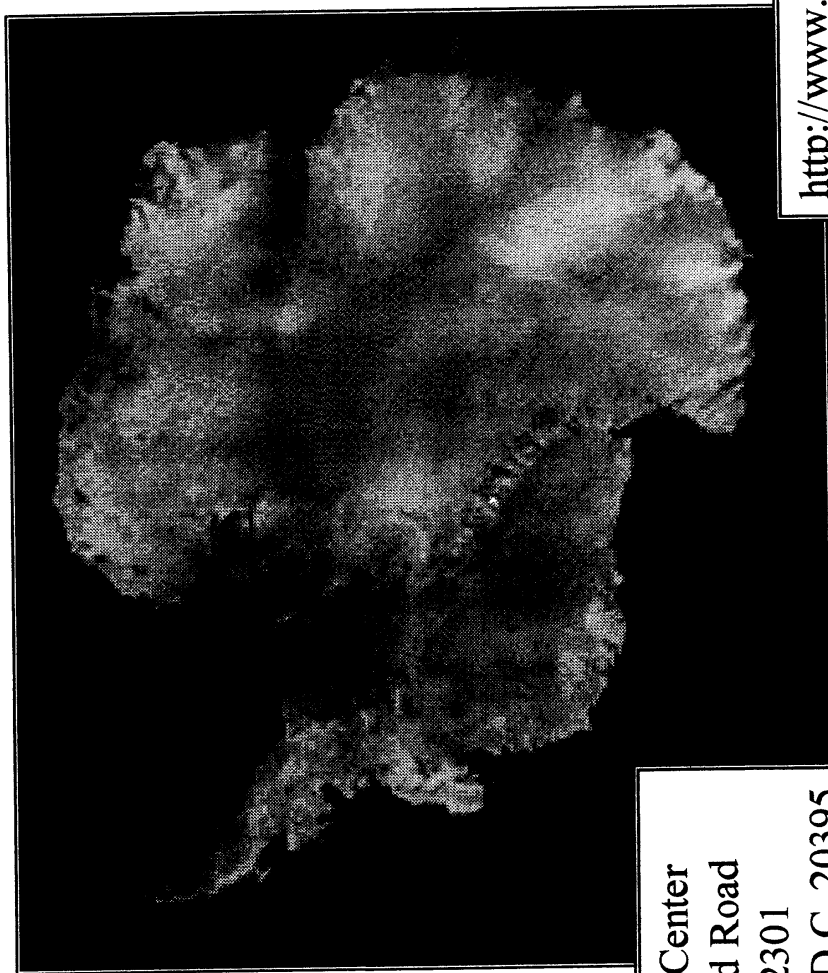




**National Ice Center
Antarctic Sea Ice Atlas
1996**



19990722 019



National Ice Center
4251 Suitland Road
FB4, Room 2301
Washington D.C. 20395

<http://www.natice.noaa.gov>

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DTIC QUALITY INSPECTED 4

PREFACE

The National Ice Center (NIC), under sponsorship of the United States Navy, the United States Coast Guard, and the National Oceanic and Atmospheric Administration (NOAA), provides sea ice analyses encompassing the "Arctic" and the "Antarctic". These analyses continue the data set established under our previous name, the Joint Ice Center. These atlases continue the near real-time integration of remotely sensed data and point observations and differ only in that the Arctic and Antarctic are split into two separate publications per hemisphere per year.

This publication is the 11th edition of the annual "Antarctic Sea Ice Atlas" published in hard copy format by the NIC. The atlas contains weekly charts depicting the sea ice extent and coverage in the Southern Hemisphere from the first week of January through December 1996.

The NIC uses a wide variety of data sources in the production of sea ice analyses. Table 1 lists the data sources used to produce the Antarctic weekly ice analyses contained in this publication. The line types used in the analyses provide metadata information with regard to sensor type. Solid lines depict boundaries derived from: point observations, Defense Meteorological Satellite Program Operational Line Scan (DMSP OLS) and NOAA Advanced Very High-Resolution Radiometer (AVHRR) data. Dash-dash-dotted line depicts boundaries derived from DMSP Special Sensor Microwave Imager (SSM/I), and dashed lines depict boundaries derived from forecast models and climatology.

Please direct questions or comments to the NIC Liaison Branch, at phone number (301) 457-5303 extension 311 or 303, facsimile number (301)457-5300, or electronic mail address: lialison@natice.noaa.gov

Atlas addendum: This publication is intended to serve as an interim solution, while transitioning to distribution via CD-ROM. The purpose of this atlas is to make all National Ice Center (NIC) sea ice charts available to customers using NIC designated archive centers. By fall 1999, it is anticipated that NIC will complete and distribute Arctic/Antarctic ice atlases on CD-ROM for 1995, 1996, 1997 and 1998. It should be noted that the charts presented in this atlas have been drawn by hand for operational use. Corrections to "hand annotations" are visible on some of the charts in the atlas.

From	To	Sensor Platform	Sensor and Type	Spectral Region	Resolution	Coverage
01-96	12-96	DMSP F-10, 11, 12, 13	OLS Fine: VIS IR SSM/I	0.4 to 1.1 μm 10.2 to 12.8 μm 19.35 and 37GHz	0.55 km 25 km	3,012km 3,012km
01-96	12-96	NOAA 12, 14	AVHRR: HRPT/LAC VIS NIR IR	0.58 to 0.68 μm 0.72 to 1.10 μm 3.55 to 3.93 μm	1.1km at nadir; 2.5km at swath edge	4,000km

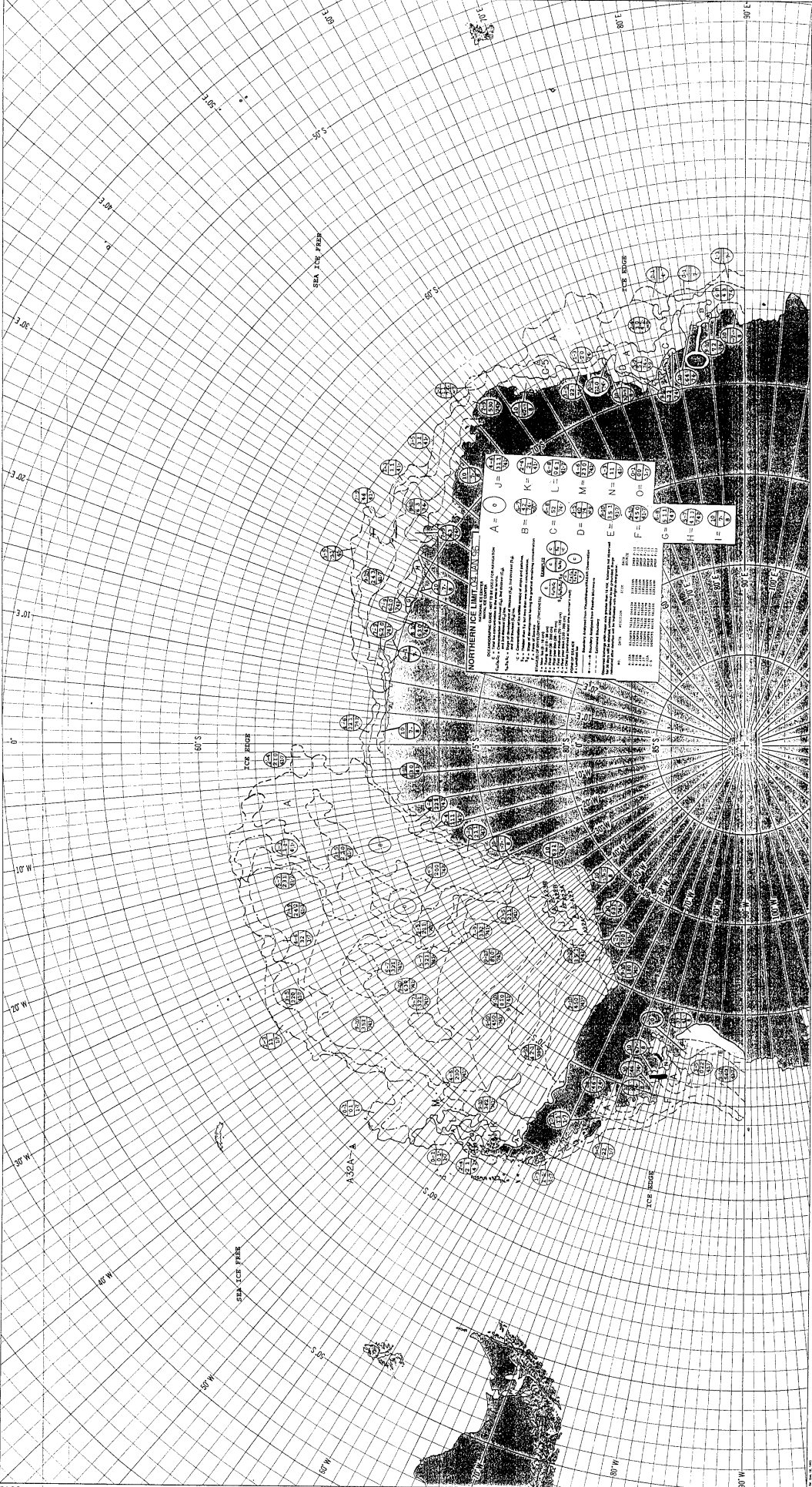
TABLE 1. 1996 Antarctic Satellite Data Sources

Abbreviations and Acronyms:

AVHRR- Advanced Very High Resolution Radiometer
cm- centimeter
GHz- Gigahertz
HRPT- High Resolution Picture transmission
IR- Infrared
km- kilometer
LAC- Local Area Coverage
NIR- Near Infrared
OLS- Operational Linescan System
SSM/I- Special Sensor Microwave Imager
 μm - micrometer
VIS- Visible

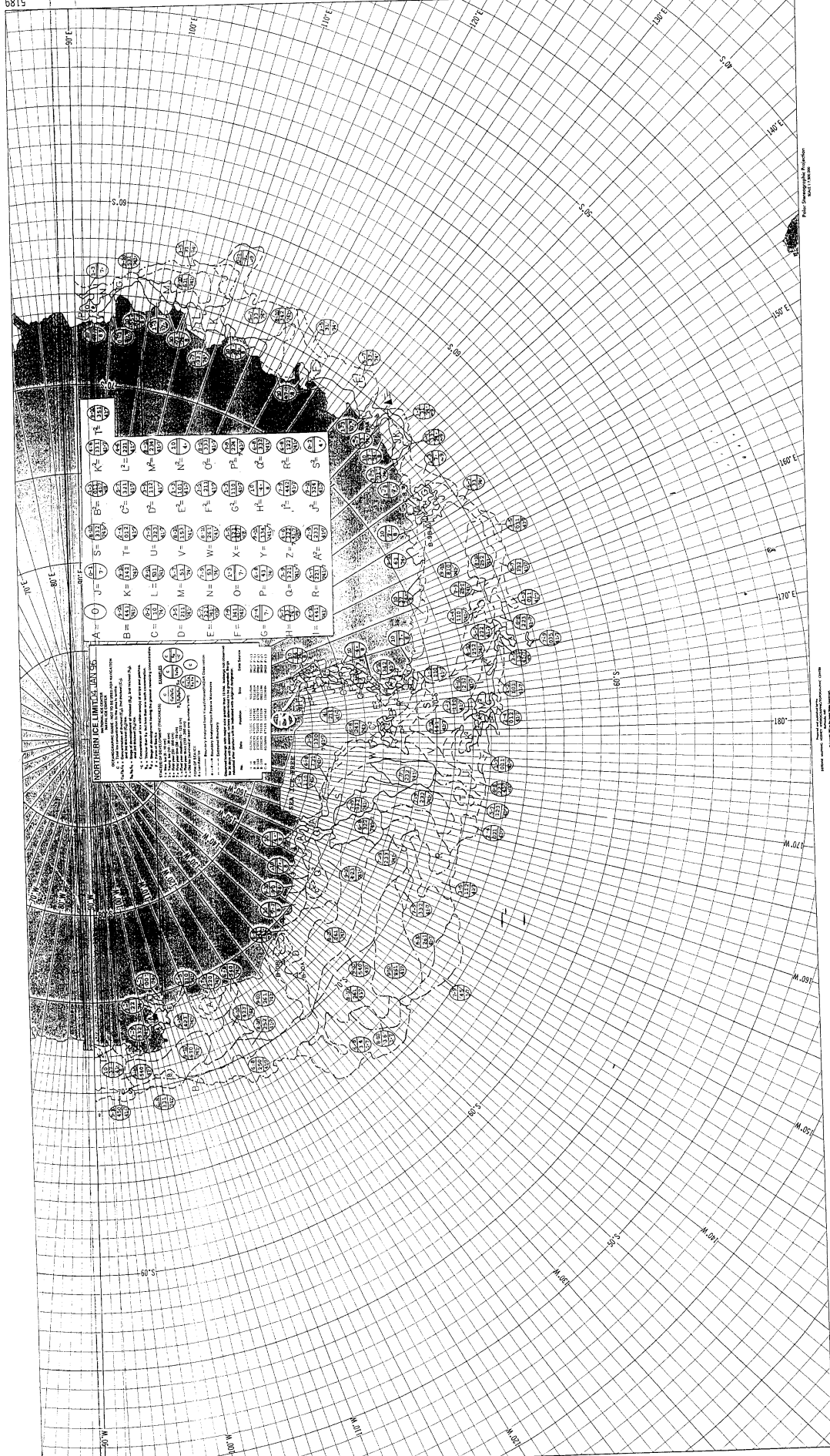
Antarctica satellite composite courtesy of United States Geological Survey, Flagstaff, AZ.
(<http://lerraWeb.wr.usgs.gov/TRS/projects/Antarctica/color/images>).

Prepared under the authority of Commander, Naval Oceanography Command, Stennis Space Center, MS 39529-5000



NORTH ATLANTIC OCEAN
 Magnetic Variation Table

Year	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
A = 0	0	0	0	0	0	0	0	0	0	0
B = 1	1	1	1	1	1	1	1	1	1	1
C = 2	2	2	2	2	2	2	2	2	2	2
D = 3	3	3	3	3	3	3	3	3	3	3
E = 4	4	4	4	4	4	4	4	4	4	4
F = 5	5	5	5	5	5	5	5	5	5	5
G = 6	6	6	6	6	6	6	6	6	6	6
H = 7	7	7	7	7	7	7	7	7	7	7
I = 8	8	8	8	8	8	8	8	8	8	8
J = 9	9	9	9	9	9	9	9	9	9	9
K = 10	10	10	10	10	10	10	10	10	10	10
L = 11	11	11	11	11	11	11	11	11	11	11
M = 12	12	12	12	12	12	12	12	12	12	12
N = 13	13	13	13	13	13	13	13	13	13	13
O = 14	14	14	14	14	14	14	14	14	14	14
P = 15	15	15	15	15	15	15	15	15	15	15
Q = 16	16	16	16	16	16	16	16	16	16	16
R = 17	17	17	17	17	17	17	17	17	17	17
S = 18	18	18	18	18	18	18	18	18	18	18
T = 19	19	19	19	19	19	19	19	19	19	19
U = 20	20	20	20	20	20	20	20	20	20	20
V = 21	21	21	21	21	21	21	21	21	21	21
W = 22	22	22	22	22	22	22	22	22	22	22
X = 23	23	23	23	23	23	23	23	23	23	23
Y = 24	24	24	24	24	24	24	24	24	24	24
Z = 25	25	25	25	25	25	25	25	25	25	25



ALPHABETIC INDEX

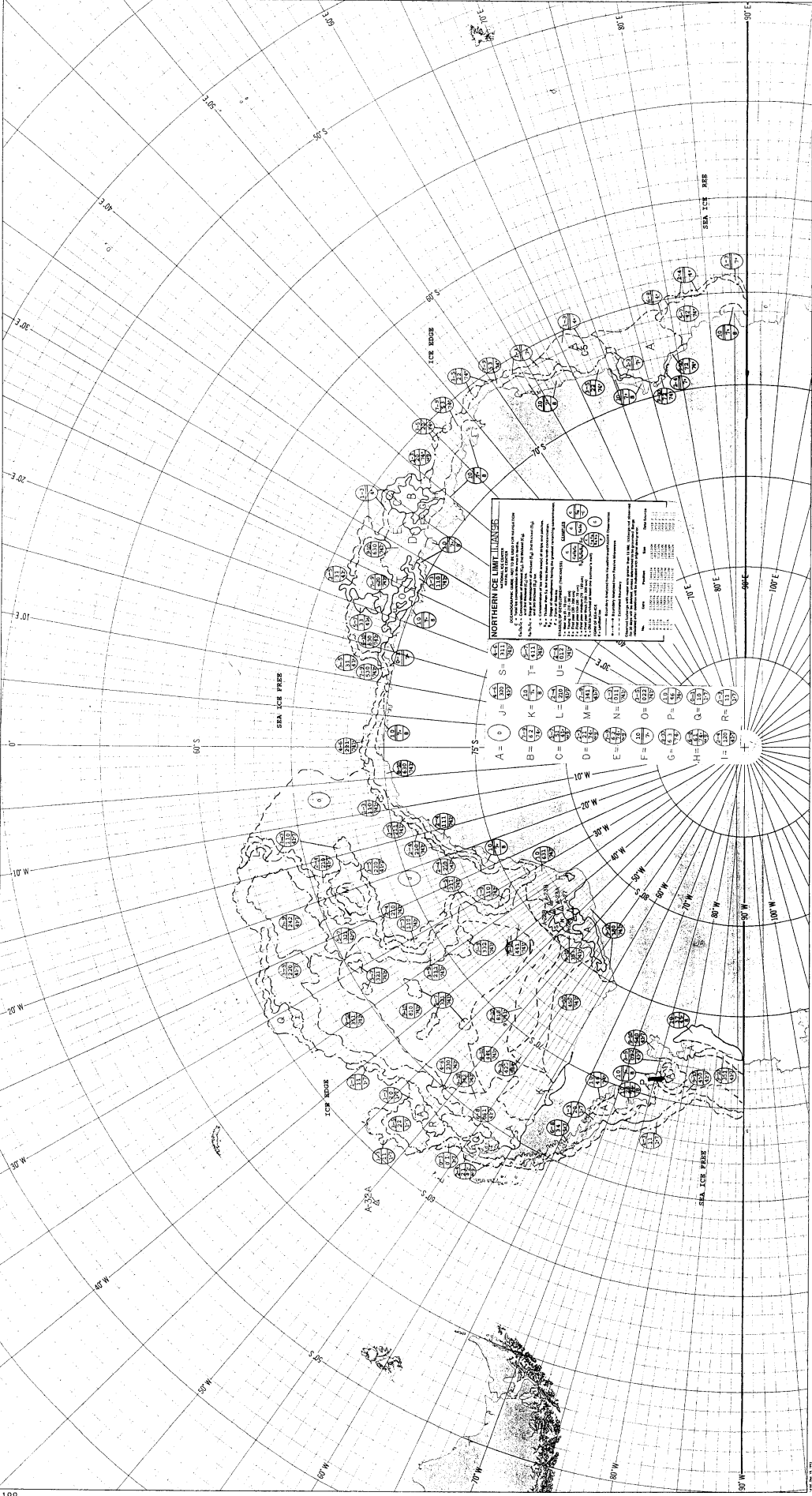
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

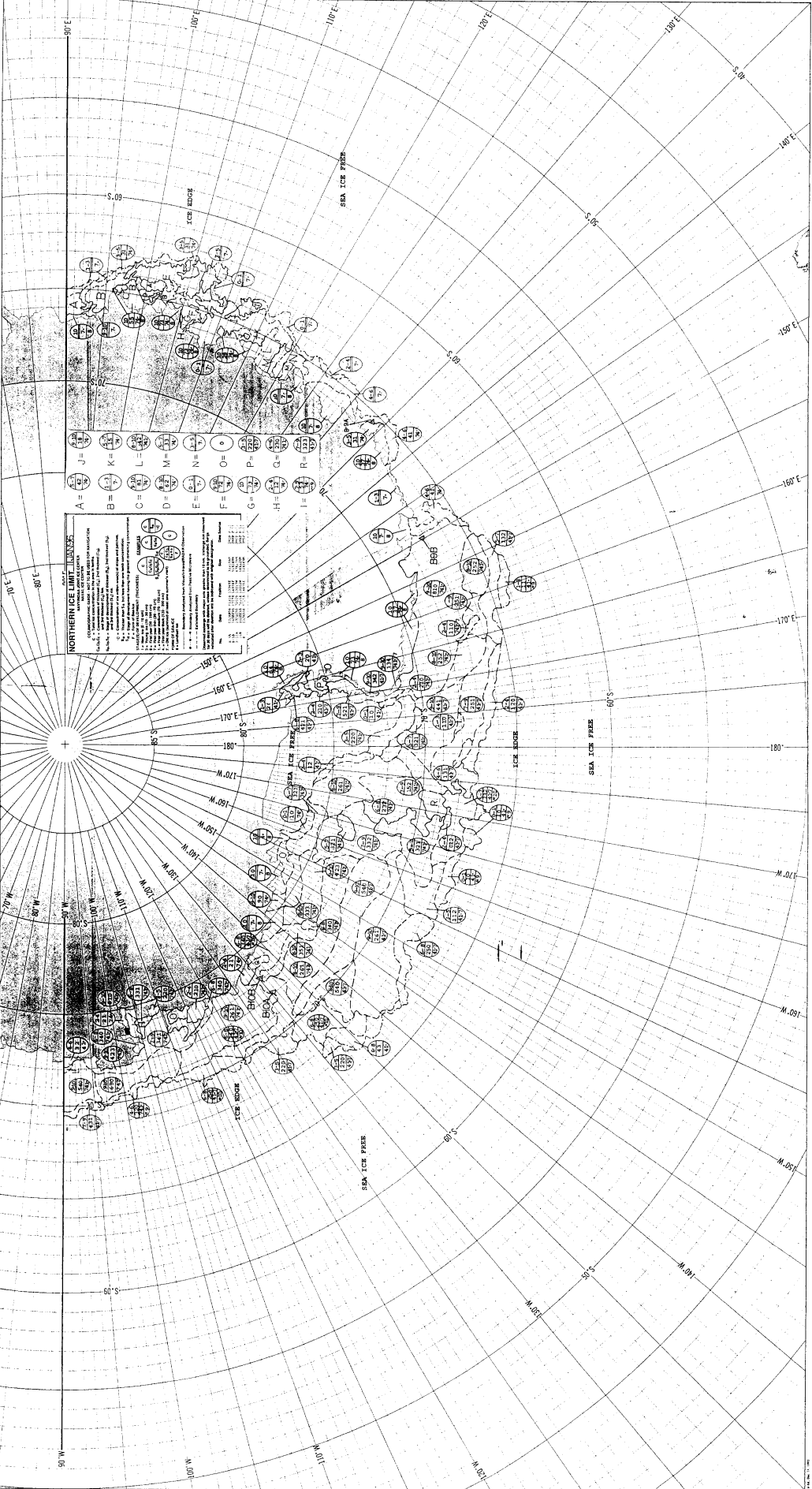
NORTHERN ICE LIMITS, JAN. 1950

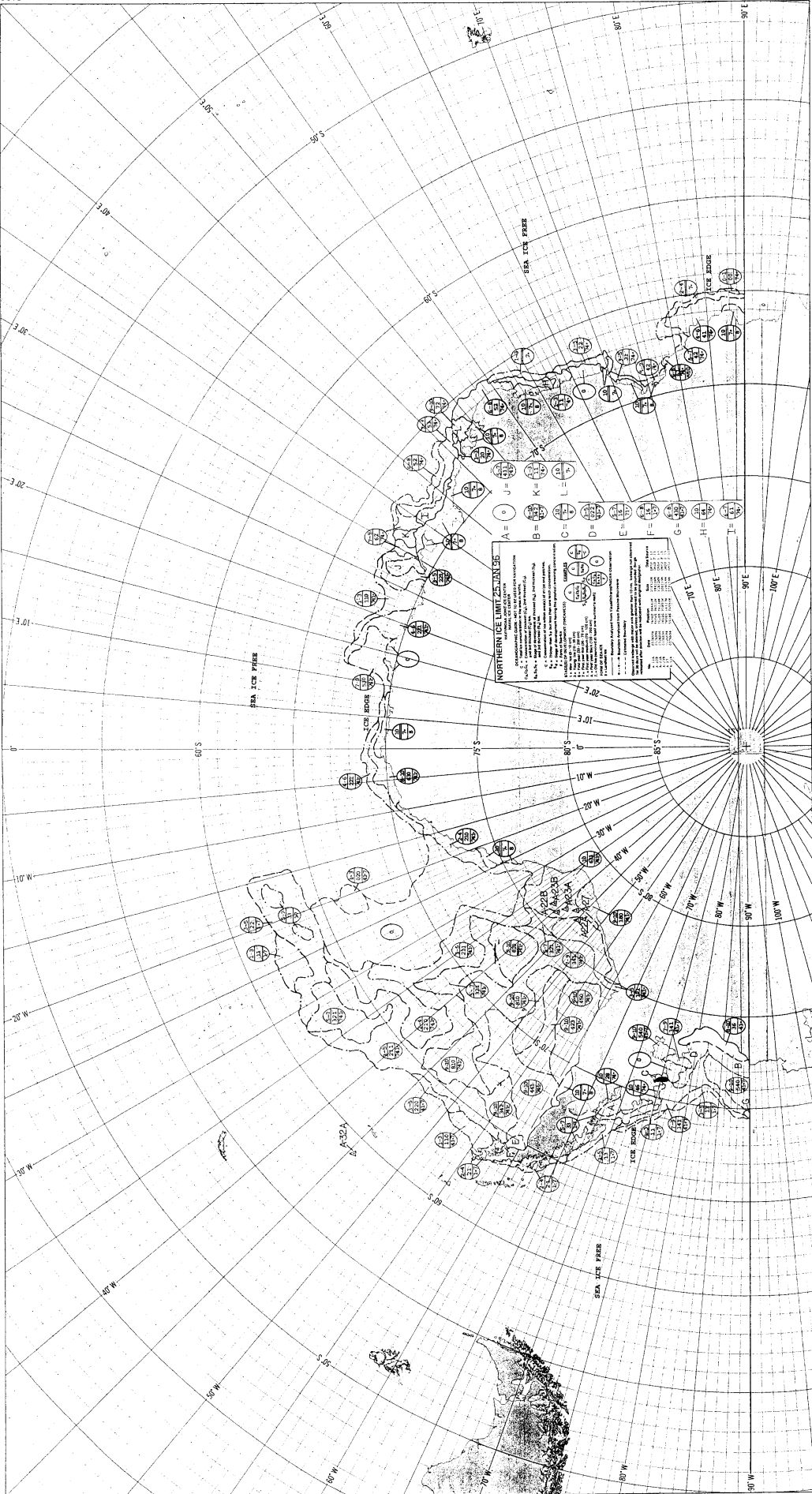
These limits are based on the observations of the U.S. Navy icebreakers and other vessels operating in the Arctic region during the winter months of 1949-1950. The limits are shown in solid lines, and the areas between the limits are shaded to indicate the extent of the ice.

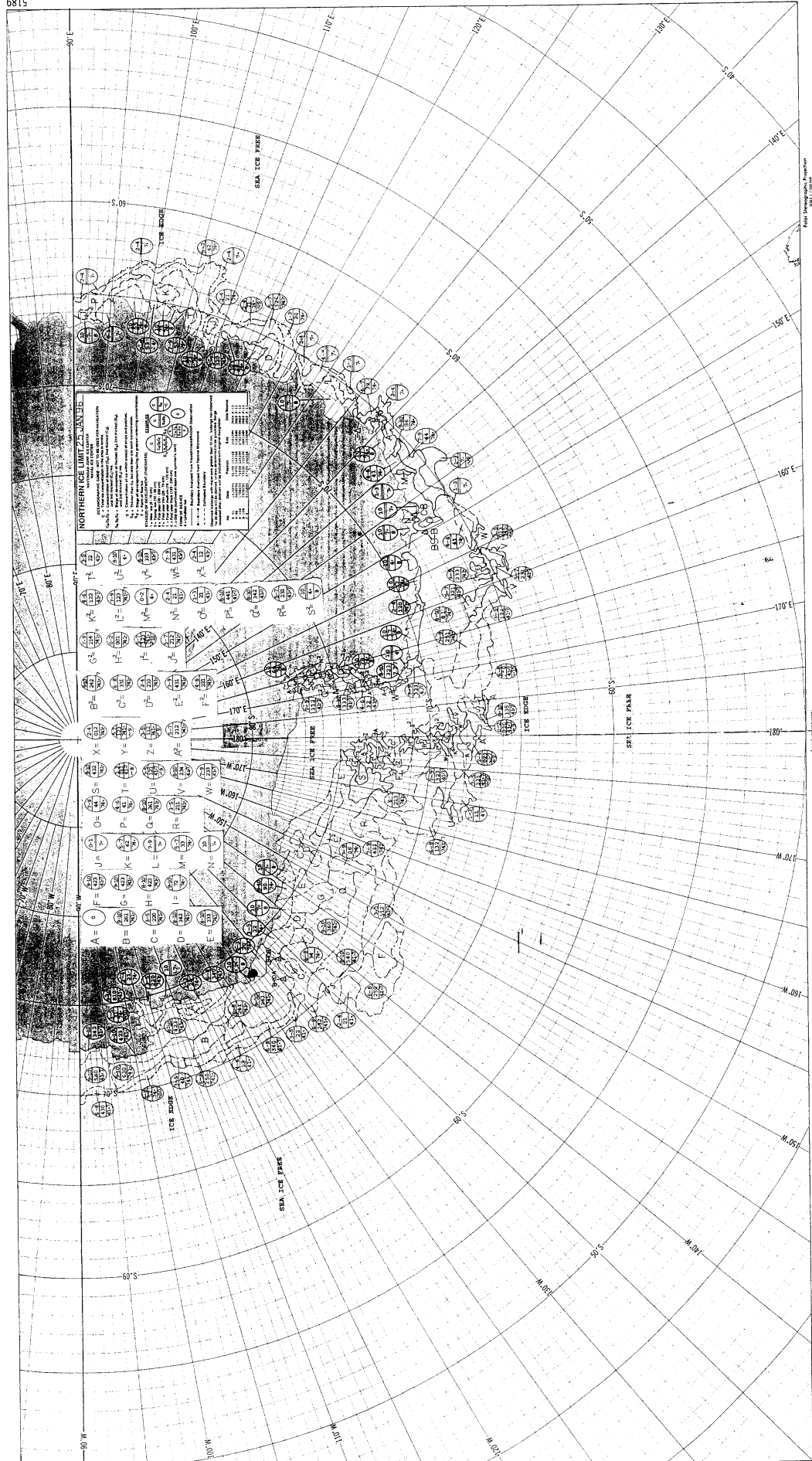
Legend:

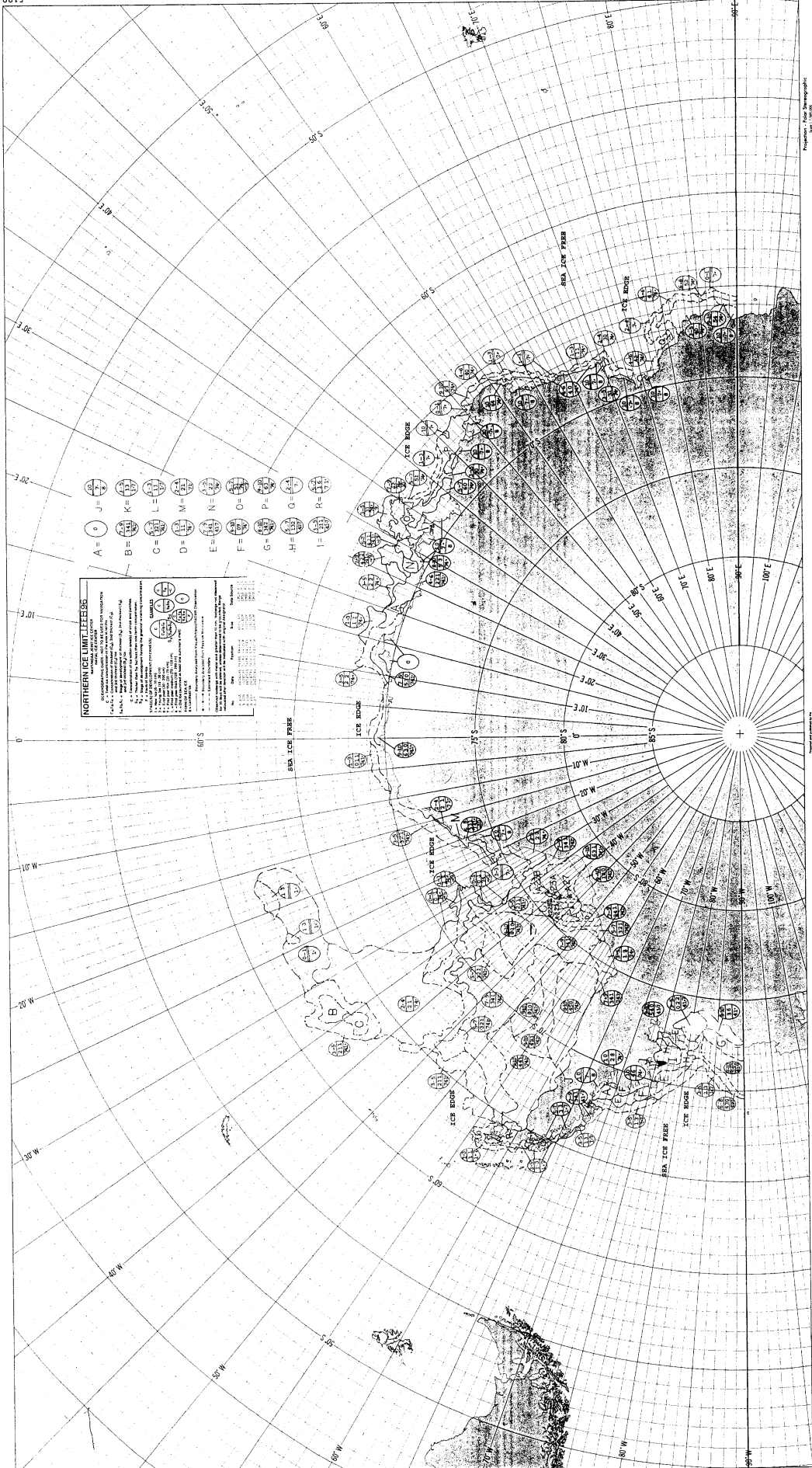
- Solid line: Northern Ice Limit
- Shaded area: Area between limits
- Dashed line: Estimated limit
- Circle with 'X': Observation point
- Circle with 'O': Observation point

