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Classifiers of Seismic and Geographical Regionalisation (UNCLASSIFIED)

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SUMMARY

This report contains a complete definition of the Flinn and Engdahl regionalisation of the earth as used by seismologists and known as the F-E Code. The information in the tables of regions is enhanced by three "classifiers" indicating political geography, seismicity or aseismicity, and oceanic or continental crust. The overlapping maps not only provide all the region numbers with latitude and longitude but also have coastlines. The "classifiers" are also illustrated by a further set of maps.

1. INTRODUCTION

In the early 1960's seismological agencies such as the United States Coast and Geodetic Survey (USCGS) and the International Seismological Summary (ISS) changed to computer based systems for earthquake information storage and epicentre determination. It soon became clear to these agencies that there was a requirement for a standard method of referring to a geographical location other than by latitude and longitude. In response to this need to standardise, particularly the description of areas where earthquakes occur, Flinn and Engdahl (FE)(1) proposed a basis for geographical and seismic regionalisation at a symposion held in Moscow and Leningrad in 1964. By the time a second paper by Flinn, Engdahl and Hill (FEH)(2) was published in 1974 most agencies had adopted FE regionalisation (which is referred to as the "F-E Code" in the Universal Decimal Classification system used by libraries). In fact, modern seismologicalagencies like the National Earthquake Information Centre (NEIC) and the International Seismological Centre (ISC) (successors to the USCGS and the ISS respectively) still use FE regionalisation in more or less its original form. Indeed, the NEIC has not allowed changes to be made to the definition of the regions. The only changes that have been made are to countries where the names have changed and to regions where the local seismological agency disagreed with the name originally adopted by FE(3), (4).

In 1984 Dr Flinn was asked by the Commission on Practice of the International Association of Seismology and Physics of the Earth's Interior (IASPEI) to review the current definition of the F-E Code and to form an International Committee to produce a new standard for the regionalisation of the earth. This report is such a current definition of FE regionalisation and it is hoped will form the basis of any new standard.

The purpose of this report is to provide:-

(a) A table of the seismic and geographical region names.

(b) A complete table of the geographical region names for all four quadrants of the earth at each degree of latitude.

(c) A set of maps not only giving a plot of regions with their numbers but also showing coastlines: the whole world is shown on a basic 13 maps with some overlap but as the plots are done by a computer any centre longitude could have been chosen.

(d) Certain "classifiers" to allow regions to be classified as:-

(i) within an area of political geography (or not);

(ii) ..highly seismic or aseismic (or neither);

(iii) continental or oceanic.

These "classifiers" are illustrated in a further set of 7 world maps.

(e) Recommendations to be considered for any new standard of the F-E Code.

We first briefly describe the current definition of the F-E Code and then describe in detail the three "classifiers" we have used.

2. DESCRIPTION OF THE F-E CODE

Flinn and Engdahl's regionalisation of the earth is based on a grid system using integral values of latitude and longitude. Each degree square on the surface of the earth has two numbers, the first being the geographical region number and the second the seismic region number. Each number has a corresponding name. The world is divided into 50 seismic regions which closely follow those published in 1954 by Gutenberg and Richter (5). Each of these larger seismic regions is divided into two or more smaller geographical regions of which there are currently 728. All these regions cover one or more degree squares, tend to be irregular in shape with each seismic region being a mosaic of geographical regions, and the seismic regions forming a coarser mosaic covering the whole earth.

Each seismic and geographical region has a name which is defined in the F-E Code up to a maximum of 32 characters. This limit on the number of characters means that a few of the region names must be drastically abbreviated. One of the improvements we have made is to extend this limit to 40 characters. As a result there are only six names containing abbreviations in a total of 778. There are four regions containing NZ for New Zealand, the other two being NE for Northeast; the standard abbreviations of USSR and SSR not being counted. We have, we hope, included all the changes rnade to region names published by the NEIC (3), (4). In some cases we have extended the name in order to further lessen confusion about the region (for example, Gulf of St Lawrence and St Lawrence Island, and Northern Eurasia). We take full responsibility for any other changes (for example, Gulf of Siam instead of Thailand, and Off instead of Near coast of Pakistan), errors, or discrepancies!

R conversion to upper and lower case letters has also been made on the geographical region name - the original F-E Code had all upper case. Table l reproduces the FEH figures 2 and 3 of the 1974 paper with the inclusion of the "classifiers" discussed below but in the combined form as published in the ISC Regional Catalogue of Earthquakes (6). Table 2 presents the information from FEH's figures 4 to 7 in a different form by providing the geographical region names at each degree of latitude with all four quadrants of the earth on a page.

In FE's 1965 paper the regions were defined by a series of maps. These maps are reasonable for looking up a seismic region number but problems have been experienced looking up a geographical region number because the display did not include the coastlines which give the familiarity expected of such maps. We have provided a series of overlapping maps 1 to 13 covering the whole earth with the coastlines added. Map 1 shows the coarser seismic regions while maps 2 to 13 show the fine detail of the geographical regions as well as the enclosing seismic region. These maps have been drawn by a computer and demonstrate the current definition of the F-E Code. If changes are made to the F-E Code then new maps are easily drawn. Also any errors in the original hand-drawn maps are immediately remedied (for example, the definition of North-western and Southwestern Afghanistan). Maps 14 to 20 illustrate the use of the three "classifiers" discussed below.

But first we shall look at some of the problems which have arisen over the last 20 years using the F-E Code.

2.1 Some problems with the F-E Code

There is no doubt about the effectiveness of the F-E Code. Its universal acceptance by all major agencies and other seismologists is proof enough. But 20 years on, with use, and with improving earthquake hypocentres it is obvious a few of the FE regions are at best ill-defined, and at worst wrong. There also appears to be a bias towards a better definition of regions in the Northern hemisphere compared to the Southern. It is also noticeable that North America has more regions than the USSR and China. In seismological terms, these biases probably have little significance but from a political point of view perhaps more thought could have been put into the original definition.

It is probably unfortunate that agencies, particularly the NEIC, decided not to allow changes to the definition of the regions. FE in their original paper (1) suggested an adequate system for adding or dividing regions. Most of the problems we experienced in specifying our "classifiers", particularly seismicity, stem from regions being ill-defined. The most common problem is of regions being "oversize" and having more than one classification within them. Some regions are too small and should be included in a neighbouring region. A "classic" problem area is the North Atlantic Ridge north of the Azores Islands and South of Iceland which is included in the North Atlantic Ocean but obviously is a separate region. Another problem region is the South Georgia Rise which is aseismic, the seismicity being ten degrees to the southeast in the Southwestern Atlantic Ocean. Apparently FE thought that this region was highly seismic so a difficult decision has to be made on its classification.

Another criticism of the F-E Code is that it is sometimes not obvious that neighbouring regions are next to each other. This problem stems primarily from the definition of the seismic regions which is based on Gutenberg and Richter's work (5) and appears to defy solution.

We have listed some of the geographical regions which we feel are obvious candidates for change in appendix A.

3. DEFINITION OF THE CLASSIFIERS

The classification of any particular property of a region depends on its defined position on the surface of the earth. FE chose their region boundaries to follow established tectonic, geographical, and political divisions within the constraint of using integral lines of latitude and longitude. (We shall not repeat here FEs detailed work in deciding on borders, seismic areas, and other matters but refer readers to the original papers (1), (2).) The size of a geographical region (and to some extent a seismic region) tends to be a compromise between these tectonic, geographical, and political divisions. Seismic (tectonic) regions tend to be small in area while aseismic regions tend to be large. Land areas tend to have smaller geographical regions than those in oceanic areas. Southern hemisphere regions seem to be less precise in definition than Northern ones. Some regions, both on land and sea, are too large to be described as having only one particular property (for example, Northeastern China and its border with Eastern USSR has significant seismicity in the south and none in the north) and it would have helped this work to have been able to subdivide regions. Certain regions can be joined up as has already happened to one geographical region - West of Tonga Islands has been included in Fiji Islands region.

The regions in the F-E Code have implicit position and seismicity. A political geography classification is inherent in the definition of a region, particularly a geographical region. For example, we have chosen regions within the USSR, Eastern Europe and China as different from regions in the rest of the world. The seismicity (or aseismicity) of an area was taken by FE as the major factor in their definition of a region and the seismicity classification is probably of most importance. The geographical position of a region can give an oceanic or continental classification which we have provided but perhaps a few regions are ill-defined enough to bring this particular "classifier" into question. We have also considered areas of high and low Q as a fourth classification but we felt that much more research is required to make this feasible.

We now come to look at the first three "classifiers" we have chosen to associate with each region and the uses we have made of the information.

3.1 Political geography classifier

Each region, particularly those regions in the land areas of the earth, has an implied political geography classification. In present global terms, the world splits broadly into three categories which can be roughly classified as "Western Bloc", "Eastern Bloc" and "Third World". If a nuclear test ban treaty is signed, seismic events occurring in the "Eastern Bloc" will be of interest to the "Western Bloc". We have chosen to mark FE regions in the USSR, Eastern Europe and China with an asterisk (*); all other regions are left blank. In GEDESS (7) (which is a series of Earthquake Data Listing computer programs) events occurring within the USSR, Eastern Europe and China are underlined with asterisks so highlighting the particular seismic disturbance. It is interesting to note that this "classifier" pre-dates (1962) the introduction of the F-E Code into GEDESS with events for underlining being chosen by a method which is unknown to the present authors. The political geography "classifier" is simple in terms of the F-E Code and can be applied in any chosen way. Map 20 illustrates our use of this "classifier".

3.2 Seismicity/aseismicity classifier

The seismicity of a region was the largest influence on FE when they were defining their regionalisation system. The method they used to choose the size of a region is not clear but regions of high seismicity tend to be small in area and aseismic regions tend to be large. Using their regionalisation framework we classified regions as highly seismic (S), aseismic (A), or neither (a blank) by a combination of computation and allocation. From a database of over 100 000 earthquakes reported by NEIC over a period of 20 years (1964-1983) we made a table of regions with the number of earthquakes reported. We applied various magnitude thresholds and displayed the table in decreasing order of the number of earthquakes per region. The majority of regions (about 90%) are clearly defined as seismic or aseismic (or neither). Some very small regions may not have any earthquakes but are clearly in a seismic area (for example, Buru, and Cebu in the Philippine Islands). All the regions defining the deep Oceans are classed as aseismic (A) though there is significant seismicity occurring in most of them. However, it is to a residue of regions (about 10%) that mainly appear in the middle of the table that some sort of allocation has to be made.

The next step we made was to refine the computation of the number of earthquakes per region. It is relatively easy to compute the area of each FE region either in degree blocks, or, better still, in square kilometres (8). Knowing the number of earthquakes in a particular region some idea of the seismicity can be estimated in terms of earthquakes per unit area. This method overcomes the problem of regions of different sizes having the same number of earthquakes, a large area is classed as aseismic and a small one as seismic. However, again there is a residue to which some sort of allocation has to be made.

A further check we have made is to compare our classification of the seismicity of the FE regions with an Atlas of Seismic Activity (9). The one we have used was published by the Institute of Geological Sciences (IGS) (now the British Geological Survey (BGS)) but the data is only to 1968. However, it gives us a reasonable check on the allocation of this "classifier" to the majority of the seismic areas.

For this particular "classifier" we identified two requirements which in some ways conflict. The first requirement is to reproduce the "standard" seismicity map, for example, indicating the Pacific Ocean's "ring of fire"[1]. This map, based on data, is required for the study of seismic signal detection and the threshold and magnitude studies of seismic array stations (10). The second requirement is to indicate to a seismologist (who might be using GEDESS (7)) whether the seismic disturbance under study occurred in, say, an aseismic region.

This "classifier" may not meet with the approval of observational seismologists (particularly those in the Eastern United States!) for an individual region but we feel that on a macroseismic scale we have, on the whole in a global sense, made reasonable allocations of this "classifier" to the F-E regions. Maps 14 to 17 illustrate the seismicity and aseismicity of the earth. Note that map 15 is not the negative of map 16 but map 14 is, as there are areas of the earth we have classed as "medium" seismicity; the "classifier" has been left blank. It should be noted that the blank "classifier" also serves as a "don't know" option.

3.3 Continental/oceanic classifier

This particular classification was considered only indirectly by FE in terms of tectonic boundaries so its definition for each region in terms of oceanic (O) or continental (C) structure is consequently more open to question. The main standard we use in judging whether an individual region is continental or oceanic is its position in relation to the continental shelf. However, in some instances, this is not a clear cut decision. Difficulties occur in regions of high tectonic activity (for example, off the Oregon–Washington coastline), where the structure is very complex (for example, in the Caribbean), where old oceans have closed up (Mediterranean) or new seas have opened (Red Sea) or where region boundaries are ill–defined in terms of the continental shelf (for example, off Argentina).

The main purpose of this "classifier" is to provide a measure of the fraction of a path from an earthquake to a seismic recording station that is oceanic (or continental) for surface wave studies. In interpreting and understanding surface wave data from earthquakes recorded on long period or broad-band instruments, a seismologist needs to know whether the wave has travelled by an all oceanic path, an all continental path, or, more usually a mixture of both. A simple program called PATH (appendix B) (which is now part of the GEDESS (7) suite of programs) takes the positions of the station and the earthquake and divides the path into a further 99 equally spaced positions. The latitude and longitude of the mid-point between each of these points is calculated assuming a great circle path and its oceanic (or continental) "classifier" noted. Simple addition produces the percentage of the path that is oceanic (or continental). Because of, and perhaps in spite of, the F–E Code we believe these percentages to be accurate to a few per cent, particularly for long distances.

As the position of continental shelves was not a major factor in the original definition of the F–E Code this "classifier" may be open to dispute but again we feel that the classification is reasonable in global terms. As a by-product of this work two interesting maps, maps 18 and 19, have been produced showing the continents and the oceans. In this case, one map is the negative of the other one.

3.4 The Q classifier

A fourth "classifier" we considered for each region is whether it is of High Q (H), Low Q (L), or Average Q (a blank). We did not attempt this extremely difficult classification due to the paucity of world–wide data. It is also questionable whether the F–E Code is a suitable regionalisation system for such a study.

4. DISCUSSION AND RECOMMENDATIONS

This report enhances the work of Flinn and Engdahl (and Hill) on geographical and seismic regionalisation of the earth and extends the information given in the F–E Code by providing three "classifiers" associated with each region. For the first time the F–E Code is published with maps showing not only the defined regions but also the coastlines, and with the listing of the regions improved by political geography, seismicity or aseismicity, and oceanic or continental "classifiers". We believe that even though we have conflicting requirements and have problems rationalising the aims of the F–E Code with our

"classifiers", overall the results of this work are generally good. The improvements we have made in the use of upper and lower case characters, using computer generated maps to enable us to include coastlines with the region definitions, and in providing compact programs point to a recognised and well-used system. The fact that this work has been carried out over a number of years indicates the usefulness of the regionalisation originally proposed by Drs Flinn and Engdahl.

The current proposal by the Commission on Practice of IASPEI to rationalise and redefine the F-E Code is further evidence of the need of the seismological community for a standard regionalisation of the earth. It is also the reason why we have not pursued our own recommendations concerning the changing of region boundaries. But we hope that this work will be accepted as an updated standard till the publication of any revised F-E Code.

We would recommend that the new standard of the F-E Code should contain the following:-

(a) Full tables of regions at each interval of latitude.

(b) Coastlines on the maps defining the regions.

(c) Appropriate "classifiers" associated with each region and each region defined to embody only one particular classification.

(d) A method of regionalisation which allows the easy division or combination of regions.

We hope that this report brings together in one volume all that seismologists need to know about the current F-E Code.

5. ACKNOWLEDGMENTS

We are grateful to Dr Engdahl for the suggestion of the word "classifier" and to Dr Flinn and Dr Adams for critical reading of this report. We acknowledge the support of colleagues in Blacknest in encouraging us to bring this rather mundane work into print. The maps defining the regions were plotted on an FR80 graphics plotter at the SERC Rutherford and Appleton Laboratory. With the closure of the FR80 we would like to thank all those involved in providing us with quality graphics for many years. We would also like to acknowledge the debt owed by seismologists to the NEIC and the ISC for continuing to provide primary data on earthquakes.

6. DESCRIPTION OF APPENDICES, MAPS AND TABLES

APPENDIX A Description of some of the geographical regions which presented problems in defining the seismicity/aseismicity "classifier".

APPENDIX B Listing of the FORTRAN program called PATH which computes the percentage of a path from a seismic recording station to an earthquake that is oceanic (or continental).

