SEA AND

ATLAS

OF

SWELL CHARTS

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ASTERN PACIFIC

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PUBLISHED BY THE U.S.
UNDER THE AUTH

FIRST EDITION REPRINTED 1950, 1971

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...STATES NAVAL OCEANOGRAPHIC OFFICE
...NT OF THE SECRETARY OF THE NAVY

UNCLASSIFIED
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This atlas contains monthly charts compiled from observations made by cooperating observers of the Hydrographic Office to and including the year 1942 (majority made between 1932 and 1940). The Hydrographic Office has included all information from its fil...

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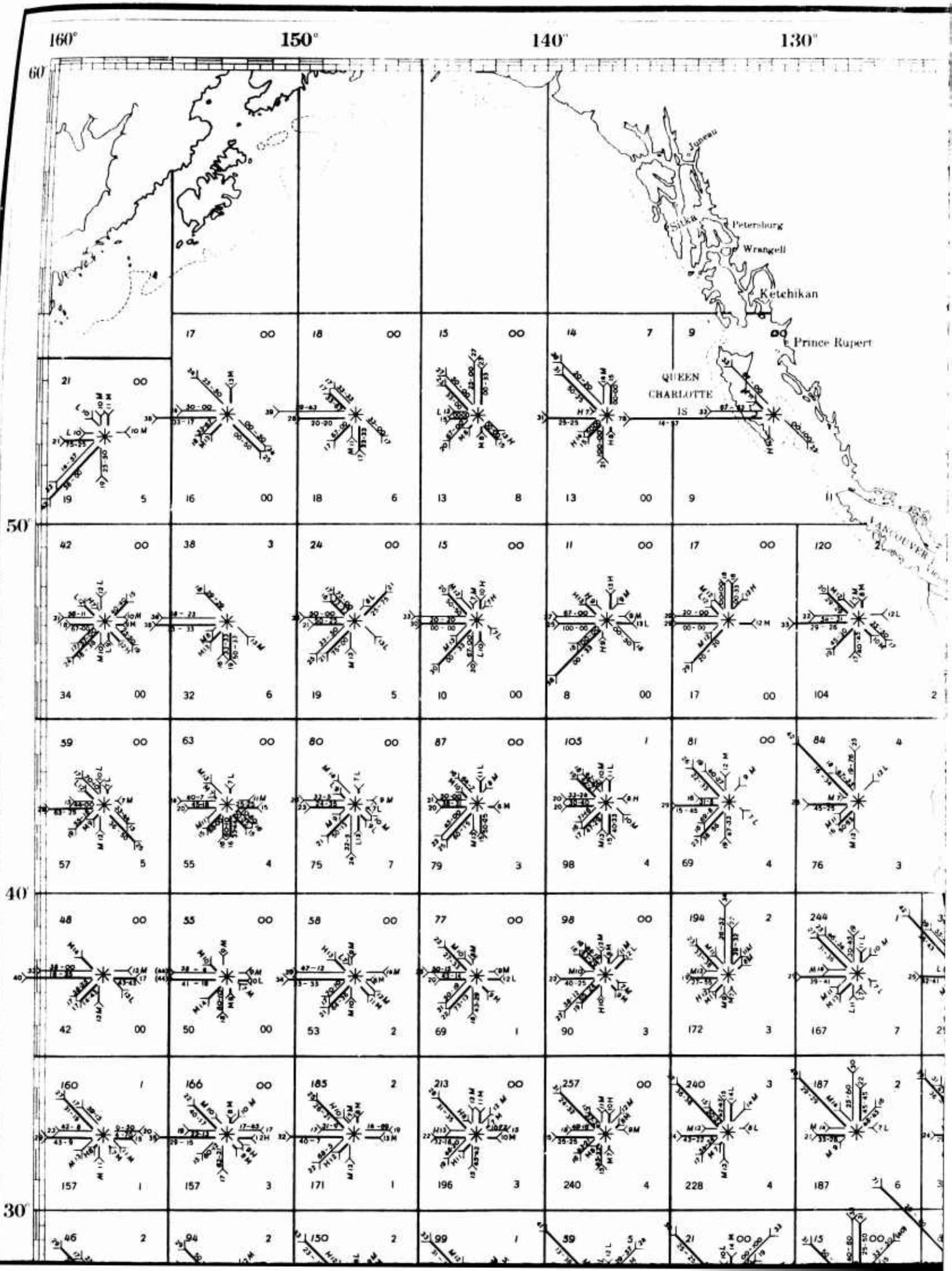

160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
IS
VANCOUVER

120° 110° 100° 90° 80

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

JANUARY

PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

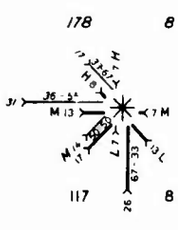
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

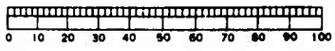
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows:

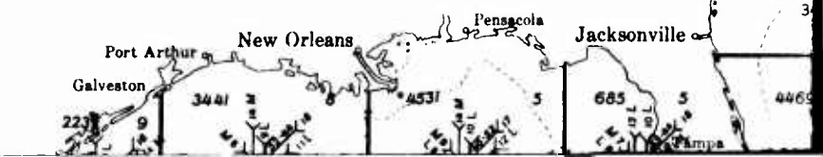


Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms: 14 percent were from the southwest and predominately medium: 31 percent were from the west, of which 55 percent were low and 36 percent were medium: 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium: 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms: 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 60 percent were low and 60 percent were medium; 13 percent were from the west and predominately medium: 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES



NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

JANUARY

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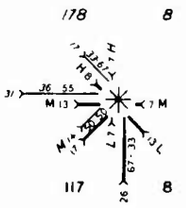

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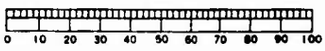
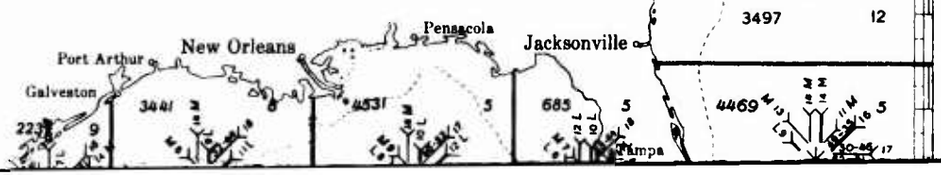
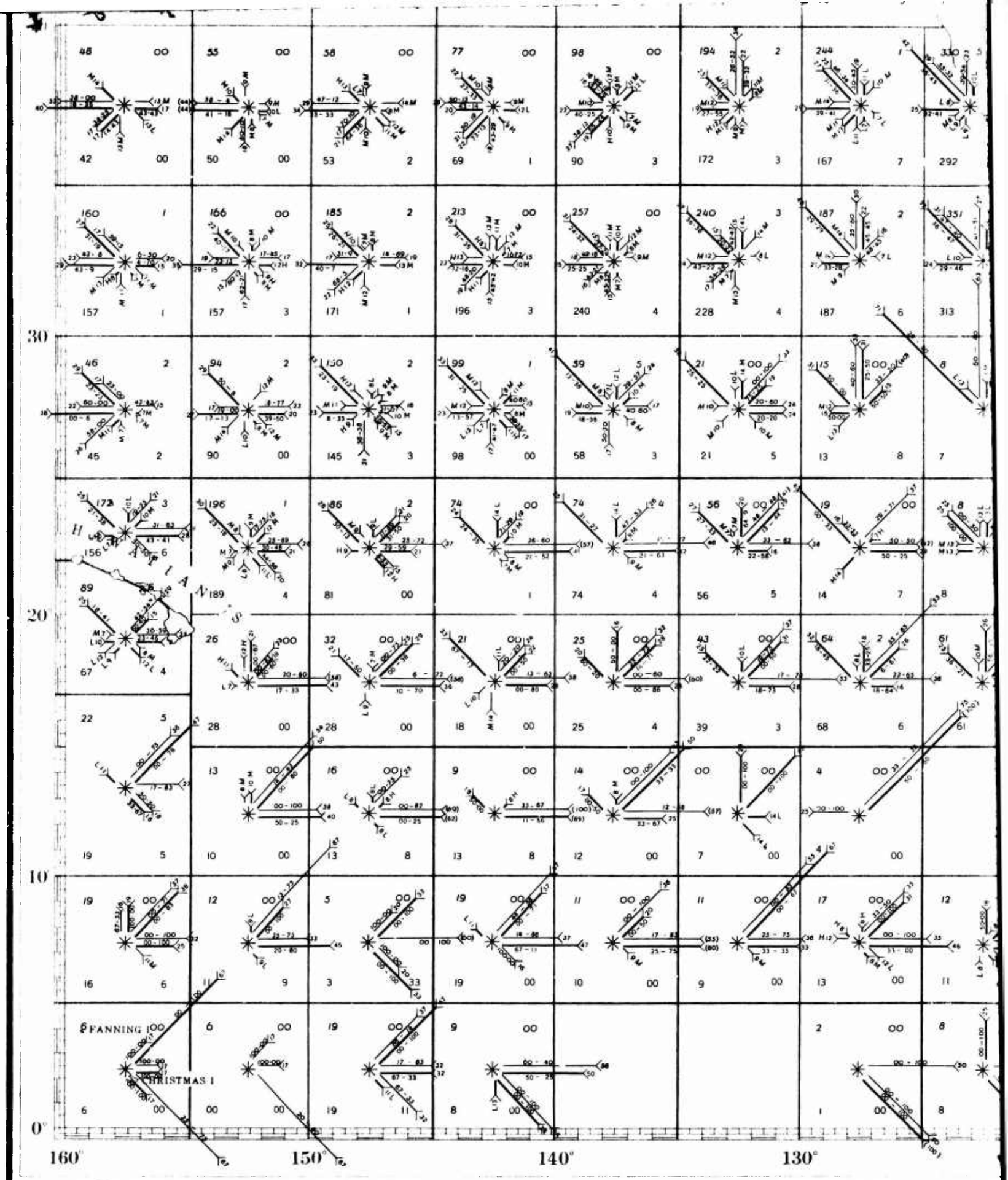
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES





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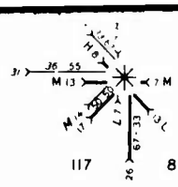

Francisco

117 8

31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.

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0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES

Pt. Arguello
Santa Barbara
Los Angeles
San Diego
Guaymas
Mazatlan
San Blas
C. Corrientes
MARIA MADRE I.
REVILLA GIGEDO IS.
Acapulco
Salina Cruz
Tampico
Vera Cruz
Port Arthur
Galveston
New Orleans
Pensacola
Jacksonville
Progreso
Belize
Champerico
San Jose
La Union
Managua
Puntarenas
CLIPPERTON I.
COCOS I.
MALPELO I.

120° 110° 100° 90°

41 percent were from the west, of which 66 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

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0 10 20 30 40 50 60 70 80 90 100

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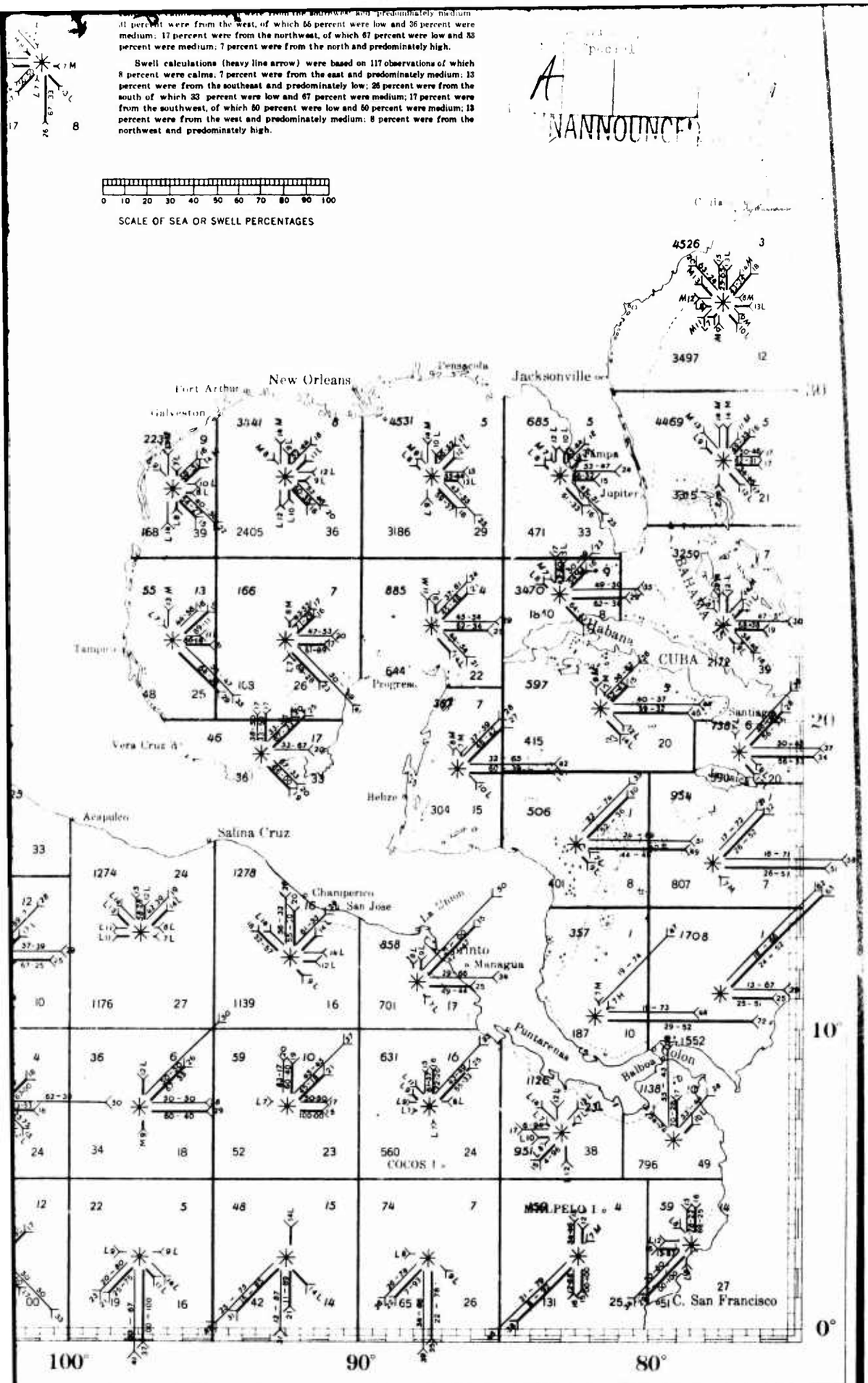

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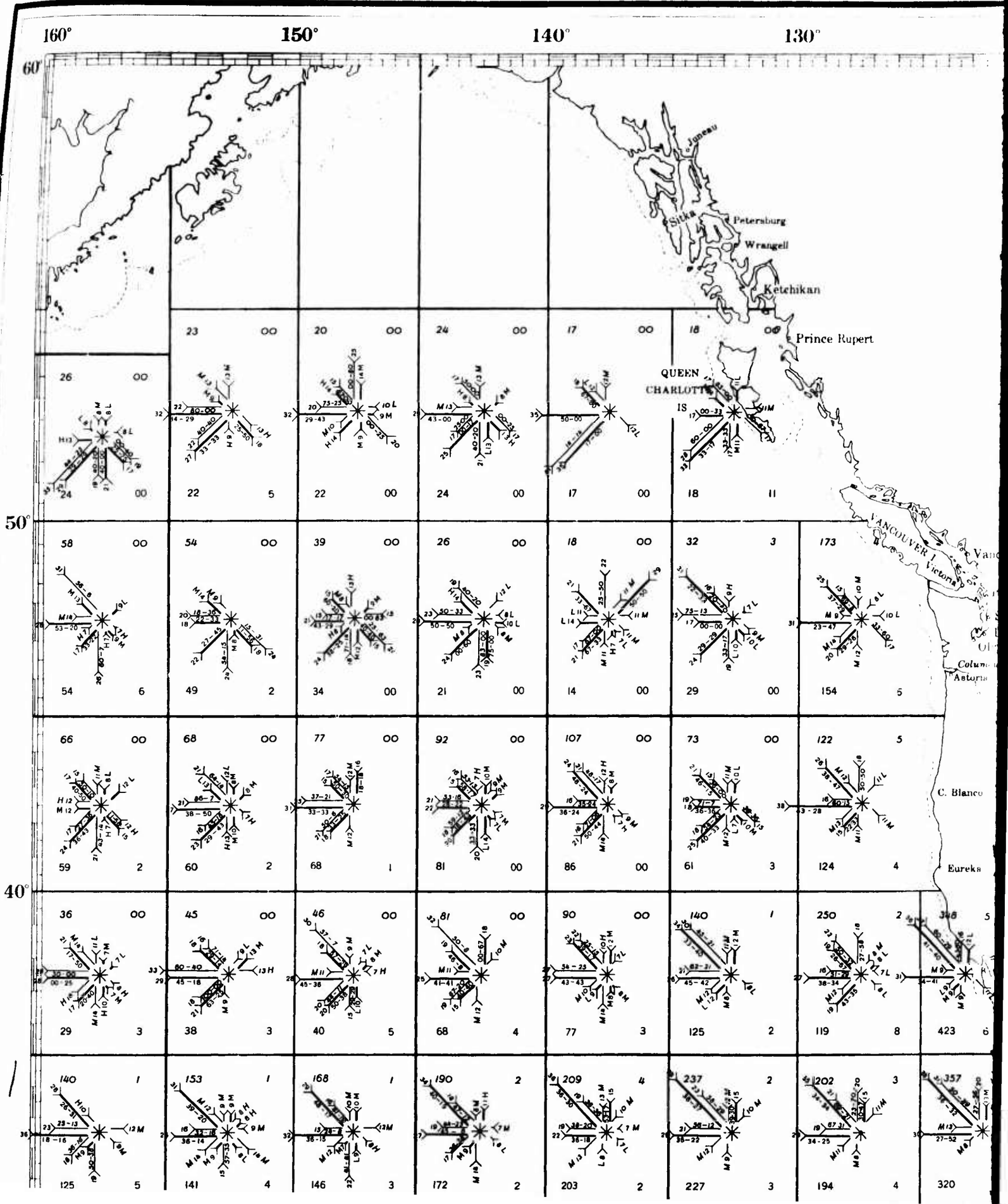
160°
150°
140°
130°
60°
50°
40°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN CHARLOTTE IS
VANCOUVER I.
Victoria
Astoria
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHARTS

FEBRUARY

PREVAILING SEAS, SWELLS AND CALMS

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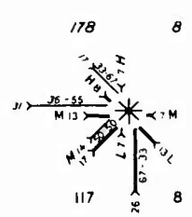

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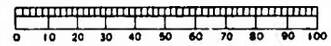

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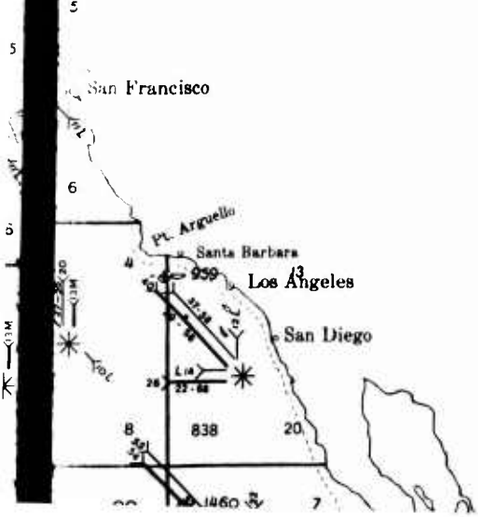

90° 80° 60

'ERN PACIFIC OCEAN

ND SWELL CHARTS

FEBRUARY

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10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES

50

40

Norfolk

C. Hatteras

4208

2

3217

10

30°

Pensacola

Jacksonville

Port Arthur

New Orleans

Galveston

227

10

3014

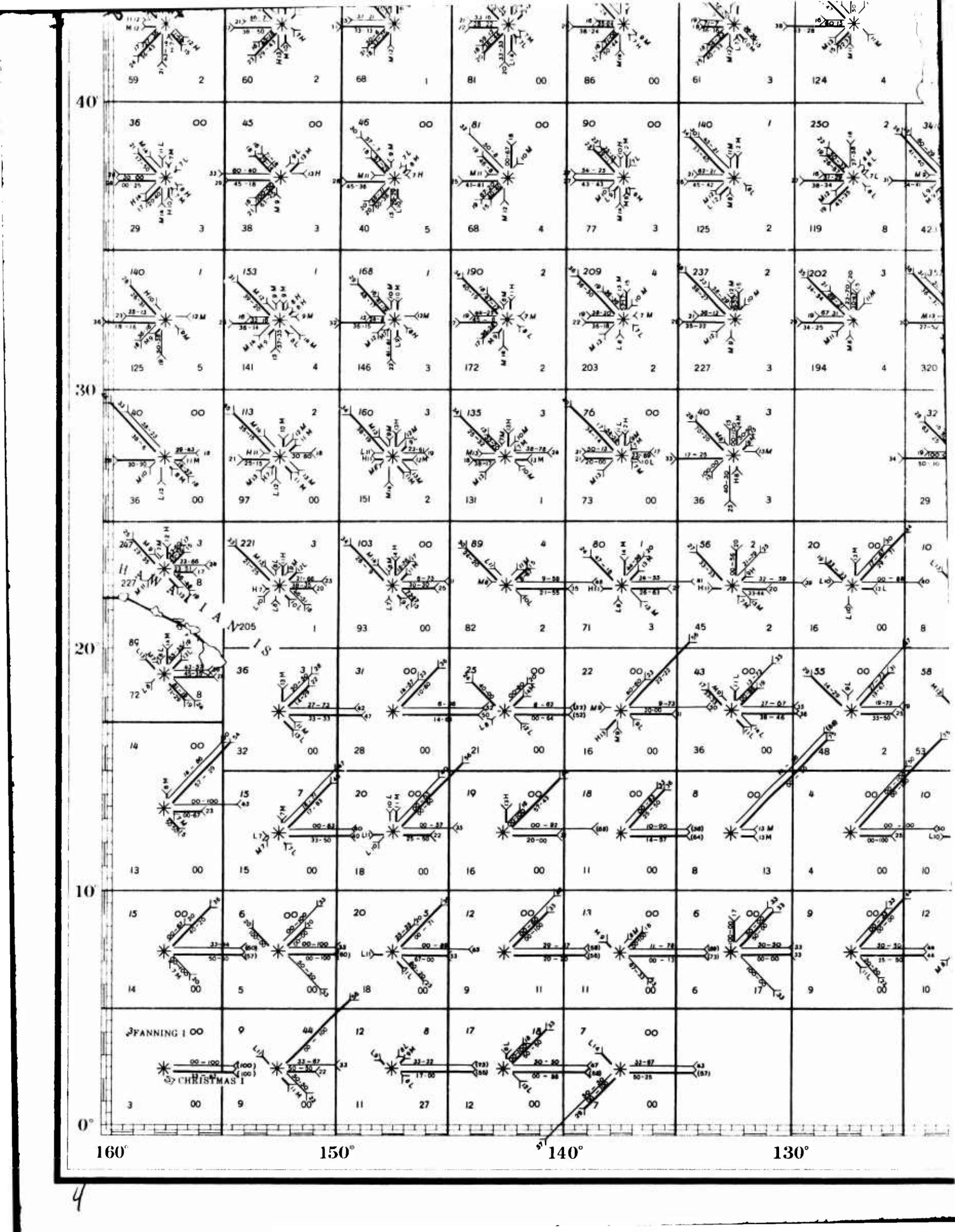
4239

631

5

4311

Tampa


40
30
20
10
0°
160°
150°
140°
130°
HAWAIIAN
205
1S
FANNING I
CHRISTMAS I

amounts 1 and 4, high sea or swells, those of amount 5 and above

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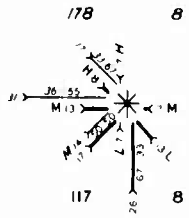

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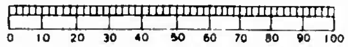
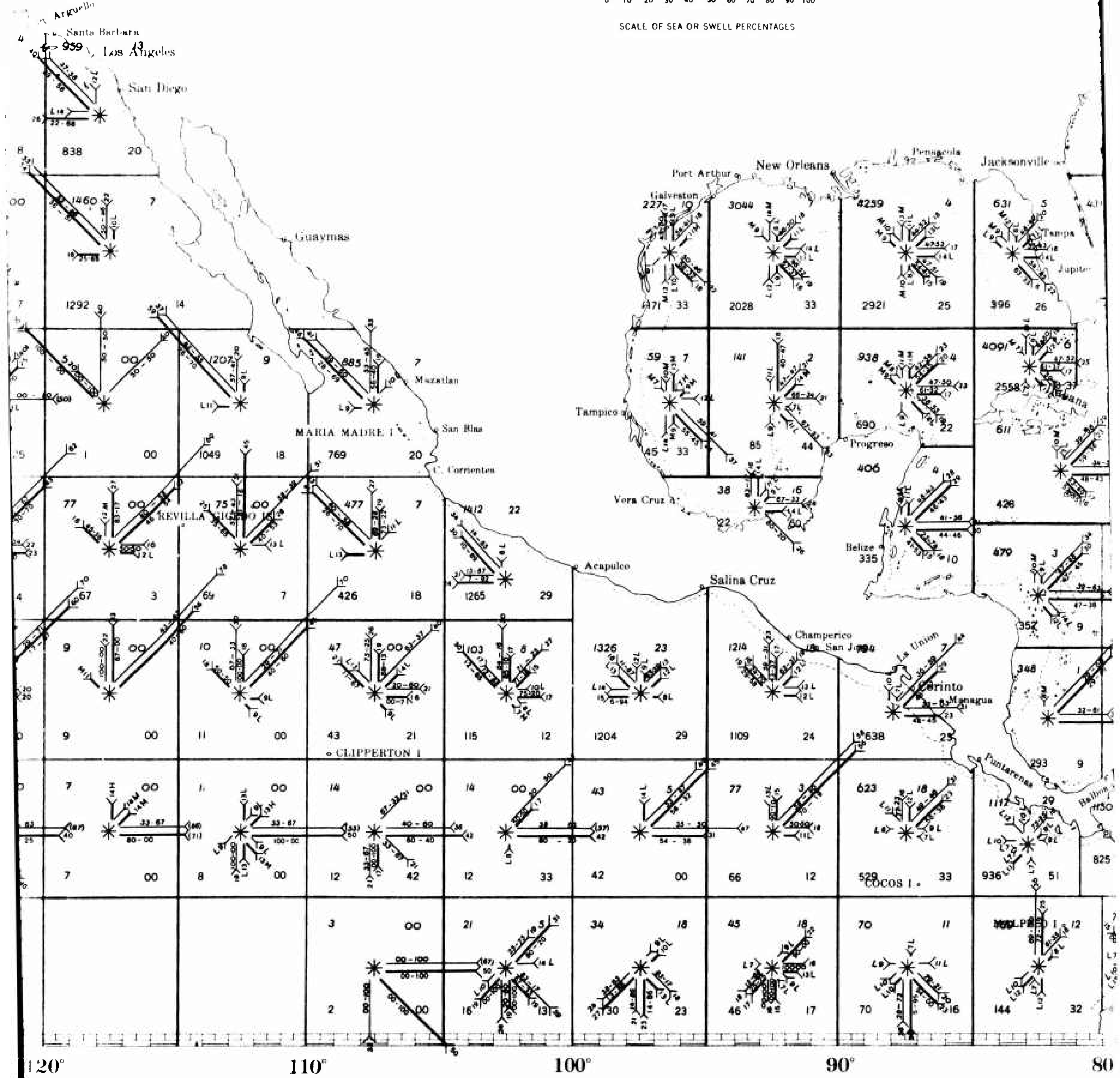
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low. 26 percent were from the south of which 33 percent were low and 67 percent were medium. 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium. 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.

