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Supporting Research

AgRISTARS CROPPING PRACTICES AND CROP CHARACTERISTICS BASED ON 1979 ESCS OBSERVATIONS

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AGRISTARS CROPPING PRACTICES AND CROP CHARACTERISTICS BASED ON 1979 ESCS OBSERVATIONS

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EARTH OBSERVATIONS DIVISION

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- Corn
- Cotton
- Soybean

Arkansas (A-9)
- Cotton
- Rice
- Soybean

California (A-16)
- Cotton
- Rice

Georgia (A-21)
- Corn
- Soybean

Illinois (A-26)
- Corn
- Soybean

Indiana (A-31)
- Corn
- Soybean

Iowa (A-36)
- Corn
- Soybean

Louisiana (A-41)
- Cotton
- Rice
- Soybean

Minnesota (A-48)
- Barley
- Corn
- Soybean
- Spring Wheat

Mississippi (A-57)
- Cotton
- Soybean

Missouri (A-62)
- Corn
- Soybean

Nebraska (A-67)
- Corn
- Sorghum
- Soybean

North Carolina (A-74)
- Corn
- Soybean

North Dakota (A-79)
- Barley
- Durum Wheat
- Spring Wheat

Ohio (A-86)
- Corn
- Soybean

Pennsylvania (A-91)
- Corn

South Carolina (A-94)
- Corn
- Soybean

Texas (A-99)
- Cotton
- Rice
- Sorghum
- Soybean

B. Seeding Rate and Row Width Histograms

Alabama (B-2)
- Corn
- Cotton
- Soybean

Arkansas (B-9)
- Cotton
- Rice
- Soybean

California (B-16)
- Cotton
- Rice

Georgia (B-21)
- Corn
- Soybean

Illinois (B-26)
- Corn
- Soybean

Indiana (B-31)
- Corn
- Soybean

Iowa (B-36)
- Corn
- Soybean

Louisiana (B-41)
- Cotton
- Rice
- Soybean

Minnesota (B-48)
- Barley
- Corn
- Soybean
- Spring Wheat

Mississippi (B-57)
- Cotton
- Soybean

Nebraska (B-67)
- Corn
- Sorghum
- Soybean

North Carolina (B-74)
- Corn
- Soybean

North Dakota (B-79)
- Barley
- Durum Wheat
- Spring Wheat

Ohio (B-86)
- Corn
- Soybean

Pennsylvania (B-91)
- Corn

South Carolina (B-94)
- Corn
- Soybean

Texas (B-99)
- Cotton
- Rice
- Sorghum
- Soybean

C. Plant Height Plots

Alabama (C-2)
- Corn
- Cotton
- Soybean

Arkansas (C-6)
- Cotton
- Rice
- Soybean

California (C-10)
- Cotton
- Rice

Georgia (C-13)
- Corn
- Soybean

Illinois (C-16)
- Corn
- Soybean

Indiana (C-19)
- Corn
- Soybean

Iowa (C-22)
- Corn
- Soybean

Louisiana (C-25)
- Cotton
- Rice
- Soybean

Minnesota (C-29)
- Barley
- Corn
- Soybean
- Spring Wheat

Mississippi (C-34)
- Corn
- Soybean

Missouri (C-37)
- Corn
- Soybean

Nebraska (C-40)
- Corn
- Sorghum
- Soybean

North Carolina (C-44)
- Barley
- Durum Wheat
- Spring Wheat

Ohio (C-51)
- Corn
- Soybean

Pennsylvania (C-54)
- Corn

South Carolina (C-56)
- Corn
- Soybean

Texas (C-59)
- Cotton
- Rice
- Sorghum
- Soybean

D. Percent Ground Cover Plots

Alabama (D-2)
- Corn
- Cotton
- Soybean

Arkansas (D-6)
- Cotton
- Rice
- Soybean

California (D-10)
- Cotton
- Rice

Georgia (D-13)
- Corn
- Soybean

Indiana (D-19)
- Corn
- Soybean

Iowa (D-22)
- Corn
- Soybean

Louisiana (D-25)
- Cotton
- Rice

Minnesota (D-29)
- Barley
- Corn
- Soybean
- Spring Wheat

Mississippi (D-34)
- Cotton
- Soybean

Missouri (D-37)
- Corn
- Soybean

Nebraska (D-40)
- Corn
- Sorghum
- Soybean

North Carolina (D-44)
- Corn
- Soybean

North Dakota (D-47)
- Barley
- Durum Wheat
- Spring Wheat

Ohio (D-51)
- Corn
- Soybean

Pennsylvania (D-54)
- Corn

South Carolina (D-56)
- Corn
- Soybean

Texas (D-59)
- Corn
- Rice
- Sorghum
- Soybean

E. Crop Growth Stage Plots

Alabama (E-2)
- Corn
- Cotton
- Soybean

Arkansas (E-6)
- Cotton
- Rice
- Soybean

California (E-10)
- Cotton
- Rice

Georgia (E-13)
- Corn
- Soybean

Illinois (E-16)
- Corn
- Soybean

Indiana (E-19)
- Corn
- Soybean

Iowa (E-22)
- Corn
- Soybean

Louisiana (E-25)
- Cotton
- Rice
- Soybean

Minnesota (E-29)
- Barley
- Corn
- Soybean
- Spring Wheat

Mississippi (E-34)
- Cotton
- Soybean

Nebraska (E-40)
- Corn
- Sorghum
- Soybean

North Carolina (E-44)
- Corn
- Soybean

North Dakota (E-47)
- Barley
- Durum Wheat
- Spring Wheat

Ohio (E-51)
- Corn
- Soybean

Pennsylvania (E-54)
- Corn

South Carolina (E-56)
- Corn
- Soybean

Texas (E-59)
- Cotton
- Rice
- Sorghum
- Soybean

F. Program Listing

1. INTRODUCTION

Analysis of research data, Bauer et al. (1979), collected at the Purdue Agronomy Farm and at the super sites have shown that crop reflectance (e.g. greeness) profile of crop canopies is significantly affected by the planting date, emergence date, biomass, percent soil cover, and maturity stage. An experiment at the Purdue Agronomy Farm using 81 soybean plots with three row spacings (15, 46, and 91 cm) showed that row width caused significant differences in both the red and near infrared reflectance until 100 percent ground cover was reached by the wider rows. In addition, it was also noted by Rice et al. (1980) that plant height affected the peak values of the reflectance greeness and that reflectance in the red and near infrared bands correlated with the percent ground cover.

Results of experiments performed by Bauer et al. (1978) on spring wheat at the Williston, North Dakota Agriculture Experiment Station during the summer of 1977 have shown that the planting date is the primary factor affecting spectral response from the early stages of plant development to the flowering stage of maturity. During the flowering to ripening stages, the soil moisture level becomes the primary factor influencing spectral response. Although planting date is the dominant influencing factor at the beginning of the growth cycle and soil moisture dominates at the end, small variations in spectral response during a particular growth stage can be attributed to percent soil cover, leaf area index, and biomass.

During the 1979 crop year, 160 segments had ground truth inventories and periodic observation data collected for the AgRISTARS project by ESCS[1]. These data were collected and recorded in four categories (cards): initial interview of the farm operator (A cards), periodic observations of the fields (B cards), final interview of the farm operator (C cards), and general comments (D cards). For this project, a subset of 143 segments in 18 states were examined to obtain an overview of farming practices and growth aspects of

[1]Economics, Statistics and Cooperative Service, U.S. Department of Agriculture.
[2]Enumerator's Manual, 1979 Ground Data Survey.

individual crops in specific states. Plots were made for planting date, emergence date, seeding rate, row width, plant height, ground cover, and growth stage. The main crops being studied were barley, corn, cotton, durum wheat, rice, sorghum, soybeans, and spring wheat. This information was compiled so that the AgRISTARS analyst can better understand different agronomic practices an a function of crop and state.

The planting date, emergence date, seeding rate, and row width information has been plotted in histograms and may be found in appendices A and B. Using these histograms it is possible for the analyst to develop a better understanding of the crop development cycles and their variability within a state. For example, soybean fields which have very narrow row widths (8 inches) will exhibit higher reflectance at the same cropstage than will more usual (32 inch) widths utilized in the corn belt (Figure A). The plant height, percent ground cover, and crop growth stage information are displayed as a function of the day of the year in the plots found in appendices C, D, and E. These plots may be used in the same manner as the histograms, and the crop growth stage plot may prove especially useful in conjunction with other information presented.

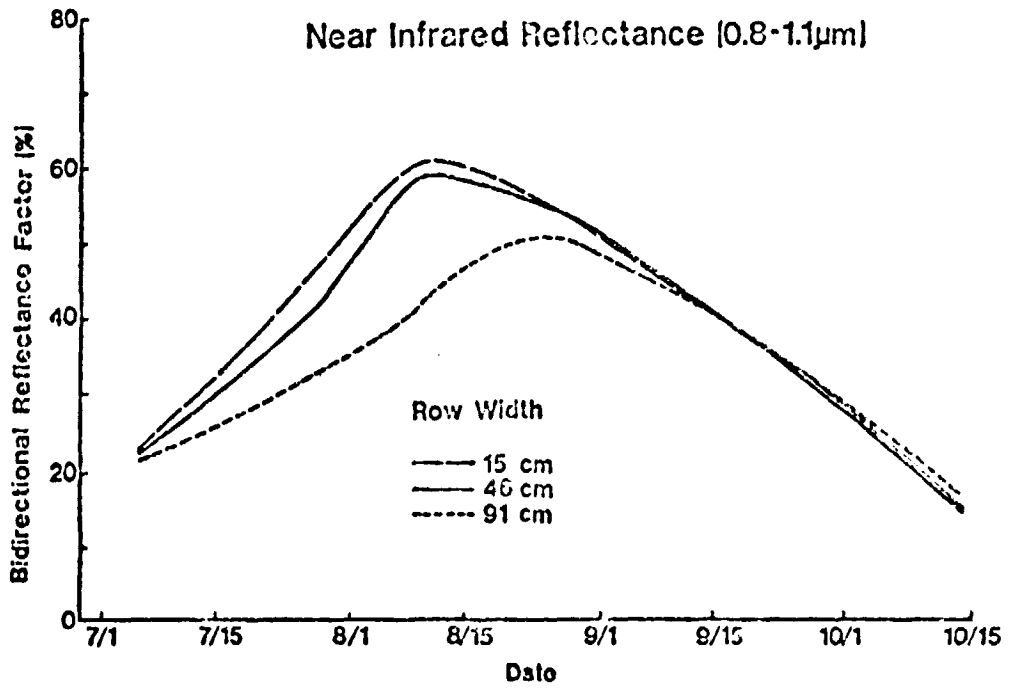


Figure A.- Effect of row width on soybean canopy reflectance as a function of measurement date.

2. RESULTS

Summary plots of planting date and row width for corn and soybeans were compiled for groups of states so that general cropping practices can easily be distinguished and detailed studies of their spectral implications can commence.

2.1 SOYBEANS

Planting date histograms for soybeans in Georgia, South Carolina, and North Carolina (figure 1) and for Iowa, Illinois, and Indiana (figure 2) appear somewhat normally distributed whereas the histograms for Mississippi, Louisiana, Texas, and Arkansas (figure 3) appears to be bimodal. The cause is not known at this time, but is suspected to be due to meteorological events. Further investigation will take place when the 1979 weather vector data base is prepared for these segments. The row width for the Southeast U.S. (figure 4) has a mode near 37 inches, whereas the corn belt (figure 5) has about an equal amount at 37 and 30 inches and about 5 percent drilled at 9 inches and a few broadcast. The gulf coast (figure 6) shows about 23 percent with 7 inch and more narrow rows. These differences will undoubtedly affect signature responses of individual soybean fields.

2.2 CORN

Corn in the Southeast U.S. (figure 7) has a wide distribution of planting dates (day 075 to 104) whereas the corn belt has a much more narrow distribution (figure 8). Row widths of 37 inches are predominant in the Southeast U.S. (figure 9) and are at 30 inches and 38 inches in the corn belt (figure 10). This will make the early spectral development different between these regional areas.

2.3 SMALL GRAINS

In the Northern Great Plains the planting date for barley appears to be bimodal (figure 11). The first mode is coincident with spring wheat at day 142 (figure 12) whereas the second mode is coincident with durum wheat at

day 158 (figure 13). This may cause some confusion between barley and the other two crops early in the season, but could allow some discrimination between spring wheat and durum wheat if this planting date sequence is normally followed by the farmers.

In table 1, the results of an ESCS study of row spacings for soybeans for 1977, 1978, and 1979 are presented, and the results of this study for the corresponding states for 1979 are presented in table 2. In general, the results from this study follow the trends of the ESCS results. This report includes soybean row width information for several important AgRISTARS regions (e.g. Georgia, North Carolina, and Louisiana) not included in the ESCS study. The ESCS field sampling included more fields and the fields were more independent whereas in this project a fewer number of fields had data collected and these fields were concentrated in a few segment areas thus causing more potential sample error. The ESCS data shows from 1977 to 1979 that the trend is toward narrower row widths, yet there is not a drastic change.

3. ACKNOWLEDGEMENTS

The authors wish to thank Dr. Gautum Bahwar for the assistance given in the use of the fortran plotting routines which he authored.

TABLE 1

MEASURED ROW SPACING OF SOYBEANS: PERCENTAGES DISTRIBUTION AND AVERAGE WIDTH FOR SELECTED STATES, 1977-79 1/

STATE AND YEAR	NUMBER OF SAMPLES	ROW WIDTH GROUPS (INCHES)					AVERAGE WIDTH 2/ (INCHES)
		10.0 & LESS 2/	10.1-18.5	18.6-28.5	28.6-34.5	34.6 & GREATER	
		PERCENT OF PLOTS					
ARK 1977	150	5.3	1.0	.3	23.3	70.1	35.5
1978	143	4.3	.3	1.0	21.3	73.1	36.3
1979	139	12.9	0	.7	23.7	62.7	36.1
ILL 1977	163	2.5	1.5	5.2	44.2	46.6	32.9
1978	166	2.4	.6	4.5	44.9	47.6	33.5
1979	164	5.2	1.2	5.5	48.5	39.6	31.7
IND 1977	109	1.9	3.7	6.9	46.3	41.2	32.2
1978	112	5.4	2.2	5.8	42.0	44.6	32.4
1979	105	3.3	.5	6.7	47.6	41.9	32.8
IOWA 1977	155	1.0	2.5	2.3	34.2	60.0	34.7
1978	141	.7	1.1	7.8	41.1	49.3	33.5
1979	145	.7	.7	4.2	42.6	51.8	34.1
MINN 1977	93	.5	2.7	3.8	42.5	50.5	33.4
1978	66	4.1	2.3	6.4	47.1	40.1	32.5
1979	89	7.9	1.7	7.9	47.1	35.4	31.3
MISS 1977	124	12.1	0	2.4	8.5	77.0	37.3
1978	121	14.5	.6	0	11.2	73.5	37.1
1979	124	10.1	2.8	4.0	19.8	63.3	35.4
MO 1977	139	2.9	.7	2.2	38.5	55.7	34.5
1978	134	3.8	.7	3.0	45.1	47.4	33.8
1979	138	5.1	1.8	3.6	43.1	46.4	32.5
OHIO 1977	103	22.3	10.2	7.8	36.8	20.9	26.6
1978	104	22.6	7.7	8.7	41.3	19.7	26.1
1979	114	28.1	14.0	1.8	37.7	18.4	23.6

1/ BASED ON ROW MEASUREMENTS IN PLOTS SELECTED FOR OBJECTIVE YIELD SAMPLES, 1977 AND 1978 RESPECTIVELY.
2/ BROADCAST SOYBEANS INCLUDED AS 10.0 INCHES AND LESS BUT EXCLUDED IN COMPUTATION OF AVERAGE WIDTH.

TABLE 2

		SOYBEAN ROW WIDTH - 1979				
		ROW WIDTHS (INCHES)				
STATE	NUMBER OF SAMPLES	10.0 & LESS	10.1-18.5	18.6-28.5	28.6-34.5	35.6 & GREATER
ARKANSAS	95	2.5	0.0	0.0	49.5	48.0
ILLINOIS	75	6.5	1.5	0.0	38.5	53.5
INDIANA	120	9.0	0.5	2.0	59.0	29.0
IOWA	150	4.0	3.0	40.0	0.0	55.0
MINNESOTA	15	0.0	33.0	0.0	60.0	7.0
MISSISSIPPI	71	8.0	1.0	1.0	56.0	33.0
OHIO	74	51.0	12.0	5.0	26.0	5.0

DISCUSSION OF APPENDICES

At the beginning of each histogram the topic being displayed such as planting date is printed. The crop type is listed next (a definition of crop codes is located in table 2). A list of segments containing the crop of interest for the particular state follows. The rest of the information directly concerns the histograms. The step size is the range of data values which are combined into each of the ten groups. The centerpoint value is printed to the left of each of the ten bands, and the range extends one half of a step size on either side of it. The centerpoint values are displayed in exponential notation. For example, 1.293E+02 is 1.293×10^2 or 129.3. Also, the number of observations listed is the total number of fields for which data are being histogrammed. Along the first and last lines of the histogram, the percentages are listed. The length of a bar can thus be read as a percentage of fields in the given range. Finally, the last two lines list the centerpoint of each group followed by the actual number of fields which are in that group. It should also be noted that the histograms are not comulative.

The three plots in appendices C, D, and E show plant height, percent ground cover, and crop growth stage respectively as a function of the day of the year. The day of the year is plotted along the x-axis and is divided by one hundred. The plant height is given in inches, the ground cover in percentage, and crop growth stage is on a scale of 1 to 7 with 1 signifying that the crop has been planted and 7 meaning that it is harvested. The plots give the number of fields which are at a certain growth value on a given day of the year. These numbers must be single digit numerals. Therefore, alphabetic characters and symbols are assigned to numbers greater than 9 (see table 4). Also, there are exactly ten columns between each of the values along the x-axis, and the total number of points received for plotting is printed in the upper left-hand corner under MPOINT.

TABLE 3

CROP CODES

CODE	CROP TYPE
BR	BARLEY
CR	CORN
CT	COTTON
DW	DURUM WHEAT
RI	RICE
SR	SORGHUM
SO	SOYBEAN
SW	SPRING WHEAT

TABLE 4

SYMBOL CODING FOR PLOTS

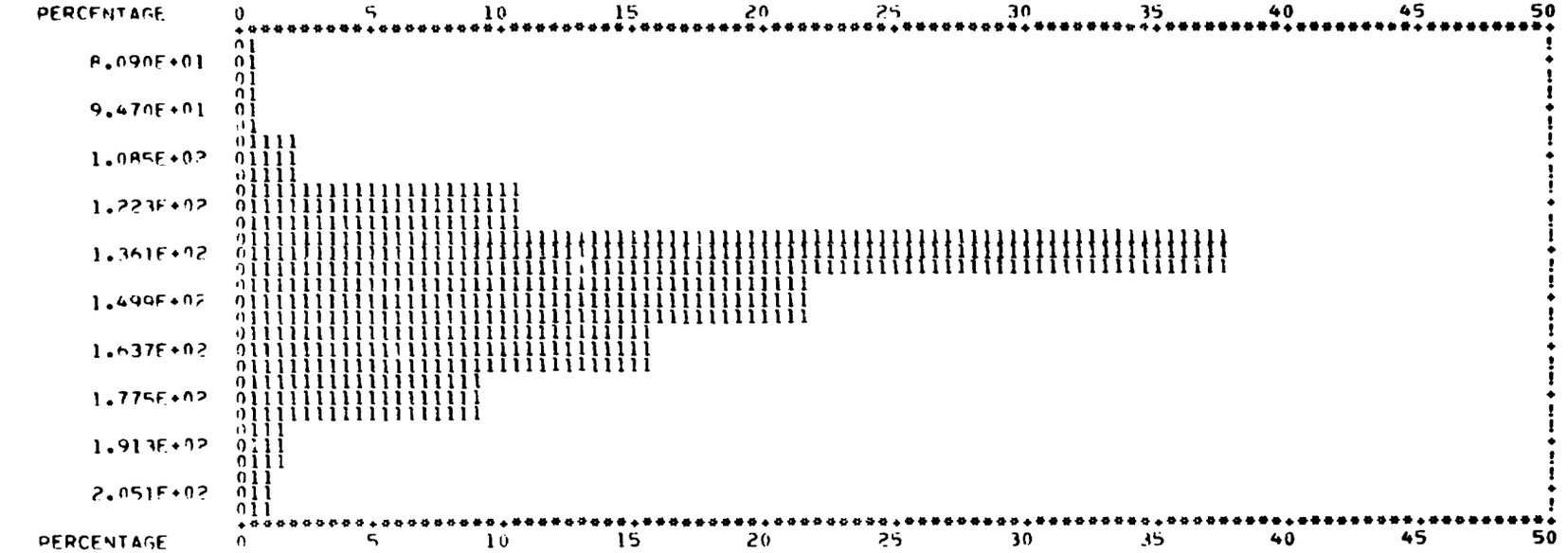
SYMBOL	NUMERICAL VALUE
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	10
A	11
B	12
C	13
D	14
E	15
F	16
G	17
H	18
I	19
J	20
K	21
L	22
M	23
N	24
O	25
P	26
Q	27
R	28
S	29
T	30
U	31
V	32
W	33
X	34
Y	35
Z	36
+	37 or greater

A. PLANTING DATE AND EMERGENCE DATA HISTOGRAMS

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 311 312 330 332 333 334 336 337 338 339 340 341 342 343 344

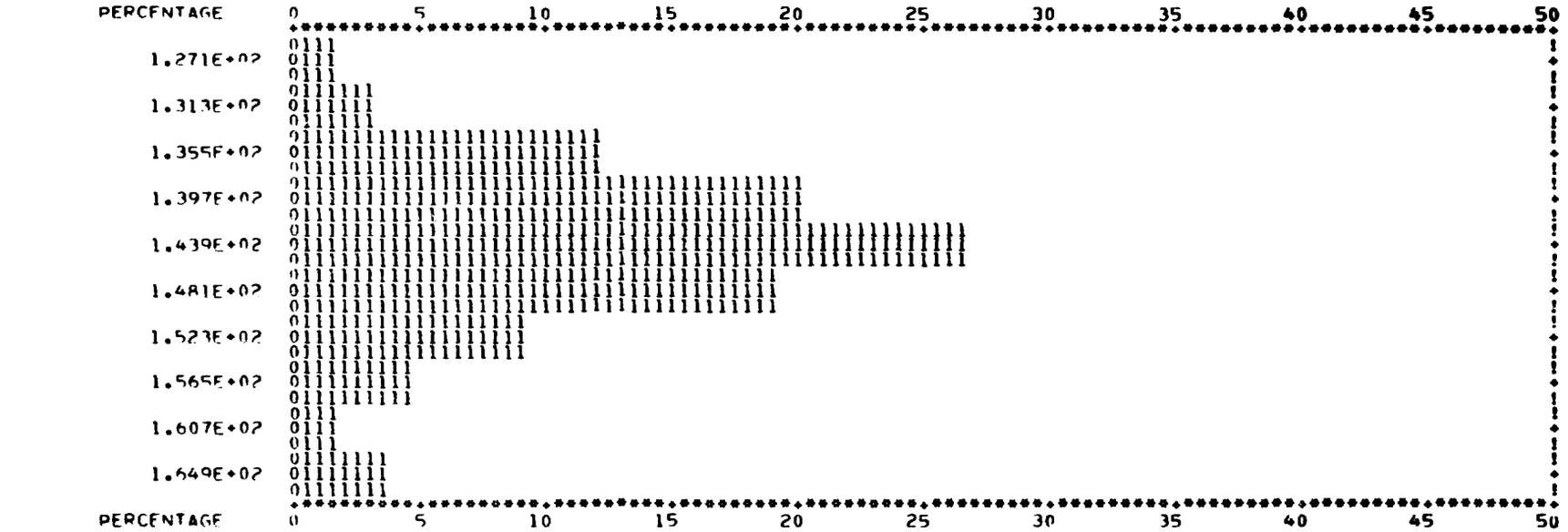
STEP = 13.8000011
CENTERPOINT OF INITIAL GROUP= 80.8999786 NUMBER OF OBSERVATIONS = 199
CENTERPOINT OF FINAL GROUP = 205.099991 NUMBER OF GROUPS = 10



BIN	80.90	94.70	108.50	122.30	136.10	149.90	163.70	177.50	191.30	205.10
CONTENT	1.00	1.00	4.00	21.00	74.00	43.00	31.00	18.00	3.00	2.00

PLANTING DATE

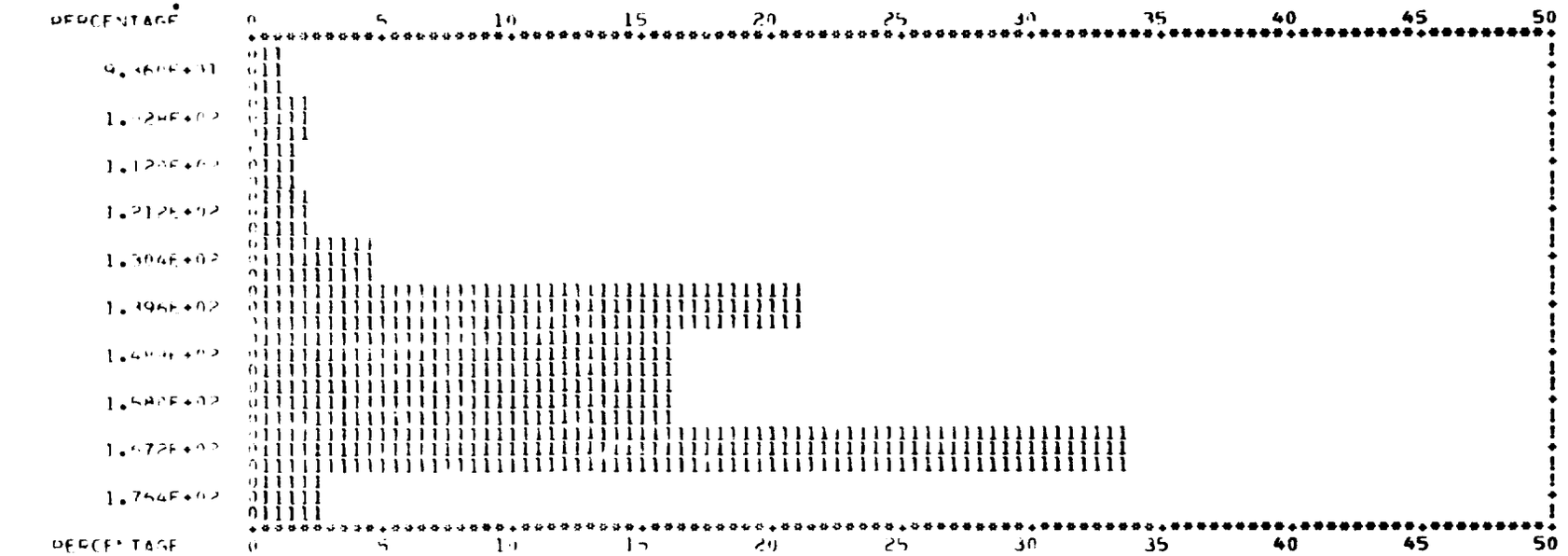
CROP TYPE IS SO
SEGMENTS = 107 114 123 127 133 135 144 145 801 804 805 824 828 833 837
843 851 856 883 886 892 893
STEP = 4.20000172
CENTERPOINT OF INITIAL GROUP= 127.099976 NUMBER OF OBSERVATIONS = 273
CENTERPOINT OF FINAL GROUP = 164.899994 NUMBER OF GROUPS = 10



BIN	127.10	131.30	135.50	139.70	143.90	148.10	152.30	156.50	160.70	164.90
CONTENT	4.00	8.00	33.00	55.00	72.00	52.00	24.00	12.00	4.00	9.00

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 102 103 104 174 177 184 195 196 198 200 266 267 268 269 270
271 273 276 284 287 288 290 301 302 303 304 305
STEP = 9.20000172
CENTERPOINT OF INITIAL GROUP= 93.5999756 NUMBER OF OBSERVATIONS = 327
CENTERPOINT OF FINAL GROUP = 176.399994 NUMBER OF GROUPS = 10

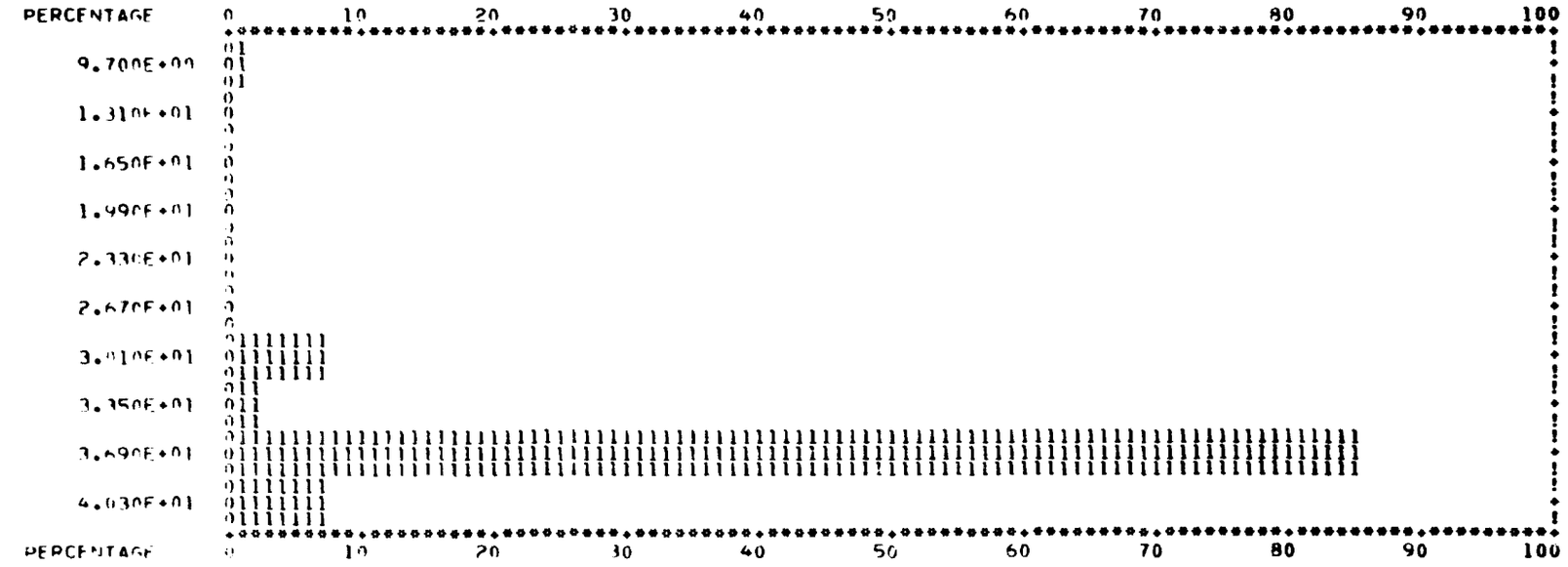


MID	93.60	102.80	112.00	121.20	130.40	139.60	148.80	158.00	167.20	176.40
CONTENT	3.00	7.00	5.00	7.00	15.00	68.00	53.00	52.00	109.00	8.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 311 312 330 332 333 334 336 337 338 339 340 341 342 343 344

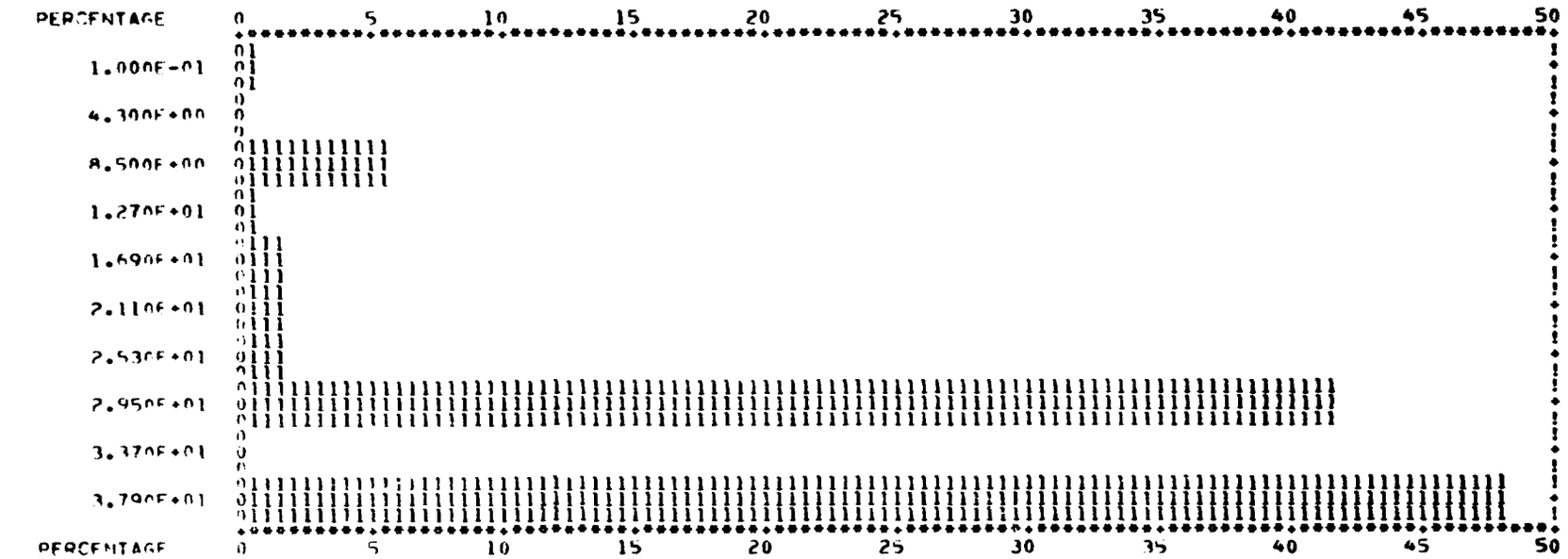
STEP = 3.39999676
CENTERPOINT OF INITIAL GROUP= 9.69999886 NUMBER OF OBSERVATIONS = 198
CENTERPOINT OF FINAL GROUP = 40.2999878 NUMBER OF GROUPS = 10



	MIN	9.70	13.10	16.50	19.90	23.30	26.70	30.10	33.50	36.90	40.30
CONTENT		1.00	0.0	0.0	0.0	0.0	0.0	13.00	3.00	168.00	13.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 107 114 123 127 133 135 144 145 801 804 805 824 828 833 837
843 851 856 883 886 892 893
STEP = 4.19999790
CENTERPOINT OF INITIAL GROUP= 0.09999841 NUMBER OF OBSERVATIONS = 273
CENTERPOINT OF FINAL GROUP = 37.8999939 NUMBER OF GROUPS = 10



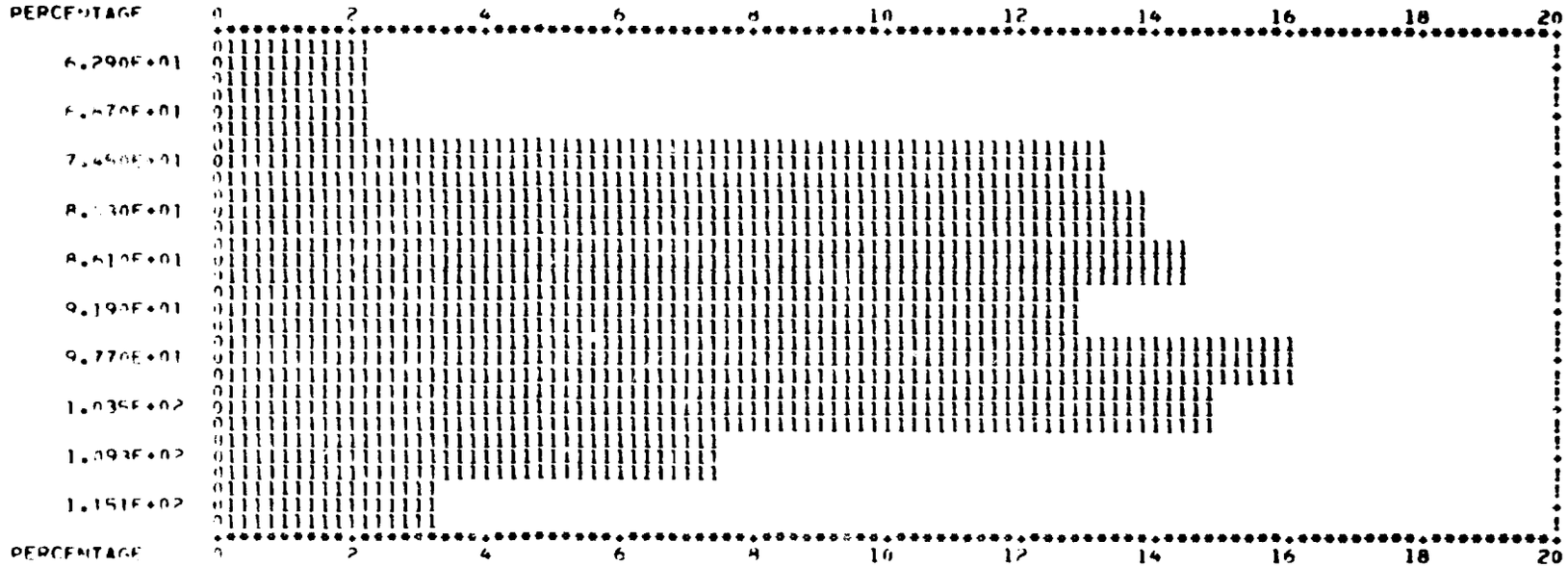
	MIN	0.10	4.30	8.50	12.70	16.90	21.10	25.30	29.50	33.70	37.90
CONTENT		1.00	0.0	15.00	1.00	4.00	4.00	4.00	113.00	0.0	131.00

WIDTH = 5 CMES
CLASS TYPE IS SQ
CLASSES = 192 193 194 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210
211 212 213 214 215
STEP = 5.19999981
(CENTERED) AT OF INITIAL GROUP= 1.09999847
(CENTERED) AT OF FINAL GROUP = 25.99999619
NUMBER OF OBSERVATIONS = 327
NUMBER OF GROUPS = 10
PERCENTAGE
1 5 10 15 20 25 30 35 40 45 50
1 5 10 15 20 25 30 35 40 45 50
1.30 7.30 13.5 19.70 25.91 32.10 38.30 44.50 50.70 56.90
21.00 55.00 4.00 4.00 21.00 71.00 147.00 0.0 0.0 1.00

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 311 312 330 332 333 334 336 337 338 339 341 342 343 344

STEP = 5.80000114
CENTERPOINT OF INITIAL GROUP= 62.89997864 NUMBER OF OBSERVATIONS = 184
CENTERPOINT OF FINAL GROUP = 115.099991 NUMBER OF GROUPS = 10

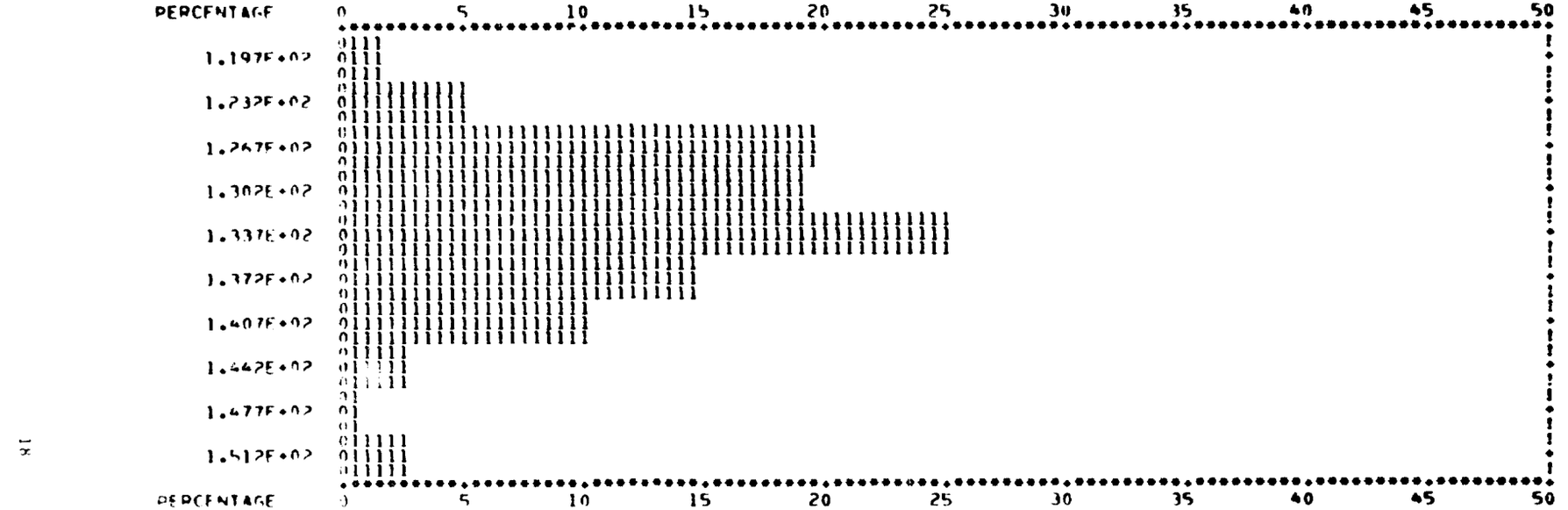


BIN	62.90	68.70	74.50	80.30	86.10	91.90	97.70	103.50	109.30	115.10
CONTENT	4.00	4.00	25.00	26.00	27.00	24.00	30.00	23.00	14.00	6.00

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 107 114 123 127 133 135 144 145 801 804 824 828 833 837 843
851 856 883 886 892 893

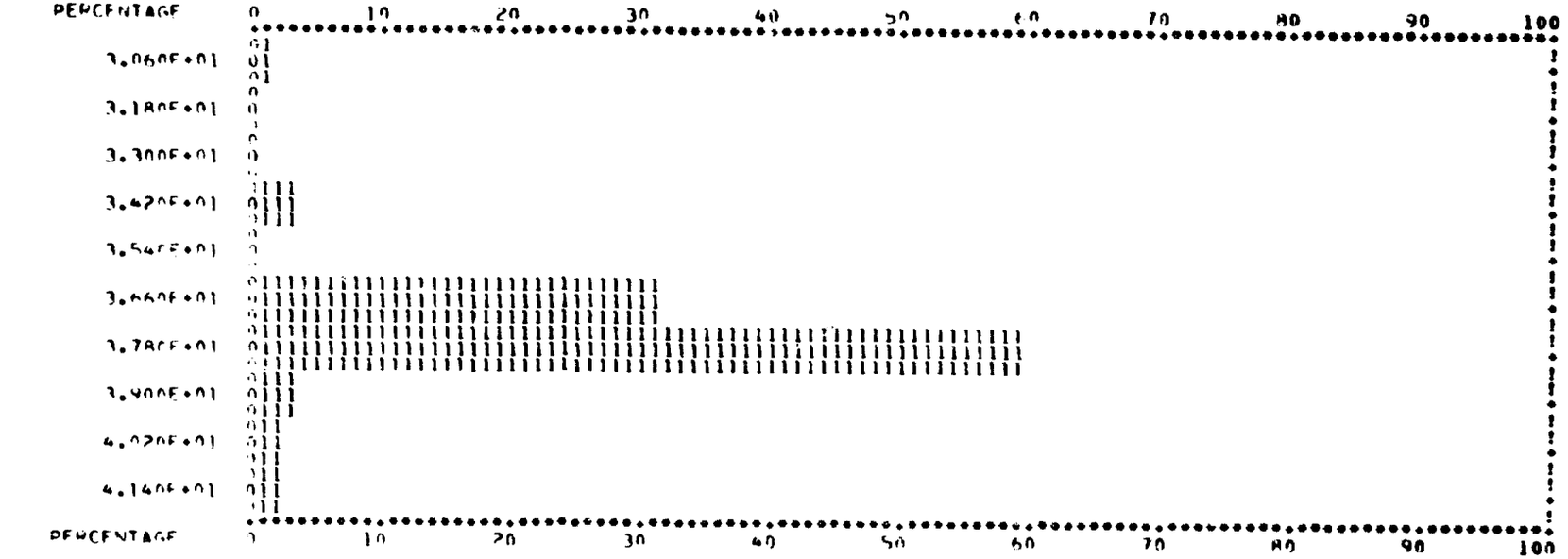
STEP = 3.50000095
CENTERPOINT OF INITIAL GROUP= 119.749985 NUMBER OF OBSERVATIONS = 265
CENTERPOINT OF FINAL GROUP = 151.250000 NUMBER OF GROUPS = 10



MID	119.75	123.25	126.75	130.25	133.75	137.25	140.75	144.25	147.75	151.25
CONTENT	4.00	13.00	52.00	51.00	66.00	38.00	26.00	7.00	1.00	7.00

ROW WIDTH - INCHES

CROP TYPE IS CO
SEGMENTS = 311 312 330 332 333 334 336 337 338 339 341 342 343 344
STEP = 1.20000172
CENTERPOINT OF INITIAL GROUP= 30.5999756 NUMBER OF OBSERVATIONS = 189
CENTERPOINT OF FINAL GROUP = 41.3999939 NUMBER OF GROUPS = 10

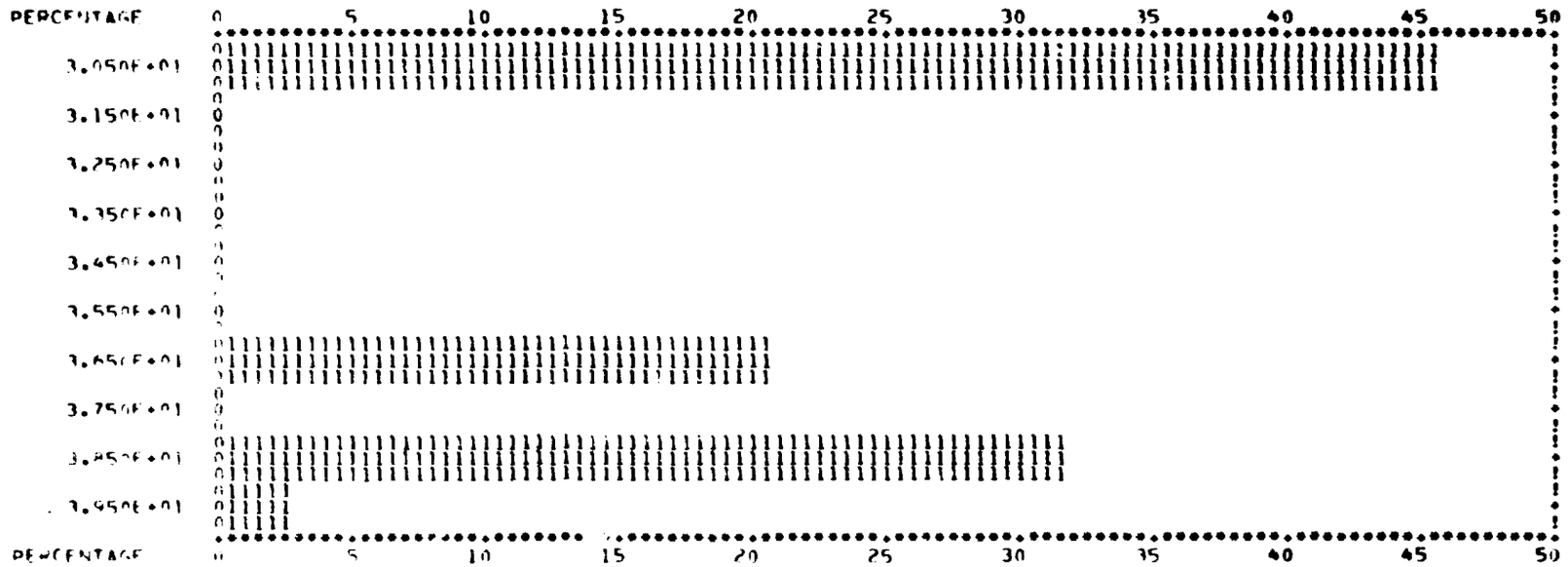


	30.60	31.80	33.00	34.20	35.40	35.60	37.80	39.00	+0.20	+1.40
CENTER	1.00	0.0	0.0	6.00	0.0	53.00	110.00	6.00	4.00	3.00

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 107 114 123 127 131 135 144 145 801 804 824 828 833 837 843
851 856 863 866 893 893

STEP = 1.00000095
CENTERPOINT OF INITIAL GROUP= 30.4999847 NUMBER OF OBSERVATIONS = 265
CENTERPOINT OF FINAL GROUP = 39.5000000 NUMBER OF GROUPS = 10



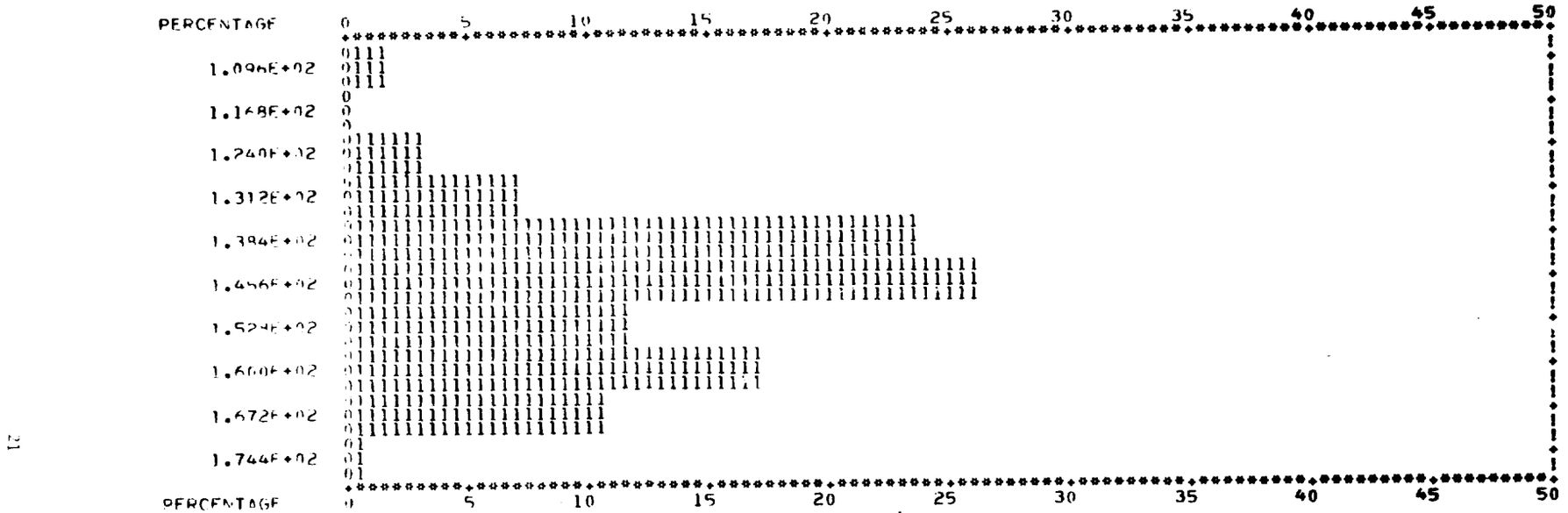
MID	30.50	31.50	32.50	33.50	34.50	35.50	36.50	37.50	38.50	39.50
CONTENT	121.00	0.0	0.0	0.0	0.0	0.0	54.00	0.0	84.00	4.00

PLANTING DATE

CROP TYPE IS 40
SEGMENTS = 1347 1392 1394 1399 1457 1461 1467 1472 1514 1518 1566 1571 1644
1502 1511 1617 1619 1630 1636 1645 1656 1658 1661 1664
1825 1869 1917 1918 1924 1974

STEP = 7.20000172
CENTERPOINT OF INITIAL GROUP= 109.599976 NUMBER OF OBSERVATIONS = 222
CENTERPOINT OF FINAL GROUP = 174.399994 NUMBER OF GROUPS = 10

Fig. 1



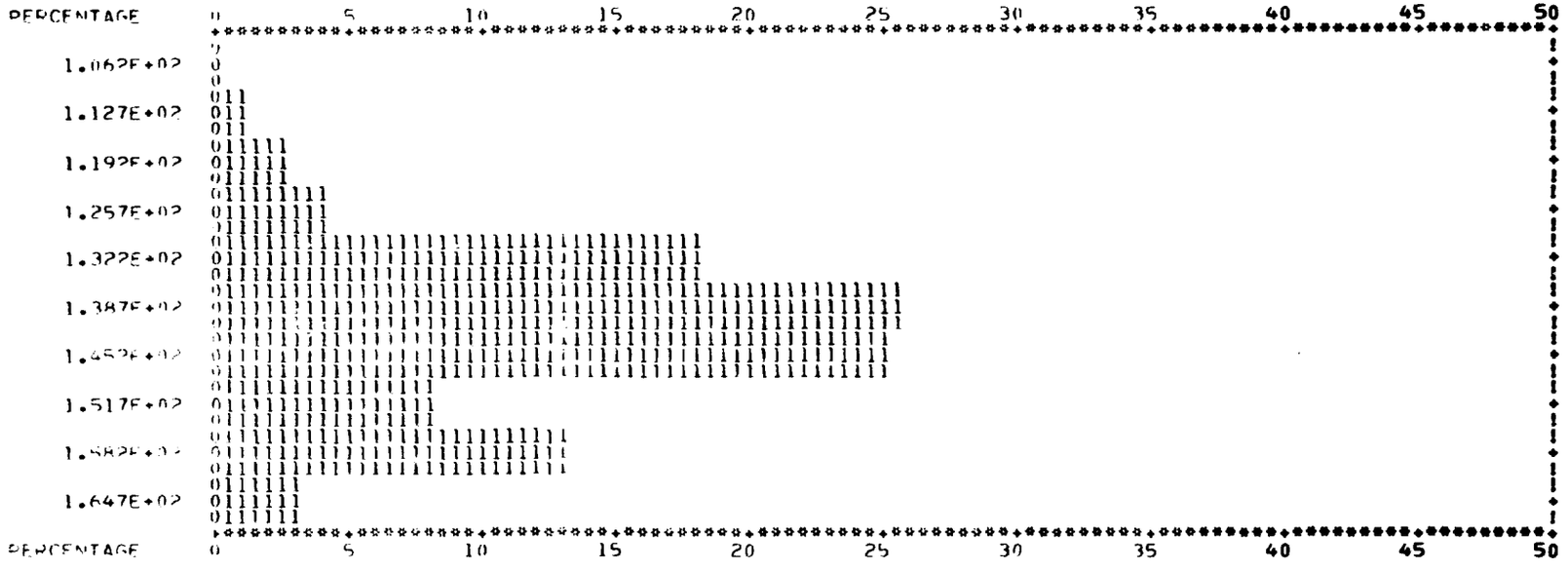
MIN	109.60	116.80	124.00	131.20	138.40	145.60	152.80	160.00	167.20	174.40
CONTENT	3.00	0.0	7.00	15.00	52.00	58.00	25.00	38.00	23.00	1.00

Fig. 12

PLANTING DATE

CROP TYPE IS SW
SEGMENTS = 1380 1387 1392 1394 1399 1457 1461 1472 1473 1514 1518 1566 1571
1584 1602 1611 1612 1617 1619 1627 1631 1636 1645 1650 1653 1656 1658 1661
1664 1825 1842 1909 1917 1918 1922 1924 1974

SIZE = 5.00000065
CENTERPOINT OF INITIAL GROUP= 100.249985 NUMBER OF OBSERVATIONS = 433
CENTERPOINT OF FINAL GROUP = 164.750000 NUMBER OF GROUPS = 10

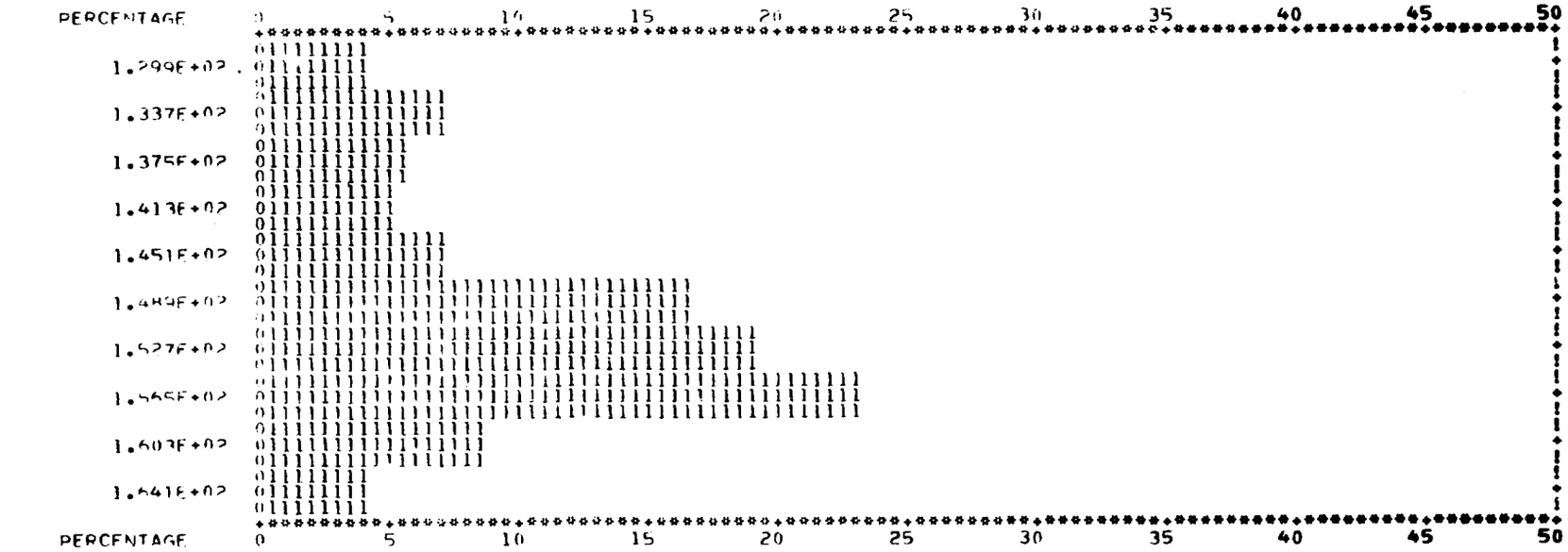


BIN	106.25	112.75	119.25	125.75	132.25	138.75	145.25	151.75	158.25	164.75
CONTENT	1.00	4.00	10.00	18.00	77.00	111.00	108.00	35.00	57.00	12.00

F.7

PLANTING DATE

CROP TYPE IS DW
SEGMENTS = 1387 1392 1394 1457 1461 1467 1472
1602 1611 1617 1619 1627 1635 1658
1917 1924 1974
STEP = 3.800000114
CENTERPOINT OF INITIAL GROUP= 129.899979 NUMBER OF OBSERVATIONS = 126
CENTERPOINT OF FINAL GROUP = 164.099991 NUMBER OF GROUPS = 10



HIGH	129.90	133.70	137.50	141.30	145.10	148.90	152.70	156.50	160.30	164.10
CONTENT	5.00	9.00	7.00	6.00	9.00	21.00	24.00	29.00	11.00	5.00

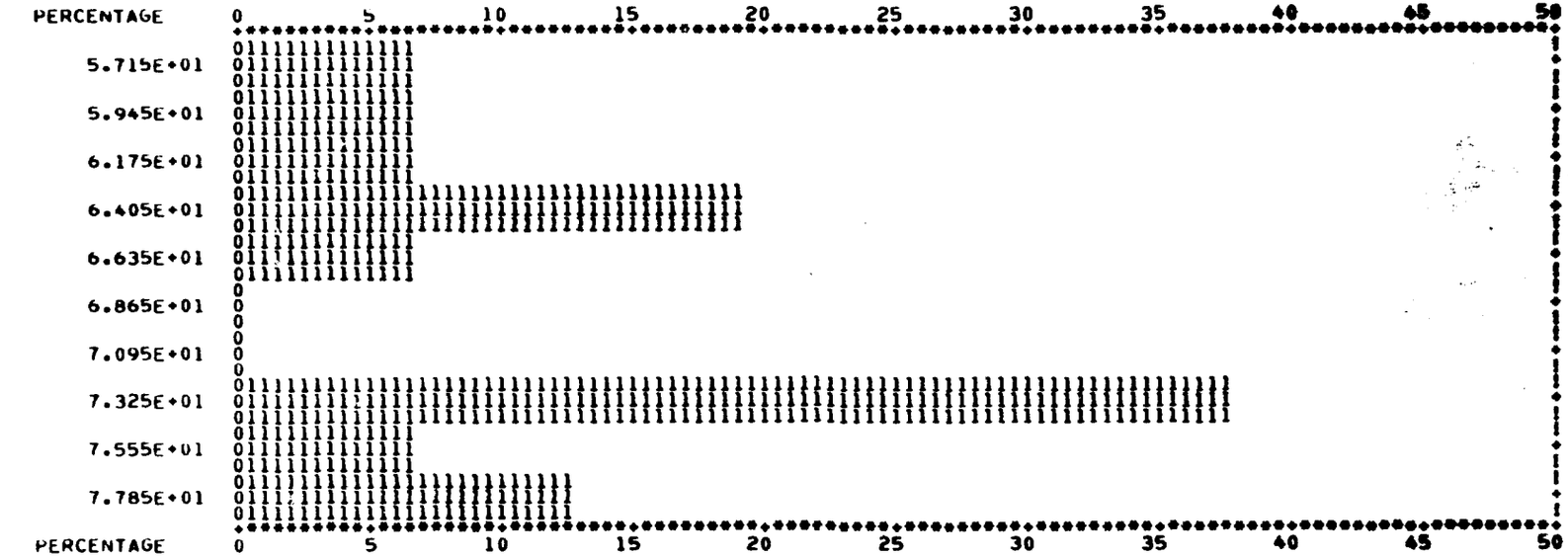
APPENDIX A

PLANTING DATE AND EMERGENCE DATE HISTOGRAMS

ALABAMA

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 288 308
STEP = 2.30000114
CENTERPOINT OF INITIAL GROUP= 57.1499786 NUMBER OF OBSERVATIONS = 16
CENTERPOINT OF FINAL GROUP = 77.8499908 NUMBER OF GROUPS = 10

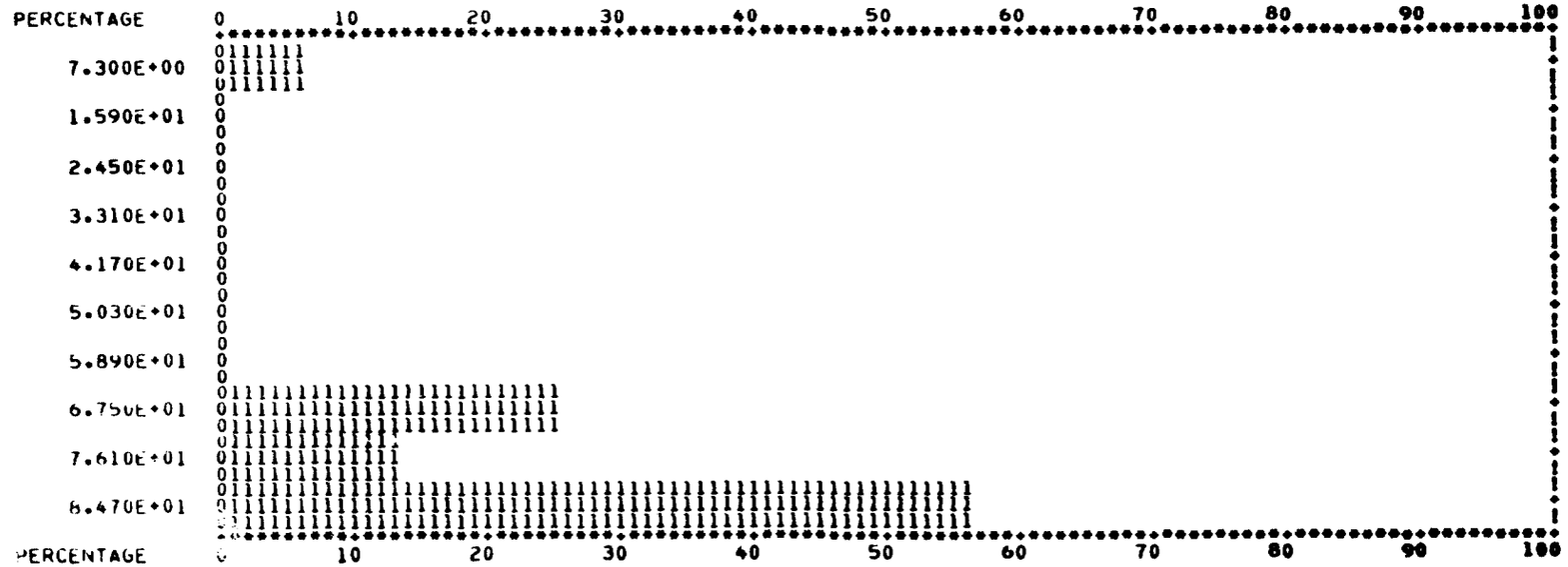


BIN	57.15	59.45	61.75	64.05	66.35	68.65	70.95	73.25	75.55	77.85
CONTENT	1.00	1.00	1.00	3.00	1.00	0.0	0.0	6.00	1.00	2.00

A-3

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 288 308
STEP = 8.59999847
CENTERPOINT OF INITIAL GROUP= 7.29999828 NUMBER OF OBSERVATIONS = 16
CENTERPOINT OF FINAL GROUP = 84.6999969 NUMBER OF GROUPS = 10

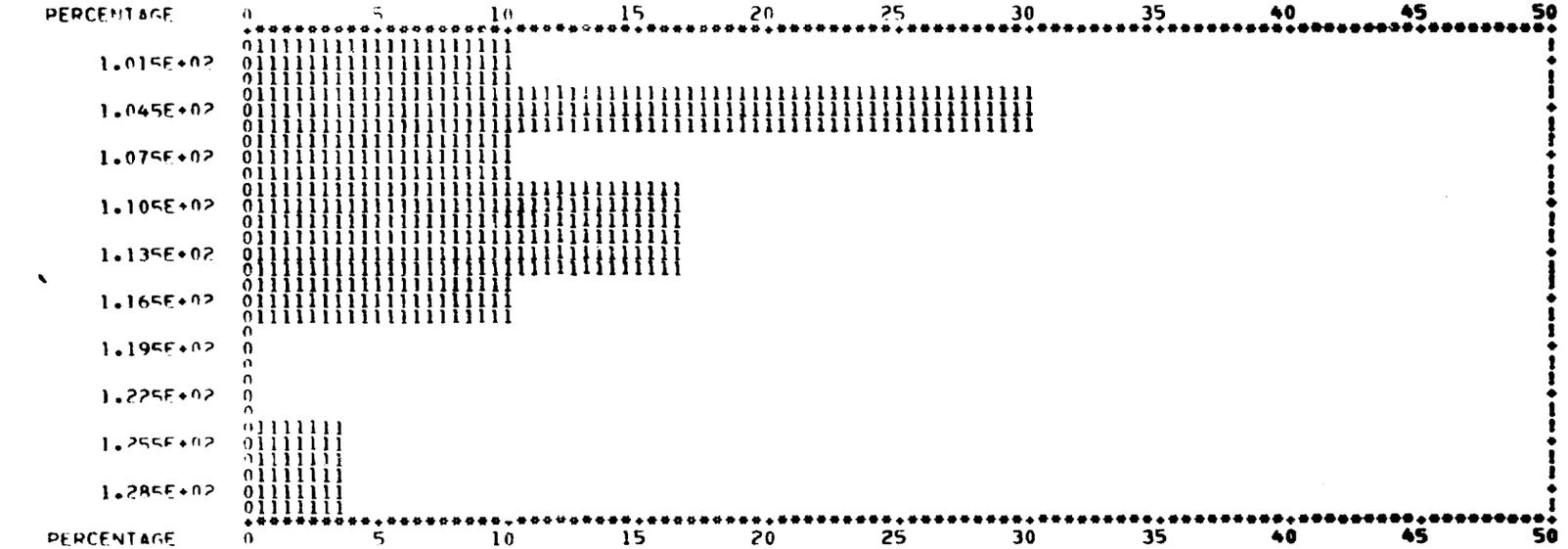


BIN	7.30	15.90	24.50	33.10	41.70	50.30	58.90	67.50	76.10	84.70
CONTENT	1.00	0.0	0.0	0.0	0.0	0.0	0.0	4.00	2.00	9.00

PLANTING DATE

CROP TYPE IS CT
SEGMENTS = 309 310

STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP = 101.499985
CENTERPOINT OF FINAL GROUP = 128.500000
NUMBER OF OBSERVATIONS = 30
NUMBER OF GROUPS = 10

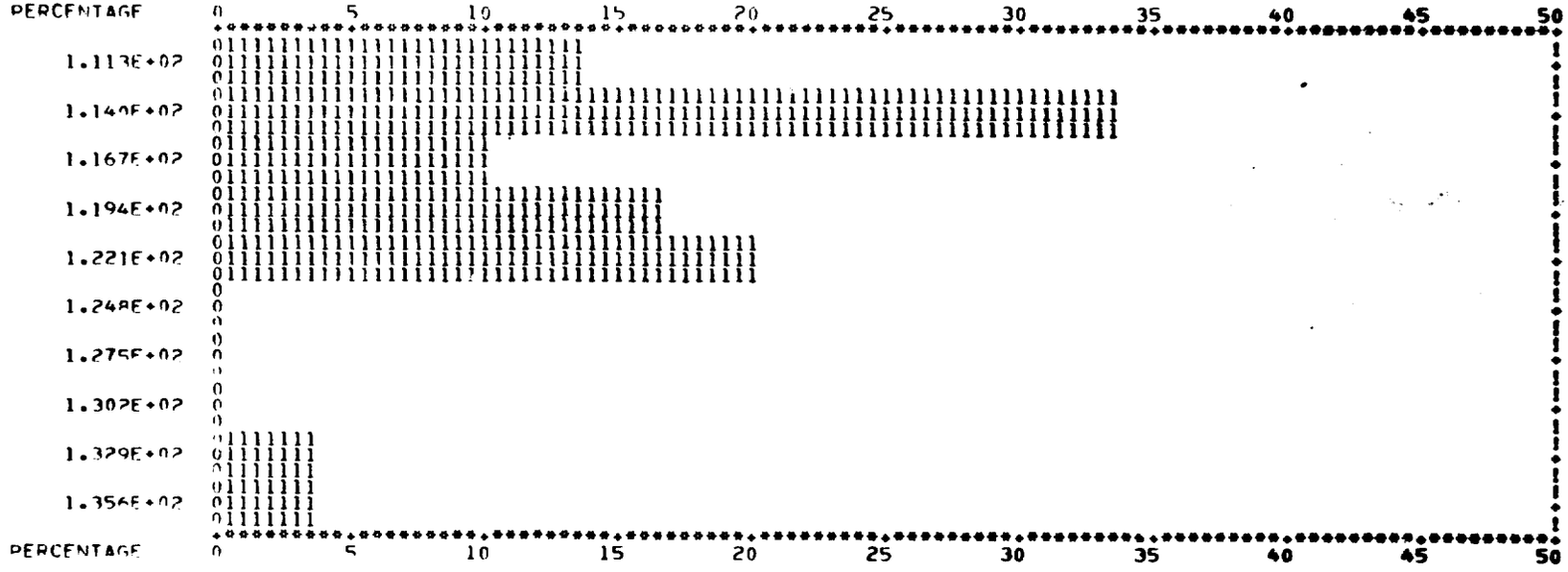


BIN	101.50	104.50	107.50	110.50	113.50	116.50	119.50	122.50	125.50	128.50
CONTENT	3.00	9.00	3.00	5.00	5.00	3.00	0.0	0.0	1.00	1.00

EMERGENCE DATE

CROP TYPE IS CT
SEGMENTS = 309 310

SIFP = 2.70000172
CENTERPOINT OF INITIAL GROUP= 111.349976 NUMBER OF OBSERVATIONS = 30
CENTERPOINT OF FINAL GROUP = 135.649994 NUMBER OF GROUPS = 10

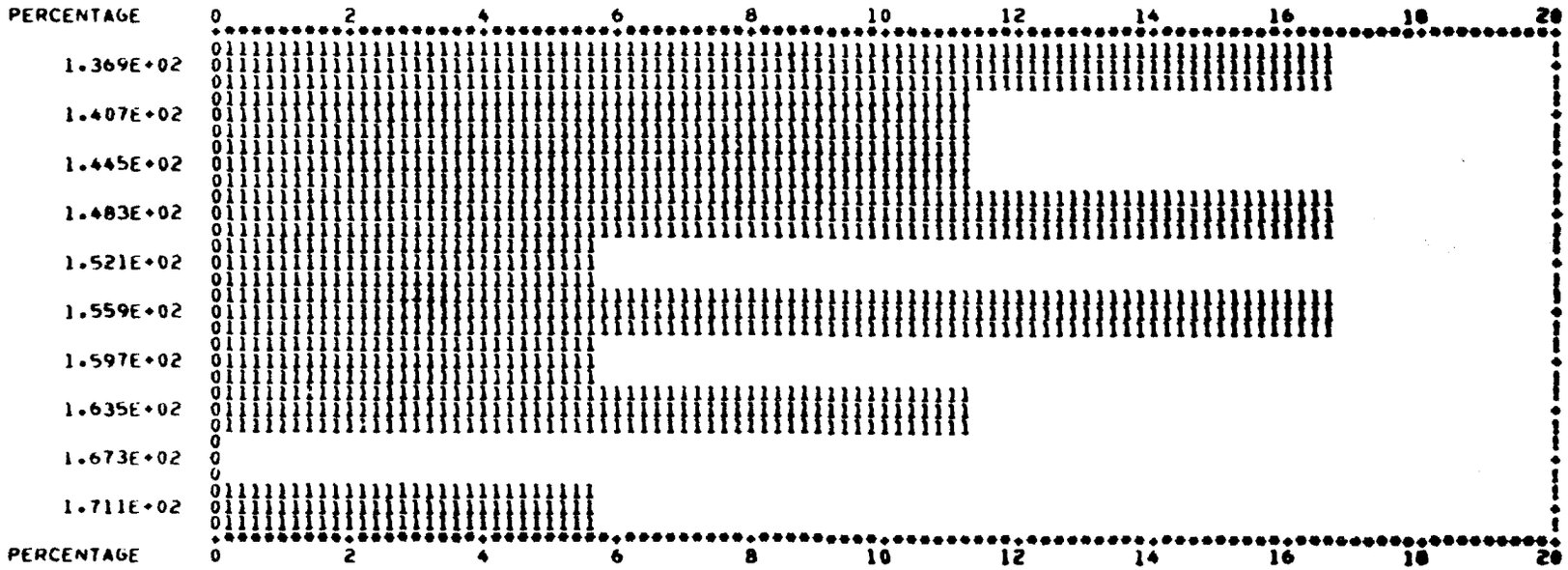


BIN	111.35	114.05	116.75	119.45	122.15	124.85	127.55	130.25	132.95	135.65
CONTENT	4.00	10.00	3.00	5.00	6.00	0.0	0.0	0.0	1.00	1.00

47

PLANTING DATE

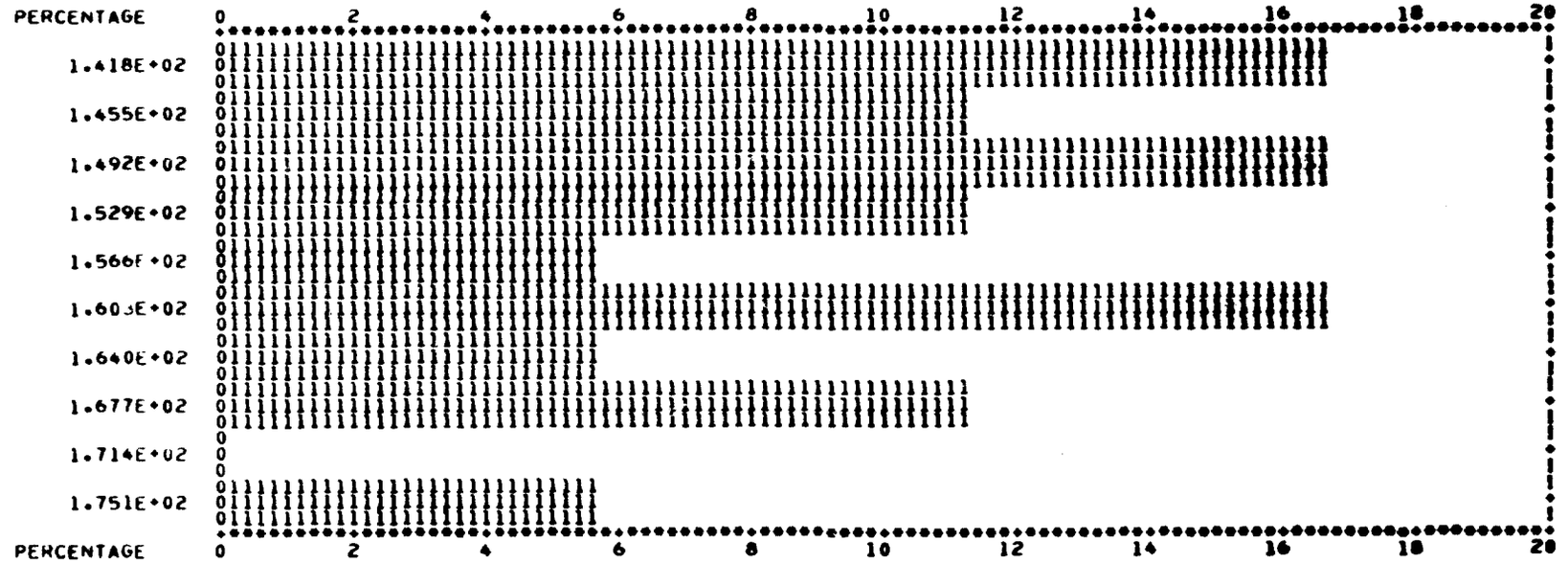
CROP TYPE IS SO
SEGMENTS = 288 308
STEP = 3.80000114
CENTERPOINT OF INITIAL GROUP= 136.899979 NUMBER OF OBSERVATIONS = 18
CENTERPOINT OF FINAL GROUP = 171.099991 NUMBER OF GROUPS = 10



BIN	136.90	140.70	144.50	148.30	152.10	155.90	159.70	163.50	167.30	171.10
CONTENT	3.00	2.00	2.00	3.00	1.00	3.00	1.00	2.00	0.0	1.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 288 308
STEP = 3.70000172
CENTERPOPINT OF INITIAL GROUP= 141.849976 NUMBER OF OBSERVATIONS = 18
CENTERPOINT OF FINAL GROUP = 175.149994 NUMBER OF GROUPS = 10



BIN	141.85	145.55	149.25	152.95	156.65	160.35	164.05	167.75	171.45	175.15
CONTENT	3.00	2.00	3.00	2.00	1.00	3.00	1.00	2.00	0.0	1.00

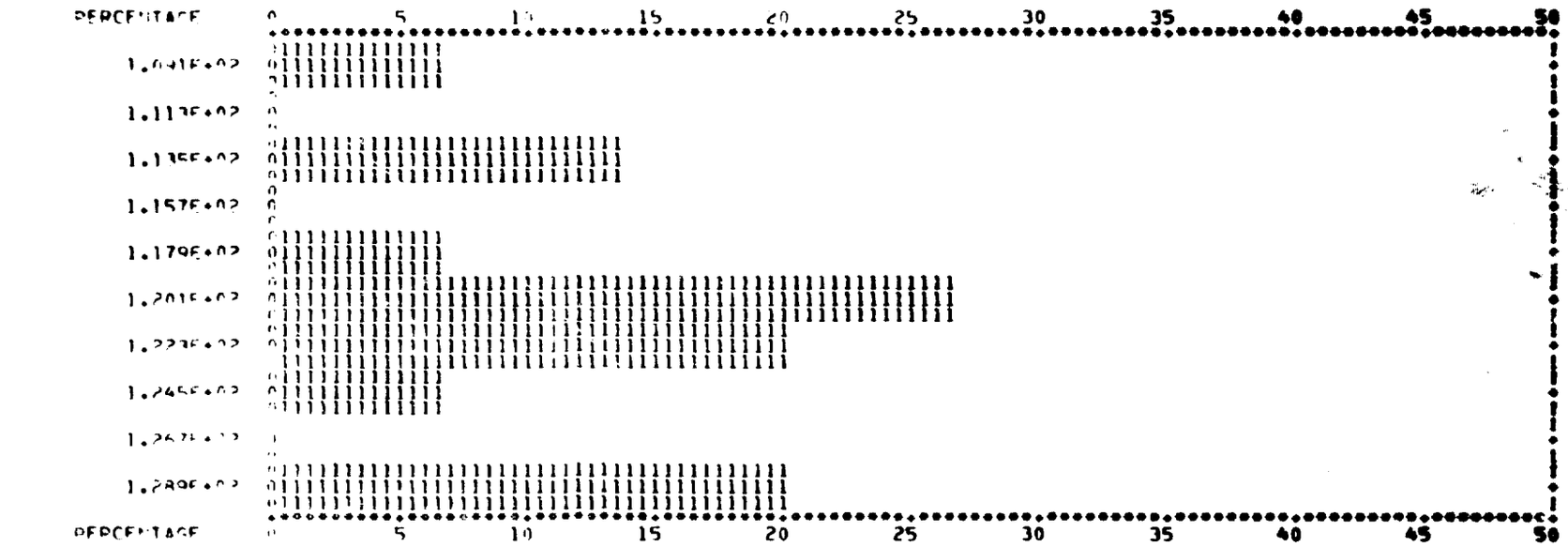
31

ARKANSAS

A-8
32

PLANTING DATE

CROP TYPE IS CT
SEGMENTS = 103 301 306
STEP = 2.20000172
CENTERPOINT OF INITIAL GROUP = 109.099997
CENTERPOINT OF FINAL GROUP = 128.499994
NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10



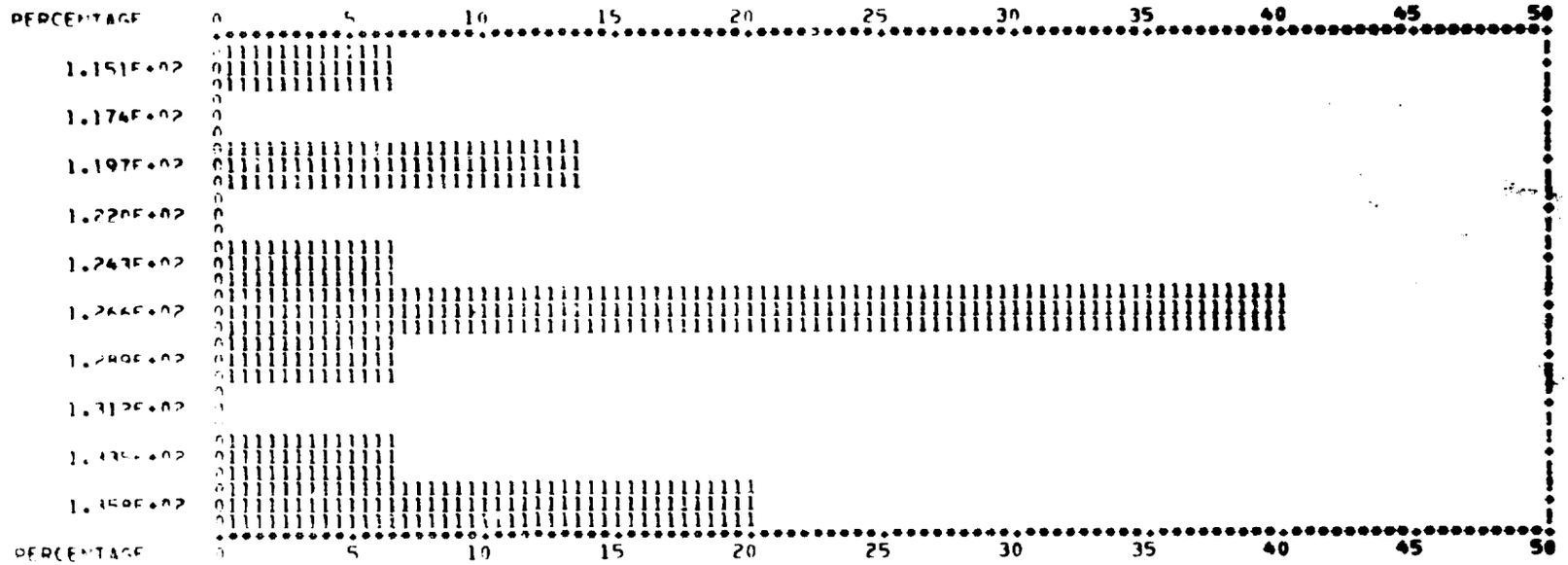
MID	109.10	111.30	113.50	115.70	117.90	120.10	122.30	124.50	126.70	128.90
COUNT	1.00	0.0	2.00	0.0	1.00	4.00	3.00	1.00	0.0	3.00

EMERGENCE DATE

CROP TYPE IS CT
SEGMENTS = 103 301 306

STEP = 2.30000114
CENTERPOINT OF INITIAL GROUP = 115.144974
CENTERPOINT OF FINAL GROUP = 135.849931

NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10

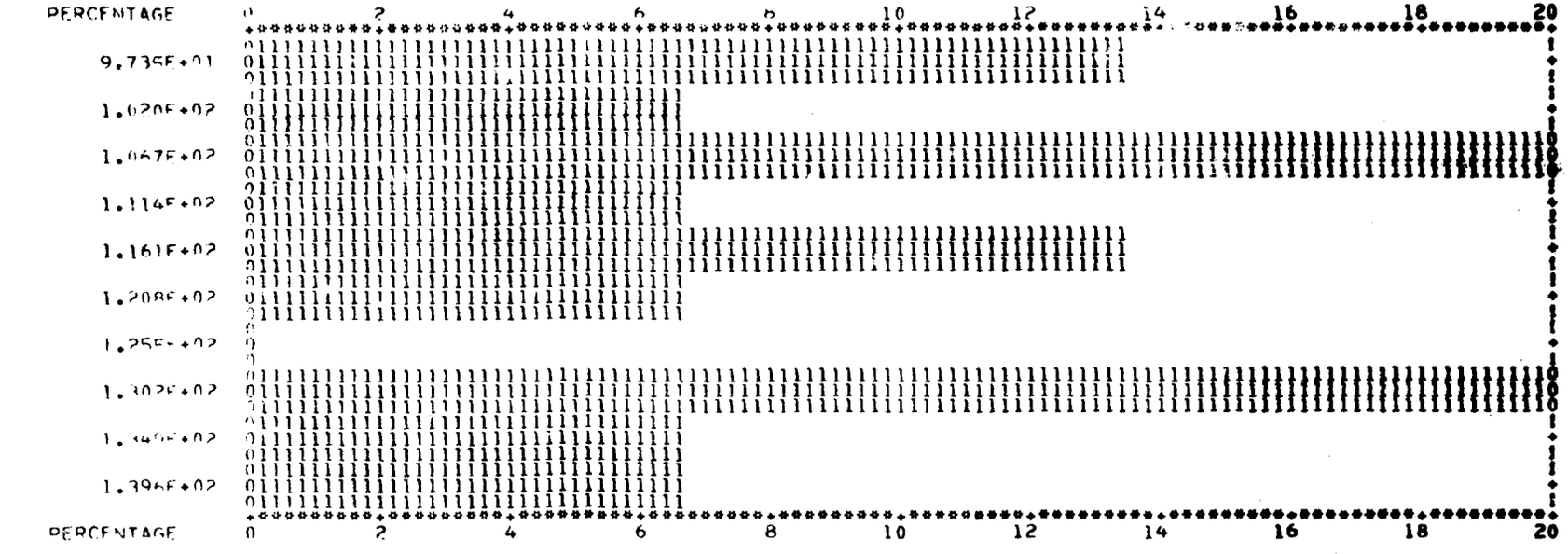


BIN	115.15	117.45	119.75	122.05	124.35	126.65	128.95	131.25	133.55	135.85
CONTENT	1.00	0.0	2.00	0.0	1.00	6.00	1.00	0.0	1.00	3.00

A-14

PLANTING DATE

CROP TYPE IS RI
SEGMENTS = 103 104 305
STEP = 4.700001[illegible]
CENTERPOINT OF INITIAL GROUP = 97.349[illegible]
CENTERPOINT OF FINAL GROUP = 139.649994
NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10



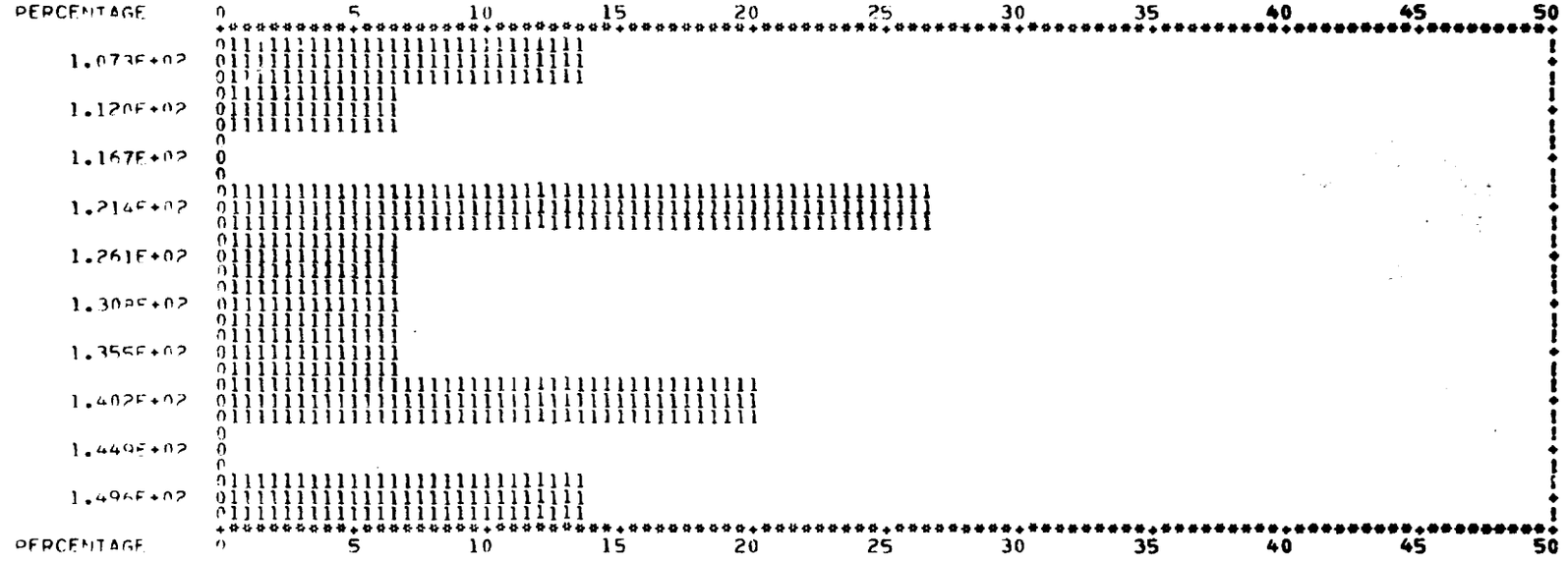
HIGH	97.35	102.05	106.75	111.45	116.15	120.85	125.55	130.25	134.95	139.65
CONTENT	2.00	1.00	3.00	1.00	2.00	1.00	0.0	3.00	1.00	1.00

A-12

ORIGINAL PAGE IS
OF POOR QUALITY

EMERGENCE DATE

CROP TYPE IS RI
SEGMENTS = 103 104 105
STEP = 4.70000172
CENTERPOINT OF INITIAL GROUP= 107.349976 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 149.649994 NUMBER OF GROUPS = 10



BIN	107.35	112.05	116.75	121.45	126.15	130.85	135.55	140.25	144.95	149.65
CONTENT	2.00	1.00	0.0	4.00	1.00	1.00	1.00	3.00	0.0	2.00

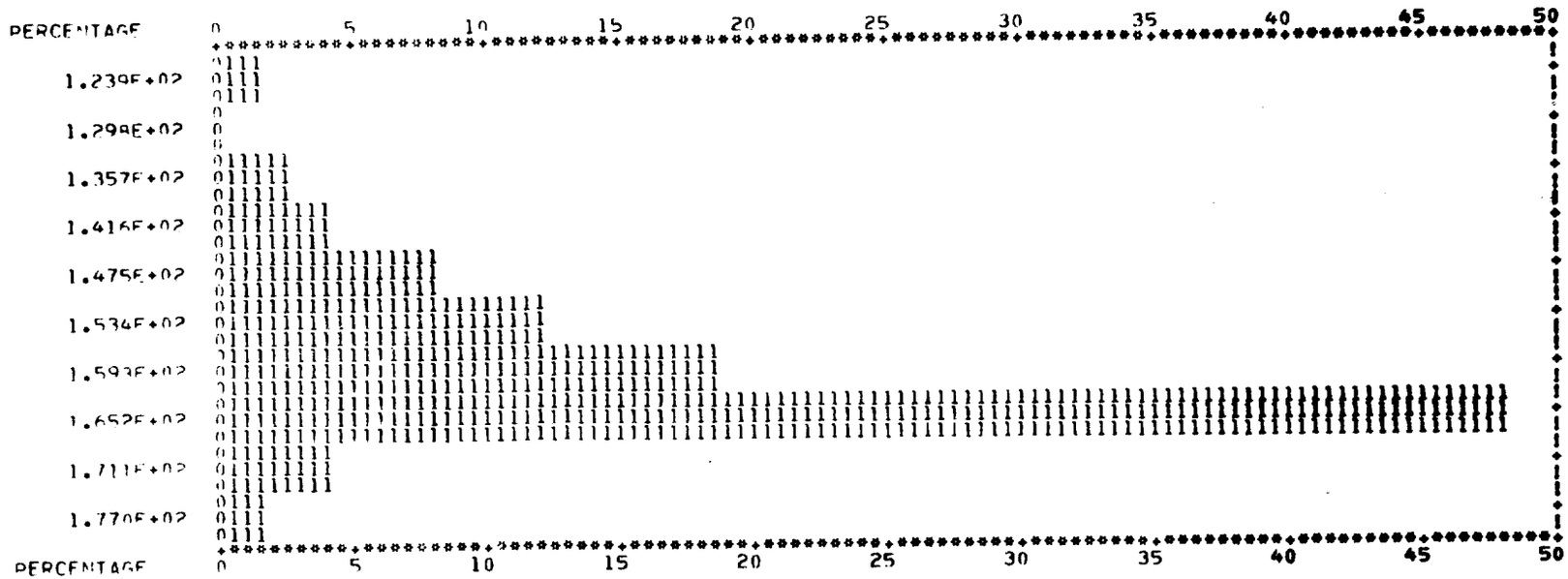
A-13
36

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 102 103 104 301 302 303 304 305

STEP = 5.99000057
CENTERPOINT OF INITIAL GROUP= 123.949982
CENTERPOINT OF FINAL GROUP = 177.049988

NUMBER OF OBSERVATIONS = 75
NUMBER OF GROUPS = 10

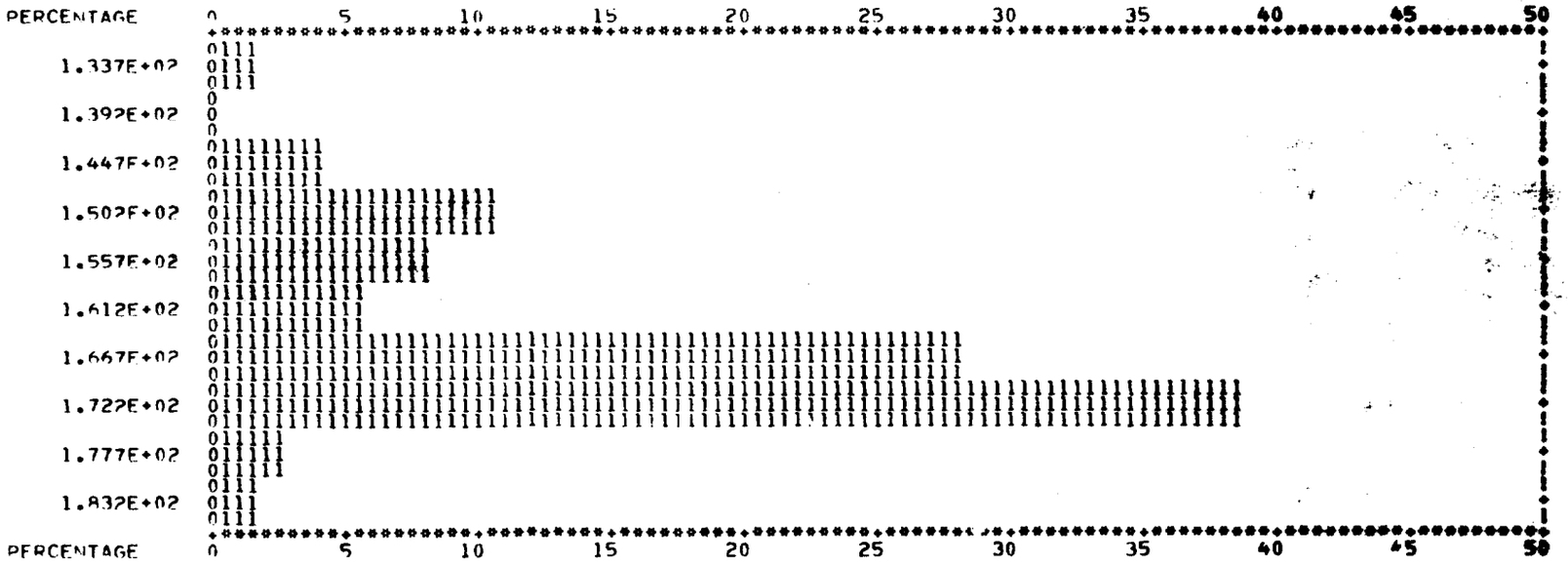


BIN	123.95	129.85	135.75	141.65	147.55	153.45	159.35	165.25	171.15	177.05
CONTENT	1.00	0.0	2.00	3.00	6.00	9.00	14.00	36.00	3.00	1.00

A-14

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 102 103 104 301 302 303 304 305
STEP = 5.50000095
CENTERPOINT OF INITIAL GROUP= 133.749985
CENTERPOINT OF FINAL GROUP = 183.250000
NUMBER OF OBSERVATIONS = 75
NUMBER OF GROUPS = 10



BIN	133.75	139.25	144.75	150.25	155.75	161.25	166.75	172.25	177.75	183.25
CONTENT	1.00	0.0	3.00	8.00	6.00	4.00	21.00	29.00	2.00	1.00

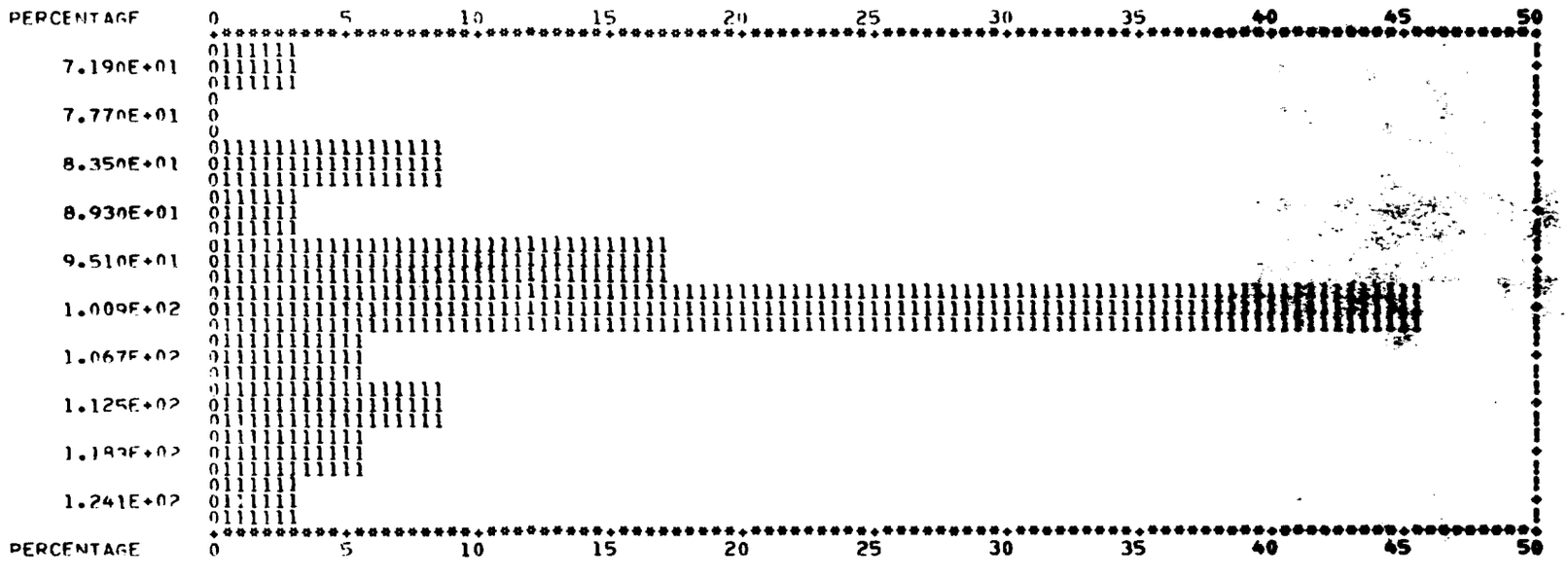
A-15
38

CALIFORNIA

A-16
34

PLANTING DATE

CROP TYPE IS CT
SEGMENTS = [illegible] 261 263 278
STEP = 5.90000114
CENTERPOINT OF INITIAL GROUP= 71.8999786 NUMBER OF OBSERVATIONS = 35
CENTERPOINT OF FINAL GROUP = 124.099991 NUMBER OF GROUPS = 10

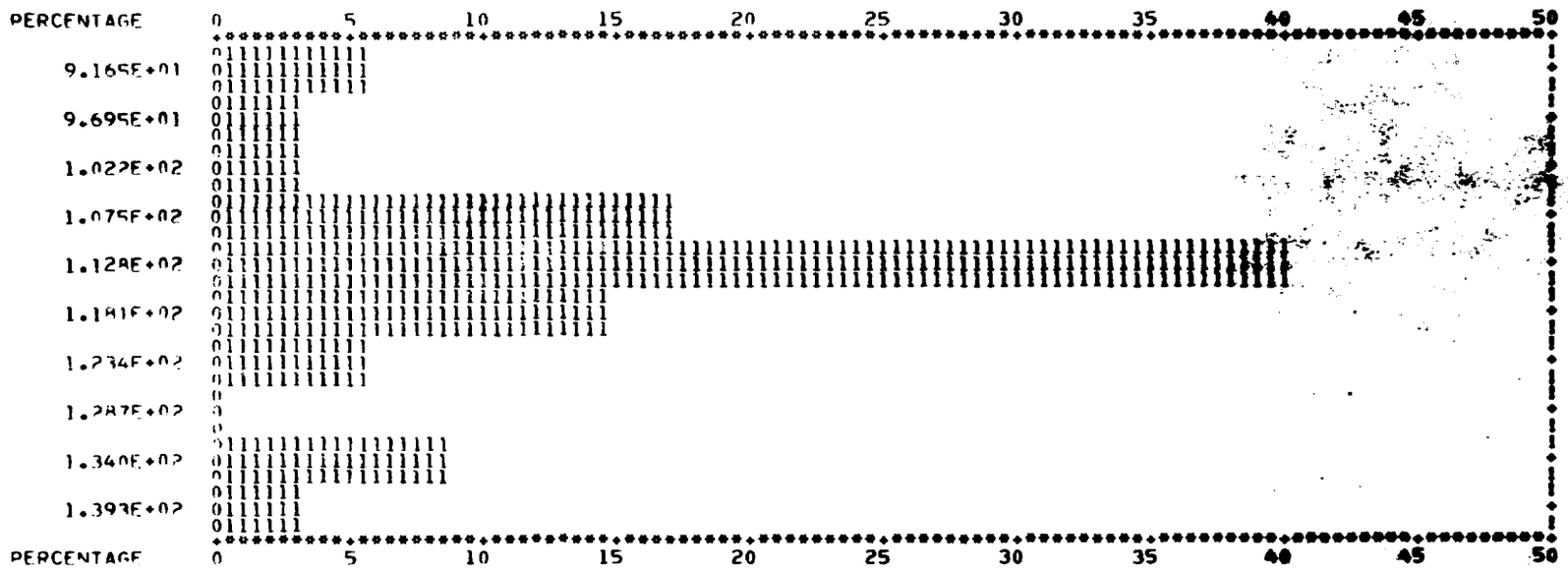


BIN	71.90	77.70	83.50	89.30	95.10	100.90	106.70	112.50	118.30	124.10
CONTENT	1.00	0.0	3.00	1.00	6.00	16.00	2.00	3.00	2.00	1.00

A-17
46

EMERGENCE DATE

CROP TYPE IS CT
SEGMENTS = 261 263 278
STEP = 5.4999911
CENTERPOINT OF INITIAL GROUP= 91.6499786 NUMBER OF OBSERVATIONS = 35
CENTERPOINT OF FINAL GROUP = 139.349991 NUMBER OF GROUPS = 10



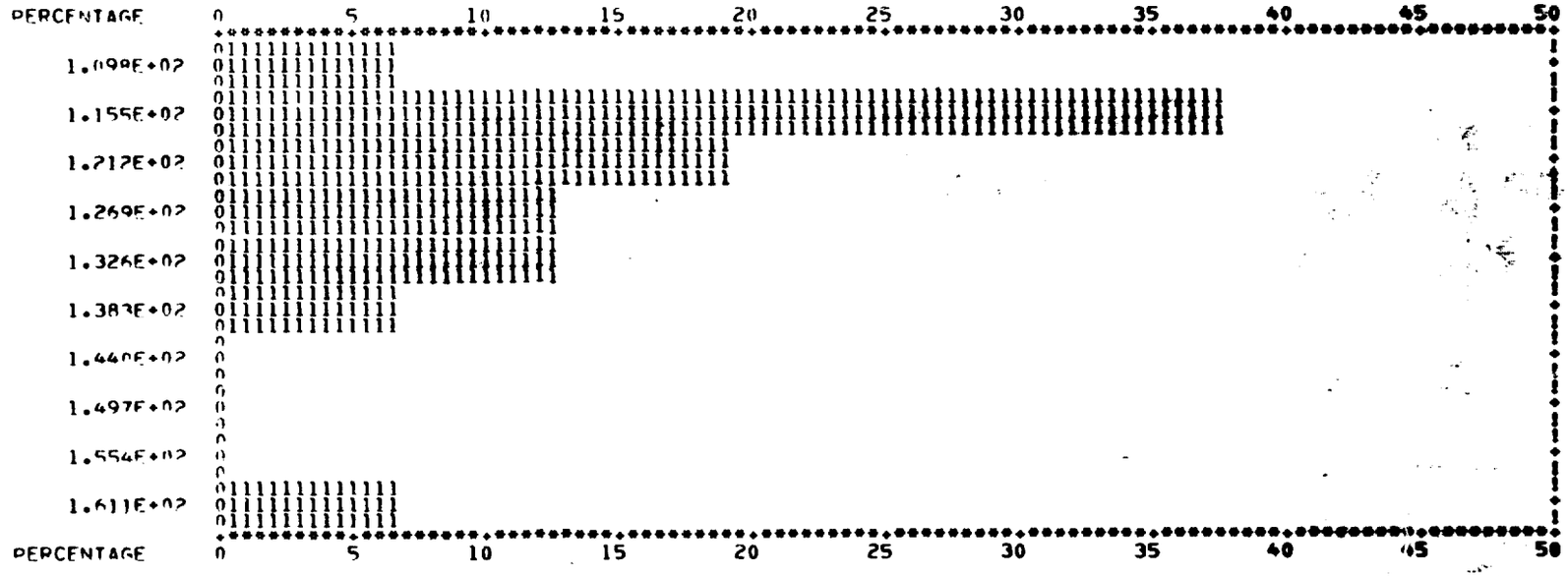
	BIN	91.65	96.95	102.25	107.55	112.85	118.15	123.45	128.75	134.05	139.35
	CONTENT	2.00	1.00	1.00	6.00	14.00	5.00	2.00	0.0	3.00	1.00

PLANTING DATE

CROP TYPE IS RI
SEGMENTS = 260 261

STEP = 5.70000172
CENTERPOINT OF INITIAL GROUP = 109.849976
CENTERPOINT OF FINAL GROUP = 161.149994

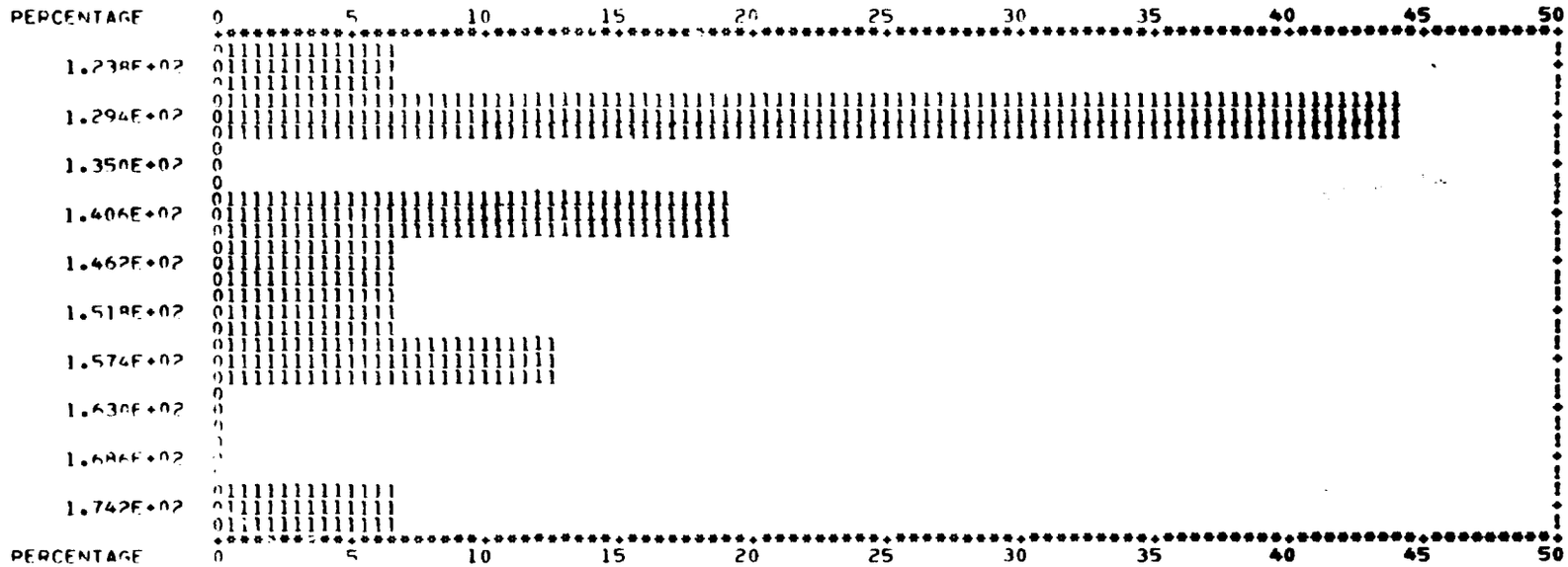
NUMBER OF OBSERVATIONS = 16
NUMBER OF GROUPS = 10



BIN	109.85	115.55	121.25	126.95	132.65	138.35	144.05	149.75	155.45	161.15
CONTENT	1.00	6.00	3.00	2.00	2.00	1.00	0.0	0.0	0.0	1.00

EMERGENCE DATE

CROP TYPE IS RI
SEGMENTS = 260 261
STEP = 5.60000229
CENTERPOINT OF INITIAL GROUP= 123.799973 NUMBER OF OBSERVATIONS = 16
CENTERPOINT OF FINAL GROUP = 174.199997 NUMBER OF GROUPS = 10



	RI
	123.80 129.40 135.00 140.60 146.20 151.80 157.40 163.00 168.60 174.20
CONTENT	1.00 7.00 0.0 3.00 1.00 1.00 2.00 0.0 0.0 1.00

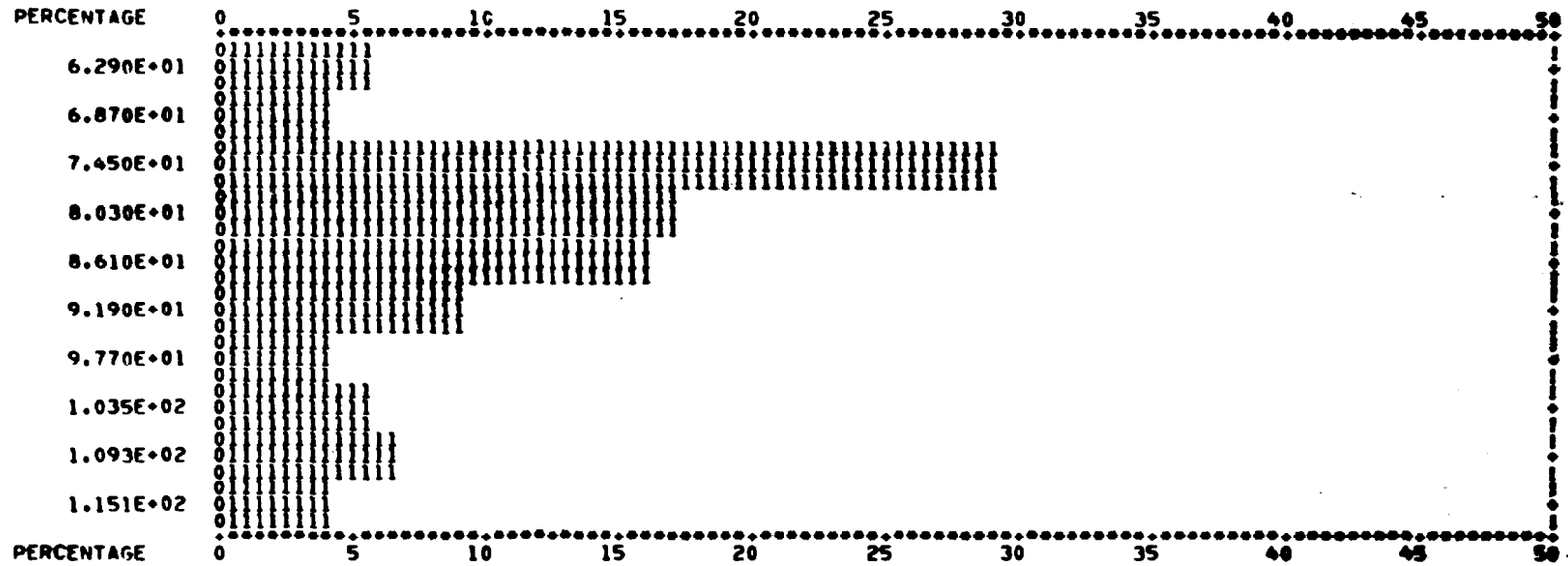
A-20
43

GEORGIA

A-24
XX

PLANTING DATE

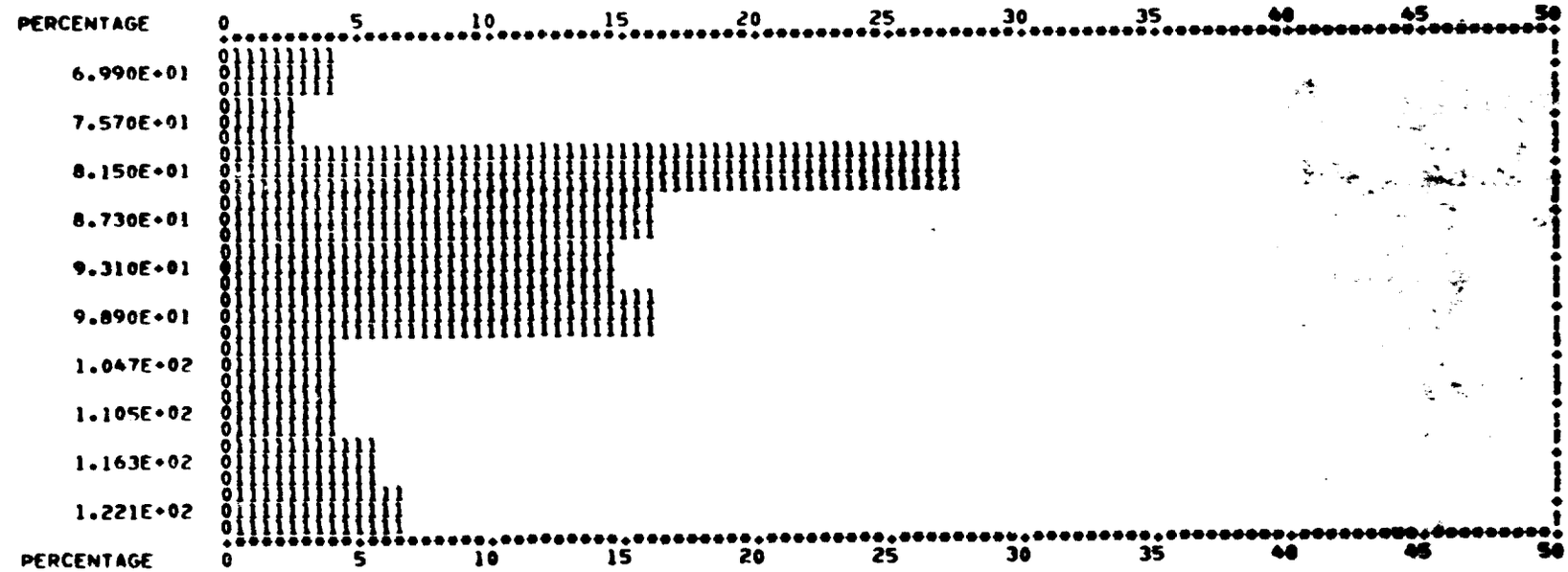
CROP TYPE IS CR
SEGMENTS = 311 312 330 333 334
STEP = 5.80000114
CENTERPOINT OF INITIAL GROUP= 62.8999786 NUMBER OF OBSERVATIONS = 76
CENTERPOINT OF FINAL GROUP = 115.099991 NUMBER OF GROUPS = 10



BIN	62.90	68.70	74.50	80.30	86.10	91.90	97.70	103.50	109.30	115.10
CONTENT	4.00	3.00	22.00	13.00	12.00	7.00	3.00	4.00	5.00	3.00

EMERGENCE DATE

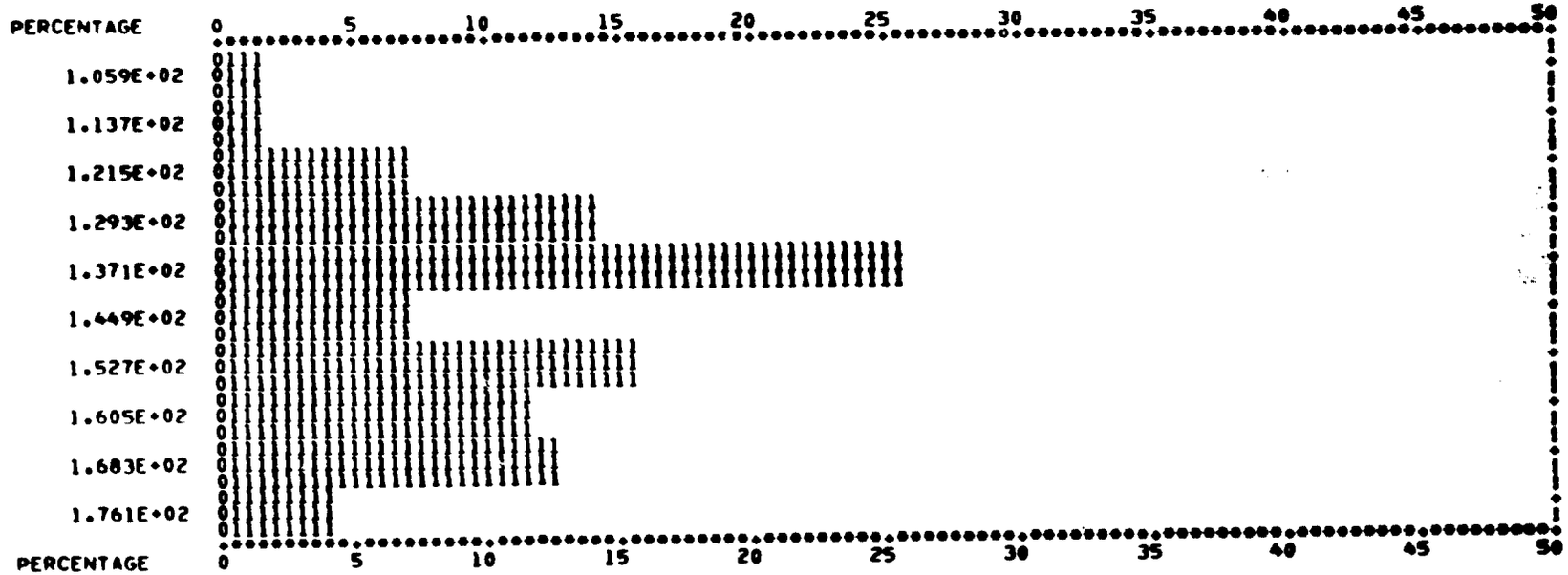
CROP TYPE IS CR
SEGMENTS = 311 312 330 333 334
STEP = 5.00000114
CENTERPOINT OF INITIAL GROUP = 69.8999786
CENTERPOINT OF FINAL GROUP = 122.099991
NUMBER OF OBSERVATIONS = 76
NUMBER OF GROUPS = 10



BIN	69.90	75.70	81.50	87.30	93.10	98.90	104.70	110.50	116.30	122.10
CONTENT	3.00	2.00	21.00	12.00	11.00	12.00	3.00	3.00	4.00	5.00

PLANTING DATE

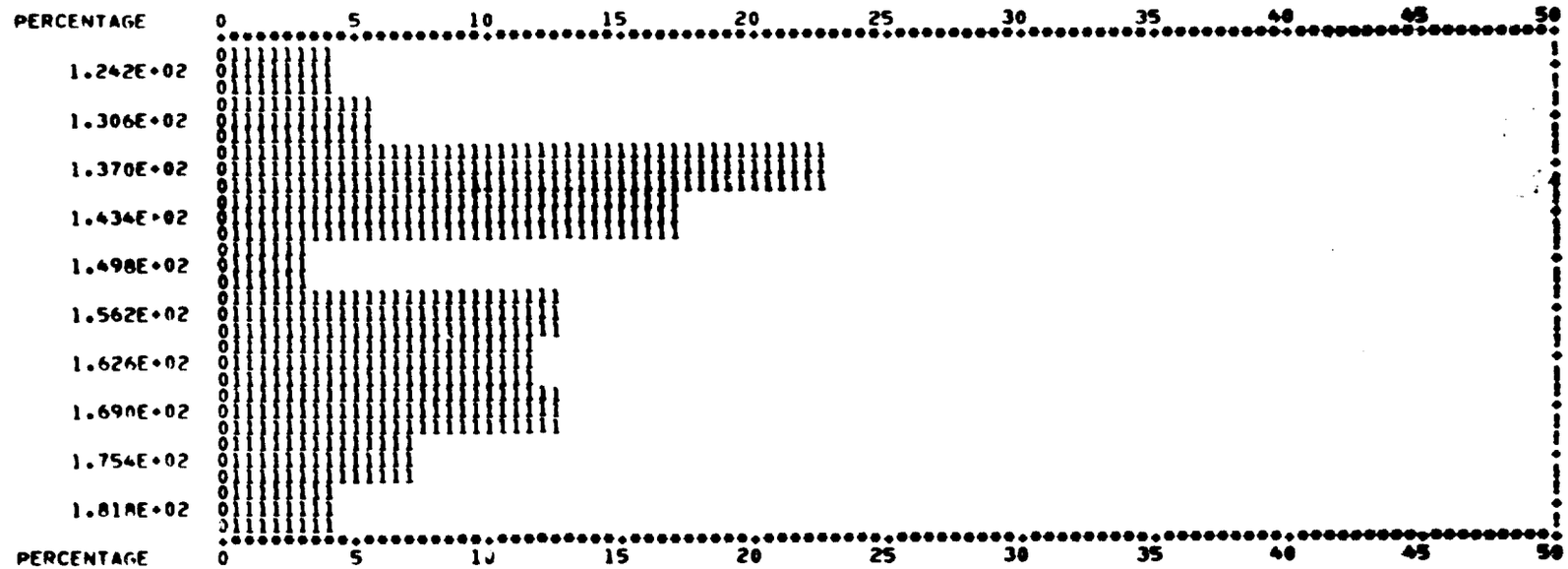
CROP TYPE IS SO
SEGMENTS = 311 312 330 333 334
STEP = 7.80000114
CENTERPOINT OF INITIAL GROUP= 105.899979
CENTERPOINT OF FINAL GROUP = 176.099991
NUMBER OF OBSERVATIONS = 71
NUMBER OF GROUPS = 10



BIN	105.90	113.70	121.50	129.30	137.10	144.90	152.70	160.50	168.30	176.10
CONTENT	1.00	1.00	5.00	10.00	18.00	5.00	11.00	8.00	9.00	3.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 311 312 330 333 334
STEP = 6.40000057
CENTERPOINT OF INITIAL GROUP= 124.199982
CENTERPOINT OF FINAL GROUP = 181.799988
NUMBER OF OBSERVATIONS = 71
NUMBER OF GROUPS = 10



BIN	124.20	130.60	137.00	143.40	149.80	156.20	162.60	169.00	175.40	181.80
CONTENT	3.00	4.00	16.00	12.00	2.00	9.00	8.00	9.00	5.00	3.00

