

U. S. DEPARTMENT OF COMMERCE  
WEATHER BUREAU

~~HYDROMETEOROLOGICAL SECTION~~

KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 2.3

OCEAN STATION VESSEL  
METEOROLOGICAL RECORDS SURVEY  
ATLANTIC AND PACIFIC



U. S. DEPARTMENT OF COMMERCE  
SINCLAIR WEEKS, Secretary  
WEATHER BUREAU  
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## PREFACE

The increase of marine commerce and of trans-oceanic aviation through the years has led to the establishment of a number of weather observing stations on the high seas. The function of each ocean station is primarily operational for air and sea commerce and also for rescue duty, yet at the same time, an opportunity is presented for other scientific work to be maintained. In general, both meteorological and oceanographic observations are made aboard ship. The meteorological observations on the United States ocean station vessels are made by United States Weather Bureau personnel aboard Coast Guard Cutters. During the war, these stations were manned by the United States Navy. The recorded observations consist of eight surface reports, four upper-wind and two upper-air (radiosonde) observations per day. The oceanographic observations, in the main, consist of bathythermograph observations and sonic depth soundings. To carry out the operational side of their function, the ocean stations transmit the meteorological data to receiving stations on shore for further dissemination and also maintain weather watches for aircraft in flight.

In order to serve best the changing needs of commerce within the limitations imposed by ships and funds, it has been necessary to revamp the system of observation points from time to time. Because of this, the names of ship station positions may not bear any continuous and direct relationship to a fixed location. The amount of data that has been collected so far since 1940 in this program and the needs of research require that the data and all pertinent information be catalogued.

Therefore, a survey of all records on file at the National Weather Records Center (NWRC) from ships operating ocean weather stations has been effected. It presents the following information:

1. At what points and times data are available.
2. What types of data are available; i.e., surface observations, upper-wind, and/or upper-air (radiosonde) observations.
3. On what record forms these meteorological data are entered; and
4. Whether or not these data are available in punched cards.

These four items, therefore, compose the bulk of the survey of the available observational data recorded under the Ocean Station Vessel Program and are summarized in the form of detailed Ocean Station Vessel Record Survey Sheets. The survey cannot, of course, include all pertinent information concerning stations manned by other than U. S. ships. All information available, though, on ships not of U. S. registry is included so as to present as complete and accurate a picture as possible for the entire program. It must be mentioned here that no oceanographic data except that of sea temperature and bathythermograph reports from Pacific Stations "X" and "T" and the Marine Life Research Vessel M/V Crest are on file at the National Weather Records Center. The portion of the survey encompassed in this report covers the period which began in January, 1940, and ended December, 1952. However, the survey continues and will be kept current. It is planned that periodic reports of available data will be made. These will be generally in the form of addenda to this publication.

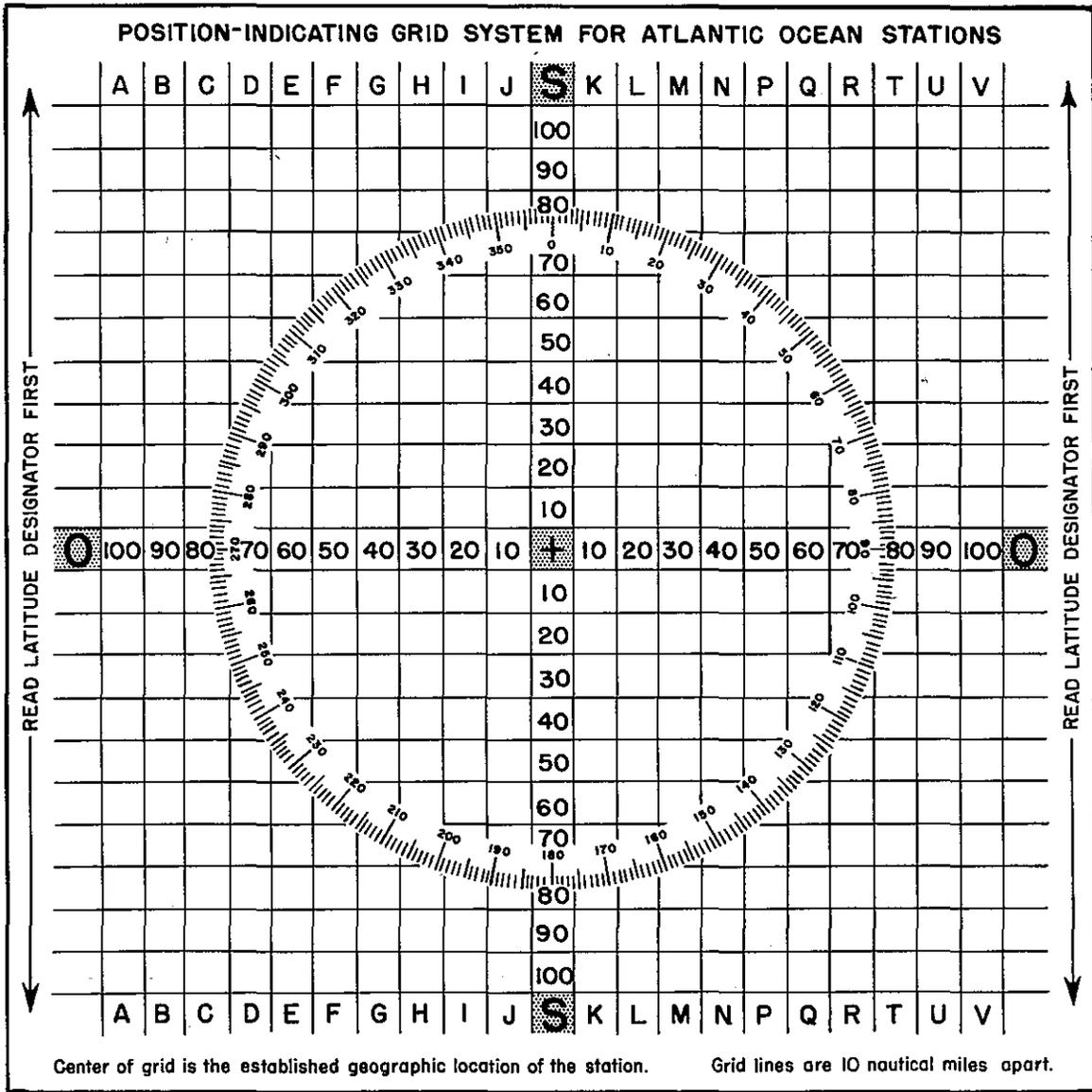
To effect the survey of past records accurately it has been necessary to make a study of the available publications concerning ocean weather stations. From this research the following history and accompanying charts developed. These are herewith presented as an accurate account of the Ocean Weather Station Program in the North Atlantic and Pacific Oceans.

These data were compiled and edited by Harold L. Crutcher and Georgia C. Whiting of the National Weather Records Center, Asheville, N. C.

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POSITION-INDICATING GRID SYSTEM FOR ATLANTIC OCEAN STATIONS



9/15/54

TIME CONVERSION TABLE

East													West														
Octants													Octants														
International Time Zones	Z	A	B	C	D	E	F	G	H	I	K	L	M	Y	X	W	V	U	T	S	R	Q	P	O	N	Z	International Time Zones
Meridian $\pm 7.5^\circ$	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°	180°	165°	150°	135°	120°	105°	90°	75°	60°	45°	30°	15°	0°	Meridian $\pm 7.5^\circ$
To Convert to Greenwich	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	+12	+11	+10	+9	+8	+7	+6	+5	+4	+3	+2	+1	0	To Convert to Greenwich
LST	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	GCT	LST									
00	23	22	21	20	19	18	17	16	15	14	13	12		12	11	10	09	08	07	06	05	04	03	02	01	00	
01	00	23	22	21	20	19	18	17	16	15	14	13		13	12	11	10	09	08	07	06	05	04	03	02	01	
02	01	00	23	22	21	20	19	18	17	16	15	14		14	13	12	11	10	09	08	07	06	05	04	03	02	
03	02	01	00	23	22	21	20	19	18	17	16	15		15	14	13	12	11	10	09	08	07	06	05	04	03	
04	03	02	01	00	23	22	21	20	19	18	17	16		16	15	14	13	12	11	10	09	08	07	06	05	04	
05	04	03	02	01	00	23	22	21	20	19	18	17		17	16	15	14	13	12	11	10	09	08	07	06	05	
06	05	04	03	02	01	00	23	22	21	20	19	18		18	17	16	15	14	13	12	11	10	09	08	07	06	
07	06	05	04	03	02	01	00	23	22	21	20	19		19	18	17	16	15	14	13	12	11	10	09	08	07	
08	07	06	05	04	03	02	01	00	23	22	21	20		20	19	18	17	16	15	14	13	12	11	10	09	08	
09	08	07	06	05	04	03	02	01	00	23	22	21		21	20	19	18	17	16	15	14	13	12	11	10	09	
10	09	08	07	06	05	04	03	02	01	00	23	22		22	21	20	19	18	17	16	15	14	13	12	11	10	
11	10	09	08	07	06	05	04	03	02	01	00	23		23	22	21	20	19	18	17	16	15	14	13	12	11	
12	11	10	09	08	07	06	05	04	03	02	01	00		00	23	22	21	20	19	18	17	16	15	14	13	12	
13	12	11	10	09	08	07	06	05	04	03	02	01		01	00	23	22	21	20	19	18	17	16	15	14	13	
14	13	12	11	10	09	08	07	06	05	04	03	02		02	01	00	23	22	21	20	19	18	17	16	15	14	
15	14	13	12	11	10	09	08	07	06	05	04	03		03	02	01	00	23	22	21	20	19	18	17	16	15	
16	15	14	13	12	11	10	09	08	07	06	05	04		04	03	02	01	00	23	22	21	20	19	18	17	16	
17	16	15	14	13	12	11	10	09	08	07	06	05		05	04	03	02	01	00	23	22	21	20	19	18	17	
18	17	16	15	14	13	12	11	10	09	08	07	06		06	05	04	03	02	01	00	23	22	21	20	19	18	
19	18	17	16	15	14	13	12	11	10	09	08	07		07	06	05	04	03	02	01	00	23	22	21	20	19	
20	19	18	17	16	15	14	13	12	11	10	09	08		08	07	06	05	04	03	02	01	00	23	22	21	20	
21	20	19	18	17	16	15	14	13	12	11	10	09		09	08	07	06	05	04	03	02	01	00	23	22	21	
22	21	20	19	18	17	16	15	14	13	12	11	10		10	09	08	07	06	05	04	03	02	01	00	23	22	
23	22	21	20	19	18	17	16	15	14	13	12	11		11	10	09	08	07	06	05	04	03	02	01	00	23	

Previous Day

International Date Line

Next Day

- Atlantic Standard Time -- 60°W add 4 hrs.
- Eastern " " E 75°W " 5 "
- Central " " C 90°W " 6 "
- Mountain " " M 105°W " 7 "
- Pacific " " P 120°W " 8 "
- Yukon " " Y 135°W " 9 "
- Alaskan " " A 150°W " 10 "
- Bering " " B 165°W " 11 "

To convert LST to GCT read down the LST column to the hour given, then across to the GCT column on the correct meridian. To convert GCT to LST read down the GCT column on the correct meridian, then across to the LST column.

This conversion table holds true for large bodies of water, but land zones are not consistent for various boundary reasons. For conversion on land areas a chart showing the time zone boundaries should be consulted.

SECTION ONE

SECTION ONE

PART I

U. S. WEATHER BUREAU HISTORY

of

ATLANTIC OCEAN WEATHER STATIONS

1940-1952

## HISTORY OF ATLANTIC OCEAN WEATHER STATIONS

### HISTORY PRIOR TO 1940

In the early years of the maritime observing program, weather information received from various ships was sent more-or-less on a voluntary basis. The only definite program involving prescribed areas that had been established was to study ice, particularly icebergs and the ocean currents that affected iceberg movement.

At the meeting of the International Meteorological Committee held in London, September 12-18, 1921, Col. Delcambre, Director of the Meteorological Service of France, stressed the necessity for establishing a stationary ship located in the North Atlantic between 47°N and 49°N, 25°W and 35°W for purposes of weather observations and forecasting to benefit merchant shipping and transatlantic air navigation that gave promise of expansion in the future. Between 1921 and 1937 the French Meteorological Service did equip a training ship, the "Jacques-Cartier", and later other merchant vessels in order that such ships might make six-hourly surface weather observations in the North Atlantic and transmit to Paris their own observations and those which they could collect from other merchant ships. Between July, 1937, and September, 1939, the French Meteorological Service had one weather ship in operation at 38°N 44°W making four cruises covering a period of three consecutive months of duty. The fifth cruise was interrupted by World War II. Germany also had a weather observational ship in the South Atlantic between Africa and South America.

The initiation of an international weather service began with The International Conference on Safety of Life at Sea, "Convention and Final Act", which was signed in London, May 31, 1929. At this conference, it was decided that information concerning tropical storms was to be transmitted from any ship encountering such storms. This was to include: (a) position and movement of the storms, (b) barometric pressure, (c) barometric change during the previous two to four hours prior to the storm, (d) wind direction, (e) wind force, (f) state of sea, and (g) sea swell. Reports were to be transmitted every three hours (desired, but not obligatory) thereafter as long as a ship remained under the influence of the storm. Also certain selected ships were to take meteorological observations at specified hours for the benefit of other ships and various official meteorological services.

Surface weather reports which had normally been transmitted by transatlantic shipping were discontinued at the onset of World War II in Europe in 1939. To protect their own shipping, belligerent nations required radio silence. The passage of the Neutrality Act then stopped U. S. shipping in the European trade. The result was that practically no weather reports at all were being received from the North Atlantic Ocean area. At the same time, American transoceanic flying was increasing and this activity required complete and accurate weather information. There was thus a manifest need for an Atlantic weather observational service with ships placed strategically in order to provide the necessary meteorological data.

### HISTORY - 1940 THROUGH 1952

In January, 1940, at the request of the Secretary of Agriculture (for the U. S. Weather Bureau), the President ordered Coast Guard cutters performing neutrality patrol off the Grand Banks withdrawn from the patrol and directed the Coast Guard to establish ocean weather stations with them. This directly followed the sinking by enemy action of two ocean weather observational stations operated by the United Kingdom. Two stations were established February 10, 1940, namely, Atlantic "1" and "2" at 35.6°N 53.3°W and 37.7°N 41.2°W, respectively, between Bermuda and The Azores, with the Coast Guard providing the ships and communications facilities and the Weather Bureau, the meteorological personnel and equipment. Originally, a ship "station" included the area within a 100-mile radius of an assigned central point. The war proved this impractical so this limit was discarded. After the war to assist ships in carrying out their function as aids to surface and air navigation, the shape of the "station" was changed to a square, 210 nautical miles on a side with sub-squares 10 miles on a side (see Diagram of Station Square Page iv). Weather reports from the ships were considered "on station" within the limits of the 210-mile square.

In 1942, fighter planes were being flown across the Atlantic by way of a chain of U. S. Army airdromes then bridging the ocean from Labrador to Greenland, thence to Iceland. This new northern route required two more plane guard or flight security positions along the routes of flight to be established. Therefore, two plane guard stations, "A" and "B" at approximate positions of 58°N 52°W between Labrador and Greenland and 63°N 31.5°W between Greenland and Iceland, were established. Plane guard stations were established primarily for air-sea rescue and navigational purposes and not to obtain meteorological data as a part of the ocean weather program. Therefore, few meteorological records have been obtained from such stations.

The number and locations of ocean weather stations manned by U. S. ships were originally determined by the Weather Bureau in consultation with the commercial airlines. With the advent of the war, these were determined by the cognizant committees under the Joint Chiefs of Staff, primarily the Meteorological Committee, of which the Weather Bureau was a member. With the establishment of the Air Coordinating Committee, that body recommended and approved the number and locations of stations. For various reasons, the period of record for some of the stations is exceedingly short and the data from such may not be sufficient to provide material for complete climatic analysis. The locations of Atlantic "1" and "2" were changed several times during the early years of the war as the increase of air transportation demanded different routes of flight. Even these positions could not be maintained consistently because of enemy submarines and rescue duty so that much of the time these two stations were moving. In fact, from September, 1942, to March, 1944, ships operating Atlantic "2" shuttled back and forth between approximately 50.5°N 41.5°W and 57.0°N 49.5°W. Nevertheless, these two stations ("1" and "2") continued to operate through 1943. In January, 1944, Atlantic "3" was activated at 43°N 38°W between Newfoundland and The Azores and in March, "4" at 54.0°N 44.5°W between Newfoundland and Iceland near position of "2". "2" was then moved to a new position of 37°N 40°W.

The operational control of the entire weather patrol was assumed by the Navy for reasons of military security and exercise of command in the Atlantic Ocean in March, 1944. The United States stations in the North Atlantic were operated by Task Force 24 with about 26 cutters.

In March, 1944, the U. S. Army requested two additional stations, and in May, these were designated as Plane Guard Stations "C" and "G" at 58°N 37°W and 50°N 34°W, respectively. "G" was established May 24, 1944, but "C" was not established until November 4, 1944, because of the shortage of ships. Also in May, 1944, the British Navy established two ship weather stations of which there are no records available. In June, 1944, just prior to the invasion of Normandy, Plane Guard Stations "A", "B", and "C" were redesignated "6", "7", and "8", respectively, at the request of the Commander of Task Force 24. However, as stated before, "8" (C) was not established as a weather station until November, 1944, and no records are available before that time. "6" (A) was not operated as a weather station until April, 1945.

On October 21, 1944, the numerical system of classification was effected for all stations and plane guard stations were to assume duties of ocean weather stations in their entirety; therefore, Plane Guard Station "G" became "5" and Plane Guard Station "C" became "8", and these two were then known as ocean weather stations. However, "6" and "7" were still known as plane guard stations. It will be noted here that the numerical and alphabetical systems of classification do not coincide consecutively since Stations "1", "2", "3", and "4", and Plane Guard "A", "B", "C", and "G" were in operation at the same time. It follows, then, that when all stations were redesignated numerically the numerals would follow in order those already assigned. However, it is to be admitted that it is not known why "G" was assigned at this time and later designated "5". Positions for Plane Guard "D", "E", and "F" may have been assigned but not operated. It may have been also that the British operated plane guard stations from which we have no records, and which were designated those letters between "C" and "G". The positions at this time were as follows on November 15, 1944:

1	- 34.0°N	55.0°W	
2	- 37.0°N	40.0°W	
3	- 43.0°N	38.0°W	
4	- 54.0°N	44.5°W	
5	- 50.0°N	34.0°W	
*6	- 58.0°N	52.0°W	(Plane Guard)
*7	- 63.0°N	31.5°W	(Plane Guard)
8	- 58.0°N	37.0°W	

\*It will again be emphasized here that, although "A" and "B" had been redesignated numerically "6" and "7", they remained plane guard stations. In March, 1945, "7" was renamed "Fox", and in April, "6" assumed duties as a weather observing station. Weather records of plane guard stations are not available except from Plane Guard "G" and Plane Guard "Fox".

There were two major changes in the Ocean Weather Station Program. First, after VE Day in May, 1945, the biggest movement of aircraft in history began across the North and South Atlantic to the Pacific war theater. This precipitated the formulation of plans for the immediate expansion of the ocean weather meteorological service. In order to safeguard the tremendous increase in air traffic involved in the redeployment of allied air forces, the Combined Chiefs of Staff directed an immediate increase in the number of ocean weather stations. Therefore, on May 15, 1945, the eight existing stations were, for the most part, relocated and two new positions were established. Station "2" at 37°N 40°W and Plane Guard Station "Fox" at 63°N 31.5°W were closed and new position 60.5°N 33.0°W was designated "2" and became a weather station. New stations "7" at 41.5°N 37.0°W and "9" at 35.5°N 40.0°W were established. In June, 1945, two more stations were added. They were as follows:

10	- 36.0°N	70.0°W
11	- 29.5°N	71.5°W

In May and June, 1945, stations near the equator in both the North and South Atlantic were established and operated by the Commander, South Atlantic Fleet (COMSOLANT). Both United States and Brazilian ships manned these stations.

In June, 1945, therefore, the following stations were operated in the Atlantic by the countries contributing to the program:

1 - 56°30'N	51°00'W	by United States of America
2 - 60°30'N	33°00'W	by United States of America
3 - 55°30'N	44°00'W	by United States of America
4 - 51°00'N	42°00'W	by United States of America
5 - 52°30'N	30°00'W	by United States of America
6 - 44°30'N	46°00'W	by United States of America
7 - 41°30'N	37°00'W	by United States of America
8 - 34°00'N	52°00'W	by United States of America
9 - 35°30'N	40°00'W	by United States of America
10 - 36°00'N	70°00'W	by United States of America
11 - 29°30'N	71°30'W	by United States of America
12 - 05°00'N	26°00'W	COMSOLANT (with U. S. and Brazilian vessels)
13 - 00°00'N	30°00'W	COMSOLANT (with Brazilian vessels)
14 - 06°30'S	28°30'W	COMSOLANT (with U. S. and Brazilian vessels)
15 - 07°30'S	21°30'W	COMSOLANT (with Brazilian vessels)
16 - 60°40'N	13°40'W	by United Kingdom
17 - 53°50'N	18°38'W	by United Kingdom
18 - 45°00'N	16°30'W	by United Kingdom
19 - 41°30'N	18°30'W	by United Kingdom
20 - 35°20'N	16°10'W	by United Kingdom
21 - 09°40'N	21°45'W	by United Kingdom
22 - 00°00'N	12°11'W	by United Kingdom (not required)

In August, 1945, the conflict ended in the Pacific. This eliminated the need for tremendous transport of men and materials from the European theater of war to the Pacific. Therefore, a second major change in the ocean weather program was indicated. On November 1, 1945, Stations "1", "5", "9", "11", "14", and "15" were discontinued. At the same time, Stations "4", "7", and "10" were moved to more strategic positions. As of that date, then, the U. S. Coast Guard was operating seven stations in the North Atlantic, and the Commander, South Atlantic Fleet (COMSOLANT), two stations with United States and Brazilian vessels. However, full responsibility for Stations "12" and "13" was assumed by the United States and the U. S. Coast Guard began operations of these stations December 7, 1945. Weather Bureau Circular Letter 91-45 dated December 5, 1945, names the stations as follows:

1 - Discontinued		
2 - 60°30'N	33°00'W	No Change
3 - 55°30'N	44°00'W	No Change
4 - 51°45'N	35°30'W	Changed Location
5 - Discontinued		
6 - 44°30'N	46°00'W	No Change
7 - 40°00'N	37°00'W	Changed Location
8 - 34°00'N	52°00'W	No Change
9 - Discontinued		
10 - 33°15'N	70°00'W	Changed Location
11 - Discontinued		
12 - 01°05'N	30°10'W	New Location
13 - 07°05'S	24°40'W	New Location
*14 - Not Assigned		
*15 - Not Assigned		
16 - 60°40'N	13°40'W	No Change (United Kingdom)
17 - 53°50'N	18°38'W	No Change (United Kingdom)
18 - 45°00'N	16°30'W	No Change (United Kingdom)
19 - 41°30'N	18°30'W	No Change (United Kingdom)
20 - 35°20'N	16°10'W	No Change (United Kingdom)
21 - 08°00'N	23°50'W	New Location (United Kingdom)
22 - 01°40'S	11°05'W	New Location (United Kingdom)

\* See above paragraph.

