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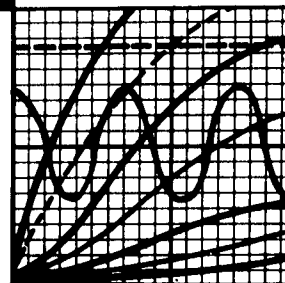
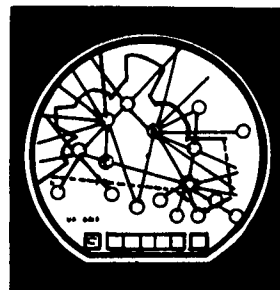
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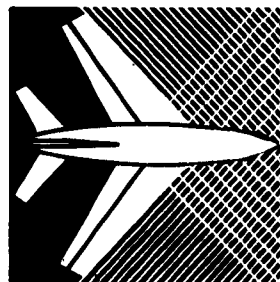
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PROJECT 101-43-5S



**NORTH ATLANTIC
AIR TRAFFIC ANALYSIS :
AUGUST 25, 1961, FLIGHT DATA**

FEBRUARY 1962

FEDERAL AVIATION AGENCY
Aviation Research & Development Service
SYSTEM MANAGEMENT DIVISION

A REPORT

NORTH ATLANTIC AIR TRAFFIC ANALYSIS:
AUGUST 25, 1961, FLIGHT DATA

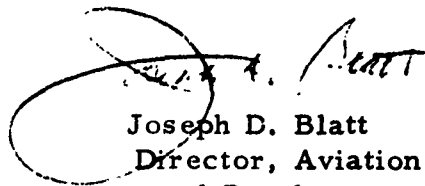
PROJECT 101-43-5S

PREPARED BY:

Richard M. Warfield

FEBRUARY 1962

This report has been approved for general distribution.

A handwritten signature in dark ink, appearing to read "Joseph D. Blatt", is written over a circular stamp or seal.

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NORTH ATLANTIC AIR TRAFFIC ANALYSIS: August 25, 1961, Flight Data,
by Richard M. Warfield, February 1962, 59 pages.

ABSTRACT

This report summarizes flight data for August 25, 1961, the second of twelve monthly peak days to be analyzed in conjunction with the North Atlantic Region Traffic Survey being conducted by the United States Federal Aviation Agency. The material presented was prepared from machine tabulations of flight plan information coded into IBM cards.

A total of 417 unduplicated flights (i.e., flights counted only once regardless of the number of OACC's involved) flew somewhere within the North Atlantic Region between 0000-2359Z on August 25, 1961. Forty of these flights were airborne at 0000Z and 27 were airborne after 2359Z. In order to eliminate the overlap incurred by counting both flights airborne at the beginning as well as the end of the day, the 27 flights airborne at the end of the day were subtracted from the 417 flights to give a representative peak day total of 390 flights. Most of the tabulations in this report are in terms of these 390 flights. The distribution of these flights by ownership and aircraft class is summarized below:

<u>Aircraft Class</u>	<u>Number of Flights</u>		
	<u>Civil</u>	<u>Military</u>	<u>Total</u>
Piston	84	88	172
Turboprop	32	13	45
Turbojet	161	12	173
Total	277	113	390

Figure 1 illustrates traffic flow. Flights classified relative to the North Atlantic Region (12 OACC's) are summarized below:

<u>Flight Class</u>	<u>Flights</u>	<u>Percent</u>
Overflights	246	59
Arrivals	72	17
Departures	78	19
Within	8	2
Round Robin	13	3
Total	417	100

The peak instant for airborne activity occurred at 0424Z when 85 aircraft were simultaneously airborne. Figure 8, page 31, shows a plot of aircraft locations and approximate headings at the peak instant.

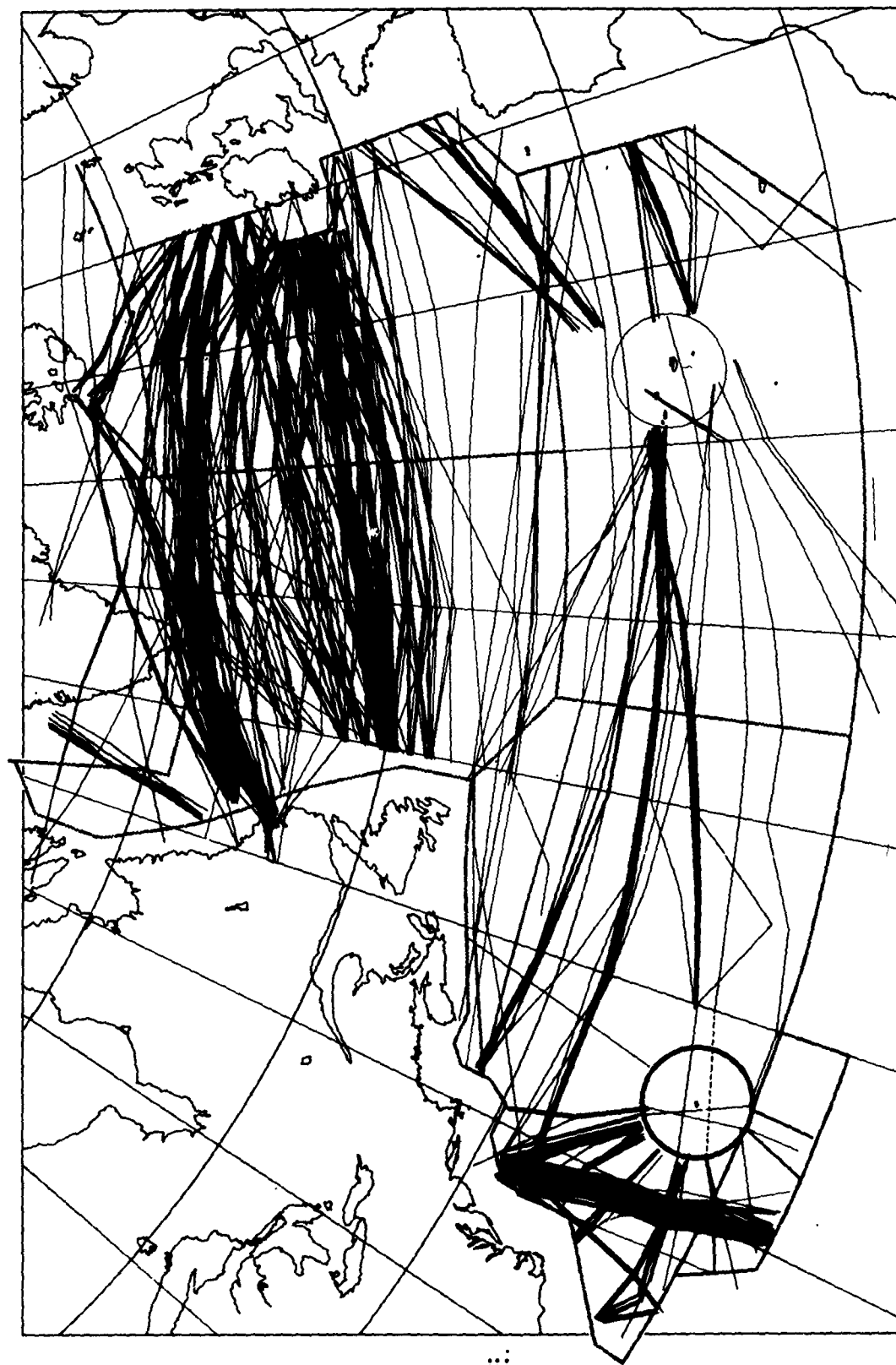


Figure 1 - Traffic Flow: Plot of all 417 flights operating in the North Atlantic Region on August 25, 1961.

TABLE OF CONTENTS

	Page
Abstract	ii
List of Tables	v
List of Figures	vi
Introduction	1
Scope of Analysis	2
Traffic Data	6
Aircraft Type and Country of Ownership	7
Traffic Flow	10
True Air Speed	19
Altitude	23
Hourly Activity	26
Peak Activity	30
Meridian Crossing Analysis	32
Latitudes	34
Altitudes	36
Times	37
Separation	38
Appendix: Data Processing	48

LIST OF TABLES

			Page
Table	1	- Monthly Summary of Daily Flights	5
	2	- Country of Ownership	8
	3	- Aircraft Type	9
	4	- Traffic Flow	14
	5	- True Air Speed	20
	6	- True Air Speed/Altitude Relationship	22
	7	- Altitude	24
	8	- Hourly Entries and Exits	27
	9	- Instantaneous Airborne Counts	28
	10	- Peak Aircraft Count	30
	11	- Meridian Crossing Latitudes	34
	12	- Meridian Crossing Altitudes	36
	13	- Meridian Crossing Times	37
	14a	- Time Separation (All Flights)	38
	14b	- Time Separation (Eastbound Flights)	40
	14c	- Time Separation (Westbound Flights)	41
	14d	- Time Separation (Altitudes 31,000 feet and above)	42
	14e	- Time Separation (Altitudes less than 31,000 feet)	43

LIST OF FIGURES

	Page
Figure 1 - North Atlantic Traffic Flow	iii
2 - Data Collection Form	3
3 - Eastbound Flow	12
4 - Westbound Flow	13
5 - True Air Speed	21
6 - Cruise Altitudes	25
7 - Instantaneous Airborne Count	29
8 - Peak Instant Aircraft Locations	31
9 - Meridian Crossings	35
10 - Time Separation	39
11a - Flight Separation (20° W, Meridian- 33,000 ft. Flight Level)	44
11b - Flight Separation (30° W, Meridian- 33,000 ft. Flight Level)	45
11c - Flight Separation (40° W Meridian- 33,000 ft. Flight Level)	46
11d - Flight Separation (50° W Meridian- 33,000 ft. Flight Level)	47
12 - Flight Data Worksheet - IBM Card Format	49

INTRODUCTION

The results in this report were derived from the August 1961 traffic data collected in the North Atlantic Region Traffic Survey. This survey is being conducted by the Federal Aviation Agency as a joint project between the Air Traffic Service and the Aviation Research and Development Service. The coordination and collection of peak day flight plan data from the 12 participating Oceanic Area Control Centers is being accomplished under the direction of Cmdr. Clinton H. Mundt, USN, Air Traffic Service. Analysis of the data and preparation of forecasts of air traffic activity in the North Atlantic Region is being undertaken by the Aviation Research and Development Service.

The material presented was prepared by Mr. R. M. Warfield from machine tabulations of flight plan information which has been coded into IBM cards. A description of code interpretations and card format is included as an appendix to this report. This report is exploratory in nature in that this data and additional data as it becomes available will receive further analysis and processing. Comments and criticisms of this report and suggestions regarding future analysis are invited.

SCOPE OF ANALYSIS

Data Sources

Data on flights for the peak North Atlantic Region traffic day each month beginning with July 1961 is being collected from each of the twelve Oceanic Area Control Centers (OACC's) listed below:

1. Bermuda OACC, Bermuda Islands
2. Bodo OACC, Bodo, Norway
3. Gander OACC, Gander, Newfoundland
4. Goose OACC, Goose, Canada
5. New York OACC, New York, N. Y.
6. Prestwick OACC, Prestwick, Scotland
7. Reykjavik OACC, Reykjavik, Iceland
8. Santa Maria OACC, Santa Maria, Azores
9. Shannon OACC, Shannon, Ireland
10. Stavanger OACC, Stavanger, Norway
11. Sondrestrom OACC, Greenland
12. Thule OACC, Greenland

The traffic data in this report pertains to the August 1961 peak day flights. It was prepared largely from machine tabulations of IBM cards containing coded flight plan data for the 36-hour period, including the peak day (August 25, 1961), and six hours prior to and six hours following the peak day, reported on data collection form Number GPO 905192 (see Figure 2, page 3) for each flight in each OACC and forwarded to the United States Federal Aviation Agency for processing. A description of code interpretations and card format is included in Appendix A of this report.

Selection of August 25, 1961, as the peak day for August 1961 was made from an inspection of the daily traffic count summary of OACC activity shown in Table 1 on page 5. Daily oceanic traffic counts by civil and military flights are reported to the United States Federal Aviation Agency's Message Center, Washington, D. C., by each Oceanic Area Control Center at the end of each month. On the basis of these message reports FAA designates the peak day and each OACC fills out an individual flight data form indicated in the previous paragraph.

Figure 2 - DATA COLLECTION FORM

UNITED STATES OF AMERICA FEDERAL AVIATION AGENCY NORTH ATLANTIC REGION TRAFFIC SURVEY			
CARD No. 1		CARD No. 2	
Card Punch Operator: <i>Fill in items 1, 2, and 3 for identification.</i>			
ITEM	COLUMN	ITEM	COLUMN
1. Month and Day		21. Recording Center Exit Fix	
2. Recording Center		22. Recording Center Exit Fix Time (GMT)	Z
3. Flight or Aircraft Identification		23. Recording Center Exit Fix Flight Level	(000 ft.)
4. Owner		24. Adjacent Center at Exit	
5. Country of Ownership		25. Flight Origin (Civil Aircraft Only)	
6. Aircraft Type		26. Flight Destination (Civil Aircraft Only)	
7. True Air Speed		27. 1st Flight Level Request	(000 ft.)
8. Recording Center Entrance Fix		28. 1st Flight Level Request Coordinates	
9. Recording Center Entrance Fix Time (GMT)	Z	29. 2nd Flight Level Request	(000 ft.)
10. Recording Center Entrance Fix Flight Level	(000 ft.)	30. 2nd Flight Level Request Coordinates	
11. Adjacent Center at Entrance		31. 3rd Flight Level Request	(000 ft.)
12. 2nd Position Report		32. 3rd Flight Level Request Coordinates	
13. 2nd Position Report Time (GMT)	Z	33. 4th Flight Level Request	(000 ft.)
14. 2nd Position Report Flight Level	(000 ft.)	34. 4th Flight Level Request Coordinates	

— NOTE —

Enter all columns left to right

Be sure all entries are sharp and legible

Traffic Activity Measurements

This report summarizes data developed on the following measures of traffic activity:

1. Aircraft Type
2. Aircraft Ownership
3. Traffic Flow
4. True Air Speed
5. Altitude
6. Hourly Activity
7. Peak Activity
8. Meridian Crossing Latitudes
9. Time Separation

Method of Data Processing

The forms for each flight were assembled separately by stapling the forms from each OACC reporting the flight in chronological order. The forms were then edited for consistency and completeness and each flight recoded onto a worksheet and subsequently punched into IBM cards. A copy of the worksheet and a description of the code interpretations and IBM card format are included in Appendix A, page 48.

Deficiencies and Limitations

The matching of flight forms from different OACC's presented some difficulties. Careful processing and editing of forms did not entirely eliminate ambiguity since the 36-hour reporting period overlaps three days and many flight identifications are repeated on a daily basis so that the exact date a flight occurred was in doubt in some cases. Participating OACC's have been requested to enter the day of month in Item 1 of reporting form strictly consistent with the entrance recording center fix time (GMT) of Item 9 to minimize future trouble. On the whole, the quality and legibility of the reporting was excellent. This report does not contain airspace reservation data.

FEDERAL AVIATION AGENCY																																			MONTH AND YEAR			
Table 1 - NORTH ATLANTIC REGION TRAFFIC SURVEY—MONTHLY SUMMARY—DAILY FLIGHTS																																			August, 1963			
PEAK DAY SELECTED																																			Friday, August 23, 1963			
OCEANIC CENTER	Day	Day																															PEAK DAY	PEAK DAY	PEAK DAY			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
GOOSE	C-130	16	66	67	66	69	55	32	25	24	27	18	37	25	39	39	22	34	35	25	30	27	30	44	50	70	63	58	46	42	32	24	8/23/63	66	1224	C		
	M-1	0	6	11	14	6	5	1	2	2	8	6	0	0	0	2	8	3	12	6	3	3	4	6	9	5	4	12	11	7	15	11	24	182	M			
	Tot	16	72	78	80	75	60	32	27	26	35	24	37	25	39	21	20	37	47	31	33	30	34	50	59	75	67	70	57	48	47	35	80	1406	T			
HAWAII	C-130	137	137	138	109	147	144	143	135	122	150	146	164	160	154	140	142	146	150	166	160	146	127	133	132	126	142	142	149	150	144	160	8/23/63	160	4394	C		
	M-1	38	50	43	34	35	32	25	34	50	42	42	23	37	35	43	63	35	47	27	22	23	57	44	46	37	28	32	23	42	44	55	55	1179	M			
	Tot	169	187	175	143	182	175	168	169	172	192	188	187	197	189	183	205	181	197	193	182	169	184	157	158	163	170	172	172	192	188	215	215	5573	T			
MEXICAN	C-130	34	49	63	77	81	67	45	34	26	26	34	30	24	29	24	35	29	46	45	29	32	42	54	52	74	81	71	46	44	42	33	8/23/63	74	1397	C		
	M-1	10	14	13	13	12	14	18	11	11	14	11	8	10	9	16	14	9	21	13	11	15	17	12	14	20	11	12	16	13	9	10	20	401	M			
	Tot	44	63	76	90	93	81	63	45	37	40	45	38	34	38	40	49	38	67	58	40	47	59	66	66	94	92	83	62	57	50	43	94	1798	T			
SOUTHERN	C-130	45	53	71	106	92	62	60	63	25	50	56	68	54	66	60	26	9	59	68	50	90	103	108	121	124	127	82	86	69	74	24	8/23/63	124	2251	C		
	M-1	53	74	57	49	26	53	55	62	56	44	52	42	81	36	58	5	52	60	40	33	39	69	63	45	51	44	65	45	44	76	67	51	1635	M			
	Tot	98	127	128	155	118	115	115	125	81	94	100	109	135	102	118	31	61	119	108	83	129	172	172	166	175	171	147	131	153	150	91	175	3786	T			
STAVANER	C-130	0	2	4	4	2	2	3	3	5	4	2	4	1	3	5	1	4	0	0	0	4	0	6	1	2	0	5	2	3	2	7	8/23/63	3	81	C		
	M-1	0	0	0	1	0	0	5	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	5	10	M			
	Tot	0	2	4	5	2	2	8	4	5	4	3	4	1	3	5	1	4	0	0	0	5	0	6	1	2	0	5	3	3	2	7	8	91	T			
TERRACE	C-130	144	147	153	149	174	153	154	144	134	153	160	178	161	161	139	154	166	157	162	179	157	138	148	159	162	179	164	178	159	158	170	8/23/63	178	4894	C		
	M-1	39	46	42	39	21	27	27	49	50	39	45	32	30	42	40	57	43	51	31	23	52	50	54	43	48	24	31	42	42	55	45	42	1259	M			
	Tot	183	193	195	188	195	180	181	193	184	192	205	210	191	203	179	211	209	208	193	202	209	188	202	208	210	203	195	220	201	213	215	220	6153	T			
TERRACE	C-130	19	31	23	26	34	32	23	22	17	18	26	26	28	16	17	19	18	29	25	35	19	18	23	17	34	27	34	23	24	21	16	8/23/63	31	730	C		
	M-1	26	62	52	47	29	29	39	44	47	35	56	32	40	39	49	46	38	46	33	16	22	24	28	47	49	37	37	29	32	42	34	62	1176	M			
	Tot	45	93	75	73	63	62	66	64	53	82	58	68	55	66	65	56	56	75	58	51	31	42	51	64	83	64	71	52	46	63	50	93	1906	T			
TERRACE	C-130	151	146	146	156	167	171	137	151	133	157	135	188	166	144	146	146	150	156	168	159	158	136	150	153	155	174	170	169	146	161	176	8/23/63	176	4818	C		
	M-1	40	43	35	45	25	25	25	35	40	30	35	25	35	37	37	34	38	40	29	22	43	53	28	45	37	19	34	27	35	38	46	46	1068	M			
	Tot	191	189	181	201	192	196	173	187	170	193	170	223	201	181	182	180	188	204	197	181	201	189	178	198	192	193	204	196	180	199	222	222	5906	T			
NEW YORK	C-130	108	66	46	78	96	86	68	68	51	79	87	101	111	70	85	60	85	79	106	128	98	83	81	91	79	99	105	68	81	82	59	8/23/63	106	2578	C		
	M-1	85	93	95	71	65	63	71	109	79	80	97	71	77	92	110	109	106	71	94	56	73	79	86	101	82	100	68	77	87	106	67	94	2620	M			
	Tot	187	159	141	149	161	149	139	177	130	159	184	172	188	162	195	169	191	150	200	184	171	162	167	192	161	199	173	145	168	188	126	200	5198	T			
TERRACE	C-130	6	4	1	2	3	2	1	4	4	1	0	3	2	1	3	3	2	1	3	1	1	2	4	1	3	3	1	3	3	4	1	8/23/63	3	73	C		
	M-1	3	0	13	17	18	19	12	11	8	12	9	8	6	2	10	10	5	3	8	4	7	9	6	4	5	7	6	4	7	13	8	18	244	M			
	Tot	9	4	14	19	21	21	13	15	18	13	9	11	8	3	13	13	7	4	11	5	8	11	10	5	8	10	7	7	10	17	9	21	327	T			
GOOSE	C-130	3	3	2	1	1	1	1	3	2	3	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8/23/63	1	63	C		
	M-1	0	0	0	1	0	0	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7	M			
	Tot	3	3	2	2	1	1	5	2	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	70	T			
SANTA MARIA	C-130	17	23	7	22	14	25	12	15	23	23	24	14	25	11	15	22	25	19	21	27	12	24	34	27	22	16	24	24	20	25	19	8/23/63	22	633	C		
	M-1	50	71	78	61	38	18	45	52	66	52	89	49	78	81	92	107	91	68	64	55	56	79	79	69	53	43	32	30	77	76	77	107	1997	M			
	Tot	67	94	85	83	52	63	57	67	89	77	113	63	103	92	106	129	116	87	85	82	68	103	113	96	75	59	56	54	97	101	96	129	2630	T			
	C-130																																					
	M-1																																					
	Tot																																					
	C-130																																					
	M-1																																					
	Tot																																					
TOTAL	C-130	704	723	715	790	884	808	680	666	557	690	609	814	760	695	653	624	670	732	790	799	746	704	768	786	852	913	859	795	730	748	690	8/23/63	852	23036	C		
	M-1	116	163	139	139	276	194	327	413	409	354	444	289	394	373	466	453	426	447	345	246	324	443	406	423	387	317	328	305	426	474	420	387	13808	M			
	Tot	1018	1186	1154	1128	1160	1002	1077	964	1044	1133	1105	1154	1064	1108	1077	1088	1156	1116	1044	1070	1145	1174	1108	1218	1210	1187	1100	1154	1222	1134	1219	14044	T				