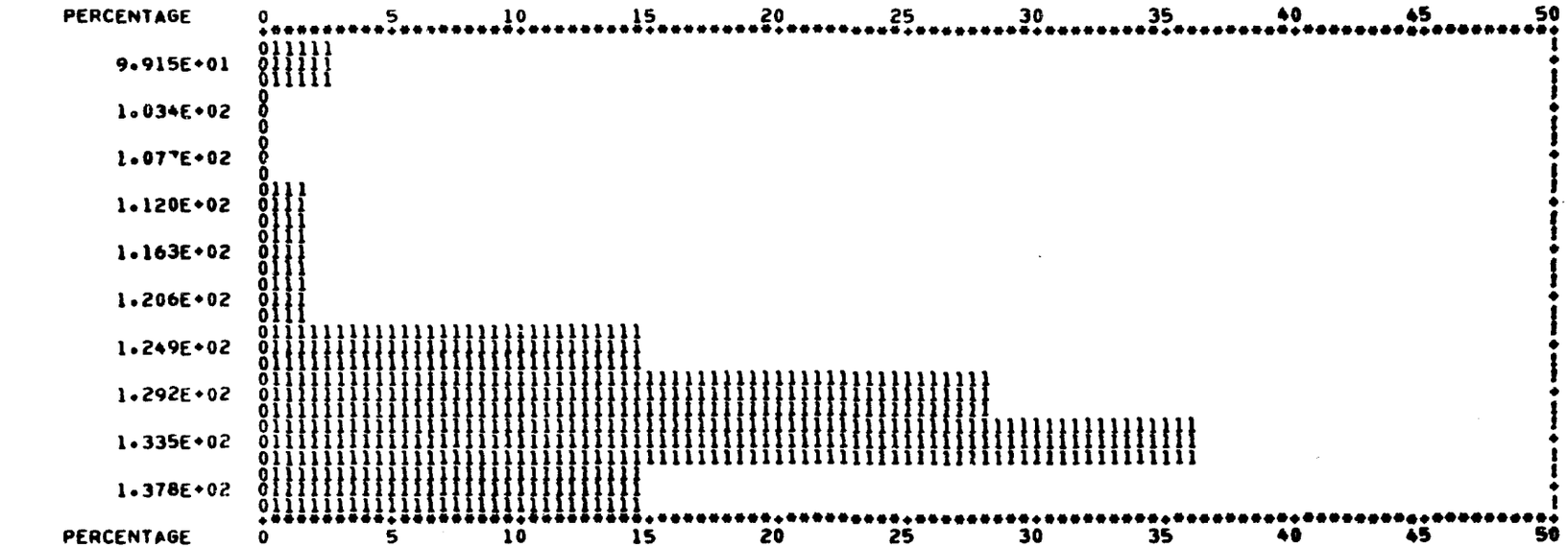
ILLINOIS

A-26

47

PLANTING DATE

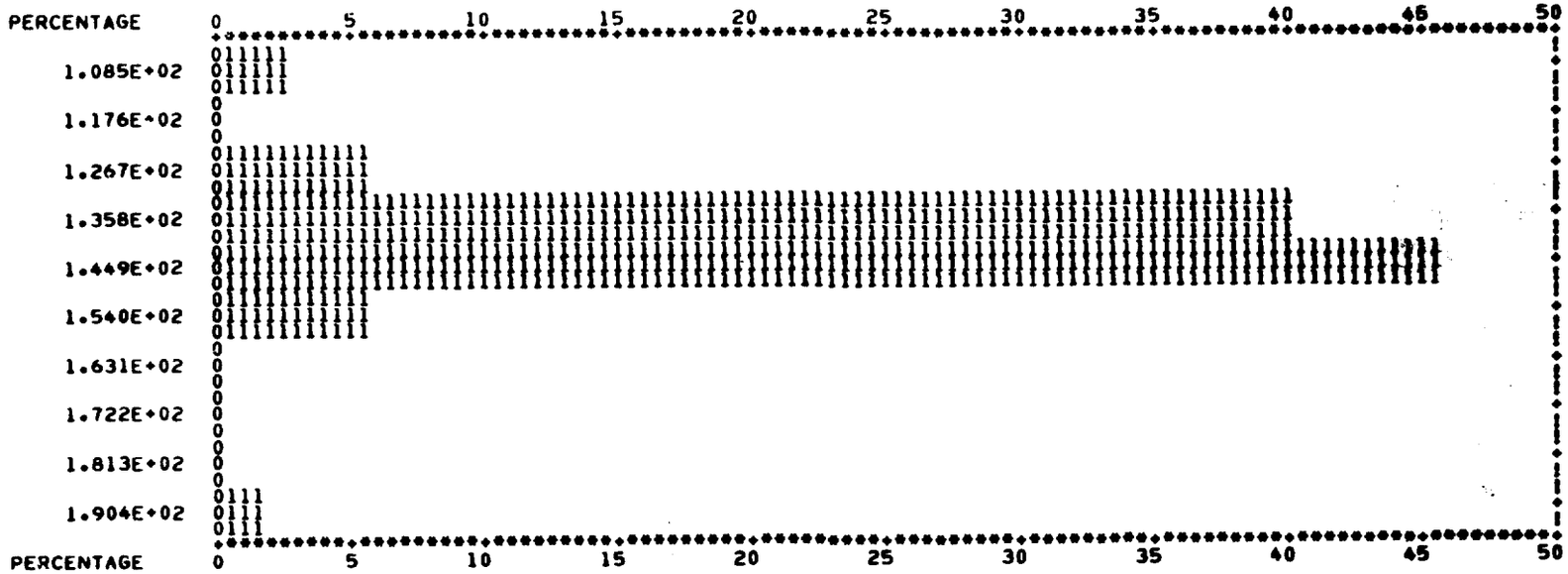
CROP TYPE IS CR
SEGMENTS = 107 114 805 824 828
STEP = 4.30000114
CENTERPOINT OF INITIAL GROUP= 99.1499786 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 137.849991 NUMBER OF GROUPS = 10



BIN	99.15	103.45	107.75	112.05	116.35	120.65	124.95	129.25	133.55	137.85
CONTENT	2.00	0.0	0.0	1.00	1.00	1.00	11.00	21.00	27.00	11.00

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 107 114 805 824 828
STEP = 9.10000229
CENTERPOINT OF INITIAL GROUP= 108.549973 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 190.449997 NUMBER OF GROUPS = 10

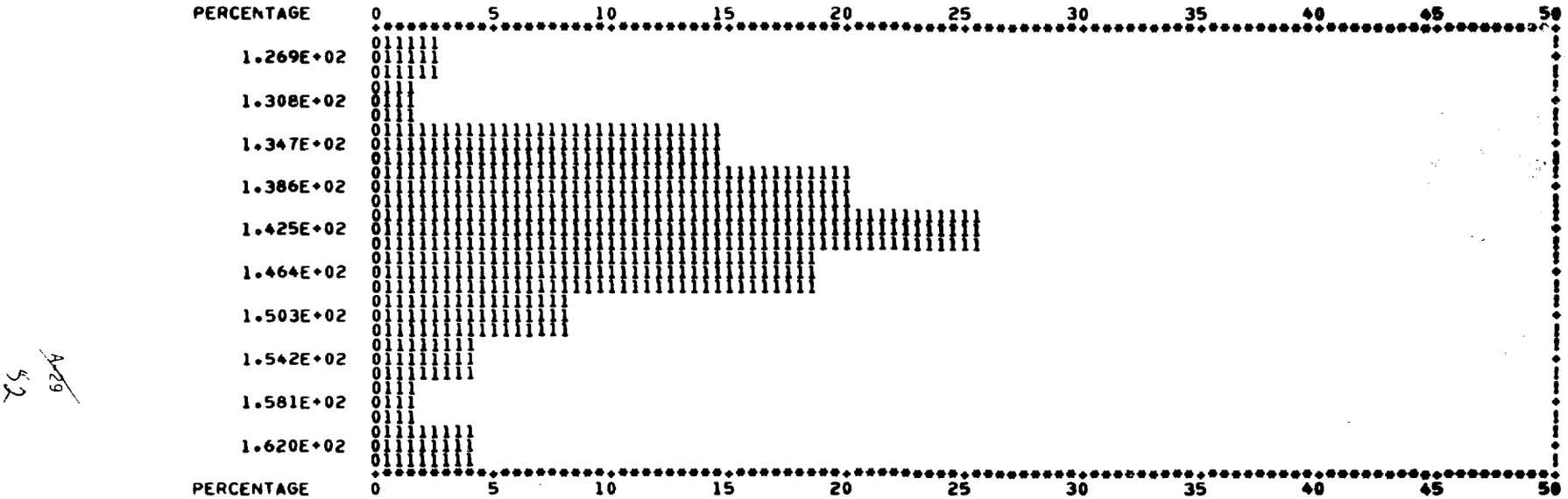


BIN	108.55	117.65	126.75	135.85	144.95	154.05	163.15	172.25	181.35	190.45
CONTENT	2.00	0.0	4.00	30.00	34.00	4.00	0.0	0.0	0.0	1.00

A-28
51

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 107 114 805 824 828
STEP = 3.90000057
CENTERPOPINT OF INITIAL GROUP= 126.949982 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 162.049988 NUMBER OF GROUPS = 10

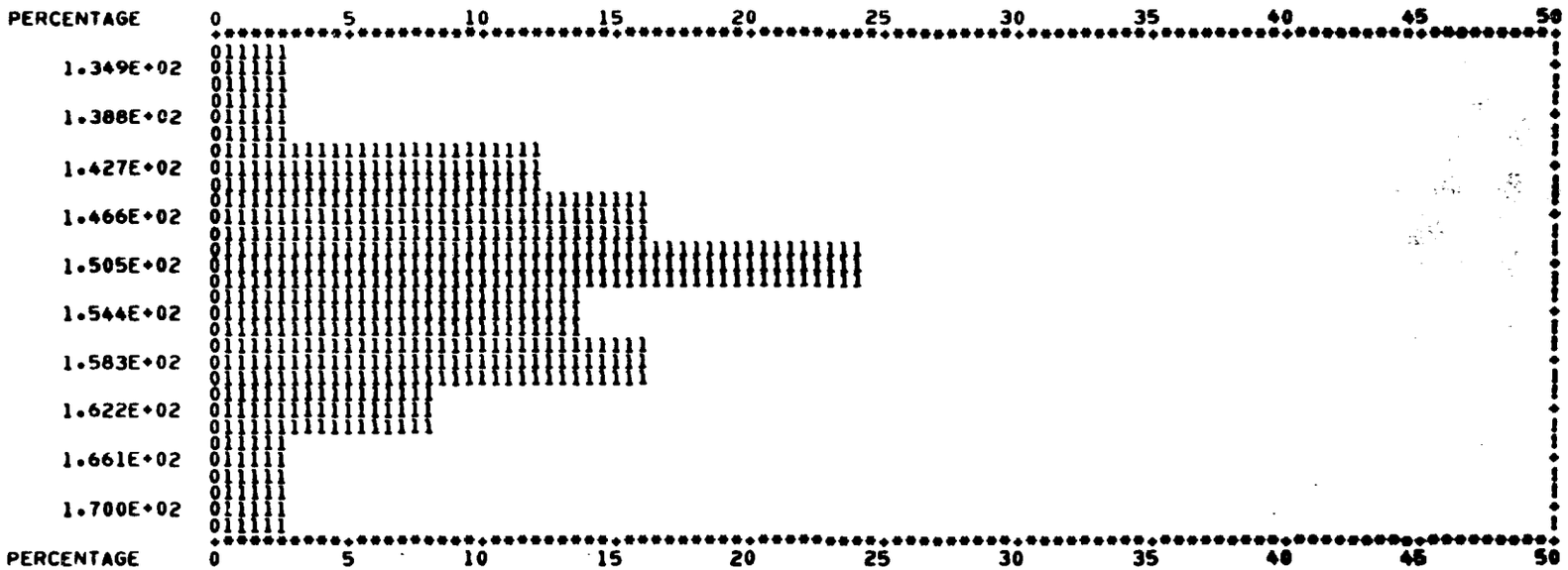


BIN	126.95	130.85	134.75	138.65	142.55	146.45	150.35	154.25	158.15	162.05
CONTENT	2.00	1.00	11.00	15.00	19.00	14.00	6.00	3.00	1.00	3.00

A29
52

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 107 114 805 824 828
STEP = 3.90000057
CENTERPOINT OF INITIAL GROUP= 134.949982 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 170.049988 NUMBER OF GROUPS = 10



BIN	134.95	138.85	142.75	146.65	150.55	154.45	158.35	162.25	166.15	170.05
CONTENT	2.00	2.00	9.00	12.00	18.00	10.00	12.00	6.00	2.00	2.00

A-30
53

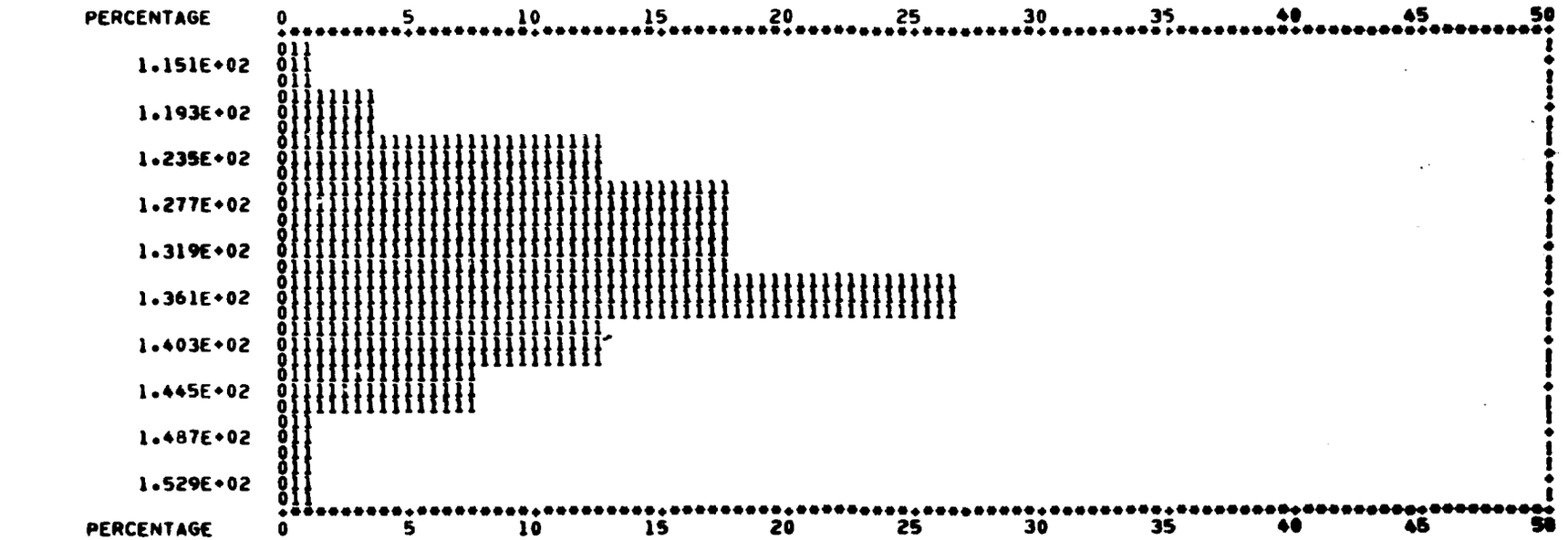
INDIANA

A-31

SK

PLANTING DATE

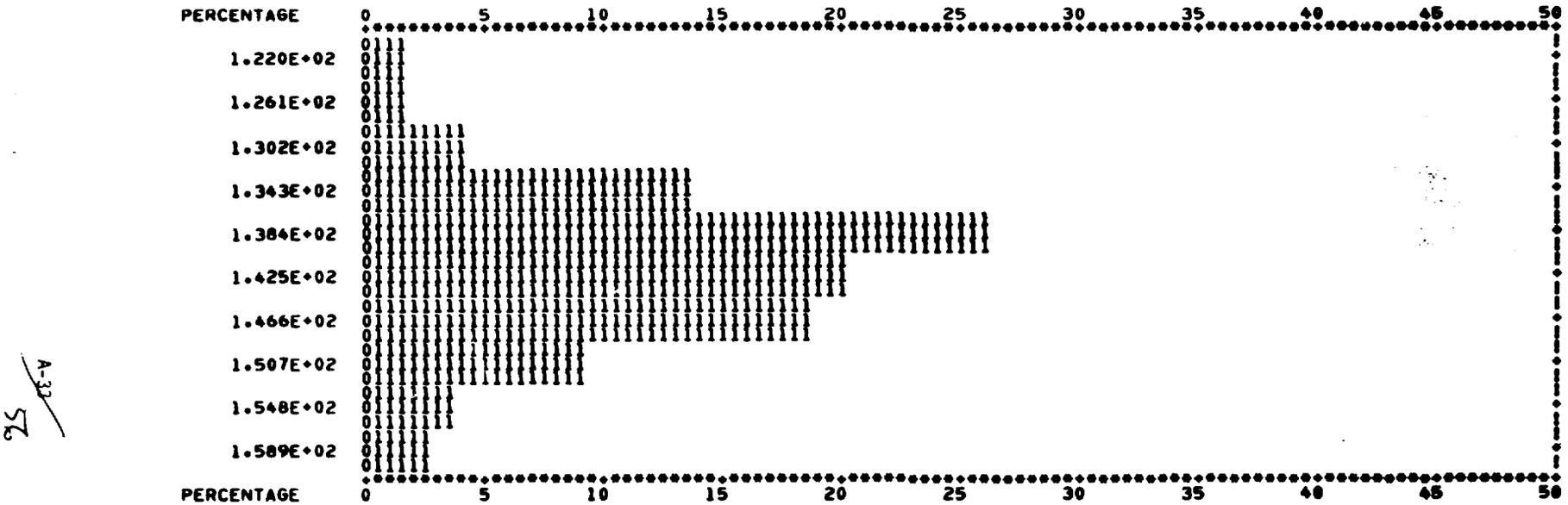
CROP TYPE IS CR
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 4.20000172
CENTERPOINT OF INITIAL GROUP= 115.099976 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 152.899994 NUMBER OF GROUPS = 10



BIN	115.10	119.30	123.50	127.70	131.90	136.10	140.30	144.50	148.70	152.90
CONTENT	1.00	4.00	15.00	21.00	21.00	32.00	15.00	9.00	1.00	1.00

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 4.10000229
CENTERPOINT OF INITIAL GROUP= 122.049973 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 158.949997 NUMBER OF GROUPS = 10

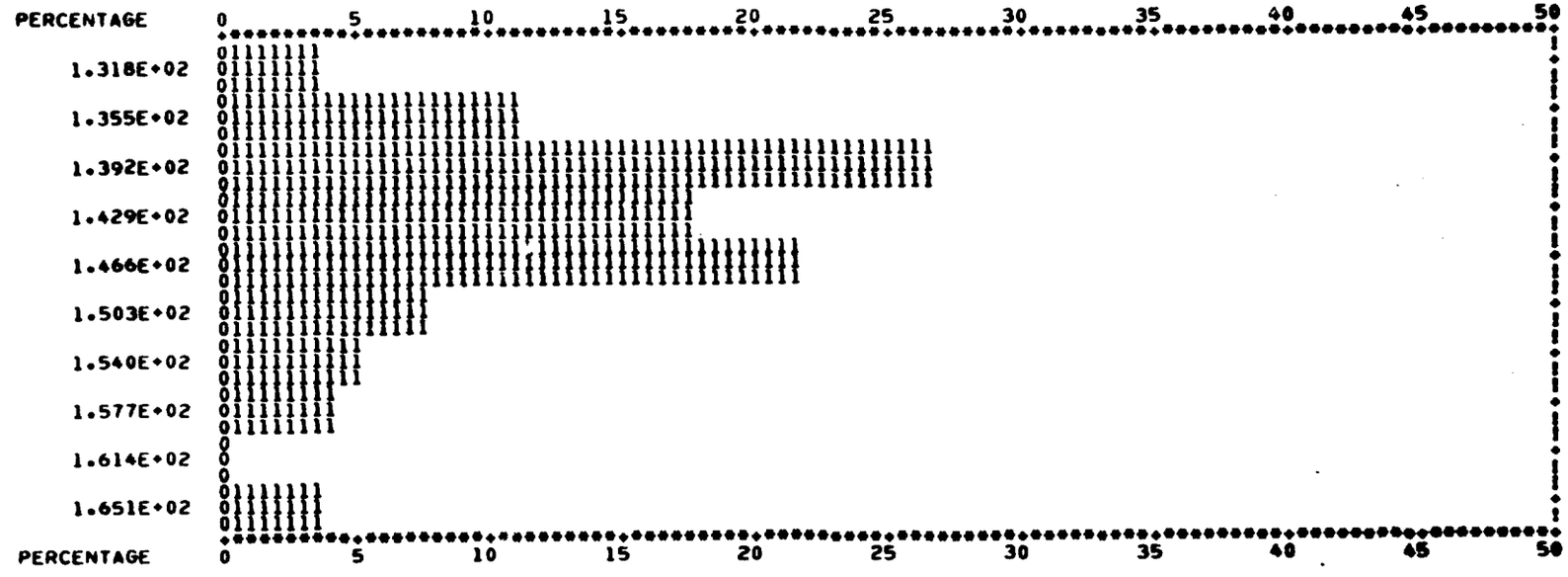


BIN	122.05	126.15	130.25	134.35	138.45	142.55	146.65	150.75	154.85	158.95
CONTENT	2.00	2.00	5.00	16.00	31.00	24.00	22.00	11.00	4.00	3.00

A-33
56

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 3.70000172
CENTERPOPINT OF INITIAL GROUP= 131.849976 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 165.149994 NUMBER OF GROUPS = 10

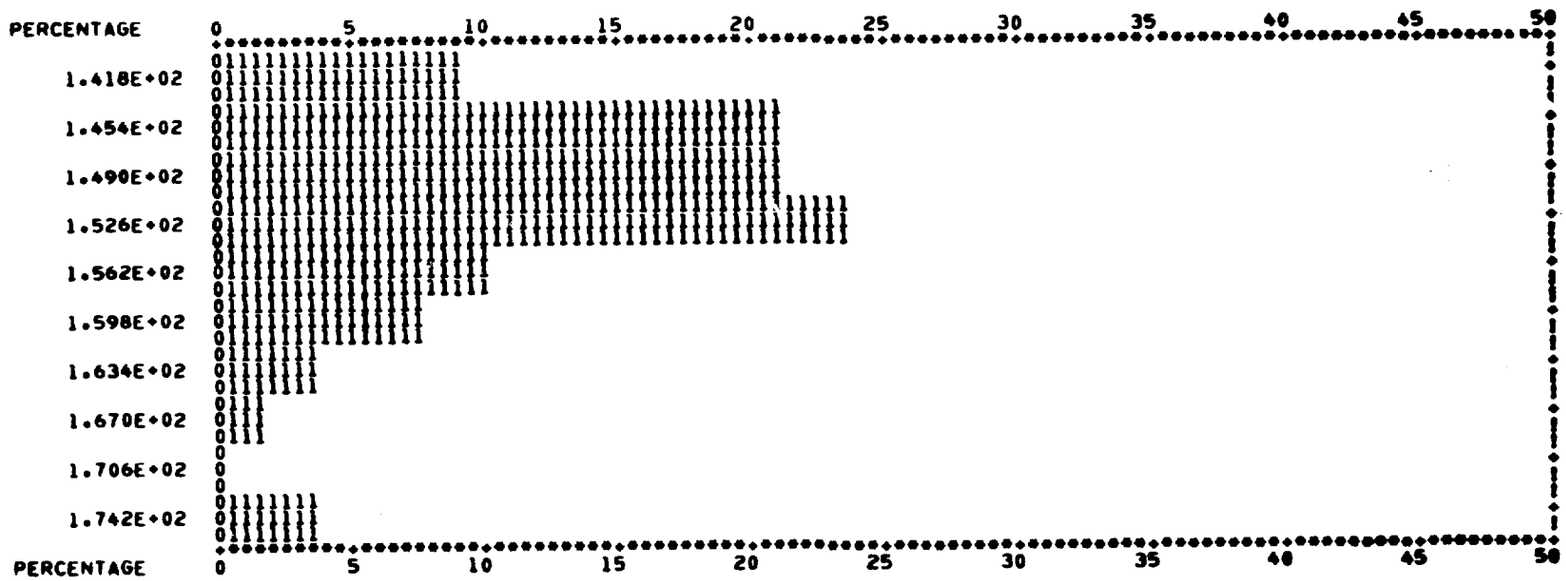


BIN	131.85	135.55	139.25	142.95	146.65	150.35	154.05	157.75	161.45	165.15
CONTENT	4.00	13.00	32.00	21.00	26.00	9.00	6.00	5.00	0.0	4.00

A-34
57

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 3.60000229
CENTERPOPINT OF INITIAL GROUP= 141.799973
CENTERPOINT OF FINAL GROUP = 174.199997
NUMBER OF OBSERVATIONS = 120
NUMBER OF GROUPS = 10

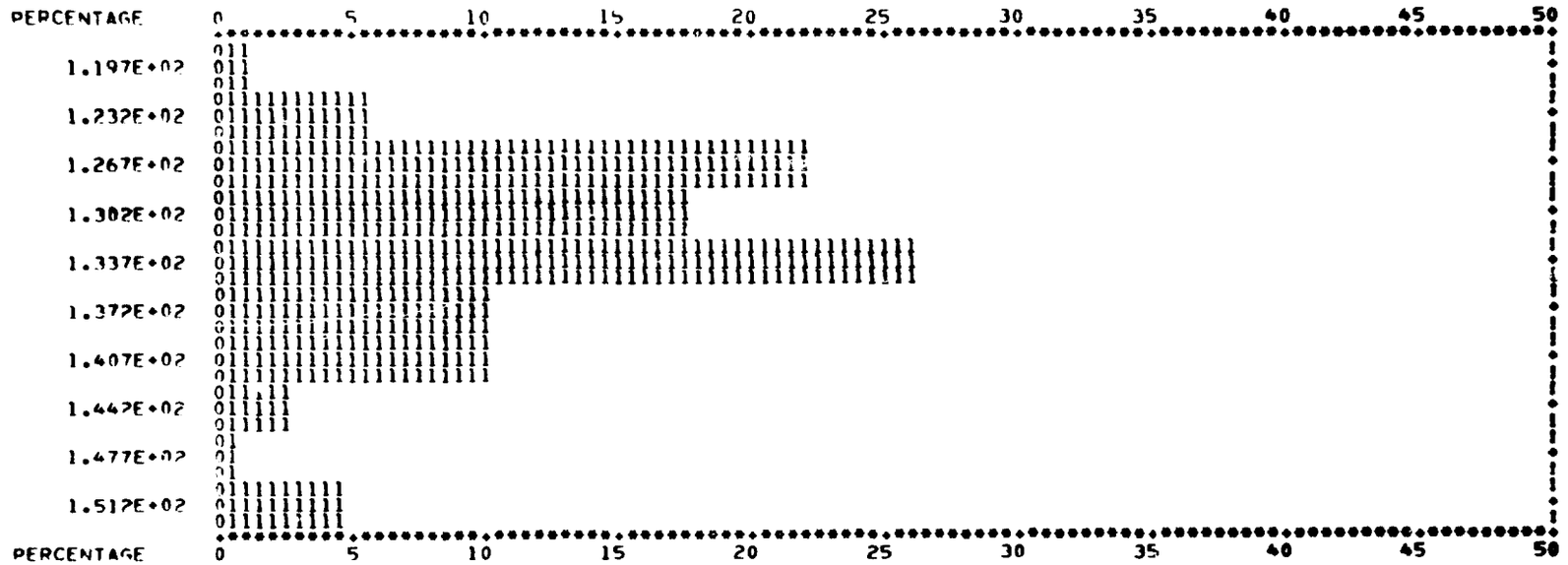


BIN	141.80	145.40	149.00	152.60	156.20	159.80	163.40	167.00	170.60	174.20
CONTENT	11.00	25.00	25.00	28.00	12.00	9.00	4.00	2.00	0.0	4.00

IOWA

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 3.50000095
CENTERPOINT OF INITIAL GROUP= 119.749985 NUMBER OF OBSERVATIONS = 160
CENTERPOINT OF FINAL GROUP = 151.250000 NUMBER OF GROUPS = 10

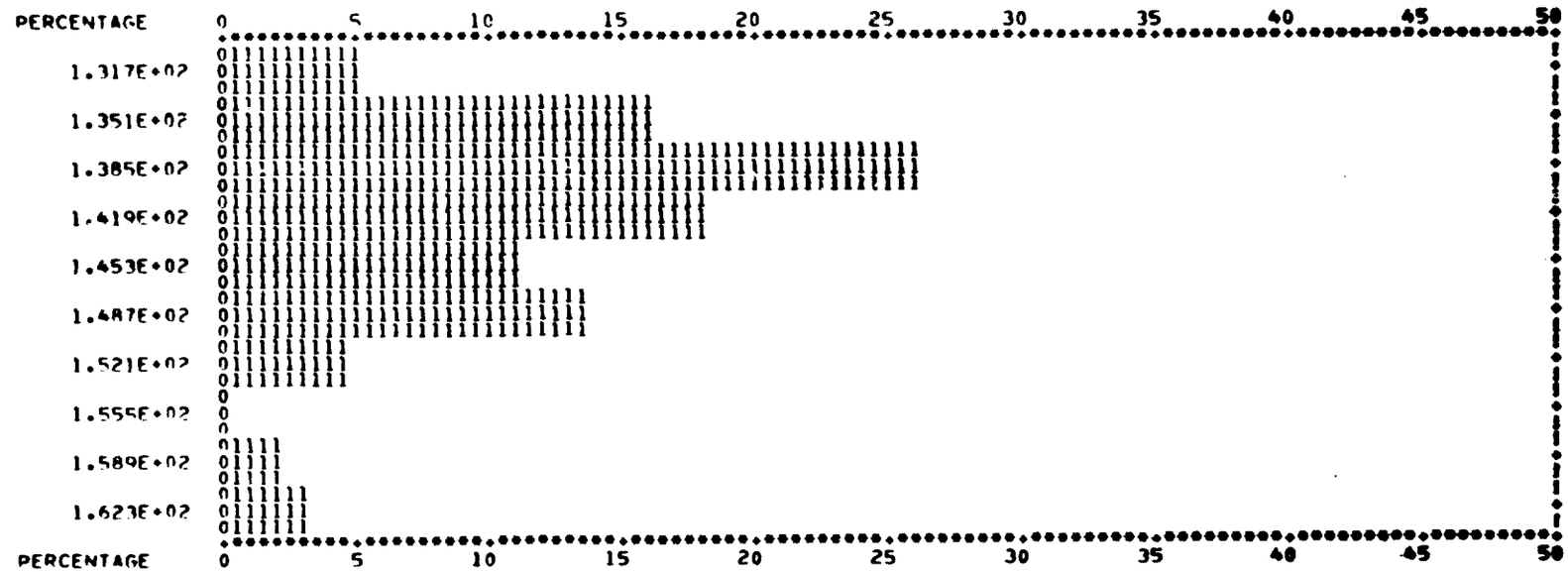


BIN	119.75	123.25	126.75	130.25	133.75	137.25	140.75	144.25	147.75	151.25
CONTENT	2.00	9.00	35.00	28.00	42.00	16.00	16.00	4.00	1.00	7.00

A-37

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 3.40000057
CENTERPOINT OF INITIAL GROUP= 131.699982 NUMBER OF OBSERVATIONS = 160
CENTERPOINT OF FINAL GROUP = 162.299988 NUMBER OF GROUPS = 10

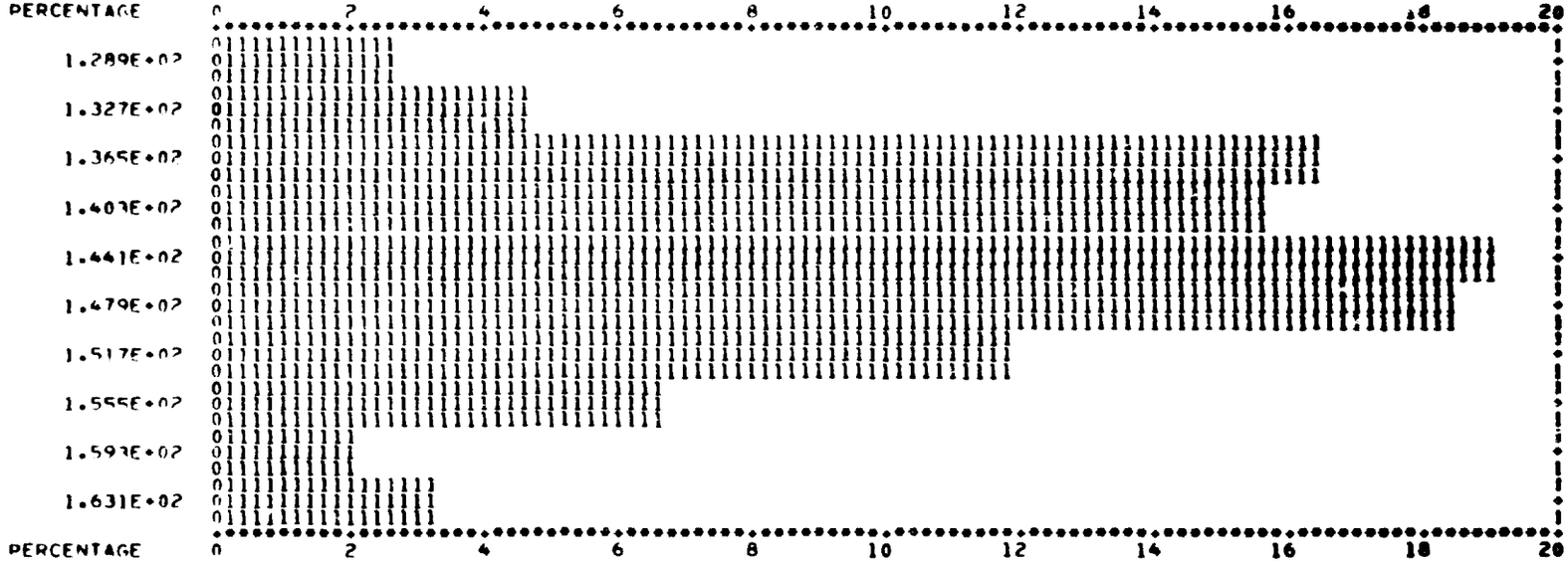


BIN	131.70	135.10	138.50	141.90	145.30	148.70	152.10	155.50	158.90	162.30
CONTENT	8.00	26.00	42.00	29.00	18.00	22.00	7.00	0.0	3.00	5.00

12 A-38

PLANTING DATE

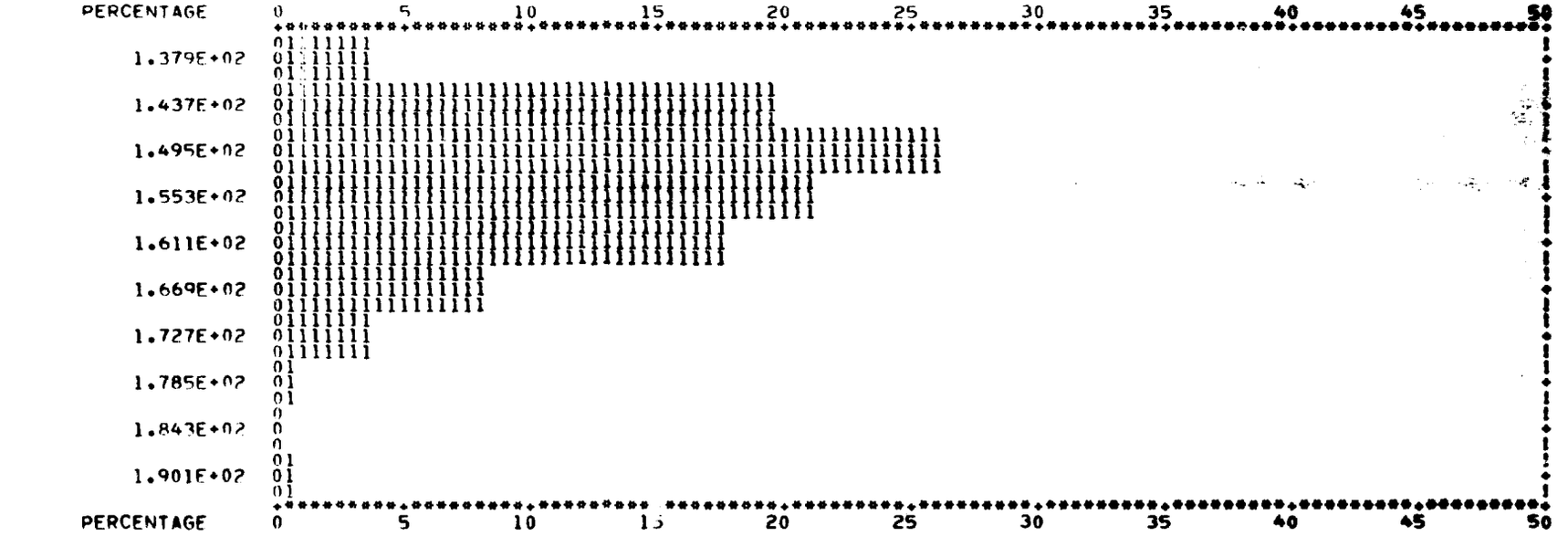
CROP TYPE IS SO
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 3.00000114
CENTERPOINT OF INITIAL GROUP= 128.899979
CENTERPOINT OF FINAL GROUP = 163.099991
NUMBER OF OBSERVATIONS = 153
NUMBER OF GROUPS = 10



BIN	128.90	132.70	136.50	140.30	144.10	147.90	151.70	155.50	159.30	163.10
CONTENT	4.00	7.00	25.00	24.00	29.00	28.00	18.00	10.00	3.00	5.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 5.80000114
CENTERPOINT OF INITIAL GROUP= 137.899979 NUMBER OF OBSERVATIONS = 153
CENTERPOINT OF FINAL GROUP = 190.099991 NUMBER OF GROUPS = 10



BIN	137.90	143.70	149.50	155.30	161.10	166.90	172.70	178.50	184.30	190.10
CONTENT	5.00	30.00	40.00	32.00	27.00	12.00	5.00	1.00	0.0	1.00

A-40

LOUISIANA

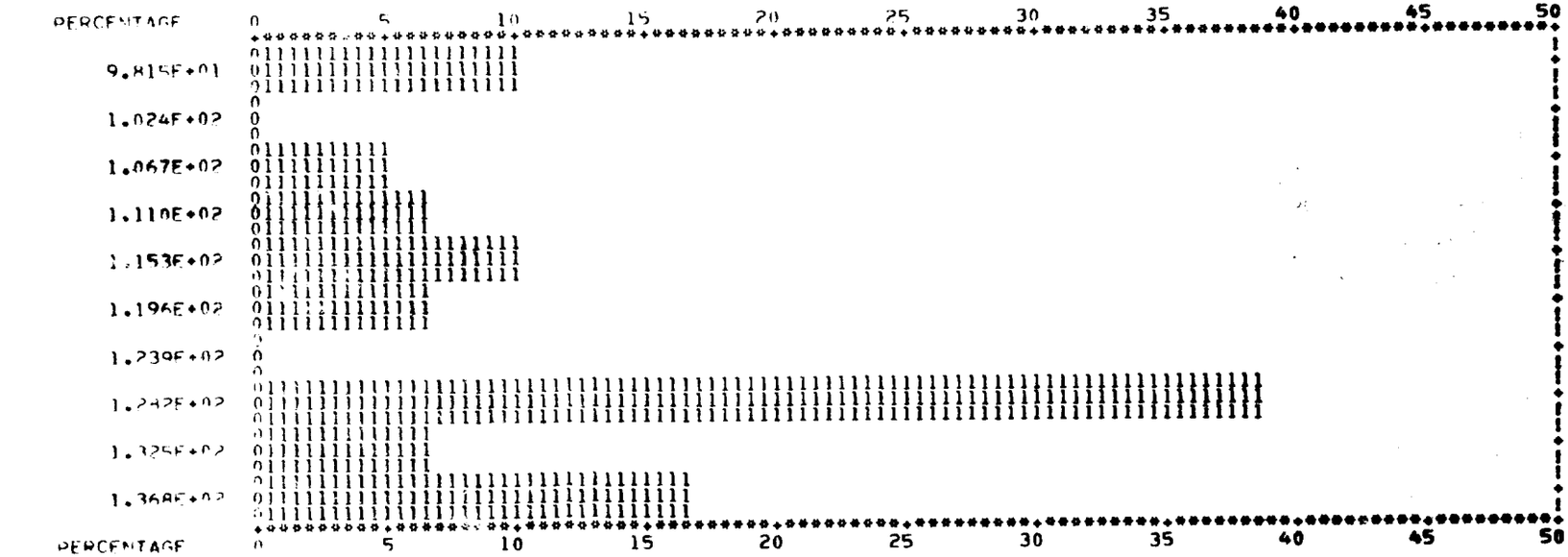
PLANTING DATE

CROP TYPE IS CT
SEGMENTS = 174

269 270 271 273 274

STEP = 4.30000114
CENTERPOINT OF INITIAL GROUP= 98.1499786
CENTERPOINT OF FINAL GROUP = 136.849991

NUMBER OF OBSERVATIONS = 60
NUMBER OF GROUPS = 10



MID	98.15	102.45	106.75	111.05	115.35	119.65	123.95	128.25	132.55	136.85
CONTENT	6.00	0.0	3.00	4.00	6.00	4.00	0.0	23.00	4.00	10.00

A-42
4-5

ORIGINAL PAGE IS
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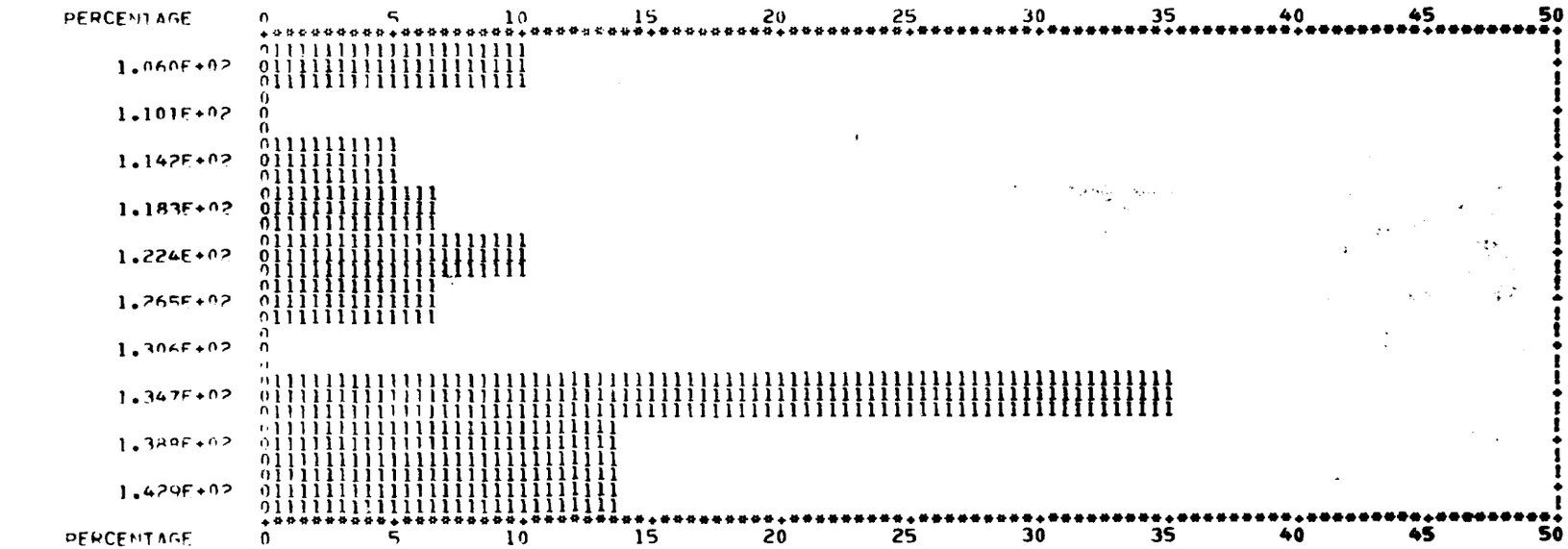
EMERGENCE DATE

CROP TYPE IS CT
SEGMENTS = 174

269 270 271 273 274

STEP = 4.10000229
CENTERPOINT OF INITIAL GROUP= 106.049971
CENTERPOINT OF FINAL GROUP = 142.949997

NUMBER OF OBSERVATIONS = 60
NUMBER OF GROUPS = 10

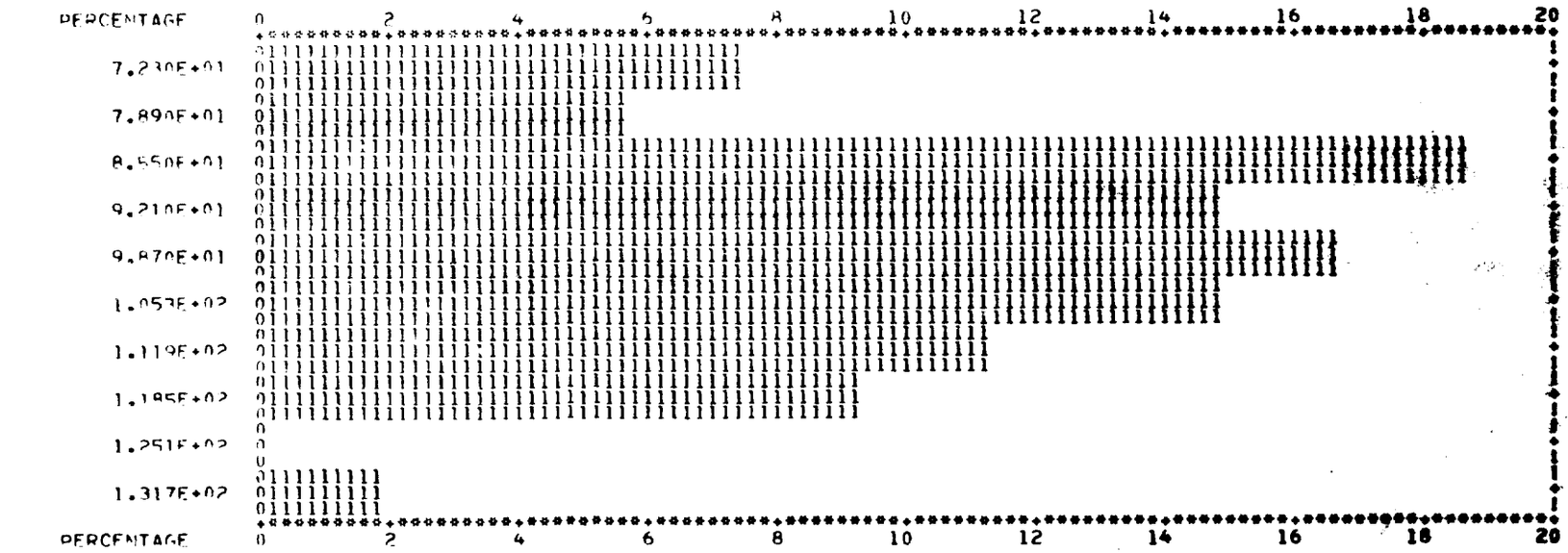


BIN	106.05	110.15	114.25	118.35	122.45	126.55	130.65	134.75	138.85	142.95
CONTENT	6.00	0.0	3.00	4.00	6.00	4.00	0.0	21.00	8.00	8.00

A-43

PLANTING DATE

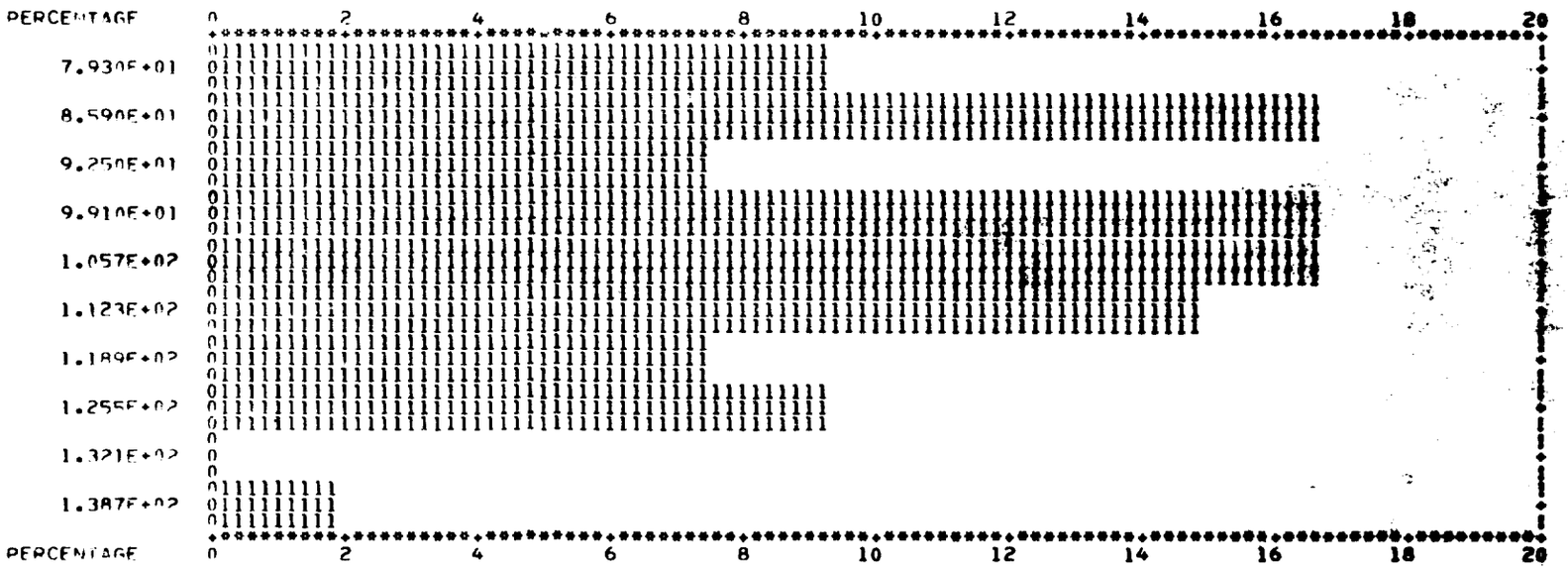
CROP TYPE IS RI
SEGMENTS = 174 266 267 268
STEP = 6.60000229
CENTERPOINT OF INITIAL GROUP= 72.2999725 NUMBER OF OBSERVATIONS = 54
CENTERPOINT OF FINAL GROUP = 131.699997 NUMBER OF GROUPS = 10



	BIN	72.30	78.90	85.50	92.10	98.70	105.30	111.90	118.50	125.10	131.70
	CONTENT	4.00	3.00	10.00	8.00	9.00	8.00	6.00	5.00	0.0	1.00

EMERGENCE DATE

CROP TYPE IS RI
SEGMENTS = 174 266 267 268
STEP = 6.60000229
CENTERPOINT OF INITIAL GROUP= 79.2999725 NUMBER OF OBSERVATIONS = 54
CENTERPOINT OF FINAL GROUP = 138.699997 NUMBER OF GROUPS = 10



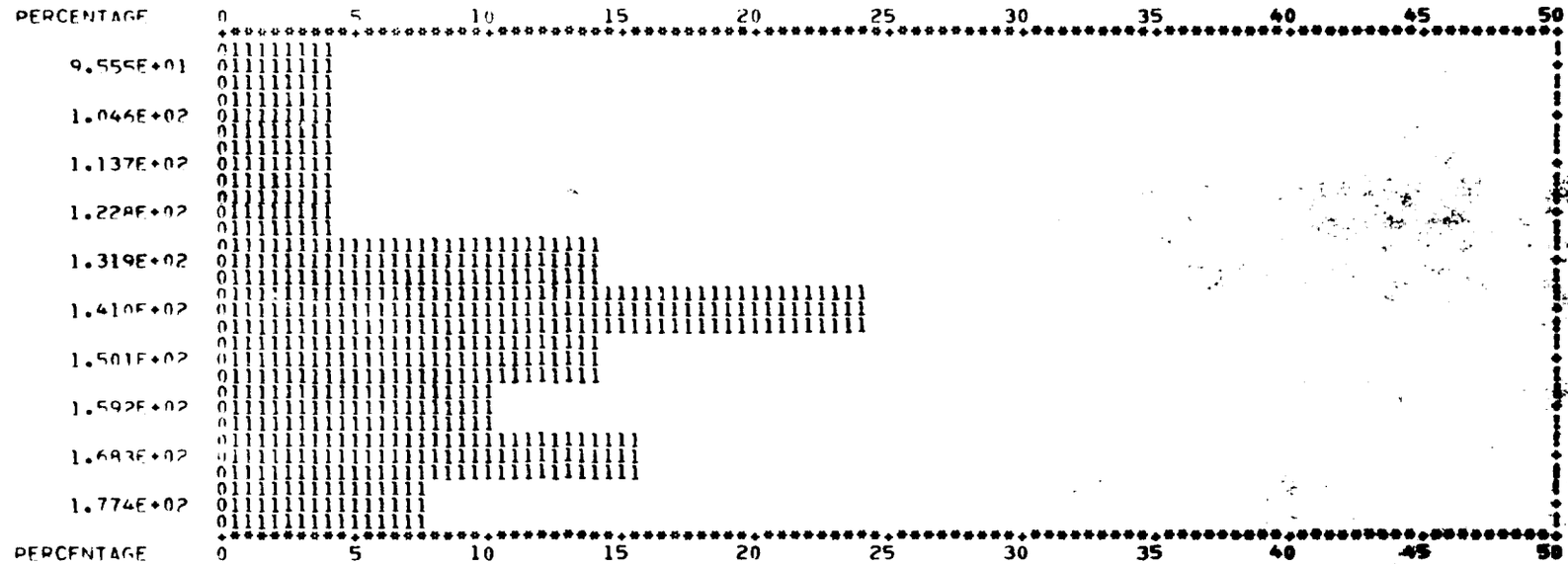
BIN	79.30	85.90	92.50	99.10	105.70	112.30	118.90	125.50	132.10	138.70
CONTENT	5.00	9.00	4.00	9.00	9.00	8.00	4.00	5.00	0.0	1.00

87

A-45

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 174 266 267 268 269 270 271 272 273
STEP = 9.10000229
CENTERPOINT OF INITIAL GROUP= 95.5499725 NUMBER OF OBSERVATIONS = 130
CENTERPOINT OF FINAL GROUP = 177.449997 NUMBER OF GROUPS = 10



BIN	95.55	104.65	113.75	122.85	131.95	141.05	150.15	159.25	168.35	177.45
CONTENT	5.00	5.00	5.00	5.00	18.00	31.00	18.00	13.00	20.00	10.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 174 266 267 268 269 270 271 272 273
STEP = 10.1000023
CENTERPOINT OF INITIAL GROUP= 103.049973
CENTERPOINT OF FINAL GROUP = 193.949997
NUMBER OF OBSERVATIONS = 130
NUMBER OF GROUPS = 10

	BIN:	103.05	113.15	123.25	133.35	143.45	153.55	163.65	173.75	183.85	193.95
	CONTENT	6.00	4.00	5.00	11.00	35.00	18.00	14.00	23.00	13.00	1.00

A-47

MINNESOTA

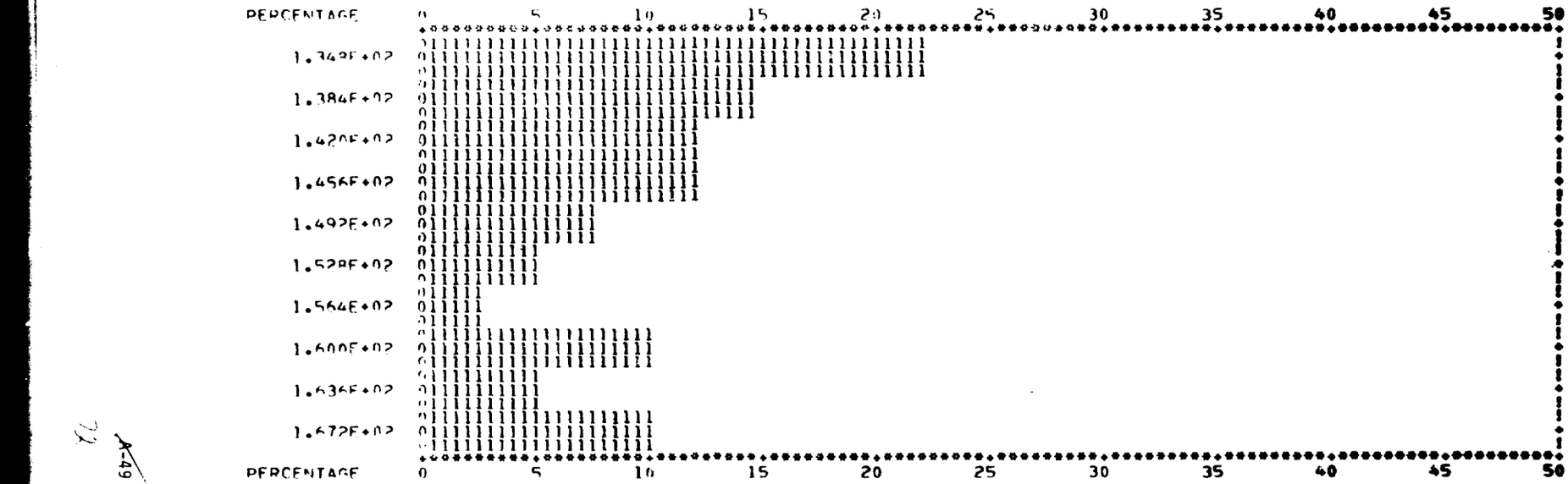
A-48

71

PLANTING DATE

CROP TYPE IS RR
SEGMENTS = 1514 1518 1566 1825 1835

STEP = 3.60000229
CENTERPOINT OF INITIAL GROUP= 134.799973 NUMBER OF OBSERVATIONS = 41
CENTERPOINT OF FINAL GROUP = 167.199997 NUMBER OF GROUPS = 10



BIN	134.80	138.40	142.00	145.60	149.20	152.80	156.40	160.00	163.60	167.20
CONTENT	9.00	6.00	5.00	5.00	3.00	2.00	1.00	4.00	2.00	4.00

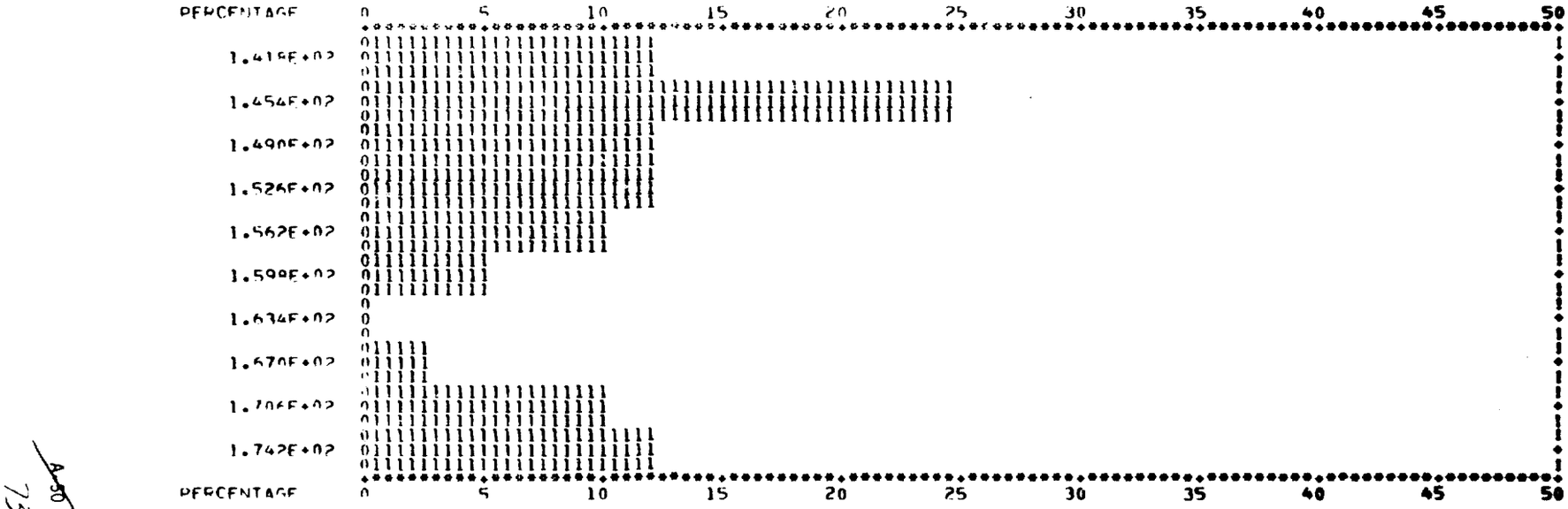
A-49

EMERGENCE DATE

CROP TYPE IS BR
SEGMENTS = 1514 1518 1566 1825 1835

STEP = 3.60000229
CENTERPOINT OF INITIAL GROUP= 141.799771
CENTERPOINT OF FINAL GROUP = 174.199997

NUMBER OF OBSERVATIONS = 41
NUMBER OF GROUPS = 10



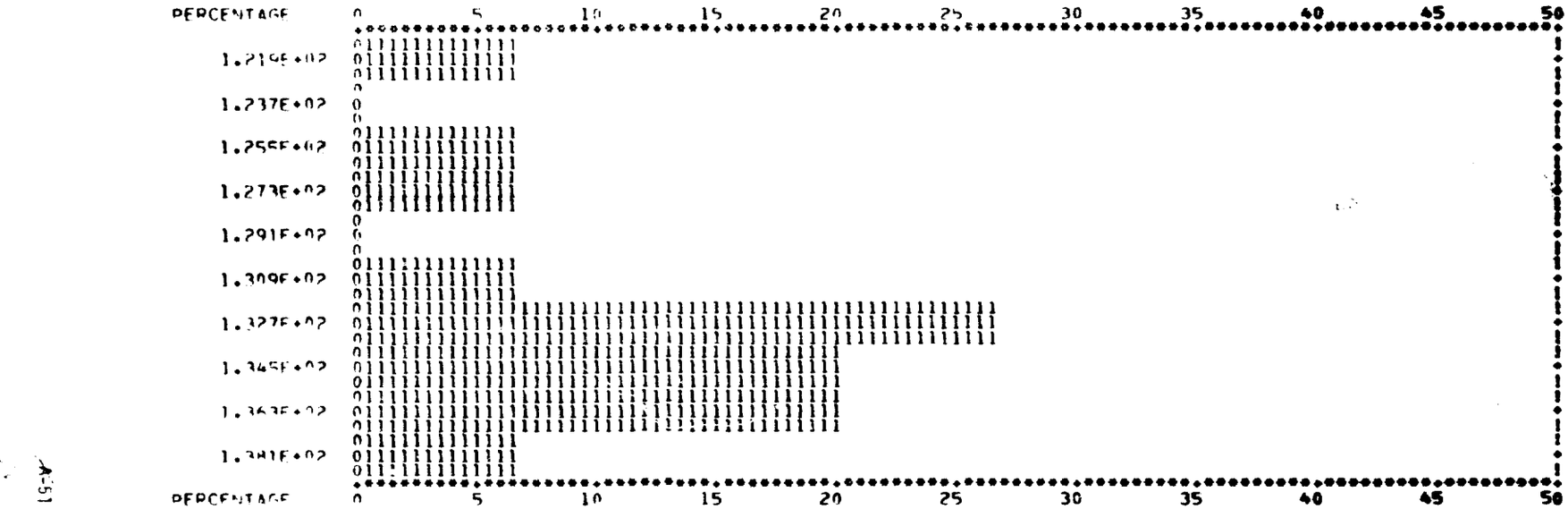
BIN:	141.80	145.40	149.00	152.60	156.20	159.80	163.40	167.00	170.60	174.20
CONTENT	5.00	10.00	5.00	5.00	4.00	2.00	0.0	1.00	4.00	5.00

A-50
73

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 315

STEP = 1.40000114
CENTERPOINT OF INITIAL GROUP= 121.899979 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 138.099991 NUMBER OF GROUPS = 10

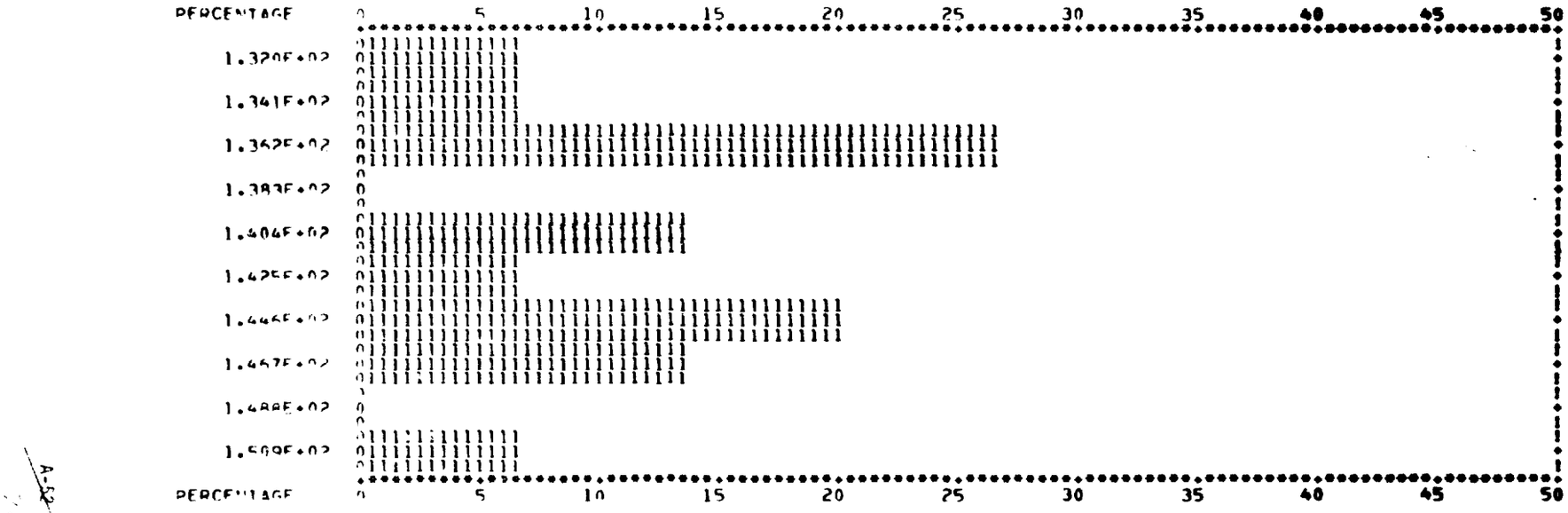


BIN	121.90	123.70	125.50	127.30	129.10	130.90	132.70	134.50	136.30	138.10
CONTENT	1.00	0.0	1.00	1.00	0.0	1.00	4.00	3.00	3.00	1.00

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 315

STEP = 2.1000225
CENTERPOINT OF INITIAL GROUP= 132.049973 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 150.949997 NUMBER OF GROUPS = 10



BI	132.05	134.15	136.25	138.35	140.45	142.55	144.65	146.75	148.85	150.95
CONTENT	1.00	1.00	4.00	0.0	2.00	1.00	3.00	2.00	0.0	1.00

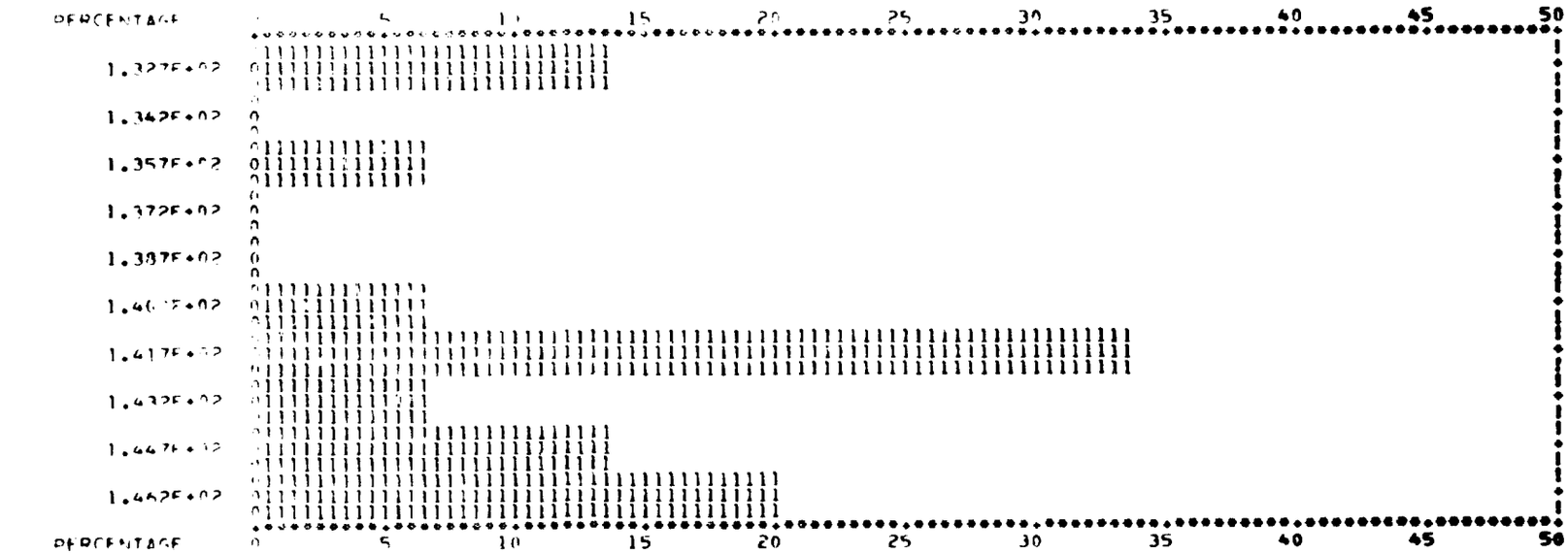
A-52

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 215

STA = 1
CENTERPOINT OF INITIAL GROUP= 132.749985
CENTERPOINT OF FINAL GROUP = 146.250000

NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10

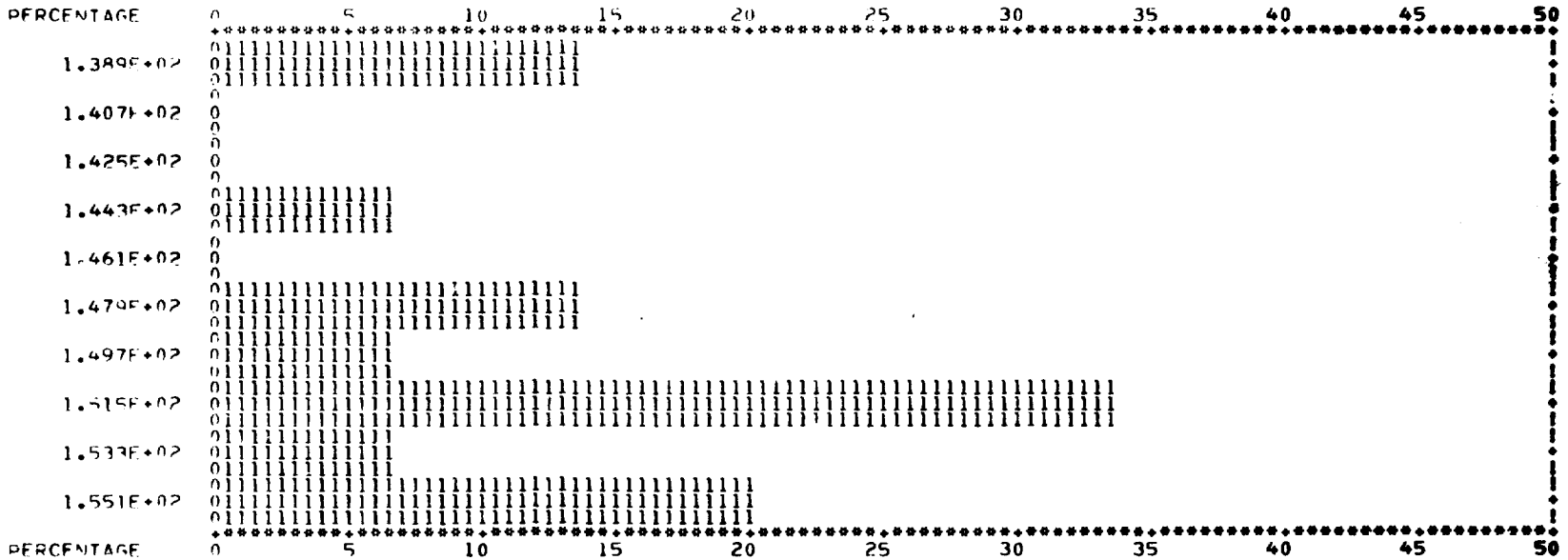


MIDPOINT	132.75	134.25	135.75	137.25	138.75	140.25	141.75	143.25	144.75	146.25
CONTENT	2.00	0.0	1.00	0.0	0.0	1.00	5.00	1.00	2.00	3.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 315

SIZE = 1.000000
CENTERPOINT OF INITIAL GROUP= 138.899979 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 155.099991 NUMBER OF GROUPS = 10



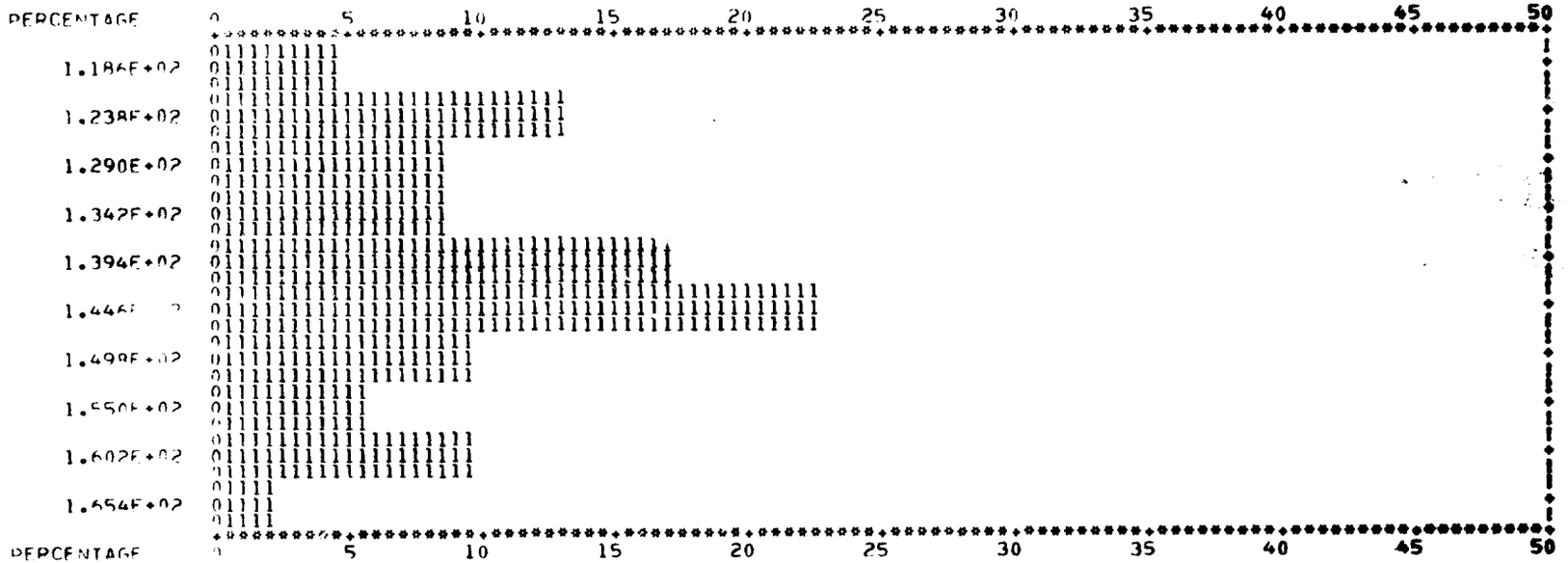
BIN	138.90	140.70	142.50	144.30	146.10	147.90	149.70	151.50	153.30	155.10
CONTENT	2.00	0.0	0.0	1.00	0.0	2.00	1.00	5.00	1.00	3.00

77

A-54

PLANTING DATE

CROP TYPE IS SW
SEGMENTS = 1346 1514 1518 15 , 1825 1435 1442
SIZE = 5.20000172
CENTERPOINT OF INITIAL GROUP= 118.599976 NUMBER OF OBSERVATIONS = 94
CENTERPOINT OF FINAL GROUP = 165.399994 NUMBER OF GROUPS = 10

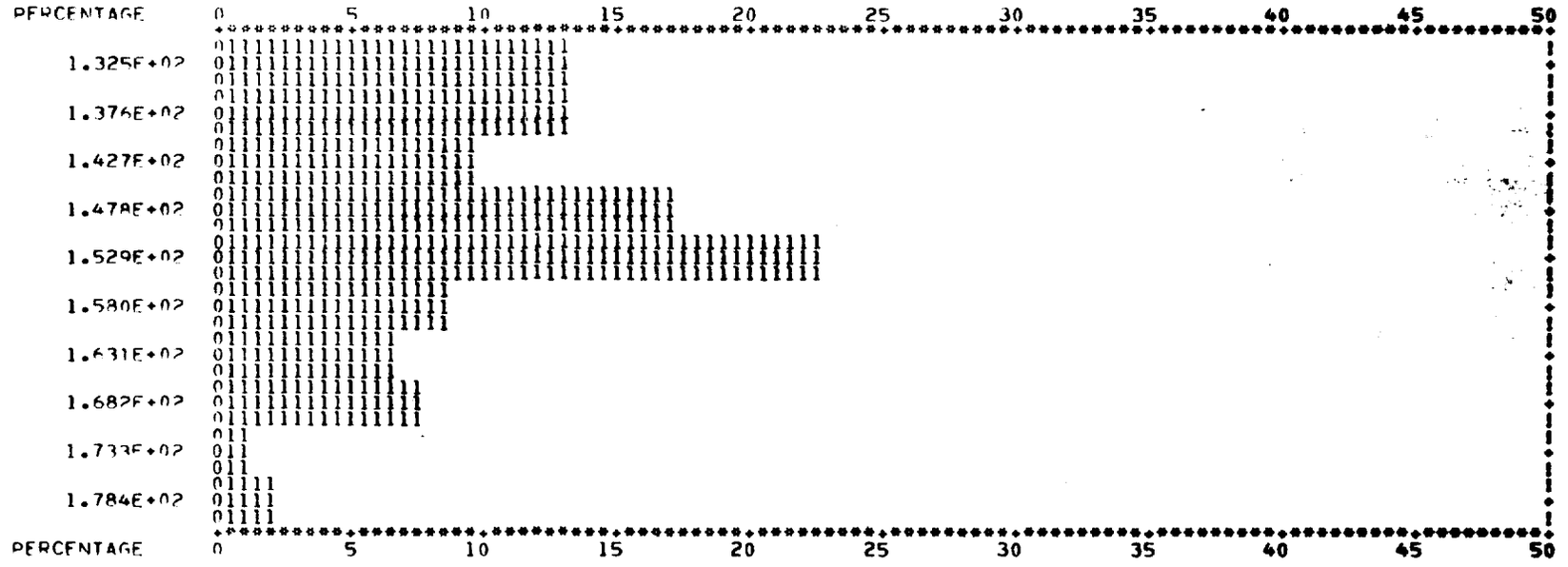


HI	118.60	123.80	129.00	134.20	139.40	144.60	149.80	155.00	160.20	165.40
CONTENT	4.00	12.00	8.00	8.00	16.00	21.00	9.00	5.00	9.00	2.00

A-55
75

EMERGENCE DATE

CROP TYPE IS SW
SEGMENTS = 1380 1514 1518 1566 1825 1835 1842
STEP = 5.10000229
CENTERPOINT OF INITIAL GROUP= 132.549973 NUMBER OF OBSERVATIONS = 94
CENTERPOINT OF FINAL GROUP = 178.449997 NUMBER OF GROUPS = 10



BIN	132.55	137.65	142.75	147.85	152.95	158.05	163.15	168.25	173.35	178.45
CONTENT	12.00	12.00	9.00	16.00	21.00	8.00	6.00	7.00	1.00	2.00

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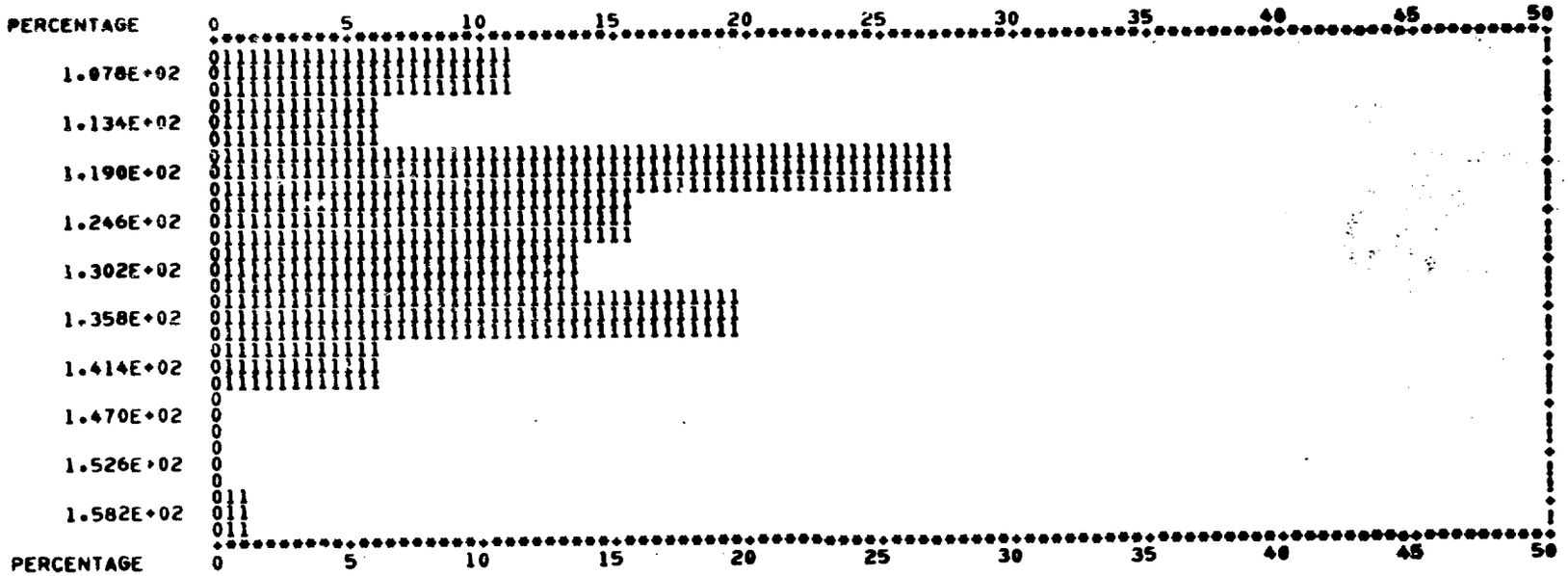
VS
83

PLANTING DATE

CROP TYPE IS CT
SEGMENTS = 187 195 196 198 200 297 298
STEP = 5.60000229
CENTERPOINT OF INITIAL GROUP= 107.799973 NUMBER OF OBSERVATIONS = 83
CENTERPOINT OF FINAL GROUP = 158.199997 NUMBER OF GROUPS = 10

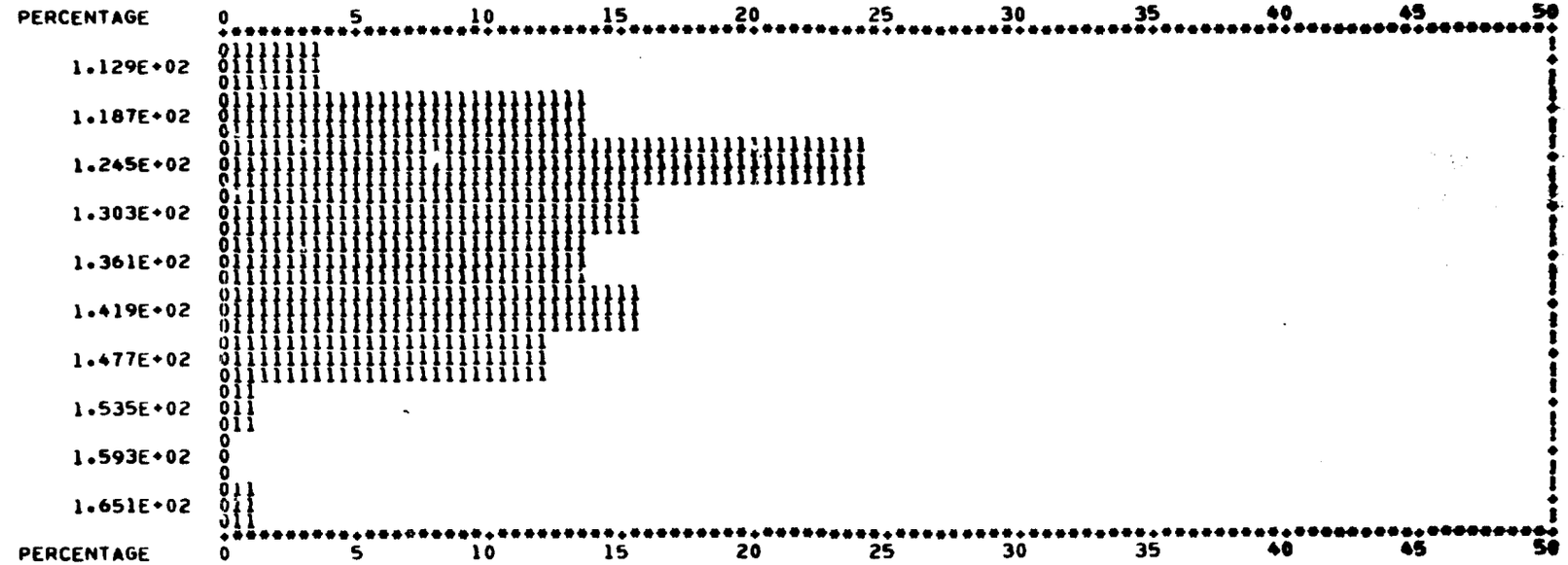


BIN	107.80	113.40	119.00	124.60	130.20	135.80	141.40	147.00	152.60	158.20
CONTENT	9.00	5.00	23.00	13.00	11.00	16.00	5.00	0.0	0.0	1.00

A-58

EMERGENCE DATE

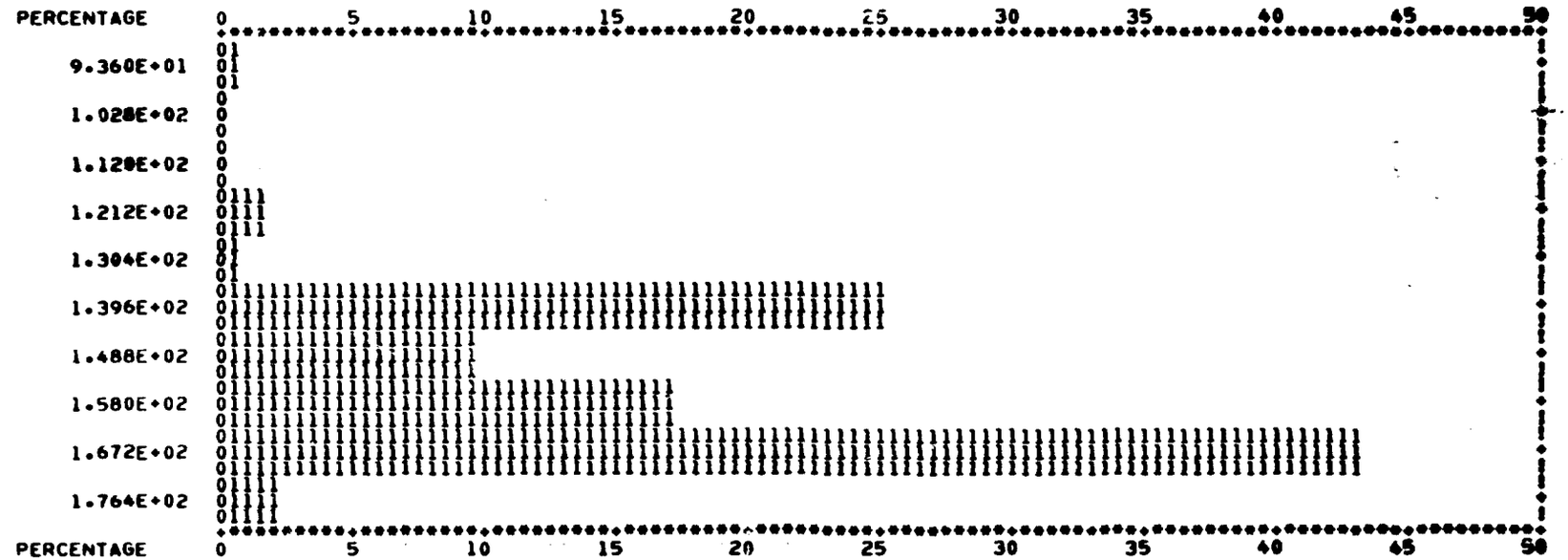
CROP TYPE IS CT
SEGMENTS = 187 195 196 198 200 297 298
STEP = 5.80000114
CENTERPOPINT OF INITIAL GROUP= 112.899979 NUMBER OF OBSERVATIONS = 83
CENTERPOINT OF FINAL GROUP = 165.099991 NUMBER OF GROUPS = 10



BIN	112.90	118.70	124.50	130.30	136.10	141.90	147.70	153.50	159.30	165.10
CONTENT	3.00	11.00	20.00	13.00	11.00	13.00	10.00	1.00	0.0	1.00

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 187 188 195 196 198 200 297 298 299
STEP = 9.20000172
CENTERPOPINT OF INITIAL GROUP= 93.5999756 NUMBER OF OBSERVATIONS = 135
CENTERPOINT OF FINAL GROUP = 176.399994 NUMBER OF GROUPS = 10



BIN	93.60	102.80	112.00	121.20	130.40	139.60	148.80	158.00	167.20	176.40
CONTENT	1.00	0.0	0.0	2.00	1.00	34.00	13.00	23.00	58.00	3.00

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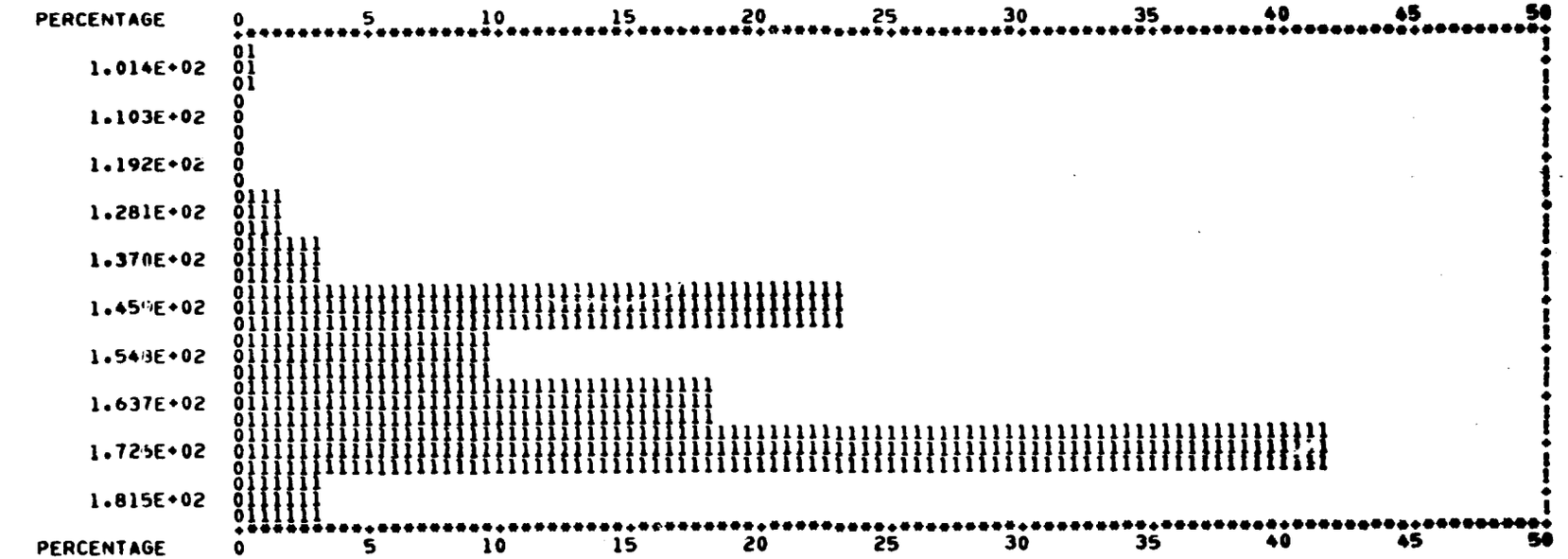
53

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 187 188 195 196 198 200 297 298 299
STEP = 8.90000057
CENTERPOINT OF INITIAL GROUP= 101.449982
CENTERPOINT OF FINAL GROUP = 181.549988
NUMBER OF OBSERVATIONS = 135
NUMBER OF GROUPS = 10



BIN	101.45	110.35	119.25	128.15	137.05	145.95	154.85	163.75	172.65	181.55
CONTENT	1.00	0.0	0.0	2.00	4.00	31.00	13.00	24.00	56.00	4.00

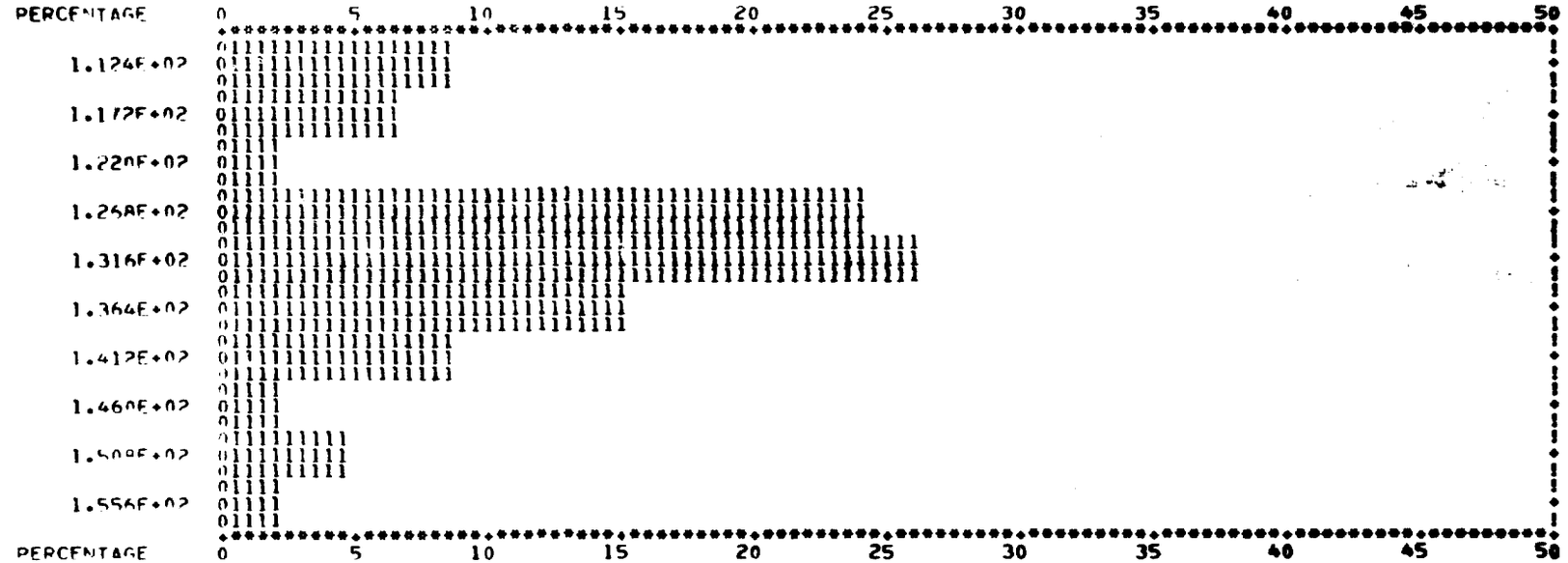
A-62

MISSOURI

A-62

PLANTING DATE

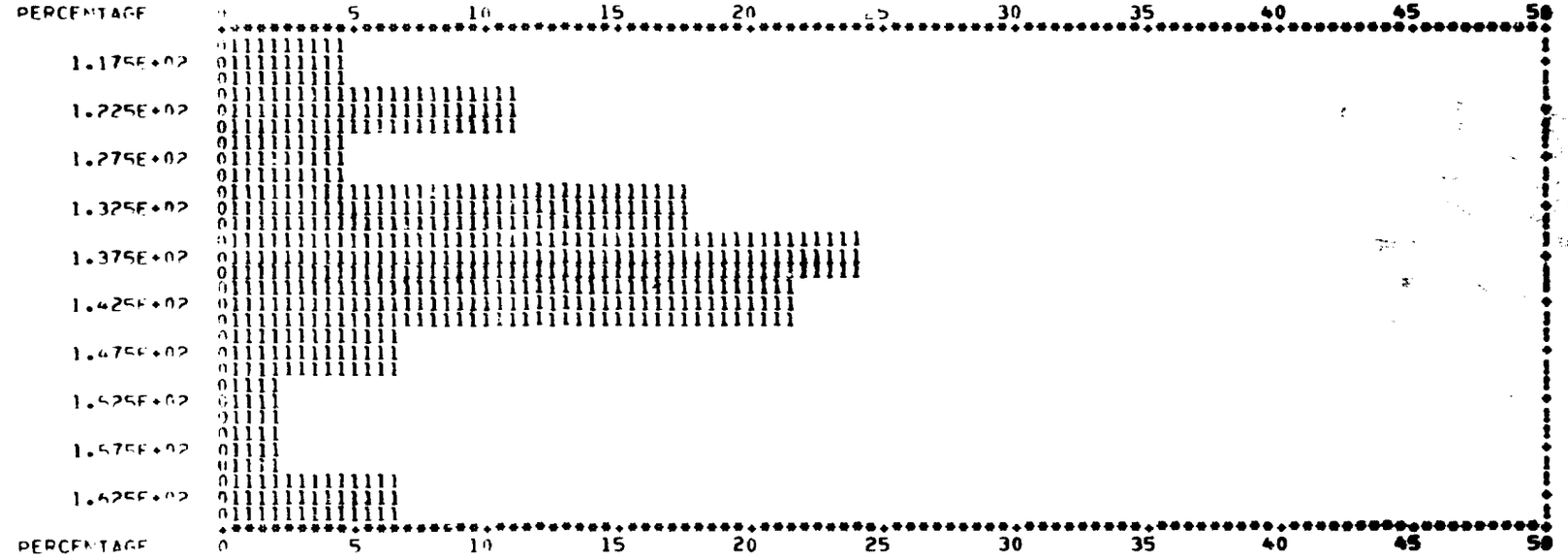
CROP TYPE IS CR
SEGMENTS = 209 211 217 316
STEP = 4.800000114
CENTERPOINT OF INITIAL GROUP= 112.399979 NUMBER OF OBSERVATIONS = 46
CENTERPOINT OF FINAL GROUP = 155.599991 NUMBER OF GROUPS = 10



BIN	112.40	117.20	122.00	126.80	131.60	136.40	141.20	146.00	150.80	155.60
CONTENT	4.00	3.00	1.00	11.00	12.00	7.00	4.00	1.00	2.00	1.00

EMERGENCE DATE

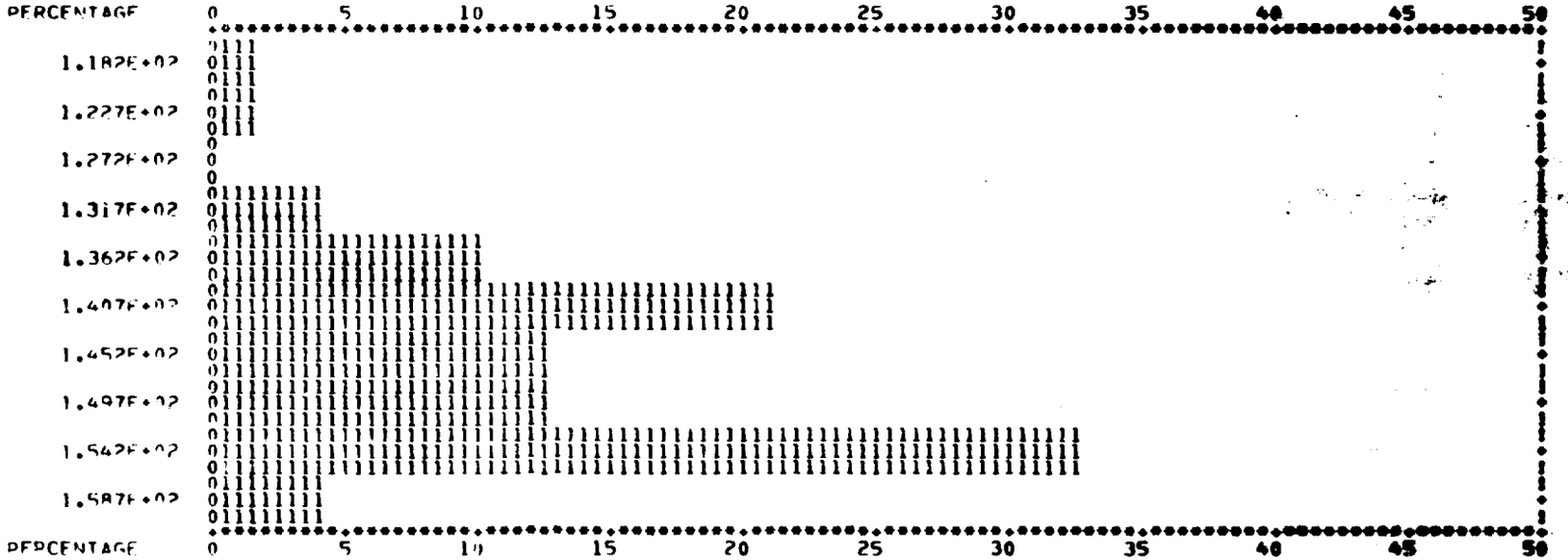
CROP TYPE IS CP
SEGMENTS = 209 211 217 316
STEP = 5.00000045
CENTERPOINT OF INITIAL GROUP= 117.499985 NUMBER OF OBSERVATIONS = 46
CENTERPOINT OF FINAL GROUP = 162.500000 NUMBER OF GROUPS = 10



BIN	117.50	122.50	127.50	132.50	137.50	142.50	147.50	152.50	157.50	162.50
CONTENT	2.00	5.00	2.00	8.00	11.00	10.00	3.00	1.00	1.00	3.00

PLANTING DATE

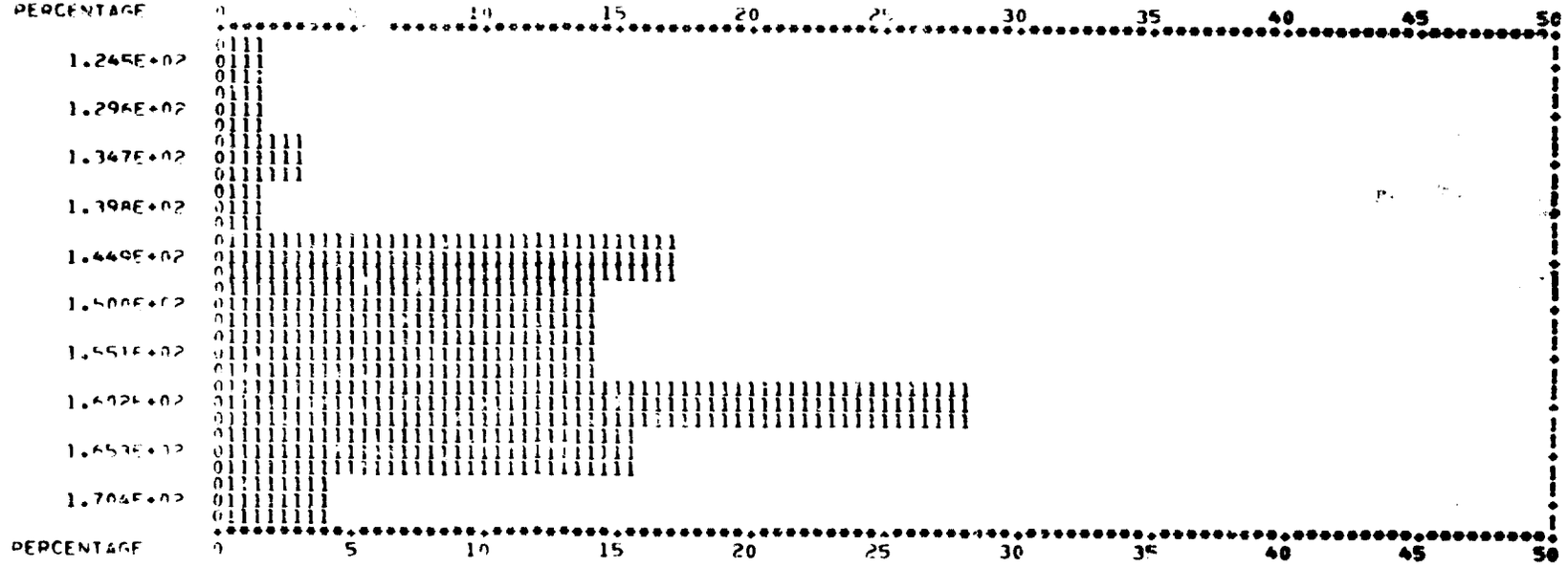
CROP TYPE IS SO
SEGMENTS = 204 209 211 217 316
STEP = 4.50000095
CENTERPOINT OF INITIAL GROUP= 118.249985 NUMBER OF OBSERVATIONS = 71
CENTERPOINT OF FINAL GROUP = 158.750000 NUMBER OF GROUPS = 10



	MIN	118.25	122.75	127.25	131.75	136.25	140.75	145.25	149.75	154.25	158.75
	CONTENT	1.00	1.00	0.0	3.00	7.00	15.00	9.00	9.00	23.00	3.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 204 209 211 217 316
STEP = 5.10000229
CENTERPOINT OF INITIAL GROUP= 124.549973
CENTERPOINT OF FINAL GROUP = 170.449997
NUMBER OF OBSERVATIONS = 71
NUMBER OF GROUPS = 10



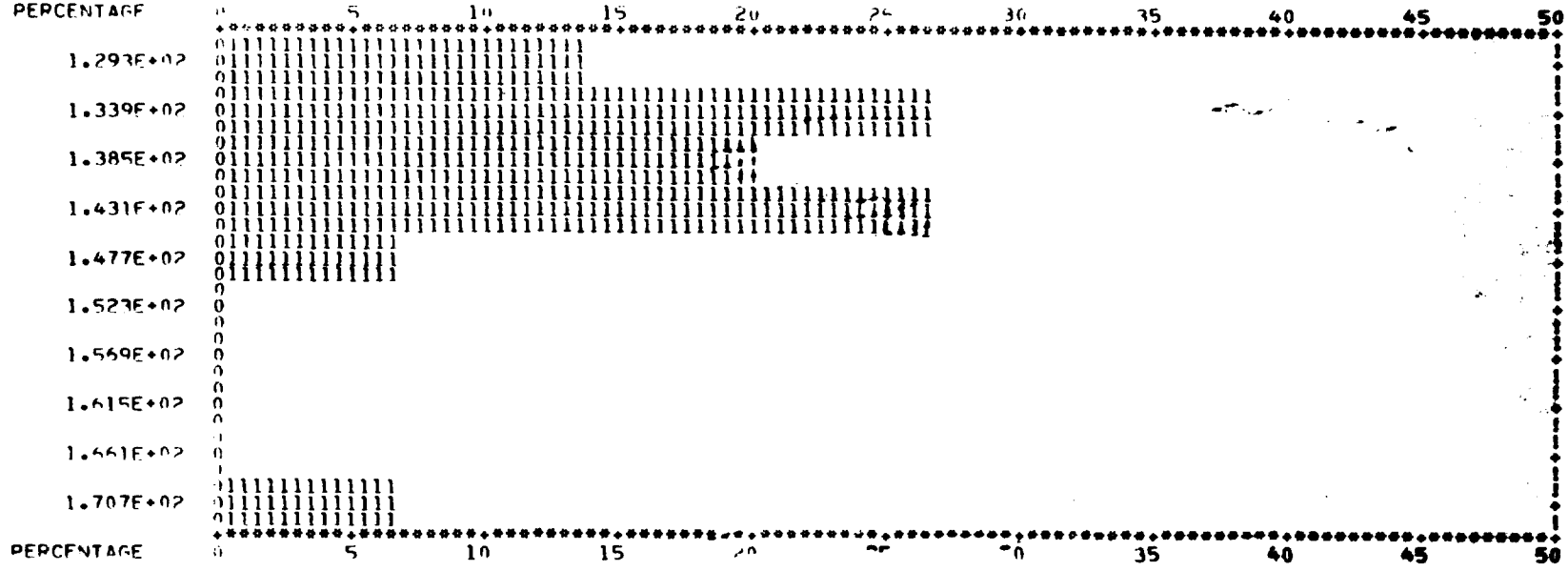
BIN	124.55	129.65	134.75	139.85	144.95	150.05	155.15	160.25	165.35	170.45
CONTENT	1.00	1.00	2.00	1.00	12.00	10.00	10.00	20.00	11.00	3.00

A-66

NEBRASKA

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 1388 1594 1596
STEP = 4.50000229
CENTERPOINT OF INITIAL GROUP = 129.299973
CENTERPOINT OF FINAL GROUP = 170.699997
NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10



BIN	129.30	133.90	138.50	143.10	147.70	152.30	156.90	161.50	166.10	170.70
CONTENT	2.00	4.00	3.00	4.00	1.00	0.0	0.0	0.0	0.0	1.00

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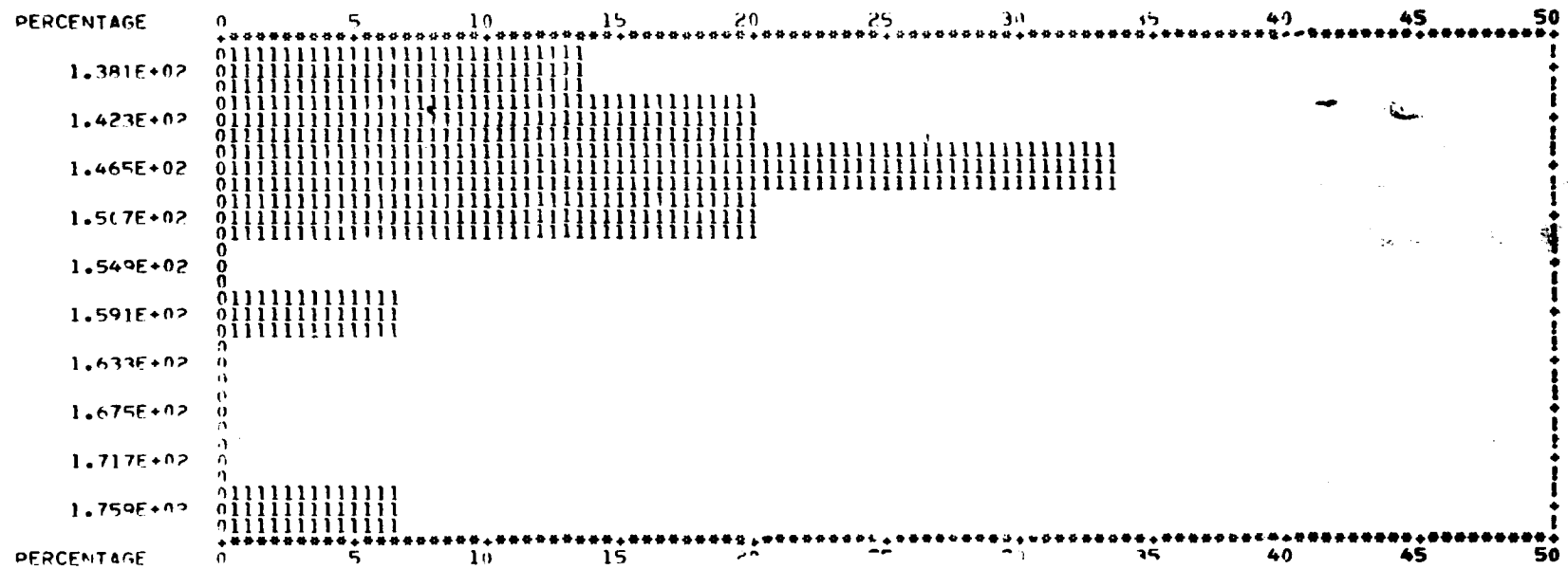
EMERGENCE DATE

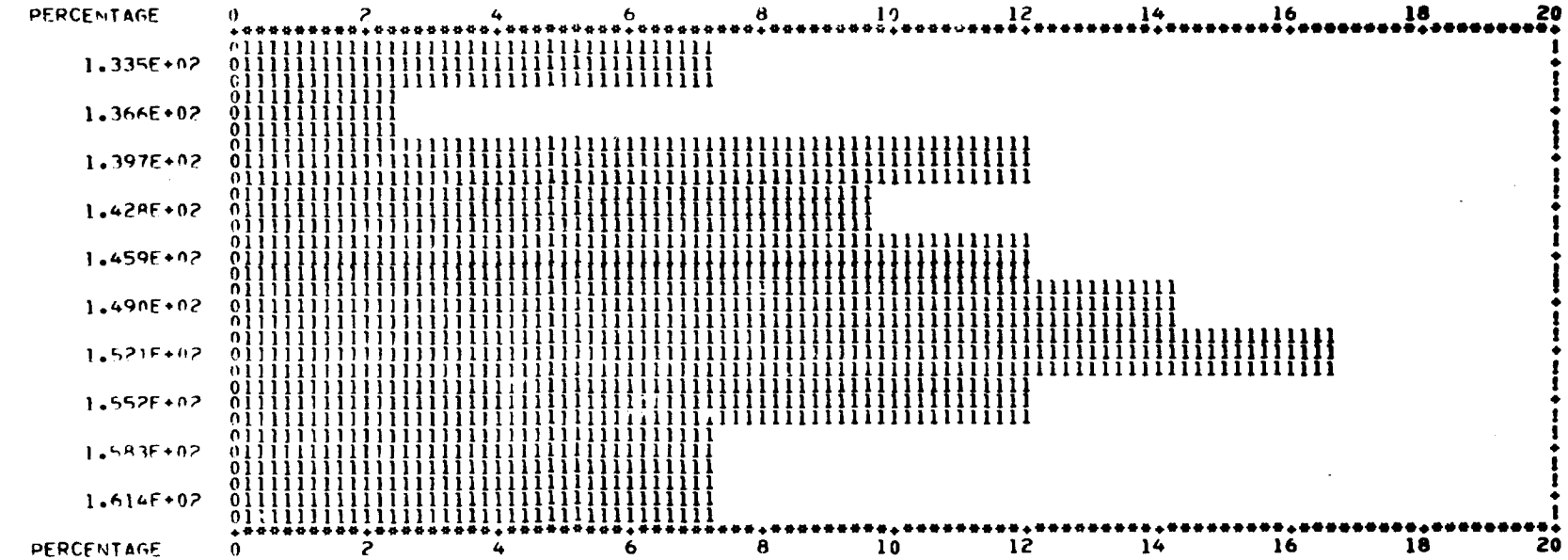
CROP TYPE IS CR
SEGMENTS = 1388 1594 1596
STEP = 4.20000172
CENTERPOINT OF INITIAL GROUP= 138.099976 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 175.899994 NUMBER OF GROUPS = 10



BIN	138.10	142.30	146.50	150.70	154.90	159.10	163.30	167.50	171.70	175.90
CONTENT	2.00	3.00	5.00	3.00	0.0	1.00	0.0	0.0	0.0	1.00

PLANTING DATE

CROP TYPE IS SR
SEGMENTS = 326 1388 1594 1596
STEP = 3.10000229
CENTERPOINT OF INITIAL GROUP= 133.549973 NUMBER OF OBSERVATIONS = 42
CENTERPOINT OF FINAL GROUP = 161.449997 NUMBER OF GROUPS = 10



BIN	133.55	136.65	139.75	142.85	145.95	149.05	152.15	155.25	158.35	161.45
CONTENT	3.00	1.00	5.00	4.00	5.00	6.00	7.00	5.00	3.00	3.00

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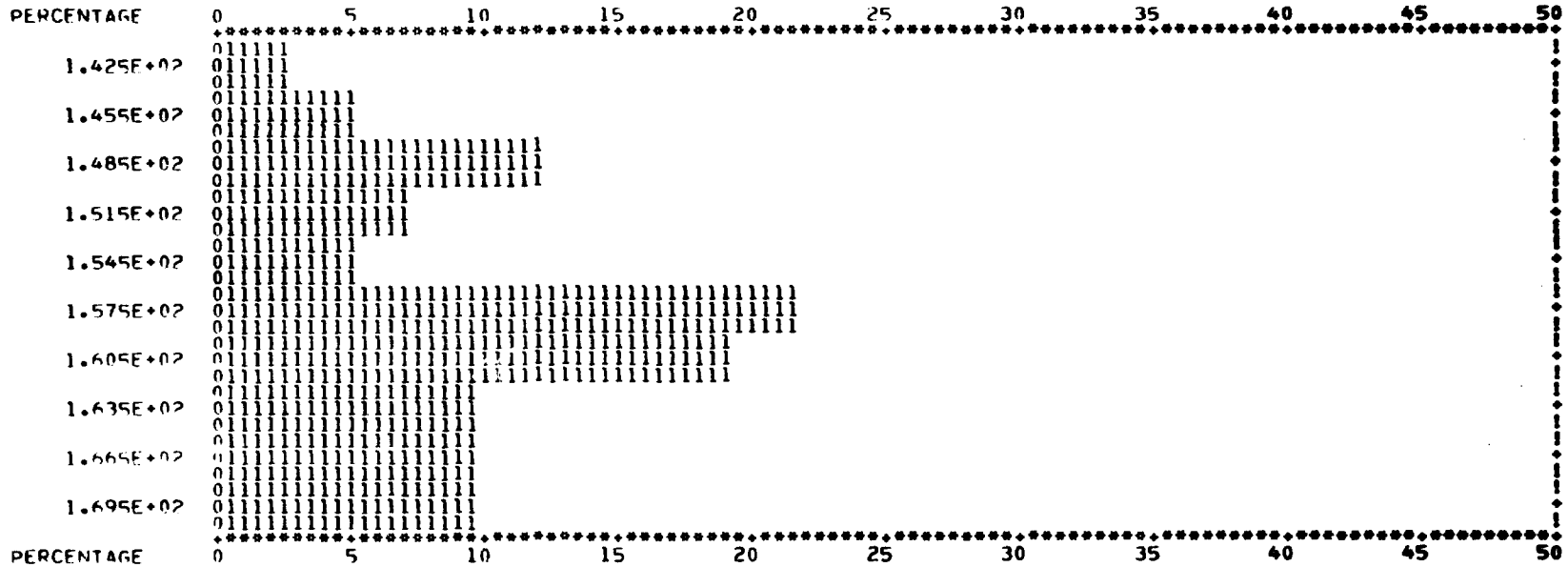
93

EMERGENCE DATE

CROP TYPE IS SR
SEGMENTS = 326 1388 1594 1596
STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP= 142.499985
CENTERPOINT OF FINAL GROUP = 169.500000
NUMBER OF OBSERVATIONS = 42
NUMBER OF GROUPS = 10

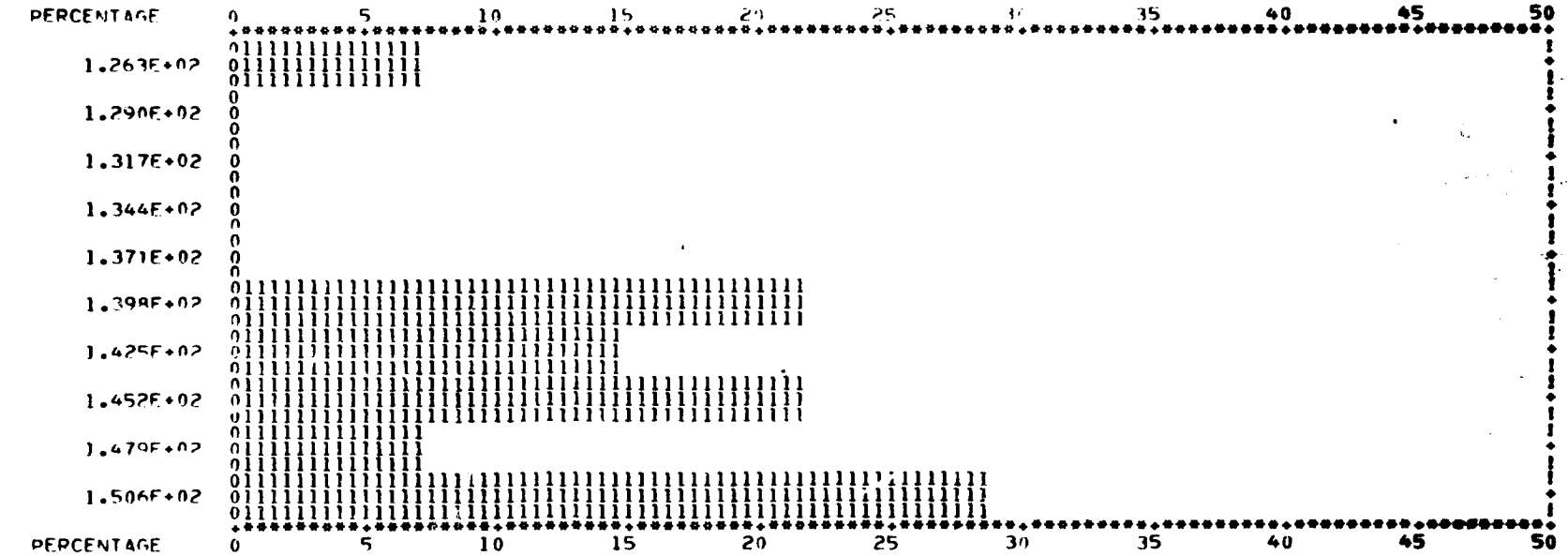


BIN	142.50	145.50	148.50	151.50	154.50	157.50	160.50	163.50	166.50	169.50
CONTENT	1.00	2.00	5.00	3.00	2.00	9.00	8.00	4.00	4.00	4.00

A-22

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 1388 1594 1596
STEP = 2.70000172
CENTERPOINT OF INITIAL GROUP= 126.349976
CENTERPOINT OF FINAL GROUP = 150.649994
NUMBER OF OBSERVATIONS = 14
NUMBER OF GROUPS = 10

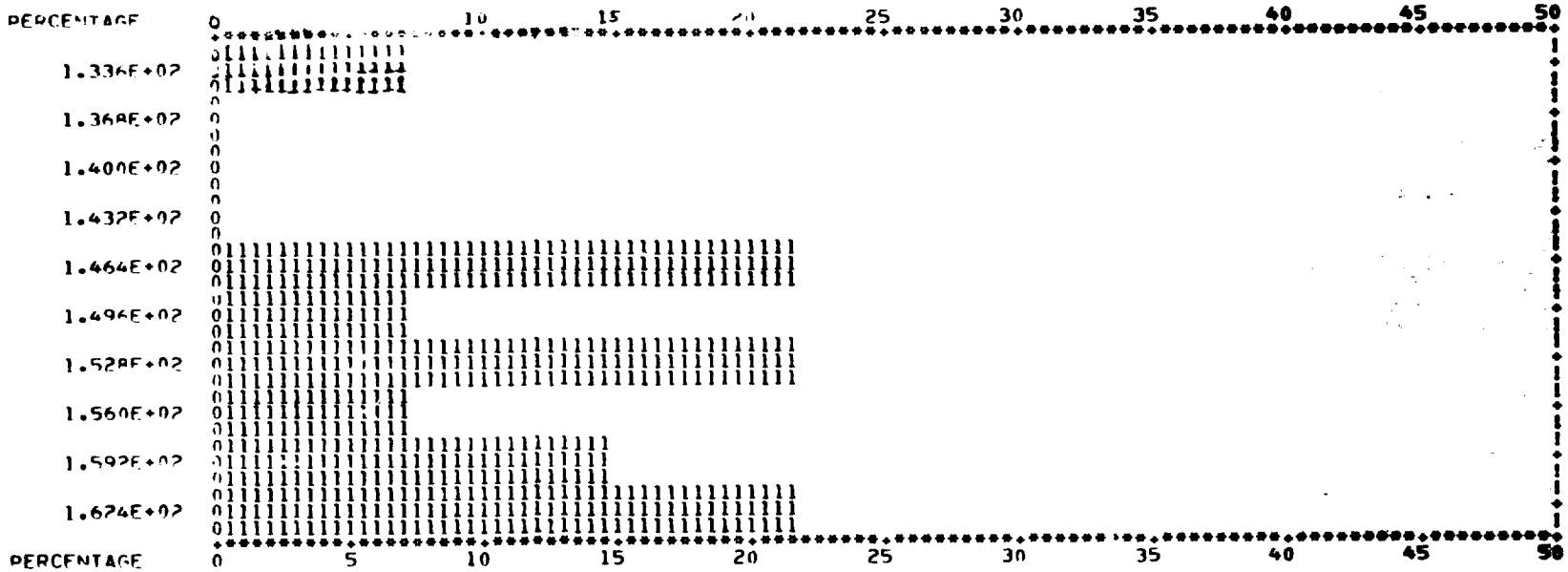


BIN	126.35	129.05	131.75	134.45	137.15	139.85	142.55	145.25	147.95	150.65
CONTENT	1.00	0.0	0.0	0.0	0.0	3.00	2.00	3.00	1.00	4.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 1388 1584 1[illegible]
STEP =
CENTERPOINT [illegible] = 152.39999
CENTERPOINT [illegible] = 162.39999

NUMBER OF OBSERVATIONS = 14
NUMBER OF GROUPS = 10

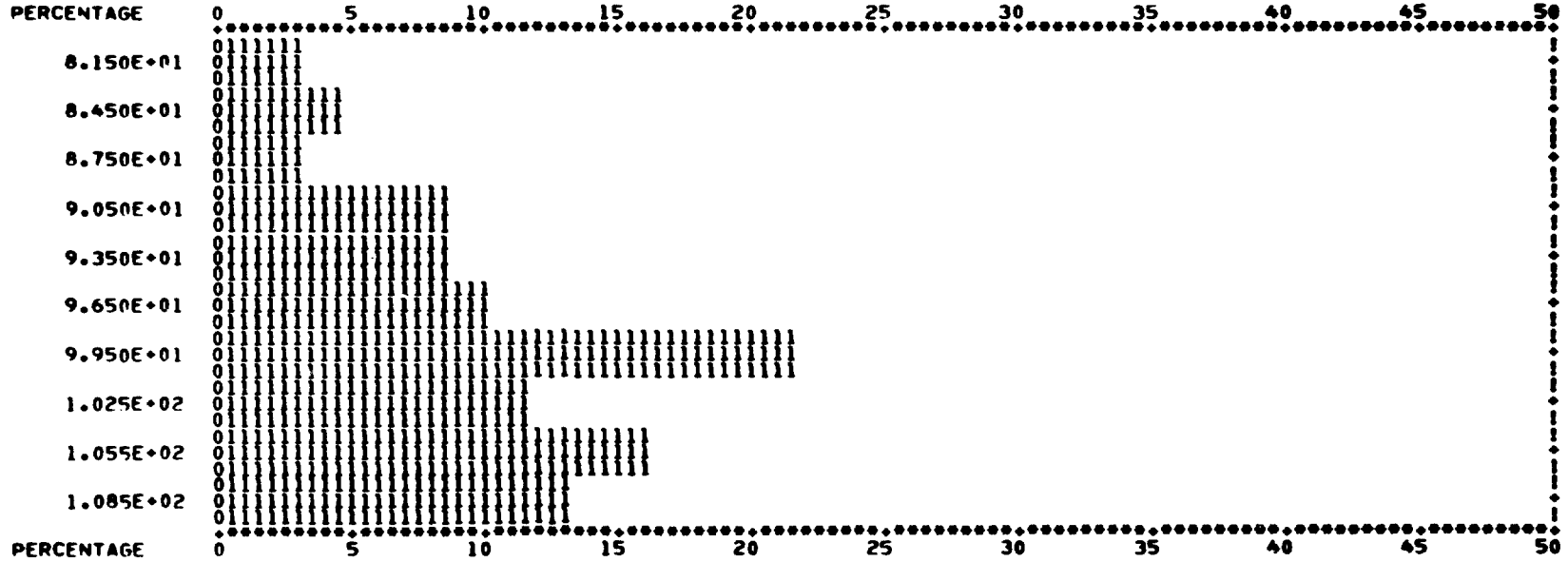


BIN	133.60	136.80	140.00	143.20	146.40	149.60	152.80	156.00	159.20	162.40
CONTENT	1.00	0.0	0.0	0.0	3.00	1.00	3.00	1.00	2.00	3.00

