

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
0630-0800 *Bealman*
0800-1000 *Smith*
1000-1145 *Lewis*
1145-1400 *Harrington*

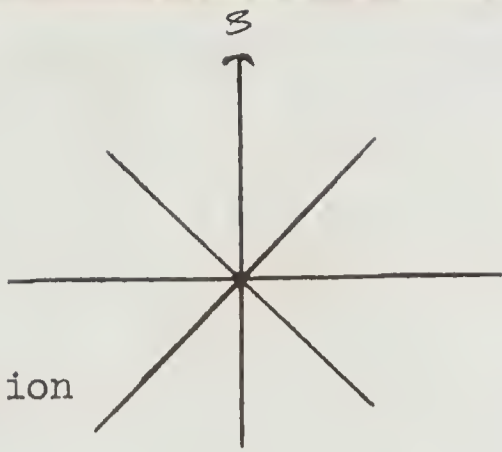
Date *9 Nov. 1966*
Pg.# *1*

Ship
Direction

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|--------------------|--------|------|----------|---|
| 0634 | | | | | Sunrise begin observations |
| - 0655 | Dark-rumped Petrel | 3 | S | | |
| - 0657 | | | | | Rain squall |
| - 0704 | WRSP | 1 | ⊙ | | |
| - 0710 | Newell's | 1 | S | | |
| - 0716 | JFP | 1 | ⊙ | | sitting on H ₂ O |
| - 0724 | WRSP | 1 | ⊙ | | " " " |
| - 0730 | Wedgetail | 1 | ⊙ | | |
| - 0738 | JFP | 1 | ⊙ | | light phase sitting on H ₂ O |
| - 0803 | RTTB | 2 | NE | | circling ship |
| - 0820 | Shear Pet | 1 | ⊙ | | |
| - 0827 | Aerodroma | 4 | ⊙ | | possibly externa |
| SF 0830 | JFP | 6 | ⊙ | | |
| - 0837 | WRSP | 1 | S | | |
| - 0908 | BWP | 1 | S | | |
| - 0921 | JFP | 2 | ⊙ | | |
| - 0948 | Shear Pet | 1 | ⊙ | | |
| SF 1000 | JFP | 20 ± 5 | ⊙ | | |
| - 1013 | WTTTB | 1 | ⊙ | | Following ship |
| - 1017 | JFP | 1 | S | | |
| - 1022 | " | 1 | S | | |
| - 1027 | " | 1 | ⊙ | | |
| - 1036 | JFP | 1 | ⊙ | | |
| - | wedge-tail | 1 | ⊙ | | Dark Phase & feeding together |
| - 1040 | JFP | 1 | S | | |
| - 1041 | JFP | 1 | ⊙ | | sitting on H ₂ O |
| - 1042 | WTTTB | | | | |
| - 1048 | JFP | 1 | S | | still following ship |
| - 1055 | wedge-tail | 1 | S | | light |
| - 1100 | WTTTB | 1 | ⊙ | | |
| - 1114 | Shear Pet. | 1 | ⊙ | | May be same bird as above |
| - 1115 | wedge-tail | 1 | ⊙ | | |
| - 1127 | Brown Booby | 1 | S | | light phase |
| - 1132 | wedge-tail | 2 | ⊙ | | Imm |
| - 1133 | JFP | 1 | ⊙ | | Following ship light phase |
| - 1134 | BWP | 1 | ⊙ | | |
| - 1137 | wedge-tail | 1 | ⊙ | | |
| - 1139 | Brown Booby | 1 | S | | Ad ♂ |
| - 1155 | BWP | 1 | SW | | |



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OBSERVERS:

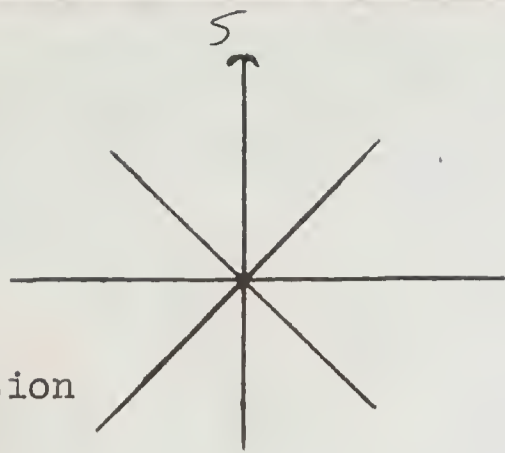
1145-1400 Harrington
1400-1600 Palmer
1505-1800 Harrington

Date ^{Nov} 08 ~~Oct~~ 1966
Pg.# 2

Ship
Direction

SPECIMEN
or
DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|---|----------------------|-------------|----------|--|
| FF 1157 | Sooty T. P. externa BWP Kermadec | 9 8+2 3+1 1 | | | all ad light. |
| 1240 | WRSP | 1 | S | | |
| 1245 | Sooty/Slender BWP | 1 | S | | light underwings |
| 1246 | | 1 | | | sitting on water |
| 1250 | Pterodroma sp. | 1 | SW | | |
| 1254 | Sooty/Slender | 1 | S | | |
| 1258 | Sooty/Slender | 2 | S | | |
| 1322 | BWP | 1 | ⊙ | | |
| 1327 | Great Frigate | 1 | ∞ | | ad ♀; chasing flying fish. |
| 1333 | P. externa | 1 | ∞ | | |
| 1337 | Black-w. Pet. | 1 | ∞ | | |
| 1342 | Brown Booby | 1 | S | | subadult. |
| 1402 | | | | | Stagella sp - 20 |
| 1418 | WRSP | 1 | ⊙ | | sitting on the Leach's type |
| 1425 | RTTB | 1 | ⊙ | | " " " |
| 1436 | JFP | 1 | ⊙ | | playing under bow |
| 1448 | BWP | 1 | ⊙ | | |
| 1454 | BWP | 1 | S | | |
| 1509 | WTTB | 1 | G | | |
| 1525 | JFP | 1 | S | | |
| 1550 | JFP | 1 | N | | |
| FF 1558 | Sooty Tern P. externa Shear/pet | 5 2 1 | | | all ad |
| FF 1602 | Sooty T. BWP | 3 3 | | | all ad |
| 1603 | Bird | 1 | - | | |
| 1612 | Bird | 1 | - | | |
| 1614 | Red-footed B | 1 | SS | | following ship immature |
| 1617 | Wilson's Storm Petrel | 1 | ∞ | | well observed, feet extending beyond shallowly-forked tail. |
| 1620 | Booby sp. | 1 | S | | |
| 1625 | P. externa | 1 | SE | | |
| 1632 | WRSP | 1 | ∞ | | |
| 1642 | Black-w. Petrel | 1 | ∞ | | |
| 1646 | Sooty Tern | 1 | S | | adult |
| 1651 | Great Frig | 1 | ∞ | | Ad ♀ Feeding |
| 1736 | Black-w Petrel | 1 | ∞ | | |
| SF 1748 | Sooty Tern? | 12 | | | circling high; two were flying in what appeared to be a courtship flight such as I have seen over colonies (BAH) |
| 1753 | Shear-pet | 1 | SE | | |
| SF 1757 | Sooty Tern Shear pet Fair Tern | 33 15+5 1 | ∞ ∞ ∞ | | apparently all adults. 12 observed well - no streamers. one wedgetail identified, one JFP identified. Feeding over predatory fish |
| 1802 | Sunset | | | | SUNSET |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

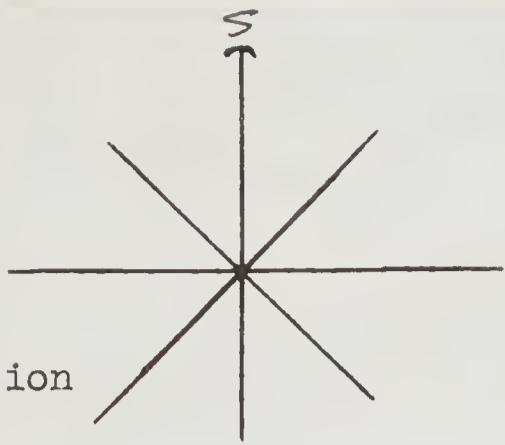
| | |
|-----------|-----------|
| 5A-0800 | Smith |
| Bulmer | 0800-1000 |
| 1000-1200 | BAH |
| 12-14 | Lewis |
| 14-16 | Smith |

Date 9 Nov 1966
Pg.# 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|--------------------|-------|---------------|----------|--|
| 0639 | | | | | Sunrise Begin observations |
| 0651 | Sooty Shear. | 1 | S | | light underwing |
| 0703 | JFP | 1 | NW | | |
| 0712 | P. externa | 2 | SW | | |
| 0721 | Sooty Tern | 1 | SW | | |
| 0726 | Frigate sp | 1 | SW | | |
| 0731 | J.F.P. | 1 | SW | | |
| 0733 | Shear-Pet | 2 | SW | | light underparts - fairly large - probably externa |
| 0738 | JFP | 2 | SW | | |
| 0743 | JFP | 1 | NW | | |
| 0746 | Shear-Pet | 1 | SW | | light underparts |
| 0750 | Fairy Tern | 1 | N | | |
| 0757 | Frigate sp. | 1 | SW | | feeding on surface of H ₂ O |
| 0812 | Pt. externa | 1 | N | | |
| 0814 | WTTB | 1 | E | | flying over ship |
| 0816 | JFP | 2 | S | | |
| 0824 | Pterodroma externa | 1 | N | | |
| 0828 | RTTB | 1 | E | | sitting on H ₂ O |
| 0832 | JFP | 1 | NW | | |
| 0847 | BB | 1 | S | | sub adult |
| 0906 | JFP | 1 | S | | |
| 0913 | WRSP | 1 | SW | | |
| 0933 | WTTB | 1 | SW | | |
| 0940 | JFP | 1 | S | | |
| 0943 | JFP | 1 | NW | | |
| 0953 | BB | 1 | S | | sub adult |
| C 0955 | WTTB | 2 | SW | | both calling |
| | RTTB | 2 | SW | | both calling, 1 coll (WB), sub adult ♀ |
| 1018 | WTTB | 1 | SW | | adult - diving & catching fish. |
| 1029 | Great Frig | 1 | SW | | ad ♂ |
| 1040 | JFP | 1 | SW | | |
| 1043 | Shear/pet | 1 | NW | | light underparts |
| 1046 | JFP | 1 | NW | | |
| FF 1120 | Sooty Tern? | 20-25 | SW | | Feeding flock, distant |
| | Shear/pet | 40-50 | SW | | |
| 1126 | WTTB | 1 | SW | | adult |
| 1210 | RFB | 1 | SW | | chasing Flying Fish & sub-ad Follows ship |
| 1314 | Sooty/sib | 1 | SW | | |
| 1335 | RFB | 1 | SW | | same as above |
| 1427 | BWP | 1 | S | | |
| 1442 | Great Frigate | 3 | SW | | AD ♀s |
| 1448 | Shear. Pet | 1 | SW | | light underparts |
| 1503 | Lesser Frigate | 1 | SW | | AD ♂ |



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OBSERVERS:

14-16 Smith

Date 9 Nov. 1966

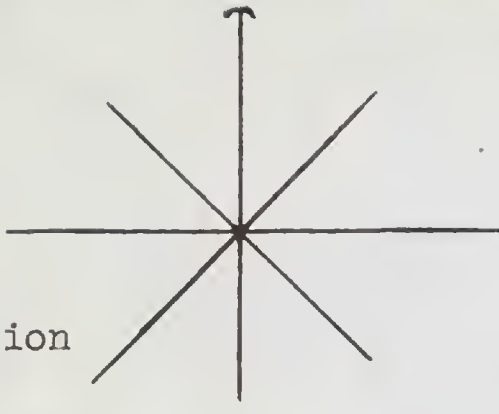
Pg.# 2

SPECIMEN

or

DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------|------|------|----------|------------------------|
| 1517 | JFP | 1 | ∞ | | |
| 1538 | Frigate sp. | 1 | ∞ | | |
| 1546 | JFP | 1 | ∞ | | |
| 1550 | J.F.P. | 1 | ∞ | | |
| 1552 | J.F.P. | 1 | ∞ | | |
| 1600 | Shear-Pet | 1 | ∞ | | |
| 1604 | RFB | 1 | ⊙ | | Subadult same as above |
| 1608 | BWP | 1 | S | | |
| 1615 | JFP | 1 | N | | |
| FF 1625 | Frigate Sp | 1 | | | |
| | Sooty Tern | 11 | | | |
| | Shear-Pet | 40±5 | | | |
| | JFP | 9 | | | |
| | BWP | 3 | | | |
| | Kermadec | 1 | | | light phase |
| | Phoenix Is. Pet | 1 | | | white throat |
| 1652 | JFP | 1 | SW | | |
| 1728 | BWP | 1 | ⊙ | | |
| | JFP | 1 | ⊙ | | |
| 1732 | Kermadec | 1 | N | | light phase |
| 1740 | Wedgetail | 2 | ⊙ | | " " |
| 1742 | BWP | 1 | ⊙ | | |
| 1803 | BWP | 1 | NW | | |
| 1808 | JFP | 1 | | | |
| 1814 | | | | | SUNSET |



Ship Direction

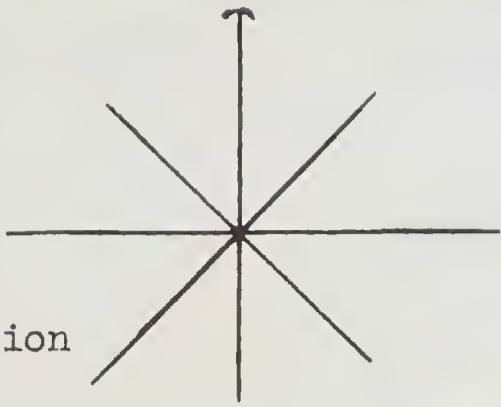
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
Lewis
0700-1000 Smith

Date 10 Nov. 66
Pg.# 1

| TIME | SPECIES | # | DIR. | SPECIMEN or BAND NO. | REMARKS |
|---------|-----------------|------|------|----------------------|--|
| 0636 | | | | | Sunrise begin observations |
| 0638 | wedge-tail | 1 | ce | | light phase |
| 0643 | RTTB | 1 | ce | | |
| 0654 | BWP | 1 | nw | | following ship |
| 0700 | Pterodroma sp | 1 | ce | | |
| 0706 | wedge-tail | 1 | S | | dark phase |
| 0707 | BWP | 1 | NW | | |
| 0708 | JFP | 1 | NW | | |
| 0709 | BWP | 1 | ce | | |
| 0710 | BWP | 1 | NW | | |
| 0710 | " | 1 | NW | | |
| 0711 | " | 1 | ce | | |
| 0713 | " | 1 | ce | | |
| 0714 | " | 1 | NW | | |
| 0714 | Pterodroma sp. | 1 | NW | | far out |
| 0716 | JFP | 1 | ce | | |
| 0719 | BWP | 1 | NW | | |
| 0724 | JFP | 3 | ce | | |
| 0724 | BWP | 1-80 | ce | | |
| 0725 | Pterodroma sp | 2 | NW | | |
| 0729 | BWP | 1 | NW | | |
| 0747 | JFP | 2 | ce | | |
| 0748 | RTTB | 1 | ce | | following ship subadult subadult |
| SF 0750 | Sooty Tern | 10 | | | 9 Ad. 1 Imm |
| | Phoenix Is Pet | 1 | | | |
| | JFP | 6 | | | |
| | BWP | 1 | | | |
| 0759 | BWP | 1 | ce | | |
| 0803 | BWP | 1 | ce | | |
| SF 0840 | Sooty tern | 6 | ⊙ | | AD |
| | Wedgetail | 8 | ⊙ | | 7 light, 1 dark |
| | BWP | 4 | ⊙ | | |
| 0846 | BWP | 1 | ⊙ | | |
| 0858 | JFP | 1 | ⊙ | | |
| 0908 | BWP | 1 | S | | |
| 1000 | Greater Frigate | 1 | ⊙ | | Ad ♂ Feeding on surface |
| 1002 | BWP | 1 | ⊙ | | |
| 1010 | Great Frigate | 1 | ⊙ | | Imm |
| | Wedgetail | 3 | ⊙ | | 2 light 1 dark |
| 1018 | Shear-pet | 2 | S | | |
| 1055 | Pt. sp | 1 | ⊙ | | Phoenix Is. size, appearing all brown above, dark upper chest, white below, white on throat. (Pt. heraldica??) |

(Pt. heraldica??)
Phoenix Is. size, appearing all brown above, dark upper chest, white below, white on throat.
underwing dark with 2 light ^{green}



Ship
Direction

SMITHSONIAN INSTITUTION
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OBSERVERS:

Bulmer 10-1200

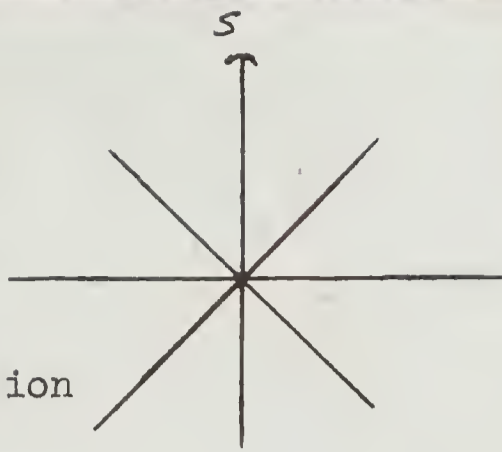
1600-1800 - Smith

Date Nov 10, 66

Pg.# 2

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|------------------|---|------|----------|---|
| 1102 | Shear-Pet | 1 | ☉ | | large |
| 1148 | Wedgetails | 2 | ☉ | | 1 dark, 1 light |
| 1150 | JFP | 1 | ☉ | | sitting on 1/20 |
| 1205 | Petrel | 1 | ☉ | | A species I have never seen before unless it's an exceptionally heavy molt Tahitian Pet. Wedge-tail size, possibly slightly larger. belly and lower breast white. Breast gray-brown with white flecks. Underwing dark with thin white line up the center almost to tip. Back and dorsal area gray-brown, somewhat mottled. White patch posterior to wing similar to a Newell's. Seen sitting and feeding twice. |
| 1212 | BWP | 1 | ☉ | | |
| 1220 | P. externa | 1 | ☉ | | |
| 1225 | Wedgetail | 1 | ☉ | | dark |
| 1245 | Phoenix/Tahitian | 1 | W | | |
| 1302 | Black-w. Pet. | 1 | NW | | |
| 1303 | Wedge-tail | 1 | ☉ | | light in molt. |
| 1330 | Sooty/Sk | 1 | SW | | dark under wings |
| 1535 | BWP | 1 | ☉ | | |
| 1545 | Shear/Pet | 1 | S | | looked like Wedge-tail but far out & Not Positive |
| 1601 | BWP | 1 | N | | |
| 1641 | Phoenix Island | 1 | S | | |
| 5F 1655 | Sooty Tern | ? | | | at least 5 ad, rest not sure |
| | P. externa | 3 | | | |
| | P. hypoleuca | 2 | | | |
| 1710 | P. externa | 1 | S | | |
| 1715 | Pterodroma sp. | 1 | S | | |
| 1729 | B.W.P. | 1 | ☉ | | |
| 1745 | Shear/Pet | 1 | ☉ | | |
| 1800 | Sooty/Sk | 1 | S | | |
| 1818 | Shear-Pet | 1 | ☉ | | |
| 1822 | | | | | close observations sunset |



Ship
Direction

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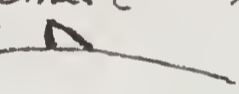
OBSERVERS:

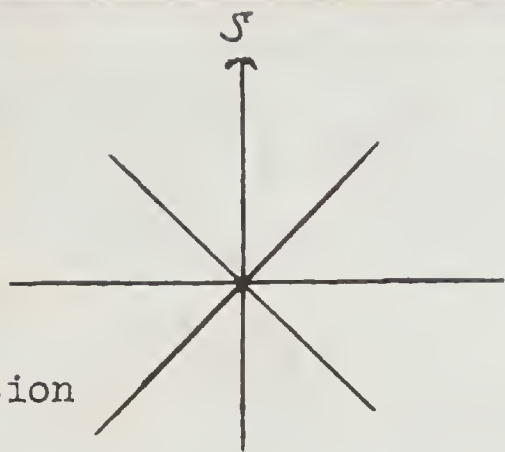
Sunrise - 0800 BAH

Date 11 November '66
Pg. # 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|---------------------|--------|------|----------|--|
| 0629 | | | | | Sunrise, begin observations |
| 0629 | Wedgetail | 2 | NE | | dark phase |
| 0632 | Shear/pet | 1 | ☉ | | |
| 0634 | Wedgetail | 1 | ☉ | | light |
| 0636 | wedgetail | 1 | ☉ | | dark, molt in primaries |
| 0645 | P. leucoptera | 1 | ☉ | | |
| 0645 | | | | | Course changed to southwest. |
| 0650 | Phoenix/tahitian | 1 | W | | |
| 0653 | Wedgetail | 1 | ☉ | | dark |
| 0655 | small pterodroma | 1 | ☉ | | |
| 0700 | | | | | course changed back to south. |
| 0714 | Small Pterodroma | 1 | ☉ | | |
| 0718 | BWP | 1 | ☉ | | |
| 0720 | Wedgetail | 1 | ☉ | | dark |
| 0720 | Phoenix I. Pet. | 1 | ☉ | | |
| 0725 | Small pterodroma | 1 | N | | |
| 0731 | Wedgetail | 1 | S | | dark |
| 0735 | Pomarine Jaeger | 1 | W | | " |
| 0735 | | | | | whales (3) - Brown - small (<20'). st Very slow, undulating motion. Dorsal fin  swimming together in a N-NE direction. |
| 0742 | WTTB | 1 | | | ad, circling ship |
| 0757 | wedge-tail | 1 | SE | | dark |
| 0800 | Small Pterodroma | 1 | ☉ | | |
| SF 0810 | Sooty Tern | 37 | ☉ | | Terns up high Ad |
| | Shear/Pet | 25 ± 5 | ☉ | | |
| 0811 | wedge-tail | 1 | ☉ | | light |
| 0812 | " " | 1 | SW | | Dark |
| 0816 | BWP | 2 | ☉ | | |
| 1 0821 | wedge-tail | 1 | W | | Partial |
| 0826 | P. externa | 1 | NW | | |
| 0828 | white-necked Petrel | 1 | NW | | |
| 0832 | Sooty Tern | 1 | ☉ | | Ad |
| 0833 | Shear/Pet | 1 | ☉ | | All darks under wings, white bellies, dark backs |
| 0840 | Mottled Pet | 1 | S | | |
| 0843 | white-necked Petrel | 1 | ☉ | | |
| (0840) | | | | | wind increased noticeably and bird numbers decreased |
| 0924 | wedge-tail | 3 | ☉ | | Follow ship 2 darks, 1 light |
| 0930 | RFB | 2 | ☉ | | Ad Intermediate Phase |
| 0932 | Small Pterodroma | 1 | ☉ | | |
| SF 0940 | P. externa | 5 | ☉ | | Dark |
| | wedge-tail | 1 | ☉ | | |
| 0945 | wedge-tail | 1 | ☉ | | Partial |
| | BWP | 2 | ☉ | | |
| | CFS | 1 | ☉ | | |



Ship
Direction

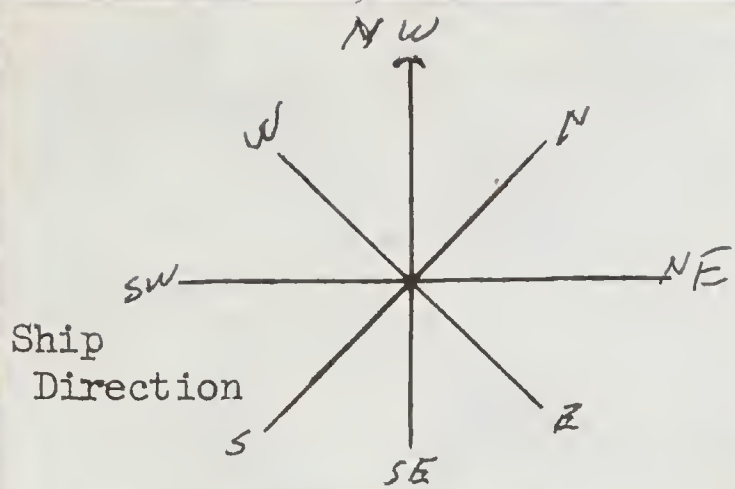
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date NOV 16 66
Pg.# 2

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|------------------|---|------|----------|-----------------------------|
| 0954 | wedge tail | 1 | | | light |
| 0956 | wedge tail | 1 | | | light |
| 1002 | BWP. | 1 | ⊙ | | |
| SF 1004 | Shear Pet | 6 | ⊙ | | |
| 1010 | wedgetail | 1 | ⊙ | | dark |
| 1019 | SKua | 1 | ⊙ | | |
| 1027 | Phoenix Island | 1 | ⊙ | | |
| 1126 | Phoenix Island | 1 | ⊙ | | |
| 1135 | Shear/Pet | 1 | ⊙ | | |
| 1140 | JFP | 1 | ⊙ | | |
| 1158 | Phoenix Is. | 1 | ⊙ | | white throat |
| 1207 | Sooty Tern | 1 | N | | Ad |
| 1212 | BWP | 1 | ⊙ | | |
| 1222 | BWP | 1 | ⊙ | | |
| 1224 | Wedgetail | 1 | N | | dark phase |
| 1242 | Bulwer's Pet | 1 | ⊙ | | sitting on H ₂ O |
| 1245 | BWP | 1 | N | | |
| 1250 | Wedgetail | 1 | E | | light phase |
| 1304 | BWP | 1 | ⊙ | | |
| 1306 | Pip/Tat. | 2 | ⊙ | | sitting on H ₂ O |
| 1313 | RFB | 1 | ⊙ | | Ad Int. phase |
| 1318 | Phoenix Is | 1 | ⊙ | | sitting on H ₂ O |
| 1322 | Shear/Pet | 1 | ⊙ | | |
| 1330 | Phoenix Island | 2 | ⊙ | | |
| 1352 | Fairy Tern | 1 | ⊙ | | } feeding |
| | Haw. Noddy | 1 | | | |
| 1400 | BWP | 1 | ⊙ | | feeding |
| 1404 | Fairy T. | 1 | | | |
| FF 1407 | Fairy T. | 7 | | | feeding |
| | Tern sp. | 1 | | | |
| 1408 | BWP | 1 | | | ad |
| 1412 | Fairy Tern | 2 | ⊙ | | |
| 1425 | Brown Booby | 1 | | | |
| 1425 | | | | | Palmyra in sight. |
| 1458 | Phoenix/Tahitian | 1 | NE | | |
| 1459 | Ruddy T | 1 | | | flying towards Island |
| 1500 | | | | | close observations |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

1000-1200 Lewis

Date 15 November 66

Pg. # 1

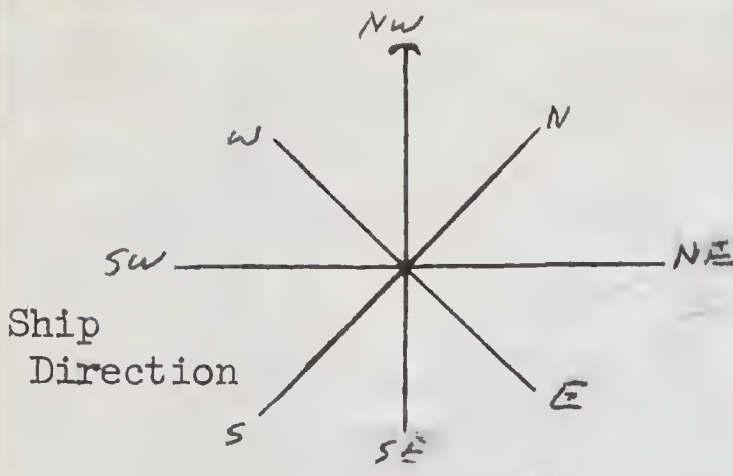
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|-----------------|-----------------------|--------------|---------------|----------|---|
| 1000 | | | | | Begin Observations 10 mi from Palmyra |
| 1015 | RFB | 1 | SW | | Ad Int. |
| 1007 | wedge-tail | 1 | W | | Darks |
| FF 1012 | Sooty Tern? | 100 ± 25 | | | Feeding |
| | RFB | 75 ± 15 | | | |
| | Frigate sp. | 2 | | | |
| | Shear/Pet Fairy Tern | 50 ± 10 | | | |
| | Fairy Tern | 3 | | | |
| 1015 | Fairy Tern | 1 | | | Follows ship |
| 1029 | Tahitian Pet | 1 | NE | | Observed closely - larger than Phoenix Island heavy Molting Backs |
| 1031 | wedge-tail | 1 | SW | | |
| 1033 | " | 1 | SW | | light |
| 1036 | P. externa | 1 | S | | light |
| 1037 | RFB | 1 | SW | | Ad Int. |
| 1038 | wedge-tail | 1 | SW | | light |
| 1041 | RFB | 2 | E | | Ad Int. |
| 1046 | " | 1 | ce | | Ad Int sitting on H ₂ O |
| 1049 | Hawaiian Noddy | 1 | S | | |
| 1051 | RFB | 1 | SE | | Ad Int. |
| 1054 | Fairy Tern | 1 | ce | | |
| 1056 | wedge-tail | 2 | ce | | light 1 dark |
| 1059 | BWP | 1 | ce | | |
| SF 1000 | sooty Tern | 9 | | | Ad Int. |
| | RFB | 3 | | | |
| | Fairy Tern | 1 | | | |
| 1101 | sooty Tern | 1 | | | headed toward flocks |
| 1105 | Phoenix/Tahitian | 1 | N | | |
| 1106 | wedge-tail | 1 | ce | | Darks |
| 1107 | ██████████ | 1 | ce | | |
| 1107 | Hawaiian Noddy | 1 | NW | | |
| 1108 | " | 1 | NW | | |
| SF 1109 | CNT | 2 | | | |
| | HNT | 1 | | | |
| | wedge-tail | 1 | | | Darks |
| | RFB | 1 | | | SA |
| 1115 | Phoenix/Tahitian | 1 | SW | | |
| 1117 | Fairy Tern | 2 | ce | | |
| 1118 | Phoenix/Tahitian | 1 | SW | | |
| 1120 | Fairy Tern | 1 | ce | | |
| 1122 | RFB | 1 | ce | | SA follows ship |
| 1123 | " | 2 | NE | | Ad Int |
| 1124 | " | 1 | " | | Ad Int |
| 1125 | " | 1 | " | | Ad Int |
| 1125 | BWP | 1 | " | | |
| 1130 | P. hypoleuca | 1 | SW | | |
| 1132 | RFB | 1 | N | | Ad Int |
| FF 1135 | Fairy Tern | 31 | ce | | |
| 1138 | Frigate S | 1 | ce | | |

OBSERVERS:

200-1900 Smith

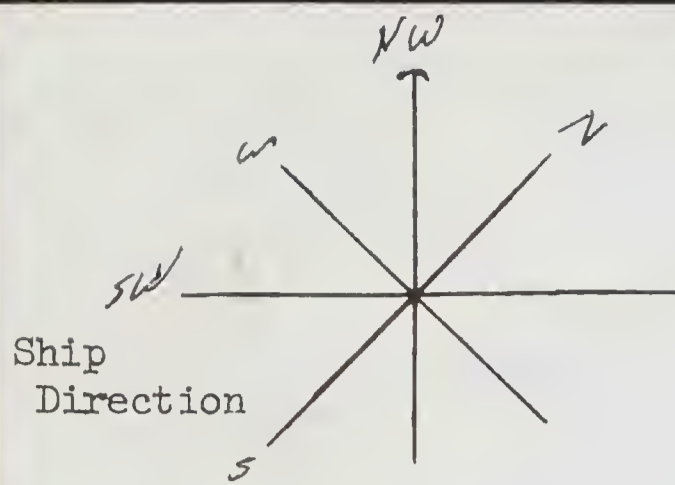


SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 15 November 66
Pg.# 2

| | TIME | SPECIES | # | DIR. | SPECIMEN or BAND NO. | REMARKS |
|----|------|-----------------|----|------|----------------------|----------------------------|
| SF | 1143 | Sooty Tern | 28 | | | Swimming up high |
| | | wedge-tail | 2 | | | Dark |
| | 1147 | Frigate sp. | 1 | SE | | |
| | 1148 | BWP | 1 | S | | |
| | 1149 | wedge-tail | 2 | W | | light 1 Dark |
| | 1149 | Bird | 1 | CE | | |
| | 1152 | RFB | 1 | CE | | Ad Int. |
| | 1154 | " | 1 | NE | | Ad Int |
| | 1165 | wedge-tail | 1 | W | | Dark |
| SF | 1156 | Sooty Tern | 11 | | | |
| | | Fairy Tern | 1 | | | up high |
| | 1200 | P. externa | 1 | | | |
| | 1201 | Fairy Tern | 1 | E | | |
| | 1205 | wedgetail | 1 | SW | | Dark |
| | 1210 | shear/pet | 1 | | | |
| | 1211 | BWP | 1 | NE | | |
| | 1221 | Fairy Tern | 4 | | | |
| | 1228 | shear/pet | 1 | SW | | |
| | 1231 | B.W.P. | 1 | | | |
| | 1233 | R.F.B | 1 | | | subadult |
| | 1237 | BWP | 1 | | | |
| | 1238 | com. Noddy | 1 | | | |
| | 1239 | Fairy Tern | 1 | | | feeding |
| | 1252 | Sooty Tern | 1 | | | immature |
| | 1258 | RFB | 2 | SE | | 2 Ad. Int. Phase |
| | 1310 | Sooty Tern | 2 | | | Ad |
| | 1311 | RFB | 2 | | | Ad Int Phase |
| | 1321 | wedgetail | 1 | | | Dark phase |
| | 1329 | shear/pet | 3 | | | |
| | 1330 | RFB | 1 | | | Ad Int. Phase |
| | 1331 | W.R.S.P. | 1 | | | |
| | 1332 | RFB | 6 | | | 4 Ad Int Phase, 2 subadult |
| | 1340 | Phoenix Is. Pet | 1 | | | |
| | 1344 | RFB | 2 | | | Ad Int Phase |
| | 1345 | Sooty/Slab. | 1 | S | | Dark underwings |
| | 1347 | " " | 1 | S | | " " |
| FF | 1348 | Fairy Terns | 11 | | | |
| | | RFB | 1 | | | Ad Int Phase |
| | 1351 | BWP | 2 | | | |
| | 1352 | RFB | 1 | | | Ad Int Phase |
| | 1353 | wedge tail | 2 | | | Dark phase |
| | 1354 | Fairy Tern | 1 | | | |
| | 1355 | wedgetail | 1 | | | light phase |

108



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Bulmer

BAH - 1400-1600

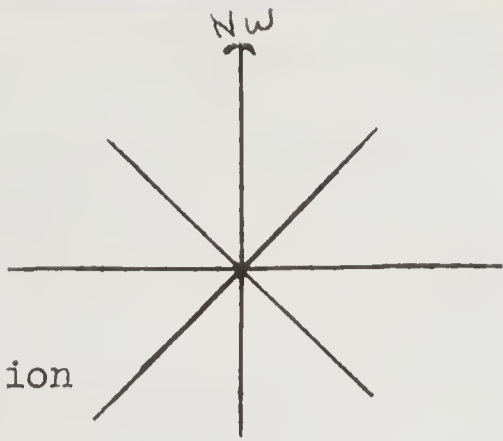
Date 15 Nov 66

Pg. # 3

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| | | | | | |
|-----------------|-----------------|---|----|--|---|
| 1405 | RTTB | 1 | ⊙ | | fish in bill |
| 1406 | T | | | | Rain squall |
| 1415 | RFB | 4 | ⊙ | | 3 Ad int. phase, 1 S. Ad |
| 1417 | Phoenix Is. Pet | 1 | SE | | |
| 1441 | Fairy Tern | 1 | ⊙ | | |
| 1450 | wedgetails | 2 | ⊙ | | 1 dark, 1 light |
| 1453 | RFB | 2 | SE | | S. Ad |
| 1455 | RFB | 2 | SE | | Ad. int phase |
| 1456 | RFB | 1 | SE | | " " " |
| 1457 | wedgetail | 1 | W | | dark phase |
| 1459 | Sooty Tern | 1 | NW | | Ad |
| 1503 | Wedgetail | 1 | ⊙ | | light phase |
| 1508 | Fairy Tern | 1 | NE | | |
| 1511 | sooty Tern | 1 | N | | Ad |
| 1515 | Wedgetail | 3 | SW | | 1 dark |
| 1518 | Sanderling | 1 | ⊙ | | landed on ship |
| 1523 | Wedgetail | 1 | ⊙ | | dark phase |
| 1525 | " | 1 | ⊙ | | " " |
| 1535 | Bulwers | 1 | NW | | |
| 1543 | Wedgetail | 1 | ⊙ | | light phase |
| 1545 | " | 1 | ⊙ | | dark phase |
| 1545 | WRSP | 1 | ⊙ | | |
| 1546 | Sooty Shear | 1 | SE | | |
| 1548 | Wedgetail | 3 | ⊙ | | |
| 1552 | " | 1 | ⊙ | | light phase |
| 1554 | " | 1 | ⊙ | | dark phase |
| 1555 | Phoenix Is Pet | 1 | ⊙ | | |
| 1557 | Wedgetail | 1 | ⊙ | | Strella 10 |
| 1558 | S/Sb | 1 | SW | | dark phase |
| 1608 | Phoenix/Tahiti | 1 | ⊙ | | |
| 1611 | Wedgetail | 1 | ⊙ | | |
| 1620 | BWP | 2 | ⊙ | | dark - molt present (primaries) |
| 1620 | Phoenix/Hahiti | 1 | ⊙ | | |
| 1620 | Shear-pet | 2 | S | | |
| 1622 | Wedgetail | 4 | ⊙ | | dark, molt present in all. All feeding. |
| 1628 | Sooty T. ? | 3 | NE | | distant. |
| 1630 | Phoenix-Tahiti | 1 | S | | |
| FF 1635 | Sooty T. | 3 | ⊙ | | adults |
| | Tahiti Pet | 1 | ⊙ | | |
| | Phoenix I. Pet. | 1 | ⊙ | | |
| | Wedgetail | 1 | ⊙ | | dark |
| | Audubon Shear. | 1 | | | |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