APPENDIX C	Personal communication describing the method of computing the area of a degree square at a particular latitude.
APPENDIX D	Special characters as used on maps 2 to 13.
Map 1	Seismic regions plotted on a repeating cylindrical projection of the earth centred on longitude 40°E.
Maps 2–13	Geographical regions plotted on a series of two overlapping cylindrical plots, one for north of the Equator and the other for south of the Equator, centred at selected longitudes and covering the whole earth.
Map 2	North of the Equator centred on longitude 145°W.
Map 3	South of the Equator centred on longitude 145°W.
Map 4	North of the Equator centred on longitude 85°W.
Map 5	South of the Equator centred on longitude 85°W.
Map 6	North of the Equator centred on longitude 25°W.
Map 7	South of the Equator centred on longitude 25°W.
Map 8	North of the Equator centred on longitude 25°E.
Map 9	South of the Equator centred on longitude 25°E.
Map 10	North of the Equator centred on longitude 85°E
Map 11	South of the Equator centred on longitude 85°E.
Map 12	North of the Equator centred on longitude 145°E.
Map 13	South of the Equator centred on longitude 145°E.
Maps 14–20	The "classifiers" plotted on standard cylindrical maps of the earth centred on various longitudes.
Map 14	Seismicity plot centred on longitude 180°E.
Map 15	Aseismicity plot centred on longitude 180°E. (This map is the negative of map 14.)
Map 16	High seismicity plot centred on longitude 180°E.
Map 17	Medium seismicity plot centred on longitude 180°E.
Map 18	Continental areas plot centred on longitude 0°E.
Map 19	Oceanic areas plot centred on longitude 0°E.
Map 20	Political geography plot centred on longitude 90°E showing the USSR, Eastern Europe and China.

TABLE 1 Seismic region names with geographical region identification and "classifiers". This table is printed and also listed on the microfiche insert.

TABLE 2 Geographical region names for all four quadrants of the earth at each degree of latitude. Each degree appears as an "eye-readable" number with the table across two pages up to 55 degrees and one page up to 90 degrees. This table is listed only on the microfiche insert.

APPENDIX A

Geographical regions which presented problems in defining the seismicity/aseismicity "classifier" described in this report.

403 North Atlantic Ridge
384 West of Gibraltar
402 North Atlantic Ocean

The extension of the North Atlantic Ridge from north of the Azores Islands to south of Iceland should be classed as a separate region. (This region got "forgotten" by HE in their original definition!) The area West of Gibraltar could be extended to the Azores Islands and would be classed as a region of medium seismicity.

152 South Georgia Rise
156 Southwestern Atlantic Ocean

We have assumed that HE meant the South Georgia Rise to be a tectonic area with high seismicity. In fact, the tectonic area linking the South Sandwich Islands to the South Atlantic Ridge is southeast of the South Georgia Rise in the Southwestern Atlantic Ocean. We have left the seismicity "classifier" blank.

421 Carlsberg Ridge
417 Arabian Sea
415 Eastern Gulf of Aden
559 Western Gulf of Aden
558 Ethopia
554 Red Sea

This area of complex seismicity is the prime example of 20 years' "hindsight". The seismicity of the Carlsberg Ridge extends into the Gulf of Aden. The seismicity of the Red Sea and the Western Gulf of Aden is continuous through the eastern part of Ethiopia. The "missing link" through Ethiopia could be classed as a separate region.

658 Northeastern China
657 Eastern USSR-Northeastern China border region

This region of Northeastern China and its border is a good example of an oversize region. Both regions contain significant seismicity in the south and could be subdivided.

396 Algeria

Another example of a large region which could be subdivided with significant seismicity in the north of the area.

17 South of Alaska
12 Alaska Peninsula

The northern boundary of the South of Alaska region could be moved south to place the seismicity in the Alaska Peninsula.

618 Kiribati (Gilbert Islands) region
339 Uzbek SSR
176 North of New Zealand
165 North of Macquarie Island

Examples of fairly large regions with most of the seismicity in the region at one spot. Defining the seismic area as a separate region within a region would give the seismicity "classifier" more meaning.

435 Southeast Indian Rise
437 South of Australia

These two oversize regions with seismicity approximately through the middle caused us the biggest problem in defining our seismicity "classifier" for this area.

427 Mascarene Islands region
429 Mid-Indian Rise

If the Mascarene Islands region was reduced in size the seismicity would come into the Mid-Indian Rise where it really belongs.

695 West of Galapagos Islands
693 East Central Pacific Ocean

The West of Galapagos Islands region could be extended westwards to include the seismicity occurring in the East Central Pacific Ocean.

428 Atlantic-Indian Rise
686 West Chile Rise

Both these regions are ill-defined in terms of following the seismicity of the regions.

255 Cebu, Philippine Islands
271 Buru
27 Near Coast of Washington
31 Near Coast of Oregon

These are examples of very small regions with no significant earthquakes in highly seismic areas.

APPENDIX B

Listing of the FORTRAN Program used to compute the percentage of Oceanic (or Continental) Path between a seismic recording station and an earthquake.

```
      SUBROUTINE PATH(SLAT,SLON,ELAT,ELON,OPER,CPER,DTOR)
      CHARACTER*1 CODE,O,BLANK
      DATA O/'O'/,BLANK/' '/
      OPER=0.
C
COMPUTE AZIMUTH AND OISTANCE
C
      SAZ=0.
      CAZ=1.
      SLA=SLAT*DTOR
      SLO=SLON*DTOR
      ELA=ELAT*DTOR
      ELO=ELON*DTOR
      SLAC=COS(SLA)
      SLAS=SIN(SLA)
      SLOC=COS(SLO)
      SLOS=SIN(SLO)
      ELAC=COS(ELA)
      ELAS=SIN(ELA)
      ELOC=COS(ELO)
      ELOS=SIN(ELO)
      AE=ELAC*ELOC
      BE=ELAC*ELOS
      CE=ELAS
      AS=SLAC*SLOC
      BS=SLAC*SLOS
      CS=SLAS
      DS=SLOS
      ES=-SLOC
      GS=SLAS*SLOC
      HS=SLAS*SLOS
      SK=-SLAC
      CDIST=AE*AS+BE*BS+CE*CS
      SDIST=SQRT(1.-CDIST*CDIST)
      IF(SDIST.EQ.0.)GO TO 10
      CSDIST=1./SDIST
      SAZ=-(AE*DS+BE*ES)*CSDIST
      CAZ=-(AE*GS+BE*HS+CE*SK)*CSDIST
X  10 DIST=ATAN2(SDIST,CDIST)
C
CUT DISTANCE INTO 100 AND LOOKUP PERCENTAGE OCEANIC CODE
C
      PCDIST=DIST/100.
      DO 100 K=1,100
      DIST=(FLOAT(K)-0.5)*PCDIST
      CDIST=COS(DIST)
      SDIST=SIN(DIST)
      C=CDIST*CS-SDIST*CAZ*SK
      S=SQRT(1.-C*C)
      ALAT=ATAN2(C,S)/DTOR
      C=CDIST*SK+SDIST*CAZ*CS
      S=SDIST*SAZ
      ALON=ATAN2(S,-C)/DTOR+SLON
      IF(ABS(ALON).GT.180.)ALON=ALON-SIGN(360.,ALON)
      CALL LOOKUP(ALAT,BLANK,ALON,BLANK,IGREG,ISREG,0,0)
      CALL REGAIN(IGREG,0,3,CODE,1)
      IF(CODE.EQ.O)OPER=OPER+1.
  100 CONTINUE
C
CONTINENTAL PERCENTAGE
C
      CPER=100.-OPER
      RETURN
      END
```

APPENDIX C

Formula to compute the area of a one degree square at latitude 8.

Let the area of a 1^o cell at the equator be δA where the corners of the cell are at

$\{0^o , \phi^o\}$, $\{0^o , (\phi+1)^o\}$

$\{1^o , \phi^o\}$, $\{1^o , (\phi+1)^o\}$

Then the area $\delta A'$ of a 1^o cell that is bounded by latitude θ^o and $(\theta+1)^o$ is

$$\delta A' = \left(\frac{\sin (\theta+1)^o - \sin \theta^o}{\sin 1^o}\right) \delta A$$

eg, if $8 = 0^o$ $\quad \delta A' = \delta A$

if $\theta = 89^o$ $\quad \delta A' = \frac{1 - \sin 89^o}{\sin 1^o} = \frac{.0002}{.0175} = 2/175$

$$= 0.01143\delta A$$

APPENDIX D

Single Character Codes for Geographic Regions

As Used on the Maps 2-13

	WEST region name			EAST region name	
	No.			No.	
A	44	California-Arizona border region	A	392	Greece-Albania border region
B	93	Belize	B	295	Burma-Bangladesh border region
C	102	Near west coast of Colombia	C	255	Cebu, Philippine Islands
D			D		
E	485	Eastern Missouri	E		
F			F		
G	520	Texas Gulf coast	G		
H	458	Hebgen Lake region	H		
I			I	343	Turkey-Iran border region
J	494	New Jersey	J		
K			K	711	Southwestern Kashmir
L	674	St Lawrence Island region	L		
M	100	Lake Maracaibo	M	250	Mindoro, Philippine Islands
N			N	257	Negros, Philippine Islands
O	31	Near coast of Oregon	O		
P	80	Panama-Costa Rica border region	P	254	Panay, Philippine Islands
Q	82	Panama-Colombia border region	Q		
R			R		
S			S	276	Sunda Strait
T	98	Trinidad	T		
U			U		
V	91	Virgin Islands	V		
W	27	Near coast of Washington	W		
X	487	Cape Girardeau, Missouri, region	X	271	Buru
Y			Y		
Z			Z	586	Swaziland
/			/	311	Sikkim
.	482	Missouri-Kansas border region			
-	501	Arkansas-Oklahoma border region	-		
=	503	Louisiana-Texas border region	=		
+	136	Central Chile	+	243	Taiwan region
*	518	Texas-Mexico border region	+	320	Kirghiz-Xinjiang border region