NORTH CAROLINA

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 332 341 342 343 344
STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP= 81.4999847 NUMBER OF OBSERVATIONS = 69
CENTERPOINT OF FINAL GROUP = 108.500000 NUMBER OF GROUPS = 10

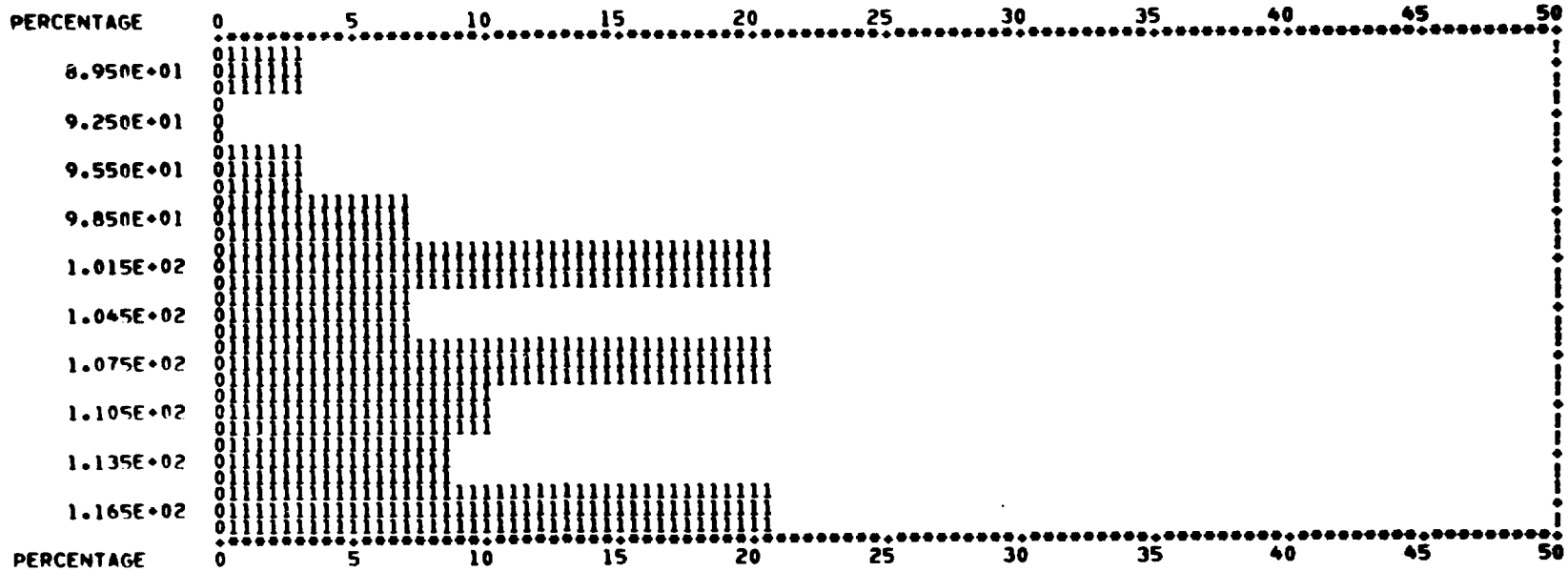


BIN	81.50	84.50	87.50	90.50	93.50	96.50	99.50	102.50	105.50	108.50
CONTENT	2.00	3.00	2.00	6.00	6.00	7.00	15.00	8.00	11.00	9.00

A-25
95

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 332 341 342 343 344
STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP= 89.4999847 NUMBER OF OBSERVATIONS = 69
CENTERPOINT OF FINAL GROUP = 116.500000 NUMBER OF GROUPS = 10

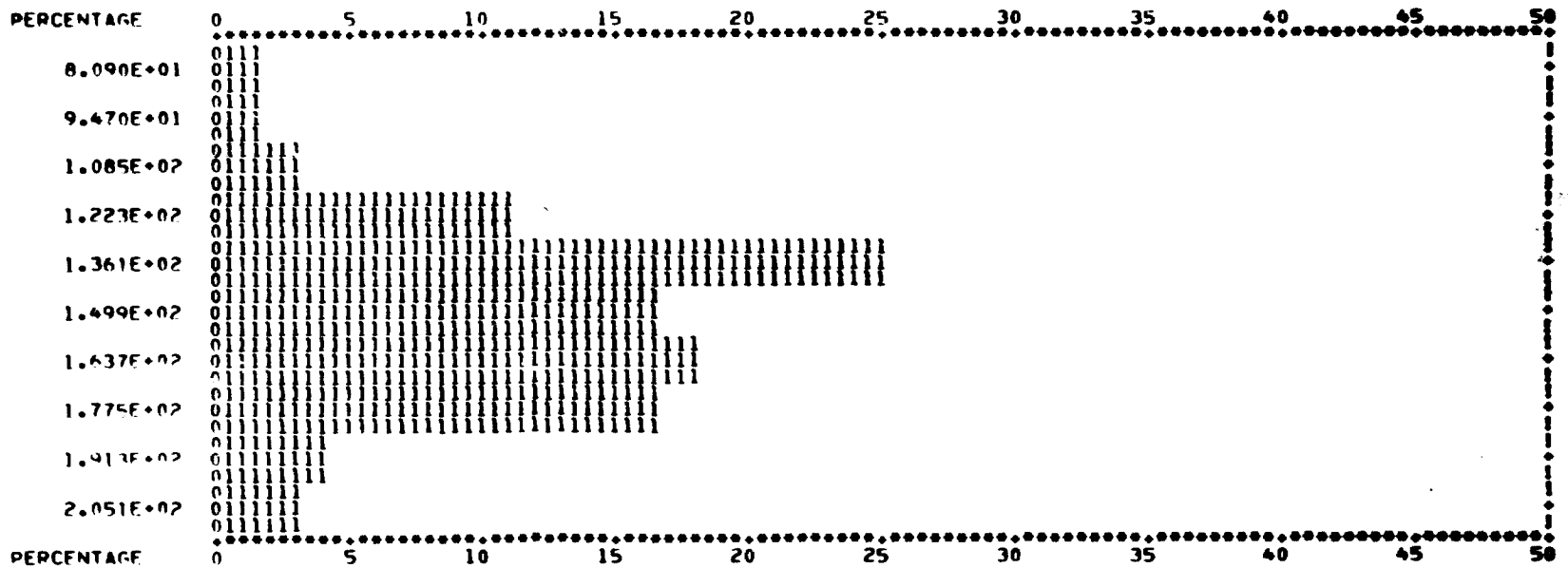


BIN	89.50	92.50	95.50	98.50	101.50	104.50	107.50	110.50	113.50	116.50
CONTENT	2.00	0.0	2.00	5.00	14.00	5.00	14.00	7.00	6.00	14.00

A-76
99

PLANTING DATE

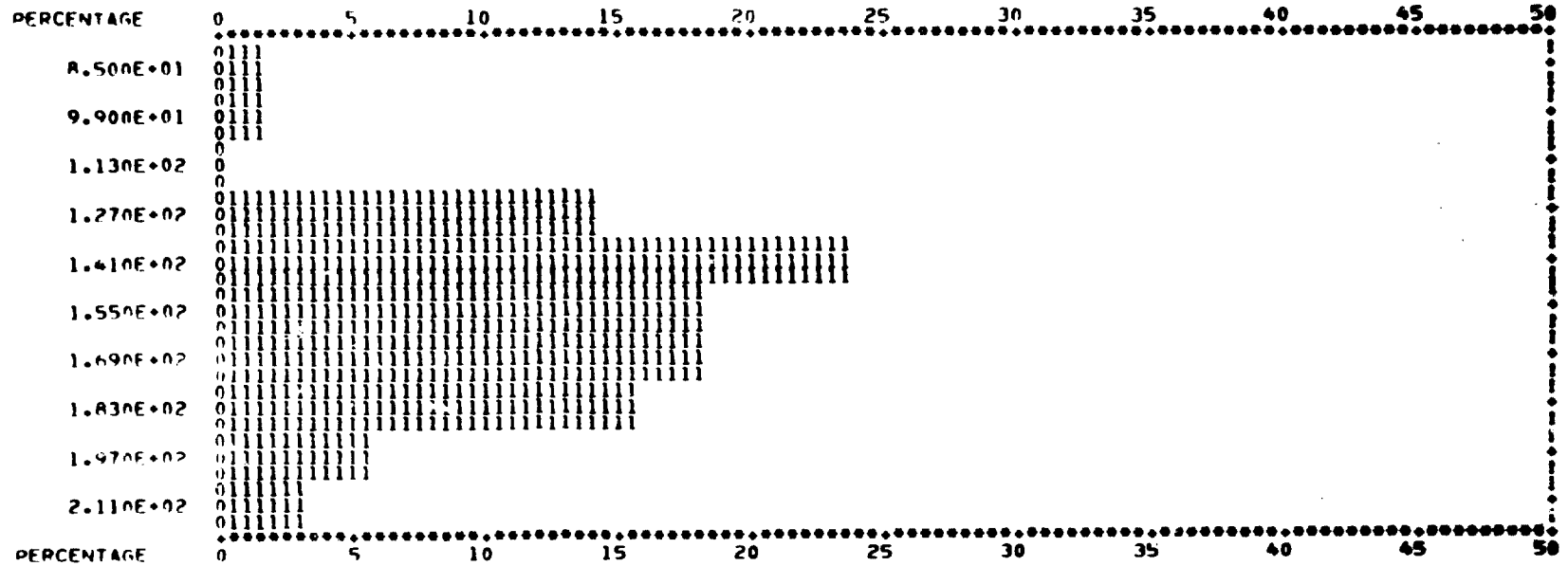
CROP TYPE IS SO
SEGMENTS = 332 340 341 342 343 344
STEP = 13.800011
CENTERPOINT OF INITIAL GROUP = 80.949997
CENTERPOINT OF FINAL GROUP = 205.049991
NUMBER OF OBSERVATIONS = 72
NUMBER OF GROUPS = 10



	MIN	80.90	94.70	108.50	122.30	136.10	149.90	163.70	177.50	191.30	205.10
CONTENT		1.00	1.00	2.00	8.00	18.00	12.00	13.00	12.00	3.00	2.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 339 340 341 342 343 344
STEP = 14.0000010
CENTERPOINT OF INITIAL GROUP = 84.3999847 NUMBER OF OBSERVATIONS = 72
CENTERPOINT OF FINAL GROUP = 211.000000 NUMBER OF GROUPS = 10



BIN	85.00	99.00	113.00	127.00	141.00	155.00	169.00	183.00	197.00	211.00
CONTENT	1.00	1.00	0.0	10.00	17.00	13.00	13.00	11.00	4.00	2.00

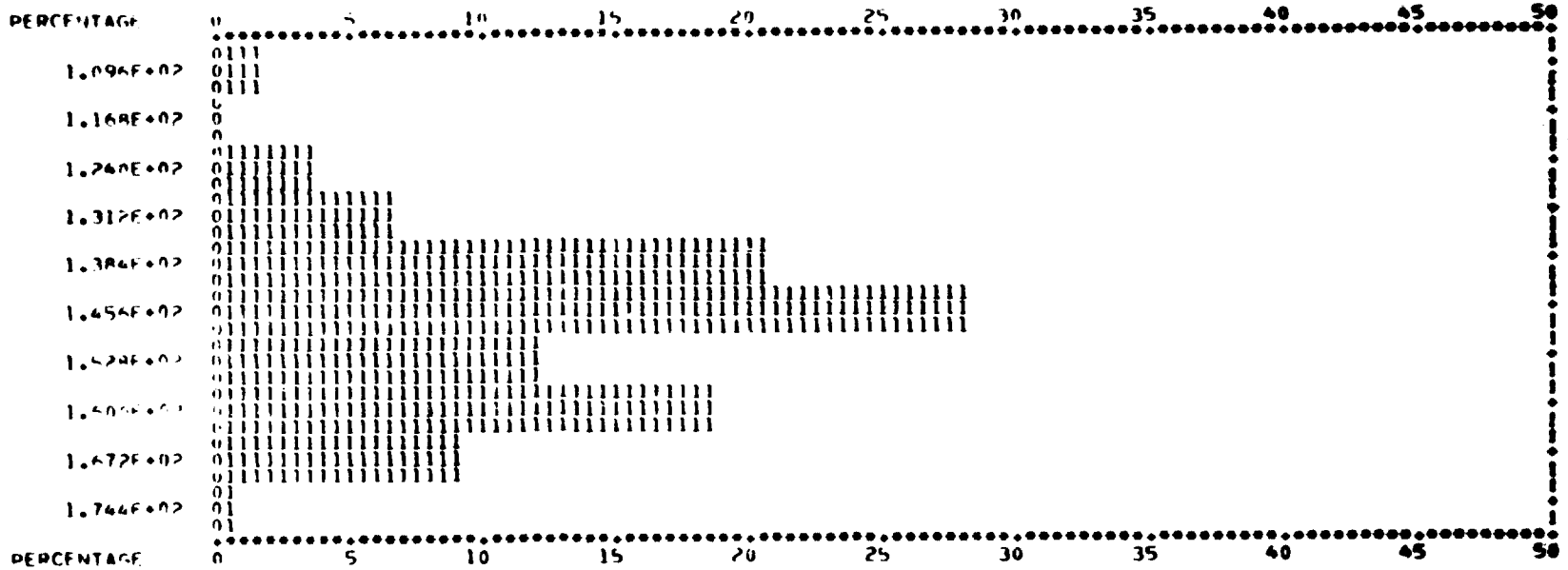
NORTH DAKOTA

A-79
/c2

PLANTING DATE

CROP TYPE IS PP
SEGMENTS = 1387 1392 1396 1399 1457 1461 1467 1472 1571 1575 1602 1611 1617 1619
1630 1635 1645 1655 1658 1671 1664 1909 1917 1919 1924
1974

STEP = 7.29000172
CENTERPOINT OF INITIAL GROUP= 109.599976
CENTERPOINT OF FINAL GROUP = 174.399994
NUMBER OF OBSERVATIONS = 190
NUMBER OF GROUPS = 10



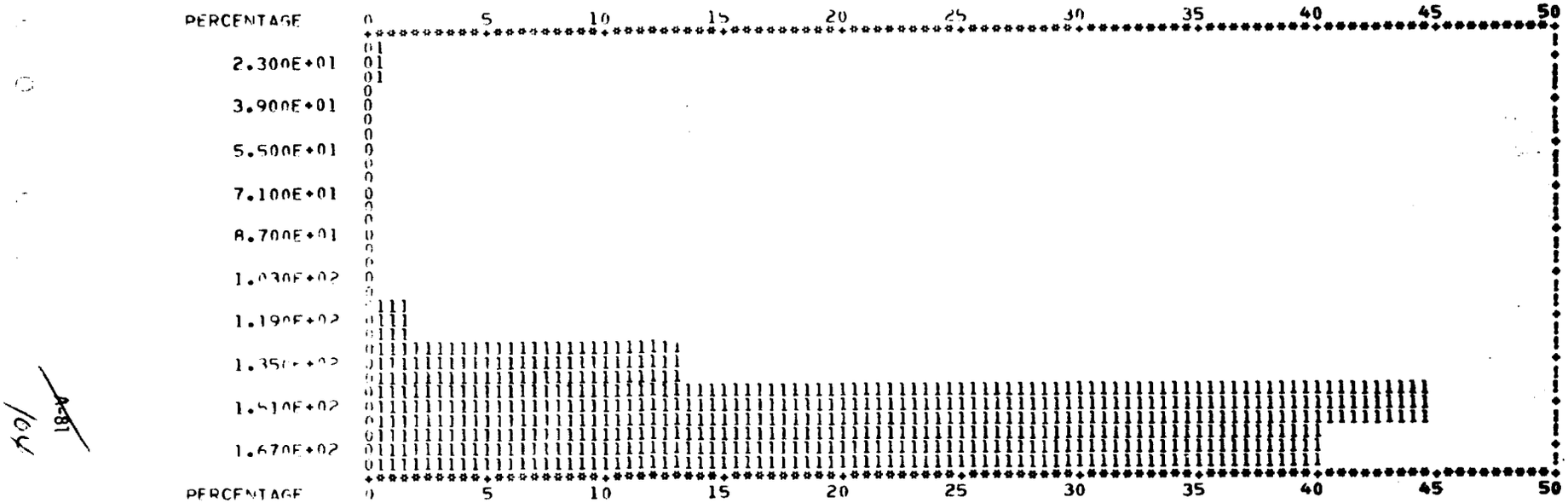
	MID	CONTENT
	109.60	3.00
	116.80	0.0
	124.00	7.00
	131.20	12.00
	138.40	39.00
	145.60	53.00
	152.80	23.00
	160.00	35.00
	167.20	17.00
	174.40	1.00

A-80

EMERGENCE DATE

CROP TYPE IS 39
SEGMENTS = 1387 1392 1394 1349 1457 1461 1467 1472 1571 1584 1602 1611 1617 1619
1630 1636 1645 1655 1658 1551 1564 1909 1917 1918 1924
1974

STEP = 16.0000000
CENTERPOINT OF INITIAL GROUP= 22.4999847 NUMBER OF OBSERVATIONS = 190
CENTERPOINT OF FINAL GROUP = 167.000000 NUMBER OF GROUPS = 10

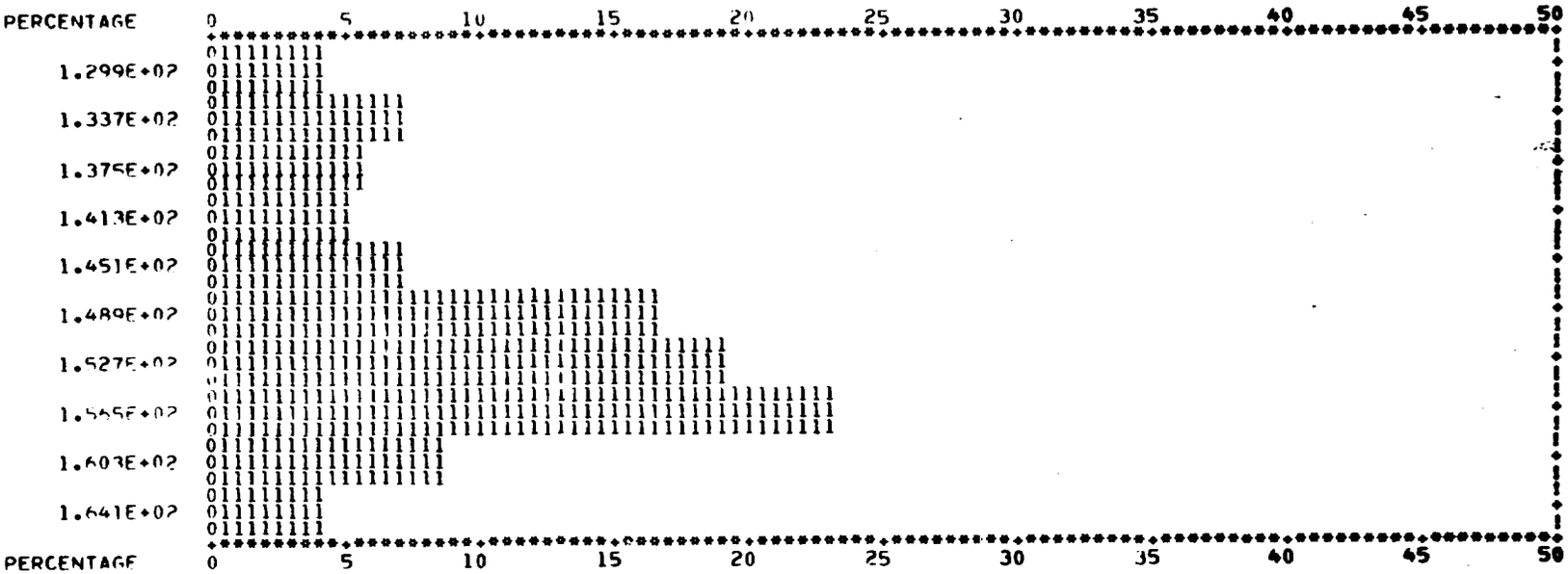


MIN	23.00	39.00	55.00	71.00	87.00	103.00	119.00	135.00	151.00	167.00
CONTENT	1.00	0.0	0.0	0.0	0.0	0.0	3.00	25.00	85.00	76.00

PLANTING DATE

CROP TYPE IS DW
SEGMENTS = 1387 1392 1394 1457 1461 1467 1472 1602 1611 1617
1619 1627 1636 1658 1917
1924 1974

STEP = 3.80000114
CENTERPOINT OF INITIAL GROUP= 129.899979 NUMBER OF OBSERVATIONS = 126
CENTERPOINT OF FINAL GROUP = 164.099991 NUMBER OF GROUPS = 10

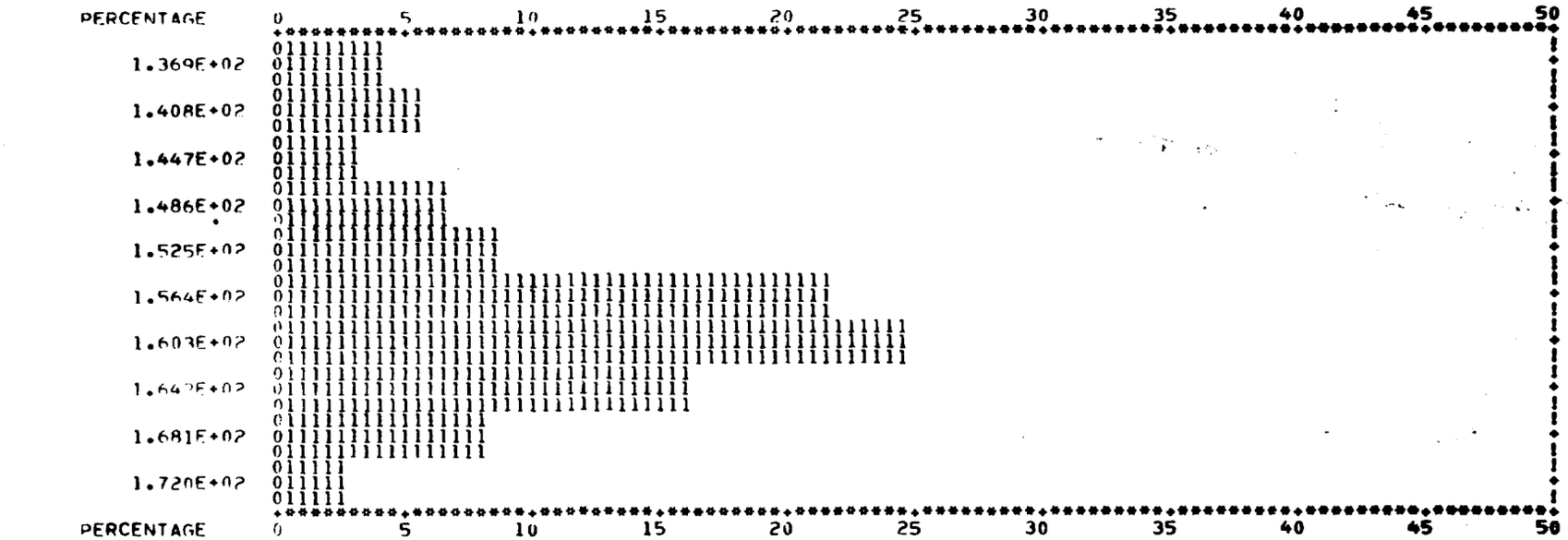


BIN	129.90	133.70	137.50	141.30	145.10	148.90	152.70	156.50	160.30	164.10
CONTENT	5.00	9.00	7.00	6.00	9.00	21.00	24.00	29.00	11.00	5.00

EMERGENCE DATE

CROP TYPE IS DW
SEGMENTS = 1387 1392 1394 1457 1461 1467 1472 1602 1611 1617
1619 1627 1636 1653 1917
1924 1974

STEP = 3.90000057
CENTERPOINT OF INITIAL GROUP= 136.949982 NUMBER OF OBSERVATIONS = 126
CENTERPOINT OF FINAL GROUP = 172.049988 NUMBER OF GROUPS = 10



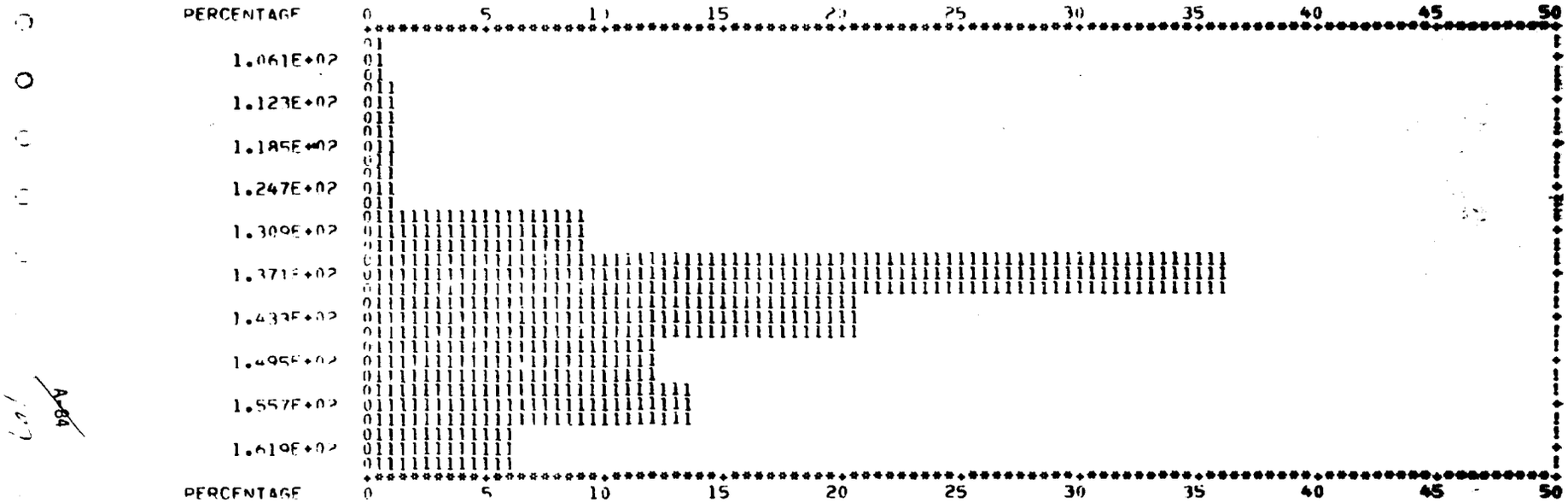
BIN	136.95	140.85	144.75	148.65	152.55	156.45	160.35	164.25	168.15	172.05
CONTENT	5.00	7.00	4.00	8.00	11.00	27.00	31.00	20.00	10.00	3.00

A-83
106

PLANTING DATE

CROP TYPE IS SW
SEGMENTS = 1387 1392 1394 1399 1457 1461 1472 1473 1571 1584 1602 1611 1612 1617
1619 1627 [illegible] 1924 1974

STEP = 6.20000172
CENTERPOINT OF INITIAL GROUP= 106.099976 NUMBER OF OBSERVATIONS = 354
CENTERPOINT OF FINAL GROUP = 161.899994 NUMBER OF GROUPS = 10



	MIN	106.10	112.30	118.50	124.70	130.90	137.10	143.30	149.50	155.70	161.90
CONTENT		1.00	4.00	3.00	4.00	32.00	127.00	72.00	43.00	47.00	21.00

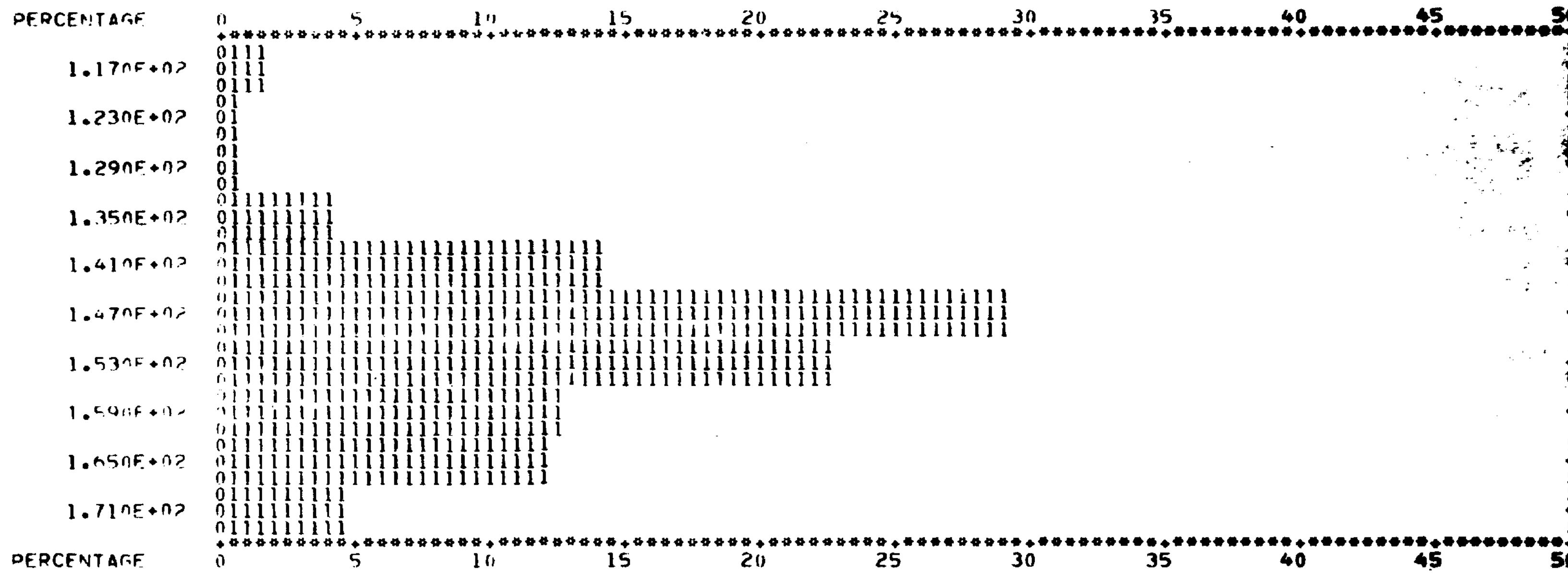
A-84

EMERGENCE DATE

CROP TYPE IS SW
SEGMENTS = 1387 1392 1394 1399 1457 1461 [illegible] 1472 1473 1571 1584 1602 1611 1612 1617
[illegible]
1924 1974

STEP = 6.00000095
CENTERPOINT OF INITIAL GROUP= 116.999965
CENTERPOINT OF FINAL GROUP = 171.000000

NUMBER OF OBSERVATIONS = 354
NUMBER OF GROUPS = 10

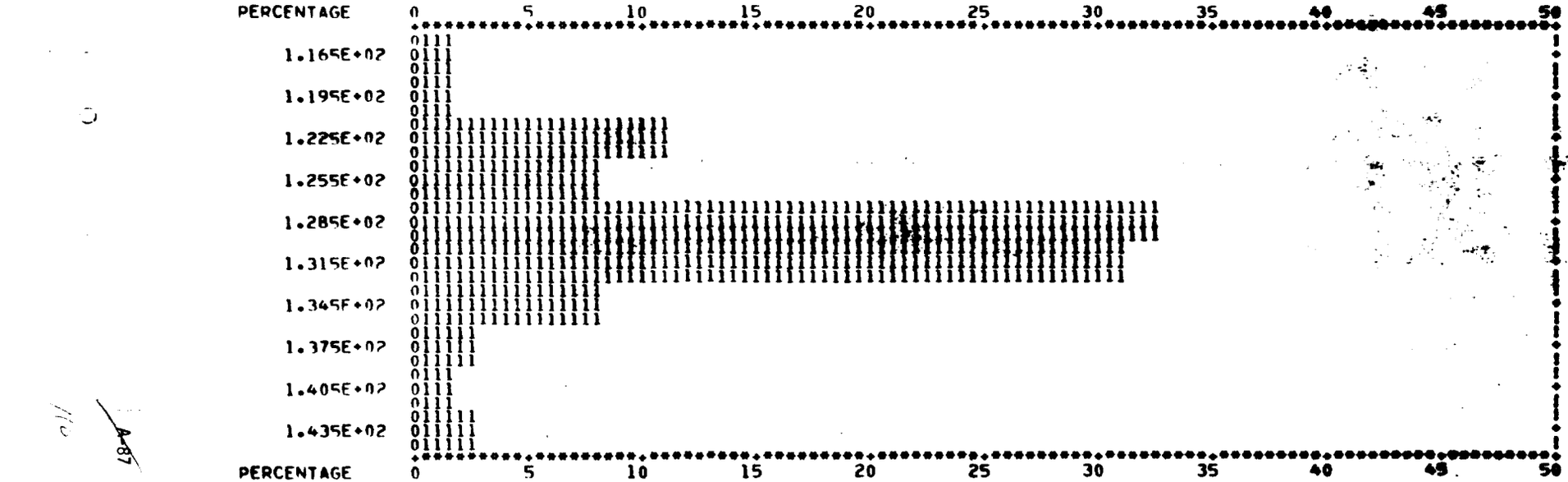


BIN	117.00	123.00	129.00	135.00	141.00	147.00	153.00	159.00	165.00	171.00
CONTENT	5.00	1.00	2.00	14.00	49.00	102.00	79.00	44.00	42.00	16.00

OHIO

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 229 230 231 234 238
STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP = 116.499985 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 143.500000 NUMBER OF GROUPS = 10

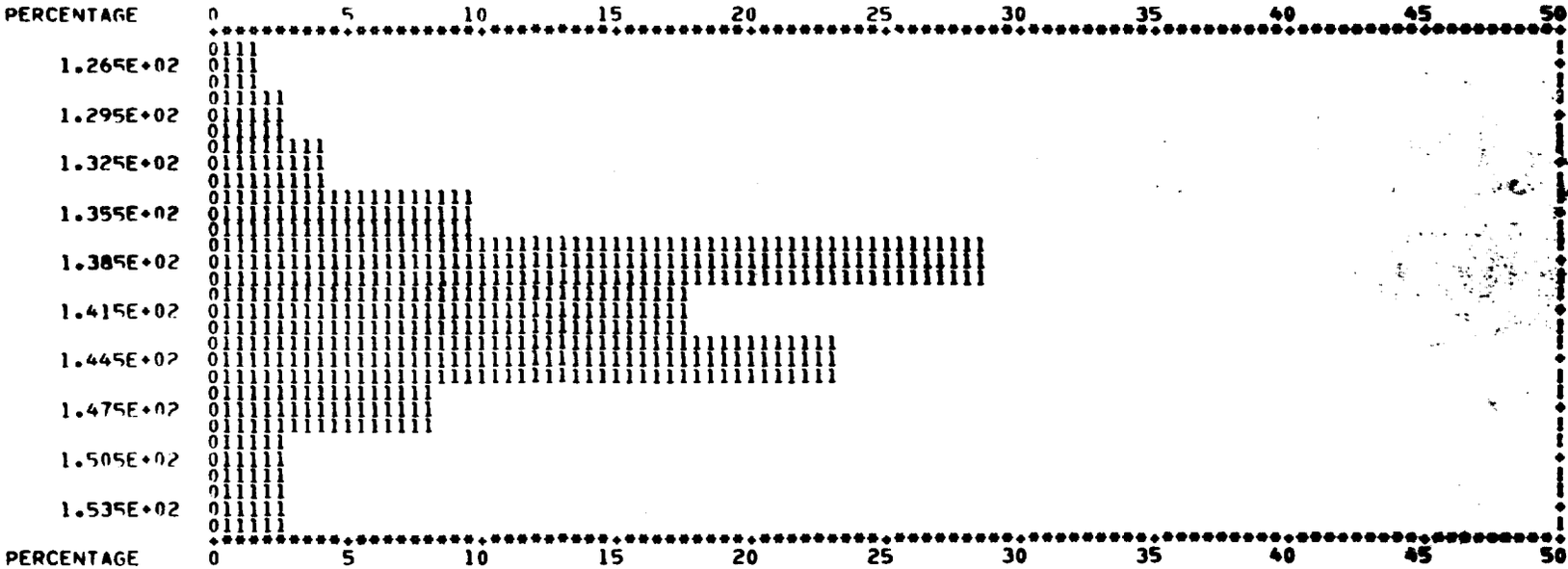


BIN	116.50	119.50	122.50	125.50	128.50	131.50	134.50	137.50	140.50	143.50
CONTENT	1.00	1.00	8.00	6.00	24.00	23.00	6.00	2.00	1.00	2.00

A-87

EMERGENCE DATE

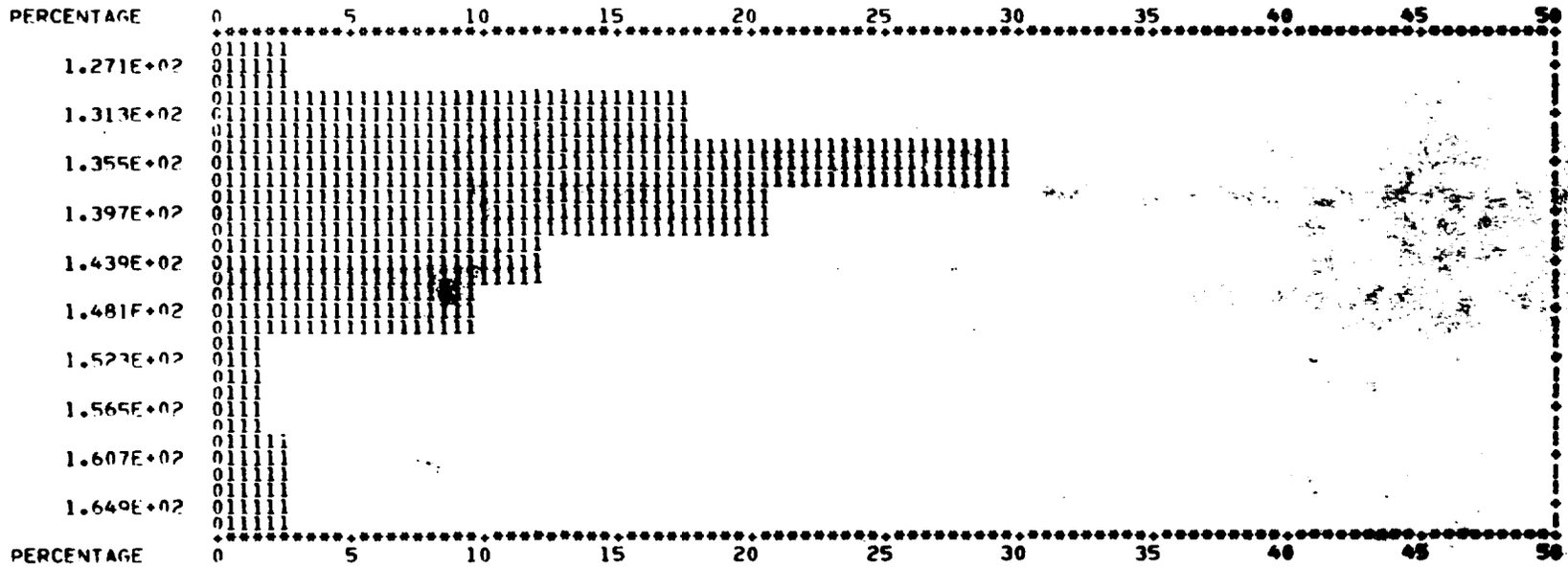
CROP TYPE IS CR
SEGMENTS = 229 230 231 234 238
STEP = 3.00000095
CENTERPOINT OF INITIAL GROUP= 126.499985 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 153.500000 NUMBER OF GROUPS = 10



BIN	126.50	129.50	132.50	135.50	138.50	141.50	144.50	147.50	150.50	153.50
CONTENT	1.00	2.00	3.00	7.00	21.00	13.00	17.00	6.00	2.00	2.00

PLANTING DATE

CROP TYPE IS SO
SEGMENTS = 229 230 231 234 238
STEP = 4.20000172
CENTERPOINT OF INITIAL GROUP = 127.099976
CENTERPOINT OF FINAL GROUP = 164.899994
NUMBER OF OBSERVATIONS = 74
NUMBER OF GROUPS = 10

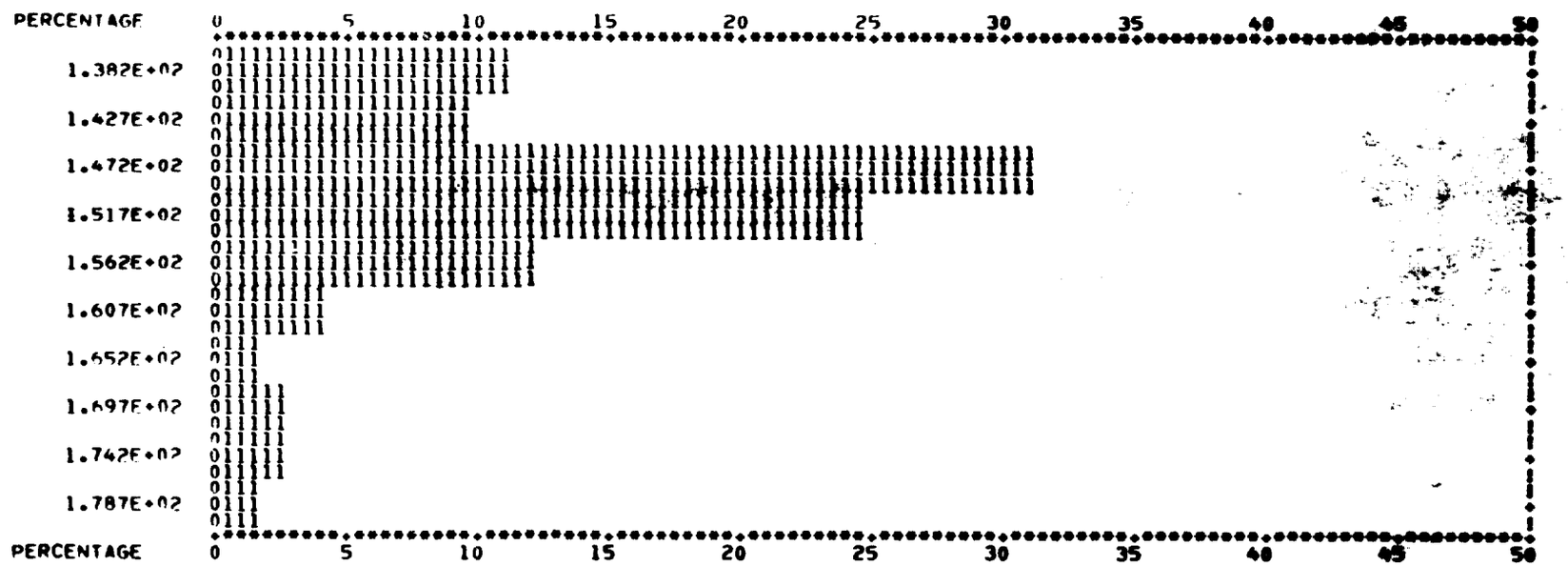


BIN	127.10	131.30	135.50	139.70	143.90	148.10	152.30	156.50	160.70	164.90
CONTENT	2.00	13.00	22.00	15.00	9.00	7.00	1.00	1.00	2.00	2.00

A-99

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 229 230 231 234 238
STEP = 4.50000095
CENTERPOINT OF INITIAL GROUP= 138.249985 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 178.750000 NUMBER OF GROUPS = 10



BIN	138.25	142.75	147.25	151.75	156.25	160.75	165.25	169.75	174.25	178.75
CONTENT	8.00	7.00	23.00	18.00	9.00	3.00	1.00	2.00	2.00	1.00

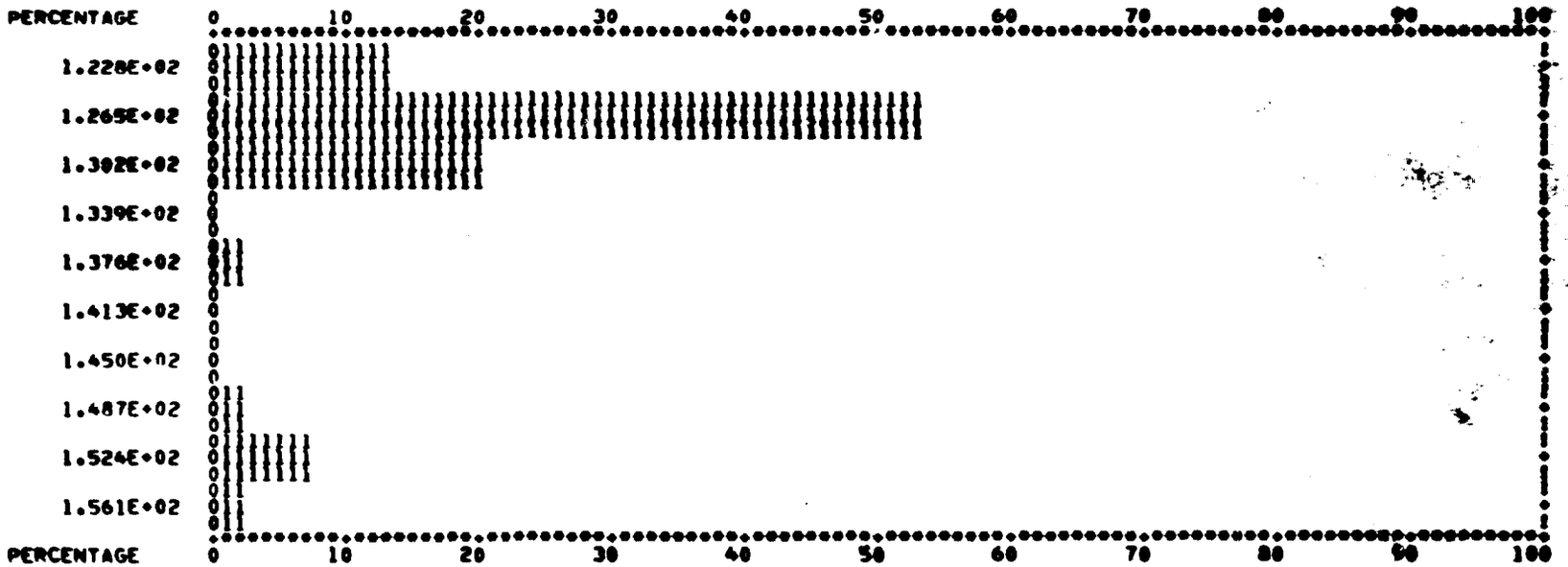
A-90

PENNSYLVANIA

A-9

PLANTING DATE

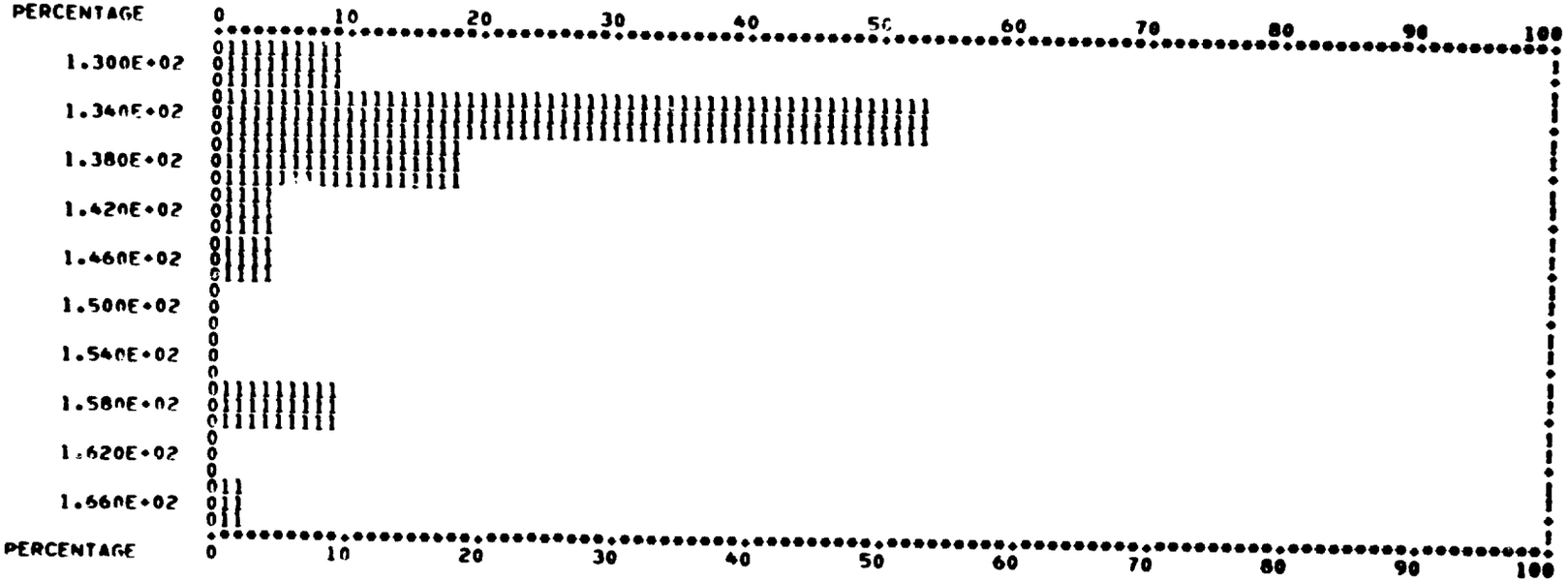
CROP TYPE IS CR
SEGMENTS = 319 320 322
STEP = 3.70000172
CENTERPOINT OF INITIAL GROUP= 122.849976 NUMBER OF OBSERVATIONS = 45
CENTERPOINT OF FINAL GROUP = 156.149994 NUMBER OF GROUPS = 10



BIN	122.85	126.55	130.25	133.95	137.65	141.35	145.05	148.75	152.45	156.15
CONTENT	6.00	24.00	9.00	0.0	1.00	0.0	0.0	1.00	3.00	1.00

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 319 320 322
STEP = 4.00000095
CENTERPOINT OF INITIAL GROUP= 129.999985
CENTERPOINT OF FINAL GROUP = 166.000000
NUMBER OF OBSERVATIONS = 45
NUMBER OF GROUPS = 10



BIN	130.00	134.00	138.00	142.00	146.00	150.00	154.00	158.00	162.00	166.00
CONTENT	4.00	24.00	8.00	2.00	2.00	0.0	0.0	4.00	0.0	1.00

A-93

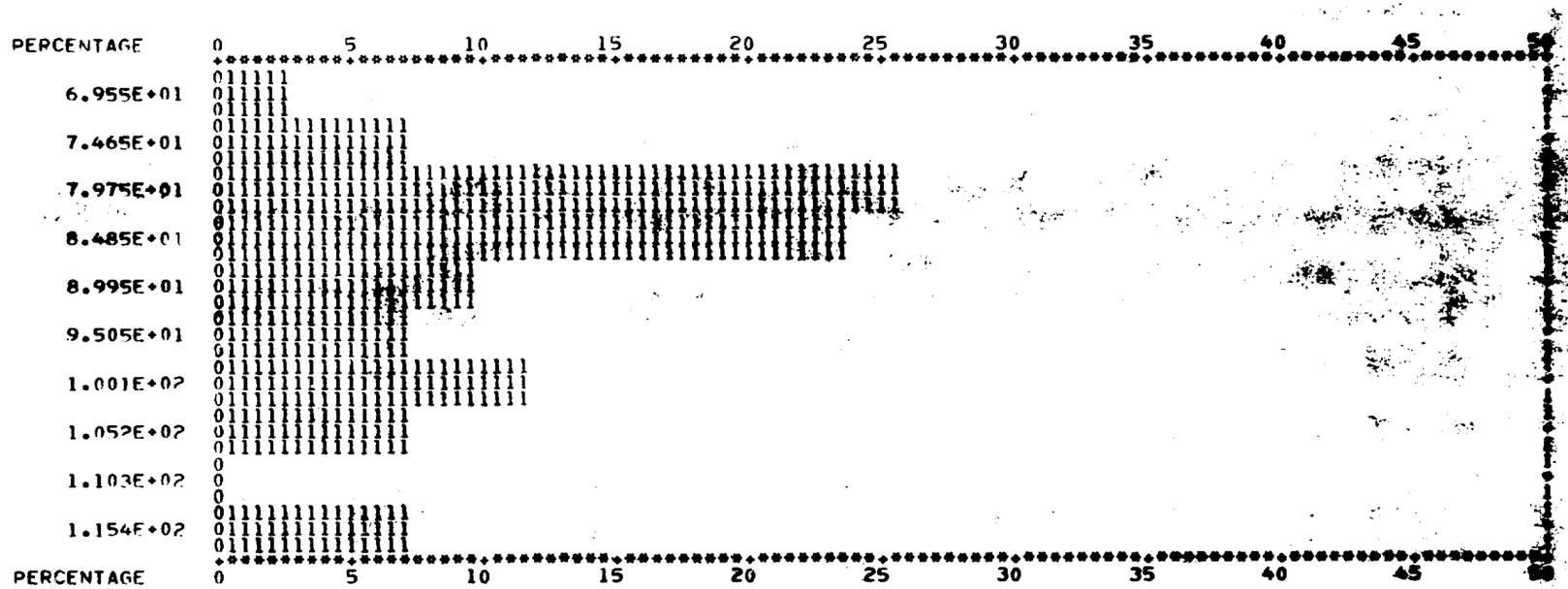
SOUTH CAROLINA

~~A-94~~

117

PLANTING DATE

CROP TYPE IS CR
SEGMENTS = 336 337 338 339
STEP = 5.10000229
CENTERPOINT OF INITIAL GROUP = 69.5499725
CENTERPOINT OF FINAL GROUP = 115.449997
NUMBER OF OBSERVATIONS = 43
NUMBER OF GROUPS = 10

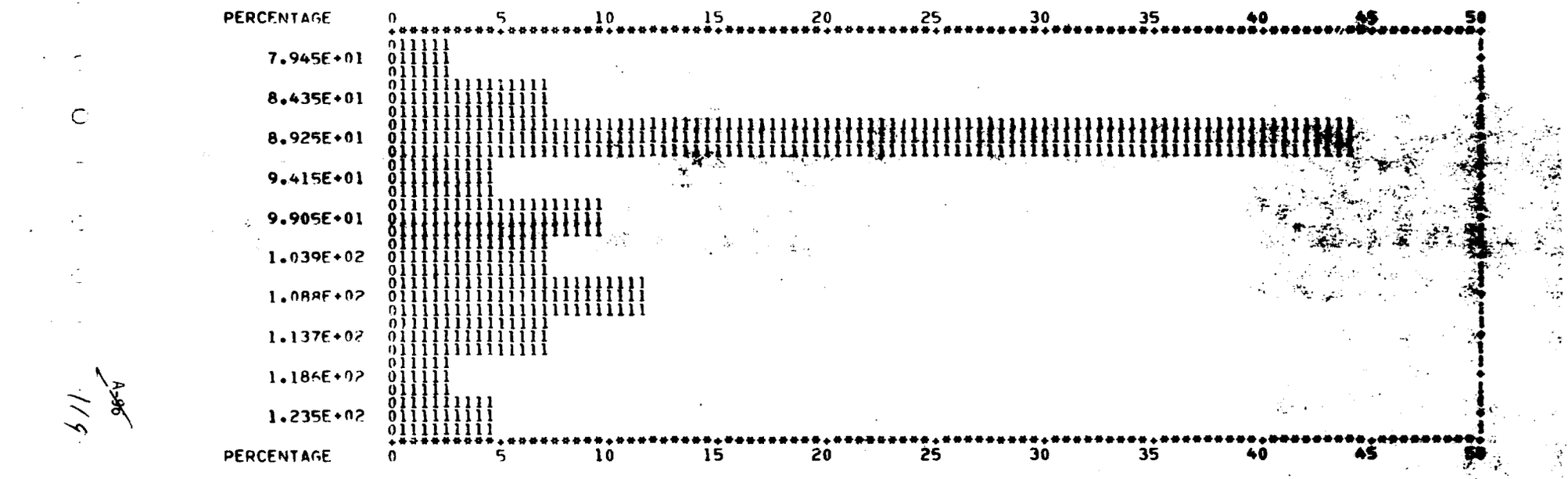


BIN	69.55	74.65	79.75	84.85	89.95	95.05	100.15	105.25	110.35	115.45
CONTENT	1.00	3.00	11.00	10.00	4.00	3.00	5.00	3.00	0.0	3.00

EMERGENCE DATE

CROP TYPE IS CR
SEGMENTS = 336 337 338 339

STEP = 4.90000057
CENTERPOINT OF INITIAL GROUP = 73.4499817 NUMBER OF OBSERVATIONS = 43
CENTERPOINT OF FINAL GROUP = 123.549988 NUMBER OF GROUPS = 10

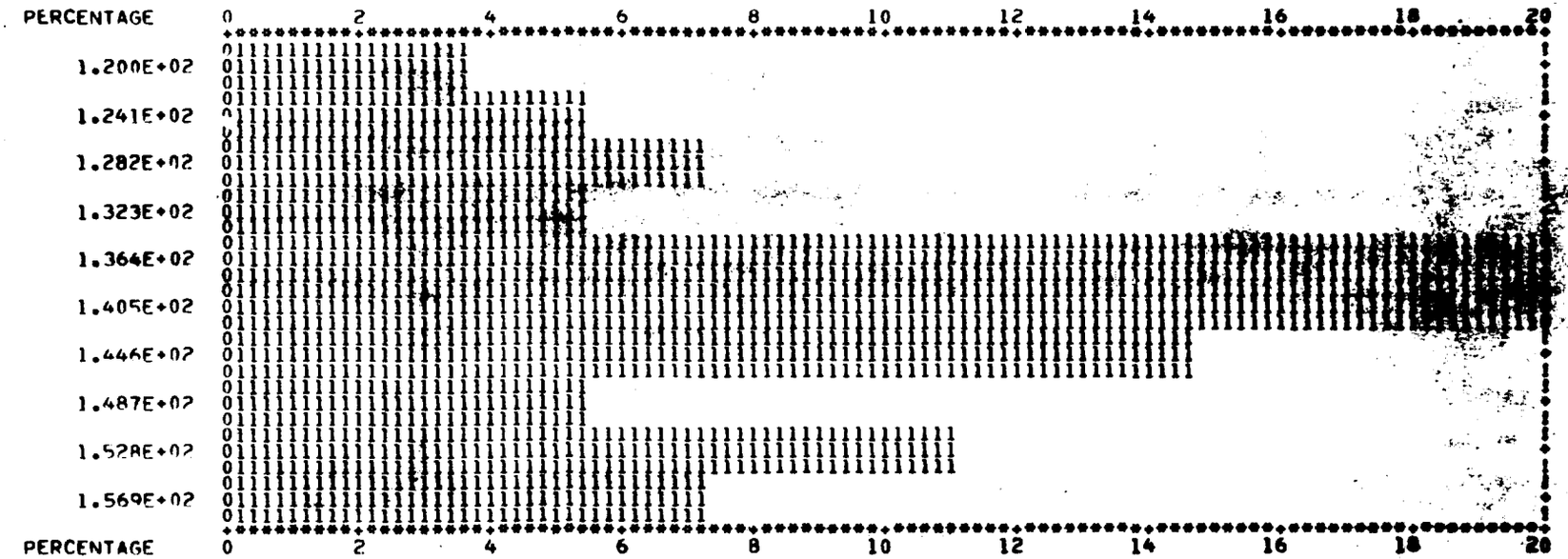


	BIN	79.45	84.35	89.25	94.15	99.05	103.95	108.85	113.75	118.65	123.55
CONTENT		1.00	3.00	19.00	2.00	4.00	3.00	5.00	3.00	1.00	2.00

A-96

PLANTING DATE

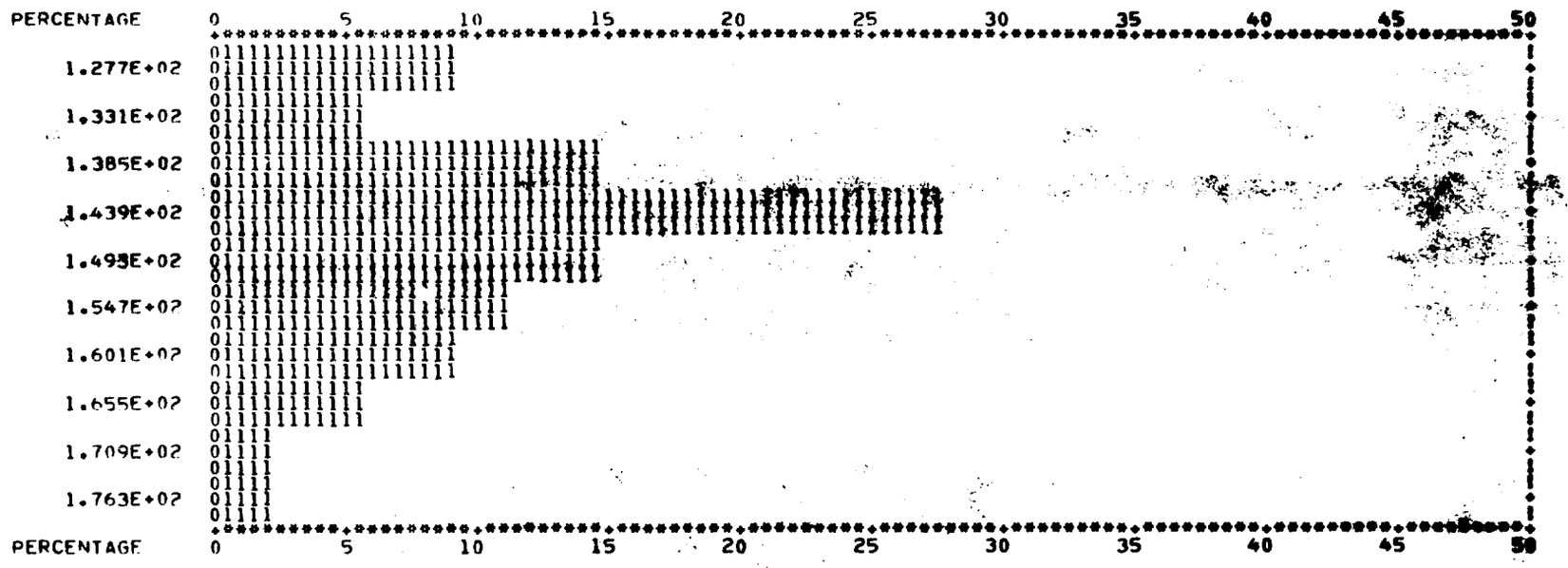
CROP TYPE IS SO
SEGMENTS = 336 337 338 339
STEP = 4.10000229
CENTERPOINT OF INITIAL GROUP= 120.049973 NUMBER OF OBSERVATIONS = 55
CENTERPOINT OF FINAL GROUP = 156.949997 NUMBER OF GROUPS = 10



BIN	120.05	124.15	128.25	132.35	136.45	140.55	144.65	148.75	152.85	156.95
CONTENT	2.00	3.00	4.00	3.00	11.00	11.00	8.00	3.00	6.00	4.00

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 336 337 338 339
STEP = 5.40000057
CENTERPOINT OF INITIAL GROUP = 127.699982
CENTERPOINT OF FINAL GROUP = 176.299988
NUMBER OF OBSERVATIONS = 55
NUMBER OF GROUPS = 10



BIN	127.70	133.10	138.50	143.90	149.30	154.70	160.10	165.50	170.90	176.30
CONTENT	5.00	3.00	8.00	15.00	8.00	6.00	5.00	3.00	1.00	1.00

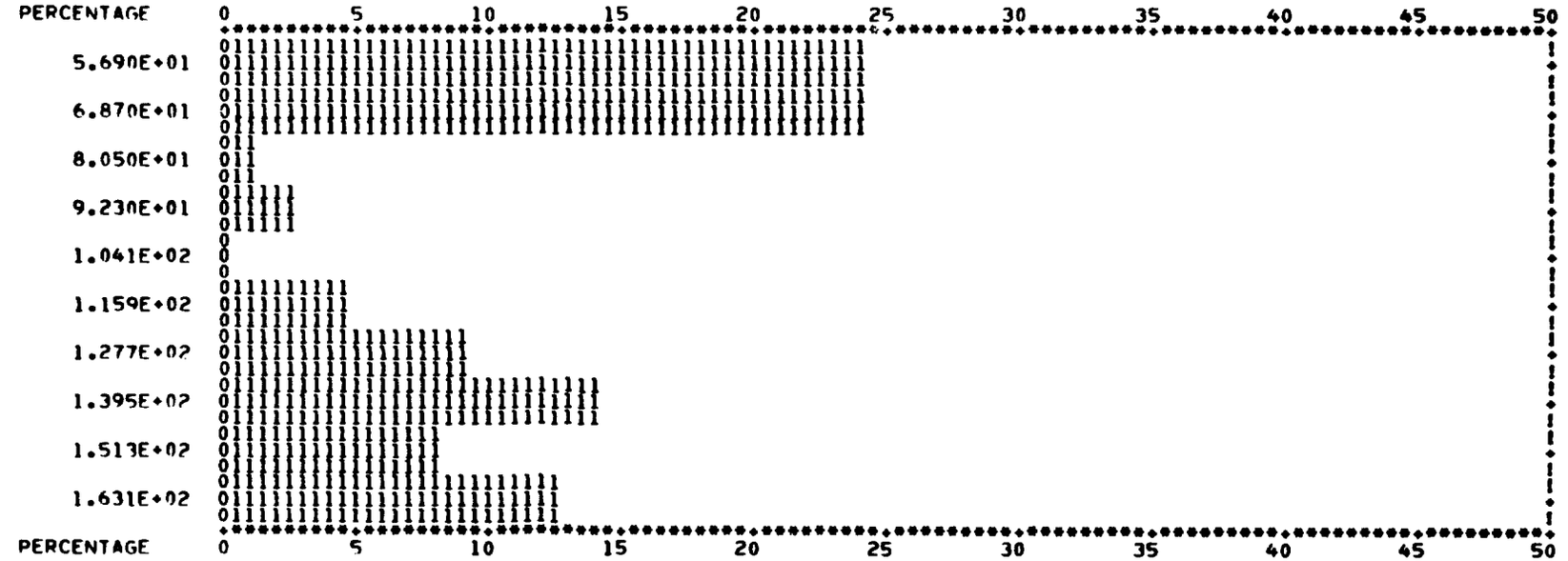
A-98

TEXAS

PLANTING DATE

CROP TYPE IS CT
SEGMENTS = 282 283 284 290 292 1377

STEP = 11.8000011
CENTERPOINT OF INITIAL GROUP= 56.8999786
CENTERPOINT OF FINAL GROUP = 163.099991
NUMBER OF OBSERVATIONS = 87
NUMBER OF GROUPS = 10



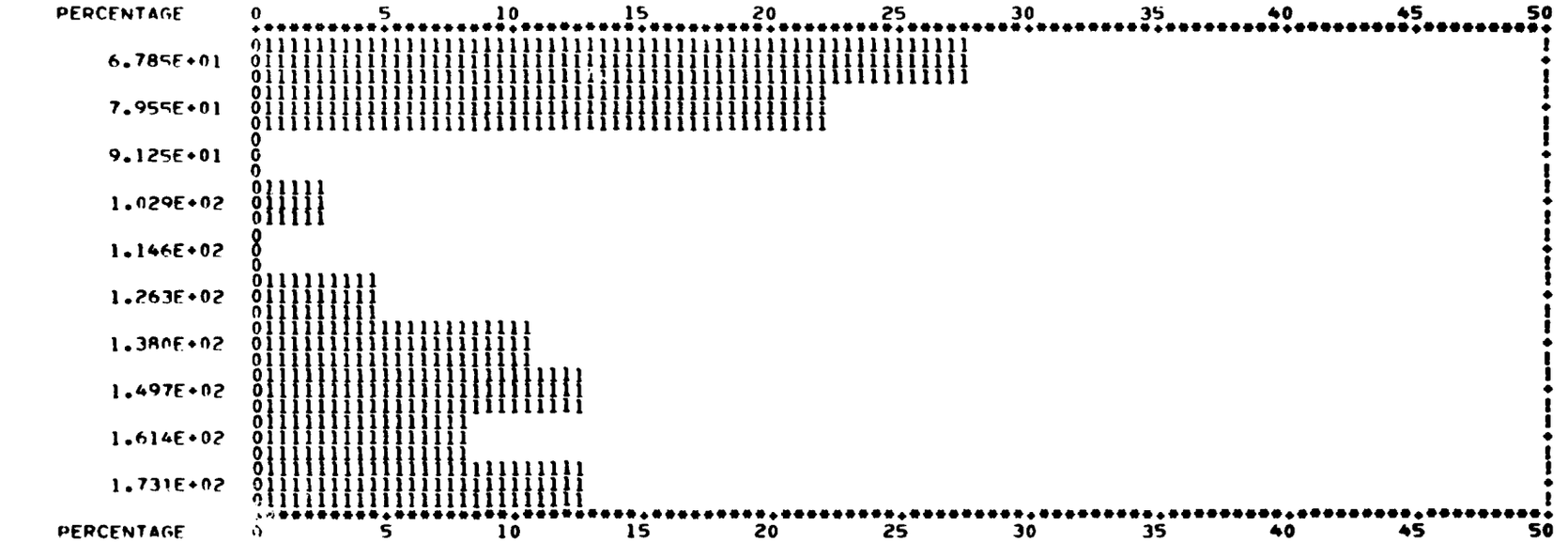
BIN	56.90	68.70	80.50	92.30	104.10	115.90	127.70	139.50	151.30	163.10
CONTENT	21.00	21.00	1.00	2.00	0.0	4.00	8.00	12.00	7.00	11.00

A-100
123

EMERGENCE DATE

CROP TYPE IS CT
SEGMENTS = 282 283 284 290 292 1377

STEP = 11.7000017
CENTERPOINT OF INITIAL GROUP= 67.8499756
CENTERPOINT OF FINAL GROUP = 173.149994
NUMBER OF OBSERVATIONS = 87
NUMBER OF GROUPS = 10

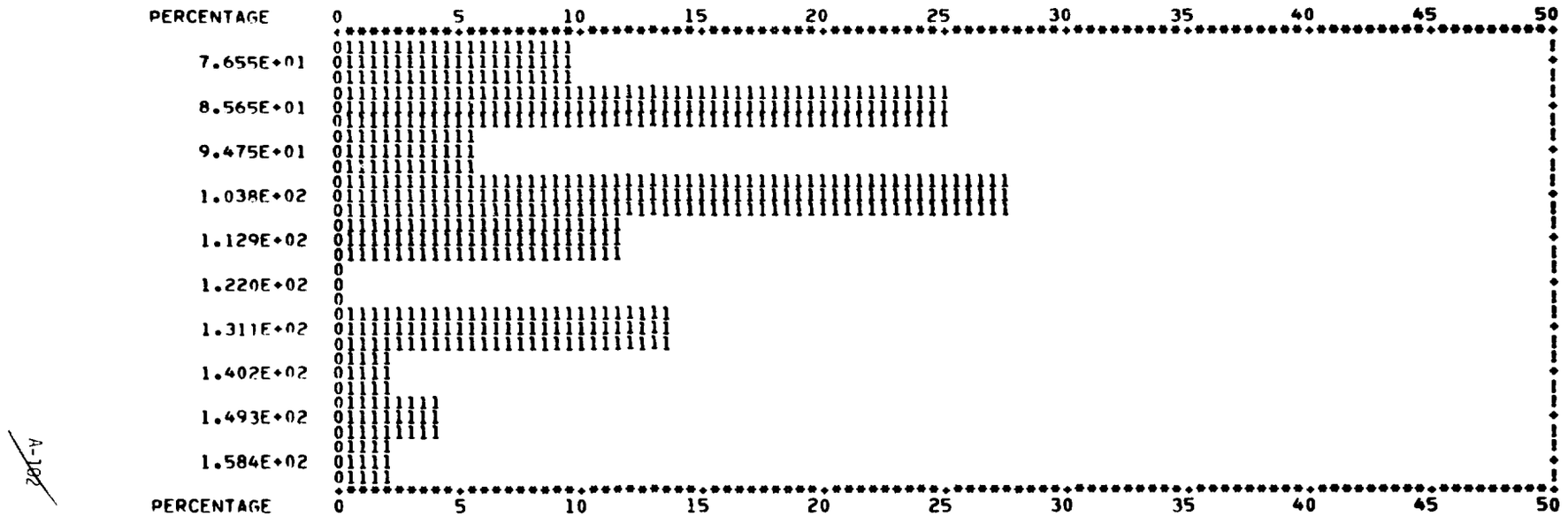


BIN	67.85	79.55	91.25	102.95	114.65	126.35	138.05	149.75	161.45	173.15
CONTENT	24.00	19.00	0.0	2.00	0.0	4.00	9.00	11.00	7.00	11.00

A-104

PLANTING DATE

CROP TYPE IS RI
SEGMENTS = 276 277 279
STEP = 9.10000229
CENTERPOINT OF INITIAL GROUP= 76.5499725 NUMBER OF OBSERVATIONS = 105
CENTERPOINT OF FINAL GROUP = 158.449997 NUMBER OF GROUPS = 10

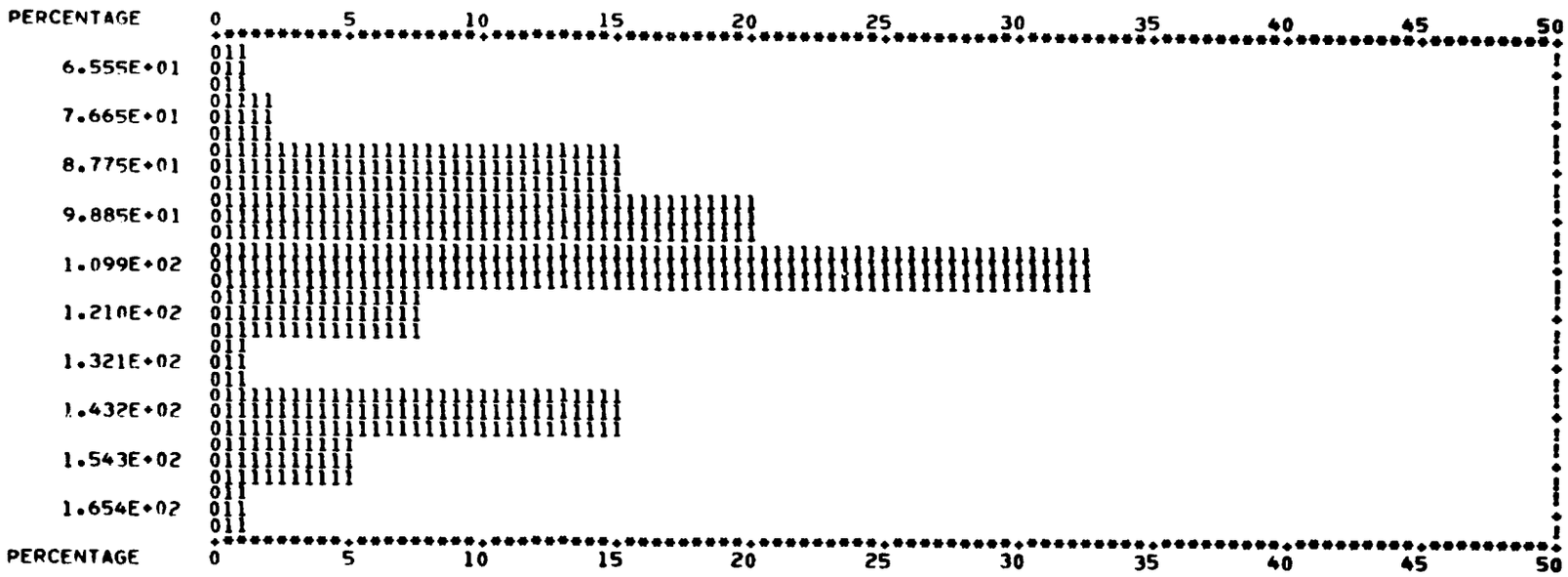


BIN	76.55	85.65	94.75	103.85	112.95	122.05	131.15	140.25	149.35	158.45
CONTENT	10.00	26.00	6.00	29.00	12.00	0.0	14.00	2.00	4.00	2.00

A-182
125

EMERGENCE DATE

CROP TYPE IS RI
SEGMENTS = 276 277 279
STEP = 11.1000023
CENTERPOINT OF INITIAL GROUP= 65.5499725 NUMBER OF OBSERVATIONS = 105
CENTERPOINT OF FINAL GROUP = 165.449997 NUMBER OF GROUPS = 10



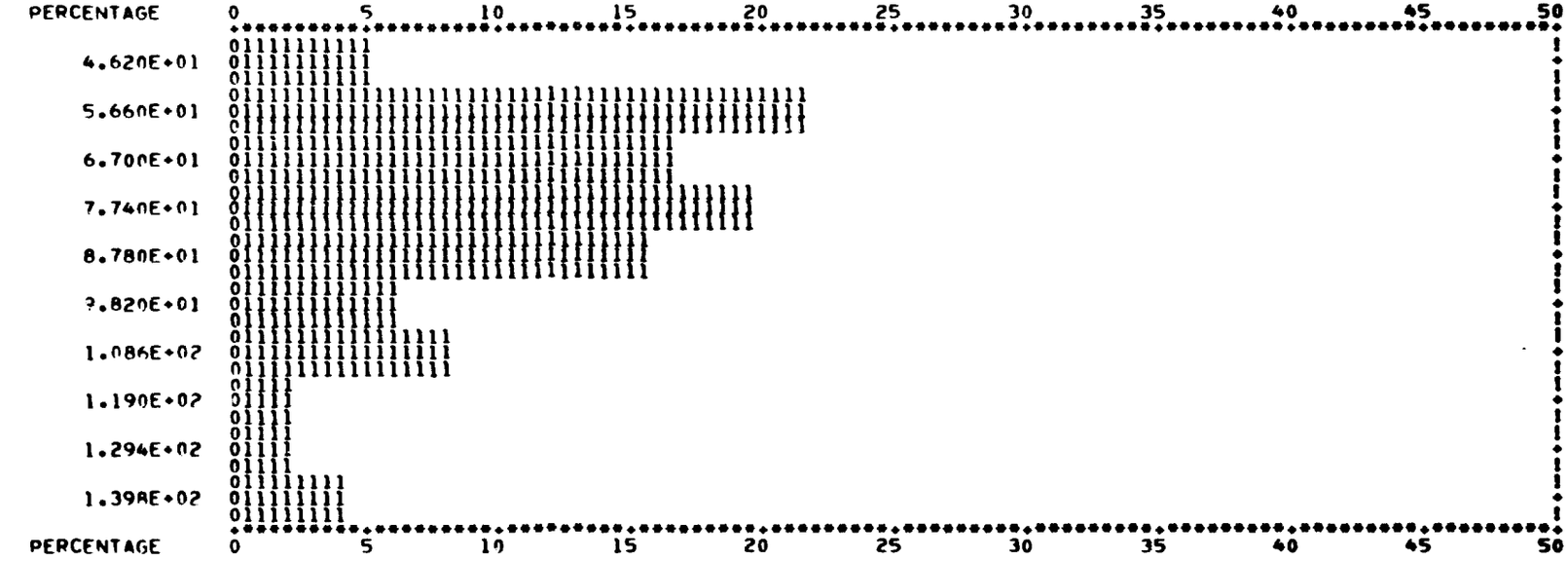
BIN	65.55	76.65	87.75	98.85	109.95	121.05	132.15	143.25	154.35	165.45
CONTENT	1.00	2.00	16.00	21.00	34.00	8.00	1.00	16.00	5.00	1.00

A-103
126

PLANTING DATE

CROP TYPE IS SR
SEGMENTS = 275 283 284 286 292 1377

STEP = 10.4000006
CENTERPOINT OF INITIAL GROUP= 46.1999817 NUMBER OF OBSERVATIONS = 102
CENTERPOINT OF FINAL GROUP = 139.799988 NUMBER OF GROUPS = 10



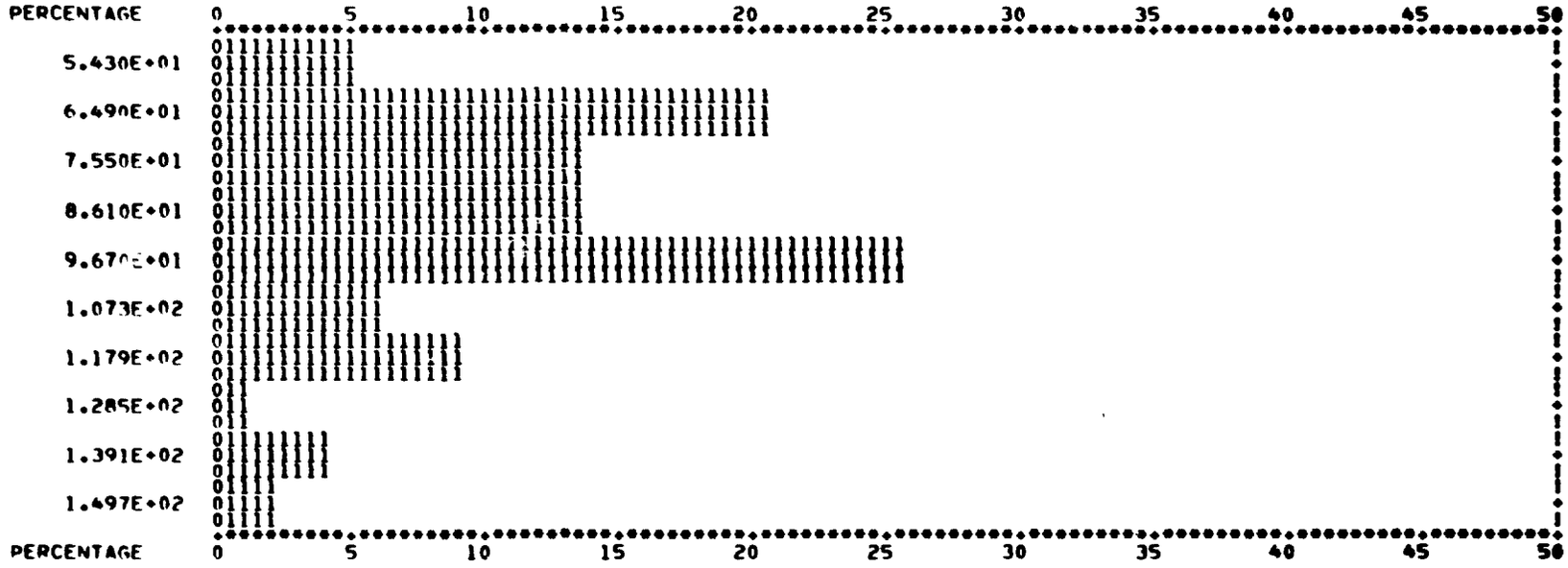
BIN	46.20	56.60	67.00	77.40	87.80	98.20	108.60	119.00	129.40	139.80
CONTENT	5.00	22.00	17.00	20.00	16.00	6.00	8.00	2.00	2.00	4.00

A-M14
127

EMERGENCE DATE

CROP TYPE IS SR
SEGMENTS = 275 283 284 286 292 1377

STEP = 10.4000023
CENTERPOINT OF INITIAL GROUP= 54.2999725 NUMBER OF OBSERVATIONS = 102
CENTERPOINT OF FINAL GROUP = 149.699997 NUMBER OF GROUPS = 10



	BIN	54.30	64.90	75.50	86.10	96.70	107.30	117.90	128.50	139.10	149.70
CONTENT		5.00	21.00	14.00	14.00	26.00	6.00	9.00	1.00	4.00	2.00

A-105
125

PLANTING DATE

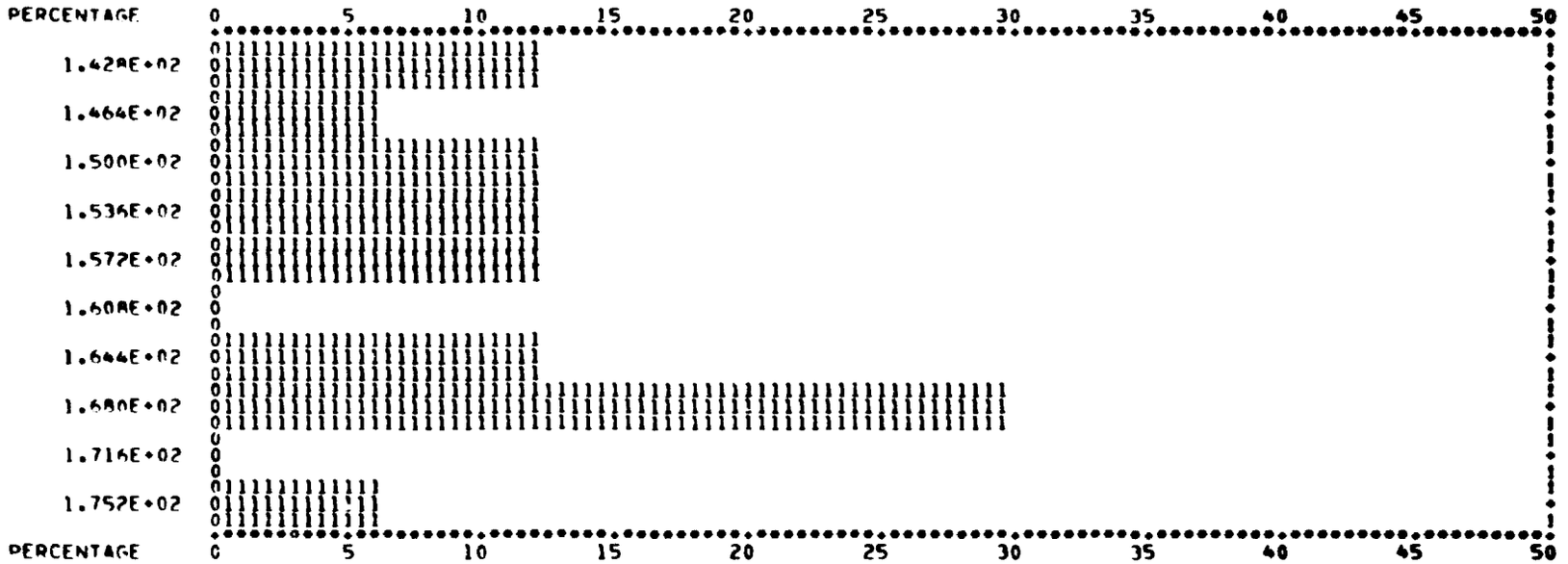
CROP TYPE IS SO
SEGMENTS = 276 28A
STEP = 4.10000229
CENTERPOINT OF INITIAL GROUP= 134.049973 NUMBER OF OBSERVATIONS = 17
CENTERPOINT OF FINAL GROUP = 170.949997 NUMBER OF GROUPS = 10

BIN	134.05	138.15	142.25	146.35	150.45	154.55	158.65	162.75	166.85	170.95
CONTENT	1.00	2.00	1.00	3.00	1.00	1.00	0.0	7.00	0.0	1.00

A-106
29

EMERGENCE DATE

CROP TYPE IS SO
SEGMENTS = 276 288
STEP = 3.60000229
CENTERPOINT OF INITIAL GROUP= 142.799973 NUMBER OF OBSERVATIONS = 17
CENTERPOINT OF FINAL GROUP = 175.199997 NUMBER OF GROUPS = 10



BIN	142.80	146.40	150.00	153.60	157.20	160.80	164.40	168.00	171.60	175.20
CONTENT	2.00	1.00	2.00	2.00	2.00	0.0	2.00	5.00	0.0	1.00

A-1w
/3

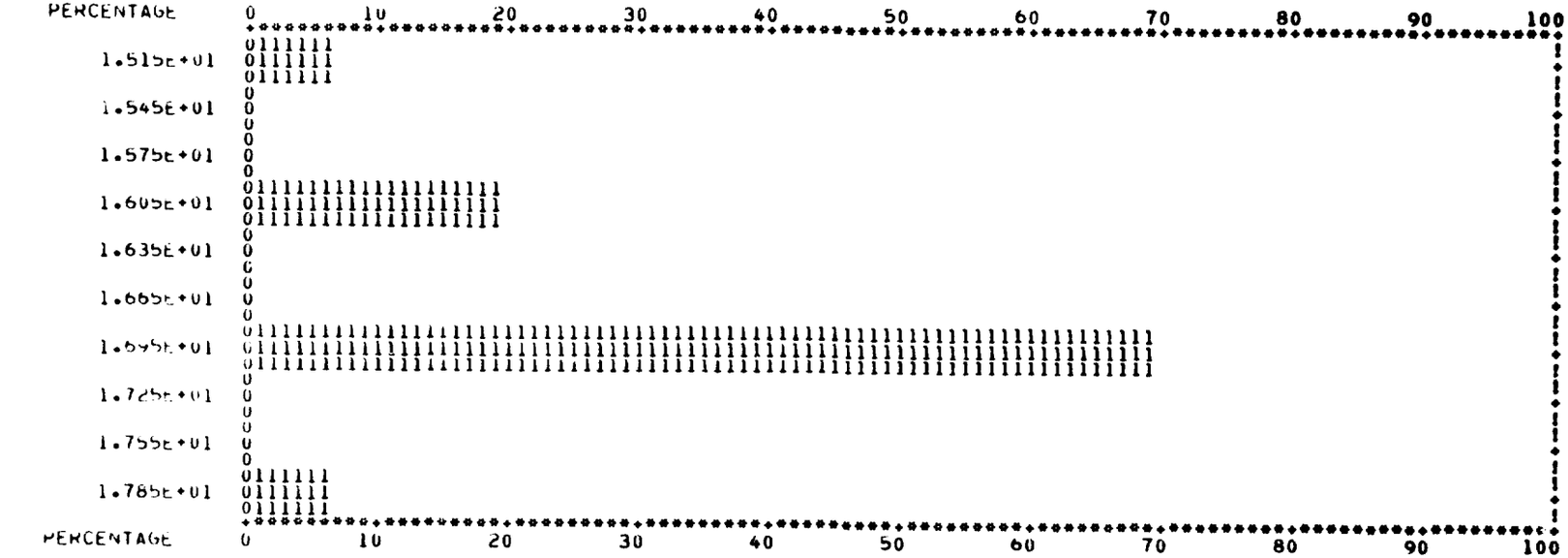
APPENDIX B

SPEEDING RATE AND ROW WIDTH HISTOGRAMS

ALABAMA

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 288 308
STEP = 0.29999912
CENTERPOINT OF INITIAL GROUP= 15.1499987
CENTERPOINT OF FINAL GROUP = 17.8499908
NUMBER OF OBSERVATIONS = 16
NUMBER OF GROUPS = 10

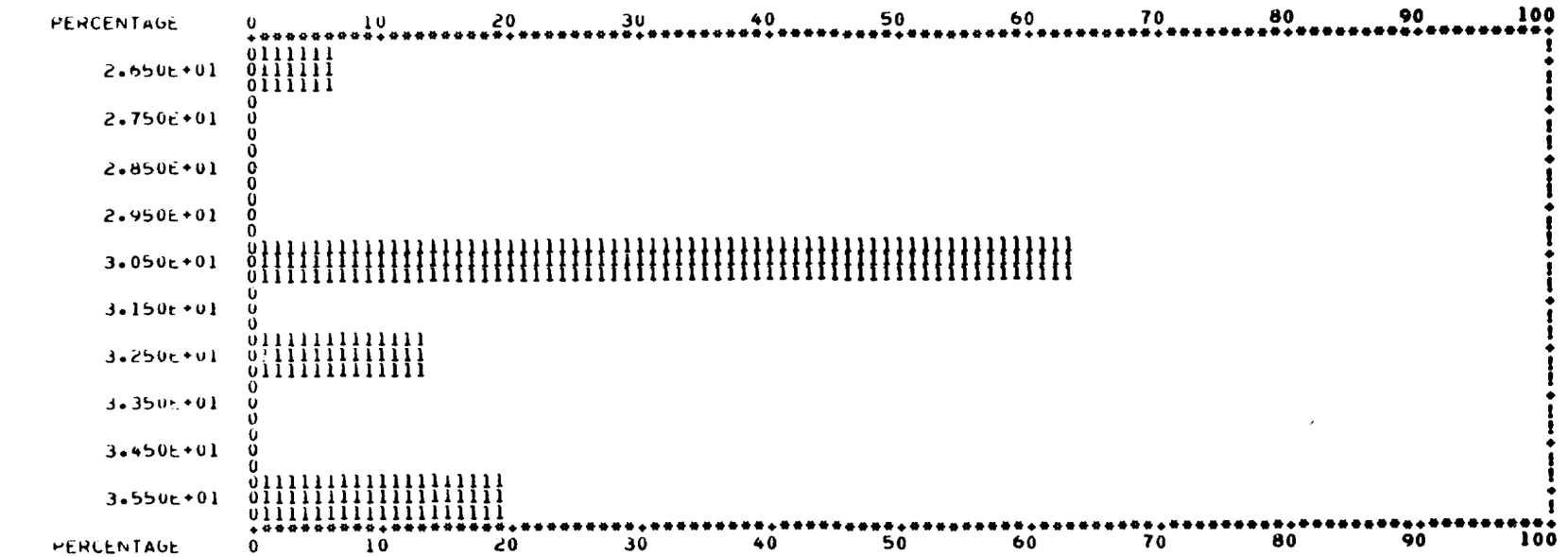


BIN	15.15	15.45	15.75	16.05	16.35	16.65	16.95	17.25	17.55	17.85
CONTENT	1.00	0.0	0.0	3.00	0.0	0.0	11.00	0.0	0.0	1.00

B3
153

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 288 308
STEP = 1.00000095
CENTERPOINT OF INITIAL GROUP= 26.4999847
CENTERPOINT OF FINAL GROUP = 35.5000000
NUMBER OF OBSERVATIONS = 16
NUMBER OF GROUPS = 10



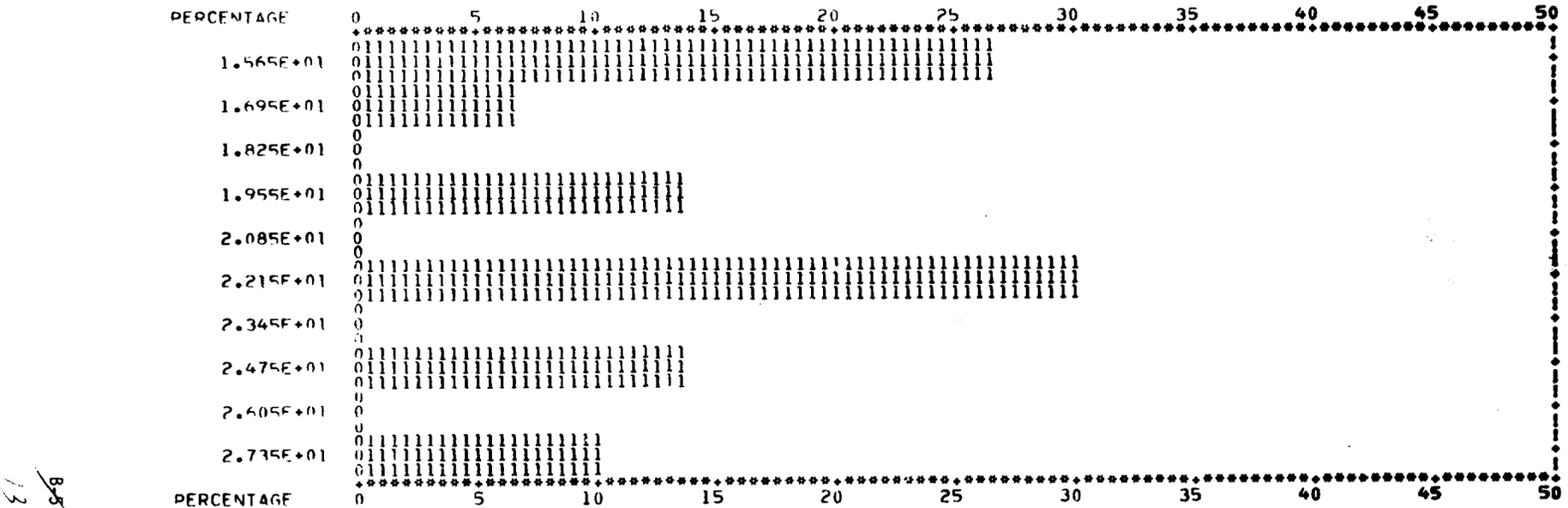
BIN	26.50	27.50	28.50	29.50	30.50	31.50	32.50	33.50	34.50	35.50
CONTENT	1.00	0.0	0.0	0.0	10.00	0.0	2.00	0.0	0.0	3.00

SEEDING RATE - LB/ACRE

CROP TYPE IS CT
SEGMENTS = 309 310

STEP = 1.29999828
CENTERPOINT OF INITIAL GROUP = 15.6499987
CENTERPOINT OF FINAL GROUP = 27.3499908

NUMBER OF OBSERVATIONS = 30
NUMBER OF GROUPS = 10

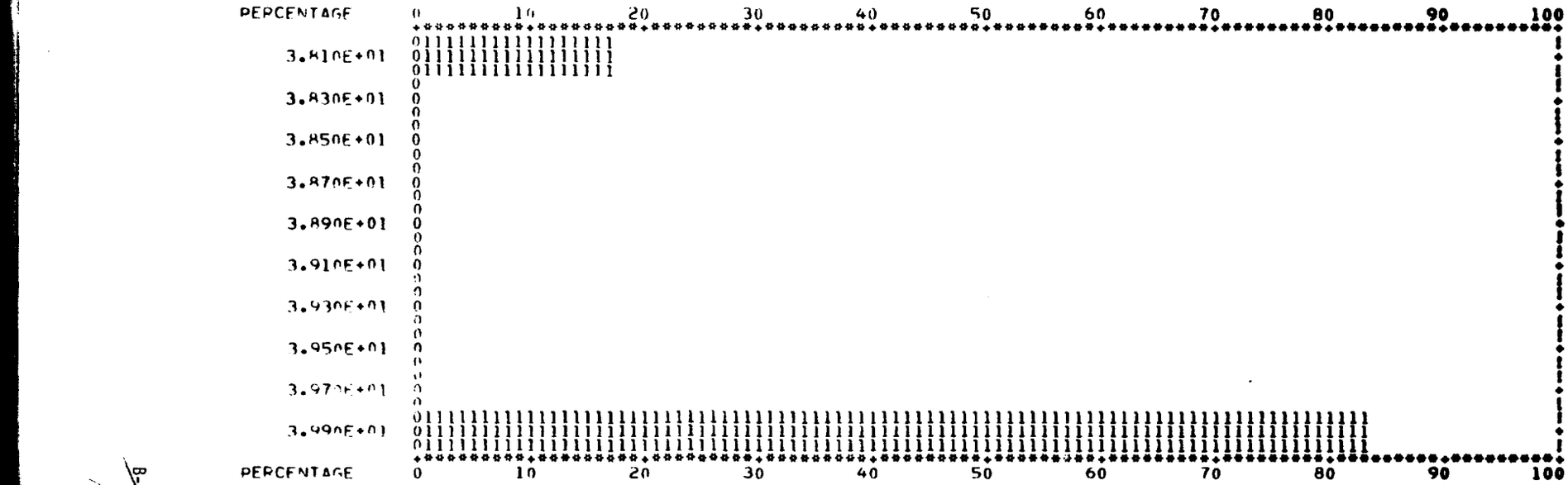


	MIN	15.65	16.95	18.25	19.55	20.85	22.15	23.45	24.75	26.05	27.35
CONTENT		8.00	2.00	0.0	4.00	0.0	9.00	0.0	4.00	0.0	3.00

8-5
133

ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 309 310
STEP = 0.20000201
CENTERPOINT OF INITIAL GROUP= 38.0999756 NUMBER OF OBSERVATIONS = 30
CENTERPOINT OF FINAL GROUP = 39.8999939 NUMBER OF GROUPS = 10



BIN	38.10	38.30	38.50	38.70	38.90	39.10	39.30	39.50	39.70	39.90
CONTENT	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.00

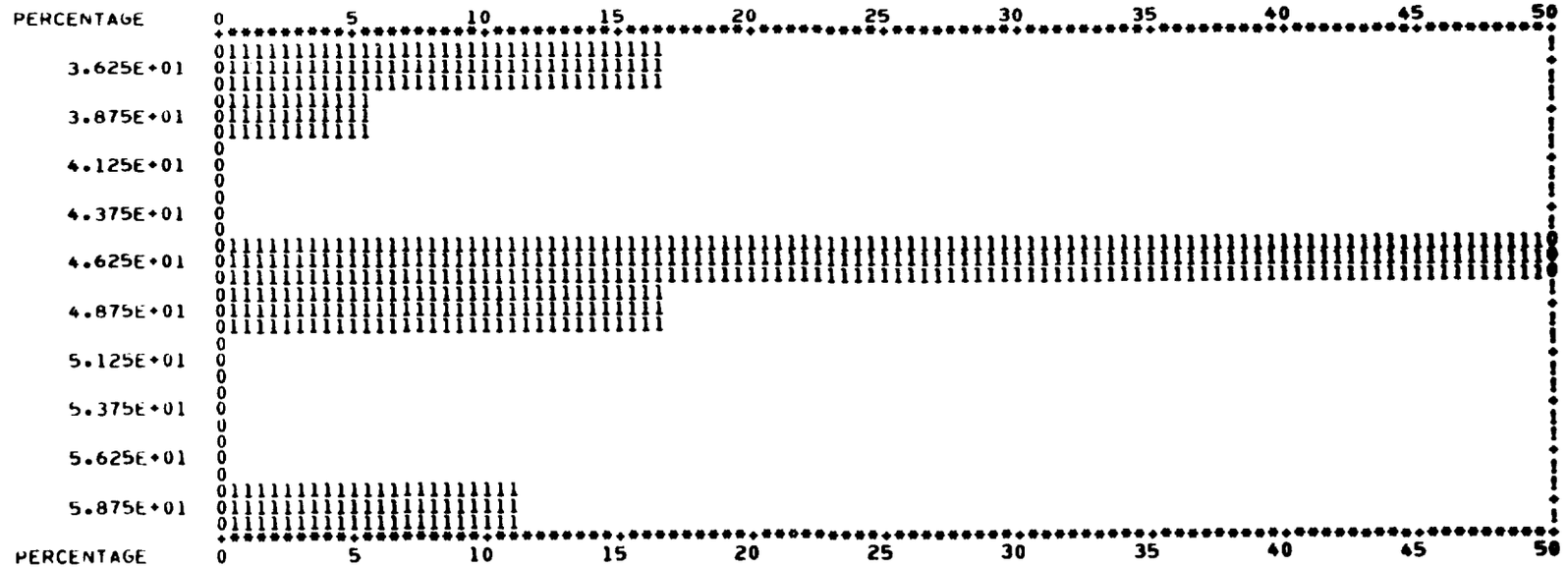
B-6

134

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 288 308

STEP = 2.50000095
CENTERPOINT OF INITIAL GROUP= 36.2499847 NUMBER OF OBSERVATIONS = 18
CENTERPOINT OF FINAL GROUP = 58.7500000 NUMBER OF GROUPS = 10

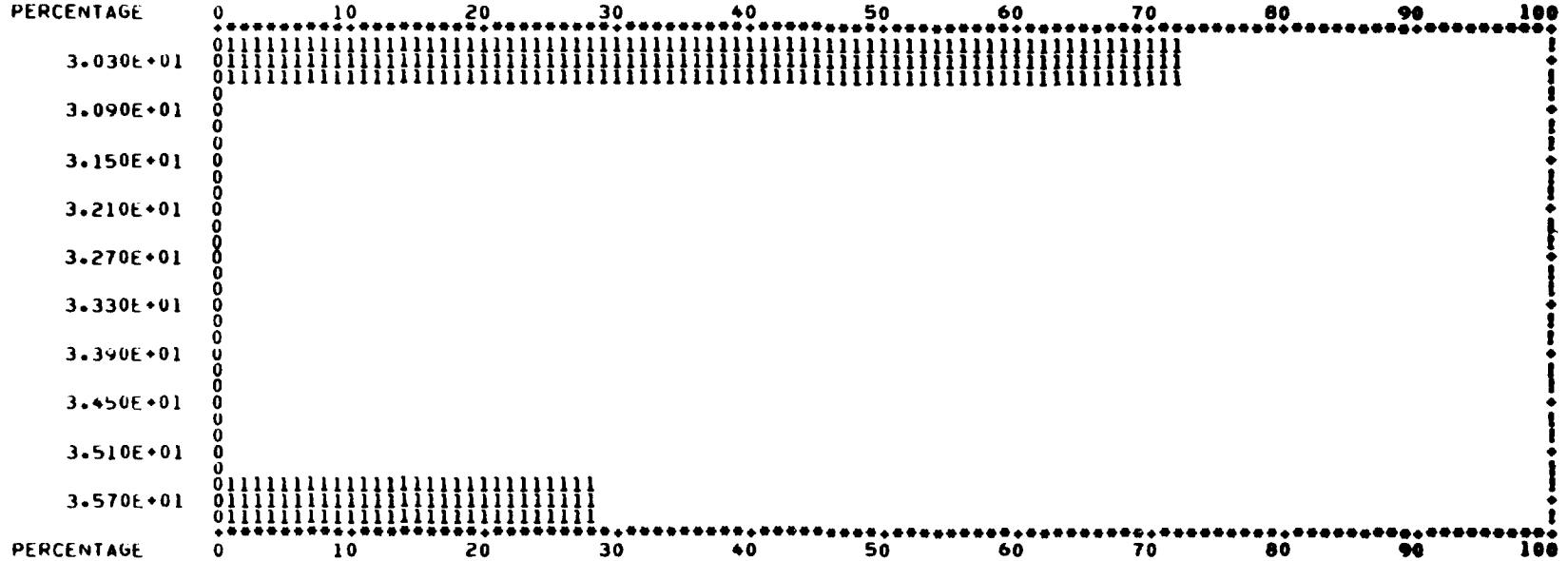


BIN	36.25	38.75	41.25	43.75	46.25	48.75	51.25	53.75	56.25	58.75
CONTENT	3.00	1.00	0.0	0.0	9.00	3.00	0.0	0.0	0.0	2.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 288 308

STEP = 0.60000271
CENTERPOINT OF INITIAL GROUP= 30.2999725 NUMBER OF OBSERVATIONS = 18
CENTERPOINT OF FINAL GROUP = 35.6999969 NUMBER OF GROUPS = 10



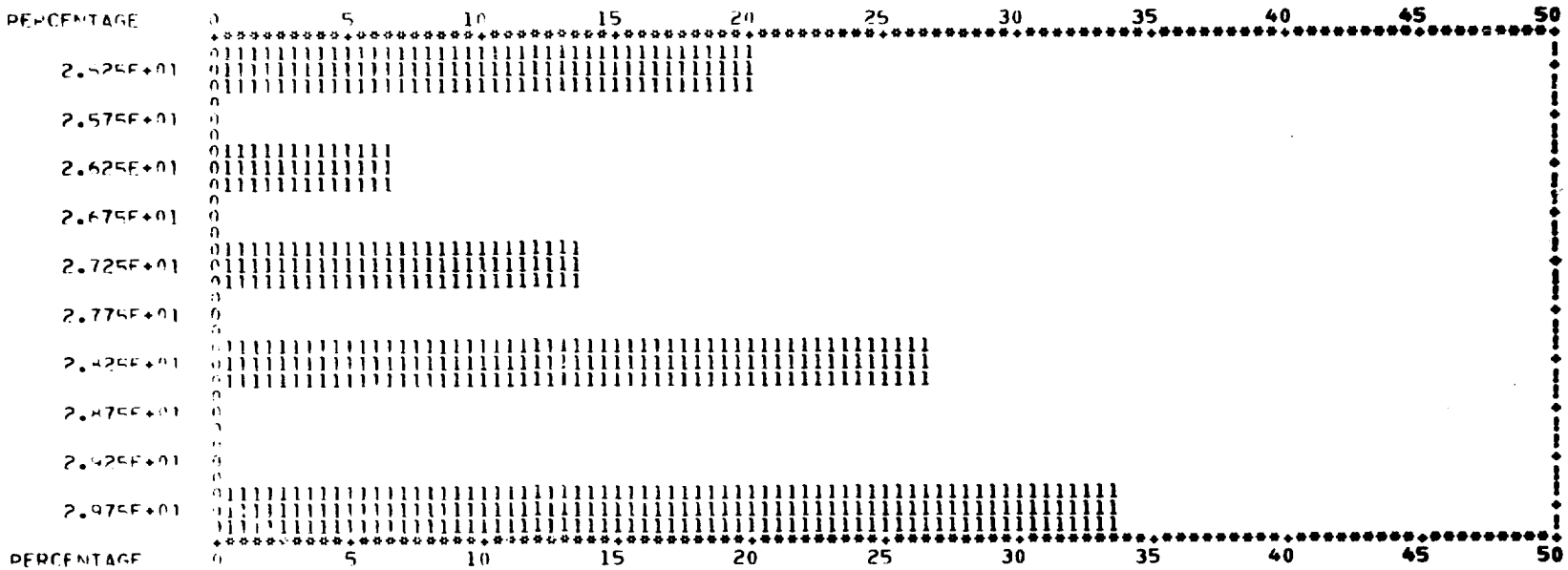
BIN	30.30	30.90	31.50	32.10	32.70	33.30	33.90	34.50	35.10	35.70
CONTENT	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.00

B-8
175

ARKANSAS

SEEDING RATE - LB/ACRE

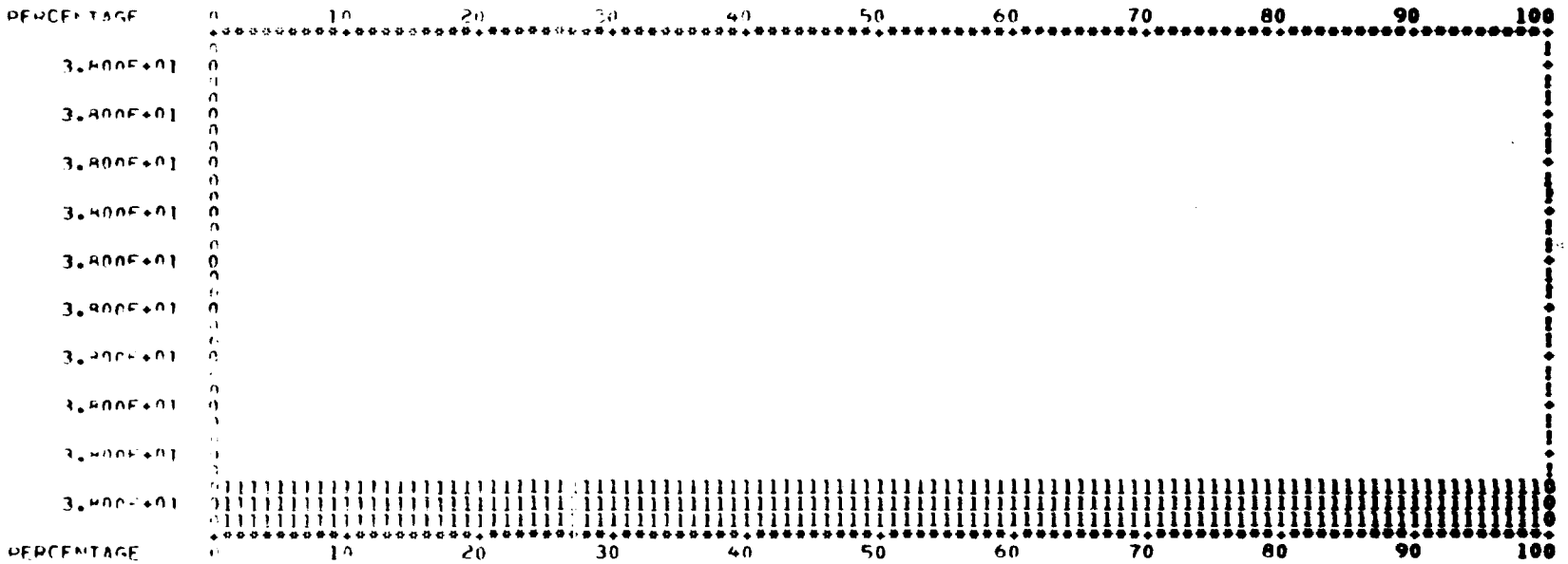
CROP TYPE IS CT
SEGMENTS = 1 1 1 301 305
TOL = 0.00000167
CENTERPOINT OF INITIAL GROUP= 25.2499847 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 29.7500000 NUMBER OF GROUPS = 10



MID	25.25	25.75	26.25	26.75	27.25	27.75	28.25	28.75	29.25	29.75
CONTENT	3.00	0.0	1.00	0.0	2.00	0.0	4.00	0.0	0.0	5.00

ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 103 301 306
STEP = 0.00000170
CENTERPOINT OF INITIAL GROUP= 37.9999847 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 38.0000000 NUMBER OF GROUPS = 10

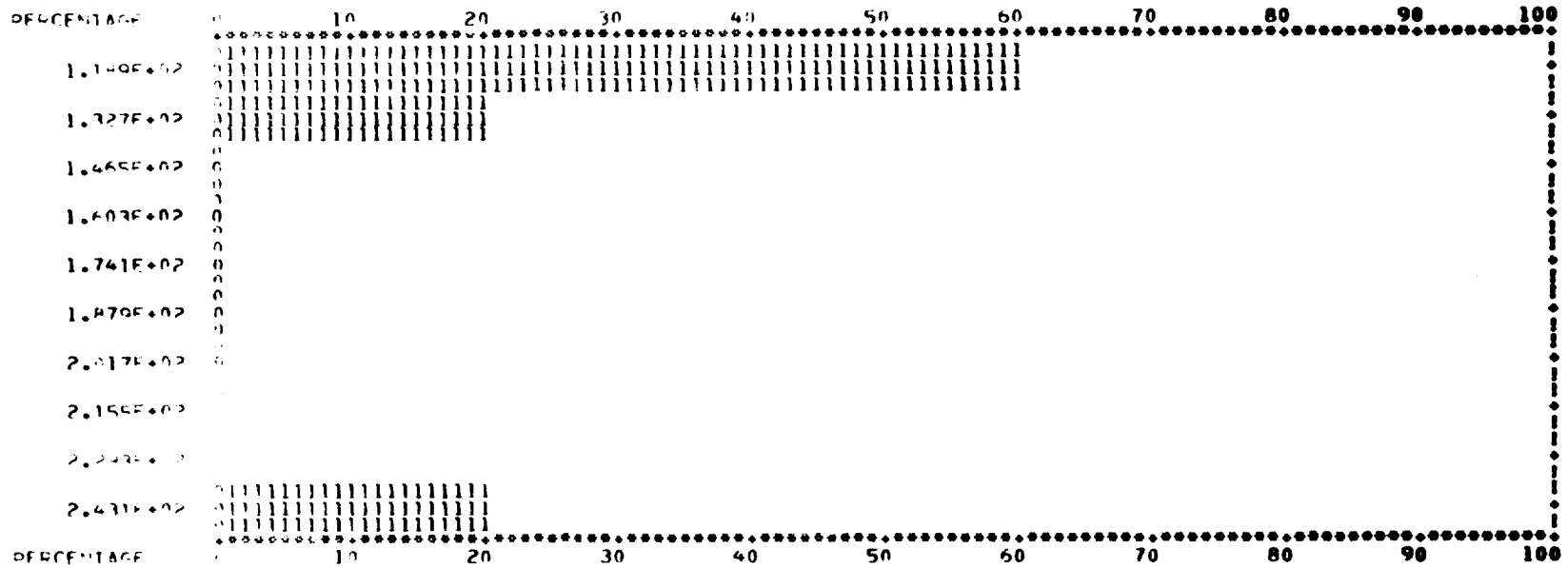


BI:	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
CONTENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.00

B-14

SEEDING RATE = LB/ACRE

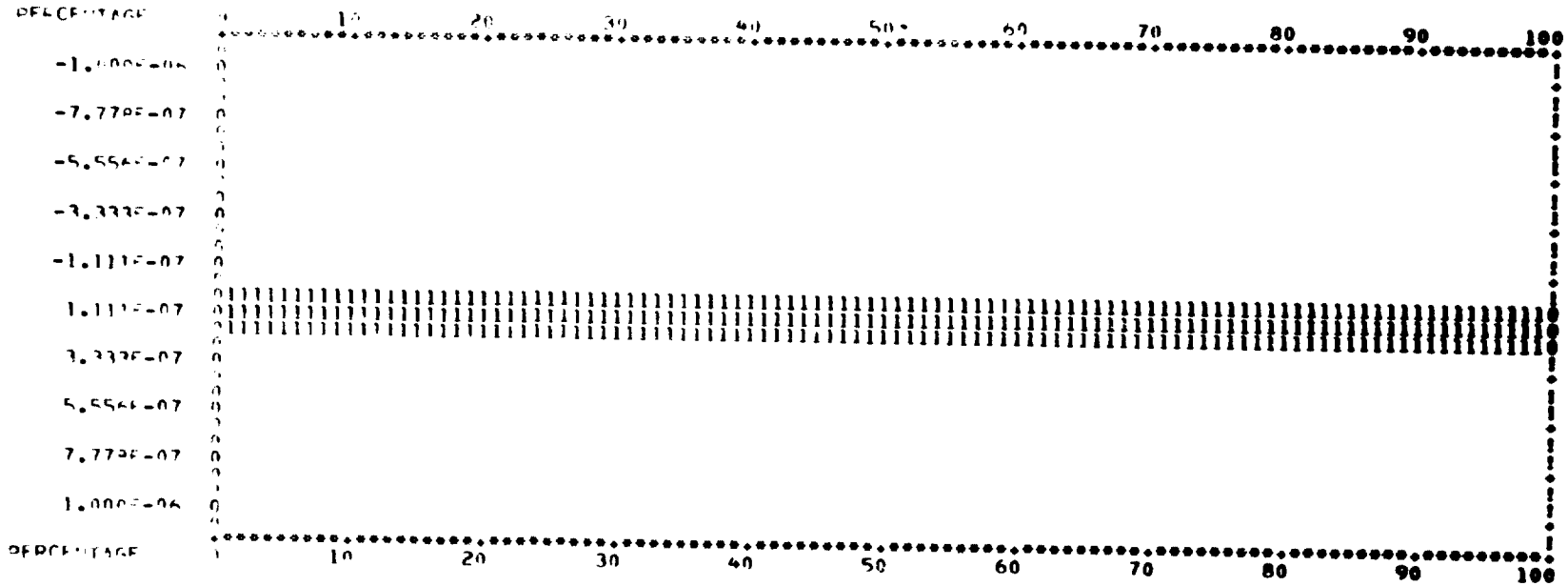
CROP TYPE IS RI
SEGMENTS = 103 104 305
STEP = 13.8000011
CENT-POINT OF INITIAL GROUP= 114.599976 NUMBER OF OBSERVATIONS = 15
CENTROID OF FINAL GROUP = 243.099991 NUMBER OF GROUPS = 10



RI	115.90	132.70	146.50	160.30	174.10	187.90	201.70	215.50	229.30	243.10
CONTENT	9.00	3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.00

BOX WIDTH = 1.0000

CROP TYPE IS CT
SEGMENTS = 103 104 105
STEP = 0.00000022
CENTERPOINT OF INITIAL GROUP = -0.00000011
CENTERPOINT OF FINAL GROUP = 0.00000100
NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10



CELL	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00
COUNT	0.0	0.0	0.0	0.0	0.0	15.00	0.0	0.0	0.0	0.0

SEEDING RATE = 1.42/ACRE

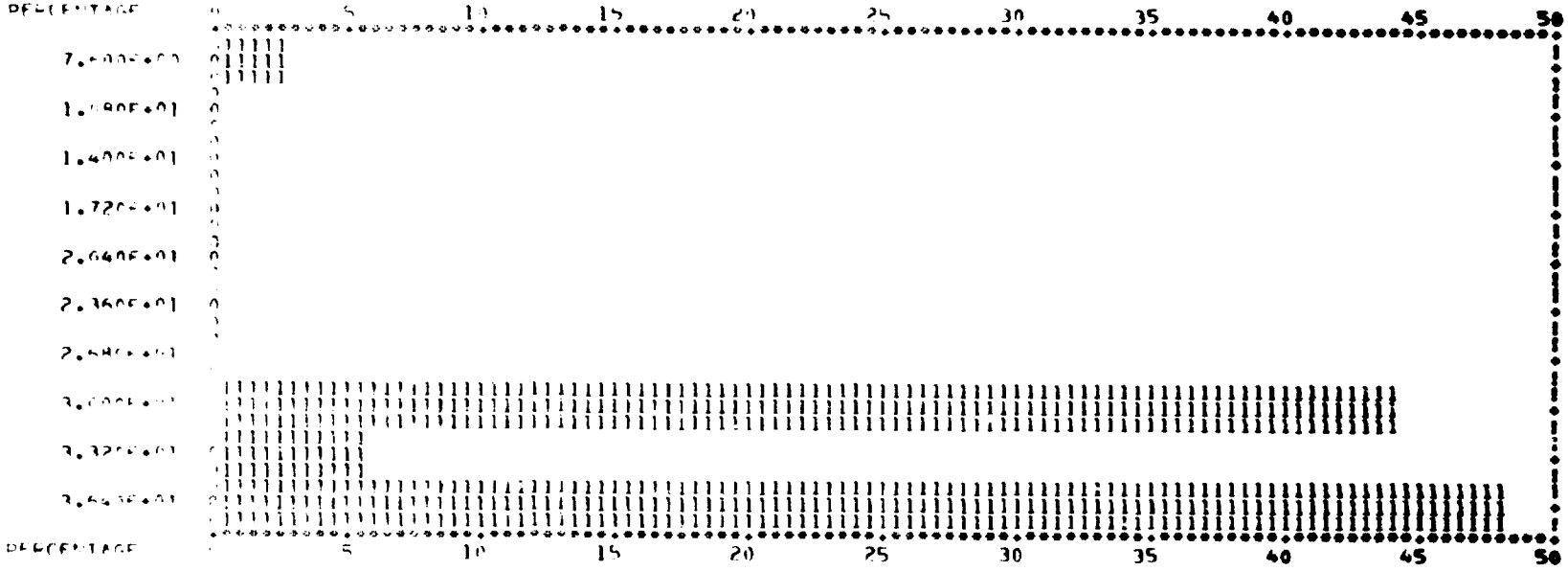
CROP TYPE IS SO
SEGMENTS = 102 103 104 301 302 303 304 305
STEP = 2.7[illegible]72
CENTERPOINT OF INITIAL GROUP= 39.4449756 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 63.6449939 NUMBER OF GROUPS = 10

MI	39.35	42.05	44.75	47.45	50.15	52.85	55.55	58.25	60.95	63.65
CONTENT	9.00	2.00	17.00	2.00	17.00	7.00	1.00	0.0	19.00	1.00

B-14

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 102 103 104 [illegible] 103 104 105
STEP = [illegible]
CENTERPOINT OF INITIAL GROUP= 7.5999984 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 36.9999939 NUMBER OF GROUPS = 10

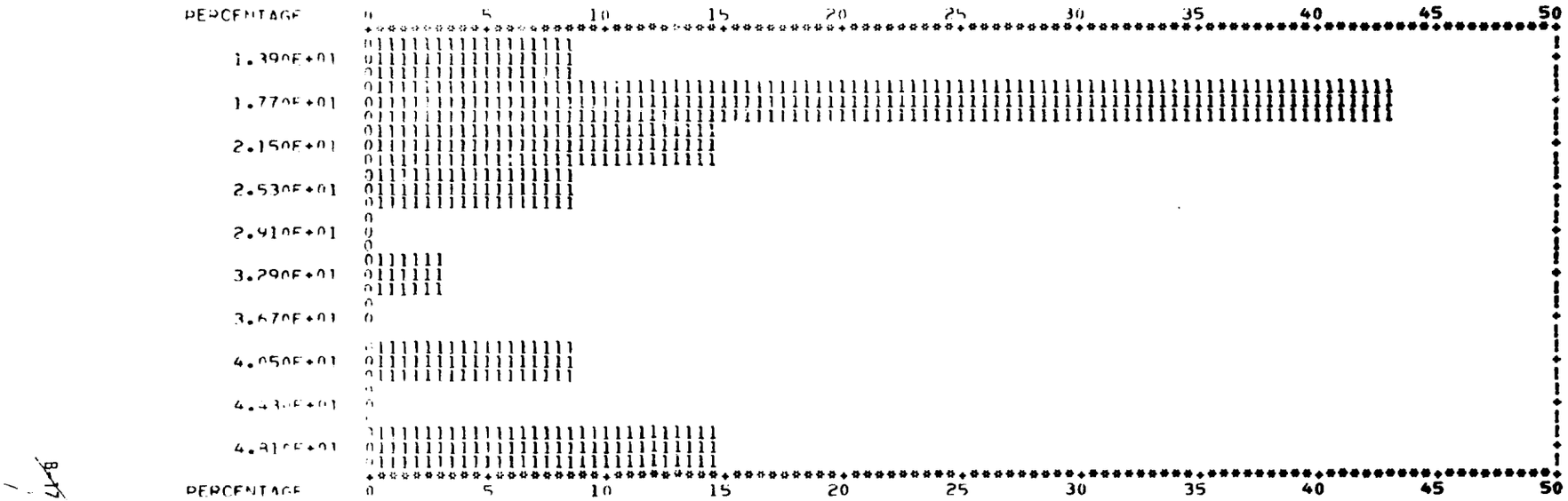


MID	7.60	10.80	14.00	17.20	20.40	23.60	26.80	30.00	33.20	36.40
COUNT	2.00	0.0	0.0	0.0	0.0	0.0	0.0	33.00	4.00	36.00

CALIFORNIA

SEEDING RATE = 134/ACRE

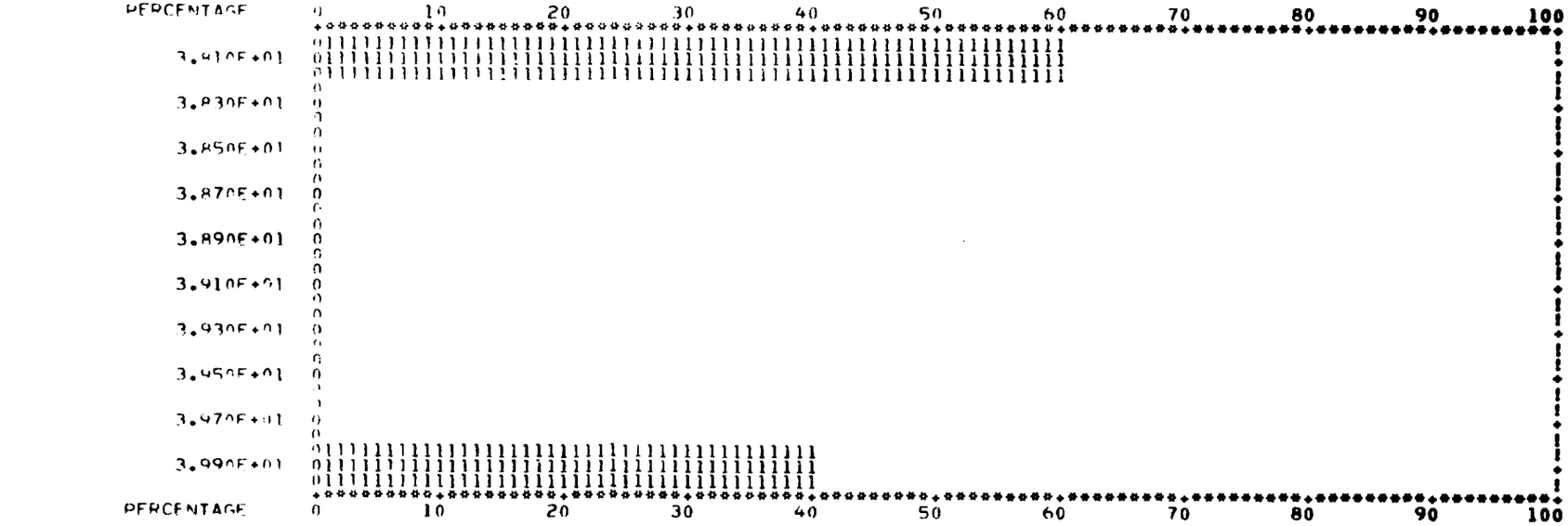
CROP TYPE IS CT
SEGMENTS = 261 263 278
STEP = 3.74999733
CENTERPOINT OF INITIAL GROUP = 13.4399997 NUMBER OF OBSERVATIONS = 35
CENTERPOINT OF FINAL GROUP = 48.0999985 NUMBER OF GROUPS = 10