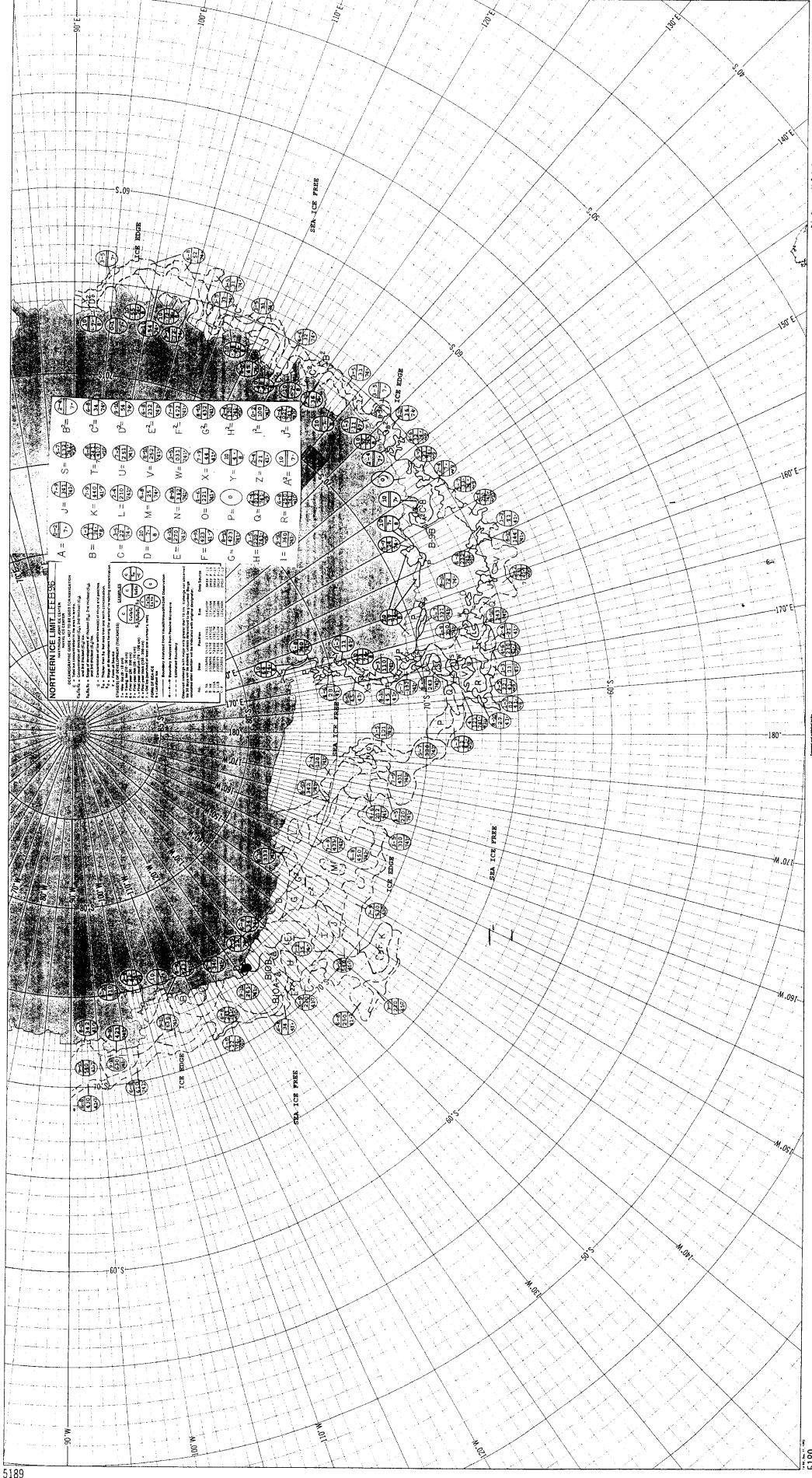








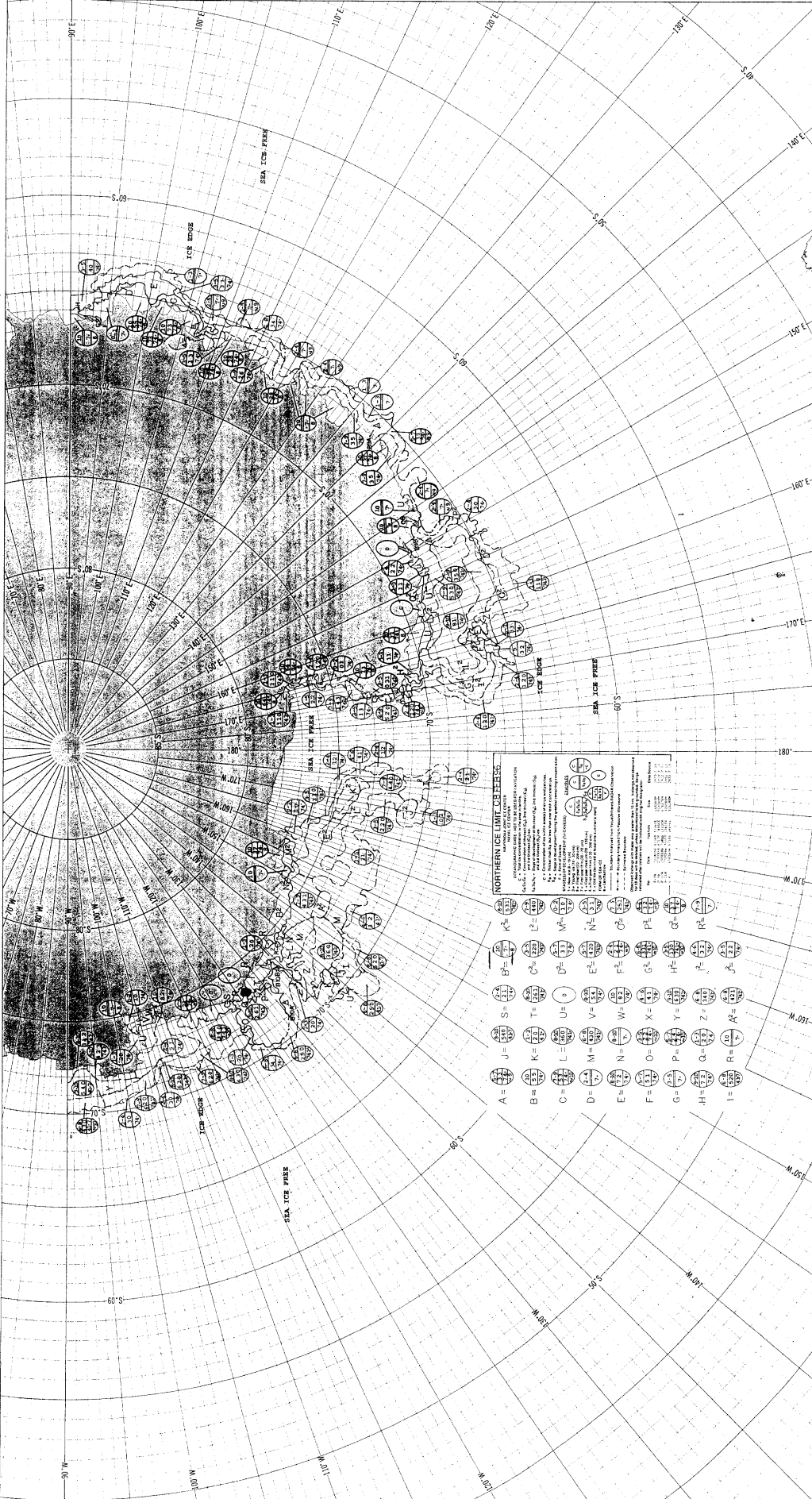


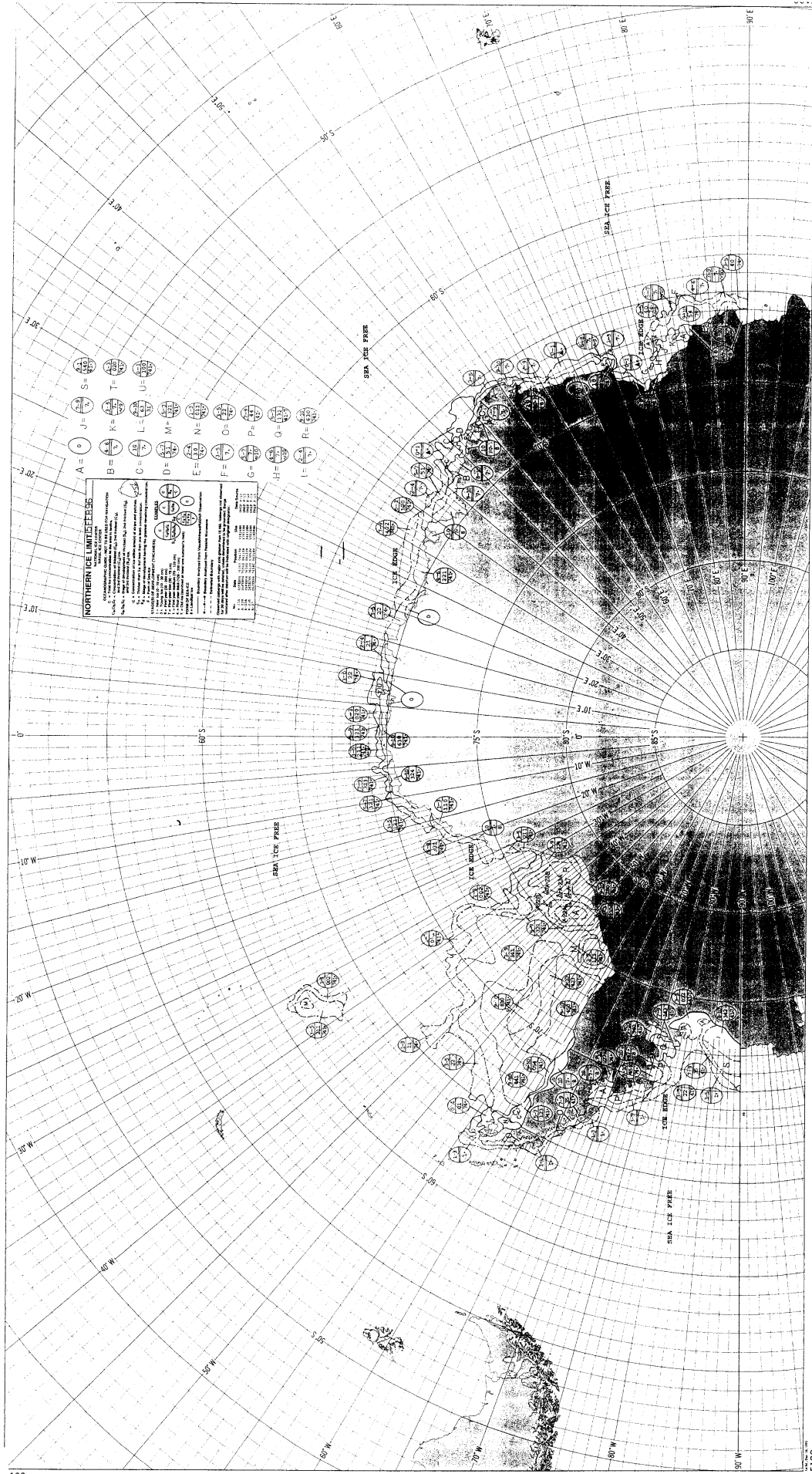


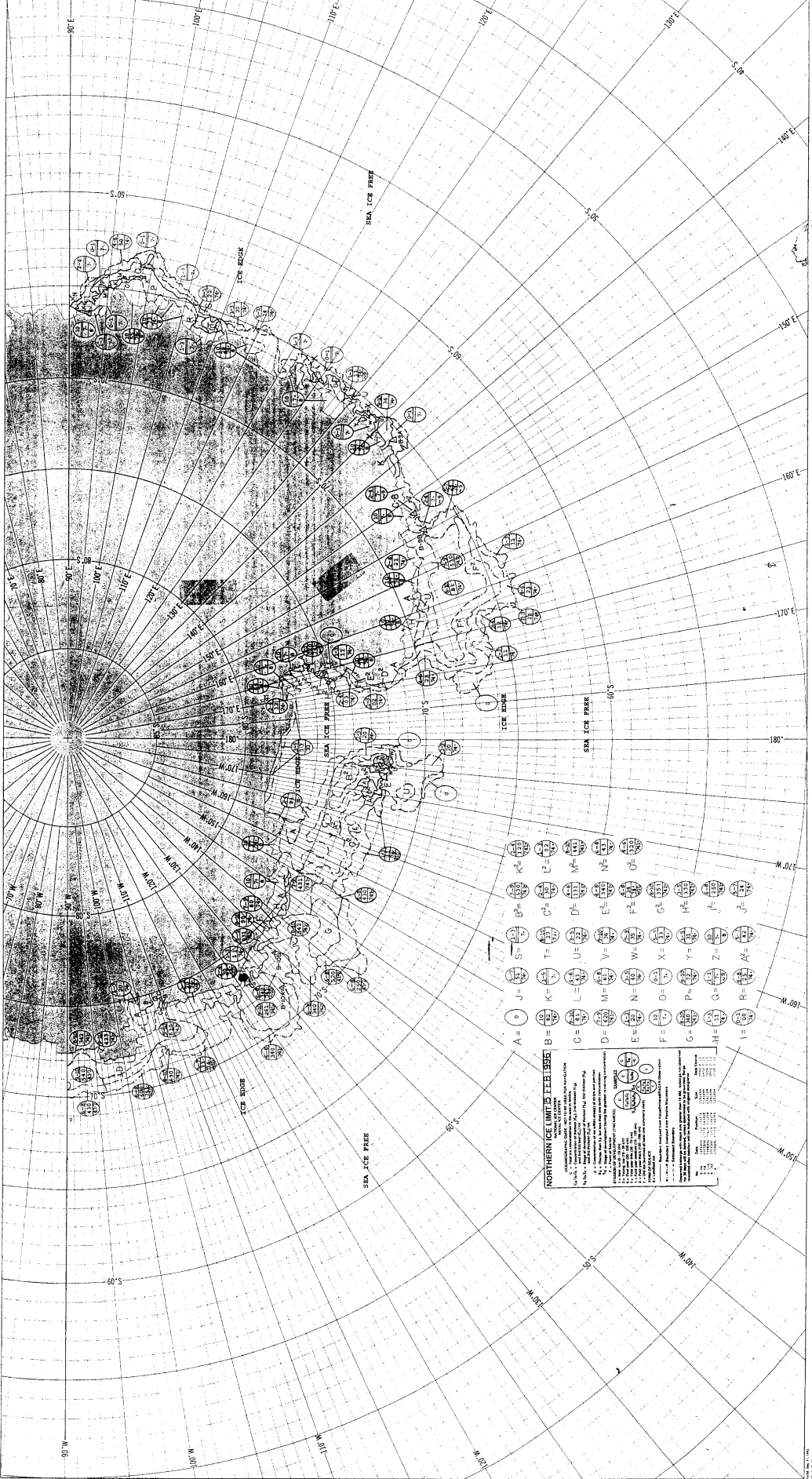
NORTHERN ICE LIMITS

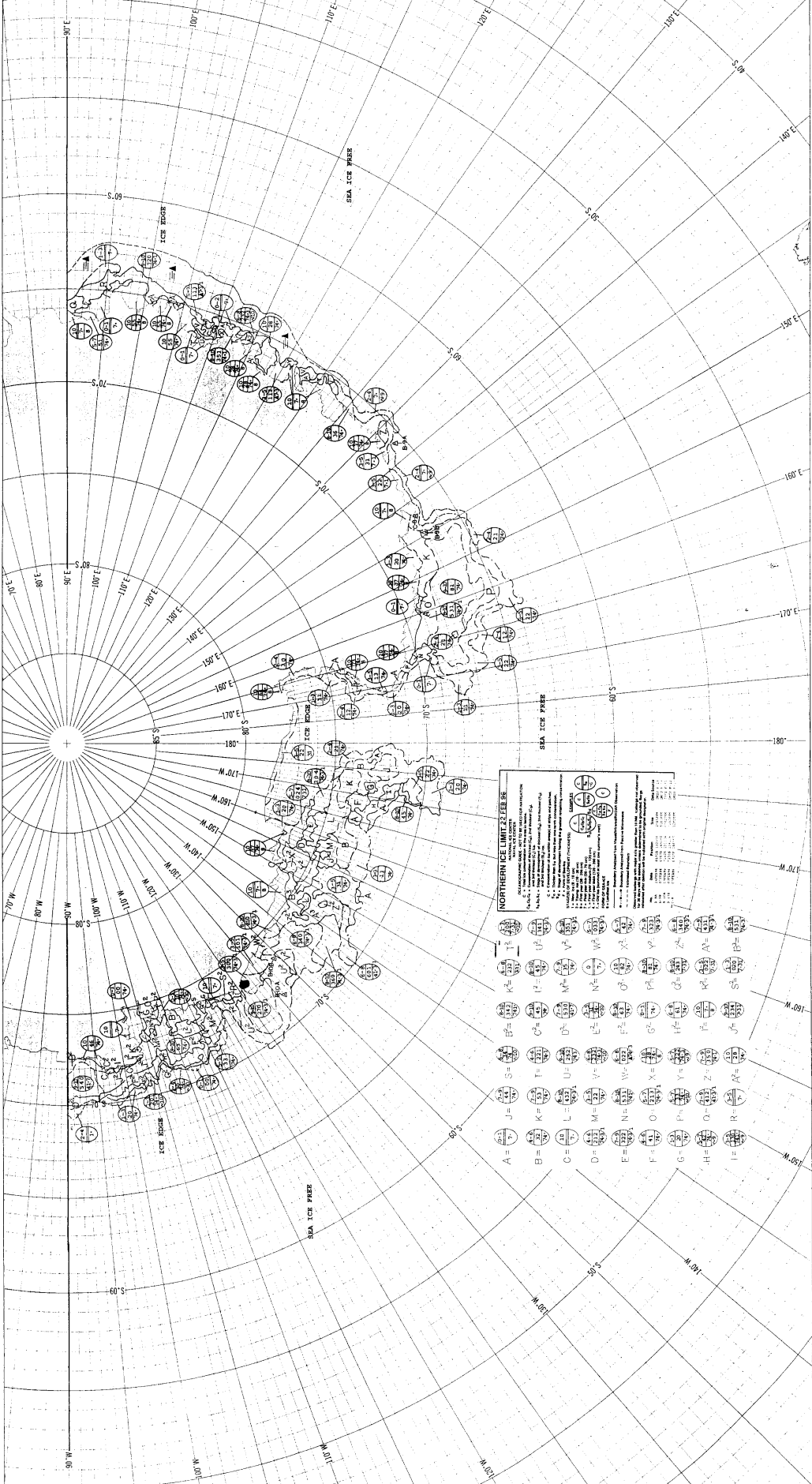
1. The limits of the ice are shown by the lines marked with letters A through Z. The letters are arranged in a grid across the chart. The letters are: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z.

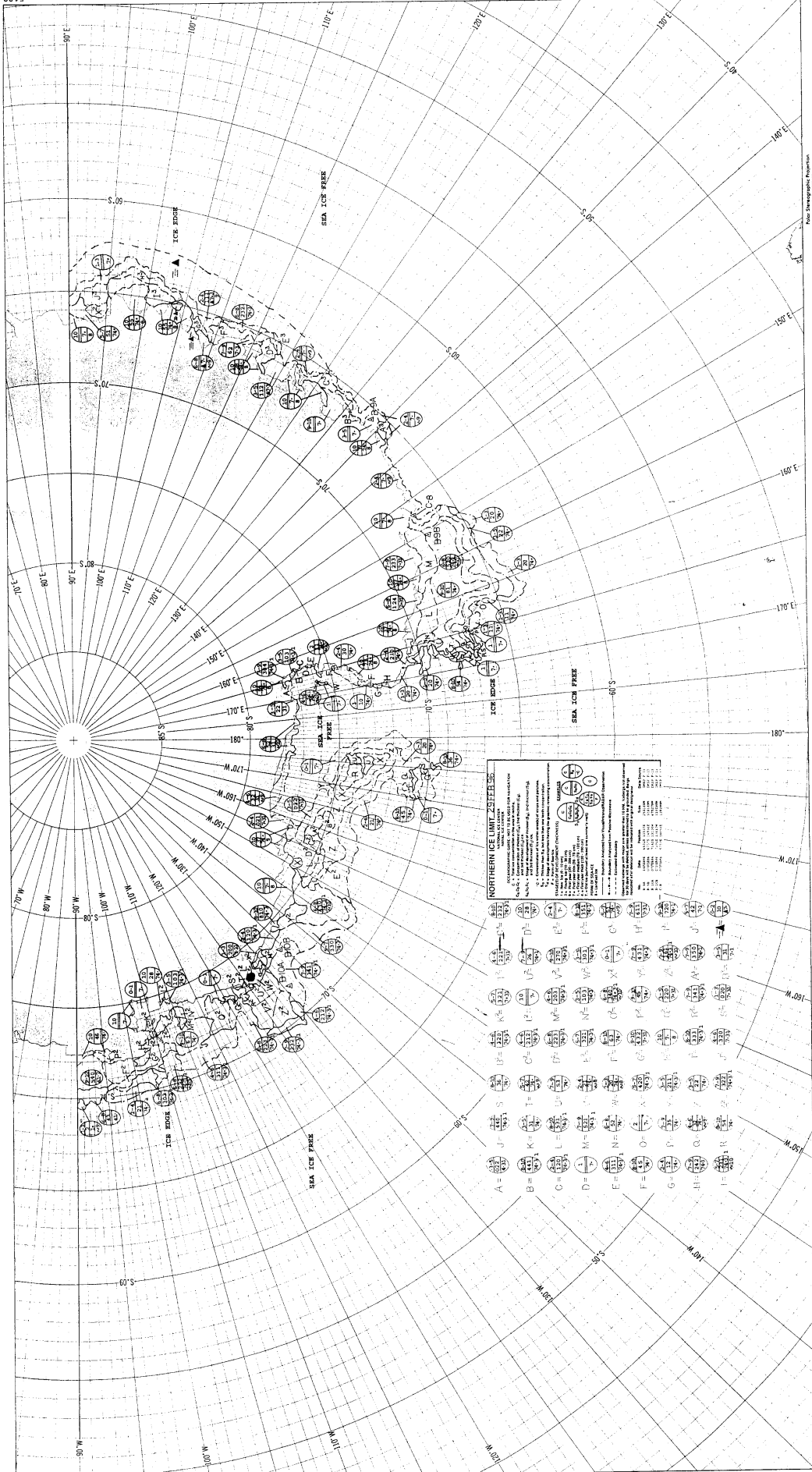
Letter	Symbol	Meaning
A	Circle with A	Ice limit
B	Square with B	Ice limit
C	Triangle with C	Ice limit
D	Diamond with D	Ice limit
E	Circle with E	Ice limit
F	Square with F	Ice limit
G	Triangle with G	Ice limit
H	Diamond with H	Ice limit
I	Circle with I	Ice limit
J	Square with J	Ice limit
K	Triangle with K	Ice limit
L	Diamond with L	Ice limit
M	Circle with M	Ice limit
N	Square with N	Ice limit
O	Triangle with O	Ice limit
P	Diamond with P	Ice limit
Q	Circle with Q	Ice limit
R	Square with R	Ice limit
S	Triangle with S	Ice limit
T	Diamond with T	Ice limit
U	Circle with U	Ice limit
V	Square with V	Ice limit
W	Triangle with W	Ice limit
X	Diamond with X	Ice limit
Y	Circle with Y	Ice limit
Z	Square with Z	Ice limit

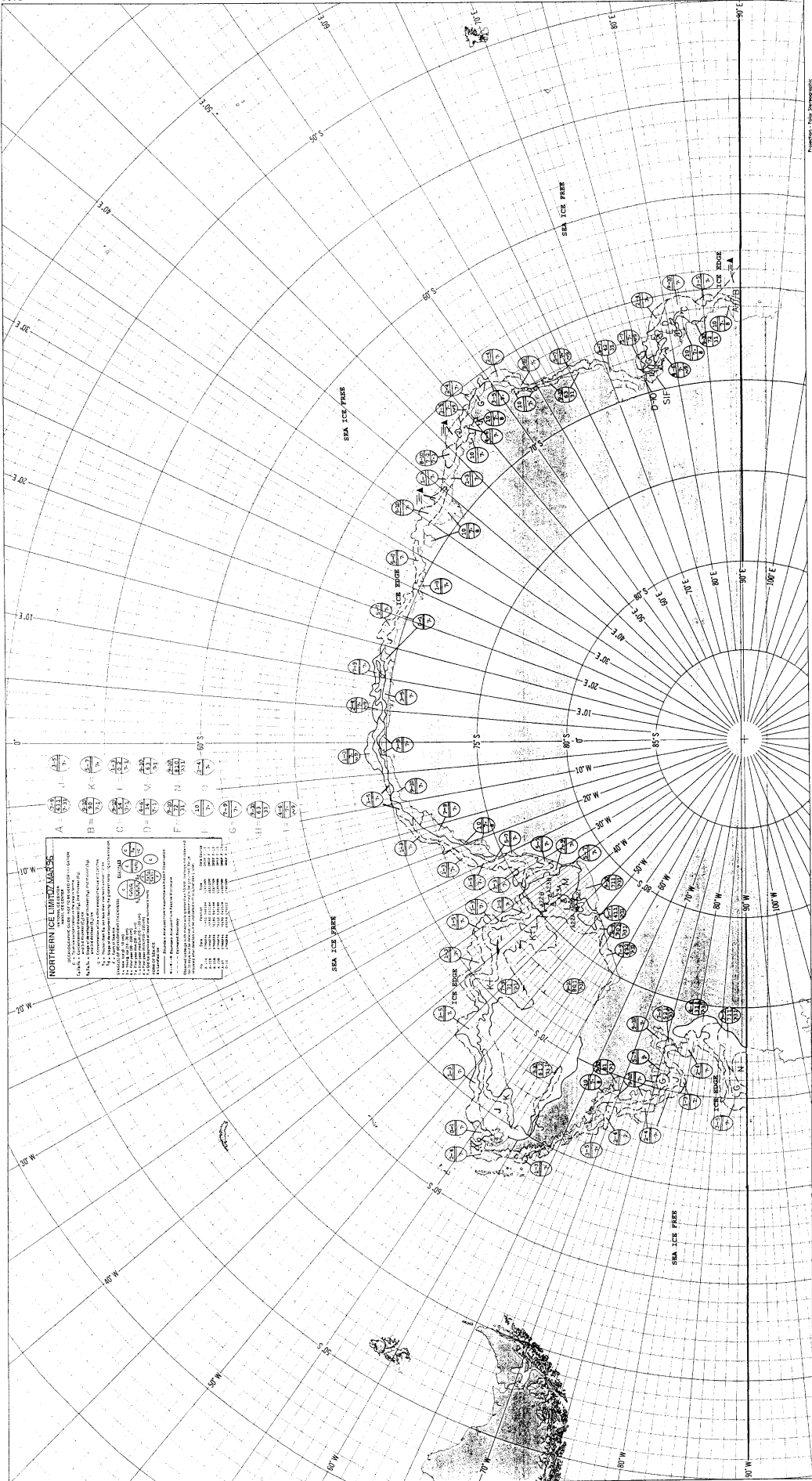










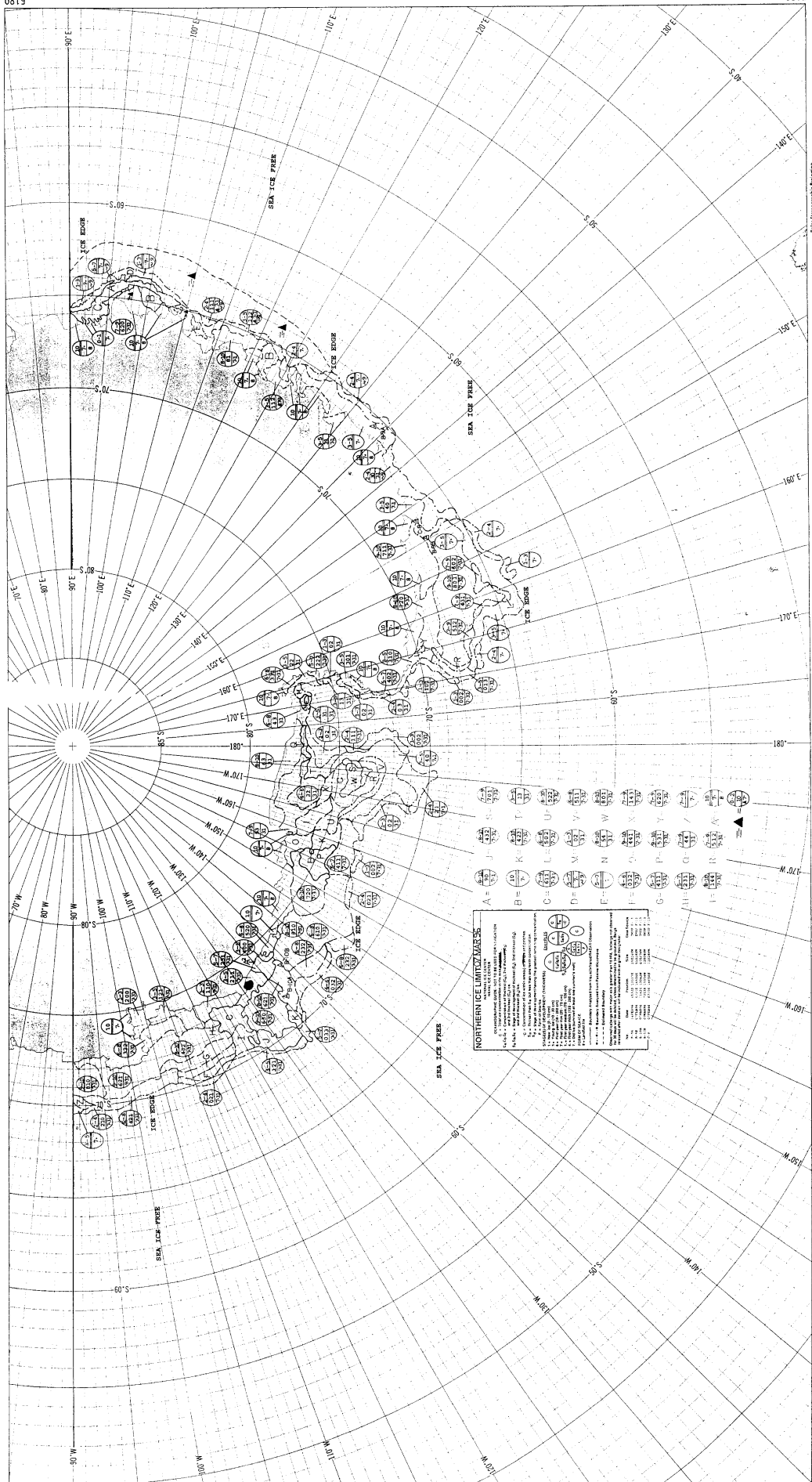


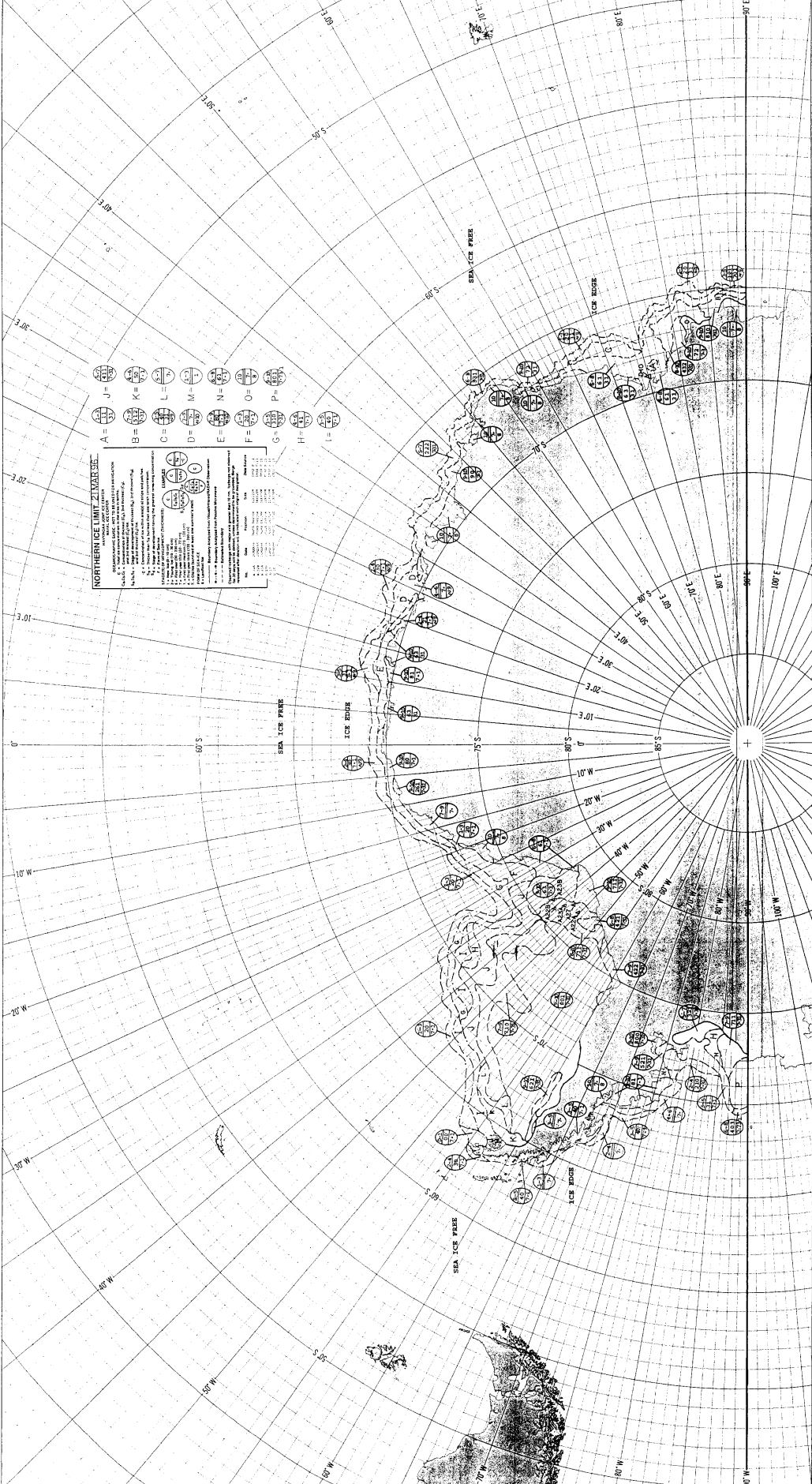
NORTHERN ICE LIMIT AREA
 CHART NO. 1000
 PUBLISHED 1980
 BY THE HYDROGRAPHIC OFFICE
 WASHINGTON, D.C. 20375

- A.
- B.
- C.
- D.
- E.
- F.
- G.
- H.
- I.
- J.
- K.
- L.
- M.
- N.
- O.
- P.
- Q.
- R.
- S.
- T.
- U.
- V.
- W.
- X.
- Y.
- Z.

PROVISIONAL CHART

NO. 1000



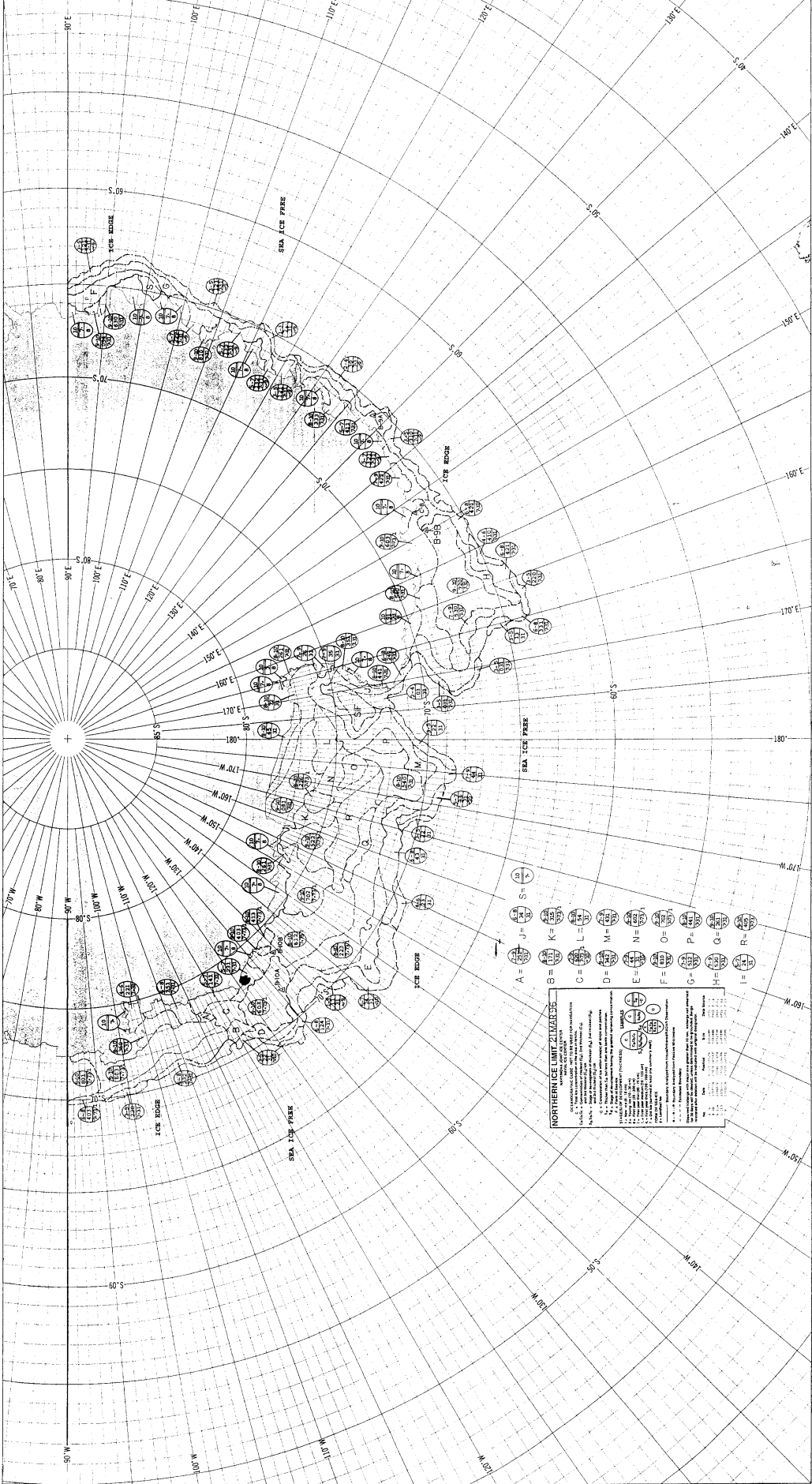


NORTHERN ICE LIMIT

SYMBOLS: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q

TABLE:

Symbol	Year	Latitude	Longitude
A	1957	75°N	15°W
B	1957	75°N	25°W
C	1957	75°N	35°W
D	1957	75°N	45°W
E	1957	75°N	55°W
F	1957	75°N	65°W
G	1957	75°N	75°W
H	1957	75°N	85°W
I	1957	75°N	95°W
J	1957	75°N	105°W
K	1957	75°N	115°W
L	1957	75°N	125°W
M	1957	75°N	135°W
N	1957	75°N	145°W
O	1957	75°N	155°W
P	1957	75°N	165°W
Q	1957	75°N	175°W



NORTHERN ICE LIMIT 21 MAR 56

ICEBERG INFORMATION

ICEBERG DATA

ICEBERG SIZE

ICEBERG LOCATION

ICEBERG DIRECTION

ICEBERG DURATION

ICEBERG DENSITY

ICEBERG COLOR

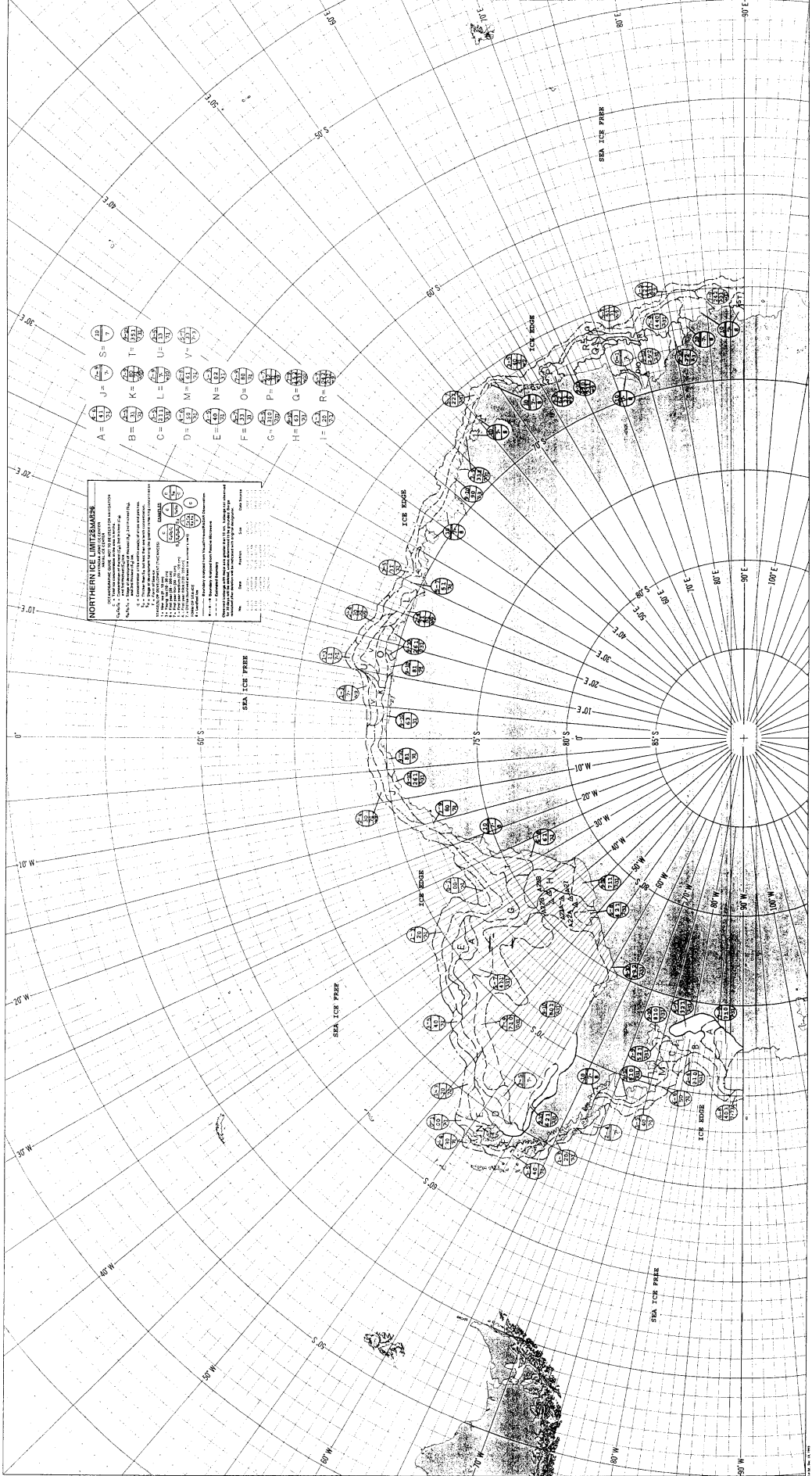
ICEBERG SHAPE

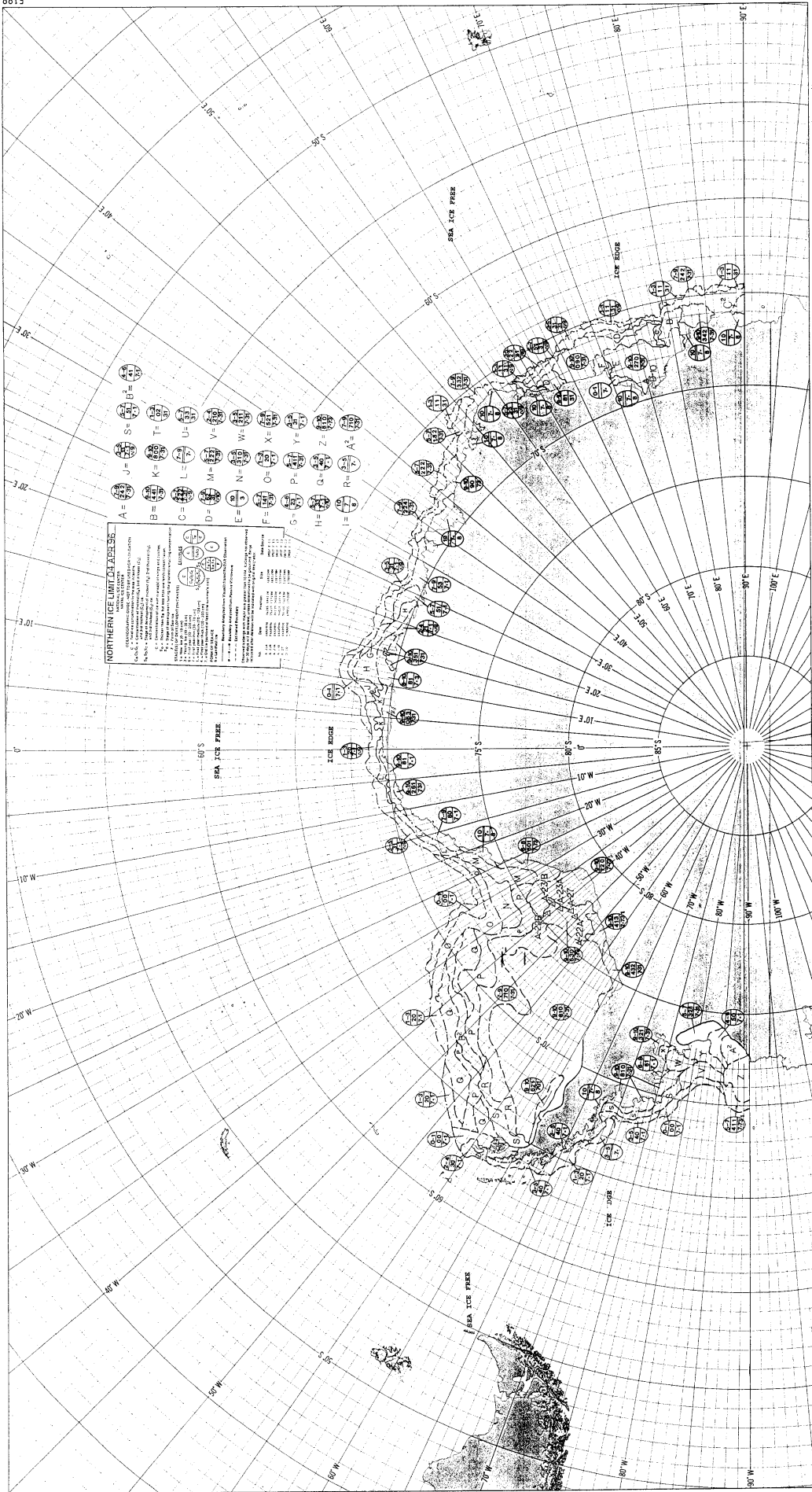
ICEBERG SURFACE

ICEBERG UNDERWATER

ICEBERG HISTORY

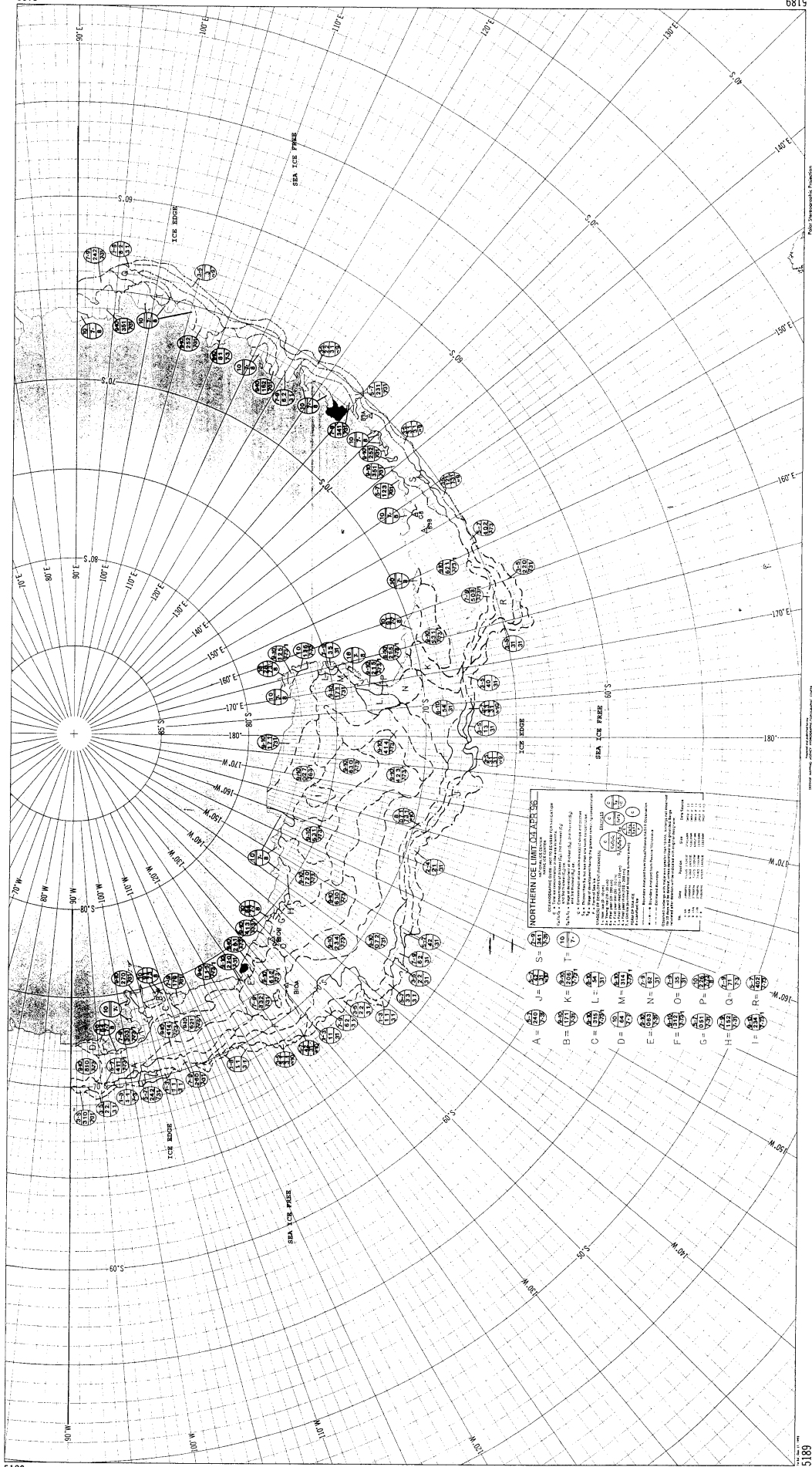
ICEBERG NOTES





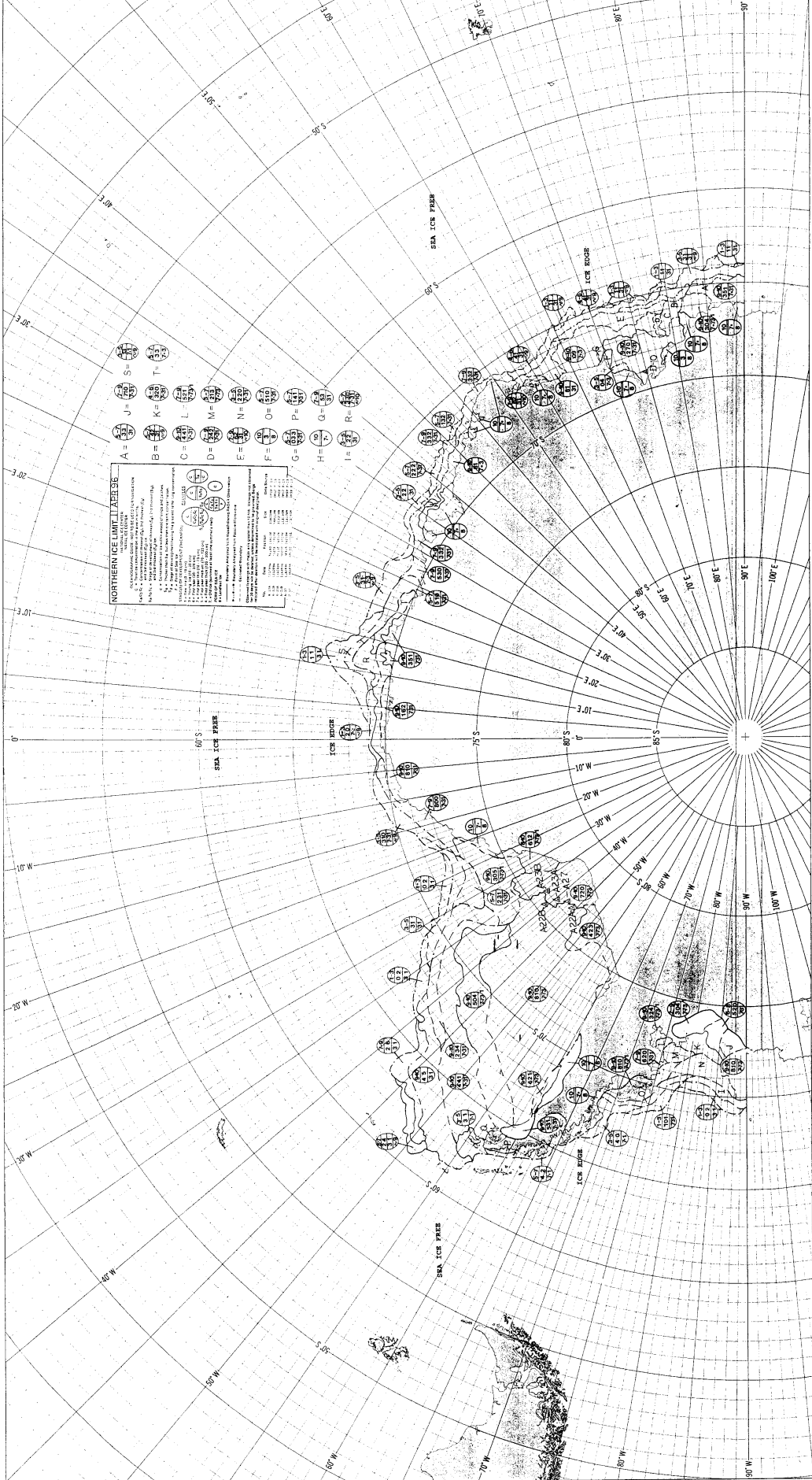
Projection - Polar Stereographic
Scale - True