On December 31, 1945, Stations "2" (later "Able"), "3", "6", "7", "10", and "12" were moved in order to meet the exigency created by the changing needs of commerce. Station "12" was relocated in the North Atlantic at 46°N 29°W. The discontinuance of Station "13" on March 1, 1946, ended all South Atlantic operations. By this time, England had reduced the number of her stations to one.

At a conference with the Chief of Naval Operations (CNO) on March 1, 1946, it was agreed to reduce Atlantic stations to six by March 15 and to return operational control back to the Coast Guard on that date; however, the Navy continued to keep directional control of the program. Stations "10" and "12" were discontinued March 3 and March 15, 1946, respectively.

At the International Civil Aviation Conference in Chicago, Illinois, November 1 to December 7, 1944, it had been decided that "the contracting States shall provide for the developing of ocean networks including an adequate network of stationary meteorological ships under the International Agreement". The need for the services supplied by the patrol vessels had not lessened since the war because, as military flying decreased, commercial flying operations increased. The first step to establish the weather patrol on a permanent peacetime basis was taken at the North Atlantic Route Conference at the International Civil Aviation Organization (PICAO) in March, 1946, at Dublin, Ireland. This action was taken in order to establish an adequate North Atlantic weather service which would provide the North Atlantic region with adequate air navigation facilities for safe, regular, and economical air services. This conference recommended that a minimum of 13 stations be established in the North Atlantic. These stations were to be maintained continuously by vessels thoroughly equipped with modern meteorological instruments, electronic navigational gear, and trained technical personnel. The United States, operating approximately sixty-five percent of the transatlantic aircraft, was to provide seven stations, plus an eighth station in cooperation with Canada. The recommended positions of these stations are as follows:

62°00'N	33°00'W
56°30'N	51°00'W
51°45'N	35°30'W
45°00'N	45°00'W
35°30'N	40°00'W
34°00'N	52°00'W
36°00'N	70°00'W
46°00'N	29°00'W
60°00'N	20°00'W
53°50'N	18°40'W
47°00'N	15°00'W
39°00'N	17°00'W
66°00'N	02°00'E

The Council of PICAO (now ICAO) in Montreal, Canada, approved these recommendations in the latter part of May, 1946, and preliminary steps were taken to implement this recommendation. The council requested each member nation to establish one or more weather patrol stations. To further implement this action, the United States of America was requested to meet with Belgium, Canada, Denmark, France, Iceland, Ireland, The Netherlands, Norway, Portugal, Spain, Sweden, and The United Kingdom to investigate the situation thoroughly. This conference was held at the Regional Air Navigation meeting at London, England, September 16-25, 1946. An International Agreement that thirteen permanent Atlantic Ocean Weather Stations were to be established not later than July 1, 1947, was signed. All terms of the Agreement were to come into force August 25, 1947, and remain so until June 30, 1950. Furthermore, a conference was to convene not later than April 1, 1949, in order to consider revision and renewal of this agreement. The thirteen permanent Atlantic Ocean Weather Stations were to be maintained at the following locations and to be known by the following identifications:

"A" (Able)

62°00'N	33°00'W	Mid-Atlantic, to begin operation by September 27, 1947, and to be maintained by the United States and Canada.
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"B" (Baker)

56°30'N	51°00'W	Western North Atlantic, to begin operation November 27, 1947, and to be maintained by the United States and Canada, with Canada beginning operations November 27, 1947, and the United States, September 18, 1948.
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"C" (Charlie)

51°45'N	35°30'W	Mid-Atlantic, to begin operations July 1, 1947, and to be maintained by the United States.
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		"D" (Dog)
45°00'N	45°00'W	Western North Atlantic, to be maintained by the United States and to begin operations by January 10, 1949.
		"E" (Easy)
34°00'N	52°00'W	Western North Atlantic, to be maintained by the United States and to begin operations by September 29, 1948.
		"F" (Fox)
35°30'N	40°00'W	Western North Atlantic, to be maintained by the United States and to begin operations by February 26, 1949.
		"G" (George)
46°00'N	29°00'W	Eastern North Atlantic, to be maintained by the United States and to begin operations by June 13, 1949.
		"H" (How)
36°00'N	70°00'W	Western North Atlantic, to be maintained by the United States and to begin operations by May 5, 1949.
		"I" (Item)
60°00'N	20°00'W	Eastern North Atlantic, to be maintained by the United Kingdom and to begin operations by September 23, 1947.
		"J" (Jig)
53°50'N	18°40'W	Eastern North Atlantic, to be maintained by the United Kingdom and to begin operations by July 31, 1947.
		"K" (King)
47°00'N	15°00'W	Eastern North Atlantic, to be maintained by Belgium, to begin by October 5, 1947, and by The Netherlands, to begin by September 14, 1948.
		"L" (Love)
39°00'N	17°00'W	Eastern North Atlantic, to be maintained by France and to begin by January 13, 1948.
		"M" (Mike)
66°00'N	02°00'E	Eastern North Atlantic, to be maintained by Norway, Sweden, and the United Kingdom and to begin operations by September 7, 1948.

(This phonetic alphabet was effected June 1, 1946, replacing the numerical; however, it did not coincide with numerical in consecutive order because of the fact that some numerical stations had been closed prior to this change. It will be noted that the fixed point for Station "D" in the Western North Atlantic was 45°N 45°W but the United States Delegate at the PICA meeting in 1946 stated that it would be relocated at 44°30'N 41°00'W during the winter of 1946. However, it was temporarily closed in June, 1946, and not reopened at new position until January 8, 1949.)

On July 1, 1946, the Coast Guard received directional control of the entire program for stations maintained by the United States. Nevertheless, due to demobilization and lack of funds, all Atlantic Ocean Stations were temporarily discontinued or closed except one, Atlantic "C", during the year 1946. However, in August the U. S. Coast Guard was able to reestablish "A" after it had been unmanned since June 16th and "E" which had been closed June 15th, but by the end of the year all except "A" and "C" had been temporarily discontinued. They were the only two operating in the early months of 1947. "A" was closed again on July 1, 1947, but reopened on September 26, 1947. In November, 1947, "B" was put back into operation, and in September, 1948, "E" resumed operation.

According to The International Agreement of 1946, "I", "J", and "K" were activated in 1947 by those countries which agreed to maintain them, and in 1948, "L" and "M" began operations. There are no available records on "K" from December 1, 1948, until June 25, 1949. No information as to operation of station during that time is available at the National Weather Records Center.

Congressional authority to establish permanent ocean weather stations was granted by Public Law No. 738 on June 22, 1948. Subsequently, the remaining stations were reestablished on or about the dates specified by the PICA meeting in 1946 so that by June 15, 1949, the following stations were in operation:

"A"	-	62°00'N	33°00'W	(United States)
"B"	-	56°30'N	51°00'W	(United States)
"C"	-	52°45'N	35°30'W	(United States)
"D"	-	45°00'N	45°00'W	(United States)
"E"	-	34°00'N	52°00'W	(United States)
"F"	-	35°30'N	40°00'W	(United States)
"G"	-	46°00'N	29°00'W	(United States)
"H"	-	36°00'N	70°00'W	(United States)
"I"	-	60°00'N	20°00'W	(United Kingdom)
"J"	-	53°50'N	18°40'W	(United Kingdom)
"M"	-	66°00'N	02°00'E	(Norway)

A meeting was held in Oslo, Norway, February 28, 1949, to revise and renew the 1946 Agreement. The revisions made at this time were ratified at the ICAO Conference April 20 - May 12, 1949, in London. It was agreed to reduce the stations to ten, thereby closing "G" on July 1, 1949. This station had operated for only one cruise subsequent to being reopened. Station "L" was also closed June 7, 1949, and on September 3, 1949, "F" was discontinued. According to this International Agreement, the following stations were to be maintained in the North Atlantic by the governments named:

"A"	-	62°00'N	33°00'W	United States - two-thirds
				Netherlands - one-third (to begin July, 1950)
"B"	-	56°30'N	51°00'W	United States - two-thirds
				Canada - one-third
"C"	-	52°45'N	35°30'W	United States
"D"	-	44°00'N	41°00'W	United States
"E"	-	35°00'N	48°00'W	United States
"H"	-	36°00'N	70°00'W	United States
"I"	-	59°00'N	19°00'W	United Kingdom
"J"	-	52°30'N	20°00'W	United Kingdom and The Netherlands
"K"	-	45°00'N	16°00'W	France and The Netherlands
"M"	-	66°00'N	02°00'E	Norway, The Netherlands, France, and The United Kingdom

The operation of "I", "J", and "K" were to be shared among the vessels of France, The Netherlands, and The United Kingdom and these countries to assist Norway if needed on "M"; however, only Norwegian ships manned Station "M" 1948-1952.

It will be noted that Stations "D", "E", "I", "J" and "K" were relocated at this meeting. This change of position was effected on September 3, 1949, for Stations "D" and "E" and June 25, 1949, for "K" and March 25, 1950, for "I" and "J".

The above Agreement was to come into force January 23, 1950, and to remain in effect until June 30, 1953. A conference of all interested governments was to convene not later than October 1, 1952, for purposes of revision and renewal of the 1949 Agreement.

During the years 1947, 1948, 1949, and 1950, the Canadian ships operated fifteen cruises on Atlantic "B" and Dutch ships operated thirteen cruises on Atlantic "A" in 1950, 1951, and 1952. In the Agreement between Canada and the United States entered into force June 22, 1950, it was agreed that Canada would assume full operation of Pacific "P" and the United States was to assume full operation of Atlantic "B".

During the war years, it was necessary for ships to move about so that the original station limits could not be maintained. In order to make the observational data more usable, tolerances were set up in

this survey of approximately 1.5° on each side of the center point of latitude and 2.5° on each side of the center point of longitude. On Station "2" from 1942 to 1944, the ships shuttled back and forth between about 52°N 43°W and 55.5°N 47°W so that a mean of 53.5°N 45.5°W was used with limits of 50.0°N 41.5°W and 56.5°N 49.2°W. After permanent fixed points and limits were designated at the 1946 PICA0 Conference and thereafter, these were adhered to in all cases.

On Station "I", beginning about May 25, 1949, and continuing through 1952, the weather ships left the assigned position 59.0°N 19.0°W and occupied a position approximately 60°40'N 13°40'W for a part or, in some cases, the entire tour of "on station" duty. In order to incorporate these data into the records, additional position limits of 62°25'N 17°15'W and 58°55'N 10°05'W were assigned and position 60.7°N 13.7°W was assigned Station No. 69 at the National Weather Records Center. Such numbers are assigned at the Center for purposes of identification on IBM cards of all available climatological data within each 210-mile (nautical) square.

The new ICAO phonetic code agreed upon by the last conference became effective April 1, 1952, as follows:

"Able"	redesignated	"Alpha"
"Baker"	redesignated	"Bravo"
"Charlie"	redesignated	"Coca"
"Dog"	redesignated	"Delta"
"Easy"	redesignated	"Echo"
"How"	redesignated	"Hotel"
"Item"	redesignated	"India"
"Jig"	redesignated	"Juliatt"
"King"	redesignated	"Kilo"
"Mike"	redesignated	"Metro"

These, then, were the stations in operation January 1, 1953, and were still in operation June 30, 1954. On July 1, 1954, Station "Hotel" was discontinued and the United States was relieved of operation of "Alpha" by European countries.

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SECTION ONE

PART II

LIST OF TABLES

ATLANTIC OCEAN WEATHER STATIONS

U. S. WEATHER BUREAU  
OCEAN STATION VESSEL RECORDS SURVEY - SUMMARY OF POSITIONS  
1940-1952

U. S. STATIONS		U. S. COAST GUARD, U. S. NAVY, CANADIAN AND NETHERLANDS VESSELS											All positions Degrees North Latitude, West Longitude except where other- wise specified, occupied for any part of or all of the years listed.	
Atlantic	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951		1952
A						63.0-31.5 60.5-33.0 62.0-33.0	*	*			(A) 62.0-33.0	(A) 62.0-33.0	(A) 62.0-33.0	(A) Jointly operated with Netherlands 6/16-8/5-1946 * 7/1-9/26-1947 > closed
1	35.6-53.3 39.0-59.0	39.0-59.0 37.5-52.5	37.5-52.5	37.5-52.5	37.5-52.5 34.0-55.0	34.0-55.0 56.5-51.0								Closed 11/1/45
2	37.7-41.2 40.4-44.0 39.0-46.0	39.0-46.0 52.0-43.0	52.0-43.0	53.5-45.5	53.5-45.5 37.0-40.0	37.0-40.0								Closed 5/15/45
3 "B"					43.0-38.0	55.5-44.0 56.5-51.0	* 56.5-51.0	*(B) 56.5-51.0	(B) 56.5-51.0	(B) 56.5-51.0	(B) 56.5-51.0	56.5-51.0	56.5-51.0	(B) Jointly operated with Canada *Closed 4/29/46-11/25/47
4 "C"					54.0-44.5	54.0-44.5 51.0-42.0 51.8-35.5	51.8-35.5	52.8-35.5	52.8-35.5	52.8-35.5	52.8-35.5	52.8-35.5	52.8-35.5	
5 "G"					50.0-34.0	50.0-34.0 52.5-30.0 *				46.0-29.0				*Closed 11/1/45-6/11/49 Closed 7/1/49
6 "D"						58.0-52.0 44.5-46.0 44.5-41.0	* 44.5-41.0			45.0-45.0 44.0-41.0	44.0-41.0	44.0-41.0	44.0-41.0	*Closed 6/15/46-1/9/49
7 "F"						41.5-37.0 40.0-37.0 35.5-40.0	* 35.5-40.0			35.5-40.0				*Closed 5/5/46-2/26/49 Closed 9/3/49
8 "E"					58.0-37.0	58.0-37.0 34.0-52.0	* 34.0-52.0		34.0-52.0	34.0-52.0 35.0-48.0	35.0-48.0	35.0-48.0	35.0-48.0	Closed 6/16/46-9/21/46 *Closed 12/15/46-9/29/48
9						35.5-40.0								Closed 11/1/45
10 "H"						36.0-70.0 33.2-70.0 36.0-70.0	* 36.0-70.0			36.0-70.0	36.0-70.0	36.0-70.0	36.0-70.0 36.7-69.6	*Closed 3/3/46-5/5/49
11						29.5-71.5								Closed 11/1/45
12						(C) 05.0-26.0 01.1-30.2 46.0-29.0	(C) 46.0-29.0							(C) COMSOLANT (with Brazilian vessels) Closed 3/15/46
13						(C) 07.1-24.7 S	(C) 07.1-24.7 S							(C) COMSOLANT (with Brazilian vessels) Closed 3/1/46
14						(C) 06.5-28.5 S								(C) COMSOLANT (with Brazilian vessels) Closed 11/1/45
15						(C) 07.5-21.5 S								(C) COMSOLANT (with Brazilian vessels) Closed 12/31/45 Never operated by United States

Table 1

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U. S. WEATHER BUREAU  
 OCEAN STATION VESSEL RECORDS SURVEY - DETAIL SHEET  
 1940 - 1952

U. S. STATIONS

U. S. COAST GUARD, U. S. NAVY,  
 CANADIAN AND NETHERLANDS VESSELS

(Positions degrees north latitude, west longitude or otherwise specified)

ATLANTIC	POSITION	FROM	TO	POSITIONS REDESIGNATED OR CLOSED	NO. OF CRUISES	IN OPERATION JANUARY 1, 1953
"A"	*63.0 - 31.5 60.5 - 33.0 62.0 - 33.0	3-16-45 5-15-45 12-31-45	5-14-45 12-30-45 12-31-52	Plane Guard "B" 1942 - June, 1944 Plane Guard "7" June, 1944 - 3/16/45 - No Records Available *Plane Guard "Fox" - 3/16/45 "2" - 5/15/45 "Able" - 6/1/46, "Alpha" - 4/1/52	124	Alpha 62.0 - 33.0
1	35.6 - 53.3 39.0 - 59.0 37.5 - 52.5 *34.0 - 55.0 **56.5 - 51.0	2-10-40 4-13-40 12-19-41 3-11-44 5-15-45	4-12-40 12-15-41 3-10-44 5-14-45 11-1-45	*Position 34.0 - 52.0 Designated "8" on 5/16/45 Closed on 11/1/45 **Position redesignated "3" on 12/31/45	110	
2	37.7 - 41.2 40.4 - 44.0 39.0 - 46.0 52.0 - 43.0 *53.5 - 45.5 **37.0 - 40.0	2-10-40 5-4-40 12-6-40 12-16-41 9-15-42 3-13-44	5-3-40 12-6-40 12-15-41 9-15-42 3-12-44 5-15-45	*Position 54.0 - 44.5 Designated "4" on 3/13/44 Closed on 5/15/45 **Position 35.5 - 40.0 Designated "9" on 5/16/45	98	
3 "B"	*43.0 - 38.0 55.5 - 44.0 56.5 - 51.0	1-14-44 5-17-45 12-31-45	5-14-45 12-30-45 12-31-52	*Position 41.5 - 37.0 Designated "7" on 5/14/45 "Baker" - 6/1/46 "Bravo" - 4/1/52	122	Bravo 56.5 - 51.0
4 "C"	*54.0 - 44.5 51.0 - 42.0 51.8 - 35.5 52.8 - 35.5	3-13-44 5-14-45 11-1-45 6-3-46	5-14-45 10-31-45 6-3-46 12-31-52	*Position 55.5 - 44.0 Designated "3" on 5/14/45 "Charlie" - 6/1/46 "Coca" - 4/1/52	162	Coca 52.8 - 35.5
5 "G"	*50.0 - 34.0 52.5 - 30.0 46.0 - 29.0	5-24-44 5-16-45 6-12-49	5-15-45 10-31-45 7-1-49	*Plane Guard "G" - 5/24/44 "5" - 10/21/44 "George" - 6/1/46 Closed on 7/1/49	31	
6 "D"	*58.0 - 52.0 44.5 - 46.0 44.5 - 41.0 45.0 - 45.0 44.0 - 41.0	4-3-45 5-16-45 12-30-45 1-9-49 9-3-49	5-13-45 12-29-45 6-15-46 9-3-49 12-31-52	*Plane Guard "A" prior to 4/3/45 - No Records Available "Dog" - 6/1/46 "Delta" - 4/1/52	92	Delta 44.0 - 41.0
7 "F"	41.5 - 37.0 40.0 - 37.0 35.5 - 40.0	5-14-45 11-1-45 12-31-45	10-31-45 12-29-45 9-3-49	"Fox" - 6/1/46 Closed on 9/3/49	28	
8 "E"	*58.0 - 37.0 34.0 - 52.0 35.0 - 48.0	11-4-44 5-16-45 9-4-49	5-16-45 9-3-49 12-31-52	*Plane Guard "C" prior to 11/4/44 - No Records Available "Easy" - 6/1/46 "Echo" - 4/1/52	113	Echo 35.0 - 48.0
9	*35.5 - 40.0	5-16-45	11-1-45	Closed on 11/1/45 *Redesignated "7" on 12/31/45	10	
10 "H"	36.0 - 70.0 33.2 - 70.0 36.0 - 70.0 36.7 - 69.6	6-15-45 11-1-45 12-31-45 5-1-52	10-31-45 12-30-45 4-30-52 12-31-52	"How" - 6/1/46 "Hotel" - 4/1/52	80	Hotel 36.7 - 69.6
11	29.5 - 71.5	6-13-45	10-31-45	Closed on 11/1/45	8	
12	05.0 - 26.0 01.1 - 30.2 *46.0 - 29.0	5-21-45 12-7-45 12-31-45	9-24-45 12-29-45 3-15-46	Closed on 3/15/46 *Redesignated "George" on 6/1/46	10	
13	07.1 - 24.7 S	12-7-45	2-28-46	Closed on 3/1/46	6	
14	06.5 - 28.5 S	6-5-45	9-24-45	Closed on 11/1/45	10	
15	07.5 - 21.5 S			Closed on 12/31/45 Not operated by U. S.	0	

Table 2

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ATLANTIC OCEAN VESSEL STATIONS

METEOROLOGICAL RECORD FORMS — UNITED STATES AND CANADA

1940 - 1952

ORIGINAL RECORDS AVAILABLE			AVAILABLE RECORDS ON CARDS		
Form Nos. - All Stations			Card Deck Nos. - All Stations **(1)		
Surface	Winds Aloft	Radiosonde	Surface	Winds Aloft	Radiosonde
1940 - 1943 Marine 1210A	1940 Navy 444	1940 - 1942 1126A&B (Graph)	1940 - 1945 115	1940 - 1944 511	1940 - 1944 501
Aug., 1943 1210A or B	1940 - 1941 1110A & 1110C	1940 - 1941 1109A	July, 1945 - 1952 116	1945 - 1946 530	1945 541
1944 - 1948 1210E	1115 (Graph)	1940 - 1941 1103A	July, 1952 117	1947 - 1948 531	1946 - 1948 542
1945 - 1948 WBAN 11	1940 - 1942 1114, 1114A (Summary)	1942 - 1945 1109, 1109A			
1949 - 1951 1210AB	1942 - 1945 1110C and Graph	1942 - 1/31/45 1103		1949 - 1952 532	1949 - 1952 544
1952 1210A&B	1943 - 1/31/45 1114, 1114A 1114A&B (Summary)	1943 1126A&B 1147			July, 1952 505 began ("B" began 1946 including Freezing Level)
	2/1/45 WBAN 22	2/1/45 WBAN- 31A&B WBAN 32			
	1946 WBAN- 20 & 20A, 21 & 21A (Originals & Graphs)	2/1/45-12/31/49 WBAN 30			
		1/1/46 WBAN 33			
		Microfilm began July, 1947			
Canadian forms on micro- film	Microfilm began July, 1947	Machine listings began 2/1/50 (2 listings by ship and by station)			
Microfilm began July, 1947 (U.S. Forms)	Machine listings (WBAN 22) began Oct., 1950 2 listings by ship and by station	Machine listings (by station only) began 11/1/52			
	Canadian forms on microfilm	Canadian forms on microfilm			

(1) All information on cards from machine tabulating unit - this includes individual survey sheets.

\*\* "ID" in Detail Cards Available columns on Survey Sheets means "identification cards only" showing observations are not available.