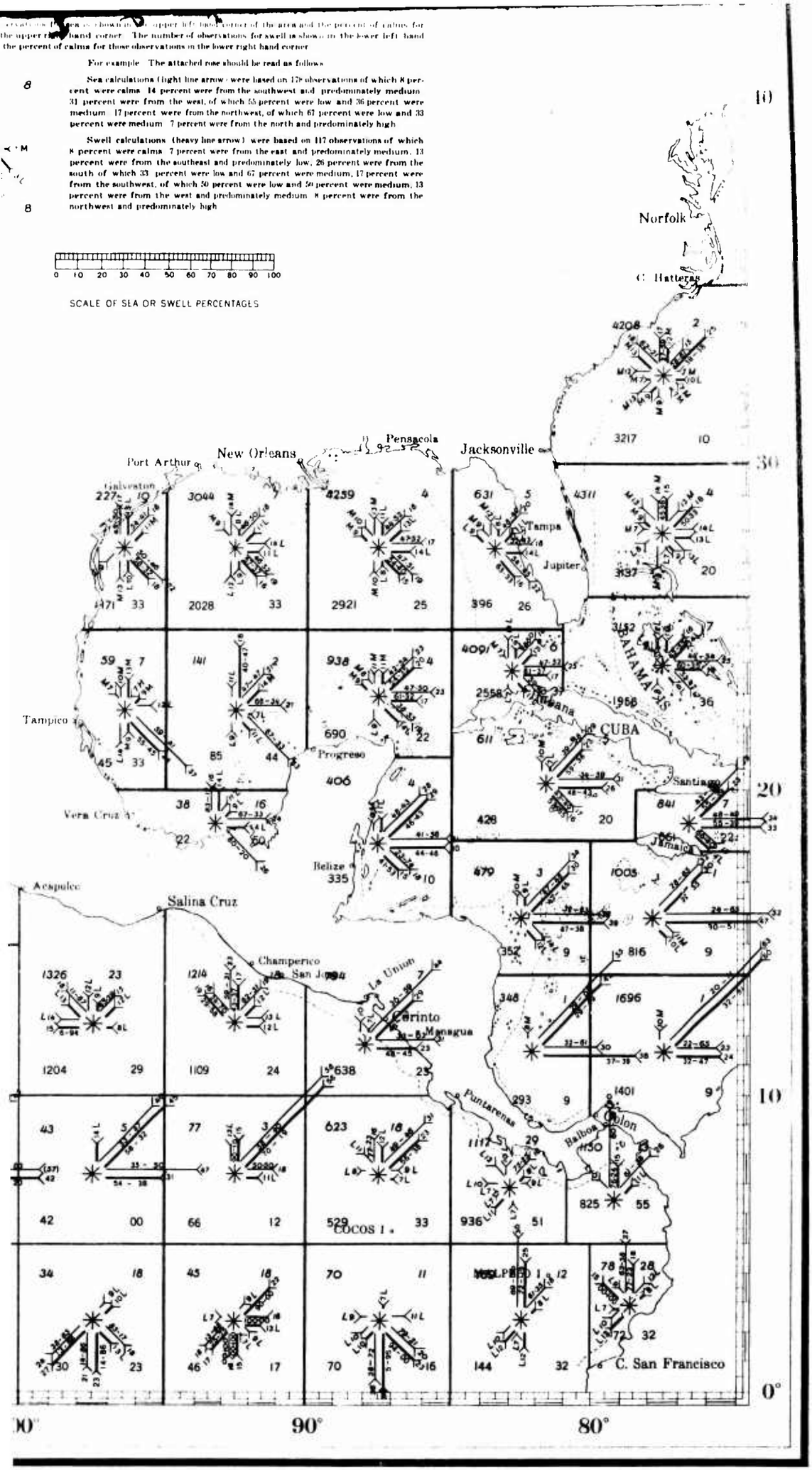


SCALE OF SEA OR SWELL PERCENTAGES



Sheet

5



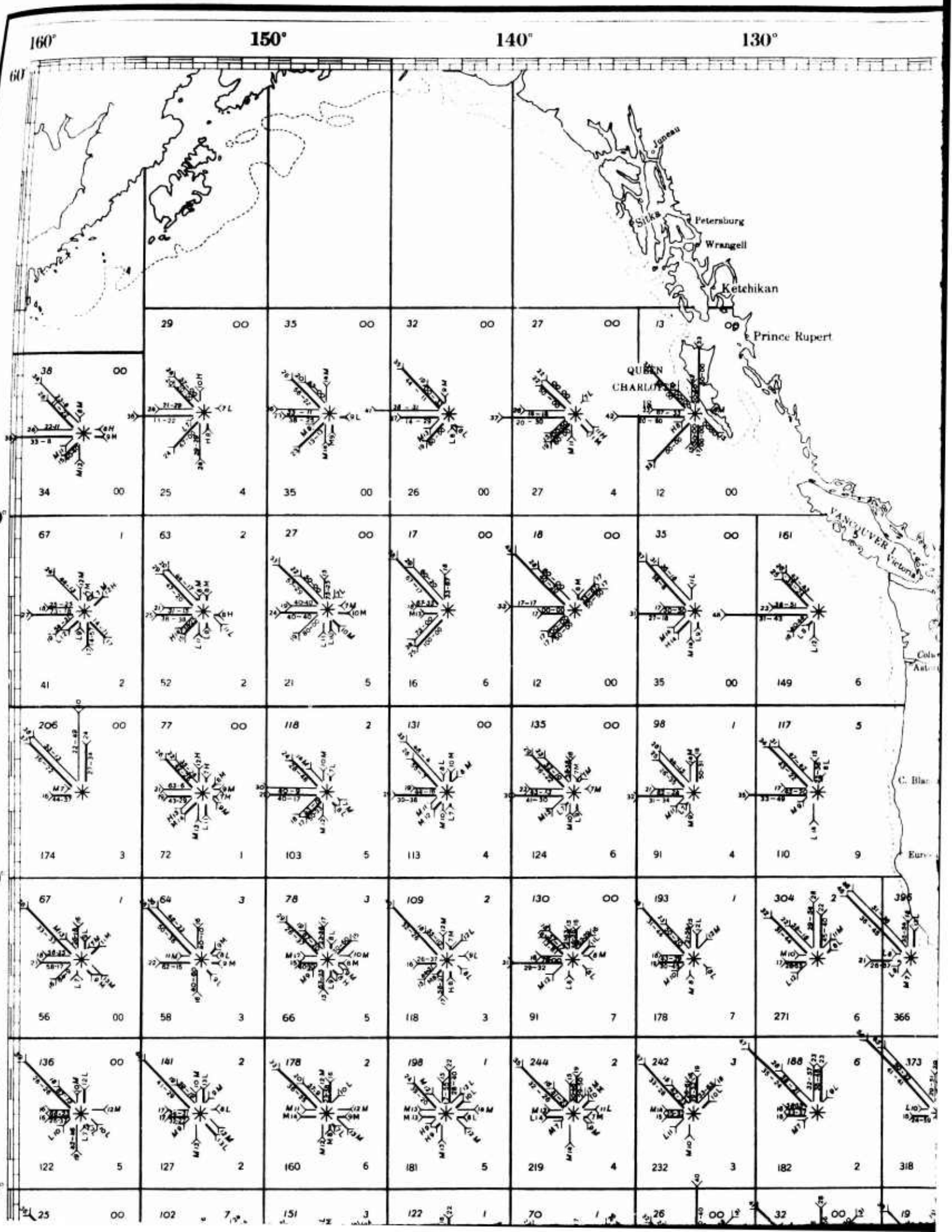
Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms. 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 55 percent were low and 36 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low. 26 percent were from the south of which 33 percent were low and 67 percent were medium. 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium. 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.

0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES

Sheet 2


160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
VANCOUVER I.
Victoria
C. Blanco
29 00
35 00
32 00
27 00
13 00
38 00
34 00
25 4
35 00
26 00
27 4
12 00
67 1
63 2
27 00
17 00
18 00
35 00
161
41 2
52 2
21 5
16 6
12 00
35 00
149 6
206 00
77 00
118 2
131 00
135 00
98 1
117 5
174 3
72 1
103 5
113 4
124 6
91 4
110 9
67 1
64 3
78 3
109 2
130 00
193 1
304 2
396
56 00
58 3
66 5
118 3
91 7
178 7
271 6
366
136 00
141 2
178 2
198 1
244 2
242 3
188 6
373
122 5
127 2
160 6
181 5
219 4
232 3
182 2
318
25 00
102 7
151 3
122 1
70 1
26 00
32 00
19

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

MARCH

PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE

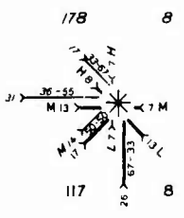
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow, measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

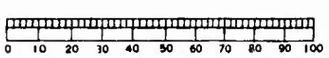
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows:

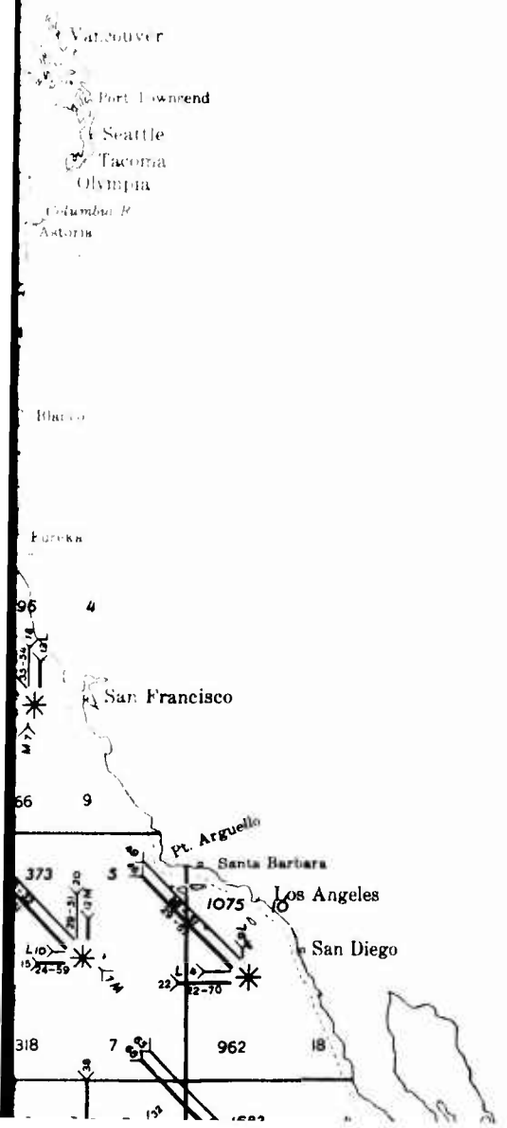


Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium: 31 percent were from the west, of which 55 percent were low and 36 percent were medium: 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES



100° 90° 80

IEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

MARCH

PREVAILING SEAS, SWELLS AND CALMS

shown on this chart has been compiled from observations made during the month by the cooperating drographic Office to and including the year 1942, the majority of the observations having been taken 2 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and the number of observations is small the graphical presentation will convey a false impression unless y. In evaluating the reliability of the information for any given area consider the number of obser- phical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA RE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON RT FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE EA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT E IDENTICAL AT ANY GIVEN TIME OR PLACE

METHOD OF PRESENTATION

this chart is to show both graphically and with figures, by means of an eight point double rose, printed ter of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA E REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE ONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow percent of direction is less than 7. In instances where the number of observations in any direction is 15 rcent of direction is less than 7, the conditions within that direction may be shown in the usual manner The arrows point in the directions toward which the seas or swells move The length of the arrow center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the ach 100 observations that the seas or swells have been moving from or near the given point In instances h of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the placed in parenthesis.

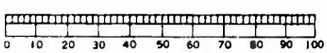
nt of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow and medium seas or swells, the first figure from the center is always the percent of low. The percent s within the direction is the remainder of the percentage When the percent of direction is less than the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, ide the percentage figures for direction The conditions of seas and swells (low, medium and high) n, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of gh seas or swells, those of amounts 5 and above.

observations for sea is shown in the upper left hand corner of the area and the percent of calms for n the upper right hand corner. The number of observations for swell is shown in the lower left hand nd the percent of calms for those observations in the lower right hand corner.

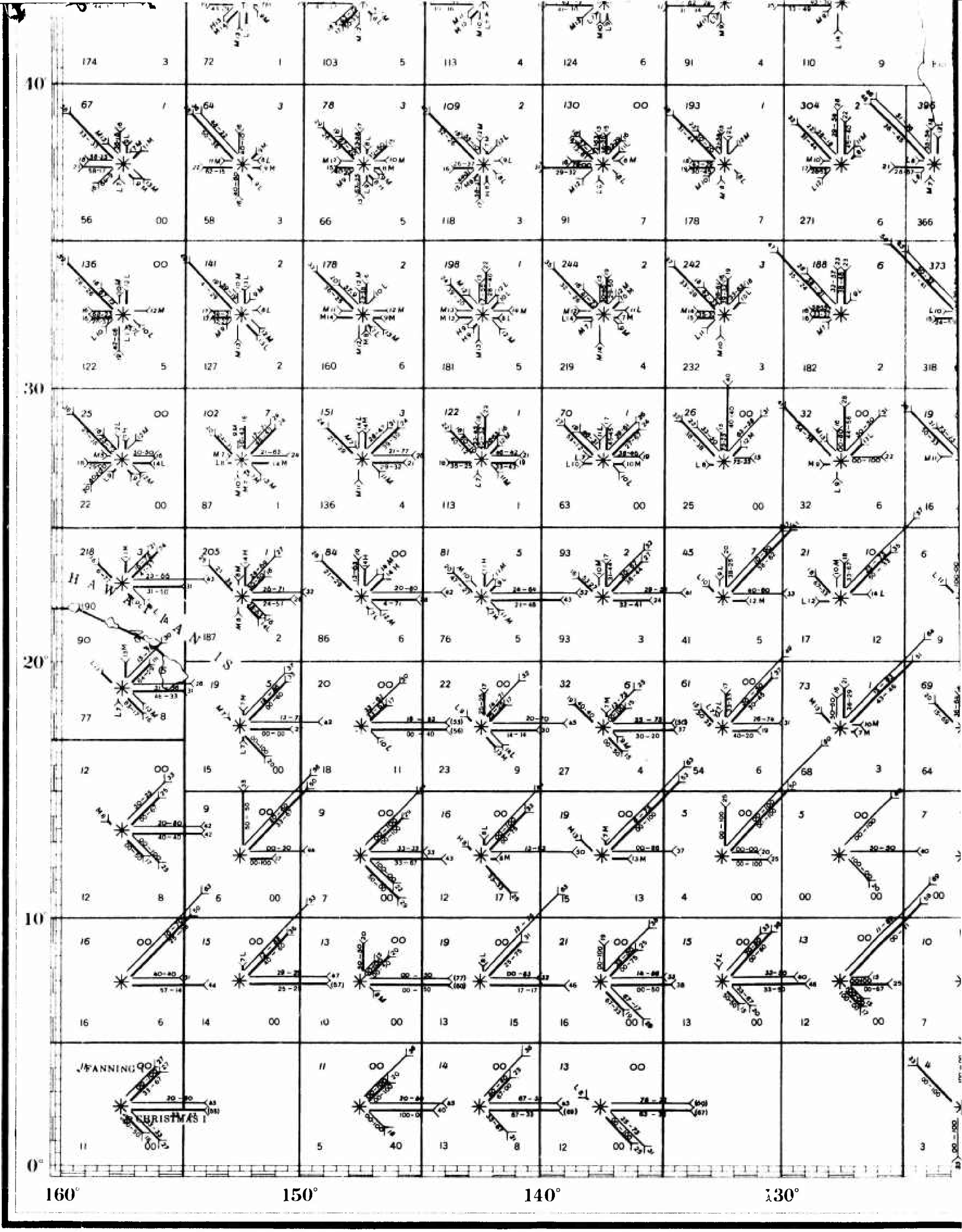
For example—The attached rose should be read as follows:

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms, 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 60 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

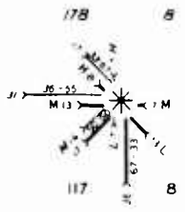


4

within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4, high seas or swells, those of amounts 5 and above.

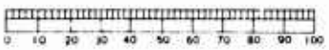
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example - The attached rose should be read as follows:



Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms. 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium; 15 percent were from the southeast and predominately low; 36 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

...is shown in the upper left hand corner of the area and the percent of calms in the upper left hand corner, the number of observations for swell is shown in the lower left hand corner and calms for those observations in the lower right hand corner

For example - The attached rose should be read as follows

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms, 14 percent were from the southwest and predominately medium 31 percent were from the west, of which 55 percent were low and 36 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

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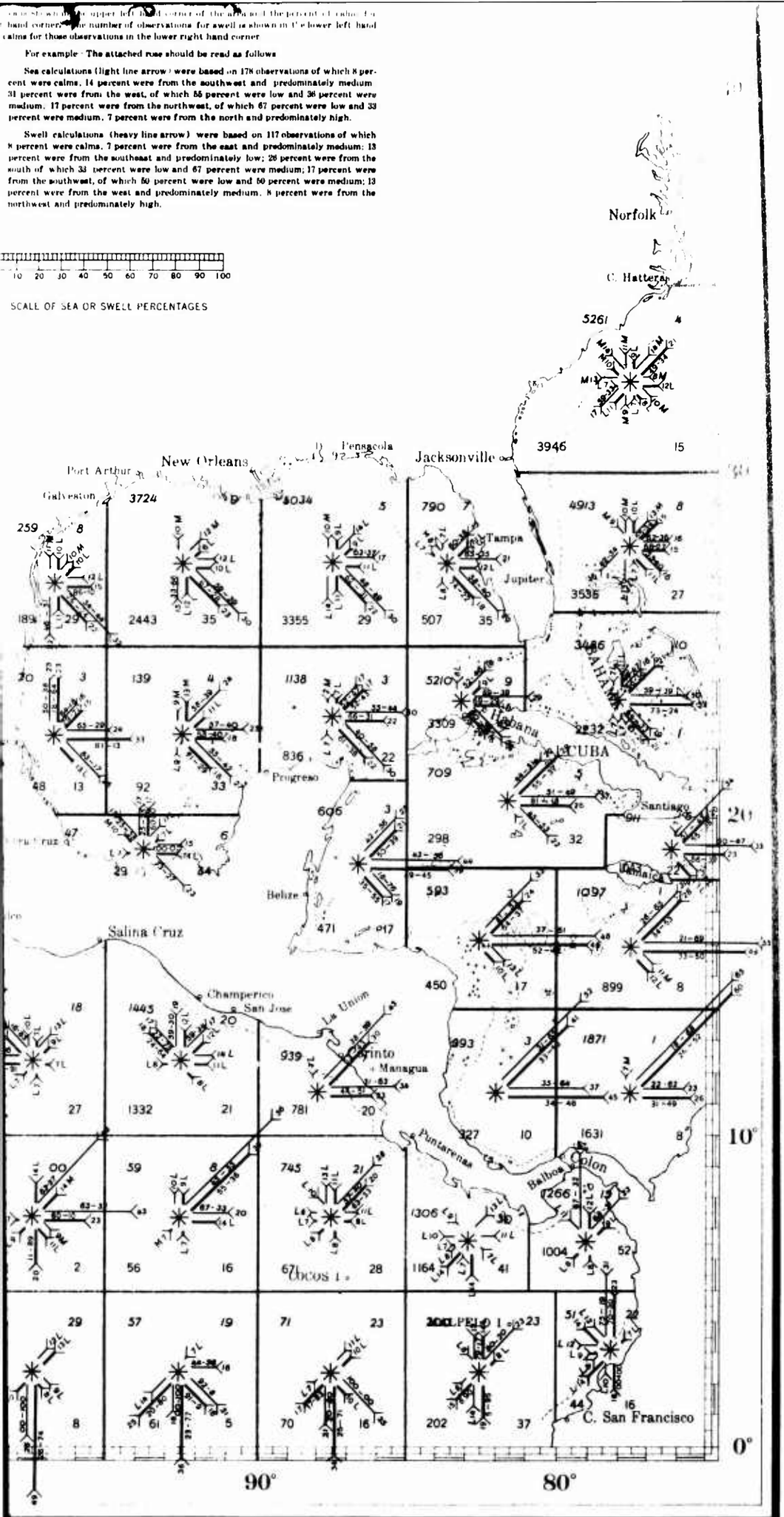
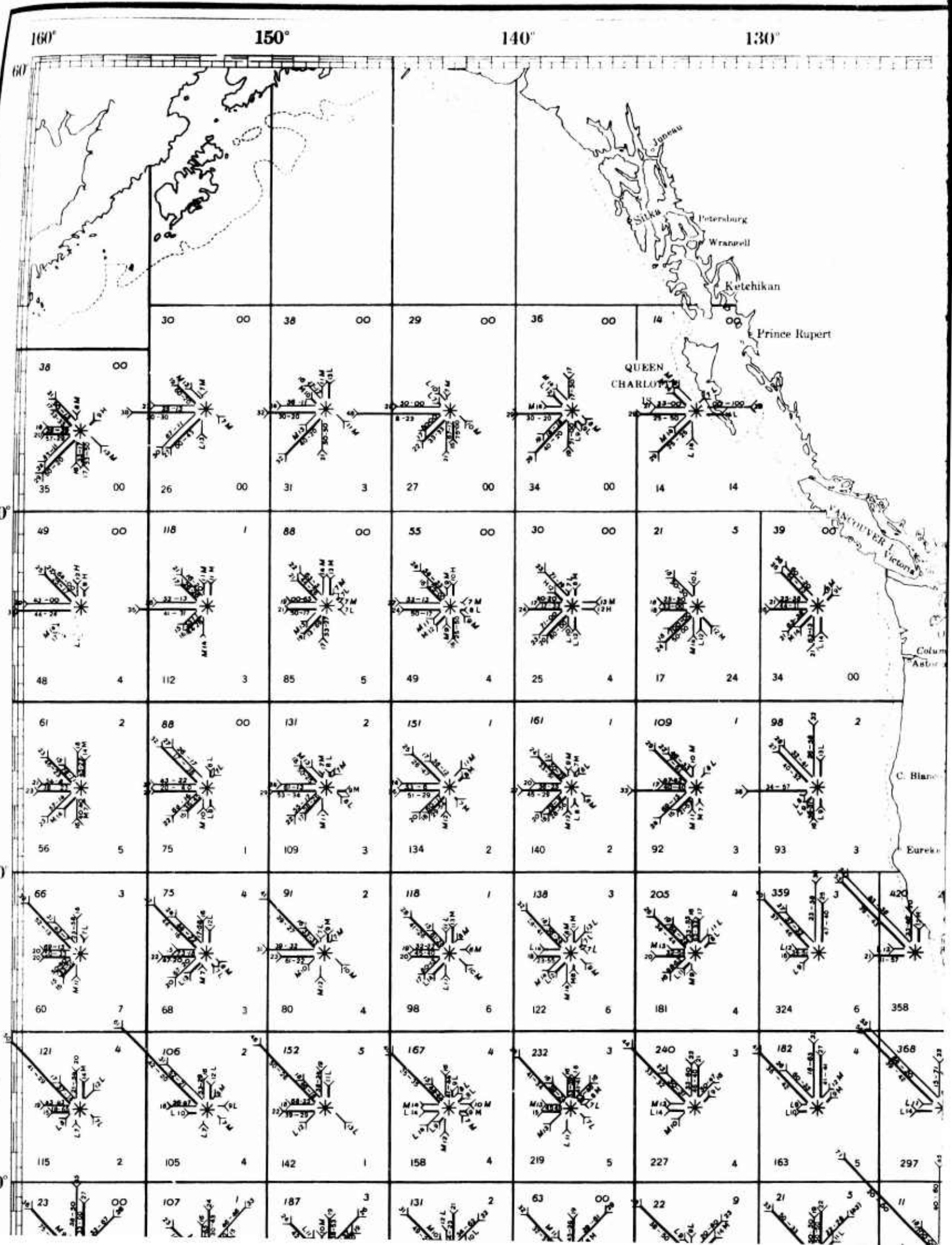
10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES



6


160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
VANCOUVER I.
Victoria
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

APRIL

PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

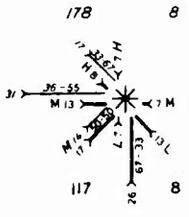
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

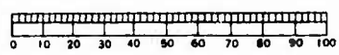
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows

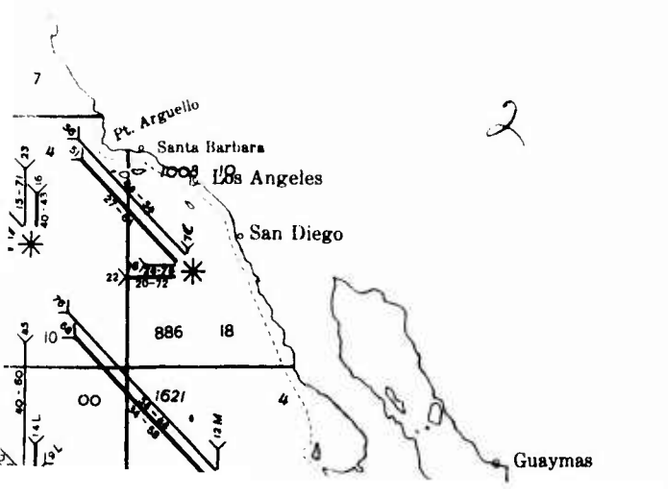


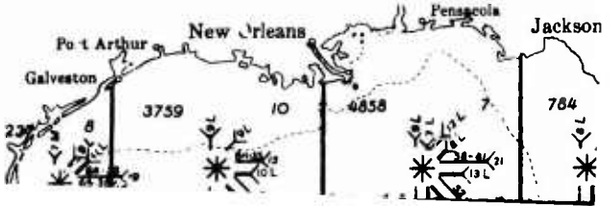
Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES





90° 80

60

TERN PACIFIC OCEAN

AND SWELL CHART

APRIL

AILING SEAS, SWELLS AND CALMS

rt has been compiled from observations made during the month by the cooperating
o and including the year 1942, the majority of the observations having been taken
The Hydrographic Office has shown all information in its files, however slight, and
ervations is small the graphical presentation will convey a false impression unless
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percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA
RATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON
NVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE
AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT
ANY GIVEN TIME OR PLACE

50

METHOD OF PRESENTATION

w both graphically and with figures, by means of an eight point double rose, printed
swells that have prevailed within the areas outlined on the brown base. THE SEA
D BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE
SENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow
is less than 7. In instances where the number of observations in any direction is 15
s less than 7, the conditions within that direction may be shown in the usual manner
in the directions toward which the seas or swells move The length of the arrow
n placed on the attached scale and the numeral at the tail of the arrow, gives the
ns that the seas or swells have been moving from or near the given point. In instances
not be shown, the shaft is shortened as much as necessary and the true percent at the
ns.

or over, the conditions within the direction are shown along the shaft of the arrow
or swells, the first figure from the center is always the percent of low. The percent
ion is the remainder of the percentage When the percent of direction is less than
hin the direction are shown by the letter L, M, or H (meaning predominately low,
figures for direction. The conditions of seas and swells (low, medium and high)
llows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of
hose of amounts 5 and above.

a is shown in the upper left hand corner of the area and the percent of calms for
hand corner. The number of observations for swell is shown in the lower left hand
lms for those observations in the lower right hand corner.