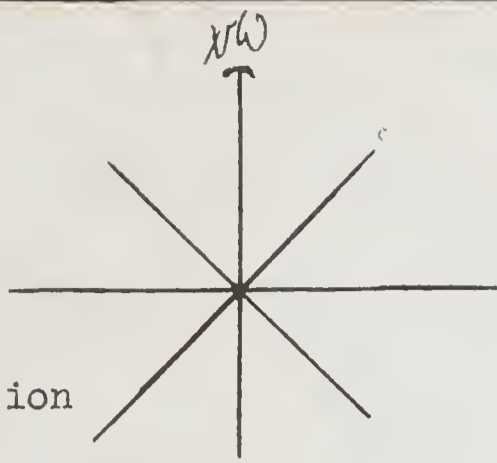
OBSERVERS:

14-1600 BAH
16-1633 Lewis

Date 15 Nov. '66
Pg. # 4

SPECIMEN
or

| | TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|----|------|--------------------------|--------------|---------------|----------|---------------------------|
| | 1647 | wedgetail | 1 | S | | dark |
| | 1652 | " | 1 | S | | dark |
| | 1700 | BWP | 1 | ce | | |
| | 1723 | Phaodroma sp | 1 | w | | |
| TF | 1732 | RFB | 7 | NE | | 5 ad, 1 S, 1 imm |
| | 1733 | wedge-tail | 1 | ce | | |
| | 1744 | BWP | 1 | ce | | Partly |
| SF | 1754 | Sooty Tern Shear/Pet. | 60±5 10±5 | | | All adult |
| | 1755 | wedgetail | 1 | S | | dark |
| | 1803 | wedge-tail | 1 | w | | dark |
| | 1807 | BWP | 1 | ce | | |
| | 1808 | BWP | 1 | ce | | |
| | 1808 | wedgetail | 1 | ce | | dark |
| | 1814 | Shear/Pet. | 1 | N | | |
| | 1830 | " " | 1 | w | | |
| | 1833 | | | | | sunset close observations |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

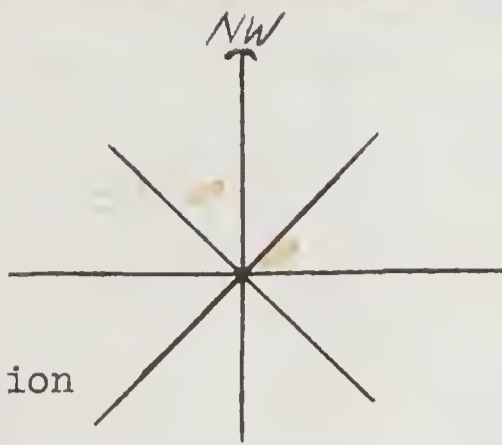
OBSERVERS:

Rulmer + Lewis

Date 15 Nov 1966
Pg.# 1

SPECIMEN or Nocturnal Non Grid

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------|------------|---|------|----------|---|
| 2200 | | | | | begin observations |
| 2220 | Shear-Pet | 1 | | | |
| 2235 | Sooty Tern | 1 | | | |
| 2239 | " | 1 | | | |
| 2243 | Birdsp | 1 | | | |
| 2245 | Shear-Pet | 1 | | | |
| 2300 | Sooty Tern | 1 | | | Ad |
| 2305 | Shear-Pet | 1 | | | probably BWP |
| 2309 | Shear-Pet | 1 | | | all Shear-Pet are the same apparently small, white below, flying high and NE |
| 2311 | Sooty Tern | 1 | | | |
| 2325 | RTTB | 1 | | | calling Sitting on the water with head under wing. Then woke up and flew around ship |
| 2400 | | | | | Close observations |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SR-0800 Smith
0800-1000 Harrington
1000-1200 Bulmer
1200-1400 Lewis
1400-1600 Smith

Ship
Direction

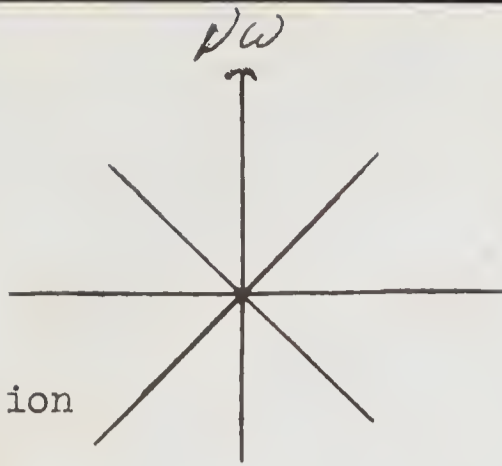
Date 16 Nov. 1966
Pg.# 1

SPECIMEN

or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|--------|------|----------|---|
| 0651 | | | | | Sunrise Begin Observations |
| 0657 | B.W.P. | 1 | NW | | |
| 0700 | Shear/Pet | 1 | | | light underparts |
| 0720 | Wedgetail | 1 | | | Dark phase |
| TF 0724 | Slenderbill | 7 | S | | Dark underwings |
| TF 0735 | " | 19 | S | | " " |
| TF 0740 | " | 11 | S | | " " |
| 0742 | JFP | 1 | | | |
| 0743 | Slenderbill | 2 | S | | Dark underwings |
| 0757 | Shear/Pet | 1 | | | |
| 0806 | Sooty Shear | 1 | S-SE | | light underwings |
| FF 0824 | JFP | 2 | } | | all feeding over large predatory fish (tuna or dolphin) |
| | BWP | 2 | | | |
| | Dark-rump Pet. | 1 | | | |
| 0830 | Wedgetail | 1 | | | well observed close to ship. No doubt. Was next to JFP for comparison |
| 0831 | BWP | 1 | | | light |
| 0838 | Sm. Pterodroma | 1 | | | |
| 0838 | Shear/Pet. | 1 | | | |
| 0852 | BWP | 1 | S | | |
| TF 0927 | Slenderbill | 7 | S-SE | | well observed; dark underwings - no doubt as to identification |
| TF 0939 | " | 24 | S-SE | | " " " " " " " " |
| 0939 | Wedgetail | 2 | | | light |
| 0958 | Slenderbill | 3 | S | | travelling; dark underwings. |
| TF 1000 | Sooty/slender | 15-20 | S | | on horizon |
| TF 1003 | Slenderbill | 10 | SW | | well observed - dark underwing. |
| 1152 | BWP | 2 | | | at last!! |
| 1154 | Wedgetail | 1 | | | light phase |
| 1155 | Pt. externa | 1 | S | | |
| TF 1200 | Sooty/slender | 15-20 | SW | | edge of squall |
| TF 1207 | " | 11 | SW | | white underwing |
| TF 1218 | " | 22 | SW | | white underwing |
| TF 1254 | " | 10 | SW | | Dark underwings |
| TF 1303 | " | 30 ± 3 | SW | | Mostly Dark underwings 3 or 4 with light underwing |
| TF 1352 | " | 60 ± 6 | SW | | All dark underwings |
| 1354 | " | 1 | S | | Dark underwings |
| 1357 | Fairy Tern | 1 | NE | | white |
| 1403 | Darkrump Pet | 1 | | | seen at close range. |
| TF 1410 | Slenderbill | 59 | | | Dark underwing |
| TF 1419 | " | 6 | | | " " |
| TF 1426 | " | 16 | | | " " |
| TF 1451 | " | 26 | S | | " " |
| TF 1454 | " | 43 | S | | " " |
| 1544 | Phoenix Island | 1 | | | |
| TF 1620 | Slenderbill | 62 | SW | | Observed close |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

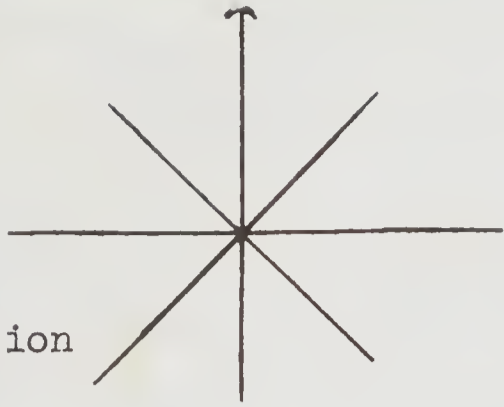
OBSERVERS:

Palmer

Date 16 Nov. 1966
Pg.# 2

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|---------------------------------------|------|------|----------|-----------------------|
| 1635 | BWP | 1 | ⊙ | | |
| TF 1636 | Slenderbill | 27 | SE | | near close |
| TF 1644 | Sooty Shear | 18 | SW | | close |
| 1652 | BWP | 1 | SW | | |
| FF 1655 | Sooty Tern | 38 | ⊙ | | Ad |
| | JFP | 15+3 | ⊙ | | |
| | Shear-Pet | 5 | ⊙ | | |
| 1738 | RTTB | 1 | ⊙ | | |
| 1744 | s/sb | 3 | SW | | out far |
| 1756 | Slenderbill | 2 | SW | | close |
| 1758 | " | 1 | SW | | " |
| TF 1805 | Slenderbill | 18 | SW | | |
| | Sooty Shear | 6 | SW | | |
| 1806 | RTTB | 2 | ⊙ | | |
| 1815 | Sooty/slend. | 1 | SW | | out far |
| 1818 | Shear-Pet | 1 | ⊙ | | |
| TF 1820 | Sooty Shear | 6 | S | | |
| 1840 | | | | | Sunset. |
| TF 1846 | Sooty Shear Slenderbill | 6 | SW | | |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

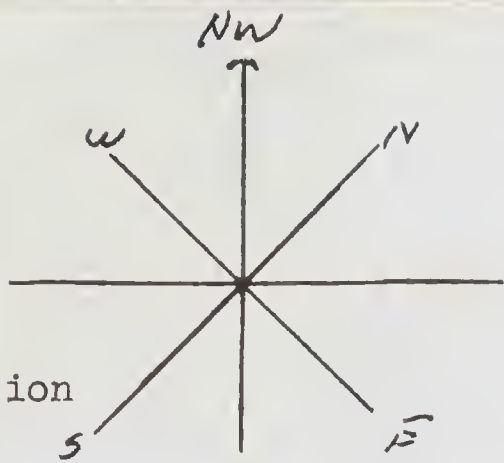
OBSERVERS:

~~2200-2400~~
BAH

Date 16 Nov '66
Pg.# 1

SPECIMEN NOCTURNAL
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|-------------------------|-----------|---|---------------|----------|--------------------|
| 1800 1010 | BWP | 1 | ce | | open observations |
| 1620 | shear/pet | 1 | ce | | close observations |
| 1830 | | | | | |



OBSERVERS:

0800-1000 Smith

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

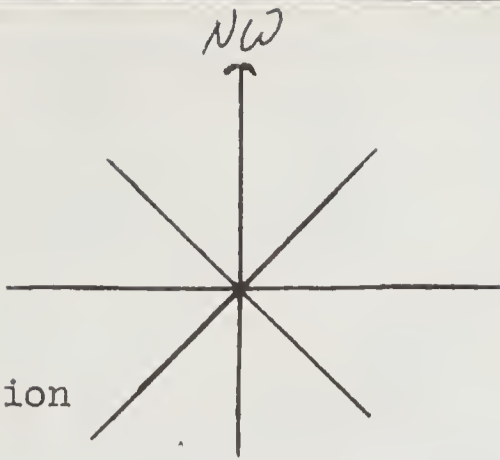
Date 17 November
Pg.# 1

SPECIMEN

or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------------|--------------|---------------|----------|-----------------------------|
| 0706 | | | | | Surviv. beg in observations |
| 0716 | Frigate sp | 1 | ce | | |
| 0719 | BWP | 1 | ce | | Follow ship Immature |
| 0720 | JFP | 1 | ce | | |
| TF 0722 | Sooty/Sib | 7 | SW | | Far out |
| TF 0724 | " | 9 | W | | way out |
| 0726 | JFP | 1 | ce | | |
| 0731 | Sooty shear. | 3 | SW | | |
| FF 0735 | RFB | 1 | ce | | 5A |
| | JFP | 8 | ce | | |
| | BWP | 12 | ce | | |
| | Wedge-tail | 2 | | | 1 light 1 dark |
| TF 0743 | Sooty shear | 7 | SW | | |
| 0743 | JFP | 2 | N | | |
| FF 0745 | Sooty shear | 5 | SW | | |
| TF 0753 | " | 4 | SW | | |
| 0754 | " | 4 | SW | | |
| 0803 | JFP | 1 | ce | | |
| 0810 | Slenderbill | 3 | S | | Dark underwings |
| 0811 | Shear/Pet | 1 | ce | | |
| 0812 | Sooty Shear | 1 | SE | | light underwings |
| TF 0818 | slenderbill | 19 | S | | Dark underwings |
| 0828 | RTTB | 2 | ce | | feeding |
| TF 0834 | Slenderbill | 22 | S | | Dark underwings |
| TF 0843 | Slenderbill | 73 | S | | " " |
| TF 0845 | " | 25 | S | | " " |
| TF 0848 | " | 32 | S | | " " |
| FF 0855 | Sooty tern | 16 | ce | | Ad feeding |
| | Wedge-tail | 2 | ce | | light |
| | JFP | 8 | ce | | |
| | Wedge-tail | 2 | ce | | light |
| | BWP | 1 | ce | | |
| TF 0900 | Slenderbill | 12 | S | | Dark underwings |
| TF 0913 | " | 17 | S | | " " |
| 0915 | BWP | 1 | ce | | |
| 0918 | Sooty Shear | 1 | S | | light underwings |
| 0935 | JFP | 1 | S | | |
| 0946 | BWP | 1 | ce | | |
| 0948 | BWP | 1 | ce | | |
| FF 1006 | BWP | 4 | ce | | |
| | JFP | 1 | ce | | |
| 1015 | BWP | 1 | ce | | |
| 1031 | JFP | 1 | NE | | |
| TF 1035 | S/Sb | 23 | S | | |
| TF 1037 | S/Sb | 5 | SW | | |
| 1042 | BWP | 1 | SW | | |
| 1052 | BWP | 3 | ce | | |
| | Bulwer's | 1 | ce | | |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

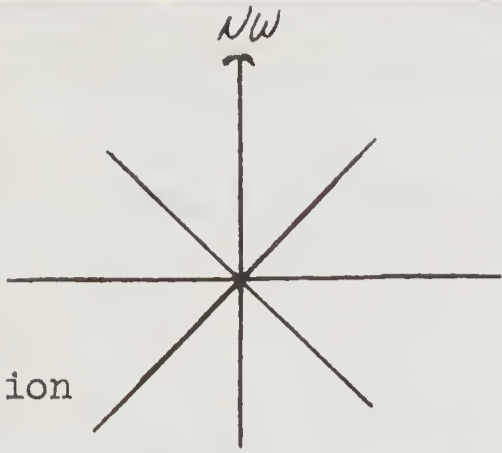
OBSERVERS:

Bulmer
1200-1400 Harrington

Date 17 Nov 1966
Pg.# 2

SPECIMEN
or

| | TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|----|------|------------------|--------|------|----------|---|
| | 1052 | Sooty Shear | 1 | ☉ | | circling without apparent direction |
| | 1055 | BWP | 1 | N | | |
| | 1056 | JFP | 1 | N | | |
| | 1059 | Slenderbill | 25 | SW | | close |
| | 1102 | S/sb | 1 | SW | | |
| TF | 1104 | S/sb | 15 | SW | | appeared to be a mixed flock that approached ship and turned back. The birds circled until the ship was out of their way and then continued on course of positively SW! |
| | 1127 | Dark-rump | 1 | | | |
| | 1204 | Shear/petrel | 1 | ☉ | | good obser. |
| | 1220 | RFTB | 1 | | | over ship, adult no central tail feather |
| | 1234 | sooty/sldr. | 1 | SW | | distant |
| SF | 1250 | Wedgetail | 2 | ☉ | | light |
| | | JFP | 5 | | | SF |
| | | BWP | 6 | | | |
| | 1255 | Pterodroma sp. | 1 | ☉ | | distant - heading for above flock. |
| TF | 1258 | Wedgetail | 7 | N | | all light. Close; none had streamers. One with molt in lower primaries. Appears to be "gravitating" to the northward. |
| | 1305 | JFP | 1 | ☉ | | |
| | 1310 | " | 1 | ☉ | | |
| | 1315 | BWP | 1 | ☉ | | |
| | 1315 | Haw. Noddy | 1 | | | sitting on fishball. |
| | 1325 | Sooty Shear | 1 | SSW | | close, light underwing, large body, flight. |
| | 1400 | Sooty-slender | 5 | SW | | distant. |
| | 1412 | " | 1 | SW | | " |
| | 1421 | BWP | 1 | ☉ | | |
| | 1426 | sooty-slender | 1 | SW | | distant |
| TF | 1442 | " " | 25 ± 5 | SW | | " |
| | 1505 | " " | 1 | SW | | |
| | 1519 | BWP | 1 | ☉ | | |
| | 1520 | Sooty shearwater | 1 | ☉ | | close No direction established |
| | 1525 | Sooty/slb. | 1 | SW | | way out |
| | 1529 | Slenderbill | 1 | SW | | dark Dark under wings |
| | 1534 | sooty/slb | 2 | ☉ | | |
| | 1535 | P. Externa | 1 | ☉ | | |
| TF | 1550 | Sooty/slb | 6 | SW | | |
| | 1551 | BWP | 1 | N | | |
| TF | 1603 | Slenderbill | 7 | SW | | Dark underwing |
| | 1604 | Sooty/slb | 1 | SW | | Way out |
| | 1607 | Slenderbill | 1 | SW | | |
| TF | 1608 | Sooty/slb | 7 | SW | | |
| TF | 1600 | " " | 15 | SW | | on horizon |
| | 1624 | " " | 1 | SW | | |
| | 1634 | JFP | 1 | ☉ | | |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

1600-1800 Smith

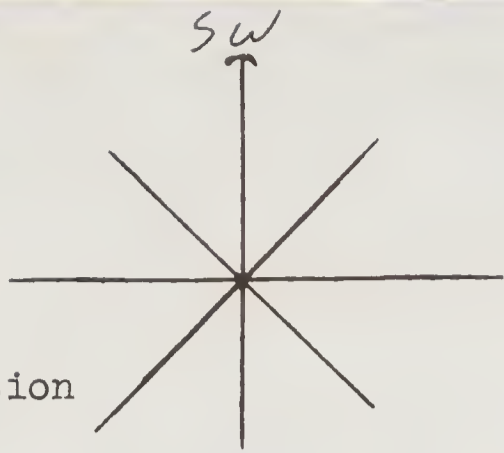
Date 17 Nov

Pg.# 3

SPECIMEN

or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------|----|------|----------|---|
| 1647 | Slenderbill | 1 | S | | dark underwings - distant |
| 1649 | Shear-pet | 1 | W | | |
| 1700 | | | | | Whale sp. Probably Sperm - blow ca 10' high pointed slightly forward. |
| 1705 | JFP | 1 | W | | |
| 1710 | BWP | 2 | W | | |
| 1712 | JFP | 1 | W | | |
| 1722 | Pterodroma | 1 | W | | |
| 1728 | Wedgetail | 1 | W | | light phase |
| 1735 | Frigate sp. | 2 | W | | |
| 1740 | BWP | 1 | W | | |
| SF 1745 | JFP | 5 | W | | light phase |
| | Wedgetail | 2 | W | | |
| 1747 | Pomarine Jaeger | 1 | W | | |
| 1801 | Wedgetail | 1 | W | | light phase |
| | BWP | 1 | W | | |
| 1820 | Sooty Shear | 1 | SW | | |
| TF 1822 | S/Sb | 11 | SW | | |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

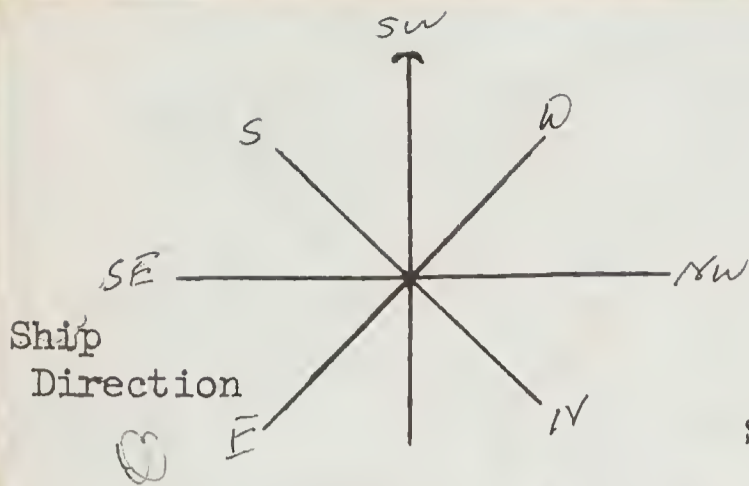
21-2400 Lewis
0000-0300 Sulzby
0330-0600 Bulmer
0600 - Sunrise BAH

Date 17-18 November
Pg.# 1

SPECIMEN or Nocturnal

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|-----------------|------------------|----|------|----------|---|
| 2200 | | | | | Begin Nocturnal Observations |
| 2220 | | | | | Course change from NW (324) To SW (224) |
| 2236 | Shear/Pet | -1 | | | Enter Grid |
| 2243 | BWP | -1 | | | white underneath, May be P. externa |
| 2300 | Small Pterodroma | -1 | | | |
| C 0015 | Storm Pet | -1 | | | |
| 0040 | Sooty Tern | -1 | ∞ | | Flaw onto light + landed under light |
| 0041 | Shear/Pet | -1 | ∞ | | Ad calling |
| 0145 | Sooty Tern | -1 | ∞ | | large |
| 0208 | Small Pterodroma | -1 | ∞ | | Ad |
| 0240 | Sooty Tern | -1 | ∞ | | Ad calling |
| 0307 | Wedgetail | -1 | ∞ | | light phase |
| 0410 | " | -1 | ∞ | | " |
| 0416 | W | -2 | ∞ | | " |
| 0615 | P. externa | -1 | S | | |
| 0620 | " | -1 | S | | |
| 0620 | | | | | SUNRISE |

Shear-Pet 2
BWP 1
Small Pterodroma 2
Leach's Pet 1 (c)
Sooty Tern 3
Wedgetail 4
P. externa 2



Ship Direction

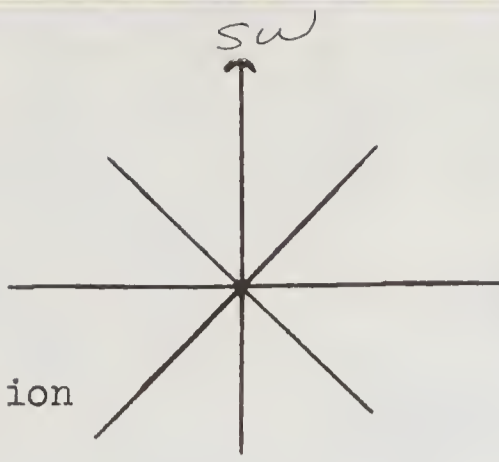
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
 sunrise - 0800 Harrington
 0800 - 1100 Lewis
 1000 - 1200 Smith
 1200 - 1400 Bulmer

Date 18 Nov 66
 Pg.# 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|----------|----------------------|--------------|------|----------|--|
| 0620 | | | | | SUNRISE |
| 0635 | | | | | |
| 0635 | S/sld. | 1 | S | | whale - blow in distance |
| 0639 | Shear-Pet | 1 | ee | | direction positive, distant. |
| 0645 | JFP | 2 | N | | distant |
| 0655 | " | 1 | NW | | |
| 0702 | " | 1 | ee | | |
| | BWP | 1 | ee | | |
| 0707 | S/sldr. | 2 | - | | |
| 0712 | BWP | 1 | S | | |
| 0724 | P. hypoleuca | 1 | NW | | |
| 0724 | Wedgetail | 1 | S | | light. |
| 0734 | P. externa | 1 | ee | | |
| 0800 | P. externa | 1 | ee | | |
| 0810 | JFP | 2 | NW | | |
| 0815 | Mottled Pet | 1 | SW | | |
| 0816 | P. externa | 1 | NW | | |
| 0819 | P. hypoleuca | 1 | N | | |
| 0823 | BWP | 1 | N | | |
| TF- 0825 | Slender bill | 6 | SW | | |
| 0828 | JFP | 1 | NW | | |
| 0831 | Phoenix/Tahiti | 1 | S | | |
| TF 0834 | Sooty & slender bill | 8 | SW | | Mixed flocks turned somewhat to west when approaching ship |
| 0836 | JFP | 1 | ee | | |
| 0840 | " | 2 | W | | |
| 0845 | " | 1 | N | | |
| 0846 | P. externa | 1 | ee | | distant |
| 0851 | JFP | 1 | ee | | |
| 0854 | " | 1 | NW | | |
| 0857 | " | 1 | W | | distant probably externa |
| 0912 | Pterodroma sp | 1 | NW | | |
| 0917 | P. hypoleuca | 1 | NW | | |
| 0925 | BWP | 1 | N | | |
| 0932 | Mottled Pet. | 1 | S | | |
| 0933 | BWP | 1 | NW | | |
| 0934 | Slender bill shear | 1 | S | | |
| 1030 | Wedgetail | 1 | N | | light |
| 1123 | WRSP | 1 | ee | | |
| 1158 | S/sldr. | 4 | S | | distant. |
| 1332 | JFP | 1 | NW | | |
| 1336 | BWP | 1 | ee | | |
| 1345 | BFB | 1 | ee | | Ad |
| 1430 | " | 1 | ee | | ad - same as above? |
| 1432 | JFP | 2 | ee | | |
| 1445 | BWP | 1 | ee | | |
| 1520 | sooty/slender | 1 | S | | distant |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

1400-1600 BAH
16-1800 TSL

Ship
Direction

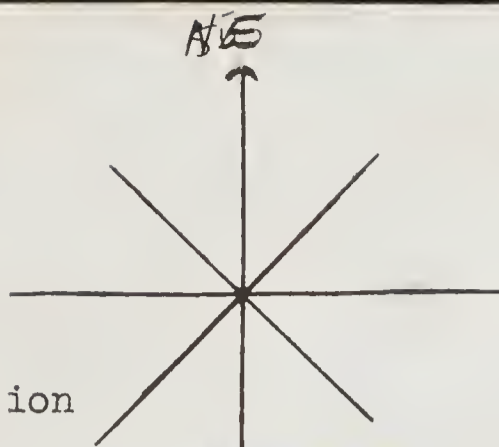
Date 18 Nov 66
Pg.# 2

SPECIMEN
OR

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|------|------|----------|--|
| SF-1535 | Wedgetail | 1 | | | light |
| | JFP | 4 | | | |
| | BWP | 3 | | | |
| | P. leucoptera? | 1 | | | all dark underwing, almost totally dark breast and belly |
| | Common Noddy | 1 | | | |
| TF 1536 | s/sldr. | 7 | S | | distant. |
| TF 1547 | s/sldr. | 25±5 | S | | " |
| TF 1604 | Shear/Pet | 1 | SW | | " |
| TF 1612 | G. Frigate | 1 | NE | | Ad ♂ ad. |
| TF 1626 | RTTB | 2 | ∞ | | calling & courtship type flying |
| TF 1655 | S/S/Av | 3 | S | | No Band on bird shot but not be traced |
| TF 1715 | " | 9 | S | | |
| TF 1725 | Sooty Shear | 1 | SW | | |
| TF 1752 | Sooty/S/S | 10 | S | | |
| 1757 | | | | | Sunset |

| | N | NE | E | SE | S | SW | W | NW |
|------------------|---|----|---|----|----|----|---|-----|
| Sooty/Slender | | | | | 60 | 14 | | |
| Shear-Pet | | | | | | | 3 | 6 |
| JFP | | | 3 | | | | | |
| BWP | | | 2 | | | | | |
| Phylogouk | | | 1 | | | | | |
| Wedgetail L. | | | 1 | | | | | |
| P. externa | | | | | | | | |
| mottled | | | | | | | | |
| Phoenix/Trinidad | | | | | | | | |
| Pterodroma AP | | | | | | | | |
| WR SF | | | | | | | | |
| BFB | | | | | | | | |
| P. leucoptera | | | | | | | | |
| Common Noddy | | | | | | | | |
| G. Frig | | | | | | | | |
| RTTB | | | | | | | | |
| Sooty shear | | | | | | | | |
| Slender | | | | | | | | |
| | | | | | | | | 133 |

| | |
|----------------------|----------|
| total birds SE to S | : 123 |
| total birds SE to S | : 114 |
| Birds/lin. miles | : 117 |
| Birds/sp. mile | : .585 |
| Birds/sector sq mile | : 24.250 |
| S/S/ per lin. mi. | : .660 |
| " sq. " | : .333 |
| Shear-Pet | : .017 |
| | : .009 |
| JFP | : .184 |
| BWP | : .092 |
| | : .088 |
| | : .044 |
| Phylogouk | : .026 |
| | : .013 |
| | : .013 |
| Phylogouk | : .035 |
| | : .018 |
| mottled | : .017 |
| | : .009 |
| Phoenix/T. | : .004 |
| Pterod. sp | : .001 |
| | : .004 |
| WR SF | : .001 |
| BFB | : .017 |
| | : .002 |
| P. leucop. | : .001 |
| | : .004 |
| CNT | : .001 |
| GF | : .001 |
| | : .002 |
| RTTB | : .017 |
| | : .007 |
| Sooty S. | : .001 |
| | : .004 |
| Slend | : .001 |
| | : .004 |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
 1800-2100 Smith
 21-2400 Bulmer
 0000-0300 BAH
 0300-0600 TFL
 0600-512 Smith

Date 18 Nov 1966
 Pg.# 1

SPECIMEN or Nocturnal Grid

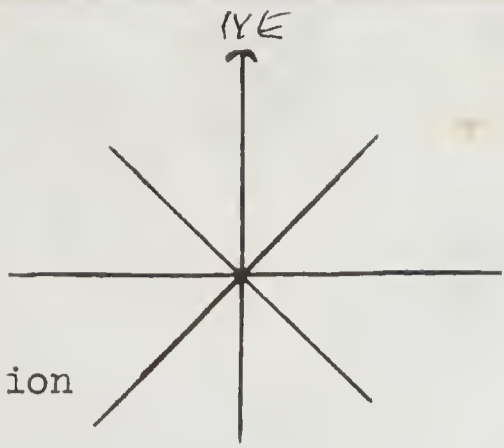
Ship Direction

sunset, Begin obs.

