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U.S. NAVAL OCEANOGRAPHIC OFFICE GEOMAGNETIC SURVEYS. (U)  
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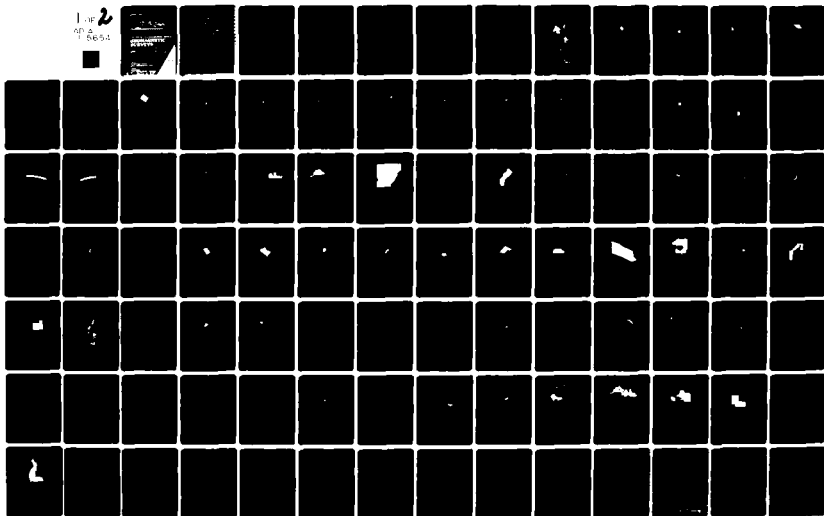
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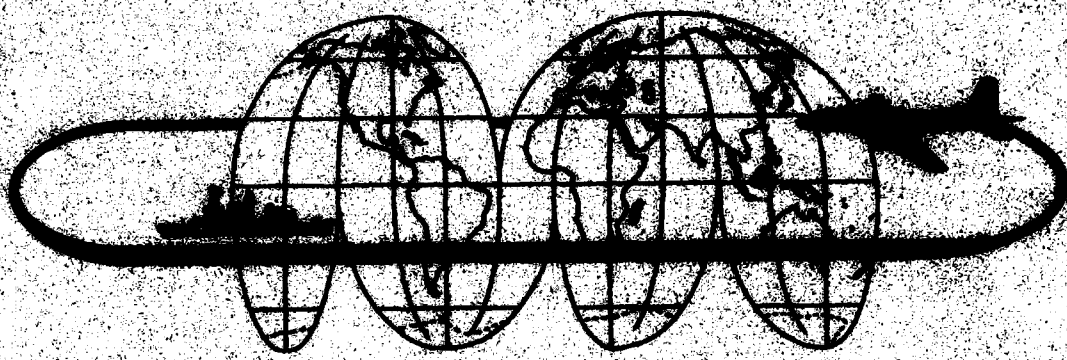
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AD A115654

# U.S. NAVAL OCEANOGRAPHIC OFFICE GEOMAGNETIC SURVEYS

1982

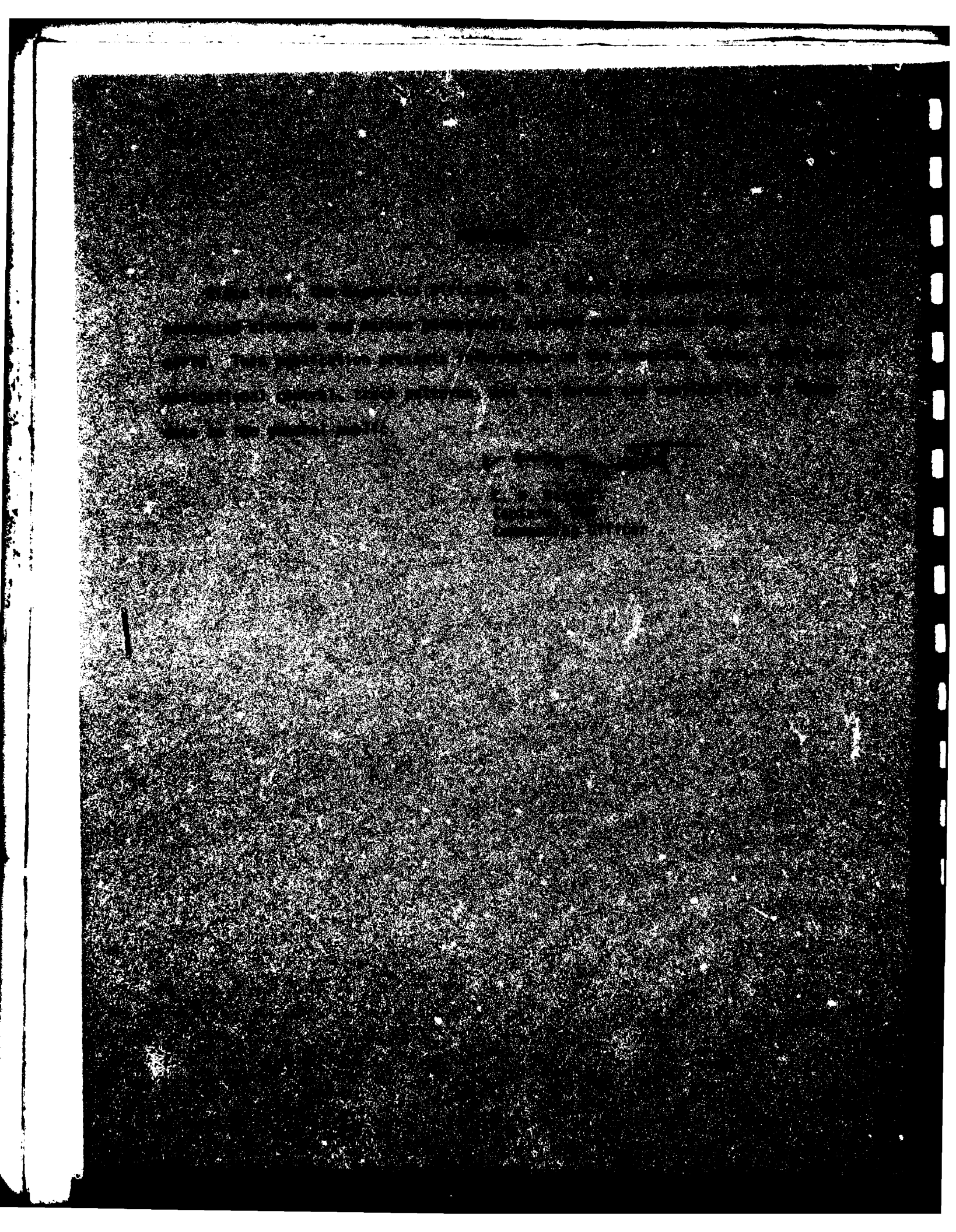
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COMMANDING OFFICER,  
NAVAL OCEANOGRAPHIC OFFICE

PREPARED FOR  
COMMANDEER  
NAVAL GEOGRAPHY COMMAND  
NETL STATION, BAY ST. LOUIS, MISSOURI



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  This publication presents location charts and brief descriptions of geomagnetic surveys conducted by the Magnetics Division, U. S. Naval Oceanographic Office and provides information on the format and availability of the resulting data.		

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## I. INTRODUCTION

### A. General

The Naval Oceanographic Office has been conducting geomagnetic investigations of ocean areas since the initiation in 1953 of Project MAGNET, a worldwide airborne geomagnetic survey. This program provides information for computing and charting all elements of the earth's magnetic field. The information derived from these airborne geomagnetic surveys is used for special naval requirements and provides for safe navigation of ships and aircraft, and also supports many scientific research programs. With the introduction of the proton precession magnetometer, total magnetic intensity measurements have been made routinely from steel-hulled ships by the Navy since 1957.

This report presents brief descriptions of geomagnetic surveys accomplished by the U. S. Naval Oceanographic Office and provides information on the format and availability of the data. It also revises and replaces the Geomagnetic Survey Information Report IR 70-18 previously distributed by the U. S. Naval Oceanographic Office.

Information included in this report should assist other organizations in their survey planning and research investigations. When similar information is obtained, it should be provided to this office to avoid duplication of effort.

### B. Instrumentation

From 1953 to 1972, vector airborne geomagnetic measurements were made by a Naval Surface Weapons Center (formerly Naval Ordnance Laboratory) fluxgate Vector Airborne Magnetometer (VAM-2). Total magnetic intensity, inclination, and declination were determined to the following respective accuracies:  $\pm 15$  nanoteslas (gammas),  $\pm 0.1$  degrees, and  $\pm 0.2$  degrees. To reduce the effects of aircraft motion, angular measurements were averaged over a 100 second

time period centered on each 5 minute GMT. The observed data were recorded on continuous analog strip charts. Navigational accuracy was  $\pm 5$  nm. Beginning in 1964, the survey aircraft was equipped with a digital magnetic tape recording system which sampled and recorded the data at a one sample per second rate; and in 1965, an optical pumping metastable helium magnetometer system was operated during special aeromagnetic surveys. This magnetometer system was towed approximately 100 feet behind and 100 feet below the survey aircraft and measured only the total magnetic intensity.

Since 1973, navigational and geomagnetic data have been collected on board the Project MAGNET RP-3D aircraft using the Geomagnetic Airborne Survey System (GASS). Both vector geomagnetic measurements and scalar magnetic measurements have been made with a Honeywell Vector Fluxgate Magnetometer and the optical pumping metastable helium magnetometer system, respectively. The navigational sensors include a Loran C, Omega, Navigational Satellite, and an electrostatically suspended gyro inertial navigator. The vector magnetometer is located in the magnetically clean cabin of the aircraft, and the scalar magnetometer is located in the tail-boom section.

Magnetic data accuracies obtained with the GASS system are inclination,  $\pm 7$  arc minutes; variation,  $\pm 6$  arc minutes; horizontal intensity,  $\pm 5$  nanoteslas; vertical intensity,  $\pm 5$  nanoteslas; and total intensity,  $\pm 1$  nanotesla.

Navigational equipment used on the aircraft and their accuracies are Navigational Satellite (ARNNS)  $\pm 0.5$  nm; Loran C (ARN-98)  $\pm 0.25$  nm; inertial navigation, (ASN-84 and ASN-101) 1.0 nm/hour and 0.1 nm/hour respectively. The GASS system overall positional accuracy is  $\pm 1$  nm for high-level worldwide vector geomagnetic surveys and  $\pm 0.25$  nm for low-level magnetic surveys.

All shipboard magnetic measurements are made with proton precession magnetometers which record total magnetic intensity with an absolute accuracy of

±1 to 2 nanoteslas. Measurements are made at 2 to 6 second time intervals and recorded continuously while underway. The sensor unit is towed 500 to 1200 feet astern of the survey ship to minimize the effects of the ship's magnetic field. Data are recorded on analog and digital recorders. Navigation accuracy is generally ±0.25 nm or better when using Loran C, satellite, and inertial systems.

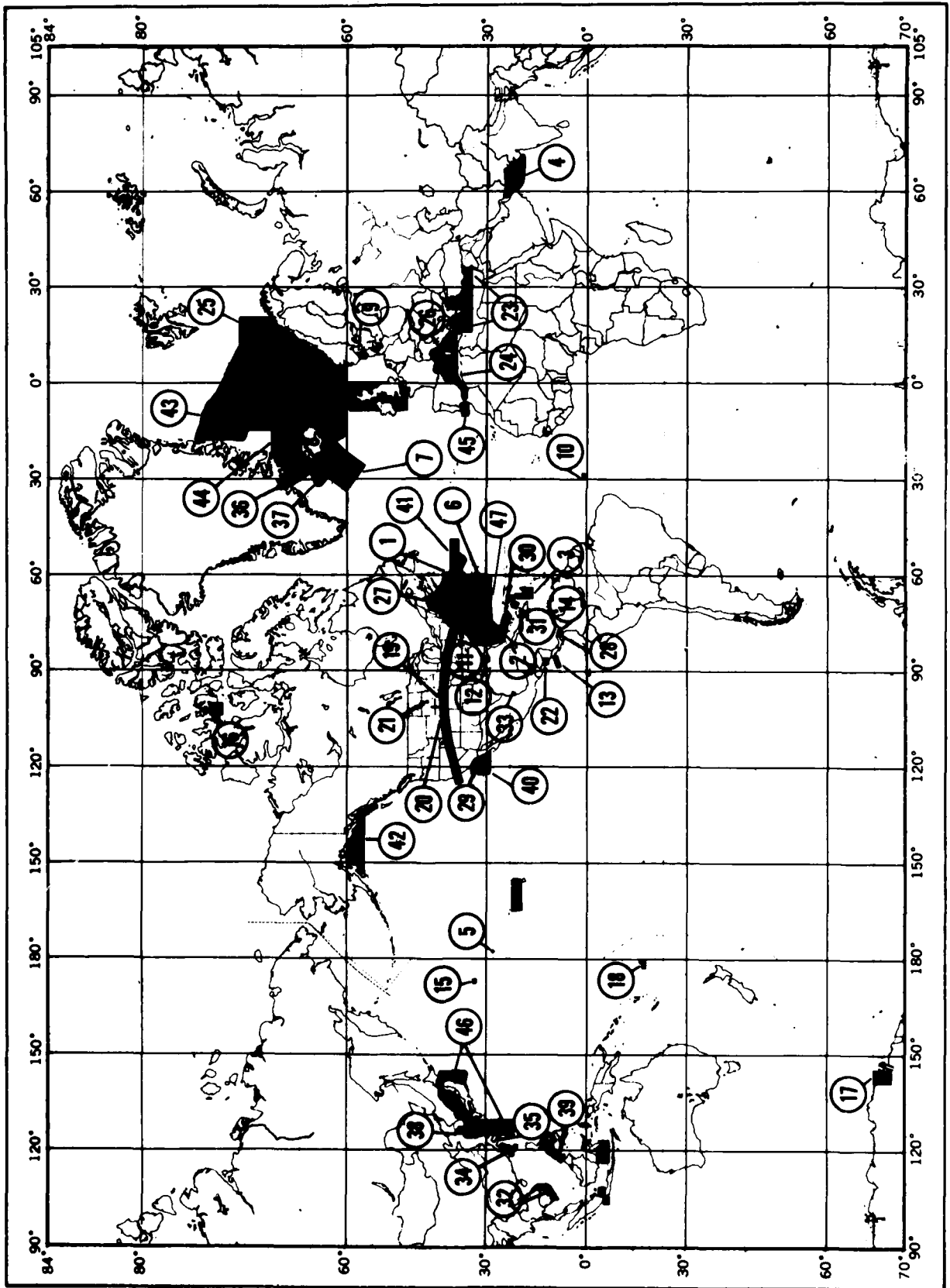
### C. Geomagnetic Surveys

The U. S. Naval Oceanographic Office has conducted detailed geomagnetic surveys with aircraft in response to specific requirements or on an opportunity basis aboard ships. These special surveys are usually conducted on a systematic track pattern and often produce sufficient data for the construction of contour charts. Data collected along tracks to and from the survey areas frequently provide profile information in areas where other geomagnetic data are sparse.

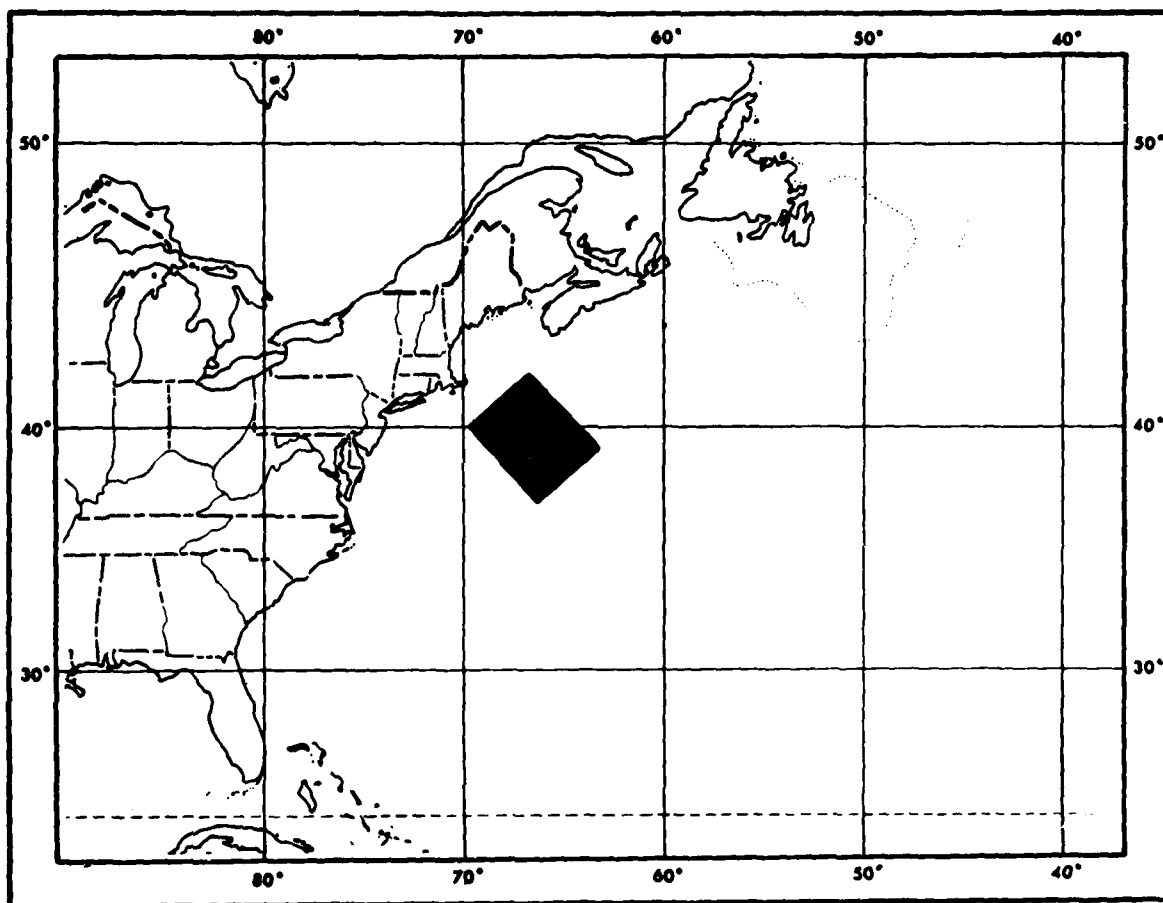
U.S. Naval Oceanographic Office  
**AIRBORNE MAGNETIC SURVEYS**

SEP 1956 - JAN 1978

II. AIRBORNE SURVEYS



## 1. NEW ENGLAND SEAMOUNT CHAIN SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** May 1957

**NAVIGATIONAL CONTROL:** Loran-A, Doppler radar

**MILES SURVEYED:** 38,000 square miles

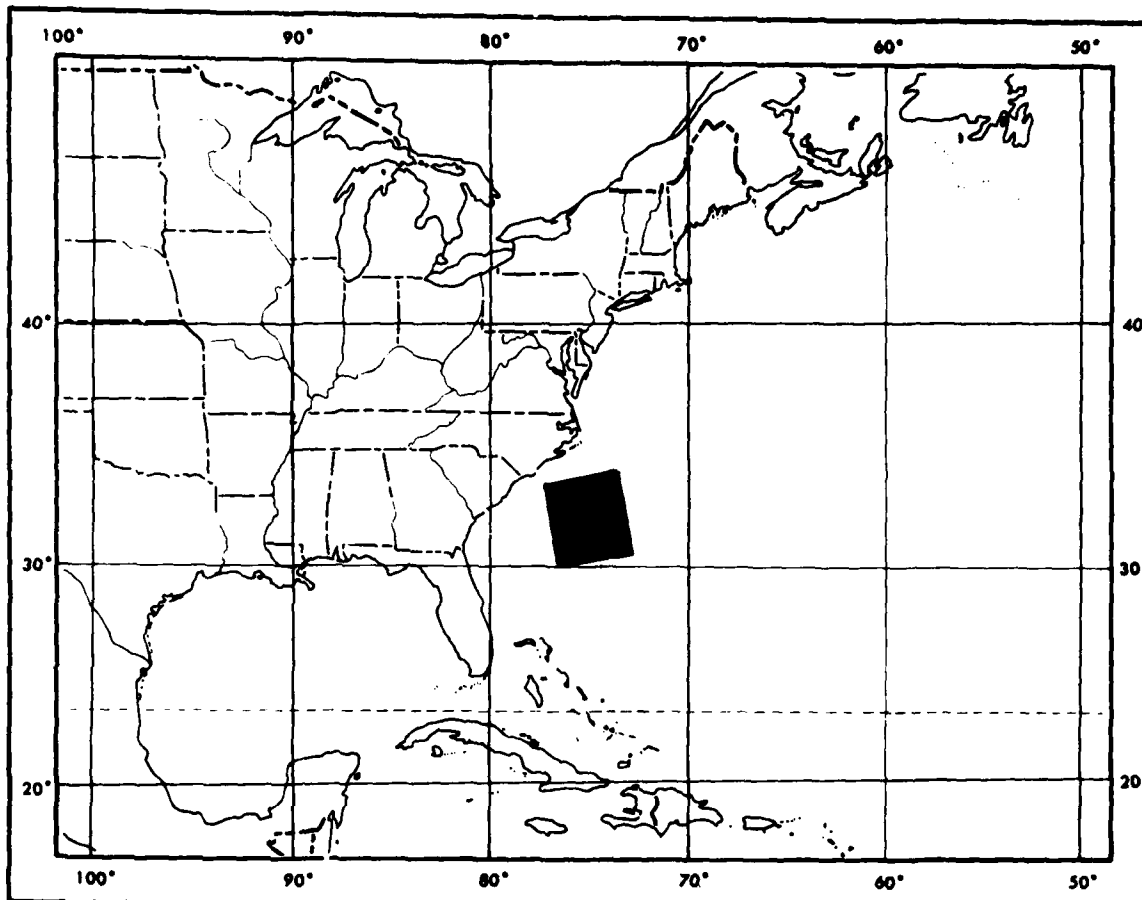
**TRACK PATTERN:** 5-mile spacing, NW-SE track orientation

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total intensity, horizontal intensity, vertical intensity, and inclination contour charts.

**REPORTS:** Technical Report 166, "A Study of Aeromagnetic Data - New England Seamount Area."

## 2. BLAKE RIDGE SURVEY (FORMERLY CALLED CHARLESTON RISE SURVEY)



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** April 1957

**NAVIGATIONAL CONTROL:** Loran-A, Doppler radar

**MILES SURVEYED:** 31,000 square miles

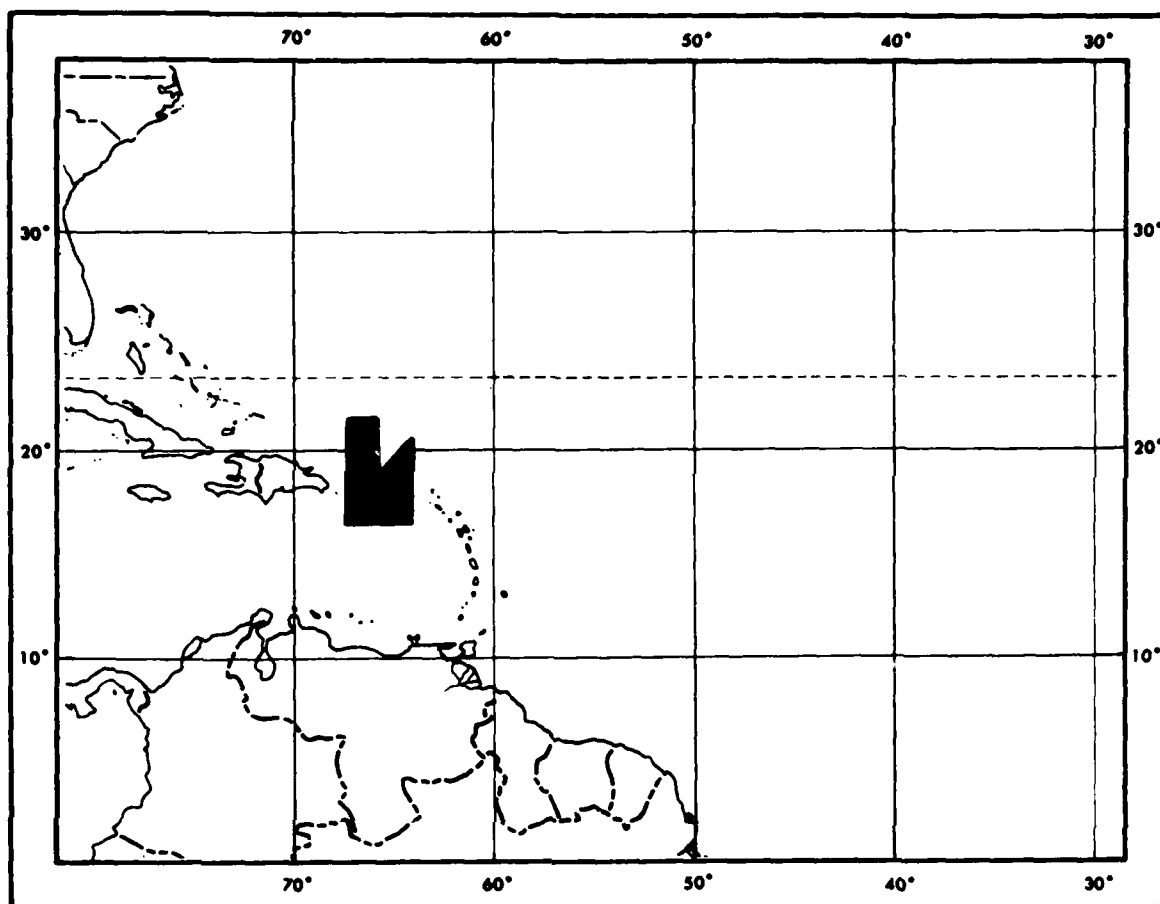
**TRACK PATTERN:** 5-mile spacing, NW-SE track orientation

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total and residual magnetic intensity contour charts.

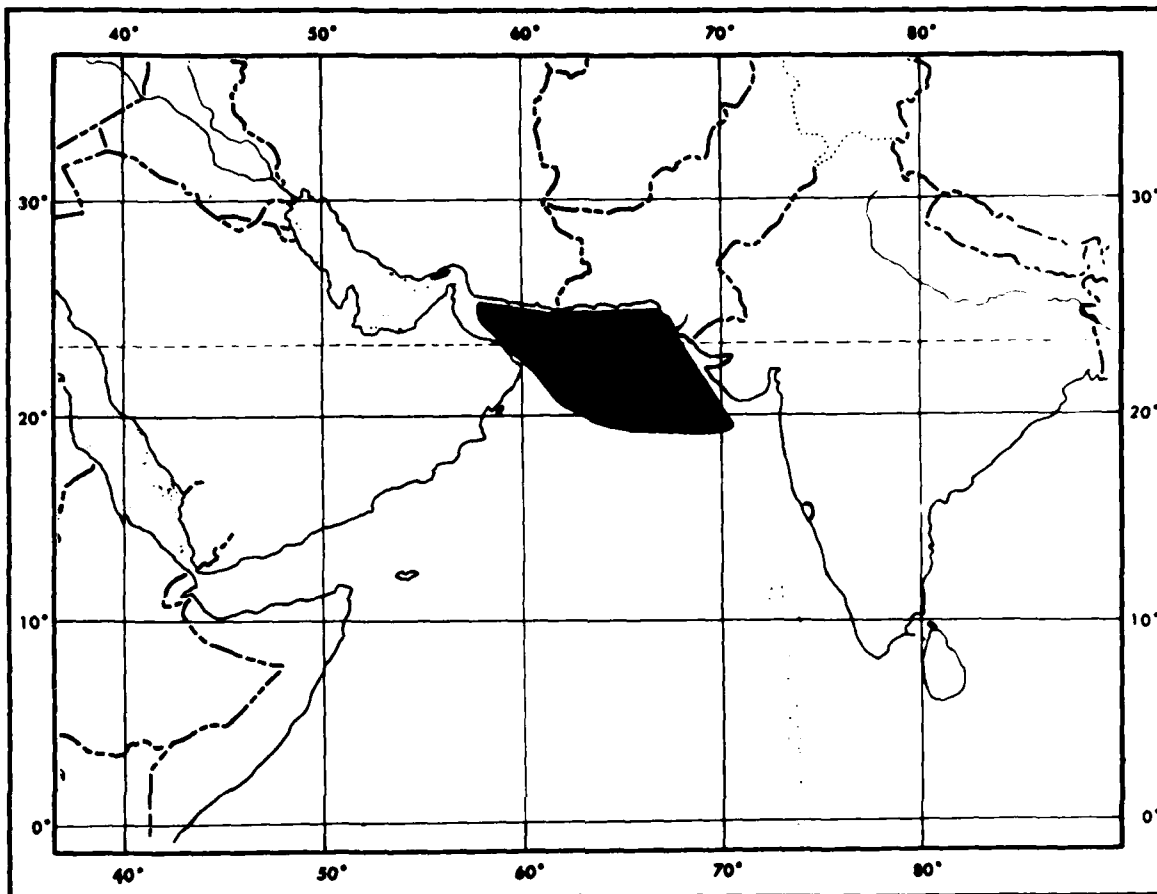
**REPORTS:** Informal Report No. 67-48, "Blake Ridge Aeromagnetic Survey."

### 3. PUERTO RICO TRENCH SURVEY



- AIRCRAFT:** NC-54R BUNO 90396
- SURVEY DATE:** July 1962
- NAVIGATIONAL CONTROL:** Loran-A, visual, Doppler radar
- MILES SURVEYED:** 49,000 square miles
- TRACK PATTERN:** 10-mile spacing, N-S track orientation
- ALTITUDE:** 1000 feet over water; 10,000 feet over land
- DATA FORMAT:** Total magnetic intensity contour chart.
- REPORTS:** 1) "Island-Arc Structures Interpreted from Aeromagnetic Data near Puerto Rico and the Virgin Islands," Geol. Soc. Am. Bull., V. 77, pp. 153-162, 1966. 2) Informal Manuscript Report No. M-1-63, "Preliminary Report on Special Aeromagnetic Survey Puerto Rico Trench." 3) Informal Report H-1-66, "Magnetic Anomalies North of Puerto Rico: Trend Removal with Orthogonal Polynomials." 4) J. of Geophys. Res., V. 69, No. 24, 1964.

#### 4. NORTH ARABIAN SEA SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** January 1961

**NAVIGATIONAL CONTROL:** Dead reckoning and celestial

**MILES SURVEYED:** 130,000 square miles

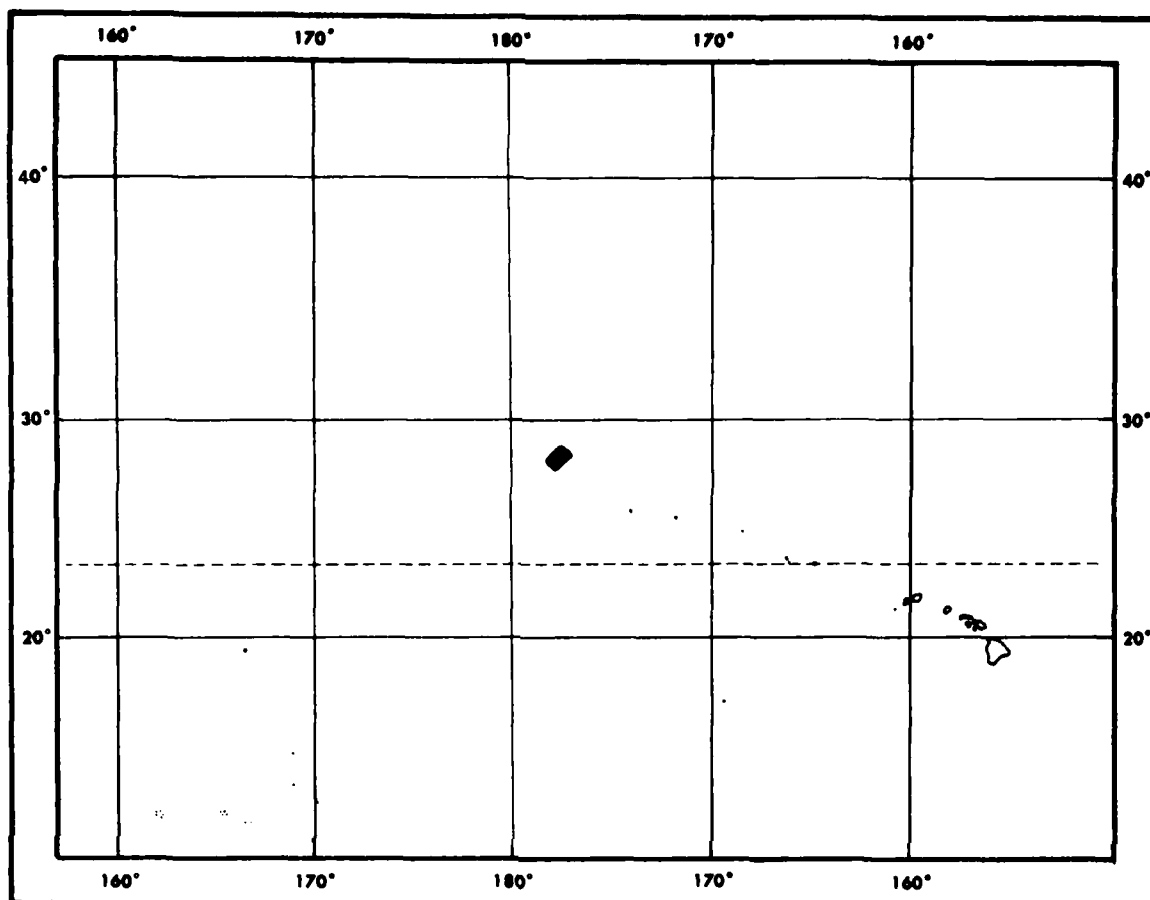
**TRACK PATTERN:** Radial pattern south from Karachi, Pakistan; maximum spacing of radials averaged 45 miles.

**ALTITUDE:** 1000 FEET

**DATA FORMAT:** Total magnetic intensity contour chart.

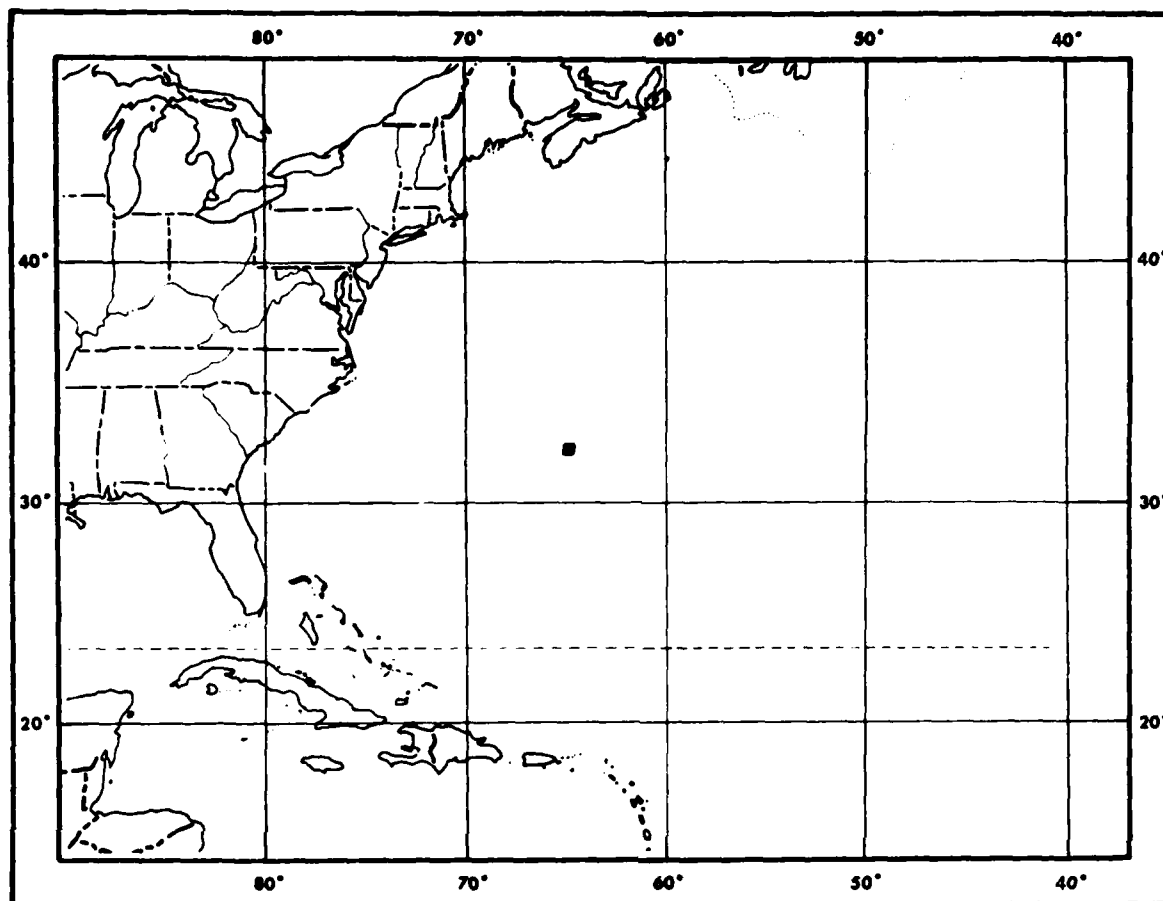
**REPORTS:** "Interpretation of the North Arabian Sea Aeromagnetic Survey,"  
Earth and Planetary Science Letters, V. 4, No. 3, pp. 232-236,  
1968.

## 5. MIDWAY ISLANDS SURVEY



**AIRCRAFT:** NC-54R BUNO 90396  
**SURVEY DATE:** April 1963  
**NAVIGATIONAL CONTROL:** Visual, Doppler radar  
**MILES SURVEYED:** 2400 square miles  
**TRACK PATTERN:** One-mile spacing, NE-SW track orientation  
**ALTITUDE:** 500 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.

## 6. PLANTAGENET BANK SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** January 1961

**NAVIGATIONAL CONTROL:** Loran-C

**MILES SURVEYED:** 52 square miles

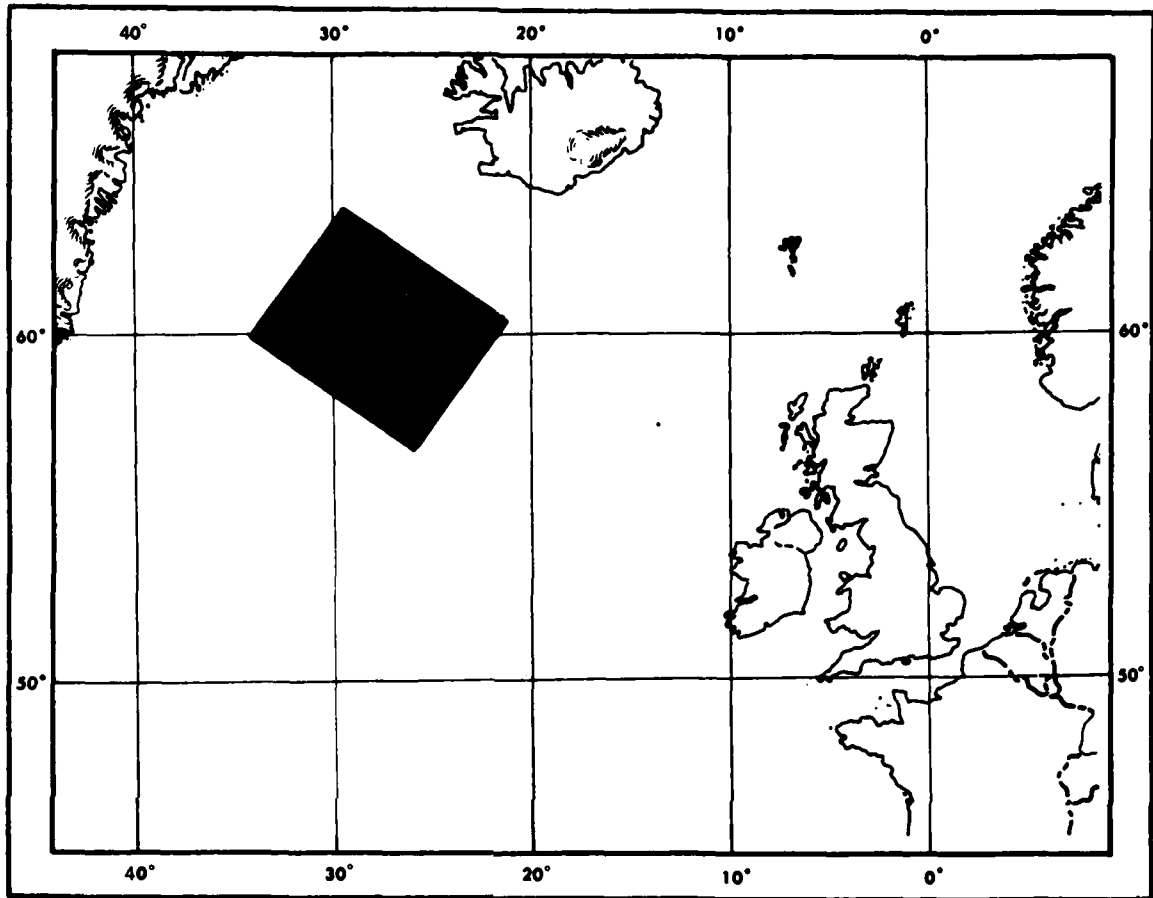
**TRACK PATTERN:** 1/2-mile spacing, E-W track orientation

**ALTITUDE:** 500 feet

**DATA FORMAT:** Contour charts of total magnetic intensity, inclination, declination, anomalous X, Y, and Z components of the earth's field.