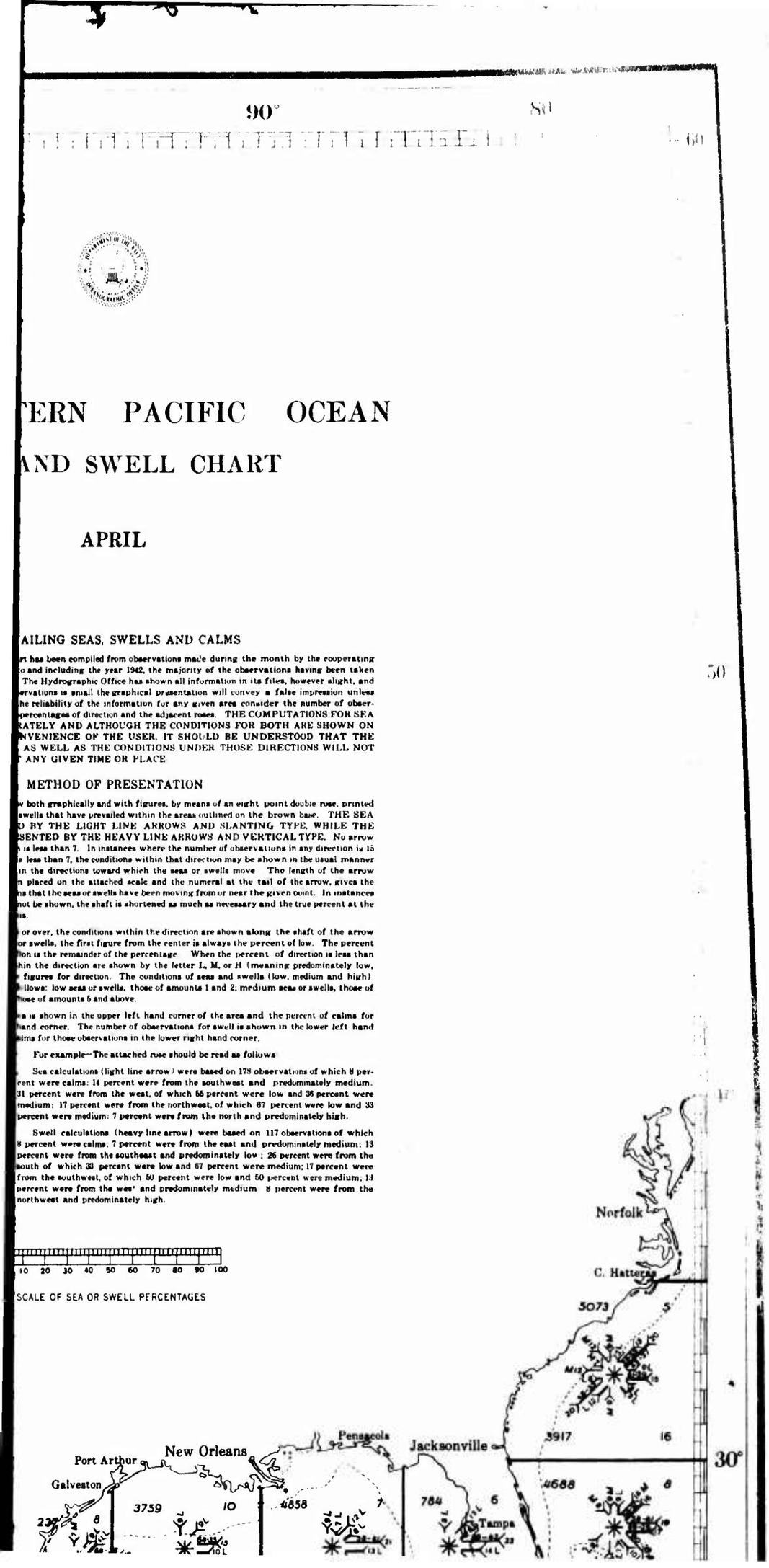
For example—The attached rose should be read as follows

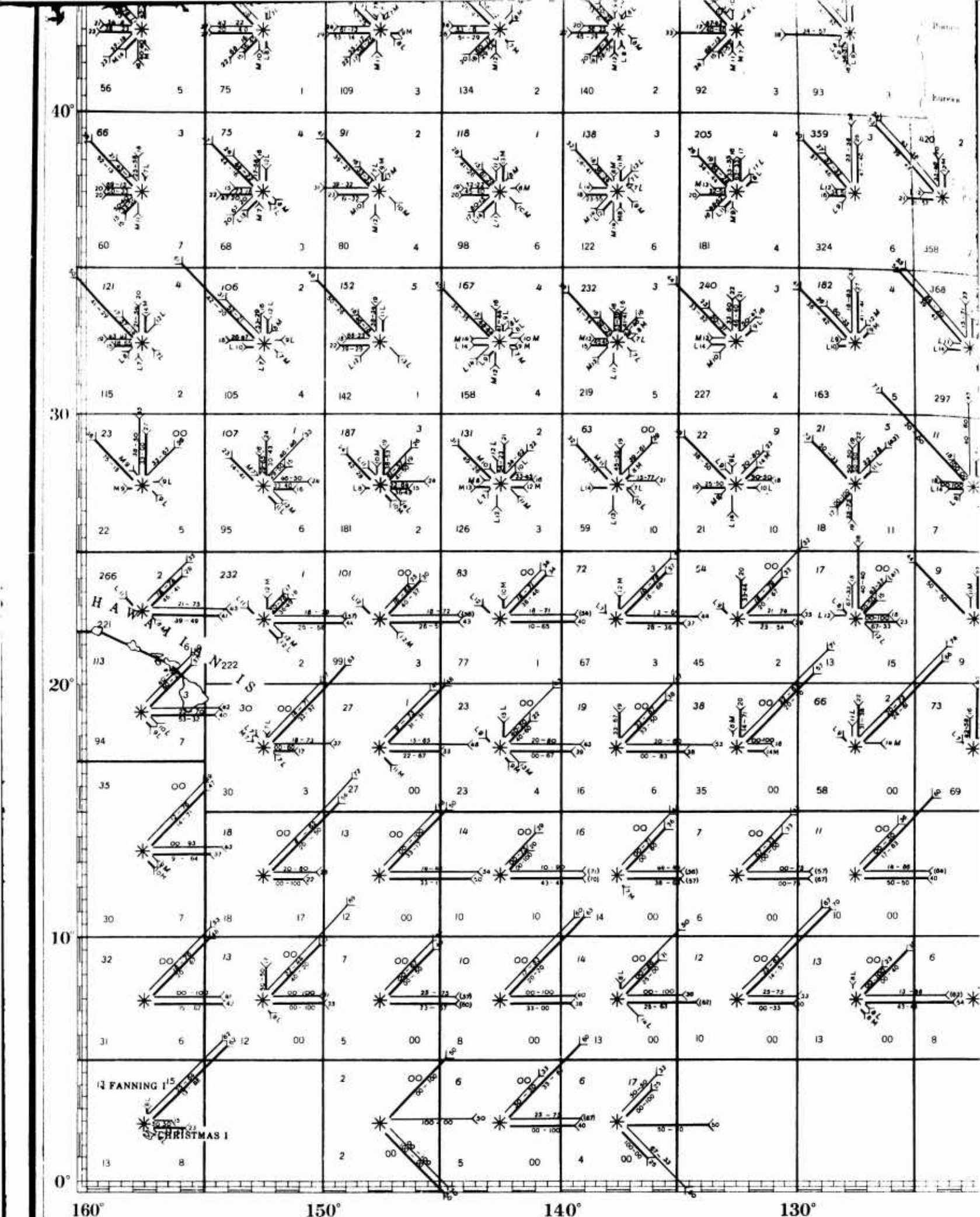
Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

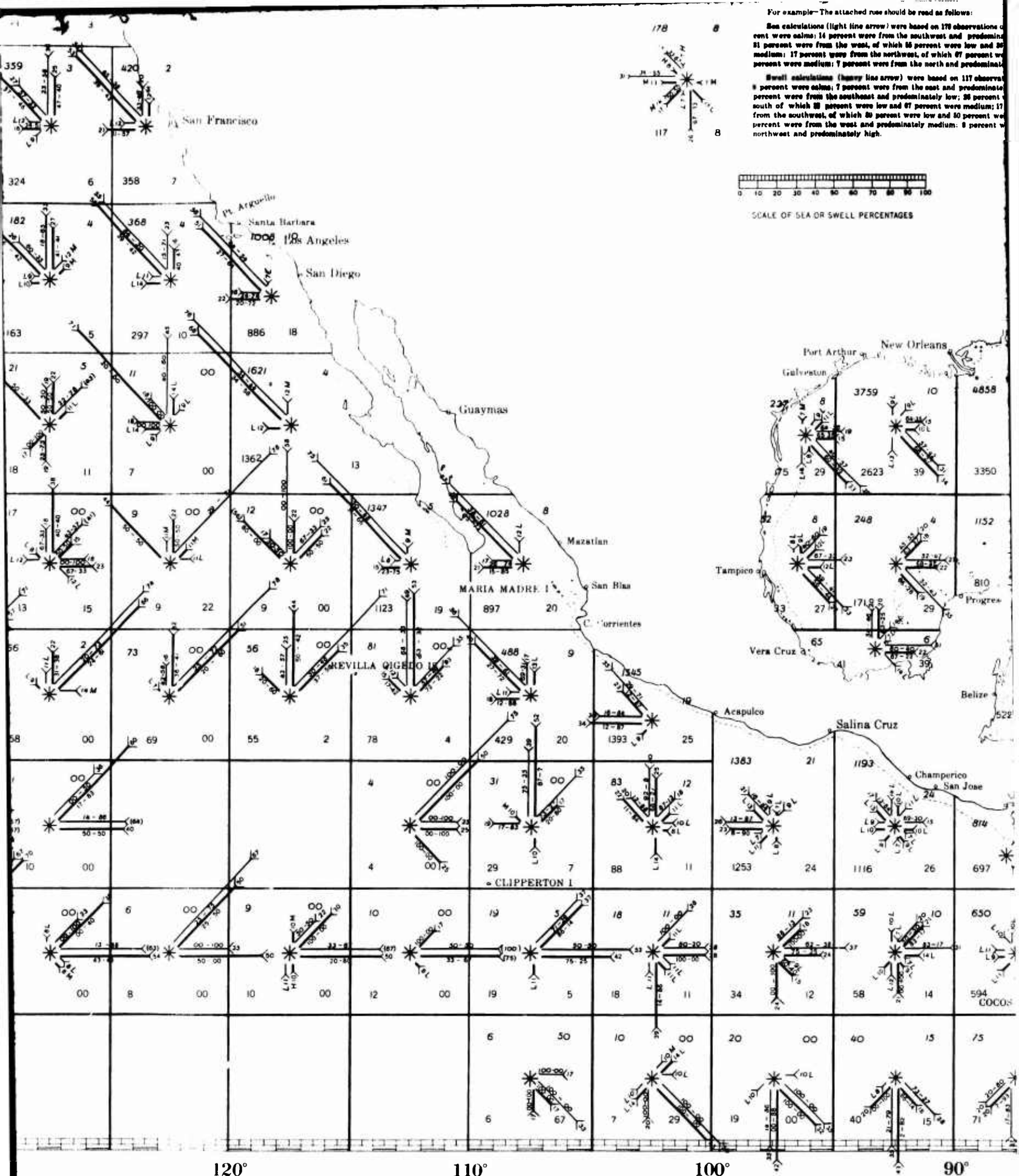
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms, 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium 8 percent were from the northwest and predominately high.

10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES



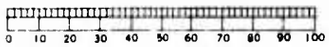

40°
30°
20°
10°
0°
160°
150°
140°
130°
HAWAII
N222
I 6
I 5
FANNING I
CHRISTMAS I


For example—The attached rose should be read as follows:
Sea calculations (light line arrow) were based on 176 observations
cent were calms; 14 percent were from the southwest and predomina
81 percent were from the west, of which 55 percent were low and 26
medium; 17 percent were from the northwest, of which 07 percent w
percent were medium; 7 percent were from the north and predominat
Swell calculations (heavy line arrow) were based on 117 observat
8 percent were calms; 7 percent were from the east and predominate
percent were from the southeast and predominately low; 36 percent
south of which 30 percent were low and 07 percent were medium; 17
from the southwest, of which 80 percent were low and 50 percent we
percent were from the west and predominately medium; 8 percent w
northwest and predominately high.
0 10 20 30 40 50 60 70 80 90 100
SCALE OF SEA OR SWELL PERCENTAGES
San Francisco
Pt. Arguello
Santa Barbara
Los Angeles
San Diego
Guaymas
Mazatlan
San Blas
C. Corrientes
MARIA MADRE 1
GREVILLA OIGEDO 1
CLIPPERTON 1
Port Arthur
New Orleans
Galveston
Tampico
Vera Cruz
Progreso
Belize
Acapulco
Salina Cruz
Champerico
San Jose
COCOS
120°
110°
100°
90°

5

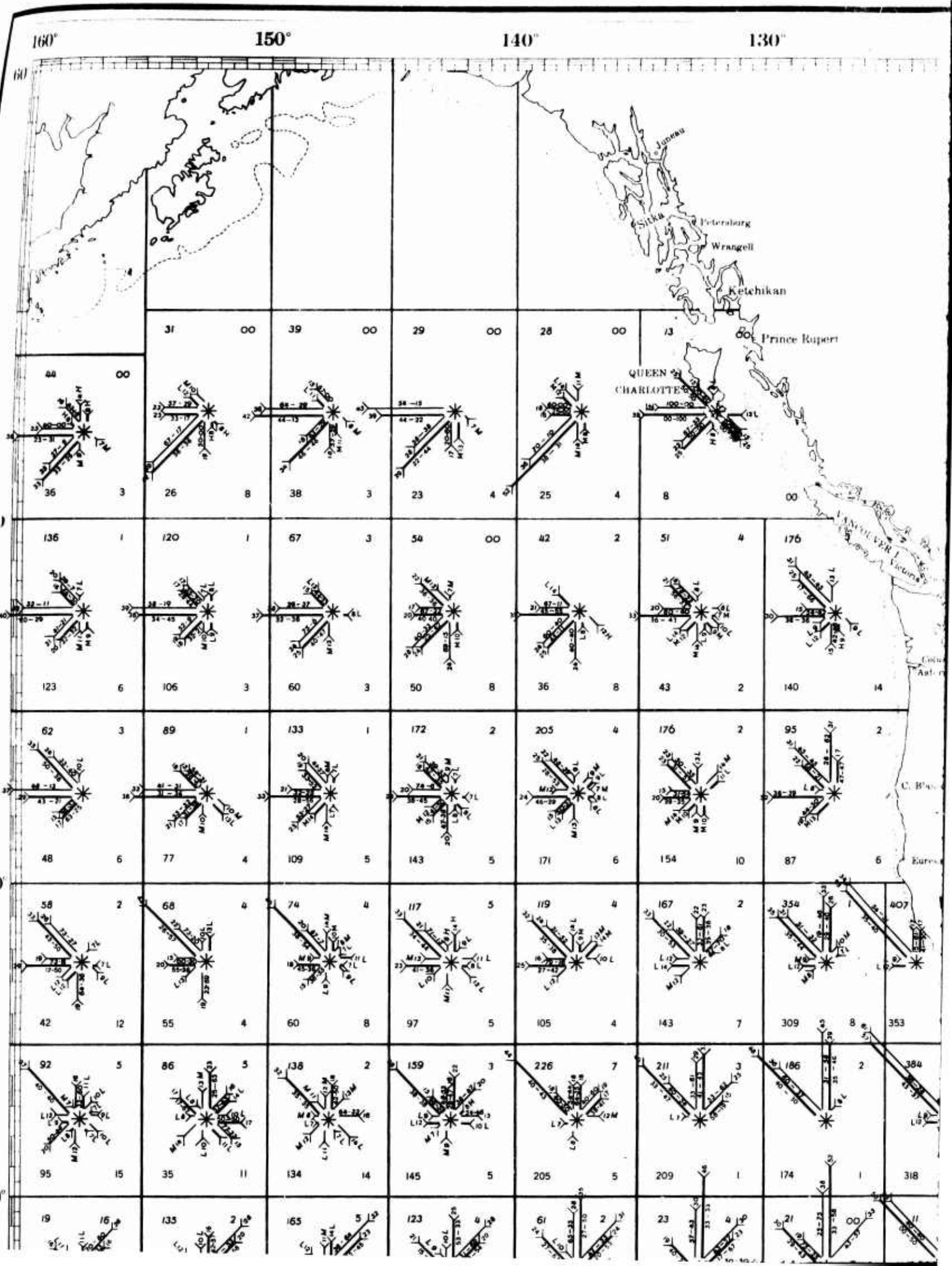
Wind calculations (light line arrow) were based on 178 observations of which 8 percent were calms. 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 55 percent were low and 38 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low. 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium. 14 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

Sheet 4


160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN CHARLOTTE
VANCOUVER I.
Victoria
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

MAY

PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

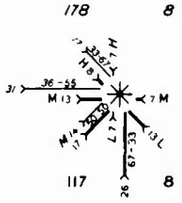
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

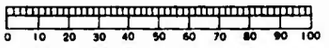
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows:

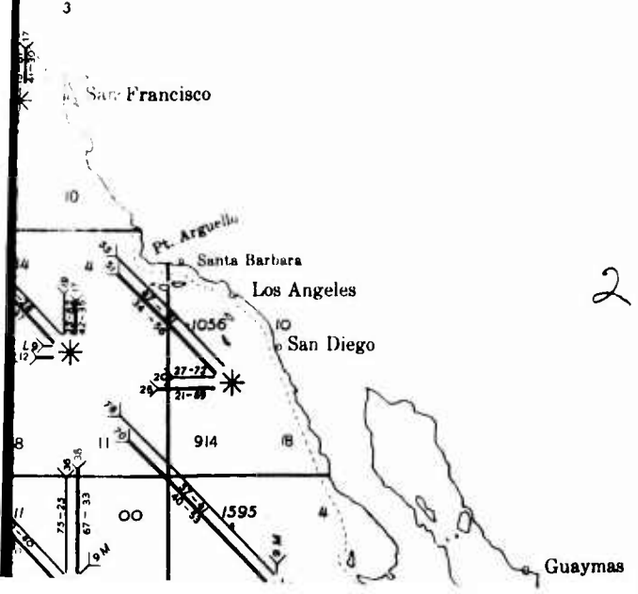


Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms: 14 percent were from the southwest and predominately medium: 31 percent were from the west, of which 55 percent were low and 36 percent were medium: 17 percent were from the northwest, of which 67 percent were low and 32 percent were medium: 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES



100 90° 80 60

THEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

MAY

PREVAILING SEAS, SWELLS AND CALMS

ormation shown on this chart has been compiled from observations made during the month by the cooperating f the Hydrographic Office to and including the year 1942, the majority of the observations having been taken years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and as where the number of observations is small the graphical presentation will convey a false impression unless horoughly. In evaluating the reliability of the information for any given area consider the number of obser- geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA LL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON E CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE N OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT RILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

METHOD OF PRESENTATION

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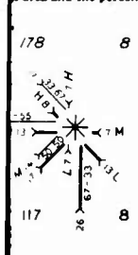
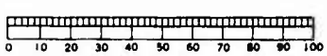


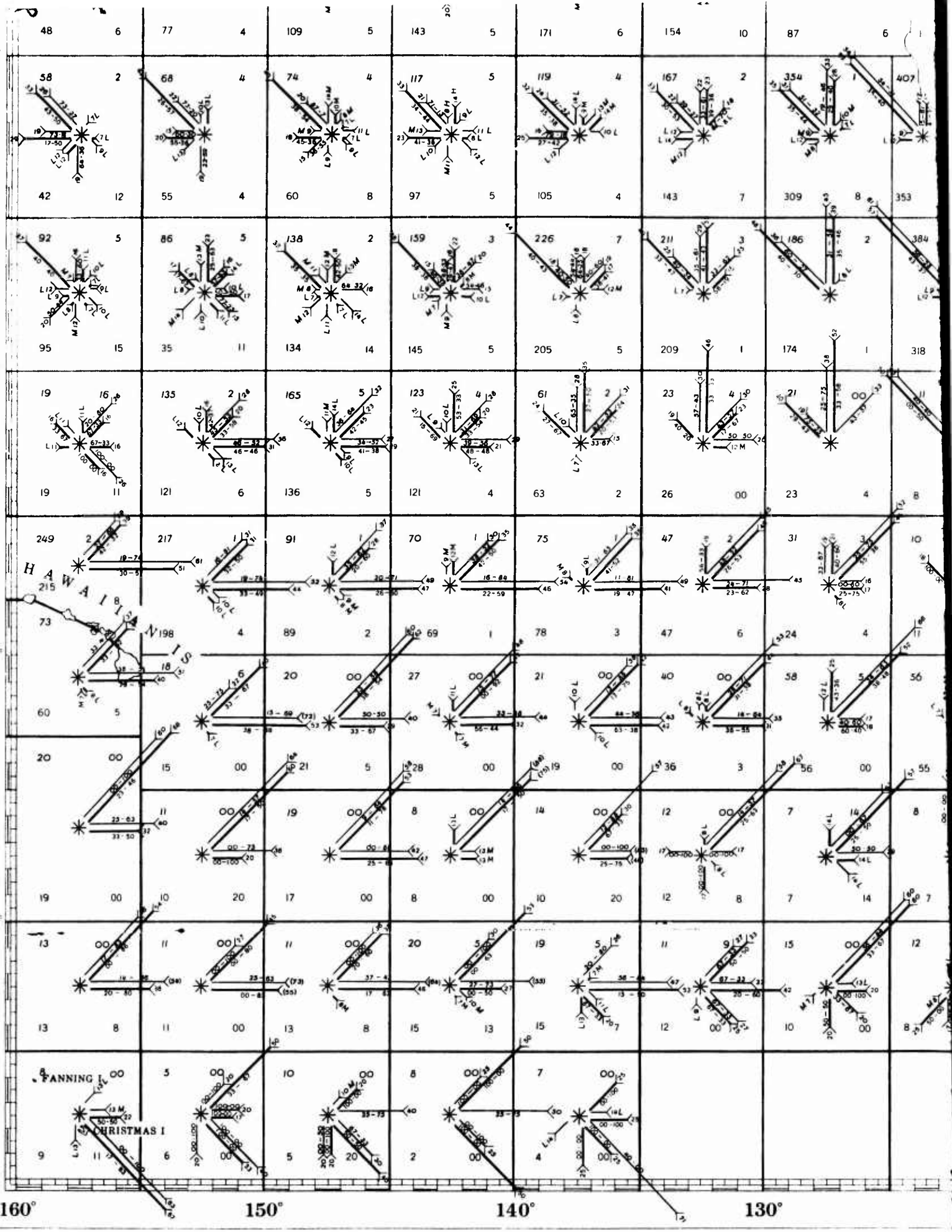
For example—The attached rose should be read as follows:

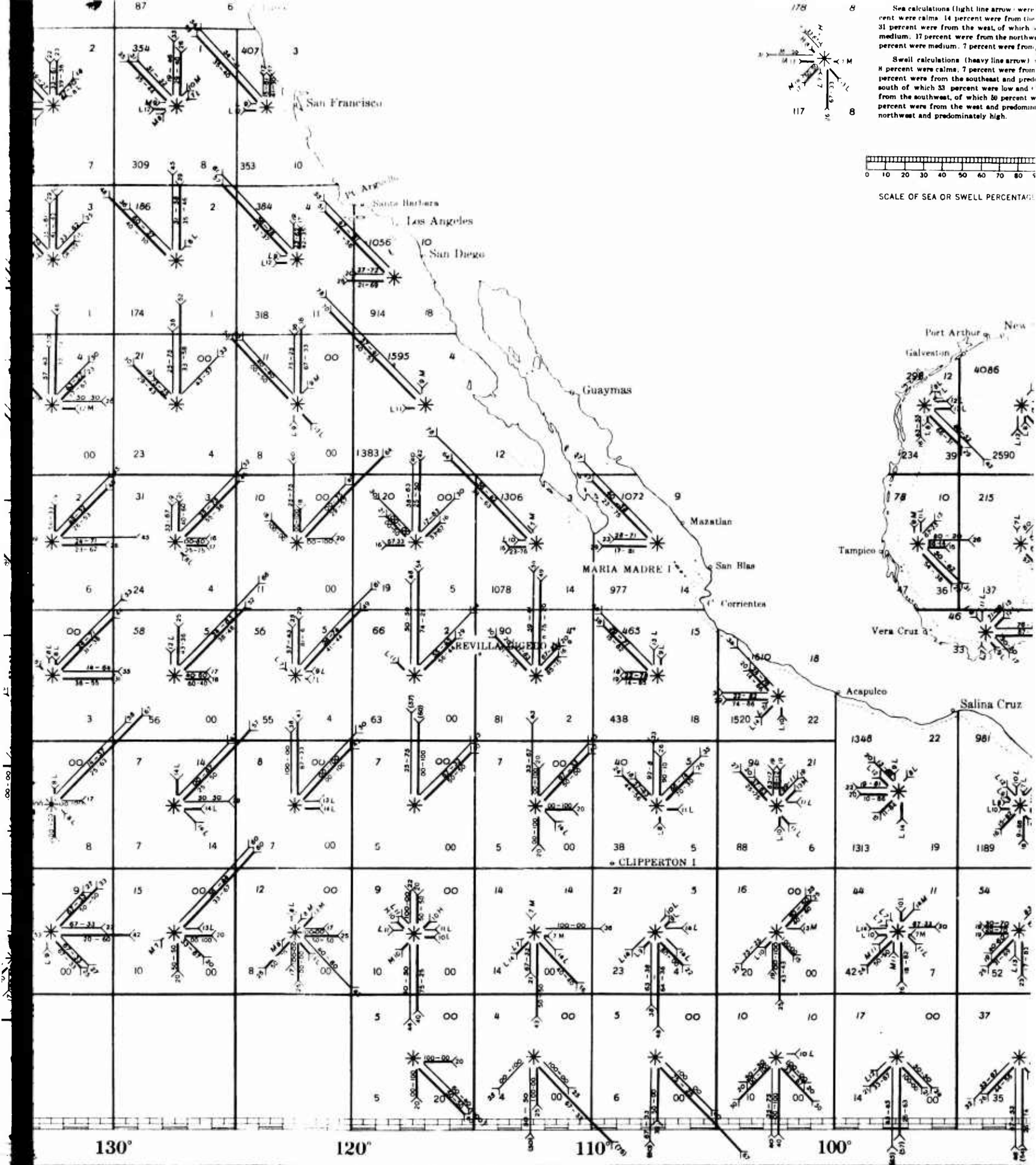
Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms: 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 32 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES


10°
30°
20°
10°
0°
160°
150°
140°
130°
HAWAII
N198
IS
FANNING I.
CHRISTMAS I



Sea calculations (light line arrow) were
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31 percent were from the west, of which
medium. 17 percent were from the northwe
percent were medium. 7 percent were from

Swell calculations (heavy line arrow)
8 percent were calms. 7 percent were from
percent were from the southeast and predo
south of which 33 percent were low and
from the southwest, of which 50 percent w
percent were from the west and predomina
northwest and predominately high.

5

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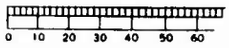
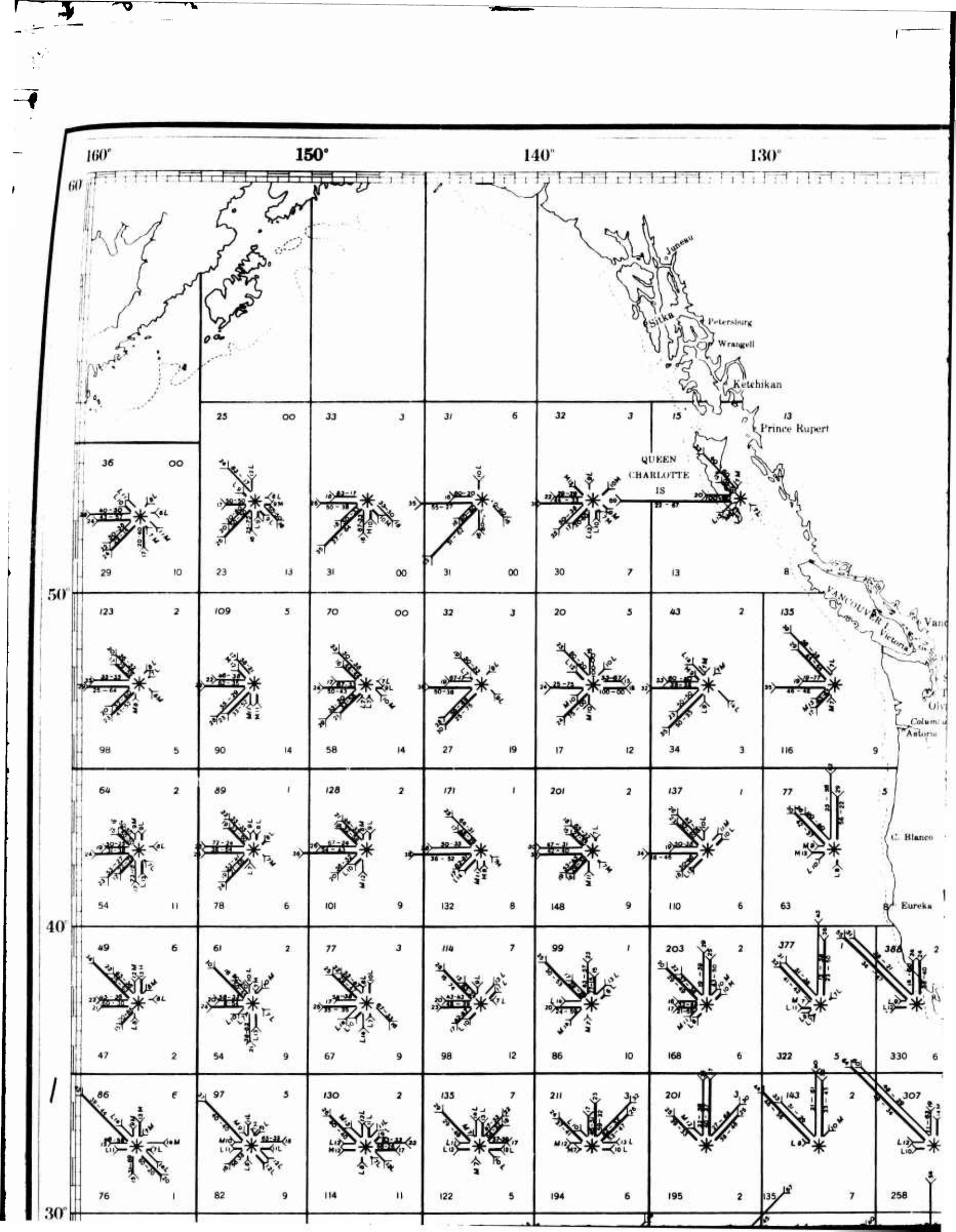
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 83 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWF

Sheet 5

6

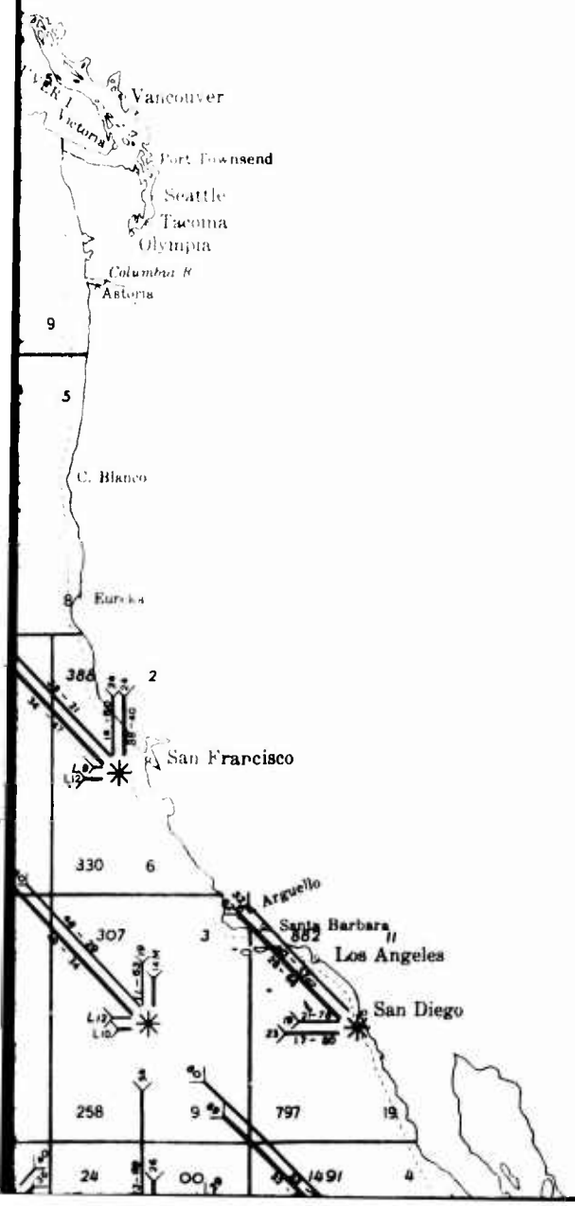

160°
150°
140°
130°
60
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
IS
VANCOUVER I.
Victoria
Eureka
C. Blanco
25 00
33 3
31 6
32 3
15 13
36 00
29 10
23 13
31 00
31 00
30 7
13 8
123 2
109 5
70 00
32 3
20 5
43 2
135
98 5
90 14
58 14
27 19
17 12
34 3
116 9
64 2
89 1
128 2
171 1
201 2
137 1
77 5
54 11
78 6
101 9
132 8
148 9
110 6
63 8
49 6
61 2
77 3
114 7
99 1
203 2
377
386 2
47 2
54 9
67 9
98 12
86 10
168 6
322 5
330 6
86 6
97 5
130 2
135 7
211 3
201 3
143 2
307
76 1
82 9
114 11
122 5
194 6
195 2
135 7
258

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

JUNE



PREVAILING SEAS, SWELLS AND CALMS

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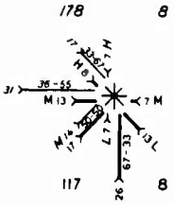
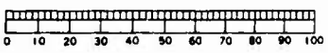
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows



Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

90° 80

60

ACIFIC OCEAN

L CHART

S AND CALMS

vations made during the month by the cooperating
he majority of the observations having been taken
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the seas or swells move. The length of the arrow
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the letter L, M, or H (meaning predominately low,
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of amounts 1 and 2; medium seas or swells, those of

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lower right hand corner.

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were from the north and predominately high.

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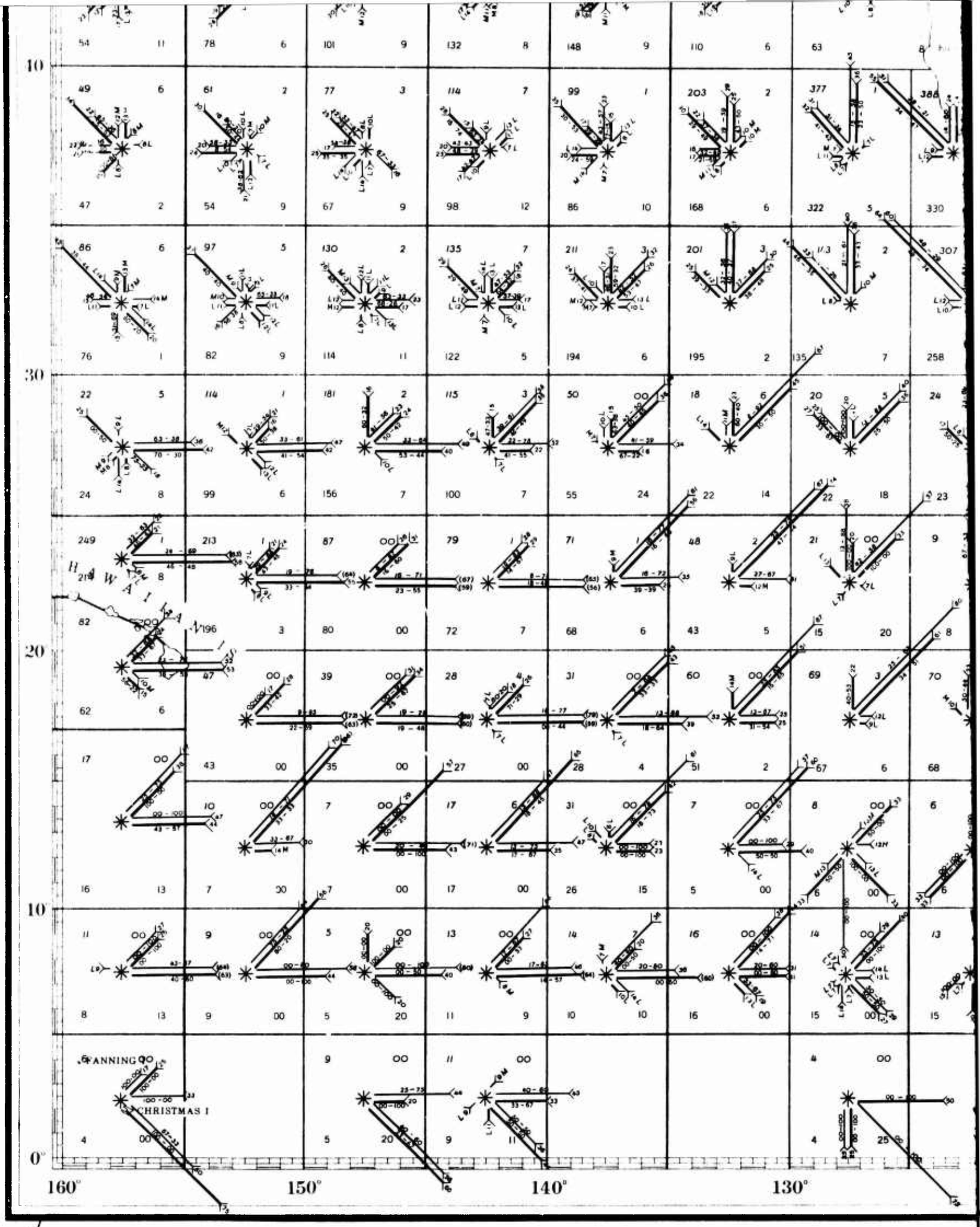
were from the east and predominately medium; 13
and predominately low; 26 percent were from the
low and 67 percent were medium; 17 percent were
percent were low and 50 percent were medium; 13
predominately medium 8 percent were from the
gh

0 80 90 100

CENTAGES


10
30
20
10
0°
160°
150°
140°
130°
HAWAII
PANNING
CHRISTMAS I

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seconds and 8, high seas or swells, those of an onto hand above

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corner of the area and the percent of calms for those observations in the lower

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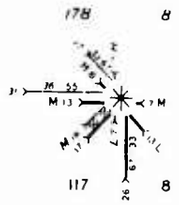

Sea calculations (light line arrow: w
cent were calms, 14 percent were from
31 percent were from the west, of wh
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percent were medium, 7 percent were fr

Swell calculations (heavy line arr
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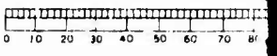
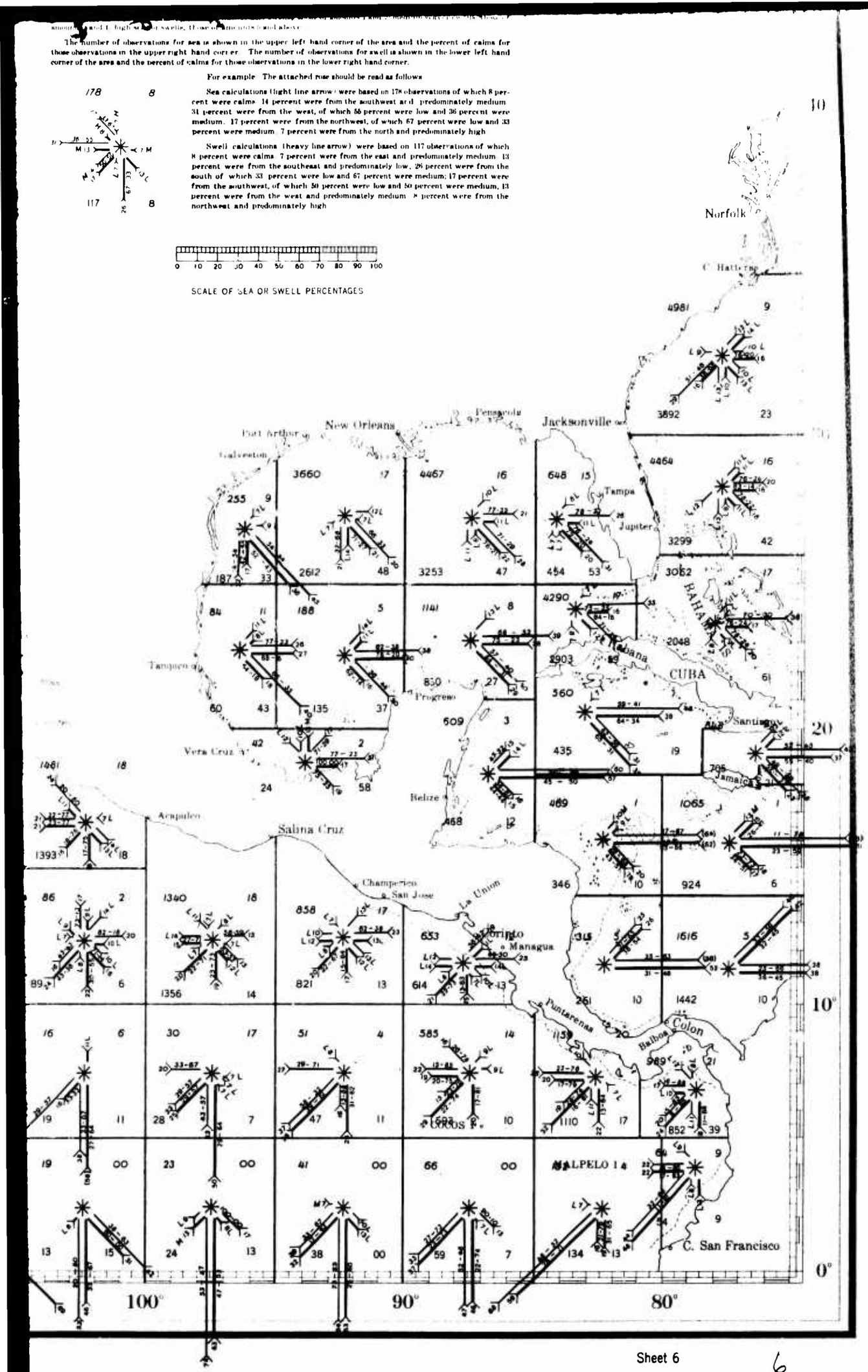
percent were from the west and pre
northwest and predominately high



SCALE OF SEA OR SWELL PERCENT



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For example: The attached rose should be read as follows

178 8

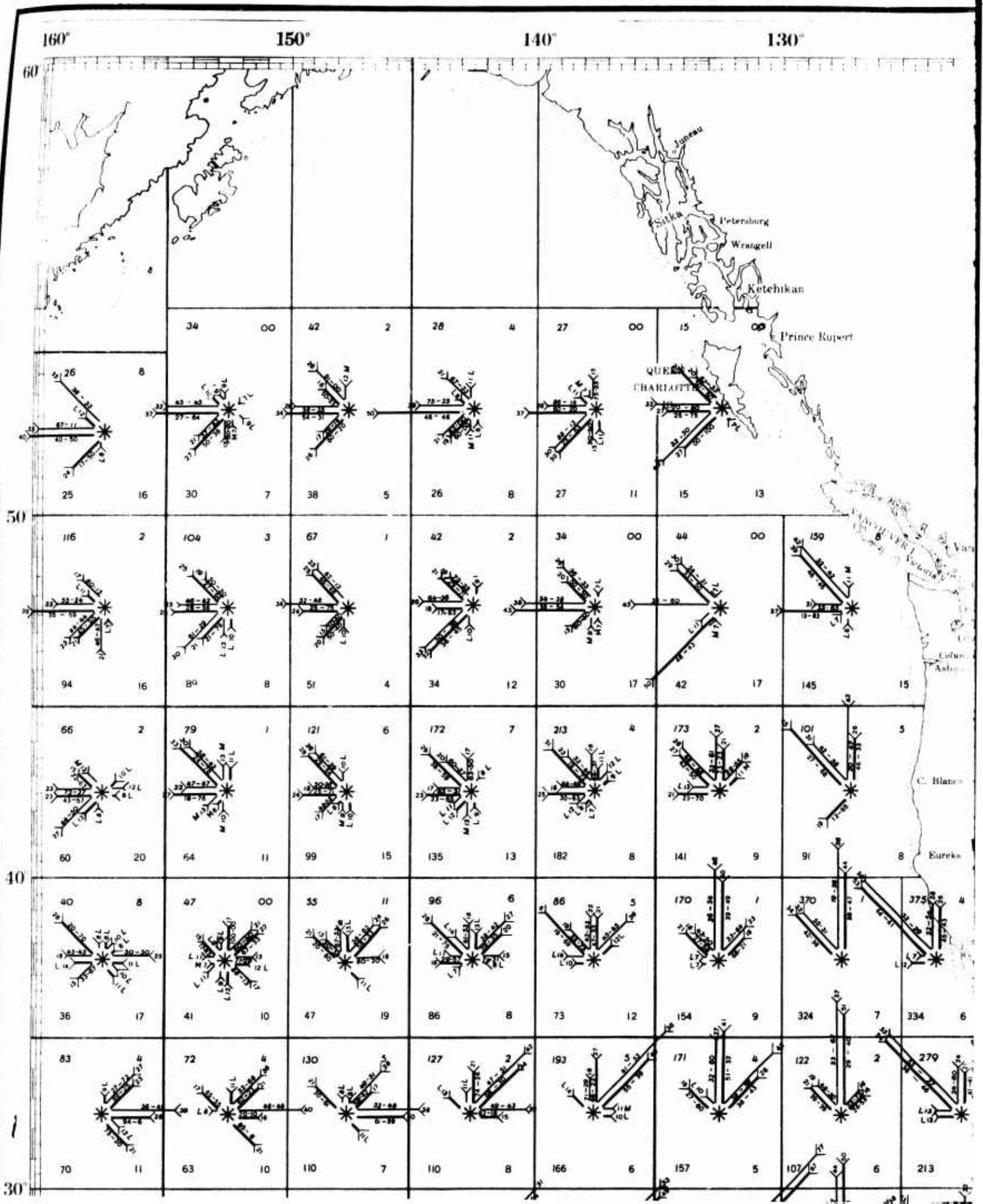
117 8

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms. 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 56 percent were low and 36 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low. 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.

0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES


160°
150°
140°
130°
60
50
40
30
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

JULY

PREVAILING SEAS, SWELLS AND CALMS

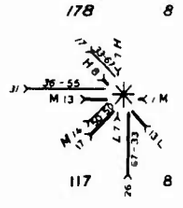
The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1938 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

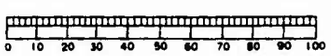
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.