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Table 3

U. S. WEATHER BUREAU

OCEAN STATION VESSEL RECORDS SURVEY - SUMMARY OF POSITIONS

1945 - 1952

European Stations

European Vessels

STATIONS AND POSITIONS - ATLANTIC

All Positions Degrees North Latitude, West Longitude, Except Where Otherwise Specified - Occupied For Any Part or All of Years Listed

Year	16	17	18	19	20	21	22	
1945	60.7 - 13.7	53.9 - 18.6	45.0 - 16.5	41.5 - 18.5	35.3 - 16.2	09.7 - 21.8 08.0 - 23.9	00.0 - 12.2 01.7S - 11.1	16, 17, 18, 19 - British 20, 21, 22 - United Kingdom No Records Available "22" Never Manned
1946								England Maintained One Station - No Records Available
Atlantic	1947	1948	1949	1950	1951	1952	Stations Maintained by Countries Named	
"I"	60.0 - 20.0	60.0 - 20.0	60.0 - 20.0 60.7 - 13.7	60.0 - 20.0 60.7 - 13.7 59.0 - 19.0	59.0 - 19.0 60.7 - 13.7	59.0 - 19.0 60.7 - 13.7	United Kingdom	
"J"	53.8 - 18.7	53.8 - 18.7	53.8 - 18.7	53.8 - 18.7 52.5 - 20.0	52.5 - 20.0	52.5 - 20.0	United Kingdom and Netherlands	
"K"	47 - 15	47* - 15	45* - 16	45 - 16	45 - 16	45 - 16	*12/1/48 - 6/25/49 No Records Available 1947 - 1948 Belgium & Netherlands 1949 - 1952 France & Netherlands	
"L"		39 - 17	39 - 17				France Closed 6/7/49	
"M"		66 - 02E	66 - 02E	66 - 02E	66 - 02E	66 - 02E	Norway, Netherlands; France & United Kingdom (Norwegian Ships 1948 - 1952)	

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Table 4

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U. S. WEATHER BUREAU  
OCEAN STATION VESSEL RECORDS SURVEY - DETAIL SHEET  
1947 - 1952

European Stations

(Positions Degrees North Latitude, West Longitude or Otherwise Specified)

European Vessels

Atlantic	Position	Began	Ended	Position Redesignated or Closed and/or Explanatory Notes About Records	No. of Cruises	In Operation January 1, 1953	Original Records Available Form Nos. - (microfilm only)			Available Records on Cards Card Deck Nos. ***(1)		
							Surface	Winds Aloft	Radio-sonde	Surface	Winds Aloft	Radio-sonde
"I"	60-20 60-20/60.7-13.7 59-19/60.7-13.7	9/25/47 5/25/49 3/25/50	5/25/49 3/25/50 12/31/52	<u>United Kingdom</u> Redesignated "India" 4/1/52 1947 - Microfilm - Surface only 1948-1952 - Microfilm and Microprints	91	"India" 59-19/60.7-13.7	Synoptic	Similar to WBAN 22	Similar to WBAN 33	116	Hollerith (1951 only)	Hollerith (1951 only)
"J"	53.8-18.7 52.5-20.0	8/10/47 3/25/50	3/25/50 12/31/52	<u>United Kingdom and Netherlands</u> Redesignated "Juliett" 4/1/52 1947 - Microfilm - Surface only 1948-1952 - Microfilm and Microprints	92	"Juliett" 52.5-20.0	Synoptic and Similar to 1210A & B	"	"	116	"	"
"K"	47-15 45-16	10/5/47 6/25/49	12/1/48 12/31/52	<u>Belgium, Netherlands and France</u> Redesignated "Kilo" 4/1/52 1947 - Microfilm - Surface & Winds Aloft only 1948 - " " " " " " with Raobs beginning in June 1949-1952 - Microfilm - Surface & Raobs Only	53	"Kilo" 45-16	"	Similar to 1110	Similar to 1103	116	None	505 **
"L"	39-17	1/13/48	6/7/49	<u>France</u> Closed 6/7/49 Microfilm - Surface & Raobs Only	27		Similar to 1130	None	"	116	None	505 **
"M"	66-02E	6/11/48	12/31/52	<u>Norway</u> Redesignated "Metro" 4/1/52 *1948-1952 - Microfilm - Surface, Winds Aloft (Radar) and Raobs all on one form	59	"Metro" 66-02E	*	*	*	116	505	505

\*\* Special deck - significant levels

(1) All information about cards was obtained from Machine Tabulation Unit. This includes information entered on individual survey sheets.

\*\*\* "ID" in Detail Cards Available columns on Survey Sheets means "identification cards only" showing observations are not available.

Table 5

9/15/54

SECTION ONE

PART III

U. S. SHIPS

ATLANTIC OCEAN WEATHER STATIONS

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
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U. S. SHIPS OPERATING ATLANTIC OCEAN WEATHER STATIONS

Abilene PF-58	Forsyth PF-102	Pontchartrain W-70
Absecon	Grand Rapids PF-31	Reading PF-66
Alexandria PF-18	Greensboro PF-101	Rockaway
Algonquin	Groton PF-29	Sea Cloud
Androscoggin	Half Moon WAVP-378	Sebaygo
Barataria	Hamilton	Sheboygan PF-57
Beaufort PF-59	Hingham PF-30	Shreveport PF-23
Bibb	Humboldt	Sorrel (#2)
Big Horn (#7)	Hutchinson PF-45	Spencer W-36
Brunswick PF-68	Ingham	Tahoe
Campbell W-32	Knoxville PF-64	Tampa
Casco WAVP-370	Lorain PF-93	Unimak AVP-31
Castle Rock	Mackinac WAVP-371	Uniontown PF-65
Cayuga	Manasquan	Winnebago WPG-40
Chambers (#35)	Manhasset (#5)	Woonsocket PF-32
Champlain	Manitowoc PF-61	Yakutat
Charlotte PF-60	Matagorda WAVP-373	Zircon (#9)
Chelan	McCulloch WPG-386	#1
Chinconteaue	Menemsha	#2 (Sorrel)
Comanche	Mendota WPG-69	#3 (Conifer)
Conifer (#3)	Milledgeville PF-94	#4
Cook Inlet	Mojave	#5 (Manhasset)
Coos Bay	Monomoy	#6
Covington PF-56	Muskegon PF-24	#7 (Big Horn)
Davenport PF-69	North Land	#8
Dearborn PF-33	Nourmahal	#9 (Zircon)
Dexter	Opponent	#10 (Palisade)
Duane W-33	Owasco WPG-39	#11
Emporia PF-28	Palisade (#10)	#12
Eugene PF-40	Peoria PF-67	#35

