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EASTLANT SHIPPING DENSITIES

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Raff Associates, Incorporated

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EASTLANT SHIPPING DENSITIES

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20 ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report presents the shipping surveillance data gathered during the EASTLANT II Exercise in August 1972 under the sponsorship of LRAPP. The report contains a description of the surveillance methods used and the areas covered. The shipping data are presented on maps and in tabular form for each day of surveillance. The tabulated data include length and speed estimates for some of the ships surveyed.

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PREFACE

In August 1972 a joint acoustic and environmental exercise was carried out under the sponsorship of the Long Range Acoustic Propagation Project (LRAPP). As part of this exercise there was an extensive amount of shipping surveillance for which J.I. Bowen of Raff Associates, Inc. was Principal Investigator. This report is a detailed accounting of the results obtained.

Many people contributed to the shipping surveillance exercises and subsequent data reduction. They include R.P. Burruss, R.N. Crane, D.C. Dickey, and E.L. Sander of Raff Associates and R.L. Barrett, P. Bucca, J.K. Duncan, K.W. Lackie, B.A. Watrous and J.C. Wilkerson of U.S. Naval Oceanographic Office.

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I -- PURPOSE AND SCOPE

The shipping surveillance portion of EASTLANT II was carried out to provide some of the essential inputs for modelling the low frequency ambient noise, with particular emphasis on the horizontal directionality of the noise in the EASTLANT region. These inputs are the location of the ships and their radiated noise. Using ASW patrol aircraft, the ships' locations can be observed by radar and visual means to within an accuracy which is reasonable for modelling purposes. The aircraft can also observe and attempt to measure (or estimate) those variables believed to be the principle determinants of the radiated noise. These are the type of vessel and its size and the speed of the vessel.

The aircraft services for carrying out the shipping surveillance were furnished by the Air Reserve Wing, Atlantic, by CINCLANT and CINCSIXTHFLT, by VXN-8 for the U.S Naval Oceanographic Office, and by Southern Maritime Command of the RAF. The flights originated from the U.S. bases at Rota, Spain and Lajes in the Azores as well as the RAF base at St. Mawgan in Cornwall.

A total of 33 surveillance flights were made on August 8, 9, 11, and 13, these dates having been chosen to observe shipping movements while the most significant of the acoustic measurements were being made. A civilian observer participated in nearly every single flight to assist with recording the shipping data and to assure their accuracy and completeness.

II -- SURVEILLANCE METHODS

The surveillance was carried out using a number of aircraft tactics, which are discussed in greater detail in Refernce 1. The general guideline in planning the flights was to make the more detailed observations closest to the acoustic receivers. In particular it was deemed desirable to estimate ship speeds accurately because of the sensitivity of acoustic output to speed variations. This sensitivity has been empirically described in Reference 2 as governed by the fifth power of the velocity. In logarithmic units, this translates to about 1.5 dB in radiated noise per knot of ship speed between 10 and 20 knots.

2.1 Tactics

Three surveillance tactics were used.

2.1.1 Radar Only Tactic (ROT)

The aircraft covers the area assigned for surveillance flying on tracks spaced at about twice the reliable radar range, at altitudes between 5,000 and 10,000 feet and at cruise speed. All radar contacts believed to be surface ships are logged. This covers the region at a high rate (something like 30,000 square miles per hour under good conditions) but provides no information on the speed or type of vessel or its length.

2.1.2 Radar Survey Tactic (RST)

The aircraft observes a fixed area for an assigned period of time, usually 3 to 4 hours, in order to make a speed estimate of the ships observed by radar contact over this time interval. This tactic tends to give good ship speed estimates but the rate of area coverage is small. There are short time intervals while this tactic is being carried out which permit visual observations, hence allowing for sampling of ship length and type observations.

2.1.3 Visual Survey Tactic (VST)

In this tactic the aircraft proceeds through the assigned area in a modified "ladder search" pattern while flying at some medium altitude,

sufficient to give radar range equivalent to half the ladder spacing. Instead of maintaining the ladder search the aircraft goes from ship to ship (as contacted on the radar) going at low altitude (several hundred feet) for close range visual observation. During this observation, the ship's length and speed as well as course are estimated.

2.2 Data Reduction

For the ROT, there is virtually no data reduction possible since the only information which is obtained is the contact time (of contacts presumed to be ships) and location, as estimated from the radar range and bearing superimposed on the best estimate of aircraft location. Due to the fact that some ships may be observed (on radar) more than once on the same day -- either by different aircraft or by even a single aircraft -- an effort is made to eliminate duplicate contacts. This is based only on judgement, and on a knowledge of the aircraft tracks. In regions where the ship density is not too large, this elimination of repeated contacts can be done rather easily. If some regions of ocean are surveyed more than once in a given day, we average through the observations. If there is a problem with false contacts (this problem is very dependent on the skill and experience of the radar operator) this tends to make the apparent ship count too large and no method is known to reduce these counts with assurance. The purpose of the ROT method is to assign to each region of the ocean surveyed, of some arbitrary size (e.g., a one-degree square), a number of ships which is representative of the observations of that region made on a given day.

For the RST method, the first step is to associate the many radar contacts (usually made on sequential radar plots) into "tracks", each of which represents the passage of a single ship over several hours duration. When there are false contacts, it is frequently possible to eliminate these in the data reduction phase, especially when they occur at short and medium radar ranges. After eliminating the false contacts, the remaining contacts are associated into tracks by human judgement. The course estimates for the ships on these tracks are then made by visually fitting a straight line

through track contact points and then estimating the speed from the position estimates for the track end-points. (Note: In some cases we have used an analytic procedure to fit the lines and make the speed estimates but the quantitative results from these different methods are, as can be expected, very similar). Once the course and speed estimates are made, the ship positions are dead-reckoned to some common time, usually 1200Z.

For the data obtained by the VST method, there is again virtually no data reduction. The contact positions at the time of aircraft over-flights are estimated by the best available aircraft navigation. The ship positions are dead-reckoned to a common time (1200Z) using the visual course and speed estimates.

III -- SURVEILLANCE COVERAGE

The following tables and maps summarize the daily operations. The maps indicate the areas covered on each day and also show where the surveillance tactic was degraded. The tables summarize the tactics which were used, give the percentage of area covered and list the reasons the planned tactics were unsuccessful.

From an examination of the tables it can be seen that the surveillance flights of the P2 aircraft were plagued by equipment difficulties. The surveillance coverage in the southern region was limited by the short radar range on the EC 121 aircraft and this will limit the ability to model the noise recieved in this region on all days except August 8. On the other hand the modelling inputs for other geographic regions should be satisfactory.

TABLE 3-1

TACTIC AND COVERAGE TABLE
FOR AUGUST 8

Plane	Planned Tactic	Actual Tactic	% Area Covered	Comments
NIMORD #1	VST	VST	100	
NIMROD #2	RST	RST	100	High density area, possibly some false contacts
P3#1	RST	RST	100	
	RST	ROT	100	Only mapped west area once
P3#2	RST	RST	100	Only mapped each buoy twice in RST
	VST	VST	100	area due to time constraint
P3#3	ROT	ROT	95	
P3#4	ROT	ROT	100	
P2#1	RST	ROT	85	OTPI failed and buoys could not be relocated after first map. Time limitation inhibited extensive VST
P2#2	VST	VST	90	Left out part of area because of time limitation.
EC-121	ROT	ROT	95	

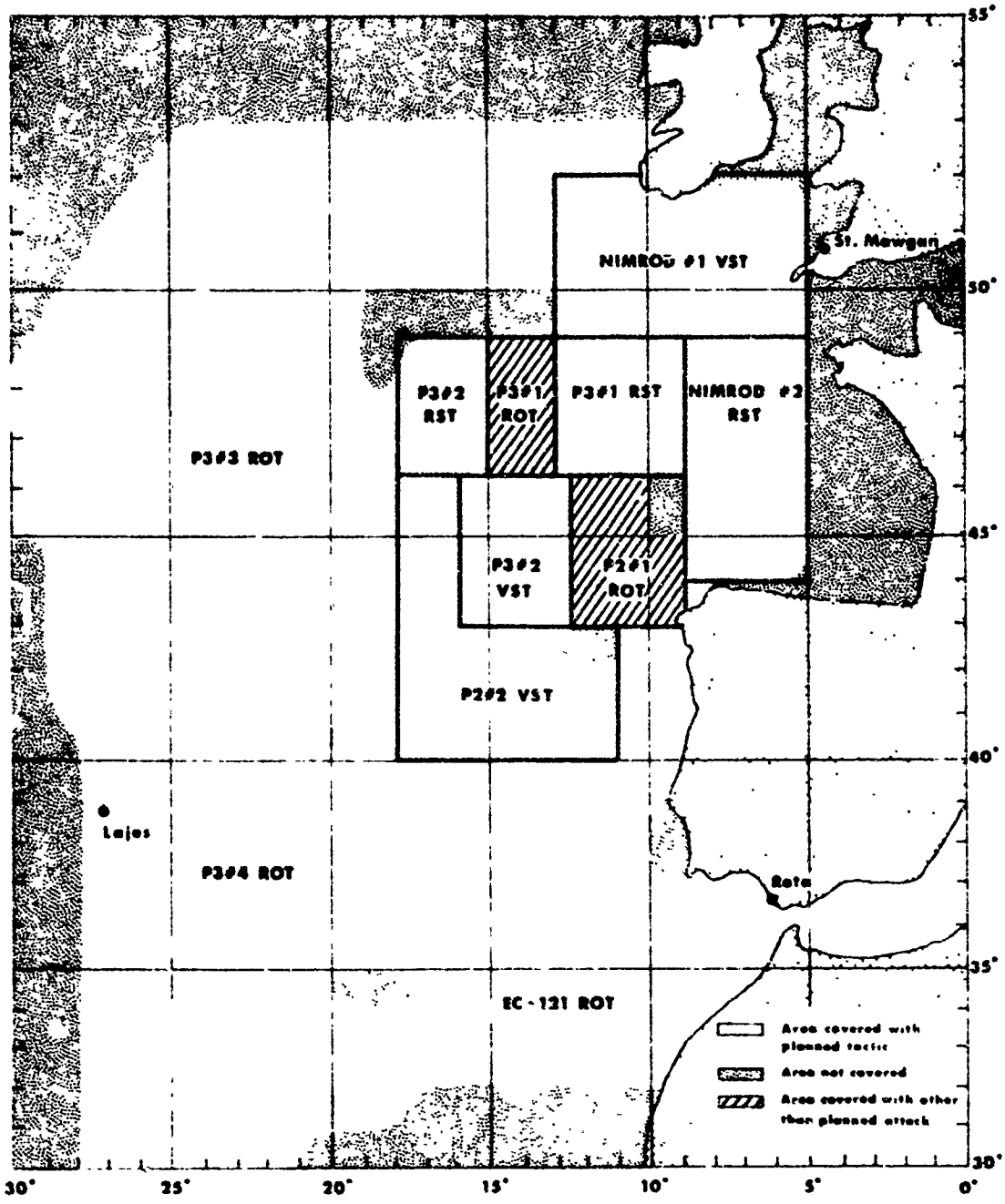

FIGURE 3-1 -- Surveillance Coverage Map for August 8

TABLE 3-2

TACTIC AND COVERAGE TABLE
FOR AUGUST 9

Plane	Planned Tactic	Actual Tactic	% Area Covered	Comments
NIMROD #1	RST	RST	100	High density area, possibly some false contacts
NIMROD #2	RST	RST	100	
P3#1	VST	VST	100	
P3#2	ROT	ROT	100	
P3#3	ROT	ROT	90	
P2#1	RST	VST	75	Radar went down, visually surveyed area in 30 mile strips. ROT along coast was cancelled to conserve radar.
P2#2	RST	ROT	100	Aircraft could not mark over buoy
EC-121	ROT	ROT	60	Radar range low

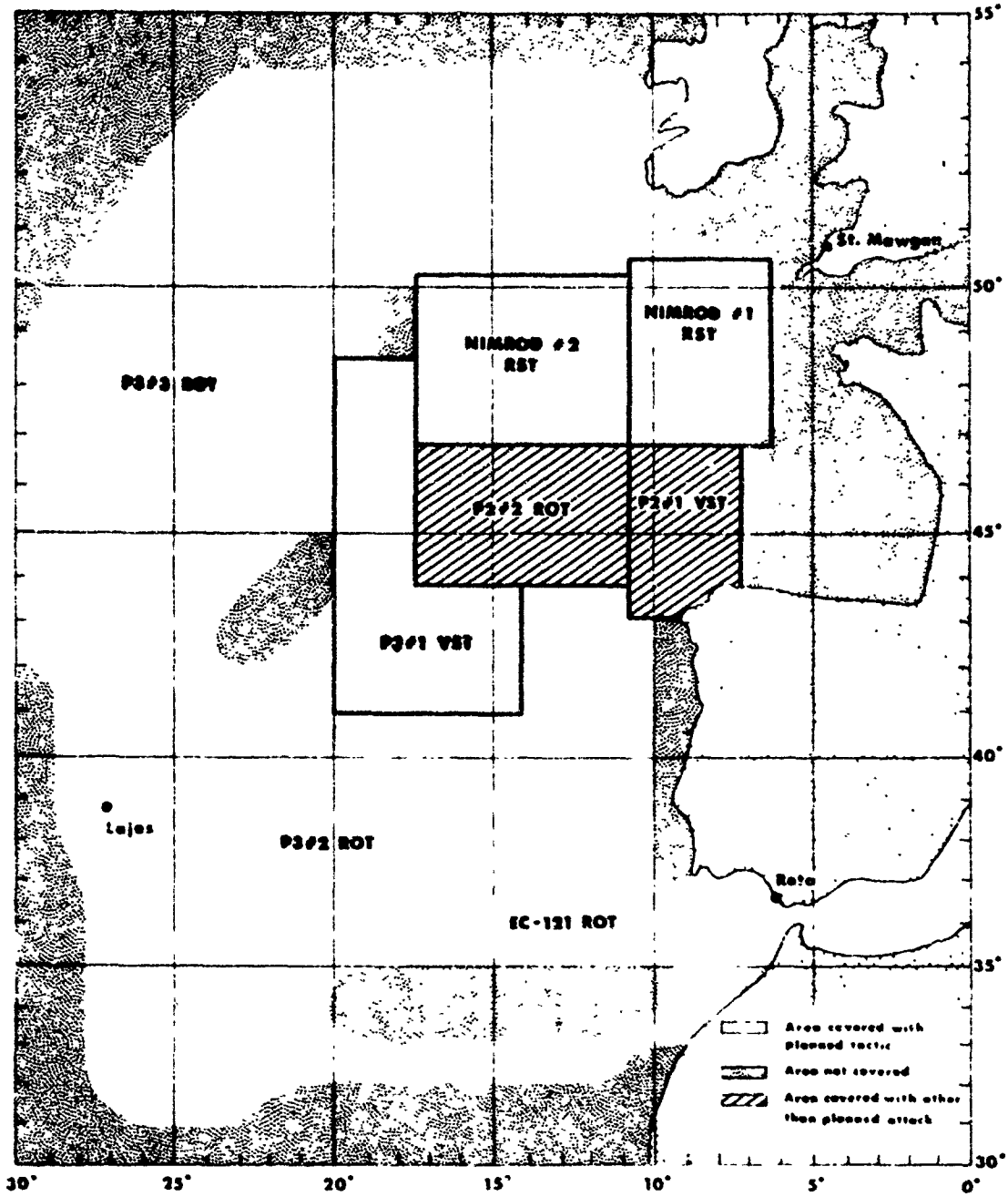

FIGURE 3-2 -- Surveillance Coverage Map for August 9

TABLE 3-3

TACTIC AND COVERAGE TABLE
FOR AUGUST 11

Plane	Planned Tactic	Actual Tactic	% Area Covered	Comments
NIMROD #1	RST	RST	100	
NIMROD #2	RST	RST	100	
P3#1	VST	VST	95	
P3#2	ROT	ROT	90	
P3#3	ROT	ROT	100	
P2#1	RST	VST	95	RST tactic appeared to work but no contacts were seen. ROT in transit was cancelled to conserve radar
P2#2	RST	VST	100	OTPI failed so VST tactic was initiated. ROT in transit was cancelled to conserve radar
EC-121	ROT	ROT	70	Radar range low

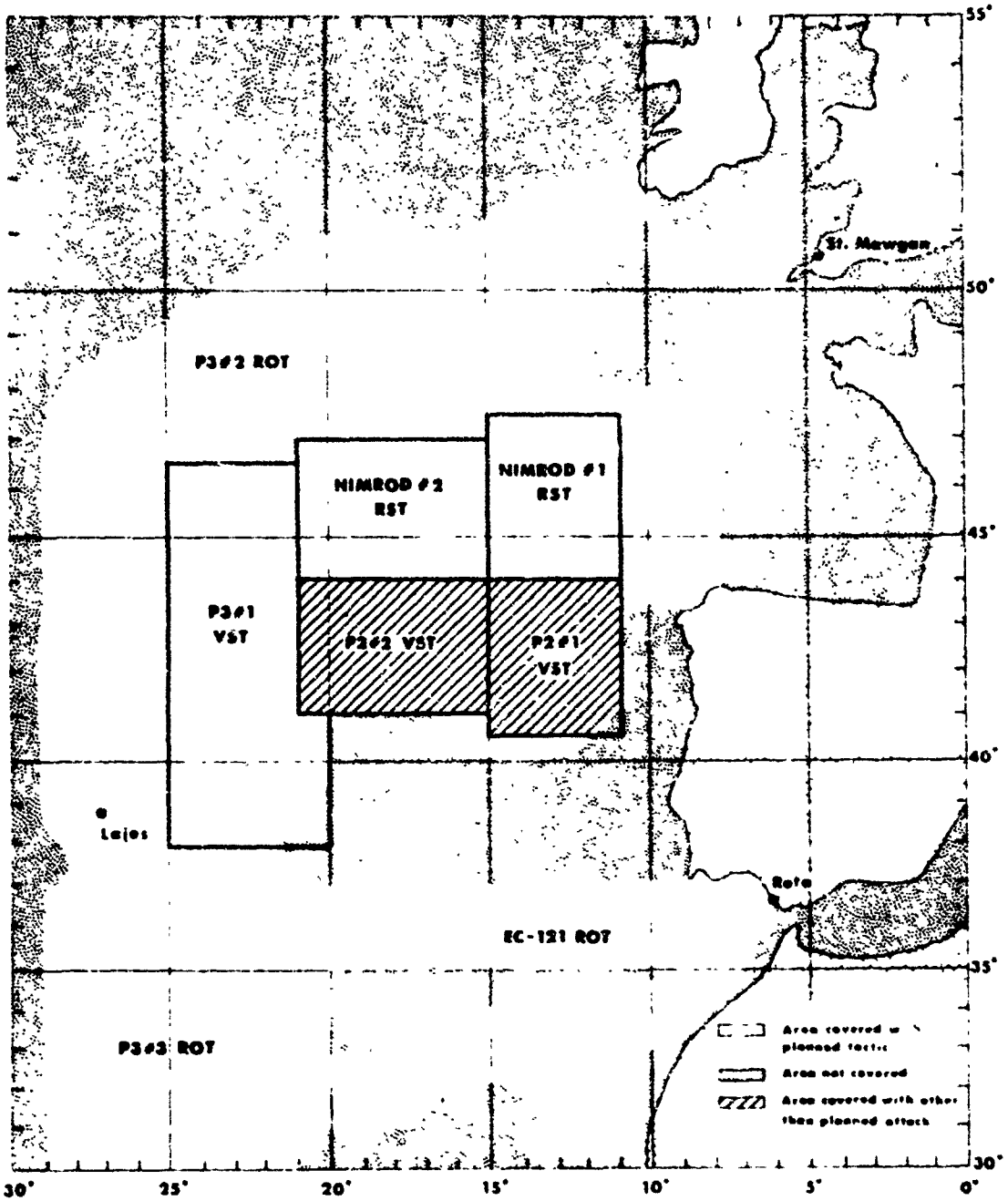

FIGURE 3-3 -- Surveillance Coverage Map for August 11

TABLE 3-4

TACTIC AND COVERAGE TABLE
FOR AUGUST 13

Plane	Planned Tactic	Actual Tactic	% Area Covered	Comments
NIMROD #1	RST	RST	100	
NIMROD #2	RST	RST	100	
	RST	ROT	100	Navigation failure
P3#1	RST	VST	85	Radar failure
P3#2	VST	VST	100	
P3#3	ROT	ROT	90	
P3R#1	RST	RST	85	Radar range low
P3R#2	VST	VST	100	
EC-121	ROT	ROT	70	Radar range low