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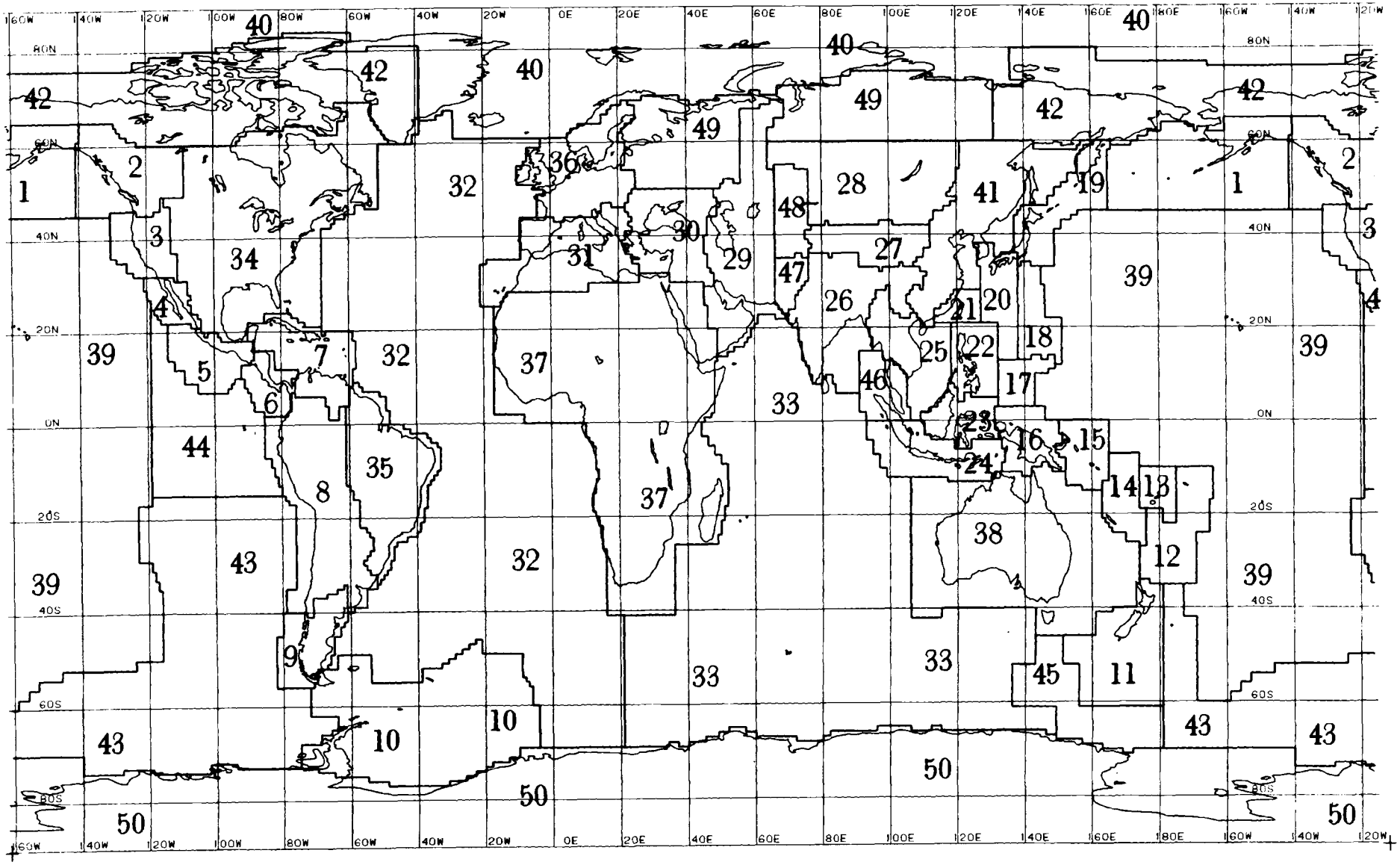
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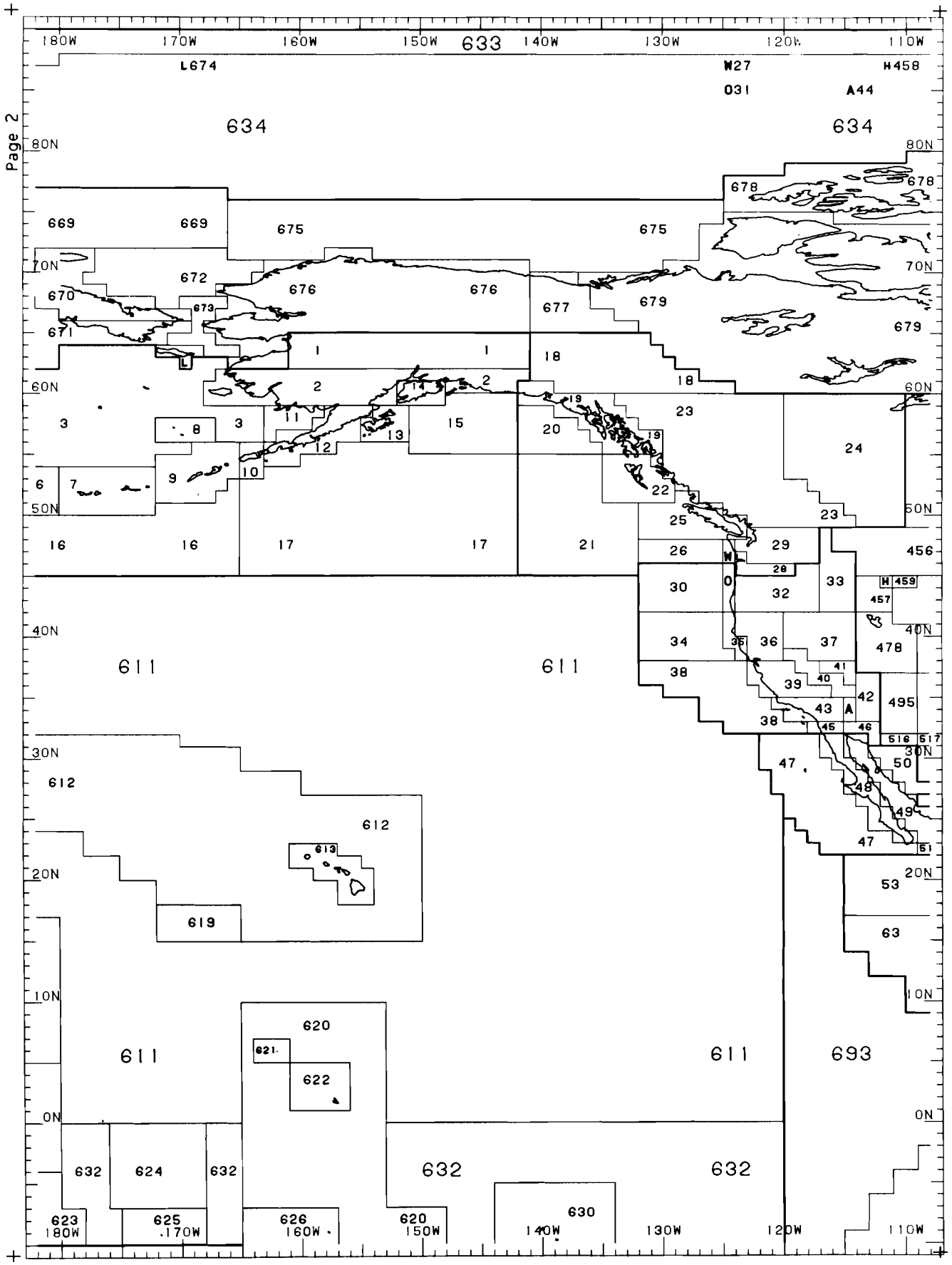
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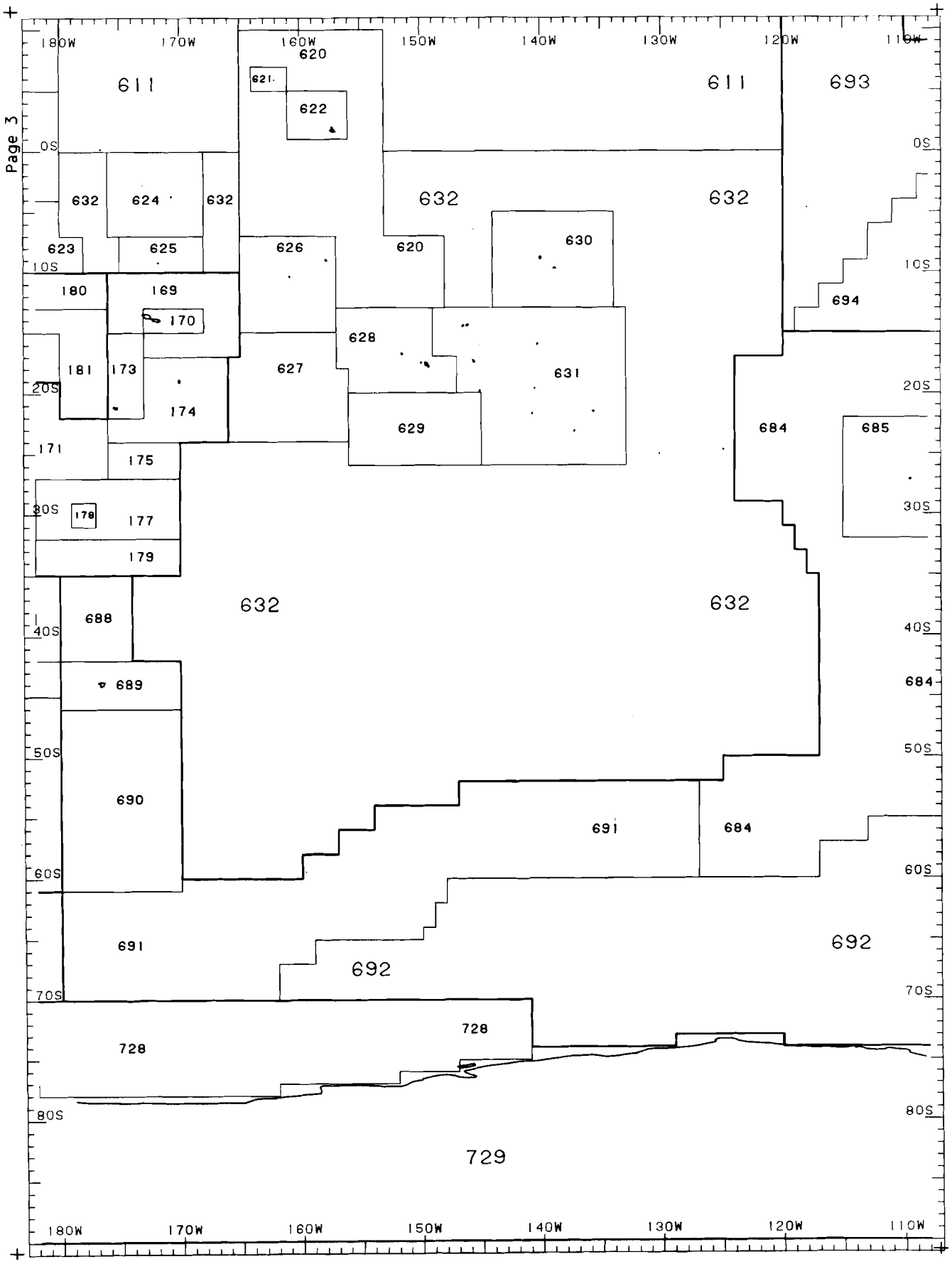
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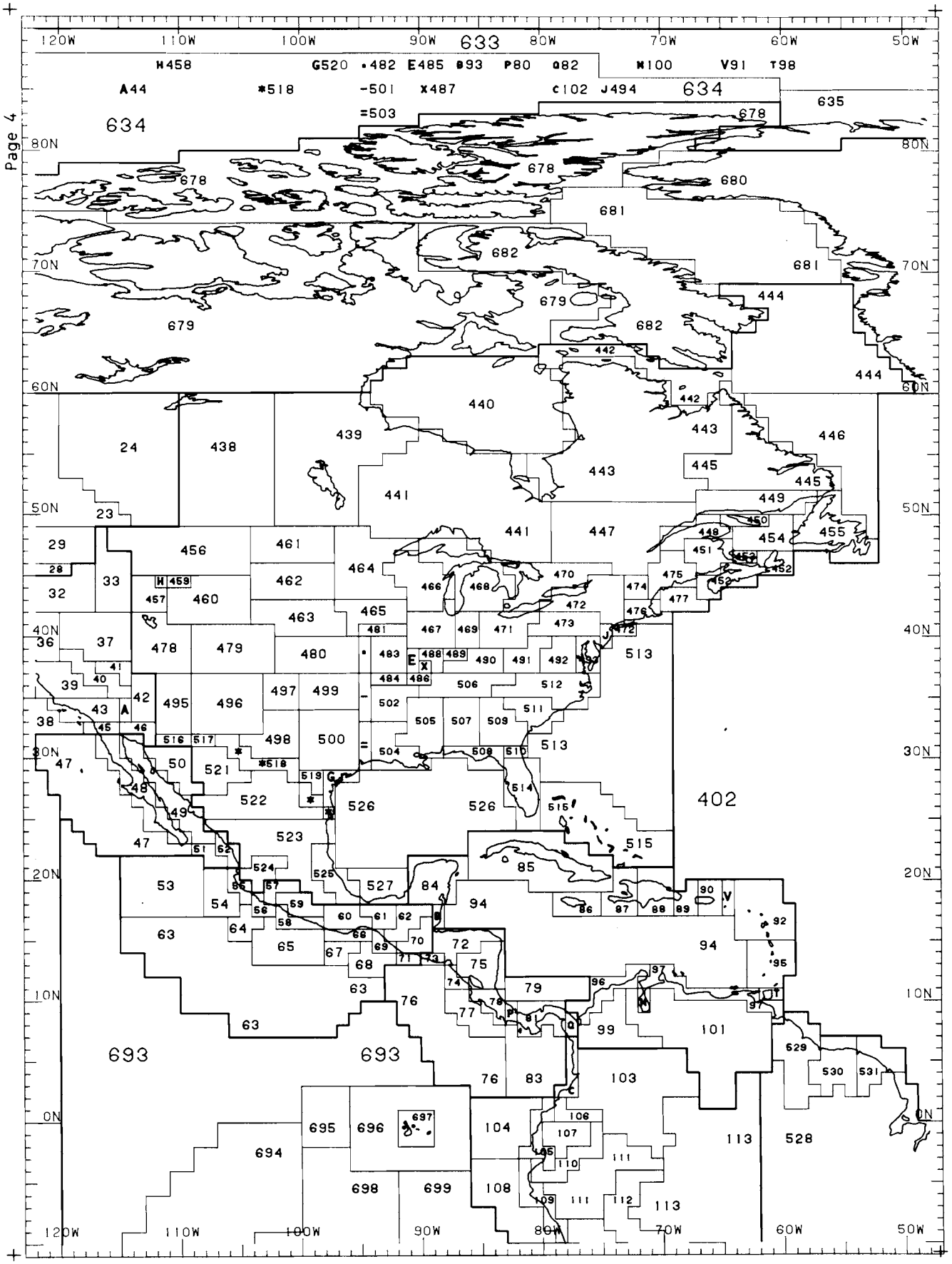
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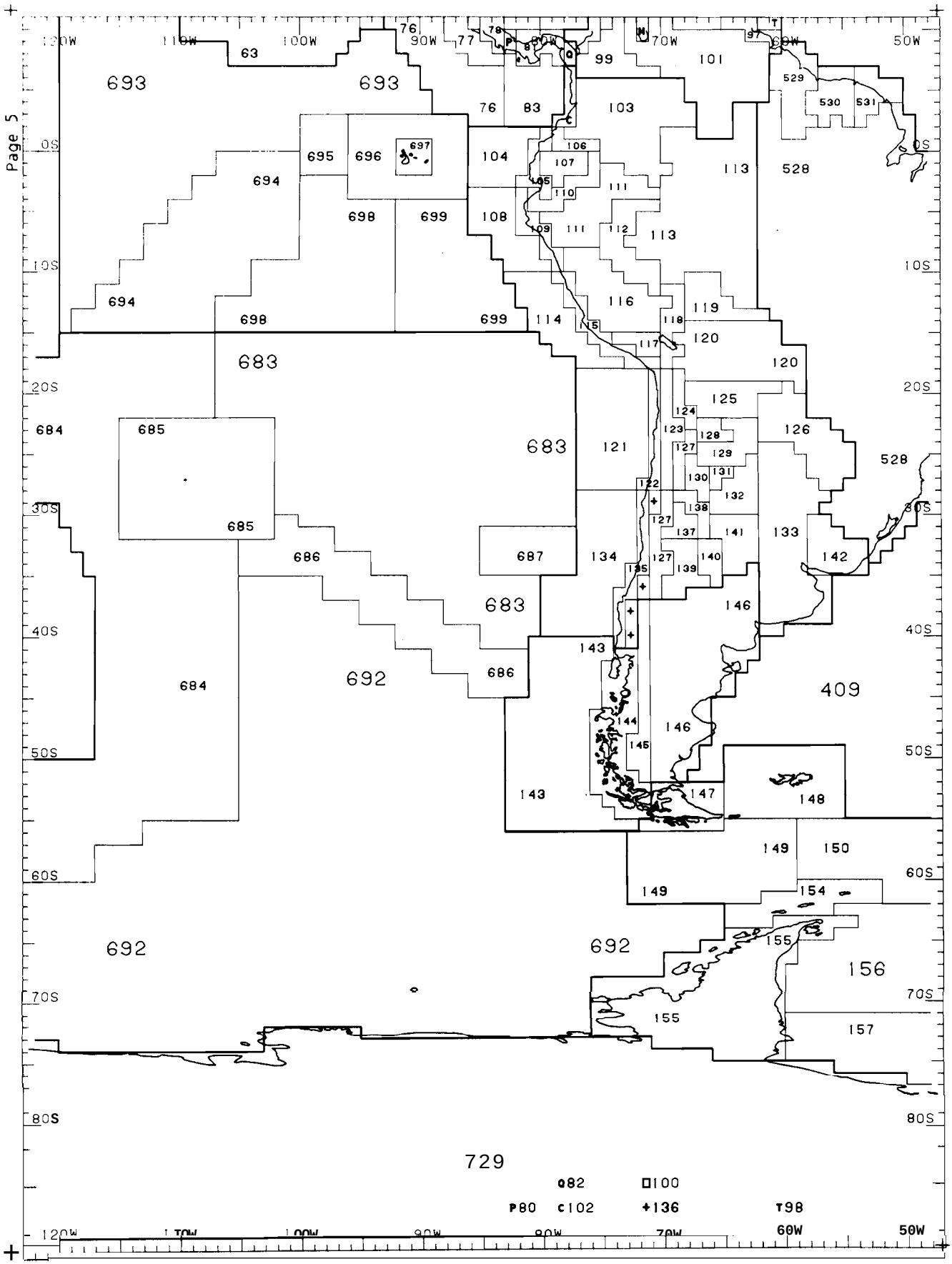
