

DATE 30 Mar 64

Time at sunrise = 0548 Position at sunrise = 15° 59' N 148° 04' W
Time at sunset = 1806 Position at sunset = 17° 50' N 147° 59' W
~~Time of arrival at last point of actual grid =~~
Miles traveled between 0000 and sunrise = 45
Miles traveled between sunrise and sunset = 115
Miles traveled between sunset and 2400 = 62
~~Miles between sunrise and last point of grid =~~
~~Miles between last point of grid and 2400 =~~

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 31 Mar 64

Time at sunrise = 0546 Position at sunrise = 19° 46' N 147° 56' W
Time at sunset = 1806 Position at sunset = 21° 49' N 148° 01' W
Miles between 0000 and sunrise = 54
Miles between sunrise and sunset = 123
Miles between sunset and 2400 = 48
Time and miles from Johnston Island at nearest point =

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 1 Apr 64

Time at sunrise = ⁰⁵⁴⁶ Position at sunrise = 23° 31' N 147° 59' W

Time at sunset = ¹⁸⁰⁶ Position at sunset = 25° 33' N 148° 00' W

Miles traveled from 0000 hours to sunrise = 54

Miles traveled from sunrise to sunset = 122

Miles traveled from sunset to 2400 hours = 57

TIME OF FIX TYPE OF FIX LONGITUDE LATITUDE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 2 Apr 64

Time at sunrise = ⁰⁵⁵⁰ Position at sunrise = 26° 05' N 148° 48' W

Time at sunset = ¹⁸²⁰ Position at sunset = 25° 03' N 150° 58' W

Miles traveled from 0000 hours to sunrise = 51

Miles traveled from sunrise to sunset = 113

Miles traveled from sunset to 2400 hours = 58

TIME OF FIX TYPE OF FIX LONGITUDE LATITUDE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 3 Apr 64

Time at sunrise = 0601 Position at sunrise = 24°54'N 153°09'W

Time at sunset = 1834 Position at sunset = 25°01'N 155°29'W

~~Time of arrival at last point of actual grid =~~

Miles traveled between 0000 and sunrise = 73

Miles traveled between sunrise and sunset = 140

Miles traveled between sunset and 2400 = 57

~~Miles between sunrise and last point of grid =~~

~~Miles between last point of grid and 2400 =~~

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
--	-------------	-------------	-----------	----------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 4 Apr 64

Time at sunrise = 0617 Position at sunrise = 24°34'N 157°04'W

Time at sunset = 1844 Position at sunset = 22°~~35'~~¹⁷N 157°00'W

Miles between 0000 and sunrise = 63

Miles between sunrise and sunset = 121

Miles between sunset and 2400 = 34

Time and miles from Johnston Island at nearest point =

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
--	-------------	-------------	-----------	----------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

19
28
77
16
24
41

DATE 5 Apr 64

Time at sunrise = 0623 Position at sunrise = 21°14'N 157°49'W
Time at sunset = Position at sunset =
Times and miles from Johnston Island at nearest point =
Miles traveled from 0000 to sunrise = 54
Miles traveled from sunrise to sunset =
Miles traveled from sunset to 2400 =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE _____

Time at sunrise = Position at sunrise =
Time at sunset = Position at sunset =
Miles traveled from 0000 to sunrise =
Miles traveled from sunrise to sunset =
Miles traveled from sunset to 2400 =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

Time at first leg of the actual grid =
Miles between sunrise to first leg of grid =
Miles between first leg of grid and sunset =

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Bureau of Commercial Fisheries
P. O. Box 3830, Honolulu, Hawaii 96812

PLAN FOR TOWNSEND CROMWELL, CRUISE 2

I. OBJECTIVE:

The Trade Wind Zone Investigation is an oceanographic experiment to verify a qualitative circulation model and to obtain those data which are necessary to develop a model to explain the changes in the distribution of properties (temperature, salinity, etc.) in the sea in terms of seasonal changes in processes (net heat exchange and water exchange across the sea surface, wind stress, and effects of water motion). The experiment consists of three phases: the design and planning phase to ensure that the data to be obtained are significant in terms of the problems to be tackled; the field phase, a four-ship, 24 months operation to obtain observations of the three-dimensional time-sequence distribution of properties in the North Pacific trade wind zone; the analysis and evaluation phase.

As part of the design and planning phase of the investigation a sequence of cruises to take place at 30-day intervals using one ship has been planned to test and evaluate the sampling procedures and processing techniques.

Cruise 2 of the Townsend Cromwell is the second in this series of cruises.

II. CRUISE PERIOD:

March 16 to April 4, 1964.

III. AREA OF OPERATION:

Central North Pacific bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W. (See attached chart for cruise track).

IV. MISSIONS:

A. OCEANOGRAPHIC

1. On each of the 42 oceanographic stations temperatures and salinities will be obtained at the following depths: 0, 10 (50), 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 400, 500, 600, 800, 1000, 1200, and 1500 meters.

2. To determine the depth of the mixed surface layer and thermocline structure, 270 m. bathythermograph casts will be made at 30 mile intervals and before and after each oceanographic station except as specified below.
3. For variability studies 270 m. bathythermograph casts will be made.
 - a. at 10 mile intervals between stations 19 and 21, 26 and 28, and 35 and 37;
 - b. at 1 hour intervals on current stations.
4. Surface bucket temperatures and water samples for salinity determination are to be obtained at each bathythermograph observation.
5. Bathythermograph data are to be coded and transmitted as per instructions from the Naval Oceanographic Office, Prediction Division at 0000Z, 0600Z, 1200Z, 1800Z.
Radio address: FLE NUM WEA FAC Monterey.
6. Current observations
 - a. Occupy two 12 hour current stations, one in the southern section and the other in the northern section of the observational region. Exact location depends upon weather conditions and is to be determined by the field party chief. Currents are to be measured in the mixed surface layer at 10 m., 25 m. and thence at 25 m. intervals with the deepest measurement in the upper portion of the thermocline, while drifting relative to a parachute drogue set at 1000 m.
 - b. Plastic enclosed drift cards will be released at each oceanographic station and at 30 mile intervals when making bathythermograph casts.

B. METEOROLOGICAL

1. Standard marine weather observations are to be made and transmitted at 0000, 0600, 1200, and 1800 GMT.
2. Radiation measurements
 - a. Solar radiation is to be measured and recorded.

C. BIOLOGICAL

1. Surface plankton tows

- a. A half-hour 1-meter surface tow (approx. depth 2-10 meters) to be made each night at 2000 except at current stations.
 - b. One set of day-night surface tows (12 hours apart) to be made at 0800 and 2000 at current station.
2. Maintain a standard watch for bird flocks and fish schools during daylight hours.

D. MISCELLANEOUS OBSERVATIONS

1. The thermograph is to be operated continuously, noting the time and date of beginning and end of record and when changing the recording paper. Time is to be corrected daily.

V. OPERATIONAL SCHEDULE:

Depart for station 1 March 16 returning after completion of observational program on or about April 4, 1964.

VI. GEAR REQUIREMENTS:

- A. All gear necessary to conduct 20 bottle oceanographic casts to 1500 m.
- B. Equipment for 270 m. BT casts.
- C. Equipment to make standard marine weather observations.
- D. Eppley pyrhelimeter and recorder.
- E. Sufficient salinity sample bottles for shore analysis.
- F. Bergen Nautic current meter.
- G. Parachute drogue assemblies (3) and spares for mooring at 1000 m. depths.
- H. 3000 plastic enclosed drift cards.
- I. Plankton gear.

VII. FIELD PARTY PERSONNEL:

Field party chief.
4 oceanographic observers
2 bird observers, Smithsonian Institution

VIII. RECORDS AND REPORTS:

Logs and records are to be kept in accordance with procedures outlined in the Scientific Field Manual and as specified by the TWZO Program.

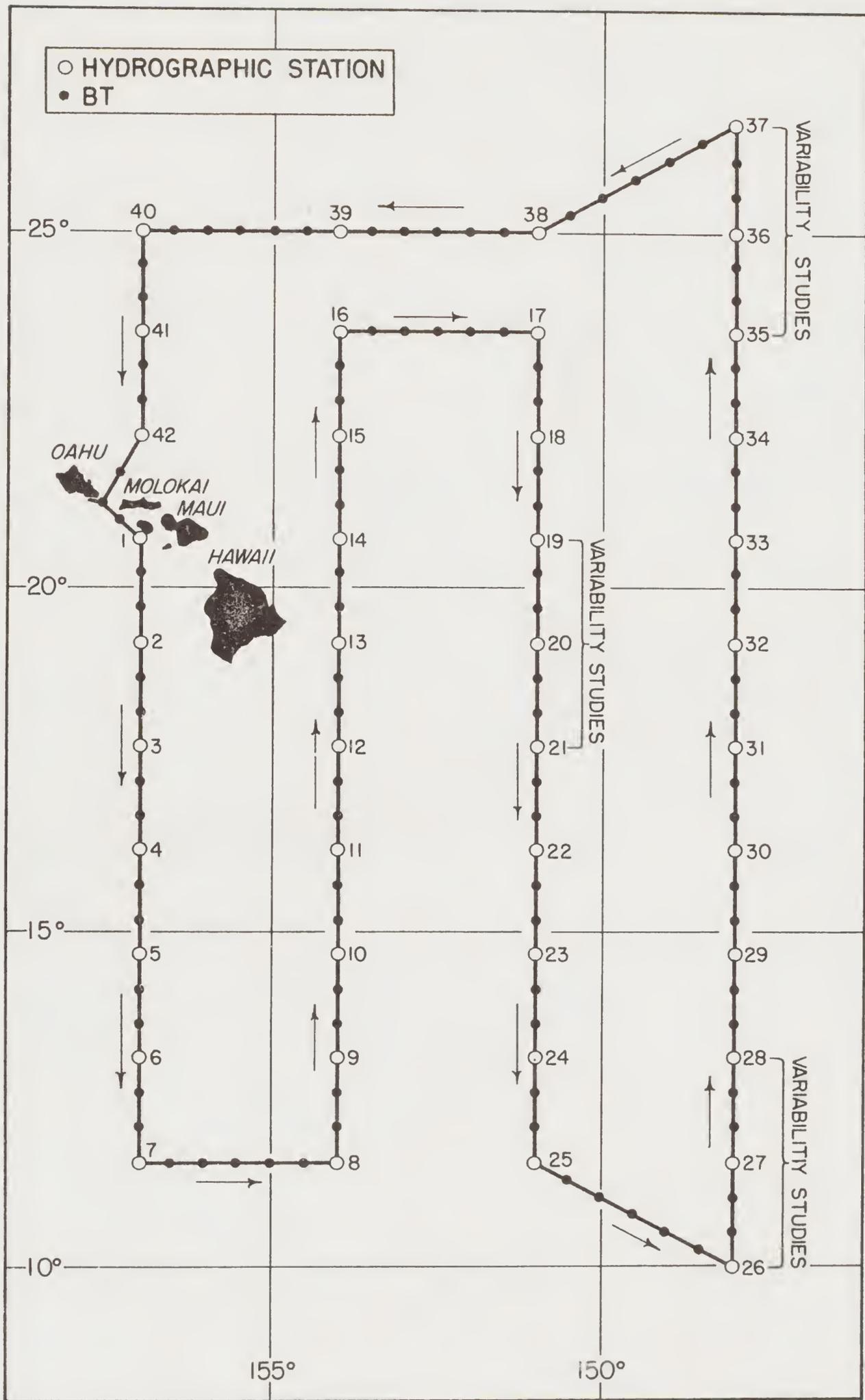
A press release and cruise report will be submitted upon conclusion of the cruise and a narrative report shortly thereafter.



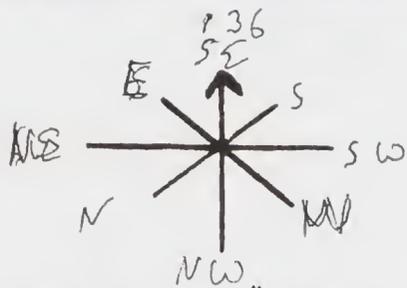
Tamio Otsu
Acting Area Director

Attachment

March 9, 1964



Track chart for Townsend Cromwell Cruise 2.



150F

DATE 16 Mar 64

Pg. # 1

time species # dir. hgt. remarks loc.

1430 begin observations

1450 Shearwater/Petrel 1 NW not clearly seen

1515 Pomarine J. ~~Shearwater~~ 2 @ splashing + chasing on water - large + chunky with dark breast bands. 1 light phase

1516 Pomarine Jaeger 1 NW 400 off port

1520 Pomarine J. 1 NW 20 ft 300 off port

1545 Pomarine Jaeger 1 S 300 off bow

1549 Newell's S. 1 W

1550 Sooty Tern 2 NE

1608 Newell's Shearwater 5 SE 300 off starboard

1612 Red-footed Booby 2 NE adults 5 ft above surface

1614 Sooty Tern 6 NE travelling

1616 Red-footed Booby 1 NE

1620 Sooty Tern 3 NE

1625 Red-footed Booby 2 NE 1 adult, 1 immature

1629 Red-footed Booby 1 NE

1630 Sooty Tern 1 NE

1636 whale 1 N

1637 Sooty Tern(?) 1 N

1650 whale 1 E

1651 whale 1 S

1652 Sooty Tern 3 NE off bow

1655 Porpoise 1 NW

1657 Sooty Tern 2 N

1700 Pomarine Jaeger 1

1702 Sooty Tern 1 NE

1705 Sooty Tern 9 NE

1705 Red-foot B 2 NE adult

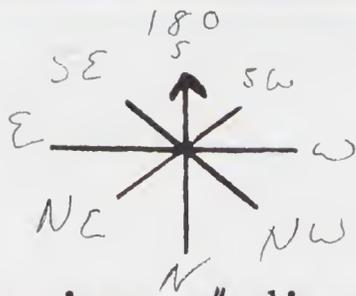


B.F.F.

DATE 16 Mar 64
Pg. # 2

time species # dir. hgt. remarks loc.

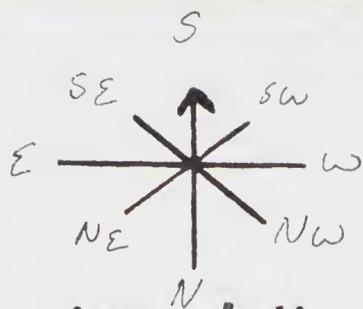
1706	Sooty Tern	4	NE			
	P. Jaeger	2				
1711	Wedgetail S.	1	NE		lt. phase	
1712	Sooty Tern	4	NE			
1713	Noddy Tern	1			perched on block of wood	
1715	Sooty Tern	100+	@		feeding flock	
1716	Red-foot B	2	NE		adult	
1718	Noddy T	2	NE			
1720	P Jaeger	2	N		coming from main flock	
1728	Sooty Tern	1	NE			
1729	Sooty Tern	3	SW			
1731	Booby sp	7	NW		very tight flock	
1734	Sooty Tern	1	SW			
1737	Pomarine Jaeger	1	SE			
1745	Pomarine Jaeger	2	SE			
1747	Sooty Tern	12	@			
1748	Pomarine Jaeger	2				
1749	Sooty Tern	50	@		feeding flock 2 jaegers observed chasing terns	
to						
1754						
1758	Pomarine Jaeger	1	SE		flying along side of ship	
1800	Pomarine Jaeger	3	SE		fly along or ahead of ship until 1808	
1817	Sooty Tern	1	NE		100 yds in front of ship	
1900	observations	secured				



DATE 17 Mar 64
Pg. # 1

time species # dir. hgt. remarks loc.