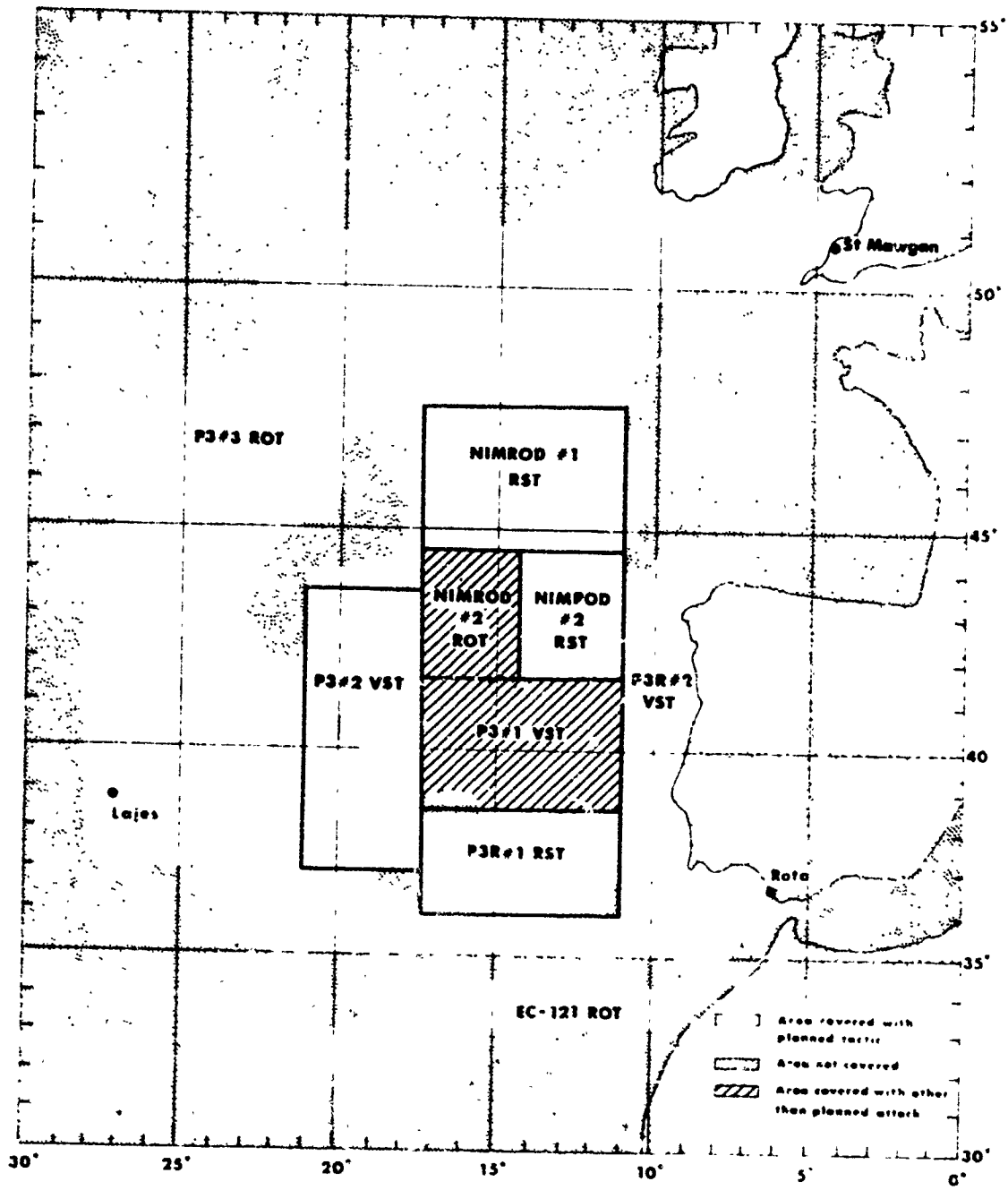

FIGURE 3-4 -- Surveillance Coverage Map for August 13

IV — DATA PRESENTATION AND ACCURACY

4.1 Data Presentation

The shipping data is presented in Figures 4-1 through 4-4 by four daily maps, one each for August 8, 9, 11, and 13. These maps are accompanied by lists of ship data in the Appendix for each day.

Each map is divided into one-degree squares. In each square there is a number, or two numbers separated by a diagonal slash, or no numbers. If there are no numbers, this means that we have no surveillance of that square (on that day). If there is one number, it represents, based on the aircraft surveillance of that day, the number of ships one should expect to find in that square if one were to take a census of ships at 1200Z on that day; if there are two numbers, the number above the diagonal represents the estimate of the census figure at 1200Z. Some of the ships within these squares (with two numbers), however, have either been examined visually or held as repeated radar contacts and we therefore have speed (and course) estimates for them. These contacts were dead-reckoned to their (estimated) positions at 1200Z. The number of ships for which this information is available is shown below the diagonal in each square. Note that this number (for which we have speed and course estimates), is included in the number above the diagonal, i.e., the census figure for that square.

There are also daily lists of ship contacts in the Appendix. Each day's contacts are listed in one or at most two of three lists. These three lists contain:

a. Those contacts which are (one-time) ROT contacts. These are arranged in chronological order, aircraft by aircraft.

b. Those contacts which are RST, and have resulted in speed estimates. These are listed in geographic order, which facilitates finding the speed and course of ship contacts on the map. For some of these, there were visual contacts as well.

c. Those contacts which are VST, and hence have resulted in speed estimates. These are also arranged geographically. There are contact numbers assigned to both the VST and RST contacts, which can be used to avoid duplication since the VST contact numbers are given on the RST lists.