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------|------------|----|------|----------|----------------------|
| 1757 | Shear/pet | -1 | ∞ | | light underwings |
| 2047 | " " | -1 | ∞ | | |
| 2125 | shear pet | -1 | ∞ | | |
| 2147 | Sooty Tern | -1 | ∞ | | Ad calling |
| 0130 | Shear/pet | -1 | ? | | white below. |
| 0435 | Wedgetail | -1 | ? | | light phase |
| 0555 | wedgetail | 7 | ∞ | | following ship |
| 0601 | RITTB | 1 | ∞ | | " " high over head |
| 0612 | Wedgetail | -2 | : | | following ship light |
| 0625 | | | | | Sunrise |

*1757 - Sunset
 1800 change course*

Shear-Pet- 4
 Sooty T 1
 Wedge 4
 RITTB 1



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E
Diurnal Grid

OBSERVERS:

5A-0800 Smith
0800-1000 Bulmer
1000-1200 BAH
12-1400 Lewis
14-1600 Smith
16-1800 Bulmer

Date 19 Nov. 1966
Pg.# 1

SPECIMEN
or

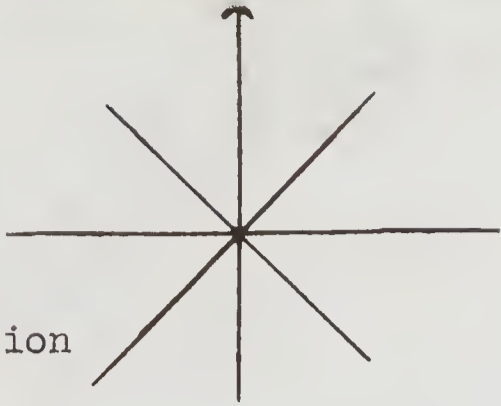
| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------------|--------------|--------------|----------|----------------------------------|
| 0625 | | | | | Sunrise - Begin observations |
| 0630 | Shear/Pet | 1 | ∞ | | |
| 0731 | " " | 1 | ∞ | | light underwings |
| 0805 | JFP | 1 | NE | | |
| 0810 | JFP | 1 | NW | | |
| 0811 | Wedgetail | 1 | NE | | light |
| 0820 | JFP | 1 | SW | | |
| 0835 | Bulwer's | 1 | SE | | |
| 0840 | JFP | 3 | NE | | |
| 0848 | RFB | 1 | NE | | S. Ad |
| 0850 | JFP | 1 | SW | | |
| 0853 | JFP | 1 | NW | | |
| 0854 | S/Sb | 1 | SW | | |
| 0855 | JFP | 1 | SW | | |
| 0859 | RTTB | 1 | ∞ | | |
| 1028 | s/slender | 1 | S | | distant |
| 1050 | BWP | 3 | ∞ | | ∞ |
| 1050 | BWP | 3 | ∞ | | |
| 1058 | WTTB | 1 | NE | | high (150') apparently searching |
| 1110 | G. Frigate | 1 | ∞∞∞ | | ad ♀ |
| 1137 | Shear/pet. | 1 | ∞ | | |
| 1306 | P. externa | 1 | NW | | sitting on H ₂ O |
| 1310 | RFB | 1 | ∞ | | edge of Brim squall |
| 1314 | Bird | 1 | ∞ | | edge of squall |
| 1347 | BWP | 1 | NW | | |
| 1352 | JFP | 1 | N | | |
| 1354 | JFP | 1 | N | | |
| FF-1357 | JFP | 5 | ∞ | | Feeding |
| | Phaenotypus | 1 | ∞ | | |
| 1412 | BWP | 1 | ∞ | | |
| | Wedgetail | 1 | | | light |
| 1511 | JFP | 2 | ∞ | | |
| EF-1512 | BWP | 1 | ∞ | | |
| | Shear/Pet | 7 | ∞ | | |
| | JFP | 8 | ∞ | | |
| | BWP | 5 | ∞ | | |
| | Skua | 1 | | | |
| 1620 | Sooty Shear | 3 | SE | | close |
| 1624 | slenderbill | 1 | SE | | " |
| 1626 | BWP | 1 | NW | | |
| 1634 | JFP | 1 | SW | | |
| 1636 | JFP | 1 | ∞ | | |
| 1645 | BWP | 2 | ∞ | | flying together |
| 1750 | BWP | 1 | ∞ | | Sunset close over |

| | Tot # | # in F | N | NE | E | SE | S | SW | W | NW | BPM/BPS M |
|----------------|-----------|--------|---|----|---|----|---|----|---|----|-----------|
| Shear Pet | 10 | 7 | | | | | | | | | .083 .041 |
| JFP | 29 | 13 | 2 | 5 | | | | 3 | | 2 | .240 .120 |
| Bulwer's | 1 | | | | | | | | | | .008 .004 |
| RFB | 2 | | | | | | | | | | .016 .004 |
| s/s | 2 | | | | | | 1 | 1 | | | .016 .008 |
| Sooty Shear | 3 | | | | | 3 | | | | | .025 .012 |
| Slender " | 1 | | | | | 1 | | | | | .008 .004 |
| RTB | 1 | | | | | | | | | | .008 .004 |
| WTB | 1 | | | | | | | | | | .008 .004 |
| BWP | 14 | 5 | | | | | | | | | .160 .058 |
| G. Frig | 1 | | | | | | | | | | .008 .002 |
| Pext. | 1 | | | | | | | | | | .008 .004 |
| Bird | 1 | | | | | | | | | | .008 .004 |
| Phoenix/tahiti | 1 | | | | | | | | | | .008 .004 |
| Wedge | 1 | | | | | | | | | | .008 .004 |
| Skua | 1 | | | | | | | | | | .008 .002 |
| | <u>70</u> | | | | | | | | | | |

572-53121
 121
 12 = 242
 14 = 484

Total birds/lin mile = .531
 " " / sq " = .289

NE NW



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

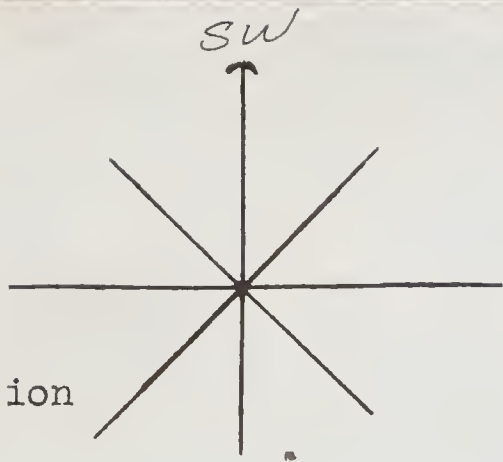
1800-2100 BA 17

SPECIMEN
or

Nocturnal Grid

Date 19 + 20 Nov.
Pg. # 1

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------|------------|----|------|----------|------------------------------|
| 1757 | | | | | Sunset begin Nocturnal obs |
| 1759 | Newell's | -1 | ⊙ | | |
| 1930 | | | | | change course to NW |
| 1955 | Bird | -1 | ⊙ | | |
| 2045 | RFB | -1 | | | Subadult circling ship. |
| 2255 | | | | | change course to SW |
| 2350 | Bird | -1 | | | |
| 0210 | Shear Pet | -1 | ⊙ | | Small white below |
| 0305 | Sooty Tern | -1 | ⊙ | | Ad |
| 0358 | Shear/Pet | -1 | | | |
| 0628 | | | | | SUNRISE - CLOSE OBSERVATIONS |
| | | | | | Newell's 1 |
| | | | | | Bird 2 |
| | | | | | RFB 1 |
| | | | | | Shear Pet 2 |
| | | | | | Sooty T 1 |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E
DIURNAL GRID

SPECIMEN
or

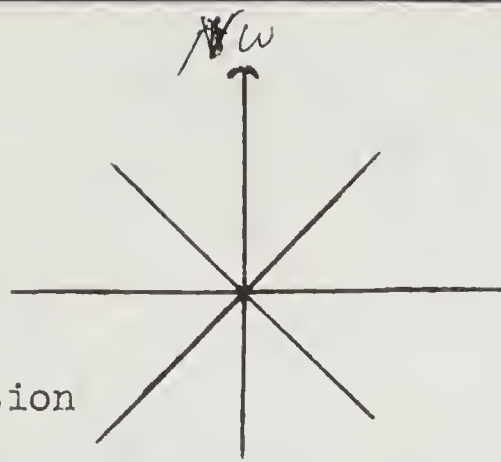
OBSERVERS:

0628-0800 Harrington
8-10 Lewis
10-12 Smith
12-14 Bulmer

Date 20 Nov. 1966
Pg.# 1

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------|------|------|----------|---|
| 0628 | | | | | SUNRISE; begin diurnal observations |
| 0632 | Wedgetail | 1 | ∞ | | light. |
| 0653 | s/sldr. | 4 | S | | |
| 0653 | shear/petrel | 1 | S | | distant |
| 0654 | sooty shear | 1 | S | | close - light underwings, big body, flight, tail. Direction positive. |
| TF 0656 | sooty/slender | 6 | S | | distant, direction positive |
| TF 0701 | " | 10±5 | S | | horizon |
| 0702 | shear-pet | NW 1 | | | small - possibly Bulwer's |
| 0705 | P. externa | 1 | S | | |
| 0707 | BWP | 1 | ∞ | | |
| 0715 | RTTB | 2 | | | adults circling ship - called |
| TF 0723 | sooty/slender | 6 | S | | |
| 0726 | Bird | 1 | ∞ | | distant. |
| TF 0732 | sooty/slender | 11 | S | | " |
| SF 0740 | Common Noddy | 7 | | | |
| | BFB | 1 | | | sub ad |
| | JFP | 4 | | | |
| | Wedgetail | 1 | | | light. |
| 0746 | Fairy T. | 1 | SE | | |
| 0748 | Sooty shear | 2 | S | | close. Field marks observed. |
| 0807 | " " | 1 | S | | |
| 0807 | " " | 3 | SW | | |
| TF 0812 | sooty/slb | 6 | SW | | |
| 0816 | wedge-tail | 1 | SE | | light |
| 0826 | sooty shear | 1 | S | | close observed direction positive |
| 0847 | WRSP | 1 | S | | Leache's Type |
| 0848 | shear/pet | 1 | ∞ | | distant - light underwings |
| 0910 | sooty/slb | 3 | S | | distant direction positive |
| TF 0912 | sooty+slb | 16 | S | | |
| 0918 | WRSP | 1 | SE | | |
| 0922 | sooty shear | 1 | S | | close light underwings direction positive |
| TF 0925 | slb shear | 31 | S | | very close dark underwings |
| 0929 | shear/pet | 1 | S | | " " |
| TF 0943 | sooty+slb shear | 6 | S | | light underwings distant |
| TF 0957 | sooty/slb | 19 | S | | close 4 dark underwings 2 light direction positive |
| TF 1012 | sooty/slb | 21 | S | | distant direction positive |
| 1100 | shear/pet | 1 | ∞ | | distant |
| TF 1138 | sooty/slb | 13 | S | | |
| 1147 | " | 1 | S | | |
| 1150 | " | 1 | S | | |
| 1150 | JFP | 1 | ∞ | | |
| 1151 | sooty shear | 1 | S | | |
| TF 1158 | s/sb | 25 | S | | |
| 1159 | sooty shear | 2 | S | | |
| 1203 | PT. externa | 1 | ∞ | | |
| 1254 | s/sb | 2 | S | | |
| 1312 | " | 1 | S | | |

All sooty/slender have been travelling slowly with high arcing. Quite different from rate 4 days ago ^{south} East of grid.



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
200480 Palmer
1400-1600 Harrington

Date 20 Nov 1966
Pg.# 2

SPECIMEN

or

DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|------|-------|----------|---|
| 1330 | Pale-foot | 1 | ☉ | | |
| TF 1335 | S/Sb | 15 | S | | |
| 1337 | " | 1 | S | | |
| 1345 | Christmas Isln | 1 | NE | | |
| 1355 | S/Sb | 1 | S | | |
| TF 1402 | Slenderbill | 9 | S | | |
| 1414 | Wedgetail | 1 | ☉☉☉ | | light. |
| TF 1425 | s/s/dr | 14 | S | | distant - direct. positive |
| TF 1437 | s/slender | 20±5 | S | | horizon |
| TF 1501 | Slenderbill | 27 | S | | close - all with dark underwing, direct. positive |
| 1528 | Wedgetail | 1 | NE | | light. |
| TF 1532 | Slenderbill | 23 | S | | Fairly close - dark underwings, direct. + |
| 1540 | Dark-rump Pet | 1 | ☉☉ | | } flying together, very close to ship; DRP well observed |
| | BWP | 1 | ☉ | | |
| 1551 | WRSP | 1 | ☉☉☉ | | |
| 1552 | Birds | 3 | ☉☉☉-N | | |
| 1558 | Shear-Pet | 1 | - | | |
| 1605 | | | | | course changed to N.W. |
| TF 1627 | sooty/slender | 15 | S | | distant - direction positive |
| TF 1630 | " | 10 | S | | " |
| TF 1636 | " | 8 | S | | " |
| 1637 | " | 1 | S | | " |
| TF 1640 | Slenderbill | 7 | S | | close. |
| TF 1645 | " | 17 | S | | " |
| TF 1649 | s/s/dr | 7 | S | | dist. |
| TF 1706 | S/Sb | 25 | S | | " |
| TF 1708 | " | 9 | S | | " |
| TF 1720 | " | 7 | S | | " |
| TF 1730 | " | 68 | S | | close - flocks contained about 75% slenderbills and 25% sooty |
| TF 1742 | " | 19 | S | | " |
| TF 1750 | " | 12 | S | | " |
| 1756 | " | 3 | S | | " |
| 1800 | | | | | summed close diurnal observations |

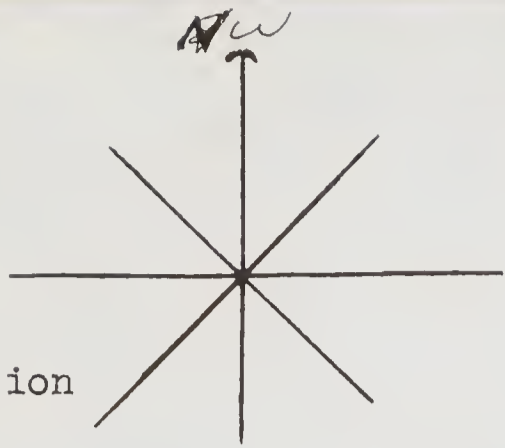
W. M. K.
 #/lin mi
 #/400 mi

~~456~~
~~336~~

| | | | N | NE | E | SE | S | SW | W | NW | #/lin mi | #/400 mi |
|------------------|------------|-----|---|----|---|----|-----|----|---|----|----------|----------|
| Wedge-tail light | 5 | 1 | 1 | 1 | 1 | 1 | | | | | .039 | .019 |
| S/S | 416 | 399 | | | | | 390 | 6 | | | 3.30 | 1.65 |
| Swamp/pet | 7 | | | | | | | | | | .056 | .028 |
| P. externa | 2 | | | | | | 1 | | | | .016 | .008 |
| BWP | 2 | | | | | | | | | | .016 | .008 |
| RTTB | 2 | | | | | | | | | | .016 | .008 |
| Bird | 4 | | | | | | | | | | .032 | .016 |
| CNT | 7 | 7 | | | | | | | | | .056 | .028 |
| BFB | 1 | 1 | | | | | | | | | .008 | .004 |
| JFP | 5 | 4 | | | | | | | | | .039 | .019 |
| Fairy T | 1 | | | | | | | | | | .008 | .004 |
| Sooty Shear | 12 | | | | | | 12 | | | | .095 | .048 |
| WISP | 3 | | | | | 1 | 1 | | | | .024 | .012 |
| Pale foot | 1 | | | | | | | | | | .008 | .004 |
| Kermadec I | 1 | | | | | | | | | | .008 | .004 |
| Slenderbill | 83 | 83 | | | | | 83 | | | | 1.52 | .76 |
| Dark Rump | 1 | | | | | | | | | | .008 | .004 |
| | <u>553</u> | | | | | | | | | | | |

Sooty }
 S/S } → 4.25 2.03
 Slend. }
 Pext. }
 JFP } → .056 .028

Total diurnal miles - 126
 Total bird/lin mile - 4.4



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

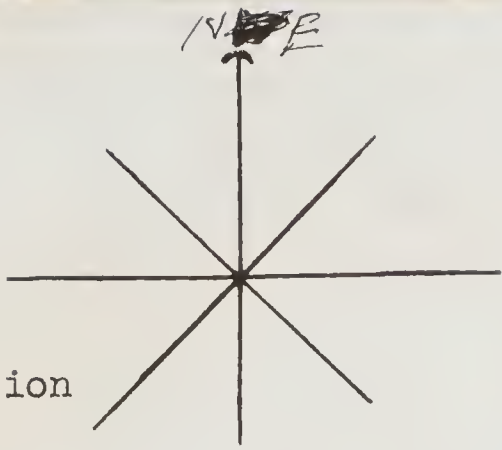
1600-200 TJZ

Date 20-21 Nov 66

Pg.# 1

SPECIMEN *Nocturnal*
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|------------|----------|------|----------|------------------------------|
| 1800 | | | | | Begin Nocturnal Observations |
| 1806 | Birds | - 2 | | | on horizon |
| TF 1810 | sooty/s/b | - 15 ± 5 | SW | | |
| 1817 | " " | - 1 | S | | |
| 2115 | | | | | change course to NW |
| 2215 | Sooty Tern | 1 | | | ad. calling overhead. |
| 2325 | Bird | - 1 | | | white below |
| 0122 | Shear/Pet | - 1 | ∞ | | |
| 0320 | " " | - 2 | ∞ | | white below |
| 0633 | | | | | Sunrise close observations |
| | | | | | Birds 3 |
| | | | | | S/sld 16 |
| | | | | | Sooty T. 1 |
| | | | | | Shear/pet 2 |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

| | |
|-----------|------------|
| 0600-0800 | JTC |
| 0800-10 | Harrington |
| 10-12 | Pulmer |
| 12-14 | Lewis |
| 14-16 | Harrington |

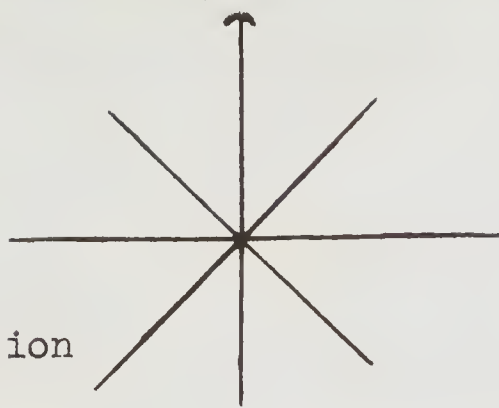
Date 21 June 66
Pg.# 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|----|------|----------|---|
| 0633 | | | | | sunrise |
| 0634 | wedge-tail | 1 | CE | | following ship light |
| 0648 | " | 1 | CE | | " " " |
| 0658 | Sooty/Slb | 4 | CE | | detering around ship |
| 0725 | Shear/Pet | 1 | CE | | |
| 0755 | G. Frigate | 1 | CE | | ad♀ |
| | RFB | 2 | CE | | 1 ad light, 1 sub. } feeding together, Frig. NOT chasing RFB. |
| 0805 | Shear/Pet | 2 | - | | |
| 0831 | S/S/dr. | 5 | S | | fairly far away - direction positive |
| 0854 | WTTB | 1 | | | over ship |
| 0902 | Sooty Shear | 1 | S-SE | | close - direction varying between S & SE |
| 0928 | RTTB | 1 | SE | | ad. 1/2 mile off |
| 0930 | G. Frigate | 1 | CE | | ad♀ chasing flying fish |
| 0950 | " | 1 | CE | | imm. |
| 1015 | " | 2 | CE | | Ad + imm |
| FF 1122 | Shear-Pet | 7 | SW | | way out! probably Wedgies |
| 1145 | Sooty Shear | 1 | SW | | close |
| 1157 | Phoenix Island | 1 | CE | | close |
| 1158 | wedge-tail | 1 | E | | dart |
| 1211 | Shear/Pet | 1 | CE | | distal |
| 1217 | " " | 1 | SE | | |
| 1218 | wedge-tail | 1 | E | | light |
| 1224 | " " | 1 | SE | | Dart's. |
| 1230 | Shear/Pet | 1 | NW | | |
| 1232 | RFB | 1 | CE | | following ship SA |
| 1238 | RFB | 1 | CE | | " " SA - new two following ship } No streamers |
| 1238 | Frigate sp | 2 | CE | | |
| 1243 | wedge-tail | 1 | SE | | circling high, both from |
| 1252 | " " | 2 | SE | | dart's |
| 1258 | Sooty Shear | 2 | SE | | " |
| 1304 | " " | 1 | SE | | close |
| 1305 | wedge-tail | 1 | CE | | light - following ship |
| TF 1312 | Stenderbill | 10 | SE | | |
| | Sooty Shear | 1 | SE | | close |
| TF 1315 | Sooty Shear | 5 | SE | | |
| 1322 | RFB | 1 | NE | | Ad Int Phase |
| 1333 | Stenderbill | 2 | N | | close |
| 1341 | | 1 | | | whale larvae 30+ ft Brown |
| 1346 | wedge-tail | 1 | CE | | Following ship - light phase |
| 1350 | Sooty Shear | 3 | CE | | Just messing around - very slow meandering flight |
| 1430 | WRSP | 1 | E | | |
| 1437 | E/SI. | 1 | S | | |
| 1441 | Stenderbill | 1 | S | | |
| 1506 | Sooty Shear | 1 | SE | | close, light underwing |

100 ^{at} 7000

NE



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

14-16 BAH

16-18 FHS

Date 21 Nov. '66

Pg.# 2

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

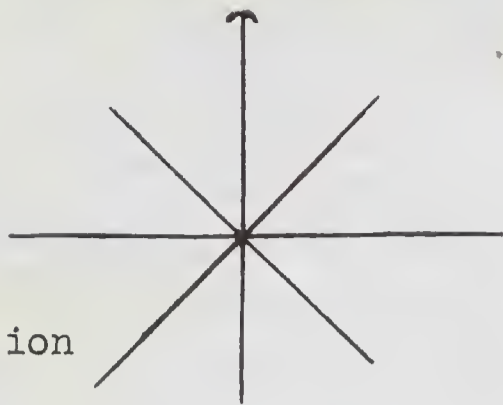
| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|--------|----------------|----|------|----------|----------------------------------|
| 1526 | White-neck Pet | 1 | ENE | | |
| 1540 | P. externa. | 1 | W | | |
| 1634 | Wedgetail | 1 | SE | | light |
| 1719 | Xmas Is. Shear | 1 | Q | | |
| C 1720 | RTTB | 2 | Q | | 1 coll. F. Smith (not retrieved) |
| 1721 | Wedgetail | 1 | Q | | light |
| | | 83 | | | |
| 1747 | | | | | Sunset |

Flocks ratio of S/S in flocks by day

| | # Flocks | N | NE | E | SE | S | SW | W | NW | birts/mi. | b/29 mi. |
|-----------------|----------|---|----|---|----|----|----|---|----|-----------|----------|
| Wedgetail light | 7-0 | | | 1 | 1 | | | | | .070 | .035 |
| Wedgetail dark | 5-0 | | | 1 | 4 | | | | | .050 | .025 |
| CIS | 1-0 | | | | | | | | | .010 | .005 |
| Sooty slender | 10-0 | | | | | 6 | | | | .100 | .050 |
| Sooty Shear | 14-6 | | | 9 | 1 | 1 | | | | .140 | .070 |
| Slender bill | 13-10 | 2 | | | | 10 | 1 | | | .130 | .065 |
| Shear/pet | 13-7 | | | | | | | | | .130 | .065 |
| Phoenix I. | 1-0 | | | | | | | | | .010 | .005 |
| W. N. Pet. | 1-0 | | | | | | | | | .010 | .005 |
| P. externa | 1-0 | | | | | | | | | .010 | .005 |
| WRSP | 1- | | | | | | | | | .110 | .010 |
| WTTB | 1-0 | | | | | | | | | .00 | .005 |
| RTTB | 3-0 | | | | | | | | | .030 | .015 |
| RFB | 5-0 | | | | | | | | | .050 | .025 |
| G. Frig | 5-0 | | | | | | | | | .070 | .035 |
| Frug | 2-0 | | | | | | | | | .020 | .010 |
| Whale | 1 | | | | | | | | | | |

FF (1)
TF (2)

Total Diver miles: 100
Birts/mi mile .830



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
J. Bulmer

Nocturnal Grid

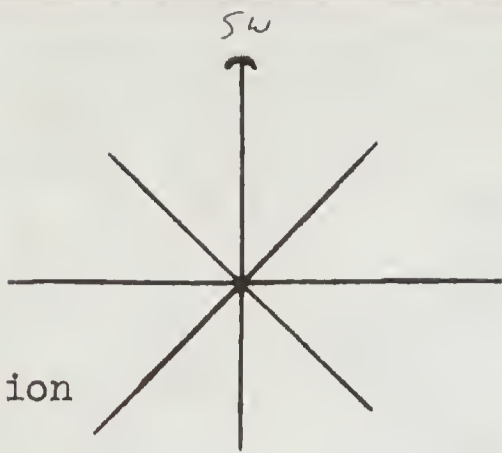
Date 21-22 Nov
Pg.# 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| | | | | | |
|------|---------------|---|----|--|---|
| 1800 | | | | | Sunset begin Nocturnal obser. |
| 1800 | G. Frigate | 1 | ⊙ | | Ad ♀ |
| 1830 | | | | | under way after failure to retrieve RTTB |
| 1945 | Bird sp | 1 | ⊙ | | white below |
| 2020 | Shear-Pet | 1 | ⊙ | | Ad calling |
| 2055 | Sooty Tern | 2 | ⊙ | | edge of rain |
| 2235 | Shear/Pet | 1 | | | |
| 2318 | BWP | 1 | NE | | |
| 2325 | BFB | 1 | ⊙ | | Ad |
| 0015 | Shear/Pet | 1 | ⊙ | | light underneath |
| 1225 | " | 1 | ⊙ | | edge of the light may have taken off from |
| 1227 | " | 1 | ⊙ | | sitting on H ₂ O |
| 1228 | " | 1 | ⊙ | | |
| 1229 | BWP | 1 | ⊙ | | landed in H ₂ O |
| 1232 | Shear/Pet | 1 | ⊙ | | |
| 0055 | BFB | 1 | ⊙ | | Ad follows ship |
| 0110 | Shear/Pet | 1 | ⊙ | | |
| 0215 | BFB | 1 | ⊙ | | |
| 0245 | Bird | 1 | | | up high |
| 0445 | P. externa | 1 | ⊙ | | storm or Bulwers |
| 0450 | Petrel | 1 | ⊙ | | |
| 0505 | Bird | 1 | ⊙ | | overhead. |
| 0535 | Tropicbird sp | 1 | ⊙ | | |
| 0613 | RTTB | 1 | ⊙ | | |
| 0657 | | | | | Sunrise |

G. Frig 1
Bird 3
Shear-pet 9
Sooty T. 2
BWP 2
BFB 2
RTTB 1
P. externa 1
Tropic Sp. 1
RTTB 1



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

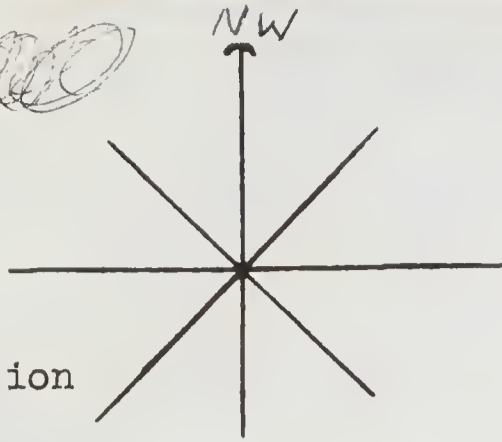
OBSERVERS:

0600-0800 Bulmer
0800-1000 Smith
10-12 BAH
~~12-14 Bulmer~~

Date 22 Nov. 1966
Pg.# 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|------------------|------|------|----------|--|
| 0637 | | | | | Sunrise |
| 0638 | Wedgetail | 2 | ⊙ | | light |
| 0643 | G. Frigate | 1 | ⊙ | | |
| 0650 | Wedgetail | 4 | ⊙ | | light |
| TF 0700 | Slenderbill | 22 | S | | close (dark underwing) |
| 0701 | wedgetail | 1 | S | | light |
| 0703 | " | 3 | S | | " |
| 0704 | S/Sb | 1 | S | | |
| 0705 | Wedgetail | 2 | S | | light |
| 0707 | " | 4 | S | | " |
| 0708 | " | 3 | S | | " |
| 0708 | Sooty Shear | 2 | S | | close (white underwing) |
| 0709 | Wedgetail | 1 | S | | light |
| 0712 | Frigate sp | 1 | ⊙ | | |
| 0730 | shear-pet | 1 | ? | | Way out |
| 0740 | " " | 1 | S | | possibly S/Sb |
| 0742 | Slenderbill | 1 | S | | |
| 0743 | White-necked pet | 1 | ⊙ | | beautiful |
| 0745 | Wedgetail | 1 | S | | light |
| TF 0748 | S/Sb | 25±5 | S | | |
| | Sooty Shear | 7 | S | | |
| | shear-pet | 1 | S | | white below and apparently migrating with S/Sb. to far out |
| 0750 | wedgetail | 1 | E | | light |
| 0818 | Frigate sp. | 2 | ⊙ | | |
| 0820 | S/Sb | 2 | S | | |
| 0821 | Slenderbill | 1 | S | | Dark underwings (close) |
| FF 0824 | Frigate sp | 2 | ⊙ | | hovering |
| | shear/pet | 20±5 | ⊙ | | feeding |
| 0826 | Wedgetail | 2 | ⊙ | | light phase |
| 0830 | shear/pet | 3 | ⊙ | | |
| 0832 | Wedgetail | 2 | ⊙ | | light |
| 0859 | " " | 1 | ⊙ | | " |
| 0943 | WRSP | 3 | ⊙ | | |
| TF 0945 | Slenderbill | 58 | S | | dark underwings close |
| TF 0955 | " | 74 | S | | " " |
| 0958 | Shear/pet | 1 | ⊙ | | |
| 1023 | RITB | 1 | ⊙ | | high over ship; adult, no central rectrices. |
| 1039 | Pterodroma | 1 | ⊙ | | |
| 1130 | Wedgetail | 1 | W | | light |



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

12-14 Bohman
14-16 Lewis
16-18 Harrington

Date 22 Nov.
Pg. # 2

SPECIMEN
or

9, 10 ^{imm}

| | TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|----|------|------------------|------|------|----------|--|
| FF | 1215 | Sooty Tern | 9 | | | all shear-Pets gathered in a small area on the water with small fish jumping Sooty Terns hovering above |
| | | Sooty Shear | 12 | | | |
| | | Pt. externa | 7 | | | |
| | | BWP | 3 | | | |
| | | Wedgetail | 5 | | light | |
| | | Kermadec | 1 | | light | |
| | 1218 | White-necked Pt | 1 | ⊙ | | |
| | 1248 | Wedgetail | 1 | ⊙ | | |
| | 1324 | " | 1 | ⊙ | | light |
| FF | 1330 | Sooty Tern | 9 | ⊙ | | Ad |
| | | " " | 1 | | | imm |
| | | Pt. externa | 7 | | | White-necked + Juan Fernandez |
| | | BWP | 10±2 | | | |
| | | Phoenix Islet | 3 | | | |
| | | Wedgetail | 15±3 | | | light |
| SF | 1436 | sooty Shear | 9 | S | | circling & feeding - sitting on H ₂ O as they |
| TF | 1440 | sooty/sib | 10±2 | W | | Moved along |
| | 1442 | P. externa | 1 | SW | | distant |
| | 1446 | wedge-tail | 1 | N | | light |
| | 1512 | WNP | 1 | S | | |
| | 1523 | G. Frigate | 2 | ∞ | | ♂ ♀ Ad, ♀ chasing ♂ continued for over 3 mins. |
| | 1545 | WRSP | 1 | ∞ | | |
| FF | 1600 | JFP | 1 | | | |
| | | BWP | 5 | | | |
| | | PIP | 1 | | | |
| | | P. leucoptera | 3 | | | |
| SF | 1632 | Sooty/slender | 10±2 | | | horizon - appeared to be searching flock, gravitating to the south. Frequently milling, then moving on to S. |
| | 1637 | am. pterodroma | 1 | ∞ | | |
| JF | 1650 | sooty/slender | 6 | S | | |
| JF | 1656 | " | 8±2 | ? | | |
| | 1703 | Sooty Shearwater | 1 | S | | |
| | 1704 | Sooty Tern | 1 | S | | Ad |
| TF | 1705 | S/sib Shear | 19 | S | | distant |
| | 1710 | | | | | course changed TO NW |
| | 1721 | JFP | 1 | ∞ | | |
| | 1730 | RITB | 1 | | | subad over ship. |
| | 1745 | sooty Shearwater | 1 | S | | light underwings |
| | 1750 | JFP | 1 | ∞ | | |
| | 1804 | | | | | SUNSET |

430

in Flocks

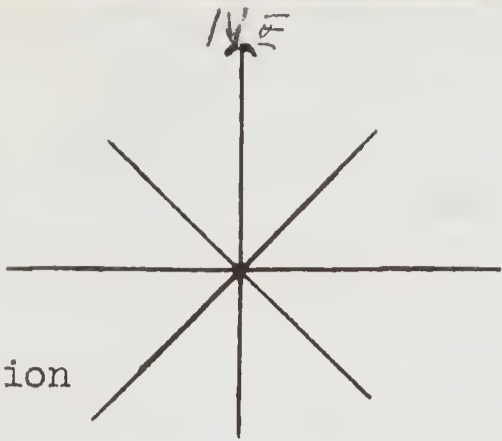
N NE E SE S SW W NW no direct

birds/lin mi

b/49.mi.

| | # | # in Flocks | N | NE | E | SE | S | SW | W | NW | no direct | birds/lin mi | b/49.mi. |
|-------------------|-----|-------------|---|----|---|-----|---|----|---|----|-----------|---------------|----------|
| Wedgetail - light | 49 | 20 | | | | | | | | | | .399 | .200 |
| " - dark | 0 | 0 | | | | | | | | | | | |
| Phase N.R. | 2 | 0 | | | | | | | | | | .016 | .008 |
| Sooty/Slender | 81 | 72 | | | | 63 | | 10 | | 8 | | .650 | .325 |
| sooty | 32 | 28 | | | | 20 | | | | 12 | | .320 | .160 |
| slender | 156 | 151 | | | | 156 | | | | | | 1.270 | .635 |
| Kermadec | 1 | 1 | | | | | | | | | | .008 | .004 |
| Phoenix I. | 4 | 3 | | | | | | | | | | .032 | .016 |
| Shear/Pet | 27 | 21 | | | | | | | | | | .220 | .110 |
| WNP | 3 | 0 | | | | 1 | | | | | | .024 | .012 |
| JFP | 3 | 2 | | | | | | | | | | .024 | .012 |
| P. externa | 16 | 14 | | | | | | 1 | | | | .130 | .650 |
| BWP | 18 | 18 | | | | | | | | | | .146 | .073 |
| WWP | 3 | 3 | | | | | | | | | | .024 | .012 |
| WRSP | 4 | 0 | | | | | | | | 4 | | .032 | .032 |
| G. Frig | 3 | 0 | | | | | | | | | | .024 | .006 |
| Frig Ap | 5 | 2 | | | | | | | | | | .041 | .010 |
| RITB | 2 | 0 | | | | | | | | 2 | | .016 | .008 |
| Sooty T ad | 19 | 18 | | | | 1 | | | | | | } → .163 .032 | |
| imm | 1 | 1 | | | | | | | | | | | |
| Small Pterodroma | 1 | 0 | | | | | | | | | | .008 | .004 |
| Total | 430 | | | | | | | | | | | | |

Total diurnal miles: 123
 Birds/lin mile: 3.49



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SS-2100 Smith

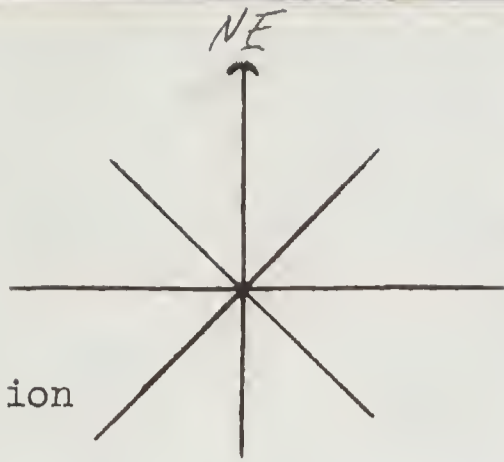
Date ^{22-23 Nov} 22 Nov 1966
Pg. # 1

SPECIMEN Nocturnal Grid
or

TIME SPECIES # DIR. BAND NO. REMARKS

| | | | | | |
|------|------------|----|-----|--|--|
| 1804 | | | | | Sunset Begin Observations |
| 2200 | | | | | F. Smith was here from 6 to 9 - but the birds weren't. |
| 0020 | Sooty Tern | -1 | 000 | | change course to 045° ad. calling. |
| 0305 | Bird | -1 | 000 | | |
| 0327 | WRSP | -1 | 000 | | 0320 Drifting |
| 0331 | BWP | -1 | 000 | | I missed |
| 0350 | | | | | under way |
| 0420 | | | | | drifting |
| 0425 | Shear/Pet | -1 | | | |
| 0430 | " | -1 | | | |
| 0432 | " | -1 | | | |
| 0520 | | | | | under way (we failed) |
| 0635 | wedgetail | -4 | NE | | tight no streamers |
| 0638 | | | | | sunrise |

Sooty T. 1
Bird 1
WRSP 1
BWP 1
Shear/pet 3
Wedgetail 4



OBSERVERS:

Balmer 0600-0800

Smith 0800-1000

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

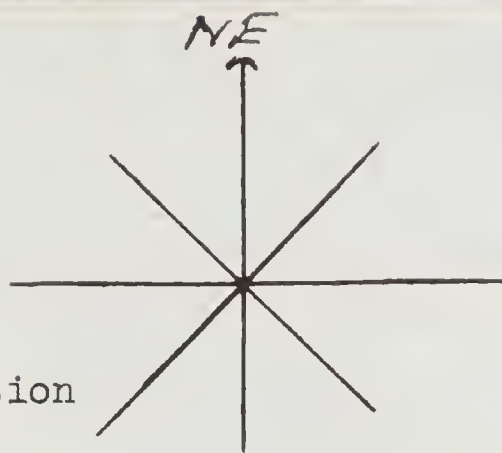
Date 23 Nov. 1966

Pg.# 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|--------------|------|------|----------|---|
| 0638 | | | | | Sunrise |
| 0645 | Pt. externa | 1 | ⊙ | | |
| 0653 | Wedgetails | 3 | N | | light |
| 0658 | RTTB | 1 | ⊙ | | |
| 0705 | wedgetail | 2 | ⊙ | | light |
| | JFP | 1 | ⊙ | | |
| 0713 | JFP | 1 | E | | |
| | Pt. sp | 1 | ⊙ | | small |
| | WRSP | 1 | ⊙ | | |
| 0718 | Sooty Shear | 1 | SE | | |
| FF 0720 | Frigate sp | 2 | | | } feeding over 8 whales probably sperm whales mostly wedgetails |
| | Skua | 1 | | | |
| | Shear. Pet | 30±5 | | | |
| 0745 | Sooty Shear | 1 | S | | |
| SF 0752 | Pt. externa | 4 | ⊙ | | |
| | Wedgetail | 3 | | | |
| C 0758 | ATTB | 3 | ⊙ | | calling & circling high over ship 1 call F. Smith |
| 0800 | ATTB | 1 | ∞ | | joined above group |
| FF 0810 | wedgetail | 5 | ⊙ | | light |
| | JFP | 3 | ∞ | | |
| | | | | | 0805 - stopped to pick up bird 0920 - underway again |
| SF 0933 | JFP | 3 | ∞ | | |
| | Wedgetail | 2 | | | light |
| 0938 | ATTB | 3 | ∞ | | Ad - circling ship probably same three seen earlier |
| 0940 | JFP | 1 | NE | | |
| 0950 | wedgetail | 1 | ∞ | | light |
| 1000 | RTTB | 3 | ∞ | | joined above group; now six circling |
| 1003 | wedgetail | 3 | ∞ | | light |
| | Tahitian Pet | 1 | ⊙ | | |
| 1010 | Wedge-tail | 2 | E | | Dark |
| 1015 | JFP | 1 | NE | | |
| 1019 | BFB | 1 | NE | | Ad |
| 1022 | P. externa | 1 | E | | |
| 1025 | WTTB | 2 | ⊙ | | very high |
| 1033 | Frigate sp. | 1 | ∞ | | |
| 1039 | wedge-tail | 1 | E | | |
| 1054 | CNT | 1 | ⊙ | | sitting on log |