TRAFFIC DATA

OACC Data Forms Received

The following is a summary of the number of forms received from each participating Oceanic Area Control Center:

<u>OACC</u>	<u>Number of Forms Received for each Day</u>		
	<u>24 Aug 61</u>	<u>25 Aug 61</u>	<u>26 Aug 61</u>
Bermuda	17	78	13
Bodo	-	1	-
Gander	35	157	82
Goose	-	99	19
New York	34	129	31
Prestwich	41	190	27
Reykjavik	23	94	27
Santa Maria	20	62	23
Shannon	51	189	63
Stavanger	1	2	-
Sondrestrom	15	53	15
<u>Thule</u>	<u>1</u>	<u>9</u>	<u>1</u>
Total	238	1,063	301

Peak Day Flights

The data reported by each OACC covers a 36-hour period. This provides a six hour overlap on each end of the peak day which provides flight history on flights in the North Atlantic Region at the beginning and end of the peak day. A summary of flights entering and exiting the North Atlantic Region relative to August 25, 1961, is shown below:

<u>Entrance Flights</u>	<u>Exit Flights</u>		
	<u>During</u>	<u>After</u>	<u>Total</u>
Before	40	-	40
<u>During</u>	<u>350</u>	<u>27</u>	<u>377</u>
Total	390	27	417

In this report, the 390 exit flights were used as representative of a peak day. This was done to eliminate the overlap incurred by counting both flights in the area at the beginning as well as flights in the area at the end of the day. If the entrance flights (377 in this case) had been larger than exit flights it would have been used to represent the peak day.

Country of Ownership

Table 2, page 8, shows the distribution by country, civil or military ownership and aircraft class.

Aircraft Types

Aircraft types for the peak day are summarized by aircraft and ownership class in Table 3, page 9.

Table 2 - COUNTRY OF OWNERSHIP: Distribution by Country of Ownership
and Aircraft Class for Flights in the North Atlantic Region on
August 25, 1961

Country	Piston			Turboprop			Turbojet			Total Civ	Total Mil	Grand Total
	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total			
United States	49	87	136	2	13	15	64	10	74	115	110	225
United Kingdom	2	1	3	21	0	21	20	2	22	43	3	46
Netherlands	9	0	9	0	0	0	10	0	10	19	0	19
Canada	4	0	4	4	0	4	7	0	7	15	0	15
France	0	0	0	0	0	0	13	0	13	13	0	13
Iceland	8	0	8	2	0	2	0	0	0	10	0	10
Italy	3	0	3	0	0	0	6	0	6	9	0	9
Germany	3	0	3	0	0	0	5	0	5	8	0	8
Ireland	0	0	0	0	0	0	5	0	5	5	0	5
Switzerland	0	0	0	0	0	0	5	0	5	5	0	5
Belgium	1	0	1	0	0	0	3	0	3	4	0	4
Denmark	0	0	0	0	0	0	4	0	4	4	0	4
Mexico	0	0	0	0	0	0	4	0	4	4	0	4
Norway	0	0	0	0	0	0	4	0	4	4	0	4
Spain	4	0	4	0	0	0	0	0	0	4	0	4
Venezuela	0	0	0	0	0	0	3	0	3	3	0	3
Israel	0	0	0	1	0	1	1	0	1	2	0	2
India	0	0	0	0	0	0	2	0	2	2	0	2
Sweden	1	0	1	0	0	0	1	0	1	2	0	2
Argentina	0	0	0	1	0	1	0	0	0	1	0	1
Australia	0	0	0	0	0	0	1	0	1	1	0	1
Brazil	0	0	0	0	0	0	1	0	1	1	0	1
Cuba	0	0	0	1	0	1	0	0	0	1	0	1
Japan	0	0	0	0	0	0	1	0	1	1	0	1
Pakistan	0	0	0	0	0	0	1	0	1	1	0	1
Total	84	88	172	32	13	45	161	12	173	277	113	390

Table 3 - AIRCRAFT TYPE: Distribution by Aircraft Class and Type by Ownership for Flights in the North Atlantic Region on August 25, 1961

SUMMARY

<u>Aircraft Class</u>	<u>Ownership Class</u>		
	<u>Civil</u>	<u>Military</u>	<u>Total</u>
Piston	84	88	172
Turboprop	32	13	45
Turbojet	161	12	173
Total	277	113	390

<u>Piston</u>	
<u>Civil</u>	<u>Flights</u>
C45	1
DC3	2
DC4	6
DC6B	10
DC6	12
DC7B	4
DC7C	11
DC7	12
LO49	23
L649	3
Total	84

<u>Mil.</u>	<u>Flights</u>
B50	1
C118	25
C119	2
C121	10
C123	1
C124	15
C131	3
C54	4
C97	4
HAST	1
KC97	3
P2V	1
P5M	1
R4D	1
R5D	1
R7V	1
T29	2
UF2	1
WVZ	11
Total	88

<u>Turboprop</u>	
<u>Civil</u>	<u>Flights</u>
BRTA	27
CL	1
V170	2
V180	2
Total	32

<u>Mil.</u>	<u>Flights</u>
C133	13

<u>Turbojet</u>	
<u>Civil</u>	<u>Flights</u>
B707	88
B720	3
DC8	66
DH04	4
Total	161

<u>Mil.</u>	<u>Flights</u>
B47	9
B66	1
MJB	1
VCTR	1
Total	12

Traffic Flow

Flights have been analyzed in terms of the following considerations:

Flight Position Reports
Flight Direction
Origin/Destination Combinations
Meridian Crossings

Flight Position Reports

A flight consists of one takeoff and one landing (i.e., a flight making an intermediate stop at the Azores on its way between Europe and North America is counted as two flights). The summary below shows the classification of flights relative to their takeoff and landing airports:

<u>Flight Class</u>	<u>Flights</u>		<u>Location of Airport Relative to the North Atlantic Region (12 OACC's)</u>	
	<u>Number</u>	<u>Percent</u>	<u>Takeoff Airport</u>	<u>Landing Airport</u>
Overflights	246	59	Outside	Outside
Arrivals	72	17	Outside	Within
Departures	78	19	Within	Outside
Within	8	2	Within	Within
Round Robin (RR)	13	3	Within	Same as Takeoff
Total	417	100		

The reporting fixes for each flight were recorded in terms of latitude and longitude. A plot of the 417 flights which operated in the North Atlantic Region on August 25, 1961, is shown by Figure 1, page iii. Flow is depicted by joining reporting fixes by straight line plots.

Flight Direction

Flight direction for any particular segment of flight may be calculated from reporting fix information, however, for a broad view of traffic flow relative to the North Atlantic Region the following directional classifications were used:

<u>Takeoff Airport</u>	<u>Landing Airport</u>					<u>No. Amer.</u>	<u>So. Amer.</u>
	<u>Azores</u>	<u>Ber- muda</u>	<u>Europe</u>	<u>Green- land</u>	<u>Ice- land</u>		
Azores	RR	West	East	North	North	West	West
Bermuda	East	RR	East	North	North	West	South
Europe <u>1/</u>	West	West	RR	West	West	West	West
Greenland	South	South	East	RR	East	West	South
Iceland	South	South	East	West	RR	West	South
No. Amer. <u>2/</u>	East	East	East	East	East	RR	South
So. Amer. <u>3/</u>	East	North	East	North	North	North	RR

1/ Including North Africa

2/ Including U.S., Canada, Alaska and Newfoundland

3/ Including Caribbean Island and Latin America

A summary of the directional classifications for the flights in the North Atlantic Region on August 25, 1961, is shown below:

<u>Flight Direction</u>	<u>Flights</u>	
	<u>Number</u>	<u>Percent</u>
Eastbound	146	35
Westbound	198	47
Northbound	28	7
Southbound	32	8
Round Robin	13	3
Total	417	100

Figure 3, page 12, shows a plot of Eastbound and Southbound flights; Figure 4, page 13, shows a similar plot for Westbound and Northbound flights.

Origin/Destination Combinations

Table 4, page 14, lists the origin (takeoff) and destination (landing) airports for the 417 flights which operated in the North Atlantic Region on August 25, 1961.

Meridian Crossings

The eastbound and westbound traffic flow across the 20° W, 30° W, 40° W and 50° W longitude meridians has been analyzed in some detail. The method of analysis and results are contained in pages 32-47, inclusive.

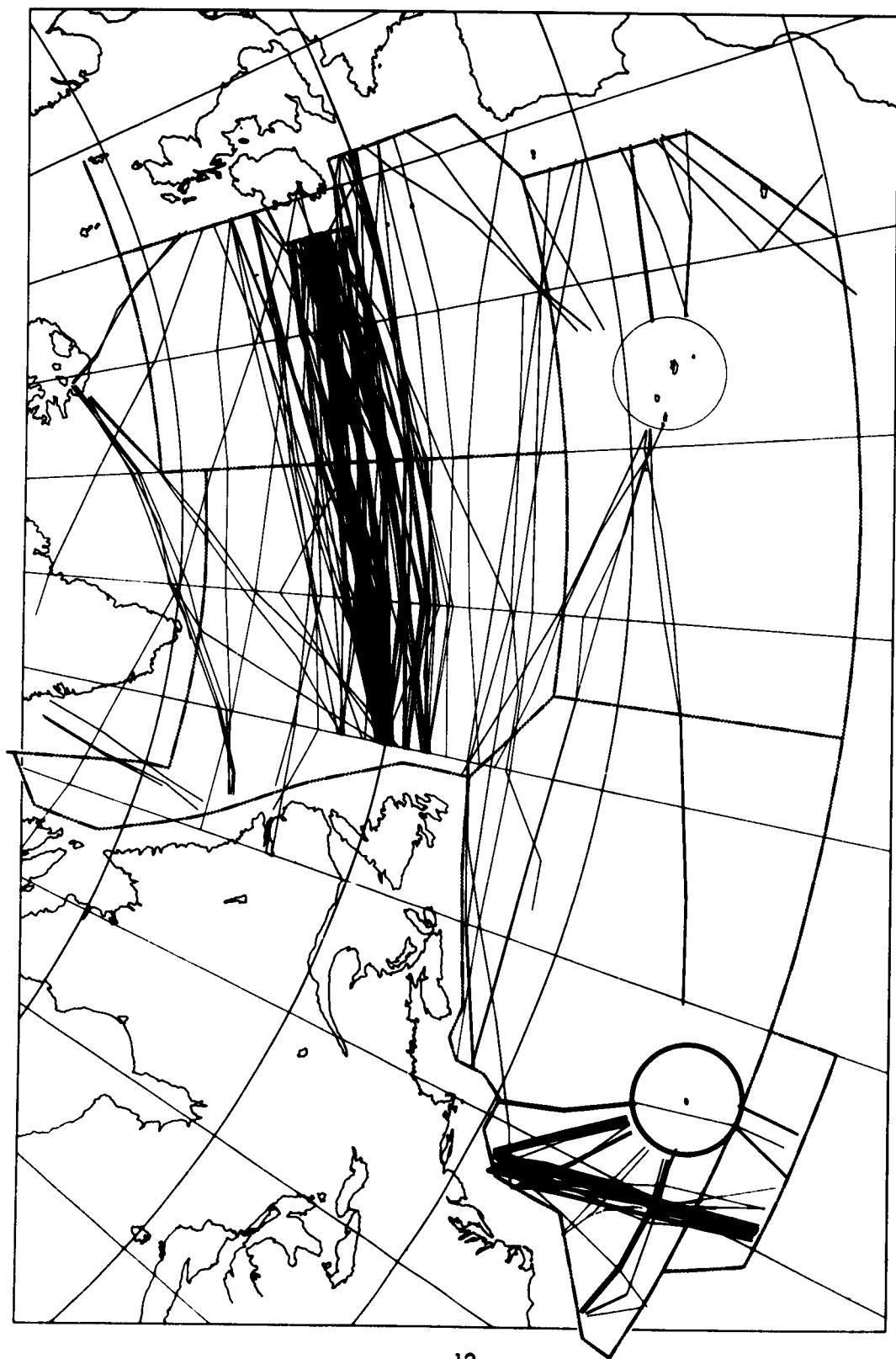


Figure 3 p. 12 - Eastbound Traffic Flow: Plot of 146 Eastbound and 32 Southbound flights operating in the North Atlantic Region on August 25, 1961.

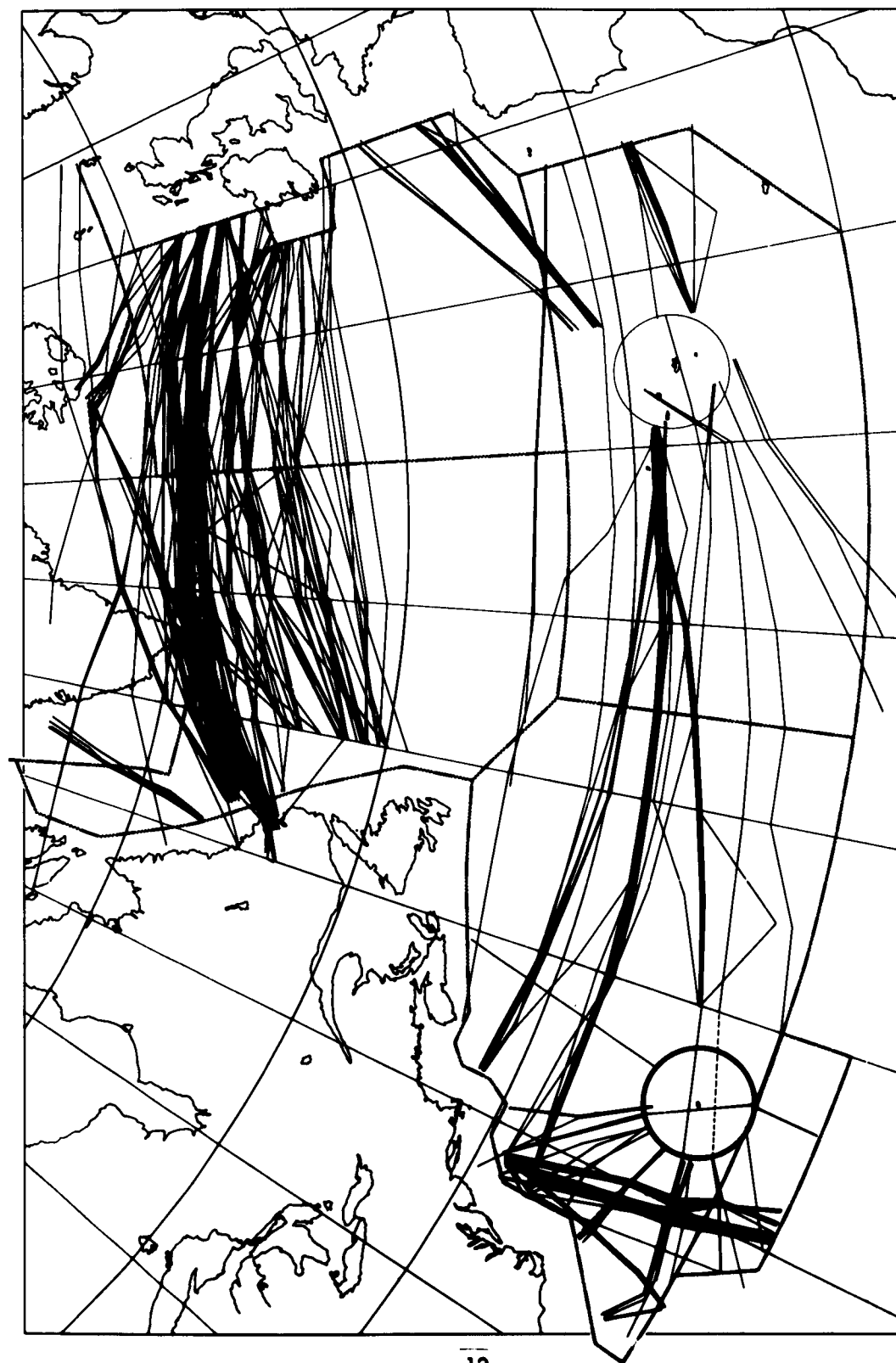


Figure 4 p. 13 - Westbound Traffic Flow: Plot of 198 Westbound and 28 Northbound flights operating in the North Atlantic Region on August 25, 1961.

