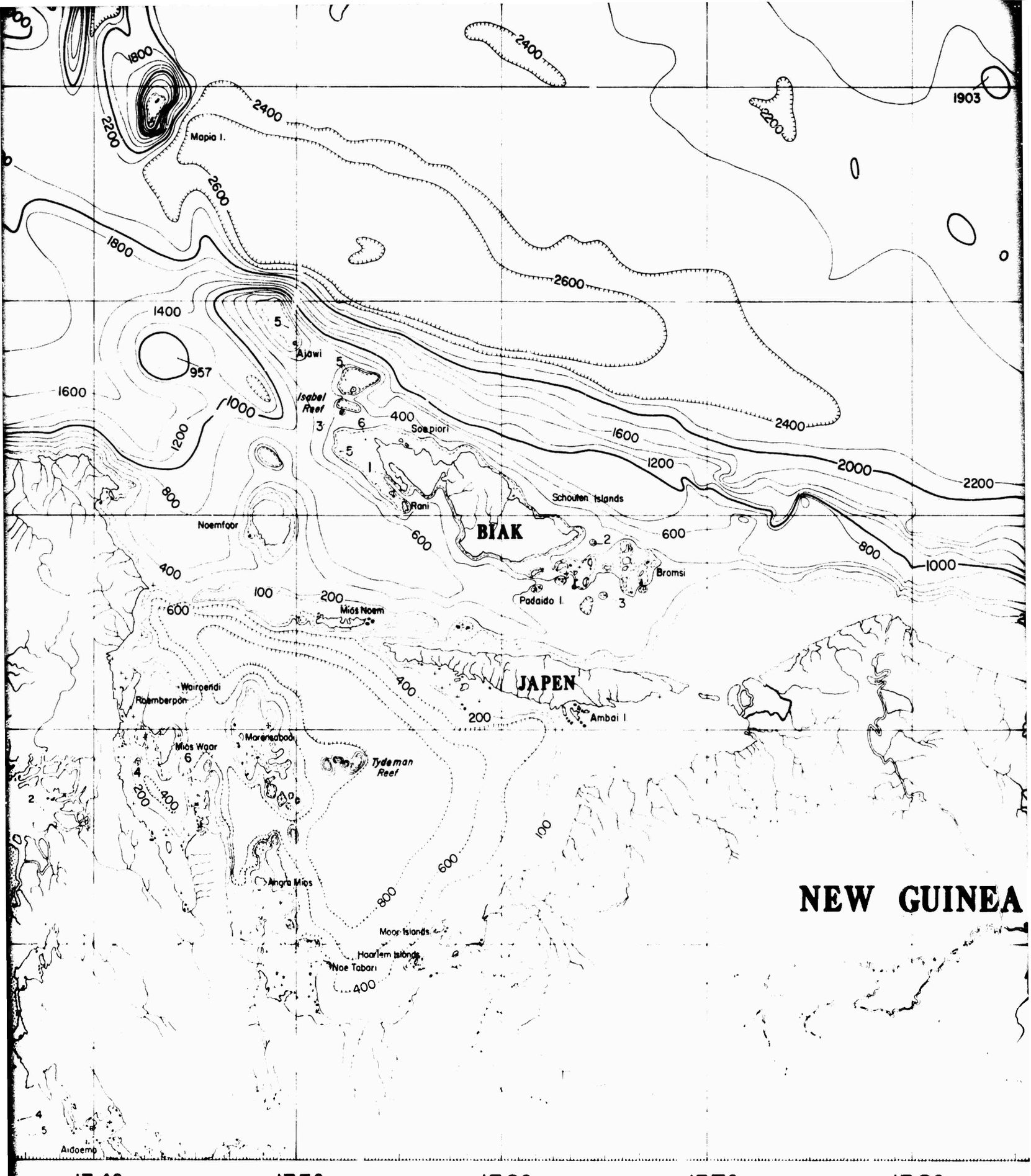
100
1400
Koemamba I
1380
JAPEN
200
Ambai I
400
Podena I



Sources of Data: U.S. Naval Oceanographic Office, R/V Vitiaz U.S.S.R.
World Aeronautical Charts D.C. Krause, 1965.
Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected
with 100 fathom contour dashed where applicable

D



134° 135° 136° 137° 138°

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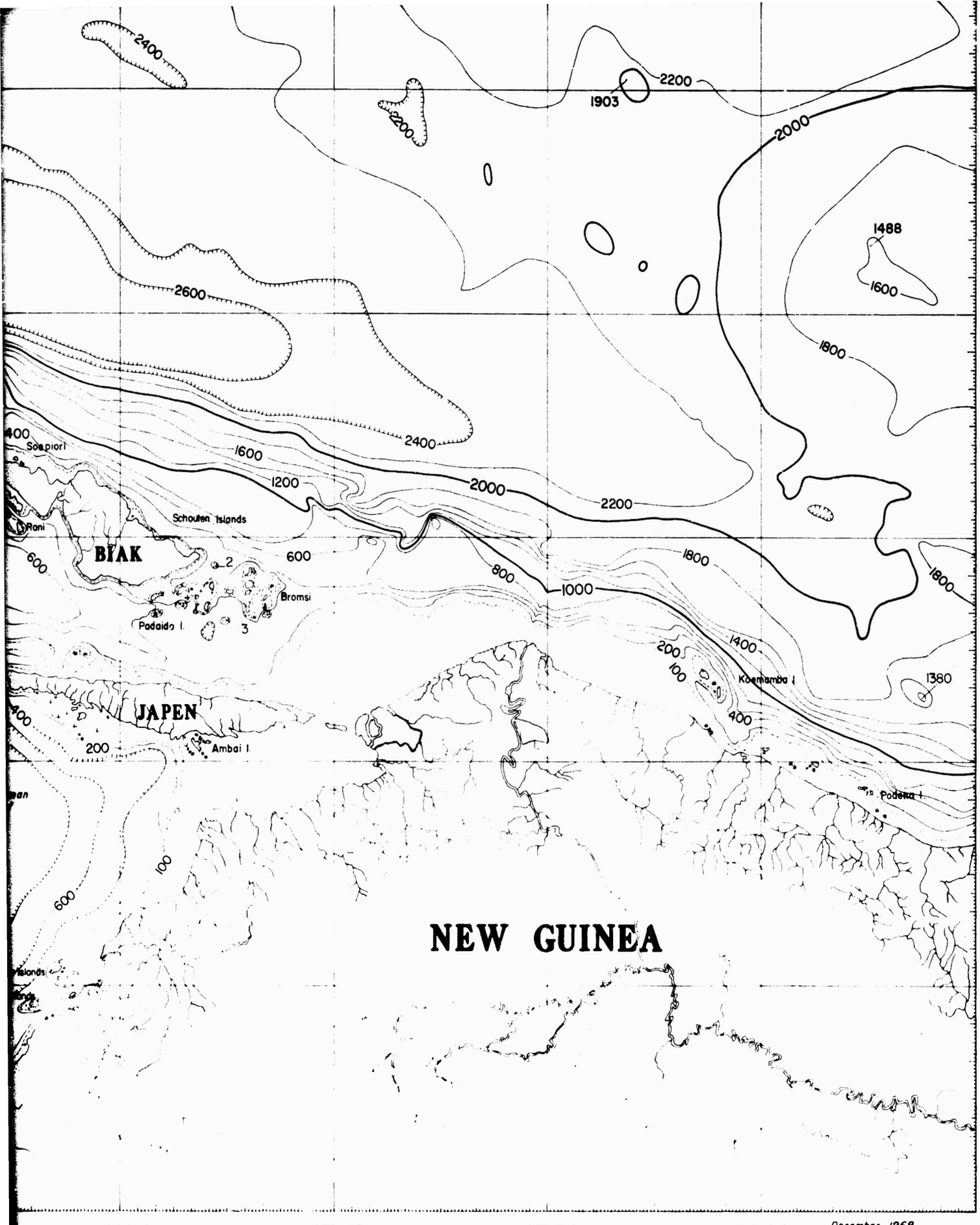
1 E


2400
2200
1903
2200
2000
1488
1600
2600
1800
0°
2400
1600
1200
2000
2200
Soepiori
Rani
Schouten Islands
BIAK
600
800
1000
1800
1800
2
Bromsi
Padaido I.
3
1400
200
100
Koemamba I
1380
JAPEN
400
200
Ambai I
400
2°
Podena I
100
600
NEW GUINEA
Islands
3°
4°
136°
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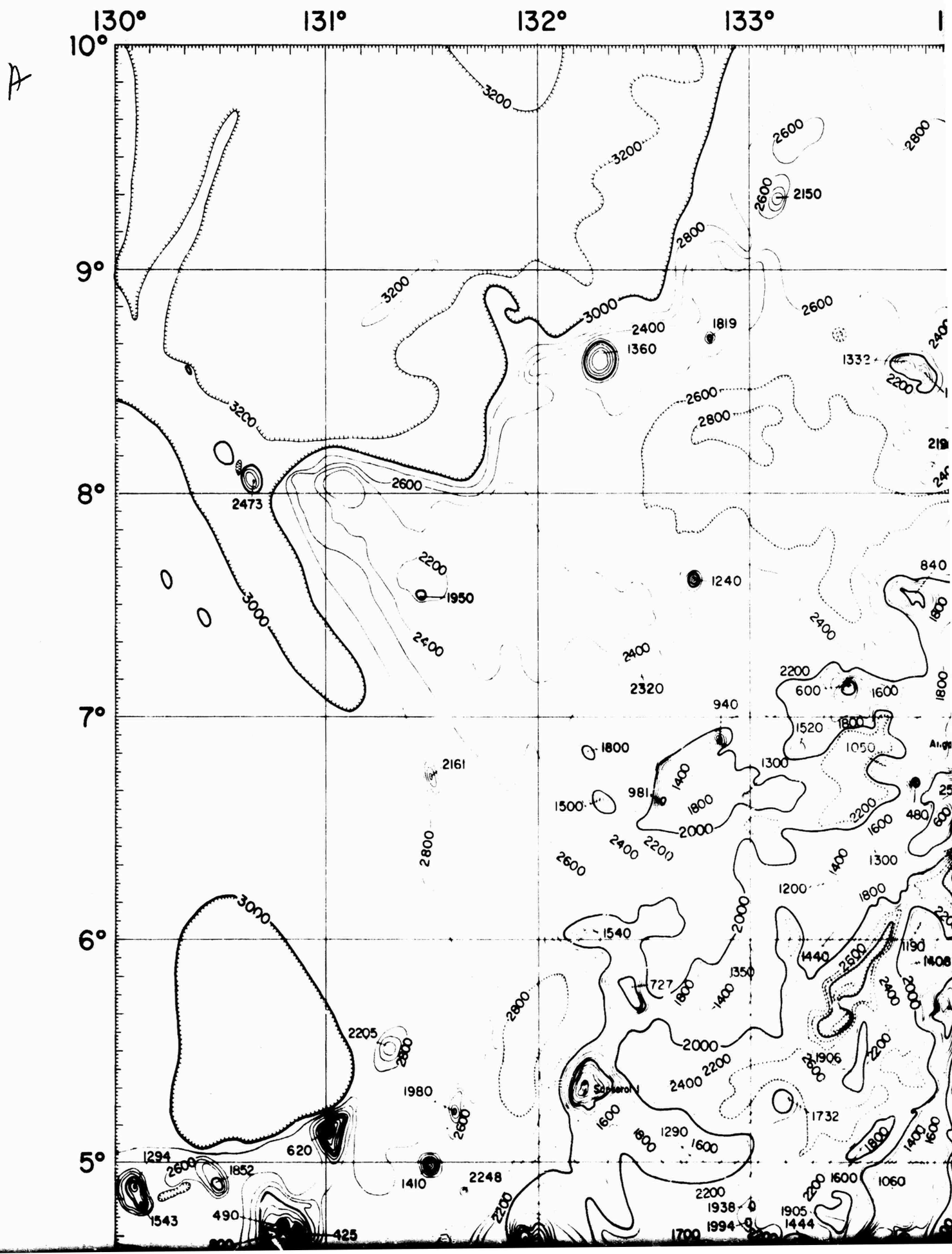
139°
140°
December, 1968
ANOGRAPHY
Contoured by
Assisted by
Do Not Use For Navigation
No. 2301
18

F


130°
131°
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133°
10°
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5°
3200
2600
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2400
1819
1360
1332
2200
2473
1950
1240
840
1800
2320
940
600
1520
1050
1300
1400
981
1500
2161
480
1540
1440
1190
1350
727
2500
2205
1980
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425
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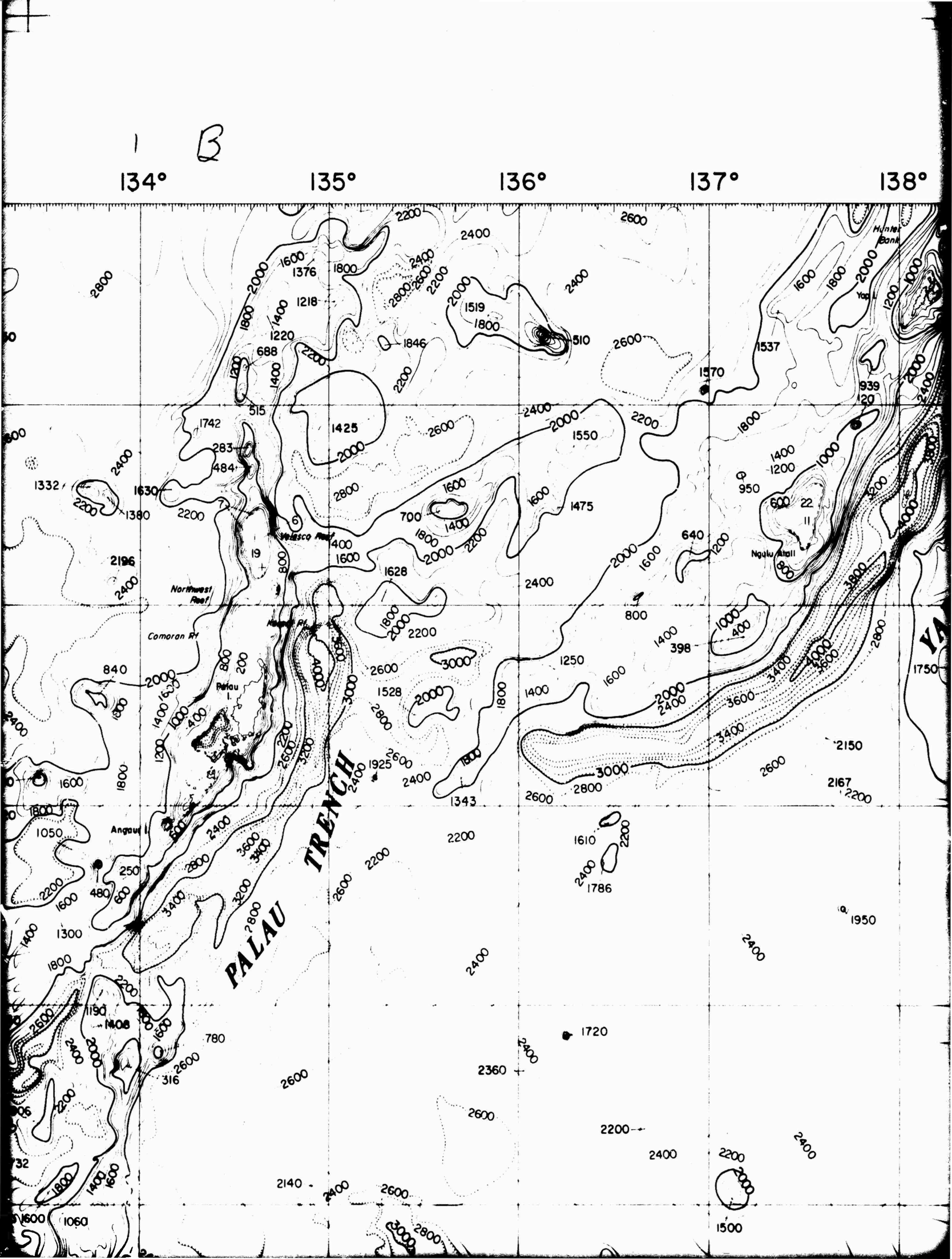
1905
1994
1444
1700


1 B
134°
135°
136°
137°
138°
PALAU TRENCH
Velasco Reef
Northwest Reef
Comoran Rf
Palau I.
Angaur I.
Ngulu Atoll
Hunter Bank
Yap
Y
1376
1218
1519
1846
510
1537
1570
939
120
1742
515
1425
283
484
1332
1630
1380
2196
19
1628
1550
1475
950
640
1528
1925
1343
1610
1786
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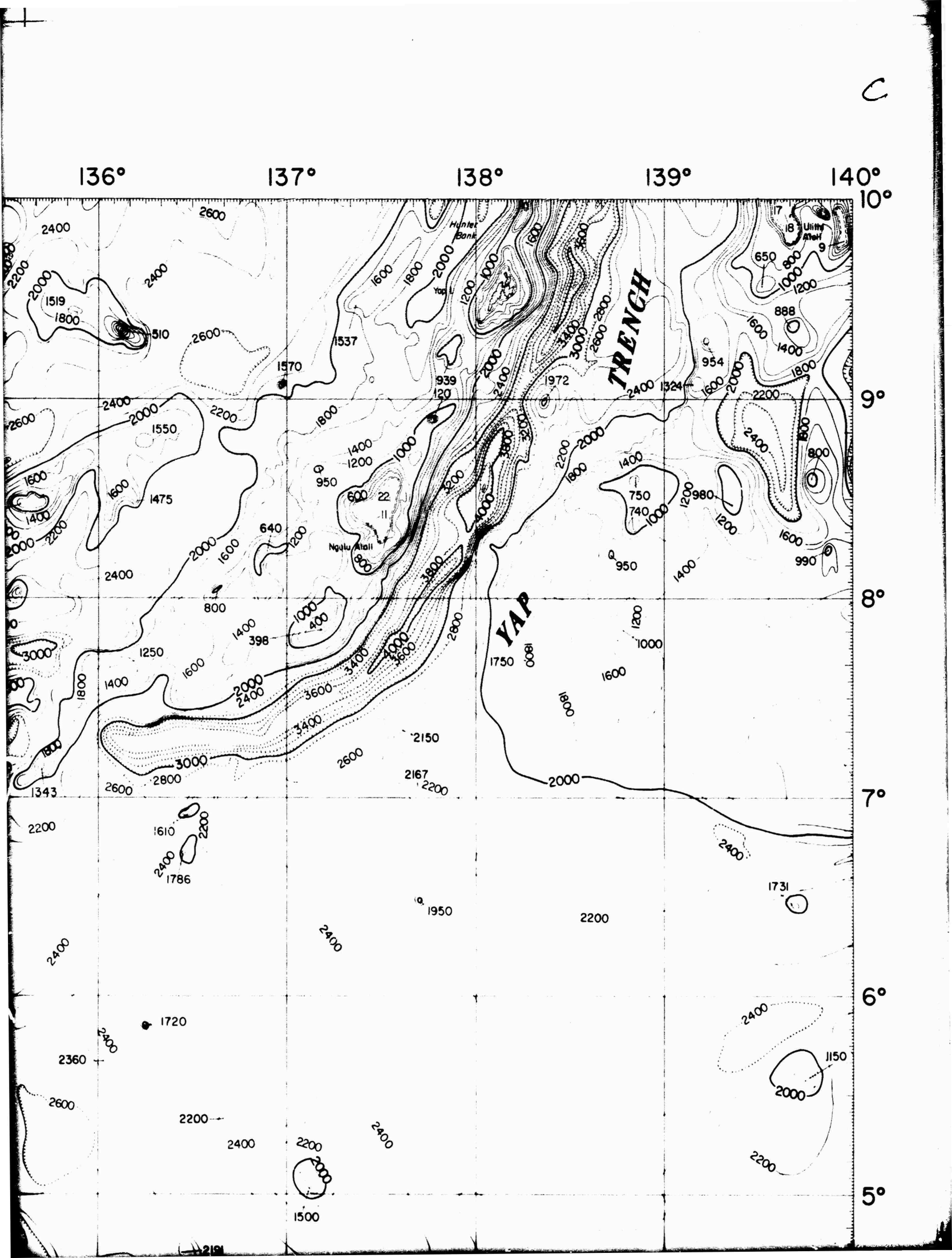
316
1060
1500
2140
1925


136°
137°
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140°
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8°
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TRENCH
YAP
Hunter Bank
Yap I.
Ngulu Atoll
Ulithi Atoll
2400
2600
2200
2000
1800
1600
1400
1200
1000
800
3600
3400
3000
2800
1519
510
1570
1537
939
120
1972
1324
954
888
650
1550
1475
640
950
600
22
11
750
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1950
1720
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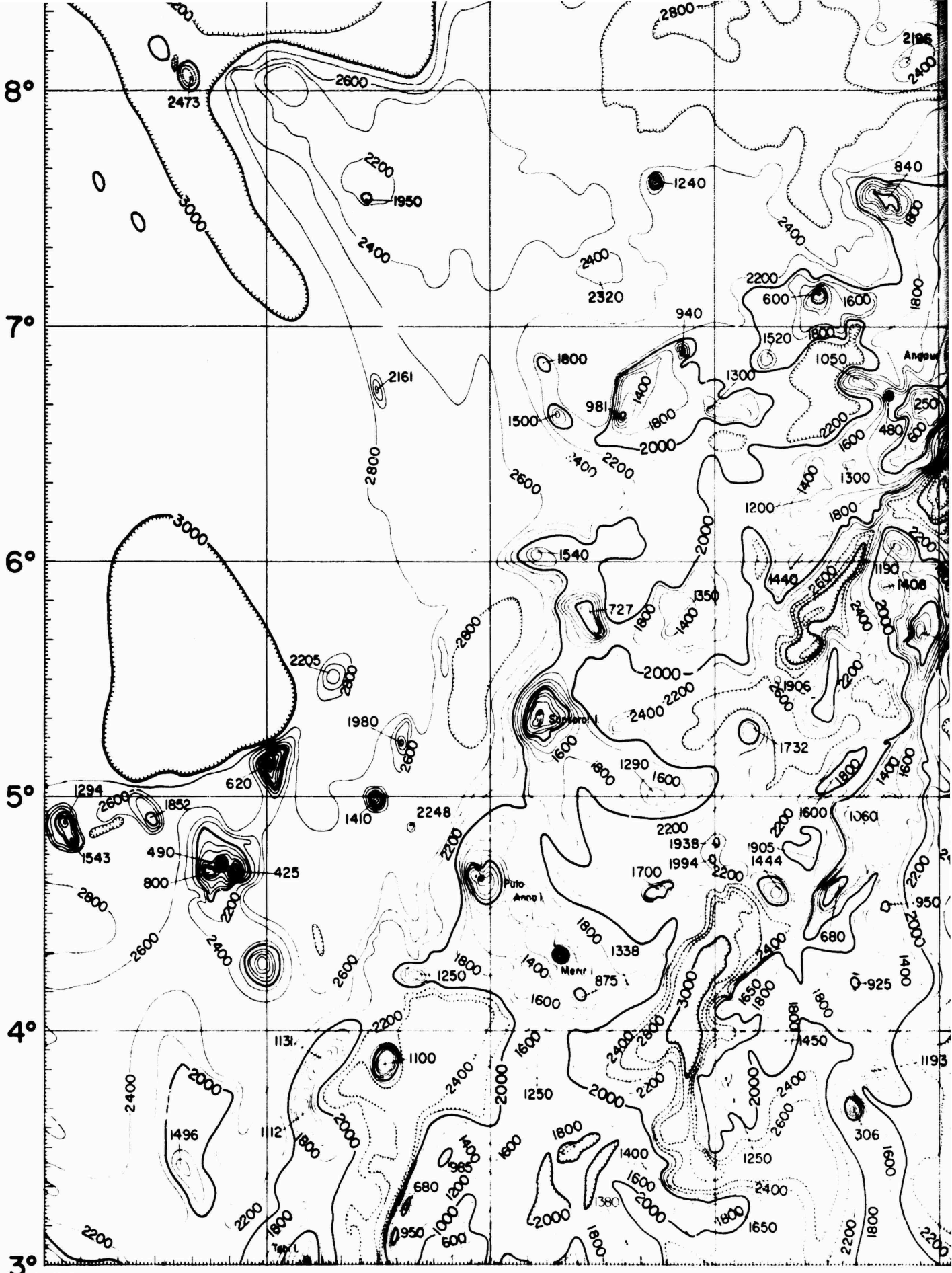
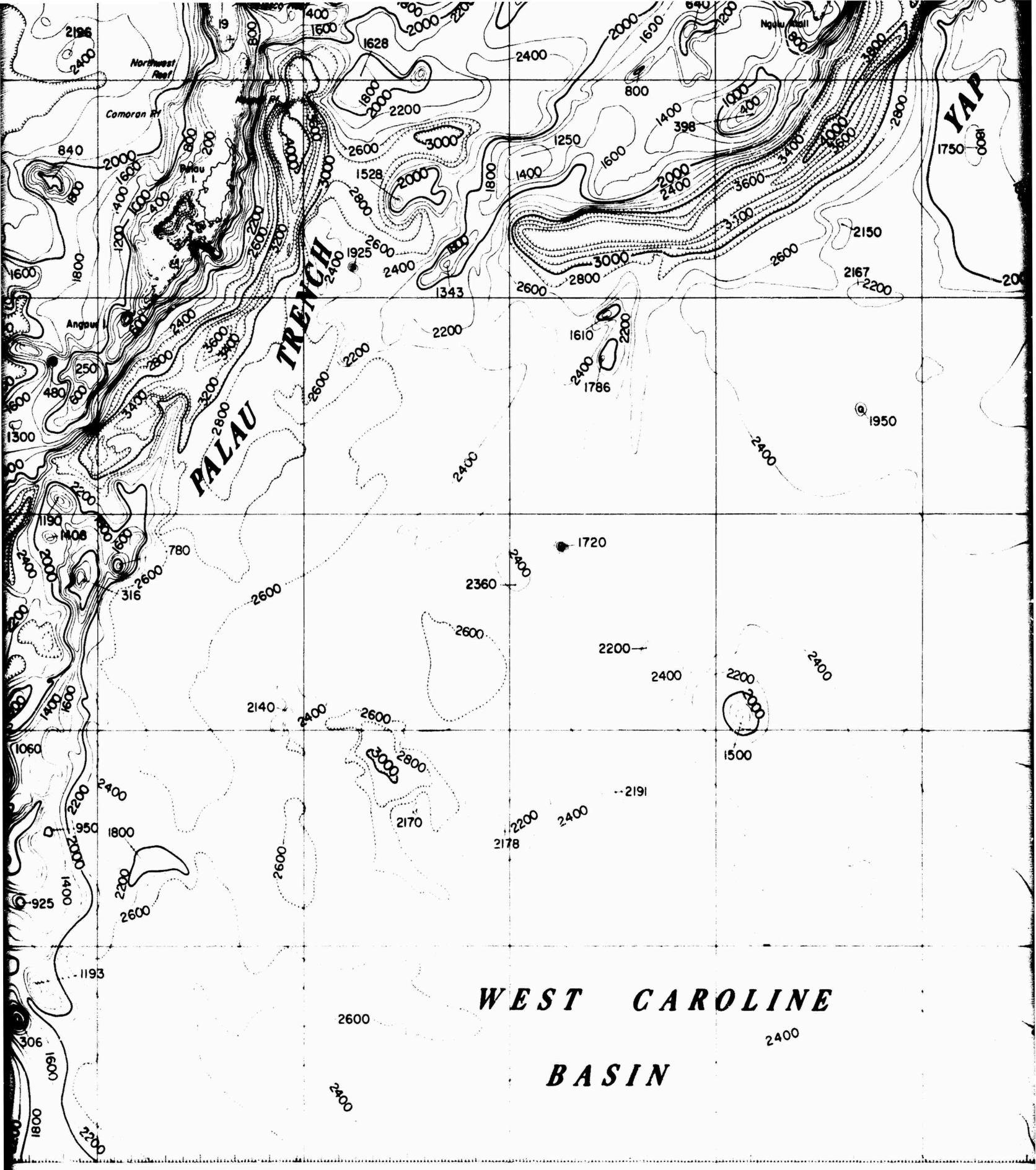
1150
1500



Sources of Data: U.S. Naval Oceanographic Office, DC Krause, 1965, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable



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Assisted by [illegible]

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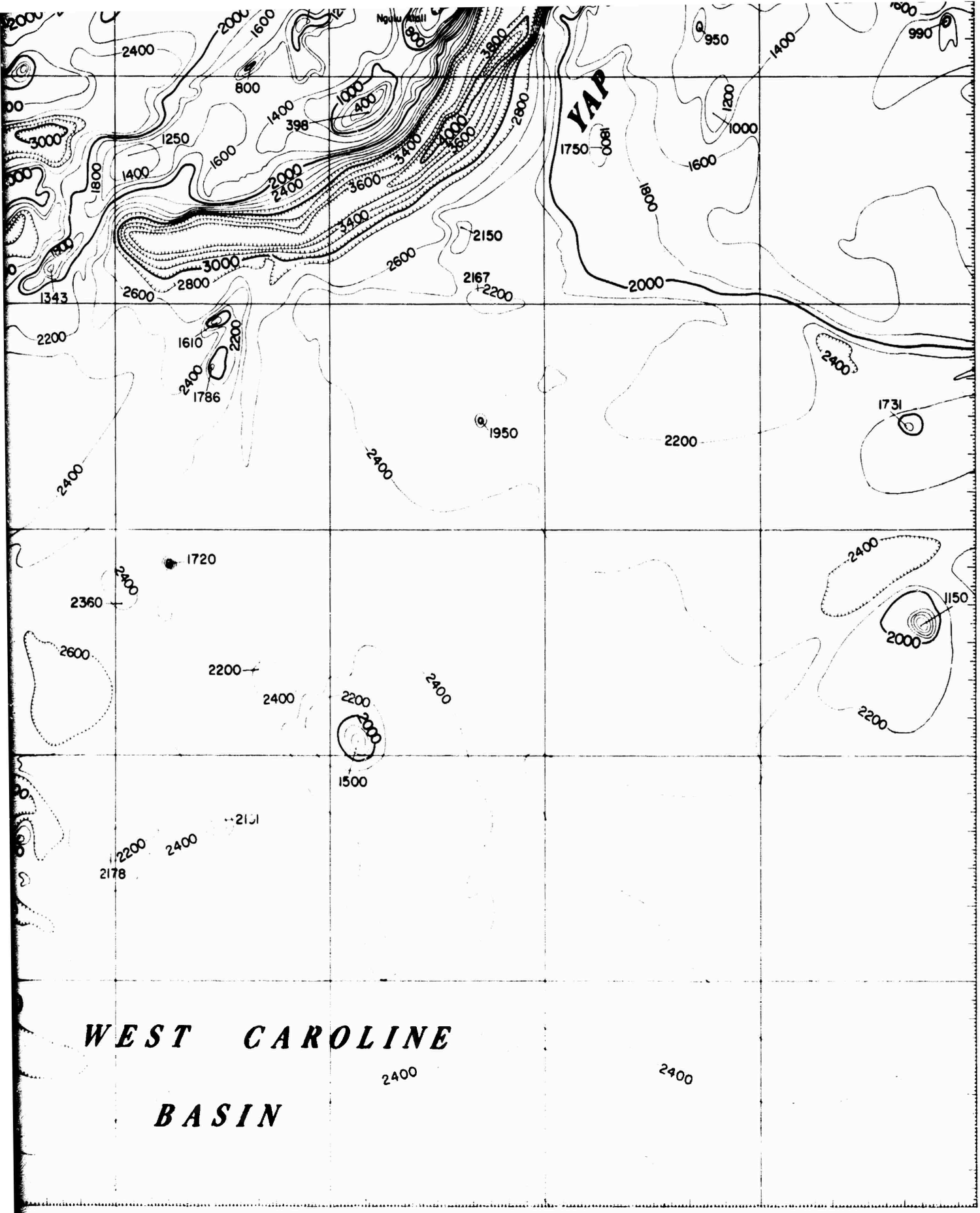
1 E


YAP
WEST CAROLINE
BASIN
8°
7°
6°
5°
4°
3°
136°
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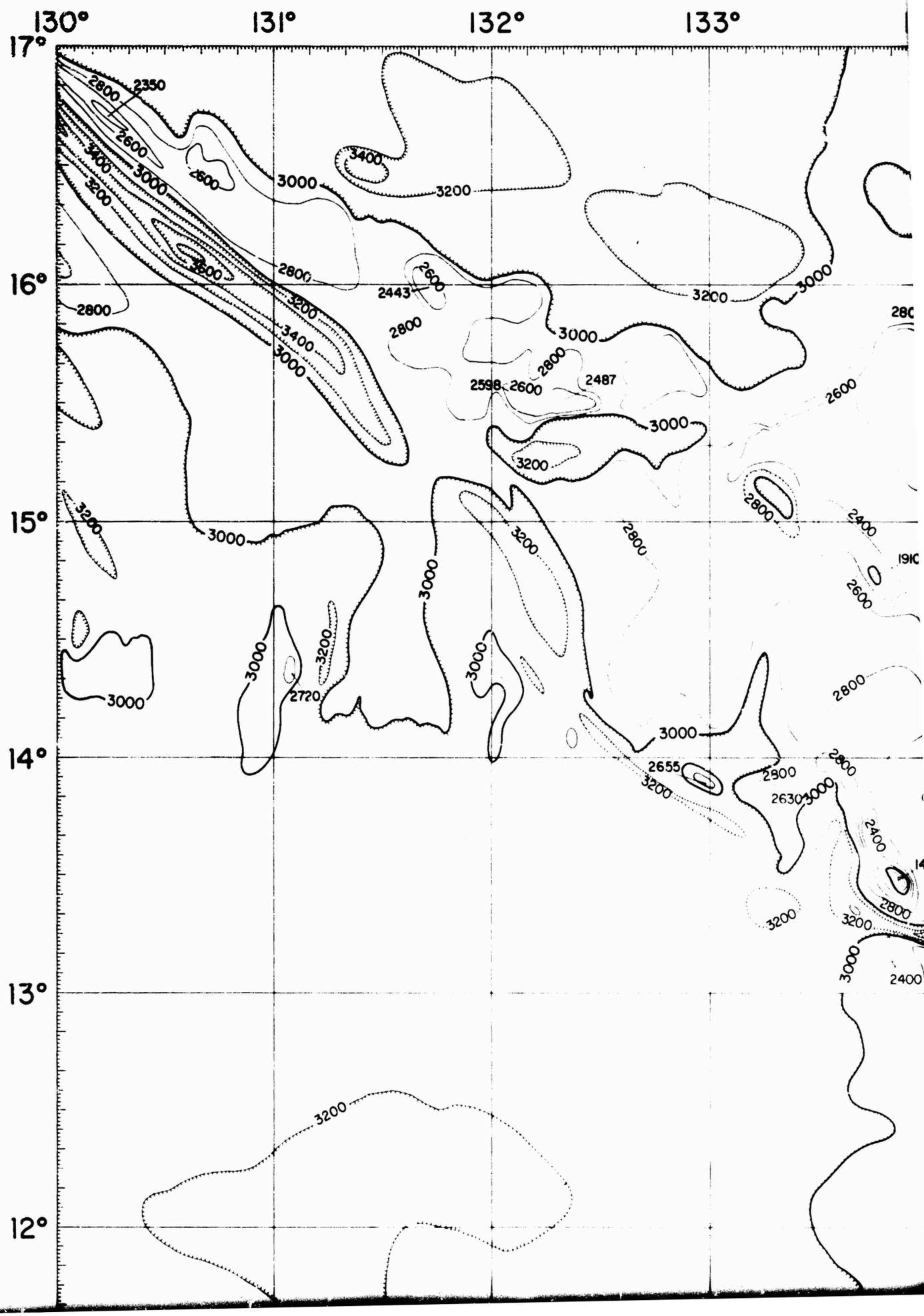
139°
140°
December, 1968
Do Not Use For Navigation
No. 2302 N
19
F


130°
131°
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A
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2443
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2487
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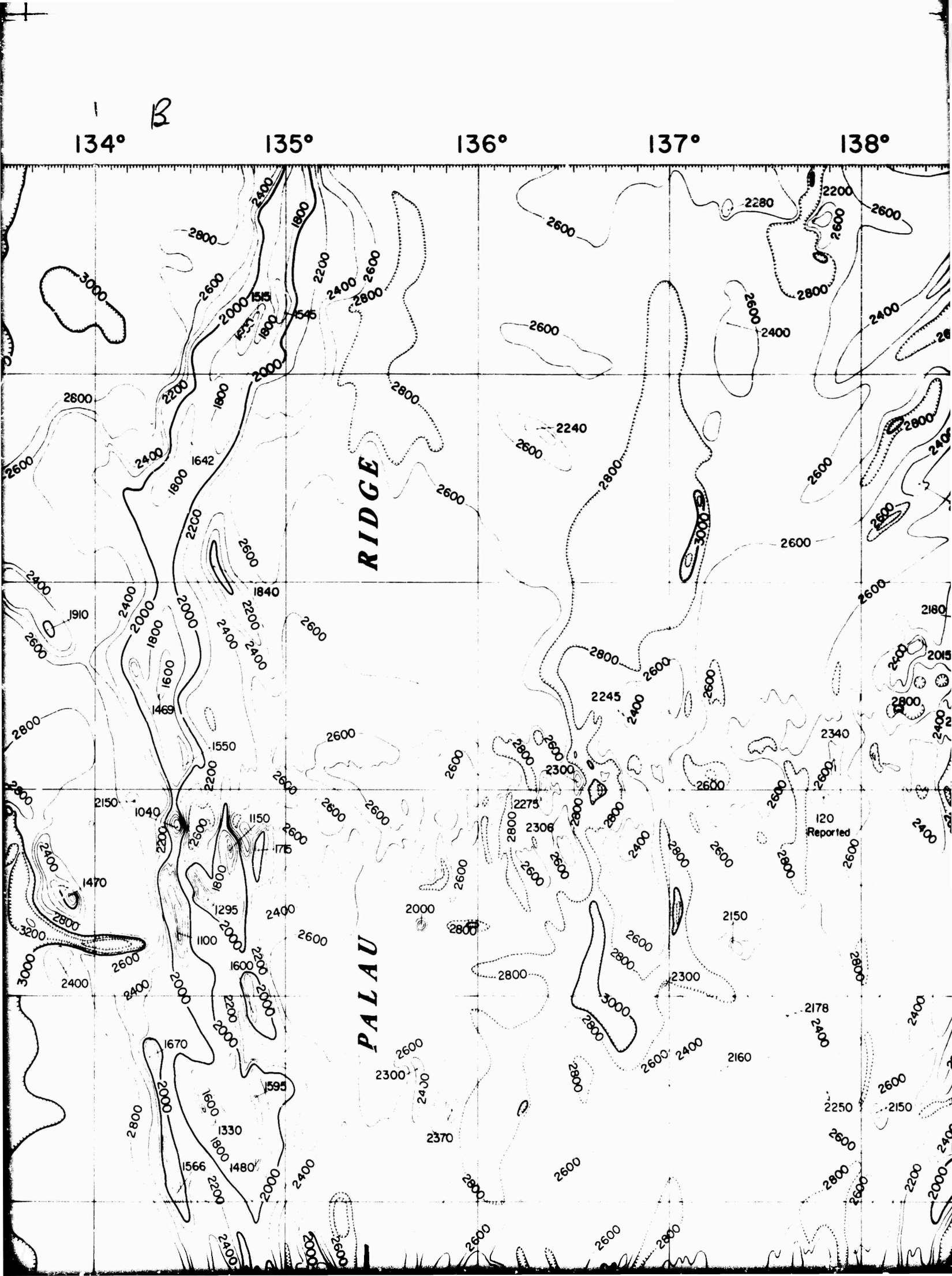
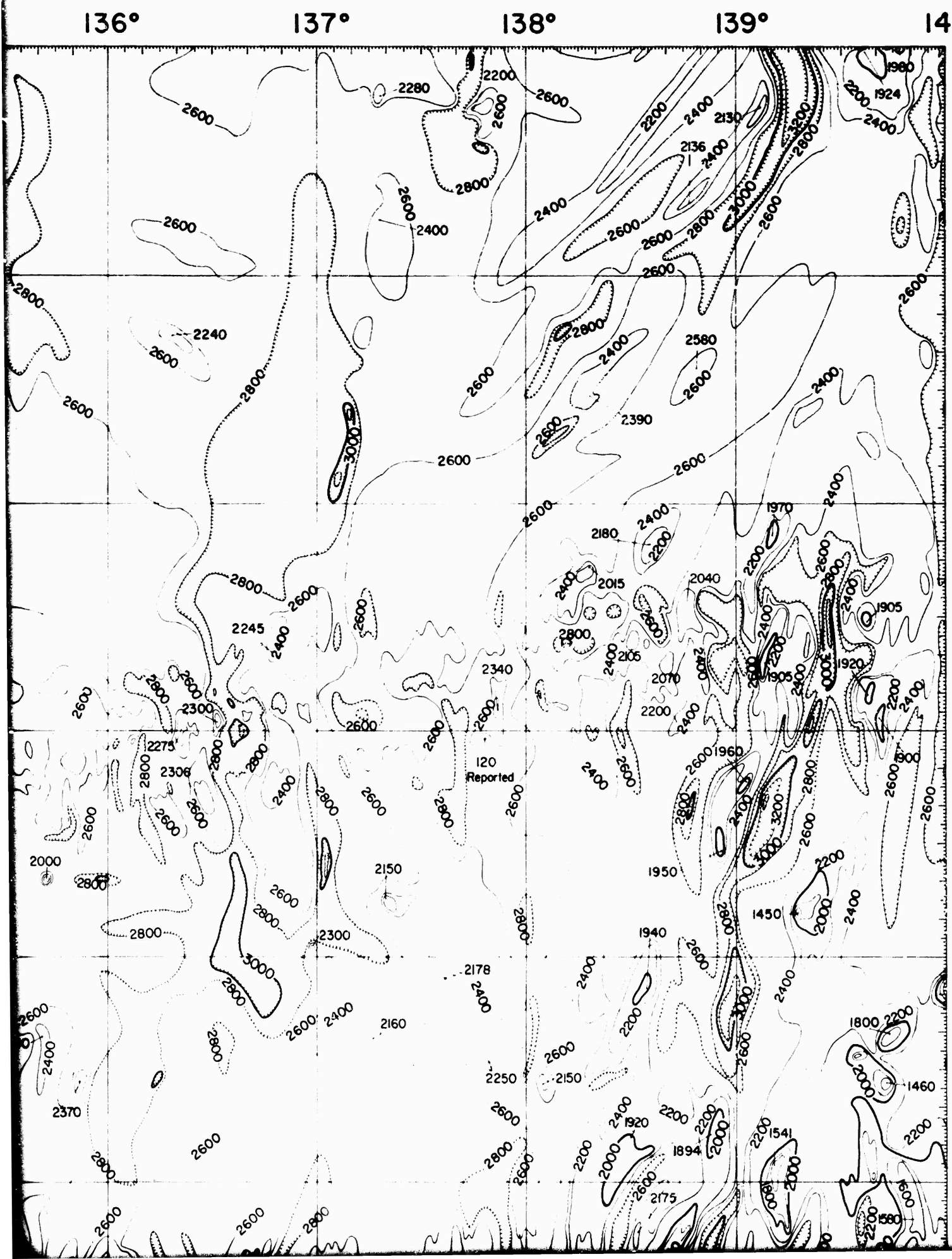
2630
2400
1910


B
134°
135°
136°
137°
138°
RIDGE
PALAU
120
Reported


136°
137°
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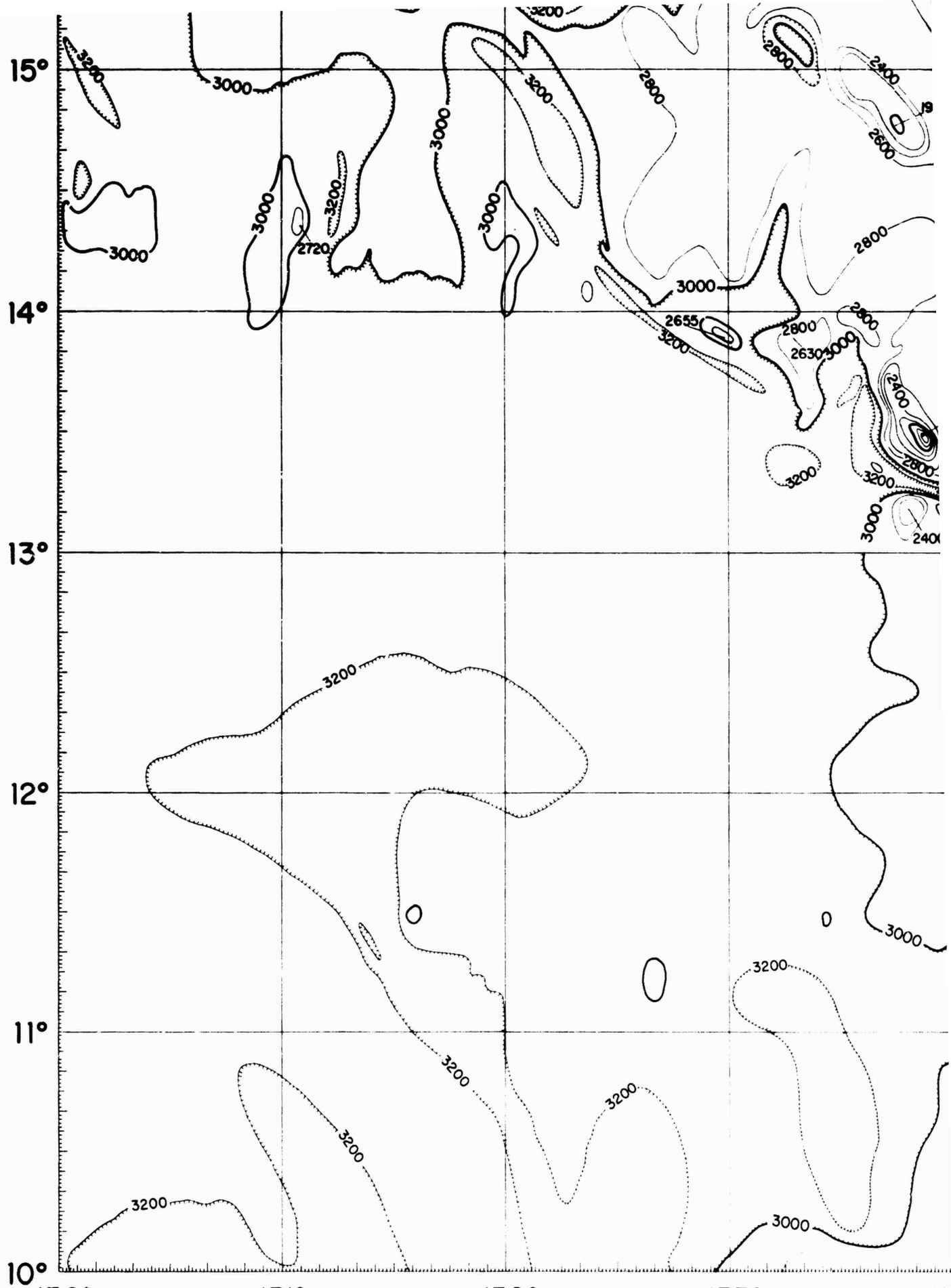
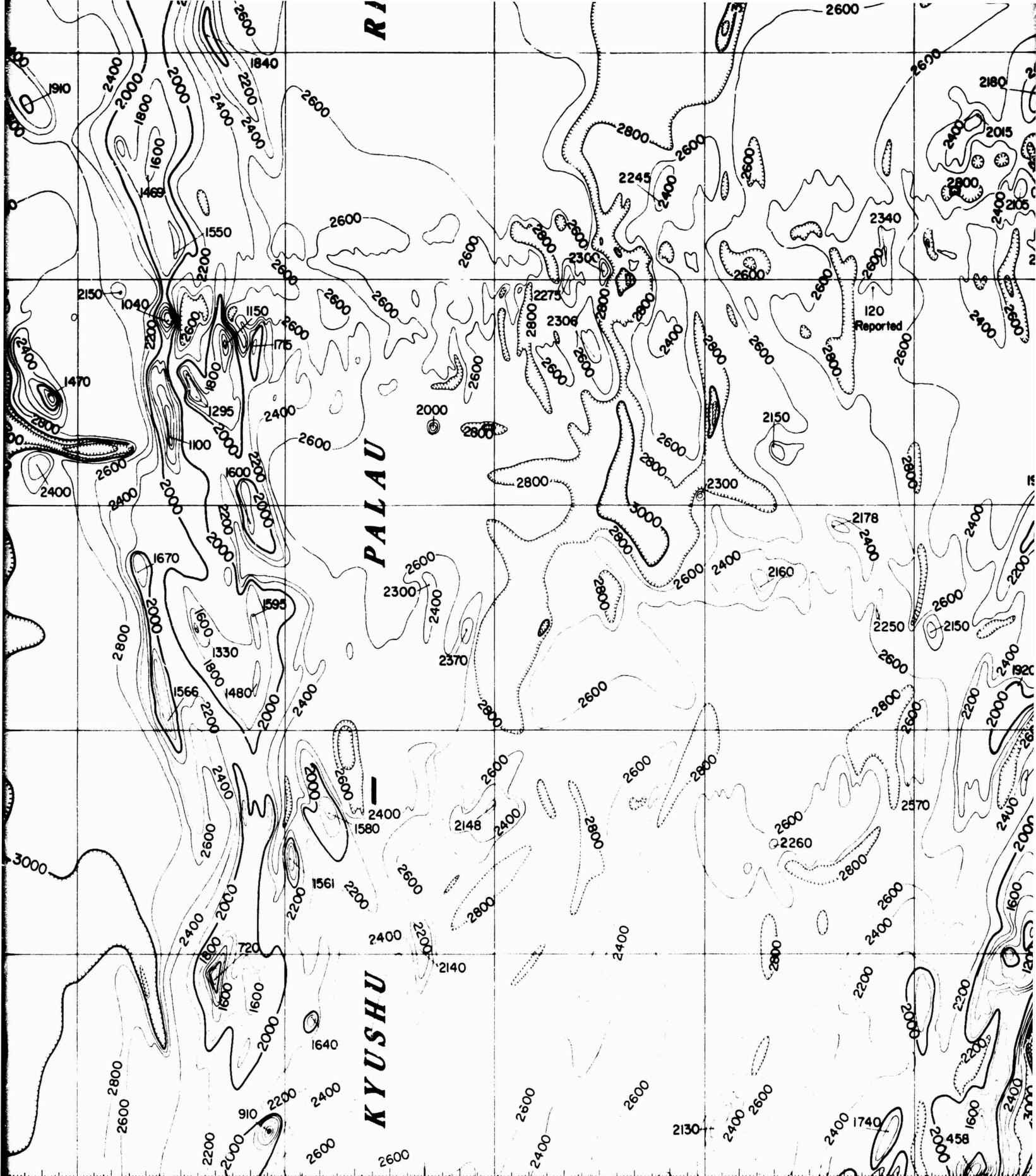
120
Reported



Sources of Data: American Telephone & Telegraph, U.S. Naval Oceanographic Office, Lamont Geological Observatory, R/V Vitaz, U.S.S.R., H. Hess, 1948, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by: [illegible]

Assisted by: [illegible]

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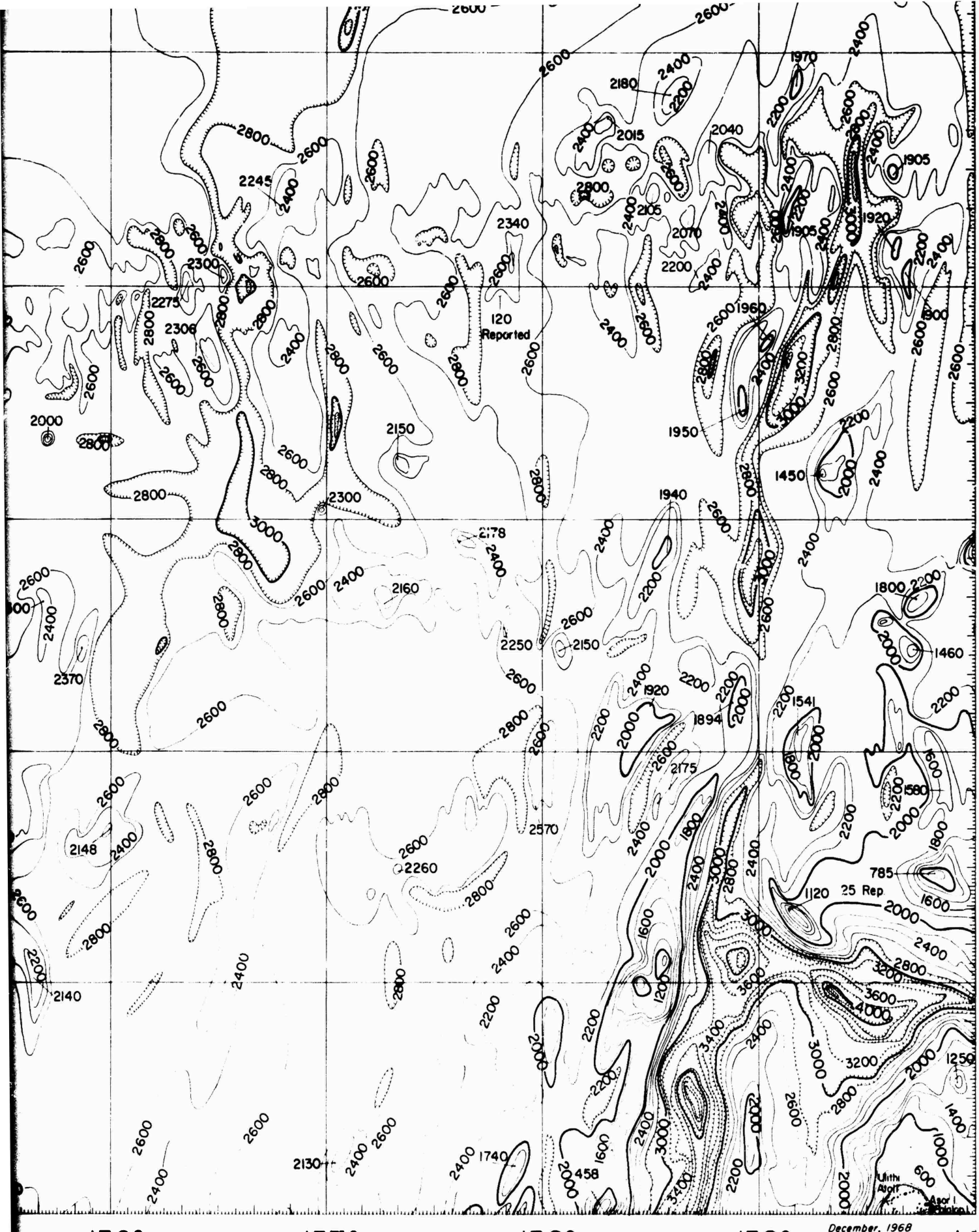
1 E



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Contoured by: [illegible]

Assisted by: [illegible]

December, 1968

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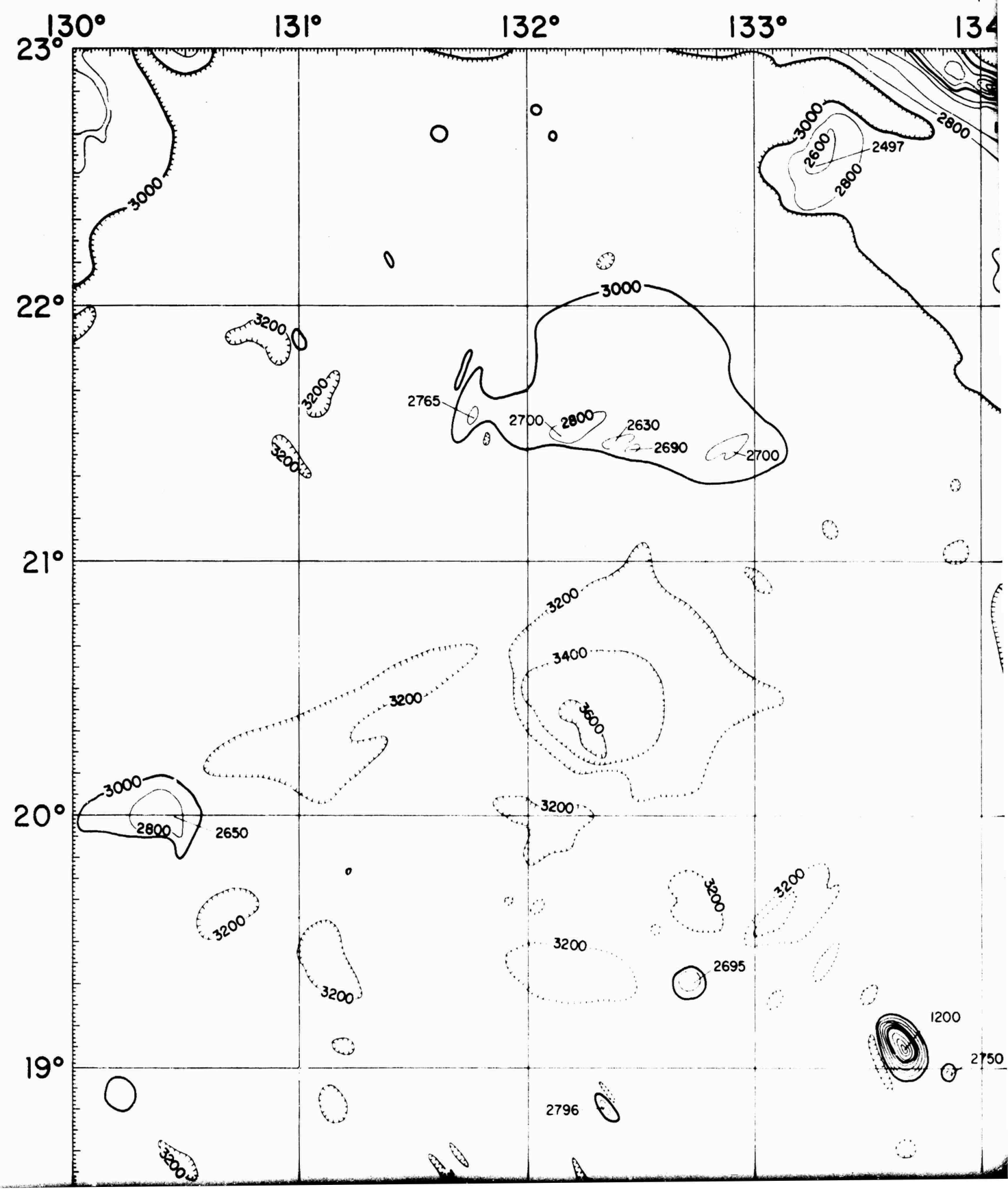
A


130°
131°
132°
133°
134
23°
22°
21°
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19°
3000
2800
2600
2497
2800
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2765
2700
2800
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2700
3200
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3200
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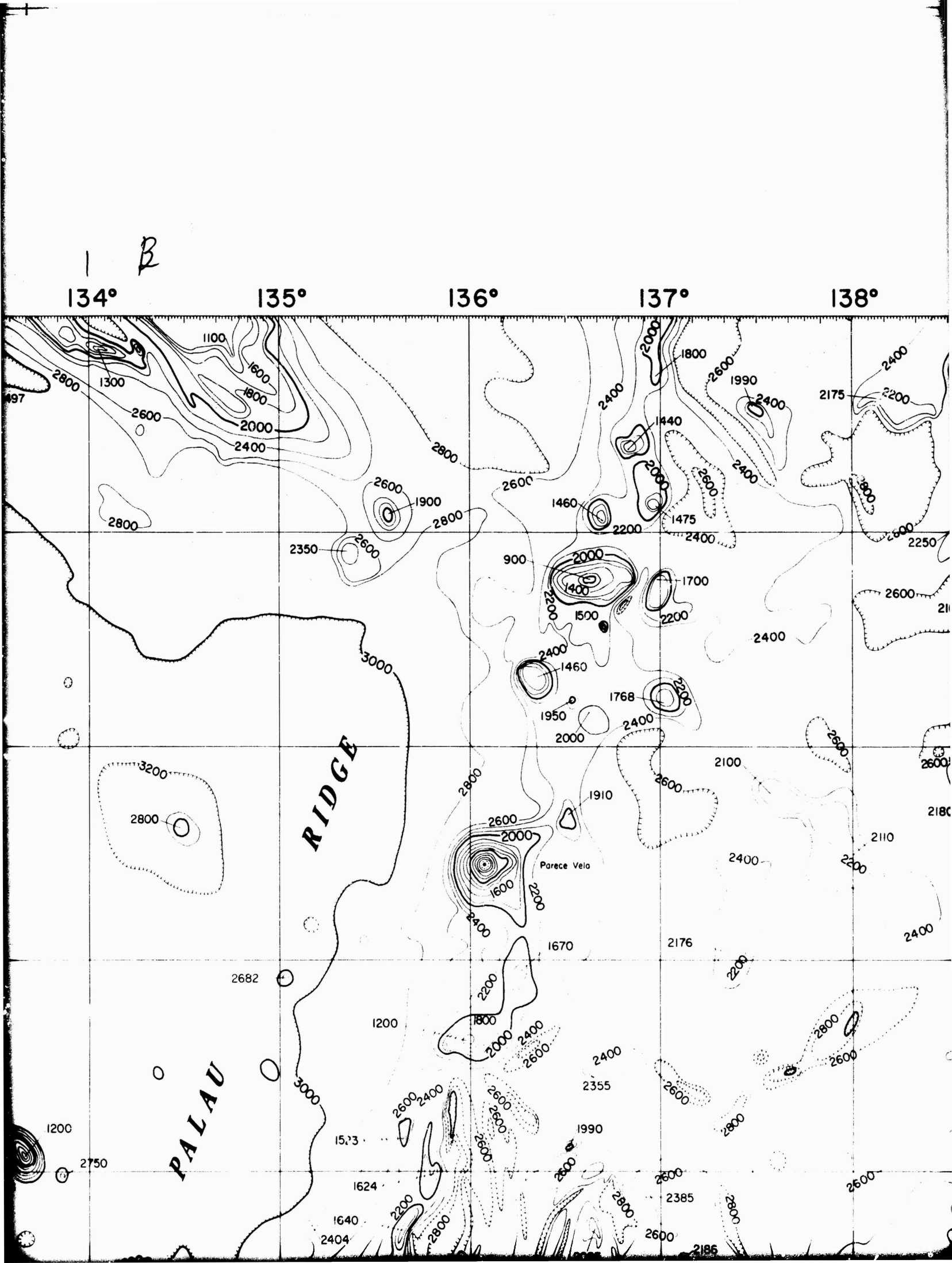
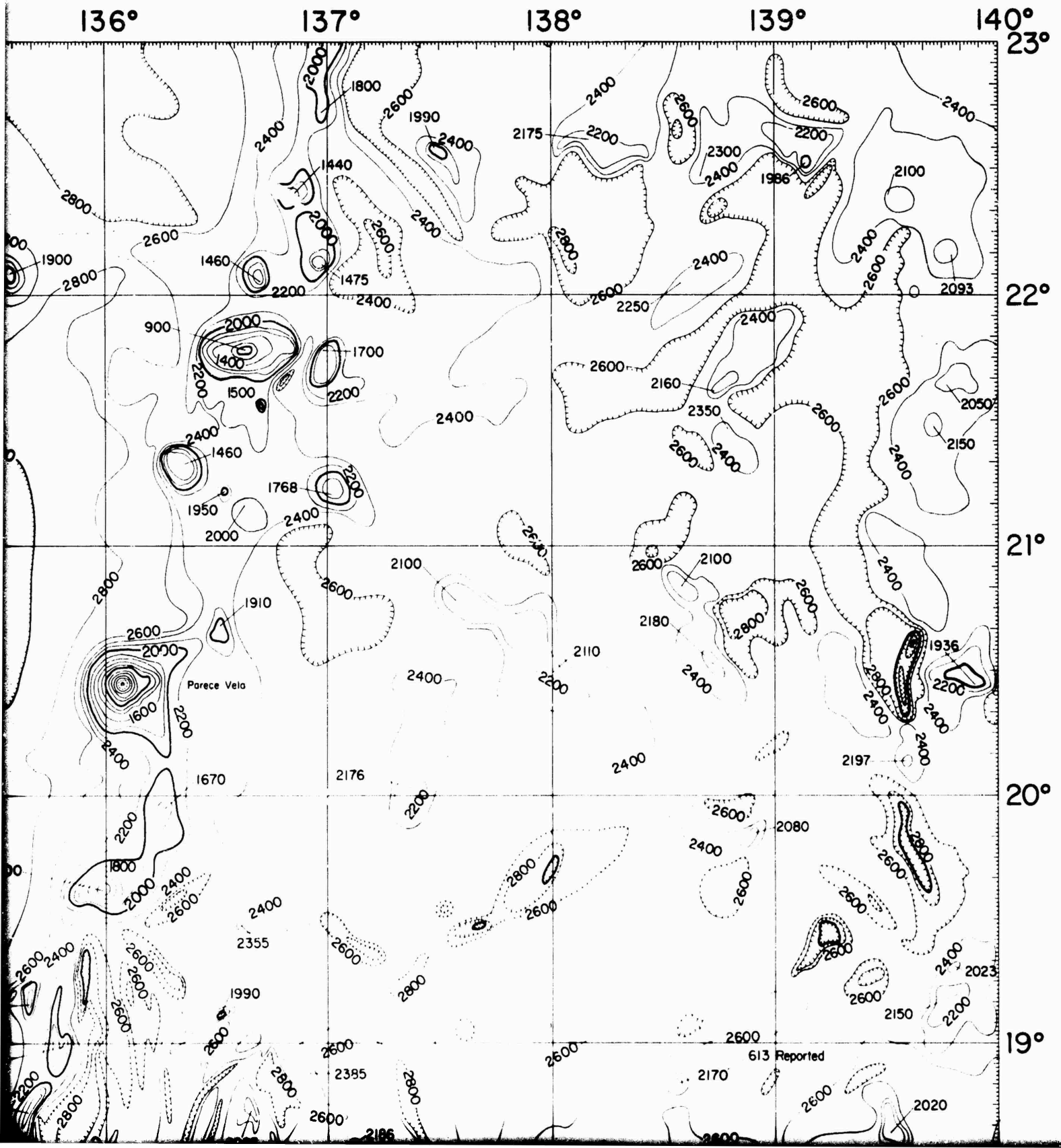
2796
3200

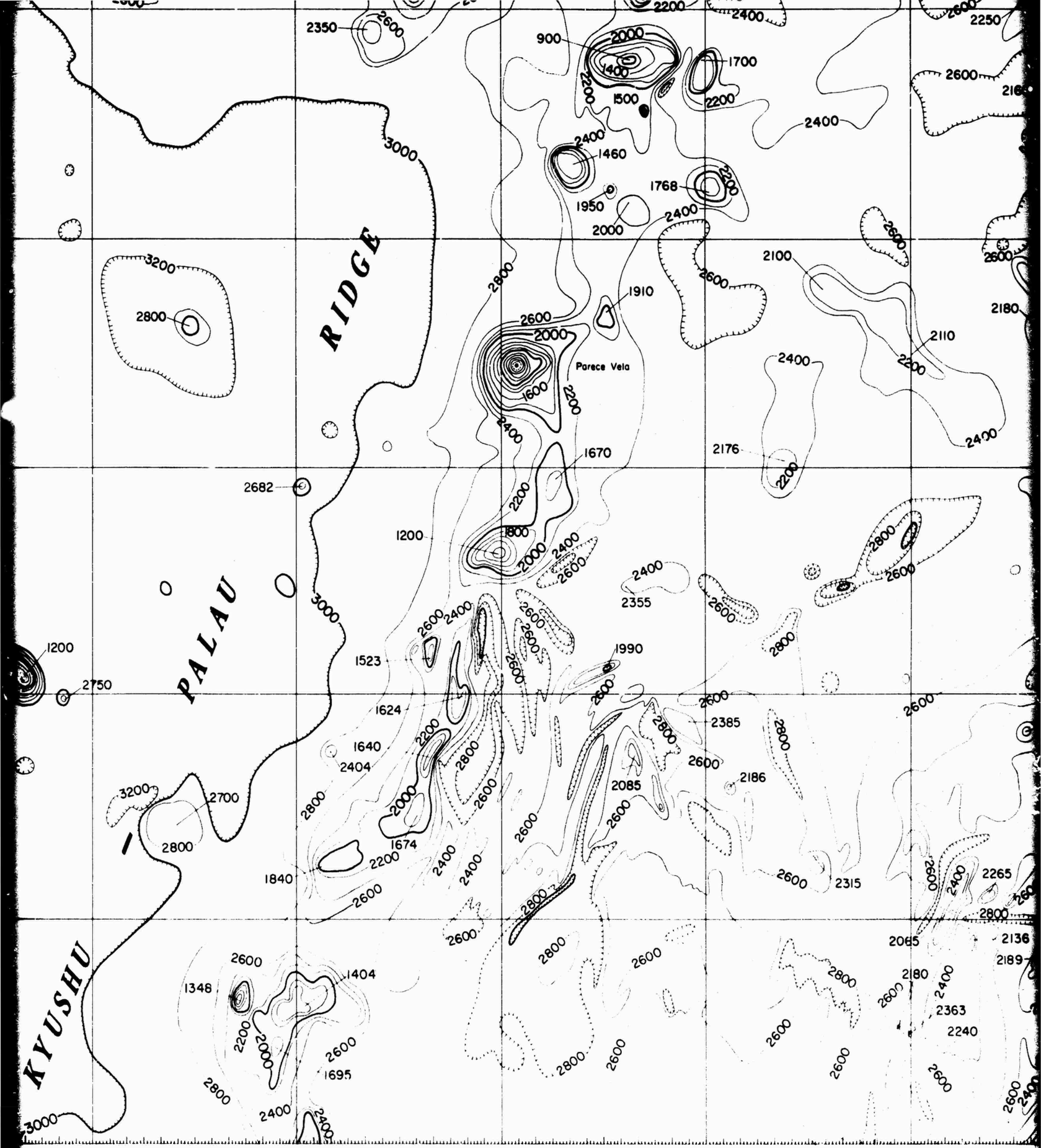

1 B
134°
135°
136°
137°
138°
PALAU RIDGE
Parece Vela

C



Sources of Data: American Telephone & Telegraph, U.S. Naval Oceanographic Office, R/V Vitiaz, U.S.S.R., Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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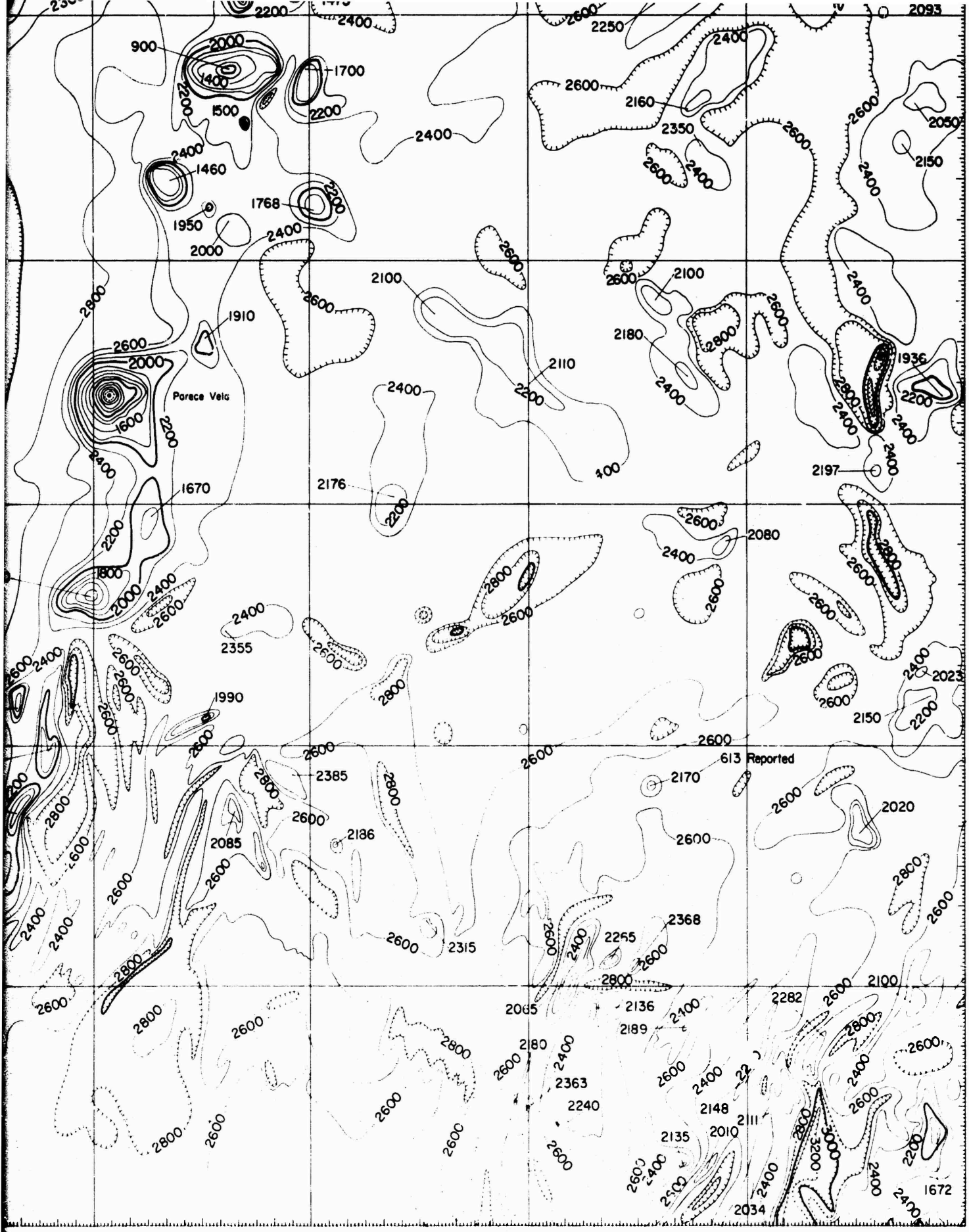
Contoured by: [illegible]

Assisted by: [illegible]

Do Not Use For Nav

1 E



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Contoured by: [illegible]

Assisted by: [illegible]

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No. 2304N 21

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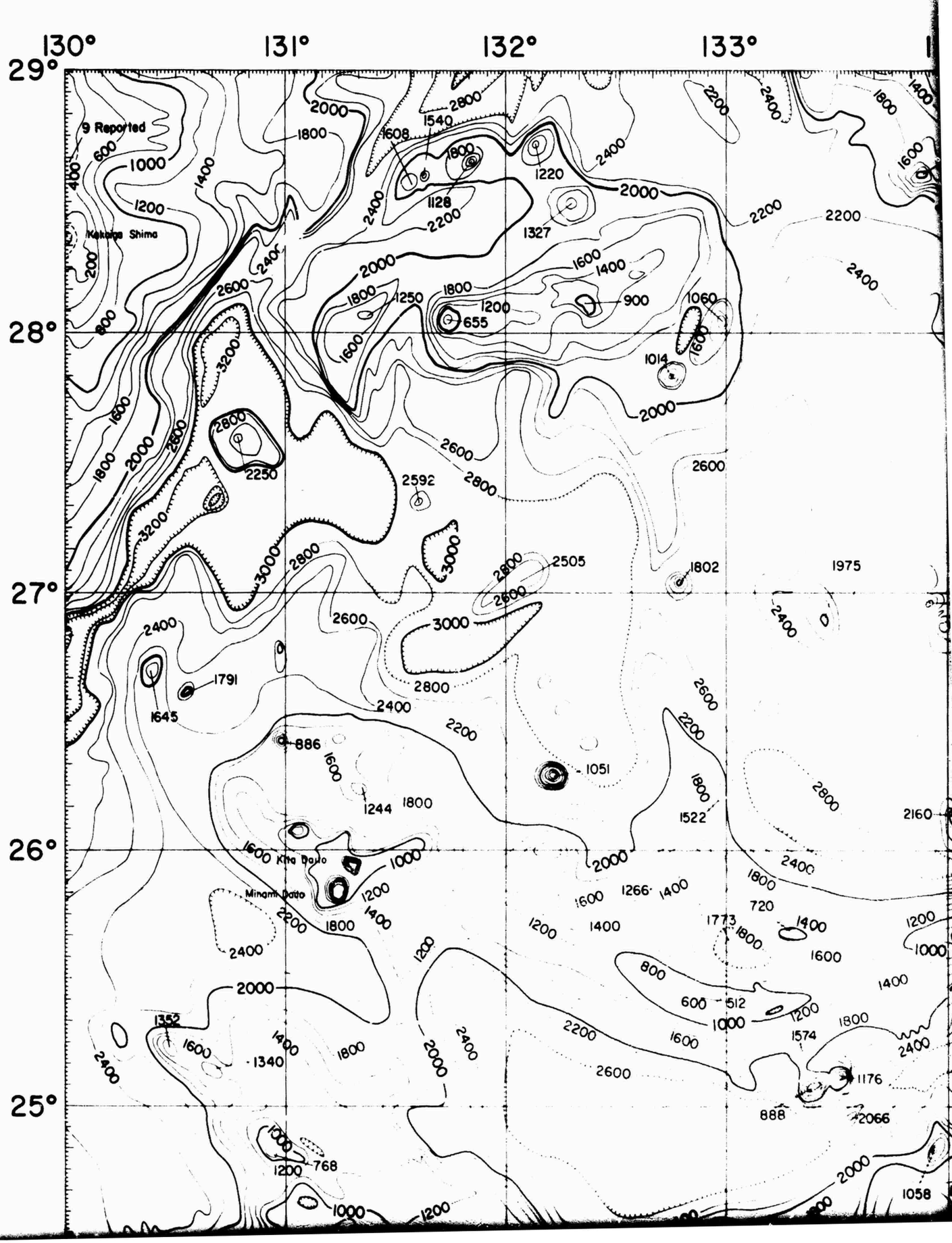
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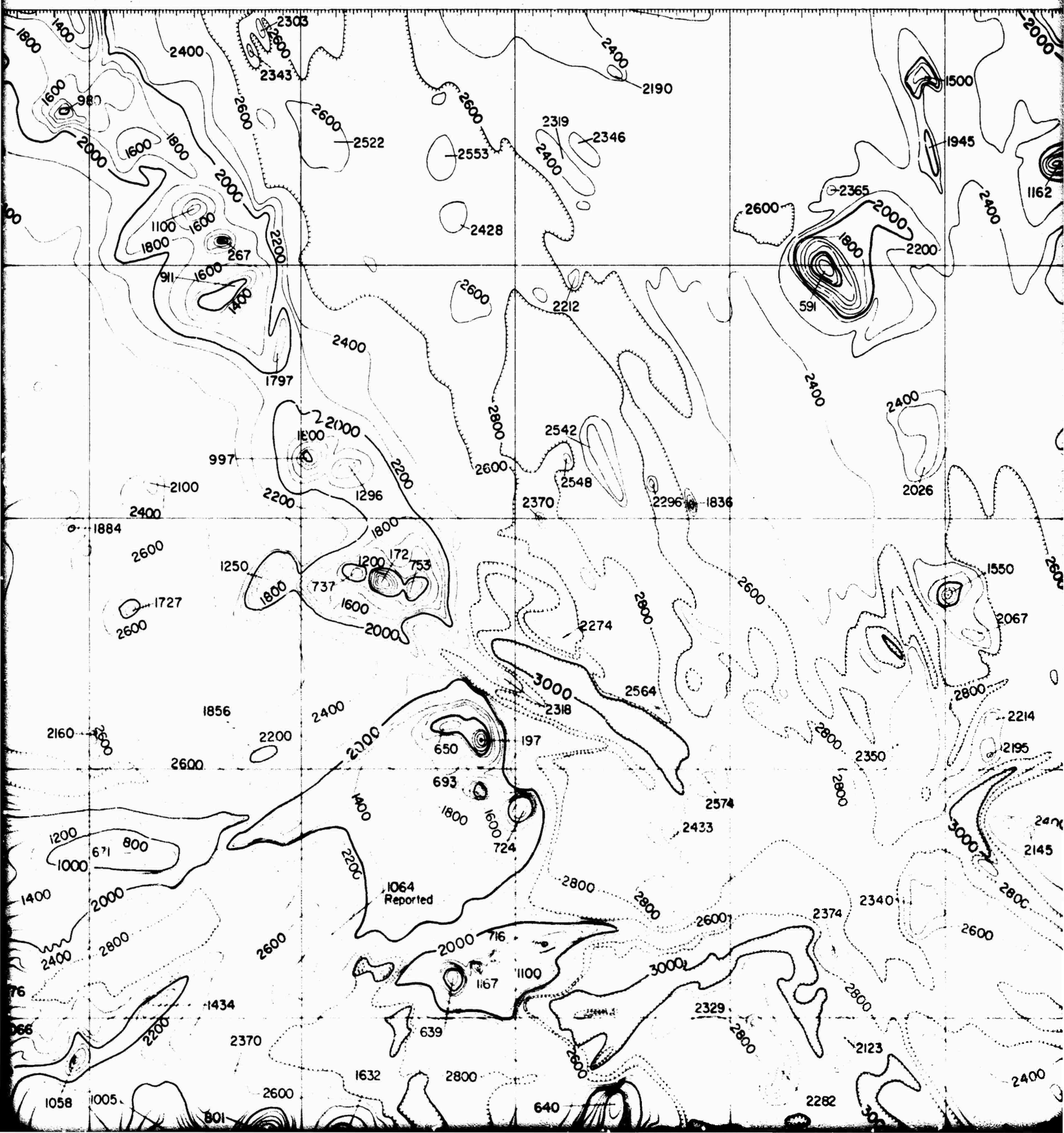
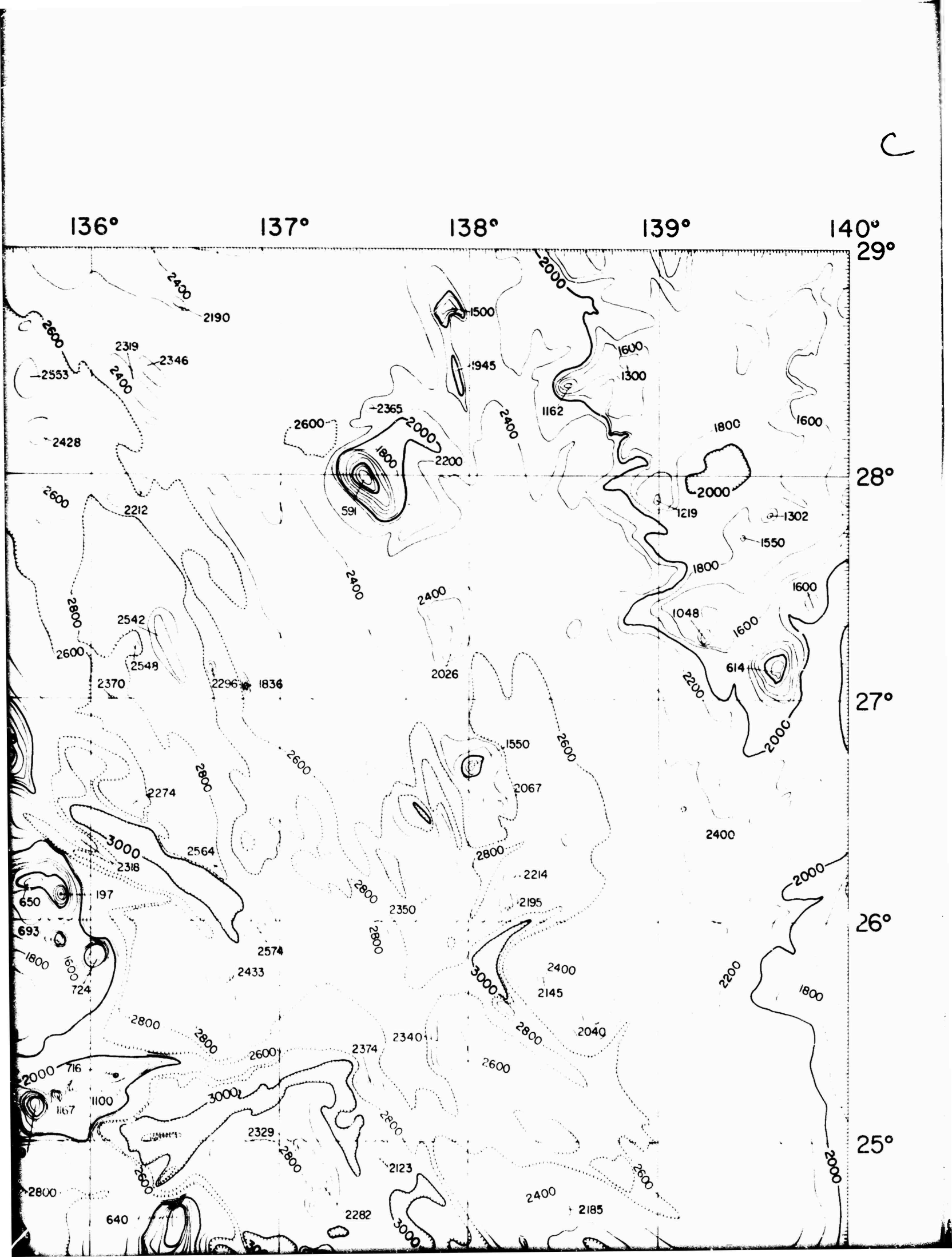
9 Reported
Kekaiga Shima
Kita Daito
Minami Daito