1803
638



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

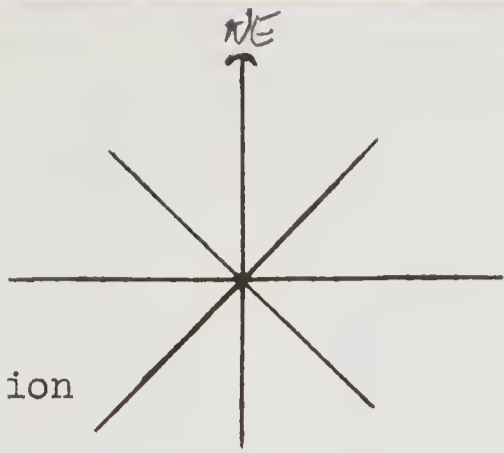
1145-1400 Harrington

Date 23 Nov. 66
Pg.# 2

SPECIMEN
or

Ship
Direction

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|------------------|-------|------|-------------|--|
| | JFP | 1 | NW | | |
| 1110 | Sooty/slb | 2 | SE | | Feeding steadily |
| FF 1115 | JFP | 6 | all | | Circling & sitting in H ₂ O |
| FF 1120 | JFP | 9 | | | } Feeding over flying fish } chasing JFP was successful |
| | BWP | 3 | | | |
| | wedge-tail | 2 | | light | |
| | G. Frigate | 1 | | Ad ♂ | |
| | Kermadec | 1 | | light | |
| | WNP | 1 | | | |
| 1129 | BWP | 1 | NW | | |
| 1130 | RTTB | 2 | | | Following ship |
| 1143 | JFP | 1 | all | | |
| 1145 | JFP | 3 | all | | } Together |
| | Kermadec | 1 | all | | |
| 1149 | G. Frig. | 1 | all | | ad ♂ chasing flying fish |
| FF 1155 | Sooty Tern? | 20±10 | | | When flock first sighted was believed to have been Sooties over it. Course of ship was altered and approached flock. apparently sooties took off as not present. Sighting (of Sooties) as a whole considered unreliable. |
| | Shear-Pet | 25 | | | |
| 1246 | JFPet | 2 | all | | |
| 1321 | RTTB | 1 | all | | Ad |
| 1325 | BWP | 1 | all | | |
| 1325 | P. externa | 1 | all | | |
| 1327 | Tropicbird sp. | 1 | | | sitting out H ₂ O |
| 1340 | Bird | 1 | | | horizon distant |
| 1342 | shear/pet | 1 | | | light phase |
| 1347 | Wedgetail | 1 | all | | " " |
| 1354 | " | 1 | E | | " " |
| 1402 | " | 1 | E | | " " |
| 1512 | JFP | 1 | NW | | |
| 1515 | Sooty Shearwater | 1 | SE | | light underwings saw close |
| FF 1530 | Sooty Tern | 2 | all | | Ad |
| | Fairy Tern | 2 | | | Shear/Pets alternately flying & sitting in water - fish (small) jumping |
| | JFP | 10 | | | |
| | BWP | 6 | | | |
| | wedgetail | 12 | | light phase | |
| | Kermadec | 1 | | | |
| | G. Frigate | 1 | | Ad ♀ | |
| 1549 | P. externa | 1 | WW | | |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 23 Nov 1966
Pg.# 3

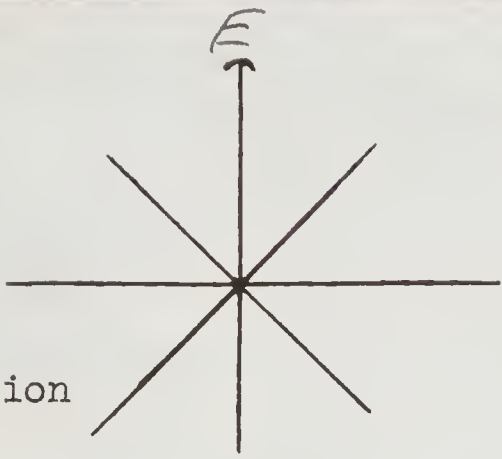
SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------------|----|------|----------|--|
| SF-1555 | Wedgetail | 12 | ∞ | | light |
| | JFP | 10 | | | |
| | BWP | 3 | | | |
| 1607 | Sooty Shear | 1 | | | |
| | JFP | 1 | ∞ | | |
| 1625 | JFP | 1 | E | | |
| 1635 | JFP | 1 | ∞ | | |
| 1652 | Pink-Browed Petrel | 1 | SW | | close - like wedgetail with white forehead |
| 1700 | | | | | course change to EAST |
| 1711 | Frigate | 1 | | | circling high. |
| 1713 | RTTB | 1 | | | sitting on H ₂ O. |
| 1803 | | | | | Sunset |

| | Total | | N | NE | E | SE | S | SW | W | NW |
|------------------------------|-------|----|---|----|---|----|---|----|---|----|
| Light | - 49 | 35 | 3 | | 3 | | | | | |
| Wedge dark | - 2 | | | | | | | | | |
| S/S | - 2 | 0 | | | | 2 | | | | |
| Sooty | - 4 | 0 | | | | 2 | 1 | | | |
| Slender | - 0 | 0 | | | | | | | | |
| P. externa | - 8 | 4 | | | 1 | | | | | 1 |
| JFP | - 56 | 41 | | 2 | 2 | | | | | 2 |
| WNP | - 1 | 1 | | | | | | | | |
| P. hypoleuca | - 0 | | | | | | | | | |
| BWP | - 14 | 12 | | | | | | | | 1 |
| Shear/Pet | - 56 | 55 | | | | | | | | |
| Bird | - 1 | 0 | | | | | | | | |
| SKUA | - 1 | 1 | | | | | | | | |
| RFB | - 13 | 0 | | | | | | | | |
| WTTIS | - 2 | 0 | | | | | | | | |
| Tropic AP | - 1 | 0 | | | | | | | | |
| G. Frig. | - 3 | 2 | | | | | | | | |
| Total P. T. E. P. | - 1 | | | 1 | | | | | | |
| | | | N | NE | E | SE | S | SW | W | NW |
| Ernst T | - 22 | 22 | | | | | | | | |
| CNT | - 1 | 0 | | | | | | | | |
| Fairy | - 2 | 2 | | | | | | | | |
| Tahiti | - 1 | 0 | | | | | | | | |
| Phoenix | - | | | | | | | | | |
| Kermadec | - 3 | 3 | | | | | | | | |
| Brown Noddy | - 1 | | | | | | | | | |
| Phred. sp. | - 1 | 0 | | | | | | | | |
| WRSP | - 1 | 0 | | | | | | | | |
| Frig. sp. | - 4 | 2 | | | | | | | | |
| | 250 | | | | | | | | | |

Whales 8

Total miles 96
 BPL mi 2.6
 FR Sq mi 1.3



Ship
Direction

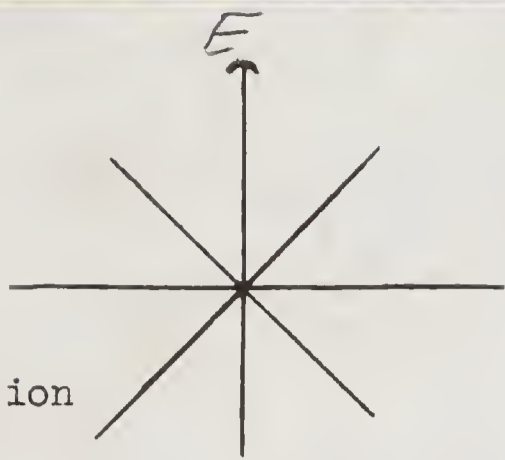
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SPECIMEN *Nocturnal*
or

Date *23-24 Nov*
Pg. # _____

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------------------------------------|------------|---|------|----------|----------------------|
| 1840 0640 | Booby sp | 1 | — | | |
| 1855 0655 | Booby sp | 1 | — | | same as above? |
| 2040 0840 | Sooty Tern | 1 | — | | ad approached from W |
| 2136 0436 | " " | 1 | oe | | Ad calling |
| 0330 | shear-pet | 1 | @ | | white below |
| 0610 | Bird | 1 | — | | |
| 0622 | S/slend. | 1 | S | | |
| 0630 | " | 1 | S | | |
| 0631 | | | | | <u>SUNRISE</u> |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

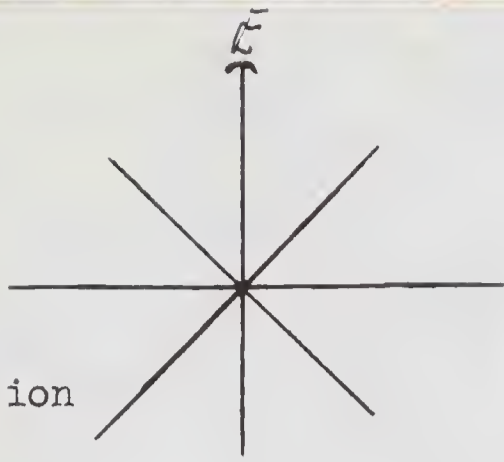
OBSERVERS:

0600-0800 BAH
0800-1000 JSL

Date 24 Nov. 1966
Pg. # 1

SPECIMEN Non-grid
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|---------------------|------|------|----------|--|
| 0631 | | | | | SUNRISE - one Turkey seen scrambling over horizon. |
| 0639 | S/Sdr | 2 | S | | medium |
| 0646 | Wedgetail | 1 | ☉ | | light |
| 0650 | " | 2 | ☉ | | " |
| 0651 | " | 2 | ☉ | | " |
| 0658 | Sooty Shear | 2 | S | | close |
| 0700 | Wedgetail | 4 | ☉ | | light |
| 0741 | Wedgetail | 2 | S | | |
| 0756 | S/Sdr | 1 | S | | |
| FF 0802 | RFB | 7±2 | S | | FF |
| | Shear/pet | 25±5 | | | |
| 0837 | Sooty/S/b | 2 | S | | |
| 0846 | Wedge-tail | 1 | NE | | light |
| 0850 | | | | | change course - depart grid (point calcite) |
| 0857 | Sooty Shearwater | 1 | SE | | close well observed, very slow wandering |
| 0906 | Sooty/S/b | 2 | SE | | flight, light underwings |
| 0910 | Wedge-tail | 1 | S | | light underwings |
| 0914 | Sooty/S/b | 3 | S | | |
| 0919 | Sooty/shearwater | 1 | S | | close light underwings |
| 0920 | " | 2 | S | | " " " |
| 0927 | P. hypoleuca | 1 | E | | |
| 0933 | Small Pterodroma | 2 | ☉ | | |
| 0937 | BWP | 1 | ☉ | | |
| 1008 | CNT | 1 | ☉ | | |
| 1009 | White-necked Petrel | 1 | ☉ | | close |
| 1020 | Frigatesp | 1 | ☉ | | |
| | RFB | 1 | ☉ | | Ad light phase |
| 1022 | Sooty Shear | 1 | SE | | |
| 1024 | BWP | 2 | ☉ | | |
| | Kermadec | 1 | ☉ | | light phase close |
| 1028 | sooty shear | 1 | S | | |
| 1103 | PWP | 1 | ☉ | | dark |
| | Wedgetail | 1 | ☉ | | |
| 1106 | JFP | 1 | ☉ | | |
| 1108 | Wedgetail | 1 | ☉ | | light |
| 1110 | Leach's STB | 1 | ☉ | | Sitting on the black line in white runway |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Bulmer

Date 24 Nov 66

Pg.# 2

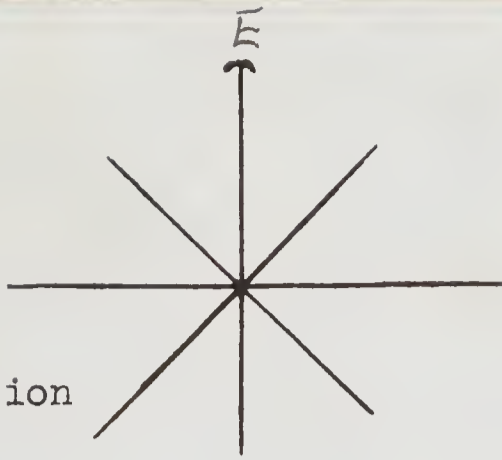
SPECIMEN

or

Winged

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|-----------------------------------|--------------|---------------|----------|---|
| 1125 | Sooty Shear | 3 | SW | | |
| 1128 | BWP | 1 | SW | | |
| 1157 | WRSP | 1 | SW | | |
| 1225 | P. externa | 1 | ↑ | | |
| 1227 | slender Sooty Shear | 3 | SW | | milling. |
| 1245 | G. Frigate | 1 | | | |
| 1248 | Bird | 1 | — | | |
| 1300 | " | 1 | — | | |
| 1303 | Sooty Shear | 1 | S | | |
| 1305 | " " | 1 | S | | |
| 1314 | N.Z. Shear. | 1 | S | | |
| 1320 | Sooty S. | 3 | S | | |
| 1328 | Wedgetail | 1 | SW | | light |
| 1330 | Sooty S. | 1 | S | | |
| 1335 | Wedgetail. | 1 | SW | | light |
| 1345 | Sooty S. | 1 | S | | |
| 1347 | G. Frigate | 1 | E | | ad ♀ |
| 1350 | SKUA | 1 | SE | | |
| 1352 | Sooty Shear. | 1 | S | | |
| 1352 | " " | 1 | " | | |
| 1352 | " " | 1 | " | | |
| 1358 | Wedgetail | 1 | SW | | light |
| 1403 | BFB | 2 | SW | | Ads alternately flying & sitting on water |
| 1430 | WRSP | 1 | SW | | |
| TF 1431 | Sooty Shearwater | 5 | S | | light underwings - close |
| 1435 | BWP | 1 | SW | | |
| 1440 | sm Petrel | 1 | SW | | |
| 1443 | Sooty Shearwater | 1 | S | | distant |
| 1445 | " " | 2 | S | | light underwings - close |
| 1450 | Wedgetail | 1 | SW | | light |
| 1451 | Sooty Shear | 1 | S | | light underwings - close |
| 1455 | " " | 1 | S | | distant |
| 1502 | " " | 1 | S | | light underwings - close |
| 1504 | " " | 1 | S | | |
| 1506 | " " | 1 | S | | |
| 1509 | BWP | 1 | S | | |
| 1511 | Sooty Shear | 1 | S | | |
| 1512 | JFP | 1 | S | | |
| 1515 | Sooty Shear | 1 | S | | distant |
| 1522 | Wedgetail | 1 | SW | | light |
| 1528 | Sooty Shear | 3 | S | | distant |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

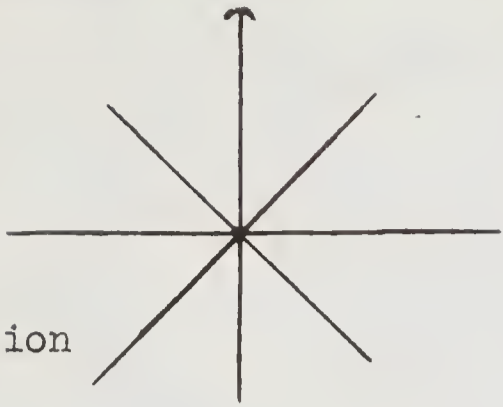
OBSERVERS:

Date 24 Nov 1966
Pg.# 3

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------|-------------------|---|------|----------|--------------------------|
| 1533 | Sooty Shear | 2 | S | | light underwings - close |
| 1557 | " " | 1 | S | | " " |
| 1558 | " " | 1 | S | | |
| 1559 | " " | 1 | S | | close |
| 1615 | " " | 4 | S | | |
| 1616 | BWP | 1 | @ | | |
| 1617 | Soot Shear | 1 | S | | |
| 1620 | " " | 2 | S | | |
| 1625 | " " | 1 | S | | |
| 1645 | " " | 3 | S | | |
| 1659 | " " | 1 | S | | |
| 1720 | Wedgetail | 1 | E | | light |
| 1724 | BWP | 1 | SF | | |
| 1733 | White Neck Petrel | 1 | @ | | |
| 1734 | | | | | Sunset |

11/11/11
11/11/11
11/11/11



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SR-1500r Smith
Palmer

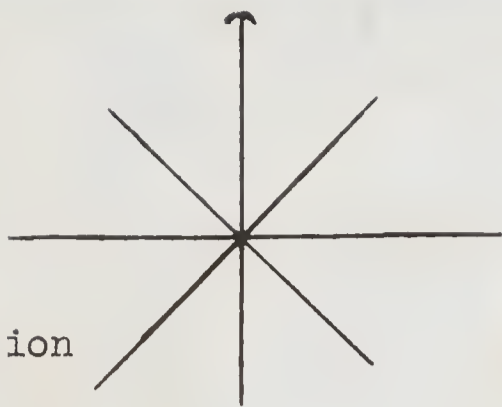
Date 25 Nov 1966
Pg.# 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS | |
|---------|------------------|---------|------|----------|---|-------------------------------------|
| 0717 | | | | | Sunrise - Begin Observations | |
| 0721 | RTTB | 1 | Q | | Ad circling ship | |
| 0742 | sm. Pterodroma | 1 | NE | | | |
| 0805 | WRSP | 1 | Q | | | |
| 0825 | BWP | 1 | Q | | | |
| 0840 | WRSP | 1 | Q | | | |
| | Sooty Shear | 1 | S | | | |
| 0851 | " " | 1 | S | | | |
| 0907 | Shear/Pet | 6 | S | | good chance of a N.2. Shearwater but not positive | |
| 0948 | G. Frigate | 1 | S | | | |
| 0955 | Fairy Tern | 1 | Q | | Ad ♀ | |
| | Wedgetail | 1 | Q | | | |
| | JFP | 2 | Q | | light | |
| | | 1 | Q | | | |
| 0909 | Sooty Shear | 1 | S | | | |
| 1010 | G. Frigate | 1 | SW | | Ad ♂ | |
| 1016 | " | 1 | Q | | Ad ♂ | |
| 1024 | Sooty Shear | 1 | S | | | |
| 1031 | BWP | 1 | S | | | |
| 1035 | wedge-tail | 1 | S | | light | |
| 1105 | JFP | 1 | SE | | | |
| 1123 | BWP | 1 | Q | | | |
| FF 1130 | Sooty Tern | 40 ± 5 | | | } Feeding over Tuna | |
| | Fairy Tern | 8 | | | | |
| | RFB | 11 | | | | 2 SA, 1 Int Phase, 7 Ad light phase |
| | Sooty Shear | 10 | | | | light |
| | wedge-tail | 20 ± 5 | | | | |
| | JFP | 50 ± 10 | | | | |
| | BWP | 15 ± 3 | | | | |
| | Shear/Pet | 40 | | | | |
| | G Frigate | 1 | | | Ad ♂ | |
| | Tern sp | 10 ± 3 | | | | |
| 1140 | Sooty Shearwater | 1 | S | | | |
| 1153 | " | 1 | S | | | |
| 1158 | P. externa | 1 | NE | | | |
| 1206 | Shear/Pet | 1 | Q | | | |
| 1215 | Bird | 1 | | | | |
| 1300 | G. Frigate | 1 | SE | | | |
| 1320 | WRSP | 2 | | | | |
| 1400 | sm. Pterodroma | 1 | SE | | | |
| 1402 | BWP | 1 | Q | | | |
| 1416 | Shear/Pet | 3 | Q | | 100 Rain squall | |
| 1450 | Sooty Shear | 2 | SW | | distant | |

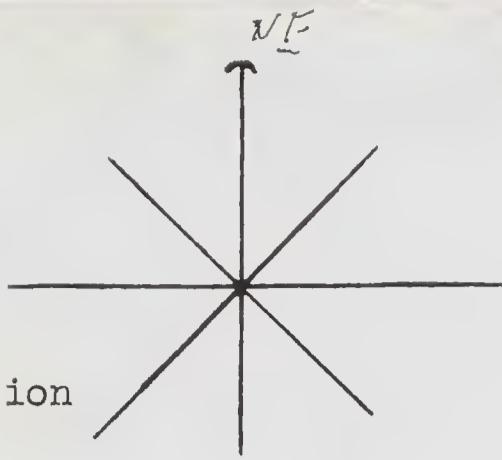
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Ship
DirectionDate 25 Nov
Pg.# 2SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|------|-------------|---|------|----------|----------------------------|
| 1453 | WRSP | 1 | ☉ | | |
| 1505 | Sooty Shear | 1 | S | | distant |
| 1513 | BWP | 1 | ☉ | | |
| | wedgetail | 1 | ☉ | | light |
| 1514 | Shear/Pet | 1 | ☉ | | probably New Zealand Shear |
| 1615 | WRSP | 1 | ☉ | | |
| 1618 | wedgetail | 2 | ☉ | | light in Rain Squall |
| 1627 | BWP | 2 | ☉ | | |
| | RTTB | 1 | ☉ | | |
| 1630 | Wedgetail | 2 | ☉ | | light |
| 1632 | WRSP | 1 | ☉ | | |
| 1637 | RTTB | 1 | ☉ | | |
| 1643 | RTTB | 1 | ☉ | | |
| 1645 | WRSP | 1 | ☉ | | |
| 1651 | BWP | 1 | ☉ | | |
| 1655 | Bird | 1 | S | | |
| 1700 | BWP | 1 | ☉ | | |
| 1725 | wedgetail | 1 | ☉ | | |
| 1740 | Sooty Shear | 1 | S | | |
| 1745 | BWP | 1 | ☉ | | |
| 1753 | Sooty Shear | 1 | S | | |
| 1757 | " " | 1 | S | | |
| 1759 | " " | 1 | S | | |
| 1803 | " " | 1 | S | | |
| 1805 | RFB | 1 | ☉ | | Following ship SA |
| 1807 | Sooty Shear | 2 | S | | |
| 1821 | | | | | Sunset close observation |



Ship
Direction

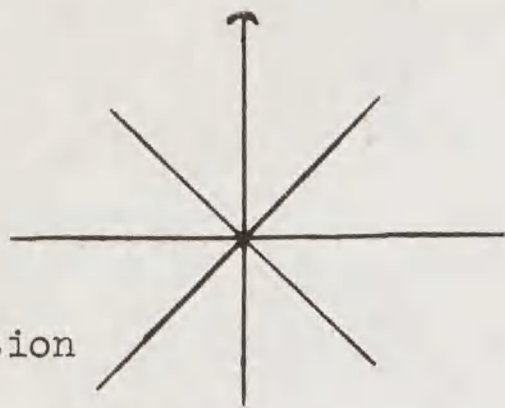
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:
C. Cooper - J. Bulmer

Date 26 Nov. 1966
Pg. # 1

SPECIMEN
or

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|---|---------------|----------|--|
| 0707 | | | | | Sunrise |
| 0835 | Wedgetail | 1 | SE | | light |
| 0938 | BWP | 1 | SE | | |
| 0950 | BWP | 1 | NE | | |
| 1014 | JFP | 1 | S | | |
| 1023 | Shear/pet | 1 | S | | |
| 1028 | BWP | 2 | | | following ship |
| 1030 | JFP | 1 | SE | | |
| 1031 | RTTB | 1 | SE | | |
| 1102 | G. Frigate | 1 | SE | | adu |
| 1135 | " | 1 | SE | | ad ♂ chasing flying fish. |
| 1135 | Wedgetail | 1 | SE | | light |
| 1135 | Phoenix/tahiti | 1 | SE | | close: no doubt that it was 1 of 2, but wind vibration prevented specific identification: Nota kermadec. |
| 1200 | Shear/Pet | 1 | SE | | |
| 1203 | Pendroma sp | 1 | SE | | |
| 1250 | JFP | 1 | SE | | edge of egg |
| 1358 | Shear/pet | 1 | SE | | |
| SF 1545 | Sooty Tern | 9 | NE | | Ad |
| | " " | 1 | NE | | imm - positive (not L.T. Jaeger) |
| | Wedgetail | 3 | NE | | light |
| | Dark-rump | 1 | NE | | good comparison with wedgetails, good look |
| 1607 | RFB | 1 | N | | SA heavy molt on wings |
| 1642 | Shear/Pet | 1 | SE | | |
| 1650 | BWP | 1 | SE | | |
| 1658 | White NP | 1 | SE | | |
| 1807 | | | | | Sunset Close observations |



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Lewis

Date 27 Nov 66

Pg. # 1

SPECIMEN

or

TIME SPECIES # DIR. BAND NO. REMARKS

| TIME | SPECIES | # | DIR. | BAND NO. | REMARKS |
|---------|----------------|----|------|----------|--|
| 0656 | | | | | Sunrise begin observations |
| 0656 | RFB | 1 | ce | | Roosting on TV camera unbanded subad |
| 0743 | wedgetail | 1 | ce | | light |
| 0750 | " " | 2 | ce | | " following ship } together |
| 0756 | BFB | 1 | ce | | Immature |
| 0920 | Shear-Pet | 2 | ce | | |
| | Pom. Jaeger | 1 | ce | | imm. dark |
| 0942 | wedgetail | 1 | ce | | light |
| 0944 | sooty tern | 2 | NW | | Ad |
| 0948 | wedgetail | 1 | ce | | light |
| 0949 | RFB | 1 | NE | | imm |
| SF 1016 | Sooty Terns | 7 | ce | | Ads |
| 1017 | Darkrumped Pet | 1 | ce | | |
| 1035 | Pom. Jaeger | 1 | SW | | |
| 1108 | Wedgetail | 1 | W | | light |
| 1215 | CNT | 2 | E | | |
| 1242 | Wedgetail | 2 | N | | light |
| 1250 | " | 2 | N | | light - 1 defecating. |
| 1255 | BFB | 1 | ce | | ad. |
| 1307 | Wedgetail | 1 | ce | | light. |
| TF 1335 | Sooty Tern | 4 | | | 3 ad, 1 imm. |
| | Pterodroma | 2 | | | |
| | Wedgetail | 16 | | | all light. |
| | CNT | 4 | | | |
| 1413 | P. Jaeger | 3 | | | follow. ship. (2 light, 1 dark) |
| 1441 | Sooty Shear | 3 | S | | close |
| 1540 | BFA | 1 | ce | | following ship |
| 1550 | wedgetail | 1 | ce | | light |
| 1613 | " | 1 | ce | | " |
| 1637 | " | 1 | ce | | feeding; diving in the H ₂ O from 4' up |
| 1645 | " | 1 | ce | | " |
| 1700 | | | | | close observations |

Date 18 November Ship ^{USS} George Eastman (AG-39) Cruise No. _____

Organization POBSP Recorder Bridge - 46-39

Sunrise: Time 0637 Position: Lat. 19-10, Long. 158-30

Sunset: Time 1802 Position: Lat. 17-13, Long. 159-06

Miles travelled from 0000 hours to sunrise = 69

Miles travelled from sunrise to sunset = 123

Miles travelled from sunset to 2400 hours = 63

5-2
6
110 W

41
60-25 mi
300
100

| TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|------------------|-------------|-----------|------------|
| 1. 0000 (7-8 AM) | DR | 20-17.5 N | 158-13 W |
| 2. 0600 | Celestial | 19-16.5 | 158-27 W |
| 3. 1200 | Celestial | 18-14 | 158-45.8 W |
| 4. 2000 | Celestial | 16-54 | 159-11 W |
| 5. | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 20-17.5 N | 158-13 W | | | | |
| 0100 | 20-07 | 15 | | | | |
| 0200 | 19-57 | 19 | | | | |
| 0300 | 47 | 21 | | | | |
| 0400 | 37 | 23 | | | | |
| 0500 | 27 | 25 | | | | |
| 0600 | 19-16.5 | 158-27 | | | | |
| 0700 | -16 | 20 | | | | |
| 0800 | 18-55 | 33 | | | | |
| 0900 | 45 | 36 | | | | |
| 1000 | 34 | 39 | | | | |
| 1100 | 24 | 42 | | | | |
| 1200 | 18-14 | 158-45.8 | | | | |
| 1300 | 17-04 | -47 | | | | |
| 1400 | 17-34 | -52 | | | | |
| 1500 | 17-44 | -55 | | | | |
| 1600 | 17-34 | -57 | | | | |
| 1700 | 17-24 | 159-02 | | | | |
| 1800 | 17-14 | 05 | | | | |
| 1900 | 17-04 | 08 | | | | |
| 2000 | 16-54 | 159-11 | | | | |
| 2100 | 16-44 | 14 | | | | |
| 2200 | 16-34 | 17 | | | | |
| 2300 | 16-23 | 20 | | | | |
| 2400 | 16-13 | 23 | | | | |

Date 9 NOV 1966 Ship GEORGE EASTMAN (JAL 39) Cruise No. _____

Organization POBSP Recorder Ship's bridge (Elmer Polovina)

Sunrise: Time 0639 Position: Lat. 15-12N, Long. 159-45W

Sunset: Time 1811 Position: Lat. 13-16.5N, Long. 160-17W

Miles travelled from 0000 hours to sunrise = 65

Miles travelled from sunrise to sunset = 121

Miles travelled from sunset to 2400 hours = 61

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 16-13.2N | 159-23W |
| 2. | 0800 | CELESTIAL | 14-58N | 159-49W |
| 3. | 1200 | CELESTIAL | 14-15N | 160-00W |
| 4. | 2000 | CELESTIAL | 12-56N | 160-20W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. | Ship speed |
|------|------------------------|-----------|-----------|----------|-----------|-----------|----------------|
| 0000 | 16-13.2N | 159-23W | | | | | 7.4 knots |
| 0100 | 16-04 | -26 | | | | | 10.4 |
| 0200 | 15-54 | -29 | | | | | 9.8 |
| 0300 | 15-45 | -33 | | | | | 9.4 |
| 0400 | -36 | 36 | | | | | 10.4 |
| 0500 | -26 | 39 | | | | | 9.8 |
| 0600 | -17 | 43 | | | | | 10.4 |
| 0700 | -07 | 46 | | | | | 9.5 |
| 0800 | 14-58 | 159-49 | | | | | 11.4 |
| 0900 | -47 | -52 | | | | | 11.2 |
| 1000 | -36 | -54 | | | | | 10.4 |
| 1100 | -26 | -57 | | | | | 10.4 |
| 1200 | 14-15 | 160-00 | | | | | 10.4 |
| 1300 | 05 | -03 | | | | | 10.4 |
| 1400 | 13-55 | -05 | | | | | 10.4 |
| 1500 | -45 | -08 | | | | | 10.4 |
| 1600 | -35 | 10 | | | | | 10.4 |
| 1700 | -25 | -13 | | | | | 10.4 |
| 1800 | -15 | -15 | | | | | 10.4 |
| 1900 | -05 | -18 | | | | | 9.2 |
| 2000 | 12-56 | 160-20 | | | | | } average 10.5 |
| 2100 | 12-46 | 21 | | | | | |
| 2200 | 12-35 | 22 | | | | | |
| 2300 | 12-25 | 22 | | | | | |
| 2400 | 12-14 12-14 | 160 23 | | | | | |

Date 10 NOV 1966 Ship GEORGE EASTMAN (YAG 39) Cruise No. _____

Organization NOBSP Recorder Ship's Bridge (Chris Williams)

60144.0
7

Sunrise: Time 0636 Position: Lat. 11-03N, Long. 160-33

Sunset: Time 1820 Position: Lat. 09-08.5N, Long. 161-01W

11-41

Miles travelled from 0000 hours to sunrise = 72

Miles travelled from sunrise to sunset = 118

Miles travelled from sunset to 2400 hours = 59

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE | |
|----|----------------------------|------------------|----------------------------------|-----------------------------------|---------------------------|
| 1. | <u>0000</u> <u>0600</u> | <u>PR</u> | <u>12-14N</u> <u>11°-10 N</u> | <u>160-23W</u> <u>160-33 W</u> | celestial from plot sheet |
| 2. | <u>0800</u> | <u>CELESTIAL</u> | <u>10-49N</u> | <u>160-34.5W</u> | |
| 3. | <u>1200</u> | <u>CELESTIAL</u> | <u>10-10N</u> | <u>160-45W</u> | |
| 4. | <u>2000</u> | <u>CELESTIAL</u> | <u>08-52.5N</u> | <u>161-05W</u> | |
| 5. | | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. | Ship Speed |
|------|----------------|-----------------|-----------|----------|-----------|-----------|----------------|
| 0000 | <u>12-14 N</u> | <u>160-23 W</u> | | | | | |
| 0100 | <u>12-03 N</u> | <u>160-25</u> | | | | | } over 10.7 |
| 0200 | <u>11-53</u> | <u>160-26</u> | | | | | |
| 0300 | <u>11-42</u> | <u>160-28</u> | | | | | |
| 0400 | <u>11-32</u> | <u>160-30</u> | | | | | |
| 0500 | <u>11-21</u> | <u>160-32</u> | | | | | |
| 0600 | <u>11-10 N</u> | <u>160-33 W</u> | | | | | } average 10.5 |
| 0700 | <u>10-59</u> | <u>160-34</u> | | | | | |
| 0800 | <u>10-49 N</u> | <u>160-35 W</u> | | | | | |
| 0900 | <u>10-39</u> | <u>160-38</u> | | | | | } average 10.1 |
| 1000 | <u>10-30</u> | <u>160-40</u> | | | | | |
| 1100 | <u>10-20</u> | <u>160-43</u> | | | | | |
| 1200 | <u>10-10 N</u> | <u>160-45 W</u> | | | | | |
| 1300 | <u>10-00</u> | <u>46</u> | | | | | } average 9.7 |
| 1400 | <u>09-51</u> | <u>50</u> | | | | | |
| 1500 | <u>09-41</u> | <u>53</u> | | | | | |
| 1600 | <u>09-32</u> | <u>55</u> | | | | | |
| 1700 | <u>09-22</u> | <u>58</u> | | | | | |
| 1800 | <u>09-12</u> | <u>161-00</u> | | | | | |
| 1900 | <u>09-03</u> | <u>03</u> | | | | | } 11.0 |
| 2000 | <u>08-53 N</u> | <u>161-05 W</u> | | | | | |
| 2100 | <u>43</u> | <u>07</u> | | | | | |
| 2200 | <u>23</u> | <u>11</u> | | | | | |
| 2300 | <u>23</u> | <u>14</u> | | | | | |
| 2400 | <u>08-12 N</u> | <u>161-17 W</u> | | | | | |

(41)

Date 11 Nov 1966 Ship GEORGE EASTMAN (YAG 39) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0629 Position: Lat. 07-20N, Long. 161-35

Sunset: Time 1829 Position: Lat. Palmyra, Long. _____

Miles travelled from 0000 hours to sunrise = 56

Miles travelled from sunrise to ^{Palmyra} sunset = 91

Miles travelled from sunset to 2400 hours = _____

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|---------------------|-----------|
| 1. | 0000 | DR | 08-12N | 161-17W |
| 2. | 0800 | CELESTIAL | 07-06N | 161-39W |
| 3. | 1200 | CELESTIAL | 06-29.5N | 161-55W |
| 4. | 1700 | VISUAL | PALMYRA 05°-04'N | 162-06W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 8-12 N | 161-17 W | | | | |
| 0100 | 8-04 | -20 | | | | |
| 0200 | 7-56 | -23 | | | | |
| 0300 | 7-47 | -25 | | | | |
| 0400 | 7-39 | -28 | | | | |
| 0500 | 7-31 | -31 | | | | |
| 0600 | 7-23 | -34 | | | | |
| 0700 | 7-14 | -36 | | | | |
| 0800 | 07-06 N | 161-39 W | | | | |
| 0900 | 06-57 | 43 | | | | |
| 1000 | -48 | 47 | | | | |
| 1100 | -39 | 51 | | | | |
| 1200 | 06-29.5 N | 161-55 W | | | | |
| 1300 | 22 | 57 | | | | |
| 1400 | 15 | 59 | | | | |
| 1500 | 08 | 162 01 | | | | |
| 1600 | 01 | 03 | | | | |
| 1700 | 05-04'N | 162-06 W | | | | |
| 1800 | | | | | | |
| 1900 | | | | | | |
| 2000 | | | | | | |
| 2100 | | | | | | |
| 2200 | | | | | | |
| 2300 | | | | | | |
| 2400 | | | | | | |

10.4

av. speed 8.7

9.3

7.4

Date 15 Nov 1966 Ship GEORGE EASTMAN () Cruise No. _____

Organization MBSP Recorder John ()

Sunrise: Time _____ Position: Lat. PALMYRA, Long. _____

Sunset: Time 1833 Position: Lat. 07-04N, Long. 163-12.2 W

Miles travelled from 0000 hours to sunrise = —

Miles travelled ^{u/w} from sunrise to sunset = 108

Miles travelled from sunset to 2400 hours = 57

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|------------------|-----------------|------------------|
| 1. | <u>0800</u> | <u>PALMYRA</u> | <u>05°52</u> | <u>162 09</u> |
| 2. | <u>1200</u> | <u>D.R.</u> | <u>06-04N</u> | <u>162-36.5W</u> |
| 3. | <u>2000</u> | <u>CELESTIAL</u> | <u>07-16.5N</u> | <u>163-22 W</u> |
| 4. | | | | |
| 5. | | | | |