0625	begin observations					
0634	Tropicbird sp	2	E	75ft	called fairy terns by crew	
0640	Sooty Tern	2	E	25ft		
0645	Wedgetail	1	W		lt phase	
0737	Petrel sp	2	W			
0749	Petrel sp	1	NW			
0844	Sooty Tern	2	W	25ft		
0925	Sooty Tern	2	E		seen by watch	
0927	Sooty Tern	1	N		close to ship (50yds)	
0930	Bonin Is P.	1	NW		heavy black edges to wings	
0958	Shorebird sp	1	SW		possibly Sanderling	
1026	Bonin Is P	1	S		400 to starboard - heavy black wing edges. called storm P. by crew	
1105	White bird	1	NW		at least 1 mile distant. Fairy Tern or Tropicbird probably	
1142	Sooty Tern	1	NW		1000+ yds off starboard	
1200	observation suspended					
1300	observations resumed					
1230	"stompetrel"	1			identified by crew - had white breast, probably Bonin Is P.	
1336	Sooty Tern	3	E	low	in front of squall line	
1339	Sooty Tern	3	S-E	low	flying toward squall line crossing bow	
P. 01 1340	White-necked P	1	SE		200 to starboard	
1346	Turtle	1			20 yds from ship on surface	
1405	Harcourt's SP.	1	S		150 off starboard	
1410	Harcourt's SP	1	NW			
1458	Shearwater / petrel	1	W		spotted by watch	
1530	stop for hydro station					
1624	Newell's Shear.	1	E		500 off port while stationary - typical shearwater flight - contracting upper + lower -	
1650	resume ship's course					
1705	observations suspended for 1 hr					
P. 01 1801	Hard-humped P	2	N		scaling high into wind 400-600 to port	
1845	end observations					

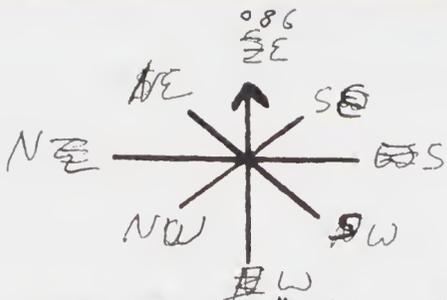


DATE 18 Mar 64

Pg. # 1

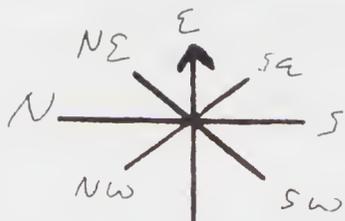
time species # dir. hgt. remarks loc.

0618	observations commence						
0826	Red-tailed T.B.	1	NE	75 ft	bill red - tail long + red		
0930	Shearwater/ Petrel	1			sighted by watch		
1005	stop for hydro station						
1020	Red-tailed T.B.	1	⊙	75 ft	bill yellow, tail short and bleached - no black on axillaries		
1105	Red-tailed T.B.	3	⊙	75 ft	display behavior noted - all 3 immature birds - all white no pink tinge flew off toward SE		
1117	Red-tailed T.B.	1	S	75 ft	circled ship once flew off toward S		
1129	New Zealand Shearwater	1	W	20-50 ft	first seen as it circled about 30 ft. off starboard black cap, light gray neck and back; very strongly marked dark bars on wings (upper surface) and back forming inverted W pattern (well described but not pictured in Peterson)		
1147	Red-tailed T.B.	1	S	0-40 ft	flushed from water by ship		
1309	Harbour's Storm Petrel	1	W	WT to 10 ft	cut in front of ship (less than 30 ft.)		inverted W much more clearly defined
1320	Unidentified shearwater	1	E	WT to 15 ft	grayish brown back and wings similar to Wedge-tail; undersurfaces not seen		
1335-1340	feeding flock	40+	⊙	WT to 50 ft	circling and splashing (dipping) in water in small area approximately 1000 yds. off starboard side of ship		
1338	Harbour's (?) Storm Petrel	1			about 500 yds off starboard; white rump patch not clearly seen		
1350	Unidentified shearwater	1	NE	low			
1450	Sooty Tern	10	N	1-25 ft			
1500	Jaeger sp.	1	N	1-40 ft	large, dark, gull-like; against light; observation unsatisfactory		
1555	Sooty Tern	13	E	10-50 ft	at least 2 immatures (one approached within 50 feet of the ship and called several times)		
1711	Shearwater sp.	1	N	2-25	soaring well above horizon at 1 mile distance to starboard in same manner as Sooty Shearwaters		
1847	end observations						



DATE 19 Mar 64
Pg. # 1

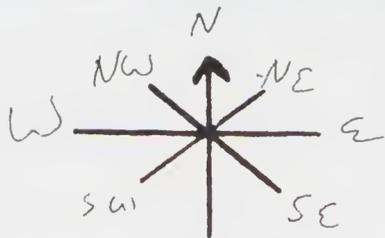
time	species	#	dir.	hgt.	remarks	loc.
0630	observations	begin				
0645	Bonin Is. Petrel	1	E		400 to starboard - ^{thick} dark underwing edges	
0715	Bonin Is. (?) Petrel	1	S		300 yds off starboard	
0813	Red-tailed T.B.	1			Flew above ship for several minutes immature with very short pale red central rectrices	
0844	Wedge-tailed Shearwater	1	SW	WT to 10 ft.	light phase	
1006	Fairy Tern	1	E	25 ft	1000+ off starboard	
1034	Tern, SP Noddy?	1	S	25 ft	all dark, either young Sooty or Noddy, probably latter since not speckled - passed over bow.	
1145	Christmas Island Shearwater?	1	N	2-5 ft	medium sized all dark shearwater, 250 off bow flapped on stiff wings, did not bend steeply flaps + glide pattern more typically shearwater than Wedgetail but not with long arcs like Newell's or Sooty Shearwater - not in hurry, unrushed flight	
1215	Sooty Shearwater	1	N	2-5 ft	silver underwing linings seen otherwise correspond to above	
1221	Sooty Shear?	1	N	2-10	further off bow, not as clearly seen, but perhaps faint of silver - arced more	
1314	Red-tailed T.B.	1	E	60 ft.	imm. with short central tail feathers	
1345	Sooty(?) Shearwater	1	N	5 ft.	DARK BACK SEEN but NOT UNDERPARTS AS BIRD PASSED 50 ft off bow of ship	
1435	Harcourt's Storm Petrel	1	S	WT to 5 ft.	200 yds. off starboard	
1436	Shearwater/Petrel	1	N		seen by watch	
1504	Jaeger, Pom?	1	N	25 ft	close off port - large, gull sized - brown dorsally light ventrally with light bar in dorsal wing surface  - seemed for too large for Pom. some J. gull-like flapping of wings	
1506	Wedge-tails	1	S		light phase	
1552	Harcourt's Storm Petrel	1	E		150 off starboard - light pattern on dorsal wing surface noted	



DATE 19 Mar 64
Pg. # 2

time species # dir. hgt. remarks loc.

1630	Sooty Tern	20	E	20 - 100 ft	1500 yds off port bow		
1758	Sooty Shearwater	2	N	2-25	silver linings seen on one - other spotted by watch		
1806	Leach's Storm Petrel	1	S		white wings seen 200 on starboard		
1807	Leach's Storm Petrel	1	N		200 on port - weird + bottle flight		
1827	Shearwater/ petrel	1	W		seen by watch		
1832	Shearwater SP	1	N		headed north after following ship 30 sec or so typical shearwater flight + silhouette. Appeared all dark but light was failing		
1845	suspend observations						
1846	Shearwater SP	1	N		behind ship		

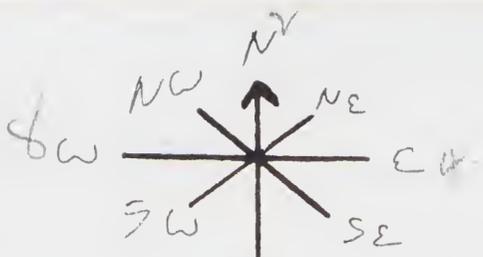


DATE 20 Mar 64

Pg. # 1

time species ^S # dir. hgt. remarks loc.

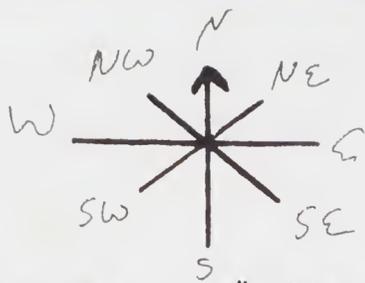
0615	begin observations					
0632	"Lark" Storm Petrel	1	N			75 yds off starboard - flew like small petrel on stiff wings, banking back & forth & only flapping occasionally. White rump clearly visible <u>Type B</u>
0634	Shearwater sp	1	N			sighted by watch - high scaling - possible sooty shear
0711	Wedgetail S.	1	E			very dark - somewhat lighter underwing & on breast definitely dark phase but flying also Wedgetail
0720	Newell's S.	1	NE			200 off bow. sharp contrast upper & lower - typical shearwater flight on stiff wings - white "tab" like Violet-green Swallow clearly seen.
0730	Shearwater sp.	1	N			250 yds. off port dark back underparts not seen high scaling flight possible Sooty Shearwater
✓ 0746	Sooty Shearwater	1	N	5 to 40 ft.		high scaling flight did not flap dark (grayish brown upper parts) white wing linings very conspicuous
✓ 0800	Sooty Shearwater	1	N			300 yds off starboard
	Shearwater sp.	1	N			2000 yds. off starboard silhouette seen against horizon ←
→ 0805	under way					stopped for hydrostation during past hour
0810	Shearwater sp	1	N			probable Sooty Shear but too far off.
0815	sooty shear?	1	N			at distance - high scaling shearwater
0830	Shearwater sp	1	N			at distance high scaling - probable sooty shear
0837	Shearwater sp	1	NW			ditto above
✓ 0850	Sooty shear.	3	NW			white lining seen clearly
0903	Storm Petrel sp	1	N			in sun. bad light
0934	Shearwater/ petrel	1	NW			spotted by watch
0946	"Lark" Storm Petrel	1	NW			<u>Type B</u> petrel-like. flies with swoops & fast course changes on stiff wings. Not very batty - white rump seen
1020	Sooty tern	15	⊙			feeding flock, dispersing as we came up to them
✓ 1021	Sooty Shearwater	1	NW			between ship & feeding flock



DATE 20 Mar 64
Pg. # 2

time species # dir. hgt. remarks loc.

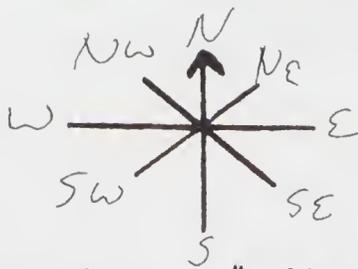
1022	Wedgetail S.	1	N		dark phase	
1023	Bulwer's Petrel	1	N		all dark small petrel with light wing bars + wedge tail. clearly seen	
1024	Sooty Tern	1	SE	20	Between Bulwers + Wedgetail.	
1030	Bulwer's P.	1	S		second Bulwers - first in company of above Wedgetail both seen at same time	
1039	Shearwater sp.	1	N			
1042	Sooty Shear?	1	NW		high scaling shearwater 800 off bow	
1140	Shearwater sp.	1	N		sighted by watch	
1159	Whale	4	NE		just off bow	
1224	Sooty Shear?	3	N		high scaling shearwaters 1500 to port. all dark	
1300	Harcourt's Storm Petrel	1	N		250 yds. off port petrel-like Type B petrel-like Type B	
1318	Harcourt's SP	1	N		Petrel-like - Type B	
1320	Wedgetail S.	1	SE		dark phase 100 yds from port	
1320	Storm Petrel SP	1			seen by watch	
1348	Wedgetailed Shearwater	2	E	WT to 15 ft.	Feeding behavior observed light phase	
1357	Harcourt's Storm Petrel	1	N	WT to 10 ft.	Flight petrel-like, steady Type B	
1405	Sooty Tern	3	SE	50 ft.	passed 100 ft. of bow of ship	
1426	Sooty Shear	2	NW		sitting on water - flushed by ship. white linings seen.	
1446	Harcourt's S.P.	1	NE		Type B sitting with sooty shears.	
1515	stop for hydrostation					
1630	resume course					
1643	Wedgetail S	1	E		50 yds off bow - dark phase	
1645	Tropicbird sp	2	SE	75 ft	didn't come close enough for species identification	
1810	sooty Tern	50	S	5-150 ft	some feeding activity although most of the	
1816	Sooty Tern	16	S	50 ft	birds were high no feeding	
1845	end observations					



DATE 21 Mar 64
Pg. # 1

time species # dir. hgt. remarks loc.