Table 4 - TRAFFIC FLOW: Origin/Destination Combinations
by Aircraft Operating in and through Oceanic Centers
of the North Atlantic Region on August 25, 1961

Location				Location			
Identifier *		Flights		Identifier *		Flights	
Orig./Dest.		Civil	Mil. Total	Orig./Dest.		Civil	Mil. Total
BGSF-BGSF		2	1 3	CYJT-BIKF			1 1
" CYQX		1	1	" EDAF			1 1
" EHAM		1	1	" EGPK			3 3
" EKCH		1	1	" LFPO			2 2
" KDOV			1 1	" MXKF	$\frac{1}{1}$	$\frac{1}{7}$	$\frac{1}{8}$
" KFMH			1 1				
" KLAX	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{9}$	CYQX-EDDF	$\frac{1}{1}$		$\frac{1}{1}$
BGTL-BGSF			1 1				
" CYR		$\frac{1}{2}$	$\frac{1}{2}$	CYQY-EINN	$\frac{1}{1}$		$\frac{1}{1}$
BIKF-BIKF			6 6				
" CYAR			1 1	CYUL-EDDF	1		1
" CYQX	1		1	" EGLL	1		1
" CYUL	2		2	" EGPK	3		3
" CYR			1 1	" EHAM	1		1
" KIDL	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{12}$	" LFPO	1		1
				" LIMC	1		1
				" LPAZ	$\frac{1}{9}$		$\frac{1}{9}$
BIRK-EGLL	1		1				
" EGPF	1		1	CYYQ-BGTL		$\frac{1}{1}$	$\frac{1}{1}$
" ELLX	$\frac{1}{3}$		$\frac{1}{3}$				
CYAR-BIKF			2 2	CYYR-BGSF			2 2
" LPLA		$\frac{1}{3}$	$\frac{1}{3}$	" BGTL			2 2
				" BIKF	1		1
CYEG-BGSF	$\frac{1}{1}$		$\frac{1}{1}$	" BIRK	3		3
				" EGXJ		1	1
				" EHAM	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{10}$
CYFB-EGLL	$\frac{1}{1}$		$\frac{1}{1}$				
				CYYZ-EGLL	$\frac{1}{1}$		$\frac{1}{1}$
CYHZ-LKPR	$\frac{1}{1}$		$\frac{1}{1}$				
				EBBR-CYUL	1		1
				" KIDL	$\frac{1}{2}$		$\frac{1}{2}$

Table 4 - TRAFFIC FLOW: (continued)

Location Identifier * Orig./Dest.	Flights			Location Identifier * Orig./Dest.	Flights		
	Civil	Mil.	Total		Civil	Mil.	Total
EDAF-LPLA		$\frac{3}{3}$	$\frac{3}{3}$	EGPK-KBOS	1		1
				" KDTW	1		1
EDAR-LPLA		$\frac{1}{1}$	$\frac{1}{1}$	" KIDL	$\frac{3}{12}$	$\frac{6}{6}$	$\frac{3}{18}$
EDDF-KBOS	1		1	EGUA-KLNK		$\frac{1}{1}$	$\frac{1}{1}$
" KIDL	2		2				
" KWRI	$\frac{1}{4}$		$\frac{1}{4}$	EGUN-LPLA		$\frac{3}{3}$	$\frac{3}{3}$
EDDK-KIDL	$\frac{1}{1}$		$\frac{1}{1}$	EGVA-KLKC		$\frac{2}{2}$	$\frac{2}{2}$
EGCC-CYUL	$\frac{1}{1}$		$\frac{1}{1}$	EGVI-KLCK		$\frac{2}{2}$	$\frac{2}{2}$
EGLL-BIKF	1		1	EGVN-BIKF		1	1
" BIRK	1		1	" KPSM		$\frac{1}{2}$	$\frac{1}{2}$
" CYUL	3		3				
" CYWG	1		1	EGYM-EGYM		$\frac{1}{1}$	$\frac{1}{1}$
" CYJR	1		1				
" KBOS	3		3	EHAM-BGSF	1		1
" KIDL	9		9	" BIKF	1		1
" KPHL	$\frac{1}{20}$		$\frac{1}{20}$	" CYUL	3		3
EGOA-EGOA		$\frac{1}{1}$	$\frac{1}{1}$	" KBOS	1		1
EGPF-BIRK	$\frac{1}{1}$		$\frac{1}{1}$	" KIDL	$\frac{2}{8}$		$\frac{2}{8}$
EGPK-BIKF	2		2	EINN-CYQM	2		2
" CYAR		1	1	" CYQX	7		7
" CYJT		4	4	" CYUL	2		2
" CYUL	3		3	" CYJR	3		3
" CYWG	1		1	" KDTW	1		1
" CYYT		1	1	" KIDL	11		11
" CYYZ	1		1	" KWRI	$\frac{1}{27}$		$\frac{1}{27}$

Table 4 - TRAFFIC FLOW: (continued)

Location Identifier * Orig./Dest.	Flights			Location Identifier * Orig./Dest.	Flights		
	Civil	Mil.	Total		Civil	Mil.	Total
EKCH-BGSF	1		1	KIDL-EGLL	14		14
" CYHZ	1		1	" EGPK	4		4
" KIDL	1		1	" EHAM	3		3
" PAFB	$\frac{1}{4}$		$\frac{1}{4}$	" EIDW	1		1
				" EINN	7		7
ENGM-KIDL	$\frac{1}{1}$		$\frac{1}{1}$	" EKCH	1		1
				" LEMD	1		1
KBAL-EGLL	1		1	" LFPO	9		9
" MJSJ	$\frac{1}{2}$		$\frac{1}{2}$	" LIMC	2		2
				" LIRF	2		2
KBOS-EGPK	1		1	" LPPT	2		2
" EINN	1		1	" LSCG	1		1
" MXKF	$\frac{1}{3}$		$\frac{1}{3}$	" LSZZ	1		1
				" MACC	1		1
KCHS-MXKF	$\frac{2}{2}$		$\frac{2}{2}$	" MJSJ	13		13
				" MKPB	1		1
KDCA-EGLL	1		1	" MKPP	1		1
" MXKF	$\frac{1}{2}$		$\frac{1}{2}$	" MVMJ	1		1
				" MXKF	6		6
KDOV-LETO		1	1	" MYNN	1		1
" LFOU		$\frac{2}{3}$	$\frac{2}{3}$	" SBGL	$\frac{1}{78}$		$\frac{1}{78}$
KDTW-EGLL	1		1	KILG-EINN	$\frac{1}{1}$		$\frac{1}{1}$
" EINN	$\frac{1}{2}$		$\frac{1}{2}$				
				KLAX-BGSF	1		1
KFMH-BGSF		$\frac{1}{1}$	$\frac{1}{1}$	" EGLL	$\frac{2}{3}$		$\frac{2}{3}$
KIDL-EBBR	2		2	KMHT-MJBQ		$\frac{1}{1}$	$\frac{1}{1}$
" EDDF	1		1				
" EDDK	1		1	KMIA-MXKF	$\frac{1}{1}$		$\frac{1}{1}$
" EGKK	1		1				
				KORD-EDDF	$\frac{1}{1}$		$\frac{1}{1}$
				KPBG-LEMO		$\frac{1}{1}$	$\frac{1}{1}$

Table 4 - TRAFFIC FLOW: (continued)

Location				Location			
Identifier *		Flights		Identifier *		Flights	
Orig./Dest.		Civil	Mil. Total	Orig./Dest.		Civil	Mil. Total
KWRI-EDDF		2	2	LPLA-DMMP		1	1
" EINN		3	3	" EDAB		1	1
" LPLA		<u>5</u>	<u>2</u> 7	" EGVN		1	1
LEMD-KIDL		1	1	" KDOV		8	8
" LPAZ		<u>2</u> 3	<u>2</u> 3	" KGRE		1	1
LEMO-KLNK			<u>1</u> 1	" KIDL	1		1
LETO-KPSM			1	" KLCK		1	1
" LPLA		<u>1</u> 2	<u>1</u> 2	" KNGU		1	1
LFOU-CYJT			1	" KWRI		3	3
" LPLA		<u>4</u> 5	<u>4</u> 5	" LEMO		1	1
LFPB-CYQX		<u>1</u> 1	<u>1</u> 1	" LETO		3	3
LFPO-CYQX		1	1	" MXKF		<u>3</u> 1	<u>3</u> 25
" CYUL		3	3	LPPT-LPAZ		<u>6</u> 6	<u>6</u> 6
" KBOS		1	1	LSGG-KIDL		<u>1</u> 1	<u>1</u> 1
" KIDL		5	5	MACC-KIDL		1	1
" PANC		<u>1</u> 11	<u>1</u> 11	" LPPT		<u>1</u> 2	<u>1</u> 2
LPAZ-DCLP		1	1	MDCT-KIDL		<u>1</u> 1	<u>1</u> 1
" KIDL		2	2	MJSJ-KIDL		12	12
" KMIA		1	1	" KPHL		<u>1</u> 13	<u>1</u> 13
" KPHL		1	1	MKJM-KIDL		<u>1</u> 1	<u>1</u> 1
" LPPT		1	1	MKPA-MXKF		<u>1</u> 1	<u>1</u> 1
" MJSJ		2	2	MKPP-KIDL		<u>1</u> 1	<u>1</u> 1
" MVMJ		1	1				
" MXKF		<u>1</u> 10	<u>1</u> 11				

Table 4 - TRAFFIC FLOW: (continued)

Location				Location			
Identifier *		Flights		Identifier *		Flights	
Orig./Dest.		Civil	Mil. Total	Orig./Dest.		Civil	Mil. Total
MOOY-KXKF		$\frac{1}{1}$	$\frac{1}{1}$	(Omitted from page 1)			
				DMMN-LPLA		$\frac{1}{1}$	$\frac{1}{1}$
MVMI-KIDL		2	2				
" LPPT		$\frac{1}{3}$	$\frac{1}{3}$				
		3	3	GRAND TOTAL	291	126	417
MXKF-CYUL		1	1				
" KBAD			1				
" KBOS		1	1				
" KCHS			1				
" KCOF			3				
" KDCA		1	1				
" KFMH			1				
" KIDL		9	9				
" KLF1			1				
" KMIA		1	1				
" KNGU			2				
" KNSF			1				
" LPLA		1	1				
" MJNR			2				
" MKPA		1	1				
" MKPP		1	1				
" MXKF			1				
" -----			$\frac{1}{16}$				
		16	32				
MYNN-KIDL		$\frac{2}{2}$	$\frac{2}{2}$				
		2	2				
PANC-EDDM		1	1				
" EHAM		$\frac{1}{2}$	$\frac{1}{2}$				
		2	2				
----- - MXKF			11				
----- - -----			$\frac{6}{17}$				
			17				

* Location Identifiers consistent with ICAO Document 7910.

True Air Speed

Table 5, and Figure 5, pages 20 and 21, show the distribution of true air speed (knots) by aircraft class and owner for flights in the North Atlantic Region on August 25, 1961. Speeds are those reported by the first oceanic area control center to exercise control over the flight.

True Air Speed/Altitude Relationship

Table 6, page 22, shows a joint plot of the true air speed and assigned flight level relationship taken at the 20° W, 30° W, 40° W and 50° W longitude meridians.

**Table 5 - TRUE AIRSPEED: Distribution of Cruise Speeds
(TAS-Knots) by Aircraft Class and Owner for Flights
in the North Atlantic Region on August 25, 1961**

TAS (knots)	Piston			Turboprop			Turbojet			Total	Total	Grand
	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	
150-159	0	2	2	0	0	0	0	0	0	0	2	2
160-169	2	1	3	0	0	0	0	0	0	2	1	3
170-179	4	8	12	0	0	0	0	0	0	4	8	12
180-189	2	6	8	0	0	0	0	0	0	2	6	8
190-199	1	8	9	0	0	0	0	0	0	1	8	9
200-209	0	19	19	0	0	0	0	0	0	0	19	19
210-219	0	4	4	0	0	0	0	0	0	0	4	4
220-229	6	17	23	1	0	1	0	0	0	7	17	24
230-239	17	7	24	1	0	1	0	0	0	18	7	25
240-249	19	15	34	0	0	0	0	0	0	19	15	34
250-259	11	1	12	0	0	0	0	0	0	11	1	12
260-269	12	0	12	0	13	13	0	0	0	12	13	25
270-279	8	0	8	2	0	2	0	0	0	10	0	10
280-289	2	0	2	0	0	0	0	0	0	2	0	2
290-299	0	0	0	2	0	2	0	0	0	2	0	2
300-309	0	0	0	1	0	1	0	0	0	1	0	1
310-319	0	0	0	11	0	11	0	0	0	11	0	11
320-329	0	0	0	9	0	9	0	0	0	9	0	9
330-339	0	0	0	4	0	4	0	0	0	4	0	4
340-349	0	0	0	1	0	1	0	0	0	1	0	1
350-359	0	0	0	0	0	0	0	0	0	0	0	0
360-369	0	0	0	0	0	0	0	0	0	0	0	0
370-379	0	0	0	0	0	0	0	0	0	0	0	0
380-389	0	0	0	0	0	0	0	0	0	0	0	0
390-399	0	0	0	0	0	0	0	0	0	0	0	0
400-409	0	0	0	0	0	0	0	0	0	0	0	0
410-419	0	0	0	0	0	0	0	0	0	0	0	0
420-429	0	0	0	0	0	0	2	3	5	2	3	5
430-439	0	0	0	0	0	0	2	6	8	2	6	8
440-449	0	0	0	0	0	0	2	0	2	2	0	2
450-459	0	0	0	0	0	0	6	2	8	6	2	8
460-469	0	0	0	0	0	0	26	0	26	26	0	26
470-479	0	0	0	0	0	0	47	0	47	47	0	47
480-489	0	0	0	0	0	0	55	0	55	55	0	55
490-499	0	0	0	0	0	0	19	1	20	19	1	20
500-509	0	0	0	0	0	0	1	0	1	1	0	1
510-519	0	0	0	0	0	0	1	0	1	1	0	1
Total	84	88	172	32	13	45	161	12	173	277	113	390

Figure 5 - TRUE AIR SPEED: Distribution of Speeds by Aircraft Class for Flights in the North Atlantic Region on August 25, 1961

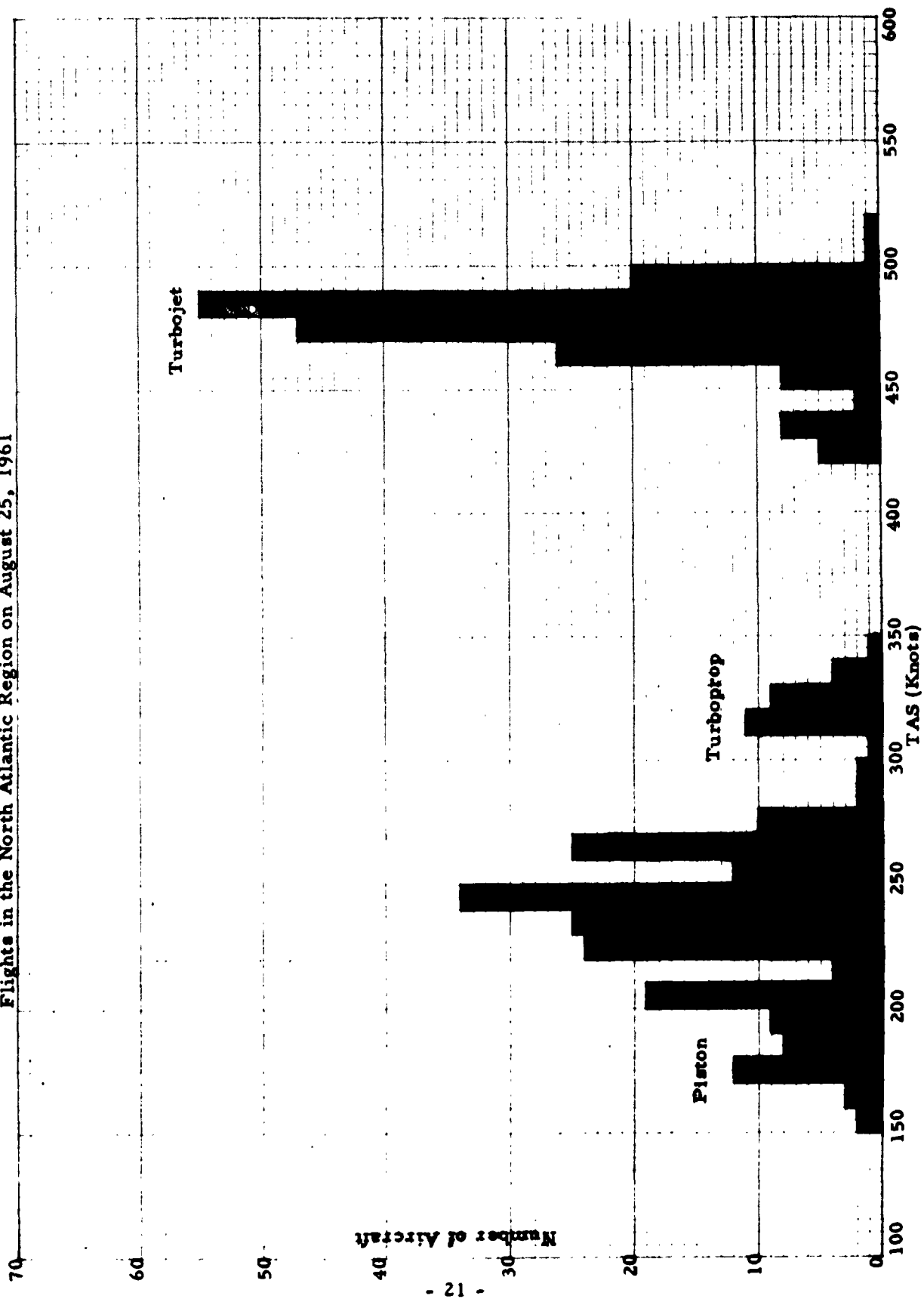


Table 6 - TRUE AIRSPEED/ALTITUDE RELATIONSHIP: Joint Distributions of True Airspeed and Assigned Flight Level for Flights in the North Atlantic Region on August 25, 1961. (Counts made at the 20° W, 30° W, 40° W and 50° W Meridians for flights crossing between 45° N and 65° N Latitude)

[illegible]

Altitude

Table 7 and Figure 6, pages 24 and 25, show the distribution of assigned flight levels (at entry fixes) for flights in the North Atlantic Region on August 25, 1961, by aircraft and ownership class.

Altitude Changes

Altitude changes between reporting fixes (flight leg) are summarized below:

<u>Type of Change</u>	<u>Flight Legs *</u>		<u>Number of Levels Changed</u>							
	<u>Number</u>	<u>Percent</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Climb	136	8	33	79	5	9	1	8	-	1
Descent	20	1	3	9	-	3	2	-	2	1
No Change	1,576	91								
Total	1,732	100								

* These 1,732 flight legs represent 417 flights.