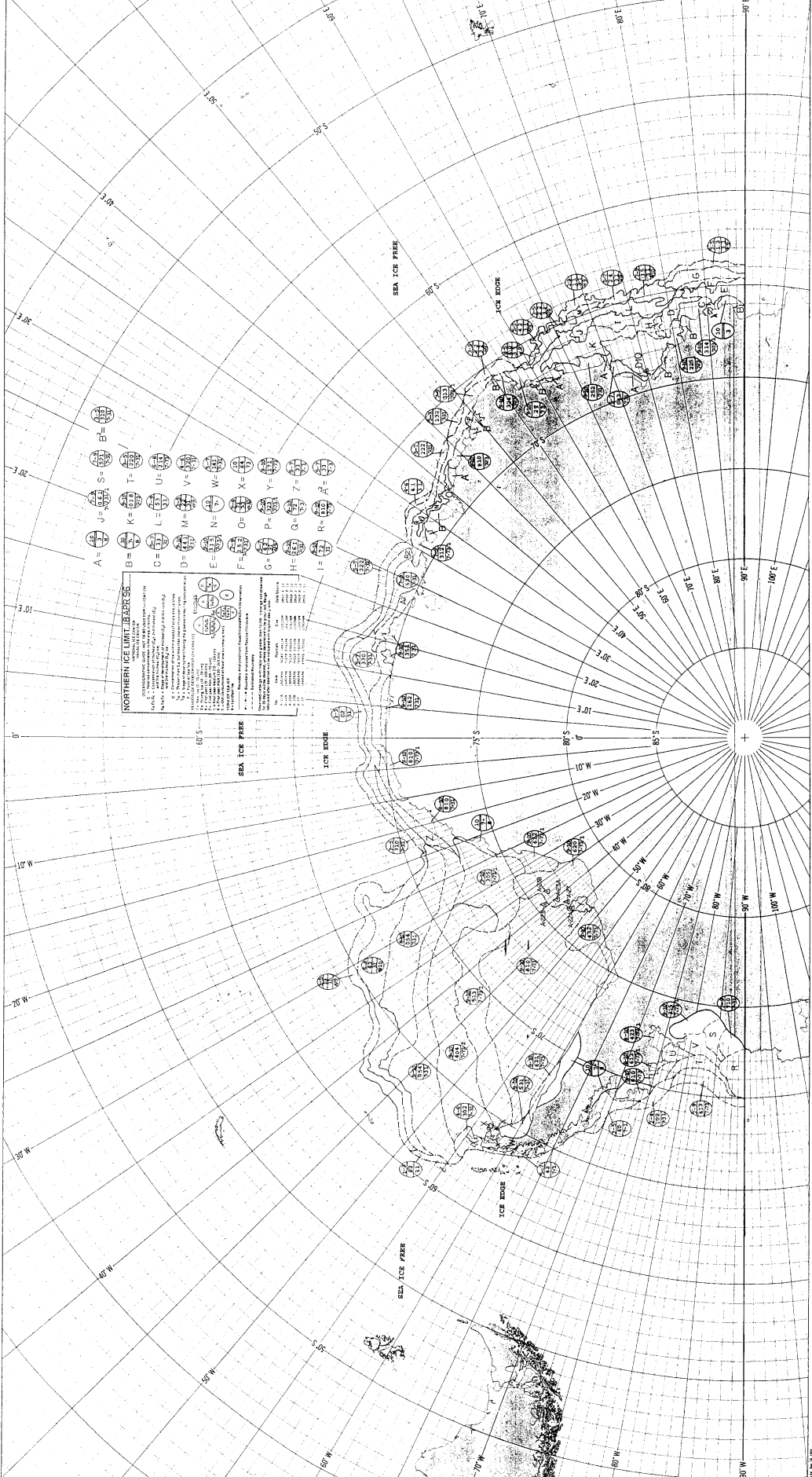
Source: U.S. Navy Hydrographic Office
Revised: 1988



NORTHERN LIMIT OF ICEBERGS
 INFORMATION CONCERNING THIS CHART:
 1. This chart is based on the latest available information.
 2. It is not intended for navigation.
 3. It is not intended to show the position of any vessel.
 4. It is not intended to show the position of any landmass.
 5. It is not intended to show the position of any sea ice.
 6. It is not intended to show the position of any icebergs.
 7. It is not intended to show the position of any other objects.
 8. It is not intended to show the position of any other features.

- A =
- B =
- C =
- D =
- E =
- F =
- G =
- H =
- I =
- J =
- K =
- L =
- M =
- N =
- O =
- P =
- Q =
- R =
- S =
- T =





NORTHERN ICE LIMIT TABLE

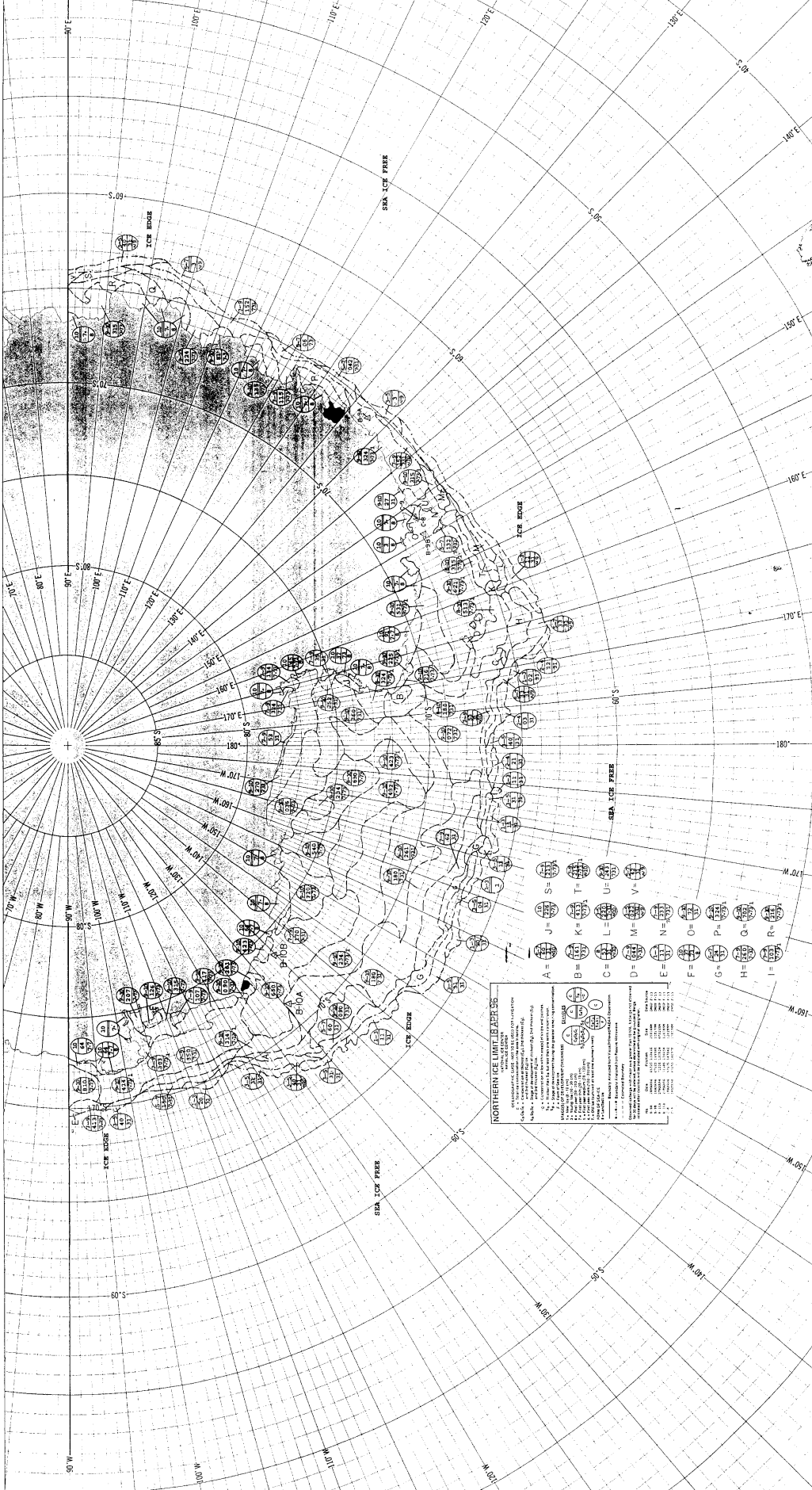
TABLE 1. - Characteristics of Ice Types and Classes

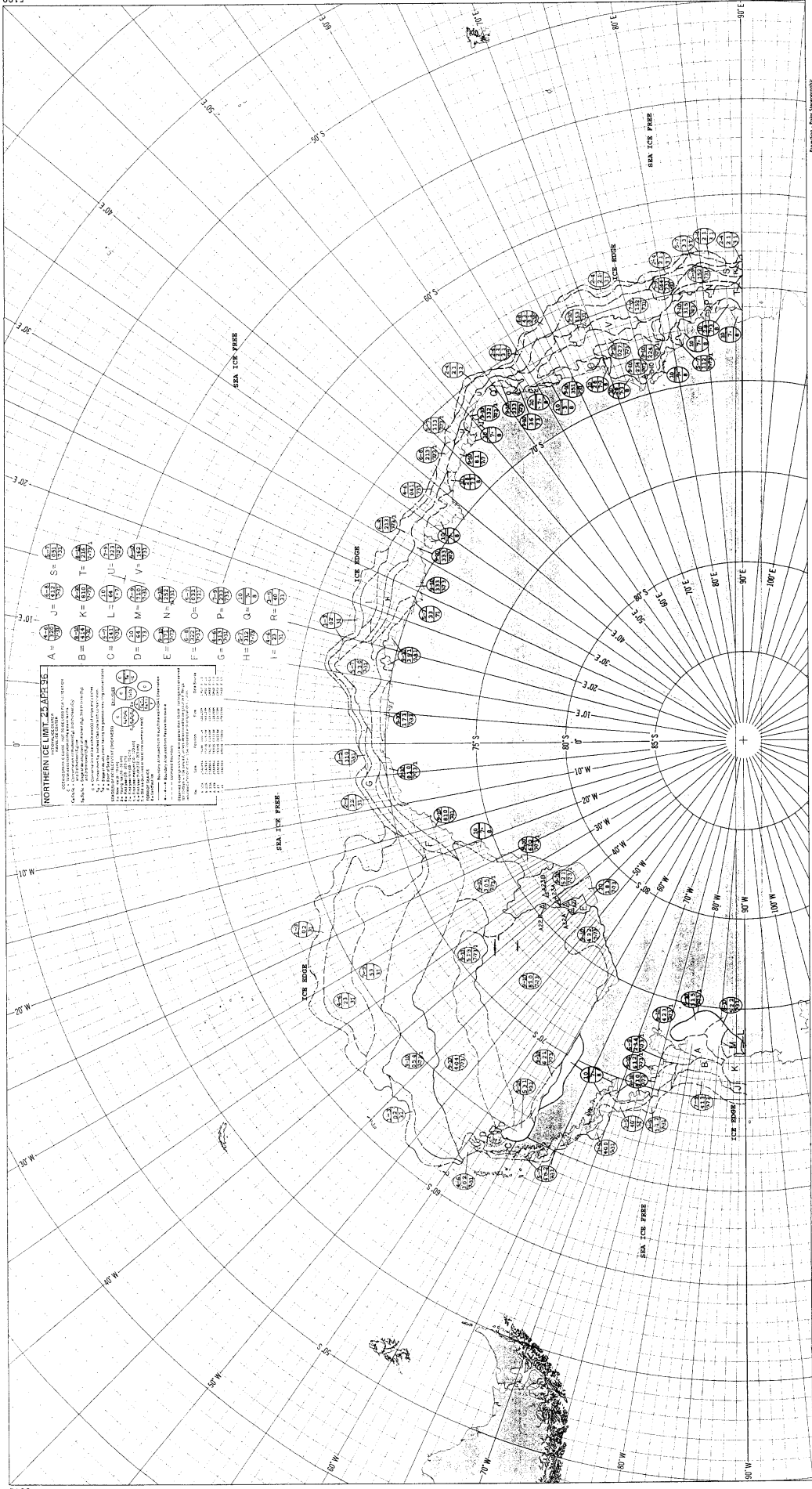
1. Ice Type: (A) Sea Ice, (B) Land Ice, (C) Ice Edge, (D) Ice Bond, (E) Ice Free, (F) Ice Edge, (G) Ice Bond, (H) Ice Free, (I) Ice Edge, (J) Ice Bond, (K) Ice Free, (L) Ice Edge, (M) Ice Bond, (N) Ice Free, (O) Ice Edge, (P) Ice Bond, (Q) Ice Free, (R) Ice Edge, (S) Ice Bond, (T) Ice Free, (U) Ice Edge, (V) Ice Bond, (W) Ice Free, (X) Ice Edge, (Y) Ice Bond, (Z) Ice Free.

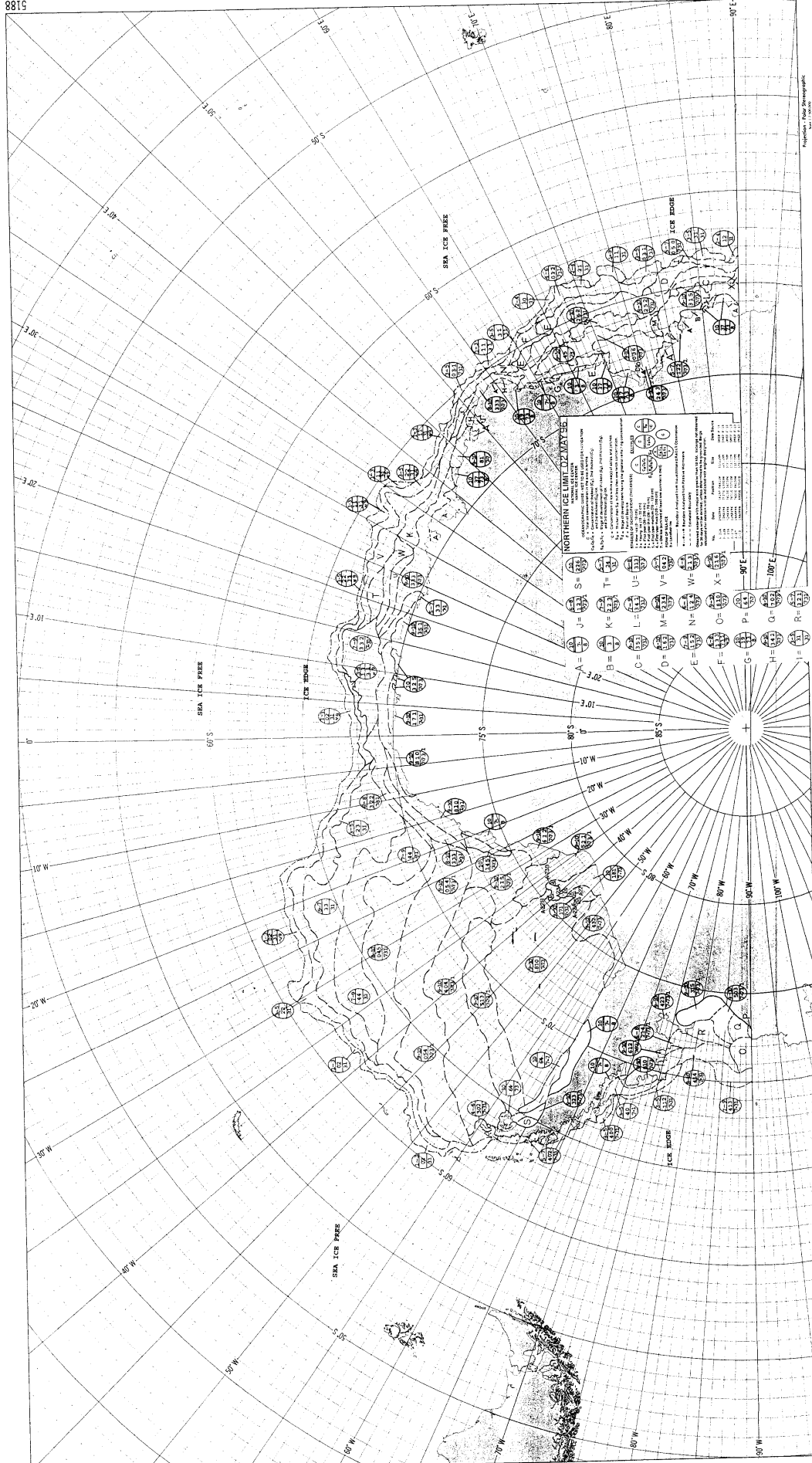
2. Ice Classification: (A) Sea Ice, (B) Land Ice, (C) Ice Edge, (D) Ice Bond, (E) Ice Free, (F) Ice Edge, (G) Ice Bond, (H) Ice Free, (I) Ice Edge, (J) Ice Bond, (K) Ice Free, (L) Ice Edge, (M) Ice Bond, (N) Ice Free, (O) Ice Edge, (P) Ice Bond, (Q) Ice Free, (R) Ice Edge, (S) Ice Bond, (T) Ice Free, (U) Ice Edge, (V) Ice Bond, (W) Ice Free, (X) Ice Edge, (Y) Ice Bond, (Z) Ice Free.

3. Ice Density: (A) Sea Ice, (B) Land Ice, (C) Ice Edge, (D) Ice Bond, (E) Ice Free, (F) Ice Edge, (G) Ice Bond, (H) Ice Free, (I) Ice Edge, (J) Ice Bond, (K) Ice Free, (L) Ice Edge, (M) Ice Bond, (N) Ice Free, (O) Ice Edge, (P) Ice Bond, (Q) Ice Free, (R) Ice Edge, (S) Ice Bond, (T) Ice Free, (U) Ice Edge, (V) Ice Bond, (W) Ice Free, (X) Ice Edge, (Y) Ice Bond, (Z) Ice Free.

4. Ice Temperature: (A) Sea Ice, (B) Land Ice, (C) Ice Edge, (D) Ice Bond, (E) Ice Free, (F) Ice Edge, (G) Ice Bond, (H) Ice Free, (I) Ice Edge, (J) Ice Bond, (K) Ice Free, (L) Ice Edge, (M) Ice Bond, (N) Ice Free, (O) Ice Edge, (P) Ice Bond, (Q) Ice Free, (R) Ice Edge, (S) Ice Bond, (T) Ice Free, (U) Ice Edge, (V) Ice Bond, (W) Ice Free, (X) Ice Edge, (Y) Ice Bond, (Z) Ice Free.



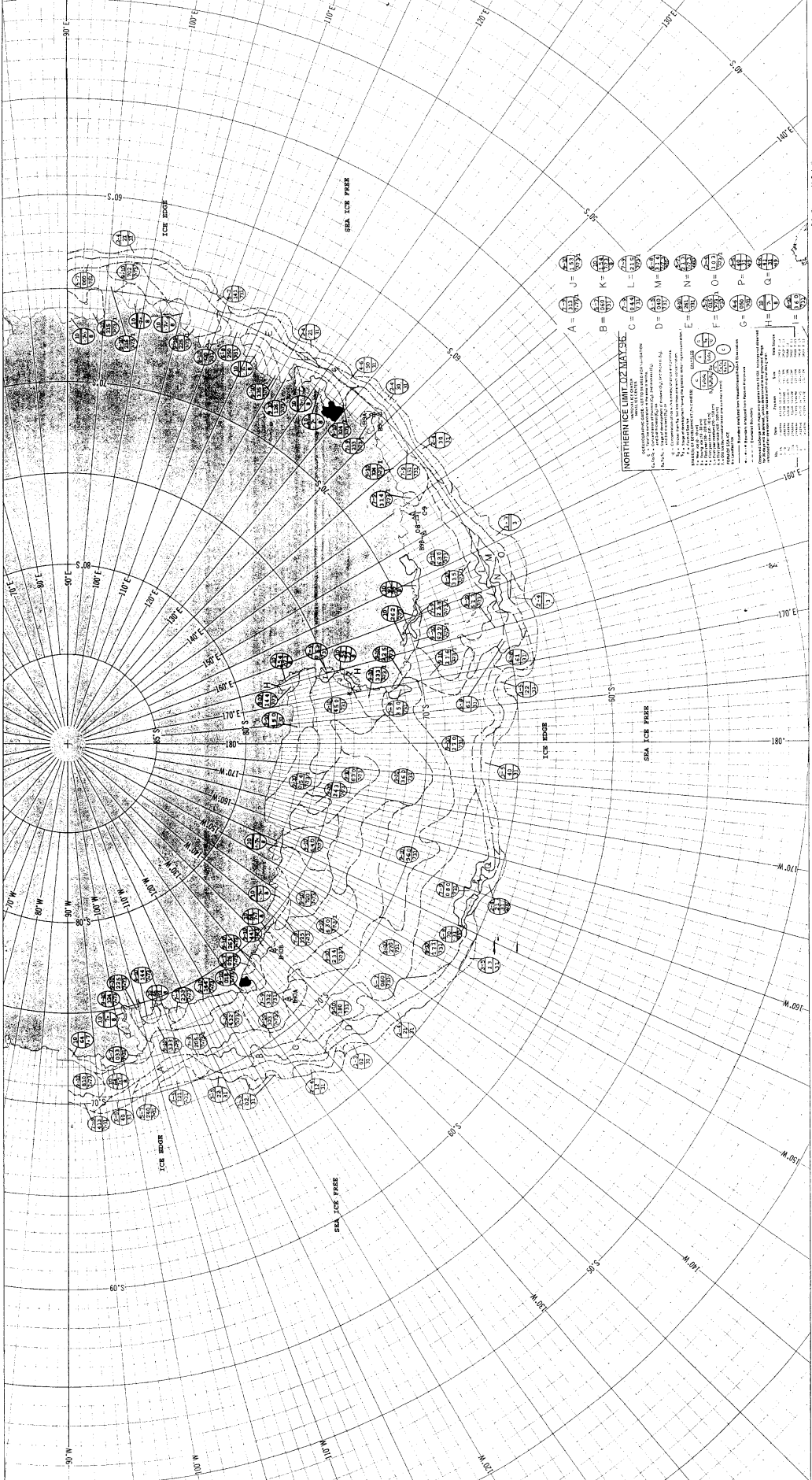


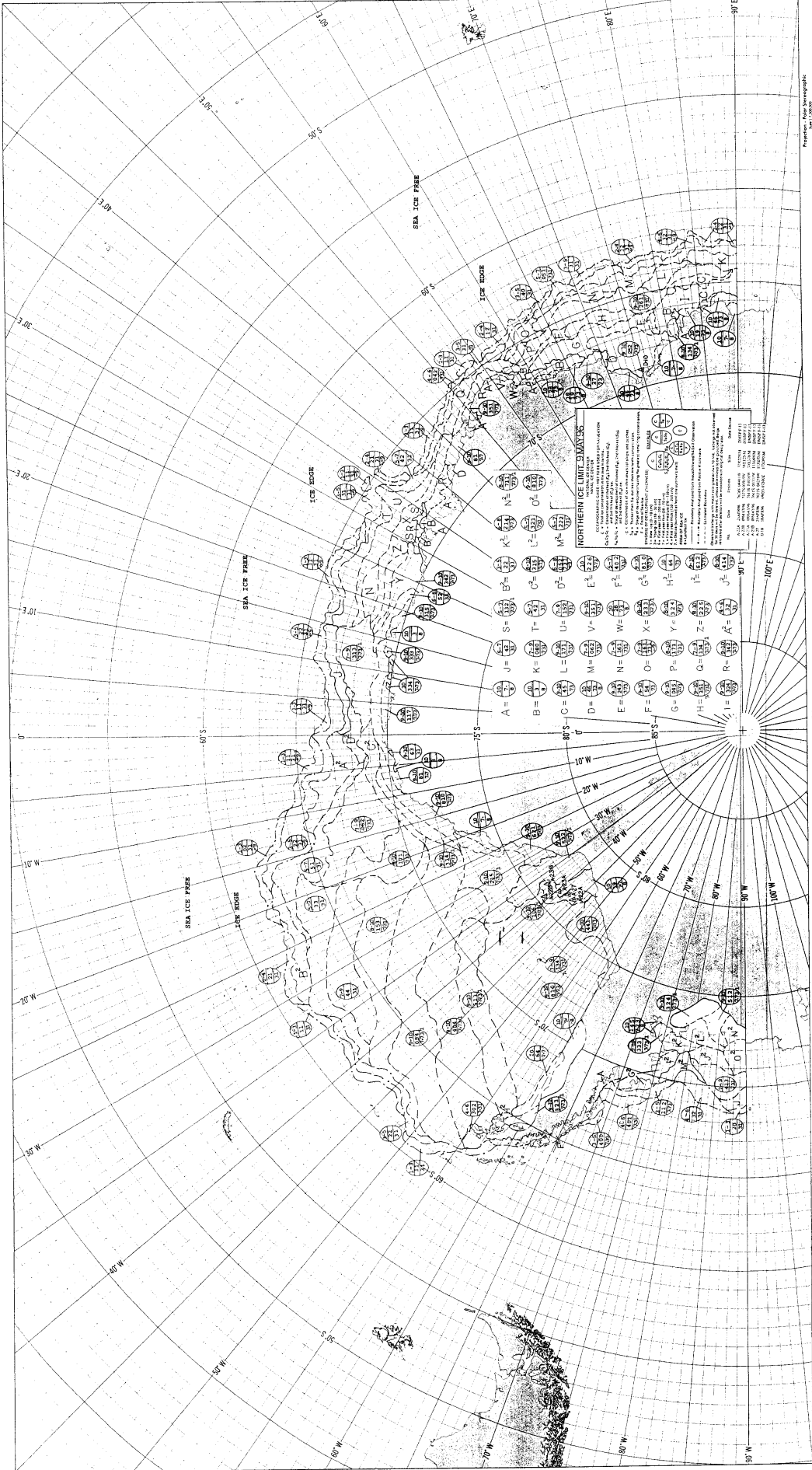


NORTHERN ICE LINE (2 MAY 55)

ICE LINE DATA

ICE LINE	ICE LINE	ICE LINE	ICE LINE	ICE LINE	ICE LINE
A = 100	B = 100	C = 100	D = 100	E = 100	F = 100
G = 100	H = 100	I = 100	J = 100	K = 100	L = 100
M = 100	N = 100	O = 100	P = 100	Q = 100	R = 100
S = 100	T = 100	U = 100	V = 100	W = 100	X = 100
Y = 100	Z = 100	AA = 100	AB = 100	AC = 100	AD = 100
AE = 100	AF = 100	AG = 100	AH = 100	AI = 100	AJ = 100
AK = 100	AL = 100	AM = 100	AN = 100	AO = 100	AP = 100
AQ = 100	AR = 100	AS = 100	AT = 100	AU = 100	AV = 100
AW = 100	AX = 100	AY = 100	AZ = 100	BA = 100	BB = 100
BC = 100	BD = 100	BE = 100	BF = 100	BG = 100	BH = 100
BI = 100	BJ = 100	BK = 100	BL = 100	BM = 100	BN = 100
BO = 100	BP = 100	BQ = 100	BR = 100	BS = 100	BT = 100
BU = 100	BV = 100	BW = 100	BX = 100	BY = 100	BZ = 100
CA = 100	CB = 100	CC = 100	CD = 100	CE = 100	CF = 100
CG = 100	CH = 100	CI = 100	CJ = 100	CK = 100	CL = 100
CM = 100	CN = 100	CO = 100	CP = 100	CQ = 100	CR = 100
CS = 100	CT = 100	CU = 100	CV = 100	CW = 100	CX = 100
CY = 100	CZ = 100	DA = 100	DB = 100	DC = 100	DD = 100
DE = 100	DF = 100	DETAILED	DETAILED	DETAILED	DETAILED





NORTHERN ICE LIMIT SYMBOLS

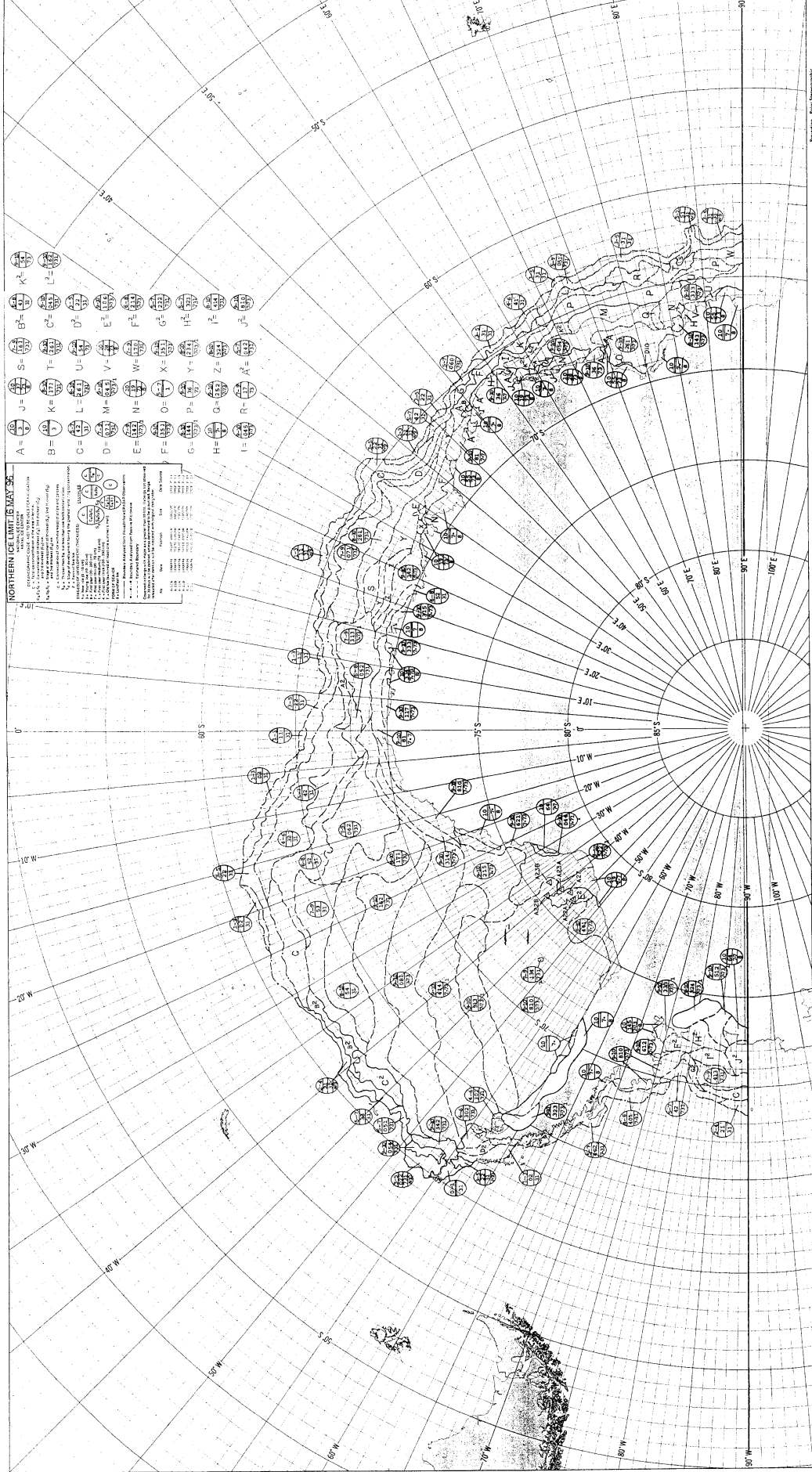
SYMBOLS FOR THE NORTHERN ICE LIMIT SYMBOLS ARE AS FOLLOWS:

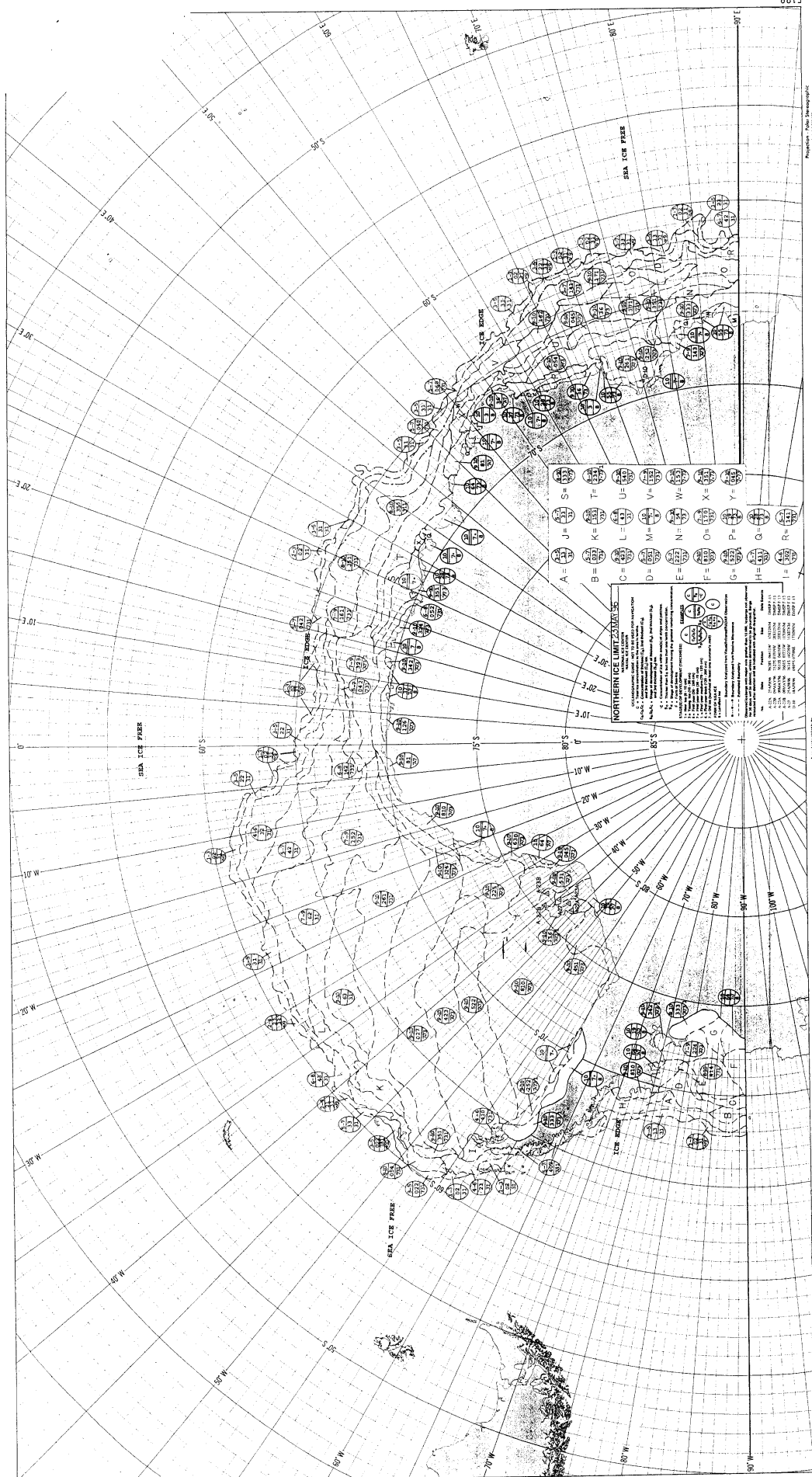
A = $\frac{1}{2}$	B = $\frac{1}{4}$	C = $\frac{1}{8}$	D = $\frac{1}{16}$	E = $\frac{1}{32}$	F = $\frac{1}{64}$	G = $\frac{1}{128}$	H = $\frac{1}{256}$	I = $\frac{1}{512}$	J = $\frac{1}{1024}$
K = $\frac{1}{2048}$	L = $\frac{1}{4096}$	M = $\frac{1}{8192}$	N = $\frac{1}{16384}$	O = $\frac{1}{32768}$	P = $\frac{1}{65536}$	Q = $\frac{1}{131072}$	R = $\frac{1}{262144}$	S = $\frac{1}{524288}$	T = $\frac{1}{1048576}$
U = $\frac{1}{2097152}$	V = $\frac{1}{4194304}$	W = $\frac{1}{8388608}$	X = $\frac{1}{16777216}$	Y = $\frac{1}{33554432}$	Z = $\frac{1}{67108864}$	AA = $\frac{1}{134217728}$	AB = $\frac{1}{268435456}$	AC = $\frac{1}{536870912}$	AD = $\frac{1}{1073741824}$

SYMBOLS FOR THE NORTHERN ICE LIMIT SYMBOLS ARE AS FOLLOWS:

SYMBOLS FOR THE NORTHERN ICE LIMIT SYMBOLS ARE AS FOLLOWS:

SYMBOLS FOR THE NORTHERN ICE LIMIT SYMBOLS ARE AS FOLLOWS:





NORTHERN ICE LIMIT 2000-50

1. The Northern Ice Limit is the limit of sea ice extent in the Arctic region. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next. The Northern Ice Limit is shown on this chart as a dashed line.

2. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

3. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

4. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

5. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

6. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

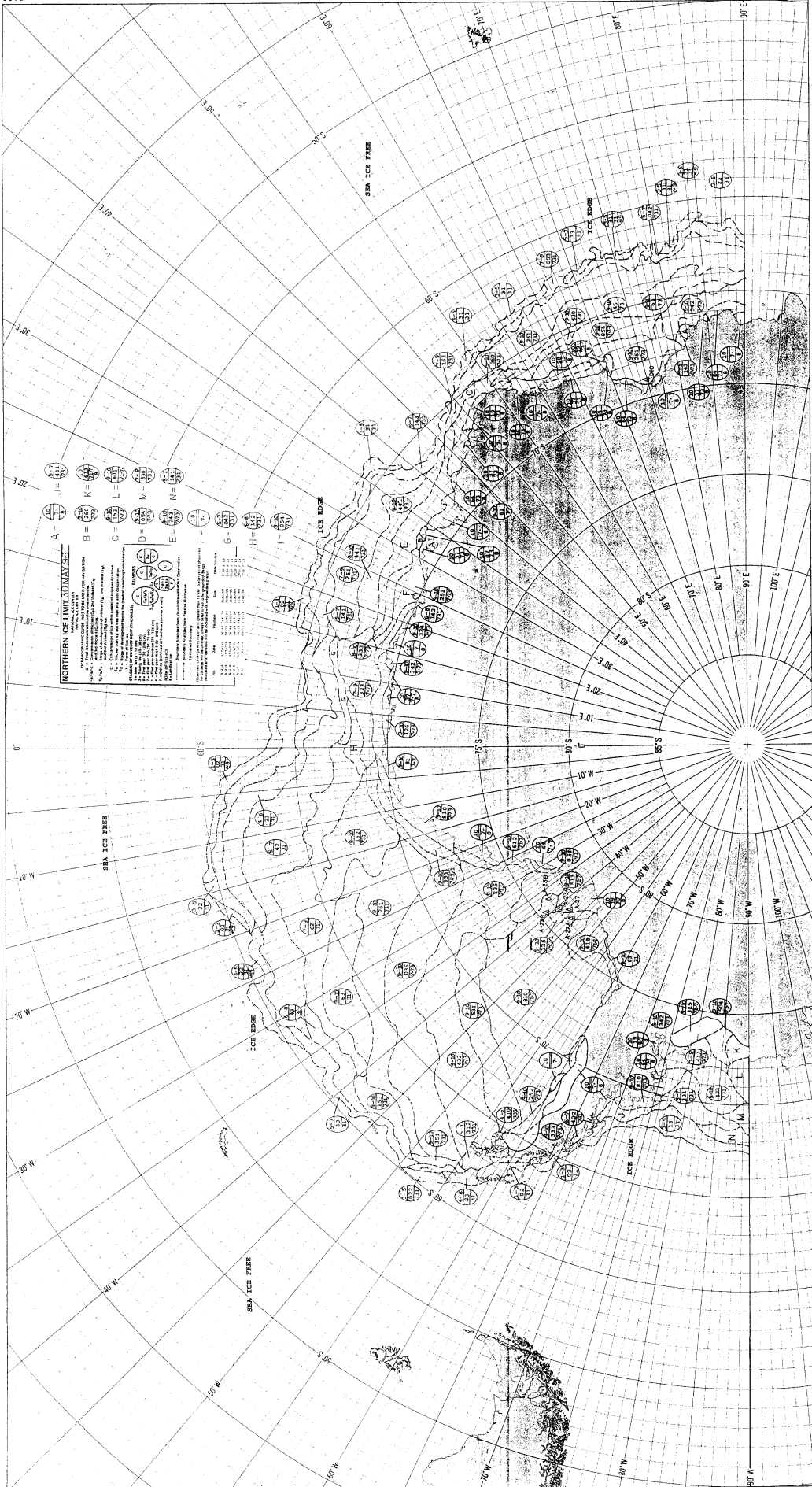
7. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

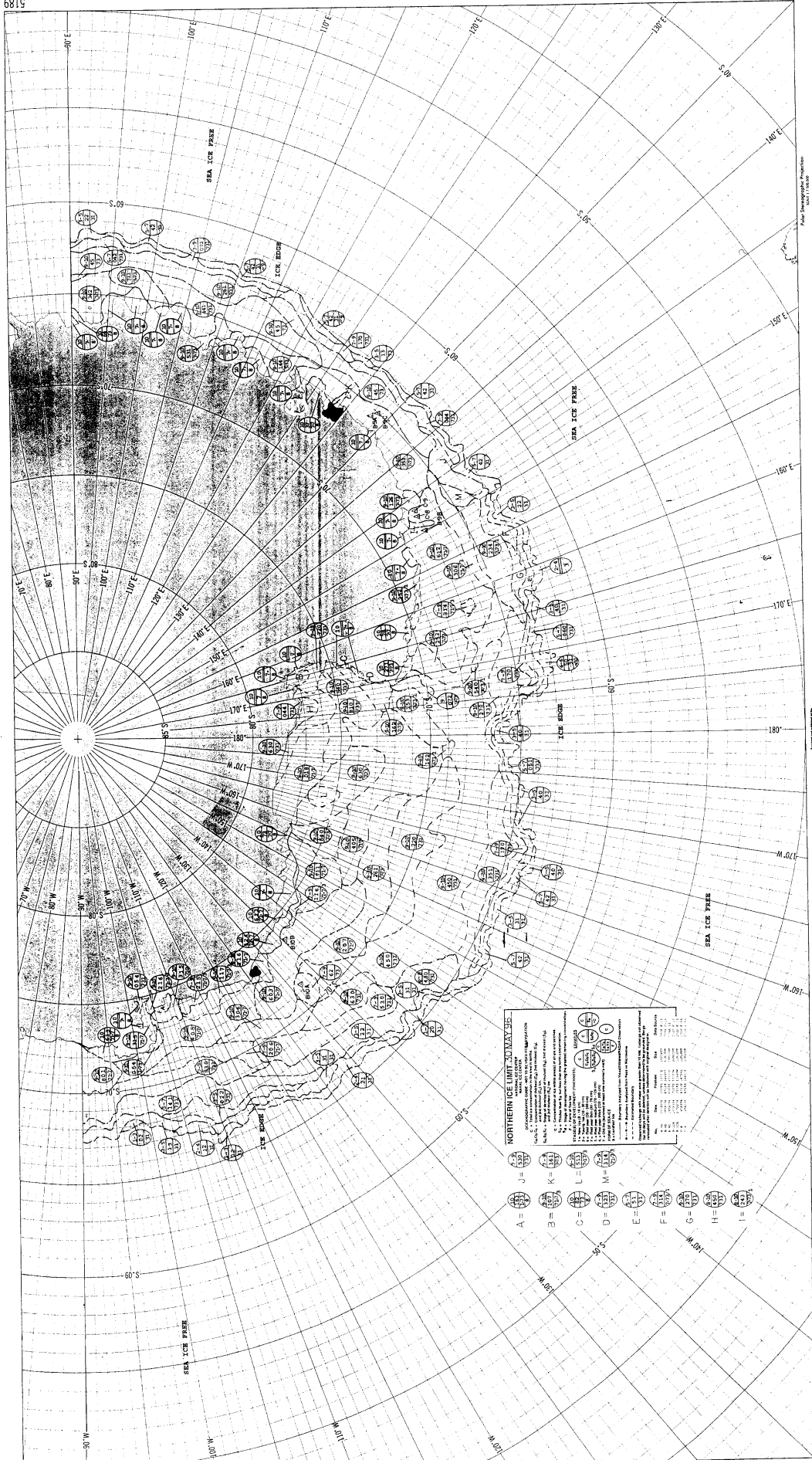
8. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

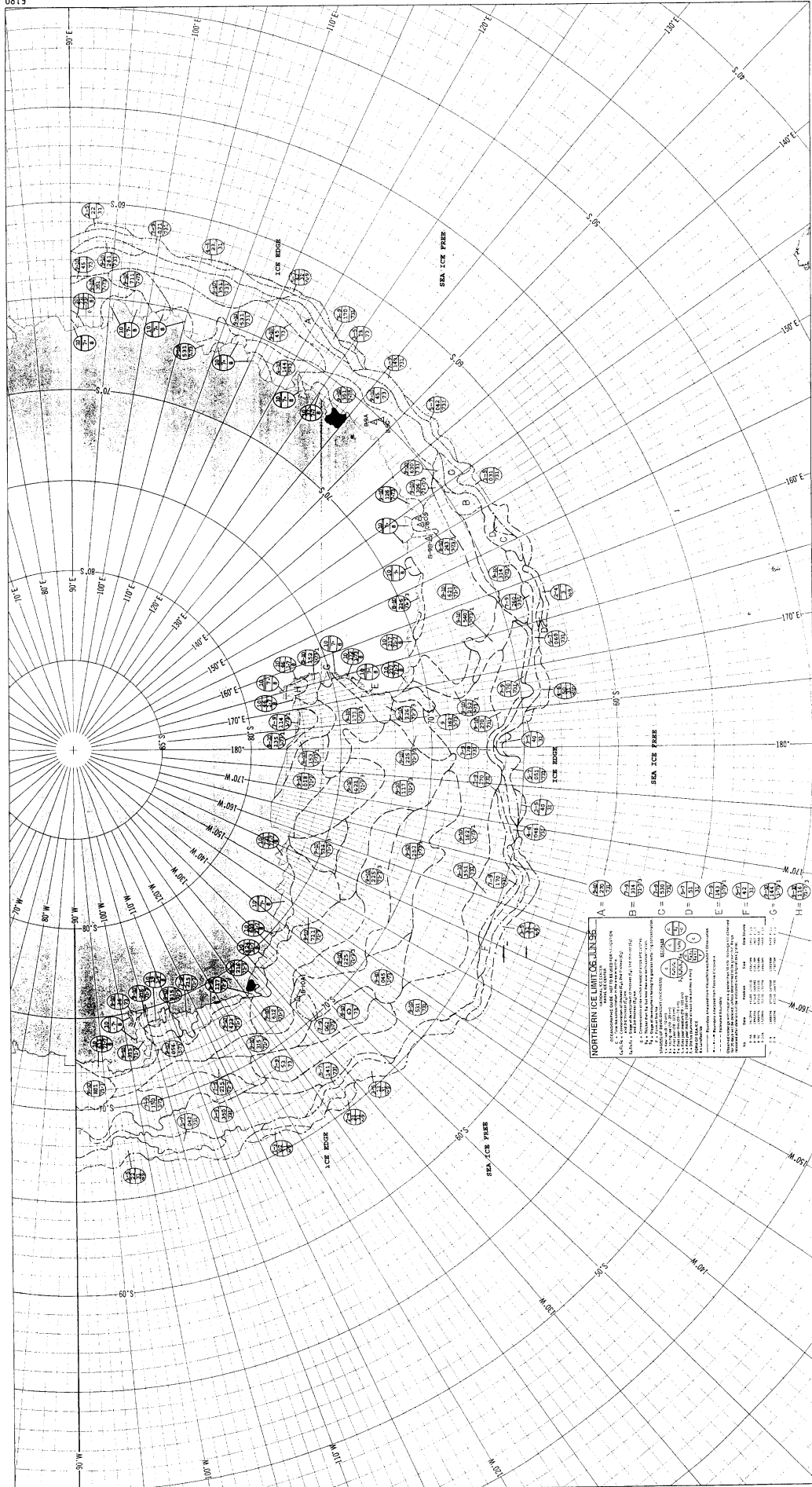
9. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

10. The Northern Ice Limit is shown on this chart as a dashed line. It is determined by the amount of sea ice that remains in the Arctic region from one year to the next.

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	







NORTHERN LIMIT OF THE ICEBERG

PROVISIONAL CHART FOR THE NORTHERN LIMIT OF THE ICEBERG. THIS CHART IS A SUPPLEMENT TO THE CHART OF THE NORTH PACIFIC OCEAN, AND IS NOT TO BE USED IN CONNECTION WITH THE CHART OF THE NORTH PACIFIC OCEAN.

1. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

2. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

3. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

4. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

5. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

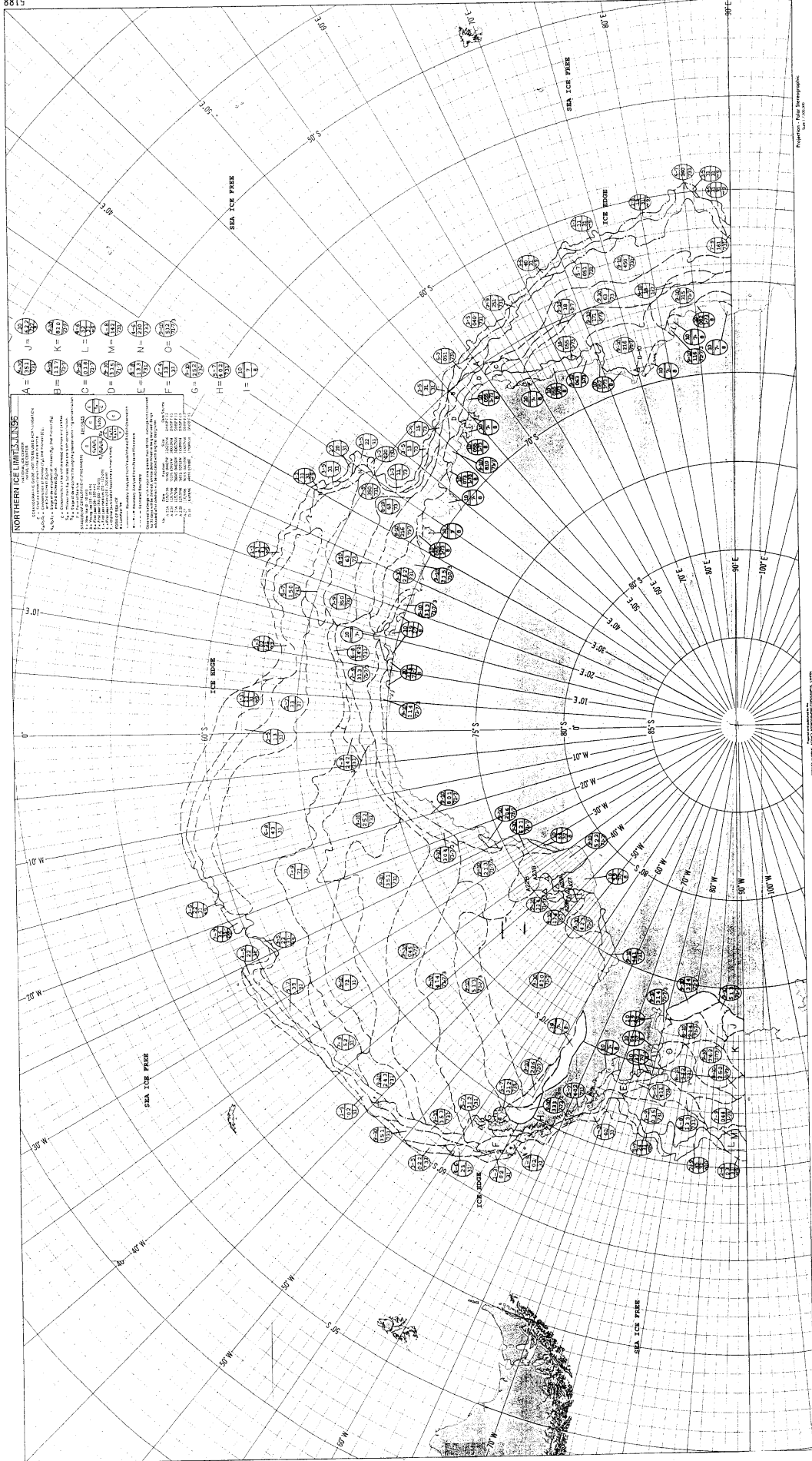
6. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

7. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

8. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

9. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.

10. The chart is a projection of the Northern Limit of the Iceberg, and is not to be used in connection with the Chart of the North Pacific Ocean.



NORTHERN ICE LIMITS

1. **ICE LIMITS:** The limits of the ice are shown by dashed lines. The area between the ice limit and the coast is shaded. The area between the ice limit and the sea ice free zone is unshaded.

2. **ICE TYPES:** The types of ice are indicated by the letters A through O. The letters are defined as follows:

A	1/4
B	1/2
C	3/4
D	1
E	1 1/4
F	1 1/2
G	1 3/4
H	2
I	2 1/4
J	2 1/2
K	2 3/4
L	3
M	3 1/4
N	3 1/2
O	3 3/4

3. **ICE DIRECTION:** The direction of the ice is indicated by the letters A through O. The letters are defined as follows:

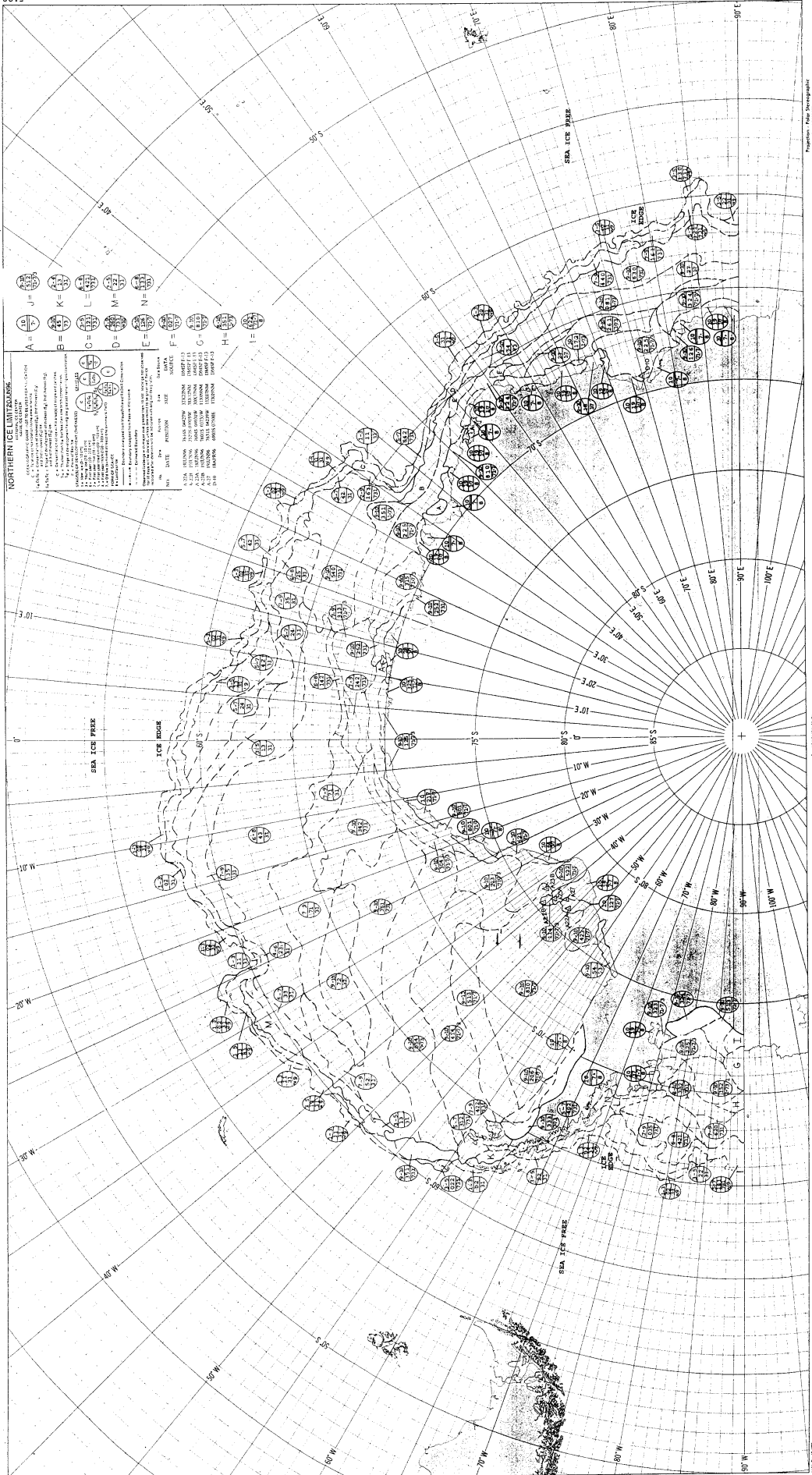
A	0°
B	15°
C	30°
D	45°
E	60°
F	75°
G	90°
H	105°
I	120°
J	135°
K	150°
L	165°
M	180°
N	195°
O	210°

4. **ICE DENSITY:** The density of the ice is indicated by the letters A through O. The letters are defined as follows:

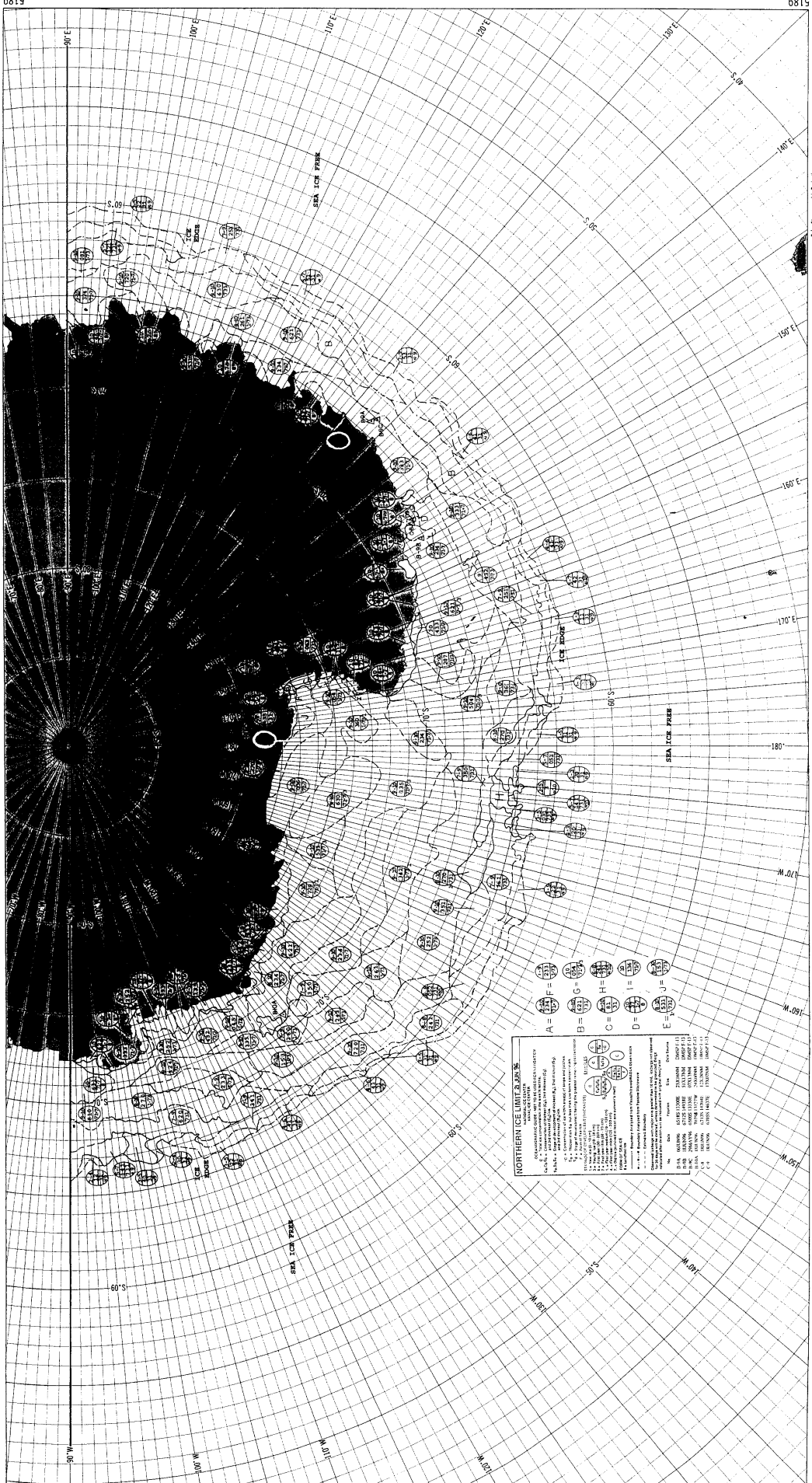
A	0.85
B	0.90
C	0.95
D	1.00
E	1.05
F	1.10
G	1.15
H	1.20
I	1.25
J	1.30
K	1.35
L	1.40
M	1.45
N	1.50
O	1.55

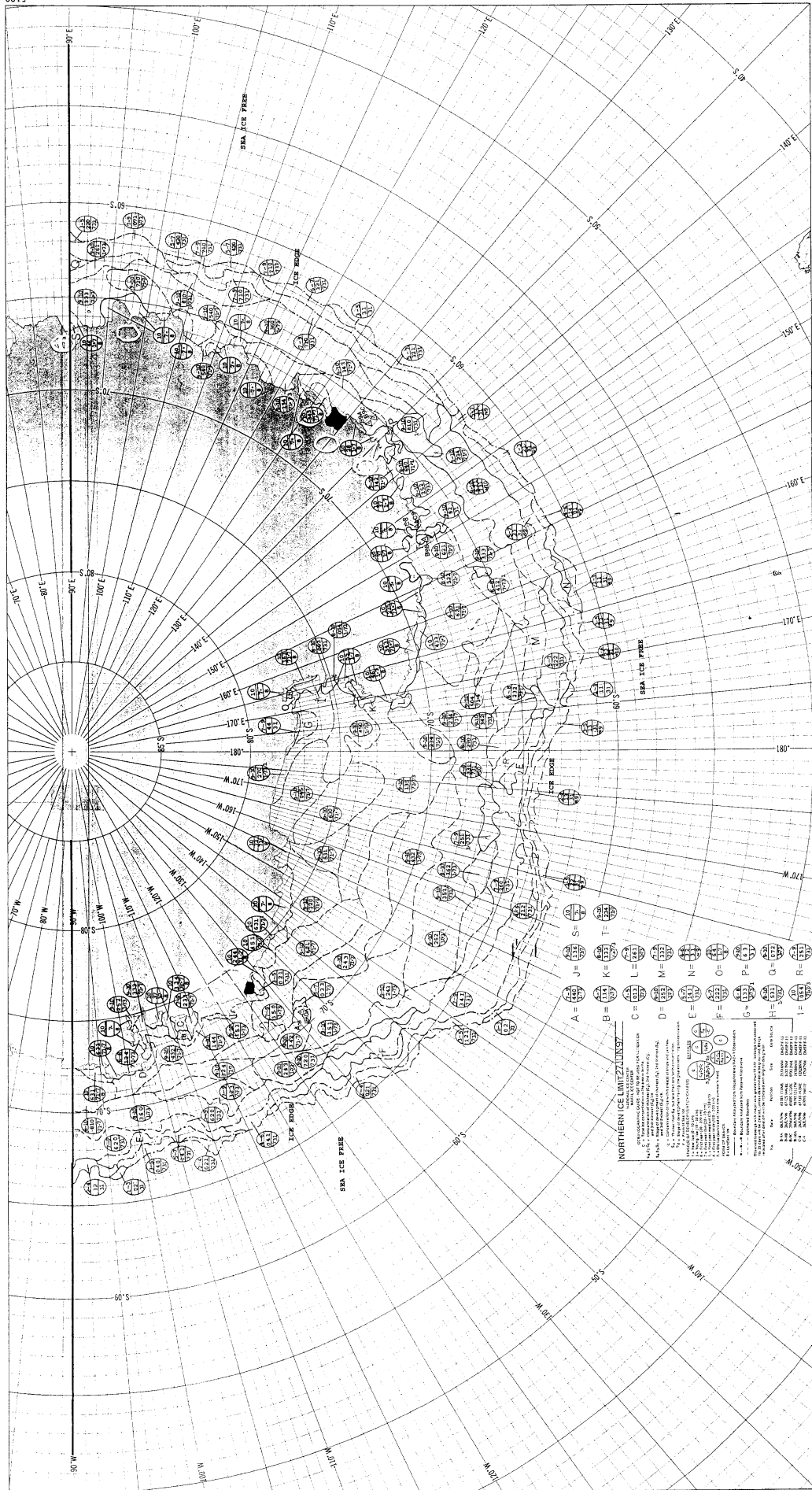
Projection: Polar Stereographic
Scale: 1:100,000

NO. 1000
NO. 1001
NO. 1002
NO. 1003
NO. 1004
NO. 1005
NO. 1006
NO. 1007
NO. 1008
NO. 1009
NO. 1010
NO. 1011
NO. 1012
NO. 1013
NO. 1014
NO. 1015
NO. 1016
NO. 1017
NO. 1018
NO. 1019
NO. 1020

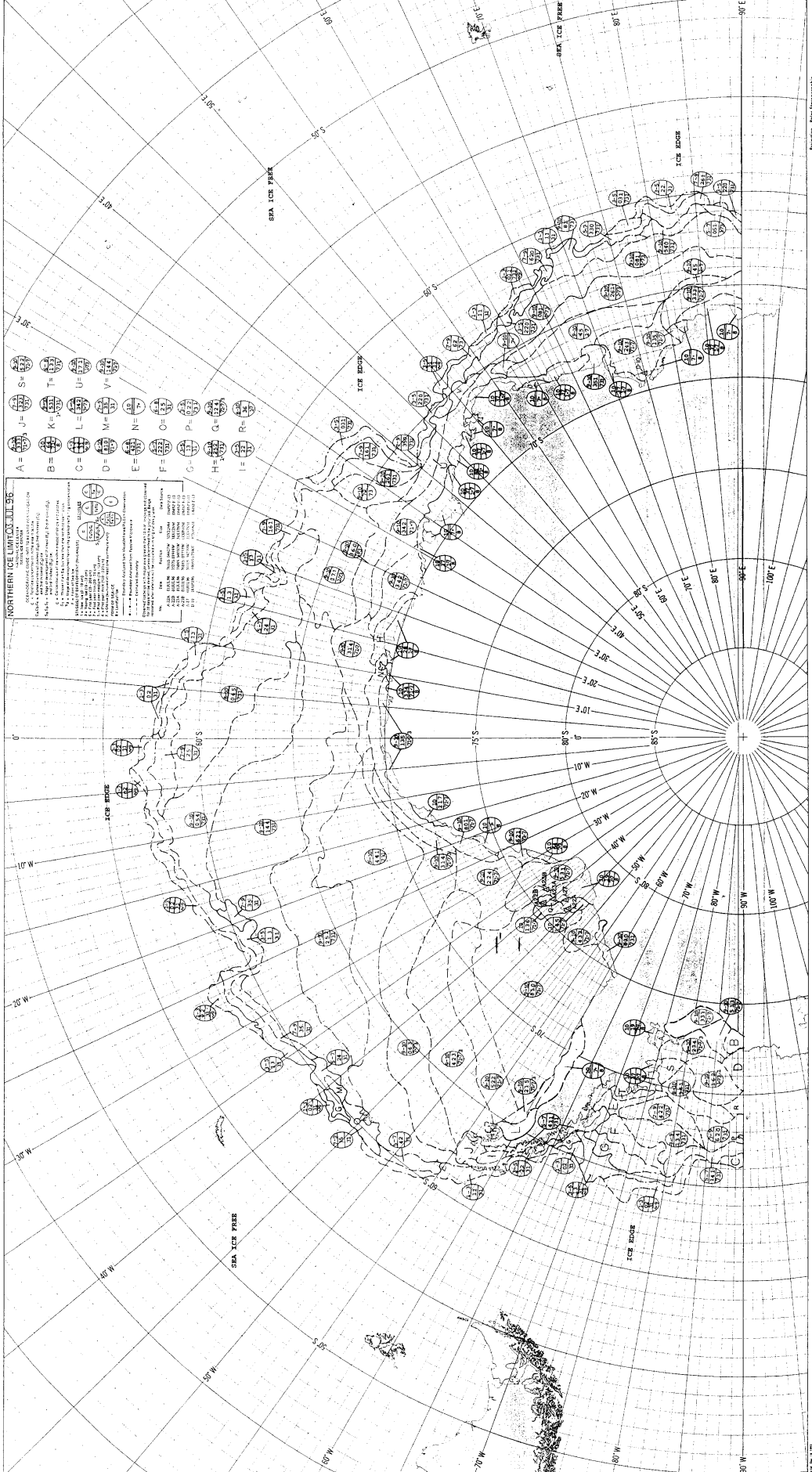


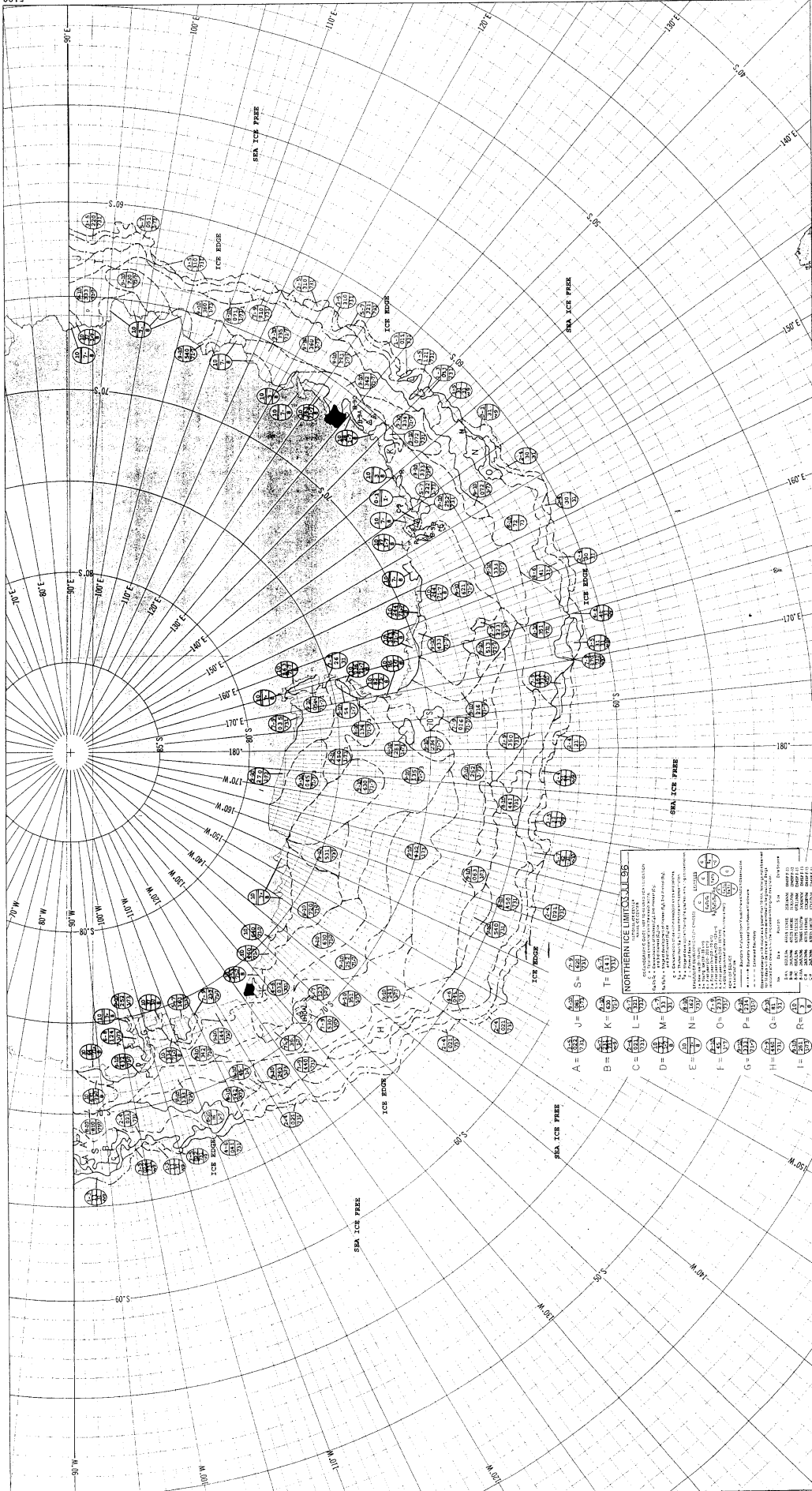
Properties: All drawings are
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NORTHERN ICE LIMITATIONS
 SYMBOLS FOR ICE LIMITATIONS
 A = ...
 B = ...
 C = ...
 D = ...
 E = ...
 F = ...
 G = ...
 H = ...
 I = ...
 J = ...
 K = ...
 L = ...
 M = ...
 N = ...
 O = ...
 P = ...
 Q = ...
 R = ...
 S = ...
 T = ...





NORTHERN ICE LIMITS (I.C.S.)