0615	commence observations					
0620	Newell's S.	1	NE		may have been flushed from water by ship -	
0640	Harcourt's Type B	1	NE		in pretty close - 150 yds or so	
0647	Harcourt's Type B	3	NE		100 off starboard petrel-like	
0652	Wedgetail S.	2	W		light phase	
0655	Wedgetail S.	2	W		light phase	
0728	Petrel SP	2	NW		flying away from us	
0759	Wedgetail S.	1	NW		light phase	
0815	Harcourt's Type B	1	NE		50 ft off bow	
0817	Harcourt's Type B	1	NW		100 ft off bow	
0827	Shearwater / Petrel	1	NW		seen by watch	
0831	shearwater / Petrel	2	NW		not well seen 400 off bow + 800 off bow	
0836	Harcourt's Type B	1	-		sat on water 100 yds to port	
0914	Wedge-tailed Shearwater	1	SW	WT to 15 ft	light phase about 400 yds. off starboard	
0920	Great Frigatebird	1	@	150 ft	♀ adult right fork of tail about 1/2 length of left fork which was normal length	
1002	Shearwater sp.	2	N		500 yds. off bow of ship high scaling flight dark upperparts possible Sooty Shearwater	
1015					underway stopped for past hour for hydro station	
1052	shearwater sp	1	N		high scaling shearwater 1 mile out - possible	
1101	white bird	1	SE		Sooty Shear	
1101	Shearwater sp	1	N		not well seen - flying at wave level	
1147	Red Tailed T.B.	1	S	100 ft	1 mile on starboard - high scaling - possible Sooty Shear	
1155	Red Tailed T.B.	1	SE	75 ft	400 on port - medium central retrices long central retrices	
1159	Wedgetail S	1	NW	to 30 ft	scaling rather high but 18 knot wind - light phase	
1205	Flock Sooty Tern	16	→		not actively feeding - Wedgetails all light phase	
	Wedgetail S.	4		25 ft		
1211	Shearwater sp	3	NW		high scaling - possible Sooty Shear.	
1213	Bulwer's P?	1	NW		small dark petrel seen from 800 yds	
1214	Shearwater / Petrel	2	NW		white underwing linings showed as birds flew directly away from ship - possible Sooty Shearwater	



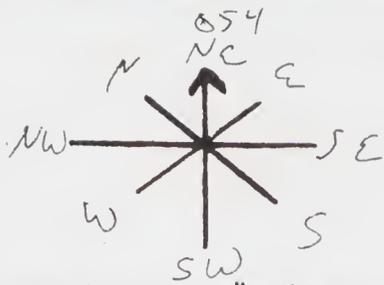
DATE 21 Mar 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
1219	Shearwater SP	1	NW		Possible Sooty Shear	
1219	Harporhynchus Type B	1	NE		petellid	
1230	Harporhynchus Type B	1	S		50 yds off bow	
✓ 1231	Sooty Shear	1	NW		high arcing - all dark - in 400 yds of ship but facing wrong way for seeing silver linings - flight typical	
✓ 1245	Sooty Shearwater	1	N		200 yds off starboard	
1253	Wedge-tailed Shearwater	2	W	5 ft. to 15 ft.	75 yds off port light phase	
1310	Storm Petrel	1			sighted by watch	
1338	Shearwater sp.	2	W	WT to 10 ft.	possibly Wedge-tails	
✓ 1432	Sooty Shearwater	1	NW	2-40 ft	350 off bow high arcing dark shearwater facing wrong way	
1445	Wedgetail S.	1	W		light phase 300 off bow	
1502	Wedgetail S.	1	W		light phase 400 off bow - scaling pretty high but still staying more horizontal than Sooty Shear.	
1510	Puffin White-headed P.	1	S		300 off port	
1514	Wedgetail S	1	W		light phase 400 off bow	
✓ 1520	Sooty Shear.	1	NNW		silver linings seen - 400 off bow.	
✓ 1522	Sooty Shear.	1	NW		silver linings	
1522	Wedgetail S	1	NW		light phase	
1526	Sooty Shear?	1	NW		700 off bow	
1527	Wedgetail	1	W		light phase	
1527	Frigatebird	1	E	75 ft	feeding - diving to inches of surface	
1604	Large Allator	1	N		following ship briefly	
1612	Sooty? Shearwater	1	N		high arcing flight 300 yds. off starboard	
1727	Wedgetail S	1	W		light phase 400 off bow	
1840	observations ceased					



time	species	#	dir.	hgt.	remarks	loc.
0620	start observations					
0620	Black-foot A	3	⊙		following ship	
0638	Wedgetail S	1	↖		behind ship	
0639	P Tanager	2	↗		following ship at distance	
0641	Noddy Tern	1	SE		200 off bow	
0643	Gull?	1			seen from 400 yds+ grey back - black tipped tail, white closer to wing like Laysan A.	
0644	Noddy Noddy sp	2	SE		slightly larger than Tanager, with constant flapping	
0645	Noddy Noddy sp	1	SE		maybe Hawaiian Noddies	
0651	Noddy Noddy sp	1	SE		300 behind ship	
0730	put into		Hilo, Hawaii			
0930					under way from Hilo	
1018	Black-footed Albatross	1	E		following ship	
11:11	Shearwater sp.	2	E		about 100 yds off bow of ship	
1123	Sanderling	4	N	WT	winter plumage	
1136	Black-footed Albatross	1	E		second individual following ship with first	
1142	Shearwater sp.	1	E		100 yds. in front of ship	
	Red-tailed Tropicbird	1	E	10ft.	Fighting strong headwinds about 300 yds off bow of ship	
1210	Hawaiian Noddy	1	W	15 ft.		
✓ 1216	Sooty Shearwater	2	E N	WT to 30 ft.	200 ft. off starboard	
1218	Bulwer's Petrel	1	SE			
1220	Bulwer's P?	1	N		600 to port	
1223	Shearwater sp	4	N		possible sooty shear	
1230	Black-foot A.	1	other departed at 1227			
1231	Red-tailed T.B.	1	⊙	75 ft		
1235	Black-footed A.	3	for a minute then back to 2	1 A 1 D		
1239	Sooty Shear?	2	N		600 off bow	
1240	Sooty Shear?	2	N		500 off bow	
✓ 1244	sooty shear	1	N		silver lining seen	
1249	Sooty Shear?	1	N		500 off bow	
1251	Sooty Shear?	1	N		"	
1255	Petrel sp	1	N		large type	

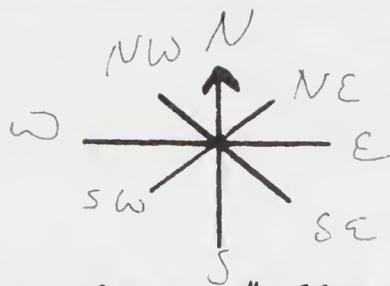
A = all white
B = more white than dark
C = more dark than white
D = all dark



DATE 22 Mar 64

Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
1300	Black-foot A	4			2A 1B	
1304	Sooty Shear	5	N		silver seen on 2 - 250 to 1200 yds out, scattered	
1305	Sooty Shear?	1	N		500 off bow	
1305	Sooty Shear	1	N		400 astern silver seen	
1309	Shearwater SP	2	NW		possibly Wedgetails	
1314	Shearwater SP	2	NW		probable Sooty Shears.	
1325	Petrel SP.	2	NW			
1329	Wedgetail S. light phase	1	SW	50 ft	scaling very high - higher than Sooty Shears on tightly reefed wings - gray back, white below wings ventrally: white with thick black edges + pattern! mottled??	
1331	Shearwater SP	1	NW		600 astern probable Sooty Shear	
1332	Black-foot A	3			2A 1D	
1356	Term SP	2	S	75 ft	flies near ship - probably Sooties but light bod	
1401	Black-foot A	1			up to four then all sat in water - 1 coming up from astern	
1409	Sooty Tern	5	NW			
1430	Black-foot A	2			1A 1 wing back	
1435	Sooty Shear?	1	N		400 off bow	
1440	Sooty Shear.	1	N		silver seen 500 off bow	
1450	White-tailed T. B.	1	E		possibly flushed from water - black apillars seen	
1457	Sooty Shear	1	N		500 off bow - silver lining seen	
1502	Black-foot A.	2			1 out on water astern, other 300 astern	
1504	Wedgetail S.	1	SW		100 to port light phase	
1524	Shearwater SP	1	N		probable Sooty	
1525	Shearwater SP	1	NW		probable Wedgetail	
1525	Sooty Shear.	1	N		silver linings	
1540	Wedgetail S.	1	W		200 off port	
1600	Harris's Storm Petrel	1	E	WT	100 yds. off port Type B	
1615	Wedge-tailed Shearwater	1	E	WT & 30 ft.	200 yds. off starboard in perfect light flew unusually high for Wedge-tail	
1615	stop for hydro station					
1715	Black-foot A.	5			sitting on water together	
1720	underway					
1740	Petrel/ Shearwater	2			seen by watch	
1740	BF A	5				
1845	end observation					



DATE 23 Mar 64

Pg. # 1

time species # dir. hgt. remarks loc.

0614 Sooty Tern 2 S 25ft

0618 Sooty Tern 4 S 5-20

0619 ~~White-necked P.~~ 1 NW 300 to port

0619 Black-footed A 5 following ship 2 B 1 C 0

0626 Tropicbird sp 1 S 125ft

0726 ~~Sanderling~~ 1 N WT to 5ft. winter plumage 50 ft. off bow

0850 Wedge-tailed (?) Shearwater 1 W

0852 Shearwater/petrel 2 N

Sooty Tern 2 N

0855 Wedge-tailed Shearwater 1 W 100 ft. off port

0857 Black-foot A 5

1100 Black-footed Albatross 3

1150 Sooty Shear 1 N 300 off bow silver linings seen

1151 Sooty Tern 2 N 35ft

1151 Sooty Shear 1 N silver linings seen - 450 off bow

1228 Black-foot A 3 following ship

1420 Black Foot A 4

1425 Red-tail TB 1 SE low flushed from water

1700 Black-footed Albatross 3 following ship

1752 Shearwater/petrel 1 N 500 off bow

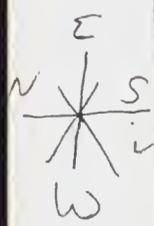
1801 Sooty Shear 1 N 400 off bow

1816 Sooty Shear 1 N 400 off bow silver linings clearly seen

1824 Shearwater/sp 1 aster of ship

1824 Black-footed A 6

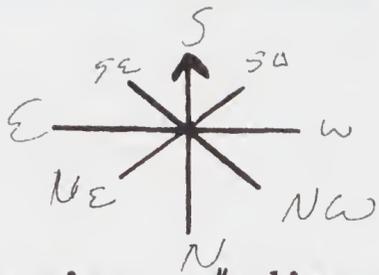
1838 and observations





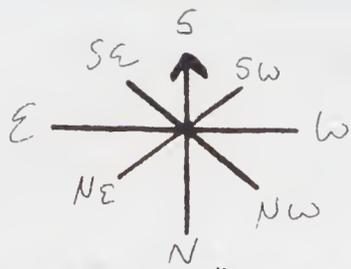
DATE 24 Mar 64
Pg. # 1

time	species	N	#	dir.	hgt.	remarks	loc.
✓ 0604	Stunt observations						
✓ 0608	Black-footed A		2			Following ship	
✓ 0714	Black-footed Albatross		1			Additional individual making 3	
✓ 0940	Black-footed A.		1				
✓ 1045	Black-footed A		2			bird sitting in water as ship approached, silver leg band seen on left leg as bird took flight perhaps	
✓ 1100	stop for hydro					- during hydro for Albatross on scraps of balloon - came within 20 ft of ship. would not take scrap with hook + line embedded in it. identified by D. Au.	
✓ 1130	Heermann's S.P.		1				
✓ 1245	Sooty Shear		1	N			
✓ 1500	Black footed A		2				
✓ 1520	Frigatebird		1	⊙		100 off starboard	
✓ 1522	Black footed A.		3				
✓ 1705	Shearwater sp.		1	W		500 yds. off starboard flying into sun	
1740	Shearwater/sp Petrel		1			seen by watch	
1741	Shearwater Petrel		1			seen by watch	
1742	Shearwater Petrel		1			seen by watch	
1805	Tropicbird sp		1		100ft		
1820	Black footed A.		3				
1840	end observations						



DATE 25 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0601	begin observation					
0603	Black footed A.	0				
0626	Wedgetail S.	1	NW		200 off starboard bow - light phase	
0654	Harcourt's Type B	1	NW		75 off bow	
0746	Black-footed A.	1				
0820	Tropicbird sp.	1	S	200ft.	3000 ft yds. off starboard	
0922	phalarope sp.	1	N	on water	75 yds off starboard; seen on water three different times between short flights; gray back (possibly with stripes between wings as in Northern Phalarope); white head and underparts; pronounced white wing stripe; long neck; sat high on water in typical phalarope attitude; tail pattern black or dark central stripe separating white patches along sides, entire tip of tail dark; bird in typical winter plumage but not close enough to allow species differentiation by back markings or bill shape and color	
1025	Sooty Tern	5±2			feeding flock - saw one but the water cut distance of 1 mile	
1040	Sooty Tern	1			seen by watch	
1100	Tropicbird sp	1			seen by watch	
1124	White tailed TB	1			black skimmers seen	
1140	Wedgetail S	4	N		1 dark phase 3 light phase	
1210	Wedgetail S	1	↻		light phase	
1256	Harcourt's SP Type B	1	↻		200 yds off bow	
1306	Wedgetail S.	1	NW		light phase	
1520	Shearwater sp.	1.	SE		possible Wedge-tail sighted by watch	
1830	end observations					



DATE 26 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0555	start observations					
0610	Sooty Tern	2	SE		200 across bow	
0654	shorebirds	2	W		100 yds off starboard possible Sanderlings or phalaropes	
0732	Wedgetails	3	N		500 off starboard all light phase	
0852	Harcourt's Type B	1	S		100 off bow	
0945	Storm Petrel sp	1			to starboard sighted by watch	
1030	Tropicbird sp	1	N	125 ft	1 mi to starboard	
✓ 1031	Sooty Shear.	1	NW		300 to starboard - silver linings well seen - good light	
1146	Red-tailed TB	1	⊙	50 ft	750 to starboard - feeding - diving from about 50 ft + checking fall slightly before entering water with splash	
1151	Red? Shorebird sp	1	W		Sanderling or phalarope	
1255	Shearwater	3	N		2000 yds off starboard	
1300	Red? Harcourt's Storm Petrel	1	⊙	WT to 5 ft.	Approached to within 25 ft. Type B	
1342	Shearwater sp.	1	W		600 yds. off bow sighted by watch	
1347	Fairy Tern	1	E	WT to 15 ft.	to crossed bow within 150 ft. feeding	
1500	Shearwater sp.	1	N		600 yds. off starboard sighted by watch	
1600	Shearwater/ petrel	1	N		high arcing flight } 200 yds. off port	
	Wedge-tailed Shearwater	1	N		light phase	
✓ 1640	Sooty Shear	1	NW		silver linings seen 300 to starboard	
1641	Bulwer's Petrel	1	S		200 to starboard	
1647	Shearwater/ petrel	1	NW		500 to port	
1706	Shearwater/ petrel	1	SE		glimpse at 400 to port	
1716	Shearwater sp	1	N		possible Sooty Shear	
1718	Red? Harcourt's sp	1	W		seen by watch	
1725	Shearwater/ petrel	1	W		seen by watch	
1830	end observations					



DATE 27 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0604	start observations					
✓ 0605	Sooty Shear	4	NE		Seen by watch	
0605	Shearwater/ petrel	2			in flock sitting on water around ship.	
	P. externa? White-tailed P?	1				
	Masked Booby	1			immature almost caught when hovering over ship	
0635	Masked booby returns					
0636	Shearwater/ petrel	1	11W		600 astern of ship	
0645	Wedgetail S.	1	NE		500 to port light phase	
0720	shearwater/ petrel?	1			seen for a second or so - close to ship on other side from me - coming rapidly into sun's path. Appeared thin-winged large shearwater sized, light grey above white below. wing tips seemed patched with black. Perhaps gull? low over water, gull like wingbeats interspersed with glides.	
0853	Shearwater sp.	1	N		possible Sooty Shearwater about one mile astern off port	
0903	Combing Harcourt's Storm Petrel	1	⊙	WT to 15 ft.	within 50 ft. of port side of ship at closest point Type B	
0906	Shearwater sp.	2	N		observed by watch on horizon (about one mile away) possible Sooty Shearwaters	
0925	Feeding Flock					
	Sooty Tern	40±	10%		spotted by watch	
	Wedge-tailed Shearwater	1			light	
	Shearwater sp.	10				
0945	Wedgetail ♂	1			light	
	Storm Petrel sp	1				
	unidentified Shearwater/petrel	1			white underparts - white underwing w/ very small dark edges except at ends of primaries where black is thicker - light grey-brown back - slow flying, loose flapping - almost like Sooty Tern, short glides. About Wedgetail sized same bird as 0720.	
1023	Sooty Tern	1	⊙	40ft	circled ship	

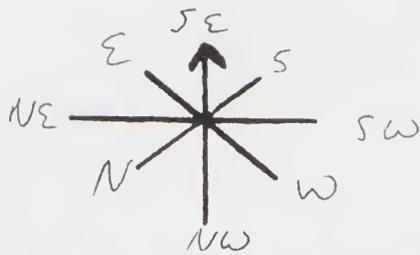
87/42



DATE 27 Mar 64

Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
1040	White-necked Petrel	1	SW	5 to 20 ft	100 yds off starboard side of ship in excellent light back mottled sandy or light gray and dark gray	
	Shearwater petrel	1	SW		250 yds. off starboard observation UNSATISFACTORY	
1135	Tropicbird sp.	1	N		observed by watch about one mile off port	
	Shearwater sp.	1				
1240	Shearwater/ petrel	1	NW		} 300 yds. off port side of ship } possible Bonin Is Petrels	
1242	Shearwater/ petrel	1	NW			
1305	Shearwater / Bulwers Petrel?	1			astern - seen by watch	
1405	Longear Albatross	1	SE		75 yds off bow	
1419	Red-tailed TB.	1	⊙	100ft	immature	
1442	Mashed Booby	1	↙	30ft	immature - maybe same one as this morning	
1445	Newell's Shear.	1	W		200 off port - well seen	
1545	Red-tailed TB	1	⊙	40ft	immature	
1720	Christmas Island (?) Shearwater	1	NE	WT to 5 ft.	SMALL ALL DARK shearwater going directly AWAY from the ship about 100 yds. when first observed	
1725	Shearwater/ petrel	2				
✓ 1751	Sooty Shearwater	1	N		silver lining shimmering in sunlight	
1757	Wedgetails	1	W		400 into sun ?	
1758	Sooty Shear?	1	N		800 to starboard - brief sculling	
✓ 1800	Sooty Shear	1	N		silver lining	
1802	Wedgetail S.	1	↗		dark phase	
1815	Wedgetails	2	↗		dark phase	
1845	end observations					



DATE 28 Mar 64
Pg. # 1

time species # dir. hgt. remarks loc.