BIN	13.90	17.70	21.50	25.30	29.10	32.90	36.70	40.50	44.30	48.10
CONTENT	3.00	15.00	5.00	3.00	0.0	1.00	0.0	3.00	0.0	5.00

ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 261 263 273
STEP = 0.20000201
CENTERPOINT OF INITIAL GROUP= 38.0999756 NUMBER OF OBSERVATIONS = 35
CENTERPOINT OF FINAL GROUP = 39.8999939 NUMBER OF GROUPS = 10

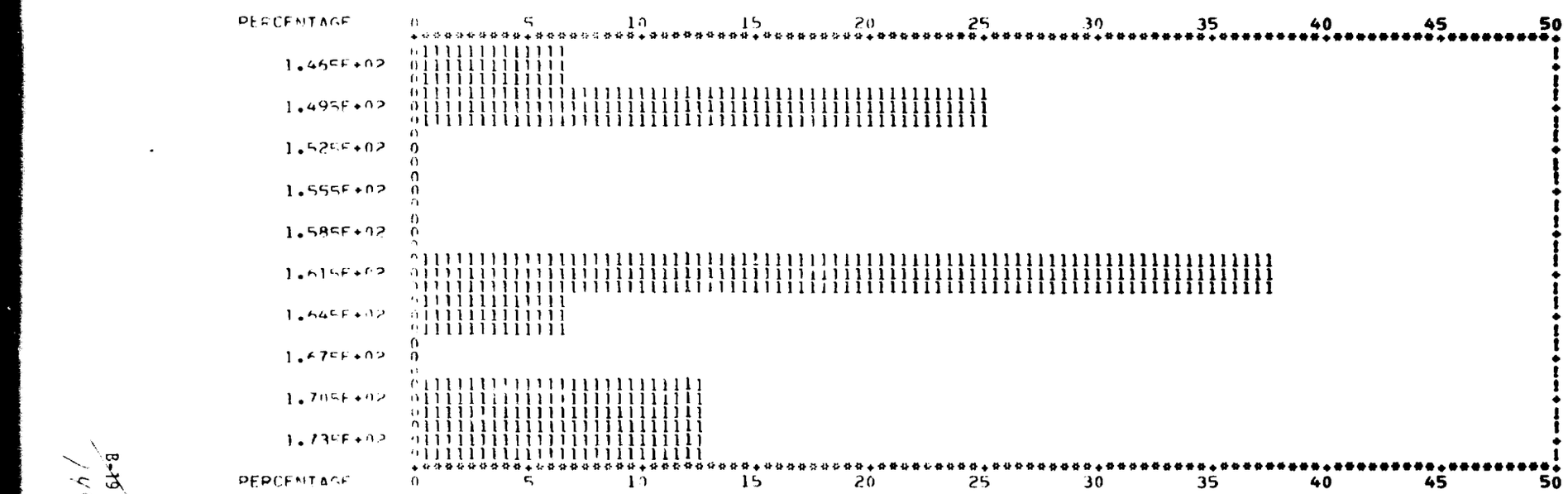


MIN	38.10	38.30	38.50	38.70	38.90	39.10	39.30	39.50	39.70	39.90
CONTENT	21.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.00

SEEDING RATE - LB/ACRE

CROP TYPE IS 61
SEGMENTS = 260 261

STEP = 3.000000
CENTERPOINT OF INITIAL GROUP= 146.499985 NUMBER OF OBSERVATIONS = 16
CENTERPOINT OF FINAL GROUP = 173.500000 NUMBER OF GROUPS = 10

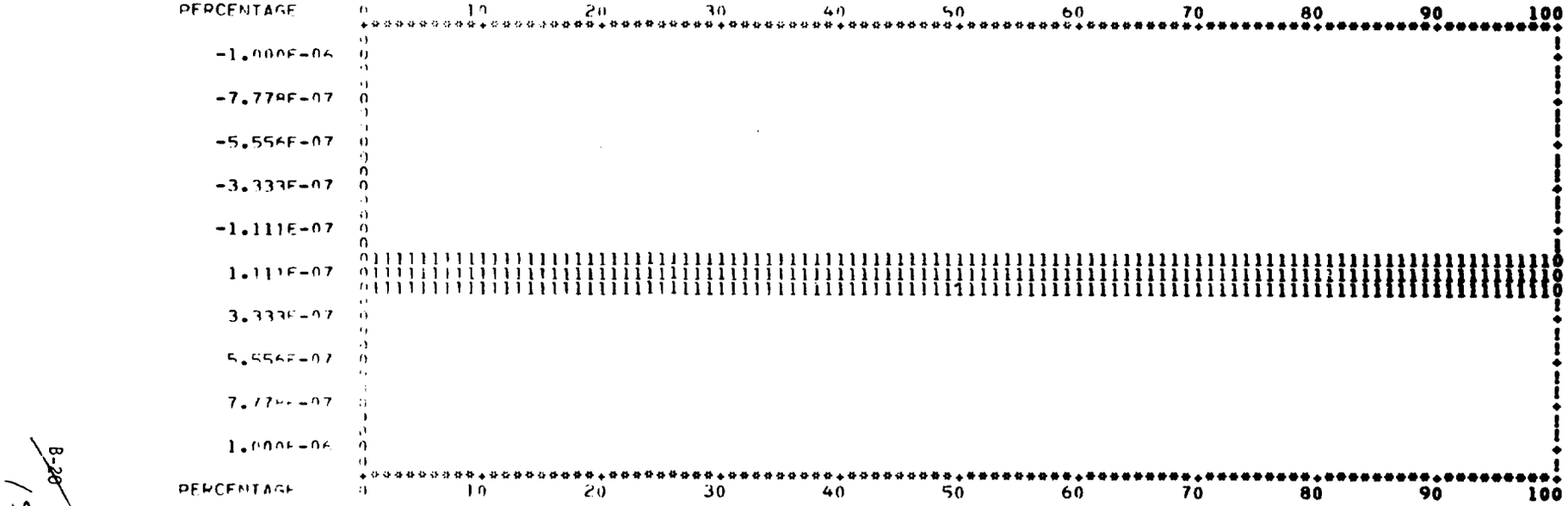


BIN	146.50	149.50	152.50	155.50	158.50	161.50	164.50	167.50	170.50	173.50
CONTENT	1.00	4.00	0.0	0.0	0.0	6.00	1.00	0.0	2.00	2.00

B-49

ROW WIDTH - INCHES

CROP TYPE IS HI
SEGMENTS = 260 261
STEP = 0.00000022
CENTERPOINT OF INITIAL GROUP = -0.00000180 NUMBER OF OBSERVATIONS = 16
CENTERPOINT OF FINAL GROUP = 0.00000100 NUMBER OF GROUPS = 10

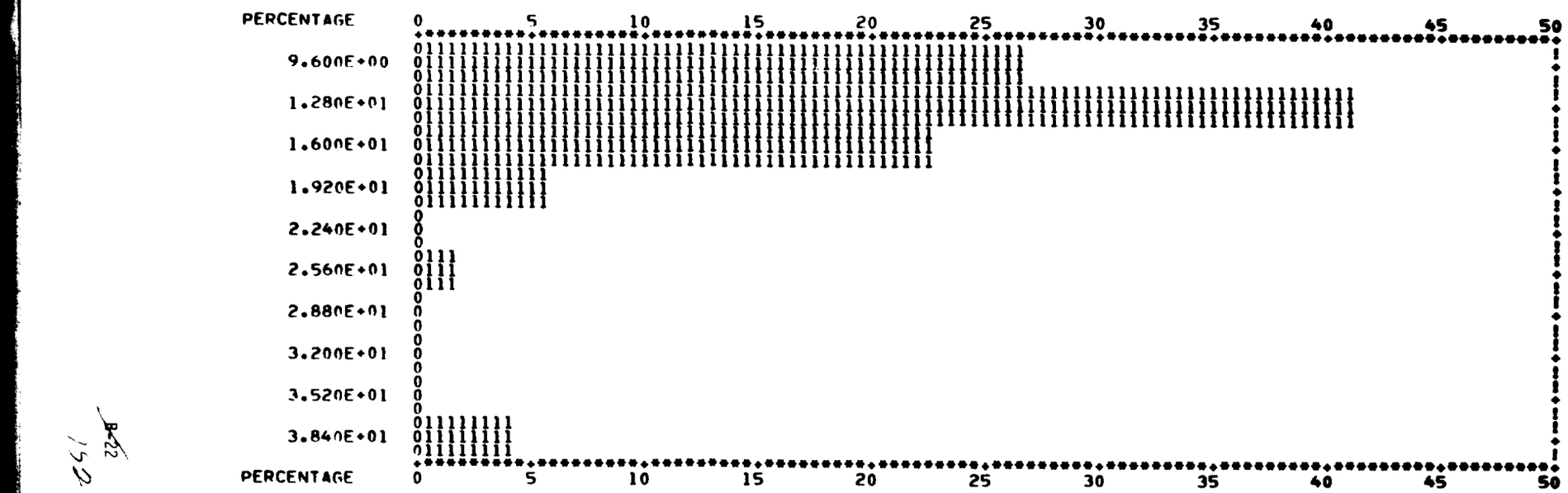


HI	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00
CONTENT	0.0	0.0	0.0	0.0	0.0	16.00	0.0	0.0	0.0	0.0

GEORGIA

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 311 312 330 333 334
STEP = 3.19999790
CENTERPOINT OF INITIAL GROUP= 9.59999847 NUMBER OF OBSERVATIONS = 76
CENTERPOINT OF FINAL GROUP = 38.3999939 NUMBER OF GROUPS = 10

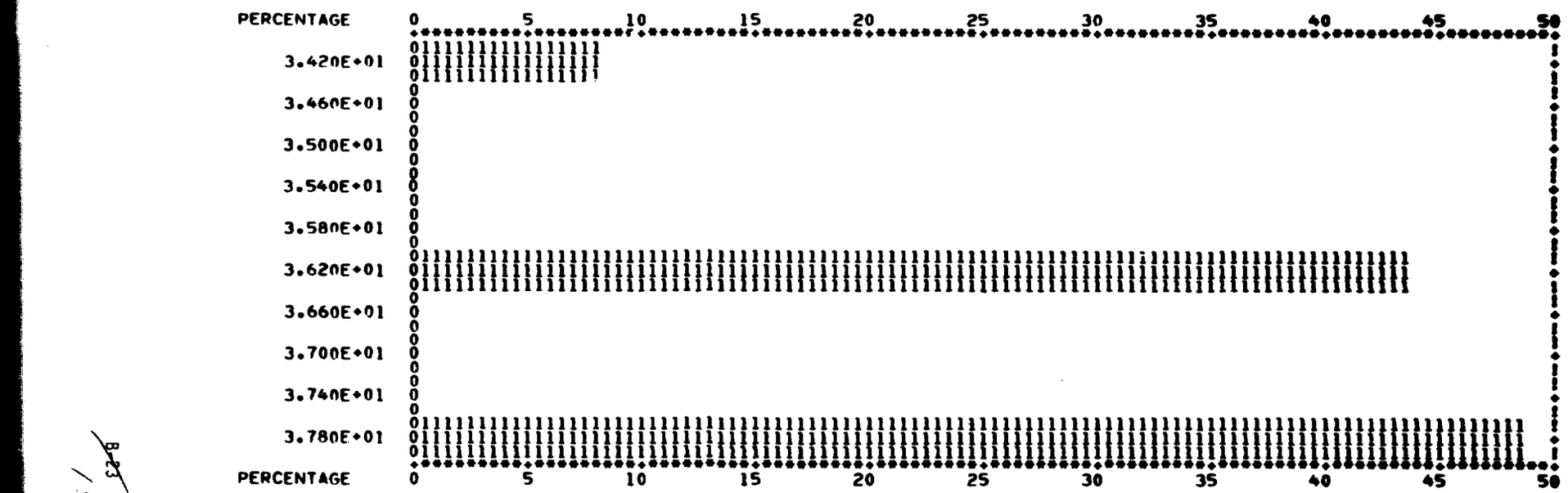


BIN	9.60	12.80	16.00	19.20	22.40	25.60	28.80	32.00	35.20	38.40
CONTENT	20.00	31.00	17.00	4.00	0.0	1.00	0.0	0.0	0.0	3.00

B-22
152

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 311 312 330 333 334
STEP = 0.40000063
CENTERPOINT OF INITIAL GROUP= 34.1999817 NUMBER OF OBSERVATIONS = 76
CENTERPOINT OF FINAL GROUP = 37.7999878 NUMBER OF GROUPS = 10

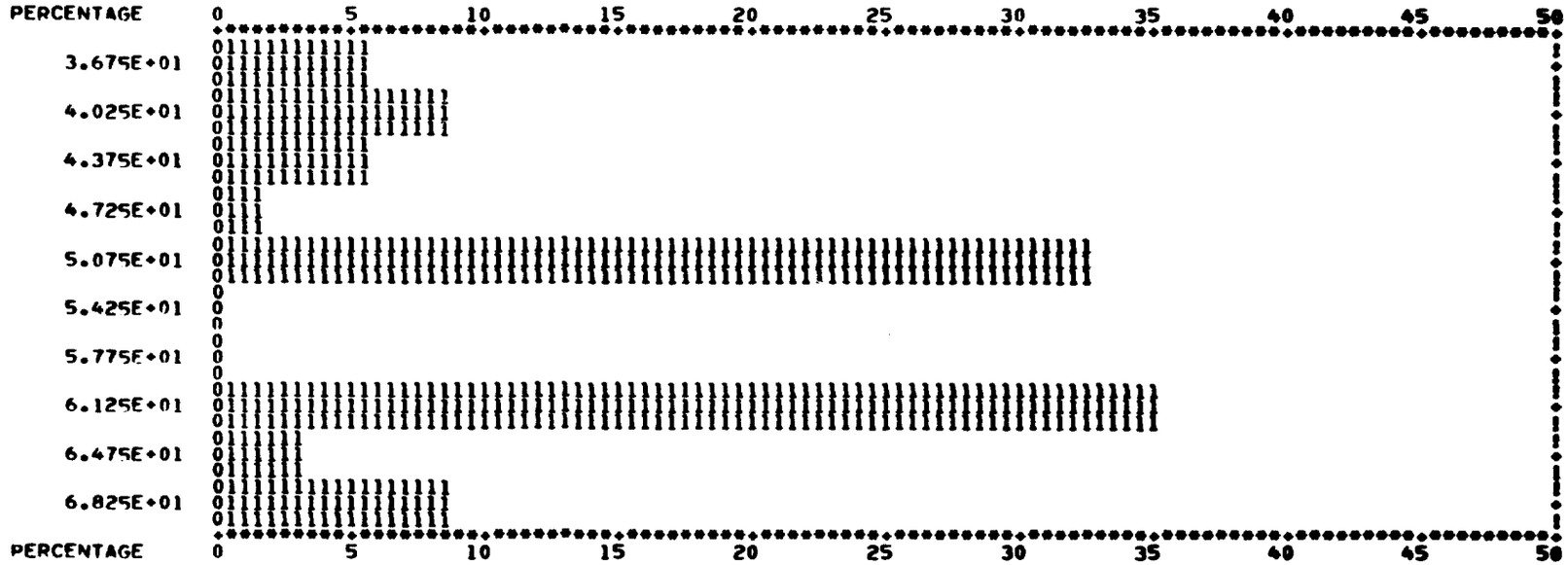


BIN	34.20	34.60	35.00	35.40	35.80	36.20	36.60	37.00	37.40	37.80
CONTENT	6.00	0.0	0.0	0.0	0.0	33.00	0.0	0.0	0.0	37.00

Beg / 53

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 311 312 330 333 334
STEP = 3.50000095
CENTERPOINT OF INITIAL GROUP= 36.7499847 NUMBER OF OBSERVATIONS = 71
CENTERPOINT OF FINAL GROUP = 68.2500000 NUMBER OF GROUPS = 10

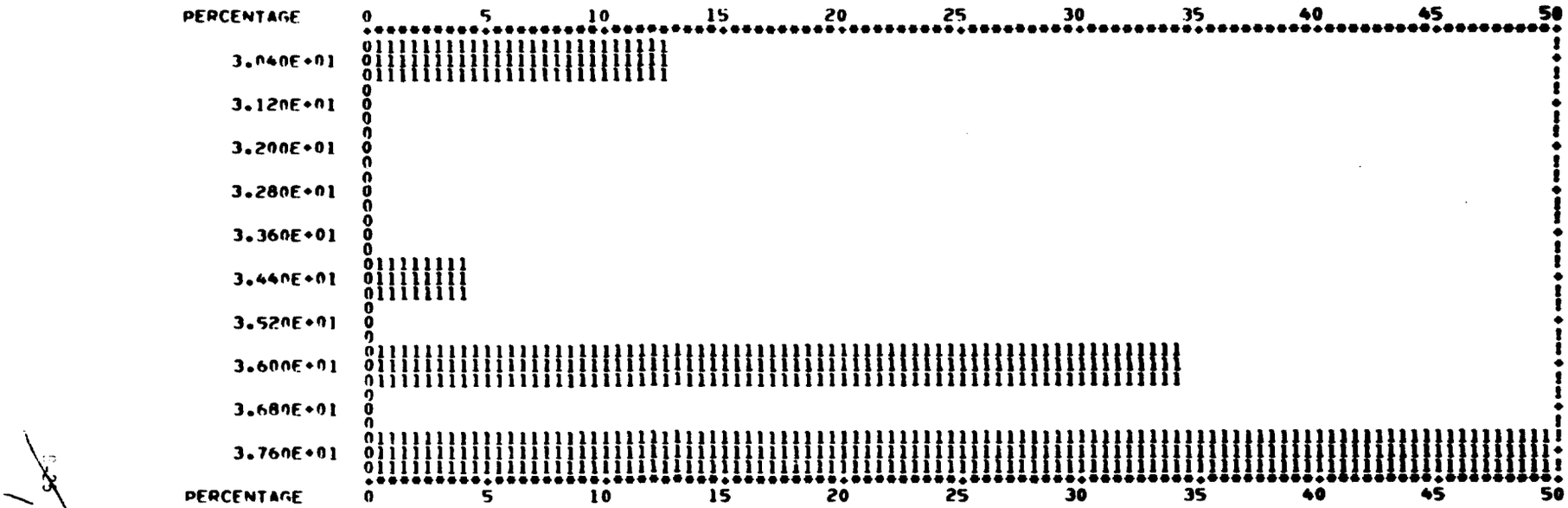


BIN	36.75	40.25	43.75	47.25	50.75	54.25	57.75	61.25	64.75	68.25
CONTENT	4.00	6.00	4.00	1.00	23.00	0.0	0.0	25.00	2.00	6.00

B-24
154

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 311 312 330 333 334
STEP = 0.80000132
CENTERPOINT OF INITIAL GROUP= 30.3999786 NUMBER OF OBSERVATIONS = 71
CENTERPOINT OF FINAL GROUP = 37.5999908 NUMBER OF GROUPS = 10



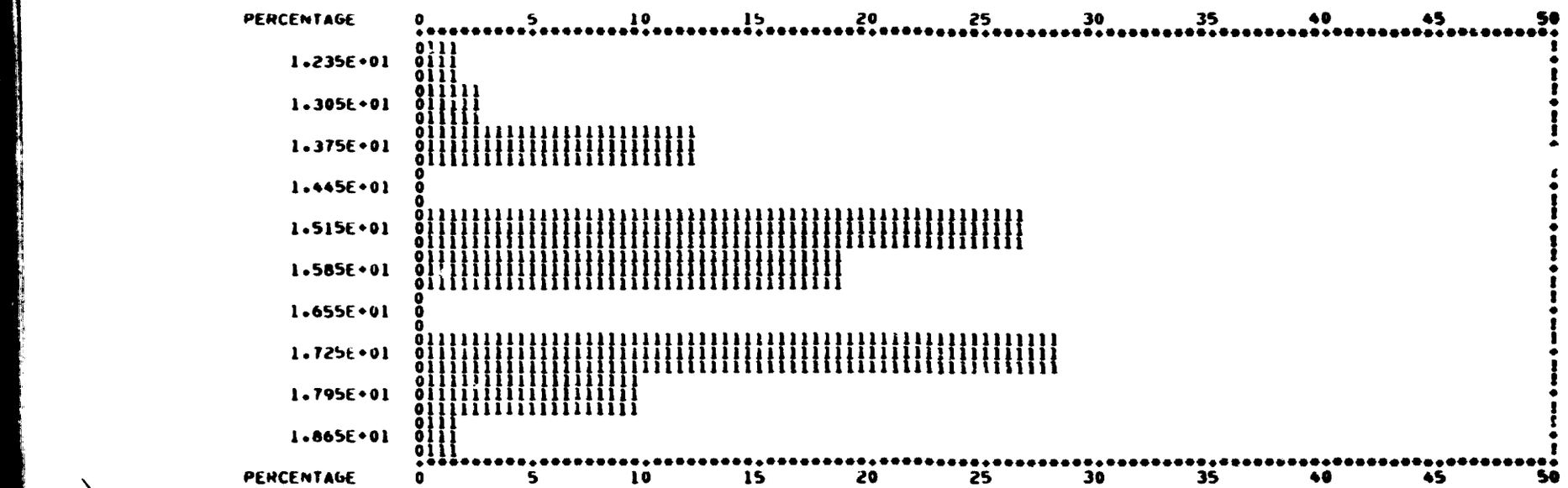
BIN	30.40	31.20	32.00	32.80	33.60	34.40	35.20	36.00	36.80	37.60
CONTENT	9.00	0.0	0.0	0.0	0.0	3.00	0.0	24.00	0.0	35.00

ILLINOIS

B-26
151

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 107 114 805 824 828
STEP = 0.69999945
CENTERPOINT OF INITIAL GROUP= 12.3499985 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 18.6499939 NUMBER OF GROUPS = 10

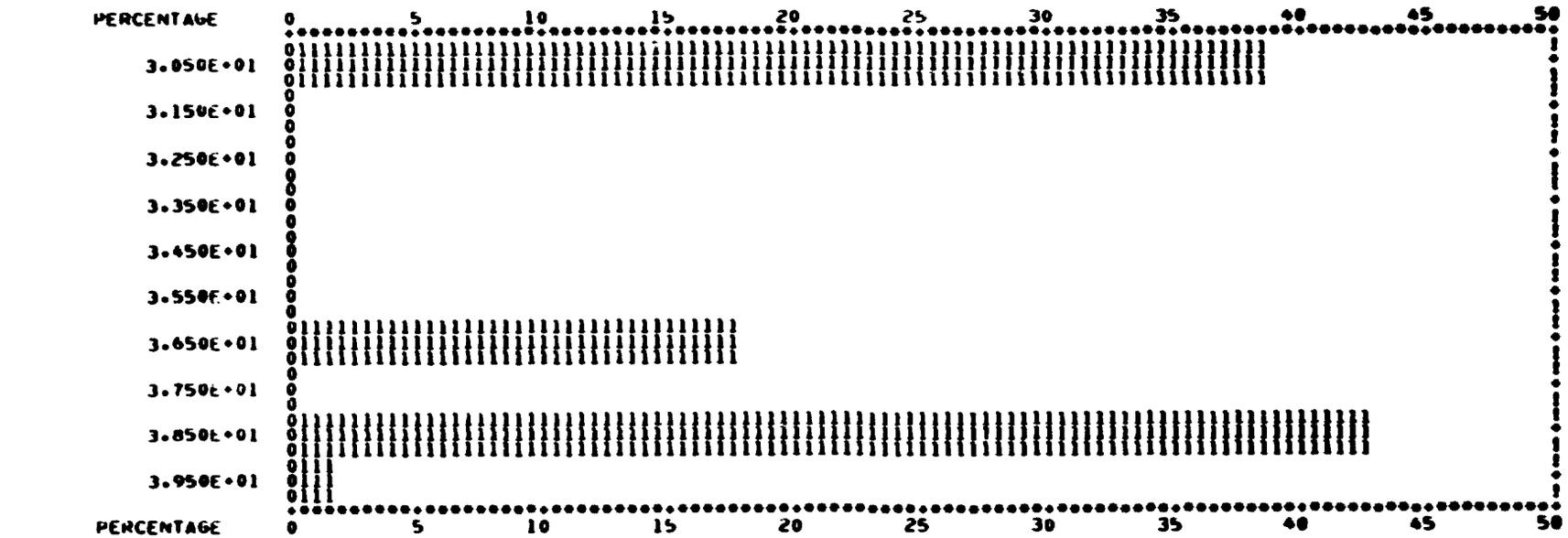


BIN	12.35	13.05	13.75	14.45	15.15	15.85	16.55	17.25	17.95	18.65
CONTENT	1.00	2.00	9.00	0.0	20.00	14.00	0.0	21.00	7.00	1.00

8.29
157

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 107 114 805 824 828
STEP = 1.00000095
CENTERPOINT OF INITIAL GROUP= 30.4999847 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 39.5000000 NUMBER OF GROUPS = 10

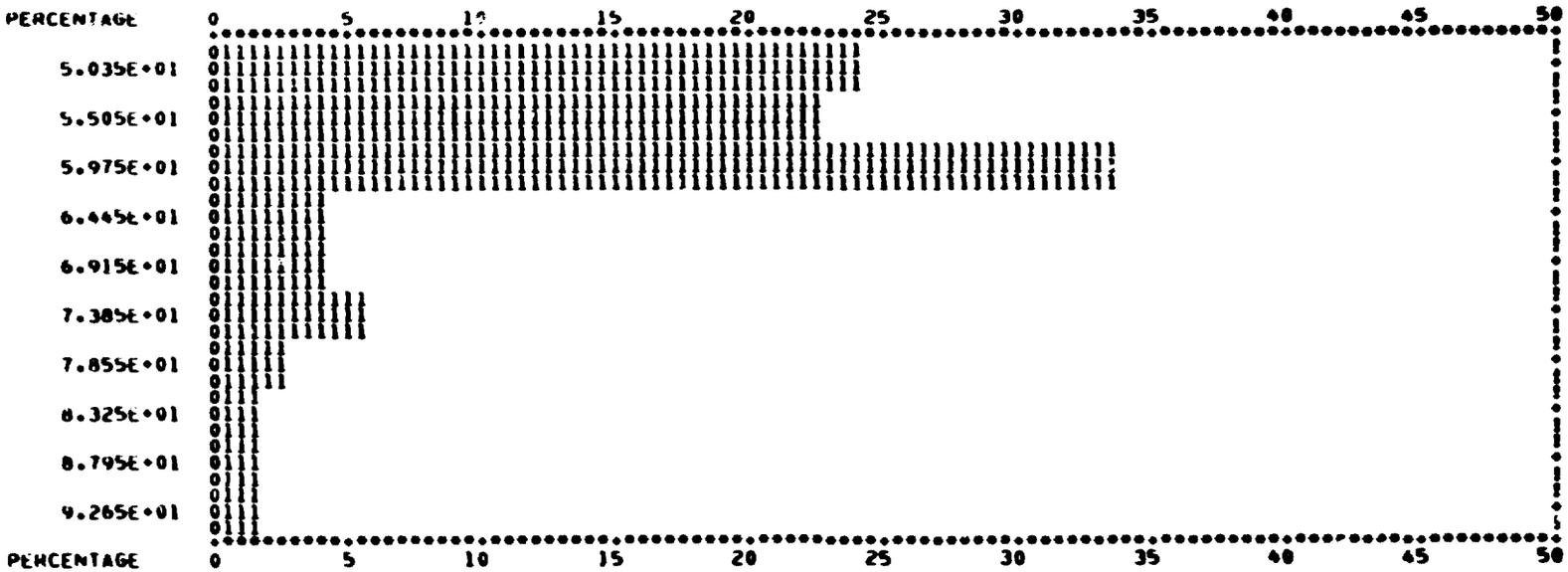


BIN	30.50	31.50	32.50	33.50	34.50	35.50	36.50	37.50	38.50	39.50
CONTENT	29.00	0.0	0.0	0.0	0.0	0.0	13.00	0.0	32.00	1.00

Bad
155

SEEDING RATE - LB/ACRE

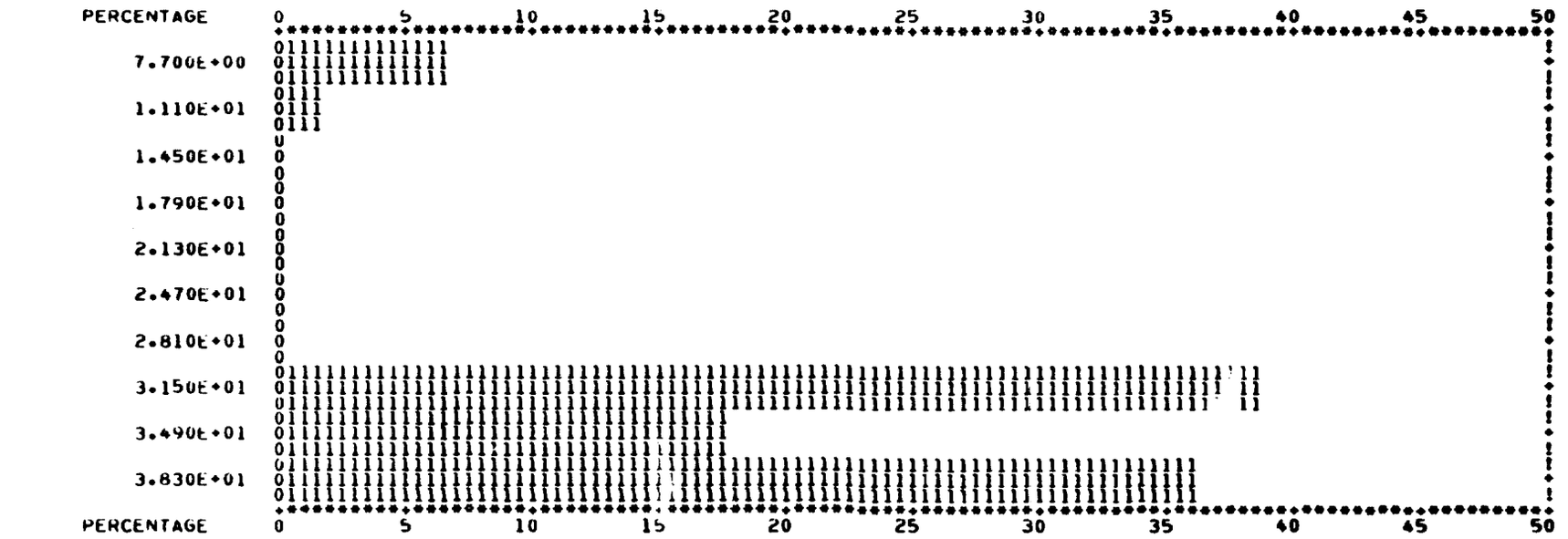
CROP TYPE IS SO
SEGMENTS = 107 11s 805 824 828
STEP = 4.70000172
CENTERPOINT OF INITIAL GROUP= 50.3499756 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 92.6499939 NUMBER OF GROUPS = 10



BIN	50.35	55.05	59.75	64.45	69.15	73.85	78.55	83.25	87.95	92.65
CONTENT	18.00	17.00	25.00	3.00	3.00	4.00	2.00	1.00	1.00	1.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 107 114 805 824 828
STEP = 3.39999676
CENTERPOINT OF INITIAL GROUP= 7.69999886 NUMBER OF OBSERVATIONS = 75
CENTERPOINT OF FINAL GROUP = 38.2999878 NUMBER OF GROUPS = 10

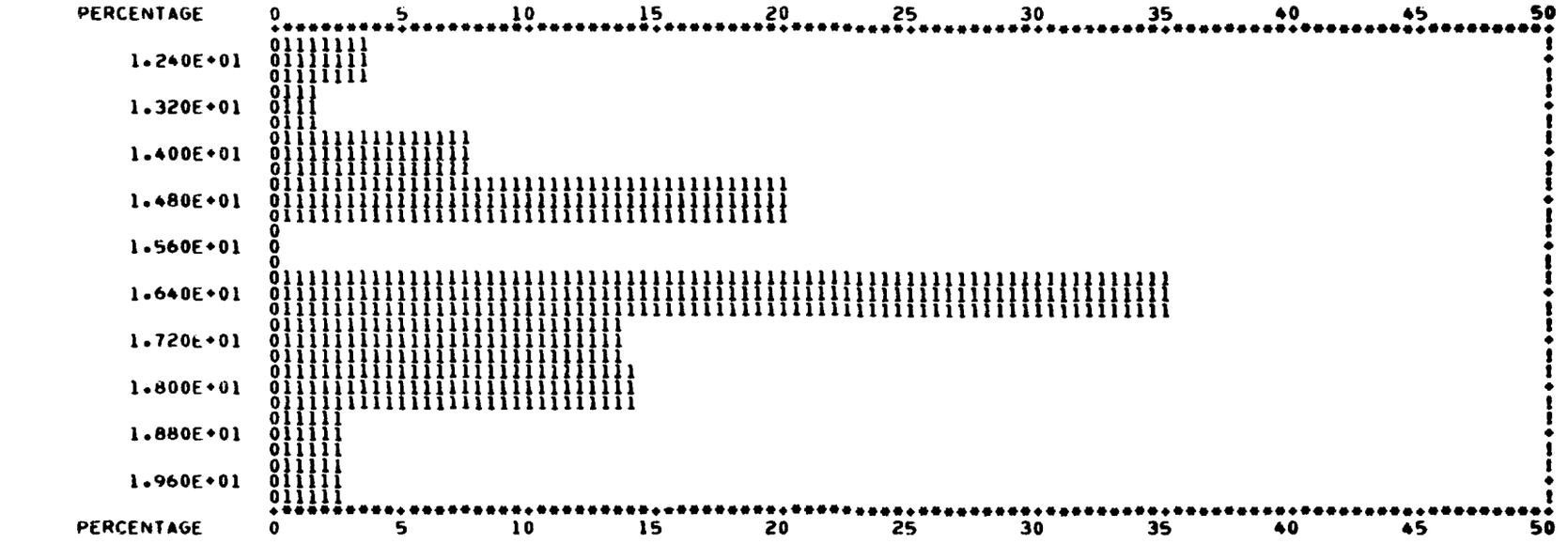


BIN	7.70	11.10	14.50	17.90	21.30	24.70	28.10	31.50	34.90	38.30
CONTENT	5.00	1.00	0.0	0.0	0.0	0.0	0.0	29.00	13.00	27.00

INDIANA

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 0.79999912
CENTERPOINT OF INITIAL GROUP= 12.3999987 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 19.5999908 NUMBER OF GROUPS = 10

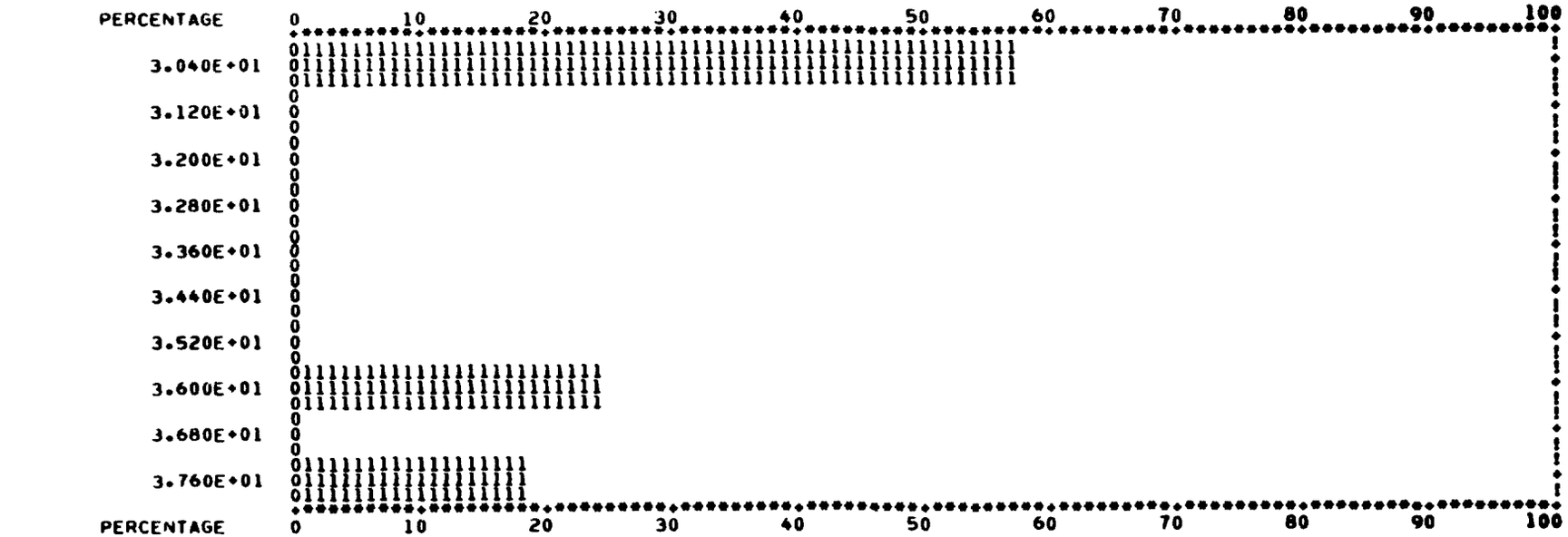


BIN	12.40	13.20	14.00	14.80	15.60	16.40	17.20	18.00	18.80	19.60
CONTENT	4.00	2.00	9.00	24.00	0.0	42.00	16.00	17.00	3.00	3.00

8-32
16.7

ROW WIDTH - INCHES

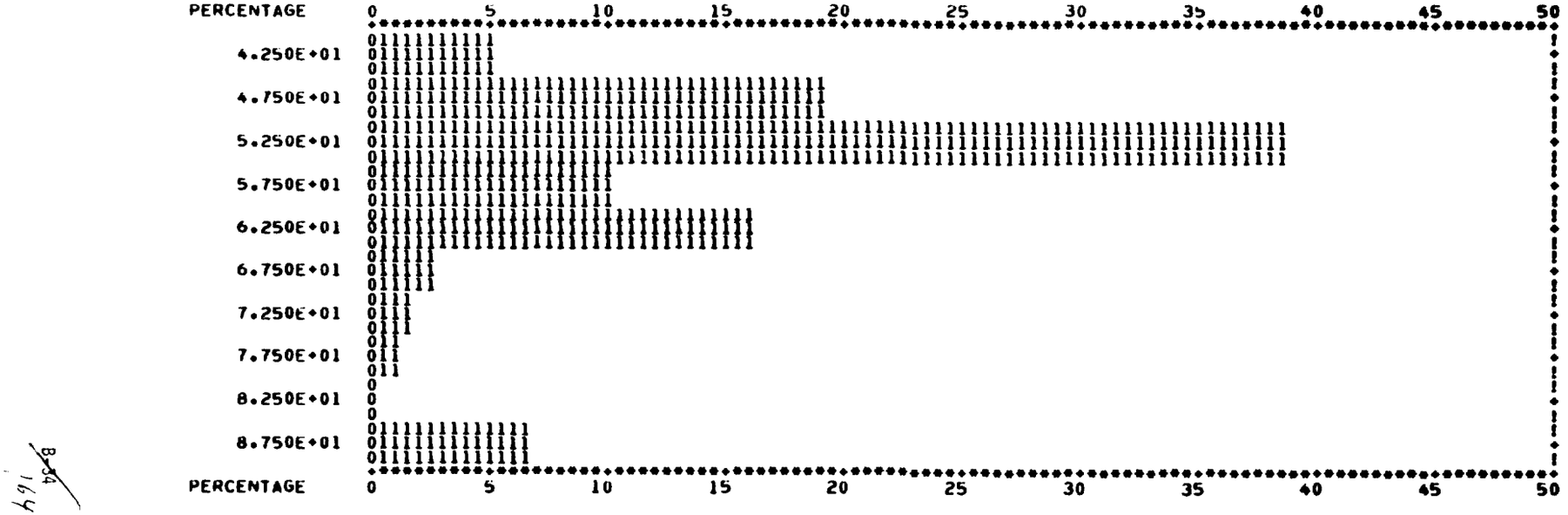
CROP TYPE IS CR
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 0.80000132
CENTERPOINT OF INITIAL GROUP= 30.3999786 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 37.5999908 NUMBER OF GROUPS = 10



BIN	30.40	31.20	32.00	32.80	33.60	34.40	35.20	36.00	36.80	37.60
CONTENT	69.00	0.0	0.0	0.0	0.0	0.0	0.0	29.00	0.0	22.00

SEEDING RATE - LB/ACRE

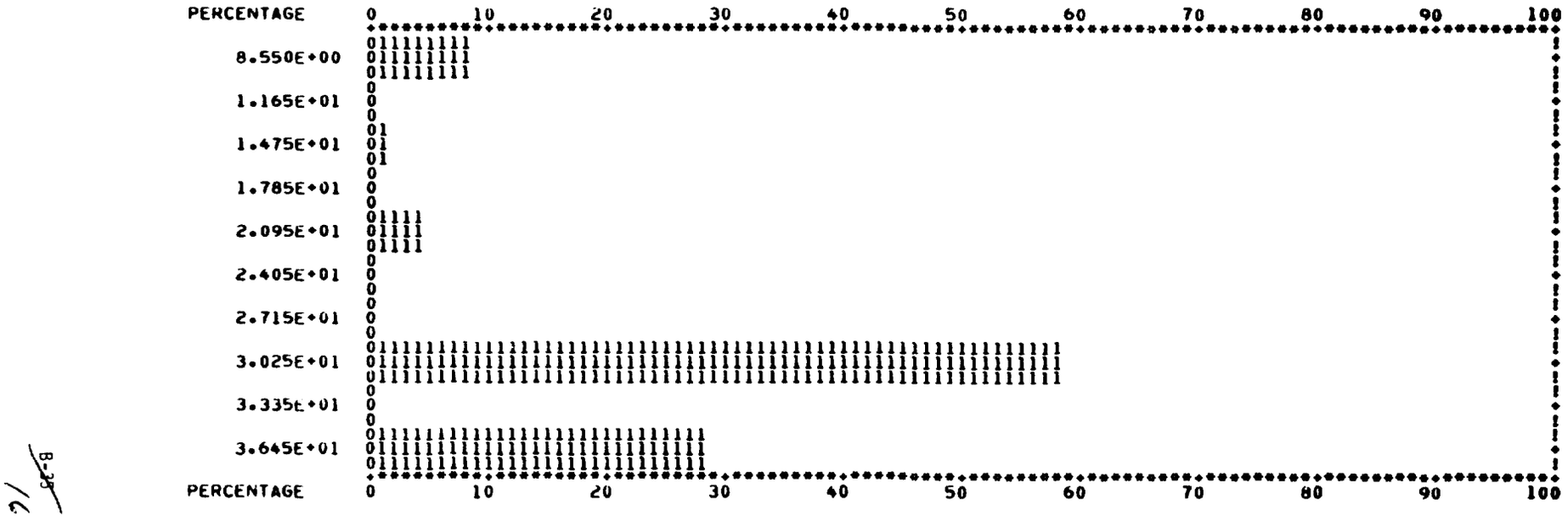
CROP TYPE IS SO
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 5.00000095
CENTERPOINT OF INITIAL GROUP= 42.4999847 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 87.5000000 NUMBER OF GROUPS = 10



BIN	42.50	47.50	52.50	57.50	62.50	67.50	72.50	77.50	82.50	87.50
CONTENT	6.00	23.00	46.00	12.00	19.00	3.00	2.00	1.00	0.0	8.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 123 127 133 833 837 843 851 856
STEP = 3.09999847
CENTERPOINT OF INITIAL GROUP= 8.54999828 NUMBER OF OBSERVATIONS = 120
CENTERPOINT OF FINAL GROUP = 36.4499969 NUMBER OF GROUPS = 10



BIN	8.55	11.65	14.75	17.85	20.95	24.05	27.15	30.25	33.35	36.45
CONTENT	10.00	0.0	1.00	0.0	5.00	0.0	0.0	70.00	0.0	34.00

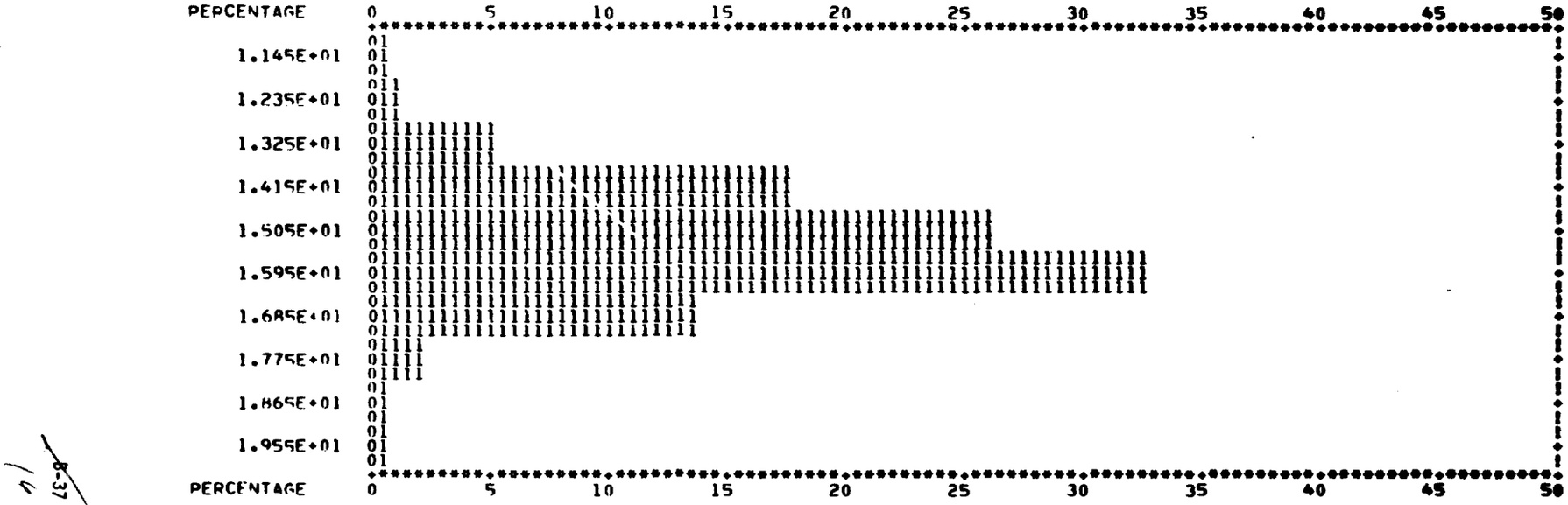
B-36

IOWA

B-36
/C 6

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 0.89999872
CENTERPOINT OF INITIAL GROUP= 11.4499989
CENTERPOINT OF FINAL GROUP = 19.5499878
NUMBER OF OBSERVATIONS = 160
NUMBER OF GROUPS = 10

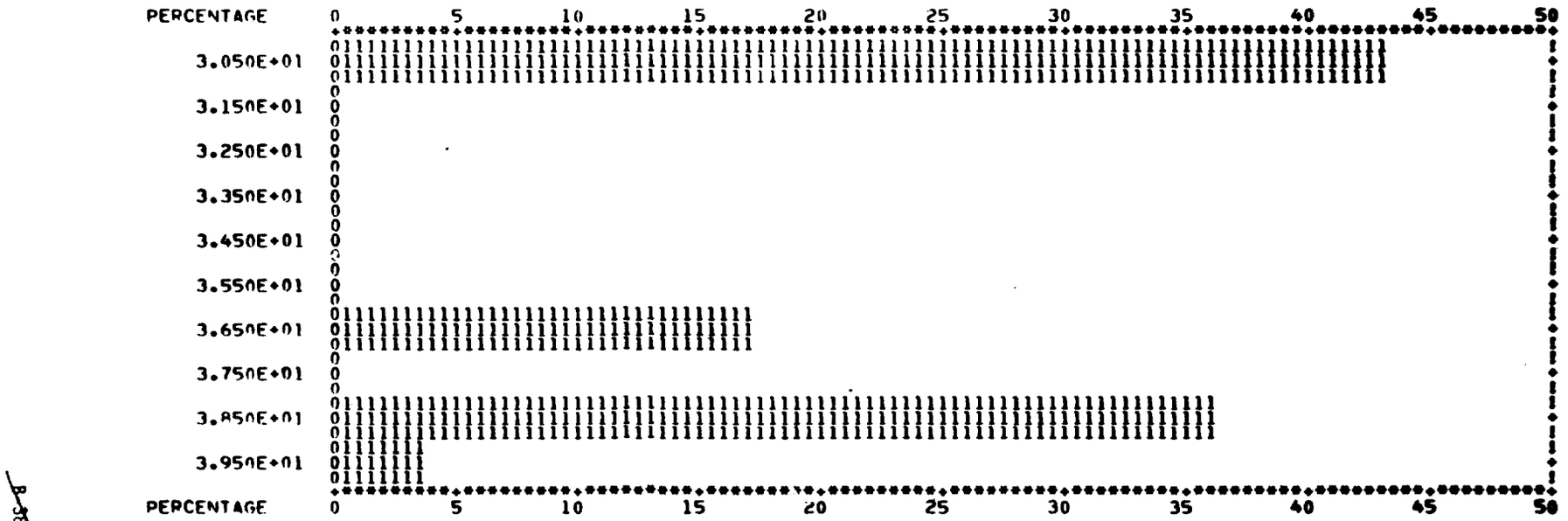


BIN	11.45	12.35	13.25	14.15	15.05	15.95	16.85	17.75	18.65	19.55
CONTENT	1.00	2.00	8.00	28.00	42.00	52.00	22.00	3.00	1.00	1.00

(91) 8-37

ROW WIDTH - INCHES

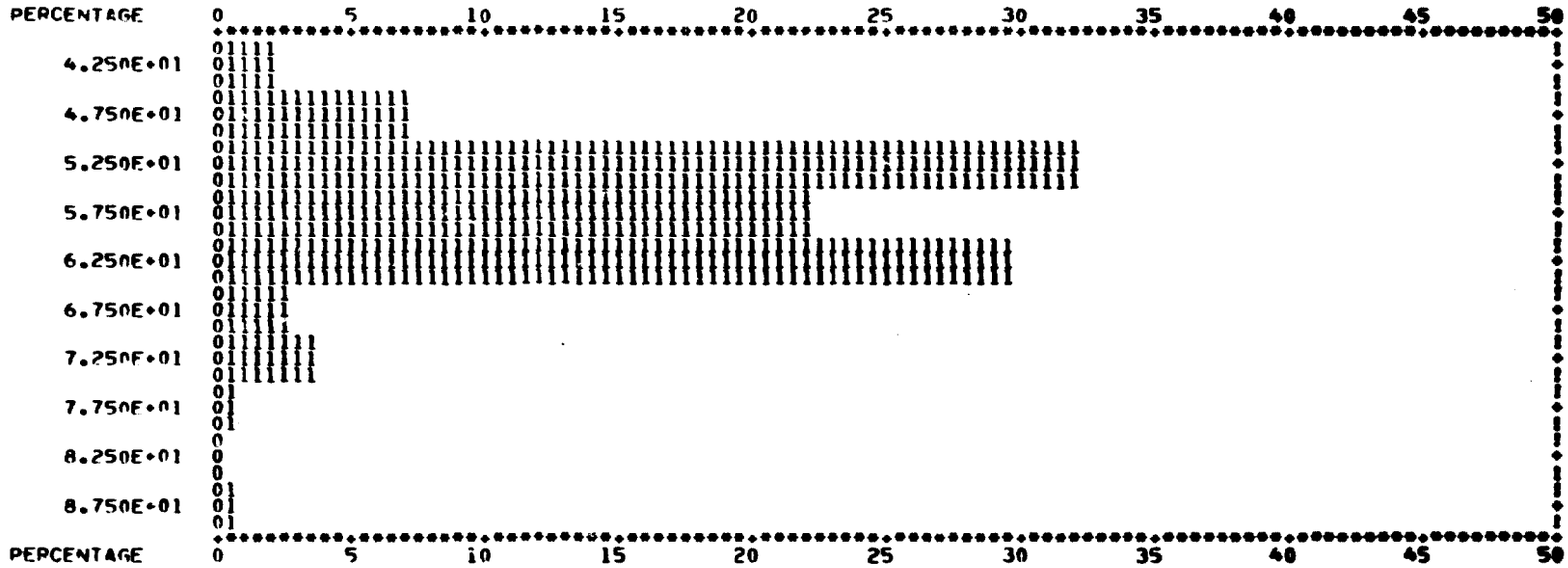
CROP TYPE IS CR
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 1.00000095
CENTERPOINT OF INITIAL GROUP= 30.4999847 NUMBER OF OBSERVATIONS = 160
CENTERPOINT OF FINAL GROUP = 39.5000000 NUMBER OF GROUPS = 10



BIN	30.50	31.50	32.50	33.50	34.50	35.50	36.50	37.50	38.50	39.50
CONTENT	69.00	0.0	0.0	0.0	0.0	0.0	27.00	0.0	58.00	6.00

SEEDING RATE - LB/ACRE

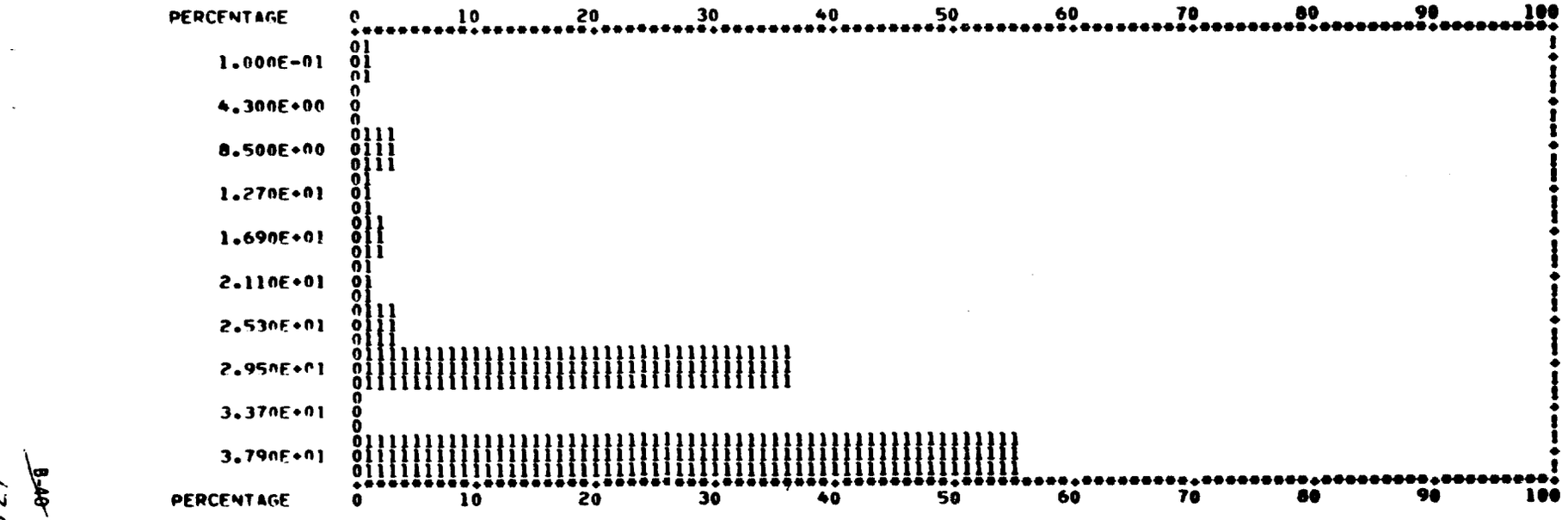
CROP TYPE IS SO
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 5.00000095
CENTERPOINT OF INITIAL GROUP= 42.4999847 NUMBER OF OBSERVATIONS = 153
CENTERPOINT OF FINAL GROUP = 87.5000000 NUMBER OF GROUPS = 10



BIN	42.50	47.50	52.50	57.50	62.50	67.50	72.50	77.50	82.50	87.50
CONTENT	3.00	11.00	49.00	34.00	45.00	4.00	5.00	1.00	0.0	1.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 135 144 145 801 804 883 886 892 893
STEP = 4.19999790
CENTERPOINT OF INITIAL GROUP= 0.09999841 NUMBER OF OBSERVATIONS = 153
CENTERPOINT OF FINAL GROUP = 37.8999939 NUMBER OF GROUPS = 10



BIN	0.10	4.30	8.50	12.70	16.90	21.10	25.30	29.50	33.70	37.90
CONTENT	1.00	0.0	4.00	1.00	3.00	1.00	4.00	55.00	0.0	84.00

LOUISIANA

171 Boat

SEEDING RATE - LB/ACRE

CROP TYPE IS CT
SEGMENTS = 176 269 270 271 273 274

STEP = 1.5999943
CENTERPOINT OF INITIAL GROUP= 12.799994 NUMBER OF OBSERVATIONS = 60
CENTERPOINT OF FINAL GROUP = 27.199969 NUMBER OF GROUPS = 10

MID	12.80	14.40	16.00	17.60	19.20	20.80	22.40	24.00	25.60	27.20
CONTENT	13.00	14.00	2.00	6.00	0.0	19.00	1.00	0.0	0.0	3.00

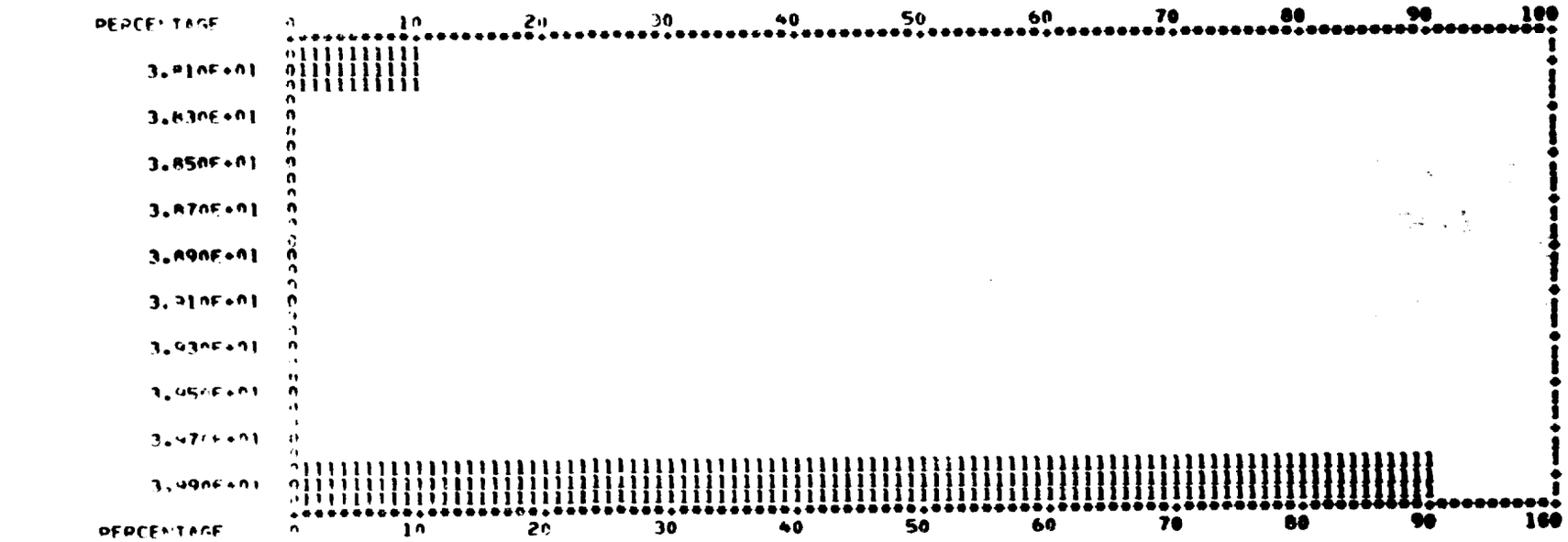
ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 174

269 270 271 273 274

STEP = 0.20000201
CENTERPOINT OF INITIAL GROUP= 38.0999756
CENTERPOINT OF FINAL GROUP = 39.8999939

NUMBER OF OBSERVATIONS = 60
NUMBER OF GROUPS = 10

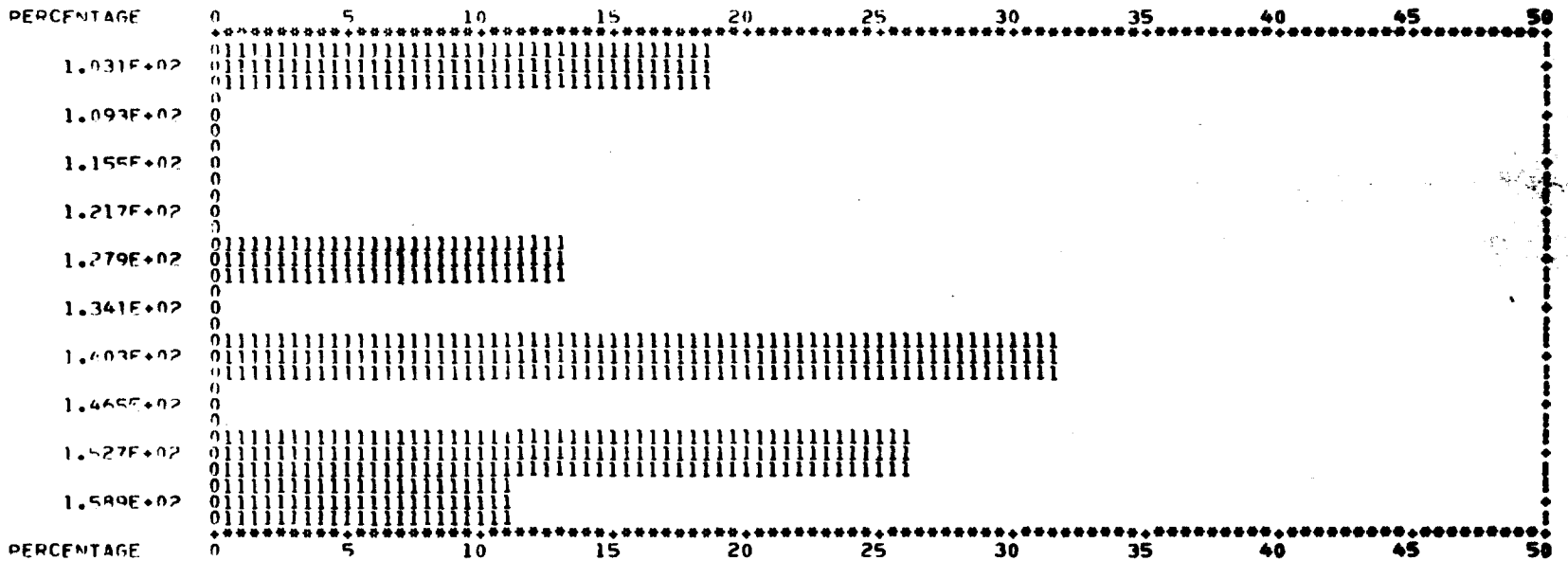


MID-POINT	38.10	38.30	38.50	38.70	38.90	39.10	39.30	39.50	39.70	39.90
CONTENT	6.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.00

173

SEEDING RATE - LB/ACRE

CROP TYPE IS RI
SEGMENTS = 174 266 267 268
STEP = 6.20000172
CENTERPOINT OF INITIAL GROUP= 103.099976 NUMBER OF OBSERVATIONS = 54
CENTERPOINT OF FINAL GROUP = 158.899994 NUMBER OF GROUPS = 10

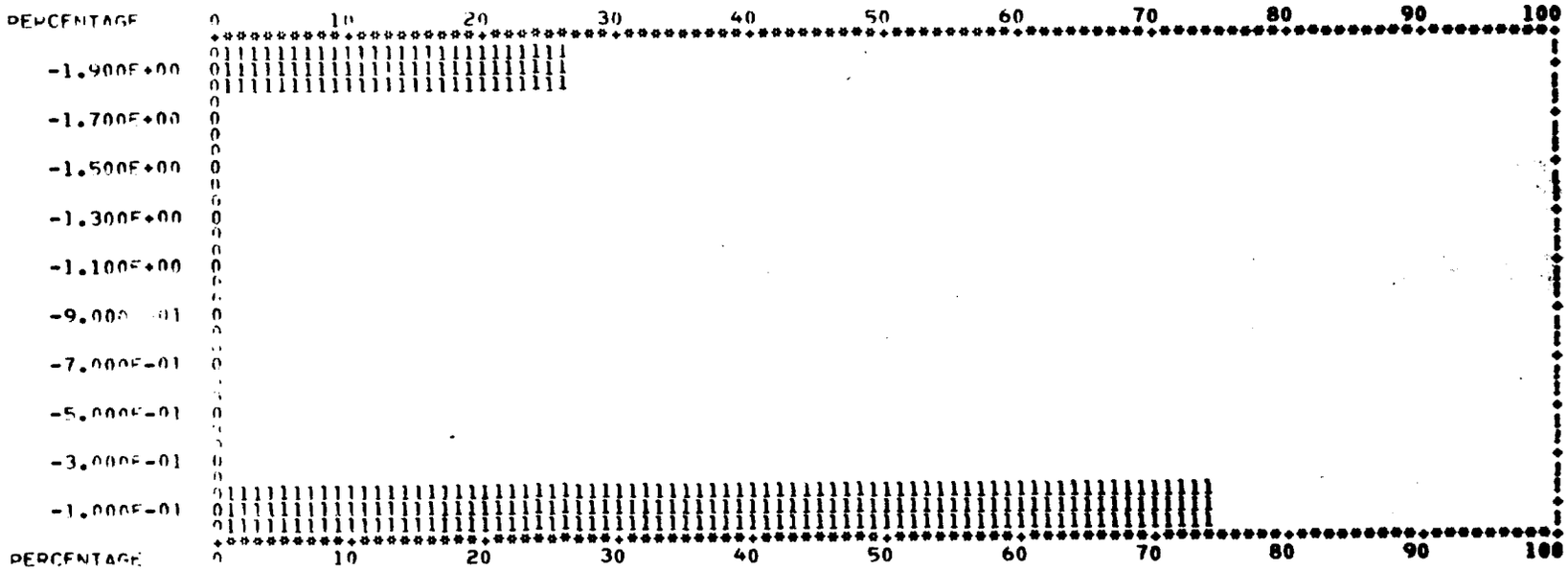


BIN	103.10	109.30	115.50	121.70	127.90	134.10	140.30	146.50	152.70	158.90
CONTENT	10.00	0.0	0.0	0.0	7.00	0.0	17.00	0.0	14.00	6.00

B44
174

ROW WIDTH - INCHES

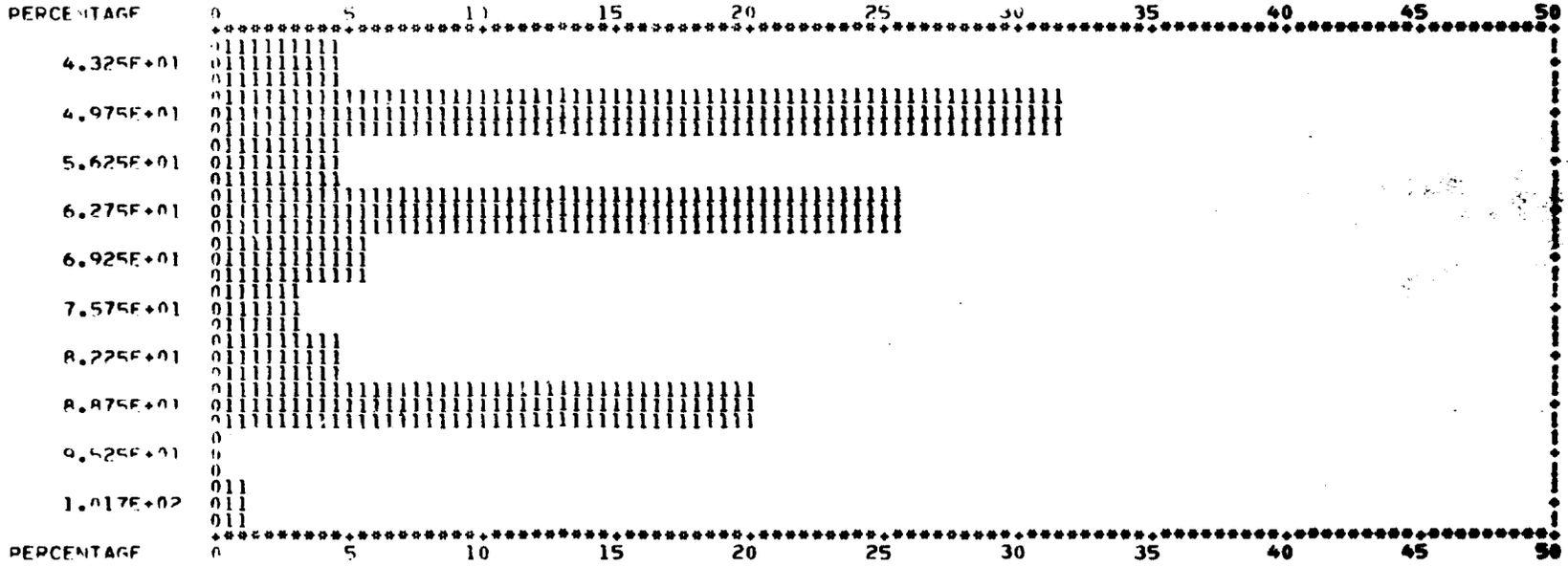
CROP TYPE IS RI
SEGMENTS = 174 266 267 268
STEP = 0.20000011
CENTERPOINT OF INITIAL GROUP= -1.90000057 NUMBER OF OBSERVATIONS = 54
CENTERPOINT OF FINAL GROUP = -0.09999895 NUMBER OF GROUPS = 10



MIN	-1.90	-1.70	-1.50	-1.30	-1.10	-0.90	-0.70	-0.50	-0.30	-0.10
CONTENT	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.00

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 174 266 267 268 269 270 271 272 273
SIZE = 6.50000095
CENTERPOINT OF INITIAL GROUP= 43.2499847 NUMBER OF OBSERVATIONS = 130
CENTERPOINT OF FINAL GROUP = 101.750000 NUMBER OF GROUPS = 10



	BIN	43.25	49.75	56.25	62.75	69.25	75.75	82.25	88.75	95.25	101.75
	CONTENT	6.00	41.00	6.00	33.00	7.00	4.00	6.00	26.00	0.0	1.00

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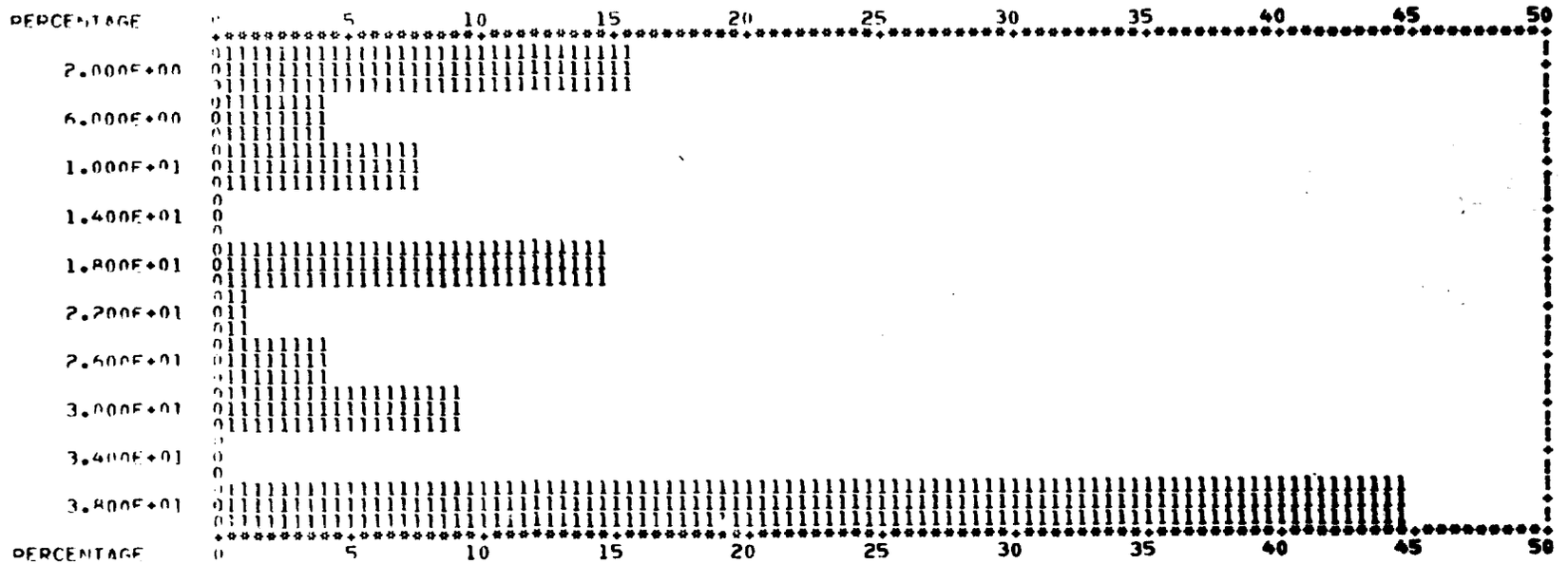
ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 174 266 267 268 269 270 271 272 273
STEP = 4.00000000
CENTERPOINT OF INITIAL GROUP= 1.99999905 NUMBER OF OBSERVATIONS = 130
CENTERPOINT OF FINAL GROUP = 38.0000000 NUMBER OF GROUPS = 10



	MIN	2.00	6.00	10.00	14.00	18.00	22.00	26.00	30.00	34.00	38.00
CONTENT		20.00	5.00	10.00	0.0	19.00	1.00	5.00	12.00	0.0	58.00

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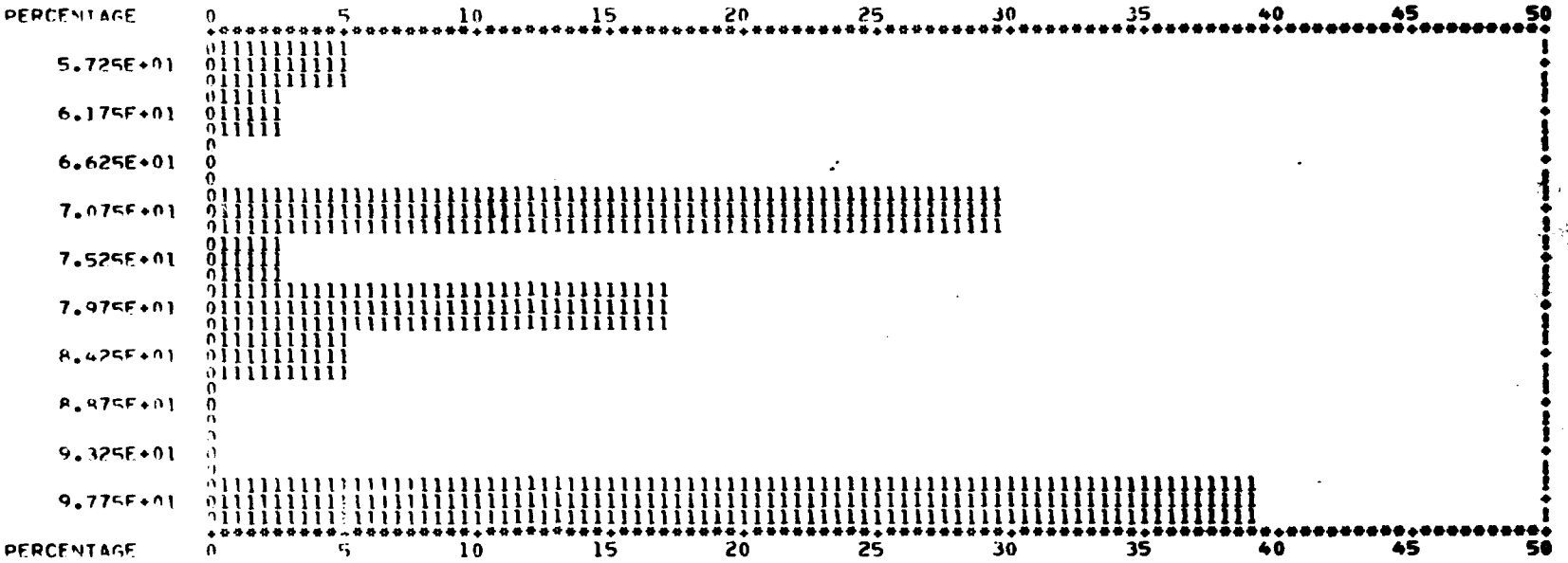
MINNESOTA

SEEDING RATE - LB/ACRE

CROP TYPE IS BR
SEGMENTS = 1514 1518 1566 1825 1835
SIED = 4.50000095
CENTERPOINT OF INITIAL GROUP= 57.2499847 NUMBER OF OBSERVATIONS = 41
CENTERPOINT OF FINAL GROUP = 97.7500000 NUMBER OF GROUPS = 10



BIN	57.25	61.75	66.25	70.75	75.25	79.75	84.25	88.75	93.25	97.75
CONTENT	2.00	1.00	0.0	12.00	1.00	7.00	2.00	0.0	0.0	16.00

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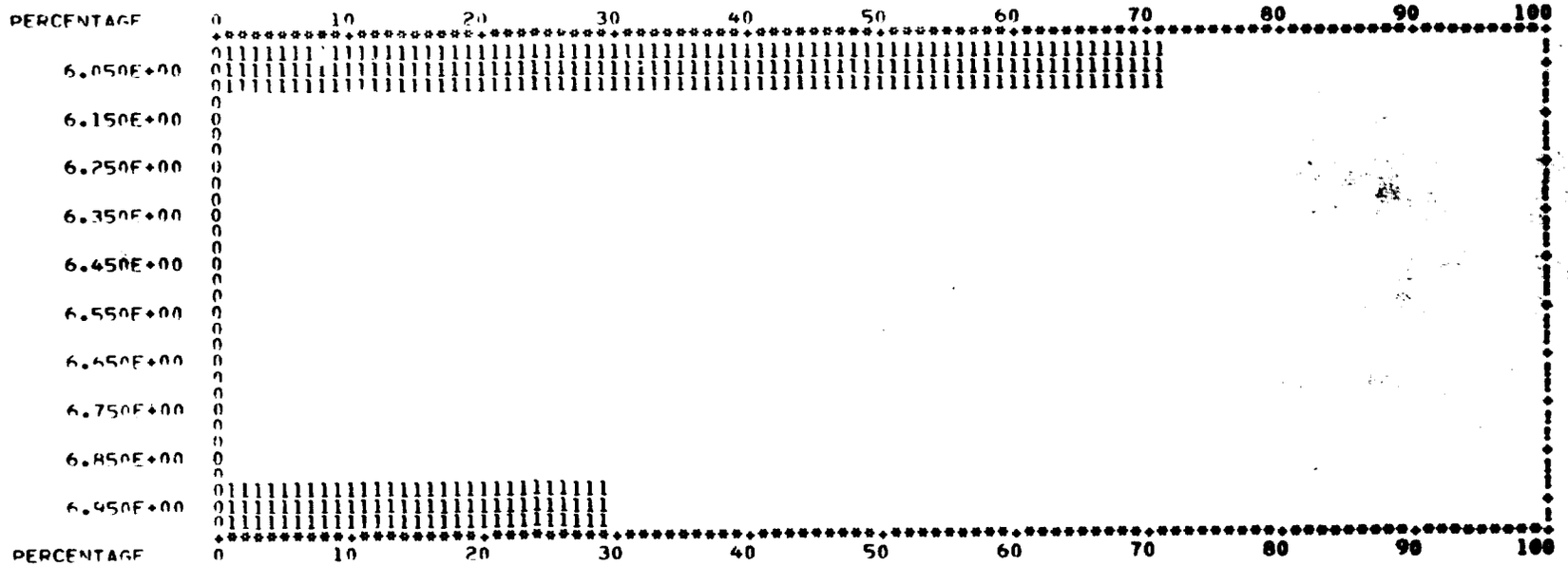
ROW WIDTH - INCHES

CROP TYPE IS SB
SEGMENTS = 1514 1518 1566 1825 1835
STEP = 0.10000026
CENTERPOINT OF INITIAL GROUP= 6.04999828 NUMBER OF OBSERVATIONS = 41
CENTERPOINT OF FINAL GROUP = 6.95000076 NUMBER OF GROUPS = 10

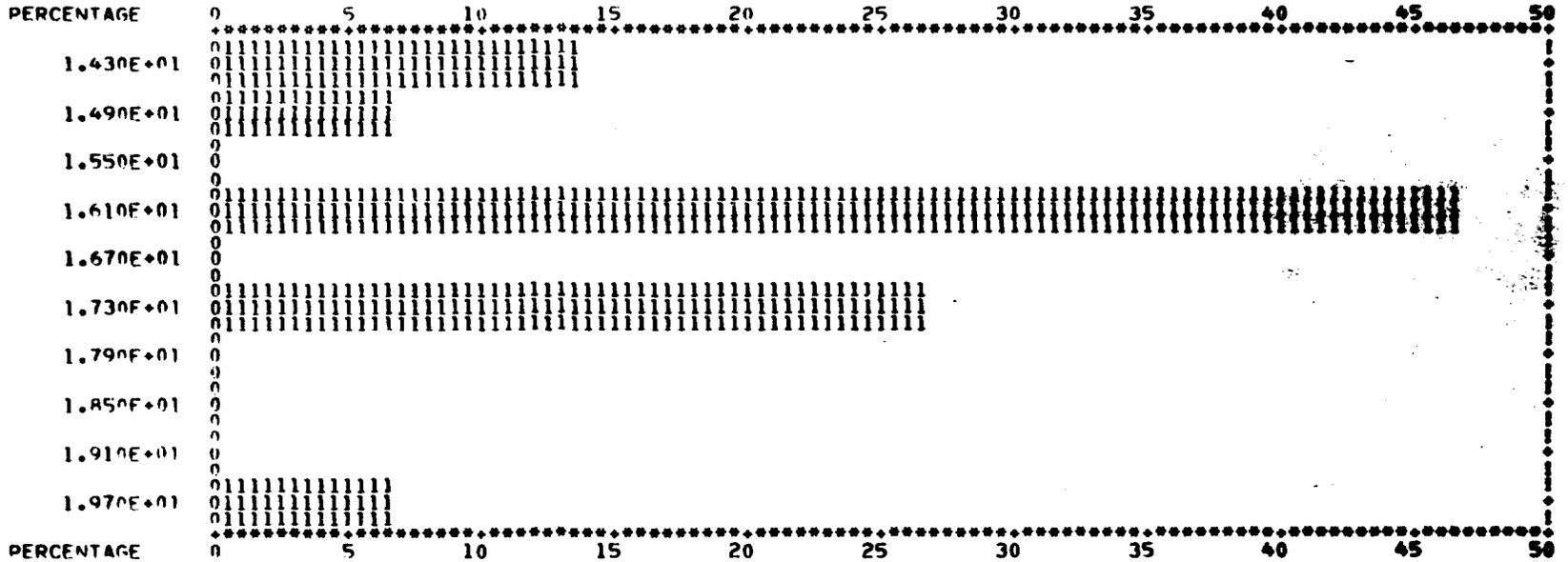


BIN	6.05	6.15	6.25	6.35	6.45	6.55	6.65	6.75	6.85	6.95
CONTENT	29.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.00

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 315

STEP = 0.5999985
CENTERPOINT OF INITIAL GROUP= 14.2999983 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 19.6999969 NUMBER OF GROUPS = 10

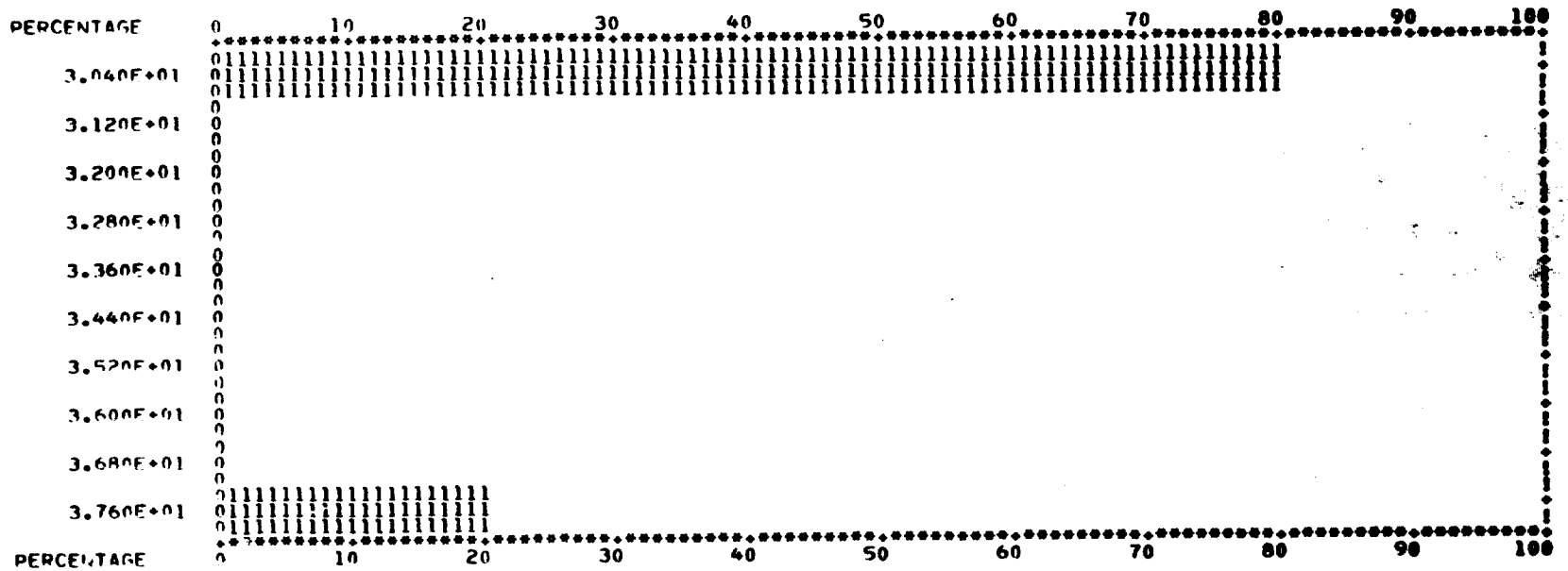


BIN	14.30	14.90	15.50	16.10	16.70	17.30	17.90	18.50	19.10	19.70
CONTENT	2.00	1.00	0.0	7.00	0.0	4.00	0.0	0.0	0.0	1.00

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 315

STEP = 0.80000132
CENTERPOINT OF INITIAL GROUP= 30.3999786 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 37.5999908 NUMBER OF GROUPS = 10



BIN	30.40	31.20	32.00	32.80	33.60	34.40	35.20	36.00	36.80	37.60
CONTENT	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.00

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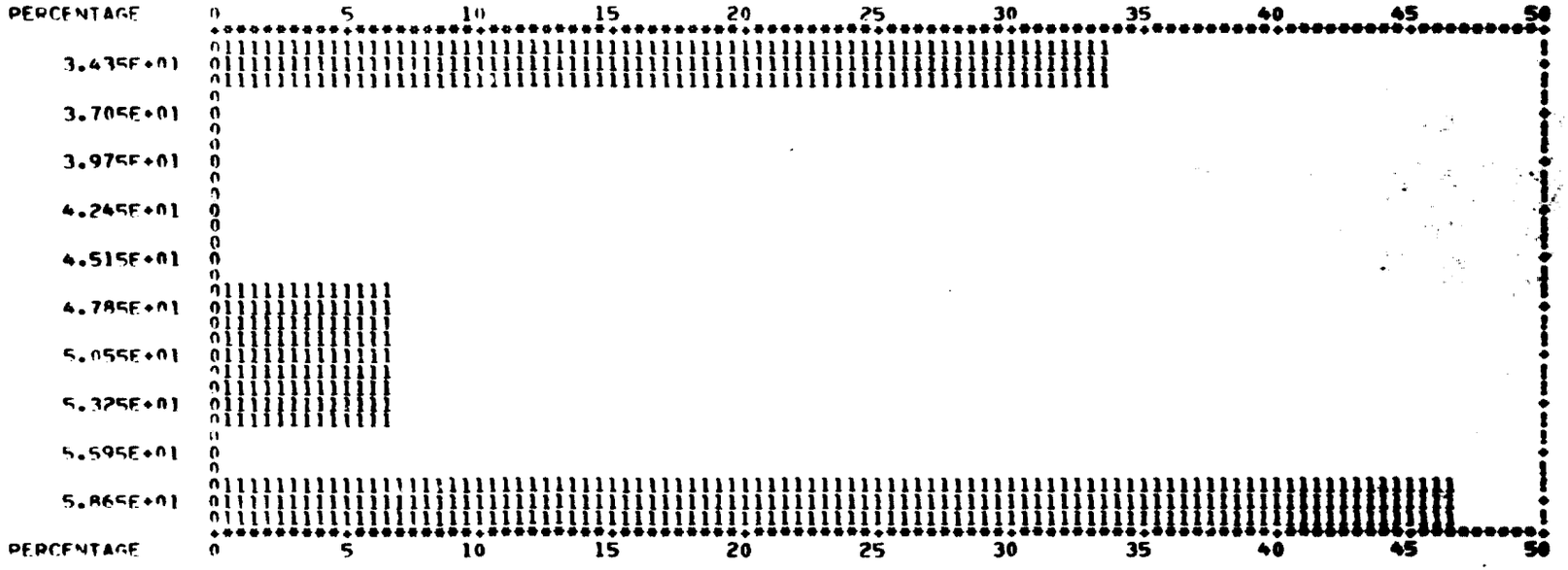
SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 315

STEP = 2.70000172
CENTERPOINT OF INITIAL GROUP= 34.3499756
CENTERPOINT OF FINAL GROUP = 58.6499939
NUMBER OF OBSERVATIONS = 15
NUMBER OF GROUPS = 10

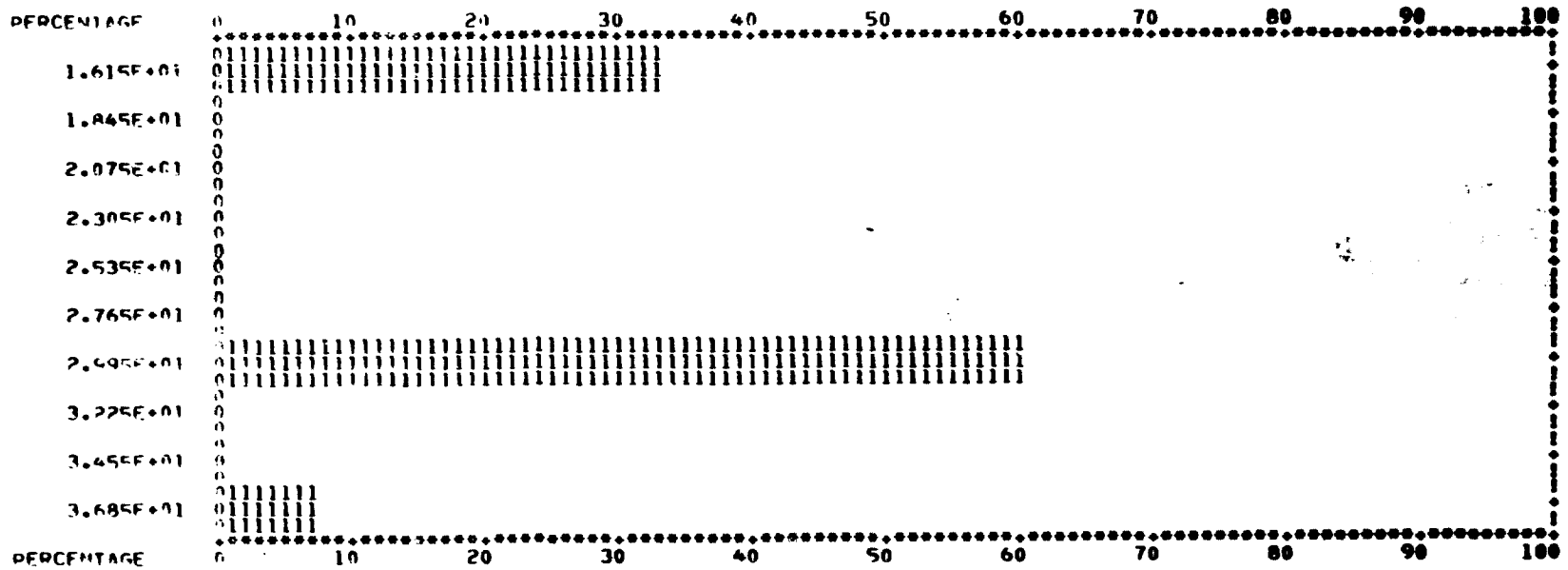


MID	34.35	37.05	39.75	42.45	45.15	47.85	50.55	53.25	55.95	58.65
CONTENT	5.00	0.0	0.0	0.0	0.0	1.00	1.00	1.00	0.0	7.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 315

STEP = 2.30000114
CENTERPOINT OF INITIAL GROUP= 16.1499786 NUMBER OF OBSERVATIONS = 15
CENTERPOINT OF FINAL GROUP = 36.8499908 NUMBER OF GROUPS = 10



MID	16.15	18.45	20.75	23.05	25.35	27.65	29.95	32.25	34.55	36.85
CONTENT	5.00	0.0	0.0	0.0	0.0	0.0	9.00	0.0	0.0	1.00

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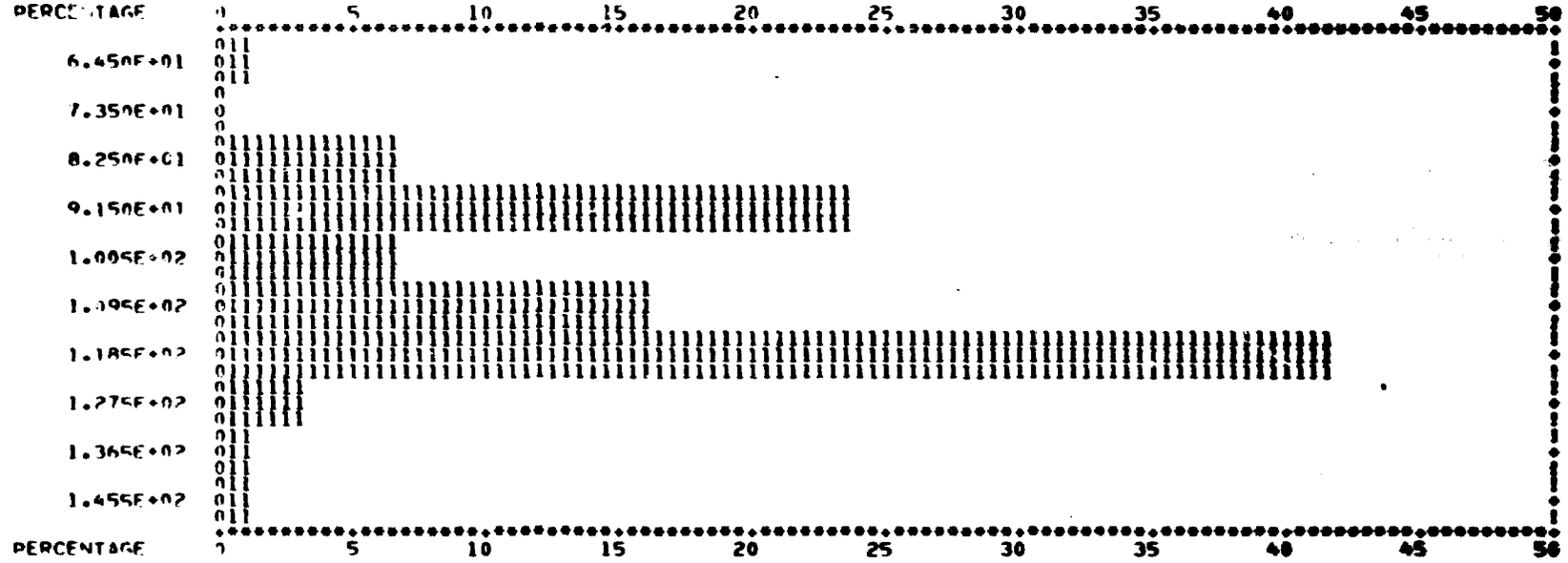
SEEDING RATE - LB/ACRE

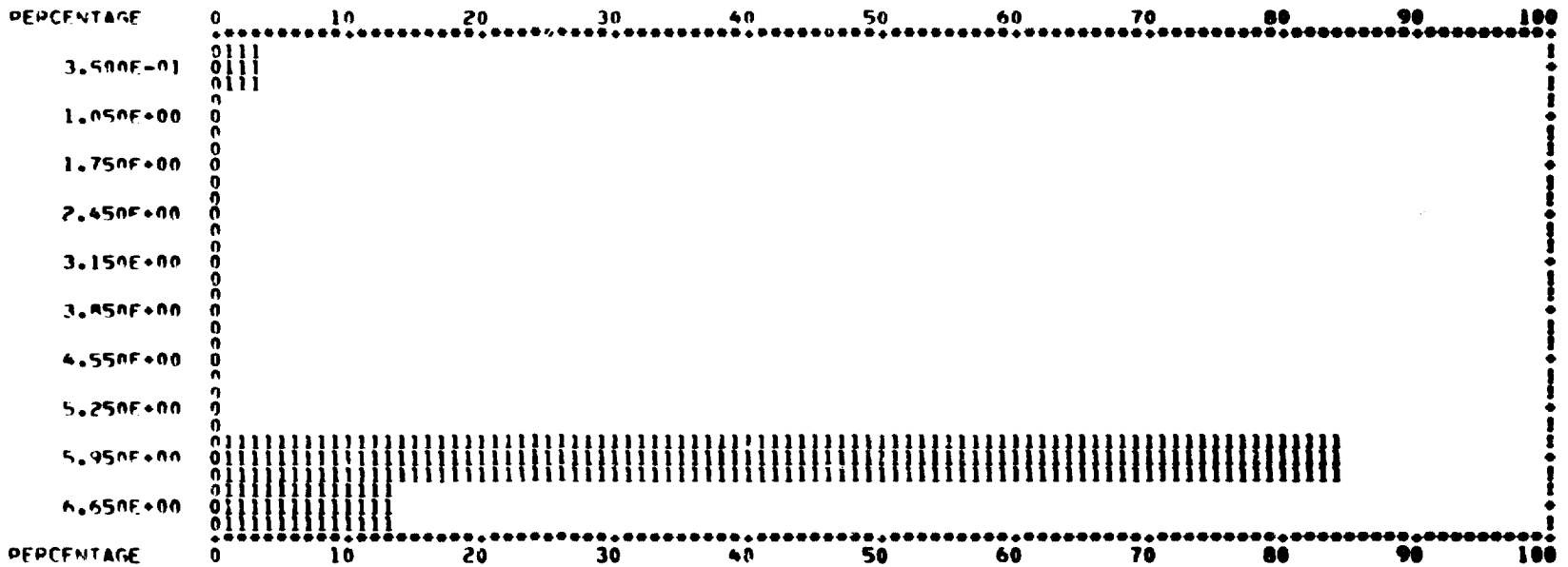
CROP TYPE IS SW
SEGMENTS = [illegible] 1514 1514 1566 1825 1835 1842
CFS = 0.00100095
CENTERPOINT OF INITIAL GROUP= 64.4999847 NUMBER OF OBSERVATIONS = 94
CENTERPOINT OF FINAL GROUP = 145.500000 NUMBER OF GROUPS = 10



BIN	64.50	73.50	82.50	91.50	100.50	109.50	118.50	127.50	136.50	145.50
CONTENT	1.00	0.0	6.00	22.00	6.00	15.00	39.00	3.00	1.00	1.00

ROW WIDTH - INCHES

CROP TYPE IS SW
SEGMENTS = 1388 1514 1518 1566 1825 1835 1842
STEP = 0.70000011
CENTERPOINT OF INITIAL GROUP= 0.34499895 NUMBER OF OBSERVATIONS = 94
CENTERPOINT OF FINAL GROUP = 6.65000057 NUMBER OF GROUPS = 10

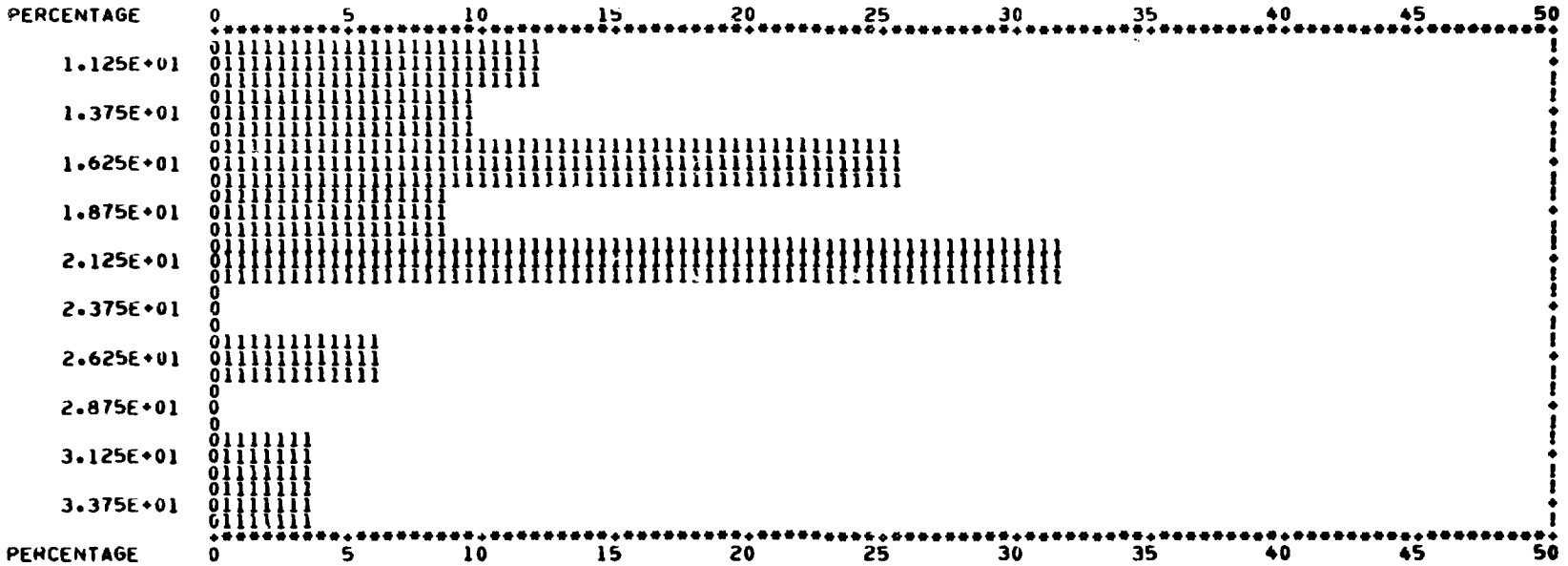


BIN	0.35	1.05	1.75	2.45	3.15	3.85	4.55	5.25	5.95	6.65
CONTENT	3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.00	12.00

MISSISSIPPI

SEEDING RATE - LB/ACRE

CROP TYPE IS CT
SEGMENTS = 187 195 196 198 200 297 298
STEP = 2.50000000
CENTERPOINT OF INITIAL GROUP= 11.2499990 NUMBER OF OBSERVATIONS = 83
CENTERPOINT OF FINAL GROUP = 33.7500000 NUMBER OF GROUPS = 10

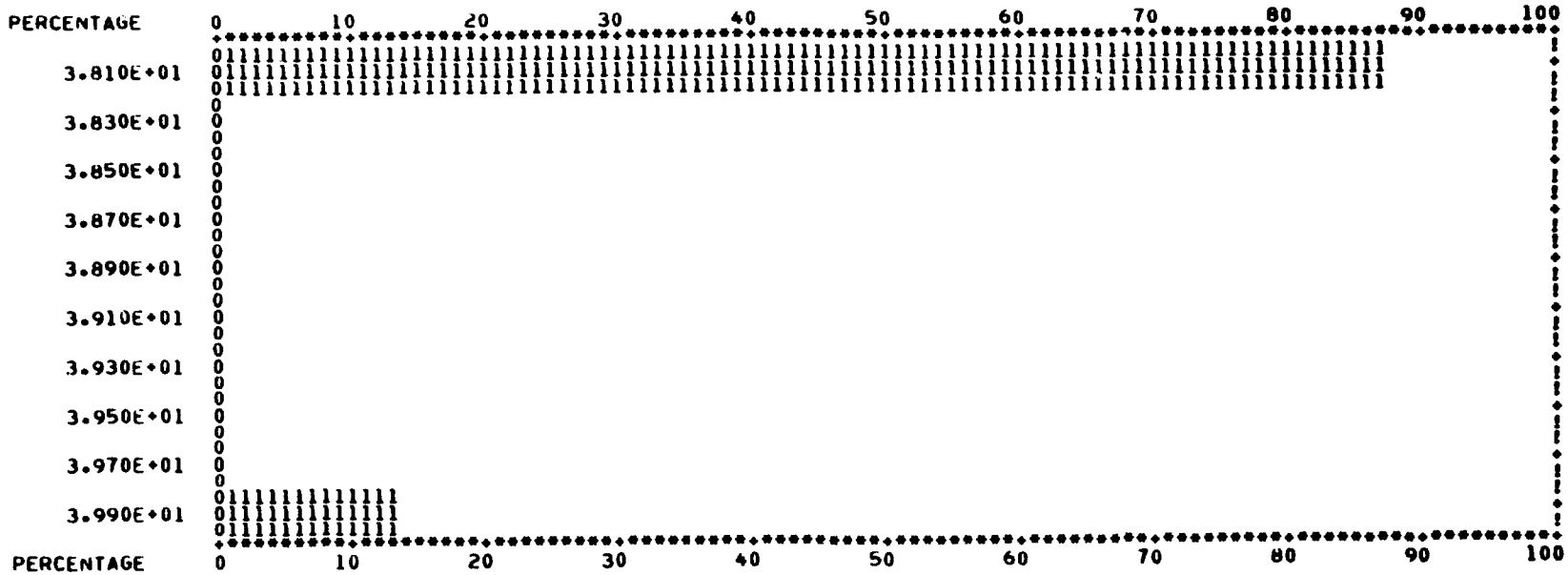


BIN	11.25	13.75	16.25	18.75	21.25	23.75	26.25	28.75	31.25	33.75
CONTENT	10.00	8.00	21.00	7.00	26.00	0.0	5.00	0.0	3.00	3.00

ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 187 195 196 198 200 297 298

STEP = 0.2000201
CENTERPOINT OF INITIAL GROUP= 38.0999756
CENTERPOINT OF FINAL GROUP = 39.8999939
NUMBER OF OBSERVATIONS = 83
NUMBER OF GROUPS = 10



BIN	38.10	38.30	38.50	38.70	38.90	39.10	39.30	39.50	39.70	39.90
CONTENT	72.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.00

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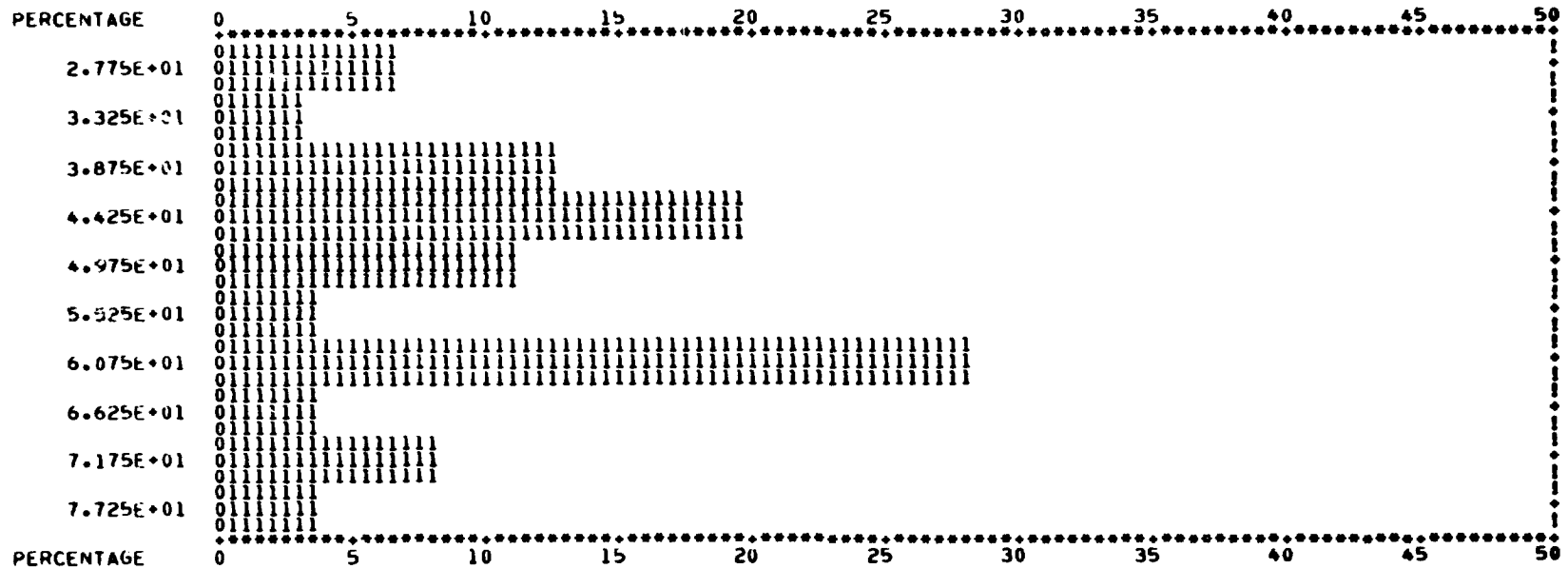
6-8-87

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 187 188 195 196 198 200 297 298 299
STEP = 5.50000095
CENTERPOINT OF INITIAL GROUP= 27.7499847 NUMBER OF OBSERVATIONS = 135
CENTERPOINT OF FINAL GROUP = 77.2500000 NUMBER OF GROUPS = 10



BIN	27.75	33.25	38.75	44.25	49.75	55.25	60.75	66.25	71.75	77.25
CONTENT	9.00	4.00	17.00	26.00	15.00	5.00	38.00	5.00	11.00	5.00

B-80

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 187 188 195 196 198 200 297 298 299
STEP = 5.19999791
CENTERPOINT OF INITIAL GROUP= 1.09999847 NUMBER OF OBSERVATIONS = 135
CENTERPOINT OF FINAL GROUP = 56.8999939 NUMBER OF GROUPS = 10

BIN	1.10	7.30	13.50	19.70	25.90	32.10	38.30	44.50	50.70	56.90
CONTENT	1.00	21.00	0.0	3.00	14.00	19.00	76.00	0.0	0.0	1.00

MISSOURI

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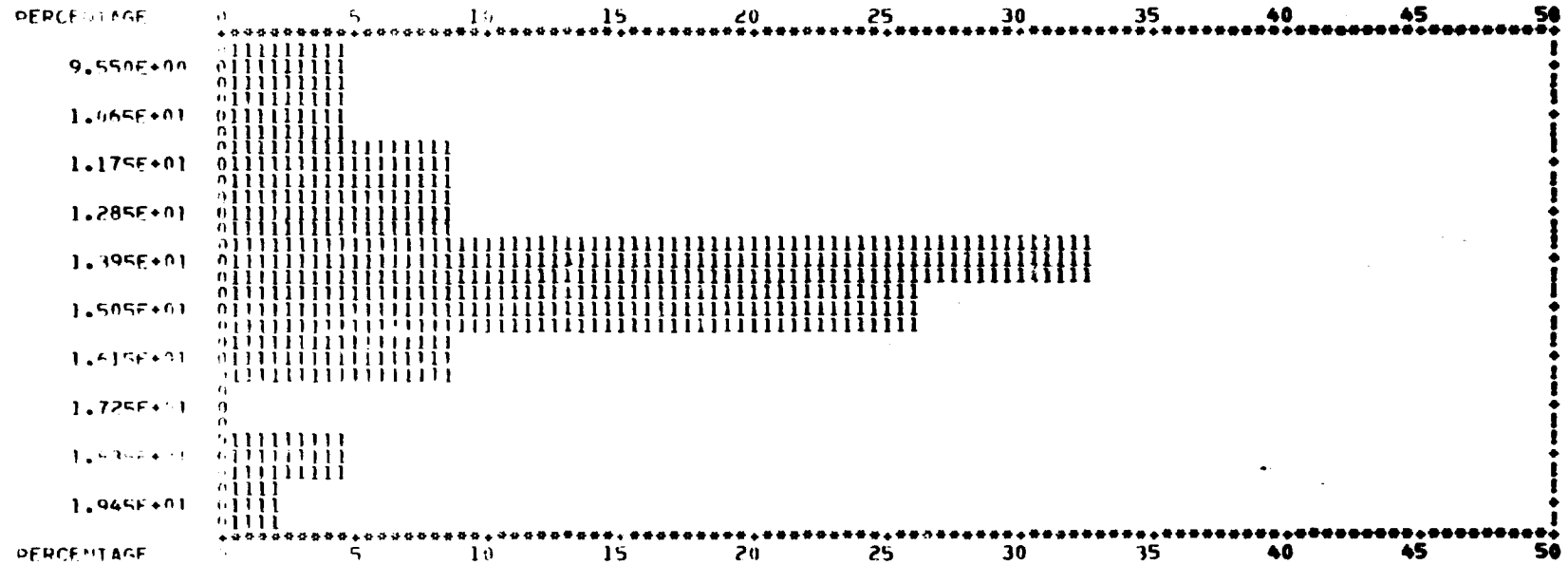
192

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 209 211 217 316
STEP = 1.0999998
CENTER-POINT OF FIRST GROUP = 9.5499992 NUMBER OF OBSERVATIONS = 46
CENTER-POINT OF FINAL GROUP = 19.4499969 NUMBER OF GROUPS = 10



MID	9.55	10.65	11.75	12.85	13.95	15.05	16.15	17.25	18.35	19.45
CONTENT	2.00	2.00	4.00	4.00	15.00	12.00	4.00	0.0	2.00	1.00

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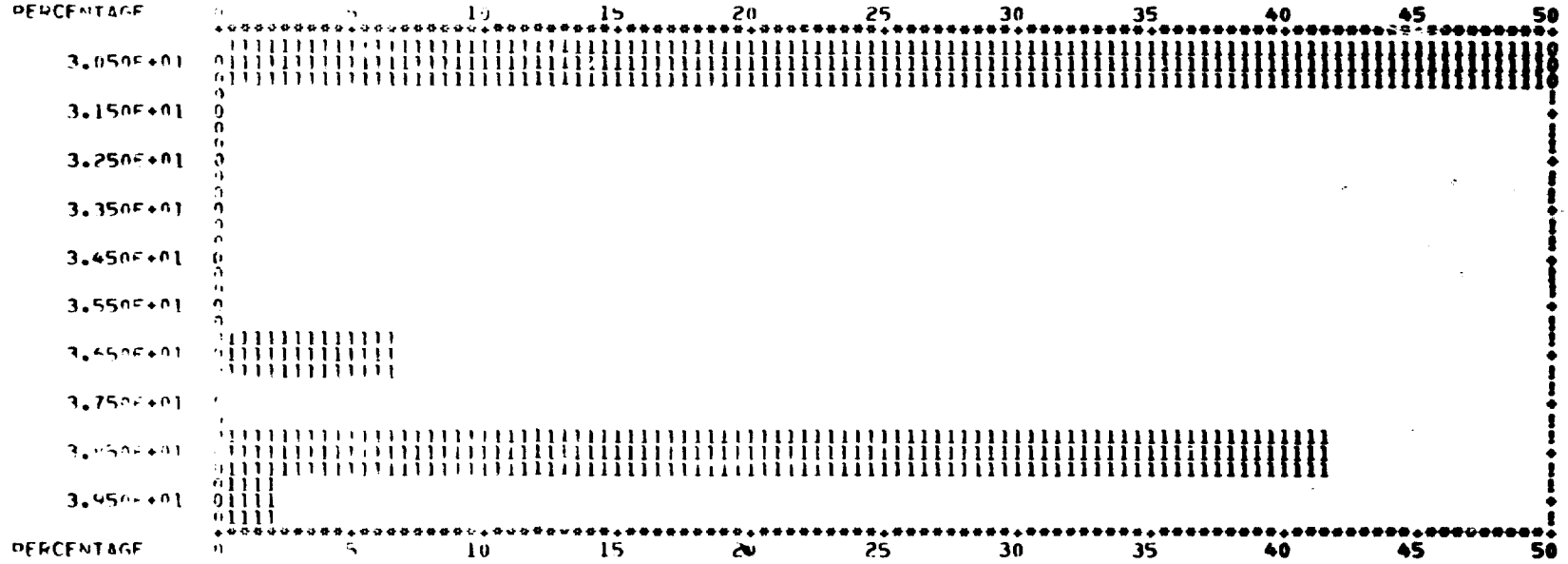
1/63

ROW WIDTH = INCHES

CROP TYPE IS CR
SEGMENTS = 209 211 217 316
STEP = 1.0000000
MIDPOINT OF INTERVAL WIDTH = 30.4999847 NUMBER OF OBSERVATIONS = 46
CENTERPOINT OF INITIAL CELL = 39.5000000 NUMBER OF GROUPS = 10

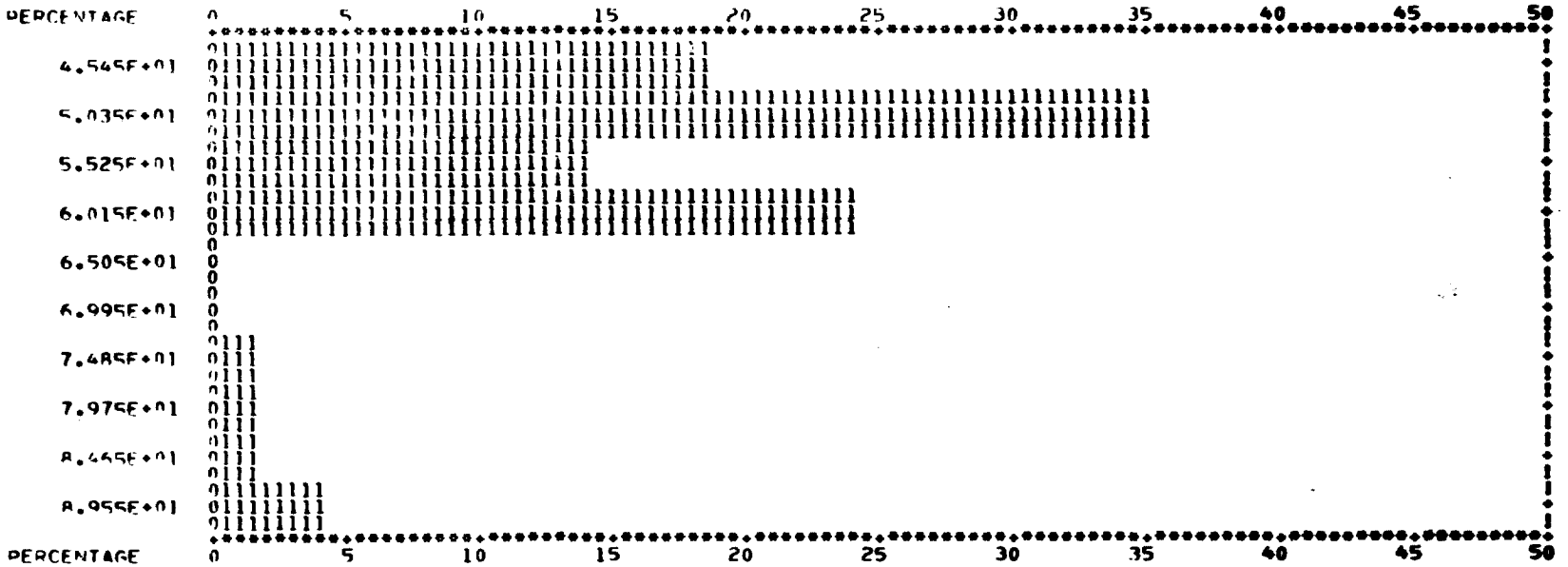


MID	30.50	31.50	32.50	33.50	34.50	35.50	36.50	37.50	38.50	39.50
CONTENT	23.00	0.0	0.0	0.0	0.0	0.0	3.00	0.0	19.00	1.00

461

SEEDING RATE - LB/ACRE

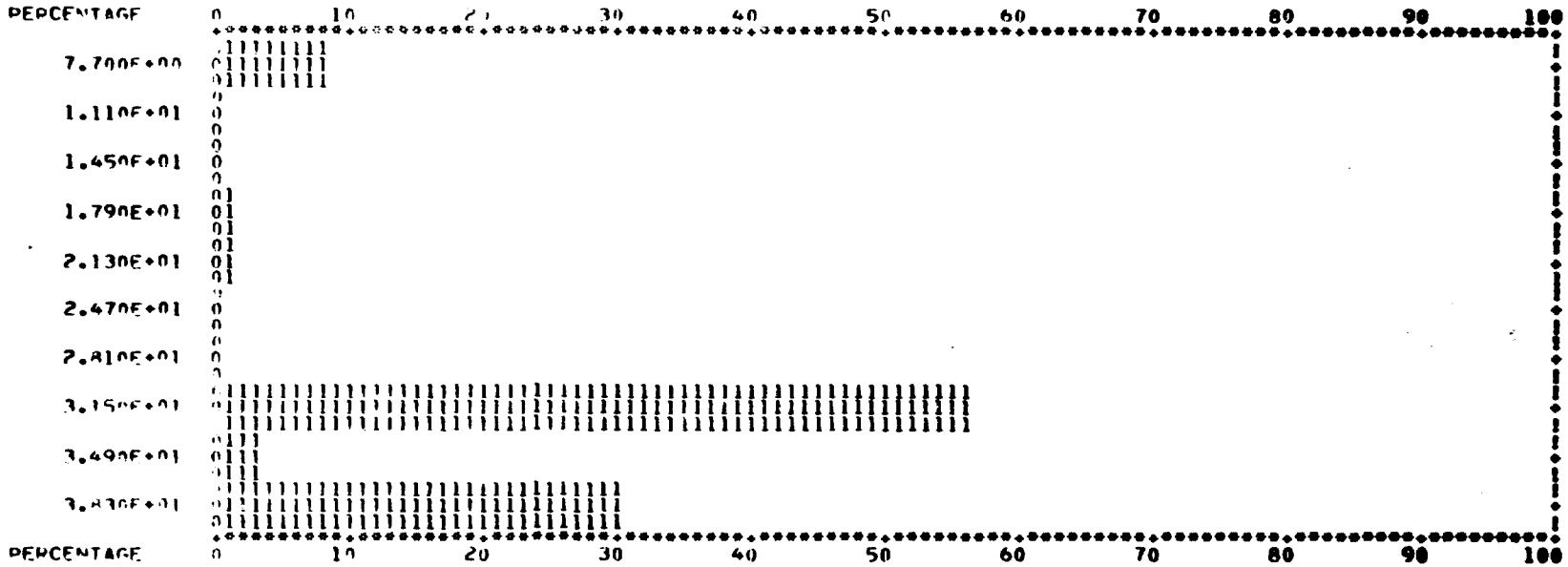
CROP TYPE IS 50
SEGMENTS = 204 209 211 217 316
STEP = 4.90000057
CENTERPOINT OF FIRST GROUP = [illegible]
CENTERPOINT OF FINAL GROUP = 89.5499878
NUMBER OF OBSERVATIONS = 71
NUMBER OF GROUPS = 10



	BIN	45.45	50.35	55.25	60.15	65.05	69.95	74.85	79.75	84.65	89.55
	CONTENT	13.00	25.00	10.00	17.00	0.0	0.0	1.00	1.00	1.00	3.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 206 209 211 217 315
STEP = 3.3333333
CENTERPOINT OF INITIAL GROUP= 7.4999988
CENTERPOINT OF FINAL GROUP = 35.299987
NUMBER OF OBSERVATIONS = 71
NUMBER OF GROUPS = 10