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

| | | | | | | |
|------|--------------|---------------|-------------|---------------|------------|-----------|
| 0100 | | | | | | |
| 0200 | | | | | | |
| 0300 | | | | | | |
| 0400 | | | | | | |
| 0500 | | | | | | |
| 0600 | | | | | | |
| 0700 | | | | | | |
| 0800 | | | | | | |
| 0900 | <u>05-52</u> | <u>162-09</u> | | | | |
| 1000 | <u>05-36</u> | <u>19</u> | | | | |
| 1100 | <u>06-00</u> | <u>28</u> | | | | |
| 1200 | <u>06 04</u> | <u>162-37</u> | <u>115°</u> | <u>17 Knt</u> | <u>115</u> | <u>2'</u> |
| 1300 | <u>13</u> | <u>42</u> | | | | |
| 1400 | <u>22</u> | <u>48</u> | | | | |
| 1500 | <u>32</u> | <u>53</u> | | | | |
| 1600 | <u>41</u> | <u>59</u> | | | | |
| 1700 | <u>50</u> | <u>163-04</u> | | | | |
| 1800 | <u>59</u> | <u>09</u> | <u>113</u> | <u>12</u> | <u>095</u> | <u>3'</u> |
| 1900 | <u>07-08</u> | <u>163-15</u> | | | | |
| 2000 | <u>16</u> | <u>22</u> | | | | |
| 2100 | <u>24</u> | <u>28</u> | | | | |
| 2200 | <u>32</u> | <u>35</u> | | | | |
| 2300 | <u>40</u> | <u>41</u> | | | | |
| 2400 | <u>07-47</u> | <u>163-48</u> | <u>095</u> | <u>10</u> | <u>085</u> | <u>3</u> |

} 4.5 knots
7.5 knots
10.5 knots

Date 16 NOV 1966 Ship GEORGE EASTMAN (YAL 37) Cruise No. _____

Organization _____ Recorder Phillip (U.S.S. George Eastman)

Sunrise: Time 0651 Position: Lat. 08-47N, Long. 164-20

Sunset: Time 1839 Position: Lat. 10-27N, Long. 165-49W

Miles travelled from 0000 hours to sunrise = 69

Miles travelled from sunrise to sunset = 133.5

Miles travelled from sunset to 2400 hours = 54

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 07-49N | 163-48W |
| 2. | 0800 | CELESTIAL | 08-57N | 164-29W |
| 3. | 1200 | CELESTIAL | 09-32.5N | 164-52.8W |
| 4. | 2000 | CELESTIAL | 10-38N | 165-58.5W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| | 07-49 | 163-48 | | | | |
| 0100 | 58 | 53 | | | | |
| 0200 | 08-06 | 58 | | | | |
| 0300 | 15 | 164-03 | | | | |
| 0400 | 23 | 08 | | | | |
| 0500 | 32 | 13 | | | | |
| 0600 | 40 | 18 | 110 | 16 | 070 | 3 |
| 0700 | 49 | 23 | | | | |
| 0800 | 08-57 | 164-29 | | | | |
| 0900 | 09-06 | 35 | | | | |
| 1000 | -15 | 41 | | | | |
| 1100 | -24 | 47 | | | | |
| 1200 | 09-33 | 164-53 | 120 | 15 | 080 | 3 |
| 1300 | 41 | 01 | | | | |
| 1400 | 49 | 09 | | | | |
| 1500 | 57 | 18 | | | | |
| 1600 | 10-05 | 26 | | | | |
| 1700 | 13 | 34 | | | | |
| 1800 | 21 | 42 | 115 | 14 | 090 | 3 |
| 1900 | 29 | 50 | | | | |
| 2000 | 10-38 | 165-59 | | | | |
| 2100 | 10-46 | 06 | | | | |
| 2200 | 10-54 | 12 | | | | |
| 2300 | 11-02 | 18 | | | | |
| 2400 | 11-10 | 166-24 | 100 | 17 | 090 | 3 |

10 knots
10.8
11.8

NW

Date 17 Nov 1966 Ship GEORGE EASTMAN (V163) Cruise No. _____

Organization POBSP Recorder Chef Pokua (GNIC)

Sunrise: Time 0706 Position: Lat. 12-07N, Long. 167-09

Sunset: Time 1844 Position: Lat. 13-48N, Long. 168-20W
0700 13-55 168-26

Miles travelled from 0000 hours to sunrise = 72

Miles travelled from sunrise to sunset = 123

Miles travelled from sunset to 2400 hours = 43

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 11-10N | 166-24W |
| 2. | 0800 | CELESTIAL | 12-15N | 167-15W |
| 3. | 1200 | CELESTIAL | 12-47.5N | 167-38.2W |
| 4. | 2000 | CELESTIAL | 14-08N | 168-34W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|------------------|------------------|-----------|----------|-----------|-----------|
| 0000 | 11-10 | 166-24 | | | | |
| 0100 | 18 | 30 | | | | |
| 0200 | 26 | 37 | | | | |
| 0300 | 34 | 43 | | | | |
| 0400 | 42 | 50 | | | | |
| 0500 | 50 | 56 | | | | |
| 0600 | 58 | 167-02 | 100 | 13 | 090 | 3 |
| 0700 | 12-06 | -09 | | | | |
| 0800 | 12-15 | 167-15 | | | | |
| 0900 | 23 | 21 | | | | |
| 1000 | 31 | 27 | | | | |
| 1100 | 39 | 23 | | | | |
| 1200 | 12-48 | 167-38 | 085 | 21 | 085 | 5 |
| 1300 | 57 | 44 45 | | | | |
| 1400 | 13 06 12 | 50 53 | | | | |
| 1500 | 15 18 | 168-57 00 | | | | |
| 1600 | 24 28 | 168-03 07 | | | | |
| 1700 | 33 38 | 09 14 | | | | |
| 1800 | 42 48 | 15 21 | 110 | 17 | 090 | 5 |
| 1900 | 51 58 | 21 28 | | | | |
| 2000 | 14 08 | 168-34 | | | | |
| 2100 | 16 | 41 | | | | |
| 2200 | 24 | 168-48 | | | | |
| 2300 | 33 | 55 | | | | |
| 2400 | 14-17 | 169-02 W | 080 | 17 | 100 | 3 |

NOTE: REMOVED RECORDS 1 HR AT 1900W TO CORRECT W. 11 (X) TIME 2000

av. sp. 10.4 knots
 10. knots
 10.3
 10.1

Date 18 NOV 1966 Ship GEORGE EASTMAN (YAL 31) Cruise No. _____

Organization P.O. BSP Recorder F. J. ... (RMC)

Sunrise: Time 0620 Position: Lat. 13-34N, Long. 169-53W

Sunset: Time 1757 Position: Lat. 12-10N, Long. 171-11W

DR

Miles travelled from 0000 hours to sunrise = 66

Miles travelled from sunrise to sunset = 114

Miles travelled from sunset to 2400 hours = 55

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|---|----------|-----------|
| 1. | 0000 | DR | 14-17N | 169-02W |
| 2. | 0800 | CELESTIAL | 13-21.5N | 170-05W |
| 3. | 1200 | CELESTIAL | 12-47N | 170-32.5W |
| 4. | 2000 | ^{DR} CELESTIAL | 12-24N | 171-28W |
| 5. | | DR - dead reckoning; data's quite figure, 10 BAH used 12'20' 286W | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 14-17 | 169-02 | | | | |
| 0100 | -10 | 10 | | | | |
| 0200 | -03 | 18 | | | | |
| 0300 | 13-56 | 26 | | | | |
| 0400 | -49 | 34 | | | | |
| 0500 | -43 | 42 | | | | |
| 0600 | -36 | 50 | 060 | 24 | 060 | 06 |
| 0700 | -31 | 58 | | | | |
| 0800 | 13-22 | 170-05 | | | | |
| 0900 | 13 | 12 | | | | |
| 1000 | 04 | 19 | | | | |
| 1100 | 55 | 26 | | | | |
| 1200 | 12-47 | 170-33 | 070 | 17 | 065 | 05 |
| 1300 | 39 | 41 | | | | |
| 1400 | 31 | 49 | | | | |
| 1500 | 23 | 57 | | | | |
| 1600 | 15 | 171-05 | | | | |
| 1700 | 11 | 09 | | | | |
| 1800 | 04 | 15 | 075 | 18 | 070 | 05 |
| 1900 | 12-11 | 21 | | | | |
| 2000 | 12-18 | 171-29 | | | | |
| 2100 | 12-25 | 171-35 | | | | |
| 2200 | 12-32 | 171-42 | | | | |
| 2300 | 12-39 | 171-45 | | | | |
| 2400 | 12-45 | 171-38 | 075 | 26 | 070 | 06 |

7.0
4.0
7.0

10.5
11.2
10.0
10. (approx)

Date 19 Nov 1966 Ship GEORGE EASTMAN () Cruise No. _____

Organization POBSP Recorder Pohina (QMG)

Sunrise: Time 0625 Position: Lat. 13.28N, Long. 170.51W

Sunset: Time 1750 Position: Lat. 14.57N, Long. 169.44W

Miles travelled from 0000 hours to sunrise = 64

Miles travelled from sunrise to sunset = 121

Miles travelled from sunset to 2400 hours = 70

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE | |
|----|-------------|-------------|----------|--------------------------------------|----------------------------|
| 1. | 0000 | DR | 12-45N | 171- 38 ³³ W ← | changed to 171-38 by SA.H. |
| 2. | 0800 | CELESTIAL | 13-39N | 170-38W | |
| 3. | 1200 | CELESTIAL | 14-09N | 170-17W | |
| 4. | 2000 | CELESTIAL | 15-13N | 169-34W ← | any chance this was 24'? |
| 5. | | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| | 12-11 | 171-38 | | | | |
| 0100 | -52 | -31 | | | | |
| 0200 | 59 | -23 | | | | |
| 0300 | -05 | -16 | | | | |
| 0400 | -12 | -08 | | | | |
| 0500 | -17 | -01 | | | | |
| 0600 | -26 | 70 -53 | 067 | 25 | 067 | 5 |
| 0700 | -32 | -46 | | | | |
| 0800 | 13-39 | 170-38 | | | | |
| 0900 | -47 | -33 | | | | |
| 1000 | -54 | -28 | | | | |
| 1100 | 14-02 | -22 | | | | |
| 1200 | 14-09 | 170-17 | 090 | 18 | 065 | 8 |
| 1300 | 17 | 11 | | | | |
| 1400 | 25 | 05 | | | | |
| 1500 | 33 | 169-59 | | | | |
| 1600 | 41 | 53 | | | | |
| 1700 | 49 | 47 | | | | |
| 1800 | 57 | 41 | 068 | 23 | 070 | 5 |
| 1900 | 15-05 | 169-34 | | | | |
| 2000 | 15-13 | 169-34 | | | | |
| 2100 | 21 | 43 | | | | |
| 2200 | 29 | 52 | | | | |
| 2300 | 37 | 170-02 | | | | |
| 2400 | 15-29 | 170-10 | 060 | 21 | 070 | 5 |

10.1
9.2
10.1
12.5

Date 20 NOV 1966 Ship GEORGE EASTMAN (19639) Cruise No. _____

Organization POBSP Recorder Pohina (QMC)

Sunrise: Time 0628 Position: Lat. 14-35N, Long. 170-56W

Sunset: Time 1800 Position: Lat. 13-32N, Long. 172-35

Miles travelled from 0000 hours to sunrise = 70

Miles travelled from sunrise to sunset = 126

Miles travelled from sunset to 2400 hours = 62

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 15-29N | 170-10W |
| 2. | 0800 | CELESTIAL | 14-24N | 171-08W |
| 3. | 1200 | CELESTIAL | 13-53.5N | 171-47W |
| 4. | 2000 | CELESTIAL | 13-46N | 172-52W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 15-29 | 170-10 | | | | |
| 0100 | 21 | 17-2 | | | | |
| 0200 | 13 | 24 | | | | |
| 0300 | 05 | 32 | | | | |
| 0400 | 14-57 | 40 | | | | |
| 0500 | 49 | 47 | | | | |
| 0600 | 41 | 54 | 075 | 23 | 070 | 05 |
| 0700 | 33 | 01 | | | | |
| 0800 | 14-24 | 171-08 | | | | |
| 0900 | 17 | 18 | | | | |
| 1000 | 09 | 28 | | | | |
| 1100 | 02 | 38 | | | | |
| 1200 | 13-54 | 171-47 | 070 | 17 | 070 | 04 |
| 1300 | 46 | 56 | | | | |
| 1400 | 38 | 172-05 | | | | |
| 1500 | 30 | 14 | | | | |
| 1600 | 13-23 | 172-22 | | | | |
| 1700 | 13-24 | 172-27 | | | | |
| 1800 | 31 | 172-35 | 075 | 15 | 080 | 05 |
| 1900 | 24 | 172-43 | | | | |
| 2000 | 13-46 | 172-52 | | | | |
| 2100 | 13-53 | 173-00 | | | | |
| 2200 | 14-03 | 172-54 | | | | |
| 2300 | 14-10 | 172-49 | | | | |
| 2400 | 14-16 | 172-43 | 095 | 20 | 080 | 05 |

10.9

12.3

11.7

9.5

10 knots

Date 21 Nov 1966 Ship GEORGE EASTMAN (YAG 39) Cruise No. _____

Organization POBSP Recorder Pohua (QMC)

Sunrise: Time 0633 Position: Lat. 15-00N, Long. 172-02W

Sunset: Time 1747 Position: Lat. 16-08N, Long. 170-47

Miles travelled from 0000 hours to sunrise = 60

Miles travelled from sunrise to sunset = 100

Miles travelled from sunset to 2400 hours = 59

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 14-16N | 172-43W |
| 2. | 0800 | CELESTIAL | 15-10.5N | 171-51W |
| 3. | 1200 | CELESTIAL | 15-37.5N | 171-22W |
| 4. | 2000 | CELESTIAL | 16-19N | 170-57W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 14-16 | 172-43 | | | | |
| 0100 | 23 | -37 | | | | |
| 0200 | 30 | -30 | | | | |
| 0300 | 37 | -24 | | | | |
| 0400 | 44 | -17 | | | | |
| 0500 | 51 | -11 | | | | |
| 0600 | 58 | -04 | 069 | 12 | 060 | 05 |
| 0700 | 15-05 | 171-58 | | | | |
| 0800 | 15-11 | 171-51 | | | | |
| 0900 | 18 | 44 | | | | |
| 1000 | 25 | 37 | | | | |
| 1100 | 31 | 30 | | | | |
| 1200 | 15-38 | 171-22 | 060 | 13 | 060 | 05 |
| 1300 | 45 | -14 | | | | |
| 1400 | 52 | -05 | | | | |
| 1500 | 59 | 170-57 | | | | |
| 1600 | 16-06 | 170-48 | | | | |
| 1700 | 16-13 | 170-54 | | | | |
| 1800 | 14 | 55 | 050 | 10 | 090 | 04 |
| 1900 | | | | | | |
| 2000 | 16-19 | 170-57 | | | | |
| 2100 | 25 | 171-04 | | | | |
| 2200 | 33 | -10 | | | | |
| 2300 | 16-41 | -17 | | | | |
| 2400 | 16-45 | 171-23 | 007 | 14 | 010 | 02 |

7.5

9.9

11

1730-1830, Not under way

Speed ca. 4 knots

Speed ca. 9

1730-1830
1830-1930

Date 22 NOV 1962 Ship GEORGE EASTMAN (AG-39) Cruise No. _____

Organization P.O.B.S.P. Recorder Pohina (OMC)

Sunrise: Time 0637 Position: Lat. 15-48N, Long. 172-14W

Sunset: Time 1803 Position: Lat. ~~15-32N~~
14-32N, Long. 177-50W

Miles travelled from 0000 hours to sunrise = 75

Miles travelled from sunrise to sunset = 123

Miles travelled from sunset to 2400 hours = 63

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 16-40N | 171-23 |
| 2. | 0800 | CELESTIAL | 15-36N | 172-30W |
| 3. | 1200 | CELESTIAL | 15-06N | 173-01W |
| 4. | 2000 | CELESTIAL | 14-46N | 174-03.2W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 16-40 | 171-23 | | | | |
| 0100 | 32 | -31 | | | | |
| 0200 | 24 | -40 | | | | |
| 0300 | 16 | -48 | | | | |
| 0400 | 08 | -57 | | | | |
| 0500 | 16-00 | 172-05 | | | | |
| 0600 | 15-52 | -13 | 025 | 17 | 010 | 02 |
| 0700 | 44 | -22 | | | | |
| 0800 | 15-36 N | 172-30 | | | | |
| 0900 | -29 | 38 | | | | |
| 1000 | -21 | 46 | | | | |
| 1100 | -14 | 55 | | | | |
| 1200 | 15-06 | 173-01 | 020 | 19 | 010 | 04 |
| 1300 | 14-58 | 19 | | | | |
| 1400 | 14-50 | 17 | | | | |
| 1500 | 14-42 | 25 | | | | |
| 1600 | 14-34 | 33 | | | | |
| 1700 | 14-26 | 173-40 | | | | |
| 1800 | 14-32 | 73-48.50 | 027 | 16 | 020 | 03 |
| 1900 | 14-39 | 57 | | | | |
| 2000 | 14-46 | 174-03 | | | | |
| 2100 | 14-56 | 174-07 | | | | |
| 2200 | 15-06 | 174-11 | | | | |
| 2300 | 15-13 | 174-06 | | | | |
| 2400 | 15-20 | 174-00 | 355 | 2.4 | 020 | 04 |

11.5
10.7
11.2
10.2

↓
1710

Date 23 NOV 1966 Ship USCGC EASTMAN (YAL 37) Cruise No. _____

Organization POBSP Recorder Pohina (Qmc)

Sunrise: Time 0631 Position: Lat. 15-45N, Long. 173-34W

Sunset: Time 1842 Position: Lat. 16-53N, Long. 172-25W

Miles travelled from 0000 hours to sunrise = 35

Miles travelled from sunrise to sunset = 90

Miles travelled from sunset to 2400 hours = 60

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 15-20N | 174-00W |
| 2. | 0800 | CELESTIAL | 15-55N | 173-24W |
| 3. | 1200 | CELESTIAL | 16-15N | 172-55W |
| 4. | 2000 | CELESTIAL | 16-57N | 172-20.5W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|----------|-----------|-----------|----------|-----------|-----------|
| 0000 | 15-20 | 174-00 | | | | |
| 0100 | 15-27 | 173-52 | | | | |
| 0200 | 15-34 | 173-46 | | | | |
| 0300 | 15-42 | 173-38 | | | | |
| 0400 | 15-44 | 173-36 | | | | |
| 0500 | 15-49 | 173-31 | | | | |
| 0600 | 15-50 | 173-29 | 000 | 12 | 325 | 04 |
| 0700 | 15-52 | 173-27 | | | | |
| 0800 | 15-55 | 173-24 | | | | |
| 0900 | 15-58 | 173-17 | | | | |
| 1000 | 16-00 | 173-10 | | | | |
| 1100 | 16-08 | 173-03 | | | | |
| 1200 | 16-15 | 172-55 | 260 | 14 | 340 | 03 |
| 1300 | 16-22 | 172-49 | | | | |
| 1400 | 16-28 | 172-40 | | | | |
| 1500 | 16-34 | 172-39 | | | | |
| 1600 | 16-40 | 172-34 | | | | |
| 1700 | 16-46 | 172-29 | | | | |
| 1800 | 16-53 | 172-23 | | | | |
| 1900 | 16-55 | 172-13 | | | | |
| 2000 | 16-57 | 172-03 | | | | |
| 2100 | 17-03 | 171-53 | | | | |
| 2200 | 17-01 | 171-42 | | | | |
| 2300 | 17-03 | 171-32 | | | | |
| 2400 | 17-05 | 171-21 | | | | |

10.4
alternately still
run.
63knts
10.4
10.5

9.1
1.4

Date 24 NOV 1966 Ship GEORGE EASTMAN (JAG 39) Cruise No. _____

Organization POBSP Recorder _____

Sunrise: Time 0631 Position: Lat. 17-17N, Long. 170-10W

Sunset: Time 1730 Position: Lat. 17-47N, Long. 168-33W

Miles travelled from 0000 hours to sunrise = 68

Miles travelled from sunrise to sunset = 94

Miles travelled from sunset to 2400 hours = 62

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------------------------|-----------------------------|-----------|
| 1. | 0000 | DR | 17-05N | 171-21W |
| 2. | 0800 | DR | 17-20N | 169-55W |
| 3. | 1200 | Celestial | 17-29N | 167-23W |
| 4. | 2000 | Celestial LORAN | 17-56N 17-56N | 168-12.5W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-----------|------------|-----------|----------|-----------|-----------|
| 0000 | 17° 05' N | 171° 21' W | | | | |
| 0100 | 17° 06' N | 171° 10' W | | | | |
| 0200 | 17° 08' N | 170° 59' W | | | | |
| 0300 | 17° 10' N | 170° 48' W | | | | |
| 0400 | 17° 12' N | 170° 37' W | | | | |
| 0500 | 17° 14' N | 170° 26' W | | | | |
| 0600 | 17° 16' N | 170° 15' W | | | | |
| 0700 | 17° 18' N | 170° 05' W | | | | |
| 0800 | 17° 20' N | 169° 55' W | | | | |
| 0900 | 17° 23' N | 169° 47' W | | | | |
| 1000 | 17° 25' N | 169° 39' W | | | | |
| 1100 | 17° 27' N | 169° 31' W | | | | |
| 1200 | 17° 29' N | 169° 23' W | | | | |
| 1300 | 17° 33' N | 169° 14' W | | | | |
| 1400 | 17° 37' N | 169° 05' W | | | | |
| 1500 | 17° 41' N | 168° 56' W | | | | |
| 1600 | 17° 44' N | 168° 47' W | | | | |
| 1700 | 17° 47' N | 168° 38' W | | | | |
| 1800 | 17° 50' N | 168° 29' W | | | | |
| 1900 | 17° 53' N | 168° 21' W | | | | |
| 2000 | 17° 56' N | 168° 12' W | | | | |
| 2100 | 17° 50' N | 168° 01' W | | | | |
| 2200 | 18° 03' N | 167° 10' W | | | | |
| 2300 | 18° 06' N | 167° 21' W | | | | |
| 2400 | 18° 09' N | 167° 31' W | | | | |

9 knots
NE

Date 25 NOV 1966 Ship USC GEORGE EASTMAN (AGOS) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0717 Position: Lat. 18-26N, Long. 166-46W

Sunset: Time 1821 Position: Lat. 18-53N, Long. 165-10W

Miles travelled from 0000 hours to sunrise = 47

Miles travelled from sunrise to sunset = 96

Miles travelled from sunset to 2400 hours = 56

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 18-09N | 167-31W |
| 2. | 0100 | LOXAN | 18-28N | 166-39W |
| 3. | 1200 | LOXAN | 18-40.5N | 165-58W |
| 4. | 2000 | LOXAN | 18-57.5N | 164-56.5W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-----------|------------|-----------|----------|-----------|-----------|
| 0000 | 18° 09' N | 167° 31' W | | | | |
| 0100 | 11 | | | | | |
| 0200 | | | | | | |
| 0300 | 14 | | | | | |
| 0400 | 17 | | | | | |
| 0500 | 20 | | | | | |
| 0600 | 23 | 55 | | | | |
| 0700 | 26 | 46 | | | | |
| 0800 | 18-28 | 166-39 | | | | |
| 0900 | 32 | 29 | | | | |
| 1000 | 35 | 19 | | | | |
| 1100 | 38 | 09 | | | | |
| 1200 | 18' 40.5N | 165° 58' W | | | | |
| 1300 | 43 | 50 | | | | |
| 1400 | 45 | 42 | | | | |
| 1500 | 47 | 35 | | | | |
| 1600 | 49 | 28 | | | | |
| 1700 | 51 | 21 | | | | |
| 1800 | 53 | 13 | | | | |
| 1900 | 55 | 05 | | | | |
| 2000 | 18° 57.5N | 164° 56.5W | | | | |
| 2100 | 01 | | | | | |
| 2200 | 04 | | | | | |
| 2300 | 07 | | | | | |
| 2400 | 19° 10' N | 164° 15' W | | | | |

ADVANCED CHECKS 1 HR AT 0100
 TO CONFIRM WITH 410 (W TIME ZONE)

8.9
 7.9
 2.109

Date 26 NOV 1966 Ship GEORGE EASTMAN (YAG 39) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0707 Position: Lat. 19-30N, Long. 163-21W

Sunset: Time 1807 Position: Lat. 20-03N, Long. 161-54W

Miles travelled from 0000 hours to sunrise = 56

Miles travelled from sunrise to sunset = 89

Miles travelled from sunset to 2400 hours = 52

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|-----------------------------|-------------------------------|
| 1. | 0000 | DR | 19-10N 20-00N | 164-15W 163-00W |
| 2. | 0800 | LORAN | 19-33N | 163-14W |
| 3. | 1200 | LORAN | 19-42N | 162-40W |
| 4. | 2000 | LORAN | 20-08N | 161-37W |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-----------|------------|-----------|----------|-----------|-----------|
| 0000 | 19° 10' N | 164° 15' W | | | | |
| 0100 | | | | | | |
| 0200 | | | | | | |
| 0300 | | | | | | |
| 0400 | | | | | | |
| 0500 | | | | | | |
| 0600 | 19 28 | 163 31 | | | | |
| 0700 | | | | | | |
| 0800 | 19° 33' N | 163° 14' W | | | | |
| 0900 | 19° 35' N | 163 05 | | | | |
| 1000 | 19° 37' N | 162-56 | | | | |
| 1100 | 19° 39' N | 162° 48' W | | | | |
| 1200 | 19° 42' N | 162° 40' W | | | | |
| 1300 | 19° 46' N | 162° 33' W | | | | |
| 1400 | 19° 50' N | 162° 25' W | | | | |
| 1500 | 19° 53' N | 162° 17' W | | | | |
| 1600 | 19° 56' N | 162° 09' W | | | | |
| 1700 | 19° 59' N | 162° 01' W | | | | |
| 1800 | 20° 02' N | 161° 53' W | | | | |
| 1900 | 20° 05' N | 161° 45' W | | | | |
| 2000 | 20° 08' N | 161° 37' W | | | | |
| 2100 | 20° 11' N | 161° 29' W | | | | |
| 2200 | 20° 14' N | 161° 21' W | | | | |
| 2300 | 20° 17' N | 161° 13' W | | | | |
| 2400 | 20° 20' N | 161° 04' W | | | | |

Date 27 NOV 1966 Ship GEORGE EASTMAN (YAG 37) Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0656 Position: Lat. 20-46N, Long. 16-05W

^{Close Obs} Sunset: Time 1700 Position: Lat. 21° 11' N, Long. 158° 15' W

Miles travelled from 0000 hours to sunrise = 51

Miles travelled from sunrise to ^{Close Obs.} sunset = 112

Miles travelled from sunset to 2400 hours = _____

| | TIME OF FIX | TYPE OF FIX | LATITUDE | LONGITUDE |
|----|-------------|-------------|----------|-----------|
| 1. | 0000 | DR | 20-20N | 161-04W |
| 2. | 0800 | CELESTIAL | 20-48.5N | 159-53.5W |
| 3. | 1200 | LODRAN | 20 51 N | 159-10 W |
| 4. | 1930 | DR | 21-16 | 157-55 |
| 5. | | | | |

Hourly Positions:

| Time | Latitude | Longitude | Wind Dir. | Wind Sp. | Wave Dir. | Wave Hgt. |
|------|-------------|--------------|-----------|----------|-----------|-----------|
| 0000 | 20° 20' N | 161° 04' W | | | | |
| 0100 | 20° 24' N | 160° 55' W | | | | |
| 0200 | 20° 28' N | 160° 46' W | | | | |
| 0300 | 20° 32' N | 160° 37' W | | | | |
| 0400 | 20° 36' N | 160° 28' W | | | | |
| 0500 | 20° 39' N | 160° 19' W | | | | |
| 0600 | 20° 42' N | 160° 11' W | | | | |
| 0700 | 20° 45' N | 160° 02' W | | | | |
| 0800 | 20° 48.5' N | 159° 53.5' W | | | | |
| 0900 | 20° 49' N | 159° 42' W | | | | |
| 1000 | 20° 50' N | 159° 31' W | | | | |
| 1100 | 20° 50.5' N | 159° 20' W | | | | |
| 1200 | 20° 51' N | 159° 10' W | | | | |
| 1300 | 20° 55' N | 158° 59' W | | | | |
| 1400 | 20° 59' N | 158° 48' W | | | | |
| 1500 | 21° 02' N | 158° 37' W | | | | |
| 1600 | 21° 07' N | 158° 26' W | | | | |
| 1700 | 21° 11' N | 158° 15' W | | | | |
| 1800 | | | | | | |
| 1900 | | | | | | |
| 2000 | | | | | | |
| 2100 | | | | | | |
| 2200 | | | | | | |
| 2300 | | | | | | |
| 2400 | | | | | | |

8 Nov

66

| Time | Local | GMT | | | | | | | | | | | | |
|------|-------|-----|----|-----|-------|----|----|----|------|-------|----|----------------|---|---|
| | 1400 | 00 | | | | | | | | | | | | |
| | 347 | 6 | 6 | OVC | 29.97 | 78 | 76 | 9 | 1200 | ST | 83 | 350 | 4 | 2 |
| 01 | 347 | 6 | 6 | OVC | 29.97 | 78 | 76 | 8 | | ST | | 350 | | |
| 02 | 085 | 4 | 6 | OVC | 29.98 | 78 | 75 | 7 | | ST/CU | | 080 | | |
| 03 | 085 | 3 | 6 | OVC | 30.00 | 77 | 75 | 8 | | | | 085 | | |
| 04 | 215 | 3 | 6 | OVC | 29.98 | 77 | 75 | 6 | | | | 215 | 5 | |
| 05 | 216 | 4 | 6 | OVC | 30.00 | 78 | 76 | 6 | | | | 215 | | |
| 06 | 050 | 7 | 8 | BKN | 29.96 | 80 | 75 | 6 | 1500 | CU | 85 | 070 | | 3 |
| 07 | 083 | 15 | 10 | SCT | 29.95 | 80 | 74 | 5 | 2000 | CU | 84 | 070 | | 3 |
| 08 | | | | | | | | | | | | | | |
| 09 | | | | | | | | | | | | | | |
| 10 | 050 | 15 | 8 | BKN | 29.96 | 80 | 75 | 6 | 1500 | CU | 85 | 070 | 5 | 3 |
| 11 | 050 | 15 | 10 | SCT | 29.95 | 80 | 74 | 5 | 2000 | | 84 | | | |
| 12 | 083 | 15 | 10 | BKN | 29.95 | 80 | 74 | 8 | 1500 | SC | 84 | | | |
| 13 | 085 | 14 | 10 | SCT | 29.92 | 79 | 75 | 3 | 2000 | | 85 | | | |
| 14 | 085 | 14 | 10 | SCT | 29.92 | 79 | 74 | 3 | | | | | 4 | |
| 15 | 068 | 10 | 10 | SCT | 29.92 | 79 | 75 | 2 | 1600 | | | 090 | 4 | |
| 16 | 080 | 8 | 10 | SCT | 29.93 | 78 | 75 | 3 | 4000 | | | 080 | 5 | |
| 17 | 085 | 10 | 10 | OVC | 29.95 | 78 | 75 | 10 | 1000 | CU | | 080 | | |
| 18 | 040 | 10 | 7 | OVC | 29.96 | 76 | 73 | 10 | 1200 | ST | 84 | 120 | | |
| 19 | 092 | 10 | 10 | BKN | 29.97 | 80 | 75 | 8 | 1500 | CU | | 120 | | |
| 20 | 092 | 18 | 12 | SCT | 29.96 | 82 | 74 | 4 | 2000 | | | 120 | | |
| 21 | 092 | 18 | 12 | SCT | 29.96 | 82 | 75 | 15 | | | | 120 | | |
| 22 | 134 | 16 | 12 | SCT | 29.96 | 82 | 75 | 7 | | | | 134 | 4 | |
| 23 | 085 | 18 | 10 | SCT | 29.92 | 84 | 77 | 4 | | | | 130 | 4 | |

TIME
Local GMT
1400 00

1100

16

17

20

21

| | | | | | | | | | | | | | |
|-----|----|----|------|-------|----|----|---|-----------------|----|----|-----|---|---|
| 095 | 16 | 10 | SCT | 29.91 | 83 | 76 | 6 | 3000 | CU | 86 | 110 | 4 | 3 |
| 095 | ↓ | | | .90 | 84 | ↓ | 6 | | | 86 | 110 | 4 | ↓ |
| 080 | ↓ | | | .90 | 84 | ↓ | 6 | | | 86 | 110 | 4 | ↓ |
| 092 | 20 | | | .92 | 82 | 74 | 4 | | | 84 | 105 | 3 | 5 |
| 095 | 17 | | | .93 | 81 | 74 | 4 | | | 84 | ↓ | | ↓ |
| 075 | 17 | | | .94 | 80 | 73 | 4 | | | 84 | ↓ | | ↓ |
| 072 | 19 | | | .94 | ↓ | 73 | 3 | | SC | 84 | ↓ | | ↓ |
| 072 | 8 | | | .95 | ↓ | 73 | 4 | | SC | 84 | ↓ | | 4 |
| 050 | 13 | | BICN | .96 | ↓ | 74 | 4 | 2000 | CU | 85 | 070 | | 4 |
| 053 | 15 | | BICN | .96 | 79 | 74 | 2 | 1800 | | 85 | 095 | | 5 |
| 080 | 19 | | BICN | .92 | 78 | 73 | 2 | 1800 | | 84 | 095 | | ↓ |
| | 19 | | SCT | .91 | 79 | 78 | 2 | 2000 | | 85 | ↓ | | ↓ |
| | 18 | | | .90 | 78 | 77 | 2 | | | 85 | ↓ | | ↓ |
| | 17 | | | .89 | 77 | 76 | 2 | | | 85 | ↓ | | ↓ |
| 050 | 14 | | | .83 | 79 | 74 | 2 | | | 85 | 090 | | ↓ |
| 050 | ↓ | | | .86 | 79 | ↓ | 2 | | | 85 | 090 | | ↓ |
| 060 | ↓ | | | .88 | 80 | ↓ | 2 | | | 85 | 070 | 2 | 3 |
| 053 | ↓ | | | .90 | 80 | ↓ | 3 | 1800 | | 84 | 060 | | 5 |
| 063 | 19 | | | .90 | 80 | 75 | 4 | 2000 | | | ↓ | | 5 |
| 049 | 14 | | | .91 | 80 | 74 | 4 | 2000 | | | ↓ | | 5 |
| 060 | 15 | | BICN | .92 | 81 | 75 | 6 | 1600 | | | ↓ | | 4 |
| 060 | 13 | | BICN | .90 | 81 | 75 | 6 | 1800 | | | ↓ | | 4 |
| 060 | 18 | | SCT | .94 | 82 | 75 | 3 | 1800 | | 86 | 070 | 4 | 4 |
| 080 | 18 | | SCT | .86 | 82 | 75 | 3 | 1800 | | 83 | 070 | 4 | |