**REPORTS:** 1) Technical Report 144, "A Study of Aeromagnetic Component Data Plantagenet Bank." 2) "Approximation of Residual Total Magnetic Intensity Anomalies," Geophysics, V. 29, No. 4, pp. 623-627, 1964.

## 7. SURVEY OF REYKJANES RIDGE



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** October - November 1963

**NAVIGATIONAL CONTROL:** Loran-A

**MILES SURVEYED:** 58,000 square miles

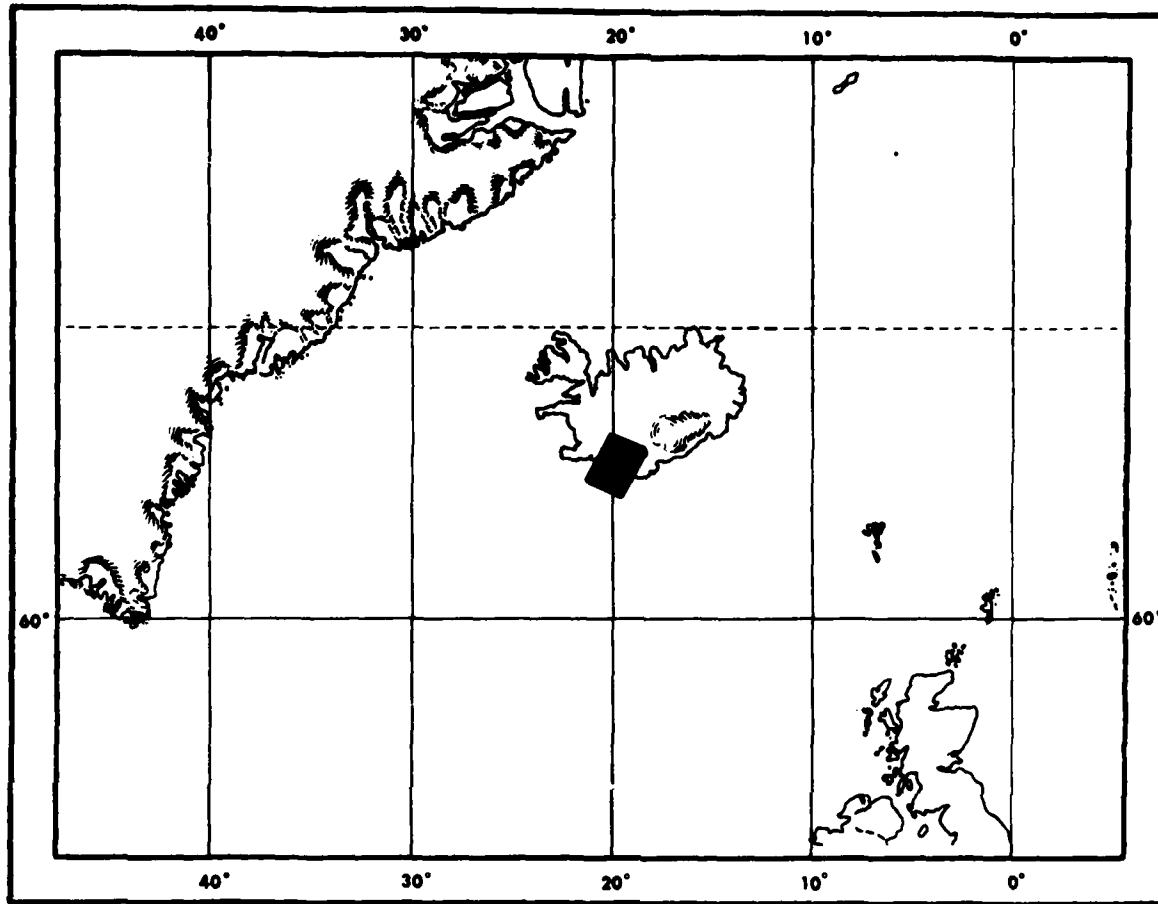
**TRACK PATTERN:** 2-4 nautical mile spacing, tracks flown along Loran-A rates generally orientated NW-SE.

**ALTITUDE:** 1500 feet

**DATA FORMAT:** Total intensity and residual total intensity charts.

**REPORTS:** 1) Informal Report No. H-3-65, "An Airborne Geomagnetic Survey of the Reykjanes Ridge, 1963." 2) "Magnetic Anomalies Over the Reykjanes Ridge," DEEP SEA RESEARCH, V. 13, p. 427-443, 1966.

## 8. SURVEYS OF WESTMANN ISLANDS, ICELAND (SURTSEY)



**AIRCRAFT:** NC-54R BUNO 90396 and NC-121K BUNO 145925

**SURVEY DATES:** November 1963, February 1964 and July 1966

**NAVIGATIONAL CONTROL:** Visual, aircraft radar

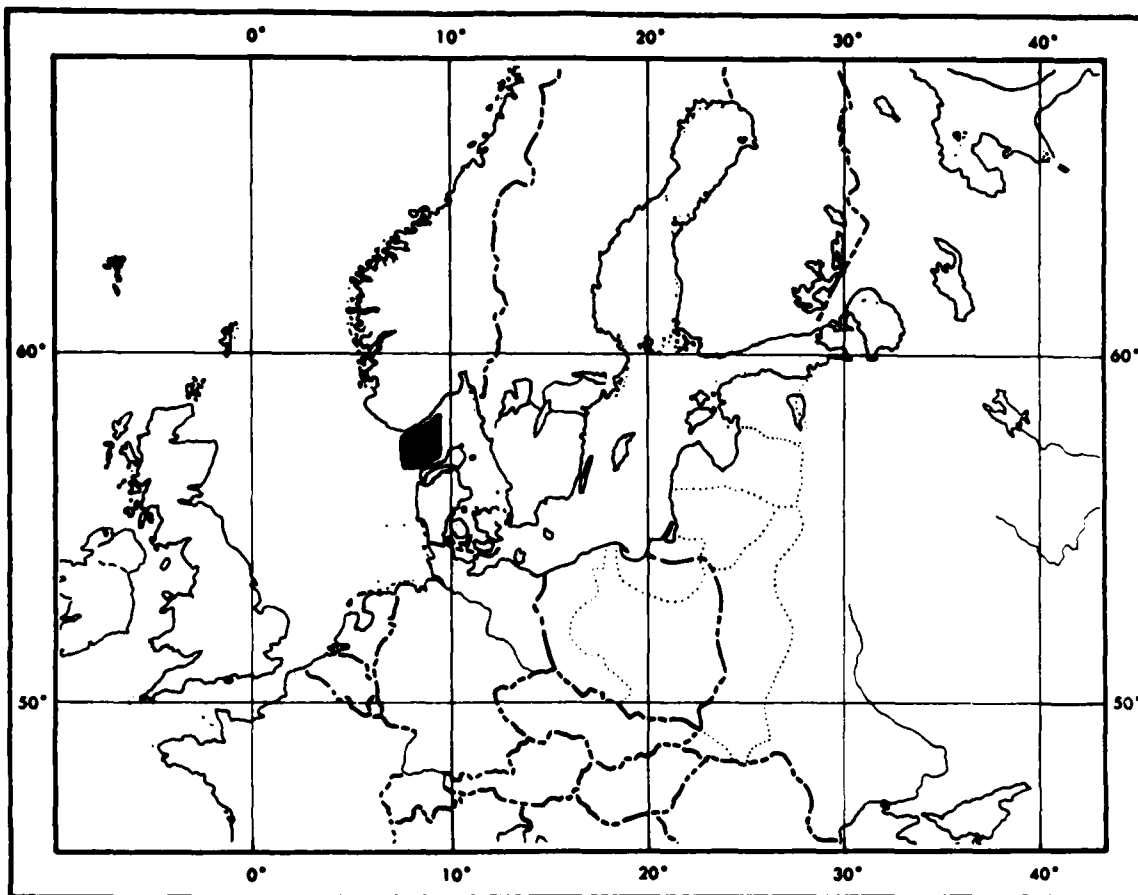
**MILES SURVEYED:** 1100 square miles (Westmann Islands); 3600 square miles (Westmann Islands and South Iceland).

**TRACK PATTERN:** One-mile spacing at 2000 feet; 2-mile spacing at 6000 feet (1964); NW-SE track orientation at both levels.

**ALTITUDE:** 2000 feet (Westmann Islands); 6000 feet (Westmann Islands and South Iceland).

**DATA FORMAT:** Total magnetic intensity contour charts for 1964 and 1966 Westmann Islands survey.

## 9. SURVEY OF THE SKAGERRAK



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** September 1958

**NAVIGATIONAL CONTROL:** Visual, aircraft radar, and Doppler radar

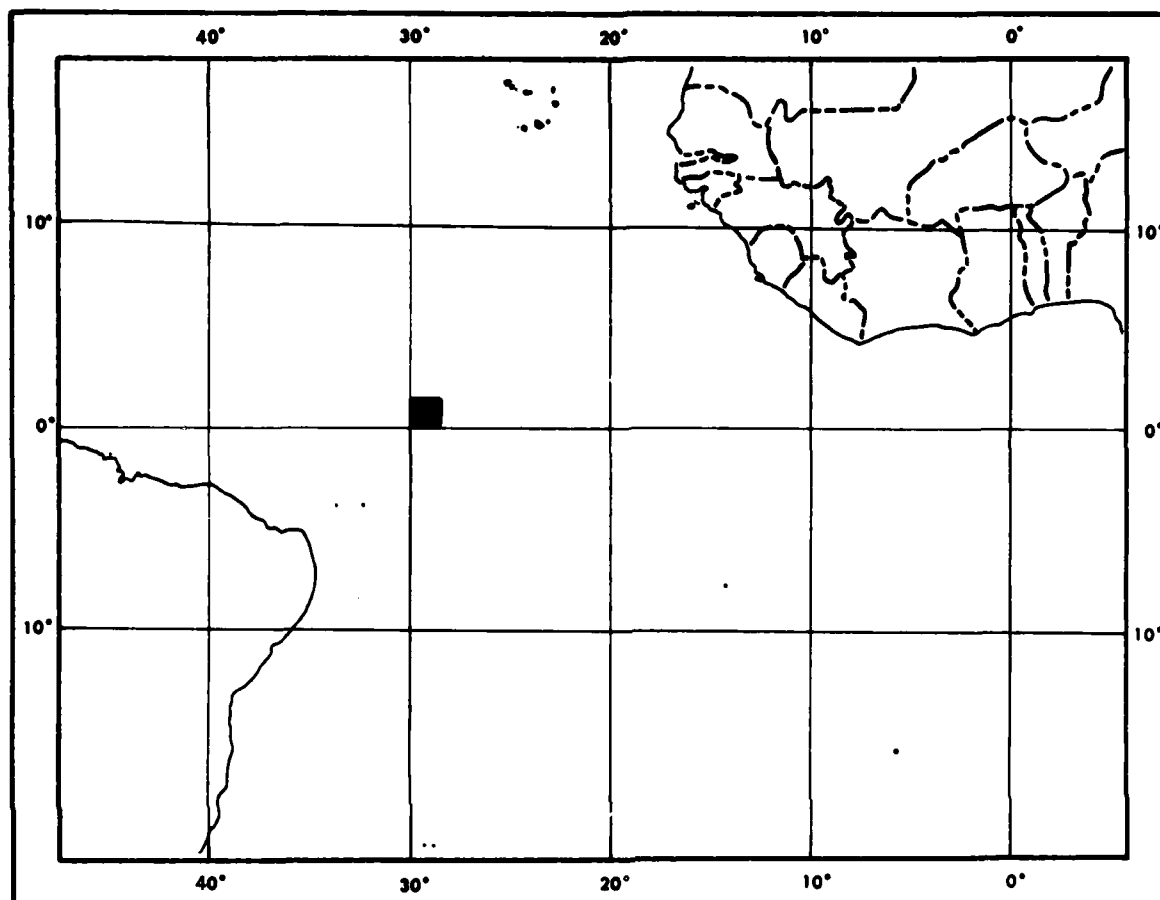
**MILES SURVEYED:** 5500 square miles

**TRACK PATTERN:** 10-mile spacing; N-S track orientation

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total magnetic intensity contour chart.

## 10. SURVEY OF ST. PETER AND ST. PAUL ROCKS



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** July 1963

**NAVIGATIONAL CONTROL:** Aircraft radar and Doppler radar

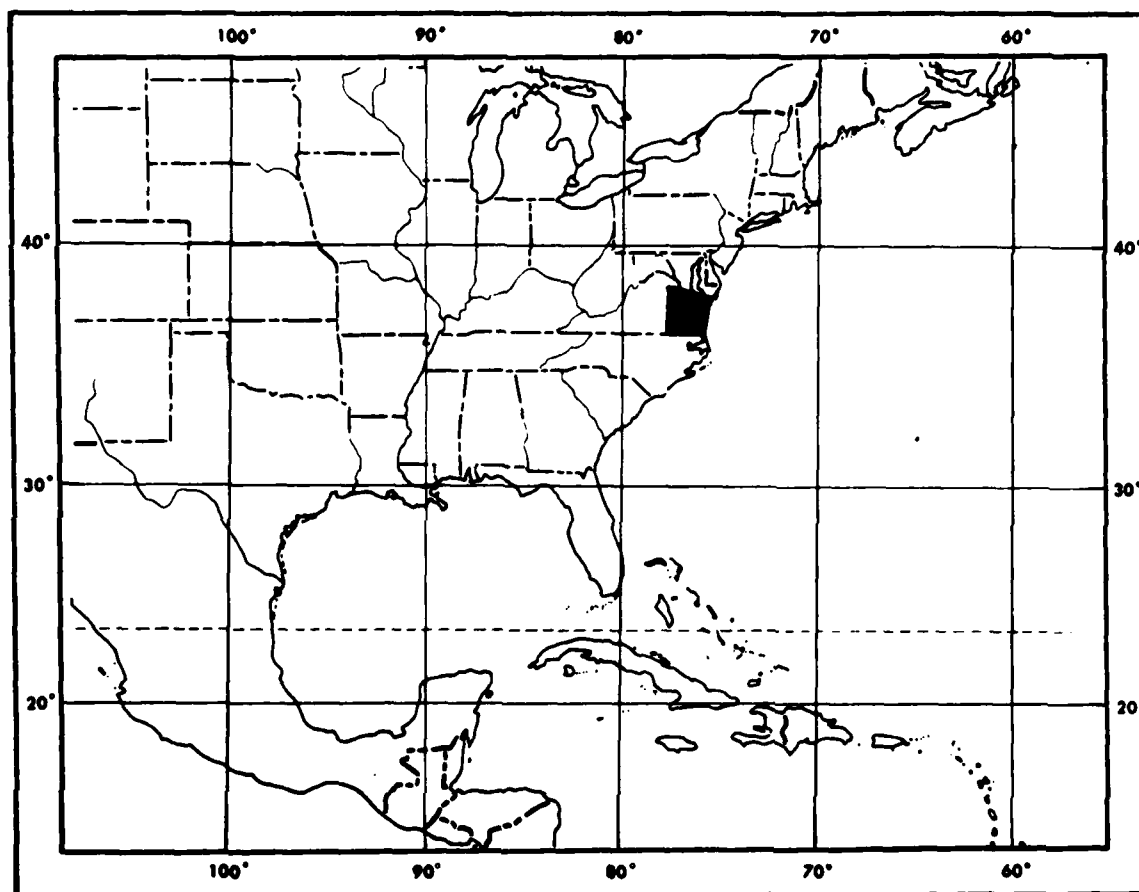
**MILES SURVEYED:** 3600 square miles

**TRACK PATTERN:** Radial pattern, maximum spacing of radials averaged 25 miles

**ALTITUDE:** 500 and 1000 feet

**DATA FORMAT:** Total magnetic intensity contour chart.

## 11. SURVEY OF EASTERN VIRGINIA



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** October 1961

**NAVIGATIONAL CONTROL:** Visual fixes and Doppler radar

**MILES SURVEYED:** 10,000 square miles

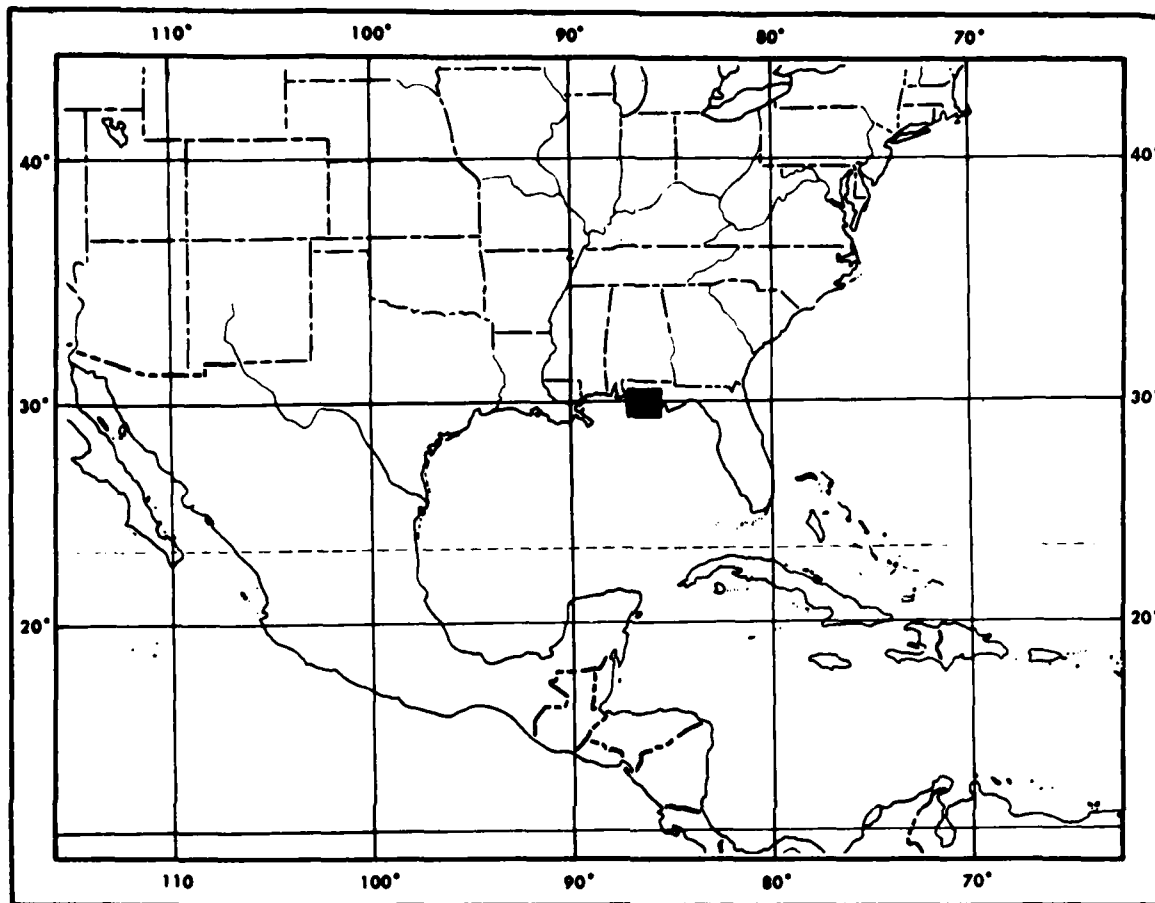
**TRACK PATTERN:** 15-mile spacing, E-W track orientation

**ALTITUDE:** 1800 to 3600 feet

**DATA FORMAT:** Total magnetic intensity and second vertical derivative contour charts.

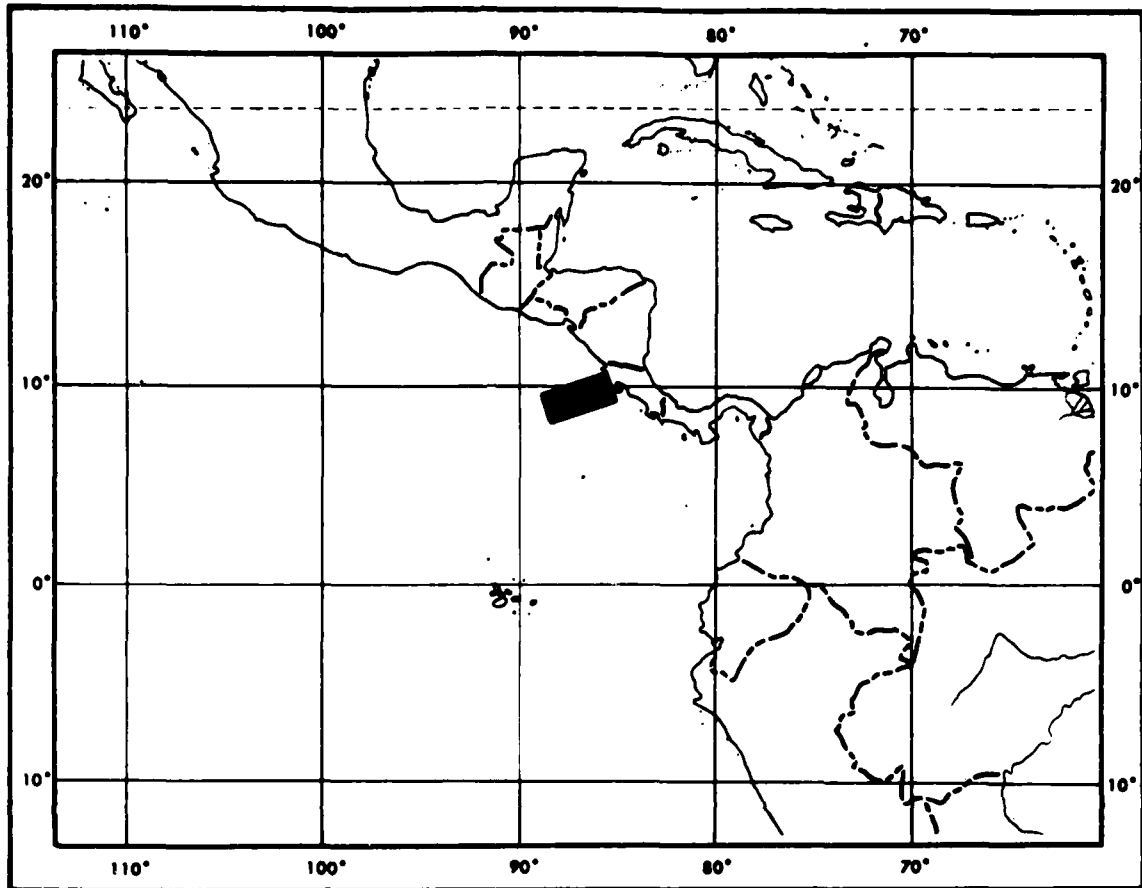
**REPORTS:** Informal Report No. M-10-63, "An Interpretation of an Aero-magnetic and Gravity Survey of Eastern Virginia."

## 12. SURVEY OF THE GULF COASTAL AREA NEAR PENSACOLA, FLA.



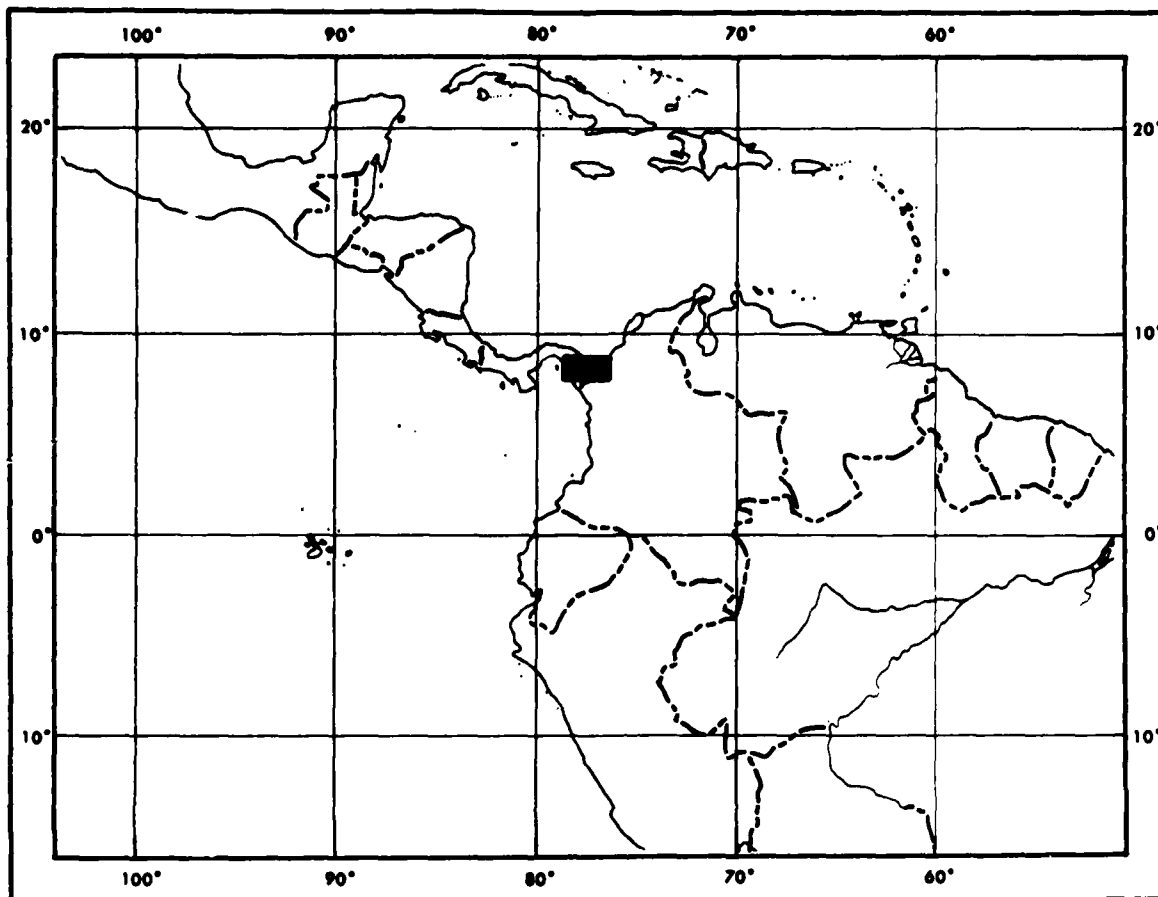
**AIRCRAFT:** WV-2 BUNO 126513  
**SURVEY DATE:** September 1959  
**NAVIGATIONAL CONTROL:** Ground radar  
**MILES SURVEYED:** 3600 square miles  
**TRACK PATTERN:** 2-mile spacing, N-S, E-W track grid.  
**ALTITUDE:** 20,000 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.

### 13. GUARDIAN BANK SURVEY



**AIRCRAFT:** NC-121K BUNO 145925  
**SURVEY DATE:** January 1964  
**NAVIGATIONAL CONTROL:** Aircraft radar and Doppler radar  
**MILES SURVEYED:** 13,500 square miles  
**TRACK PATTERN:** 10-mile spacing, NE-SW track orientation  
**ALTITUDE:** 1000 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.

## 14. PANAMA SURVEY



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATE:** April 1963

**NAVIGATIONAL CONTROL:** Visual

**MILES SURVEYED:** 7500 square miles

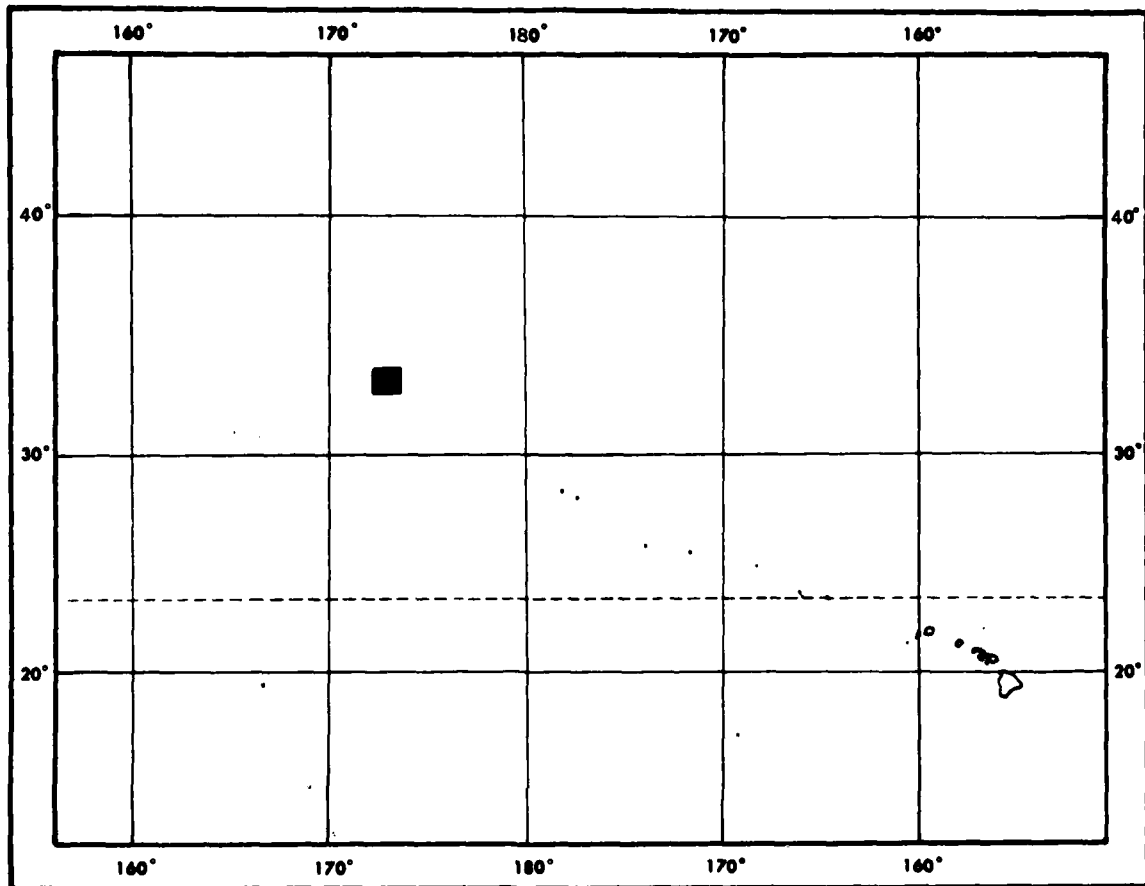
**TRACK PATTERN:** 10-mile spacing, E-W track orientation

**ALTITUDE:** 10,000 feet

**DATA FORMAT:** Total magnetic intensity, declination, and inclination contour charts and total magnetic intensity, declination and inclination residual contour charts. Copies of the total magnetic intensity analog trace for the Panama survey are available on microfilm (Track T-115, Reel No. 4. See Section III-C).

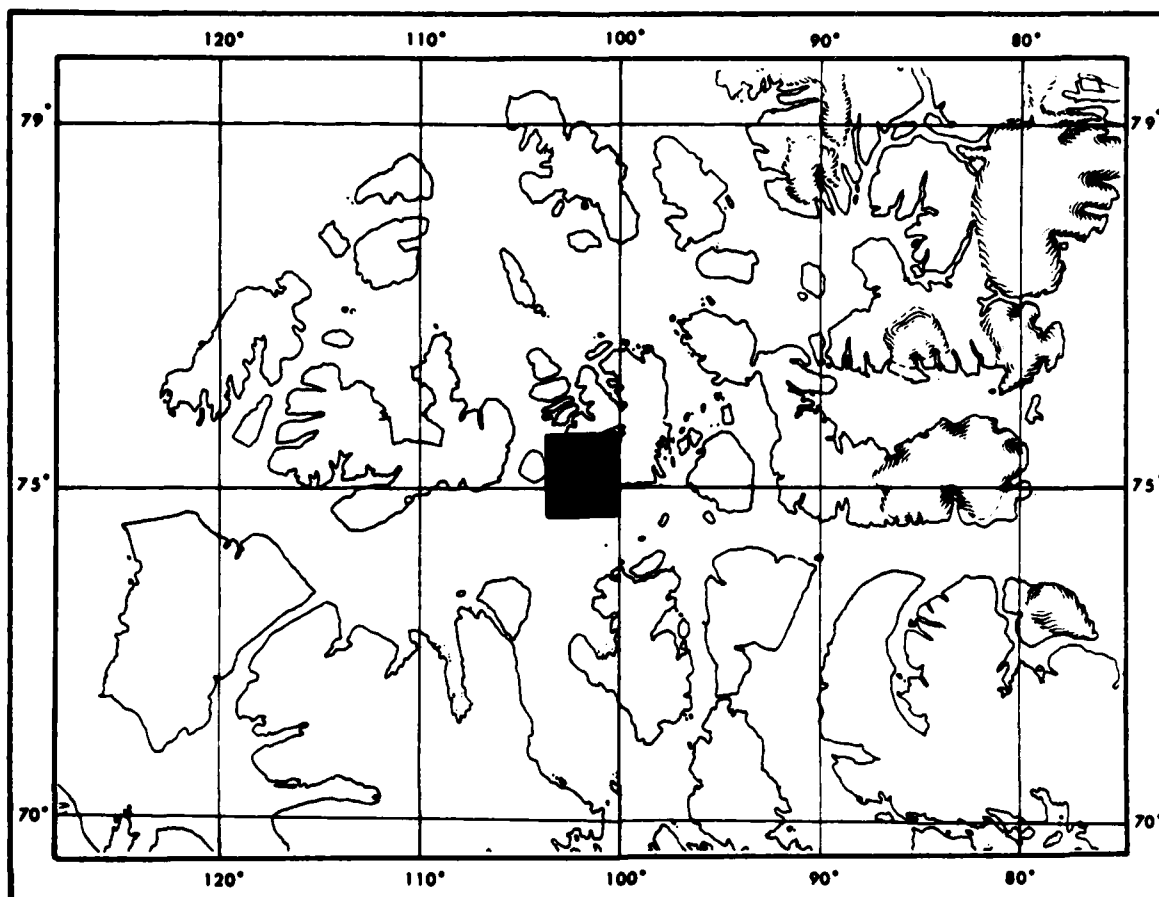
**REPORTS:** Informal Report No. IR H-5-65, "An Airborne Geomagnetic Investigation of a Reported Declination Anomaly in Eastern Panama."

## 15. MILWAUKEE BANK SURVEY



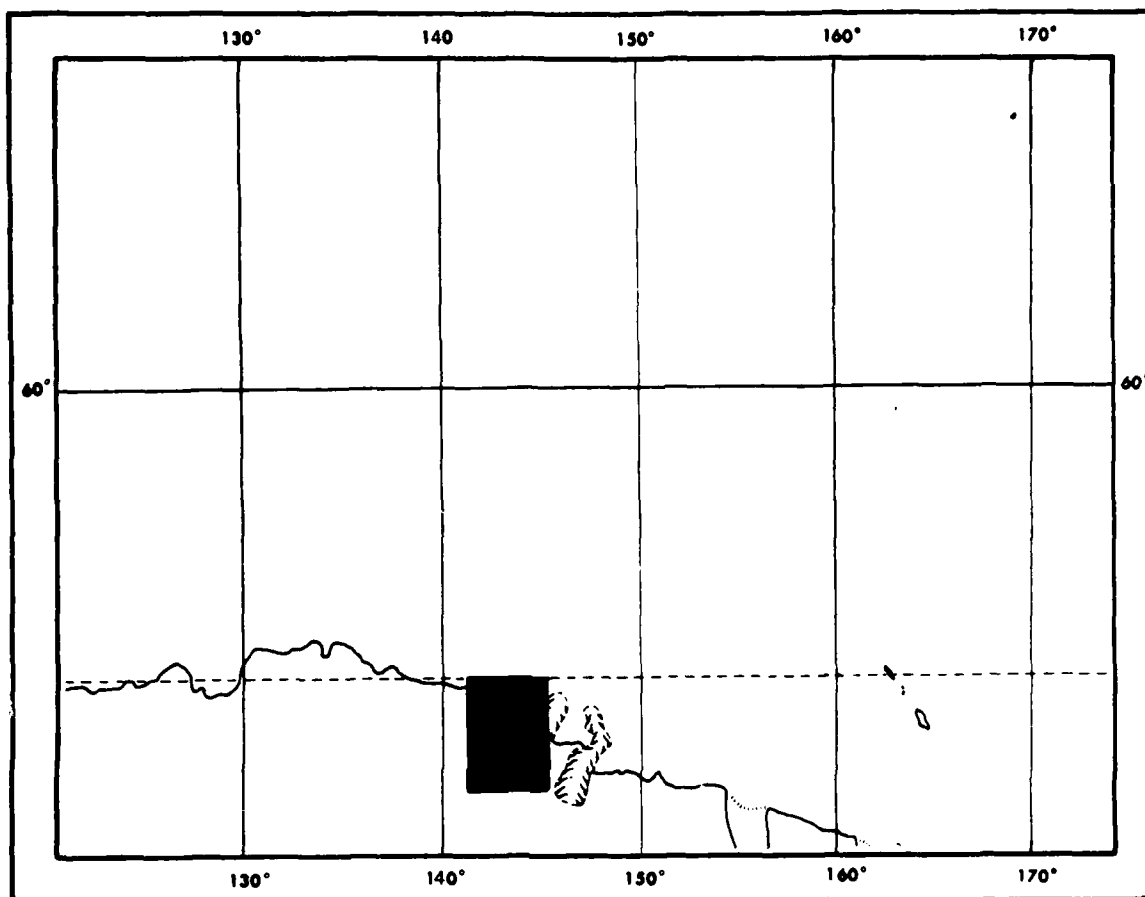
**AIRCRAFT:** NC-54R BUNO 90396  
**SURVEY DATE:** August 1963  
**NAVIGATIONAL CONTROL:** Doppler radar  
**MILES SURVEYED:** 3600 square miles  
**TRACK PATTERN:** 10-mile spacing, N-S track orientation  
**ALTITUDE:** 1500 feet  
**DATA FORMAT:** Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the Milwaukee Bank Survey are available on microfilm (Track 376, Reel No. 30. See Section III-C).