SECTION ONE

PART IV

MAPS

ATLANTIC OCEAN WEATHER STATIONS

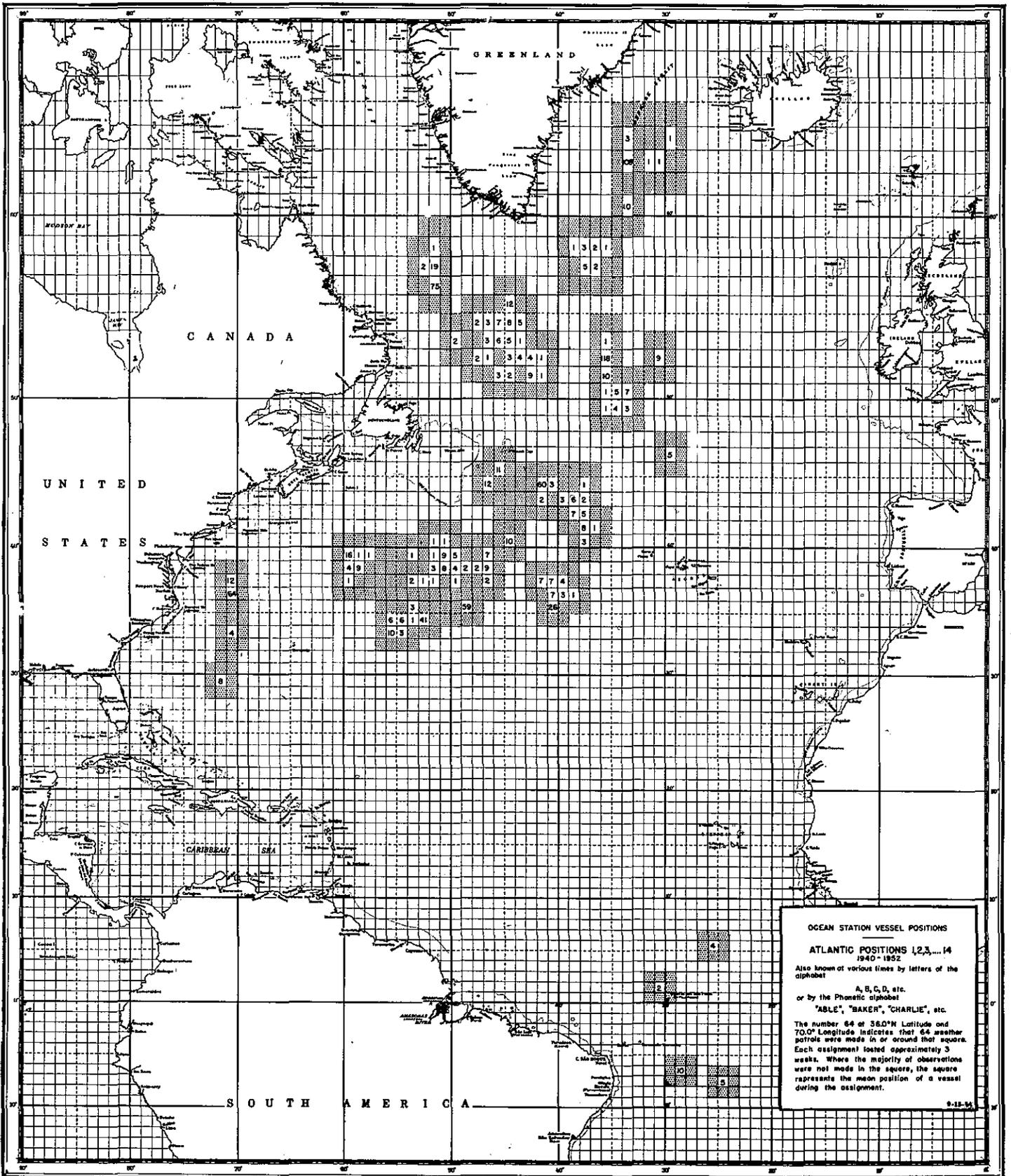


Fig. 1

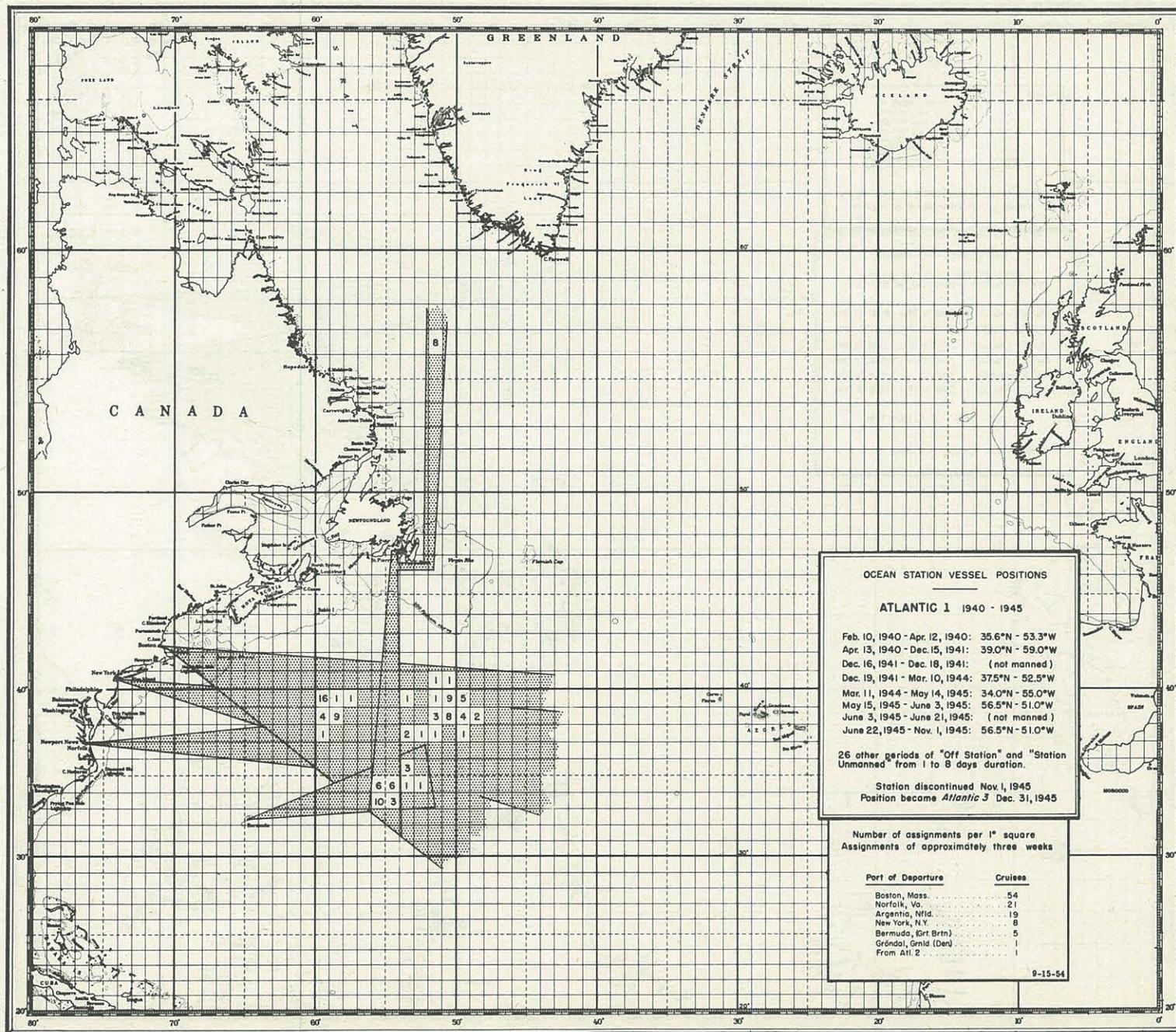


Fig. 2

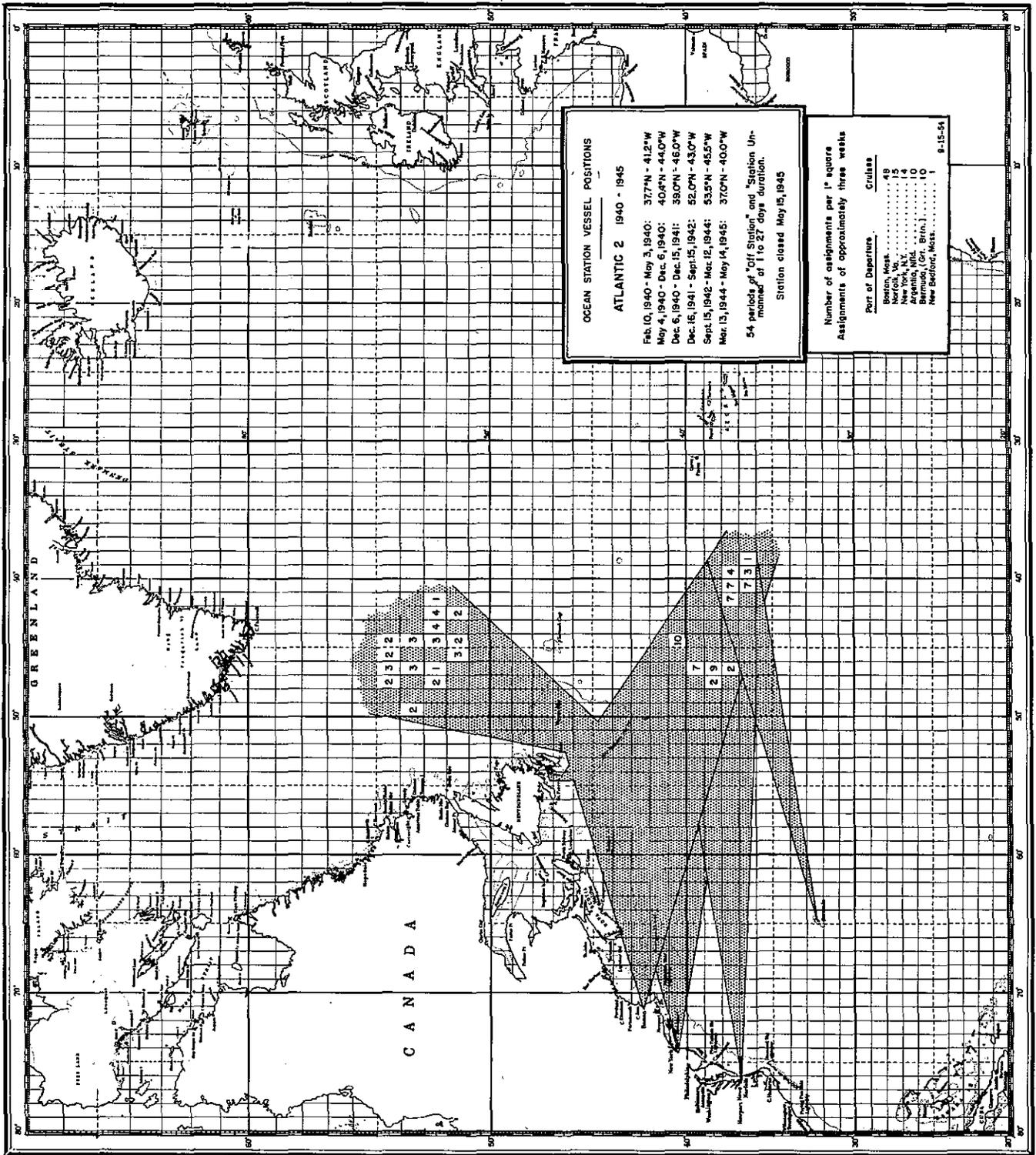


Fig. 3

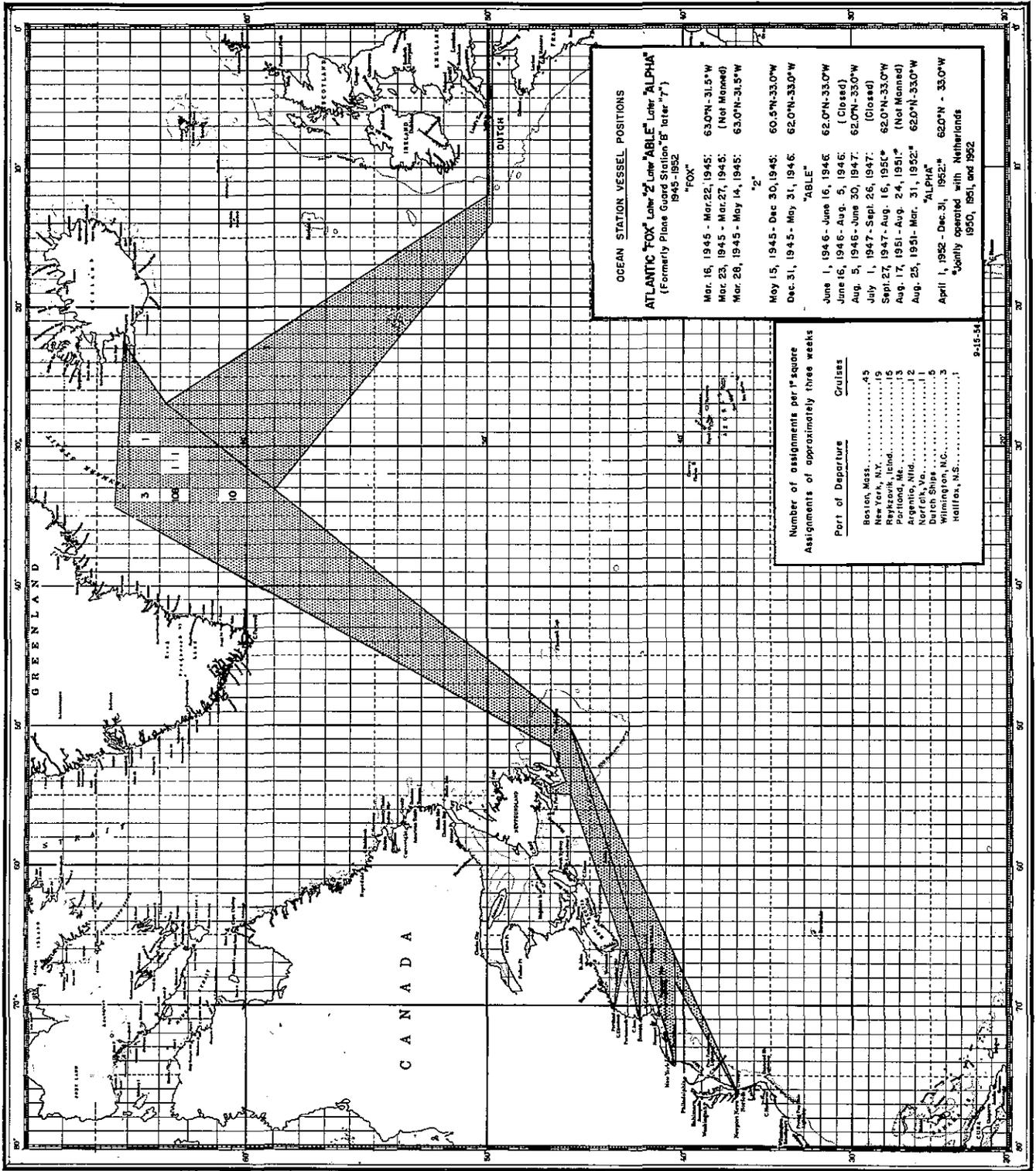


FIG. 4



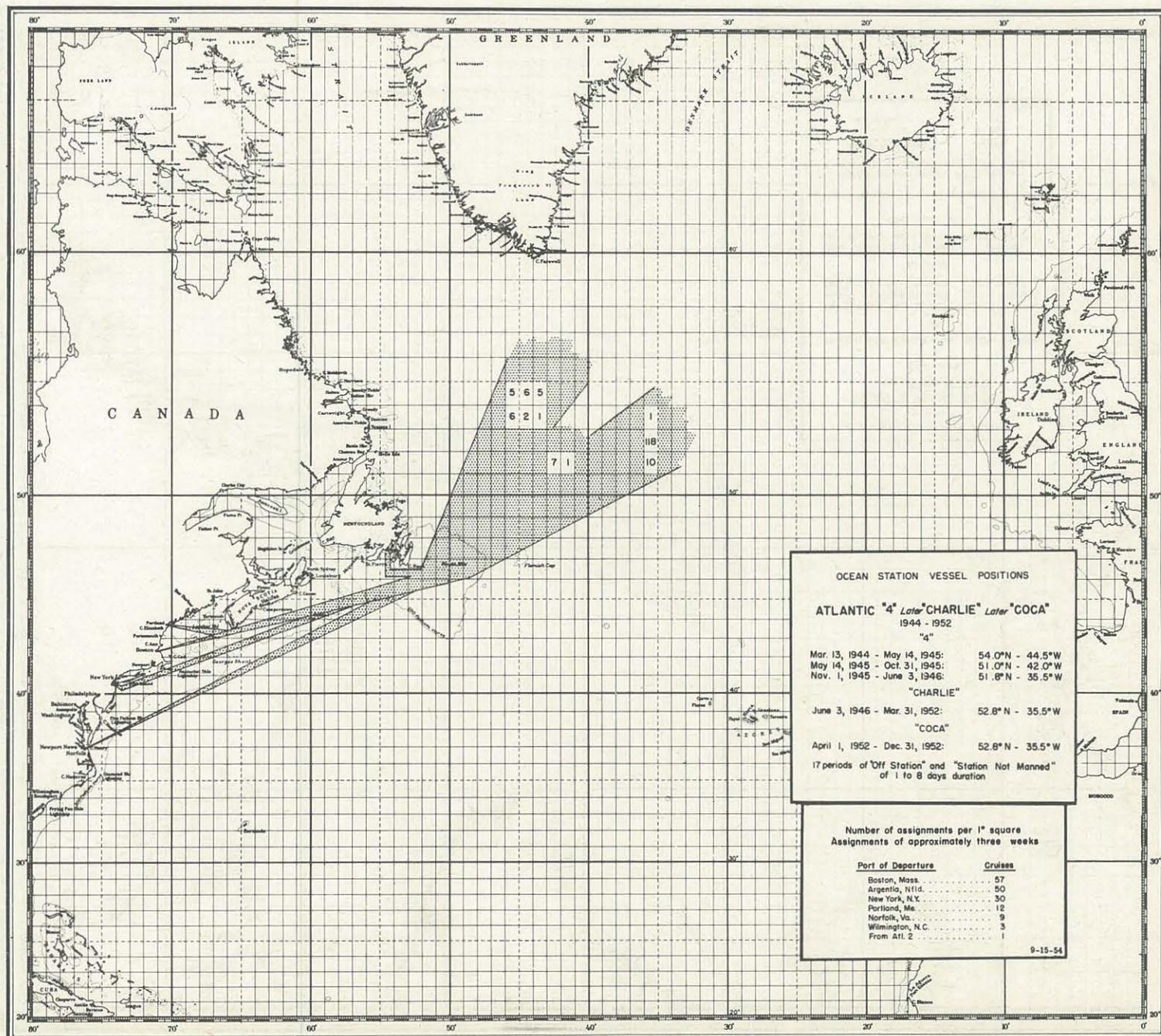


Fig. 6

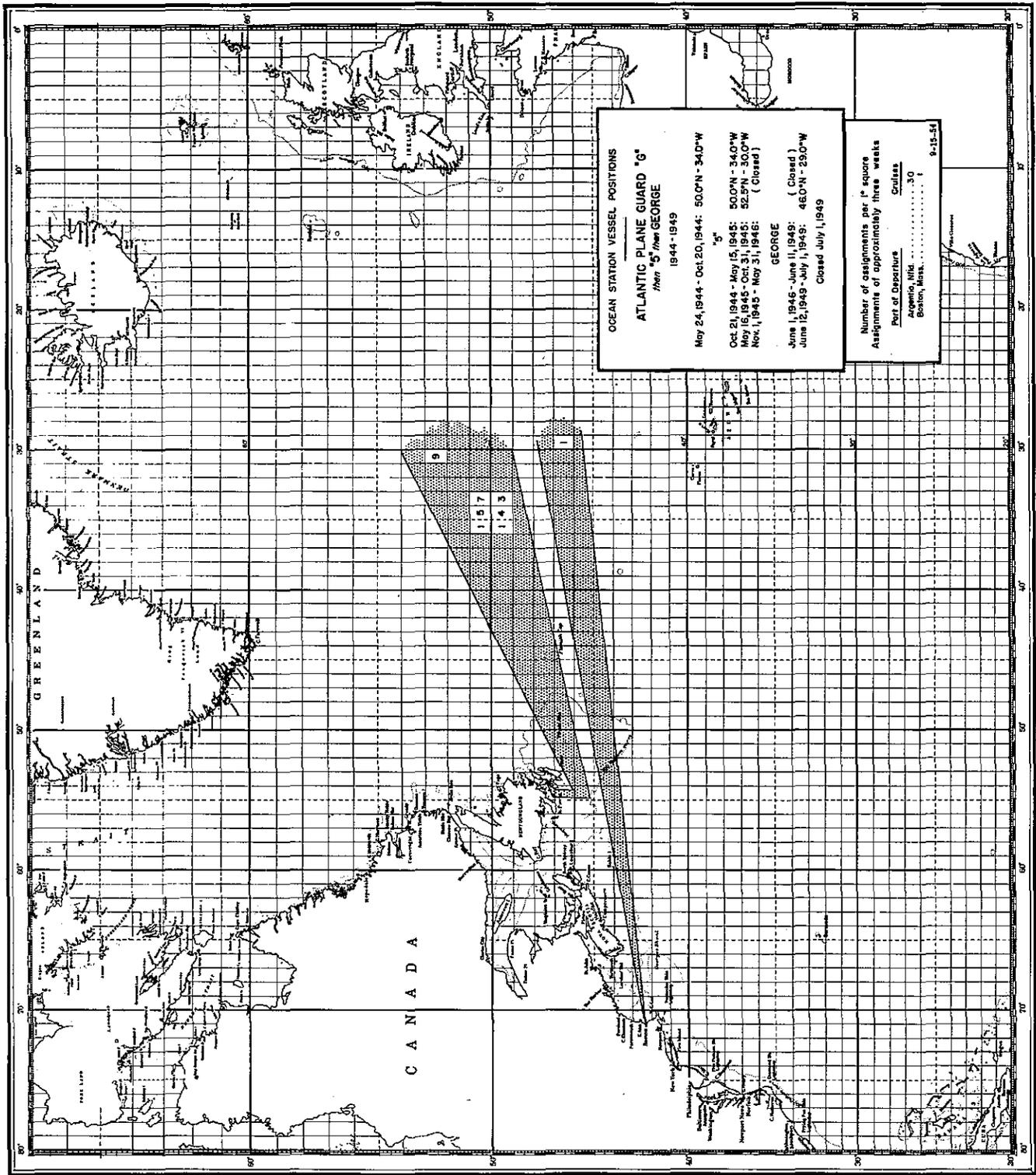


Fig. 7

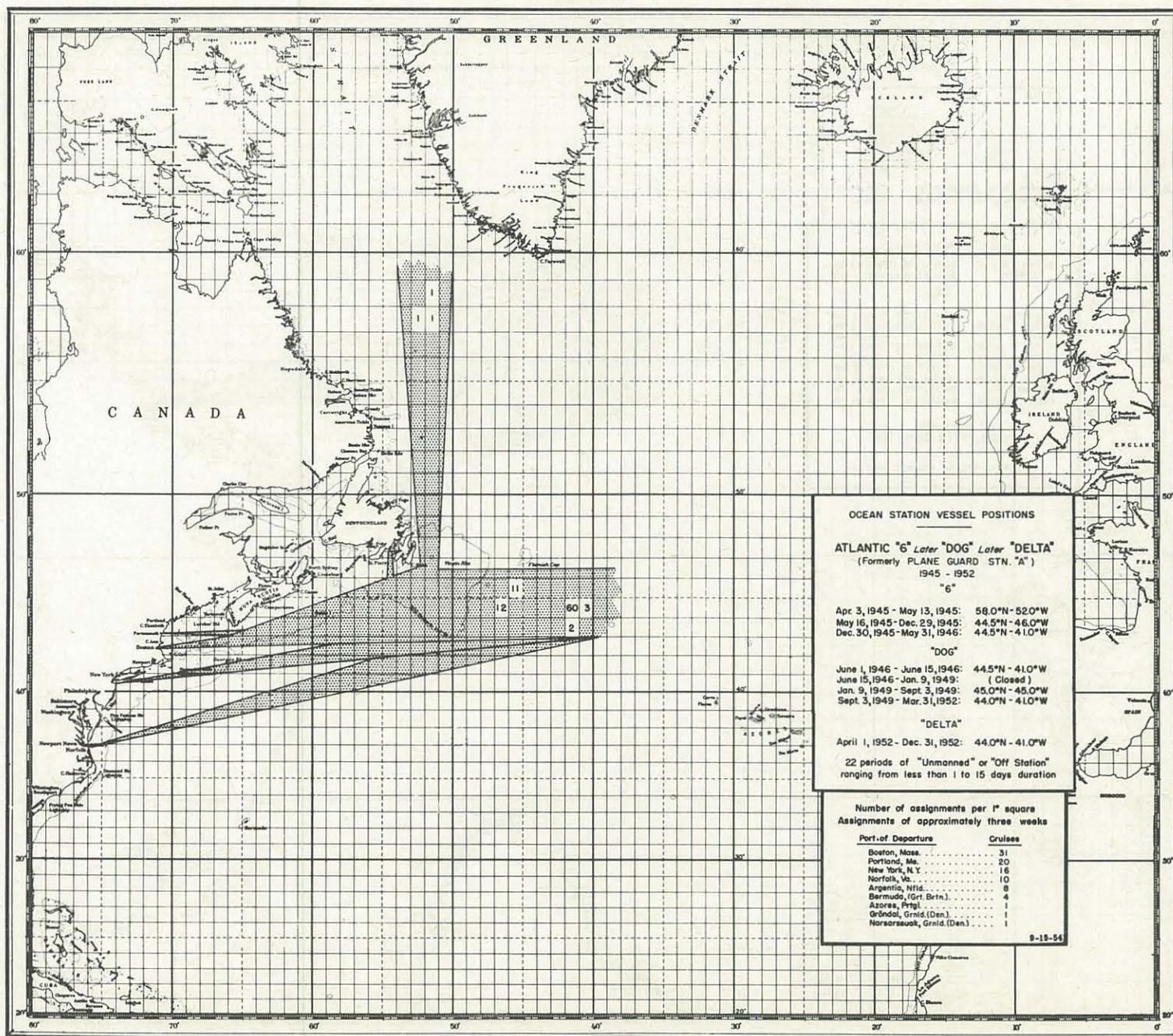


Fig. 8

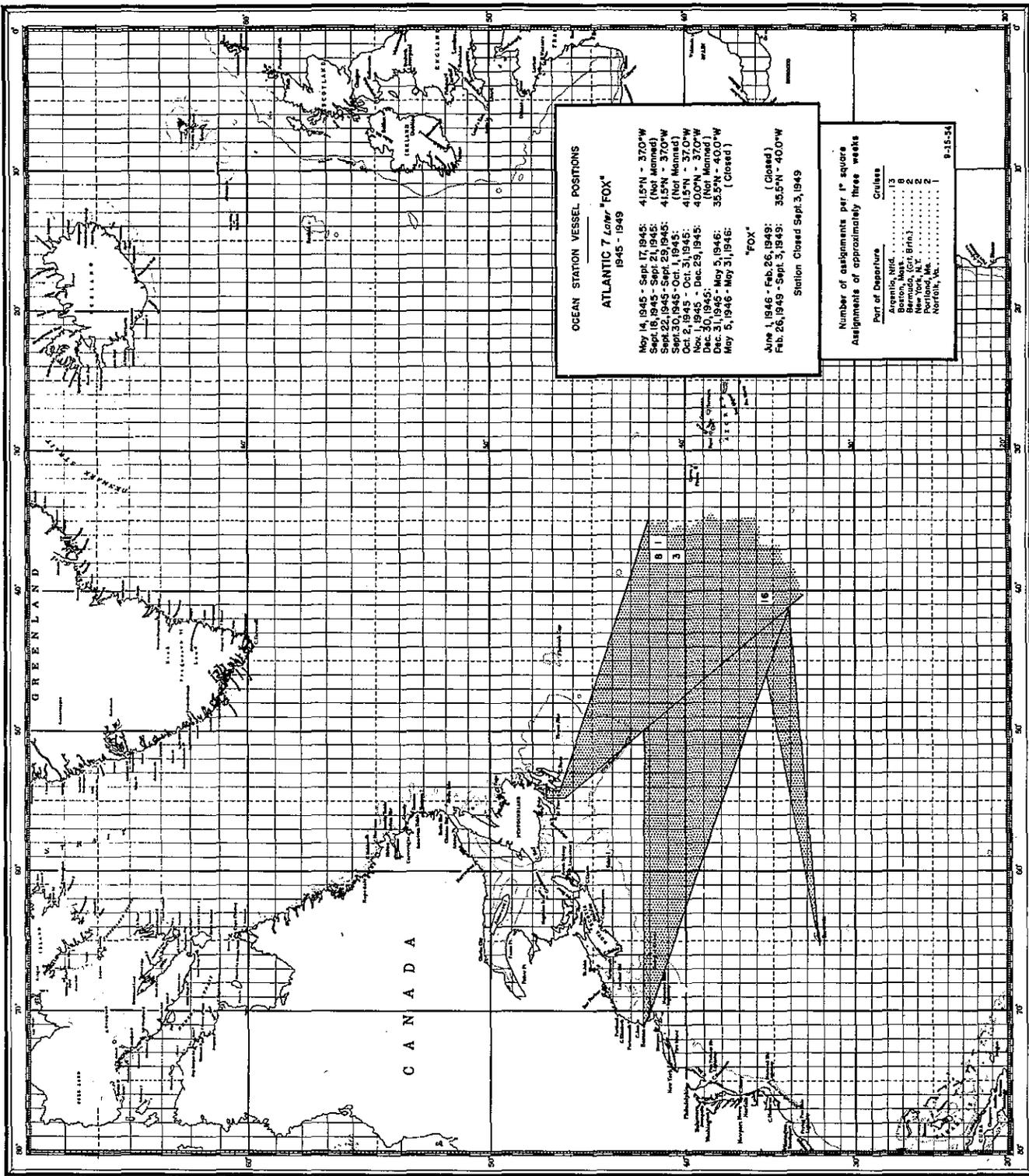


FIG. 9

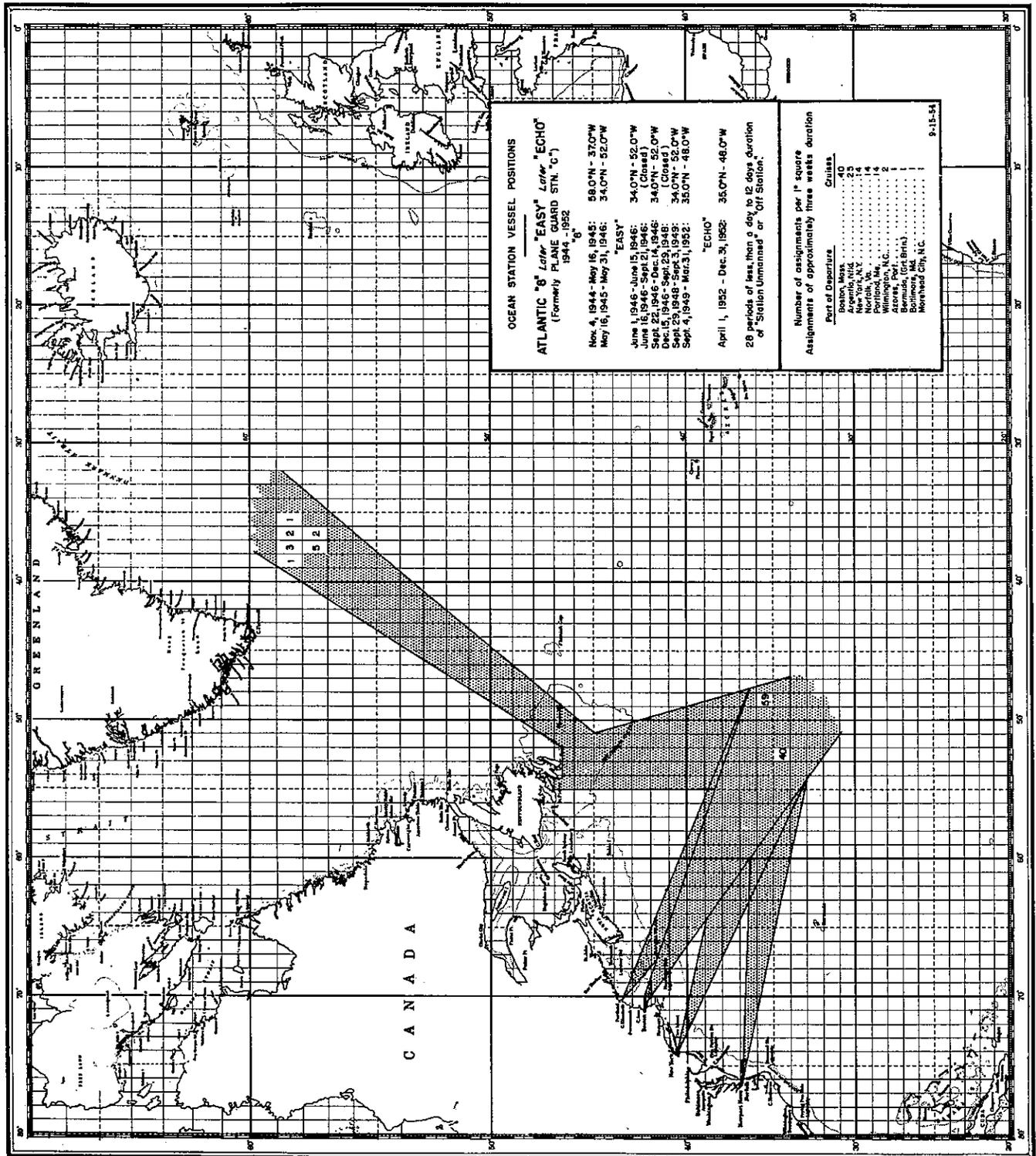


FIG. 10

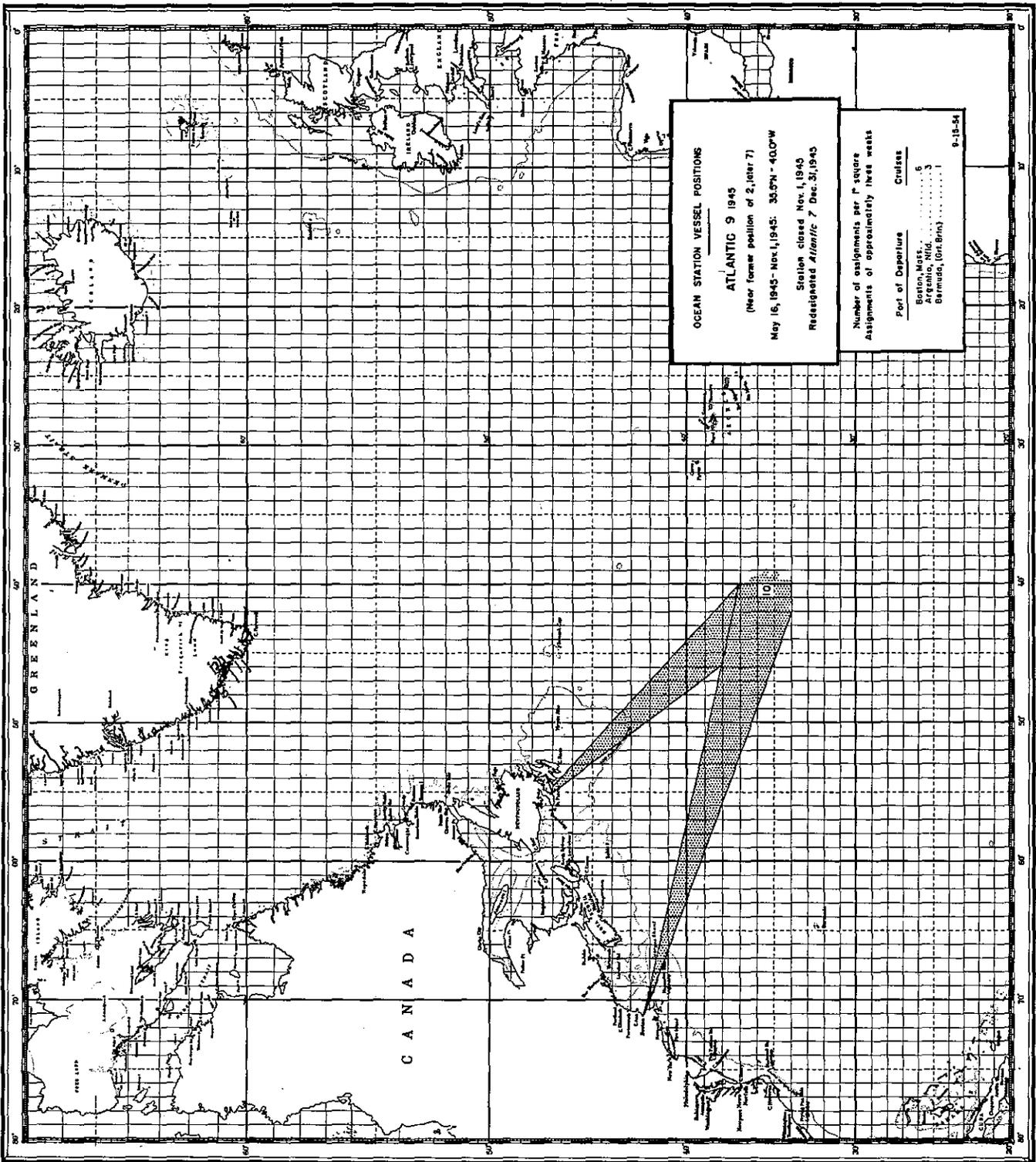


FIG. 11

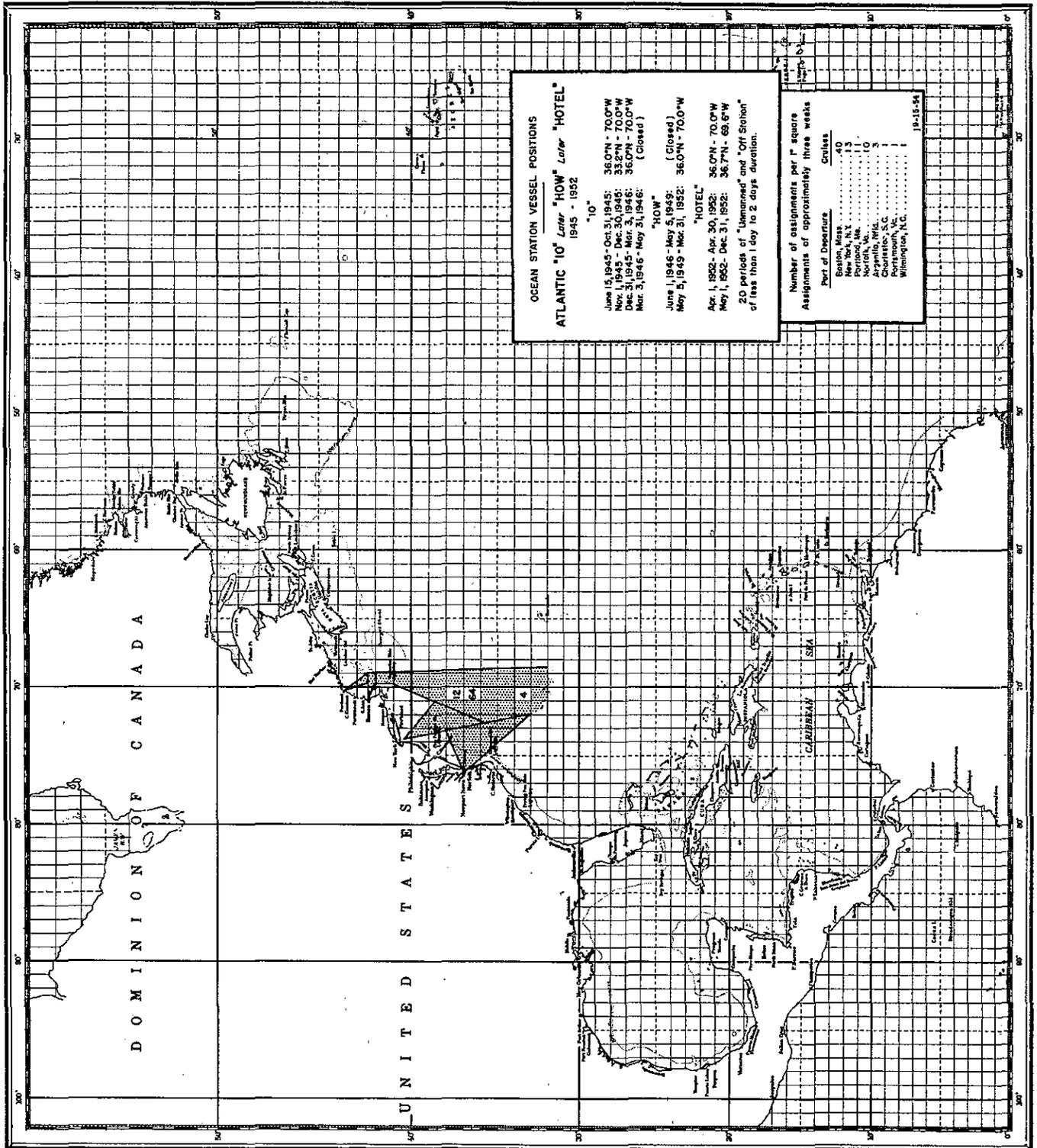


Fig. 12

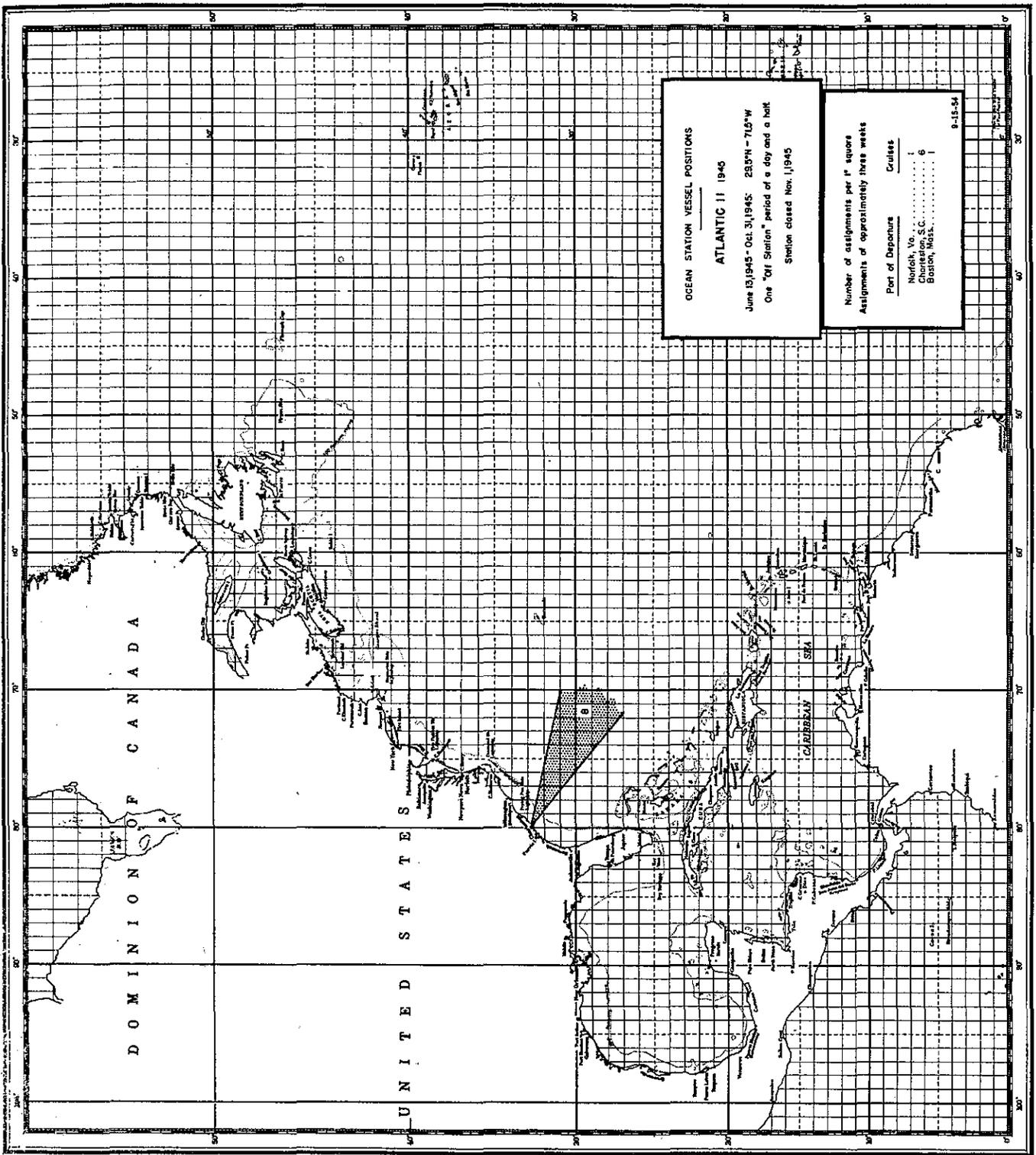


Fig. 13

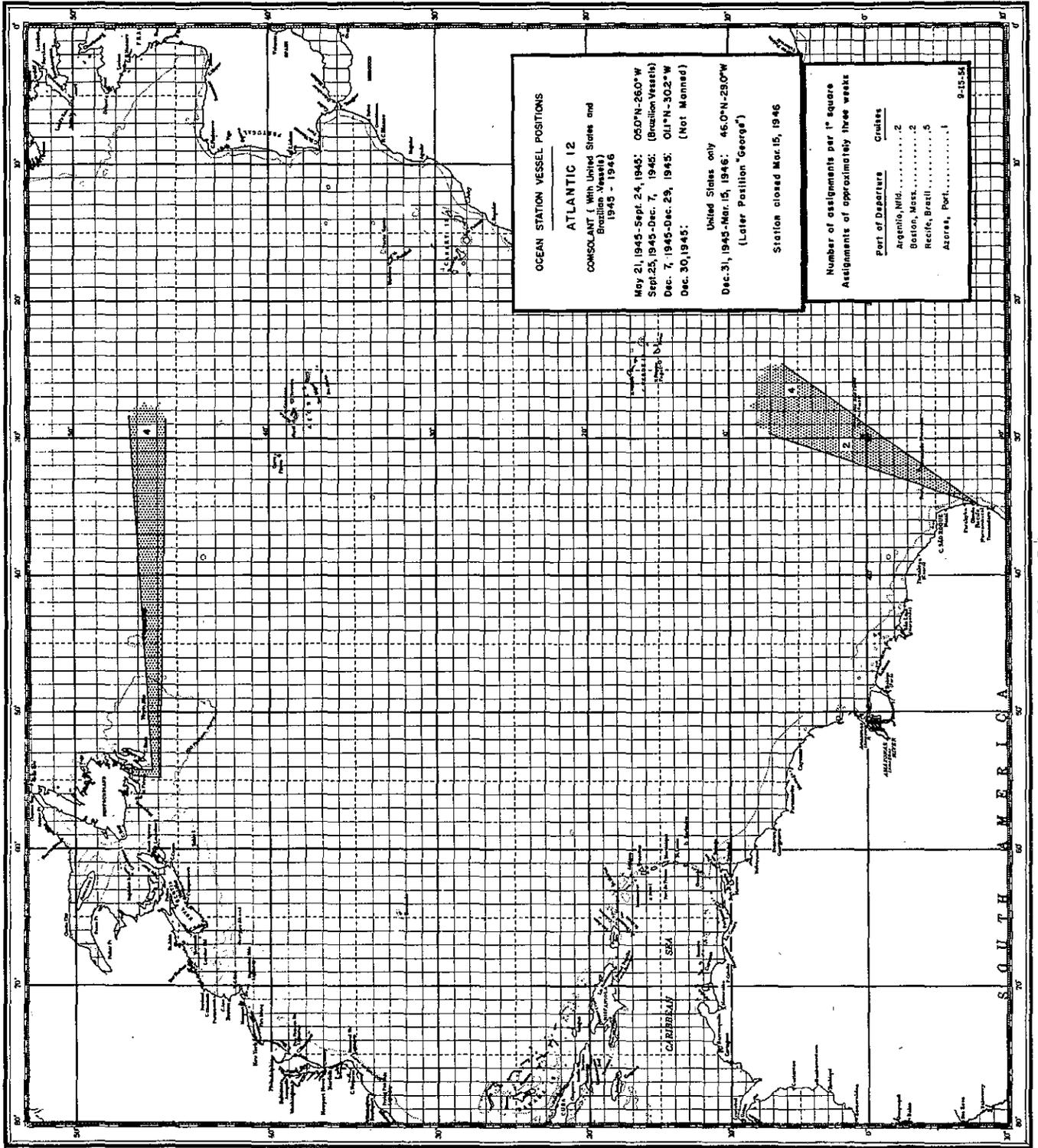


Fig. 14

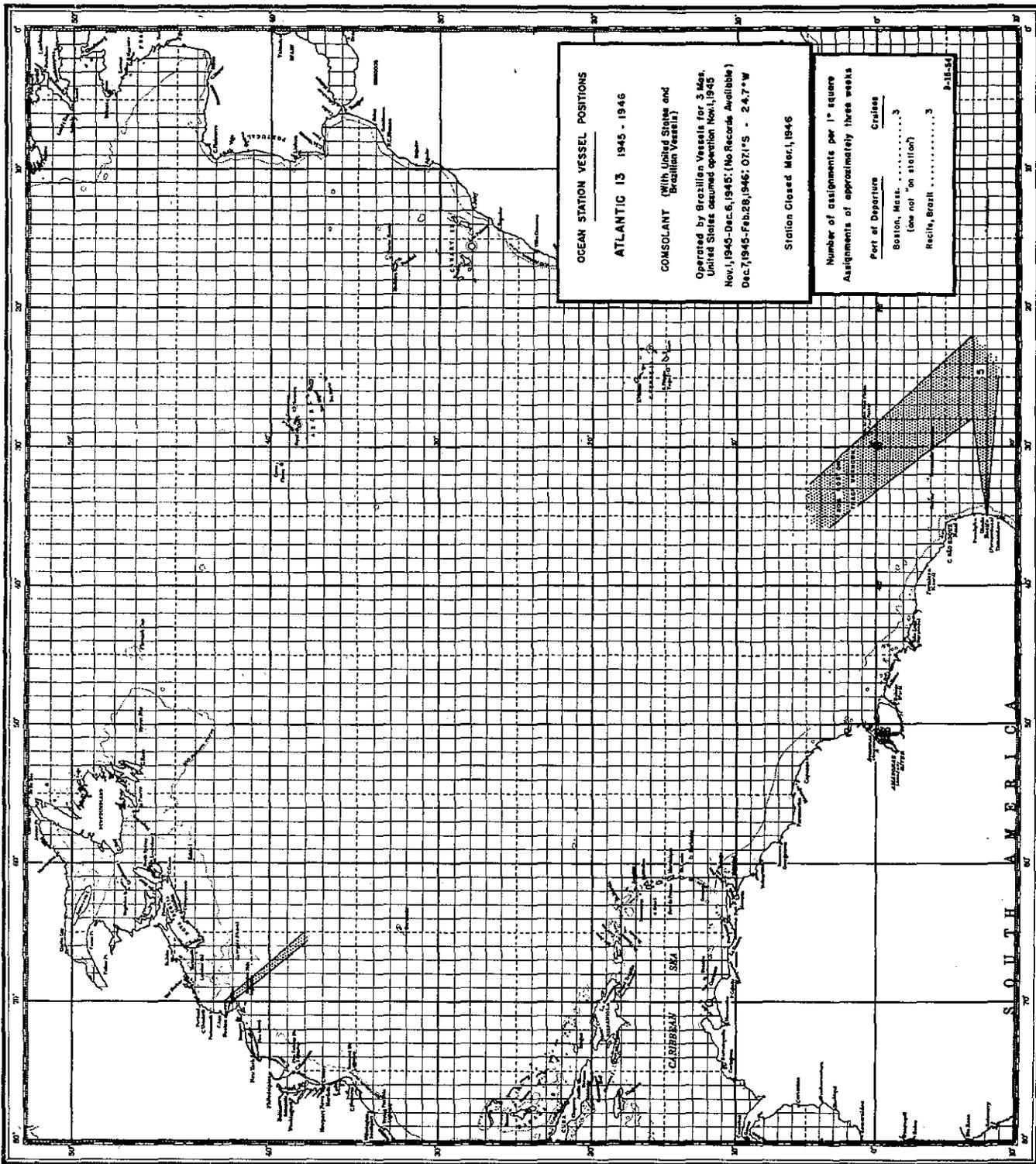


FIG. 15

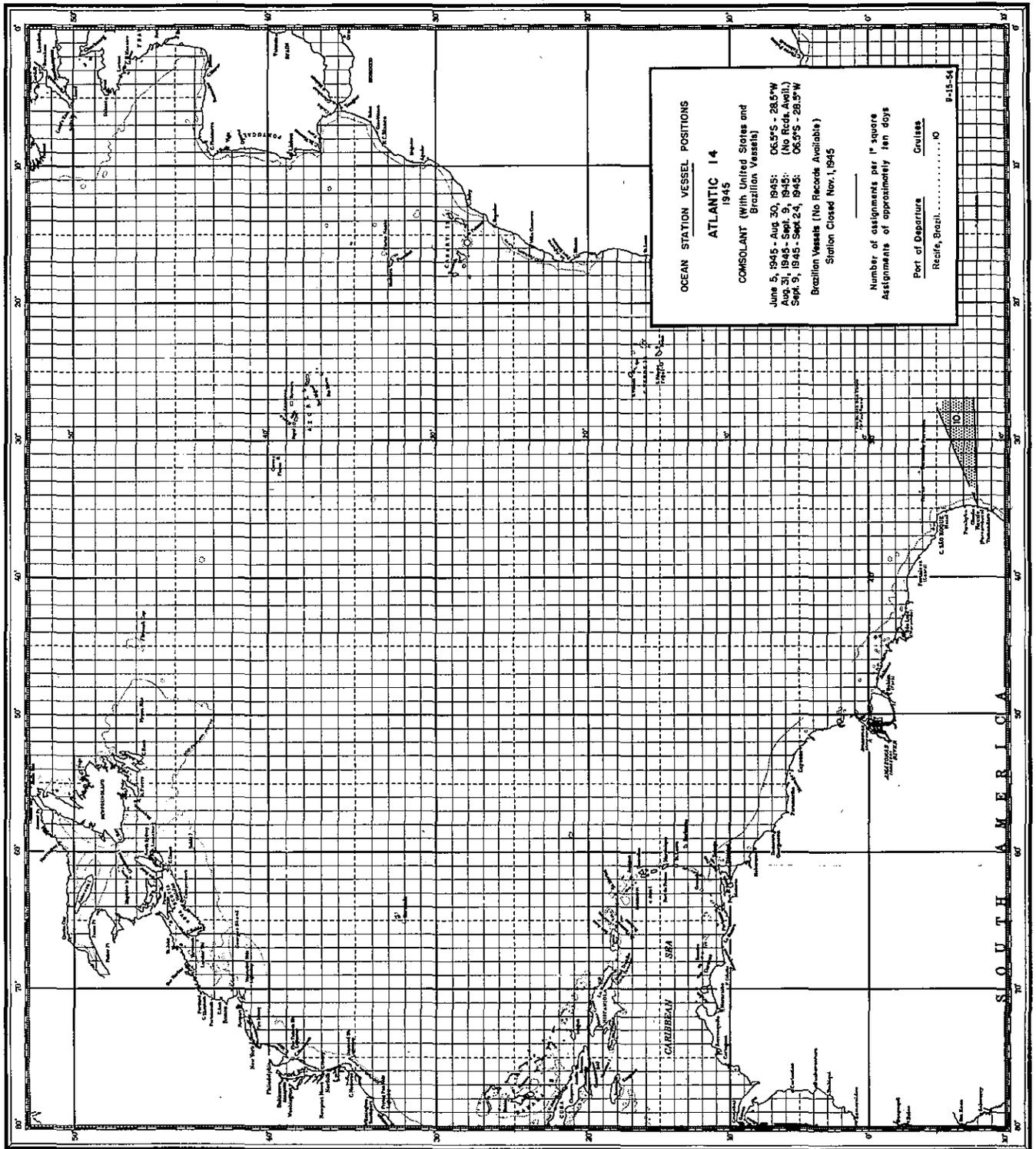


FIG. 16

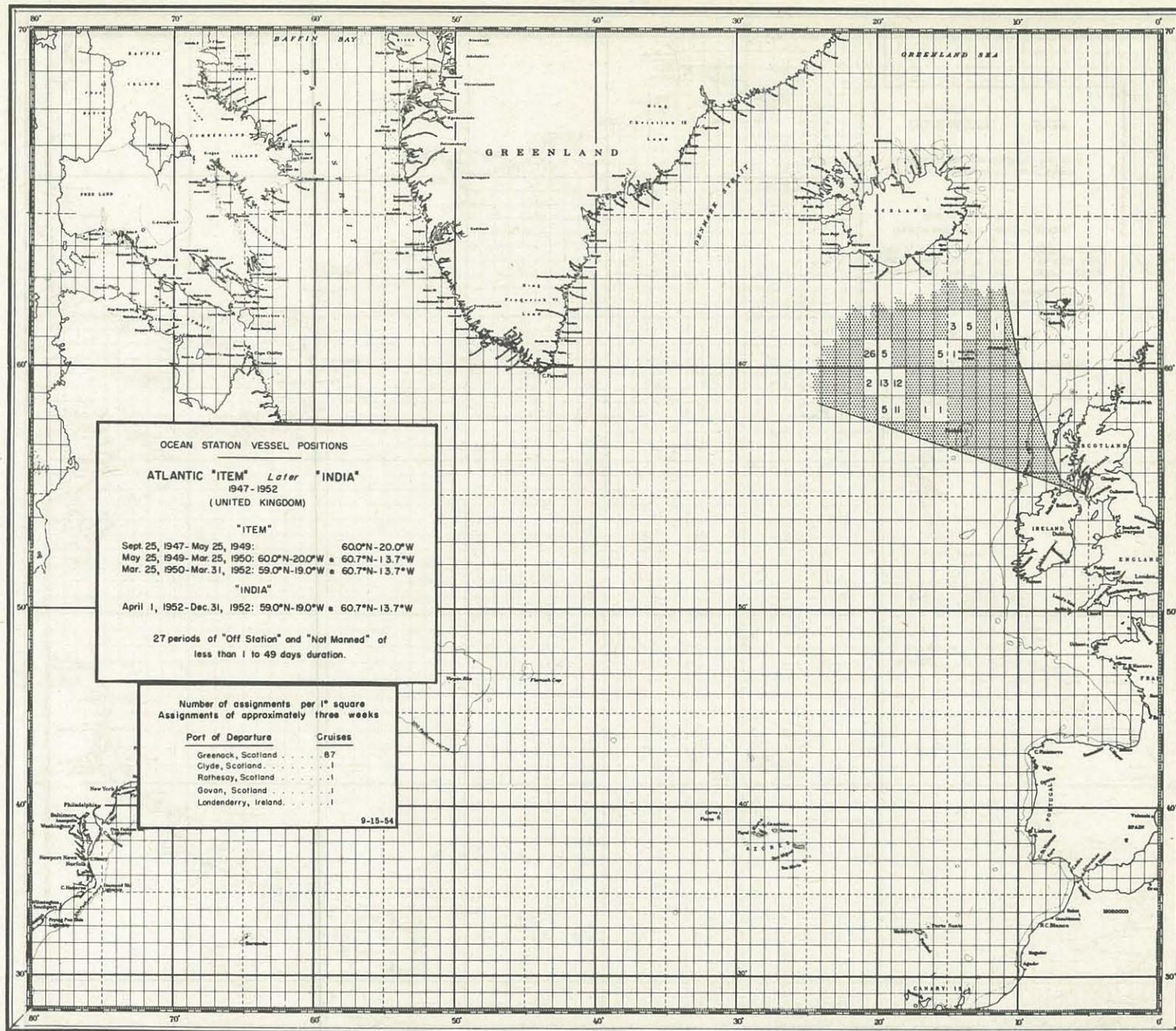


Fig. 17

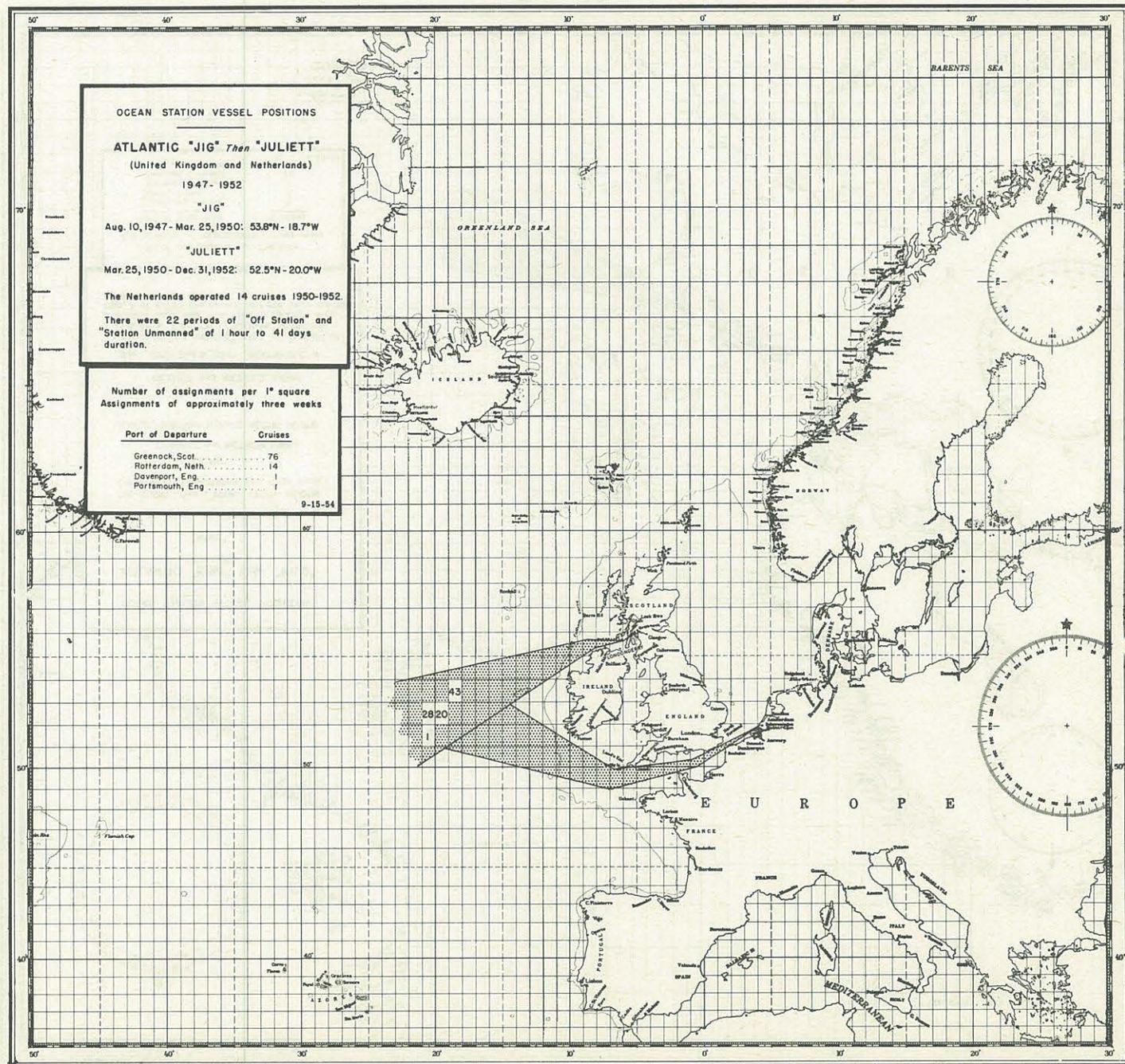


Fig. 18

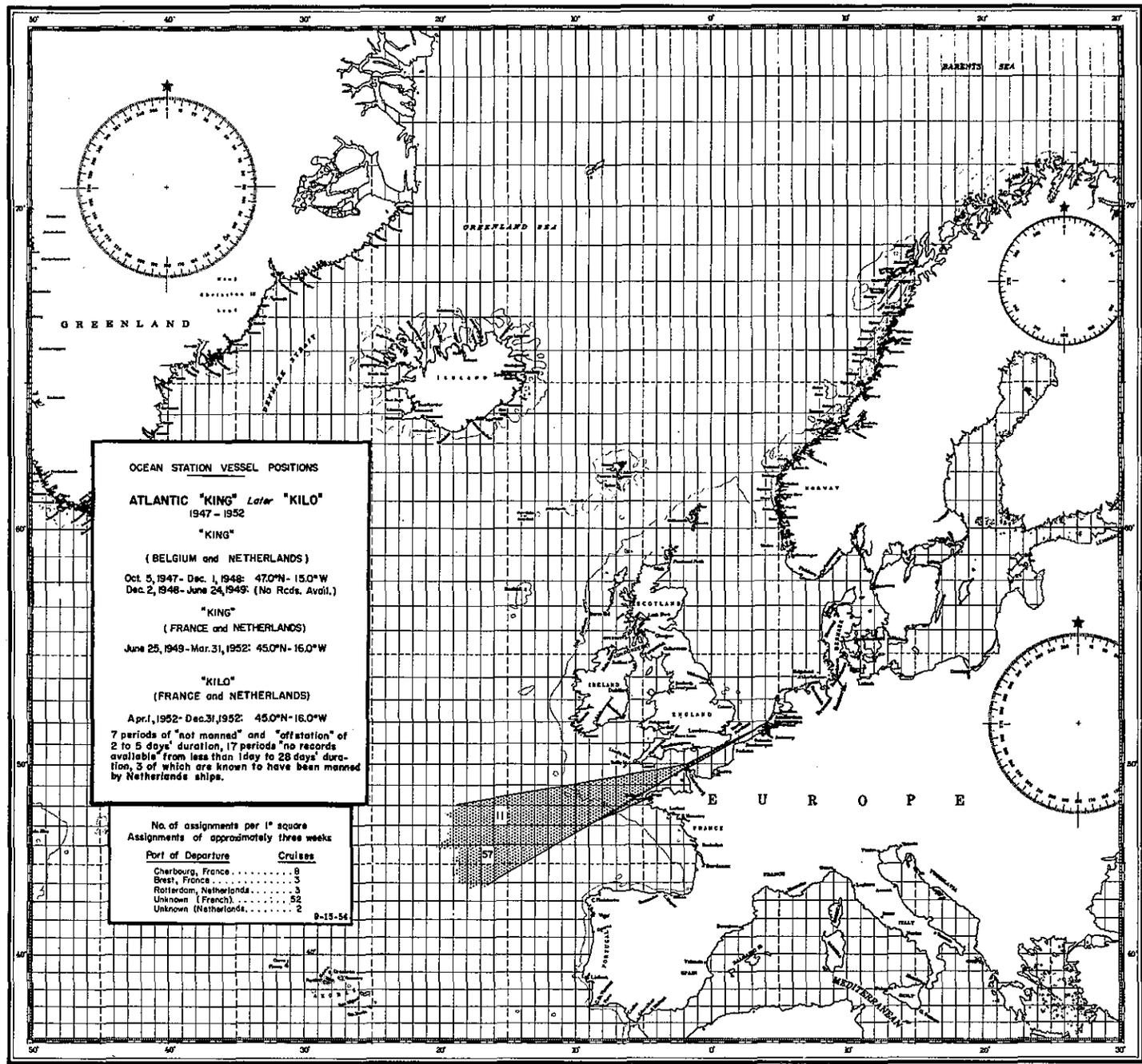


Fig. 19

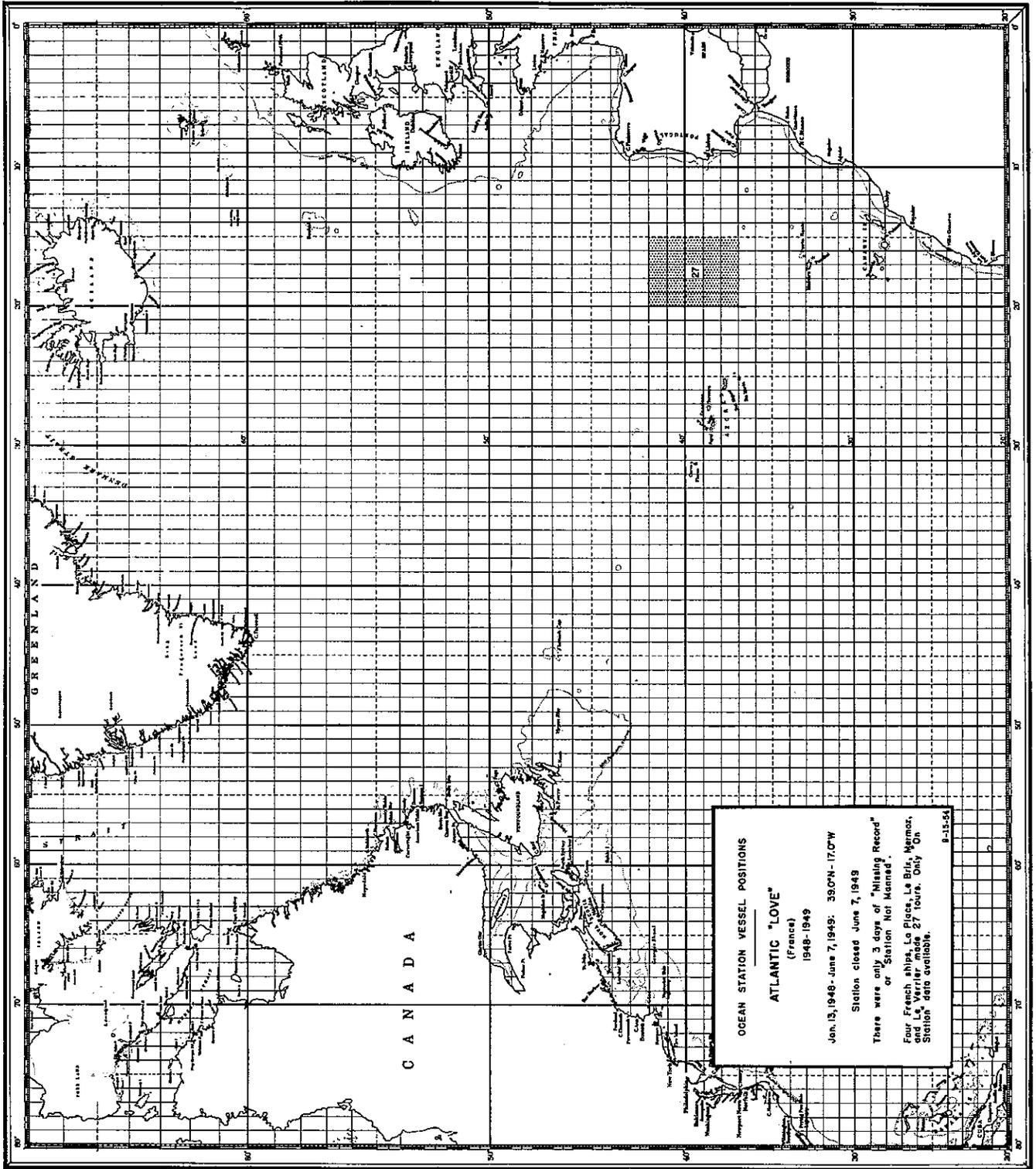


FIG. 20-

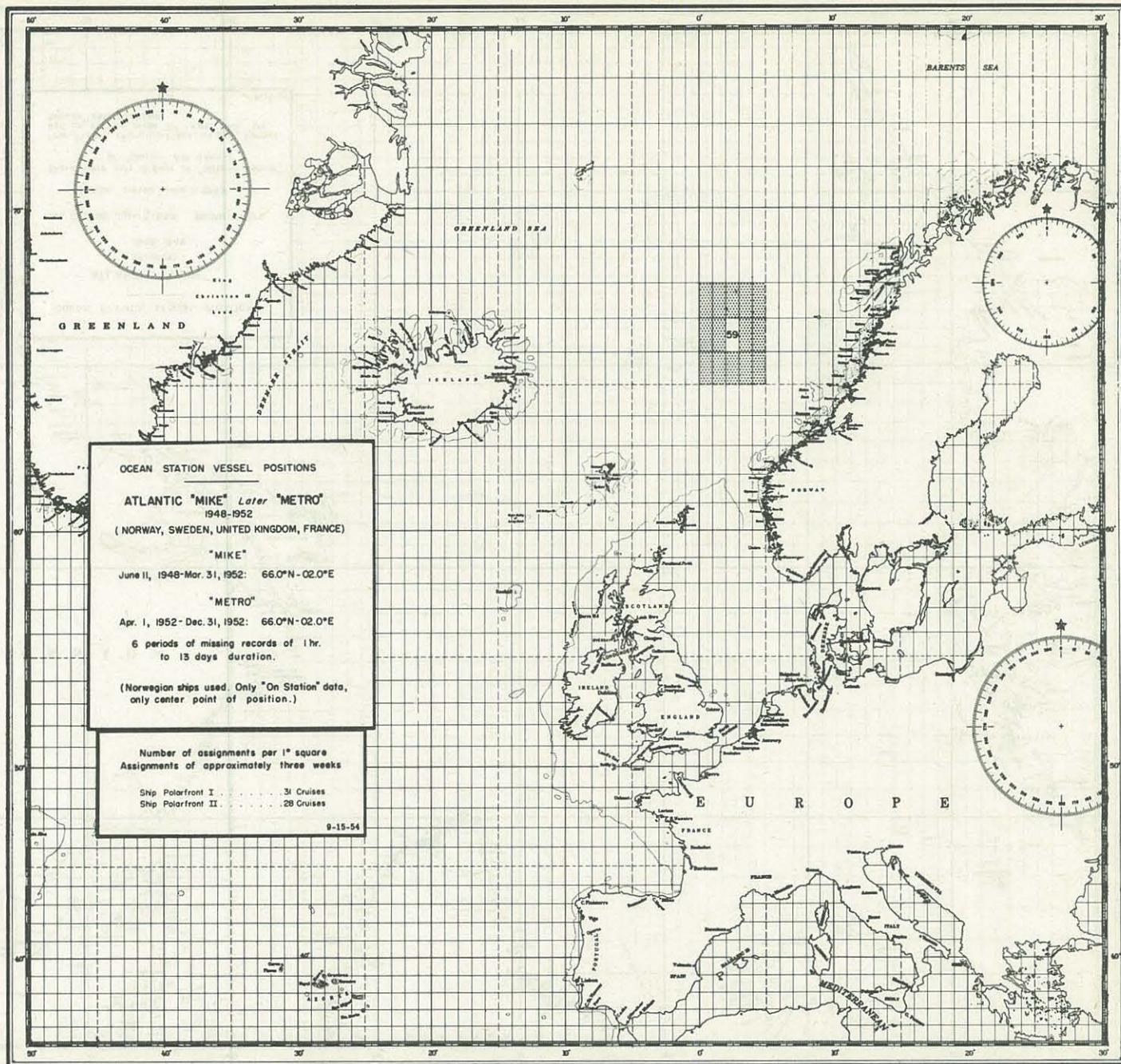


Fig. 21

SECTION TWO

PART I

U. S. WEATHER BUREAU HISTORY

OF

PACIFIC OCEAN WEATHER STATIONS

1943 - 1952

## HISTORY OF PACIFIC OCEAN WEATHER STATIONS

The history of the Pacific Ocean Vessel Program began in 1943 when the Commander in Chief of the U. S. Fleet (COMINCH) ordered the Commander in Chief of the Pacific Fleet (CINCPAC) to establish two weather reporting stations in the Pacific. One was established between the Hawaiian Islands and the California coast; the other, in the Gulf of Alaska.

During World War II, all stations were manned by the U. S. Navy. Since the war, the stations have been manned either by the U. S. Navy or by the U. S. Coast Guard with U. S. Weather Bureau observational personnel.

Originally, stations were established at approximately 700 miles between stations, and between stations and shore. The permanent fixed points and limits designated by the International Civil Aviation Organization (ICAO) were used in all cases where applicable (see Diagram of Station Square Page iv). In all other cases, limits of 1.5° each side of center point of latitude and 2.5° each side of center point of longitude was used for "on station" data for purposes of the survey of available records at the National Weather Records Center and for this publication.

On April 1, 1946, the first International Civil Aviation Organization (ICAO) phonetic alphabet came into effect, replacing the numerical. However, this was not used to identify Pacific Ocean Stations until the U. S. Coast Guard assumed operation. On April 15, 1946, the U. S. Coast Guard officially assumed operational control of one weather and one plane guard station east of the Hawaiian Islands with the U. S. Navy retaining directional control. Plane guard stations were then redesignated "Bird Dog". However, because of limited funds and personnel, the Coast Guard could not begin operation immediately. But, in June, 1946, that agency found it possible to assist in the Ocean Station Vessel program to some extent. Subsequently, the operation of two stations was fully assumed by the U. S. Coast Guard on June 23 and July 15, respectively, designating them as follows:

Bird Dog 1	30°00'N	140°00'W	(formerly Navy 935, Plane Guard "Fox")
Dog	47°00'N	142°00'W	(formerly Navy Weather Station 990)