1. I.C.S. is a code for ice conditions. It is used to indicate the presence and thickness of ice in the Arctic region.

2. I.C.S. is based on the following symbols:

A =	1/4" - 1/2"	S =	1/2" - 3/4"
B =	3/4" - 1"	T =	3/4" - 1"
C =	1" - 1 1/2"	L =	1 1/2" - 2"
D =	1 1/2" - 2"	M =	2" - 3"
E =	2" - 3"	N =	3" - 4"
F =	3" - 4"	O =	4" - 5"
G =	4" - 5"	P =	5" - 6"
H =	5" - 6"	Q =	6" - 7"
I =	6" - 7"	R =	7" - 8"

3. I.C.S. is used to indicate the presence and thickness of ice in the Arctic region.

4. I.C.S. is based on the following symbols:

5. I.C.S. is used to indicate the presence and thickness of ice in the Arctic region.

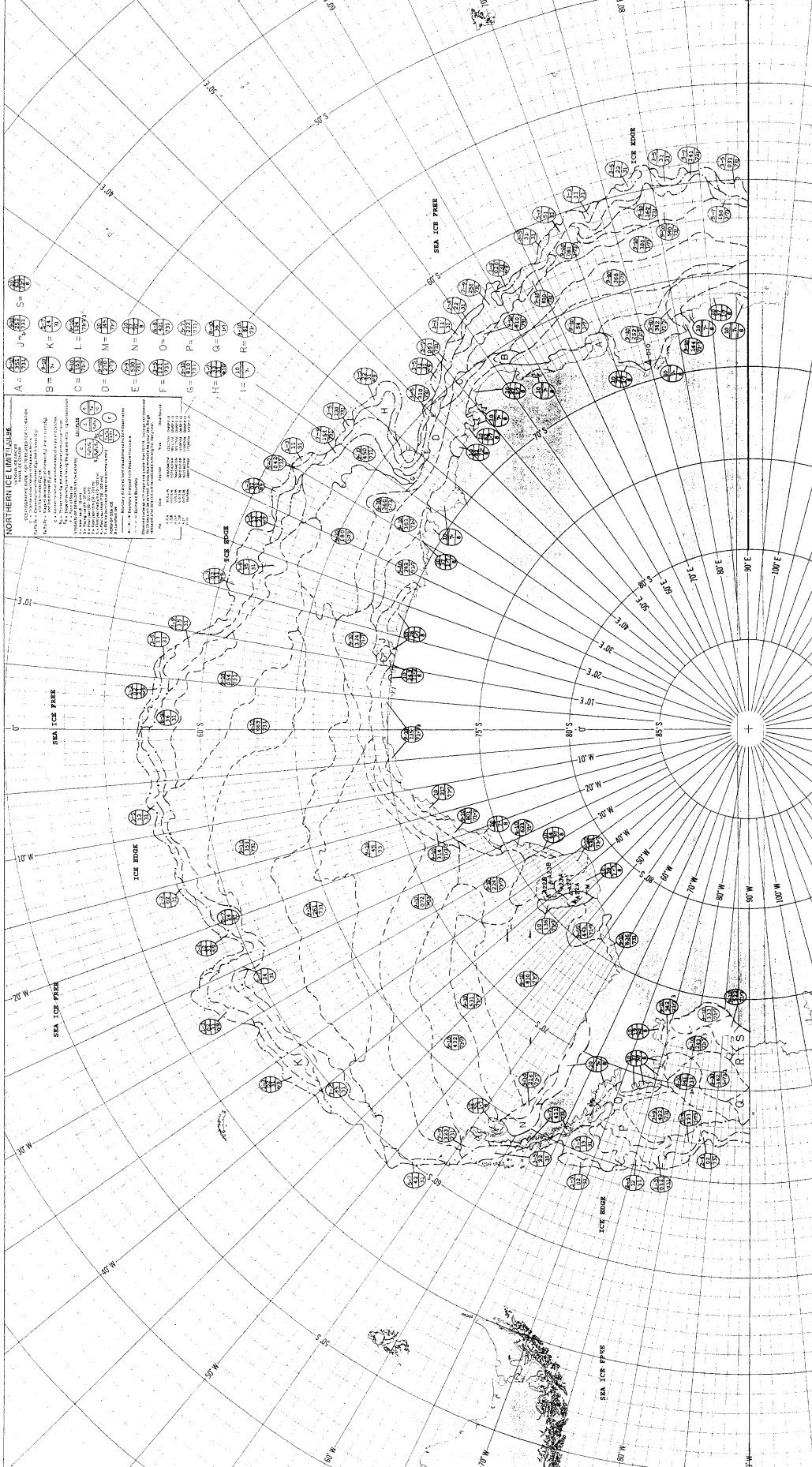
6. I.C.S. is based on the following symbols:

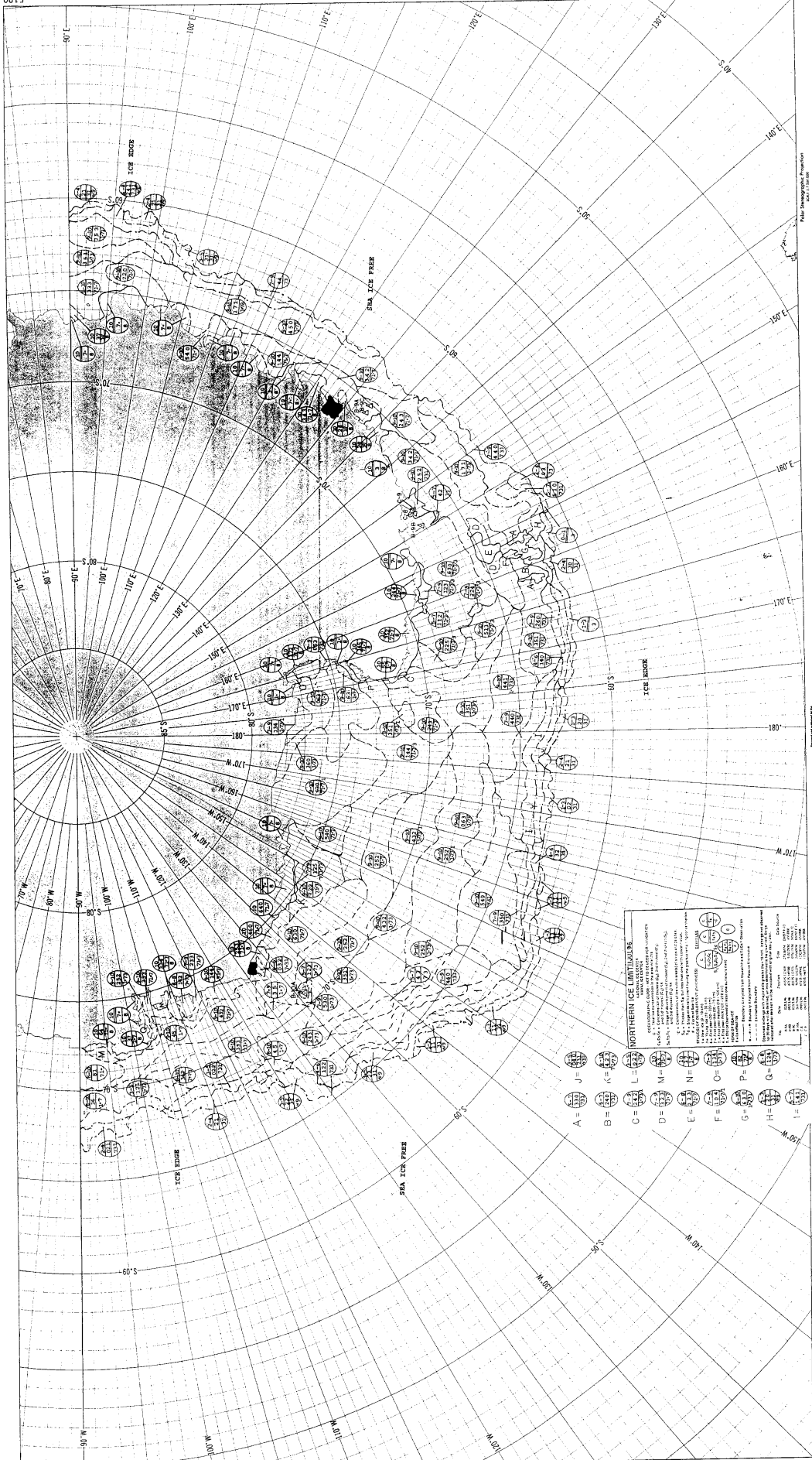
7. I.C.S. is used to indicate the presence and thickness of ice in the Arctic region.

8. I.C.S. is based on the following symbols:

9. I.C.S. is used to indicate the presence and thickness of ice in the Arctic region.

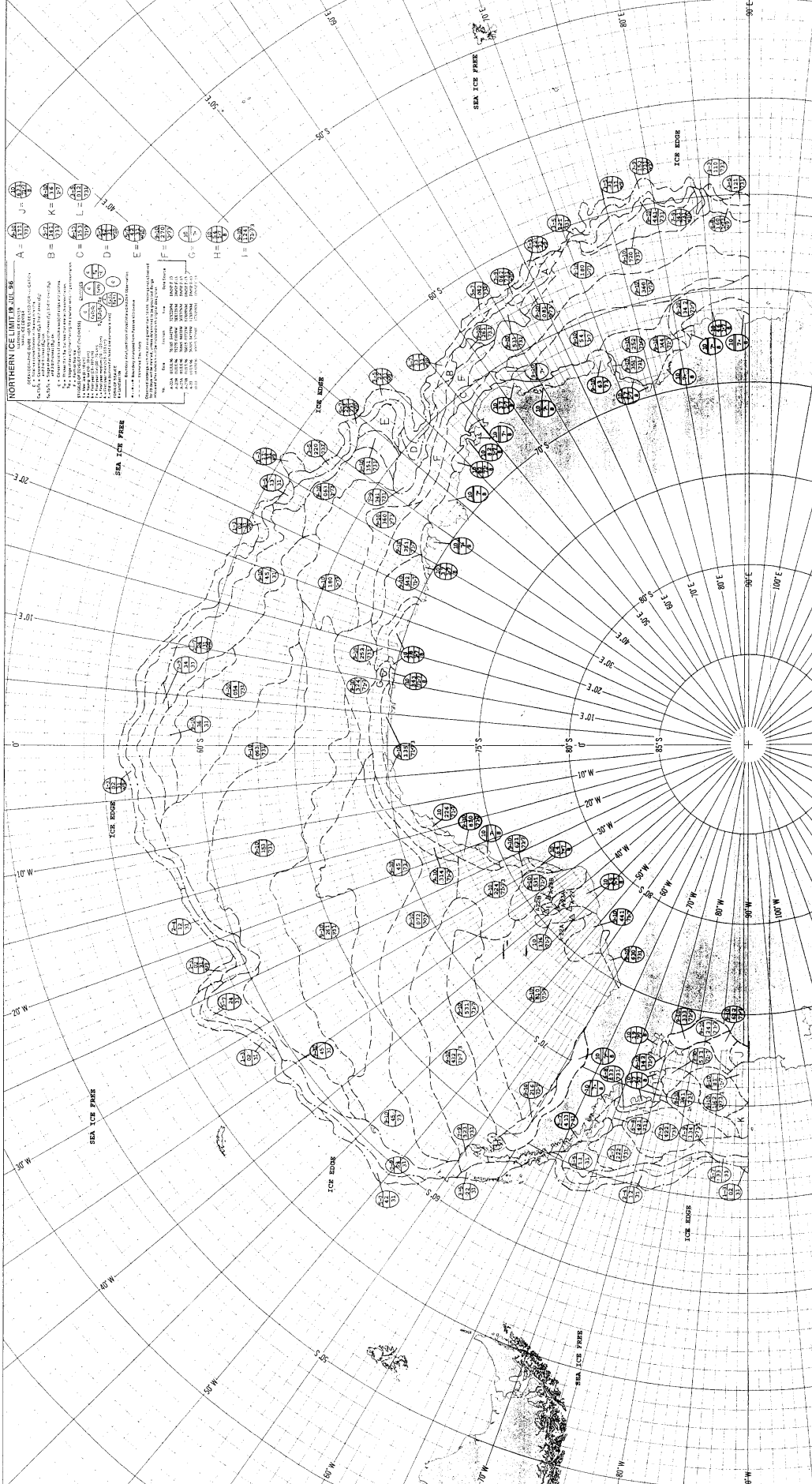
10. I.C.S. is based on the following symbols:

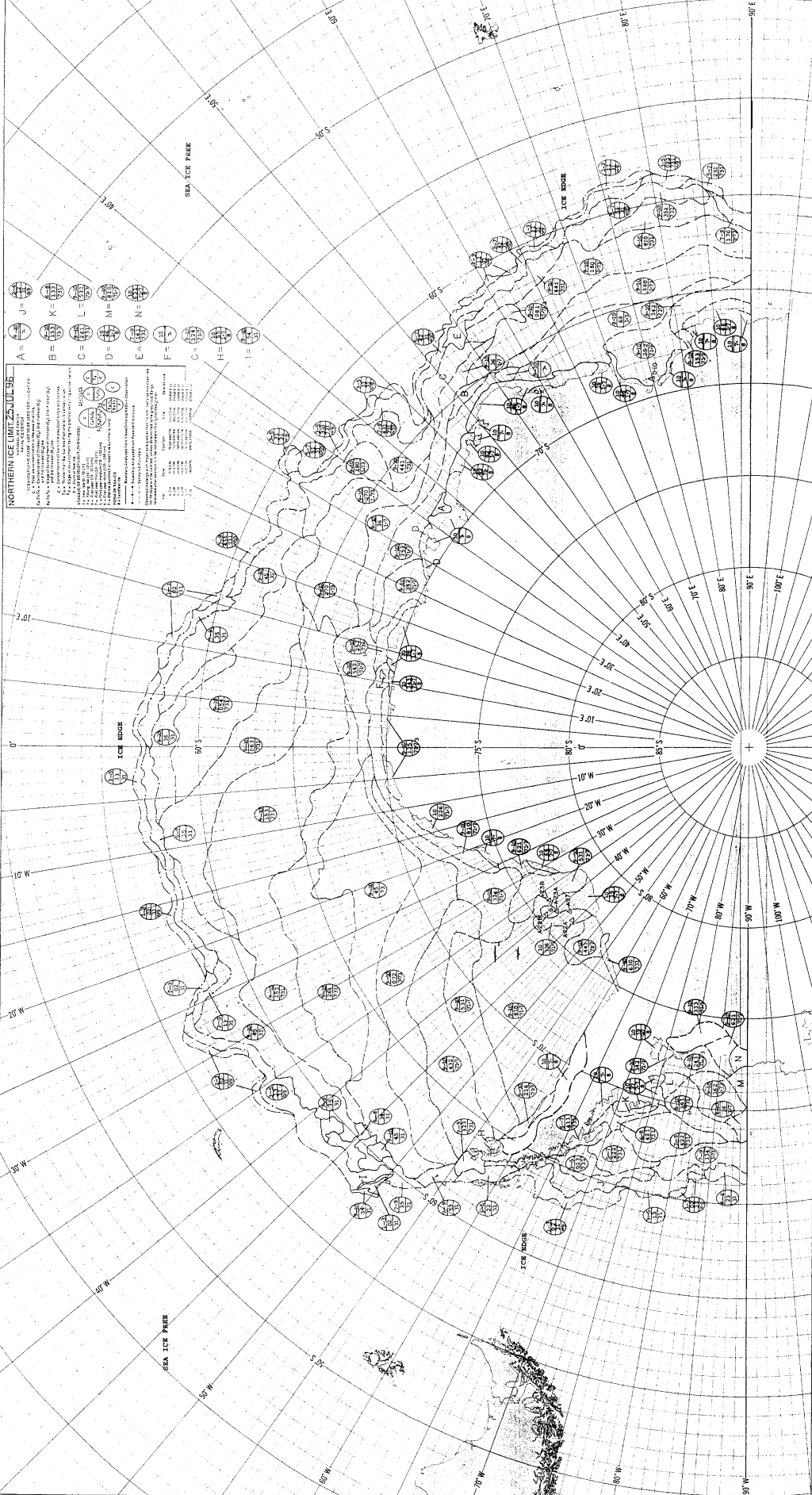




NORTHERN ICE LIMITATIONS
 This chart shows the extent of sea ice in the Arctic region. The symbols indicate the type of ice and its characteristics. The legend below provides the key for these symbols.

- A =
- B =
- C =
- D =
- E =
- F =
- G =
- H =
- I =

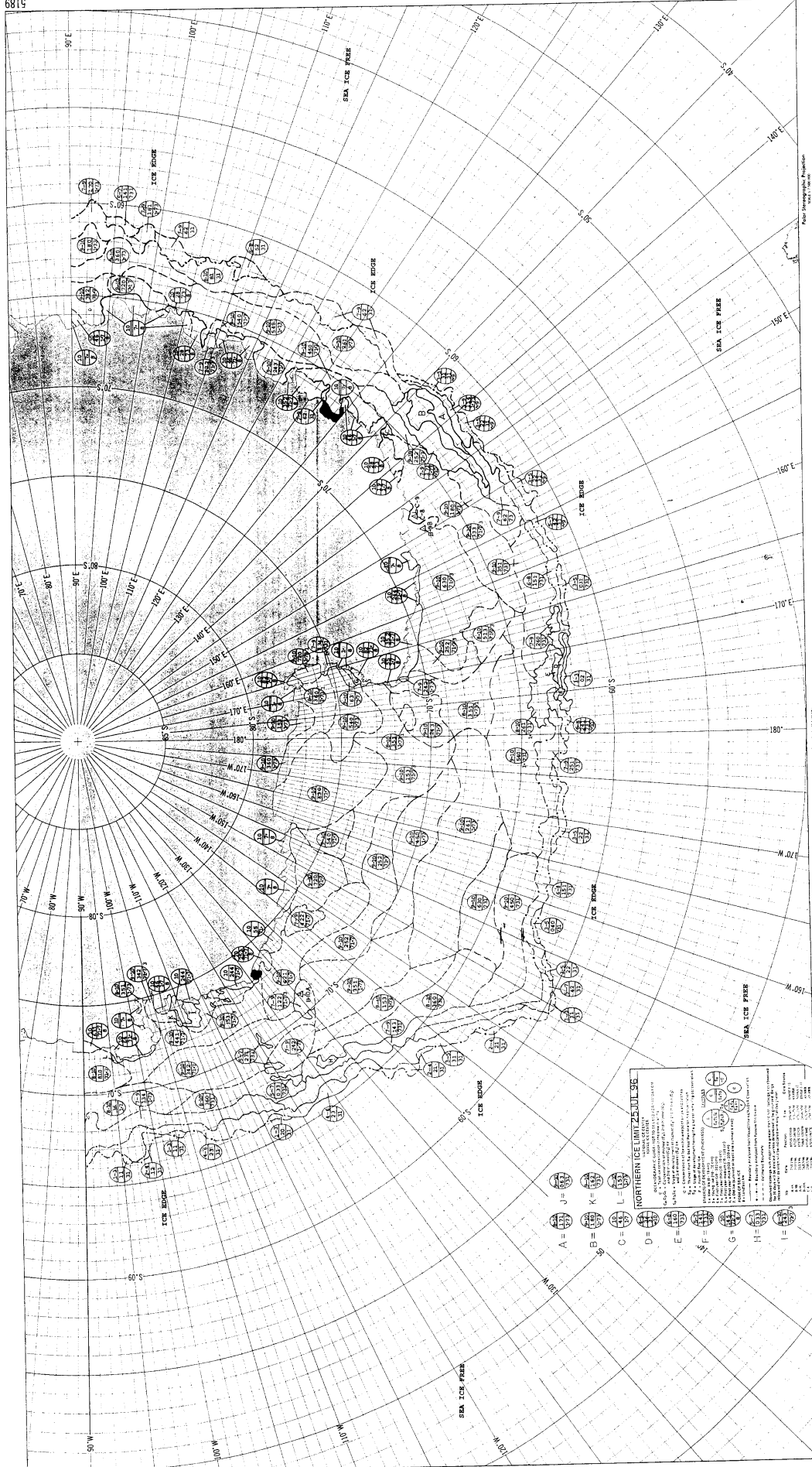




NORTHERN ICE LIMITS JUL 56

Abbreviations:
 A = 1st Year Sea Ice
 B = 2nd Year Sea Ice
 C = 3rd Year Sea Ice
 D = 4th Year Sea Ice
 E = 5th Year Sea Ice
 F = 6th Year Sea Ice
 G = 7th Year Sea Ice
 H = 8th Year Sea Ice
 I = 9th Year Sea Ice
 J = 10th Year Sea Ice
 K = 11th Year Sea Ice
 L = 12th Year Sea Ice
 M = 13th Year Sea Ice
 N = 14th Year Sea Ice
 O = 15th Year Sea Ice
 P = 16th Year Sea Ice
 Q = 17th Year Sea Ice

Sea Ice Bare
 Ice Bare
 Ice Edge
 Sea Ice Edge

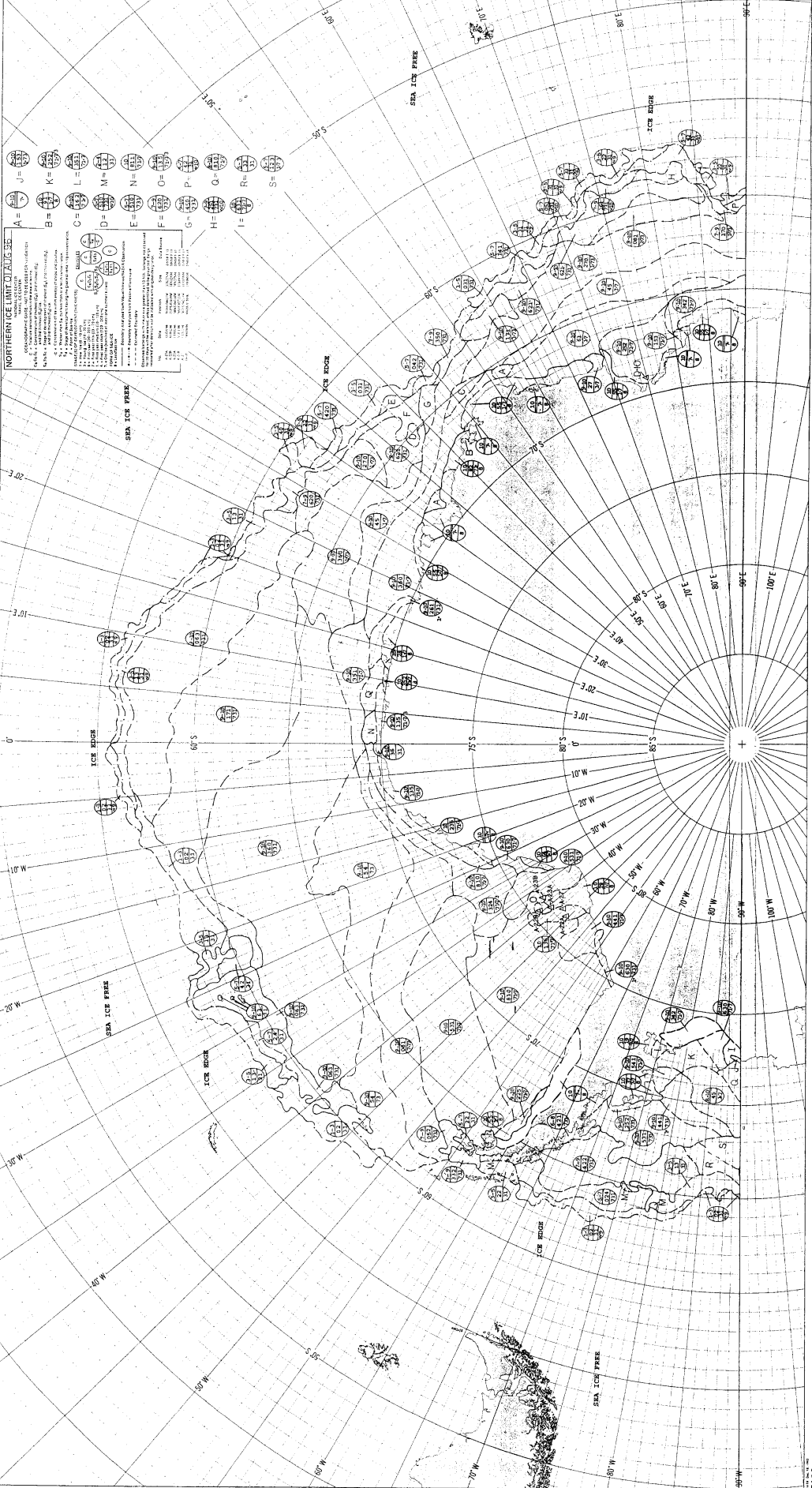


NORTHERN ICE LIMIT 25 JUL 38

ICE LIMITS ARE SHOWN BY SHADING AND DASHED LINES. SEA ICE FREE AREAS ARE SHOWN BY DOTTED LINES. CIRCLES WITH NUMBERS AND LETTERS INDICATE OBSERVATIONS.

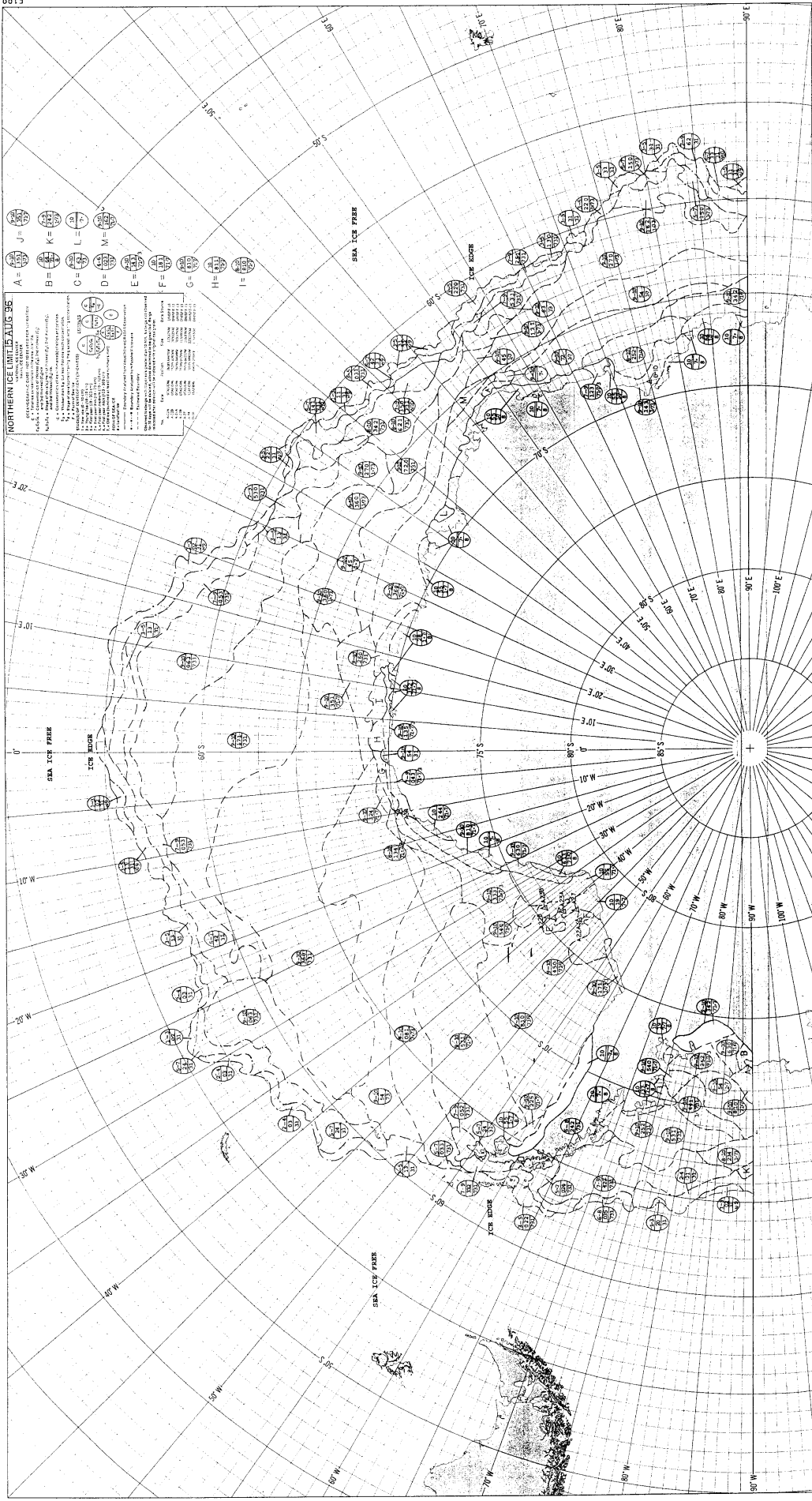
A = 1/16	J = 1/8	K = 1/4	L = 1/2
B = 1/4	M = 3/8	N = 1/2	O = 3/4
C = 1/2	P = 3/4	Q = 1	R = 1 1/2
D = 3/4	S = 1	T = 1 1/2	U = 2
E = 1	V = 1 1/2	W = 2	X = 3
F = 1 1/2	Y = 3	Z = 4	AA = 5
G = 2	AB = 6	AC = 7	AD = 8
H = 3	AE = 9	AF = 10	AG = 11
I = 4	AH = 12	AI = 13	AJ = 14

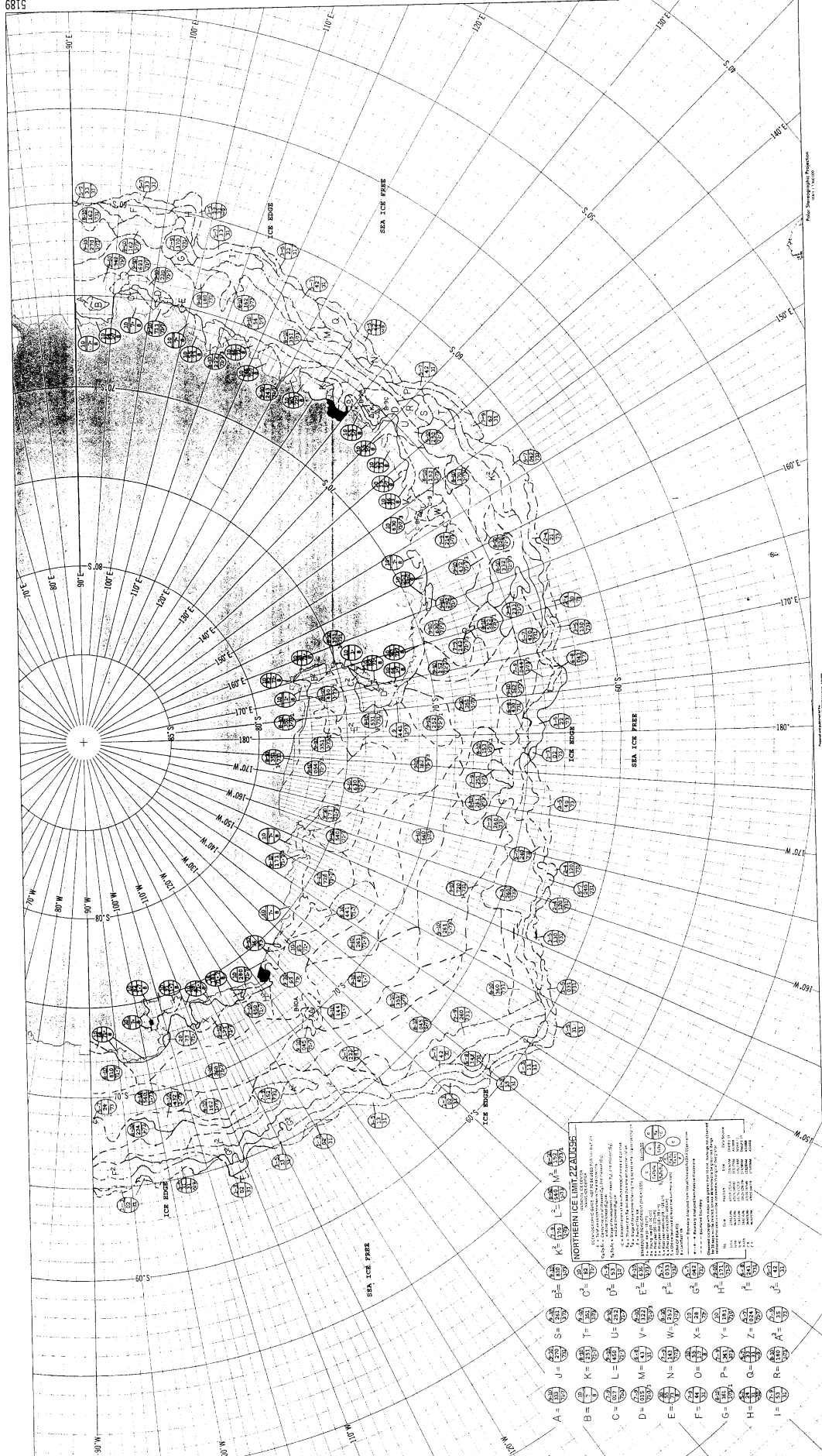
ICE LIMITS ARE SHOWN BY SHADING AND DASHED LINES. SEA ICE FREE AREAS ARE SHOWN BY DOTTED LINES. CIRCLES WITH NUMBERS AND LETTERS INDICATE OBSERVATIONS.



NORTHERN ICE LIMIT DIALS
 NORTH PACIFIC OCEAN
 NORTH ATLANTIC OCEAN
 NORTH INDIAN OCEAN
 NORTH ARCTIC OCEAN
 NORTH PACIFIC OCEAN
 NORTH ATLANTIC OCEAN
 NORTH INDIAN OCEAN
 NORTH ARCTIC OCEAN

- A =
- B =
- C =
- D =
- E =
- F =
- G =
- H =
- I =
- J =
- K =
- L =
- M =
- N =
- O =
- P =
- Q =
- R =
- S =





NORTHERN ICE LIMIT 22 AUGUST

ICEBERGS OBSERVED IN THE ARCTIC OCEAN AND NORTH ATLANTIC OCEAN FROM 1950 TO 1959.

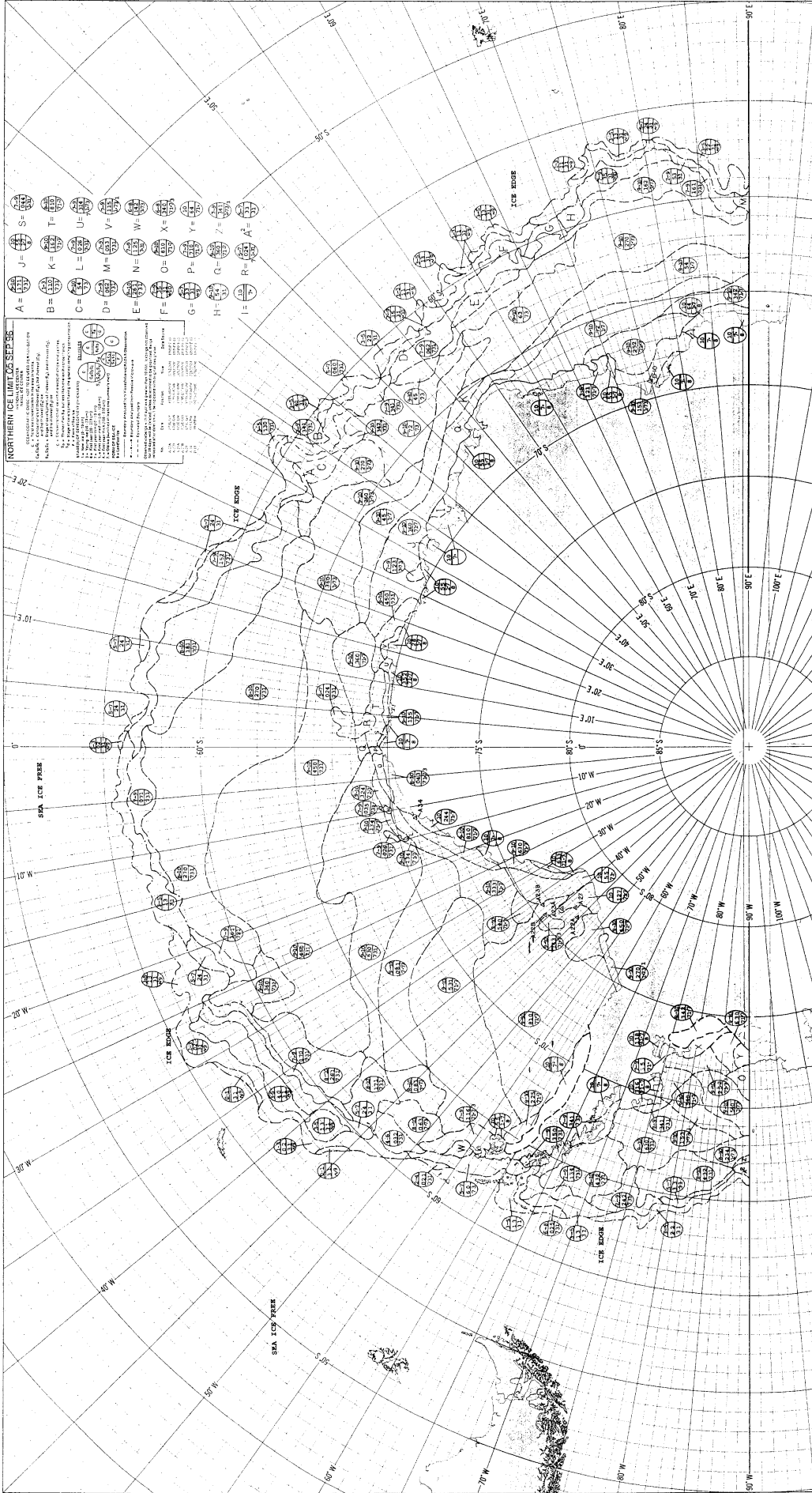
ICEBERGS OBSERVED IN THE ARCTIC OCEAN AND NORTH ATLANTIC OCEAN FROM 1950 TO 1959.

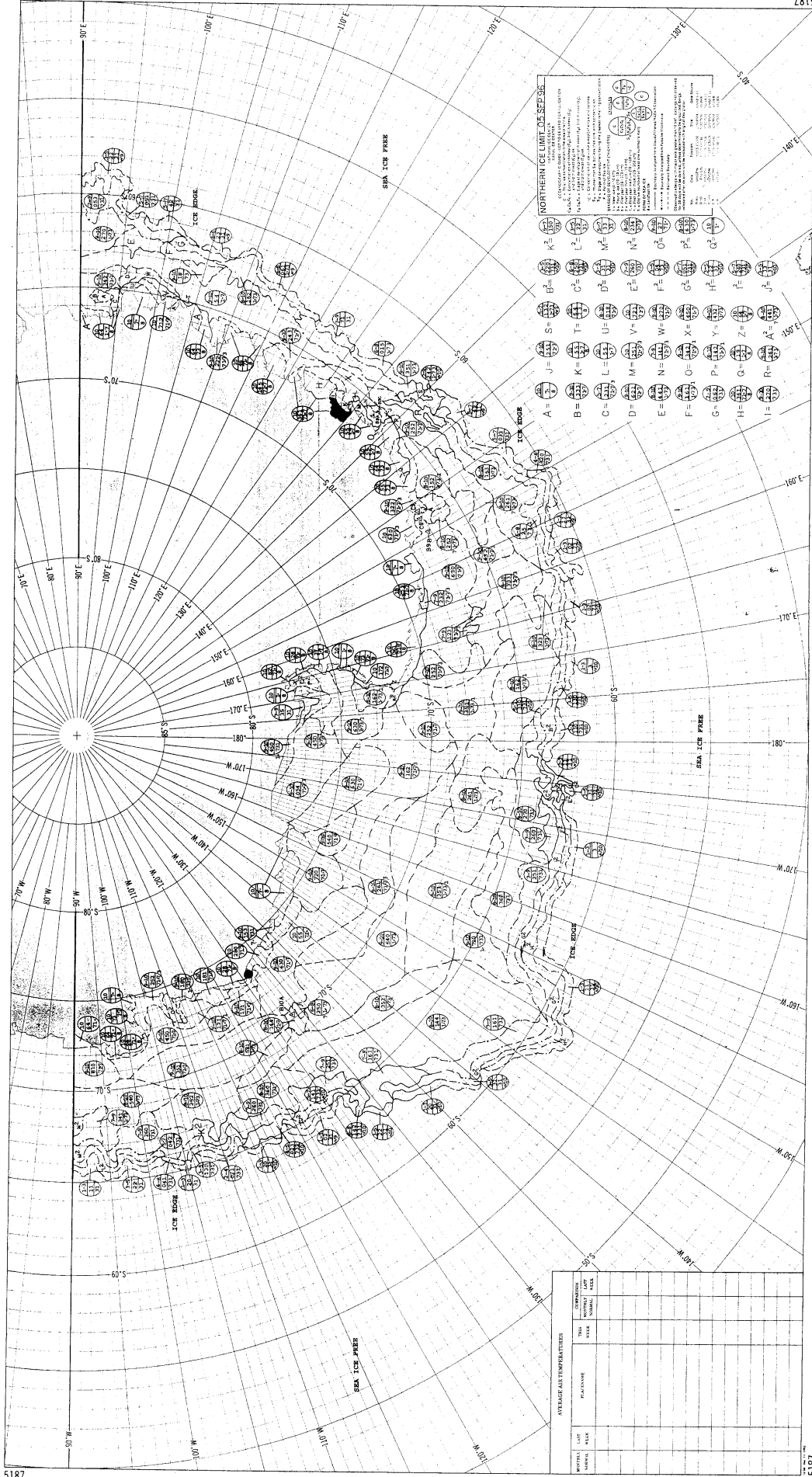
A = 1/2	B = 1/3	C = 1/4	D = 1/5	E = 1/6	F = 1/7	G = 1/8	H = 1/9	I = 1/10	J = 1/11	K = 1/12	L = 1/13	M = 1/14	N = 1/15	O = 1/16	P = 1/17	Q = 1/18	R = 1/19	S = 1/20	T = 1/21	U = 1/22	V = 1/23	W = 1/24	X = 1/25	Y = 1/26	Z = 1/27	A = 1/28
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ICEBERGS OBSERVED IN THE ARCTIC OCEAN AND NORTH ATLANTIC OCEAN FROM 1950 TO 1959.

ICEBERGS OBSERVED IN THE ARCTIC OCEAN AND NORTH ATLANTIC OCEAN FROM 1950 TO 1959.

ICEBERGS OBSERVED IN THE ARCTIC OCEAN AND NORTH ATLANTIC OCEAN FROM 1950 TO 1959.