## 16. SEARCH FOR THE NORTH MAGNETIC POLE, 1960



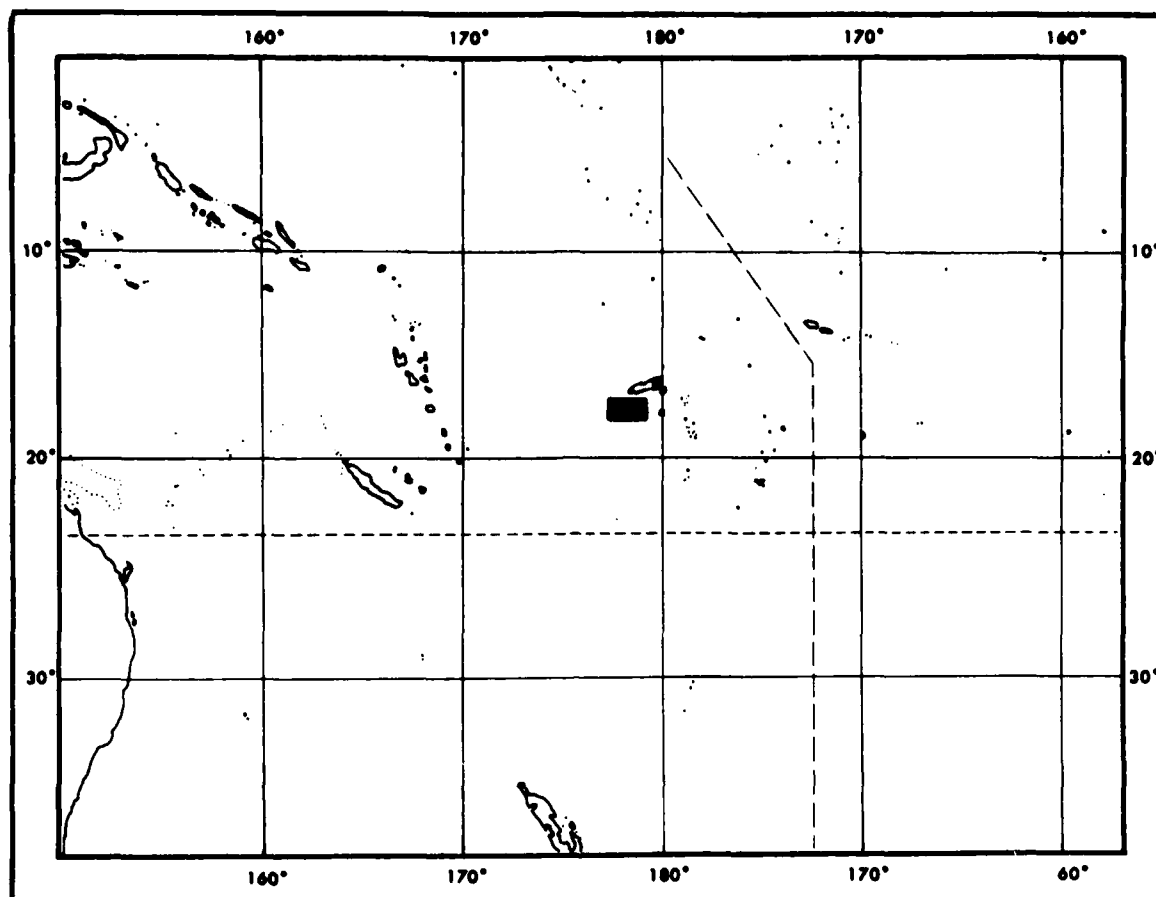
**AIRCRAFT:** WV-2 BUNO 126513  
**SURVEY DATE:** 2 September 1960  
**NAVIGATIONAL CONTROL:** Aircraft radar  
**MILES SURVEYED:** 8000 square miles  
**TRACK PATTERN:** Triangular search patterns  
**ALTITUDE:** 11,000 feet  
**DATA FORMAT:** Inclination contour chart.

## 17. SEARCH FOR THE SOUTH MAGNETIC POLE, 1960



**AIRCRAFT:** WV-2 BUNO 126513  
**SURVEY DATE:** 23 October 1960  
**NAVIGATIONAL CONTROL:** Aircraft radar  
**MILES SURVEYED:** 8000 square miles  
**TRACK PATTERN:** Triangular search patterns  
**ALTITUDE:** 13,000 feet  
**DATA FORMAT:** Inclination contour chart.

## 18. SURVEY OF VITI LEVU, FIJI ISLANDS



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATE:** November 1964

**NAVIGATIONAL CONTROL:** Radar and visual

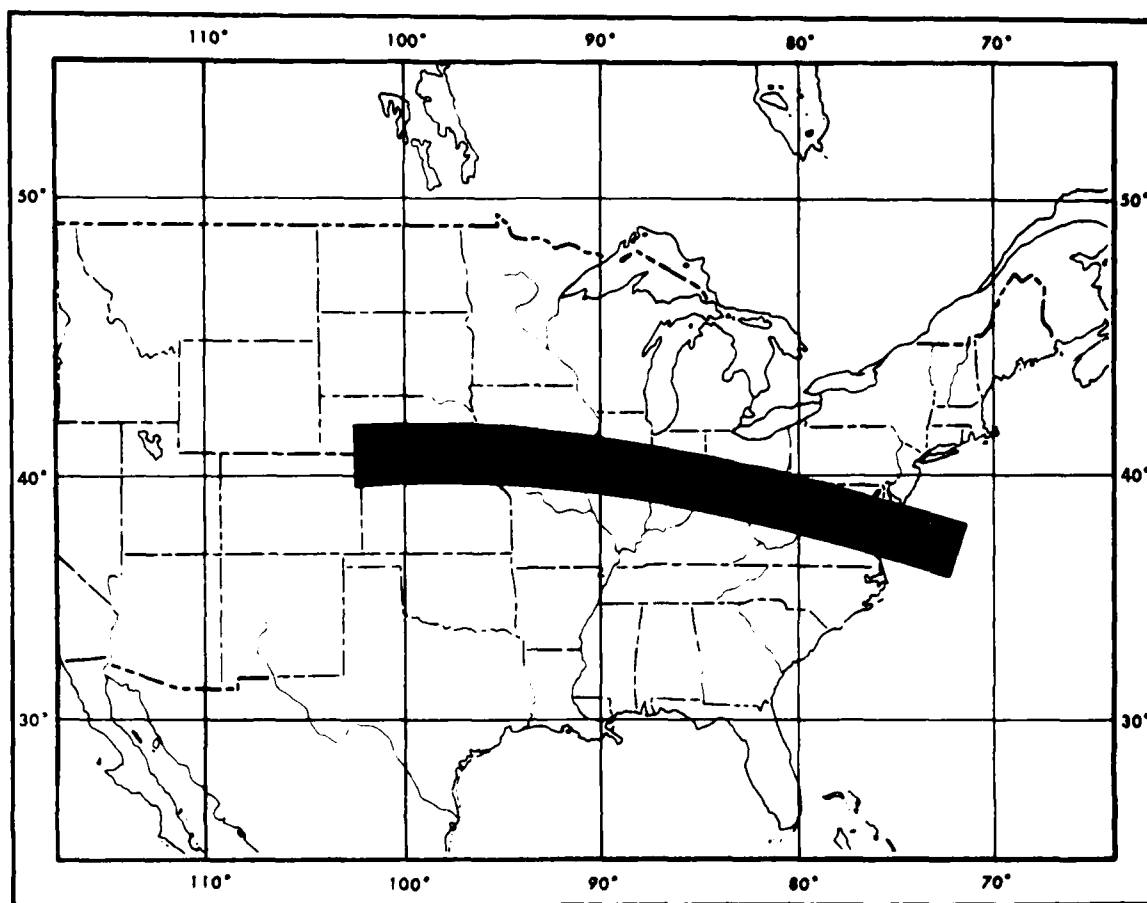
**MILES SURVEYED:** 5000 square miles

**TRACK PATTERN:** E-W track orientation; 7 mile track spacing

**ALTITUDE:** 6500 feet

**DATA FORMAT:** Total magnetic intensity contour chart.

19. A 100 MILE WIDE CRUSTAL SURVEY ACROSS THE UNITED STATES (EAST OF 103°W)



**AIRCRAFT:** NC-54R BUNO 90396, NC-121K BUNO 145925

**SURVEY DATES:** August 1962 - June 1964

**NAVIGATIONAL CONTROL:** Radar, visual

**MILES SURVEYED:** 140,000 square miles

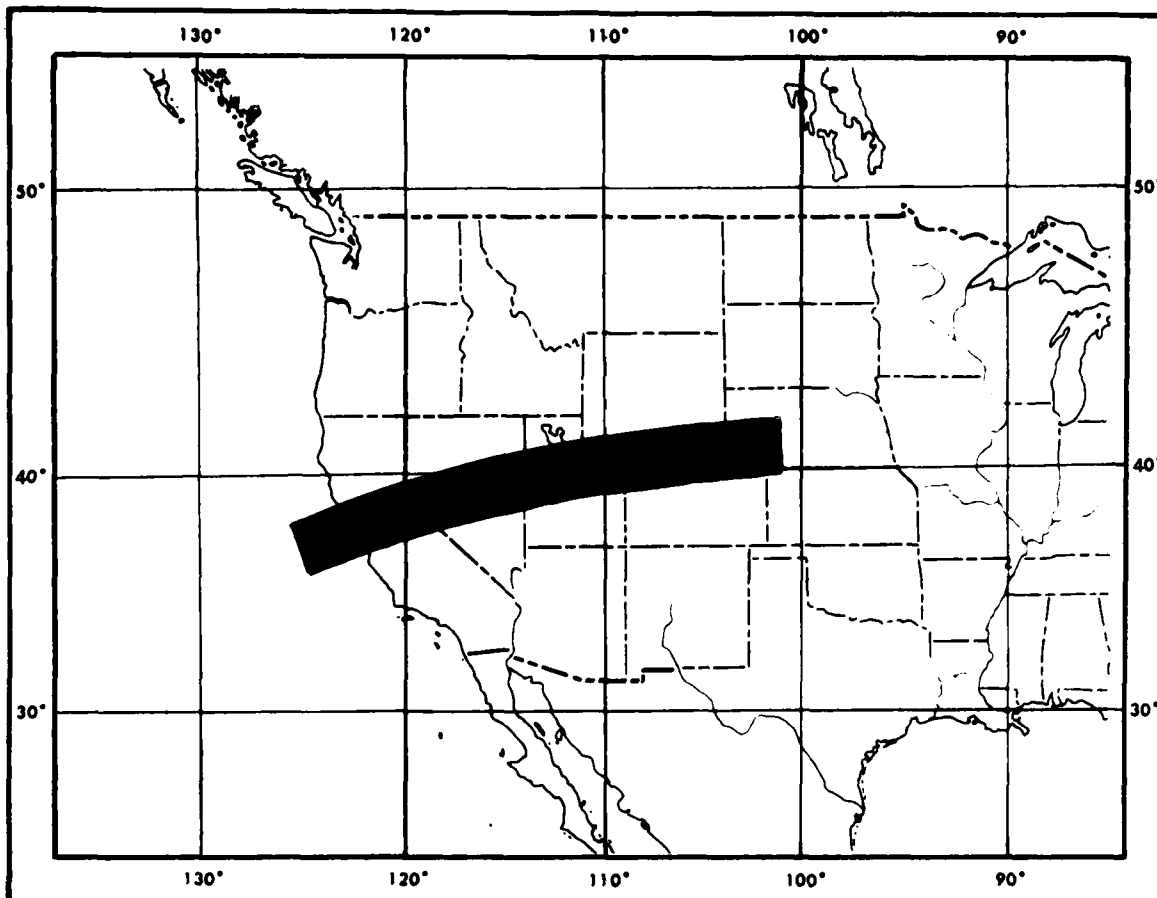
**TRACK PATTERN:** 5 mile spacing, E-W track orientation

**ALTITUDE:** 6000 feet

**DATA FORMAT:** Residual total intensity charts and nested profiles.

**REPORTS:** 1) "Crustal Study of a Continental Strip from the Atlantic Ocean to the Rocky Mountains," Geological Society of America Bulletin, V. 77, p. 1427-1448, December 1966. 2) "Transcontinental Geophysical Survey (35° - 39°N)," Miscellaneous Geologic Investigations Maps I-531-A; I-532-A; I-533-A; I-534-A; I-535-A; I-536. Published by the U.S. Geological Survey, Washington, D.C. 20390, 1968.

**20. A 100 MILE WIDE CRUSTAL SURVEY ACROSS THE UNITED STATES (WEST OF 102°E)**



**AIRCRAFT:** NC-54R BUNO 90396 and NC-121K BUNO 145925

**SURVEY DATES:** August 1962 - February 1965

**NAVIGATIONAL CONTROL:** Radar, visual

**MILES SURVEYED:** 100,000 square miles

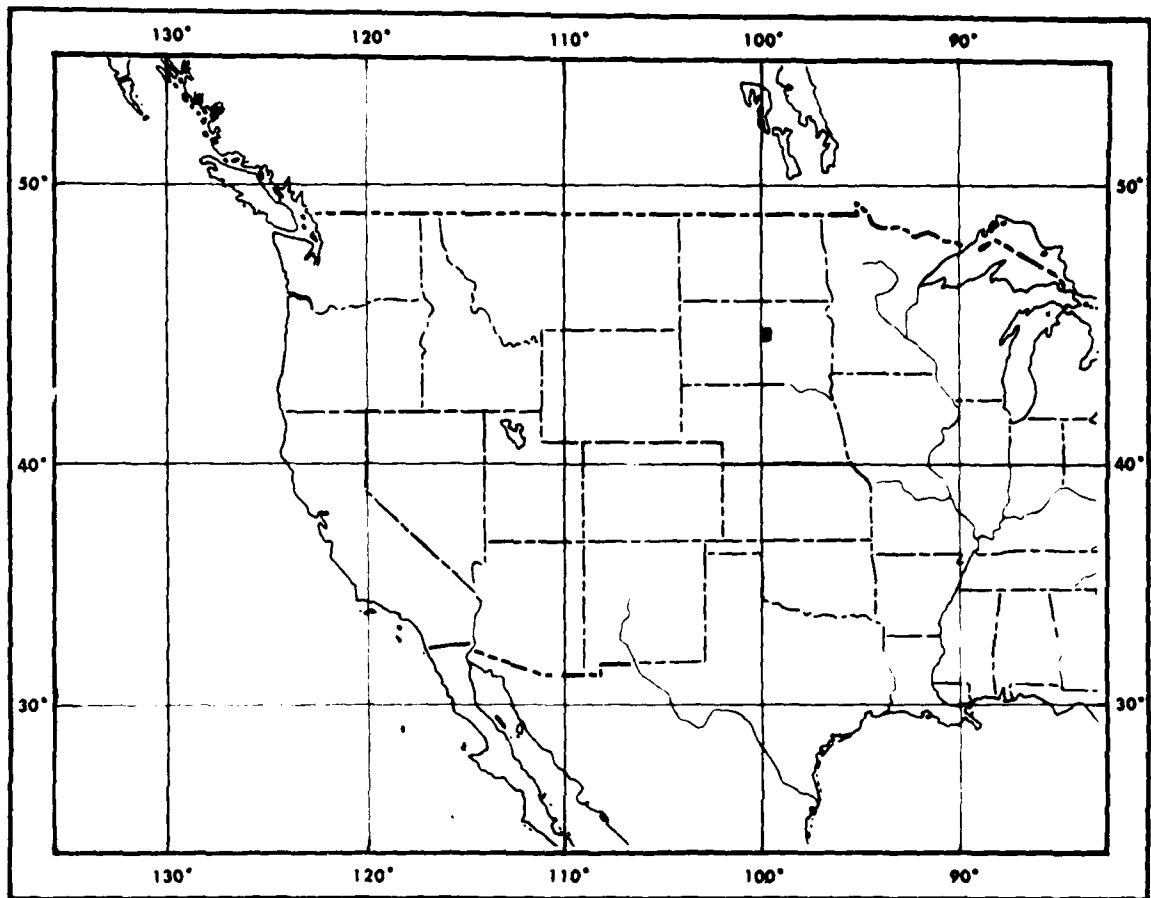
**TRACK PATTERN:** 5 mile spacing, E-W track orientation

**ALTITUDE:** 16,000 feet 103°W to San Francisco, 6000 feet over Pacific Ocean and Coastal Range.

**DATA FORMAT:** Contour chart.

**REPORTS:** 1) "Transcontinental Geophysical Survey (35° - 39°N)" Miscellaneous Geologic Investigations Maps I-531-A; I-532-A; I-533-A; I-534-A; I-535-A; I-536. Published by the U.S. Geological Survey, Washington, D.C. 20390, 1968. 2) "Aeromagnetic Investigation of Crustal Structure for a Strip Across the Western United States," Geological Society of America Bulletin, Vol. 80, September 1969.

## 21. CENTRAL SOUTH DAKOTA SURVEY



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATE:** December 1964

**NAVIGATIONAL CONTROL:** Ground radar

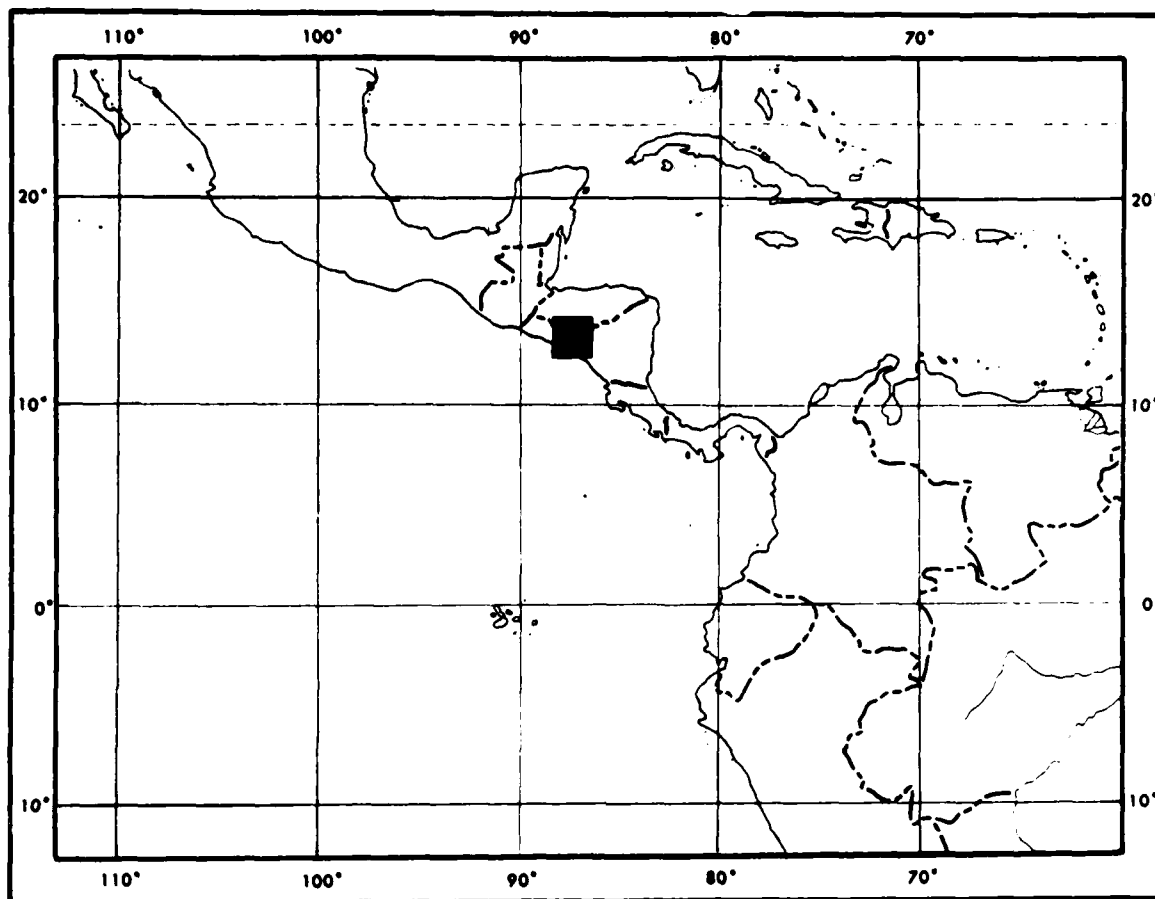
**MILES SURVEYED:** 1500 square miles

**TRACK PATTERN:** 2-mile track spacing, E-W track orientation

**ALTITUDE:** 500 feet above terrain and 1700 feet above terrain.

**DATA FORMAT:** Total magnetic intensity contour chart at 500 feet.

## 22. GULF OF FONSECA SURVEY



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATE:** October 1964

**NAVIGATIONAL CONTROL:** Aircraft radar, visual

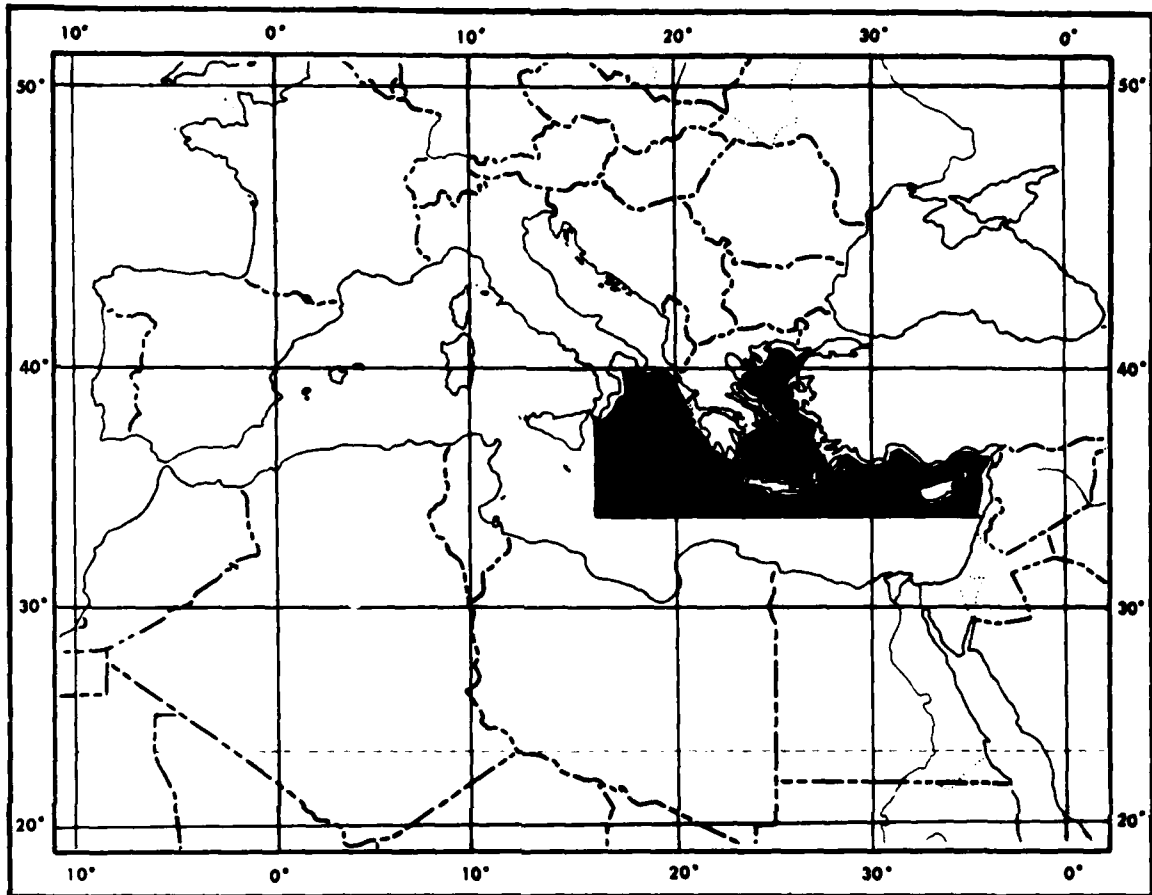
**MILES SURVEYED:** 24,000 square miles

**TRACK PATTERN:** 8-mile track spacing, E-W orientation

**ALTITUDE:** 7200 feet south of 13°30'N, 9300 feet north of 13°30'N.

**DATA FORMAT:** Total magnetic intensity contour chart.

## 23. EASTERN MEDITERRANEAN SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** July - September 1957

**NAVIGATIONAL CONTROL:** Aircraft radar, Doppler radar, visual

**MILES SURVEYED:** 190,000 square miles

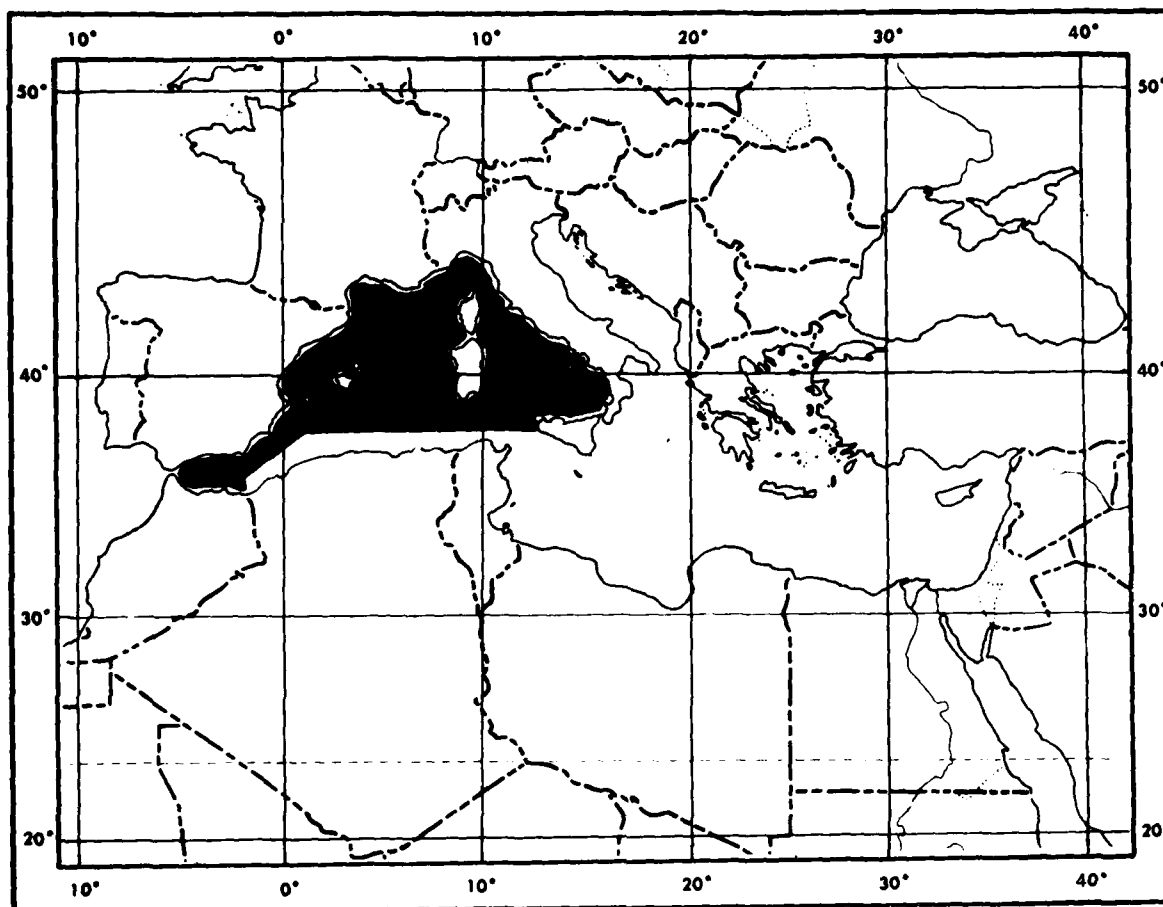
**TRACK PATTERN:** 10-mile spacing, N-S track orientation with 3 E-W cross tracks

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total magnetic intensity contour charts. Copies of the total magnetic intensity analog traces for the combined Eastern and Western Mediterranean Sea surveys are available on microfilm (See Section III-C).

**REPORTS:** "An Aeromagnetic Survey of the Eastern Mediterranean Sea and its Interpretation," Earth and Planetary Science Letters, V. 5, pp. 439-448, 1969.

## 24. WESTERN MEDITERRANEAN SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** February - April 1958

**NAVIGATIONAL CONTROL:** Aircraft radar, Doppler radar, visual

**MILES SURVEYED:** 190,000 square miles

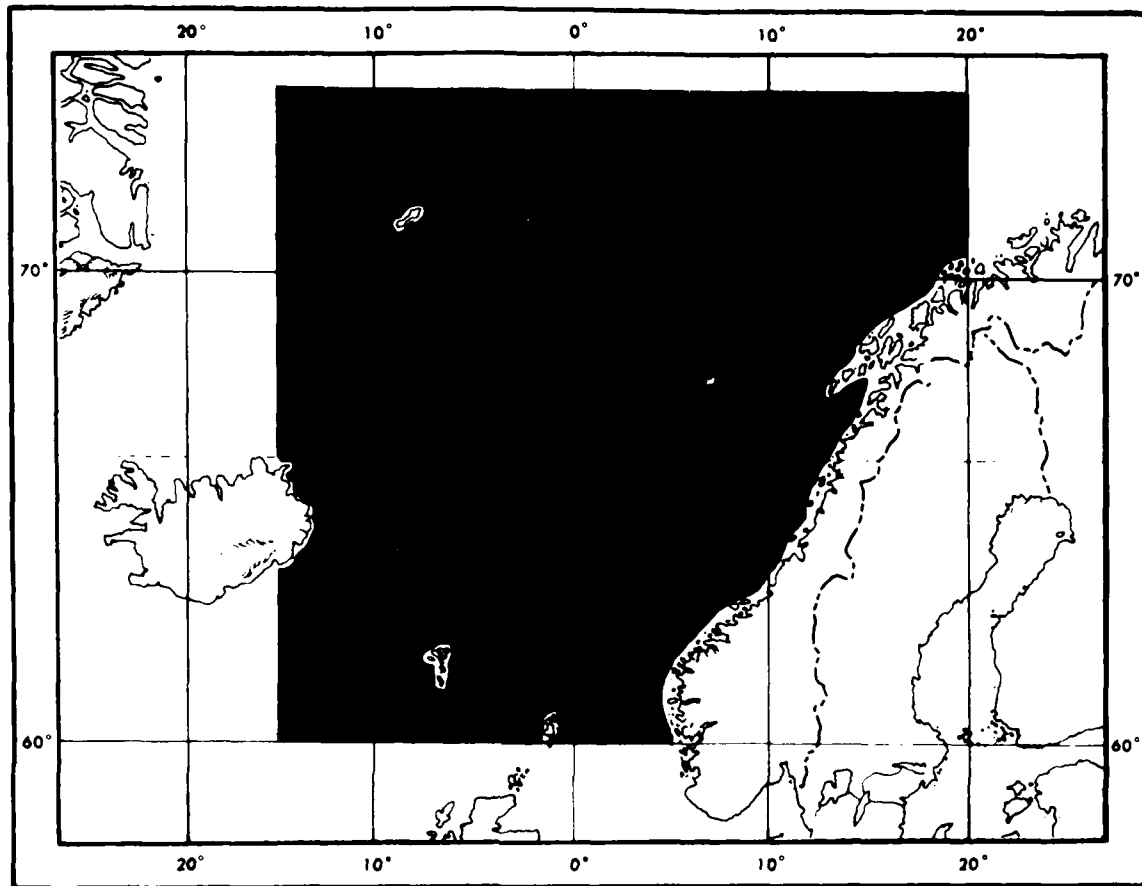
**TRACK PATTERN:** 10-mile spacing, E-W track orientation primarily with 5 N-S cross tracks

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the combined Eastern and Western Mediterranean Sea surveys are available on microfilm (See Section III-C).

**REPORTS:** "Hypothesis on the Origin of the Mediterranean Basin: Magnetic Data," J. Geophys. Res., V. 76, No. 14, p. 3207-3228, 1971.

## 25. NORWEGIAN SEA SURVEY



**AIRCRAFT:** NC-54R BUNO 90396, WV-2 BUNO 126513

**SURVEY DATES:** July 1958 - June 1959

**NAVIGATIONAL CONTROL:** Radar, Doppler radar, visual, Loran-A south of 62°

**MILES SURVEYED:** 660,000 square miles

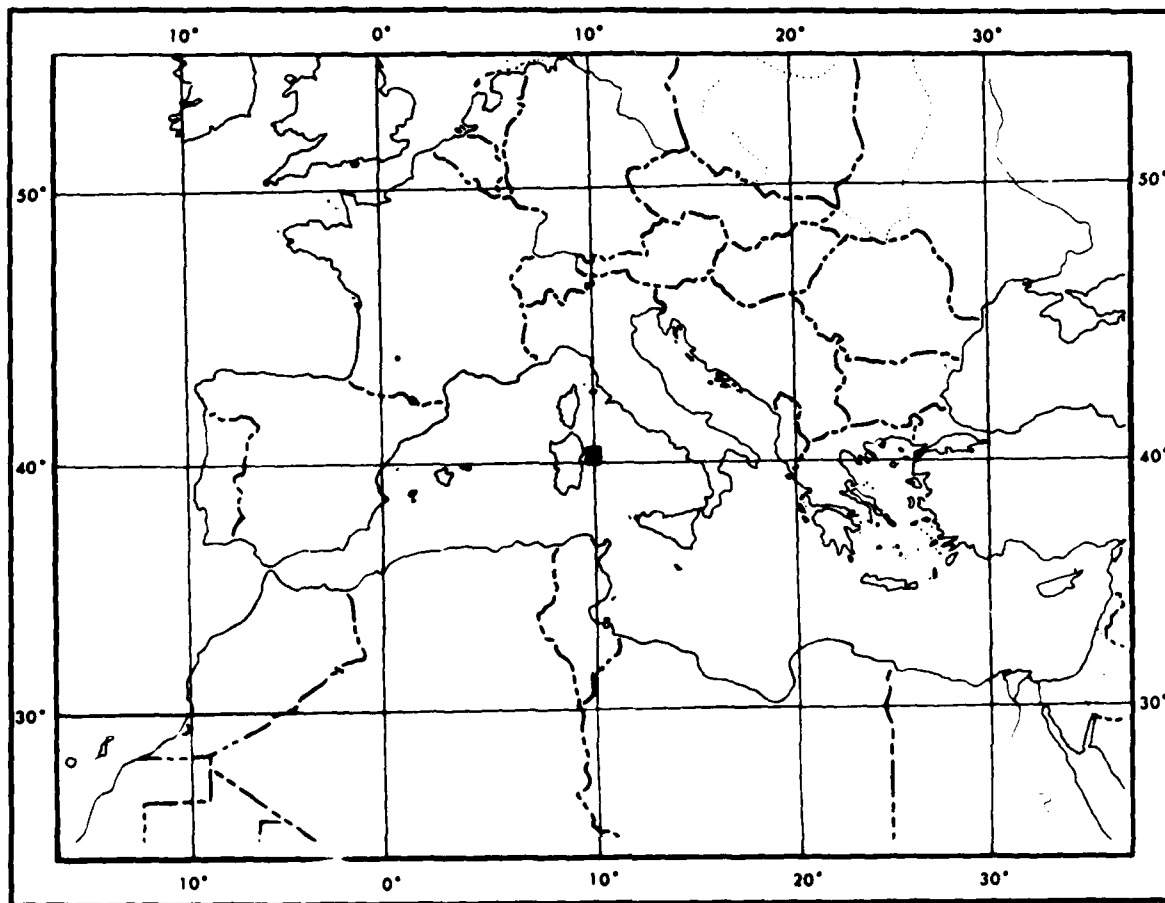
**TRACK PATTERN:** 10-mile spacing, primarily E-W track orientation.

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the Norwegian Sea survey are available on microfilm (See Section III-C).

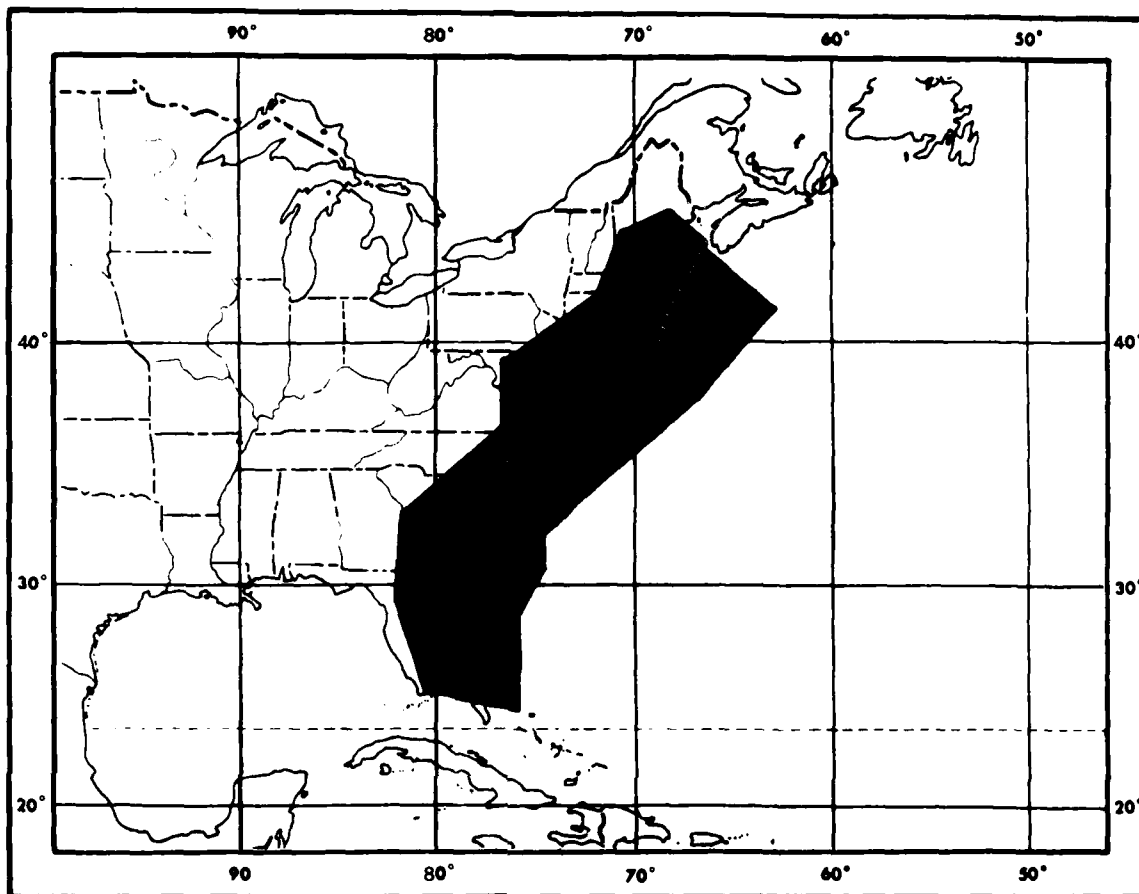
**REPORTS:** "Aeromagnetic Survey of the Norwegian Sea," J. Geophys. Res., V. 73, No. 14, pp. 4583-4600, 1968.

**26. A SURVEY IN THE WESTERN TYRRHENIAN SEA**



**AIRCRAFT:** NC-54R BUNO 90396  
**SURVEY DATE:** September 1957  
**NAVIGATIONAL CONTROL:** Radar, Doppler radar  
**MILES SURVEYED:** 900 square miles  
**TRACK PATTERN:** 3-mile spacing, E-W, N-S grid  
**ALTITUDE:** 1000 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.

## 27. UNITED STATES ATLANTIC COASTAL REGION SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** 27 May 1964 - 30 Oct 1966

**NAVIGATIONAL CONTROL:** Loran-A, aircraft radar, Doppler radar, and visual

**MILES SURVEYED:** 450,000 square miles

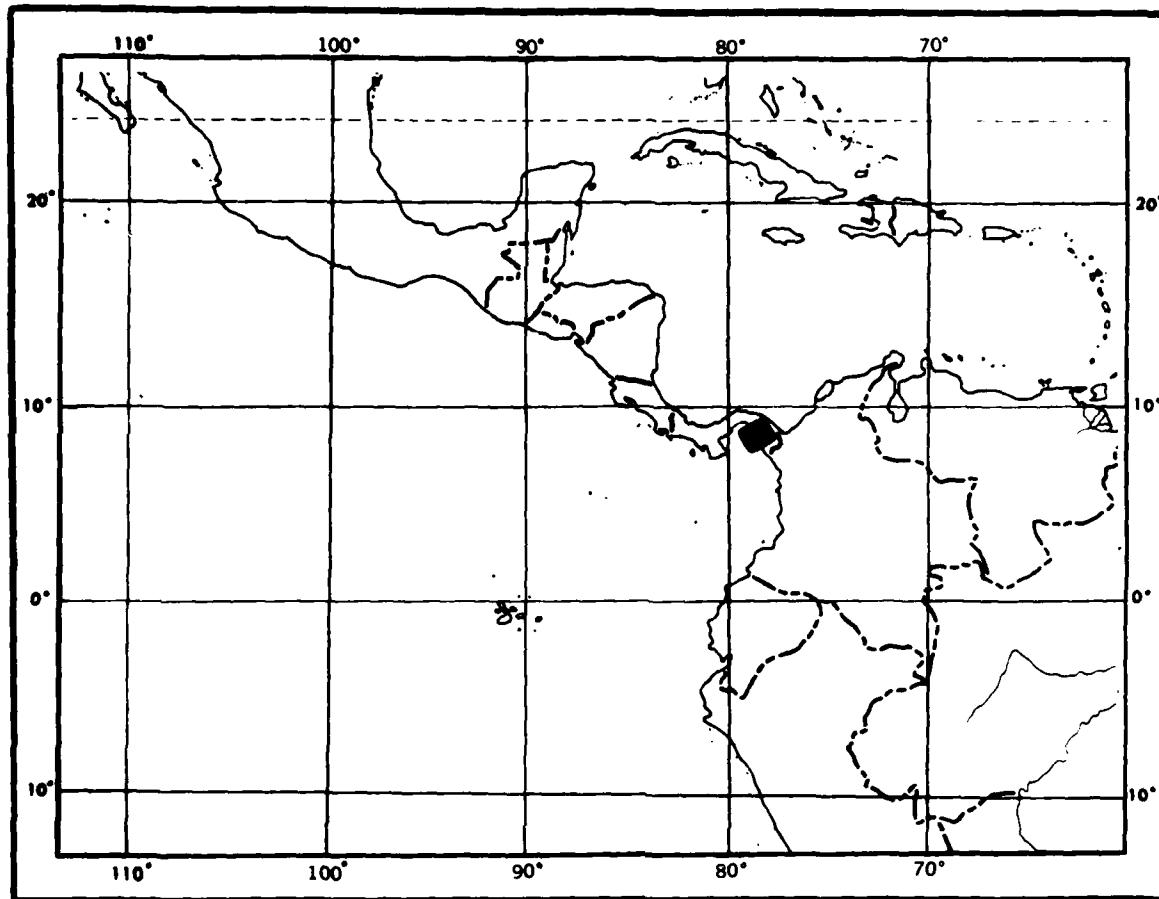
**TRACK PATTERN:** 5-mile spacing, NW-SE orientation, cross tracks.