BIN	7.70	11.10	14.50	17.90	21.30	24.70	28.10	31.50	34.90	38.30
CONTENT	6.00	0.0	0.0	1.00	1.00	0.0	0.0	40.00	2.00	21.00

96/

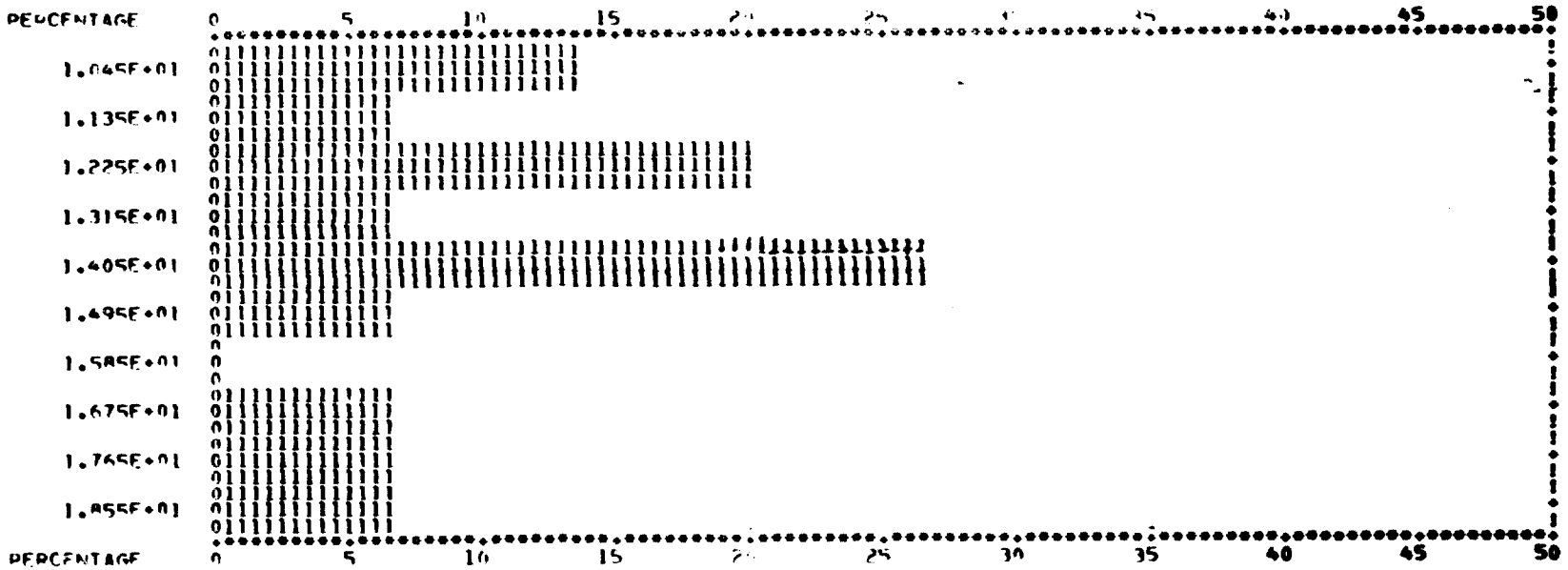
NEBRASKA

~~B-67~~

197

SEEDING RATE = 1 M/ACRE

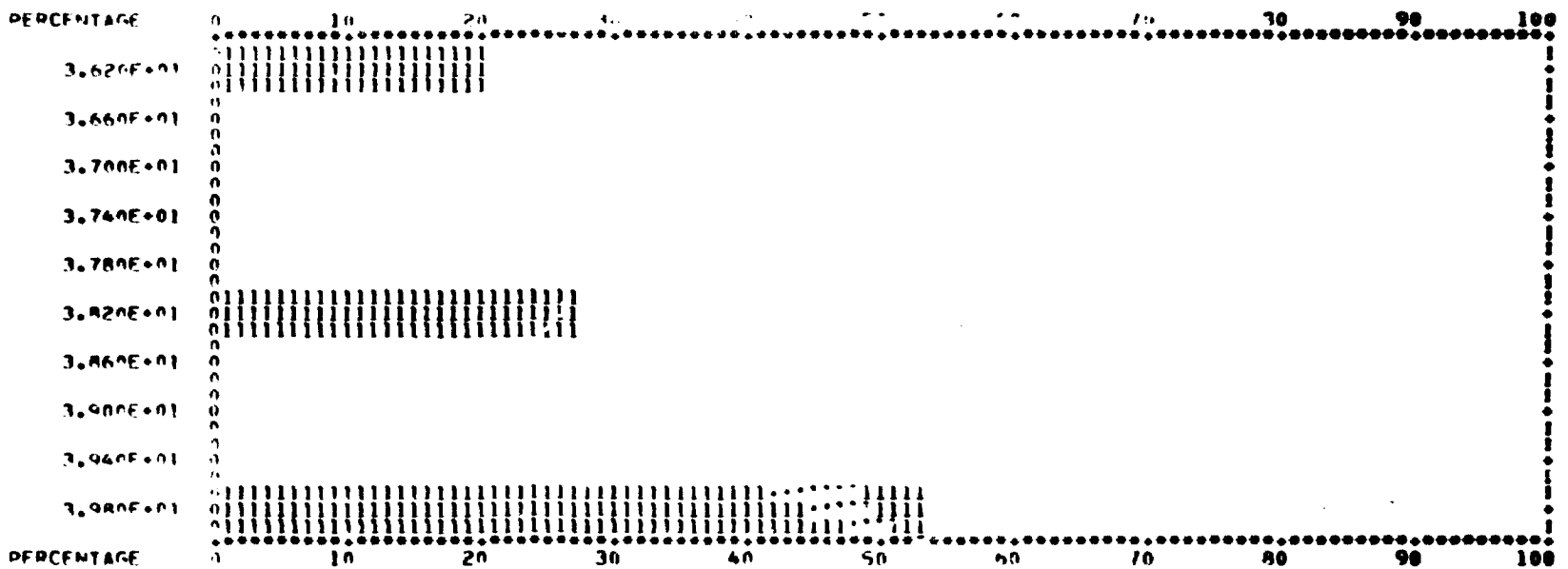
CROP TYPE IS CR
SEGMENTS = 1388 1594 1596
STEP = 0.49439872
CENTERPOINT OF INITIAL GROUP= 10.4449[illegible]
CENTERPOINT OF FINAL GROUP = 18.5449[illegible]
[illegible] = 15
[illegible] = 19



	MID	10.45	11.35	12.25	13.15	14.05	14.95	15.85	16.75	17.65	18.55
	CONTENT	2.00	1.00	3.00	1.00	4.00	1.00	0.0	1.00	1.00	1.00

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 1398 1594 1596
STEP = 0.40000063
CENTERPOINT OF INITIAL [illegible] = [illegible]E+17 [illegible] = 15
CENTERPOINT OF FINAL [illegible] = [illegible]E+17 [illegible] = 10



BIN	36.20	36.60	37.00	37.40	37.80	38.20	38.60	39.00	39.40	39.40
CONTENT	3.00	0.0	0.0	0.0	0.0	4.00	0.0	0.0	0.0	4.00

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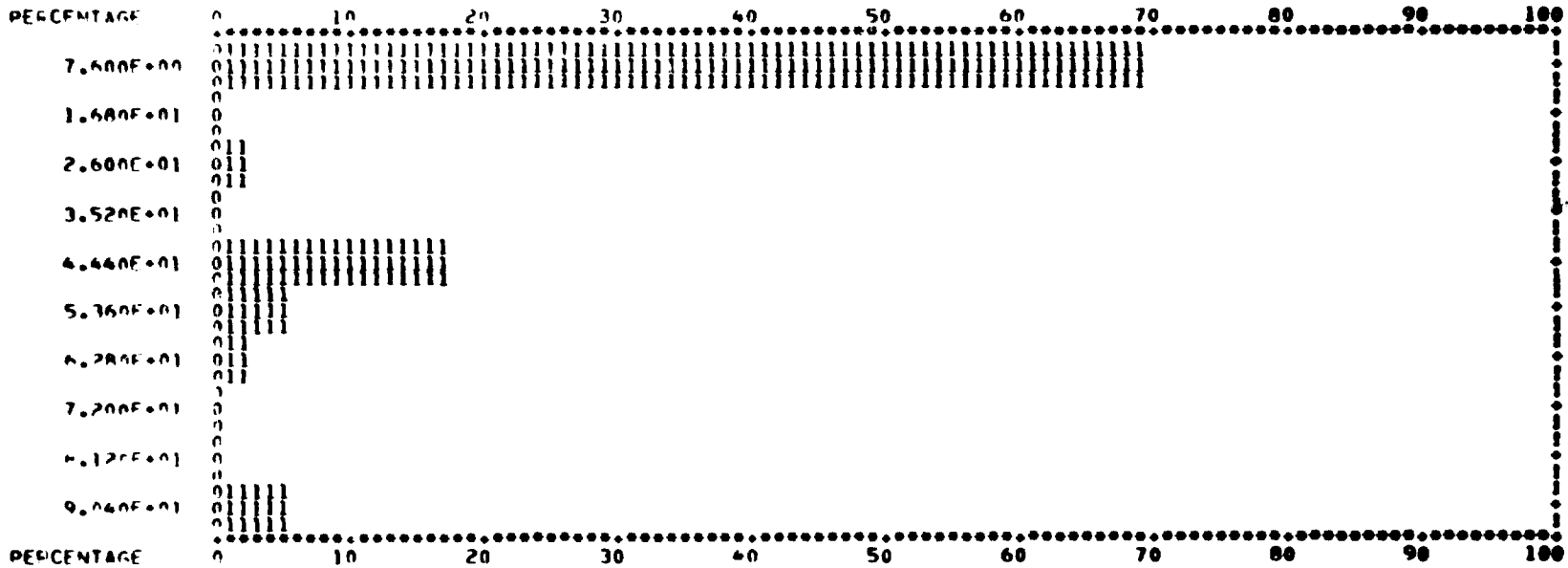
SEEDING RATE - LB/ACRE

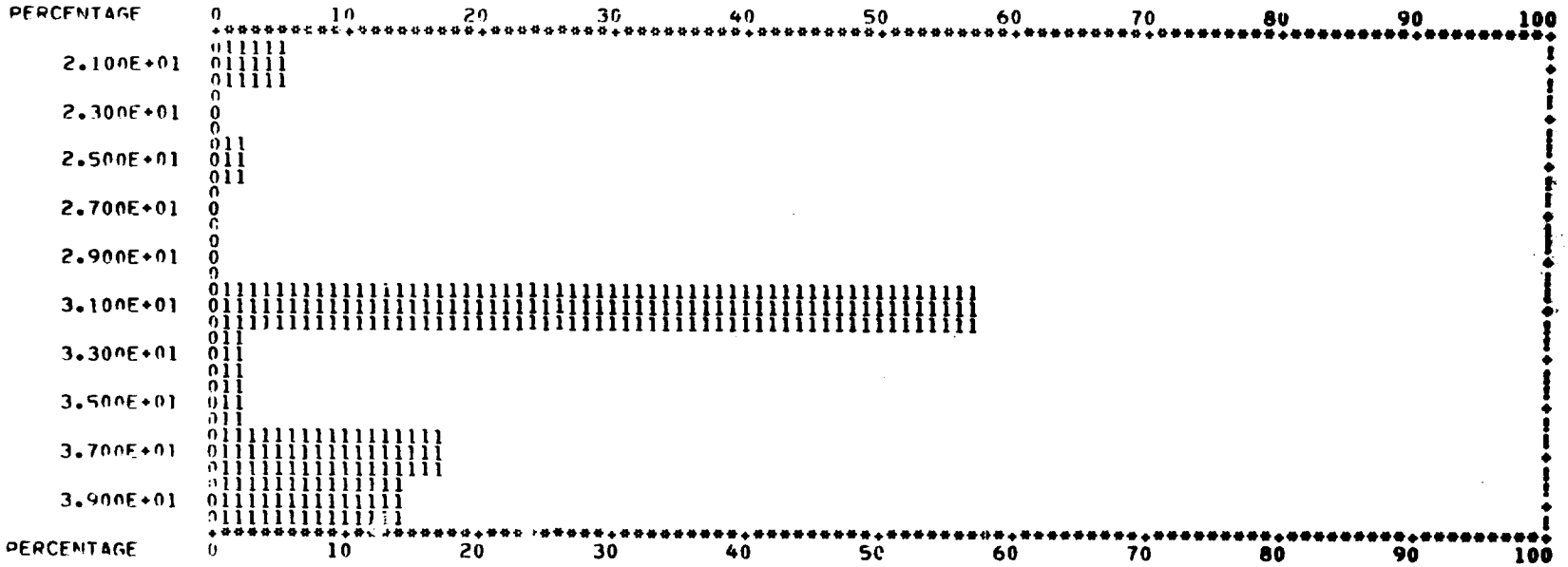
CROP TYPE IS SB
SEGMENTS = 326 1398 1594 1596
STEP = 9.1999756
CENTERPOINT OF INITIAL GROUP = 7.5999947 NUMBER OF OBSERVATIONS = 42
CENTERPOINT OF FINAL GROUP = 90.3999939 NUMBER OF GROUPS = 10



	MIN	7.60	16.80	26.00	35.20	44.40	53.60	62.80	72.00	81.20	90.40
CONTENT		29.00	0.0	1.00	0.0	7.00	2.00	1.00	0.0	0.0	2.00

ROW WIDTH - INCHES

CROP TYPE IS SR
SEGMENTS = 326 1388 1594 1596
STEP = 2.00000095
CENTERPOINT OF INITIAL GROUP= 20.9999847 NUMBER OF OBSERVATIONS = 42
CENTERPOINT OF FINAL GROUP = 39.0000000 NUMBER OF GROUPS = 10

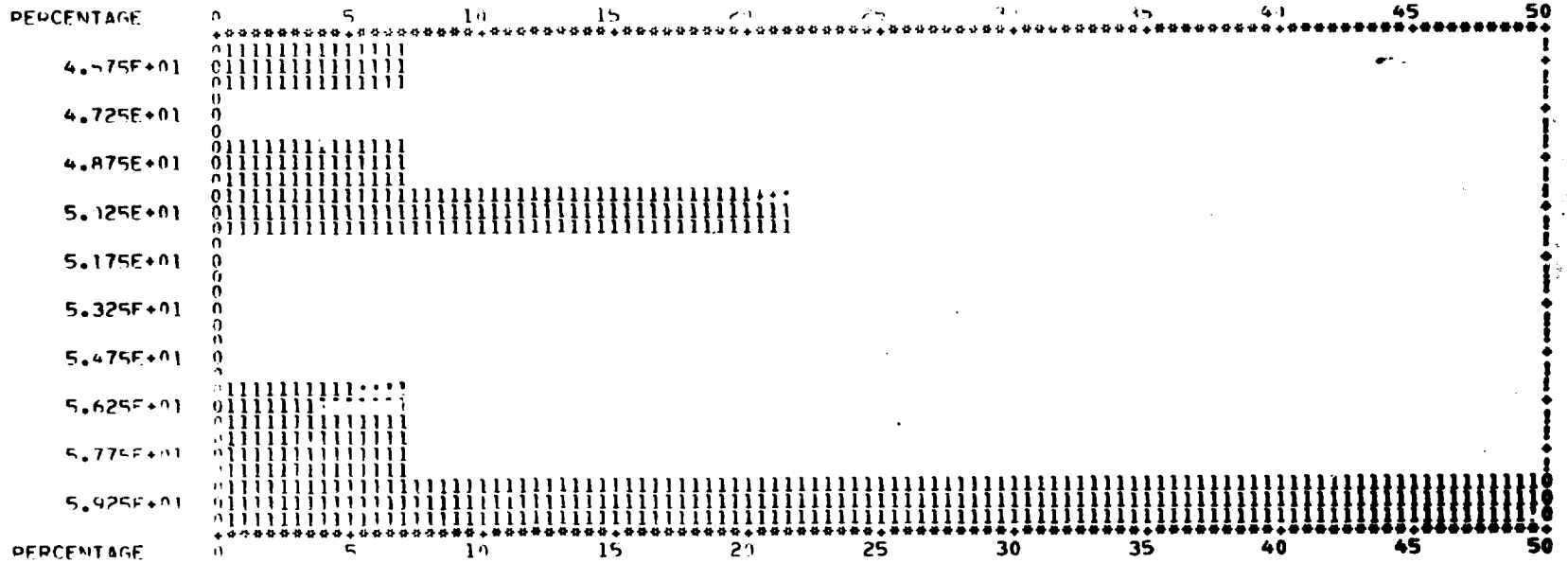


BIN	21.00	23.00	25.00	27.00	29.00	31.00	33.00	35.00	37.00	39.00
CONTENT	2.00	0.0	1.00	0.0	0.0	24.00	1.00	1.00	7.00	6.00

126

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 1388 1594 1596
STEP = 1.50000095
CENTERPOINT OF INITIAL GROUP= 45.7499847
CENTERPOINT OF FINAL GROUP = 59.2500000
NUMBER OF OBSERVATIONS = 14
NUMBER OF GROUPS = 10



BIN	45.75	47.25	48.75	50.25	51.75	53.25	54.75	56.25	57.75	59.25
CONTENT	1.00	0.0	1.00	3.00	0.0	0.0	0.0	1.00	1.00	7.00

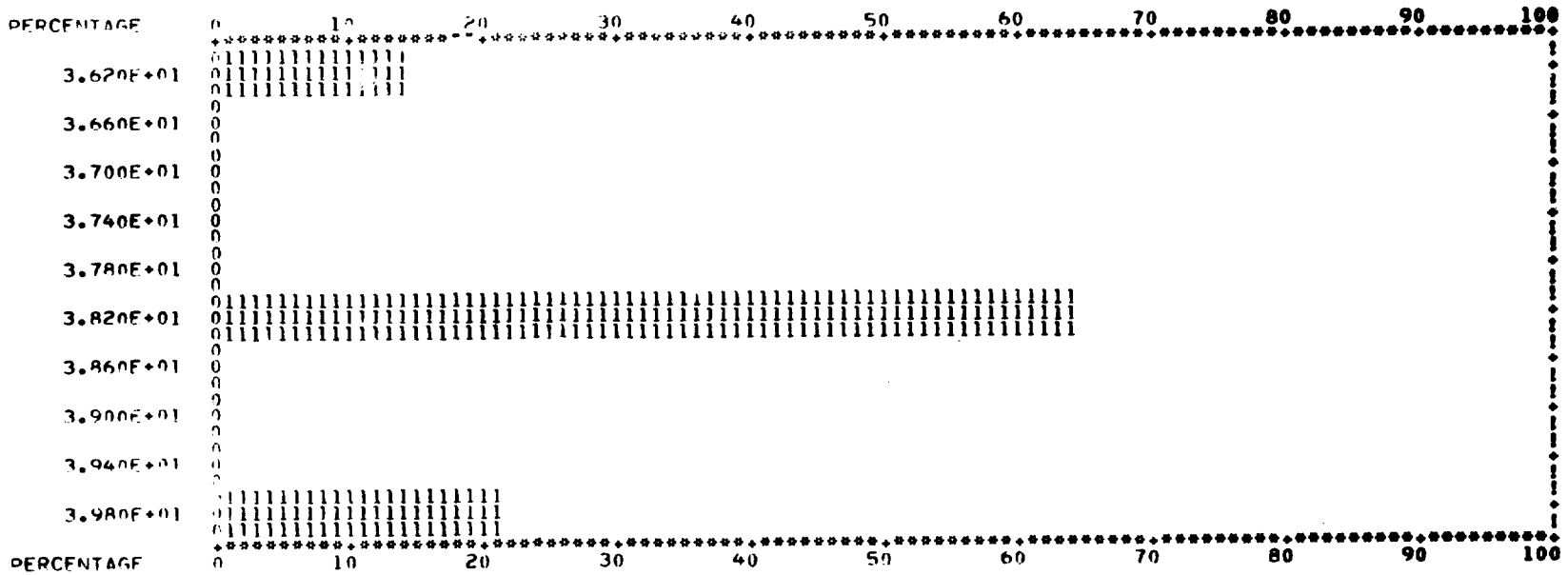
B-72
202

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 1388 1594 1596

STEP = 0.40000063
CENTERPOINT OF INITIAL GROUP= 36.1999817
CENTERPOINT OF FINAL GROUP = 39.7999878

NUMBER OF OBSERVATIONS = 14
NUMBER OF GROUPS = 10



MID	36.20	36.60	37.00	37.40	37.80	38.20	38.60	39.00	39.40	39.80
CONTENT	2.00	0.0	0.0	0.0	0.0	9.00	0.0	0.0	0.0	3.00

873

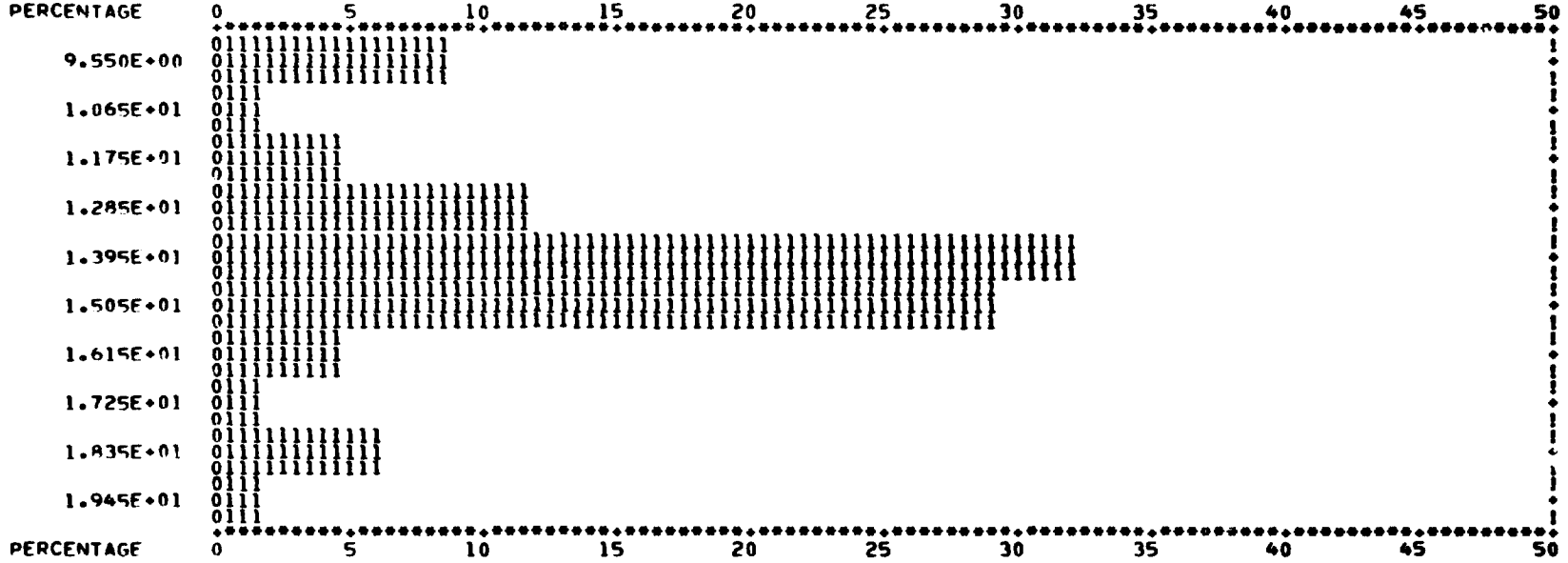
203

NORTH CAROLINA

B-74

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 337 341 342 343 344
STEP = 1.09999943
CENTERPOINT OF INITIAL GROUP= 9.54999828 NUMBER OF OBSERVATIONS = 69
CENTERPOINT OF FINAL GROUP = 19.4499969 NUMBER OF GROUPS = 10

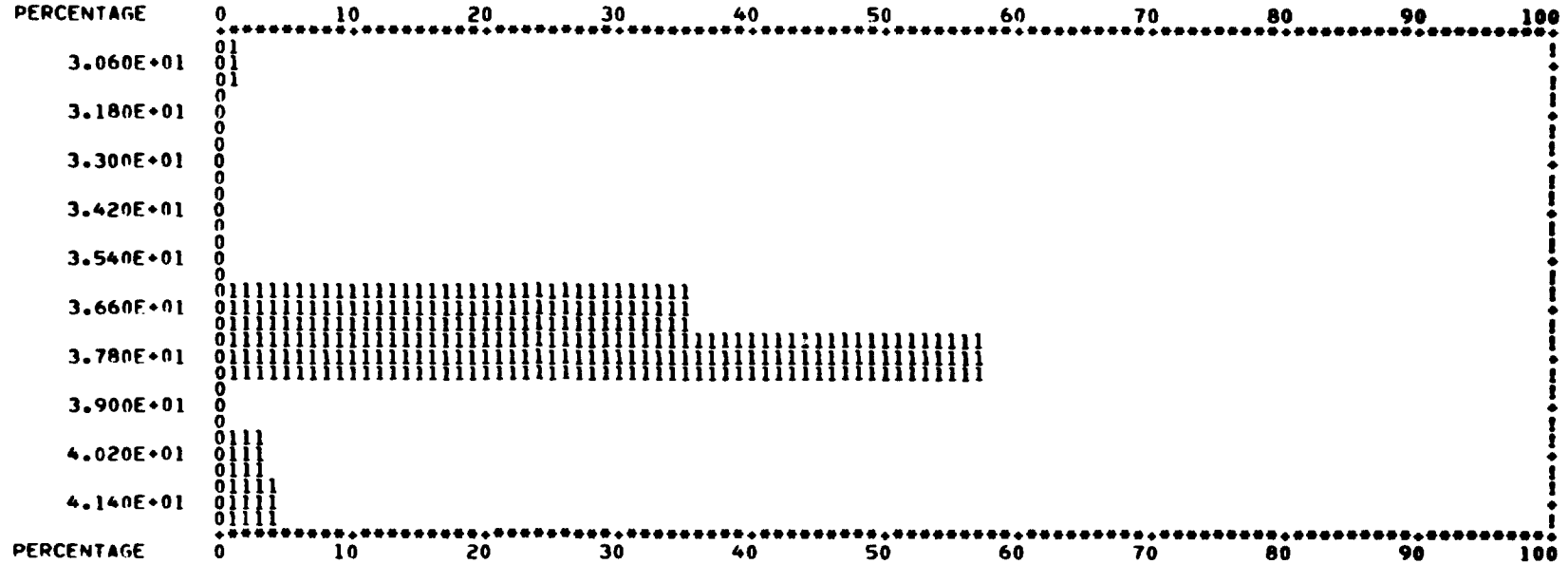


BIN	9.55	10.65	11.75	12.85	13.95	15.05	16.15	17.25	18.35	19.45
CONTENT	6.00	1.00	3.00	8.00	22.00	20.00	3.00	1.00	4.00	1.00

B-75
205

ROW WIDTH - INCHES

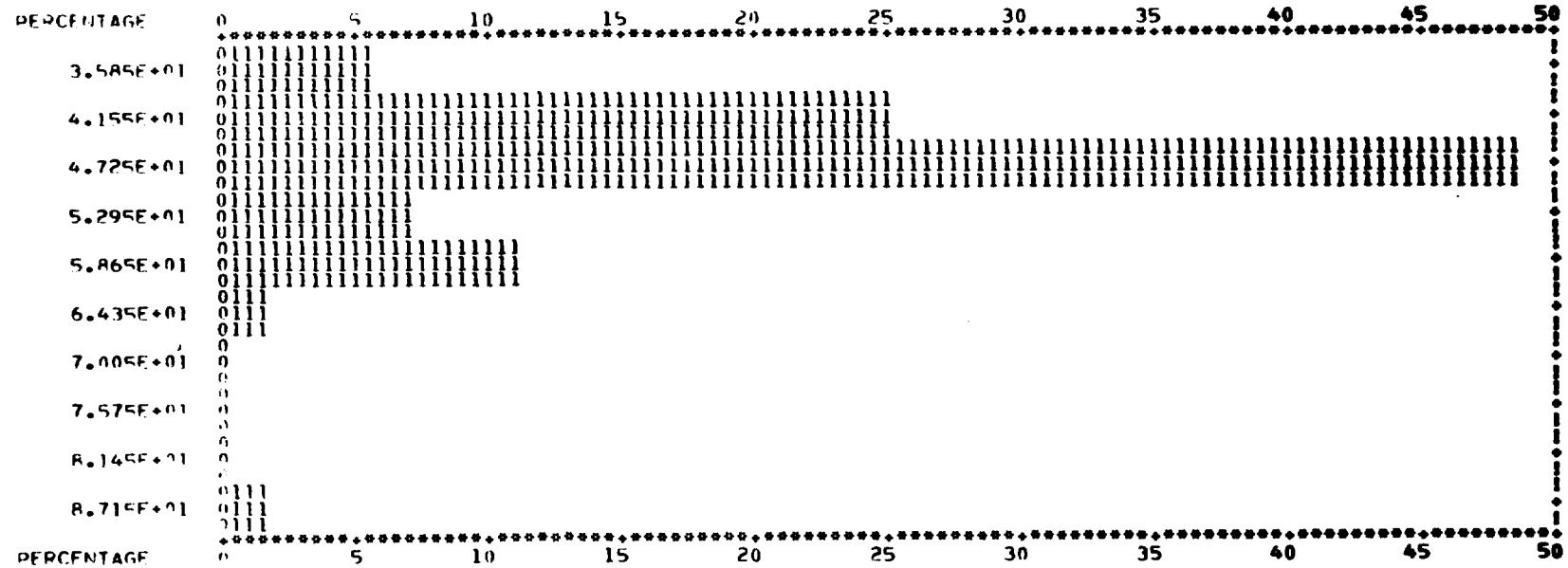
CROP TYPE IS CR
SEGMENTS = 332 341 342 343 344
STEP = 1.20000172
CENTERPOINT OF INITIAL GROUP= 30.5999756 NUMBER OF OBSERVATIONS = 69
CENTERPOINT OF FINAL GROUP = 41.3999939 NUMBER OF GROUPS = 10



BIN	30.60	31.80	33.00	34.20	35.40	36.60	37.80	39.00	40.20	41.40
CONTENT	1.00	0.0	0.0	0.0	0.0	24.00	39.00	0.0	2.00	3.00

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 332 340 341 342 343 344
STEP = 5.70000172
CENTERPOINT OF INITIAL GROUP= 35.8499756 NUMBER OF OBSERVATIONS = 72
CENTERPOINT OF FINAL GROUP = 87.1499939 NUMBER OF GROUPS = 10

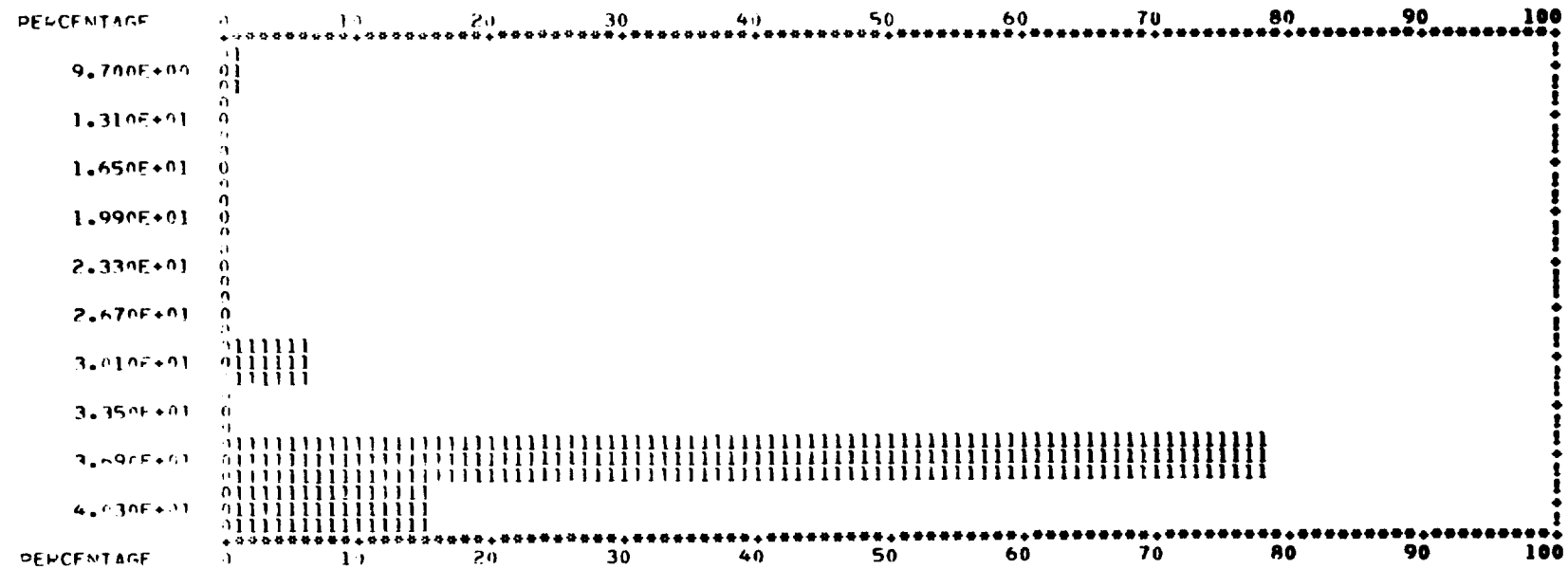


	MID	35.85	41.55	47.25	52.95	58.65	64.35	70.05	75.75	81.45	87.15
	CONTENT	4.00	18.00	35.00	5.00	8.00	1.00	0.0	0.0	0.0	1.00

B-27
12e1

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 339 340 341 342 343 344
STEP = 3.3000476
CENTERPOINT OF INITIAL GROUP = 9.6499988 NUMBER OF OBSERVATIONS = 72
CENTERPOINT OF FINAL GROUP = 40.299987 NUMBER OF GROUPS = 10



MID	9.70	13.10	16.50	19.90	23.30	26.70	30.10	33.50	36.90	40.30
CONTENT	1.00	0.0	0.0	0.0	0.0	0.0	4.00	0.0	56.00	11.00

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OHIO

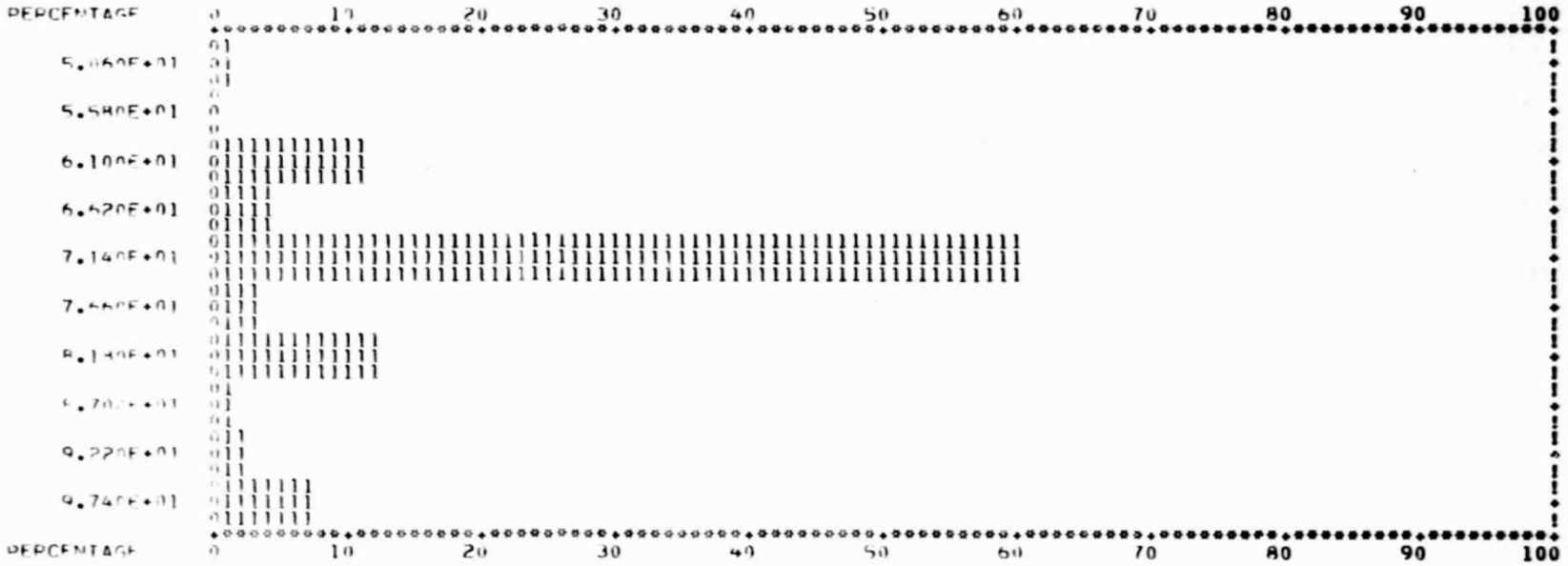
B-86
216

NORTH DAKOTA

SEEDING RATE - LB/ACRE

CROP TYPE IS RB
SEGMENTS = 1337 1392 1394 1394 1397 1401 1407 1476 1571 1584 1602 1611 1617 1619
1636 1638 1665 1655 1658 1691 1704 1707 1717 1719 1724
1974

STEP = 5.20000172
CENTER POINT OF INITIAL GROUP= 50.5999756 NUMBER OF OBSERVATIONS = 190
CENTER POINT OF FINAL GROUP = 97.3999939 NUMBER OF GROUPS = 10



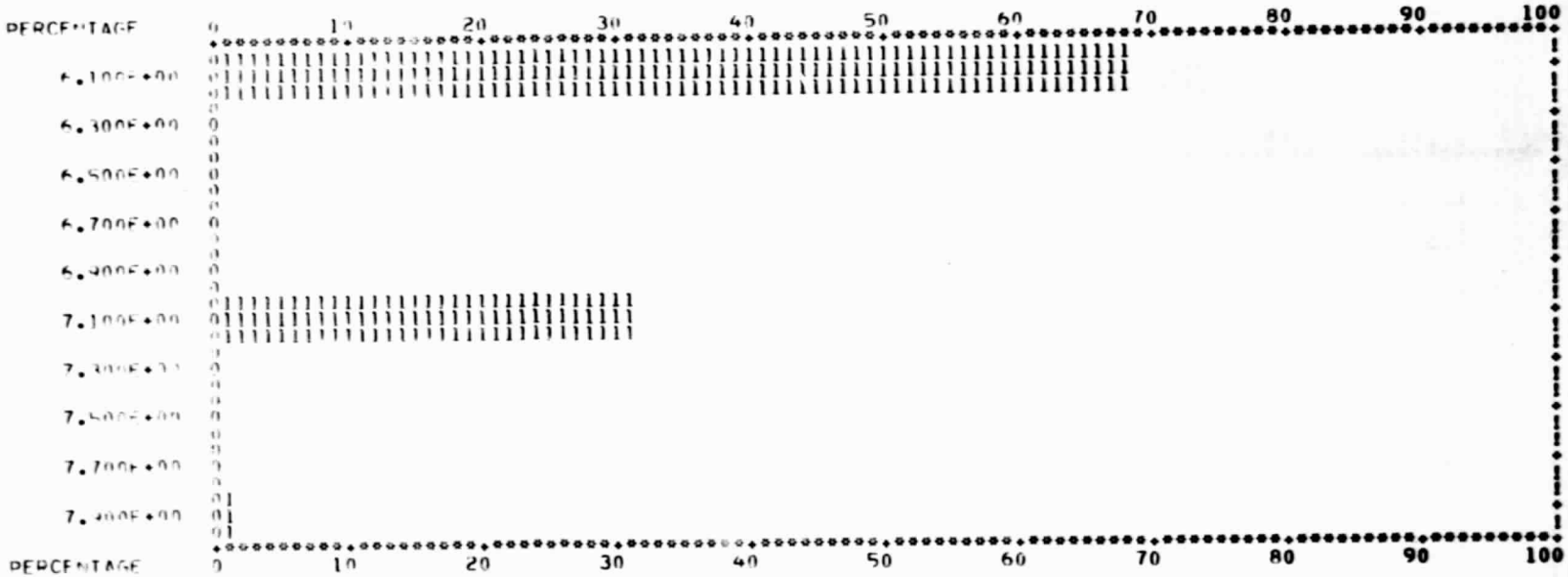
MID	50.80	55.80	61.00	66.20	71.40	76.60	81.80	87.00	92.20	97.40
COUNT	2.00	0.0	21.00	7.00	114.00	6.00	22.00	1.00	4.00	13.00

B-80

ROW WIDTH - INCHES

CROP TYPE IS 48
SEGMENTS = 1387 1342 1446 1304 1467 1461 1467 1472 1571 1546 1602 1611 1617 1614
1630 1632 1605 1654 1655 1651 1654 1909 1917 1918 1424
1974

SIES = 6.20000023
CENTROID OF INITIAL GROUP= 6.09999847 NUMBER OF OBSERVATIONS = 190
CENTROID OF FINAL GROUP = 7.90000057 NUMBER OF GROUPS = 10



	MIN	6.10	6.30	6.50	6.70	6.90	7.10	7.30	7.50	7.70	7.90
	CONTENT	130.00	0.0	0.0	0.0	0.0	58.00	0.0	0.0	0.0	2.00

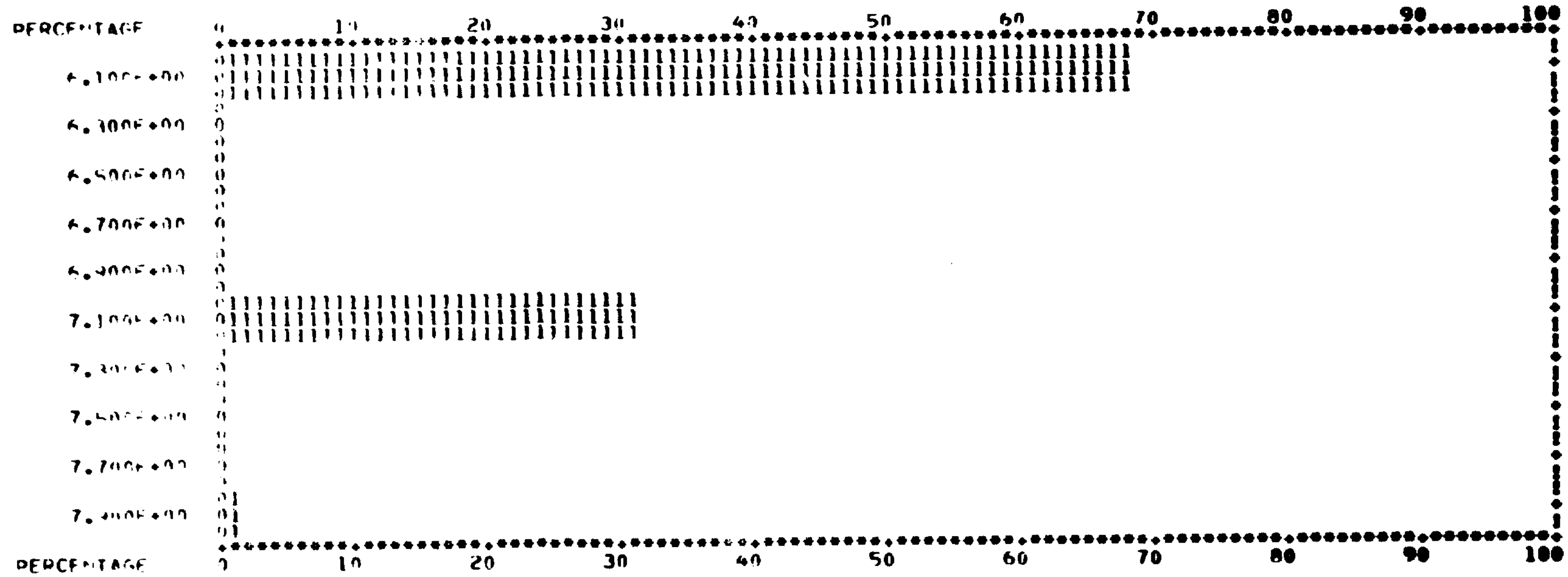
116

ROW WIDTH - INCHES

CROP TYPE IS 40
SEGMENTS = 1397 1342 1446 1364 1457 1461 1467 1472 1571 1596 1602 1611 1617 1619
1630 1636 [illegible] 1644 1655 1651 1656 1909 1917 1918 1924
1974

STEP = 0.20000023
CENTERPOINT 1 OF INITIAL GROUP = 6.09999847
CENTERPOINT OF FINAL GROUP = 7.90000057

NUMBER OF OBSERVATIONS = 190
NUMBER OF GROUPS = 10



BIN	6.10	6.30	6.50	6.70	6.90	7.10	7.30	7.50	7.70	7.90
CONTENT	130.00	0.0	0.0	0.0	0.0	58.00	0.0	0.0	0.0	2.00

~~B-81~~ 211

SEEDING RATE - LB/ACRE

CROP TYPE IS DW
SEGMENTS = 1397 1392 1394 1457 1451 1457 1472 1502 1511 1617
1613 1627 1648 1552 1917
1924 1974

STEP = 7.50000095
CENTERPOINT OF INITIAL GROUP= [illegible].7499847 NUMBER OF OBSERVATIONS = 126
CENTERPOINT OF FINAL GROUP = [illegible] NUMBER OF GROUPS = 10

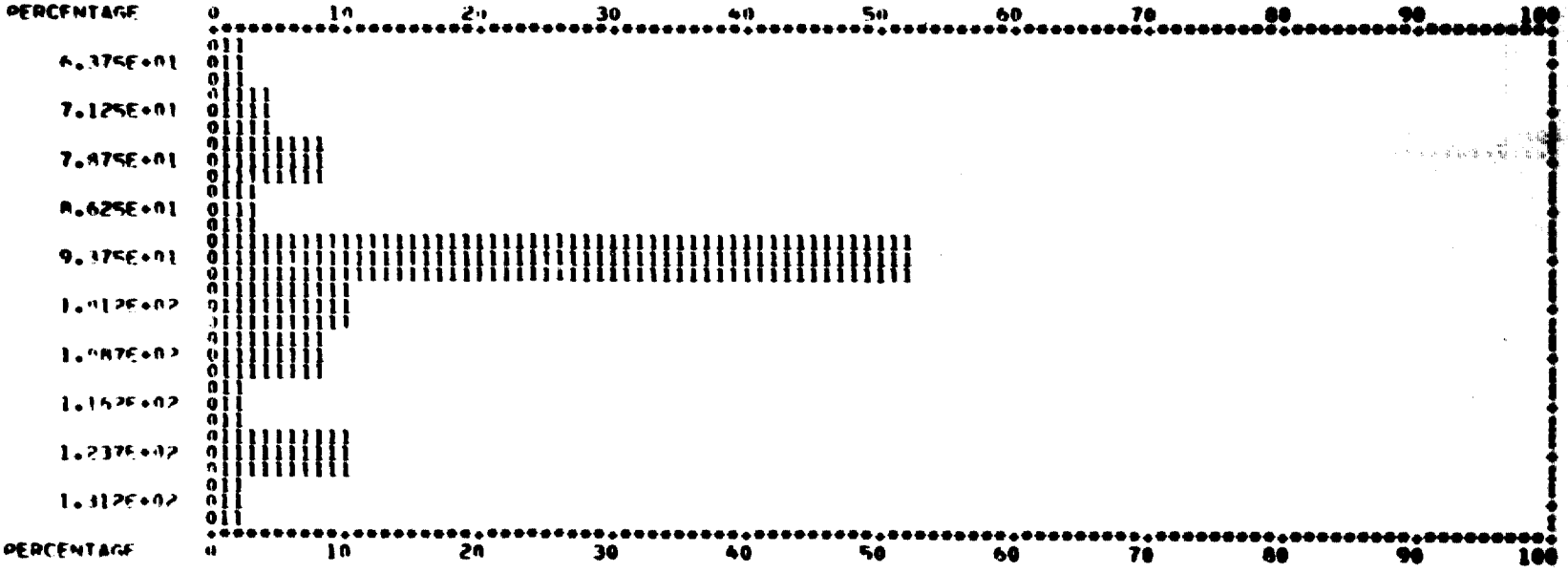
BIN	63.75	71.25	78.75	86.25	93.75	101.25	108.75	116.25	123.75	131.25
CONTENT	2.00	5.00	10.00	4.00	66.00	12.00	10.00	2.00	13.00	2.00

B-82
2/2

SEEDING RATE - LB/ACRE

CROP TYPE IS DW
SEGMENTS = 1347 1392 1396 1457 1461 1467 1472 1502 1511 1617
1617 1637 1638 1652 1917
1924 1976

STEP = 7.50000095
CENTERPOINT OF INITIAL GROUP= 67.7499847 NUMBER OF OBSERVATIONS = 126
CENTERPOINT OF FINAL GROUP = 131.250000 NUMBER OF GROUPS = 10



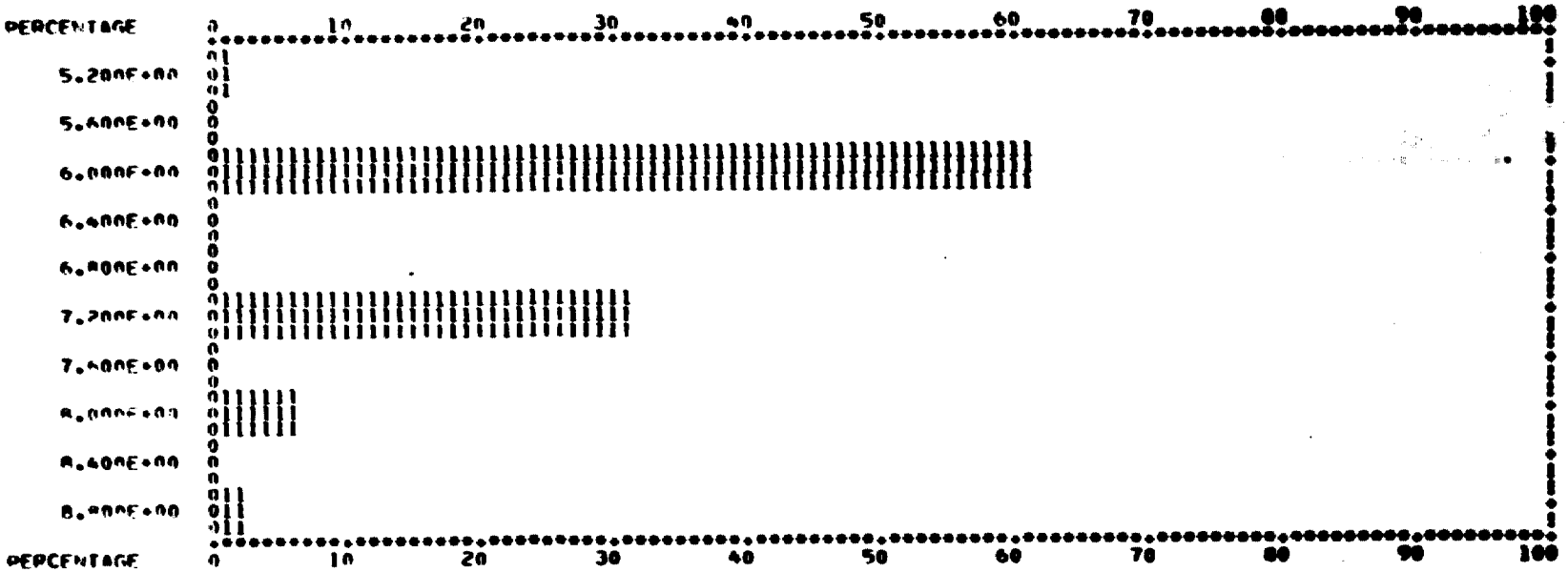
MIN	63.75	71.25	78.75	86.25	93.75	101.25	108.75	116.25	123.75	131.25
CONTENT	2.00	5.00	10.00	4.00	66.00	12.00	10.00	2.00	13.00	2.00

212

ROW WIDTH - INCHES

CROP TYPE IS CW
SEGMENTS = 1347 1392 1404 1457 1461 1467 1472 1492 1511 1617
1619 1627 1634 1639 1641 1917
1926 1974

SIZE = 0.40000010
CENTEROID OF INITIAL GROUP= 5.1999969482 NUMBER OF OBSERVATIONS = 126
CENTEROID OF FINAL GROUP = 6.4000010490 NUMBER OF GROUPS = 10



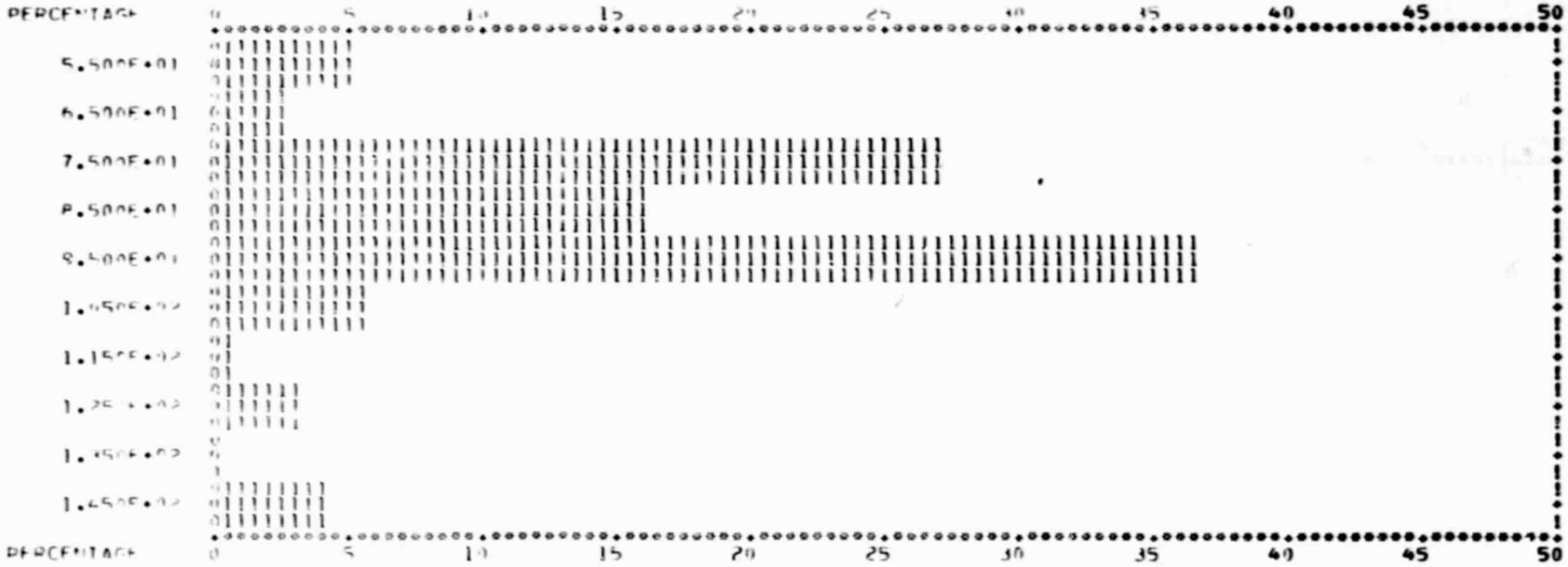
MIN	5.20	5.60	6.00	6.40	6.80	7.20	7.60	8.00	8.40	8.80
CONTENT	1.00	0.0	77.00	0.0	0.0	34.00	0.0	7.00	0.0	2.00

213

SEEDING RATE - LB/ACRE

CROP TYPE IS SW
SEGMENTS = 1337 1342 1346 1349 1457 1461 [illegible] 1472 1473 1571 1584 1602 1611 1612 1617
1619 1627 163[illegible] [illegible]
1924 1974

STEP = 10.000000
CENTERPOINT OF INITIAL GROUP= 54.999[illegible]7 NUMBER OF OBSERVATIONS = 354
CENTERPOINT OF FINAL GROUP = 145.000000 NUMBER OF GROUPS = 10



MID	55.00	65.00	75.00	85.00	95.00	105.00	115.00	125.00	135.00	145.00
CONTENT	17.00	9.00	96.00	57.00	129.00	19.00	1.00	11.00	0.0	15.00

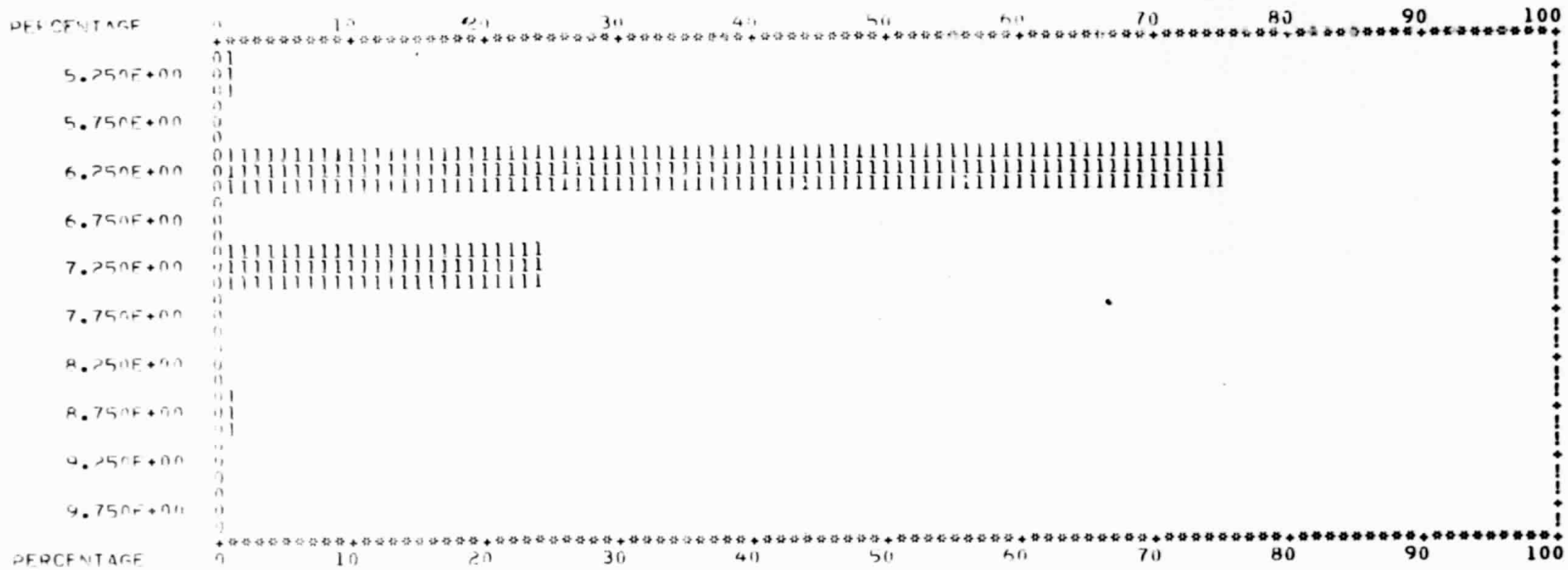
B-84
214

ROW WIDTH - INCHES

CROP TYPE IS SW
SEGMENTS = 1387 1392 1394 1399 1457 1461 [illegible] 1472 1473 1571 1584 16[illegible] 1611 1612 1617
1619 1627 1630 1636 1646 165[illegible] 1653 1655 [illegible] 1561 1664 1[illegible] 1917 1[illegible] 1920
1924 1974

STEP = 0.50000113
CENTERPOINT OF INITIAL GROUP = 5.24999905
CENTERPOINT OF FINAL GROUP = 9.75000095

NUMBER OF OBSERVATIONS = 354
NUMBER OF GROUPS = 10



BIN	5.25	5.75	6.25	6.75	7.25	7.75	8.25	8.75	9.25	9.75
CONTENT	2.00	0.0	264.00	0.0	85.00	0.0	0.0	2.00	0.0	1.00

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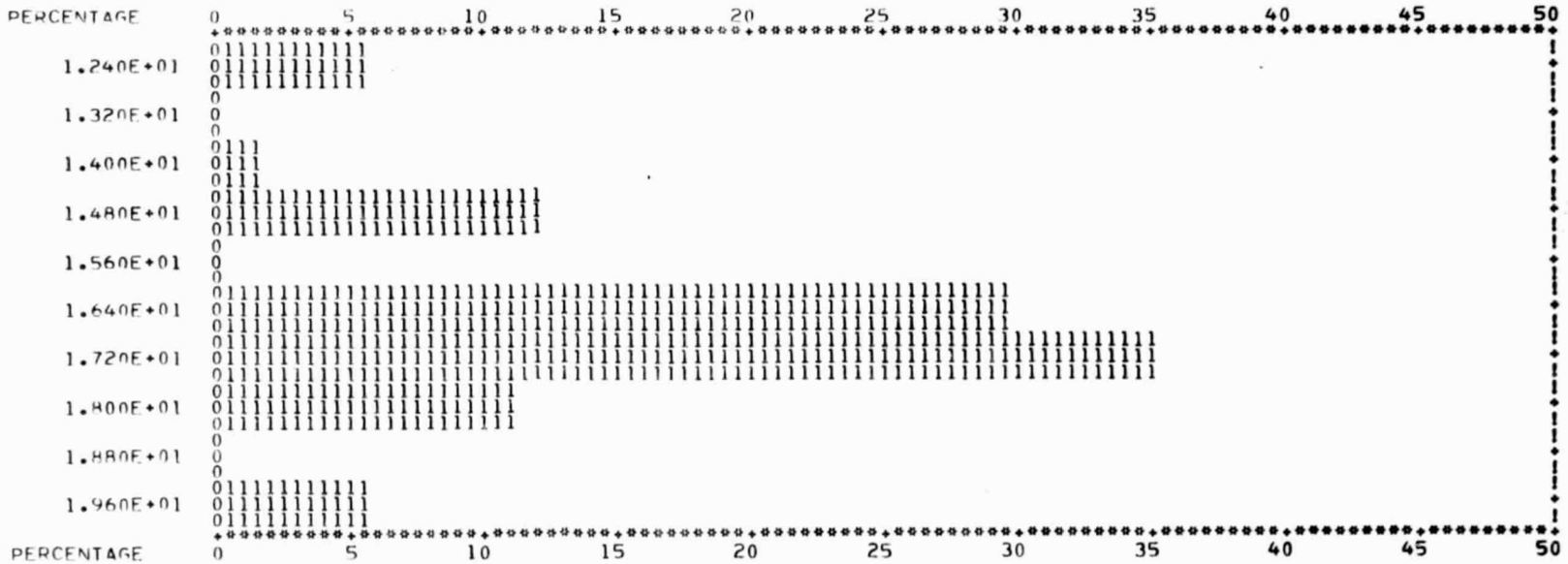
OF POOR QUALITY

OHIO

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 229 230 231 234 238
STEP = 0.79999912
CENTERPOINT OF INITIAL GROUP = 12.3999987 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 19.5999908 NUMBER OF GROUPS = 10

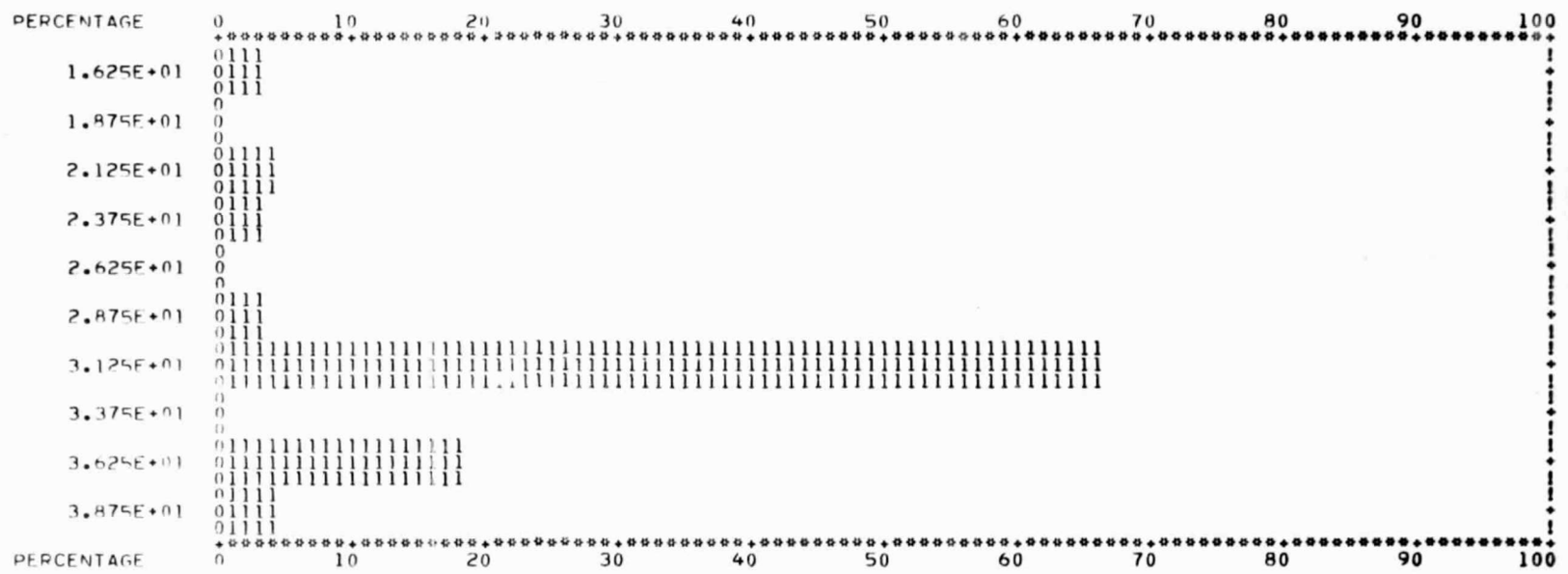


BIN	12.40	13.20	14.00	14.80	15.60	16.40	17.20	18.00	18.80	19.60
CONTENT	4.00	0.0	1.00	9.00	0.0	22.00	26.00	8.00	0.0	4.00

217
8-87

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 229 230 231 234 238
STEP = 2.50000095
CENTERPOINT OF INITIAL GROUP= 16.2499847 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 38.7500000 NUMBER OF GROUPS = 10

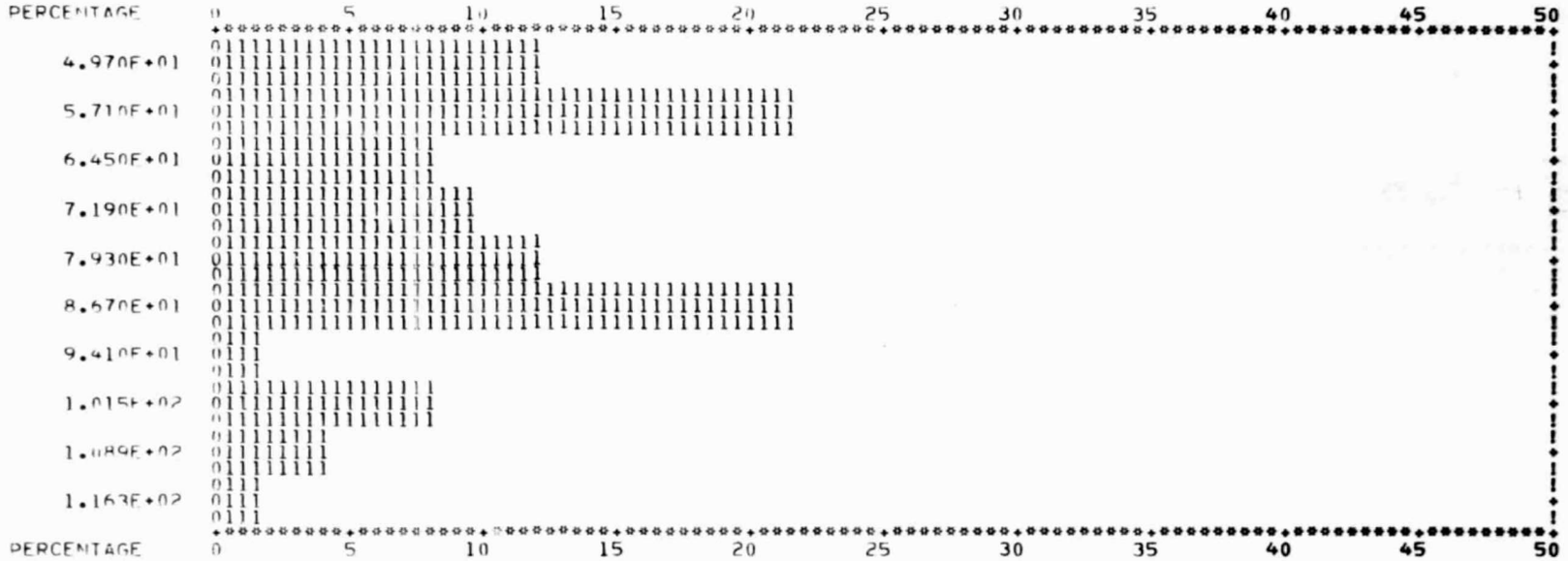


BIN	16.25	18.75	21.25	23.75	26.25	28.75	31.25	33.75	36.25	38.75
CONTENT	2.00	0.0	3.00	2.00	0.0	2.00	49.00	0.0	13.00	3.00

8/2
B-88

SEEDING RATE - LB/ACRE

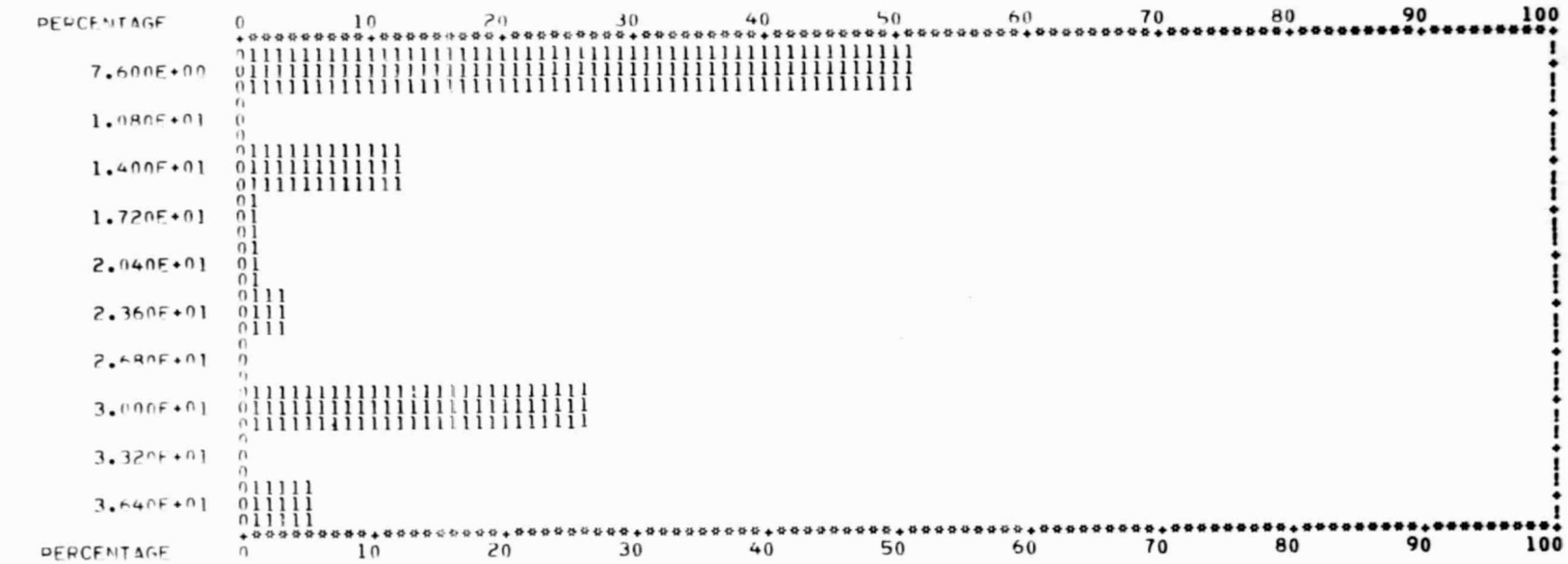
CROP TYPE IS SO
SEGMENTS = 229 230 231 234 238
STEP = 7.40000057
CENTERPOINT OF INITIAL GROUP= 49.6999817 NUMBER OF OBSERVATIONS = 74
CENTERPOINT OF FINAL GROUP = 116.299988 NUMBER OF GROUPS = 10



BIN	49.70	57.10	64.50	71.90	79.30	86.70	94.10	101.50	108.90	116.30
CONTENT	9.00	16.00	6.00	7.00	9.00	16.00	1.00	6.00	3.00	1.00

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 229 230 231 234 238
STEP = 3.19999790
CENTERPOINT OF INITIAL GROUP= 7.59999847
CENTERPOINT OF FINAL GROUP = 36.3999939
NUMBER OF OBSERVATIONS = 74
NUMBER OF GROUPS = 10



BIN	7.60	10.80	14.00	17.20	20.40	23.60	26.80	30.00	33.20	36.40
CONTENT	38.00	0.0	9.00	1.00	1.00	2.00	0.0	19.00	0.0	4.00

B-90

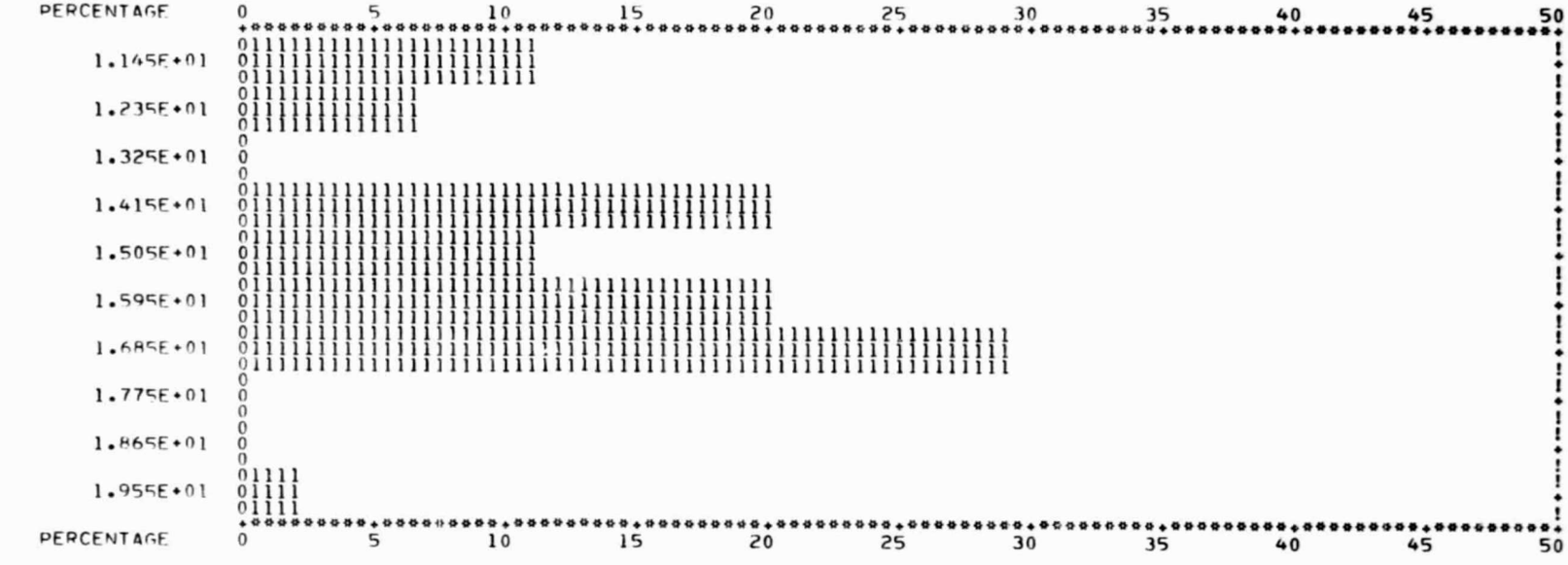
270

PENNSYLVANIA

B-91
221

SEEDING RATE - LB/ACRE

CROP TYPE IS CR
SEGMENTS = 319 320 322
STEP = 0.89999872
CENTERPOINT OF INITIAL GROUP= 11.4499989 NUMBER OF OBSERVATIONS = 45
CENTERPOINT OF FINAL GROUP = 19.5499878 NUMBER OF GROUPS = 10

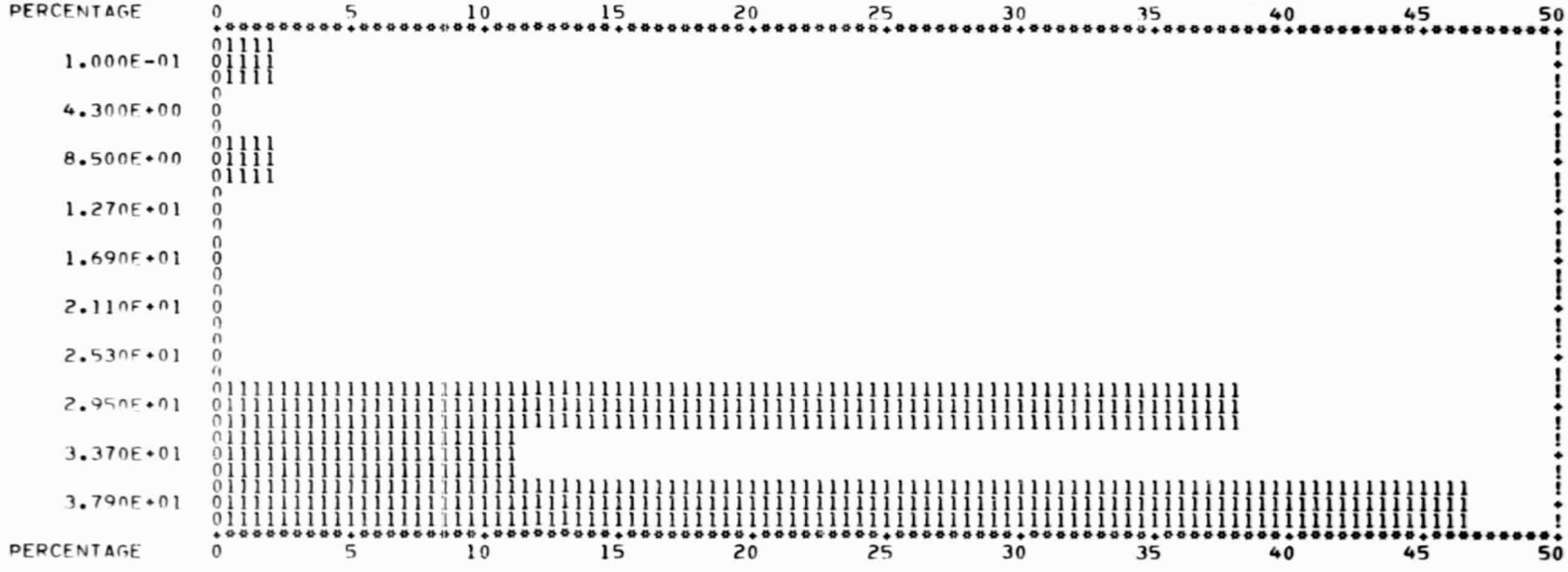


BIN	11.45	12.35	13.25	14.15	15.05	15.95	16.85	17.75	18.65	19.55
CONTENT	5.00	3.00	0.0	9.00	5.00	9.00	13.00	0.0	0.0	1.00

B-92
222

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 319 320 322
STEP = 4.19999790
CENTERPOINT OF INITIAL GROUP= 0.09999841 NUMBER OF OBSERVATIONS = 45
CENTERPOINT OF FINAL GROUP = 37.8999939 NUMBER OF GROUPS = 10



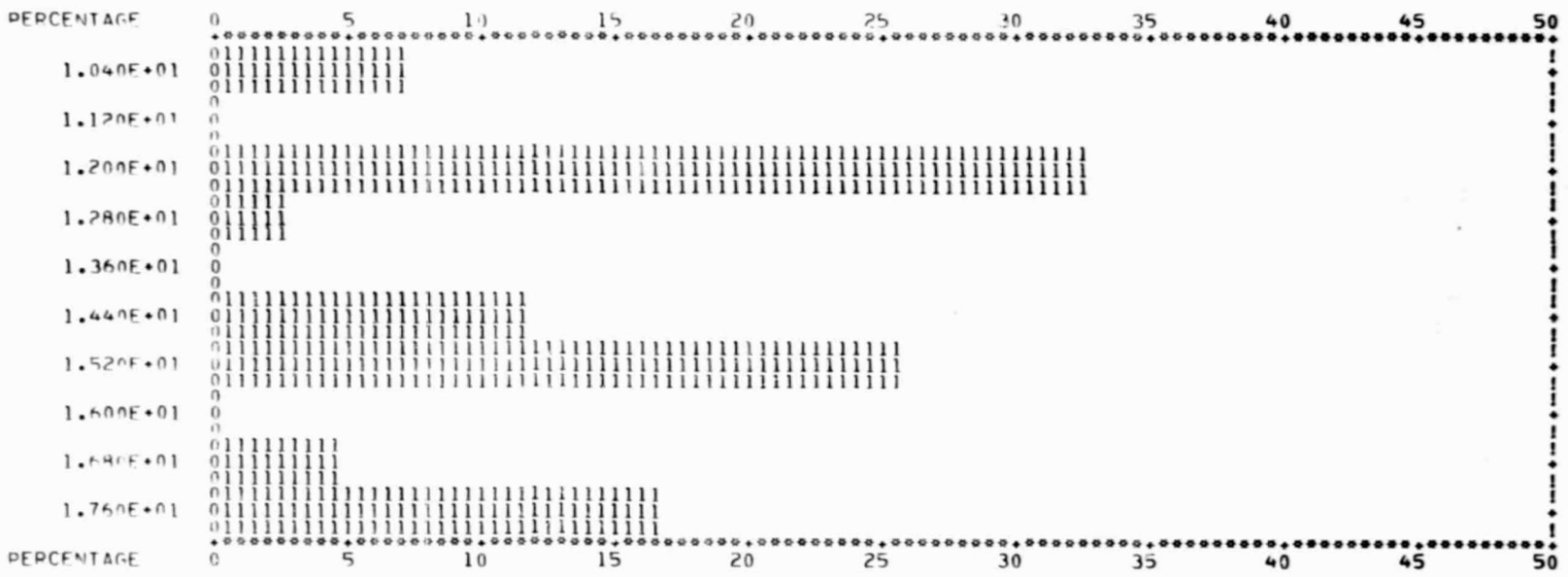
BIN	0.10	4.30	8.50	12.70	16.90	21.10	25.30	29.50	33.70	37.90
CONTENT	1.00	0.0	1.00	0.0	0.0	0.0	0.0	17.00	5.00	21.00

Bag 223

SOUTH CAROLINA

SEEDING RATE - LB/ACRE

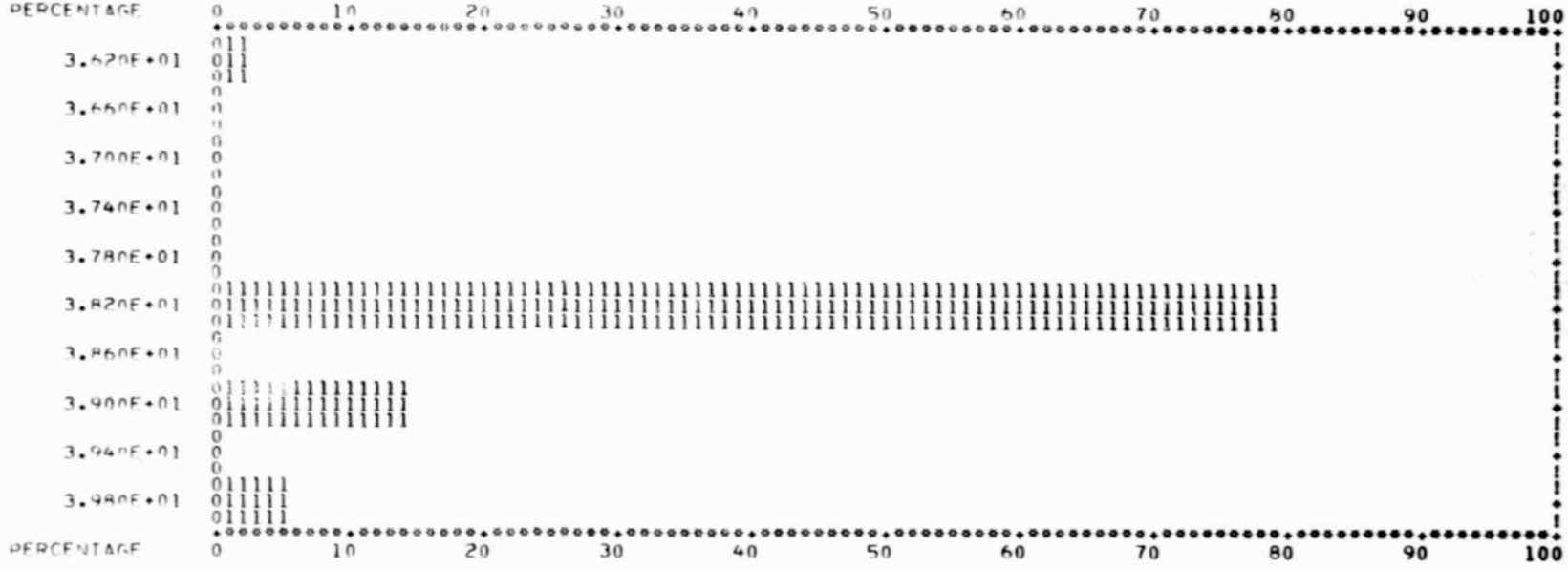
CROP TYPE IS CR
SEGMENTS = 336 337 338 339
STEP = 0.79999912
CENTERPOINT OF INITIAL GROUP= 10.399998
CENTERPOINT OF FINAL GROUP = 17.599998
NUMBER OF OBSERVATIONS = 43
NUMBER OF GROUPS = 10



BIN	10.40	11.20	12.00	12.80	13.60	14.40	15.20	16.00	16.80	17.60
CONTENT	3.00	0.0	14.00	1.00	0.0	5.00	11.00	0.0	2.00	7.00

ROW WIDTH - INCHES

CROP TYPE IS CR
SEGMENTS = 336 337 338 339
STEP = 0.40000063
CENTERPOINT OF INITIAL GROUP= 36.199981 7
CENTERPOINT OF FINAL GROUP = 39.799987 8
NUMBER OF OBSERVATIONS = 43
NUMBER OF GROUPS = 10

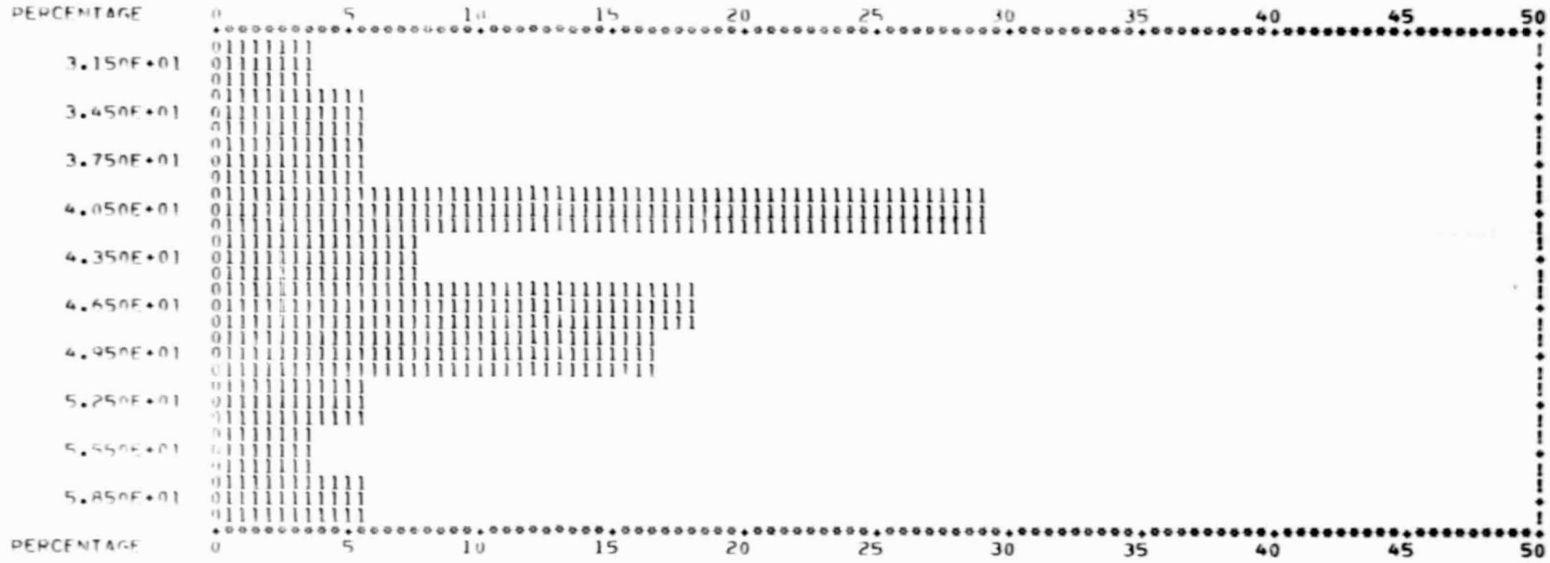


BIN	36.20	36.60	37.00	37.40	37.80	38.20	38.60	39.00	39.40	39.80
CONTENT	1.00	0.0	0.0	0.0	0.0	34.00	0.0	6.00	0.0	2.00

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 336 337 338 339

STEP = 3.0000000
CENTERPOINT OF INITIAL GROUP= 31.4999847
CENTERPOINT OF FINAL GROUP = 58.5000000
NUMBER OF OBSERVATIONS = 55
NUMBER OF GROUPS = 10

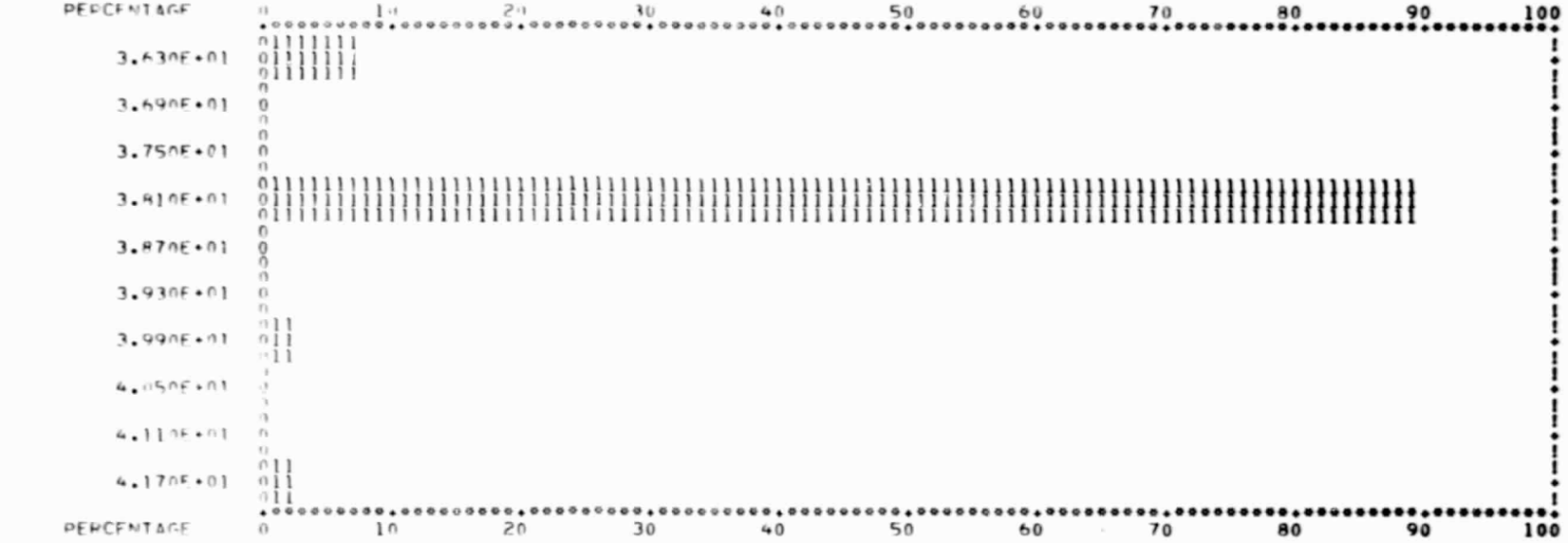


	MID	31.50	34.50	37.50	40.50	43.50	46.50	49.50	52.50	55.50	58.50
	CONTENT	2.00	3.00	3.00	16.00	4.00	10.00	9.00	3.00	2.00	3.00

B-97

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 336 337 338 339
STEP = 0.60000271
CENTERPOINT OF INITIAL GROUP= 36.2499725 NUMBER OF OBSERVATIONS = 55
CENTERPOINT OF FINAL GROUP = 41.6999969 NUMBER OF GROUPS = 10



BIN	36.30	36.90	37.50	38.10	38.70	39.30	39.90	40.50	41.10	41.70
CONTENT	4.00	0.0	0.0	49.00	0.0	0.0	1.00	0.0	0.0	1.00

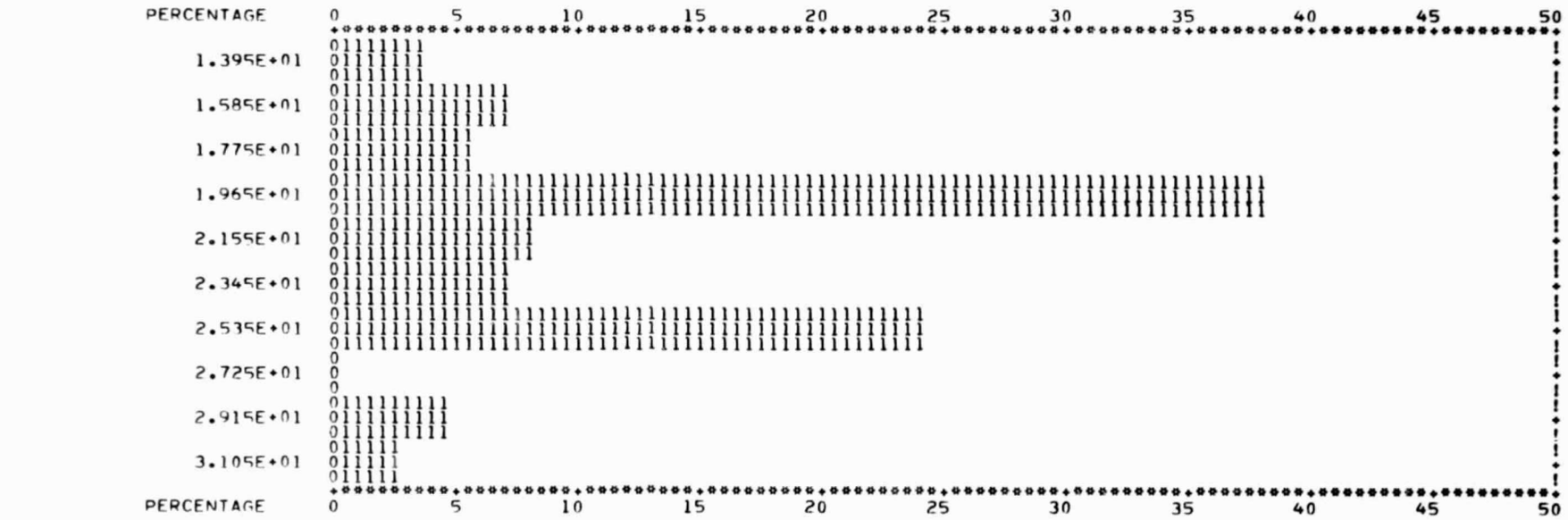
B-98
328

TEXAS

SEEDING RATE - LB/ACRE

CROP TYPE IS CT
SEGMENTS = 282 283 284 290 292 1377

STEP = 1.89999676
CENTERPOINT OF INITIAL GROUP= 13.9499987 NUMBER OF OBSERVATIONS = 87
CENTERPOINT OF FINAL GROUP = 31.0499878 NUMBER OF GROUPS = 10



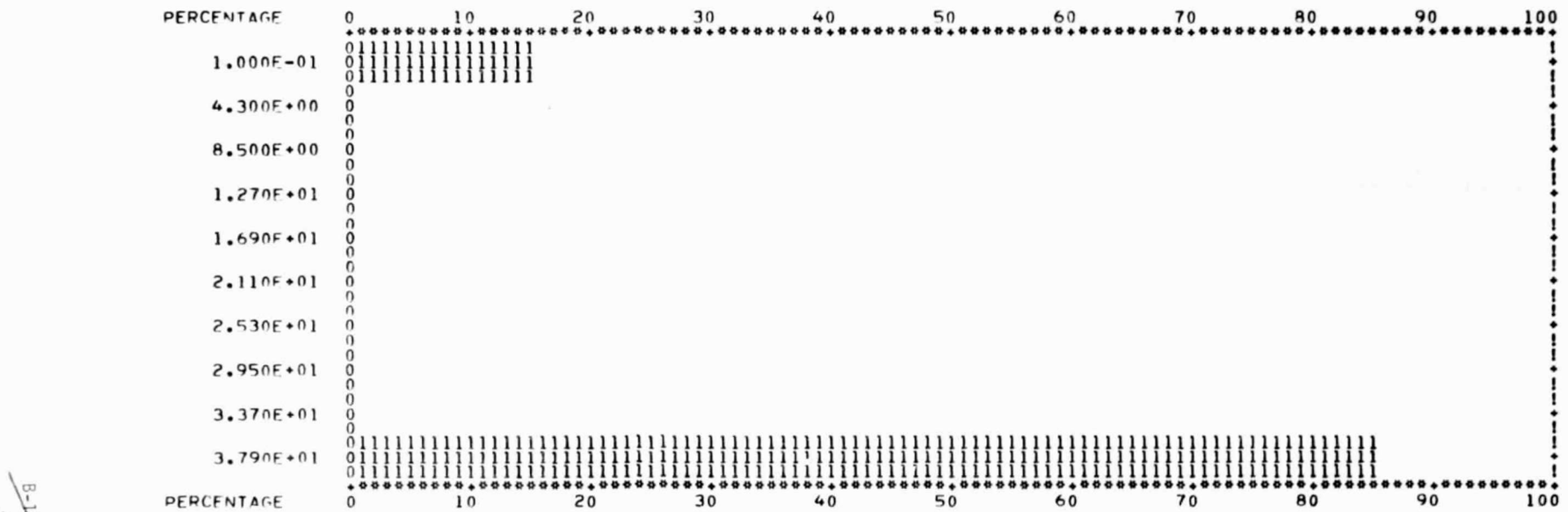
BIN	13.95	15.85	17.75	19.65	21.55	23.45	25.35	27.25	29.15	31.05
CONTENT	3.00	6.00	5.00	33.00	7.00	6.00	21.00	0.0	4.00	2.00

B-100
230

ROW WIDTH - INCHES

CROP TYPE IS CT
SEGMENTS = 282 283 284 290 292 1377

STEP = 4.19999790
CENTERPOINT OF INITIAL GROUP= 0.09999841
CENTERPOINT OF FINAL GROUP = 37.8999939
NUMBER OF OBSERVATIONS = 87
NUMBER OF GROUPS = 10

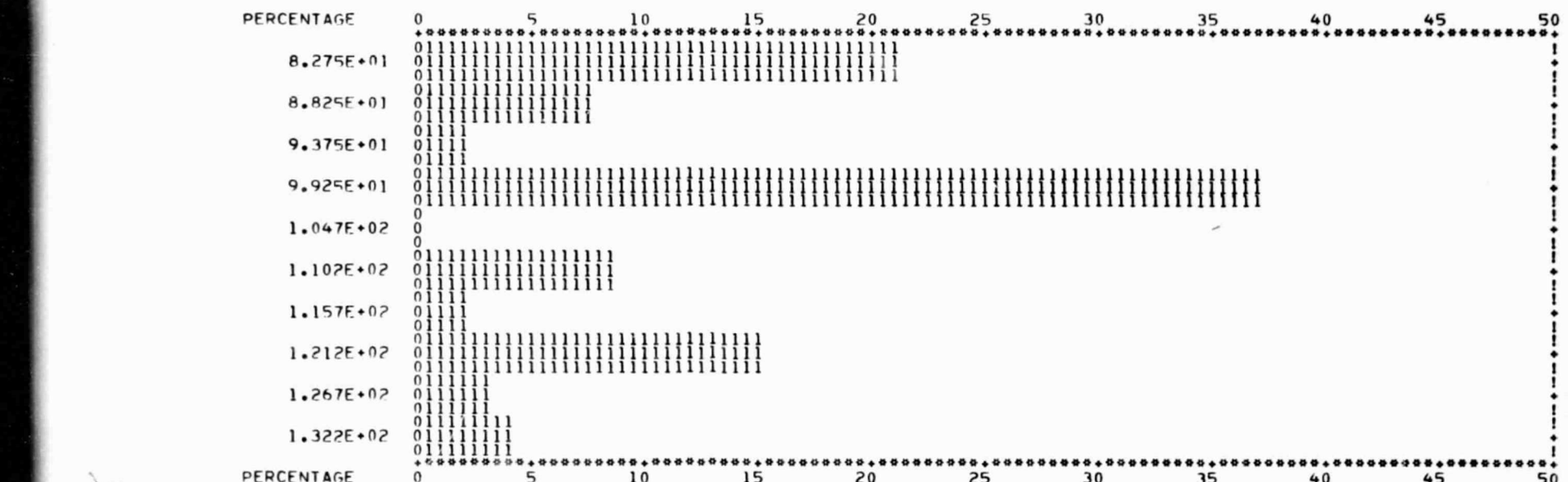


BIN	0.10	4.30	8.50	12.70	16.90	21.10	25.30	29.50	33.70	37.90
CONTENT	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.00

B-107
231

SEEDING RATE - LB/ACRE

CROP TYPE IS RI
SEGMENTS = 276 277 279 329
STEP = 5.50000095
CENTERPOINT OF INITIAL GROUP= 82.7499847 NUMBER OF OBSERVATIONS = 105
CENTERPOINT OF FINAL GROUP = 132.250000 NUMBER OF GROUPS = 10



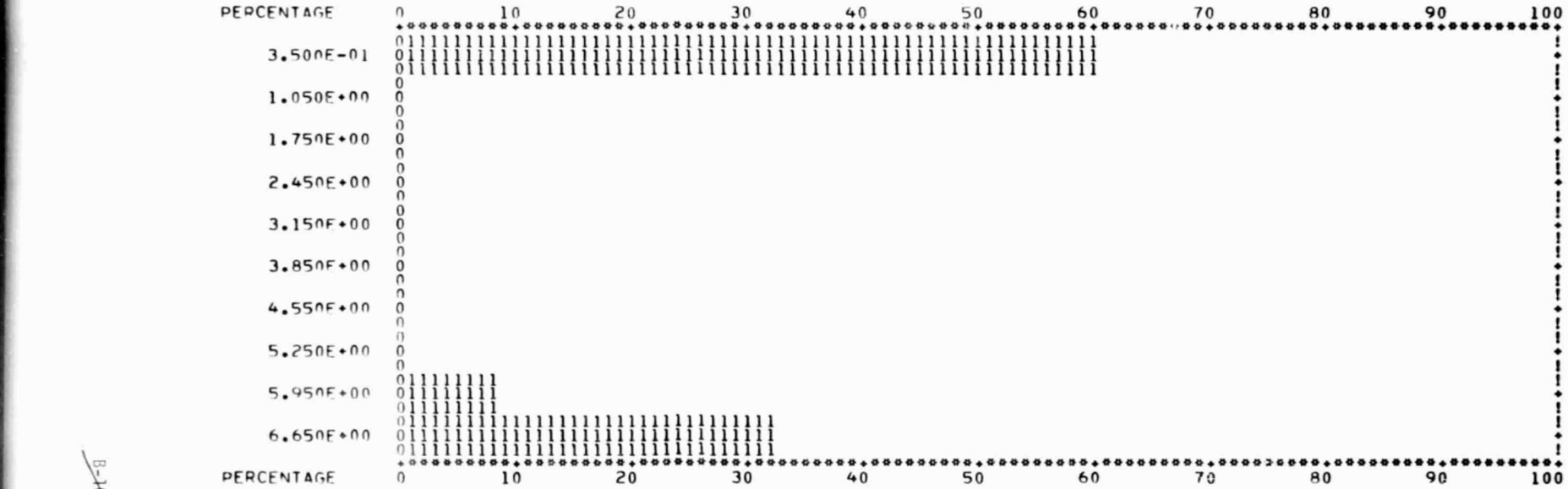
BIN	82.75	88.25	93.75	99.25	104.75	110.25	115.75	121.25	126.75	132.25
CONTENT	22.00	8.00	2.00	39.00	0.0	9.00	2.00	16.00	3.00	4.00

B-102

232

ROW WIDTH - INCHES

CROP TYPE IS RI
SEGMENTS = 276 277 279 329
STEP = 0.70000011
CENTERPOINT OF INITIAL GROUP= 0.34999895 NUMBER OF OBSERVATIONS = 105
CENTERPOINT OF FINAL GROUP = 6.65000057 NUMBER OF GROUPS = 10



BIN	0.35	1.05	1.75	2.45	3.15	3.85	4.55	5.25	5.95	6.65
CONTENT	63.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.00	34.00

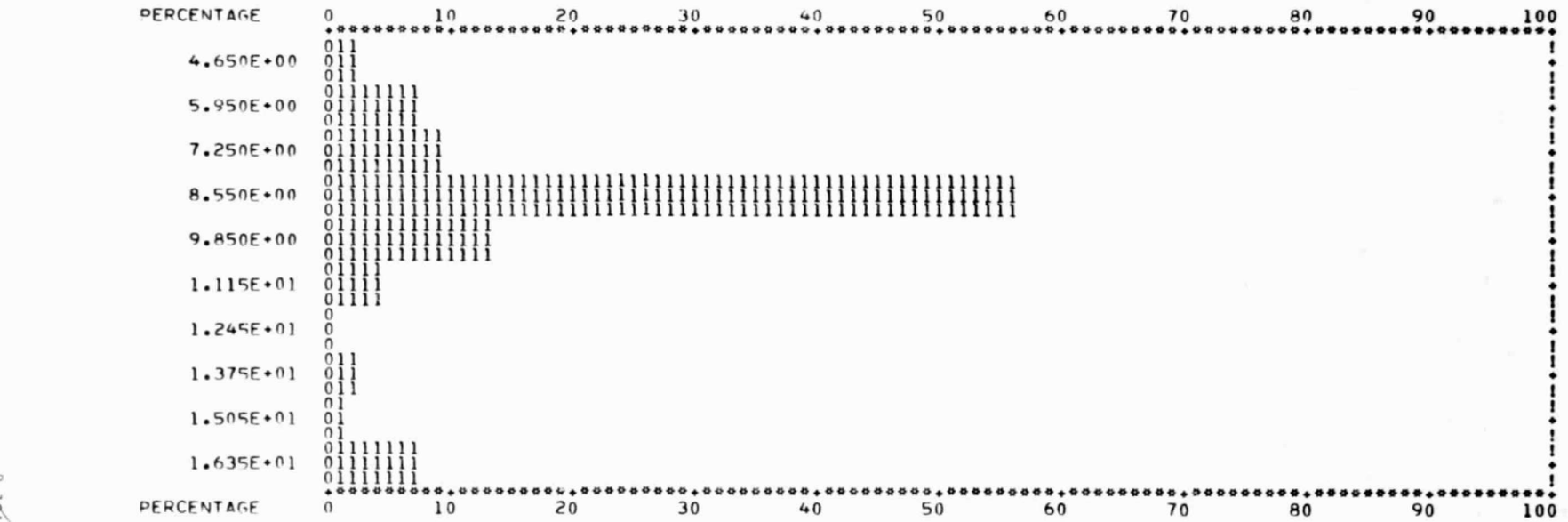
B-183

393

SEEDING RATE - LB/ACRE

CROP TYPE IS SR
SEGMENTS = 275 283 284 286 292 1377

STEP = 1.29999828
CENTERPOINT OF INITIAL GROUP= 4.64999866 NUMBER OF OBSERVATIONS = 102
CENTERPOINT OF FINAL GROUP = 16.3499908 NUMBER OF GROUPS = 10

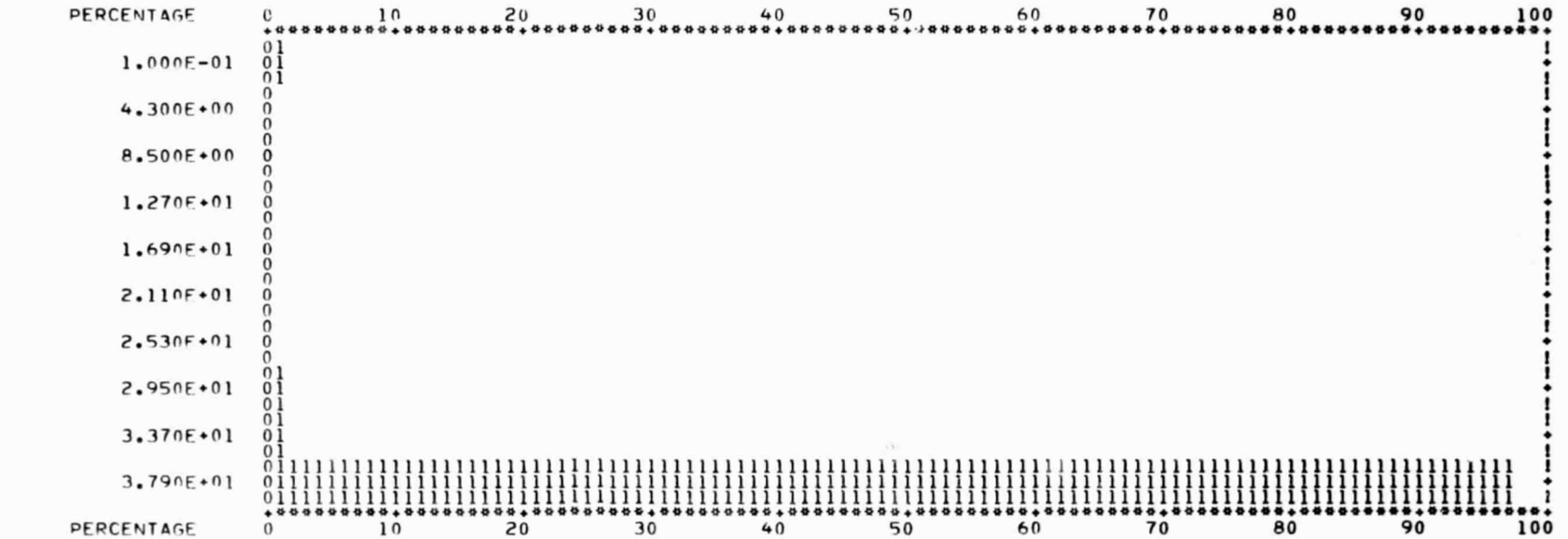


BIN	4.65	5.95	7.25	8.55	9.85	11.15	12.45	13.75	15.05	16.35
CONTENT	2.00	7.00	9.00	57.00	13.00	4.00	0.0	2.00	1.00	7.00

B-104
234

ROW WIDTH - INCHES

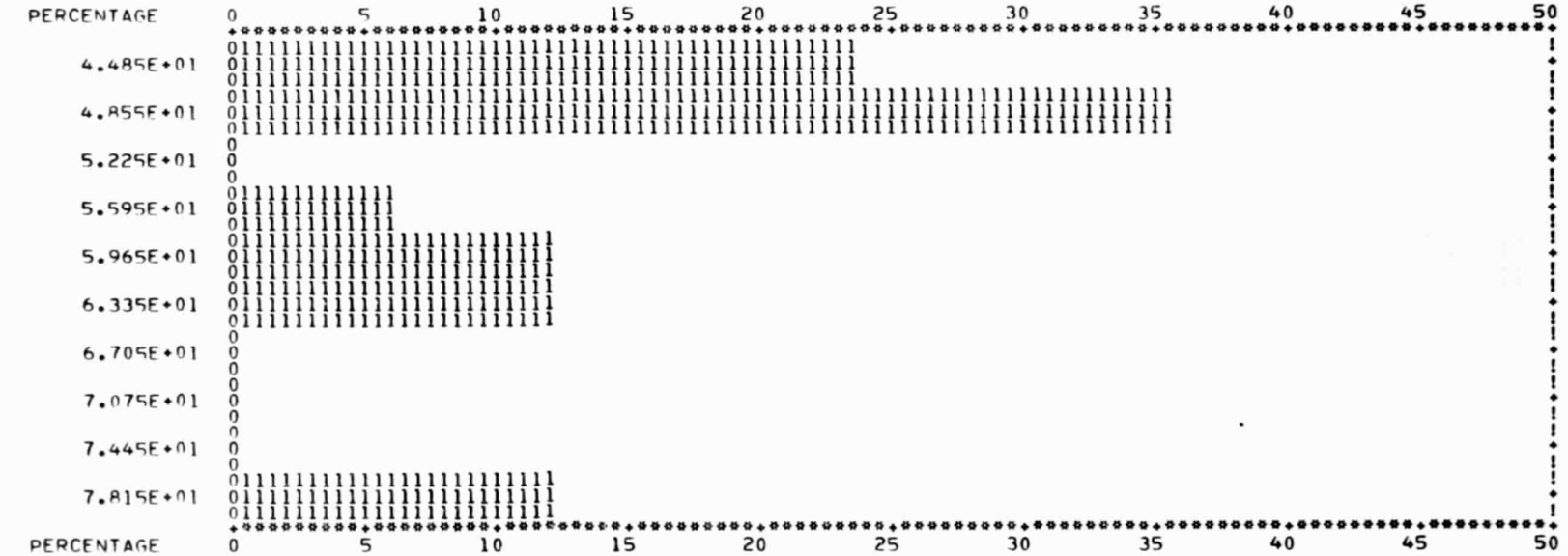
CROP TYPE IS SR
SEGMENTS = 275 283 284 286 292 1377
STEP = 4.19999790
CENTERPOINT OF INITIAL GROUP= 0.09999841 NUMBER OF OBSERVATIONS = 102
CENTERPOINT OF FINAL GROUP = 37.8999939 NUMBER OF GROUPS = 10



BIN	0.10	4.30	8.50	12.70	16.90	21.10	25.30	29.50	33.70	37.90
CONTENT	1.00	0.0	0.0	0.0	0.0	0.0	0.0	1.00	1.00	99.00

SEEDING RATE - LB/ACRE

CROP TYPE IS SO
SEGMENTS = 276 288
STEP = 3.70000172
CENTERPOINT OF INITIAL GROUP= 44.8499756 NUMBER OF OBSERVATIONS = 17
CENTERPOINT OF FINAL GROUP = 78.1499939 NUMBER OF GROUPS = 10

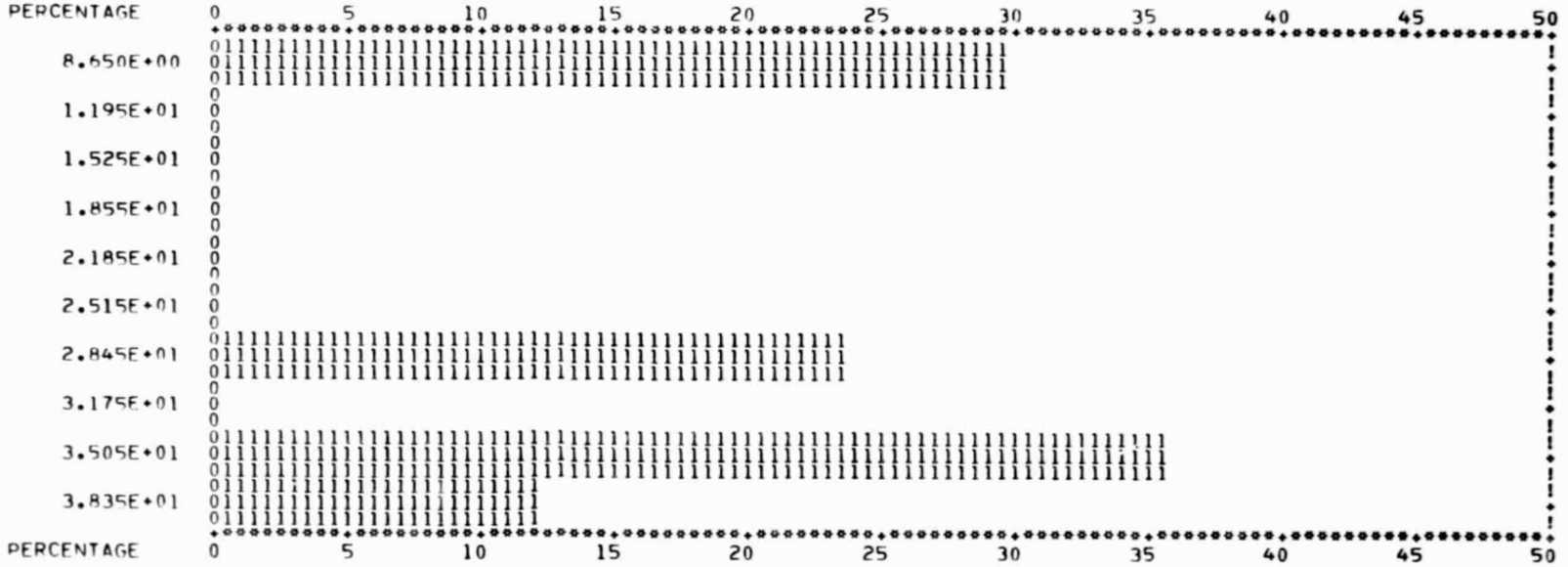


BIN	44.85	48.55	52.25	55.95	59.65	63.35	67.05	70.75	74.45	78.15
CONTENT	4.00	6.00	0.0	1.00	2.00	2.00	0.0	0.0	0.0	2.00

B-106
236

ROW WIDTH - INCHES

CROP TYPE IS SO
SEGMENTS = 276 288
STEP = 3.29999733
CENTERPOINT OF INITIAL GROUP= 8.64999866 NUMBER OF OBSERVATIONS = 17
CENTERPOINT OF FINAL GROUP = 38.3499908 NUMBER OF GROUPS = 10



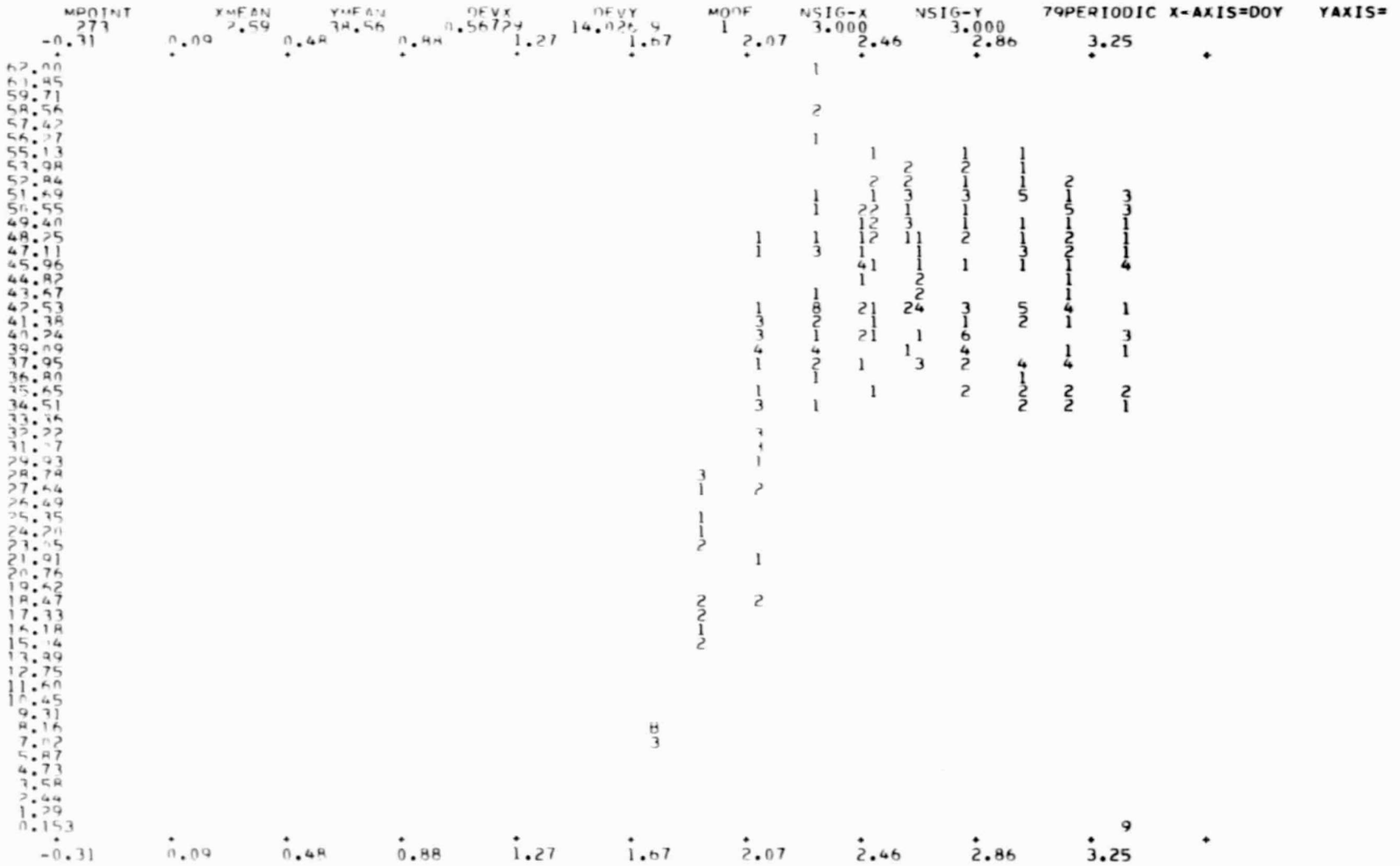
BIN	8.65	11.95	15.25	18.55	21.85	25.15	28.45	31.75	35.05	38.35
CONTENT	5.00	0.0	0.0	0.0	0.0	0.0	4.00	0.0	6.00	2.00

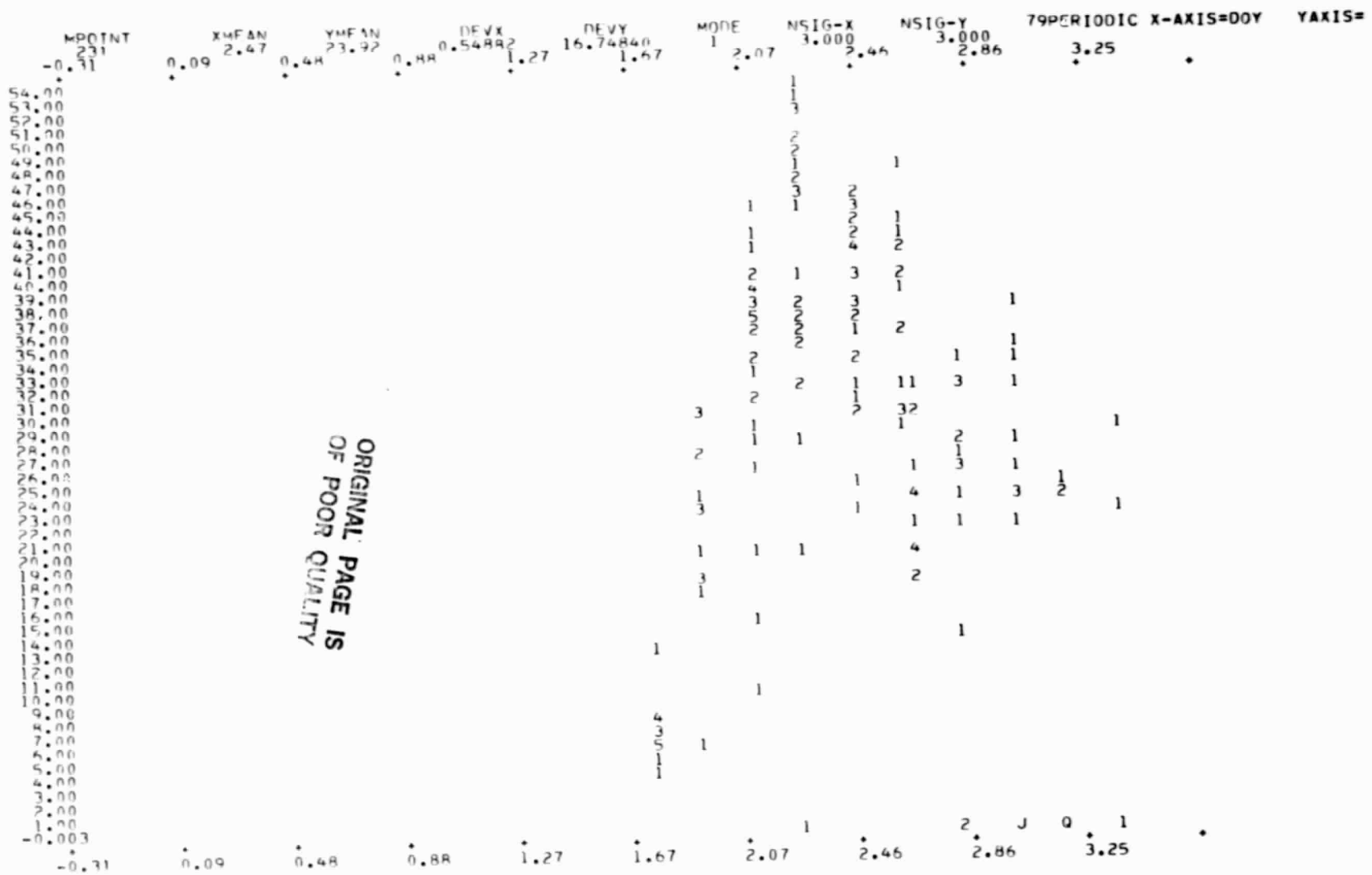
APPENDIX C

PLANT HEIGHT GRAPHS

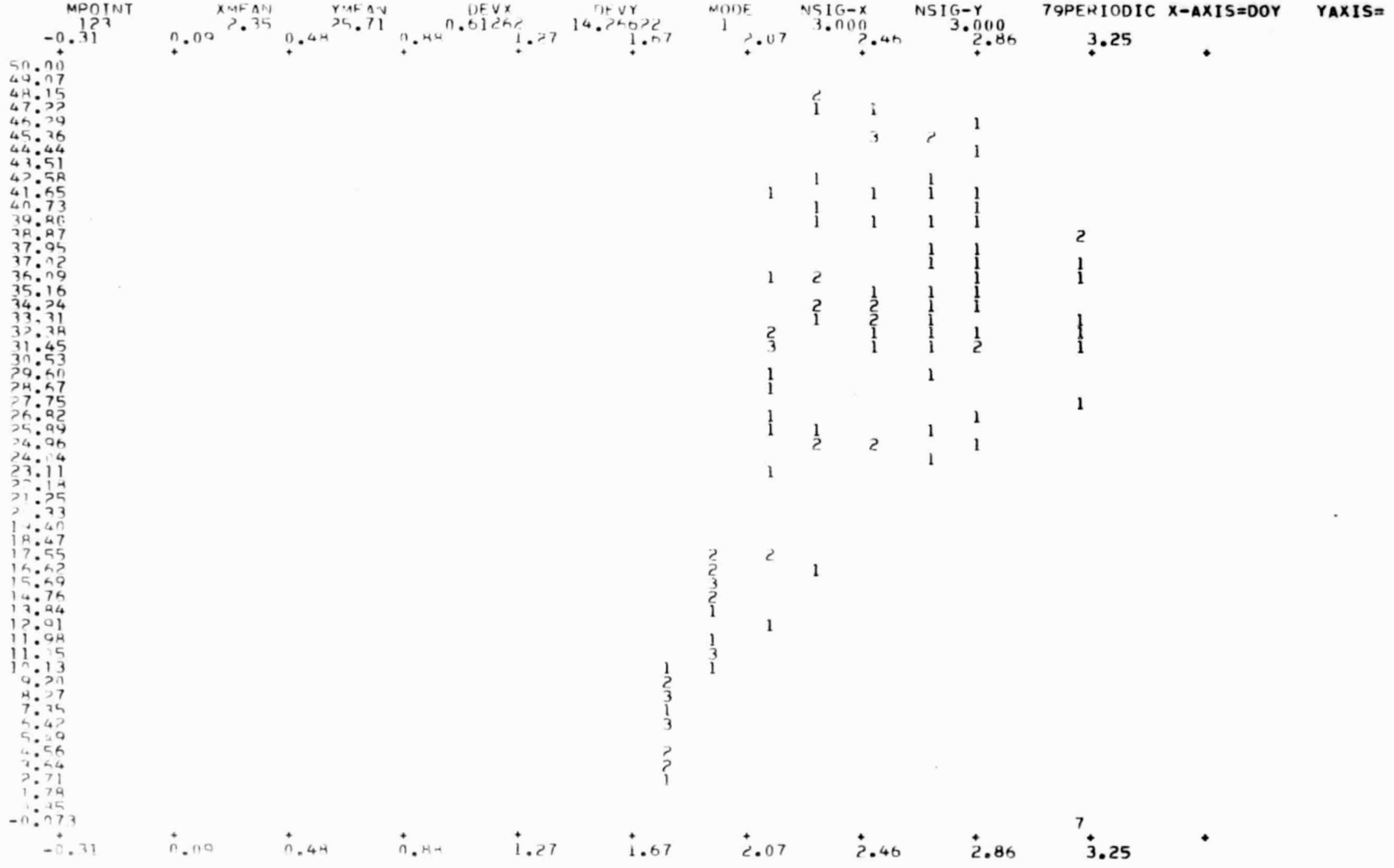
ALABAMA

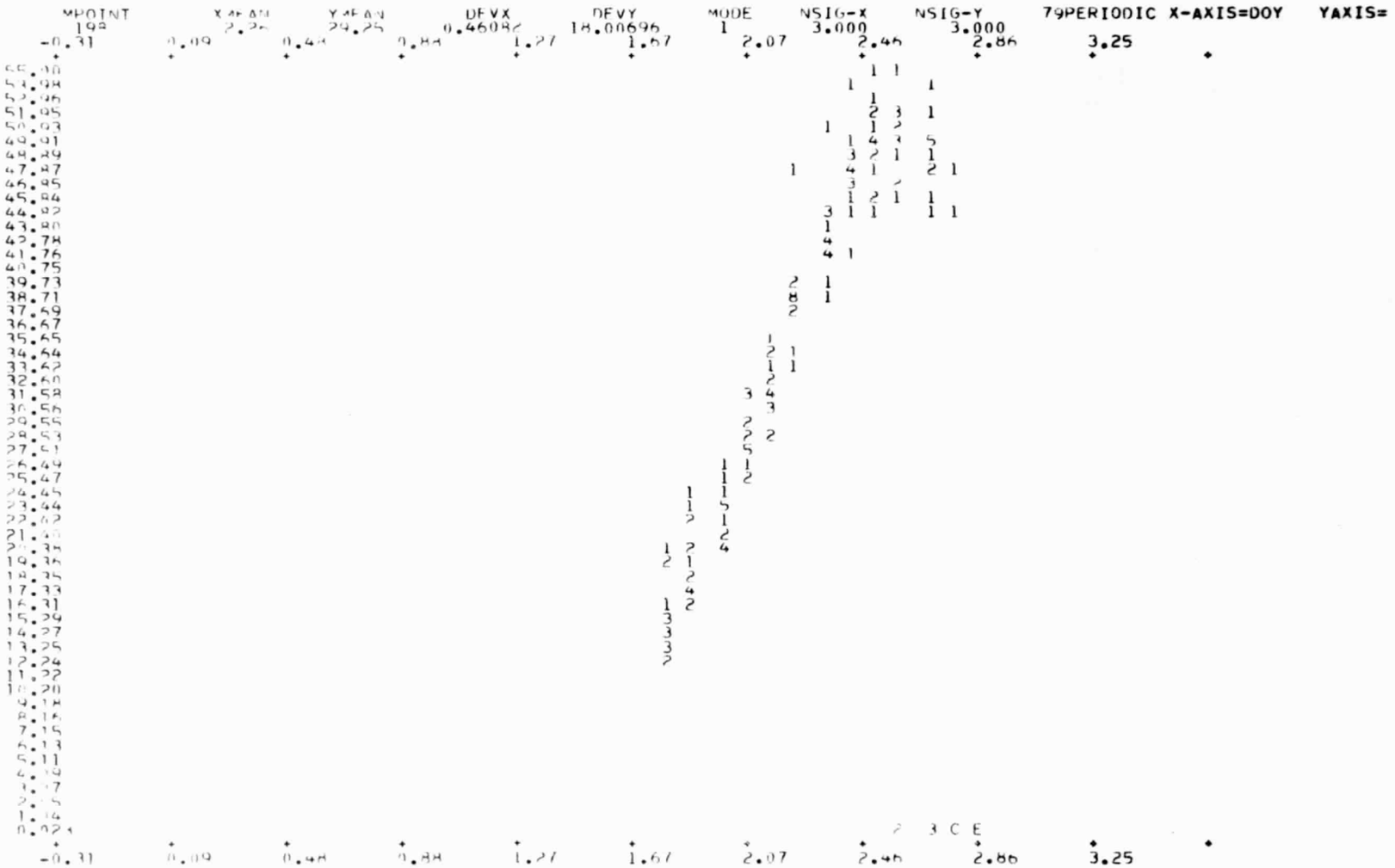
```
     MPOINT        XMEAN        YMEAN         DEVX         DEVY         MODE      NSIG-X      NSIG-Y    79PERIODIC X-AXIS=DOY   YAXIS=
       106         2.03        45.07      0.45345      45.34862            1      3.000       3.000
    -0.31         0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
      +            +            +            +            +            +            +            +            +            +            +
115.00                                                                  1
112.89
110.78                                                                  1
108.67                                                                  2    1
106.56                                                                  1    2
104.45                                                                  1    1
102.35                                                                  2    3
100.24                                                                       1
 98.13                                                                  2
 96.02                                                                  1    2    1    1
 93.91
 91.80
 89.69                                                                  1    2
 87.58                                                                            2    3
 85.47                                                                       1    3
 83.36                                                                       1    2
 81.25                                                                  2         2
 79.15                                                                  1    1    2
 77.04                                                                  1         1
 74.93                                                                            2
 72.82
 70.71
 68.60
 66.49
 64.38                                                                                 1
 62.27                                                                            1
 60.16
 58.05
 55.95                                                                            2
 53.84
 51.73
 49.62
 47.51
 45.40
 43.29                                                                            1
 41.18
 39.07                                                                            1
 36.96
 34.85                                                                                 1
 32.75
 30.64
 28.53
 26.42
 24.31
 22.20
 20.09
 17.98
 15.87
 13.76
 11.65
  9.55
  7.44
  5.33
  3.22
  1.11
    +            +            +            +            +            +            +            +            +            +            +
    -0.31         0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
```