10 Nov '66

TIME

Local GMT

| Local | GMT | | | | | | | | | | | | | | |
|-------|-----|-----|---------------|----|-----|-------|----|----|---|------|-------|----|-----|---|---|
| 1400 | 00 | 080 | 18 | 10 | SCT | 29.86 | 82 | 75 | 3 | 1800 | CU | 86 | 070 | 4 | 4 |
| | | 068 | 17 | | | .81 | ↓ | 76 | 3 | | | 86 | 065 | | 4 |
| | | 075 | ↓ | | | .81 | ↓ | 76 | 4 | | | 86 | 080 | | 5 |
| | | 075 | ↓ | | | .82 | 81 | 75 | | | | 87 | 080 | | 5 |
| | | 086 | 16 | | | .85 | 80 | 74 | | | | 88 | 086 | | 5 |
| | | 086 | ↓ | | | .86 | 80 | 73 | ↓ | | CU/st | 86 | 086 | | 4 |
| | | 068 | ↓ | | | .88 | 82 | 74 | 5 | | SC | 85 | 080 | | 4 |
| | | 070 | 18 | | | .88 | 81 | 74 | ↓ | | | 86 | 080 | | |
| | | 065 | 15 | | ↓ | .87 | 80 | 73 | ↓ | | | 86 | 080 | | |
| | | 090 | 11 | | BKN | .87 | 80 | 75 | 6 | 1500 | | 86 | 090 | | |
| | | 055 | 15 | | BKN | .87 | 80 | 75 | 6 | 1800 | ↓ | 86 | 080 | | |
| | | 060 | 13 | | SCT | .85 | ↓ | 75 | 4 | | CU | 86 | 070 | | |
| | | 062 | 14 | | | .84 | ↓ | 76 | 4 | | CU | 86 | | | |
| | | 050 | 15 | | | .82 | ↓ | 75 | 1 | 2000 | SC | 86 | | | |
| | | 050 | 15 | | | .81 | ↓ | 75 | 1 | | SC | 86 | | | |
| | | 048 | 14 | | | .80 | 78 | 75 | 2 | | CU | 86 | | | |
| 16:00 | | 050 | 14 | | | .81 | 80 | 76 | 3 | 1800 | | 86 | | | 3 |
| | | 055 | 14 | | | .82 | 80 | 76 | 3 | | | 86 | | | 3 |
| | | 075 | 20 | | BKN | .85 | 82 | 76 | 6 | 2000 | | 86 | 080 | 3 | 4 |
| | | 075 | 17 | | BKN | .86 | 82 | 77 | 5 | | | 86 | | | |
| 20:00 | | 075 | 18 | | BKN | .85 | 82 | 77 | 5 | | | 86 | | | |
| | | 075 | 18 | | BKN | .85 | 82 | 77 | 5 | | | 86 | | | |
| | | 085 | 15 | | SCT | .83 | 84 | 77 | 3 | | | 86 | 085 | 2 | 2 |
| | | 070 | 13 | | SCT | .80 | 86 | 78 | 4 | | | 86 | 080 | 2 | 2 |

11 NOV.

TIME

Local GMT

| Local | GMT | | | | | | | | | | | | | | |
|-------|-----|-----|----|----|------|-------|----|----|---|------|----|----|-----|---|---|
| 1400 | 00 | 070 | 13 | 10 | SCT | 29.80 | 86 | 75 | 4 | 2000 | CU | 86 | 080 | 2 | 2 |
| | | 110 | 11 | | ↓ | .70 | 87 | 79 | 3 | | | 86 | 080 | | |
| | | 110 | 11 | | ↓ | .78 | 83 | 80 | 3 | | | 87 | 080 | | |
| | | 053 | 7 | | BICN | .76 | 80 | 80 | 5 | | | | 060 | | |
| | | 060 | 8 | | SCT | .78 | 80 | 80 | 3 | | | | 040 | | |
| | | 060 | 9 | | ↓ | .80 | 84 | 75 | 2 | | | ↓ | 040 | | |
| | | 056 | 6 | | ↓ | .81 | 83 | 75 | 1 | 1800 | | 88 | 050 | | |
| | | 098 | 4 | | ↓ | .82 | 80 | 75 | 1 | | | | 050 | | |
| | | 095 | 4 | | ↓ | .82 | 80 | 75 | 1 | | | | 050 | | |
| | | 180 | 2 | | ↓ | .83 | 79 | 75 | 4 | | | | 100 | | |
| | | 180 | 2 | | ↓ | .83 | 79 | 75 | 4 | | | | 100 | | |
| | | 150 | 3 | | CLK | .83 | 81 | 75 | 0 | - | - | ↓ | 150 | | 1 |
| | | 150 | 4 | | CLK | .83 | 82 | 75 | 0 | - | - | 87 | 150 | | |
| | | 150 | 3 | | BCK | .79 | 82 | 74 | 3 | 2000 | CU | 88 | 150 | | |
| | | 110 | 10 | | Sct | .81 | 82 | 76 | 4 | | | | 150 | | |
| | | 100 | 11 | | ↓ | .83 | 82 | 76 | 4 | | | | 150 | | |
| 18 | | 120 | 9 | | ↓ | .84 | 83 | 76 | 4 | | | | 150 | | |
| | | 130 | 15 | | ↓ | .85 | 82 | 75 | 4 | | | | 150 | | |
| | | 120 | 12 | | ↓ | .86 | 82 | 76 | 5 | | | | 150 | | |
| | | 100 | 7 | | ↓ | .87 | 82 | 76 | 5 | | | | 150 | | |
| 20 | | 100 | 14 | | BNN | .88 | 82 | 76 | 8 | 1800 | | | 150 | | |
| | | 102 | 11 | | BKN | .87 | 83 | 74 | 6 | | | | 150 | | |
| | | D93 | 6 | | ↓ | .86 | 83 | 77 | 4 | | | | 140 | | |
| | | 086 | 6 | | ↓ | .84 | 84 | 77 | 5 | | | | 135 | | |

15 Nov. '66

| Local time | GMT X-time | | | | | | | | | | | | | | |
|------------|------------|-----|-----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 1400 | 00 | 190 | 5.2 | 8 | Bkn | 29.80 | 81 | 76 | 9 | 1500 | CU | 84 | 170 | 3 | 4 |
| | | 145 | 3.5 | | | .76 | 84 | 77 | 8 | 2000 | | 84 | 165 | 2 | 3 |
| | | 100 | 4.3 | | | .76 | 82 | 75 | 8 | | | 85 | 165 | 2 | |
| | | 100 | 2.6 | | | .76 | 82 | 76 | 8 | | | 84 | 165 | 2 | |
| | | 90 | 2.6 | | | .81 | 81 | 77 | 8 | | | 84 | 160 | 2 | |
| | | 90 | 2.6 | 6 | | .81 | 81 | 77 | 8 | | | 84 | | 2 | |
| | | 160 | .8 | 7 | | .80 | 80 | 76 | 2 | | | 84 | | 2 | |
| | | 108 | 2.6 | | | .80 | 80 | 76 | 2 | | | 84 | | 2 | |
| | | 002 | 5.2 | | | .80 | 82 | 76 | 2 | | | 84 | 165 | 2 | |
| | | 051 | 3.5 | | | .80 | 81 | 76 | 2 | | | 84 | | 2 | |
| | | 093 | 5.2 | | | .84 | 78 | 76 | 8 | | | 84 | | 2 | |
| | | 093 | 5.2 | | | .84 | 78 | 76 | 8 | | | 84 | | 2 | |
| | | 093 | 4.3 | 5 | | .82 | 81 | 76 | 8 | | | 84 | | 2 | |
| | | 093 | 4.3 | 5 | | .82 | 81 | 76 | 8 | | | 84 | | 2 | |
| | | 095 | 3.5 | 6 | | .80 | 81 | 77 | 8 | | | 84 | 163 | 2 | 2 |
| | | 068 | 4.3 | 5 | | .79 | 81 | 77 | 8 | | | 84 | 165 | 2 | 1 |
| 16 | | 070 | 4.3 | 5 | | .79 | 83 | 76 | 8 | | | 84 | 170 | 2 | 2 |
| | | 122 | 7.6 | 8 | | .80 | 81 | 76 | 8 | | | 86 | 170 | 2 | 2 |
| | 18 | | | | | | | | | | | | | | |
| 0900 | 19 | 135 | 12 | 10 | BKN | .85 | 82 | 77 | 8 | | | 86 | 135 | 2 | 3 |
| | 20 | 115 | 15 | 10 | | .85 | 85 | 78 | 8 | | | 88 | 115 | 3 | 3 |
| | | 114 | 16 | 10 | | .85 | 86 | 78 | 8 | | | 86 | 114 | 3 | 2 |
| | | 115 | 20 | 10 | | .84 | 89 | 79 | 8 | | | 86 | 115 | 3 | 2 |
| | | 114 | 12 | 10 | | .83 | 92 | 81 | 7 | | | 86 | 115 | 3 | 2 |

EASTMAN

16 Nov. 1966

| Local Time | GMT Time | | | | | | | | | | | | | | |
|------------|----------|-----|----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 1400 | 00 | 115 | 17 | 10 | BM | 29.81 | 89 | 79 | 7 | 2000 | CU | 86 | 115 | 2 | 2 |
| | | 070 | 15 | | BKN | .76 | 82 | 78 | 9 | | | 86 | 090 | 2 | 4 |
| | | 080 | 16 | | | .76 | 83 | 76 | 9 | | | 87 | 090 | 2 | 4 |
| | | 075 | 16 | | | .74 | | 76 | 0 | | | | 090 | 2 | 4 |
| 1200 | | 113 | 12 | | | .75 | | 78 | | | | | | 2 | 3 |
| | | 117 | 13 | | | .70 | | 77 | | | | | | 2 | 3 |
| | | 082 | 10 | | CLR | .78 | | 77 | | | | | | 2 | 3 |
| | | 080 | 10 | | | .79 | | 77 | | | | | | 2 | 3 |
| 22 | | 080 | 10 | | | .80 | | 77 | | | | | | 2 | 3 |
| | | 085 | 10 | | | .81 | 82 | 77 | | | | | | 2 | 3 |
| | | 003 | 14 | | SCT | .81 | | 77 | 5 | 2000 | CU | 86 | 085 | | |
| | | 085 | 10 | 10 | | .84 | | 74 | 6 | | | | 085 | | |
| 0200 | | 055 | 10 | | | .77 | | 74 | 4 | | | | 055 | | |
| 0300 | 13 | 055 | 10 | | | .77 | | 74 | | | | | 055 | | |
| | | 060 | 11 | | | .77 | | 75 | | | | 87 | 055 | | |
| | | 105 | 17 | | | .79 | 81 | 77 | | | | | 065 | | |
| 0600 | | 110 | 16 | | | .80 | | 77 | 5 | | | | 070 | | |
| | | 110 | 16 | | | .81 | | 77 | 5 | | | | | | |
| | | 115 | 13 | | | .81 | | 77 | 5 | | | | | | |
| | | 115 | 14 | | | .82 | 82 | 77 | 6 | | | | 060 | | |
| 0700 | 0200 | 115 | 13 | | | .81 | 82 | 77 | 6 | | | | 060 | | |
| | | 110 | 15 | | | .82 | 82 | 77 | 6 | | | | 070 | | |
| | | 120 | 15 | | PNY | .81 | 83 | 78 | 7 | | | | 080 | 3 | |
| | | 120 | 15 | | SCT | .80 | 83 | 76 | 7 | | | | 080 | 3 | |

17 Nov. 66

EASTMAN

| Time Local | Time GMT | | | | | | | | | | | | | | |
|------------|----------|------|----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 1400 | 00 | 11 2 | 11 | 10 | BKN | 29.79 | 89 | 79 | 6 | 2000 | CU | 87 | 085 | 3 | 3 |
| | | 115 | | | BKN | .78 | 88 | 79 | | | | 87 | 090 | | |
| | | | | | BKN | .78 | 88 | 79 | | | | | 090 | | |
| | | | | | BLK | .78 | 88 | 79 | | | | | | | |
| 1800 | | | | | BLK | .80 | 87 | 78 | | | | | | | |
| | | 11 5 | | | BLK | .82 | 83 | 79 | | 1000 | | 86 | | | |
| | | 090 | 13 | | Sct | .83 | 83 | 78 | 2 | 2000 | | | | | |
| | | 090 | 14 | | | .84 | 82 | 78 | 1 | | | | | | |
| 22 | | 095 | 18 | | | .84 | 82 | 78 | 4 | | | | | | |
| | | 100 | 16 | | | .85 | 82 | 74 | 3 | | | | | | |
| | | 100 | 17 | | | .84 | 80 | 74 | | | | | | | |
| | | 095 | 17 | | | .82 | 80 | 74 | | | | | | | |
| 0200 | 1200 | 100 | 13 | | | .80 | 80 | 74 | | | | | | | |
| | | 113 | 17 | | | .80 | 82 | 77 | | | | | | | |
| | | 097 | 62 | | | .79 | 82 | 77 | | | | | | | |
| | | 100 | 12 | | | .78 | 82 | 77 | | | | | | | |
| 0600 | | 100 | 13 | | | .80 | 82 | 77 | | | | | | | |
| | | 100 | 13 | | | .80 | 82 | 77 | | | | | | | |
| | | 100 | 25 | | | .82 | 82 | 77 | 5 | | | 87 | 080 | | 4 |
| | | 080 | 17 | | | .82 | 82 | 77 | 5 | | | | | | |
| 1000 | | 090 | 17 | | | .83 | 82 | 77 | 5 | | | | | | |
| | | 085 | 17 | | | .84 | 82 | 77 | 5 | | | | 085 | | |
| | | 085 | 21 | | | .84 | 83 | 78 | 5 | | | 86 | | | |
| | | 085 | 19 | | | .81 | 85 | 78 | 5 | | | 86 | | | |

Time Log @ 1700

18 Nov. '66

TIME
LOCAL GMT

| TIME | LOCAL | GMT | | | | | | | | | | | | | |
|------|-------|-----|-----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 1400 | 000 | 105 | 23 | 10 | SCT | 29.81 | 83 | 77 | 5 | 2000 | CU | 86 | 095 | 3 | 5 |
| | 15 | 01 | 100 | 20 | | .179 | | | | | | | 095 | | |
| | 16 | 02 | 117 | 17 | | .77 | | | | | | | 090 | | |
| | 17 | 03 | 116 | 15 | | .78 | | | | | | | 090 | | |
| | 18 | 04 | 110 | 17 | | .80 | | | | | | | 090 | | |
| | 18 | 05 | 114 | 14 | | .82 | | 78 | 4 | | | 87 | 100 | | 4 |
| | 19 | 06 | 114 | 14 | | .83 | | | | | | | 100 | | |
| | 20 | 07 | 114 | 14 | | .82 | | | | | | | 100 | | |
| | 21 | 08 | 114 | 6 | | .87 | | | | | | | 88 | | |
| | 22 | 09 | 100 | 7 | | .87 | 82 | 77 | | | | 86 | 100 | | 3 |
| | 23 | 10 | 100 | 7 | | .87 | | | | | | 86 | 100 | | |
| | 2400 | 11 | 080 | 17 | | .87 | | | | | SC | 84 | 100 | | |
| | 0100 | 12 | 080 | 17 | | .87 | | | | | SC | 84 | | | |
| | 0200 | 13 | 080 | 20 | | .83 | | | 5 | | SC | 87 | | | |
| | | | 085 | 15 | | .83 | | | | | SC | 84 | | | |
| | | | 065 | 18 | | .80 | | | | | CU | | 060 | | |
| | 0600 | 16 | 066 | 18 | | .79 | | | | | | | | | |
| | | | 060 | 20 | | .78 | | 76 | | | | | | | |
| | | | 065 | 17 | | .83 | | 76 | | | | | | | |
| | | | 069 | 15 | | .81 | 83 | 77 | 3 | | | | | | 5 |
| | | | 070 | 16 | | .86 | | | 5 | | | | | | |
| | | | 070 | 16 | | .88 | | | 4 | | | | | | |
| | | | 070 | 16 | | .86 | | | 4 | | | | | | |
| | | | 070 | 17 | | .86 | | | 5 | | | | 065 | | |

19 Nov. '66

Time
Local GMT

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|------|----|-----|----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 1300 | 00 | 075 | 19 | 10 | BKN | 29.82 | 83 | 77 | 5 | 2000 | CU | 84 | 070 | 3 | 5 |
| 1400 | | 075 | 19 | | | .81 | 89 | 80 | | | | 87 | | | |
| | | 075 | 19 | | | .80 | 89 | 84 | | | | 87 | | | |
| | | 070 | 19 | | SCT | .80 | 86 | 79 | | | | 87 | | | |
| | | 080 | 17 | | | .83 | 85 | 79 | 7 | | | | | | |
| 1800 | | 075 | 18 | | | .84 | 84 | 76 | 8 | | | | | | |
| | | 085 | 25 | 8 | | .86 | 83 | 80 | 9 | | | | | | |
| | | 080 | 20 | 8 | | .85 | 83 | 80 | 8 | | | | | | |
| | | 095 | 25 | 10 | | .86 | 83 | 78 | 9 | | | | | | |
| | | 098 | 17 | | | .86 | 82 | 78 | 8 | | | 86 | | | |
| | | 070 | 17 | | | .85 | 82 | 78 | 8 | | | | | | |
| | | 075 | 20 | | SCT | .84 | 82 | 77 | 3 | 1500 | | | | | 6 |
| | | 081 | 28 | | | .84 | 82 | 77 | | | | | | | |
| | | 080 | 23 | | | .85 | 82 | 77 | | | | | | | |
| | | 080 | 23 | | | .85 | 82 | 77 | | | | | | | |
| | | 082 | 23 | | | .85 | 82 | 77 | | | | | | | |
| | | 067 | 28 | | | .85 | 82 | 76 | | | | | 067 | | 5 |
| | | 067 | 25 | | | .85 | 82 | 77 | | | | | | | |
| | | 067 | 25 | | R | .88 | 81 | 77 | 5 | | | 87 | | | |
| | | 070 | 28 | | BKN | .93 | 81 | 77 | 7 | 2000 | | 86 | 070 | | |
| | | 080 | 30 | | SCT | .93 | 82 | 77 | 5 | | | 86 | 065 | | 8 |
| | | 080 | 24 | | | .92 | 82 | 77 | 4 | | | 86 | | | |
| | | 090 | 20 | | | .91 | 82 | 77 | 4 | | | 86 | | | |
| | | 090 | 18 | | | .89 | 81 | 77 | 4 | | | 86 | | | |

TIME

Local GMT
1300 00

| Local | GMT | | | | | | | | | | | | | | |
|-------|-----|-----|----|----|------|-------|----|----|----|------|-------|----|-----|---|---|
| 1300 | 00 | 070 | 25 | 10 | BLCN | 29.87 | 83 | 78 | 4 | 2000 | CU | 86 | 070 | 3 | 6 |
| 1400 | | 085 | 29 | | | .84 | | | 6 | | | | | | |
| | | 090 | 27 | | | .84 | | | 6 | | | | | | |
| | | 105 | 28 | | SCT | .85 | | | 5 | | | | | | |
| | | 088 | 23 | | | .85 | 82 | 76 | | | | 87 | | 4 | 5 |
| 1500 | | 088 | 23 | | | .88 | | | | | | 87 | | | |
| | | 088 | 24 | | | .90 | | | | | | 87 | | | |
| | | 088 | 24 | | | .90 | | | | | | | | | |
| | | 088 | 24 | | | .90 | | | | | | | | | |
| 2200 | | 088 | 24 | | | .90 | | | | | | | | | |
| | | 075 | 24 | | | .92 | | 77 | 6 | | | | | | |
| | | 060 | 21 | | BKN | .95 | | | | | | | | | |
| | | 060 | 19 | | BKN | .94 | | | | | | | | | |
| 0200 | | 060 | 19 | | SCT | .91 | | | 5 | | | | | | |
| | | 075 | 20 | | | .93 | | | | | | | | | |
| | | 075 | 21 | | | .93 | | | | | | | | | |
| | | 084 | 19 | | | .90 | | | 4 | | | | | | |
| 0600 | | 075 | 23 | | | .91 | | | 6 | | | | | | |
| | | 065 | 18 | | | .91 | | | 6 | | | | | | |
| | | 051 | 16 | | OVC | .92 | | 76 | 10 | 2500 | SC | | | | 4 |
| | | 055 | 16 | | | .92 | | | | | | | | | |
| 1700 | | 070 | 17 | | | .93 | | | | | | | | | |
| | | 070 | 17 | | | .93 | | | | | | | | | |
| | | 070 | 17 | | | .94 | | | | 2000 | SC/CU | | | | |

Eastman

22 NOVEMBER '66

| Time | | Local | GMT | | | | | | | | | | | | |
|------|----|-------|-----|----|-----|-------|----|----|----|------|-------|---------------|-----|---|---|
| 1300 | 00 | 030 | 11 | 10 | BKN | 29.85 | 83 | 75 | 8 | 2000 | CU | 86 | 090 | 3 | 4 |
| 1400 | | 043 | 14 | | | .85 | | | 8 | | | | | | |
| | | 050 | 12 | | | .83 | | | 7 | | | | | | |
| | | 050 | 10 | | SCT | .82 | | 74 | 4 | | | | | | |
| | | 050 | 10 | | | .83 | | | 5 | | | | | | |
| 1700 | | 050 | 10 | | | .85 | | | 5 | | | | | | |
| | UG | 037 | 11 | | | .86 | - | - | 6 | | | | 050 | | |
| | | 279 | 11 | | | .88 | 80 | 74 | 6 | | | 86 | 279 | | |
| | | 277 | 11 | | | .88 | 80 | | 6 | | | 86 | | | |
| | | 279 | 12 | | OVC | .88 | 79 | | 10 | | CU/ST | 88 | | | |
| | | 279 | 12 | | OVC | .86 | 76 | 72 | 10 | | CU/ST | 88 | | | 3 |
| | | 007 | 14 | | BKN | .86 | 77 | | 7 | | SC | 86 | 010 | | 2 |
| 12 | | 010 | 13 | | | .86 | | | 7 | | | | | | |
| 1700 | | 013 | 20 | | | .84 | | | 6 | | | | | | |
| | | 015 | 20 | | SCT | .81 | 76 | 71 | 2 | | CU | | | | |
| | | 010 | 20 | | BKN | .80 | | | 6 | | | | | | |
| | | 025 | 17 | | SCT | .80 | | | 4 | | | | | | |
| 0600 | | 025 | 17 | | | .82 | 79 | 73 | 3 | | | | | | |
| | 18 | 020 | 17 | | OVC | .82 | | 73 | 10 | | | | 000 | | |
| | | 020 | 17 | | BKN | .85 | | 73 | 7 | | | 87 | | | |
| | | 030 | 23 | | | .88 | 77 | 75 | 7 | | | | | | |
| 1300 | | 020 | 21 | | SCT | .86 | 82 | 74 | 4 | 3000 | SC | | | | |
| | | 020 | 21 | | SCT | .86 | 82 | 74 | 4 | 3000 | SC | | | | |
| | 23 | 020 | 19 | 10 | SCT | .81 | 82 | 73 | 5 | 2000 | SC/CO | 87 | 010 | 3 | 4 |

Eastman

23 Nov '66

TIME
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|------|----|-----|----|----|-----|-----|-----|-----|----|---|------|-----|----|----|-----|---|---|
| 1300 | 00 | 020 | 12 | 10 | SCT | 29. | 79 | 8.5 | 74 | 5 | 2000 | SC/ | CU | 86 | 000 | 2 | 4 |
| 1400 | | 020 | | | | | .76 | | | | | | | | 030 | | 5 |
| | | 010 | | | | | .74 | | | | | | | | | | 5 |
| | | 010 | | | | | .74 | | | | | | | | | | 5 |
| | | 010 | | | | | .73 | | 73 | | | | | | | | 3 |
| | | 027 | 16 | | | | .73 | 81 | 71 | | | SC | | | | | |
| | | 030 | 16 | | | | .75 | | | | | CU | | | | | |
| | | 030 | 18 | | | | .76 | | | | | | | | | | |
| | | 000 | 15 | | | | .77 | | | 3 | | | | | | | |
| | | 015 | 24 | | | | .77 | 80 | 73 | 5 | | | | | 020 | | 4 |
| | | 355 | 24 | | | | .77 | | | 5 | | | | | 020 | | |
| | | 355 | 24 | | | RNY | .76 | | | 5 | | | | | 020 | | |
| | 12 | 348 | 15 | | | BKN | .74 | 79 | 68 | 7 | | | | | 010 | | |
| | | 345 | 12 | | | SCT | .72 | 77 | | 4 | | | | | 350 | | |
| | | 325 | 15 | | | | .72 | | | 3 | | | | | 350 | | |
| | | 000 | 12 | | | | .73 | | | 3 | | | | | 000 | | |
| | | 325 | 12 | | | | .74 | 78 | 67 | | | | | | 325 | | |
| | | 060 | 12 | | | | .74 | 78 | 68 | | | | 88 | | 325 | | |
| | | 000 | 8 | | | | .74 | 79 | 79 | | | | 88 | | 020 | 3 | 3 |
| | | 300 | 12 | | | | .75 | 79 | 79 | | | | 88 | | 020 | | |
| | | 225 | 16 | | | | .81 | 82 | 71 | | | | 86 | | 340 | | |
| | | 230 | 14 | | | | .80 | 83 | 72 | | | | 86 | | 340 | | |
| | | 260 | 14 | | | | .79 | 83 | 72 | | | | 86 | | 340 | | |
| | | 260 | 14 | 10 | | SCT | .79 | 83 | 72 | 3 | 2000 | CU | 86 | | 340 | 3 | 3 |

| | | | | | | | | | | | | | | |
|-------|-----|----|----|-----|-------|----|----|---|------|----|----|-----|---|---|
| 13 00 | 225 | 14 | 10 | SCT | 29.73 | 86 | 74 | 3 | 2000 | CU | 86 | 345 | 2 | 3 |
| 14 00 | 225 | 14 | | | .71 | 86 | 74 | | | | | | | |
| | 215 | 15 | | | .70 | 86 | 74 | | | | | | | |
| | 227 | 19 | | | .70 | 84 | 70 | | | | | | | |
| | 227 | 19 | | | .70 | 84 | 70 | | | | | | | |
| 18 00 | 220 | 26 | | | .71 | 84 | 70 | | | | | 239 | | |
| | 220 | 22 | | | .72 | 80 | 69 | | | | | 230 | | |
| | 220 | 22 | | | .76 | | 69 | | | | | 230 | | |
| | 220 | 22 | | | .76 | | 69 | | | | | 230 | | |
| 20 00 | 215 | 13 | | | .79 | | 68 | | | | | 215 | | 4 |
| | 215 | 14 | | | .80 | | 68 | | | | | 215 | | |
| | 215 | 22 | | | .80 | 79 | 72 | | | | | 215 | | |
| | 200 | 20 | | | .80 | | 72 | | | | | 190 | | |
| 22 00 | 200 | 22 | | | .79 | | 72 | | | | 87 | | | |
| | 190 | 18 | | | .79 | 78 | 72 | | | | | | | |
| | 190 | 18 | | | .79 | | 72 | | | | | | | |
| | 209 | 17 | | | .79 | | 72 | | | | | | | |
| 24 00 | 210 | 20 | | BKN | .82 | | 72 | 8 | | | | | | |
| | 200 | 18 | | BKN | .83 | | 73 | 8 | | | | 105 | | 2 |
| | 200 | 18 | | SCT | .84 | | 73 | 5 | | | | 105 | | |
| | 160 | 24 | | | .88 | 80 | 74 | 5 | | | | 140 | | |
| 26 00 | 143 | 24 | | | .88 | 82 | 77 | 4 | | | | 135 | | |
| | 140 | 24 | | | .87 | 82 | 77 | 4 | | | 86 | 135 | | |
| | 140 | 25 | 10 | BKN | .85 | 82 | 77 | 7 | 2000 | CU | 86 | 135 | 2 | 4 |

| Time | | | | | | | | | | | | | | | |
|-------|-----|-----|----|----|-----|-------|----|----|----|------|----|----|-----|---|----|
| Local | GMT | | | | | | | | | | | | | | |
| 1300 | 00 | 115 | 16 | 10 | BKN | 29.84 | 81 | 78 | 9 | 2000 | SC | 86 | 120 | 2 | 6 |
| 14 | | 115 | 22 | | | .80 | 79 | 72 | | | | | | | |
| 15 | | 115 | 19 | | | .80 | 80 | 73 | | | | | | | |
| 16 | | 115 | 20 | | OVC | .86 | 80 | 73 | 10 | | | 85 | | | |
| 17 | | 115 | 18 | | | .87 | 80 | 74 | | | | | | | |
| 18 | | 170 | 20 | | | .87 | 80 | 74 | | | | | | | 5 |
| 19 | | 165 | 27 | | | .89 | 79 | 74 | | 1500 | | | | | |
| 20 | | 175 | 12 | | | .93 | 79 | 74 | | | | | | | |
| 21 | | 045 | 28 | | | .93 | 78 | 75 | | | | 87 | | | |
| 22 | | 125 | 28 | | | .94 | 78 | 73 | | | | | | | |
| 23 | | 125 | 28 | | | .94 | 78 | 73 | | | | | | | |
| 00 | | 080 | 16 | | | .93 | 80 | 74 | | 2000 | | 85 | | 3 | 10 |
| 01 | 12 | 120 | 24 | | | .92 | 80 | 74 | | 2500 | | 85 | | | |
| 03 | 13 | 130 | 35 | | | .90 | 79 | 73 | | | | | | | |
| 04 | | 130 | 27 | | | .90 | 79 | 73 | | | | | | | 8 |
| 05 | | 135 | 17 | | | .91 | 76 | 72 | | 2000 | | | 130 | | 5 |
| 06 | | 117 | 9 | | | .95 | 77 | 70 | | | | | 120 | | 4 |
| 07 | | 130 | 8 | | | .95 | 77 | 70 | | | | | | | 4 |
| 08 | | 070 | 15 | | | .99 | 79 | 70 | | | | | | | 4 |
| 09 | | 290 | 15 | | | .02 | 79 | 74 | | | | | | | 4 |
| 10 | | 330 | 25 | | | .02 | 79 | 74 | | | | | 110 | | 5 |
| 11 | | 040 | 20 | 10 | | .03 | 79 | 74 | | | | | 000 | | 5 |
| 12 | | 347 | 13 | 6 | | .01 | 77 | 74 | | 1500 | | | 090 | | 5 |
| 13 | | 000 | 14 | 10 | OVC | 29.99 | 79 | 75 | 10 | 1500 | SC | 85 | 085 | 3 | 5 |

26 NOV.

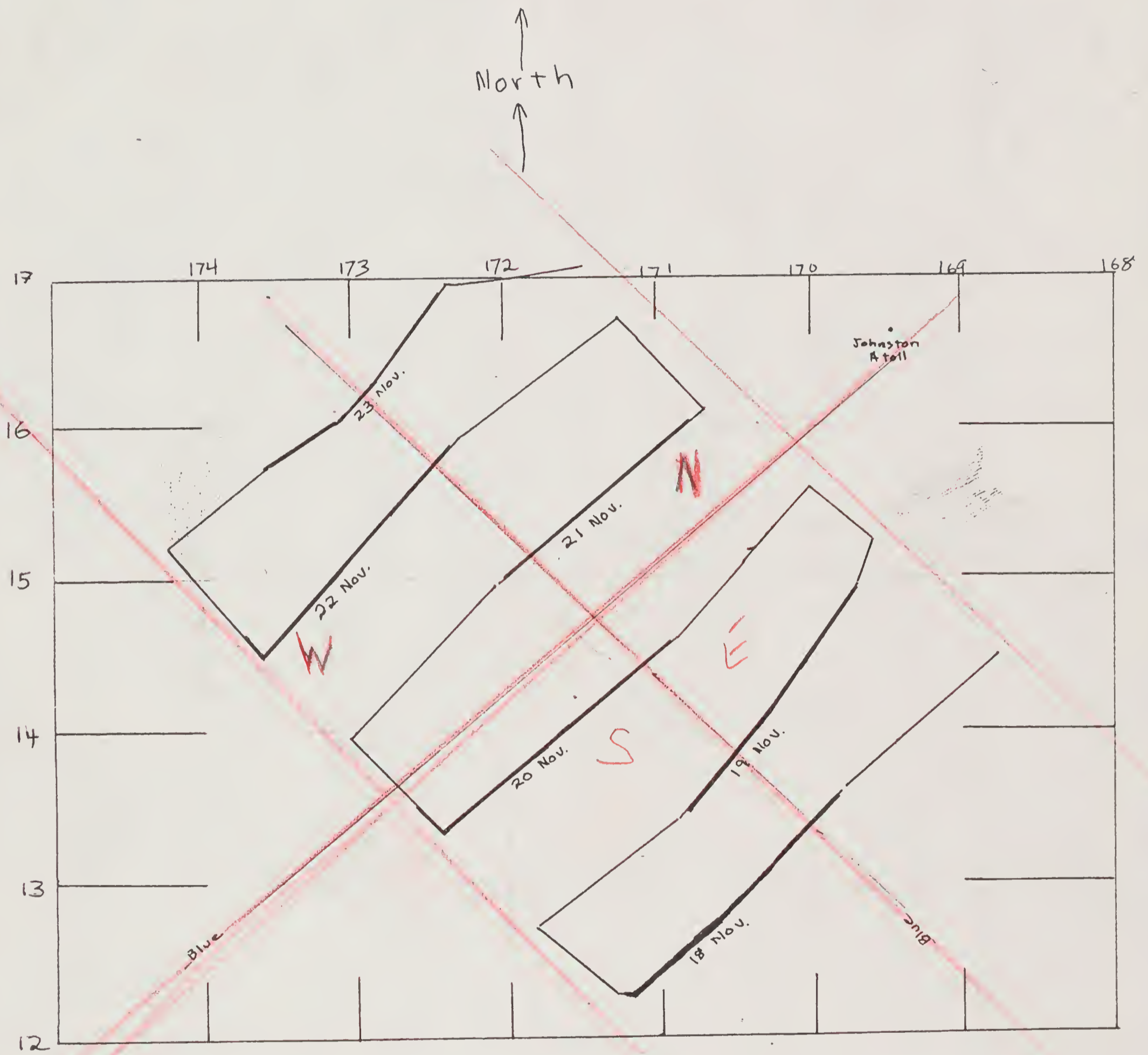
| | | | | | | | | | | | | | | |
|-----------------|-----|----|----|-----|-------|----|------------------|----|------|----|----|-----|---|---|
| 1.40 | 345 | 17 | 8 | OVC | 29.99 | 78 | 75 | 10 | 2000 | SC | 86 | 090 | 4 | 3 |
| 1.40 | 050 | 14 | | | .94 | 78 | | | | CU | | | | |
| | 050 | 14 | | | .94 | 78 | | | | CU | | | | |
| | 116 | 25 | | | .93 | 77 | 78 74 | | | SC | | 116 | | 8 |
| 1.000 | 186 | 24 | | | .97 | | 74 | | | | | | | 5 |
| | 097 | 16 | | | .98 | | 74 | | | | 85 | 091 | | 1 |
| | 100 | 19 | 10 | | 30.00 | 78 | 73 | | | | | 100 | | 7 |
| | 070 | 16 | | | .01 | | | | | | | | | |
| | 070 | 15 | | | .03 | | | | | | | | | |
| | 130 | 25 | | | .04 | 77 | 74 | | | | | | | |
| | 145 | 25 | | | .00 | | 74 | | | | | | | |
| | 122 | 28 | 6 | | .00 | 76 | 72 | | | | | 090 | | 6 |
| | 128 | 26 | 10 | | 29.99 | | 72 | | | | | 090 | | |
| | 093 | 27 | | | .97 | 77 | 73 | | | | | | | |
| | 090 | 22 | | | .94 | 77 | | | | | | | | |
| | 085 | 23 | | | .96 | | | | | | | | | |
| 0.600 | 085 | 23 | | BKN | .98 | | | | | | | | | |
| | 080 | 22 | | SET | .99 | | | 5 | | | | | 3 | 5 |
| | 073 | 17 | | | 30.02 | 78 | 70 | | | | | | | 6 |
| | 075 | 17 | | | .02 | 78 | | | | | | 075 | | |
| 1.250 | 073 | 16 | | | .02 | | | | | | | | | |
| | 073 | 16 | | | .00 | 77 | | | | | | | | |
| | 070 | 18 | | BKN | .00 | 78 | | 8 | | CU | 84 | | | |
| | 070 | 20 | 10 | BKN | 29.97 | 80 | 70 | 6 | | CU | 84 | | 3 | 6 |

Eastman

27 NOV '66

TIME
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1400 00

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|----------------|---------------|----|-----|-------|----|----|---|------|-------|----|-----|---|---|
| 070 | 21 | 10 | BKN | 29.92 | 80 | 70 | 8 | 2000 | CU | 85 | 075 | 3 | 6 |
| 080 | 21 | | | .92 | 80 | | | | | 84 | | | |
| 080 | 28 | | | .89 | 80 | | | | | 80 | | | |
| 090 | 25 | | | .89 | 80 | | | | | 84 | | | |
| 095 | 24 | | | .90 | 79 | 72 | | | | | | | |
| 095 | 25 | | | .92 | 79 | 72 | | | | | | | |
| 100 | 19 | | | .95 | 79 | 70 | | | | | 085 | | 5 |
| 070 | 18 | | SCT | .93 | 77 | 69 | 5 | | | | 075 | | 4 |
| 072 | 22 | | | .93 | 77 | 69 | 5 | | | | | | 4 |
| 071 | 22 | | | .93 | 74 | 68 | 4 | 2500 | SC | | | | 4 |
| 070 | 22 | | | .94 | 77 | 69 | 5 | | SC/CU | | | | 6 |
| 070 | 22 | | | .94 | 77 | 69 | | | SC/CO | | | | 5 |
| 070 | 24 | | | .92 | 77 | 70 | | | | 83 | | | 5 |
| 070 | 23 | | | .91 | 76 | 69 | | | | | | | 6 |
| 070 | 21 | | | .90 | 76 | 68 | | 2000 | CU | | | | |
| 075 | 22 | | | .90 | 77 | 69 | | | | | | | |
| 070 | 14 | | | .92 | 76 | 69 | | | | | | | |
| 070 | 12 | | | .91 | 77 | 70 | | | | | | | 4 |
| 070 | 12 | | | .90 | 77 | 72 | | | | | | | 4 |
| 070 | 25 | | | .91 | 77 | 72 | | | | | | | 4 |
| 070 | 24 | | | .91 | 77 | 72 | | | | | | | |
| 070 | 24 | | | .90 | 79 | 73 | | | | | | | |
| 070 | 17 | | | .89 | 76 | 68 | 5 | | | | | | 3 |
| 070 | 18 | 10 | SCT | .88 | 76 | 68 | 4 | 2000 | CU | 83 | 075 | 3 | 3 |



Map 1. : Pelagic Bird Survey, Smithsonian Grid Number 1, November 1966
 Darkened areas of Cruise Tract Represent areas Transversed during Diurnal Survey.
 Blue lines are for division of Grid into Quadrants.