**ALTITUDE:** 500 feet over the ocean, 2500 feet over land north of the Potomac River, and 1500 feet over land south of the Potomac River.

**DATA FORMAT:** Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the Atlantic Coastal Region survey are available on microfilm (See Section III-C).

**REPORTS:** 1) "Geological Implications of Aeromagnetic Data for the Eastern Continental Margin of the United States," Geophysics, V. 33, No. 5, Oct. 1968.

## 28. GULF OF SAN MIGUEL SURVEY



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATE:** January 1966

**NAVIGATIONAL CONTROL:** Visual, aircraft radar

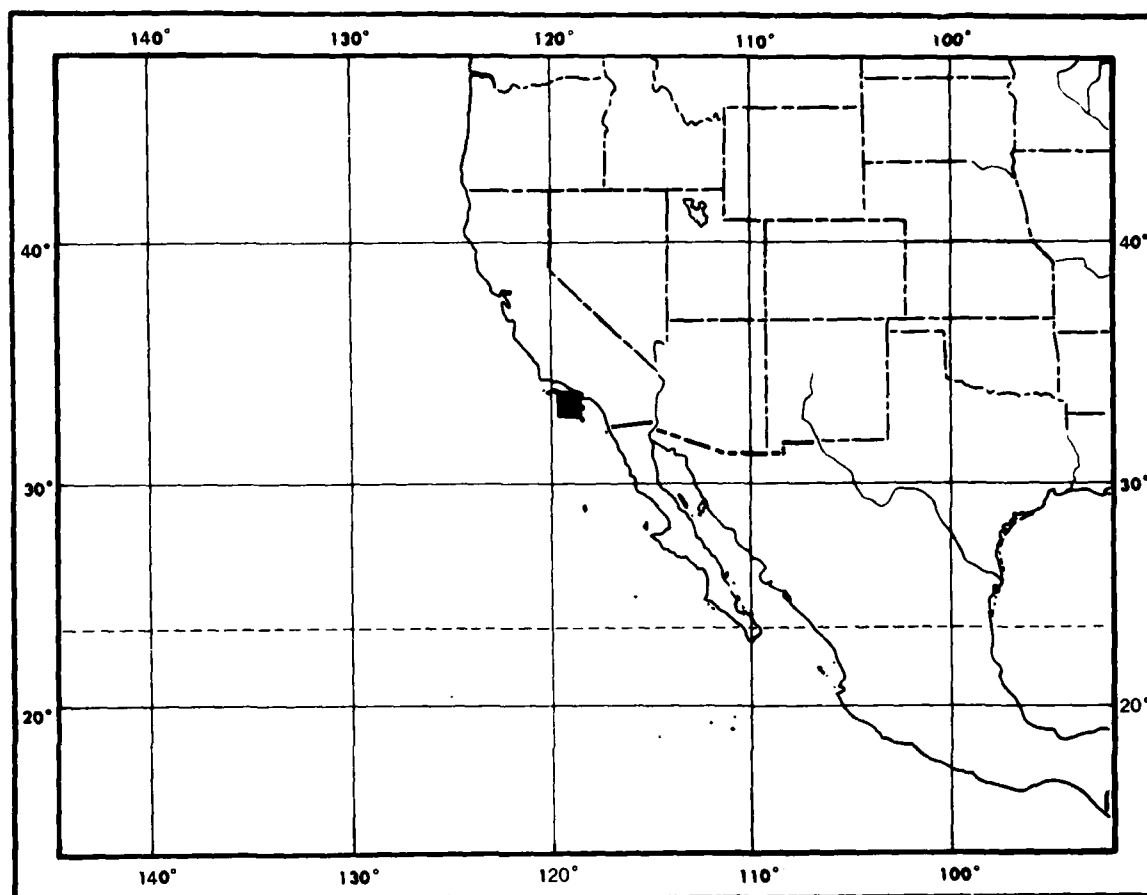
**MILES SURVEYED:** 4800 square miles at 5000 feet; 900 square miles at 10,000 feet

**TRACK PATTERN:** 3 mile track spacing, NE-SW track orientation

**ALTITUDE:** 5000 feet and repeated at 10,000 feet

**DATA FORMAT:** Total magnetic intensity contour chart for 5000 foot portion. Copies of the total magnetic intensity analog traces for the Gulf of San Miguel Survey are available on microfilm (Tracks 915, 916 and 917, Reel No. 36. See Section III-C).

## 29. SURVEY OF AN AREA OFF SOUTHERN CALIFORNIA



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** July 1961

**NAVIGATIONAL CONTROL:** Visual, aircraft radar

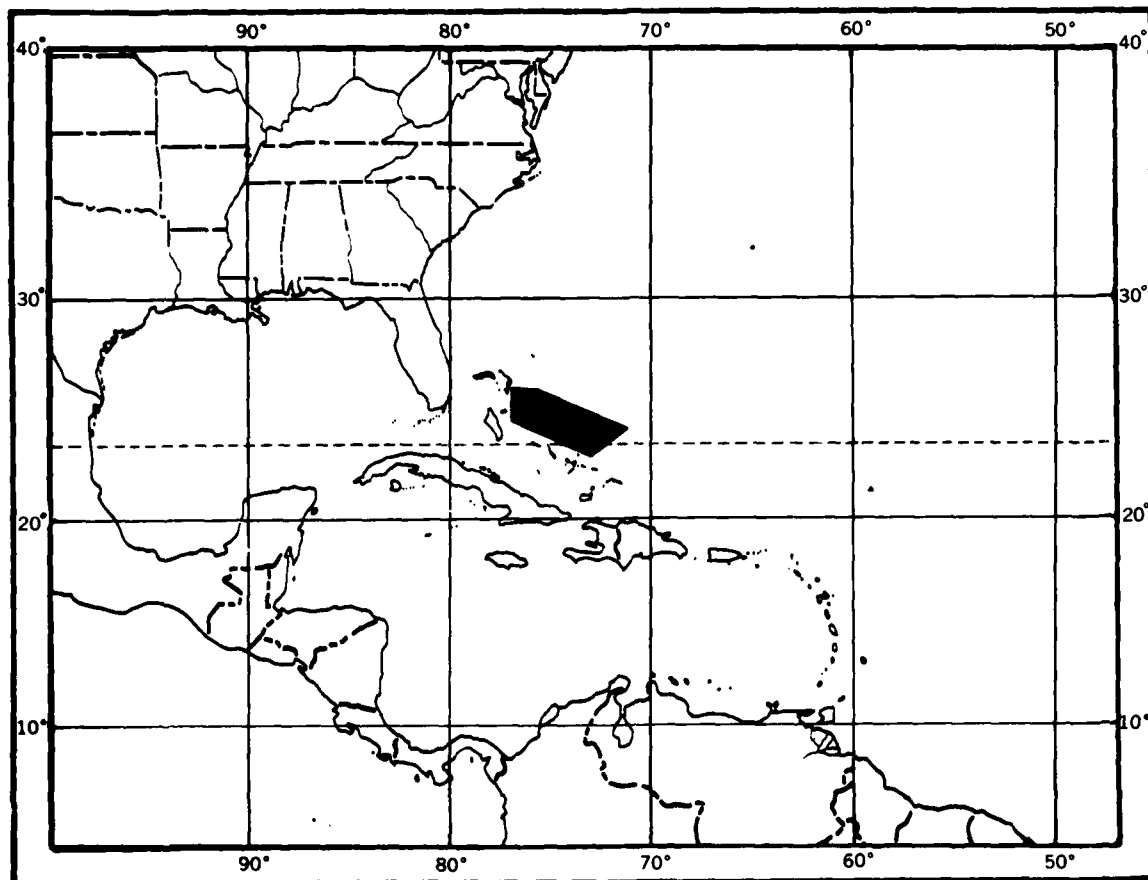
**MILES SURVEYED:** 4400 square miles

**TRACK PATTERN:** 2 mile track spacing, N-S track orientation

**ALTITUDE:** 500 feet

**DATA FORMAT:** Total magnetic intensity contour charts.

### 30. EAST COAST EXTENSION SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATE:** August 1966

**NAVIGATIONAL CONTROL:** Loran-A

**MILES SURVEYED:** 47,700 square miles

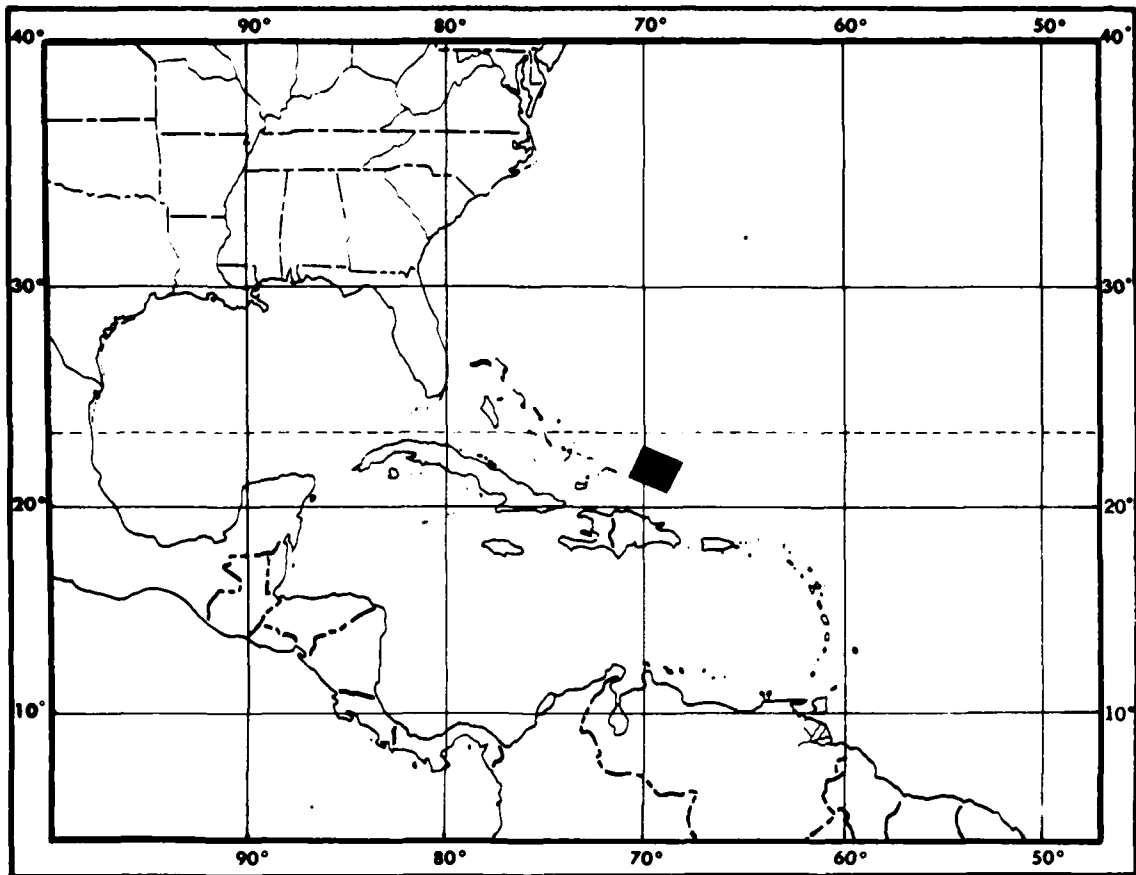
**TRACK PATTERN:** 5-mile spacing, NW-SE track orientation

**ALTITUDE:** 500 feet

**DATA FORMAT:** Total magnetic intensity contour chart

**REPORT:** These data combined with data from surveys on pages II-A-3, II-B-7, II-B-11, II-B-20, and II-A-31 are reported in "Structural Implications of Magnetic Anomalies North of the Bahama-Antilles Islands," *GEOPHYSICS*, V. 33, No. 6, pp. 950-961.

### 31. BAHAMA HOLIDAY SURVEY



**AIRCRAFT:** NC-121 BUNO 145925

**SURVEY DATE:** June 1967

**NAVIGATIONAL CONTROL:** Loran-A

**MILES SURVEYED:** 19,000 square miles

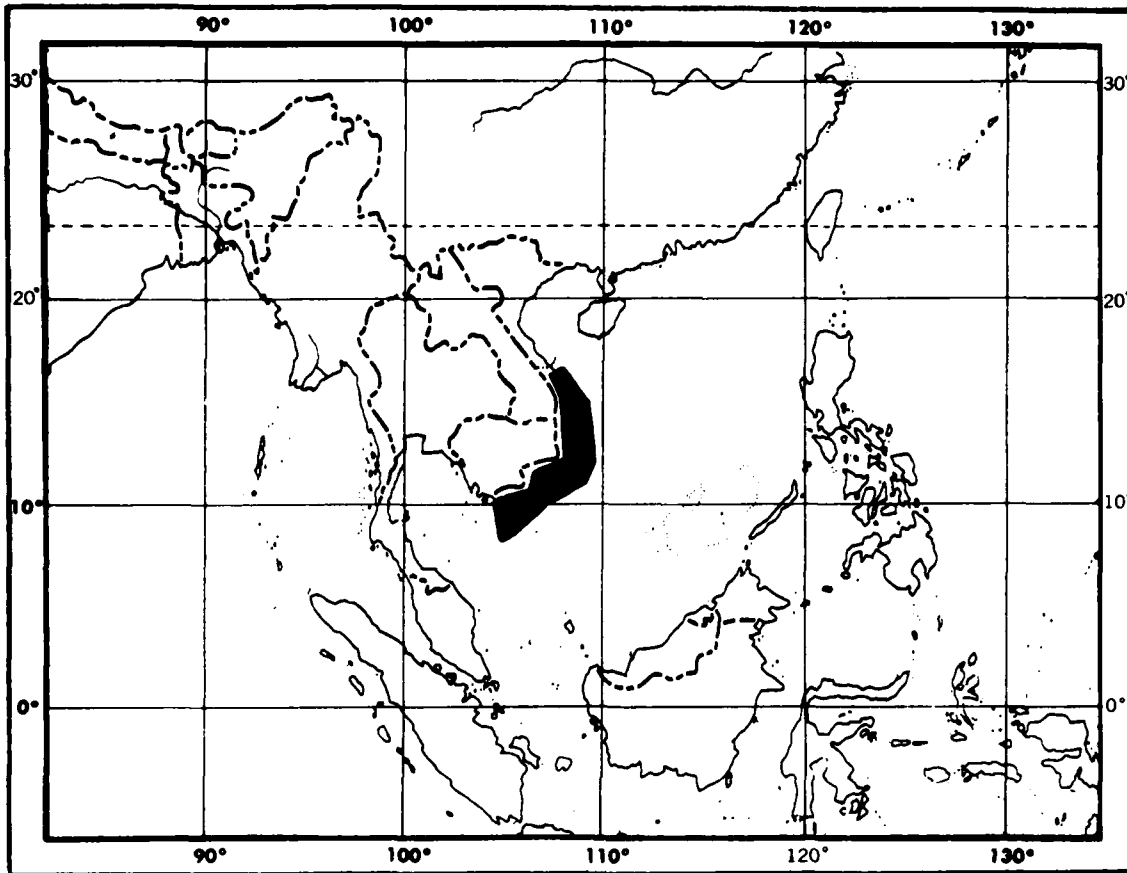
**TRACK PATTERN:** 5-mile spacing, NE-SW track orientation

**ALTITUDE:** 600 feet

**DATA FORMAT:** Total magnetic intensity contour chart

**REPORT:** These data combined with data from surveys on pages II-A-3, II-B-7, II-B-18, II-B-20, and II-A-30 are reported in "Structural Implications of Magnetic Anomalies North of the Bahama-Antilles Islands," GEOPHYSICS, V. 33, No. 6, pp. 950-961.1

## 32. SOUTH VIETNAM SURVEYS



**AIRCRAFT:** NC-121K BUNO 145925

**SURVEY DATES:** August - October 1967

**NAVIGATIONAL CONTROL:** Ground control radar (GCI)

**MILES SURVEYED:** 71,600 square miles

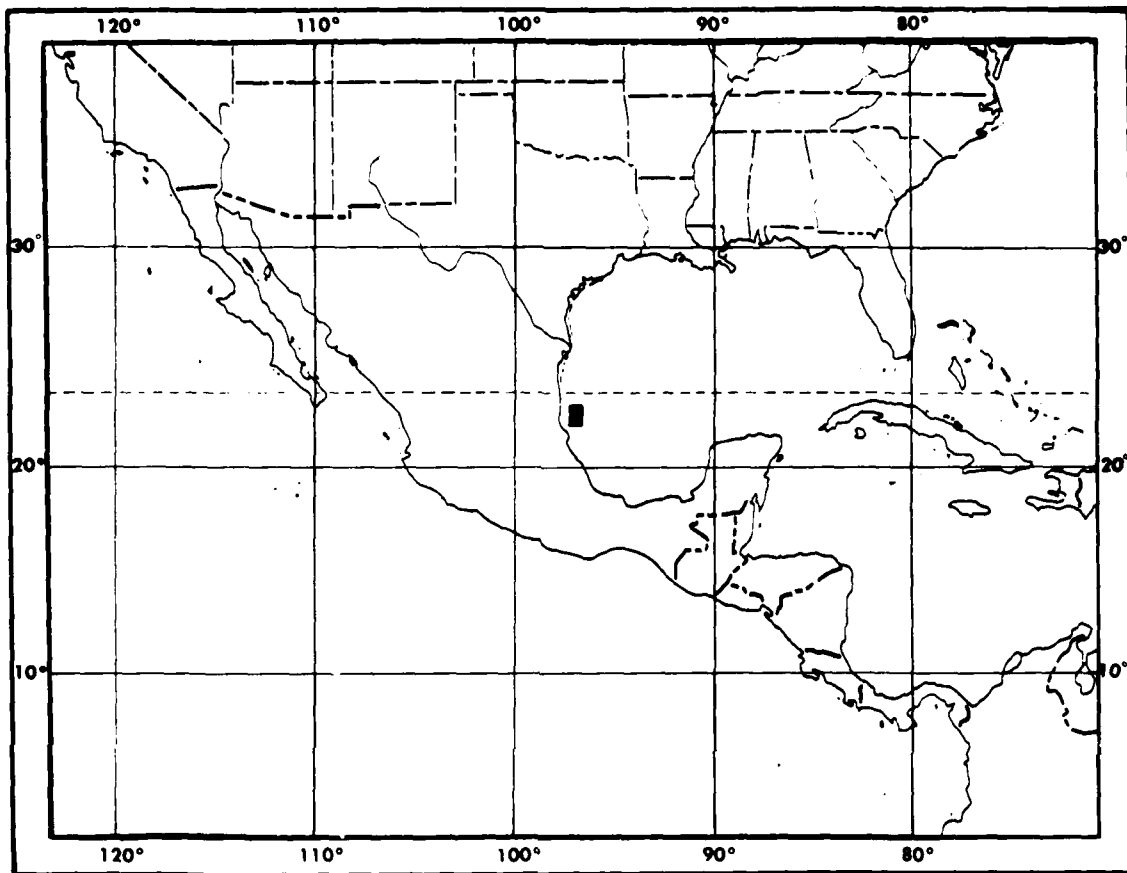
**TRACK PATTERN:** 5-mile track spacing; south of latitude 12°N, NW-SE track orientation; north of latitude, 12°N, E-W track orientation.

**ALTITUDE:** South of latitude 12°N, 6,500 feet; north of latitude 12°N, 10,500 feet.

**DATA FORMAT:** Total magnetic intensity contour chart

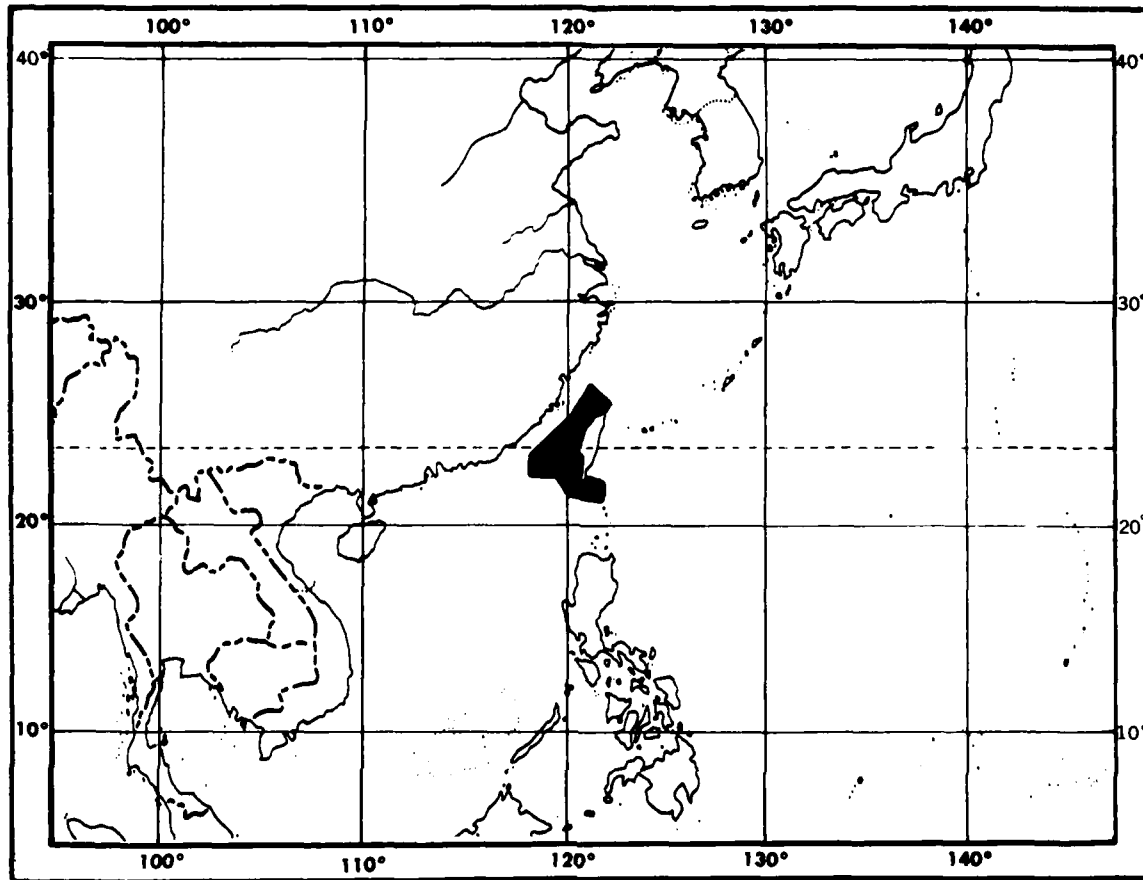
**REPORT:** "Interpretation of the Aeromagnetic Map Covering the Mekong Delta," United Nations ECAFE-CCOP Tech. Bul., V. 4, p. 93-102, 1971.

### 33. TAMPICAO BANK SURVEY



**AIRCRAFT:** NC-121K BUNO 145925  
**SURVEY DATE:** 26 Feb 1967  
**NAVIGATIONAL CONTROL:** Visual, radar fixes, and dead reckoning using doppler navigator  
**MILES SURVEYED:** 5,500 square miles  
**TRACK PATTERN:** 4-mile spacing, NW-SE track orientation  
**ALTITUDE:** 1,000 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.  
**REPORT:** IR No. 67-89, "Aeromagnetic Survey of Tampico Bank"

### 34. FORMOSA STRAIT SURVEYS



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** April - June 1968

**NAVIGATIONAL CONTROL:** Celestial, visual, Tacan, Loran-A

**MILES SURVEYED:** 25,000 square miles

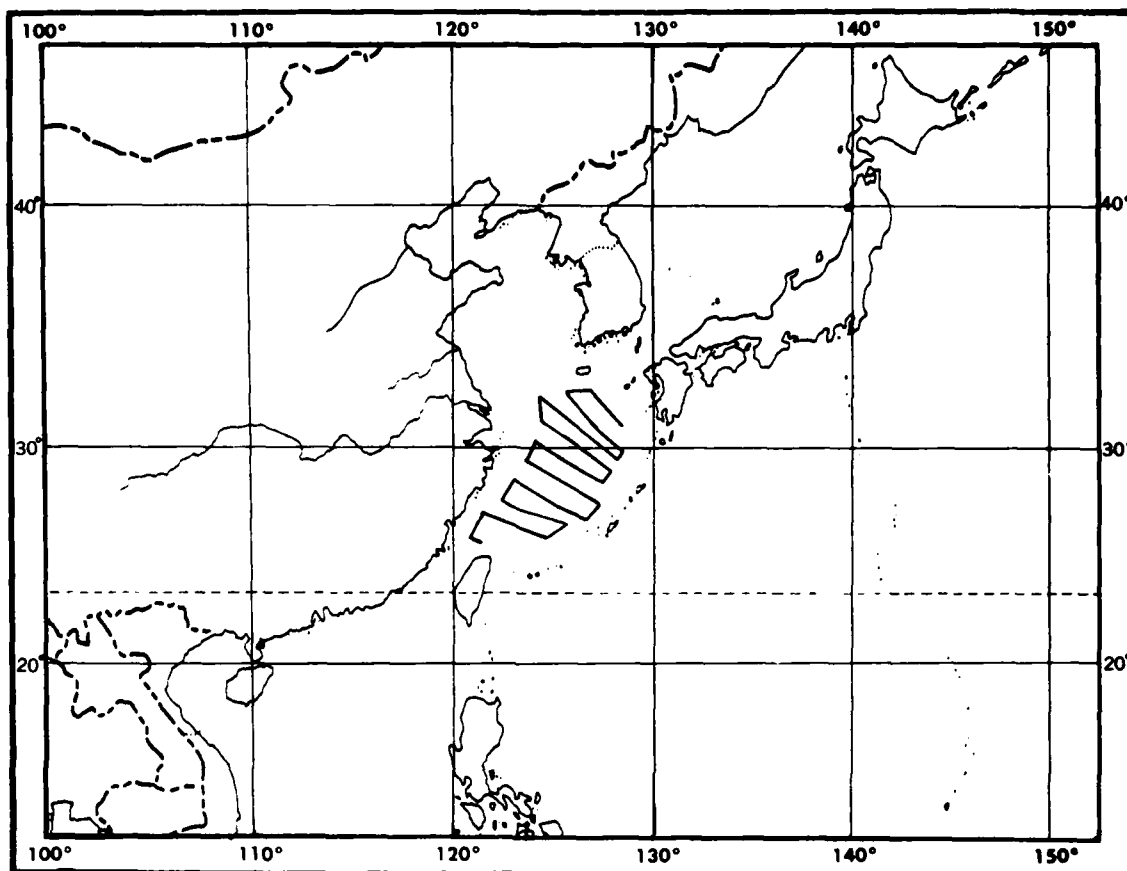
**TRACK PATTERN:** 4-mile spacing; NW-SE track orientation

**ALTITUDE:** 500 feet

**DATA FORMAT:** Total magnetic intensity contour charts.

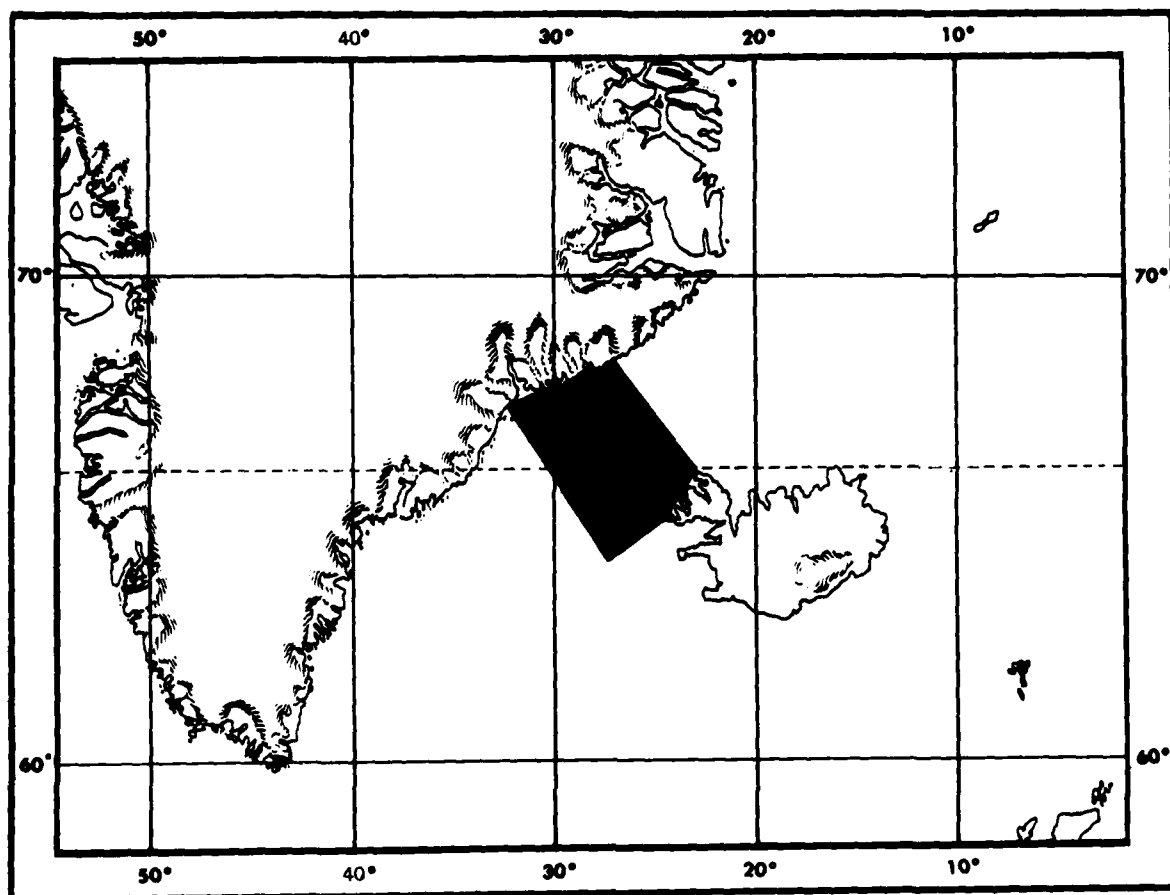
**REPORTS:** "Aeromagnetic Survey of Offshore Taiwan," United Nations ECAFE-CCOP Tech. Bul., V. 3, p. 1-34, 1970.

### 35. EAST CHINA SEA SURVEY



**AIRCRAFT:** NC-54R BUNO 90396  
**SURVEY DATA:** June 1968  
**NAVIGATIONAL CONTROL:** Celestial, Tacan, Loran-A  
**MILES SURVEYED:** 2,500 line miles  
**TRACK PATTERN:** 50-mile spacing; NW-SE track orientation  
**ALTITUDE:** 500 feet  
**DATA FORMAT:** Residual profiles.  
**REPORT:** "Geologic Structure and Some Water Characteristics of the East China Sea and Yellow Sea," United Nations ECAFE-CCOP Tech. Bul., V. 2, p. 3-44, 1969.

## 36. DENMARK STRAIT SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** August - September 1968

**NAVIGATIONAL CONTROL:** Loran-A, Aircraft radar, Doppler radar, visual

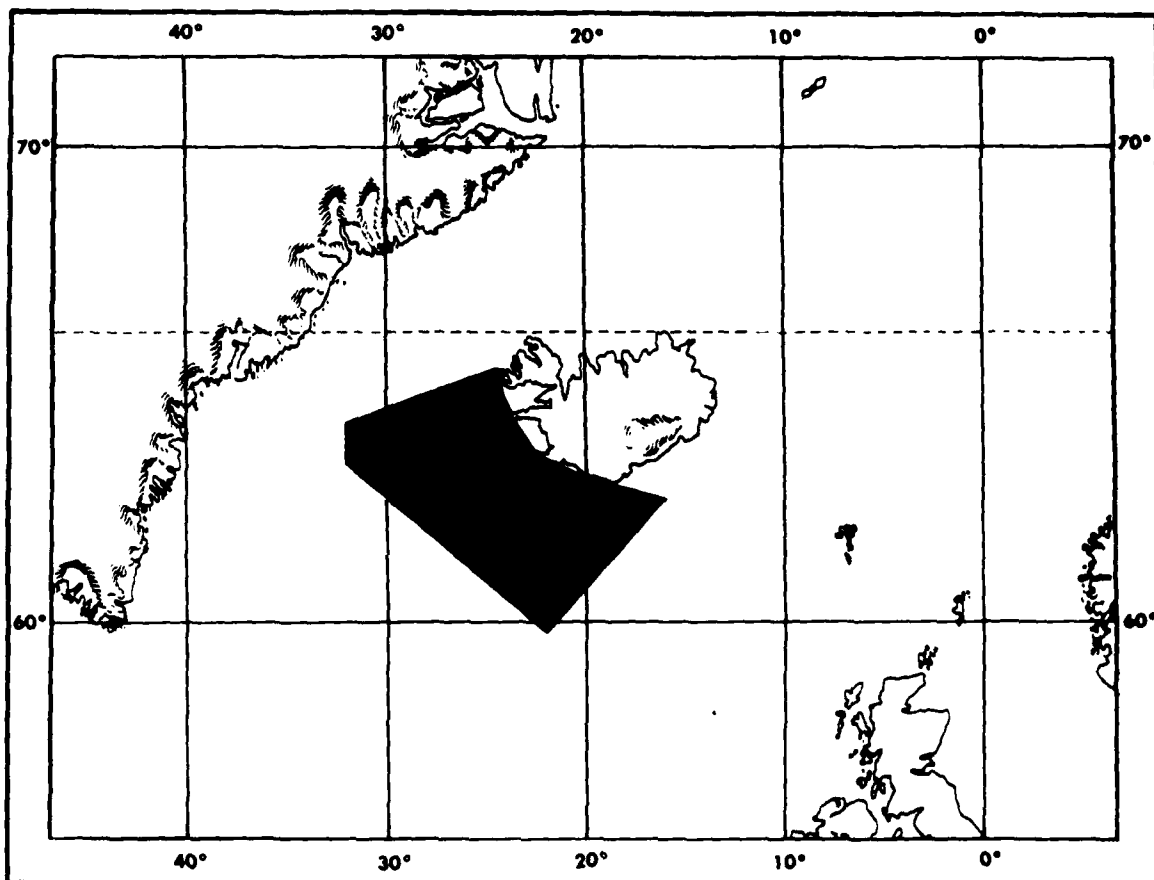
**MILES SURVEYED:** 30,000 square miles

**TRACK PATTERN:** 5 mile spacing, NW-SE orientation, cross tracks

**ALTITUDE:** 600 feet

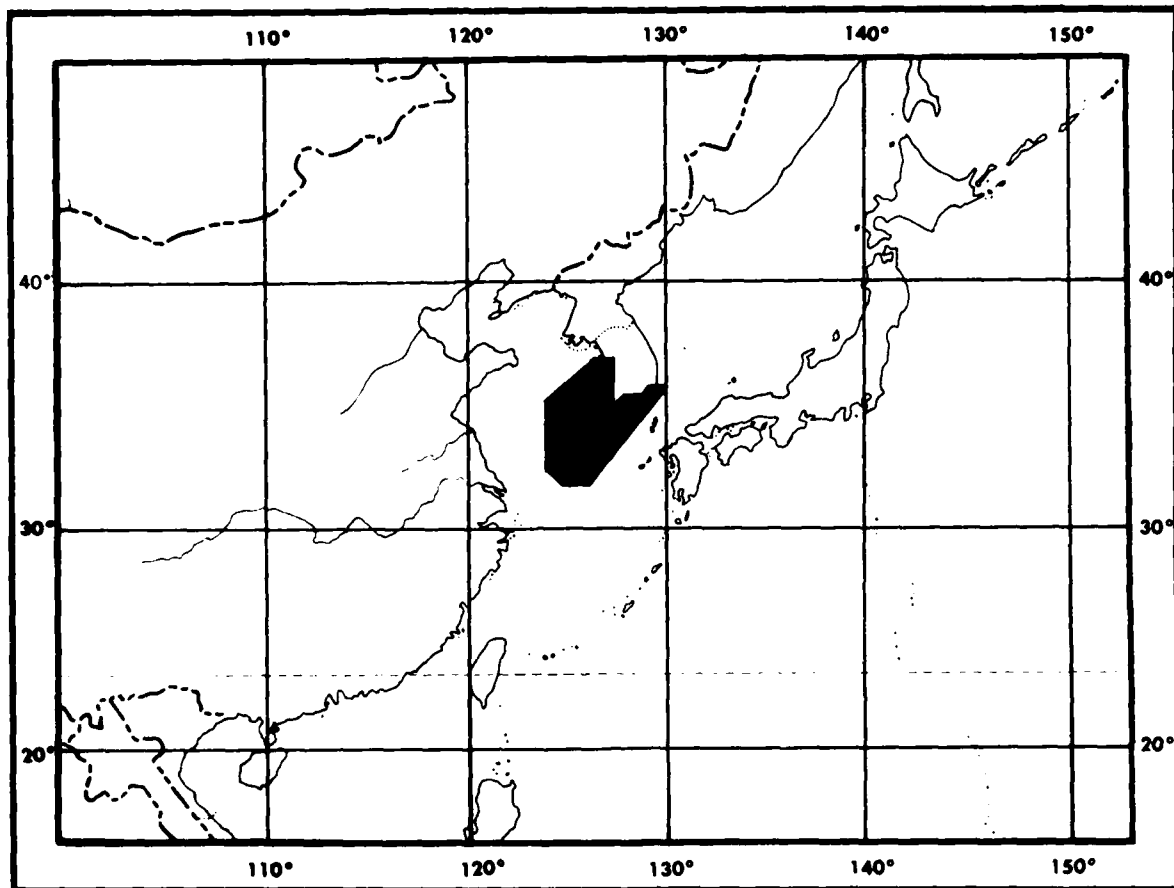
**DATA FORMAT:** Total magnetic intensity contour chart.

### 37. UPPER REYKJANES RIDGE SURVEY



**AIRCRAFT:** NC-54 BUNO 90396  
**SURVEY DATES:** September - October 1968  
**NAVIGATIONAL CONTROL:** Loran-A, Aircraft radar, Doppler radar, visual  
**MILES SURVEYED:** 60,000 square miles  
**TRACK PATTERN:** 5-15 miles flying Loran-A station 1L4 rate, generally NW-SE orientation, cross tracks  
**ALTITUDE:** 600 feet  
**DATA FORMAT:** Total magnetic intensity contour chart.