First Flight Level Request

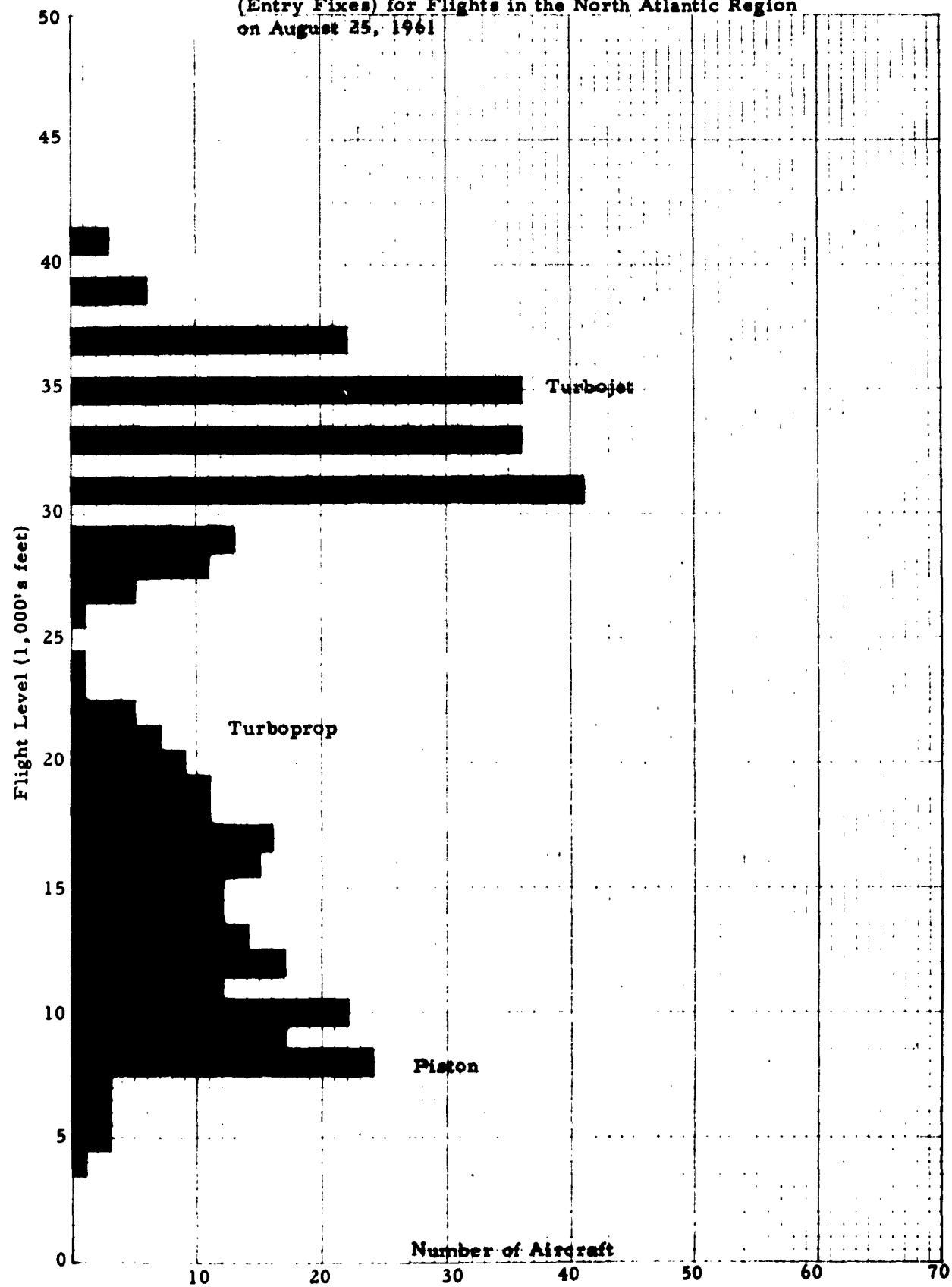
A summary of altitude assignment in terms of first flight level requested by OACC's exercising departure control is shown below:

<u>Assignment with Respect to Request</u>	<u>Flights</u>		<u>Difference in Flight Levels between Request and Assignment</u>				
	<u>Number</u>	<u>Percent</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5 or more</u>
Less	28	12	5	16	1	4	2
More	23	9	11	8	-	1	3
Identical	192	79					
Total	243	100					

Table 7 - ALTITUDE: Distribution of Assigned Flight
Altitudes (Entry Fixes) for Flights in the
North Atlantic Region on August 25, 1961

Ft. Level (000')	Piston			Turboprop			Turbojet			Total	Total	Grand
	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total
4	-	1	1	-	-	-	-	-	-	-	1	1
5	-	3	3	-	-	-	-	-	-	-	3	3
6	-	3	3	-	-	-	-	-	-	-	3	3
7	1	2	3	-	-	-	-	-	-	1	2	3
8	6	18	24	-	-	-	-	-	-	6	18	24
9	4	13	17	-	-	-	-	-	-	4	13	17
10	10	12	22	-	-	-	-	-	-	10	12	22
11	4	8	12	-	-	-	-	-	-	4	8	12
12	14	3	17	-	-	-	-	-	-	14	3	17
13	13	1	14	-	-	-	-	-	-	13	1	14
14	7	4	11	-	1	1	-	-	-	7	5	12
15	8	1	9	1	2	3	-	-	-	9	3	12
16	4	7	11	3	1	4	-	-	-	7	8	15
17	5	9	14	2	-	2	-	-	-	7	9	16
18	2	3	5	1	5	6	-	-	-	3	8	11
19	4	-	4	5	2	7	-	-	-	9	2	11
20	1	-	1	7	1	8	-	-	-	8	1	9
21	1	-	1	6	-	6	-	-	-	7	-	7
22	-	-	-	4	1	5	-	-	-	4	1	5
23	-	-	-	1	-	1	-	-	-	1	-	1
24	-	-	-	1	-	1	-	-	-	1	-	1
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	1	-	1	1	-	1
27	-	-	-	-	-	-	5	-	5	5	-	5
28	-	-	-	-	-	-	9	2	11	9	2	11
29	-	-	-	1	-	1	11	1	12	12	1	13
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	37	4	41	37	4	41
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	35	1	36	35	1	36
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	35	1	36	35	1	36
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	22	-	22	22	-	22
38	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	5	1	6	5	1	6
40	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	1	2	3	1	2	3
Total	84	88	172	32	13	45	161	12	173	277	113	390

Figure 6 - ALTITUDE: Distribution of Assigned Flight Levels
(Entry Fixes) for Flights in the North Atlantic Region
on August 25, 1961



Hourly Activity

Table 8 shows the distribution of entry times at the first oceanic area fix and the distribution of exit times at the last oceanic area fix for flights in the North Atlantic Region on August 25, 1961.

Instantaneous Airborne Counts

Instantaneous airborne counts (IAC) were developed from the above entry and exit times. Table 9 and Figure 7, pages 28 and 29, show the IAC in the North Atlantic Region on August 25, 1961, at the beginning of each hour.

Peak Activity

Inspection of the busy hours on a minute by minute basis revealed that a peak IAC of 85 aircraft for the day occurred at 0424 Zebra. Table 10 and Figure 8, pages 30 and 31, respectively, show the location and altitude distribution by flight direction and ownership class of airborne aircraft at the peak instant.

Table 8 - HOURLY ENTRIES AND EXITS: Hourly Distribution of Flight Entries and Exits to the Oceanic Control Centers of North Atlantic Region on August 25, 1961, by Flight Direction and Ownership Class

Hour (Zebra)	Entries										Exits																								
	Civil					Military					Civil					Military																			
	E	W	N	S	RR Tot	E	W	N	S	RR Tot	E	W	N	S	RR Tot	E	W	N	S	RR Tot															
00	9	6	1	1	-	17	3	-	1	-	1	5	12	6	2	1	1	22	3	4	1	-	-	8											
01	11	7	2	2	-	22	3	2	2	-	2	9	14	9	4	2	2	31	4	9	1	1	-	15											
02	13	7	-	-	-	20	1	-	-	-	1	14	7	-	-	-	21	2	4	1	1	-	-	8											
03	11	5	1	-	-	17	3	1	-	-	-	4	14	6	1	-	-	21	5	3	1	1	-	-	10										
04	10	2	-	3	-	15	1	1	-	-	3	11	3	1	3	-	18	12	7	2	1	-	-	-	10										
05	2	4	1	-	-	7	2	2	-	-	1	5	4	6	1	-	12	17	6	1	-	-	-	-	24										
06	10	1	-	-	-	11	1	2	1	-	1	5	11	3	1	-	16	10	6	-	-	-	-	-	16										
07	3	2	-	2	-	7	-	1	-	-	-	1	3	3	2	-	8	9	5	1	1	-	-	-	16										
08	3	2	-	-	-	5	3	4	1	-	-	8	6	6	1	-	13	8	3	-	4	-	-	-	15										
09	4	3	1	2	1	11	-	5	-	-	-	5	4	8	1	2	16	9	4	-	-	-	-	-	13										
10	1	3	-	-	-	4	-	2	-	-	-	2	1	5	-	-	6	-	3	-	-	-	-	-	3										
11	1	8	-	-	-	9	1	3	-	-	1	5	2	11	-	-	14	5	2	1	1	-	-	-	9										
12	-	6	-	1	-	7	-	1	1	1	3	-	7	2	1	10	12	3	4	-	2	-	-	-	9										
13	1	9	-	1	-	11	1	-	-	-	-	1	2	9	-	1	12	-	-	-	1	1	-	-	2										
14	1	6	-	3	-	10	3	5	-	1	2	11	4	11	-	4	21	3	5	1	-	-	-	-	9										
15	3	7	-	1	-	11	3	1	-	-	-	4	6	8	-	1	15	1	9	-	1	-	-	-	11										
16	2	8	1	1	-	12	-	2	-	1	-	3	2	10	1	2	15	1	5	-	3	-	-	-	9										
17	3	9	1	2	-	15	2	5	-	-	-	7	5	14	1	2	22	-	11	-	-	-	-	-	12										
18	3	4	-	-	-	8	1	3	-	1	-	5	4	7	-	1	13	1	8	1	2	-	-	-	12										
19	4	7	1	3	-	15	-	-	-	-	-	-	4	7	1	3	15	4	7	1	1	-	-	-	13										
20	2	3	3	1	-	9	4	4	1	-	1	10	6	7	4	1	19	5	8	-	2	-	-	-	15										
21	1	5	3	1	-	10	2	6	-	1	-	9	3	11	3	2	19	1	7	3	-	-	-	-	11										
22	2	3	3	-	-	8	1	2	-	2	-	5	3	5	3	2	13	5	10	3	3	1	-	-	22										
23	1	1	-	1	-	3	-	2	-	-	-	2	1	3	-	1	5	1	3	2	-	-	-	-	6										
Grand Total	101	118	18	25	2	264	35	54	7	7	10	113	136	172	25	32	377	104	128	19	24	2	277	36	53	7	6	11	173	140	181	26	30	13	390

Table 9 - INSTANTANEOUS AIRBORNE COUNTS: Instantaneous Airborne Aircraft Counts (IAC) at the Beginning of Each Hour in the North Atlantic Region on August 25, 1961, by Flight Direction and Ownership Class

Hour (Zebra)	Civil					Military					Total							
	E	W	N	S	RR	Tot	E	W	N	S	RR	Tot	E	W	N	S	RR	Tot
00	7	17	3	-	-	27	3	9	-	-	1	13	10	26	3	-	1	40
01	13	19	3	1	-	36	6	8	1	-	1	16	19	27	4	1	1	52
02	20	17	4	2	-	43	8	9	3	-	2	22	28	26	7	2	2	65
03	31	20	3	1	-	55	9	6	2	-	-	17	40	26	5	1	-	72
04	37	22	3	-	-	62	10	6	2	-	-	18	47	28	5	-	-	80
05	40	22	2	3	-	67	10	5	2	-	-	17	50	27	4	3	-	84
06	25	20	2	3	-	50	9	7	1	-	1	18	34	27	3	3	1	68
07	25	15	2	3	-	45	9	7	2	-	2	20	34	22	4	3	2	65
08	19	12	1	4	-	36	7	7	2	-	2	18	26	19	3	4	2	54
09	14	11	1	-	-	26	7	10	3	-	2	22	21	21	4	-	2	48
10	9	10	2	2	1	24	6	14	2	-	2	24	15	24	4	2	3	48
11	10	10	2	2	1	25	2	15	2	-	2	21	12	25	4	2	3	46
12	6	16	1	1	1	25	1	16	1	-	3	21	7	32	2	1	4	46
13	3	18	1	-	1	23	-	13	-	1	3	17	3	31	1	1	4	40
14	4	27	1	-	-	32	1	9	-	-	3	13	5	36	1	-	3	45
15	2	28	-	3	-	33	2	12	-	-	2	16	4	40	-	3	2	49
16	4	26	-	3	-	33	3	12	-	-	2	17	7	38	-	3	2	50
17	5	29	1	1	-	36	3	13	-	-	1	17	8	42	1	1	1	53
18	8	27	2	3	-	40	2	14	-	-	1	17	10	41	2	3	1	57
19	10	23	1	1	1	36	2	15	-	1	1	19	12	38	1	2	2	55
20	10	23	1	3	1	38	2	11	-	-	1	14	12	34	1	3	2	52
21	7	18	4	2	1	32	5	11	-	-	2	18	12	29	4	2	3	50
22	7	16	4	3	1	31	6	15	-	1	1	23	13	31	4	4	2	54
23	4	9	4	-	-	17	5	13	-	3	-	21	9	22	4	3	-	38
Grand Total	320	455	48	41	8	872	118	257	23	6	35	439	438	712	71	47	43	1,311

Note: Totals approximate peak day flying hours within the North Atlantic Region. RR signifies round robin flight.

Figure 7 - INSTANTANEOUS AIRBORNE COUNTS: Instantaneous Airborne Aircraft Counts (IAC) at the Beginning of Each Hour in the North Atlantic Region on August 25, 1961

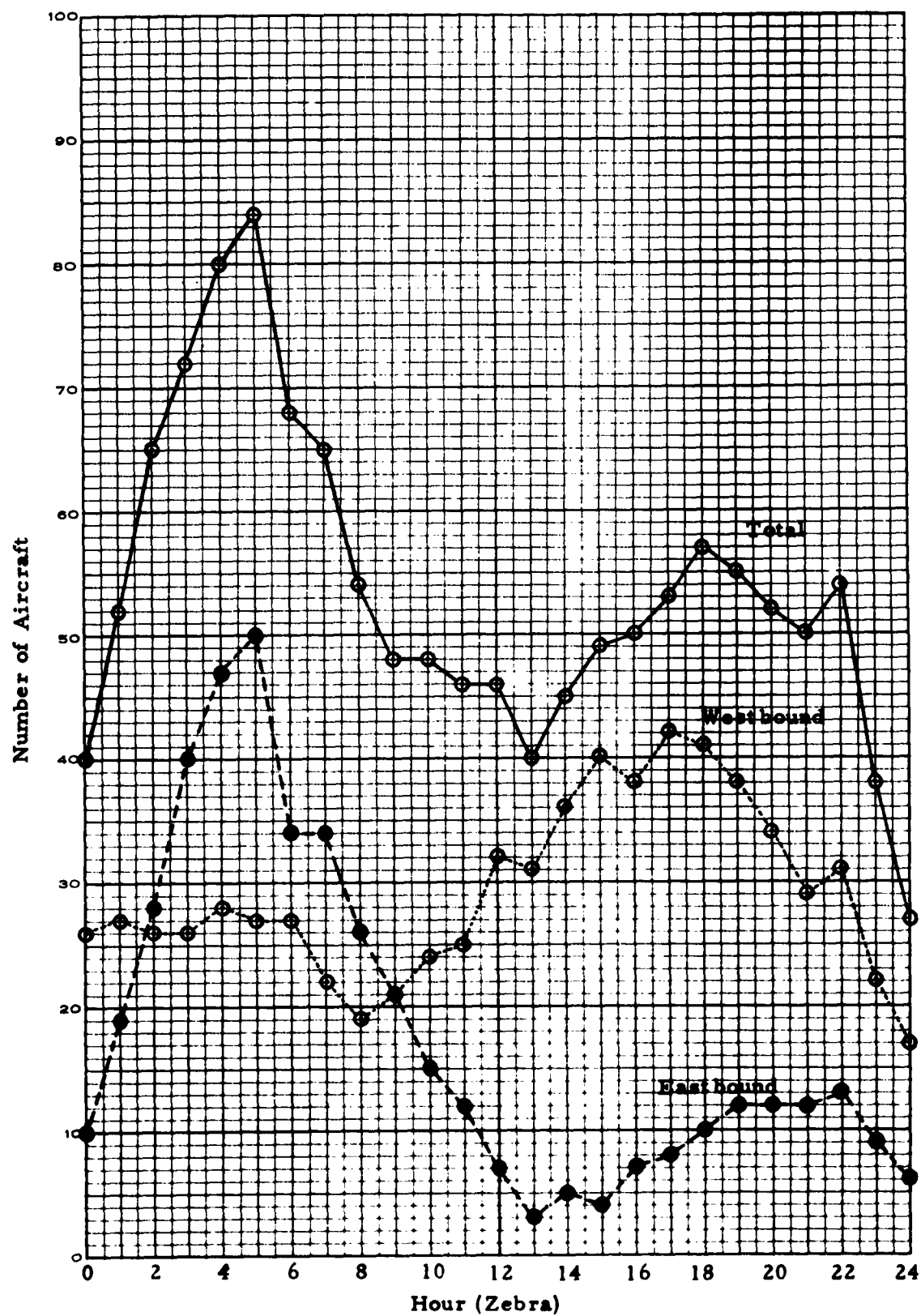


Table 10 - PEAK AIRCRAFT COUNT: Distribution of
Assigned Flight Levels for Aircraft Air-
borne at the Peak Traffic Instant (0424 Zebra)
in the North Atlantic Region on August 25,
1961, by Ownership and Flight Direction

Flt. Level (000')	Number of Flights								
	Civil			Military			Total		
	East	West	Total	East	West	Total	East	West	Total
5	-	-	-	-	-	-	-	-	-
6	-	1	1	-	-	-	-	1	1
7	-	-	-	-	-	-	-	-	-
8	-	3	3	-	5	5	-	8	8
9	1	-	1	2	-	2	3	-	3
10	-	2	2	-	2	2	-	4	4
11	-	-	-	2	-	2	2	-	2
12	-	6	6	-	-	-	-	6	6
13	2	-	2	-	-	-	2	-	2
14	-	2	2	-	-	-	-	2	2
15	2	-	2	1	-	1	3	-	3
16	-	-	-	-	1	1	-	1	1
17	1	-	1	4	1	5	5	1	6
18	-	1	1	-	-	-	-	1	1
19	2	-	2	-	-	-	2	-	2
20	-	2	2	-	-	-	-	2	2
21	1	-	1	-	-	-	1	-	1
22	-	3	3	-	-	-	-	3	3
23	2	-	2	1	-	1	3	-	3
24	-	1	1	-	-	-	-	1	1
25	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-
27	2	-	2	-	-	-	2	-	2
28	-	-	-	-	-	-	-	-	-
29	1	-	1	1	-	1	2	-	2
30	-	-	-	-	-	-	-	-	-
31	3	1	4	-	-	-	3	1	4
32	-	-	-	-	-	-	-	-	-
33	10	-	10	-	-	-	10	-	10
34	-	-	-	-	-	-	-	-	-
35	3	3	6	-	-	-	3	3	6
36	-	-	-	-	-	-	-	-	-
37	8	-	8	-	-	-	8	-	8
38	-	-	-	-	-	-	-	-	-
39	2	-	2	-	-	-	2	-	2
Total	40	25	65	11	9	20	51	34	85

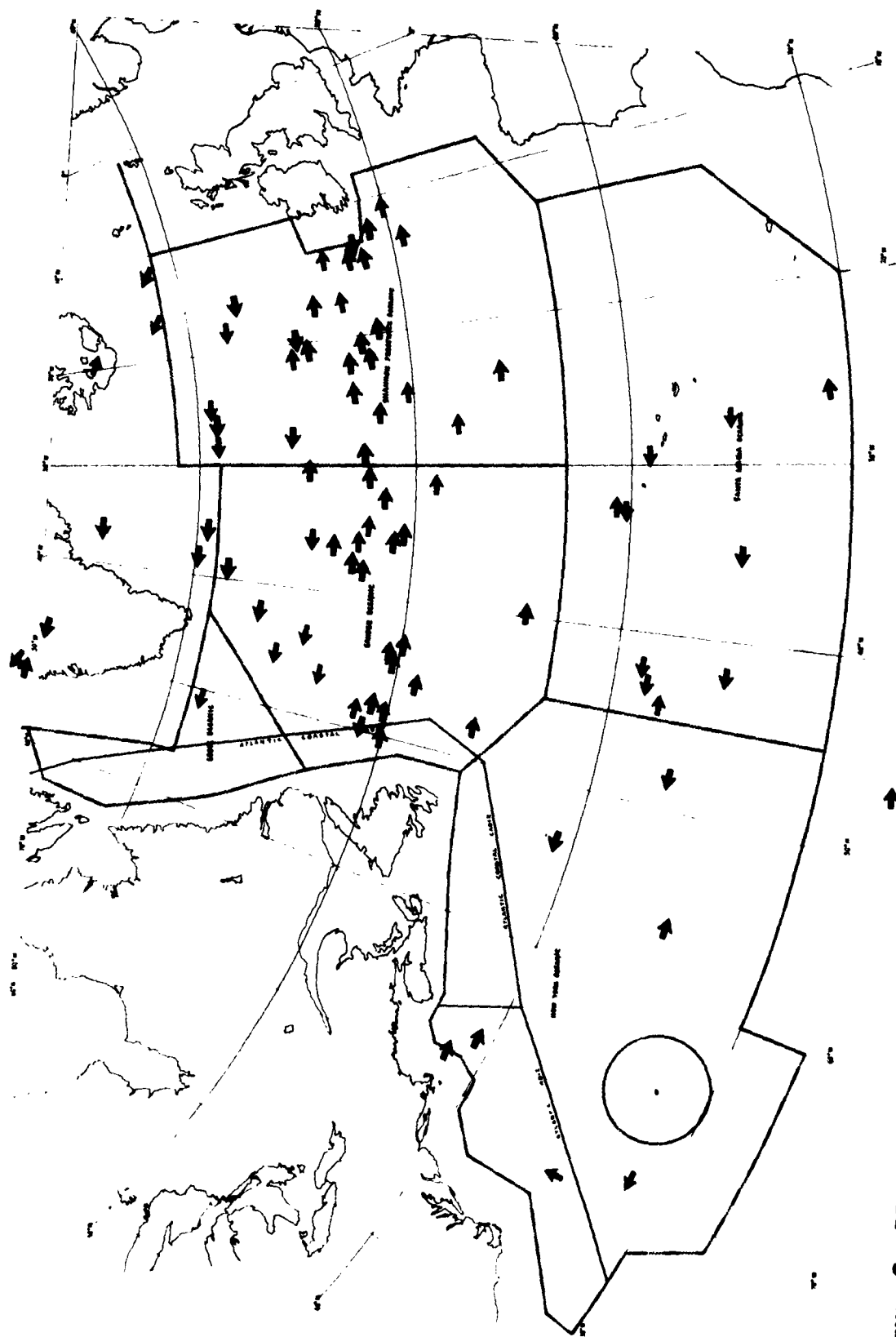


Figure 8 - PEAK INSTANT AIRCRAFT LOCATIONS: Location of Aircraft Airborne at the Peak Traffic Instant (0424 Zebra) in North Atlantic Region on August 25, 1961

Meridian Crossing Analysis

An analysis of traffic at the 20° W, 30° W, 40° W and 50° W longitude meridian crossings was made in terms of the following:

Crossing Latitude

Altitude

Time

Separation

Meridian Crossing Latitudes

Table 11 and Figure 9, pages 34 and 35, show the distribution of crossing latitudes at the 20° W, 30° W, 40° W and 50° W longitude meridians for flights in the North Atlantic Region on August 25, 1961. Only flights crossing the particular meridian between 0000-2359 Zebra on August 25, 1961, were counted so that in some cases a flight is not included in all four meridian tables. Also, flights landing at intermediate stops such as the Azores and Iceland may not have crossed all four meridians.