0557 begin observations

0625 Storm Petrel sp 1 NW

0626 ~~Shearwater~~ SP 1 NW

small, light colored back - sanderling or phalarope

0650 Shearwater / Petrel 1

seen by watch

0652 ~~Sooty Storm P?~~ 1

probably all dark - wings proportionately longer than Harcourts. Flew less petrel like dark phase

0653 Wedgetail S 1

0800 Feeding Flock Sooty Tern 250 ± 50

feeding on skipper

Wedgetail S 15 ± 5
10 ± 4

2 light phase & dark phase

unidentified Shearwater / Petrel 5

0815 Storm Petrel sp 1

sighted by watch

0819 Shearwater / Petrel 1

sighted by watch

0820 Wedgetail S 1 N

light phase 200 across bow

0850 Sooty Shear 2 NW

silver linings seen

0850 Shearwater / Petrel 1 SW

just glimpse

0905 Sooty Shear 1 NW

silver linings seen

0910 Shearwater / Petrel 1 NW

seen by watch

0943 ~~White-necked P?~~ 1 SW

sandy brown gray upperparts - white underparts immature - 250 off port

0944 Masked Booby 1 NW

300 off port

0944 Sooty Shear 2 N

400 off port

0952 ~~Harbour's SP?~~ 1 NW

Type B 50 yds off starboard

1000 Sooty Shear? 1 N

probable - 500 off bow

1029 ~~White-necked~~ Petrel 1 SE

100 yds off starboard

1125 ~~Harbour's~~ Storm Petrel 1 S

50 yds. off starboard

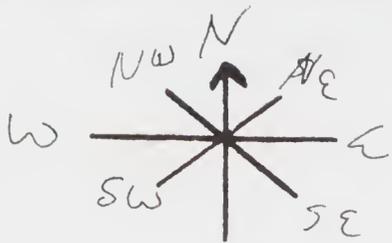
Petrel sp 2 S

observed by watch



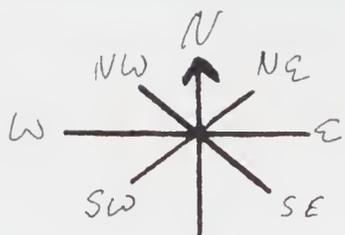
time species # dir. hgt. remarks loc.

1140	Feeding flock Sooty Tern	30	⊙	WT to 50 ft.	1 light phase, 1 dark phase	
	Wedge-tailed Shearwater	2				
	Shearwater sp.	4				
	Leach's Harcourt's Storm Petrel	3			about 50 yds. from center of feeding activity at closest point two Harcourts on water at same time Type B	
	Petrel White-necked Petrel	1				
1204	Shearwater sp.	1			observed by watch	
1207	Leach's Harcourt's S.P.	1	NW		almost rammed ship - 4ft off bow Type B	
1212	Sooty Tern	75	10 ⊙		no shearwater/petrels seen - feeding	
1220	Shearwater / petrel	1	?		not well seen	
1227	Wedge-tailed Storm Petrel sp	1	⊙		light phase too far to see rump white underparts - didn't see underwings. either Bonin's or Phoenix - smallish	
1230	Petrel Shearwater P.	1	N		seen by watch	
1234	Masked Booby	1	SE		immature	
1240	Petrel sp.	1	SE		brown backed - underparts white - similar underwing to Bonin's but slightly too large + flapped too much - didn't bend like a Bonin's - stayed somewhat flatter	
1246	Petrel White-necked Petrel	1	SE	WT to 5 ft.	25 yds. off starboard	
1300	Petrel? White-necked Petrel?	1	⊙	WT to 50 ft.	apparently frightened by ship flew in front of ship twisting and turning like a gull it then flew up (at least 50 ft.) and circled around the ship to the stern crossing to opposite side it had been seen by watch	
1307	Shearwater / petrel	1	NW			
1307	Leach's Harcourt's Storm Petrel	1			Type B	
1311	Sooty Shearwater?	1	N			
1320	JFP Dark-rumped Petrel	1	SE		50 yds. off starboard	
1327	Shearwater sp.	1			observed by watch	



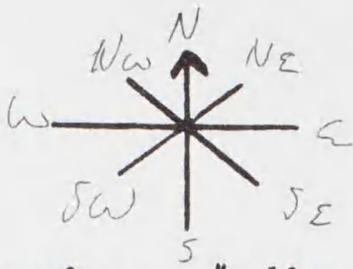
DATE 28 MAR 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
1355	Blue-faced Booby	1	E	10 ft.	immature	
1445	Shearwater/petrel	1			seen by watch	
1515	Harcourt's Storm Petrel	1	⇒		75 yds to starboard - hanging above wave tops, occasionally dropping feet + p uttering along up the crest of a wave	
1540	ships course	00	3°		Type B -	
1555	Flock					
	Wedgetail S	3+			flight 1 dark	
	Dark-rumped P	2+			both with 2 secondaries missing making white slots in wings - back splotchy	
	Petrel sp	1			brown backed - white underparts	
	Shearwater petrel	2			unidentified	
1615	Dark-rumped P	1			mottled + messed up plumage - molting	
1635	Wedgetail S	1			Light phase	
	Navells S	1				
1640	Petrel sp	1			brown backed - white underparts - dark spot around eye - ^{under} wing dark edged with white center and maybe dark pattern crossing white. White shafts to primaries showing through brown of upper wings	
1648	Harcourt's SP	1			Type B	
1657	Storm Petrel sp	1			too distant but flew like Harcourt's Type B	
1705	Harcourt's SP	2			50 yds off port Type B	
1715	Storm Petrel sp	1			seen by watch	
1730	Harcourt's SP	1	N		Type B	
1735	Dark-rumped P	1	W			
	Wedgetail S	1	W		light	
1736	Sooty Tern	35 ± 10			floor feeding	
1743	Storm Petrel	1			seen by watch	
1801	Storm Petrel	1			too far	
1803	Navells S	1			end observations 1815	



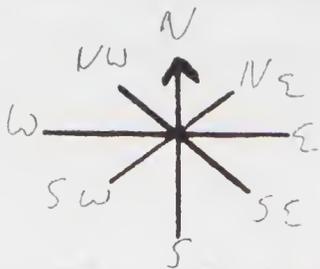
DATE 29 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0551	begin observations					
0635	Newell's S	1	S	25 ft	may have been flushed from water by ship	
0644	Albatross sp	1	!		just a glimpse at 500+ yds - first seen by watch.	
0645	Dark-rumped Petrel	1			no color or pattern impressions just size & length of wings 200 across bow clear view - no apparent molt	
0705	Shearwater/petrel	1	S		observed by watch	
0710	Bonin Island Petrel	1	N	WT to 10 ft.	black bar on under surface of wing observed	
	Petrel sp.	2	N	WT to 30 ft.		
0720	Sooty Shearwater	1	N	WT to 30 ft.	200 yds. off bow of ship silver wing linings observed	
0724	Wedgetailed Shearwater	1	W		within 100 yds. of port side of ship light phase	
0732	Shearwater	1	NW	low	Phalarope or sandpiper	
0820	Petrel sp.	1	W		seen by watch	
0825	Petrel sp.	1	S		seen by watch	
0828	Shearwater	1	NW		seen by watch	
1115	Shearwater Harpornt's S.P.	1	N		very close to ship - 20 yds type not seen	
1145	Wedgetail Shearwater	1	W		200 off bow - light phase	
1146	Shearwater Harpornt's S.P.	1	E		200 astern - Type B	
1215	Bulwer's Petrel	1	E		250 off bow all black small petrel - lighter	
1228	Shearwater/petrel	1	E		upper secondary coverts visible - seen by watch	
1233	Shearwater/petrel sp.	1	W		seen by watch	
1235	Shearwater sp.	1	W		500 yds. off bow NOT well seen	
1310	Shearwater/petrel	1			seen by watch	
1315	Shearwater/petrel	2			seen by watch	
1342	Sooty Shear?	1	NW		1500 yds off bow	
1404	Sooty Shear	2	NW		500 off bow	
1407	Shearwater Harpornt's S.P.	1	N		Type B	
1426	Wedgetail S Shearwater/petrel	1	S		light phase	
1427	Shearwater Shearwater	1	NW		probably phalarope - crossed bow	
1432	Sooty Shear	1	NW		silver linings	



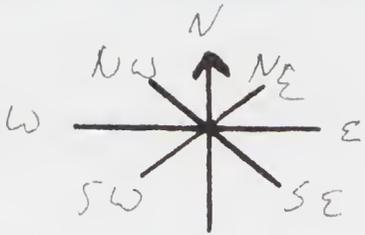
DATE 29 Mar 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
1515	Sooty Tern	1	W		seen by watch	
1545	phalarope shorebird Phal?	1	N	WT to 10 ft.	probably phalarope seen about 30 ft. off starboard side of ship during BT cast	
1624	shearwater/petrel	1	W		seen by watch	
1656	Storm Petrel sp.	1	S		seen by watch	
1700	petrel sp	1	W		upperparts light grey, underparts white, some black edging on wings underneath. Medium sized bird - larger than Bonins. Typical petrel flight - high tight scales in strong wind with reefed wings.	
1701	Sooty Shear?	1			way off - 1 mile or so	
✓ 1707	Sooty Shear	1	?		flight direction: interrupted by ships course - turned	
1800	Sooty Shear?	1			headed away - silver linings seen	
1801	Shearwater/ petrel	1			1000 to port 800 to port	
1803	Shearwater/ petrel	1			seen by watch	
1815	end obs,					



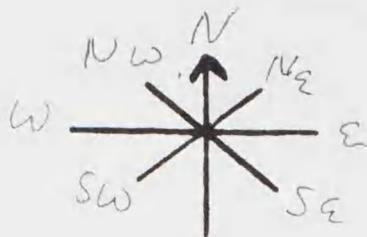
DATE 30 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0610	begin observations					
✓ 0635	Sooty Shearwater ? ? ?	1	W		seen by watch	
0652	Sooty Shear?	2	NW		1000 off bow	
✓ 0653	Sooty Shear	1	NW		silver linings seen - 600 behind ship	
0658	Shearbird	1	NW		possible phalarope	
✓ 0710	Sooty Shear White Noddy P Shearwater/ petrel	2 1 1	NW E E		all went bow + forth across bow - then Sooties turned + flew NW	
0711	Dark rumped P.	1	NW			
✓ 0726	Sooty Shear	1	NW		silver linings seen 600 off bow	
✓ 0830	Sooty Shear	1	NW		silver linings seen 500 off bow	
✓ 0834	Sooty Shear	1	NW		silver linings seen 400 off bow	
✓ 0835	Sooty Shear	1	NW		silver linings seen 400 off bow	
0849	Sooty Shear?	1	NW			
0851	Sooty Shear?	1	NW			
0904	Sooty Shear?	1	NW			
0906	Sooty Shear?	1	NW			
✓ 1012	Sooty Shearwater	1	NW		500 yds off bow silver linings observed	seen by watch
✓ 1031	Sooty Shearwater	1	NW		500 yds off bow	seen by watch
1035	Shearwater/ petrel Phalarope? shorebird	1 2	NW NW		white underparts probably phalaropes	
1116	Shearwater/ petrel	1	NW		2000 yds.	
1132	Shearwater/ petrel	3	NW		2500 yds off port bow	
✓ 1250	Sooty Shear	1	NW		400 off bow	
✓ 1255	Sooty Shear	1	NW		400 off bow	
1401	Sooty Shear?	1	NW		800 off bow	
1445	Shearwater Harcourt SP	1	W		30 feet off bow type B	
1629	Wedge-tailed Shearwater	1	NW		light phase 200 yds. off bow	
1630	Sooty Shearwater	1	NW		silver linings seen 350 yds. off bow	
1755	Sooty Shear?	1	NW			
✓ 1811	Sooty Shear	1	NW			
1815	end observations					



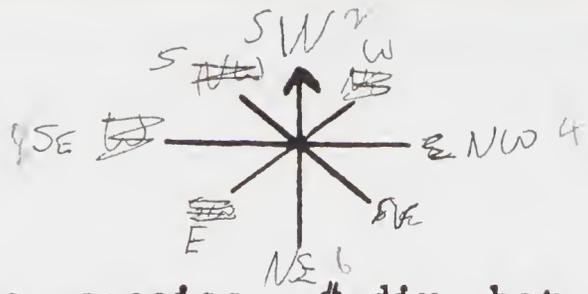
DATE 31 Mar 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0530	Storm Petrel	1			seen by watch	
0545	begin observations					
0618	Sooty Shear?	1			turned back before crossing bow of ship	
0619	Storm Petrel sp	1				
✓ 0745	Sooty Shear	1	NW		silver linings seen	
0946	Harcourt's Storm Petrel	1	W		50 yds. off port side of ship Type B	
1019	Storm Petrel	1			seen by captain	
✓ 1030	Sooty Shearwater	1	N		silver linings seen flew within 100 yds. of bow of ship	
✓ 1203	Sooty Shearwater	1	NW		silver linings seen	
✓ 1214	Sooty Shear	1	NW		silver linings seen	
✓ 1229	Sooty Shear	1	NW			
1235	Sooty Shear- water?	1	NW		seen by watch	
1240	Harcourt's Storm Petrel	1			seen by watch - white on tail	
✓ 1254	Sooty Shearwater	1	NW		seen by watch	
1301	Shearwater/ petrel	1	W		seen by watch	
1303	Sooty Shear?	1	NW		1 mile off bow	
1306	Sooty Shear?	1	NW		3/4 mile off port bow	
✓ 1416	Sooty Shear	1	NW		500 yds off bow	
1443	Sooty Shear?	1	NW		seen by watch	
✓ 1503	Sooty Shear	1	NW		silver under wings	
✓ 1530	Sooty Shear	1	NW		silver linings seen.	
✓ 1606	Sooty Shearwater	1	NW		seen by watch	
1615	Storm Petrel Booby sp	1			seen by watch	
1618	(Booby sp.)	1			seen by watch → misidentified It was a LAYSAN ALBATROSS AND WAS VERIFIED WHEN AN ALBATROSS WAS WELL SEEN ON APRIL 1.	
✓ 1633	Sooty Shearwater	1	NW		seen by watch	
✓ 1654	Sooty Shearwater?	1	NW		seen by watch	
✓ 1747	Sooty Shear	1	NW		silver linings seen	
1815	end observations					