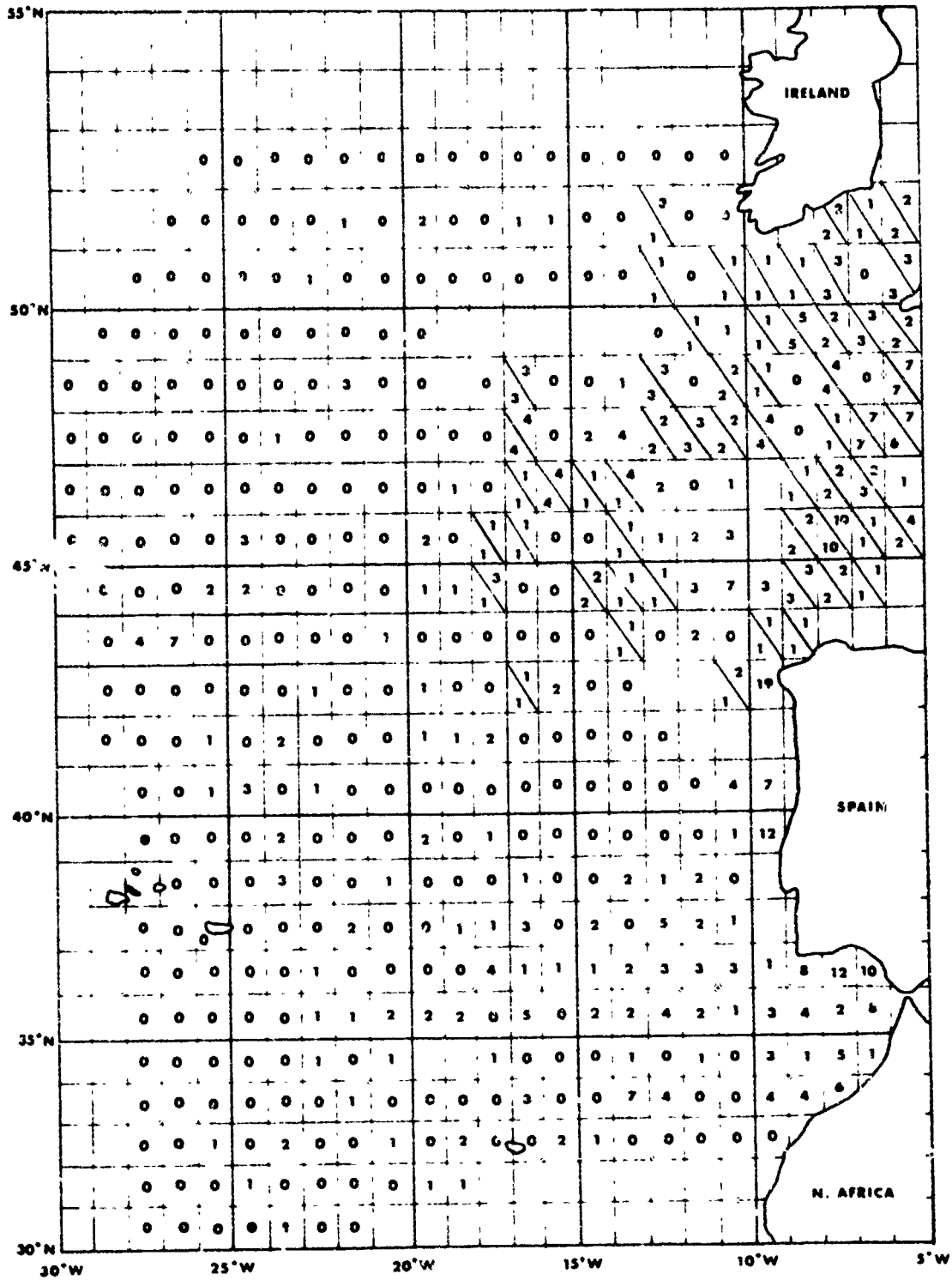

FIGURE 4-1 -- Shipping Densities - 8 August 1972

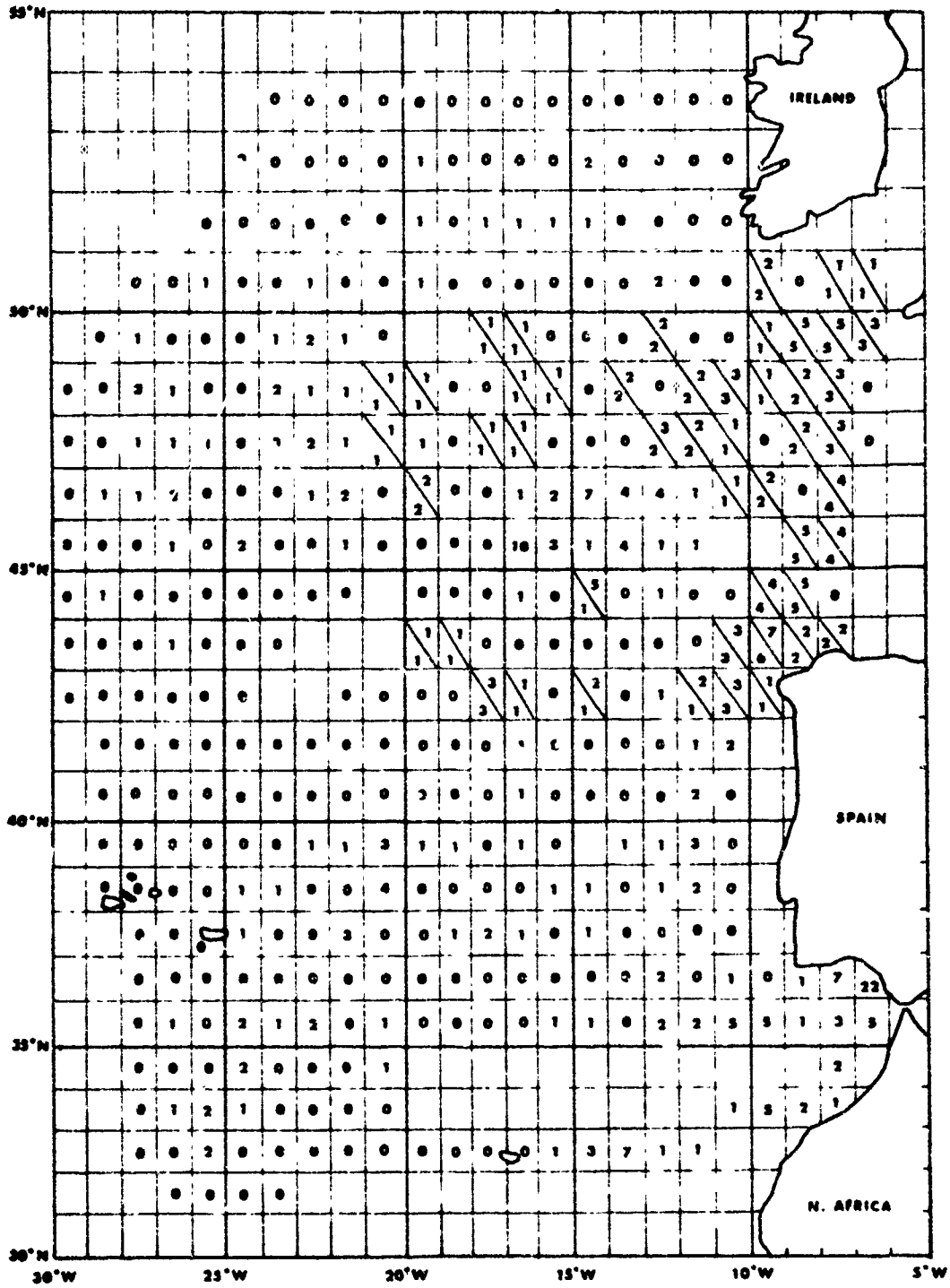

FIGURE 4-2 – Shipping Densities - 9 August 1972

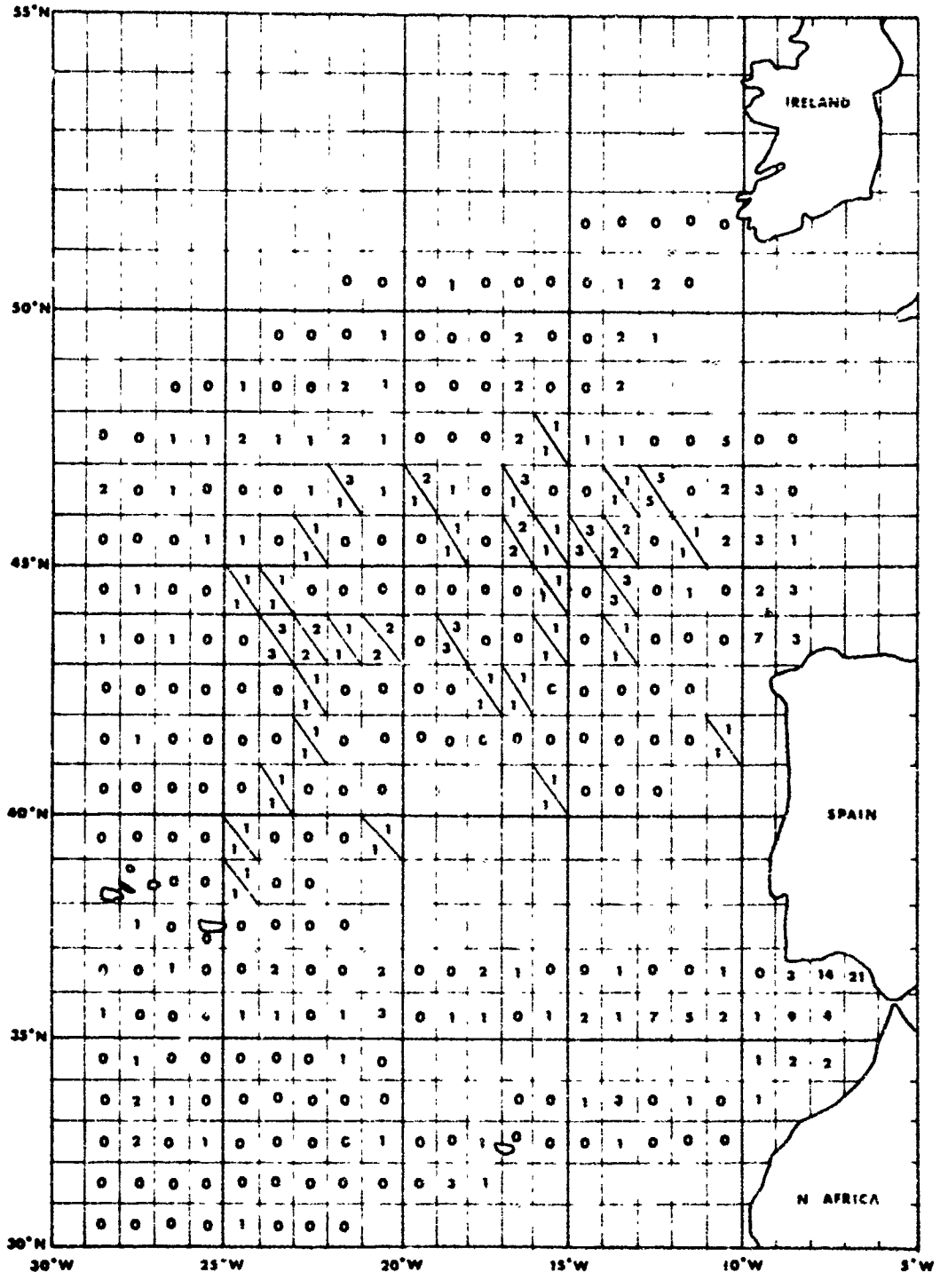

FIGURE 4-3 - Shipping Densities - 11 August 1972

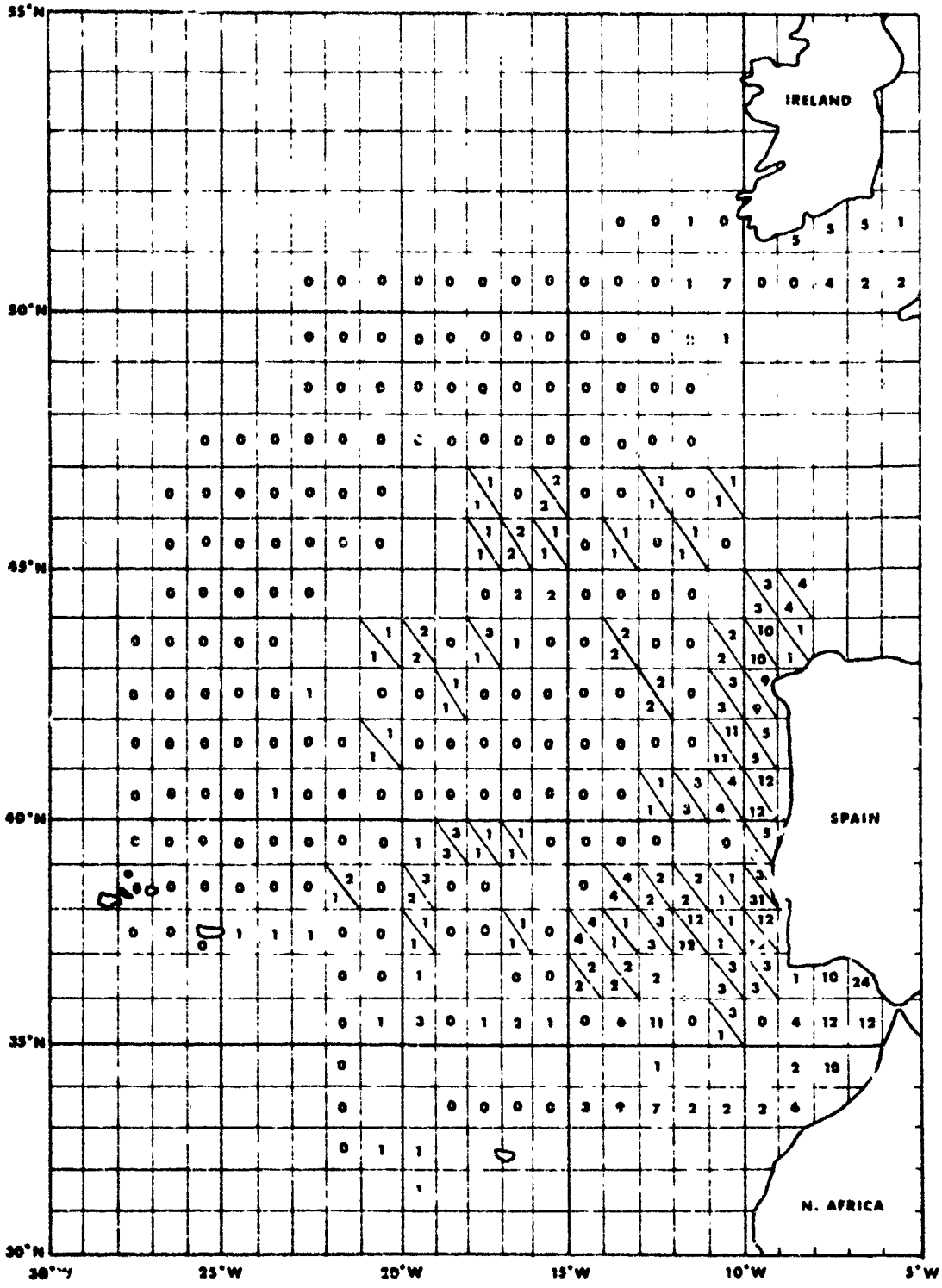

FIGURE 4-4 — Shipping Densities - 13 August 1972

With the exception of the few visual contacts on the RST lists, the lists are mutually exclusive.*

There are two additional maps (Figures 4-5 and 4-6) enclosed with the shipping surveillance data, which can be used to fill in blanks on the daily maps. One is a "composite" of the four days of EASTLANT observation. Hopefully, the figure contained therein is "representative" of the time period of EASTLANT. The other map gives some archival data in 5 degree squares.

4.2 Speed Estimates

For the sake of modelling and model validation it is important to quantitatively describe the accuracy of the speed estimates. In the RST surveys, we have first associated the ship contacts by human judgement and by performing some simple tests of the track associations. Then for each track so generated, the velocity estimate has been made from the apparent position of the contact at the start and end of the observation interval. Thus the intermediate contact points do not contribute to the velocity estimate accuracy; they serve only to confirm the association of contacts into tracks and to put the quantitative description of the apparent motion into a one-dimensional framework.

For the Nimrod flights, the aircraft inertial navigation system played an important role, as the on-board computer uses this position estimate to calculate the geographical position of a radar contact. Hence the contact position is contaminated by the drift in the inertial navigation system, which gives a bias to the velocity estimate, and by the radar position estimate. Assuming that the radar position estimate has a zero mean and variance σ_r^2, that the inertial navigation drift is drawn from a population with zero mean and variance σ_{DR}^2, and that the two error contributions are uncorrelated, then the velocity estimate has variance

$$\sigma_v^2 = 2\left(\frac{\sigma_r}{\Delta t}\right)^2 + \sigma_{DR}^2$$

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*There were some RST radar contacts that could not be identified as ship contacts. A discussion of this data is given in Section 4.4.

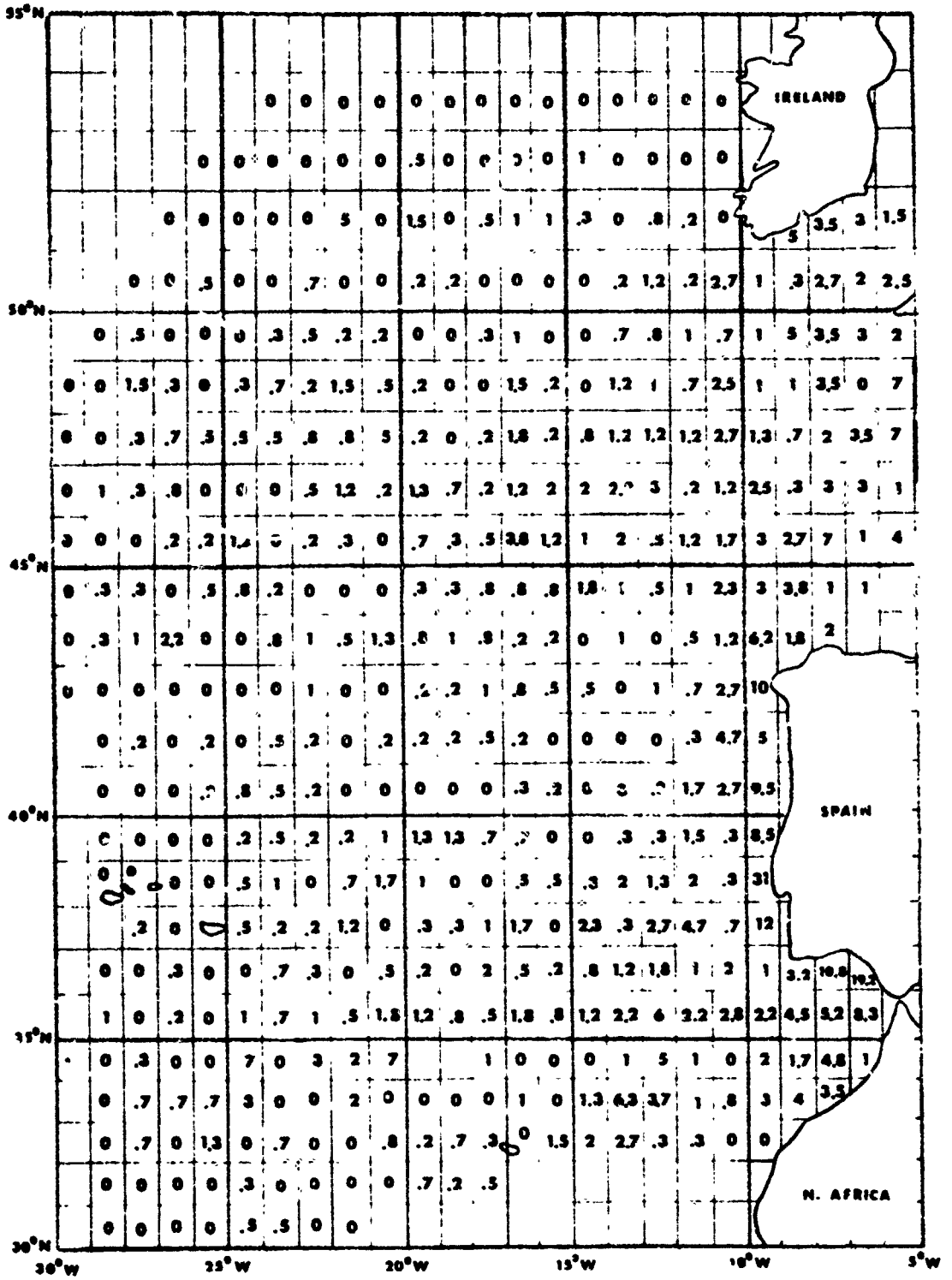

FIGURE 4-5 -- Eastient Composite

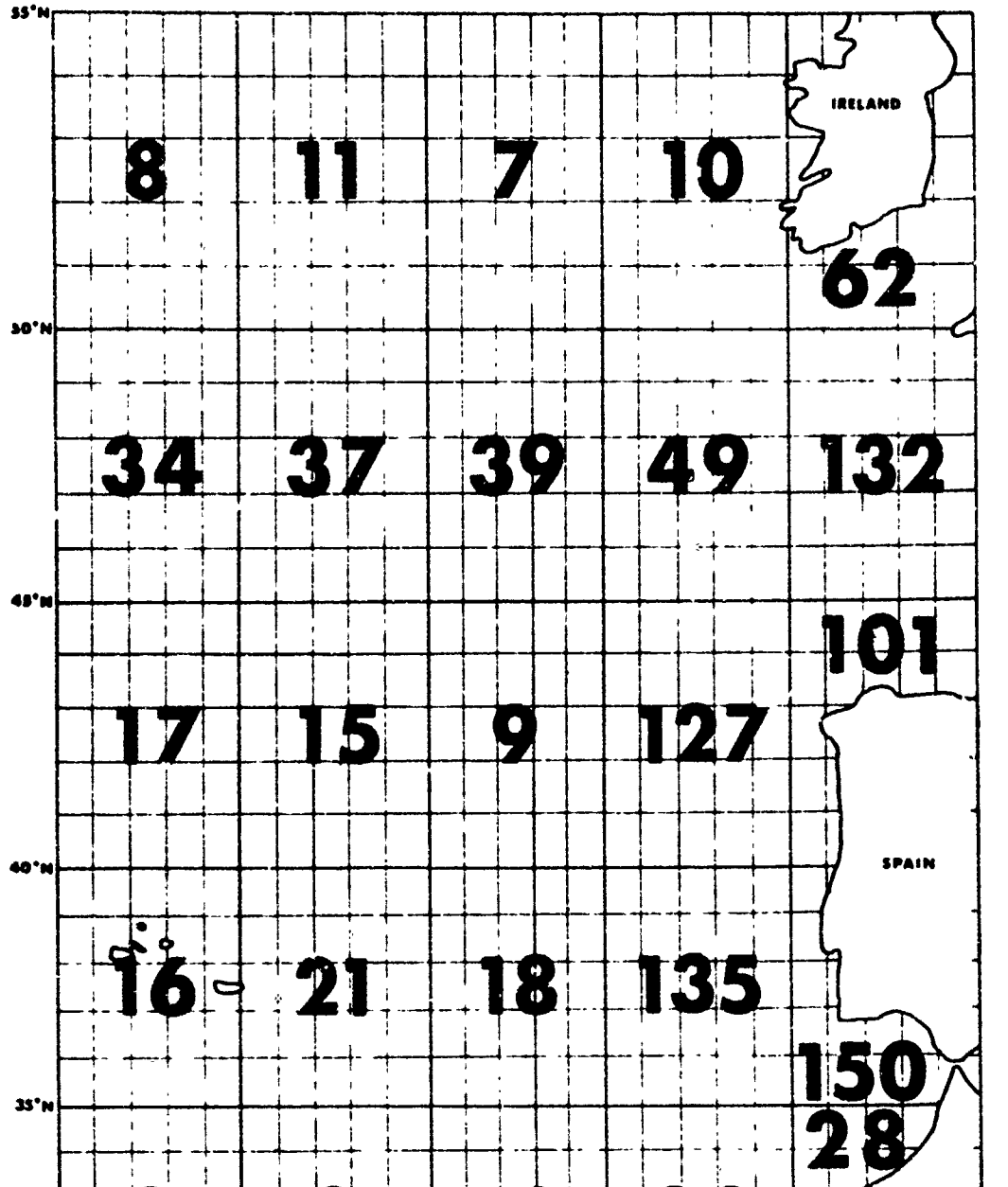

FIGURE 4-6 — Archival Data

(Taken from U.S. Oceanographic Office Chart No. 1262b.)

where Δt is the time separation of the first and last contacts. The quantity σ_v is tabulated in the data, under the assumption that σ_r = 2 nautical miles (corresponding to 4% at 50 nautical mile range) and σ_{DR} = 1 knot. This latter figure is based on extensive reconstruction of the navigation records, comparing the LORAN fixes with the inertial system read-outs and then smoothing.*

For the P3 flights, the RST was carried out by over-flying sonobuoys and using the aircraft On-Top-Indicator. Thus the inertial system drift plays no role. The contact position estimate is contaminated however by (in addition to the radar error) the drift of the sonobuoy in the ocean current, and the location inaccuracy inherent in the use of the On-Top-Indicator i.e., due to the sonobuoy beam angle. The latter may be assumed negligible compared to σ_r = 2 miles. In the tabulations which follow, it has been assumed that the P3 velocity accuracy is numerically the same as for the Nimrod flights. This implies assuming a current drift (constant over the observation interval) of 1 knot in the direction of travel of each surface ship. This procedure almost surely over-estimates the speed uncertainty but may ignore a small bias inherent in making the velocity estimate.

For the speed estimates made from the VST flights, no speed accuracy estimate is possible. Some previous attempts to calibrate the accuracy of the visual estimates appeared to show that the results vary widely from air crew to air crew, and that there exists a distinct possibility of a speed estimate bias.

4.3 Fishing Boats

For the sake of modelling the ambient noise which is observed, some care should be taken to segregate fishing boats from the larger merchant vessels. The reason for this is that these boats, while they surely contribute to the noise, tend to be small and to be going very slowly while fishing. As the actual count of surface ships is based on radar detection of surface contacts, one can anticipate that some small boats remain undetected on the one hand, while on the other hand some of the radar contacts are indeed fishing boats. The aircraft operations were not organized

*For one Nimrod flight (Aug 9 · NIM 1) there was no navigation data available and σ_{DR} was therefore raised to two knots.

to assess these two effects quantitatively but some of the data obtained during EASTLANT II can be used to make crude inferences. There are two useful peices of data.

a. There were a total of 336 ships (in all the four days) for which there was some useful form of visual identification. The greatest bulk of these were during VST flights, hence these vessels were detected on radar and then over-flown. Of these 336 contacts, 58 were identified as fishing boats, trawlers, or as small boats (under 200 feet). Thus one may say that something like 58/336 = 0.17 of the radar contacts logged are fishing boats.

b. The vessel M/V SEISMIC SURVEYOR maintained a ship contact log which listed 57 contacts. Of these 17 were fishing boats and trawlers. Thus, a very rough estimate is that 17/56 = 0.30 of the vessels in the area are fishing boats. (Note: This remark also implies a gratuitous assumption about geographical homogeneity, almost surely unwarranted.)

Assuming that larger ships are reliably found by radar, the above numbers suggest, based on some straightforward algebra, that the fraction of actual fishing boats found by radar (using radar ranges typical of EASTLANT operations) is about 1/2. These observations also imply that the actual total number of ships (including fishing boats) is about 20% larger than the total number observed and that the actual number of ships which are not fishing boats is about 20% smaller than the total number observed.

4.4 Unidentified RST Contacts

A table of RST contact identification data is given on the following page. For each flight, the table shows the percentage of RST contacts that were not identifiable using a majority of the area maps. Averaging over all flights results in a 30% unidentified contact ratio out of 745 total contacts. While a few of the unidentified contacts probably correspond to ships of reasonable size, it is felt that most correspond either to small fishing boats or to false radar contacts. Using the results of the previous section, this implies that, on the average, 17% of the unidentified RST contacts are fishing boats and the remaining 13% are false contacts.

TABLE 4-1

RST Contact Identification Data

Date	Aircraft	Percent of Unidentified Contact	Total Number of Radar Contacts For All Maps	No. of Area Maps Made	% of Large Visual Contacts Identified With RST Tracks	Total Visual Contacts Made in Area
Aug 8	NIM 1	39	293	4	80	10
	P3 #1	12	34	2	--	0
	P3 #2	20	25	2	100	3
Aug 9	NIM 1	30	98	4	100	11
	NIM 2	17	81	4	--	0
Aug 11	NIM 1	20	45	3	100	1
	NIM 2	48	46	3	--	0
Aug 13	NIM 1	33	69	4	100	5
	NIM 2	07	15	4	100	4
	P3R #1	13	38	3	100	4

One should emphasize again that such a quantitative division between false contacts and fishing boats is very dependent on assumptions of geographic homogeneity which cannot be defended on the basis of shipping data gathered during the EASTLANT exercise. The RST contact identification table also gives the total number of large visual contacts made in the RST area and the percentage of those identified with RST tracks.

V -- REFERENCES

1. "EASTLANT II Acoustics Exercise Plan", A.D. Little, Inc., ED 15012, July 1972.

2. D. Ross and F.F. Alvarez, "Radiated Underwater Noise of Surface Ships", U.S. Navy Journal of Underwater Acoustics, 14, 331, April 1964.