NORTHERN ICE LIMIT AS SET BY

1. THE POSITION OF THE ICE BOUNDARY
2. THE POSITION OF THE ICE EDGE
3. THE POSITION OF THE SEA ICE FREE ZONE

LEGEND

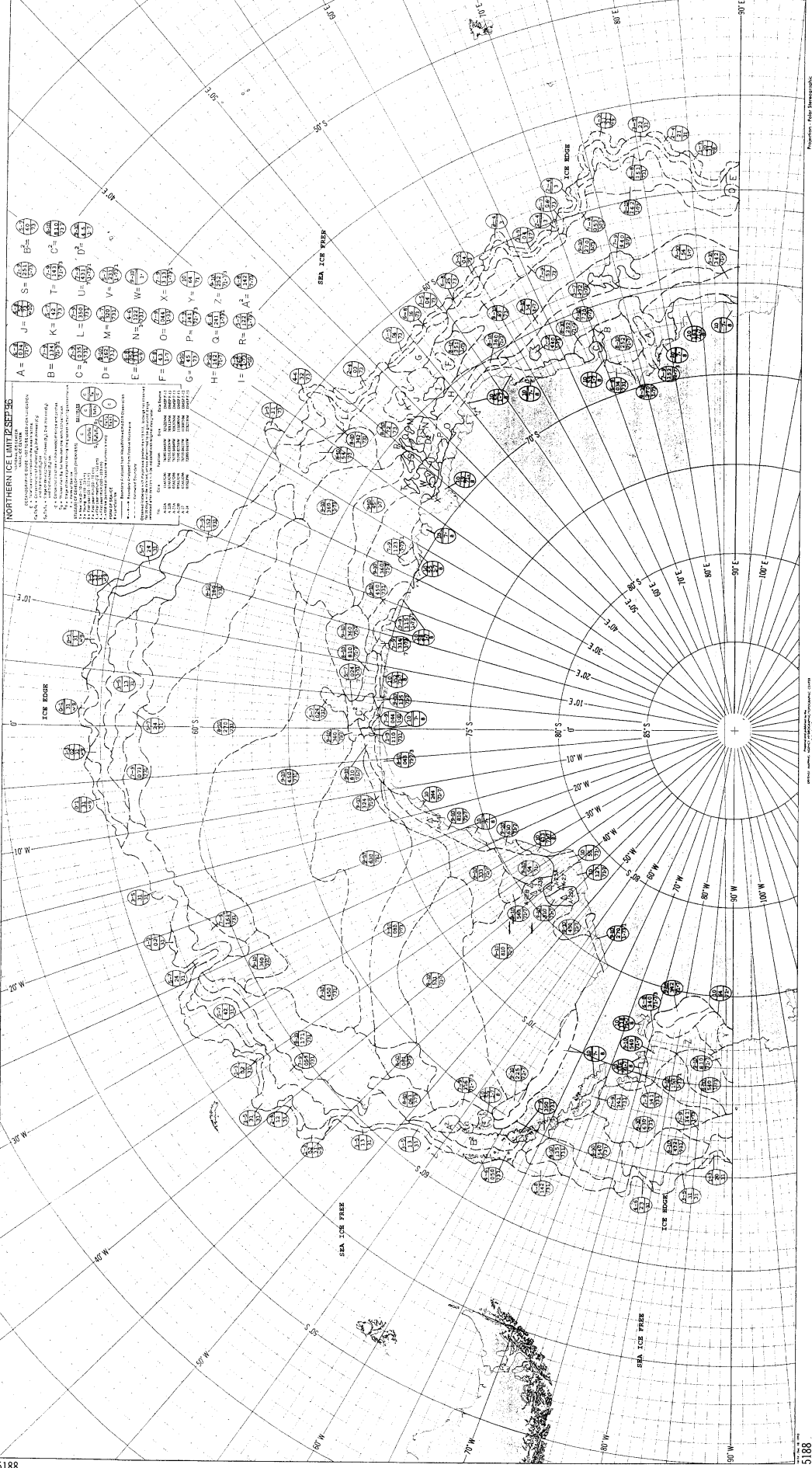
ICE BOUNDARY
A = 100, B = 100, C = 100, D = 100, E = 100, F = 100, G = 100, H = 100, I = 100, J = 100, K = 100, L = 100, M = 100, N = 100, O = 100, P = 100, Q = 100, R = 100, S = 100, T = 100, U = 100, V = 100, W = 100, X = 100, Y = 100, Z = 100

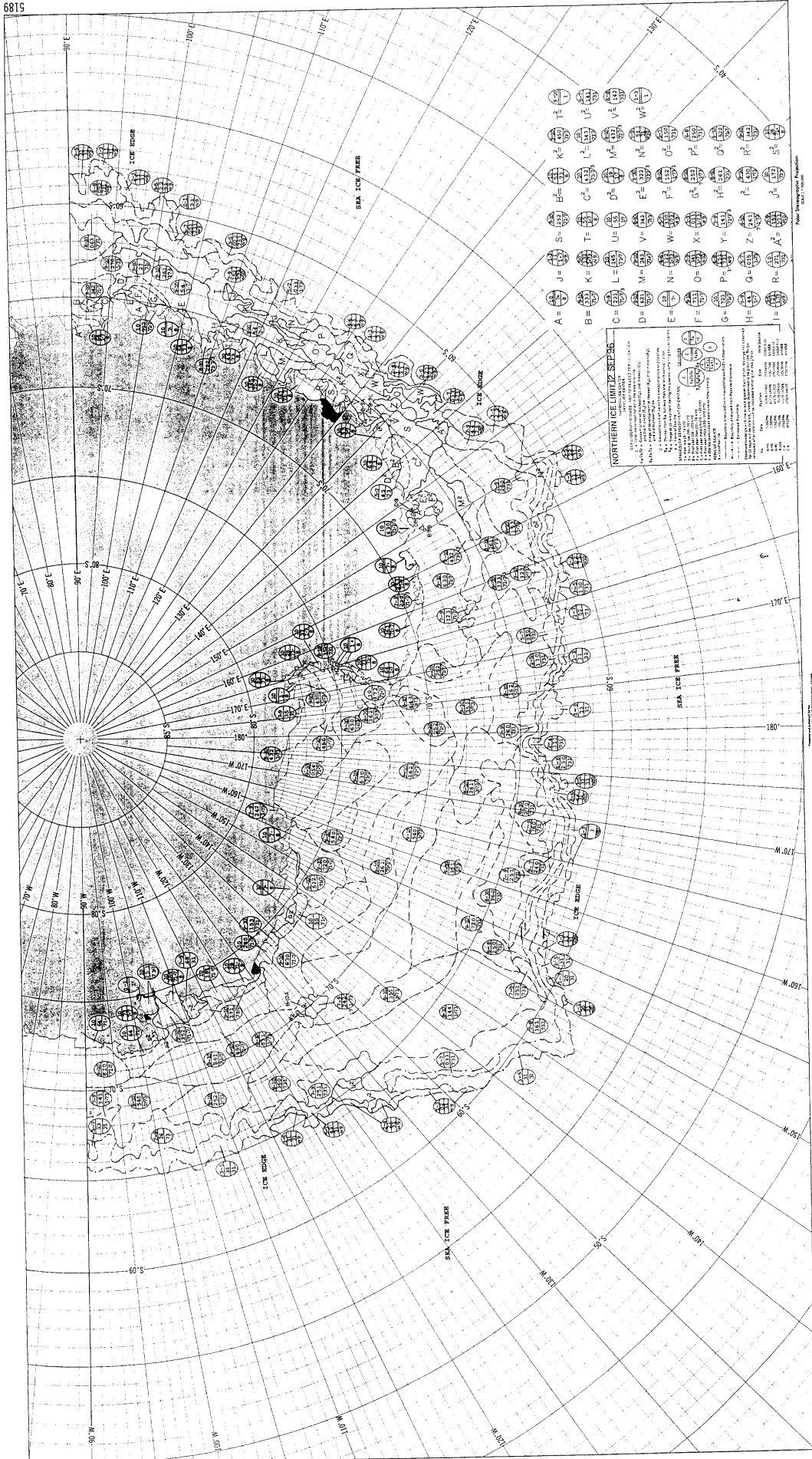
ICE EDGE
A = 100, B = 100, C = 100, D = 100, E = 100, F = 100, G = 100, H = 100, I = 100, J = 100, K = 100, L = 100, M = 100, N = 100, O = 100, P = 100, Q = 100, R = 100, S = 100, T = 100, U = 100, V = 100, W = 100, X = 100, Y = 100, Z = 100

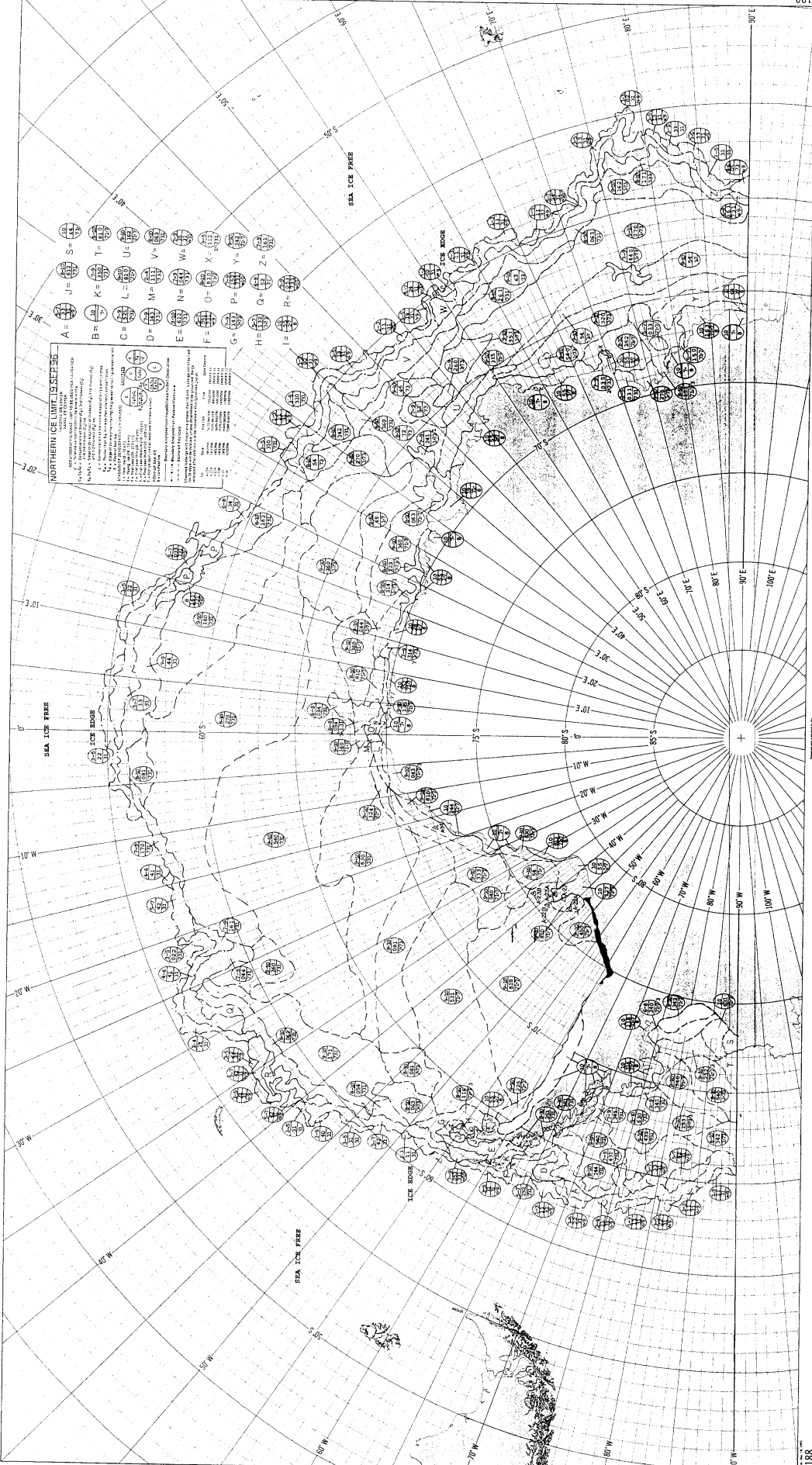
SEA ICE FREE
A = 100, B = 100, C = 100, D = 100, E = 100, F = 100, G = 100, H = 100, I = 100, J = 100, K = 100, L = 100, M = 100, N = 100, O = 100, P = 100, Q = 100, R = 100, S = 100, T = 100, U = 100, V = 100, W = 100, X = 100, Y = 100, Z = 100

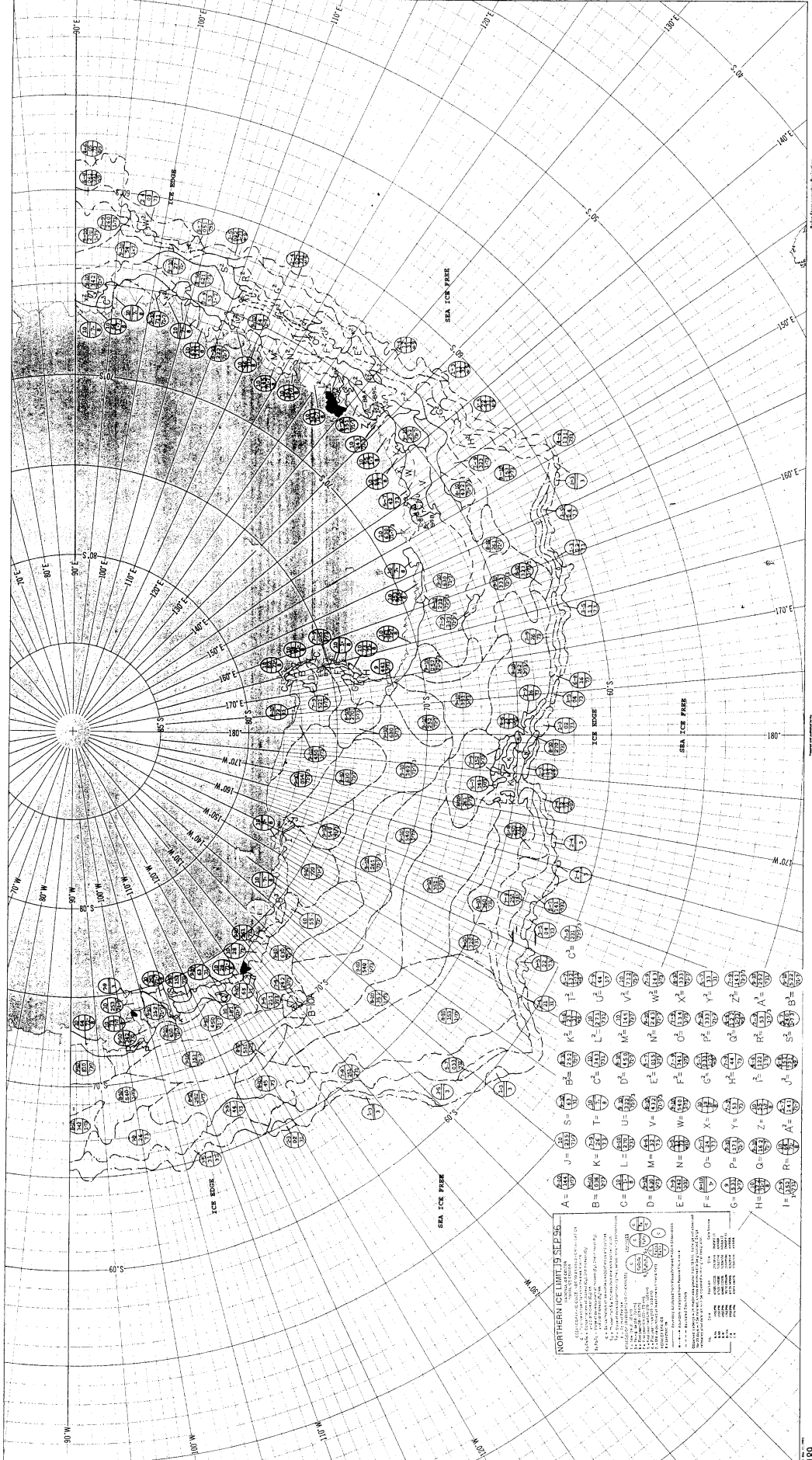
AVERAGE ALTITUDES

FEATURE	ALTITUDE
ICE BOUNDARY	100
ICE EDGE	100
SEA ICE FREE	100
...	...





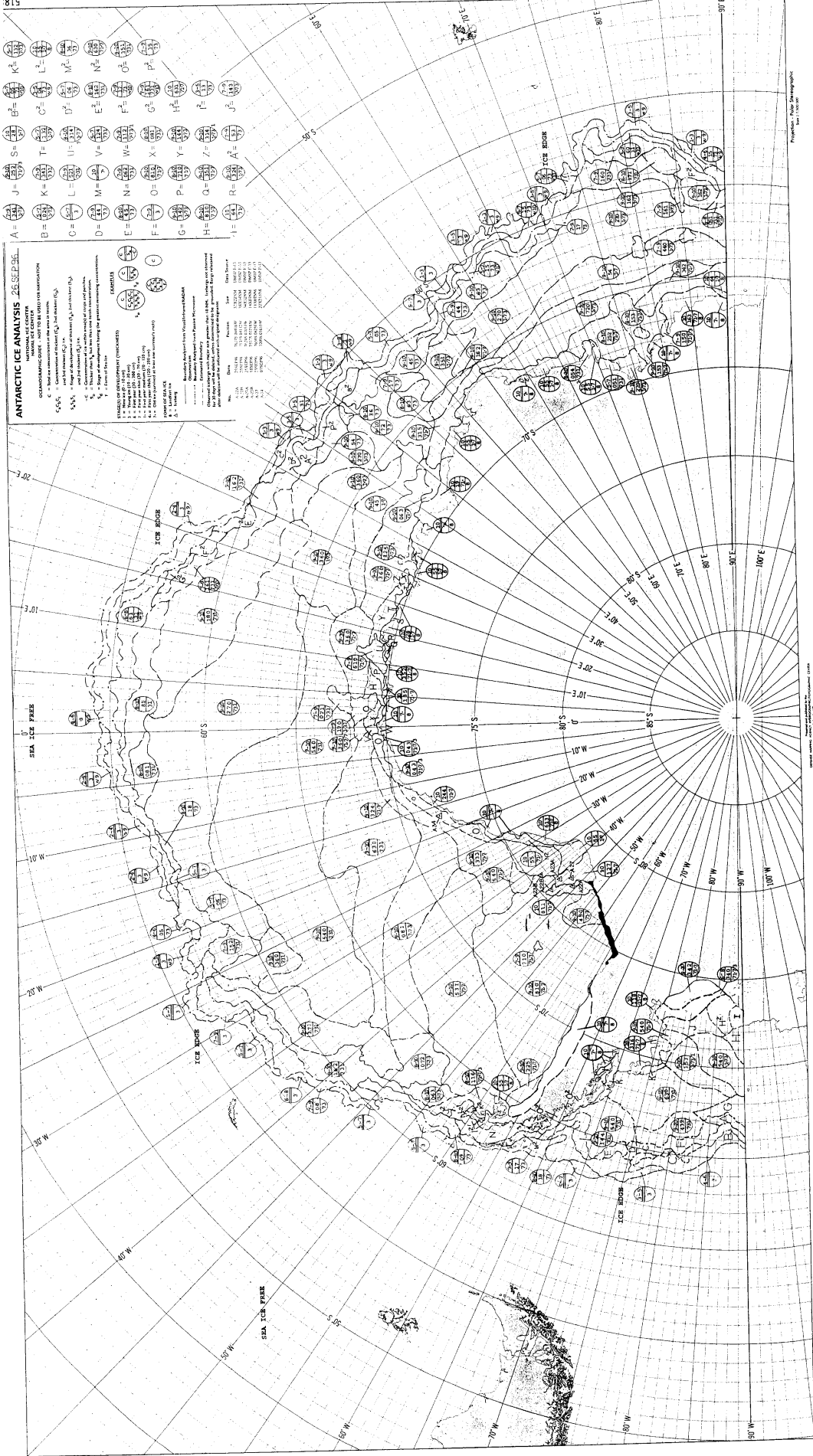


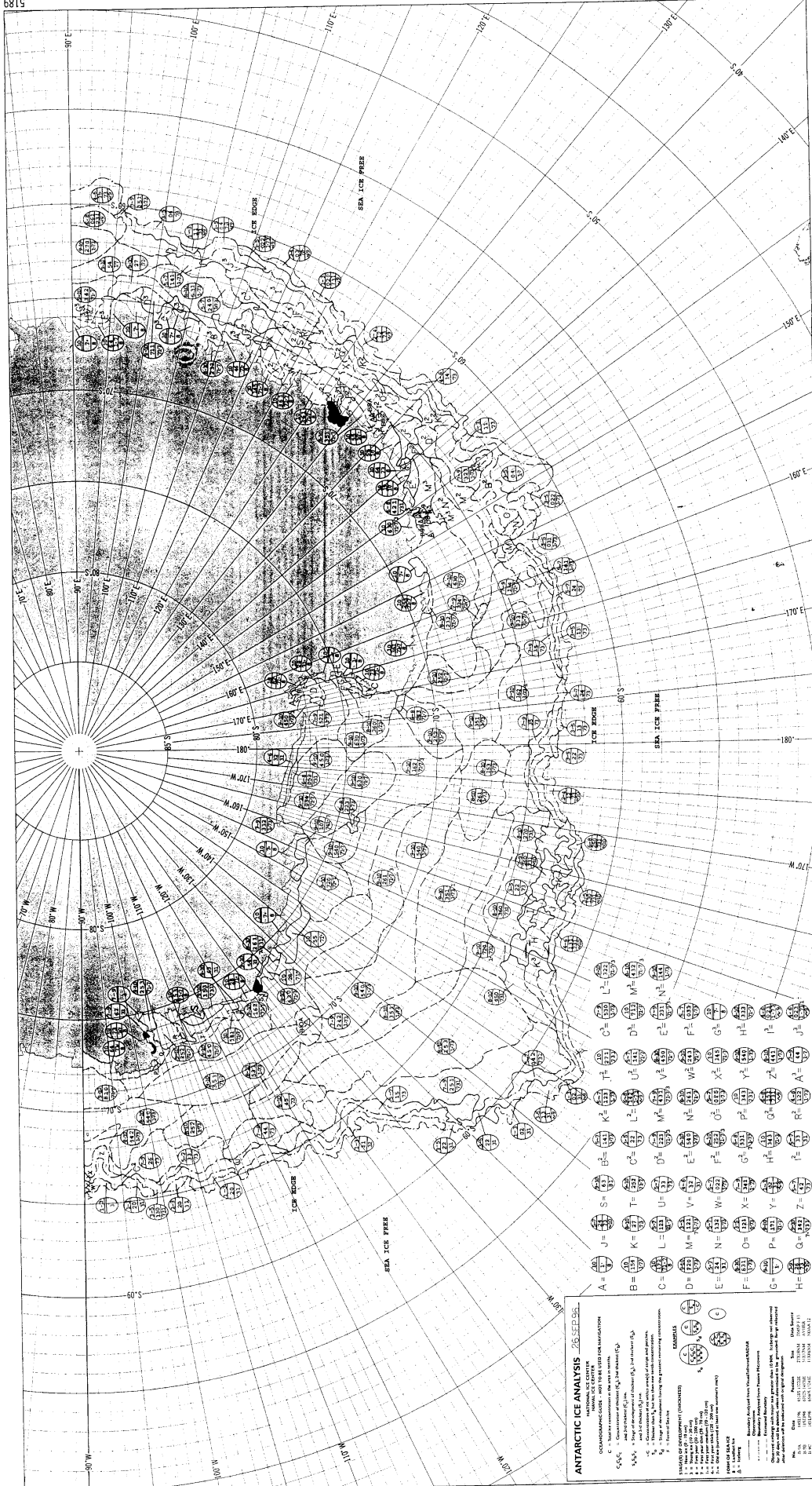


NORTHERN ICE LIMIT IS SECS

A = B = C = D = E = F = G = H = I =

J = K = L = M = N = O = P = Q = R = S = T = U = V = W = X = Y = Z = AA = AB = AC = AD = AE = AF = AG = AH = AI = AJ = AK = AL = AM = AN = AO = AP = AQ = AR = AS = AT = AU = AV = AW = AX = AY = AZ = BA = BB = BC = BD = BE = BF = BG = BH = BI = BJ = BK = BL = BM = BN = BO = BP = BQ = BR = BS = BT = BU = BV = BW = BX = BY = BZ = CA = CB = CC = CD = CE = CF = CG = CH = CI = CJ = CK = CL = CM = CN = CO = CP = CQ = CR = CS = CT = CU = CV = CW = CX = CY = CZ = DA = DB = DC = DD = DE = DF = DG = DH = DI = DJ = DK = DL = DM = DN = DO = DP = DQ = DR = DS = DT = DU = DV = DW = DX = DY = DZ = EA = EB = EC = ED = EE = EF = EG = EH = EI = EJ = EK = EL = EM = EN = EO = EP = EQ = ER = ES = ET = EU = EV = EW = EX = EY = EZ = FA = FB = FC = FD = FE = FF = FG = FH = FI = FJ = FK = FL = FM = FN = FO = FP = FQ = FR = FS = FT = FU = FV = FW = FX = FY = FZ = GA = GB = GC = GD = GE = GF = GG = GH = GI = GJ = GK = GL = GM = GN = GO = GP = GQ = GR = GS = GT = GU = GV = GW = GX = GY = GZ = HA = HB = HC = HD = HE = HF = HG = HH = HI = HJ = HK = HL = HM = HN = HO = HP = HQ = HR = HS = HT = HU = HV = HW = HX = HY = HZ = IA = IB = IC = ID = IE = IF = IG = IH = II = IJ = IK = IL = IM = IN = IO = IP = IQ = IR = IS = IT = IU = IV = IW = IX = IY = IZ = JA = JB = JC = JD = JE = JF = JG = JH = JI = JJ = JK = JL = JM = JN = JO = JP = JQ = JR = JS = JT = JU = JV = JW = JX = JY = JZ = KA = KB = KC = KD = KE = KF = KG = KH = KI = KJ = KK = KL = KM = KN = KO = KP = KQ = KR = KS = KT = KU = KV = KW = KX = KY = KZ = LA = LB = LC = LD = LE = LF = LG = LH = LI = LJ = LK = LL = LM = LN = LO = LP = LQ = LR = LS = LT = LU = LV = LW = LX = LY = LZ = MA = MB = MC = MD = ME = MF = MG = MH = MI = MJ = MK = ML = MM = MN = MO = MP = MQ = MR = MS = MT = MU = MV = MW = MX = MY = MZ = NA = NB = NC = ND = NE = NF = NG = NH = NI = NJ = NK = NL = NM = NN = NO = NP = NQ = NR = NS = NT = NU = NV = NW = NX = NY = NZ = OA = OB = OC = OD = OE = OF = OG = OH = OI = OJ = OK = OL = OM = ON = OO = OP = OQ = OR = OS = OT = OU = OV = OW = OX = OY = OZ = PA = PB = PC = PD = PE = PF = PG = PH = PI = PJ = PK = PL = PM = PN = PO = PP = PQ = PR = PS = PT = PU = PV = PW = PX = PY = PZ = QA = QB = QC = QD = QE = QF = QG = QH = QI = QJ = QK = QL = QM = QN = QO = QP = QQ = QR = QS = QT = QU = QV = QW = QX = QY = QZ = RA = RB = RC = RD = RE = RF = RG = RH = RI = RJ = RK = RL = RM = RN = RO = RP = RQ = RR = RS = RT = RU = RV = RW = RX = RY = RZ = SA = SB = SC = SD = SE = SF = SG = SH = SI = SJ = SK = SL = SM = SN = SO = SP = SQ = SR = SS = ST = SU = SV = SW = SX = SY = SZ = TA = TB = TC = TD = TE = TF = TG = TH = TI = TJ = TK = TL = TM = TN = TO = TP = TQ = TR = TS = TT = TU = TV = TW = TX = TY = TZ = UA = UB = UC = UD = UE = UF = UG = UH = UI = UJ = UK = UL = UM = UN = UO = UP = UQ = UR = US = UT = UJ = UV = UW =

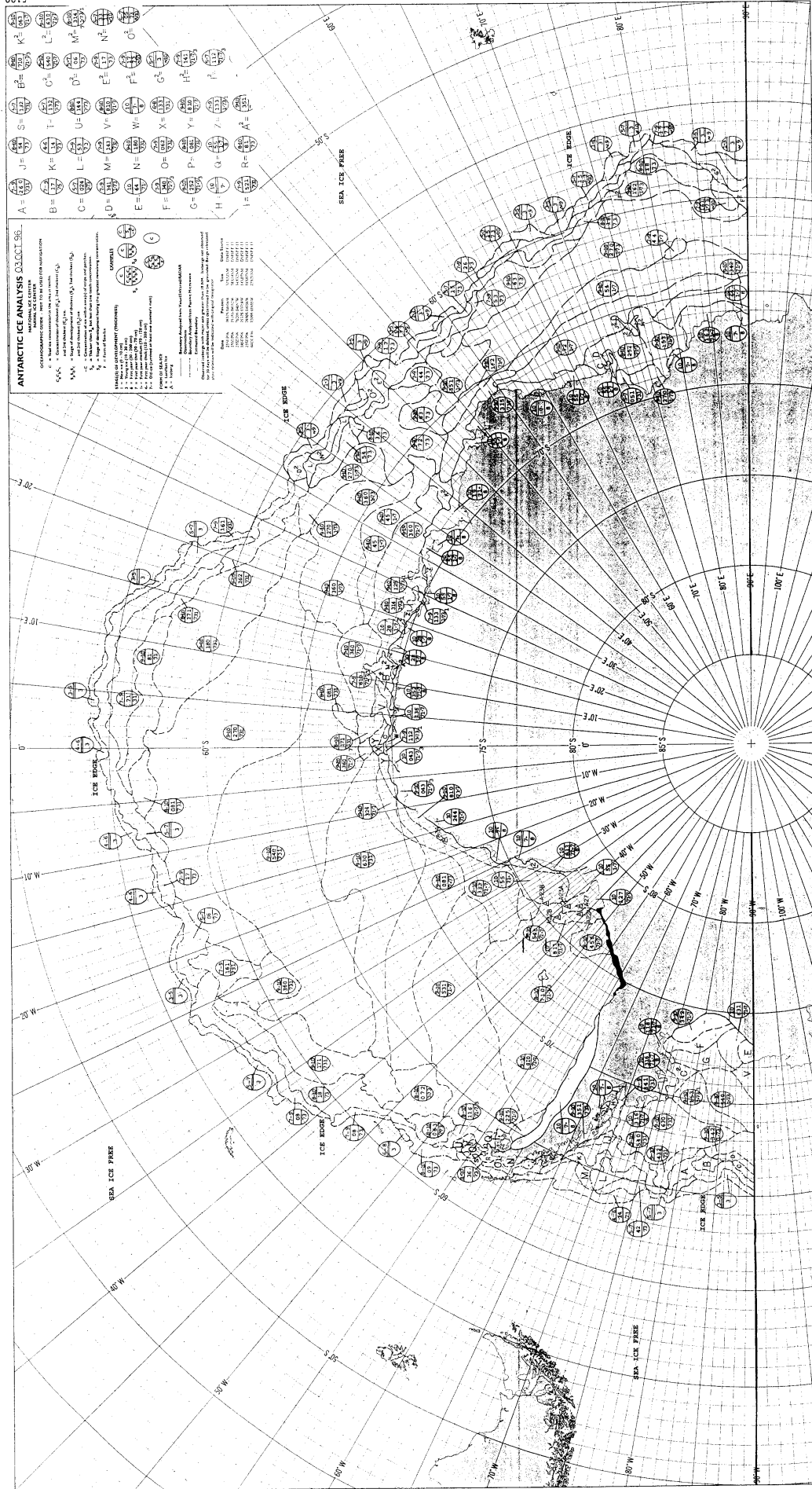


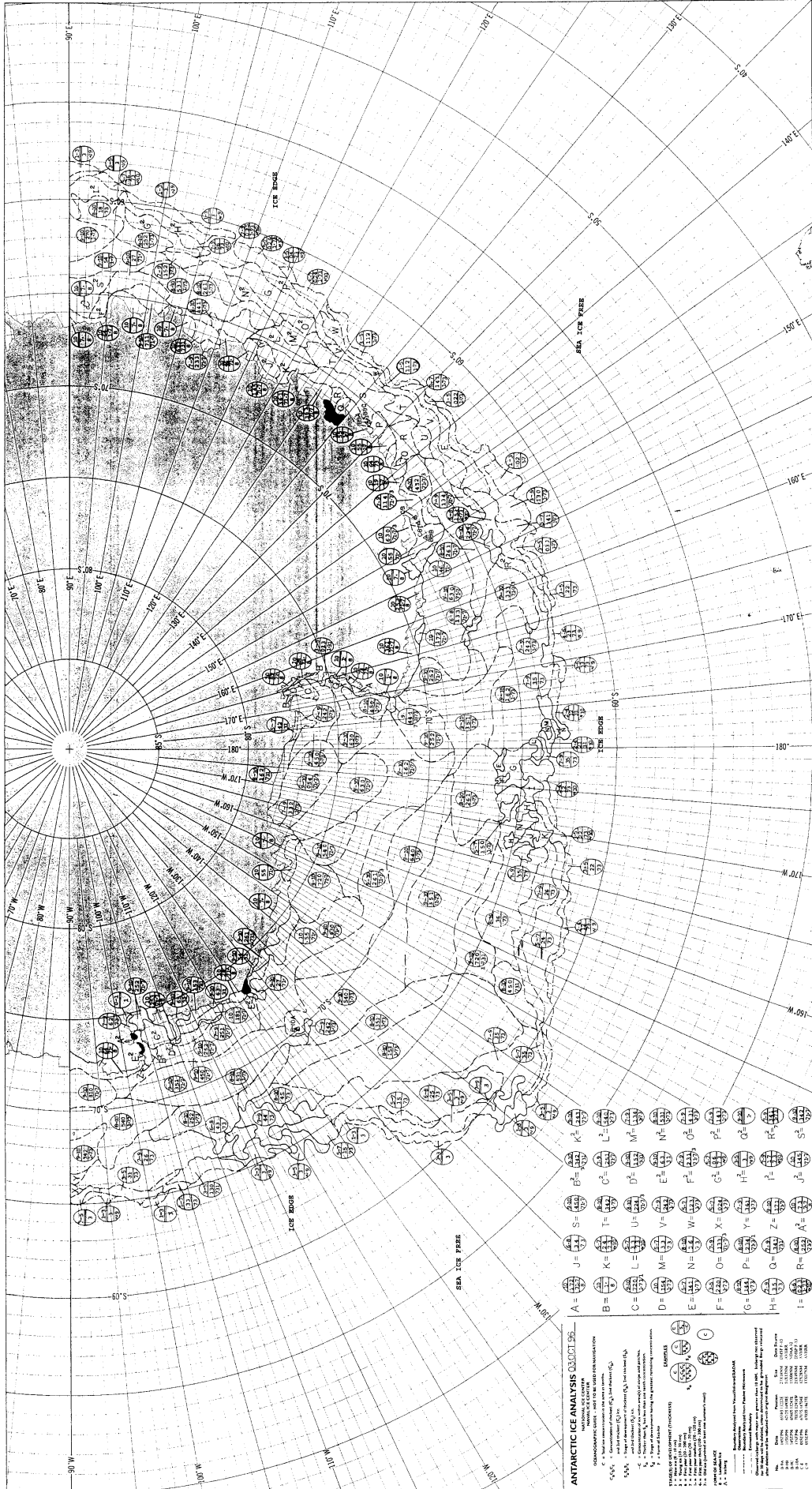


ANTARCTIC ICE ANALYSIS

UNION OF SOVIET REPUBLICS
 NATIONAL CENTER FOR INVESTIGATION OF THE ARCTIC AND ANTARCTIC
 C = Number of icebergs in the area
 S, S₁, S₂ = Character of icebergs (S₁ - icebergs with a sharp peak, S₂ - icebergs with a rounded peak)
 M, M₁, M₂ = Degree of deformation of icebergs (M₁ - icebergs with a sharp peak, M₂ - icebergs with a rounded peak)
 L, L₁, L₂ = Direction of movement of icebergs (L₁ - icebergs moving towards the South, L₂ - icebergs moving towards the North)
 V, V₁, V₂ = Direction of movement of icebergs (V₁ - icebergs moving towards the East, V₂ - icebergs moving towards the West)
 W, W₁, W₂ = Direction of movement of icebergs (W₁ - icebergs moving towards the East, W₂ - icebergs moving towards the West)
 X, X₁, X₂ = Direction of movement of icebergs (X₁ - icebergs moving towards the East, X₂ - icebergs moving towards the West)
 Y, Y₁, Y₂ = Direction of movement of icebergs (Y₁ - icebergs moving towards the East, Y₂ - icebergs moving towards the West)
 Z, Z₁, Z₂ = Direction of movement of icebergs (Z₁ - icebergs moving towards the East, Z₂ - icebergs moving towards the West)
 A, B, C, D, E, F, G, H, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NJ, NK, NL, NM, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ

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ANTARCTIC ICE ANALYSIS OBJECTS

SYMBOLS FOR ICE ANALYSIS

CONTINENTAL SHEETS

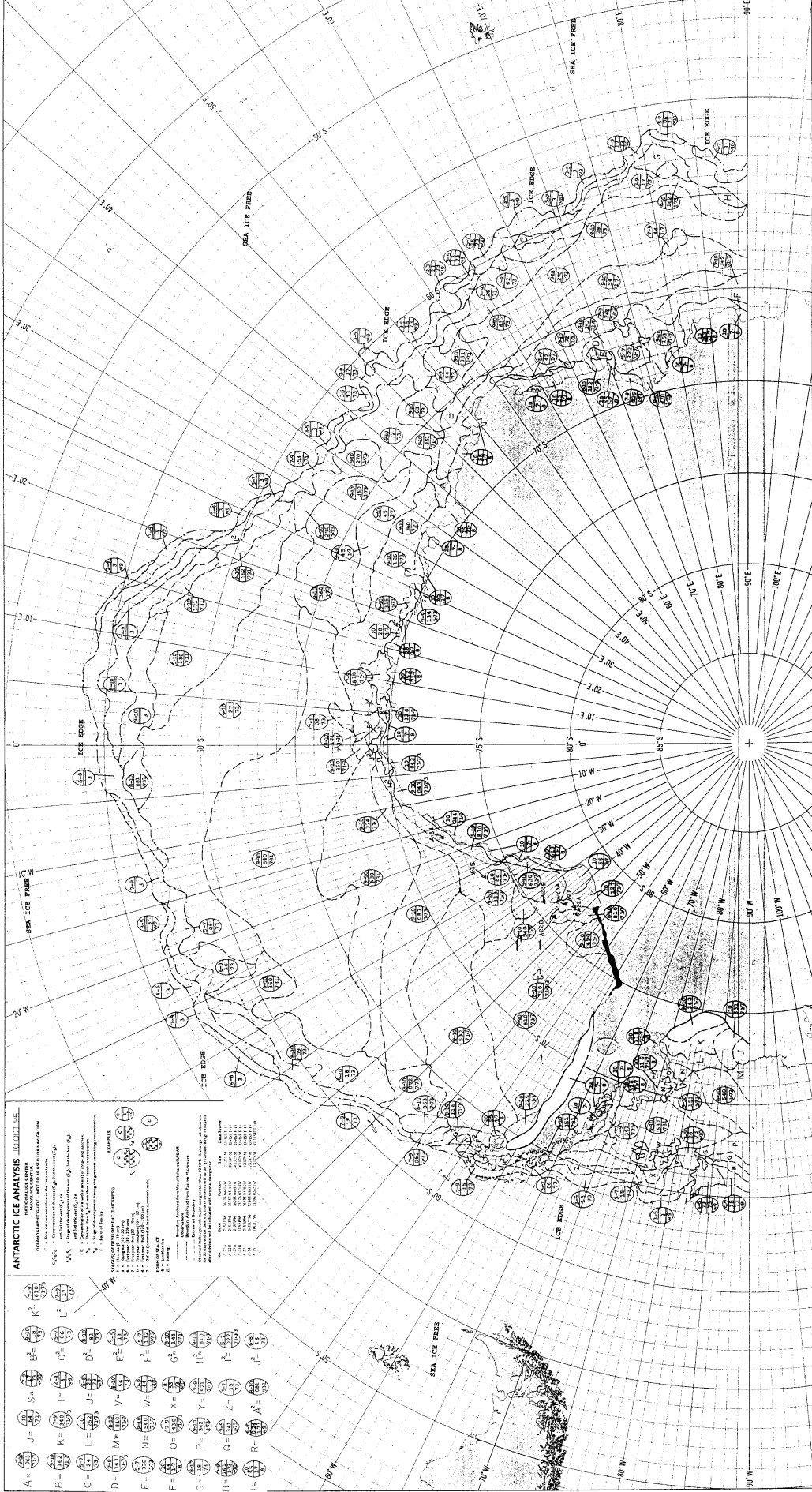
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- 2. 1/2 Degree Grid
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SYMBOLS FOR ICE ANALYSIS

- 1. Ice Sheet
- 2. Ice Shelf
- 3. Ice Plateau
- 4. Ice Mass
- 5. Ice Cap
- 6. Ice Dome
- 7. Ice Ridge
- 8. Ice Rise
- 9. Ice Mound
- 10. Ice Hill
- 11. Ice Trough
- 12. Ice Depression
- 13. Ice Basin
- 14. Ice Pond
- 15. Ice Lake
- 16. Ice Stream
- 17. Ice Flow
- 18. Ice Drainage
- 19. Ice Outlet
- 20. Ice Margin
- 21. Ice Edge
- 22. Ice Boundary
- 23. Ice Limit
- 24. Ice Front
- 25. Ice Back
- 26. Ice Side
- 27. Ice Top
- 28. Ice Bottom
- 29. Ice Surface
- 30. Ice Underneath
- 31. Ice Inside
- 32. Ice Outside
- 33. Ice Middle
- 34. Ice End
- 35. Ice Beginning
- 36. Ice Middle
- 37. Ice End
- 38. Ice Beginning
- 39. Ice Middle
- 40. Ice End
- 41. Ice Beginning
- 42. Ice Middle
- 43. Ice End
- 44. Ice Beginning
- 45. Ice Middle
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- 93. Ice Middle
- 94. Ice End
- 95. Ice Beginning
- 96. Ice Middle
- 97. Ice End
- 98. Ice Beginning
- 99. Ice Middle
- 100. Ice End