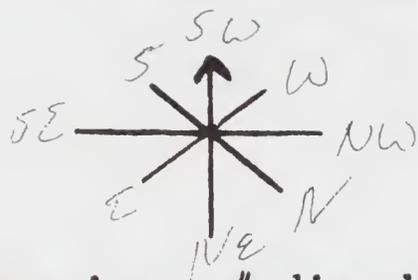
DATE 1 April 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0615	begin observations					
0550	Black-footed A	1			seen by watch	
0620	Shearwater/ petrel	1			seen indistinctly	
0636	Shearwater SP.	1	↔		Type B	
0640	Sooty Shear?	1	NW		3/4 mile off starboard	
0641	Sooty Shear?	1	NW		seen by watch	
0642	Sooty Shear	1	NW		700 astern - silver linings seen	
0700	Sooty Shear?	1	NW		1000 astern yds off bow	
0852	Sooty Shearwater?	3	NW		1500 yds. of bow	
0948	Sooty Shear?	1	NW		seen by watch	
1040	Shearwater/ petrel	1	W		directly ship - seen by watch	
1104	Laysan Albatross	1	⊙		within 50 yds. of ship	
1200?	Sooty Shear?	1	NW		came very close to ship - seen by watch	
1227	Black-foot A	1			A departed 1255	
1616	Sooty Shear	2	NW		silver seen	
1630	Black-foot A	1			D	
1641	Shearwater Shearwater?	1	NW		Phalarope or sandpiper	
1650	Sooty Shear?	1	NW		seen by watch	
1657	Sooty Shear?	1	NW		800-1000 off starboard	
1712	Sooty Shear?	1	NW		1 mile to port bow	
1755	Sooty Shearwater ?	3	NW		seen by watch	
1815	end observations					



DATE 2 Apr 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0555	begin observations					
0555	Black-foot A.	2				
0810	Blackfoot A	3			2D 1B 1DD 1DB 1BA 1DD	
0840	Shearwater sp.	1	N		seen by watch	
0843	Shearwater sp.	1	N		seen by captain	
0852	Laysan Albatross	1	NE		circled ship once and followed for several minutes	
0900	Black-footed Albatross	5				
0910	Harcourt's Storm Petrel	1	SW		200 yds. off stern of ship Type B	
0914	Bonin Island? Petrel	1	NW		300 yds. off starboard	
✓ 0932	Sooty Shearwater	1	NW		silver linings seen 250 yds. off starboard	
✓ 0951	Sooty Shearwater	1	NW		silver linings seen	
0958	Shearwater/ petrel	2	N			
1004	Shearwater? Shorebird	1	NW		phalarope or rarerling - small's light	
1015	Harcourt's SP	1	↗		Type B	
	Sooty S.P. ? Shearwater/petrel	1			seen by watch	
1016	Sooty shear?	1			off port 700 - turning to avoid ship	
1028	Shearwater? shorebird	1	NW		same	
✓ 1035	Sooty Shearwater	2	NW		silver linings seen	
1042	Shearwater? Shorebird	1	NW		same	
1055	Shearwater/ petrel	1			seen by watch	
✓ 1103	Sooty Shearwater	2	NW		one had <u>no</u> silver underwing but flew identical to last 100 or so Sooties. Light excellent	
1116	Laysan A.	1	↗			
1120	Sooty Shear?	1	NW		1000 to starboard	
1127	Harcourt's sp.	1	↗		white rump seen by watch Type?	
✓ 1134	Sooty Shearwater	3	NW		silver linings	
1136	Harcourt's SP.	1	↗		Type B	
✓ 1140	Sooty Shearwater	2	NW		silver linings	
1143	Shearwater? Shorebird	1	SE		phalarope etc	
1144	Sooty Shear?	1	NW		seen by watch	
1145	Sooty Shear?	1	NW		seen by watch	



DATE 2 Apr 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
✓ 1149	Sooty Shear	2	NW			
1153	Sooty Shear?	1	NW			
1158	Shorebird?	1	NW		Phalarope or Sanderling	winter plumage
✓ 1159	Sooty Shearwater	1	NW			
1202	Sooty Shearwater?	1	NW			
✓ 1204	Sooty Shearwater	1	NW			
1209	Shorebird	1	N			
1223	Black-footed Albatross	7			3 on water, 4 in flight	
1225	Red-tailed Tropicbird	1	E			
1242	Sooty Shear?	2	NW			
✓ 1243	Sooty Shear	4	NW			
1250	Sooty Shear?	2	NW			
✓ 1255	Sooty Shear	2	NW			
✓ 1310	Sooty Shear	2	NW			
✓ 1311	Sooty Shear	2	NW			
1314	Sooty Shearwater?	1	NW		seen by watch	
1320	Sooty Shearwater?	2	NW		seen by watch	
1322	Sooty Shearwater?	1	NW		seen by watch	
✓ 1323	Sooty Shearwater?	1	NW		seen by watch	
1327	Harcourt's Storm Petrel	2	SW		50 yds. off starboard	Type B
1331	Sooty Shearwater?	1	NW			
1334	Sooty Shearwater?	1	NW			
1340	Sooty Shearwater?	1	NW			
1343	Sooty Shearwater?	1	NW			
1350	Sooty Shearwater?	4	NW			
1357	Sooty Shearwater?	1	NW			
1402	Sooty Shearwater?	3	NW			

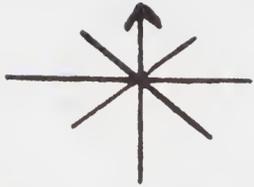


time	species	#	dir.	hgt.	remarks	loc.
1413	Sooty Shearwater?	2	NW			
1414	Sooty Shearwater?	1	NW			
✓ 1419	Sooty Shear	1	NW			
✓ 1426	Sooty Shear	1	NW			
✓ 1430	Sooty S.	1	N			
✓ 1431	Sooty S.	1	N		stopped, backtracked to get around ship	
✓ 1446	Sooty S.	1	NW			
✓ 1450	Sooty S.	1	NW			
✓ 1451	Sooty S.	2	NW			
✓ 1455	Sooty S.	2	NW			
✓ 1459	Sooty S.	4	NW			
✓ 1502	Sooty S.	2	NW			
✓ 1509	Sooty S.	3	NW			
1503	Bulwer's Petrel	1	NW			
✓ 1518	Sooty S.	1	NW			
✓ 1519	Sooty S.	1	NW			
✓ 1520	Sooty S.	3	NW			
✓ 1524	Sooty S.	2	NW		seen by watch	
1525	Sooty Tern?	2	NW			
✓ 1526	Sooty S.	3	NW			
✓ 1527	Sooty S.	2	NW			
✓ 1528	Sooty S.	3	NW			
✓ 1530	Sooty S.	3	NW			
✓ 1531	Sooty S.	1	NW			
✓ 1532	Sooty S.	1	NW			
✓ 1533	Sooty S.	1	NW			
✓ 1540	Sooty S.	1	NW			
✓ 1543	Sooty S.	2	NW			
✓ 1544	Sooty S.	1	NW			
✓ 1544	Sooty S.	1	NW			
✓ 1545	Sooty S.	1	NW			
✓ 1545	Sooty S.	4	NW			
✓ 1546	Sooty S.	2	NW			
✓ 1547	Sooty S.	1	NW			
✓ 1547	Sooty S.	1	NW			
✓ 1547	Sooty S.	1	NW			
✓ 1548	Sooty S.	2	NW			



DATE 2 Apr 64
Pg. # 4

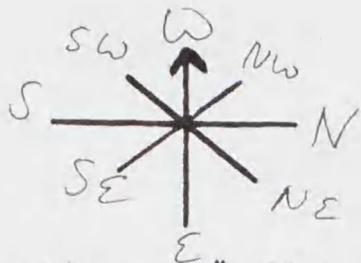
time	species	#	dir.	hgt.	remarks	loc.
✓ 1550	Sooty Shear	3	NW			
✓ 1552	Sooty S	2	NW			
✓ 1554	Sooty S	1	NW			
1610	Sooty Storm Petrel	1	S		no white rump patch - forked tail - slightly larger than Hancock's - flight somewhat petrel-like	
✓ 1611	Sooty S.	1	NW			
✓ 1613	Sooty S.	1	NW			
1615	Shoebird	1	NW			
1615	Black-foot A	6				
✓ 1616	Sooty S.	1	NW			
1617	Sooty S. Hancock's SP.	1	↔		Type B	
1617	Shoebird	1	NW			
✓ 1618	Sooty S.	2	NW			
✓ 1619	Sooty S	1	NW			
✓ 1619	Sooty S	1	NW			
✓ 1625	Sooty S	1	NW			
1626	Laysan A.	1				
✓ 1629	Sooty S	1	NW			
✓ 1634	Sooty S	1	NW			
✓ 1635	Sooty S.	1	NW			
✓ 1635	Sooty S	7	NW			
✓ 1635	Sooty S	2	NW			
✓ 1637	Sooty S	1	NW			
✓ 1637	Sooty S	1	NW			
✓ 1638	Sooty S	1	NW			
✓ 1645	Sooty S	2	NW			
✓ 1646	Sooty S	1	NW			
✓ 1647	Sooty S.	2	NW			
✓ 1650	Sooty S.	1	NW			
✓ 1655	Sooty S.	3	NW			
✓ 1656	Sooty S.	2	NW			
✓ 1700	Sooty S.	1	NW			
✓ 1702	Sooty S.	2	NW			
✓ 1705-1710	Sooty S.	11	NW			
✓ 1711	Sooty S	2	NW			
✓ 1715	Sooty S.	1	NW			
✓ 1720	Sooty S.	1	NW			
✓ 1721	Sooty S.	1	NW			



DATE 2 April 4
Pg.# 5

time	species	#	dir.	hgt.	remarks	loc.
1725	Sooty Shear	1	N			
1745	Sooty shear	2	N			
1746	Sooty Shear	1	N			
1754	Sooty Shearwater	3	N			
1805	Sooty Shearwater	4	N			
1809	Sooty Shearwater	3	N			
1815	Sooty Shearwater	1	N			
1817	Sooty Shearwater	1	N			
1819	Sooty Shearwater	1	N			
1824	Sooty Shearwater	1	N			
1830	Sooty Shearwater	2	N			
1830	end observations					

855
+29



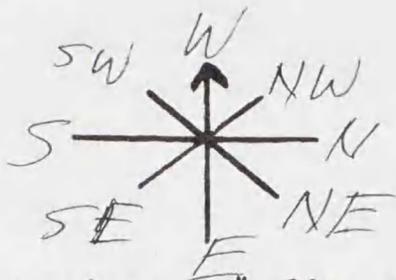
DATE 3 Apr 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0555	begin observations					
0601	Sooty Shear	1	N			
0603	Sooty shear	2	N			
0606	Sooty S	3	N			
0610	Sooty S	9	N			
0615	Sooty S	11	N			
0614	Leach's Harcourt's S.P.	1	W		Type B omit	
0620	Sooty S,	14	N			
0625	sooty S	3	N			
0630	Sooty S	13	N			
0628	Shearbird	1	N		small + light	
0635	sooty S	18	N			
0640	Sooty S	12	N			
0645	Sooty S	20	N			
0642	Shearwater/ petrel	2	N		white underparts - high sailing	
0650	sooty S	20	N			
0655	Sooty S	5	N			
0700	Sooty S	18	N			
0705	Sooty S	20	N			
0710	sooty S	17	N			
0715	Sooty S	7	N			
0720	Sooty S	33	N			
0725	sooty S	19	N			
0730	Sooty S	36	N		- flock of 7!	
0730	Sooty S	16	N			
0758	shearwater/ petrel	2	N			
0759	Shearbird	1	N		small + light	
0805	Sooty S	12	N			
0810	Sooty S	8	N			
0808	Leach's Harcourt's S.P.	1	N		Type B omit	
0815	sooty S.	14	N			
0820	Sooty S	9	N			
0824	Shearbird	2	N		small + light	
0825	Sooty S.	10	N			
0830	sooty S.	7	N			
0835	sooty S	8	N			
0840	Sooty S	6	N			

26 ✓
30 ✓
50 ✓
186 ✓
20 ✓
23 ✓
31 ✓
36 ✓

2 ✓
28 ✓
17 ✓
55 ✓
15 ✓
370

85 ✓
15 ✓
29 ✓
100 ✓
20 ✓
316



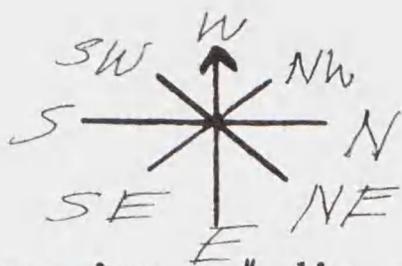
DATE 3 Apr 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.	
0845	Sooty S.	2	N				
0849	Sooty Tern	2	E				
0850	Sooty S.	3	N				
0852	Wedge-tailed Shearwater	1	W				
0855	Sooty S.	2					
0900	Sooty S.	3	N				
0905	Sooty S.	5	N				
0907	Wedge-tailed Shearwater	1	W				
0910	Sooty S.	4	N				
0915	Sooty S.	2	N				
0920	Sooty S.	1	N				
0925	Sooty S.	10	N				
0930	Sooty S.	11	N				
0935	Sooty S.	15	N				
0940	Sooty S.	11	N				
0945	Sooty S.	2	N				
0950	Sooty S.	8	N				
	Shearwater/petrel	1	N				
0950	stopped for hydro station						
1025	Sooty S	2	N				
1032	Sooty S	8	N				
1036	Sooty S	8	N		loose flock		
					loose flock		
1040	Sooty S	3	N				
1044	Sooty S	2	NW				
1048	Sooty S	1	NW				
1052	Sooty S.	3	NW				
1057	"	1	NW				
1100	"	1	NW				
1104	"	3	NW				
1110	"	13	NW				
1115	"	2	NW				
1117	"	1	NW				
1125	"	3	NW				
1140	"	2	NW				
1144	"	2	NW				
1151	"	2	NW				
1154	Sooty Tern	3	SE				
1155	Sooty Shear	3	NW				