APPENDIX A

SHIP CONTACT TABLES

TABLE A-1

ROT CONTACTS

8 August 1972

Aircraft # P3#1

Range Scale ___

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0832	40°34'	23°45'	40°27'	22°52'		
0841	41°14'	22°47'	42°32'	22°38'		
0906	42°32'	20°28'	43°47'	20°31'		
0919	43°16'	19°04'	44°22'	17°51'		
0923	43°35'	18°45'	44°33'	18°55'		
1040	46°40'	13°30'	47°54'	13°11'		
1044			46°40'	13°20'		
1045			46°20'	13°37'		
1047			47°01'	14°55'		
1049			47°02'	14°27'		
1051			47°05'	13°55'		
1053			47°04'	13°37'		
1054			46°55'	13°21'		
1146	48°15'	13°30'	48°47'	13°11'		
1202			47°29'	13°25'		
1554	45°01'	16°58'	44°41'	17°06'		
1605	44°16'	18°06'	44°37'	09°06'		
1715	40°18'	24°44'	41°09'	25°04'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P-3#2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0835	40°00'	25°17'	39°53'	25°04'		
0843	40°26'	24°45'	40°51'	25°02'		
0846	40°49'	24°32'	40°39'	24°21'		
0846	40°49'	24°32'	40°39'	24°05'		
0856	41°28'	23°46'	41°06'	23°10'		
0910	42°21'	22°48'	42°23'	22°28'		
0910	42°21'	22°48'	42°20'	22°12'		
0947	42°51'	19°52'	42°33'	18°50'		
0951	45°14'	19°16'	45°27'	20°10'		
0951	45°14'	19°16'	45°09'	19°00'		
1013	46°38'	18°22'	46°36'	18°05'		
1633	42°38'	15°23'	42°02'	15°47'		
1645	42°34'	15°33'	41°40'	14°44'		
1658	41°44'	17°42'	40°29'	17°08'		
1700	41°40'	17°53'	40°26'	16°51'		
1712	41°13'	18°59'	41°18'	20°14'		
1713	41°16'	19°01'	40°59'	16°56'		
1800	41°04'	23°57'	39°30'	24°03'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P3#3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1237	43°32'	27°02'	43°32'	24°52'		
1237	43°32'	27°02'	43°06'	26°50'		
1237	43°32'	27°02'	45°24'	27°44'		
1237	43°32'	27°02'	44°19'	27°24'		
1250	44°00'	25°49'	44°20'	25°42'		
1250	44°00'	25°49'	44°28'	26°28'		
1300	44°35'	24°50'	45°06'	23°33'		
1300	44°35'	24°50'	44°43'	23°51'		
1310	45°00'	24°04'	45°31'	23°00'		
1310	45°00'	24°04'	45°00'	23°11'		
1310	45°00'	24°04'	44°29'	23°55'		
1351	47°32'	23°43'	48°42'	25°21'		
1405	48°40'	21°41'	48°56'	20°41'		
1405	48°40'	21°41'	49°31'	22°15'		
1405	48°40'	21°41'	50°16'	21°41'		
1616	50°30'	22°45'	49°45'	21°23'		
1630	51°35'	21°50'	52°34'	22°20'		
1650	51°56'	19°21'	51°02'	18°18'		
1650	51°56'	19°21'	51°56'	18°21'		
1705	51°55'	16°58'	52°38'	17°28'		
1717	51°51'	15°10'	52°04'	13°32'		
1730	51°50'	12°56'	51°50'	11°45'		
1730	51°50'	12°56'	51°27'	13°13'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P3 #4

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1021	33°16'	25°59'	32°29'	25°05'		
1050	31°12'	25°56'	31°17'	24°47'		
1121	30°25'	24°07'	30°57'	23°29'		
1214	33°52'	23°17'	34°53'	22°59'		
1230	35°09'	23°22'	35°41'	22°26'		
1245	36°27'	23°21'	36°37'	22°47'		
1303	37°04'	22°16'	37°54'	21°46'		
1327	36°41'	19°47'	35°48'	19°16'		
1346	36°50'	17°43'	36°59'	16°31'		
1346	36°50'	17°43'	37°04'	16°20'		
1348	36°50'	17°32'	37°25'	16°44'		
1349	36°50'	17°32'	37°42'	17°02'		
1410	36°55'	15°17'	37°49'	14°45'		
1414	36°57'	14°46'	37°02'	14°31'		
1414	36°57'	14°46'	36°57'	14°31'		
1417	36°59'	14°24'	35°57'	14°10'		
1420	36°49'	14°18'	36°32'	13°06'		
1426	36°55'	13°43'	37°10'	12°43'		
1430	36°58'	13°18'	37°10'	12°17'		
1434	37°01'	12°51'	37°47'	12°30'		
1435	37°02'	12°46'	37°28'	12°07'		
1436	37°03'	12°41'	37°10'	11°58'		
1437	37°04'	12°34'	36°40'	12°02'		
1438	37°04'	12°29'	36°18'	12°15'		
1443	37°04'	12°02'	36°37'	11°44'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P3 #4

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1443	37°04'	12°02'	36°44'	11°30'		
1444	36°56'	11°54'	36°39'	11°44'		
1445	36°55'	11°39'	37°58'	10°04'		
1445	36°55'	11°39'	36°49'	10°59'		
1451	37°09'	11°16'	37°36'	10°49'		
1500	37°48'	11°22'	38°37'	11°33'		
1503	38°02'	11°23'	39°06'	10°36'		
1514	38°36'	11°37'	38°18'	11°37'		
1519	38°33'	12°10'	37°52'	12°32'		
1520	38°33'	12°13'	38°12'	12°58'		
1521	38°33'	12°22'	38°19'	13°10'		
1526	38°35'	12°52'	38°57'	13°33'		
1552	38°40'	15°15'	38°12'	16°35'		
1603	38°40'	16°12'	37°25'	16°41'		
1607	38°41'	16°36'	39°08'	17°36'		
1622	38°43'	17°58'	39°01'	19°10'		
1623	38°43'	18°03'	39°15'	19°03'		
1624	38°43'	18°09'	37°42'	18°34'		
1639	38°43'	19°32'	38°37'	20°29'		
1653	38°44'	20°47'	37°55'	21°15'		
1711	38°43'	22°27'	38°40'	23°28'		
1716	38°43'	22°49'	38°13'	23°33'		
1717	38°43'	22°57'	39°19'	23°50'		
1723	38°42'	23°27'	38°31'	23°27'		
1724	38°42'	23°32'	39°29'	23°47'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P2#1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0953	39°21'	09°23'	39°31'	09°23'		
			39°32'	09°24'		
			39°33'	09°26'		
			39°30'	09°31'		
			39°27'	09°33'		
			39°35'	09°36'		
			39°42'	09°31'		
			39°46'	09°34'		
			39°47'	09°25'		
			39°47'	09°16'		
			39°44'	09°13'		
			39°51'	09°19'		
			40°02'	09°47'		
			40°00'	09°36'		
			40°01'	09°31'		
			40°02'	09°25'		
			40°04'	09°47'		
			40°12'	09°37'		
			40°14'	09°35'		
			40°08'	10°40'		
			40°06'	10°32'		
			40°00'	10°40'		
			40°06'	10°46'		
1043	42°05'	08°53'	42°0[illegible]'	09°33'		
			42°03'	09°31'		

TABLE A-1 (Cont)

BOT CONTACTS

8 August 1972

Aircraft # P2#1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
			42°05'	09°35'		
			42°00'	09°50'		
			42°03'	09°52'		
			42°10'	10°20'		
			42°08'	09°40'		
			42°08'	09°33'		
1053	42°30'	09°00'	42°29'	09°20'		
			42°30'	09°24'		
			42°30'	09°28'		
			42°33'	09°24'		
			42°30'	09°15'		
			42°28'	09°08'		
			42°26'	09°14'		
			42°39'	09°34'		
			42°41'	09°30'		
			42°39'	09°23'		
			42°42'	09°20'		
			42°43'	09°47'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # P2#1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1310	43°59'	10°50'	44°34'	10°41'		
			43°33'	11°30'		
			43°27'	11°32'		
			44°00'	11°48'		
			44°01'	11°51'		
			44°11'	11°56'		
			44°37'	10°18'		
			44°17'	10°02'		
			44°25'	09°36'		
1413	44°59'	10°50'	45°15'	11°04'		
			45°15'	11°14'		
			45°02'	12°10'		
			45°48'	10°35'		
			45°20'	10°28'		
			45°21'	10°01'		
			44°52'	09°56'		
			44°45'	10°01'		
			44°51'	10°03'		
			44°40'	09°36'		
			44°19'	10°27'		
			44°13'	10°57'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0607	36°07'	06°24'	35°47'	06°44'		
0608	36°07'	06°24'	35°49'	06°50'		
0608	36°08'	06°24'	36°20'	06°57'		
0610	35°59'	06°25'	35°46'	06°24'		
0610	35°58'	06°25'	35°46'	06°50'		
0613	35°53'	06°40'	35°23'	06°44'		
0616	35°53'	06°41'	35°51'	06°57'		
0616	35°53'	06°41'	36°15'	07°15'		
0616	35°54'	06°41'	36°24'	07°02'		
0617	35°54'	06°42'	36°12'	06°49'		
0617	35°54'	06°42'	36°12'	06°48'		
0617	35°54'	06°47'	34°51'	07°09'		
0618	35°54'	06°50'	37°11'	06°52'		
0619	35°54'	06°56'	36°31'	07°54'		
0620	35°54'	06°59'	35°55'	07°29'		
0621	35°53'	07°09'	36°16'	07°21'		
0622	35°53'	07°13'	36°22'	07°14'		
0624	35°52'	07°17'	36°26'	07°29'		
0624	35°52'	07°19'	36°08'	07°34'		
0625	35°52'	07°21'	36°21'	07°55'		
0626	35°52'	07°25'	35°40'	07°37'		
0628	35°52'	07°33'	36°14'	08°07'		
0628	35°52'	07°34'	35°59'	08°10'		
0628	35°52'	07°35'	36°18'	07°54'		
0628	35°53'	07°36'	36°25'	07°49'		
0629	35°53'	07°36'	36°22'	07°41'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0629	35°53'	07°38'	36°43'	07°47'		
0630	35°53'	07°40'	35°51'	08°22'		
0630	35°53'	07°40'	35°54'	08°19'		
0631	35°53'	07°44'	36°04'	08°04'		
0631	35°54'	07°45'	36°39'	08°23'		
0631	35°54'	07°45'	36°39'	08°23'		
0632	35°54'	07°47'	36°46'	08°03'		
0634	35°53'	08°02'	36°40'	08°58'		
0638	35°54'	08°13'	36°00'	08°43'		
0642	35°54'	08°31'	36°34'	08°28'		
0643	35°55'	08°38'	35°32'	09°04'		
0644	35°55'	08°43'	35°44'	09°31'		
0644	35°56'	08°44'	36°06'	10°03'		
0647	35°56'	08°55'	36°15'	09°13'		
0651	35°56'	09°14'	35°29'	09°07'		
0652	35°58'	09°17'	36°03'	10°00'		
0653	35°57'	09°22'	34°53'	09°42'		
0657	35°57'	09°41'	36°56'	10°13'		
0705	36°00'	10°17'	36°18'	10°31'		
0706	36°00'	10°21'	36°12'	10°35'		
0714	36°60'	10°55'	35°34'	11°34'		
0715	36°59'	10°59'	36°31'	11°17'		
0720	36°03'	11°23'	36°07'	11°22'		
0722	36°04'	11°31'	35°33'	11°35'		
0723	36°04'	11°36'	36°00'	12°28'		
0725	36°04'	11°42'	36°38'	12°09'		

TABLE A-1 (Cont)

ROI CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0726	36°05'	11°46'	36°30'	12°31'		
0726	36°05'	11°48'	35°47'	12°25'		
0728	36°05'	11°53'	36°37'	12°31'		
0730	36°05'	12°06'	35°50'	12°08'		
0731	36°05'	12°07'	35°55'	12°06'		
0733	36°04'	12°16'	36°13'	12°45'		
0735	36°04'	12°24'	35°39'	13°11'		
0741	36°04'	12°51'	35°42'	12°35'		
0742	36°04'	12°56'	35°41'	13°37'		
0743	36°04'	12°57'	36°33'	13°09'		
0746	36°04'	13°14'	35°46'	14°38'		
0749	36°04'	13°28'	36°57'	13°45'		
0753	36°03'	13°45'	35°37'	14°23'		
0759	36°03'	14°13'	36°32'	15°17'		
0829	35°55'	16°21'	36°24'	16°15'		
0833	35°54'	16°39'	35°07'	17°44'		
0839	35°53'	17°02'	36°01'	17°44'		
0840	35°53'	17°08'	35°13'	17°33'		
0842	35°52'	17°17'	36°45'	17°16'		
0843	35°52'	17°21'	35°57'	17°39'		
0844	35°52'	17°24'	35°59'	17°33'		
0846	35°52'	17°30'	36°03'	17°51'		
0848	36°53'	17°49'	36°28'	17°47'		
0852	35°50'	18°04'	35°17'	17°36'		
0902	35°47'	18°35'	35°31'	18°50'		
0909	35°48'	19°05'	35°34'	19°42'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0910	35°48'	19°11'	35°31'	19°49'		
0911	35°48'	19°16'	35°15'	18°33'		
0926	35°52'	20°20'	35°34'	19°40'		
0927	35°53'	20°26'	35°56'	21°28'		
0939	35°41'	21°00'	35°15'	20°41'		
0940	35°38'	21°00'	34°31'	20°53'		
0945	35°21'	21°00'	35°00'	20°23'		
1001	34°21'	20°58'	33°45'	21°06'	12-14	Tanker
1026	32°41'	21°00'	32°32'	20°32'		
1040	31°55'	20°48'	32°25'	23°57'		
1046	31°55'	20°25'	32°06'	23°13'		
1057	31°53'	19°31'	31°41'	19°05'	12	Tanker
1108	31°56'	18°39'	31°40'	18°00'		
1112	31°57'	18°23'	32°07'	18°15'		
1112	31°57'	18°23'	32°09'	18°14'		
1139	33°18'	17°42'	34°08'	17°40'		
1202	33°46'	16°30'	33°08'	16°24'		
1202	33°46'	16°30'	33°06'	16°24'		
1202	33°46'	16°30'	33°01'	16°23'		
1217	33°41'	15°21'	32°49'	14°25'		
1225	33°39'	14°45'	33°27'	14°03'		
1226	33°38'	14°40'	33°42'	13°24'		
1227	33°38'	14°36'	33°49'	13°59'		
1228	33°38'	14°32'	33°25'	13°44'		
1229	33°37'	14°26'	33°34'	13°16'		
1231	33°37'	14°17'	33°38'	14°11'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1237	33°33'	13°49'	33°19'	13°28'		
1240	33°34'	13°34'	33°50'	12°56'		
1241	33°33'	13°28'	33°03'	13°32'		
1244	33°34'	13°16'	33°55'	13°00'		
1247	33°34'	13°04'	34°09'	13°09'		
1248	33°34'	12°59'	33°31'	12°29'		
1252	33°44'	12°41'	33°38'	12°18'		
1253	33°35'	12°37'	33°32'	12°23'		
1302	33°37'	11°57'	34°35'	11°39'		
1320	33°43'	10°42'	33°36'	09°06'		
1324	33°44'	10°25'	33°09'	09°42'		
1331	33°47'	09°54'	34°13'	09°46'		
1333	33°48'	09°48'	35°14'	10°17'		
1336	33°49'	09°35'	34°31'	09°51'		
1339	33°50'	09°20'	33°42'	08°57'		
1340	33°50'	09°16'	33°21'	09°08'		
1341	33°10'	09°11'	33°30'	09°06'		
1342	33°51'	09°05'	33°44'	08°27'		
1343	33°51'	09°02'	33°54'	08°26'		
1347	33°52'	08°44'	33°45'	08°44'		
1349	33°53'	08°32'	33°35'	07°56'		
1350	33°54'	08°29'	33°42'	07°49'		
1350	33°54'	08°28'	33°44'	07°54'		
1353	34°01'	08°22'	33°44'	07°23'		
1354	34°04'	08°19'	33°56'	07°13'		
1357	34°14'	08°13'	34°34'	08°38'		

TABLE A-1 (Cont)

ROT CONTACTS

8 August 1972

Aircraft # EC-121

Range Scale 100 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1358	34°20'	09°08'	34°51'	07°06'		
1402	34°52'	07°59'	35°07'	08°15'		
1404	34°37'	07°57'	34°41'	07°32'		
1404	34°37'	07°57'	34°52'	06°59'		
1405	34°38'	07°52'	34°52'	07°31'		
1407	34°45'	07°52'	34°54'	07°04'		
1418	35°18'	07°28'	35°26'	06°40'		
1418	35°20'	07°27'	35°24'	06°20'		
1420	35°23'	07°24'	36°14'	06°57'		
1421	35°24'	07°19'	33°55'	07°06'		
1429	36°00'	06°48'	36°18'	06°37'		
1431	36°07'	06°40'	36°20'	06°19'		
1431	36°08'	06°40'	36°12'	06°14'		
1437	36°28'	06°25'	36°32'	06°23'	10	Freighter
1438	36°31'	06°30'	36°31'	06°29'		Lg Fishing Bt

TABLE A-2

RADAR SURVEYED CONTACTS

8 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
1	185	10.6	1.9				49-50	6-7
2	158	18.7	1.4				49-50	7-8
3	215	12.0	1.4				48-49	5-6
4	259	6.6	1.4				48-49	5-6
5	210	9.4	1.6	30	210	14	48-49	5-6
6	234	6.1	1.6	29	240	10	48-49	5-6
7	178	3.2	2.6				48-49	7-8
8	204	11.0	1.6				48-49	7-8
9	159	17.5	1.5				48-49	7-8
10	120	25.5	1.9				48-49	7-8
11	021	12.1	1.9				48-49	7-8
12	193	14.7	3.1				48-49	9-10
13	190	20.0	4.5				48-49	10-11
14	226	18.5	6.6				48-49	10-11
15	051	8.6	2.6				48-49	12-13
16	138	11.4	8.1				48-49	12-13
17	340	15.6	3.8				48-49	16-17
18	184	11.1	2.9				48-49	16-17
19	078	6.8	2.9				48-49	16-17
20	242	15.6	1.6				47-48	4-5
21	036	11.9	1.7	36	030	10	47-48	5-6
22	027	12.7	1.7	35	030	10	47-48	5-6

TABLE A-2 (Cont)

RADAR SURVEYED CONTACTS

8 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
23	211	11.8	1.4				47-48	5-6
24	212	12.6	1.4				47-48	5-6
25	031	10.6	1.4	34	030	10	47-48	5-6
26	027	15.9	1.4	39	025	18	47-48	6-7
27	030	14.1	1.4	40	030	16	47-48	6-7
28	065	8.5	1.4				47-48	6-7
29	213	15.6	2.5				47-48	6-7
30	219	13.1	1.6				47-48	6-7
31	001	22.4	2.6				47-48	7-8
32	012	12.0	4.4				47-48	9-10
33	325	16.1	3.2				47-48	9-10
34	293	20.5	4.2				47-48	9-10
35	096	21.8	2.0				47-48	9-10
36	107	21.5	4.5				47-48	10-11
37	165	4.2	4.2				47-48	10-11
38	052	14.6	4.2				47-48	11-12
39	076	12.2	3.0				47-48	11-12
40	023	16.2	6.6				47-48	11-12
41	282	11.8	2.4				47-48	12-13
42	309	14.8	2.2				47-48	12-13
43	268	15.8	3.0				47-48	16-17
44	004	14.2	3.0				47-48	16-17

TABLE A-2 (Cont)

RADAR SURVEYED CONTACTS

8 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
45	271	18.3	3.0				47-48	16-17
46	312	14.2	3.0				47-48	16-17
47	027	14.7	1.6				46-47	6-7
48	022	15.8	1.5	38	020	10	46-47	6-7
49	020	15.1	1.5				46-47	6-7
50	015	12.9	1.6				46-47	6-7
51	221	16.0	2.6				46-47	7-8
52	149	8.3	2.1				46-47	7-8
53	016	13.1	1.6				46-47	8-9
54	254	20.0	4.1	43	240	16	46-47	15-16
55	097	8.2	4.0	45	090	6	46-47	15-16
56	047	12.0	4.0	44	075	16	46-47	15-16
57	100	17.6	2.1				45-46	5-6
58	048	12.3	1.7				45-46	5-6
59	336	9.5	1.9				45-46	6-7
60	047	16.3	2.5				45-46	7-8
61	049	8.2	2.1				45-46	7-8
62	194	10.1	2.0				45-46	7-8
63	096	11.5	2.1				45-46	7-8
64	132	6.4	1.9				45-46	7-8
65	358	6.6	2.7				45-46	7-8
66	242	16.5	2.6				45-46	7-8