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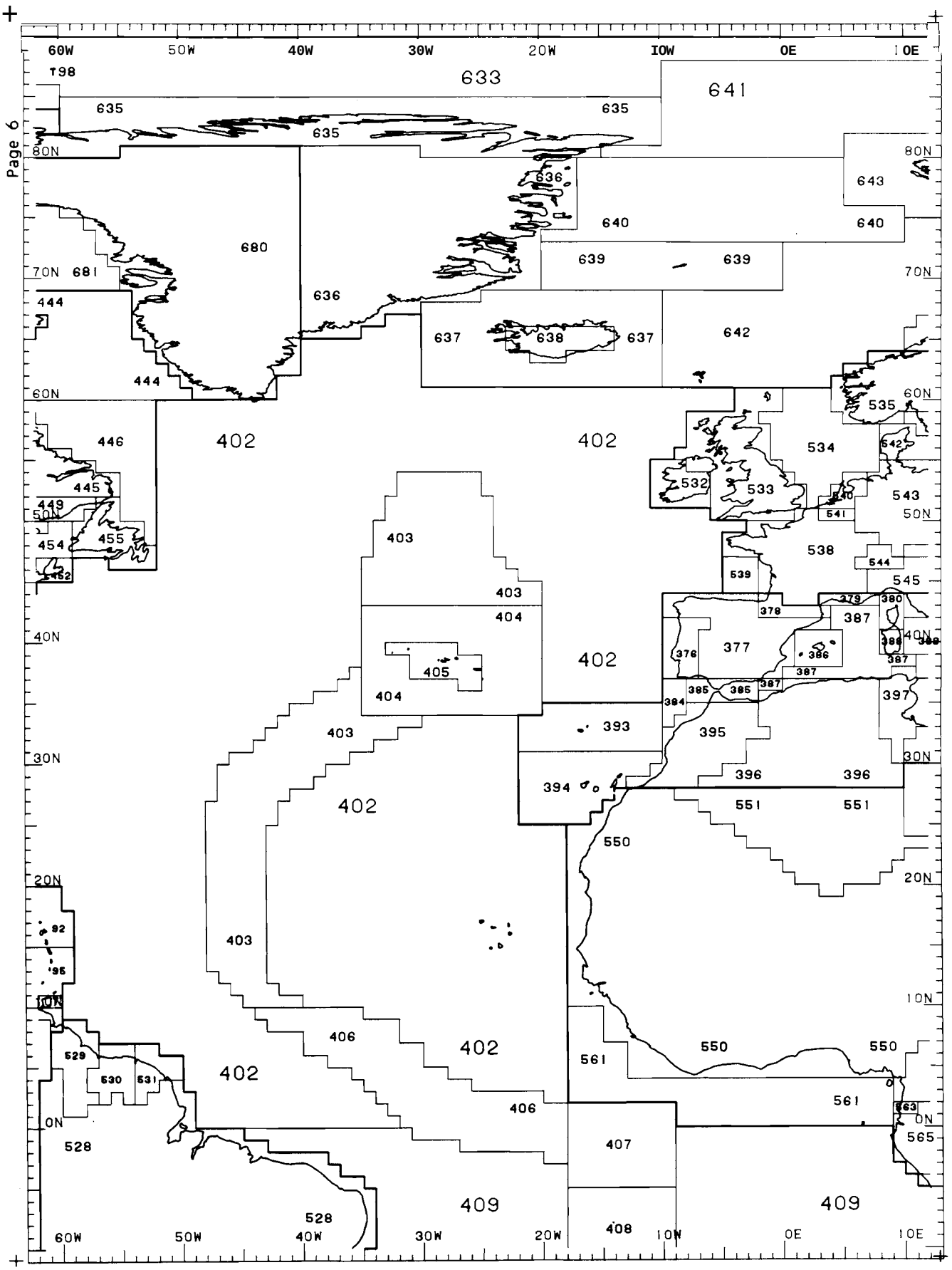
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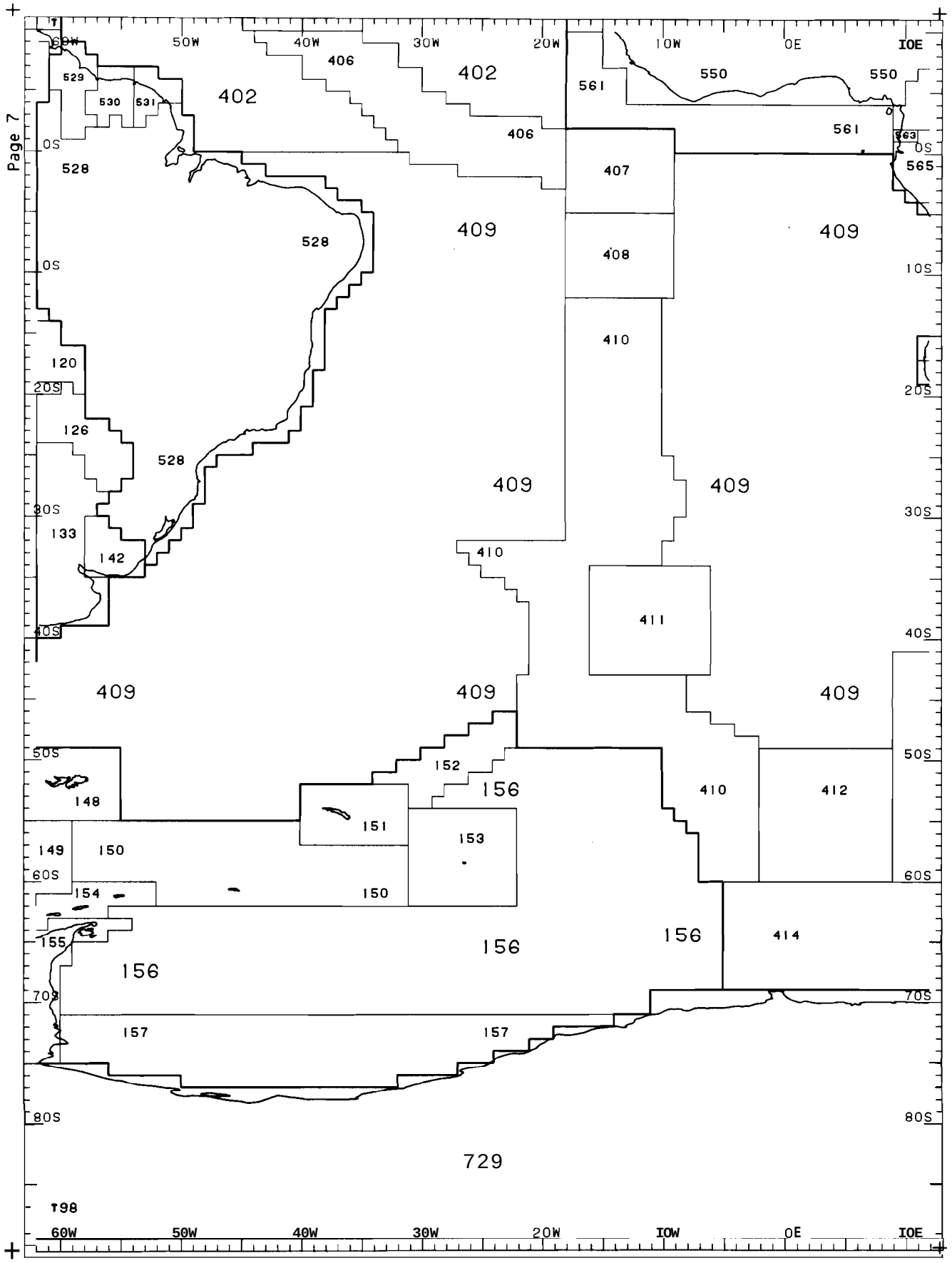
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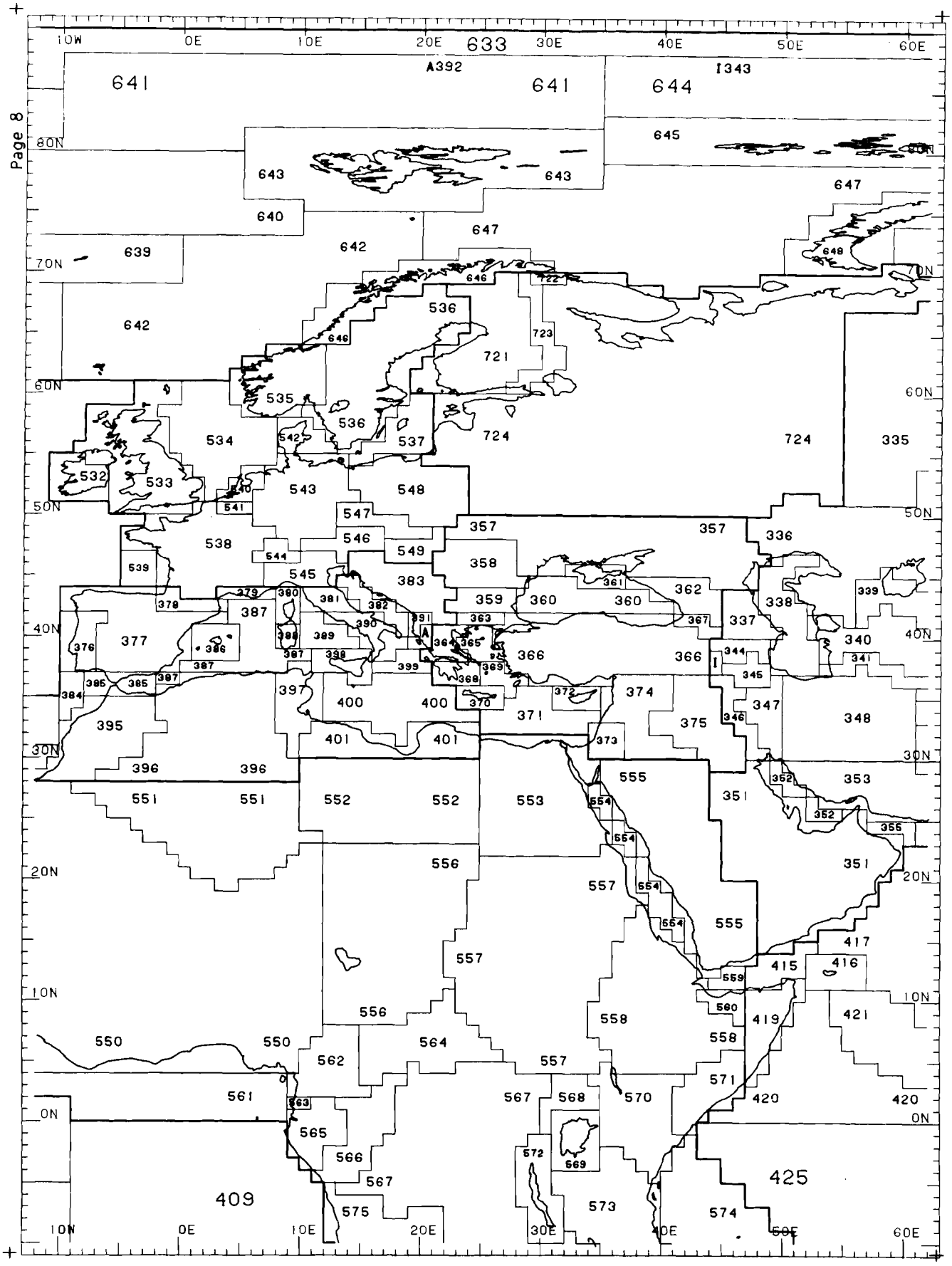
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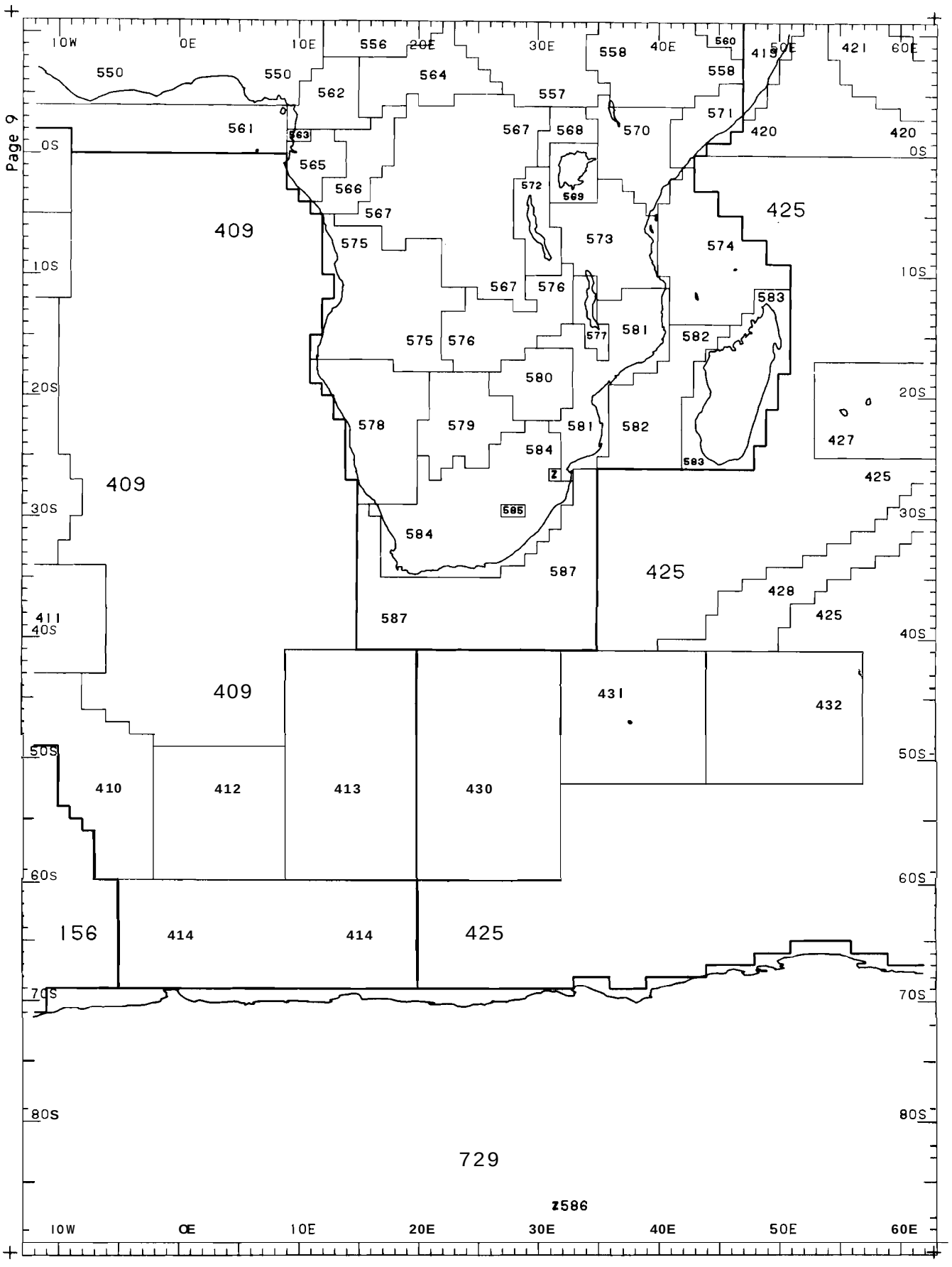
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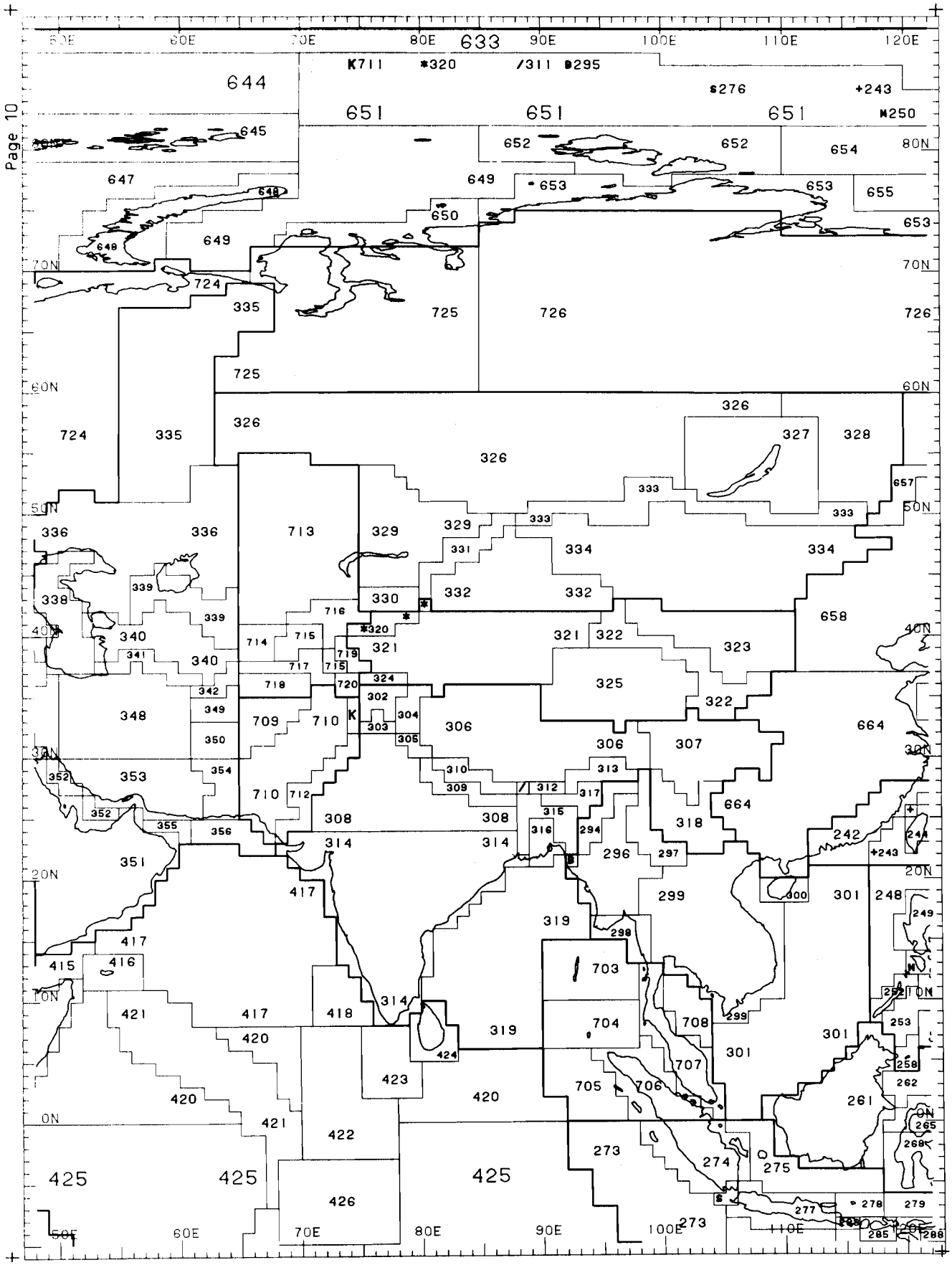