Meridian Crossing Altitudes

Table 12, page 36, shows the distribution of assigned flight levels for aircraft crossing the selected meridians on August 25, 1961, by flight direction. The busiest flight level for all meridians was 33,000 feet.

Meridian Crossing Times

Table 13, page 37, shows the distribution of meridian crossing times for flights in the North Atlantic Region on August 25, 1961, by flight direction. Traffic shows a marked peaking effect in terms of flight direction.

Flight Separation

Table 14 and Figure 10, pages 38 thru 43, show time interval separations between successive flights at the same flight level crossing reporting meridians with less than two-degree latitude separation (lateral minimum) by flight direction. Each flight that crossed a selected meridian was inspected in turn. The time interval between its crossing and the next flight at the same altitude with less than two-degrees latitude separation was recorded. If no such flight followed on the peak day, no entry was made.

Figures 11a thru 11d, pages 44-47, show flight separation in terms of reporting times and fix latitudes for flights crossing the 20° W, 30° W, 40° W, and 50° W longitude meridians at the 33,000 feet flight level in the North Atlantic Region on August 25, 1961. Eastbound flights are represented by arrows pointing to the right; Westbound flights are represented by arrows pointing to the left. Actual crossing time is represented by the left hand end of the plotted 30 minute interval (i. e., Eastbound flights by the tail of the arrow and Westbound flights by the head).

A comparison of separation intervals at the busiest flight level with all flight levels is shown below:

Time Interval (minutes)	33,000'		All levels	
	Number	Percent	Number	Percent
30-39	15	14.2	59	11.7
40-49	12	11.3	59	11.7
50-59	20	18.9	45	8.9
60-69	12	11.3	39	7.7
70-79	9	8.5	21	4.1
80-89	7	6.6	24	4.7
Tot. under 90	75	70.8	247	48.8
Over 90	31	29.2	258	51.2
Grand Total	106	100.0	505	100.0

Table 11 - MERIDIAN CROSSING LATITUDES: Distribution of Latitudes of Flights Crossing the 20°W, 30°W, 40°W, 50°W Meridians in the North Atlantic Region on August 25, 1961, by Flight Direction

Latitude North	Number of Flights											
	20° W			30° W			40° W			50° W		
	East	West	Tot	East	West	Tot	East	West	Tot	East	West	Tot
21	-	-	-	-	1	1	-	-	-	-	-	-
25	-	-	-	-	-	-	-	1	1	-	-	-
28	-	-	-	1	-	1	-	1	1	-	-	-
29	-	-	-	1	-	1	-	1	1	-	-	-
30	-	-	-	-	-	-	-	1	1	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-
33	1	-	1	-	-	-	-	-	-	-	1	1
34	-	-	-	-	2	2	-	1	1	-	1	1
35	-	-	-	-	1	1	-	1	1	-	-	-
36	1	2	3	-	2	2	-	-	-	2	3	5
37	2	5	7	-	1	1	-	1	1	-	-	-
38	2	2	4	-	-	-	2	9	11	-	7	7
39	-	-	-	5	13	18	-	1	1	-	-	-
40	-	-	-	-	-	-	-	-	-	-	3	3
41	1	-	1	-	-	-	1	-	1	-	1	1
42	-	8	8	-	-	-	-	-	-	1	-	1
43	3	4	7	-	-	-	2	-	2	-	-	-
44	1	-	1	2	2	4	1	2	3	2	1	3
45	-	-	-	1	-	1	2	-	2	3	-	3
46	1	-	1	-	-	-	-	-	-	1	-	1
47	-	-	-	1	-	1	3	-	3	1	-	1
48	1	-	1	2	-	2	5	-	5	16	-	16
49	1	-	1	7	-	7	10	-	10	13	1	14
50	9	-	9	9	-	9	19	-	19	41	9	50
51	13	-	13	16	-	16	24	1	25	2	6	8
52	21	1	22	23	1	24	15	7	22	5	8	13
53	22	7	29	18	5	23	3	5	8	1	2	3
54	8	1	9	5	1	6	4	3	7	2	8	10
55	8	5	13	5	7	12	-	2	2	-	1	1
56	3	8	11	1	3	4	2	9	11	1	8	9
57	-	12	12	-	10	10	1	4	5	4	11	15
58	1	13	14	1	7	8	1	9	10	-	30	30
59	-	29	29	-	20	20	1	21	22	-	4	4
60	-	11	11	-	22	22	4	21	25	-	4	4
61	1	2	3	2	4	6	-	5	5	-	-	-
62	1	8	9	3	8	11	-	2	2	-	1	1
63	3	3	6	-	1	1	-	5	5	-	-	-
64	-	-	-	1	4	5	-	-	-	-	2	2
65	1	1	2	-	-	-	1	1	2	-	-	-
66	-	-	-	1	-	1	1	1	2	-	-	-
67	-	1	1	-	-	-	1	1	2	-	-	-
68	-	-	-	-	1	1	-	-	-	-	-	-
75	-	-	-	-	1	1	-	-	-	-	-	-
Total	105	123	228	105	117	222	103	116	219	95	112	207

Note: Latitude classes include 00 to 59 minutes for each degree. Four Polar Route flights above 80°N. not included.

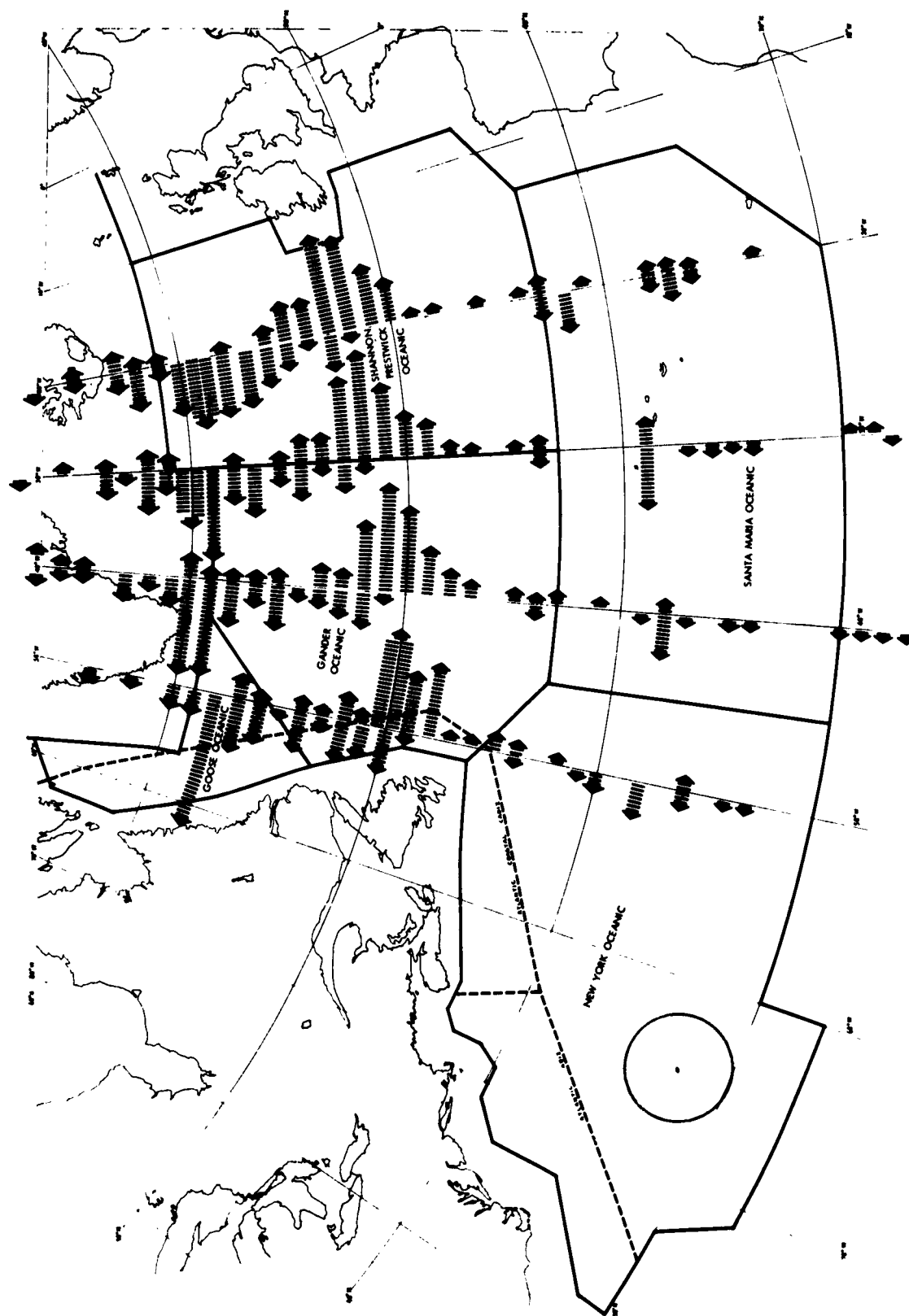


Figure 9 - MERIDIAN CROSSINGS: Distribution of Meridian Crossings by Flights in North Atlantic Region on August 25, 1961

Table 12 - MERIDIAN CROSSING ALTITUDES: Distribution of Assigned Flight Levels for Aircraft Crossing the 20°W, 30°W, 40°W, 50°W Meridians in the North Atlantic Region on August 25, 1961, by Flight Direction

Flt. Level (000')	Number of Flights											
	20° W			30° W			40° W			50° W		
	East	West	Tot	East	West	Tot	East	West	Tot	East	West	Tot
5	1	-	1	-	-	-	-	-	-	-	-	-
6	-	2	2	-	1	1	-	-	-	-	1	1
7	-	-	-	-	-	-	-	-	-	-	-	-
8	-	7	7	-	9	9	-	8	8	-	9	9
9	4	-	4	2	-	2	2	-	2	3	-	3
10	-	11	11	-	9	9	-	10	10	-	9	9
11	4	-	4	5	-	5	7	-	7	7	-	7
12	-	10	10	-	8	8	-	8	8	-	8	8
13	6	-	6	6	-	6	10	-	10	7	-	7
14	-	7	7	-	7	7	-	8	8	-	7	7
15	8	-	8	8	-	8	6	-	6	7	-	7
16	-	4	4	-	2	2	-	2	2	-	3	3
17	9	-	9	9	-	9	6	-	6	5	-	5
18	-	4	4	-	5	5	-	6	6	-	3	3
19	6	-	6	6	-	6	8	-	8	7	-	7
20	-	7	7	-	3	3	-	2	2	-	3	3
21	4	-	4	8	-	8	7	-	7	4	-	4
22	-	5	5	-	6	6	-	3	3	-	1	1
23	6	-	6	2	-	2	1	-	1	-	-	-
24	-	1	1	-	1	1	-	3	3	-	5	5
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	1	1
27	1	-	1	-	-	-	-	-	-	-	-	-
28	-	6	6	-	6	6	-	5	5	-	2	2
29	3	-	3	4	-	4	5	-	5	5	1	6
30	-	-	-	-	-	-	-	-	-	-	-	-
31	3	23	26	4	20	24	4	12	16	4	8	12
32	-	-	-	-	-	-	-	-	-	-	-	-
33	24	9	33	22	12	34	21	13	34	22	12	34
34	-	-	-	-	-	-	-	-	-	-	-	-
35	6	21	27	6	21	27	6	24	30	7	26	33
36	-	-	-	-	-	-	-	-	-	-	-	-
37	14	5	19	17	6	23	14	7	21	12	7	19
38	-	-	-	-	-	-	-	-	-	-	-	-
39	4	1	5	4	1	5	4	5	9	3	6	9
40	-	-	-	-	-	-	-	-	-	-	-	-
41	2	-	2	2	-	2	2	-	2	2	-	2
Total	105	123	228	105	117	222	103	116	219	95	112	207

Note: Four Polar Route Flights (three at 33,000' and one at 35,000') not included.

Table 13 - MERIDIAN CROSSING TIMES: Hourly Distributions of Aircraft Crossing Times at the 20°W, 30°W, 40°W, 50°W Meridian Crossings for Flights in the North Atlantic Region on August 25, 1961, by Flight Direction

Hour (Zebra)	Number of Flights											
	20° W			30° W			40° W			50° W		
	East	West	Tot	East	West	Tot	East	West	Tot	East	West	Tot
00	1	5	6	2	1	3	3	4	7	9	2	11
01	2	10	12	5	3	8	8	1	9	10	3	13
02	6	4	10	6	8	14	13	1	14	12	3	15
03	7	5	12	17	6	23	14	8	22	12	1	13
04	16	3	19	15	6	21	8	6	14	9	2	11
05	11	3	14	9	3	12	11	6	17	6	7	13
06	9	-	9	6	6	12	7	4	11	9	7	16
07	8	1	9	9	-	9	9	4	13	5	3	8
08	10	2	12	6	2	8	4	3	7	-	3	3
09	5	5	10	5	4	9	2	2	4	4	3	7
10	3	5	8	4	3	7	4	2	6	2	3	5
11	8	2	10	1	4	5	2	3	5	1	1	2
12	-	5	5	1	5	6	1	8	9	-	3	3
13	3	10	13	3	6	9	-	4	4	-	4	4
14	2	9	11	-	7	7	-	10	10	2	4	6
15	-	8	8	-	10	10	-	6	6	1	14	15
16	-	4	4	-	6	6	3	8	11	2	7	9
17	-	11	11	1	10	11	3	7	10	5	8	13
18	1	5	6	5	7	12	3	9	12	4	6	10
19	6	10	16	3	5	8	3	7	10	1	12	13
20	1	3	4	3	6	9	3	4	7	-	5	5
21	3	2	5	2	2	4	-	7	7	1	7	8
22	1	5	6	1	3	4	2	1	3	-	3	3
23	2	6	8	1	4	5	-	1	1	-	1	1
Total	105	123	228	105	117	222	103	116	219	95	112	207

Note: Four Polar Route Flights Crossing above 80°N Latitude not included.

Table 14a - TIME SEPARATION (All Flights): Distribution of Time Intervals Between Successive Flights at the Same Flight Level Crossing Reporting Meridians with Less Than Two-Degrees Latitude Separation in the North Atlantic Region on August 25, 1961

Time Interval (minutes)	Meridian									
	20° W		30° W		40° W		50° W		Total	
	#	%	#	%	#	%	#	%	#	%
30- 39	18	13.5	12	9.4	12	9.9	17	13.8	59	11.7
40- 49	12	9.0	13	10.2	15	12.4	19	15.4	59	11.7
50- 59	12	9.0	14	10.9	11	9.1	8	6.5	45	8.9
60- 69	10	7.5	8	6.2	10	8.3	11	8.9	39	7.7
70- 79	5	3.8	4	3.1	6	4.9	6	4.9	21	4.1
80- 89	5	3.8	8	6.2	6	4.9	5	4.1	24	4.7
90- 99	6	4.5	1	0.8	1	0.8	4	3.3	12	2.4
100-109	8	6.0	2	1.6	1	0.8	4	3.3	15	3.0
110-119	7	5.3	10	7.8	4	3.3	4	3.3	25	4.9
120-129	6	4.5	3	2.3	5	4.1	4	3.3	18	3.5
130-139	-	-	2	1.6	2	1.7	2	1.6	6	1.2
140-149	1	0.7	2	1.6	3	2.5	-	-	6	1.2
150-159	1	0.7	3	2.3	-	-	2	1.6	6	1.2
160-169	1	0.7	-	-	1	0.8	1	0.8	3	0.6
170-179	1	0.7	5	3.9	4	3.3	2	1.6	12	2.4
180-189	7	5.3	2	1.6	5	4.1	2	1.6	16	3.2
190-199	4	3.0	3	2.3	2	1.7	-	1.6	11	2.2
200-209	-	-	4	3.1	4	3.3	-	-	8	1.6
210-219	1	0.7	-	-	-	-	-	-	1	0.2
220-229	1	0.7	1	0.8	1	0.8	-	-	3	0.6
230-239	-	-	2	1.6	1	0.8	1	0.8	4	0.8
4 hrs *	2	1.5	5	3.9	10	8.3	8	6.5	25	4.9
5 hrs	3	2.3	8	6.2	4	3.3	2	1.6	17	3.3
6 hrs	5	3.8	3	2.3	2	1.7	3	2.5	13	2.6
7 hrs	1	0.7	-	-	1	0.8	2	1.6	4	0.8
8 hrs	-	-	1	0.8	-	-	2	1.6	3	0.6
9 hrs	5	3.8	1	0.8	2	1.7	1	0.8	9	1.8
10 hrs	-	-	-	-	1	0.8	3	2.5	4	0.8
11 hrs	1	0.8	2	1.6	-	2.5	-	-	6	1.2
12 hrs	1	0.8	-	-	2	1.7	2	1.6	5	1.0
13 hrs	-	-	1	0.8	2	1.7	2	1.6	5	1.0
14 hrs	-	-	2	1.6	-	-	-	-	2	0.4
15 hrs	1	0.8	-	-	-	-	1	0.8	2	0.4
16 hrs	1	0.8	3	2.3	-	-	3	2.5	7	1.4
17 hrs	3	2.3	-	-	-	-	-	-	3	0.6
18 hrs	2	1.5	1	0.8	-	-	-	-	3	0.6
19 hrs	-	-	1	0.8	-	-	-	-	1	0.2
20 hrs	-	-	-	-	-	-	-	-	-	-
21 hrs	2	1.5	1	0.8	-	-	-	-	3	0.6
22 hrs	-	-	-	-	-	-	-	-	-	-
23 hrs	-	-	-	-	-	-	-	-	-	-
Total	133	100.0	128	100.0	121	100.0	123	100.0	505	100.0

* Hourly intervals measured 00 to 59 minutes inclusive.