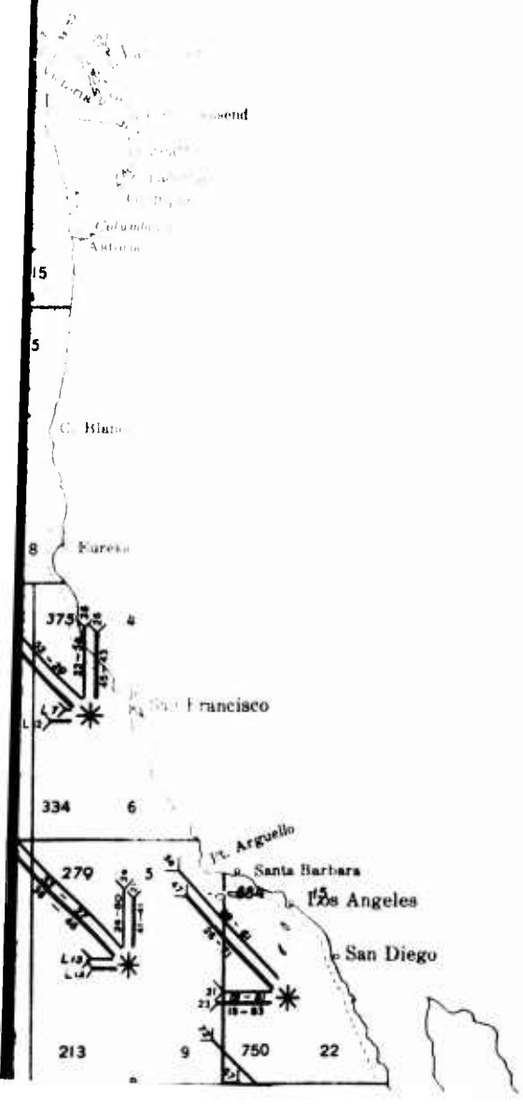
For example—The attached rose should be read as follows:

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 36 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high



SCALE OF SEA OR SWELL PERCENTAGES



90° 80° 60°

PACIFIC OCEAN

VELL CHART

LY

SWELLS AND CALMS

from observations made during the month by the cooperating
ear 1942, the majority of the observations having been taken
ffice has shown all information in its files, however slight, and
graphical presentation will convey a false impression unless
nformation for any given area consider the number of obser-
on and the adjacent roses. THE COMPUTATIONS FOR SEA
HOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON
HE USER. IT SHOULD BE UNDERSTOOD THAT THE
CONDITIONS UNDER THOSE DIRECTIONS WILL NOT
OR PLACE

PRESENTATION

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LINE ARROWS AND SLANTING TYPE, WHILE THE
HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow
tances where the number of observations in any direction is 15
itions within that direction may be shown in the usual manner
ard which the seas or swells move. The length of the arrow
hed scale and the numeral at the tail of the arrow, gives the
lls have been moving from or near the given point. In instances
t is shortened as much as necessary and the true percent at the

s within the direction are shown along the shaft of the arrow
ure from the center is always the percent of low. The percent
f the percentage. When the percent of direction is less than
shown by the letter L, M, or H (meaning predominately low,
. The conditions of seas and swells (low, medium and high)
ells, those of amounts 1 and 2; medium seas or swells, those of
above.

per left hand corner of the area and the percent of calms for
mber of observations for swell is shown in the lower left hand
tions in the lower right hand corner.

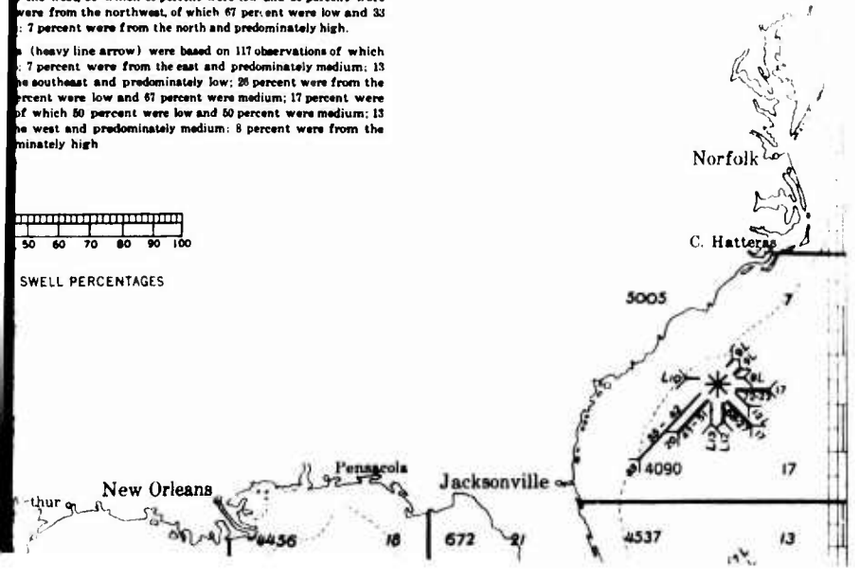
attached rose should be read as follows.

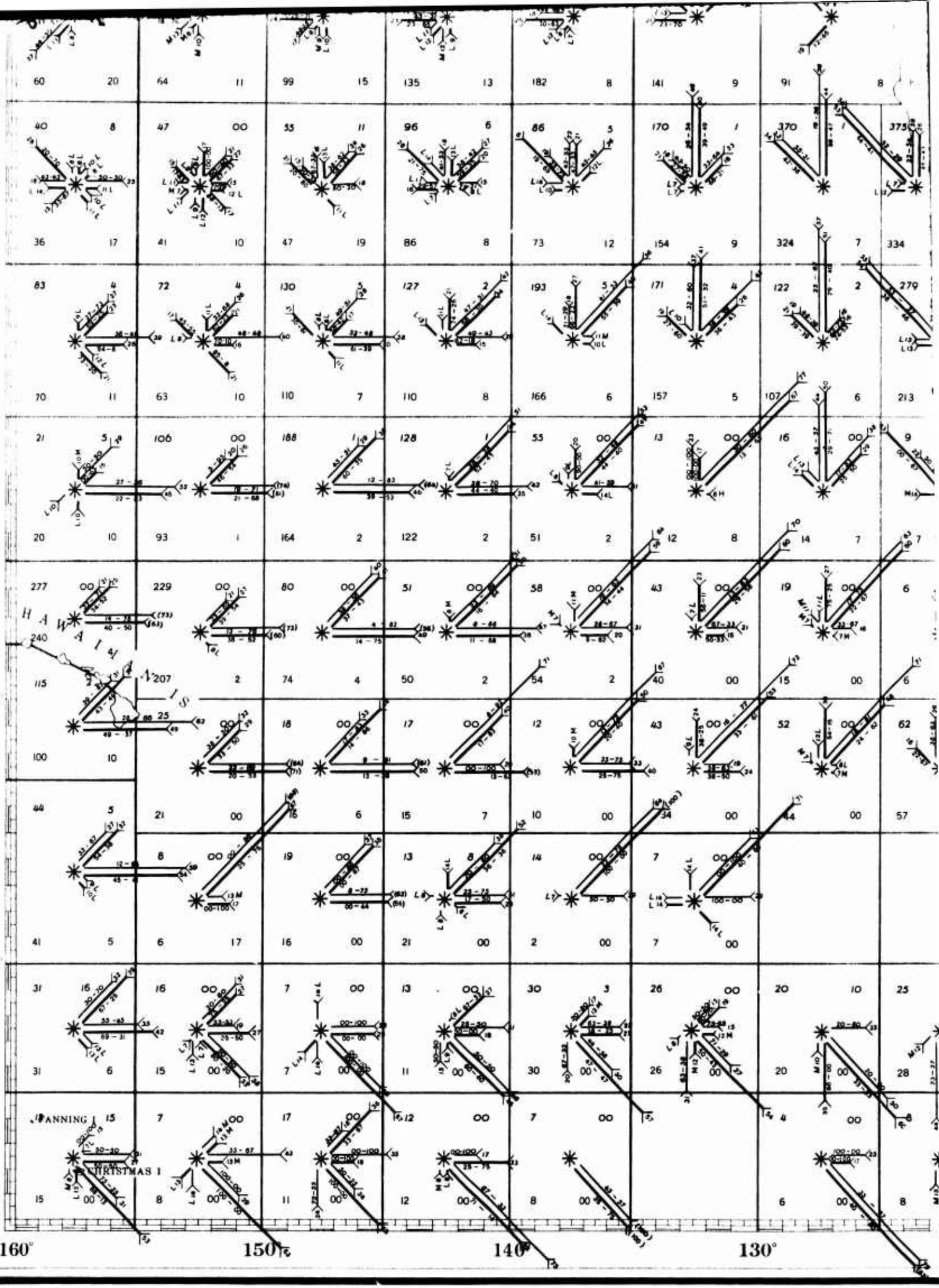
ight line arrow) were based on 178 observations of which 8 per-
ercent were from the southwest and predominately medium:
the west, of which 85 percent were low and 36 percent were
were from the northwest, of which 67 percent were low and 33
7 percent were from the north and predominately high.

(heavy line arrow) were based on 117 observations of which
7 percent were from the east and predominately medium; 13
e southeast and predominately low; 26 percent were from the
rcent were low and 67 percent were medium; 17 percent were
f which 50 percent were low and 50 percent were medium; 13
e west and predominately medium; 8 percent were from the
minately high

50 60 70 80 90 100

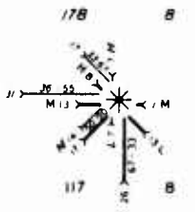
SWELL PERCENTAGES




10
30
20
10
0°
160°
150°
140°
130°
HAWAII
PANNING
CHRISTMAS I

amounts 3 and 4, high seas or swells, those of amounts 5 and above

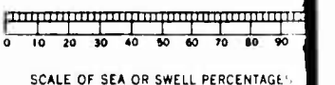
The number of observations for sea is shown in the upper left hand corner of those observations in the upper right hand corner. The number of observations for corner of the area and the percent of calms for those observations in the lower right h



For example—The attached rose should be

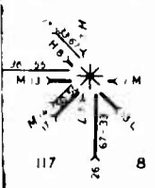
Sea calculations (light line arrow) were ba
cent were calms; 14 percent were from the sou
31 percent were from the west, of which 55 pe
medium. 17 percent were from the northwest,
percent were medium; 7 percent were from thi

Swell calculations (heavy line arrow) were
8 percent were calms; 7 percent were from th
percent were from the southeast and predomi
south of which 33 percent were low and 67 pe
from the southwest, of which 50 percent were
percent were from the west and predominate
northwest and predominately high



SCALE OF SEA OR SWELL PERCENTAGE

The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.



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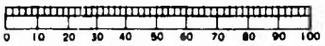
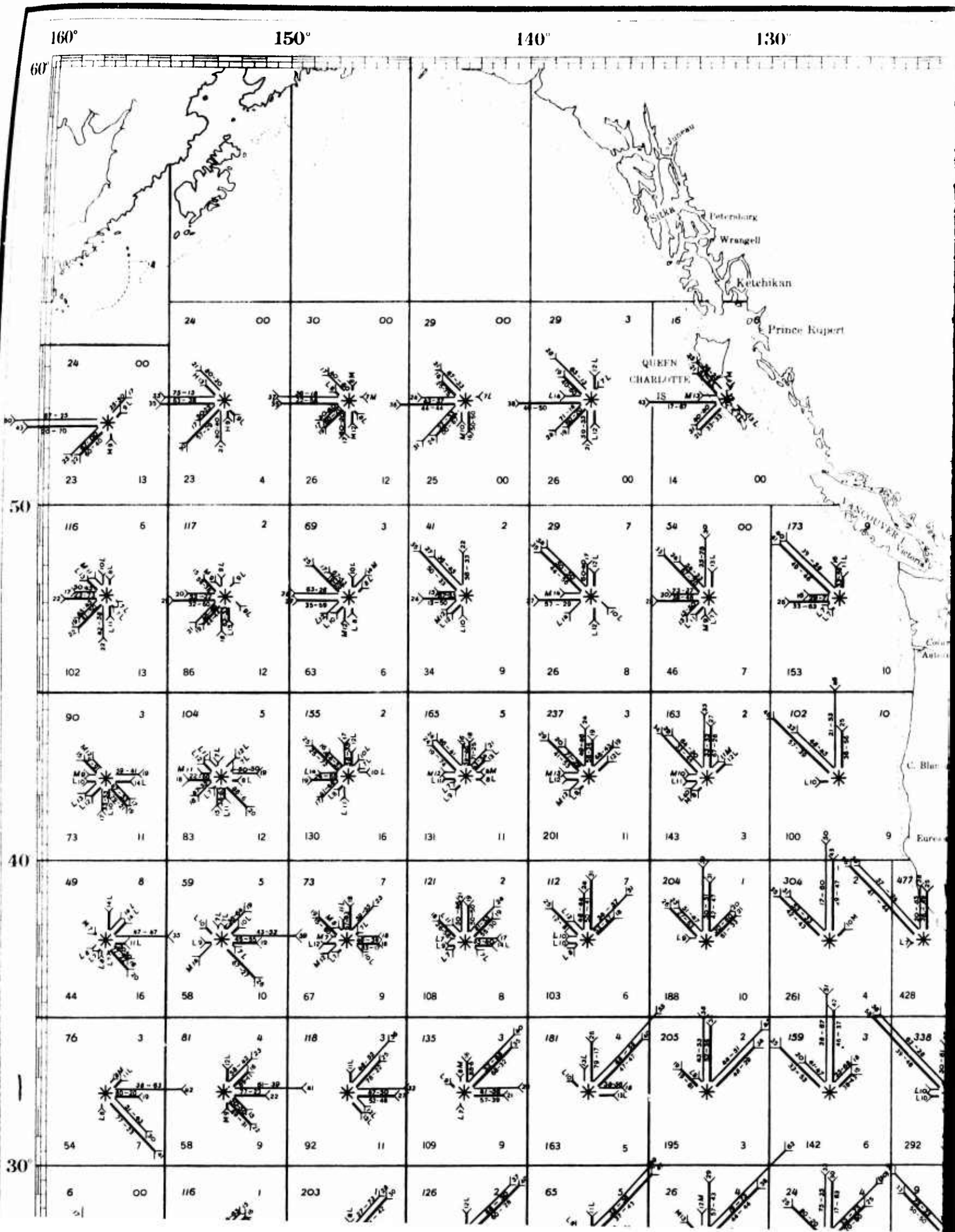


SCALE OF SEA OR SWELL PERCENTAGES

6

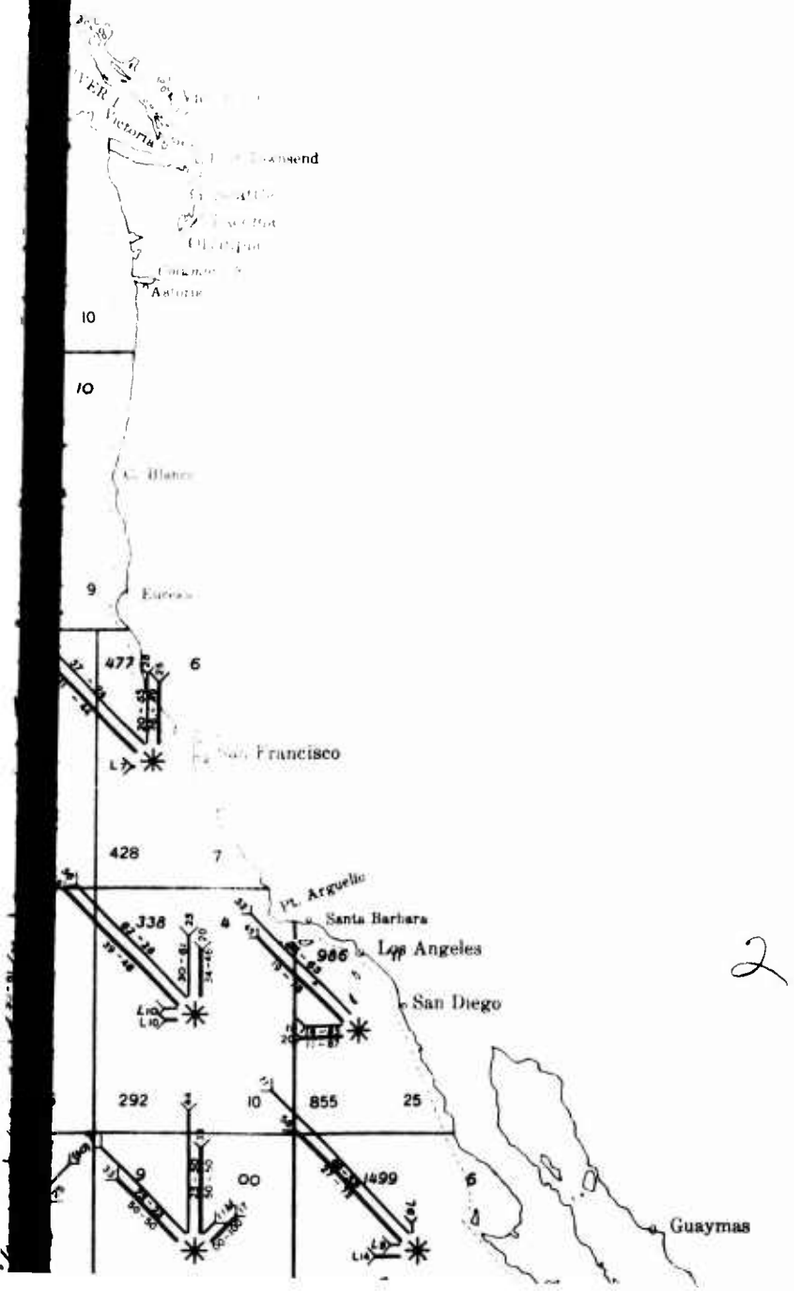

160°
150°
140°
130°
60°
50°
40°
30°
Juneau
SITKA
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
IS
VANCOUVER
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

AUGUST



PREVAILING SEAS, SWELLS AND CALMS

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METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

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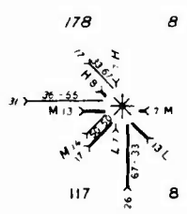
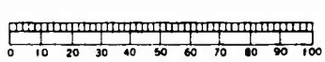


For example—The attached rose should be read as follows

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

EASTERN PACIFIC OCEAN

SEA AND SWELL CHART

AUGUST

PREVAILING SEAS, SWELLS AND CALMS

wn on this chart has been compiled from observations made during the month by the cooperating raphic Office to and including the year 1942, the majority of the observations having been taken 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and number of observations is small the graphical presentation will convey a false impression unless n evaluating the reliability of the information for any given area consider the number of obser- l position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA ADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON OR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT ENTICAL AT ANY GIVEN TIME OR PLACE

METHOD OF PRESENTATION

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For example: The attached rose should be read as follows

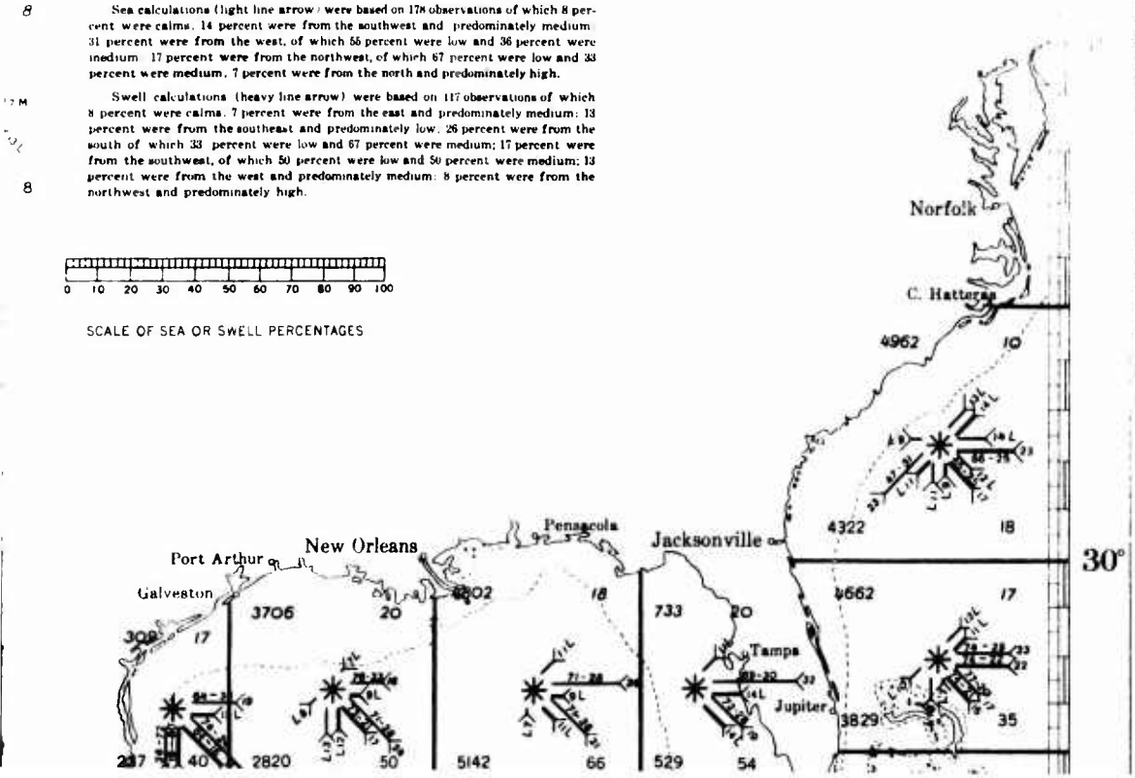
8 Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

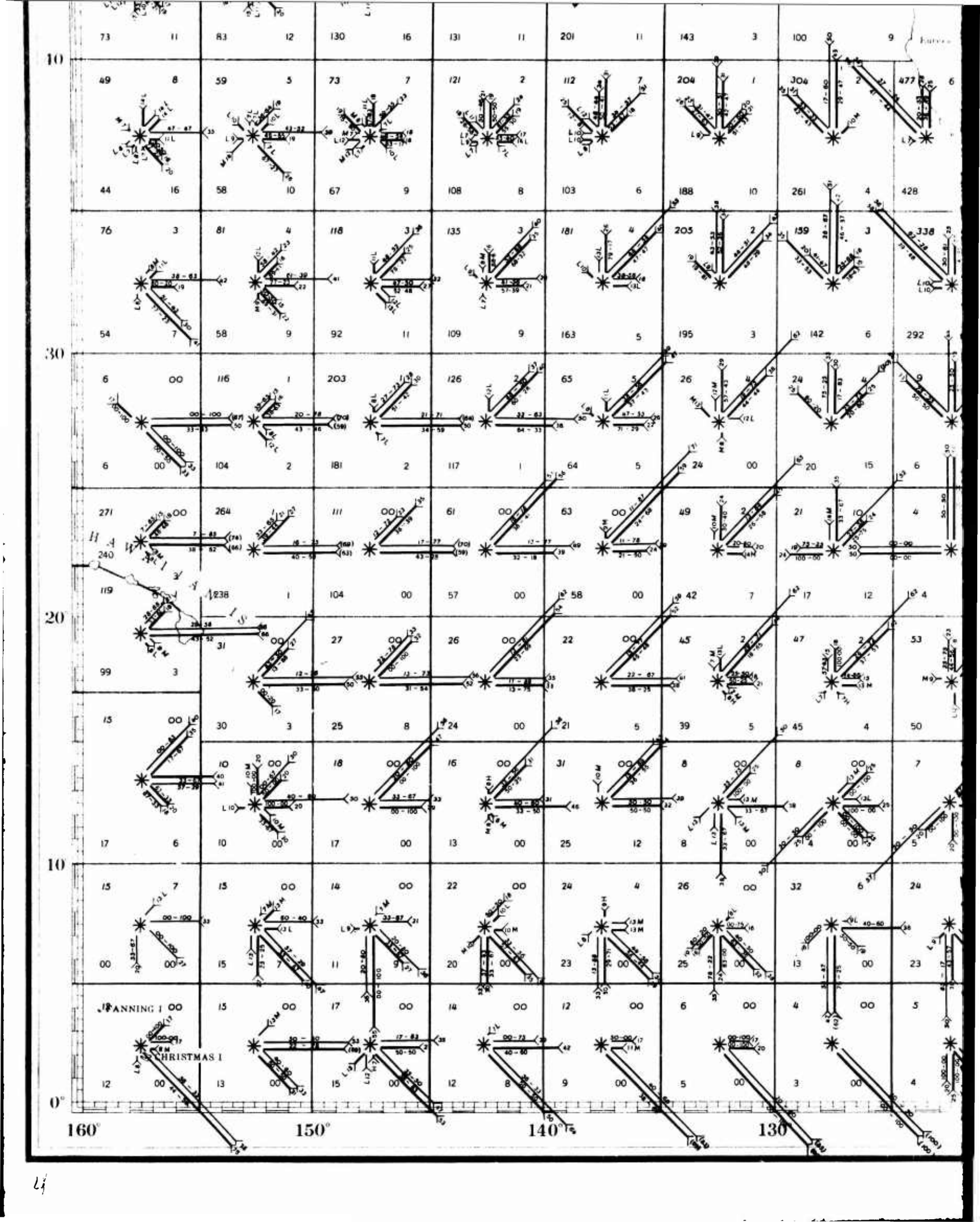
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.