### 38. KOREAN CONTINENTAL SHELF SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** February - March 1969

**NAVIGATIONAL CONTROL:** Loran-A, aircraft radar, Doppler radar, and visual fix

**MILES SURVEYED:** 47,150 square miles

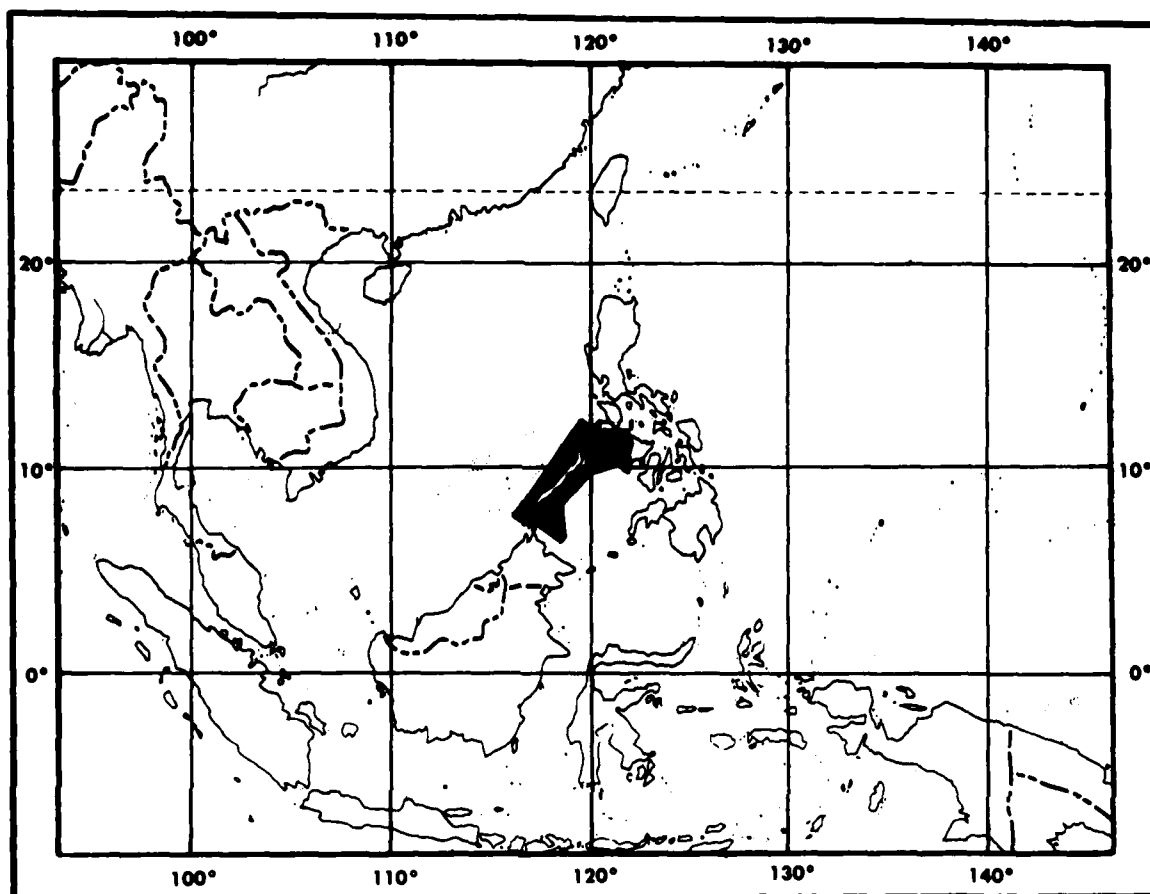
**TRACK PATTERN:** 4-mile spacing, E-W orientation, cross tracks

**ALTITUDE:** 600 feet over the ocean, 3500 feet over adjacent coastal areas,  
7200 feet over Cheju-Do

**DATA FORMAT:** Total magnetic intensity contour charts

**REPORTS:** "Aeromagnetic Survey of Offshore Areas Adjoining the Korean Peninsula," United Nations ECAFE-CCOP Tech. Bul., V. 4, p. 1-22, 1971.

### 39. PALAWAN ISLAND CONTINENTAL SHELF SURVEY



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** June 1969

**NAVIGATIONAL CONTROL:** Loran-A, aircraft radar, Doppler radar, and visual

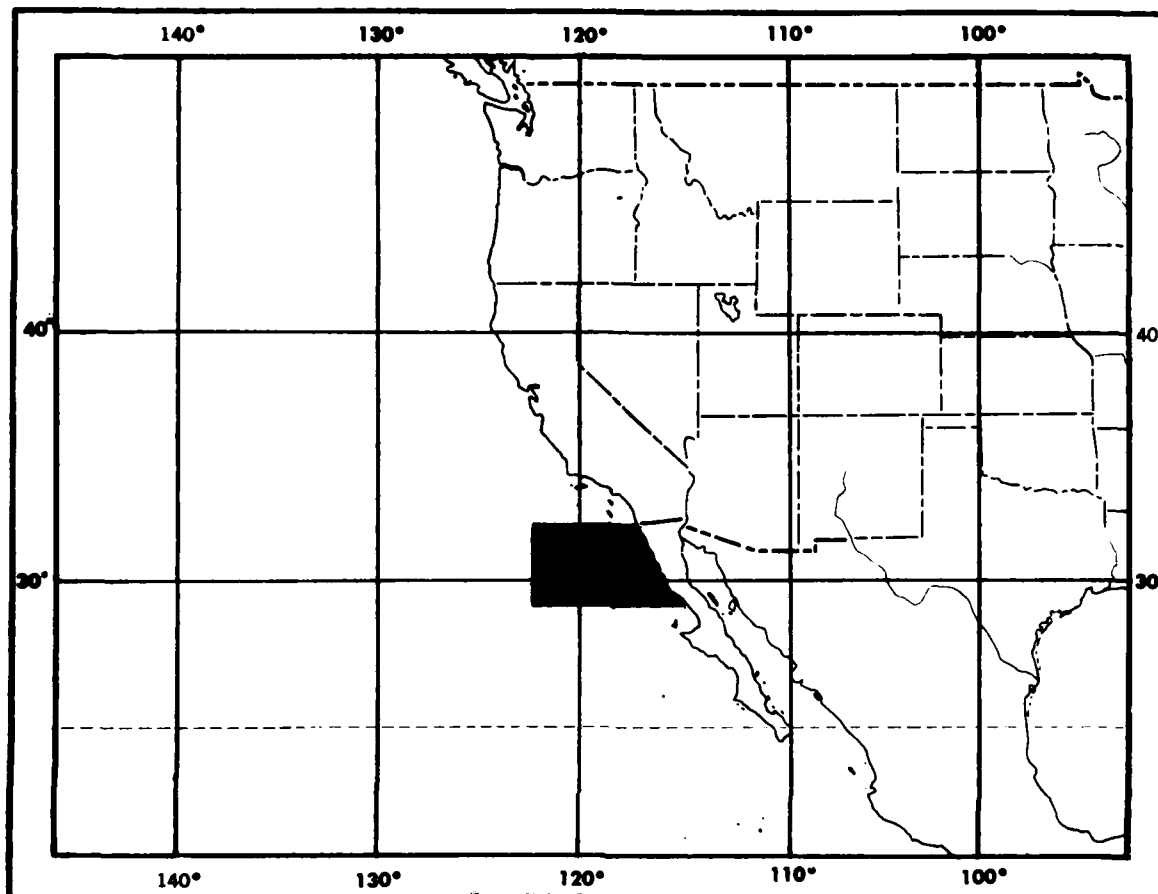
**MILES SURVEYED:** 41,350 square miles

**TRACK PATTERN:** 4-mile spacing, NW-SE orientation, cross tracks

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Total magnetic intensity contour chart.

#### 40. SURVEY SOUTHWEST OF SAN DIEGO



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** August 1969

**NAVIGATIONAL CONTROL:** Loran-A, aircraft radar, Doppler radar, visual

**MILES SURVEYED:** 63,000 square miles

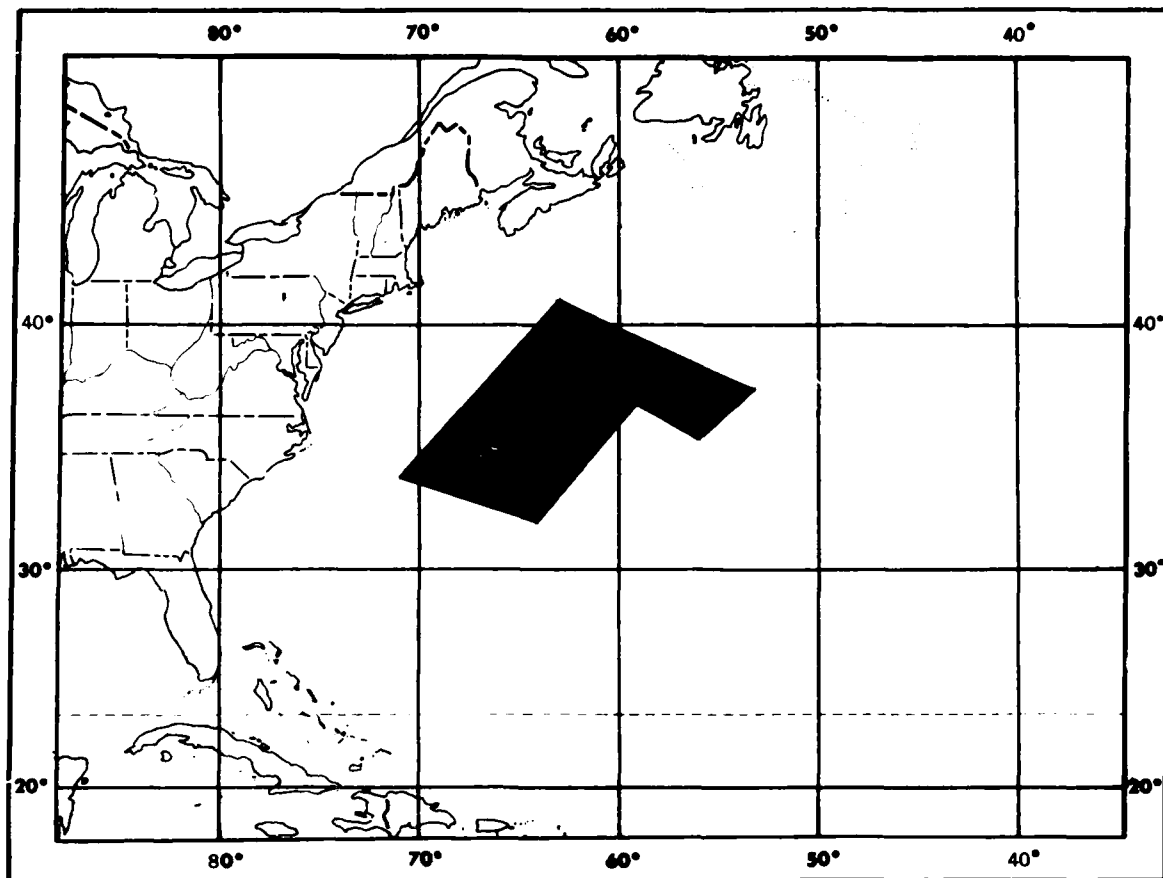
**TRACK PATTERN:** 10 mile track spacing, E-W track orientation, cross tracks

**ALTITUDE:** 1000 feet

**DATA FORMAT:** Residual magnetic intensity profiles presented in report below

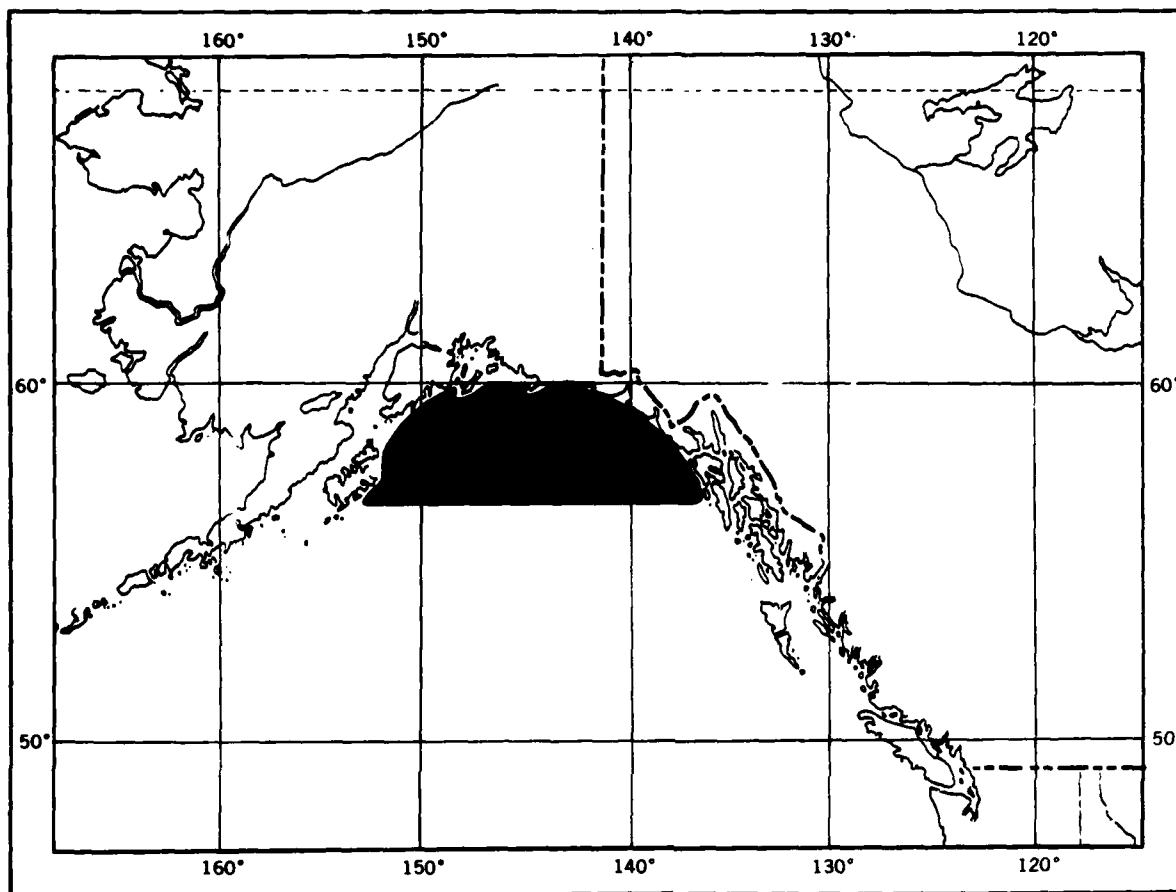
**REPORT:** "Variable Sea-Floor Spreading Off Baja, California," NATURE, V. 229, No. 5284, p. 396-399, 1971.

#### 41. SURVEY NORTH OF BERMUDA



**AIRCRAFT:** NC-121, BUNO 145925  
**SURVEY DATES:** November - December 1969  
**NAVIGATIONAL CONTROL:** Loran-A, Doppler radar  
**MILES SURVEYED:** 205,000 square miles  
**TRACK PATTERN:** 10 mile spacing, NW-SE orientation; cross tracks  
**ALTITUDE:** 1000 feet  
**DATA FORMAT:** Profiles of Residual Magnetic Intensity.

## 42. GULF OF ALASKA SURVEYS



**AIRCRAFT:** NC-54R BUNO 90396

**SURVEY DATES:** April - May 1970

**NAVIGATIONAL CONTROL:** Loran-A

**MILES SURVEYED:** 80,000 square miles

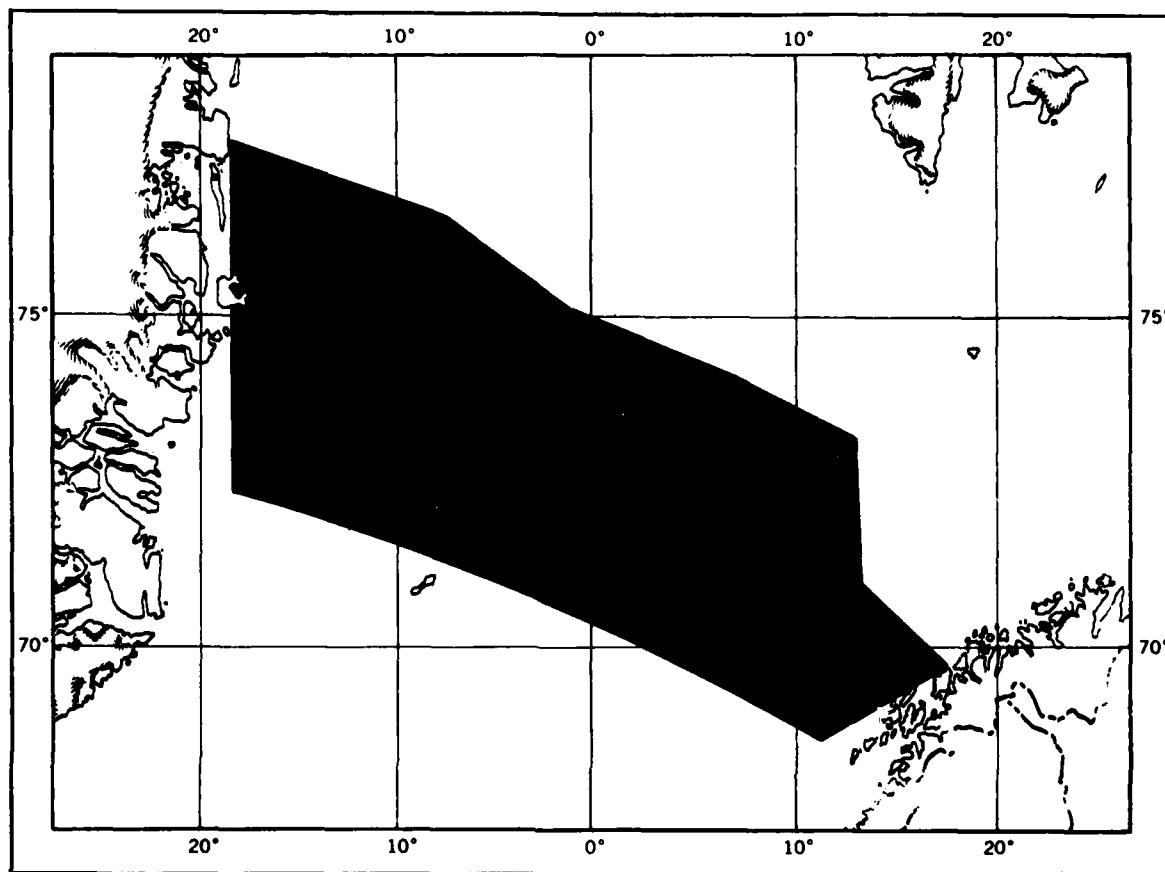
**TRACK PATTERN:** 5 to 7 mile spacing, west of 146°E primarily NW-SE orientation, east of 146°E primarily SW-NE orientation.

**ALTITUDE:** 900 feet

**DATA FORMAT:** Total magnetic intensity contour chart

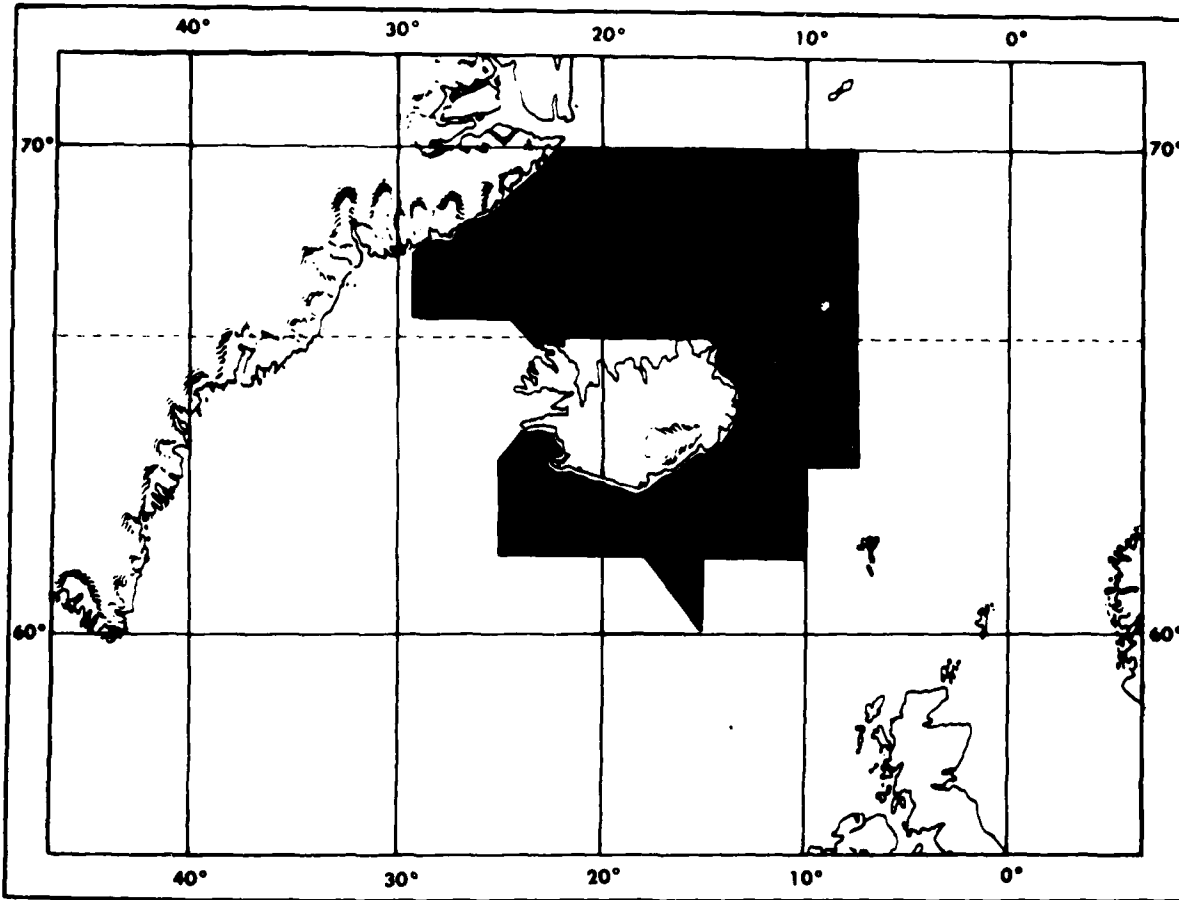
**REPORTS:** "Results of an Aeromagnetic Survey in the Gulf of Alaska," J. Geophys. Res., V. 79, No. 5, p. 719-724, 1974.

### 43. NORWEGIAN - GREENLAND SEA SURVEYS



**AIRCRAFT:** RP-3D BUNO 158227  
**SURVEY DATES:** April - June 1973  
**NAVIGATIONAL CONTROL:** Loran-C and Navigational Satellite  
**MILES SURVEYED:** 180,000 square miles  
**TRACK PATTERN:** 7 mile spacing, NW-SE orientation  
**ALTITUDE:** 1,000 feet  
**DATA FORMAT:** Residual magnetic intensity stacked profiles

#### 44. OFFSHORE ICELAND



**AIRCRAFT:** RP-3D BUNO 1588227

**SURVEY DATES:**

**NAVIGATIONAL CONTROL:** Loran-C, Inertial Navigation System, Satellite

**MILES SURVEYED:** 210,000 square miles

**TRACK PATTERN:** 6 and 3 mile spacing E-W, 25 mile spacing N-S

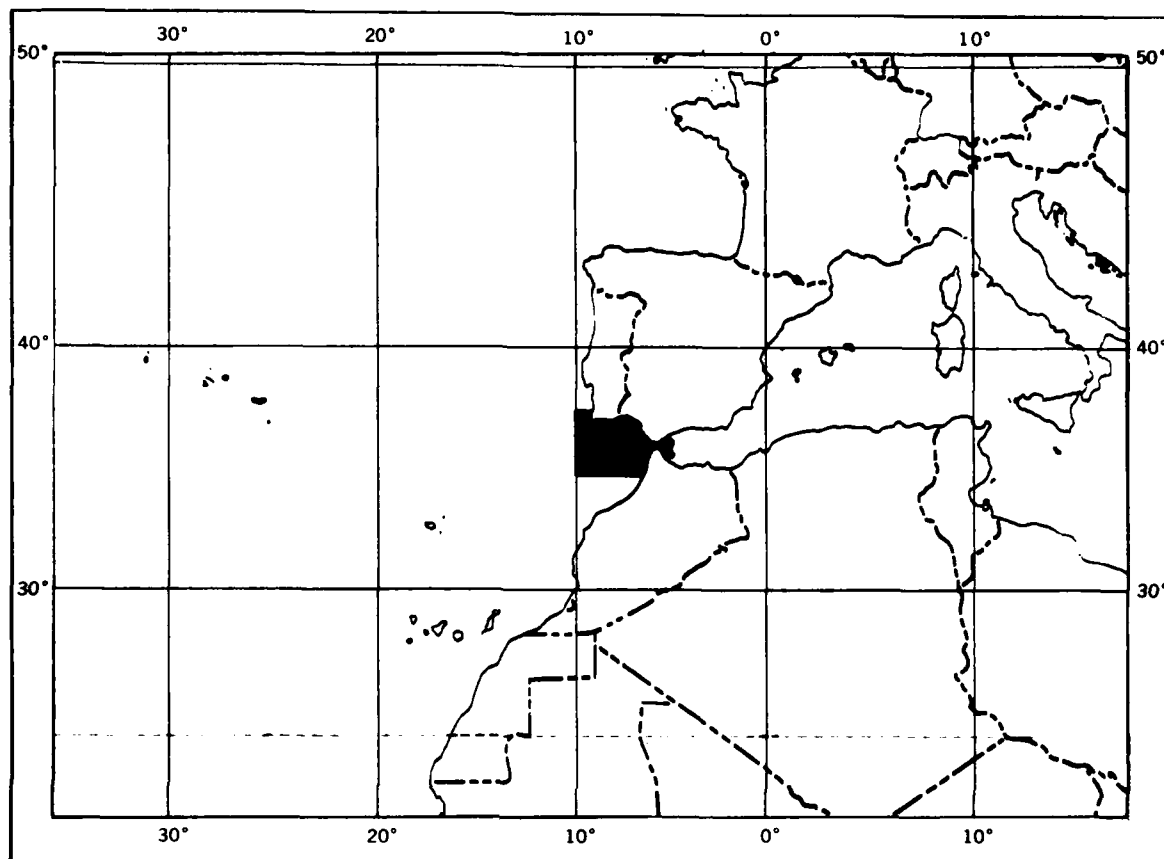
**ALTITUDE:** 500 feet

**DATA FORMAT:** Residual magnetic intensity contour charts, 50 nt contour interval.

Scale: 4"/degree longitude.

In preparation, data availability will be announced.

## 45. STRAITS OF GIBRALTAR SURVEYS



**AIRCRAFT:** RP-3D BUNO 158227

**SURVEY DATES:** June - July 1974

**NAVIGATIONAL CONTROL:** Inertial Navigational System, Satellite

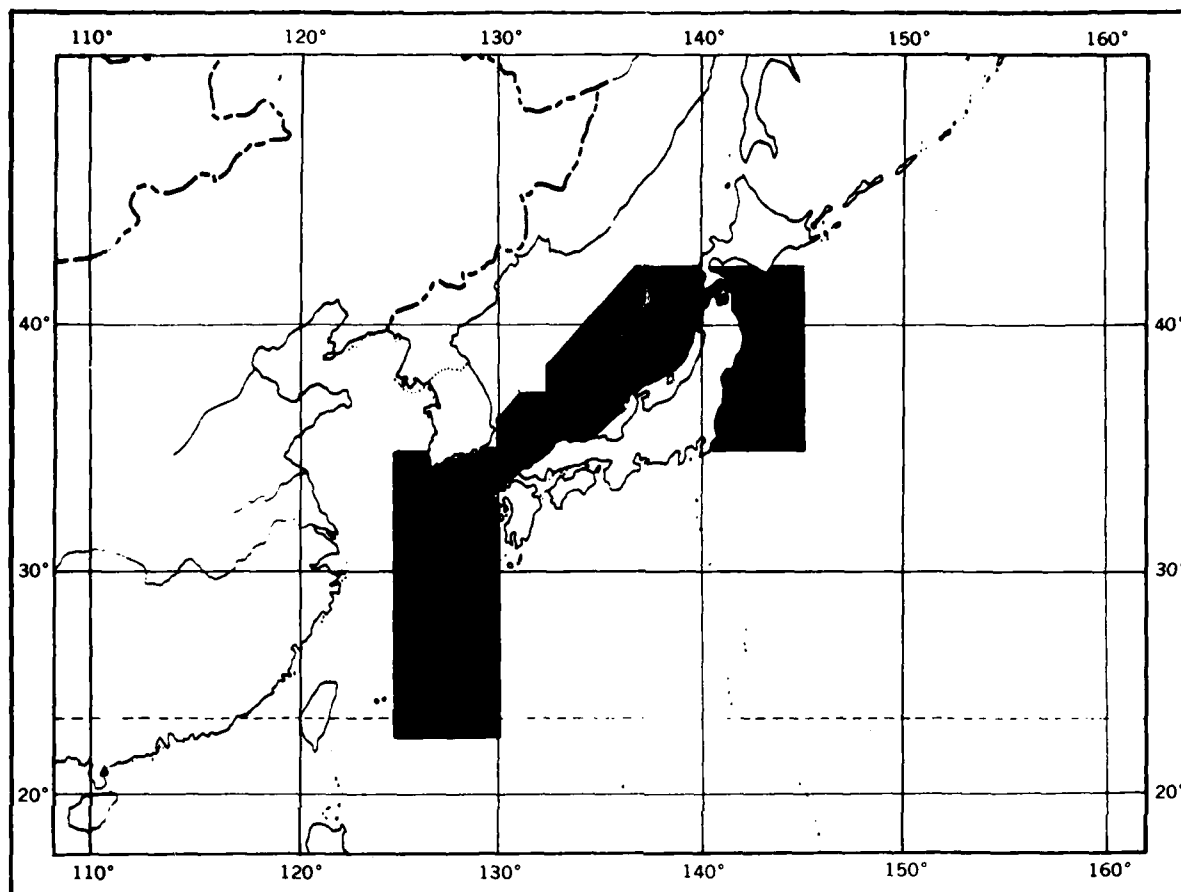
**MILES SURVEYED:** 1,000 square miles

**TRACK PATTERN:** 6 mile spacing N-S, and 25 mile spacing E-W

**ALTITUDE:** 500 feet

**DATA FORMAT:** Residual magnetic intensity chart, 50 nt contour interval.  
Scale: 4"/degree longitude.

## 46. OFFSHORE JAPAN SURVEYS



**AIRCRAFT:** RP-3D BUNO 158227

**SURVEY DATES:** Nov 1970 - May 1976

**NAVIGATIONAL CONTROL:** Loran-C, Radar, Inertial Navigation System, Satellite.

**MILES SURVEYED:** 525,000 square miles

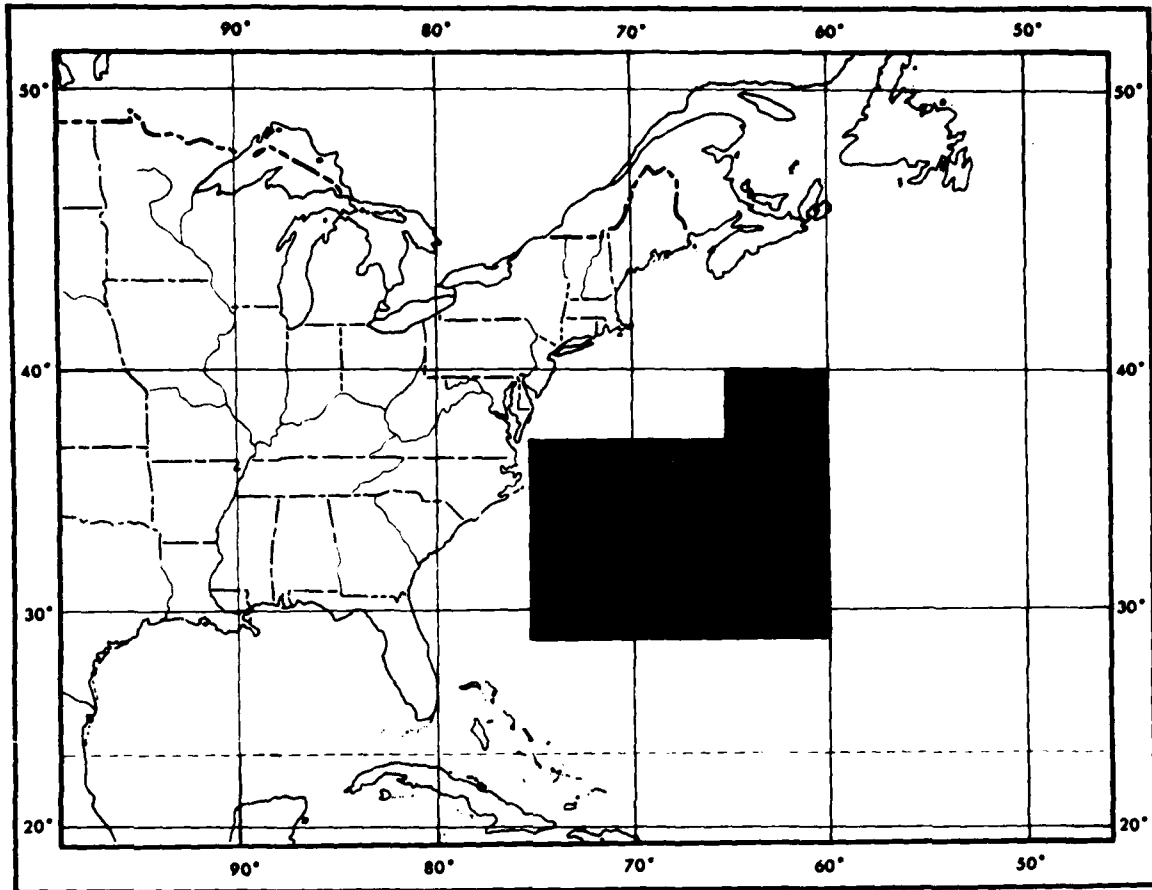
**TRACK PATTERN:** 6 and 3 mile spacing E-W, 25 mile spacing N-S

**ALTITUDE:** 500 feet

**DATA FORMAT:** Residual magnetic intensity contour charts, 50 nt. contour interval.

Scale: 4"/degree longitude. In preparation, data availability will be announced.

## 47. WESTERN ATLANTIC SURVEYS

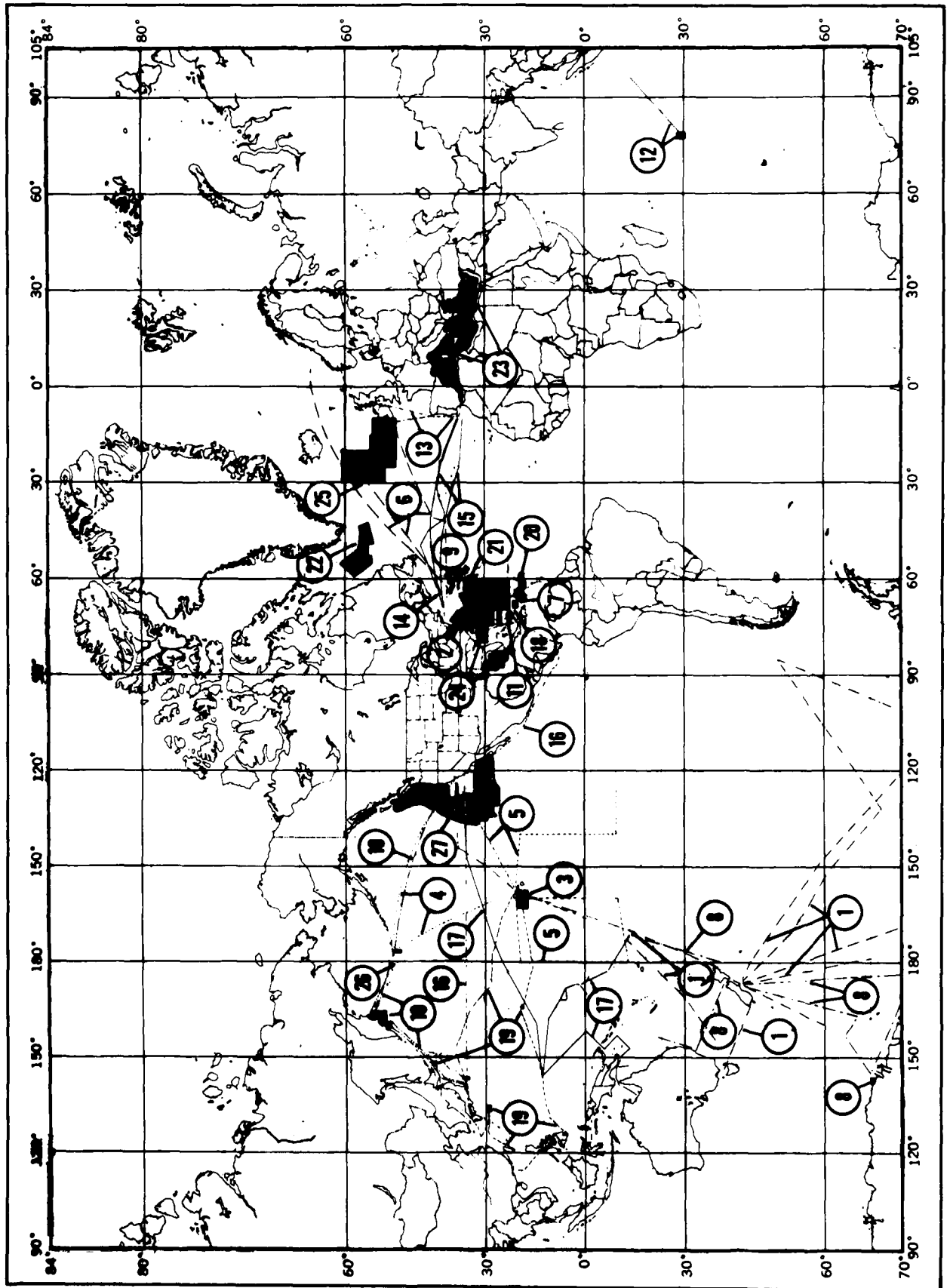


**AIRCRAFT:** RP-3D BUNO 158227  
**SURVEY DATES:** June 1975 - Sept 1976  
**NAVIGATIONAL CONTROL:** Loran-C, Inertial Navigation System, Satellite  
**MILES SURVEYED:** 365,000 square miles  
**TRACK PATTERN:** 6 mile spacing E-W, 25 mile spacing N-S  
**ALTITUDE:** 500 feet  
**DATA FORMAT:** Residual magnetic intensity contour charts, 50 nt contour interval.  
Scale: 4"/degree availability will be announced.