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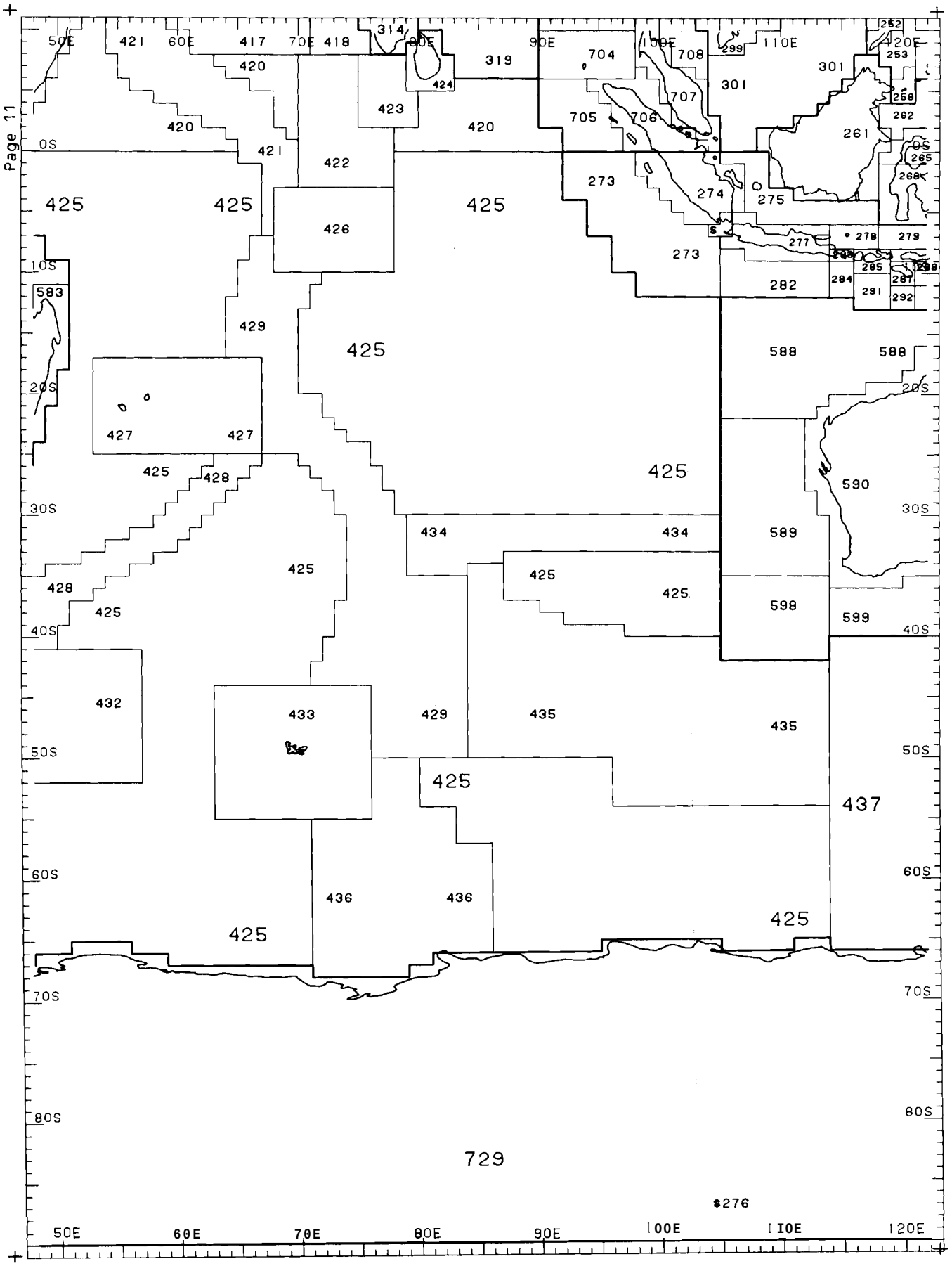
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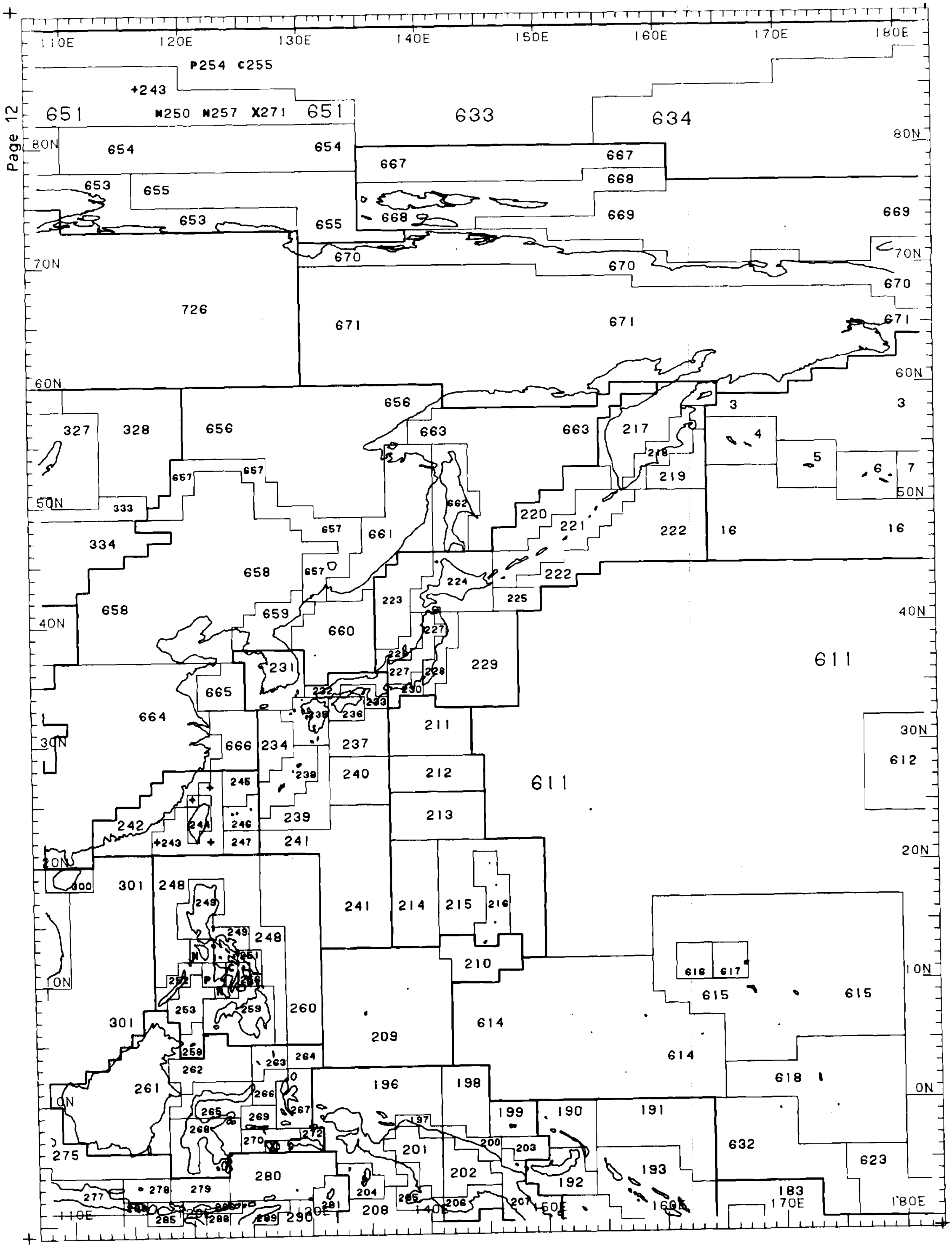
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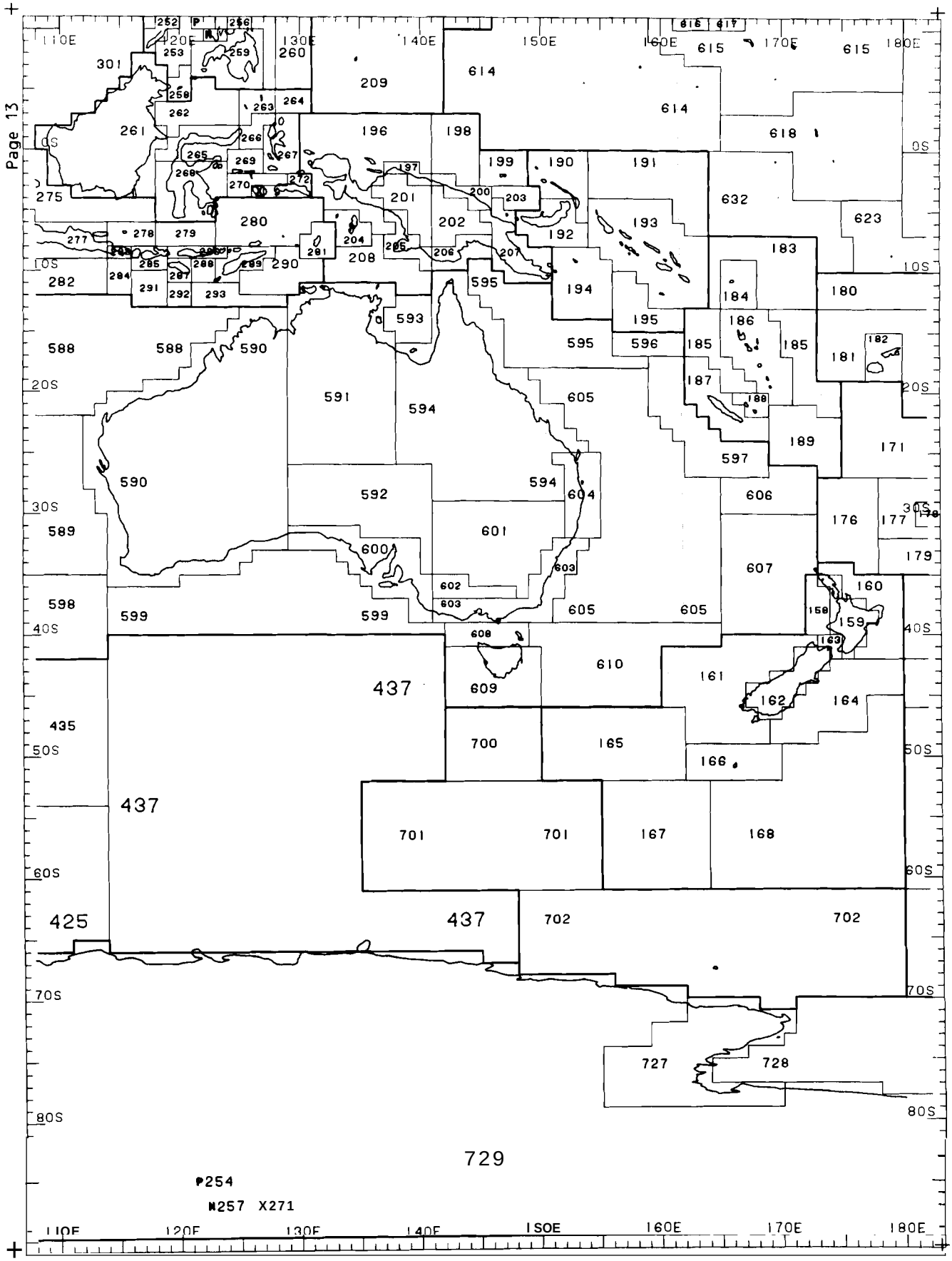
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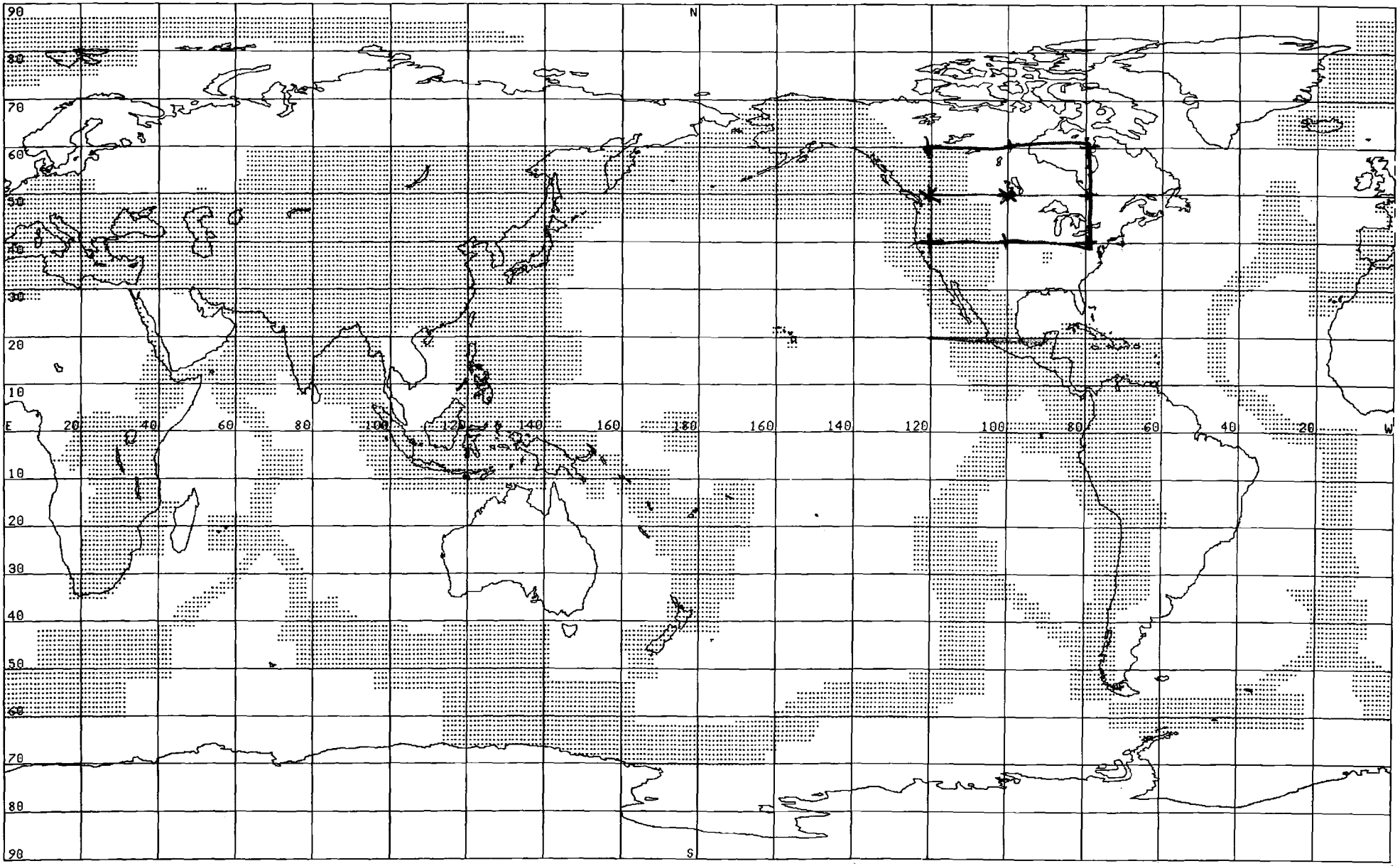
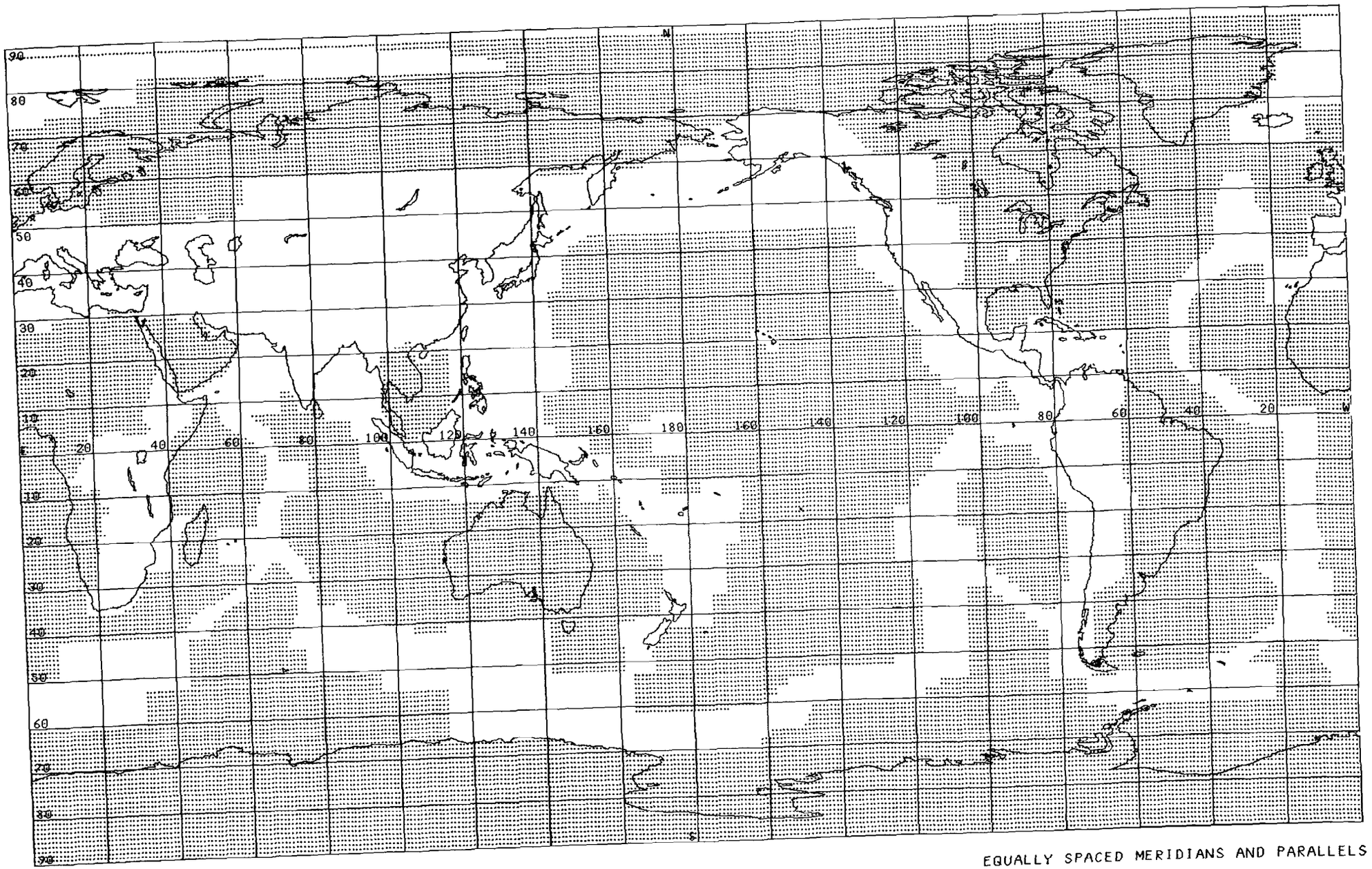