MPOINT 273
XMEAN 2.59
YMEAN 38.56
DEVX 0.56724
DEVY 14.026 9
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
62.00
61.85
59.71
58.56
57.42
56.27
55.13
53.98
52.84
51.69
50.55
49.40
48.25
47.11
45.96
44.82
43.67
42.53
41.38
40.24
39.09
37.95
36.80
35.65
34.51
33.36
32.22
31.07
29.93
28.78
27.64
26.49
25.35
24.20
23.05
21.91
20.76
19.62
18.47
17.33
16.18
15.04
13.89
12.75
11.60
10.45
9.31
8.16
7.02
5.87
4.73
3.58
2.44
1.29
0.153



ARKANSAS


MPOINT 123
XMEAN 2.35
YMEAN 25.71
DEVX 0.61262
DEVY 14.25622
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
4.56
3.64
2.71
1.78
.85
-0.073


MPOINT 198
XMEAN 2.25
YMEAN 29.25
DEVX 0.46082
DEVY 18.00696
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
0.02
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

CALIFORNIA

CT

```
     MPOINT        XMEAN        YMEAN         DEVX         DEVY        MODE      NSIG-X      NSIG-Y      79PERIODIC X-AXIS=DOY   YAXIS=
       287         2.53        25.91      0.52491     19.18677           1       3.000       3.000
    -0.31        0.09        0.48        0.88        1.27        1.67        2.07        2.46        2.86        3.25
      +           +           +           +           +           +           +           +           +           +           +
70.00                                                                                                   1
68.71
67.42                                                                                   1           1
66.13
64.84                                                                   1
63.55                                                                                   1
62.25
60.96
59.67                                                                               1       1
58.38                                                                   1           2   1   1
57.09                                                                                           1
55.80                                                                   1           2
54.51                                                                   1               2       1
53.22                                                                               2
51.93                                                                               1       1
50.64                                                                               1   2   2       1
49.35                                                                   1                   1       1
48.05                                                                   1                   3       1
46.76                                                                   1                           1
45.47                                                                                   3           3       1
44.18                                                                                   2       1   1       1
42.89                                                                               1   1   1       2       1
41.60                                                                   2           4   3   5       3       3
40.31                                                                               2   1           1       1
39.02                                                                               1   5   3       3
37.73                                                                               2   1   2       1
36.44                                                                   3           1   1   2       3       2
35.15                                                                                                           1
33.85                                                                   2           2   1   2       2       1
32.56                                                           1       3           2   2   3       2       3
31.27                                                                               3   1                   2
29.98                                                                   1           3   1                   1
28.69                                                                   1           2   4   1       2
27.40                                                           2       1               2       3
26.11                                                           2       1               1   2
24.82                                                           1       1           1       1       1
23.53                                                   2       2       1           1       1
22.24                                                           2       1           1   1
20.94
19.65                                                           1
18.36                                                   4       1
17.07
15.78                                                           1
14.49                                                   1               1
13.20                                                   2
11.91                                                   1       1
10.62                                                   1       1
 9.33
 8.04                                                   2
 6.74                                                   2
 5.45                                                   1       1
 4.16                                                   1
 2.87
 1.58
 0.293                                                  3       4       A                   4   D   EI
      +           +           +           +           +           +           +           +           +           +           +
    -0.31        0.09        0.48        0.88        1.27        1.67        2.07        2.46        2.86        3.25
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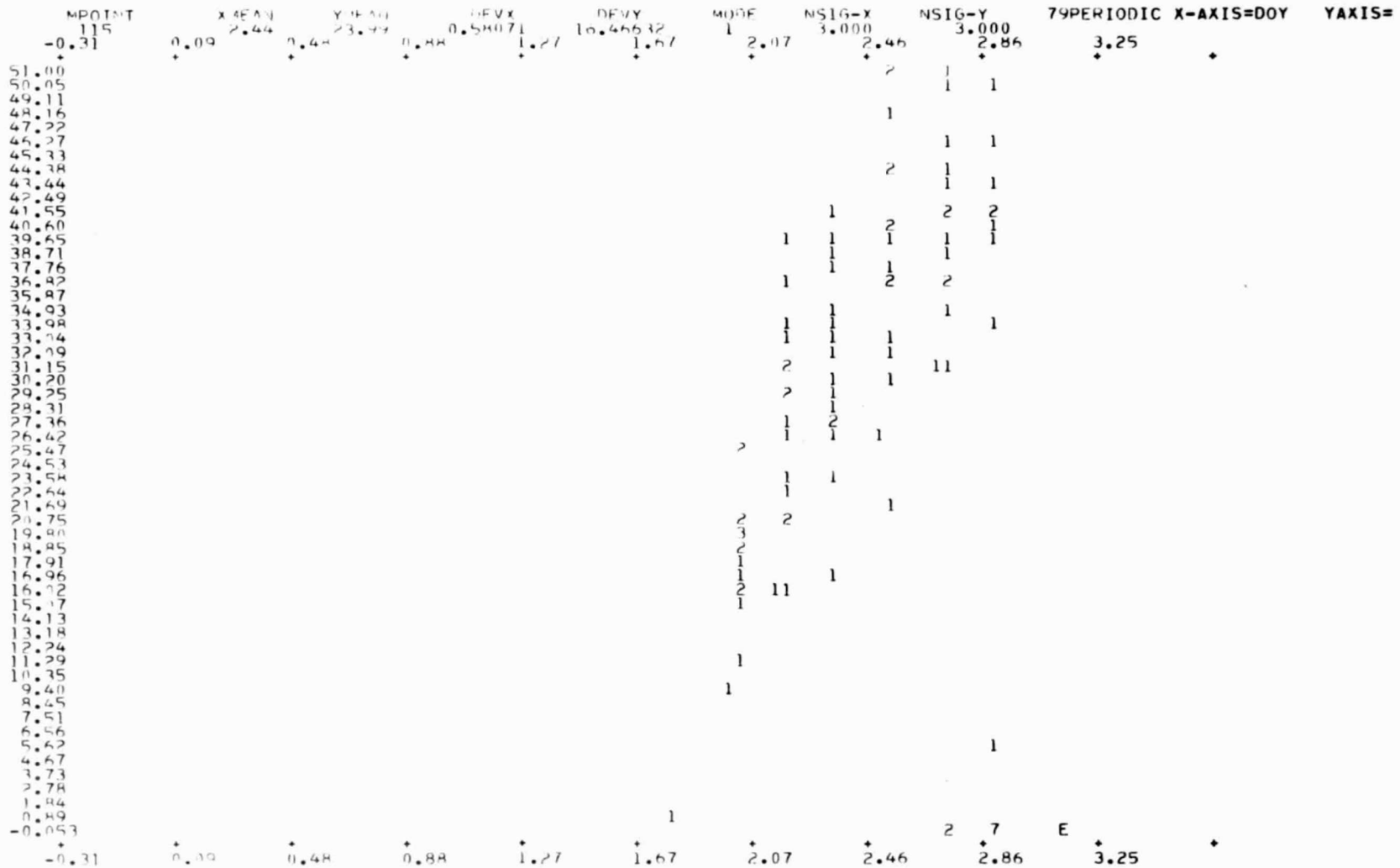
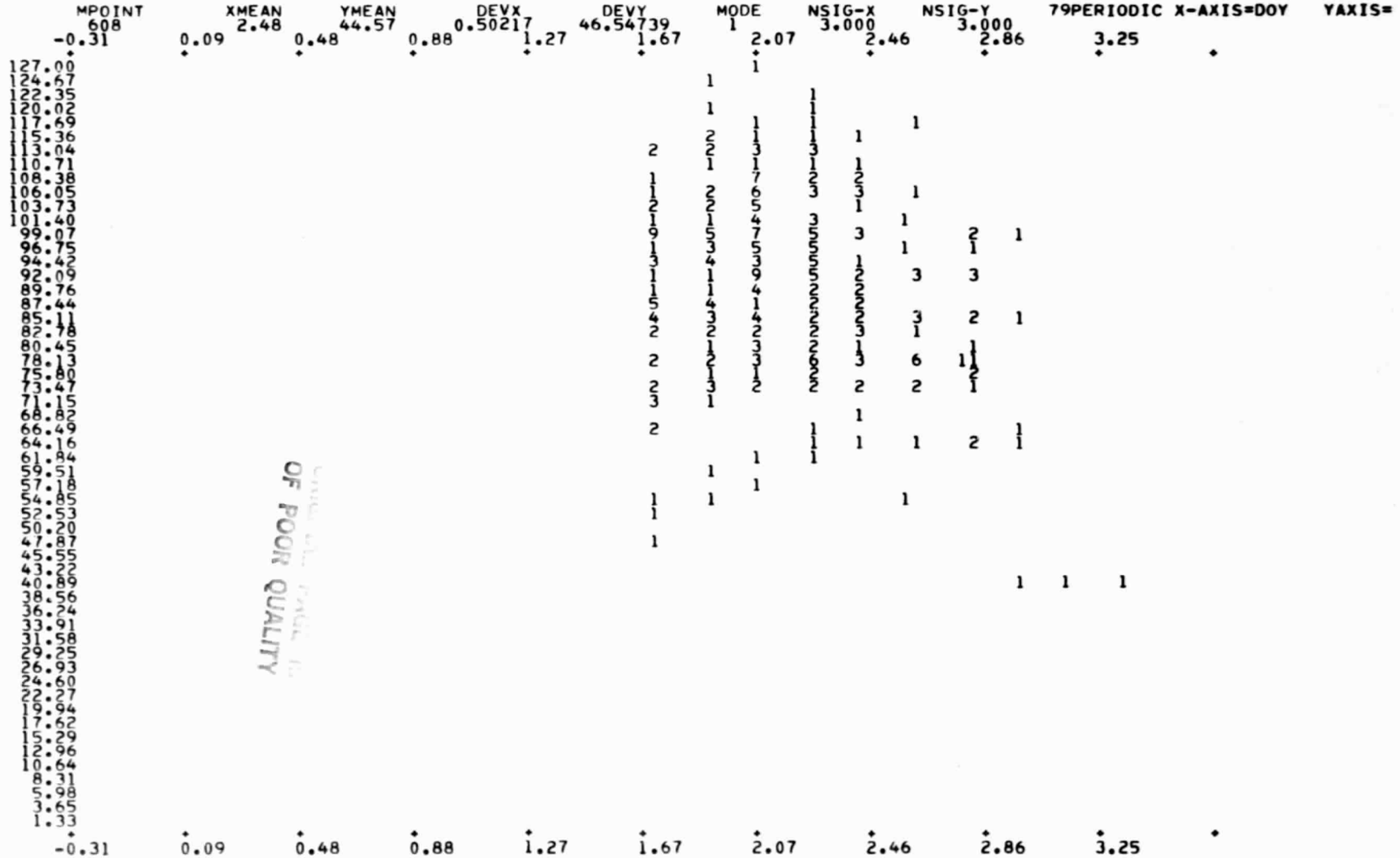

MPOINT 115
XMEAN 2.44
YMEAN 23.99
DEVX 0.580871
DEVY 10.46632
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
51.00
50.05
49.11
48.16
47.22
46.27
45.33
44.38
43.44
42.49
41.55
40.60
39.65
38.71
37.76
36.82
35.87
34.93
33.98
33.04
32.09
31.15
30.20
29.25
28.31
27.36
26.42
25.47
24.53
23.58
22.64
21.69
20.75
19.80
18.85
17.91
16.96
16.02
15.07
14.13
13.18
12.24
11.29
10.35
9.40
8.45
7.51
6.56
5.62
4.67
3.73
2.78
1.84
0.89
-0.053
E

GEORGIA

252
C-13



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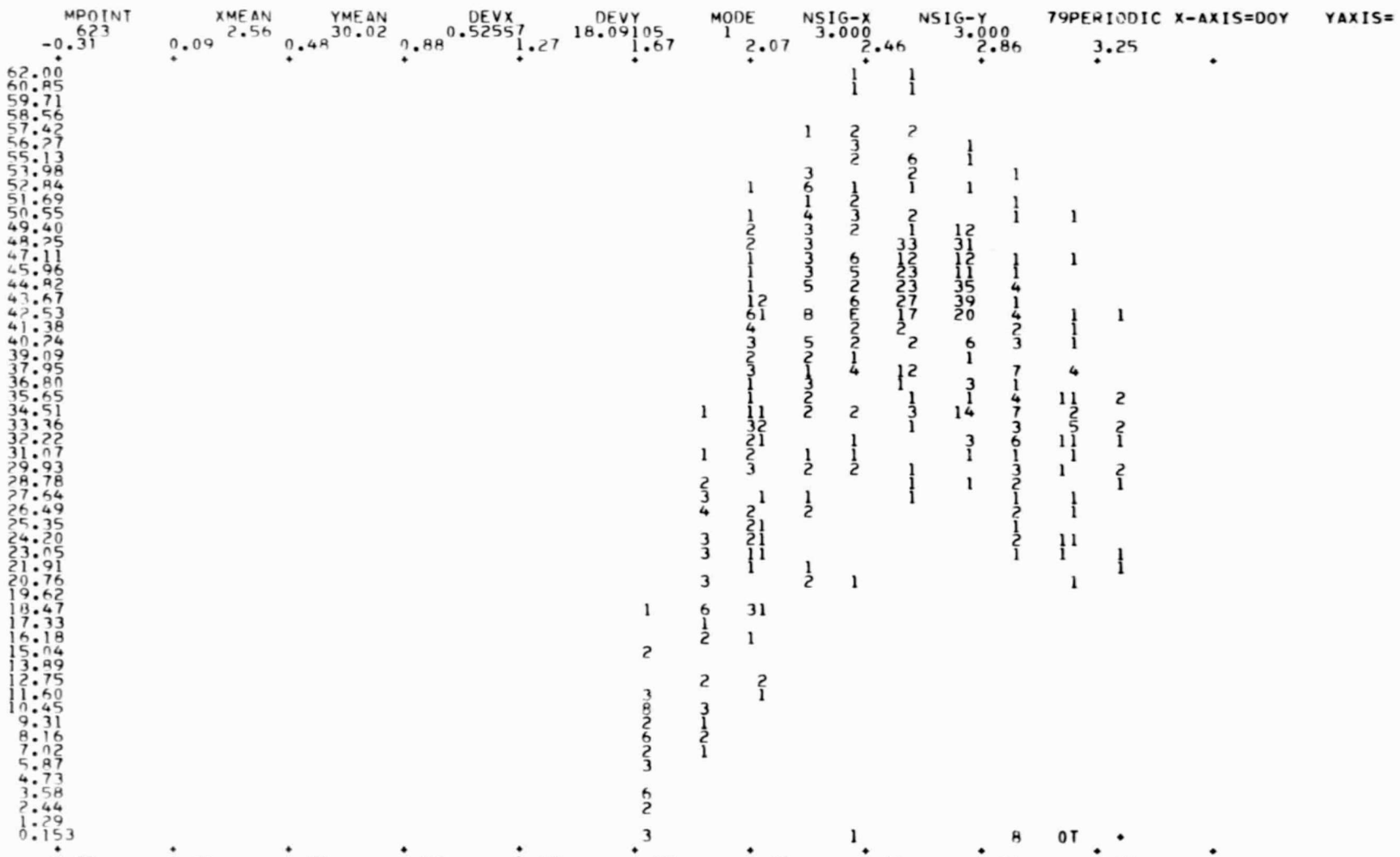
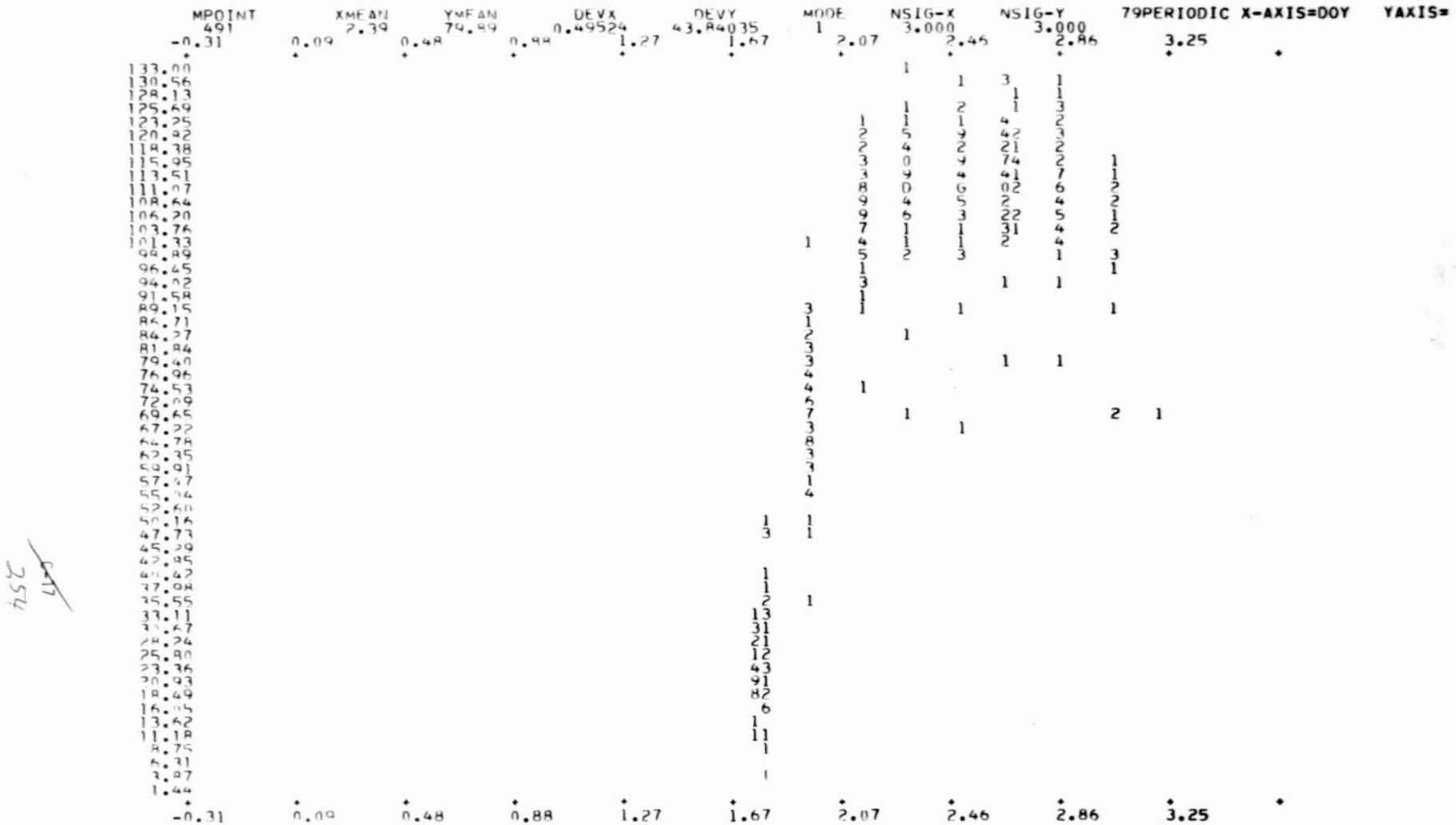

MPOINT 623
XMEAN 2.56
YMEAN 30.02
DEVX 0.52557
DEVY 18.09105
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
62.00
60.85
59.71
58.56
57.42
56.27
55.13
53.98
52.84
51.69
50.55
49.40
48.25
47.11
45.96
44.82
43.67
42.53
41.38
40.24
39.09
37.95
36.80
35.65
34.51
33.36
32.22
31.07
29.93
28.78
27.64
26.49
25.35
24.20
23.05
21.91
20.76
19.62
18.47
17.33
16.18
15.04
13.89
12.75
11.60
10.45
9.31
8.16
7.02
5.87
4.73
3.58
2.44
1.29
0.153
0T

ILLINOIS


MPOINT 491
XMEAN 2.39
YMEAN 79.99
DEVX 0.49524
DEVY 43.84035
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
133.00
130.56
128.13
125.69
123.25
120.82
118.38
115.95
113.51
111.07
108.64
106.20
103.76
101.33
98.89
96.45
94.02
91.58
89.15
86.71
84.27
81.84
79.40
76.96
74.53
72.09
69.65
67.22
64.78
62.35
59.91
57.47
55.04
52.60
50.16
47.73
45.29
42.85
40.42
37.98
35.55
33.11
30.67
28.24
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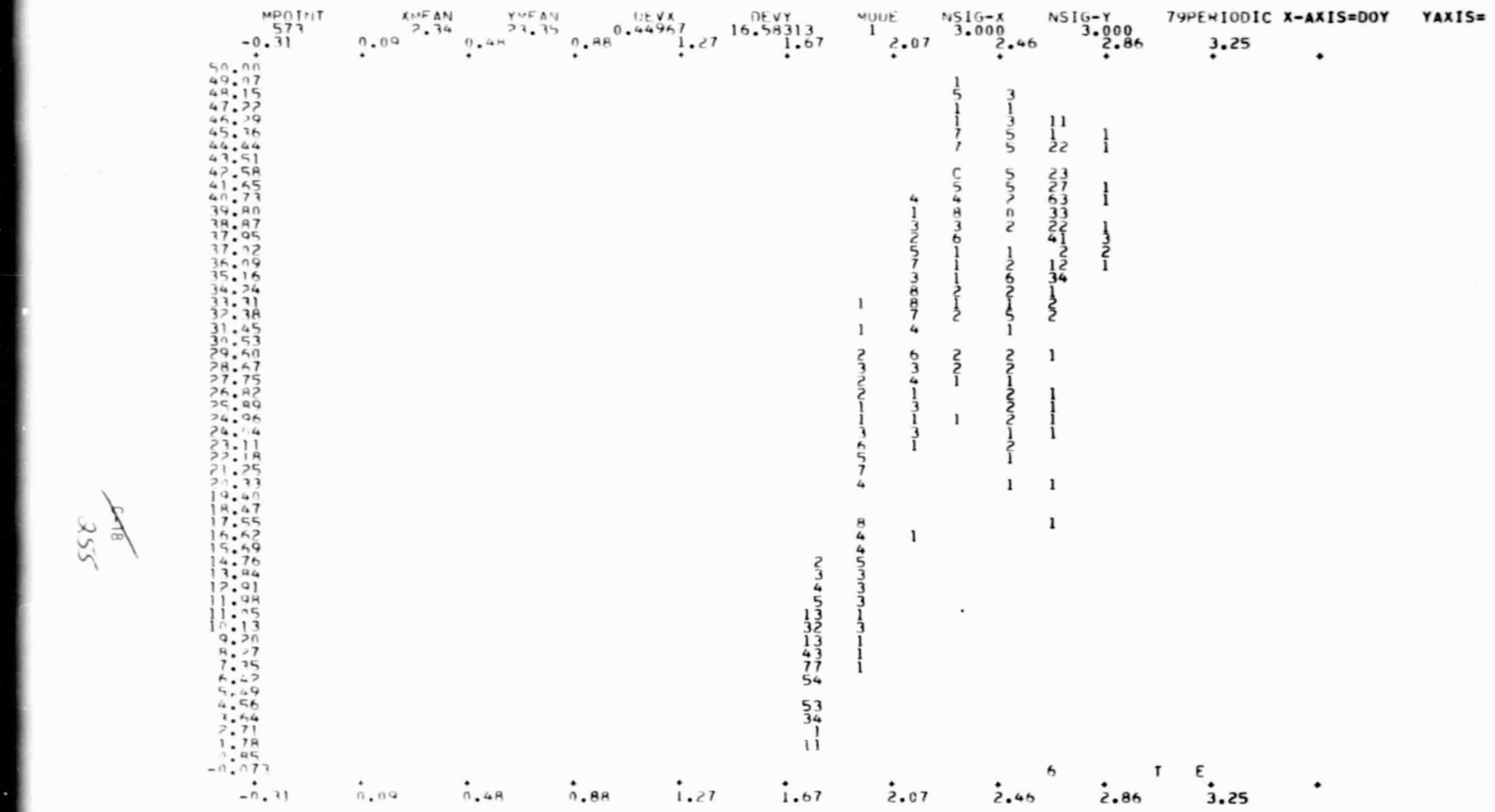
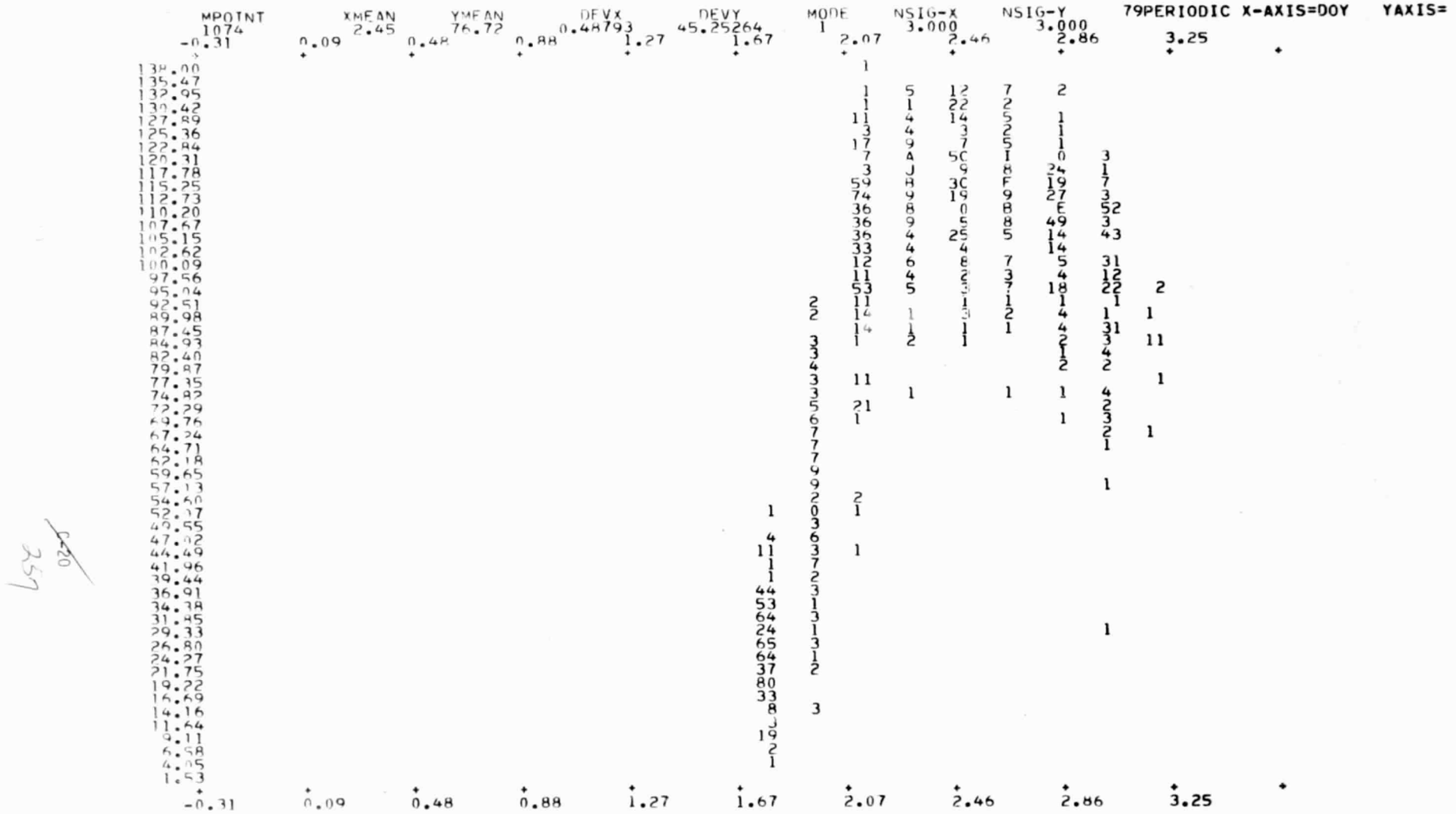
11.18
8.75
6.31
3.87
1.44


MPOINT 573
XMEAN 2.34
YMEAN 23.35
DEVX 0.44967
DEVY 16.58313
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
4.56
3.64
2.71
1.78
0.85
-0.073
T E
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

578
355

INDIANA


MPOINT 1074
XMEAN 2.45
YMEAN 76.72
DEVX 0.48793
DEVY 45.25264
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
138.00
135.47
132.95
130.42
127.89
125.36
122.84
120.31
117.78
115.25
112.73
110.20
107.67
105.15
102.62
100.09
97.56
95.04
92.51
89.98
87.45
84.93
82.40
79.87
77.35
74.82
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49.55
47.02
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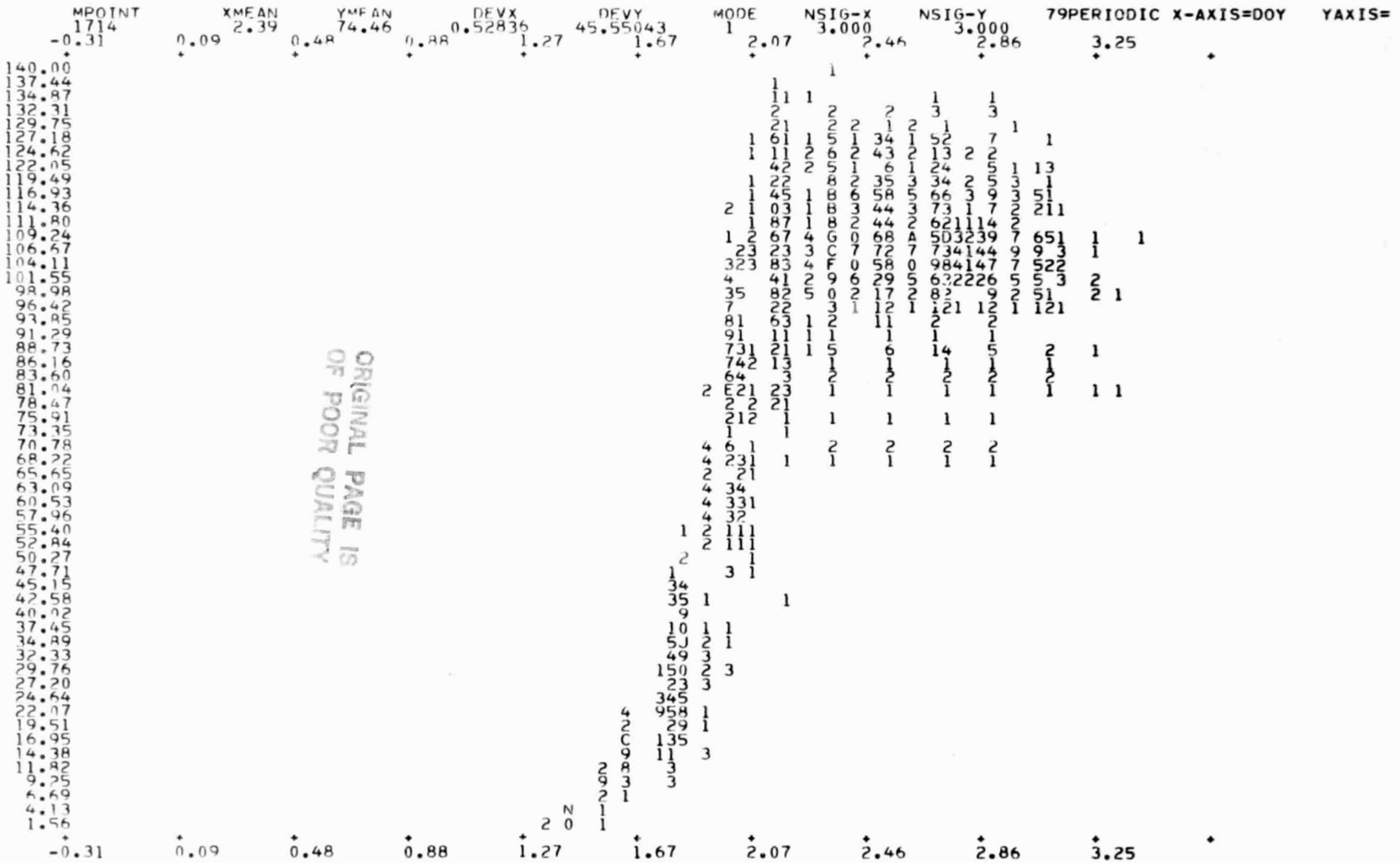
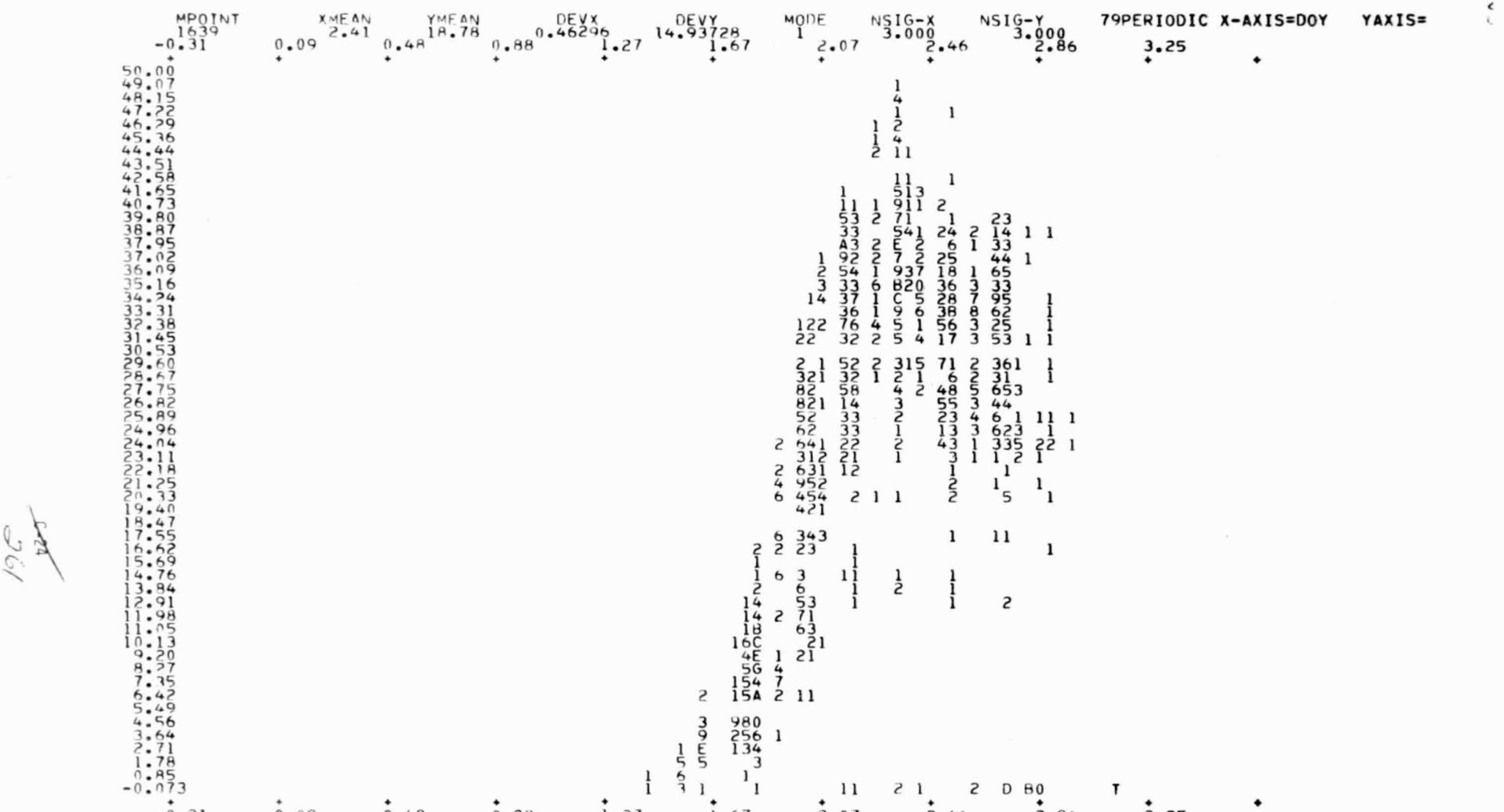
36.91
34.38
31.85
29.33
26.80
24.27
21.75
19.22
16.69
14.16
11.64
9.11
6.58
4.05
1.53

79PERIODIC X-AXIS=DOY YAXIS=
ORIGINAL PAGE IS
OF POOR QUALITY

IOWA




MPOINT 1639
XMEAN 2.41
YMEAN 18.78
DEVX 0.46296
DEVY 14.93728
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
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41.65
40.73
39.80
38.87
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11.98
11.05
10.13
9.20
8.27
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6.42
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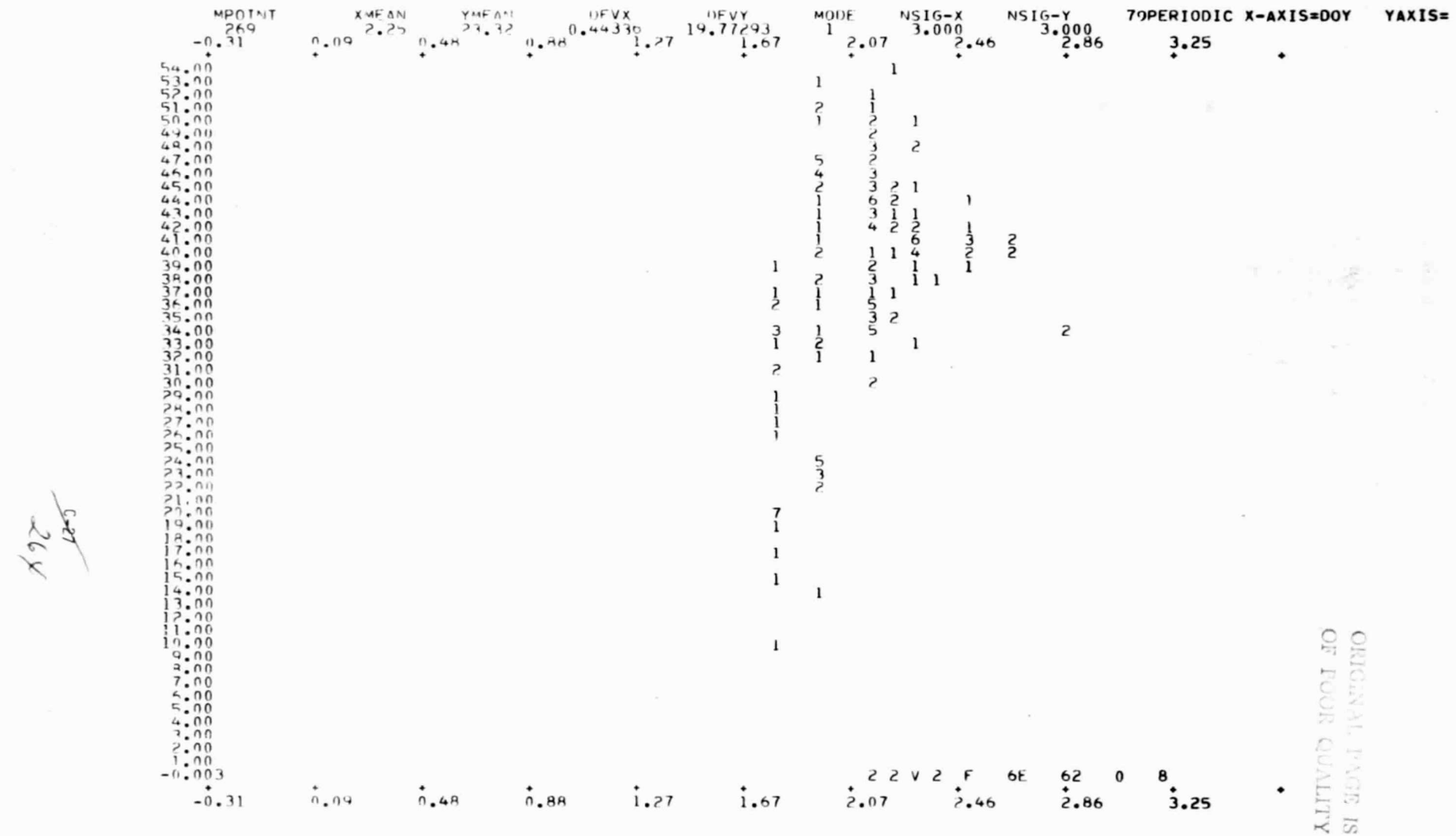
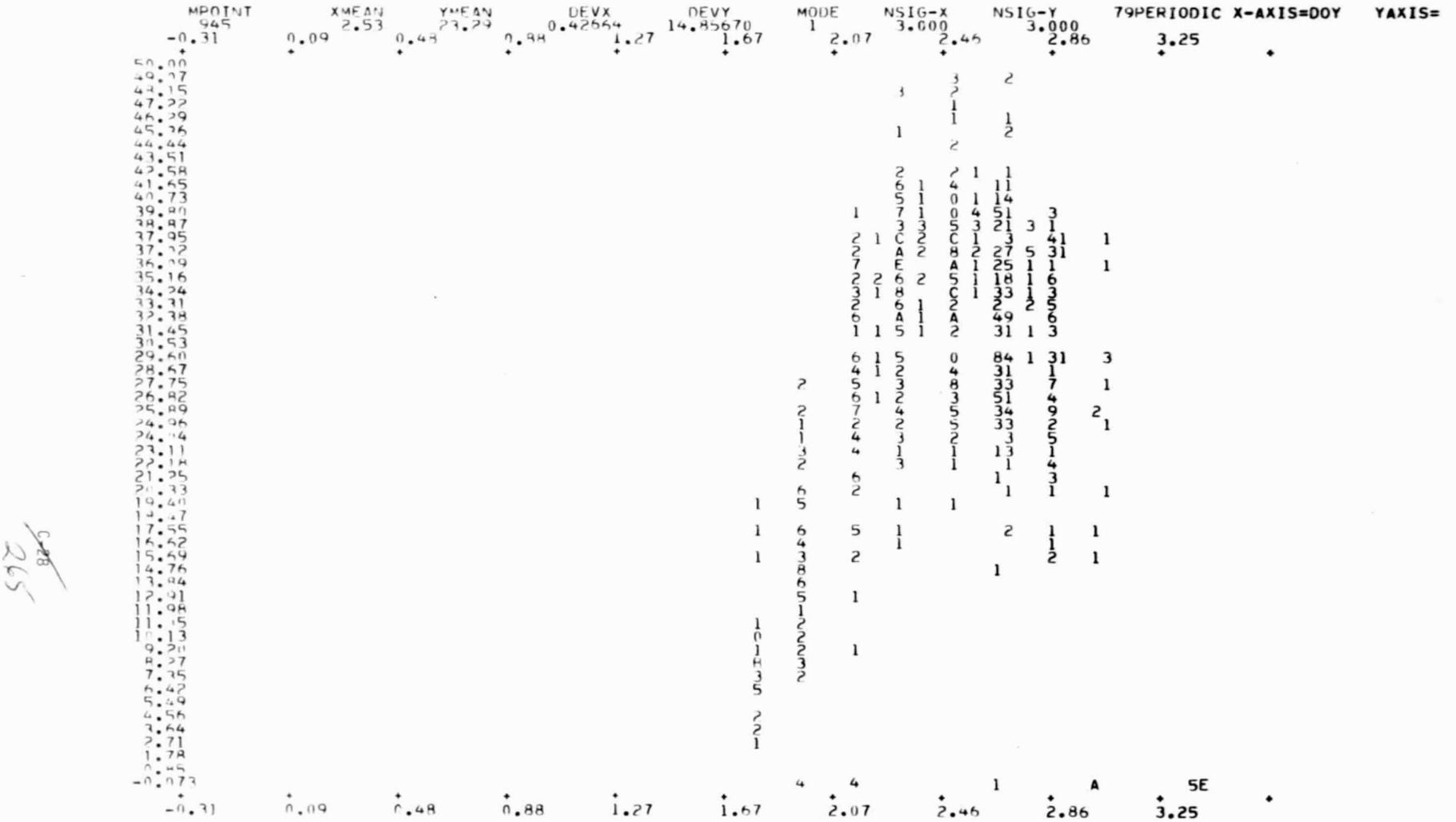
4.56
3.64
2.71
1.78
0.85
-0.073

LOUISIANA

C-25
362




MPOINT 945
XMEAN 2.53
YMEAN 23.29
DEVX 0.42564
DEVY 14.85670
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
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32.38
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14.76
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12.91
11.98
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9.20
8.27
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4.56
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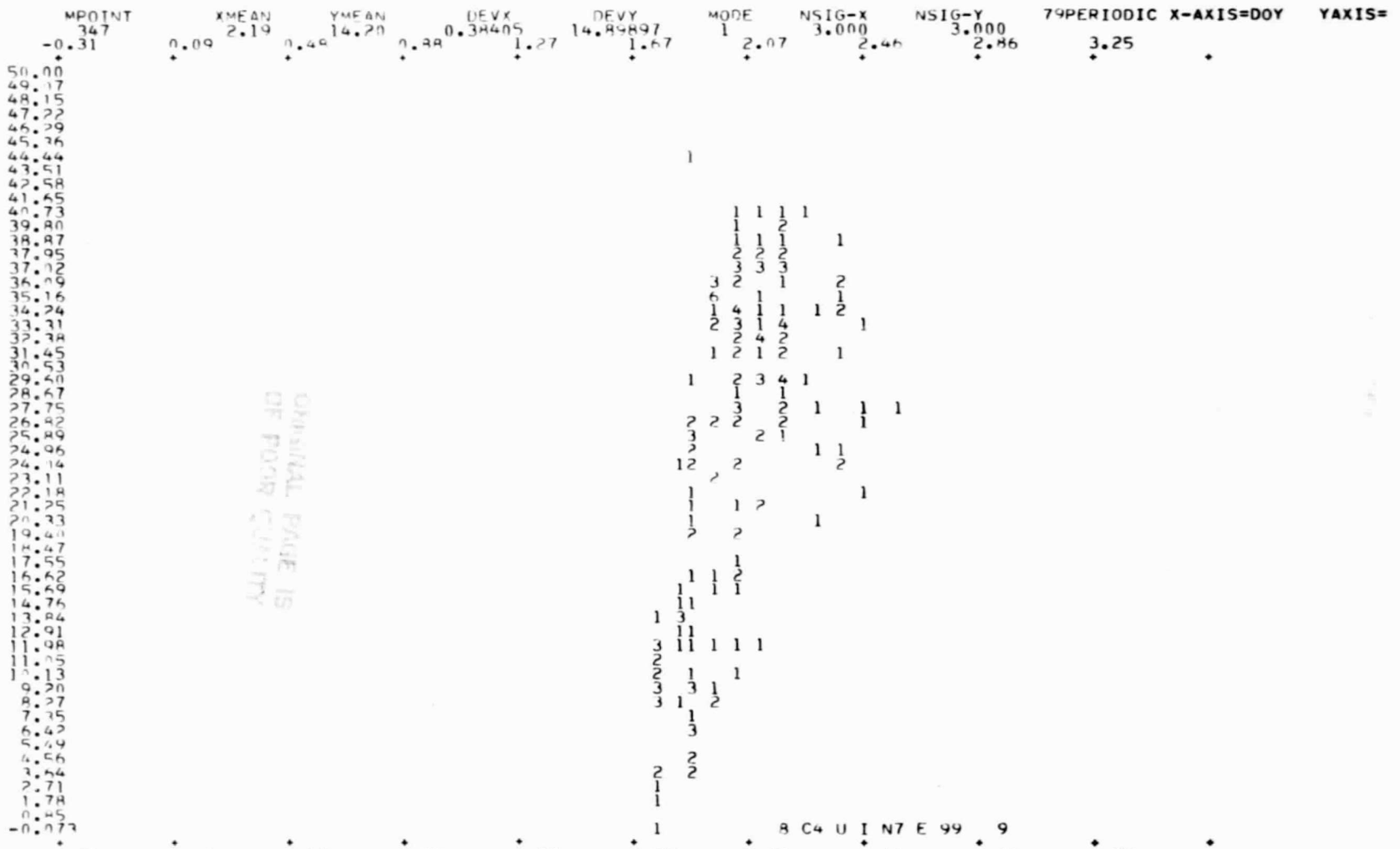
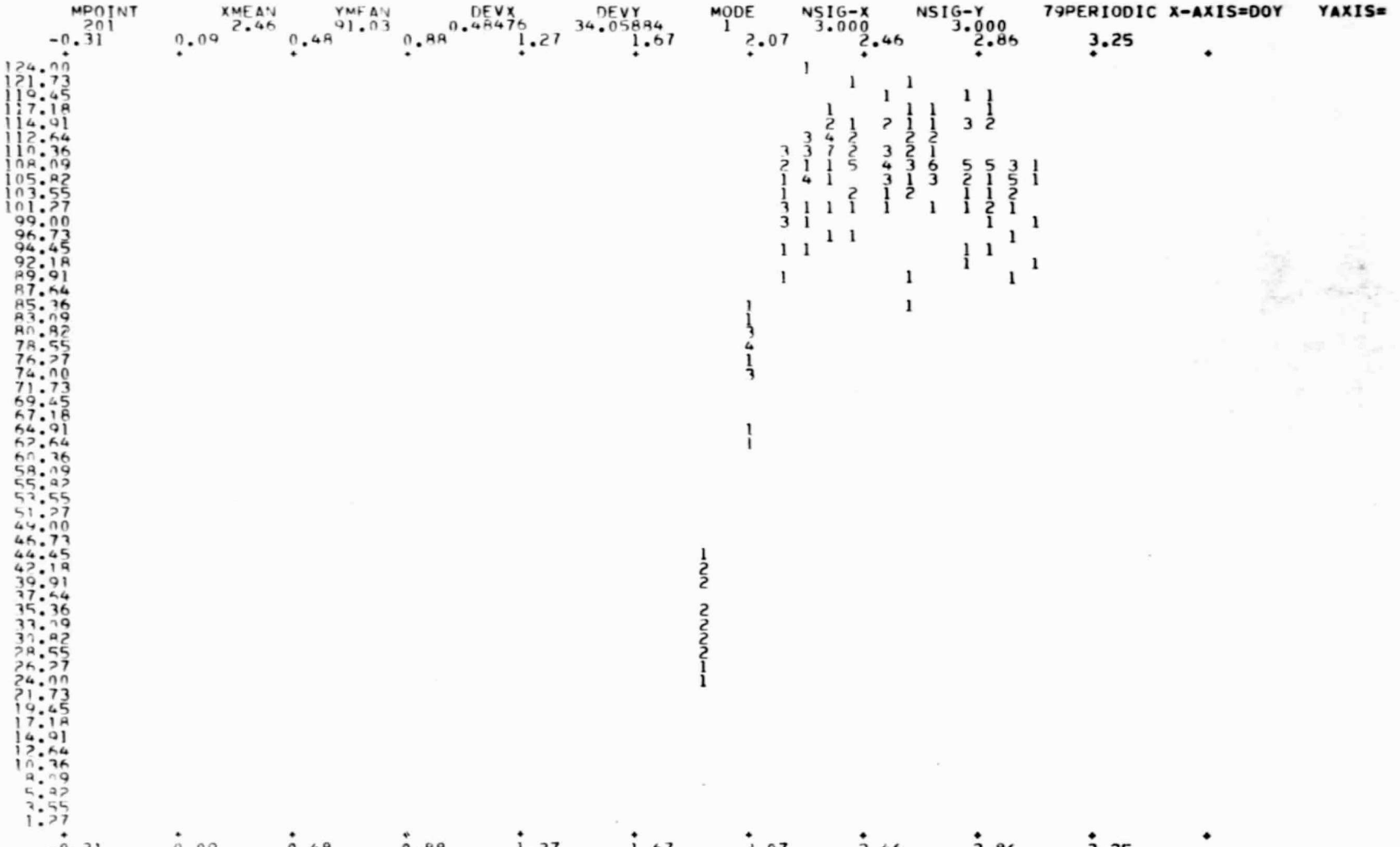
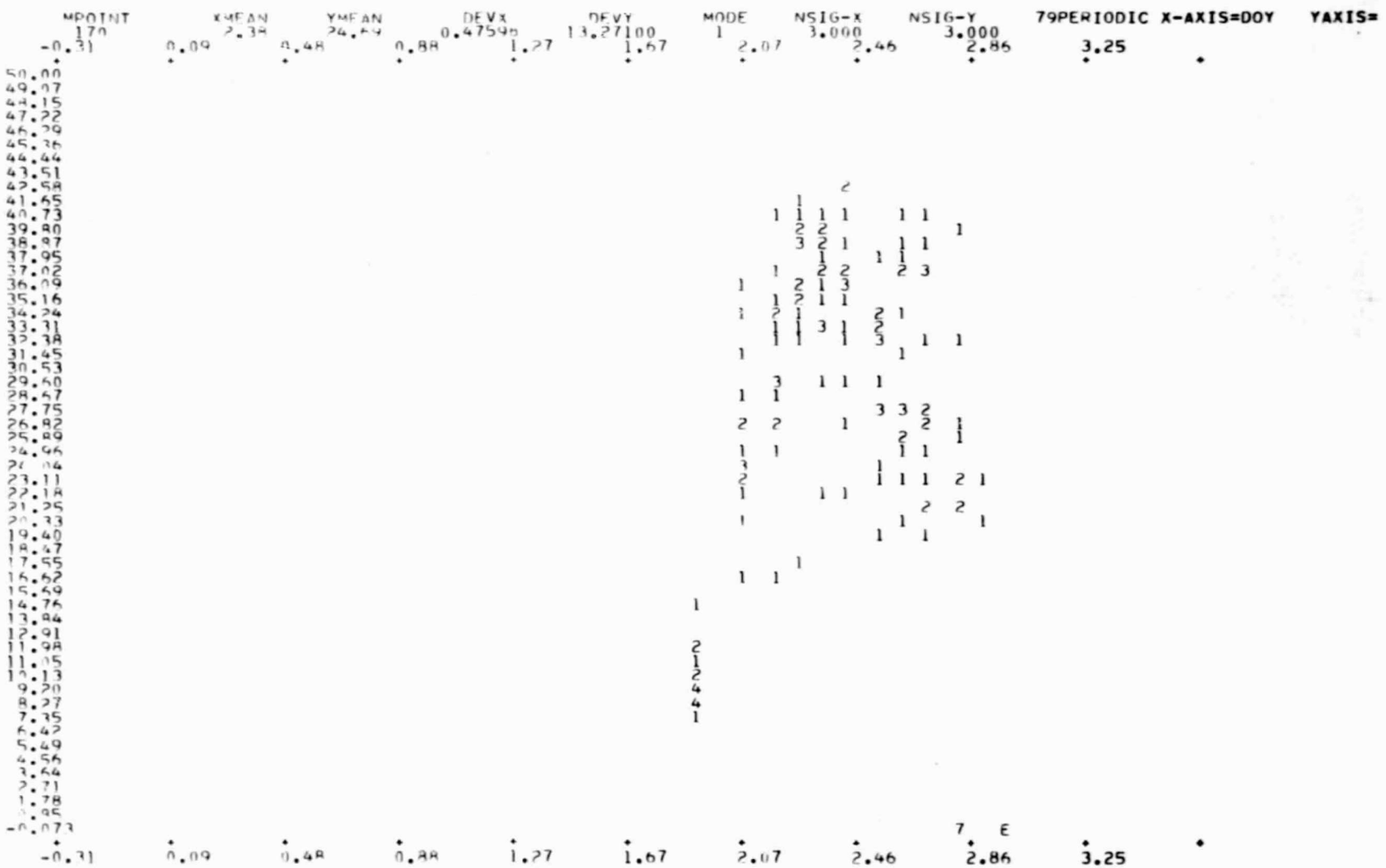
2.71
1.78
0.85
-0.073
A
5E

MINNESOTA



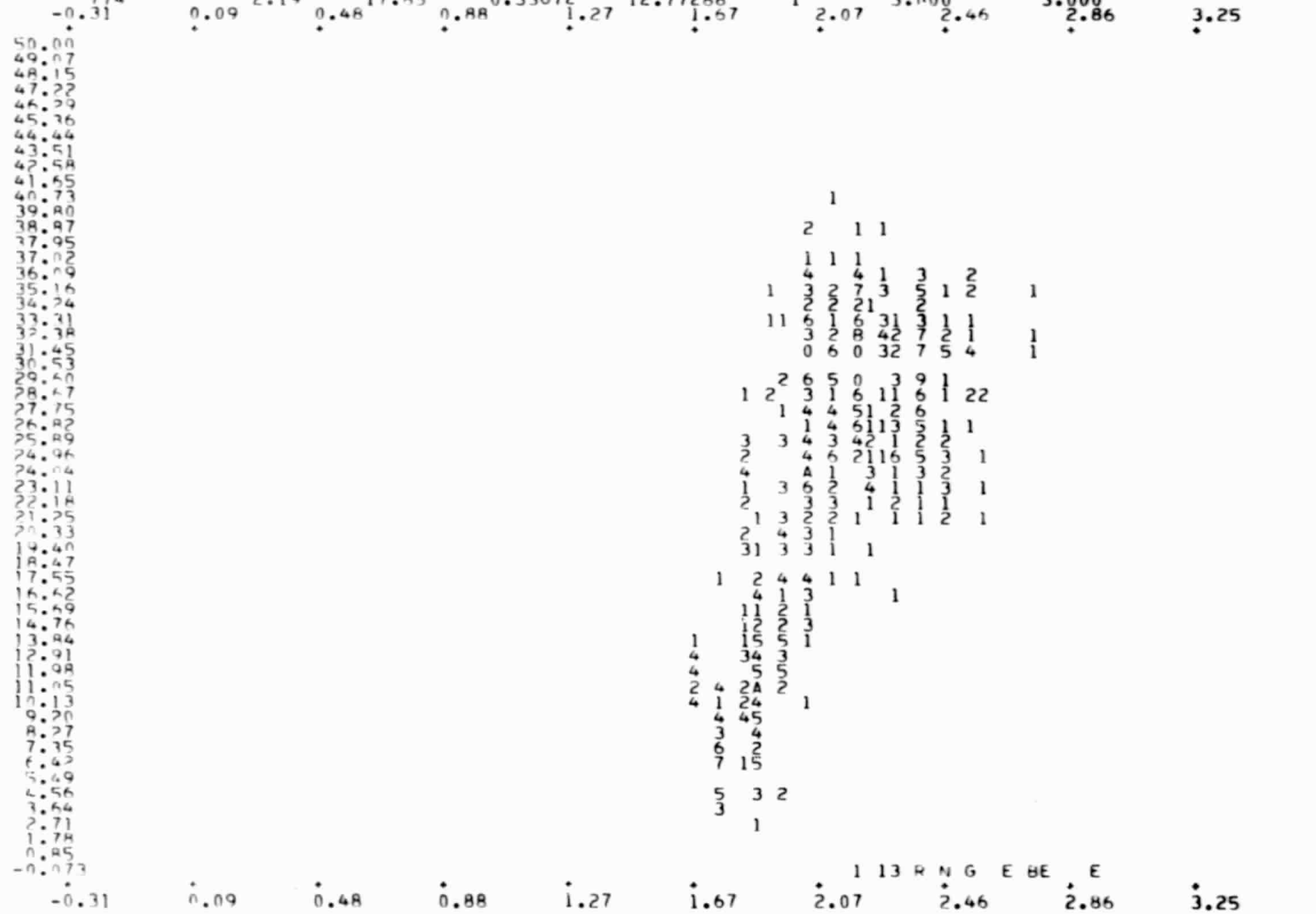
C30
267


MPOINT 201
XMEAN 2.46
YMEAN 91.03
DEVX 0.48476
DEVY 34.05884
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
124.00 121.73 119.45 117.18 114.91 112.64 110.36 108.09 105.82 103.55 101.27 99.00 96.73 94.45 92.18 89.91 87.64 85.36 83.09 80.82 78.55 76.27 74.00 71.73 69.45 67.18 64.91 62.64 60.36 58.09 55.82 53.55 51.27 49.00 46.73 44.45 42.18 39.91 37.64 35.36 33.09 30.82 28.55 26.27 24.00 21.73 19.45 17.18 14.91 12.64 10.36 8.09 5.82 3.55 1.27


MPOINT 170
XMEAN 2.38
YMEAN 24.49
DEVx 0.47595
DEVY 13.27100
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
4.56
3.64
2.71
1.78
0.85
-0.073
7 E
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

692
28-2

NPOINT	XMEAN	YMEAN	DEVX	DEVY	MODE	NSIG-X	NSIG-Y	79PERIODIC X-AXIS=DOY	YAXIS=
774	2.19	17.85	0.33672	12.77288	1	3.000	3.000		



51

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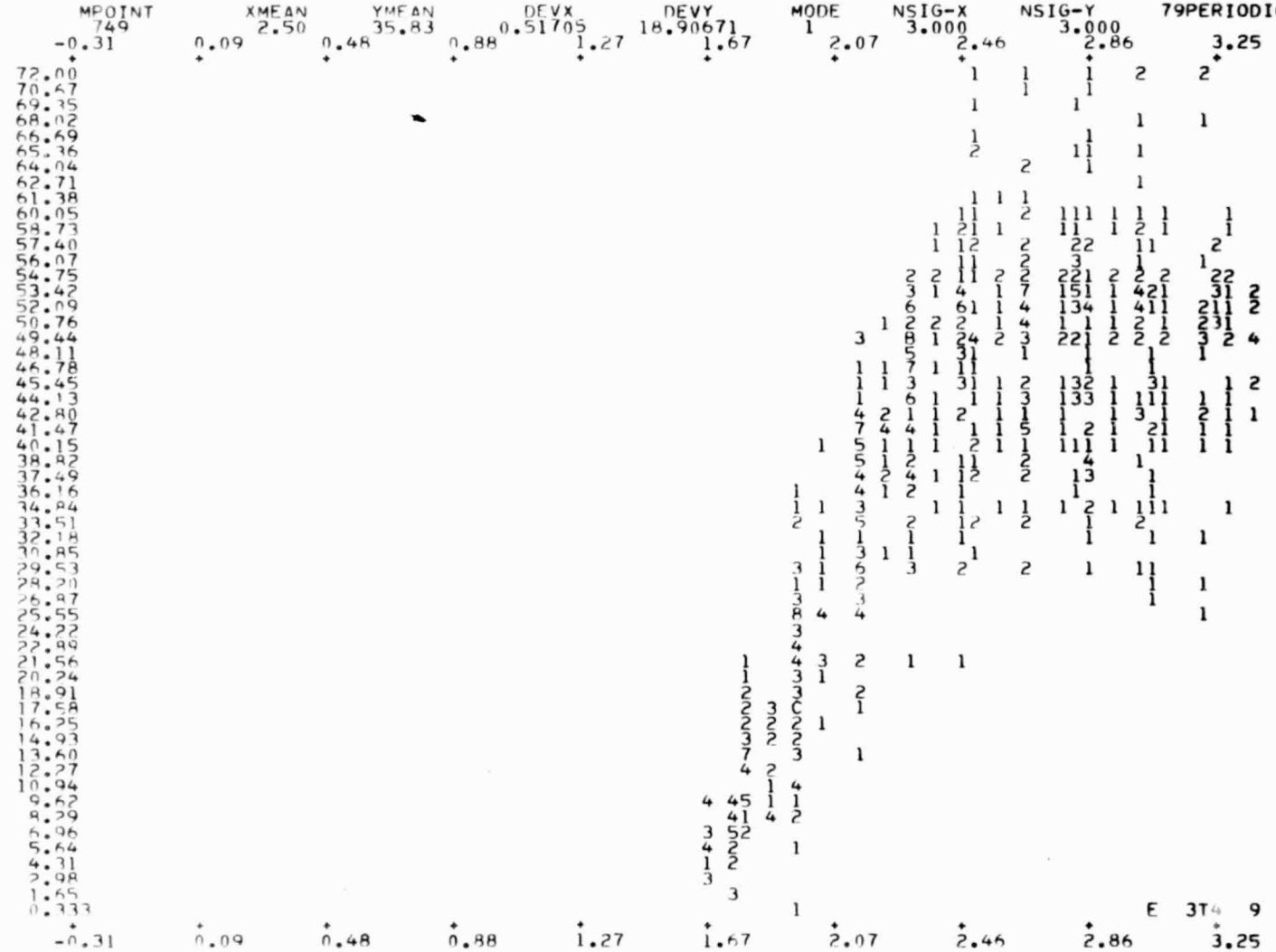
MPOINT 749
XMEAN 2.50
YMEAN 35.83
DEVX 0.51705
DEVY 18.90671
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
72.00
70.67
69.35
68.02
66.69
65.36
64.04
62.71
61.38
60.05
58.73
57.40
56.07
54.75
53.42
52.09
50.76
49.44
48.11
46.78
45.45
44.13
42.80
41.47
40.15
38.82
37.49
36.16
34.84
33.51
32.18
30.85
29.53
28.20
26.87
25.55
24.22
22.89
21.56
20.24
18.91
17.58
16.25
14.93
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12.27
10.94
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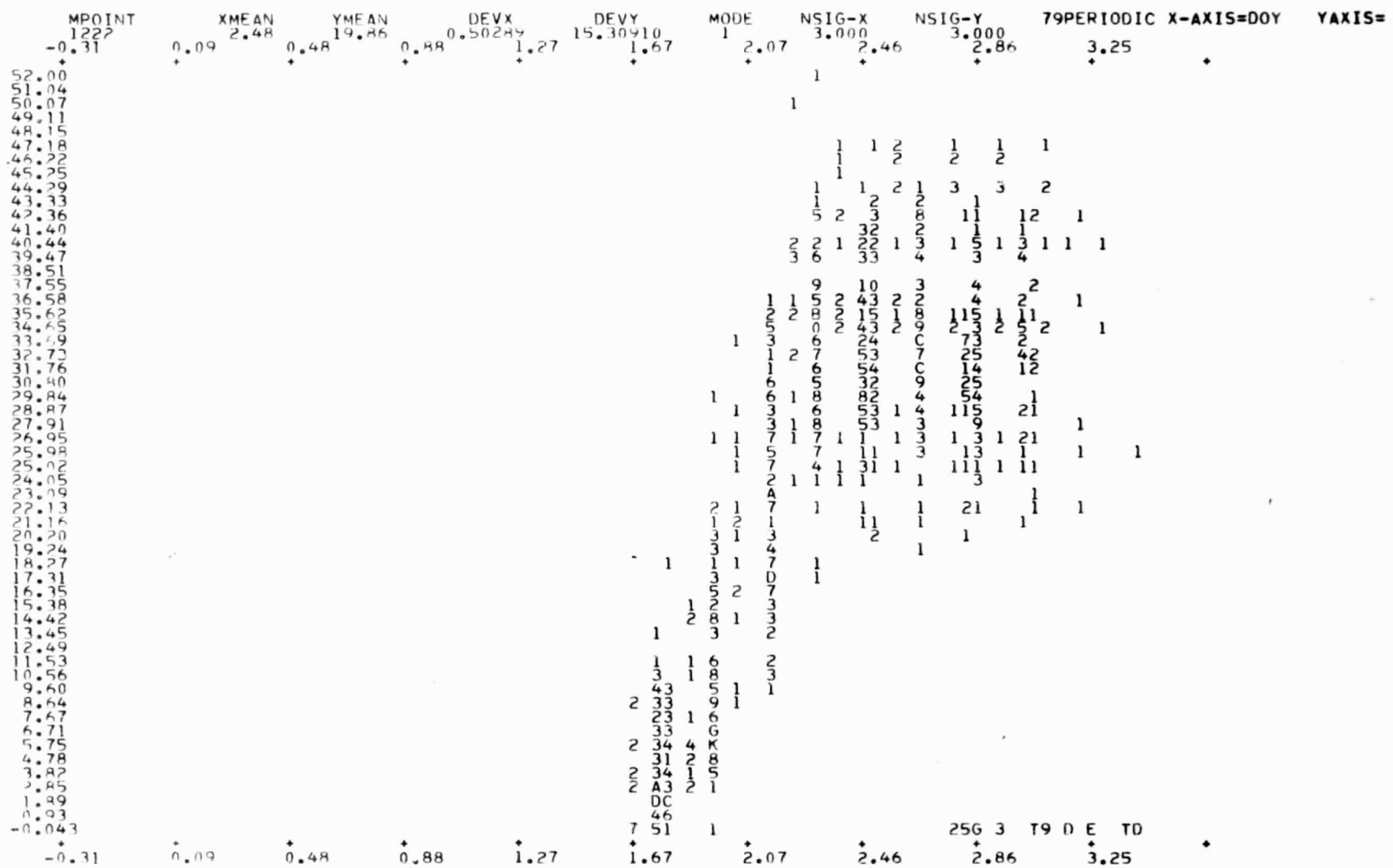
6.96
5.64
4.31
2.98
1.65
0.333


MPOINT 1222
XMEAN 2.48
YMEAN 19.86
DEVX 0.50284
DEVY 15.30910
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
52.00
51.04
50.07
49.11
48.15
47.18
46.22
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44.29
43.33
42.36
41.40
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27.91
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25.98
25.02
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16.35
15.38
14.42
13.46
12.49
11.53
10.56
9.60
8.64
7.67
6.71
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3.82
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-0.043
25G 3 T9 D E TD

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273

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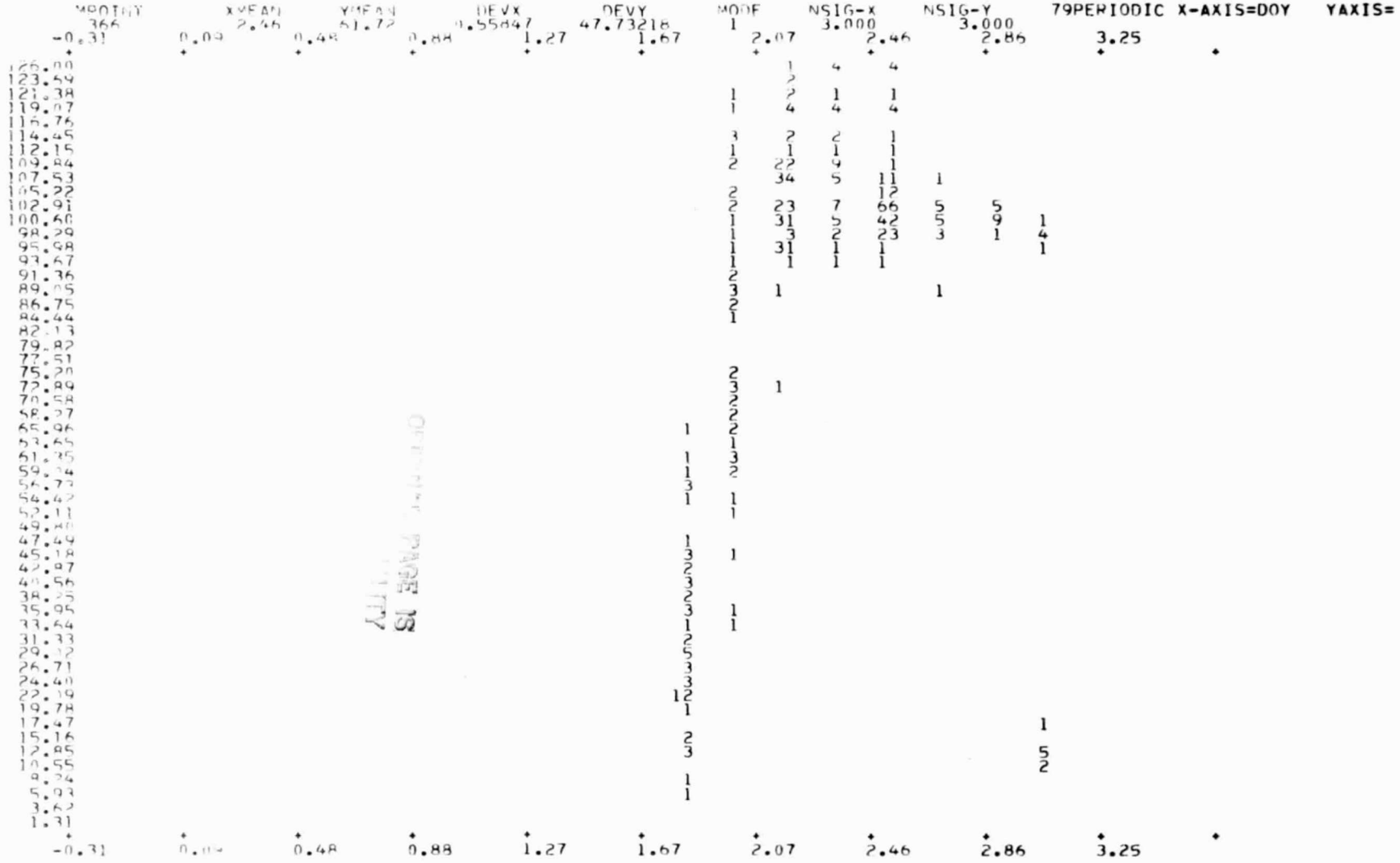
MPOINT 366
XMEAN 2.46
YMEAN 51.72
DEVX 0.55847
DEVY 47.73218
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

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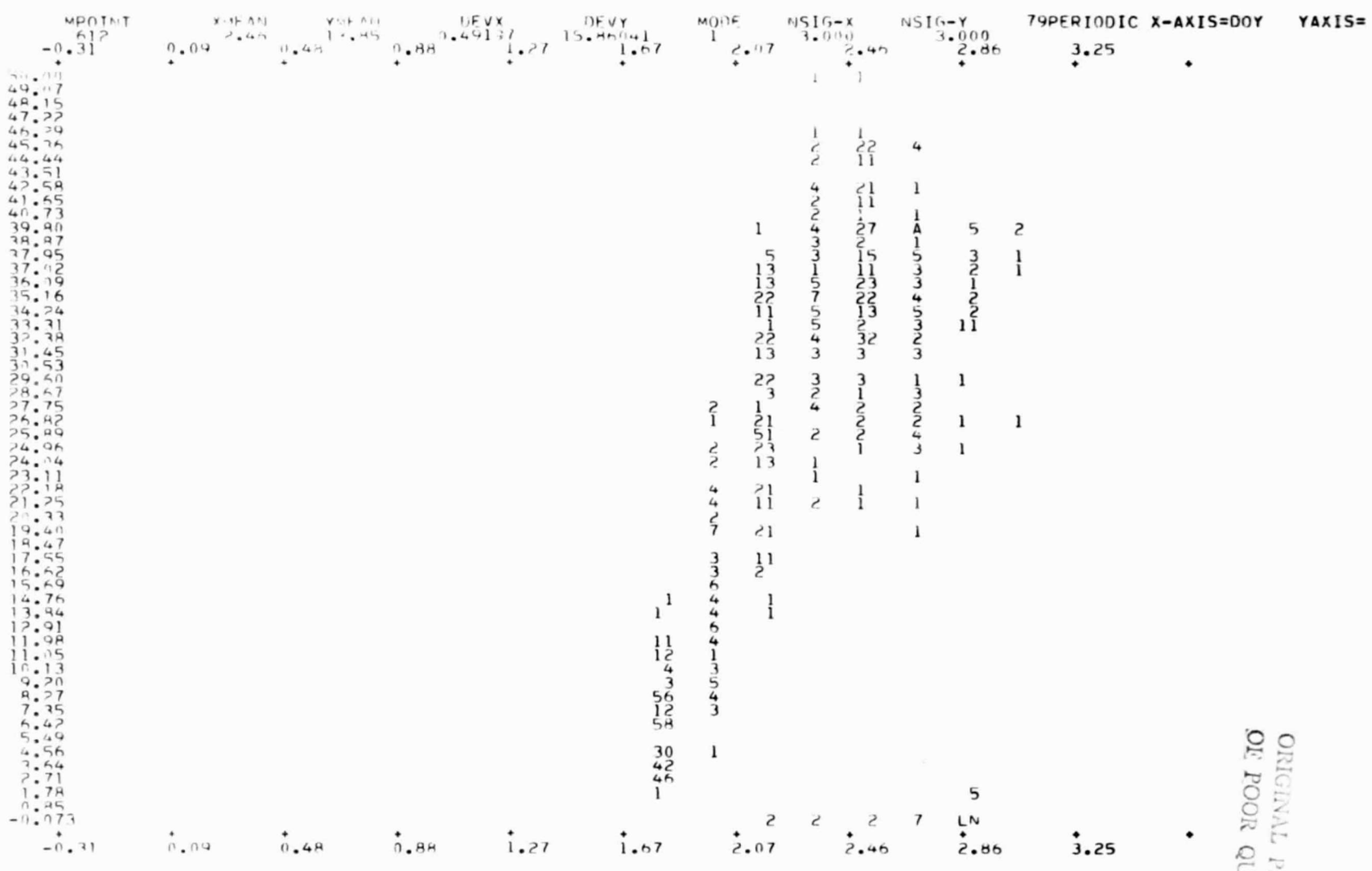
215



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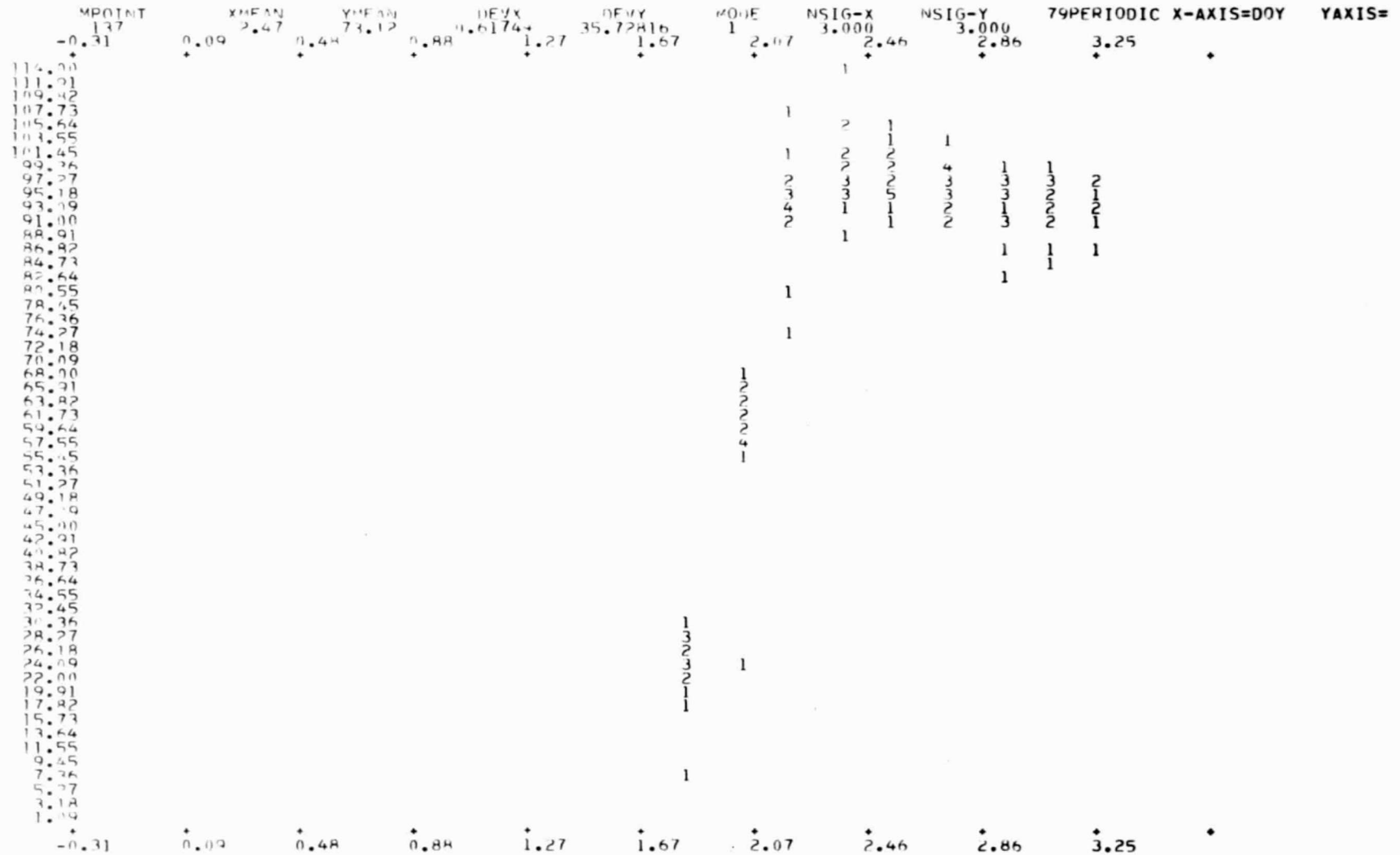
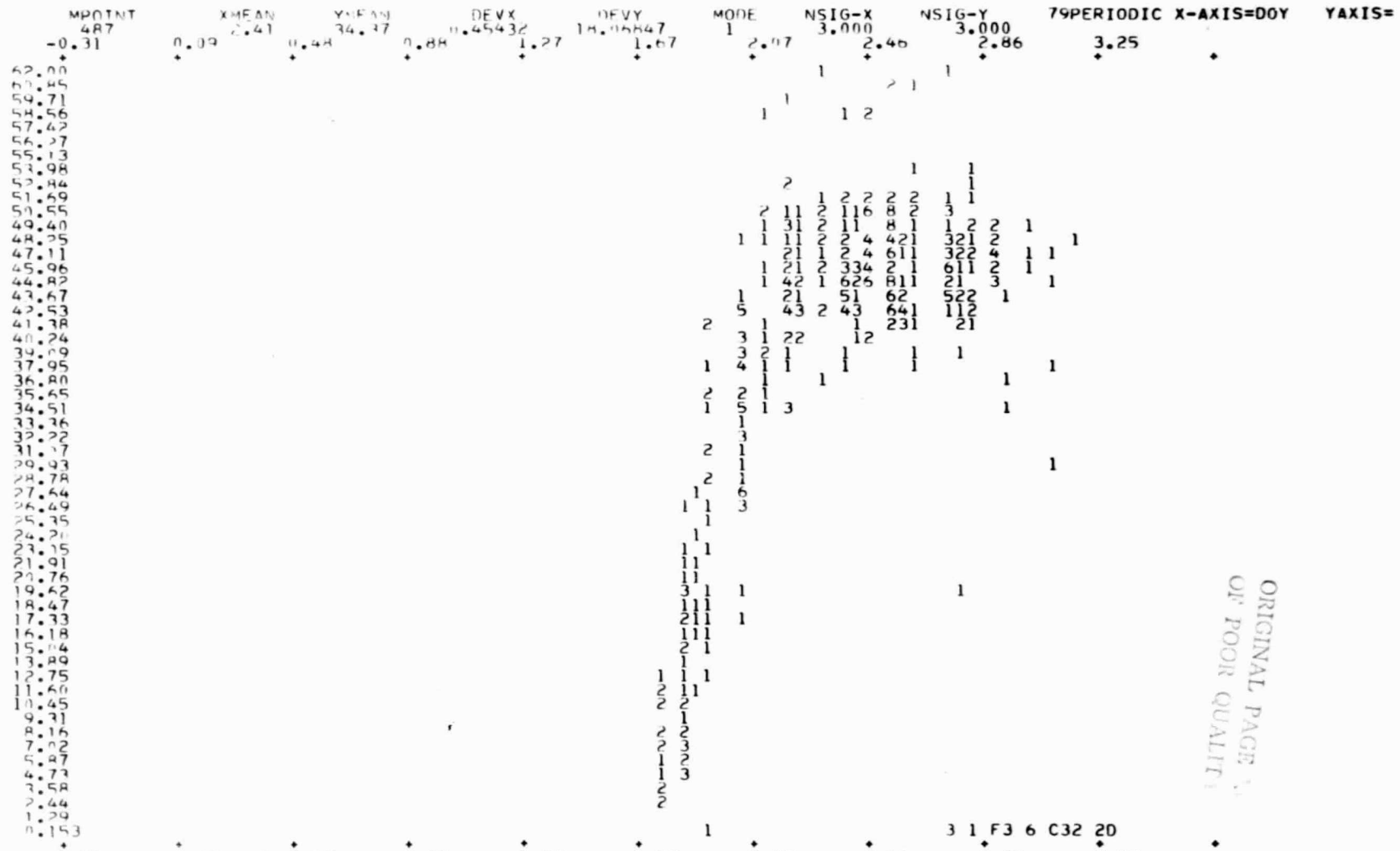
C-40
277


MPOINT 137
XMEAN 2.47
YMEAN 74.12
DEVX 0.61744
DEVY 35.72816
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
114.00
111.91
109.82
107.73
105.64
103.55
101.45
99.36
97.27
95.18
93.09
91.00
88.91
86.82
84.73
82.64
80.55
78.45
76.36
74.27
72.18
70.09
68.00
65.91
63.82
61.73
59.64
57.55
55.45
53.36
51.27
49.18
47.09
45.00
42.91
40.82
38.73
36.64
34.55
32.45
30.36
28.27
26.18
24.09
22.00
19.91
17.82
15.73
13.64
11.55
9.45
7.36
5.27
3.18
1.09
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

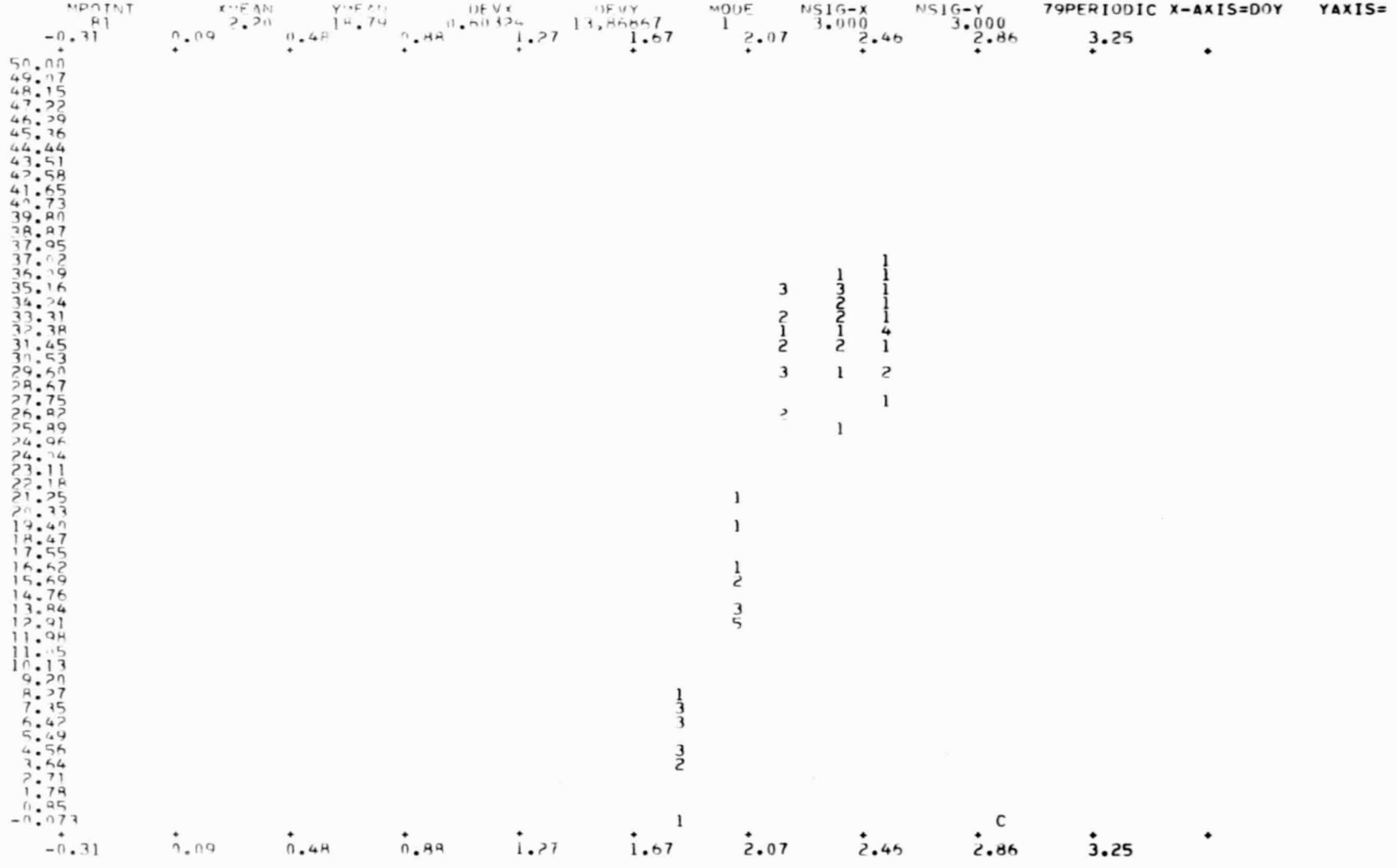
C-47

278



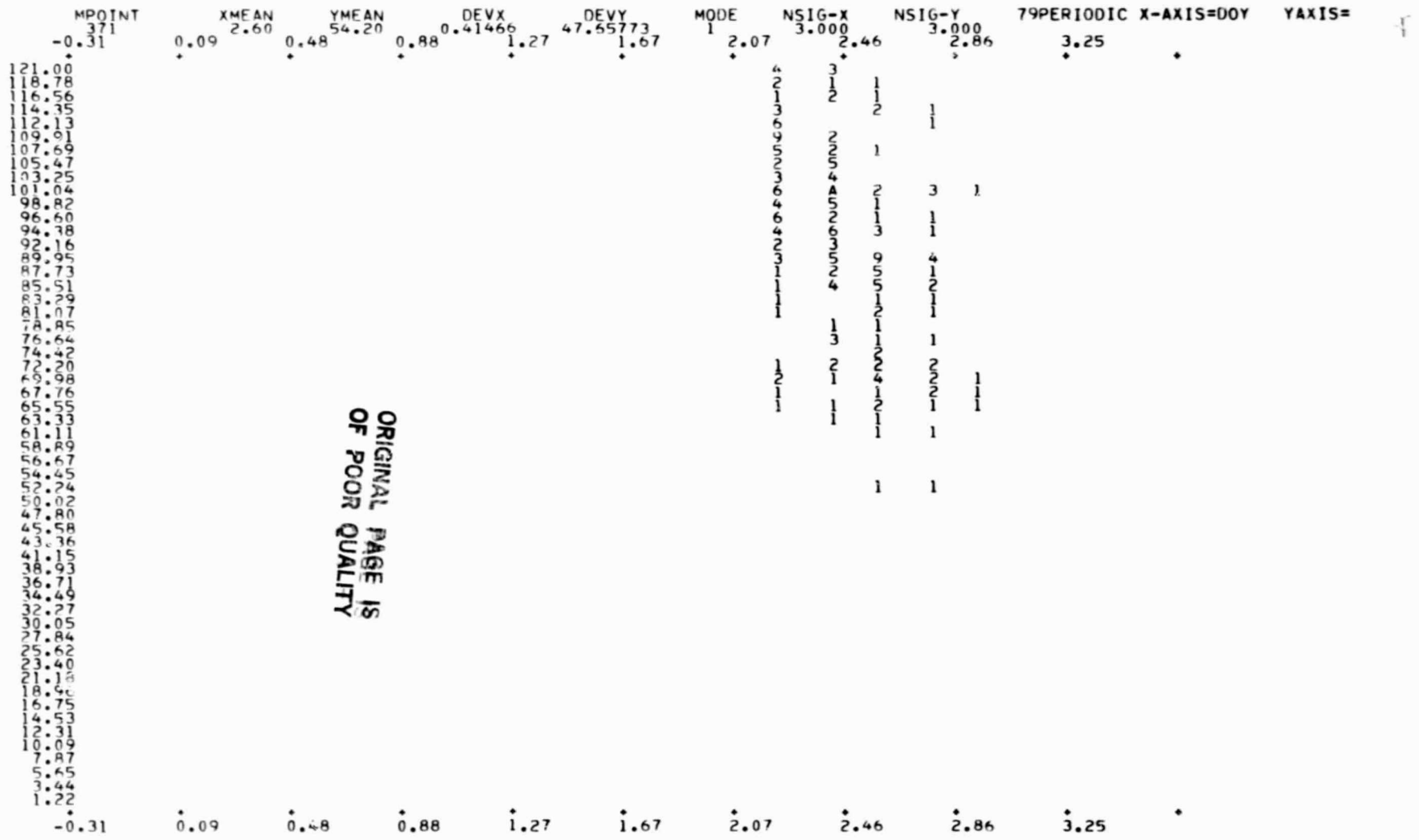
S-42

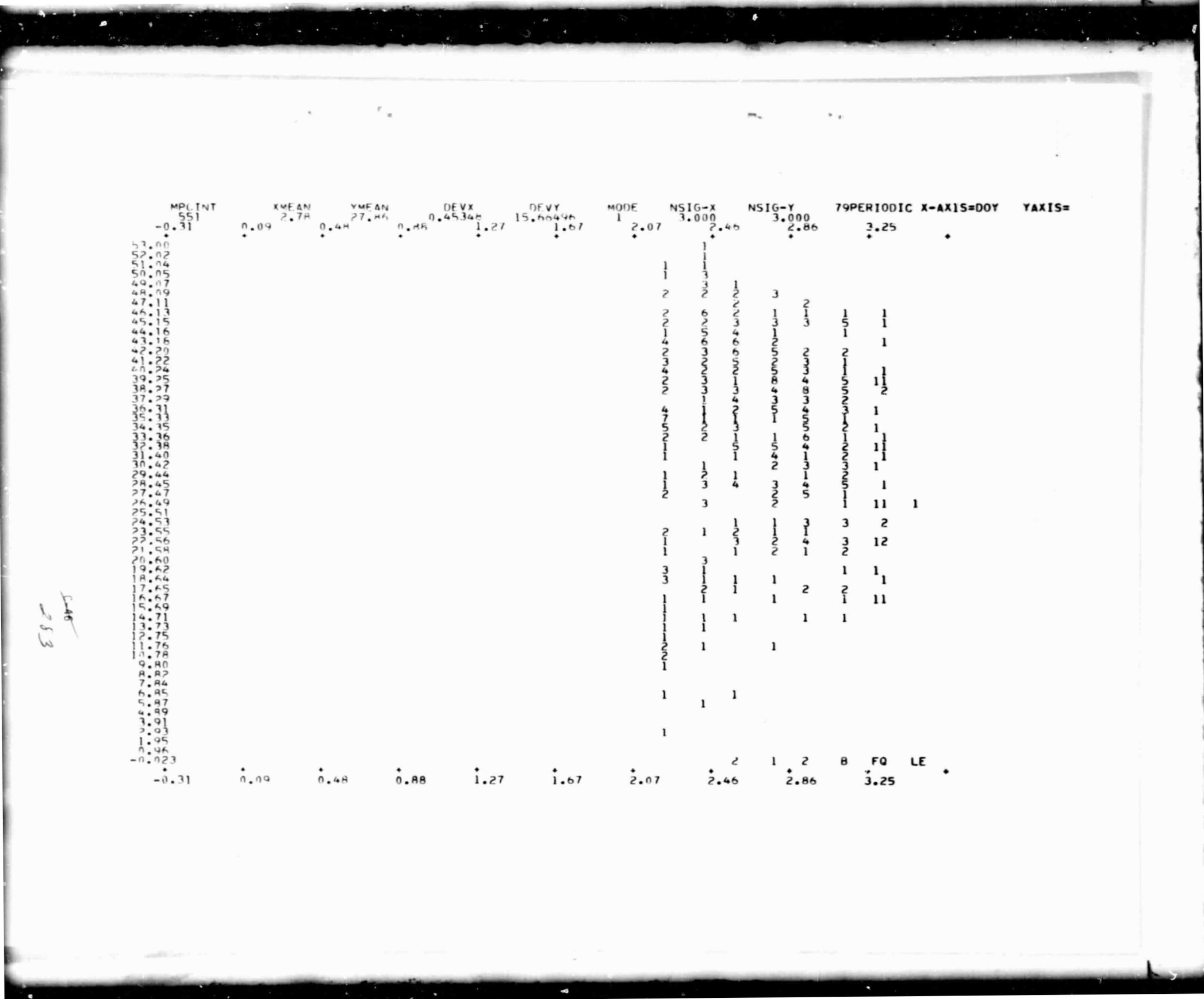
276


NPOINT 81
XMEAN 2.20
YMEAN 18.79
DEVX 0.50434
DEVY 13.86867
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
4.56
3.64
2.71
1.78
0.85
-0.073
C
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

NORTH CAROLINA

C-44
151




NPOINT 551
XMEAN 2.78
YMEAN 27.86
DEVX 0.45348
DEVY 15.66496
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
53.00
52.02
51.04
50.05
49.07
48.09
47.11
46.13
45.15
44.16
43.18
42.20
41.22
40.24
39.25
38.27
37.29
36.31
35.33
34.35
33.36
32.38
31.40
30.42
29.44
28.45
27.47
26.49
25.51
24.53
23.55
22.56
21.58
20.60
19.62
18.64
17.65
16.67
15.69
14.71
13.73
12.75
11.76
10.78
9.80
8.82
7.84
6.85
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4.89
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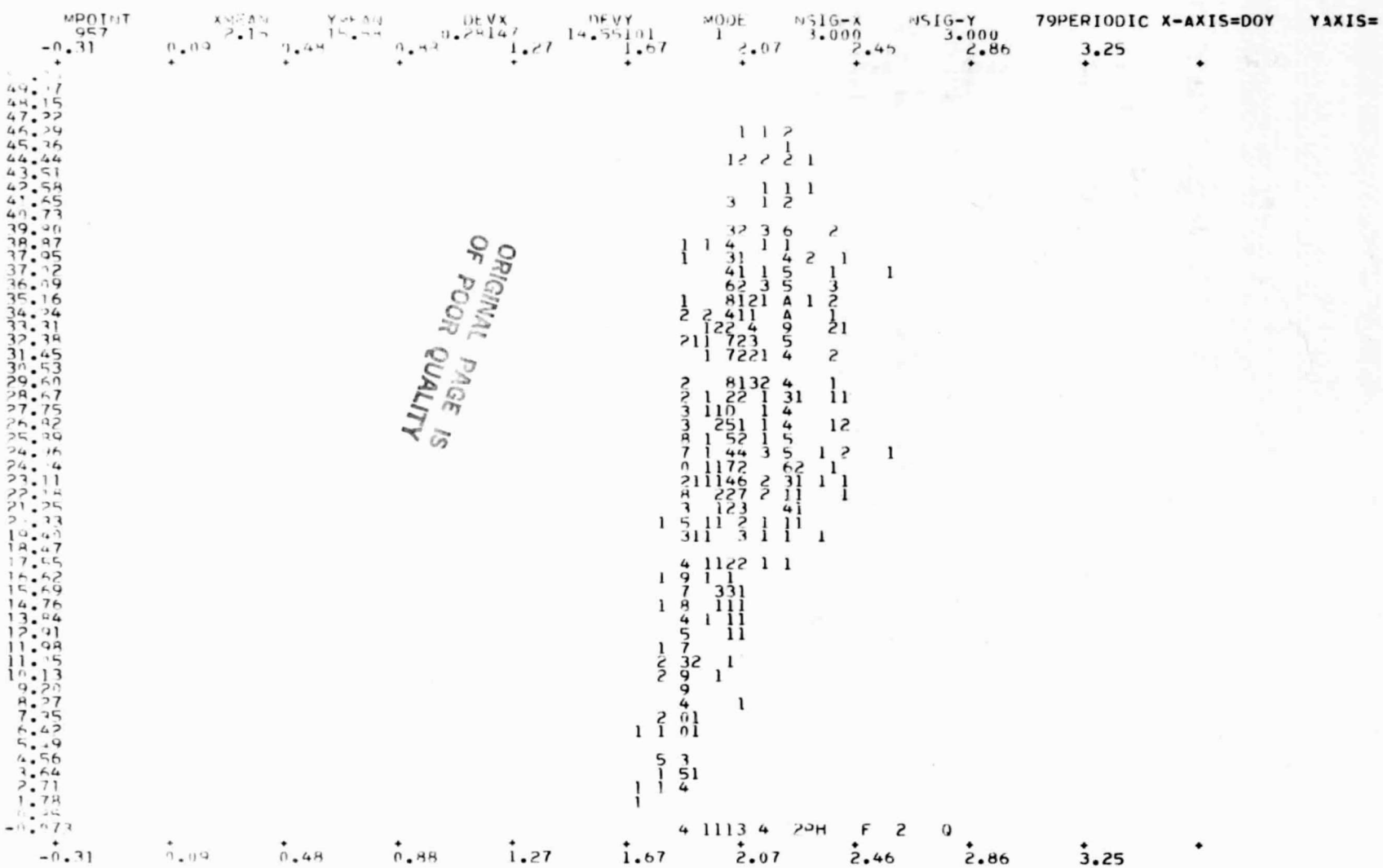
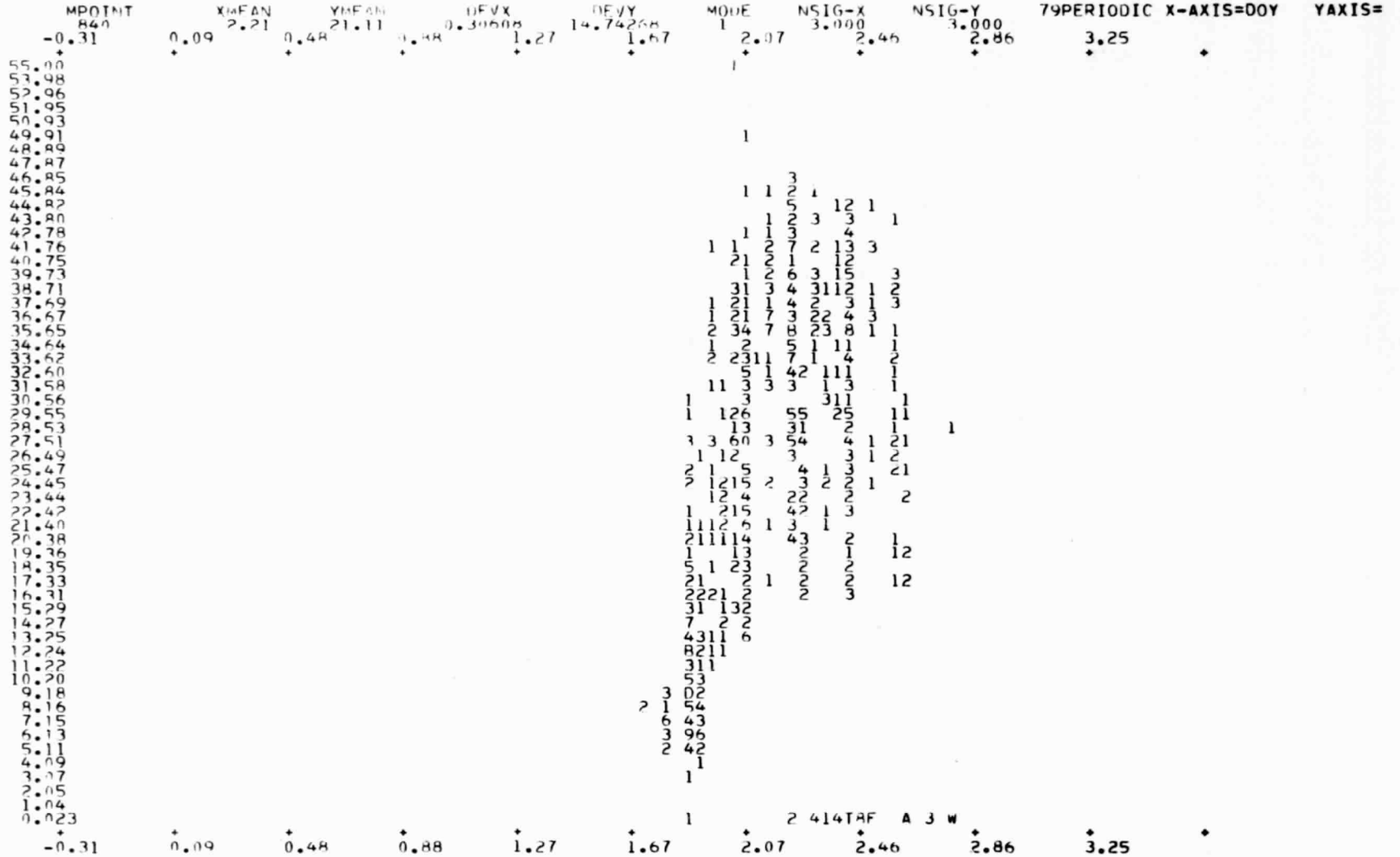
-0.023
B FQ LE

NORTH DAKOTA


MPOINT 957
XMEAN 2.15
YMEAN 15.54
DEVX 0.28147
DEVY 14.55101
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
ORIGINAL PAGE IS OF POOR QUALITY


MPOINT 840
XMEAN 2.21
YMEAN 21.11
DEVX 0.30508
DEVY 14.74268
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
55.00
53.98
52.96
51.95
50.93
49.91
48.89
47.87
46.85
45.84
44.82
43.80
42.78
41.76
40.75
39.73
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36.67
35.65
34.64
33.62
32.60
31.58
30.56
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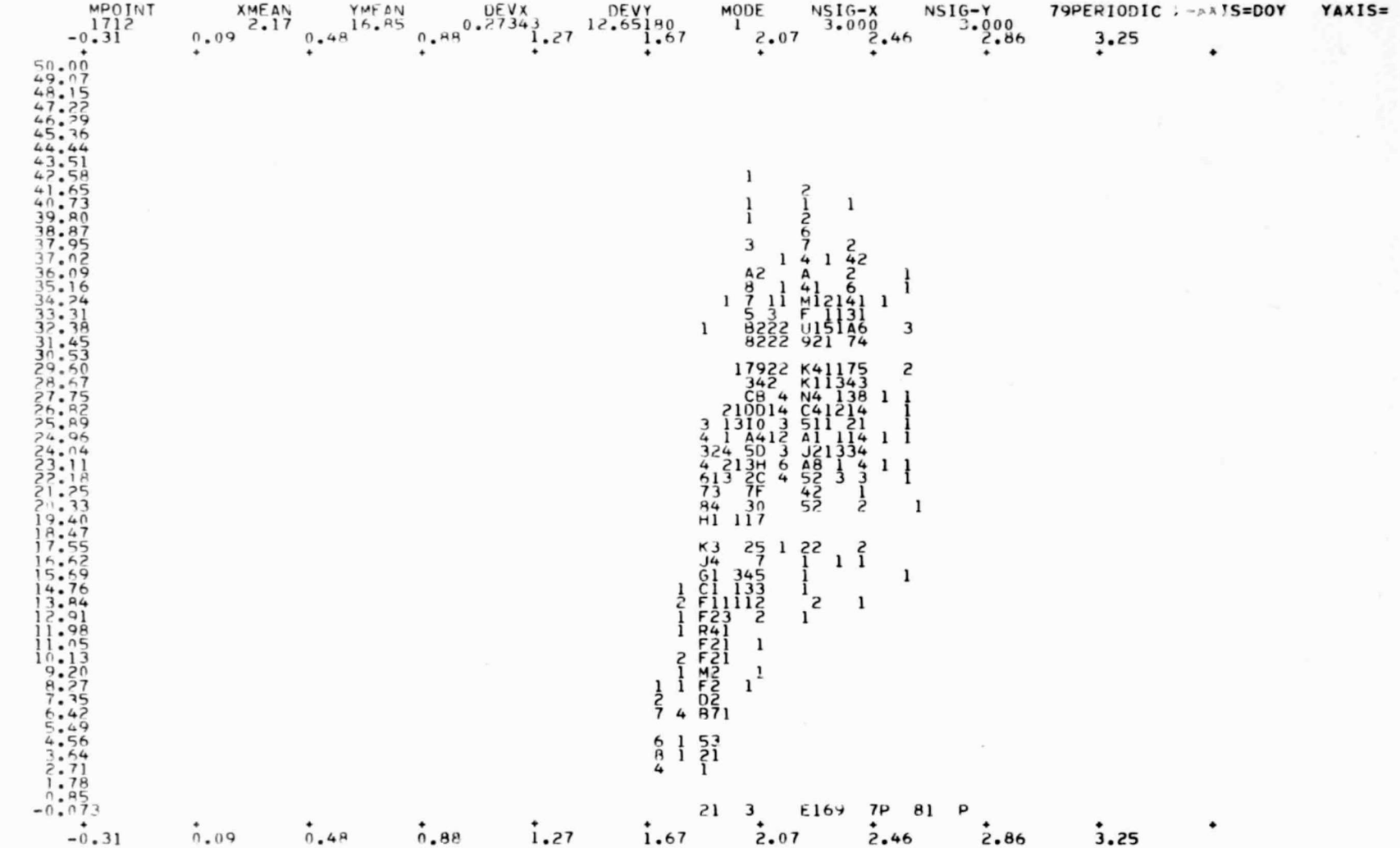
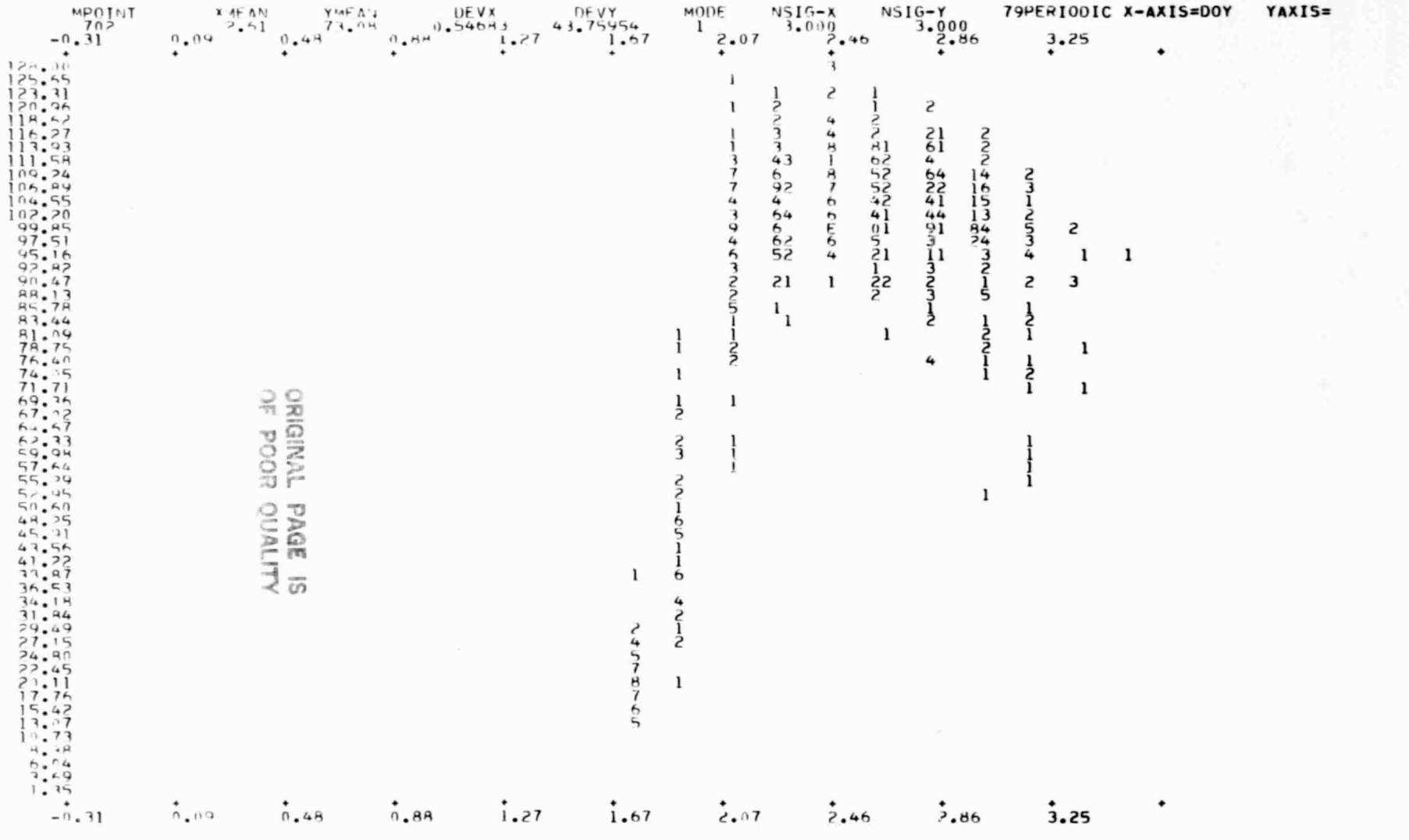
28.53
27.51
26.49
25.47
24.45
23.44
22.42
21.40
20.38
19.36
18.35
17.33
16.31
15.29
14.27
13.25
12.24
11.22
10.20
9.18
8.16
7.15
6.13
5.11
4.09
3.07
2.05
1.04
0.023
2 414TBF A 3 W

249


MPOINT 1712
XMEAN 2.17
YMEAN 16.85
DEVX 0.27343
DEVY 12.65180
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC
XAXIS=DOY
YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00 49.07 48.15 47.22 46.29 45.36 44.44 43.51 42.58 41.65 40.73 39.80 38.87 37.95 37.02 36.09 35.16 34.24 33.31 32.38 31.45 30.53 29.60 28.67 27.75 26.82 25.89 24.96 24.04 23.11 22.18 21.25 20.33 19.40 18.47 17.55 16.62 15.69 14.76 13.84 12.91 11.98 11.05 10.13 9.20 8.27 7.35 6.42 5.49 4.56 3.64 2.71 1.78 0.85 -0.073
E169 7P 81 P

OHIO


MPOINT 702
XMEAN 2.51
YMEAN 73.08
DEVX 0.546833
DEVY 43.75954
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
ORIGINAL PAGE IS
OF POOR QUALITY

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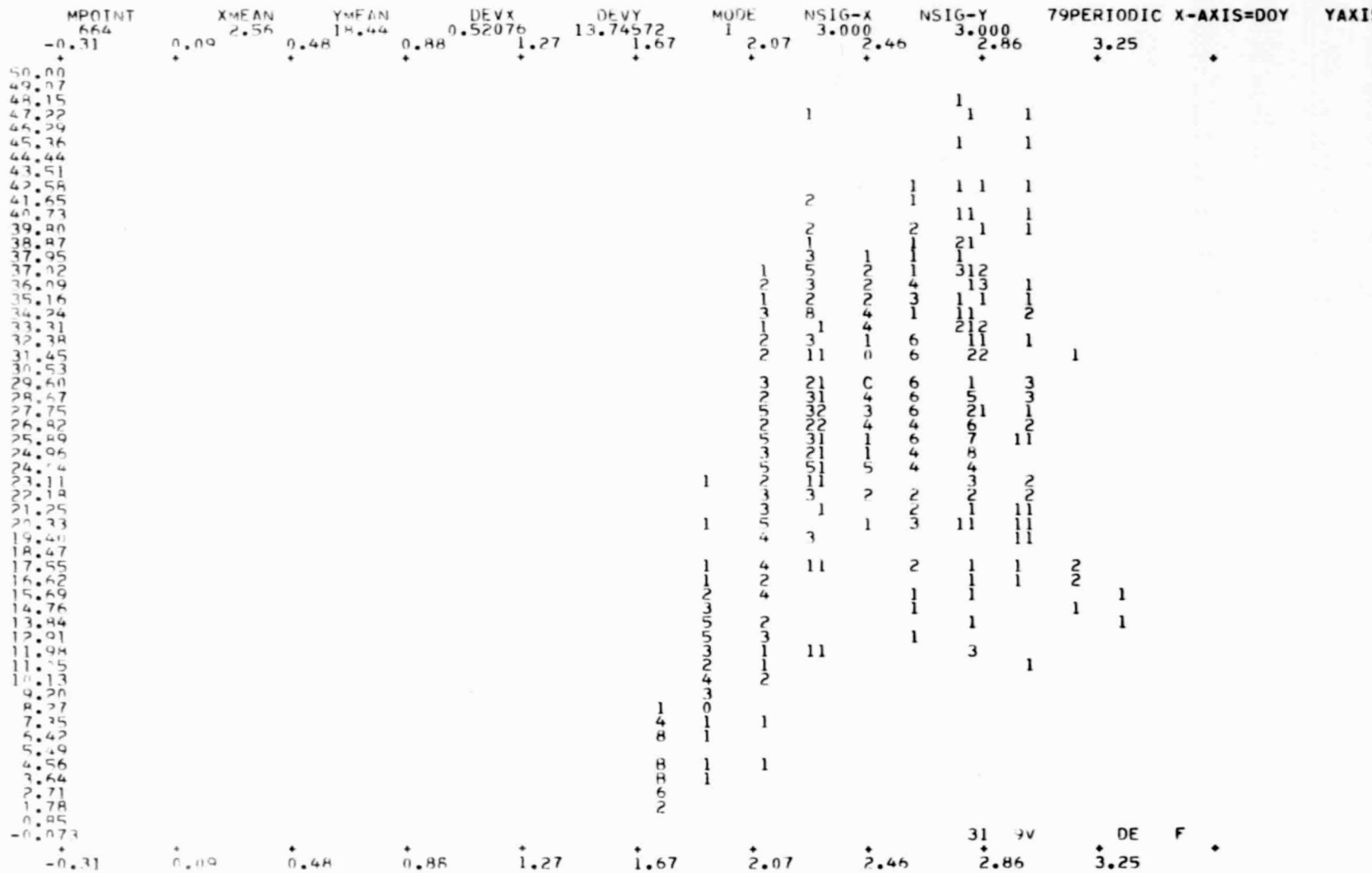
285


MPOINT 664
XMEAN 2.56
YMEAN 18.44
DEVX 0.52076
DEVY 13.74572
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
45.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
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23.11
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20.33
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18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
5.42
5.49
4.56
3.64
2.71
1.78
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-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

C-53

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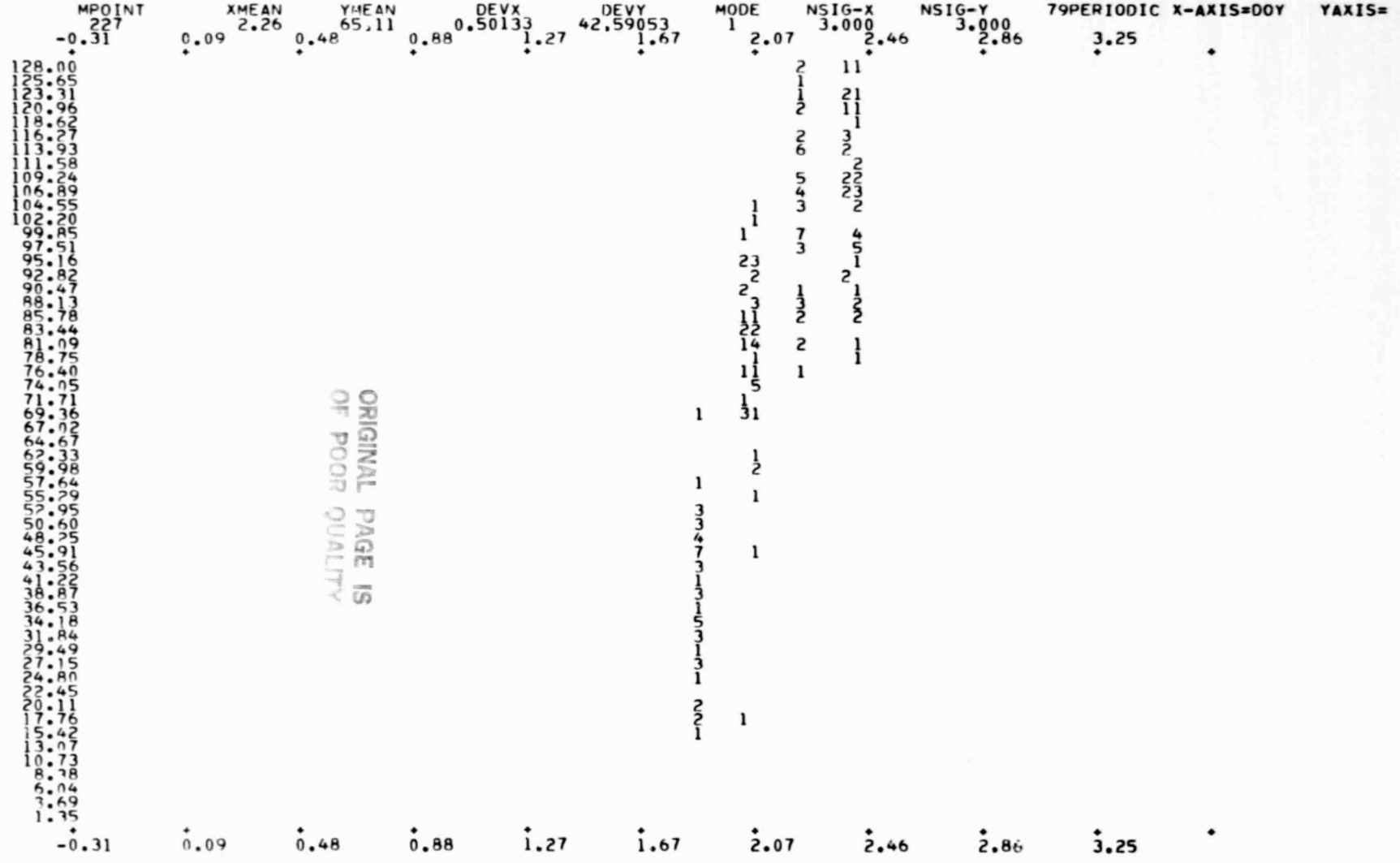
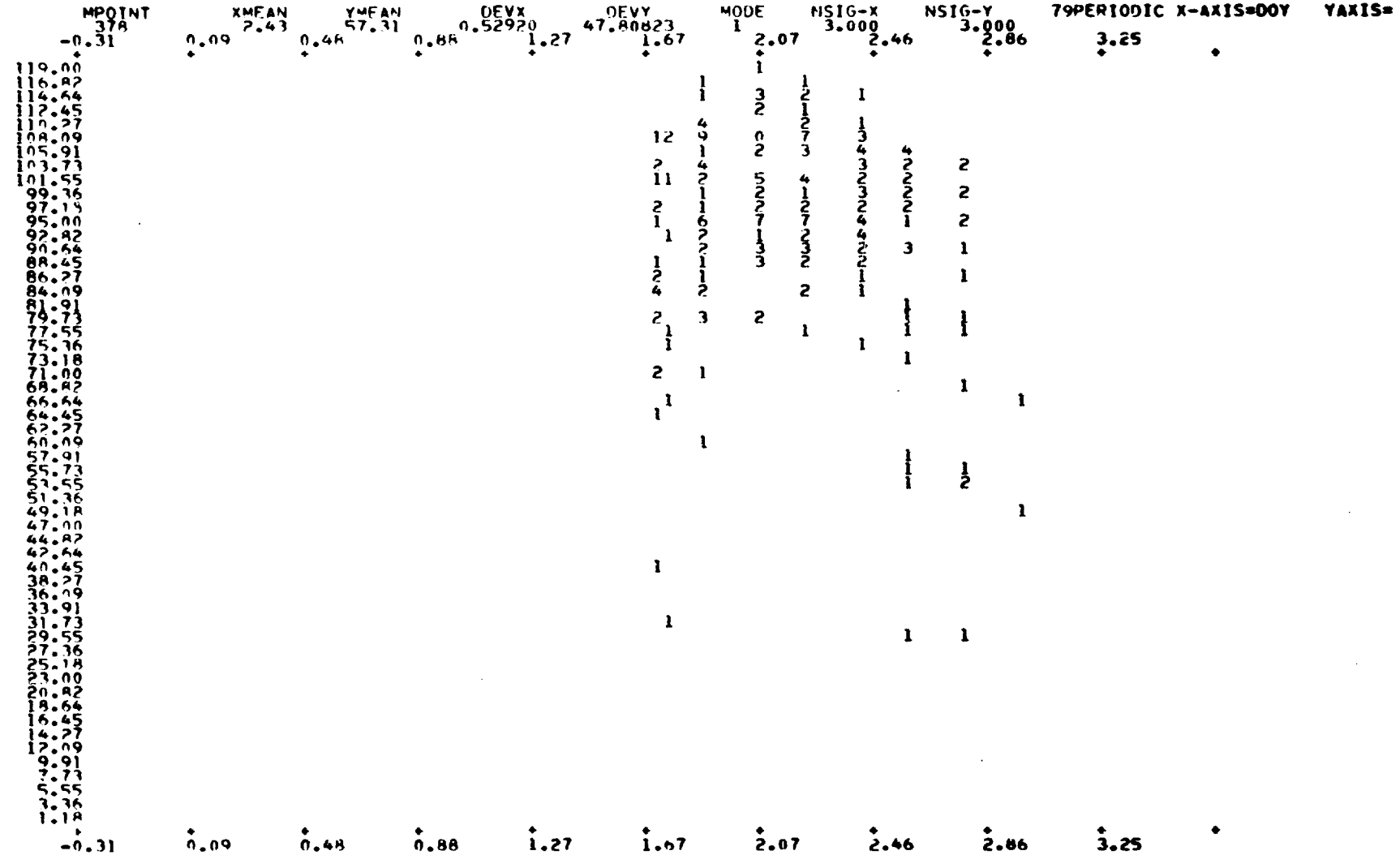


SOUTH CAROLINA


MPOINT 378
XMEAN 2.43
YMEAN 57.31
DEVX 0.52920
DEVY 47.80823
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
119.00
116.82
114.64
112.45
110.27
108.09
105.91
103.73
101.55
99.36
97.18
95.00
92.82
90.64
88.45
86.27
84.09
81.91
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77.55
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73.18
71.00
68.82
66.64
64.45
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60.09
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51.36
49.18
47.00
44.82
42.64
40.45
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36.09
33.91
31.73
29.55
27.36
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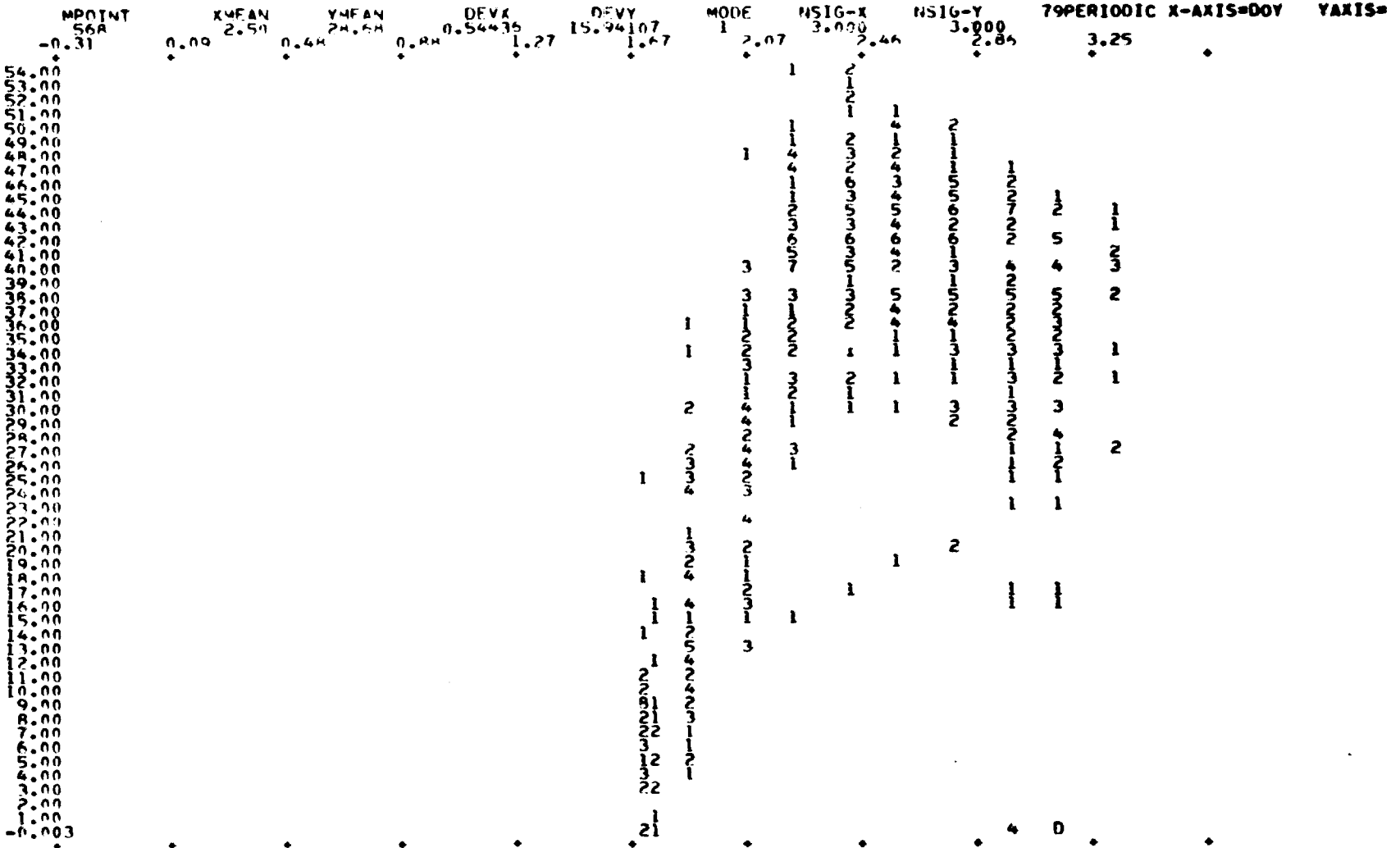
1.18


MPOINT 568
XMEAN 2.59
YMEAN 24.68
DEVX 0.54435
DEVY 15.94107
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
54.000
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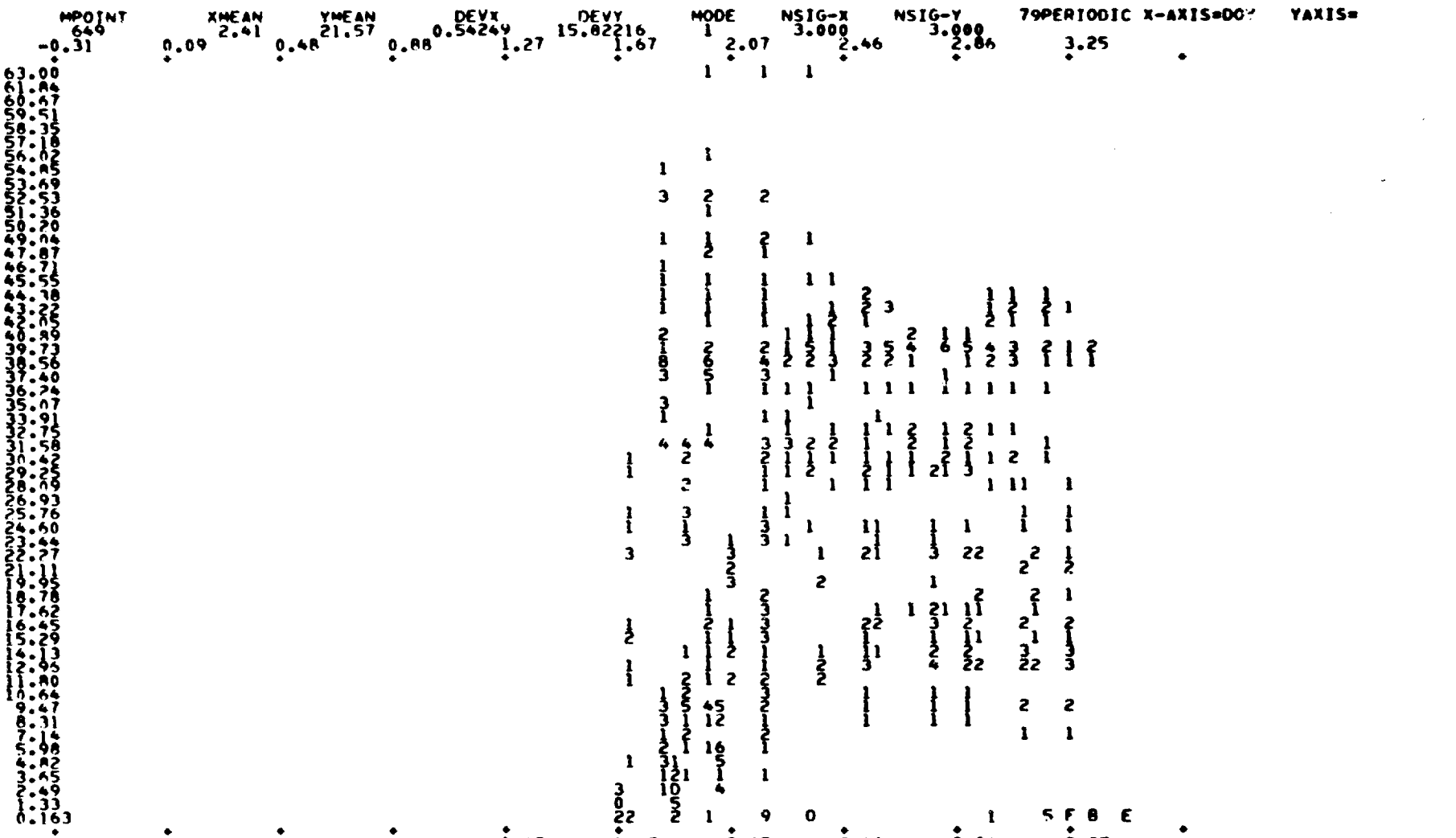
MPOINT 649
XMEAN 2.41
YMEAN 21.57
DEVX 0.54249
DEVY 15.82216
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DO
YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
63.00
61.84
60.67
59.51
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57.18
56.02
54.85
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52.53
51.36
50.20
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46.71
45.55
44.38
43.22
42.05
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15.29
14.13
12.96
11.80
10.64
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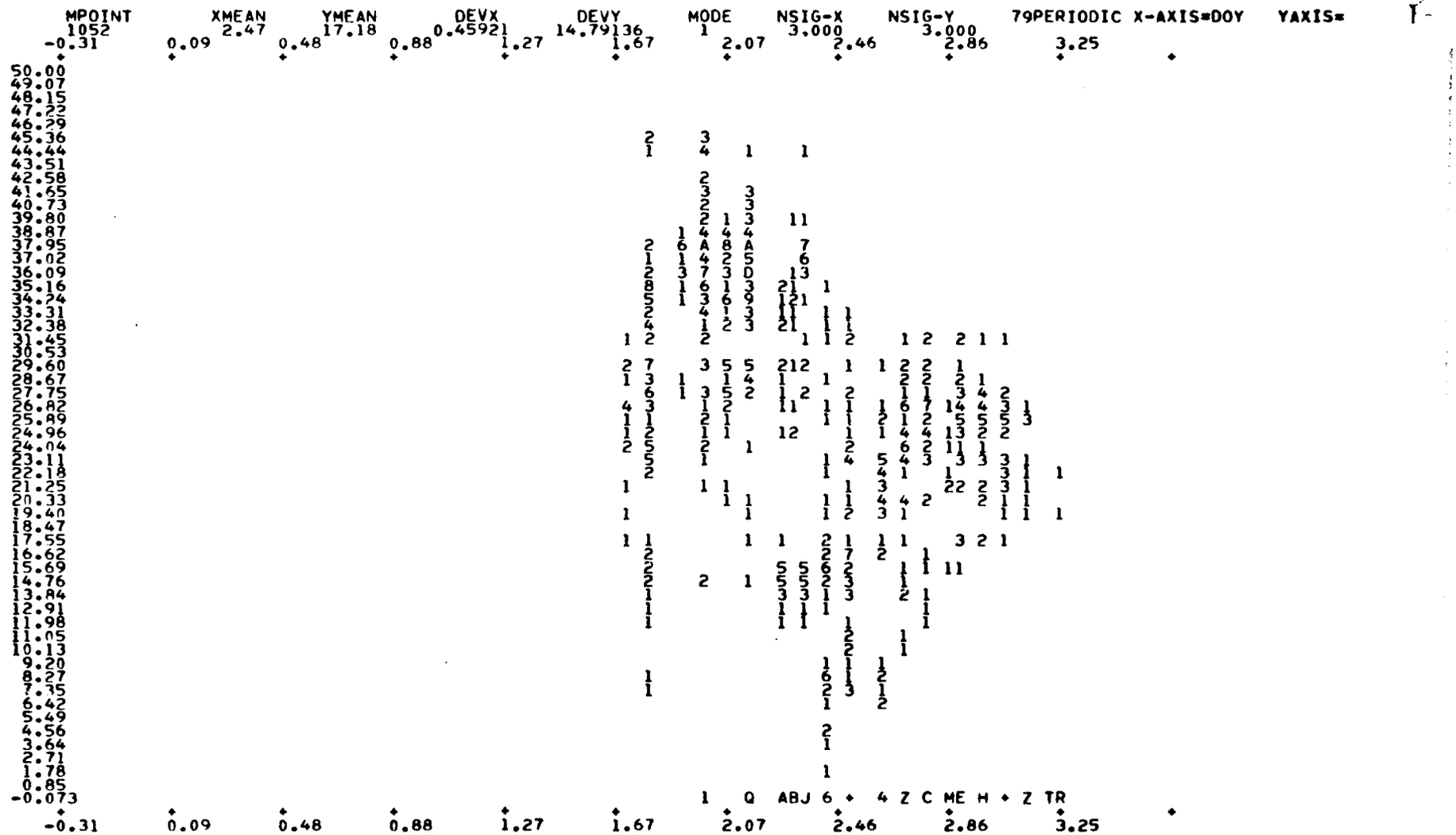
S F B E


MPOINT 1052
XMEAN 2.47
YMEAN 17.18
DEVX 0.45921
DEVY 14.79136
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
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33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
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2.71
1.78
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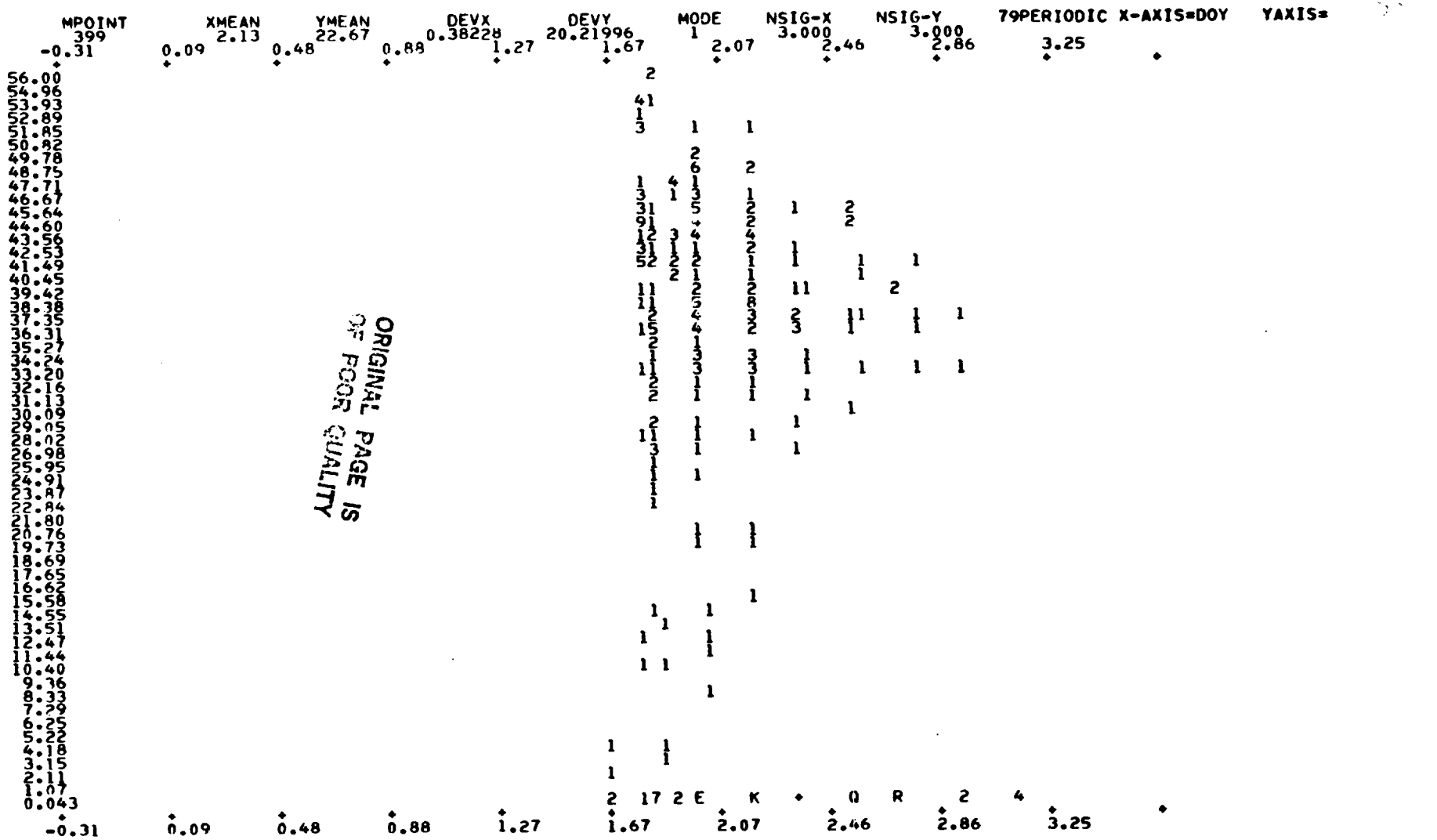
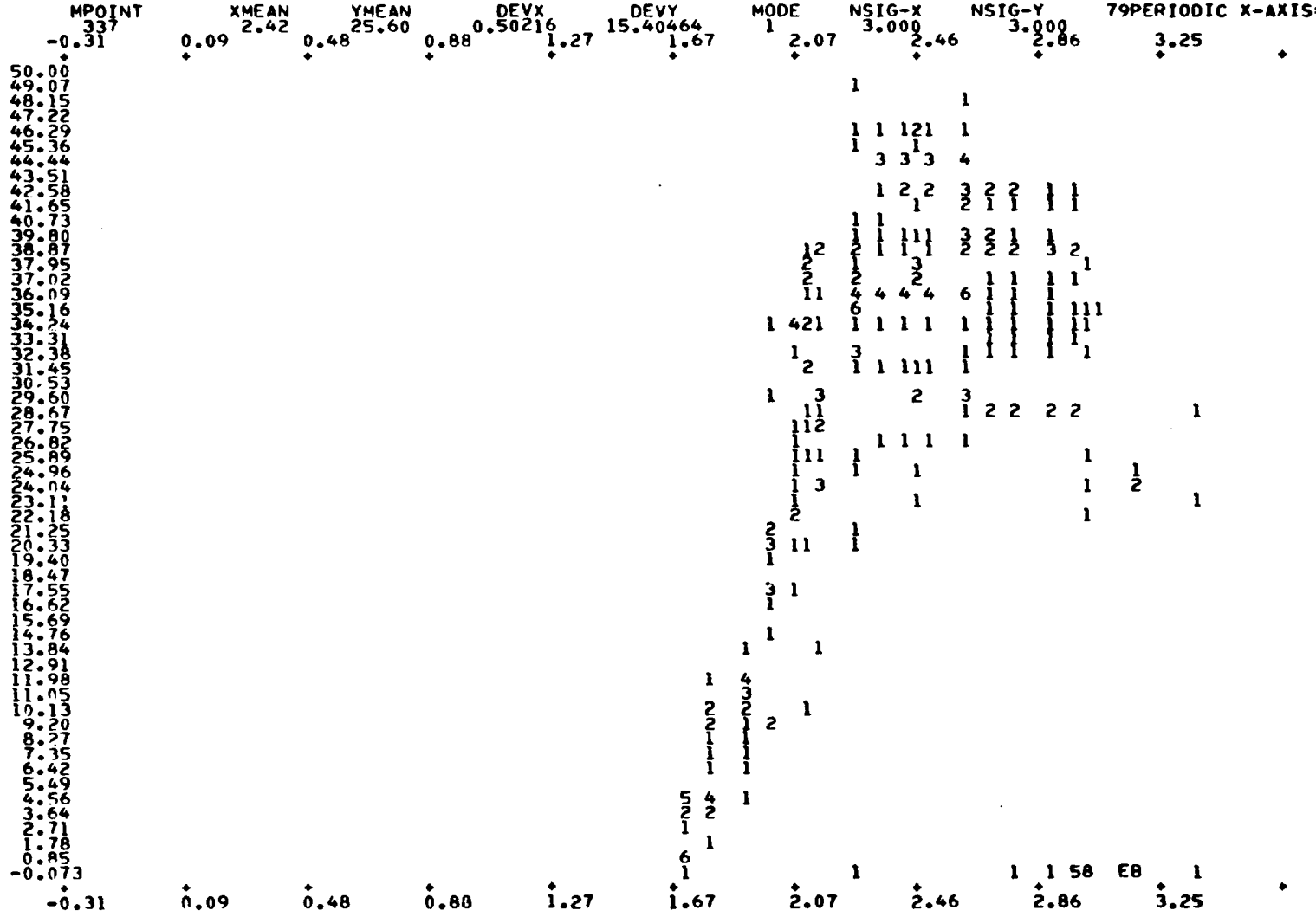
-0.073




MPOINT 337
XMEAN 2.42
YMEAN 25.60
DEVX 0.50216
DEVY 15.40464
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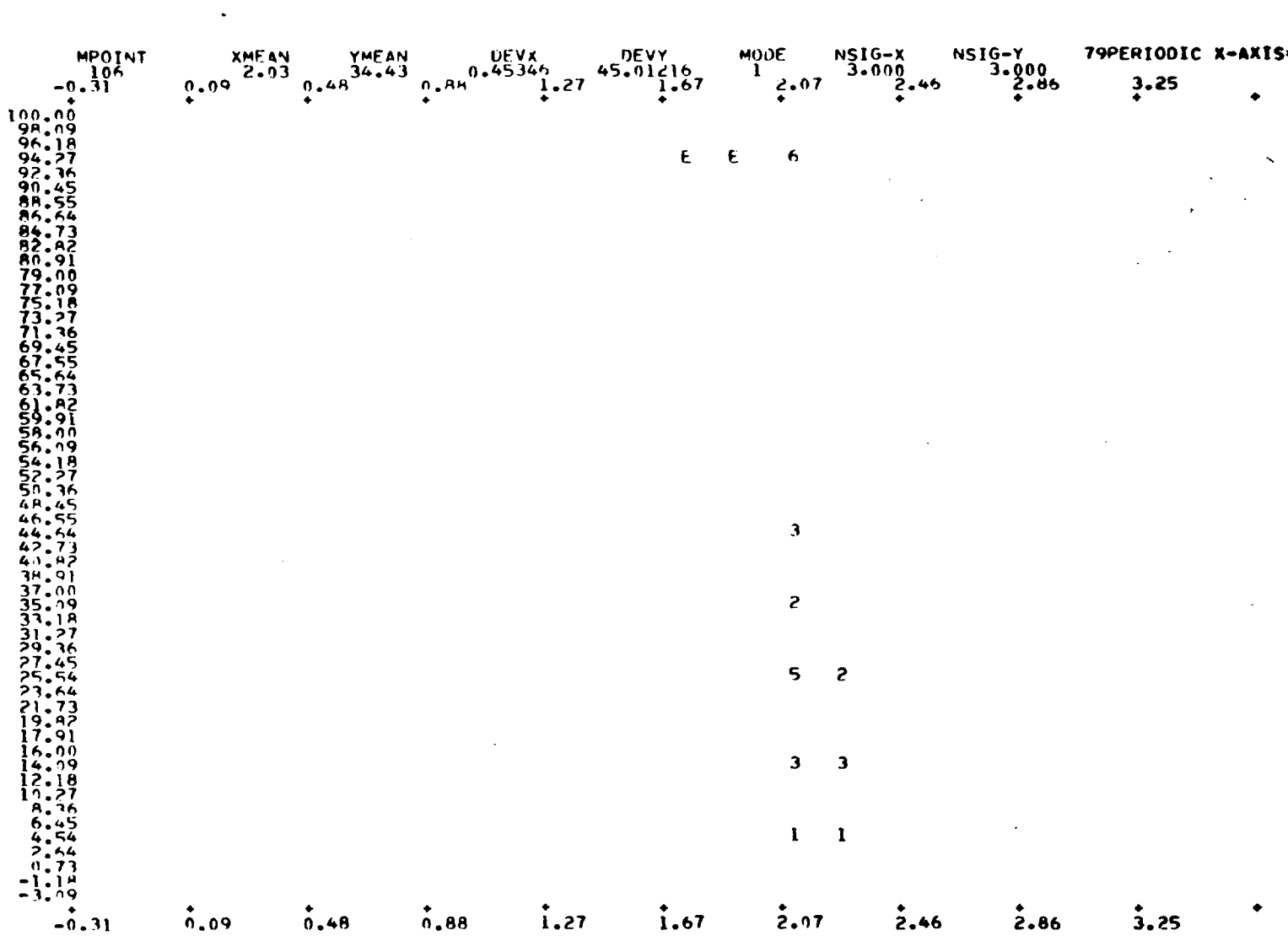
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
50.00
49.07
48.15
47.22
46.29
45.36
44.44
43.51
42.58
41.65
40.73
39.80
38.87
37.95
37.02
36.09
35.16
34.24
33.31
32.38
31.45
30.53
29.60
28.67
27.75
26.82
25.89
24.96
24.04
23.11
22.18
21.25
20.33
19.40
18.47
17.55
16.62
15.69
14.76
13.84
12.91
11.98
11.05
10.13
9.20
8.27
7.35
6.42
5.49
4.56
3.64
2.71
1.78
0.85
-0.073
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

306

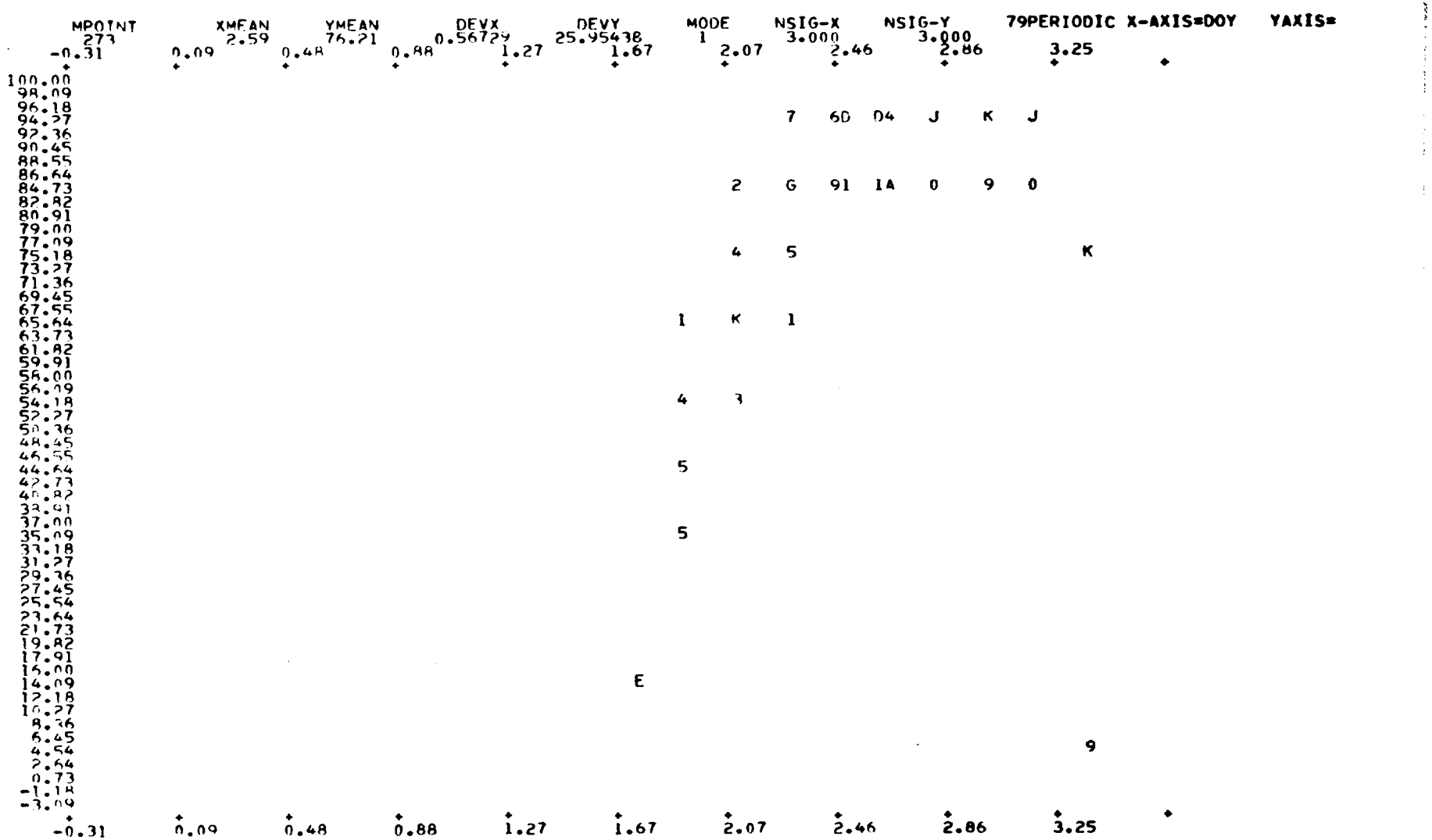
APPENDIX D
GROUND COVER GRAPHS

ALABAMA

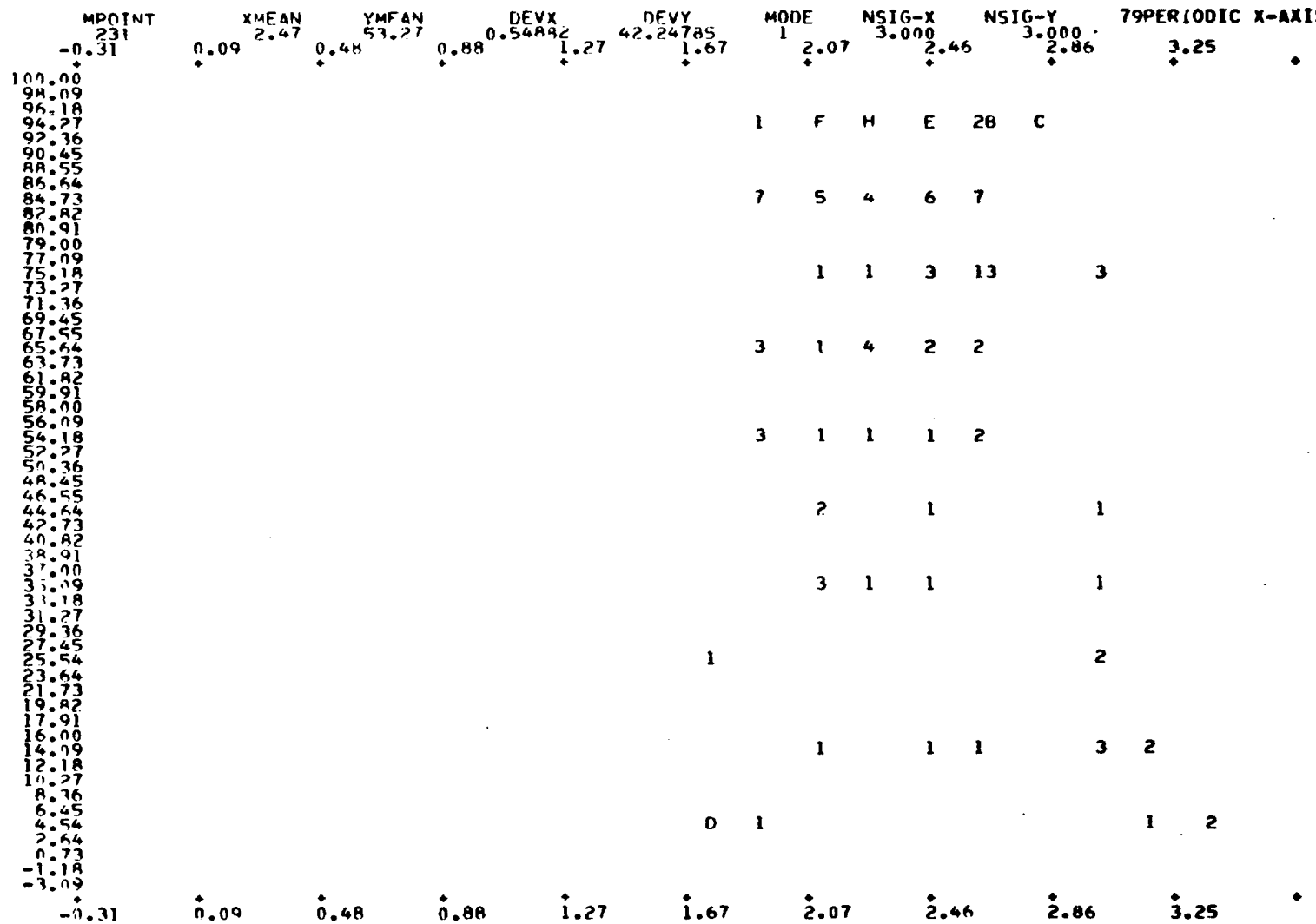
D-2
302


MPOINT 106
XMEAN 2.03
YMEAN 34.43
DEVX 0.45346
DEVY 45.01216
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00 98.09 96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18 -3.09
E E 6
3
2
5 2
3 3
1 1

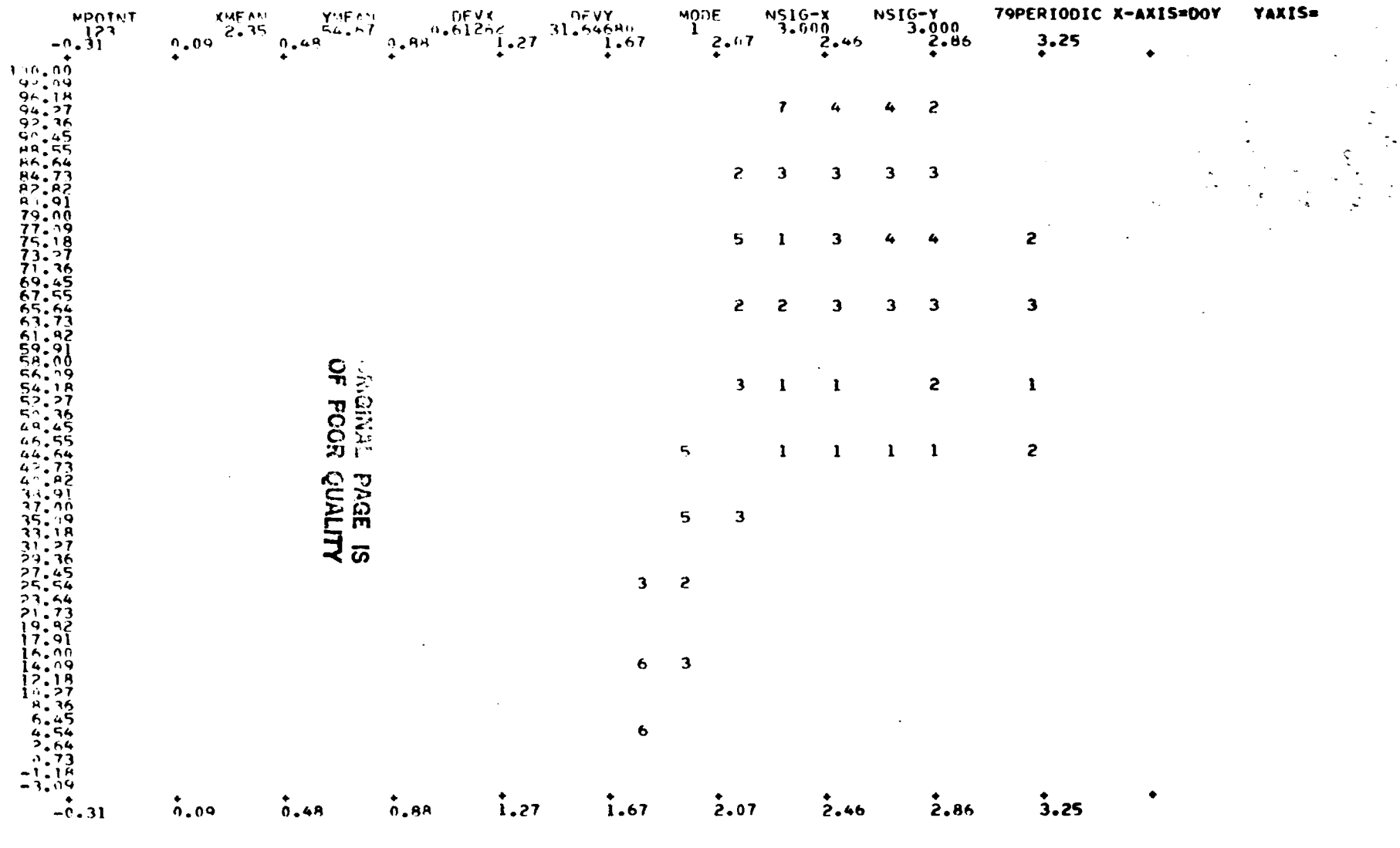
D-3
303


MPOINT 273
XMEAN 2.59
YMEAN 76.21
DEVX 0.56729
DEVY 25.95438
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
56.00
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
7 6D D4 J K J
2 G 91 IA 0 9 0
4 5 K
1 K 1
4 3
5
5
E
9

0-4
304

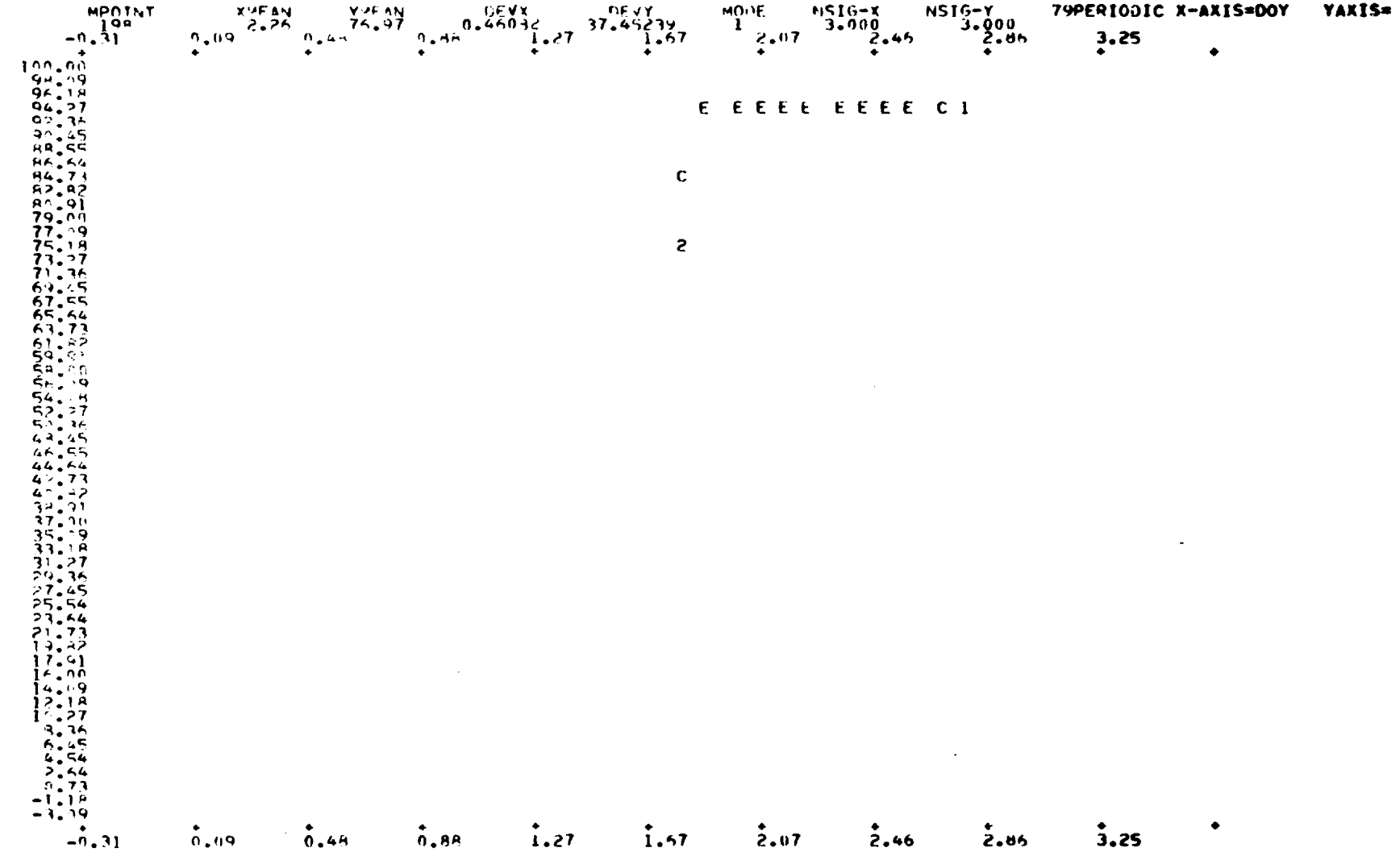

MPOINT 231
XMEAN 2.47
YMEAN 53.27
DEVX 0.54882
DEVY 42.24785
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
94.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
1 F H E 2B C
7 5 4 6 7
1 1 3 13 3
3 1 4 2 2
3 1 1 1 2
2 1 1
3 1 1 1
1 2
1 1 1 3 2
0 1 1 2

ARKANSAS



ORIGINAL PAGE IS
OF POOR QUALITY

B-7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XMEAN 2.26
YMEAN 76.97
DEVX 0.46032
DEVY 37.45239
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
94.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
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50.36
48.45
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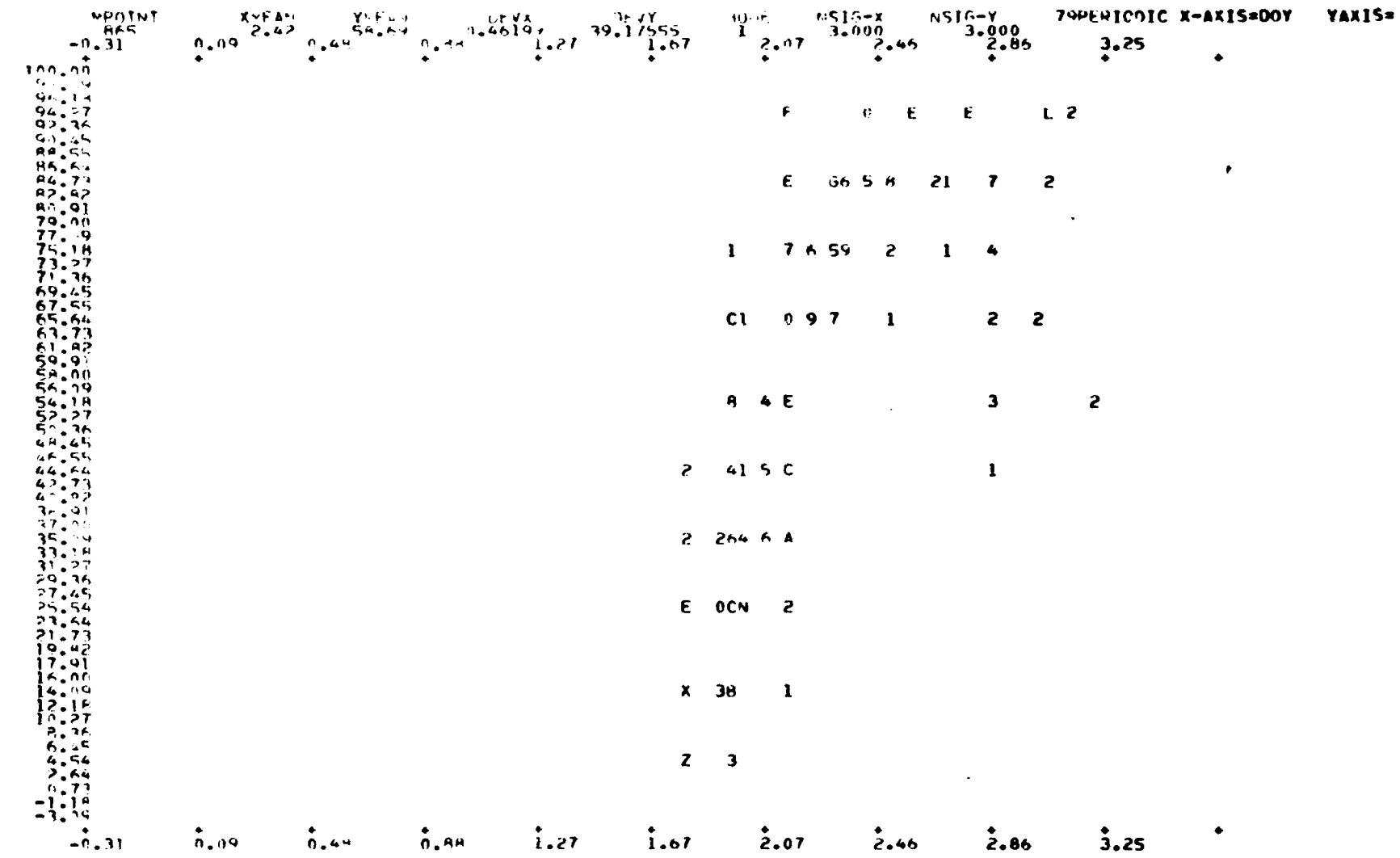
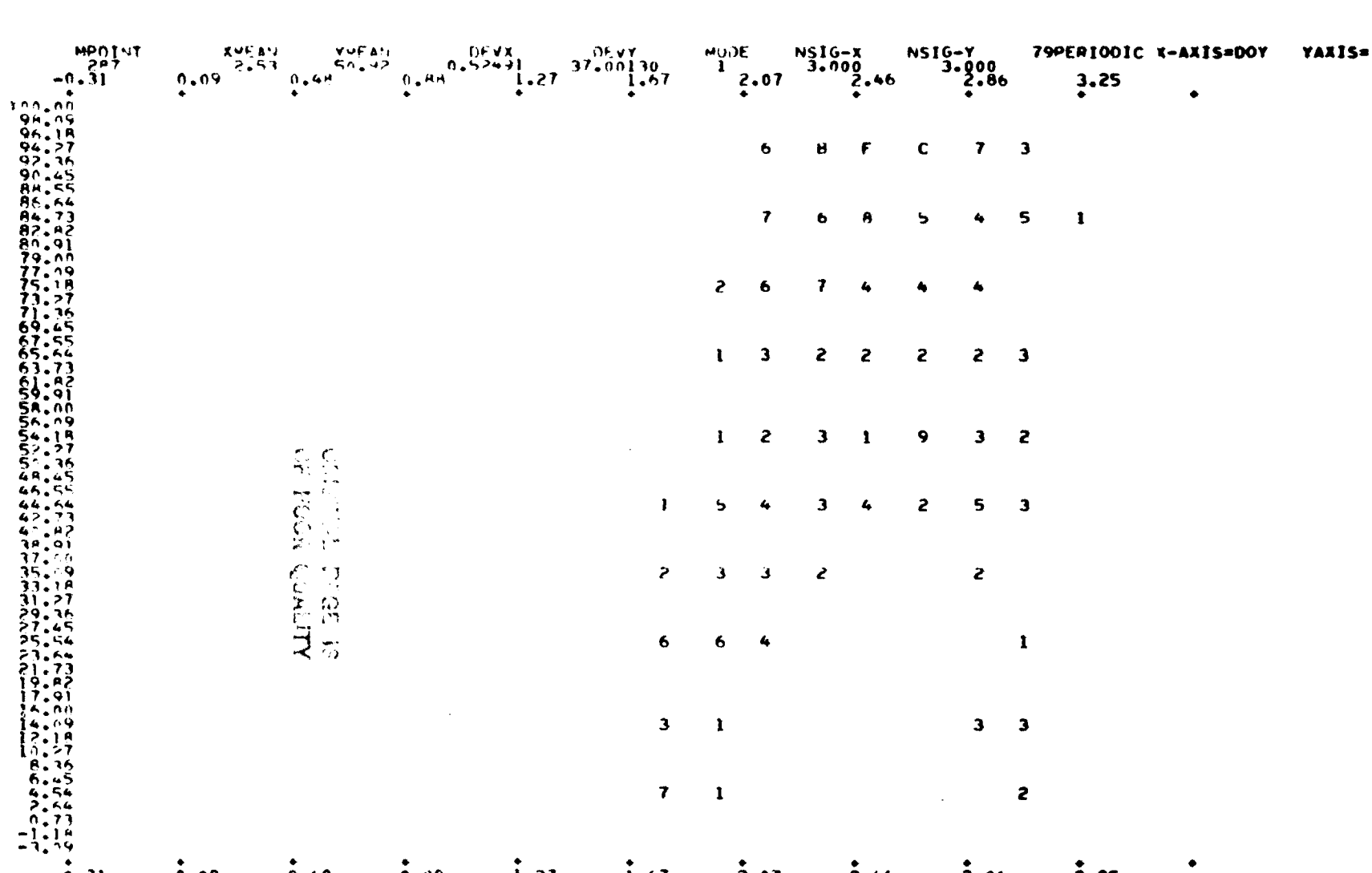
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
E E E E E E E E C 1
C
2


NPOINT 865
XMEAN 2.42
YMEAN 58.64
DEVX 1.46197
DEVY 39.17555
NSIG-X 3.000
NSIG-Y 3.000
TYPENICOIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

CALIFORNIA


MPOINT 287
XMEAN 2.53
YMEAN 50.42
DEVX 0.52491
DEVY 37.00130
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
6 B F C 7 3
7 6 8 5 4 5 1
2 6 7 4 4 4
1 3 2 2 2 2 3
1 2 3 1 9 3 2
1 5 4 3 4 2 5 3
2 3 3 2 2
6 6 4 1
3 1 3 3
7 1 2