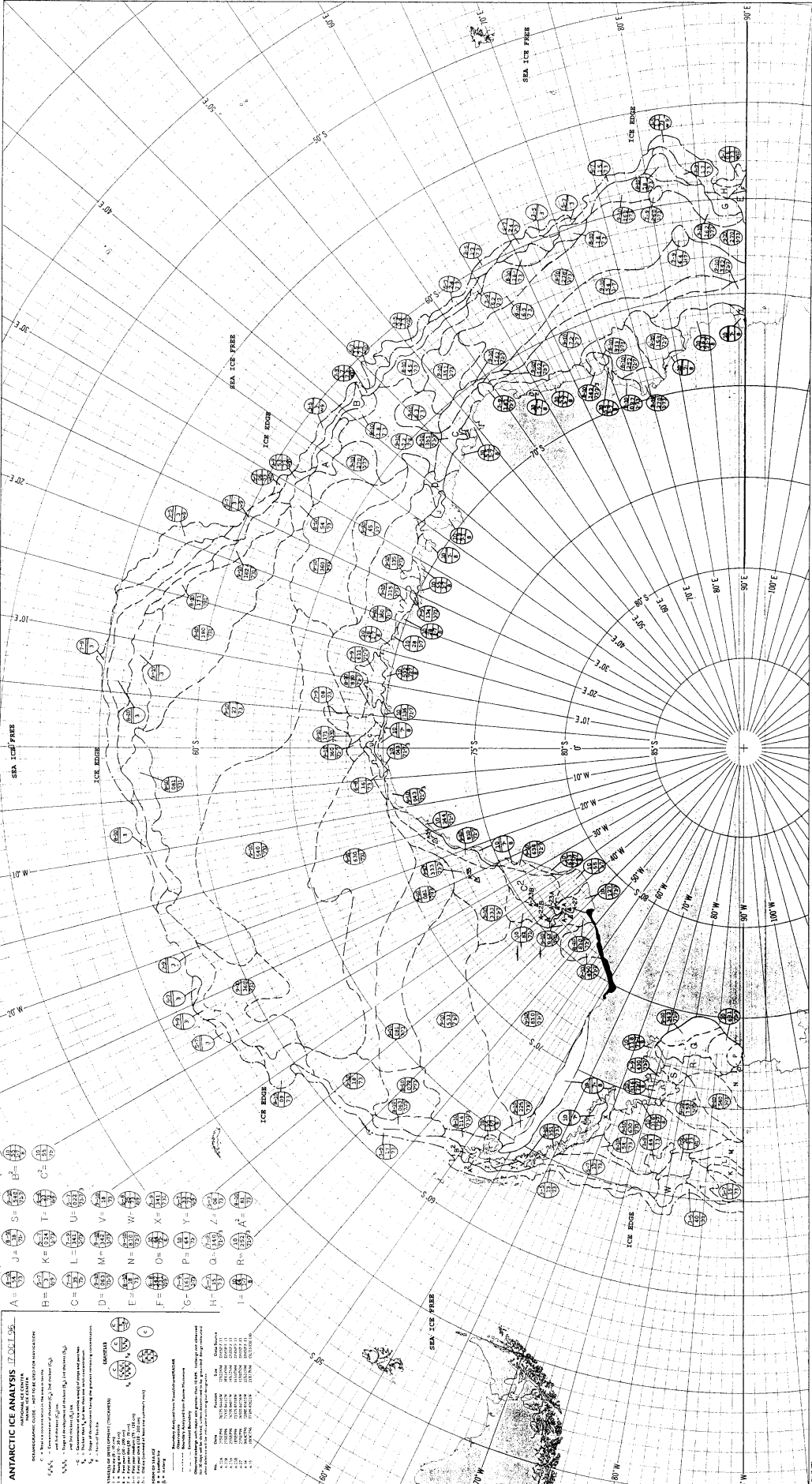
SYMBOLS FOR ICE ANALYSIS

- 1. Ice Sheet
- 2. Ice Shelf
- 3. Ice Plateau
- 4. Ice Mass
- 5. Ice Cap
- 6. Ice Dome
- 7. Ice Ridge
- 8. Ice Rise
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- 100. Ice End



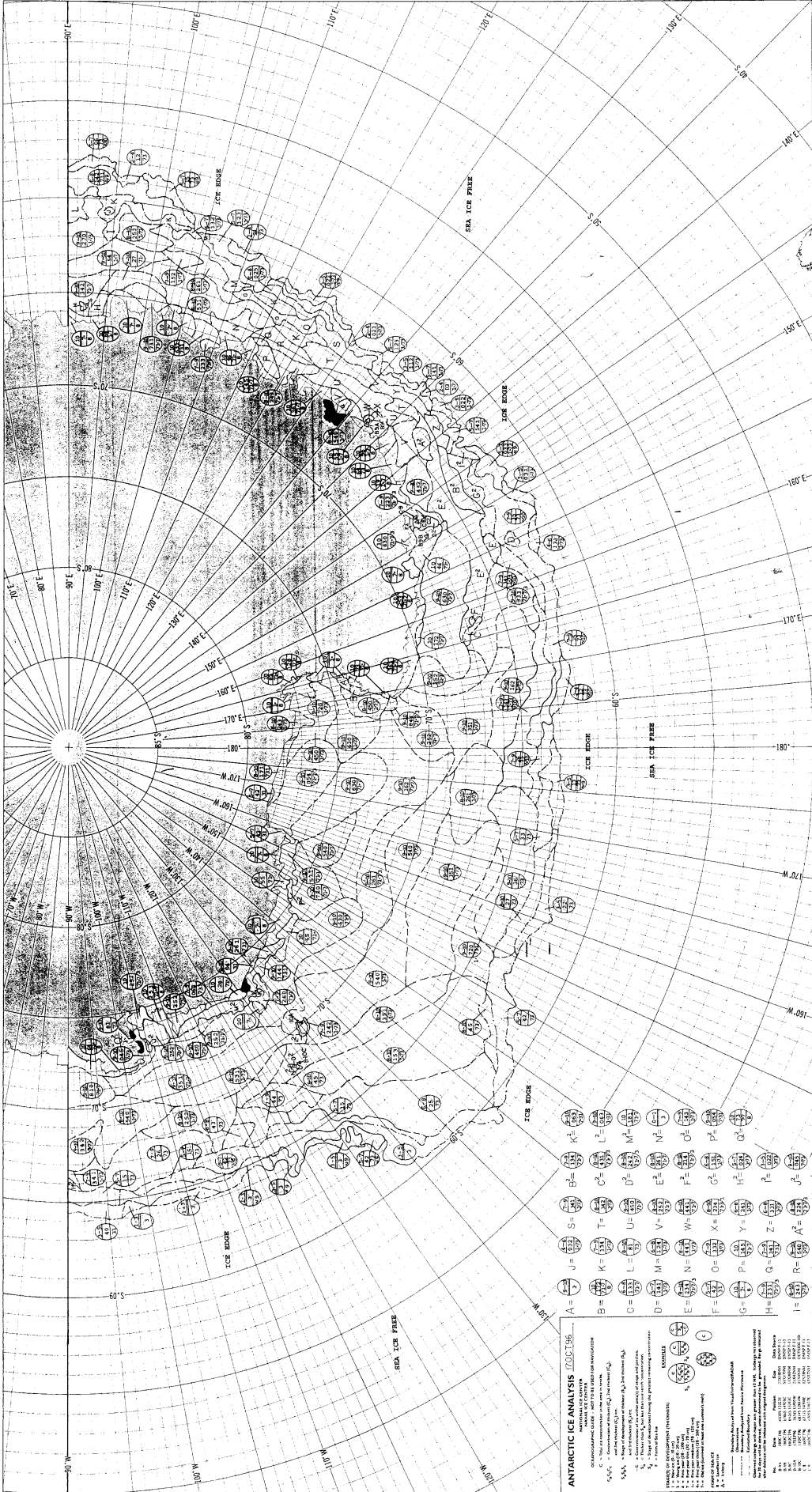
Publication: 1960, Hydrographic

Scale: 1:100,000



ANTARCTIC ICE ANALYSIS

SYMBOLS: A = 1/10, B = 2/10, C = 3/10, D = 4/10, E = 5/10, F = 6/10, G = 7/10, H = 8/10, I = 9/10, J = 10/10, K = 11/10, L = 12/10, M = 13/10, N = 14/10, O = 15/10, P = 16/10, Q = 17/10, R = 18/10, S = 19/10, T = 20/10, U = 21/10, V = 22/10, W = 23/10, X = 24/10, Y = 25/10, Z = 26/10, AA = 27/10, AB = 28/10, AC = 29/10, AD = 30/10, AE = 31/10, AF = 32/10, AG = 33/10, AH = 34/10, AI = 35/10, AJ = 36/10, AK = 37/10, AL = 38/10, AM = 39/10, AN = 40/10, AO = 41/10, AP = 42/10, AQ = 43/10, AR = 44/10, AS = 45/10, AT = 46/10, AU = 47/10, AV = 48/10, AW = 49/10, AX = 50/10, AY = 51/10, AZ = 52/10, BA = 53/10, BB = 54/10, BC = 55/10, BD = 56/10, BE = 57/10, BF = 58/10, BG = 59/10, BH = 60/10, BI = 61/10, BJ = 62/10, BK = 63/10, BL = 64/10, BM = 65/10, BN = 66/10, BO = 67/10, BP = 68/10, BQ = 69/10, BR = 70/10, BS = 71/10, BT = 72/10, BU = 73/10, BV = 74/10, BW = 75/10, BX = 76/10, BY = 77/10, BZ = 78/10, CA = 79/10, CB = 80/10, CC = 81/10, CD = 82/10, CE = 83/10, CF = 84/10, CG = 85/10, CH = 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472/10, RE = 473/10, RF = 474/10, RG = 475/10, RH = 476/10, RI = 477/10, RJ = 478/10, RK = 479/10, RL = 480/10, RM = 481/10, RN = 482/10, RO = 483/10, RP = 484/10, RQ = 485/10, RR = 486/10, RS = 487/10, RT = 488/10, RU = 489/10, RV = 490/10, RW = 491/10, RX = 492/10, RY = 493/10, RZ = 494/10, SA = 495/10, SB = 496/10, SC = 497/10, SD = 498/10, SE = 499/10, SF = 500/10, SG = 501/10, SH = 502/10, SI = 503/10, SJ = 504/10, SK = 505/10, SL = 506/10, SM = 507/10, SN = 508/10, SO = 509/10, SP = 510/10, SQ = 511/10, SR = 512/10, SS = 513/10, ST = 514/10, SU = 515/10, SV = 516/10, SW = 517/10, SX = 518/10, SY = 519/10, SZ = 520/10, TA = 521/10, TB = 522/10, TC = 523/10, TD = 524/10, TE = 525/10, TF = 526/10, TG = 527/10, TH = 528/10, TI = 529/10, TJ = 530/10, TK = 531/10, TL = 532/10, TM = 533/10, TN = 534/10, TO = 535/10, TP = 536/10, TQ = 537/10, TR = 538/10, TS = 539/10, TT = 540/10, TU = 541/10, TV = 542/10, TW = 543/10, TX = 544/10, TY = 545/10, TZ = 546/10, UA = 547/10, UB = 548/10, UC = 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626/10, XG = 627/10, XH = 628/10, XI = 629/10, XJ = 630/10, XK = 631/10, XL = 632/10, XM = 633/10, XN = 634/10, XO = 635/10, XP = 636/10, XQ = 637/10, XR = 638/10, XS = 639/10, XT = 640/10, XU = 641/10, XV = 642/10, XW = 643/10, XX = 644/10, XY = 645/10, XZ = 646/10, YA = 647/10, YB = 648/10, YC = 649/10, YD = 650/10, YE = 651/10, YF = 652/10, YG = 653/10, YH = 654/10, YI = 655/10, YJ = 656/10, YK = 657/10, YL = 658/10, YM = 659/10, YN = 660/10, YO = 661/10, YP = 662/10, YQ = 663/10, YR = 664/10, YS = 665/10, YT = 666/10, YU = 667/10, YV = 668/10, YW = 669/10, YX = 670/10, YZ = 671/10, ZA = 672/10, ZB = 673/10, ZC = 674/10, ZD = 675/10, ZE = 676/10, ZF = 677/10, ZG = 678/10, ZH = 679/10, ZI = 680/10, ZJ = 681/10, ZK = 682/10, ZL = 683/10, ZM = 684/10, ZN = 685/10, ZO = 686/10, ZP = 687/10, ZQ = 688/10, ZR = 689/10, ZS = 690/10, ZT = 691/10, ZU = 692/10, ZV = 693/10, ZW = 694/10, ZX = 695/10, ZY = 696/10, ZZ = 697/10



ANTARCTIC ICE ANALYSIS

SYMBOLS:

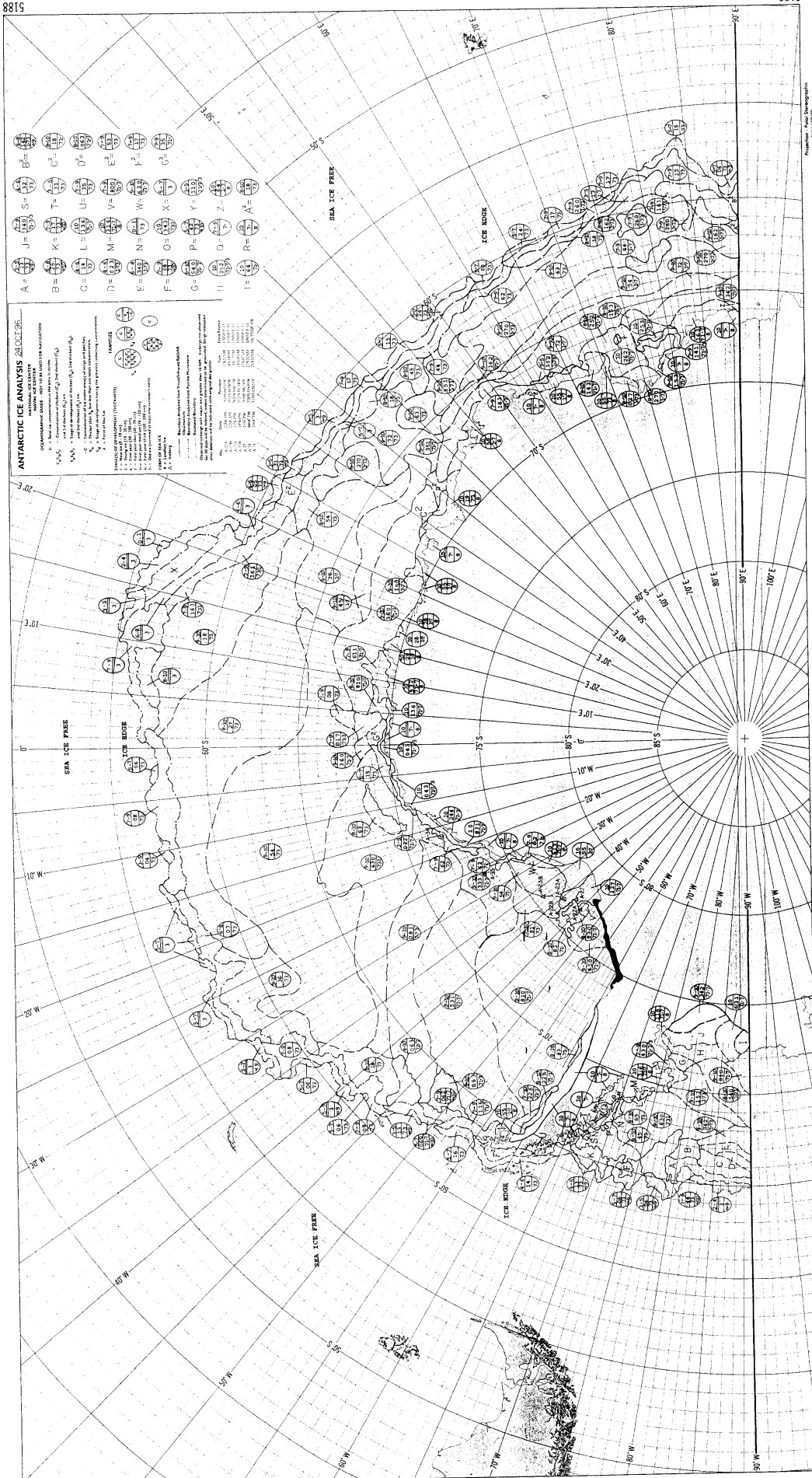
- = 100% ice coverage
- = 75% ice coverage
- = 50% ice coverage
- = 25% ice coverage
- = 10% ice coverage
- = 5% ice coverage
- = 1% ice coverage
- = 0% ice coverage

EXAMPLES:

- = 100% ice coverage
- = 75% ice coverage
- = 50% ice coverage
- = 25% ice coverage
- = 10% ice coverage
- = 5% ice coverage
- = 1% ice coverage
- = 0% ice coverage

NOTES:

- 1. The number in the center of the symbol indicates the percentage of ice coverage.
- 2. The letter in the center of the symbol indicates the month of observation.
- 3. The number in the center of the symbol indicates the day of observation.
- 4. The number in the center of the symbol indicates the station number.
- 5. The number in the center of the symbol indicates the observation time.
- 6. The number in the center of the symbol indicates the observation location.
- 7. The number in the center of the symbol indicates the observation method.
- 8. The number in the center of the symbol indicates the observation instrument.
- 9. The number in the center of the symbol indicates the observation operator.
- 10. The number in the center of the symbol indicates the observation date.



ANTARCTIC ICE ANALYSIS 31 OCT 96

NATIONAL ICE CENTER
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thicker (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁S₂S₃ = Concentration of ice with average of stages and patches.
 C = Concentration of ice with average of stages and patches.
 S = Stage of development during the greatest remaining concentration.
 F = Form of Seaice

STAGES OF DEVELOPMENT (THICKNESS)

1 = New ice (0 - 20 cm)
 2 = First year ice (20 - 90 cm)
 3 = First year ice (90 - 200 cm)
 4 = First year ice (200 - 300 cm)
 5 = Old ice (300 cm to least one summer's melt)
 A = Iceberg

FORMS OF SEAICE

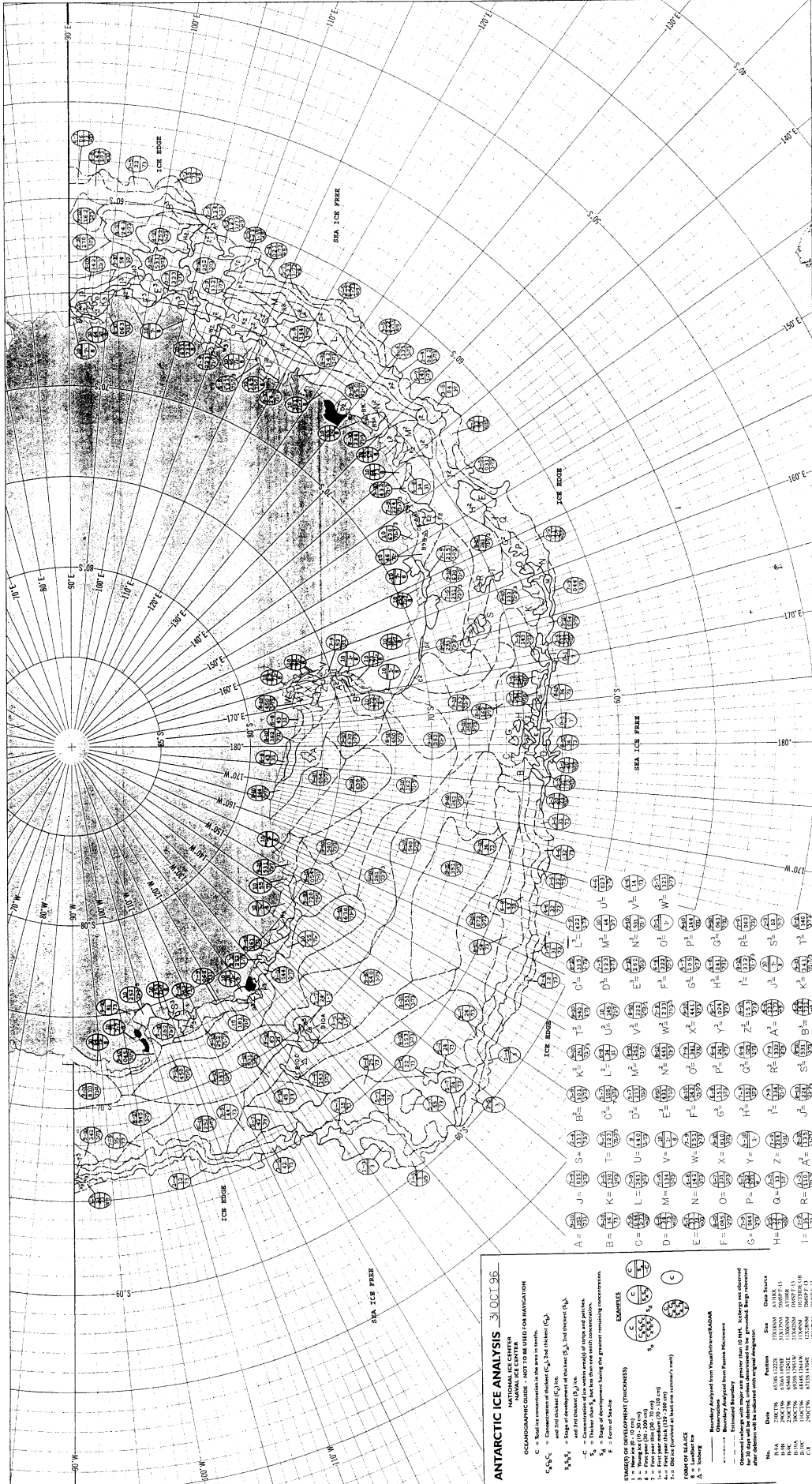
..... Boundary Analyzed from Visual Observations
 - - - - - Boundary Analyzed from Passive Microwave

Observations taken with sensor with greater than 10 MHz. Icebergs not observed for 10 days with the sensor, unless indicated with the groundswell flag (groundswell flag) (groundswell flag)

DISK SOURCE

No.	Date	Position	Size	Disk Source
1	22 OCT 96	74S 043 E	1000	DAND P15
2	23 OCT 96	74S 043 E	1000	DAND P15
3	24 OCT 96	74S 043 E	1000	DAND P15
4	25 OCT 96	74S 043 E	1000	DAND P15
5	26 OCT 96	74S 043 E	1000	DAND P15
6	27 OCT 96	74S 043 E	1000	DAND P15
7	28 OCT 96	74S 043 E	1000	DAND P15
8	29 OCT 96	74S 043 E	1000	DAND P15
9	30 OCT 96	74S 043 E	1000	DAND P15
10	31 OCT 96	74S 043 E	1000	DAND P15





ANTARCTIC ICE ANALYSIS 31 OCT 96

NATIONAL ICE CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Concentrations of thick (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 C₁, C₂, C₃ = Concentrations of thick (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 C₁, C₂, C₃ = Concentrations of ice within width of 1000 and greater.
 C₁, C₂, C₃ = Concentrations of ice within width of 1000 and greater.
 C₁, C₂, C₃ = Concentrations of ice within width of 1000 and greater.
 C₁, C₂, C₃ = Concentrations of ice within width of 1000 and greater.

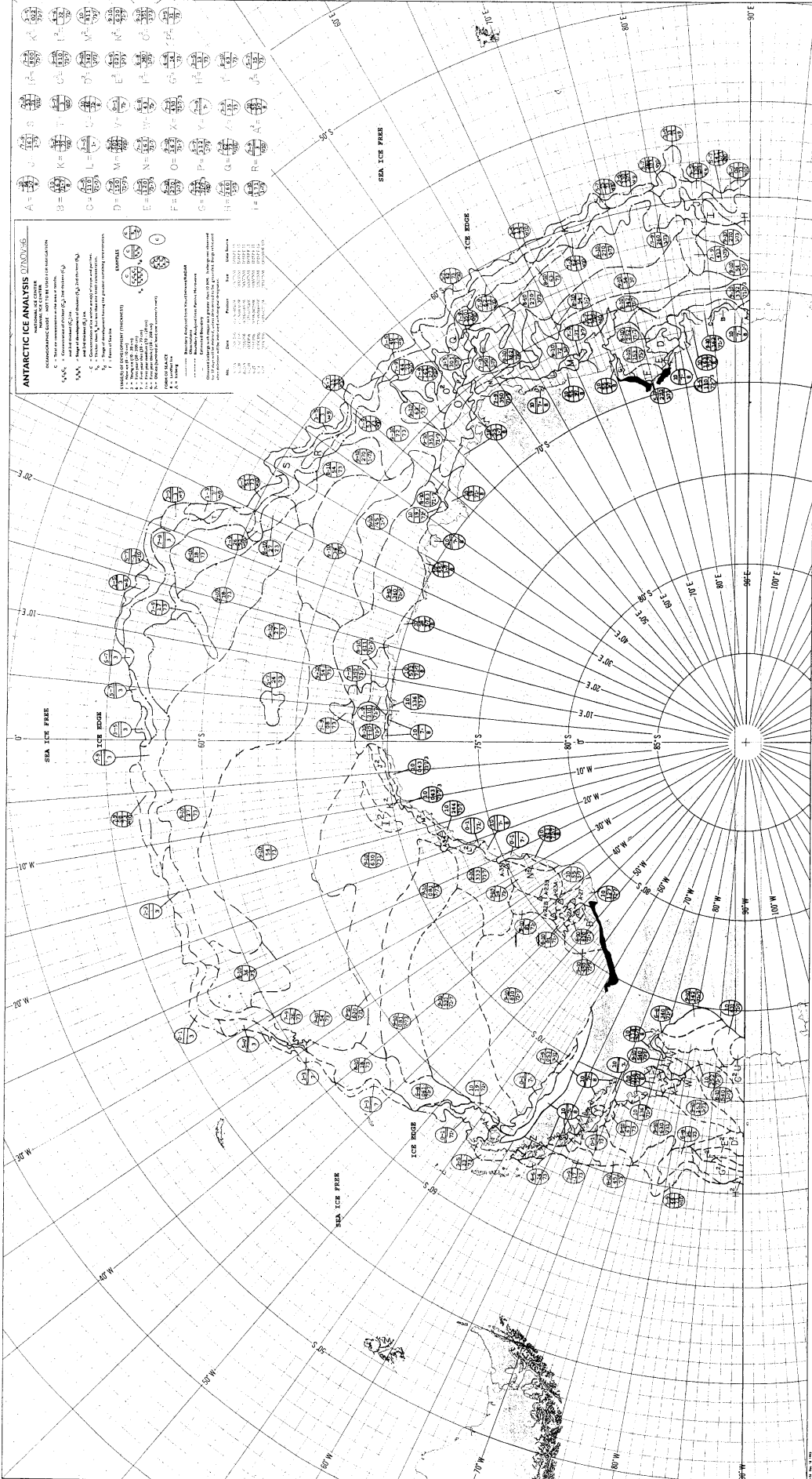
STAGES OF DEVELOPMENT (THICKNESS)
 1 = New ice (10 - 20 cm)
 2 = First year ice (20 - 25 cm)
 3 = First year ice (25 - 30 cm)
 4 = First year ice (30 - 35 cm)
 5 = First year ice (35 - 40 cm)
 6 = First year ice (40 - 50 cm)
 7 = Older ice (thickness as listed in summer's code)

FORM OF ICE
 A = Iceberg
 B = Iceberg
 C = Iceberg

EXAMPLES

No.	Date	Position	Size	Data Source
1	28 OCT 96	65°S 122°E	100000	ANTIPR 01
2	28 OCT 96	65°S 122°E	100000	ANTIPR 01
3	28 OCT 96	65°S 122°E	100000	ANTIPR 01
4	28 OCT 96	65°S 122°E	100000	ANTIPR 01
5	28 OCT 96	65°S 122°E	100000	ANTIPR 01
6	28 OCT 96	65°S 122°E	100000	ANTIPR 01
7	28 OCT 96	65°S 122°E	100000	ANTIPR 01

Boundary analyzed from Visual/Infrared
 Boundary analyzed from SeaWiFS
 Observed iceberg with area and greater than 10000. Icebergs not observed in 20 days will be deleted, unless reported as persistent.



ANTARCTIC ICE ANALYSIS (NOV 56)

INTERNATIONAL GEOPHYSICAL YEAR
 NATIONAL CENTER FOR
 ENVIRONMENTAL DATA INTERCHANGE
 NATIONAL CENTER FOR ENVIRONMENTAL DATA INTERCHANGE
 NATIONAL CENTER FOR ENVIRONMENTAL DATA INTERCHANGE

SYMBOLS:

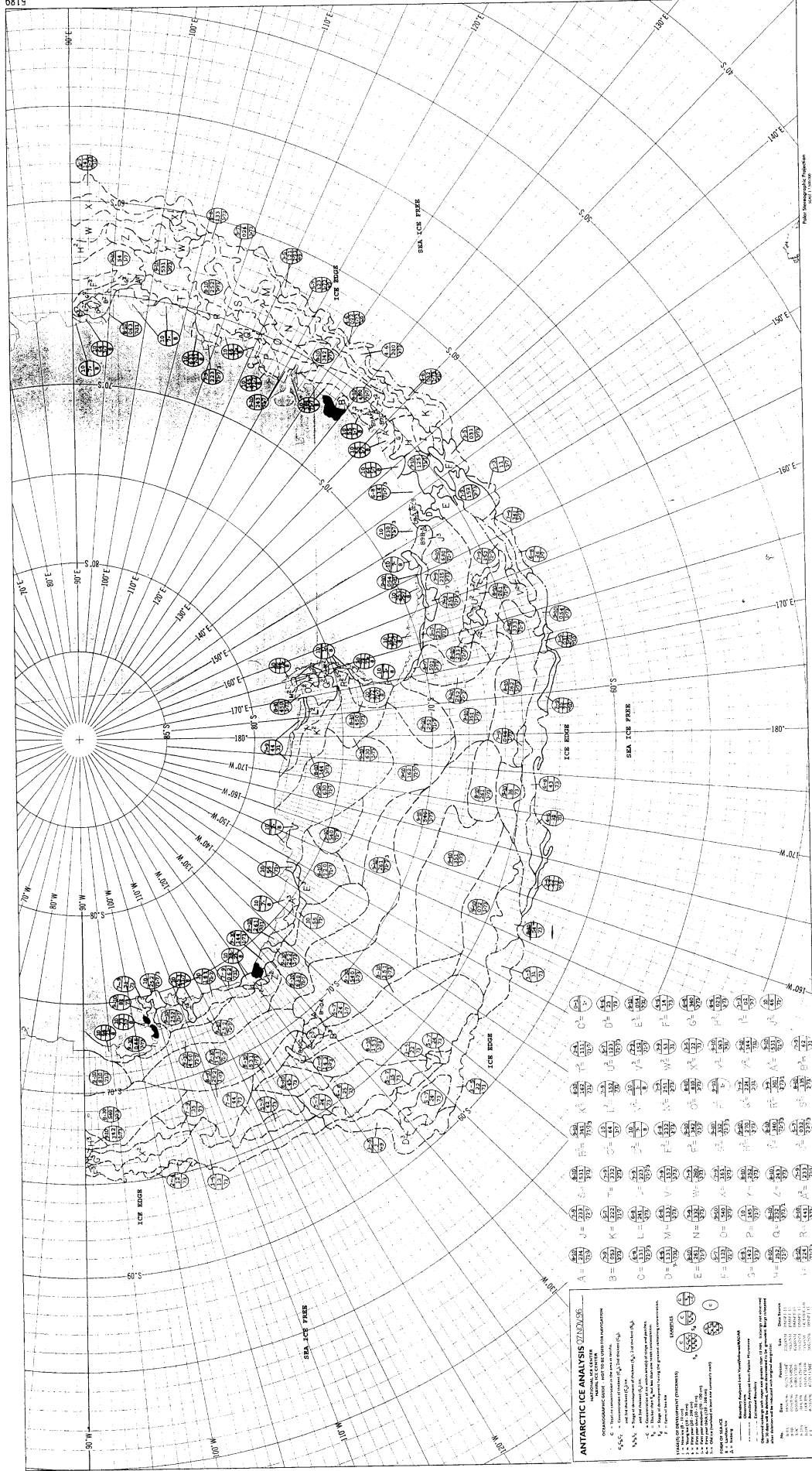
- A-Z: Letters representing different ice analysis stations.
- 1-9: Numbers representing different ice analysis stations.
- 10-19: Numbers representing different ice analysis stations.
- 20-29: Numbers representing different ice analysis stations.
- 30-39: Numbers representing different ice analysis stations.
- 40-49: Numbers representing different ice analysis stations.
- 50-59: Numbers representing different ice analysis stations.
- 60-69: Numbers representing different ice analysis stations.
- 70-79: Numbers representing different ice analysis stations.
- 80-89: Numbers representing different ice analysis stations.
- 90-99: Numbers representing different ice analysis stations.

LEGEND:

- SEA ICE FREE: Areas where sea ice is absent.
- ICE EDGE: The boundary of the ice extent.
- ICE BOUNDARY: A secondary boundary.

NOV 56

5188



ANTARCTIC ICE ANALYSIS SYMBOLS

SYMBOLS FOR ICE ANALYSIS

1. Type of ice (see key)

2. Direction of ice movement (see key)

3. Degree of ice cover (see key)

4. Direction of ice cover (see key)

5. Direction of ice cover (see key)

6. Direction of ice cover (see key)

7. Direction of ice cover (see key)

8. Direction of ice cover (see key)

9. Direction of ice cover (see key)

10. Direction of ice cover (see key)

11. Direction of ice cover (see key)

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17. Direction of ice cover (see key)

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36. Direction of ice cover (see key)

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61. Direction of ice cover (see key)

62. Direction of ice cover (see key)

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64. Direction of ice cover (see key)

65. Direction of ice cover (see key)

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67. Direction of ice cover (see key)

68. Direction of ice cover (see key)

69. Direction of ice cover (see key)

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74. Direction of ice cover (see key)

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76. Direction of ice cover (see key)

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78. Direction of ice cover (see key)

79. Direction of ice cover (see key)

80. Direction of ice cover (see key)

81. Direction of ice cover (see key)

82. Direction of ice cover (see key)

83. Direction of ice cover (see key)

84. Direction of ice cover (see key)

85. Direction of ice cover (see key)

86. Direction of ice cover (see key)

87. Direction of ice cover (see key)

88. Direction of ice cover (see key)

89. Direction of ice cover (see key)

90. Direction of ice cover (see key)

91. Direction of ice cover (see key)

92. Direction of ice cover (see key)

93. Direction of ice cover (see key)

94. Direction of ice cover (see key)

95. Direction of ice cover (see key)

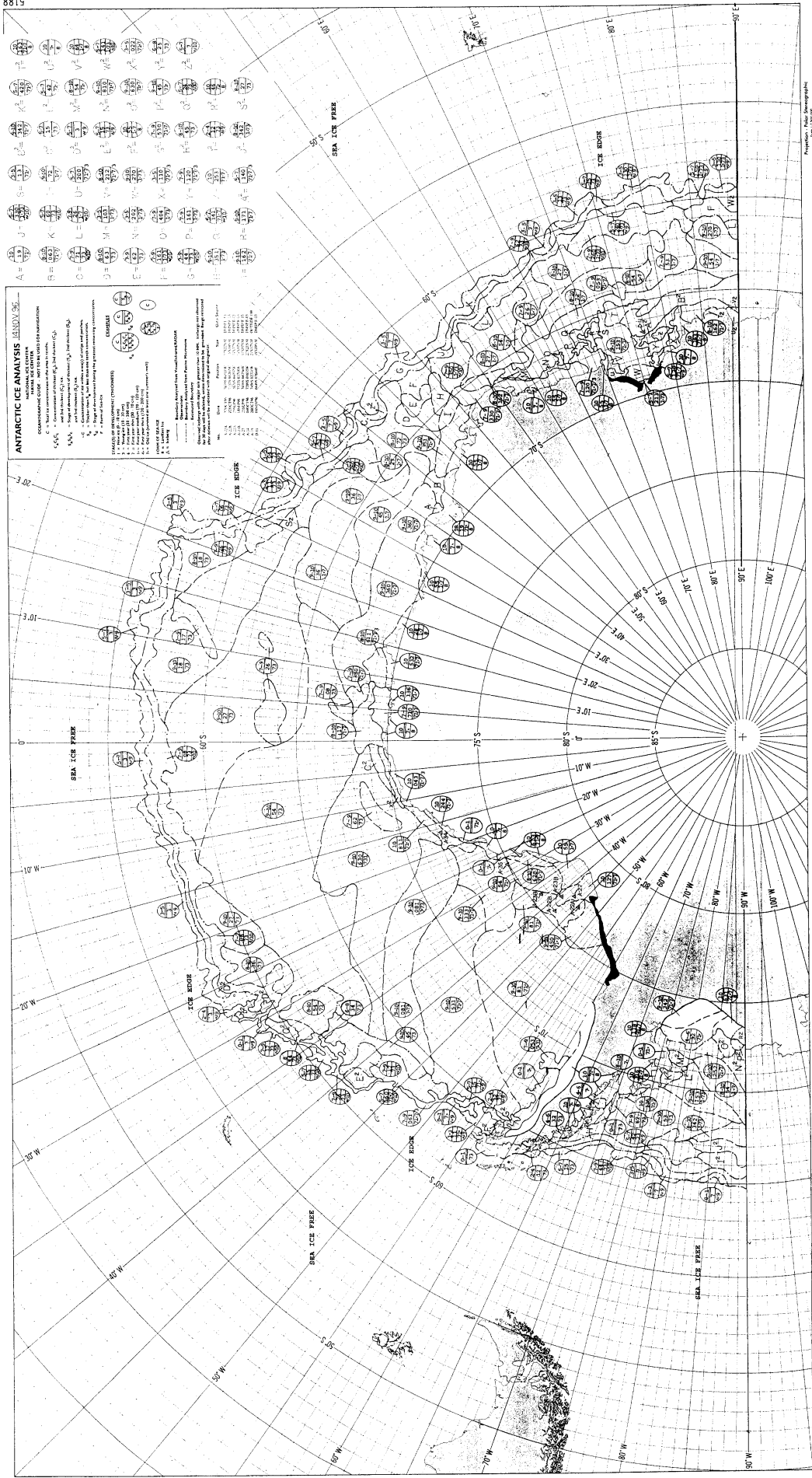
96. Direction of ice cover (see key)

97. Direction of ice cover (see key)

98. Direction of ice cover (see key)

99. Direction of ice cover (see key)

100. Direction of ice cover (see key)



ANTARCTIC ICE ANALYSIS JANUARY 56

SYMBOLS

1. Ice thickness (in feet)

2. Ice type (see key)

3. Ice concentration (in percent)

4. Ice motion (in degrees)

5. Ice age (in years)

6. Ice density (in grams per cubic centimeter)

7. Ice salinity (in parts per thousand)

8. Ice temperature (in degrees Celsius)

9. Ice surface albedo (in percent)

10. Ice surface roughness (in degrees)

11. Ice surface reflectance (in percent)

12. Ice surface emissivity (in percent)

13. Ice surface absorption (in percent)

14. Ice surface scattering (in percent)

15. Ice surface transmission (in percent)

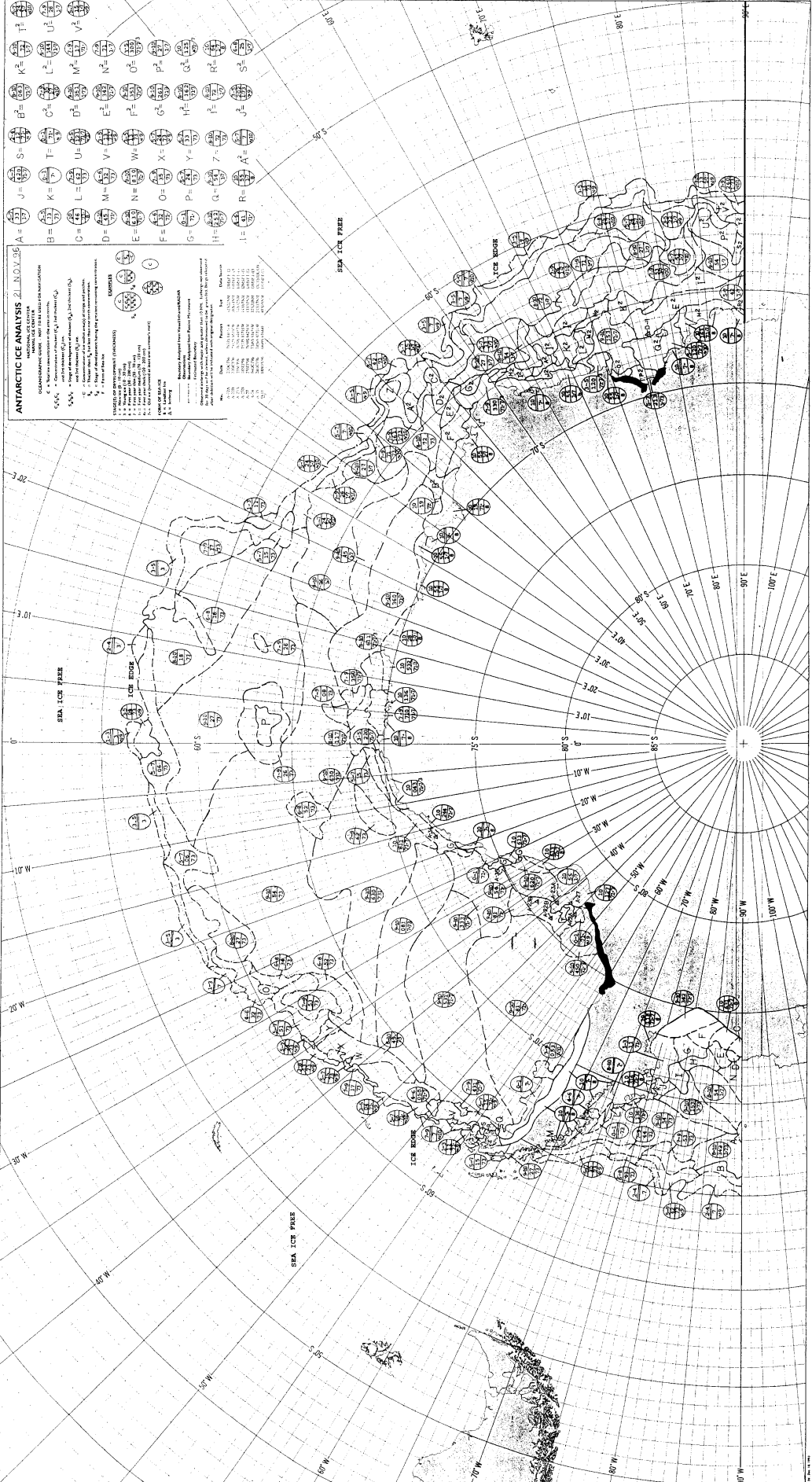
16. Ice surface reflection (in percent)