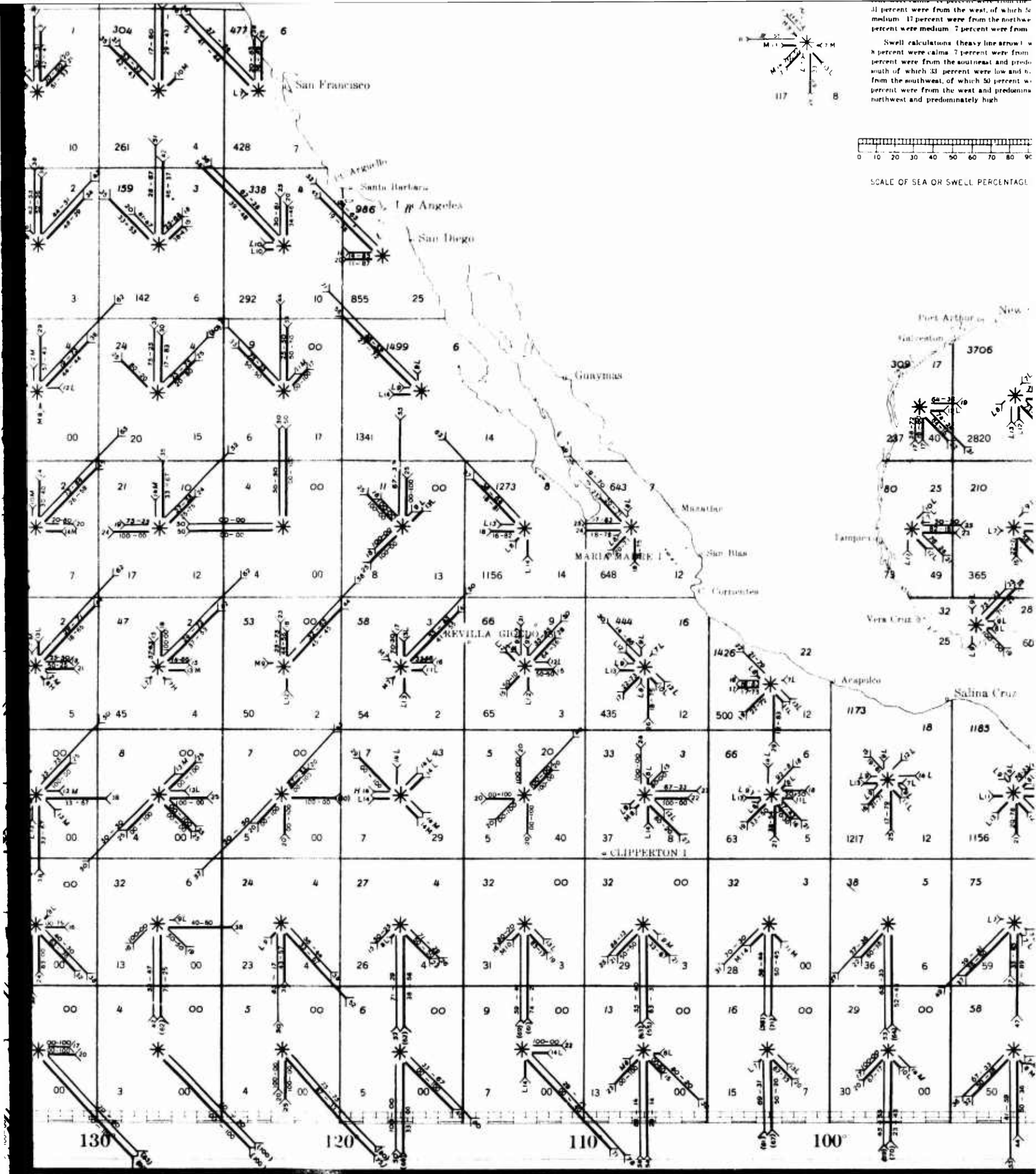
8

0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES




40
30
20
10
0°
160°
150°
140°
130°
PANNING I
CHRISTMAS I



41 percent were from the west, of which 5
medium 17 percent were from the northwe
percent were medium 7 percent were from

Swell calculations (heavy line arrow) w
8 percent were calms 7 percent were from
percent were from the southeast and predo
south of which 33 percent were low and 6
from the southwest, of which 50 percent w
percent were from the west and predomina
northwest and predominately high

0 10 20 30 40 50 60 70 80 90

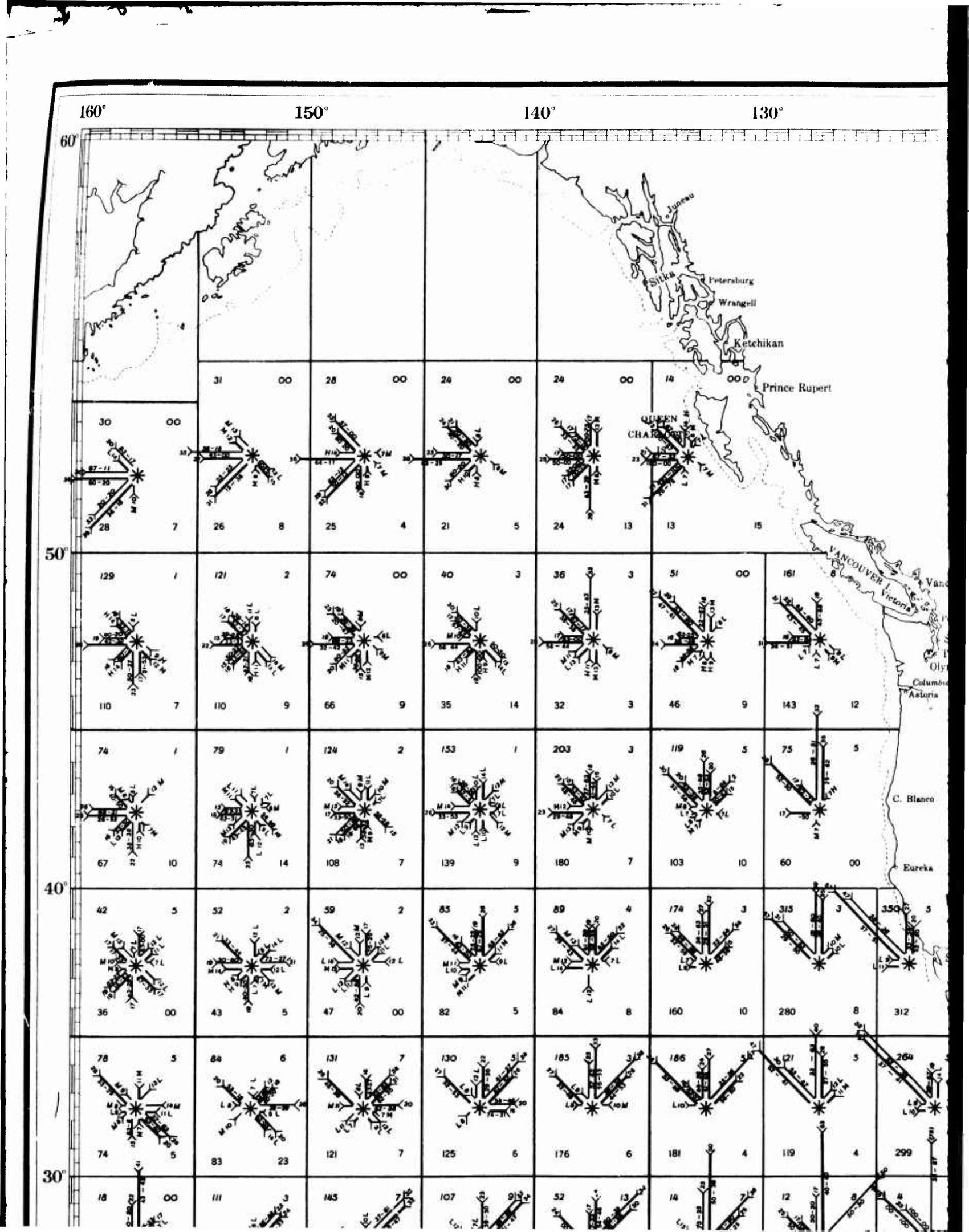
SCALE OF SEA OR SWELL PERCENTAGE

5

medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms. 7 percent were from the east and predominately medium. 13 percent were from the southeast and predominately low. 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.

SCALE OF SEA OR SWELL PERCENTAGES

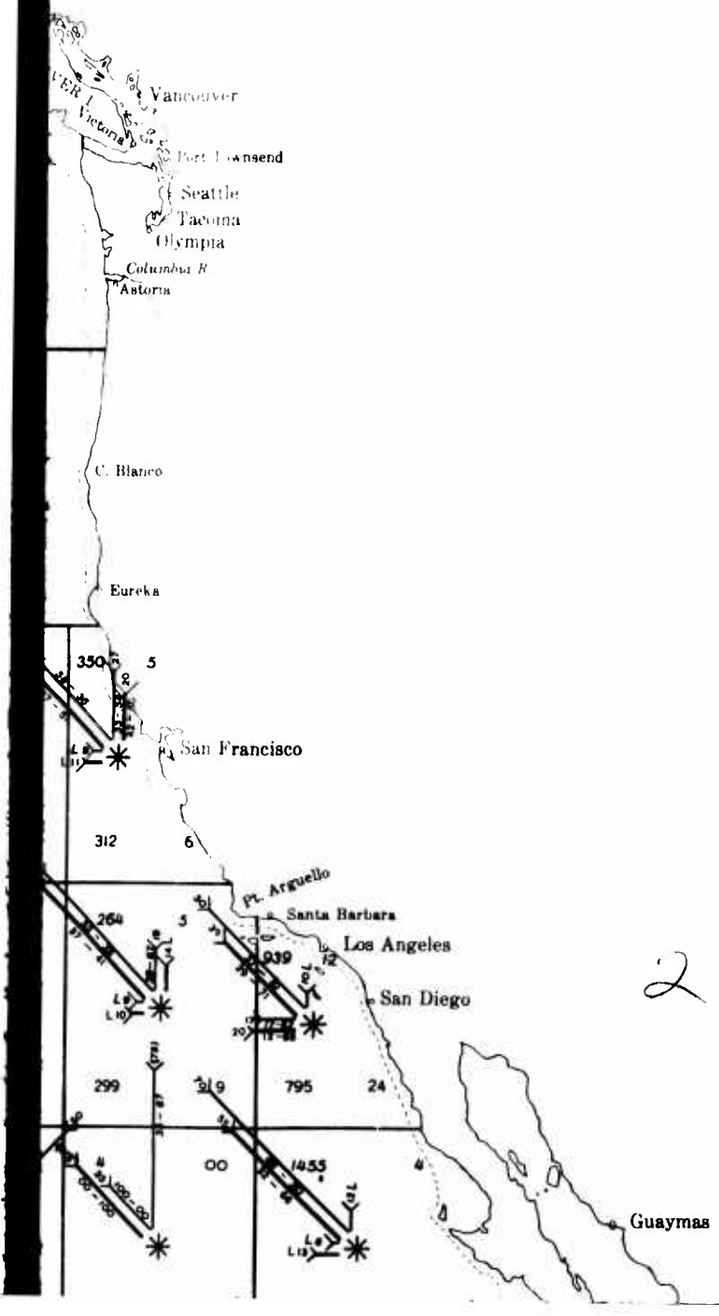

160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
VANCOUVER I.
Victoria
Olympia
Columbia R.
Astoria
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

SEPTEMBER



PREVAILING SEAS, SWELLS AND CALMS

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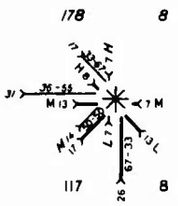
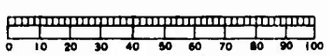
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows:



Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium, 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 25 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

100° 90° 80° 60°

RTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

SEPTEMBER

PREVAILING SEAS, SWELLS AND CALMS

information shown on this chart has been compiled from observations made during the month by the cooperating of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken e years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and reas where the number of observations is small the graphical presentation will convey a false impression unless d thoroughly. In evaluating the reliability of the information for any given area consider the number of obser- the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA WELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON ME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE ION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT ARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

METHOD OF PRESENTATION

purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA IONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE. WHILE THE CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow when the percent of direction is less than 7. In instances where the number of observations in any direction is 16 but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow d from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances he full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the e arrow is placed in parenthesis.

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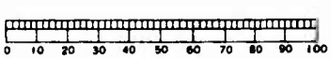
number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for ervations in the upper right hand corner. The number of observations for swell is shown in the lower left hand the area and the percent of calms for those observations in the lower right hand corner.

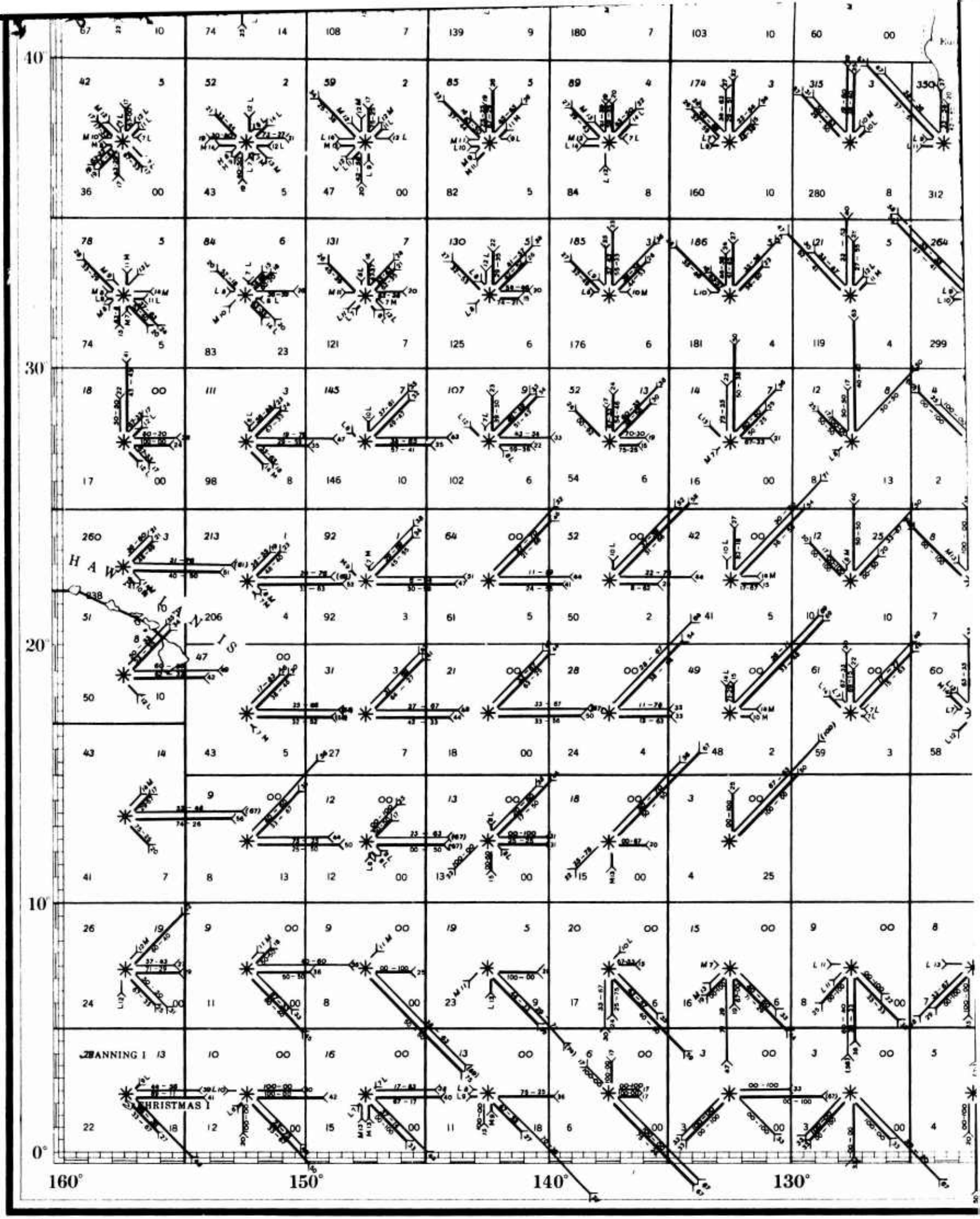
For example—The attached rose should be read as follows:

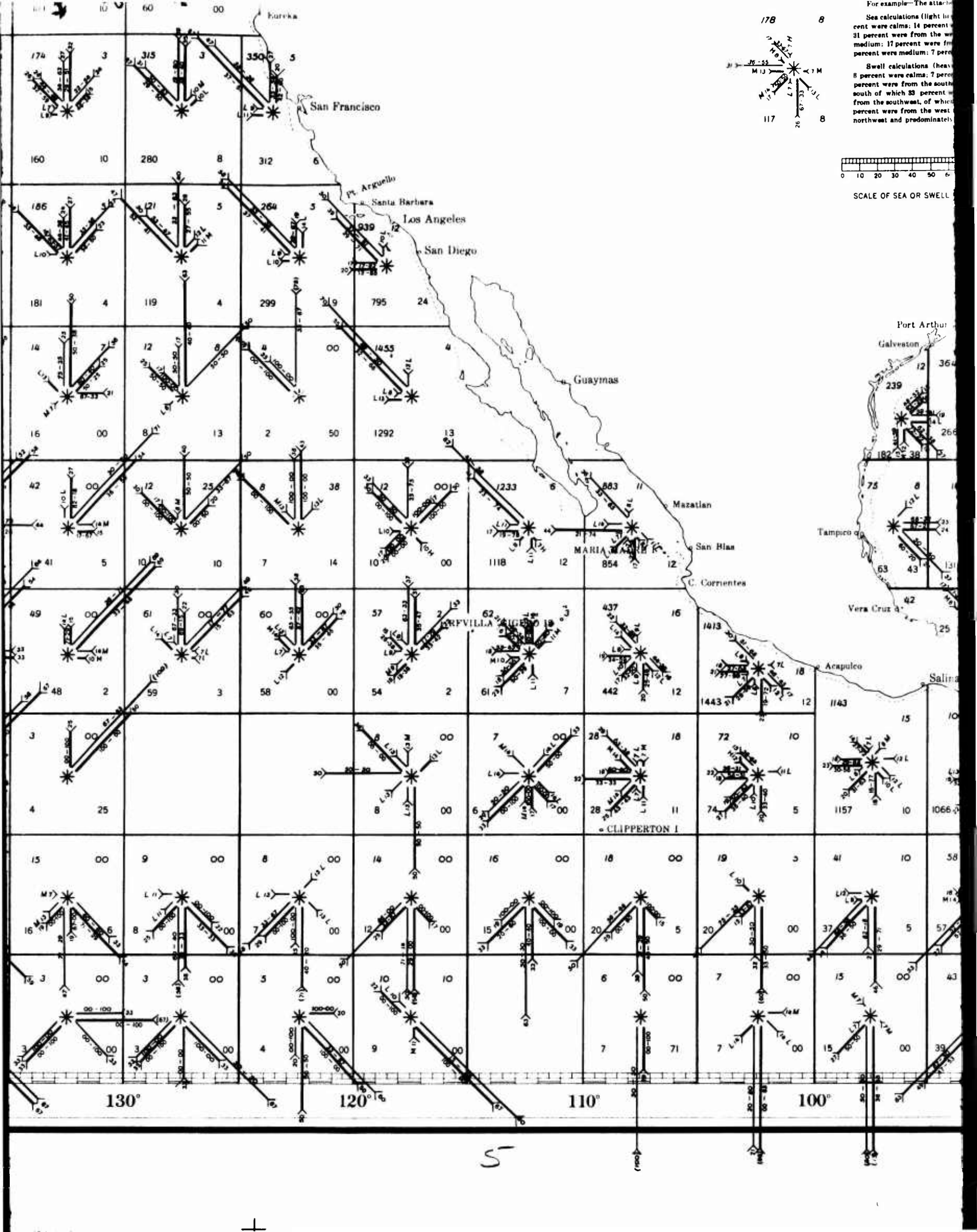
Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms: 14 percent were from the southwest and predominately medium, 31 percent were from the west, of which 55 percent were low and 36 percent were medium: 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms: 7 percent were from the east and predominately medium: 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium. 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES


40°
30°
20°
10°
0°
160°
150°
140°
130°
HAWAII
MAUI
OAHU
KAUAI
NIIHAU
PENNING I
CHRISTMAS I


Eureka
San Francisco
Pt. Arguello
Santa Barbara
Los Angeles
San Diego
Guaymas
Mazatlan
San Blas
C. Corrientes
Acapulco
Port Arthur
Galveston
Tampico
Vera Cruz
CLIPPERTON I
130°
120°
110°
100°
SCALE OF SEA OR SWELL

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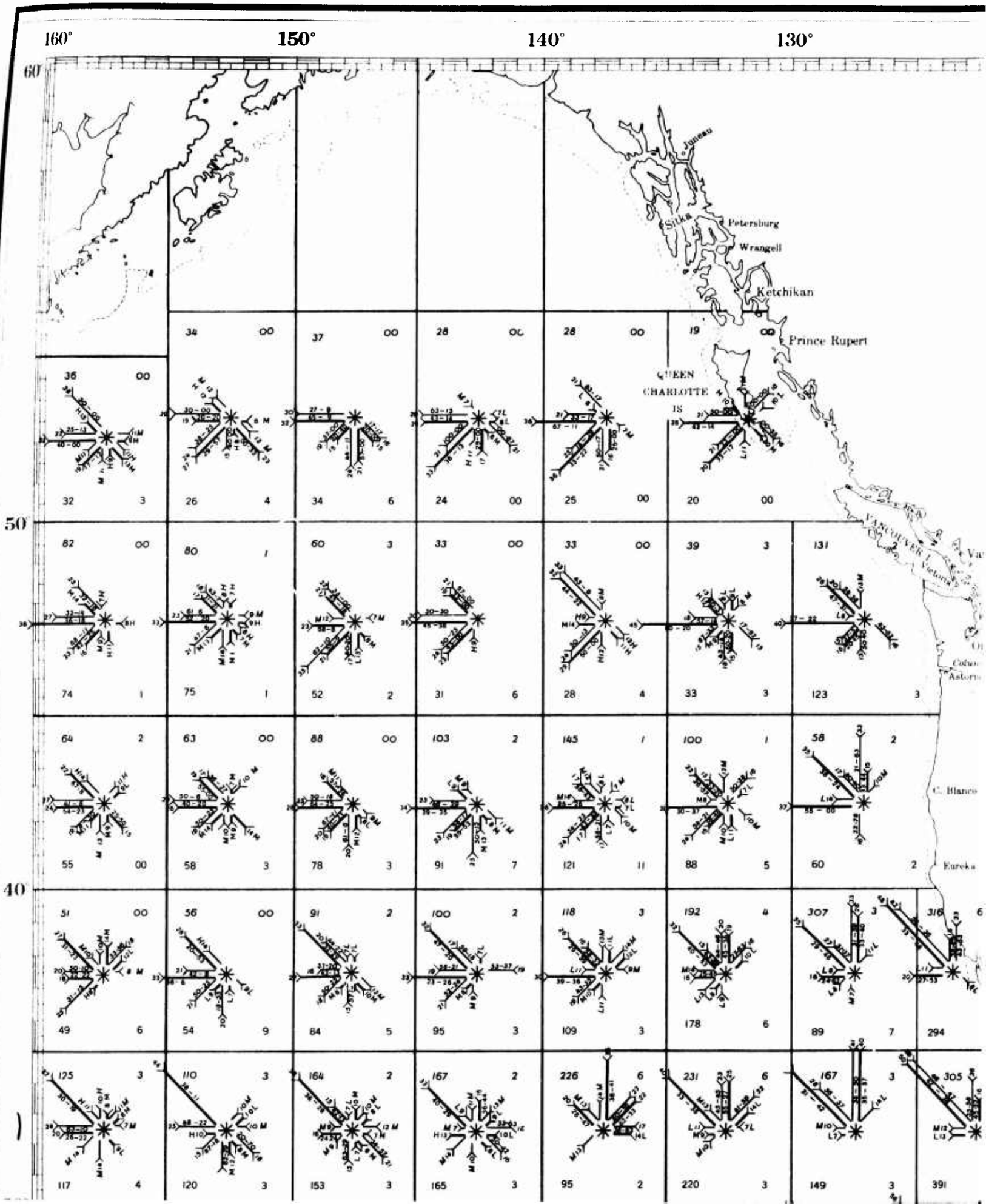
Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 28 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium, 8 percent were from the northwest and predominately high.

SCALE OF SEA OR SWELL PERCENTAGES

Sheet 9


160°
150°
140°
130°
60
50
40
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN CHARLOTTE IS
VANCOUVER I.
Victoria
C. Blanco
Eureka
36 00
32 3
34 00
26 4
37 00
34 6
28 00
24 00
28 00
25 00
19 00
20 00
82 00
74 1
80 1
75 1
60 3
52 2
33 00
31 6
33 00
28 4
39 3
33 3
131 2
123 3
64 2
55 00
63 00
58 3
88 00
78 3
103 2
91 7
145 1
121 11
100 1
88 5
58 2
60 2
51 00
49 6
56 00
54 9
91 2
84 5
100 2
95 3
118 3
109 3
192 4
178 6
307 3
89 7
316 6
294
125 3
117 4
110 3
120 3
164 2
153 3
167 2
165 3
226 6
95 2
231 6
220 3
167 3
149 3
305
391

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

OCTOBER

PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE

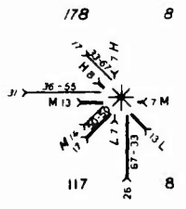
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows.