A124
RLL
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08

PRELIMINARY REPORT
NORTHERN GRID SURVEY NO. 34
November 17-23, 1966

Prepared by
Brian Harrington

This report summarizes the results of a pelagic survey of Smithsonian Grid I from 2230 hours 17 November until 1800 hours 23 November, 1966. Smithsonian personnel included Brian Harrington (Biologist in charge), T. James Lewis, Frank Smith, and Walter Bulmer. Excellent cooperation was received from Captain Church, the officers, and crew of the U.S.S. GEORGE EASTMAN (YAG 39) throughout the survey period. Faulty LORAN receiving equipment and frequent overcast periods made navigation difficult, but positions are considered accurate within 5-10 miles on 22 and 23 November, and within five miles during the remainder of the grid survey. The grid track is shown on map one.

Diurnal observations covered 68.8 hours and 679 miles within the grid area, and an additional 62.4 hours of nocturnal observations were conducted, 1.5 of which were spent drifting on the night of 22-23 November.

Nocturnal observations were conducted in an attempt to clarify the activity of Sooty Terns and other species. A discussion of this phase of the survey is included in the species accounts, but none of the observations are included in the density figures.

It should be emphasized that a comparison of nocturnal and diurnal survey is difficult due to the fact that some species seem to be attracted to the ship at night; it is also possible that others may avoid the ship during the nocturnal hours.

Bird density varied considerably from one area of the grid to another. For purposes of discussion the grid has been divided into quadrants (see map one) and the species density figures have been compiled in table 3. Generally these figures demonstrate that resident birds (i.e., all but transient migrants) were most abundant in the northern and western quadrants of the grid, which also coincides with the areas supporting the most feeding flocks.

SPECIES ACCOUNTS

Wedge-tailed Shearwater

The abundance of Wedgetails in the North and West quadrants of the grid is in keeping with the comparative abundance of other species. But when compared with the November 1965 northern grid survey, they were surprisingly numerous. Last year no Wedgetails were seen in November in the grid, whereas this November 135 were identified. None of these were suspected of being young birds which are readily identified (in the north) if within a month or two of fledging.

That this species should vary in numbers from year to year (and month to month) probably reflects the abundance of food rather than seasonal direction movements. If directional movement occurred, it would seem probable that it would be reflected in the directions of flights recorded with each observation. Analysis of this year's data suggests no directional trends, nor do the data from previous years suggest migration patterns.

Christmas Island Shearwater

Two individuals were noted as single birds. Although this species might be confused with the Sooty Shearwater, both identifications were quite certain.

Sooty and Slender-billed Shearwater

These two species are difficult to separate at long distances; however, if an experienced observer is alert they may be identified at a relatively close range. Most personnel on this cruise were familiar with the two species, and specific identifications are considered reliable when given.

There is no doubt of the fact that both species were migrating through the grid this month. But the proportion is difficult to pin down due to the great variation from day to day, and even hour to hour. In addition, when a mixed flock passes by it is all but impossible to determine how many of each species were present due to their fast flight and the relatively long time required for exact identification of each individual. However, during this survey it was established that both homogenous and mixed flocks occurred, and that

either species may occur as a single bird. However, the sightings of a single Slenderbill are quite scarce relative to the number of single Sooties identified.

Large day to day variations in the number of Sooty/Slenderbills occurred throughout the grid cruise. There was no east-west pattern of abundance, and the writer feels that when either species is abundant in one part of the grid they may well be just as numerous over the rest of the area. In other words, it is postulated that both species pass through in "waves" which probably originate in areas other than the central Pacific. That no east-west pattern of abundance is found may be interpreted from data collected on this cruise. Almost all birds were travelling due south, yet there were days when large numbers were observed north or south of a preceding or following day when low numbers were seen. Thus it would seem logical to surmise that in November the flow is not continuous, but interrupted and in "waves".

Generally the Sooties and Slenderbills were not observed feeding or loitering in their southward movement. However, there were scarce observations of birds milling and feeding. This occurred most frequently on 22 November when three separate groups of Sooty and/or Slenderbills were observed apparently searching for food. One of these groups was with a mixed feeding flock with five other species of birds.

Pale-footed Shearwater

The peak of the migration of this species appears to have passed in October. It is interesting to note that this peak seems to have been reached during an apparent lull in the Sooty and Slenderbill migration, both of which the Pale-foot frequently associates with.

Newell's Shearwater

A single bird was seen shortly after sunset on the 19th.

Dark-rumped Petrel

Two separate sightings of this Hawaiian Island breeder were recorded this month. Accumulated evidence would suggest that this is a regular "winter" visitor to the grid area.

Pterodroma externa

The largest concentrations of this species were encountered in the western quadrant of the grid. Good numbers were also recorded in the other quadrants, but with significantly lower numbers between 171 and 173 degrees west. The grid population size and distribution is quite different from that found in Nov. 1965, there being many more P. externa this year.

Two subspecies (White-necked and Juan Fernandez Petrel) were recorded, with the former being very scarce and only in the northwestern area of the grid.

Pterodroma hypoleuca

The distribution of this species in the grid closely resembles that of P. externa. Like that species, the Black-winged Petrel was noticeably missing from the area between 171 and 173 degrees west. In the eastern areas of the grid both P. externa and hypoleuca were most frequently noted as single birds while in the western portions they were most frequently seen in mixed feeding flocks. This is most likely due to variations in concentrations of food.

White-winged Petrel

Although this is usually an easily misidentified species, one observation of a "dark phase" bird in a mixed feeding flock on the 18th is quite certain. This observation was within 20 miles of the southernmost part of the grid.

An additional sighting of three birds on 22 November was not accompanied by any description, and field marks later described did not fit P. leucoptera.

Kermadec Petrel

All four sightings of this species were in the western third of the grid, and all were in different feeding flocks.

Phoenix Island and Tahitian Petrel

All sightings of both species were in the western portion of the grid. Although the two are easily confused, one bird seen on the 23rd was believed to have been a Tahitian Petrel.

Mottled Petrel

Mottled Petrel

Two individuals were seen on the eighteenth; one was travelling south and the other to the southwest. Apparently the migration through the grid is virtually over after October.

Leach's Storm Petrel

One Leach's Petrel was collected on the night of the 17th after it flew onto the ship. In addition, eleven storm petrels identified only as white-rumped storm petrels were probably Leach's. Distribution seemed to be fairly random throughout the grid area.

White-tailed Tropicbird

This Hawaiian Island breeder was present in the grid in low numbers. Distribution was fairly even throughout the survey, with single birds fishing without regard to other species.

Red-tailed Tropicbird

This species was fairly evenly distributed over the survey area with the exception of an unusually high density in the northwest portion of the grid. The lower population from last year is not explained, but the small difference does not seem significant. One bird was collected November 23, and a serum sample obtained.

The fact that none of the tropicbirds had orange streamers is suggestive of the probability that those present in the grid were not on Johnston Atoll this year (a large percentage there were color marked). This does not mean, however, that the birds are not Johnston-oriented as a streamer wears off in less than a year and the birds may not return to the island each season.

Blue-faced Booby

Four birds of this species were seen during the day. Three were lone adults, and one was a subadult in a mixed feeding flock. Except for one sighting of an adult headed northwest, none of the birds were flying in any determinable direction.

Two Blue-faced were also noted during the nocturnal observations.

Red-footed Booby

A total of nine were seen in the grid, only two of which were adults. All birds sighted were on days when the cruise tract was closest to Johnston Atoll (within 180 miles), but no orange streamers were seen.

The fact that over 85% of the birds were subadults is interesting. This data, along with previously collected data, would tend to indicate that during November the subadult and immature birds have a greater tendency to wander at sea than do the adults.

The significantly larger grid population this year (as compared to November 1965) probably reflects a better food supply, but could result from some other factor.

Great Frigatebird

A total of 24 Frigates was seen in the grid. Of these, 13 were identified as Great Frigates while the remainder were identified as Frigate species, but were quite probably Great Frigates.

The November distribution of this species within the grid does not appear to be random. Over 90% were in the western and northern quadrants, or west of 171 degrees west longitude. In this area, where mixed feeding flocks were most numerous, over 50% of the Frigates sighted were in feeding flocks. Single birds were often noted chasing flying fish.

Ages (when noted) included three immatures and eight adults.

Sooty Tern

A total of 51 Sooties (42 during the day and 9 at night) was observed in the grid this month. This is a considerably lower number than last year (122) despite the fact that more hours of nocturnal observation were conducted this November.

All of the diurnal sightings of Sooties were west of 172 degrees longitude and with the exception of a single adult, were all in feeding flocks. The unquestionable identification of one immature is interesting.

During nocturnal observations small numbers of Sooties were seen throughout the grid area. As stated before, none were seen east of 172 longitude during the

day. Thus, what data which were collected in the eastern two-thirds of the grid would suggest that for some reason Sooties were present at night but not during the day. However, the writer feels that there is also a possibility that Sooties may be present during the day, but are not being seen. Reasons for this suggestion are not well verified, but follow for what they are worth. First, it has been noted on occasion that a single Sooty is often difficult to see (as opposed to a flock). If for some reason, Sooties do not flock in the grid during the "winter" season, they would appear to be present in low numbers. The writer does not intend to imply that the population is at a "normal" level; it is quite probably at a very low level and comprised of single birds. That they travel as single birds seems to be quite possible in view of the observations suggesting the lack of concentrated food sources at this season in the grid. The main numbers have apparently moved to another area. But it is quite probable that scattered individuals remain in the grid area. These single birds very possibly may avoid ships during the day (a behavior frequently noted in flocks.) That they shy from a ship during the day does not mean that they avoid them at night. In fact, the data collected to date would suggest that they are in fact attracted to the lights of a ship.

The above discussion is not intended to deny that there may be directional nocturnal movement through the grid from November through February, but is intended to present a possible alternative. More data and survey are needed supply an answer.

Common Noddy Tern

A total of 9 birds was seen in three sightings. One group of seven in a mixed feeding flock on 20 November was unusual. Last year none were seen in November in the grid.

Fairy Tern

A total of three was recorded, two of which were in mixed feeding flocks on the 23rd.

Skua

Two were observed this year as opposed to one last year. Until a few are collected it will not be possible to determine whether these are of the Arctic or Antarctic race.

Table 1. Summary of Diurnal Bird Observations in Northern Grid,
November, 1966

| <u>Date</u> | <u>No. Birds</u> | <u>Sightings</u> | <u>Species</u> | <u>flocks</u> | <u>Miles</u> | <u>Hours</u> | <u>No. Birds/lin. mile</u> |
|-------------|------------------|------------------|----------------|---------------|--------------|--------------|----------------------------|
| 18 | 133 | 53 | 15 | 6 | 114 | 11.6 | 1.17 |
| 19 | 70 | 53 | 12 | 2 | 121 | 11.5 | .58 |
| 20 | 553 | 73 | 13 | 31 | 126 | 11.5 | 4.40 |
| 21 | 83 | 46 | 11 | 3 | 100 | 11.3 | .83 |
| 22 | 430 | 59 | 13 | 14 | 123 | 11.5 | 3.49 |
| 23 | 250 | 58 | 16 | 9 | 96 | 11.4 | 2.25 |

Table 2. Diurnal Density of Species Groups in Northern Grid
November, 1966

| <u>Species Group</u> | <u>No. Birds</u> | <u>No. Birds/sq. Mile</u> | <u>Grid Population</u> | <u>% Total Birds</u> |
|-----------------------|------------------|---------------------------|------------------------|----------------------|
| Shearwater/Petrel | 1384 | 1.01 | 50,500 | 91.1 |
| Terns | 54 | .039 | 1,950 | 3.5 |
| Tropicbirds | 28 | .021 | 1,050 | 1.8 |
| Boobies | 11 | .004 | 200 | .7 |
| Frigates | 24 | .009 | 450 | 1.6 |
| Storm Petrels | 10 | .015 | 880 | .7 |
| Miscellaneous | 8 | .006 | 300 | .6 |
| TOTAL Birds | 1519 | 1.12 | 56,000 | 100. |
| Total Birds in Flocks | 1140 | | | 75. |

Diurnal Abundance of Birds by Grid Quadrants, Nov. 1966

| | Total in grid | % in flocks | birds/lin. mi. | East Quadrant | | South Quadrant | | West Quadrant | | North Quadrant | |
|--|---------------|-----------------------|----------------|---------------|------------|----------------|-------------|---------------|------------|----------------|-------------|
| | | | | Count | #/lin. mi. | Count | #/lin. mi. | Count | #/lin. mi. | Count | #/lin. mi. |
| Wedge-tailed Shearwater | 123 | 46% | .183 | 4 | .032 | 5 | .021 | 45 | .354 | 69 | .384 |
| Christmas Island Shear. | 2 | 0 | .003 | 0 | — | 1 | .004 | 0 | — | 1 | .006 |
| Sooty Shearwater | 66 | 51% | .099 | 6 | .047 | 10 | .042 | 25 | .197 | 25 | .139 |
| Slender-billed Shearwater | 254 | 97% | .376 | 1 | .008 | 84 | .350 | 133 | 1.48 | 36 | .20 |
| Pale-footed Shearwater | 1 | 0 | .001 | 1 | .008 | — | — | — | — | — | — |
| Dark-rumped Petrel | 2 | 0 | .003 | 1 | .008 | — | — | — | — | 1 | .006 |
| Juan Fernandez Petrel | 95 | 67% | .141 | 28 | .219 | 27 | .112 | 12 | .095 | 47 | .262 |
| White-necked Petrel | 5 | 20% | .007 | — | — | — | — | 2 | .016 | 3 | .017 |
| Black-winged Petrel | 58 | 65% | .086 | 17 | .133 | 9 | .038 | 18 | .142 | 14 | .078 |
| White-winged Petrel | 4 | 100% | .006 | 1 | .008 | 3 | .012 | — | — | — | — |
| Kermadec Petrel | 4 | 100% | .006 | — | — | — | — | 1 | .008 | 3 | .017 |
| Phoenix Island Petrel | 5 | 0 | .007 | — | — | — | — | 4 | .031 | 1 | .006 |
| Mottled Petrel | 2 | 0 | .003 | — | — | 2 | .008 | — | — | — | — |
| Tahitian Petrel | 1 | 0 | .001 | — | — | — | — | — | — | 1 | .006 |
| Leach's Storm Petrel ⁺ | 10 | 0 | .015 | — | — | 4 | .017 | 5 | .039 | 1 | .006 |
| Bulwer's Petrel | 1 | 0 | .001 | — | — | 1 | .004 | — | — | — | — |
| White-tailed Tropicbird | 4 | 0 | .006 | 1 | .008 | — | — | — | — | 3 | .017 |
| Red-tailed Tropicbird | 23 | 0 | .034 | 2 | .016 | 3 | .012 | 10 | .079 | 8 | .049 |
| Blue-faced Booby | 4 | 25% | .006 | 1 | .008 | 2 | .008 | — | — | 1 | .006 |
| Red-footed Booby | 7 | 0 | .013 | 1 | .008 | 1 | .004 | — | — | 5 | .031 |
| Great Frigatebird [#] | 24 | 25% | .037 | 1 | .008 | 1 | .004 | 7 | .055 | 13 | .072 |
| Sooty Tern | 44 | 93% | .065 | — | — | — | — | 20 | .157 | 22 | .122 |
| Common Noddy Tern | 9 | 89% | .013 | 7 | .183 | 1 | .004 | — | — | 1 | .006 |
| Fairy Tern | 3 | 67% | .004 | 1 | .008 | — | — | — | — | 2 | .012 |
| SKUA | 2 | 50% | .003 | 1 | .008 | — | — | 1 | .008 | — | — |
| Bird (Unidentified) | 6 | 0 | .009 | 2 | .016 | 3 | .012 | — | — | 1 | .006 |
| Shearwater/Petrel (unident.) | 113 | 80% | .168 | 12 | .16 | 6 | .022 | 55 | .433 | 43 | .240 |
| Pterodroma Species (") | 3 | 0 | .004 | — | — | 1 | .008 | 2 | .016 | — | — |
| Tropicbird Species (") | 1 | 0 | .001 | — | — | — | — | — | — | 1 | .006 |
| Sooty or Slenderbill Shear. (") | 587 | 92% | .892 | 40 | .311 | 453 | 1.89 | 55 | .433 | 38 | .212 |
| Phoenix or Tahitian Petrel | 2 | 0 | .003 | 1 | .008 | 1 | .004 | — | — | — | — |
| Pterodroma externa (JFP or WNP) | 32 | 18% 56% | .047 | 4 | .032 | 3 | .012 | 21 | .165 | 4 | .022 |
| Pterodroma hypoleuca (BWP or BIP) | 3 | 33% | .004 | 1 | .008 | 2 | .008 | — | — | — | — |
| TOTALS | 1519 | 73.5% | 2.25 | 133 | 1.4 | 624 | .216 | 416 | 3.3 | 344 | 1.91 |
| Total density (excluding all sooty and slenderbilled Shearwaters.) | | | | 85 | .66 | 77 | .32 | 203 | 1.60 | 245 | 1.36 |

+ includes all storm petrels

" those identified only as Frigate species

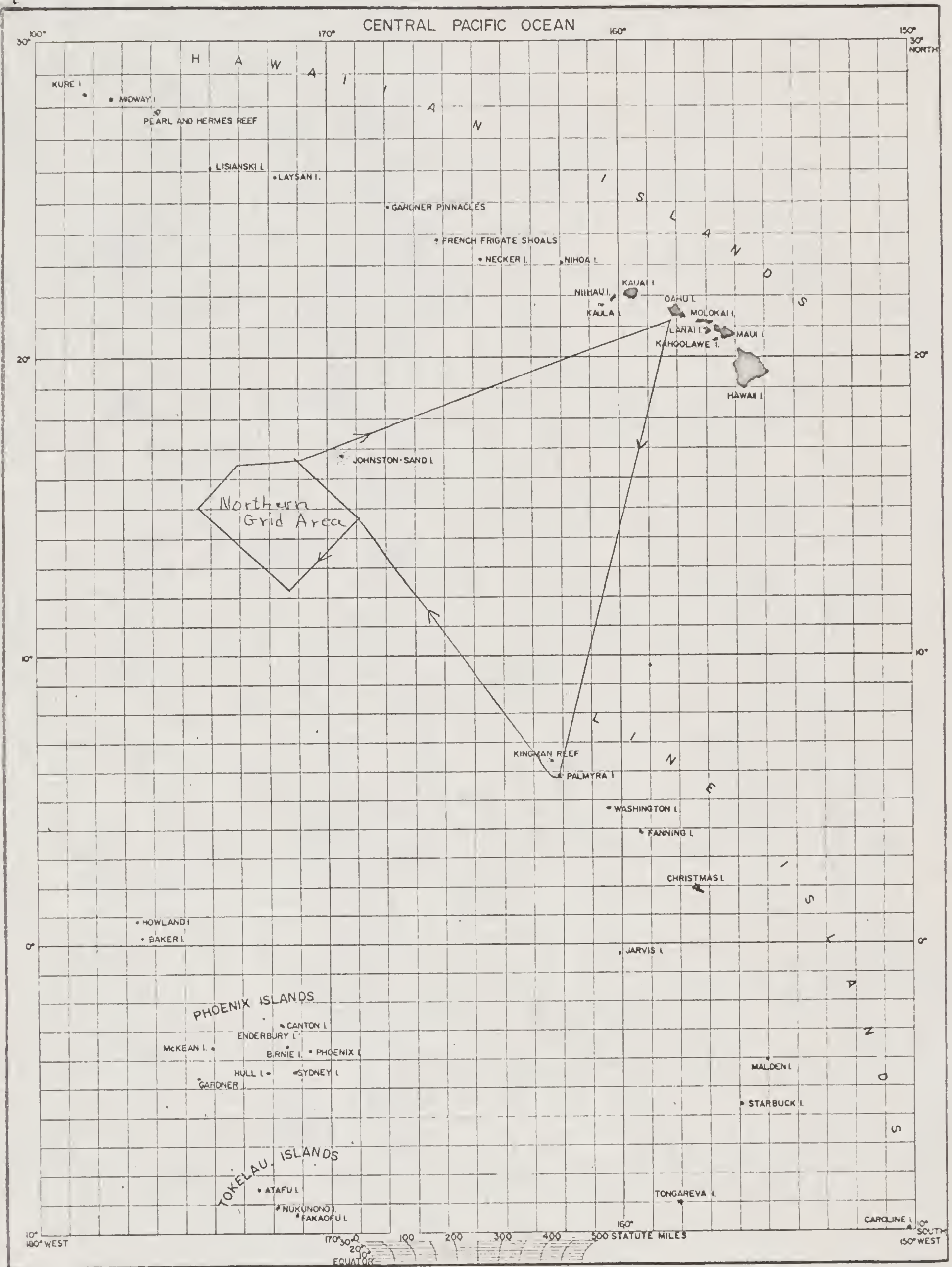
Table 4. Summary of Nocturnal Observations in the Northern Grid
November, 1966.

| <u>Date</u> | <u>Shearwater-Petrel</u> | <u>Terns</u> | <u>Others</u> |
|-------------|--------------------------|--------------|---------------|
| 17-18 | 11 | 3 | 1 |
| 18-19 | 8 | 1 | 1 |
| 19-20 | 3 | 1 | 3 |
| 20-21 | 18* | 1 | 3 |
| 21-22 | 11 | 2 | 10 |
| 22-23 | 8# | 1 | 2 |

* 16 seen before darkness
4 seen after darkness

Table 5. Species and Species Groups Identified During Nocturnal Observation in
Northern Grid, November, 1966

| <u>Bird Type</u> | <u>Number during Darkness</u> | <u>Before or After Darkness</u> |
|---------------------------|-------------------------------|---------------------------------|
| Bird | 7 | 2 |
| Shearwater/Petrel | 22 | - |
| Tropicbird | 1 | - |
| Black-winged Petrel | 4 | - |
| White-rumped Storm Petrel | 2 | - |
| Sooty Tern | 9 | - |
| Wedge-tailed Shearwater= | 6 | 6 |
| <u>Pterodroma externa</u> | 1 | 2 |
| Red-tailed Tropicbird | - | 2 |
| Newell's Shearwater | - | 1 |
| Red-footed Booby | 2 | - |
| Sooty Slenderbill | - | 16 |
| Great Frigate | - | 1 |
| Blue-faced Booby | 2 | - |



Map 1: Non-grid cruise track, November 1966

PRELIMINARY REPORT

PALMYRA ISLAND

¹¹⁻¹⁵
~~Survey #33~~ November 1966

NORTHERN GRID SURVEY. CRUISE (No. 34)

by

Walter Bulmer

Preliminary Report
Palmyra Island
Survey #33
-November 1966

Field Party: B. Harrington (Biologist-in-Charge), W. Bulmer, J. Lewis,
F. Smith.

Itinerary:

11 November -1800 Entire field party arrives.
13 November -0900 Lewis departs.
13 November -1600 Lewis arrives.
15 November -0700 Entire field party departs.

Man Days: 13.4

Palmyra (an atoll) is a heavily vegetated ring of islets surrounding two lagoons. Coconut palms, Messerschmidia and Pisonia trees form the dominant vegetation of the island. Several other species of trees and a dense undergrowth of flowering plants vines and shrubs comprise the tropical flora of most islets.

Upon arrival at Palmyra a boat (the Pele) was anchored in the lagoon. It contained a party of divers from Honolulu who were working the reefs for Mollusca and other marine animals. They had evidently not disturbed anything on the island and contributed helpful information.

The first night the POBSP field party surveyed and banded Red-footed Boobies on three small islands on the west end of the atoll. A Sooty Tern colony that was completing its breeding cycle was worked to capacity and then emphasis was placed on accurate diurnal and nocturnal survey and banding the abundant Red-footed Boobies.

All islets were surveyed by POBSP personnel or by naval officers. The only area not covered was the west end of Cooper Island. A total of 3,800 birds were banded, 202 returns were recorded, 212 sera samples were collected, and 22 birds were collected.

We were given excellent co-operation from Captain Church, Lt. Dibble, and the officers and crew of Yag #39.

ANNOTATED BIRD LIST

| | | |
|---|----------------------|-----|
| Red-tailed Tropicbird (<u>Phaethon rubricauda</u>) | Estimated population | -20 |
| | Number of nests | -1 |
| | Actual count | -7 |
| | Number collected | -1 |

Red-tails displayed over the causeway on several occasions. One bird collected was an adult female that had recently laid. Nests were not found in the general vicinity due to heavy vegetation. One nestling was found on the largest of the three small islets at the west end of the west lagoon. This is believed to be the first record of Red-tailed Tropicbirds breeding on Palmyra.

| | | |
|---|----------------------|-----|
| White-tailed Tropicbird (<u>Phaethon lepturus</u>) | Estimated population | -12 |
| | Actual count | -4 |
| | Number collected | -1 |

White-tails circled over the east lagoon near the southeastern part of the island. They may nest in the tall Pisonia trees but no indication of breeding activity was observed. The one bird collected proved to be an adult male with gonads slightly enlarged. It is believed to represent the first specimen from Palmyra.

| | | |
|--|------------------|----|
| Blue-faced Booby (<u>Sula dactylatra</u>) | Actual count | -6 |
| | Nest with egg | -1 |
| | Number collected | -2 |

One small coral-rubble island off of the eastern end of the atoll contained three pairs of Blue-faced Boobies. Two pairs defended nest scrapes and the third pair had one egg. This pair and the egg were collected and are believed to be the first specimens recorded from Palmyra. All six birds were not banded.

| | | |
|--|----------------------|-------------------|
| Red-footed Booby (<u>Sula sula</u>) | Estimated population | -15,000 \pm 20% |
| | Number banded | -351 |
| | Number returns | -170 |
| | Number collected | -4 |
| | Number sera samples | -69 |

The Red-footed Booby population is believed to be slightly less than it was in May. Due to the dense foliage and the utilization of nesting sites, up to 80' above ground, an accurate nest count is almost impossible. All stages of reproduction appeared to be common.

The main concentrations of Red-foots is along the heavily forested southeastern sections of the atoll and islands in the east lagoon. A good portion of these birds roost in the same spot each night. This was made evident by the large proportion of banded birds roosting low enough to be captured and the unbanded birds above 20'. Also, several series of consecutive returns were noticed by our field party.

Color phases were recorded on 219 birds. Forty-seven per cent of these were inter-mediate phase with $\frac{1}{2}$ of the back white, 45% were inter-mediate phase with a complete brown back, and 7% were light phase. Dark phase Red-foots were present in small numbers and probably represent less than .1% of the total population.

One Christmas Island Red-foot is the only inter-island return recorded by our field party.

| | | |
|-----------------------------|-----------------------|-----------------------|
| Brown Booby | Estimated population | -400 [±] 10% |
| (<u>Sula leucogaster</u>) | Number banded | -27 |
| | Number returns | -12 |
| | Number sera samples - | -31 |

Brown Boobies nested on the large island directly south, across the lagoon from Cooper Island. Their main roosting concentrations were along the causeway and on one islet in the east lagoon.

| | | |
|--------------------------|----------------------|-----------------------|
| Great Frigatebird | Estimated population | -300 [±] 10% |
| (<u>Fregata minor</u>) | Number banded | -2 |

Great Frigates swirled and roosted at the southeastern end of the atoll. No nesting activity was observed and from the numbers of flying immatures it seemed likely that they had finished nesting a couple of months previous.

| | | |
|-----------------------|------------------|----|
| Pintail Duck | Actual count | -9 |
| (<u>Anas acuta</u>) | Number collected | -6 |

Pintails were collected at the duck pond on Paradise Island. They were fairly tame, allowing us to collect 6 out of eight the first day. After that, ducks were not observed with the exception of one drake flying over the lagoon.

Members of the Pele informed us of two flocks of ducks and possibly 2 species that they had observed before our arrival. The duck pond on Hotel Island was void of ducks on each of our visits.

The collected birds represent adult male and female, and immature birds, all of which were quite lean.

| | | |
|--|----------------------|-----------------------|
| Golden Plover (<u>Pluvialis dominica</u>) | Estimated population | -700 [±] 10% |
| | Number collected | -1 |

Golden Plovers are very abundant on Palmyra. The birds inhabited all sections of the island from the heavily forested areas to the mud flats and exposed reefs. All birds were in fall plumage.

| | | |
|--|----------------------|-----------------------|
| Ruddy Turnstone (<u>Arenaria interpres</u>) | Estimated population | -100 [±] 10% |
|--|----------------------|-----------------------|

Turnstones were surprisingly scarce on Palmyra. The largest number observed at one time was approximately 20 which were roosting in the Paradise Island duck pond at high tide. A few birds fed in the heavily forested areas of Hotel Island. No streamered birds were found.

| | | |
|---|----------------------|-----------------------|
| Bristle-thighed Curlew (<u>Numenius tahitiensis</u>) | Estimated population | -300 [±] 10% |
|---|----------------------|-----------------------|

Curlews, like the Golden Plovers, inhabited every ecological niche on Palmyra. Birds fed along exposed reefs, tidal mud flats, and in the heavily forested sections of the island. Their large population is supported by the abundant crustacean fauna of the island. A small, red, fiddler crab was found to be a favorite food of the curlews.

| | | |
|--|----------------------|-----------------------|
| Wandering Tattler (<u>Heteroscelus incanus</u>) | Estimated population | -200 [±] 10% |
|--|----------------------|-----------------------|

Tattlers were at their normal abundance in relationship with the Golden Plovers. Birds fed along the reef and on exposed mud flats. Only an occasional individual was flushed from forested areas of the island. One interesting observation was the viewing of a tattler roosting 25' up in a coconut palm.

| | | |
|---|------------------|----|
| Sharp-tailed Sandpiper (<u>Erolia acuminata</u>) | Actual count | -2 |
| | Number collected | -1 |

Erolia were quite scarce in view of the available habitat. The one bird collected was a male, only slightly fat.

| | | |
|---|--------------|----|
| Sanderling (<u>Crocethia alba</u>) | Actual count | -1 |
|---|--------------|----|

Sanderlings were also quite scarce on Palmyra, in comparison to their

abundance on Oahu. Since they associate with turnstones and Palmyra has a low turnstone population, it is possible that birds moving south from Hawaii head southwest to the Phoenix Islands.

| | | |
|---|----------------------|------------------------|
| Hawaiian Noddy Tern (<u>Anous minutus</u>) | Estimated population | -5,000 ^{+25%} |
| | Number collected | -5 |

Hawaiian Noddies were at a peak in their breeding cycle. Most nests examined contained eggs. Due to the thick foliage, an accurate population estimate could not be obtained.

The birds nested in most islets of the atoll with the largest number in the heavily forested southeastern islets.

| | | |
|--|----------------------|----------------------|
| Common Noddy Tern (<u>Anous stolidus</u>) | Estimated population | -100 ^{+10%} |
|--|----------------------|----------------------|

Common Noddies nested sparingly on most islets of the atoll. Nests found in coconut palms and Messerschmidia contained eggs.

| | | |
|---|----------------------------|------------------------|
| Sooty Tern (<u>Sterna fuscata</u>) | Estimated adult population | -10,000 ^{+5%} |
| | Number breeding | -8,000 |
| | Number chicks | -4,000 |
| | Number banded | -3,400 |
| | Number returns | -20 |
| | Number sera samples | -112 |

A Sooty Tern colony located on an island in the southeastern part of the west lagoon contained about 4,000 large chicks. Due to the dense cover of Messerschmidia on the islet, only one night's banding was accomplished. POBSP personnel banded 2,400 chicks and 1,000 adults. Flying immatures were observed over the lagoon and the runway. A swirl of about 100 birds formed daily over the lagoon. Due to the complete lack of eggs and the small size of the swirls we arrived at the decision that Sooty Terns would not be present in sufficient numbers to make a December visit profitable.

| | | |
|-------------------------------------|----------------------|----------------------|
| Fairy Tern (<u>Gygis alba</u>) | Estimated population | -500 ^{+10%} |
| | Number collected | -1 |

Fairy Terns were common on all islets of the atoll. Very few nesting birds were found, and the population must be at a low in their breeding cycle.

The one bird collected may have been preparing to nest. It proved to be a male with gonads slightly enlarged and brood patch bare.

ARTHROPODS

The insect fauna of Palmyra shows considerable diversity and abundance. A large per cent of insect species has been introduced. Of course the most notable pest is the over-abundant mosquito.

A search for ticks in the Sooty Tern colony proved futile. One Hippoboscid fly was collected from a Golden Plover. Red-footed Boobies were infested with Hippoboscids.

Crustaceans are a dominant form of invertebrates on Palmyra. Two species of hermit crabs are abundant along with normal land crabs. Fiddlercrabs formed the staple diet for Curlews on the mudflats. Three coconut crabs were observed on the island and one of these weighed (by personnel from the PELE) 13 pounds.

MAMMALS AND HERPS.

Skinks were absent although an adequate search for them was not conducted. Geckos of two species (Lepidodactylus lugubris and Gehyra oceanica (?)) were collected by F. Smith.

Sea turtle pits were found on islets off of the eastern end of the atoll. Divers from the PELE reported that Green Turtles were uncommon off of the reef.

The introduced Bufo marinus is common on Cooper Island where 2 were collected.

One porpoise skull which had been left in the forest by POBSP personnel on a previous trip, was collected.

Rattus rattus were found on most of the islets, but were not abundant. Five were collected for ectoparasite studies.

File

PRELIMINARY REPORT
NORTHERN GRID SURVEY CRUISE NO 34
NON-GRID PELAGIC OBSERVATIONS
(Oahu to Palmyra Is.)
(Palmyra Is. to Northern Grid)
(Northern Grid to Oahu)

November, 1966

Prepared by
Frank Smith

Introduction

This report will cover the non-grid portion of the November, 1966 cruise to Palmyra Island and the Northern Grid. The POBSP personnel participating in this trip were Brian Harrington (Biologist-in-Charge), Walter Bulmer, Jim Lewis, and Frank Smith.

The non-grid portion of this cruise was taken in three parts: Honolulu to Palmyra Island, Palmyra Island to the Northern Grid, and thence to Honolulu.

Phase 1: Honolulu to Palmyra Island.

The first section of this report will deal with the initial leg of the cruise which is the trip from Honolulu to Palmyra Island. This journey took four days and included diurnal pelagic observations on the 8, 9, 10, and 11th of November, 1966.

Generally, bird activity was low/moderate for this entire section of the cruise, although there were some variations from day to day. We did not observe over two hundred birds in any single day and the lowest number observed was one hundred and ten birds on the 10th of November (see table). Of the birds observed, a high percentage were Shearwater Petrels. Sooty Terns accounted for 24% of the total birds, and most of these were seen in small flocks. No streamered or banded birds were observed during this cruise.

Flock activity was also low for the first four days. All of the flocks were either searching or feeding. No traveling flocks were observed. The highest number was observed on the 8th (see table) near the Hawaiian Islands, and the lowest number was seen on the 9th. The flock activity began to increase again as we approached the Line Islands but remained rather low in comparison to previous recordings. The majority of all flocks were mixed, Sooty Terns and Shearwater Petrels (see table).

A brief discussion of the abundance, distribution and behavior of each species follows:

Sooty/Slender-billed Shearwater:

Seven birds identified as either Sooty or Slender-billed Shearwater (Puffinus griseus and Puffinus tenuirostris) were observed during the first three days of the cruise (see table). One of those sighted on the eighth of November had light underwings. Of the total number seen, five were traveling south and two were going southwest. We were apparently getting stragglers from an earlier migration or stray birds from the main route.