B

134° 135° 136° 137° 138°

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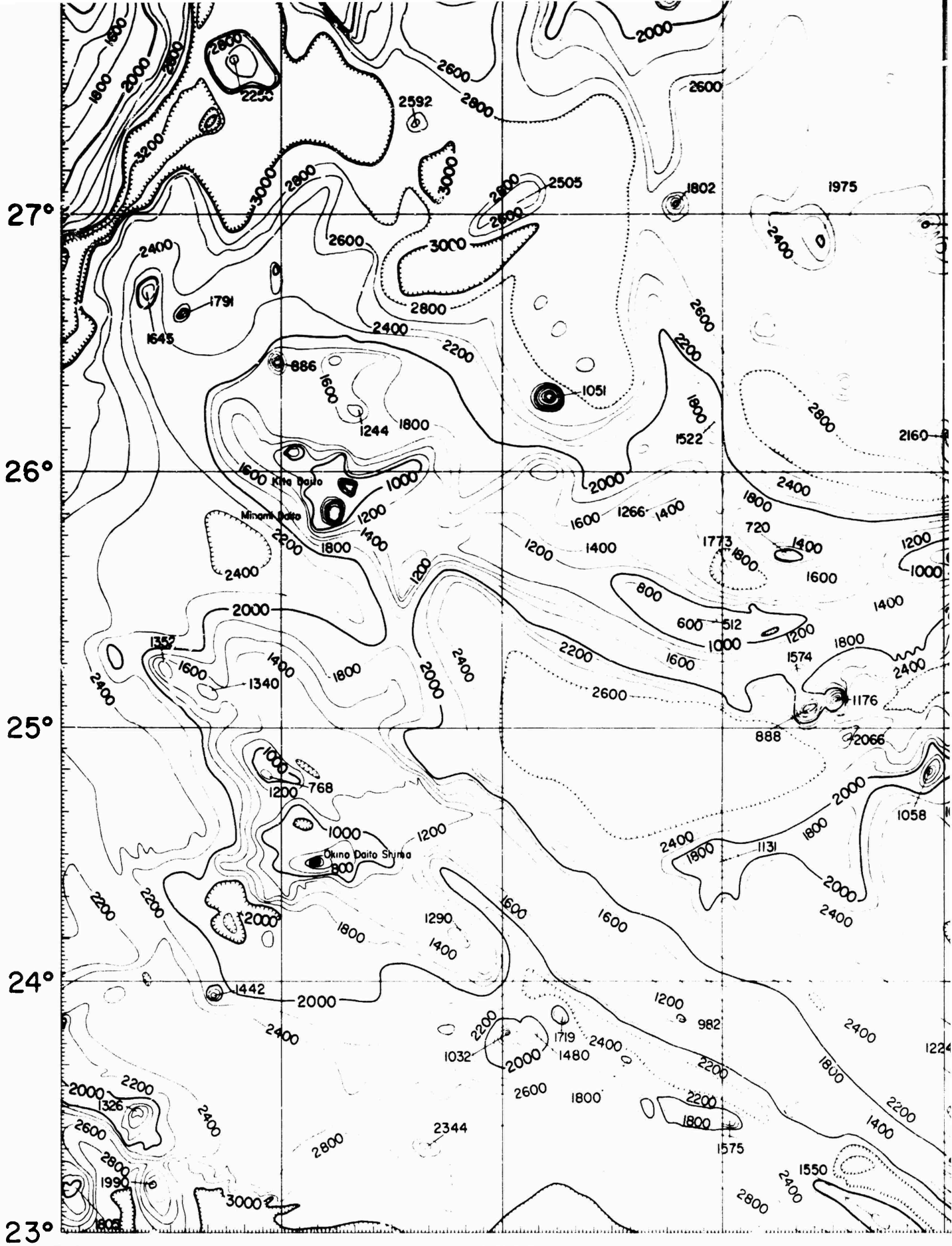
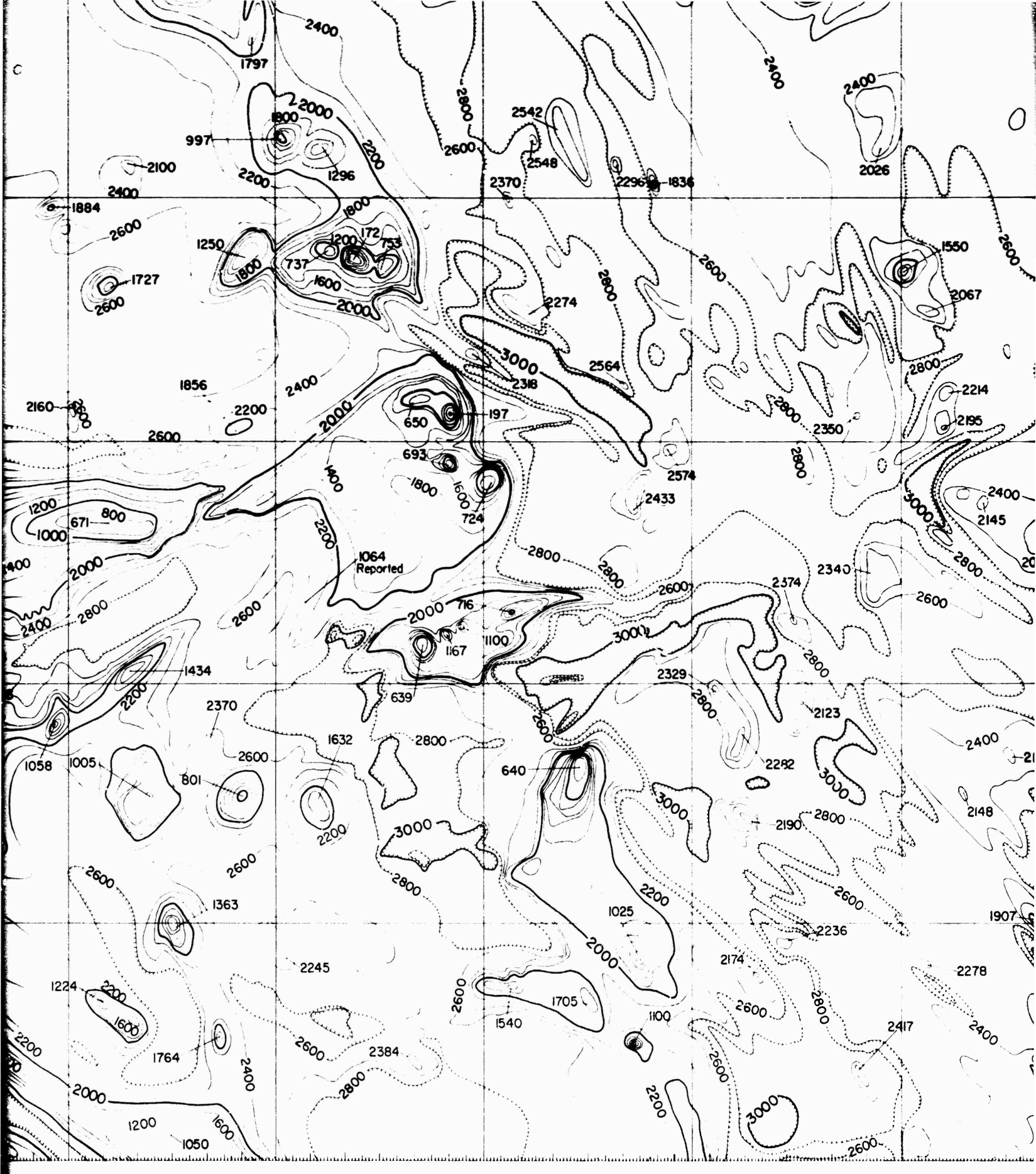


Sources of Data: U.S. Naval Oceanographic Office, M.G.S. Program, 1965-1967; Maritime Safety Agency, Japan, R/V Vitiaz, U.S.S.R., Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable



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Contoured by: R.J. Bruce & Hammerich
Assisted by: [illegible]

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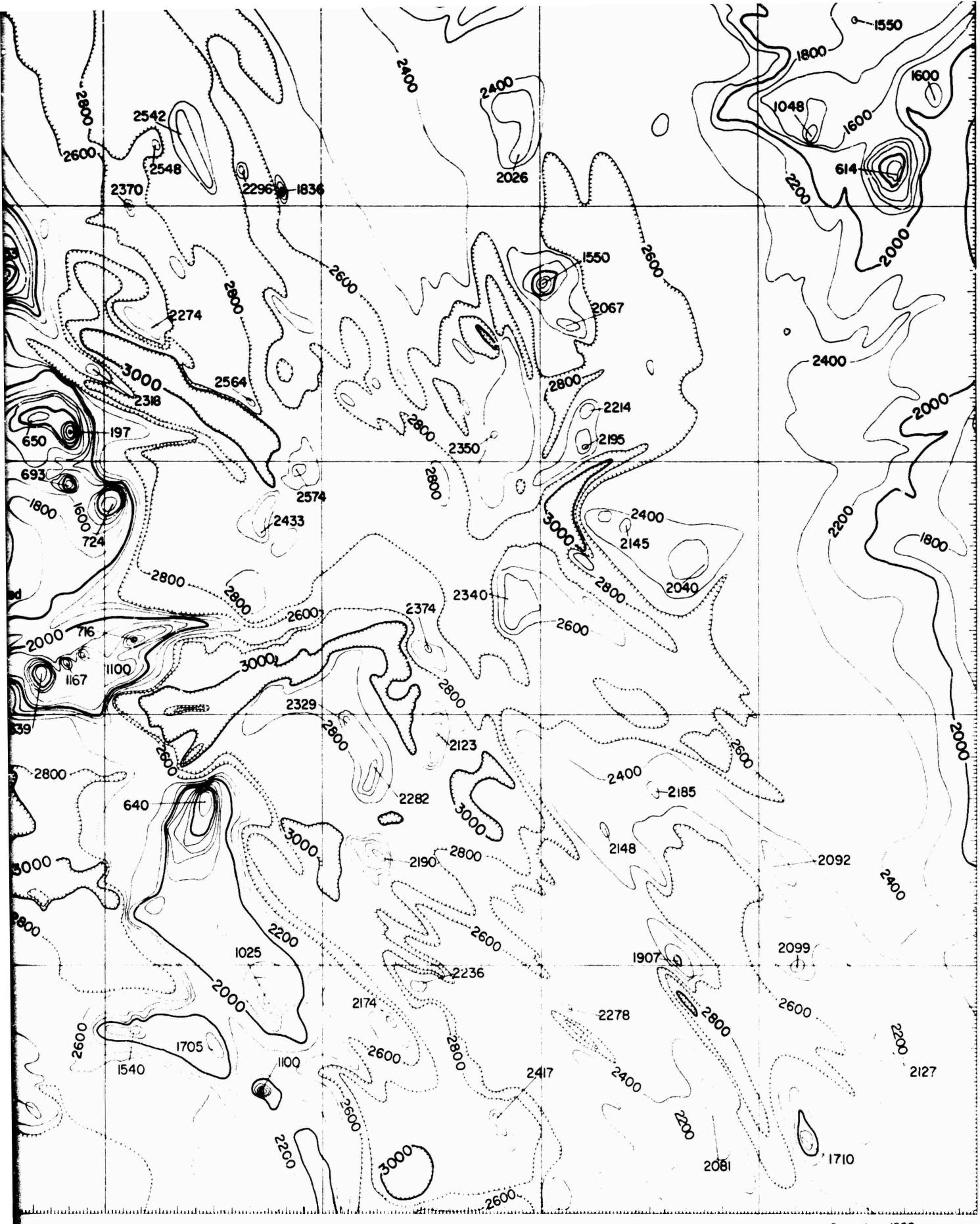

NOGRAPHY

Contoured by: R.J. Brush & Hammerich

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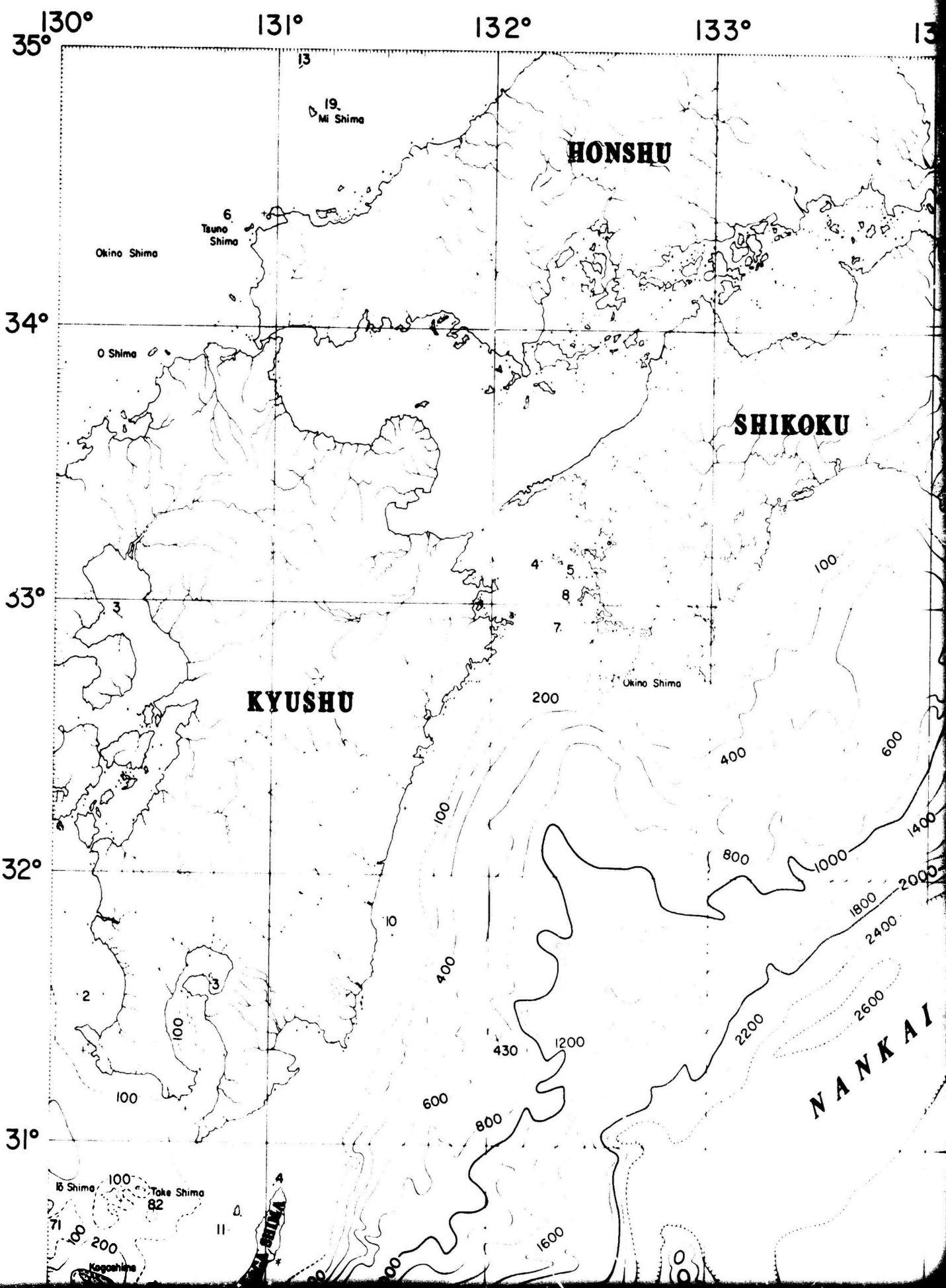
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131°
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31°
HONSHU
SHIKOKU
KYUSHU
NANKAI
Mi Shima
Tsuno Shima
Okino Shima
O Shima
Okino Shima
Ō Shima
Take Shima
Kagoshima
100
200
400
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800
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1400
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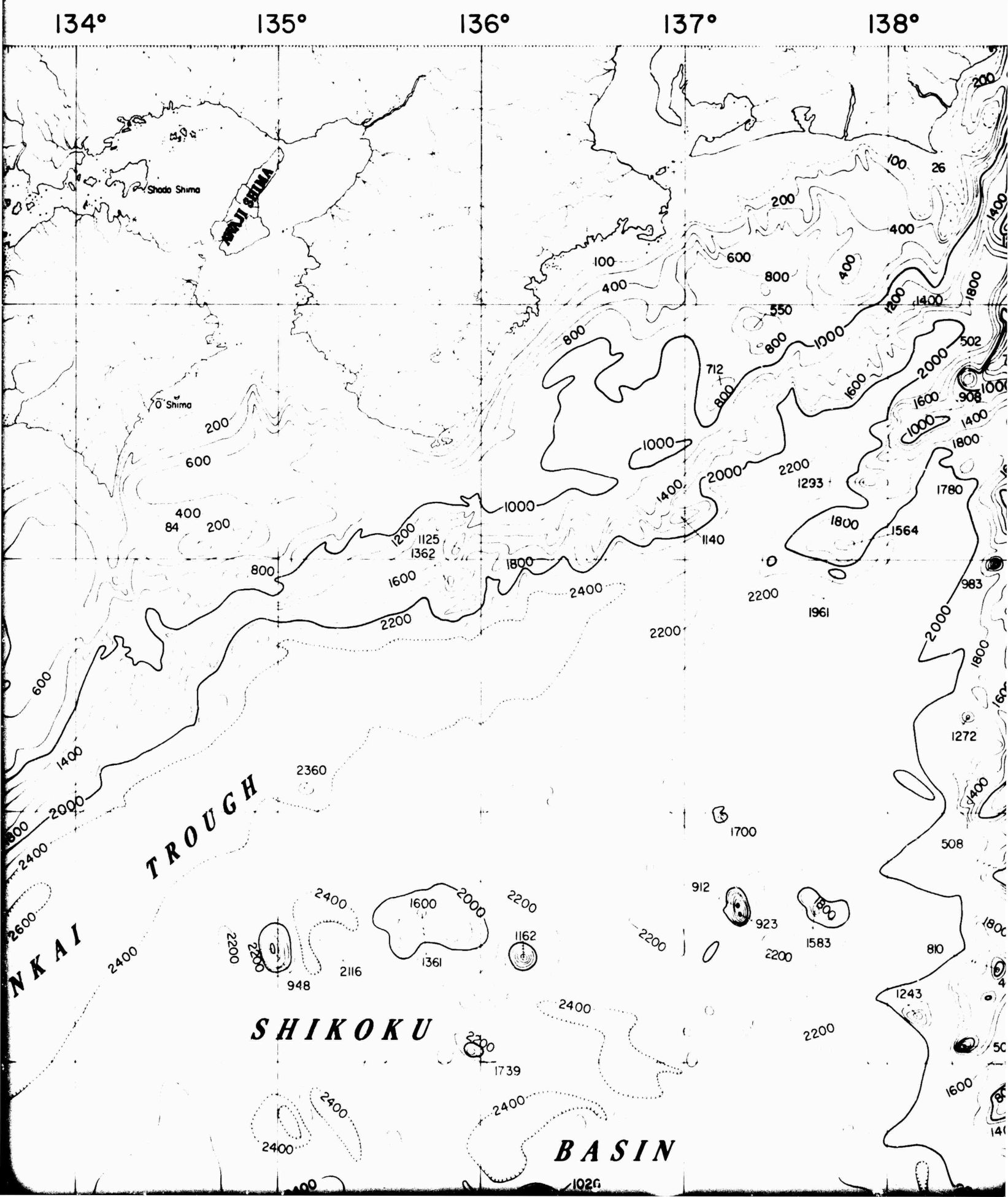
2600
2200
1200
1600

B


134°
135°
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138°
Shodo Shima
AWAJI SHIMA
O Shima
TROUGH
NKAI
SHIKOKU
BASIN
100
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1600
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84
502
908
983
1272
1780
1564
1293
1140
1125
1362
712
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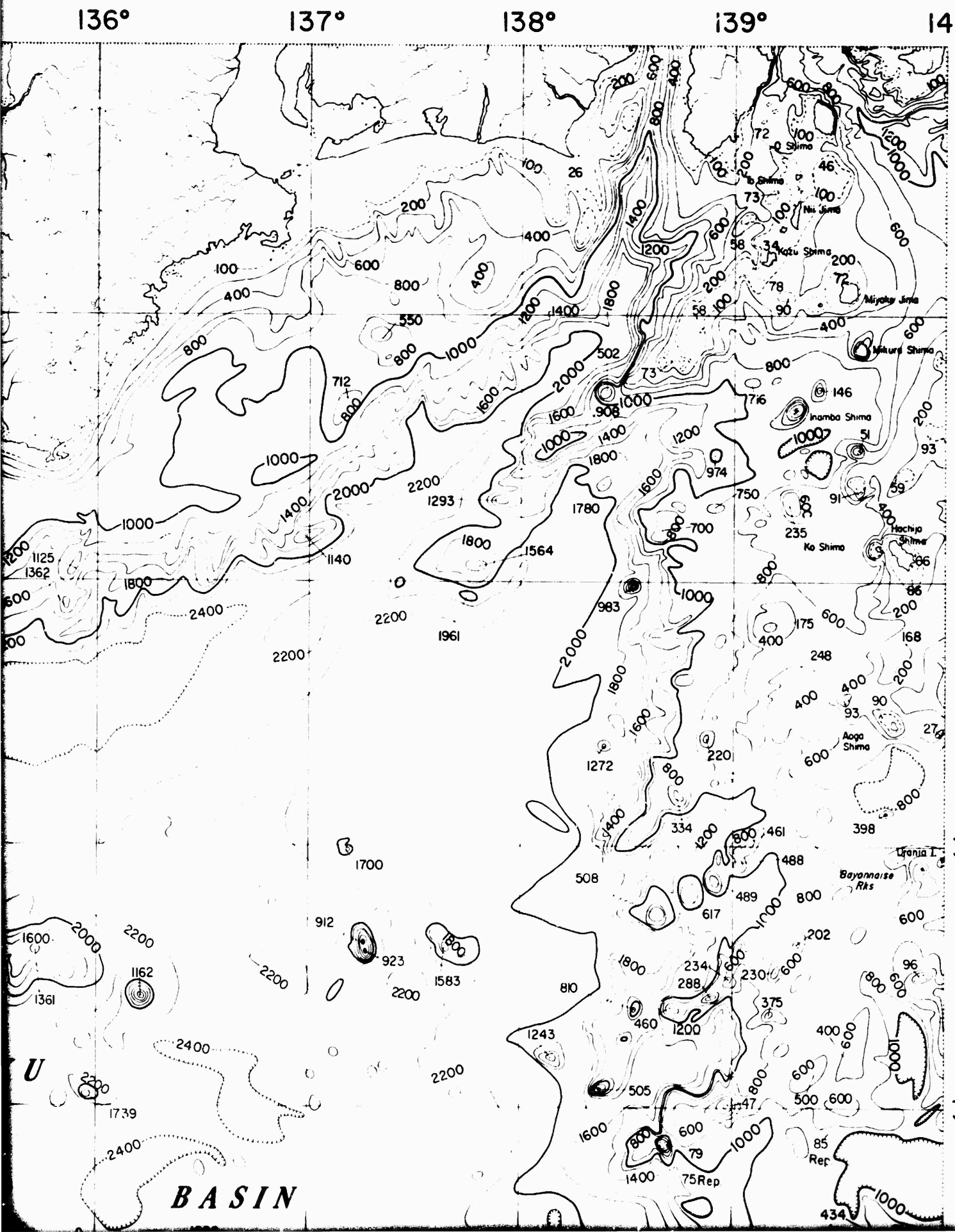
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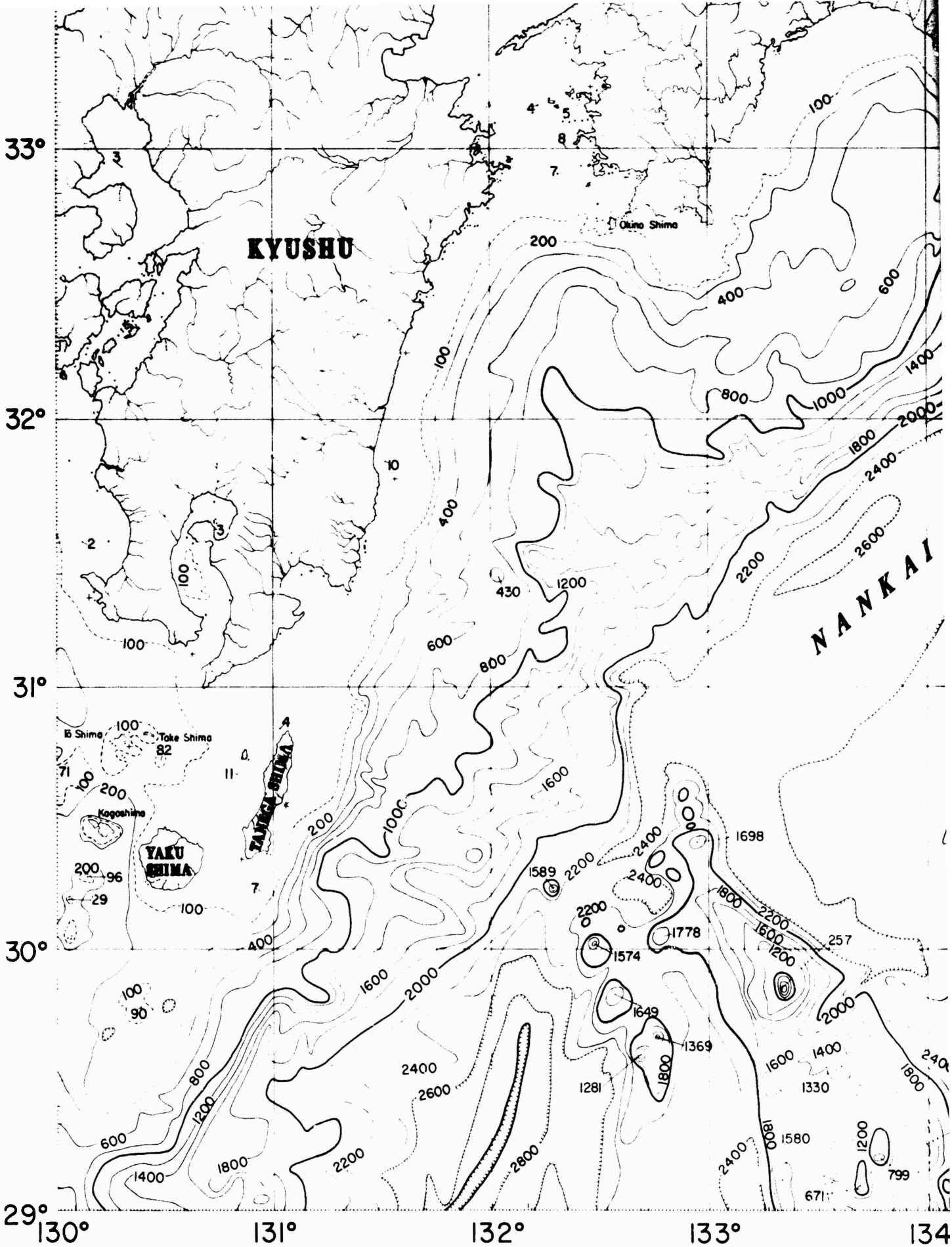
Shima
Nii Jima
Kozu Shima
Miyake Jima
Mikura Shima
Inamba Shima
Hachijo Shima
Ko Shima
Aoga Shima
Bayonnaise Rks
Urania I.
BASIN

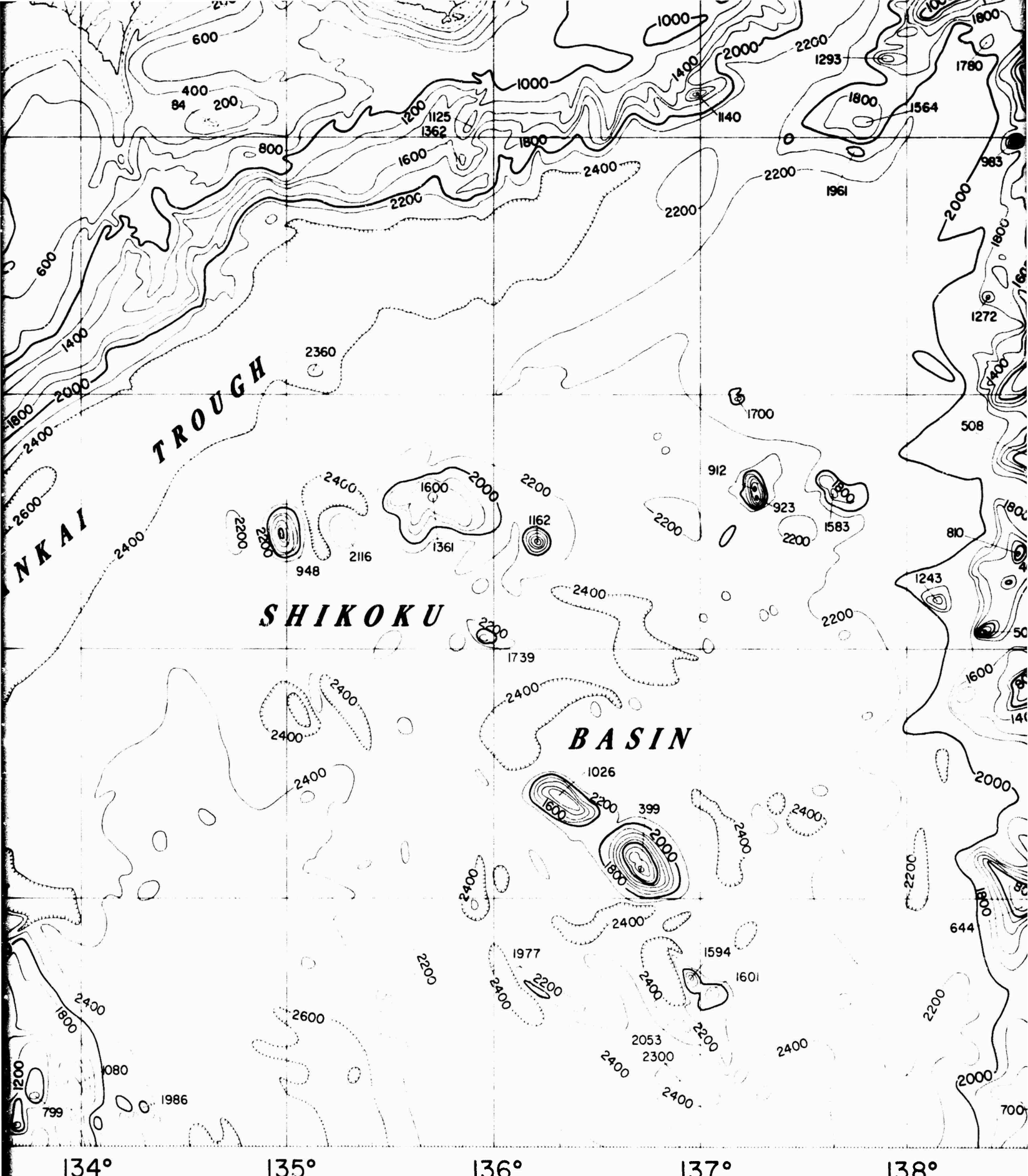


Sources of Data: U.S. Naval Oceanographic Office, Maritime Safety Agency, Japan, M.G.S. Program, 1965-1967, R/V Vitiaz, U.S.S.R., World Aeronautical Charts, F.P. Shepard, 1964, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

PRE

D



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Contoured by: R.J. Bunnell
Assisted by: [illegible]

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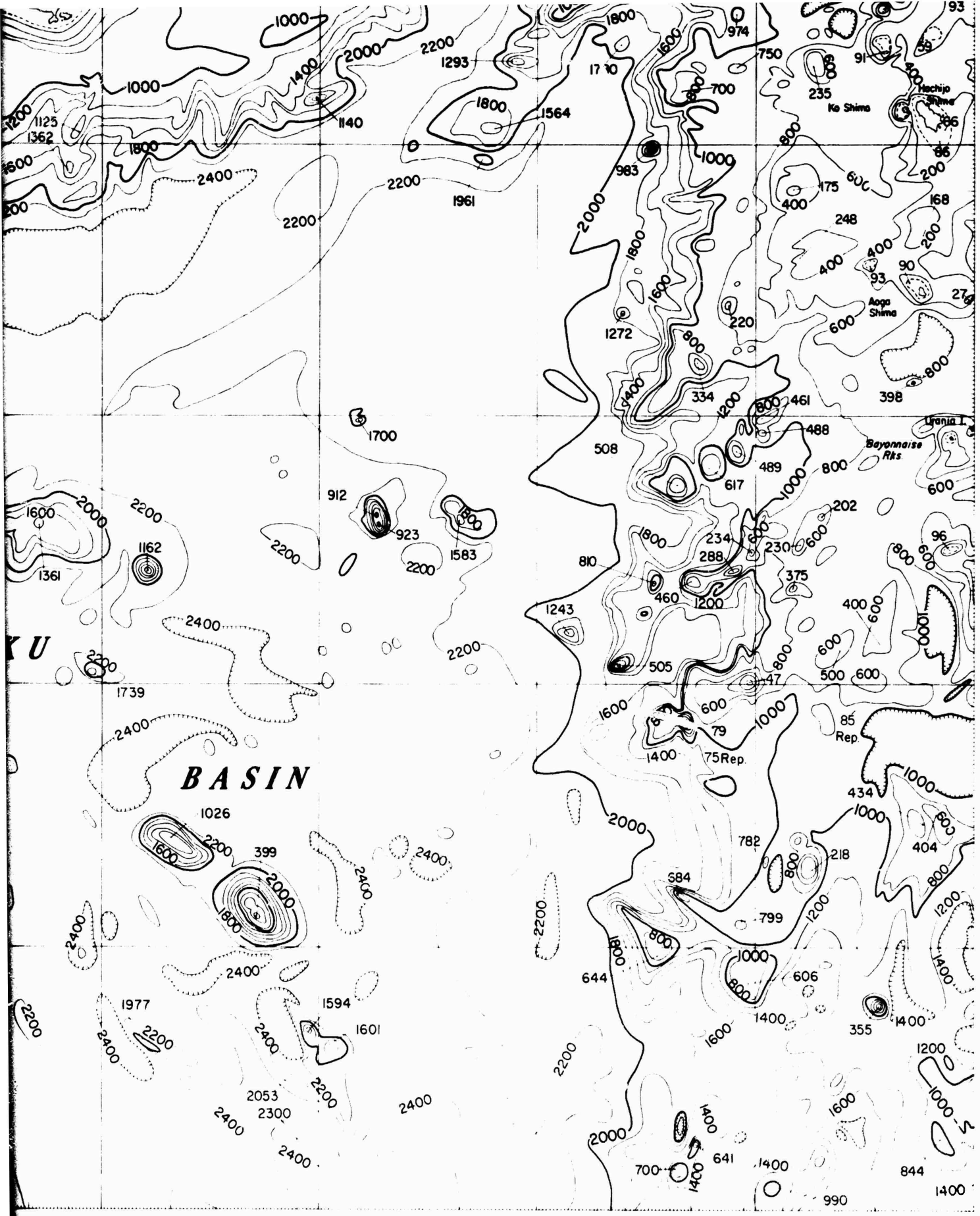
E



December, 1968

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Assisted by: [illegible]

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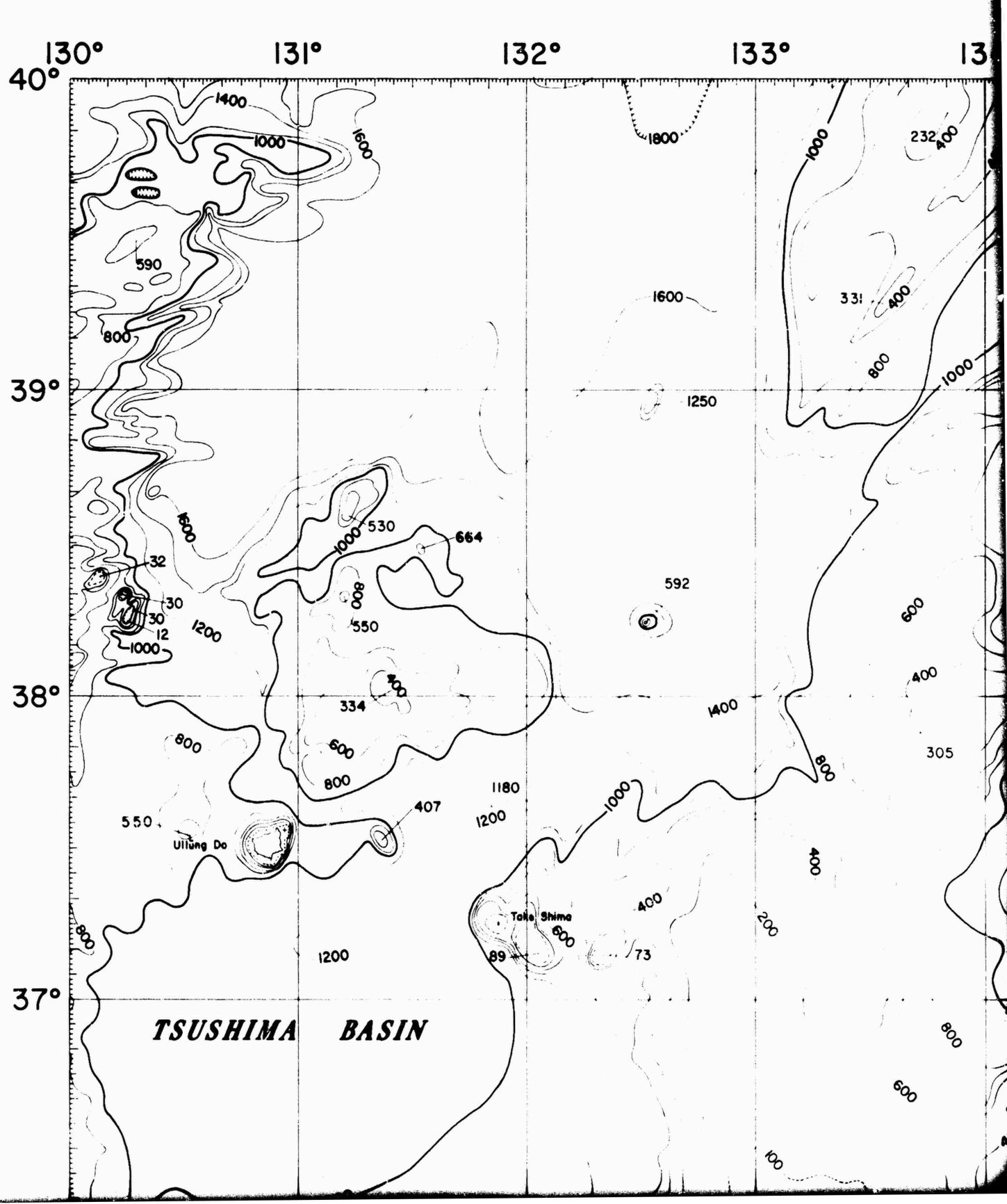
No. 2306N 23

F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1180
1000
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Ullung Do
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TSUSHIMA BASIN
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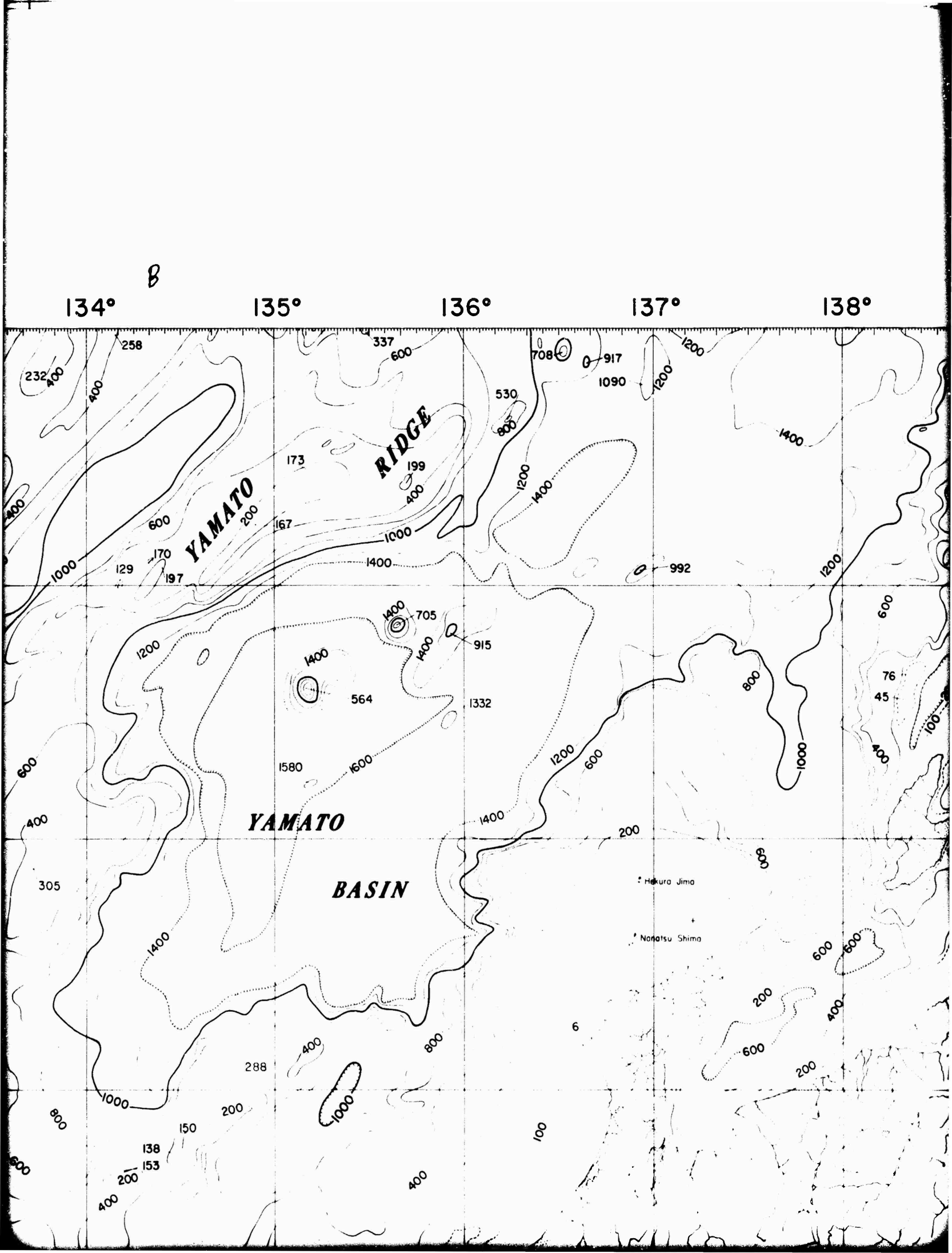
100


B
134°
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YAMATO
RIDGE
YAMATO
BASIN
Hekura Jima
Nanatsu Shima
258
232
337
708
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564
1332
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153
138
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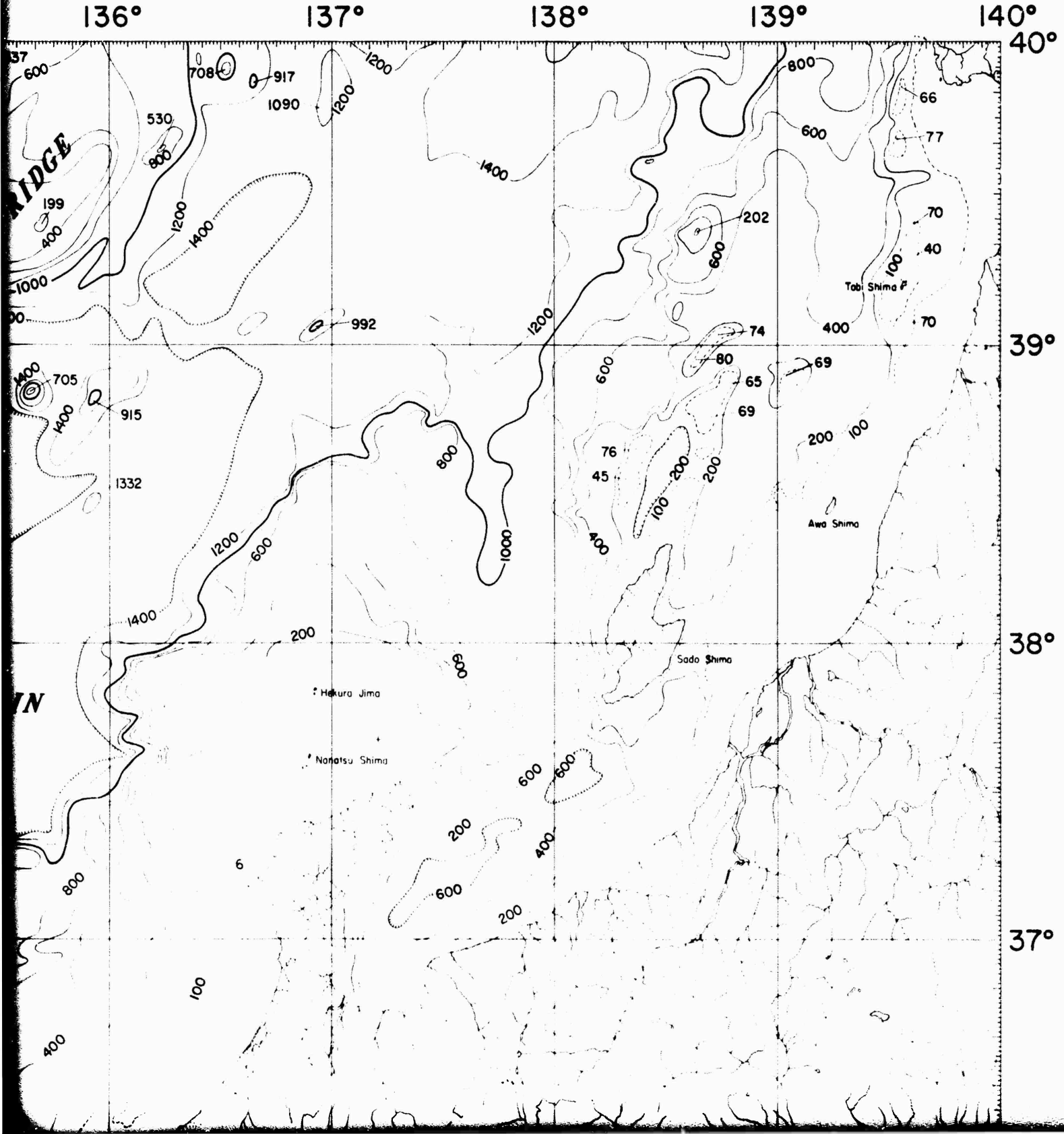
C


136°
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IN
Hokuro Jima
Nomatsu Shima
Sado Shima
Awa Shima
Tobi Shima P
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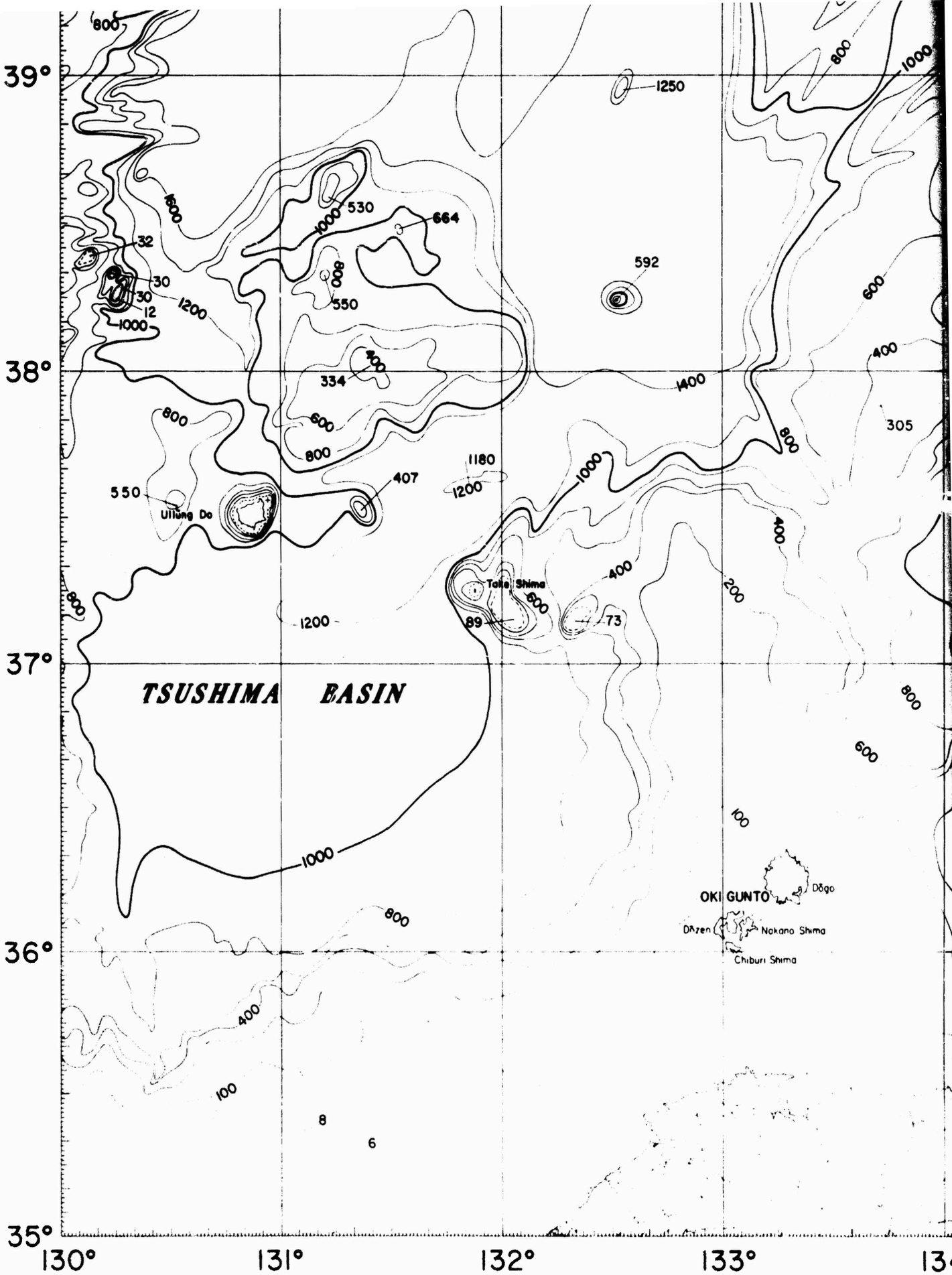
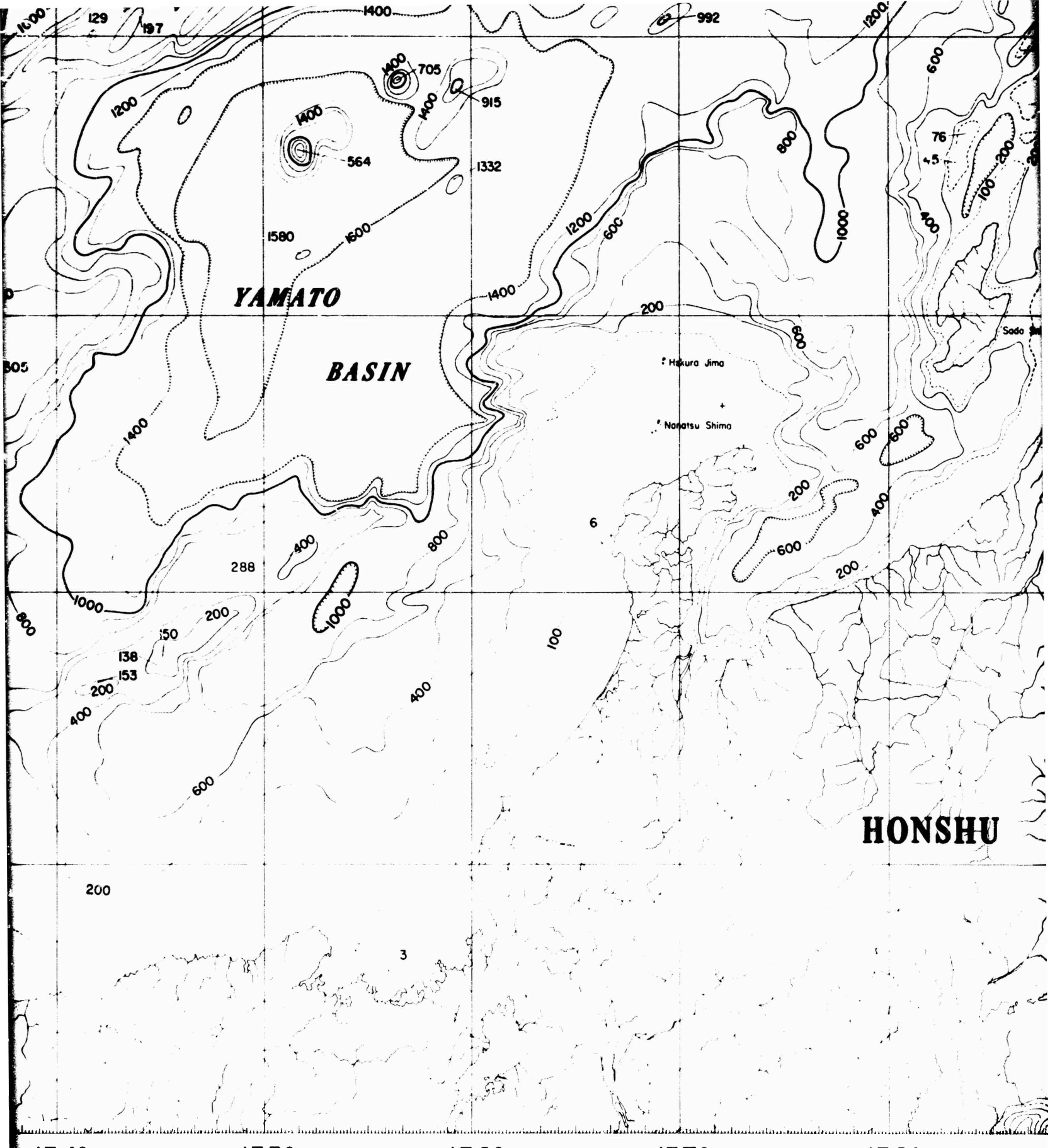


Sources of Data: U.S. Naval Oceanographic Office, Pacific Support Group, ASW/USW, Maritime Safety Agency, Japan, World Aeronautical Charts, R/V Vitaz, U.S.S.R., F.P. Shepard, 1964, Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

PRI

D



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Assisted by [illegible]

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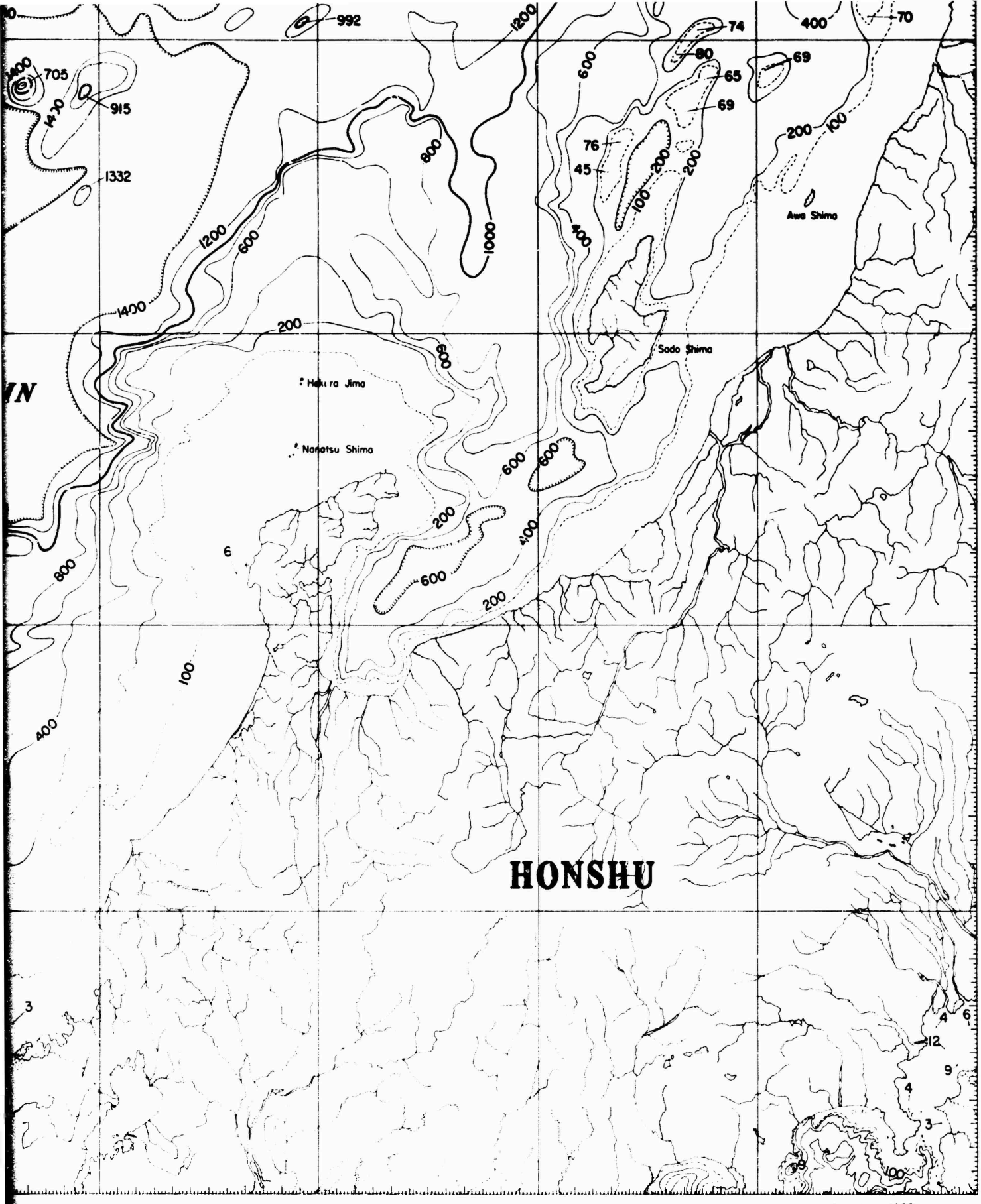
E



December, 1968

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Assisted by

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No. 2307N 24

F

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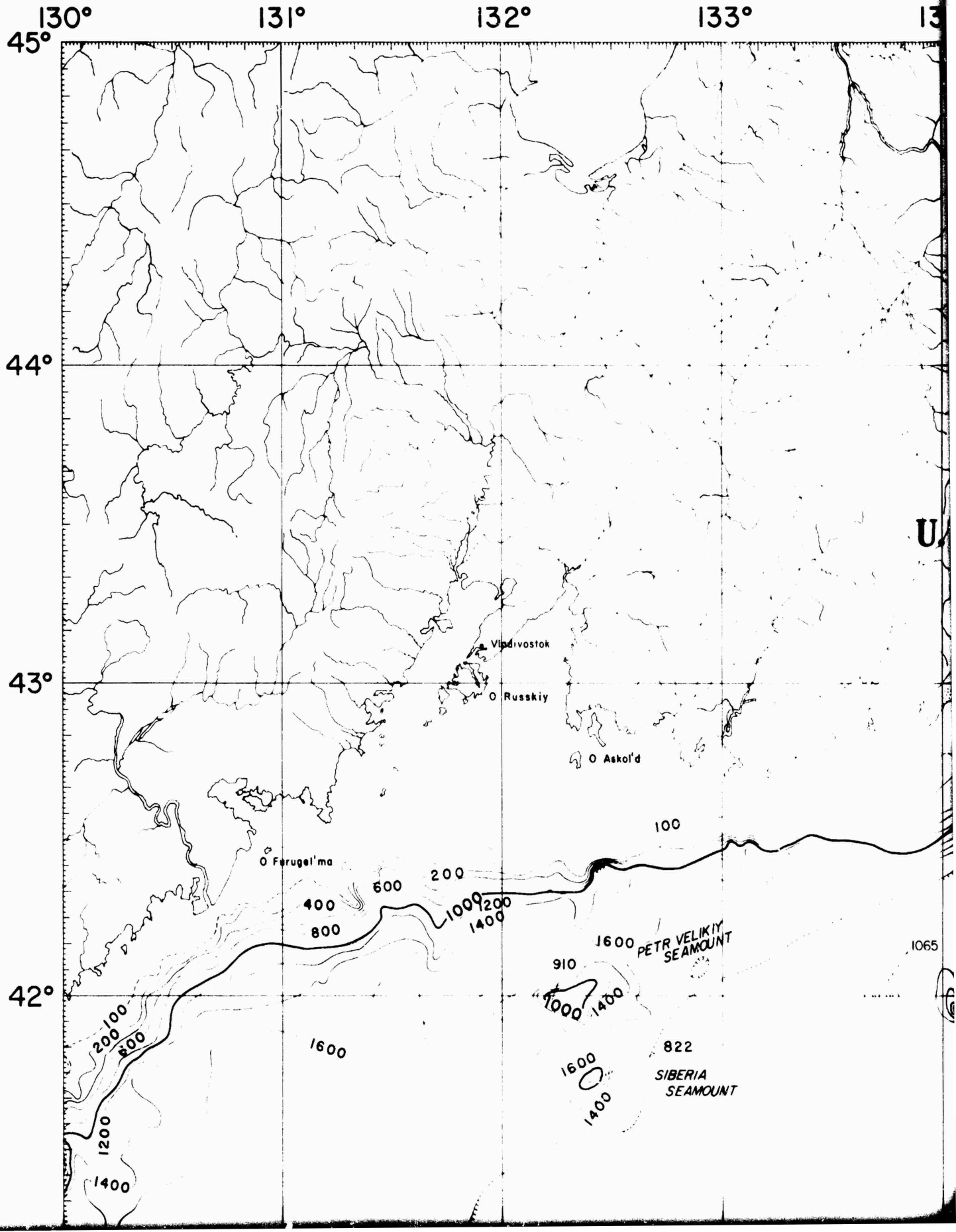
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131°
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Vladivostok
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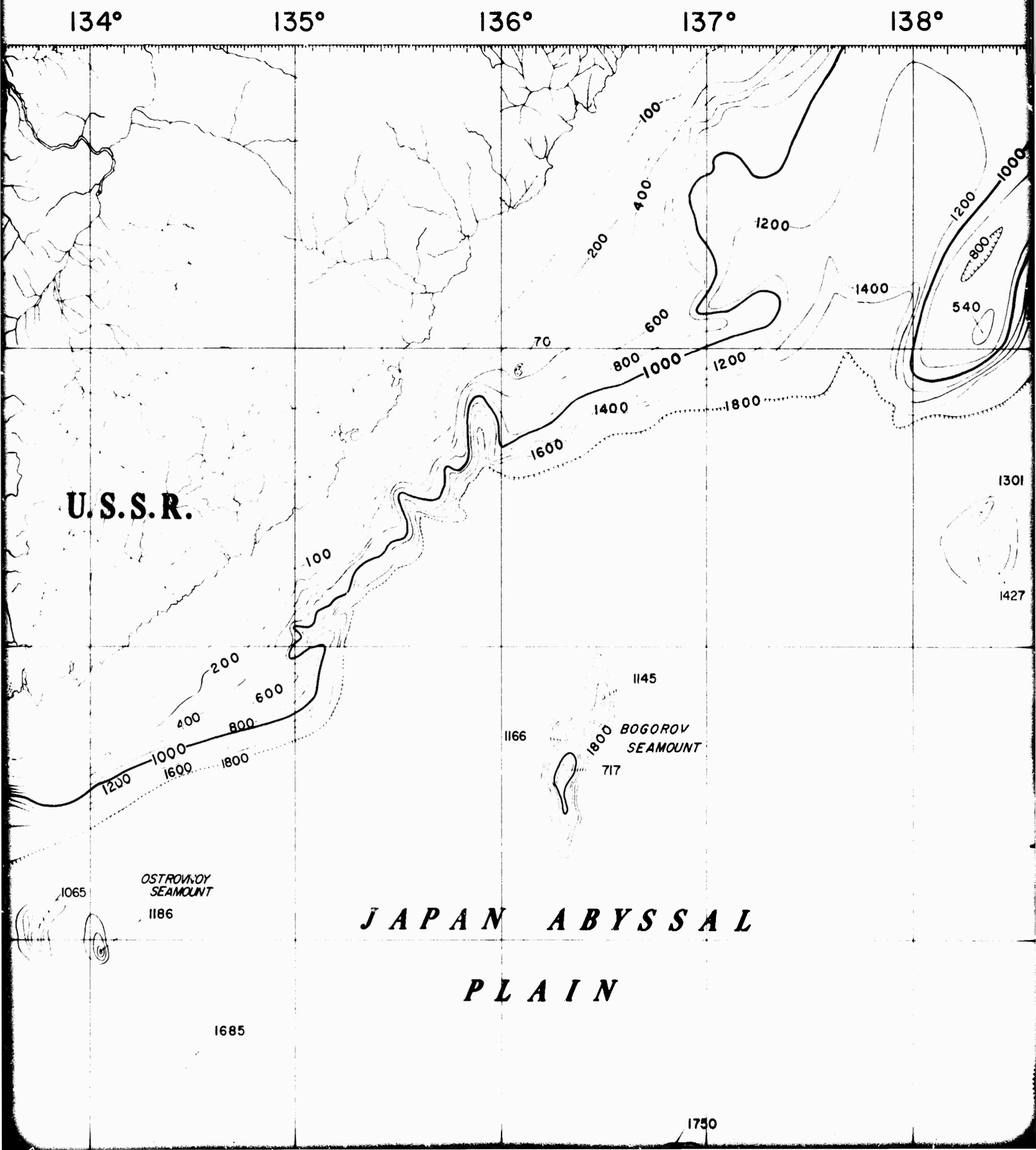
PETR VELIKIY SEAMOUNT
910
822
SIBERIA SEAMOUNT
1065

B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1427
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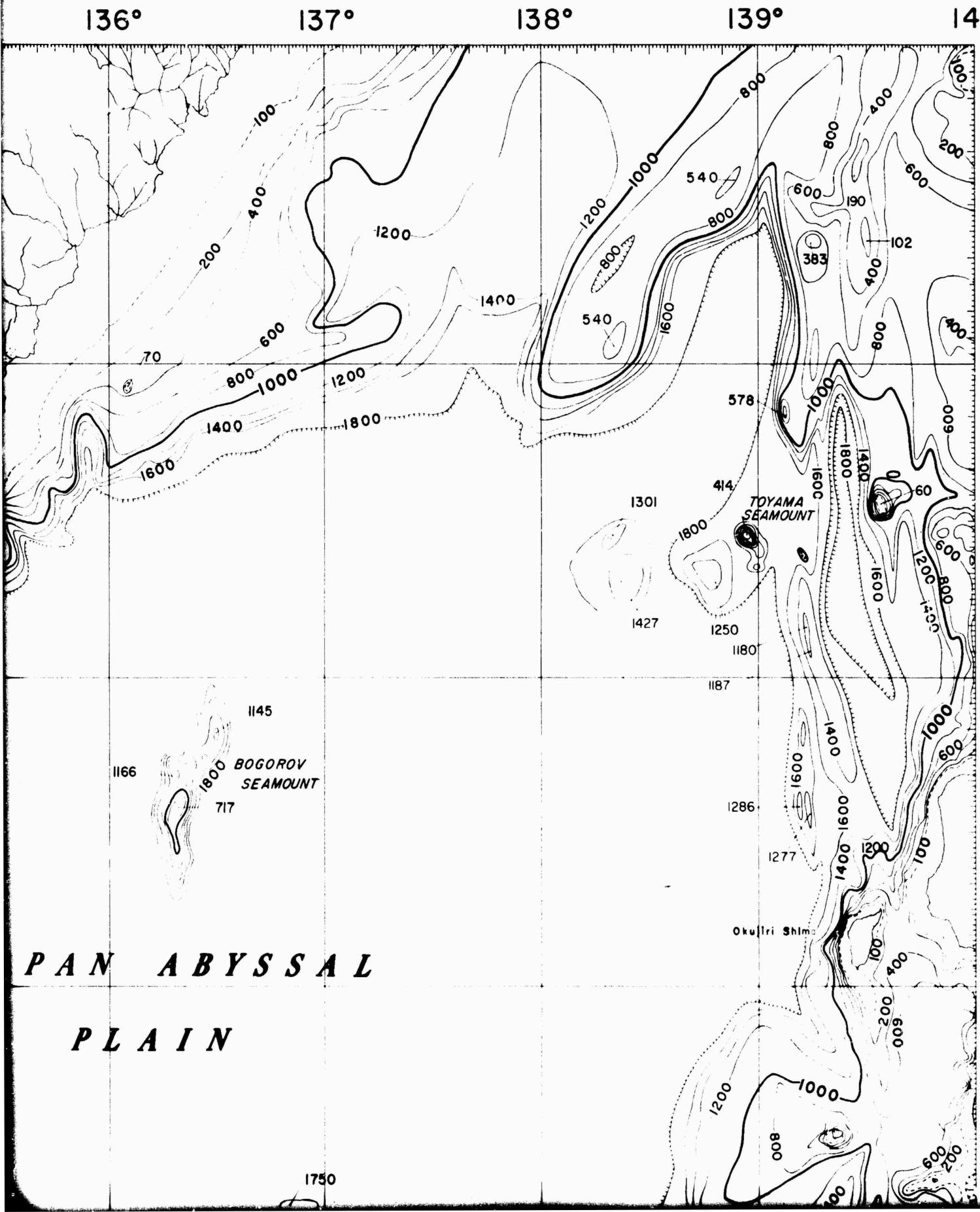
BOGOROV SEAMOUNT
717
1065
OSTROVNOY SEAMOUNT
1186
JAPAN ABYSSAL PLAIN
1685
1750

C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TOYAMA SEAMOUNT
BOGOROV SEAMOUNT
PAN ABYSSAL PLAIN
Okujiri Shima
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1600
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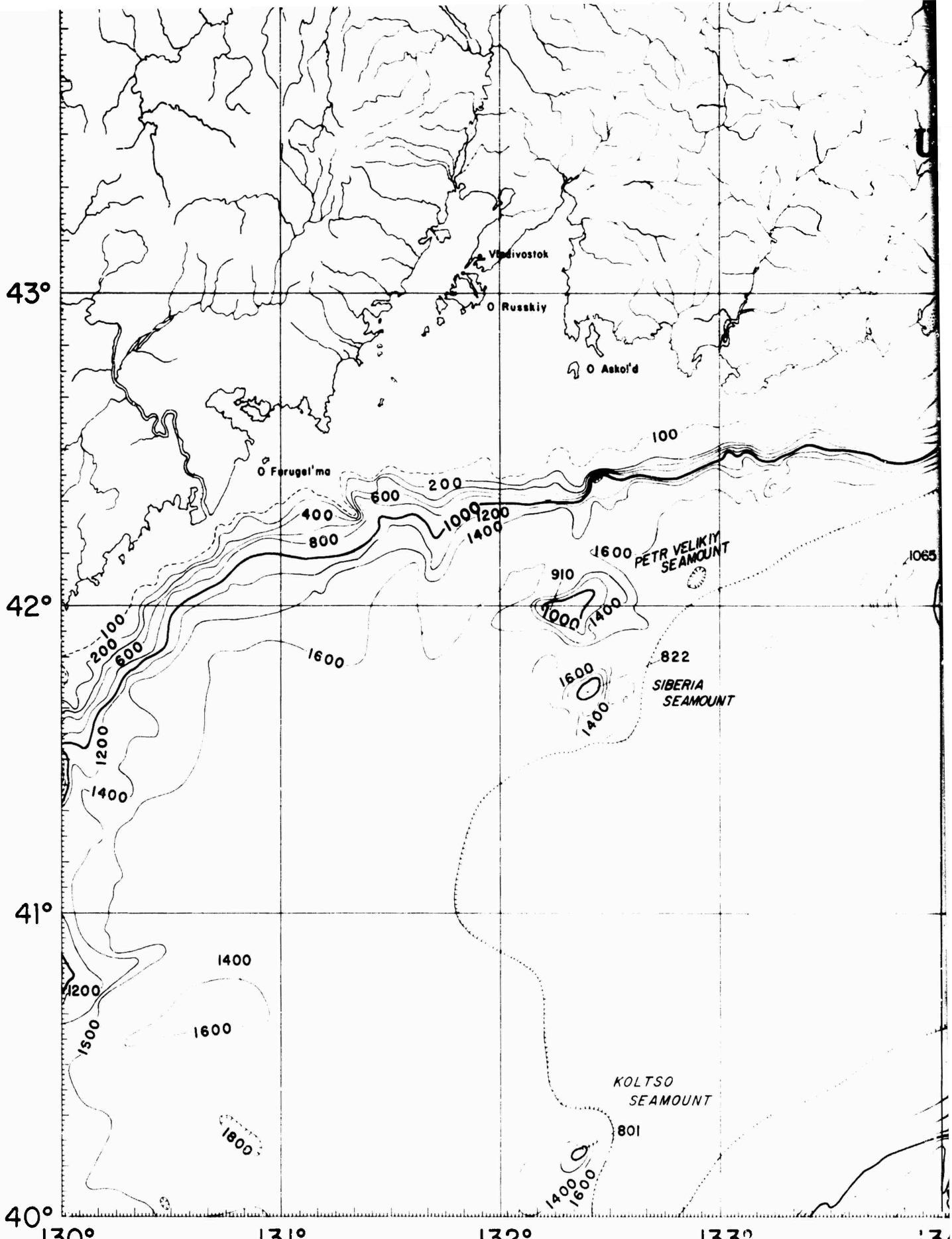
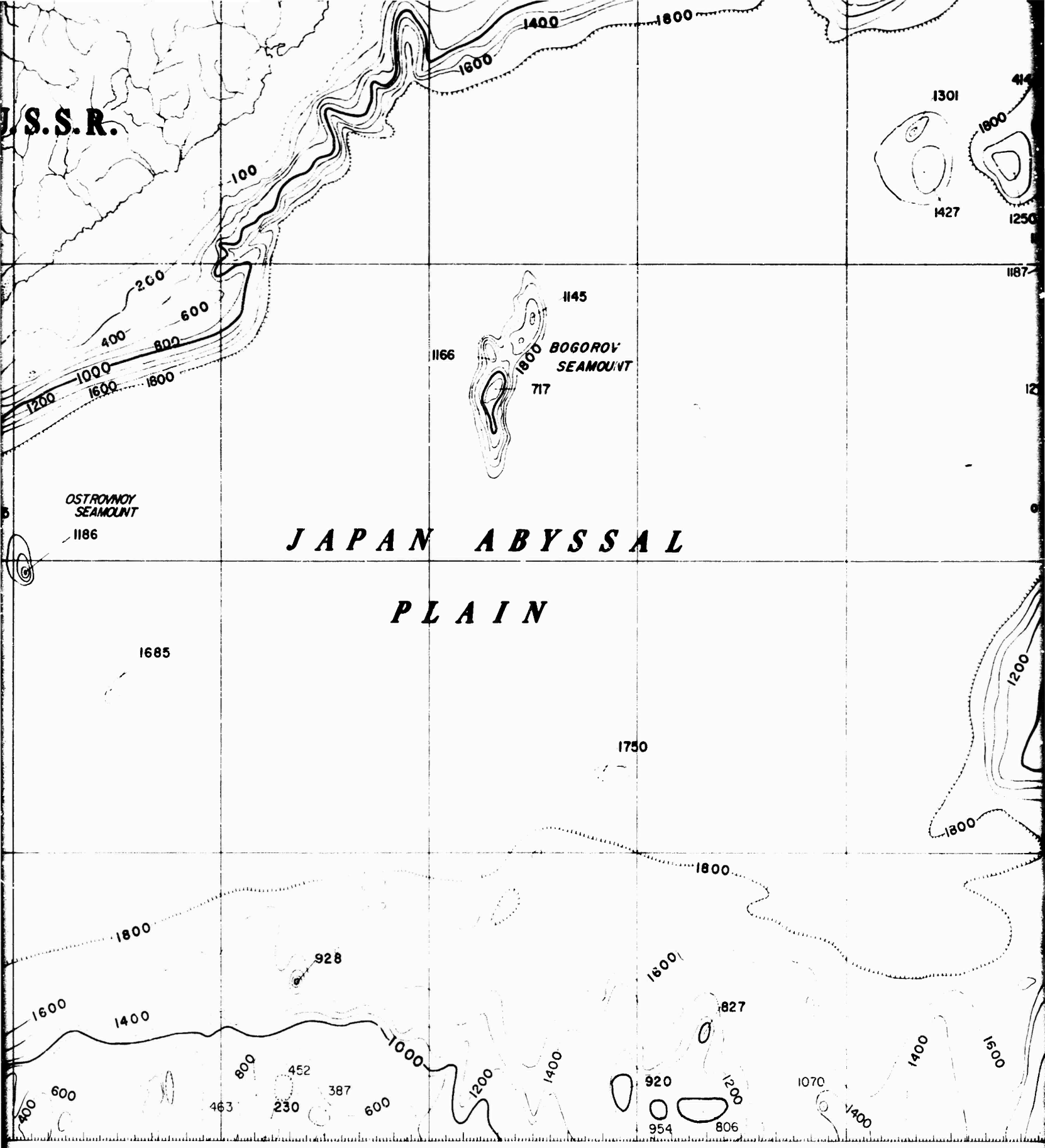


Sources of Data: Maritime Safety Agency, Japan, U.S. Naval Oceanographic Office, R/V Vityaz, USSR

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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Assisted by [illegible]

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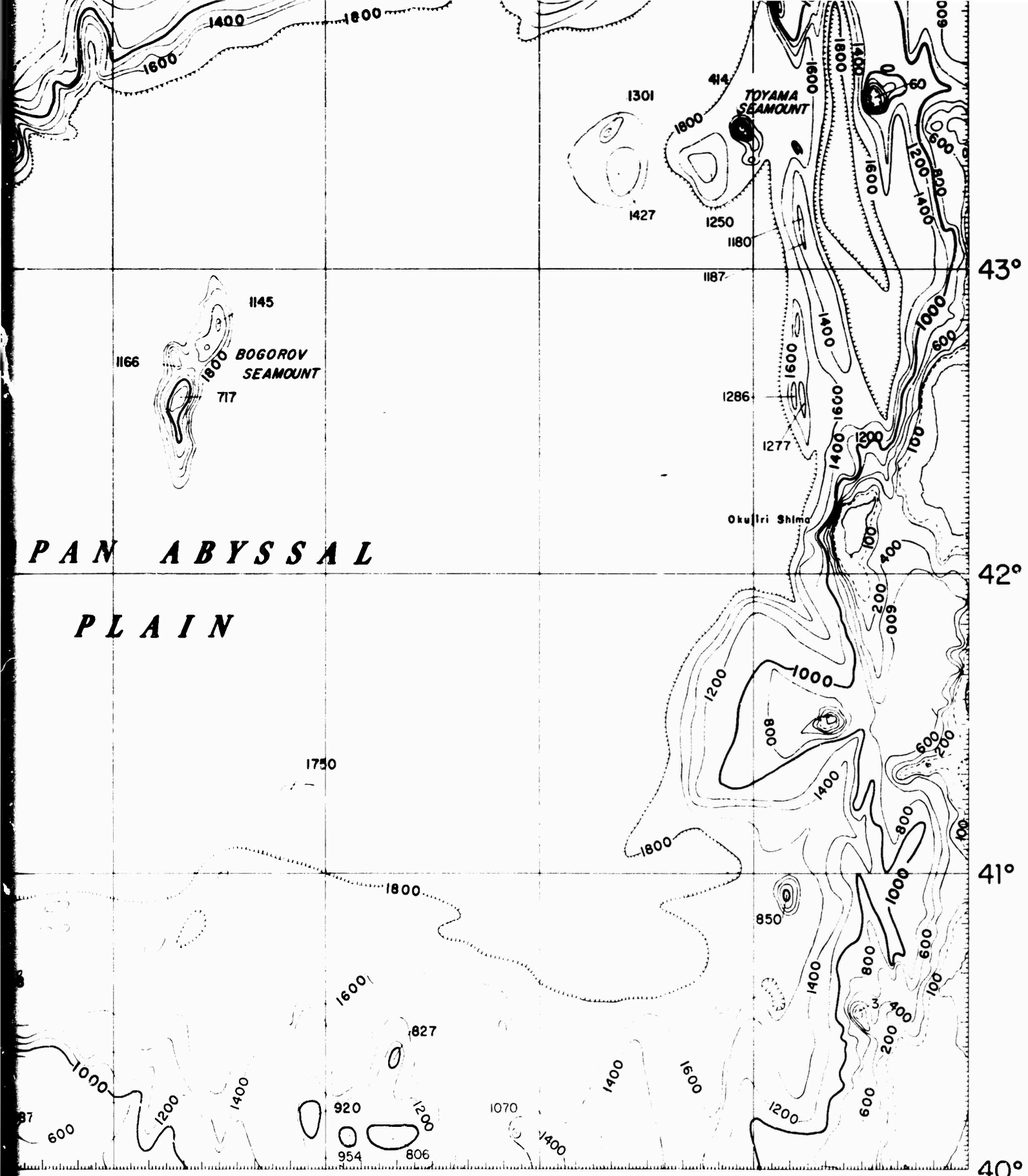
E


TOYAMA SEAMOUNT
BOGOROV SEAMOUNT
PAN ABYSSAL PLAIN
Okujiri Shima
1301
1427
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850
43°
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July 1, 1968
ANOGRAPHY
Contoured by
Assisted by
Do Not Use For Navigation
No. 2308N 25

F

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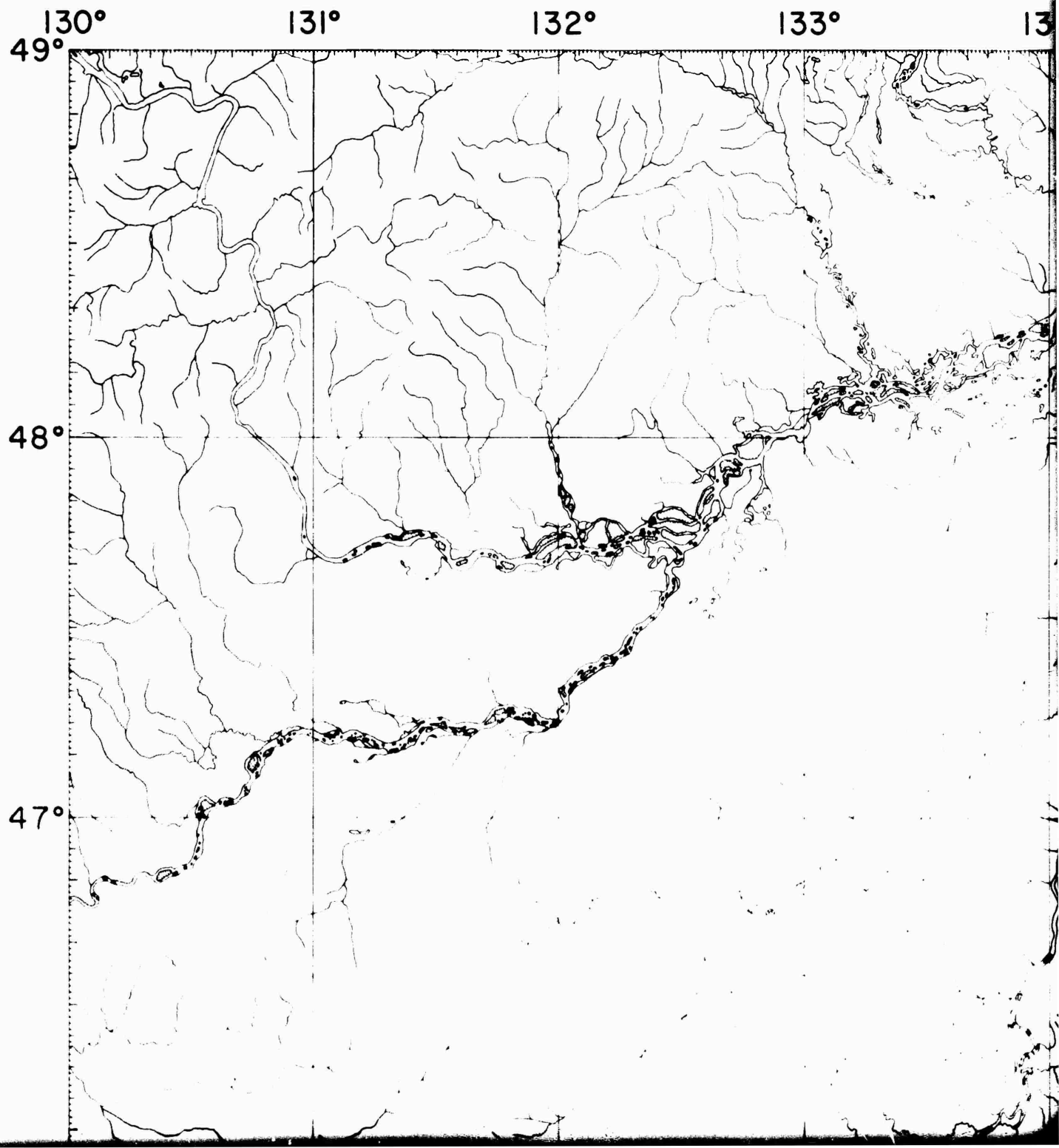