Figure 10 - TIME SEPARATION: Percentage Distribution of Time Intervals (10 minute) Between Successive Flights at the Same Flight Level and Crossing Selected Reporting Meridians with Less Than Two-Degrees Latitude Separation, North Atlantic Region, August 23, 1961

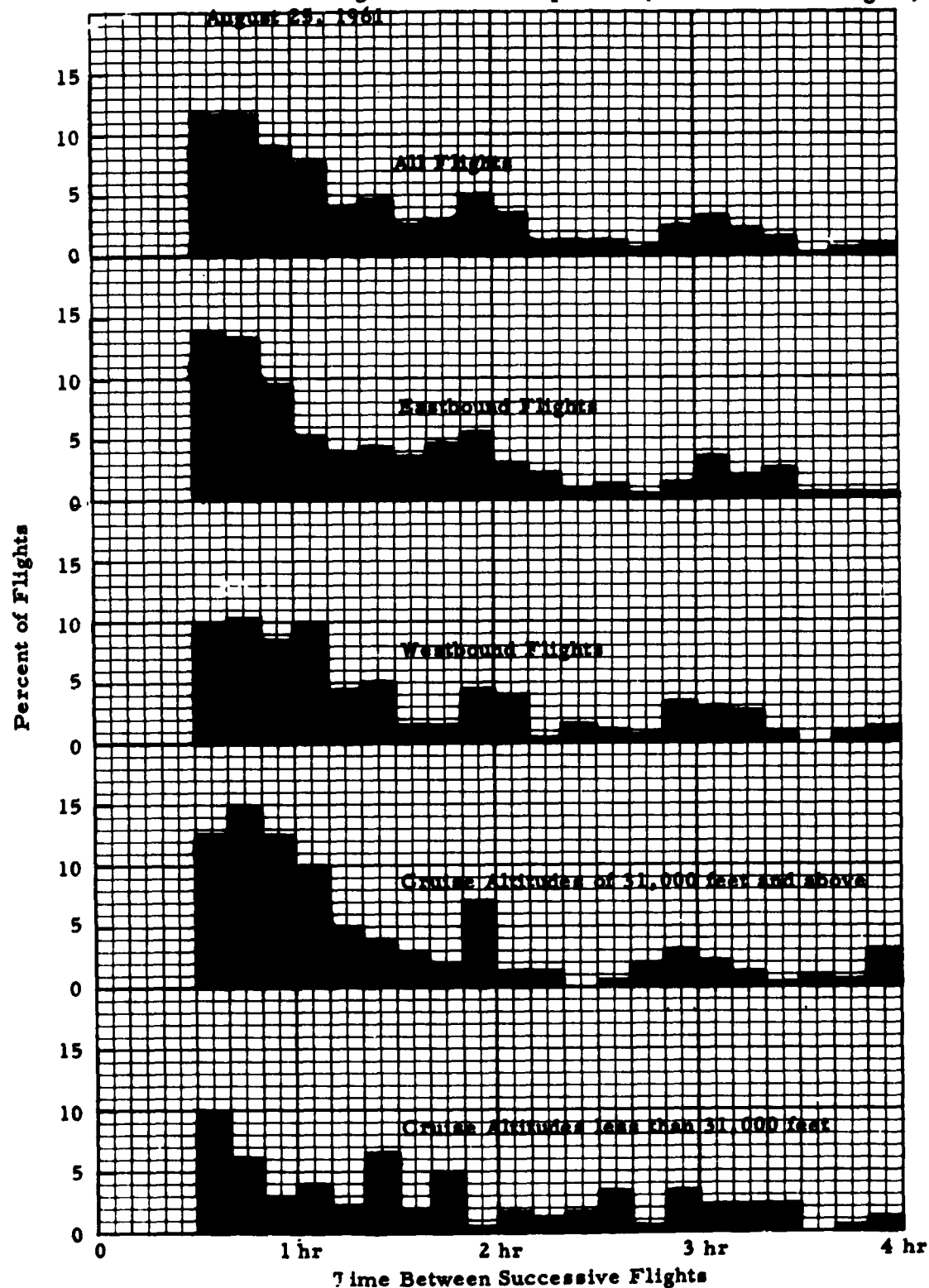


Table 14b - TIME SEPARATION (Eastbound Flights): Distribution of Time Intervals Between Successive Flights at the Same Flight Level Crossing Reporting Meridians with Less Than Two-Degrees Latitude Separation in the North Atlantic Region on August 25, 1961

Time Interval (minutes)	Meridian									
	20° W		30° W		40° W		50° W		Total	
	#	%	#	%	#	%	#	%	#	%
30- 39	7	11.7	5	8.8	8	14.5	12	20.0	32	13.8
40- 49	4	6.7	7	12.3	10	18.2	10	16.7	31	13.4
50- 59	7	11.6	7	12.3	5	9.1	3	5.0	22	9.5
60- 69	2	3.3	2	3.5	3	5.5	5	8.3	12	5.2
70- 79	2	3.3	2	3.5	3	5.5	2	3.3	9	3.9
80- 89	3	5.0	4	7.0	1	1.8	2	3.3	10	4.3
90- 99	4	6.7	-	-	1	1.8	3	5.0	8	3.5
100-109	6	10.0	2	3.5	1	1.8	2	3.3	11	4.7
110-119	4	6.7	5	8.8	2	3.7	2	3.3	13	5.6
120-129	2	3.3	-	-	3	5.5	2	3.3	7	3.0
130-139	-	-	2	3.5	1	1.8	2	3.3	5	2.2
140-149	-	-	1	1.8	1	1.8	-	-	2	0.9
150-159	-	-	2	3.5	-	-	1	1.7	3	1.3
160-169	-	-	-	-	1	1.8	-	-	1	0.4
170-179	1	1.7	2	3.5	-	-	-	-	3	1.3
180-189	5	8.3	-	-	2	3.7	1	1.7	8	3.5
190-199	3	5.0	-	-	-	-	1	1.7	4	1.7
200-209	-	-	3	5.3	3	5.5	-	-	6	2.6
210-219	1	1.7	-	-	-	-	-	-	1	0.4
220-229	-	-	-	-	1	1.8	-	-	1	0.4
230-239	-	-	1	1.8	-	-	-	-	1	0.4
4 hrs *	2	3.3	2	3.5	2	3.6	2	3.3	8	3.5
5 hrs	2	3.3	4	7.0	2	3.6	-	-	8	3.5
6 hrs	2	3.3	1	1.8	1	1.8	2	3.3	6	2.6
7 hrs	-	-	-	-	-	-	-	-	-	-
8 hrs	-	-	-	-	-	-	1	1.7	1	0.4
9 hrs	-	-	-	-	-	-	1	1.7	1	0.4
10 hrs	-	-	-	-	1	1.8	3	5.0	4	1.7
11 hrs	-	-	-	-	1	1.8	-	-	1	0.4
12 hrs	-	-	-	-	-	-	1	1.7	1	0.4
13 hrs	-	-	-	-	2	3.6	1	1.7	3	1.3
14 hrs	-	-	1	1.7	-	-	-	-	1	0.4
15 hrs	-	-	-	-	-	-	-	-	-	-
16 hrs	1	1.7	2	3.5	-	-	1	1.7	4	1.7
17 hrs	1	1.7	-	-	-	-	-	-	1	0.4
18 hrs	1	1.7	1	1.7	-	-	-	-	2	0.9
19 hrs	-	-	1	1.7	-	-	-	-	1	0.4
20 hrs	-	-	-	-	-	-	-	-	-	-
21 hrs	-	-	-	-	-	-	-	-	-	-
22 hrs	-	-	-	-	-	-	-	-	-	-
23 hrs	-	-	-	-	-	-	-	-	-	-
Total	60	100.0	57	100.0	55	100.0	60	100.0	232	100.0

* Hourly intervals measured 00 to 59 minutes inclusive.

Table 14c - TIME SEPARATION (Westbound Flights): Distribution of Time Intervals Between Successive Flights at the Same Flight Level Crossing Reporting Meridians with Less Than Two-Degrees Latitude Separation in the North Atlantic Region on August 25, 1961

Time Interval (minutes)	Meridian									
	20° W		30° W		40° W		50° W		Total	
	#	%	#	%	#	%	#	%	#	%
30- 39	11	15.1	7	9.9	4	6.1	5	7.9	27	9.9
40- 49	8	10.9	6	8.5	5	7.6	9	14.2	28	10.3
50- 59	5	6.8	7	9.9	6	9.1	5	7.9	23	8.4
60- 69	8	11.0	6	8.5	7	10.6	6	9.5	27	9.9
70- 79	3	4.1	2	2.8	3	4.6	4	6.3	12	4.4
80- 89	2	2.7	4	5.6	5	7.6	3	4.7	14	5.1
90- 99	2	2.7	1	1.4	-	-	1	1.6	4	1.5
100-109	2	2.7	-	-	-	-	2	3.2	4	1.5
110-119	3	4.1	5	7.1	2	3.0	2	3.2	12	4.4
120-129	4	5.5	3	4.2	2	3.0	2	3.2	11	4.0
130-139	-	-	-	-	1	1.5	-	-	1	0.4
140-149	1	1.4	1	1.4	2	3.0	-	-	4	1.5
150-159	1	1.4	1	1.4	-	-	1	1.6	3	1.1
160-169	1	1.4	-	-	-	-	1	1.6	2	0.7
170-179	-	-	3	4.2	4	6.1	2	3.2	9	3.3
180-189	2	2.7	2	2.8	3	4.6	1	1.6	8	2.9
190-199	1	1.4	3	4.2	2	3.0	1	1.6	7	2.6
200-209	-	-	1	1.4	1	1.5	-	-	2	0.7
210-219	-	-	-	-	-	-	-	-	-	-
220-229	1	1.4	1	1.4	-	-	-	-	2	0.7
230-239	-	-	1	1.4	1	1.5	1	1.6	3	1.1
4 hrs *	-	-	3	4.2	8	12.2	6	9.5	17	6.2
5 hrs	1	1.4	4	5.7	2	3.0	2	3.2	9	3.3
6 hrs	3	4.1	2	2.8	1	1.5	1	1.6	7	2.6
7 hrs	1	1.4	-	-	1	1.5	2	3.2	4	1.5
8 hrs	-	-	1	1.4	-	-	1	1.6	2	0.7
9 hrs	5	6.8	1	1.4	2	3.0	-	-	8	2.9
10 hrs	-	-	-	-	-	-	-	-	-	-
11 hrs	1	1.4	2	2.8	2	3.0	-	-	5	1.8
12 hrs	1	1.4	-	-	2	3.0	1	1.6	4	1.5
13 hrs	-	-	1	1.4	-	-	1	1.6	2	0.7
14 hrs	-	-	1	1.4	-	-	-	-	1	0.4
15 hrs	1	1.4	-	-	-	-	1	1.6	2	0.7
16 hrs	-	-	1	1.4	-	-	2	3.2	3	1.1
17 hrs	2	2.7	-	-	-	-	-	-	2	0.7
18 hrs	1	1.4	-	-	-	-	-	-	1	0.4
19 hrs	-	-	-	-	-	-	-	-	-	-
20 hrs	-	-	-	-	-	-	-	-	-	-
21 hrs	2	2.7	1	1.4	-	-	-	-	3	1.1
22 hrs	-	-	-	-	-	-	-	-	-	-
23 hrs	-	-	-	-	-	-	-	-	-	-
Total	73	100.0	71	100.0	66	100.0	63	100.0	273	100.0

* Hourly intervals measured 00 to 59 minutes inclusive.

Table 14d - TIME SEPARATION (Altitudes 31,000 Feet and Above):
Distribution of Time Intervals Between Successive Flights
at the Same Flight Level Crossing Reporting Meridians
with Less Than Two-Degrees Latitude Separation in the
North Atlantic Region on August 25, 1961

Time Interval (minutes)	Meridian									
	20° W		30° W		40° W		50° W		Total	
	#	%	#	%	#	%	#	%	#	%
30- 39	12	14.5	9	11.0	8	10.4	12	15.0	41	12.7
40- 49	9	10.9	12	14.7	13	16.8	14	17.5	48	14.9
50- 59	12	14.5	12	14.7	9	11.7	7	8.8	40	12.4
60- 69	5	6.0	8	9.8	9	11.7	10	12.5	32	9.9
70- 79	4	4.8	3	3.7	5	6.5	4	5.0	16	5.0
80- 89	3	3.6	4	4.9	2	2.6	3	3.8	12	3.7
90- 99	5	6.0	-	-	1	1.3	3	3.8	9	2.8
100-109	3	3.6	-	-	-	-	3	3.8	6	1.9
110-119	6	7.3	10	12.2	4	5.2	3	3.8	23	7.1
120-129	5	6.0	3	3.7	5	6.5	2	2.5	15	4.7
130-139	-	-	1	1.2	1	1.3	2	2.5	4	1.3
140-149	1	1.2	1	1.2	2	2.6	-	-	4	1.3
150-159	-	-	-	-	-	-	-	-	-	-
160-169	1	1.2	-	-	-	-	1	1.2	2	0.6
170-179	1	1.2	1	1.2	2	2.6	2	2.5	6	1.9
180-189	4	4.8	2	2.4	3	3.9	1	1.2	10	3.1
190-199	4	4.8	-	-	2	2.6	1	1.2	7	2.2
200-209	-	-	2	2.4	2	2.6	-	-	4	1.3
210-219	1	1.2	-	-	-	-	-	-	1	0.3
220-229	2	2.4	1	1.2	-	-	-	-	3	0.9
230-239	-	-	2	2.4	-	-	-	-	2	0.6
4 hrs *	1	1.2	2	2.4	4	5.2	3	3.8	10	3.1
5 hrs	1	1.2	3	3.7	1	1.3	1	1.2	6	1.9
6 hrs	1	1.2	1	1.2	1	1.3	1	1.2	4	1.3
7 hrs	-	-	-	-	-	-	1	1.2	1	0.3
8 hrs	-	-	1	1.2	-	-	1	1.2	2	0.6
9 hrs	-	-	-	-	-	-	1	1.2	1	0.3
10 hrs	-	-	-	-	-	-	-	-	-	-
11 hrs	1	1.2	1	1.2	1	1.3	-	-	3	0.9
12 hrs	1	1.2	-	-	1	1.3	2	2.5	4	1.2
13 hrs	-	-	-	-	1	1.3	1	1.3	2	0.6
14 hrs	-	-	2	2.4	-	-	-	-	2	0.6
15 hrs	-	-	-	-	-	-	1	1.3	1	0.3
16 hrs	-	-	-	-	-	-	-	-	-	-
17 hrs	-	-	-	-	-	-	-	-	-	-
18 hrs	-	-	-	-	-	-	-	-	-	-
19 hrs	-	-	1	1.2	-	-	-	-	1	0.3
20 hrs	-	-	-	-	-	-	-	-	-	-
21 hrs	-	-	-	-	-	-	-	-	-	-
22 hrs	-	-	-	-	-	-	-	-	-	-
23 hr	-	-	-	-	-	-	-	-	-	-
Total	83	100.0	82	100.0	77	100.0	80	100.0	322	100.0

* Hourly Intervals measured 00 to 59 minutes inclusive.

Table 14e - TIME SEPARATION (Altitudes Less Than 31,000 Feet):
Distribution of Time Intervals Between Successive Flights
at the Same Flight Level Crossing Reporting Meridians
with Less Than Two-Degrees Latitude Separation in the
North Atlantic Region on August 25, 1961

Time Interval (minutes)	20° W		30° W		40° W		50° W		Total	
	#	%	#	%	#	%	#	%	#	%
30- 39	5	10.0	3	6.5	5	11.6	5	11.7	18	9.9
40- 49	3	6.0	1	2.2	2	4.7	5	11.7	11	6.1
50- 59	-	-	2	4.3	2	4.7	1	2.3	5	2.7
60- 69	5	10.0	-	-	1	2.3	1	2.3	7	3.8
70- 79	1	2.0	1	2.2	1	2.3	1	2.3	4	2.2
80- 89	2	4.0	4	8.7	4	9.3	2	4.7	12	6.6
90- 99	1	2.0	1	2.2	-	-	1	2.3	3	1.7
100-109	5	10.0	2	4.3	1	2.3	1	2.3	9	4.9
110-119	-	-	-	-	-	-	1	2.3	1	0.5
120-129	1	2.0	-	-	-	-	2	4.7	3	1.7
130-139	-	-	1	2.2	-	-	1	2.3	2	1.1
140-149	-	-	1	2.2	2	4.7	-	-	3	1.7
150-159	1	2.0	3	6.5	-	-	2	4.7	6	3.3
160-169	-	-	-	-	1	2.3	-	-	1	0.5
170-179	-	-	4	8.7	2	4.7	-	-	6	3.3
180-189	3	6.0	-	-	-	-	1	2.3	4	2.2
190-199	-	-	3	6.5	-	-	1	2.3	4	2.2
200-209	-	-	2	4.3	2	4.7	-	-	4	2.2
210-219	-	-	-	-	-	-	-	-	-	-
220-229	-	-	-	-	1	2.3	-	-	1	0.5
230-239	-	-	-	-	1	2.3	1	2.3	2	1.1
4 hrs *	1	2.0	3	6.5	6	13.9	5	11.6	15	8.2
5 hrs	2	4.0	5	10.9	3	7.0	1	2.3	11	6.1
6 hrs	4	8.0	2	4.3	1	2.3	2	4.7	9	4.9
7 hrs	1	2.0	-	-	1	2.3	1	2.3	3	1.7
8 hrs	-	-	-	-	-	-	1	2.3	1	0.5
9 hrs	5	10.0	1	2.2	2	4.7	-	-	8	4.4
10 hrs	1	2.0	-	-	1	2.3	3	7.0	5	2.7
11 hrs	-	-	1	2.2	2	4.7	-	-	3	1.7
12 hrs	-	-	-	-	1	2.3	-	-	1	0.5
13 hrs	-	-	1	2.2	1	2.3	1	2.3	3	1.7
14 hrs	-	-	-	-	-	-	-	-	-	-
15 hrs	1	2.0	-	-	-	-	-	-	1	0.5
16 hrs	1	2.0	3	6.5	-	-	3	7.0	7	3.8
17 hrs	3	6.0	-	-	-	-	-	-	3	1.7
18 hrs	2	4.0	1	2.2	-	-	-	-	3	1.7
19 hrs	-	-	-	-	-	-	-	-	-	-
20 hrs	-	-	-	-	-	-	-	-	-	-
21 hrs	2	4.0	1	2.2	-	-	-	-	3	1.7
22 hrs	-	-	-	-	-	-	-	-	-	-
23 hrs	-	-	-	-	-	-	-	-	-	-
Total	50	100.0	46	100.0	43	100.0	43	100.0	182	100.0

* Hourly Intervals measured 00 to 59 minutes inclusive.