TABLE A-2 (Cont)

RADAR SURVEYED CONTACTS

8 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
67	180	5.8	2.0				45-46	7-8
68	074	7.4	2.2				45-46	7-8
69	182	11.8	3.0				45-46	7-8
70	148	21.5	2.1				45-46	8-9
71	222	9.4	2.8				44-45	6-7
72	100	21.4	2.0				44-45	7-8
73	085	15.3	2.2				44-45	7-8
74	028	16.3	2.1				44-45	8-9
75	033	13.5	2.1				44-45	8-9
76	037	15.7	2.9				44-45	8-9

TABLE A-3

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
8 Aug 72	1	1617		195	12		Craiga Boy	51-52	5-6
8 Aug 72	2	1623	215	220	08	Tanker	Dingle Bank	51-52	5-6
8 Aug 72	3	1605	631	360	05	Passenger	Gripsholm	51-52	6-7
8 Aug 72	4	1414		260	10		Smit-Lloyd 1	51-52	7-8
8 Aug 72	5	1415		260	10		Solmar-Sea	51-52	7-8
8 Aug 72	6	1032	548	105	15	Container	CP Voyageur	51-52	12-13
8 Aug 72	7	1430	319	270	16	Sci/Res	Priboy	50-51	5-6
8 Aug 72	8	1536		270	18		Stephan Bosorey	50-51	5-6
8 Aug 72	9	1607	300	350	10	Tanker	Inka	50-51	5-6
8 Aug 72	10	1253		280	10	Trawler	M60453	50-51	7-8
8 Aug 72	11	1253		310	10	Trawler	M60353	50-51	7-8
8 Aug 72	12	1253		310	10	Trawler	M60303	50-51	7-8
8 Aug 72	13	1249	280	345	14	Container	Tormes/Liver-pool	50-51	8-9
8 Aug 72	14	1159		100	10	Small Coaster		50-51	9-10
8 Aug 72	15	1148		280	08		Segiro S. Sourhorn	50-51	10-11
8 Aug 72	16	1110	580	280	14	Tanker	Balla Brovig	50-51	12-13
8 Aug 72	17	1446	710	270	15	Tanker	Phillipine Sea	49-50	5-6
8 Aug 72	18	1509		240	16		Tarangerstar	49-50	5-6
8 Aug 72	19	1523	532	090	15	Bulk Cargo	Saga Sailor	49-50	6-7
8 Aug 72	20	1615	556	015	17	Tanker	Texaco Durham	49-50	6-7

TABLE A-3 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
8 Aug 72	21	1456	506	070	17	Bulk Cargo	Louisiana	49-50	7-8
8 Aug 72	22	0915		250	15	Merchant		49-50	8-9
8 Aug 72	23	1313	696	270	15	Container	Atlantic Champagne	49-50	8-9
8 Aug 72	24	1335		300	7	Trawler	A756	49-50	8-9
8 Aug 72	25	1335	745	030	14	Bulk Cargo	Escherscheim	49-50	8-9
8 Aug 72	26	1359	484	085	14	Cargo	Woltersum	49-50	8-9
8 Aug 72	27	1322	661	275	19	Container	American Ace	49-50	9-10
8 Aug 72	28	0950	378	070	16	Refrig. Ship	Ft. Niagara	49-50	11-12
8 Aug 72	29	1543		240	10	Freighter		48-49	4-5
8 Aug 72	30	1517		210	14	Tanker		48-49	5-6
8 Aug 72	31	1519		210	10	Freighter		48-49	5-6
8 Aug 72	32	1522		210	10	Freighter		48-49	5-6
8 Aug 72	33	1548		210	10	Freighter		48-49	5-6
8 Aug 72	34	1537		030	10	Tanker		47-48	5-6
8 Aug 72	35	1539		030	10	Tanker		47-48	5-6
8 Aug 72	36	1540		030	10	Tanker		47-48	5-6
8 Aug 72	37	1513		180	3	Fishing		47-48	6-7
8 Aug 72	38	1516		020	10	Tanker		47-48	6-7
8 Aug 72	39	1526		025	18	Tanker	Fairfield	47-48	6-7
8 Aug 72	40	1550		030	16	Tanker		47-48	6-7
8 Aug 72	41	1351	300	210	/		USS Hammerberg	46-47	13-14

TABLE A-3 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
8 Aug 72	42	1341	614	240	14	Bulk Cargo	Ossendrecht	46-47	14-15
8 Aug 72	43	1225	600	240	16	Bulk Cargo	Oxfordshire	46-47	15-16
8 Aug 72	44	1235	493	075	16	Cargo	Aragrace	46-47	15-16
8 Aug 72	45	1249	150	090	6	Fishing		46-47	15-16
8 Aug 72	46	1250	150	090	6	Fishing		46-47	15-16
8 Aug 72	47	1304	150	180	0	Trawler	Elle	46-47	16-17
8 Aug 72	48	1354	286	030	15	Refrig Ship	Barrad Wave	45-46	13-14
8 Aug 72	49	1136	546	250	10	Bulk Cargo	Rhine Ore	45-46	16-17
8 Aug 72	50	1146	482	240	8	Cargo	Kasimov	45-46	17-18
8 Aug 72	51	1504	262	300	13	Cement Carr.	Planet	44-45	12-13
8 Aug 72	52	1514	50	Various	Various	Fishing (6)		44-45	12-13
8 Aug 72	53	1457	538	220	15		Prof.Baranov	44-45	13-14
8 Aug 72	54	1530	300	150	14	Cargo		44-45	14-15
8 Aug 72	55	1601	517	220	14	Cargo	Berlin	44-45	14-15
8 Aug 72	56	1203	527	120	10	Bulk Cargo	Kristin Brovig	44-45	17-18
8 Aug 72	57	1603	150	270	10		Bermeo	43-44	8-9
8 Aug 72	58	1550	1107	210	12	Tanker	Paul L.Fahnrey	43-44	9-10
8 Aug 72	59	1612	794	240	15	Bulk Cargo	Ore Titan	43-44	13-14
8 Aug 72	60	1540	244	035	15	Cargo	Atlanta	43-44	10-11
8 Aug 72	61	1251	520	240	12	Cargo	Azalea	43-44	16-17

TABLE A-4

ROT CONTACTS

9 August 1972

Aircraft # P3 #2

Range Scale 50 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1000	36°30'	25°02'	35°59'	26°02'		
1002	36°20'	25°00'	35°20'	24°38'		
1004	36°07'	24°56'	35°32'	23°54'		
1004	36°07'	24°56'	35°36'	24°18'		
1019	34°50'	25°21'	34°00'	24°25'		
1019	34°50'	25°21'	33°48'	24°51'		
1019	34°50'	25°21'	34°43'	24°56'		
1019	34°50'	25°21'	33°44'	25°19'		
1019	34°50'	25°21'	33°33'	25°19'		
1034	33°41'	25°48'	33°42'	26°13'		
1046	32°53'	25°53'	32°59'	25°26'		
1046	32°53'	25°53'	32°30'	25°19'		
1135	34°55'	23°45'	35°32'	22°54'		
1146	35°51'	23°48'	35°48'	22°58'		
1158	36°43'	23°44'	37°22'	24°09'		
1213	37°40'	23°39'	38°16'	23°04'		
1222	38°11'	23°15'	38°15'	21°45'		
1231	38°02'	22°15'	38°04'	21°51'		
1231	38°02'	22°15'	38°03'	21°42'		
1231	38°02'	22°15'	38°00'	21°32'		
1231	38°02'	22°15'	37°57'	21°07'		
1231	38°02'	22°15'	37°50'	21°01'		
1248	37°57'	20°26'	37°44'	20°21'		
1301	37°51'	19°17'	37°02'	18°47'		
1301	37°51'	19°17'	37°08'	17°26'		
1313	37°56'	17°46'	37°19'	17°30'		
1320	37°58'	17°21'	37°12'	16°04'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # P3 #2

Range Scale 50 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1330	38°03'	16°19'	38°52'	15°47'		
1338	38°07'	15°35'	38°19'	14°56'		
1348	38°08'	14°34'	37°26'	14°15'		
1405	38°10'	12°52'	38°24'	12°03'		
1405	38°10'	12°52'	38°20'	11°55'		
1405	38°10'	12°52'	38°18'	11°53'		
1414	38°10'	12°52'	39°18'	12°05'		
1414	38°10'	12°52'	39°07'	11°53'		
1414	38°10'	12°52'	39°09'	11°39'		
1414	38°10'	12°52'	39°03'	11°25'		
1420	39°42'	13°06'	39°42'	13°07'		
1424	39°08'	12°29'	40°00'	11°45'		
1429	39°45'	12°29'	40°11'	11°33'		
1446	41°10'	12°30'	42°10'	11°05'		
1446	41°10'	12°30'	41°56'	10°15'		
1446	41°10'	12°30'	41°24'	11°03'		
1446	41°10'	12°30'	41°32'	10°04'		
1505	42°32'	12°28'	42°44'	12°58'		
1512	43°03'	12°29'	43°25'	09°54'		
1525	42°43'	13°17'	42°43'	14°42'		
1555	41°15'	15°30'	41°37'	16°16'		
1559	41°15'	15°46'	40°47'	16°19'		
1608	40°36'	16°30'	39°28'	16°32'		
1618	40°08'	17°14'	39°38'	18°02		
1631	39°23'	19°17'	39°34'	19°22'		
1652	38°45'	19°31'	39°12'	20°16'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # P3 #2

Range Scale 50 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1655	38°45'	19°49'	39°22'	20°08'		
1703	38°44'	20°33'	39°50'	21°40'		
1703	38°44'	20°33'	39°55'	20°55'		
1714	38°45'	21°34'	39°05'	22°31'		
1720	38°54'	22°15'	38°55'	23°20'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft / P3#3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1230	51°55'	12°00'	52°10'	10°36'		
			51°44'	10°06'		
			51°35'	09°47'		
			50°14'	12°12'		
			50°28'	12°46'		
			51°59'	14°09'		
			52°22'	14°18'		
1300	51°50'	15°54	52°03'	14°31'		
			51°22'	15°24'		
			51°45'	16°59'		
			51°47'	17°13'		
1315	51°52'	17°48'	51°47'	19°15'		
1330	51°53'	19°52'	52°18'	19°30'		
1330	51°53'	19°52'	50°42'	19°48'		
1400	50°30'	22°05'	49°27'	21°26'		
			48°47'	21°46'		
			49°12'	22°06'		
			49°27'	22°18'		
			49°26'	23°09'		
			48°55'	23°48'		
			50°03'	22°42'		
1400	50°30'	22°05'	50°34'	25°06'		
1415	49°36'	23°42'	48°08'	23°54'		
1432	48°35'	25°25'	48°15'	26°25'		
			48°18'	27°01'		
			48°11'	27°44'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # P3#3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1432	48°35'	25°25'	49°06'	27°29'		
1445	47°58'	26°43'	46°58'	26°25'		
			46°35'	26°52'		
			47°02'	26°50'		
			46°45'	28°04'		
			47°18'	27°38'		
			48°12'	27°41'		
1500	46°33'	26°46'	45°50'	26°25'		
			46°32'	27°00'		
1523	46°45'	25°05'	47°03'	25°05'		
			45°00'	24°56'		
1545	47°50'	23°20'	47°48'	22°19'		
			47°30'	22°12'		
1605	48°45'	21°01'	47°46'	19°09'		
			47°45'	21°11'		
1626	47°00'	21°09'	46°52'	22°55'		
1626	47°00'	21°09'	46°35'	21°24'		
1626	47°00'	21°09'	46°36'	21°14'		
1645	45°57'	23°02'	45°35'	21°55'		
1645	45°57'	23°02'	45°38'	24°54'		
1720	44°08'	26°45'	43°24'	26°45'		
1720	44°08'	26°45'	44°27'	28°24'		

TABLE A-4 (Cont)
ROT CONTACTS
9 August 1972

Aircraft # P2#2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1221	45°30'	13°41'	46°46'	13°35'		
1222			46°14'	13°14'		
1222			46°19'	13°07'		
1222			46°22'	13°02'		
1223			46°33'	12°46'		
1223			46°12'	12°19'		
1223			46°04'	12°29'		
1224			46°10'	12°18'		
1224			46°51'	11°51'		
1225			45°49'	11°47'		
1225			45°03'	12°01'		
1225			45°16'	13°15'		
1226			44°46'	12°29'		
1226			44°26'	14°29'		
1226			44°14'	14°38'		
1227			45°19'	14°38'		
1227			46°00'	14°51'		
1228			46°21'	14°09'		
1228			46°26'	14°07'		
1228			46°46'	14°34'		
1228			46°50'	14°03'		
1229	45°30'	13°41'	47°01'	12°46'		
1246	45°26'	14°00'	46°51'	14°56'		
1247			45°58'	13°56'		
1247			45°44'	13°57'		
1247			45°23'	14°08'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # P2#2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1247			45°00'	13°45'		
1248			44°43'	14°58'		
1248			45°01'	15°06'		
1249			45°06'	15°57'		
1249			44°48'	16°38'		
1250			45°04'	16°13'		
1250			45°04'	16°24'		
1251			45°11'	16°00'		
1251			45°15'	16°02'		
1251			45°10'	16°20'		
1251			45°04'	16°34'		
1251			45°12'	16°50'		
1252			45°24'	16°29'		
1252			45°31'	16°32'		
1252			45°28'	16°13'		
1252			46°16'	15°00'		
1253			45°59'	15°58'		
1253			46°21'	16°12'		
1253			46°29'	15°16'		
1300			46°16'	15°18'		
1301			46°39'	14°13'		

TABLE A-4 (Cont)

BOT CONTACTS

9 August 1972

Aircraft #EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0553	36°23'	06°27'	36°23'	06°29'	5	Fishing Ves.
0553	36°23'	06°27'	36°25'	06°30'	6	Tanker
0558	36°12'	06°29'	36°09'	06°26'	7	Fishing Ves.
0558	36°10'	06°30'	36°10'	06°39'	10	Freighter
0559	36°05'	06°30'	36°03'	06°32'	12	Tanker
0560	36°03'	06°30'	36°00'	06°35'	10	S. Freighter
0617	35°58'	07°02'	36°01'	07°08'	10	Tanker
1117	36°32'	06°24'	36°32'	06°31'	5	Freighter
1118	36°27'	06°24'	36°27'	06°21'	3	Freighter
1118	36°27'	06°24'	36°27'	06°24'	4	Fishing Ves.
1119	36°26'	06°24'	36°25'	06°22'	5	Fishing Ves.
1119	36°26'	06°24'	36°25'	06°22'	5	Fishing Ves.
1121	36°18'	06°29'	36°15'	06°32'		Sm Freighter
1122	36°15'	06°31'	36°02'	06°34'	10	Tanker
1122	36°15'	06°33'	36°02'	06°36'	10	Tanker
1124	36°09'	06°33'	35°59'	06°29'	10	Freighter
1124	36°09'	06°33'	36°02'	06°23'	15	Freighter
1126	36°03'	06°34'	35°58'	06°32'	10	Freighter
1127	36°00'	06°35'	36°04'	06°38'	10	Freighter
1129	35°57'	06°42'	36°14'	06°54'	15	Sm Freighter
1129	35°57'	06°42'	36°00'	06°44'	20	Freighter
1130	35°56'	06°47'	35°56'	06°47'	8	Sm Freighter
1130	35°56'	06°47'	35°56'	06°53'	10	Tanker
1132	35°57'	06°57'	36°06'	06°48'	10	Tanker
1134	35°56'	07°03'	35°43'	06°49'		
1134	35°56'	07°04'	36°06'	07°06'		

TABLE A-4 (Cont)
ROT CONTACTS
9 August 1972

Aircraft # EC-121
Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1134	35°56'	07°05'	36°09'	07°08'		
1134	35°55'	07°06'	36°09'	07°10'		
1135	35°55'	07°07'	36°05'	07°27'		
1137	35°55'	07°18'	36°09'	07°30'		
1141	35°56'	07°32'	35°57'	07°35'	2	Large Barge
1141	35°56'	07°32'	35°57'	07°35'	2	Tug
1145	35°57'	07°45'	35°43'	07°55'		
1147	35°58'	07°56'	36°17'	07°59'		
1157	37°59'	08°46'	36°11'	08°51'		
1200	37°58'	08°56'	35°41'	09°13'		
1200	35°58'	08°56'	35°35'	08°49'		
1206	35°52'	09°23'	35°38'	09°11'		
1209	35°54'	09°36'	35°39'	09°35'		
1209	35°54'	09°36'	35°58'	09°54'		
1212	35°49'	09°48'	35°52'	09°56'		
1217	35°49'	10°07'	35°25'	10°17'		
1217	35°49'	10°07'	35°42'	10°19'	10	Tanker
1219	35°51'	10°20'	35°56'	10°40'		
1220	35°51'	10°22'	36°11'	10°35'	12	Tanker
1221	35°50'	10°26'	35°46'	10°24'		
1230	35°47'	11°08'	35°36'	10°55'		
1240	35°44'	11°52'	35°46'	11°29'	8	Lg Tanker
1240	35°44'	11°52'	35°40'	11°31'	12	Sm Freighter
1245	35°44'	12°17'	36°07'	12°26'		
1246	35°43'	12°20'	35°38'	12°41'	7	Freighter
1246	35°43'	12°20'	35°47'	12°38'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1253	35°41'	12°41'	36°04'	12°46'		
1307	35°38'	13°50'	35°37'	14°04'	12	Freighter
1324	35°37'	15°07'	35°29'	15°20'	8	Freighter
1336	35°39'	20°12'	35°21'	20°10'		
1505	34°49'	21°11'	34°48'	20°41'		
1707	32°18'	15°36'	32°37'	15°27'		
1722	32°29'	14°32'	32°36'	14°17'		
1724	32°29'	14°23'	32°22'	14°06'	5	Tanker
1725	32°29'	14°19'	32°31'	13°50'		
1726	32°30'	14°16'	32°32'	13°45'	15	Lg Tanker
1727	32°30'	14°12'	32°21'	14°13'		
1728	32°30'	14°09'	32°24'	13°42'		
1732	32°30'	13°53'	32°50'	13°55'		
1736	32°31'	13°32'	32°27'	13°09'		
1737	32°32'	13°28'	32°19'	13°08'		
1737	32°32'	13°28'	32°55'	13°20'		
1744	32°36'	12°51'	32°49'	12°49'		
1810	32°42'	11°06'	32°51'	11°02'		
1813	32°55'	10°52'	33°07'	10°41'		
1819	33°10'	10°00'	33°18'	09°48'		
1821	33°13'	09°52'	33°07'	09°36'		
1833	33°22'	09°24'	33°15'	09°12'		
1835	33°28'	09°17'	33°17'	09°00'		
1836	33°33'	09°13'	33°37'	09°00'		
1841	33°43'	09°01'	33°40'	08°39'		
1844	33°58'	08°48'	33°55'	08°37'		