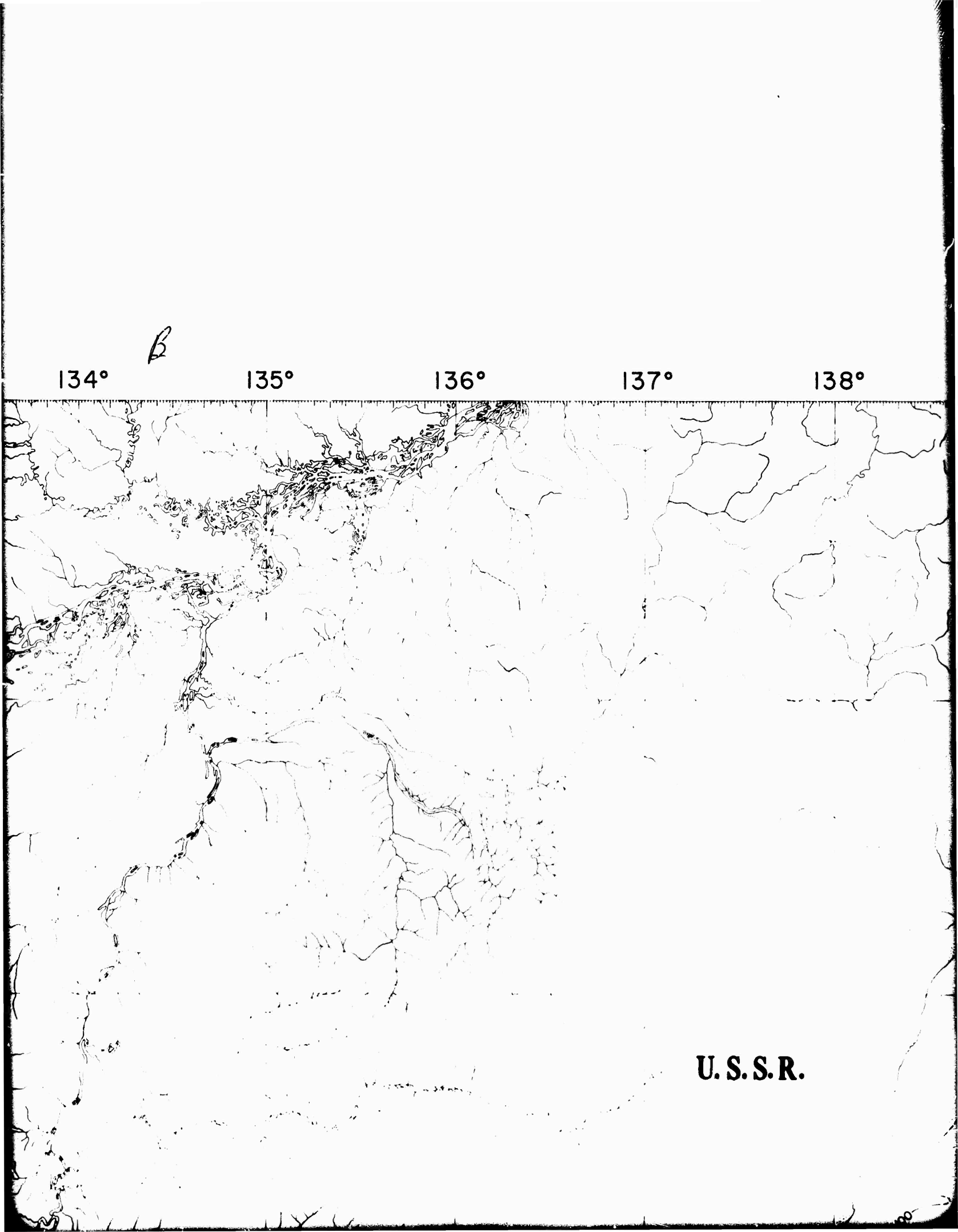
B
134°
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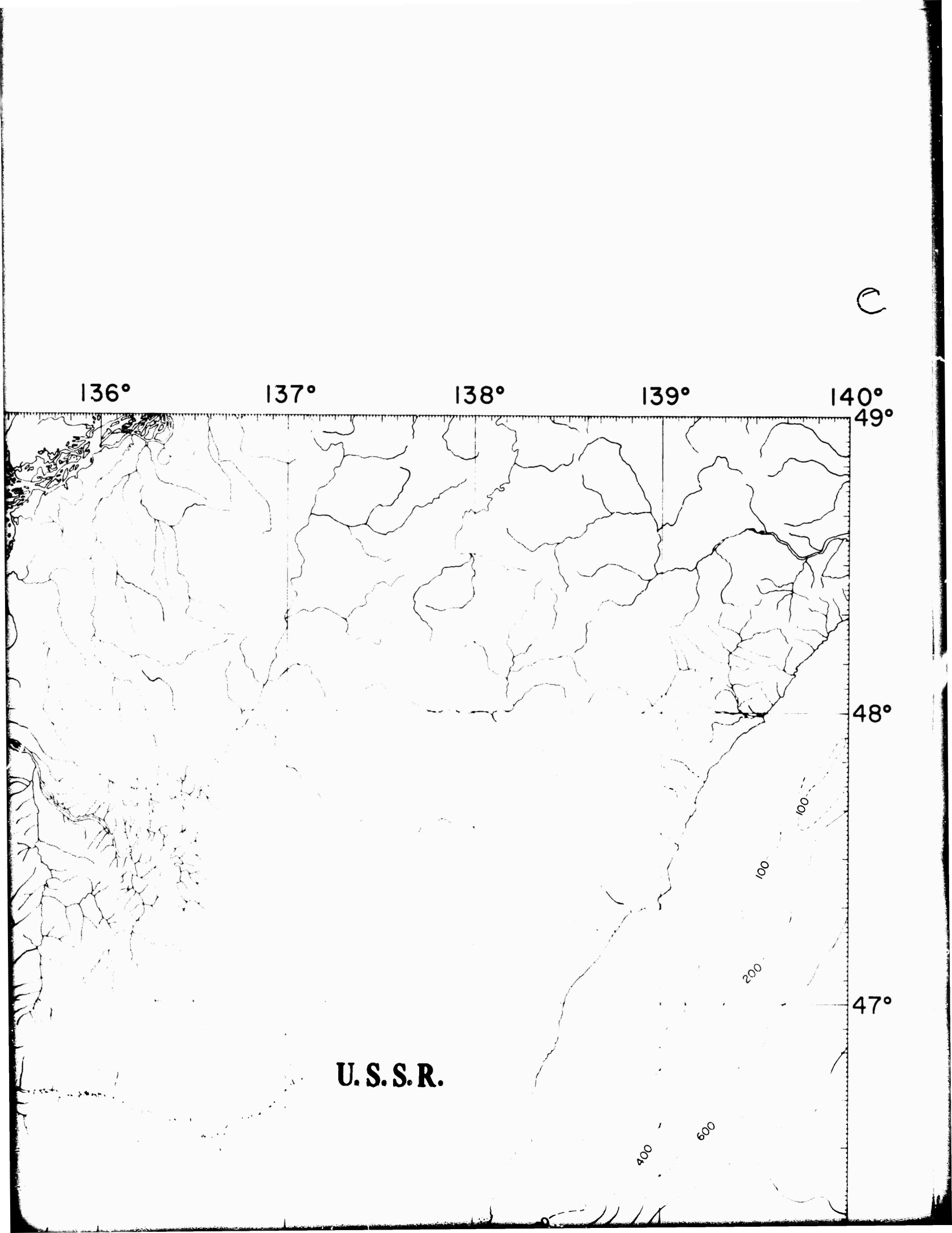
138°
U.S.S.R.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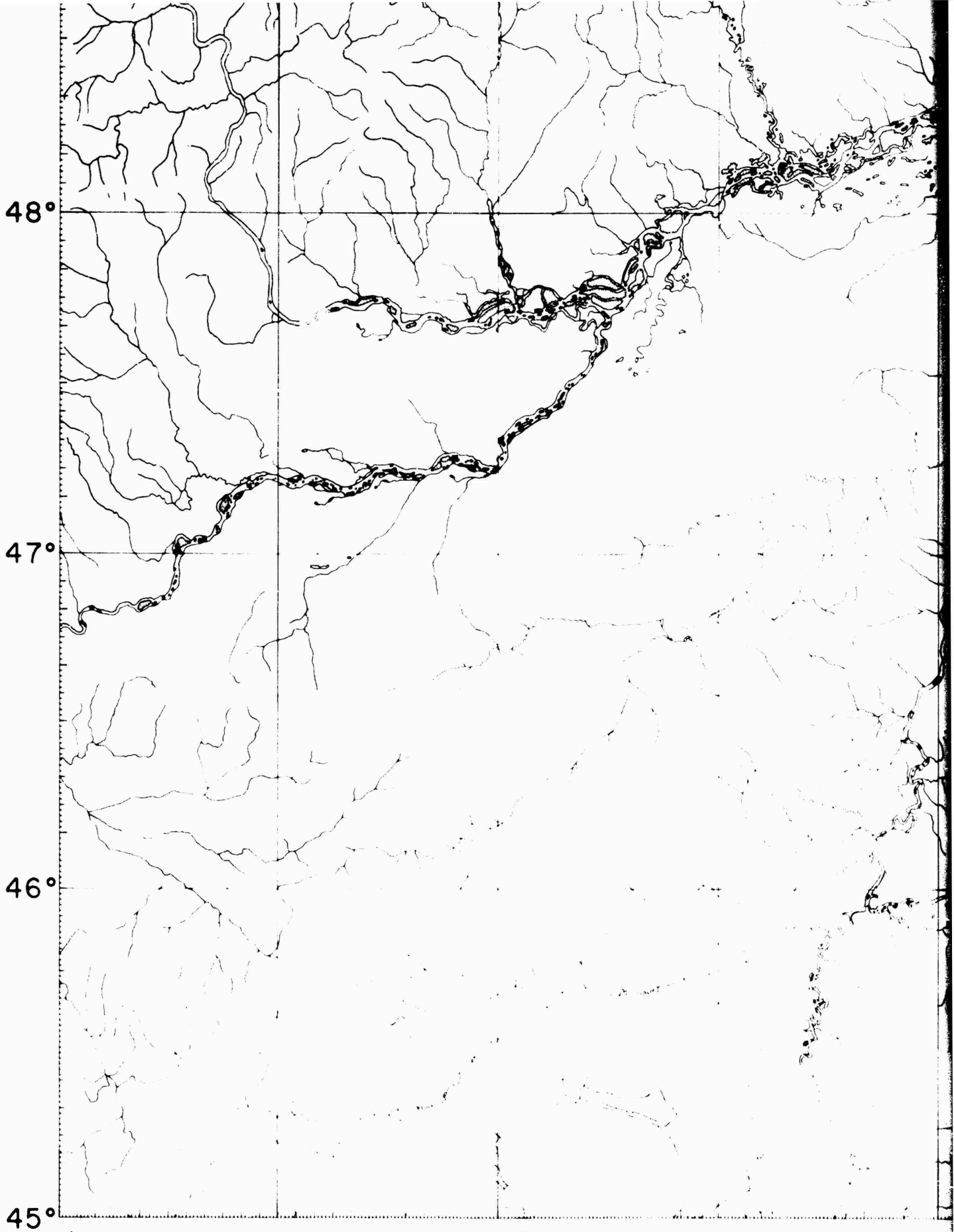

Sources of Data U S Naval Oceanographic Office, Ministry of Geology of U S S R
Maritime Safety Agency, Japan

Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable

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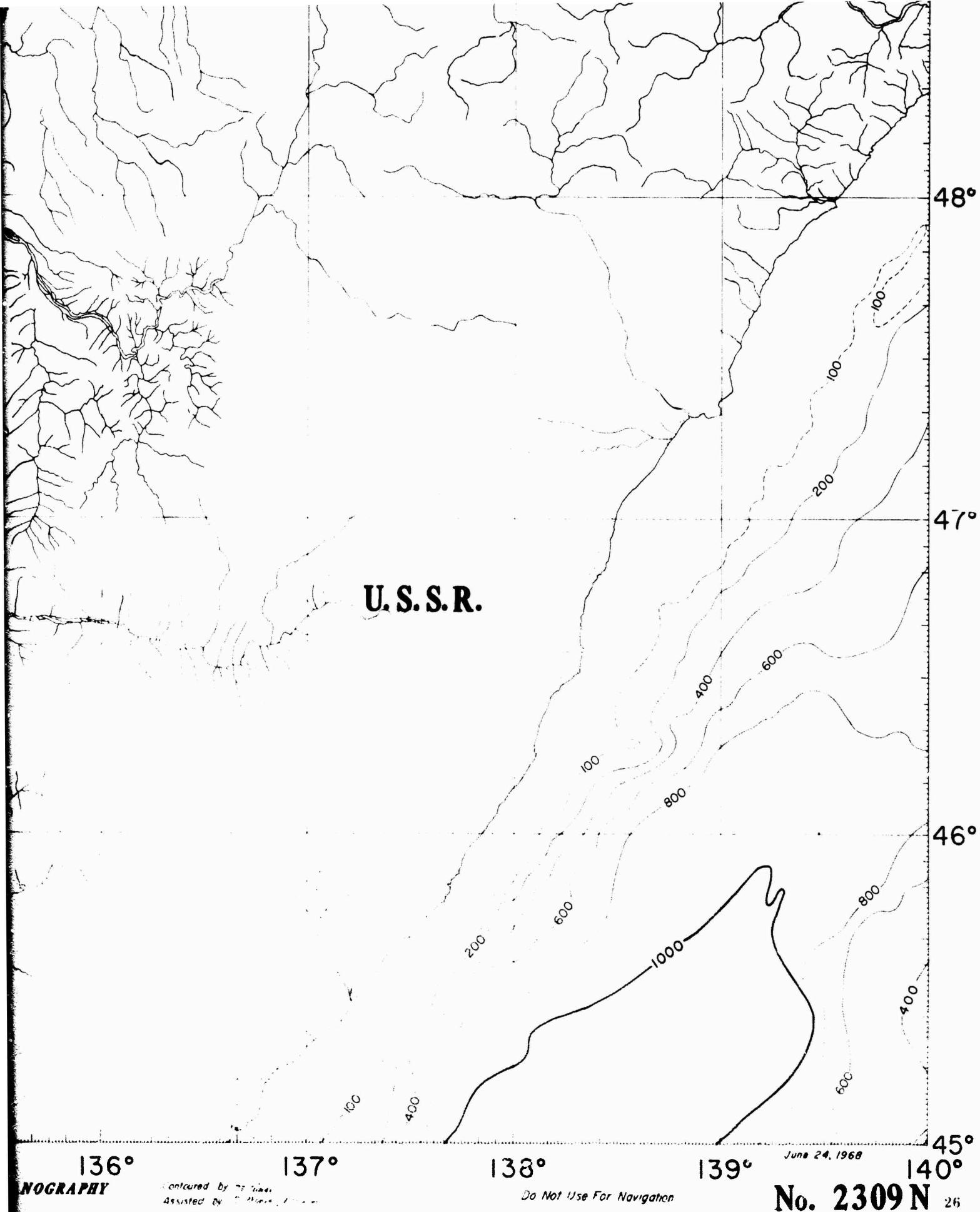
E



June 24, 1968

NOGRAPHY

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Assisted by [illegible]

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No. 2309 N 26

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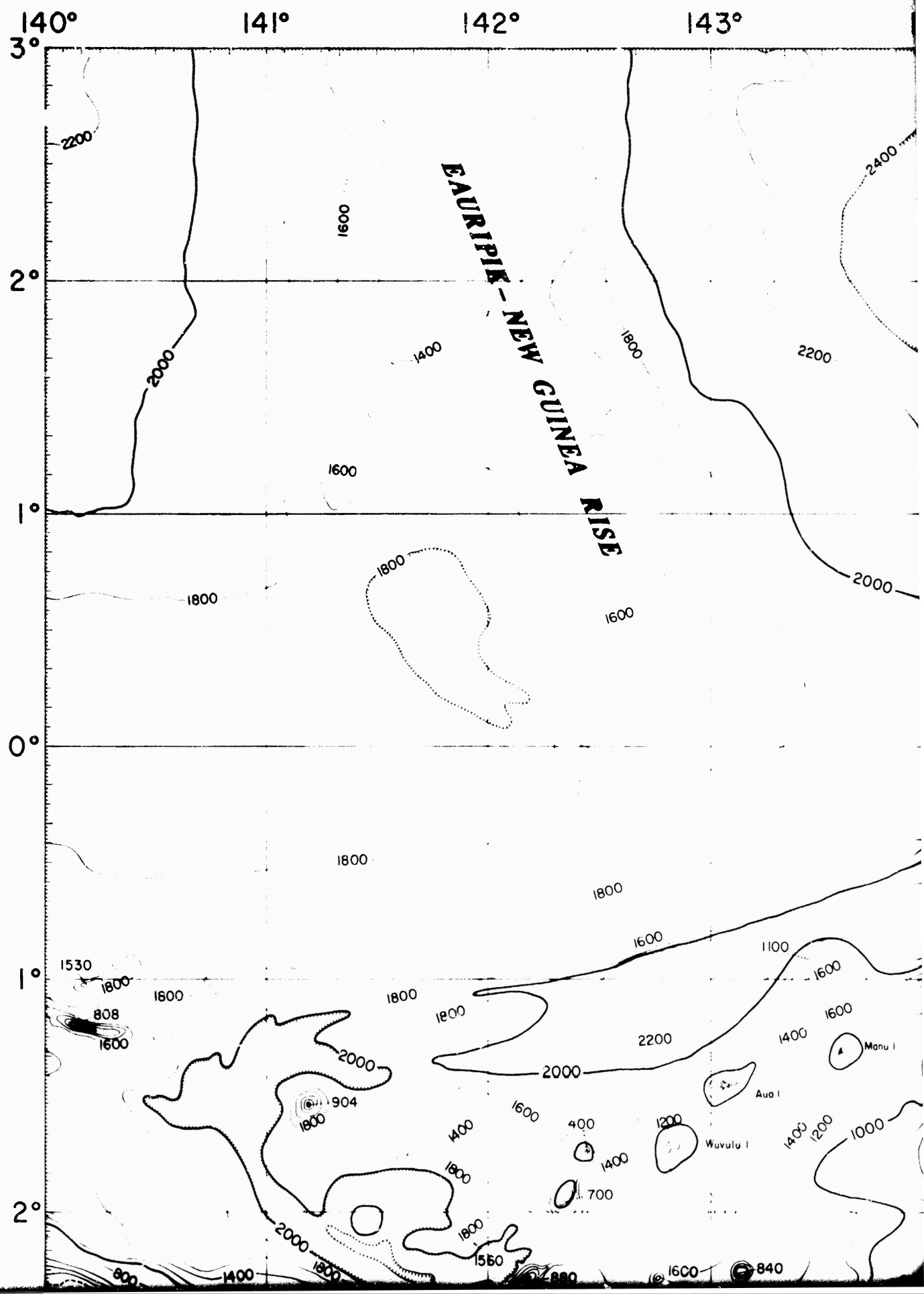
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EAURIPIK–NEW GUINEA RISE
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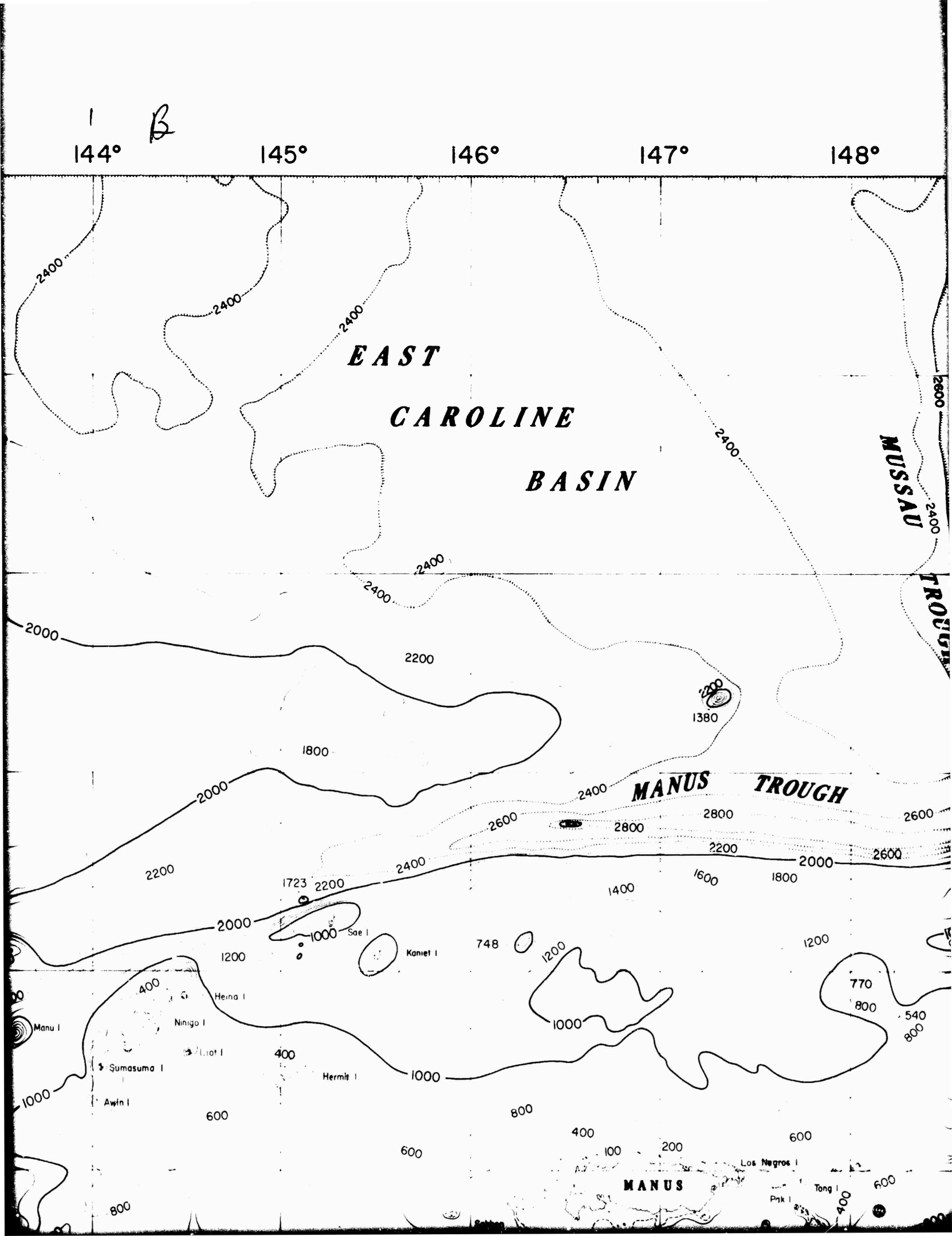
144°
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147°
148°
EAST
CAROLINE
BASIN
MUSSAU
TROUGH
MANUS
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1200
748
770
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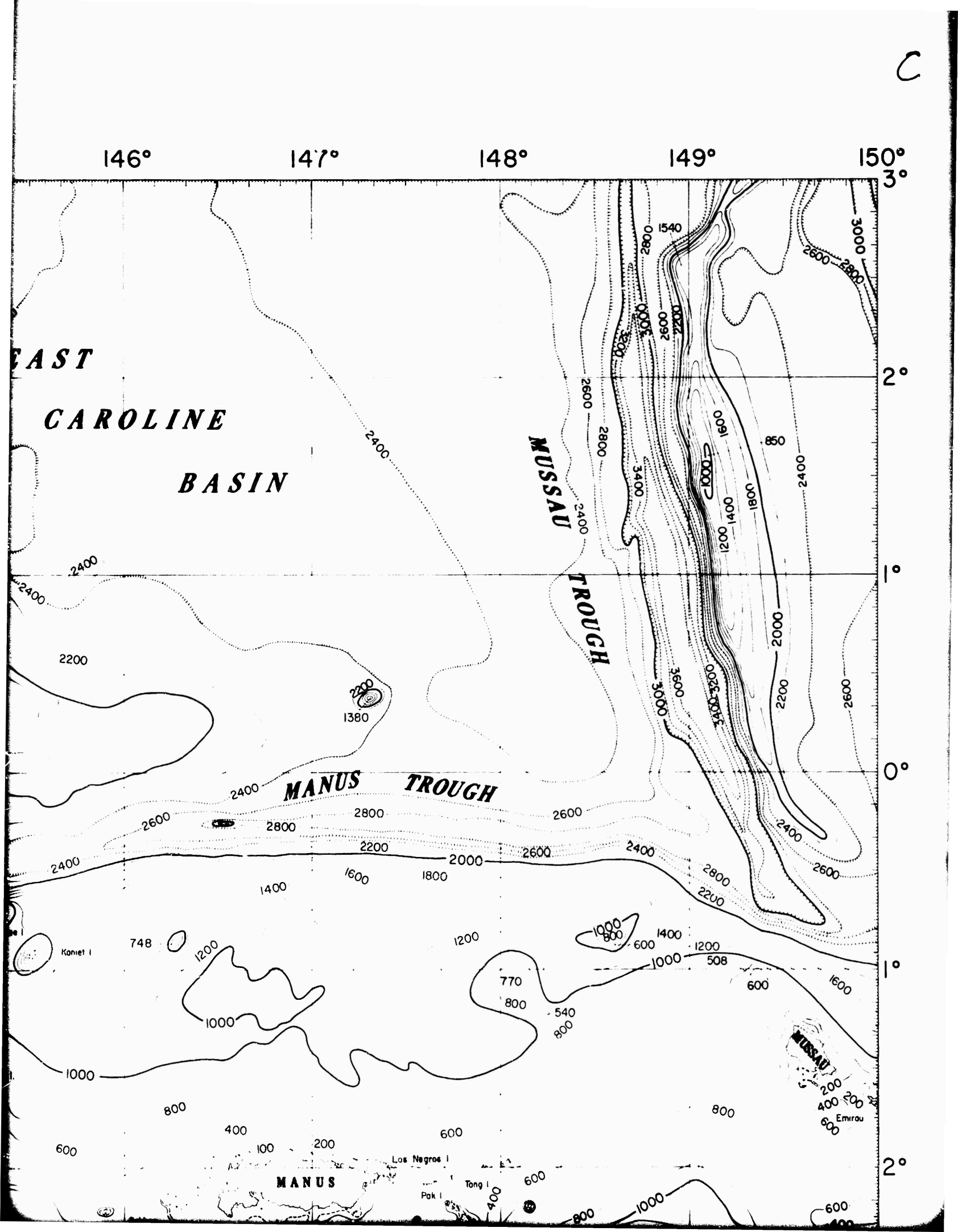
100
200
Sae I
Kaniet I
Heina I
Ninigo I
Manu I
Liot I
Sumasuma I
Hermit I
Awin I
Los Negros I
MANUS
Tong I
Pak I


C
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Emirau
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Los Negros I
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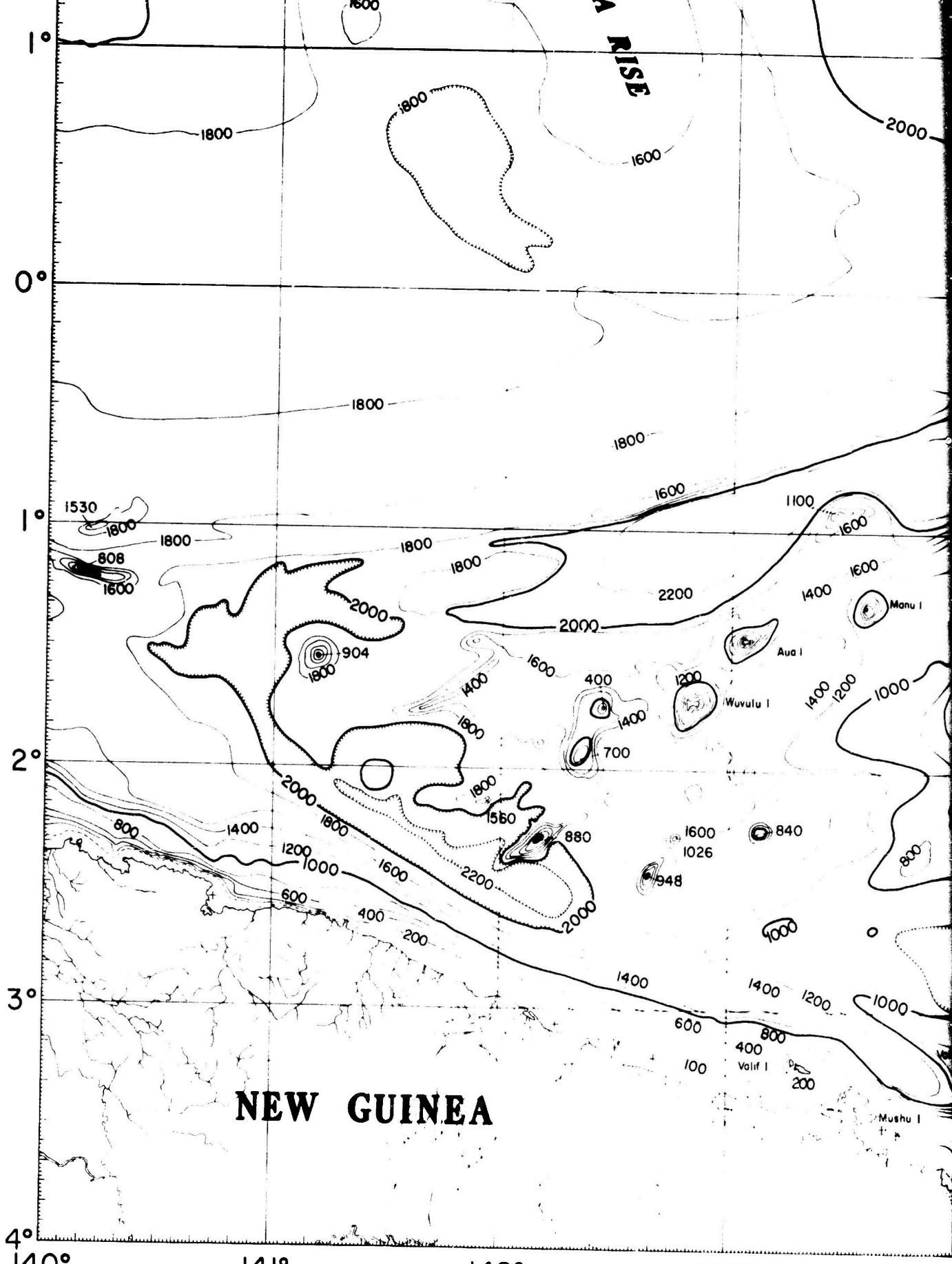
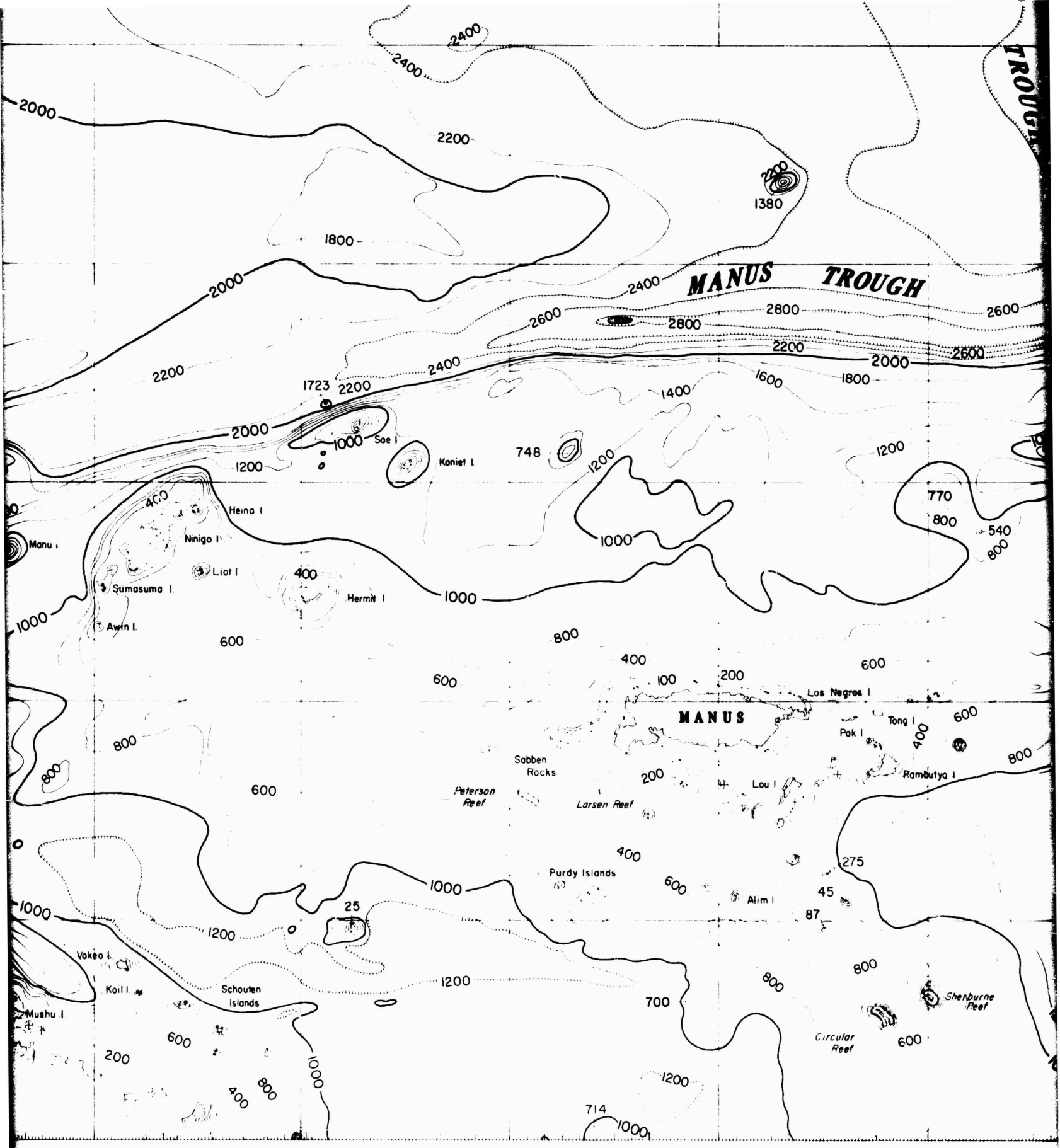
200
100



Sources of Data: U.S. Naval Oceanographic Office, R/V Vitiaz, U.S.S.R.
D.C. Krause, 1965, Scripps Institution of Oceanography,
World Aeronautical Charts

Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable



144° 145° 146° 147° 148°

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Contoured by [illegible]

Assisted by: [illegible]

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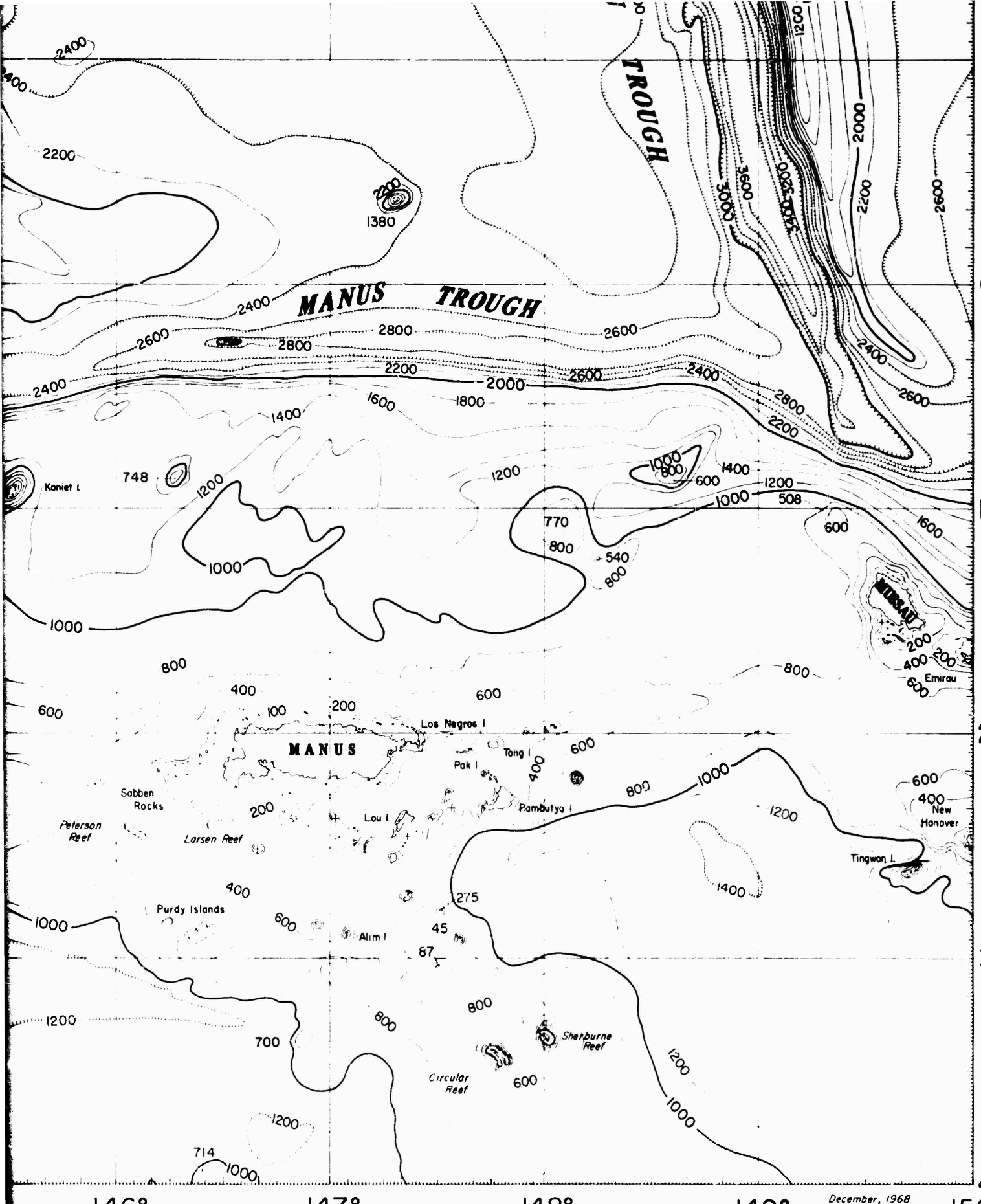
1 E



December, 1968

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Assisted by:

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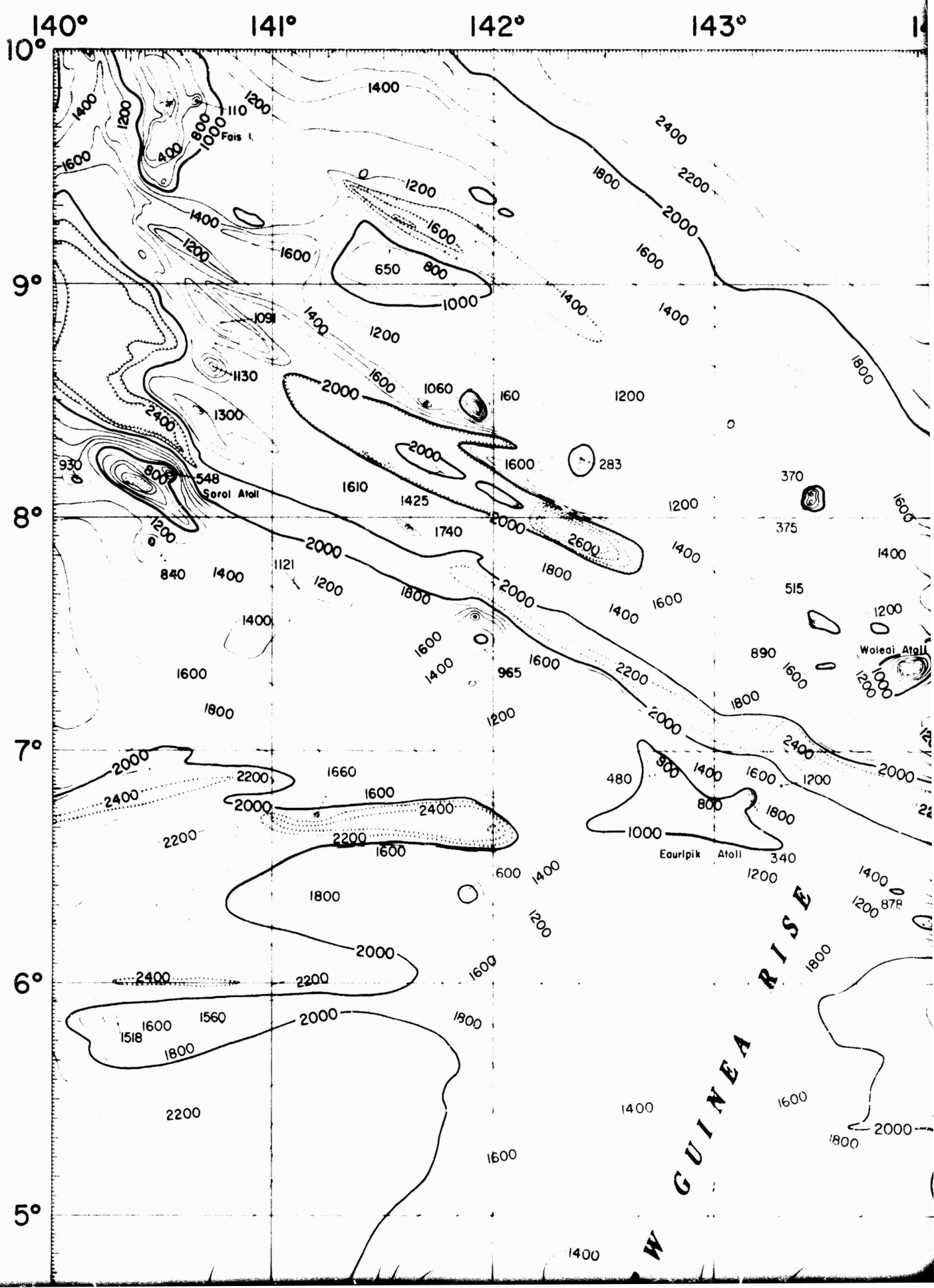
F


140°
141°
142°
143°
10°
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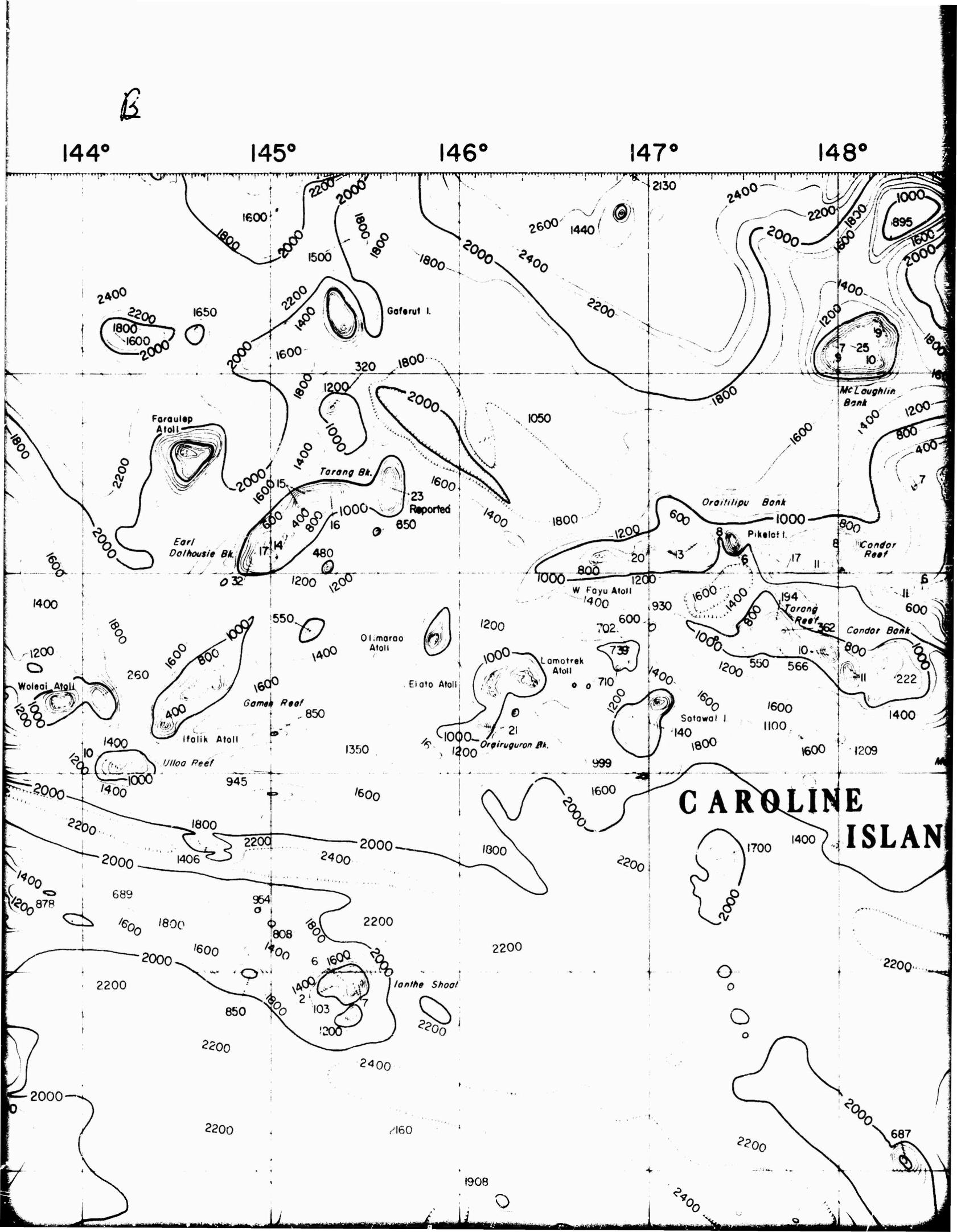
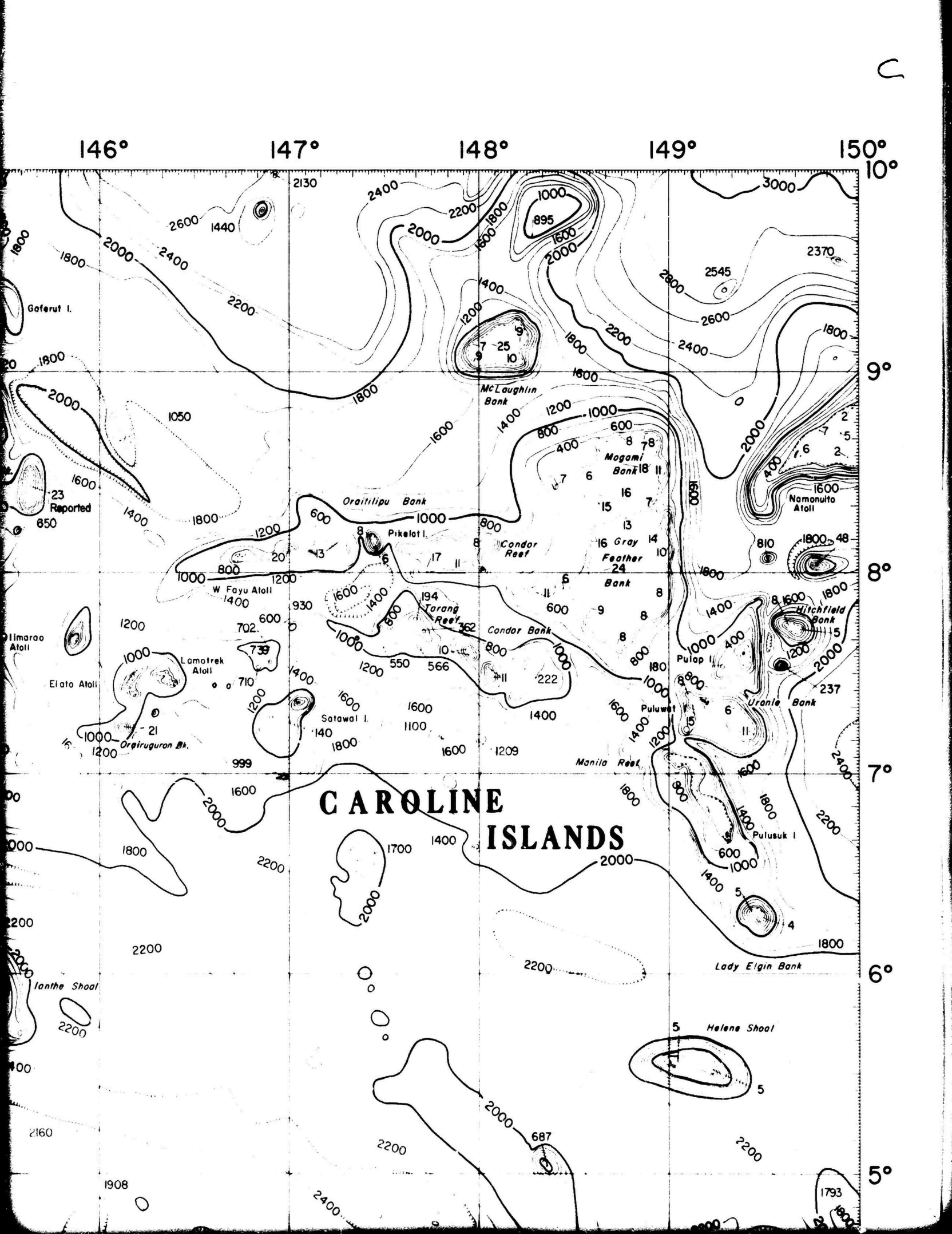
Fais I.
Sorol Atoll
Woleai Atoll
Eauripik Atoll
W GUINEA RISE


144°
145°
146°
147°
148°
Gaferut I.
Faraulep Atoll
Tarang Bk.
Earl Dalhousie Bk.
23 Reported
650
480
Oraitilipu Bank
Pikelot I.
Condor Reef
W Fayu Atoll
194
Tarang Reef
Condor Bank
Olimarao Atoll
Lamotrek Atoll
Elato Atoll
Satawal I.
Orgiruguron Bk.
Woleai Atoll
Gamen Reef
Ifalik Atoll
Ulloa Reef
McLaughlin Bank
Ianthe Shoal
CAROLINE
ISLAN


146°
147°
148°
149°
150°
10°
9°
8°
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6°
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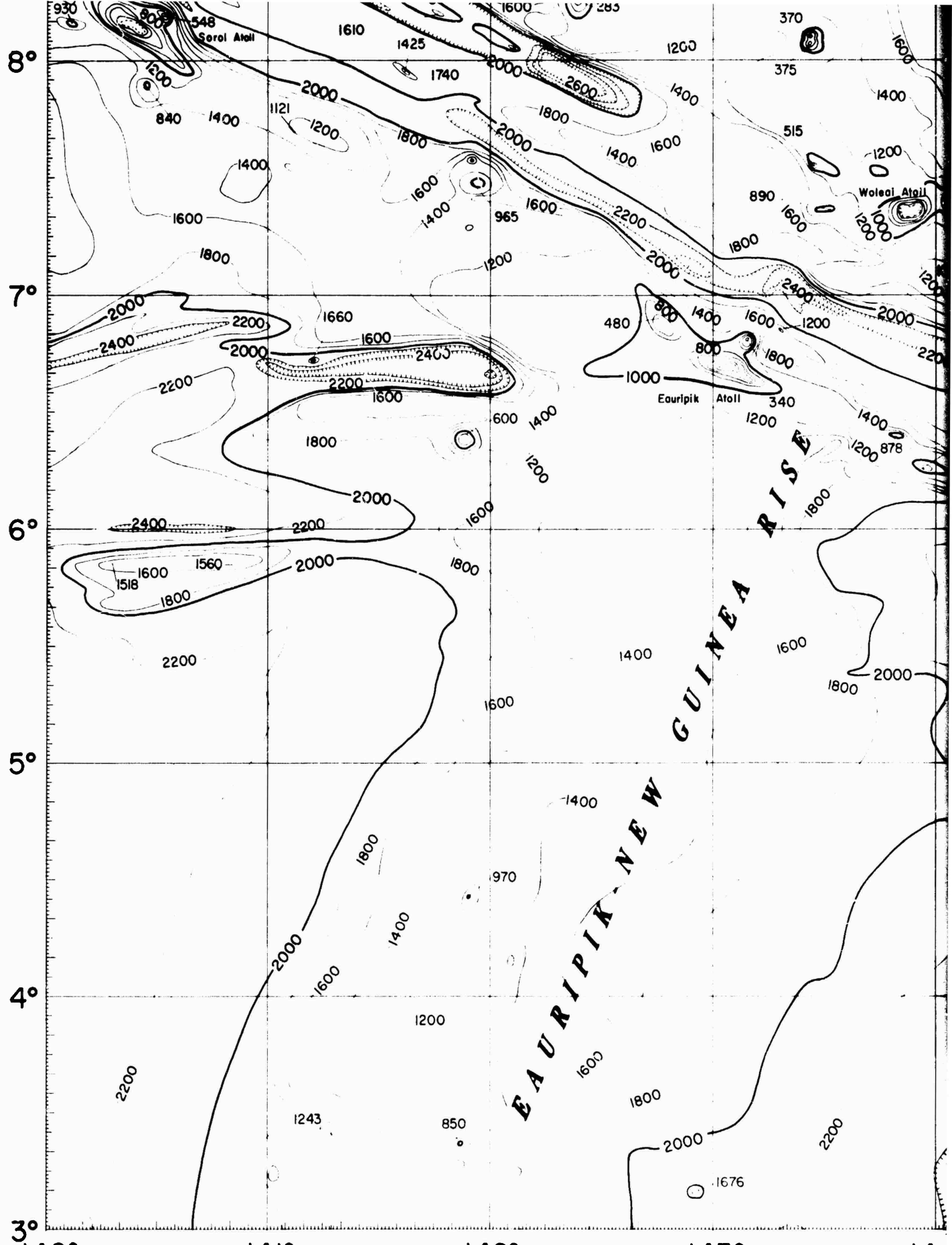
CAROLINE ISLANDS
Goferut I.
Oraitilipu Bank
McLaughlin Bank
Mogami Bank
Namonuito Atoll
Pikelot I.
Condor Reef
Gray Feather Bank
W Fayu Atoll
Torang Reef
Condor Bank
Hitchfield Bank
Ulimarao Atoll
Lamotrek Atoll
Elato Atoll
Pulap I.
Uronie Bank
Puluwat I.
Satawal I.
Oraiuruguron Bk.
Manila Reef
Pulusuk I.
Lady Elgin Bank
Ianthe Shoal
Helene Shoal
23 Reported



Sources of Data: U.S. Naval Oceanographic Office, R/V Vitiaz, USSR Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D

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Assisted by [illegible]

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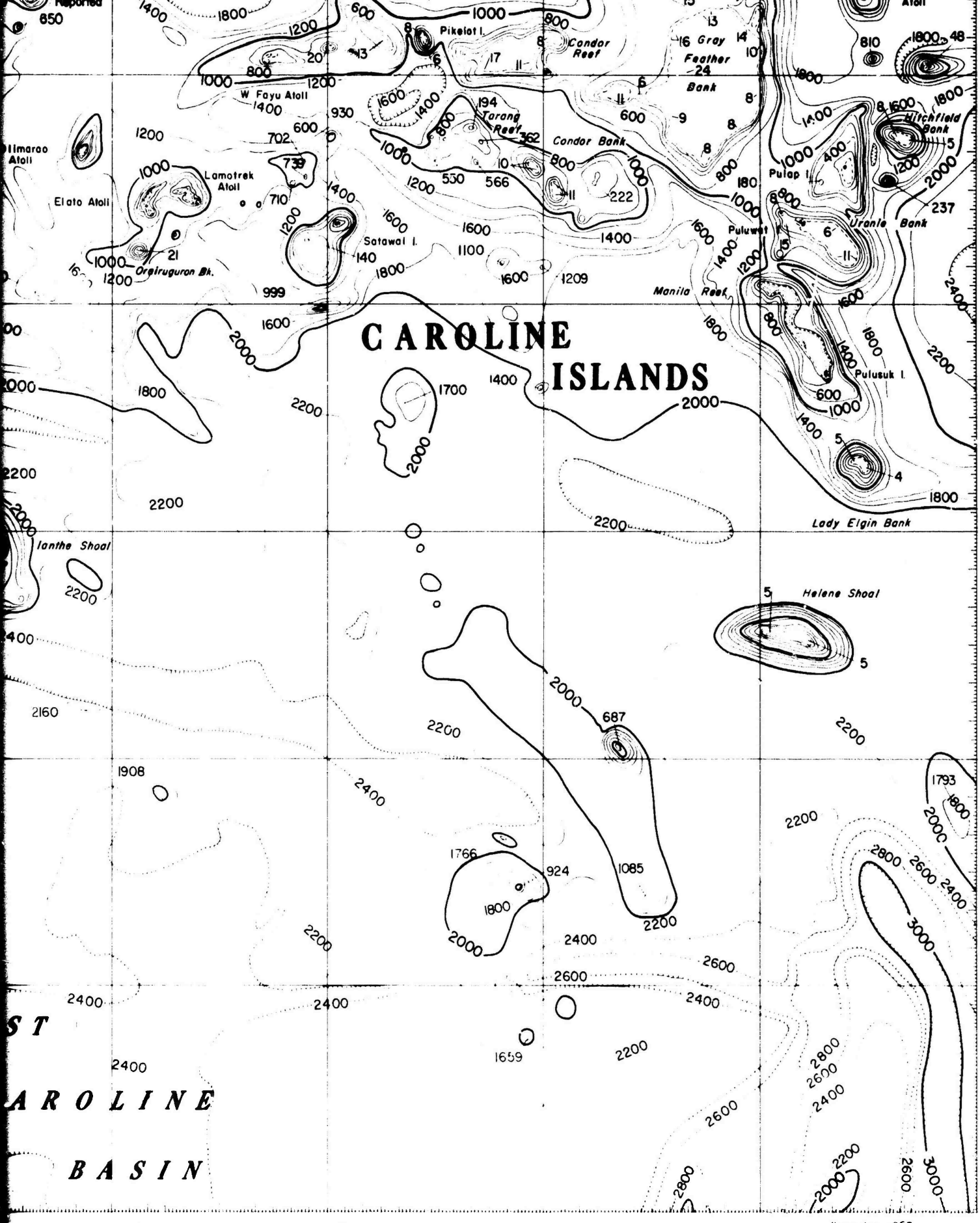
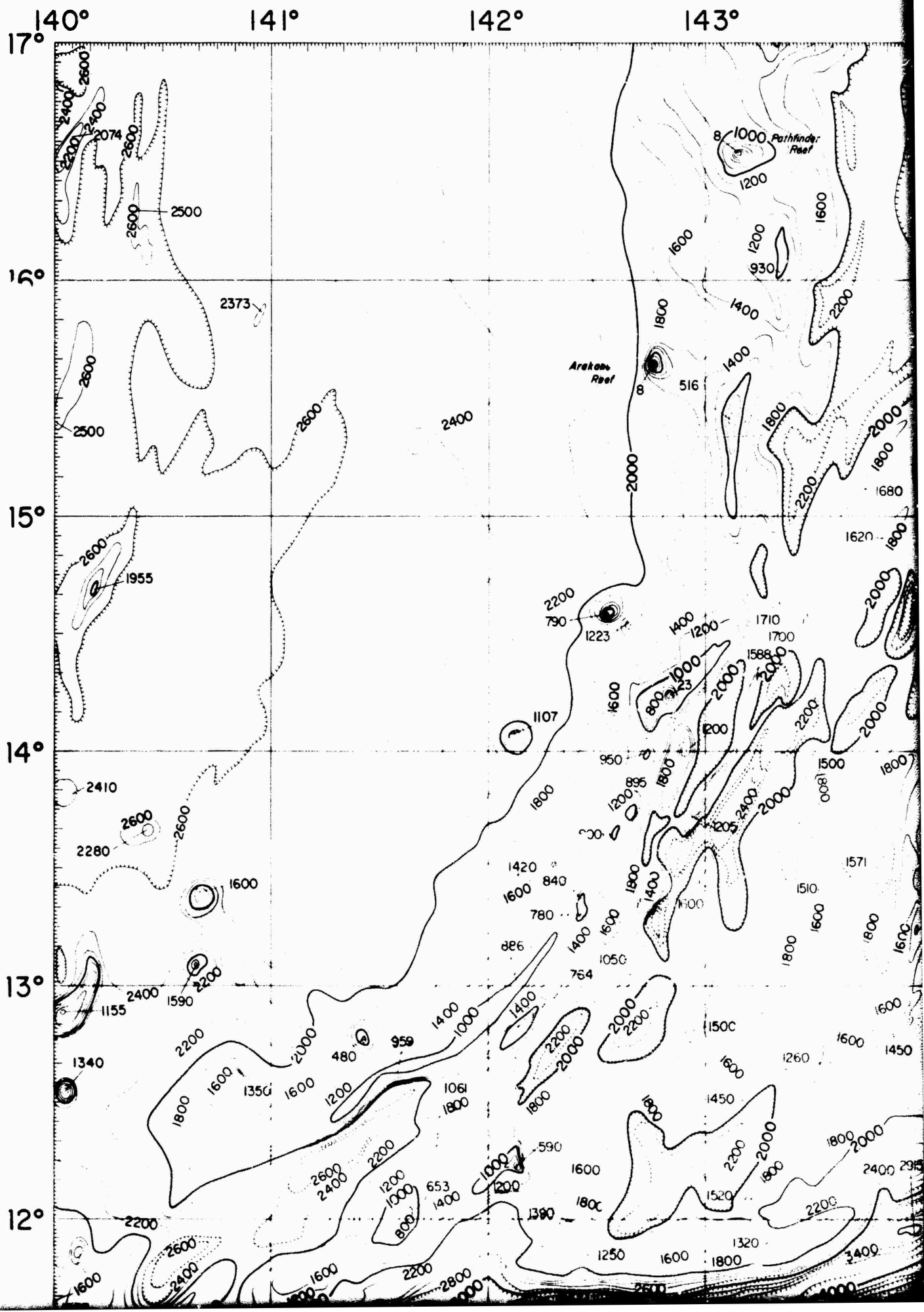
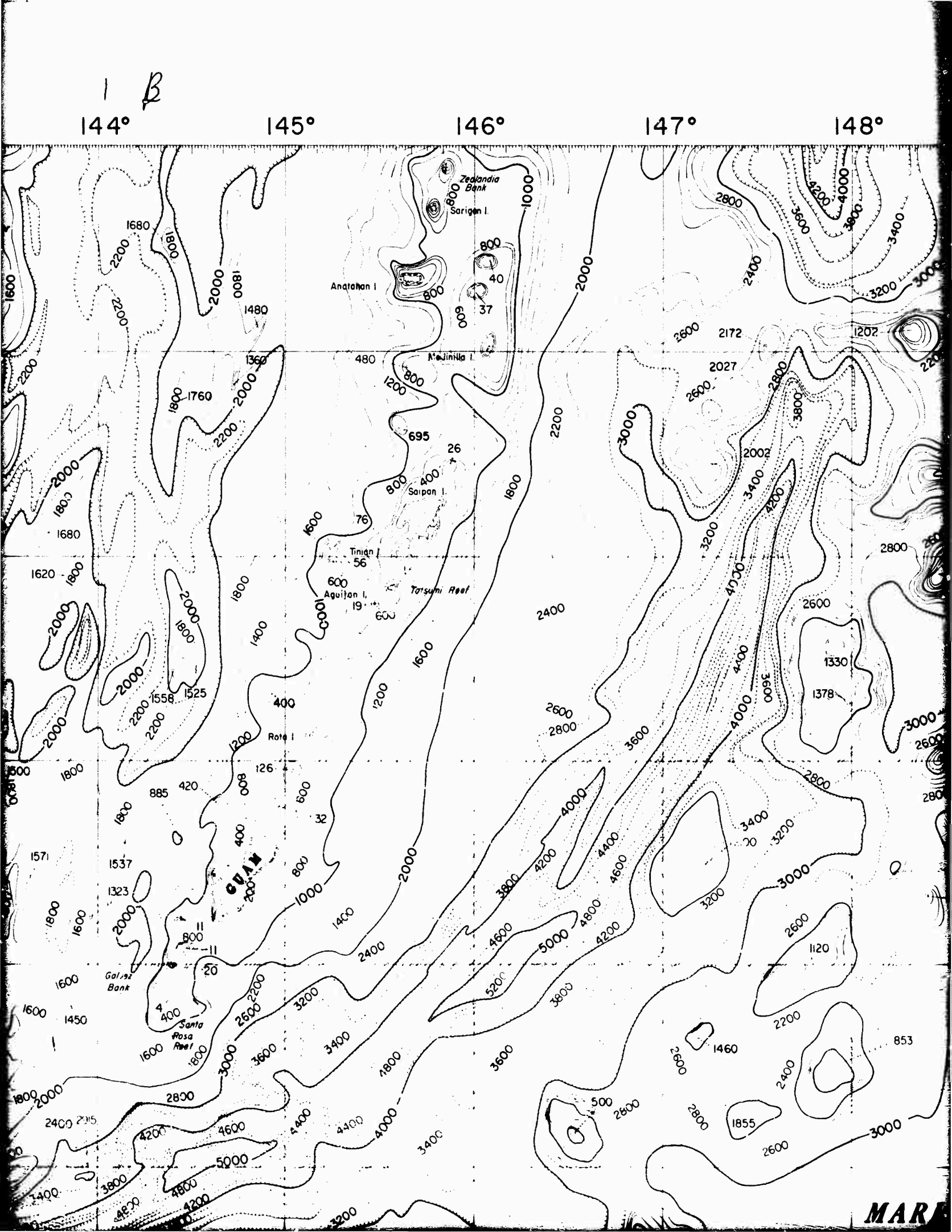
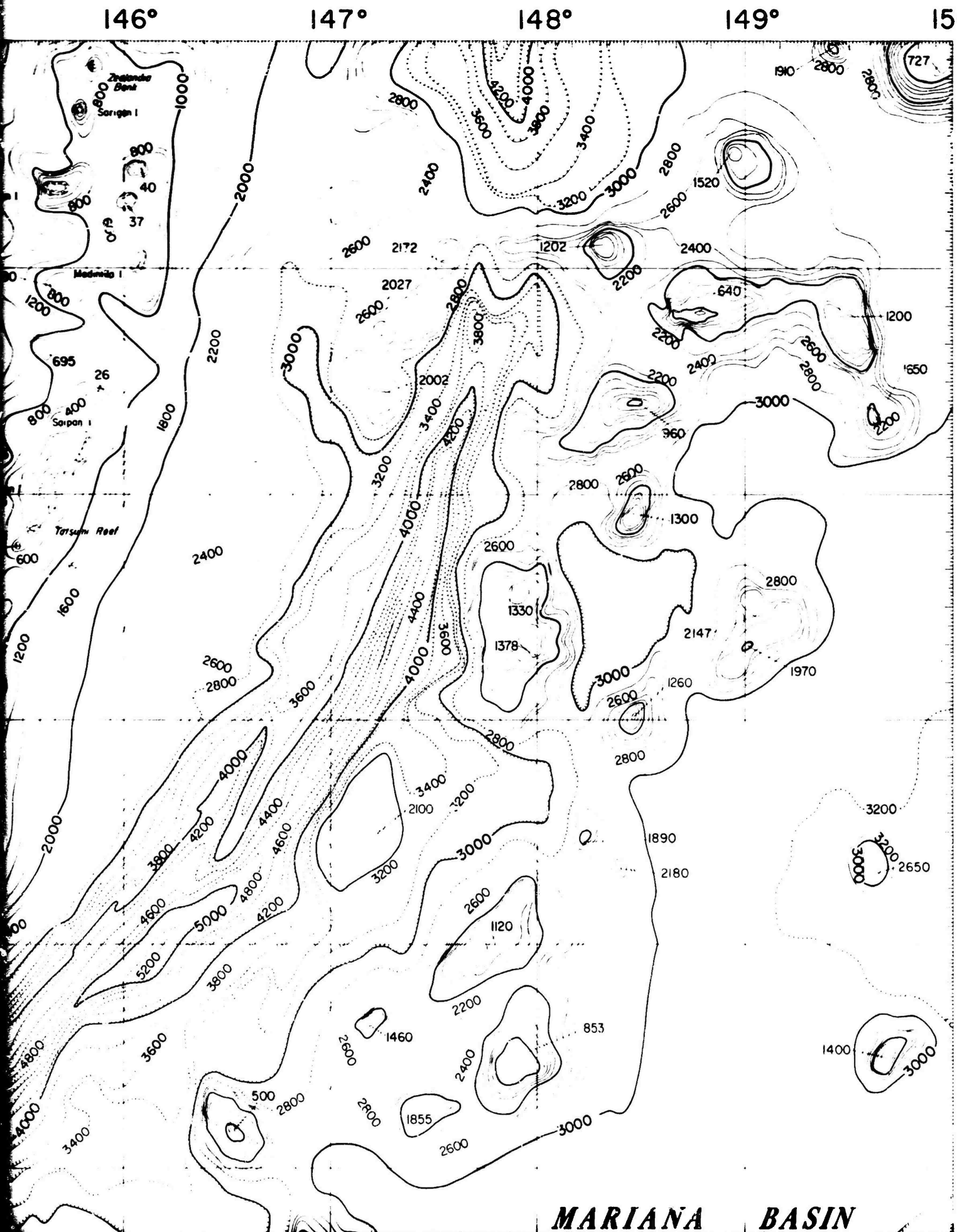
E

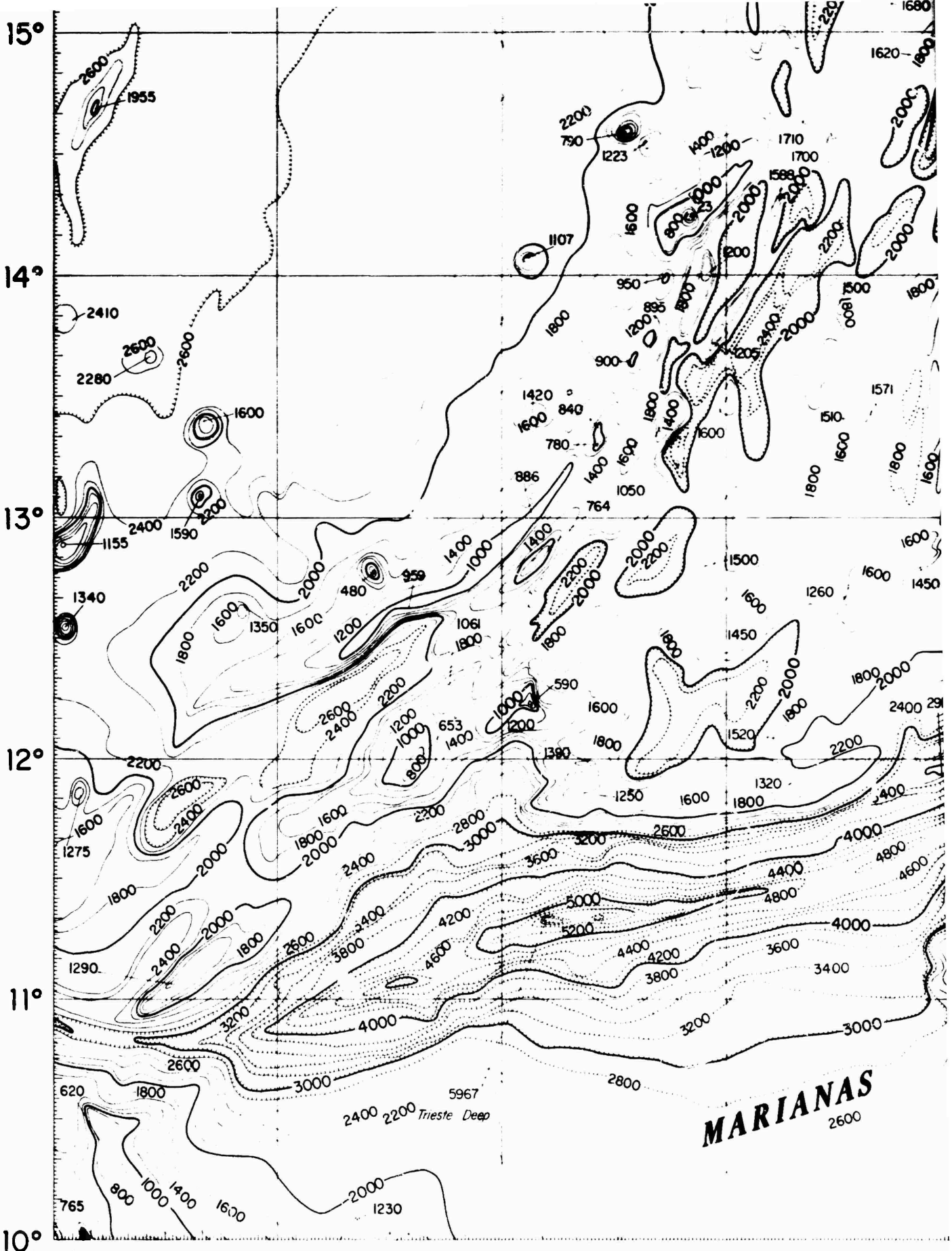

CAROLINE ISLANDS
Pikelot I.
Condor Reef
Gray Feather Bank
W Fayu Atoll
Tarang Reef
Condor Bank
Ulimarao Atoll
Elato Atoll
Lamotrek Atoll
Satawal I.
Orgiruguron Bk.
Pulap I.
Puluwat I.
Uranie Bank
Mitchfield Bank
Manila Reef
Pulusuk I.
Lady Elgin Bank
Ianthe Shoal
Helene Shoal
8°
7°
6°
5°
4°
3°
146°
147°
148°
149°
150°
December, 1968
Do Not Use For Navigation
No. 2202 N

A




144°
145°
146°
147°
148°
Zeelandia Bank
Sarigan I.
Anatahan I
Maʻjinilla I.
Saipan I.
Tinian I.
Aguijan I.
Tarşumi Reef
Rota I.
GUAM
Galvez Bank
Santa Rosa Reef
MAR

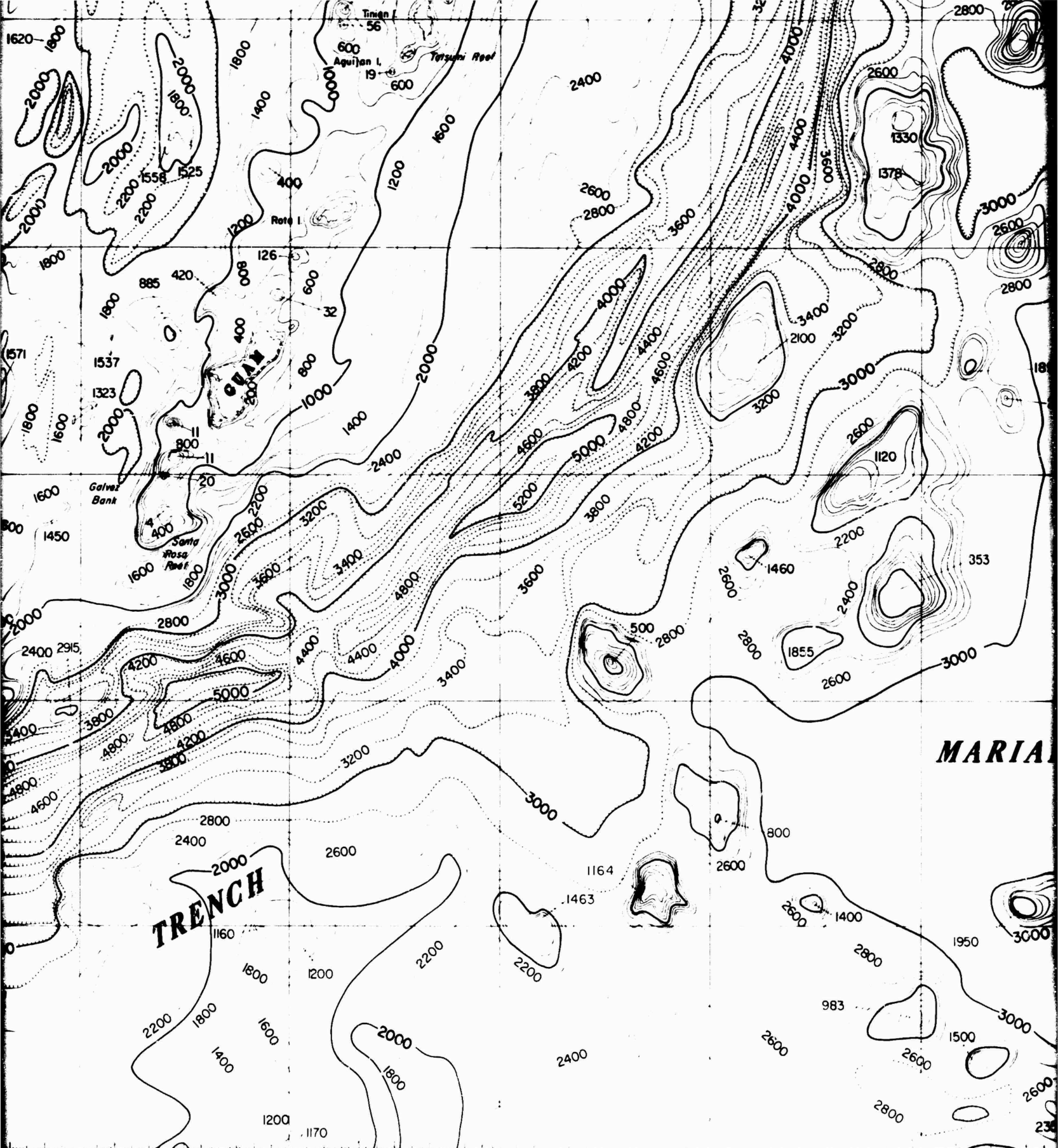

146°
147°
148°
149°
150°
17°
16°
15°
14°
13°
12°
Zealandia Bank
Sarigan I
Medinilla I
Saipan I
Tarsuan Reef
MARIANA BASIN



Sources of Data: U.S. Naval Oceanographic Office, K.O. Emery, 1952, American Telephone & Telegraph, Maritime Safety Agency, Japan, R.L. Fisher, 1963, Lamont Geological Observatory, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D



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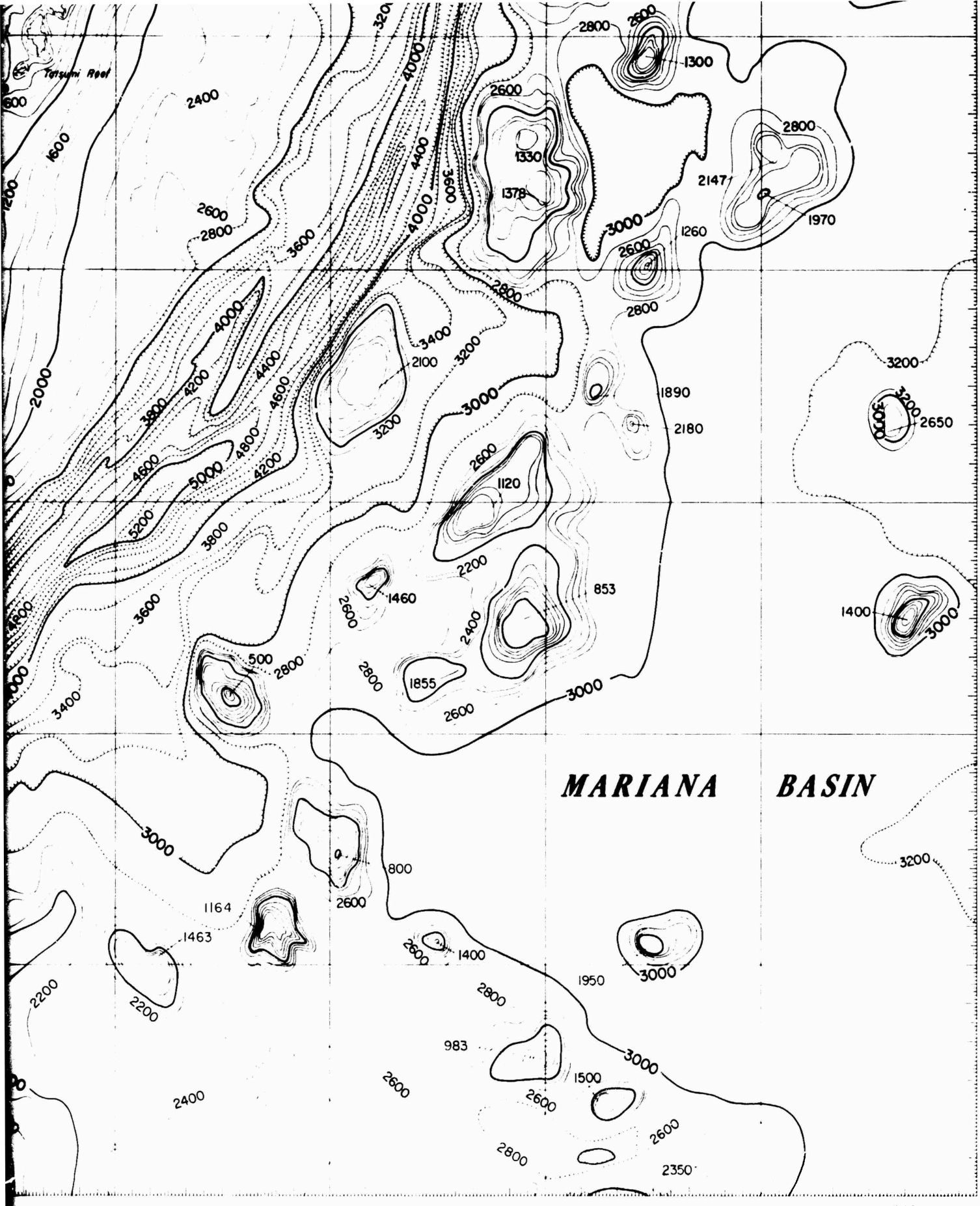

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No. 2203 N 29

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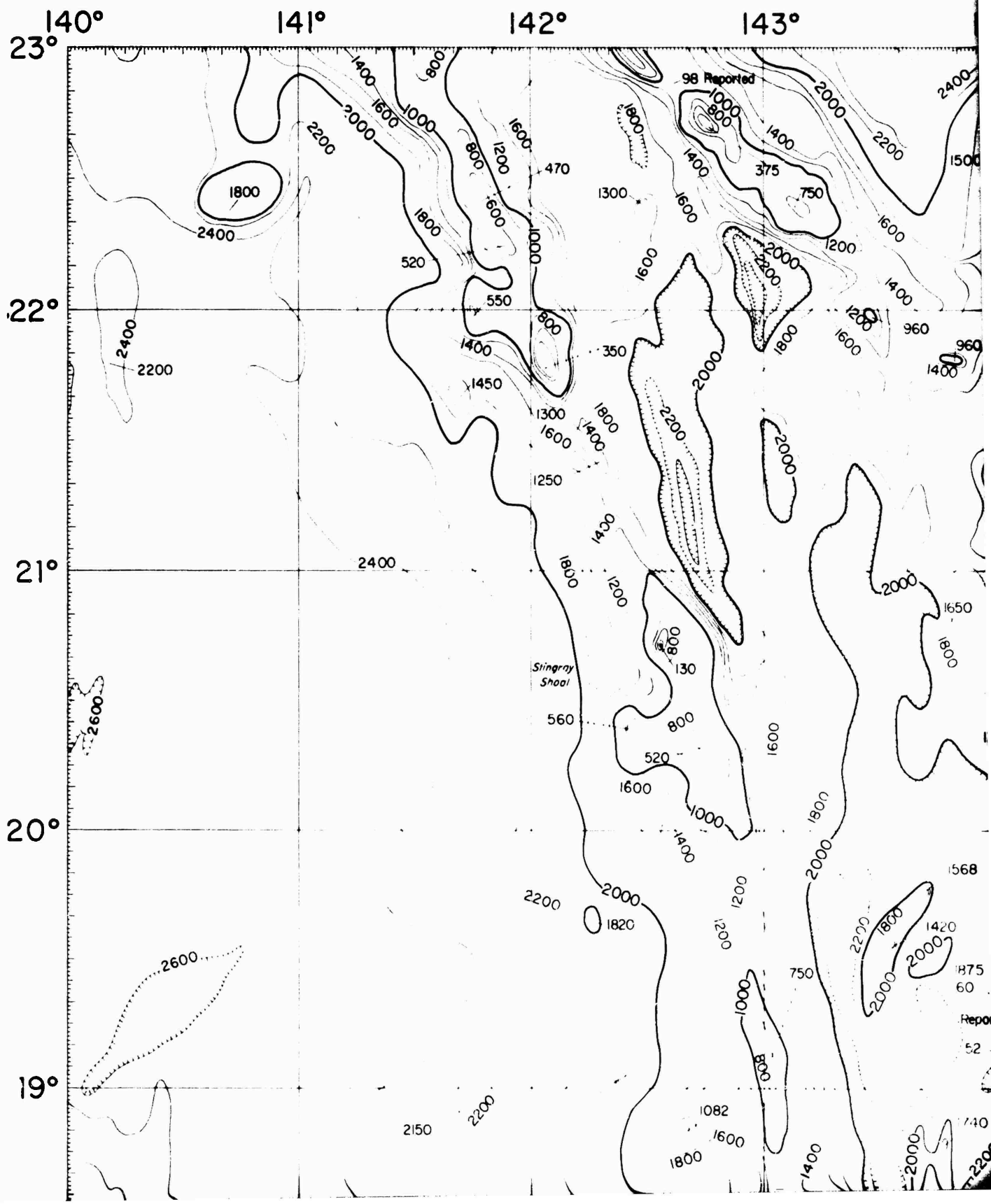
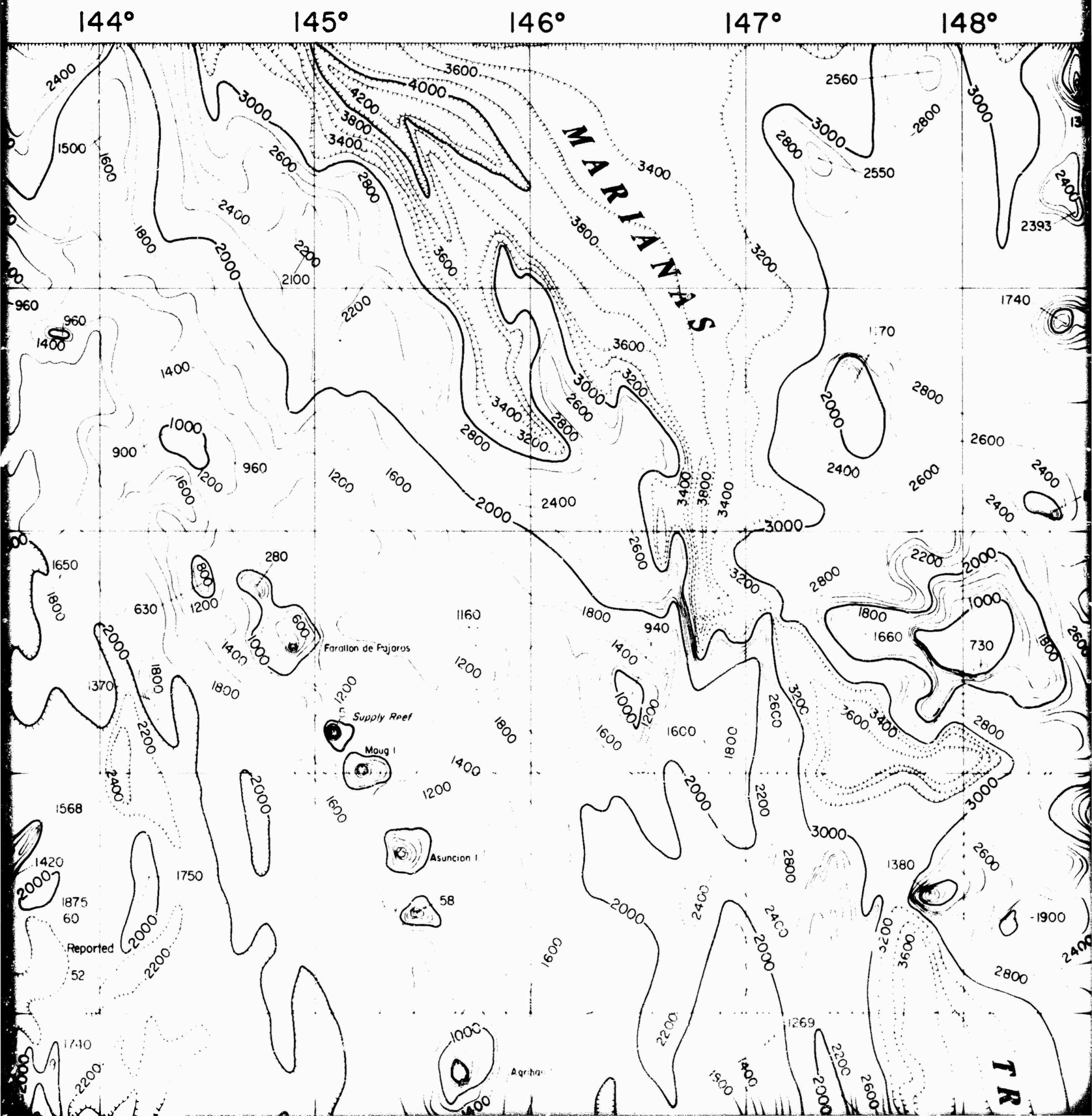
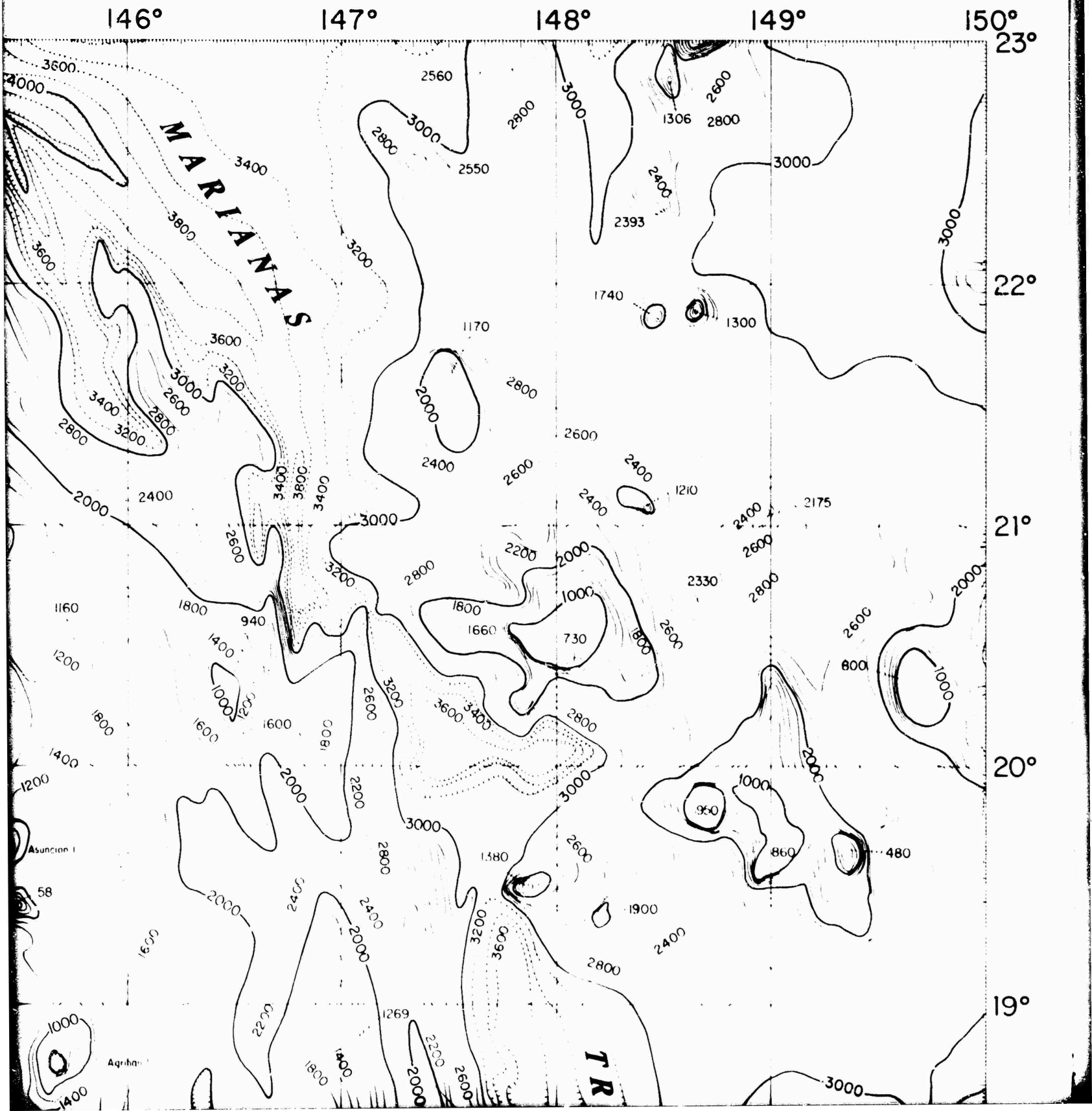
A