CYLINDRICAL PROJECTION

EQUALLY SPACED MERIDIANS AND PARALLELS

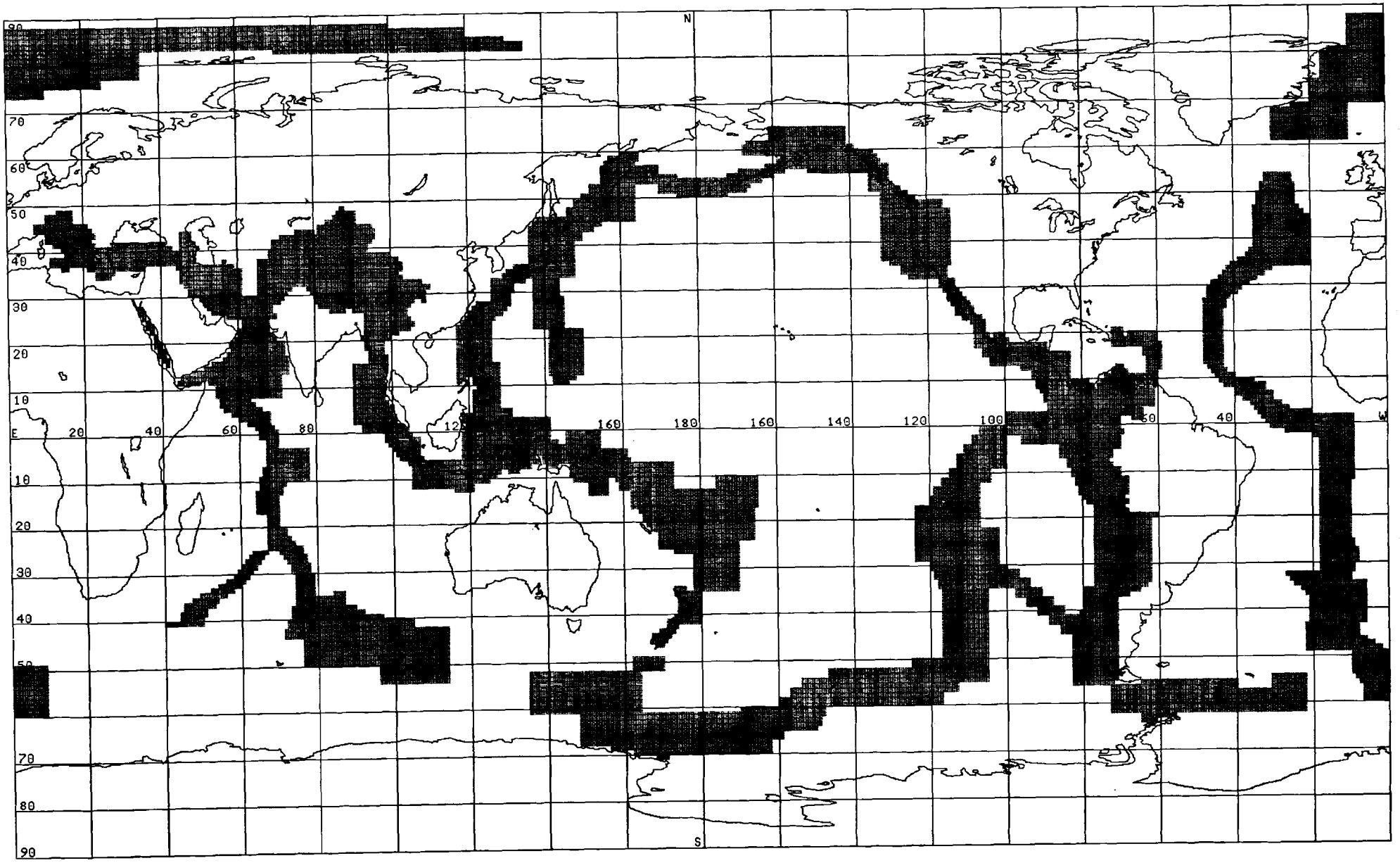
Map 14



EQUALLY SPACED MERIDIANS AND PARALLELS

CYLINDRICAL PROJECTION

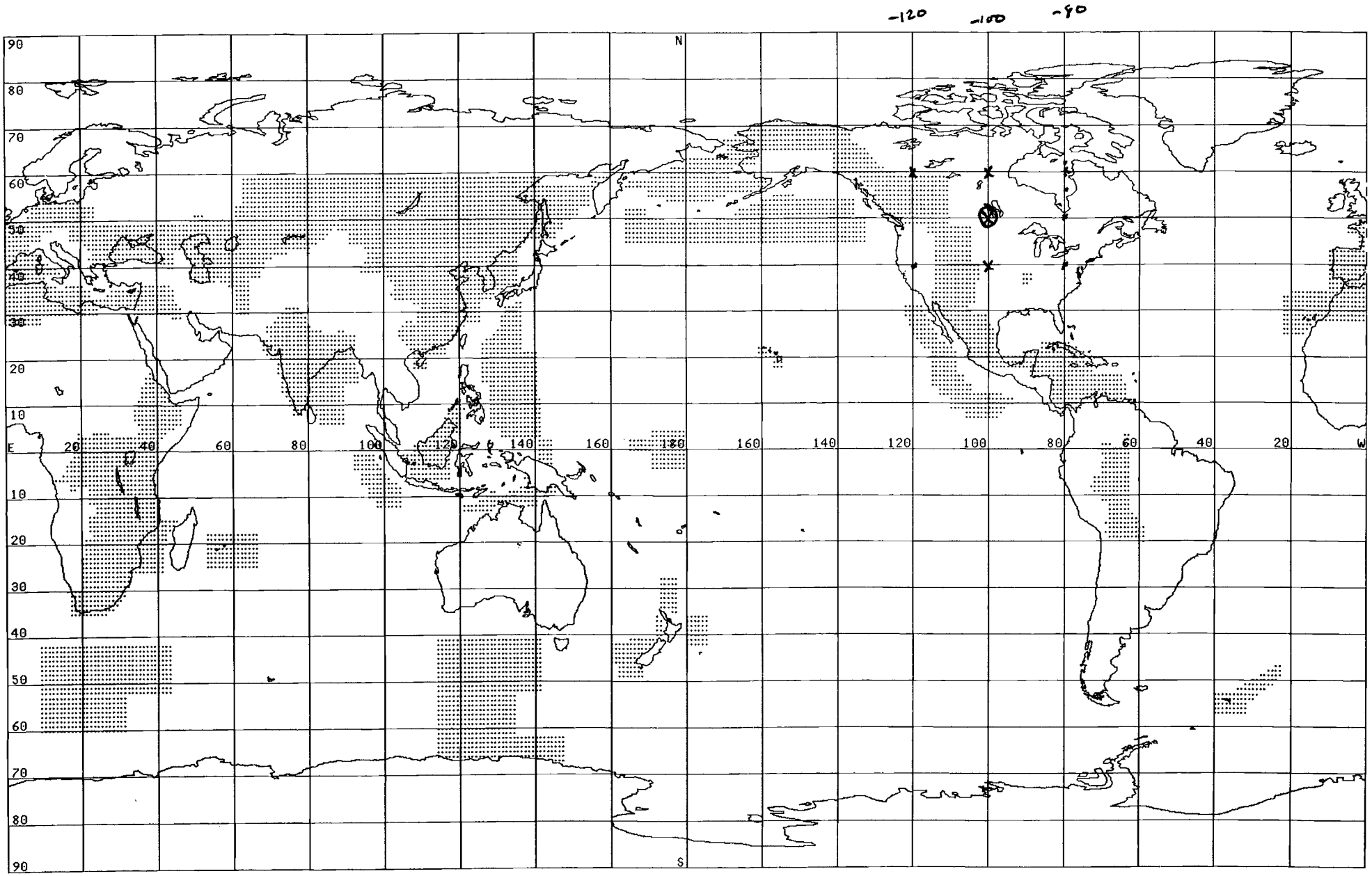
Map 15



CYLINDRICAL PROJECTION

EQUALLY SPACED MERIDIANS AND PARALLELS

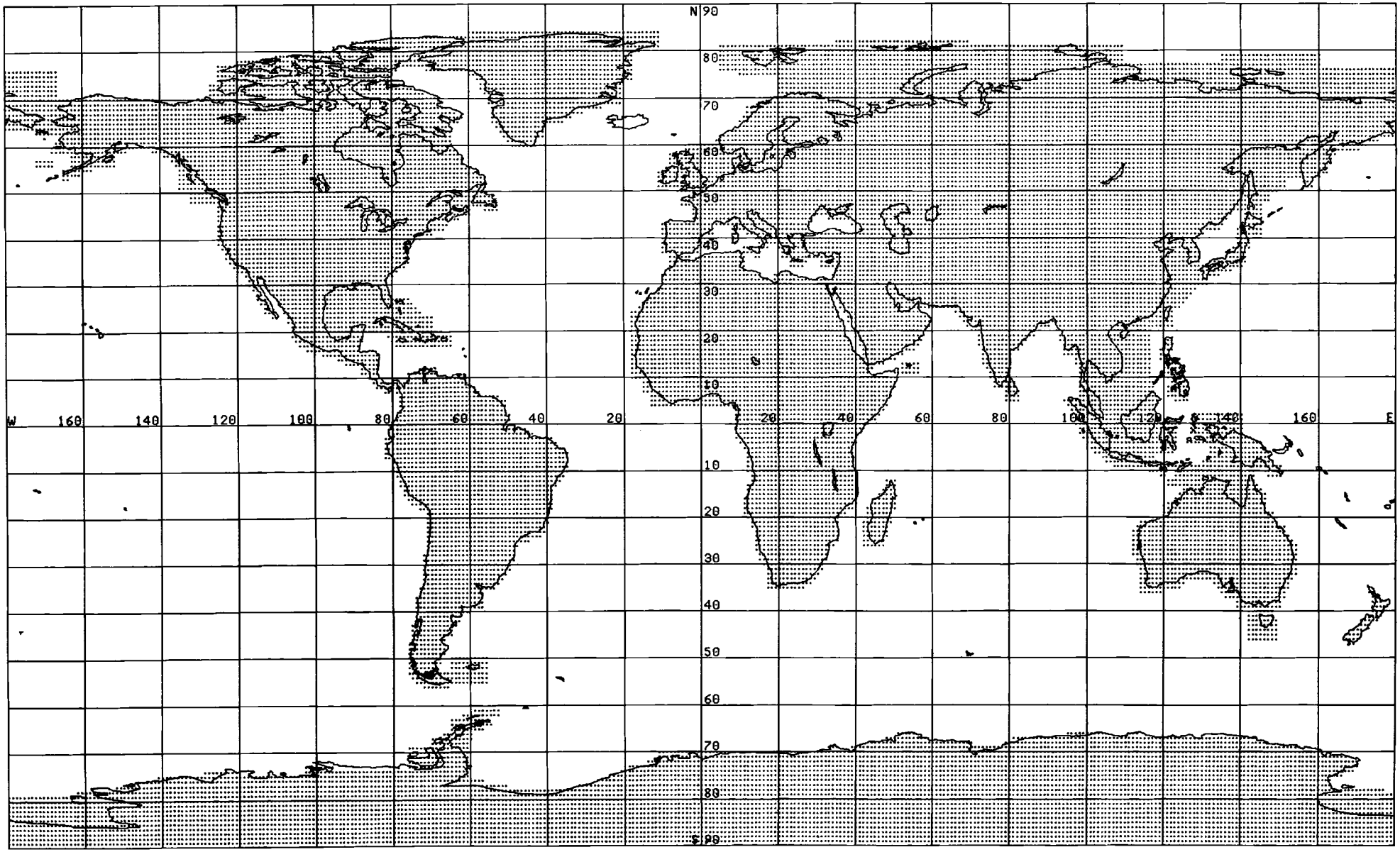
Map 16



CYLINDRICAL PROJECTION

EQUALLY SPACED MERIDIANS AND PARALLELS

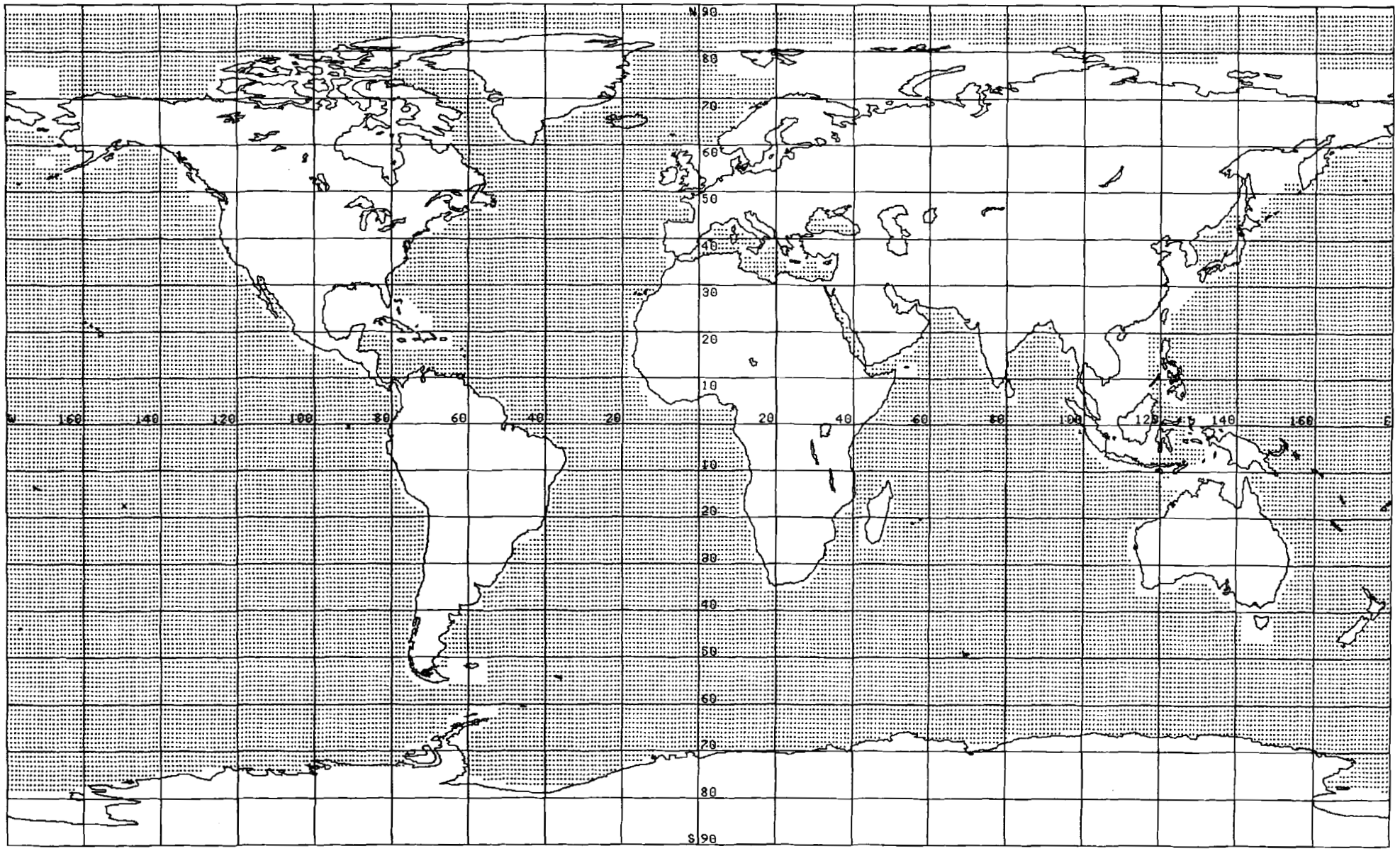
Map 17



CYLINDRICAL PROJECTION

EQUALLY SPACED MERIDIANS AND PARALLELS

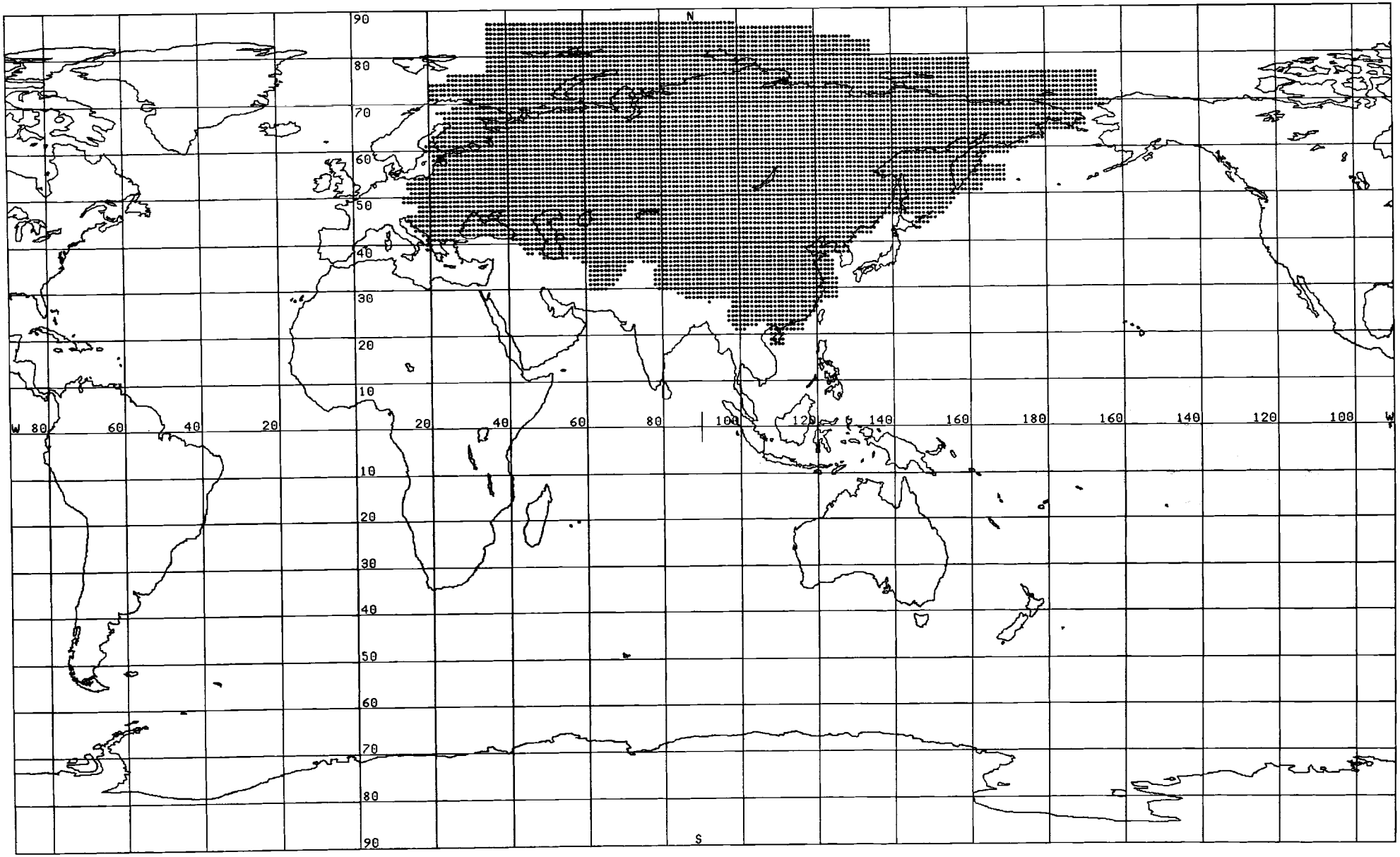
Map 18



CYLINDRICAL PROJECTION

Map 19

EQUALLY SPACED MERIDIANS AND PARALLELS



CYLINDRICAL PROJECTION

Map 20

EQUALLY SPACED MERIDIANS AND PARALLELS

TABLE 1

Seismic Region Names with Geographical Region Identification

1		**S**	**O**	**ALASKA - ALEUTIAN ARC**
1		S	C	Central Alaska
2		S	C	Southern Alaska
3			O	Bering Sea
4	*	S	O	Komandorsky Islands region
5		S	O	Near Islands, Aleutian Islands
6		S	O	Rat Islands, Aleutian Islands
7		S	O	Andreanof Islands, Aleutian Islands
8			C	Pribilof Islands
9		S	O	Fox Islands, Aleutian Islands
10		S	C	Unimak Island region
11			C	Bristol Bay
12		S	C	Alaska Peninsula
13		S	C	Kodiak Island region
14		S	C	Kenai Peninsula, Alaska
15		S	O	Gulf of Alaska
16			O	Aleutian Islands region
17			O	South of Alaska
2		**S**	**C**	**EASTERN ALASKA TO VANCOUVER ISLAND**
18			C	Southern Yukon Territory, Canada
19		S	C	Southeastern Alaska
20		S	O	Off coast of southeastern Alaska
21			O	West of Vancouver Island
22		S	C	Queen Charlotte Islands region
23			C	British Columbia
24			C	Alberta Province, Canada
25		S	C	Vancouver Island region
26		S	O	Off coast of Washington
27		S	C	Near coast of Washington
28		S	C	Washington-Oregon border region
29		S	C	Washington State
3		**S**	**C**	**CALIFORNIA - NEVADA REGION**
30		S	O	Off coast of Oregon
31		S	C	Near coast of Oregon
32		S	C	Oregon
33		S	C	Western Idaho
34		S	O	Off coast of northern California
35		S	C	Near coast of northern California
36		S	C	Northern California
37		S	C	Nevada
38		S	O	Off coast of California
39		S	C	Central California
40		S	C	California-Nevada border region
41		S	C	Southern Nevada
42			C	Western Arizona
43		S	C	Southern California
44			C	California-Arizona border region
45		S	C	California-Mexico border region
46			C	Western Arizona-Mexico border region

4	S O	BAJA CALIFORNIA AND GULF OF CALIFORNIA
47	O	Off west coast of Baja California
48	S C	Baja California
49	S O	Gulf of California
50	C	Northwestern Mexico
51	S O	Off coast of central Mexico
52	S C	Near coast of central Mexico
5	S O	MEXICO - GUATEMALA AREA
53	O	Revilla Gigedo Islands region
54	S O	Off coast of Jalisco, Mexico
55	S C	Near coast of Jalisco, Mexico
56	S C	Near coast of Michoacan, Mexico
57	S C	Michoacan, Mexico
58	S C	Near coast of Guerrero, Mexico
59	S C	Guerrero, Mexico
60	S C	Oaxaca, Mexico
61	S C	Chiapas, Mexico
62	S C	Mexico-Guatemala border region
63	O	Off coast of Mexico
64	S O	Off coast of Michoacan, Mexico
65	S O	Off coast of Guerrero, Mexico
66	S C	Near coast of Oaxaca, Mexico
67	S O	Off coast of Oaxaca, Mexico
68	S O	Off coast of Chiapas, Mexico
69	S C	Near coast of Chiapas, Mexico
70	S C	Guatemala
71	S C	Near coast of Guatemala
6	S C	CENTRAL AMERICA
72	S C	Honduras
73	S C	El Salvador
74	S C	Near coast of Nicaragua
75	S C	Nicaragua
76	S O	Off coast of Central America
77	S O	Off coast of Costa Rica
78	S C	Costa Rica
79	O	North of Panama
80	S C	Panama-Costa Rica border region
81	S C	Panama
82	S C	Panama-Colombia border region
83	S O	South of Panama
7	S C	CARIBBEAN LOOP
84	C	Yucatan Peninsula
85	C	Cuba region
86	C	Jamaica region
87	C	Haiti region
88	S C	Dominican Republic region
89	S C	Mona Passage
90	S C	Puerto Rico region
91	S C	Virgin Islands
92	S O	Leeward Islands
93	C	Belize
94	O	Caribbean Sea
95	S O	Windward Islands
96	C	Near north coast of Colombia

97	S	C	Near coast of Venezuela
98	S	C	Trinidad
99	S	C	Northern Colombia
100	S	C	Lake Maracaibo
101	S	C	Venezuela
8	S	C	ANDEAN SOUTH AMERICA
102	S	C	Near west coast of Colombia
103	S	C	Colombia
104	S	O	Off coast of Ecuador
105	S	C	Near coast of Ecuador
106	S	C	Colombia-Ecuador border region
107	S	C	Ecuador
108	S	O	Off coast of northern Peru
109	S	C	Near coast of northern Peru
110	S	C	Peru-Ecuador border region
111	S	C	Northern Peru
112	S	C	Peru-Brazil border region
113		C	Western Brazil
114	S	O	Off coast of Peru
115	S	C	Near coast of Peru
116	S	C	Peru
117	S	C	Southern Peru
118	S	C	Peru-Bolivia border region
119		C	Northern Bolivia
120		C	Bolivia
121	S	O	Off coast of northern Chile
122	S	C	Near coast of northern Chile
123	S	C	Northern Chile
124	S	C	Chile-Bolivia border region
125	S	C	Southern Bolivia
126	A	C	Paraguay
127	S	C	Chile-Argentina border region
128	S	C	Jujuy Province, Argentina
129	S	C	Salta Province, Argentina
130	S	C	Catamarca Province, Argentina
131	S	C	Tucuman Province, Argentina
132	S	C	Santiago del Estero Province, Argentina
133	A	C	Northeastern Argentina
134	S	O	Off coast of central Chile
135	S	C	Near coast of central Chile
136	S	C	Central Chile
137	S	C	San Juan Province, Argentina
138	S	C	La Rioja Province, Argentina
139	S	C	Mendoza Province, Argentina
140	S	C	San Luis Province, Argentina
141	S	C	Cordoba Province, Argentina
142	A	C	Uruguay
9		C	EXTREME SOUTH AMERICA
143	S	O	Off coast of southern Chile
144	S	C	Near coast of southern Chile
145	S	C	Southern Chile-Argentina border region
146	A	C	Argentina

10	O	SOUTHERN ANTILLES
147	A C	Tierra del Fuego
148	A C	Falkland Islands region
149	S O	Drake Passage
150	S O	Scotia Sea
151	O	South Georgia Island region