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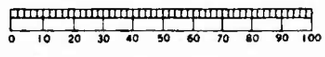
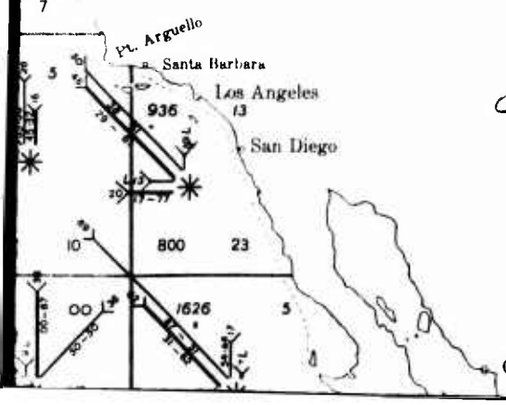


SCALE OF SEA OR SWELL PERCENTAGES



90° 80 60

PACIFIC OCEAN

WELL CHART

OBER

SWELLS AND CALMS

from observations made during the month by the cooperating
year 1942, the majority of the observations having been taken
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tion and the adjacent roses. THE COMPUTATIONS FOR SEA
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THE USER. IT SHOULD BE UNDERSTOOD THAT THE
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PRESENTATION

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HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow
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ward which the seas or swells move. The length of the arrow
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of the percentage. When the percent of direction is less than
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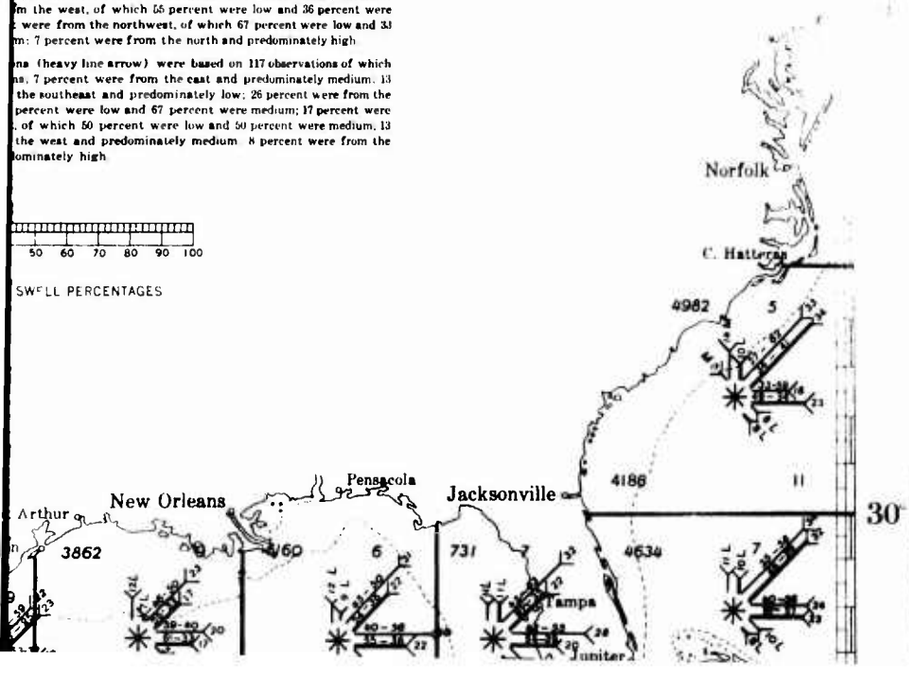
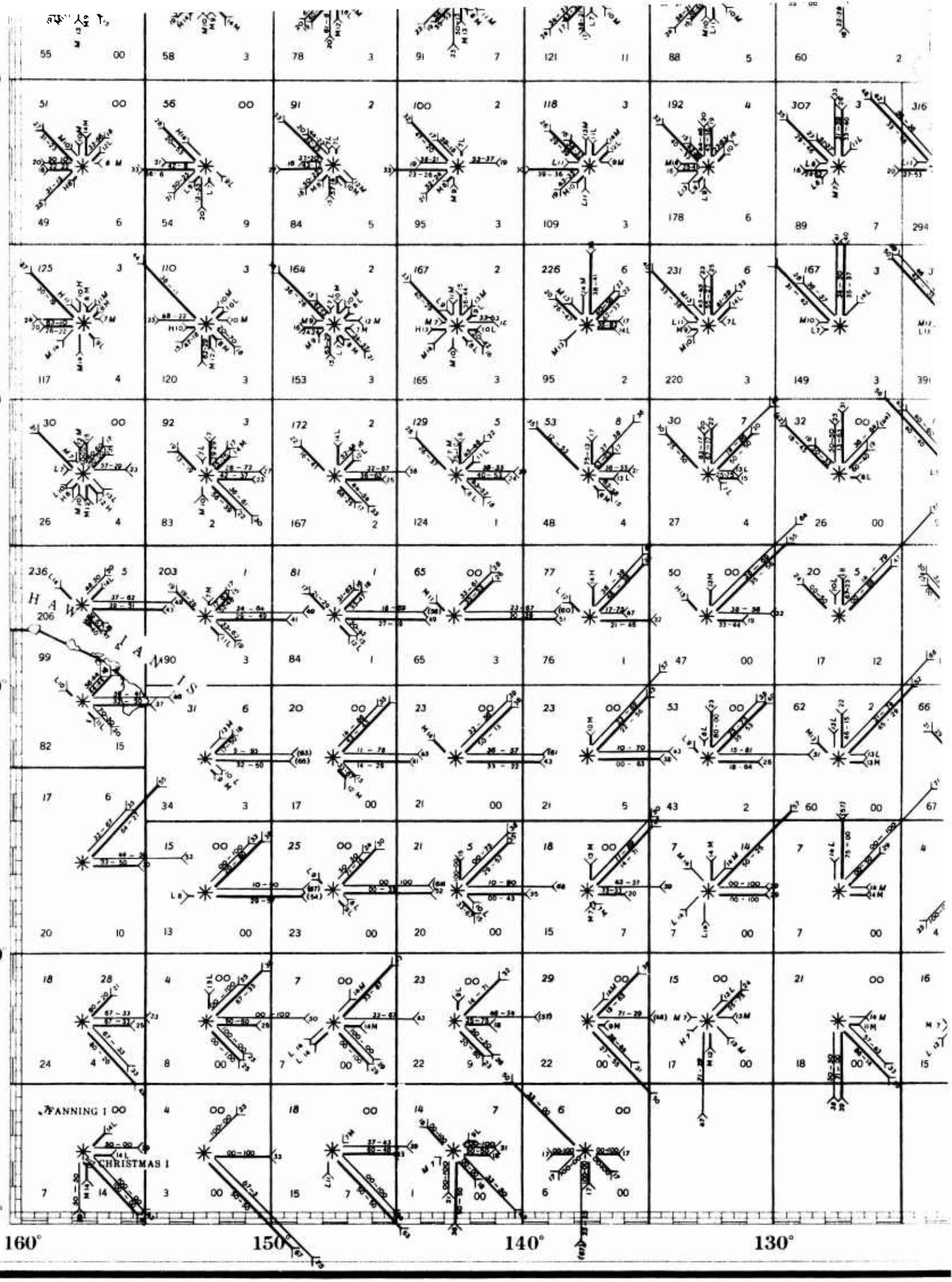
, of which 50 percent were low and 50 percent were medium; 13
the west and predominately medium. 8 percent were from the
ominately high

50 60 70 80 90 100

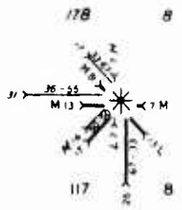
SWELL PERCENTAGES




40
30
20°
10
0°
160°
150°
140°
130°
HAWAII
PANNING I
CHRISTMAS I

those observations in the upper right hand corner. The number of observations for swell
corner of the area and the percent of calms for those observations in the lower right hand

For example--The attached rose should be read a



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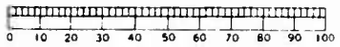
from the southwest, of which 50 percent were low a
percent were from the west and predominately med
northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

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8

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8

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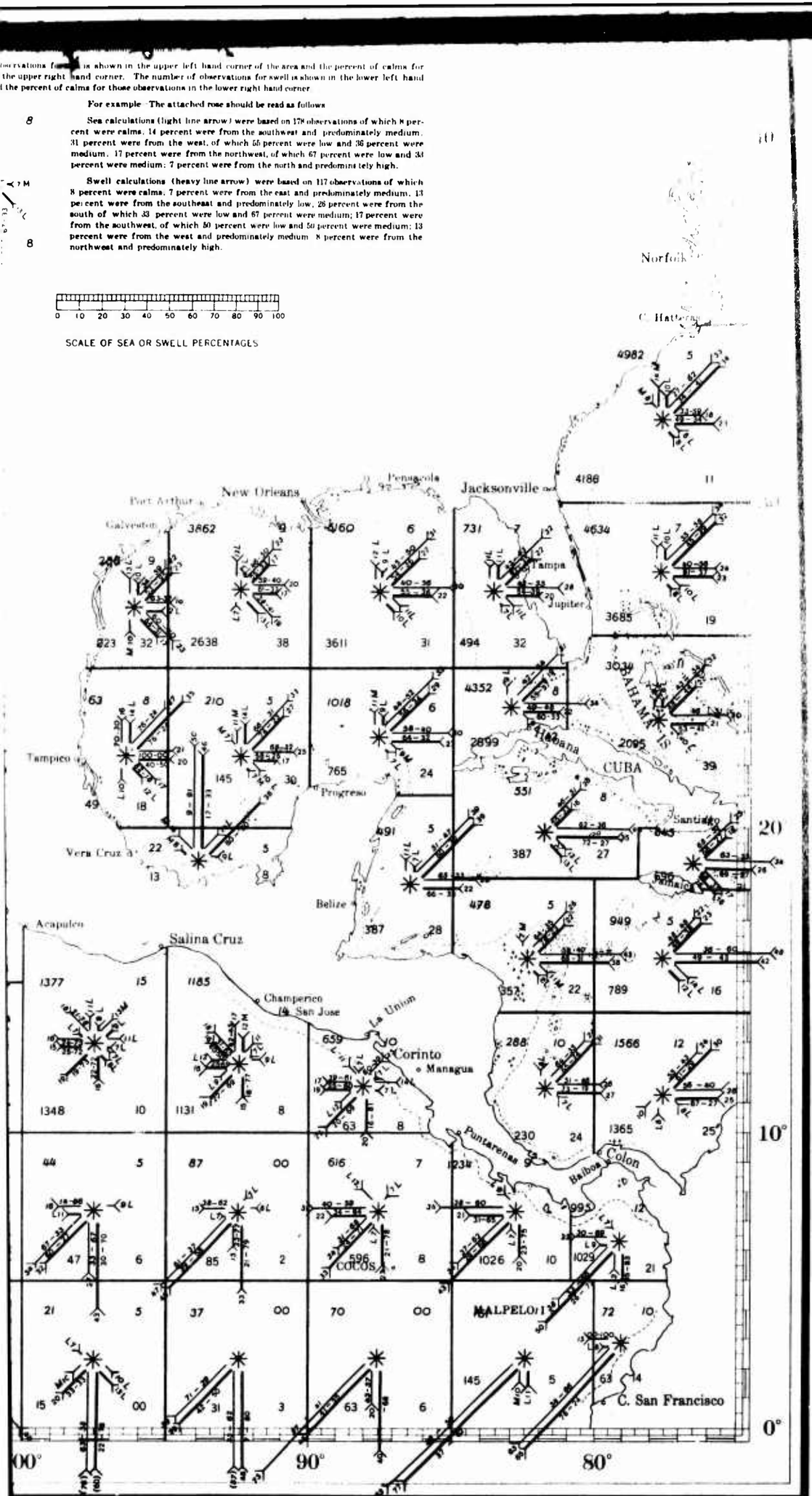
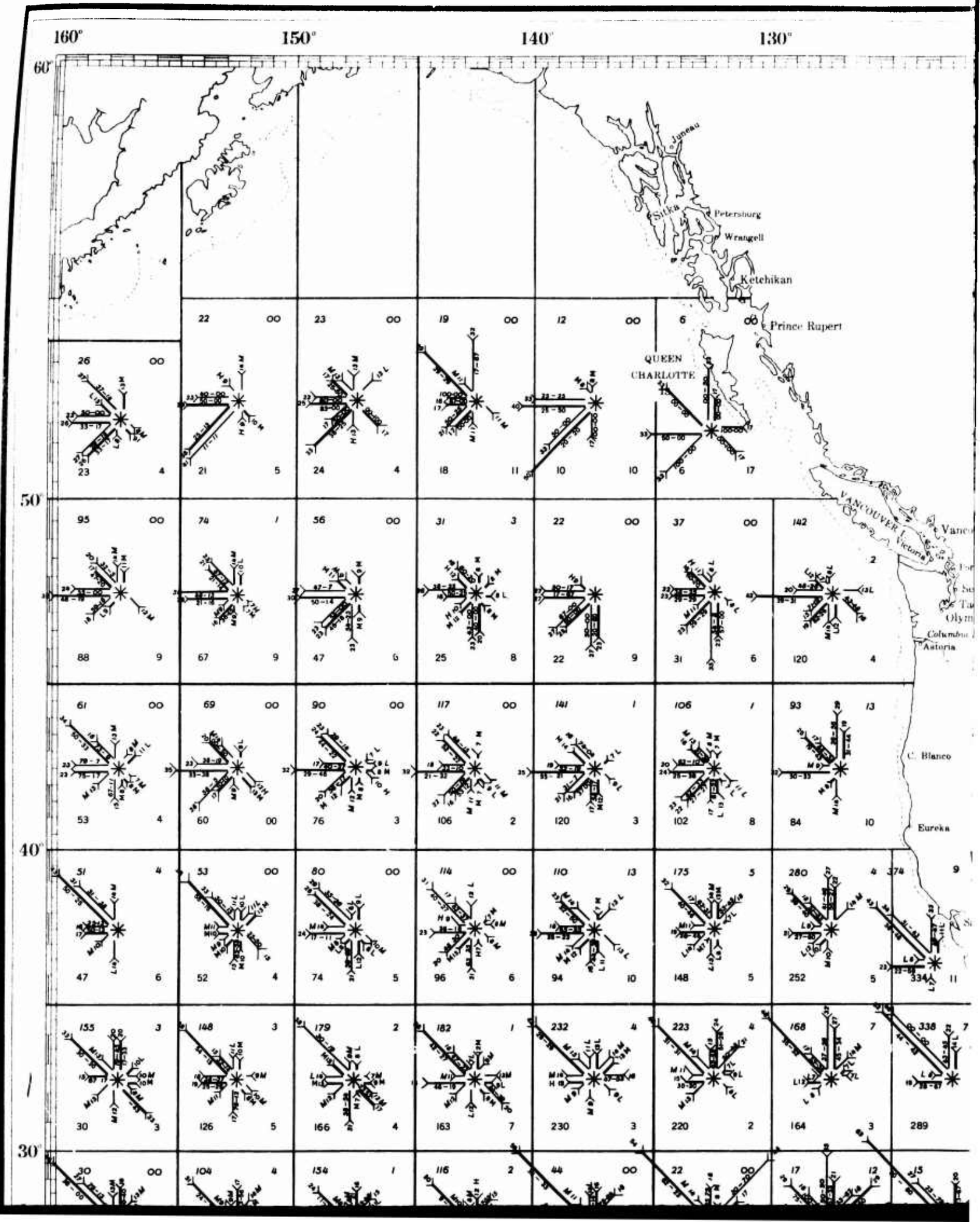
0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES




160°
150°
140°
130°
60°
50°
40°
30°
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
VANCOUVER I.
Victoria
Vanco
Astoria
C. Blanco
Eureka

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

NOVEMBER

PREVAILING SEAS, SWELLS AND CALMS

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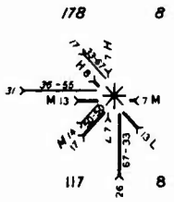

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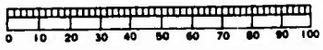
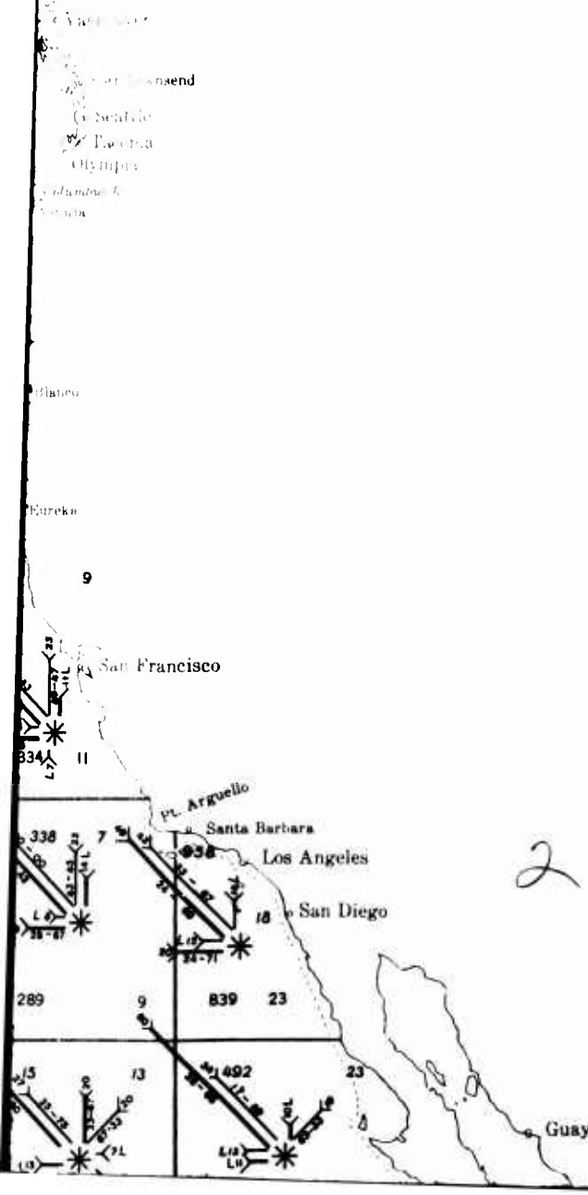


SCALE OF SEA OR SWELL PERCENTAGES



90° 80° 60°

TERN PACIFIC OCEAN

AND SWELL CHART

NOVEMBER

EVAILING SEAS, SWELLS AND CALMS

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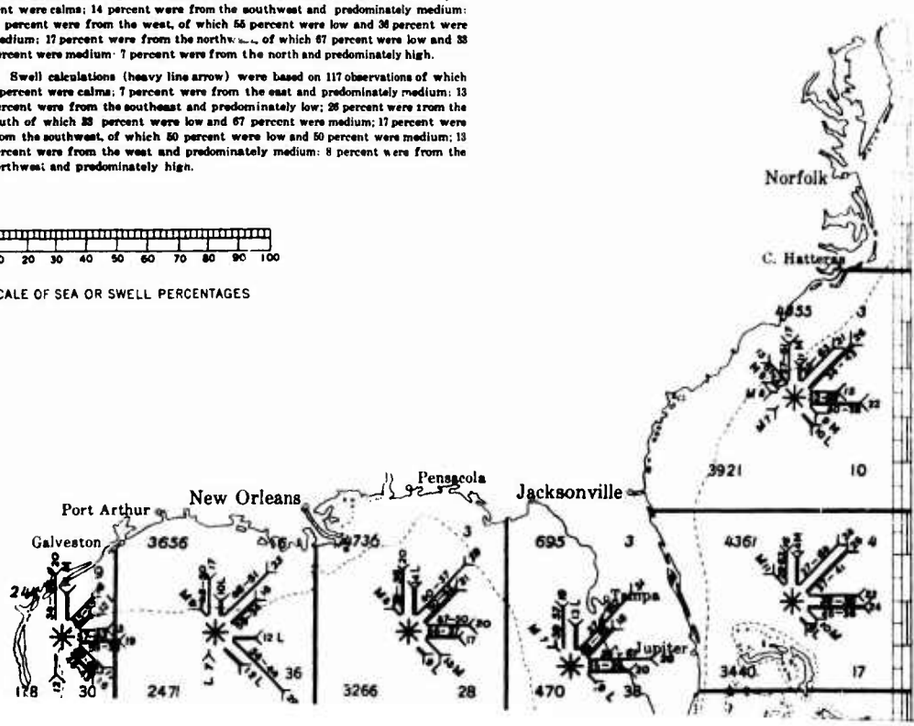
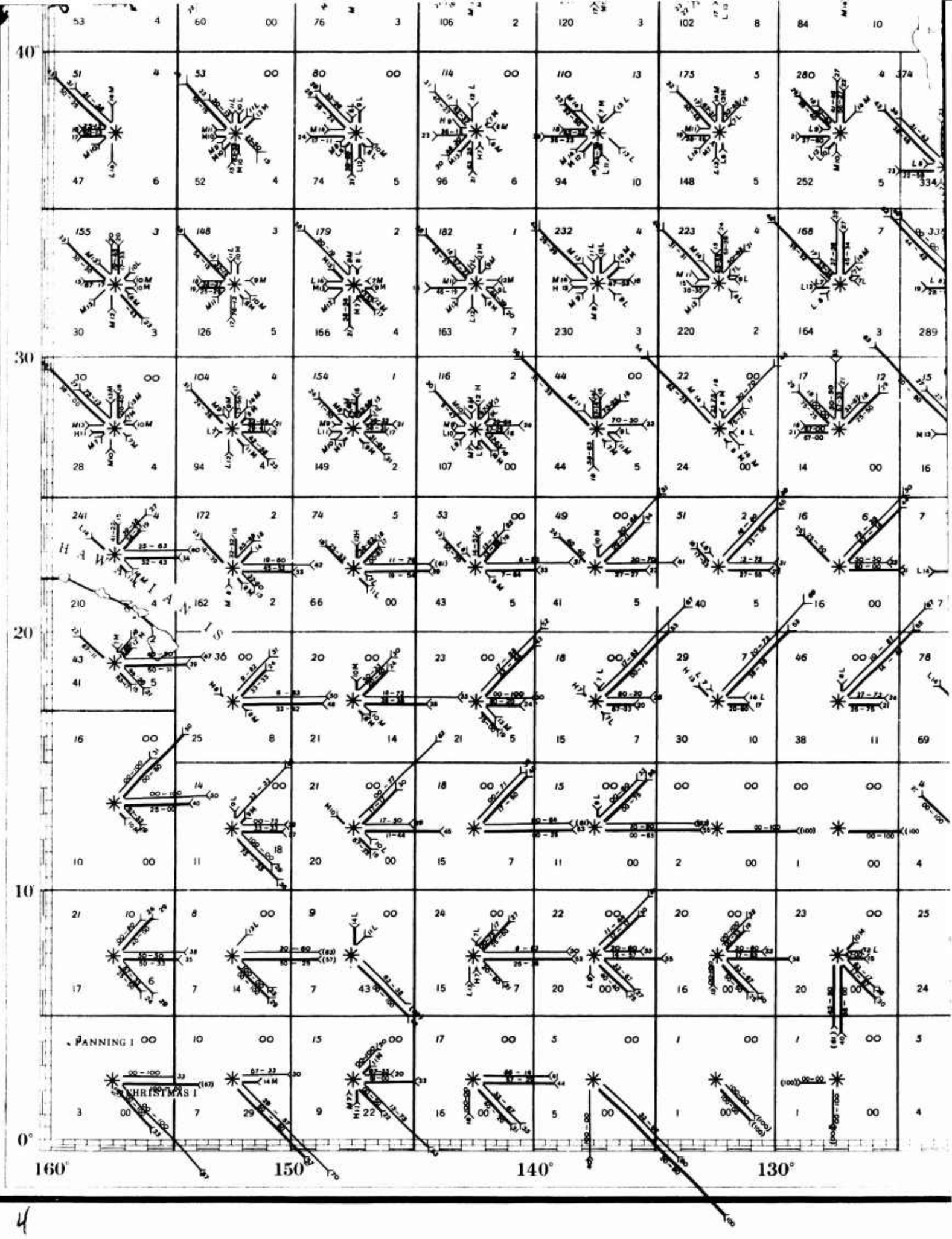
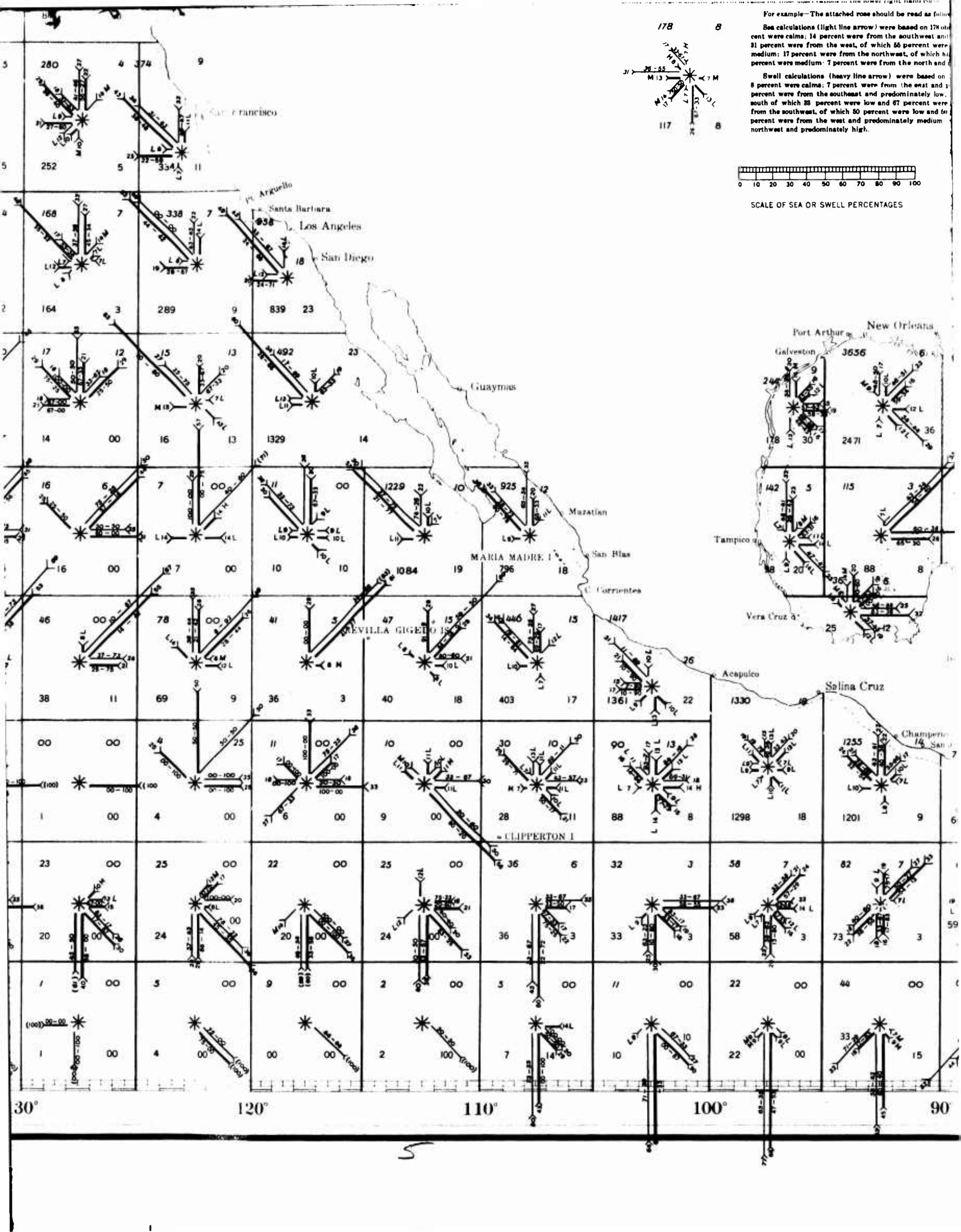
0 10 20 30 40 50 60 70 80 90 100