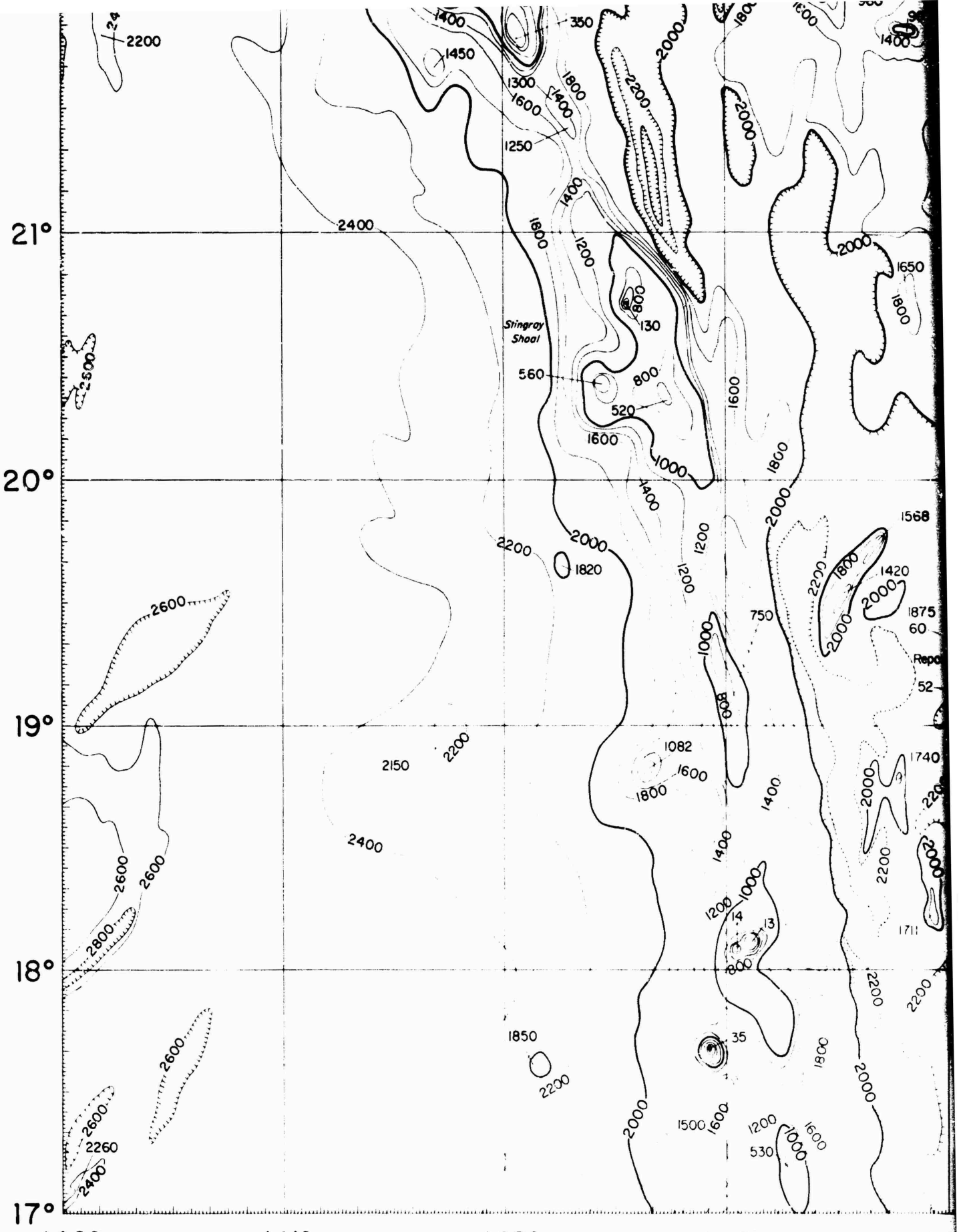


1 B


144°
145°
146°
147°
148°
MARIANAS
Farallon de Pajaros
Supply Reef
Maug I
Asuncion I
Reported
TR

C

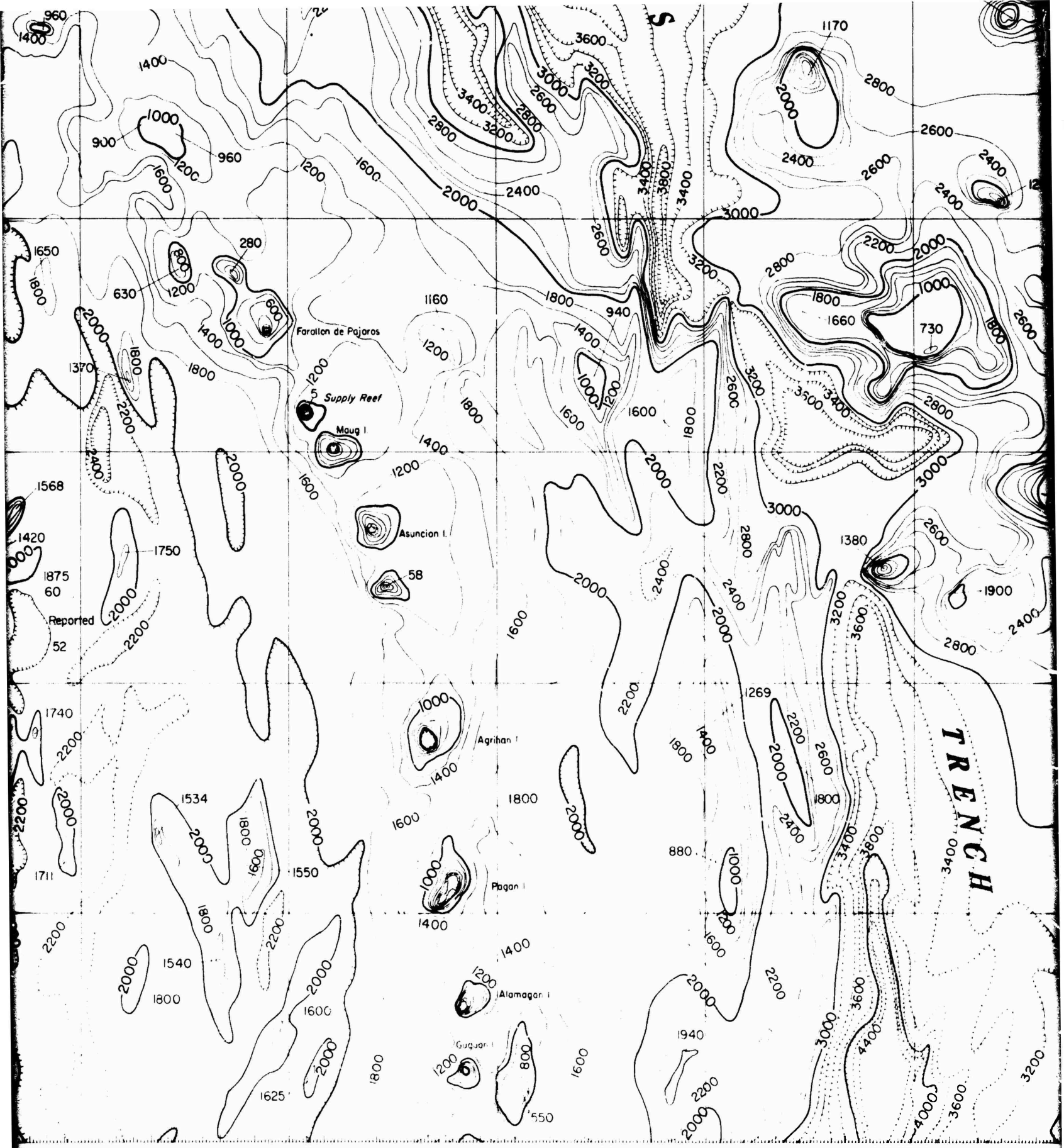

146°
147°
148°
149°
150°
23°
22°
21°
20°
19°
MARIANAS
TR
Asuncion I
Agrihan



Sources of Data: Maritime Safety Agency, Japan, Amer. or. Telephone & Telegraph, U.S. Naval Oceanographic Office, Scripps Institution of Oceanography

Contour interval - 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D



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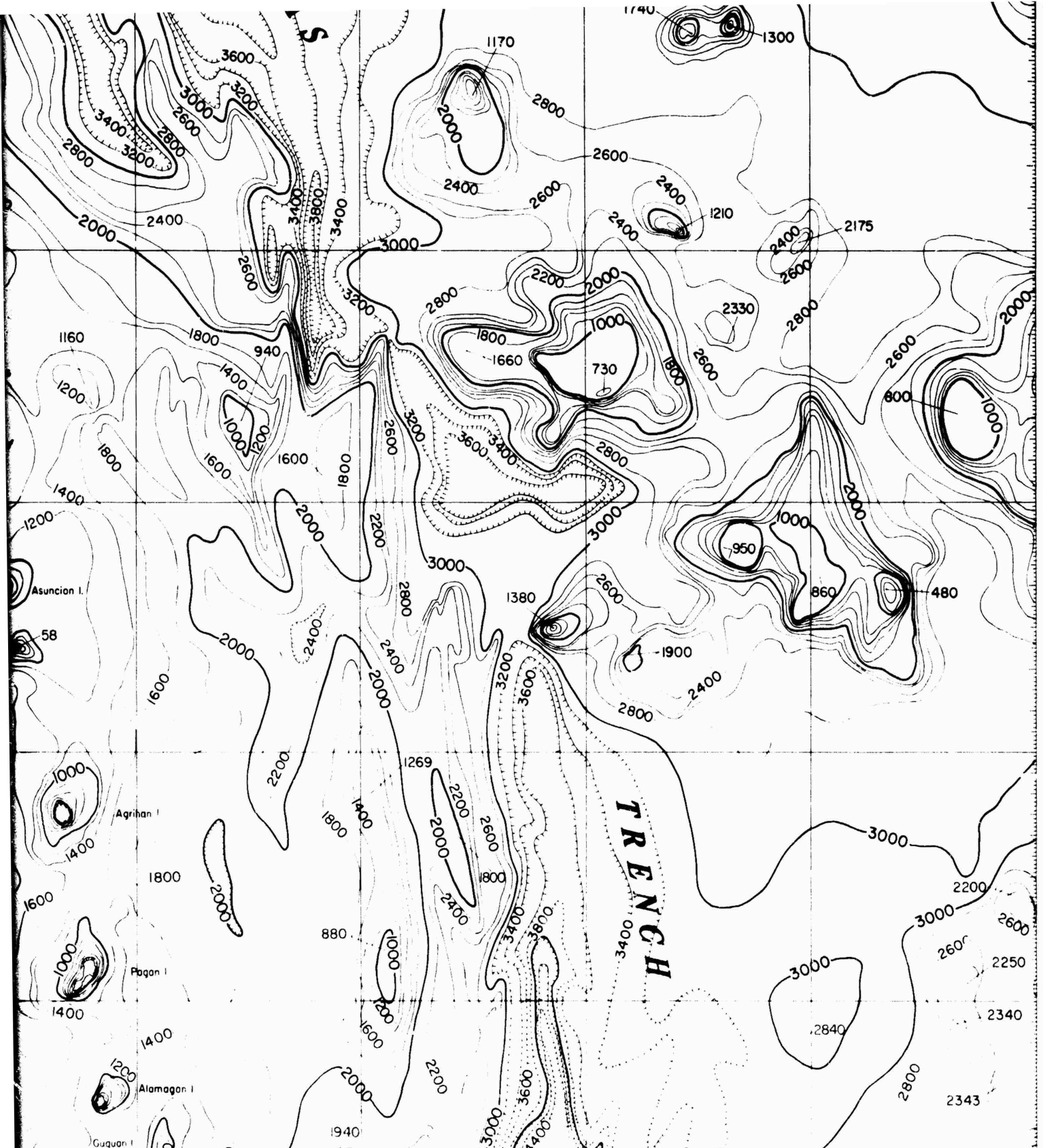

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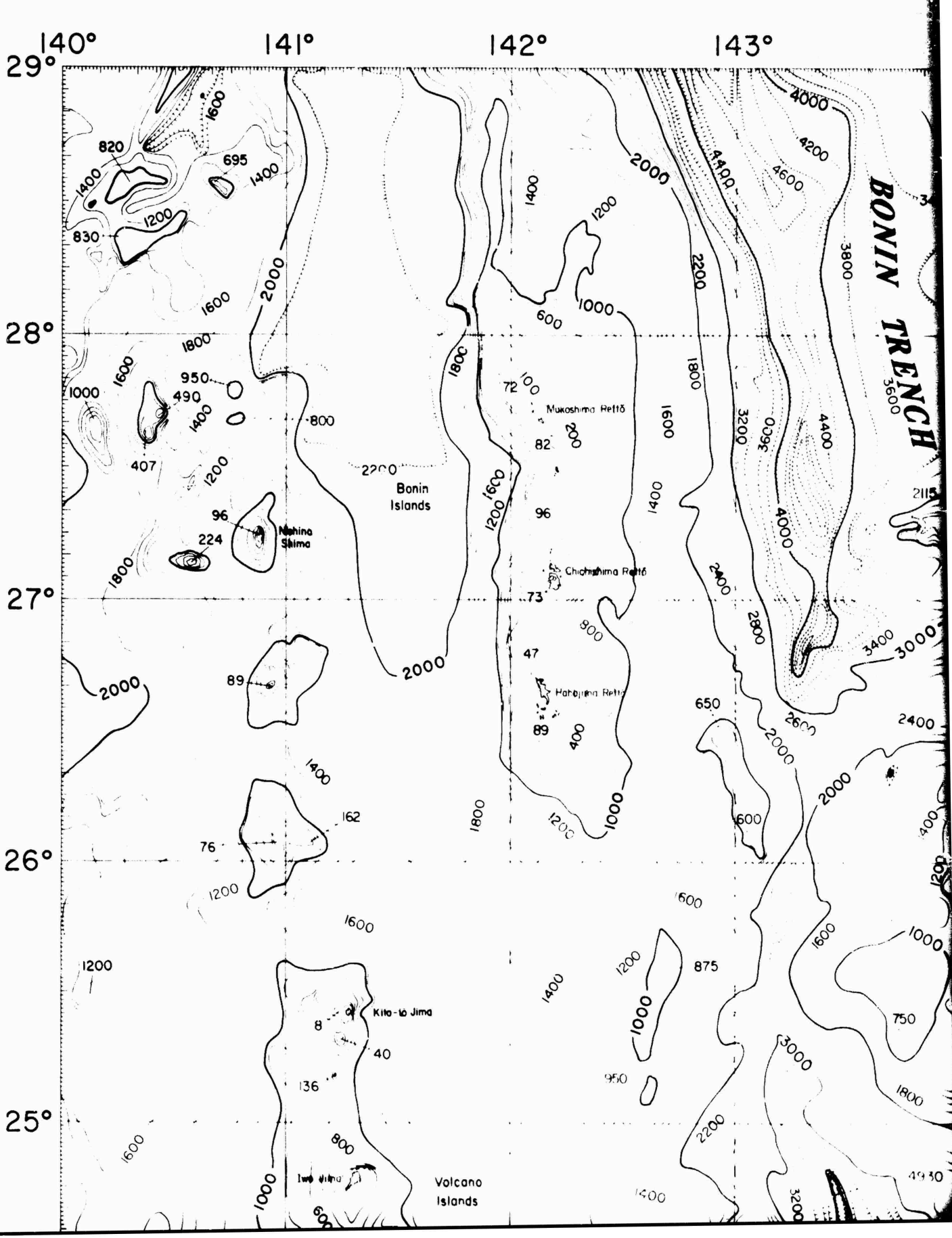
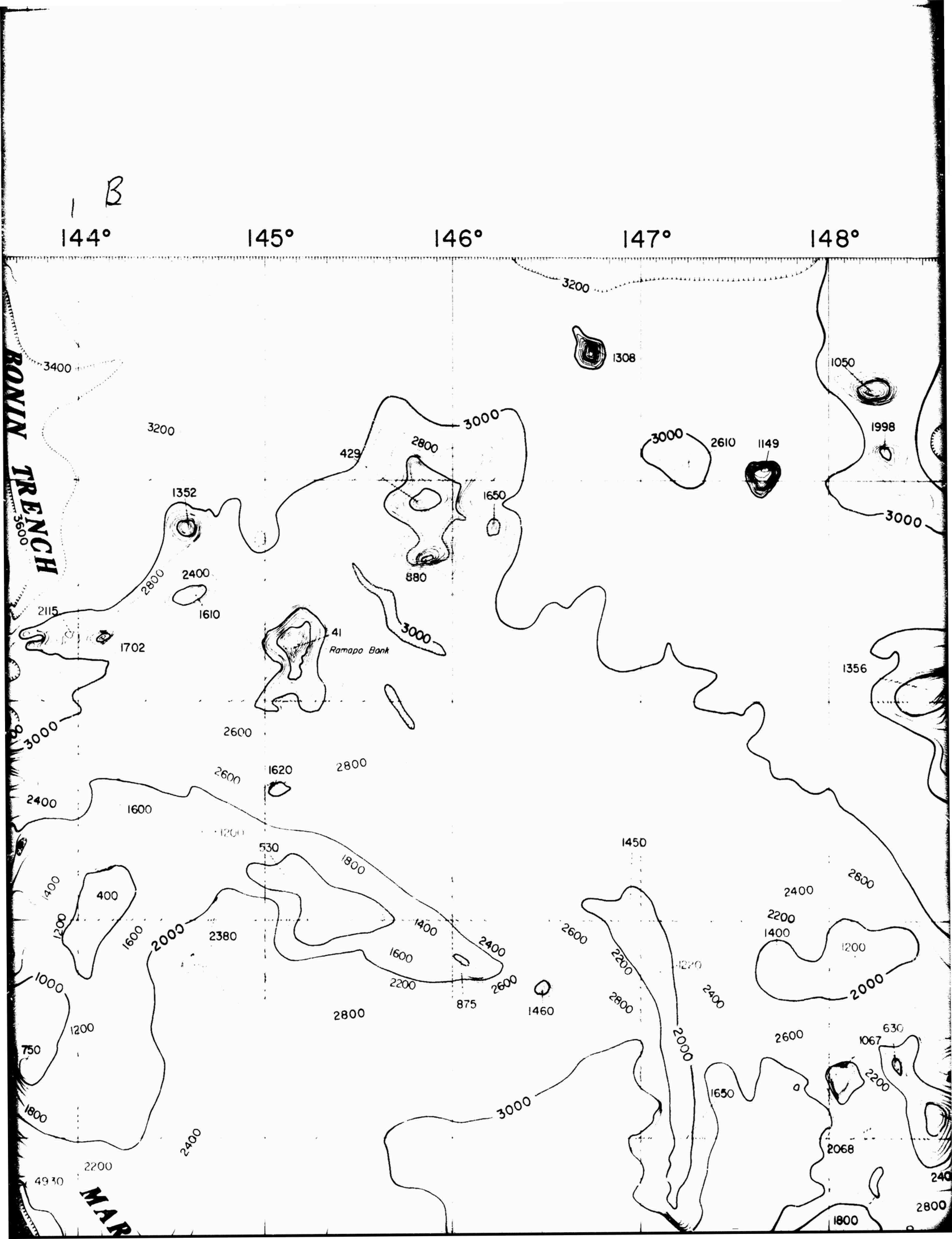
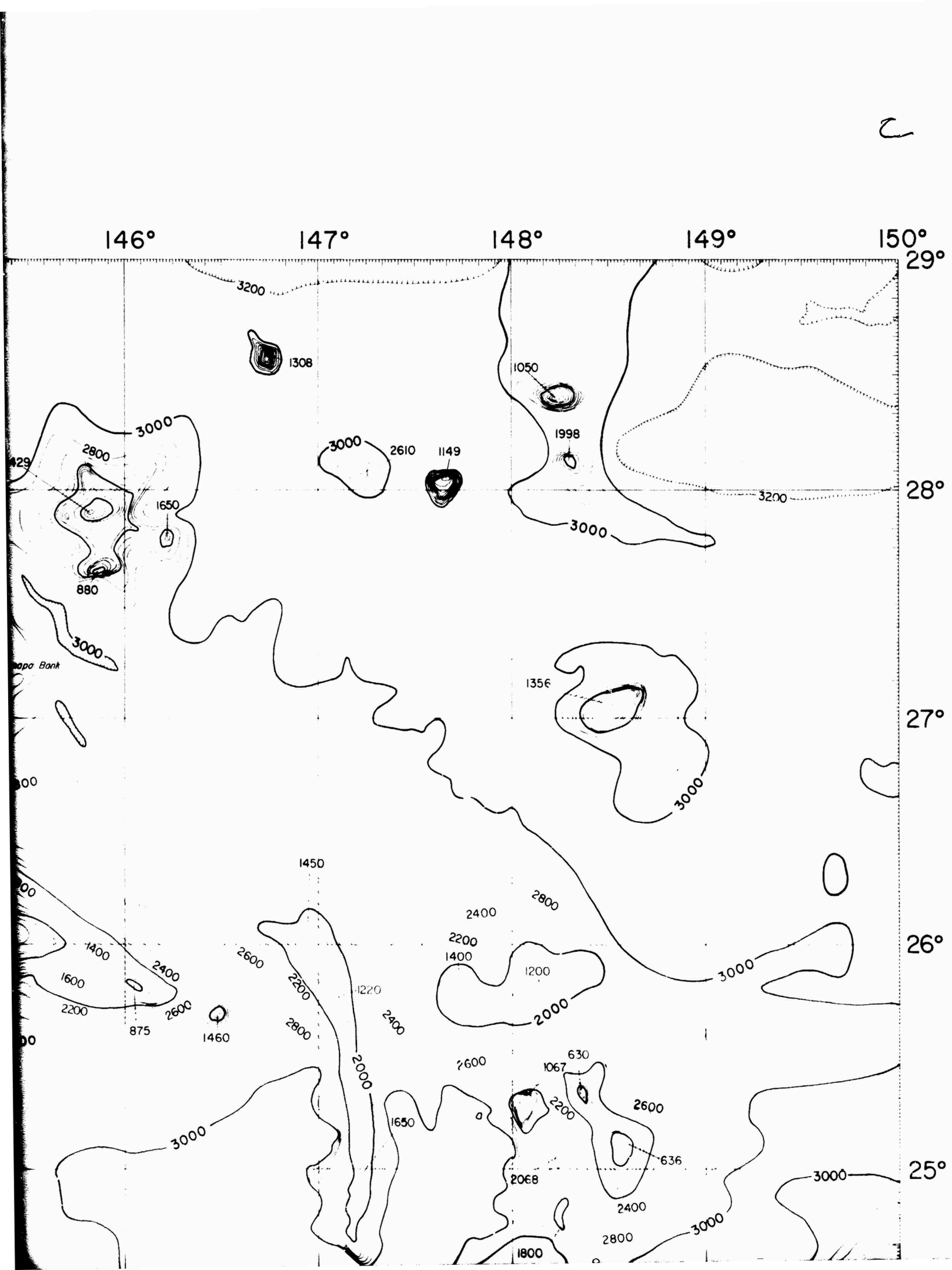
A


140°
141°
142°
143°
29°
28°
27°
26°
25°
BONIN TRENCH
Bonin Islands
Nishino Shima
Mukoshima Rettō
Chichijima Rettō
Hahajima Rettō
Kita-iō Jima
Iwo Jima
Volcano Islands
820
695
830
1400
1200
1600
2000
1800
950
490
407
1000
800
2200
96
224
72
82
73
47
89
162
76
136
40
8
875
650
600
400
200
100
3600
4000
4200
4400
4600
3800
3200
3400
3000
2800
2600
2400
2200
2115
4930

1 B


144°
145°
146°
147°
148°
BONIN TRENCH
MAR
Ramapo Bank
3200
3400
3600
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
1308
1050
1998
3000
2610
1149
429
1352
1650
880
2400
1610
2115
1702
41
1356
1620
530
1450
400
2380
875
1460
750
1067
630
1650
2068
4930


146°
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3200
1308
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1149
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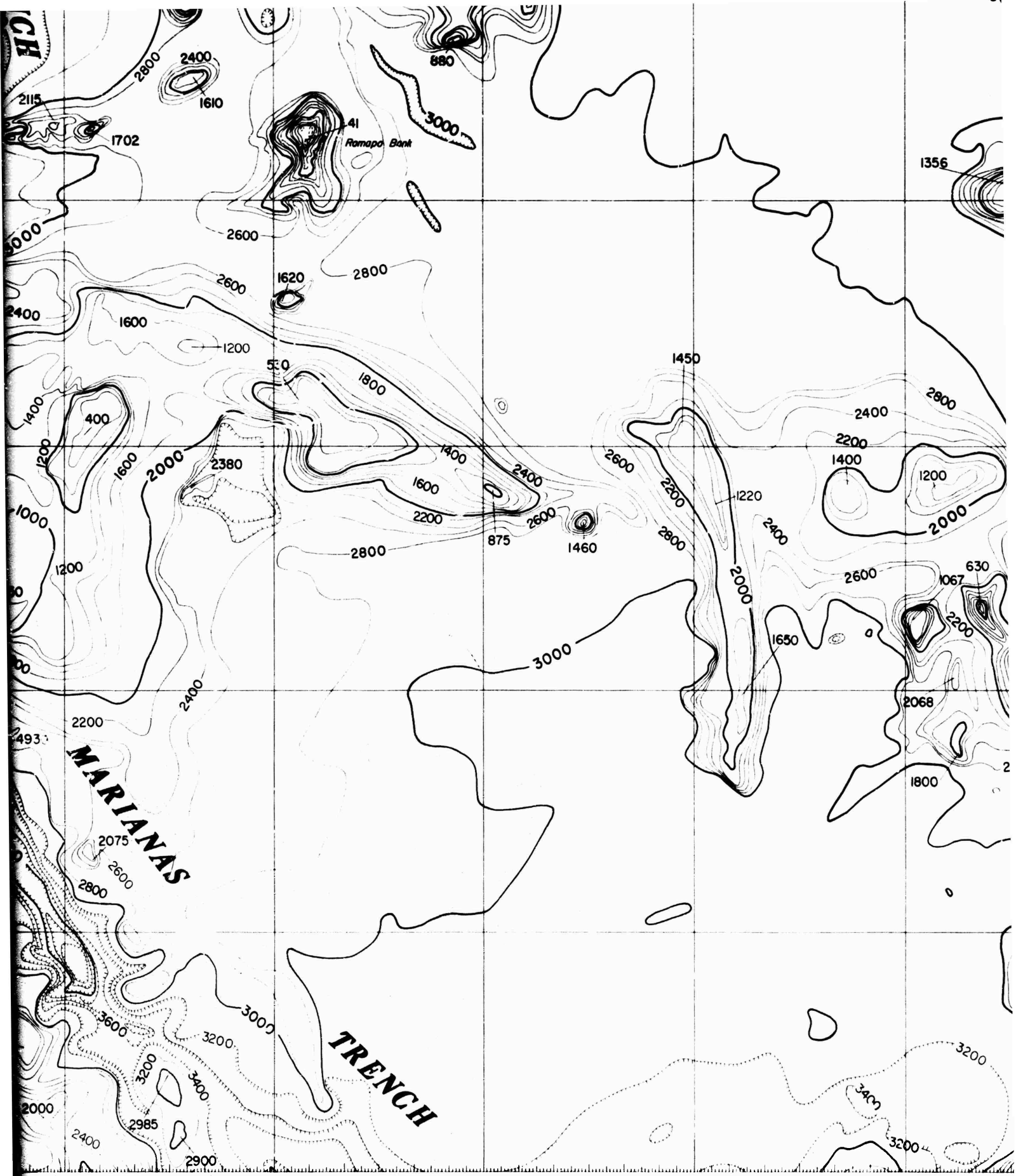
880
3200
3000
apo Bank
1356
3000
1450
2800
2400
2200
1400
1200
2000
3000
1400
2400
1600
2200
2600
875
1460
2600
2200
1220
2400
2800
2000
630
1067
2600
2200
1650
636
2068
2400
3000
3000
2800
1800

Sources of Data: U.S. Naval Oceanographic Office, Wash., D.C., U.S.A.; Maritime Safety Agency, Japan; Scripps Institution of Oceanography

Contour interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Assisted by: [illegible]

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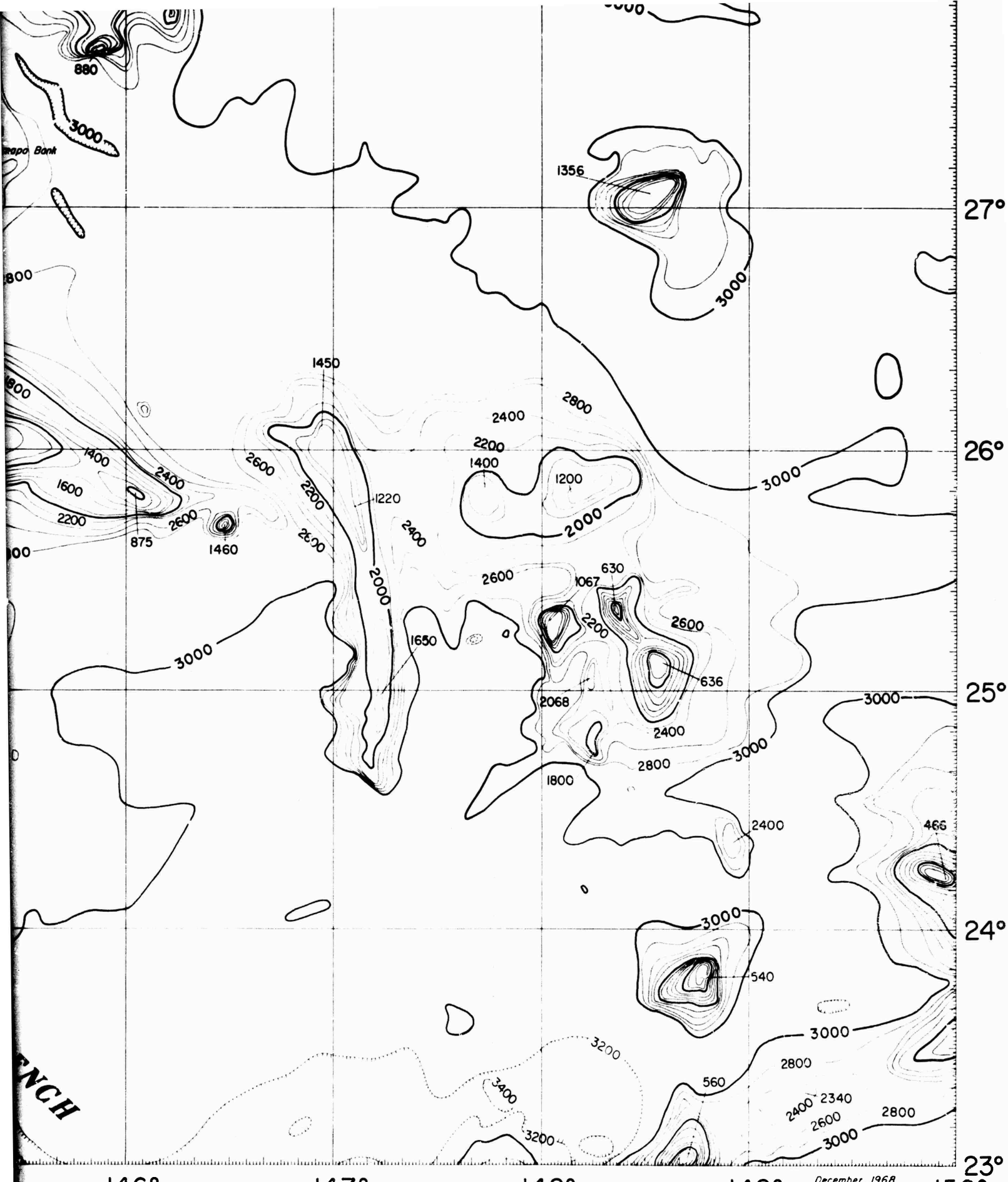
1 E



December, 1968

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Assisted by: [illegible]

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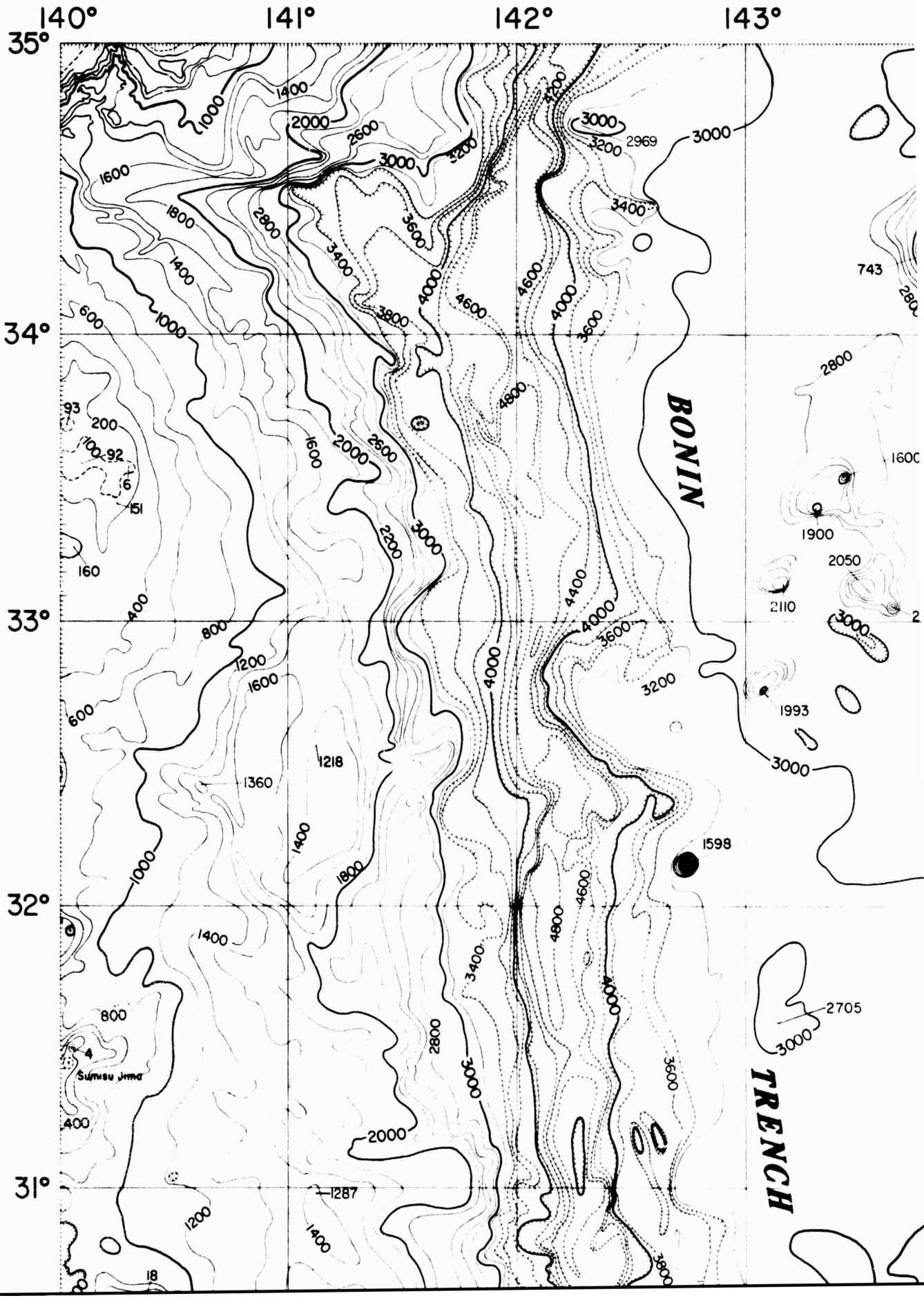
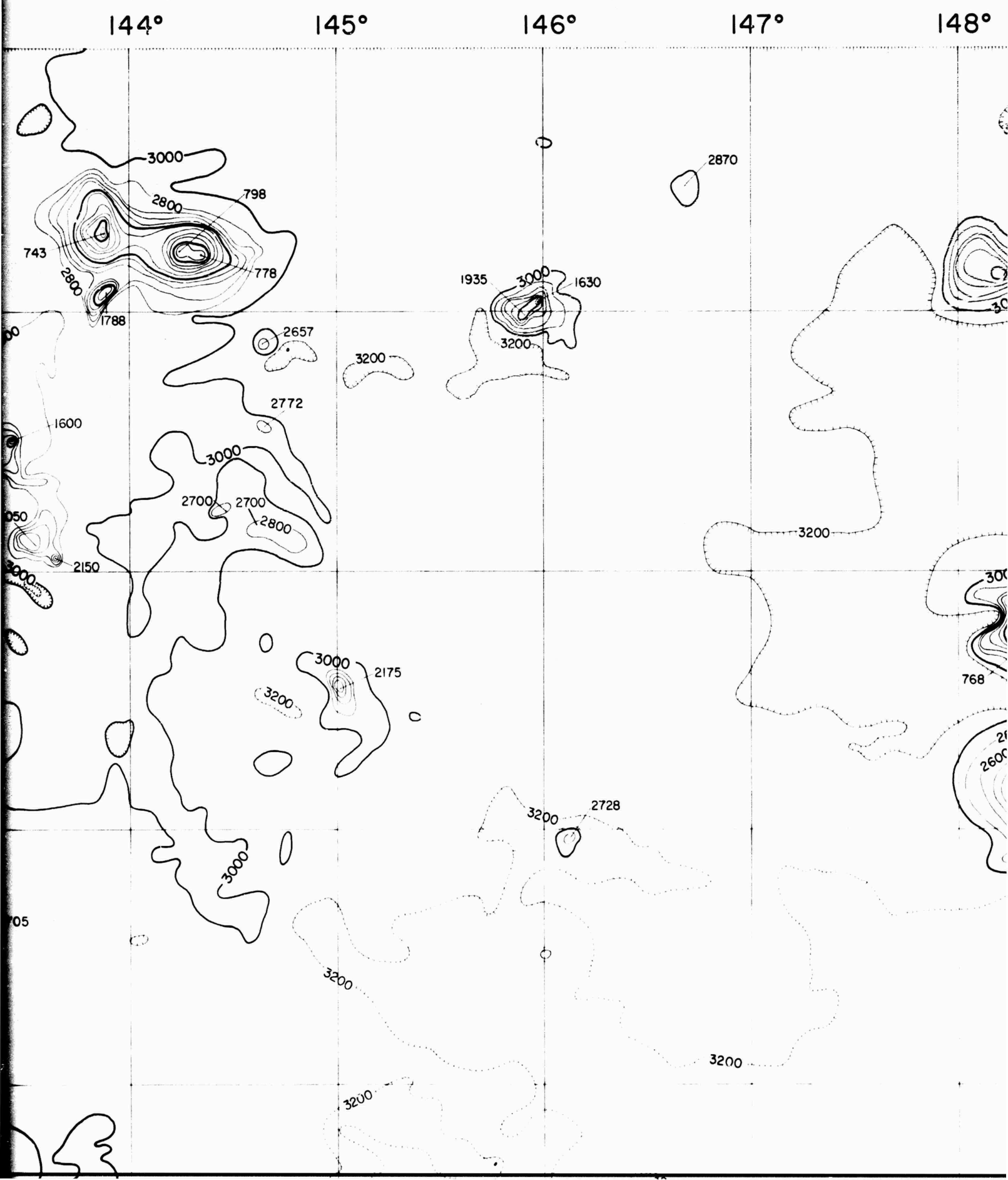
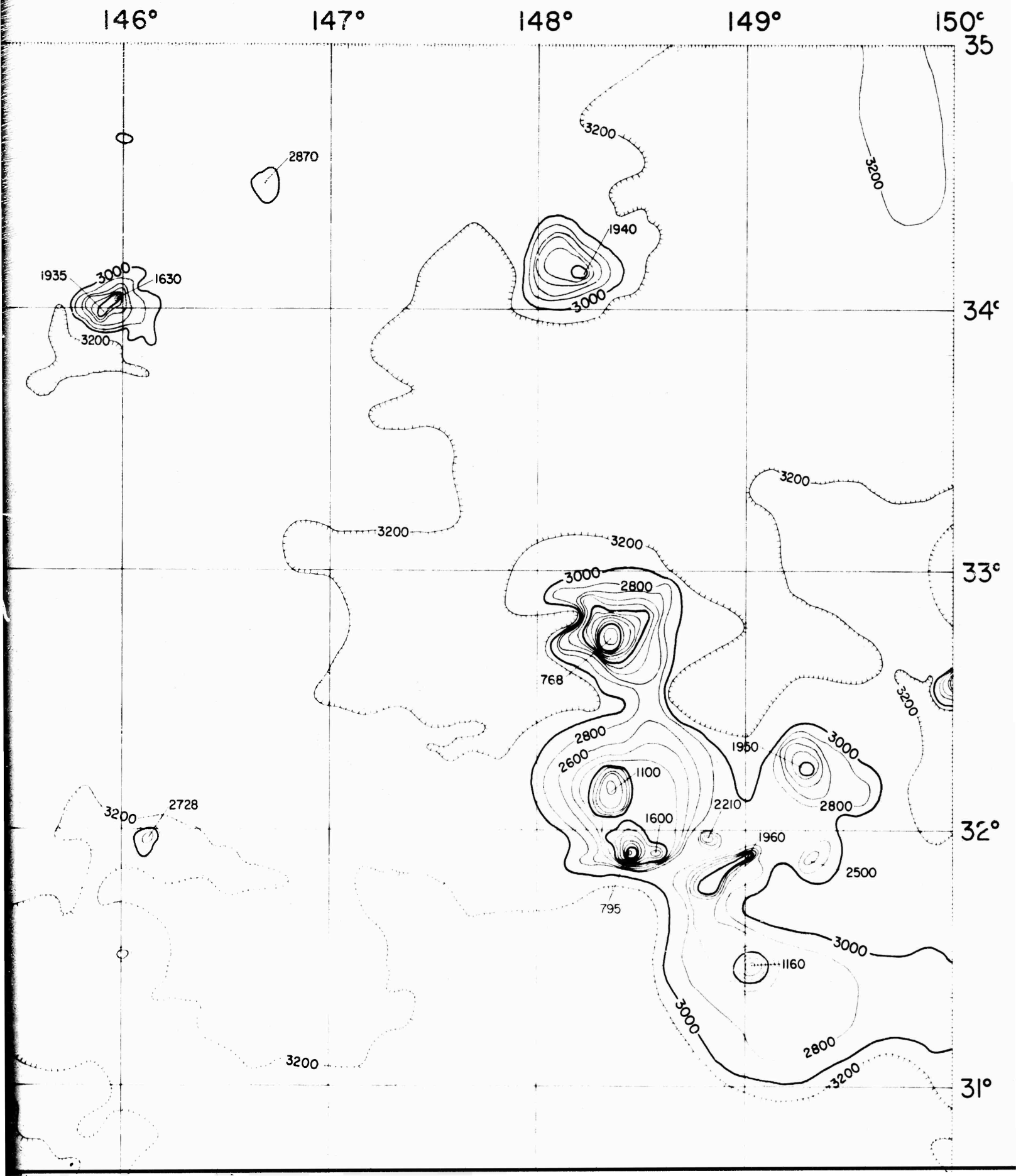
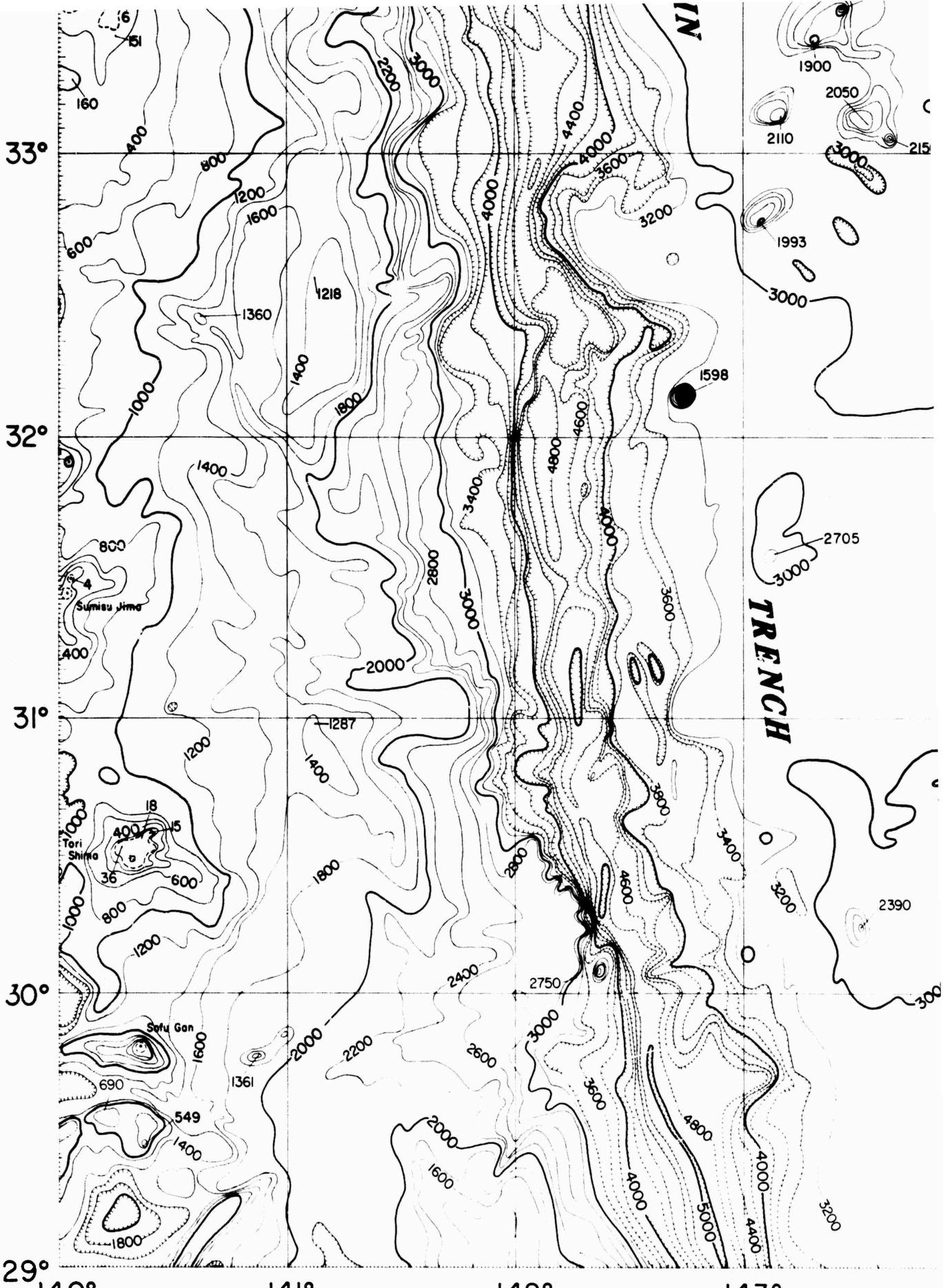
A

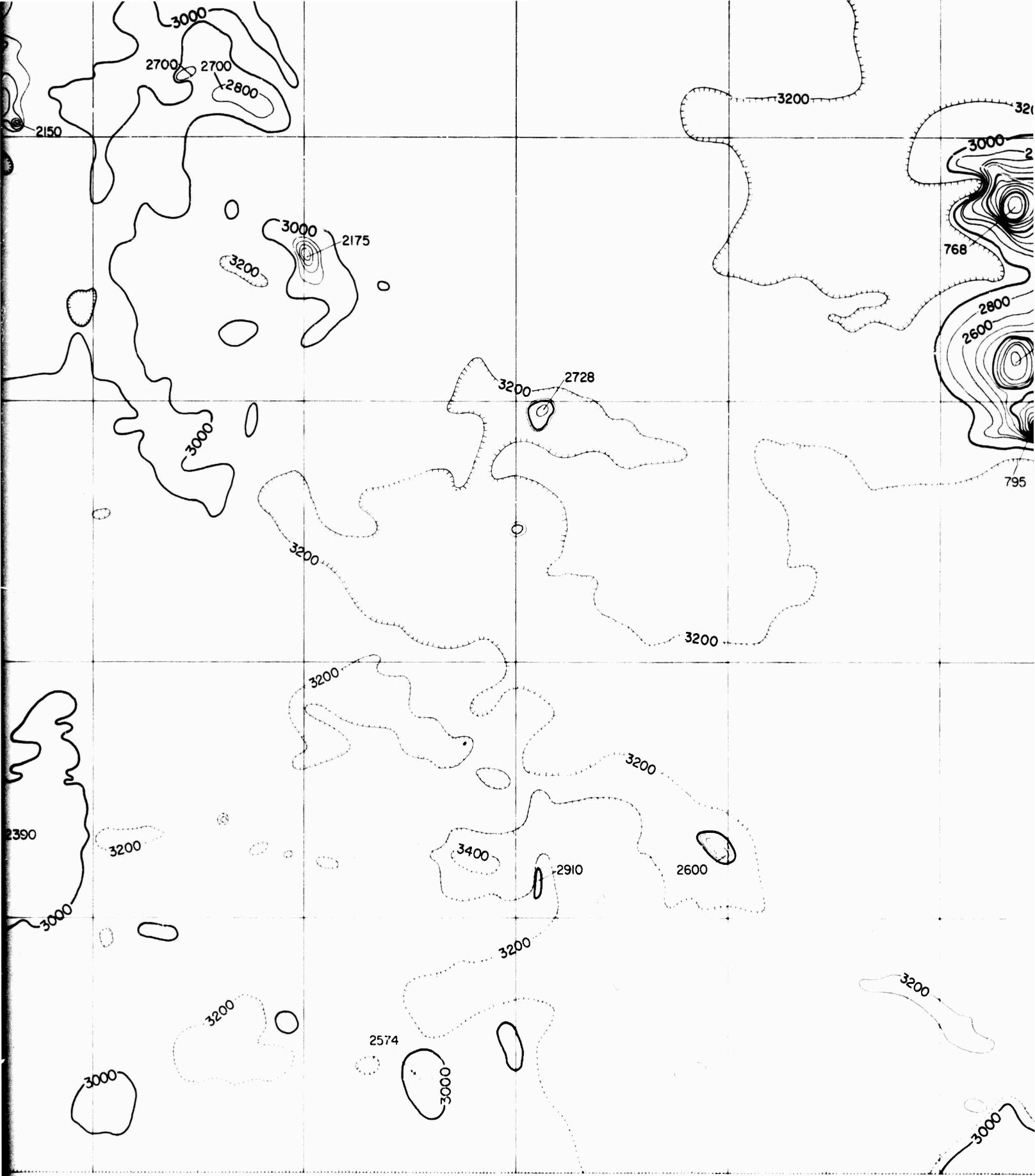

140°
141°
142°
143°
35°
34°
33°
32°
31°
BONIN
TRENCH
Sumisu Jima
1000
1400
2000
2600
3000
3200
2969
1600
1800
2800
3400
3600
4000
4600
4200
3800
600
93
200
100
92
6
151
160
400
800
1200
1218
1360
1598
1900
2050
2110
1993
2705
743
4800
4400
1287
18

1B


144°
145°
146°
147°
148°
3000
798
2800
743
778
2800
1788
2657
3200
2772
1600
3000
2700
2700
2800
2150
3000
2175
3200
3000
705
3200
2728
3200
3200
3200
2870
1935
3000
1630
3200
3200
768


146°
147°
148°
149°
150°
35
34°
33°
32°
31°
2870
3200
1940
3000
1935
1630
3200
3200
3200
3200
3000
2800
768
2800
2600
1100
1600
1950
3000
2800
2210
1960
2500
3200
2728
3200
795
3000
1160
3000
2800
3200
3200
3200


33°
32°
31°
30°
29°
140°
141°
142°
143°
TRENCH
Sumisu Jima
Tori Shima
Sofu Gan
1218
1360
1598
1287
1361
1993
2705
2390
2750
1900
2050
2110
3000
4000
5000
Sources of Data: U.S. Naval Oceanographic Office, R/V Vitaz, U.S.S.R., Maritime Safety Agency, Japan, F.P. Shepard, 1964, Scripps Institution of Oceanography
Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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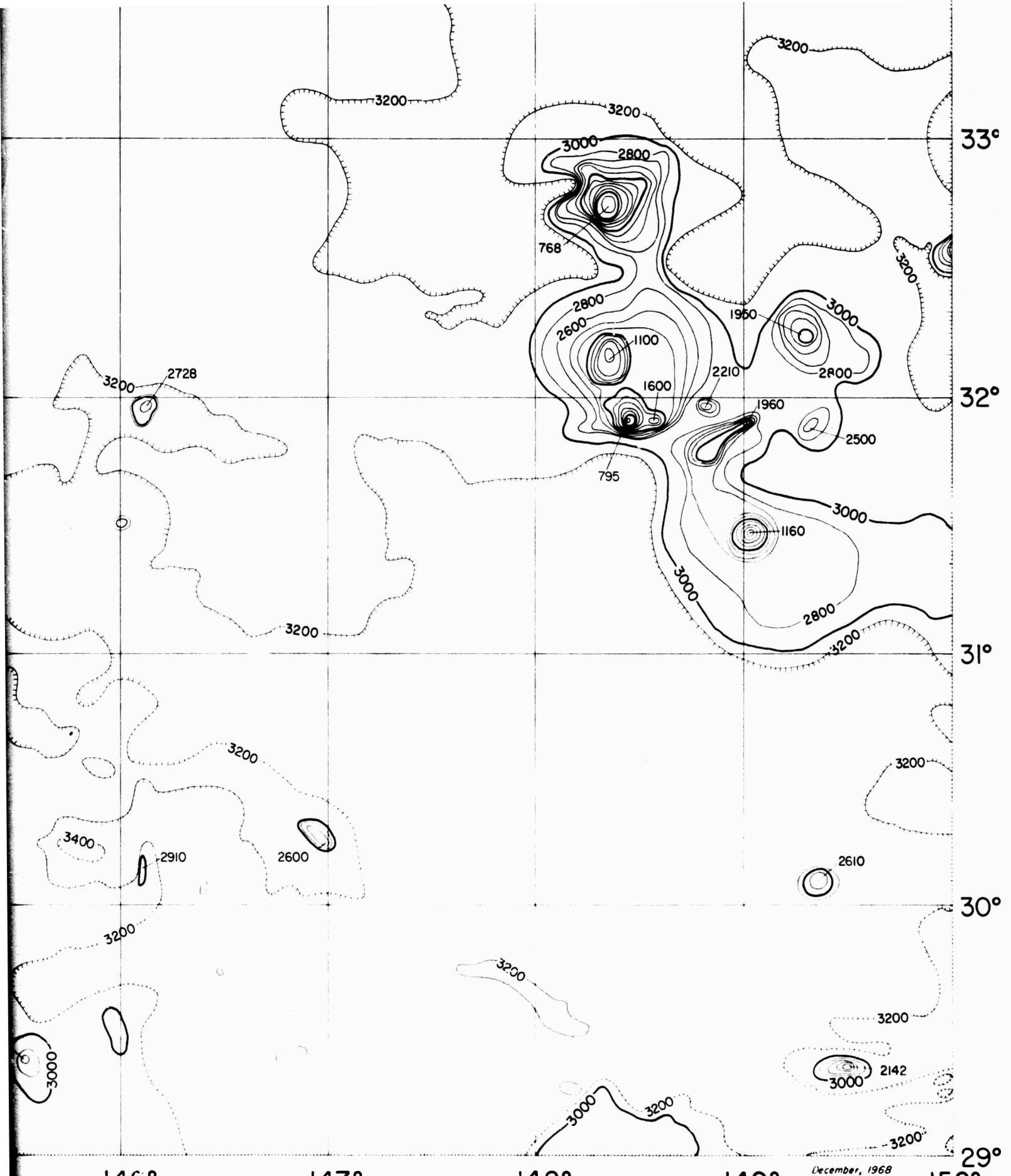
1 E



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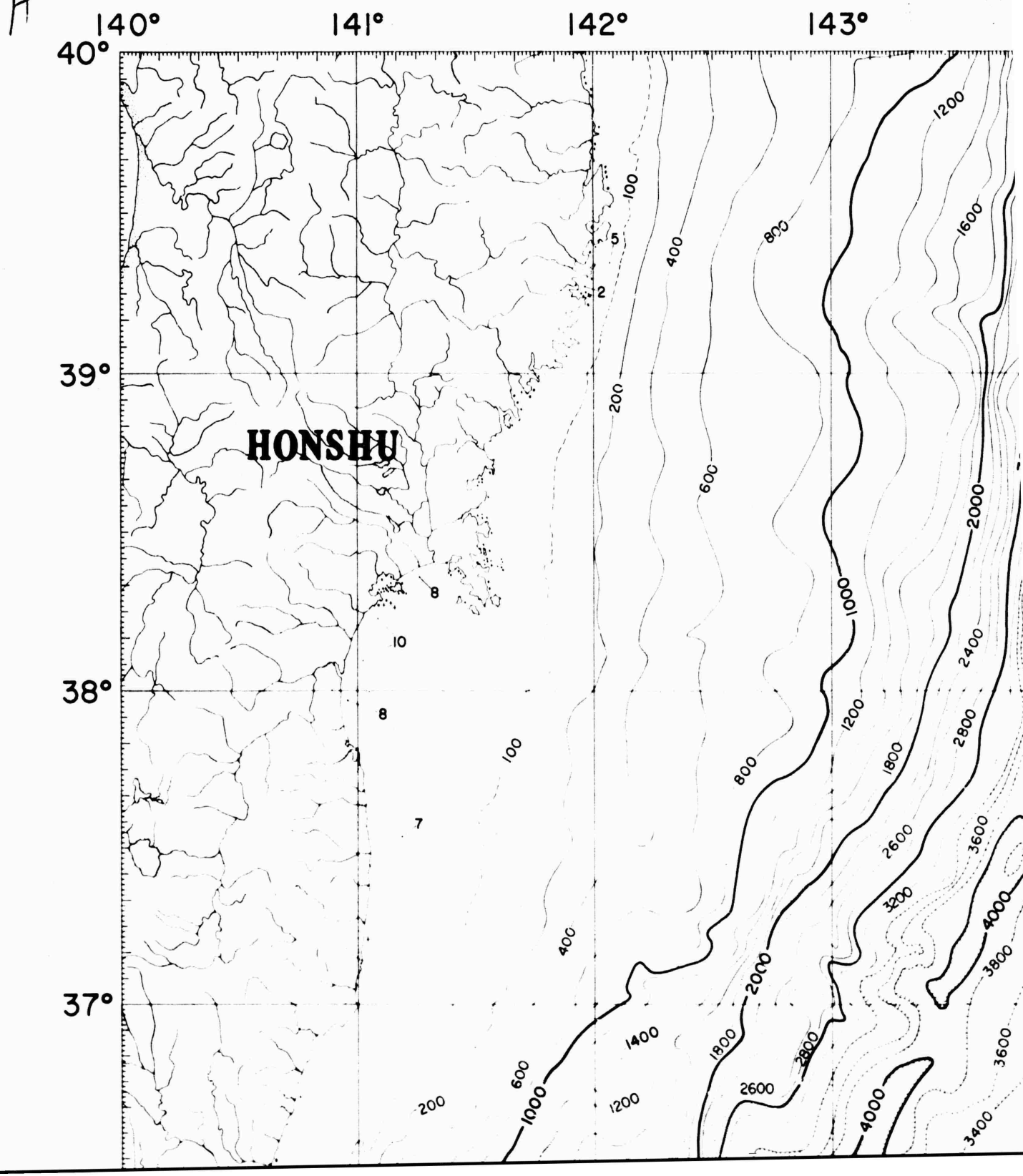
A


140°
141°
142°
143°
40°
39°
38°
37°
HONSHU
100
400
800
1200
1600
200
600
1000
2000
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2800
1800
2600
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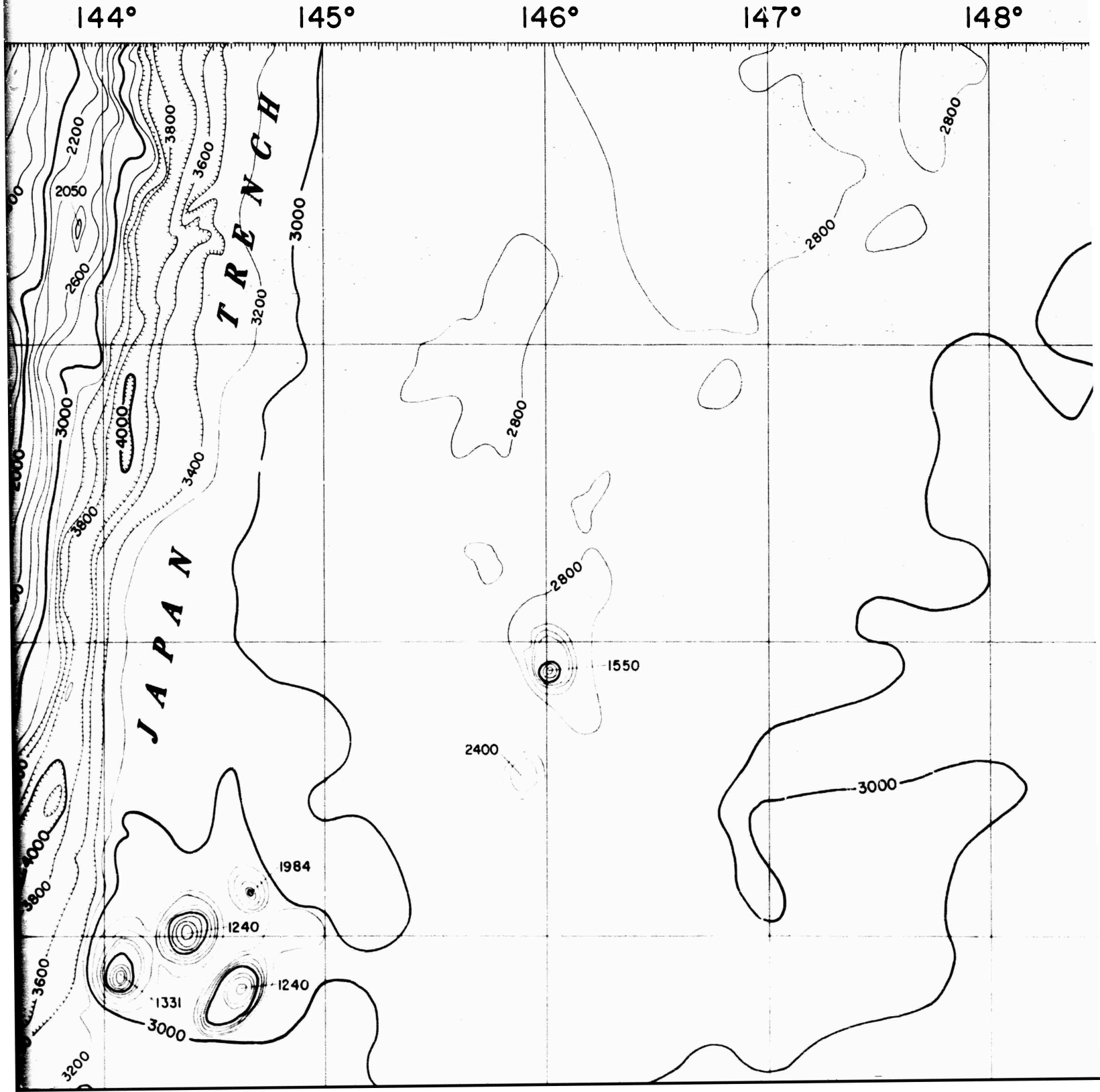
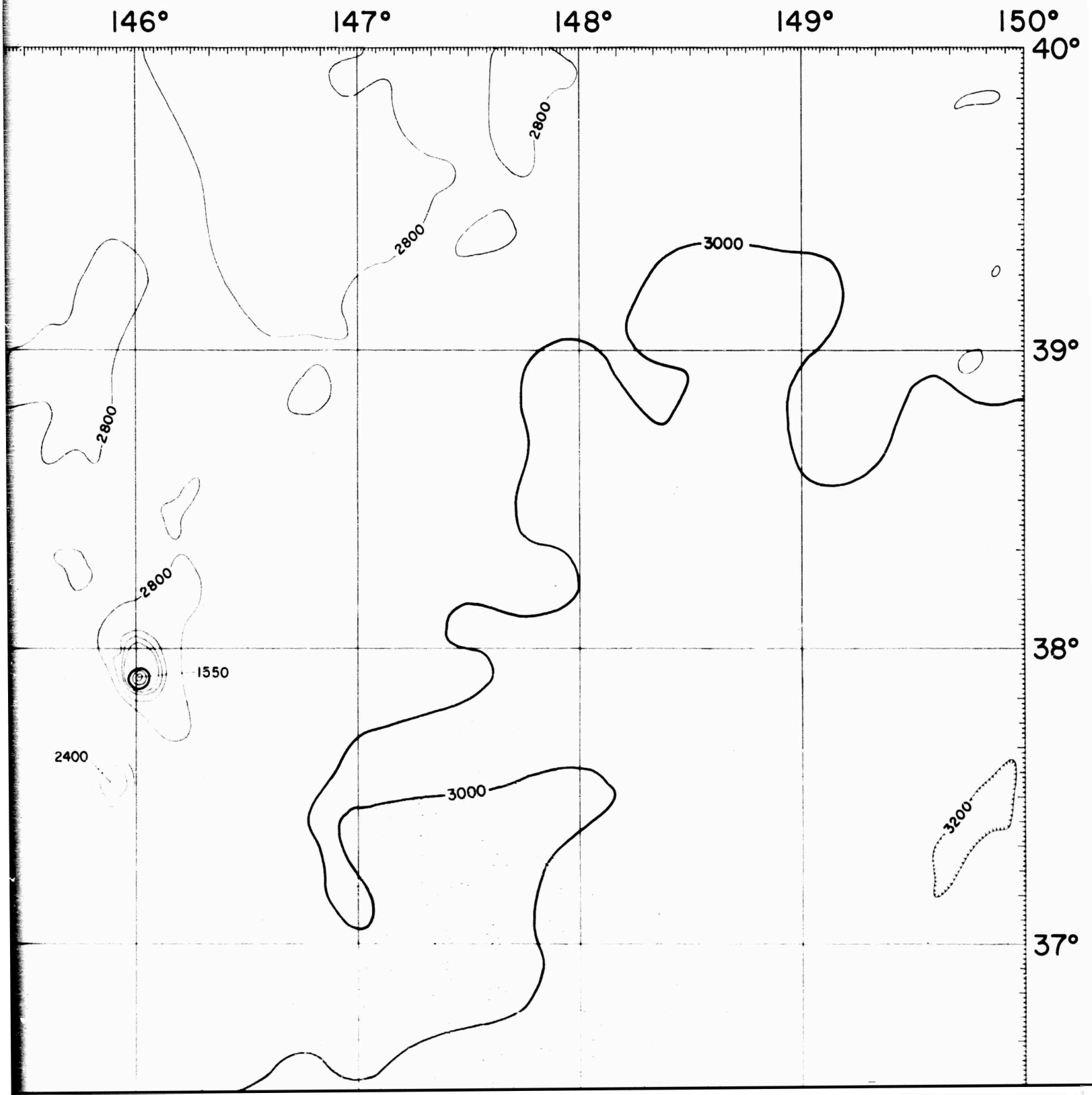
3600
4000
3800
1400
3400
5
2
8
10
7

B


144°
145°
146°
147°
148°
JAPAN TRENCH
2200
2050
2600
3000
3800
3600
3200
4000
3400
2800
2800
2800
2800
1550
2400
3000
1984
1240
1240
1331
3000
3200
3600
3800
4000

C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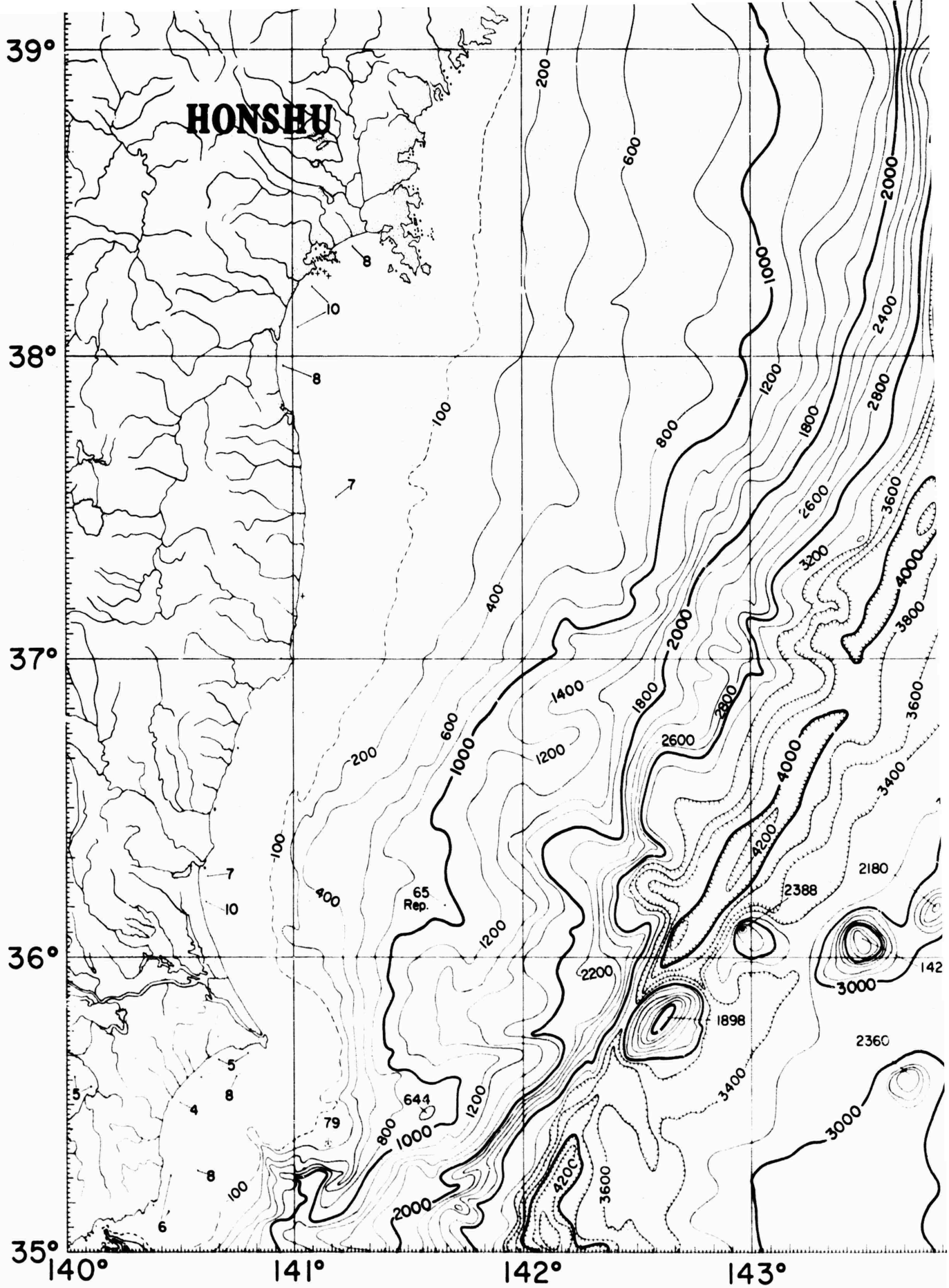

Sources of Data: U.S. Naval Oceanographic Office, H/V Vitiaz, U.S.S.R., Maritime Safety Agency, Japan. F.P. Shepard, 1964, Scripps Institution of Oceanography, World Aeronautical Charts

Contour Interval = 200 fathoms, uncorrected with 100 fathom contour dashed where applicable

D

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Assisted by [illegible]

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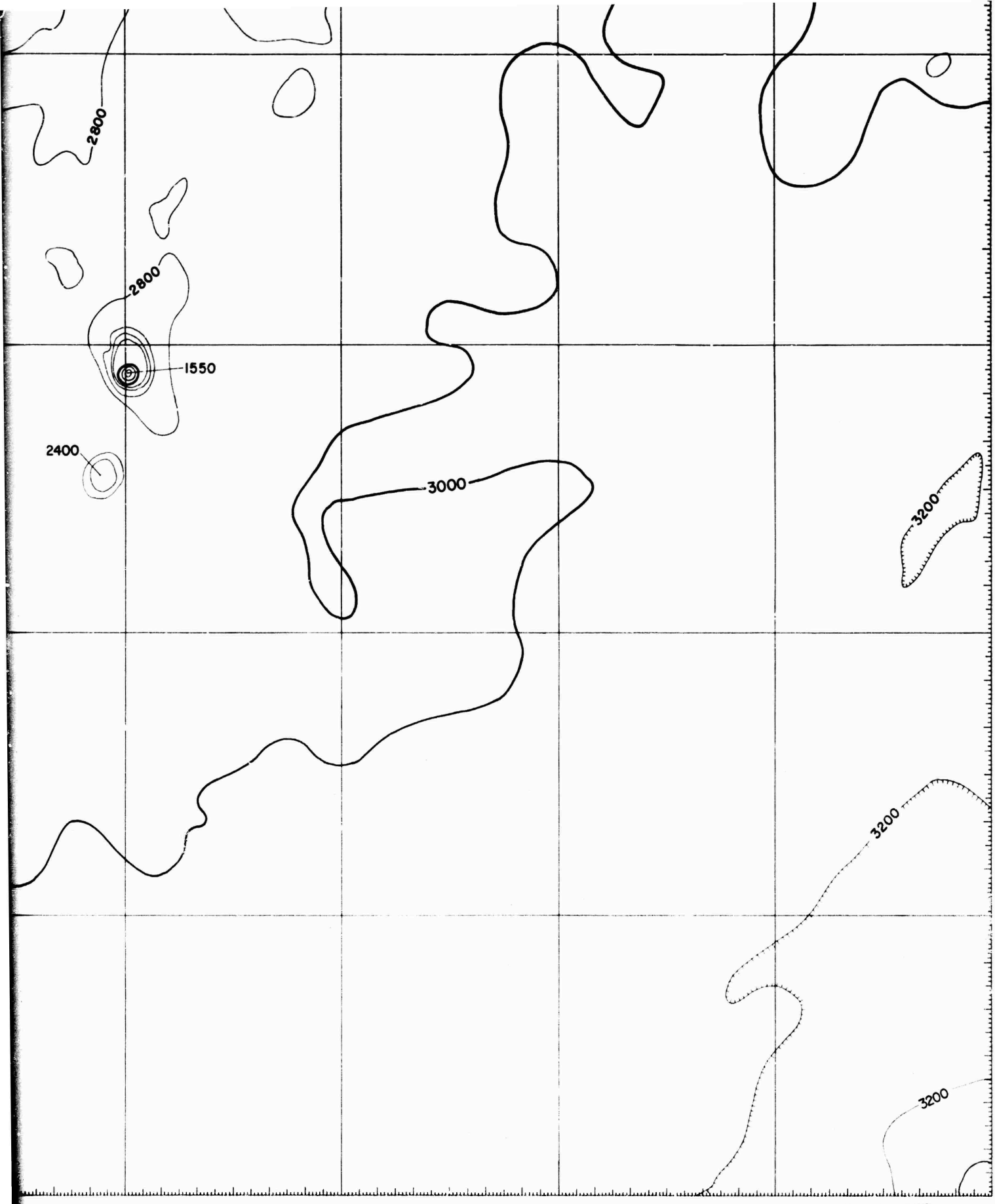
1 E



December, 1968

BANOGRAPHY

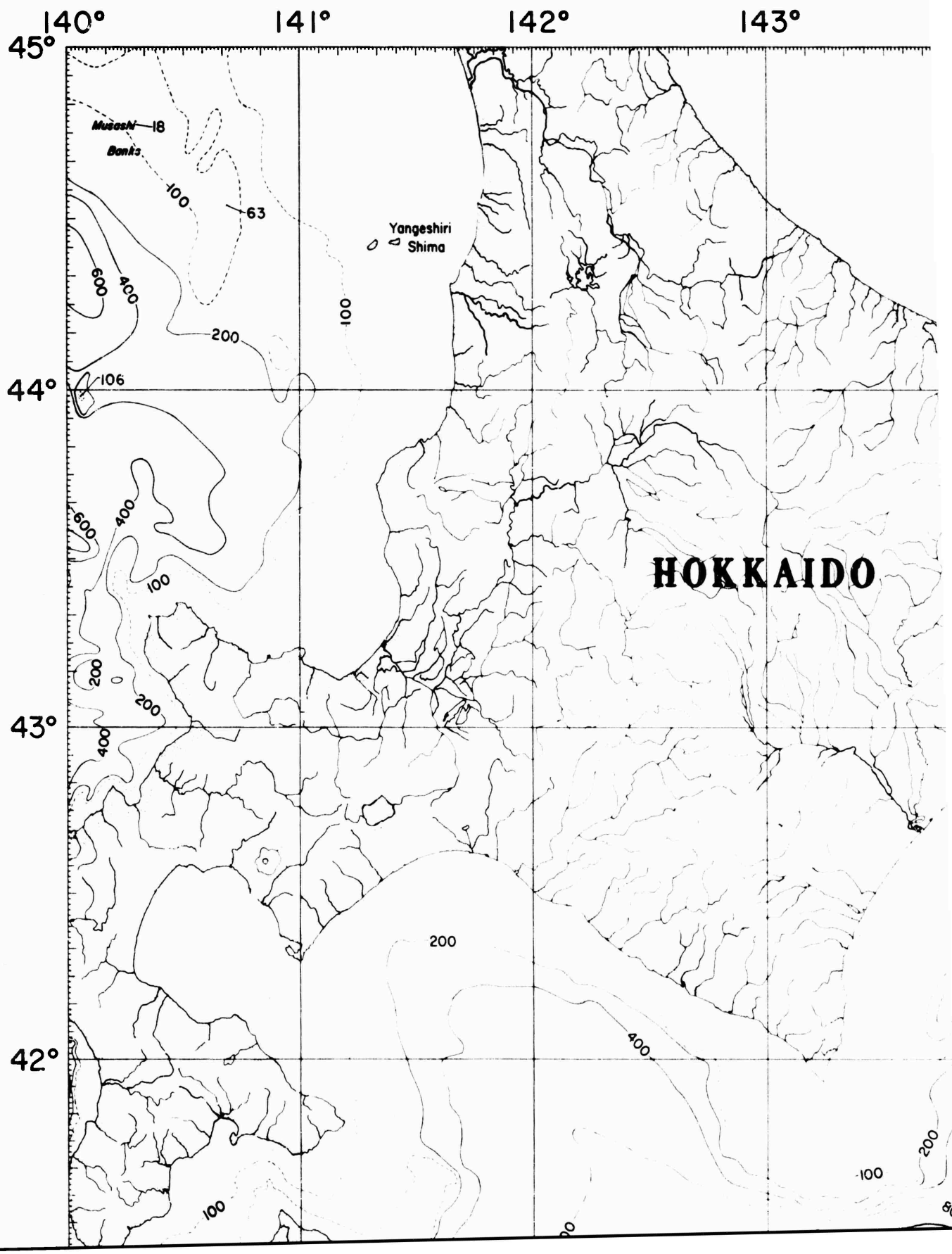
Contoured by: [illegible]

Assisted by: [illegible]

Do Not Use For Navigation

No. 2207 N 33

F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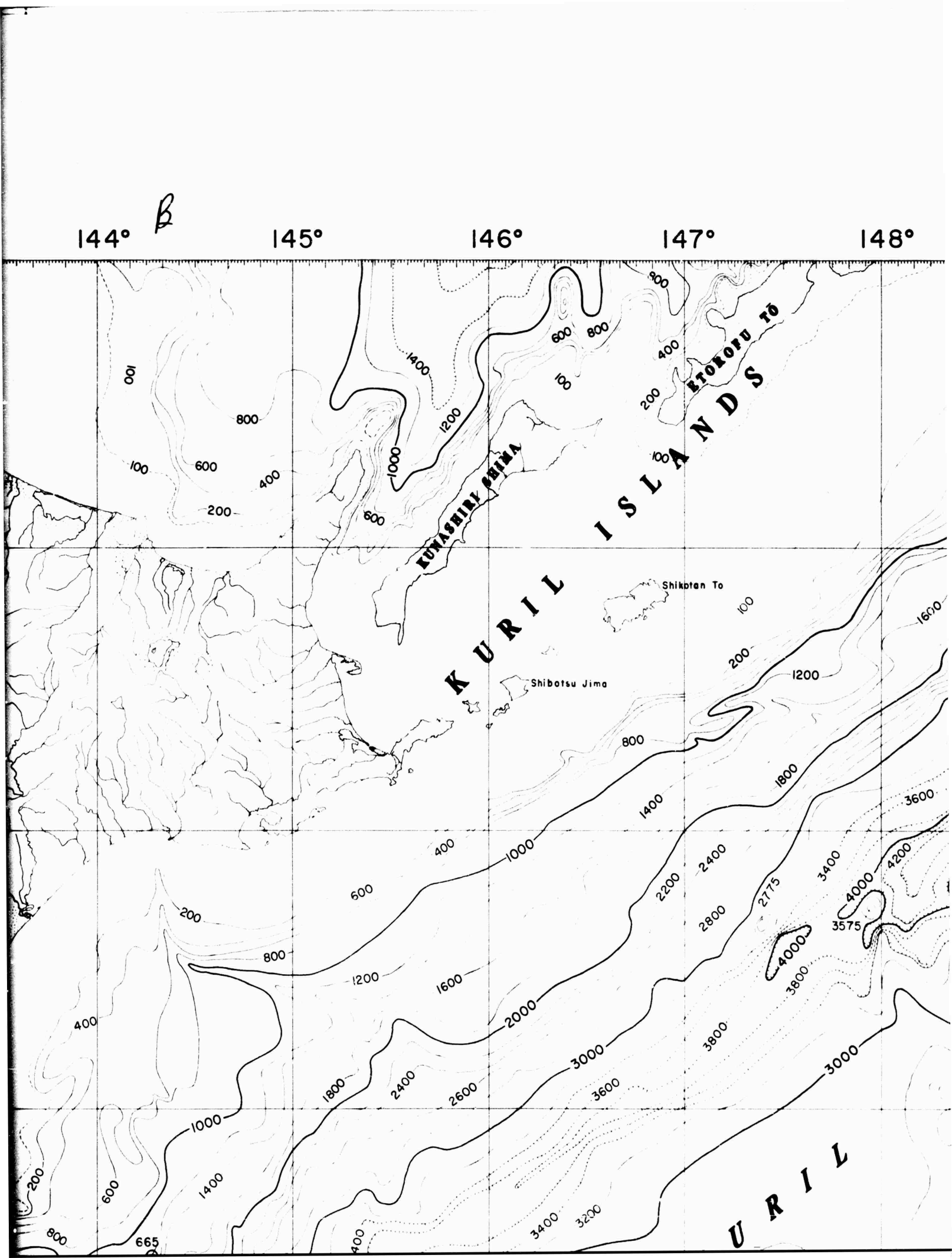
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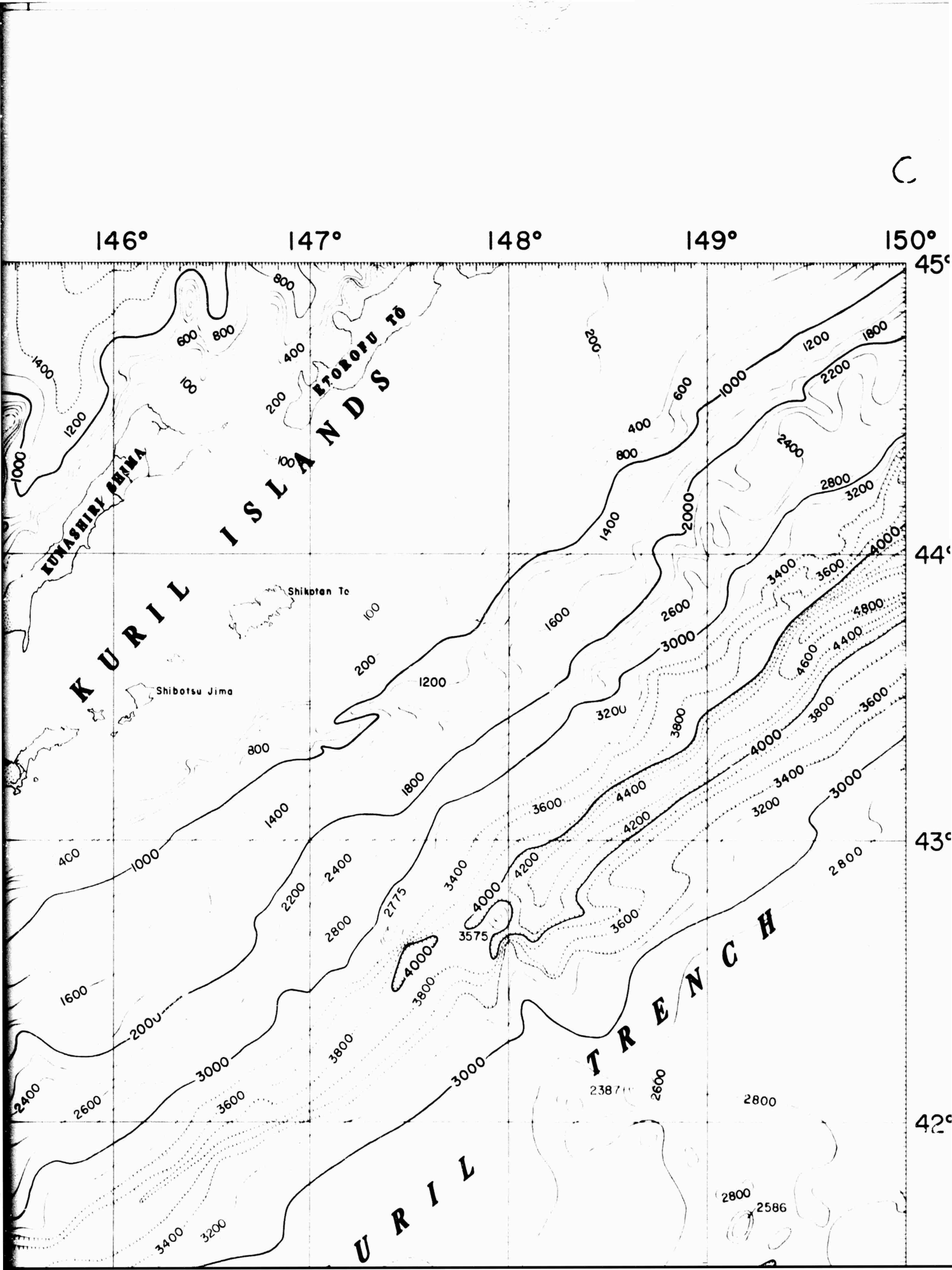
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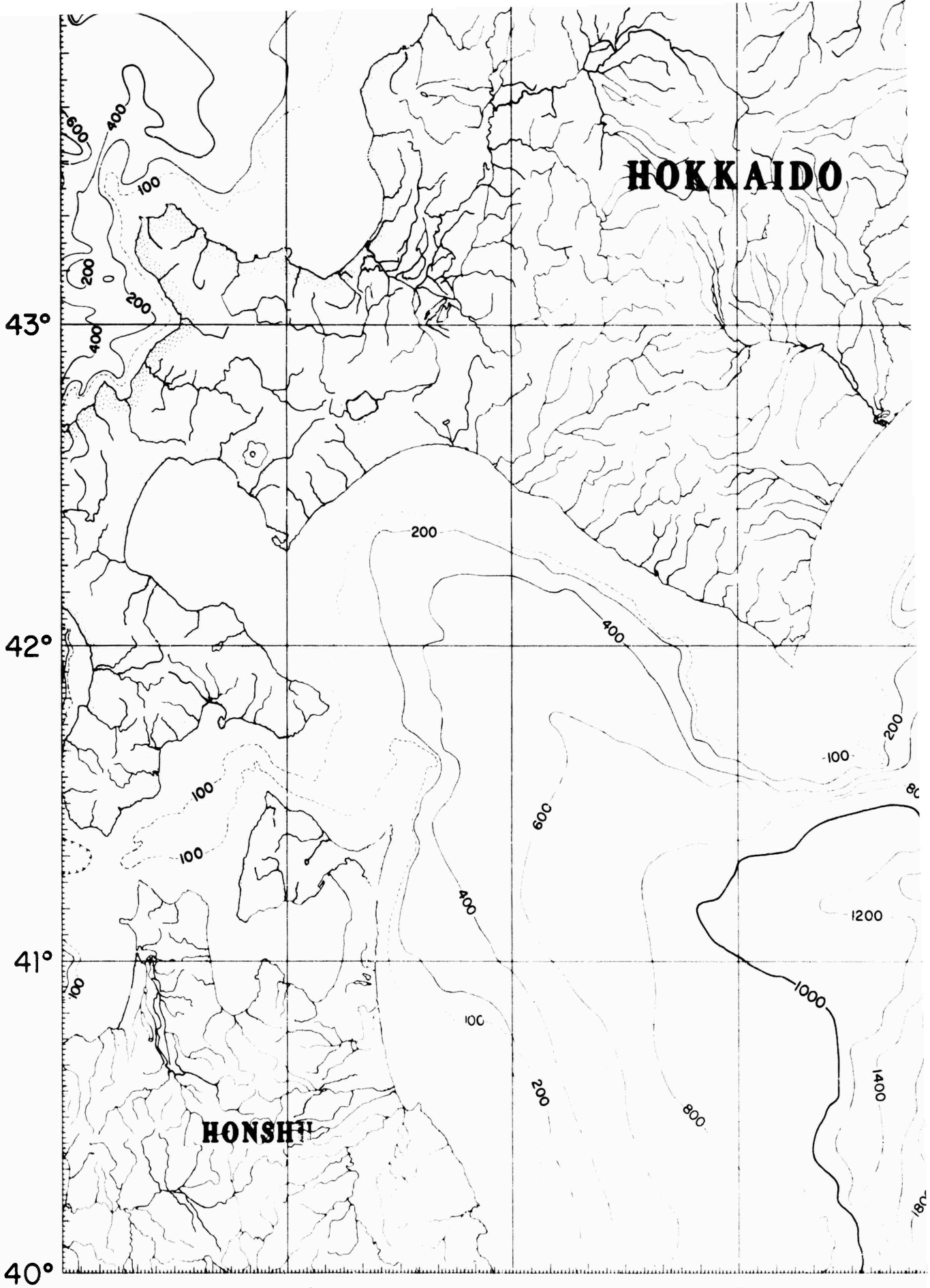
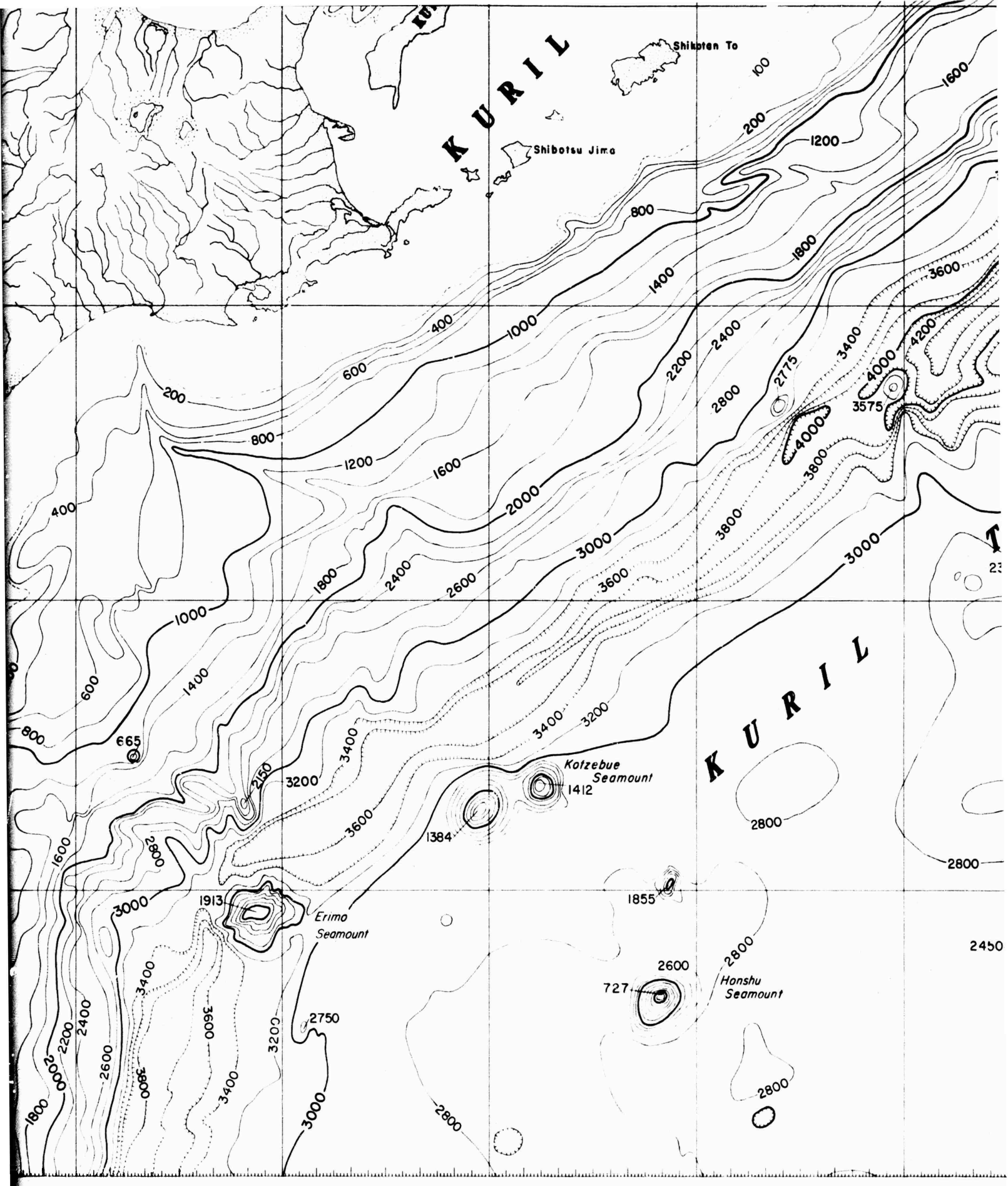