TABLE A-4 (Cont)

ROT CONTACTS

9 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1848	34°08'	08°03'	33°56'	07°47'		
1903	34°52'	07°55'	34°36'	07°31'		
1904	34°54'	07°54'	34°47'	07°41'		
1913	36°21'	07°32'	36°11'	07°04'		
1916	36°30'	07°24'	36°30'	06°53'		
1917	36°33'	07°22'	36°34'	07°22'	5	Sm Fish. Ves.
1918	36°36'	07°18'	36°57'	07°03'		
1919	36°39'	07°15'	36°39'	06°56'		
1921	36°44'	07°11'	36°55'	06°56'		
1922	35°46'	07°09'	35°49'	07°01'		Barge
1922	35°46'	07°09'	35°48'	07°09'	8	Sm Freighter
1923	35°50'	07°06'	35°49'	07°06'	10	Tanker
1923	35°50'	07°06'	35°53'	07°04'	10	Freighter
1926	35°59'	06°56'	36°17'	06°46'		
1927	36°00'	06°54'	36°00'	06°29'		
1927	36°02'	06°53'	35°45'	06°31'		
1928	36°30'	06°52'	36°29'	06°33'		
1928	36°04'	06°51'	36°06'	06°52'	10	Freighter
1928	36°04'	06°51'	36°18'	06°48'		
1929	36°07'	06°48'	36°30'	06°46'		
1930	36°10'	06°45'	36°21'	06°22'		
1932	36°17'	06°41'	36°17'	06°41'	10	Freighter
1933	36°19'	06°39'	36°22'	06°25'		

TABLE A-5

RADAR SURVEYED CONTACTS

9 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
1	245	12.4	2.5	1	255	15	50-51	6-7
2	203	11.7	5.8				50-51	9-10
3	227	25.9	5.7				50-51	9-10
4	253	13.2	3.0	3	255	14	49-50	6-7
5	202	13.6	2.8				49-50	6-7
6	276	14.0	1.4	5	270	12	49-50	6-7
7	030	2.7	2.9				49-50	7-8
8	318	13.7	5.8				49-50	7-8
9	252	16.9	5.5				49-50	7-8
10	278	18.2	5.6				49-50	7-8
11	254	19.3	7 1				49-50	8-9
12	276	13.0	5.7				49-50	8-9
13	241	14.0	6.7				49-50	8-9
14	285	20.7	6.9				49-50	8-9
15	358	21.7	5.8				49-50	8-9
16	250	15.0	6.4				49-50	9-10
17	335	9.2	1.9				49-50	12-13
18	045	9.2	2.0				49-50	12-13
19	097	16.3	2.3				49-50	16-17
20	074	16.5	2.3				49-50	17-18
21	018	13.2	2.7	8	020	15	48-49	7-8
22	012	15.7	3.7				48-49	7-8

TABLE A-5 (Cont)

RADAR SURVEYED CONTACTS

9 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
23	Stationary		2.6				48-49	8-9
24	338	6.8	5.9				48-49	8-9
25	340	5.2	1.6				48-49	9-10
26	Stationary		6.6	6	165	5	48-49	10-11
27	300	11.4	2.6	9	280	3	48-49	10-11
28	082	12.5	1.6				48-49	11-12
29	335	10.0	2.1				48-49	11-12
30	064	21.0	1.7				48-49	11-12
31	Stationary		1.5				48-49	12-13
32	348	7.0	2.2				48-49	13-14
33	088	16.5	1.8				48-49	15-16
34	092	16.3	1.9				48-49	16-17
35	251	15.5	2.5				47-48	7-8
36	Stationary		3.8				47-48	7-8
37	277	7.2	3.6	14	285	8	47-48	8-9
38	313	7.7	3.0	13	325	7	47-48	8-9
39	230	10.0	2.6	15	300	10	47-48	10-11
40	055	9.9	2.1				47-48	11-12
41	161	9.7	1.6				47-48	11-12
42	062	5.9	2.1				47-48	12-13
43	024	6.2	2.0				47-48	12-13
44	084	14.2	2.0				47-48	16-17

TABLE A-5 (Cont)
RADAR SURVEYED CONTACTS
9 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
45	076	20.0	2.1				47-48	17-18
46	158	8.6	2.3	22	180	8-10	46-47	9-10
47	163	9.1	2.8	21	180	7	46-47	9-10

TABLE A-6

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
9 Aug 72	1	1551		255	15	Freighter		50-51	6-7
9 Aug 72	2	1611		170	8	Freighter		50-51	7-8
9 Aug 72	3	1449		255	14	Freighter		49-50	7-8
9 Aug 72	4	1454		230	2	Trawler		49-50	7-8
9 Aug 72	5	1558		270	12	Bulk Carrier		49-50	7-8
9 Aug 72	6	1428		165	5	Trawler		49-50	10-11
9 Aug 72	7	1446		330	8	Trawler		48-49	7-8
9 Aug 72	8	1511		020	15	Tanker		48-49	7-8
9 Aug 72	9	1202		280	2-3	Deep Sea Fisher		48-49	10-11
9 Aug 72	10	1640	835		DIW	Tanker	Tropic	48-49	19-20
9 Aug 72	11	1628	383	100	12	Cargo	Dalbek	48-49	20-21
9 Aug 72	12	1124		260	6	Fishing		47-48	7-8
9 Aug 72	13	1114		325	7	Trawler		47-48	8-9
9 Aug 72	14	1117		285	8	Small Boat		47-48	8-9
9 Aug 72	15	1153		300	10	Coastal Freighter		47-48	10-11
9 Aug 72	16	1616	337	100	8		Ulysses Reefer	47-48	20-21
9 Aug 72	17	1341		210	12	Cargo		46-47	7-8
9 Aug 72	18	1347		210	15	Unknown		46-47	7-8
9 Aug 72	19	1348		210	14	Unknown		46-47	7-8
9 Aug 72	20	1401		030	12	Oiler		46-47	7-8
9 Aug 72	21	1137		180	7	Fishing		46-47	9-10
9 Aug 72	22	1138		180	8-10	Fishing		46-47	9-10

TABLE A-6 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
9 Aug 72	23	1138		175	8-10	Trawler		46-47	10-11
9 Aug 72	24	1737	440	100	12	Cargo	Halifax City	46-47	19-20
9 Aug 72	25	1747	520	100	10	Bulk Cargo	Brooknes	46-47	19-20
9 Aug 72	26	1343		030	10	Unknown		45-46	7-8
9 Aug 72	27	1348		030	8	Cargo		45-46	7-8
9 Aug 72	28	1354		010	10	Unknown		45-46	7-8
9 Aug 72	29	1540		220	10	Merchant		45-46	7-8
9 Aug 72	30	1346		030	18	Unknown		45-46	8-9
9 Aug 72	31	1414		360	12	Cargo		45-46	8-9
9 Aug 72	32	1515		230	10	Unknown		45-46	8-9
9 Aug 72	33	1515		220	18	Unknown		45-46	8-9
9 Aug 72	34	1521		220	10	Unknown		45-46	8-9
9 Aug 72	35	1402		040	15	Merchant		44-45	8-9
9 Aug 72	36	1518		210	10	Merchant		44-45	8-9
9 Aug 72	37	1540		070	10	Merchant		44-45	8-9
9 Aug 72	38	1609		180	6	Unknown		44-45	8-9
9 Aug 72	39	1613		180	5	Unknown		44-45	8-9
9 Aug 72	40	1511		210	10	Unknown		44-45	9-10
9 Aug 72	41	1513		360	8	Unknown		44-45	9-10
9 Aug 72	42	1624		210	10	Unknown		44-45	9-10
9 Aug 72	43	1635		220	12	Merchant		44-45	9-10
9 Aug 72	44	1915	397	210	10	Refrig. Ship	Karukera	44-45	14-15

TABLE A-6 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
9 Aug 72	45	1558		270	10	Unknown		43-44	7-8
9 Aug 72	46	1608		280	6	Coastal Vessel		43-44	7-8
9 Aug 72	47	1522		030	8	Tanker		43-44	8-9
9 Aug 72	48	1623		250	10	Merchant		43-44	8-9
9 Aug 72	49	1626		290	12	Tanker		43-44	8-9
9 Aug 72	50	1514		030	12	Merchant		43-44	9-10
9 Aug 72	51	1519		020	8	Tanker		43-44	9-10
9 Aug 72	52	1520		030	18	Merchant		43-44	9-10
9 Aug 72	53	1612		120	5	Unknown		43-44	9-10
9 Aug 72	54	1612		120	5	Unknown		43-44	9-10
9 Aug 72	55	1650		250	10	Unknown		43-44	9-10
9 Aug 72	56	1513		060	12	Unknown		43-44	9-10
9 Aug 72	57	1621		060	8	Unknown		43-44	10-11
9 Aug 72	58	1624		040	12	Tanker		43-44	10-11
9 Aug 72	59	1445	522	250	8	Tanker	Probity	43-44	18-19
9 Aug 72	60	1550		210	5	Fishing		43-44	19-20
9 Aug 72	61	1622		030	10	Unknown		42-43	9-10
9 Aug 72	62	1623		030	12	Merchant		42-43	10-11
9 Aug 72	63	1624		030	12	Unknown		42-43	10-11
9 Aug 72	64	1642		020	14	Unknown		42-43	10-11
9 Aug 72	65	1635		050	15	Merchant		42-43	11-12

TABLE A-6 (Cont)
VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
9 Aug 72	66	1913	625	330	12	Bulk Cargo	Elenora F.	42-43	14-15
9 Aug 72	67	1943	334	080	8	Liq. Gas Carrier	Caty Multina	42-43	16-17
9 Aug 72	68	2042		260	6		Bemmel	42-43	17-18
9 Aug 72	69	2047		250	6	Merchant		42-43	17-18
9 Aug 72	70	2051		250	10	Fishing		42-43	17-18

TABLE A-7

ROT CONTACTS

11 August 1972

Aircraft # NIM-1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0940			47°20'	10°04'		
0941			47°24'	10°14'		
0941			47°16'	10°17'		
0942			47°08'	10°14'		
0942			46°59'	09°56'		
0943			46°47'	09°46'		
0943			47°16'	10°41'		
0951			46°30'	10°43'		
0954			45°55'	10°15'		
0955			46°13'	10°44'		
0958			46°10'	09°24'		
1001			45°37'	09°17'		
1001			45°42'	09°34'		
1002			45°43'	10°18'		
1003			45°44'	08°42'		
1004			45°26'	09°14'		
1020			44°43'	08°37'		
1021			44°41'	08°48'		
1022			44°22'	08°56'		
1023			44°15'	09°03'		
1023			44°15'	09°36'		
1025			43°51'	09°08'		
1025			43°50'	09°26'		
1026			43°46'	09°05'		
1028			43°42'	08°57'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # NIM-1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1029			43°35'	09°16'		
1030			43°37'	08°58'		
1031			43°31'	09°06'		
1031			43°33'	08°58'		
1032			43°23'	09°28'		
1032			43°22'	09°42'		
1037			44°04'	11°17'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # NIM-2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0908			48°23'	16°05'		
0912			48°35'	16°06'		
0913			47°13'	14°10'		
0913			47°15'	13°42'		
0916			47°44'	16°58'		
0918			46°54'	16°36'		
0922			47°11'	16°34'		
0930			46°41'	16°48'		
0951			48°35'	20°16'		
1003			47°29'	20°27'		
1008			46°47'	20°54'		
1009			46°41'	19°16'		
1012			46°39'	21°13'		
1013			47°07'	21°44'		
1020			46°12'	18°16'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # P3#2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1237			41°05'	27°01'		
1257			43°11'	26°31'		
1304			44°28'	27°06'		
1304			43°11'	28°22'		
1331			46°01'	26°16'		
1331			45°38'	25°27'		
1331			45°07'	24°45'		
1354			47°43'	26°39'		
1354			47°31'	24°48'		
1354			47°07'	25°01'		
1358			46°53'	28°06'		
1358			46°47'	28°44'		
1358			47°14'	24°07'		
1412			47°54'	22°51'		
1412			47°17'	23°25'		
1412			46°53'	22°25'		
1412			48°39'	24°58'		
1428			48°51'	21°36'		
14°28'			48°31'	21°11'		
14°28'			47°12'	21°32'		
1451			49°36'	20°37'		
15°12'			49°46'	16°57'		
1512			49°38'	16°47'		
1512			50°44'	18°31'		
1528			49°56'	13°05'		
1528			49°18'	12°24'		

TABLE A-7 (Cont)
ROT CONTACTS
11 August 1972

Aircraft # P3#2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1528			49°09'	13°08'		
1528			48°58'	13°12'		
1528			48°29'	13°39'		
1532			50°04'	13°08'		
1532			50°25'	12°14'		
1532			50°14'	12°12'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # P3 #3

Range Scale 150 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1034	35°57'	26°20'	36°43'	26°52'		
1036	36°00'	26°47'	37°04'	27°30'		
1050	35°35'	28°03'	34°33'	27°17'		
1050	35°35'	28°03'	34°33'	27°17'		
1100	35°03'	28°00'	35°27'	28°27'		
1104	34°38'	26°59'	33°48'	26°29'		
1104	34°38'	26°59'	33°48'	26°29'		
1119	33°40'	27°12'	33°09'	27°16'		
1119	33°40'	27°12'	33°09'	27°16'		
1121	33°32'	27°11'	32°55'	27°18'		
1122	33°29'	27°11'	33°53'	27°18'		
1133	32°48'	27°07'	32°13'	27°11'		
1227	31°09'	25°10'	32°23'	25°24'		
1214	31°10'	26°03'	30°58'	24°26'		
1352	35°20'	24°04'	35°15'	23°58'		
1358	35°28'	24°02'	35°50'	24°49'		
1407	35°52'	23°59'	36°09'	23°02'		
1407	35°52'	23°59'	36°09'	23°02'		
1417	36°28'	23°54'	36°27'	23°00'		
1417	36°28'	23°54'	36°27'	23°00'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0632	36°33'	06°29'	36°33'	06°29'	10	Fishing boats
0633	36°31'	06°31'	36°31'	06°30'	10	Fishing boats
0637	36°22'	06°44'	36°05'	06°31'		
0637	36°22'	06°44'	36°19'	06°34'		
0637	36°22'	06°44'	36°35'	06°55'		
0637	36°22'	06°44'	36°42'	07°05'		
0638	36°20'	06°47'	36°23'	07°16'		
0639	36°18'	06°49'	36°07'	07°21'		
0639	36°18'	06°49'	36°16'	06°52'		Fishing boat
0640	36°15'	06°53'	36°04'	07°26'		
0640	36°15'	06°53'	36°27'	07°10'		
0640	36°15'	06°53'	36°15'	06°54'	5	Trawler
0641	36°19'	06°53'	36°11'	07°02'		
0641	36°18'	06°54'	36°35'	07°10'		
0642	36°18'	06°54'	36°25'	07°26'		
0643	36°16'	06°58'	35°57'	07°10'		
0644	36°09'	07°02'	36°08'	07°06'	10	Tanker
0644	36°09'	07°02'	36°08'	07°07'	10	Cargo Vessel
0655	35°59'	07°42'	36°22'	08°01'		
0656	35°58'	07°49'	35°45'	08°13'		
0657	35°58'	07°53'	36°06'	08°06'	8	Freighter
0659	35°58'	08°04'	35°47'	08°12'		
0702	35°58'	08°17'	35°30'	08°15'		
0704	35°57'	08°25'	35°43'	08°08'		
0704	35°57'	08°25'	35°40'	08°21'		
0707	35°56'	08°24'	36°05'	08°53'	12	Tanker

TABLE A-7 (Cont)
ROT CONTACTS
11 August 1972

Aircraft # EC-121
Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0716	35°54'	09°11'	35°40'	09°39'		
0724	35°49'	09°51'	35°32'	10°10'		
0733	35°48'	10°31'	36°10'	10°49'		
0736	35°47'	10°45'	35°19'	10°43'		
0736	35°47'	10°45'	35°38'	11°04'		
0740	35°46'	11°00'	35°17'	11°00'		
0748	35°43'	11°34'	35°27'	11°45'		
0748	35°43'	11°34'	35°35'	11°34'	10	Freighter
0750	35°43'	11°43'	35°54'	11°43'	8	Freighter
0753	35°42'	11°58'	35°23'	12°00	10	Freighter
0755	35°41'	12°08'	35°41'	12°33'	7	Freighter
0757	35°40'	12°17'	35°37'	12°23'	7	Freighter
0758	35°40'	12°18'	35°27'	12°37'		
0800	35°39'	12°19'	35°39'	12°37'	10	Freighter
0802	35°39'	12°39'	35°24'	12°41'	10	Freighter
0802	35°39'	12°39'	35°28'	13°00'	10	Freighter
0803	35°38'	12°44'	35°38'	12°54'	12	Tanker
0807	35°39'	13°05'	36°04'	13°11'		
0823	35°40'	14°17'	35°41'	14°27'		
0824	35°40'	14°21'	35°58'	14°29'		
0843	35°42'	15°49'	35°21'	15°56'		
0851	35°42'	16°19'	36°06'	16°35'		
0857	35°42'	16°49'	36°05'	17°02'	12	Large Ship
0858	35°42'	16°54'	35°36'	17°22'	12	Tanker
0908	35°43'	17°43'	36°09'	17°57'		
0923	35°45'	18°45'	35°42'	18°45'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0939	35°44'	19°56'	35°49'	20°13'	12	Freighter
0939	35°44'	19°56'	35°37'	20°14'	8	Freighter
0942	35°45'	20°11'	36°03'	20°26'		
0945	35°43'	20°22'	35°52'	20°40'		
0953	35°45'	20°55'	36°07'	20°57'		
0953	35°45'	20°55'	35°59'	21°18'		
1008	34°50'	21°06'	34°45'	20°35'		
1101	31°57'	20°20'	32°14'	20°17'		
1118	31°50'	19°02'	31°40'	18°47'		
1125	31°48'	18°27'	31°34'	18°18'		
1126	31°48'	18°23'	31°37'	18°03'		
1129	31°47'	18°10'	31°26'	17°59'		
1141	32°29'	18°00'	32°31'	17°29'		
1241	33°23'	14°46'	33°12'	14°18'	12	Tenker
1248	33°19'	14°14'	32°56'	13°57'		
1253	33°22'	13°47'	33°10'	13°22'		
1254	33°22'	13°45'	33°32'	13°24'	12	Tarker
1255	33°22'	13°41'	33°37'	13°20'		Freighter
1319	33°27'	11°47'	33°42'	11°49'		
1342	33°39'	09°47'	33°54'	09°38'		
1354	34°09'	09°04'	34°29'	09°21'		
1406	34°50'	08°25'	34°36'	08°04'		
1407	34°55'	08°22'	34°52'	08°04'		
1408	34°59'	08°17'	35°06'	07°53'		
1409	35°00'	08°15'	35°12'	08°12'		
1409	35°03'	08°13'	34°39'	07°45'		