N=98
NW=2
39

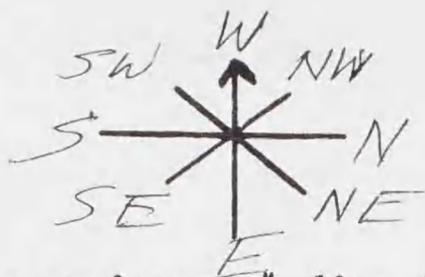
N=100
NW=39

60
NW=39



DATE 3 Apr 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
1155	Sooty Tern	1	N			
1157	Red-tailed TB.	1		100M		
1200	Sooty Shear	3	N			
1205	Sooty S	14	N			
1210	Sooty Tern	2522			actively feeding with sooty s. flying through + around but not observed feeding.	
1210	Sooty S.	14	N			
1215	"	25	N			
1220	"	2	N			
1225	"	2	N			
1230	"	5	N			
1235	"	6	N			
1235	school of porpoises + orca + shark					
1240	"	2	N			
1245	"	1	N			
1255	"	5	N			
1300	"	4	N			
1305	"	1	N			
1310	"	3	N			
1315	"	4	N			
1317	Sooty Tern	1	S			
1325	Sooty Tern	3	NW			
1325	Sooty S	2	N			
1330	" "	2	N			
1335	" "	1	N			
1340	" "	2	N			
1345	" "	2	N			
	Shorebird	1	N			
1350	Sooty S.	7	N			
1355	" "	8	N			
1400	" "	3	N			
1405	" "	2	N			
1410	" "	1	N			
1425	shorebird	1	W			
1430	Sooty S.	1	N			
1435	" "	1	N			
1440	" "	2	N			
1445	" "	1	N			
1450	" "	3	N			
1453	Sooty Tern	2	W			
1455	Sooty S.	4	N			



DATE 3 Apr 64
Pg. # 14

time species # dir. hgt. remarks loc.

time	species	#	dir.	hgt.
1500	Sooty S	4	N	
1505	" "	3	N	
1510	" "	27	N	
1515	" "	15	N	
1520	" "	16	N	
1525	" "	17	N	
1530	" "	22	N	
1535	" "	26	N	
1540	" "	29	N	
1545	" "	29	N	
1550	" "	13	N	
1555	" "	9	N	
1600	" "	13	N	
1600	Shearwater	1	N	
1605	Sooty S	13	N	
1610	" "	15	N	
1615	" "	12	N	
1620	" "	6	N	
1625	" "	7	N	
1630	" "	7	N	
1635	" "	5	N	
1640	" "	12	N	
1641	Black-footed A	1		
1700	Sooty S.	20	N	
1705	" "	14	N	
1710	" "	23	N	
1715	" "	43	N	
1715	Sooty Tern	25	S	high
	Frigatebird	1		
1720	Sooty S.	17	N	
1725	" "	14	N	
1730	" "	19	N	
1735	" "	13	N	
1740	" "	3	N	
1745	" "	3	N	
1745	Sooty Tern	12	⊙	
1750	Sooty S.	8	N	
1755	" "	22	N	
1800	" "	27	N	
1805	" "	17	N	
1810	" "	13	N	
1811	Sooty Tern	1	W	
1815	Sooty S.	20	N	

223 = N
77 = N 27
100 = N 100
68 = N 69
87 = N 87
20 = N 20

93
96
223

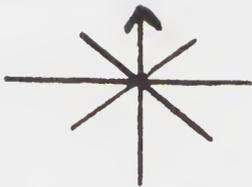
small + white

loose flock of 20

feeding ~~flight~~ flock

$$\begin{array}{r} 7500 \\ \hline 60 \overline{) 450,000} \end{array}$$

$$\begin{array}{r} 1333 \\ \hline 933 \overline{) 12382} \\ 999 \\ \hline 2392 \\ 999 \\ \hline 1393 \\ 999 \\ \hline 394 \\ 999 \\ \hline 295 \\ 999 \\ \hline 196 \\ 999 \\ \hline 96 \\ 999 \\ \hline 67 \\ 999 \\ \hline 68 \end{array}$$

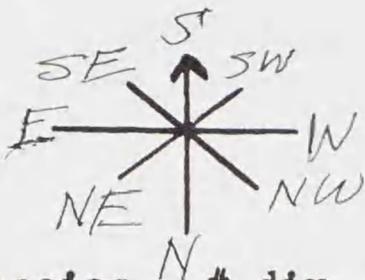


DATE 3 Apr 64

Pg. # 5

time species # dir. hgt. remarks loc.

1820	Sooty Shear.	17	N			
1825	Sooty S	16	N			
1825	Sooty Tern	1	W			
1830	Sooty Shear.	31	N			
1835	"	14	N			
1835	Storm Petrel sp	1	E			
1840	Sooty Shear	14	N			
1845	Sooty S	27	N			
1845	Black-footed A.	1				
1845	and observations					



DATE 4 Apr 64
Pg. # 1

time species # dir. hgt. remarks loc.

0615 start observations

0610 Black-footed Albatross 4 seen by watch following ship

0610 LAYSAN Albatross 1 seen by watch following ship

0655 Laysan A. 2

Black-foot A 6

0655 Sooty Tern 6

0655 Wedgetails 4

0656 Wedgetails 2

0700 Shearwater
petrel 2

0710 Laysan A 3

Black-foot A. 10

Wedgetails 2

Shearwater
petrel 1

0715 Sooty Tern 1 S

0715 Wedgetail 4

0715 Sooty shear? 1 N

0715 shearwater
petrel 1

0750 Wedgetails 2

Sooty Tern 1

0827 Sooty Tern 2 S

0912 Sooty Tern 2

0912 Wedgetails 2

0937 Sooty Tern 1 S

0953 Sooty Tern 6 S

0954 POMARINE
Jaeger 1 S

1009 Sooty Tern 2 S

1020 Sooty Tern 4 S

1045 Sooty Tern 1 S

1103 Red-tailed
Tropicbird 1 S

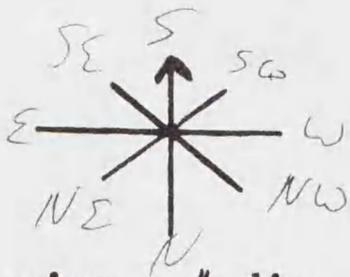
1106 Sooty Tern 15±3

Fairy Tern 4

actively feeding

1113 Wedgetails 1 N

1128 Sooty Tern 2 S



DATE 4 Apr 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.	
1132	Wedgetails	1	S		light place		
1133	Sooty Tern	1	E				
1140	Sooty Tern	2					
1140	Wedgetails	1					
1140	Black-footed A	16					
1140	Laysan A	2					
1153	Wedgetails	1					
1154	Black footed A + Laysan A	12 1			sitting in water in big congregation.		
1158	small bird	1			either shorebird or storm petrel - seen by watch		
1201	Wedgetails	1					
1201	sooty Tern	1					
1220	Wedgetail	7					
1225	Sooty tern	4					
1240	Sooty Tern Fairy Tern Pilot	115 ± 10 1			feeding		
1241	Pilot whale	8					
1310	Black-footed Albatross	40			one banded bird approached to within 5 ft. while feeding on garbage		
	Laysan Albatross	1					
1312	Sooty Tern	1					
1315	Wedge-tailed Shearwater	1					
1330	Sooty Tern	1	S				
1709	Wedge-tailed Shearwater	1	S				
1723	Sooty Tern	1	S				
1800	Black footed A Laysan A.	30 2					
1815	Sooty Tern	60	S		feeding		
1845	ceased observations						

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 16 Mar 64 Total Minutes: 248 Total Miles 50

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>42</u>	<u>351</u>	<u>8.36</u>	<u>7.02</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
4	1	0	0	8	1	0	0	2	1	0	0	.16	.02	0	0

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
0	0	0	0	0	0	0	0	0	0	0	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>20</u>	<u>306</u>	<u>15.3</u>	<u>6.12</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
7	0	6	0	17	0	10	0	2.43	0	1.67	0	.34	0	.2	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>7</u>	<u>289 289</u>	<u>.14</u>	<u>2</u>	<u>250</u>	<u>.04</u>

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 17 Mar 64 Total Minutes: 723 Total Miles 110

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
22	32	1.45	.291

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
12	1	6	0	13 13	8	0	0	1. 1 ⁰⁸	1	1.33	0	.13	.01	.07	0

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	0	0	2	0	0	2	0	0	.02	0	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
7	14	2	.13

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	1	1	.01

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
0	0	0	0	0	0

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 18 Mar 64 Total Minutes: 723 Total Miles 137

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>16</u>	<u>88</u>	<u>5.56</u>	<u>.642</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
8	0	0	0	17	0	0	0	2.1	0	0	0	.12	0	0	0

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
5	5	0	7	7	0	1.4	1.4	0	.05	.05	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>3</u>	<u>63</u>	<u>2.1</u>	<u>.46</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>3</u>	63 <u>73</u>	<u>.02</u>	<u>1</u>	<u>50</u>	<u>.01</u>

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 19 Mar 64 Total Minutes: 715 Total Miles 129

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>22</u>	<u>42</u>	<u>1.91</u>	<u>.32</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>16</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>17</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>1.06</u>	<u>.13</u>	<u>.13</u>	<u>0</u>	<u>.13</u>	<u>.02</u>	<u>.02</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>2</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>.02</u>	<u>.02</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>3</u>	<u>22</u>	<u>7.33</u>	<u>.17</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>1</u>	<u>20</u>	<u>.01</u>	<u>0</u>	<u>0</u>	<u>0</u>

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 20 Mar 64 Total Minutes: 737 Total Miles 122

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>327</u>	<u>126</u>	<u>3.5041</u>	<u>1.03</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
31	5	0	2	39	6	0	2	1.26	.16	0	.06	.32	.05	0	.02

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	0	0	2	0	0	2	0	0	.02	0	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>5</u>	<u>85</u>	<u>17</u>	<u>.69</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>3</u>	<u>81</u>	<u>.02</u>	<u>2</u>	<u>65</u>	<u>.02</u>

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 21 Mar 64 Total Minutes: 737 Total Miles 123

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>47</u>	<u>78</u>	<u>1.66</u>	<u>.63</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>42</u>	<u>13</u>	<u>1</u>	<u>0</u>	<u>57</u>	<u>19</u>	<u>1</u>	<u>0</u>	<u>1.35</u>	<u>1.46</u>	<u>1</u>	<u>0</u>	<u>.46</u>	<u>.16</u>	<u>.01</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>2</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>.02</u>	<u>.02</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>16</u>	<u>16</u>	<u>.13</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	<u>2</u>	<u>1</u>	<u>.02</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>1</u>	<u>10</u>	<u>.01</u>	<u>0</u>	<u>0</u>	<u>0</u>

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 22 Mar 64 Total Minutes: 726 Total Miles 99

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
45 45	745 745	1.58 1.58 ⁶⁷	.75

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
33 4	3	0	1	52	5	0	1	1.58	1.58	0	1	.52	.05	0	.01
								1.58 1.58							
								1.67							

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
3	2	1	3	2	1	1	1	1	.03	.02	.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
7	13	1.86	.01

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	4	4	.04

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
1	5	.01	0	0	0

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 23 Mar 64 Total Minutes: 722 Total Miles 124

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
17	28	1.65	.23

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
11	1	1	0	17	1	1	0	1.13	1	1	0	.14	.01	.01	0
								1.55							

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	1	0	2	1	0	1	1	0	.01	.01	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
3	8	2.66	.06

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	1	1	.01

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
0	0	0	0	0	0

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 24 Mar 64 Total Minutes: 732 Total Miles 127

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1 11	11	1.00	.09

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
13 7	0	0	0	9	0	0	0	13 7	0	0	0	.071	1	1	1
								1.29							

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	0	0	1	0	0	1	0	0	.01	0	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	1	1	.01

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
0	0	0	0	0	0

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 25 Mar 64 Total Minutes: 734 Total Miles 112

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>14</u>	<u>21</u>	<u>1.50</u>	<u>.18</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>8</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>11</u>	<u>7</u>	<u>0</u>	<u>0</u>	<u>1.38</u>	<u>1.75</u>	<u>0</u>	<u>0</u>	<u>.10</u>	<u>.06</u>	<u>0</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>3</u>	<u>0</u>	<u>1</u>	<u>3</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>.03</u>	<u>0</u>	<u>.01</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	<u>6</u>	<u>3</u>	<u>.05</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>1</u>	<u>1</u>	<u>.01</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>1</u>	<u>5</u>	<u>.01</u>	<u>1</u>	<u>5</u>	<u>.01</u>

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 26 Mar 64 Total Minutes: 730 Total Miles 138

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>22</u>	<u>29</u>	<u>1.32</u>	<u>.21</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
16	2	0	1	21	4	0	1	1.31	2.00	0	1.00	.15	.03	0	4.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	1	0	2	1	0	1.00	1.00	0	.01	4.01	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	<u>3</u>	<u>1.50</u>	<u>.02</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	<u>3</u>	<u>1.50</u>	<u>.02</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 27 Mar 64 Total Minutes: 730 Total Miles 0

I. Total Abundance of birds:

(drift study)

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>28</u>	102 92	3.52 3.17	—

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
25	6	2	0	46	7	2	0	1.84	1.17	1	0	—	—	—	—

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
3	2	0	3	2	0	1	1	0	—	—	—

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	41 41	20.5 20.5	—

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
2	2	0	0	2	2	0	0	1	1	0	0	—	—	—	—

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>1</u>	<u>51</u>	<u>—</u>	<u>1</u>	<u>51</u>	<u>—</u>

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 28 Mar 64

Total Minutes: 732

Total Miles 111

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>54</u>	382 <u>481</u>	7.08 <u>8.91</u>	3.44 <u>4.33</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>48</u>	<u>8</u>	<u>9</u>	<u>0</u>	<u>87</u>	<u>20</u>	<u>10</u>	<u>0</u>	1.81 <u>2.50</u>	<u>1.10</u>	<u>0</u>	<u>0</u>	<u>.78</u>	<u>.18</u>	<u>.09</u>	<u>0</u>

III. Abundance of Tropicbirds:

1.81

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>4</u>	<u>390</u>	<u>97.50</u>	<u>3.51</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>1</u>	<u>1</u>	<u>.01</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>3</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>.03</u>	<u>.03</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>5</u>	<u>423</u>	0.04 <u>.04</u>	<u>2</u>	<u>305</u>	<u>.04</u>

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 29 Mar 64

Total Minutes: 732

Total Miles 129

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>36</u>	<u>41</u>	<u>1.18</u>	<u>3.08</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>32</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>37</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>1.15</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>.29</u>	<u>.02</u>	<u>.02</u>	<u>.01</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>1</u>	<u>1</u>	<u>.01</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>3</u>	<u>3</u>	<u>1</u>	<u>.02</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 30 Mar 64 Total Minutes: 738 Total Miles 115

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>27</u>	<u>35</u>	<u>1.30</u>	<u>.30</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>26</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>32</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>1.23</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>.28</u>	<u>.01</u>	<u>.02</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>2</u>	<u>3</u>	<u>1.50</u>	<u>.03</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 31 Mar 64 Total Minutes: 740 Total Miles 1283