152	O	South Georgia Rise
153	S O	South Sandwich Islands region
154	S C	South Shetland Islands
155	A C	Palmer Peninsula
156	A O	Southwestern Atlantic Ocean
157	A O	Weddell Sea
11	O	NEW ZEALAND REGION
158	O	Off west coast of North Island, N. Z.
159	S C	North Island, New Zealand
160	S O	Off east coast of North Island, N. Z.
161	O	Off west coast of South Island, N. Z.
162	S C	South Island, New Zealand
163	S C	Cook Strait, New Zealand
164	A O	Off east coast of South Island, N. Z.
165	A O	North of Macquarie Island
166	S O	Auckland Islands region
167	S O	Macquarie Island region
168	A O	South of New Zealand
12	S O	KERMADEC - TONGA - SAMOA AREA
169	S O	Samoa Islands region
170	S O	Samoa Islands
171	S O	South of Fiji Islands
172		REGION NOT IN USE
173	S O	Tonga Islands
174	S O	Tonga Islands region
175	S O	South of Tonga Islands
176	O	North of New Zealand
177	S O	Kermadec Islands region
178	S O	Kermadec Islands
179	S O	South of Kermadec Islands
13	S O	FIJI ISLANDS AREA
180	A O	North of Fiji Islands
181	S O	Fiji Islands region
182	S O	Fiji Islands
14	S O	VANUATU (NEW HEBRIDES) ISLANDS
183	S O	Santa Cruz Islands region
184	S O	Santa Cruz Islands
185	S O	Vanuatu (New Hebrides) Islands region
186	S O	Vanuatu (New Hebrides) Islands
187	A O	New Caledonia
188	S O	Loyalty Islands
189	S O	Loyalty Islands region

15	S	O	BISMARCK AND SOLOMON ISLANDS
190	S	O	New Ireland region
191	A	O	North of Solomon Islands
192	S	O	New Britain region
193	S	O	Solomon Islands
194	S	O	D-Entrecasteaux Islands region
195	A	O	Solomon Islands region
16	S	C	NEW GUINEA
196	S	C	West Irian region
197	S	C	Near north coast of West Irian
198		O	Papua New Guinea region
199	S	O	Admiralty Islands region
200	S	C	Near north coast of Papua New Guinea
201	S	C	West Irian
202	S	C	Papua New Guinea
203	S	O	Bismarck Sea
204	S	C	Aroe Islands region
205		C	Near south coast of West Irian
206		C	Near south coast of Papua New Guinea
207	S	C	East Papua New Guinea region
208		C	Arafura Sea
17	S	O	CAROLINE ISLANDS TO GUAM
209		O	Western Caroline Islands
210	S	O	South of Mariana Islands
18	S	O	GUAM TO JAPAN
211	S	O	South of Honshu, Japan
212	S	O	Bonin Islands region
213	S	O	Volcano Islands region
214		O	West of Mariana Islands
215	S	O	Mariana Islands region
216	S	O	Mariana Islands
19	S	O	JAPAN - KURILES - KAMCHATKA
217 *	S	C	Kamchatka
218 *	S	C	Near east coast of Kamchatka
219 *	S	O	Off east coast of Kamchatka
220 *	S	O	Northwest of Kurile Islands
221 *	S	O	Kurile Islands
222	S	O	Kurile Islands region
223	S	O	Eastern Sea of Japan
224	S	C	Hokkaido, Japan, region
225	S	O	Off coast of Hokkaido, Japan
226	S	C	Near west coast of Honshu, Japan
227	S	C	Honshu, Japan
228	S	C	Near east coast of Honshu, Japan
229	S	O	Off east coast of Honshu, Japan
230	S	C	Near south coast of Honshu, Japan

20	S	O	SOUTHWESTERN JAPAN AND RYUKYU ISLANDS
231		C	South Korea
232	S	C	Southern Honshu, Japan
233	S	C	Near south coast of southern Honshu
234	S	C	East China Sea
235	S	C	Kyushu, Japan
236	S	C	Shikoku, Japan
237		O	Southeast of Shikoku, Japan
238	S	O	Ryukyu Islands
239		O	Ryukyu Islands region
240		O	East of Ryukyu Islands
241		O	Philippine Sea
21	S	C	TAIWAN
242 *		C	Near southeastern coast of China
243	S	C	Taiwan region
244	S	C	Taiwan
245	S	C	Northeast of Taiwan
246	S	O	Southwestern Ryukyu Islands
247	S	O	Southeast of Taiwan
22	S	O	PHILIPPINES
248	S	O	Philippine Islands region
249	S	C	Luzon, Philippine Islands
250	S	C	Mindoro, Philippine Islands
251	S	C	Samar, Philippine Islands
252		C	Palawan, Philippine Islands
253		O	Sulu Sea
254	S	C	Panay, Philippine Islands
255	S	C	Cebu, Philippine Islands
256	S	C	Leyte, Philippine Islands
257	S	C	Negros, Philippine Islands
258		O	Sangihe Islands
259	S	C	Mindanao, Philippine Islands
260		O	East of Philippine Islands
23	S	C	KALIMANTAN - SULAWESI
261		C	Kalimantan (Borneo)
262	S	O	Celebes Sea
263	S	O	Talaud Islands
264	S	O	North of Halmahera
265	S	C	Minahassa Peninsula
266	S	O	Molucca Passage
267	S	C	Halmahera
268	S	C	Sulawesi (Celebes)
269	S	O	Molucca Sea
270	S	O	Ceram Sea
271	S	C	Buru
272	S	C	Seram
24	S	O	SUNDA ARC
273		O	Southwest of Sumatera
274	S	C	Southern Sumatera
275		C	Java Sea
276	S	C	Sunda Strait

277		S	C	Java
278		S	C	Bali Sea
279		S	O	Flores Sea
280		S	O	Banda Sea
281		S	C	Tanimbar Islands region
282		S	O	South of Java
283		S	C	Bali Island region
284		S	O	South of Bali Island
285		S	C	Sumbawa Island region
286		S	C	Flores Island region
287		S	C	Sumba Island region
288		S	O	Savu Sea
289		S	C	Timor
290			C	Timor Sea
291		S	O	South of Sumbawa Island
292		S	O	South of Sumba Island
293			C	South of Timor
25		S	C	BURMA AND SOUTHEAST ASIA
294		S	C	Burma-India border region
295			C	Burma-Bangladesh border region
296		S	C	Burma
297	*	S	C	Burma-China border region
298		S	C	South Burma
299		A	C	Southeast Asia
300	*		C	Hainan Island
301		A	C	South China Sea
26	*	S	C	INDIA - TIBET - SICHUAN - YUNNAN
302		S	C	Eastern Kashmir
303		S	C	Kashmir-India border region
304	*	S	C	Kashmir-Tibet border region
305	*	S	C	Tibet-India border region
306	*	S	C	Tibet
307	*	S	C	Sichuan Province, China
308			C	Northern India
309		S	C	Nepal-India border region
310		S	C	Nepal
311		S	C	Sikkim
312		S	C	Bhutan
313	*	S	C	India-China border region
314			C	India
315			C	India-Bangladesh border region
316			C	Bangladesh
317		S	C	Eastern India
318	*	S	C	Yunnan Province, China
319			O	Bay of Bengal
27	*	S	C	SOUTHERN XINJIANG TO GANSU
320	*	S	C	Kirghiz-Xinjiang border region
321	*	S	C	Southern Xinjiang Province, China
322	*		C	Gansu Province, China
323	*		C	Northern China
324	*	S	C	Kashmir-Xinjiang border region
325	*	S	C	Qinghai Province, China