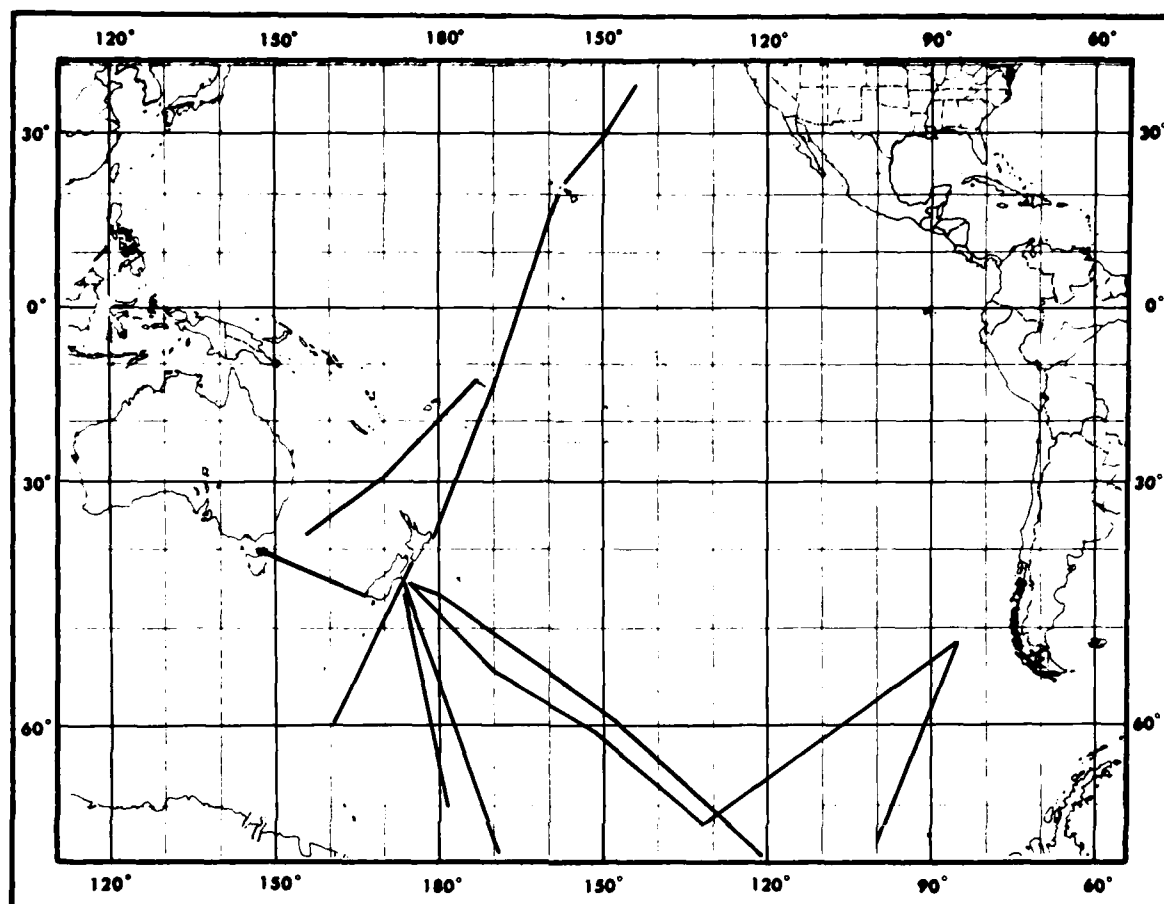
### III. SHIPBOARD SURVEYS

U.S. Naval Oceanographic Office

## SHIPBOARD MAGNETIC SURVEYS



## 1. DEEP FREEZE 1961



**SHIP:** USS STATEN ISLAND (AGB-5)

**SURVEY DATES:** 7 November 1960 - 5 May 1961

**NAVIGATIONAL CONTROL:** Celestial and dead reckoning

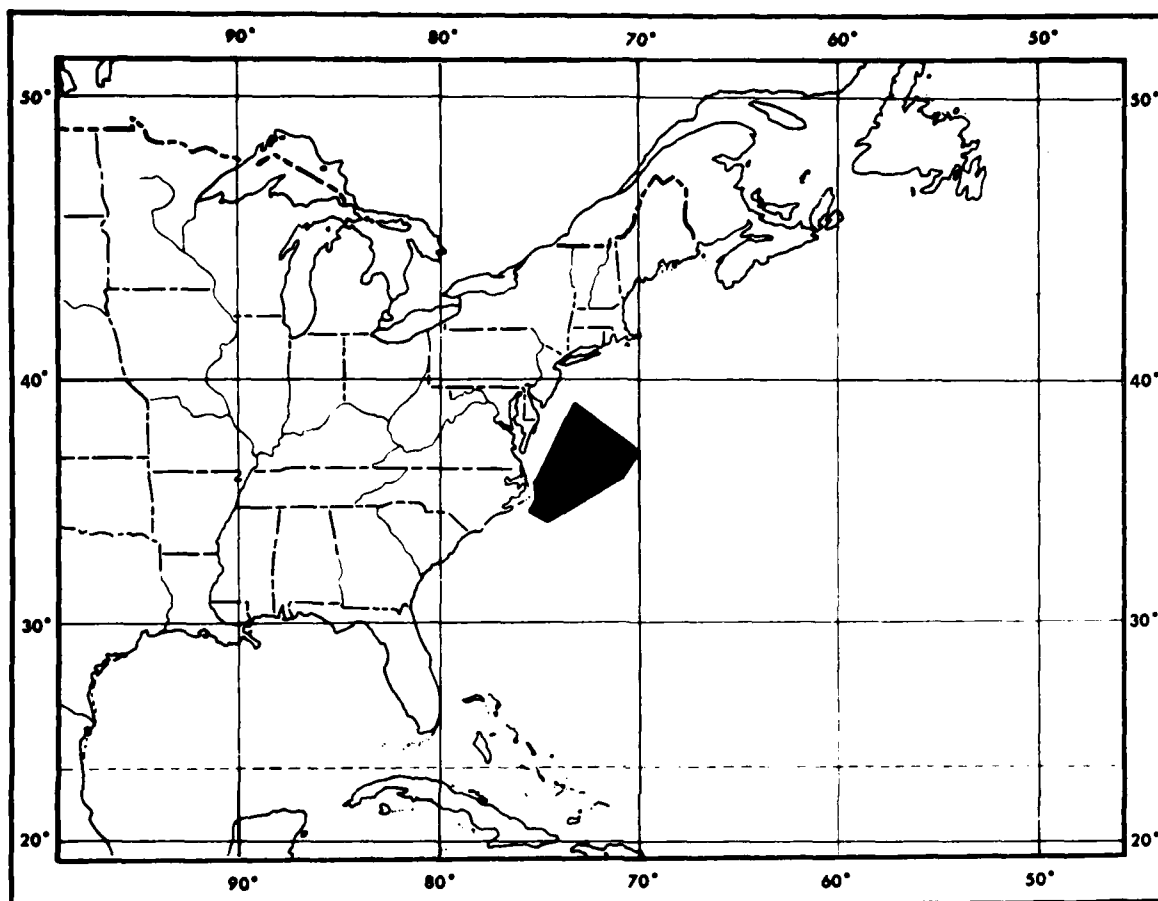
**MILES SURVEYED:** 22,000 nautical miles

**TRACK PATTERN:** Single track

**DATA FORMAT:** Profiles of magnetic intensity with regional gradient removed plotted along tracks on bathymetric contour chart in Antarctic region. Certain magnetic and bathymetric profiles presented separately. Magnetic data collected from U.S. to New Zealand presented in total intensity profile form.

**REPORTS:** Technical Report 105, "Operation Deep Freeze 61, 1960 - 1961 Marine Geophysical Investigations."

## 2. U.S. EAST COAST SURVEY



**SHIP:** USS PREVAIL (AGS-20)

**SURVEY DATES:** 17 - 25 July 1961

**NAVIGATIONAL CONTROL:** Loran-A and radar

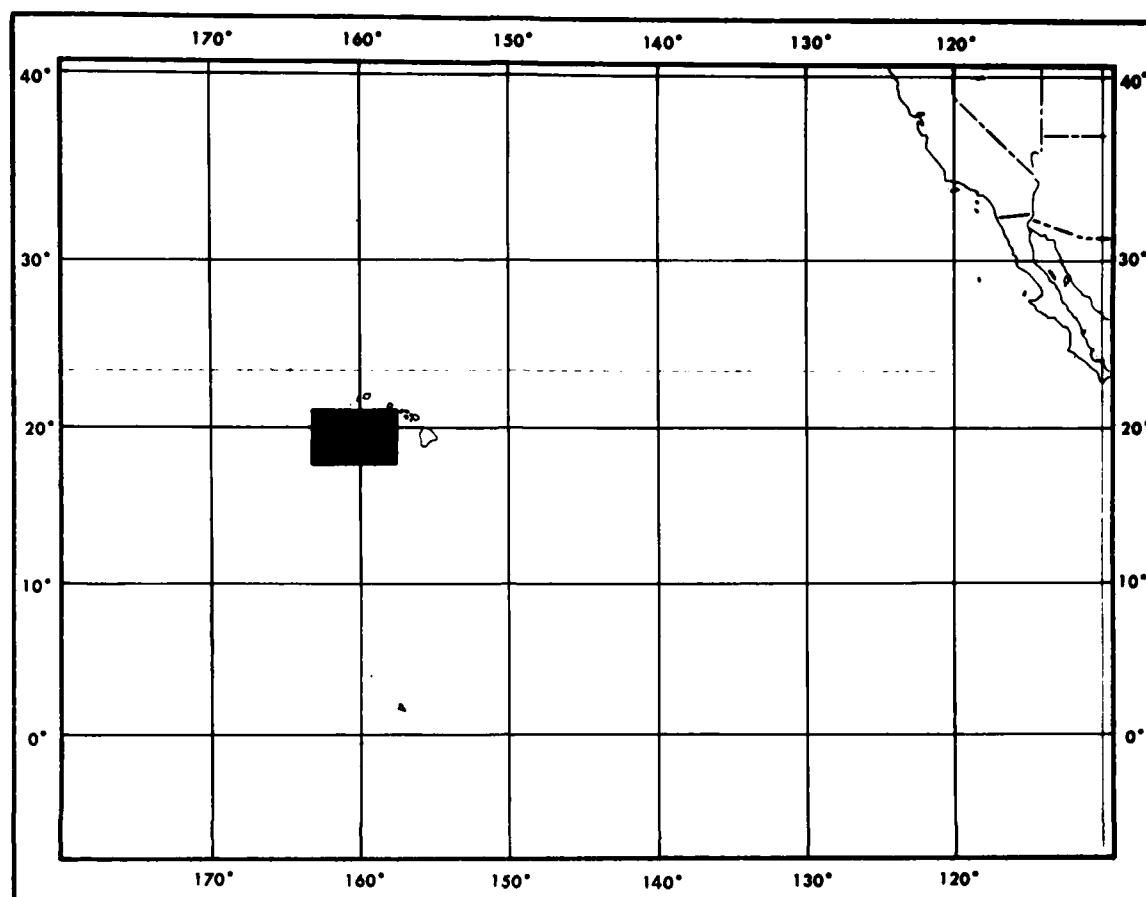
**MILES SURVEYED:** 43,200 square miles

**TRACK PATTERN:** 30-mile spacing, normal to the continental slope

**DATA FORMAT:** Total and residual magnetic contour charts. Magnetic and bathymetric profiles along each track.

**REPORTS:** Technical Report 133, "A Marine Magnetic Survey off the East Coast of the United States."

### 3. SURVEY SOUTH OF THE HAWAIIAN ISLANDS



**SHIP:** USS REHOBOTH (AGS-50)

**SURVEY DATES:** June - July 1961

**NAVIGATIONAL CONTROL:** Loran-A

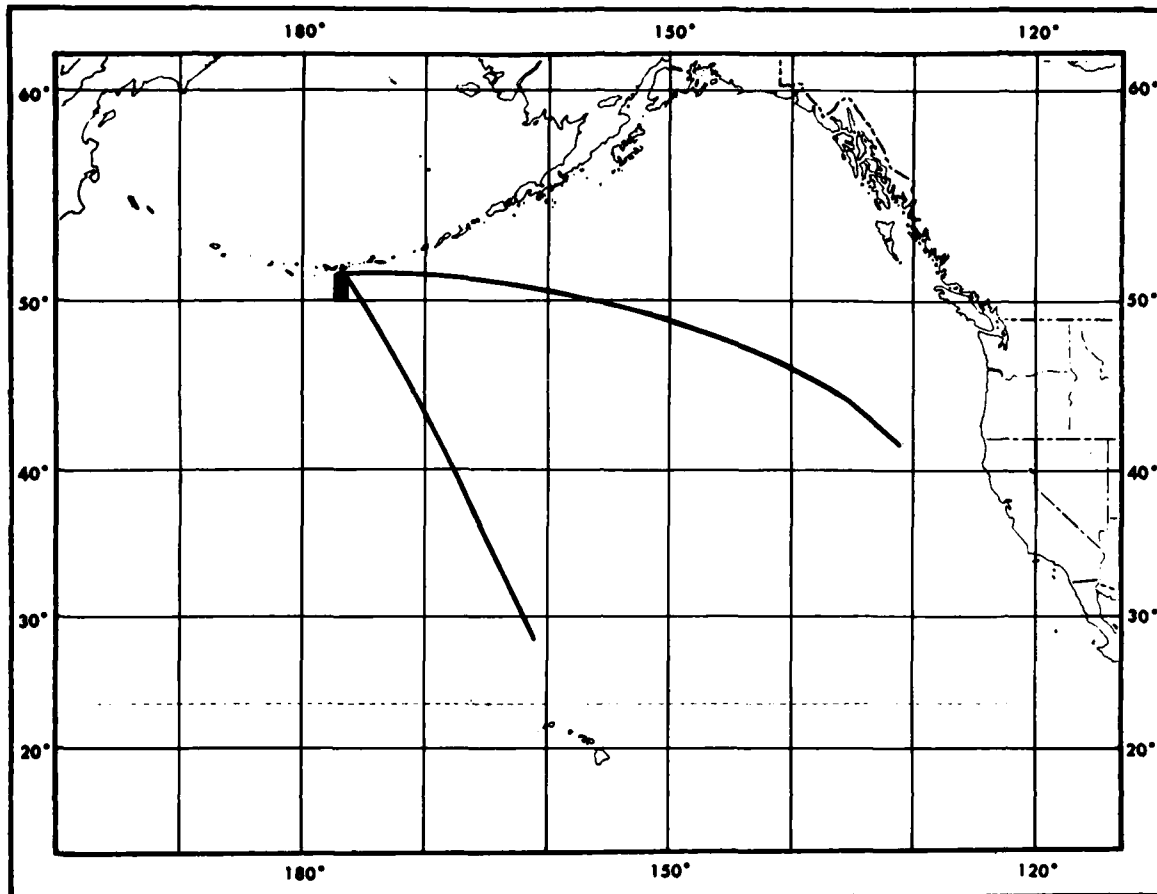
**MILES SURVEYED:** 56,000 square miles

**TRACK PATTERN:** 5 to 7 miles spacing, in E-W direction

**DATA FORMAT:** Total and residual intensity contour charts of the entire survey area. Total intensity and bathymetric profiles across the major magnetic feature in the area. Eight detailed development areas over seamounts within the area.

**REPORTS:** Technical Report 137, "A Marine Magnetic Survey South of the Hawaiian Islands."

#### 4. NORTH PACIFIC SURVEY - 1961



**SHIP:** USS REHOBOTH (AGS-50)

**SURVEY DATES:** 9 September - 7 November 1961

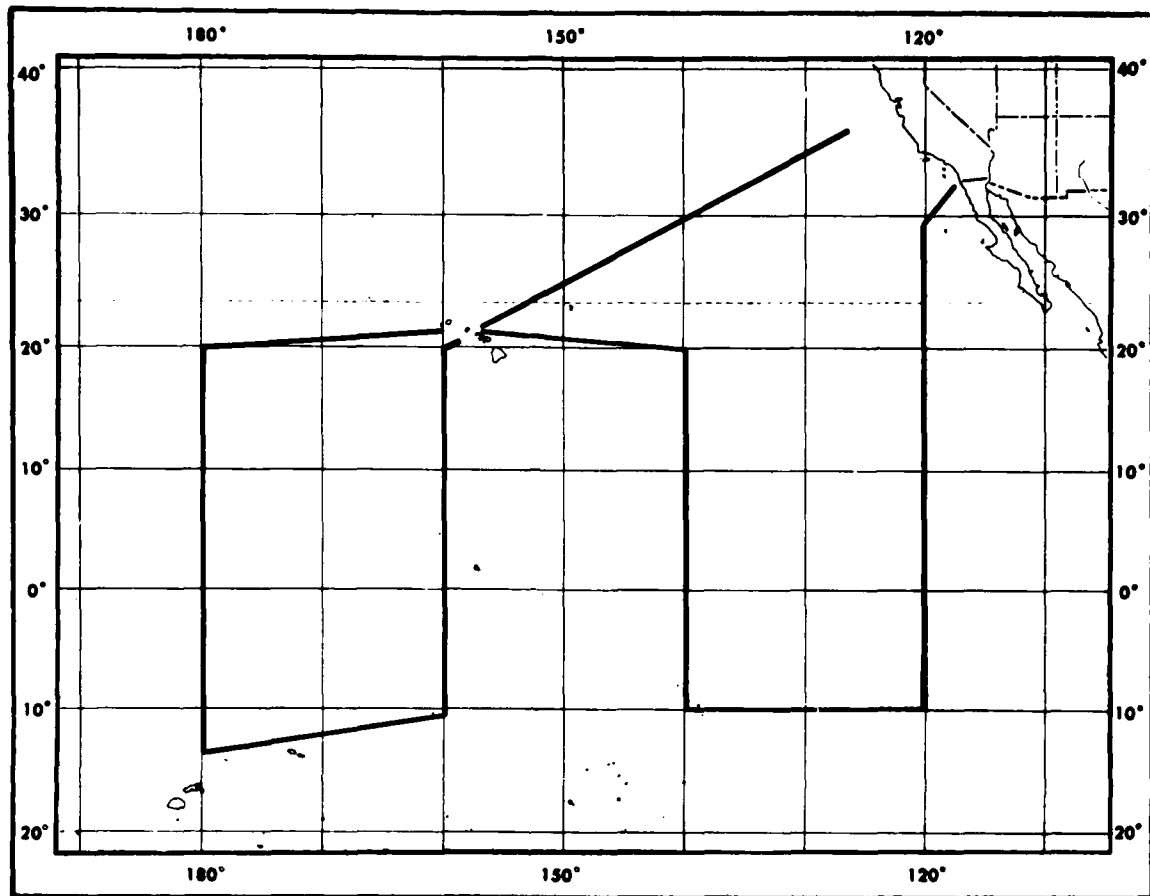
**NAVIGATIONAL CONTROL:** Loran-C, celestial, and dead reckoning

**MILES SURVEYED:** 3,600 nautical miles; additional 2,500 square mile survey area over Aleutian Trench.

**TRACK PATTERN:** Single track; 10-mile spacing, N-S, over Trench Data Format: Profiles of magnetic intensity with regional gradient removed plotted along survey tracks on bathymetric contour chart. Total magnetic intensity contour chart over Aleutian Trench: Profile charts of magnetic intensity and bathymetry.

**REPORTS:** Single track data from this survey, combined with surveys 5 and 10, is available in Informal Report M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962." Contour chart and profiles are contained in Informal Report IR H-3-66, "Geomagnetic Measurements in the North Pacific Ocean Aboard USS REHOBOTH (AGS-50), 1961."

## 5. EQUATORIAL PACIFIC SURVEY



**SHIP:** USS REHOBOTH (AGS-50)

**SURVEY DATES:** 25 April - 6 August 1961

**NAVIGATIONAL CONTROL:** Loran-A, celestial and dead reckoning

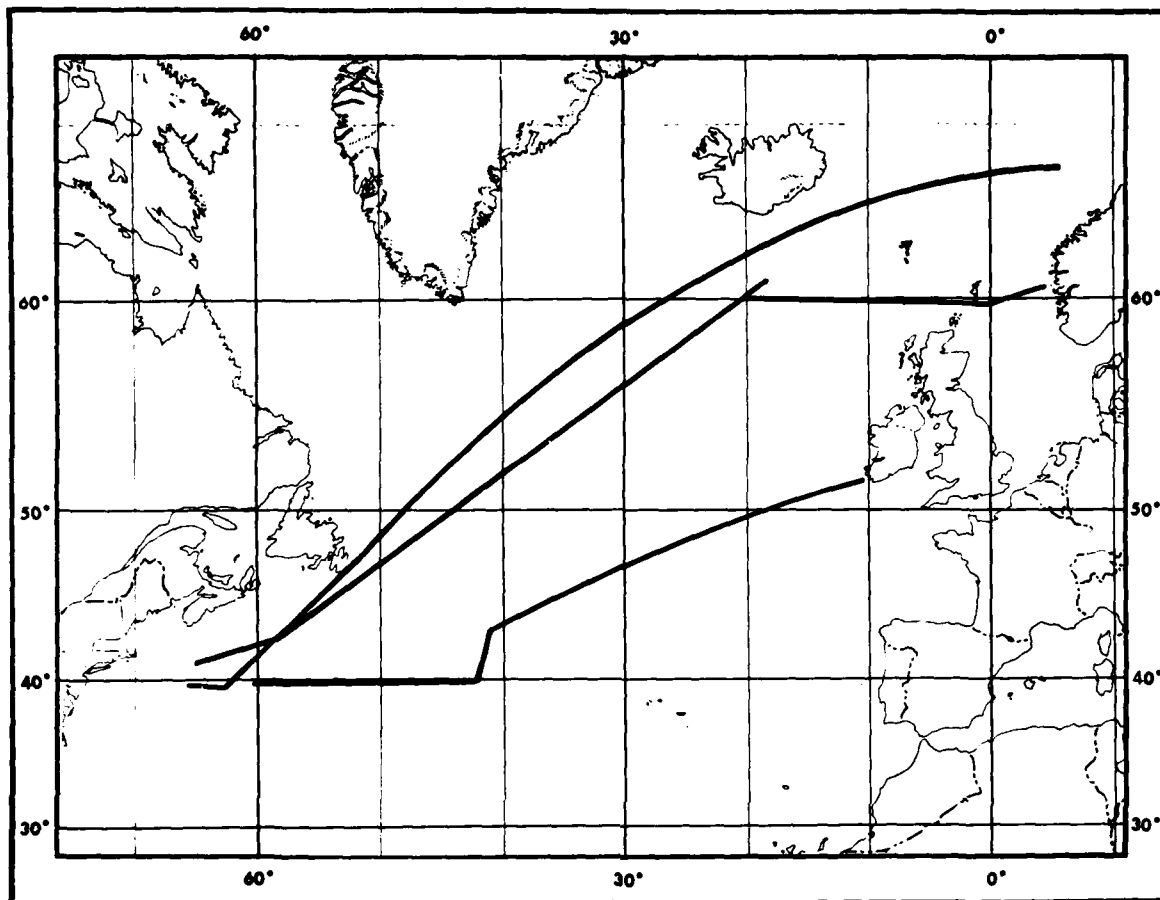
**MILES SURVEYED:** 26,000 nautical miles

**TRACK PATTERNS:** Single track

**DATA FORMAT:** Profiles of magnetic intensity with regional gradient removed plotted along survey tracks on bathymetric contour charts.

**REPORTS:** Information from this survey, combined with surveys 4 and 10, is available in Informal Report M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962."

## 6. NORTH ATLANTIC SURVEY



**SHIP:** USNS BOWDITCH (T-AGS-21); USNS DUTTON (T-AGS-22);  
USNS MICHELSON (T-AGS-23)

**SURVEY DATES:** 20 November 1961 - 13 March 1962

**NAVIGATIONAL CONTROL:** Loran-C, Loran-A, Decca, celestial and dead reckoning. Spacing between ships maintained by radar.

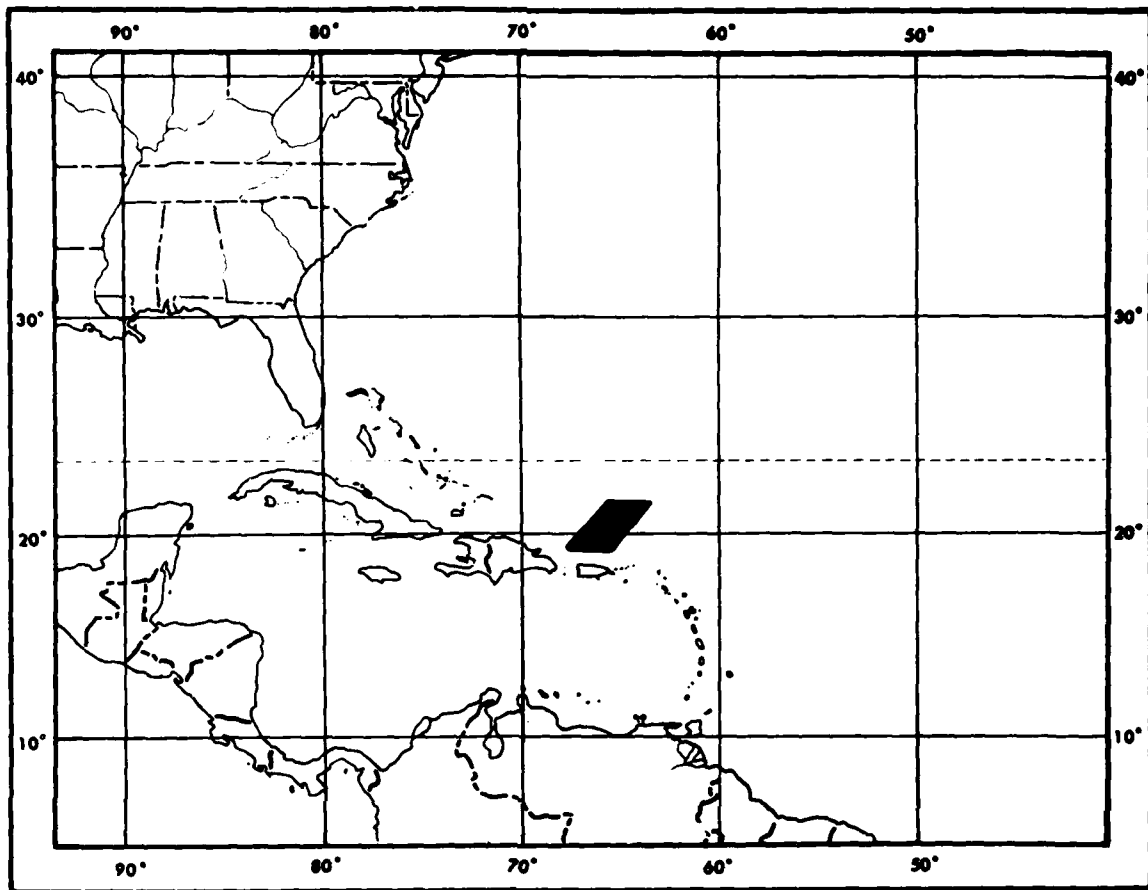
**MILES SURVEYED:** 17,200 nautical miles

**TRACK PATTERN:** 10 mile spacing simultaneously

**DATA FORMAT:** Total intensity and bathymetric profiles.

**REPORTS:** Technical Report 161, "Geomagnetic and Bathymetric Profiles Across the North Atlantic Ocean."

## 7. PUERTO RICO TRENCH SURVEY



**SHIP:** USS PREVAIL (AGS-20)

**SURVEY DATES:** 18 February - 31 March 1962

**NAVIGATIONAL CONTROL:** Loran-A

**MILES SURVEYED:** 20,000 square miles. An additional 2,700 nautical miles of en-route tracks.

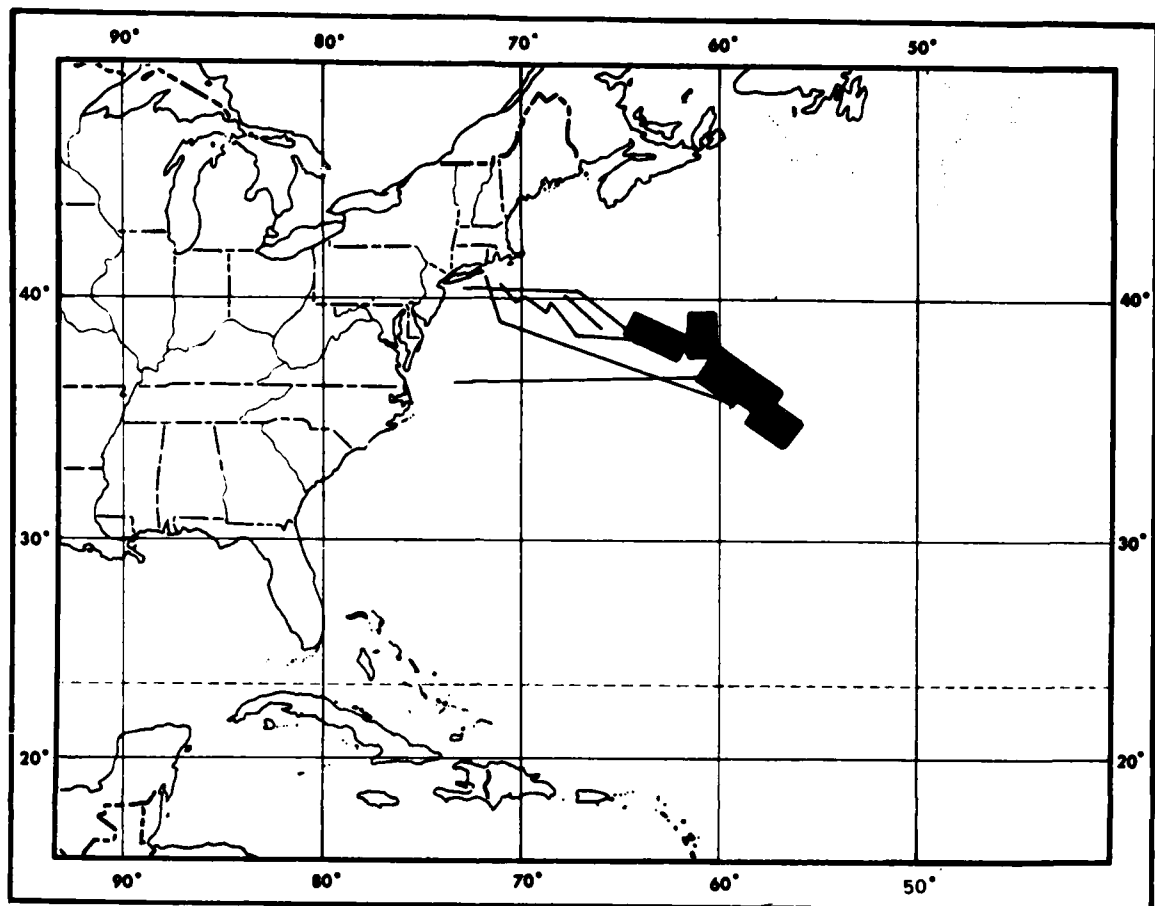
**TRACK PATTERNS:** 5 mile spacing, NE-SW orientation

**DATA FORMAT:** Total and residual intensity contour charts.

**REPORTS:** Informal Report M-6-63, "Analysis of Puerto Rico Trench Marine Magnetic Survey Data." A further analysis of these data combined with the data from airborne Puerto Rico Trench survey is contained in Informal Report H-1-66, "Magnetic Anomalies North of Puerto Rico: Trend Removal with Orthogonal Polynomials." The same report appears in J. Geophys. Res., V. 69, No. 24, 1964.



## 9. NEW ENGLAND SEAMOUNT SURVEY



**SHIP:** USS SHELDRAKE (AGS-19)

**SURVEY DATES:** 4 June - 14 August 1962

**NAVIGATIONAL CONTROL:** Loran-A

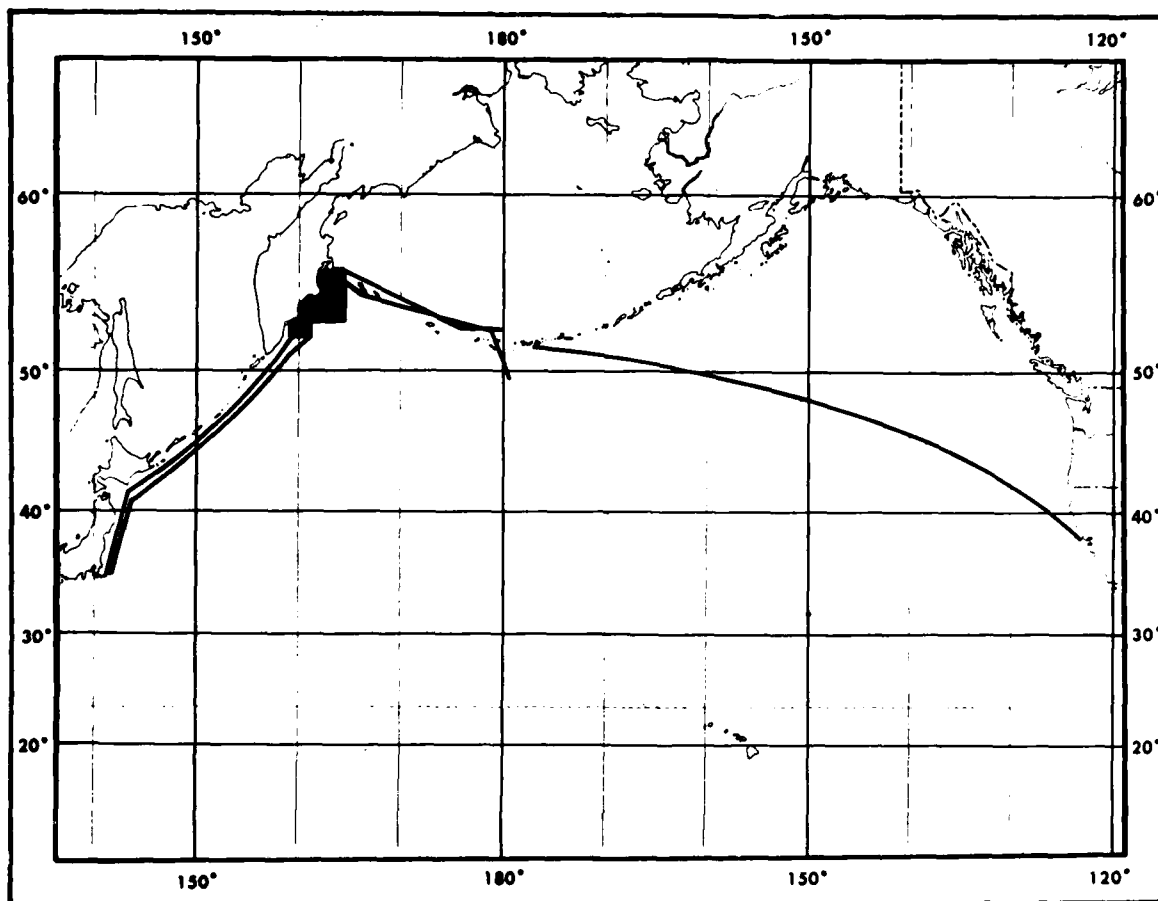
**MILES SURVEYED:** 30,000 square miles detailed survey area. Additional 2,800 nautical miles of continuous magnetic and bathymetric data collected along enroute tracks.

**TRACK PATTERN:** 5-mile spacing, normal to the seamount chain.

**DATA FORMAT:** Total intensity contour charts. Total intensity and bathymetric profile sheets for five enroute tracks.

**REPORTS:** Technical Report 159, "A Marine Magnetic Survey of the New England Seamount Chain;" Informal Report M-8-63, "Summary of Magnetization Computations for Kelvin Seamount." A brief article on this survey entitled "A Bathymetric and Geomagnetic Survey of the New England Seamount Chain" also appears in the International Hydrographic Review, Vol. XLI, No. 1, Jan 1964.

## 10. NORTH PACIFIC SURVEY - 1962



**SHIP:** USS REHOBOTH (AGS-50)

**SURVEY DATES:** 25 May - 8 September 1962

**NAVIGATIONAL CONTROL:** Loran-C, radar, celestial, and dead reckoning

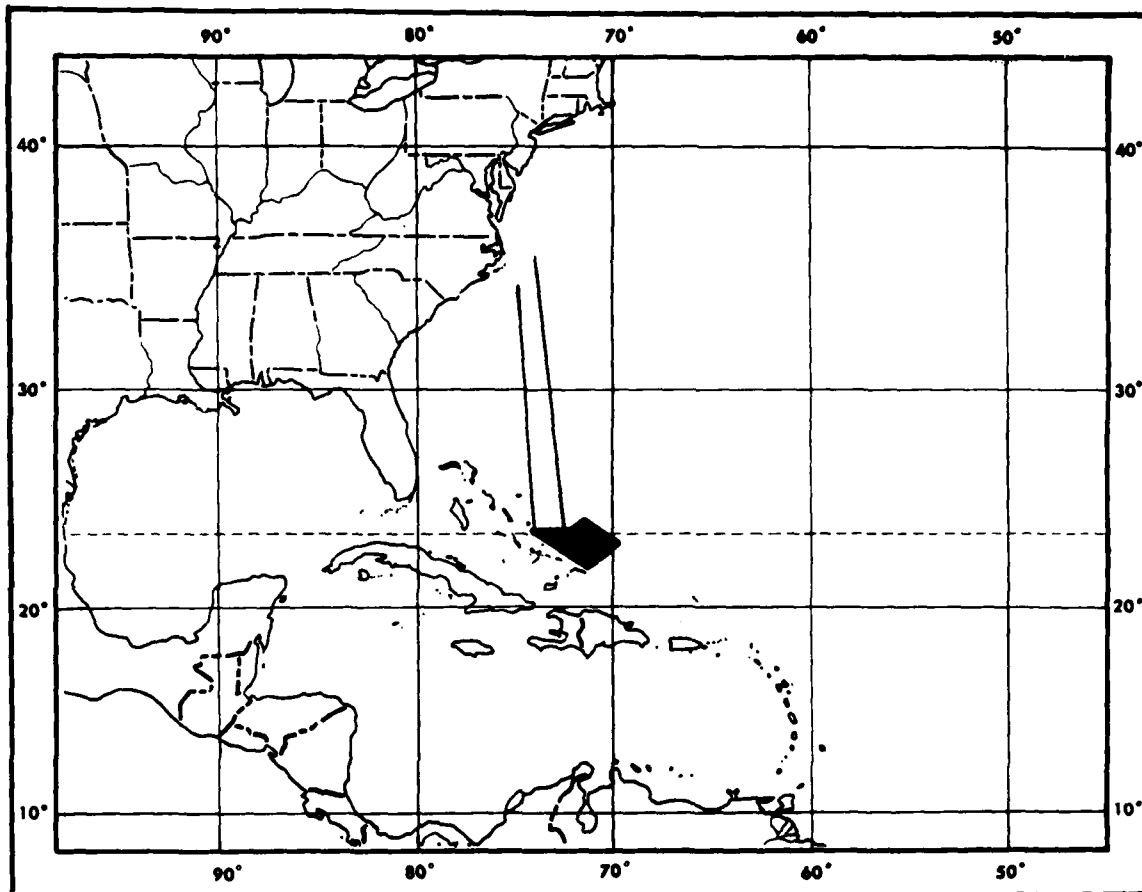
**MILES SURVEYED:** 32,500 square miles. Additional 6,732 nautical miles of continuous magnetic profile along enroute tracks.

**TRACK PATTERN:** 5 mile spacing, E-W and NW-SE orientation

**DATA FORMAT:** Total intensity contour charts.

**REPORTS:** Technical Report 168, "Marine Magnetic Surveys in the Northwest Pacific Ocean." Profiles of magnetic intensity with regional gradient removed plotted along enroute survey tracks, combined with information from surveys 4 and 5 are presented in Informal Report M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962."

## 11. SOUTH BAHAMAS SURVEY



**SHIP:** USS SHELDRAKE (AGS-19)

**SURVEY DATES:** 22 October - 25 November 1962

**NAVIGATIONAL CONTROL:** Loran-A

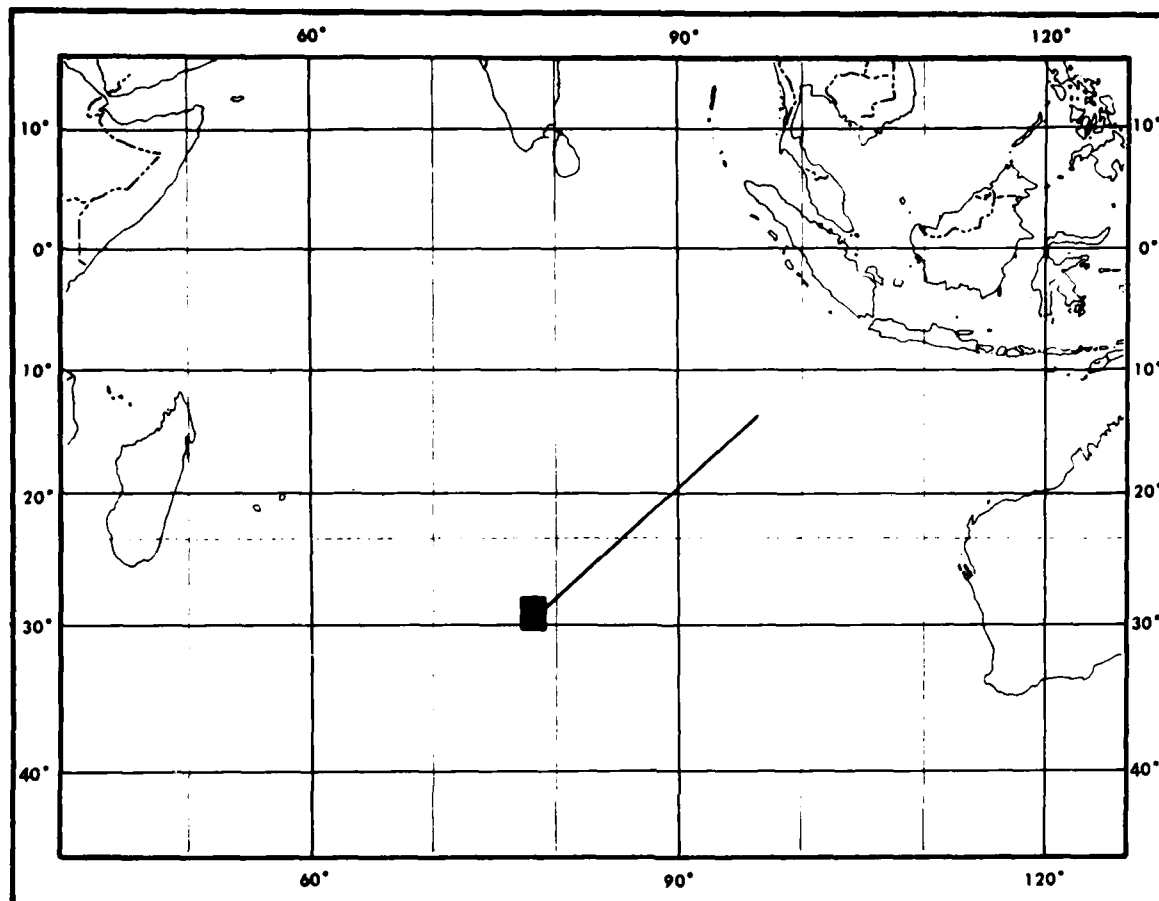
**MILES SURVEYED:** 18,000 square miles. Additional 2,350 nautical miles of continuous magnetic and bathymetric profiles along enroute tracks.