On July 1, the U. S. Coast Guard assumed directional control of stations east of the Hawaiian Islands but indicated that it could maintain no more than these two stations during the fiscal year 1946-1947. On February 28, 1947, Station "Dog" was moved to former location of Navy 916 at 49°00'N 148°00'W and redesignated "Able", but was discontinued on May 27, 1947, until September 28, 1948, at which time operations were resumed. On March 11, 1947, Bird Dog 1 was redesignated "Fox".

Meanwhile, the need was recognized for other stations, especially during the typhoon season in the eastern Pacific area. Japan established Station "X" (X-Ray) at 39°00'N 153°00'E on October 19, 1947, and "T" (Tare) at 29°00'N 135°00'E on September 19, 1948. The latter station operated only until November 2, 1948, then again from June 15, 1949, through November 2, 1949. It was again operated beginning June 1, 1950, and has been operating continuously since that date.

During 1947 and 1948, the U. S. Navy continued curtailing operations. As stations were closed and the number left in operation steadily decreased, it became increasingly evident that, in order to provide adequate navigational facilities for safe, regular and economic air service, as many ocean weather stations as were practicable would have to be established on a permanent basis. Therefore, the formulation of plans for such a network was begun at the First North Pacific Regional Air Navigation Meeting (ICAO) held in Seattle, Washington, July 13-26, 1948. Here proposals were made concerning the number of stations needed and their locations. Plans were further discussed on July 25, 1949, at a meeting in Washington, D. C., between the representatives of the governments of the United States and Canada. The recommendations agreed upon are as follows:

**"X" (X-Ray)	42°00'N	151°00'E	To continue in operation by Japan.
"N" (Nan)	30°00'N	140°00'W	To be operated by the U.S. Government.
"O" (Oboe)	40°00'N	142°00'W	To be operated by the U.S. Government.
***"P" (Peter)	50°00'N	145°00'W	To be operated by Canada.

"Q" (Queen)	43°00'N 167°00'W	To be operated by the U. S. Government as soon as appropriate funds for the purpose are available.
"S" (Sugar)	48°00'N 162°00'E	To be operated by the U. S. Government as soon as appropriate funds for the purpose are available.
****"T" (Tare)	14°00'N 133°00'E	To be operated by the U. S. Government as soon as appropriate funds for the purpose are available.

\*Although the position of "X" was established as 42°00'N 151°00'E at this meeting (1949), Japan had been operating at 39°00'N 153°00'E and has, in fact, continued operation at this point to the present.

\*\*Canada agreed to operate a previously established Pacific station, "A", if it be moved to a position more practicable for that country. As a result, "A" at 49°00'N 148°00'W was moved to 50°00'N 145°00'W and redesignated "P". Canada agreed then to operate Station "P" on a full-time basis in exchange for withdrawal from any obligation in the Atlantic so that the United States agreed to assume full operation of Atlantic "B".

\*\*\*Station "T", as mentioned above, had been established by the Japanese government September 19, 1948, at 29°00'N 135°00'E. It was operated for approximately six months during the typhoon season of each year. Since June 1, 1950, however, this station has operated continuously at this point.

By 1949, the U. S. Navy had discontinued operations on all stations except two, and these were closed during that year. Three stations had been operating continuously, "Fox", "Able", and "X-Ray". "Tare" maintained operations as mentioned above for approximately six months a year at this time.

On December 19, 1949, changes were made to conform with the Agreement of July 25, 1949, as follows:

"Fox" (formerly Bird Dog 1)	30°00'N 140°00'W	Redesignated "Nan"
"O" (Oboe)	40°00'N 142°00'W	Was established by the U. S. Coast Guard
"P" (Peter)	50°00'N 145°00'W	*

\*Station "A" (Able), 49°00'N 148°00'W was moved to 50°00'N 145°00'W and redesignated "P" (Peter) as per agreement with Canada; however, Canada could not assume the obligation of the station at this time so that it continued to be operated by the U. S. Coast Guard.

On January 1, 1950, the following Ocean Weather Stations were in operation in the Pacific:

"N"	30°00'N 140°00'W	United States
"O"	40°00'N 142°00'W	United States
"P"	50°00'N 145°00'W	United States
"T"	29°00'N 135°00'E	Japan
"X"	39°00'N 153°00'E	Japan

On June 22, 1950, the Pacific Ocean Station Program (1949) was formally effected. However, the United States found it necessary to close Station "O" at 40°00'N 142°00'W on July 31 in order to establish a station needed more in another location. Subsequently, Station "S" (Sugar) at 48°00'N 162°00'E was activated on September 10. But, on September 25, the Secretary of State suggested certain modifications to Canada which were formally accepted by that country February 16, 1951. Under this interim program, the following stations were to be operated:

"N"	30°00'N 140°00'W
"P"	50°00'N 145°00'W

"Q"	43°00'N	167°00'W
"S"	48°00'N	162°00'E
"U"	26°00'N	149°00'W
"V"	33°00'N	164°00'E
"X"	42°00'N	151°00'E

No arrangements were made for reopening Station "O" at 40°00'N 142°00'W, nor for moving Station "T" to 14°00'N 133°00'E.

"N", "P", and "X" were to be operated in accordance with the Agreement. Station "S" would continue to be operated by the U. S. Government. Stations "V", "U", and "Q" were to be established in that order as soon as possible by the U. S. Government. "Upon the termination of the emergency, the Program of the Pacific Ocean Stations to meet peacetime requirements will be resumed".

The U. S. Navy again entered the program as an operational agency when Station "V" (Victor) was established at 33°00'N 164°00'E on November 7, 1950, by that agency.

As per Agreement, Canada assumed full operation of Station "P" on December 1, 1950. On December 10, 1950, Station "N" was moved to 33°00'N 135°00'W and Station "U" was established at 28°00'N 145°00'W on December 12. It might be of interest here to note that these two stations were established along the rhumb line of the pressure pattern flying route between San Francisco, California, and Honolulu, Hawaii, which circumnavigated the semi-permanent eastern Pacific high pressure center. The two routes most used at that time had turning points at 35°N 140°W (northern route) and 30°N 135°W (southern route). Because of the inaccuracy of altimeters along the pressure gradient, it was highly advantageous to place ship stations along the main rhumb line to obtain correct altimeter settings.

By January 1, 1951, then, the following ocean weather stations were operating in the Pacific according to the permanent Ocean Vessel Station Program:

"N"	33°00'N	135°00'W	United States (Coast Guard)
"P"	50°00'N	145°00'W	Canada
"S"	48°00'N	162°00'E	United States (Coast Guard)
"T"	29°00'N	135°00'E	Japan
"U"	28°00'N	145°00'W	United States (Coast Guard)
"V"	33°00'N	164°00'E	United States (Navy)
"X"	39°00'N	153°00'E	Japan

There was no change in the program in 1951 except on Station "V" (Victor). The position of this station was moved to 31°00'N 164°00'E on February 9. The U. S. Coast Guard assumed full operation of this station September 29 so that the U. S. Navy was released from participation in the Ocean Station Vessel Program on that date.