28	*		C	ALMA-ATA TO LAKE BAIKAL
326	*		C	Central USSR
327	*		C	Lake Baykal region
328	*		C	East of Lake Baykal
329	*		C	Eastern Kazakh SSR
330	*	S	C	Alma-Ata region
331	*		C	Kazakh-Xinjiang border region
332	*	S	C	Northern Xinjiang Province, China
333	*		C	USSR-Mongolia border region
334	*		C	Mongolia
29	*		C	WESTERN ASIA
335	*	A	C	Ural Mountains region
336	*		C	Western Kazakh SSR
337	*	S	C	Eastern Caucasus
338	*		C	Caspian Sea
339	*		C	Uzbek SSR
340	*		C	Turkmen SSR
341	*		C	Iran-USSR border region
342	*		C	Turkmen-Afghanistan border region
343		S	C	Turkey-Iran border region
344	*	S	C	Northwestern Iran-USSR border region
345		S	C	Northwestern Iran
346		S	C	Iran-Iraq border region
347		S	C	Western Iran
348		S	C	Iran
349	*		C	Northwestern Afghanistan
350	*		C	Southwestern Afghanistan
351		A	C	Eastern Arabian Peninsula
352		A	C	Persian Gulf
353		S	C	Southern Iran
354		S	C	Western Pakistan
355		A	O	Gulf of Oman
356		S	O	Off coast of Pakistan
30	*		C	MIDDLE EAST - CRIMEA - BALKANS
357	*		C	Southwestern USSR
358	*		C	Romania
359	*		C	Bulgaria
360	*		O	Black Sea
361	*		C	Crimea region
362	*		C	Western Caucasus
363	*		C	Greece-Bulgaria border region
364		S	C	Greece
365		S	C	Aegean Sea
366		S	C	Turkey
367	*		C	Turkey-USSR border region
368		S	C	Southern Greece
369		S	C	Dodecanese Islands
370		S	C	Crete
371			O	Eastern Mediterranean Sea
372			C	Cyprus
373			C	Dead Sea region
374			C	Jordan - Syria region
375			C	Iraq

31			C	WESTERN MEDITERRANEAN AREA
376			C	Portugal
377			C	Spain
378			C	Pyrenees
379			C	Near south coast of France
380			C	Corsica
381		S	C	Central Italy
382		S	C	Adriatic Sea
383	*	S	C	Yugoslavia
384			O	West of Gibraltar
385			C	Straits of Gibraltar
386			C	Balearic Islands
387			O	Western Mediterranean Sea
388			C	Sardinia
389			O	Tyrrhenian Sea
390		S	C	Southern Italy
391	*	S	C	Albania
392	*	S	C	Greece-Albania border region
393			O	Madeira Islands region
394			O	Canary Islands region
395			C	Morocco
396			C	Algeria
397			C	Tunisia
398		S	C	Sicily
399		S	O	Ionian Sea
400			O	Mediterranean Sea
401			C	Near coast of Libya
32			O	ATLANTIC OCEAN
402		A	O	North Atlantic Ocean
403		S	O	North Atlantic Ridge
404		S	O	Azores Islands region
405		S	O	Azores Islands
406		S	O	Central Mid-Atlantic Ridge
407		S	O	North of Ascension Island
408		S	O	Ascension Island region
409		A	O	South Atlantic Ocean
410		S	O	South Atlantic Ridge
411		S	O	Tristan da Cunha region
412		S	O	Bouvet Island region
413			O	Southwest of Africa
414		A	O	Southeastern Atlantic Ocean
33			O	INDIAN OCEAN
415		S	O	Eastern Gulf of Aden
416		S	C	Socotra region
417		S	O	Arabian Sea
418		A	O	Laccadive Islands region
419		A	C	Northeastern Somali Republic
420		A	O	North Indian Ocean
421		S	O	Carlsberg Ridge
422		A	O	Maldive Islands region
423		A	O	Laccadive Sea
424		A	C	Sri Lanka (Ceylon)
425		A	O	South Indian Ocean
426		S	O	Chagos Archipelago region
427			O	Mascarene Islands region
428		S	O	Atlantic-Indian Rise
429		S	O	Mid-Indian Rise

430		O	South of Africa
431		O	Prince Edward Islands region
432	A	O	Crozet Islands region
433	A	O	Kerguelen Islands region
434	A	O	Amsterdam-Naturaliste Ridge
435	S	O	Southeast Indian Rise
436	A	O	Kerguelen-Gaussberg Rise
437		O	South of Australia
34	A	C	EASTERN NORTH AMERICA
438	A	C	Saskatchewan Province, Canada
439	A	C	Manitoba Province, Canada
440	A	C	Hudson Bay
441	A	C	Ontario Province, Canada
442	A	C	Hudson Strait region
443	A	C	Northern Quebec Province, Canada
444	A	O	Davis Strait
445	A	C	Labrador
446	A	O	East of Labrador
447	A	C	Southern Quebec Province, Canada
448	A	C	Gaspe Peninsula, Canada
449	A	C	Eastern Quebec Province, Canada
450	A	C	Anticosti Island, Canada
451	A	C	New Brunswick
452	A	C	Nova Scotia
453	A	C	Prince Edward Island, Canada
454	A	C	Gulf of St. Lawrence, Canada
455	A	C	Newfoundland
456		C	Montana
457		C	Eastern Idaho
458		C	Hebgen Lake region
459		C	Yellowstone National Park, Wyoming
460		C	Wyoming
461	A	C	North Dakota
462	A	C	South Dakota
463	A	C	Nebraska
464	A	C	Minnesota
465	A	C	Iowa
466	A	C	Wisconsin
467	A	C	Illinois
468	A	C	Michigan
469	A	C	Indiana
470	A	C	Southern Ontario Province, Canada
471	A	C	Ohio
472	A	C	New York State
473	A	C	Pennsylvania
474	A	C	Northern New England
475	A	C	Maine
476	A	C	Southern New England
477	A	C	Gulf of Maine
478		C	Utah
479		C	Colorado
480	A	C	Kansas
481	A	C	Iowa-Missouri border region
482	A	C	Missouri-Kansas border region
483	A	C	Missouri
484	A	C	Missouri-Arkansas border region
485		C	Eastern Missouri
486		C	New Madrid, Missouri, region
487		C	Cape Girardeau, Missouri, region
488		C	Southern Illinois
489	A	C	Southern Indiana

490	A C	Kentucky
491	A C	West Virginia
492	A C	Virginia
493	A C	Chesapeake Bay region
494	A C	New Jersey
495	C	Eastern Arizona
496	C	New Mexico
497	A C	Texas Panhandle region
498	A C	West Texas
499	A C	Oklahoma
500	A C	Central Texas
501	A C	Arkansas-Oklahoma border region
502	A C	Arkansas
503	A C	Louisiana-Texas border region
504	A C	Louisiana
505	A C	Mississippi
506	A C	Tennessee
507	A C	Alabama
508	A C	Western Florida
509	A C	Georgia
510	A C	Florida-Georgia border region
511	A C	South Carolina
512	A C	North Carolina
513	A O	Off east coast of United States
514	A C	Florida Peninsula
515	A C	Bahama Islands
516	C	Eastern Arizona-Mexico border region
517	C	Mexico-New Mexico border region
518	C	Texas-Mexico border region
519	A C	Southern Texas
520	A C	Texas Gulf coast
521	C	Chihuahua, Mexico
522	C	Northern Mexico
523	C	Central Mexico
524	C	Jalisco, Mexico
525	C	Veracruz State, Mexico
526	A C	Gulf of Mexico
527	C	Gulf of Campeche
35	A C	EASTERN SOUTH AMERICA
528	A C	Brazil
529	A C	Guyana
530	A C	Suriname
531	A C	French Guiana
36	C	NORTHWESTERN EUROPE
532	A C	Eire
533	A C	United Kingdom
534	A C	North Sea
535	A C	Southern Norway
536	A C	Sweden
537	A C	Baltic Sea
538	C	France
539	A O	Bay of Biscay
540	A C	Netherlands
541	C	Belgium
542	A C	Denmark
543	C	Germany
544	C	Switzerland
545	S C	Northern Italy

546		S C	Austria
547	*	C	Czechoslovakia
548	*	C	Poland
549	*	C	Hungary
37		C	AFRICA
550		A C	Northwest Africa
551		A C	Southern Algeria
552		A C	Libya
553		A C	Arab Republic of Egypt
554		S O	Red Sea
555		A C	Western Arabian Peninsula
556		A C	Central Africa
557		A C	Sudan
558		C	Ethiopia
559		S O	Western Gulf of Aden
560		C	Northwestern Somali Republic
561		A O	Off south coast of northwest Africa
562		A C	Cameroon
563		A C	Equatorial Guinea
564		A C	Central African Republic
565		A C	Gabon
566		A C	Congo Republic
567		C	Zaire Republic
568		C	Uganda
569		C	Lake Victoria region
570		C	Kenya
571		A C	Southern Somali Republic
572		C	Lake Tanganyika region
573		C	Tanzania
574		A O	Northwest of Madagascar
575		A C	Angola
576		C	Zambia
577		C	Malawi
578		A C	Namibia
579		C	Botswana
580		C	Zimbabwe
581		C	Mozambique
582		O	Mozambique Channel
583		A C	Madagascar
584		C	Republic of South Africa
585		C	Lesotho
586		C	Swaziland
587		A O	Off coast of South Africa
38		A C	AUSTRALIA
588		A O	Northwest of Australia
589		A O	West of Australia
590		A C	Western Australia
591		A C	Northern Territory, Australia
592		A C	South Australia
593		A C	Gulf of Carpenteria
594		A C	Queen land, Australia
595		A O	Coral Sea
596		A O	South of Solomon Islands
597		A O	New Caledonia region
598		A O	Southwest of Australia
599		A O	Off south coast of Australia
600		A C	Near south coast of Australia
601		A C	New South Wales, Australia

602	A	C	Victoria, Australia
603	A	C	Near southeast coast of Australia
604	A	C	Near east coast of Australia
605	A	O	East of Australia
606	A	O	Norfolk Island region
607	A	O	Northwest of New Zealand
608	A	C	Bass Strait
609	A	C	Tasmania region
610	A	O	Southeast of Australia
39	A	O	PACIFIC BASIN
611	A	O	North Pacific Ocean
612	A	O	Hawaiian Islands region
613		O	Hawaiian Islands
614	A	O	Caroline Islands region
615	A	O	Marshal1 Islands region
616	A	O	Eniwetok Atoll region
617	A	O	Bikini Atoll region
618		O	Kiribati (Gilbert Islands) region
619	A	O	Johnston Island region
620	A	O	Line Islands region
621	A	O	Palmyra Island region
622	A	O	Christmas Island region
623	A	O	Tuvalu (Ellice Islands) region
624	A	O	Phoenix Islands region
625	A	O	Tokelau Islands region
626	A	O	Northern Cook Islands
627	A	O	Cook Islands region
628	A	O	Society Islands region
629	A	O	Tubuai Islands region
630	A	O	Marquesas Islands region
631	A	O	Tuamotu Archipelago region
632	A	O	South Pacific Ocean
40		O	ARCTIC ZONE
633	A	O	Lomonosov Ridge
634	A	O	Arctic Ocean
635	A	C	Near north coast of Greenland
636	A	C	Eastern Greenland
637	S	O	Iceland region
638	S	O	Iceland
639	S	O	Jan Mayen Island region
640	S	O	Greenland Sea
641	S	O	North of Svalbard
642	A	O	Norwegian Sea
643	S	C	Svalbard region
644 *	S	O	North of Franz Josef Land
645 *	A	C	Franz Josef Land
646	A	C	Northern Norway
647 *	A	C	Barents Sea
648 *	A	C	Novaya Zemlya
649 *	A	C	Kara Sea
650 *	A	C	Near coast of western Siberia
651 *	S	O	North of Severnaya Zemlya
652 *	A	C	Severnaya Zemlya
653 *	A	C	Near coast of central Siberia
654 *	A	O	East of Severnaya Zemlya
655 *	A	C	Laptev Sea

41	*		C	EASTERN ASIA
656	*		C	Eastern USSR
657	*		C	Eastern USSR-N.E. China border region
658	*		C	Northeastern China
659	*		C	North Korea
660			O	Sea of Japan
661	*		C	Near east coast of eastern USSR
662	*		C	Sakhalin Island
663	*		C	Sea of Okhotsk
664	*		C	Eastern China
665	*		C	Yellow Sea
666	*		C	Off coast of eastern China
42		A	C	N.E. ASIA, NORTHERN ALASKA TO GREENLAND
667	*	A	C	North of New Siberian Islands
668	*	A	C	New Siberian Islands
669	*	A	C	East Siberian Sea
670	*	A	C	Near north coast of eastern Siberia
671	*	A	C	Eastern Siberia
672	*	A	C	Chukchi Sea
673			C	Bering Strait
674			C	St. Lawrence Island region
675		A	O	Beaufort Sea
676			C	Alaska
677			C	Northern Yukon Territory, Canada
678		A	C	Queen Elizabeth Islands
679		A	C	Northwest Territories, Canada
680		A	C	Western Greenland
681		A	O	Baffin Bay
682		A	C	Baffin Island region
43			O	SOUTHEASTERN AND ANTARCTIC PACIFIC
683		A	O	Southeast central Pacific Ocean
684		S	O	Easter Island Cordillera
685		S	O	Easter Island region
686		S	O	West Chile Rise
687		A	O	Juan Fernandez Islands region
688			O	East of North Island, New Zealand
689		A	O	Chatham Islands region
690		A	O	South of Chatham Islands
691		S	O	South Pacific Cordillera
692		A	O	Southern Pacific Ocean
44			O	GALAPAGOS AREA
693		A	O	East central Pacific Ocean
694		S	O	Northern Easter Island Cordillera
695		S	O	West of Galapagos Islands
696		S	O	Galapagos Islands region
697		S	O	Galapagos Islands
698		A	O	Southwest of Galapagos Islands
699		A	O	Southeast of Galapagos Islands

45			O	**MACQUARIE LOOP**
700		A	O	South of Tasmania
701		S	O	West of Macquarie Island
702		S	O	Balleny Islands region
46		S	O	**ANDAMAN ISLANDS TO SUMATERA**
703		S	O	Andaman Islands region
704		S	O	Nicobar Islands region
705		S	O	Off west coast of northern Sumatera
706		S	C	Northern Sumatera
707		A	C	Malay Peninsula
708		A	C	Gulf of Siam
47	*	S	C	**BALUCHISTAN**
709	*	S	C	Afghanistan
710		S	C	Pakistan
711		S	C	Southwestern Kashmir
712			C	India-Pakistan border region
48	*	S	C	**HINDU KUSH AND PAMIR**
713	*		C	Central Kazakh SSR
714	*		C	Southeastern Uzbek SSR
715	*	S	C	Tajik SSR
716	*	S	C	Kirghiz SSR
717	*	S	C	Afghanistan-USSR border region
718	*	S	C	Hindu Kush region
719	*	S	C	Tajik-Xinjiang border region
720		S	C	Northwestern Kashmir
49	*	A	C	**NORTHERN EURASIA**
721	*	A	C	Finland
722	*	A	C	Norway-USSR border region
723	*	A	C	Finland-USSR border region
724	*	A	C	European USSR
725	*	A	C	Western Siberia
726	*	A	C	Central Siberia
50		A	C	**ANTARCTICA**
727		A	C	Victoria Land, Antarctica
728		A	O	Ross Sea
729		A	C	Antarctica

DOCUMENT CONTROL SHEET

Overall security classification of sheet .....UNCLASSIFIED.....

(As far as possible this sheet should contain only unclassified information. If it is necessary to enter classified information, the box concerned must be marked to indicate the classification eg (R), (C) or (S)).

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Abstract

This report contains a complete definition of the Flinn and Engdahl regionalisation of the earth as used by seismologists and known as the F-E Code. The information in the tables of regions is enhanced by three "classifiers' indicating political geography, seismicity or aseismicity, and oceanic or continental crust. The overlapping maps not only provide all the region numbers with latitude and longitude but also have coastlines. The "classifiers" are also illustrated by a further set of maps.

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