**TRACK PATTERN:** 5 mile spacing NE-SW orientation

**DATA FORMAT:** Total and residual intensity contour charts. Data along enroute tracks presented as continuous total intensity and bathymetric profiles.

**REPORTS:** Technical Report 160, "Marine Magnetic Survey off the Southern Bahamas." A geologic interpretation of the survey area using an orthogonal polynomial residual intensity contour chart is presented in Informal Manuscript Report M-7-63, "Geologic Interpretation of Marine Magnetic Data in an Area off the Southern Bahama Islands."

## 12. INDIAN OCEAN SURVEY



**SHIP:** USNS CORE (T-AKV-41)

**SURVEY DATES:** August - December 1962

**NAVIGATIONAL CONTROL:** Celestial and dead reckoning

**MILES SURVEYED:** 10,000 square miles. Additional 1000 nautical miles of continuous magnetic profile along enroute tracks.

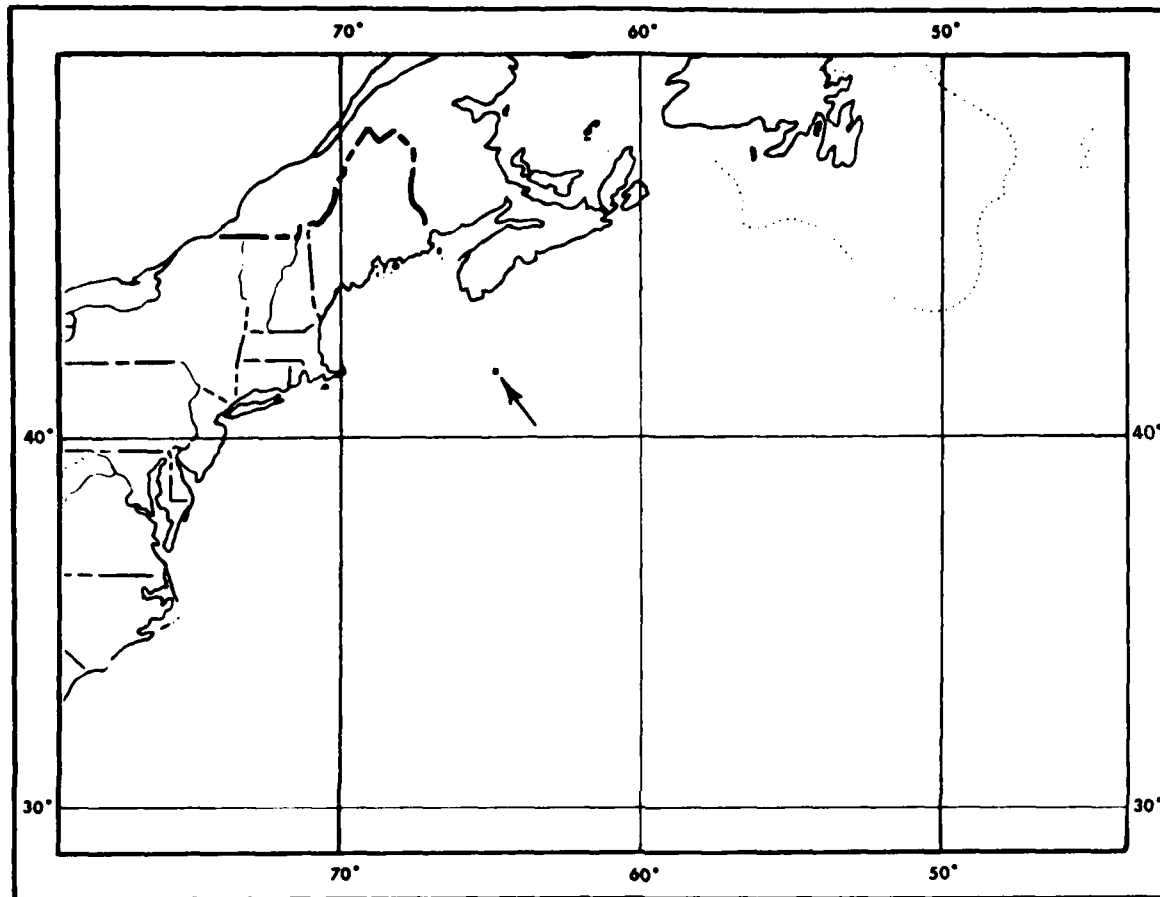
**TRACK PATTERN:** 5 mile spacing, N-S orientation

**DATA FORMAT:** Total intensity contour chart of the survey area and profiles of enroute magnetic intensity data with regional gradient removed plotted along survey track on bathymetric contour chart.

**REPORTS:** Informal Manuscript Report M-9-64, "A Marine Magnetic Survey of an Area in the Central Indian Ocean."



#### 14. THRESHER SEARCH



**SHIP:** USNS GILLISS (AGOR-4)

**SURVEY DATES:** April - August 1963

**NAVIGATIONAL CONTROL:** Loran-A, Loran-C

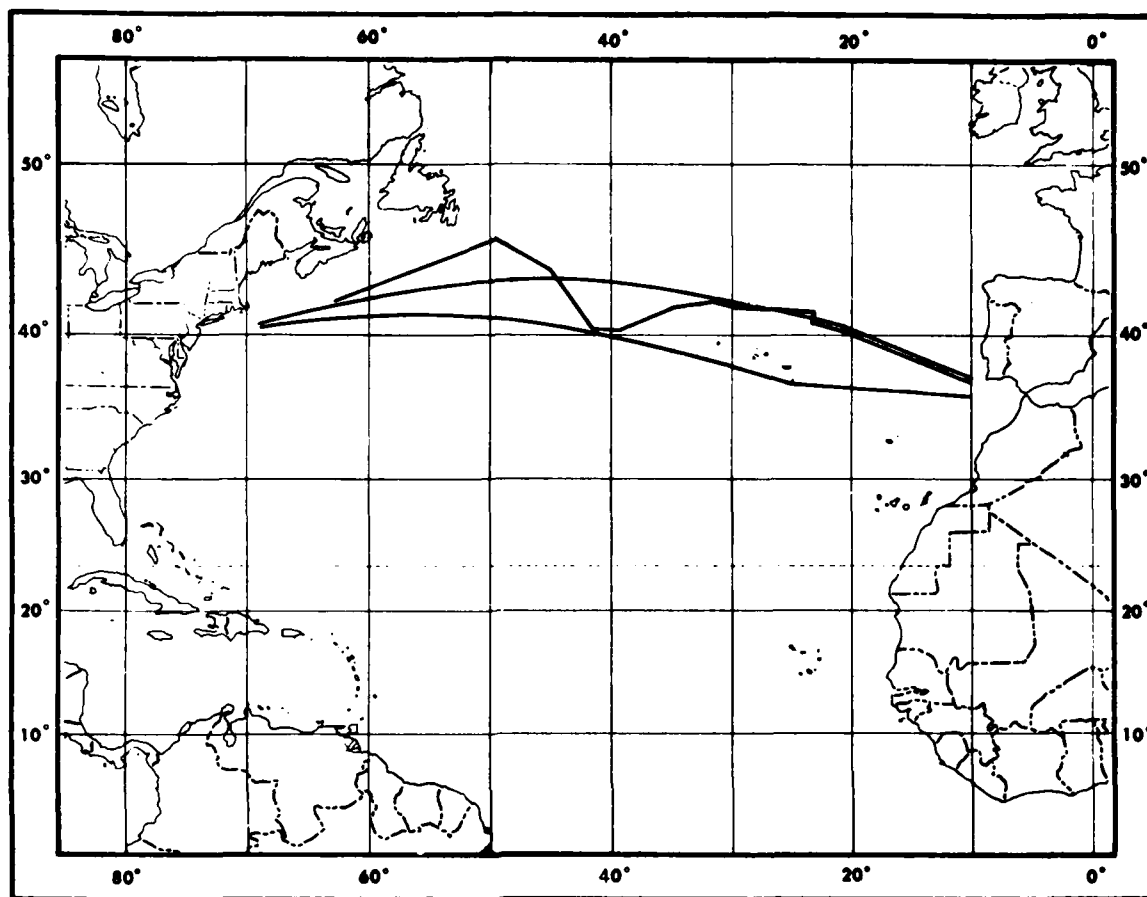
**MILES SURVEYED:** Approximately 7 square mile area with magnetometer sensor at depths exceeding 8,000 feet.

**TRACK PATTERN:** Irregular

**DATA FORMAT:** Total intensity contour chart.

**REPORTS:** Informal Report M-2-64, "A Deep-Towed Magnetometer System." Describes development and design of a deep-towed magnetometer system and its subsequent use in search operations.

## 15. ATLANTIC CROSSINGS, GIBRALTAR TO NEW YORK



**SHIP:** USNS MICHELSON (T-AGS-23), USNS BOWDITCH (T-AGS-21),  
USNS DUTTON (T-AGS-22)

**SURVEY DATES:** August, September 1963, February 1964

**NAVIGATIONAL CONTROL:** Loran-C, Loran-A, celestial, and dead reckoning

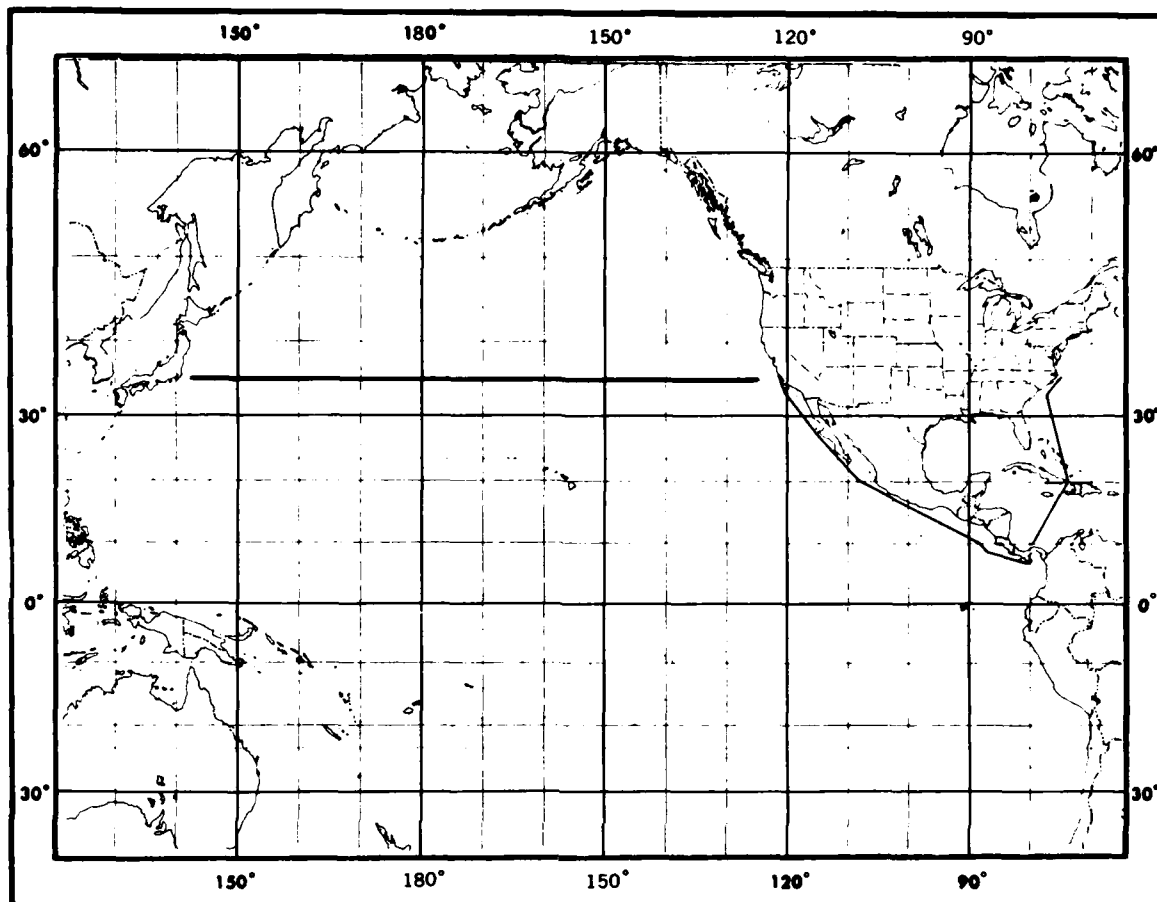
**MILES SURVEYED:** Approximately 10,000 miles of survey track.

**TRACK PATTERN:** Single track

**DATA FORMAT:** Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Traverse Mercator Projections.

**REPORTS:** Informal Report No. 69-68, "Geomagnetic Profiles, Gibraltar to New York 1963 - 1964."

## 16. OCEAN TRACK, NEW YORK TO TOKYO



**SHIP:** USNS BOWDITCH (T-AGS-21)

**SURVEY DATES:** 27 October - 26 November 1963

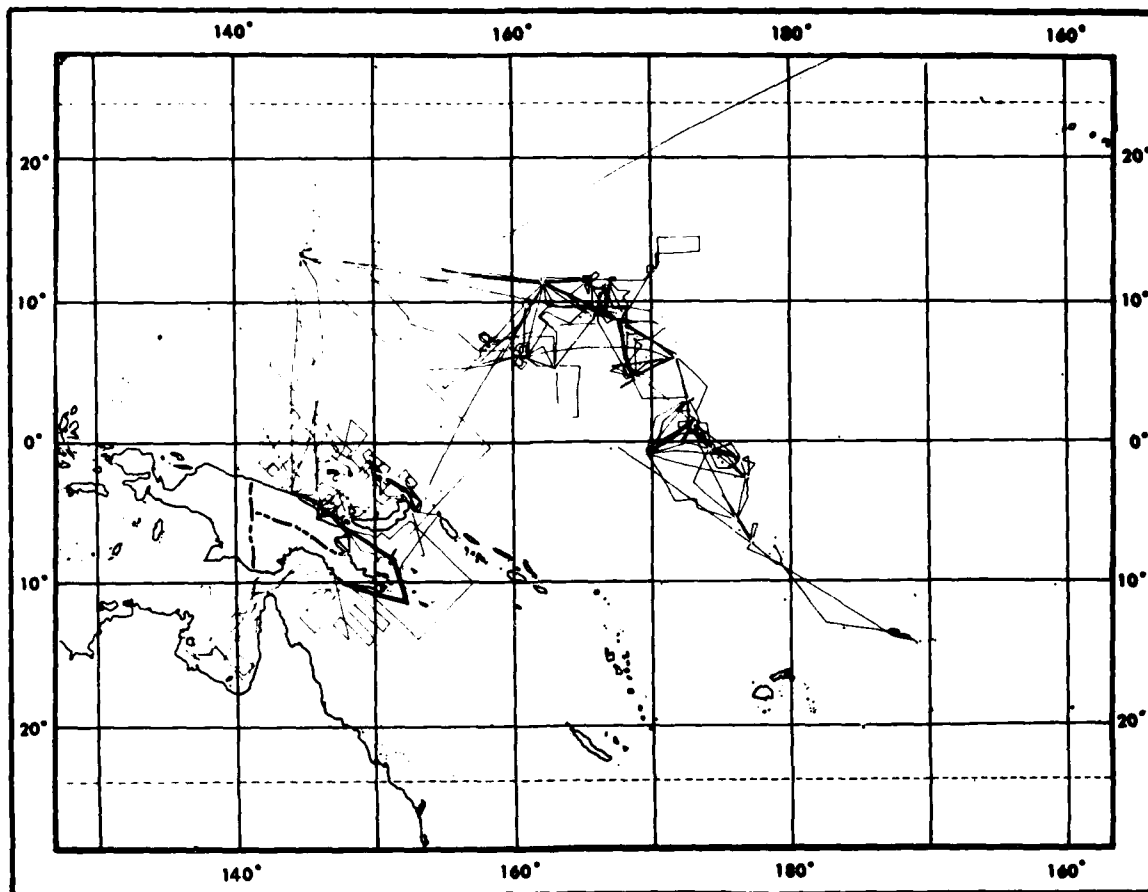
**NAVIGATIONAL CONTROL:** Loran-C, Loran-A, celestial, and dead reckoning

**MILES SURVEYED:** Approximately 10,700 miles enroute survey track via Panama Canal and San Francisco.

**TRACK PATTERN:** Single track

**DATA FORMAT:** Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections. Preliminary magnetic and bathymetric profiles with plot of ship's track available at approximately 1:1,400,000 scale.

## 17. SOUTHWEST PACIFIC SURVEY



**SHIP:** USNS SGT CURTIS F. SHOUP (T-AG-175)

**SURVEY DATES:** 18 May 1963 - 1 November 1965

**NAVIGATIONAL CONTROL:** Loran-A, radar, celestial, and dead reckoning

**MILES SURVEYED:** 78,500 miles enroute survey track

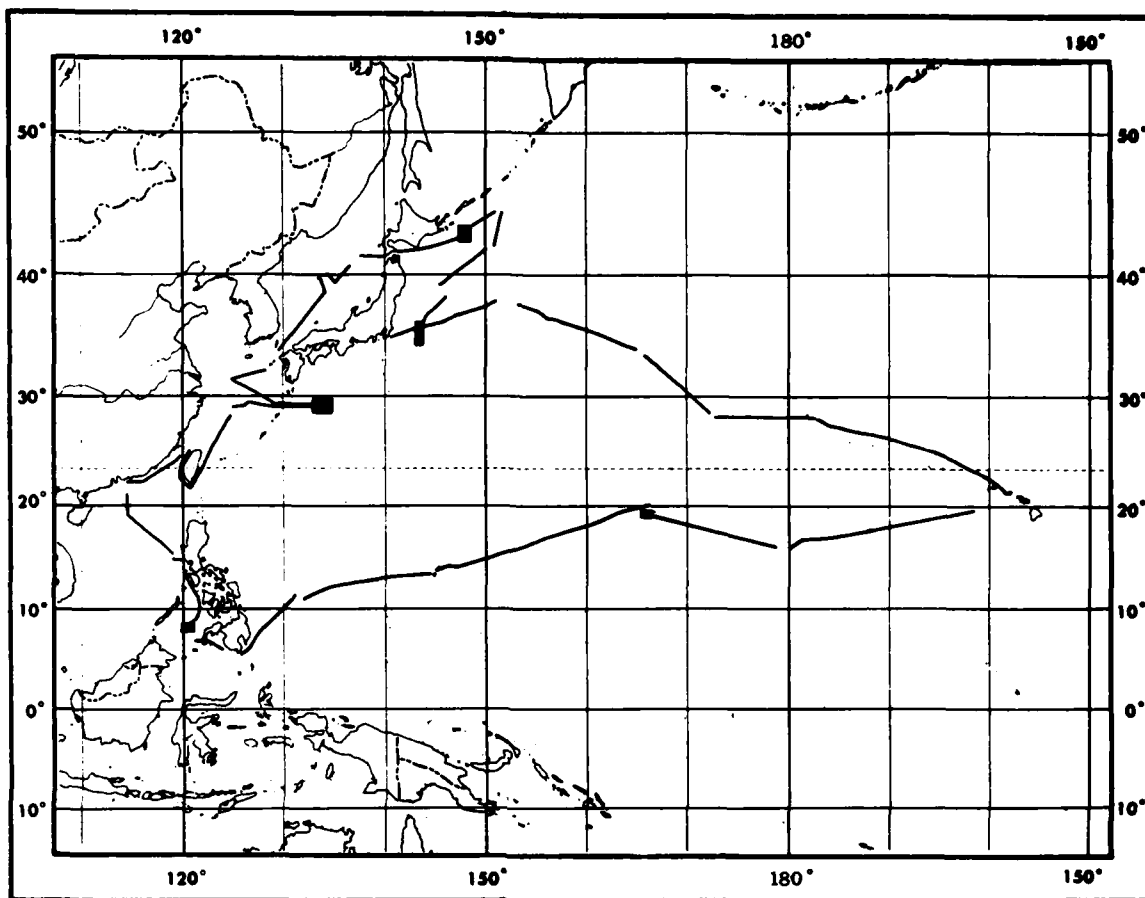
**TRACK PATTERN:** Irregular

**DATA FORMAT:** Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections. Copies of the total magnetic intensity analog traces for the Southwest Pacific Survey are available on microfilm (See Section III-C).

**REPORTS:** Brochure containing a chart index and a description of the survey operations.



## 19. WESTERN PACIFIC (RECONNAISSANCE) SURVEY 1964



**SHIP:** USNS DAVIS (AGOR-5)

**SURVEY DATES:** May - September 1964

**NAVIGATIONAL CONTROL:** Radar and visual within range of land; Loran-A, celestial, and dead reckoning on most tracks.

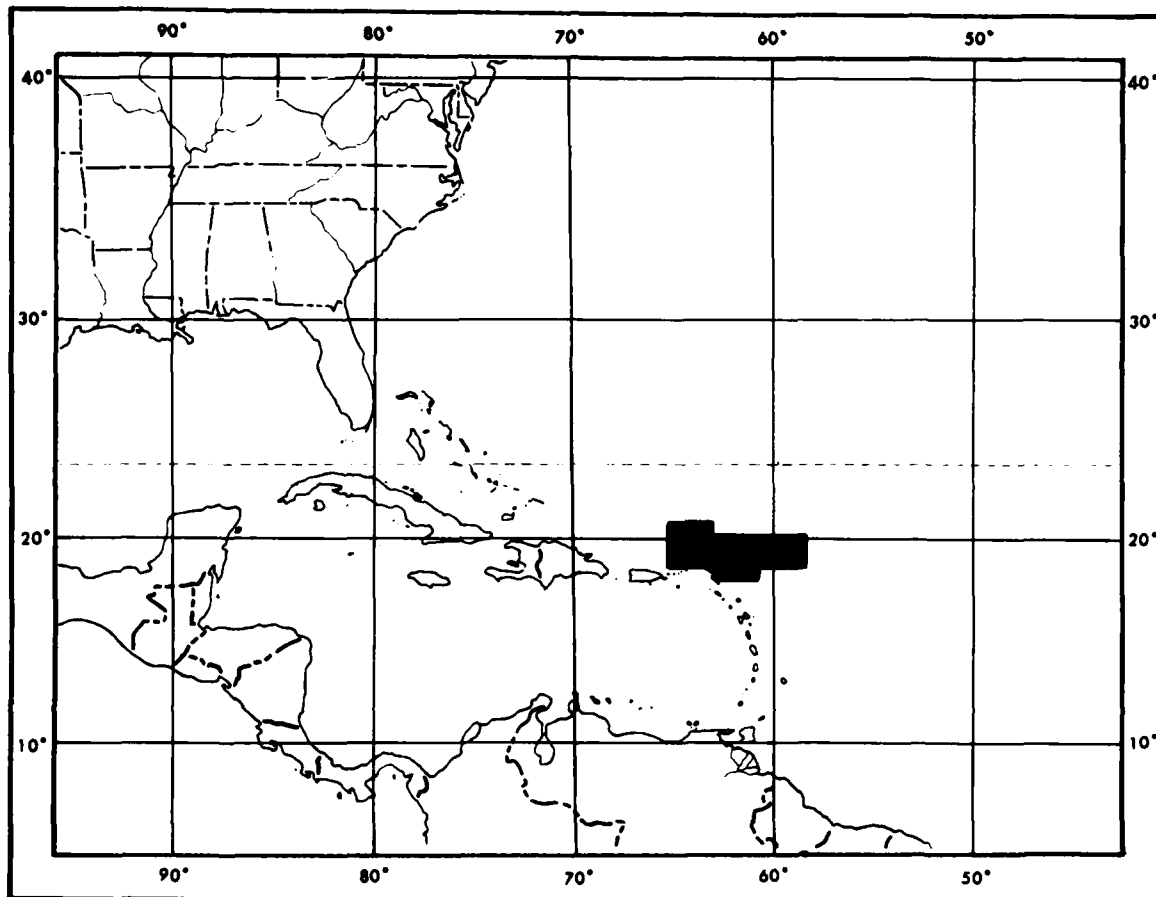
**MILES SURVEYED:** 13,500 nautical miles; an additional 7,600 square-mile coverage in 5 survey areas.

**TRACK PATTERN:** Single track; 5-10 mile spacing, N-S or NE-SW in survey areas.

**DATA FORMAT:** Total intensity and bathymetric contour charts; profile charts of magnetic intensity and bathymetry with ship's track.

**REPORTS:** Contour charts and profiles are presented in Informal Report H-4-66, "Geomagnetic Measurements in the Pacific Ocean Aboard USNS CHARLES H. DAVIS (AGOR 5), 1964."

## 20. ANTILLES ATLANTIC OCEAN SURVEYS



**SHIP:** USACS A. J. MYER

**SURVEY DATES:** September - December 1964

**NAVIGATIONAL CONTROL:** Lambda-Decca

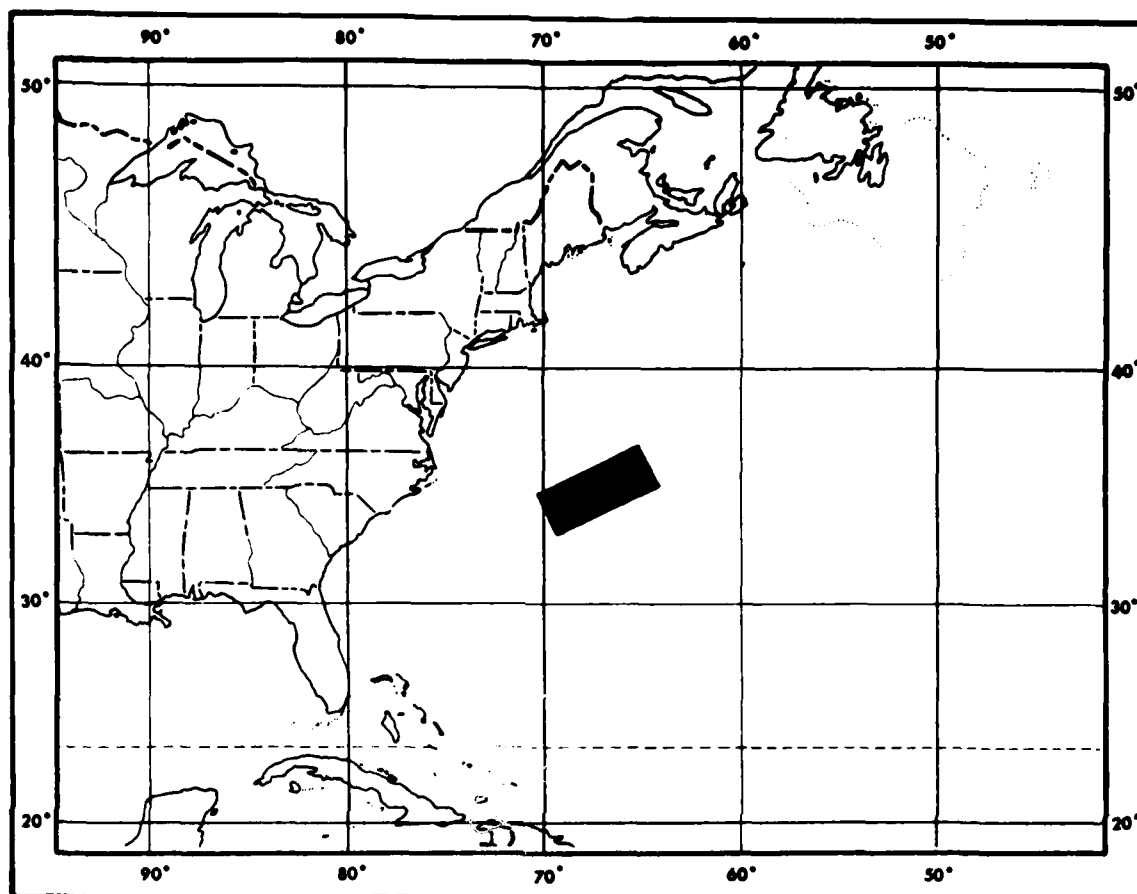
**MILES SURVEYED:** 41,000 square miles

**TRACK PATTERN:** 3 mile spacing; part N-S, part E-W orientation

**DATA FORMAT:** Total and residual intensity contour charts.

**REPORTS:** IR H-5-66, "Shipboard Magnetic Survey of an Area North of the Lesser Antilles."

## 21. AREA NORTHWEST OF BERMUDA (RECONNAISSANCE) SURVEY



**SHIP:** USNS GILLISS (AGOR-4)

**SURVEY DATES:** November - December 1964

**NAVIGATIONAL CONTROL:** Loran-A, celestial, dead reckoning

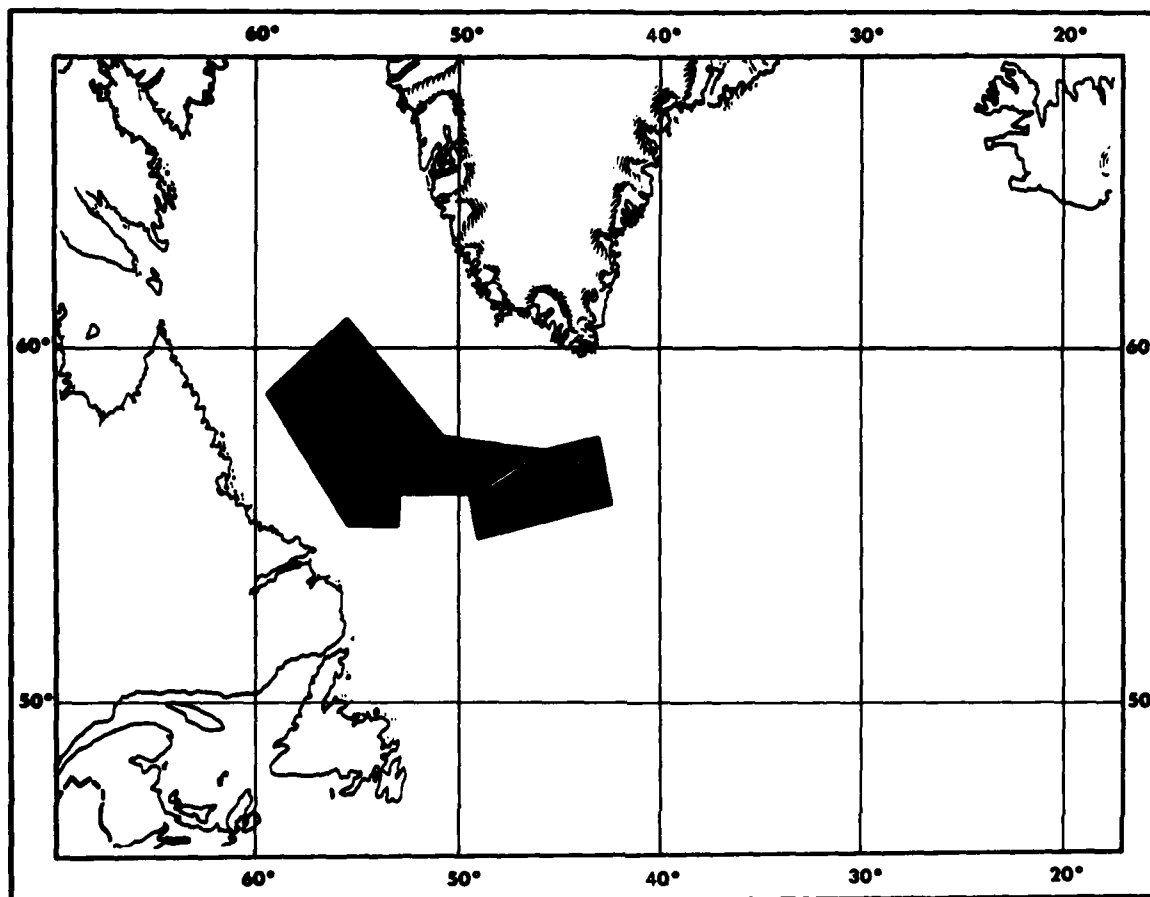
**MILES SURVEYED:** 30,000 square miles

**TRACK PATTERN:** Northwest-Southeast, 30-mile spacing

**DATA FORMAT:** Total intensity data plotted at 50-gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections; total magnetic intensity contour chart showing general magnetic characteristics.

**REPORTS:** Informal Report H-6-66, "Shipboard Magnetic Survey of an Area Northwest of Bermuda."

## 22. LABRADOR SEA SURVEY



**SHIP:** Various Naval Oceanographic Office Survey Ships

**SURVEY DATES:** 1966

**NAVIGATIONAL CONTROL:** Loran-C

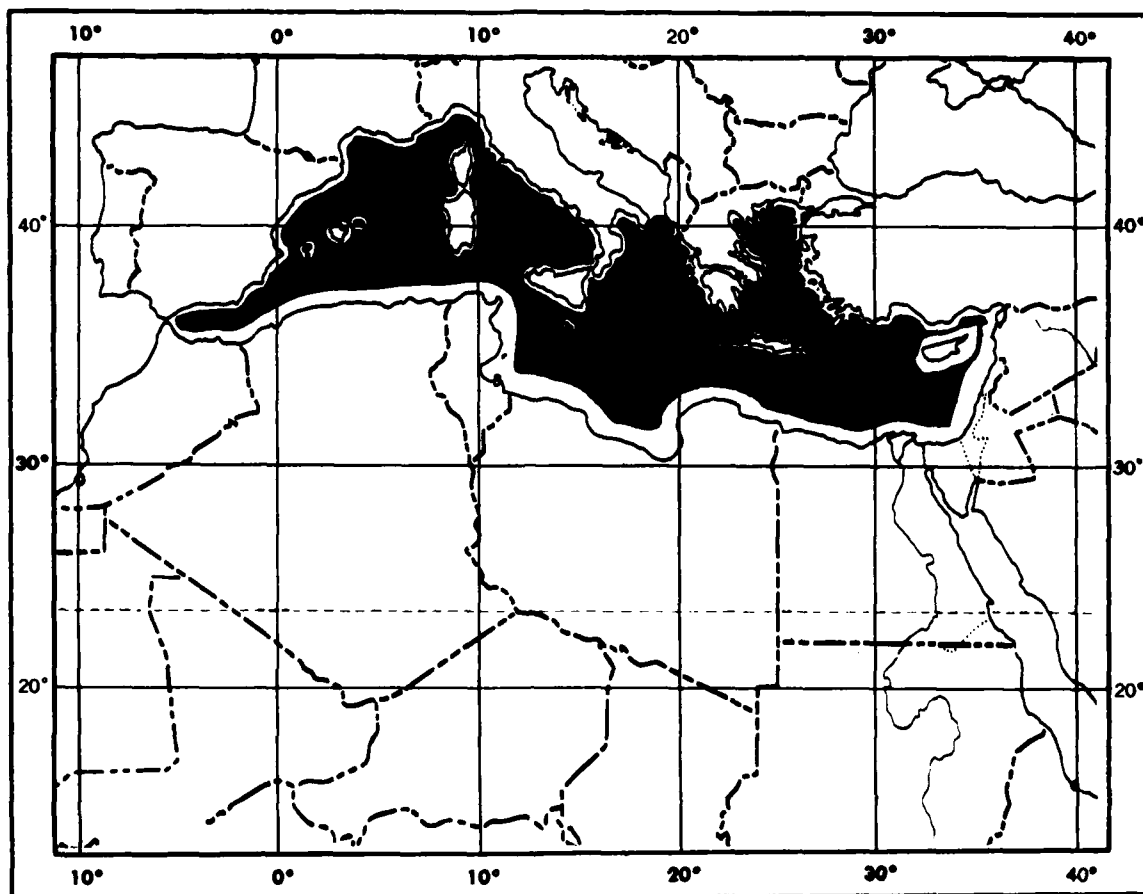
**MILES SURVEYED:** 87,000 square miles

**TRACK PATTERN:** 5 mile spacing, SW-NE orientation in southeastern section. 10 mile spacing, E-W orientation and NW-SE orientation in rest of area.

**DATA FORMAT:** Total magnetic intensity contour chart

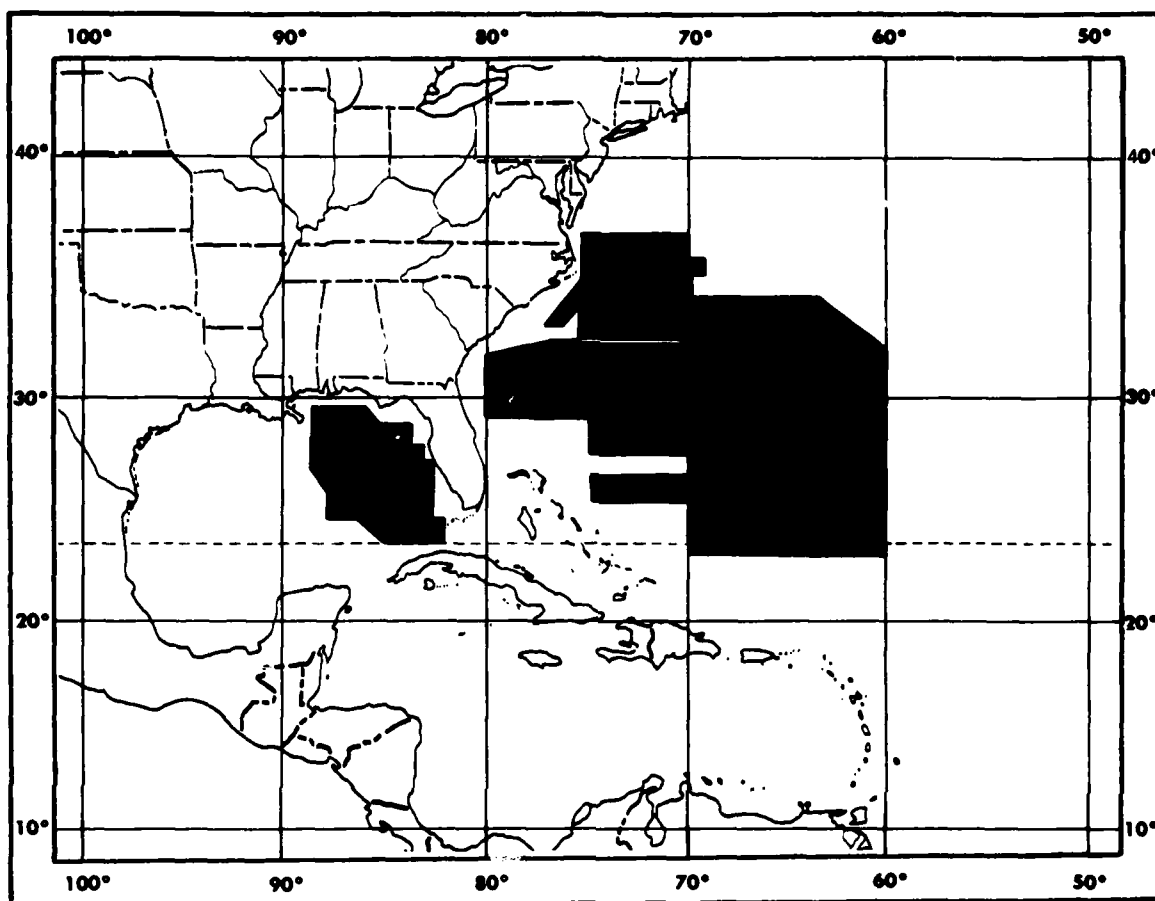
**REPORT:** "Detailed Magnetic Surveys in the Northeast Atlantic and Labrador Sea," J. Geophys. Res., V. 79, No. 2, p. 363-389, 1974.