Sources of Data: U.S. Naval Oceanographic Office, Ministry of Geology of U.S.S.R. Maritime Safety Agency, Japan, Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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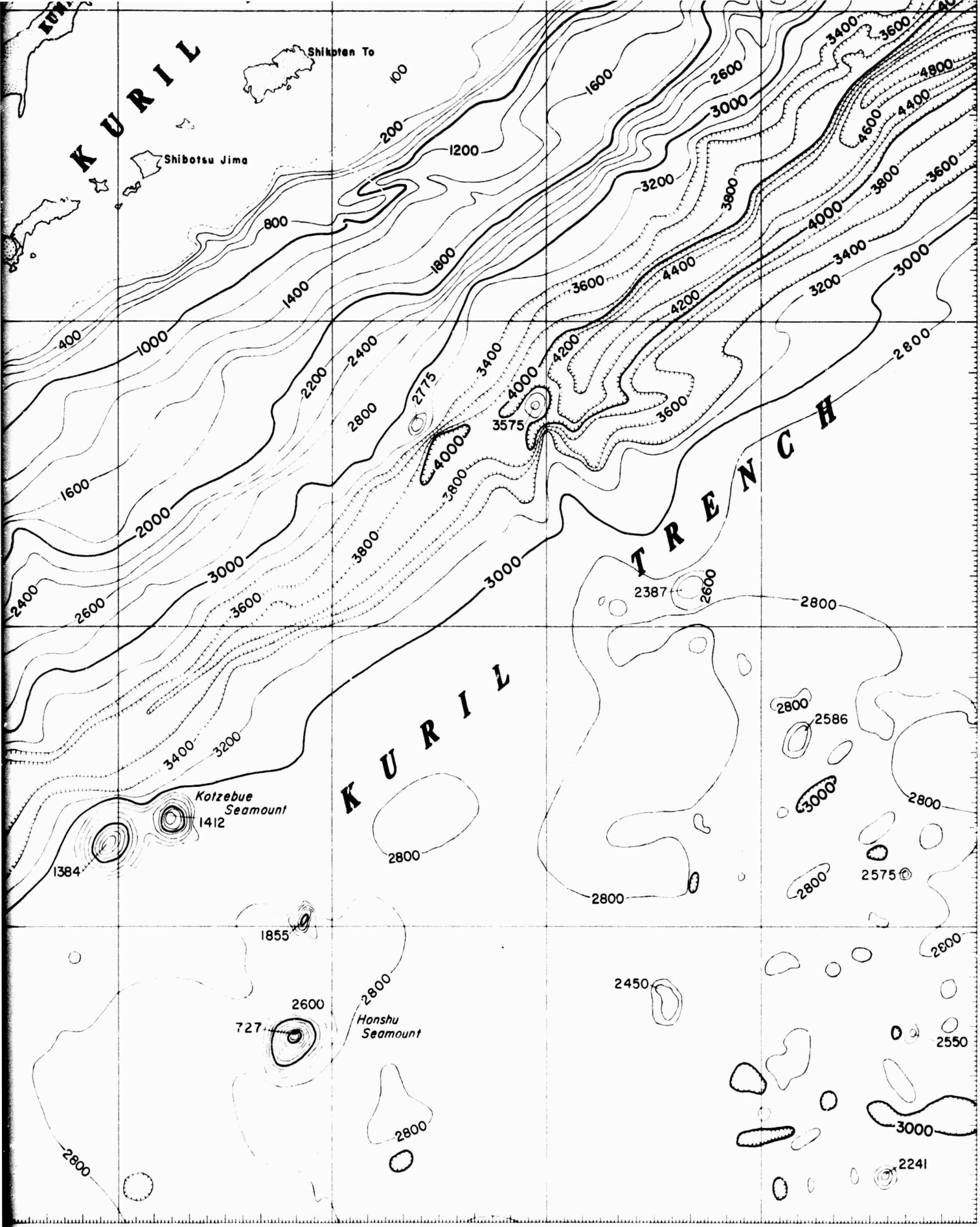
Assisted by: [illegible]

Do Not Use For

E



July 1, 1968

ANOGRAPHY

Contoured by: [illegible]

Assisted by: [illegible]

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No. 2208N 34

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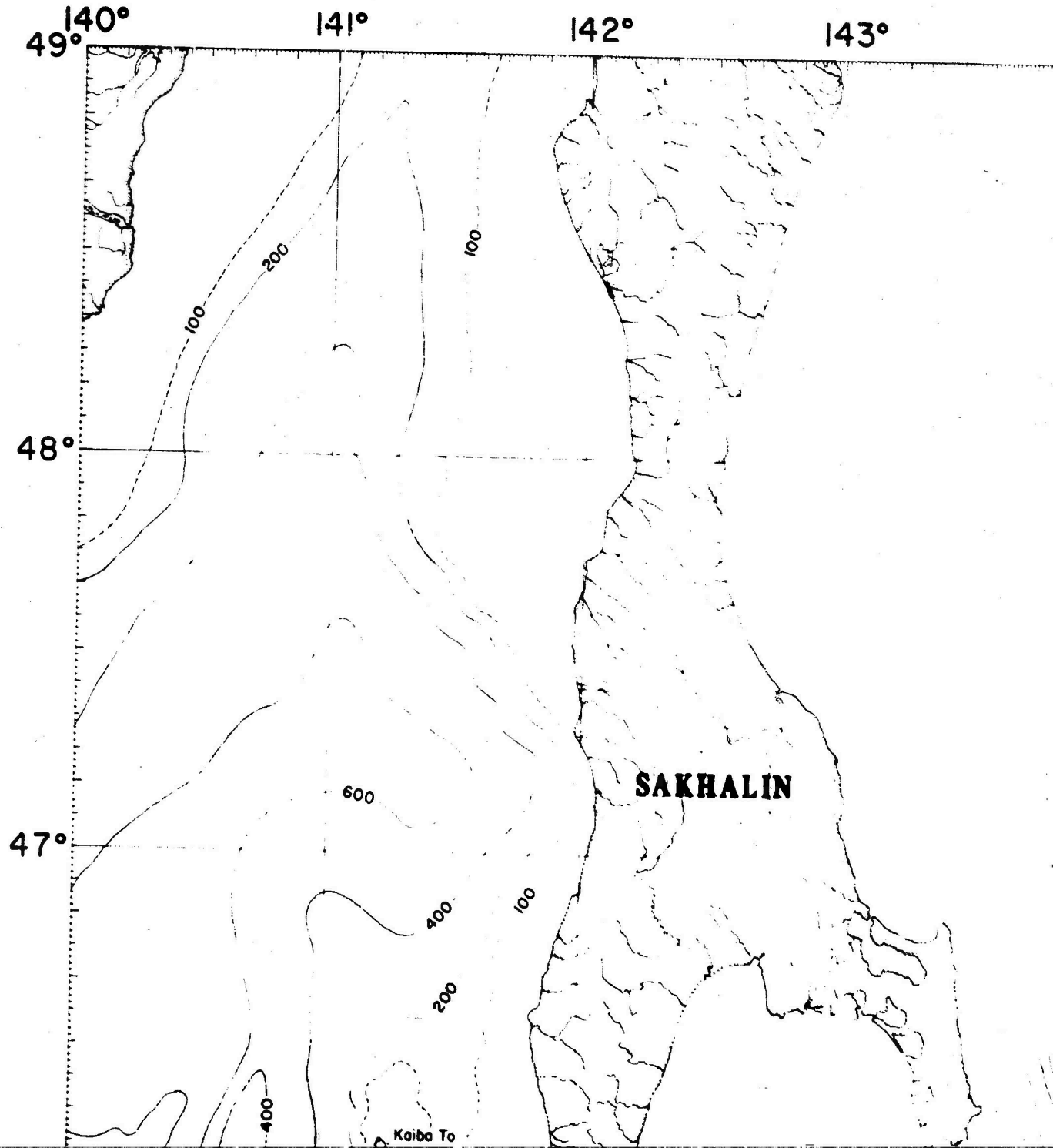
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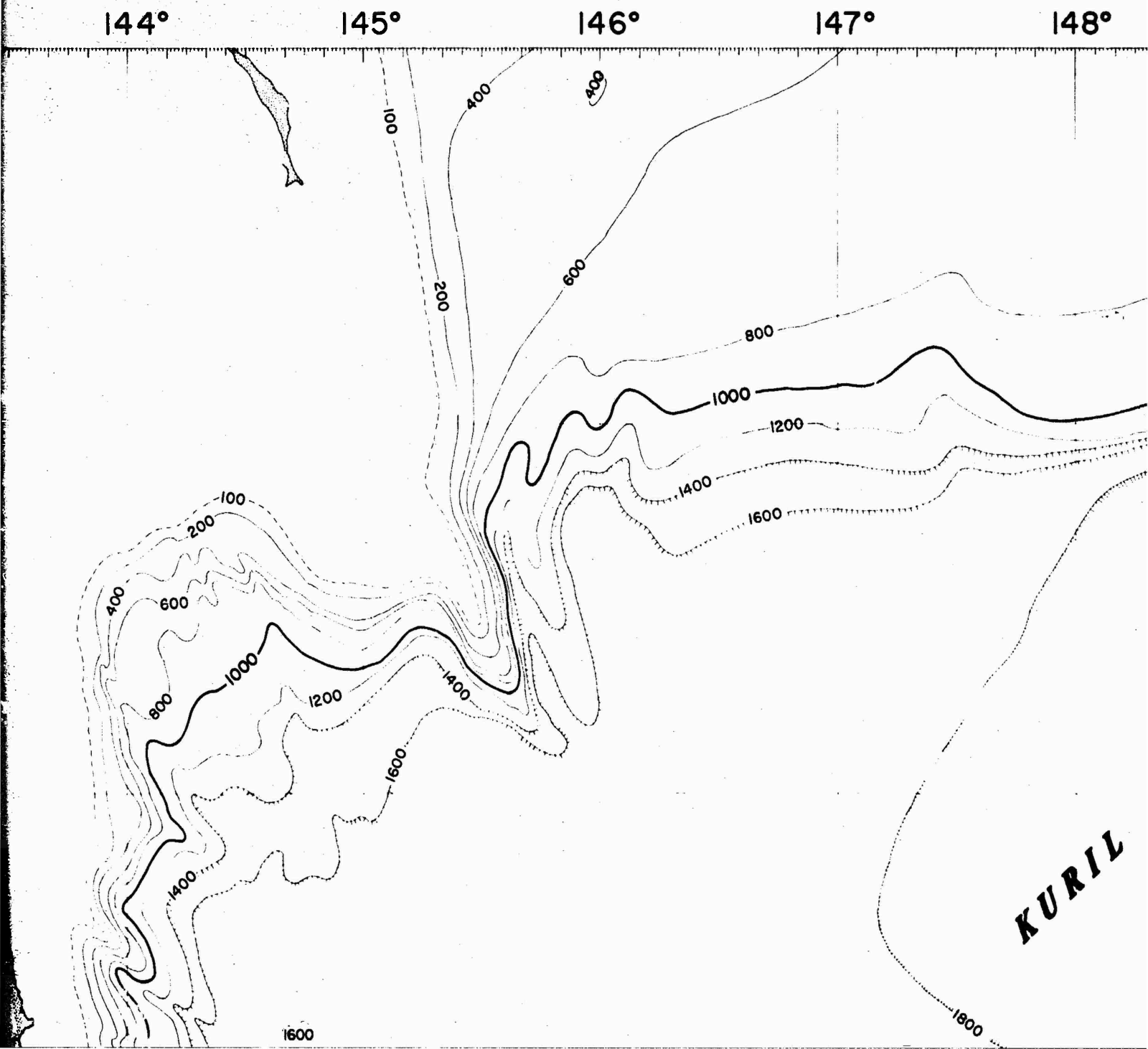
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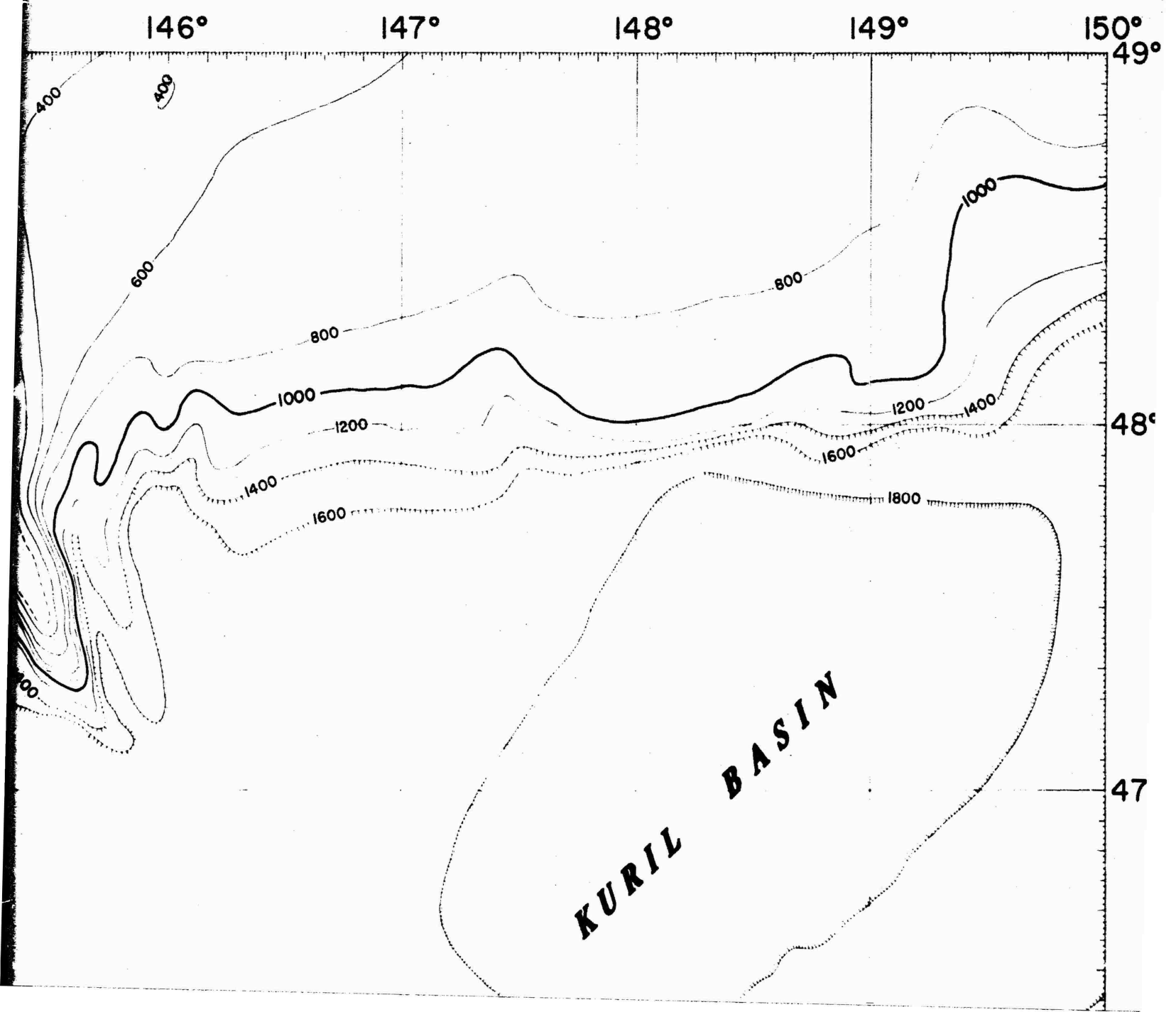
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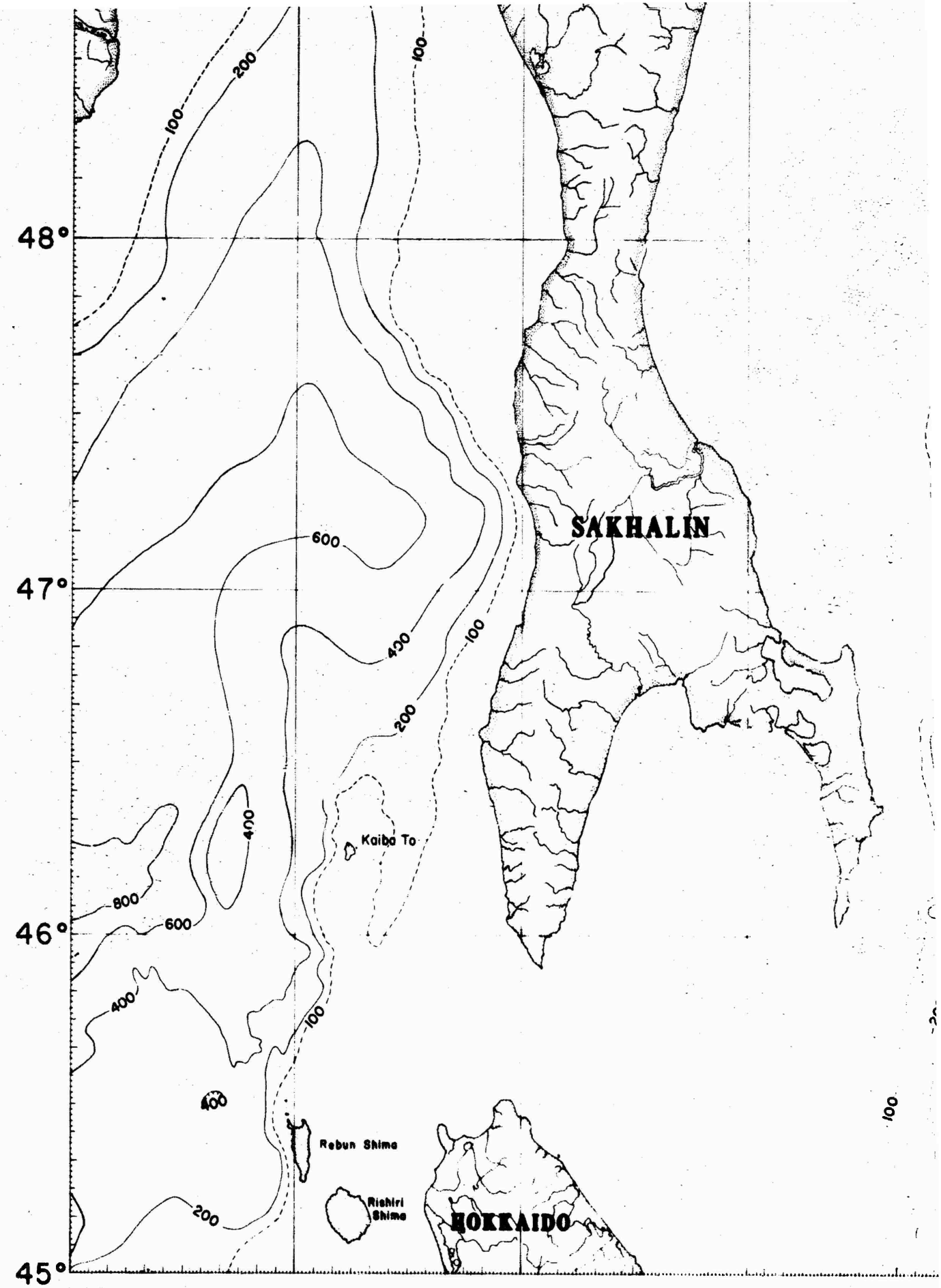
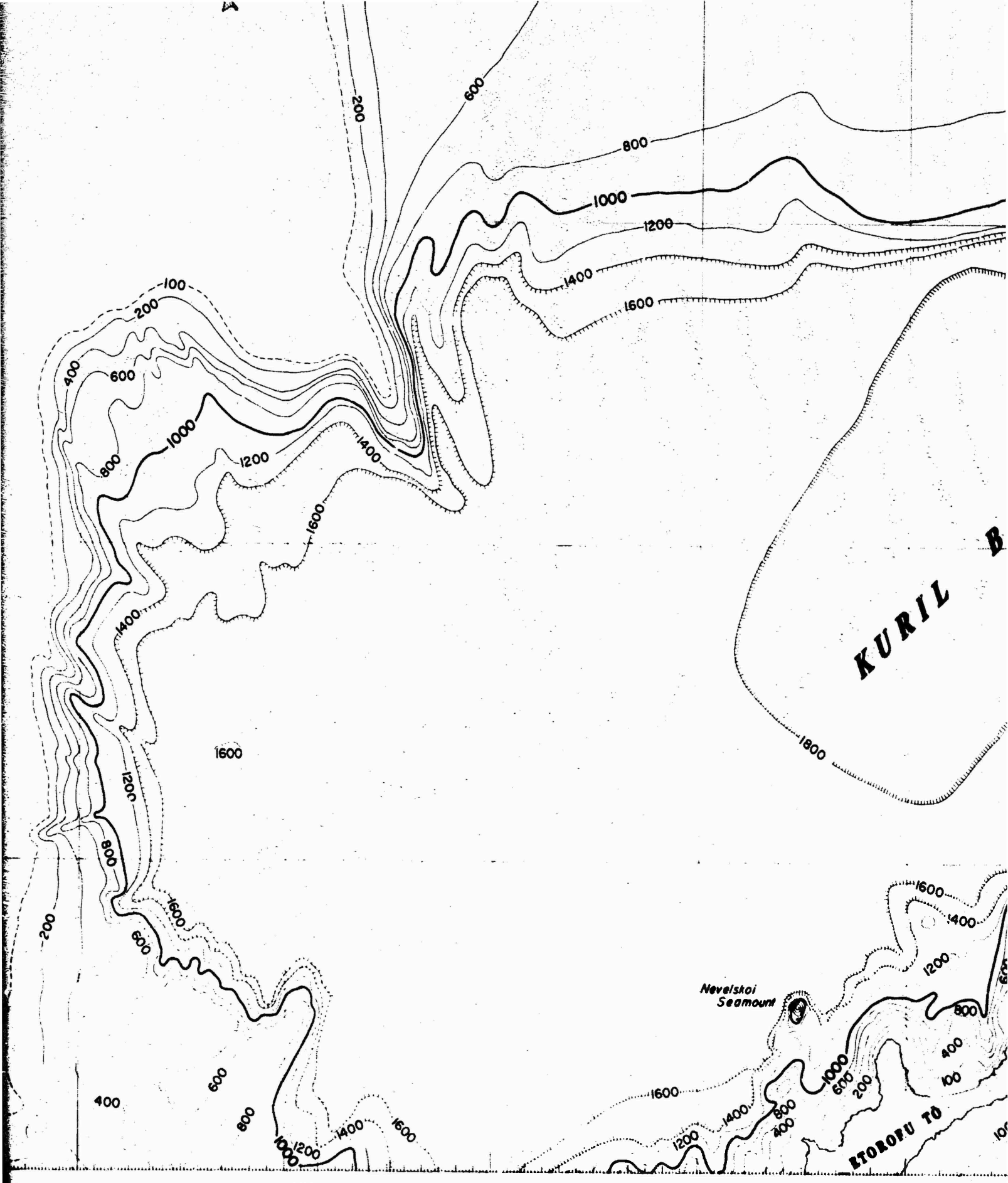


Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U.S.S.R.
Maritime Safety Agency, Japan, Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable



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Contoured by [illegible]
Assisted by [illegible]

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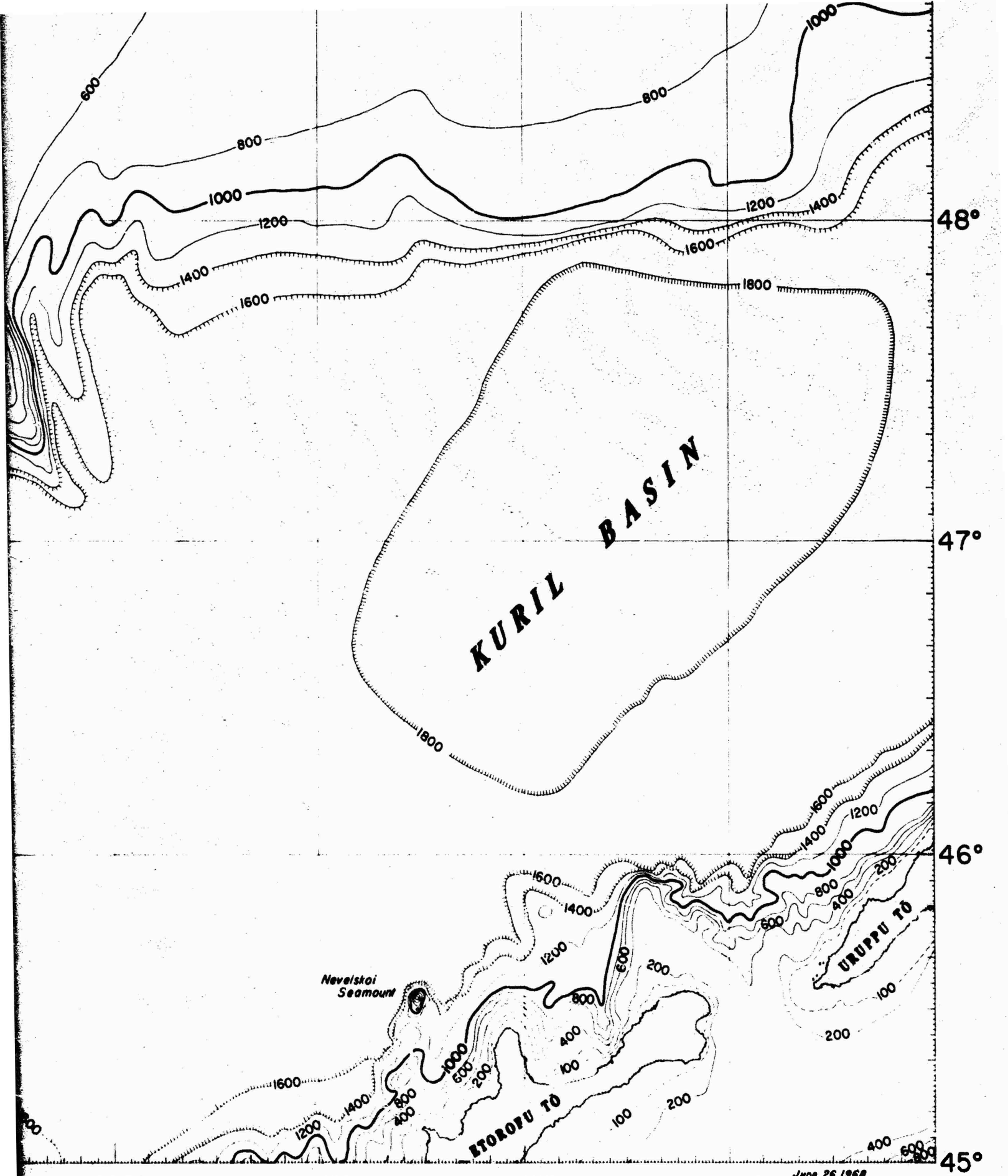
F



June 26, 1968

ANOGRAPHY

Contoured by [illegible]

Assisted by [illegible]

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No. 2209N 35

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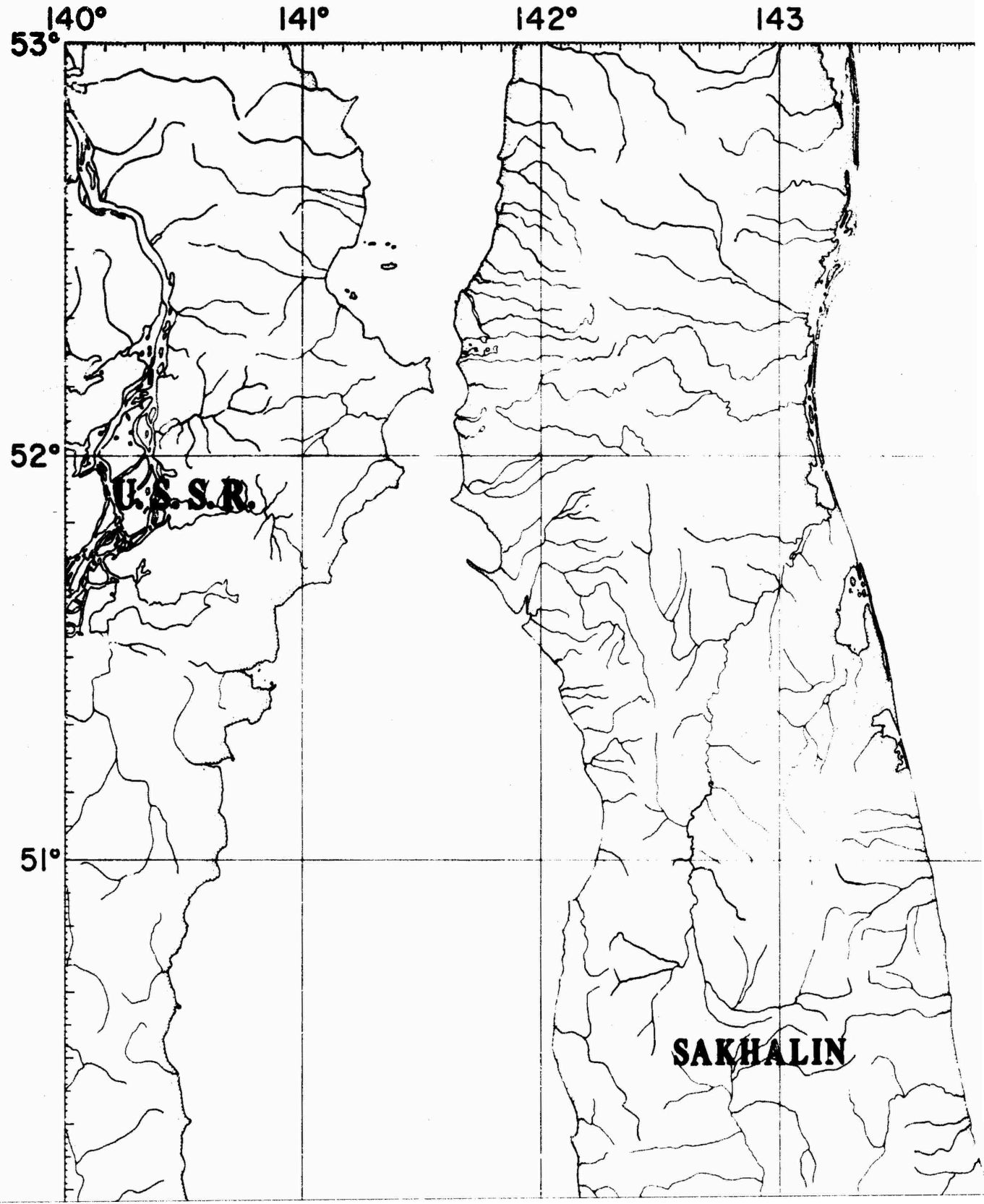

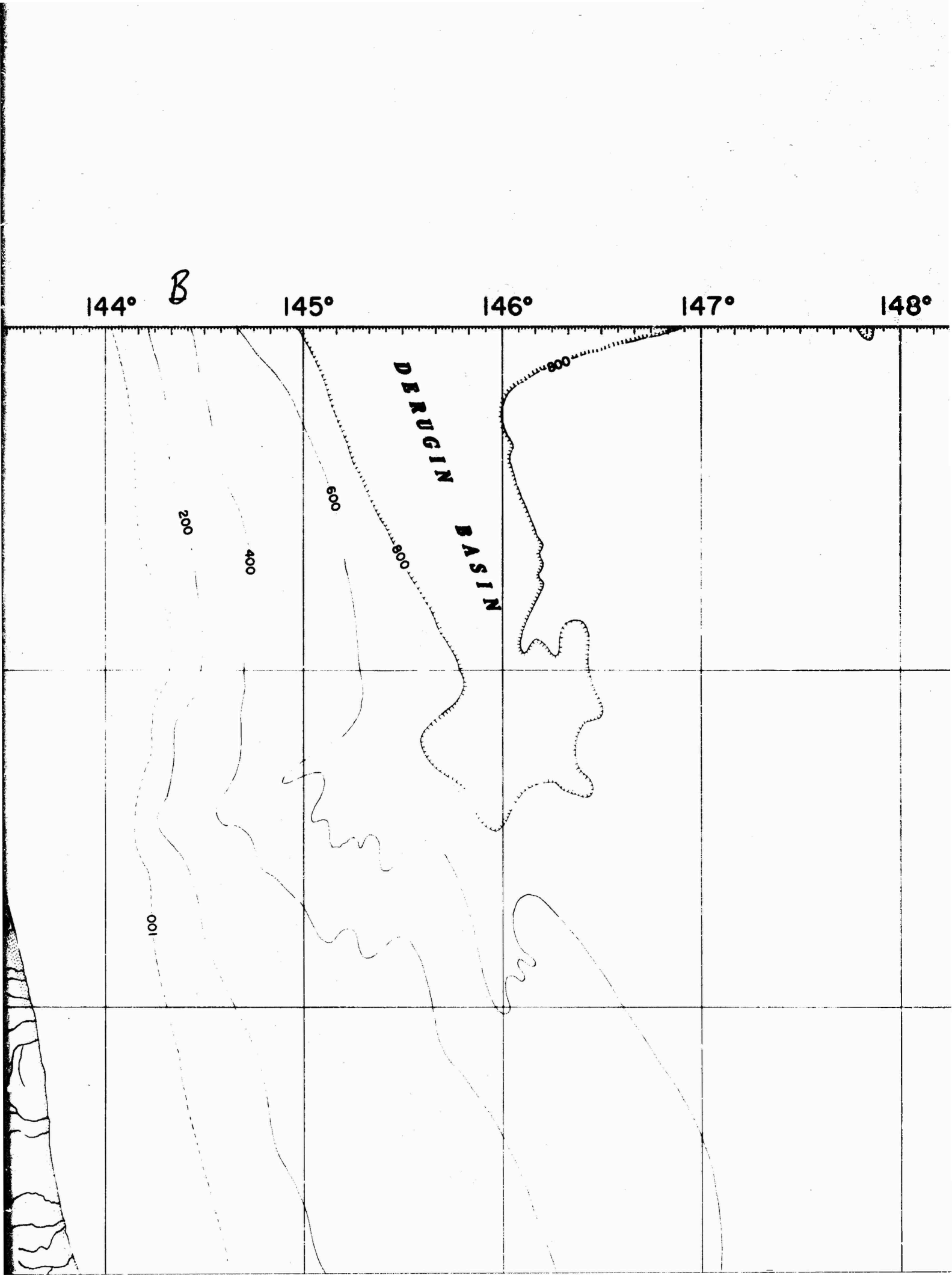
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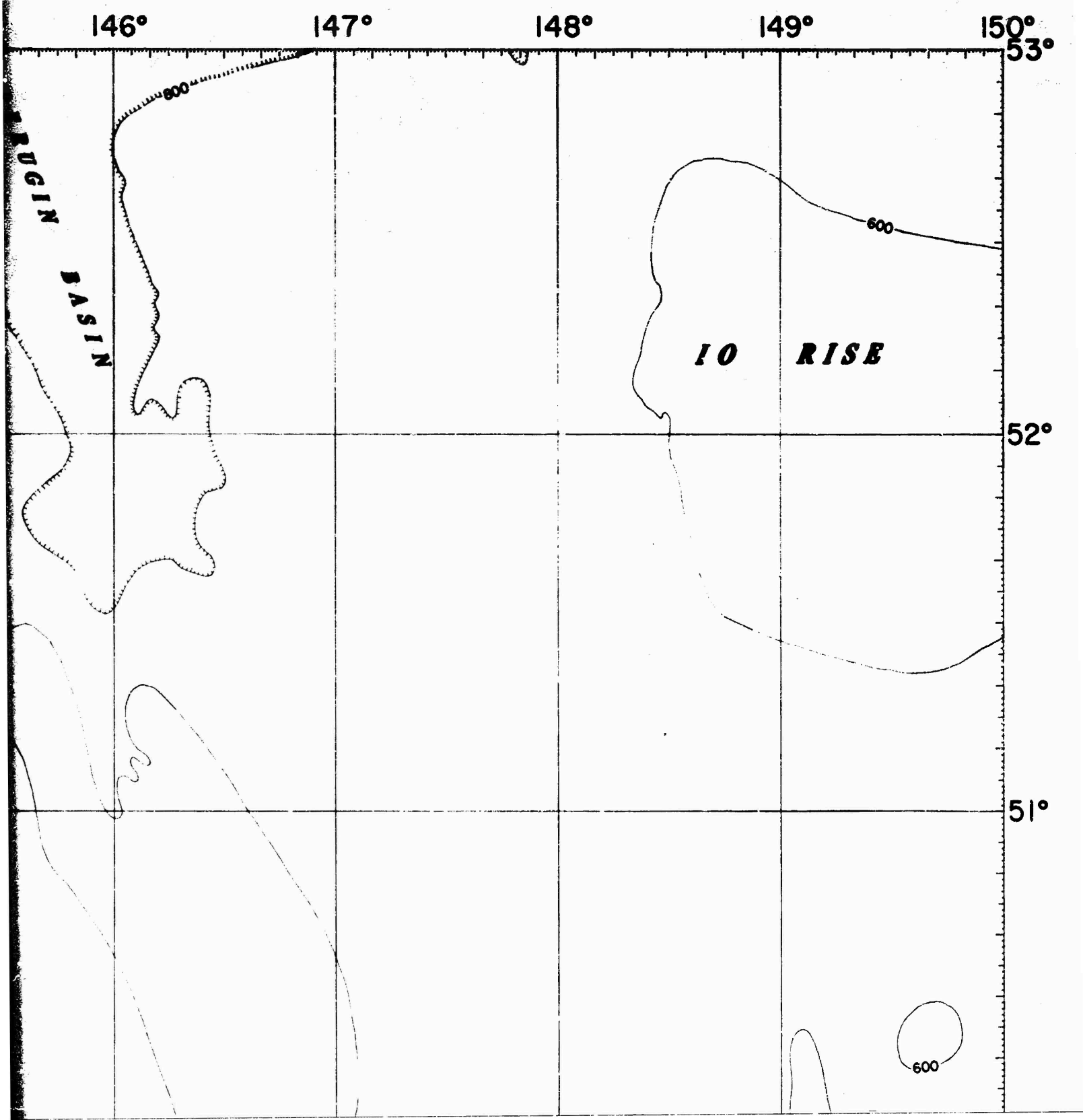
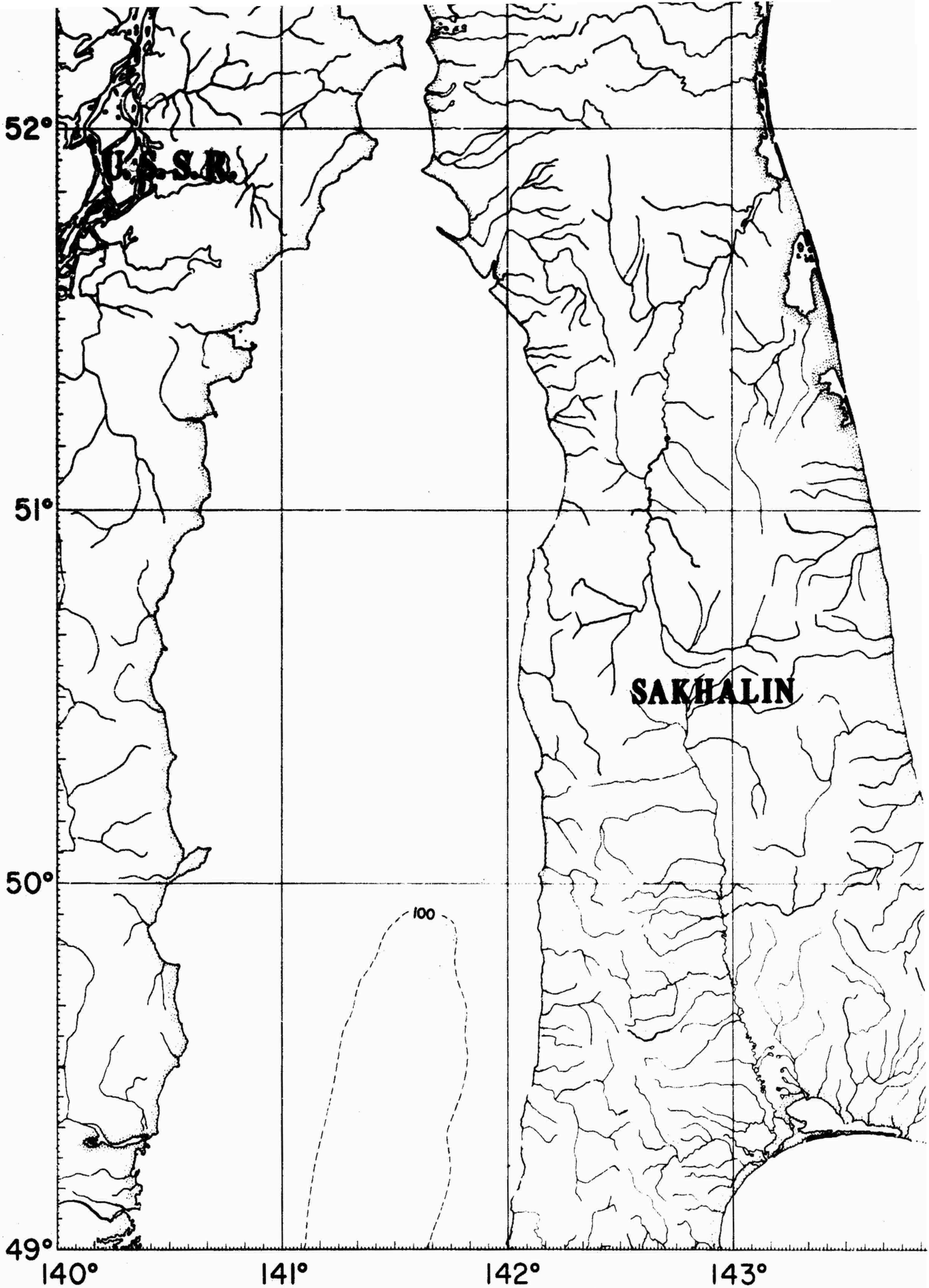
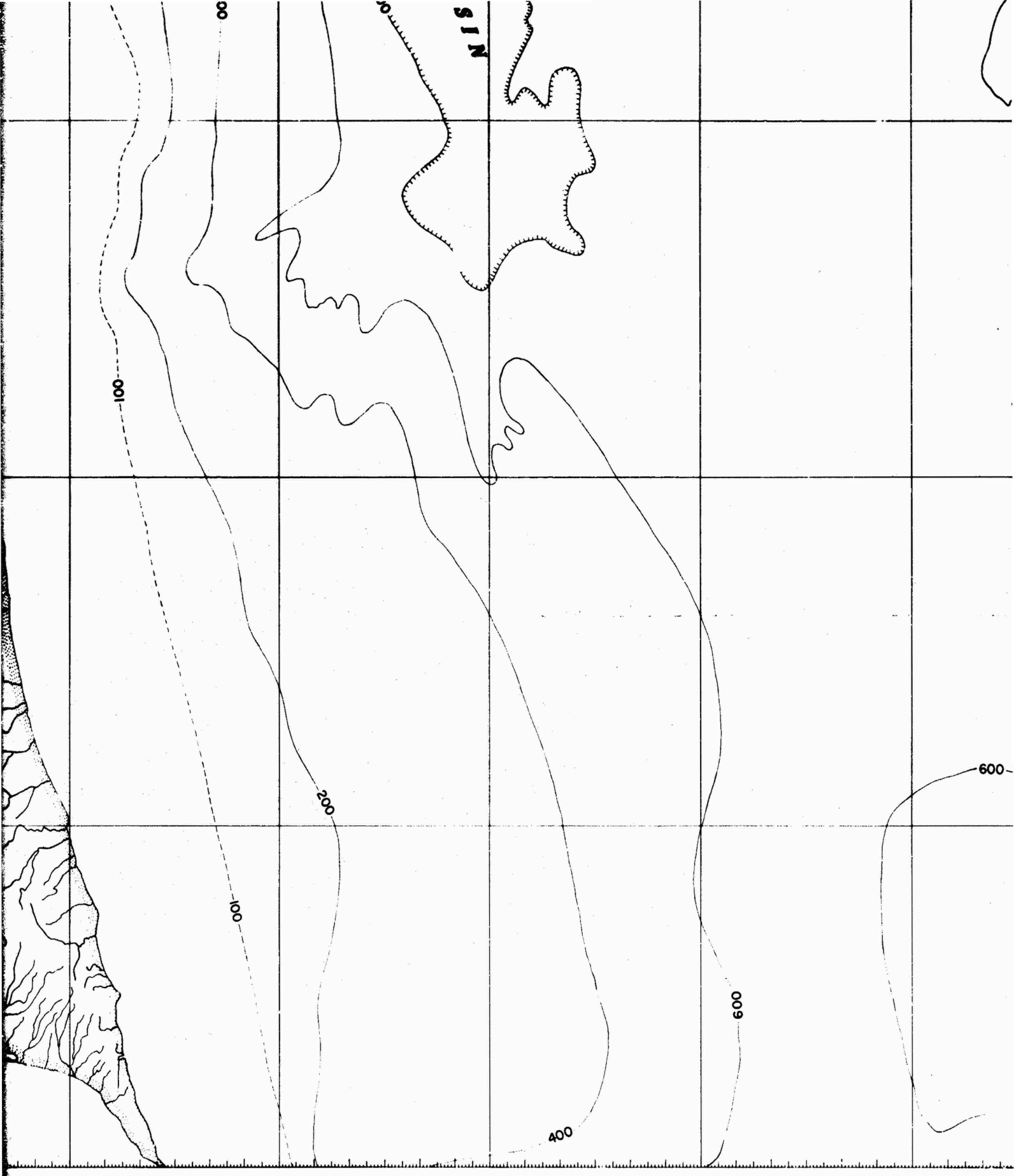




Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U.S.S.R.

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



PREPARED BY SCRIPPS INSTITUTION OF OCEANOGRAPHY
under the direction of T E Chase and H W. Menard

Contoured by: Roger J. van Wagtendonk
Assisted by: Leslie Thomas, 2' Mons, Wm 1 Cranke h, 1 mon
L. Hagans

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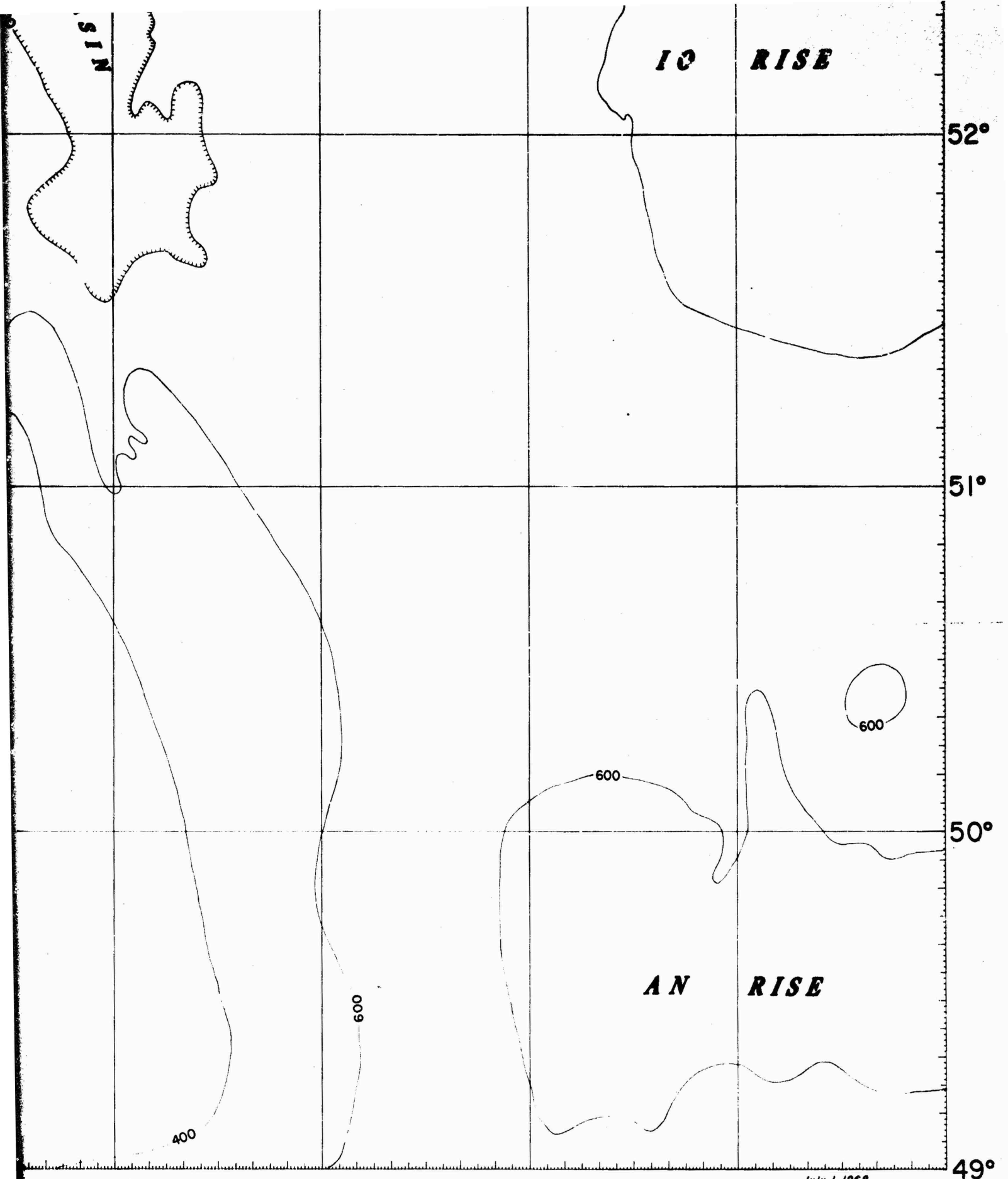

July 1, 1968

ANOGRAPHY

Contoured by: Roger J. van Wyckhouse

Assisted by: Leslie Thomas, 2 Mar, w/n 1 Crabtree, 1 mm

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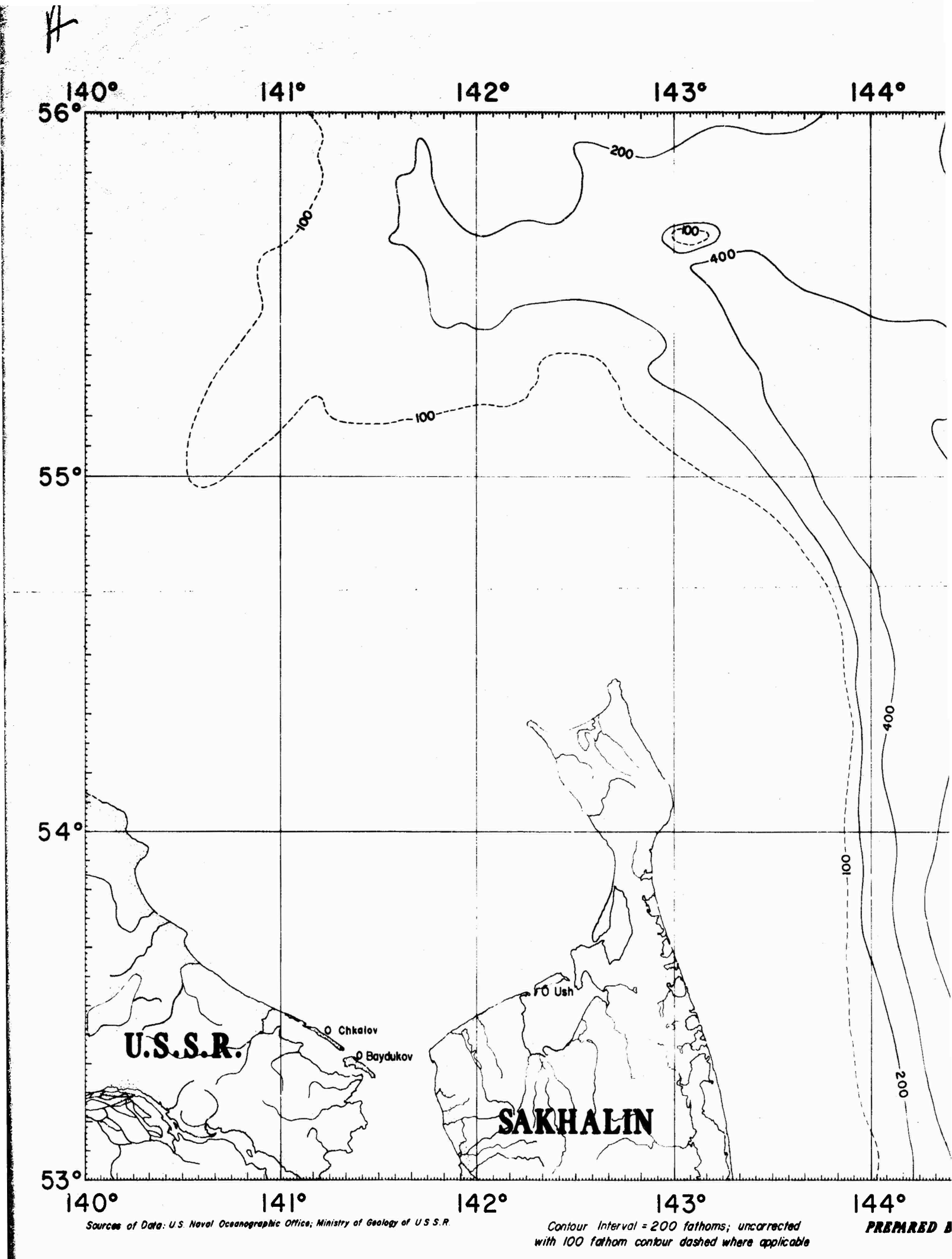
No. 2210N 36

F



Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U S S.R.

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

PREPARED B

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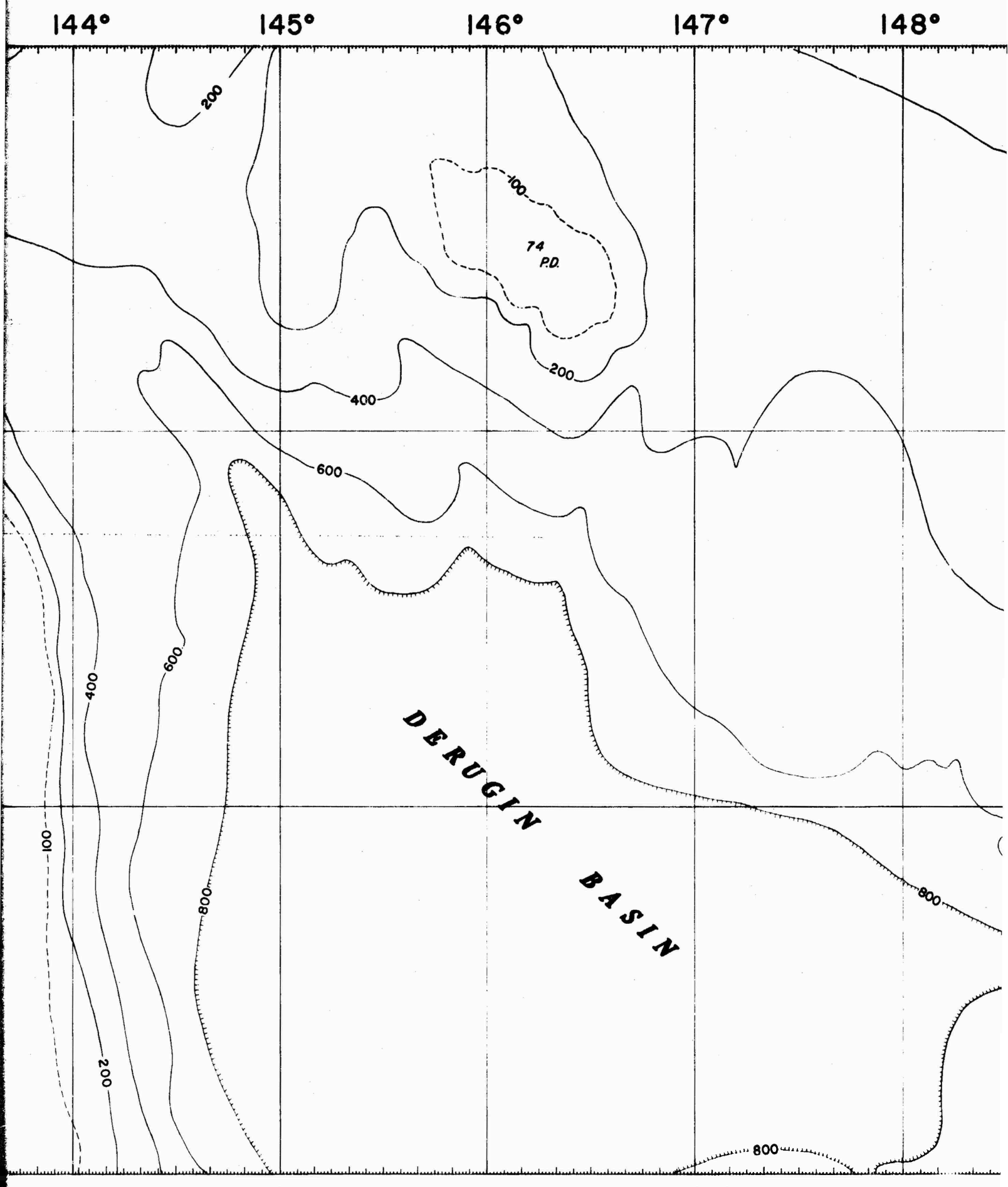

PREPARED BY SCRIPPS INSTITUTION OF OCEANOGRAPHY
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Contoured by: TE Chase
Assisted by: V. Moore, Sheila Ames, Wm. Nab, Jan Mar

Do Not Use For

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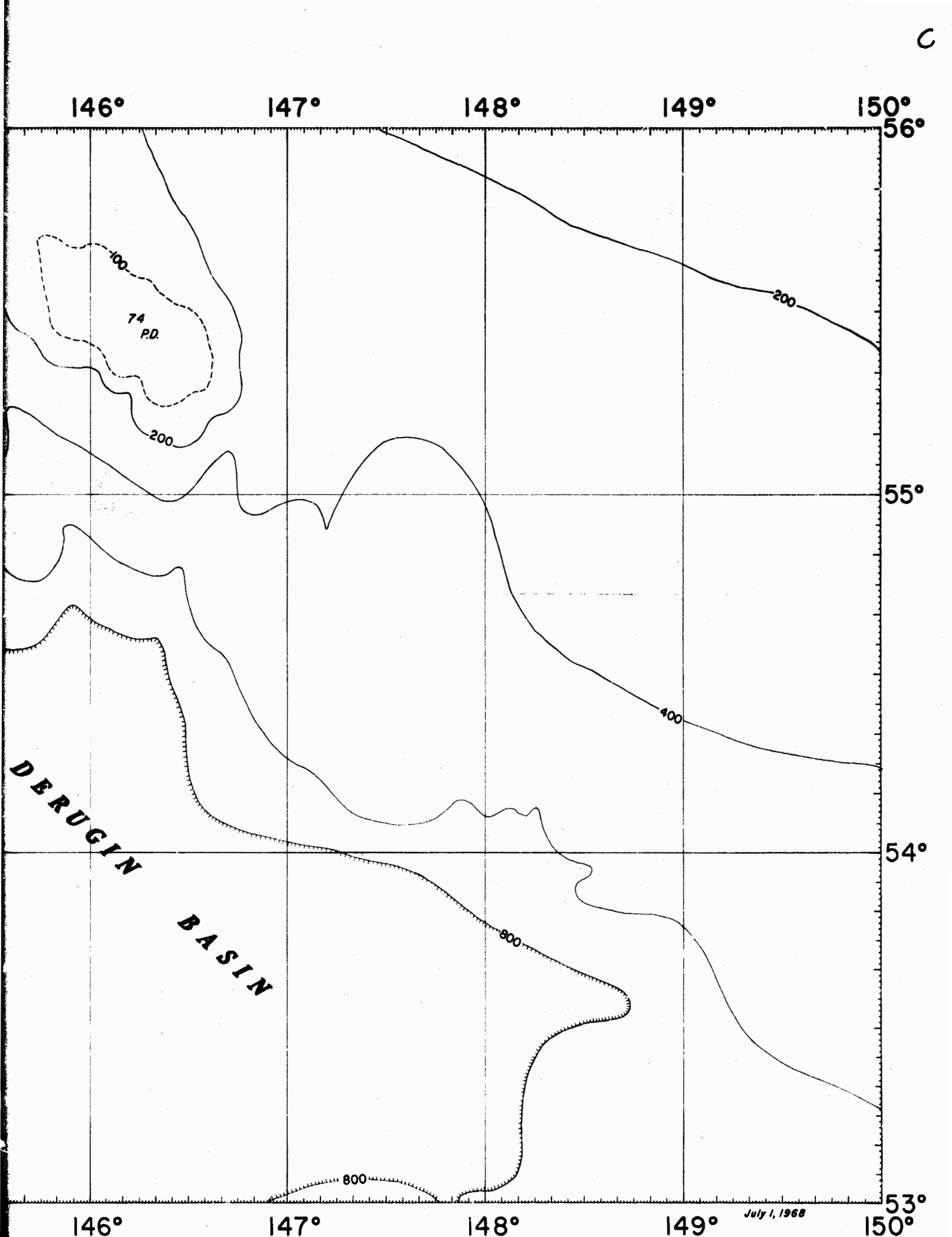

July 1, 1968

NOGRAPHY

Contoured by: R E Chase.
Assisted by: V Moore, Linda Lomax, Allan Lisle, Sue Moore

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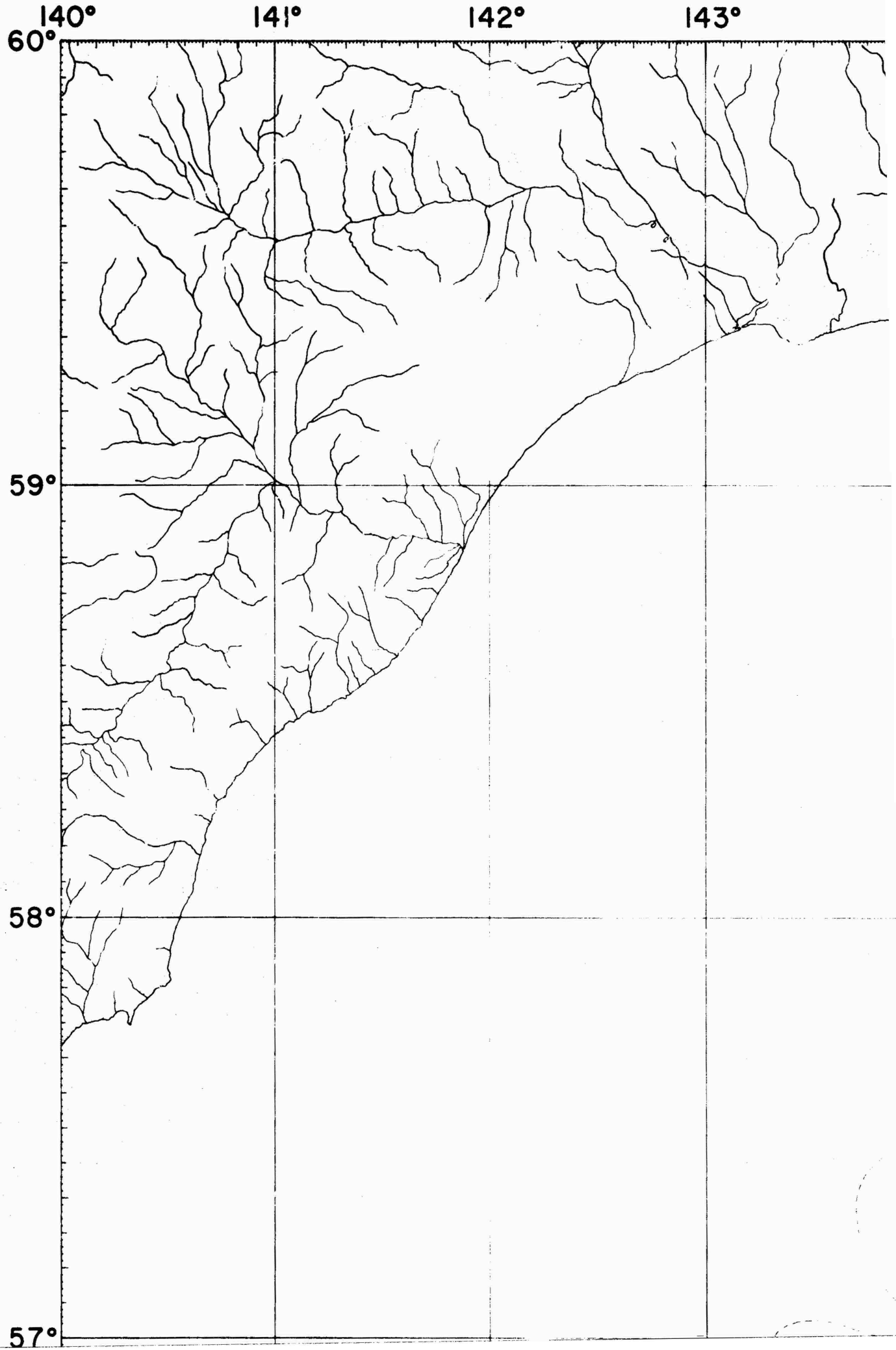
No. 2211N 37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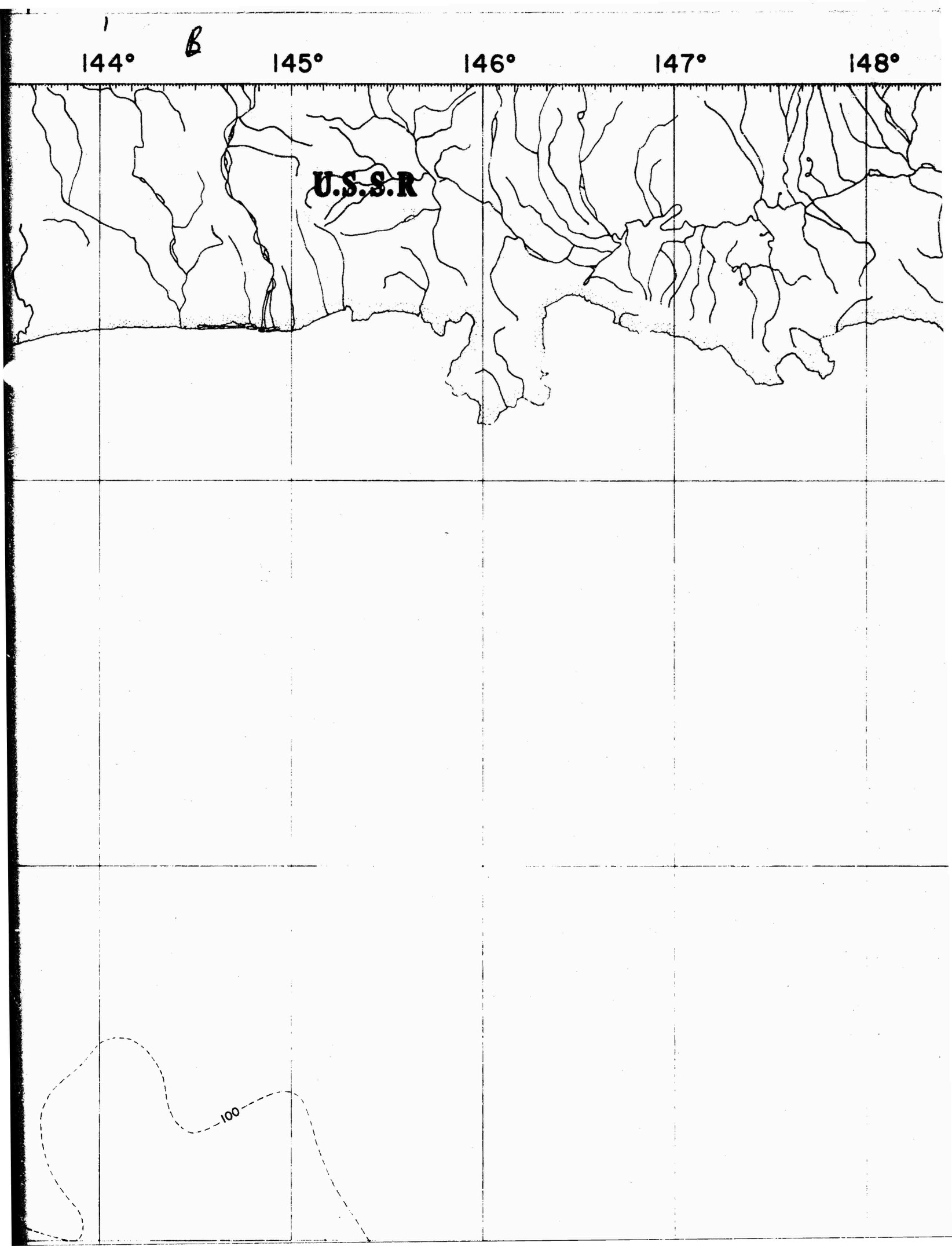
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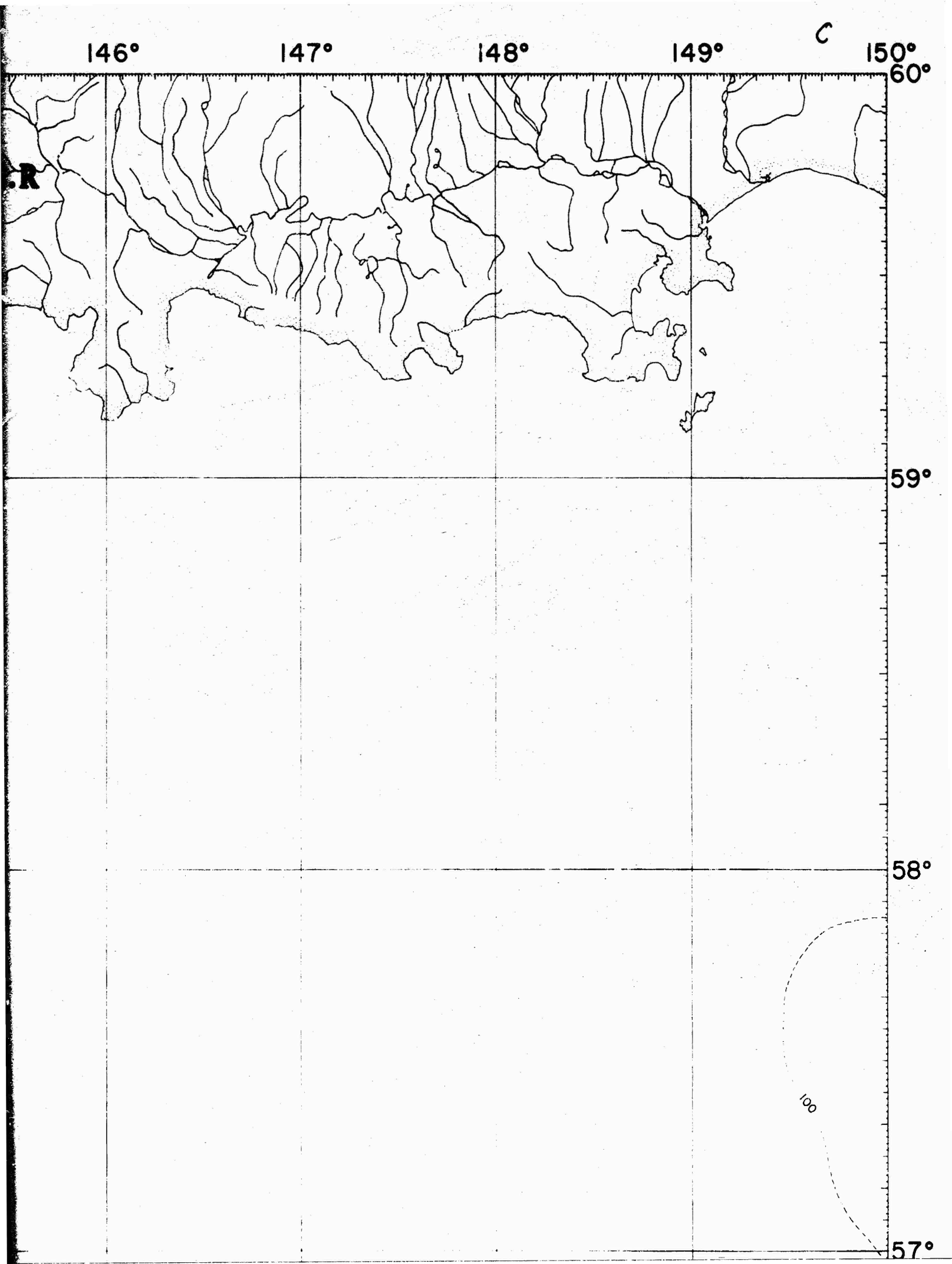
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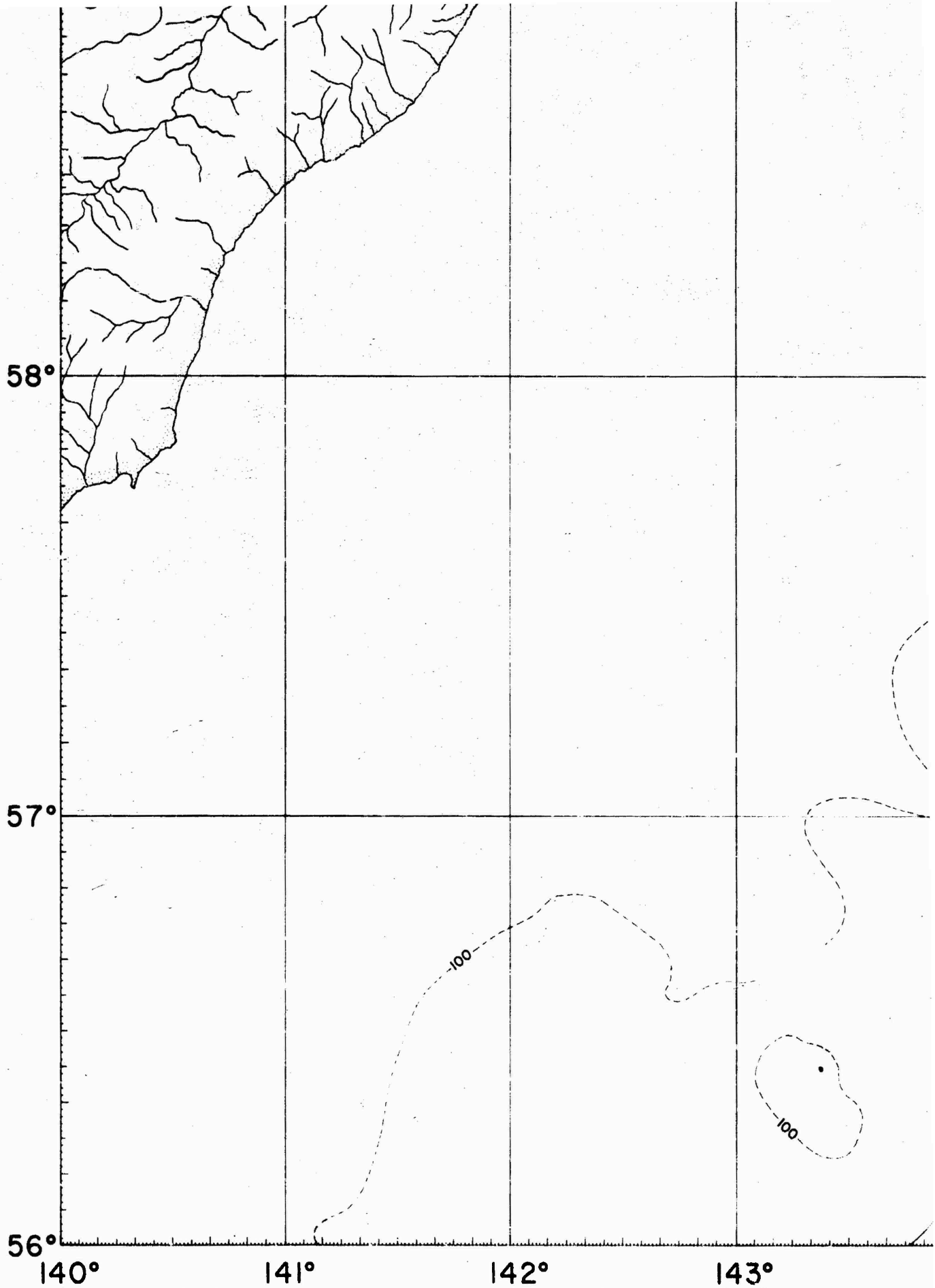

Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U.S.S.R

Contour Interval = 200 fathoms; uncorrected
with 100 fathom contour dashed where applicable

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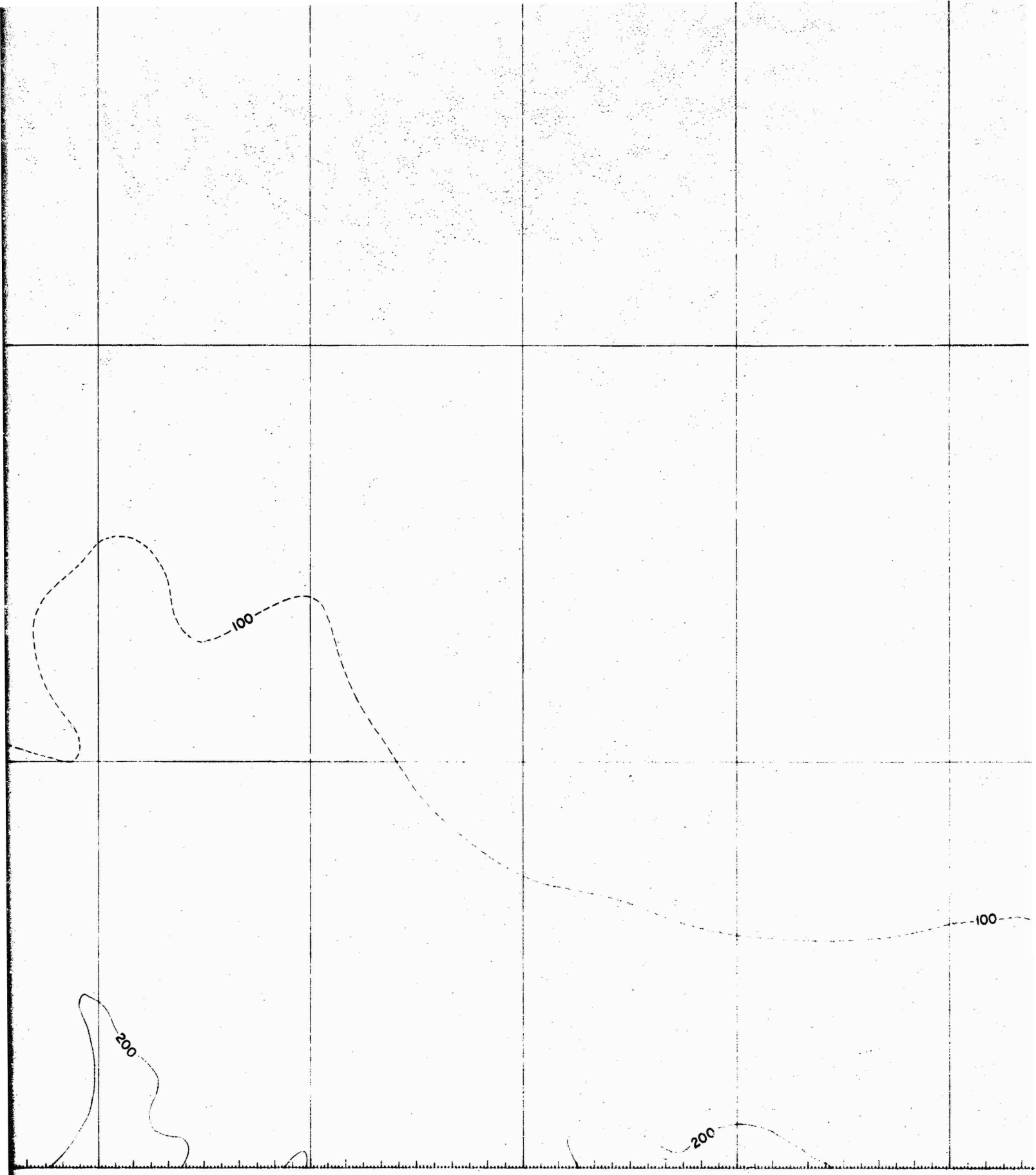

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Contoured by: T.E. Chase
Assisted by: [illegible]