On March 20, 1952, "N" and "U" were moved a little southward to 32°30'N 135°00'W and 27°40'N 145°00'W, respectively. On April 1, 1952, the new (ICAO) phonetic alphabet came into effect in the following manner:

"Nan"	redesignated	"Nectar"
"Peter"	redesignated	"Papa"
**"Queen"	redesignated	"Quebec"
"Sugar"	redesignated	"Sierra"
"Tare"	redesignated	"Tango"
"Uncle"	redesignated	"Union"
"Victor"		"Victor"
"X-Ray"	redesignated	"Extra"

\*In practice, the yet unmanned Station "Q" continued to be referred to as "Queen" even though the U. S. Coast Guard began operation of "Q" (Quebec) at 43°00'N 167°00'W on April 6, 1952.

At the end of 1952, the eight stations established on a permanent basis were still operating at the same positions:

"N"	30°00'N	140°00'W	United States
"P"	50°00'N	145°00'W	Canada
"Q"	43°00'N	167°00'W	United States
"S"	48°00'N	162°00'E	United States
"T"	29°00'N	135°00'E	Japan
"U"	26°00'N	149°00'W	United States
"V"	33°00'N	164°00'E	United States
"X"	39°00'N	153°00'E	Japan

It will be seen by comparing the histories of the North Atlantic and North Pacific Ocean Weather Stations that after the second ICAO phonetic alphabet was accepted the first half was assigned to the Atlantic and the latter half to the Pacific stations.

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SECTION TWO

PART II

LIST OF TABLES

PACIFIC OCEAN WEATHER STATIONS

1943 - 1952

U. S. WEATHER BUREAU  
OCEAN STATION VESSEL RECORDS SURVEY - SUMMARY OF POSITIONS

1943 - 1952

UNITED STATES, CANADIAN AND JAPANESE STATIONS											U. S. COAST GUARD, U. S. NAVY, CANADIAN AND JAPANESE VESSELS
Pacific	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	All positions Degrees North Latitude, West Longitude except where otherwise specified, occupied for any part of or all of the years listed.
"N"	* 30.0-140.0		* 30.0-140.0	* 30.0-140.0	30.0-140.0	30.0-140.0	30.0-140.0	30.0-140.0 33.0-135.0	33.0-135.0	33.0-135.0 32.5-135.0	*U. S. Navy Station 935 Assumed by USCG - 6/23/46
"O"							40.0-142.0	40.0-142.0			Closed 7/31/50
"P"	* 49.0-148.0	** 40.0-150.0	** 40.0-150.0	** 40.0-150.0 ** 47.0-142.0 * 49.0-148.0	47.0-142.0 * 49.0-148.0	49.0-148.0	49.0-148.0	(A) 50.0-145.0	(A) 50.0-145.0	(A) 50.0-145.0	*U. S. Navy 916 (Able) **U. S. Navy 990 (Dog) Assumed by USCG - 7/15/46 (A) Assumed by Canada - 12/1/50
"Q"										43.0-167.0	
"S"								48.0-162.0E	48.0-162.0E	48.0-162.0E	
"T"						29.0-135.0E	29.0-135.0E	29.0-135.0E	29.0-135.0E	29.0-135.0E	Operated by Japan
"U"								28.0-145.0	28.0-145.0	28.0-145.0 27.7-145.0	
"V"								* 33.0-164.0E	33.0-164.0E * 31.0-164.0E	31.0-164.0E	*U. S. Navy "Victor" Assumed by USCG - 9/21/51
"X"					39.0-153.0E	39.0-153.0E	39.0-153.0E	39.0-153.0E	39.0-153.0E	39.0-153.0E	Operated by Japan

Table 6

9/15/54

U. S. WEATHER BUREAU

OCEAN STATION VESSEL RECORDS SURVEY - DETAIL SHEET

1943 - 1952

U. S. NAVY AND COAST GUARD, CANADIAN, JAPANESE STATIONS

U. S. NAVY AND COAST GUARD,  
CANADIAN, JAPANESE VESSELS

(Positions degrees north latitude, west longitude or otherwise specified)

PACIFIC	POSITION	FROM	TO	POSITIONS REDESIGNATED OR CLOSED	NO. OF CRUISES	IN OPERATION JAN. 1, 1953
"N"	*30.0 - 140.0 **30.0 - 140.0 33.0 - 135.0  32.5 - 135.0	8-17-43 6-23-46 12-10-50  3-20-52	3-31-45 12-10-50 3-20-52  12-31-52	*U. S. Navy 935 "Fox" and Plane Guard 2 **U. S. Coast Guard - redesignated "Bird Dog 1" Redesignated "Fox" 3/11/47 Redesignated "Nan" 12/19/49 Redesignated "Nectar" 4/1/52	125	"Nectar"  32.5 - 135.0
"O"	40.0 - 142.0	12-19-49	7-31-50	Closed 7/31/50	11	
"P"	*40.0 - 150.0 *47.0 - 142.0 **49.0 - 148.0 ***47.0 - 142.0 49.0 - 148.0  (A)50.0 - 145.0	8-30-44 5-1-46 9-29-43 7-15-46 2-28-47  12-19-49	4-30-43 6-24-46 4-5-46 2-28-47 12-19-49  12-31-52	*U. S. Navy 990 "Dog"  Designated "Peter" 12/19/49  **U. S. Navy 916 "Able" ***U. S. Coast Guard - redesignated "Dog" 7/15/46  (A)Canada assumed operations December 1, 1950 "Papa" - 4/1/52  Redesignated "Able" 2/28/47	133	"Papa"  50.0 - 145.0
"Q"	43.0 - 167.0	4-6-52	12-31-52	Customarily referred to as "Queen" but not actually activated by U. S. Coast Guard until after new ICAO phonetic alphabet became effective 4/1/52	13	"Quebec" 43.0 - 167.0
"S"	48.0 - 162.0E	9-10-50	12-31-52	"Sierra" - 4/1/52	40	"Sierra" 48.0 - 162.0E
"T"	29.0 - 135.0E	9-19-48 6-15-49 6-1-50	11-2-48 11-2-49 12-31-52	Operated by Japan Original records also include oceanographic reports "Tango" - 4/1/52	58	"Tango" 29.0 - 135.0E
"U"	28.0 - 145.0 27.7 - 145.0	12-12-50 3-20-52	3-20-52 12-31-52	"Union" - 4/1/52	35	"Union" 27.7 - 145.0
"V"	*33.0 - 164.0E *31.0 - 164.0E **31.0 - 164.0E	11-6-50 2-9-51 9-29-51	2-9-51 9-29-51 12-31-52	*U. S. Navy "Victor"  **U. S. Coast Guard "Victor"	45	"Victor" 31.0 - 164.0E
"X"	39.0 - 153.0E	10-21-47	12-31-52	Operated by Japan Original records also include oceanographic reports "Extra" - 4/1/52	116	"Extra" 39.0 - 153.0E

Table 7

9/15/54

## PACIFIC OCEAN VESSEL STATIONS

U. S. WEATHER BUREAU AND OTHER METEOROLOGICAL RECORD FORMS - U. S. COAST GUARD AND NAVY, CANADIAN, JAPANESE VESSELS

1943 - 1952

ORIGINAL RECORDS AVAILABLE			AVAILABLE RECORDS ON CARDS (1)		
Form Nos. - All Stations			Card Deck Nos. - All Stations		
Surface	Winds Aloft	Radiosonde	Surface	Winds Aloft	Radiosonde
1943 - 1945 Navaer 443 (a) (b) (d)	1943 - 1945 Navaer 443 (c)	1943 - 1946 Navaer 443 (c)	1943 - 1945 281	1943 - 1952 532	1946 - 1949 542
March, 1945 - 1948 (U. S. Coast Guard and Navy) WBAN 11	March, 1945 - 1946  WBAN 22	1945 - 1946  Navaer 448 (h) (t)			
1946 - 1948 1210E 1210A (Marine)	1946 - 1952 WBAN 21, 21A WBAN 22	June 10, 1945 WBAN 32	Mar. 1945 - July 1, 1946 110		June 1, 1949 - 1952 544
1949 - 1951 1210AB WBAN 11 (Navy)	Machine listings (WBAN 22) began Oct. 1950. 2 listings by ship and by station	Sept. 1945 - 1952 WBAN 31A&B	1946 - 1952 116		
1952 WBAN 11A&B	Machine listings (WBAN 22) (by station only) began 11/1/52	May 1946 - 1952 WBAN 33	6/1/51 - 1952 117		
Microfilm began July, 1947	Microfilm began July, 1947	Machine listings began 2/1/50 (2 listings by ship and by sta- tion). Machine listings (by station only) began 11/1/52. Microfilm began July, 1947			
<u>Station "P" (Canadian)</u> Microfilm Microprints began 1/1/51	<u>Station "P" (Canadian)</u> On microfilm: 2344 2346	<u>Station "P" (Canadian)</u> On microfilm: 2358 - 1 & 4 2345 - 1 2346 - 2	<u>Station "P" (Canadian)</u> 116	<u>Station "P" (Canadian)</u> 532	<u>Station "P" (Canadian)</u> 544
<u>Station "T" (Japanese)</u> Originals and encoded 3-hrly. reports  Microfilm began 5/1/51	<u>Station "T" (Japanese)</u> Originals Machine listings Nov. 1951 through June 1952 (except April). Microfilm began 8/1/51	<u>Station "T" (Japanese)</u> Originals Microfilm began 8/1/51	<u>Station "T" (Japanese)</u> 116	<u>Station "T" (Japanese)</u> 532 Nov. 1951 through June 6, 1952, only	<u>Station "T" (Japanese)</u> 544 Nov. 1951 through June 6, 1952, only
<u>Station "X" (Japanese)</u> Originals and encoded 3-hrly. reports. Microfilm began Dec. 1947. Micro- prints began 12/21/52	<u>Station "X" (Japanese)</u> Originals Machine listings Nov. 1951 through June 1952 (except April). Microfilm began 1950	<u>Station "X" (Japanese)</u> Originals Microfilm began 1950	<u>Station "X" (Japanese)</u> 116	<u>Station "X" (Japanese)</u> 532 Nov. 1951 through June 6, 1952, only	<u>Station "X" (Japanese)</u> 544 Nov. 1951 through June 6, 1952, only

(1) All information on cards from machine tabulating unit - this includes individual survey sheets.

Table 8

SECTION TWO

PART III

LIST OF U. S. SHIPS

PACIFIC OCEAN WEATHER STATIONS

1943 - 1952 .