Figure 11a -FLIGHT SEPARATION: Distribution of Reporting Times and Fix Latitudes for Flights Crossing the 20° W Meridian at the 33,000 Feet Flight Level in the North Atlantic Region on August 25, 1961 (Eastbound ➡ ; Westbound ⬅)

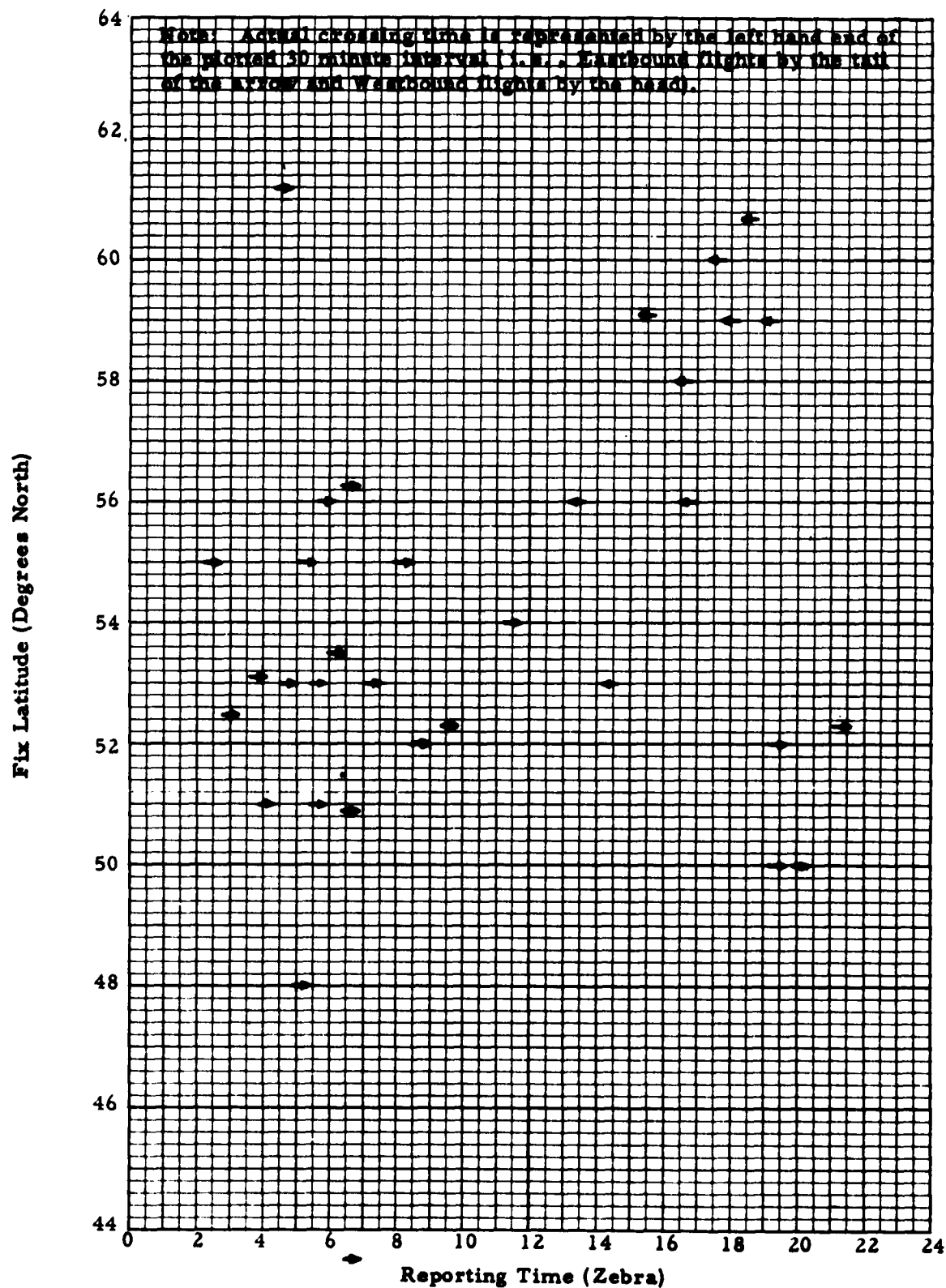


Figure 11b -FLIGHT SEPARATION: Distribution of Reporting Times and Fix Latitudes for Flights Crossing the 30° W Meridian at the 33,000 Feet Flight Level in the North Atlantic Region on August 25, 1961 (Eastbound ➡ ; Westbound ➡)

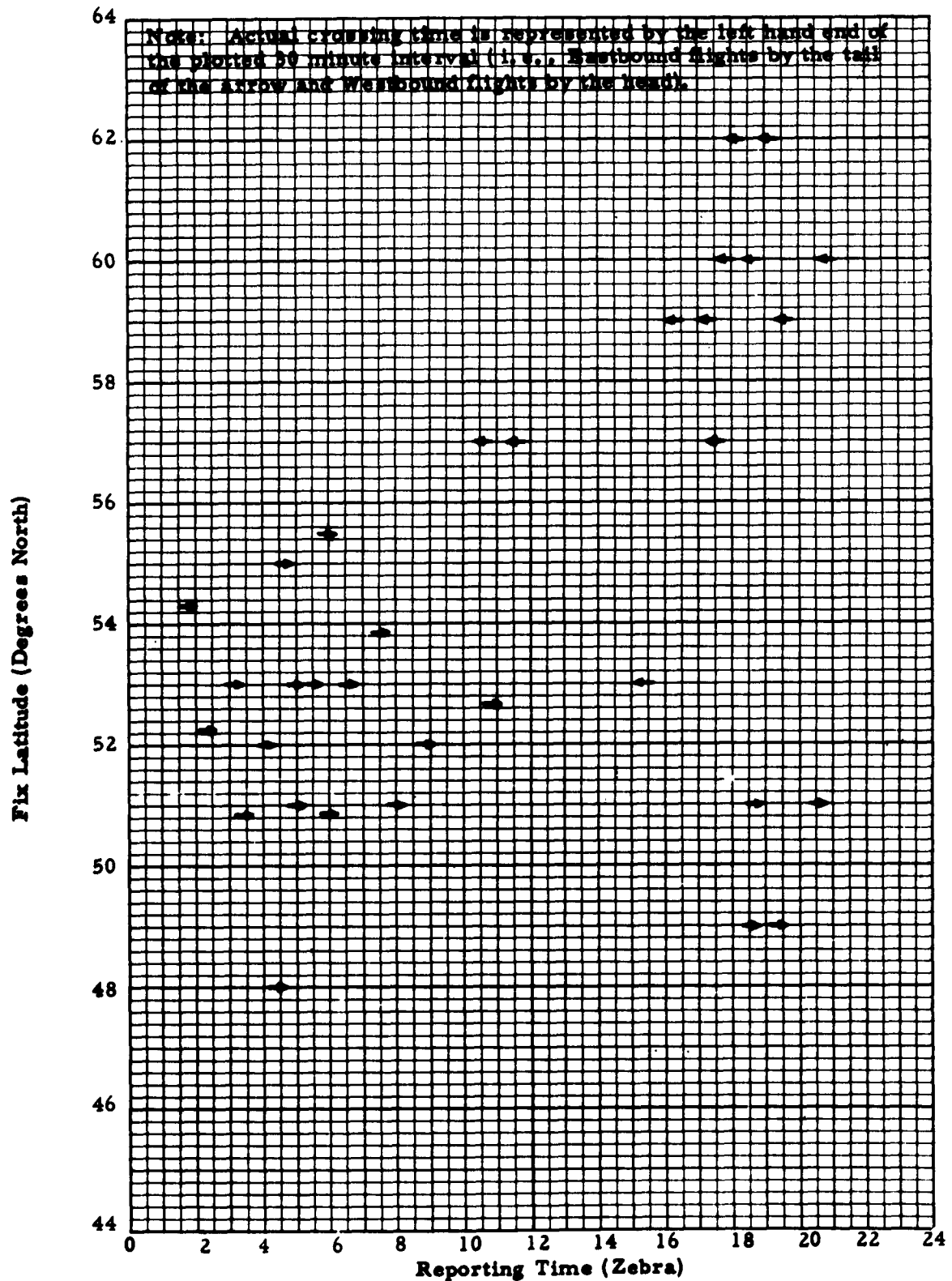


Figure 11c - FLIGHT SEPARATION: Distribution of Reporting Times and Fix Latitudes for Flights Crossing the 40° W Meridian at the 33,000 Feet Flight Level in the North Atlantic Region on August 25, 1961 (Eastbound ➡; Westbound ➡)

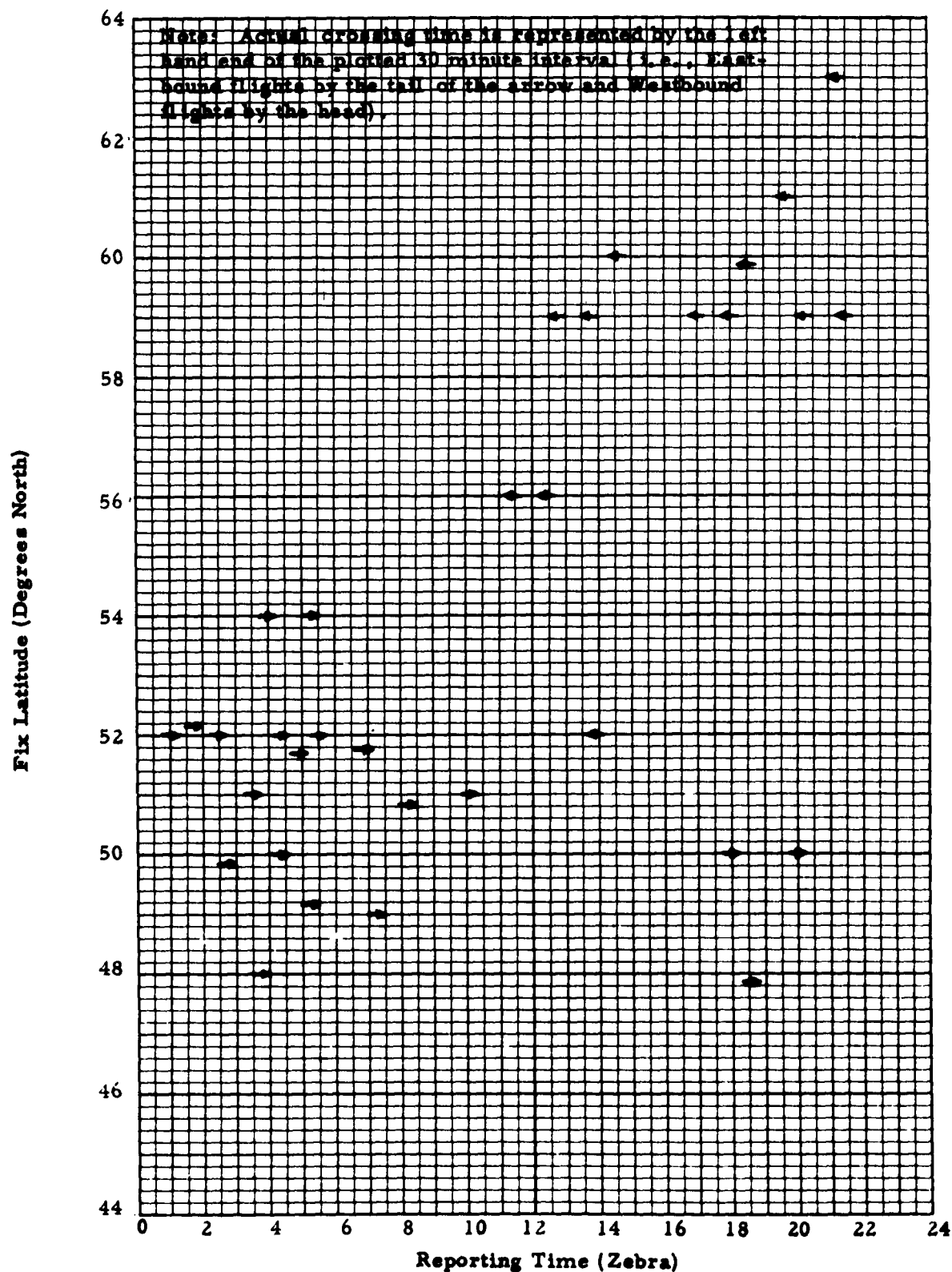
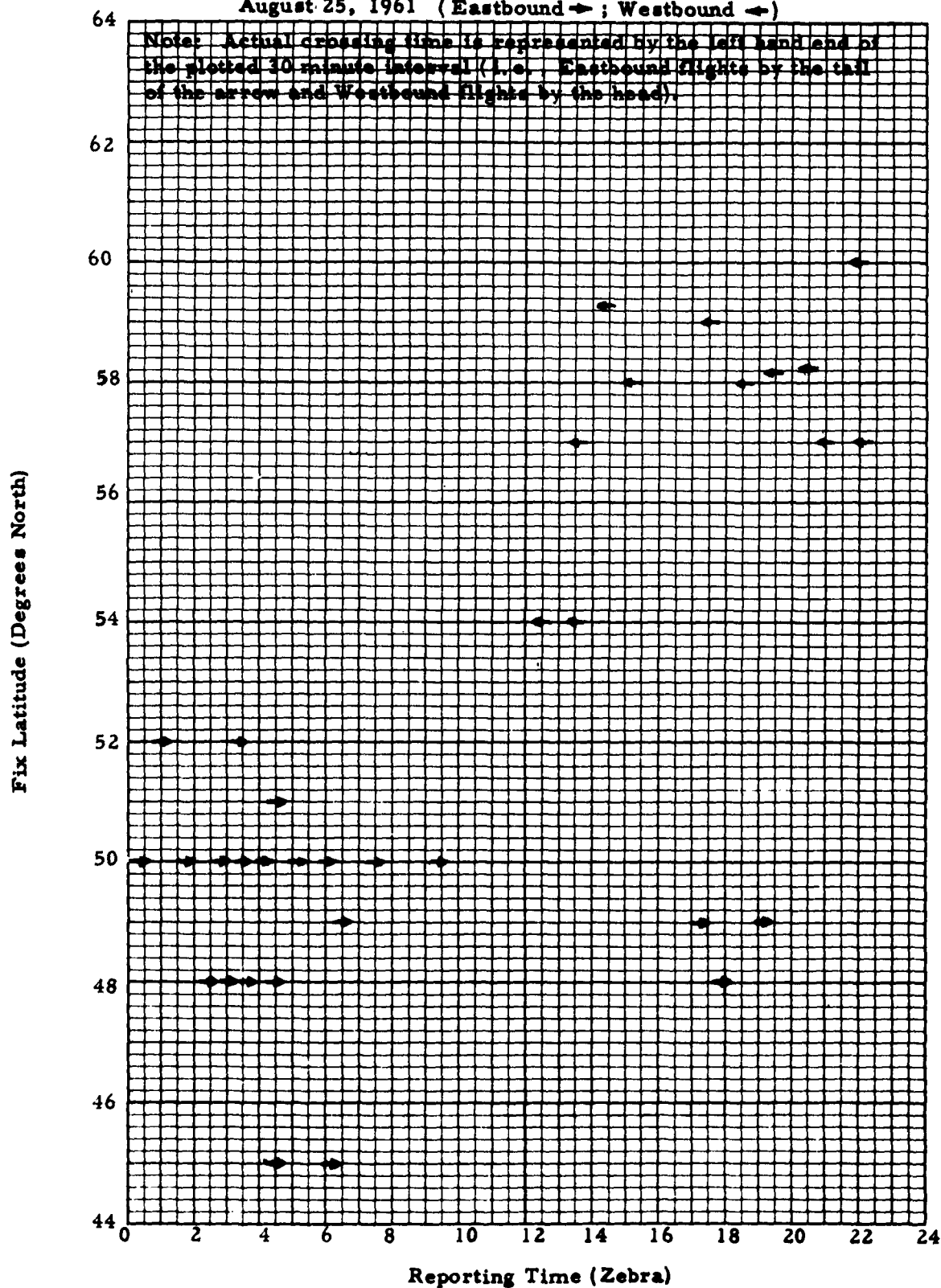


Figure 11d-FLIGHT SEPARATION: Distribution of Reporting Times and Fix Latitudes for Flights Crossing the 50° W Meridian at the 33,000 Feet Flight Level in the North Atlantic Region on August 25, 1961 (Eastbound → ; Westbound ←)



APPENDIX A: DATA PROCESSING

This appendix includes the flight data worksheet and IBM card format for the North Atlantic Region Traffic Survey Data included in this report. Original Data Collection Forms GPO 905192 (see Figure 2, page 3) were filled out in accordance with "Instructions and Alpha-Numeric Codes for North Atlantic Region Traffic Survey Data Recording Form" prepared by Analysis Branch, Bureau of Air Traffic Management, Washington, D. C.

An IBM card is prepared for each leg of a flight. A leg is the portion of flight between two successive reporting fixes. A worksheet, Figure 12, is completed for each flight. Entries in card columns 1 thru 37 are identical for all legs of a flight. Entries in card columns 38 thru 76 are made for each leg within a flight. The total number of legs (IBM Cards) for each flight is recorded in card columns 41 and 42; the sequence of flight legs is recorded in card columns 43 and 44. When the IBM cards are punched each card contains information in card columns 1 thru 76.

APPENDIX A:

CODE INTERPRETATIONS

<u>Card Column Location</u>	<u>Number of Columns</u>	<u>Field Description</u>	<u>IBM Card Code</u>	<u>Form GPO 905192 Item Code</u>	<u>Interpretation</u>
1-2	2	Sample Number	01 02 03 etc.	1	Peak Day Data for July 1961 Peak Day Data for August 1961 Peak Day Data for September 1961 (Each month until end of survey)
3-5	3	Flight Serial Number	001 002 etc.		Arbitrary Flight Serial Number assigned by TAB for cross reference and filing use.
6-7	2	Flight or Aircraft Identification Prefix	MA MV MR XX	3 XX	<u>Military Flights</u> Air Force Navy Army (See Civil Flight Identification Prefix Supplement on page 60 of this appendix)
8-11	4	Flight or Aircraft Identification Digits	XXXX XXXX	3 XXXX	Last four digits of identification number. If number is less than 4 digits enter zeros to left so that units position is in cc 11.
12	1	Time of Day		1	Entire Flight between 0000-2359Z of peak day.
		Duration Code		2	Flight already in North Atlantic Region at 0000Z of peak day.
				3	Flight remains in North Atlantic Region after 2359Z of peak day.

APPENDIX A: Code Interpretations Cont.

<u>Card Column Location</u>	<u>Number of Columns</u>	<u>Field Description</u>	<u>IBM</u>		<u>Form GPO 905192</u>	<u>Interpretation</u>
			<u>Card</u>	<u>Code</u>		
13	1	Owner	1	4	1	Scheduled Airline
			2		2	Non-Scheduled Airline
			3		M	Military
			4		4	General Aviation
14-15	2	Country of Ownership	01	5	1	United States of America
			02		2	Canada
			03		3	Italy
			04		4	France
			05		5	Ireland
			06		6	United Kingdom
			07		7	Portugal
			08		8	Iceland
			09		9	Norway
			10		A	Germany
			11		B	Brazil
			12		C	Colombia
			13		D	Argentina
			14		E	Chile
			15		F	Cuba
			16		G	Denmark
			17		H	Guatemala
			18		J	Panama
			19		K	Japan
			20		L	Spain
			21		M	Costa Rica
			22		N	Venezuela
			23		P	Israel

APPENDIX A: Code Interpretations Cont.

<u>Card Column Location</u>	<u>Number of Columns</u>	<u>Field Description</u>	<u>IBM Card Code</u>	<u>Form GPO 905192</u>		<u>Interpretation</u>
				<u>Item</u>	<u>Code</u>	
16-19	4	<u>Aircraft Type</u>	24		Q	Nicaragua
			25		R	Netherlands
			26		S	India
			27		T	Belgium
			28		U	Switzerland
			29		V	Sweden
			30		W	Honduras
			31		X	Australia
			32		Y	USSR
			33		Z	Egypt
			34			Mexico
			35			Pakistan
			36			Dominican Republic
			37			El Salvador
20	1	<u>Aircraft Class</u>	XXXX	6	XXXX	Four letter codes consistent with ATM Manual "Contractions"
			1			Piston
			2			Turboprop
21-24	4	<u>Flight Origin</u>	3			Turbojet
			XXXX	25	XXXX	Four letter location identifier from ICAO Doc. 7910
25-28	4	<u>Flight Destination</u>	XXXX	26	XXXX	Same as Flight Origin.