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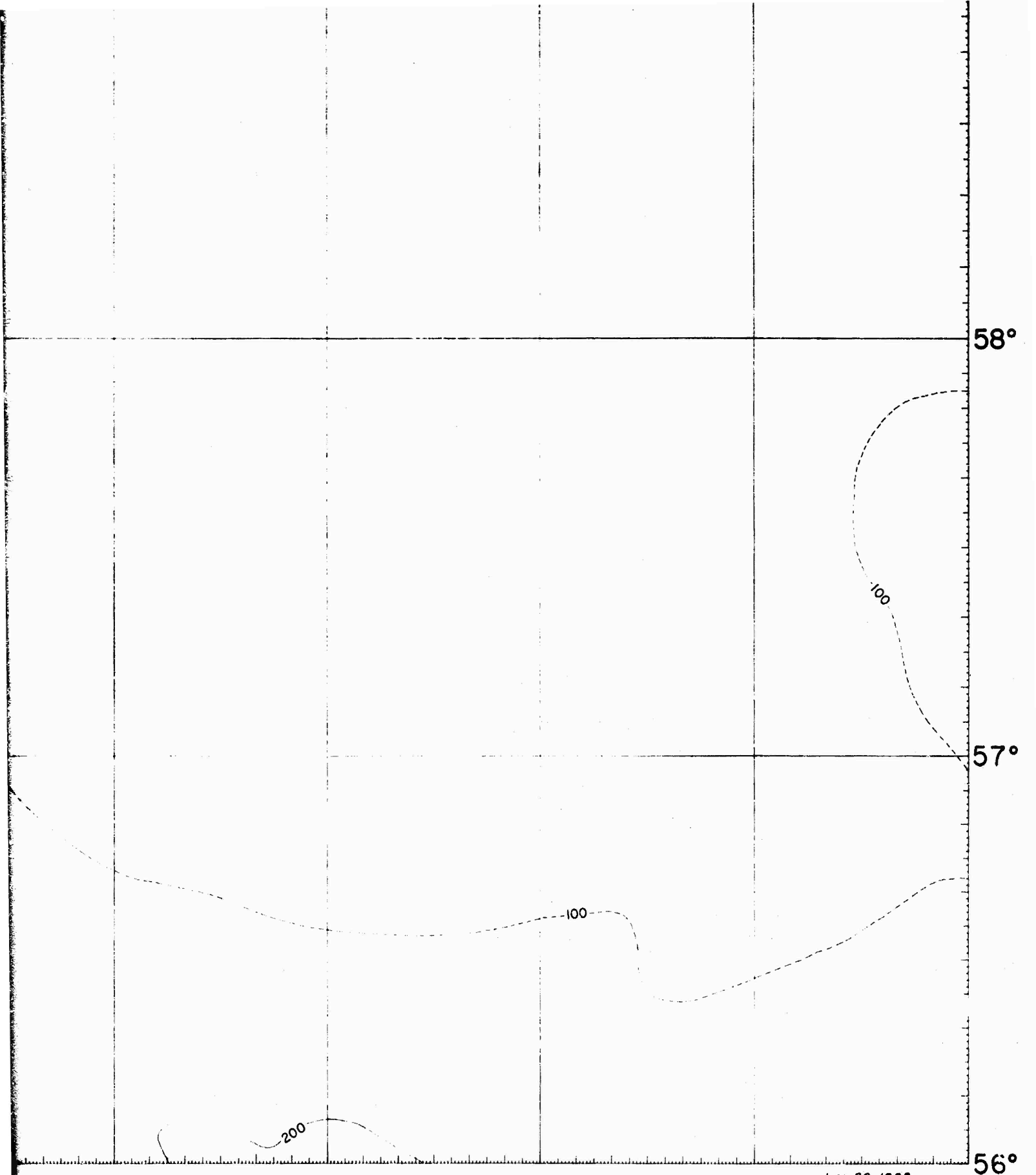

June 20, 1968

ANOGRAPHY

Contoured by: [illegible]

Assisted by: [illegible]

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No. 2212N 38

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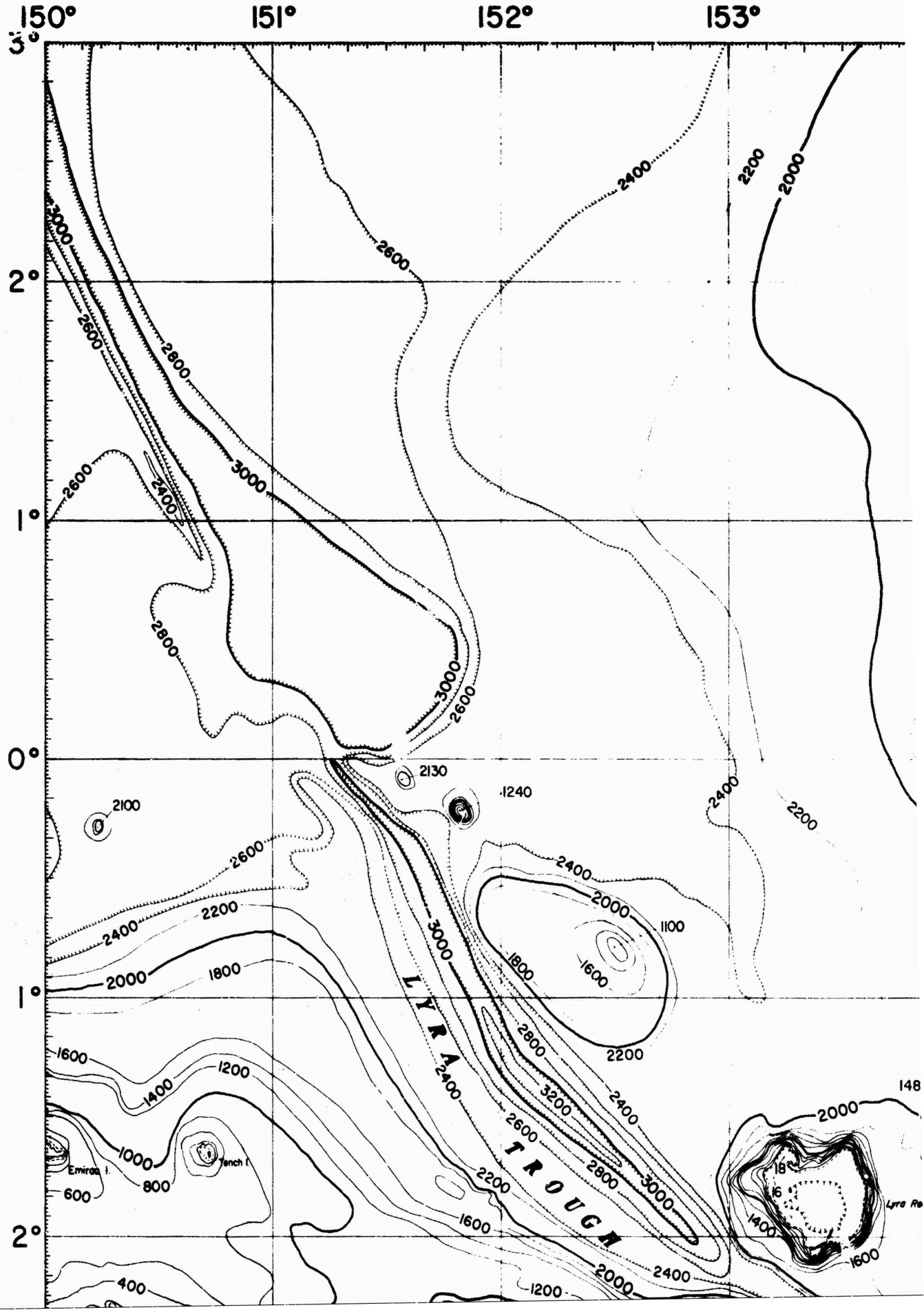
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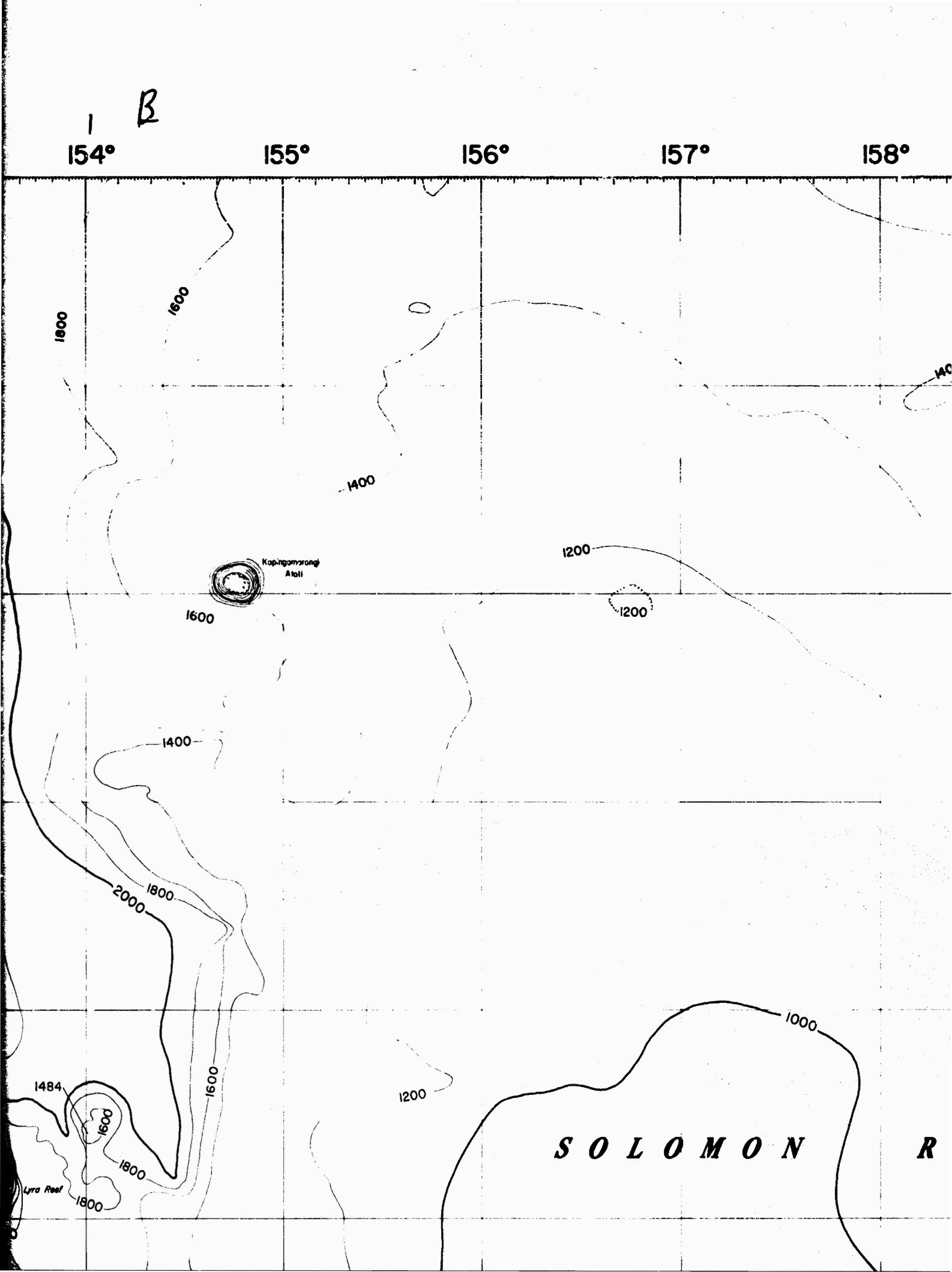
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Lyra Reef
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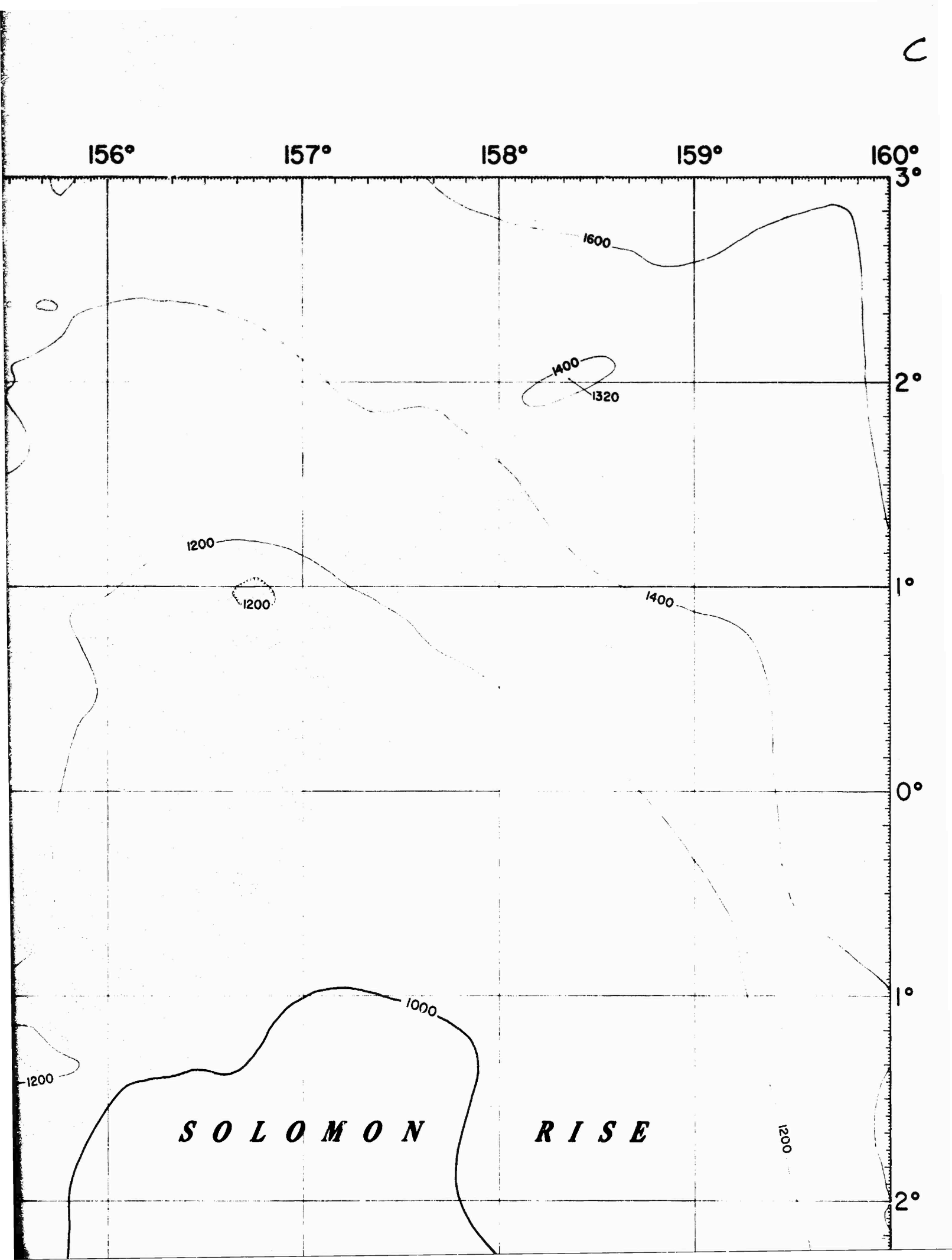
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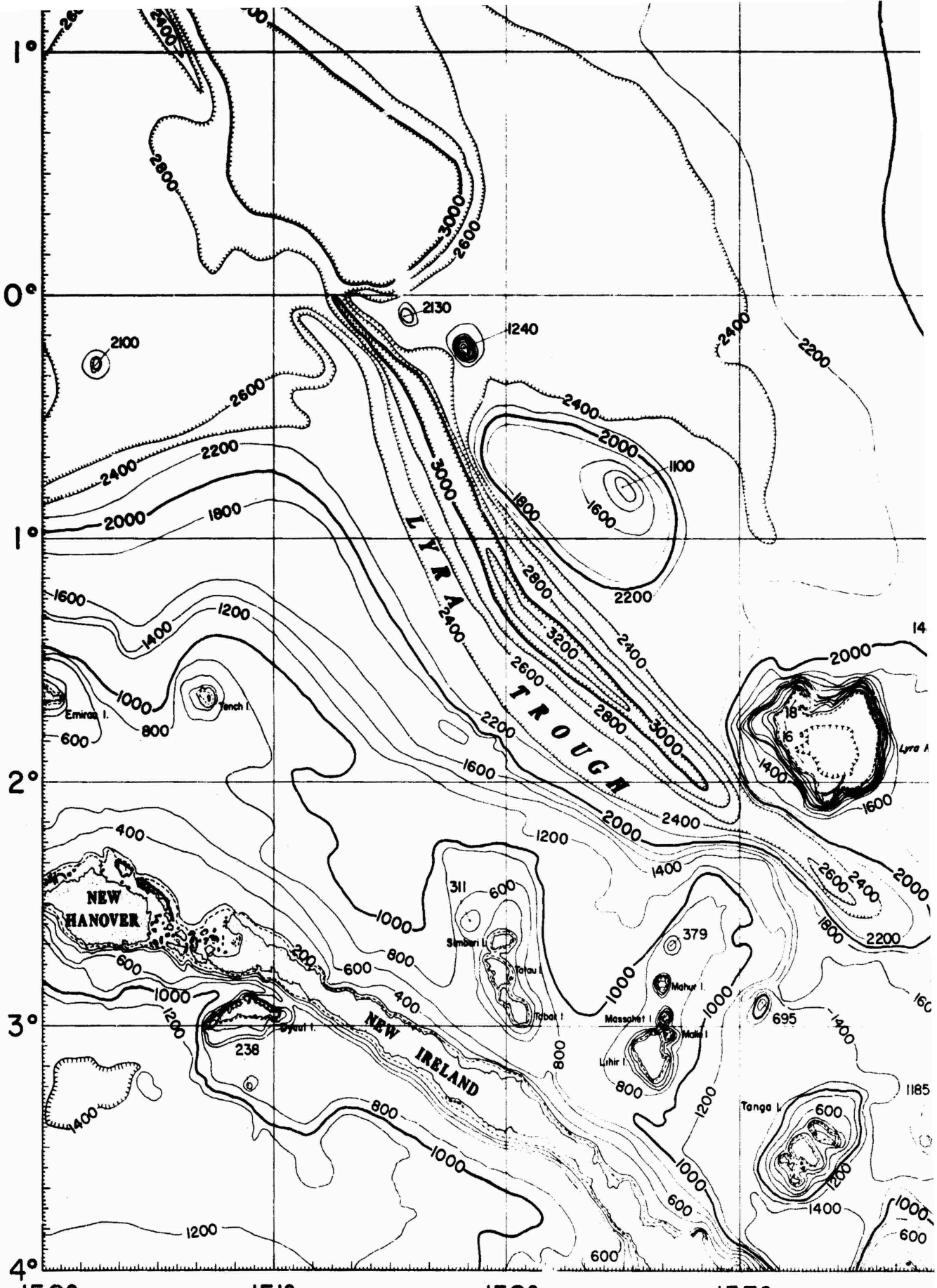

Sources of Data: U.S. Naval Oceanographic Office; British Admiralty; R/V Vitiaz, U.S.S.R.; Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

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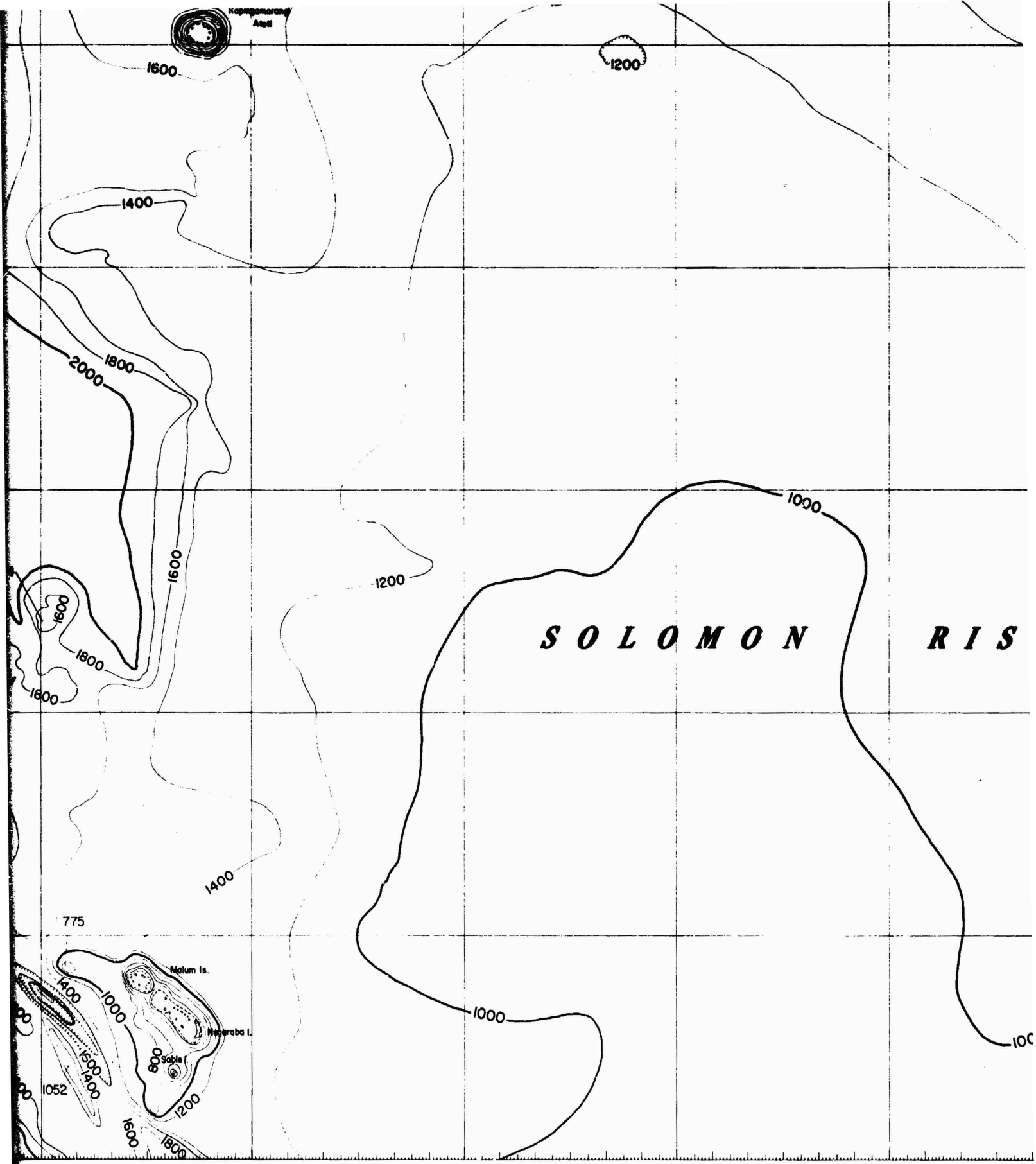

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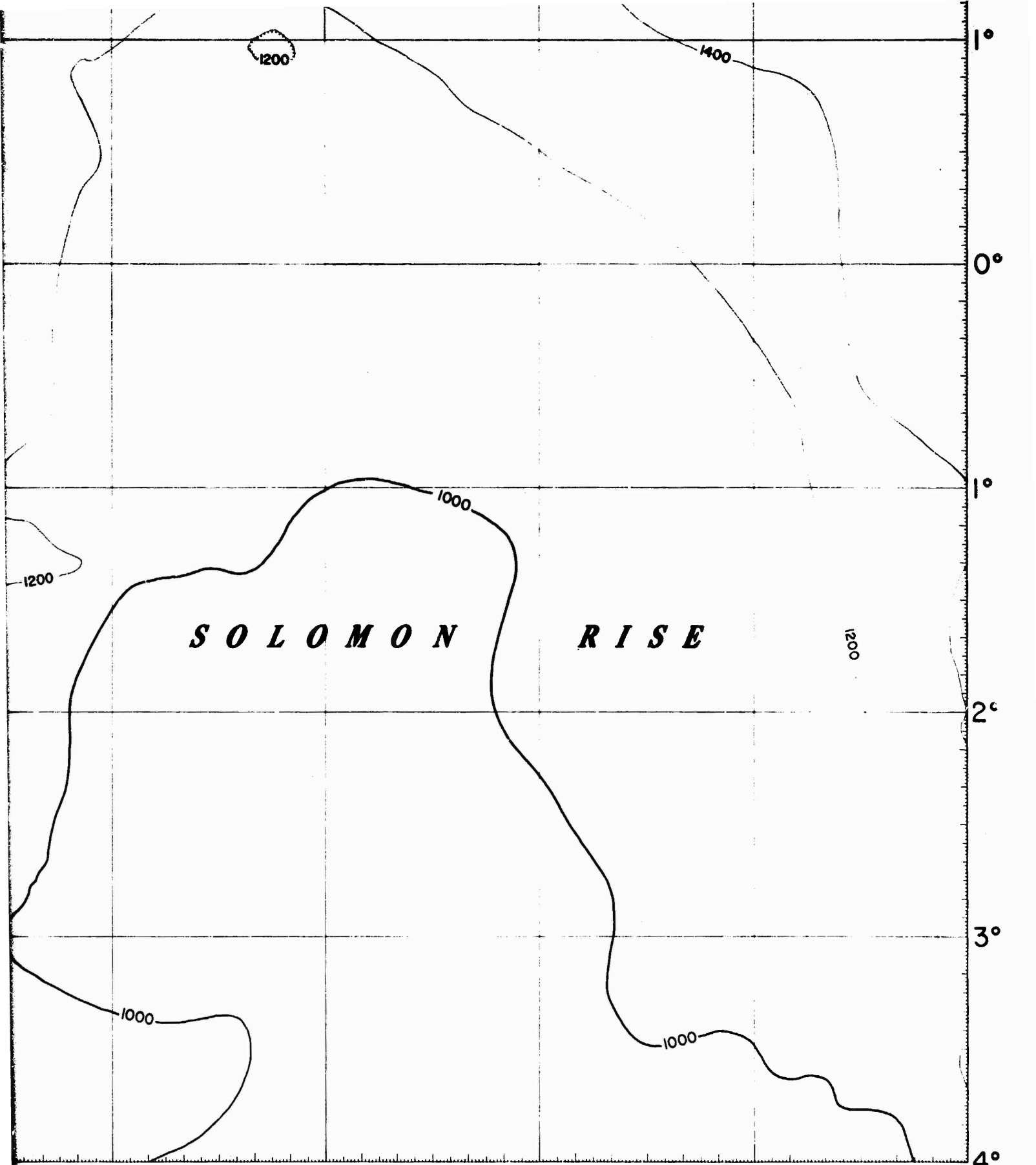
Contoured by: Arthur J. Henry
Assisted by: Eric Hayden & Moon

Do Not Use For Navigo

E



December, 1968

NOGRAPHY

Contoured by: Arthur J. Henry

Assisted by: Lou Hydrick J. Moore

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No. 2101

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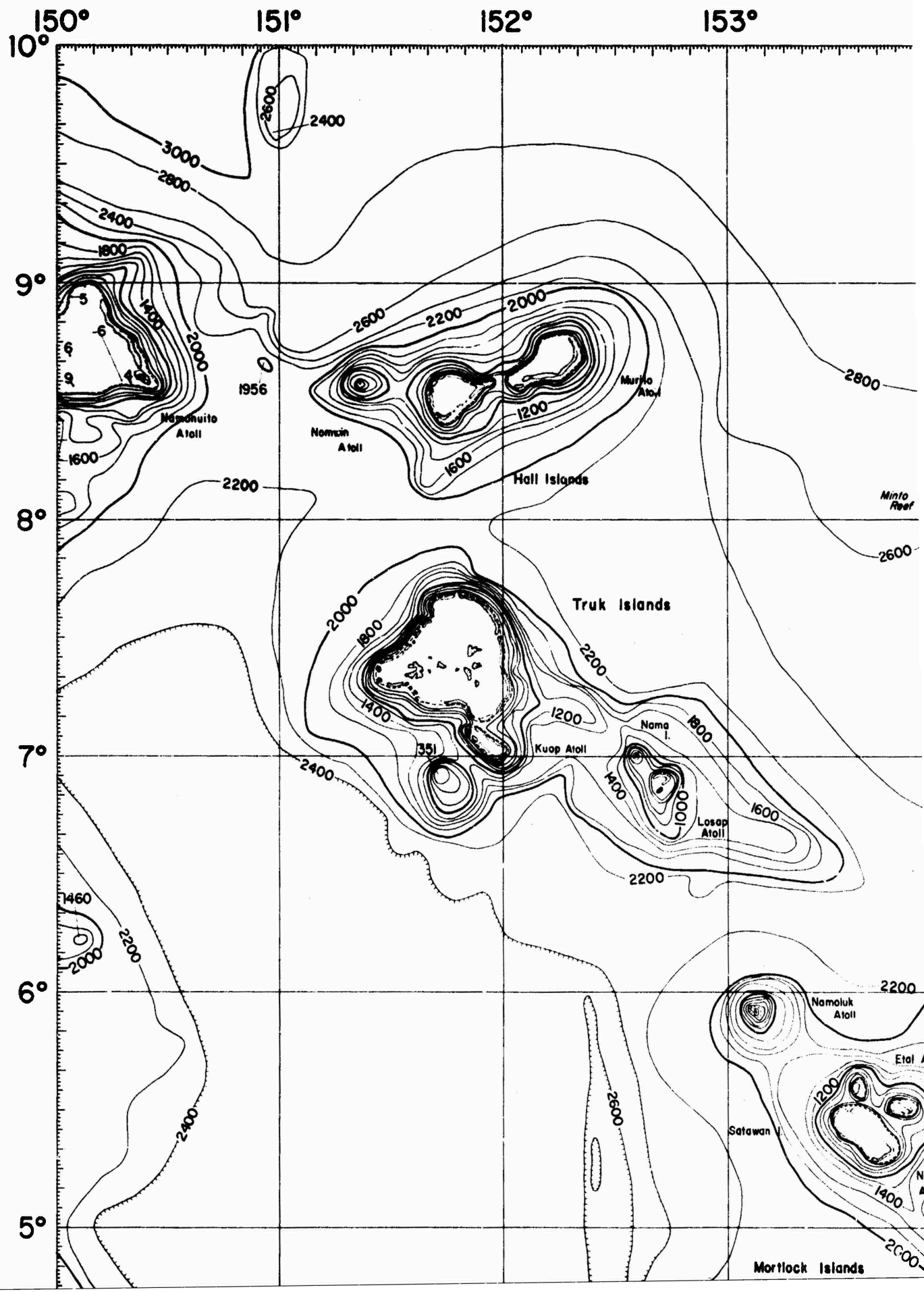
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Nomwin Atoll
Murilo Atoll
Hall Islands
Minto Reef
Truk Islands
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Kuop Atoll
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Mortlock Islands

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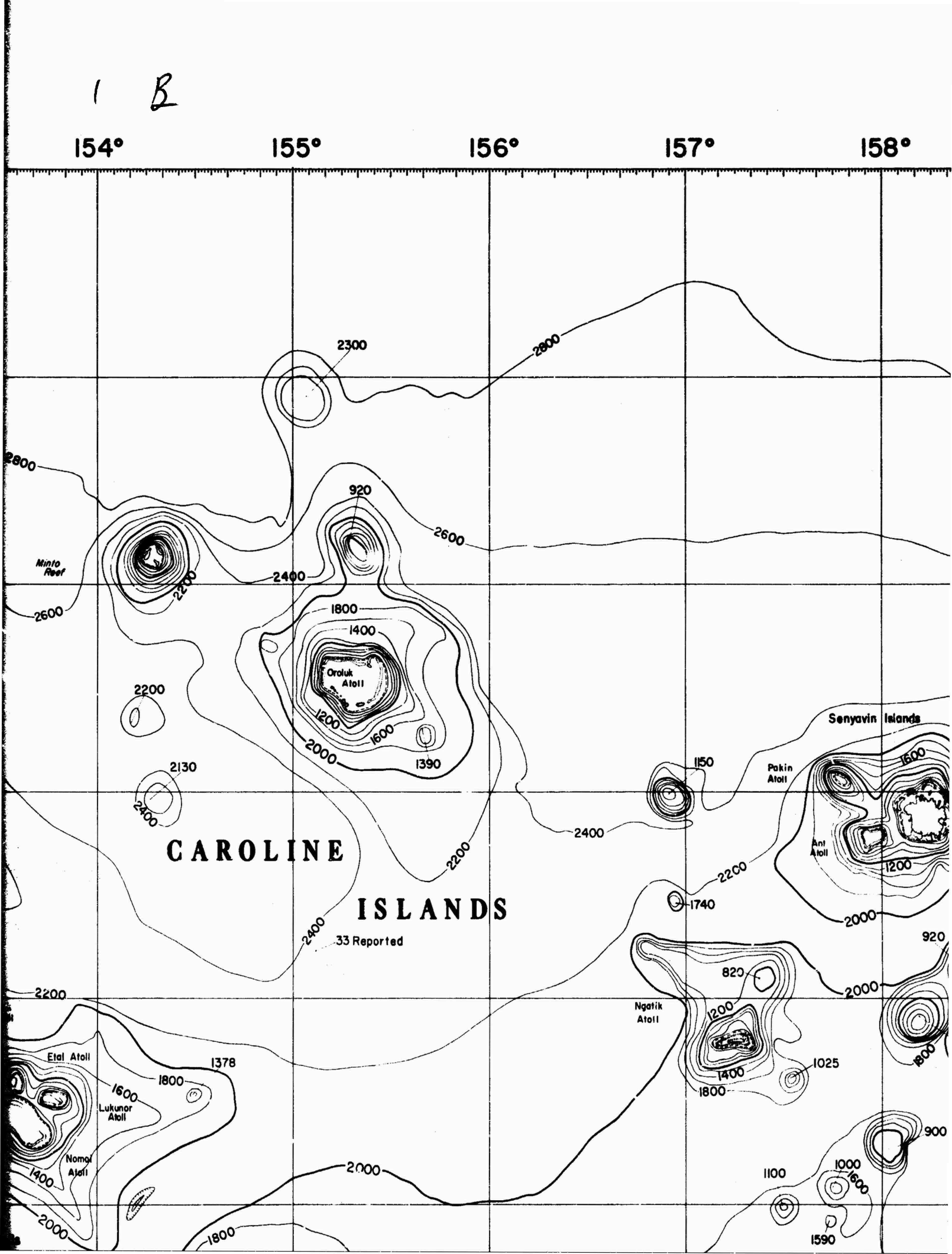
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Pakin Atoll
Senyavin Islands
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Ant Atoll
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ISLANDS
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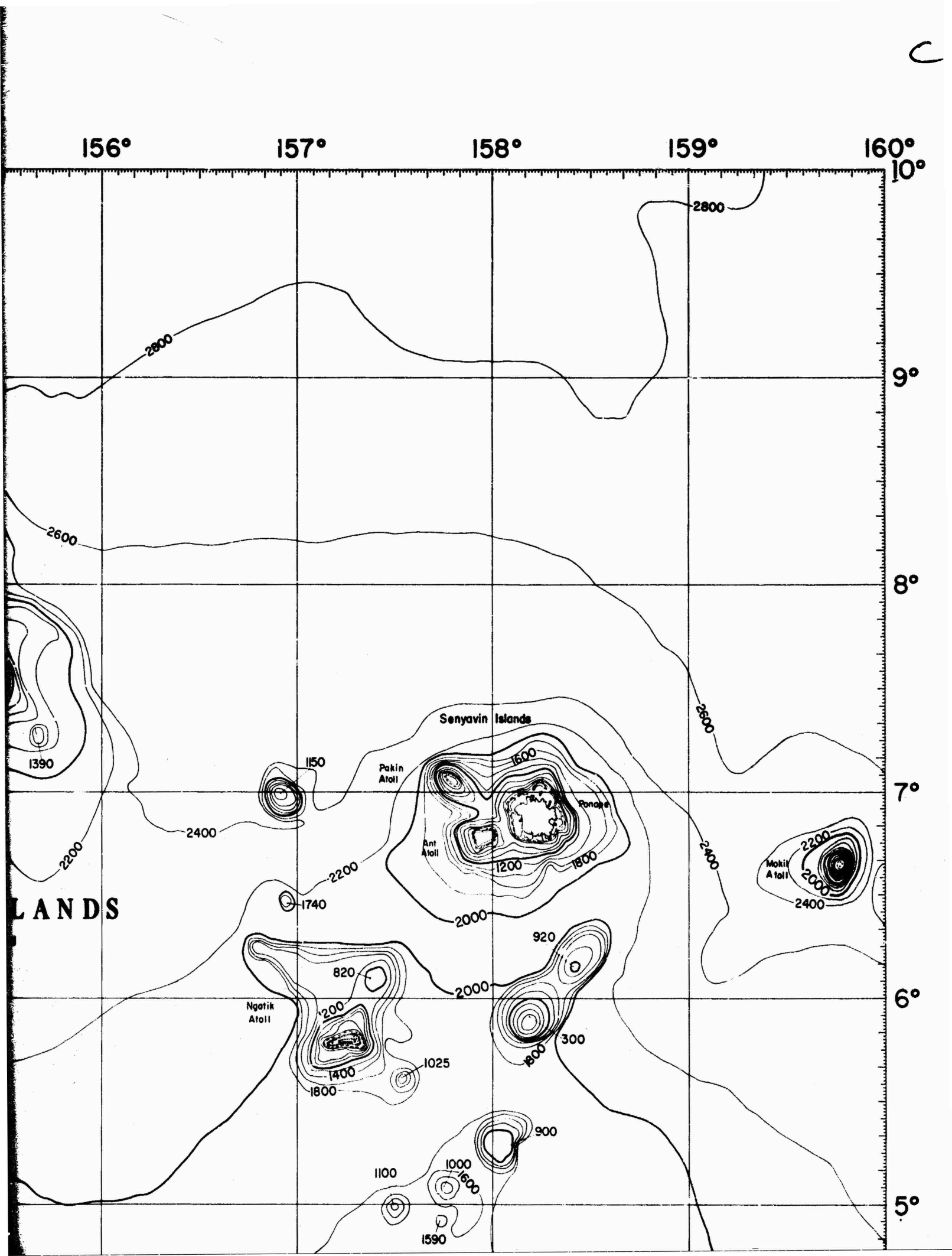
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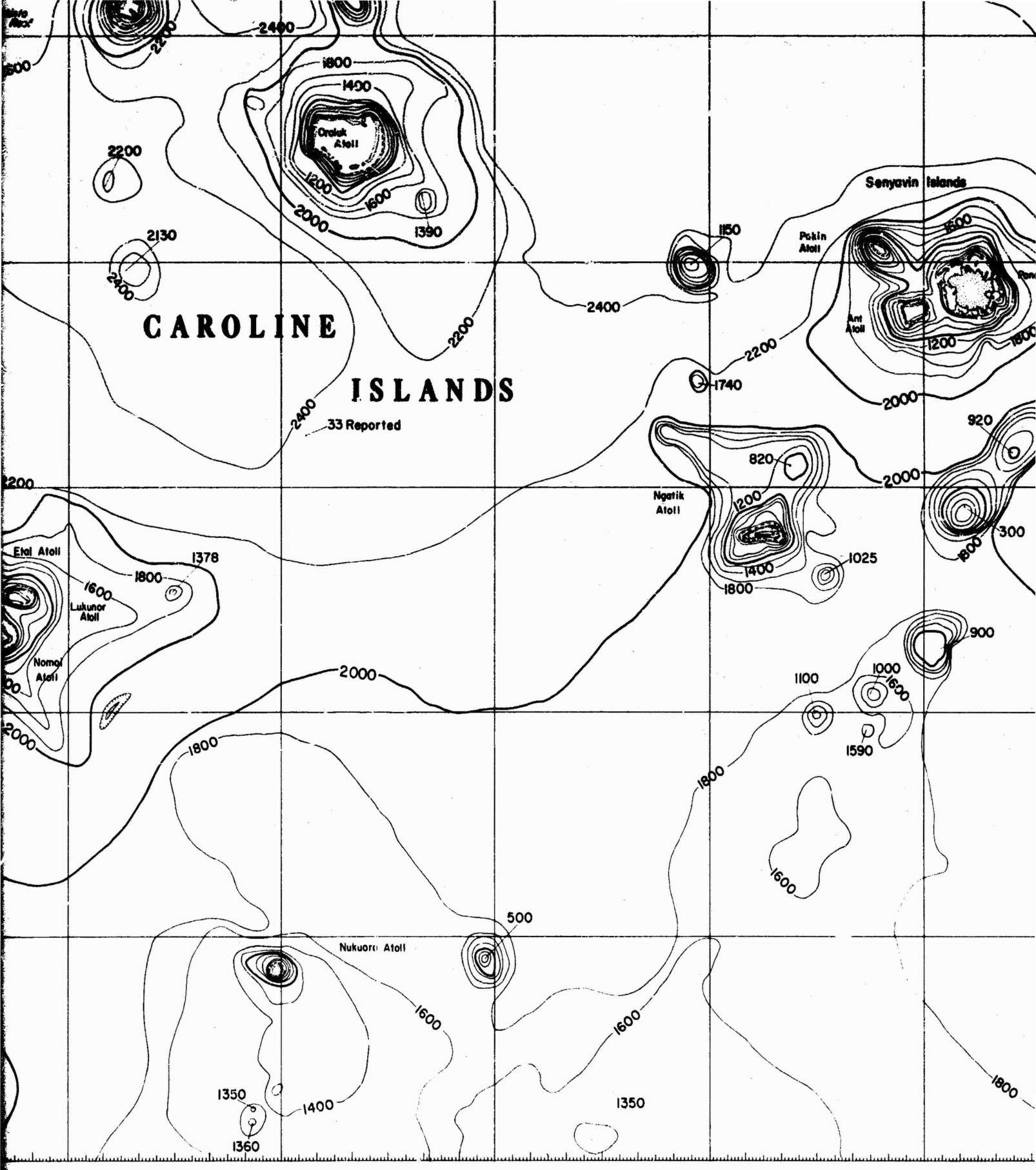
1740
1590
1390
1025
Senyavin Islands
Pakin Atoll
Ant Atoll
Ponape
Mokil Atoll
Ngatik Atoll
LANDS

Sources of Data: U.S. Naval Oceanographic Office; R/V Vitiaz, U.S.S.R., Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by: [illegible]
Assisted by: [illegible]

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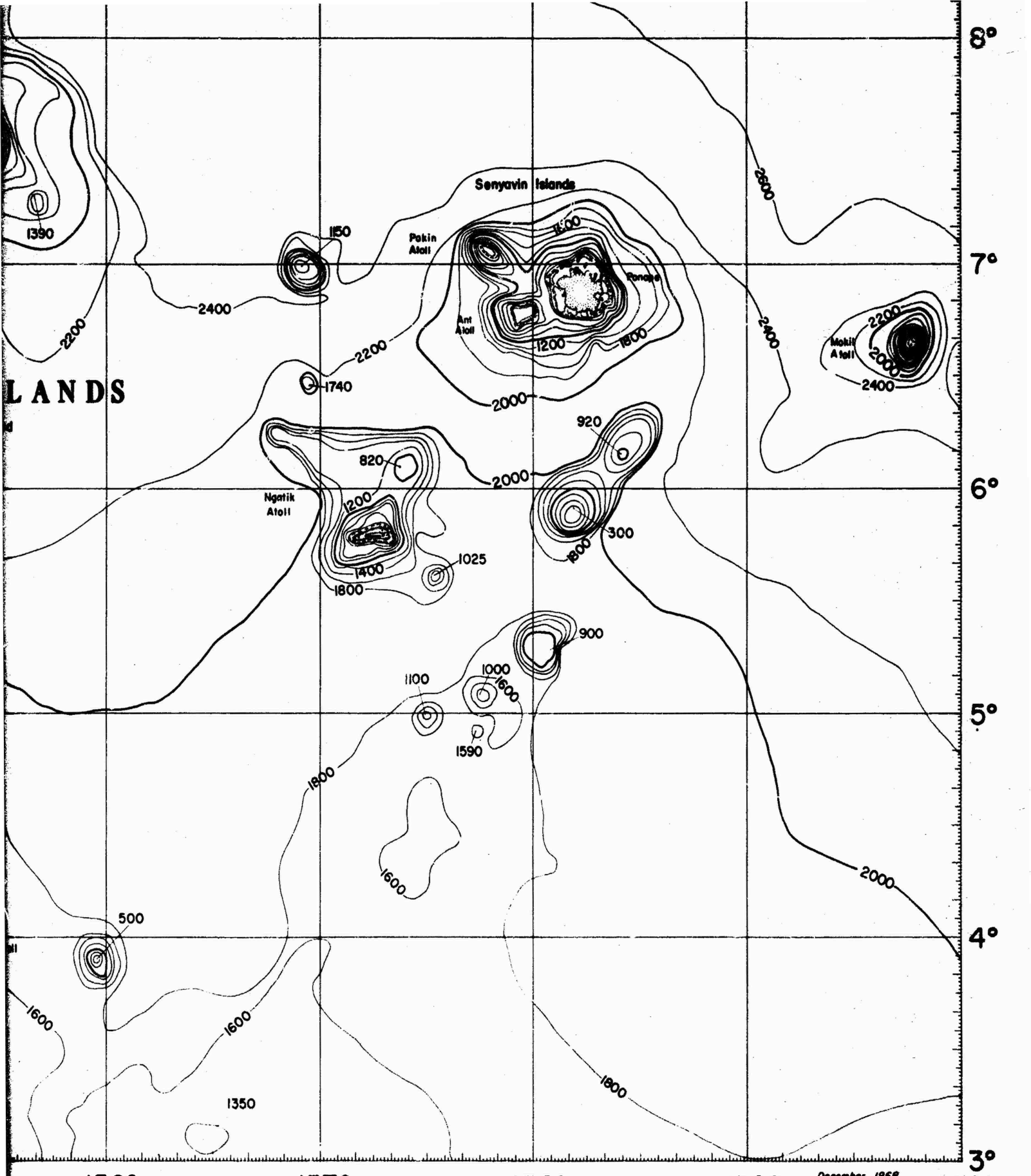
E



LANDS

December, 1968

NOGRAPHY

Contoured by: [illegible]

Assisted by: [illegible]

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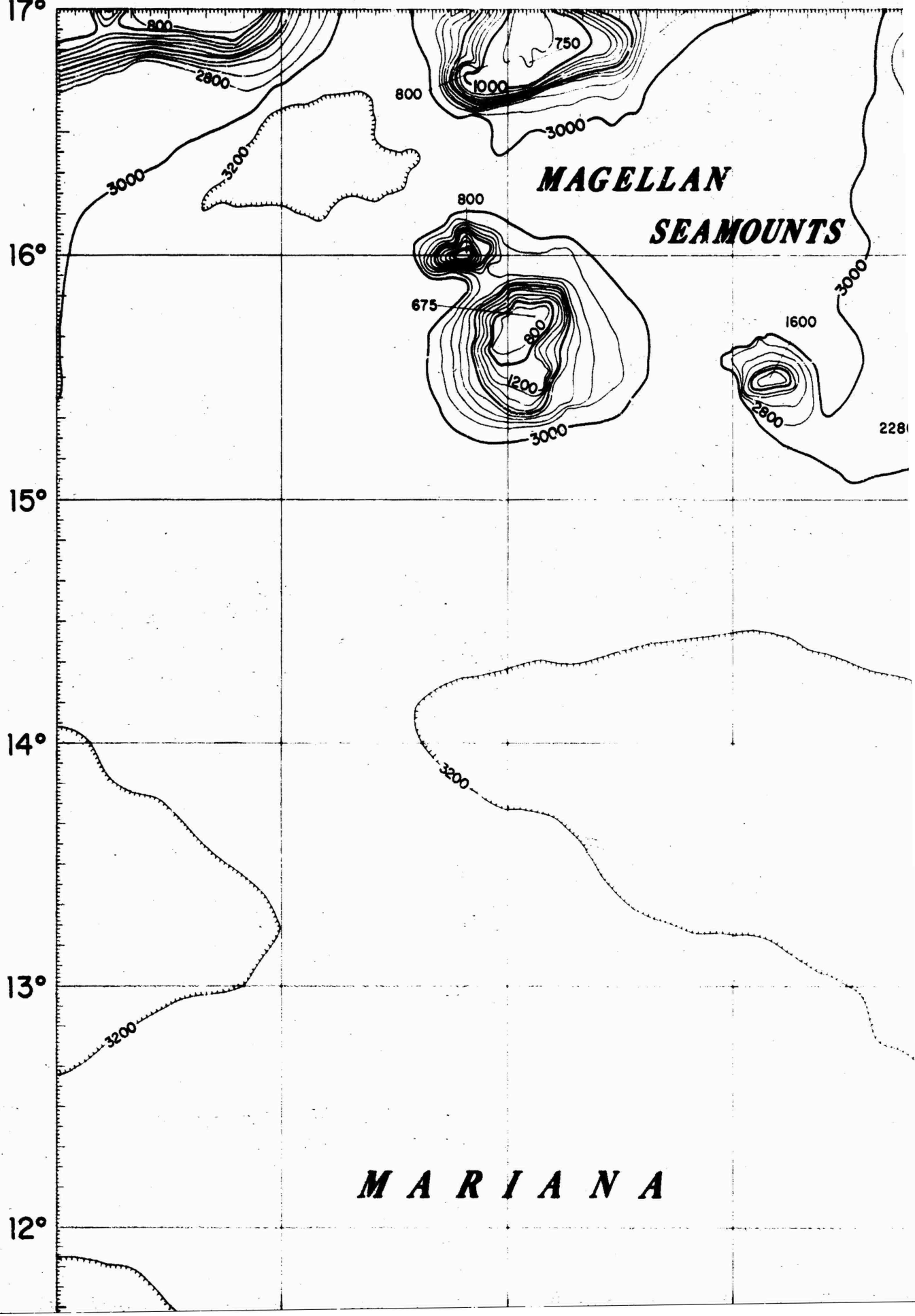
No. 2102 N

40

F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MAGELLAN
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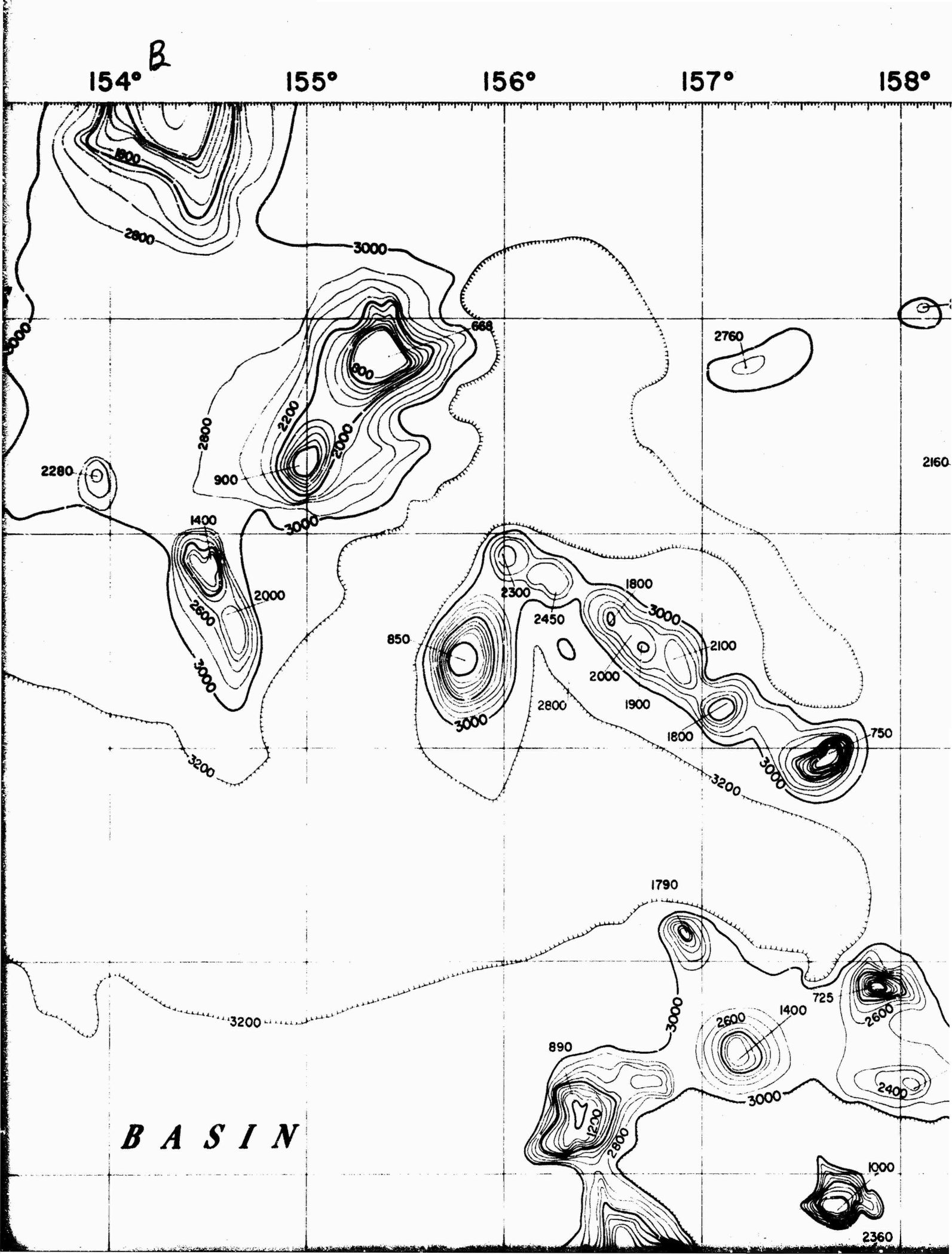
MARIANA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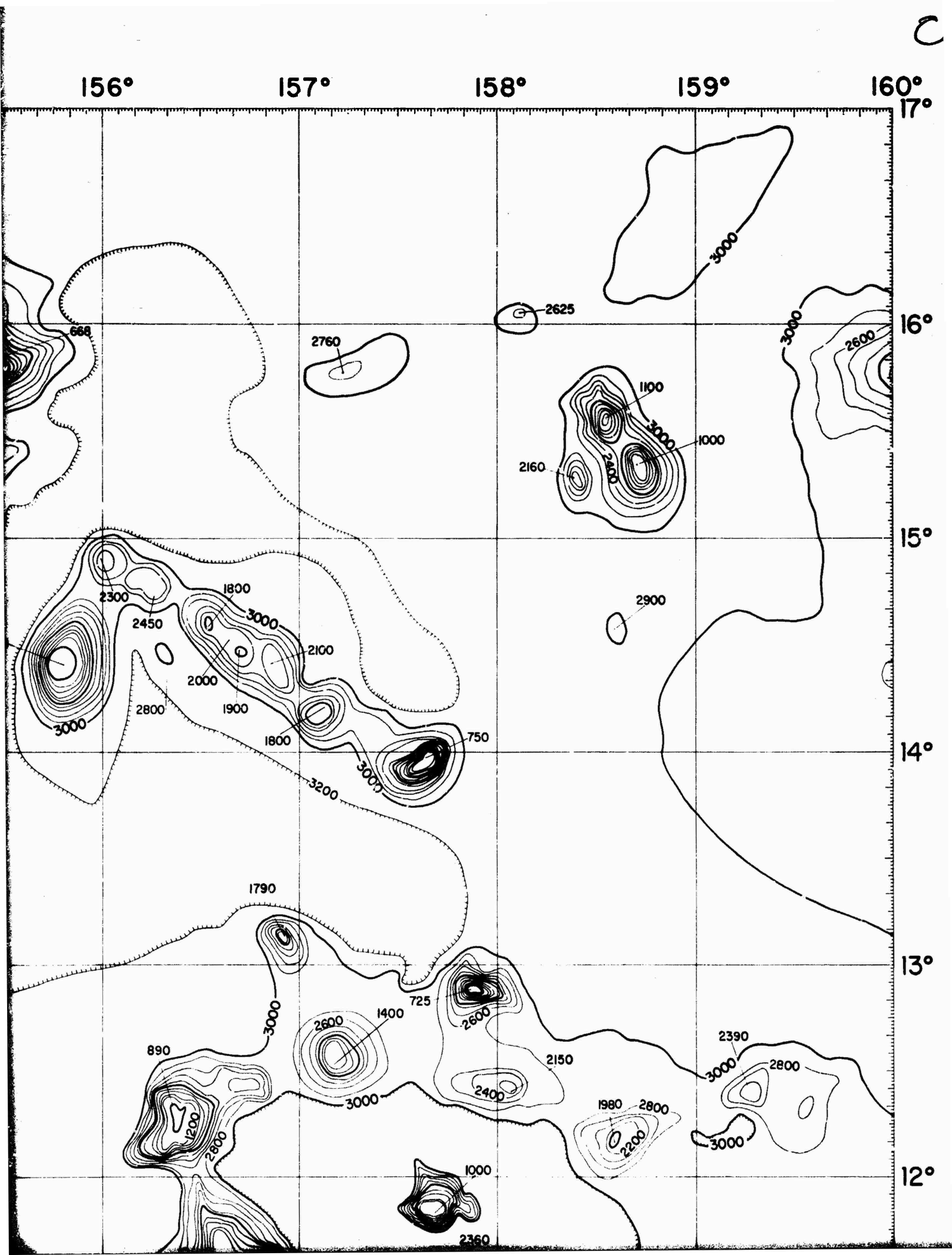
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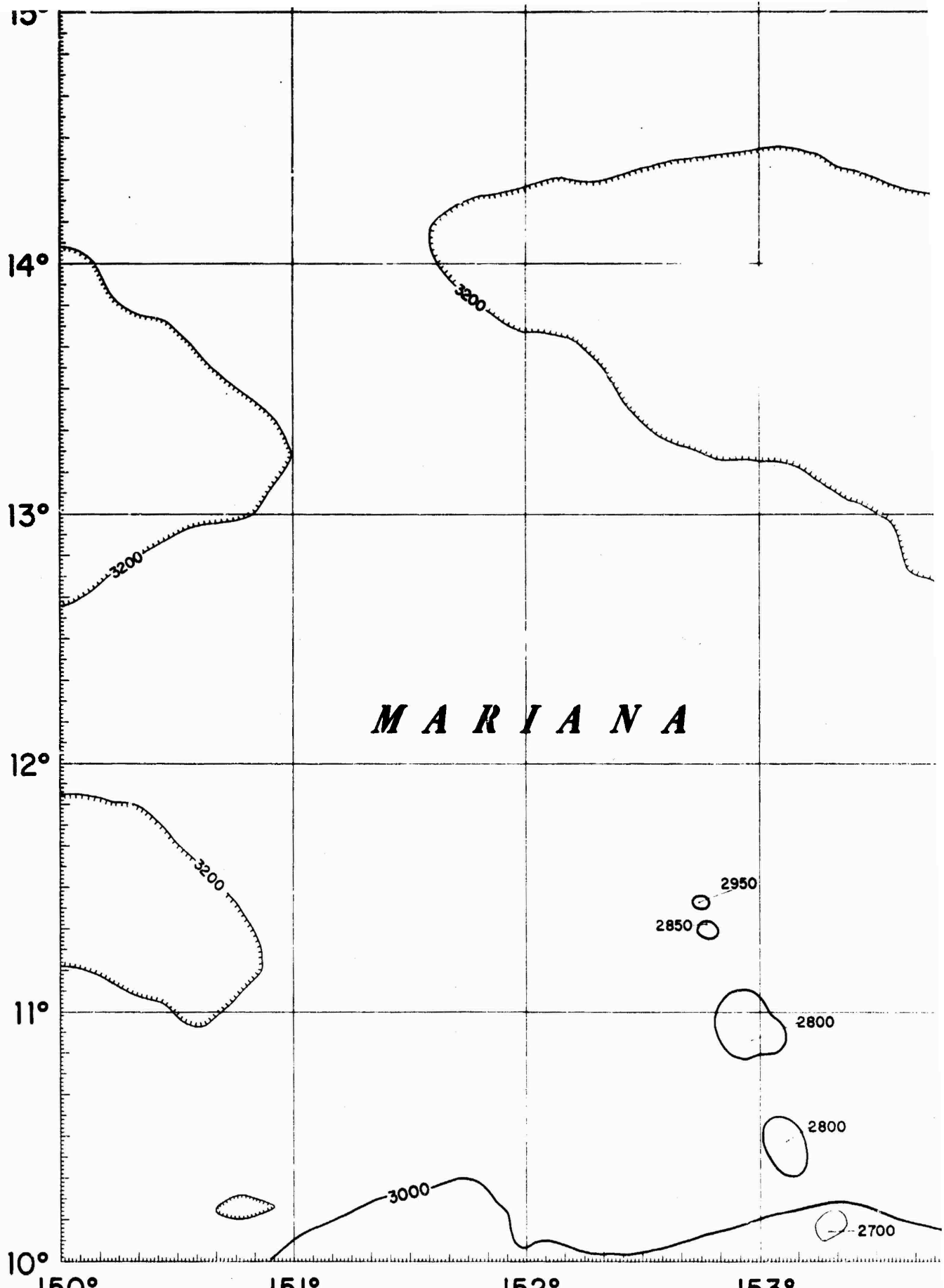
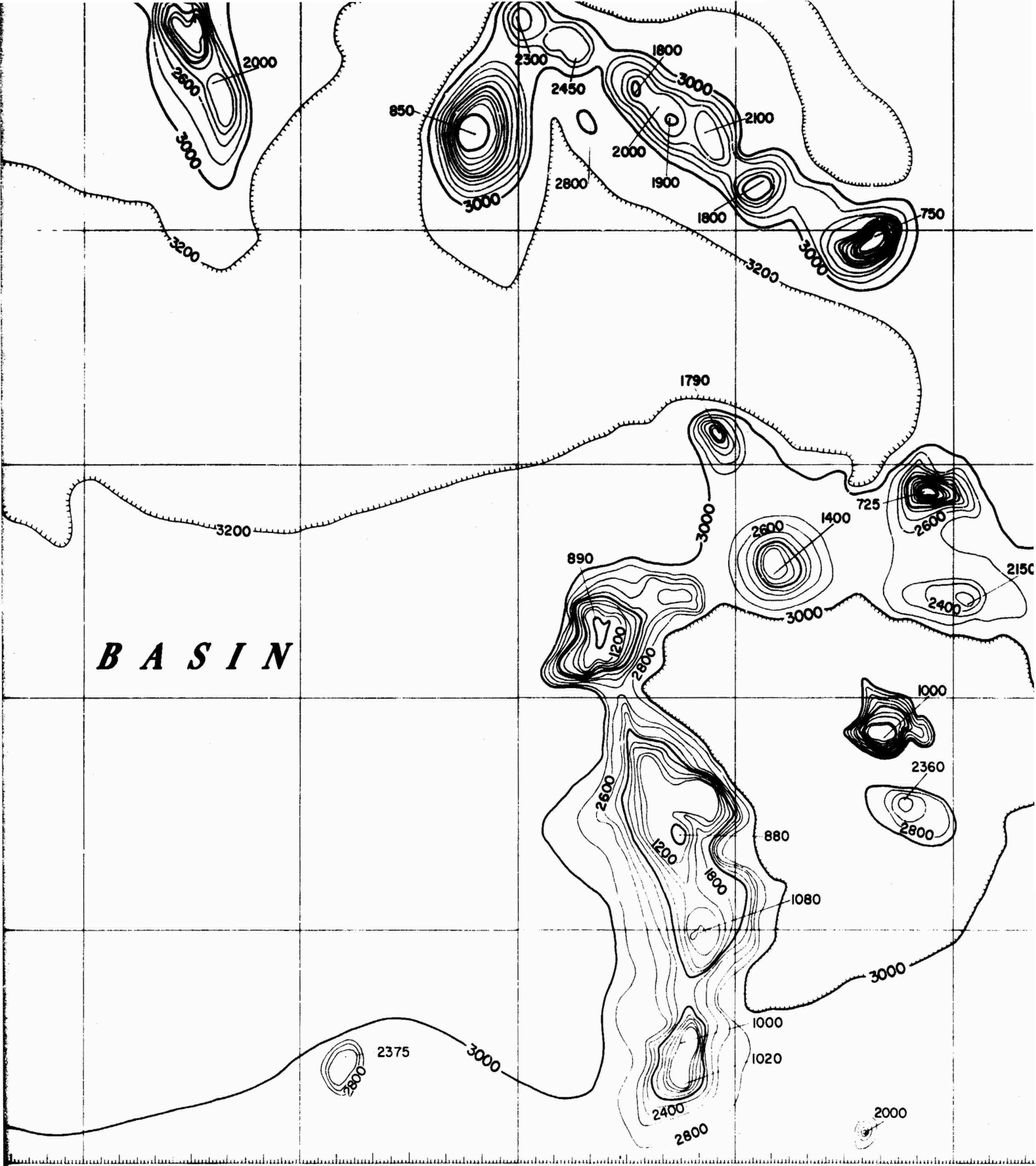


Sources of Data: Maritime Safety Agency, Japan, U.S. Naval Oceanographic Office, Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by: Arthur J. Mary
Assisted by: [illegible]

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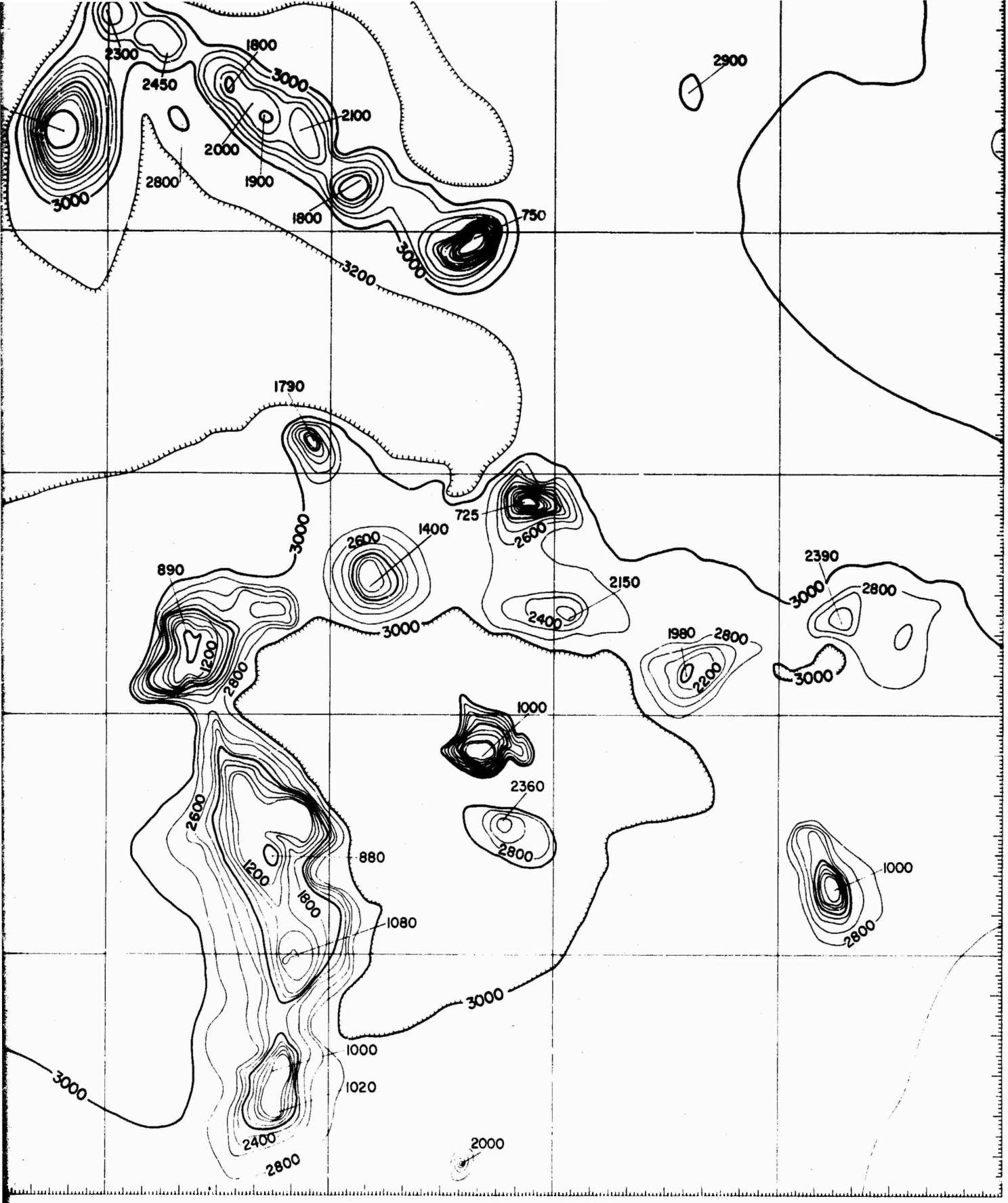
E



December, 1968

NOGRAPHY

Contoured by: [illegible]

Assisted by: [illegible]

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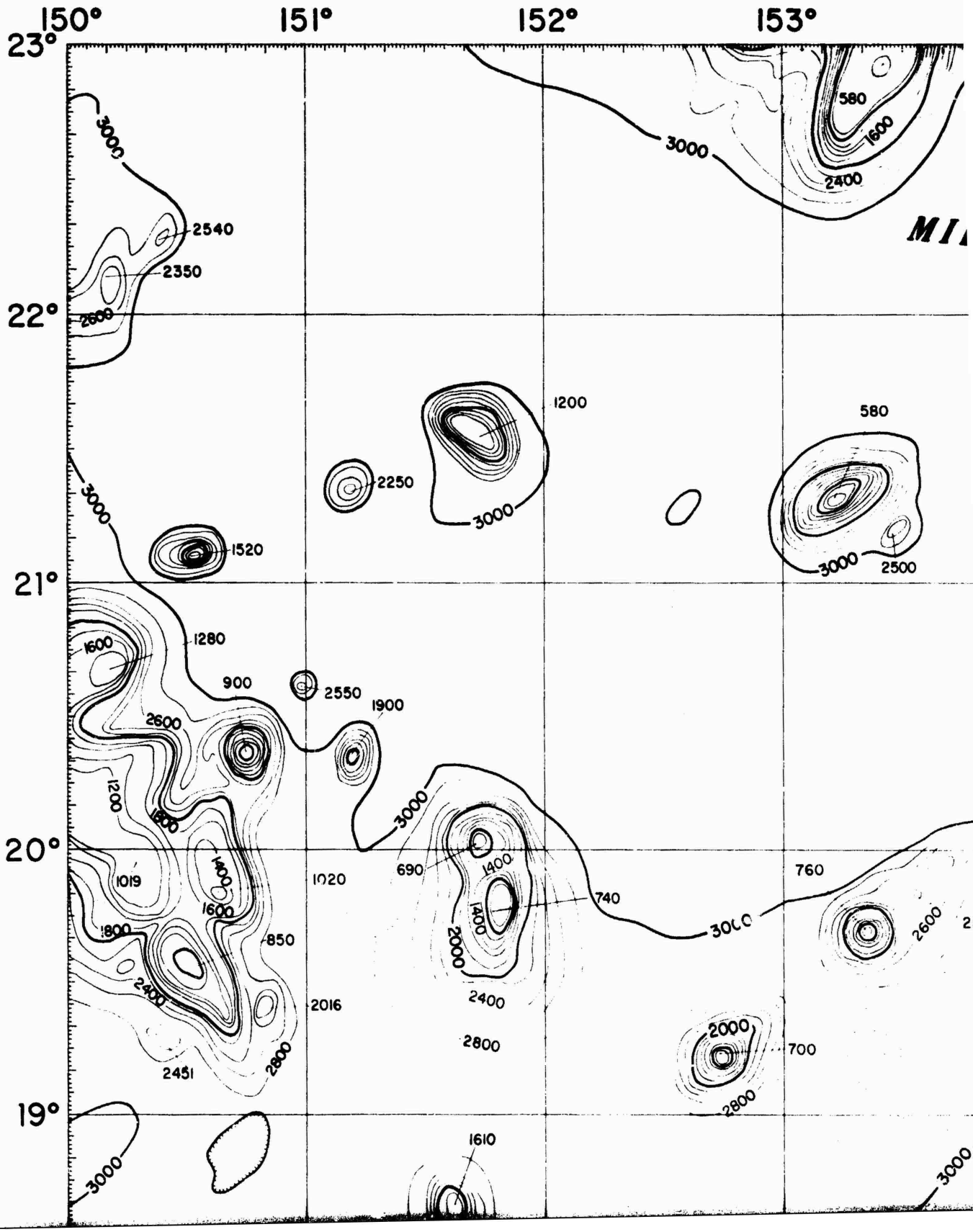
F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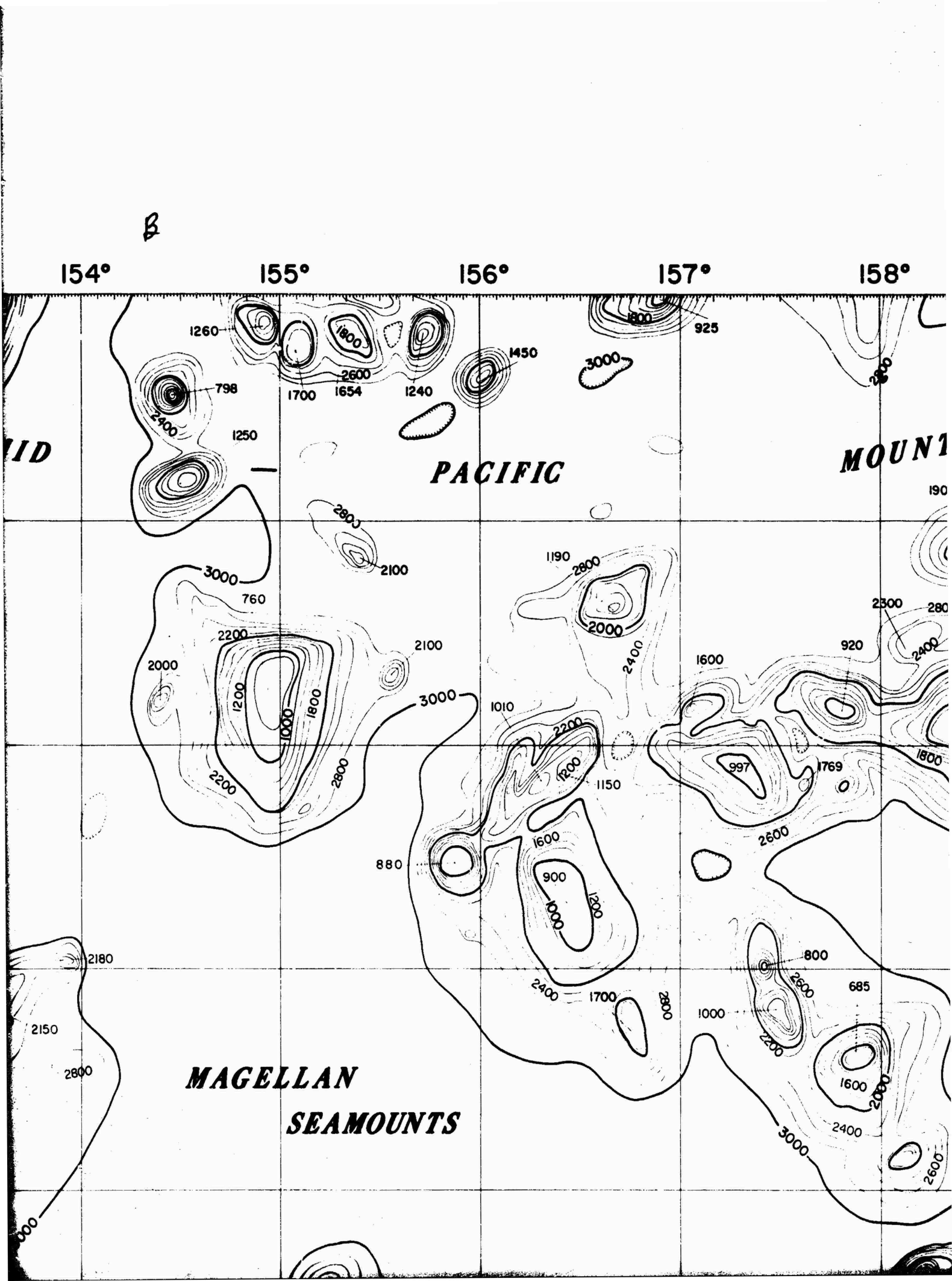
700
1610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MAGELLAN
SEAMOUNTS
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760
1190
2800
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2300
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1800
1000
3000
1010
2200
1600
920
2400
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997
1769
1200
1150
2200
2800
1600
2600
880
900
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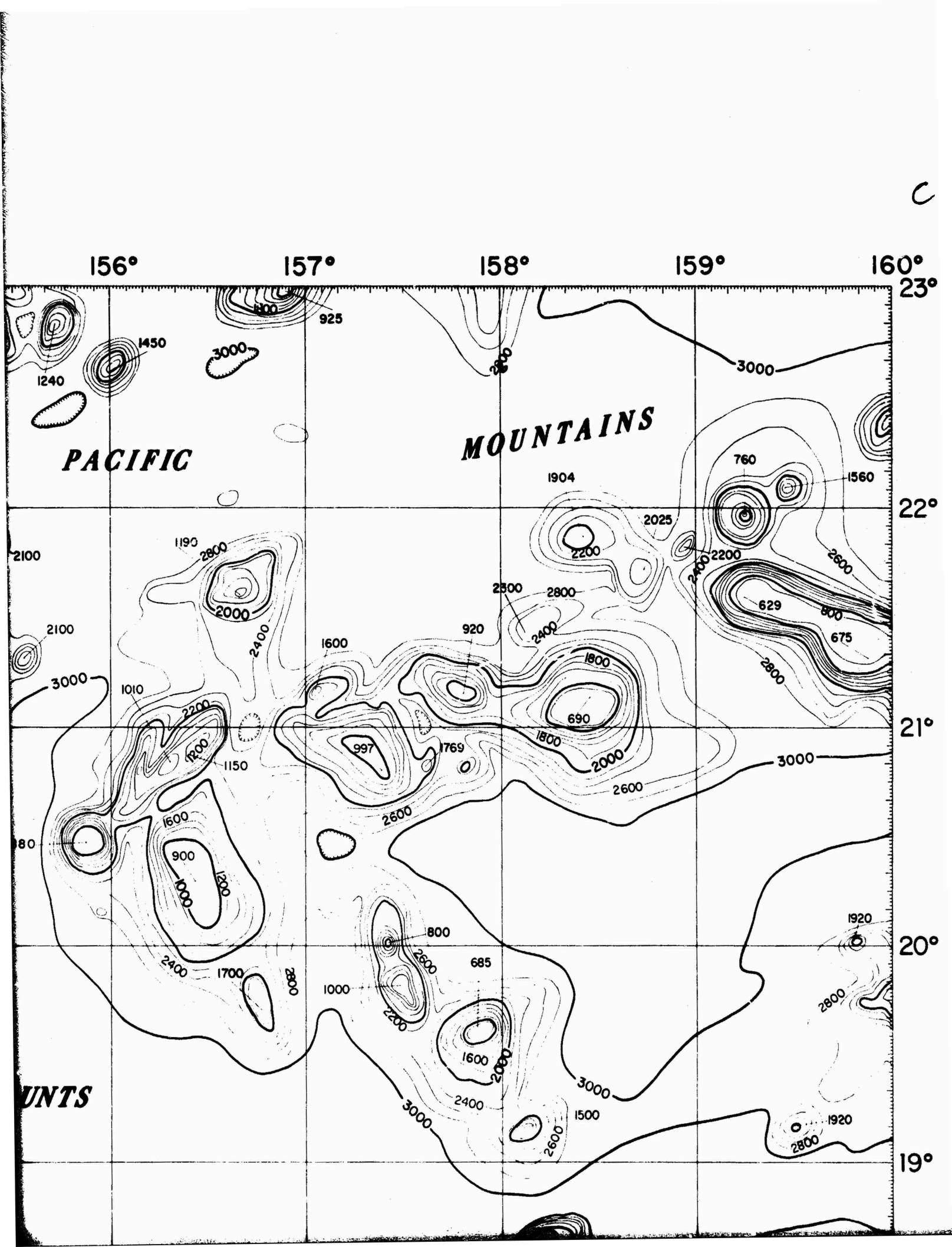
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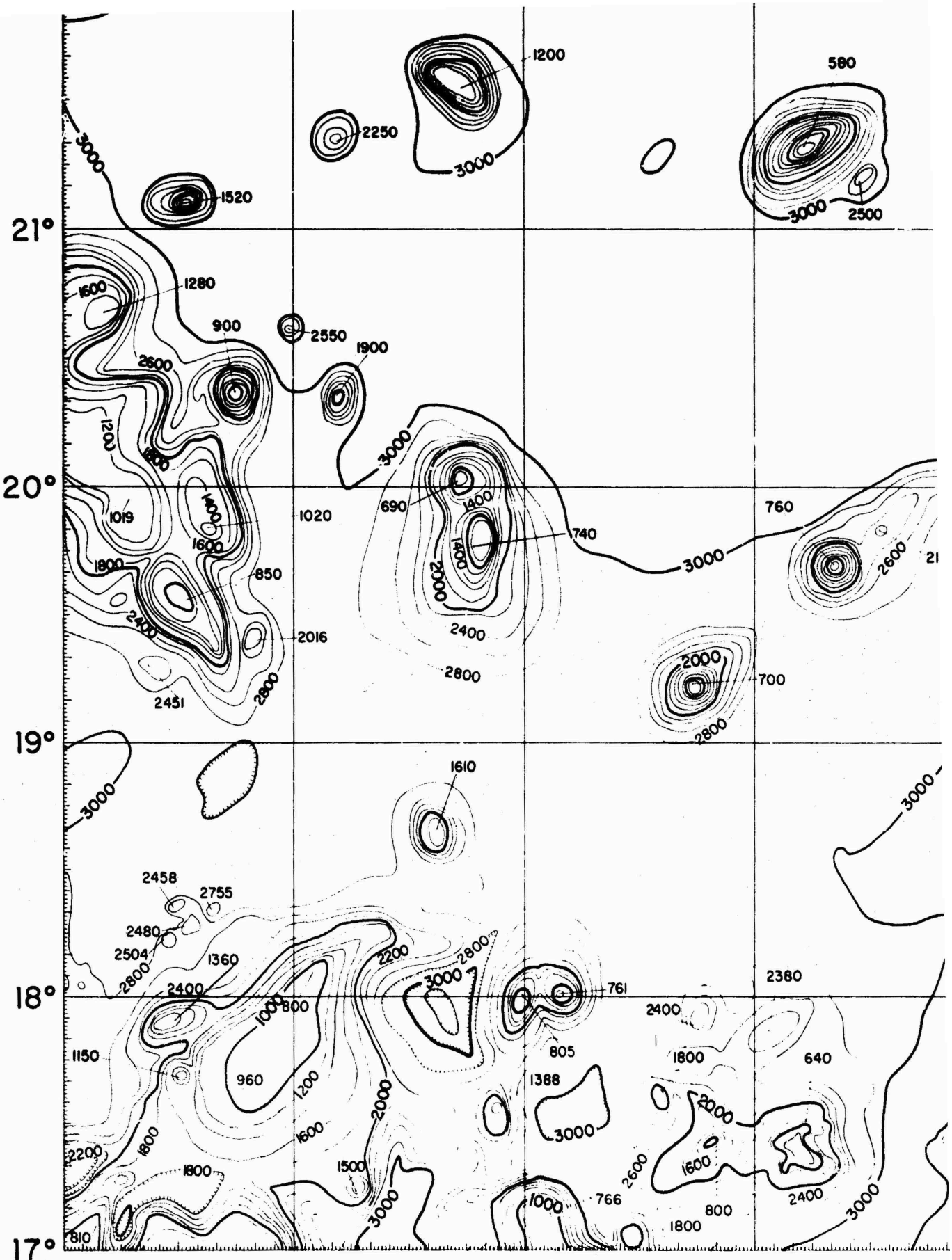
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700
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2755
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2200
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761
2380
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2600
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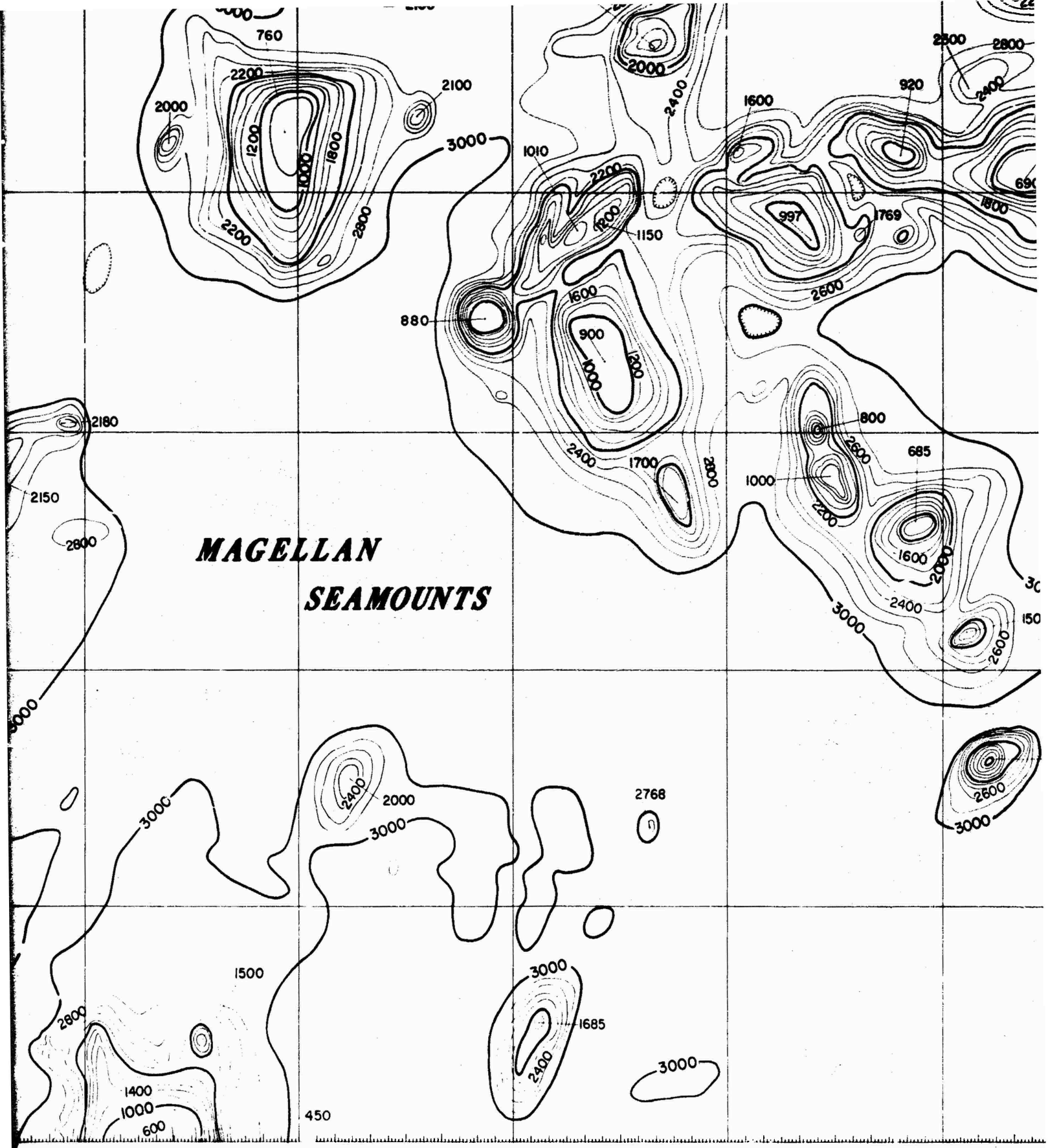
1000
766
2400
1800
800
810
Sources of Data: American Telephone & Telegraph; R/V Vitiaz, U.S.S.R.; Scripps Institution of Oceanography; Maritime Safety Agency, Japan; U.S. Naval Oceanographic Office
Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by: R.G. Bosch
Assisted by: W. [illegible]