PACIFIC SHIPS

COAST GUARD VESSELS - U. S. COAST GUARD STATIONS

Bering Strait - WAVP 382

U. S. S. Brownsville

Chautauqua - WPG 41

Escanaba - WPG 64

Falgout - WDE 424

Finch - WDE 428

Forster

Gresham

Iroquois - WPG 43

Klamath - WPG 66

Koiner - WDE 431

Lowe

Minnetonka - WPG 67

Newell

U. S. S. Orange - PF 43

Pontchartrain

Ramsden - WDE 482

Richey

Taney - WPG 37

Wachusett

Winnebago

Winona - PG 65

SECTION TWO

PART IV

MAPS

PACIFIC OCEAN WEATHER STATIONS

1943 - 1952

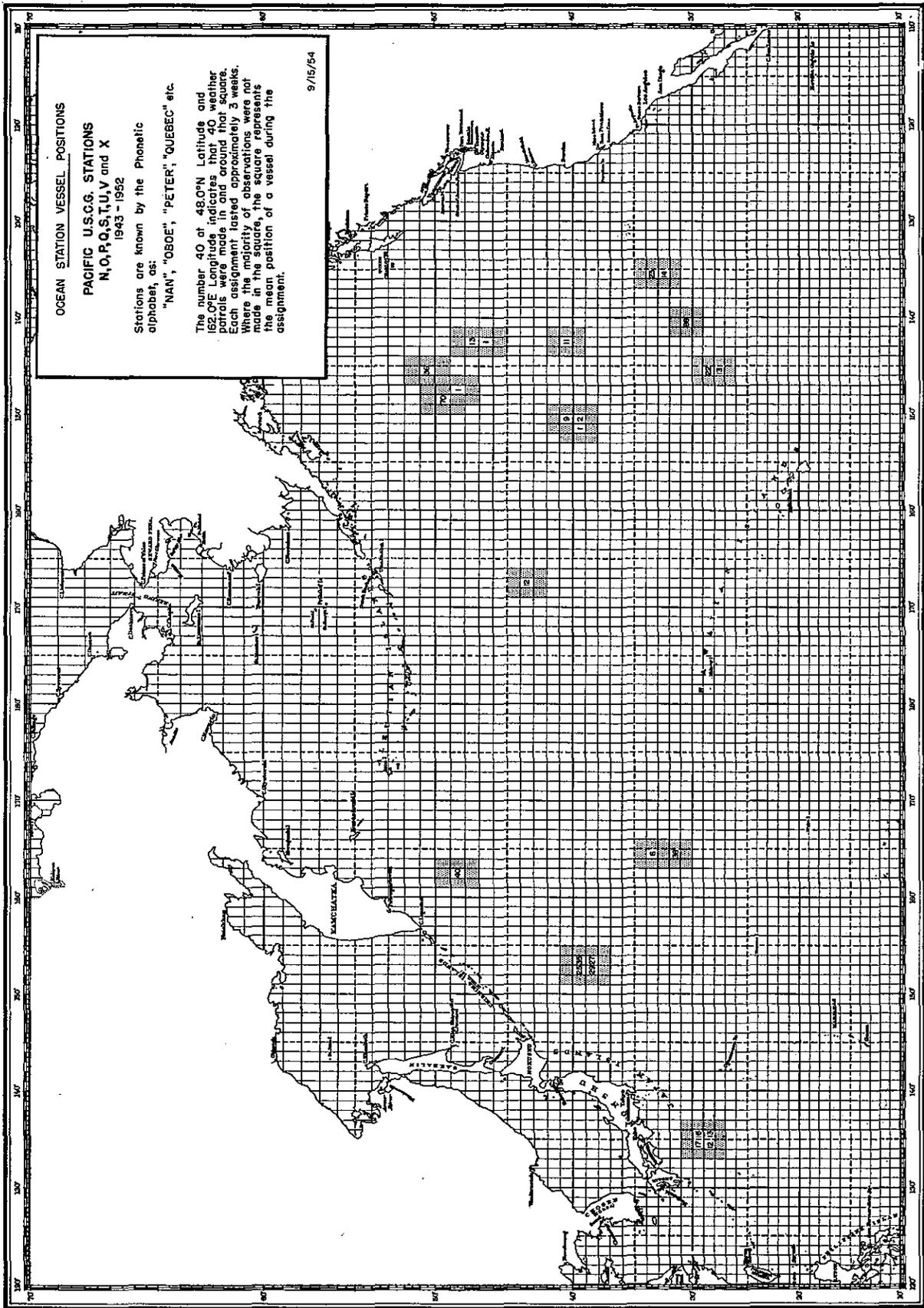


Fig. 22

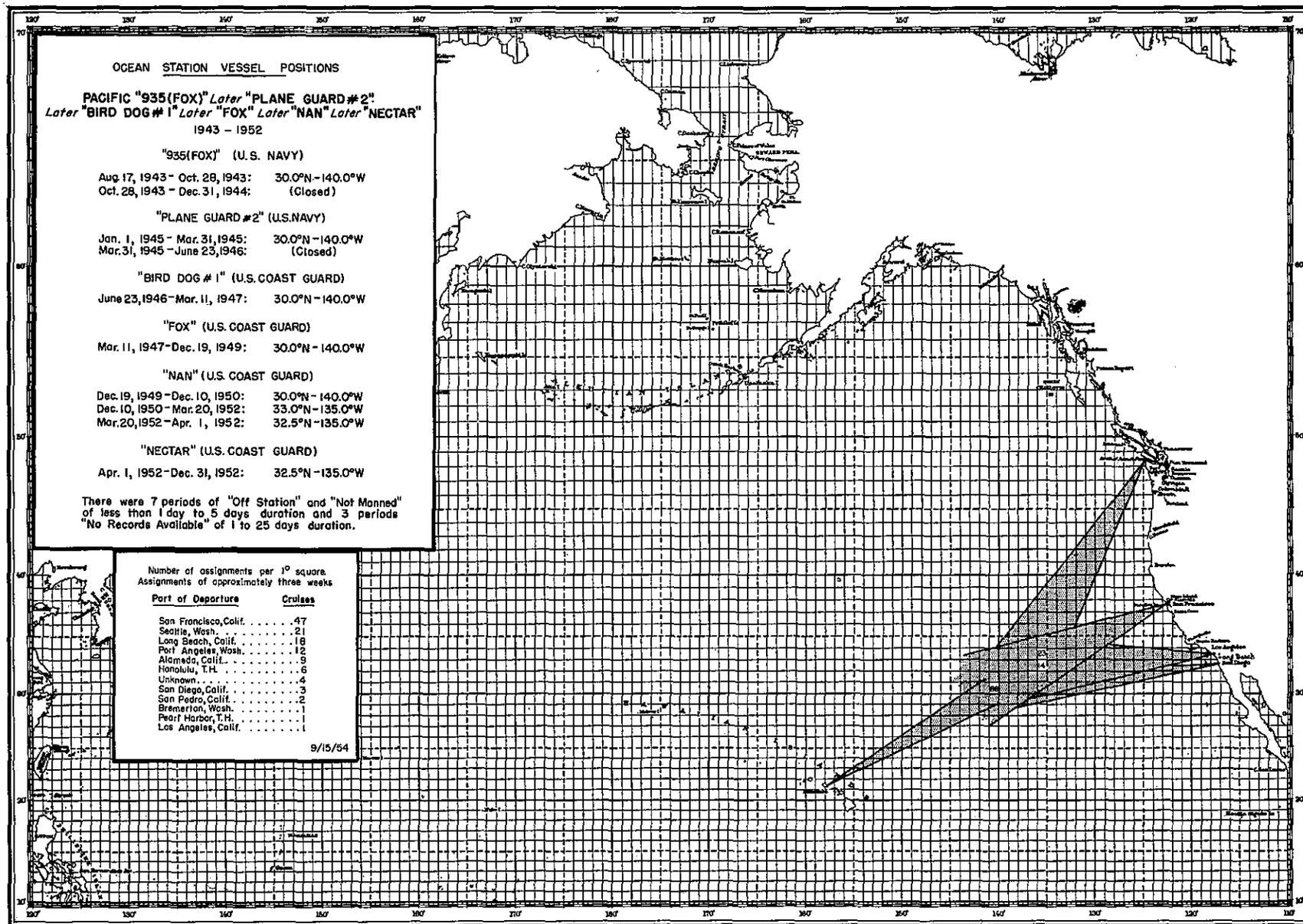


Fig. 23

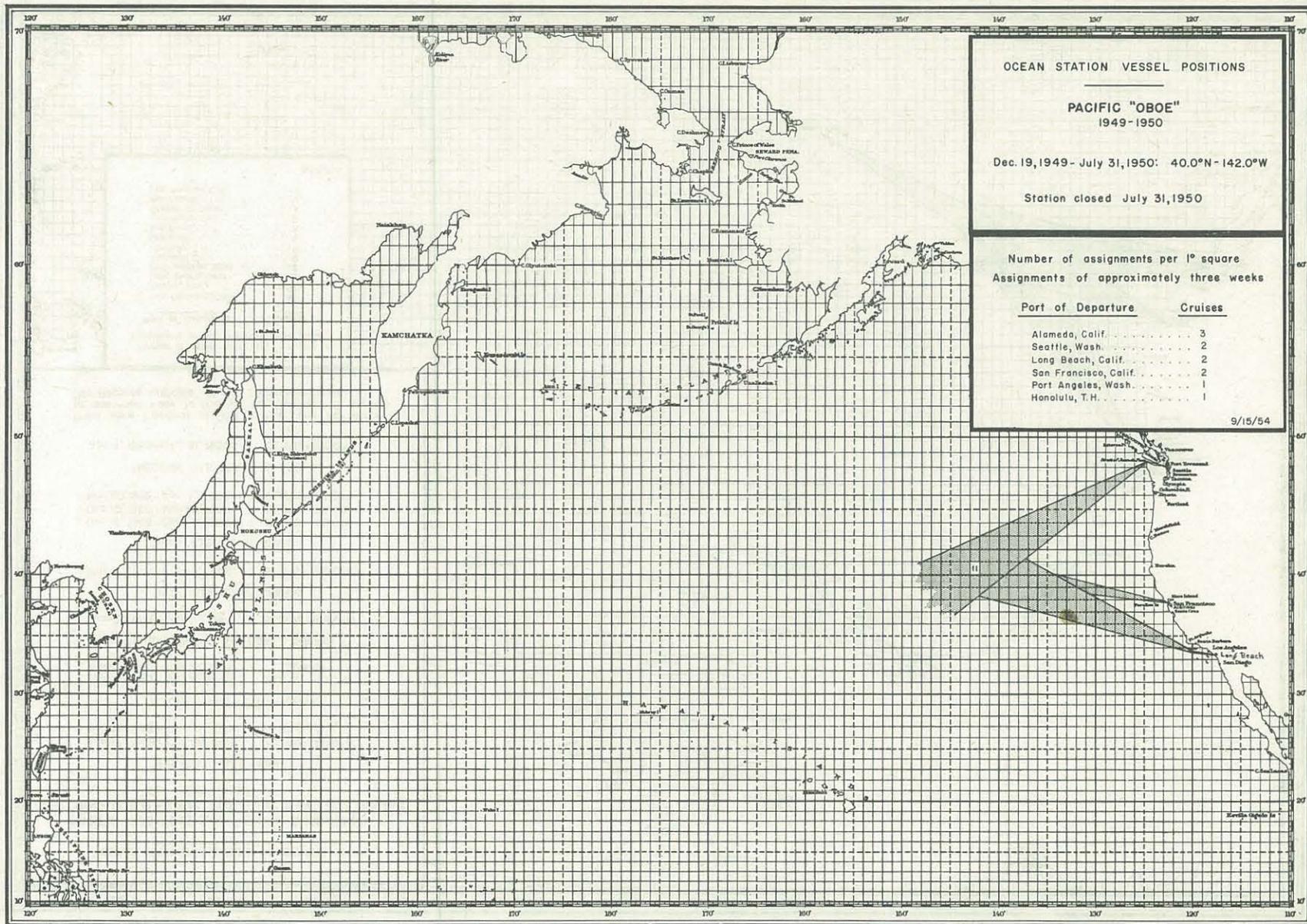


Fig. 24



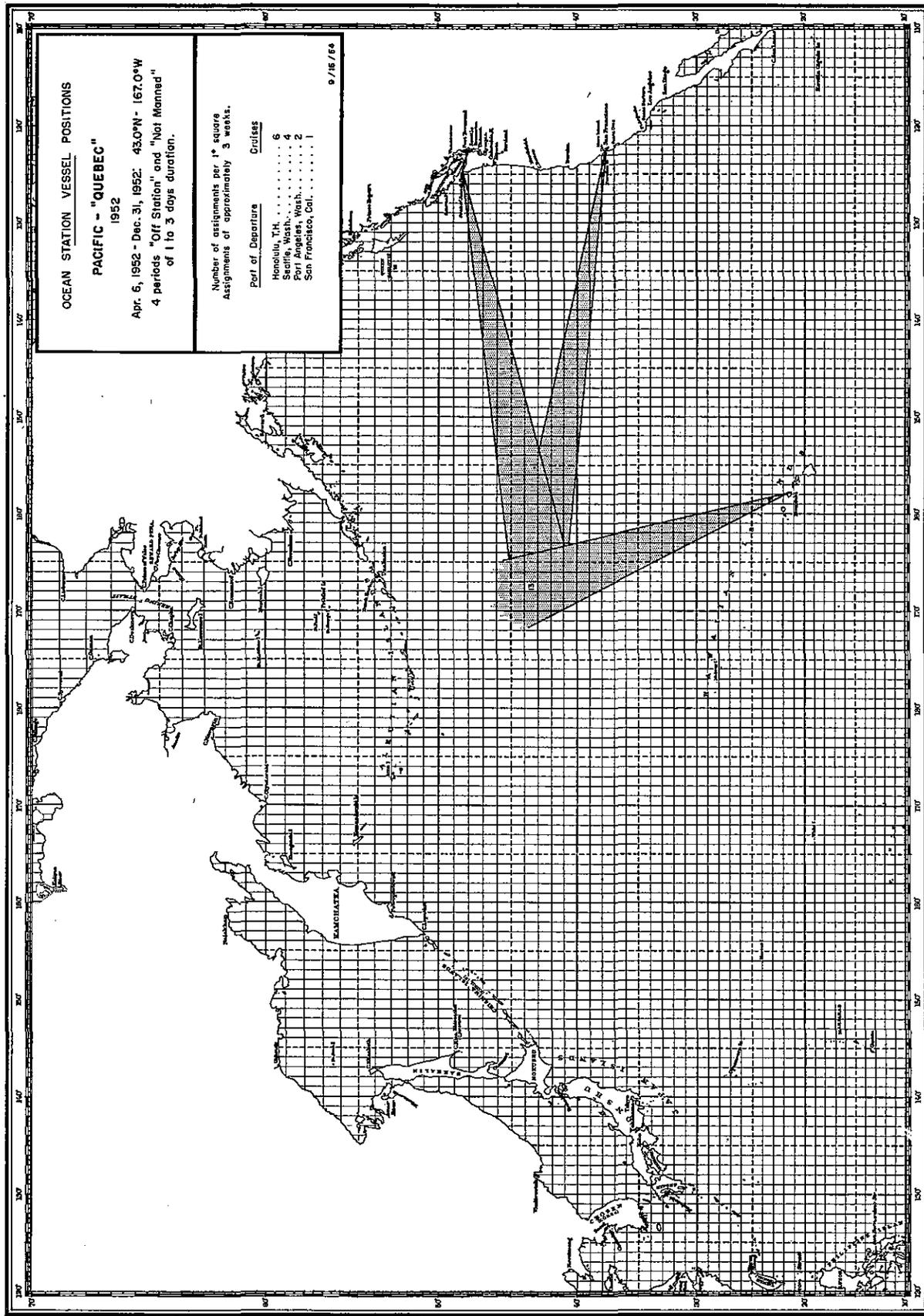


Fig. 26

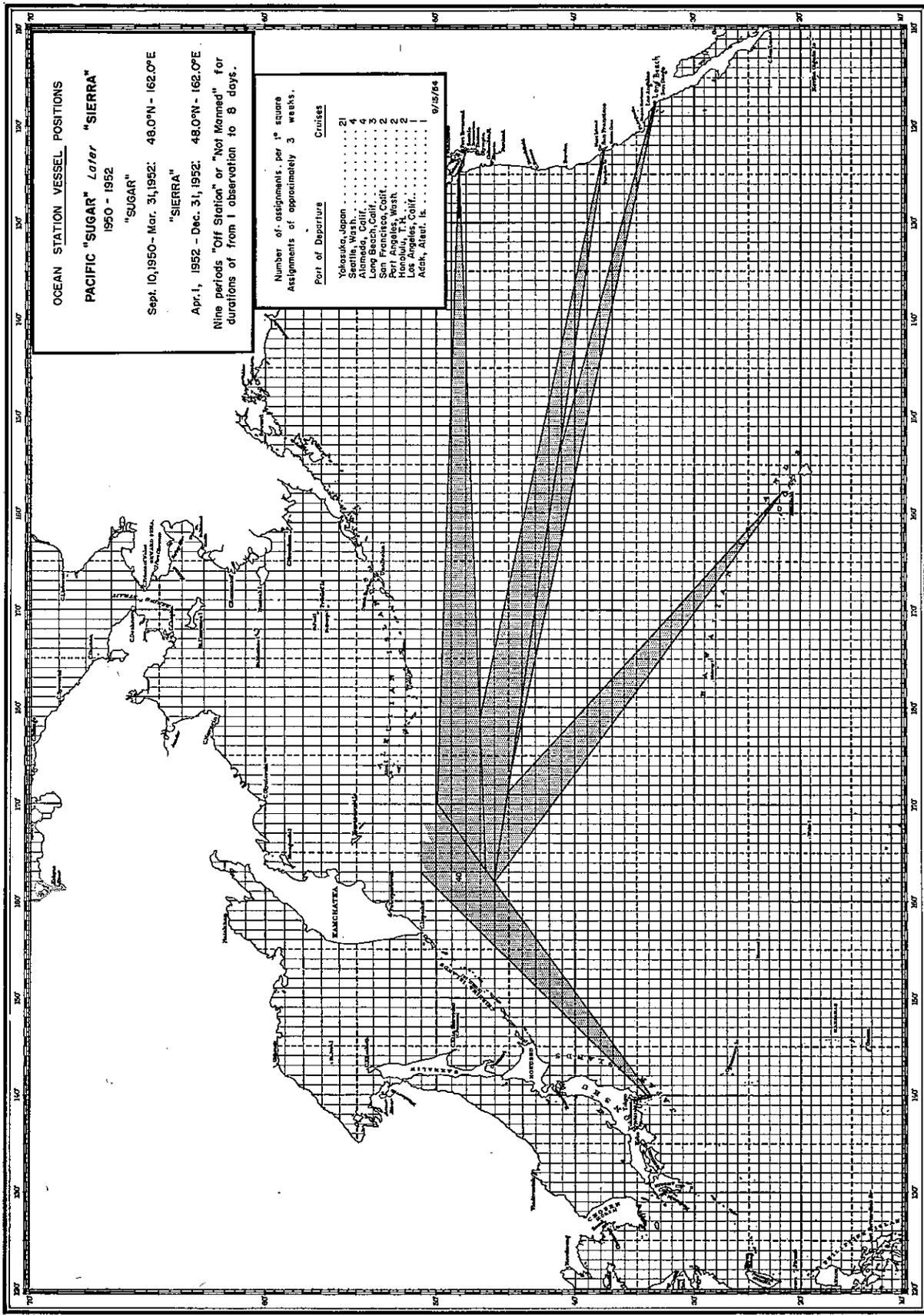


FIG. 27

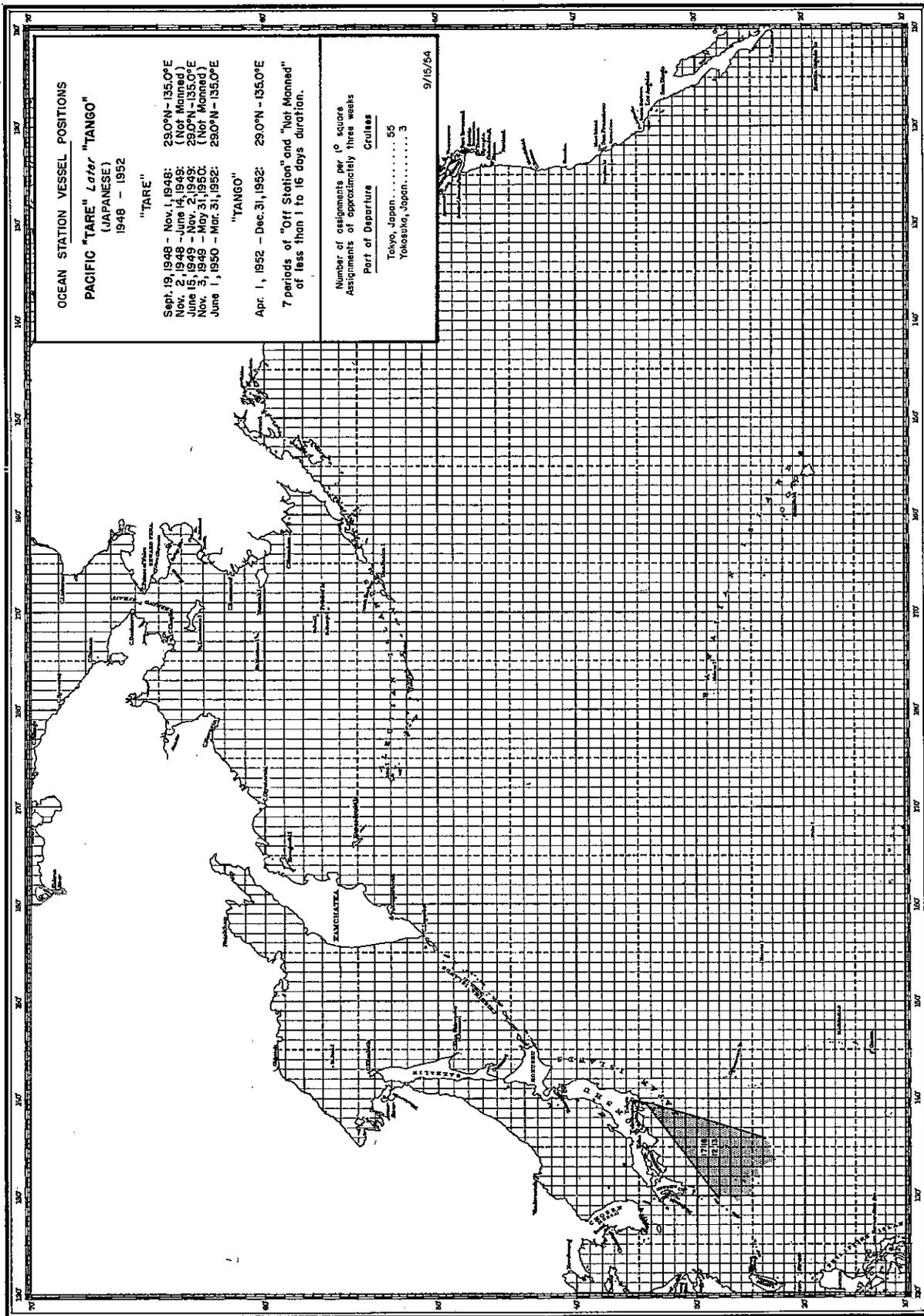


Fig. 2B.

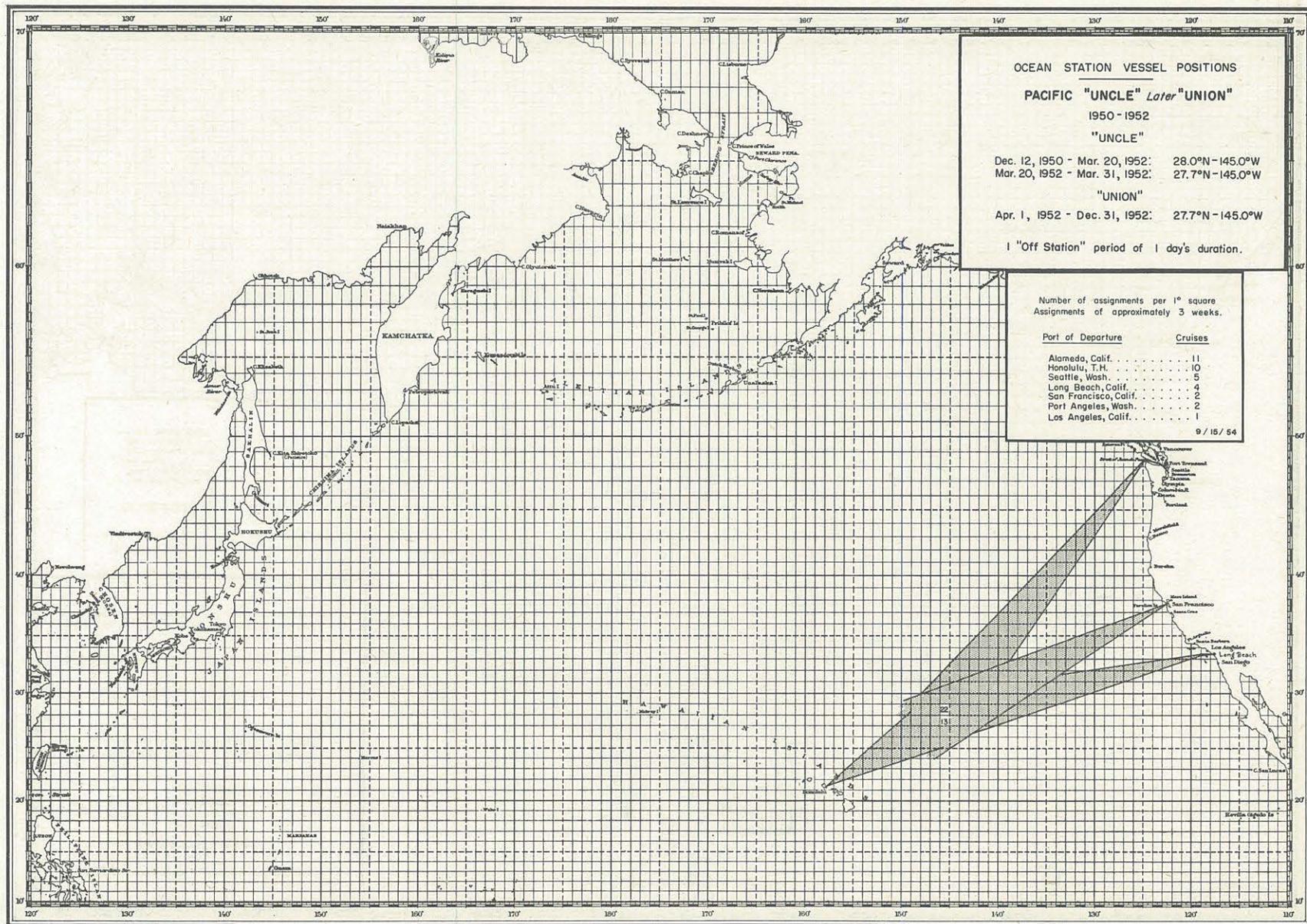


Fig. 29

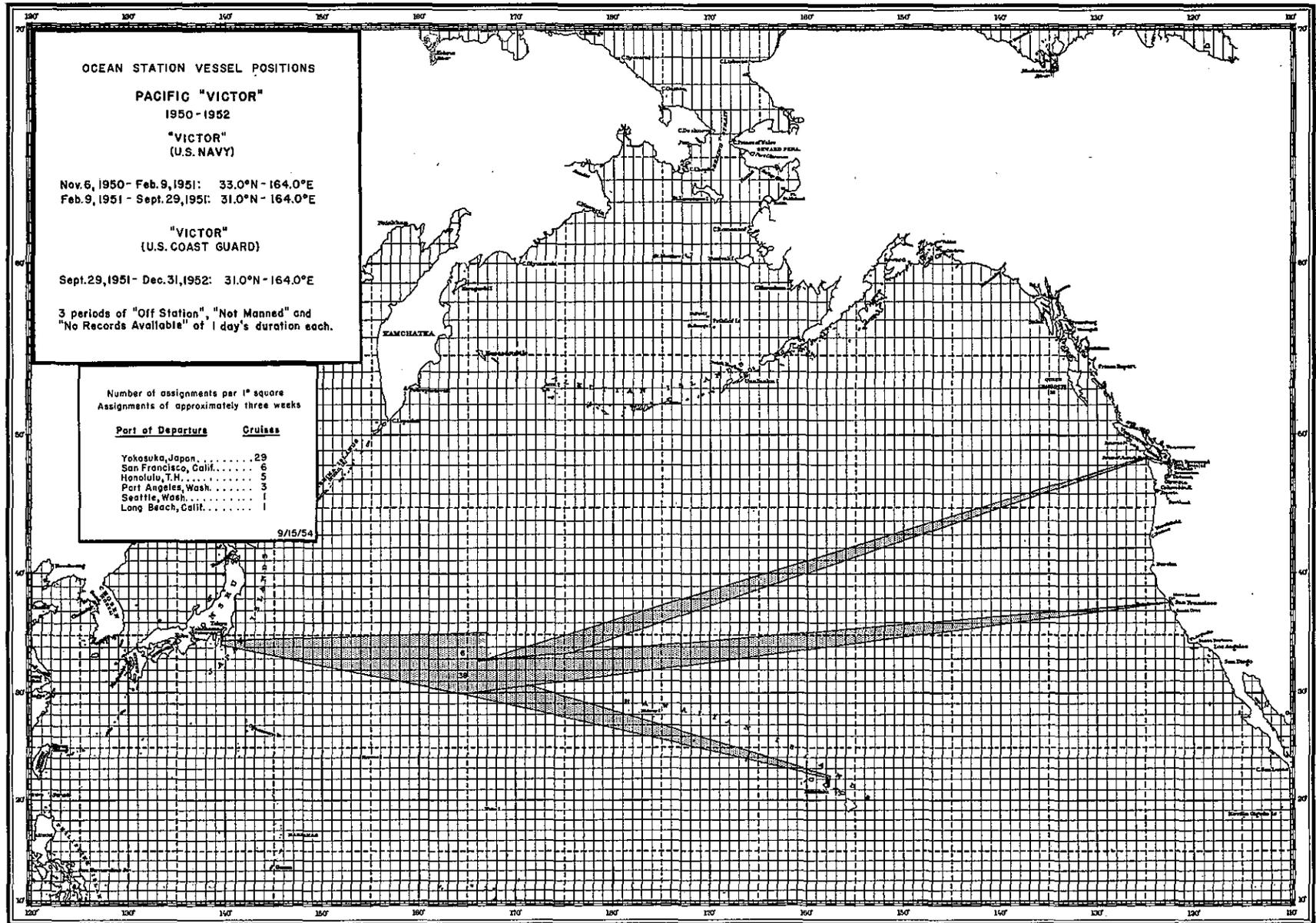


Fig. 30

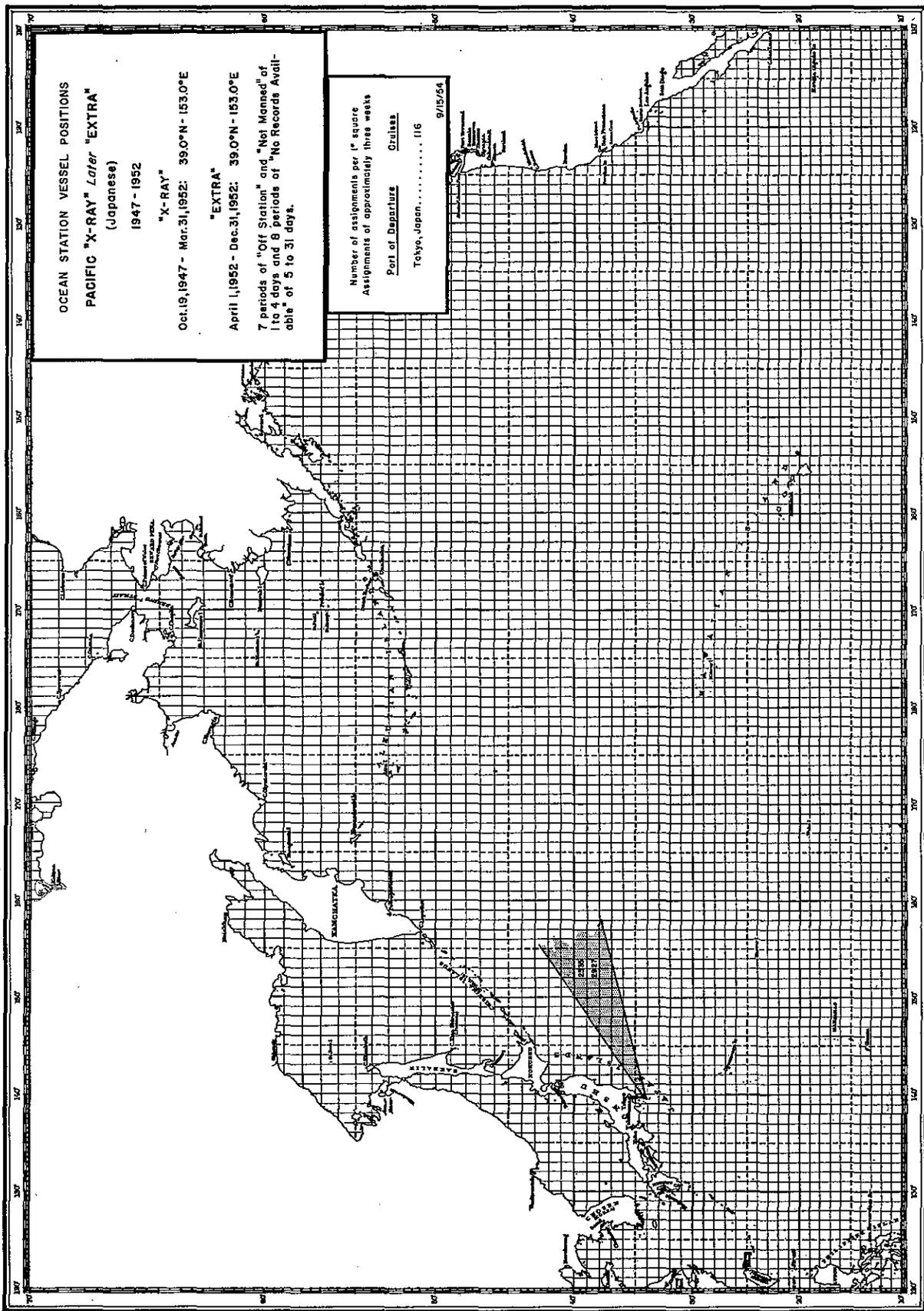


Fig. 31