APPENDIX A: Code Interpretations Cont.

Card Column Location	Number of Columns	Field Description	IBM Card Code	Form		Interpretation
				Item	Code	
29	1	Flight Direction	1			Eastbound
			2			Westbound
			3			Southbound (North America to South America)
			4			Northbound (South America to North America)
			5			Round Robin
30-32	3	Routing Sequence	1XX			Overflies entire North Atlantic Region
			2XX			Takes off within and leaves North Atlantic Region
			3XX			Enters and lands within North Atlantic Region
			4XX			Itinerant Flights Takes off within and lands within North Atlantic Region
			5XX			Round Robin Flights Takes off within and lands within North Atlantic Region
			6XX			Incomplete flight data received Note: The units and hundreds position is used to denote specific combinations of centers. This code is listed on a sequence code sheet on page 59.

APPENDIX A: Code Interpretations Cont.

Card Column Location	Number of Columns	Field Description	IBM Card Code	Form		<u>Interpretation</u>
				Item	Code	
33-34	2	First Flight Level Request	XX	27	XX	Flight level in thousands of feet. Altitudes up to 9,000 feet will be prefixed with a zero. OT means "On Top"
35	1	Altitude Compar- ison	1 2 3			Assigned Level Equal to First Request Assigned Level less than First Request Assigned Level more than First Request
36-37	2	Altitude Diff- erence	XX			Difference in Flight Levels Between Assigned and Cruise Altitudes. Flight levels have 1,000 feet vertical separa- tion up to and including 29,000 feet. Over 29,000 feet each flight level has 2,000 feet vertical separation.
38-40	3	True Air Speed	XXX	7	XXX	Filed flight plan or enroute TAS in knots.
41-42	2	Number of IBM Cards for Flight	XX			The number of IBM cards (flight legs between pairs of fixes) used to describe the flight.
43-44	2	Card Sequence Number	XX			Chronological card sequence number for flight legs.

APPENDIX A: Code Interpretations Cont.

<u>Card Column Location</u>	<u>Number of Columns</u>	<u>Field Description</u>	<u>IBM Card Code</u>	<u>Form GPO 905192</u>		<u>Interpretation</u>
				<u>Item</u>	<u>Code</u>	
45-46	2	Adjacent Center at Entrance	01	11	1	New York Oceanic
			02		2	Goose Oceanic
			03		3	Gander Oceanic
			04		4	Bermuda Oceanic
			05		5	Shannon Oceanic
			06		6	Prestwick Oceanic
			07		7	Santa Maria Oceanic
			08		8	Reykavik Oceanic
			09		9	Stavanger
			10		H	Bodo Oceanic
			11		J	Sondrestrom Oceanic
			12		Z	Thule Oceanic
			13		A	Casablanca
			14		B	Lisbon Fir
			15		C	Madrid
			16		D	Paris
			17		E	London Fir
			18		F	Shannon Fir
			19		G	Scottish Fir
			20		K	Goose Fir
			21		L	Cander Fir
			22		M	Moncton Fir
			23		N	Boston ARTCC
			24		P	New York ARTCC
			25		Q	Norfolk ARTCC
			26		R	Jacksonville ARTCC
			27		S	Miami ARTCC
			28		T	Miami Oceanic
			29		U	San Juan CTA

APPENDIX A: Code Interpretations Cont.

<u>Card Column Location</u>	<u>Number of Columns</u>	<u>Field Description</u>	<u>IBM Card Code</u>	<u>Form GPO 905192 Item Code</u>	<u>Interpretation</u>
45-46 Cont.			30 31 32 33 34 35 56	V W X Y	San Juan Fir Bodo Fir Trondheim Fir Stavanger Fir Elsewhere Area NORD Fir Shannon/Prestwick Oceanic Center
47-48	2	Reporting Center	XX	2	X Same as Adjacent Center at Entrance above.
49-50	2	Adjacent Center at Exit	XX	24	X Same as Adjacent Center at Entrance above.
51-54	2	First Fix Latitude	XXXX	8, 12 15, 18 & 21	North Latitude in degrees (Card Column 51-52), and minutes (Card Column 53-54) for first fix of pair.
55-56	2	First Fix Longitude	XX	8, 12, 15, 18 & 21	West Longitude in degrees for first fix of pair. East Longitudes are indicated by a numeric eleven overpunch in units position.
57-60	4	First Fix Time (GMT)	XXXX	9, 13, 16, 19 & 22	Time in hours (Card Column 57-58) and minutes (Card Column 59-60)

APPENDIX A: Code Interpretations Cont.

Card Column Location	Number of Columns	Field Description	IBM Card Code	For, GPO 905192		Interpretation
				Item	Code	
61-62	2	First Fix Flight level	XX	10, 14, 17, 20 & 23		Flight level in thousands of feet. Altitudes up to 9,000 feet will be prefixed with a zero. OT means "On Top"
63-66	4	Second Fix Latitude	XXXX	8, 12, 15, 18 & 21		Same as First Fix Latitude
67-68	2	Second Fix Longitude	XX	8, 12, 15, 18 & 21		Same as First Fix Longitude
69-72	2	Second Fix Time (GMT)	XXXX	9, 13, 16, 19 & 21		Same as First Fix Time
73-74	2	Second Fix Flight level	XX	10, 14 17, 20 & 23		Same as First Fix Flight Level
75	1	Quality of Data	1			Transcribed Directly from Recording Center Form.

APPENDIX A: Code Interpretations Cont.

Card Location	Number of Columns	Field Description	IBM Card Code	Form GPO 905192 Item Code	Interpretation
75 cont.			2		Recording Center Entry missing from Data Form; transcribed directly from adjacent center data form.
			3		Recording Center Entry missing from Data Form; data estimated.
			4		Recording Center Data Form Missing; data estimated.
			5		Reporting Center Data Form missing; transcribed directly from adjacent center form.
76	1	Altitude Change	0 1 2		No change Climb between 1st & 2nd fix. Descent between 1st & 2nd fix.

IBM CARD CODE

Card Column 31-32 Code	Sequence of Oceanic Centers				Card Column 31-32 Code	Sequence of Oceanic Centers				Card Column 31-32 Code	Sequence of Oceanic Centers				Card Column 31-32 Code	Sequence of Oceanic Centers											
	1st		2nd			3rd		4th			1st		2nd			3rd		4th		1st		2nd		3rd		4th	
01	01				23	03	07			*78	56	11	03		63	09	10			76	02	11	08	56			
02	01	03			*92	03	07	56							64	09	10	12		77	01	03	56	07			
03	01	03	56	07	24	03	08			43	07									78	56	11	03				
*77	01	03	56	07	25	03	08	09		44	07	01			65	10				79	56	11					
04	01	03	07		*80	03	11	08		45	07	01	04		*94	10	08			80	03	11	08	02			
05	01	03	08							46	07	03			*91	10	09			81	56	08	03	02			
06	01	04			26	04				*85	07	03	01							82	02	11	12				
07	01	07			27	04	01			47	07	03	02		66	11				83	08	11	02	03			
					28	04	01	03		*84	07	56		01	67	11	02			84	07	56					
08	02				29	04	01	03	56	*88	07	56	03	01		68	11	08		85	07	03	01				
09	02	03			30	04	01	07							69	11	08	56		86	56	03	11	02			
10	02	03	56		31	04	01	07	56	48	08	02			70	11	08	09		87	56	08	03	01			
11	02	03	07							*93	08	03								88	07	56	03	01			
12	02	03	08		32	56				50	08	03	01		71	12				89	02	12					
13	02	11			33	56	03			51	08	03	02		*90	12	02			90	12	02					
14	02	11	08		34	56	03	01		52	08	56			72	12	08			91	10	09					
*76	02	11	08	56	35	56	03	01	04	53	08	09			73	12	08	56		92	03	07	56				
15	02	11	08	09	36	56	03	02		54	08	11			74	12	11			93	08	02					
16	02	11	08	12	*86	56	03	11	02	55	08	11	02		75	12	11	08		94	10	08					
*82	02	11	12		37	56	07			*83	08	11	02	03													
*89	02	12			38	56	07	01		56	08	12															
					39	56	07	01	04																		
17	03				40	56	08			57	09																
18	03	01			*87	56	08	03		58	09	08															
19	03	01	04		*81	56	08	03	02	59	09	08	03														
20	03	02			41	56	08	11	02	60	09	08	11														
21	03	02	11		42	56	08	11		61	09	08	11	02													
22	03	56			*79	56	11			62	09	08	12														

* These entries inserted in oceanic center sequences; they appear in code sequence at end of listing.

APPENDIX A: Civil Flight Identification Prefix

Part I - Alphabetical by Code

<u>Code</u>	<u>Owner</u>
AA	American Airlines, Inc. (USA)
AB	Empresa de Transportes, Aerovias Brasil, S.A. (Brazil)
AC	Aerovias Nacionales de Colombia, S.A. AVIANCA (Colombia)
AF	Air France (France)
AG	Guest Aerovias Mexico, S.A. (Mexico)
AI	Air India Airlines (India)
AK	Alaska Coastal Airlines (USA)
AM	Aeronaves de Mexico, S.A. (Mexico)
AR	Aerolineas Argentina FAMA (Argentina)
AS	Alaska Airlines, Inc. (USA)
AW	Airwork Limited (U.K.)
AZ	Alitalia-Linee Aeree Italiane (Italy)
BA	British Overseas Airways Corp. BOAC (U.K.)
IN	Braniff International Airways, Inc. (USA)
BW	British West Indian Airways, Ltd. BWIA (U.K.)
CA	Capital Airlines, Inc. (USA)
CB	Caribbean Atlantic Airlines, Inc. (USA)
CC	Lloyd Aereo Colombiana (Colombia)
CF	General Aviation (Canada)
CH	California Hawaiian (Non-Scheduled) (USA)
CI	Cinta Chilean Airlines (Chile)
CO	Continental Air Lines, Inc. (USA)
CP	Canadian Pacific Airlines, Ltd. CPAL (Canada)
CU	Compania Cubana de Aviacion, S. A. (Cuba)
CZ	Cuba Aeropostal, S.A. (Cuba)
DL	Delta Air Lines, Inc. (USA)
DO	Compania Dominicana de Aviacion, S.A. CDA (Dominican Republic)
EA	Eastern Air Lines, Inc. (USA)
EG	Eagle Airways of Britain (U.K.)
EM	Quantas Empire Airways (Australia)
ES	Ellis Air Lines (USA)
FI	Flugfelag Islands (Iceland)
FT	Flying Tiger Airlines (USA)

APPENDIX A: Part I (continued)

<u>Code</u>	<u>Owner</u>
GL	Great Lakes (Non Scheduled) (USA)
GU	Empress Guatemalteca de Aviacion AVIATECA (Guatemala)
HP	Aerovias Panama (Panama)
IB	Ibarta Lineas Aereas de Espana, S.A. (Spain)
IN	Aerlinte Eireann Tta (Ireland)
IU	Inter Continental Airlines (USA)
JL	Japan Airlines Co., Ltd. (Japan)
KL	KLM Royal Dutch Airlines (Netherlands)
LA	Lines Aerea Nacional de Chiles LAN (Chile)
LH	Deutsche Lufthansa Aktiengesellschaft (Germany)
LL	Loftleidir H.F. - Icelandic Airlines (Iceland)
LM	Lineas Aereas Mexicanas, S.A. (Mexico)
LR	Lineas Aereas Costaricenses, S.A. LASCA (Costa Rica)
LV	Linea Aeropostal Venezolana LAV (Venezuela)
LY	El Al Israel Airlines, Ltd. (Israel)
MA	Military, Air Force (USA)
MC	Maritime Central Airways (Canada)
ME	Mackey Airlines, Inc. (USA)
MR	Military, Army (USA)
MV	Military, Navy (USA)
MX	Compania Mexicana de Aviacion, S.A. CMA (Mexico)
NA	National Airlines, Inc. (USA)
NC	Northern Consolidated Airlines, Inc. (USA)
NE	Northeast Airlines, Inc. (USA)
NI	Lineas Aereas de Nicaragua, S.A. (Nicaragua)
NO	North Central Airlines, Inc. (USA)
NN	Non-Scheduled (USA)
NW	Northwest Airlines, Inc. (USA)
NX	General Aviation (USA)
ON	Overseas National (USA)

APPENDIX A: Part I (continued)

Code	Owner
PA	Pan American World Airways System (USA)
PC	Pacific Airlines, Inc. (USA)
PG	Pan American-Grance Airways, Inc. (USA)
PK	Pakistan Int. Airlines (Pakistan)
PN	Pacific Northern Airlines, Inc. (USA)
PR	President Airlines, Inc. (USA)
PW	Pacific Western Airlines, Ltd. (Canada)
QA	Aerovias "Q", SA (Cuba)
RD	Riddle Airlines (USA)
RG	Empresa de Viacao Aerea Rio Grandense VARIG (Brazil)
RN	Rutas Aereas Nacionales, S.A. RANSA (Venezuela)
RV	Reeve Aleutian Airways, Inc. (USA)
SB	Seaboard and Western Airlines (USA)
SK	Scandinavian Airlines System SAS (Scandinavia)
SN	Societe Anonyme Belge d'Exploitation de la Navigation Aerienne SABENA (Belgium)
SR	Swiss Air Transport Co., Ltd. (Switzerland)
SU	Aeroflot (USSR)
TA	TACA International Airlines, S.A. (El Salvador)
TC	Trans-Canada Air Lines TCA (Canada)
TN	Trans-Atlantic (Non-Scheduled)
TO	Transcontinental S.A. de Transportes (Argentina)
TP	Transportes Aereos (Portugal)
TR	Trans Caribbean Airways (USA)
TW	Trans World Airlines, Inc. (USA)
TX	Transportes Aereos Nacionales, S.A. TAN (Honduras)
TZ	Aero Transportes, S.A. ATSA (Mexico)
UA	United Air Lines, Inc. (USA)
UR	Uraba Medellin and Central Airways, Inc. (USA)
US	United States Overseas Airlines, Inc.
VE	Aerovias Venezolanas, S.A. AVENSA (Venezuela)
WA	Western Air Lines, Inc. (USA)
WE	Wien Alaska Airlines (USA)

APPENDIX A:

Part II - Alphabetical by Owner

<u>Owner</u>	<u>Code</u>
Aerlínte Éireann Tta (Ireland)	IN
Aero Transportes, S.A. ATSA (Mexico)	TZ
Aeroflot (USSR)	SU
Aerolineas Argentina FAMA (Argentina)	AR
Aeronaves de Mexico, S.A. (Mexico)	AM
Aerovias Nacionales de Colombia, S.A. AVIANCA (Colombia)	AC
Aerovias Panama (Panama)	HP
Aerovias "Q", S.A. (Cuba)	QA
Aerovias Venezolanas, S.A., AVENSA (Venezuela)	VE
Air France (France)	AF
Air India Airlines (India)	AI
Airwork Limited (U.K.)	AW
Alaska Airlines, Inc. (USA)	AS
Alaska Coastal Airlines (USA)	AK
Alitalia-Linee Aeree Italiane (Italy)	AZ
American Airlines, Inc. (USA)	AA
Braniff International Airways, Inc. (USA)	BN
British Overseas Airways Corp. BOAC (U.K.)	BA
British West Indian Airways, Ltd. BWIA (U.K.)	BW
California Hawaiian (Non-Scheduled) (USA)	CH
Canadian Pacific Airlines, Ltd. (Canada)	CP
Capital Airlines, Inc. (USA)	CA
Caribbean Atlantic Airlines, Inc. (USA)	CB
Cinta Chilean Airlines (Chile)	CI
Lloyd Aereo Colombiana (Colombia)	CC
Compania Cubana de Aviacion, S.A. (Cuba)	CU
Compania Dominicana de Aviacion S.A. CDA (Dominican Republic)	DO
Compania Mexicana de Aviacion, S.A. CMA (Mexico)	MX
Continental Air Lines, Inc. (USA)	CO
Cuba Aeropostal, S.A. (Cuba)	CZ
Delta Air Lines, Inc. (USA)	DL
Deutsche Lufthansa Aktiengesellschaft (Germany)	LH

APPENDIX A: Part II (continued)

<u>Owner</u>	<u>Code</u>
Eagle Airways of Britain (U.K.)	EG
Eastern Air Lines, Inc. (USA)	EA
El Al Israel Airlines, Ltd. (Israel)	LY
Empresa de Transportes, Aerovias Brasil, S.A. (Brazil)	AB
Empresa de Viacao Aerea Rio Grandense VARIG (Brazil)	RG
Empress Guatemalteca de Aviacion AVIATECA (Guatemala)	GU
Ellis Air Lines (USA)	ES
Flying Tiger Lines (USA)	FT
Flugfelag Islands (Iceland)	FI
General Aviation	CF
General Aviation (USA)	NX
Great Lakes (Non-Scheduled)(USA)	GL
Guest Aerovias Mexico, S.A. (Mexico)	AG
Ibarta Lineas Aereas de Espana, S.A. (Spain)	IB
Inter Continental Airlines (USA)	IU
Japan Airlines Co., Ltd. (Japan)	JL
KLM Royal Dutch Airlines (Netherlands)	KL
Linea Aeropostal Venezolana LAV (Venezuela)	LV
Lineas Aereas Costaricenses, S.A. LASCA (Costa Rica)	LR
Lineas Aereas Mexicanas, S.A. (Mexico)	LM
Lineas Aereas de Nicaragua, S.A. (Nicaragua)	NI
Lines Aerea Nacional de Chile LAN (Chile)	LA
Lofleidir H.F., Ocelandic Airlines (Iceland)	LL
Mackey Airlines, Inc. (USA)	ME
Maritime Central Airways (Canada)	MC
Military, Air Force	MA
Military, Army	MR
Military, Navy	MV
National Airlines, Inc. (USA)	NA
Non Scheduled (USA)	NN
North Central Airlines, Inc. (USA)	NO
Northeast Airlines, Inc. (USA)	NE
Northern Consolidated Airlines, Inc. (USA)	NC
Northwest Airlines, Inc. (USA)	NW

APPENDIX A: Part II (continued)

<u>Owner</u>	<u>Code</u>
Overseas National (USA)	ON
Pacific Airlines, Inc. (USA)	PC
Pacific Northern Airlines, Inc. (USA)	PN
Pacific Western Airlines, Ltd. (Canada)	PW
Pakistan Int. Airlines (Pakistan)	PK
Pan American-Grance Airways, Inc. (USA)	PG
Pan American World Airways System (USA)	PA
President Airlines, Inc. (USA)	PR
Quantas Empire Airways (Australia)	EM
Reeve Aleutian Airways, Inc. (USA)	RV
Riddle Airlines (USA)	RD
Rutas Aereas Nacionales, S. A. RANSA (Venezuela)	RN
Seaboard and Western Airlines (USA)	SB
Scandinavian Airlines System SAS (Scandinavia)	SK
Societe Anonyme Belge d'Exploitation de la Navigation Aerienne SABENA (Belgium)	SN
Swiss Air Transport Co., Ltd. (Switzerland)	SR
TACA International Airlines, S. A. (El Salvador)	TA
Trans-Atlantic (Non-Scheduled) (USA)	TN
Trans-Canada Air Lines TCA (Canada)	TC
Trans Caribbean Airways (USA)	TR
Transcontinental S. A. de Transportes (Argentina)	TO
Transportes Aereas Portuguese, S. A. R. L. (Portugal)	TP
Transportes Aereos Nacionales, S. A. TAN (Honduras)	TX
Trans World Airlines, Inc. (USA)	TW
United Air Lines, Inc. (USA)	UA
Uraba Medellin and Central Airways, Inc. (USA)	UR
United States Overseas Airlines, Inc.	US
Western Air Lines, Inc. (USA)	WA
Wien Alaska Airlines (USA)	WE