SCALE OF SEA OR SWELL PERCENTAGES




40°
30°
20°
10°
0°
160°
150°
140°
130°
HAWAIIAN IS
PANNING I
CHRISTMAS I

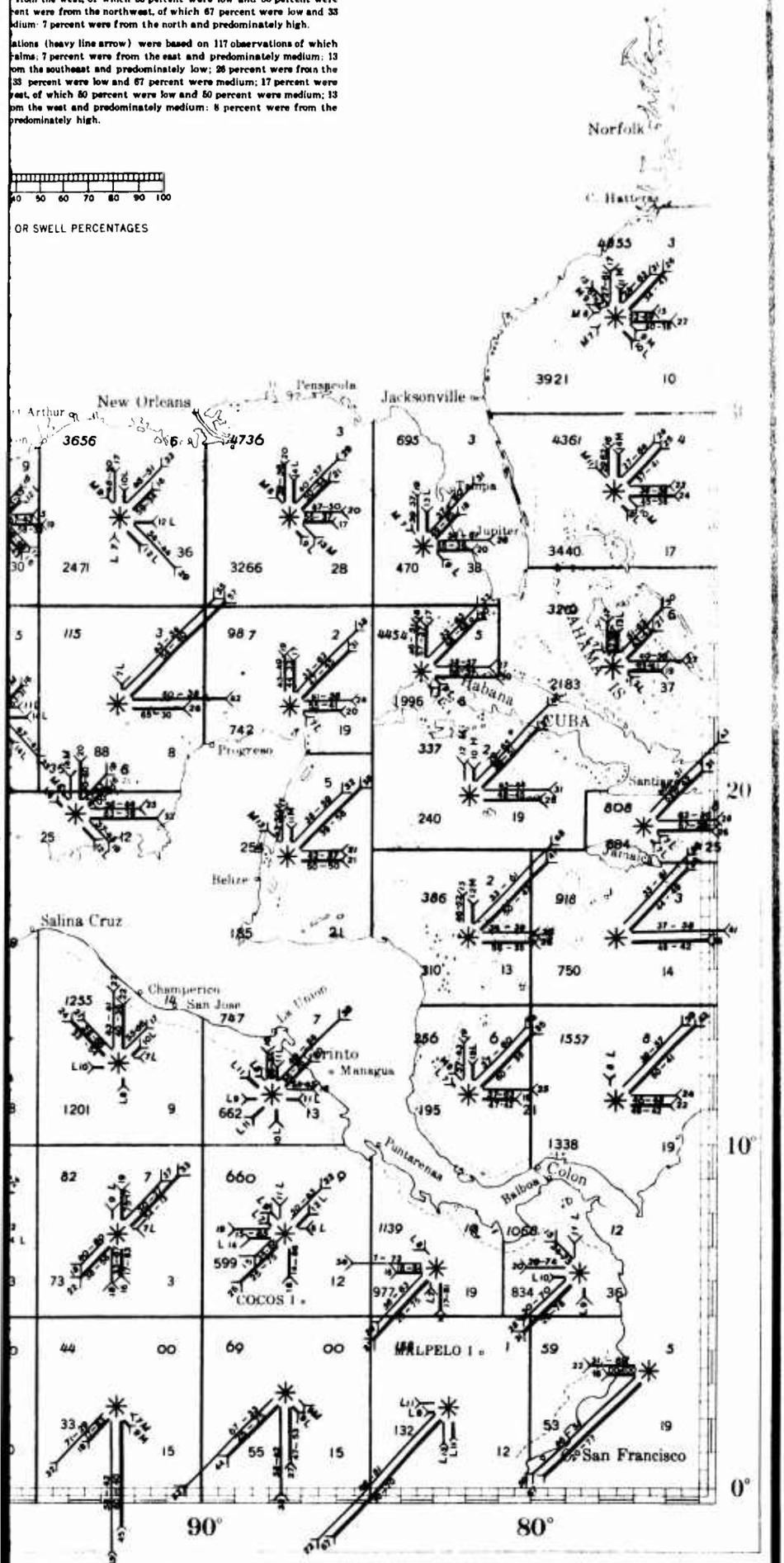

For example—The attached rose should be read as follows:
Sea calculations (light line arrow) were based on 178 observations. 39 percent were calms; 14 percent were from the southwest and predominately low; 31 percent were from the west, of which 55 percent were low and 45 percent were medium; 17 percent were from the northwest, of which 53 percent were low and 47 percent were medium; 7 percent were from the north and east.
Swell calculations (heavy line arrow) were based on 117 observations. 8 percent were calms; 7 percent were from the east and predominately low; 85 percent were from the southeast and predominately low, of which 33 percent were low and 67 percent were medium; 8 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 92 percent were from the west and predominately medium to high, of which 47 percent were from the northwest and predominately high.
0 10 20 30 40 50 60 70 80 90 100
SCALE OF SEA OR SWELL PERCENTAGES
San Francisco
Pt. Arguello
Santa Barbara
Los Angeles
San Diego
Guaymas
Mazatlan
MARIA MADRE I.
San Blas
C. Corrientes
REVILLA GIGEDO IS.
CLIPPERTON I.
Acapulco
Salina Cruz
Champerico
Port Arthur
New Orleans
Galveston
Tampico
Vera Cruz
30°
120°
110°
100°
90°

ons (light line arrow) were based on 178 observations of which 8 per-
, 14 percent were from the southwest and predominately medium-
from the west, of which 55 percent were low and 36 percent were
ent were from the northwest, of which 67 percent were low and 33
dium; 7 percent were from the north and predominately high.

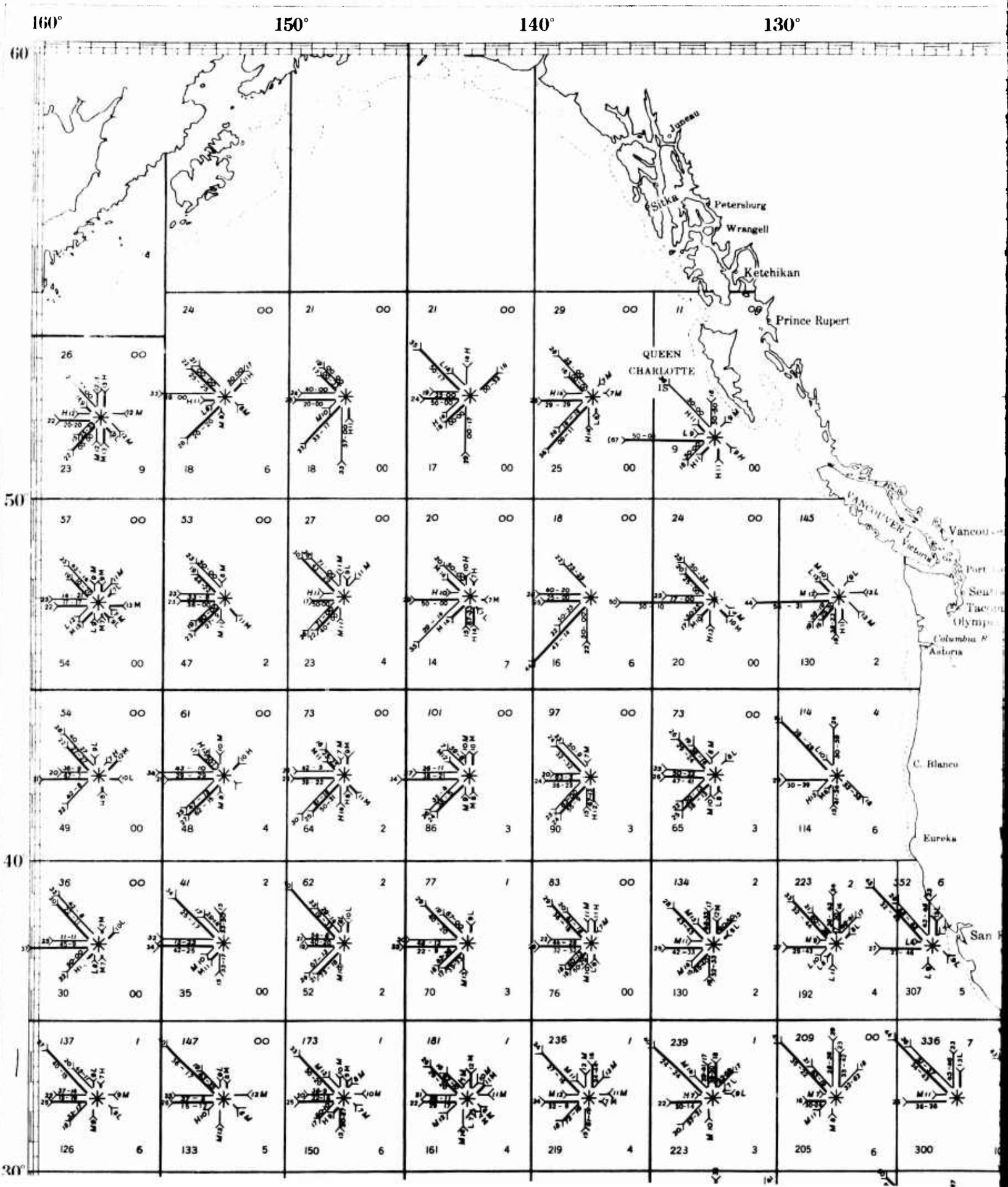
ations (heavy line arrow) were based on 117 observations of which
alms; 7 percent were from the east and predominately medium; 13
om the southeast and predominately low; 26 percent were from the
33 percent were low and 67 percent were medium; 17 percent were
est, of which 50 percent were low and 50 percent were medium; 13
om the west and predominately medium; 8 percent were from the
predominately high.

40 50 60 70 80 90 100

OR SWELL PERCENTAGES



Sheet 11

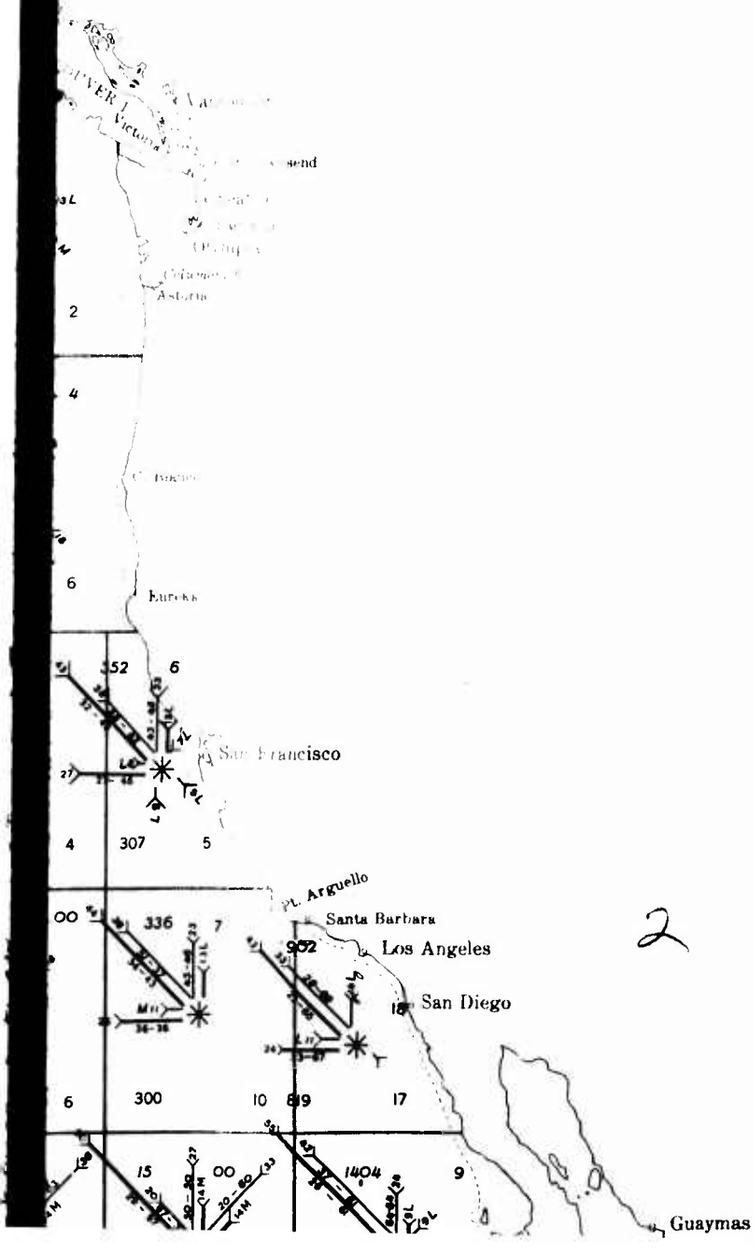

160°
150°
140°
130°
60
50
40
30
Juneau
Sitka
Petersburg
Wrangell
Ketchikan
Prince Rupert
QUEEN
CHARLOTTE
IS.
VANCOUVER I.
Victoria
Vancou
Port
Seat
Tacc
Olymp
Columbia R.
Astoria
C. Blanco
Eureka
San F
26 00
23 9
24 00
18 6
21 00
18 00
21 00
17 00
29 00
25 00
11 00
9 00
57 00
54 00
53 00
47 2
27 00
23 4
20 00
14 7
18 00
16 6
24 00
20 00
145
130 2
54 00
49 00
61 00
48 4
73 00
64 2
101 00
86 3
97 00
90 3
73 00
65 3
114 4
114 6
36 00
30 00
41 2
35 00
62 2
52 2
77 1
70 3
83 00
76 00
134 2
130 2
223 2
192 4
352 6
307 5
137 1
126 6
147 00
133 5
173 1
150 6
181 1
161 4
236 1
219 4
239 1
223 3
209 00
205 6
336 7
300

120° 110° 100° 90°

NORTHEASTERN PACIFIC OCEAN

SEA AND SWELL CHART

DECEMBER



PREVAILING SEAS, SWELLS AND CALMS

The information shown on this chart has been compiled from observations made during the month by the cooperating observers of the Hydrographic Office to and including the year 1942, the majority of the observations having been taken during the years 1932 to 1940 inclusive. The Hydrographic Office has shown all information in its files, however slight, and in some areas where the number of observations is small the graphical presentation will convey a false impression unless examined thoroughly. In evaluating the reliability of the information for any given area consider the number of observations, the geographical position, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA AND SWELL WERE MADE SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE SAME CHART FOR THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE DIRECTION OF SEA AND SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT NECESSARILY BE IDENTICAL AT ANY GIVEN TIME OR PLACE.

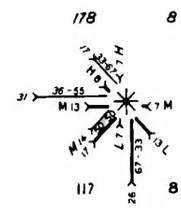
METHOD OF PRESENTATION

The purpose of this chart is to show both graphically and with figures, by means of an eight point double rose, printed in black, the character of the seas and swells that have prevailed within the areas outlined on the brown base. THE SEA CONDITIONS ARE REPRESENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE SWELL CONDITIONS ARE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow is shown when the percent of direction is less than 7. In instances where the number of observations in any direction is 15 or over but the percent of direction is less than 7, the conditions within that direction may be shown in the usual manner without the arrow. The arrows point in the directions toward which the seas or swells move. The length of the arrow measured from the center mark, when placed on the attached scale and the numeral at the tail of the arrow, gives the number of times in each 100 observations that the seas or swells have been moving from or near the given point. In instances where the full length of the arrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the tail of the arrow is placed in parenthesis.

When the percent of direction is 15 or over, the conditions within the direction are shown along the shaft of the arrow in percentage of low and medium seas or swells, the first figure from the center is always the percent of low. The percent of high seas or swells within the direction is the remainder of the percentage. When the percent of direction is less than 15 but more than 6, the conditions within the direction are shown by the letter L, M, or H (meaning predominately low, medium or high) beside the percentage figures for direction. The conditions of seas and swells (low, medium and high) within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

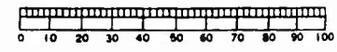
The number of observations for : a is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right nand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows:



Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium: 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium: 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

90° 80°

60

STERN PACIFIC OCEAN

AND SWELL CHART

DECEMBER

PREVAILING SEAS, SWELLS AND CALMS

this chart has been compiled from observations made during the month by the cooperating Office to and including the year 1942, the majority of the observations having been taken clusive. The Hydrographic Office has shown all information in its files, however slight, and er of observations is small the graphical presentation will convey a false impression unless luating the reliability of the information for any given area consider the number of obser- ion, the percentages of direction and the adjacent roses. THE COMPUTATIONS FOR SEA SEPARATELY AND ALTHOUGH THE CONDITIONS FOR BOTH ARE SHOWN ON THE CONVENIENCE OF THE USER, IT SHOULD BE UNDERSTOOD THAT THE SWELL AS WELL AS THE CONDITIONS UNDER THOSE DIRECTIONS WILL NOT CAL AT ANY GIVEN TIME OR PLACE.

METHOD OF PRESENTATION

s to show both graphically and with figures, by means of an eight point double rose, printed eas and swells that have prevailed within the areas outlined on the brown base. THE SEA SENTED BY THE LIGHT LINE ARROWS AND SLANTING TYPE, WHILE THE REPRESENTED BY THE HEAVY LINE ARROWS AND VERTICAL TYPE. No arrow direction is less than 7. In instances where the number of observations in any direction is 15 rection is less than 7, the conditions within that direction may be shown in the usual manner w point in the directions toward which the seas or swells move. The length of the arrow ark, when placed on the attached scale and the numeral at the tail of the arrow, gives the servations that the seas or swells have been moving from or near the given point. In instances rrow cannot be shown, the shaft is shortened as much as necessary and the true percent at the arenthesis.

tion is 15 or over, the conditions within the direction are shown along the shaft of the arrow um seas or swells, the first figure from the center is always the percent of low. The percent he direction is the remainder of the percentage. When the percent of direction is less than tions within the direction are shown by the letter L, M, or H (meaning predominately low, rcentage figures for direction. The conditions of seas and swells (low, medium and high) fined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of swells, those of amounts 5 and above.

ns for sea is shown in the upper left hand corner of the area and the percent of calms for r right hand corner. The number of observations for swell is shown in the lower left hand cent of calms for those observations in the lower right hand corner.

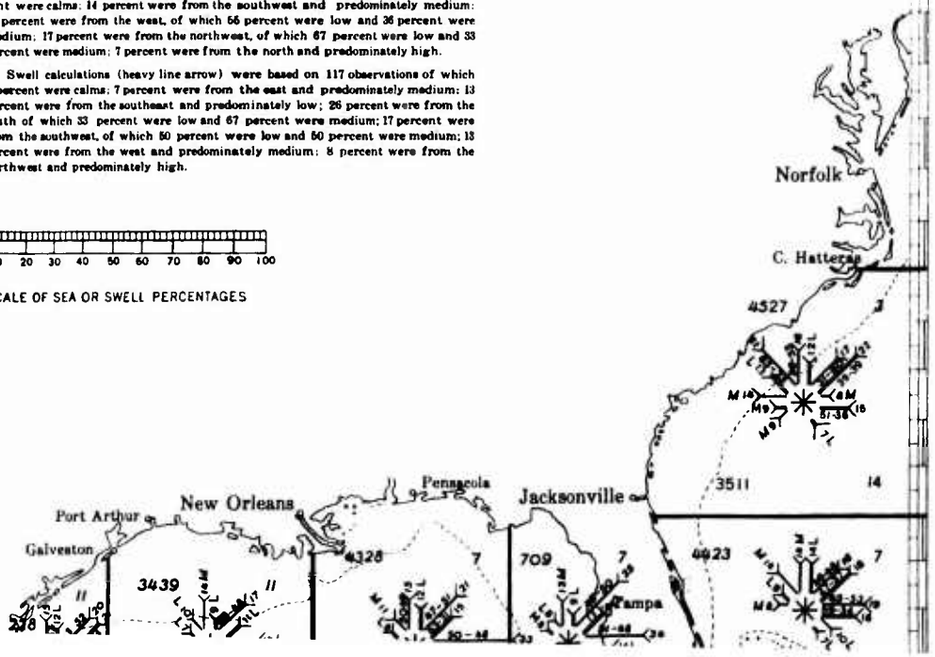
For example—The attached rose should be read as follows:

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 66 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.

0 10 20 30 40 50 60 70 80 90 100

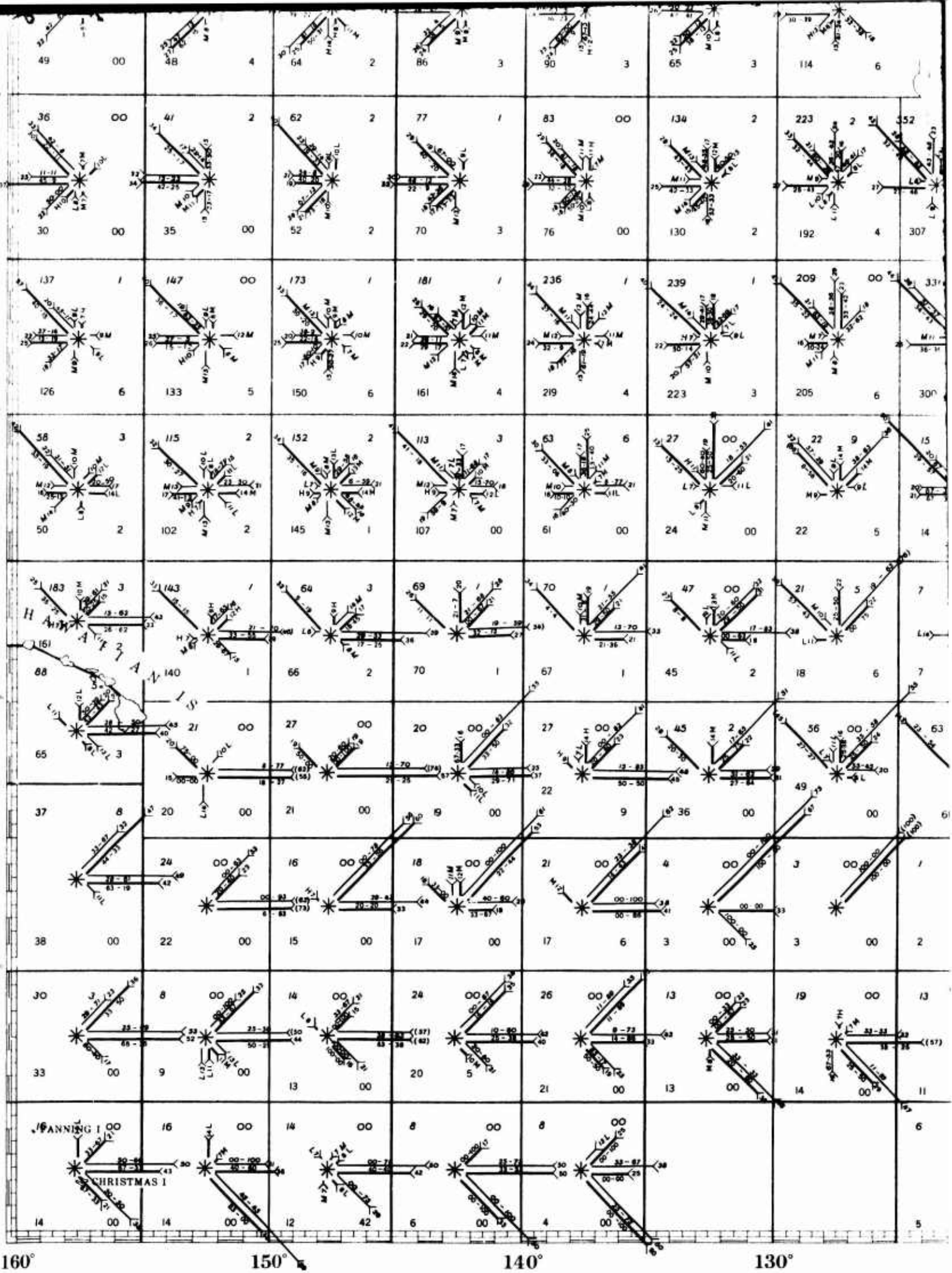
SCALE OF SEA OR SWELL PERCENTAGES



50

40°

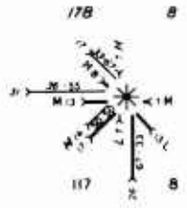
30°


10°
30°
20°
10°
0°
160°
150°
140°
130°
HAWAIIAN ISLANDS
PANNING I
CHRISTMAS I

within each direction, are defined as follows: low seas or swells, those of amounts 1 and 2; medium seas or swells, those of amounts 3 and 4; high seas or swells, those of amounts 5 and above.

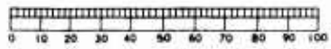
The number of observations for sea is shown in the upper left hand corner of the area and the percent of calms for those observations in the upper right hand corner. The number of observations for swell is shown in the lower left hand corner of the area and the percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows



Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms; 14 percent were from the southwest and predominately medium; 31 percent were from the west, of which 55 percent were low and 36 percent were medium; 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium; 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 60 percent were low and 60 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



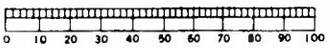
SCALE OF SEA OR SWELL PERCENTAGES

stations for sea is shown in the upper left hand corner of the area and the percent of calms for upper right hand corner. The number of observations for swell is shown in the lower left hand percent of calms for those observations in the lower right hand corner.

For example—The attached rose should be read as follows.

Sea calculations (light line arrow) were based on 178 observations of which 8 percent were calms. 14 percent were from the southwest and predominately medium. 31 percent were from the west, of which 66 percent were low and 36 percent were medium. 17 percent were from the northwest, of which 67 percent were low and 33 percent were medium. 7 percent were from the north and predominately high.

Swell calculations (heavy line arrow) were based on 117 observations of which 8 percent were calms; 7 percent were from the east and predominately medium; 13 percent were from the southeast and predominately low; 26 percent were from the south of which 33 percent were low and 67 percent were medium; 17 percent were from the southwest, of which 50 percent were low and 50 percent were medium; 13 percent were from the west and predominately medium; 8 percent were from the northwest and predominately high.



SCALE OF SEA OR SWELL PERCENTAGES

6