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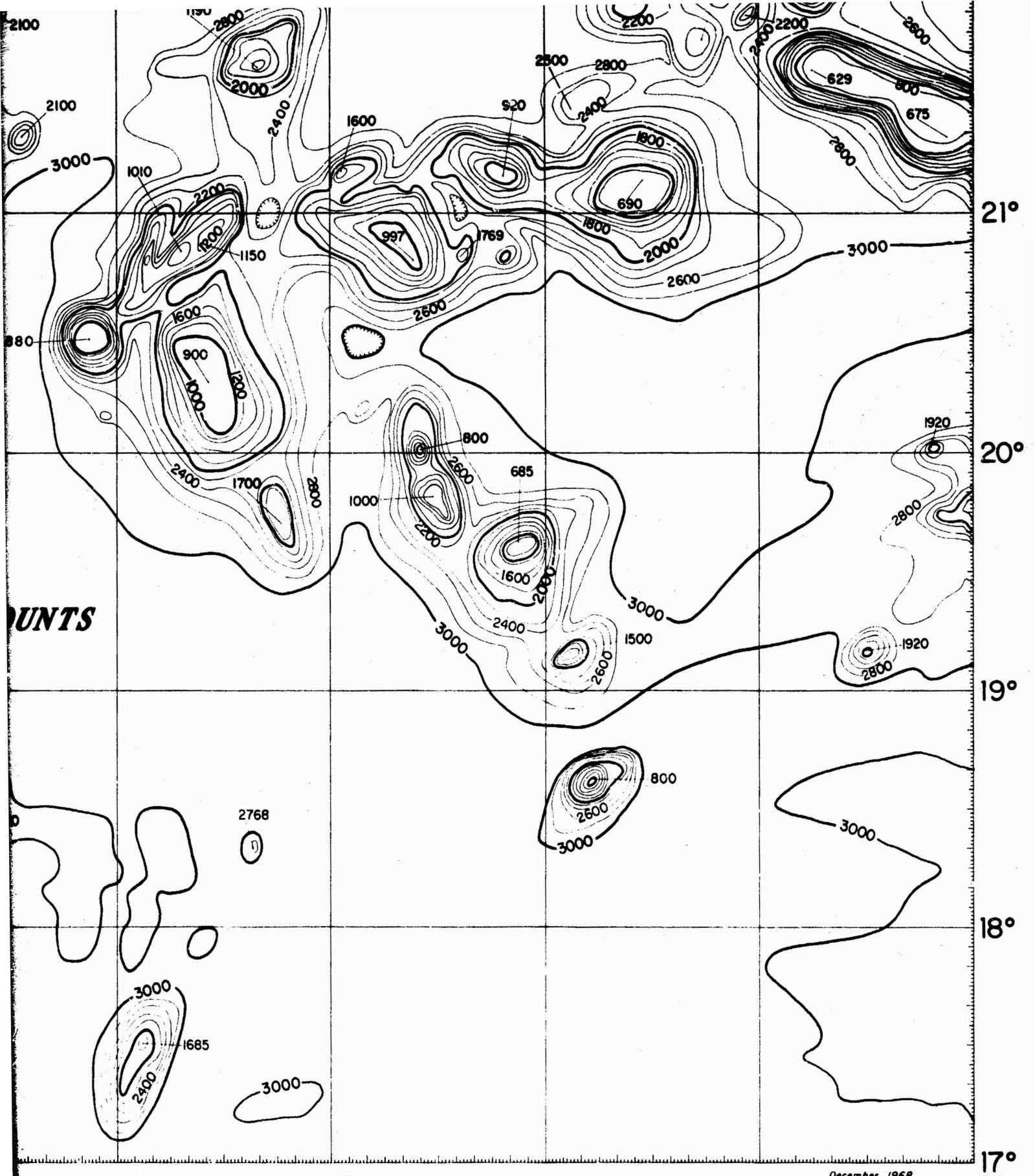
E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December, 1968
ANOGRAPHY
Contoured by: R.G. Bosch
Assisted by: H. Chase, D. Lamm
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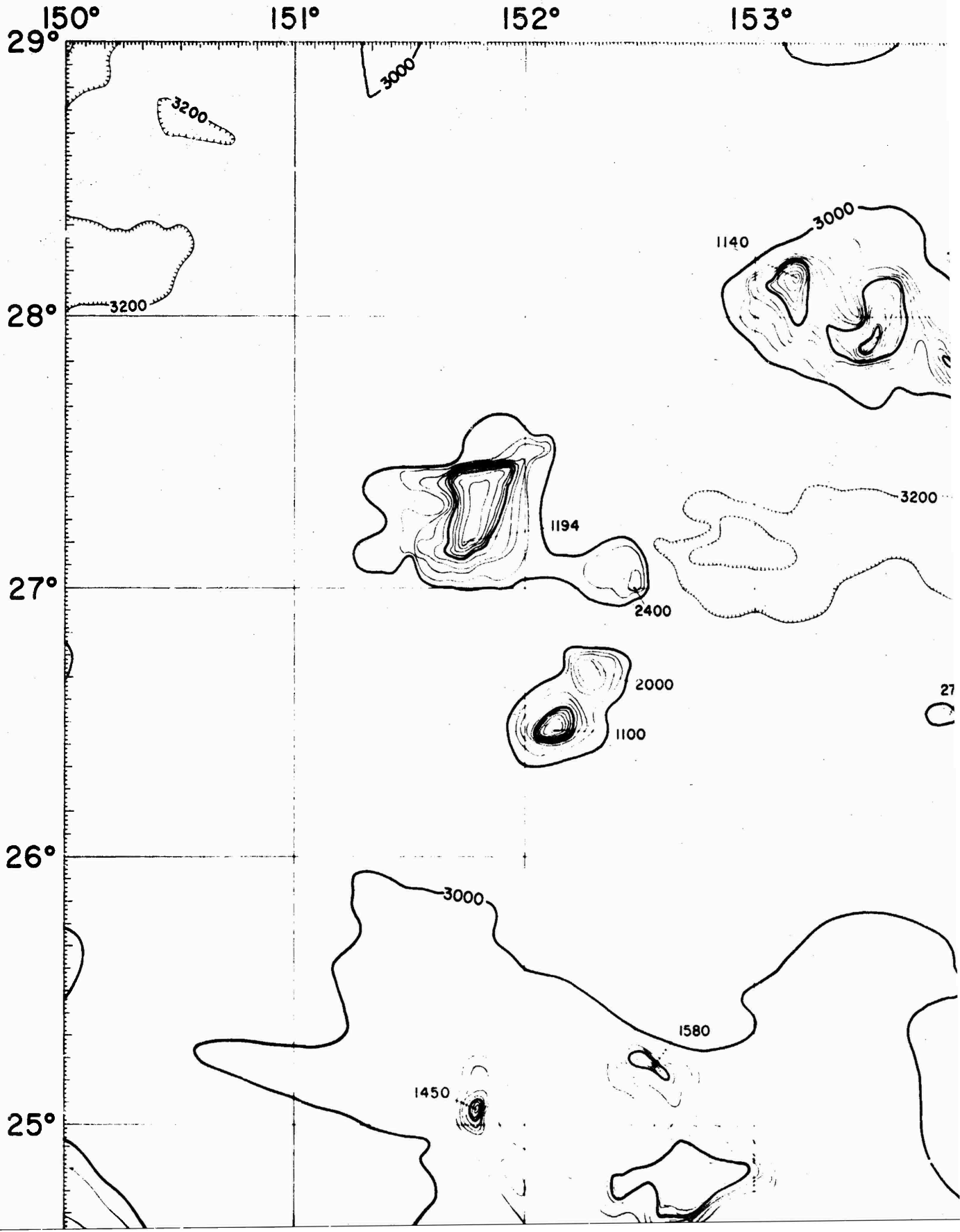
No. 2104N 42
F

A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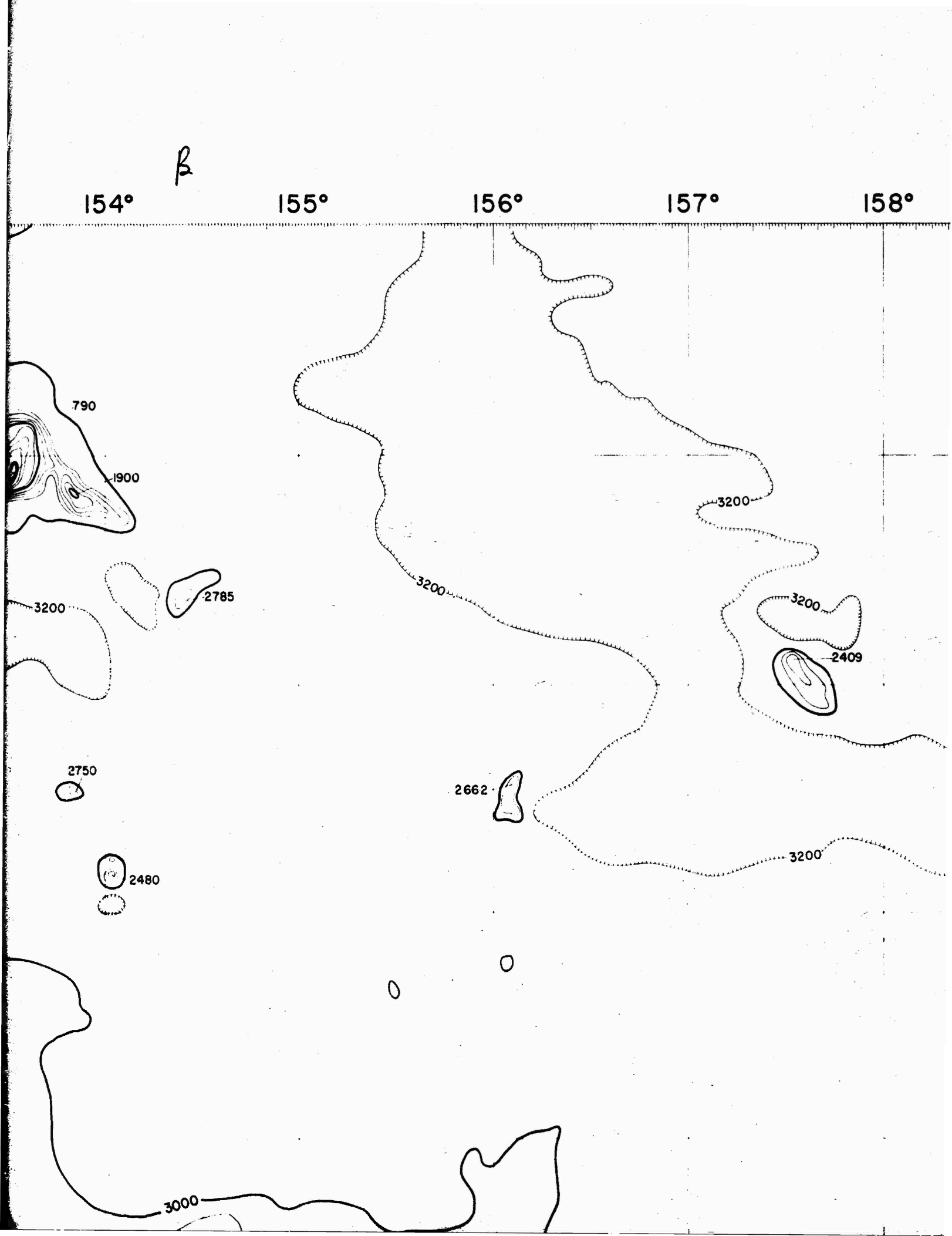
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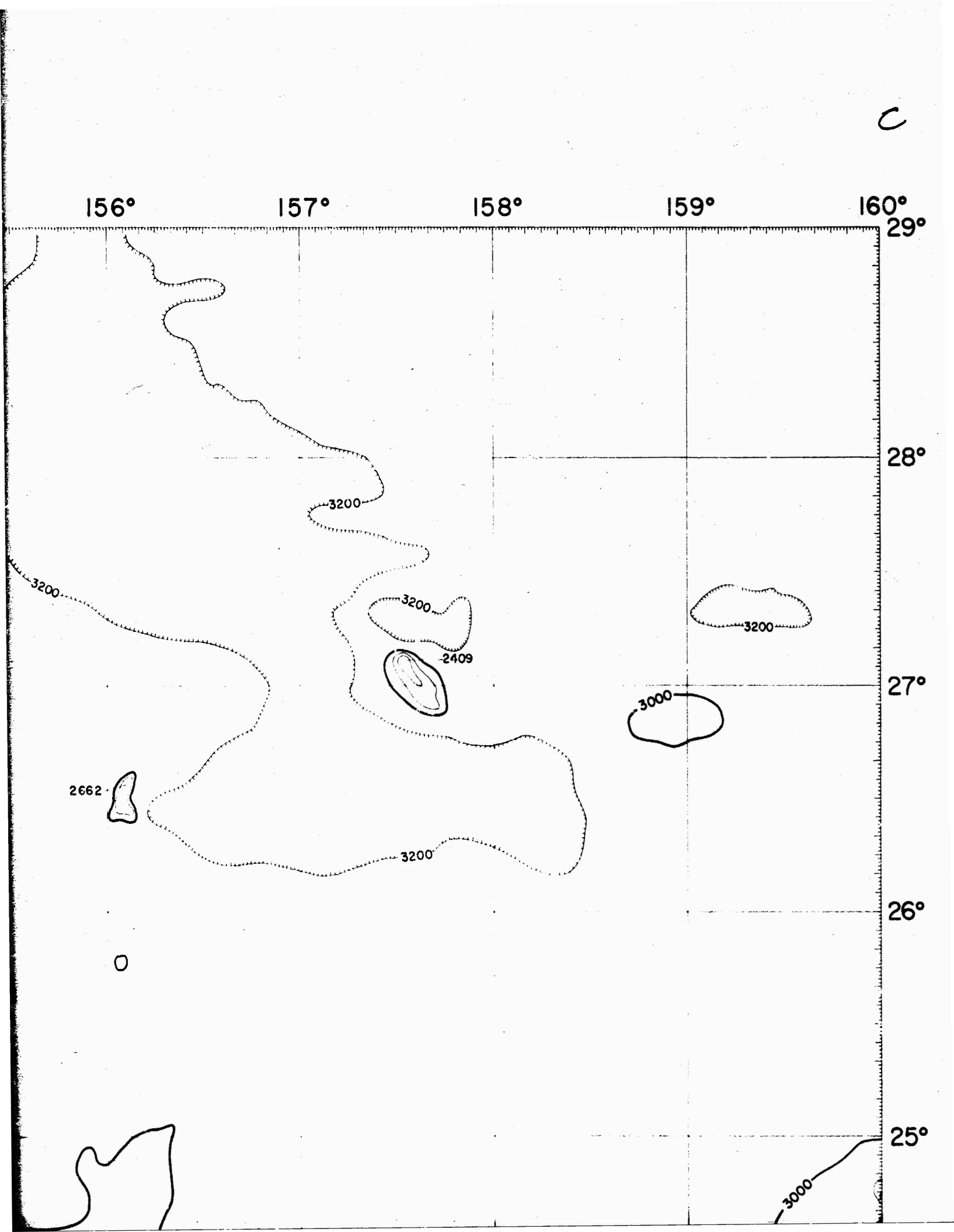
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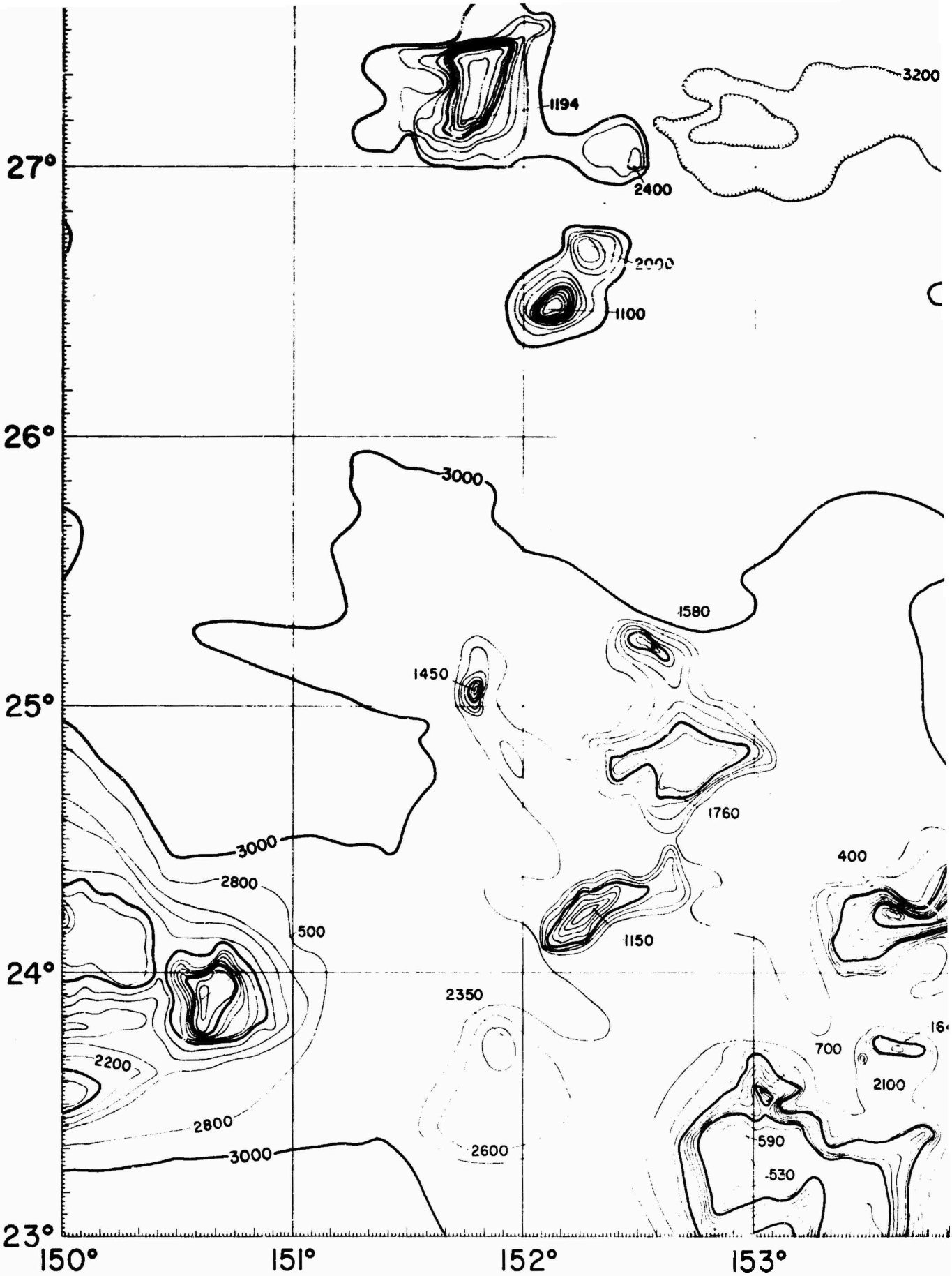
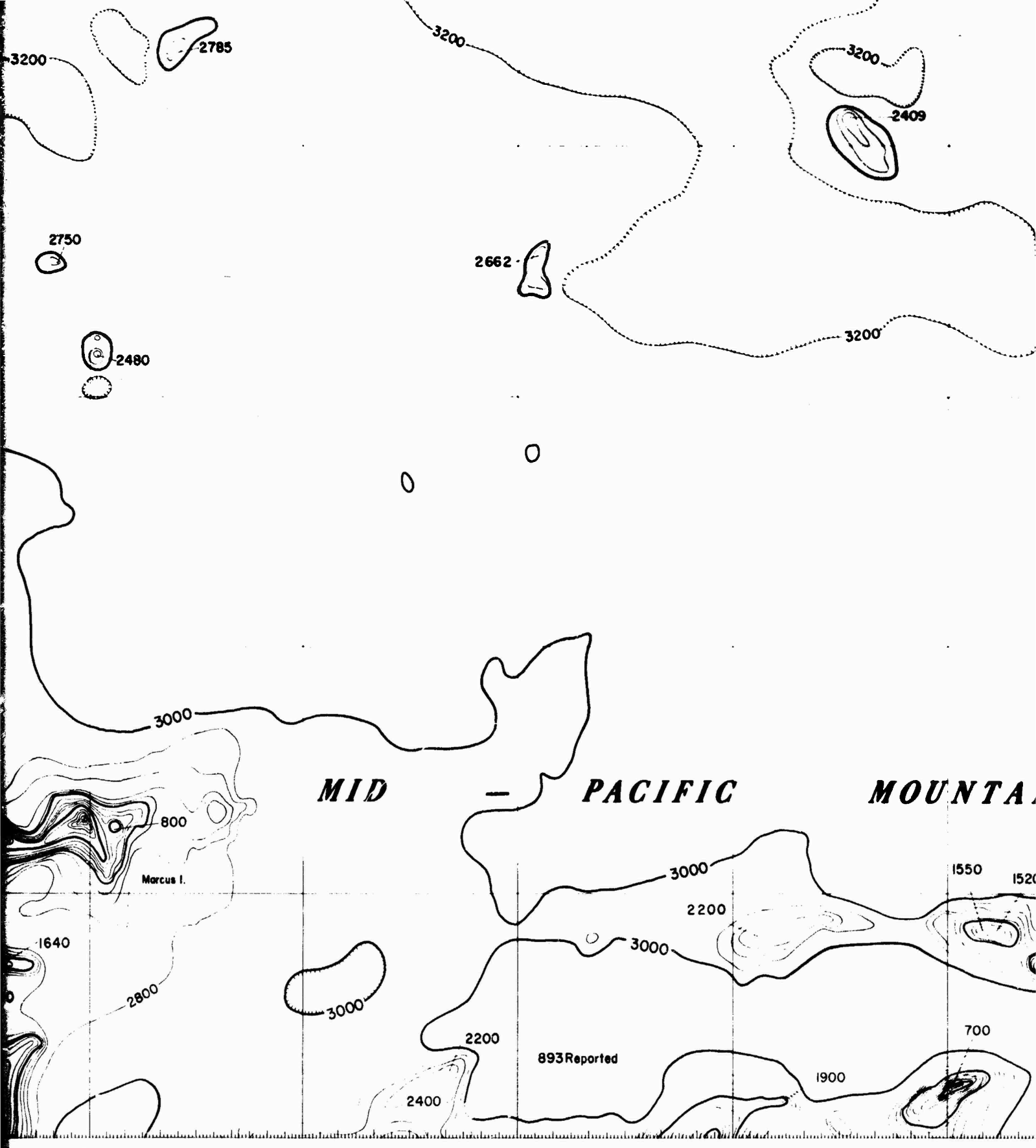


Sources of Data: U.S. Naval Oceanographic Office, Maritime Safety Agency, Japan, R/V Vitiaz, U.S.S.R.; Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable



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Contoured by:

Assisted by:

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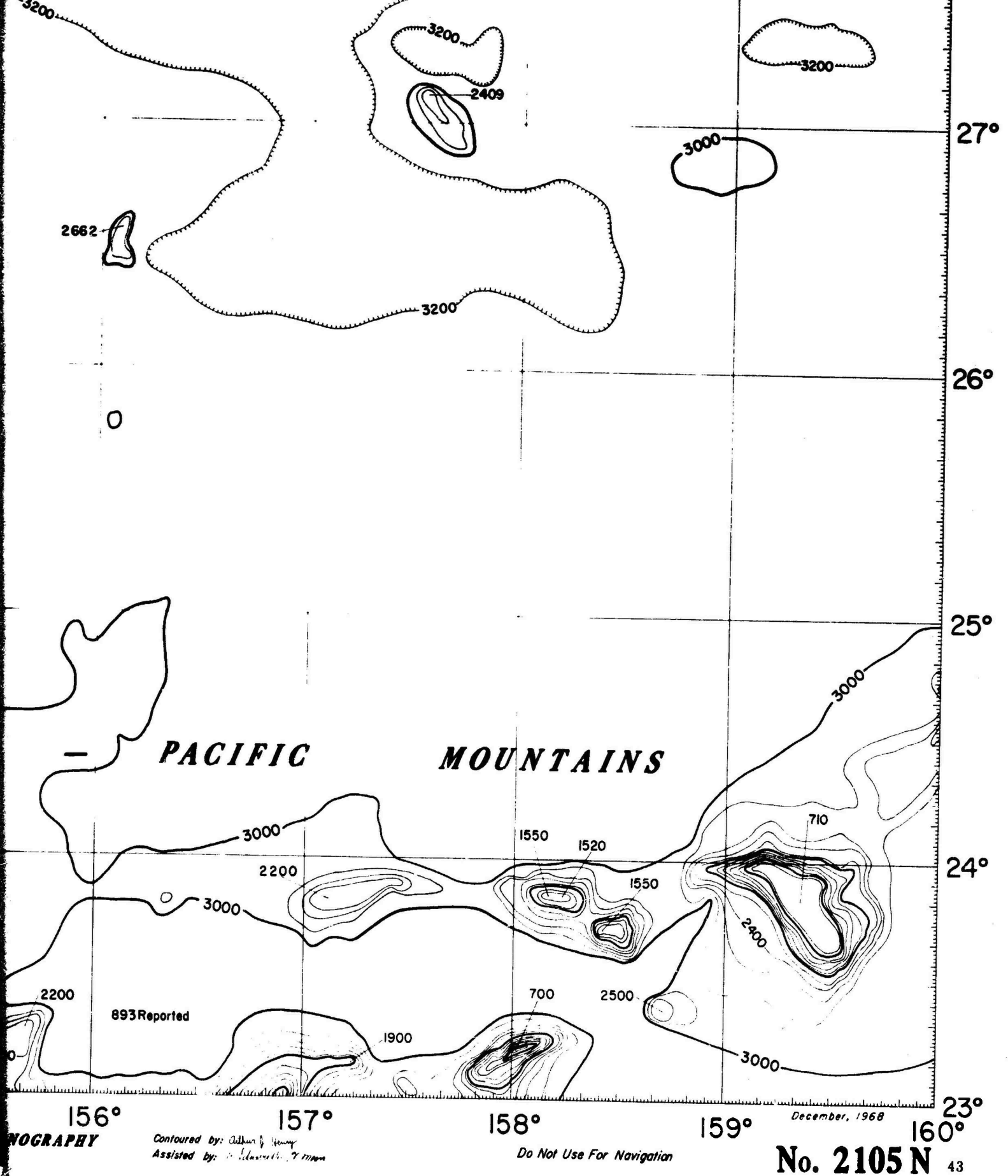

NOGRAPHY

Contoured by: Arthur J. Henry

Assisted by: [illegible]

December, 1968

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No. 2105 N 43

F

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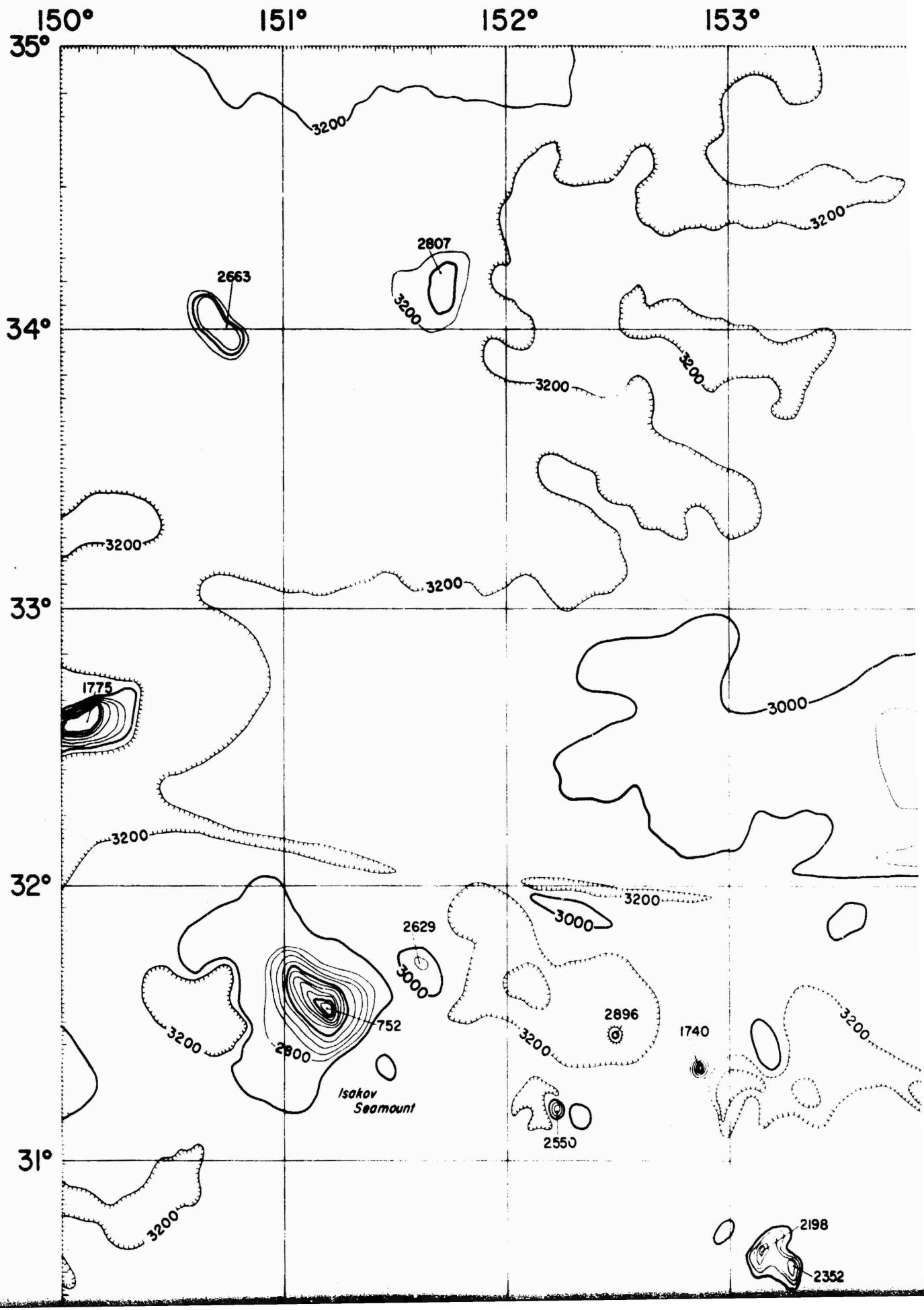
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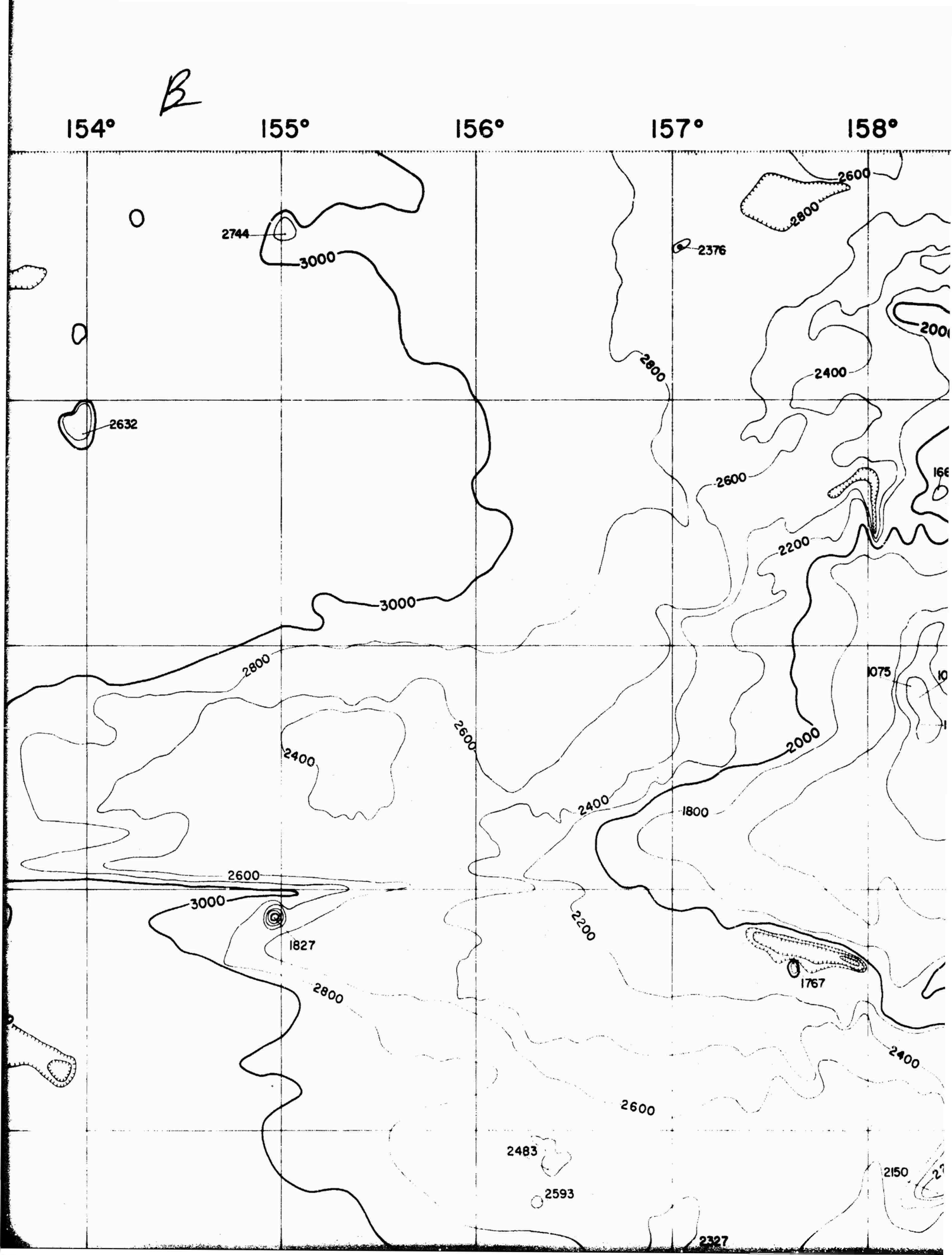
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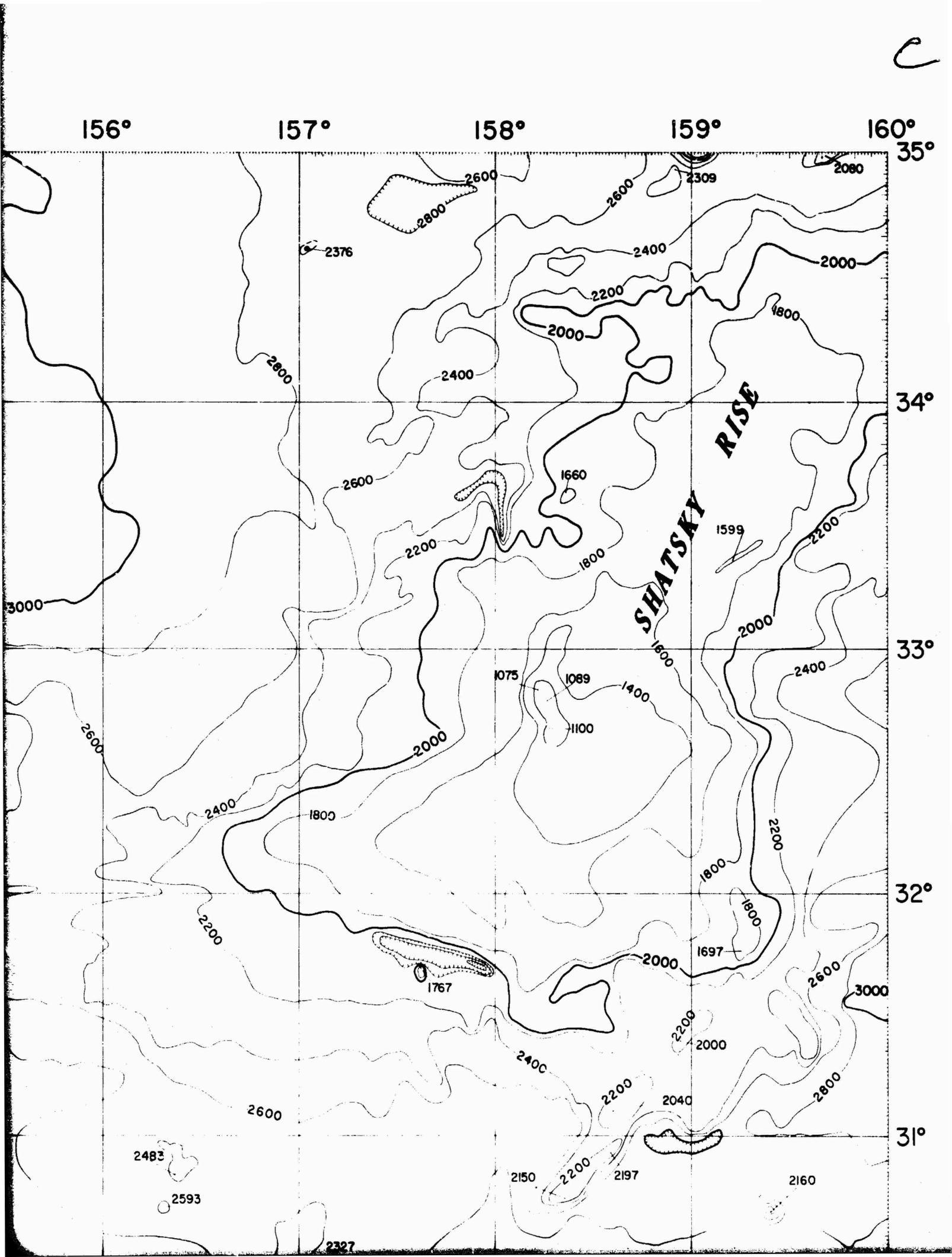
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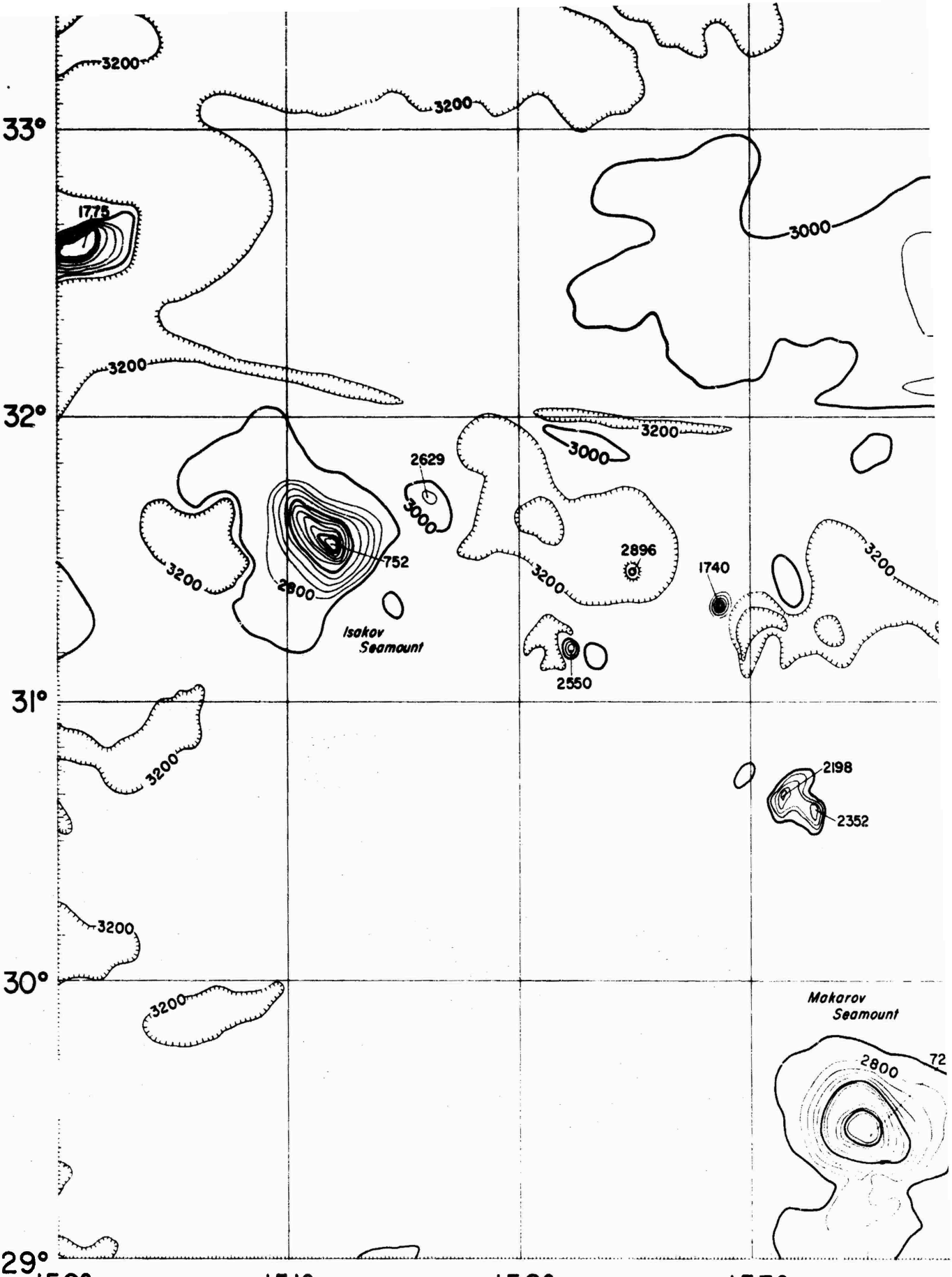
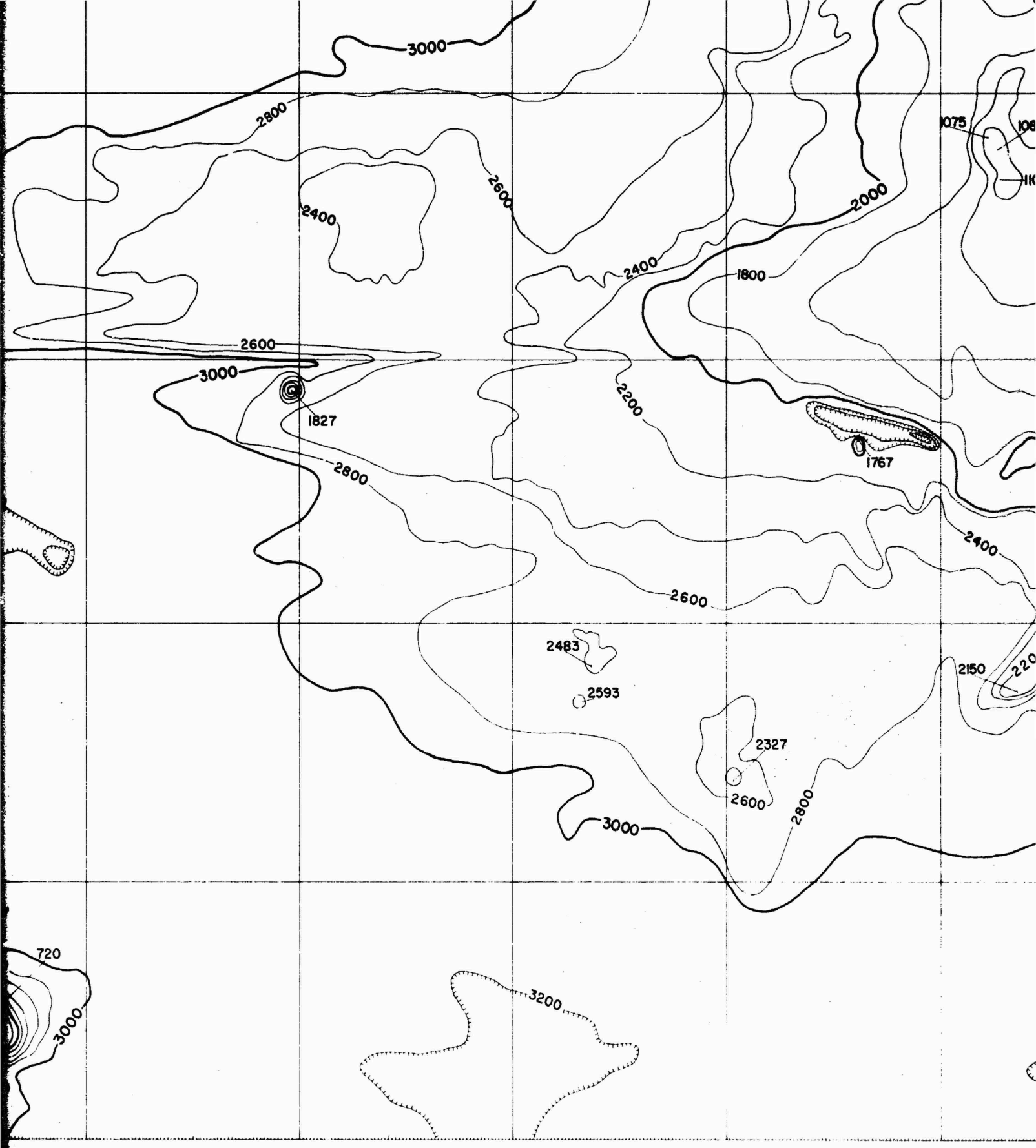


Sources of Data: U.S. Naval Oceanographic Office, Maritime Safety Agency, Japan, R/V Vitiaz, U.S.S.R., Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



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Contoured by: Arthur [illegible]
Assisted by: [illegible]

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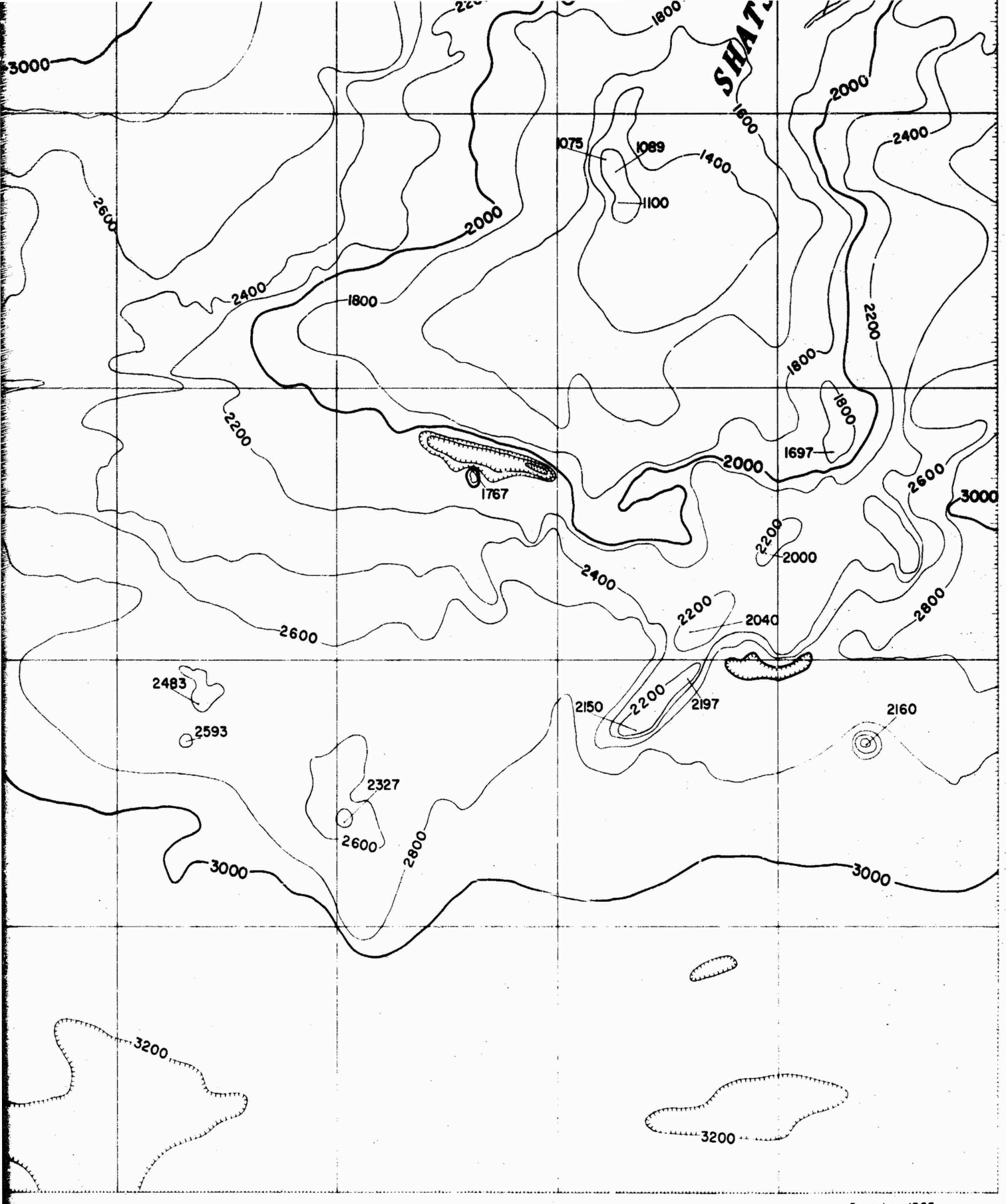
E



December, 1968

ANOGRAPHY

Contoured by: Arthur J. Harvey

Assisted by: J. Hawkins, J. Moore

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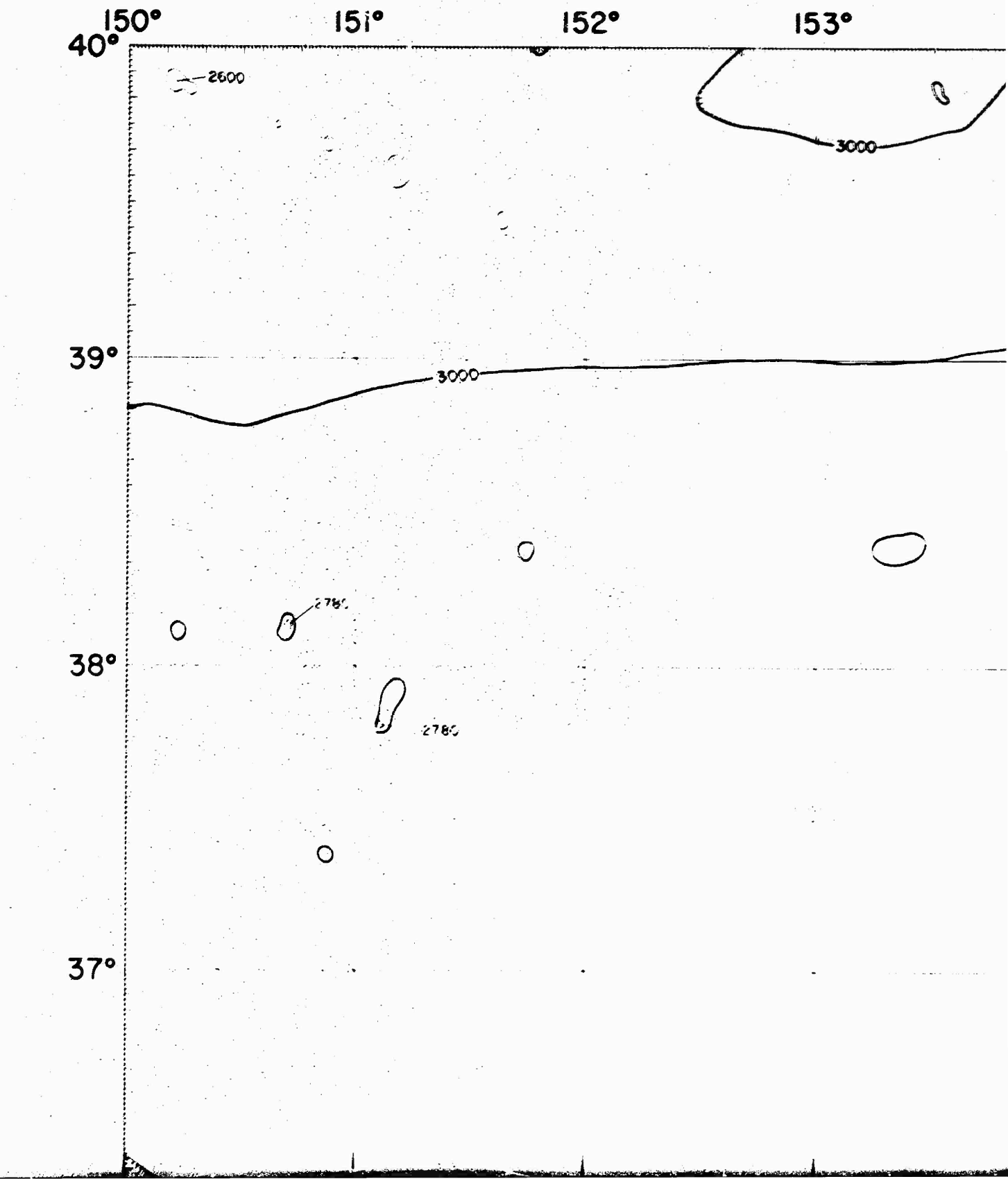
No. 2106 N 44

F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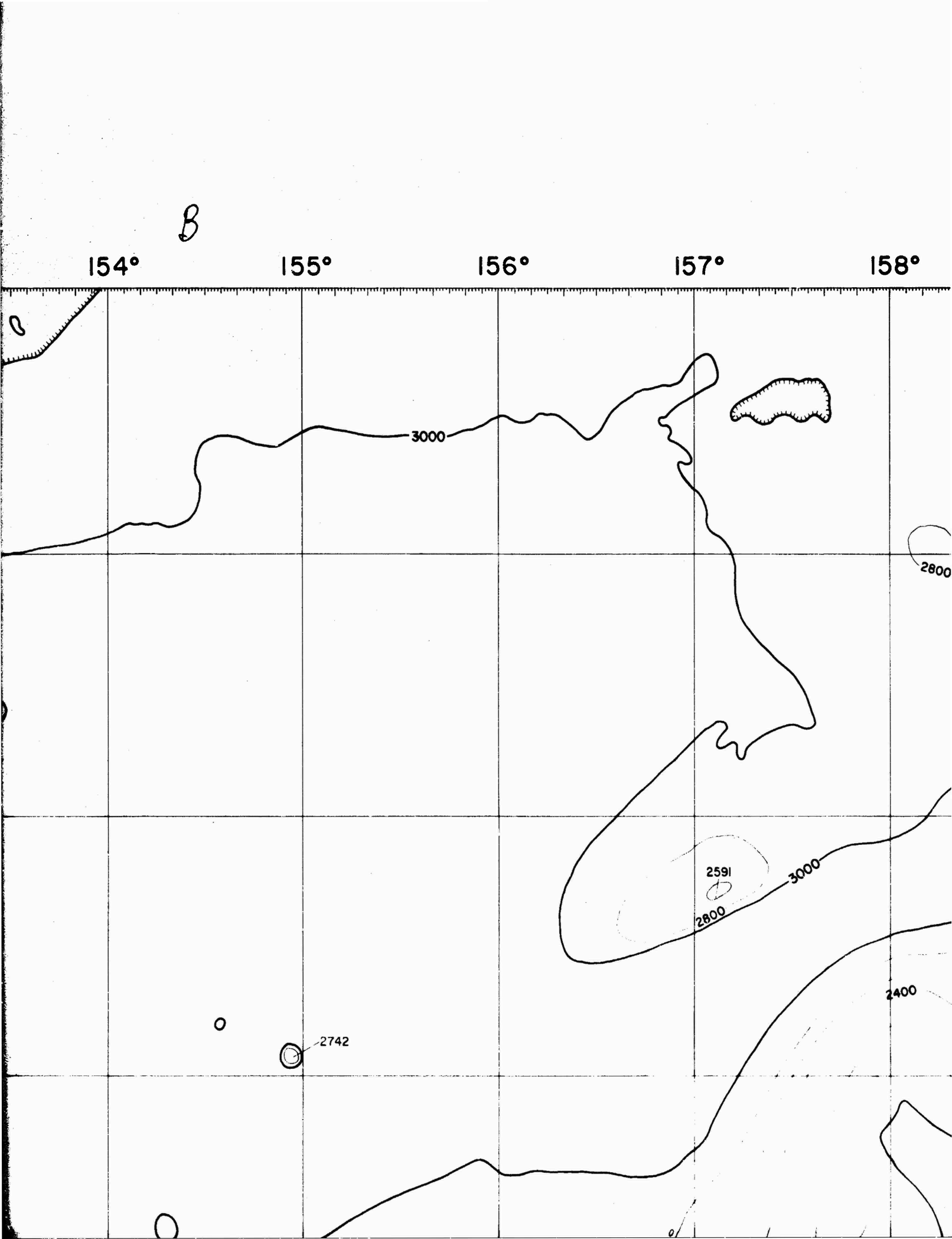
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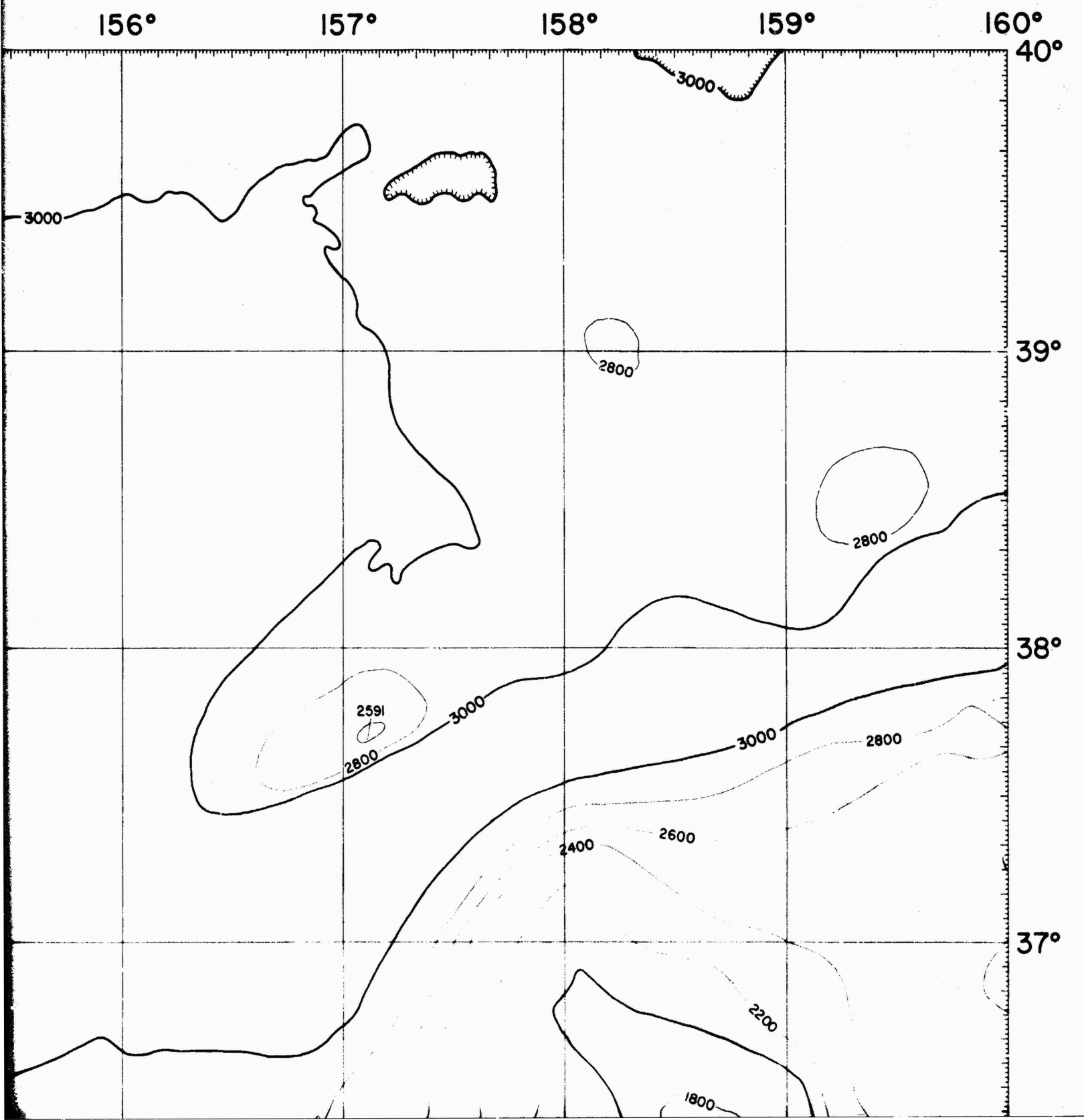
C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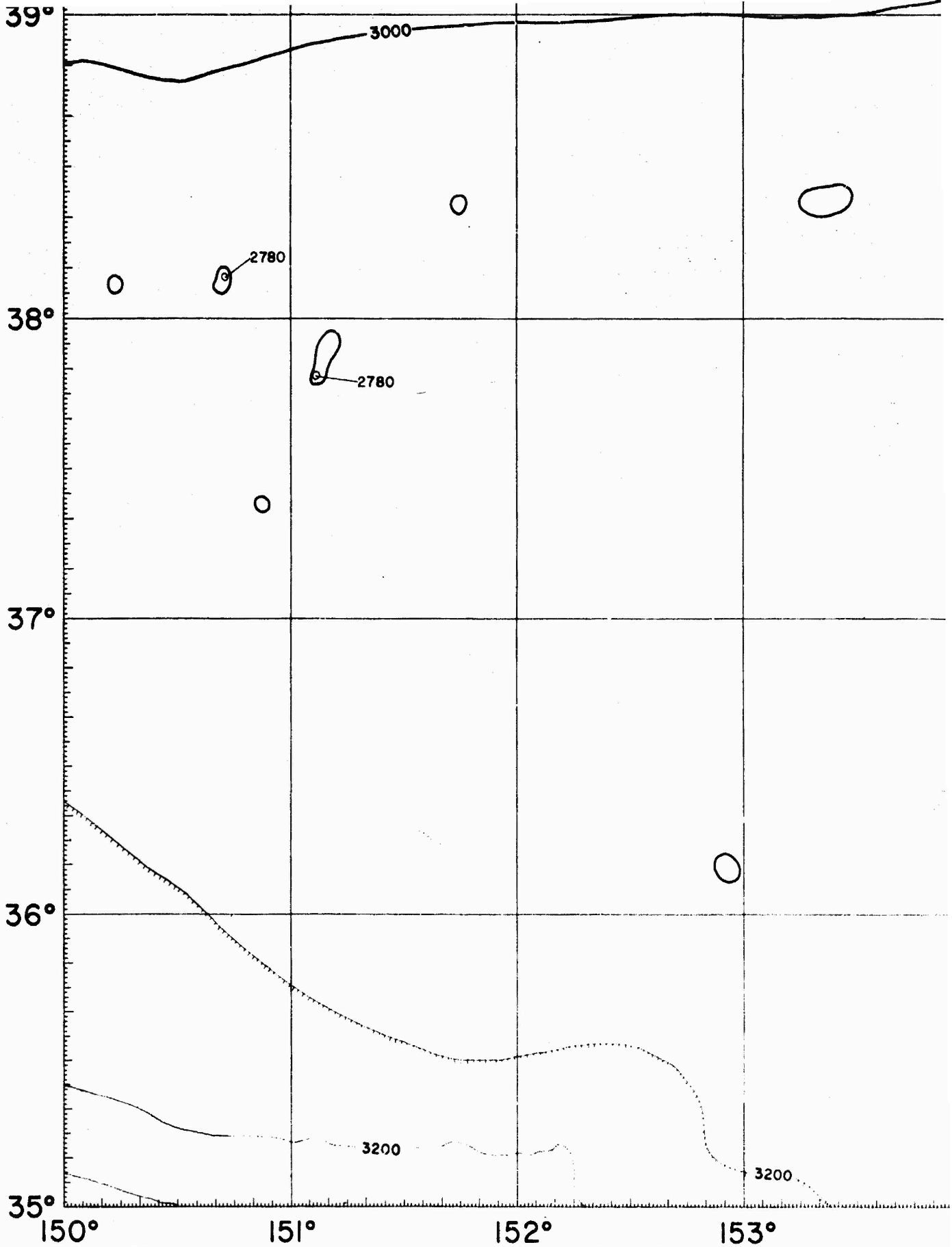
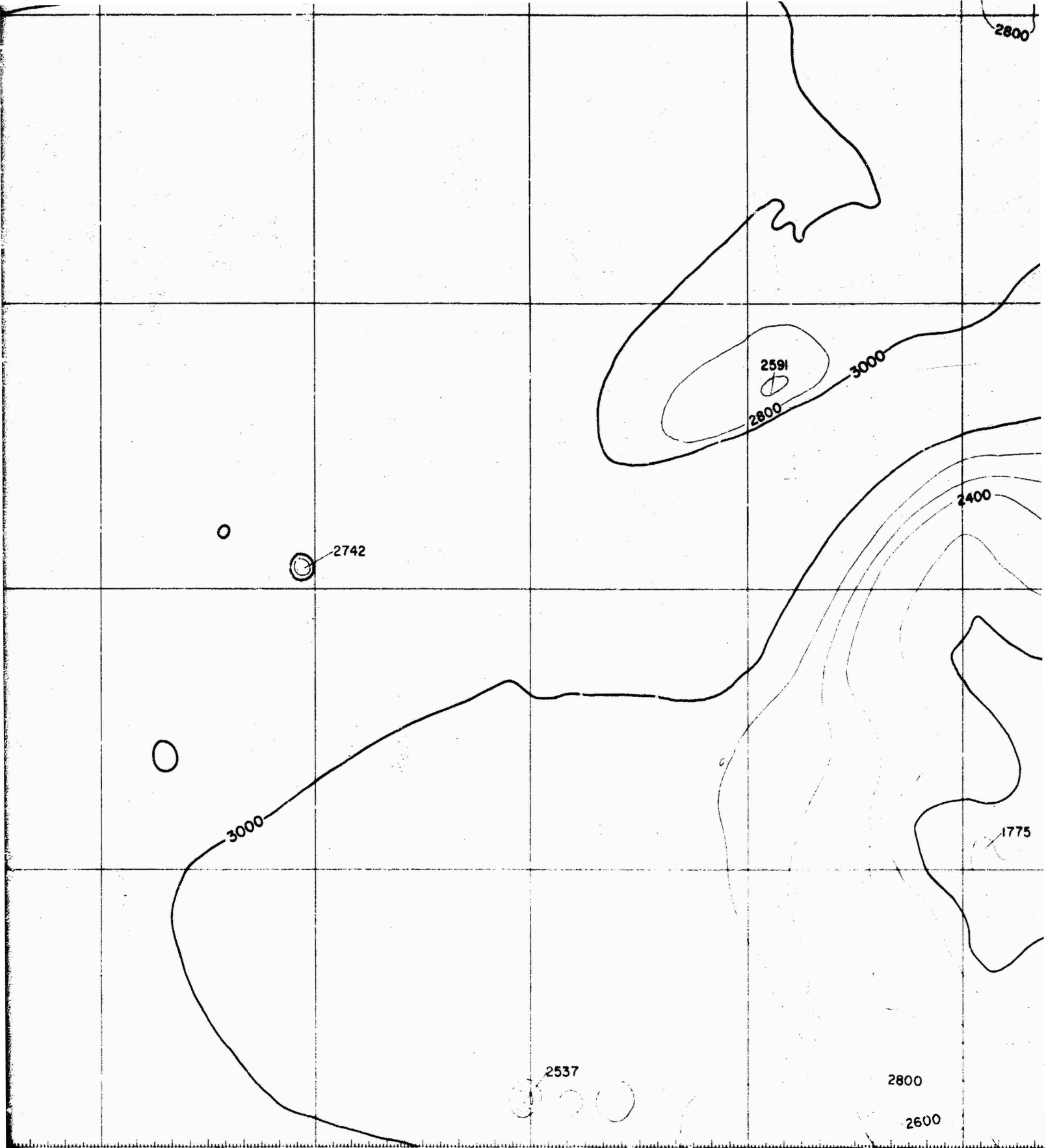


Sources of Data: U.S. Naval Oceanographic Office, R/V Vitaz, U.S.S.R.
Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected
with 100 fathom contour dashed where applicable



154° 155° 156° 157° 158°

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Contoured by: [illegible]
Assisted by: [illegible]

Do Not Use

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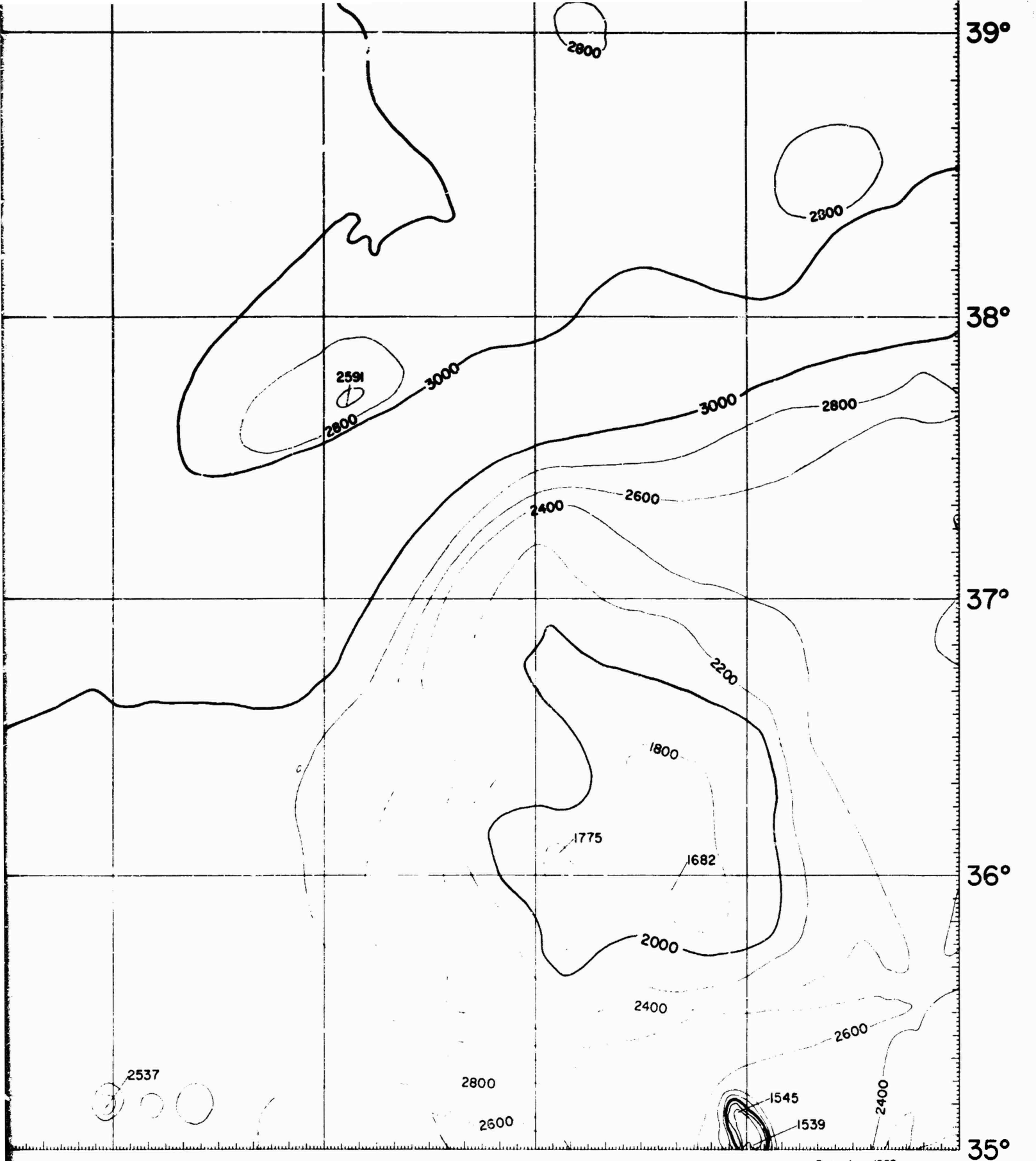

December, 1968

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Contoured by: [illegible]

Assisted by: [illegible]

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No. 2107 N 45

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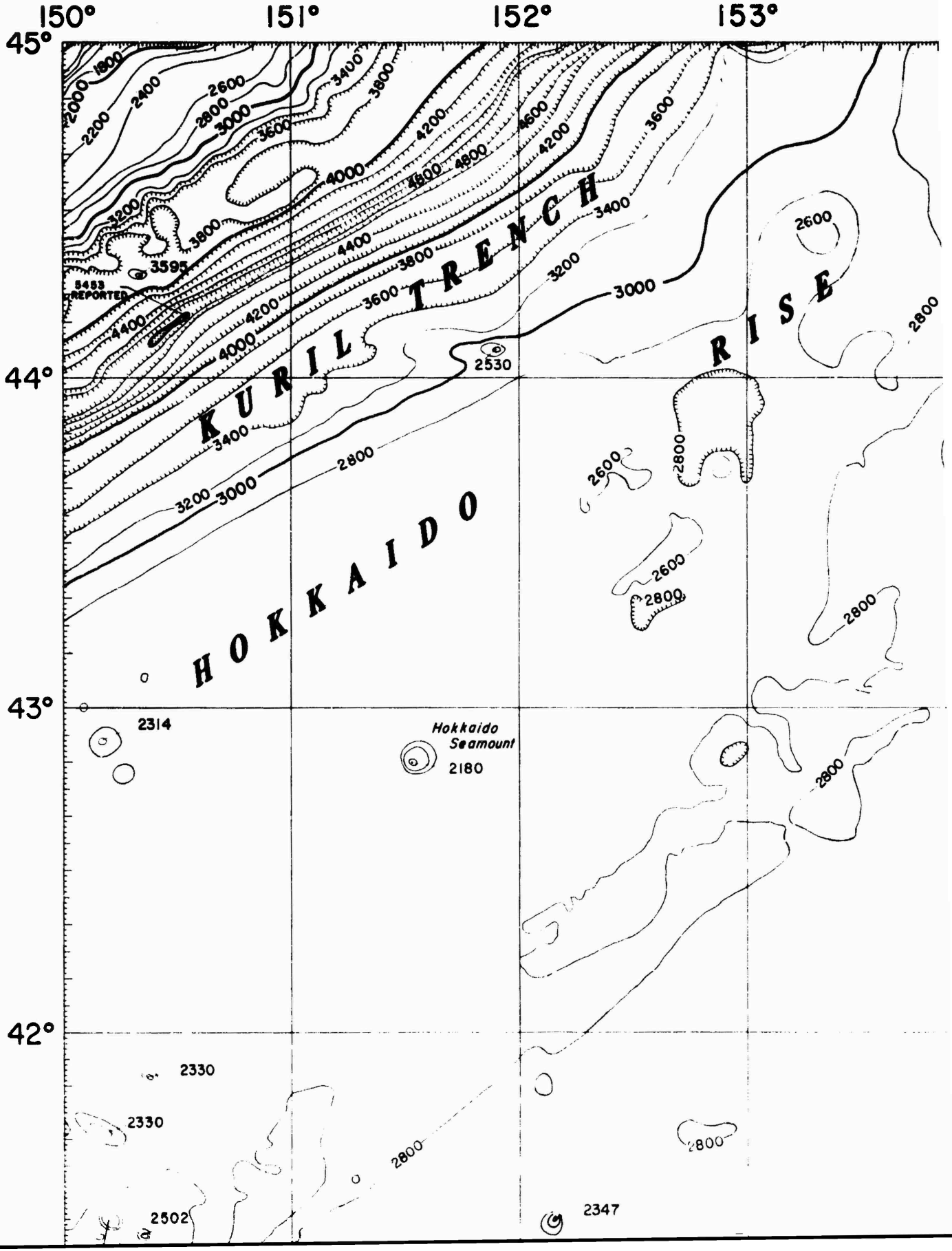
150°
151°
152°
153°
45°
44°
43°
42°
KURIL TRENCH
RISE
HOKKAIDO
5453 REPORTED
3595
2530
2314
Hokkaido Seamount
2180
2330
2330
2502
2347
1800
2000
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3000
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3400
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4400
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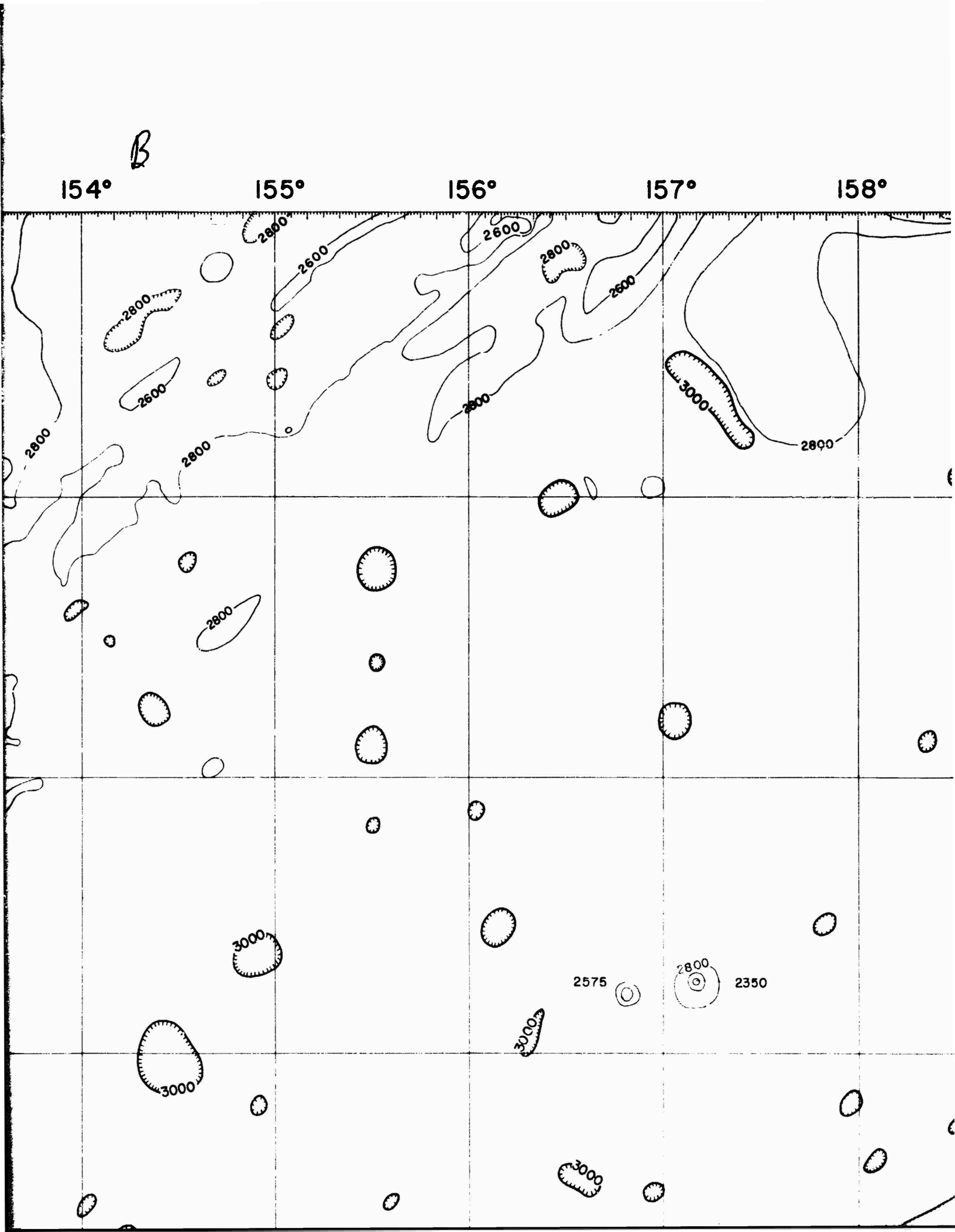
4800


B
154°
155°
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157°
158°
2800
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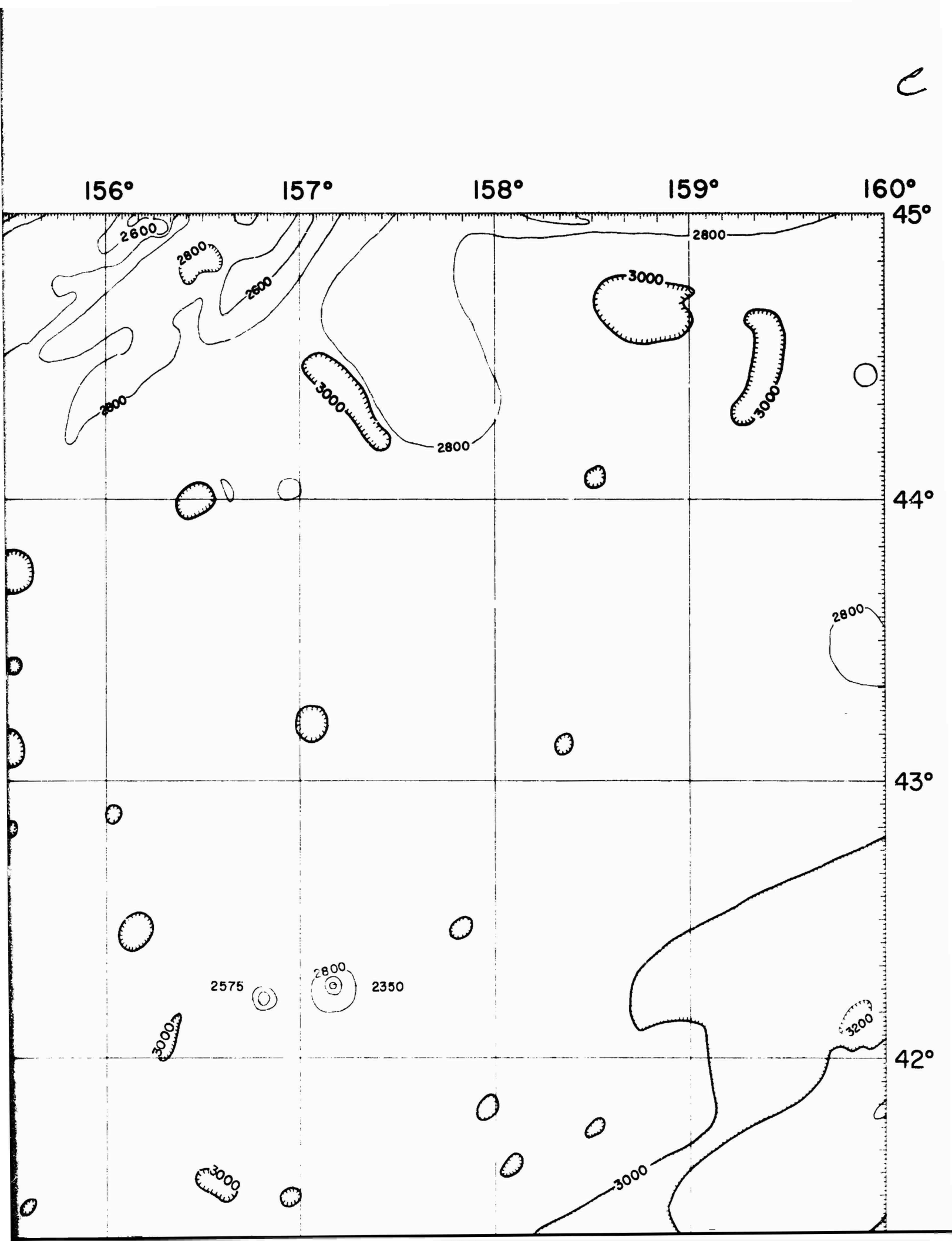
2350
3000
3000
3000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2575
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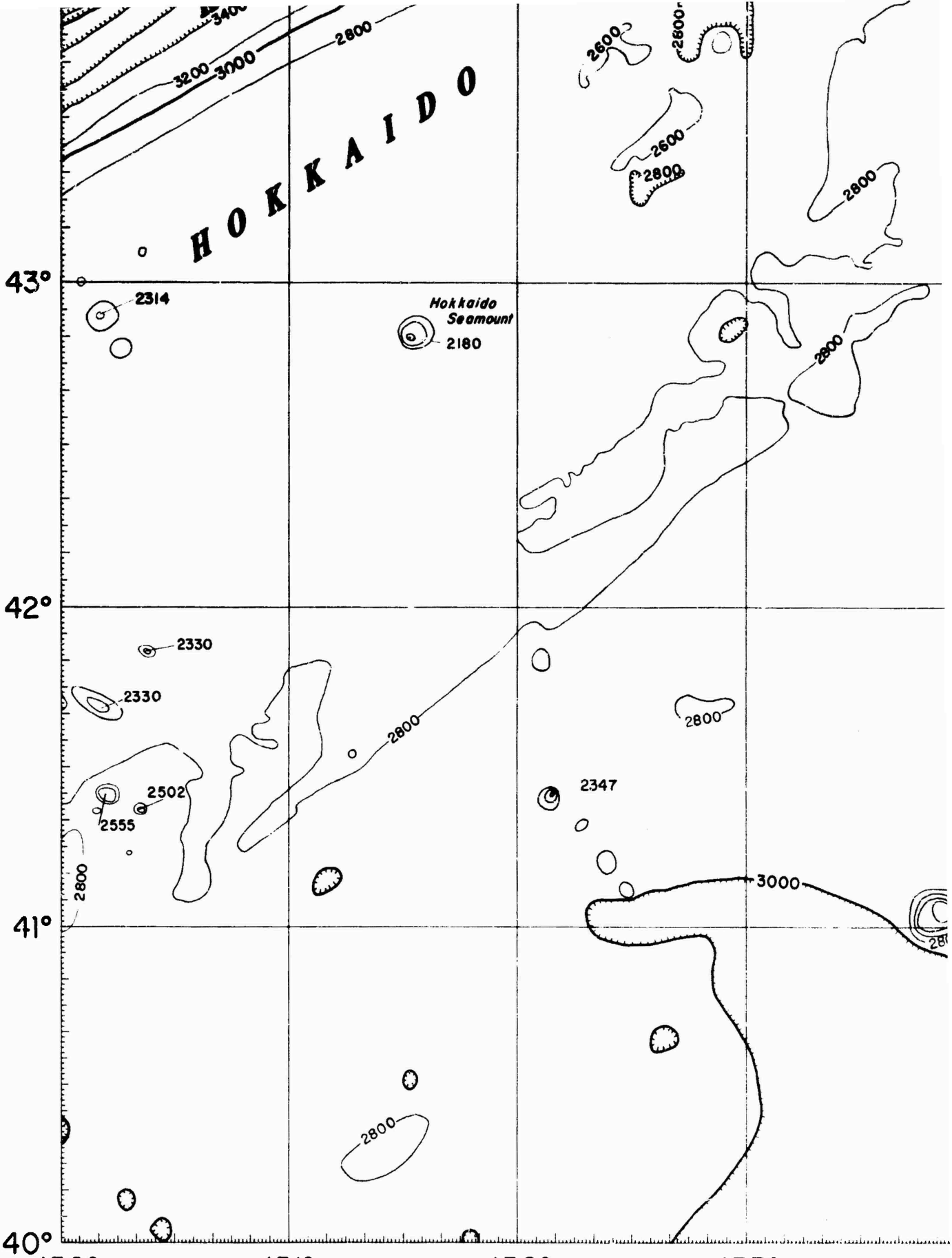
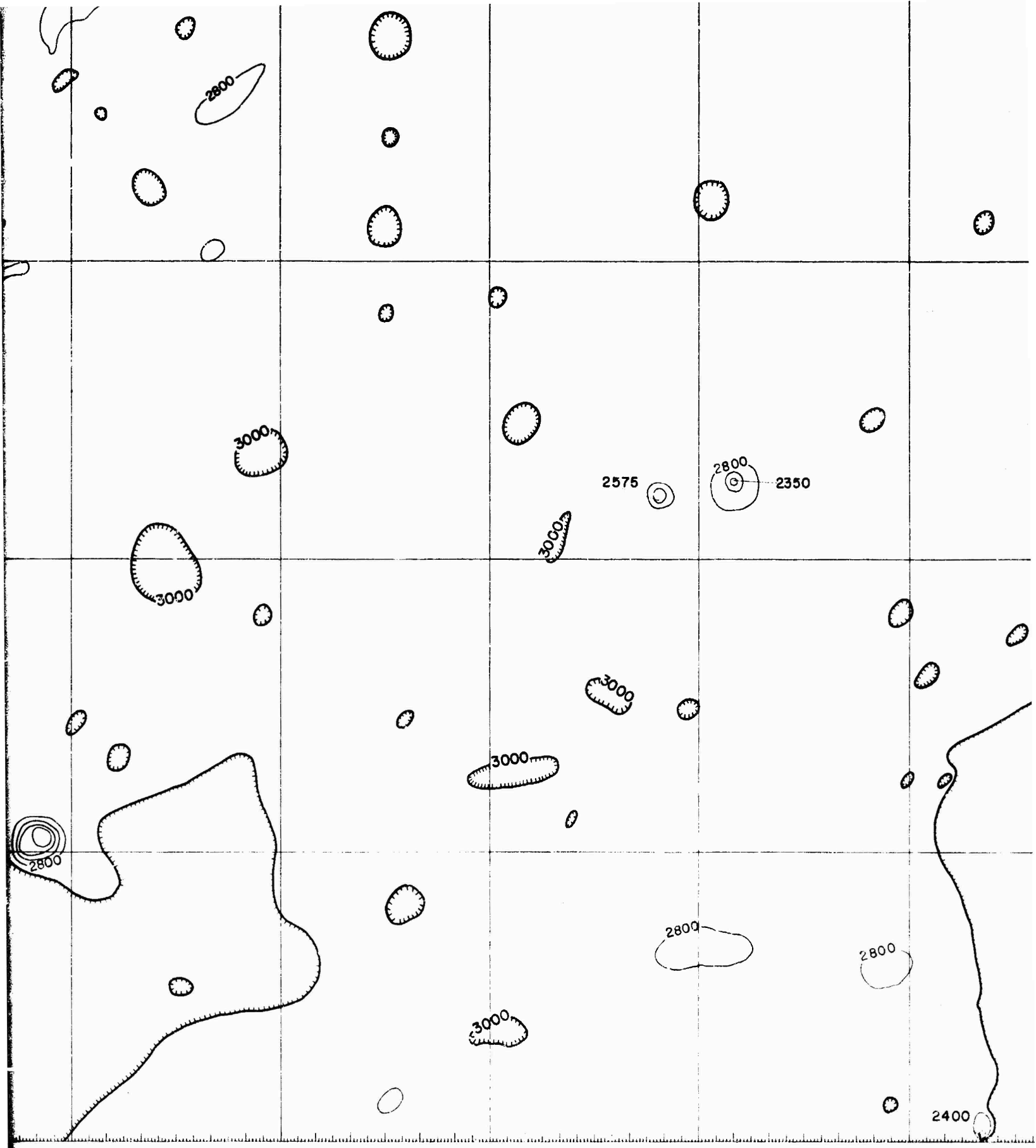