```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   115       2.44      64.57    0.58071    39.12943          1      3.000      3.000
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
    +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                     1     1    9   10    8    9     4
 92.36
 90.45
 88.55
 86.64
 84.73                                                          18    5    1   11
 82.82
 80.91
 79.00
 77.09
 75.18                                                          3    1
 73.27
 71.36
 69.45
 67.55
 65.64                                                     2    2    1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                     2    1
 52.27
 50.36
 48.45
 46.55
 44.64                                                     7
 42.73
 40.82
 38.91
 37.00
 35.09                                                     4
 33.18
 31.27
 29.36
 27.45
 25.54
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09
 12.18
 10.27
  8.36
  6.45
  4.54                                          1
  2.64
  0.73
 -1.18
 -3.09
    +          +          +          +          +          +          +          +          +          +          +
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

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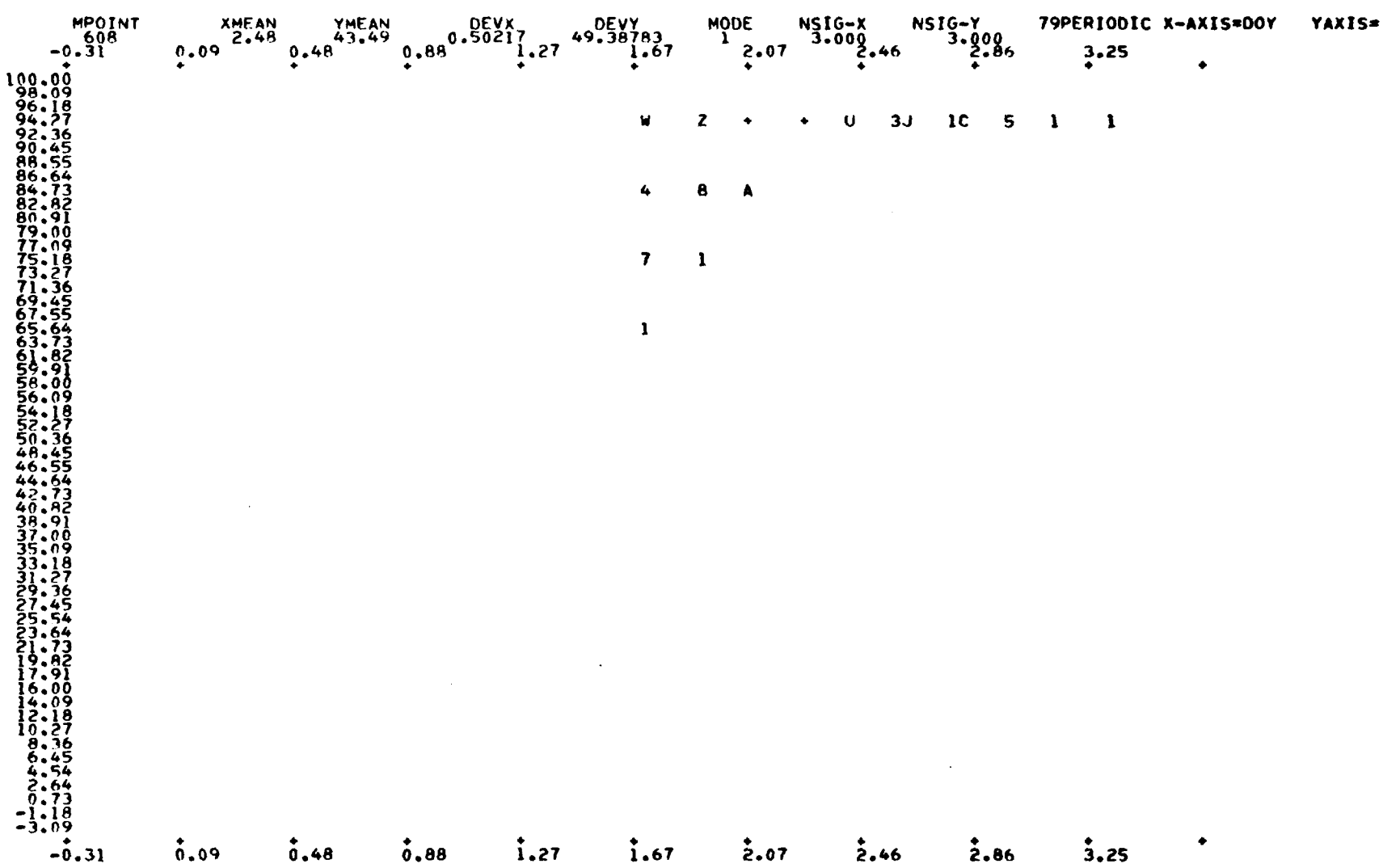
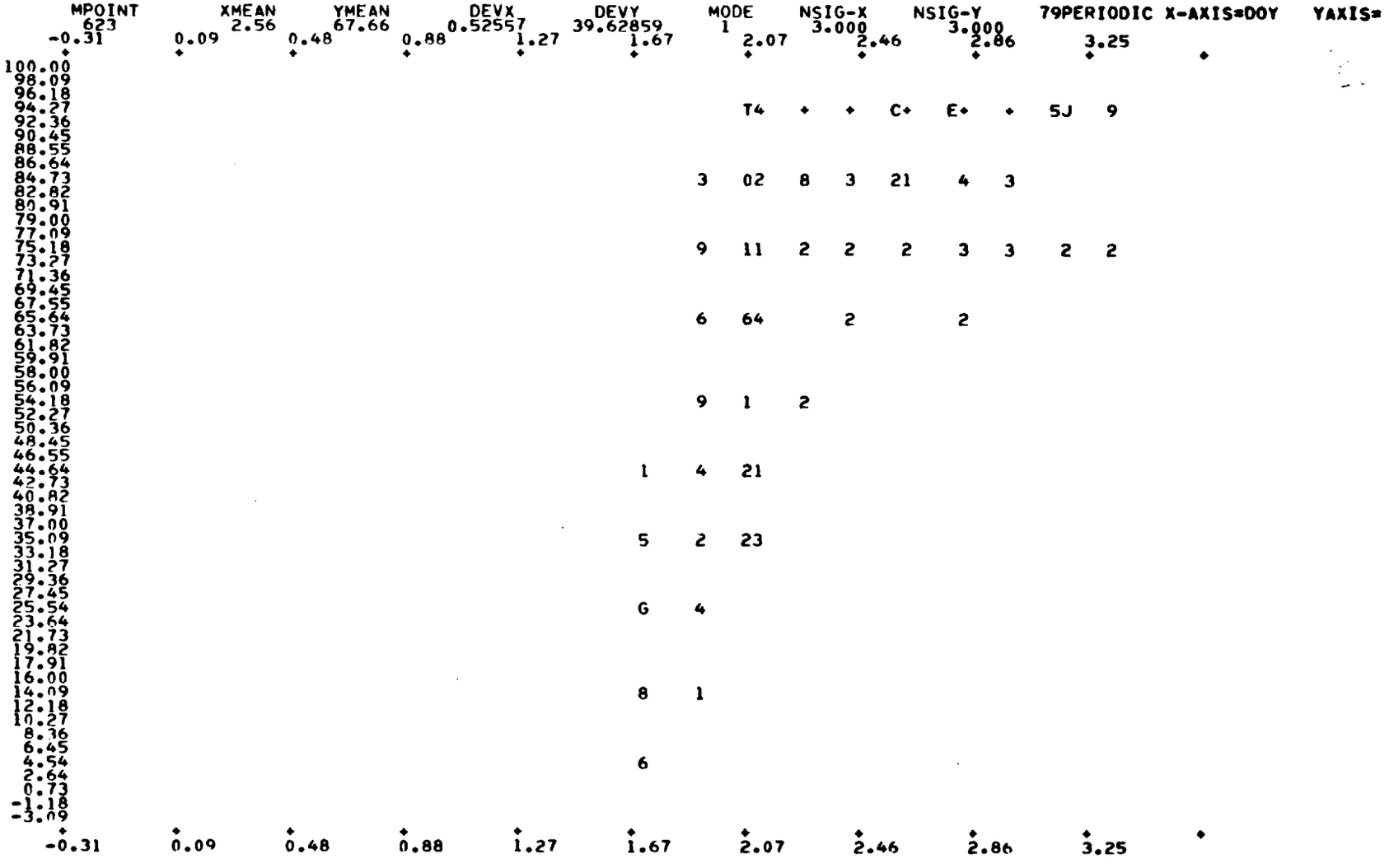
GEORGIA


MPOINT 608
XMEAN 2.48
YMEAN 43.49
DEVX 0.50217
DEVY 49.38783
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
W Z U 3J 1C 5 1 1
4 8 A
7 1
1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XMEAN 2.56
YMEAN 67.66
DEVX 0.52557
DEVY 39.62859
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY
YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00 98.09 96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18 -3.09
T4 C E 5J 9
3 02 8 3 21 4 3
9 11 2 2 2 3 3 2 2
6 64 2 2
9 1 2
1 4 21
5 2 23
G 4
8 1
6
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

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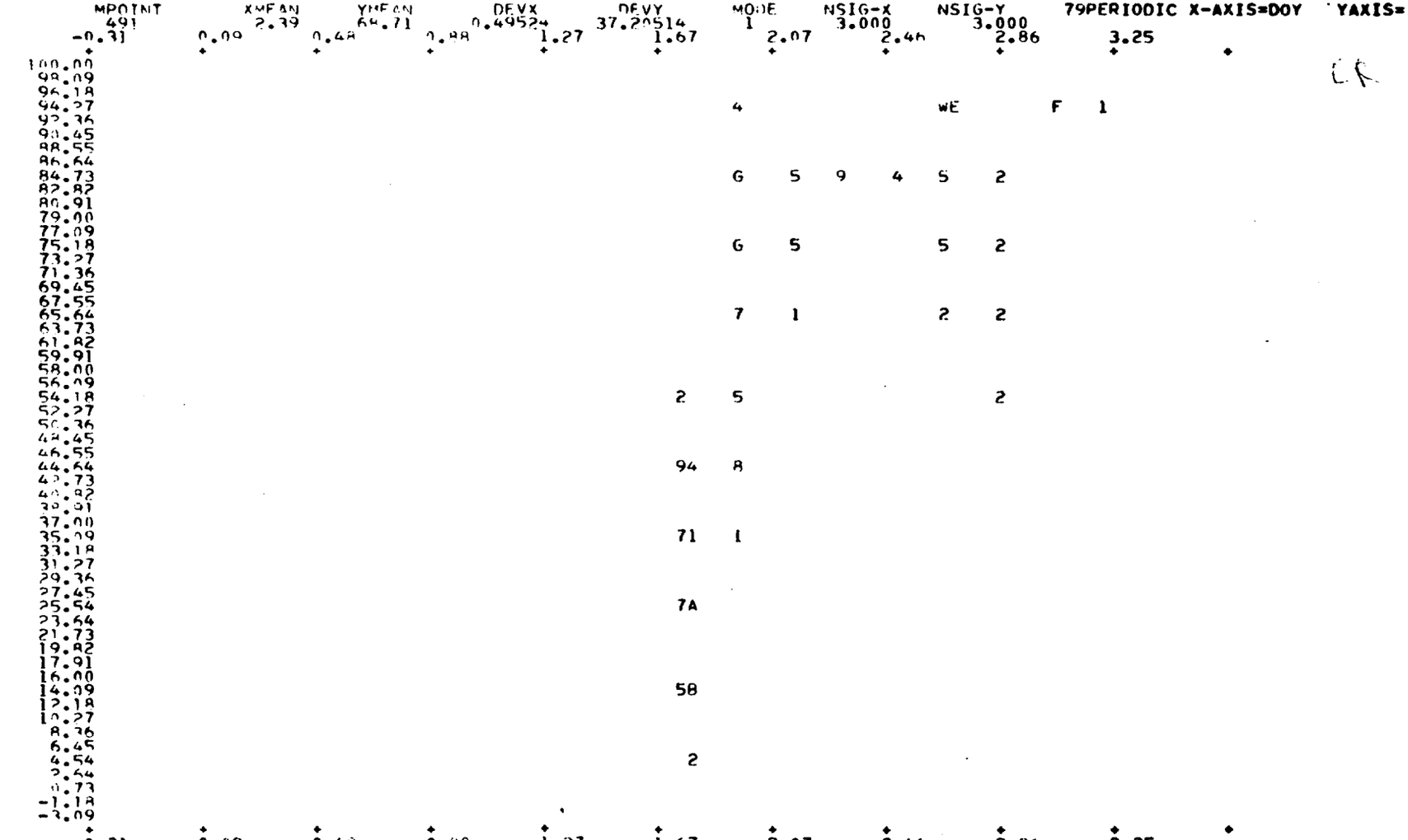
ILLINOIS


MPOINT 491
XMEAN 2.39
YMEAN 64.71
DEVX 0.49524
DEVY 37.20514
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00 98.09 96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18 -3.09
4 WE F 1
G 5 9 4 5 2
G 5 5 2
7 1 2 2
2 5 2
94 8
71 1
7A
58
2

```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY      MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   573       2.34      55.32     0.44967   41.32663         1      3.000      3.000
-0.31        0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
   +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                     1                             NG    9
 92.36
 90.45
 88.55
 86.64
 84.73                                                     2     F    4                  6     1
 82.82
 80.91
 79.00
 77.09
 75.18                                                     7     8              1   1   13     1
 73.27
 71.36
 69.45
 67.55
 65.64                                                     7     5                      2
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                     G     1                      8
 52.27
 50.36
 48.45
 46.55
 44.64                                               1     L     1
 42.73
 40.82
 38.91
 37.00
 35.09                                               6     D                            3
 33.18
 31.27
 29.36
 27.45
 25.54                                               08    3                            4
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                               DB    2                            1
 12.18
 10.27
  8.36
  6.45
  4.54                                               5E
  2.64
  0.73
 -1.18
 -3.09
   +          +          +          +          +          +          +          +          +          +          +
-0.31        0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

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INDIANA

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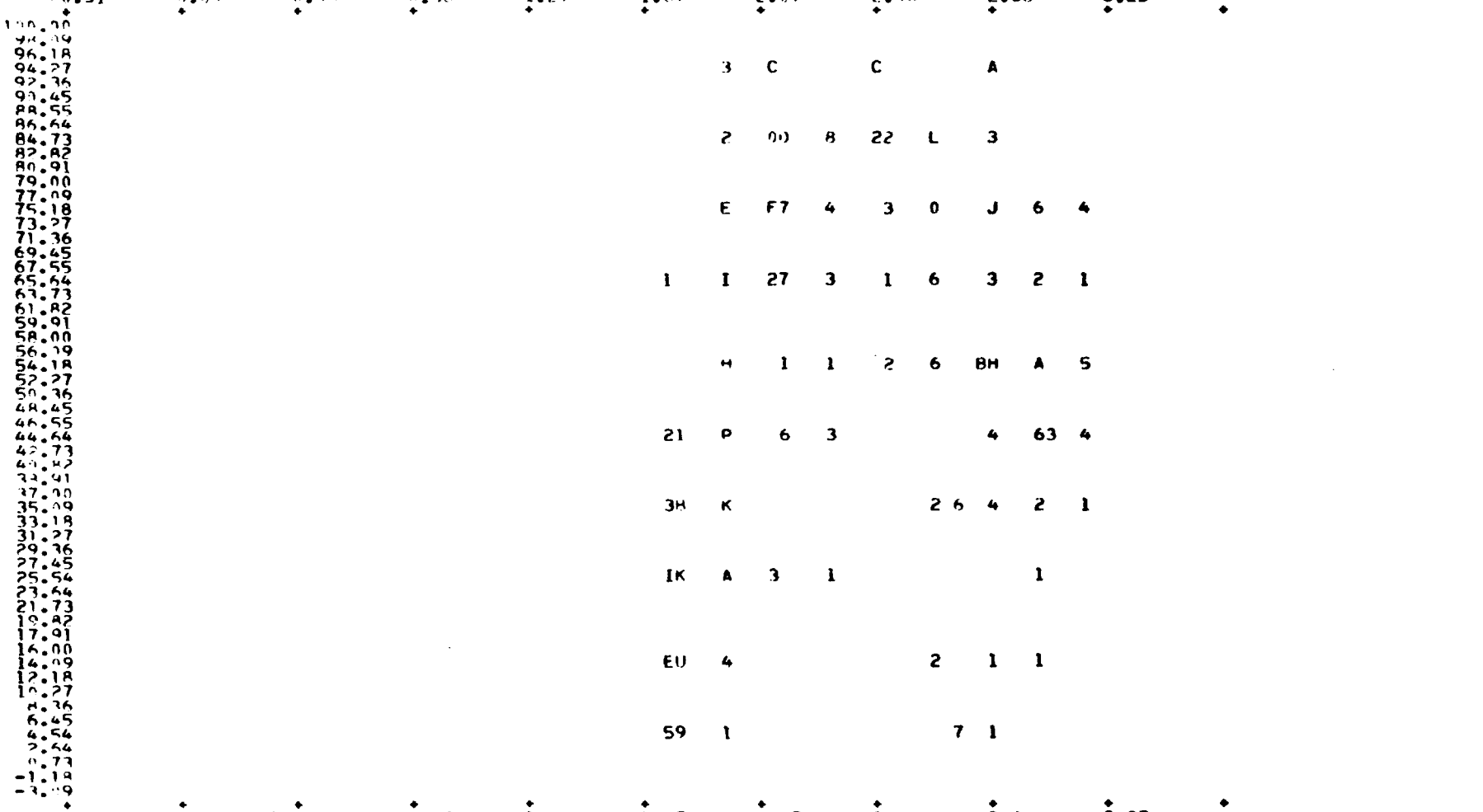
MPOINT 1074 XMEAN 2.45 YMEAN 70.58 DEVX 0.48793 DEVY 37.00734 NODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=

```
      -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
        +         +         +         +         +         +         +         +         +         +         +
100.00
 98.09
 96.18
 94.27                                                  1                   E         B        31
 92.36
 90.45
 88.55
 86.64
 84.73                                                 58   T   4A   1    1              2     1
 82.82
 80.91
 79.00
 77.09
 75.18                                                 17   F   33                   B    63
 73.27
 71.36
 69.45
 67.55
 65.64                                                 42   A    4
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                 57   6    5                        2
 52.27
 50.36
 48.45
 46.55
 44.64                                                 C9   A                        1    59
 42.73
 40.82
 38.91
 37.00
 35.09                                                 8A   3                        1     2
 33.18
 31.27
 29.36
 27.45
 25.54                                                 5E   1                             4     2
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                  8
 12.18
 10.27
  8.36
  6.45
  4.54                                                  3   1
  2.64
  0.73
 -1.18
 -3.09
        +         +         +         +         +         +         +         +         +         +         +
      -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
```


MPOINT 983
XMEAN 2.34
YMEAN 58.52
DEVX 0.45338
DEVY 36.76132
MODE 1
MSIG-X 3.000
MSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18
3 C C A
2 00 8 22 L 3
E F7 4 3 0 J 6 4
1 I 27 3 1 6 3 2 1
H 1 1 2 6 BH A 5
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3H K 2 6 4 2 1
IK A 3 1 1
EU 4 2 1 1
59 1 7 1

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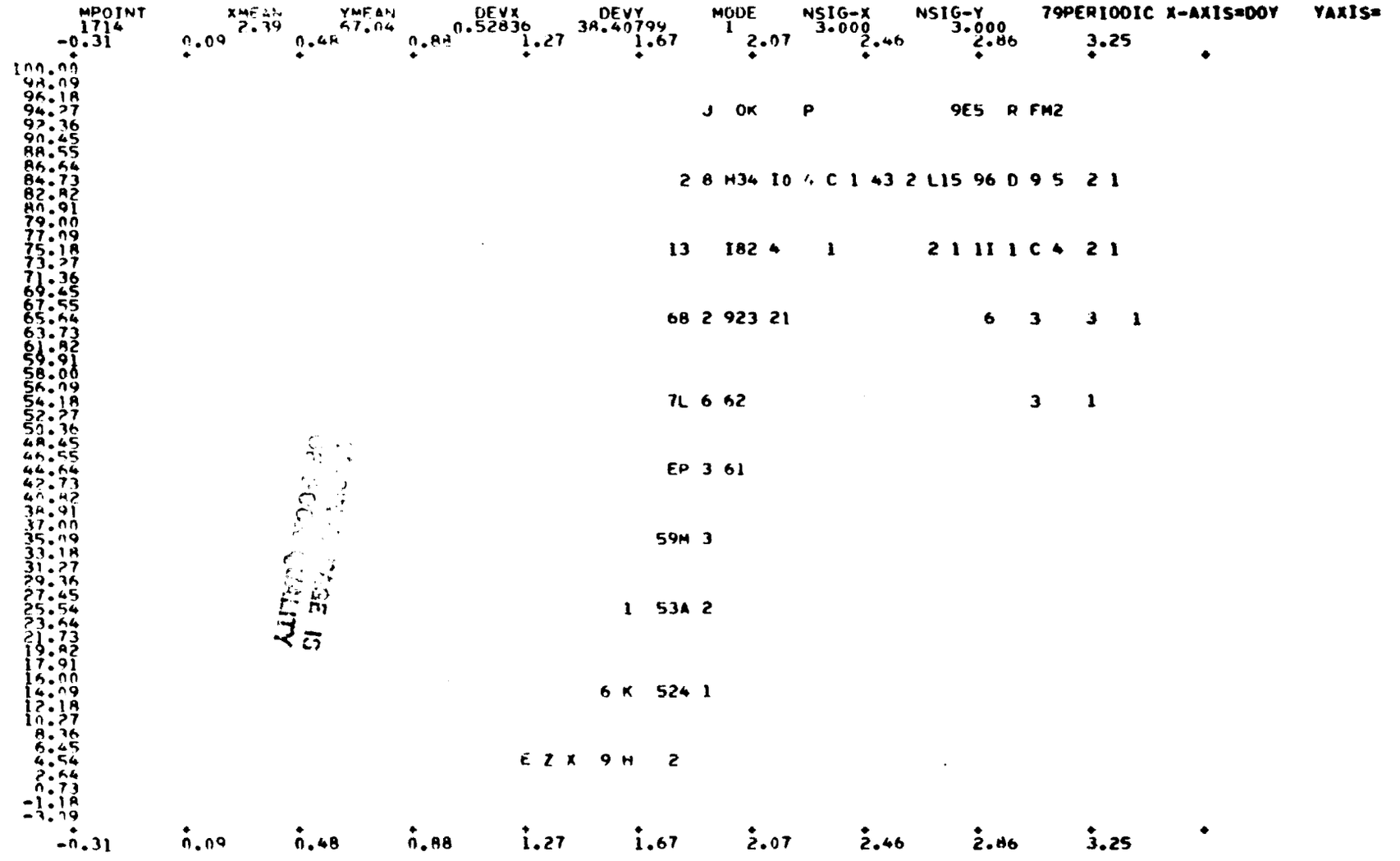
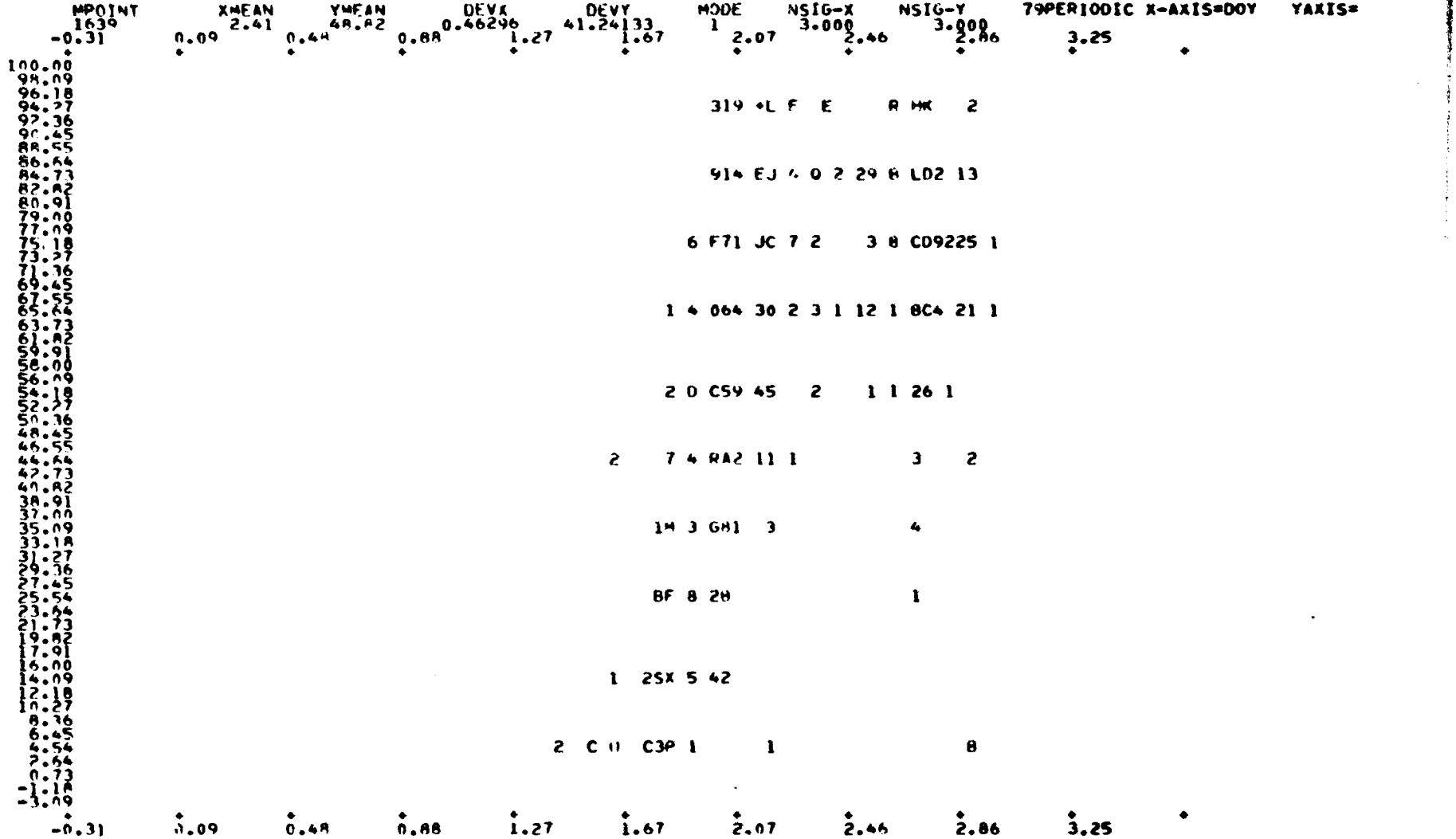
321

IOWA


MPOINT 1714
XMEAN 2.39
YMEAN 67.04
DEVX 0.52836
DEVY 38.40799
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00 98.09 96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18 -3.09
J OK P 9E5 R FM2
2 8 H34 I0 4 C 1 43 2 L15 96 D 9 5 2 1
13 I82 4 1 2 1 1I 1 C 4 2 1
68 2 923 21 6 3 3 1
7L 6 62 3 1
EP 3 61
59M 3
1 53A 2
6 K 524 1
E Z X 9 H 2


MPOINT 1639
XMEAN 2.41
YMEAN 48.82
DEVX 0.46296
DEVY 41.24133
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.55
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
319 +L F E R MK 2
914 EJ 4 0 2 29 R LD2 13
6 F71 JC 7 2 3 8 CD9225 1
1 4 064 30 2 3 1 12 1 8C4 21 1
2 D CS9 45 2 1 1 26 1
2 7 4 RA2 11 1 3 2
1M 3 GH1 3 4
BF 8 28 1
1 2SX 5 42
2 C 11 C3P 1 1 8

3.24

LOUISIANA

~~D-25~~

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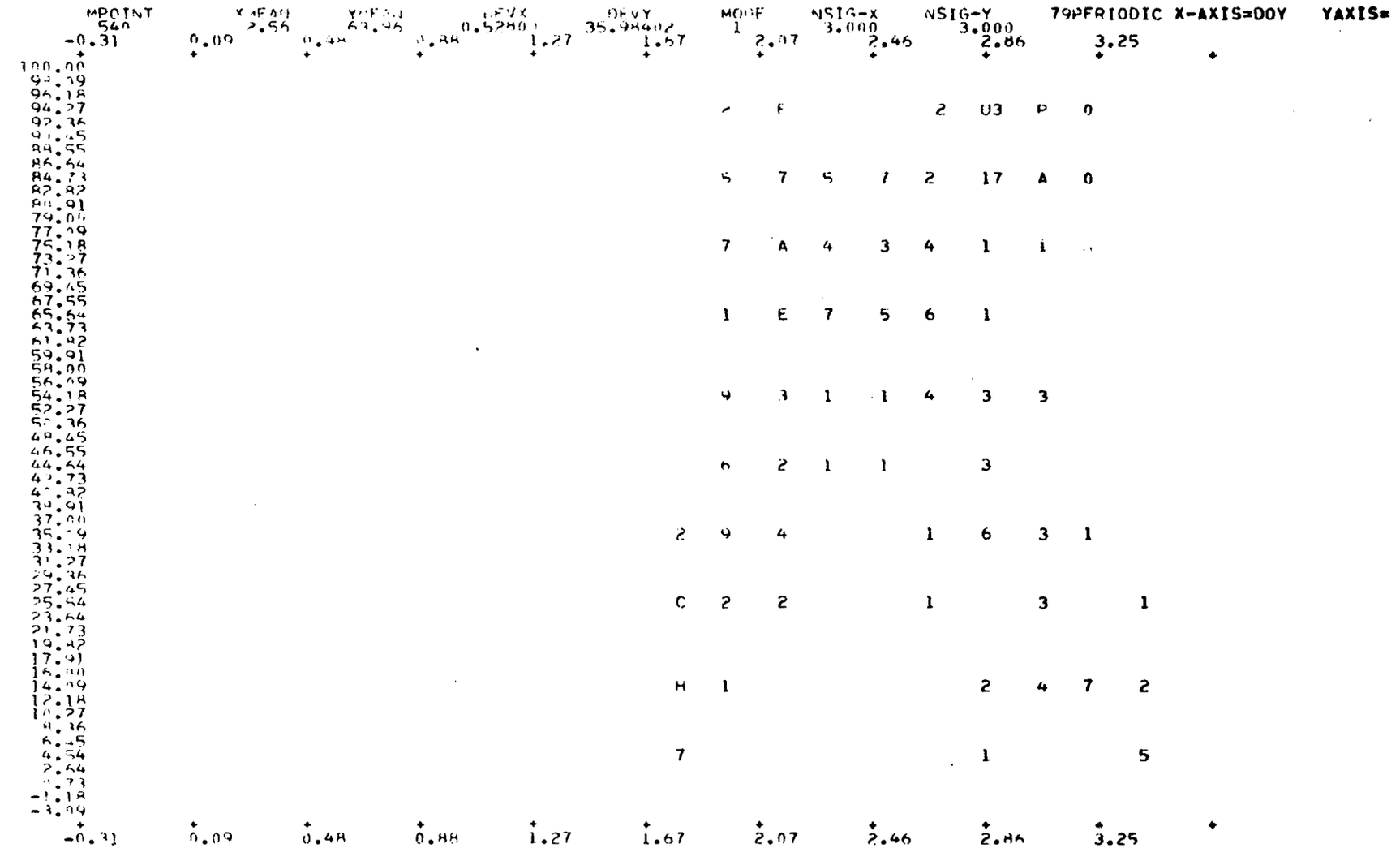
MPOINT 540
XMEAN 2.56
YMEAN 63.96
DEVX 0.52801
DEVY 35.98402
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
96.18
94.27
92.36
88.55
86.64
84.73
82.82
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
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48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09

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326

```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   269       2.25      41.82     0.44336   43.66234          1      3.000      3.000
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
    +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                      3    M 7 E 1  7   4    2
 92.36
 90.45
 88.55
 86.64
 84.73                                                1     9    E S 1
 82.82
 80.91
 79.00
 77.09
 75.18                                                      7    6   1    1
 73.27
 71.36
 69.45
 67.55
 65.64                                                2     4    3   1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                3     5    3   2
 52.27
 50.36
 48.45
 46.55
 44.64                                                7     2    3
 42.73
 40.82
 38.91
 37.00
 35.09                                                1
 33.18
 31.27
 29.36
 27.45
 25.54                                                1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09
 12.18
 10.27
  8.36
  6.45
  4.54                                                0     0
  2.64
  0.73
 -1.18
 -3.09
    +          +          +          +          +          +          +          +          +          +          +
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

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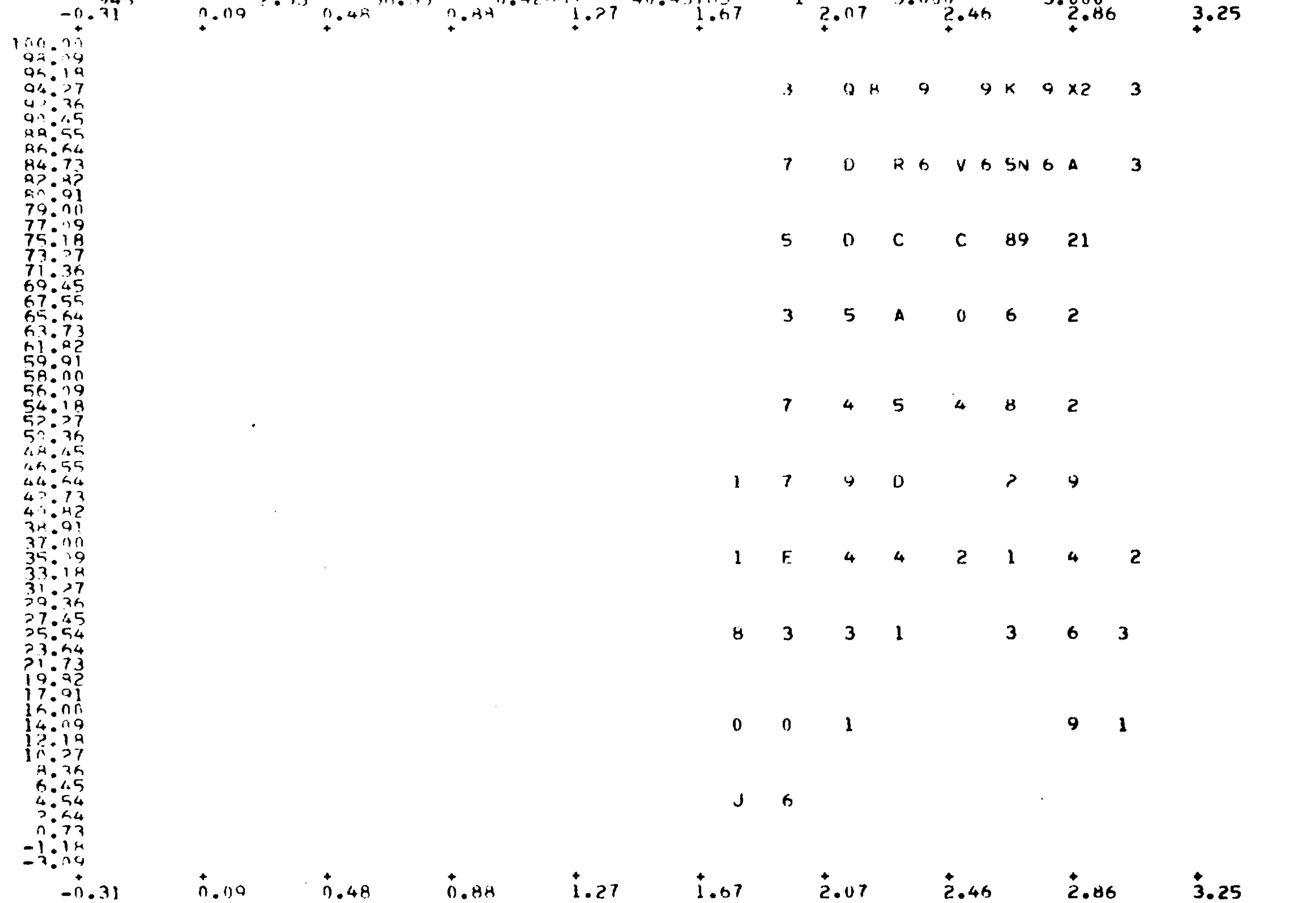
MPOINT	XMEAN	YMEAN	DEVX	DEVY	MODE	NSIG-X	NSIG-Y	79PERIODIC X-AXIS=DOY	YAXIS=
945	2.53	56.35	0.42664	40.43765	1	3.000	3.000		



MINNESOTA

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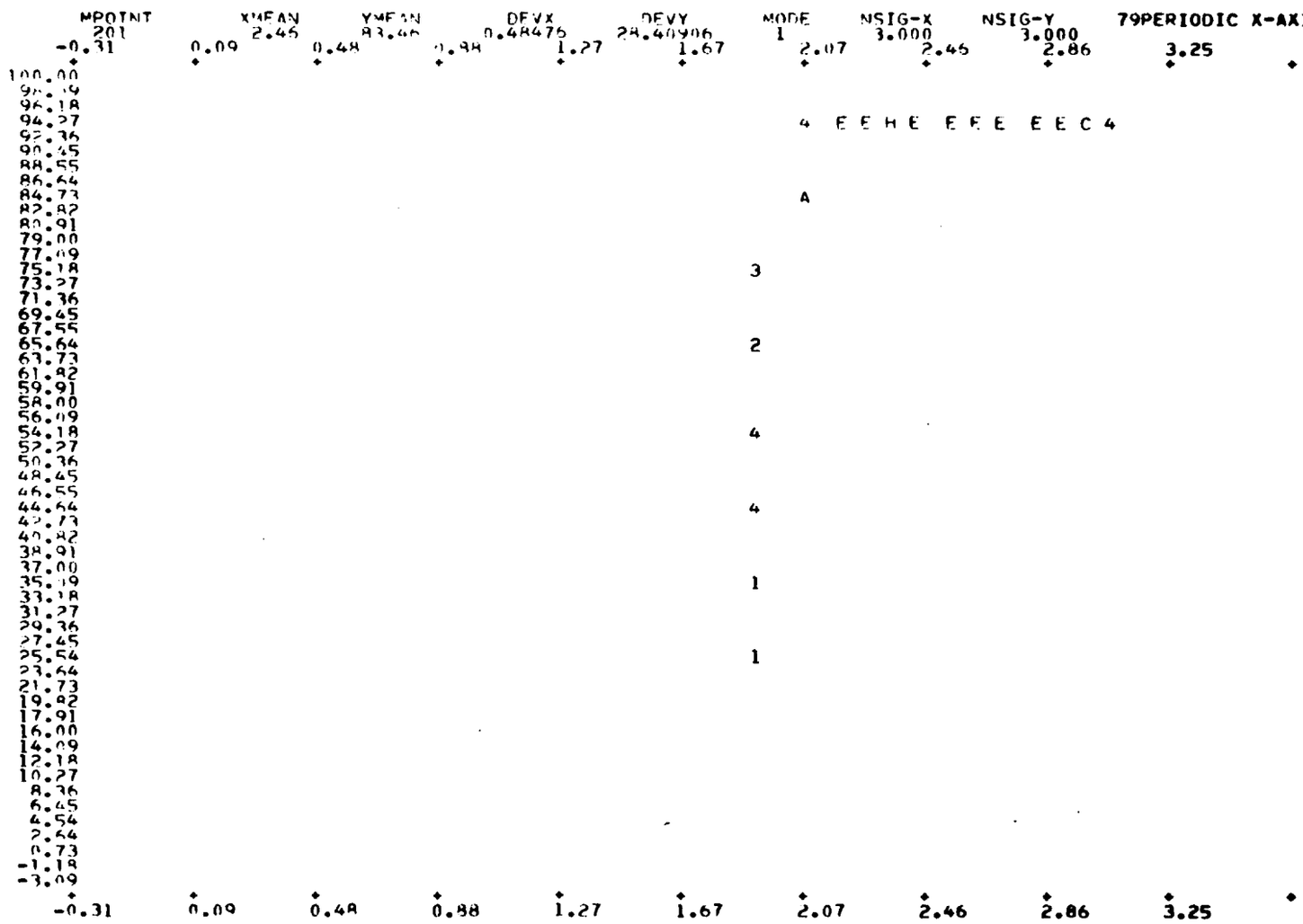
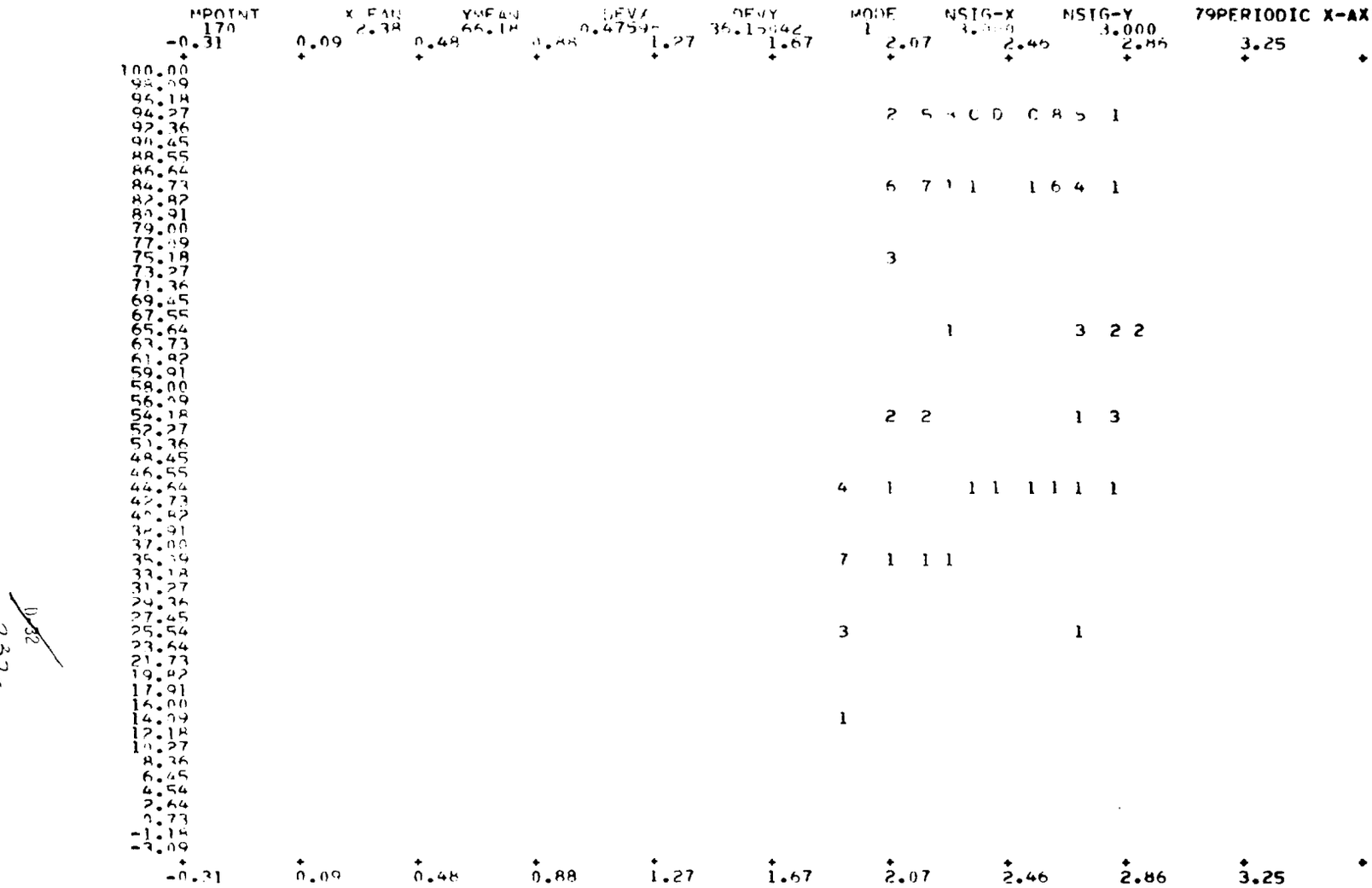
329

```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   347       2.19      41.56     0.38405   43.39758          1      3.000      3.000
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
    +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                  6 C E G G 12 9 3  3
 92.36
 90.45
 88.55
 86.64
 84.73                                                  4 3 8 4 3 11 1 1  1
 82.82
 80.91
 79.00
 77.09
 75.18                                                  6 2 5 1 2  1   1
 73.27
 71.36
 69.45
 67.55
 65.64                                                  1   5   2      2  1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                3 41   3          1
 52.27
 50.36
 48.45
 46.55
 44.64                                                9 31 1 3 1 1    3
 42.73
 40.82
 38.91
 37.00
 35.09                                                2 1  1     4    1
 33.18
 31.27
 29.36
 27.45
 25.54                                                   4 1 1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                2  4
 12.18
 10.27
  8.36
  6.45
  4.54                                                3  2 2
  2.64
  0.73
 -1.18
 -3.09
    +          +          +          +          +          +          +          +          +          +          +
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

D=30
330


MPOINT 201
XMEAN 2.46
YMEAN 83.46
DEVX 0.48476
DEVY 28.40906
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
4 E E H E E E E E C 4
A
3
2
4
4
1
1

331


MPOINT 170
X-MEAN 2.38
YMEAN 66.18
DEVX 0.47595
DEVY 36.15942
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00 98.09 96.18 94.27 92.36 90.45 88.55 86.64 84.73 82.82 80.91 79.00 77.09 75.18 73.27 71.36 69.45 67.55 65.64 63.73 61.82 59.91 58.00 56.09 54.18 52.27 50.36 48.45 46.55 44.64 42.73 40.82 38.91 37.00 35.09 33.18 31.27 29.36 27.45 25.54 23.64 21.73 19.82 17.91 16.00 14.09 12.18 10.27 8.36 6.45 4.54 2.64 0.73 -1.18 -3.09

332

```
    MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y    79PERIODIC X-AXIS=DOY   YAXIS=
       774       2.19      60.97  0.3.3672   38.72688          1      3.000      3.000
   -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
    +         +         +         +         +         +         +         +         +         +         +
100.00
 98.09
 96.18
 94.27                                        752A   Z *EGJ * M 63
 92.36
 90.45
 88.55
 86.64
 84.73                                    2   642H P 0 N 16 F 3 6    3
 82.82
 80.91
 79.00
 77.09
 75.18                                    3 1 49 7 0 2 9  1 2 2 14
 73.27
 71.36
 69.45
 67.55
 65.64                                    2 1 30 4 3 1 2    7 7  3
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                    5 4 60 2 7   2    2 1  4
 52.27
 50.36
 48.45
 46.55
 44.64                                    3 6 69 2 2   3    5    2
 42.73
 40.82
 38.91
 37.00
 35.09                                      5  2 1 1   1    1
 33.18
 31.27
 29.36
 27.45
 25.54                                      6 13 1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                      0  4
 12.18
 10.27
  8.36
  6.45
  4.54                                      1                 4
  2.64
  0.73
 -1.18
 -3.09
    +         +         +         +         +         +         +         +         +         +         +
   -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
```

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```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   749       2.50      63.69    0.51705   37.72780          1      3.000      3.000
 -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
   +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                  3 6  S E * E ND E   ETJ 0 Q 5   A
 92.36
 90.45
 88.55
 86.64
 84.73                                                  5 8  8   J   83  6   4 2  53    4
 82.82
 80.91
 79.00
 77.09
 75.18                                              4 9    4   0   4   3   3 1          1
 73.27
 71.36
 69.45
 67.55
 65.64                                              3 4 1  A   1           3    2    6
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                            2 1 4    7       1   1   1 2  4  1 4
 52.27
 50.36
 48.45
 46.55
 44.64                                            5 1 4    1       1       6    1    1
 42.73
 40.82
 38.91
 37.00
 35.09                                            5 5 3    1               1    2    1
 33.18
 31.27
 29.36
 27.45
 25.54                                            3 1 8    3                    7    2
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                          8 58   C                          6    8    6
 12.18
 10.27
  8.36
  6.45
  4.54                                          7 E7   7                               4    4
  2.64
  0.73
 -1.18
 -3.09
   +          +          +          +          +          +          +          +          +          +          +
 -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

```
     MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
       1222       2.48      49.48    0.50244   42.52672          1      3.000      3.000
     -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
       +          +          +          +          +          +          +          +          +          +          +
160.00
158.09
156.18
154.27                                                1    5   D  0 E   E S  E    80  0 725    2
152.36
150.45
148.55
146.64
144.73                                                1          0       N0   J    D
142.82
140.91
139.00
137.09
135.18                                                     4 3 1  A   H   51   4  1 8 1 2
133.27
131.36
129.45
127.55
125.64                                                       2    E   5   2         2 1 211  1
123.73
121.82
119.91
118.00
116.09
114.18                                                       1 2    D                2    5   1    1
112.27
110.36
108.45
106.55
104.64                                                1  1 4 9    G                  3   31   1
102.73
100.82
 98.91
 97.00
 95.09                                                2  1 1 G    8   1
 93.18
 91.27
 89.36
 87.45
 85.54                                                   1   R    F            2    3    2
 83.64
 81.73
 79.82
 77.91
 76.00
 74.09                                                  H1        3                 2    3
 72.18
 70.27
 68.36
 66.45
 64.54                                                0 +    I    1                 1    1   1
 62.64
 60.73
 58.82
 56.91
 55.00
       +          +          +          +          +          +          +          +          +          +          +
     -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

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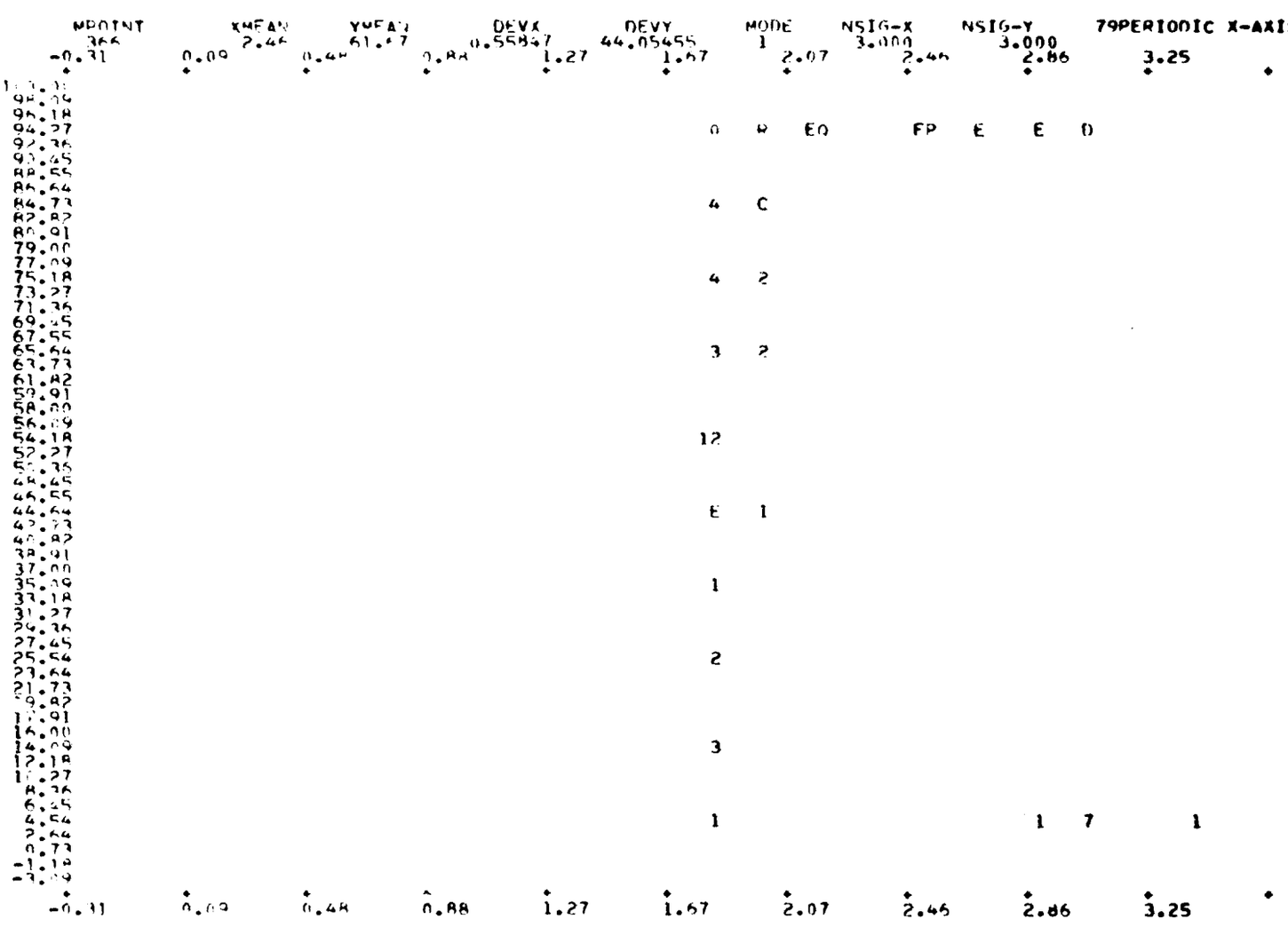
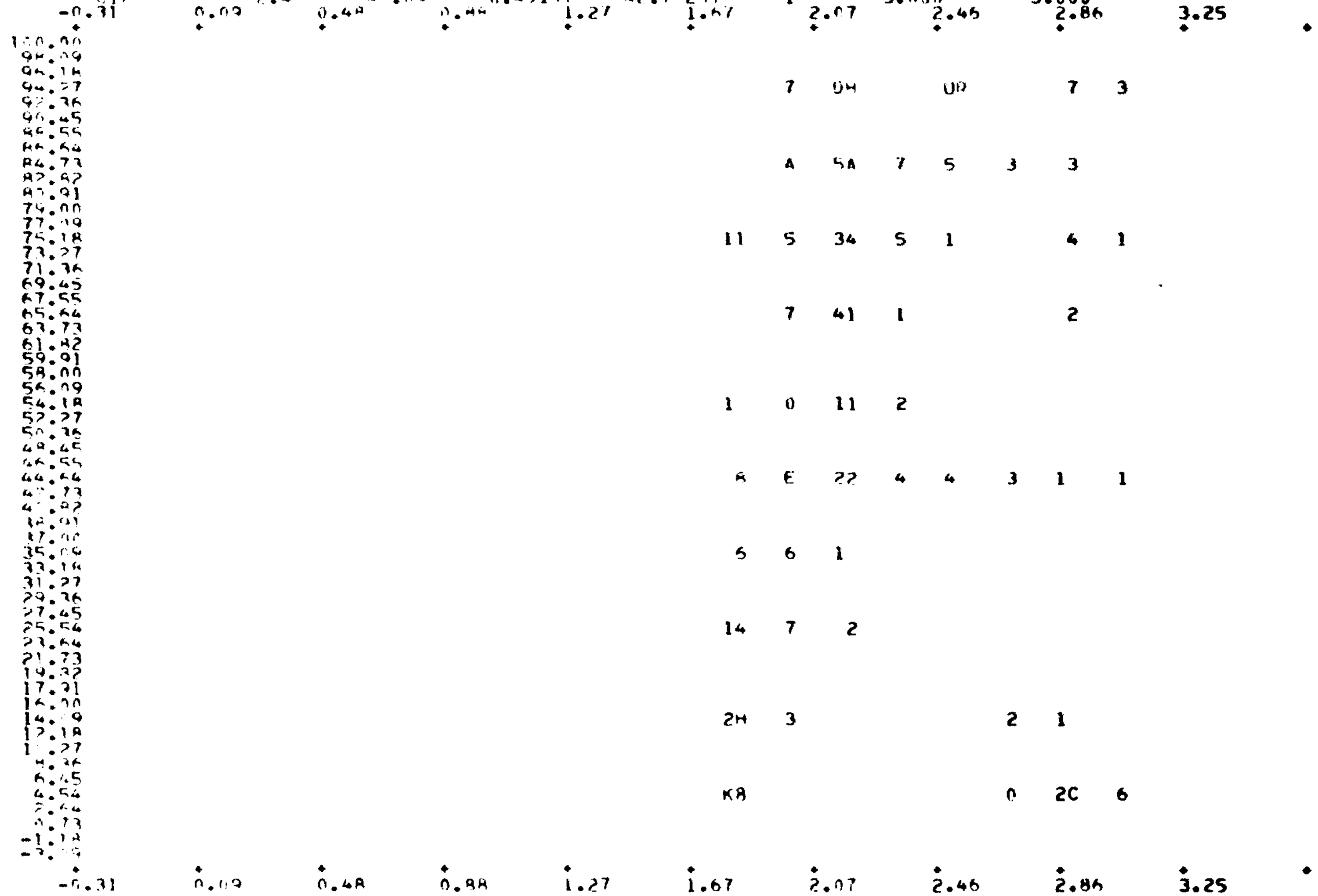

NPOINT 366
XMEAN 2.46
YMEAN 61.47
DEVX 0.55847
DEVY 44.05455
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
0 R EQ FP E E D
4 C
4 2
3 2
12
E 1
1
2
3
1 1 7 1
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

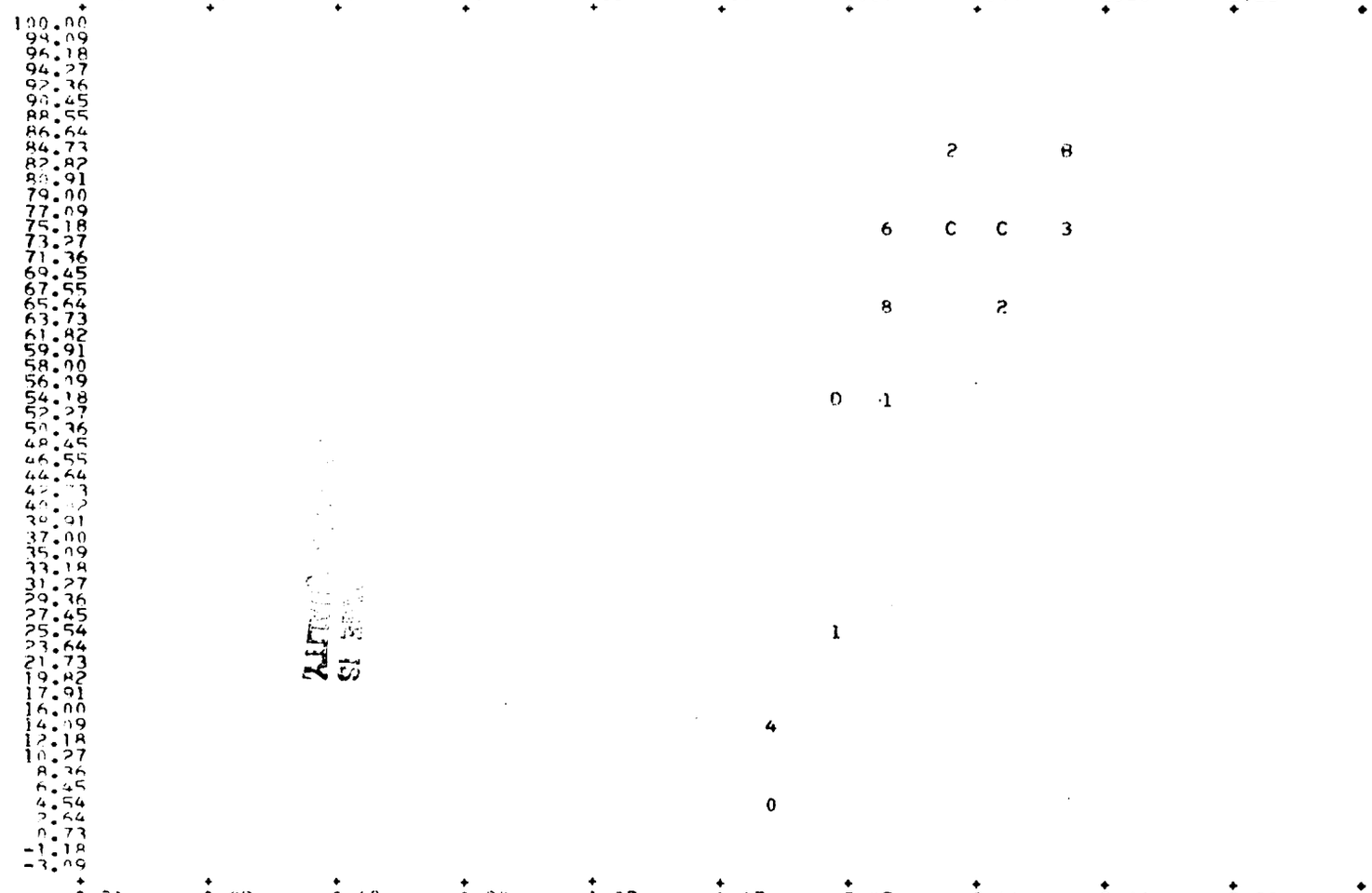
NPOINT 612 XMEAN 2.46 YMEAN 44.04 DEVX 0.49197 DEVY 42.78207 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



NEBRASKA

~~D-40~~
340

MPOINT 137 XMEAN 2.47 YMEAN 37.85 DEVX 0.61744 DEVY 37.47406 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



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     MPOINT        XMEAN        YMEAN         DEVX         DEVY         MODE      NSIG-X       NSIG-Y      79PERIODIC X-AXIS=DOY   YAXIS=
       487         2.41        54.26      0.45432     34.97533            1      3.000        3.000
    -0.31         0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
      +            +            +            +            +            +            +            +            +            +            +
100.00
 98.09
 96.18
 94.27                                                                    7    86  L12  4 1    1
 92.36
 90.45
 88.55
 86.64                                                                   39 5 878 N75  854 82
 84.73
 82.82
 80.91
 79.00
 77.09
 75.18                                                                1 4 53 3 5 8 646  653 11   1
 73.27
 71.36
 69.45
 67.55
 65.64                                                                9 3 41 4 5 4 612  434 3    1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                             1  7 1 6  3 2 2        2 1  1 1 1
 52.27
 50.36
 48.45
 46.55
 44.64                                                             2  3 3 4    1                1 1
 42.73
 40.82
 38.91
 37.00
 35.09                                                          1 3  9 4
 33.18
 31.27
 29.36
 27.45
 25.54                                                          1 347  9
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                          7 726  3
 12.18
 10.27
  8.36
  6.45
  4.54                                                          7 H2   1
  2.64
  0.73
 -1.18
 -3.09
      +            +            +            +            +            +            +            +            +            +            +
    -0.31         0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
```

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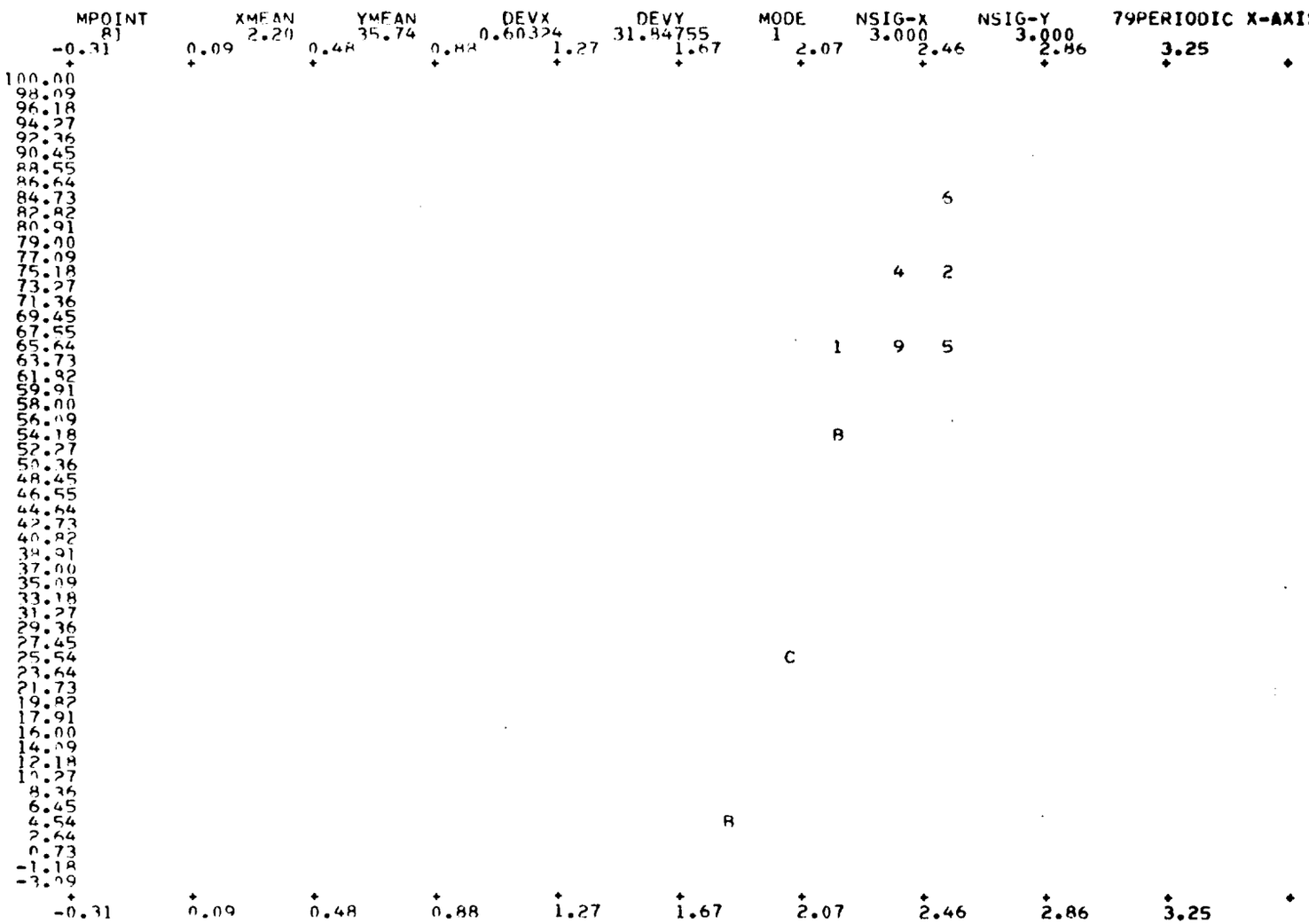
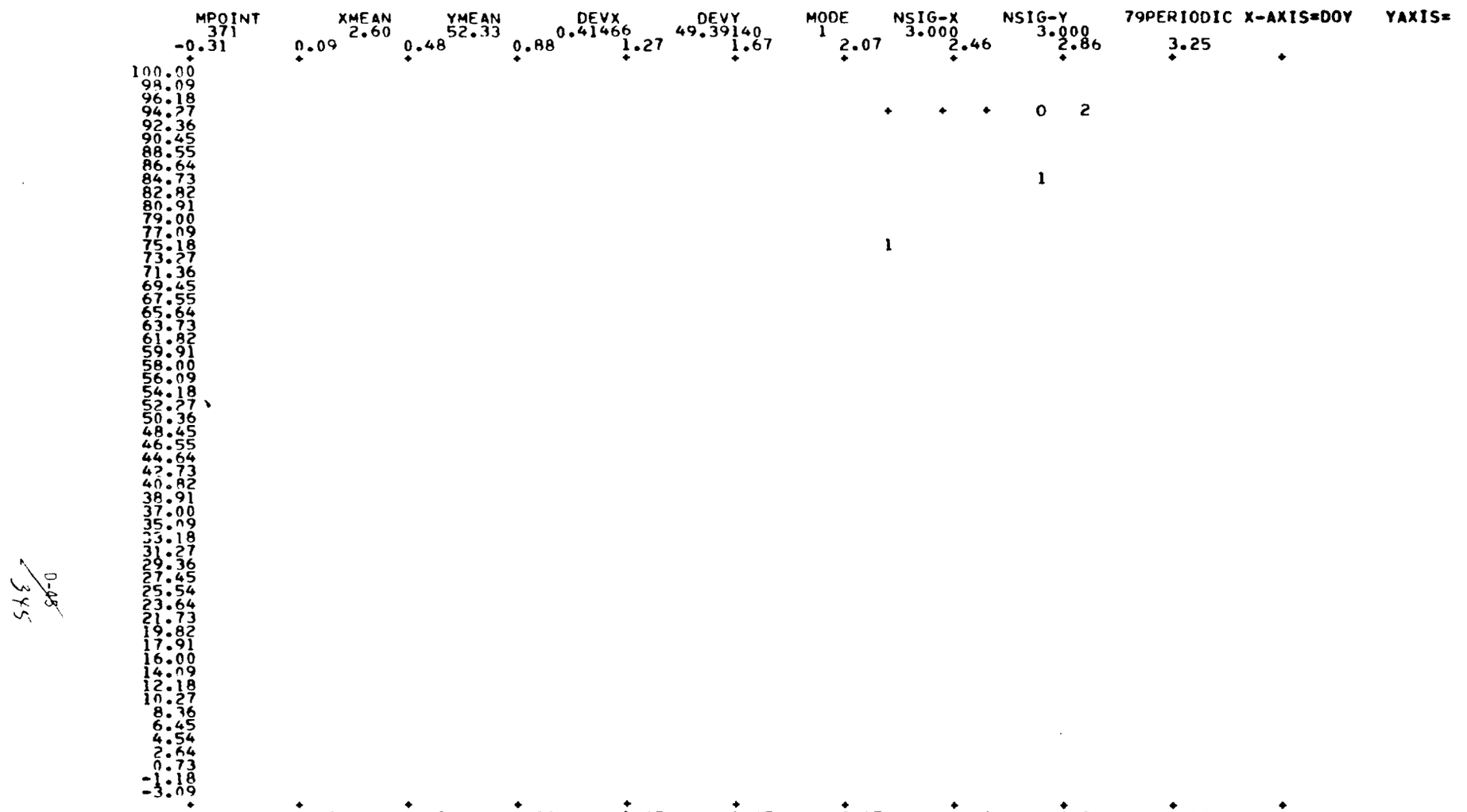
392


MPOINT 81
XMEAN 2.20
YMEAN 35.74
DEVX 0.60324
DEVY 31.84755
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09

NORTH CAROLINA


MPOINT 371
XMEAN 2.60
YMEAN 52.33
DEVX 0.41466
DEVY 49.39140
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

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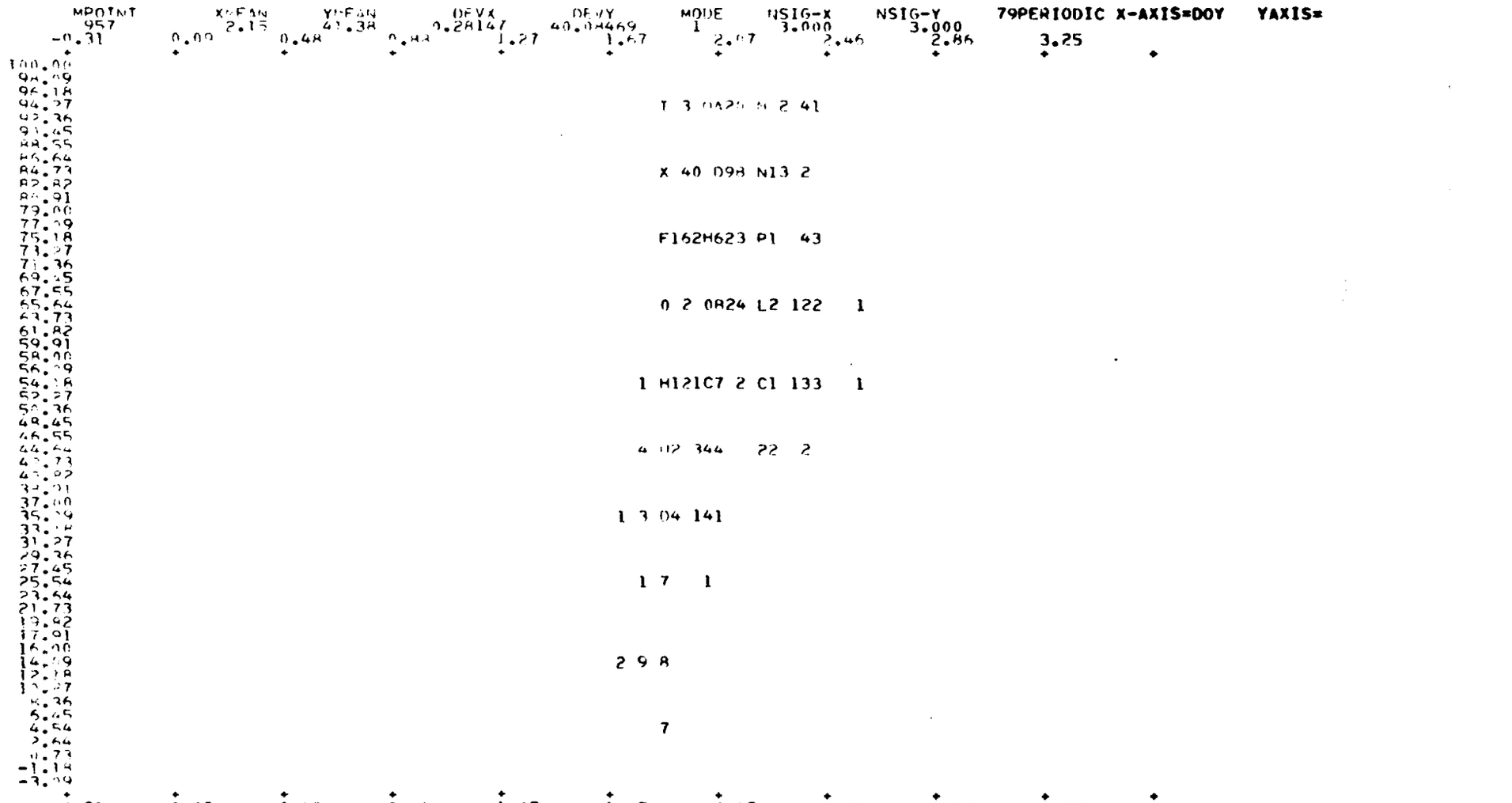
345