### 23. MEDITERRANEAN SEA SURVEY



**SHIP:** Various Naval Oceanographic Office Survey Ships  
**SURVEY DATES:** 1966-1968  
**NAVIGATIONAL CONTROL:** Loran-C, satellite  
**MILES SURVEYED:** Approximately 600,000 square miles  
**TRACK PATTERN:** 5 mile spacing, E-W orientation with random cross-checks in Aegean Sea. 10 mile spacing, E-W orientation with random cross-checks in rest of the area.  
**DATA FORMAT:** Total and residual magnetic intensity contour charts

## 24. EASTERN GULF OF MEXICO AND NORTH AMERICAN BASIN SURVEY



**SHIP:** Various Naval Oceanographic Office Survey Ships

**SURVEY DATES:** 1967-1968

**NAVIGATIONAL CONTROL:** Loran-C, Lorac, Loran-A, satellite

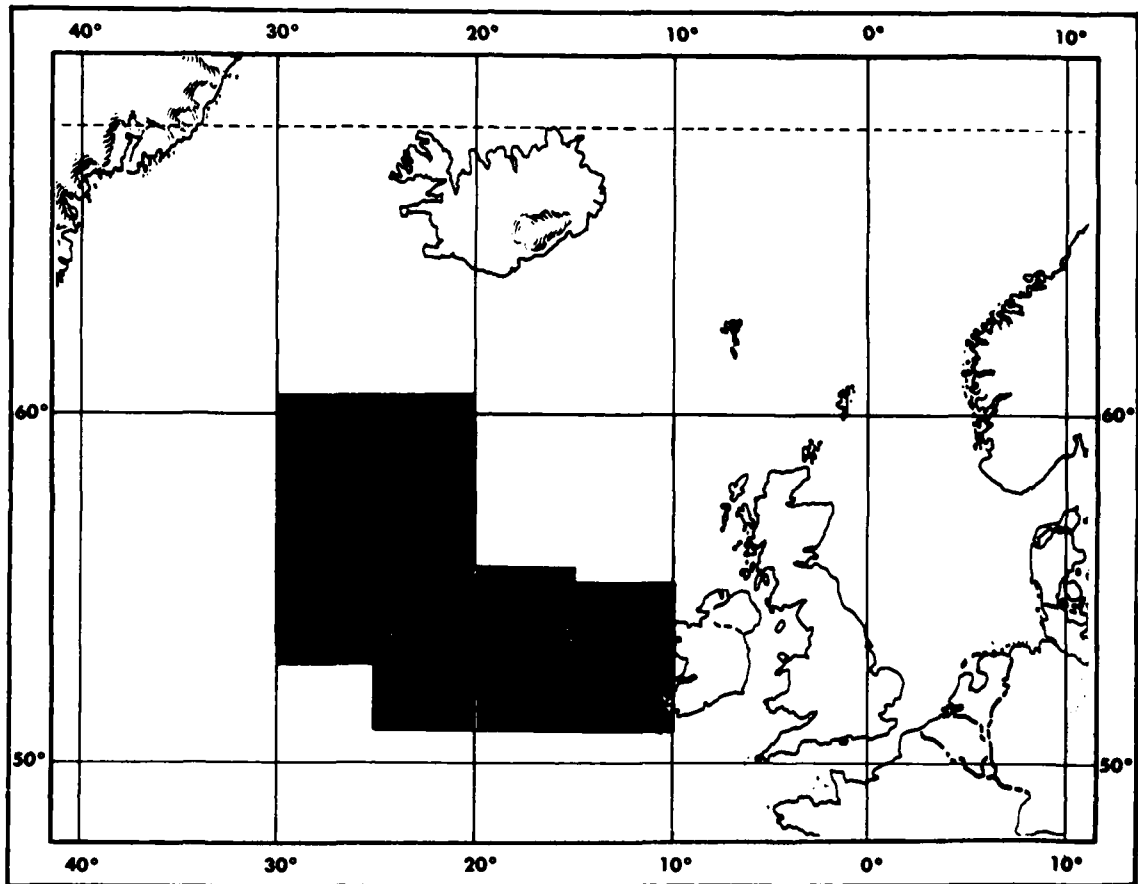
**MILES SURVEYED:** 630,000 square miles

**TRACK PATTERN:** 10 mile spacing, E-W orientation with random cross-checks in Gulf of Mexico and the area south of 32°N latitude and adjacent to the East Coast of the U.S. 20 mile spacing, E-W orientation with random cross-checks in the rest of the area.

**DATA FORMAT:** Total and residual contour charts for Eastern Gulf of Mexico. Residual magnetic intensity profiles of North American Basin survey presented in report below.

**REPORT:** "Mesozoic Magnetic Anomalies, Sea-Floor Spreading, and Geomagnetic Reversals in the Southwestern North Atlantic," J. Geophys. Res., V. 76, No. 20, p. 4796-4824, 1971.

## 25. NORTHEAST ATLANTIC SURVEY



**SHIP:** Various Naval Oceanographic Office Survey Ships

**SURVEY DATES:** 1967-1969

**NAVIGATIONAL CONTROL:** Loran-C, satellite

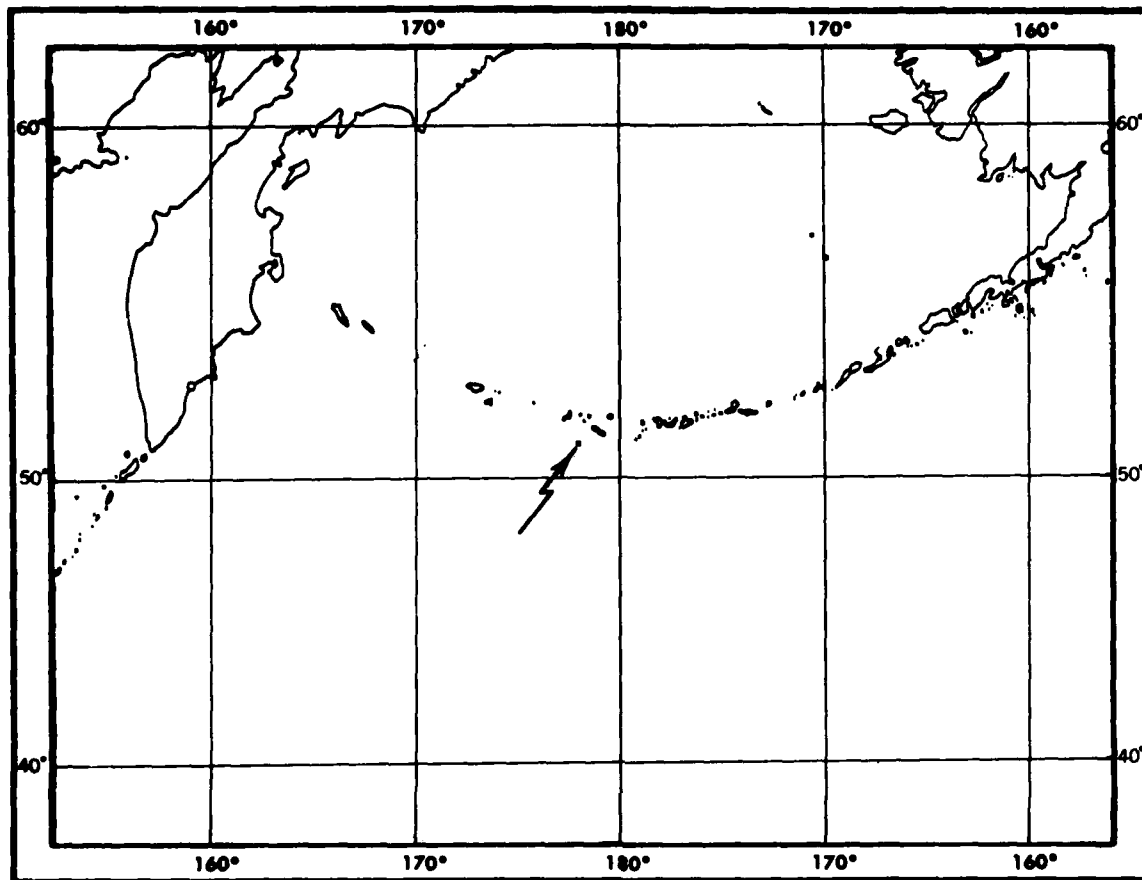
**MILES SURVEYED:** 325,000 square miles

**TRACK PATTERN:** 3 mile spacing, E-W orientation with N-S cross-checks at 15-30 mile spacing. Area from 51°N to 56°N latitude between 10°W and 20°W longitude; 6 mile spacing, E-W orientation, random N-S cross-checks.

**DATA FORMAT:** Residual magnetic intensity contour chart

**REPORT:** "Detailed Magnetic Surveys in the Northeast Atlantic and Labrador Sea," J. Geophys. Res., V. 79, No. 2 p. 363-389, 1974.

## 26. R. L. STEVENSON SEARCH



**SHIP:** USNS BENT

**SURVEY DATES:** August - September 1967

**NAVIGATIONAL CONTROL:** Loran-C and dead reckoning

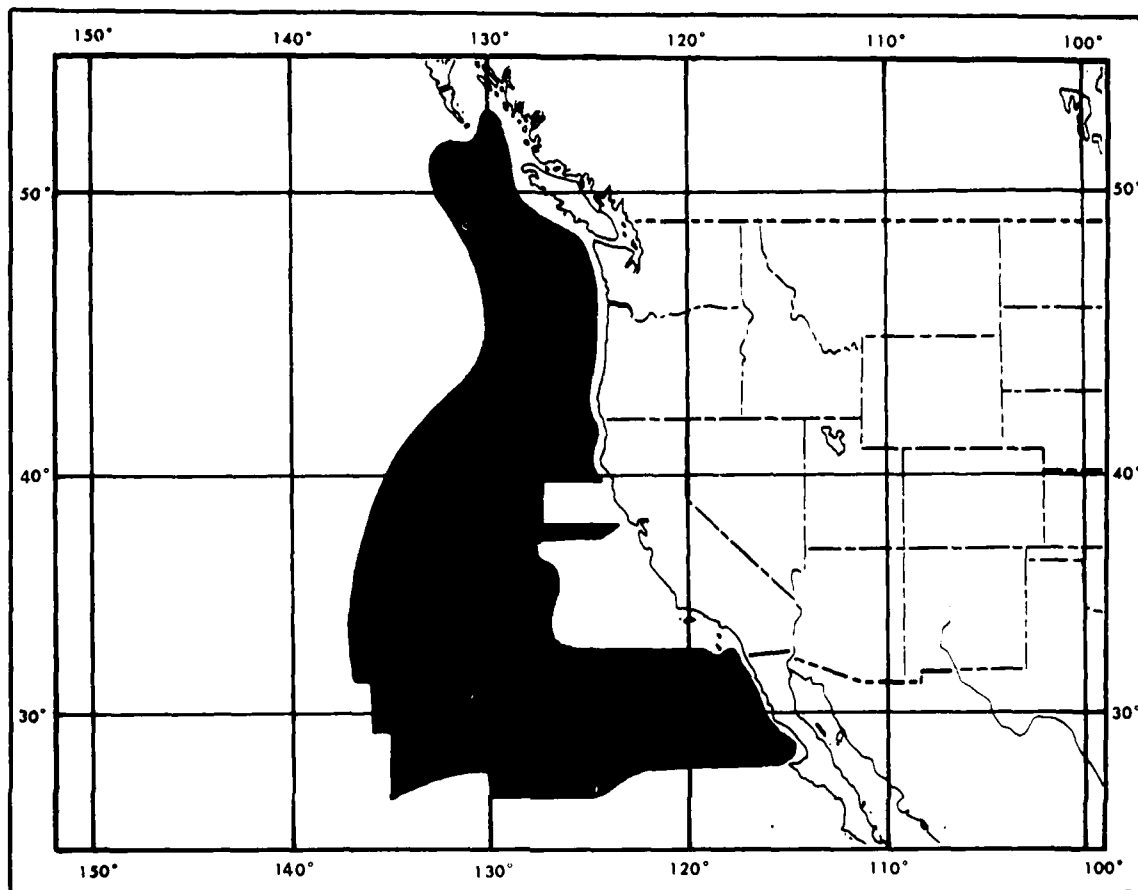
**MILES SURVEYED:** 5.3 square miles

**TRACK PATTERN:** Tracks vary in spacing and orientation

**DATA FORMAT:** Total magnetic intensity and bathymetric contour charts; magnetic and sonar profiles.

**REPORTS:** Sp-120, "Chase VI Search Operations." F. M. Daugherty, Jr. and Jerry C. Carroll. Search for the STEVENSON, Under Sea Technology, Vol. 9, No. 4, April 1968.

## 27. U.S. PACIFIC COAST SURVEY



**SHIP:** Various Naval Oceanographic Office Survey Ships  
**SURVEY DATES:** 1969  
**NAVIGATIONAL CONTROL:** Satellite  
**MILES SURVEYED:** 550,000 square miles  
**TRACK PATTERN:** 20 mile spacing, E-W orientation with random cross-checks  
**DATA FORMAT:** Residual magnetic intensity profiles plotted along ship's track on B.C. base.

#### IV. PRODUCTS

##### A. Reports

Reprints of papers published in technical journals cannot be provided by the U. S. Naval Oceanographic Office. The following reports may be ordered from the Defense Mapping Agency, Office of Distribution Services (DMAODS), Washington, DC 20315:

##### (1) Technical Reports

- |  |        |
|--|--------|
| * TRPUB105, "Operation Deep Freeze 61, 1960-1961 Marine Geophysical Investigations", June 1962 (AD #297 261)                     | \$1.25 |
| * TRPUB118, "Operation Deep Freeze 62, 1961-1962 Marine Geophysical Investigations", February 1965 (AD #462 114)                 | 1.25   |
| * TRPUB133, "A Marine Magnetic Survey off the East Coast of the United States", September 1962 (AD #402 248)                     | .40    |
| * TRPUB137, "A Marine Magnetic Survey South of the Hawaiian Islands", September 1962 (reprinted May 1965) (AD #400 322)          | .85    |
| * TRPUB144, "A Study of Aeromagnetic Component Data-Plantagenet Bank", G. A. Yound and A. L. Kontis, January 1964 (AD #433 023)  | .30    |
| * TRPUB159, "A Marine Magnetic Survey of the New England Seamount Chain", James E. Walczak, October 1963 (AD #437 916)           | .40    |
| * TRPUB160, "Marine Magnetic Survey off the Southern Bahamas", Dewey R. Bracey and Otis E. Avery, November 1963 (AD #427 762)    | .40    |
| * TRPUB161, "Geomagnetic and Bathymetric Profiles Across the North Atlantic Ocean", Otis E. Avery, November 1963 (AD #431 164)   | 1.35   |
| * TRPUB166, "A Study of Aeromagnetic Data - New England Seamount Area", A. L. Kontis and G. A. Young February 1965 (AD #614 117) | .70    |
| * TRPUB168, "Marine Magnetic Surveys in the Northwest Pacific Ocean", Dewey R. Bracey, September 1963 (AD #442 030)              | .25    |

\* Indicates publications that are no longer available from DMAODS, but they may be obtained from Defense Technical Information Center or National Technical Information Service, using AD numbers.

B. Charts

(1) Epoch 1980.0 World Magnetic Charts: These charts of the magnetic elements were compiled jointly by the U. S. Naval Oceanographic Office and the United Kingdom Institute of Geologic Sciences. The data base was compiled with the assistance of the National Oceanic and Atmospheric Administration. The world charts employ the Mercator projection, scale 1:39,000,000 at the Equator, and extend from 84°N to 70°S. The polar charts are printed on a polar stereographic projection, scale 1:10,000,000 at 71° and extend from 55° latitude to the poles. The Defense Mapping Agency, Hydrographic/Topographic Center publishes the Magnetic Variation Charts every five years (1970, 1975, 1980, etc.). The charts are available at \$1.50 each from the Defense Mapping Agency, Office of Distribution Services (DMAODS), Washington, DC 20315.

<u>Chart Title</u>	<u>N.O. Chart No.</u>
Magnetic Inclination or Dip, Epoch 1975.0	30*
Magnetic Horizontal Intensity, Epoch 1975.0	33*
Magnetic Vertical Intensity, Epoch 1975.0	36*
Magnetic Total Intensity, Epoch 1975.0	39*
Magnetic Variation, Epoch 1980.0	42** 43***
Magnetic Grid Variation, Epoch 1980.0	43***

\* World (Printed on Front Side of Chart); North and South Polar Regions (Reverse Side)

\*\* Printed on one side only.

\*\*\* North and South Polar Variation (Printed on Front Side)  
North and South Polar Grid Variation (Printed on Reverse Side)

(2) Preliminary Special Magnetic Survey Charts. The following preliminary charts, presenting data from special magnetic surveys, are available on request from the Magnetics Division, U. S. Naval Oceanographic Office, NSTL Station, Bay St. Louis, Mississippi 39522.

North Arabian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1961

Midway Islands Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

Westmann Islands Total Magnetic Intensity Contour Charts, Aeromagnetic Surveys, 1964 and 1966

Skagerrak Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958

St. Peter and St. Paul Rocks Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

Pensacola Gulf Coast Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1959

Guardian Bank Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Milwaukee Bank Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

North Magnetic Pole Inclination Contour Chart, Aeromagnetic Survey, 1960

South Magnetic Pole Inclination Contour Chart, Aeromagnetic Survey, 1960

Central South Dakota Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Viti Levu Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Eastern Mediterranean Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1957

Western Mediterranean Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958

Western Tyrrhenian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1957

Norwegian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958-1959

Gulf of San Miguel Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1966

Southern California Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1961

Total Magnetic Intensity Chart of South Vietnam, 1967

East China Sea Residual Magnetic Intensity Profiles, 1968

Taiwan Strait Total Magnetic Intensity Chart, 1968

East Coast Extension Total Magnetic Intensity Chart, 1966

Bahama Holiday Total Magnetic Intensity Chart, 1967

Palawan Island, Philippines Total Intensity Contour Chart, 1969

Korean Continental Shelf Total Intensity Contour Charts, 1969

Gulf of Alaska Total Magnetic Intensity Chart, 1969

Labrador Sea Total Magnetic Intensity Chart, 1966

Northeast Atlantic Residual Magnetic Intensity Chart, 1969

Southern Mariana Trench Combined Aeromagnetic and Marine Magnetic Total Intensity Chart, 1965

Eastern Gulf of Mexico Total and Residual Magnetic Intensity Contour Charts, 1968

Mediterranean Sea Total and Residual Intensity Contour Charts, 1968

Norwegian and Greenland Sea Residual Magnetic Intensity Contour Chart, 1973

U. S. Atlantic Coastal Region Aeromagnetic Survey, 1965

### C. Microfilm

The data listed below are available on microfilm and can be ordered from the Magnetics Division, U. S. Naval Oceanographic Office, NSTL Station, Bay St. Louis, Mississippi 39522. With the exception of the U. S. Atlantic Coastal Region Survey and the Southwest Pacific Survey, a microfilmed tabulation of aircraft altitude and position for each five minutes of time is included with each profile.

Tabulations of navigation positions for all tracks of the U. S. Atlantic Coastal Region Survey and Southwest Pacific Survey are contained on separate microfilm reels designated Reel Numbers 27A and 58A, respectively. Correlation with the microfilmed total intensity data is made by date and time.

Analog data which have not been microfilmed can be inspected upon prior arrangement with the Director of the Magnetics Division. The original data recordings, however, cannot be released outside the U. S. Naval Oceanographic Office.

#### (1) Microfilm Copies of Total Magnetic Intensity Analog Recordings from Special Surveys

Microfilmed analog recordings available for certain surveys listed in Section II are as follows:

Eastern and Western Mediterranean Sea Aeromagnetic Survey  
Page II-A-23, 24 Reel Numbers 10 through 12 --- \$ 18 per set

Norwegian Sea Aeromagnetic Survey  
Page II-A-25 Reel Numbers 13 through 18 --- \$ 36 per set

U. S. Atlantic Coastal Region Aeromagnetic Survey  
Page II-A-27 Reel Numbers 19 through 27  
and 27A --- \$ 60 per set

Southwest Pacific Survey  
Page II-B-17 Reel Numbers 39 through 58  
and 58A --- \$125 per set

Taiwan Strait Aeromagnetic Survey  
Page II-A-34 Reel Numbers 64 and 64A --- \$ 12 per set

Korean Continental Shelf Aeromagnetic Survey  
Page II-A-38 Reel Numbers 65 through 65B --- \$ 18 per set

Palawan Island Continental Shelf Survey  
Page II-A-39 Reel Number 66 --- \$ 6 per set

#### (2) Microfilm Copies of Project MAGNET Total Magnetic Intensity Analog Recordings

Microfilmed total intensity analog recordings are available for the regular Project MAGNET tracks. A microfilm index, which lists survey tracks

for each microfilm reel, and a track location chart are presented on the following pages and in the pocket.

Microfilm reel of Project MAGNET total intensity data  
\$6.00 each

Complete set of 24 reels:  
(Microfilm Reels 1 through 9, 28 through 38, 59 through 62)  
\$144.00 per set

MICROFILM REEL INDEX FOR PROJECT MAGNET TRACKS

Reel 1	Reel 1	Reel 2	Reel 2	Reel 3	Reel 4	Reel 4	Reel 5	Reel 5
P001	0005	0016	0063	0069	T006B	T108A	T203	140
P002	0006	0017	0064	0070	T008	T108B	T204	141
P003	0007	0018	0065	0071	T012	T109A	T205	201A
P004	0008	0019	0066	0072	T013	T109B	T206	201B
P005	0009	0020	0067	0073	T014	T112	T207	201C
P006	0010	0021	0068	0074	T015	T113	T208	203A
P007	0011	0022		0075	T015D	T114	T209	203B
P008	0012	0023		0076	T017A	T115*	T210	204A
P009	0013	0024		0077	T020	T116	T211	
P010	0014	0025		0078	T024	T201	T212	
P011	0015	0026		0079	T025	T202	T213	
P012		0027		0080	T026		T215	
P013		0028		0081	T028		T216	
P014		0029		0082	T030		T224A	
P015		0030		0083	T031		T224B	
P016		0031		0084	T032		T301	
P017		0032		0085	T033		T302	
P018		0033		0086	T034		T307	
P019		0034		0087	T035		T400	
P020		0035		0088	T041		T401	
P021		0036		0089	T042		T405	
P022		0037		T001A	T043		T406	
P023		0038		T001B	T044		T407	
P024		0039		T003A	T045		T410	
P025		0040		T003B	T046		T412	
P026		0041		T005	T047A		T413	
P027		0042		T006A	T047B		T414	
P028		0043			T058		T415	
P029		0044			T060		T501	
P030		0045			T061		102	
P031		0046			T062		104A	
P032		0047			T063		104B	
P033		0048			T064A		105A	
P034		0049			T064B		105B	
P035		0050			T065		106	
P036		0051			T066		107	
P037		0052			T069		108	
P038		0053			T074		109	
P039		0054			T075		110	
P040		0055			T076		111A	
P041		0056			T101		111B	
P042		0057			T102		112	
P043		0058			T103		113	
0001		0059			T104		114	
0002		0060			T105		115	
0003		0061			T106		123	
0004		0062			T107		126	

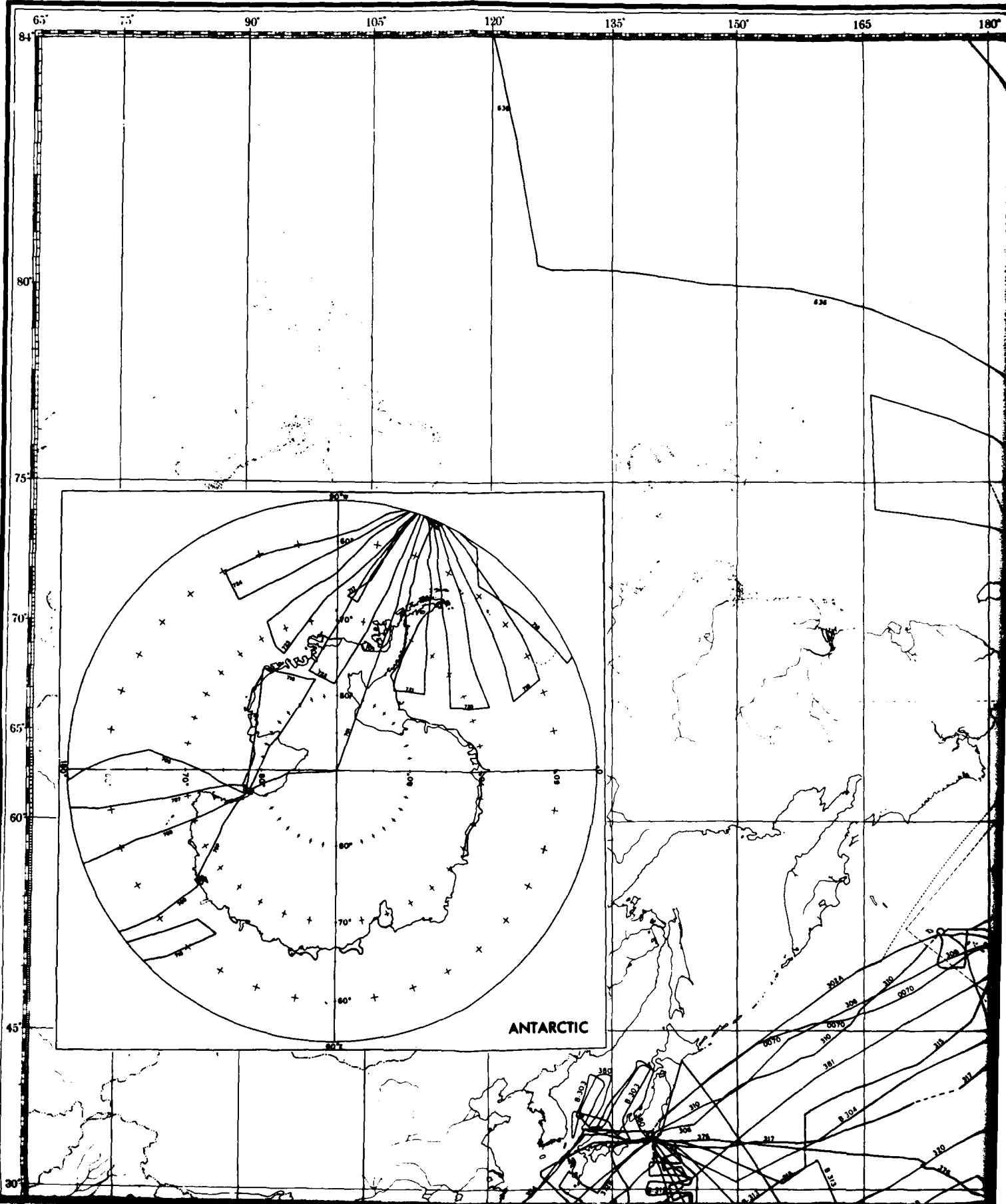
MICROFILM REEL INDEX FOR PROJECT MAGNET TRACKS

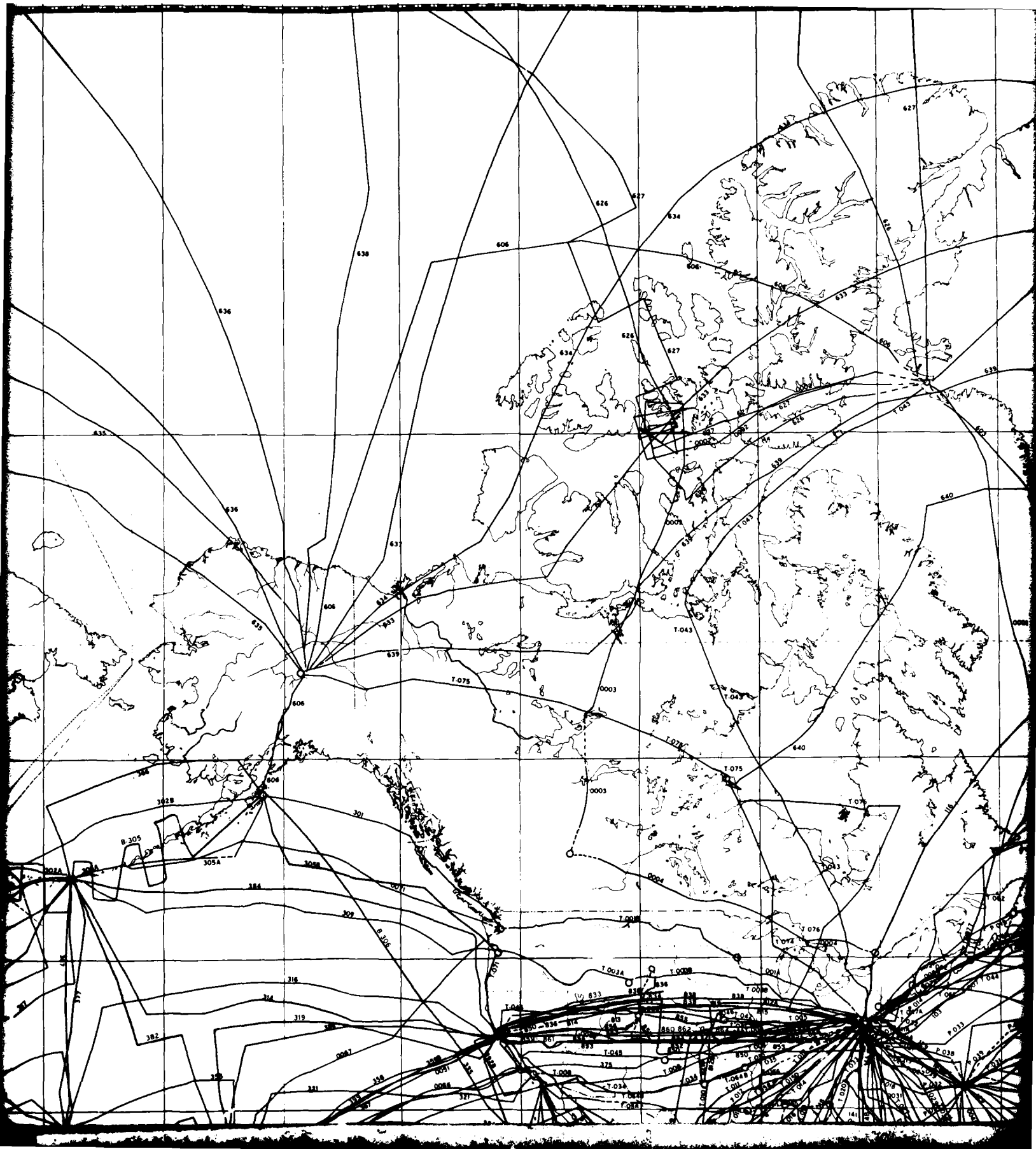
Reel 6	Reel 7	Reel 8	Reel 9	Reel 28	Reel 29	Reel 30	Reel 31	Reel 32
204B	343	437	604	103	202A	314	391	409
205A	344	440	606	129	202B	315	392A	427
205B	345	441	610A	129A	207	317	392B	429
206	345A	442	610B	149	208	305B	328	433
211	347	443	613	150	212	346	331	453
215	348	444	626	101A	213	351	332	454
217	349	445	627	127	219	363	333	403
218	350	447	633	128	226	366	335	406
301	353	449	634	142	227	368	337	410
302A	354	450	635	147B	228	371	339	412
302B	355	451A	636	148B	229	369	352	420
304	356	451B	637		209	372A	367	422
305A	357	452	638		210	372B	373	423
306	358	501	639		214	376**	384	424
307	359A	503	640		216	377	385	435
308	359B	505	701		221	383	386	438
308B	360	507	706		222A		388	439
308C	361	509	707		230		389	446
309	362A	510	708		231		390	458
310	362B	511	709		231A			459
311	364	512	715		232			460
312	375	512B	716					461
316	401	513	717					462
318	402	514B						463
320	404	515C						
321	405	516A						
322A	407	517						
322B	408	520						
323B	411	521						
324	415	523						
325A	416	526						
325B	421	527						
326	425	529						
327A	426	530						
329	428	531						
330	431	532						
334	432	533						
336	434	534						
338	436	537						
340		538						
341		540						
342		540A						
		543						
		544						
		603						

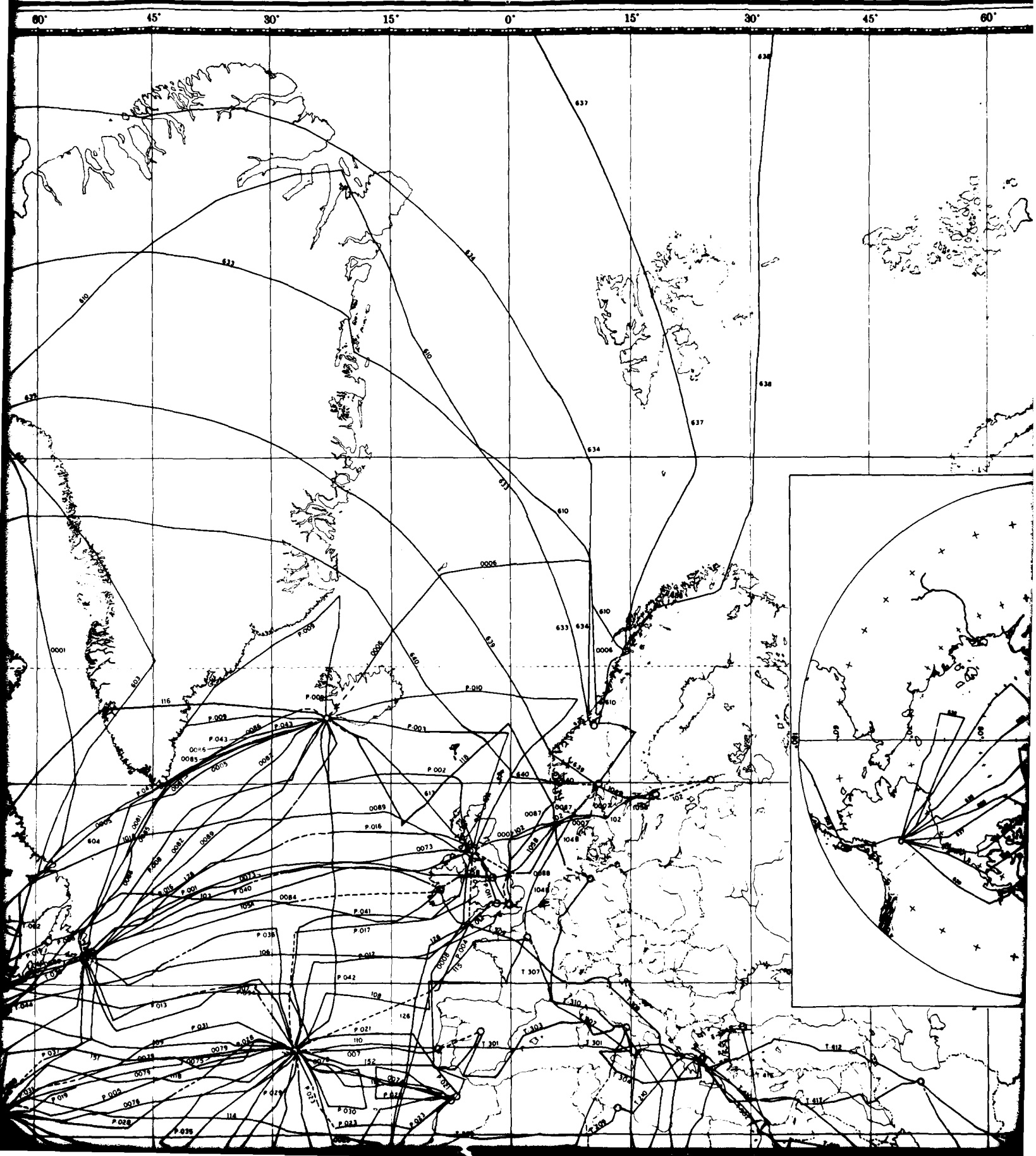
MICROFILM REEL LIST FOR PROJECT MAGNET TRACKS

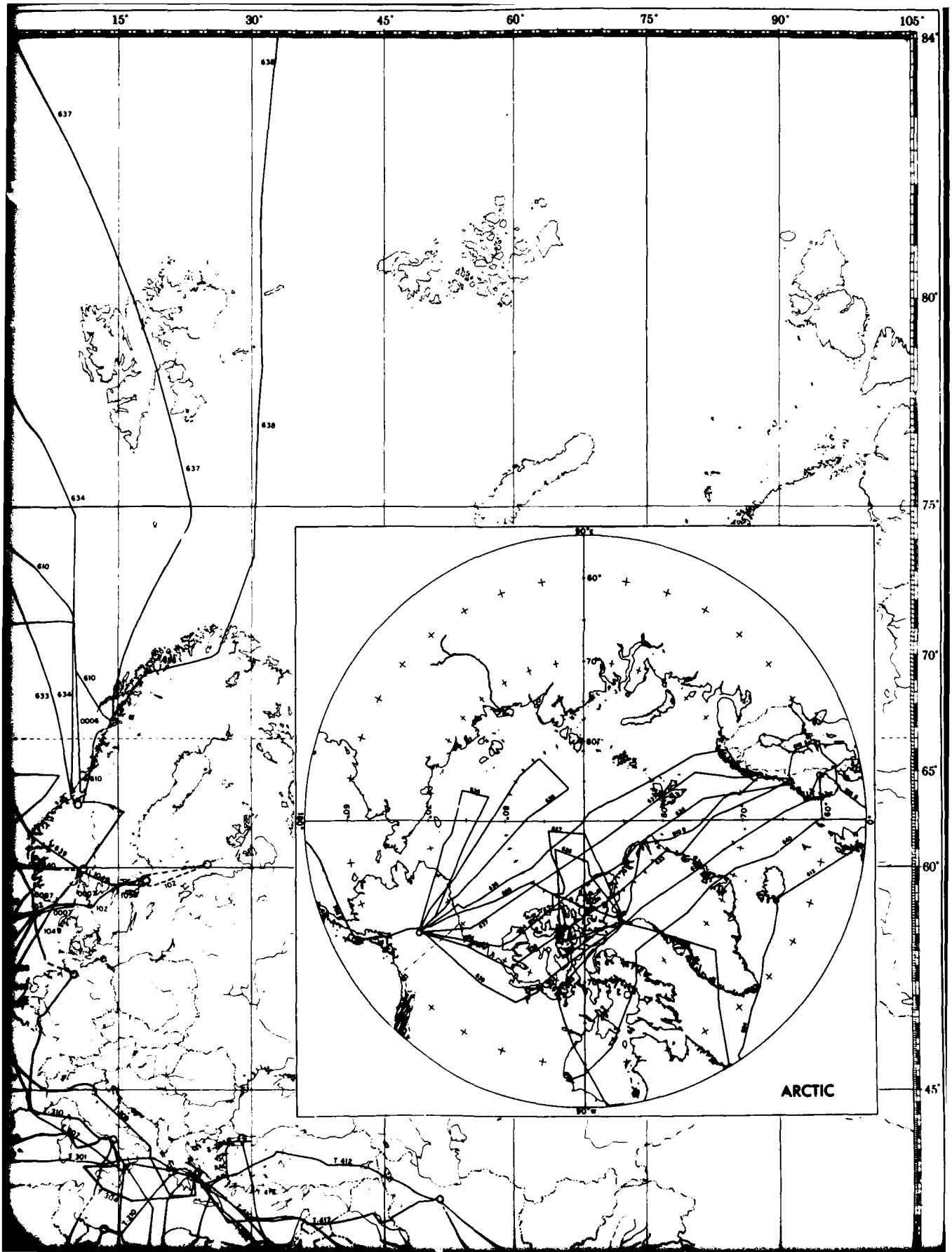
<u>Reel</u> <u>33</u>	<u>Reel</u> <u>34</u>	<u>Reel</u> <u>35</u>	<u>Reel</u> <u>36</u>	<u>Reel</u> <u>37</u>	<u>Reel</u> <u>38</u>	<u>Reel</u> <u>59</u>	<u>Reel</u> <u>60</u>	<u>Reel</u> <u>61</u>	<u>Reel</u> <u>62</u>
502	718	812A	912	T009	T018	116	B311	393	563A
506	719	812B	913	T010	T049	118	B312	394	563B
524	720	814	915***	T011	T071	122	B313	395	833
539	721	815	916***	T016	T073	131	B314	396	834
541	722	836	917***	T019	T111	151	B315	397	835
542	723	851		T027	T126	152	B316	398	859
549	724	852		T029	T218	222	319	399	860
549A		853		T077	T219A	223	365	455	861
550		854		T078	T219B	224	374	456	862
551		855		T079	T220	225	378	457	864
552		856		T110	T225	237	379	504	901
516B		857		T117	T309	239	380	508	T023
518		858		T119	T416	B301	381	536	T024B
519		813		T124	T417	B302	382	553	T048
522		838		T125	T502	B303	387	554	T120
525		850		T222	T504	B304		555	T121
528					T505	B305		556	T122
535						B306		561	T123
545						B309		562	T137
546						B310			T217
547									T303
548									T304
									T305
									T310
									T311
									T402
									T411

\* Panama Survey  
 \*\* Milwaukee Bank Survey  
 \*\*\* Gulf of San Miguel Survey









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