TABLE A-7 (Cont)

ROT CONTACTS

11 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1409	35°04'	08°12'	35°05'	07°54'		
1411	35°06'	08°09'	35°10'	08°16'		
1412	35°08'	08°07'	34°56'	07°49'		
1414	35°12'	08°03'	35°13'	08°24'		
1416	35°16'	07°59'	35°36'	08°19'		
1423	35°47'	07°27'	35°39'	07°07'		
1423	35°47'	07°27'	35°58'	07°03'		
1423	35°47'	07°27'	36°00'	06°58'		
1425	35°48'	07°21'	36°07'	06°54'	14	Freighter
1426	35°51'	07°18'	36°02'	06°55'	10	Freighter
1426	35°51'	07°18'	36°02'	06°59'	10	Oiler
1427	35°52'	07°18'	36°13'	07°22'		
1427	35°52'	07°18'	36°14'	07°21'		
1428	35°54'	07°14'	36°08'	07°05'	7	Trawler
1429	35°55'	07°14'	36°09'	06°58'	7	Trawler
1429	35°56'	07°07'	36°08'	06°46'		Freighter
1430	36°06'	06°58'	35°52'	06°23'		
1434	36°19'	06°44'	36°19'	06°29'		
1434	36°19'	06°44'	36°26'	06°32'		
1434	36°19'	06°44'	36°28'	06°39'		
1435	36°21'	06°43'	36°32'	06°50'		
1536	36°22'	06°41'	36°31'	06°32'		
1436	36°25'	06°38'	36°48'	06°57'		
1437	36°27'	06°36'	36°11'	06°14'		

TABLE A-8

RADAR SURVEYED CONTACTS

11 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contacts at 1200 Hours Lat.	Long.
1	078	13.7	4.9				47-48	15-16
2	051	22.8	1.7				46-47	12-13
3	084	8.8	1.6				46-47	12-13
4	326	2.8	2.2	2		Stationary	46-47	12-13
5	257	14.5	1.9	1	260	14.5	46-47	12-13
6	252	15.8	3.1				46-47	13-14
7	240	11.0	2.0				46-47	19-20
8	090	17.0	2.0				46-47	21-22
9	335	12.4	2.2				45-46	11-12
10	220	9.8	2.5				45-46	13-14
11	233	19.9	2.5				45-46	13-14
12	230	11.0	2.6				45-46	14-15
13	245	17.4	4.6				45-46	14-15
14	329	10.0	2.8				45-46	14-15
15	050	18.0	2.1				45-46	16-17
16	295	15.0	1.8				45-46	16-17
17	230	26.0	2.1				45-46	18-19
18	225	15.0	2.6				44-45	13-14
19	225	13.4	2.6				44-45	13-14
20	225	15.0	2.1				44-45	15-16
21	229	18.0	4.3				43-44	18-19

TABLE A-9

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
11 Aug 72	1	1354		260	14.5			46-47	12-13
11 Aug 72	2	1406		Stationary				46-47	12-13
11 Aug 72	3	1408		080				46-47	12-13
11 Aug 72	4	1250		050	10	Fishing		46-47	16-17
11 Aug 72	5	1240		070	18	Tanker		45-46	15-16
11 Aug 72	6	1257	508	055	18	Cargo	Luise Leonhardt	45-46	22-23
11 Aug 72	7	1502		235	8		Oxtania	44-45	13-[illegible]
11 Aug 72	8	1356	490	040	21	Refrig. Ship	Geestcape	44-45	24-25
11 Aug 72	9	1453	550	250	5	Bulk Cargo	Heina	43-44	13-14
11 Aug 72	10	1437	634	75	4	Tanker	Fort Hoskins	43-44	15-16
11 Aug 72	11	1359	317	240	10	Cargo	Angelica Schulte	43-44	18-19
11 Aug 72	12	1410	150	270	8	Fishing (2)		43-44	18-19
11 Aug 72	13	1420	472	250	15	Refrig. Ship	Fort Sante Marie	43-44	20-21
11 Aug 72	14	1426	250	150	10	Destroyer	USS Hammerberg	43-44	20-21
11 Aug 72	15	1440	500	110	12	Bulk Cargo	Inverness Monrovia	43-44	21-22
11 Aug 72	16	1432	351	235	10	Liquid Gas Tanker	Euclidies	43-44	22-23
11 Aug 72	17	1435	675	270	15	Bulk Cargo	Elanchove	43-44	23-24
11 Aug 72	18	1443	302	235	15	Sci. Res.	Discoverer	43-44	23-24

TABLE A-9 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Numbe.	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
11 Aug 72	19	1233	479	250	15	Cargo	Monte Sollube	42-43	16-17
11 Aug 72	20	1550	381	250	12	Cargo	Bockholm	42-43	17-18
11 Aug 72	21	1216	477	250	19	Cargo	Puebla	42-43	22-23
11 Aug 72	22	1633		360	8		Maikof	41-42	10-11
11 Aug 72	23	1525	614	270	15		Zandonsk	41-42	22-23
11 Aug 72	24	1323	474	100	8		Anisgaritor	40-41	15-16
11 Aug 72	25	1550	732	270	15	Bulk Cargo	Tonin	40-41	23-24
11 Aug 72	26	1110	90	080	6	(Tug w/Ship)		39-40	20-21
11 Aug 72	27	1544	659	045	14	Tanker	Hallanger	39-40	24-25
11 Aug 72	28	1639	480	120	12		Burgetun	38 39	24-25

TABLE A-10

ROT CONTACTS

13 August 1972

Aircraft # NIM-2

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1212			44°06'	15°11'		
1220			43°52'	16°11'		
1220			44°04'	16°01'		
1252			44°10'	16°53'		
1254			43°52'	17°02'		
1255			43°40'	17°02'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # P3 #1

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0940	39°14'	21°55'	38°35'	21°46'		
1000	39°30'	19°59'	39°18'	19°25'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # P3 #?

Range Scale

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1041	38°40'	23°56'	37°23'	24°01'		
1041	38°40'	23°56'	37°41'	23°27'		
1044	38°38'	23°40'	40°10'	23°08'		
1045	38°36'	23°28'	38°22'	21°06'		
1047	38°34'	23°14'	37°48'	22°17'		
1108	38°12'	21°45'	38°05'	19°28'		
1141	37°45'	18°53'	36°53'	19°01'		
1223	41°40'	23°03'	42°20'	22°56'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # P3 #3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1017	50°58'	05°50'	50°44'	06°01'		
			50°53'	06°09'		
			50°56'	05°56'		
			50°59'	05°54'		
			51°02'	06°08'		
			51°06'	06°09'		
			51°01'	05°54'		
			51°09'	06°09'		
			51°10'	06°05'		
			51°13'	06°08'		
1026	51°08'	06°40'	50°47'	07°18'		
			50°27'	07°54'		
			50°48'	07°38'		
			50°54'	07°40'		
			51°08'	07°26'		
			51°30'	08°29'		
			51°36'	08°48'		
			51°35'	08°25'		
			51°30'	08°16'		
			51°43'	07°36'		
			51°53'	07°46'		
			51°56'	07°50'		
			51°53'	08°09'		
			51°54'	07°00'		
			52°09'	07°00'		
1047	51°07'	09°30'	50°22'	10°17'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # P3 #3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1047	51°07'	09°30'	50°22'	10°22'		
			50°28'	10°27'		
			50°52'	10°41'		
			50°48'	10°57'		
			50°56'	10°47'		
			51°47'	11°25'		
			50°33'	11°11'		
			50°48'	10°57'		
			49°50'	11°00'		
1116	50°26'	11°38'	49°15'	10°56'		
			49°14'	11°04'		
			49°17'	13°30'		
	48°58'	12°30'	47°38'	12°21'		
			47°58'	12°58'		
1204	48°53'	14°34'	49°01'	15°13'		
			49°08'	15°09'		
			49°53'	14°50'		
			48°44'	14°49'		
			49°49'	15°24'		
1242	49°02'	18°35'	48°53'	18°47'		
			49°13	18°54'		
1350	49°15'	20°30'	49°02'	20°18'		
1400	48°57'	21°04'	49°04'	22°36'		
			49°37'	22°42'		
1410	48°26'	20°04'	48°16'	19°52'		
			48°00'	19°48'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # P3 #3

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1410	48°26'	20°04'	48°02'	20°04'		
1426	46°25'	22°05'	46°07'	20°22'		
			46°05'	19°39'		
			46°46'	24°39'		
			47°21'	23°31'		
1521	44°22'	24°25'	43°35'	23°33'		
			44°03'	25°44'		
			44°42'	25°09'		
1530	42°55'	25°30'	42°27'	22°45'		
			41°53'	23°42'		
			42°38'	23°54'		
			42°52'	23°05'		
			41°28'	26°21'		
1606	41°50'	25°45'	41°31'	25°48'		
			41°22'	25°13'		
			40°33'	25°15'		
			41°40'	25°52'		
			41°45'	26°44'		
			42°03'	26°46'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0608	36°31'	06°31'	36°30'	06°31'	10	Unknown
0608	36°31'	06°31'	36°28'	06°32'	5	Unknown
0608	36°31'	06°31'	36°28'	06°33'	5	Unknown
0608	36°31'	06°31'	36°28'	06°33'		Unknown
0610	36°30'	06°33'	36°29'	06°34'	3	Unknown
0610	36°30'	06°33'	36°30'	06°35'	3	Unknown
0611	36°27'	06°38'	36°34'	06°46'	10	Freighter
0611	36°27'	06°38'	36°23'	06°46'		Fishing Boat
0617	36°13'	06°55'	36°13'	06°57'	10	Freighter
0617	36°13'	06°55'	36°11'	06°57'	8	Fishing Ves.
0617	36°13'	06°55'	36°08'	06°59'	8	Freighter
0617	36°13'	06°55'	36°11'	06°57'	5	Fishing Boat
0618	36°11'	06°58'	36°05'	06°44'		
0618	36°11'	06°58'	36°04'	06°46'		
0618	36°11'	06°58'	35°54'	06°49'		
0619	36°07'	07°02'	35°56'	06°54'		
0619	36°07'	07°02'	35°57'	07°01'		
0619	36°07'	07°02'	36°09'	07°24'		
0621	36°02'	07°08'	35°48'	07°21'		
0622	36°00'	07°11'	35°44'	07°22'		
0623	35°58'	07°13'	35°44'	07°12'		
0624	35°58'	07°18'	35°48'	07°19'	12	Freighter
0624	35°58'	07°18'	35°43'	07°20'	10	Freighter
0625	35°58'	07°02'	35°47'	07°22'		
0627	35°58'	07°06'	36°08'	07°14'		
0627	37°58'	07°06'	36°16'	06°48'		

TABLE A-10 (Cont)
ROT CONTACTS
13 August 1972

Aircraft # EC-121
Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0627	35°58'	07°28'	36°07'	07°21'		
0628	35°58'	07°36'	36°18'	07°15'		
0628	35°58'	07°26'	36°13'	07°26'		
0628	35°58'	07°26'	36°23'	07°29'		
0628	35°58'	07°31'	36°24'	07°37'		
0629	35°57'	07°32'	35°44'	07°33'		
0631	35°57'	07°40'	36°22'	07°46'		
0632	35°58'	07°42'	35°58'	08°04'	12	Freighter
0633	35°58'	07°45'	36°03'	08°18'		
0636	35°57'	07°58'	36°22'	07°47'		
0639	35°56'	08°08'	35°53'	08°34'	2	Sml Lt Ship
0639	35°56'	08°08'	35°47'	08°27'		
0642	35°44'	08°22'	35°24'	08°36'		
0711	35°47'	10°28'	35°29'	10°33'		
0711	35°47'	10°28'	35°22'	10°20'		
0731	35°40'	11°55'	35°54'	12°10'	10	Freighter
0732	35°40'	12°01'	35°58'	12°24'		
0732	35°40'	12°01'	35°50'	12°19'	15	Freighter
0732	35°40'	12°01'	35°56'	12°07'		
0732	35°40'	12°01'	35°58'	12°12'		
0734	35°40'	12°08'	35°46'	12°37'	10	Tanker
0735	35°40'	12°15'	35°37'	12°48'	10	Tanker
0736	35°40'	12°30'	36°00'	12°51'		
0736	35°40'	12°20'	35°49'	12°36'	10	Sml Vessel
0737	35°40'	12°22'	35°37'	12°56'	10	Sml Ship
0738	35°40'	12°26'	35°28'	12°41'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # EC-121

Range Scale _____

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
0740	35°39'	12°37'	35°36'	13°11'		Sml Vessel
0740	35°39'	12°37'	35°23'	13°04'	8	Tanker
0743	35°38'	12°48'	36°00'	12°36'		
0743	35°38'	12°48'	35°3[illegible]'	12°29'		
0744	35°38'	12°54'	35°18'	13°18'		
0744	35°38'	12°57'	35°29'	13°16'		
0751	35°37'	13°25'	35°59'	13°24'		
0751	35°57'	13°25'	35°56'	13°53'		
0815	35°31'	15°14'	35°06'	15°21'		
0828	35°29'	16°15'	35°15'	16°42'		
0829	35°29'	16°19'	35°30'	16°51'		
0836	35°30'	16°50'	35°46'	17°11'		
0909	35°25'	19°27'	35°49'	19°44'		
0909	35°25'	19°27'	35°50'	19°36'		
0910	35°25'	19°29'	35°47'	19°37'		
0920	35°24'	20°15'	35°39'	20°27'		
1032	32°02'	20°03'	31°57'	19°43'		
1034	32°02'	19°54'	32°23'	20°02'		
1035	32°02'	19°49'	32°15'	19°27'		
1212	33°35'	14°26'	33°35'	14°51'		
1212	33°35'	14°26'	33°17'	14°12'		
1212	33°35'	14°26'	33°18'	14°43'		
1216	33°36'	14°10'	33°42'	13°41'		
1221	33°36'	13°49'	33°39'	13°41'		
1222	33°36'	13°45'	33°20'	13°32'		
1223	33°36'	13°40'	33°10'	13°33'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1224	33°36'	13°34'	33°50'	13°08'		
1227	33°37'	13°25'	33°05'	13°05'		
1227	33°37'	13°25'	33°59'	13°17'		
1227	33°37'	13°25'	33°28'	13°05'		
1230	33°37'	13°11'	33°14'	13°05'		
1233	33°36'	12°56'	33°49'	12°26'		
1233	33°36'	12°56'	33°59'	12°39'		
1239	33°35'	12°28'	34°02'	12°41'		
1239	33°35'	12°28'	33°51'	12°12'		
1240	33°35'	12°25'	33°22'	11°57'		
1240	33°35'	12°25'	33°56'	12°30'		
1242	33°35'	12°11'	33°17'	12°03'		
1242	33°35'	12°02'	33°53'	11°50'		
1245	33°35'	12°02'	33°58'	12°03'		
1246	33°34'	11°55'	33°08'	12°03'		
1303	33°31'	10°43'	33°08'	10°26'		
1310	33°34'	10°11'	33°12'	10°04'		
1317	33°31'	09°37'	33°26'	09°14'		
1318	33°31'	09°36'	33°17'	09°07'		
1321	33°31'	09°14'	33°12'	08°49'		
1321	33°31'	09°14'	33°33'	08°45'		
1321	33°31'	09°14'	33°37'	08°45'		
1322	33°31'	09°13'	33°45'	08°44'		
1322	33°31'	09°13'	33°24'	08°42'		
1322	33°31'	09°13'	33°31'	08°43'		
1331	33°49'	08°46'	34°06'	08°45'		

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft # EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Longitude	Contact Position Latitude	Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1338	34°13'	08°29'	34°33'	08°07'		
1338	34°10'	08°27'	34°15'	07°56'		
1343	34°26'	08°12'	34°15'	07°52'		
1345	34°30'	08°09'	34°34'	07°36'		
1346	34°33'	08°07'	34°35'	07°33'		
1346	34°36'	08°03'	34°37'	07°39'		
1348	34°39'	07°59'	34°37'	07°43'		
1353	34°53'	07°47'	34°53'	07°14'		
1352	34°53'	07°47'	34°55'	07°17'		
1353	34°56'	07°46	35°03'	07°13'		
13.3	35°08'	07°32'	35°11'	07°20'		
1402	35°21'	07°20'	35°18'	06°46'		
1402	35°21'	07°20'	35°18'	06°46'		
1403	35°24'	07°18'	35°46'	06°59'		
1405	35°31'	07°08'	35°37'	07°07'		
1407	35°35'	07°03'	35°51'	06°39'		
1407	35°37'	07°02'	35°59'	07°15'	7	
1408	35°41'	06°58'	35°52'	06°31'		
1408	35°41'	06°58'	35°57'	06°36'		
1410	35°44'	06°55'	35°54'	06°27'		
1410	35°44'	06°55'	35°55'	06°24'		
1411	35°47'	06°52'	35°55'	06°50'	12	Freighter
1411	35°47'	06°52'	35°54'	06°20'		
1412	35°51'	06°46'	36°20'	06°52'		
1412	35°51'	06°46'	36°18'	07°01'		
1414	35°59'	06°46'	36°04'	06°48'	12	Freighter

TABLE A-10 (Cont)

ROT CONTACTS

13 August 1972

Aircraft #EC-121

Range Scale 30 n.m.