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>25</u>	<u>25</u>	<u>1.00</u>	<u>.20</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>25</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>25</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1.00</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>.20</u>	<u>0</u>	<u>0</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 1 Apr 64 Total Minutes: 740 Total Miles 122

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>20</u>	<u>25</u>	<u>1.25</u>	<u>.20</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>19</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>24</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1.26</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>.20</u>	<u>0</u>	<u>0</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>1</u>	<u>1</u>	<u>.01</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 2 Apr 64 Total Minutes: 750 Total Miles 113

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
25 26	25 37*	1.40 1.42	.31 .33

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
17	14 *	0	0	1	26	0	0	1	0	0	1	.23	0	0	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	1	0	1	1	0	1	1	0	.01	.01	0

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	2	2	.02

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
8	8	1	.07

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
0	0	0	0

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
0	0	0	0	0	0

* 155 Sooty Shear + 30 probables counted in 5 minute accumulations. Sightings not recorded

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 3 Apr 64 Total Minutes: 753 Total Miles 140

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>28</u>	<u>96</u>	<u>3.40</u> 3.56	<u>.68</u> .69

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>9</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>11</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>1.22</u>	<u>1.00</u>	<u>0</u>	<u>0</u>	<u>.01</u>	<u>0</u>	<u>0</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>.01</u>	<u>.01</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>12</u>	<u>76</u>	<u>6.32</u>	<u>.54</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>6</u>	<u>7</u>	<u>1.16</u>	<u>.05</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>1</u>	<u>1</u>	<u>1</u>	<u>.01</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>3</u>	<u>62</u>	<u>.02</u>	<u>1</u>	<u>12</u>	<u>.01</u>
	<u>63</u>				

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 4 Apr 64 Total Minutes: 747 Total Miles 121

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>43</u>	<u>310</u>	<u>7.20</u>	<u>2.53</u>

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
<u>19</u>	<u>14</u>	<u>0</u>	<u>0</u>	<u>73</u>	<u>25</u>	<u>0</u>	<u>0</u>	<u>3.84</u>	<u>1.32</u>	<u>0</u>	<u>0</u>	<u>.60</u>	<u>.20</u>	<u>0</u>	<u>0</u>

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>.01</u>	<u>.01</u>	<u>0</u>

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>20</u>	<u>234</u>	<u>11.7</u>	<u>1.93</u>

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
<u>45</u>	<u>203</u>	<u>.04</u>	<u>3</u>	<u>195</u>	<u>.02</u>
	<u>207</u>				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 16 Mar 64

Time at sunrise ¹⁴³⁰ = Position at sunrise = 21° 17' N 157° 57' W

Time at sunset ¹⁸³⁸ = Position at sunset = 20° 44' N 157° 23' W

Miles traveled from 0000 hours to sunrise = —

Miles traveled from sunrise to sunset = 50

Miles traveled from sunset to 2400 hours = 39

<u>TIME OF FIX</u>	<u>TYPE OF FIX</u>	<u>LONGITUDE</u>	<u>LATITUDE</u>
1.			
2.			
3.			
4.			
5.			
6.			

DATE 17 Mar 64

Time at sunrise ⁰⁶³⁵ = Position at sunrise = 19° 01' N 156° 59' W

Time at sunset ¹⁸³⁸ = Position at sunset = 17° 11' N 157° 01' W

Miles traveled from 0000 hours to sunrise = 76

Miles traveled from sunrise to sunset = 110

Miles traveled from sunset to 2400 hours = 59

<u>TIME OF FIX</u>	<u>TYPE OF FIX</u>	<u>LONGITUDE</u>	<u>LATITUDE</u>
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 18 Mar 64

Time at sunrise $\overset{0635}{=}$ Position at sunrise = $15^{\circ}17'N$ $157^{\circ}00'W$

Time at sunset $\overset{1838}{=}$ Position at sunset = $13^{\circ}00'N$ $157^{\circ}00'W$

Miles traveled from 0000 hours to sunrise = 55

Miles traveled from sunrise to sunset = 137

Miles traveled from sunset to 2400 hours = 43

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

DATE 19 Mar 64

Time at sunrise $\overset{0632}{=}$ Position at sunrise = $11^{\circ}24'N$ $156^{\circ}51'W$

Time at sunset $\overset{1827}{=}$ Position at sunset = $11^{\circ}32'N$ $154^{\circ}39'W$

Miles traveled from 0000 hours to sunrise = 58

Miles traveled from sunrise to sunset = ~~129~~ 129

Miles traveled from sunset to 2400 hours = 43

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

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3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART B

DATE 20 Mar 64

Time at sunrise = ⁰⁶²⁰ Position at sunrise = 12°55'N 154°01'W

Time at sunset = ¹⁸³⁷ Position at sunset = ~~12°00'N~~ 14°55'N 153°57'W

Miles traveled from 0000 hours to sunrise = 75

Miles traveled from sunrise to sunset = 122

Miles traveled from sunset to 2400 hours = 65

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

DATE 21 Mar 64

Time at sunrise = ⁰⁶²⁰ Position at sunrise = 17°02'N 154°01'W

Time at sunset = ¹⁸³⁷ Position at sunset = 19°05'N 154°00'W

Miles traveled from 0000 hours to sunrise = 64

Miles traveled from sunrise to sunset = 123

Miles traveled from sunset to 2400 hours = 52

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART B

DATE 22 Mar 64

Time at sunrise $\overset{0622}{=}$ Position at sunrise = $19^{\circ} 47' N$ $155^{\circ} 00' W$

Time at sunset $\overset{1828}{=}$ Position at sunset = $20^{\circ} 47' N$ $154^{\circ} 06' W$

Miles traveled from 0000 hours to sunrise = 61

Miles traveled from sunrise to sunset = 99

Miles traveled from sunset to 2400 hours = 61

<u>TIME OF FIX</u>	<u>TYPE OF FIX</u>	<u>LONGITUDE</u>	<u>LATITUDE</u>
1.			
2.			
3.			
4.			
5.			
6.			

DATE 23 Mar 64

Time at sunrise $\overset{0618}{=}$ Position at sunrise = $22^{\circ} 48' N$ $153^{\circ} 59' W$

Time at sunset $\overset{1820}{=}$ Position at sunset = $23^{\circ} 30' N$ $152^{\circ} 37' W$

Miles traveled from 0000 hours to sunrise = 61

Miles traveled from sunrise to sunset = 124

Miles traveled from sunset to 2400 hours = 69

<u>TIME OF FIX</u>	<u>TYPE OF FIX</u>	<u>LONGITUDE</u>	<u>LATITUDE</u>
1.			
2.			
3.			
4.			
5.			
6.			

DATE 24 Mar 64

Time at sunrise = ⁰⁶⁰⁴ Position at sunrise = 22°57'N 151°04'W

Time at sunset = ¹⁸¹⁶ Position at sunset = 20°54'N 150°59'W

Miles traveled from 0000 hours to sunrise = 58

Miles traveled from sunrise to sunset = 127

Miles traveled from sunset to 2400 hours = 43

TIME OF FIX TYPE OF FIX LONGITUDE LATITUDE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 25 Mar 64

Time at sunrise = ⁰⁶⁰³ Position at sunrise = 19°10'N 151°00'W

Time at sunset = ¹⁸¹⁷ Position at sunset = 17°19'N 151°02'W

Miles traveled from 0000 hours to sunrise = 66

Miles traveled from sunrise to sunset = 112

Miles traveled from sunset to 2400 hours = 64

TIME OF FIX TYPE OF FIX LONGITUDE LATITUDE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 26 Mar 64

Time at sunrise ⁰⁶⁰⁵ = Position at sunrise = 15°16'N 150°56'W

Time at sunset ¹⁸¹⁵ = Position at sunset = 13°01'N 151°01'W

Miles traveled from 0000 hours to sunrise = 63

Miles traveled from sunrise to sunset = 138

Miles traveled from sunset to 2400 hours = 49

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

DATE 27 Mar 64

Time at sunrise ⁰⁶⁰⁵ = Position at sunrise = 11°30'N 151°01'W

Time at sunset ¹⁸¹⁵ = Position at sunset = 11°30'N 151°01'W

Miles traveled from 0000 hours to sunrise = 42

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 51

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
-------------	-------------	-----------	----------

1.

2.

3.

4.

5.

6.

DATE 28 Mar 64

Time at sunrise = 0551 Position at sunrise = 10° 34' N 149° 19' W
Time at sunset = 1803 Position at sunset = 10° 27' N 147° 58' W

~~Times and miles from Johnston Island at nearest point =~~

Miles traveled from 0000 to sunrise = 68

Miles traveled from sunrise to sunset = 111

Miles traveled from sunset to 2400 = 62

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
--	-------------	-------------	-----------	----------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

DATE 29 Mar 64

Time at sunrise = 0551 Position at sunrise = 12° 18' N 147° 59' W
Time at sunset = 1803 Position at sunset = 14° 27' N 147° 58' W

Miles traveled from 0000 to sunrise = ~~67~~ 49

Miles traveled from sunrise to sunset = 129

Miles traveled from sunset to 2400 = 51

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
--	-------------	-------------	-----------	----------

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Time at first leg of the actual grid =

Miles between sunrise to first leg of grid =

Miles between first leg of grid and sunset =

DATE 17 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID/O	TOT SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20 02	157 02														
0200	19 49	157 01														
0300	19 38	157 00														
0400	19 26	157 00														
0500	19 14	157 00														
0600	19 01	156 59														
0700	19 01	156 59														
0800	18 58.5	156 58														
0900	18 43	156 59														
1000	18 31 31	157 00														
1100	18 21	157 00														
1200	18 11	157 01														
1300	17 59	157 01														
1400	17 47	157 01	02		25+	1016	24.0	20	83 78	3	/	180-8-8	24.0	18	180	5-11
1500	17 36	157 01														
1600	17 29	157 01														
1700	17 27	157 01														
1800	17 17	157 01														
1900	17 06	157 00														
2000	16 54	156 59	02		25+	1016.5	23.5	20	92 80	2	/	80-6-7	24.2	08	120	5-11
2100	16 45	157 00														
2200	16 36	157 00														
2300	16 24	157 00														
2400	16 12	157 00														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN ^{Centigrade} FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 18 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	16 01	157 00														
0200	16 00	157 00	00		25+	1016.5	24	20	85 79	9	X	80-6-7	24.4	18	60	0-0
0300	15 54	157 00														
0400	15 46	157 00														
0500	15 34	157 00														
0600	15 23	157 00														
0700	15 11	157 00														
0800	15 00	157 01	02		25+	1016	24.4	22	88	2	X	70-6-3	24.8	13	70	5-11
0900	14 46	157 03														
1000	14 32	157 04														
1100	14 32	157 04														
1200	14 23	157 04														
1300	14 11	157 03														
1400	13 57	157 03	03		25+	1014	24.9	22	87 88	88	X	60-5-2	24.8	12	60	5-11
1500	13 45	157 02														
1600	13 32	157 01														
1700	13 19	157 01														
1800	13 07	157 00														
1900	12 55	157 00														
2000	12 55	157 00	00		25+	1014.5	24.7	22	86 84	89	X	60-6-3	24.9	12	60	0-0
2100	12 49 49	156 59														
2200	12 40	156 59														
2300	12 29	156 59														
2400	12 17	156 59														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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DATE 19 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID%	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	12 05	156 58													
0200	11 53	156 58	00	25+	1012	24.9	22	88	4 9	X	60-6-4	24.7	10	80	S-11
0300	11 4 39	156 57													
0400	11 26	156 57													
0500	11 24	156 57													
0600	11 24	156 57													
0700	11 2 34	156 45													
0800	11 25	156 33	03	25+	1012.5	25.2	22	86	3 7	X	70-6-4	25.3	17	70	E-11
0900	11 25	156 22													
1000	11 26	156 11													
1100	11 27	156 00													
1200	11 28	155 49													
1300	11 29	155 38													
1400	11 29	155 27	01	25+	1010	26	2 23	82	3	X	70-5-7	25.6	13	70	E-11
1500	11 30	155 16													
1600	11 31	155 05													
1700	11 31	154 54													
1800	11 32	154 44													
1900	11 3 33	154 33													
2000	11 33	154 23	03	25+	1012	25.6	22	84	3 3	X	90-5-7	25.5	13	90	E-11
2100	11 34	154 13													
2200	11 34	154 03													
2300	11 34	154 03													
2400	11 40	154 02													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 20 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	11 52	154 02														
0200	12 04	154 02	50		25+	1010	24.3	22	91 86	9	X	90-6-5	25.3	16	90	N-11
0300	12 16	154 02														
0400	12 28	154 02														
0500	12 40	154 02														
0600	12 51	154 01														
0700	13 02	154 01														
0800	13 02	154 01	03		25+	1012.5	24.9	21	85 78	7	X	100-6-5	24.9	22	100	N-11
0900	13 15	154 01														
1000	13 27	154 00														
1100	13 39	154 00														
1200	13 51	153 59														
1300	14 03	154 00														
1400	14 15	154 00	02		25+	1012	25.1	21	84 77	6	X	100-6-7	24.9	16	100	N-11
1500	14 26	154 00														
1600	14 30	154 00														
1700	14 37	153 58														
1800	14 49	153 57														
1900	15 01	153 57														
2000	15 13	153 58	01		25+	1013.5	25.3	21	85 77	8 4	X	90-6-5	24.6	17	90	N-11
2100	15 23	153 58														
2200	15 34	153 59														
2300	15 46	154 00														
2400	15 58	154 01														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 21 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	16 02	154 02														
0200	16 06	154 02	13		25+	1014	23.8	21	91	9	X	90-5-5	24.2	13	110	W-11
0300	16 19	154 03														
0400	16 32	154 03														
0500	16 45	154 03														
0600	16 58	154 03														
0700	17 09	154 02														
0800	17 21	154 02	15		25+	1015	23.8	21	91	7	X	120-5-7	23.8	14	120	N-11
0900	17 33	154 01														
1000	17 33	154 01														
1100	17 43	154 01														
1200	17 56	154 01														
1300	18 07	154 01														
1400	18 18	154 00	63		5	1015.3	22.8	20	91	7	X	70-6-7	23.6	19	70	N-11
1500	18 29	154 00														
1600	18 41	154 00														
1700	18 53	154 00														
1800	19 05	154 00														
1900	19 05	154 00														
2000	19 13	154 00														
2100	19 24	154 00														
2200	19 35	154 00														
2300	19 46	154 00														
2400	19 57	154 00														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955