Sources of Data: U.S. Naval Oceanographic Office; Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected with 100 fathom contour dashed where applicable

D



154° 155° 156° 157° 158°

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Contoured by:

Assisted by:

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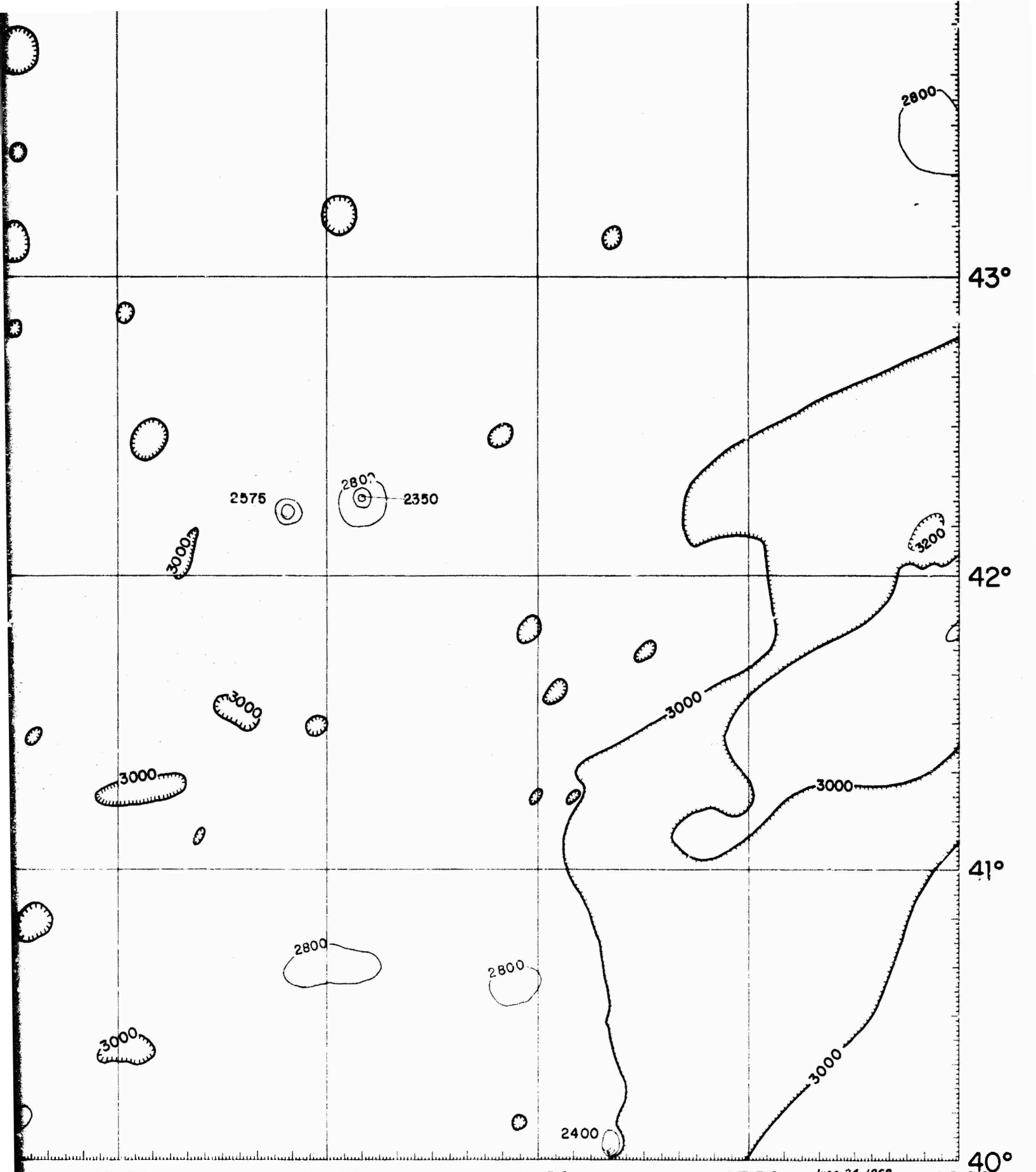

June 24, 1968

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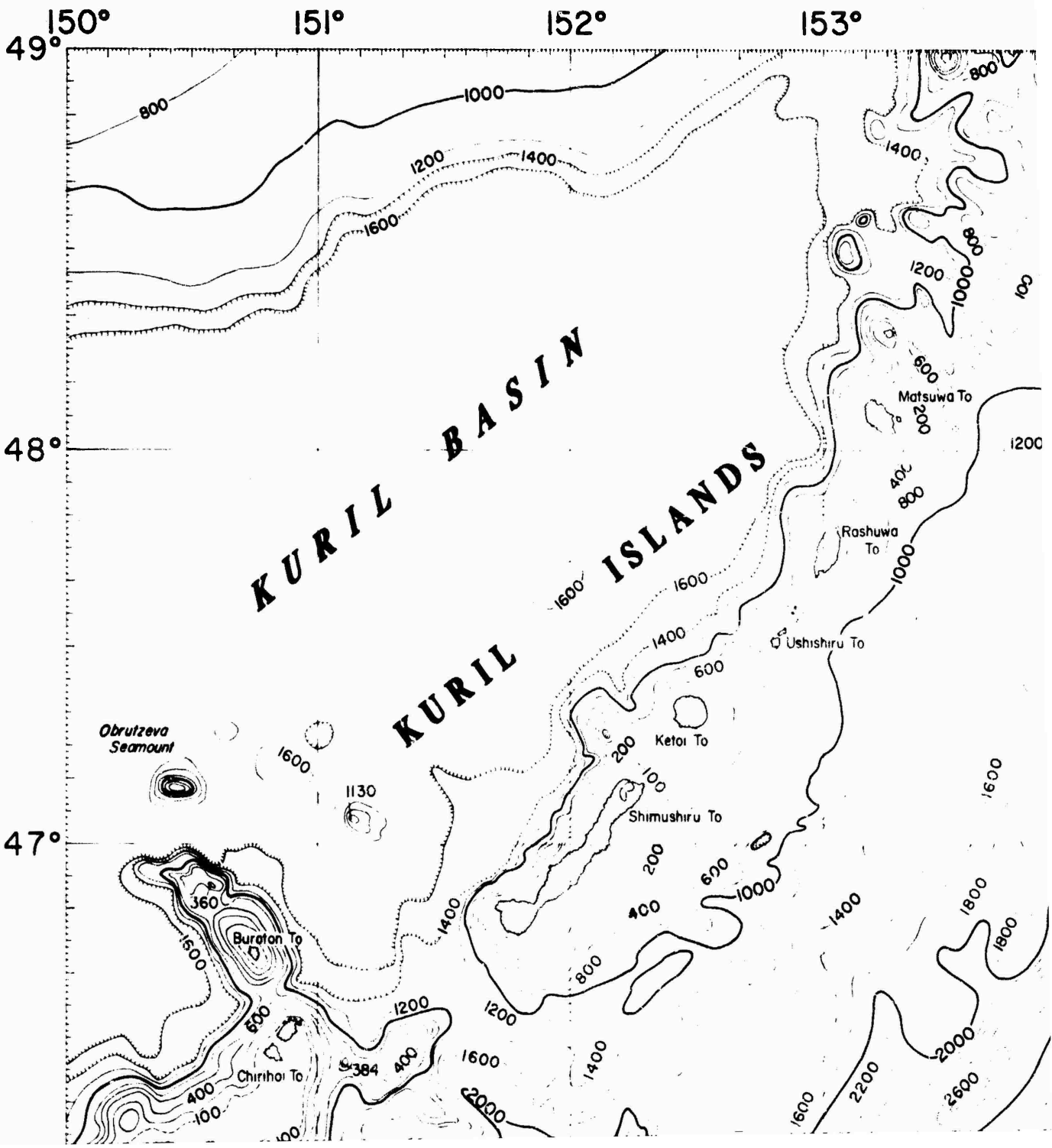
150°
151°
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KURIL BASIN
KURIL ISLANDS
KURIL
Obrutzeva Seamount
Matsuwa To
Rashuwa To
Ushishiru To
Ketoi To
Shimushiru To
Buratan To
Chirithoi To
1130
384
360
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1000
1200
1400
1600
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2000
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2600
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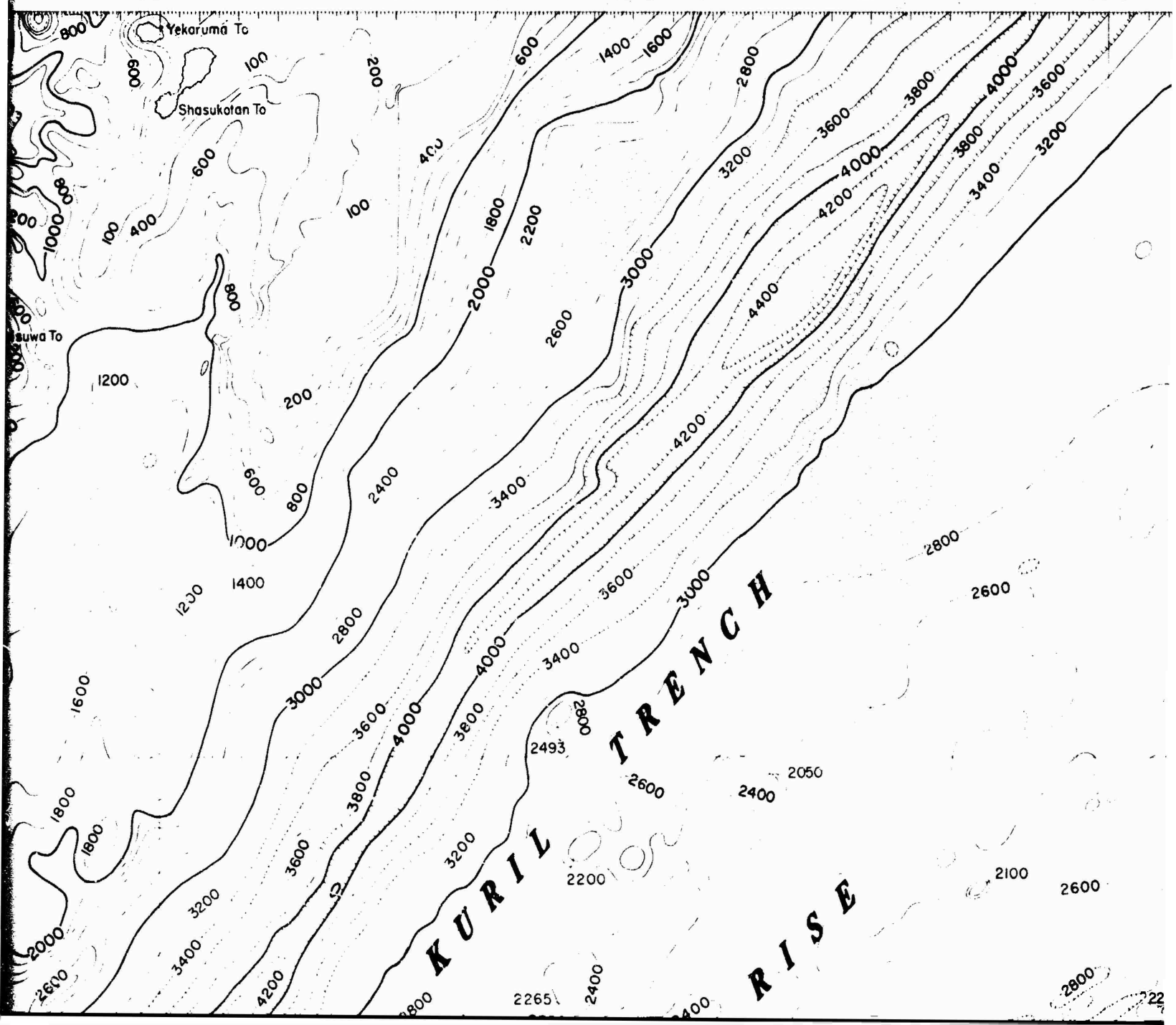
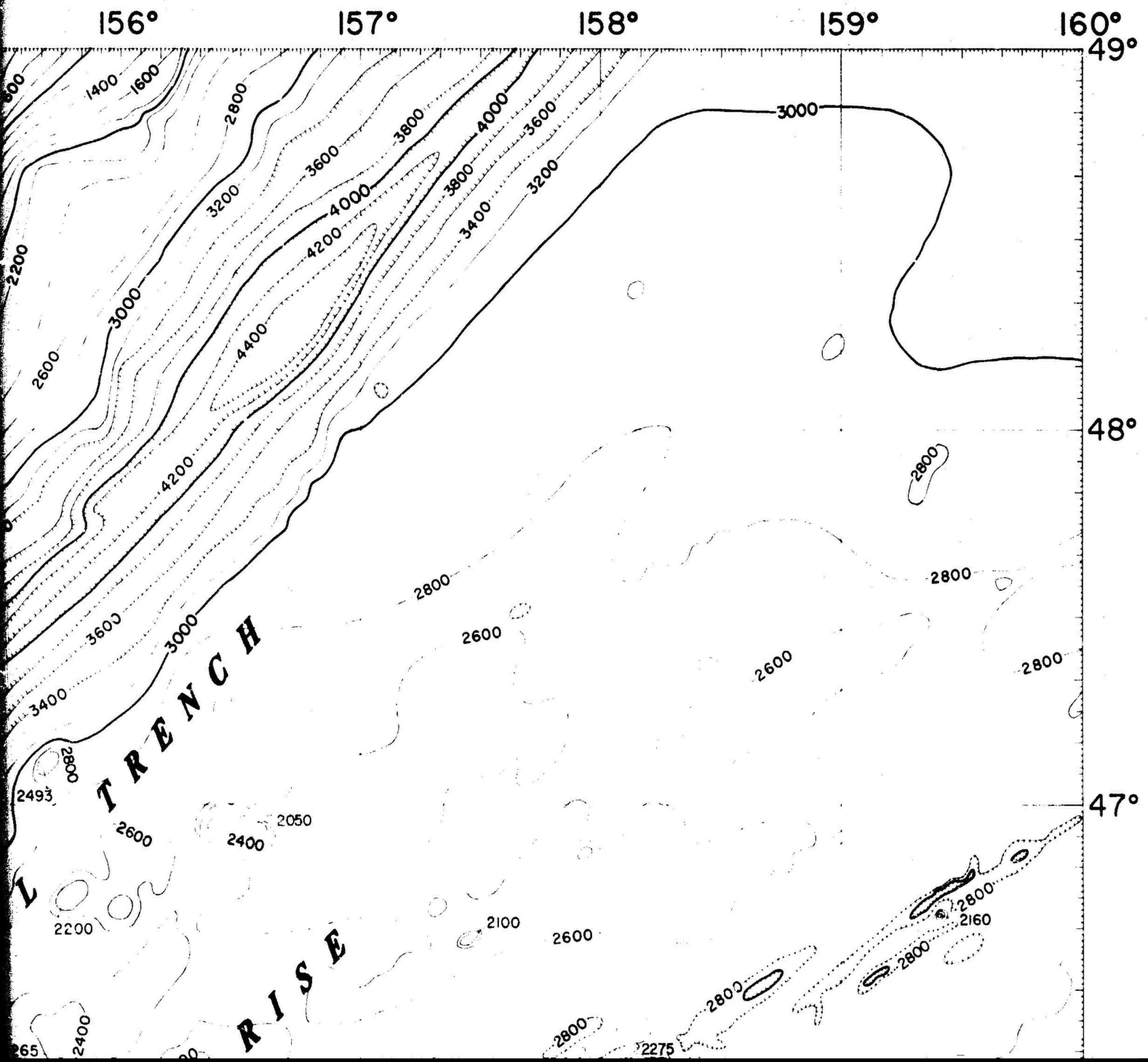
400
200
100


154°
155°
156°
157°
158°
Yekaruma To
Shasukotan To
Suwa To
KURIL TRENCH
RISE

C


156°
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160°
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48°
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2100
2050
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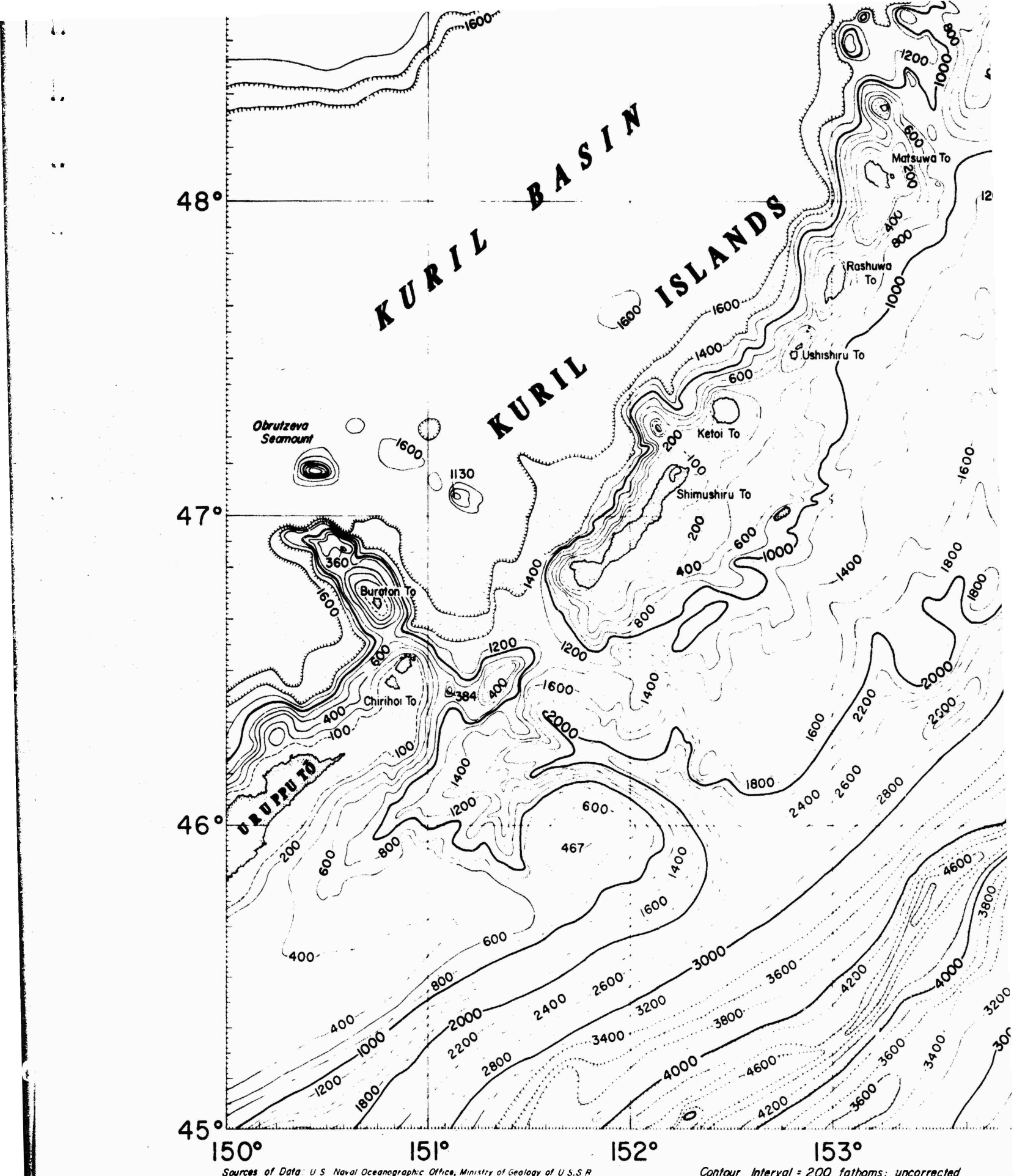
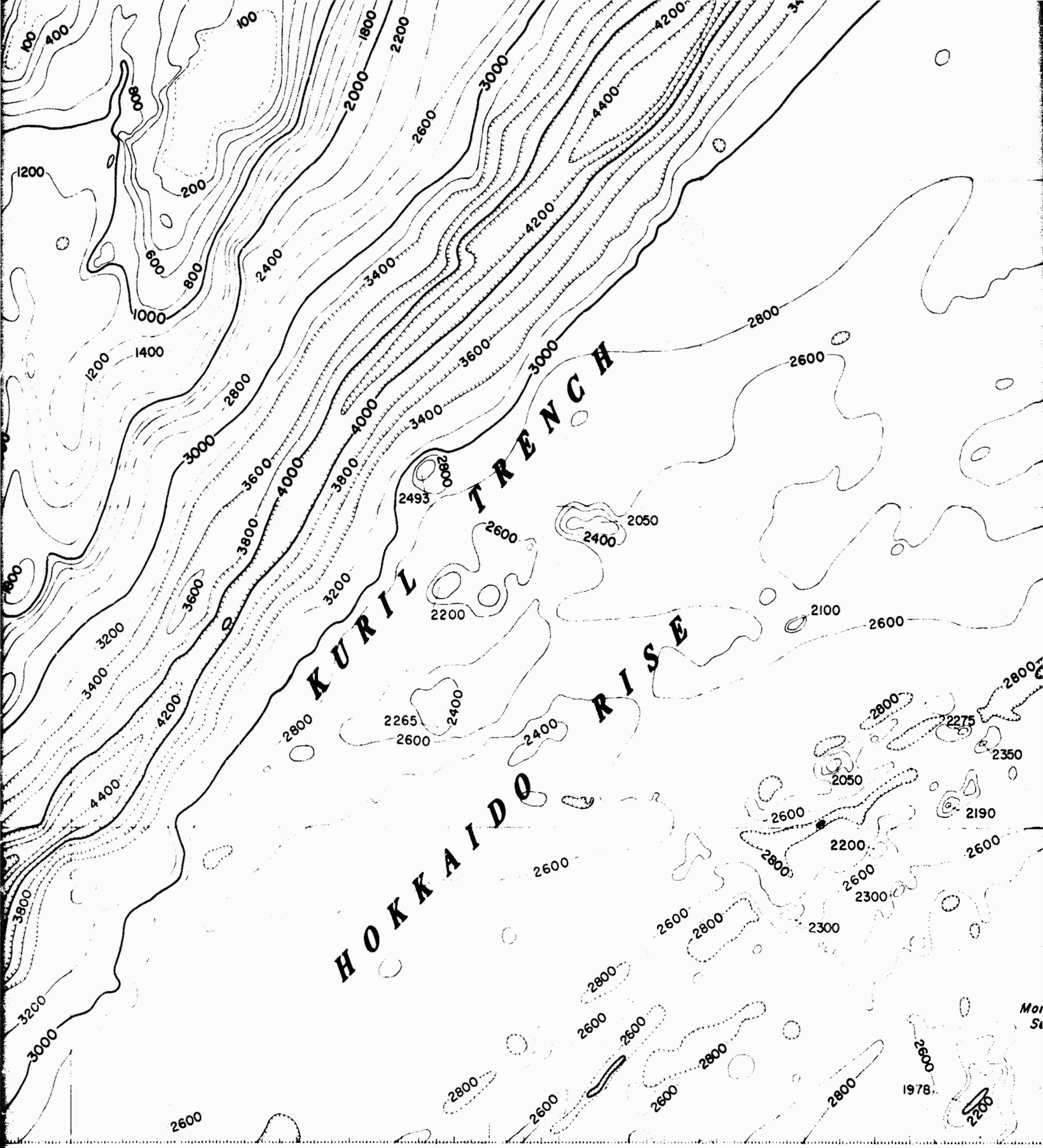
2275
2493
TRENCH
RISE



Sources of Data: U S Naval Oceanographic Office, Ministry of Geology of U.S.S.R
Scripps Institution of Oceanography

Contour Interval = 200 fathoms; uncorrected
with 100 fathom contour dashed where applicable



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Assisted by: Lalu Thomas

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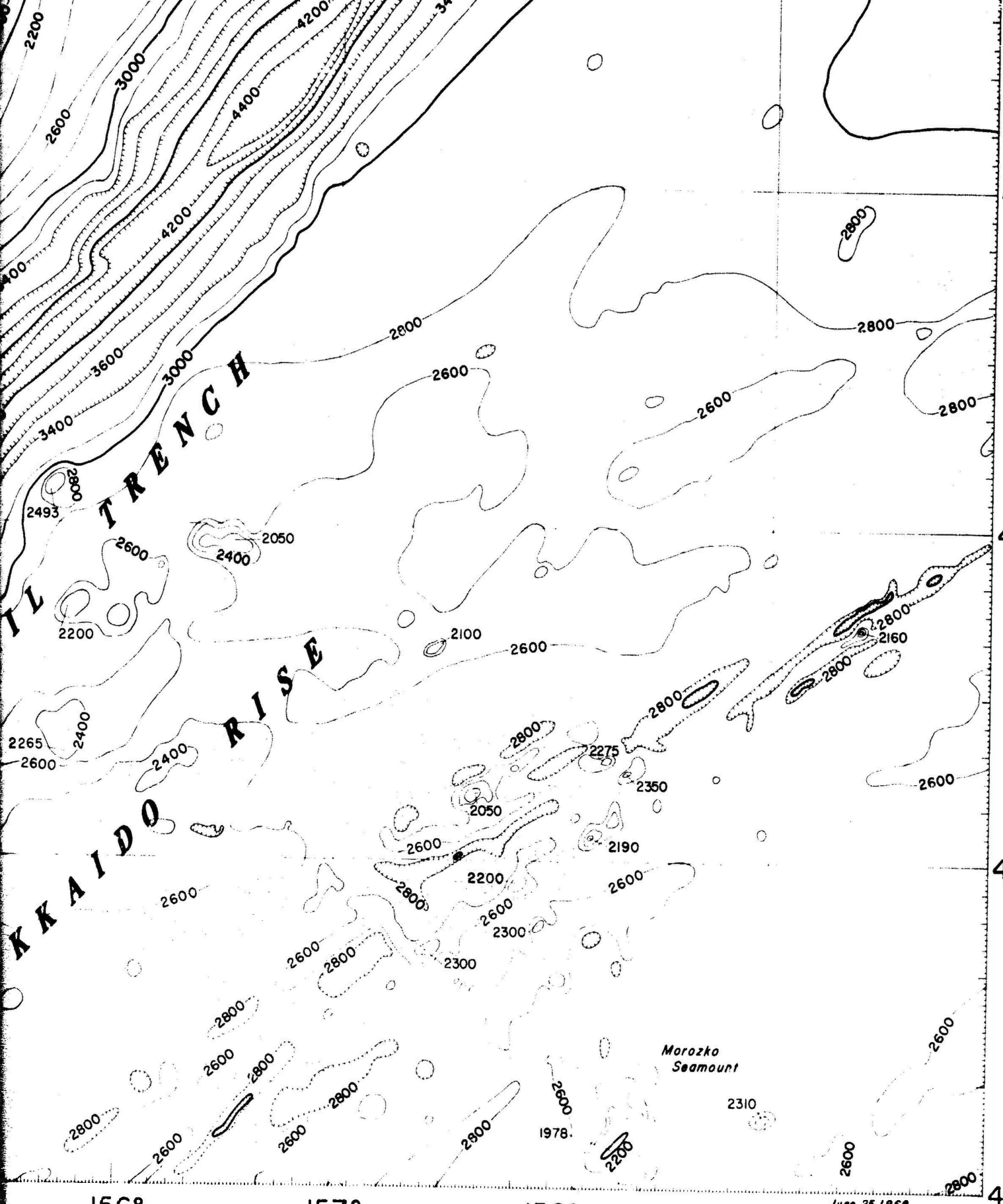

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Contoured by [illegible]

Assisted by [illegible]

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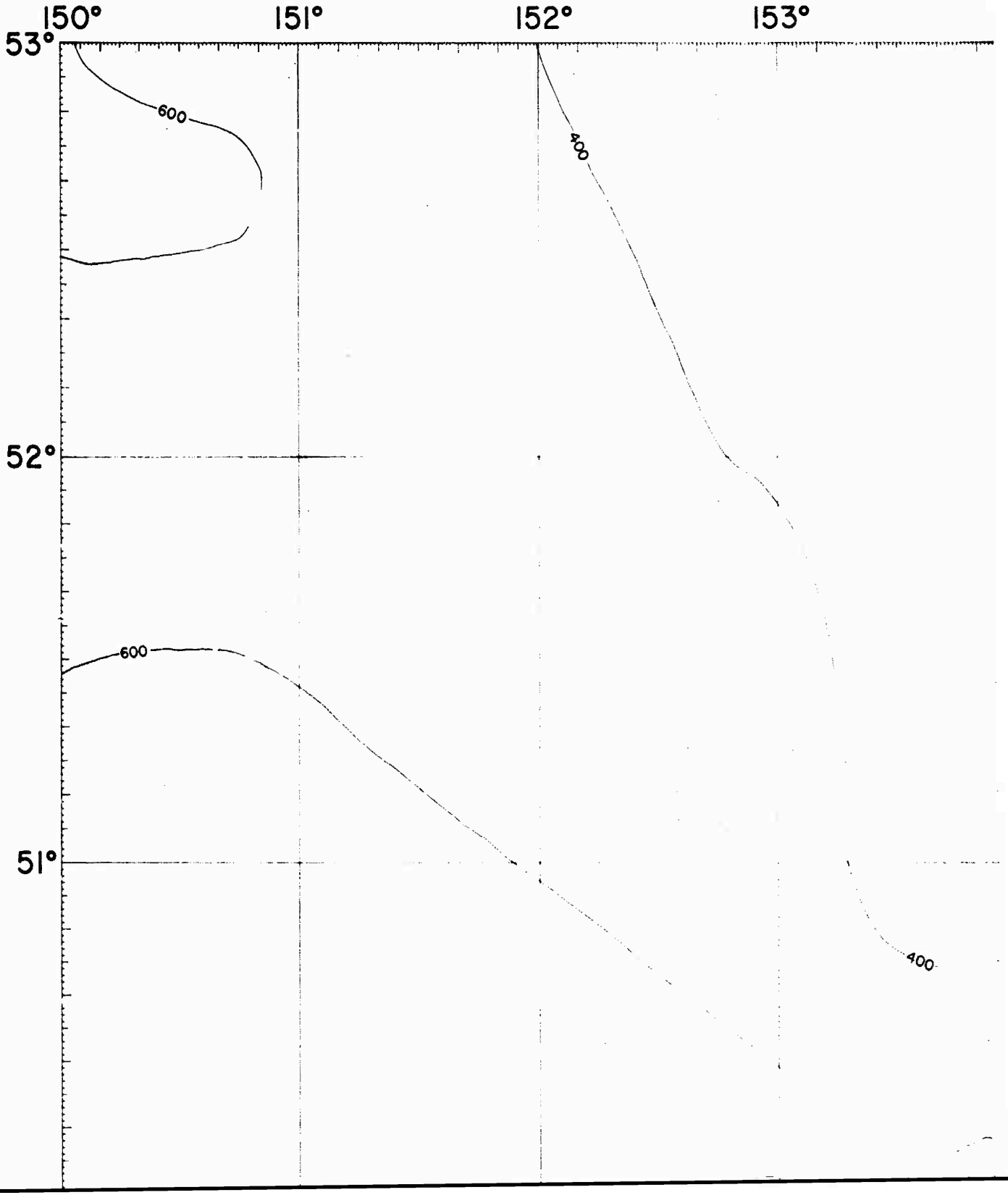

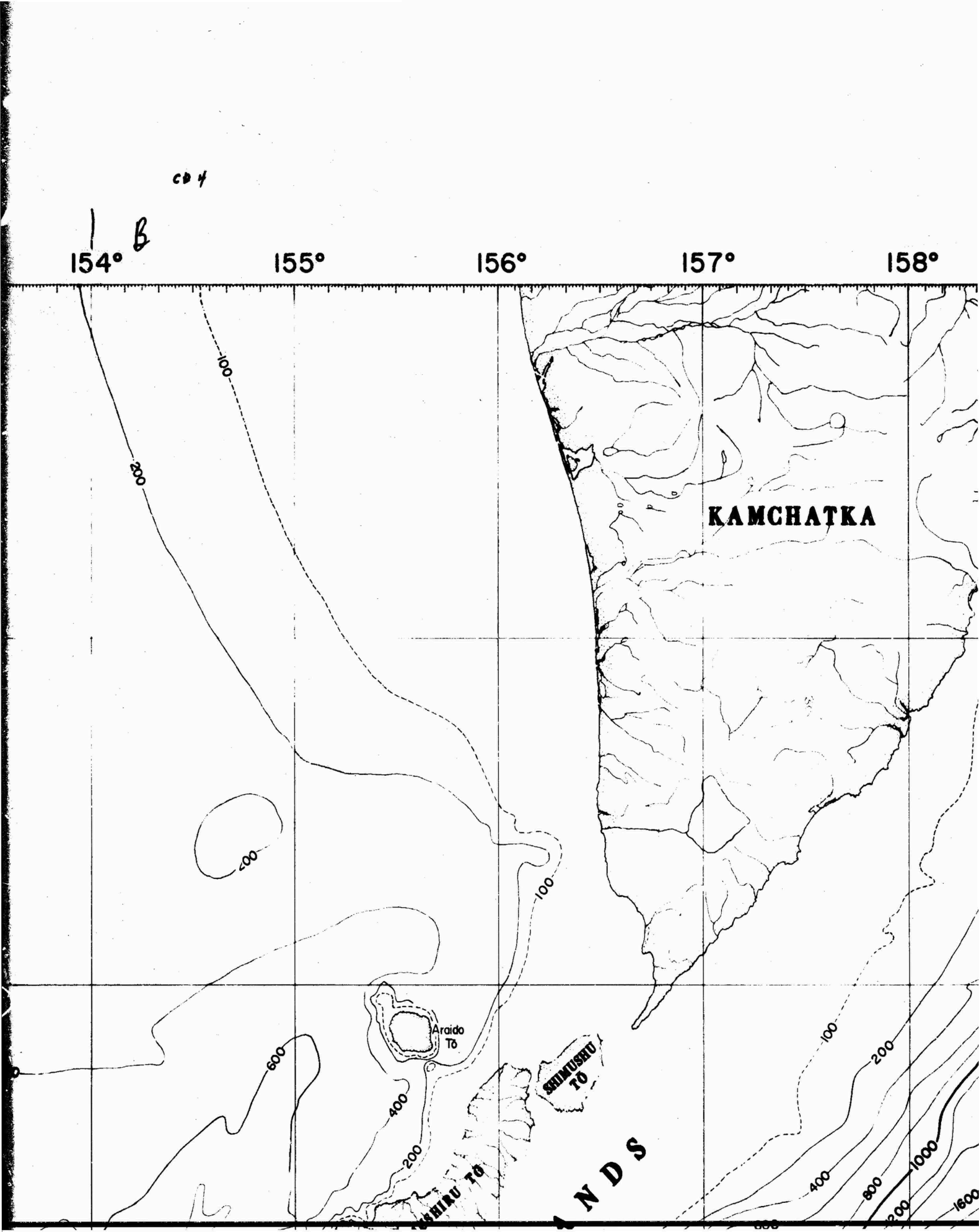
154°
155°
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158°
KAMCHATKA
Araido
To
SHIMUSHU
TO
ISHIKARU TO
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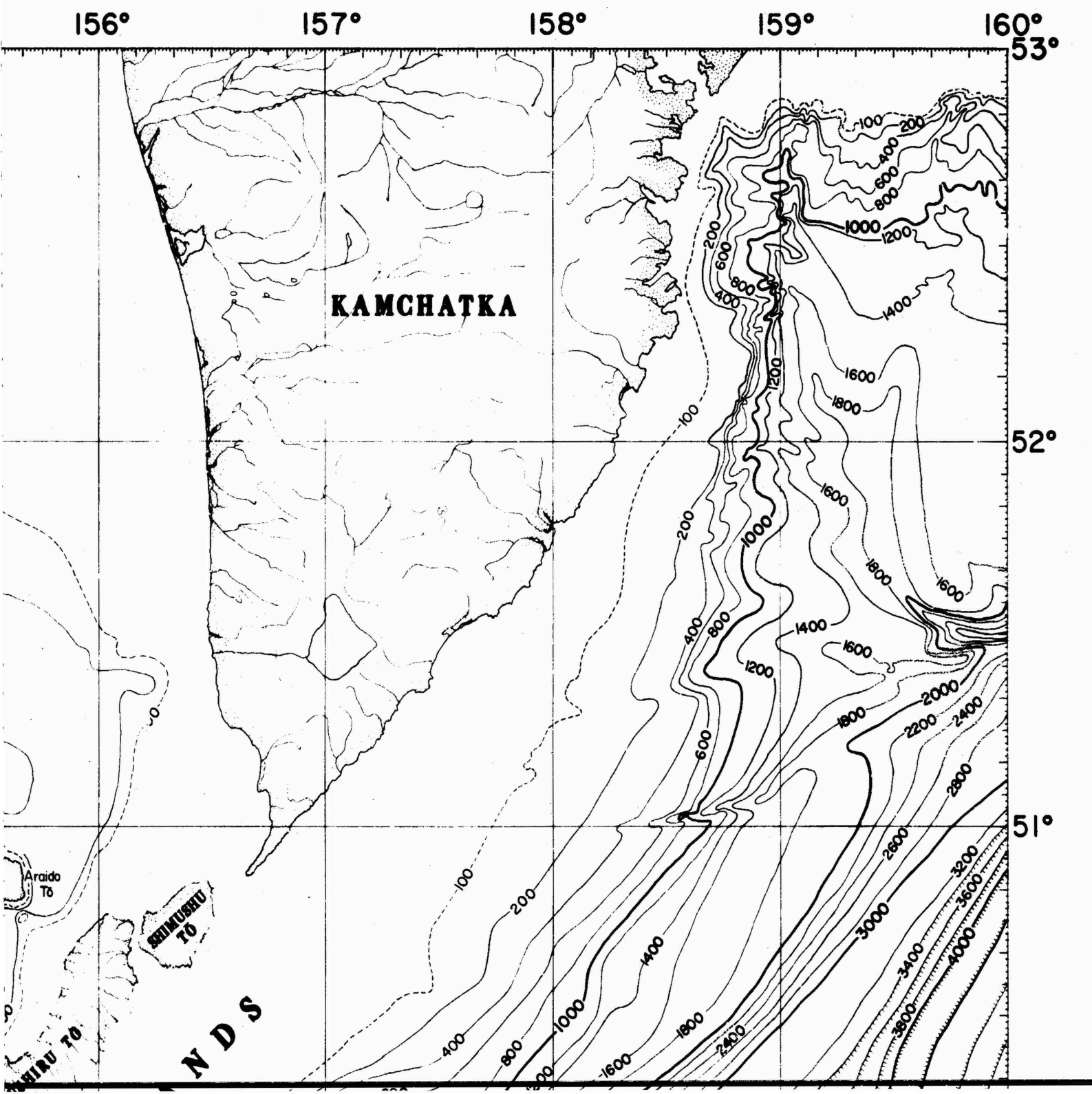
1600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KAMCHATKA
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SHIMUSHU TO
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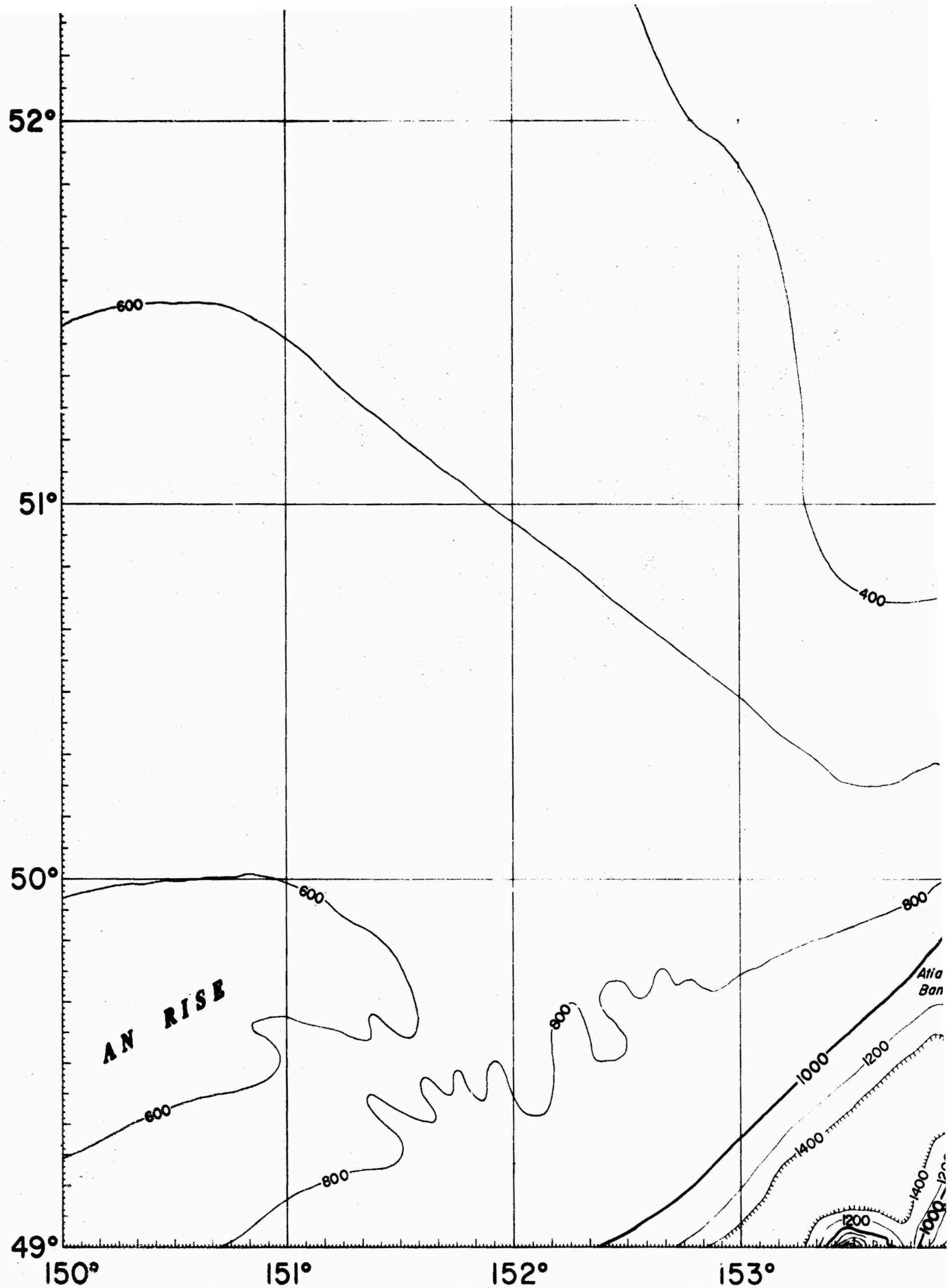
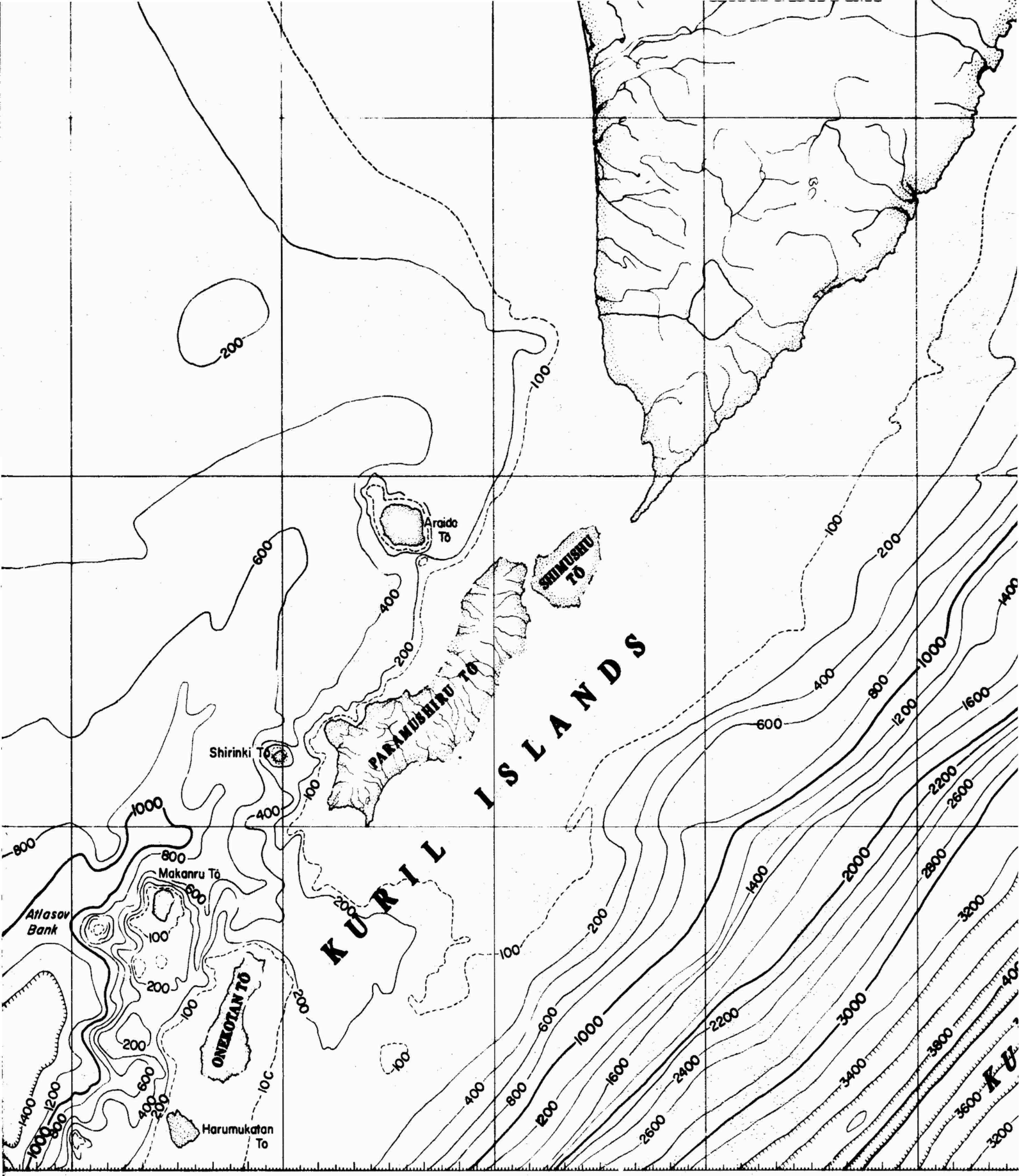


Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U.S.S.R.
Scripps Institution of Oceanography

Contour Interval = 200 fathoms, uncorrected
with 100 fathom contour dashed where applicable



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Contoured by: [illegible]
Assisted by: Constance Buffington [illegible]

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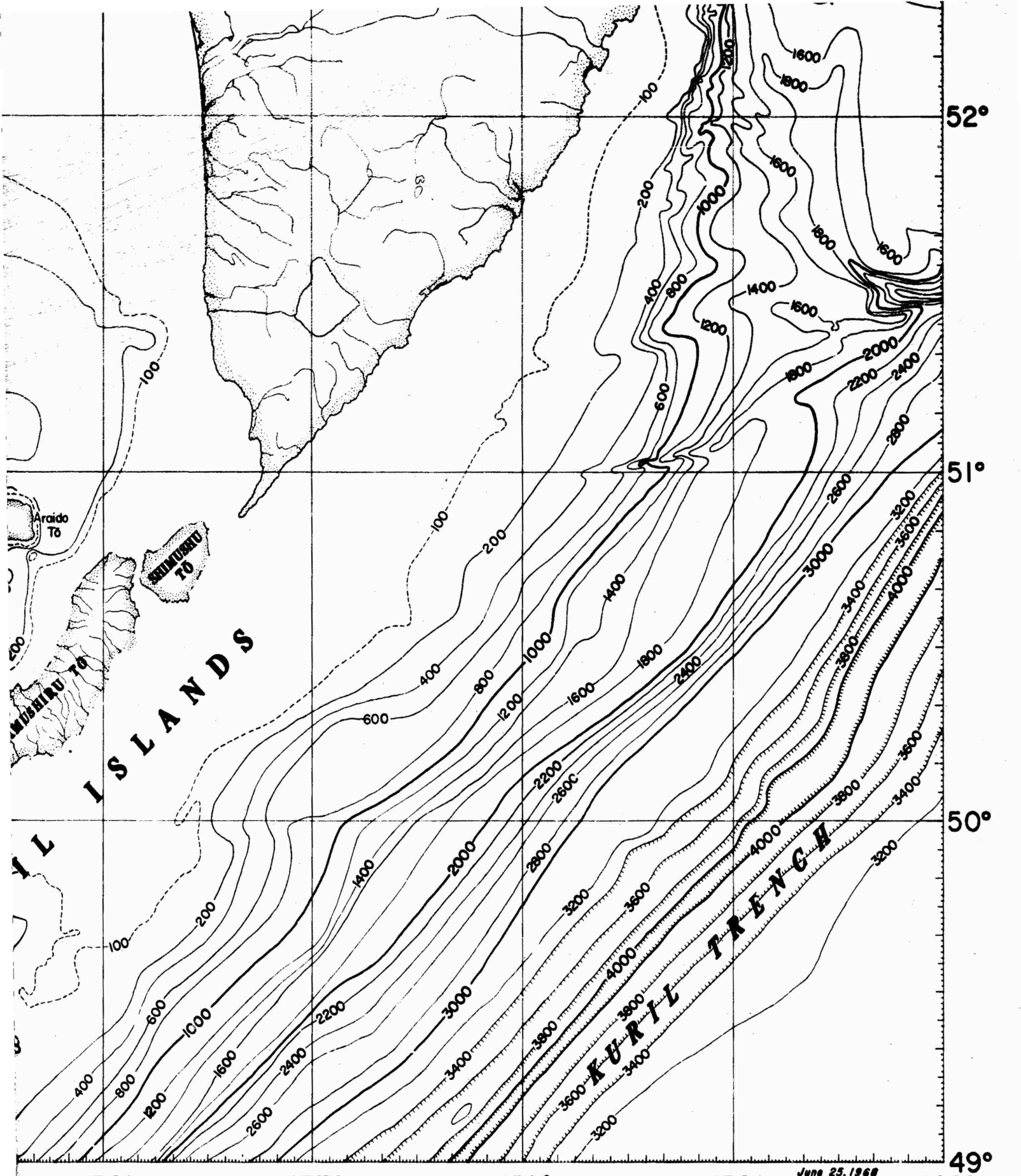

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Contoured by: Roger J. Van Wagtendonk

Assisted by: Constance Buffington, [illegible]

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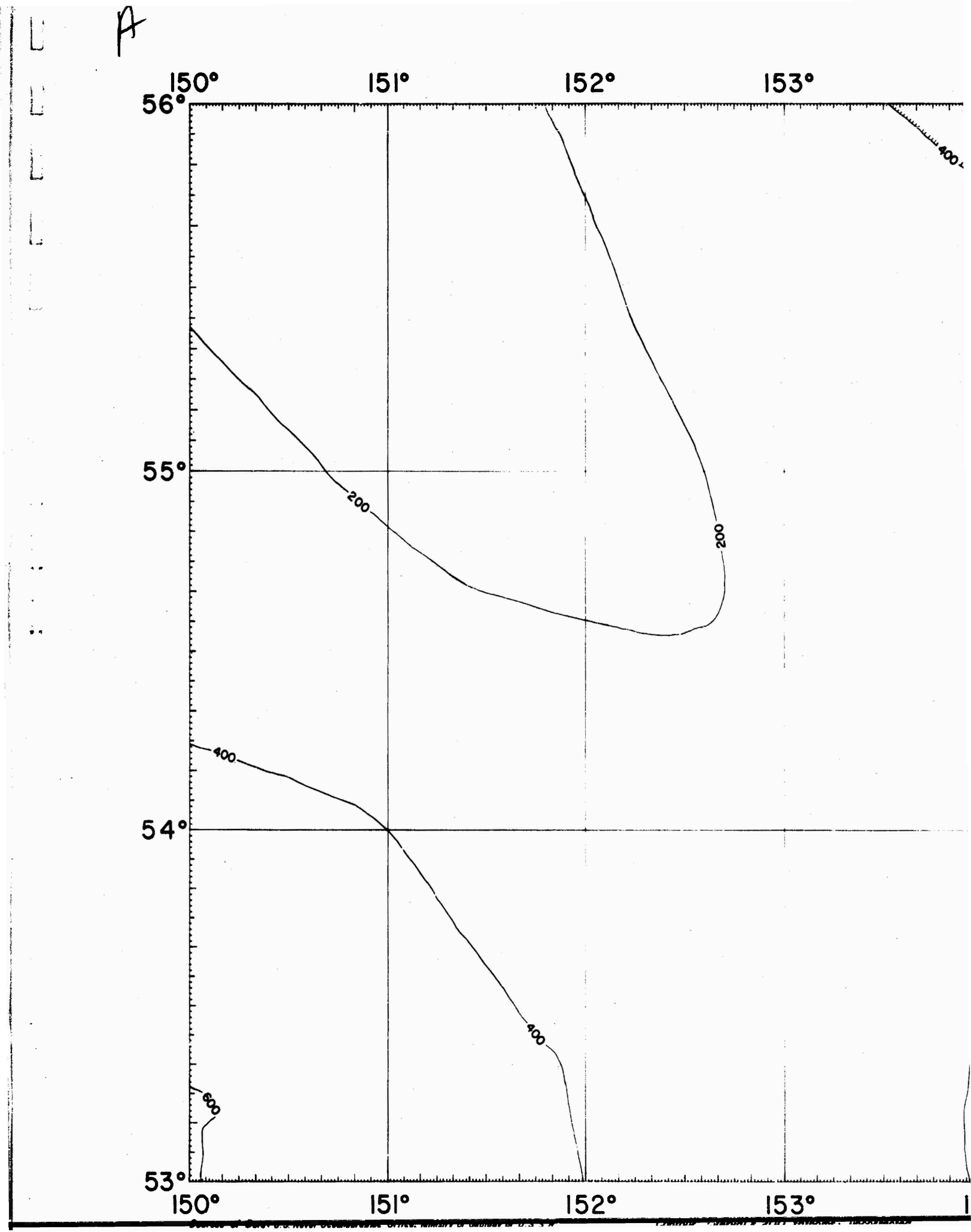

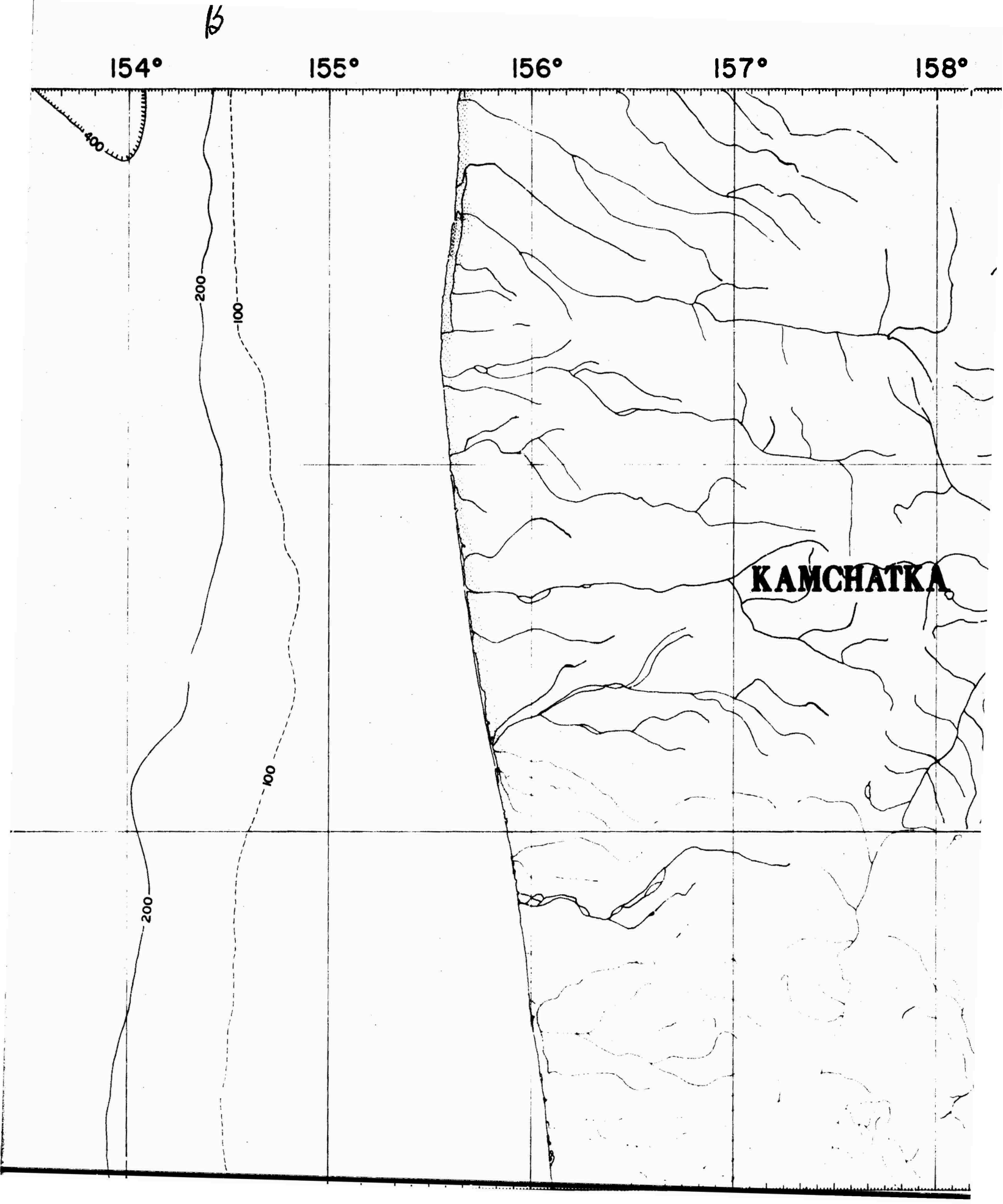
154°
155°
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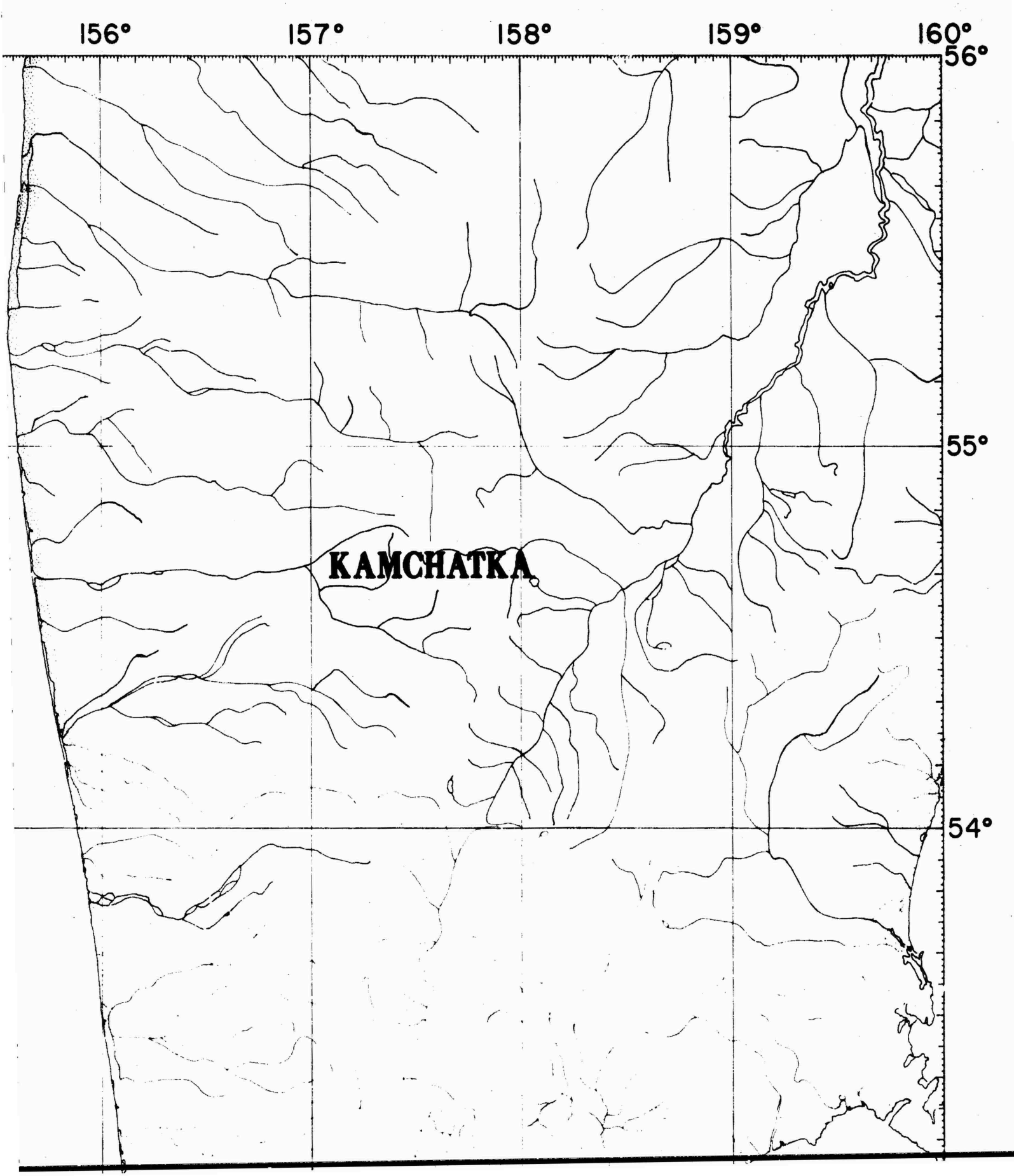
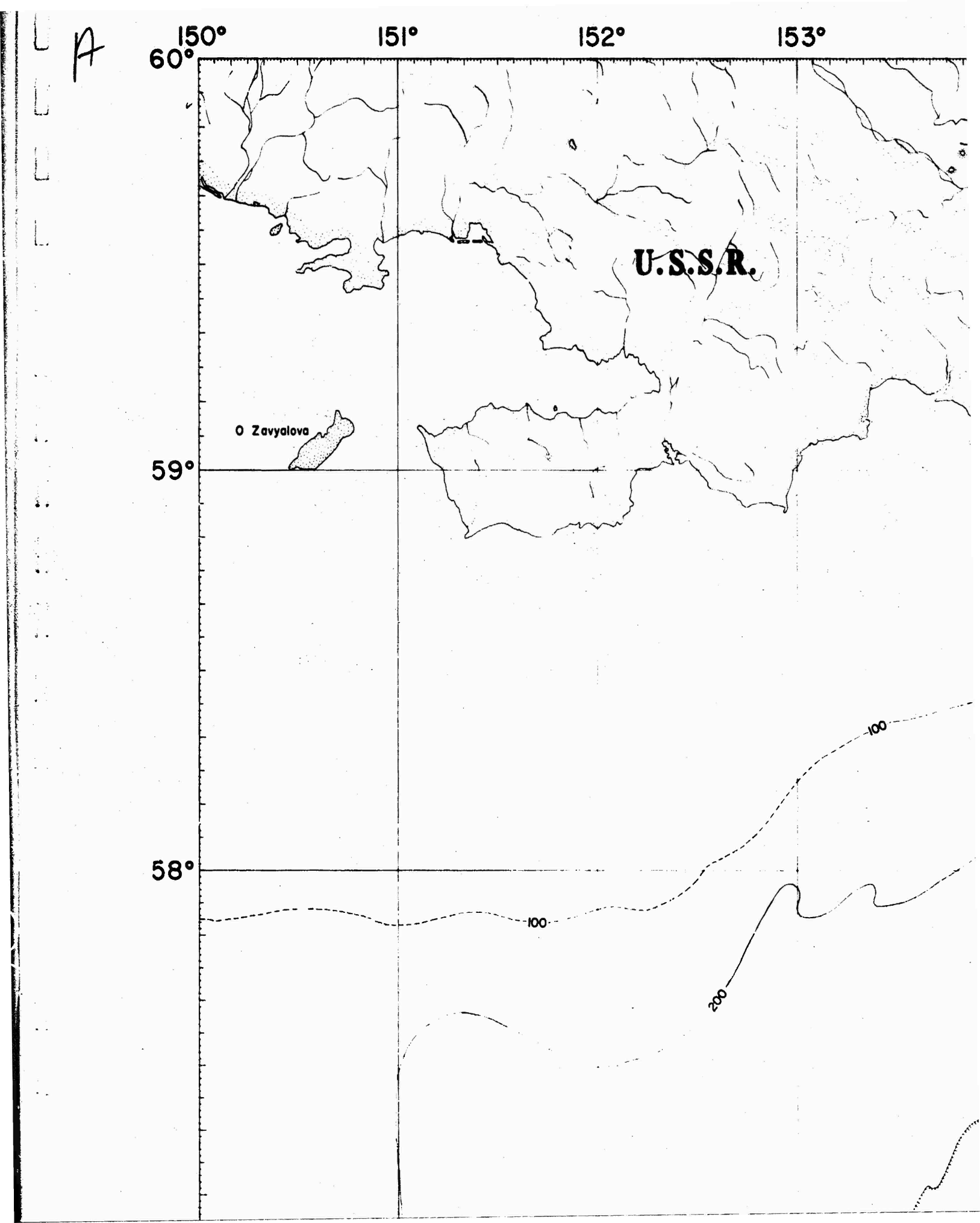
KAMCHATKA

C

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O Zavyalova
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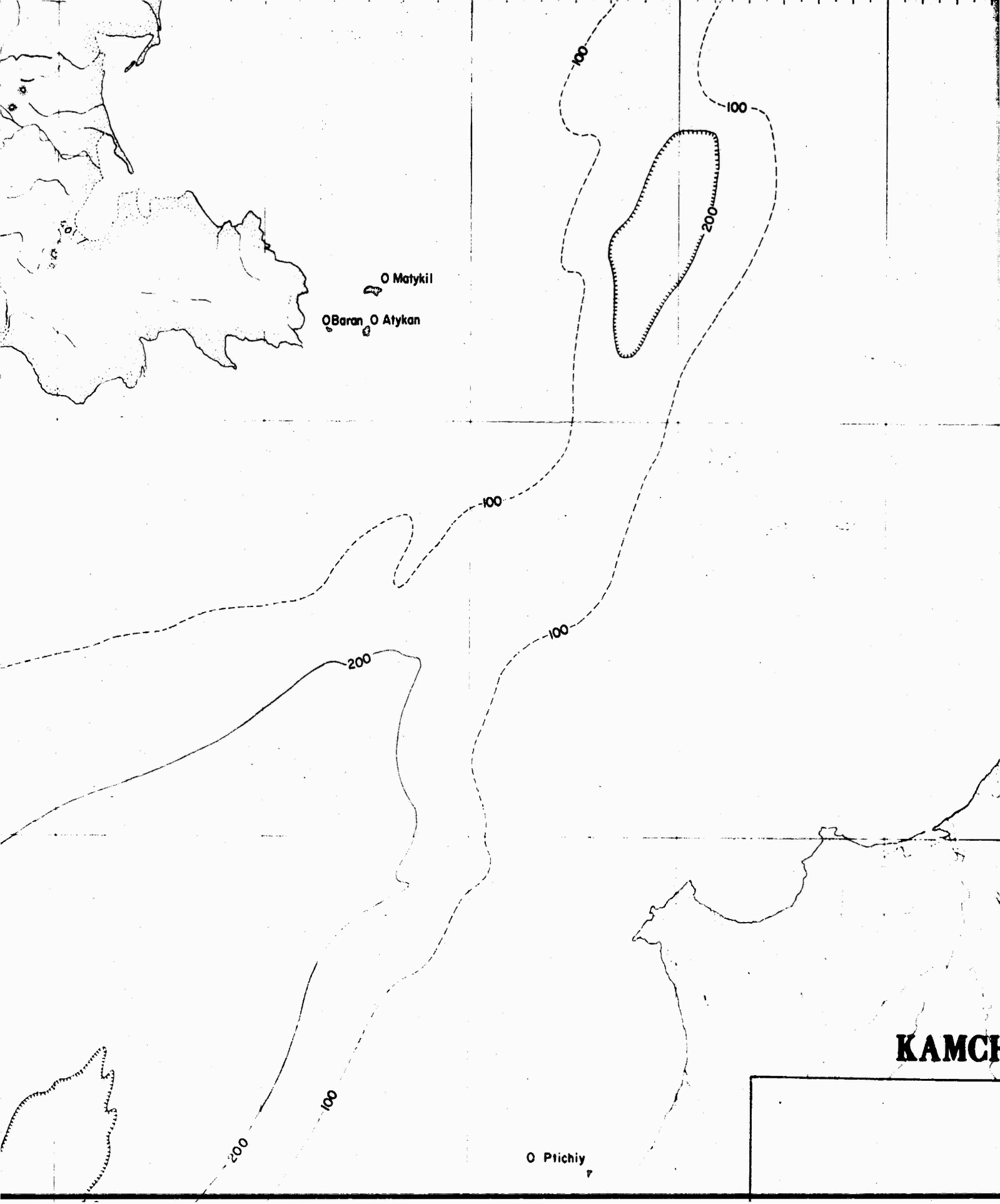
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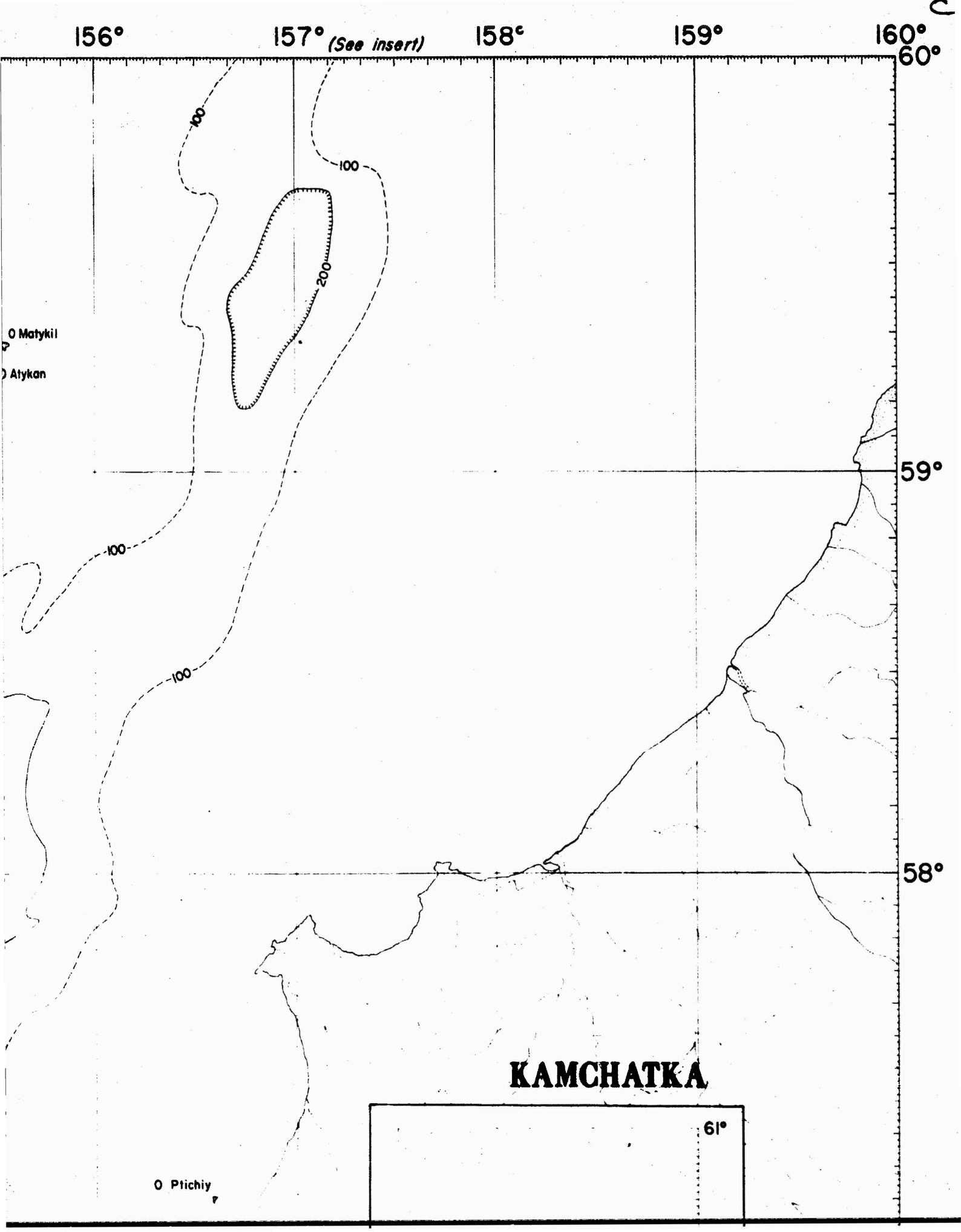
100
200
O Matykil
OBaran O Atykan
100
100
200
200
100
O Ptichiy
KAMCH


156°
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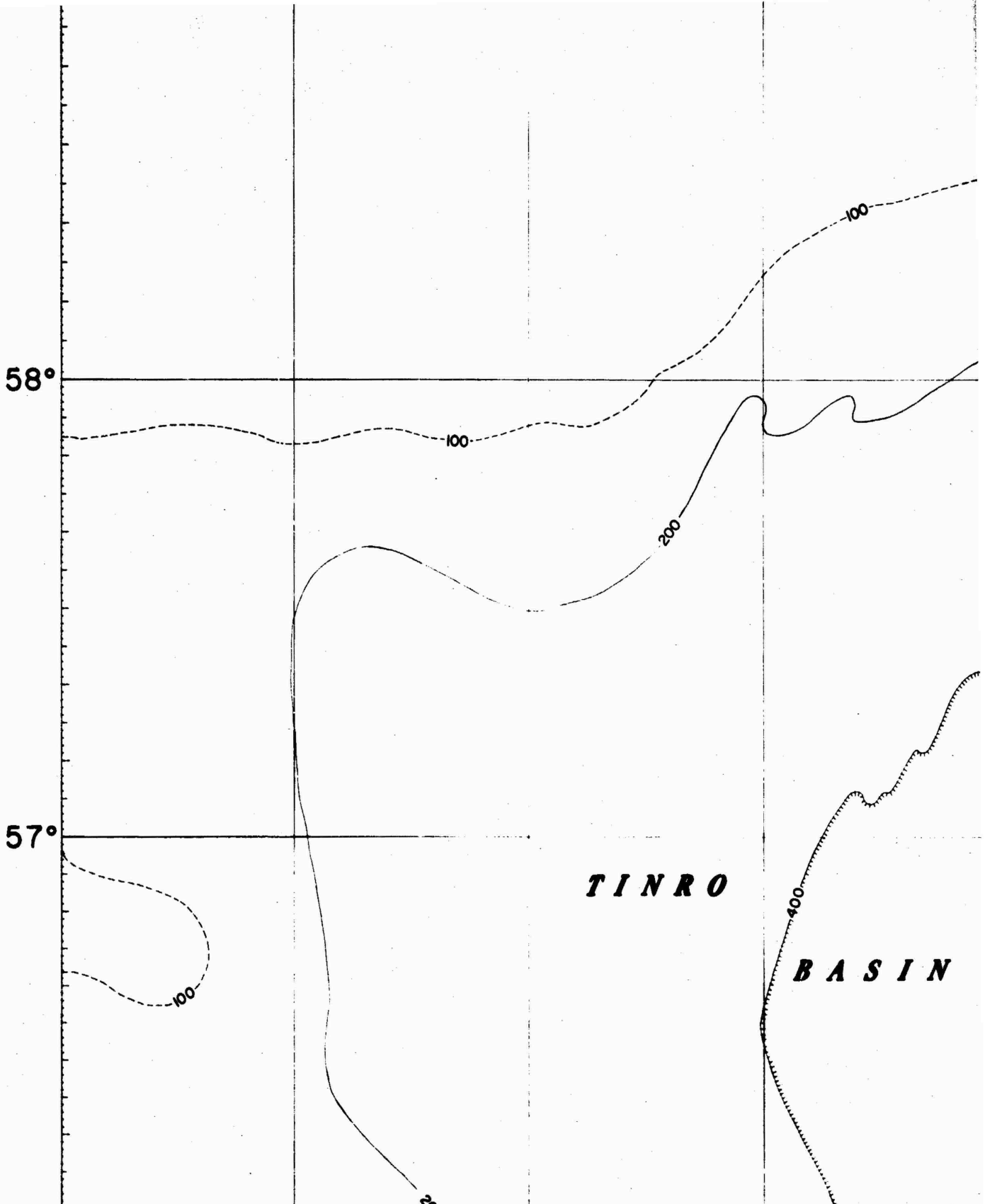
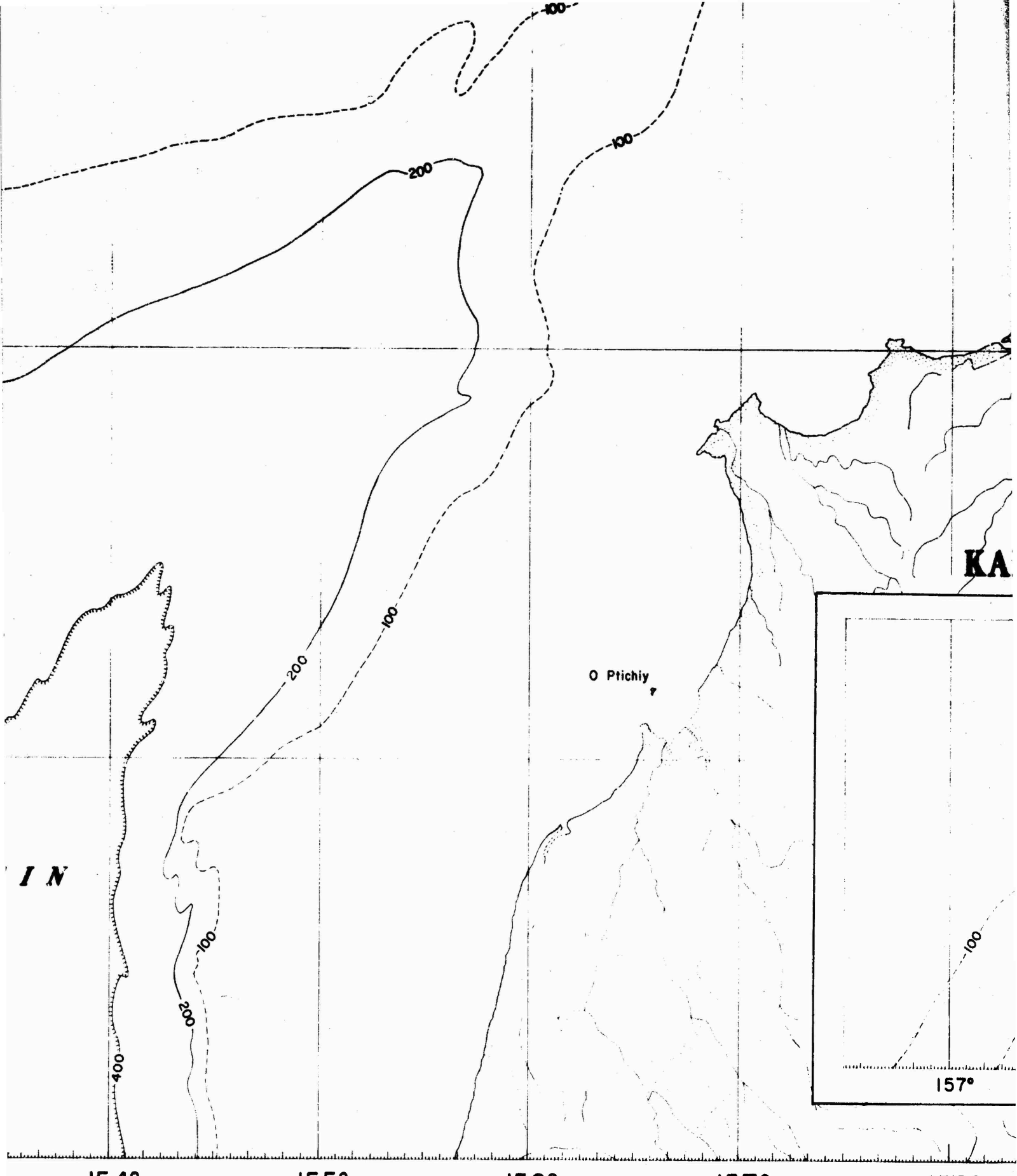
O Matykil
O Atykan
KAMCHATKA
61°
O Ptichiy



Sources of Data: U.S. Naval Oceanographic Office; Ministry of Geology of U.S.S.R.

Contour Interval = 200 fathoms; uncorrected
with 100 fathom contour dashed where applicable



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Contoured by: TE Chase
Assisted by: V Moore, B Cline

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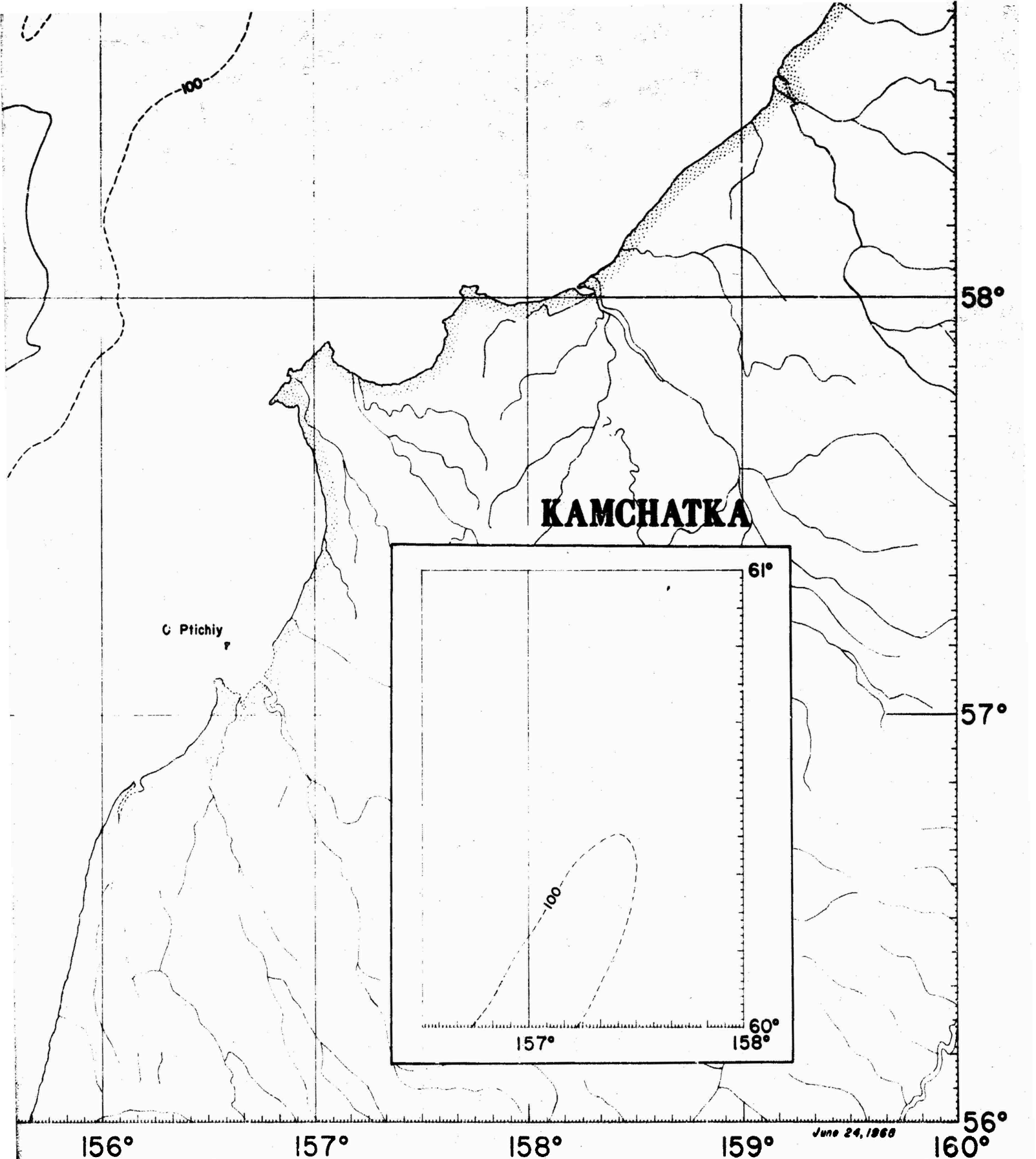

June 24, 1968

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Contoured by: R. Clause
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