Time Gained (GMT)	Aircraft Position Latitude	Aircraft Position Longitude	Contact Position Latitude	Contact Position Longitude	Estimated Speed (If Noted)	Ship Type (If Noted)
1414	35°59'	06°46'	36°04'	06°48'	12	Freighter
1414	35°59'	06°46'	36°06'	06°47'	7	Freighter
1414	35°59'	06°46'	36°21'	06°32'		
1416	36°06'	06°45'	36°32'	06°59'		
1416	36°06'	06°45'	36°34'	06°44'		
1418	36°12'	06°42'	36°35'	06°45'		
1419	36°23'	06°38'	36°29'	06°31'		

TABLE A-11

RADAR SURVEYED CONTACTS

13 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
1	063	17.7	2.0	1	040	15	46-47	10-11
2	238	9.3	2.1	3	260	12	46-47	12-13
3	085	11.2	2.0				46-47	15-16
4	262	5.2	1.9				46-47	15-16
5	066	15.8	2.0				46-47	17-18
6	160	15.6	1.9	2	160	12	45-46	11-12
7	242	14.0	1.6				45-46	13-14
8	072	15.6	2.1				45-46	15-16
9	277	12.3	1.9				45-46	16-17
10	064	17.7	2.0				45-46	16-17
11	069	20.0	5.7				45-46	17-18
12	093	2.8	1.8				44-45	16-17
13	270	8.6	1.9	24	270	8	43-44	13-14
14	270	8.6	1.9	25	270	8	43-44	13-14
15	239	11.3	1.9	42	240	10	42-43	12-13
16	301	7.4	2.8	43	280	10	42-43	12-13
17	119	20.0	1.2				38-39	13-14
18	165	16.3	1.6				38-39	13-14
19	112	15.0	1.2				38-39	13-14
20	240	14.0	1.5				38-39	13-14
21	042	14.0	1.6	158	025	18	37-38	12-13
22	056	18.6	1.6				37-38	13-14

TABLE A-11 (Cont)

RADAR SURVEYED CONTACTS

13 August 1972

Contact No.	Est. Course	Est. Speed	Speed Acc.	Visual Contact No.	Vis. Est. Course	Vis. Est. Speed	Calculated Position of Contact at 1200 Hours Lat.	Long.
23	107	20.6	1.2				37-38	14-15
24	136	15.0	1.2				37-38	14-15
25	126	16.8	1.2				37-38	14-15
26	127	15.0	1.5	159	120	15	37-38	14-15
27	025	13.0	1.2	168	360	20	36-37	13-14
28	068	15.0	1.2				36-37	13-14
29	011	11.4	1.5	169	360	17	36-37	14-15
30	114	17.6	3.5				36-37	14-15

TABLE A-12

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	1	1141		040	15	Tanker		46-47	10-11
13 Aug 72	2	1554		160	12	Freighter		46-47	11-12
13 Aug 72	3	1140		260	12	Freighter		46-47	12-13
13 Aug 72	4	1510	919	210	15	Tanker	Gwenola	44-45	8-9
13 Aug 72	5	1534		210	15		Ofilos J.Vatis	44-45	8-9
13 Aug 72	6	1539		200	10		Unknown	44-45	8-9
13 Aug 72	7	1542		210	10		Unknown	44-45	8-9
13 Aug 72	8	1529		180	7		Unknown	44-45	9-10
13 Aug 72	9	1534	483	180	10	Cargo	Mol	44-45	9-10
13 Aug 72	10	1544		180	10		Unknown	44-45	9-10
13 Aug 72	11	1458		230	10		Unknown	43-44	8-9
13 Aug 72	12	1450		200	15		Unknown	43-44	9-10
13 Aug 72	13	1502		030	5		Unknown	43-44	9-10
13 Aug 72	14	1506		180	3		Unknown	43-44	9-10
13 Aug 72	15	1513		030	12		Unknown	43-44	9-10
13 Aug 72	16	1517		040	10		Unknown	43-44	9-10
13 Aug 72	17	1541		020	12		Unknown	43-44	9-10
13 Aug 72	18	1544		360	12		Unknown	43-44	9-10
13 Aug 72	19	1544		360	7		Unknown	43-44	9-10
13 Aug 72	20	1544		360	7		Unknown	43-44	9-10
13 Aug 72	21	1544		360	7		Unknown	43-44	9-10
13 Aug 72	22	1438	1000	195	13	Tanker	Sea Splendor	43-44	10-11

TABLE A-12 (Cont)
VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	23	1522		045	12		Hogemill	43-44	10-11
13 Aug 72	24	1117		270	8	Tuna Boats		43-44	13-14
13 Aug 72	25	1117		270	8	Tuna Boats		43-44	13-14
13 Aug 72	26	1352	441	235	13	Refrig. Ship	Wesermunde	43-44	17-18
13 Aug 72	27	1411	325	120	10		Estavad	43-44	19-20
13 Aug 72	28	1424	568	220	15	Bulk Cargo	Orfeo	43-44	19-20
13 Aug 72	29	1430	464	240	14	Cargo	Gand	43-44	20-21
13 Aug 72	30	1402		190	12		Dortesteen	42-43	9-10
13 Aug 72	31	1413		170	12		Unknown	42-43	9-10
13 Aug 72	32	1425		180	15		Unknown	42-43	9-10
13 Aug 72	33	1426	557	180	13	Tanker	Pepe	42-43	9-10
13 Aug 72	34	1447		360	12		Pamastar	42-43	9-10
13 Aug 72	35	1457		020	10		Sievella	42-43	9-10
13 Aug 72	36	1459		030	14		Unknown	42-43	9-10
13 Aug 72	37	1500		030	15		Unknown	42-43	9-10
13 Aug 72	38	1502		020	15		Unknown	42-43	9-10
13 Aug 72	39	1410	556	170	15	Bulk Cargo	Montello	42-43	10-11
13 Aug 72	40	1434	1132	065	8	Tanker	Texico Denmark	42-43	10-11
13 Aug 72	41	1456		045	12		Three	42-43	10-11
13 Aug 72	42	1137		240	10	Merchant		42-43	12-13
13 Aug 72	43	1057		280	10	Freighter		42-43	12-13

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	44	1345	446	220	12	Refr Ship	Nenadir	42-43	18-19
13 Aug 72	45	1251		180	10		Unknown	41-42	9-10
13 Aug 72	46	1412		010	12		Unknown	41-42	9-10
13 Aug 72	47	1421		010	10		Unknown	41-42	9-10
13 Aug 72	48	1421		020	10		Doctor	41-42	9-10
13 Aug 72	49	1428	600	360	16	Bulk Cargo Carrier	Cheshire	41-42	9-10
13 Aug 72	50	1305		200	15		Unknown	41-42	10-11
13 Aug 72	51	1321	1057	180	13	Tanker	Olympic Athlete	41-42	10-11
13 Aug 72	52	1325		180	10		Unknown	41-42	10-11
13 Aug 72	53	1326	827	190	15	Tanker/Ore	Vestan	41-42	10-11
13 Aug 72	54	1331		200	12		Unknown	41-42	10-11
13 Aug 72	55	1333	463	190	14	Bulk Cargo	Ocean Transport	41-42	10-11
13 Aug 72	56	1339		200	14		Unknown	41-42	10-11
13 Aug 72	57	1342		200	15		Sloman	41-42	10-11
13 Aug 72	58	1348		025	15		Unknown	41-42	20-21
13 Aug 72	59	1353		060	13		Unknown	41-42	20-21
13 Aug 72	60	1359		010	10		Unknown	41-42	20-21
13 Aug 72	61	1451	450	035	15		Unknown	41-42	20-21
13 Aug 72	62	1226	290	180	10	Cargo	Susanna Reith	40-41	9-10

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	63	1229		180	10		Unknown	40-41	9-10
13 Aug 72	64	1230		180	9		Unknown	40-41	9-10
13 Aug 72	65	1231		360	10		Heric Orfdorf	40-41	9-10
13 Aug 72	66	1232		360	10		Unknown	40-41	9-10
13 Aug 72	67	1234		180	12		Unknown	40-41	9-10
13 Aug 72	68	1238		360	10		Unknown	40-41	9-10
13 Aug 72	69	1241		360	12		Unknown	40-41	9-10
13 Aug 72	70	1244	258	180	8	Cargo	Elva	40-41	9-10
13 Aug 72	71	1246	775	180	10	Tanker	Francis Hammer	40-41	9-10
13 Aug 72	72	1250		330	10		Aewapon Ur	40-41	9-10
13 Aug 72	73	1251	297	360	8	Light Gas Tanker	Ettric	40-41	9-10
13 Aug 72	74	1308		195	15		Unknown	40-41	10-11
13 Aug 72	75	1312	903	010	13	Tanker	Dauphine	40-41	10-11
13 Aug 72	76	1320		Circle	10		RC-2	40-41	10-11
13 Aug 72	77	1332		020	12		Unknown	40-41	10-11
13 Aug 72	78	1313		040	12		Begerband	40-41	11-12
13 Aug 72	79	1525	458	220	13	General Cargo	Norwid	40-41	11-12
13 Aug 72	80	1548	775	210	15	Tanker	Jonwi	40-41	11-12
13 Aug 72	81	1510		270	11	Tanker-Large		40-41	12-13
13 Aug 72	82	1207	628	180	10	Tanker	Italmotor	39-40	9-10

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	83	1217	446	360	15	General Cargo	Hamburg	39-40	9-10
13 Aug 72	84	1220	505	180	8	General Cargo	Athena	39-40	9-10
13 Aug 72	85	1223	559	180	8	Tanker	Arca	39-40	9-10
13 Aug 72	86	1224	1060	180	8	Tanker	Hadrian	39-40	9-10
13 Aug 72	87	1340		110	13	Merchant	Berger	39-40	16-17
13 Aug 72	88	1256	559	320	13	Tanker	World Hope	39-40	17-18
13 Aug 72	89	1232	498	130	13	Cargo	Banat	39-40	18-19
13 Aug 72	90	1237	474	240	12	Refrig. Ship	Matina	39-40	18-19
13 Aug 72	91	1531	421	250	12	Wine Tanker	Martinique	39-40	18-19
13 Aug 72	92	1044		020	12		Unknown	38-39	9-10
13 Aug 72	93	1125	248	360	10	Bulk Cargo	Hudson Trader	38-39	9-10
13 Aug 72	94	1126		180	8		Unknown	38-39	9-10
13 Aug 72	95	1126		180	8		Unknown	38-39	9-10
13 Aug 72	96	1126		180	8		Unknown	38-39	9-10
13 Aug 72	97	1128		360	12		Fideilo Monrovia	38-39	9-10
13 Aug 72	98	1129		360	12		Unknown	38-39	9-10
13 Aug 72	99	1129		180	10		Unknown	38-39	9-10
13 Aug 72	100	1129		180	10		Johanisburg Esso	38-39	9-10
13 Aug 72	101	1129	737	180	10	Tanker	Rigel	38-39	9-10
13 Aug 72	102	1136		130	10		Unknown	38-39	9-10

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	103	1138		360	10		ATR	38-39	9-10
13 Aug 72	104	1138		360	10		Unknown	38-39	9-10
13 Aug 72	105	1138		340	8		Unknown	38-39	9-10
13 Aug 72	106	1138		180	8		Unknown	38-39	9-10
13 Aug 72	107	1140		360	10		Unknown	38-39	9-10
13 Aug 72	108	1142		180	8		Rio Pajo	38-39	9-10
13 Aug 72	109	1147		360	10		Unknown	38-39	9-10
13 Aug 72	110	1152		350	8		Unknown	38-39	9-10
13 Aug 72	111	1153		360	10		Unknown	38-39	9-10
13 Aug 72	112	1153		180	10		Unknown	38-39	9-10
13 Aug 72	113	1153		180	10		Unknown	38-39	9-10
13 Aug 72	114	1153		360	10		Unknown	38-39	9-10
13 Aug 72	115	1156	423	360	10	Timber Carrier	Diamond	38-39	9-10
13 Aug 72	116	1157		360	12		Rusbiea	38-39	9-10
13 Aug 72	117	1200		340	8		Unknown	38-39	9-10
13 Aug 72	118	1202		360	12		Roezch	38-39	9-10
13 Aug 72	119	1203	355	180	10	Cargo	Tara	38-39	9-10
13 Aug 72	120	1205	357	180	12	Bulk Cargo	Nowy Sacz	38-39	9-10
13 Aug 72	121	1205		180	12		Silver	38-39	9-10
13 Aug 72	122	1021	870	025	18	Tanker	Neverita	38-39	9-10
13 Aug 72	123	1149		360	10		Samigee	38-39	10-11
13 Aug 72	124	1110	600	195	18	Tanker		38-39	11-12

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	125	1112	524	195	18	Roy. Fleet Aux.	Stromness	38-39	11-12
13 Aug 72	126	1120	493	195	20	Cargo	Boizenburg	38-39	12-13
13 Aug 72	127	1146	563	195	18	Cargo	Benwyvis	38-39	12-13
13 Aug 72	128	1226	600	105	14	Bulk Cargo	Monte Zalama	38-39	19-20
13 Aug 72	129	1541	125	250	9	Trawler	Trident	38-39	19-20
13 Aug 72	130	1549	583	110	16	Bulk Cargo	Ionian Skipper	38-39	21-22
13 Aug 72	131	1107		090	8		Unknown	37-38	9-10
13 Aug 72	132	1108		300	8		Bylm	37-38	9-10
13 Aug 72	133	1110		360	8		Unknown	37-38	9-10
13 Aug 72	134	1112	621	360	10	Liquid Gas Tanker	Methane Princess	37-38	9-10
13 Aug 72	135	1114		180	10		Unknown	37-38	9-10
13 Aug 72	136	1116		360	10		Unknown	37-38	9-10
13 Aug 72	137	1116		360	10		Unknown	37-38	9-10
13 Aug 72	138	1116		360	10		Gen.Gummseala	37-38	9-10
13 Aug 72	139	1120	1128	360	10	Tanker	Texco Norway	37-38	9-10
13 Aug 72	140	1121		360	10		Unknown	37-38	9-10
13 Aug 72	141	1122		180	10		Unknown	37-38	9-10
13 Aug 72	142	1124		170	12		Unknown	37-38	9-10
13 Aug 72	143	1034		030	10		Unknown	37-38	10-11
13 Aug 72	144	1020		020	12		Unknown	37-38	11-12

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
13 Aug 72	145	1016	1063	025	18	Tanker	World Happiness	37-38	11-12
13 Aug 72	146	1027	1090	025	18	Tanker	Thorshavet	37-38	11-12
13 Aug 72	147	1038	285	015	12	Refrig. Ship	Braga	37-38	11-12
13 Aug 72	148	1042		200	18		Ntonnes	37-38	11-12
13 Aug 72	149	1044	463	195	17	Cargo	Janey	37-38	11-12
13 Aug 72	150	1050	682	190	19	Tanker	Gota River	37-38	11-12
13 Aug 72	151	1054	737	025	18	Tanker	Calatrava	37-38	11-12
13 Aug 72	152	1057	683	190	18	Tanker	Thiressia Vanizelos	37-38	11-12
13 Aug 72	153	1102	497	195	16	Cargo	Busuanga	37-38	11-12
13 Aug 72	154	1106	786	195	22	Tanker	Rera Pahlavi	37-38	11-12
13 Aug 72	155	1118	746	195	22	Container	Jervis Bay	37-38	11-12
13 Aug 72	156	1031	683	210	16	Tanker	Brandon Priory	37-38	12-13
13 Aug 72	157	1129		195	18		Hbec Helling	37-38	12-13
13 Aug 72	158	1208	513	025	18	Cargo	Gowanbank	37-36	12-13
13 Aug 72	159	1423	608	120	15	Bulk Cargo	Angelita	37-38	14-15
13 Aug 72	160	1337	669	100	20	Bulk Cargo	E.R.Scaldia	37-38	16-17
13 Aug 72	161	1124	450	110	12	Merchant		37-38	19-20
13 Aug 72	162	0952		300	10		Beron Spector	36-37	9-10
13 Aug 72	163	1009		090	13		Unknown	36-37	9-10
13 Aug 72	164	1103		180	10		Unknown	36-37	9-10

TABLE A-12 (Cont)

VISUALLY SURVEYED CONTACTS

Date	Contact Number	Time Gained	Est. Length	Est. Course	Est. Speed	Ship Type	Ship Name	Calculated Position of Contact at 1200 Hours Lat.	Long.
12 Aug 72	165	1000		260	10		Lykes	36-37	10-11
13 Aug 72	166	1014	1141	210	15	Tanker	Chrysanthy M. Lemoz	36-37	10-11
13 Aug 72	167	1026		175	15		Unknown	36-37	10-11
13 Aug 72	168	1448	569	360	20	Bulk Cargo	Libra	36-37	13-14
13 Aug 72	169	1417	346	360	17	Cargo	Ceuta	36-37	14-15
13 Aug 72	170	0945		250	12		Berwy Core	35-36	10-11

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31 Jan 06

MEMORANDUM FOR DISTRIBUTION LIST

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

Ref: (a) SECNAVINST 5510.36

Encl: (1) List of DECLASSIFIED LRAPP Documents

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.

2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

   Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

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3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

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Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
Unavailable	Brancart, C. P.	TRANSMISSION REPORT, VIBROSEIS CW ACOUSTIC SOURCE, CHURCH ANCHOR EXERCISE, AUGUST AND SEPTEMBER 1973	B-K Dynamics, Inc.	730101	AD0528904	U
Unavailable	Daubin, S. C., et al.	LONG RANGE ACOUSTIC PROPAGATION PROJECT. BLAKE TEST SYNOPSIS REPORT	University of Miami, Rosenstiel School of Marine and Atmospheric Science	730101	AD0768995	U
NUSC TR NO. 4457	King, P. C., et al.	MOORED ACOUSTIC BUOY SYSTEM (MABS): SPECIFICATIONS AND DEPLOYMENTS	Naval Underwater Systems Center	730105	AD0756181; ND	U
MC-012	Unavailable	CHURCH GABBRO SYNOPSIS REPORT (U)	Maury Center for Ocean Science	730210	ND	U
Unavailable	Hecht, R. J., et al.	STATISTICAL ANALYSIS OF OCEAN NOISE	Underwater Systems, Inc.	730220	AD0526024	U
Raff rept 73-2	Bowen, J. I., et al.	EASTLANT SHIPPING DENSITIES	Raff Associates, Inc.	730227	ND AD764627	U
Unavailable	Sander, E. L.	SHIPPING SURVEILLANCE DATA FOR CHURCH GABBRO	Raff Associates, Inc.	730315	AD0765360	U
Unavailable	Wagstaff, R. A.	RANDI: RESEARCH AMBIENT NOISE DIRECTIONALITY MODEL	Naval Undersea Center	730401	AD0760692	U
Unavailable	Van Wyckhouse, R. J.	SYNTHETIC BATHYMETRIC PROFILING SYSTEM (SYNBAPS)	Naval Oceanographic Office	730501	AD0762070	U
MCPLAN012	Unavailable	SQUARE DEAL EXERCISE PLAN (U)	Maury Center for Ocean Science	730501	NS; ND	U
Unavailable	Marshall, S. W.	AMBIENT NOISE AND SIGNAL-TO-NOISE PROFILES IN IOMEDEX	Naval Research Laboratory	730601	AD0527037	U
Unavailable	Daubin, S. C.	CHURCH GABBRO TECHNICAL NOTE: SYSTEMS DESCRIPTION AND PERFORMANCE	University of Miami, Rosenstiel School of Marine and Atmospheric Science	730601	AD0763460	U
MC-011	Unavailable	CHURCH ANCHOR EXERCISE PLAN (U)	Maury Center for Ocean Science	730601	ND	U
Unavailable	Solosko, R. B.	SEMI-AUTOMATIC SYSTEM FOR DIGITIZING BATHYMETRY CHARTS	Calspan Corp.	730613	AD0761647	U
64	Jones, C. H.	LRAPP VERTICAL ARRAY- PHASE II	Westinghouse Research Laboratories	730613	AD0786239; ND	U
Unavailable	Koenigs, P. D., et al.	ANALYSIS OF PROPAGATION LOSS AND SIGNAL-TO-NOISE RATIOS FROM IOMEDEX	Naval Underwater Systems Center	730615	AD0526552	U
NUSC TR 4417	Perrone, A. J.	INFRASONIC AND LOW-FREQUENCY AMBIENT-NOISE MEASUREMENTS OFF NEWFOUNDLAND	Naval Underwater Systems Center	730619	ND AD913668	U
USRD Cal. Report No. 3576	Unavailable	CALIBRATION OF FLIP-CHURCH ANCHOR TRANSDUCERS SERIALS 15 AND 19	Naval Research Laboratory	730716	ND	U