Sooty Shearwater:

(Puffinus griseus)

One bird positively identified as a Sooty Shearwater was seen traveling south on the 8th of November at 19-05 N; 158-30 W.

Newell's Shearwater:

(Puffinus puffinus newelli)

One bird of this species was seen heading south on the eighth of November.

Wedge-tailed Shearwater:

(Puffinus pacificus)

Wedge-tailed Shearwaters were seen in fairly low numbers throughout this leg of the cruise, although the numbers did begin to increase as we approached the Line Islands on the 10th and 11th (see table). The dark-phase birds were scarce the first two days (1 on the 8th, none on the 9th) but began to increase as we traveled south of 11-03 N. Five dark phase birds were observed on the 10th (29% of total) and sixteen were seen on the 11th. (76% of total). The numbers of birds seen in flocks were low except for the 10th of November when 47% were observed in flocks. No directional trend could be established for these birds on any of the four days of observation.

Christmas Island Shearwater:

(Puffinus nativitatus)

One Christmas Island Shearwater was observed with a small group of birds (1 Wedge-tail and 2 Black-wings) on the 11th of November at 06-46 N; 161-46 W.

Juan Fernandez Petrel:

(Pterodroma externa)

This species was very abundant for the first two days, then the numbers decreased drastically (see table). Almost no birds of this species were seen south of 09-18 N. A fairly high percentage decreased as we traveled south.

On the 8th, most of the birds in flocks were in groups consisting entirely of Juan Fernandez Petrels. As we moved farther south, however, more were seen in mixed flocks of Sooty Terns and Shearwater Petrels. No directional trend could be established for these birds. Most of them seemed to be milling about, searching and feeding. An additional 27 birds identified only as Pterodroma externa but probably Juan Fernandez were seen during the first leg of the cruise.

White-necked Petrel:

(Pterodroma externa cervicalis)

Two birds of this species were observed on the 11th of November near Palmyra Island.

Kermadec Petrel:

(Pterodroma neglecta)

Three light phase Kermadec Petrels were seen on the 8th and 9th of November (see table). Two of these birds were in mixed feeding flocks and the other was a single bird.

Dark-rumped Petrel:

(Pterodroma phaeopygia)

Three birds of this species were observed on the 8th of November, flying in a group at a position of 19-09 N: 158-30 W.

Mottled Petrel:

(Pterodroma inexpectata)

One Mottled Petrel was sighted traveling south on the 11th of November at 07-00N; 161-41 W.

Phoenix Island Petrel:

(Pterodroma alba)

No Phoenix Island Petrels were seen until the third day, as we traveled south of 11-00 N, (see table). Two positive Phoenix Island Petrels and 1 Island or Tahitián Petrel were seen on the 10th of November. One of these

was with a mixed feeding flocks. On the 11th of November as we approached Palmyra Island we saw birds of this species in increasing numbers. We observed 7 Phoenix Island Petrels and 4 Phoenix/Tahitians. No directional trends could be established for these birds.

Black-winged Petrel:

(Pterodroma hypoleuca)

This species was observed in fairly large numbers, over the first leg of the cruise (see table). A fairly high percentage (25%-37%) of these birds seen the first 3 days were in mixed feeding flocks. On the 11th of November, all were seen in small groups or as single birds. No directional trend was noted for these birds. They also seemed to be searching and feeding in the area.

White-winged Petrel:

(Pterodroma leucoptra)

One White-winged Petrel was seen on the 11th of November at 07-17 N; 161-35 W.

Shearwater-Petrel:

Large numbers of birds identified only as Shearwater-Petrels were seen over the entire first leg of the cruise (see table). A large percentage of these birds were in flocks. No directional trend was noted. They seemed to be searching and feeding in the area.

Pterodroma Species:

A moderate number of birds identified only as Pterodroma species were seen during the cruise. None of these were seen in flocks. No directional trend was established for these birds. One of those seen on the 10th, from the general description given, was probably a Herald's Petrel.

White-rumped Storm Petrel

Eight of these birds were seen during the first two days of the cruise (see table). One bird, seen on the 8th of November was identified as Wilson's Storm Petrel. About 50% of these Storm Petrels were heading south or in a southerly direction.

Red-tailed Tropicbird:

(Phaethon rubricauda)

Seven Red-tailed Tropicbirds were observed but none were seen on the 11th of November near Palmyra Island (see table). One sub-adult was collected on the 9th. Two were calling when they were observed.

White-tailed Tropicbird:

(Phaethon lepturus)

Nine White-tailed Tropicbirds were sighted during the first two days and we were still near the Hawaiian chain of islands. One additional bird was seen on the 11th as we approached Palmyra Island.

Brown Booby:

(Sula leucogaster)

Three Brown Boobies, an adult male, an immature, and a sub-adult were seen on the 8th of November. All were single birds traveling south. One additional adult was observed near Palmyra Island on the 11th.

Red-footed Booby:

(Sula sula)

One immature was seen following the ship on the eighth. Three sub-adults were observed on the 9th of November, one of which was chasing flying fish in front of the ship. One sub-adult was seen on the 10th, and only 3 adults were sighted on the 11th as we approached Palmyra Island from the north. This fact is interesting considering the numbers of these

birds known to be nesting and roosting on the island. It suggests that they were feeding in another direction from Palmyra.

Great Frigatebird:

(Fregata minor)

A total of 8 Great Frigates were seen during the first three days. On the 8th, two adult females were seen feeding on the surface. On the 9th, one male, and 1 immature was seen on the 10th, and only seen singularly.

Lesser Frigatebird:

(Frigata ariel)

One adult male Lesser Frigate was observed on the 9th of November at a position of 13-45 N; 160-08 W.

Ruddy Turnstone:

(Arenaria interpres)

One was seen on the 11th as we approached Palmyra Island.

Pomarine Jaeger:

(Stercorarius pomarinus)

A dark-phase Pomarine Jaeger was sighted heading west on the 11th of November.

Skua:

(Catharacta skua)

A Skua was observed on the 11th near Palmyra but no direction was determined for the bird.

Sooty Tern:

(Sterna fuscata)

Sooty Terns were observed in fairly low numbers (24% of total birds) for the entire leg of the cruise. Almost all Sooties were either in searching or feeding flocks (see table) with Shearwater-Petrels.

One immature bird was seen on the 10th with a mixed searching flock.

No directional trend was noted for the birds. One interesting point is the low numbers of Sooty Terns seen on the 11th, north of Palmyra (see table). It was established later that there were approximately 10,000 Sooties nesting on the island. This would suggest that they were feeding in some other direction than north.

Hawaiian Noddy Tern:

(Anous minutus)

One bird of this species was seen feeding with a Fairy Tern just north of Palmyra Island on the 11th of November.

Fairy Tern:

(Gygis alba)

Only 2 Fairy Terns were seen during the first 3 days (see table). As we neared Palmyra on the 11th, however, we sighted eleven, a large percentage of which were in a feeding flock.

MAMMALS:

Approximately 20 mammals identified as Stenella sp. were sighted on the 8th of November. No description was given. In addition 3 mammals described as small brown whales less than 20 feet long were observed swimming together in a north-northeast direction on the 11th of November. They may have been in the genus Kogia judging by their manner of swimming.

Pelagic Data Tables
Phase I (Honolulu to Palmyra Is.)

| Date (Nov.) | Total Birds observed | Total Flocks observed | No. of Searching Flocks | No. of Feeding Flocks | No. of Mixed Flocks | Total Miles Traveled | Total Birds per Linear Mile | Total hours of diurnal observation |
|-------------|----------------------|-----------------------|-------------------------|-----------------------|---------------------|----------------------|-----------------------------|------------------------------------|
| 8 | 198 | 7 | 4 | 3 | 5 | 123 | 1.61 | 11.4 |
| 9 | 192 | 2 | 0 | 2 | 2 | 121 | 1.59 | 11.5 |
| 10 | 110 | 3 | 3 | 0 | 3 | 118 | 0.93 | 11.7 |
| 11 | 157 | 4 | 3 | 1 | 4 | 91 | 1.73 | 10.4 |

453 45.0

SPECIES DATA

| SPECIES | 195 8 November | | | 192 9 November | | | 109 10 November | | | 151 11 November | | |
|----------------------------|-------------------|---------------------|-------------|-------------------|---------------------|-------------|--------------------|---------------------|-------------|--------------------|---------------------|-------------|
| | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks |
| Sooty / Slenderbill Shear. | 4 | .033 | 0 | 1 | .008 | 0 | 2 | .017 | 0 | 0 | 0 | 0 |
| Sooty Shearwater | 0 | 0 | 0 | 1 | .008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Newell's Shearwater | 1 | .008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wedgetailed Shearwater | 8 | .065 | 0 | 2 | .016 | 0 | 17 | .154 | 47% | 21 | .23 | 48% |
| Christmas Is. Shearwater | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Juan Fernandez Petrel | 42 | .342 | 62% | 30 | .248 | 30% | 15 | .136 | 25% | 1 | .011 | 0 |
| White necked Petrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | .022 | 0 |
| Kermadec Petrel | 1 | .008 | 100% | 2 | .016 | 50% | 0 | 0 | 0 | 0 | 0 | 0 |
| Darkrumped Petrel | 3 | .024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mottled Petrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Phoenix Island Petrel | 0 | 0 | 0 | 1 | .008 | 100% | 2 | .017 | 50% | 7 | .077 | 0 |
| Blackwinged Petrel | 16 | .130 | 37% | 8 | .066 | 37% | 28 | .254 | 25% | 12 | .132 | 0 |
| Whitewinged Petrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Shearwater / Petrel | 20 | .162 | 85% | 86 | .710 | 93% | 6 | .055 | 0 | 35 | .385 | 88% |
| Pterodroma sp. | 5 | .041 | 0 | 0 | 0 | 0 | 7 | .064 | 0 | 5 | .055 | 0 |
| Whiterumped Storm Petrel | 7 | .057 | 0 | 1 | .008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redtailed Tropicbird | 3 | .024 | 0 | 3 | .025 | 0 | 1 | .009 | 0 | 0 | 0 | 0 |
| White tailed Tropicbird | 3 | .024 | 0 | 6 | .050 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Brown Booby | 3 | .024 | 0 | 2 | .016 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Redfooted Booby | 1 | .008 | 0 | 3 | .025 | 0 | 1 | .009 | 0 | 3 | .033 | 0 |
| Great Frigatebird | 2 | .016 | 0 | 4 | .033 | 0 | 2 | .017 | 0 | 0 | 0 | 0 |
| Lesser Frigatebird | 0 | 0 | 0 | 1 | .008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Frigate species | 0 | 0 | 0 | 4 | .033 | 25% | 0 | 0 | 0 | 0 | 0 | 0 |
| Ruddy Turnstone | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Pomarine Jaeger | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Skua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Sooty Tern | 63 | .513 | 98% | 32 | .26 | 97% | 23 | .19 | 100% | 39 | .43 | 95% |
| Haw. Noddy Tern. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 |
| Fairy Tern | 1 | .008 | 100% | 1 | .008 | 0 | 0 | 0 | 0 | 11 | .12 | 64% |
| Pterodroma externa | 12 | .098 | 83% | 4 | .033 | 0 | 5 | .042 | 60% | 6 | .066 | 83% |

Phase 2: Palmyra Island to Northern Grid.

The second phase of this report will be the observations taken from the 15th to the 17th of November during the cruise from Palmyra Island to the Northern Grid Area.

No streamered or banded birds of any species were seen during this portion of the cruise.

There was a very significant difference in the number of birds seen per linear mile during this phase of the cruise compared with the first portion from Honolulu to Palmyra (see table). The reasons for the dramatic increase are two-fold. On the fifteenth of November, the first day out of Palmyra, we were on a NW cruise course which put us into a rich feeding area apparently used by all species from the island. Red-footed Boobies, Sooty Terns, and Fairy Terns (all breeding on Palmyra Island) were seen in large numbers (see table). An interesting point here is that none of these species were observed to any extent to the north of the island. The area west of the island is at approximately 5 N. latitude which is known to be a rich feeding area north of Howland Island.

On the 16th and 17th of November, as we traveled west of 164-20 we observed less island birds, but we began to see large numbers of Sooty and Slender-billed Shearwaters traveling south (see table). We were apparently crossing a migration route for these birds and consequently they became the dominant species observed on the 16th and 17th.

Flock activity was moderate east of 163-12 west longitude, and high further west on the 16th and 17th. The majority of the flocks on the 15th were searching and feeding mixed groups containing species found on Palmyra Island. On the 16th and 17th, west of 164-20 longitude, most of the flocks were traveling groups of Sooty or Slender-billed Shearwaters.

A brief account of each species observed during this phase of the cruise follows:

Sooty/Slender-billed Shearwater:

Numerous birds identified as either Sooty or Slender-billed Shearwaters were observed on both the 16th and 17th of November (see table). The majority of these species were traveling flocks which were going to the southwest. Some were described as having light under wings but the majority had dark underwings. One interesting point here is that almost none of these birds, or positively identified Sooty Shearwaters and Slender-billed Shearwaters, were recorded on the 15th of November east of 164-20 W. longitude. This, plus the fact that we saw almost no birds of these species during the cruise from Honolulu to Palmyra, suggests that the late migrating birds, at least, must pass to the west of Oahu and possibly to the west of the Leeward chain, on their way south.

Sooty Shearwater:
(Puffinus griseus)

A moderate number of Sooty Shearwaters was observed on the 16th and 17th of November (see table). The majority both days were seen in small traveling flocks. On the 16th, a mixed flock containing both Sooty and Slender-billed Shearwater was seen. Most of the birds observed on both days were traveling in a southwest direction, however, a few were headed south and a few had no direction.

Slender-billed Shearwater:

(Puffinus tenuirostris)

Large numbers of these birds were seen on both the 16th and 17th of November (see table). These Shearwaters were observed both singularly or in flocks of up to 80 birds. Most of them were in flocks of from 10-30 birds. The dominant direction of travel for the Slender-bills was south, however, many were seen going southwest.

Wedge-tailed Shearwater:

(Puffinus pacificus)

Wedge-tailed Shearwaters were seen in high numbers on the 15th, low numbers on the 16th, and in moderate numbers on the 17th of November (see table). Seventy-one per cent were dark phase on the 15th (east of 163-12W), 20% on the 16th, and only 6% on the 17th of November (west of 167-09). Possibly we were in a transition zone between the northern (Johnston Island) and the southern (Line Islands) population on the 16th when we saw only 5 birds. Most of the birds observed on the 15, 16, were alone or small groups (less than five). However, on the 17th, almost half of the birds seen were in searching or feeding flocks. There were no clear-cut directional trends for these Shearwaters on any of the three days.

Audubon's Shearwater:

(Puffinus lherminieri)

One Audubon's Shearwater was observed with a mixed feeding flock of Sooty Terns and Shearwater-Petrels on the 15th of November at 06-46N: 163-02W.

Juan Fernandez Petrel:

(Pterodroma externa)

This species was seen in increasing numbers as we traveled northwest towards Johnston Island (see table). An interesting point is that no Juan Fernandez Petrels were seen east of 163-12W near Palmyra Island, although two birds identified as Pterodroma externa were sighted. This was a particularly good feeding area for species breeding in the Line Islands, however. A fairly high percentage of the birds seen on the 16th and 17th were in flocks (see table). No directional trend could be established for any of these birds. Apparently they were searching and feeding in the area. Perhaps they were sub-adult non-breeding birds or late migrating breeders.

Dark-rumped Petrel:

(Pterodroma phaeopygia)

Three birds of this species were observed during the 16th and 17th of November as far south as 09-02N (see table). One was seen in a mixed feeding flock on the 16th. Considering the rarity of this species, it seems fairly likely that they are using the area south of the Hawaiian Islands as a winter feeding ground.

Phoenix Island Petrel:

(Pterodroma alba)

Two Phoenix Island Petrels were seen on the 15th of November east of 163-02 W. The relatively high numbers of these birds seen near the Line Islands on this trip were probably from the Christmas Island breeding population.

Tahitian Petrel:

(Pterodroma rostrata)

Two Tahitian Petrels were observed on the 15th of November. One of these birds was in a mixed feeding flock of Sooty Terns and Shearwater/

Petrels. An additional six birds identified as Phoenix/Tahitian Petrels were also seen on the 15th, east of 163-02W.

Black-winged Petrel:
(*Pterodroma "hypoleuca" nigripennis*)

Birds of this species were sighted in moderate to relatively high numbers on this leg of the cruise (see table). Notably the numbers of birds increased on the 17th west of 167-09W. Apparently we were entering a good feeding area for this species. No directional trend was noted, indicating that the birds were searching and feeding in the area.

Shearwater-Petrel:

Large numbers of birds identified only as Shearwater-Petrels were seen on the 15th, but the numbers diminished rapidly on the 16th and 17th of November. A large percentage on the 15th were in two large mixed flocks containing Sooty Terns. No directional trend was noted for these birds.

Pterodroma Sp.

Four birds identified only as Pterodroma were seen during this leg of the cruise. None were in flocks, and no directional trend was evident.

Bulwer's Petrel:

(*Bulweria bulwerii*)

One Bulwer's Petrel was observed flying northwest on the 15th of November at a position of 06-36N; 162-56W.

White-rumped Storm Petrel:

(*Oceanodroma sp.*)

Two birds identified only as White-rumped Storm Petrels were observed on the 15th of November. Both were flying alone and had no determinable direction of travel.

Red-tailed Tropicbird:

(*Phaethon rubricauda*)

Red-tailed Tropicbirds were observed in low numbers during this leg of the cruise (see table). None were seen in flocks but three were feeding at the time they were sighted. No direction of travel was determined for any of them.

Red-footed Booby:

(*Sula sula*)

This species, known to be nesting and roosting in large numbers on Palmyra Island, was found feeding northwest of the island. Large numbers were seen feeding on the 15th of November and almost none observed on the 16th and 17th as we traveled from atoll (see table). One large group of 75 were seen feeding with a mixed flock of Terns and Shearwater-Petrels on the 15th. Of these observed the first day, forty were inter-mediate phase adults, nine were sub-adults, 1 was an immature, and 75 were not classified. Many birds were seen gravitating towards the east-or towards the island. One sub-adult bird was observed on the 17th with a feeding flock of Shearwater-Petrels.

Frigate species:

Four birds, identified only as Frigate sp. were observed on the 15th near Palmyra Island. Two of these were with a large mixed feeding flock of Sooty Terns, Red-footed Boobies, and Shearwater-Petrels. Three more were seen on the 17th as we neared Johnston Island. None of these were in flocks, and no directional trend was established.

Sanderling:

One Sanderling landed on the ship during observations on the 15th of November.

Pomarine Jaeger:

(Stercorarius pomarinus)

One Pomarine Jaeger was seen on the 17th of November flying alone, but no direction could be determined for the bird.

Sooty Tern:

(Sterna fuscata)

Numerous Sooty Terns were observed east of 163-12W, while numbers decreased on the 16th and 17th of November (see table). Almost all birds seen were in either searching or feeding flocks, all of which were mixed. One immature was sighted on the 15th, evidently from the small breeding colony on Palmyra Island. No directional trend was noted for the birds on any of the three days of observations.

Common Noddy Tern:

(Anous stolidus)

Three birds of this species were seen on the 15th, two of which were in a mixed searching flock with Wedge-tailed Shearwaters and Red-footed Boobies. This species was found to be breeding on Palmyra island in small numbers.

Hawaiian Noddy Tern:

(Anous minutus)

Four Hawaiian Noddy Terns were observed on the 15th, one of which was with a mixed searching flock. These were undoubtedly from a moderate breeding population on Palmyra Island. One additional bird was seen sitting on a fishball on the 17th of November-possibly a Johnston Island bird.

Fairy Tern:

(Gygis alba)

A large number of Fairy Terns were seen on the 15th near Palmyra Island. A large percentage were observed in flocks, and a large feeding flock of 31 Fairy Terns was sighted. These birds were probably all Palmyra residents.

Mammals:

Ten mammals identified as Stenella sp. were observed on the 15th of November. One whale described as a sperm whale was seen on the 17th of November.

Nocturnal Watches:

Nocturnal watches were held for a few hours on both the 15th and 16th of November, primarily to check the Sooty Tern activity.

Watch was held from 2200-2400 on the 15th and a total of 10 birds were seen. One Red-tailed Tropicbird was observed sleeping on the surface. Four Sooty Terns were seen-one was identified as an adult. One of these Terns was calling. Four small Shearwater-Petrels were seen heading northeast. An additional unidentified bird was also seen.

On the 16th of November watch was held from 2200-2300. Only 2 birds were seen, a Black-winged Petrel and a Shearwater-Petrel.

Pelagic Data Tables
Phase II (Palmyra Island to Northern Grid)

| Date (Nov.) | Total Birds Observed | Total Flocks Observed | No. of Searching Flocks | No. of Feeding Flocks | No. of Traveling Flocks | No. of Mixed Flocks | Total Miles Traveled | Total Birds per Linear Mile | Total hours of diurnal observation |
|-------------|----------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------------|----------------------|-----------------------------|------------------------------------|
| 15 | 573 | 10 | 5 | 4 | 1 | 8 | 108 | 5.30 | 8.6 |
| 16 | 635 | 26 | 0 | 2 | 24 | 1 | 133.5 | 4.76 | 11.8 |
| 17 | 542 | 27 | 2 | 3 | 22 | 5 | 123 | 4.41 | 11.6 |
| | | | | | | | 364 | | 32.0 |

SPECIES DATA

| SPECIES | 15 November | | | 16 November | | | 17 November | | |
|---------------------------|-------------|---------------------|-------------|-------------|---------------------|-------------|-------------|---------------------|-------------|
| | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks |
| Sooty/Slenderbill Sh. | 3 | .028 | 0 | 172 | 1.288 | 98.3% | 138 | 1.120 | 89.2% |
| Sooty Shearwater | 1 | .009 | 0 | 31 | .232 | 97% | 36 | .293 | 64% |
| Slenderbill Shearwater | 0 | 0 | 0 | 344 | 2.575 | 97.6% | 238 | 1.935 | 87% |
| Wedgetailed Shearwater | 48 | .444 | 12.5% | 5 | .037 | 0 | 17 | .138 | 47% |
| Audobon's Shearwater | 1 | .009 | 100% | 0 | 0 | 0 | 0 | 0 | 0 |
| Juan Fernandez Petrel | 0 | 0 | 0 | 18 | .135 | 94.5% | 40 | .325 | 67.5% |
| Darkrumped Petrel | 0 | 0 | 0 | 2 | .015 | 50% | 1 | .008 | 0 |
| Phoenix Island Petrel | 4 | .037 | 25% | 1 | .007 | 0 | 0 | 0 | 0 |
| Tahitian Petrel | 2 | .018 | 50% | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackwinged Petrel | 15 | .139 | 0 | 9 | .067 | 22.2% | 41 | .333 | 56% |
| Shearwater/Petrel | 69 | .639 | 87% | 9 | .067 | 55% | 3 | .024 | 0 |
| Pterodroma sp. | 1 | .009 | 0 | 1 | .007 | 0 | 2 | .016 | 0 |
| Bulwer's Petrel | 1 | .009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| White rumped Storm Petrel | 2 | .018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redtailed Tropicbird | 1 | .009 | 0 | 3 | .022 | 0 | 2 | .016 | 0 |
| Redfooted Booby | 125 | 1.58 | 69.6% | 0 | 0 | 0 | 1 | .008 | 100% |
| Frigate species | 4 | .037 | 50% | 0 | 0 | 0 | 3 | .024 | 0 |
| Sanderling | 1 | .009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pomarine Jaeger | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .008 | 0 |
| Sooty Tern | 217 | 2.010 | 97.3% | 38 | .285 | 100% | 16 | .130 | 100% |
| Com. Noddy Tern | 3 | .028 | 66.6% | 0 | 0 | 0 | 0 | 0 | 0 |
| Haw. Noddy Tern | 4 | .037 | 25% | 0 | 0 | 0 | 1 | .008 | 0 |
| Fairy Tern | 61 | .565 | 77% | 1 | .007 | 0 | 0 | 0 | 0 |
| Phoenix/Tahitian Petrel | 6 | .056 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pterodroma externa | 2 | .018 | 0 | 1 | .007 | 0 | 1 | .008 | 0 |
| Pterodroma hypoleuca | 1 | .009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bird sp. | 1 | .009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 573 | | | 635 | | | 541 | | |

Phase 3. Northern Grid to Honolulu.

The third and last section of this report will deal with the observations made on the last leg of the cruise-the trip from the Northern grid area to Honolulu. This includes the diurnal observations of the 24th through the 27th of November and nocturnal watches for a few hours each on the 23rd and 24th of November.

The general bird activity on this portion of the cruise ranged from moderate on the 24th to low on the 26th and 27th. Shearwater-Petrels of various species were observed in fairly high numbers between approximately 71-17N; 170-10W, and 18-53N; 165-10W. This area was covered on the 24th and 25th as we proceeded east-northeast of Johnston Island. Sooty Shearwaters were seen in high numbers on the 24th and Juan Fernandez Petrels were abundant on the 25th of November (see table). On the 26th and 27th, between 163 and 158 degrees west longitude, we were passing through a zone with few birds at this time of year.

Flock activity was generally low throughout the journey back to Honolulu. The highest number of flocks seen on any one day was two. The majority of bird sightings were in singles or small groups (smaller than five).

A brief account of each species observed during this portion of the cruise is as follows:

Sooty/Slender-billed Shearwater:

Ten birds identified as either Sooty Shearwater or Slender-billed Shearwater were sighted on the 24th of November traveling south as singles or in small groups (see table).

Sooty Shearwater:

(Puffinus griseus)

Sooty Shearwaters were observed in moderate to relatively high numbers on the 24th and 25th of November, east-northeast of Johnston Island (see table). On the 24th the majority (86%) were traveling south although several were seen milling about or traveling in other directions (SE or SW). Approximately 25% were positively identified as having light underwings on the 24th. Many of the others were not viewed close enough to determine the underwing color.

On the 25th, the numbers of Sooty Shearwaters observed dropped considerably (see table). One group of 10 birds was seen with a large mixed flock feeding over tuna. The directional trend of these birds was again south.

The vast majority of Sooty Shearwaters and all birds identified as Slender-billed Shearwaters/ or Sooty were observed west of 16510W. This fact, along with earlier evidence, points to the probably late migration route of both species as being west of Oahu and possibly west of the entire Leeward Chain.

New Zealand Shearwater:

(Puffinus bulleri)

One New Zealand Shearwater was observed flying south at approximately 169-13 W on the 24th. Two additional birds identified as probably this species were sighted on the 25th-one of them was headed south. This suggests that a few New Zealand Shearwaters pass through this area on their way to their breeding grounds.

Wedge-tailed Shearwaters:

(Puffinus pacificus)

Wedge-tailed Shearwaters were seen in moderate to high numbers west of 165 W. longitude. In other words, a good number were seen fairly close to Johnston Island and many were seen close to Oahu (see table). One dark-phase bird was observed on the 24th near Johnston Island. Over fifty percent of the Wedge-tails seen on the last three days were with mixed flocks. No directional trend could be established in either area where the birds were numerous. They were apparently searching and feeding in these areas.

Juan Fernandez Petrel:

(Pterodroma externa)

The vast majority of the birds of this species were observed on the 25th of November at approximately 18-39N; 166 W. One large mixed feeding flock was seen containing fifty birds of this species. No directional trend could be established--indicating that these birds were not migrating. They appeared to be milling about, searching and feeding. Four additional birds identified only as Pterodroma externa were seen on the last leg of the cruise.

White-necked Petrel:

(Pterodroma externa cervicalis)

Four petrels identified as White-necked were observed during this portion of the cruise (see table). The majority were seen near Johnston Island on the 24th. None were seen in flocks, and no directional trend was noted. The ratio of externa's to cervicalis's ran about 15 to 1 over the four days.

Dark-rumped Petrel:

(Pterodroma phaeopygia)

Two dark-rumped Petrels were sighted during the 26th and 27th of November as we approached the island of Oahu from the southwest. The bird observed on the 26th was in a mixed searching flock with Sooty Terns and Wedge-tailed Shearwaters.

Phoenix/Tahitian Petrels:

One bird identified as either Phoenix Island Petrel or Tahitian Petrel was seen at 19-41 N; 162-44W on the 26th of November. No specific direction of travel was noted.

Kermadec Petrel:

(Pterodroma neglecta)

One light phase Kermadec Petrel was seen flying with two Black-winged Petrels on the 24th of November at a position of 17-26 N; 169-35W.

Black-winged Petrel:

(Pterodroma "hypoleuca" nigripennis)

Black-winged Petrels were observed in moderate to relatively high numbers west of 162 W. longitude on the 24th, 25th, and 26th of November (see table). One group of 15 was seen with a large mixed feeding flock on the 25th. The rest were in small groups (less than 5) and alone. No directional pattern could be established for any of the three days.

Shearwater-Petrel:

Birds identified as only Shearwater Petrels were observed in moderate to high numbers west of 165 W. longitude and in lower numbers to the east towards Oahu (see table). A high percentage of the birds seen close to Johnston on the 24th and 25th of November were in feeding flocks. Most of the birds appeared to be milling and feeding about--thus no direction of flight could be determined.

Pterodroma sp.

Six birds identified as Pterodroma species were observed on the first three days of this portion of the cruise (see table). None were seen in flocks, and no directional trend was noted.

White-rumped Storm Petrel:

Eleven White-rumped Storm Petrels were sighted west of 165-16 W. longitude, near Johnston Island (see table). All were single birds which were probably wintering in this area.

Red-tailed Tropicbird:

(Phaethon rubricauda)

Five birds of this species were sighted between the 25th and 26th of November several hundred miles from the nearest land. All were single birds which appeared to be milling about in the area.

Blue-faced Booby:

(Sula dactylatra)

Four birds of this species were observed during this leg of the cruise. Two adult Blue-faced Boobies were seen on the 24th of November near Johnston Island. Two additional Birds, an immature and an adult were sighted on the 27th near Oahu.

Red-footed Booby:

(Sula sula)

Red-footed Boobies were observed in moderate numbers west of 165 longitude, near Johnston Island, and in lower numbers closer to Oahu (see table). One inter-mediate phase adult was seen on the 25th. The remaining birds were either light phase adults or sub-adults with the exception of one immature seen on the 27th near Oahu.

Great Frigatebird:

(Fregata minor)

Fairly low numbers of birds of this species were sighted west of 162 W longitude (see table). None were in flocks, and no direction of travel was noted for them. None were seen on the 27th of November as we approached the island of Oahu.

Pomarine Jaeger:

(Stercorarius pomarinus)

Five Pomarine Jaegers were observed on the 27th, east of 160 W longitude, as we approached the island of Oahu. Of the five observed, 2 were dark phase, 2 were light phase, and 1 was of uncertain color phase. One of the dark phase birds was an immature. No direction of travel was noted although three were following the ship on its northeasterly course.

Skua:

One Skua was sighted on the 24th of November at a position of 17-36 N; 169-06 W. Traveling in a southeastern direction.

Sooty Tern:

(Sterna fuscata)

Sooty Terns were seen in low to moderate numbers east of 166 W. longitude (see table). A high percentage of all the birds of this species observed were in searching or feeding flocks. One immature was spotted on the 26th of November with a mixed searching flock at a position of 19-56 N; 162-11W. No directional trend was noted for any of these birds.

Common Noddy Tern:

One Common Noddy Tern was sighted on the 24th near Johnston Island and six more were observed on the 27th near Oahu. Four of those seen on the 27th were in a mixed searching flock. The other two were flying east toward the island.

Fairy Tern:

(Gygis alba)

All of the Fairy Terns observed on this leg of the cruise were seen on the 25th of November (see table). Eight of the total of 9 observed were with a large mixed feeding flock at a position of 18-39N; 166-00W.

Nocturnal Observations:

Nocturnal observations were held on the night of the 23 and 24th of November, after we left the grid, and for two and one-half hours on the night of the 24-25th to check on Sooty Tern activity north of Johnston Island. The number of birds seen was generally low on both nights. On the 23-24th of November, from 1800-0630, eight birds were observed including two booby species, two Sooty Terns, one Shearwater-Petrel, one bird species, and two Sooty/Slender-billed Shearwaters. The Sooty-Slender-bills were traveling south. On the 24th and 25th one adult Red-footed Booby was seen following the ship.

Pelagic Data Tables
Phase III (Northern Grid to Honolulu)

| Date (Nov.) | Total Birds Observed | Total Flocks Observed | No. of Searching Flocks | No. of Feeding Flocks | No. of Traveling Flocks | No. of Mixed Flocks | Total Miles Traveled | Total Birds per Lin. Mile | Total hours of Diurnal Observation |
|-------------|----------------------|-----------------------|-------------------------|-----------------------|-------------------------|---------------------|----------------------|---------------------------|------------------------------------|
| 24 | 156 | 2 | 0 | 1 | 1 | 1 | 94 | 1.66 | 11.1 |
| 25 | 271 | 1 | 0 | 1 | 0 | 1 | 96 | 2.82 | 11.1 |
| 26 | 35 | 1 | 1 | 0 | 0 | 1 | 89 | .39 | 11.0 |
| 27 | 68 | 2 | 1 | 1 | 0 | 1 | 112 | .61 | 10.1 |
| | 530 | | | | | | 391 | | 43.3 |

SPECIES DATA

| SPECIES | 24 November | | | 25 November | | | 26 November | | | 27 November | | |
|------------------------------|-------------|---------------------|-------------|-------------|---------------------|-------------|-------------|---------------------|-------------|-------------|---------------------|-------------|
| | Total Seen | Birds per Lin. Mile | % in Flocks | Total seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks | Total Seen | Birds per Lin. Mile | % in Flocks |
| Sooty/Slenderbill Shearwater | 10 | .106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sooty Shearwater | 59 | .628 | 8.5% | 26 | .271 | 38.9% | 0 | 0 | 0 | 3 | .027 | 0 |
| New Zealand Shearwater | 1 | .011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wedgetailed Shearwater | 21 | .223 | 0 | 29 | .302 | 68.9% | 5 | .056 | 60% | 31 | .277 | 51.1% |
| Juan Fernandez Petrel | 2 | .021 | 0 | 52 | .541 | 96.1% | 3 | .034 | 0 | 0 | 0 | 0 |
| White necked Petrel | 3 | .032 | 0 | 0 | 0 | 0 | 1 | .011 | 0 | 0 | 0 | 0 |
| Darkrumped Petrel | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 100% | 1 | .009 | 0 |
| Phoenix Is / Tahitian Petrel | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .011 | 0 | 0 | 0 | 0 |
| Kermadec Petrel | 1 | .011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackwinged Petrel | 9 | .096 | 0 | 27 | .281 | 55.5% | 5 | .056 | 0 | 0 | 0 | 0 |
| Shearwater / Petrel | 25 | .266 | 100% | 44 | .458 | 90.9% | 4 | .045 | 0 | 2 | .018 | 0 |
| Pterodroma sp. | 3 | .032 | 0 | 2 | .028 | 0 | 1 | .011 | 0 | 0 | 0 | 0 |
| Whiterumped Storm Petrel | 3 | .032 | 0 | 8 | .083 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redtailed Tropicbird | 0 | 0 | 0 | 4 | .042 | 0 | 1 | .011 | 0 | 0 | 0 | 0 |
| Bluefaced Booby | 2 | .021 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | .018 | 0 |
| Redfooted Booby | 8 | .085 | 87.5% | 12 | .125 | 91.7% | 1 | .011 | 0 | 2 | .018 | 0 |
| Great Frigatebird | 2 | .021 | 0 | 5 | .052 | 0 | 2 | .022 | 0 | 0 | 0 | 0 |
| Pomarine Jaeger | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | .045 | 0 |
| Skua | 1 | .011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sooty Tern | 0 | 0 | 0 | 40 | .417 | 100% | 10 | .112 | 100% | 13 | .101 | 94.6% |
| Com. Noddy Tern | 1 | .011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | .054 | 66.7% |
| Fairy Tern | 0 | 0 | 0 | 9 | .094 | 88.9% | 0 | 0 | 0 | 0 | 0 | 0 |
| Pterodroma externa | 1 | .011 | 0 | 1 | .010 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Pterodroma hypoleuca | 1 | .011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tern species | 0 | 0 | 0 | 10 | .104 | 100% | 0 | 0 | 0 | 0 | 0 | 0 |
| Bird species | 0 | 0 | 0 | 2 | .028 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 153 | | | 271 | | | 35 | | | 67 | | |