17. Ice surface refraction (in degrees)

18. Ice surface diffraction (in degrees)

19. Ice surface diffraction (in degrees)

20. Ice surface diffraction (in degrees)



ANTARCTIC ICE ANALYSIS ZONE

1. Ice-free areas (including open water and ice-free land)

2. Sea ice free (including open water and ice-free land)

3. Ice edge (including open water and ice-free land)

4. Ice boundary (including open water and ice-free land)

5. Ice brow (including open water and ice-free land)

6. Ice-free areas (including open water and ice-free land)

7. Sea ice free (including open water and ice-free land)

8. Ice edge (including open water and ice-free land)

9. Ice boundary (including open water and ice-free land)

10. Ice brow (including open water and ice-free land)

Station Name	Latitude	Longitude
A	70°S	150°W
B	70°S	140°W
C	70°S	130°W
D	70°S	120°W
E	70°S	110°W
F	70°S	100°W
G	70°S	90°W
H	70°S	80°W
I	70°S	70°W
J	70°S	60°W
K	70°S	50°W
L	70°S	40°W
M	70°S	30°W
N	70°S	20°W
O	70°S	10°W
P	70°S	0°
Q	70°S	10°E
R	70°S	20°E
S	70°S	30°E
T	70°S	40°E
U	70°S	50°E
V	70°S	60°E
W	70°S	70°E
X	70°S	80°E
Y	70°S	90°E
Z	70°S	100°E
AA	70°S	110°E
AB	70°S	120°E
AC	70°S	130°E
AD	70°S	140°E
AE	70°S	150°E

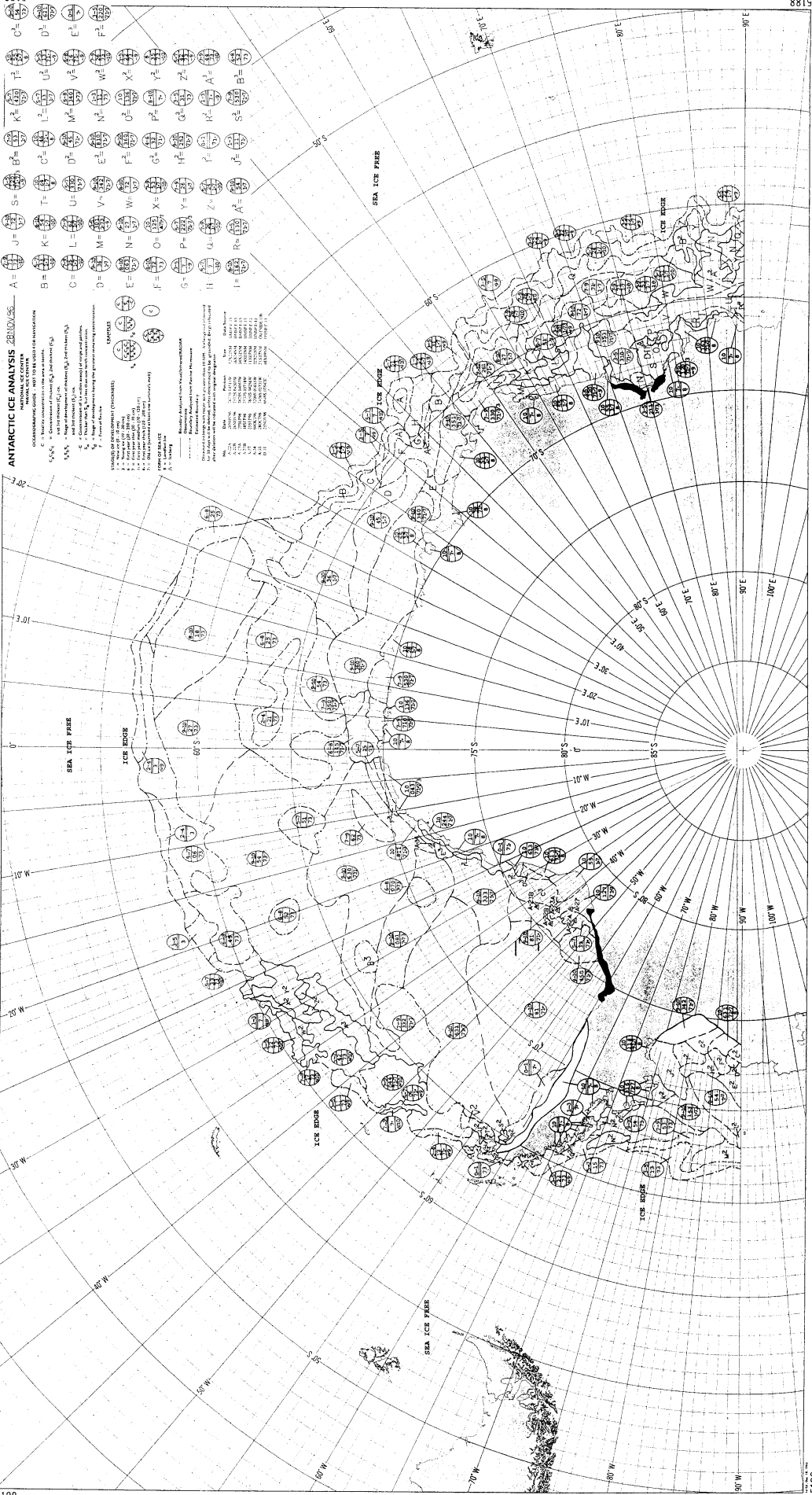
ANTARCTIC ICE ANALYSIS 221010Z 55

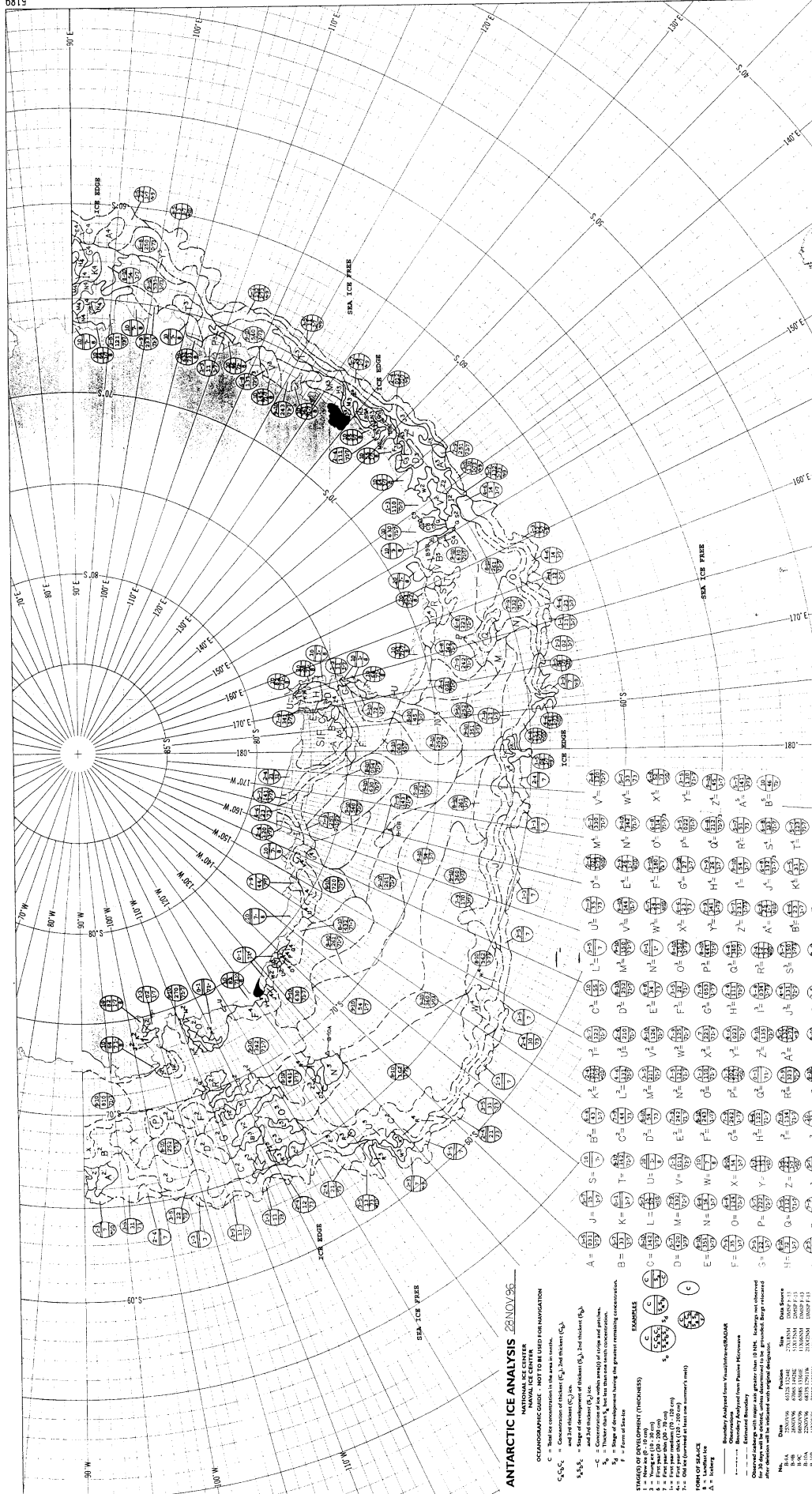
NATIONAL ICE CENTER
 GEORGIA INSTITUTE OF TECHNOLOGY
 1405 ATLANTA-CLAYTON BLVD
 ATLANTA, GA 30332-0340
 TEL: 404/875/5200 FAX: 404/875/5201

SYMBOLS:
 1. Iceberg (see 221010Z 55)
 2. Iceberg (see 221010Z 55)
 3. Iceberg (see 221010Z 55)
 4. Iceberg (see 221010Z 55)
 5. Iceberg (see 221010Z 55)
 6. Iceberg (see 221010Z 55)
 7. Iceberg (see 221010Z 55)
 8. Iceberg (see 221010Z 55)
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 13. Iceberg (see 221010Z 55)
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 17. Iceberg (see 221010Z 55)
 18. Iceberg (see 221010Z 55)
 19. Iceberg (see 221010Z 55)
 20. Iceberg (see 221010Z 55)

EXAMPLES:

1. Iceberg (see 221010Z 55)
 2. Iceberg (see 221010Z 55)
 3. Iceberg (see 221010Z 55)
 4. Iceberg (see 221010Z 55)
 5. Iceberg (see 221010Z 55)
 6. Iceberg (see 221010Z 55)
 7. Iceberg (see 221010Z 55)
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 11. Iceberg (see 221010Z 55)
 12. Iceberg (see 221010Z 55)
 13. Iceberg (see 221010Z 55)
 14. Iceberg (see 221010Z 55)
 15. Iceberg (see 221010Z 55)
 16. Iceberg (see 221010Z 55)
 17. Iceberg (see 221010Z 55)
 18. Iceberg (see 221010Z 55)
 19. Iceberg (see 221010Z 55)
 20. Iceberg (see 221010Z 55)





ANTARCTIC ICE ANALYSIS 28 NOV 56

NAVAL ICE CENTER
 CECIDROMATIC GUIDE - NOT TO BE USED FOR NAVIGATION
 C = Sea ice concentration in the area shown.
 S₁S₂S₃ = Range of development of thickness (S₁) and thickness (S₂) and ice thickness (S₃) in feet.
 T = Thickness (T) in feet.
 S₁ = Thicker than S₂, but has less ice concentration.
 S₂ = Range of development having the greater remaining concentration.
 S₃ = Range of ice thickness.

EXAMPLES

1. New ice (0-10 cm)
 2. Ice 10-20 cm
 3. Ice 20-30 cm
 4. Ice 30-40 cm
 5. Ice 40-50 cm
 6. Ice 50-60 cm
 7. Ice 60-70 cm
 8. Ice 70-80 cm
 9. Ice 80-90 cm
 10. Ice 90-100 cm

FORM OF SYMBOL

A = Labeled Ice
 B = Unlabeled Ice

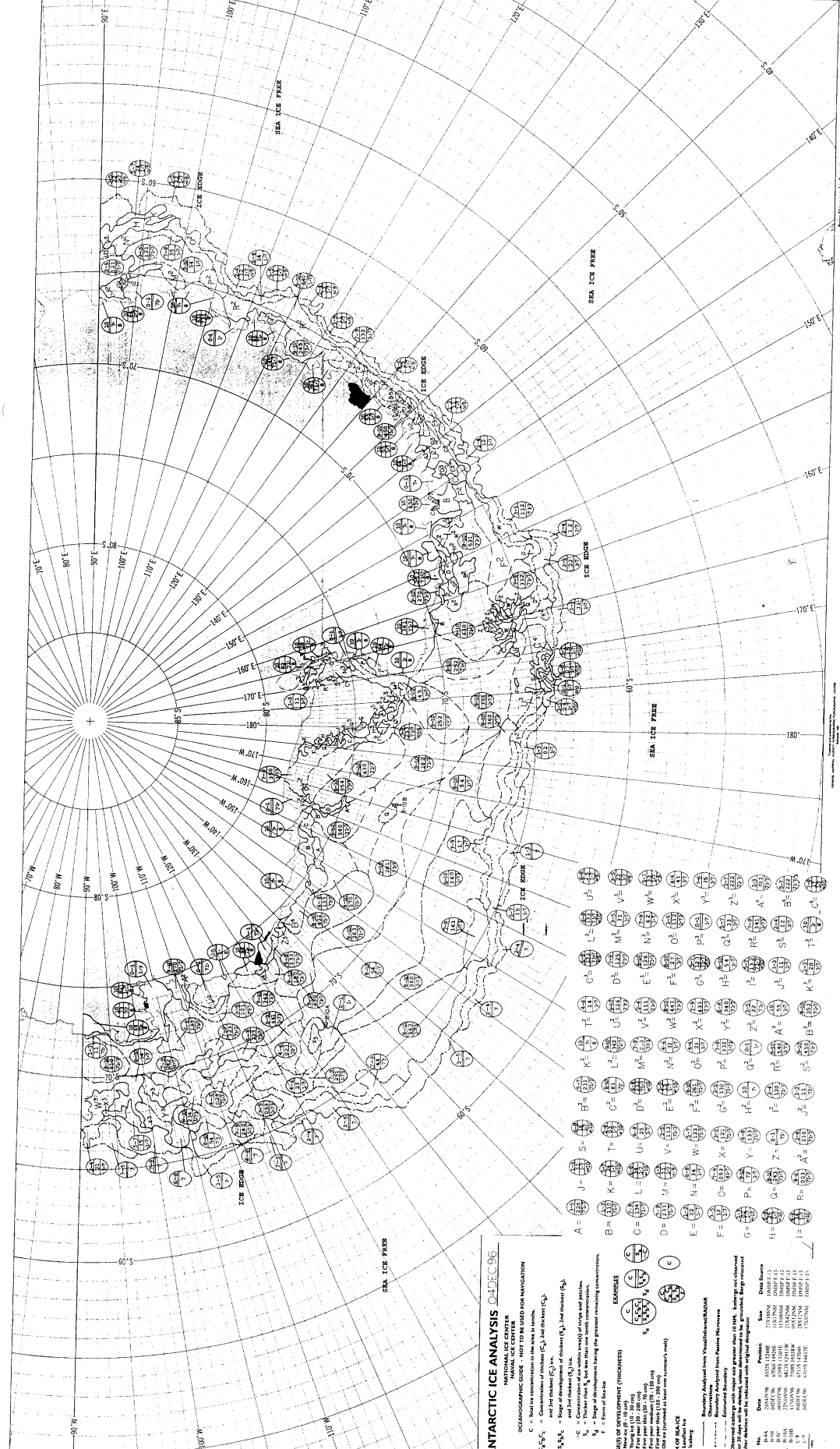
Observations
 - - - - - Estimated Boundary
 - - - - - Estimated Boundary
 - - - - - Estimated Boundary

Ice Type	Thickness (cm)	Concentration (%)	Symbol
A	10-20	10-20	(A)
B	20-30	20-30	(B)
C	30-40	30-40	(C)
D	40-50	40-50	(D)
E	50-60	50-60	(E)
F	60-70	60-70	(F)
G	70-80	70-80	(G)
H	80-90	80-90	(H)
I	90-100	90-100	(I)
J	100-110	100-110	(J)
K	110-120	110-120	(K)
L	120-130	120-130	(L)
M	130-140	130-140	(M)
N	140-150	140-150	(N)
O	150-160	150-160	(O)
P	160-170	160-170	(P)
Q	170-180	170-180	(Q)
R	180-190	180-190	(R)
S	190-200	190-200	(S)
T	200-210	200-210	(T)
U	210-220	210-220	(U)
V	220-230	220-230	(V)
W	230-240	230-240	(W)
X	240-250	240-250	(X)
Y	250-260	250-260	(Y)
Z	260-270	260-270	(Z)
A ²	270-280	270-280	(A ²)
B ²	280-290	280-290	(B ²)
C ²	290-300	290-300	(C ²)
D ²	300-310	300-310	(D ²)
E ²	310-320	310-320	(E ²)
F ²	320-330	320-330	(F ²)
G ²	330-340	330-340	(G ²)
H ²	340-350	340-350	(H ²)
I ²	350-360	350-360	(I ²)
J ²	360-370	360-370	(J ²)
K ²	370-380	370-380	(K ²)
L ²	380-390	380-390	(L ²)
M ²	390-400	390-400	(M ²)
N ²	400-410	400-410	(N ²)
O ²	410-420	410-420	(O ²)
P ²	420-430	420-430	(P ²)
Q ²	430-440	430-440	(Q ²)
R ²	440-450	440-450	(R ²)
S ²	450-460	450-460	(S ²)
T ²	460-470	460-470	(T ²)
U ²	470-480	470-480	(U ²)
V ²	480-490	480-490	(V ²)
W ²	490-500	490-500	(W ²)
X ²	500-510	500-510	(X ²)
Y ²	510-520	510-520	(Y ²)
Z ²	520-530	520-530	(Z ²)
A ³	530-540	530-540	(A ³)
B ³	540-550	540-550	(B ³)
C ³	550-560	550-560	(C ³)
D ³	560-570	560-570	(D ³)
E ³	570-580	570-580	(E ³)
F ³	580-590	580-590	(F ³)
G ³	590-600	590-600	(G ³)
H ³	600-610	600-610	(H ³)
I ³	610-620	610-620	(I ³)
J ³	620-630	620-630	(J ³)
K ³	630-640	630-640	(K ³)
L ³	640-650	640-650	(L ³)
M ³	650-660	650-660	(M ³)
N ³	660-670	660-670	(N ³)
O ³	670-680	670-680	(O ³)
P ³	680-690	680-690	(P ³)
Q ³	690-700	690-700	(Q ³)
R ³	700-710	700-710	(R ³)
S ³	710-720	710-720	(S ³)
T ³	720-730	720-730	(T ³)
U ³	730-740	730-740	(U ³)
V ³	740-750	740-750	(V ³)
W ³	750-760	750-760	(W ³)
X ³	760-770	760-770	(X ³)
Y ³	770-780	770-780	(Y ³)
Z ³	780-790	780-790	(Z ³)
A ⁴	790-800	790-800	(A ⁴)
B ⁴	800-810	800-810	(B ⁴)
C ⁴	810-820	810-820	(C ⁴)
D ⁴	820-830	820-830	(D ⁴)
E ⁴	830-840	830-840	(E ⁴)
F ⁴	840-850	840-850	(F ⁴)
G ⁴	850-860	850-860	(G ⁴)
H ⁴	860-870	860-870	(H ⁴)
I ⁴	870-880	870-880	(I ⁴)
J ⁴	880-890	880-890	(J ⁴)
K ⁴	890-900	890-900	(K ⁴)
L ⁴	900-910	900-910	(L ⁴)
M ⁴	910-920	910-920	(M ⁴)
N ⁴	920-930	920-930	(N ⁴)
O ⁴	930-940	930-940	(O ⁴)
P ⁴	940-950	940-950	(P ⁴)
Q ⁴	950-960	950-960	(Q ⁴)
R ⁴	960-970	960-970	(R ⁴)
S ⁴	970-980	970-980	(S ⁴)
T ⁴	980-990	980-990	(T ⁴)
U ⁴	990-1000	990-1000	(U ⁴)

DATE SOURCE
 A - 6 NOV 56
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 Y⁴ - 6 NOV 56
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REMARKS
 A - Labeled Ice
 B - Unlabeled Ice
 C - Estimated Boundary
 D - Estimated Boundary
 E - Estimated Boundary

DATE SOURCE
 A - 6 NOV 56
 B - 6 NOV 56
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ANTARCTIC ICE ANALYSIS 04 DEC 96

NATIONAL ICE CENTER
 OCEANOGRAPHIC DATA - NOT READY FOR NAVIGATION
 C = Total ice concentration in the area in tenths.
 S, S₁, S₂ = Concentration of slicks (S₁ and S₂) and disk(s) (S₃)
 and 3rd slick(s) (S₃) etc.
 S₁, S₂, S₃ = Slick thickness (S₁, 2nd Slick(s) (S₂),
 and 3rd Slick(s) (S₃)) etc.
 C = Concentration of ice with area(s) of slicks and patches.
 S₁, S₂, S₃ = Slick thickness (S₁, 2nd Slick(s) (S₂),
 and 3rd Slick(s) (S₃)) etc.
 F = Stage of development using the general numbering convention.
 F = Form of Iceberg

STAGE OF DEVELOPMENT (THICKNESS)

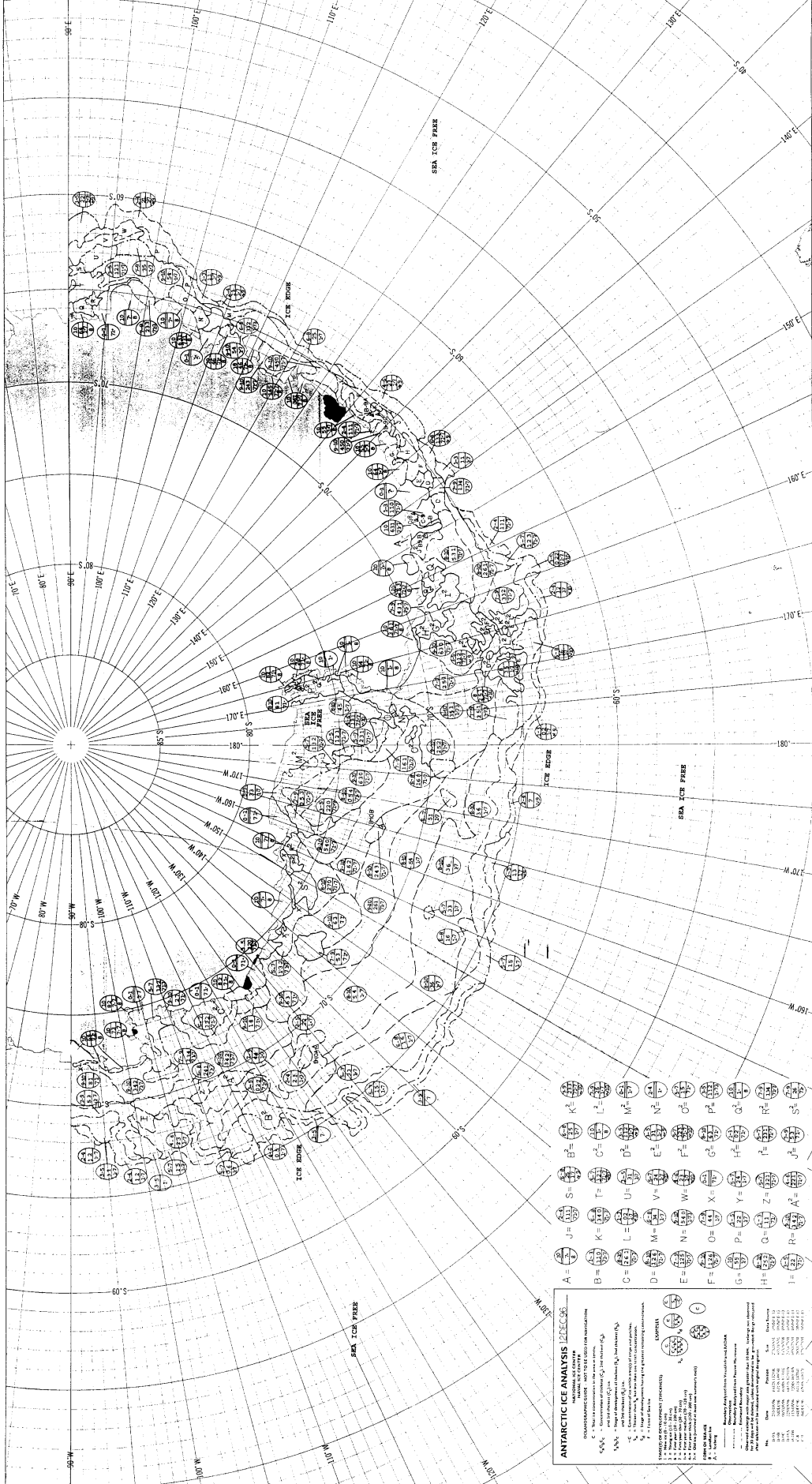
1 = Snow (0-10 cm)	10 = 100% (100%)
2 = First year (10-30 cm)	11 = 100% (100%)
3 = First year (30-100 cm)	12 = 100% (100%)
4 = First year (100-150 cm)	13 = 100% (100%)
5 = First year (150-200 cm)	14 = 100% (100%)
6 = First year (200-250 cm)	15 = 100% (100%)
7 = Old ice (formed at least one summer's melt)	16 = 100% (100%)

FORM OF ICEBERG

A = Iceberg
B = Iceberg
C = Iceberg
D = Iceberg
E = Iceberg
F = Iceberg
G = Iceberg
H = Iceberg
I = Iceberg
J = Iceberg
K = Iceberg
L = Iceberg
M = Iceberg
N = Iceberg
O = Iceberg
P = Iceberg
Q = Iceberg
R = Iceberg
S = Iceberg
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V = Iceberg
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U ⁺ = Iceberg
V ⁺ = Iceberg
W ⁺ = Iceberg
X ⁺ = Iceberg
Y ⁺ = Iceberg
Z ⁺ = Iceberg

Boundary Analyzed from Visual Observations
 Estimated Boundary
 Observed and Analyzed from Passive Microwave
 All 3 days with the lowest values determined to be 50% melted. Berg material
 has been analyzed from satellite imagery.

NO.	DATE	STATION	DATE	STATION
1	25 NOV 96	6235 1224E	27 NOV 96	6235 1224E
2	26 NOV 96	6235 1224E	28 NOV 96	6235 1224E
3	27 NOV 96	6235 1224E	29 NOV 96	6235 1224E
4	28 NOV 96	6235 1224E	30 NOV 96	6235 1224E
5	29 NOV 96	6235 1224E	01 DEC 96	6235 1224E
6	30 NOV 96	6235 1224E	02 DEC 96	6235 1224E
7	01 DEC 96	6235 1224E	03 DEC 96	6235 1224E
8	02 DEC 96	6235 1224E	04 DEC 96	6235 1224E
9	03 DEC 96	6235 1224E	05 DEC 96	6235 1224E
10	04 DEC 96	6235 1224E	06 DEC 96	6235 1224E
11	05 DEC 96	6235 1224E	07 DEC 96	6235 1224E
12	06 DEC 96	6235 1224E	08 DEC 96	6235 1224E
13	07 DEC 96	6235 1224E	09 DEC 96	6235 1224E
14	08 DEC 96	6235 1224E	10 DEC 96	6235 1224E
15	09 DEC 96	6235 1224E	11 DEC 96	6235 1224E
16	10 DEC 96	6235 1224E	12 DEC 96	6235 1224E
17	11 DEC 96	6235 1224E	13 DEC 96	6235 1224E
18	12 DEC 96	6235 1224E	14 DEC 96	6235 1224E
19	13 DEC 96	6235 1224E	15 DEC 96	6235 1224E
20	14 DEC 96	6235 1224E	16 DEC 96	6235 1224E
21	15 DEC 96	6235 1224E	17 DEC 96	6235 1224E
22	16 DEC 96	6235 1224E	18 DEC 96	6235 1224E
23	17 DEC 96	6235 1224E	19 DEC 96	6235 1224E
24	18 DEC 96	6235 1224E	20 DEC 96	6235 1224E
25	19 DEC 96	6235 1224E	21 DEC 96	6235 1224E
26	20 DEC 96	6235 1224E	22 DEC 96	6235 1224E
27	21 DEC 96	6235 1224E	23 DEC 96	6235 1224E
28	22 DEC 96	6235 1224E	24 DEC 96	6235 1224E
29	23 DEC 96	6235 1224E	25 DEC 96	6235 1224E
30	24 DEC 96	6235 1224E	26 DEC 96	6235 1224E



A	J	K	L	M	N	O	P	Q	R	S
B	K	L	M	N	O	P	Q	R	S	T
C	L	M	N	O	P	Q	R	S	T	U
D	M	N	O	P	Q	R	S	T	U	V
E	N	O	P	Q	R	S	T	U	V	W
F	O	P	Q	R	S	T	U	V	W	X
G	P	Q	R	S	T	U	V	W	X	Y
H	Q	R	S	T	U	V	W	X	Y	Z
I	R	S	T	U	V	W	X	Y	Z	A

ANTARCTIC ICE ANALYSIS

SYMBOLS

CONTINENTAL SHEET

SEA ICE

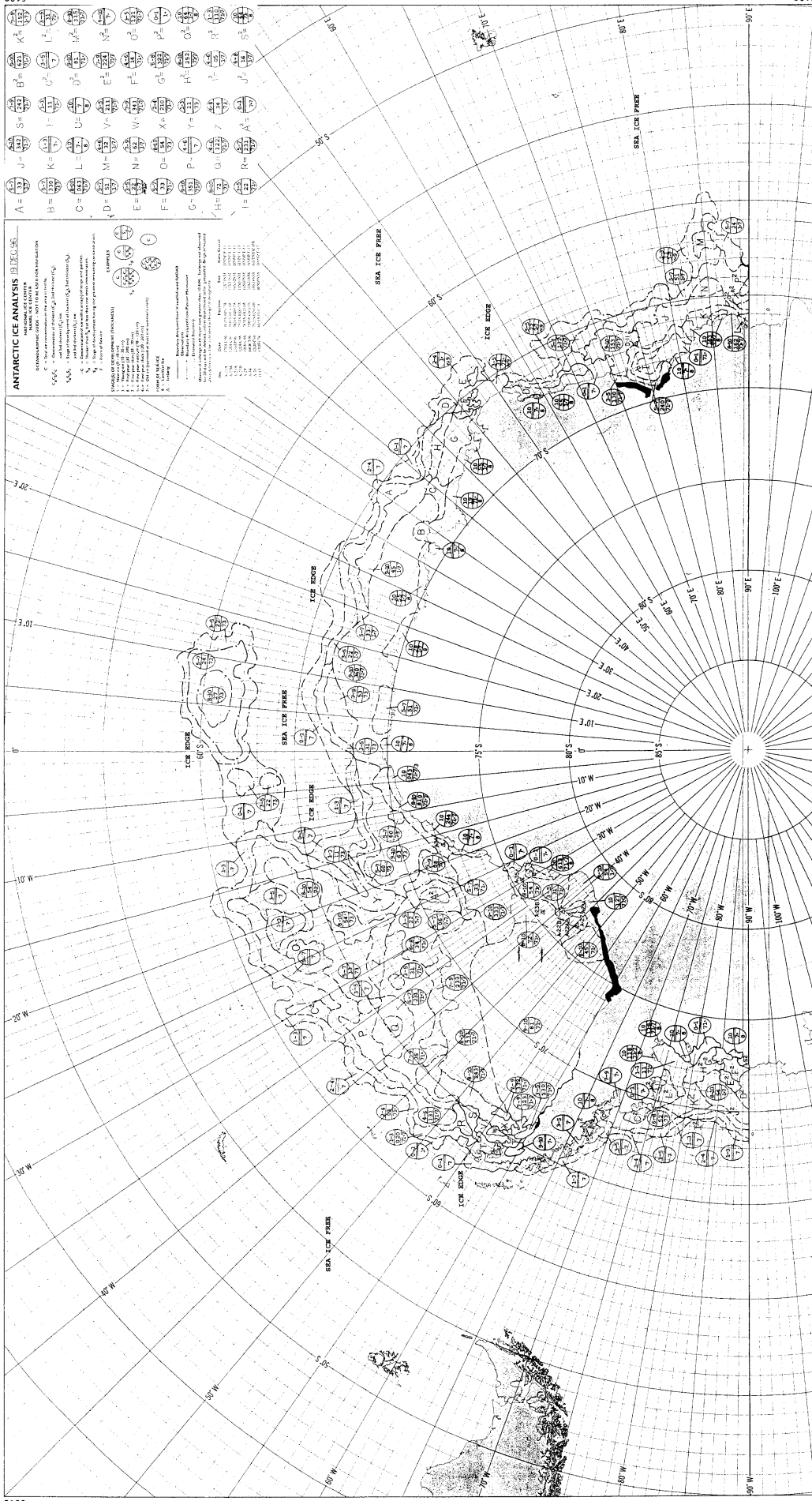
ICE BOUND

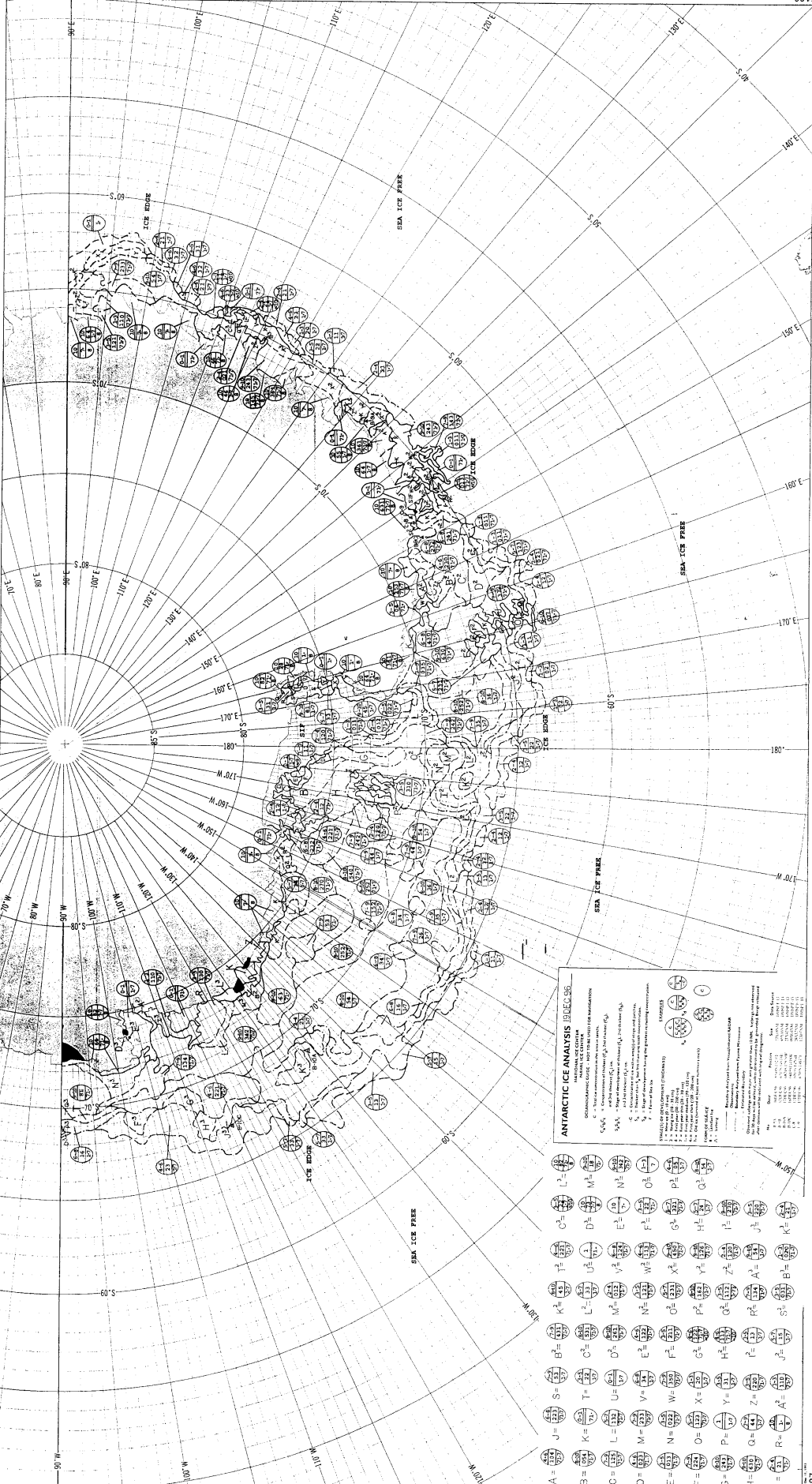
SEA ICE FREE

EXAMPLES

NOTES

REFERENCES

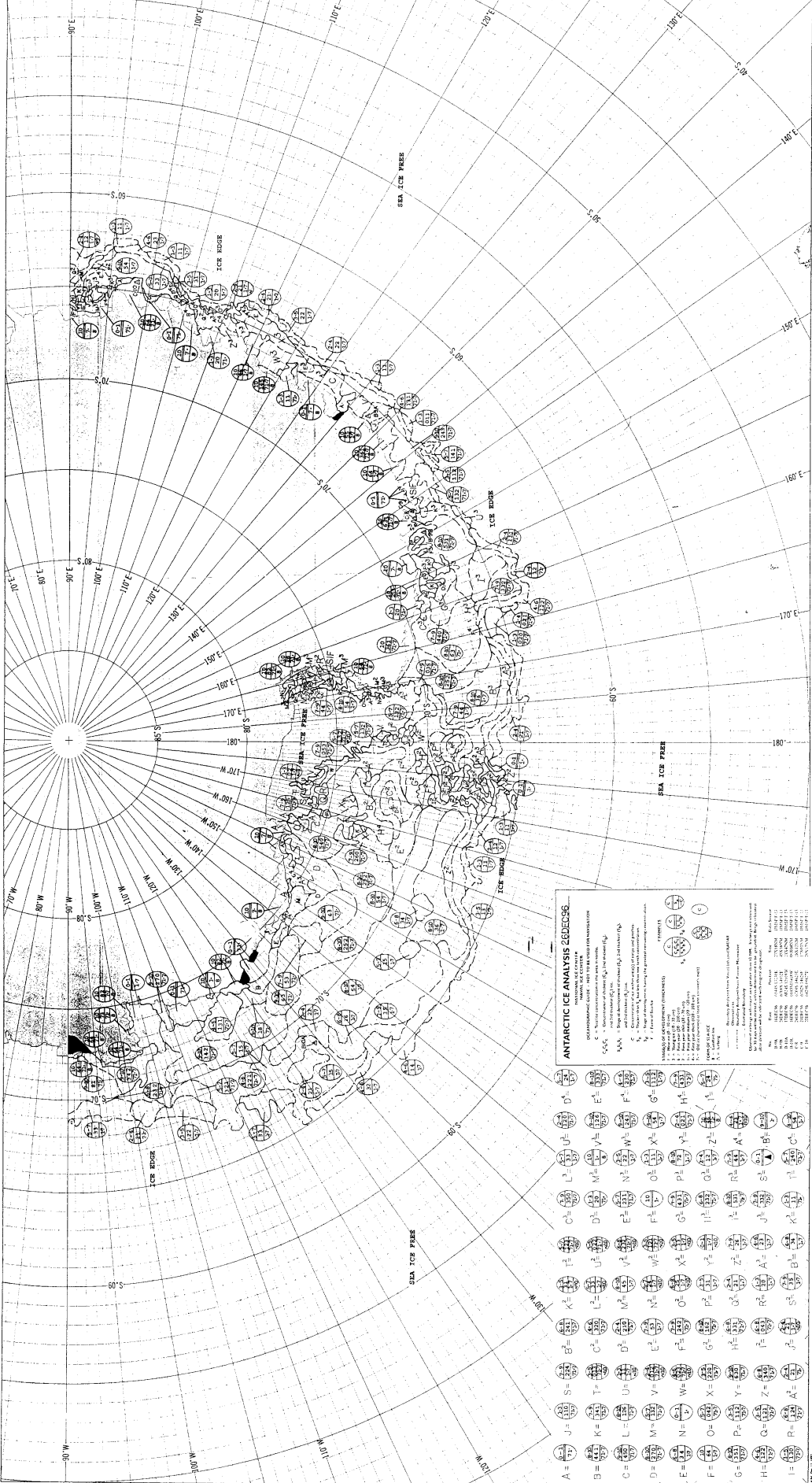




ANTARCTIC ICE ANALYSIS DEC. 55
 UNITED STATES GOVERNMENT
 OFFICE OF NAVAL OPERATIONS
 NAVY DEPARTMENT
 WASHINGTON, D. C. 20350

SYMBOLS:
 (A) - Ice analysis data points
 (B) - Ice analysis data points
 (C) - Ice analysis data points
 (D) - Ice analysis data points
 (E) - Ice analysis data points
 (F) - Ice analysis data points
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 (Z) - Ice analysis data points

KEY:
 A = 100%
 B = 90%
 C = 80%
 D = 70%
 E = 60%
 F = 50%
 G = 40%
 H = 30%
 I = 20%
 J = 10%
 K = 5%
 L = 0%
 M = 100%
 N = 90%
 O = 80%
 P = 70%
 Q = 60%
 R = 50%
 S = 40%
 T = 30%
 U = 20%
 V = 10%
 W = 5%
 X = 0%
 Y = 100%
 Z = 90%



ANTARCTIC ICE ANALYSIS 020603G

SYMBOLS:
 C = 100% ice concentration
 S = 75% ice concentration
 M = 50% ice concentration
 L = 25% ice concentration
 D = 10% ice concentration
 O = 0% ice concentration (open water)

ICE EDGE:
 S = Sea Ice Pressure
 M = Mean Ice Pressure
 L = Lower Ice Pressure
 D = Drift Ice Pressure
 O = Other Ice Pressure

SYMBOLS:
 A = 100% ice concentration
 B = 75% ice concentration
 C = 50% ice concentration
 D = 25% ice concentration
 E = 10% ice concentration
 F = 0% ice concentration (open water)

SYMBOLS:
 A = 100% ice concentration
 B = 75% ice concentration
 C = 50% ice concentration
 D = 25% ice concentration
 E = 10% ice concentration
 F = 0% ice concentration (open water)