12-5-63

DATE 23 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21 58	153 58														
0200	21 58	153 58	61		10	1020	21.0	19.8	93	9	X	140-6-7	23.5	16	100	0-0
0300	22 06	153 58														
0400	22 18	153 58														
0500	22 30	153 59														
0600	22 42	153 59														
0700	22 54	153 59														
0800	23 06	153 59	01		25	1020	22.3	18.8	84	3	X	90-25-9	22.7	24	100	N-11
0900	23 18	153 59														
1000	23 29	154 00														
1100	23 29	154 00														
1200	23 30	153 53														
1300	23 30	153 41														
1400	23 30	153 29	03		25	1020.2	23.8	19.8	77	3	X	100-5-9	23.2	14	80	E-11
1500	23 30	153 17														
1600	23 30	153 05														
1700	23 30	152 53														
1800	23 30	152 41														
1900	23 30	152 29														
2000	23 30	152 17	20		25	1019.7	21.6	18	85	5	X	90-5-10	23.2	18	90	E-11
2100	23 30	152 05														
2200	23 31	151 53														
2300	23 31	151 41														
2400	23 31	151 28														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 24 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	23 31	151 15														
0200	23 32	151 03	16		25	102.0	20.7	20	95 95	5	X	80-5-2	22.6	16	90	E-11
0300	23 32	151 03														
0400	23 21	151 04														
0500	23 08 10	151 05														
0600	22 58	151 04														
0700	22 48	151 03														
0800	22 38	151 02	01		25	1018.3	21.8	17	81 75	3	X	90-5-5	22.6	13	140	E-11
0900	22 28	151 01														
1000	22 15 15	150 59 59														
1100	22 03 03	150 58														
1200	22 03	150 57														
1300	21 52	150 57														
1400	21 41	150 58	#15		25	1017.8	21.8	18	82 77	7	X	130-5-5	22.7	13	120	S-11
1500	21 30	150 59														
1600	21 19	150 59														
1700	21 08	150 59														
1800	20 57	150 59														
1900	20 46	151 00														
2000	20 37	151 00	00		25	1017.1	22.3	18	85 77	4	X	140-5-5	22.3	10	160	S-11
2100	20 30	151 00														
2200	20 28	151 00														
2300	20 22	151 00														
2400	20 11 11	151 00														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 25 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20 00	151 00														
0200	19 50	151 00	00		25	1016	21.9	18	85	9	X	110-5-4	23.3	10	130	S-11
0300	19 40	151 00														
0400	19 30	151 00														
0500	19 20	151 00														
0600	19 10	151 00														
0700	19 00	151 00														
0800	19 00	151 00	03		25	1016.3	22.5	19	84	6	X	160-5-4	23.7	7	150	S-11
0900	18 48	150 57														
1000	18 36	150 58														
1100	18 25	150 59														
1200	18 13	151 01														
1300	18 03	151 01														
1400	17 53	151 02	02		25	1014.6	24.7	21	78	6	X	130-5-4	24.0	8	130	S-11
1500	17 42	151 03														
1600	17 31	151 03														
1700	17 31	151 03														
1800	17 23	151 02														
1900	17 11	151 02														
2000	16 58	151 02	03		25	1015.5	23.8	19	80	7	X	130-5-4	24.2	10	120	S-11
2100	16 48	151 01														
2200	16 48 38	151 00														
2300	16 38 27	151 00														
2400	16 15	151 00														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 26 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	16 04	150 59													
0200	16 00	150 59	14	25	1014.5	23.5	20	86	8	X	130-5-2	23.5	14	130	0-0
0300	15 53	150 59													
0400	15 47	150 58													
0500	15 29	150 58													
0600	15 17	150 56													
0700	15 05	150 57													
0800	14 53	150 58	01	25	1015.1	23.8	21	88	4	X	130-5-4	24.0	14	130	S-11
0900	14 41	150 59													
1000	14 28	151 00													
1100	14 28	151 00													
1200	14 17	151 01													
1300	14 04	151 01													
1400	13 52	151 01	02	25	1013.9	26.7	21	88	4	X	130-5-4	24.3	14	130	S-11
1500	13 40	151 01													
1600	13 28	151 01													
1700	13 16	151 01													
1800	13 04	151 01													
1900	12 59	151 01													
2000	12 59	151 01	02	25	1014.1	24.5	22	88	4	X	130-5-4	24.6	14	90	S-9
2100	12 47	151 00													
2200	12 35	151 00													
2300	12 24	151 00													
2400	12 12	151 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 27 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	12 00	151 00													
0200	11 48	151 00	02	25	1012.1	24.8	22	87	6	X	130-5-4	25.2	20	100	S-11
0300	11 36	151 00													
0400	11 30	151 01													
0500	11 30	151 01													
0600	11 30	151 01													
0700	11 30	151 01													
0800	11 30	151 01	01	25	1014.2	25.2	22	83	3	X	130-5-4	25.6	18	50	W-0
0900	11 30	151 01													
1000	11 30	151 02													
1100	11 30	151 03													
1200	11 30	151 04													
1300	11 30	151 04													
1400	11 30	151 04	02	25	1012.0	25.8	21	83	3	X	70-5-5	26.0	18	60	0-0
1500	11 30	151 04													
1600	11 30	151 04													
1700	11 30	151 04													
1800	11 30	151 04													
1900	11 29	151 02													
2000	11 26	150 54	02	25	1013.2	25.3	22	86	6	X	90-5-8	26.1	17	80	SE-11
2100	11 21	150 46.46													
2200	11 17 16	150 35.35													
2300	11 17 11	150 25													
2400	11 17 06	150 16													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
 WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
 12-5-63

DATE 28 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	11 01	150 09													
0200	10 55	149 58	01	10	1011.4	25.4	23	88	3	X	70-5-9	26.0	17	70	SE-11
0300	10 49	149 48													
0400	10 43	149 38													
0500	10 38	149 27													
0600	10 33	149 17													
0700	10 29	149 07													
0800	10 24	148 56	01	25	1012.9	26.0	22	84	3	X	70-5-9	26.2	13	100	SE-11
0900	10 21	148 46													
1000	10 17	148 36													
1100	10 13	148 26													
1200	10 10	148 16													
1300	10 06	148 05													
1400	10 03	147 58	03	5	1011.0	26.4	22	84	7	X	70-5-7	26.5	15	110	0-0
1500	10 02	147 58													
1600	10 07	147 58													
1700	10 16	147 58													
1800	10 26	147 58													
1900	10 41	147 58													
2000	10 52	147 58	01	25	1011.8	26.1	23	89	4	X	80-6-7	26.5	24	80	N-11
2100	10 56	147 58													
2200	11 07	147 58													
2300	11 18	147 58													
2400	11 29	147 59													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 29 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	11 30	147 59													
0200	11 35	147 59	03	10	1011.8	25.2	22	82	7	X	70-6-10	26.00	23	70	N-11
0300	11 49	147 59													
0400	11 57	147 59													
0500	12 10	147 59													
0600	12 20	147 59													
0700	12 31	147 59													
0800	12 42	147 59	01	25	1014.3	24.1	20	82	3	X	70-6-7	24.9	22	80	N-11
0900	12 54	147 59													
1000	13 03	147 59													
1100	13 03	147 59													
1200	13 15	147 59													
1300	13 27	147 59													
1400	13 39	147 59	03	25	1012.0	24.8	21	80	5	X	70-6-7	24.6	22	70	N-11
1500	13 52	147 59													
1600	14 04	147 59													
1700	14 16	147 58													
1800	14 27	147 58													
1900	14 29	147 58													
2000	14 37	147 58	02	10	1015.9	23.6	19	81	4	X	70-6-9	24.0	23	70	N-11
2100	14 46	147 59													
2200	14 55	148 00													
2300	15 06	148 00													
2400	15 16	148 01													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
 WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
 12-5-63

DATE 30 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SFD.
0100	15 28	148 02													
0200	15 39	148 03	00	10	1015.0	22.3	17	82	9	X	70-6-7	24.0	24	70	N-11
0300	15 50	148 04													
0400	15 57	148 04													
0500	15 57	148 04													
0600	16 01	148 04													
0700	16 13	148 03													
0800	16 25	148 03	02	10	1017.2	22.6	23	85	7	X	80-6-12	23.6	27	80	N-11
0900	16 35	148 03													
1000	16 44	148 02													
1100	16 53	148 02													
1200	17 02	148 01													
1300	17 11	148 00													
1400	17 21	147 59	03	10	1017.2	23.4	17	77	7	X	80-6-13	23.2	28	80	N-11
1500	17 30	147 58													
1600	17 30	147 58													
1700	17 37	147 59													
1800	17 49	147 59													
1900	18 01	147 59													
2000	18 13	147 59	00	10	1020.3	21.8	15	77	9	X	70-6-13	22.9	20	60	N-11
2100	18 27	147 59													
2200	18 30	147 58													
2300	18 41	147 58													
2400	18 52	147 58													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 31 Mar 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	19 03	147 57													
0200	19 03	147 57	00	10	1021.2	20.9	15	79	9	X	70-6-10	22.0	26	70	00
0300	19 14	147 57													
0400	19 25.6	147 57													
0500	19 37	147 56													
0600	19 49	147 56													
0700	20 01	147 56													
0800	20 13	147 55	03	10	1022.5	21.6	16	82	7	X	70-6-12	22.0	24	70	N-11
0900	20 22	147 56													
1000	20 26	147 56													
1100	20 30	147 57													
1200	20 41	147 58													
1300	20 53	147 58													
1400	21 04	147 59	02	25	1021.32	22.0	18	75	7	X	70-6-12	22.0	26	80	N-11
1500	21 15	147 59													
1600	21 26	148 00													
1700	21 37	148 00													
1800	21 48	148 01													
1900	22 00	148 01													
2000	22 00	148 01	01	10	1023.2	20.3	17	83	5	X	70-6-12	22.5	22	70	N-11
2100	22 03	148 00													
2200	22 15	148 00													
2300	22 26	148 00													
2400	22 37	148 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
 WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
 12-5-63

DATE 1 Apr 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	22 49	148 00	B												
0200	23 00	148 00	15	10	1023.5	20.3	16	84	9	X	80-5-9	22.0	29	90	N-11
0300	23 12	148 00													
0400	23 23	148 00													
0500	23 30	147 59													
0600	23 31	147 59													
0700	23 41	147 59													
0800	23 53	147 59	15	10	1025	20.9	16	82	8	X	90-5-9	21.9	23	90	N-11
0900	24 04	147 59													
1000	24 15	147 59													
1100	24 26	147 59													
1200	24 40	148 00													
1300	24 51	148 00													
1400	25 00	148 00	15	10	1024	20.2	17	86	8	X	70-5-7	21.9	20	60	N-11
1500	25 00	148 00													
1600	25 09	148 00													
1700	25 21	148 00													
1800	25 32	148 00													
1900	25 44	148 00													
2000	25 57	148 00	16	5	1026.3	20.6	14	79	8	X	70-5-10	21.0 20.9	24	100	N-11
2100	26 02	148 00													
2200	26 13	148 00													
2300	26 24	148 00													
2400	26 30	148 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 2 Apr 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	26 30	148 00														
0200	26 25	148 10														
0300	26 19	148 22														
0400	26 14	148 31														
0500	26 09	148 41														
0600	26 04 26 04	148 52														
0700	26 59 09	148 41 149 04														
0800	25 54	149 06	1026.2 1026.2		25	1026.2	20.1	17	90	3	X	70-5-7	21.0	16	90	SW-11
0900	25 49	149 27														
1000	25 45	149 38														
1100	25 40	149 50														
1200	25 31	150 01														
1300	25 25	150 12														
1400	25 20	150 22		03	25	1023.7	21.8	17	81	6	X	130-5-9	22.1	21	120	SW-11
1500	25 15	150 32														
1600	25 10	150 42														
1700	25 05	150 52														
1800	25 04	150 57														
1900	25 02	151 01														
2000	25 02	151 15		00	10	1023.4	22.1	17	80	6	X	130-5-7	22.1	21	110	SW-11
2100	25 01	151 21														
2200	25 01	151 32														
2300	25 00	151 44														
2400	24 59	151 56														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 3 Apr 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	24 57	152 11														
0200	24 56	152 23	15		10	1022.0	21.5	18	86	9	X	130-5-7	22.0	22	130	W-11
0300	24 55	152 35														
0400	24 55	152 46														
0500	24 54	152 57														
0600	24 54	153 09														
0700	24 55	153 23														
0800	24 57	153 36	01		10	1022.3	22.3	18	85	4	X	130-5-10	22.4	20	130	W-11
0900	24 58	153 50														
1000	24 59	154 01														
1100	24 59	154 01														
1200	24 59	154 01														
1300	25 00	154 14														
1400	25 01	154 28	01		25	1021.2	25.1	18	77	1	X	130-5-7	22.6	15	140	W-11
1500	25 01	154 41														
1600	25 01	154 54														
1700	25 01	155 08														
1800	25 01	155 22														
1900	25 01	155 34														
2000	25 02	155 43	01		25	1020.8	23.0	20	85	1	X	130-5-10	22.4	19	140	W-11
2100	25 02	155 52														
2200	25 02	156 01														
2300	25 01	156 13														
2400	25 01	156 26														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
 WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
 12-5-63

DATE 4 Apr 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TOT SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	25 01	156 39													
0200	25 01	156 52	00	25	1020.5	23.1	19	86	3	X	130-5-7	22.7	20	140	W-11
0300	24 56	157 05													
0400	24 57	157 05													
0500	24 47	157 05													
0600	24 37	157 05													
0700	24 25	157 04													
0800	24 13	157 03	03	25	1020.8	22.9	20	86	5	X	130-5-12	23.3	19	140	S-11
0900	24 01	157 02													
1000	23 49	157 01													
1100	23 37	157 00													
1200	23 25	157 00													
1300	23 25	157 00													
1400	23 14	157 00	03	25	1019.3	23.6	19	83	4	X	130-5-9	23.2	14	130	S-11
1500	23 03	157 01													
1600	22 50	157 00													
1700	22 37	157 00													
1800	22 25	157 00													
1900	22 13	157 00													
2000	22 01	157 00	02	25	1019.5	23.9	18	80	4	X	130-5-7	23.5	19	100	S-11
2100	22 00	157 00													
2200	21 58	157 02													
2300	21 50	157 06													
2400	21 42	157 09													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
 WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955

12-5-63

DATE 5 Apr 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21 36	157 17														
0200	21 30	157 25														
0300	21 20	157 33														
0400	21 12	157 41														
0500	21 12	157 47														
0600	21 12	157 47														
0700	21 17	157 51														
0800																
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955
12-5-63

DATE 16 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200																
0300																
0400																
0500																
0600																
0700																
0800																
0900																
1000																
1100																
1200																
1300																
1430	1400 21	17				157		57								
1500	21	13				157		53								
1600	21	05				157		45								
1700	20	57				157		36								
1800	20	49				157		27								
1900	20	40				157		20								
2000	20	34				157		15								
2100	20	34				157		15								
2200	20	34				157		15								
2300	20	22				157		10								
2400	20	11				157		05								

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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BCP

DATE 22 Mar 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUMID %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	19 58	154 06														
0200	19 56	154 16														
0300	19 54	154 26														
0400	19 52	154 36														
0500	19 50	154 46														
0600	19 48	154 56														
0700	19 45	155 05														
0800	19 45	155 05														
0900	19 45	155 05														
1000	19 48	155 01														
1100	19 55	154 51														
1200	20 02	154 40														
1300	20 08	154 30														
1400	20 15	154 21														
1500	20 22	154 12														
1600	20 29	154 02														
1700	20 31	154 00														
1800	20 42	154 00														
1900	20 52	154 00														
2000	21 03	154 00	00		10	1019.1	22.5	19	86	7	X	80-6-7	23.5	18	100	N-11
2100	21 14	154 00														
2200	21 25	153 59														
2300	21 36	153 59														
2400	21 47	153 58														

REMARKS:

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