```
 MPOINT         XMEAN      YMEAN       DEVX       DEVY         MODE    NSIG-X      NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   551           2.78      60.08     0.45348    38.79704        1       3.000       3.000
 -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
   +         +         +         +         +         +         +         +         +         +         +
100.00
 98.09
 96.18
 94.27                                                        E    T                   N   64    1
 92.36
 90.45
 88.55
 86.64
 84.73                                                        8    9    8    9    7    9    3
 82.82
 80.91
 79.00
 77.09
 75.18                                                        8    0    9    5    7    4   14
 73.27
 71.36
 69.45
 67.55
 65.64                                                        6    3    2    2    3    3    2
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                        4    2    4    6    4    3   12
 52.27
 50.36
 48.45
 46.55
 44.64                                                        A    6    5    3    4    4
 42.73
 40.82
 38.91
 37.00
 35.09                                                        6    4    1    1         1
 33.18
 31.27
 29.36
 27.45
 25.54                                                        9    6    1    1    2    3    1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                        3         1         2    6    1
 12.18
 10.27
  8.36
  6.45
  4.54                                                        2    2    1    1    1    2    1
  2.64
  0.73
 -1.18
 -3.09
   +         +         +         +         +         +         +         +         +         +         +
 -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
```

D-46 346

NORTH DAKOTA


MPOINT 957
XMEAN 2.15
YMEAN 41.38
DEVX 0.28147
DEVY 40.04469
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
94.09
92.18
90.27
88.36
86.45
84.55
82.64
80.73
78.82
76.91
75.00
73.09
71.18
69.27
67.36
65.45
63.55
61.64
59.73
57.82
55.91
54.00
52.09
50.18
48.27
46.36
44.45
42.55
40.64
38.73
36.82
34.91
33.00
31.09
29.18
27.27
25.36
23.45
21.55
19.64
17.73
15.82
13.91
12.00
10.09
8.18
6.27
4.36
2.45
0.55
-1.36
-3.27
1 3 04 141
1 7 1
2 9 8
7

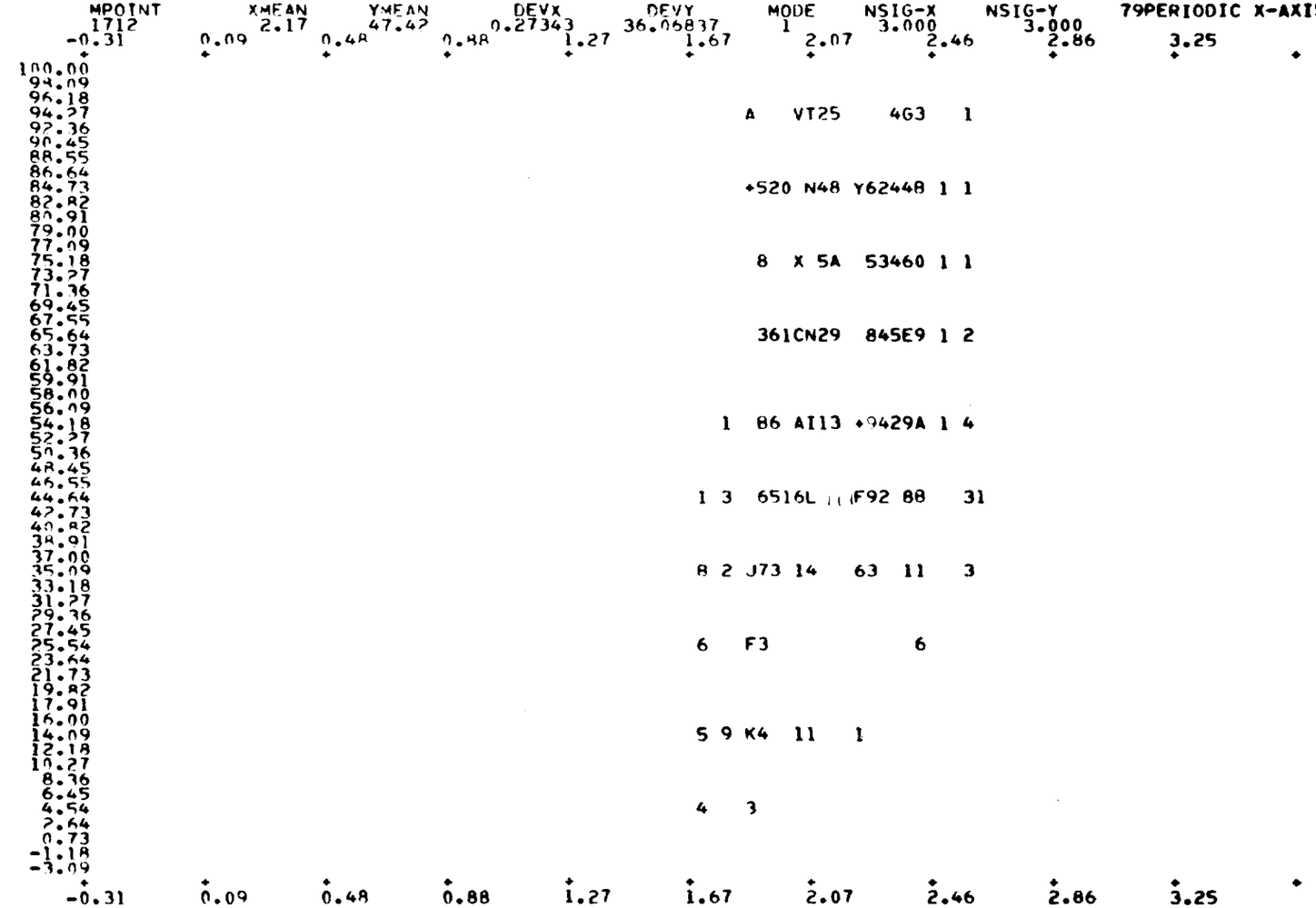
DW

MPOINT 840 XMEAN 2.21 YMEAN 48.39 DEVX 0.30608 DEVY 33.06975 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=

```
                -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
100.00
 98.09
 96.18
 94.27                                                  1 2 6G10 0 21 3 2
 92.36
 90.45
 88.55
 86.64
 84.73                                                  43353G 9 0 92 E 2 1
 82.82
 80.91
 79.00
 77.09
 75.18                                                  017359 7 M6374D 7 2
 73.27
 71.36
 69.45
 67.55
 65.64                                                  91919A 6 045338 1 21
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                  I5248J 6 0A123H 1 83
 52.27
 50.36
 48.45
 46.55
 44.64                                            1   G7 44A   36   0   92   1
 42.73
 40.82
 38.91
 37.00
 35.09                                              1 E9   6    6 1 7   24
 33.18
 31.27
 29.36
 27.45
 25.54                                            1 5 81  15    1   1   1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                              7 46 1   1         1
 12.18
 10.27
  8.36
  6.45
  4.54                                              2 31
  2.64
  0.73
 -1.18
 -3.09
                -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
```

D-49

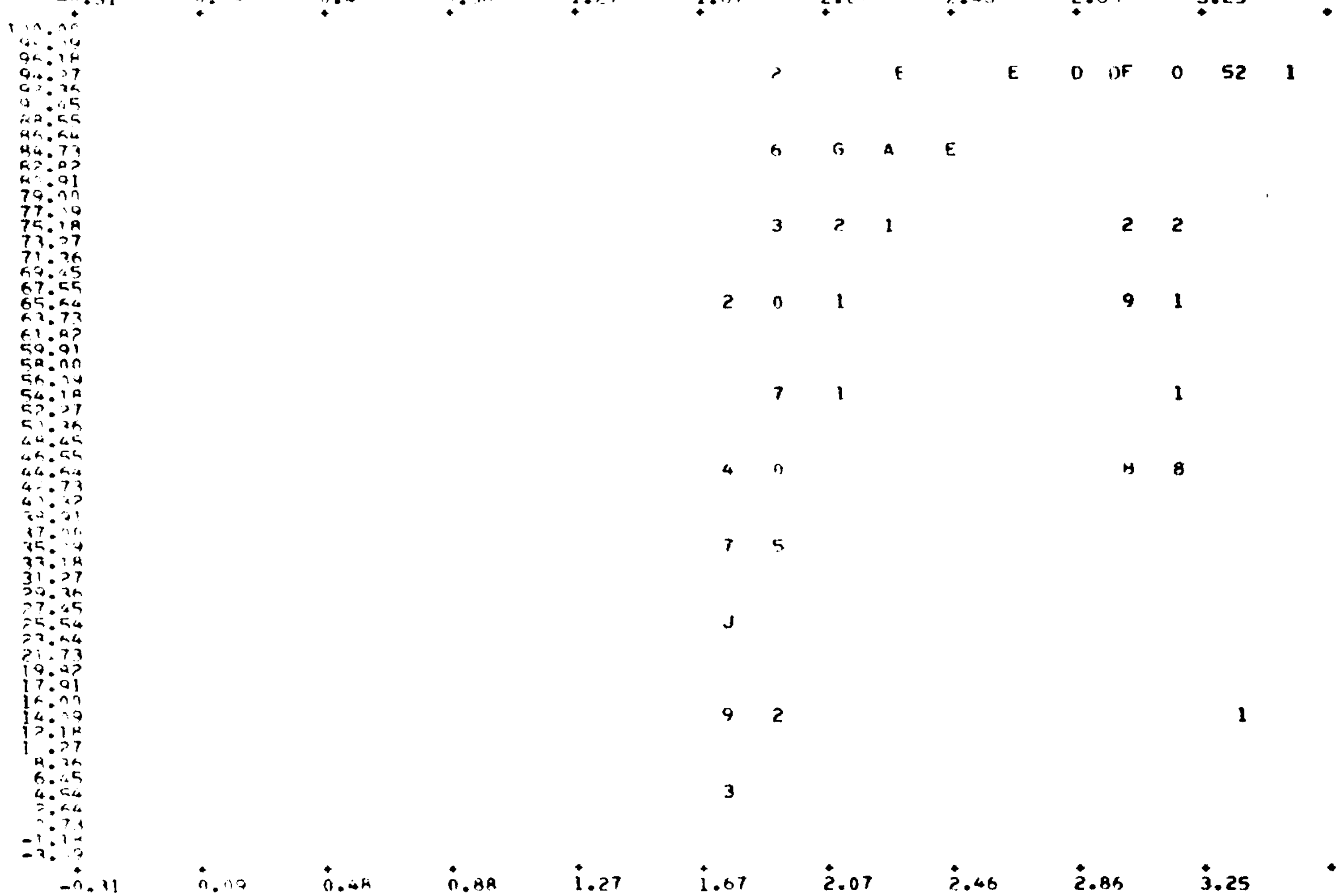
MPOINT 1712 XMEAN 2.17 YMEAN 47.42 DEVX 0.27343 DEVY 36.06837 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



OHIO

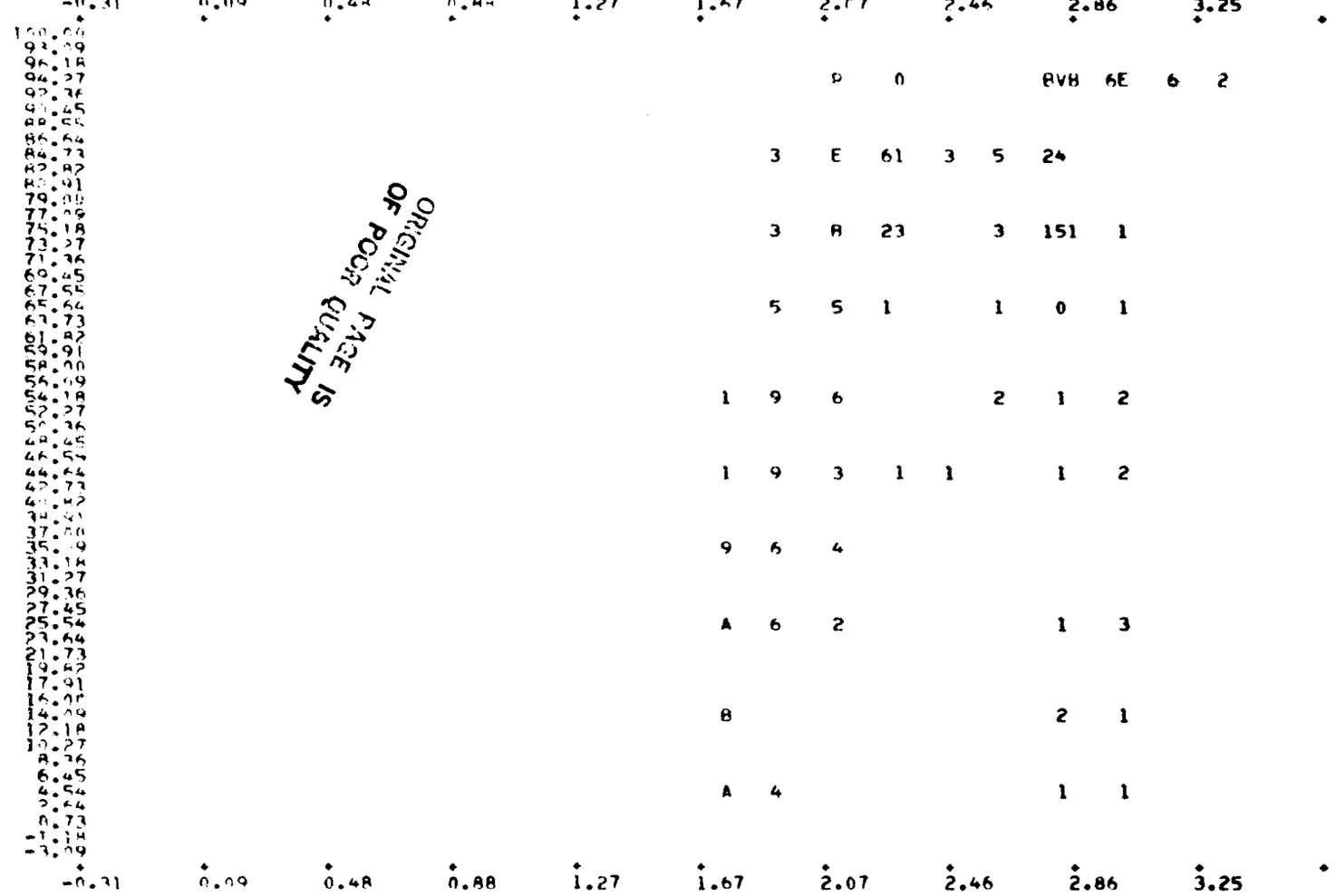
C1

NPOINT	X-MEAN	Y-MEAN	DEVX	DEVY	MODE	NSIG-X	NSIG-Y	79PERIODIC X-AXIS=DOY	YAXIS=
762	2.61	64.39	[illegible]	41.05856	1	3.000	3.000		



D-52
352

MPOINT 664 XMEAN 2.56 YMEAN 56.47 DEVX 0.52075 DEVY 42.59796 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



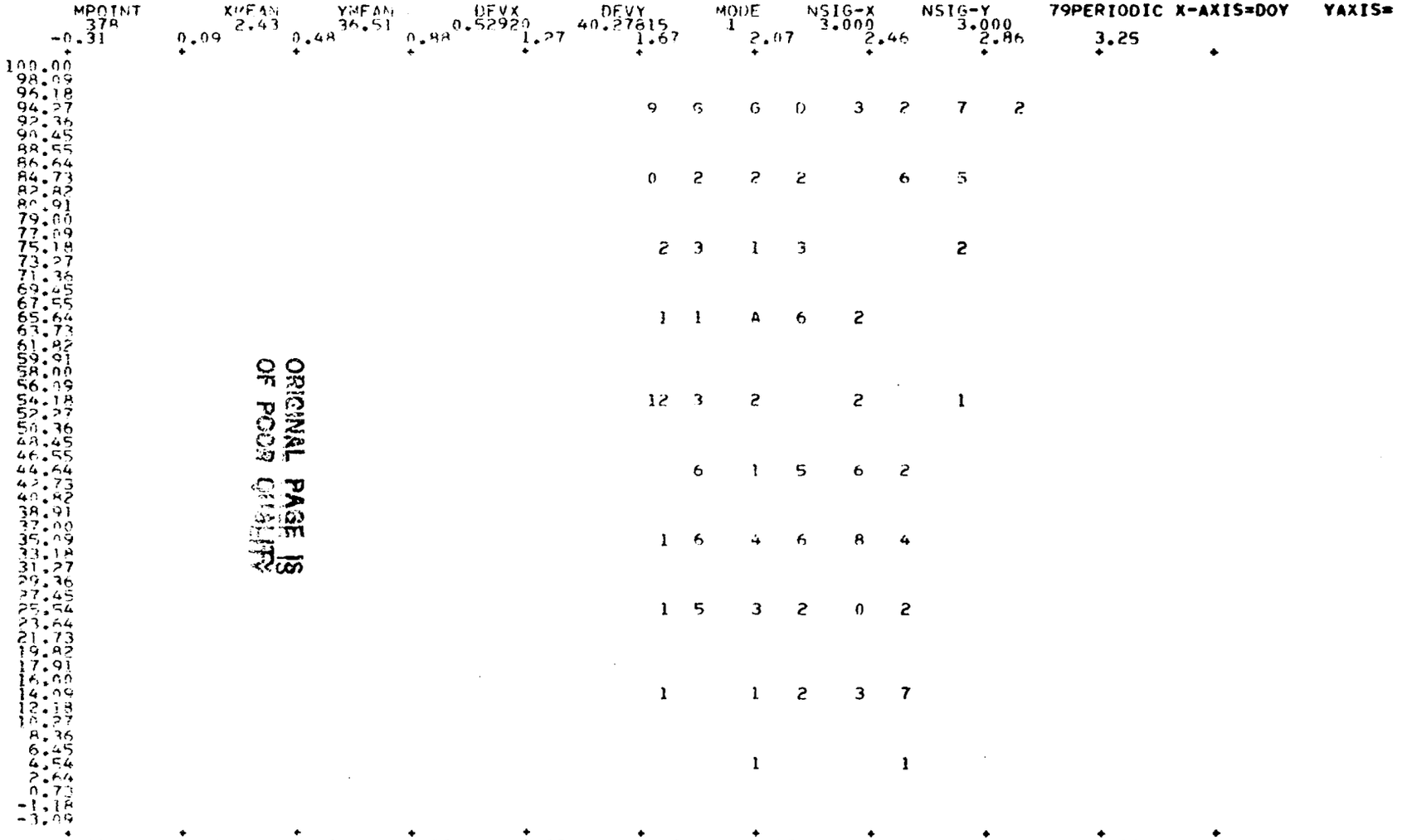
0-59
553

PENNSYLVANIA


MPOINT 227
XMEAN 2.26
YMEAN 69.49
DEVX 0.50133
DEVY 39.75786
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
0 DG + ET
D A S
B
4
2 1
1 2
2

SOUTH CAROLINA

D-56
332



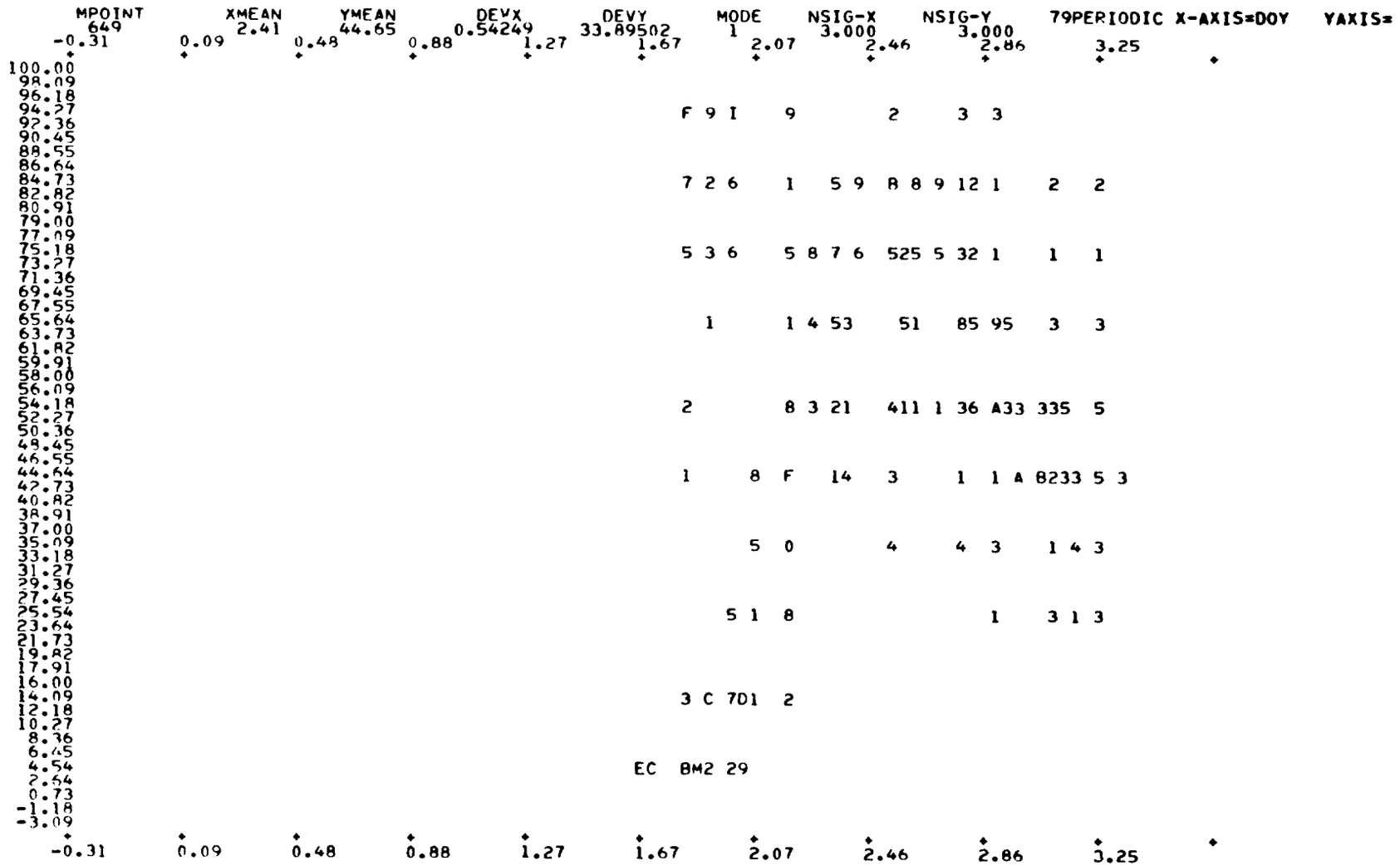
```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
  568        2.50       55.63     0.544336   38.26271      1        3.000      3.000
-0.31        0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
  +          +          +          +          +          +          +          +          +          +          +
101.00
 98.09
 96.18
 94.27                                                                4  0                          H  9  3
 92.36
 90.45
 88.55
 86.64
 84.73                                                                E  B  7  5  8  3  4
 82.82
 80.91
 79.00
 77.09
 75.18                                                          1     4  5  3  1  5  C  B  4
 73.27
 71.36
 69.45
 67.55
 65.64                                                          2     8  3  2  2  2  3  3  5
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                          1     3  4  1  1     1
 52.27
 50.36
 48.45
 46.55
 44.64                                                          6     4  3  2     1  2  2  1
 42.73
 40.82
 38.91
 37.00
 35.09                                                    2     D     8  2  2  2  2  3  1
 33.18
 31.27
 29.36
 27.45
 25.54                                                    31    7     0  3  1        3  2
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                    56    E     2  1     1  2  6  5
 12.18
 10.27
  8.36
  6.45
  4.54                                                    J3    B                    2  6
  2.64
  0.73
-1.18
-3.09
  +          +          +          +          +          +          +          +          +          +          +
-0.31        0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

0-58

358

TEXAS

D-59
336


MPOINT 649
XMEAN 2.41
YMEAN 44.65
DEVX 0.54249
DEVY 33.89502
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
F 9 I 9 2 3 3
7 2 6 1 5 9 8 8 9 12 1 2 2
5 3 6 5 8 7 6 525 5 32 1 1 1
1 1 4 53 51 85 95 3 3
2 8 3 21 411 1 36 A33 335 5
1 8 F 14 3 1 1 A 8233 5 3
5 0 4 4 3 1 4 3
5 1 8 1 3 1 3
3 C 701 2
EC 8M2 29
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

```
     MPOINT      XMEAN      YMEAN       DEVX       DEVY       MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
       1052       2.47      47.73    0.45921   42.80638          1      3.000      3.000
    -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
      +          +          +          +          +          +          +          +          +          +          +
100.00
 98.09
 96.18
 94.27                                                A I  E T T +  A05 4 7  1 1   13 3 3 3
 92.36
 90.45
 88.55
 86.64
 84.73                                                3 S    U D +  11H 2 4  5 A B 6B A G 5  1
 82.82
 80.91
 79.00
 77.09
 75.18                                                1 5    A 1 1  1 1   0  D G E  D B 5 1  1
 73.27
 71.36
 69.45
 67.55
 65.64                                                            1 C  5 8 5  1 1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                  H   2          3 4  1 1
 52.27
 50.36
 48.45
 46.55
 44.64                                                  2              C 4  3 2
 42.73
 40.82
 38.91
 37.00
 35.09                                                               E E 6
 33.18
 31.27
 29.36
 27.45
 25.54                                                              4 2
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                  2              2 2  4
 12.18
 10.27
  8.36
  6.45
  4.54                                                              4
  2.64
  0.73
 -1.18
 -3.09
      +          +          +          +          +          +          +          +          +          +          +
    -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```

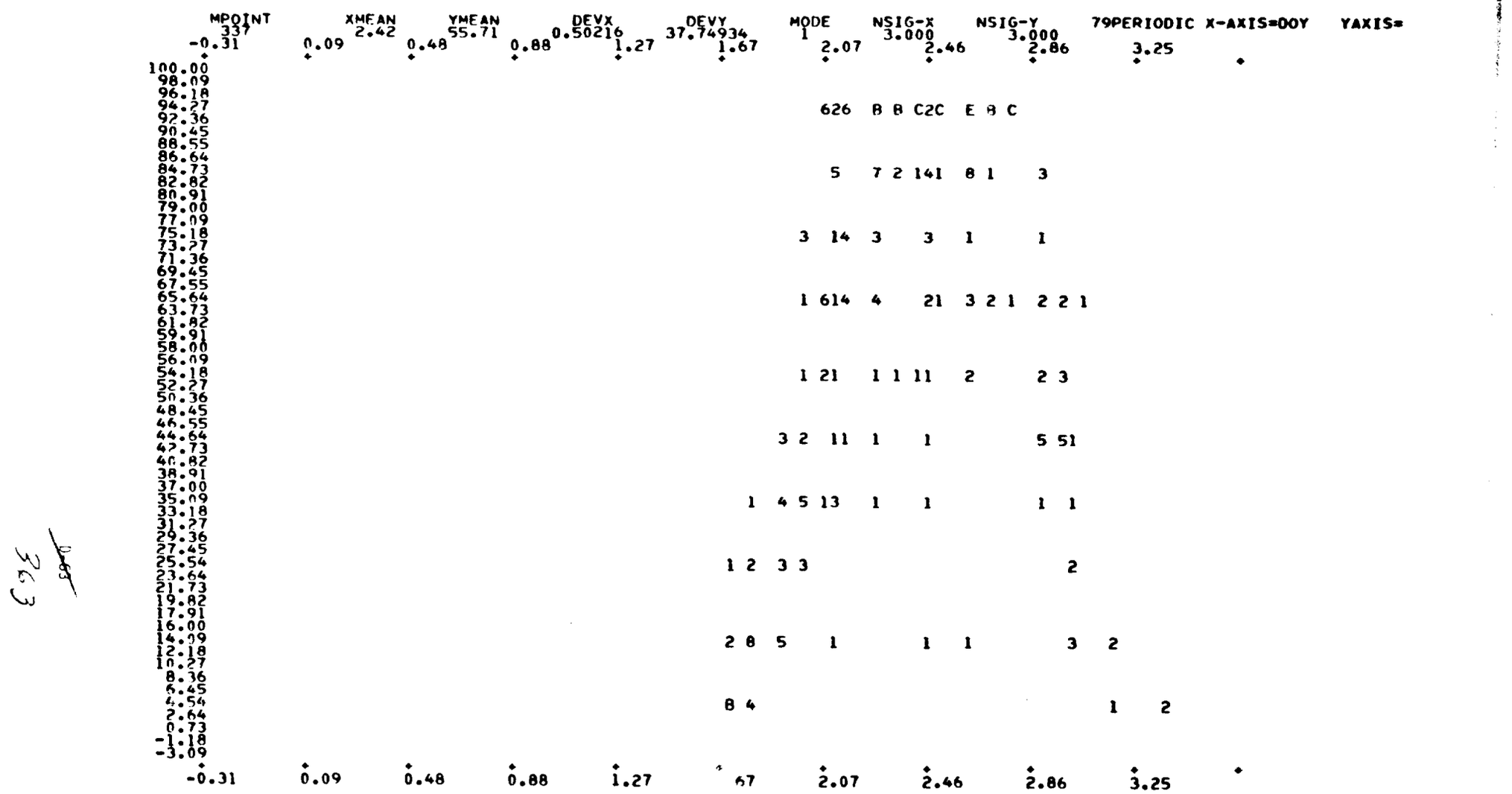
361

```
     MPOINT        XMEAN        YMEAN         DEVX         DEVY        MODE      NSIG-X      NSIG-Y    79PERIODIC X-AXIS=DOY   YAXIS=
        399         2.13        37.38      0.38228     37.91690           1        3.000       3.000
   -0.31       0.09        0.48        0.88        1.27        1.67        2.07        2.46        2.86        3.25
     +           +           +           +           +           +           +           +           +           +           +
100.00
 98.09
 96.18
 94.27                                                 4     2     8     2     1     1
 92.36
 90.45
 88.55
 86.64
 84.73                                                 B5    D     B     1     2     1
 82.82
 80.91
 79.00
 77.09
 75.18                                                 C     I     B     42    3     4     2
 73.27
 71.36
 69.45
 67.55
 65.64                                                 63 2  B     2     22    1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                                 18    71    6           4
 52.27
 50.36
 48.45
 46.55
 44.64                                                 1A 9  4     3     2
 42.73
 40.82
 38.91
 37.00
 35.09                                                 17 4  13
 33.18
 31.27
 29.36
 27.45
 25.54                                                 131   1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                                 111
 12.18
 10.27
  8.36
  6.45
  4.54                                                 4     2
  2.64
  0.73
 -1.18
 -3.09
     +           +           +           +           +           +           +           +           +           +           +
   -0.31       0.09        0.48        0.88        1.27        1.67        2.07        2.46        2.86        3.25
```

D-82
312

MPOINT 399 XMEAN 2.13 YMEAN 37.38 DEVX 0.38228 DEVY 37.91690 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=

```
      -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
100.00
 98.09
 96.18
 94.27                                          4    2    8    2    1    1
 92.36
 90.45
 88.55
 86.64
 84.73                                          B5   D    B    1    2    1
 82.82
 80.91
 79.00
 77.09
 75.18                                          C    I    B    42   3    4    2
 73.27
 71.36
 69.45
 67.55
 65.64                                          63 2 B    2    22   1
 63.73
 61.82
 59.91
 58.00
 56.09
 54.18                                          18   71   6         4
 52.27
 50.36
 48.45
 46.55
 44.64                                          1A 9 4    3    2
 42.73
 40.82
 38.91
 37.00
 35.09                                          17 4 13
 33.18
 31.27
 29.36
 27.45
 25.54                                          131  1
 23.64
 21.73
 19.82
 17.91
 16.00
 14.09                                          111
 12.18
 10.27
  8.36
  6.45
  4.54                                          4    2
  2.64
  0.73
 -1.18
 -3.09
      -0.31      0.09      0.48      0.88      1.27      1.67      2.07      2.46      2.86      3.25
```


MPOINT 337
XMEAN 2.42
YMEAN 55.71
DEVX 0.50216
DEVY 37.74934
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=OOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
100.00
98.09
96.18
94.27
92.36
90.45
88.55
86.64
84.73
82.82
80.91
79.00
77.09
75.18
73.27
71.36
69.45
67.55
65.64
63.73
61.82
59.91
58.00
56.09
54.18
52.27
50.36
48.45
46.55
44.64
42.73
40.82
38.91
37.00
35.09
33.18
31.27
29.36
27.45
25.54
23.64
21.73
19.82
17.91
16.00
14.09
12.18
10.27
8.36
6.45
4.54
2.64
0.73
-1.18
-3.09
626 B B C2C E B C
5 7 2 141 8 1 3
3 14 3 3 1 1
1 614 4 21 3 2 1 2 2 1
1 21 1 1 11 2 2 3
3 2 11 1 1 5 51
1 4 5 13 1 1 1 1
1 2 3 3 2
2 8 5 1 1 1 3 2
8 4 1 2
-0.31 0.09 0.48 0.88 1.27 67 2.07 2.46 2.86 3.25

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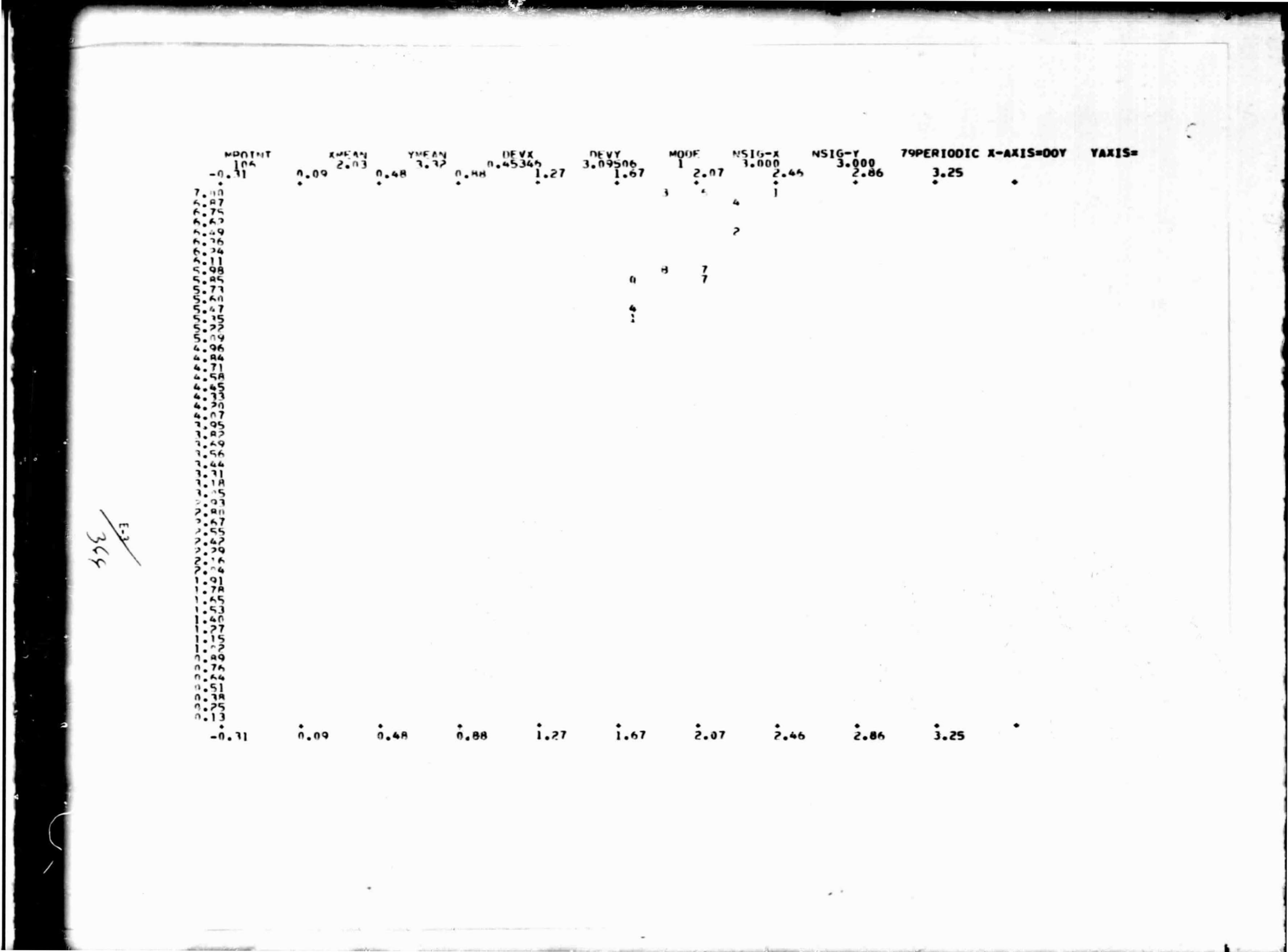
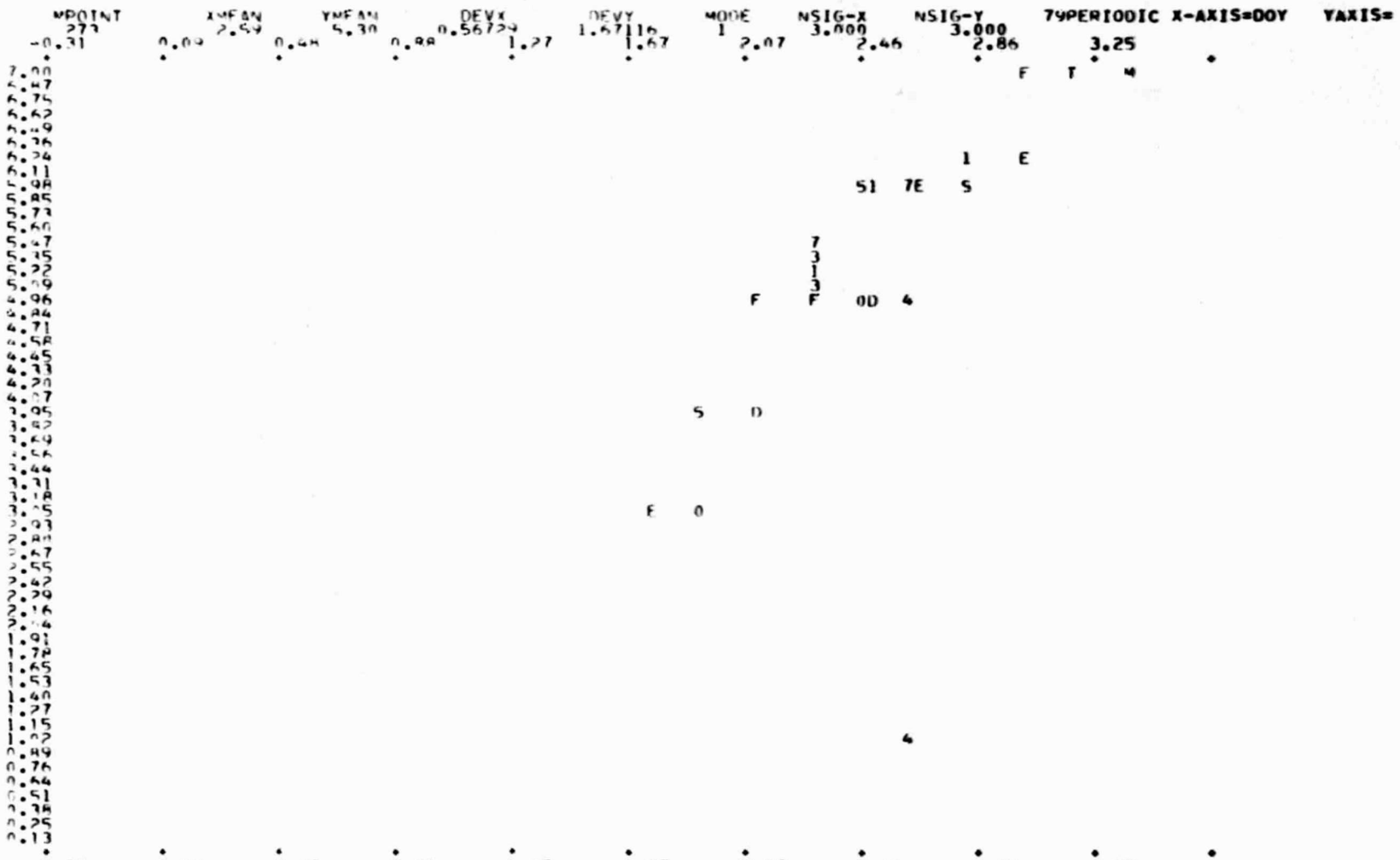
APPENDIX E

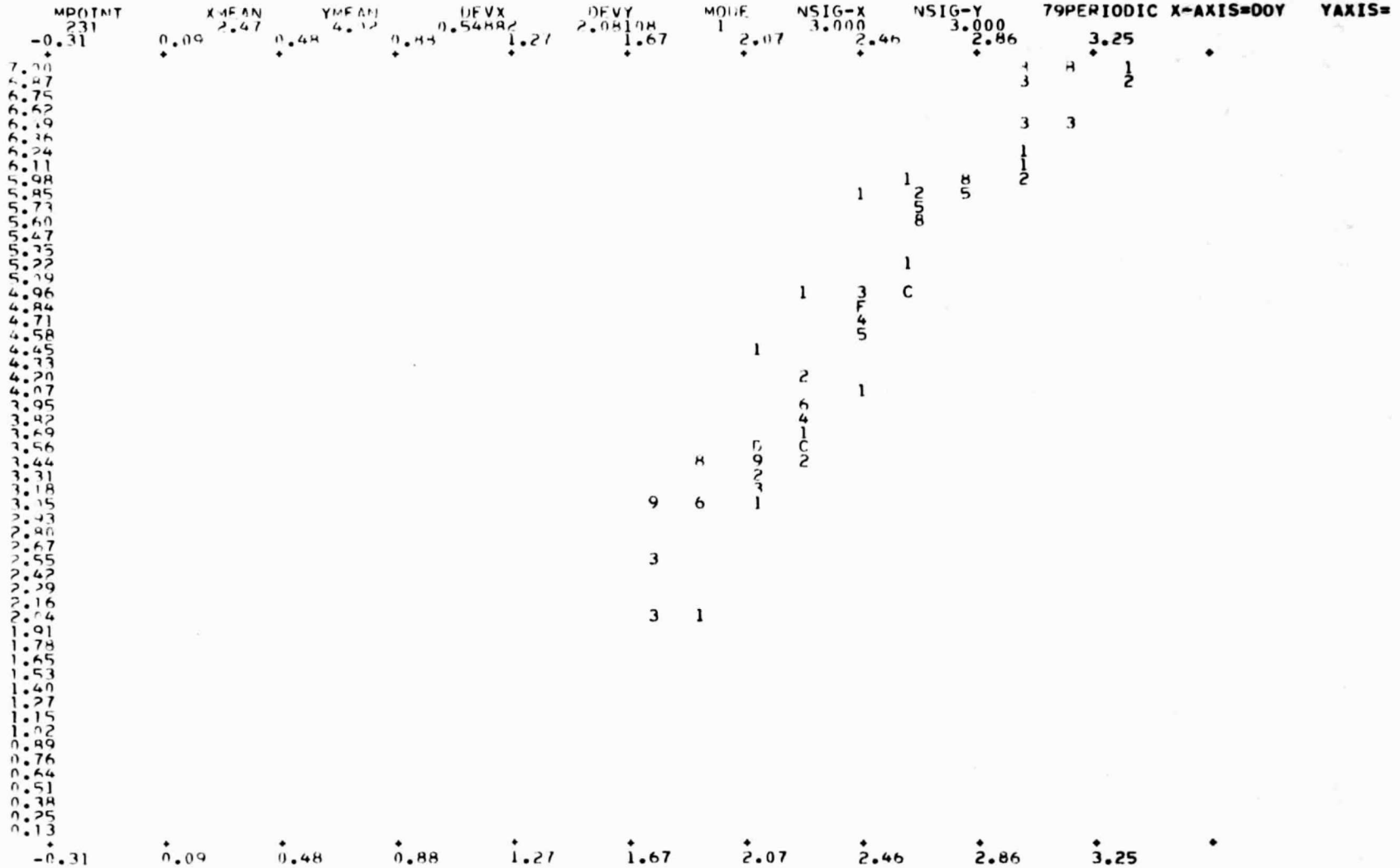
CROP GROWTH STAGE GRAPHS

ALABAMA


MPOINT 106
XMEAN 2.03
YMEAN 3.32
DEVX 0.45345
DEVY 3.09506
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13

E-3


NPOINT 273
XMEAN 2.54
YMEAN 5.30
DEVX 0.56734
DEVY 1.67116
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.47
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25


MPOINT 231
XMEAN 2.47
YMEAN 4.12
DEVX 0.54882
DEVY 2.08108
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=00Y YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
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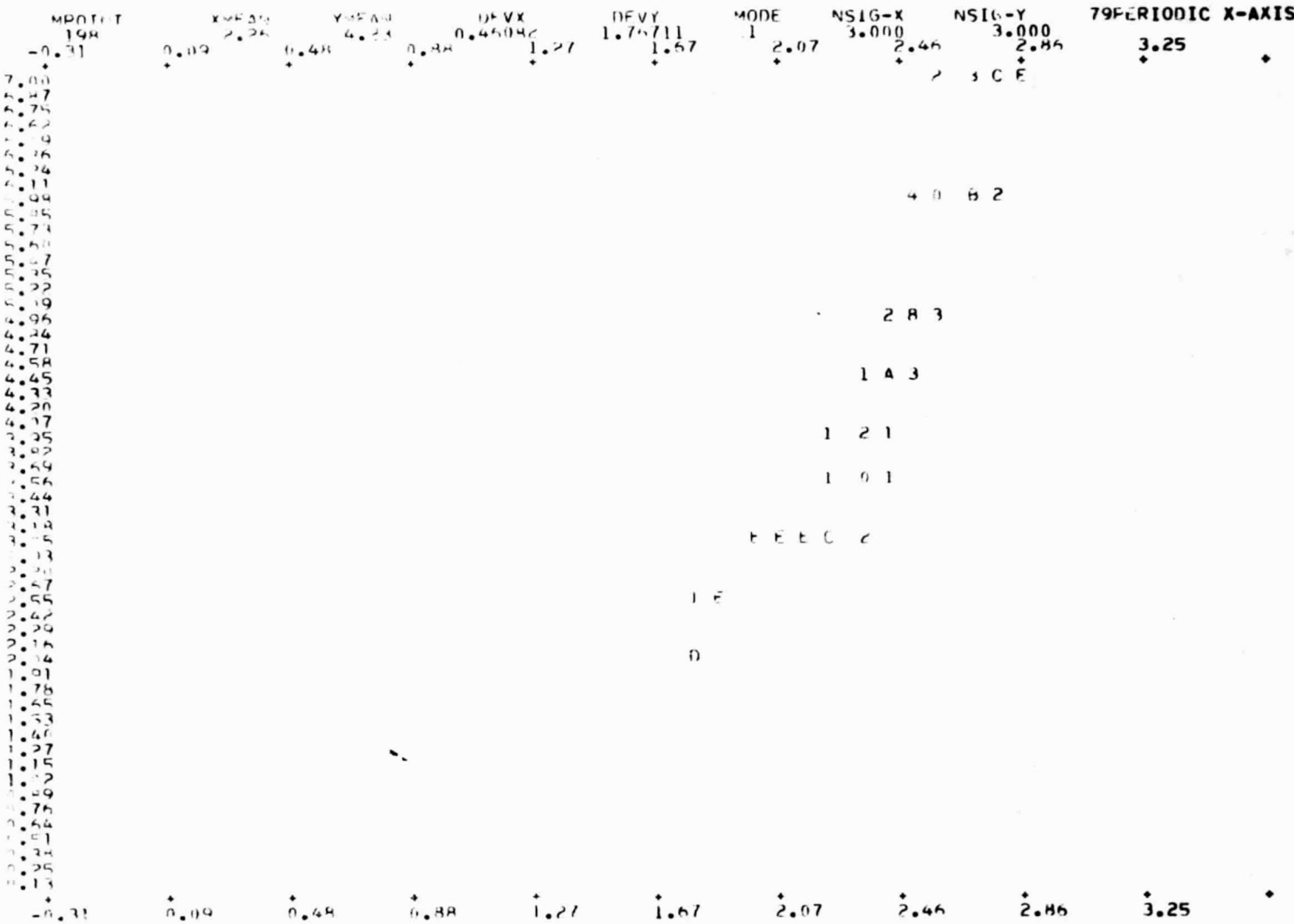
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

896

ARKANSAS


MPOINT
198
DEVX
0.45086
DEVY
1.79711
MODE
1
NSIG-X
3.000
NSIG-Y
3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

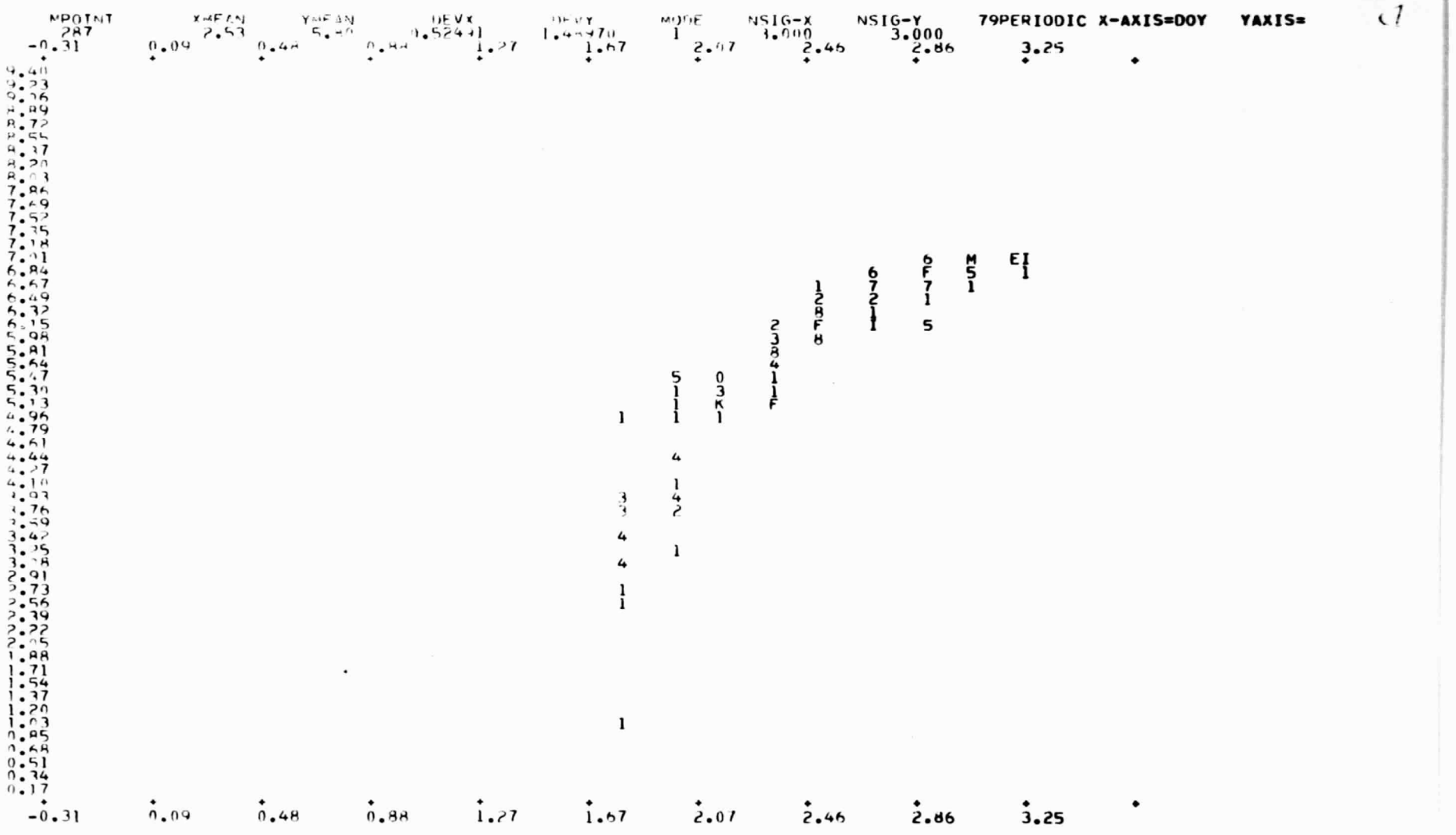
E-8

371


NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

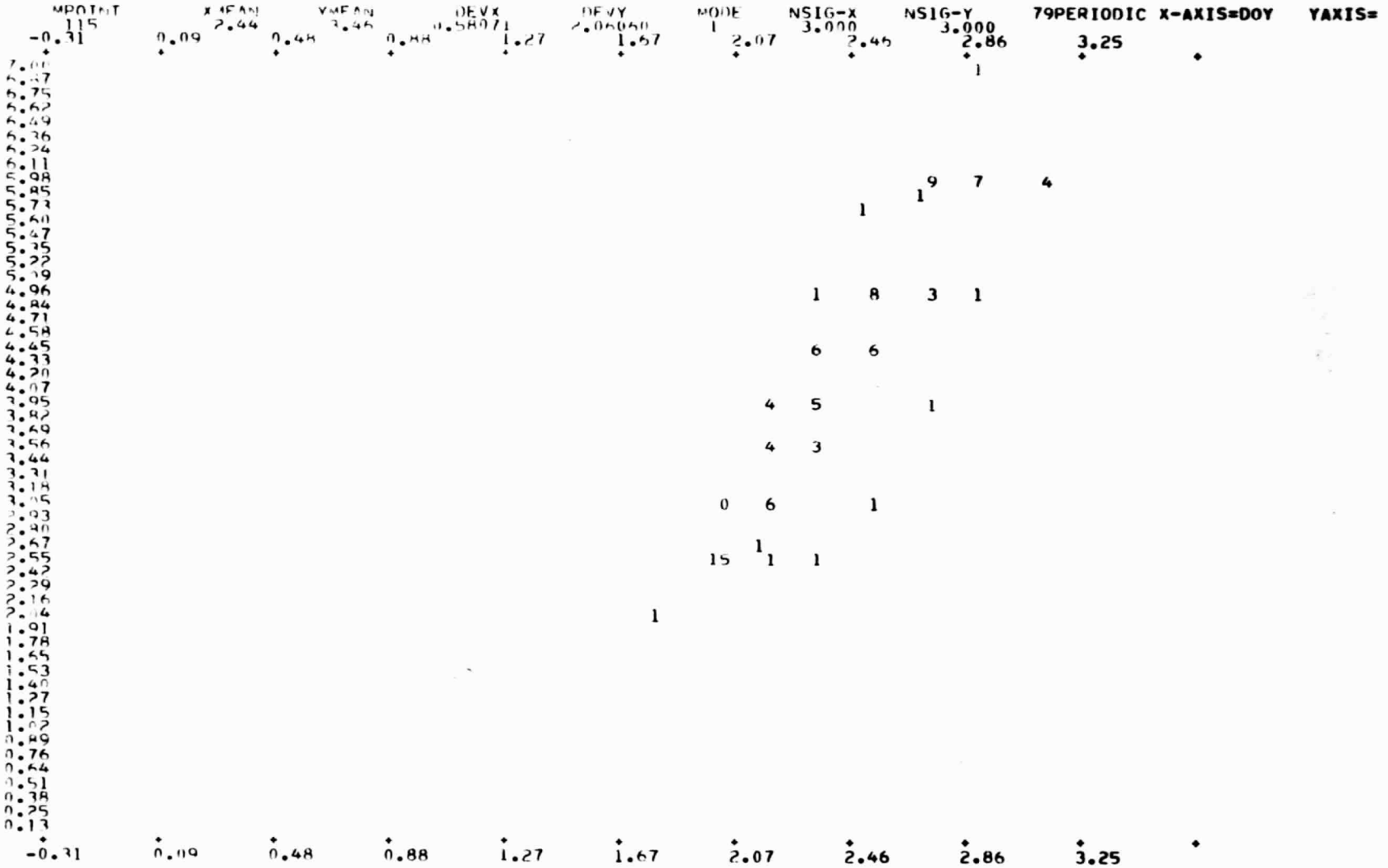
CALIFORNIA

E-10
373


NPOINT 287
XMEAN 2.53
YMEAN 5.50
DEVX 0.52441
DEVY 1.44470
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

EXIT

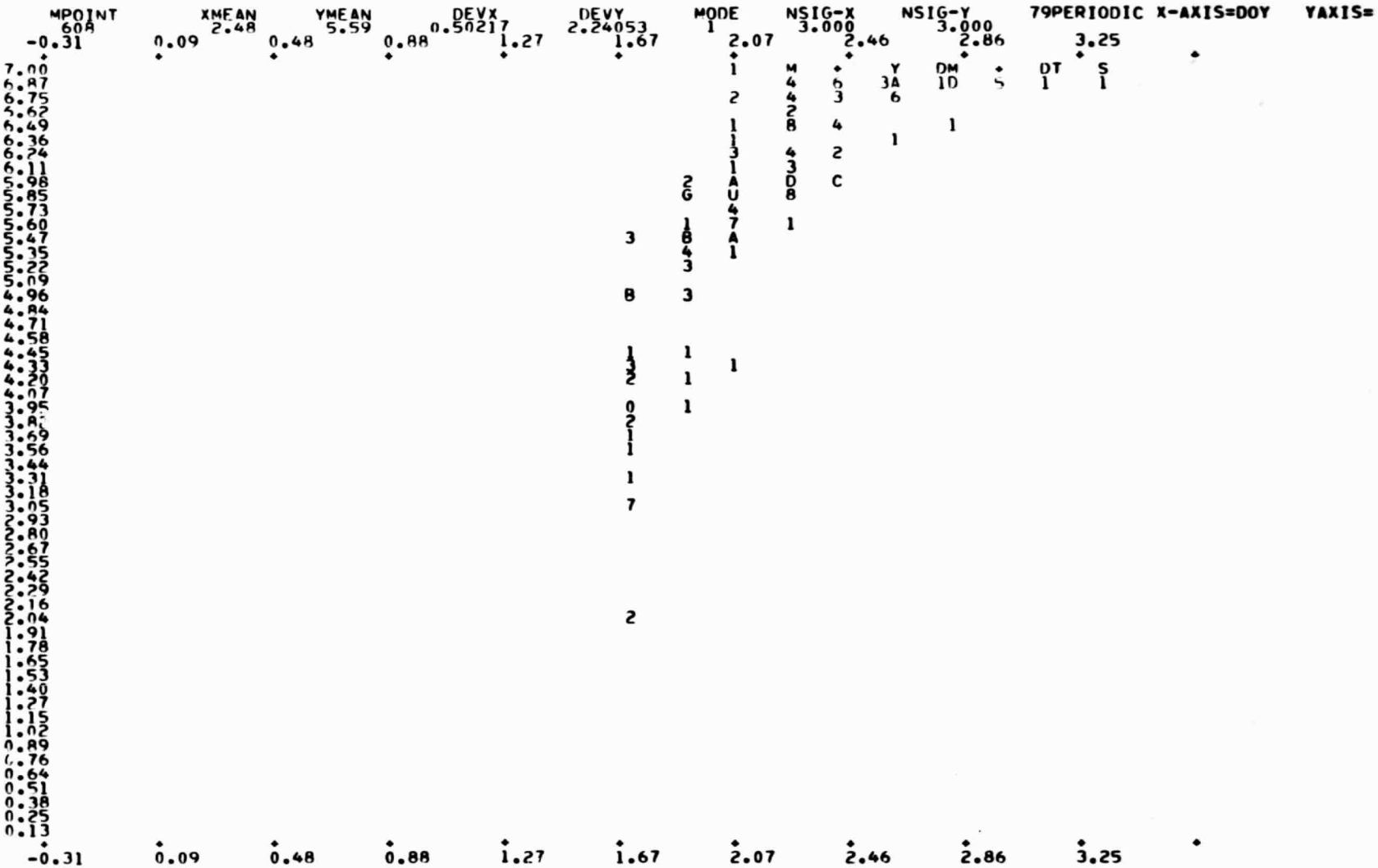
314


MPOINT 115
XMEAN 2.44
YMEAN 3.45
DEVX 0.58071
DEVY 2.06050
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

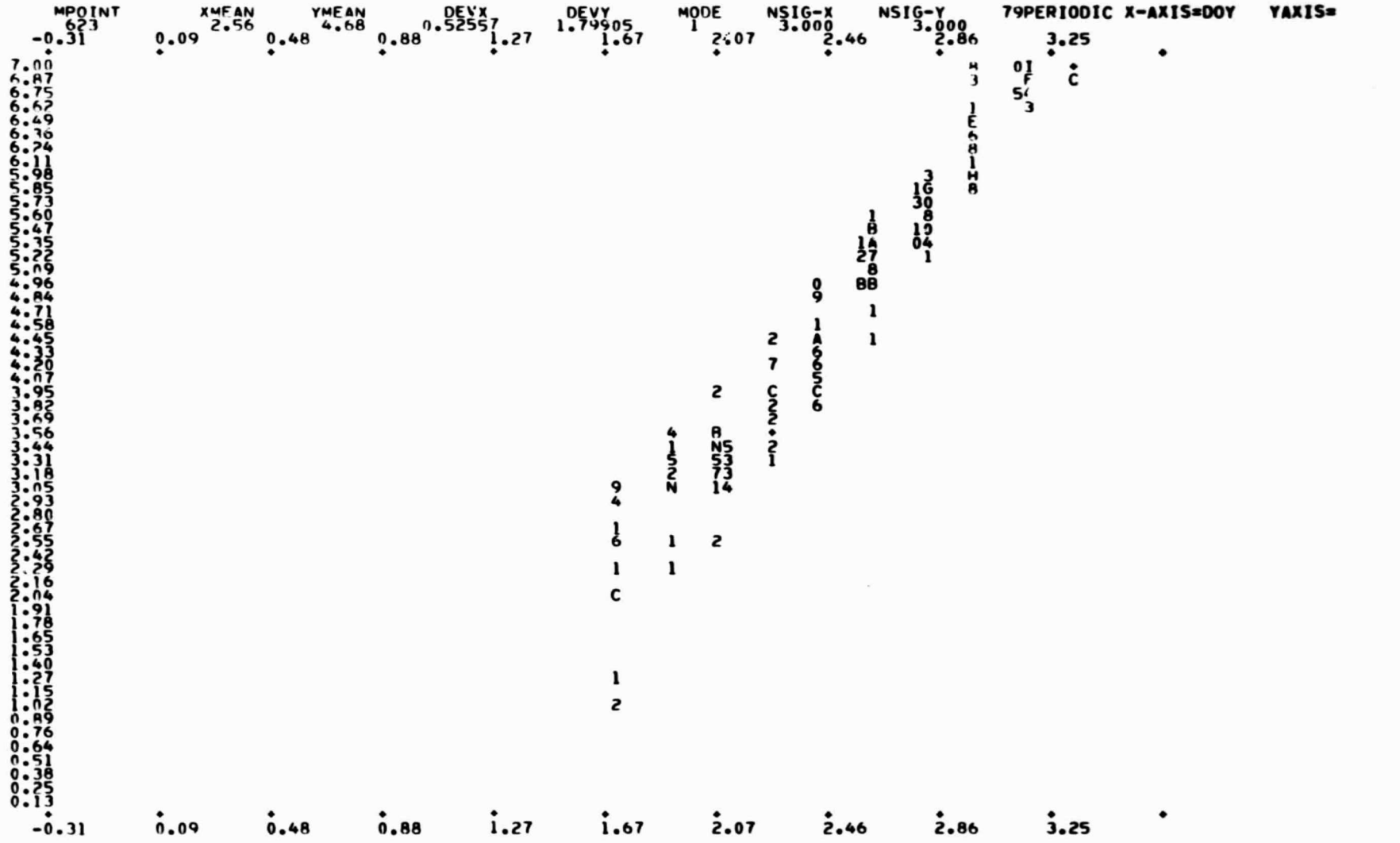
E-14

375

GEORGIA


MPOINT 608
XMEAN 2.48
YMEAN 5.59
DEVX 0.50217
DEVY 2.24053
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
M Y DM DT S
4 6 3A 1D 5 1 1
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

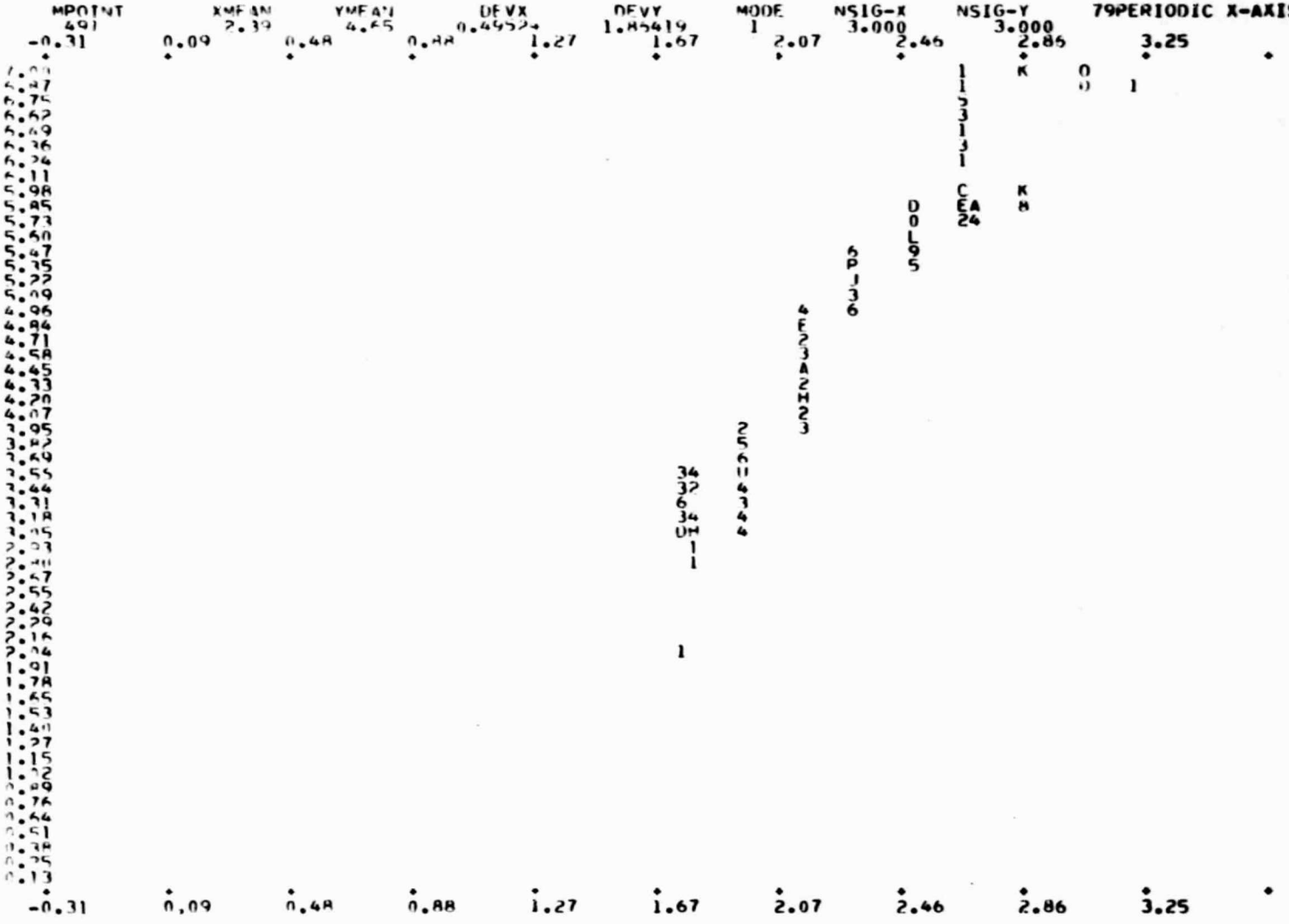
317


MPOINT 623
XMEAN 2.56
YMEAN 4.68
DEVX 0.52557
DEVY 1.79905
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

375

ILLINOIS

MPOINT 491 XMEAN 2.39 YMEAN 4.65 DEVX 0.49524 DEVY 1.85419 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



Ext 380

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INDIANA

E-19
382

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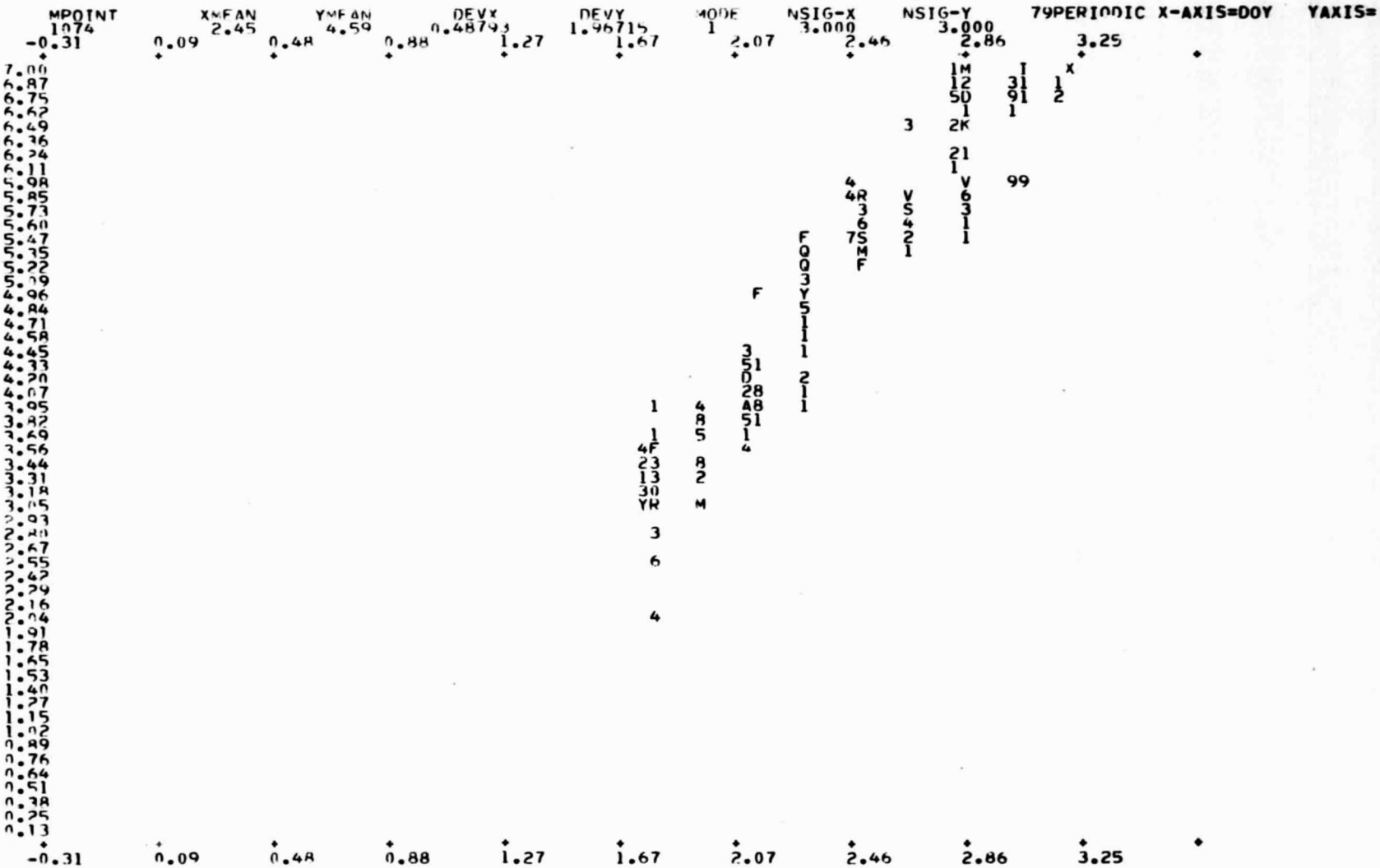
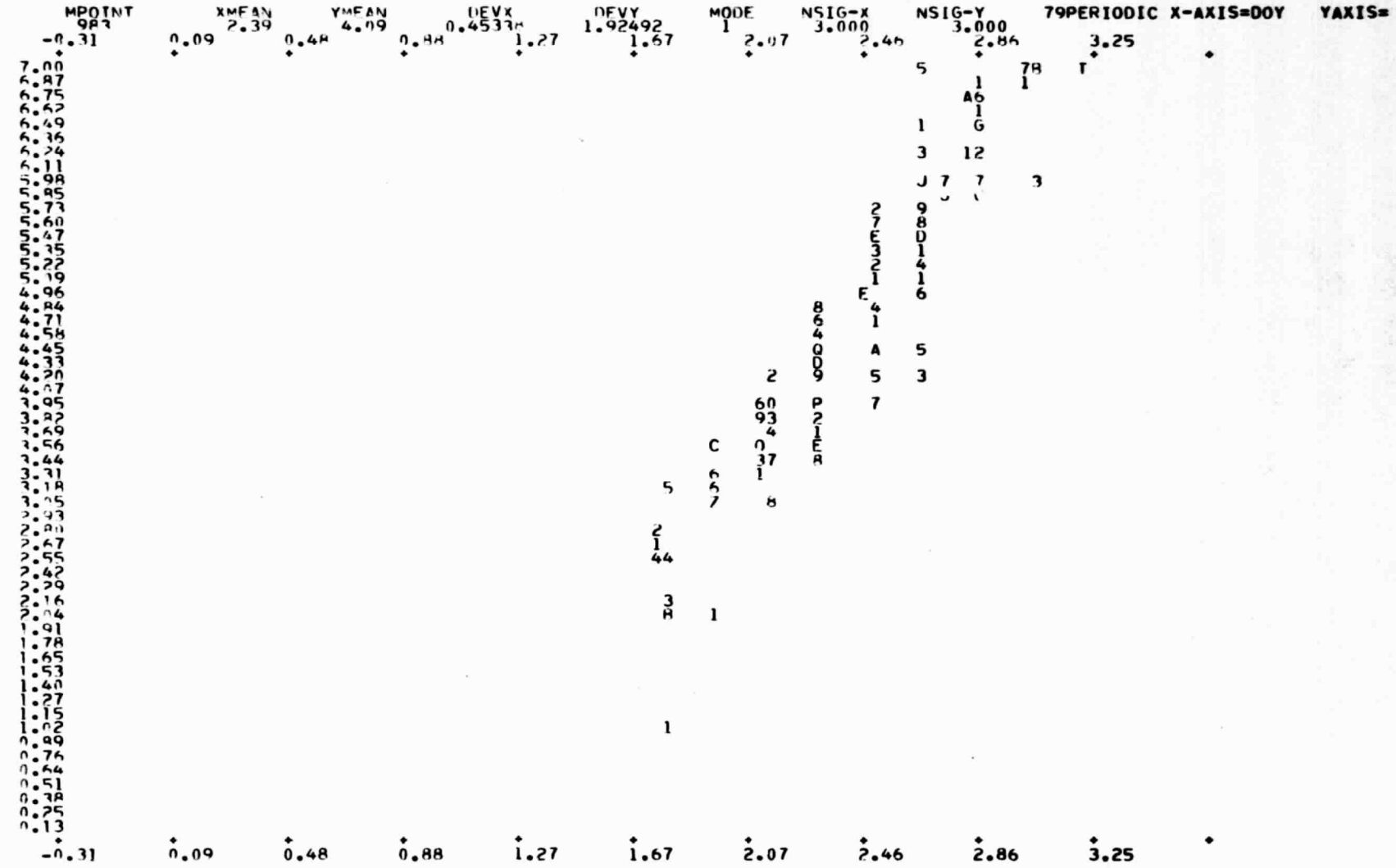
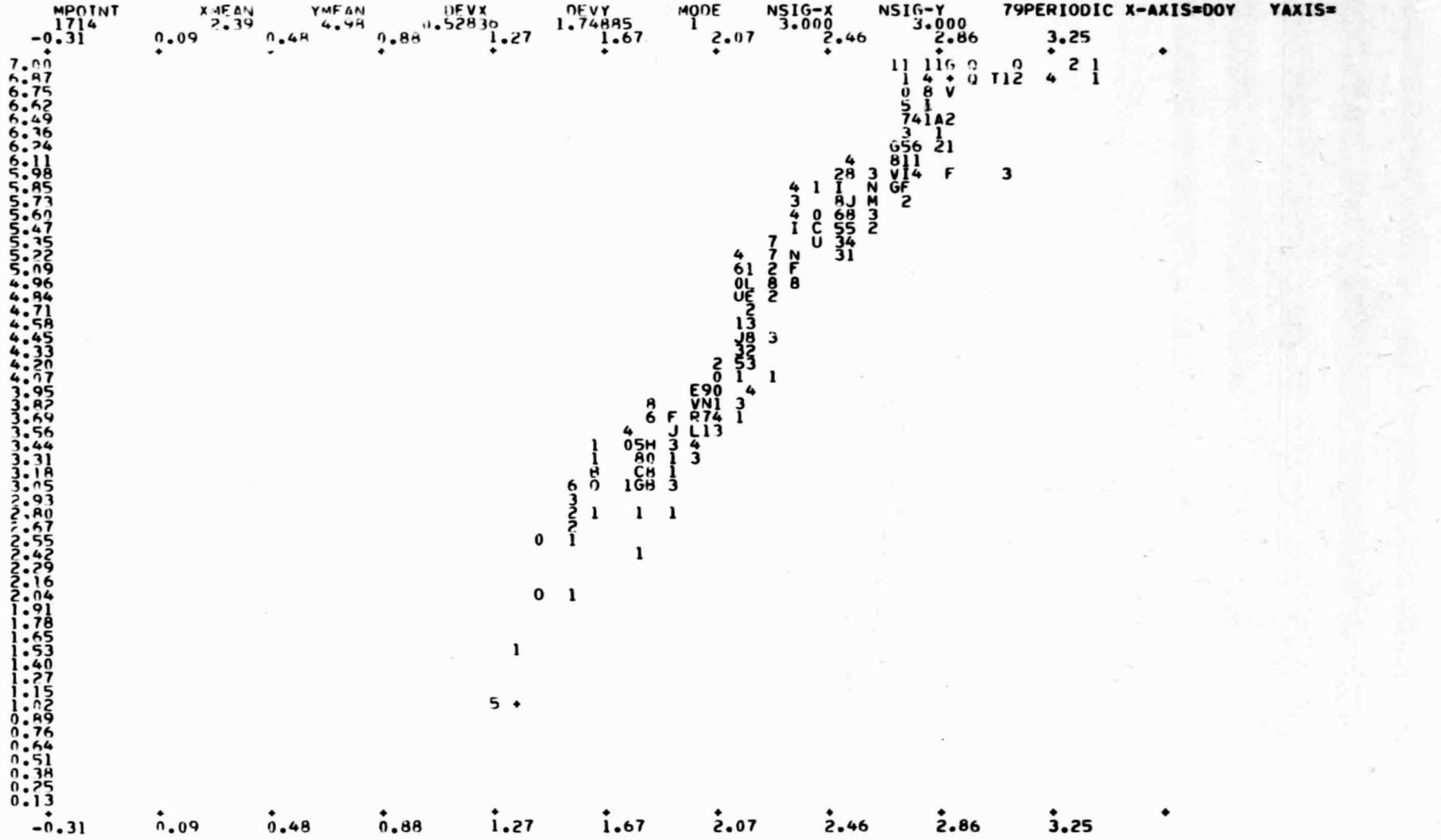

MPOINT 1074
XMEAN 2.45
YMEAN 4.59
DEVX 0.48793
DEVY 1.96715
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

E-20
383


MPOINT 983
XMEAN 2.39
YMEAN 4.09
DEVX 0.45338
DEVY 1.92492
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00 6.87 6.75 6.62 6.49 6.36 6.24 6.11 5.98 5.85 5.73 5.60 5.47 5.35 5.22 5.19 4.96 4.84 4.71 4.58 4.45 4.33 4.20 4.07 3.95 3.82 3.69 3.56 3.44 3.31 3.18 3.05 2.93 2.80 2.67 2.55 2.42 2.29 2.16 2.04 1.91 1.78 1.65 1.53 1.40 1.27 1.15 1.02 0.89 0.76 0.64 0.51 0.38 0.25 0.13

E-21
384

IOWA


MPOINT 1714
XMEAN 2.39
YMEAN 4.98
DEVX 0.528836
DEVY 1.74885
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
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5.85
5.73
5.60
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1.78
1.65
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0.76
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0.38
0.25
0.13

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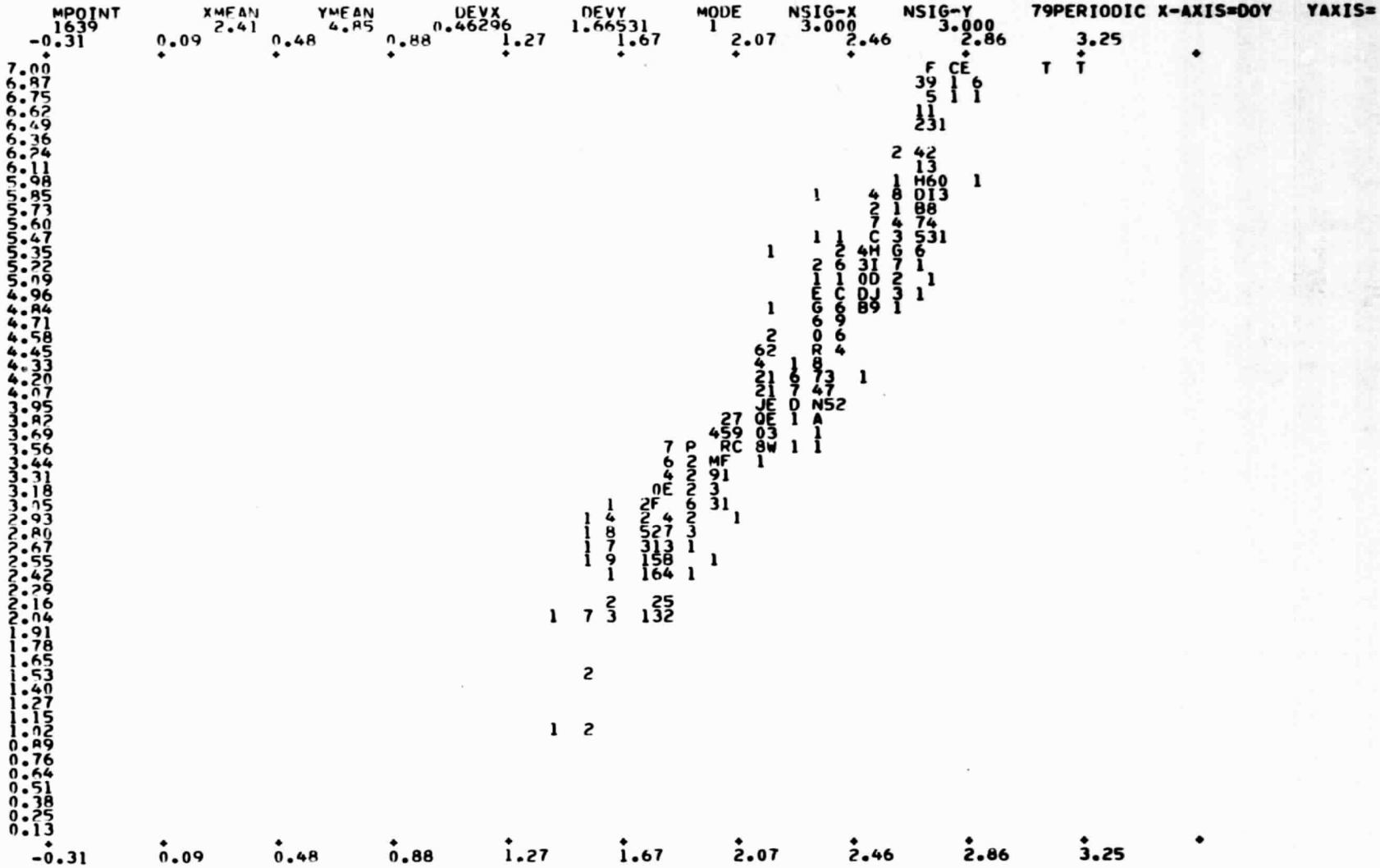
MPOINT 1639
XMEAN 2.41
YMEAN 4.85
DEVX 0.46296
DEVY 1.66531
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00 6.87 6.75 6.62 6.49 6.36 6.24 6.11 5.98 5.85 5.73 5.60 5.47 5.35 5.22 5.09 4.96 4.84 4.71 4.58 4.45 4.33 4.20 4.07 3.95 3.82 3.69 3.56 3.44 3.31 3.18 3.05 2.93 2.80 2.67 2.55 2.42 2.29 2.16 2.04 1.91 1.78 1.65 1.53 1.40 1.27 1.15 1.02 0.89 0.76 0.64 0.51 0.38 0.25 0.13

E-24
357

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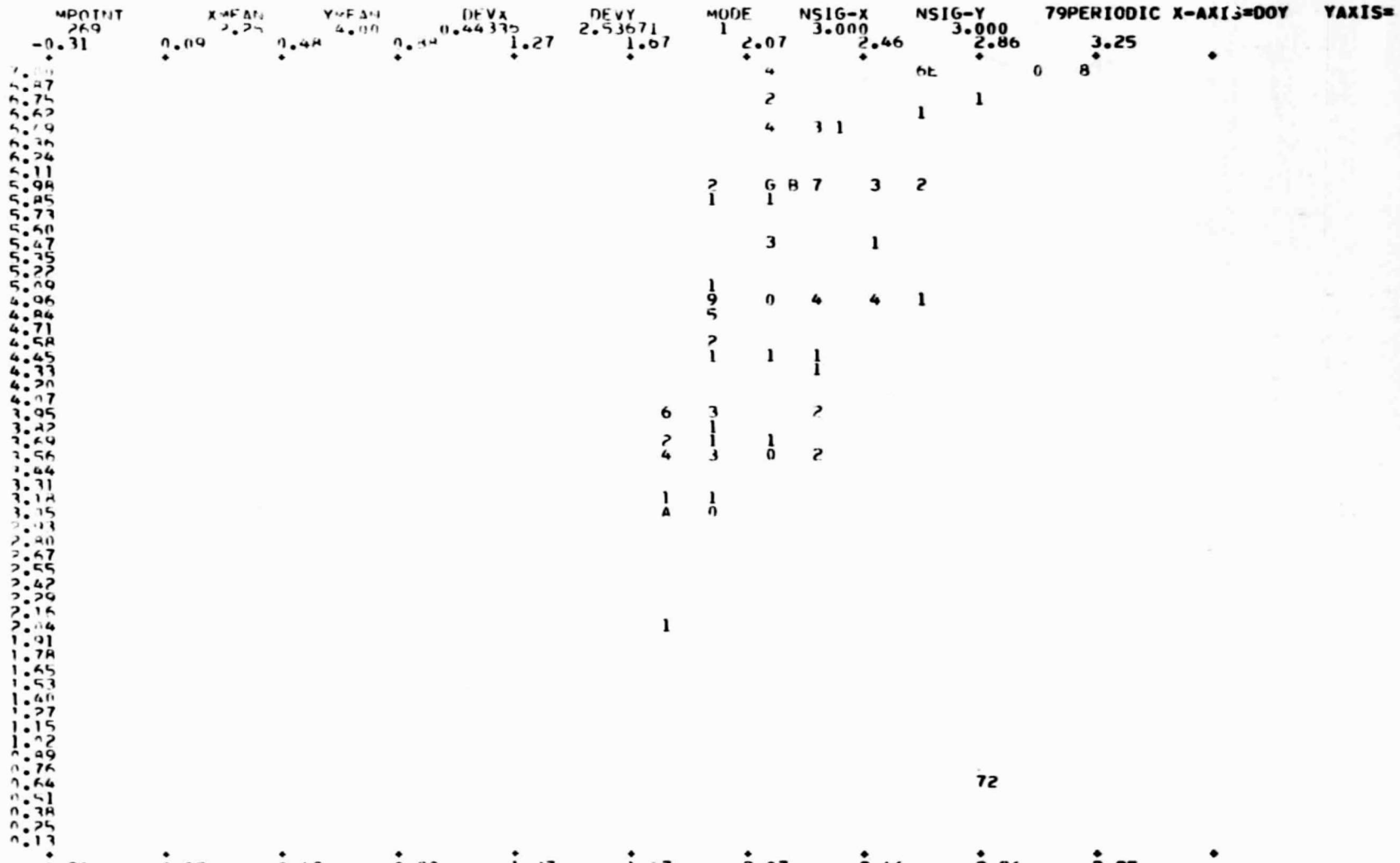
MPOINT 269
XMEAN 2.25
YMEAN 4.00
DEVX 0.443395
DEVY 2.53671
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
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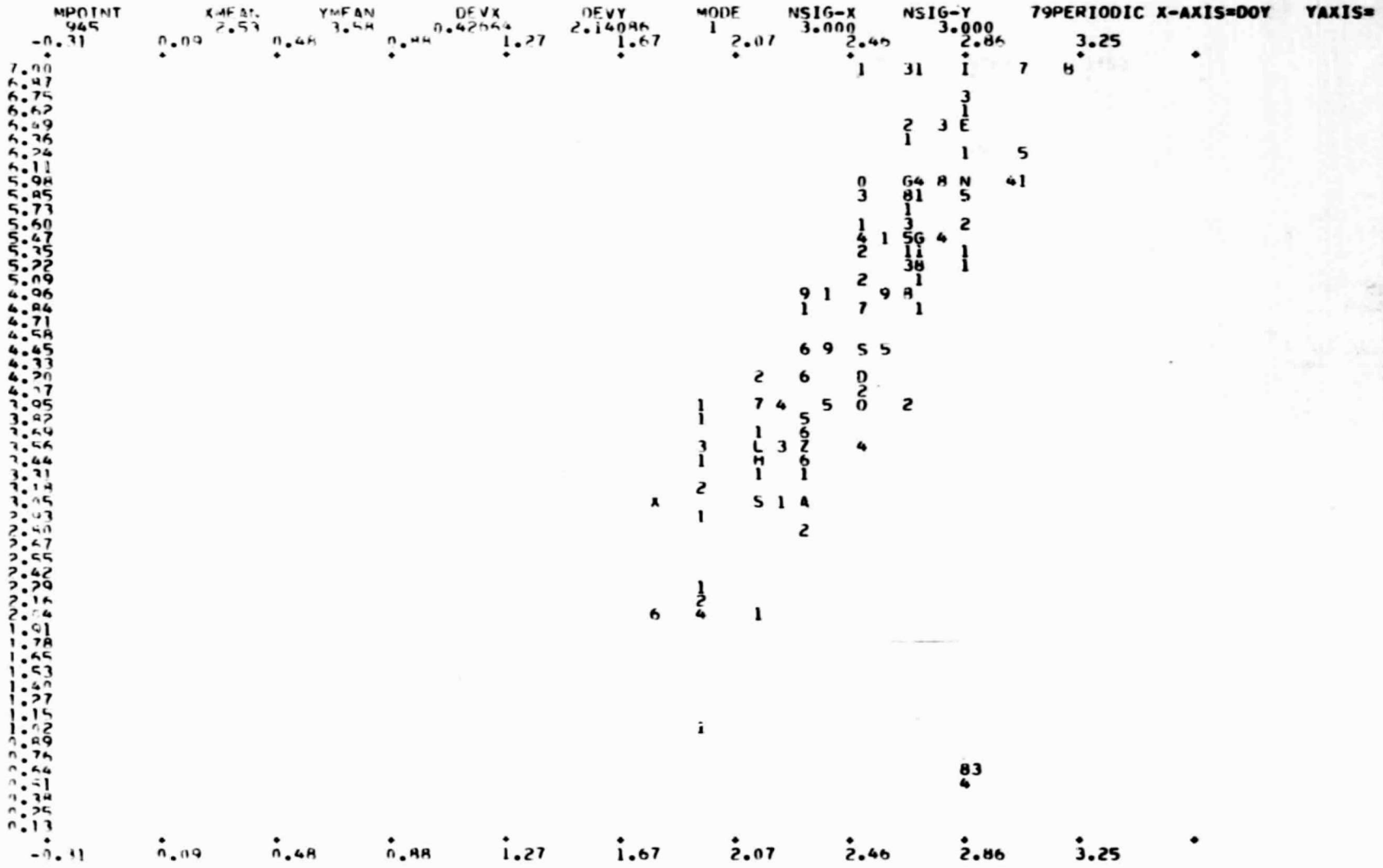
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

390


MPOINT 945
XMEAN 2.59
YMEAN 3.58
DEVX 0.42864
DEVY 2.14086
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
7.00
6.87
6.75
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6.24
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2.55
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2.04
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1.65
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0.13

191

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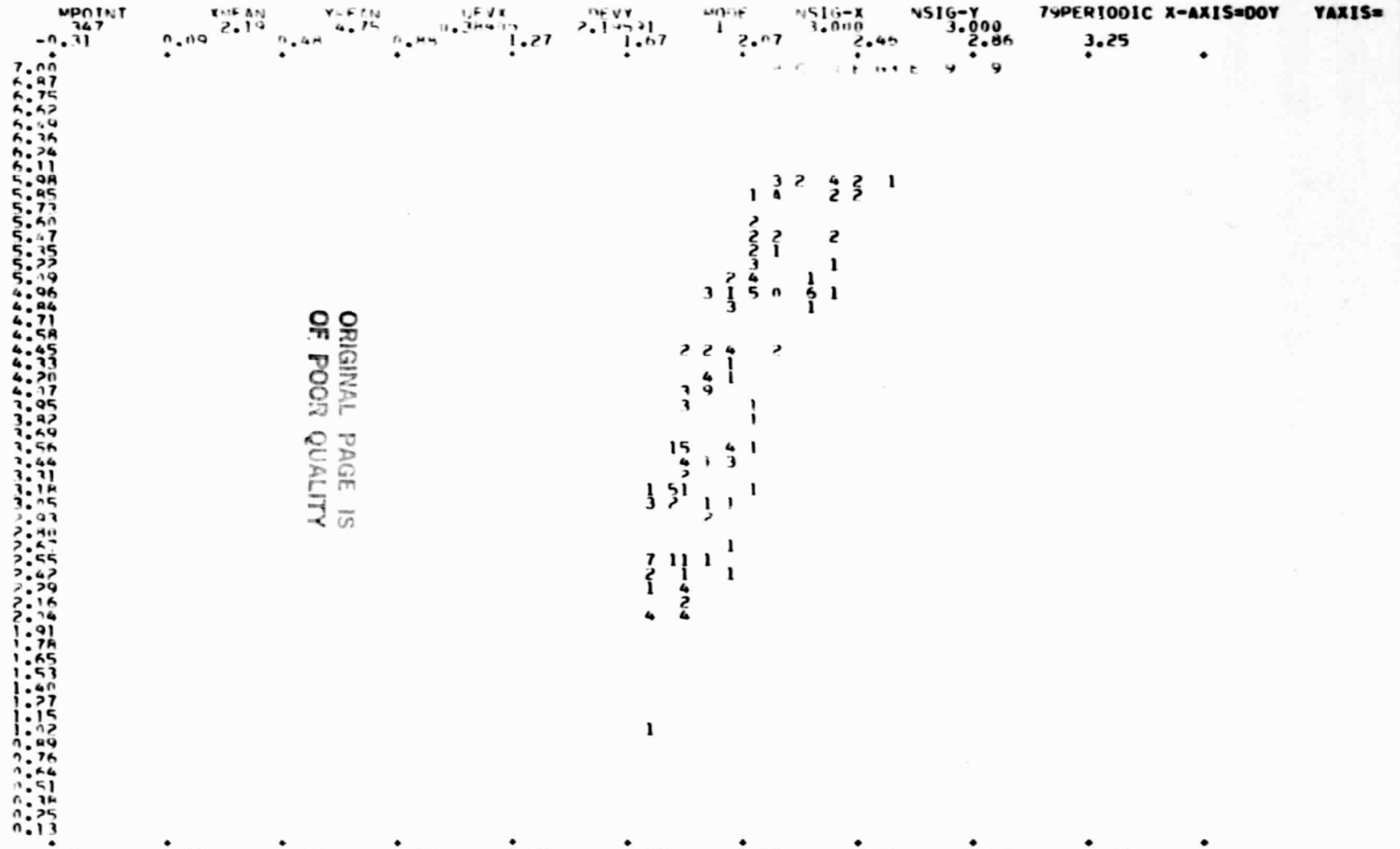
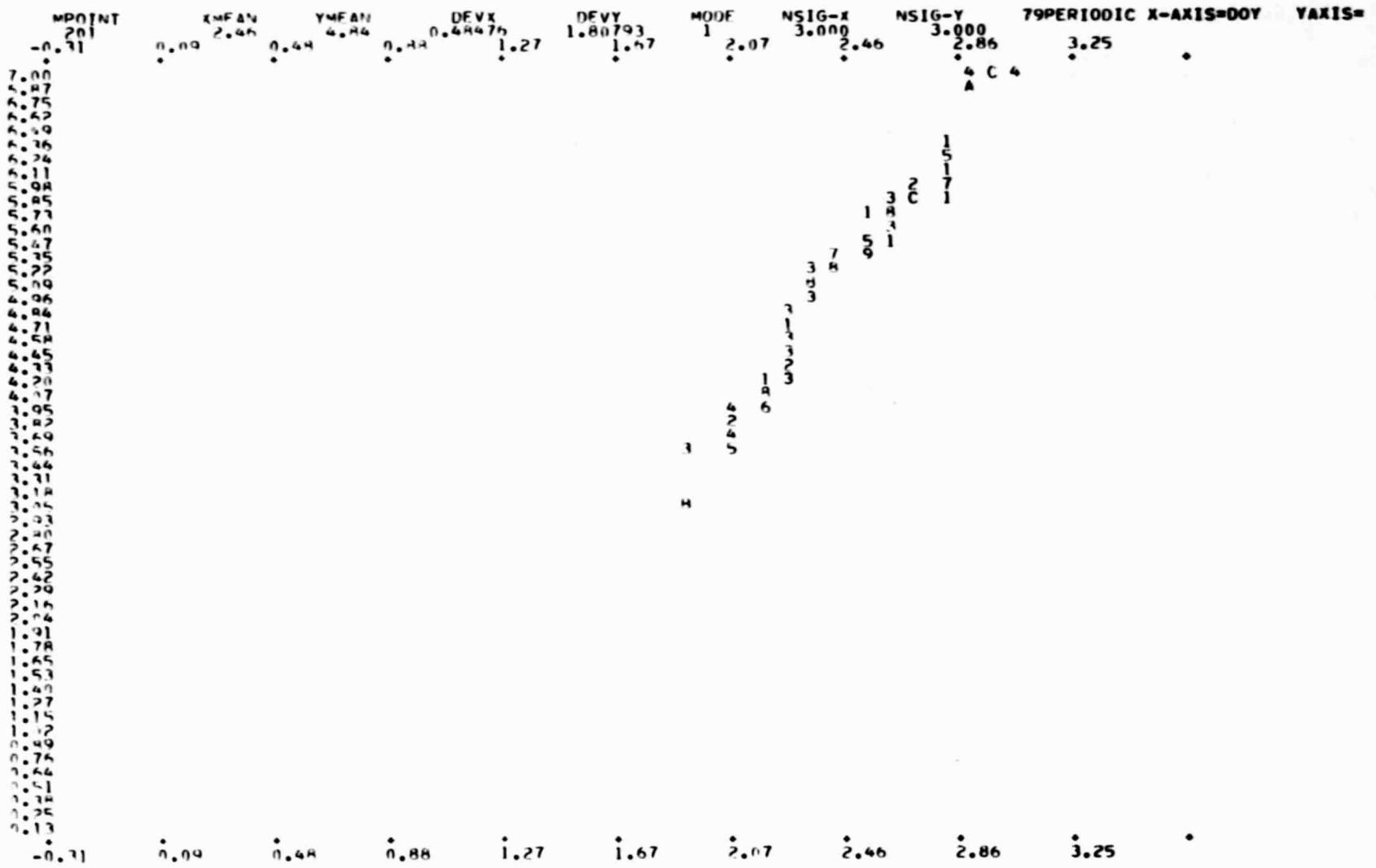
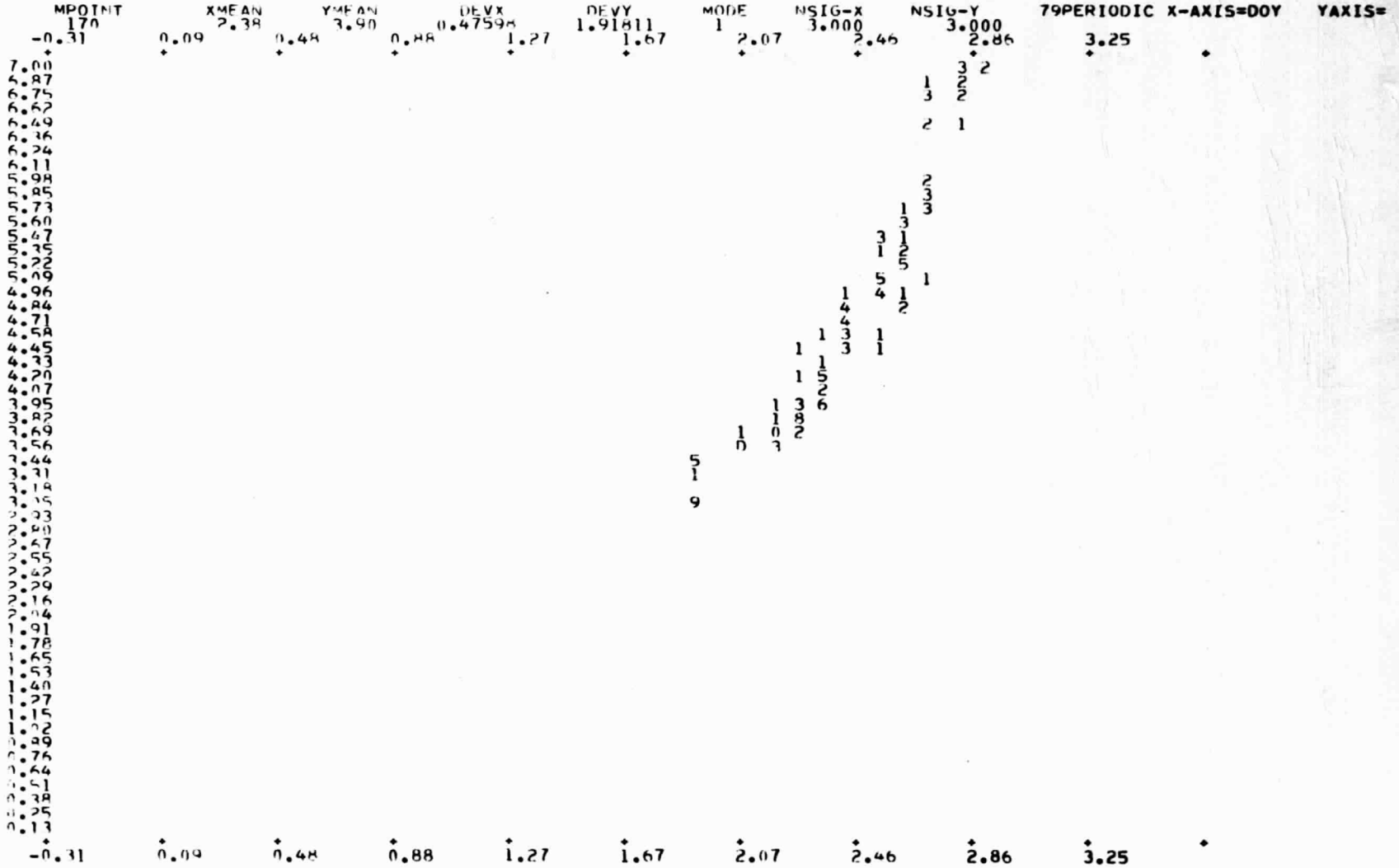
MINNESOTA



E-30
513


MPOINT 201
XMEAN 2.46
YMEAN 4.84
DEVX 0.48475
DEVY 1.80793
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
7.00
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25


MPOINT 170
XMEAN 2.38
YMEAN 3.90
DEVX 0.47598
DEVY 1.91811
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
7.00
6.87
6.75
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6.49
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6.24
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2.04
1.91
1.78
1.65
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0.76
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0.38
0.25
0.13

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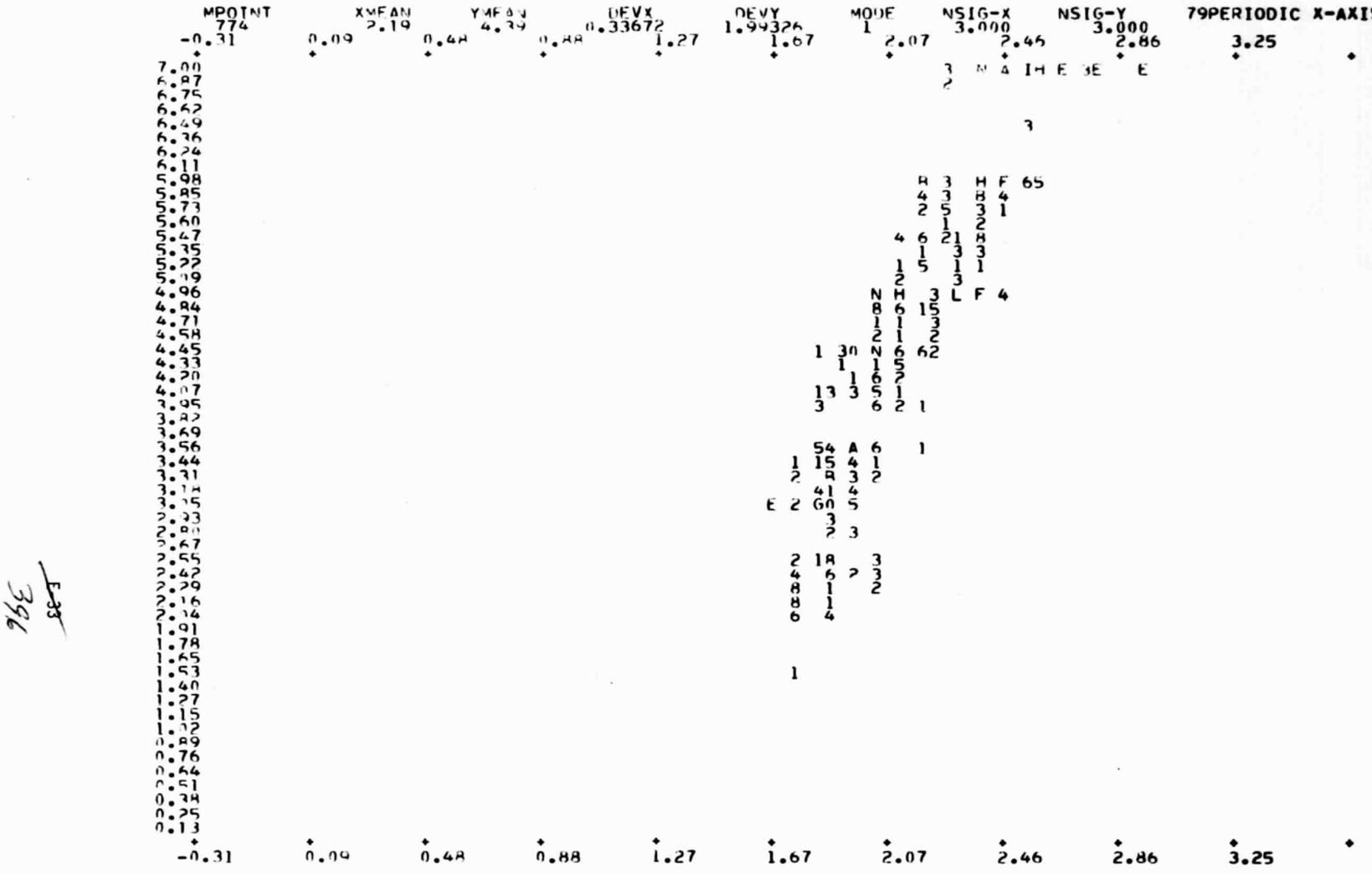
595


MPOINT 774
XMEAN 2.19
YMEAN 4.39
DEVX 0.33672
DEVY 1.99326
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
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4.96
4.84
4.71
4.58
4.45
4.33
4.20
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3.95
3.82
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2.80
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2.55
2.42
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2.16
2.04
1.91
1.78
1.65
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1.40
1.27
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0.13

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E-33

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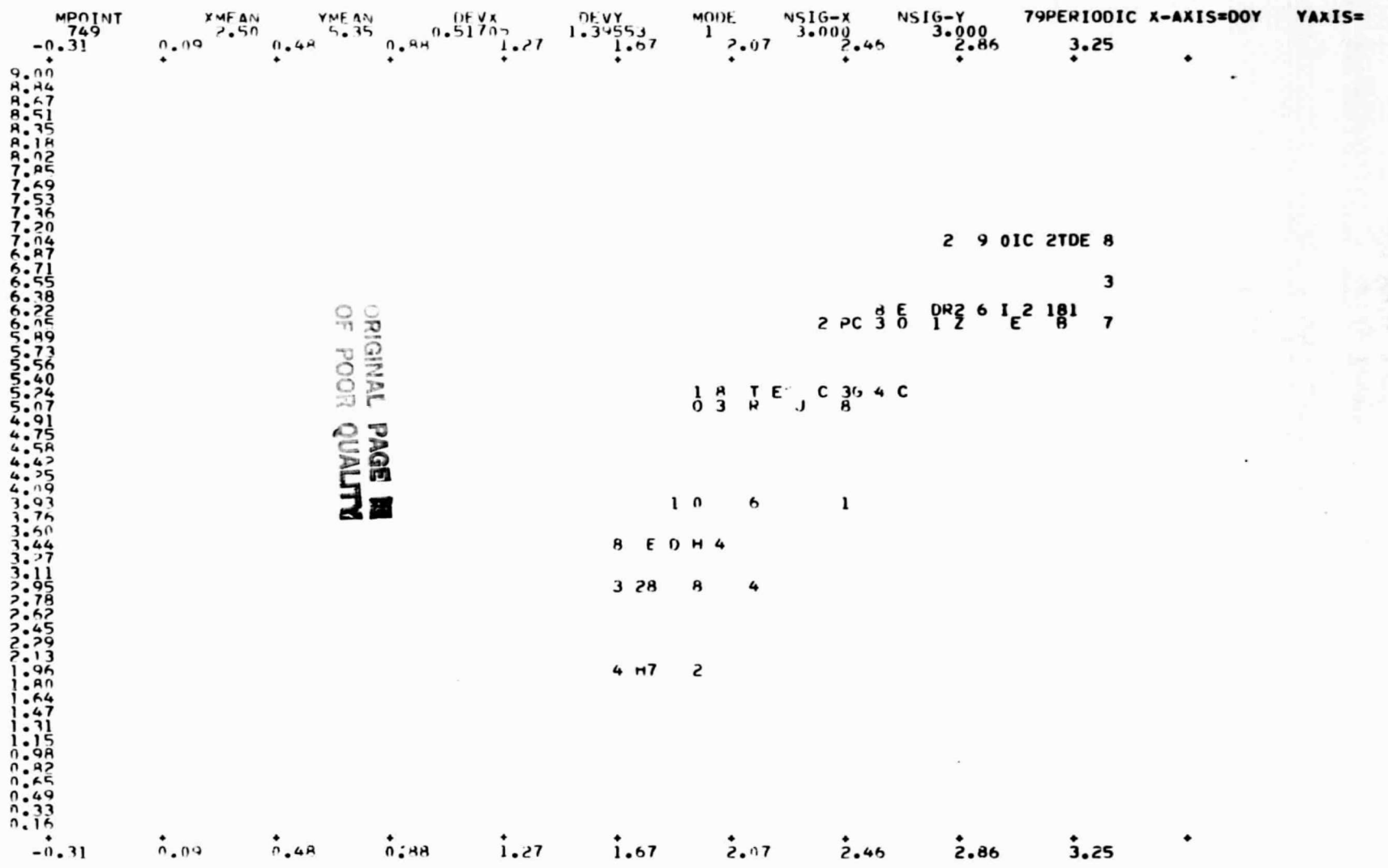
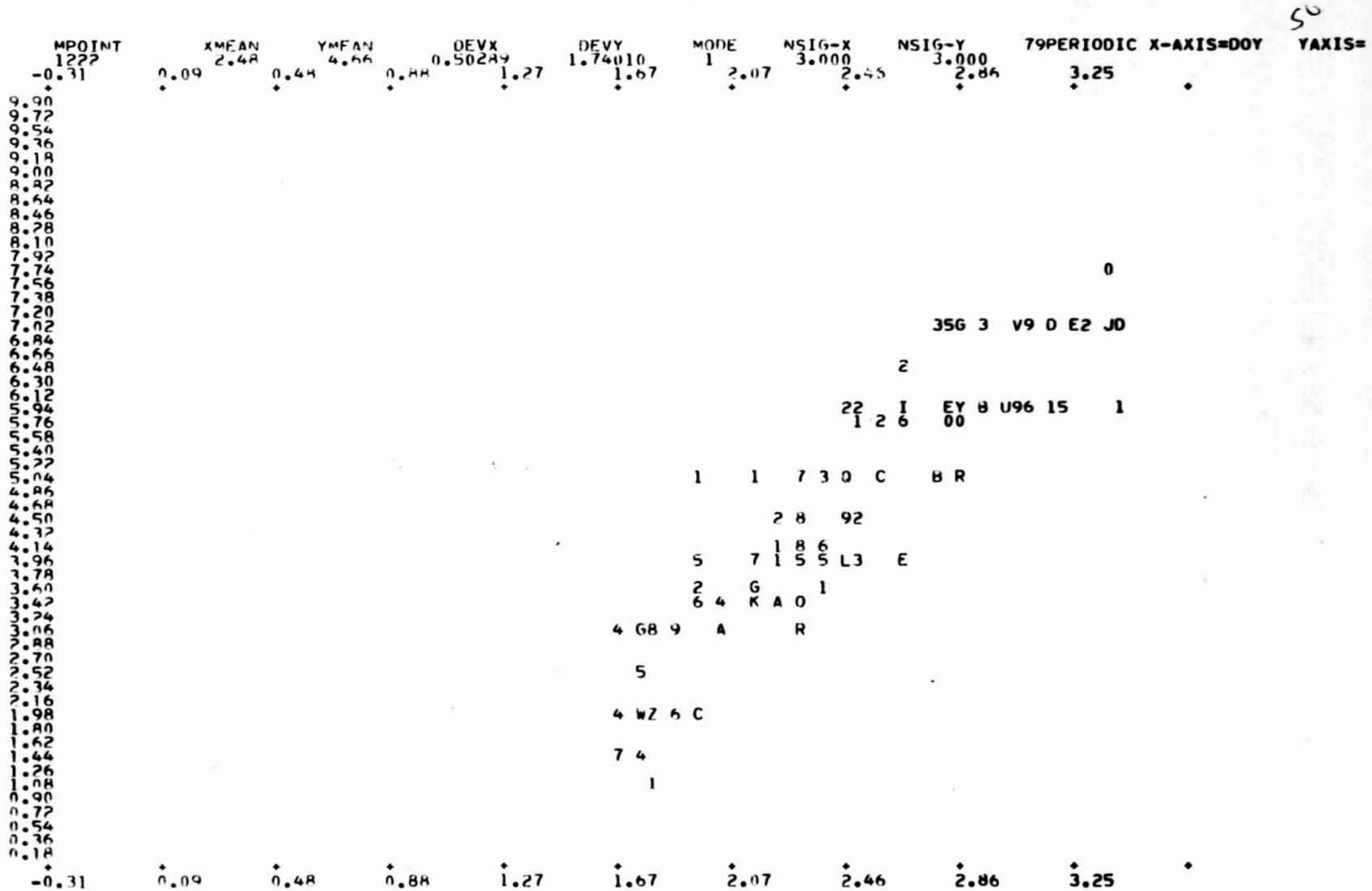


E-35
398


MPOINT 1222
XMEAN 2.48
YMEAN 4.66
DEVX 0.50289
DEVY 1.74010
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
9.90 9.72 9.54 9.36 9.18 9.00 8.82 8.64 8.46 8.28 8.10 7.92 7.74 7.56 7.38 7.20 7.02 6.84 6.66 6.48 6.30 6.12 5.94 5.76 5.58 5.40 5.22 5.04 4.86 4.68 4.50 4.32 4.14 3.96 3.78 3.60 3.42 3.24 3.06 2.88 2.70 2.52 2.34 2.16 1.98 1.80 1.62 1.44 1.26 1.08 0.90 0.72 0.54 0.36 0.18
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

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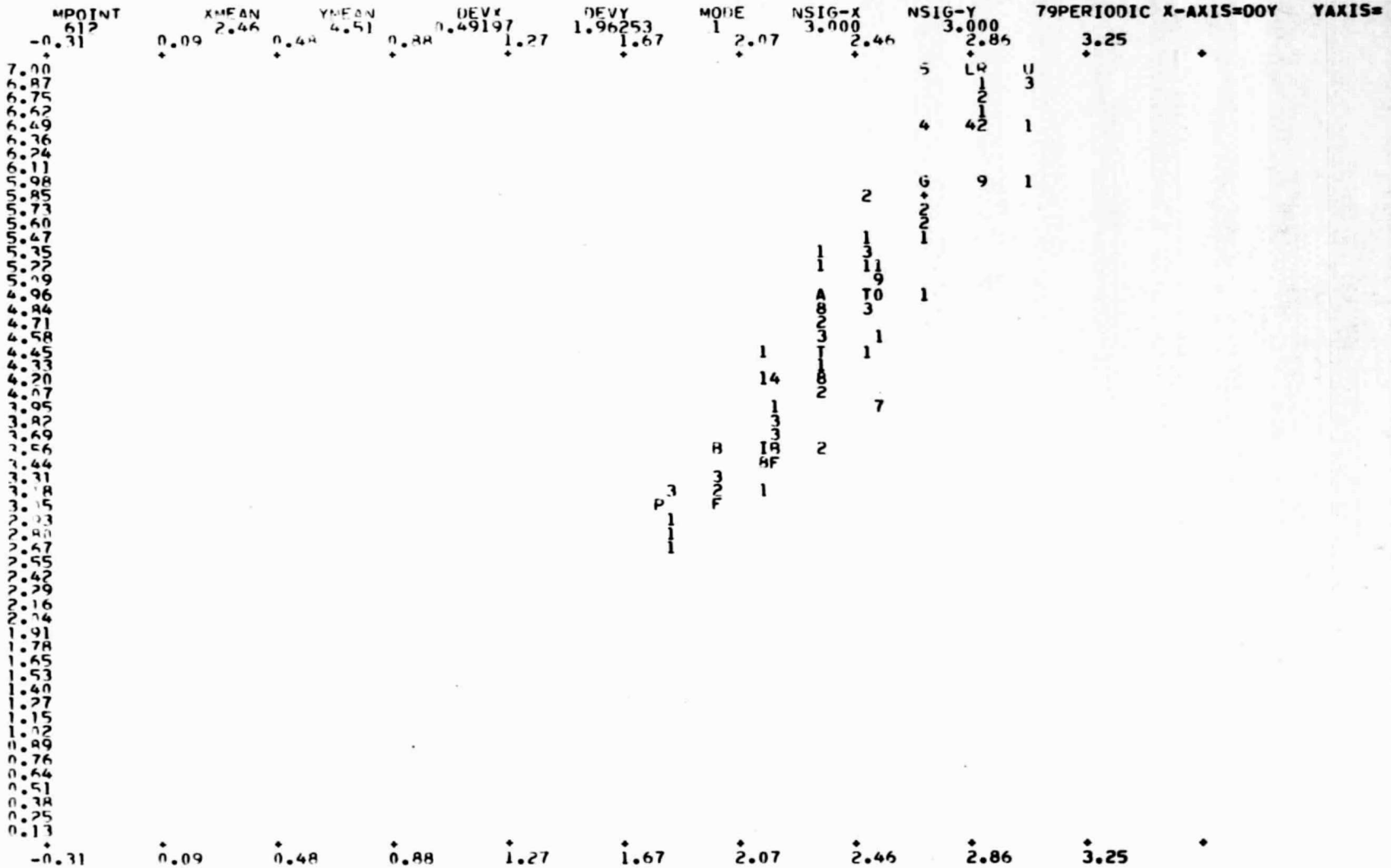
E-37
K00


MPOINT 612
XMEAN 2.46
YMEAN 4.51
DEVX 0.49197
DEVY 1.96253
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25
7.00
6.87
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6.62
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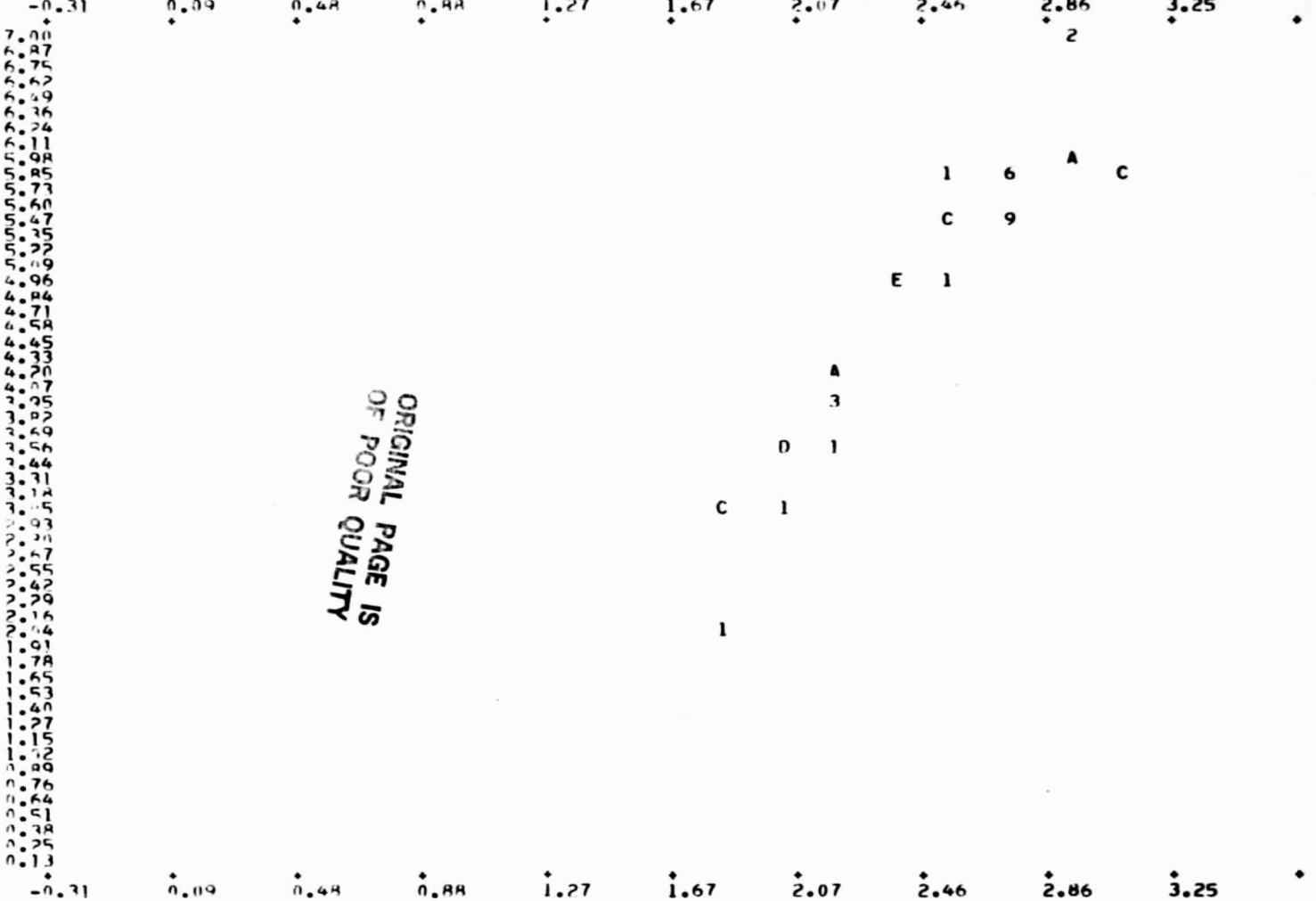
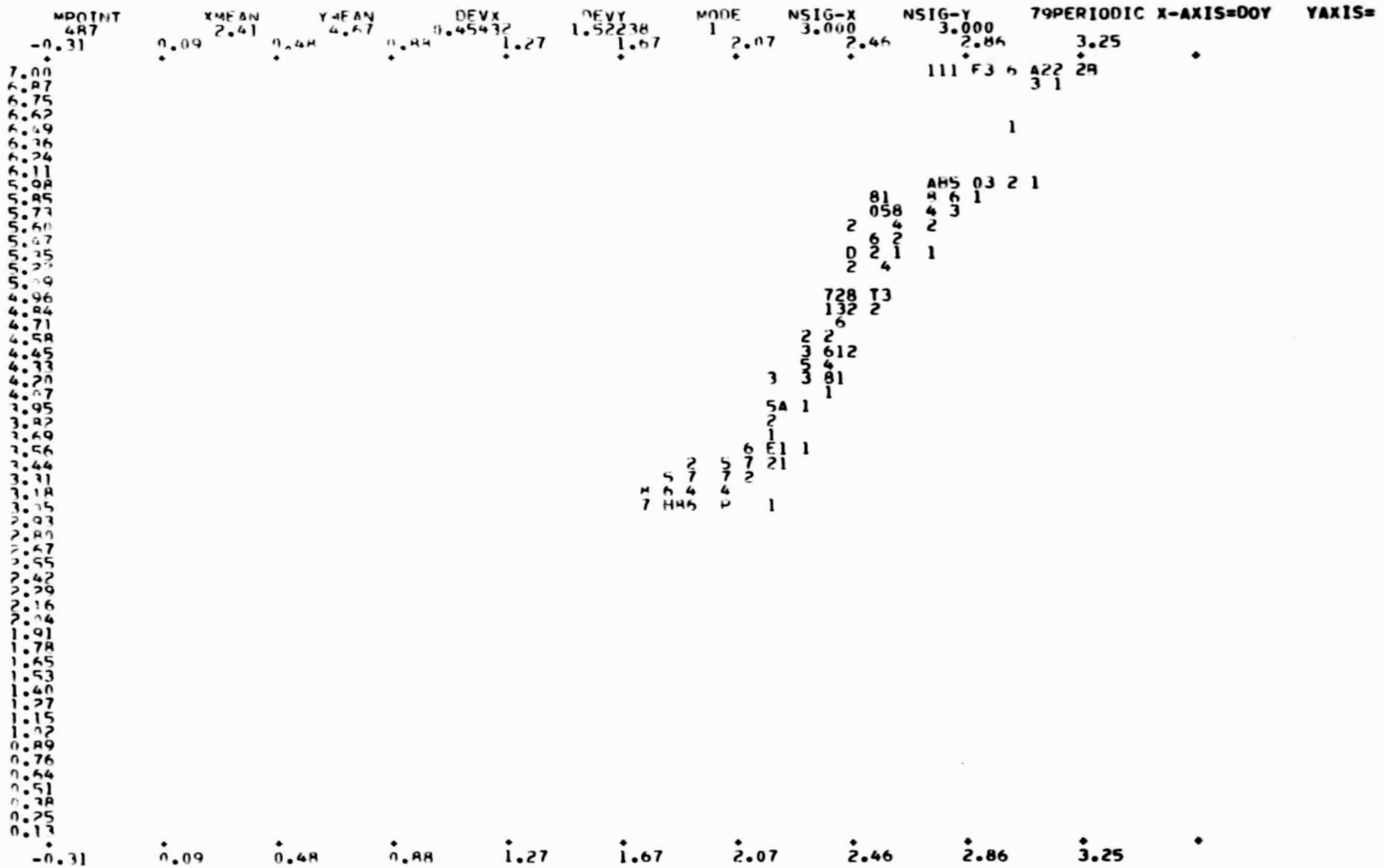
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13

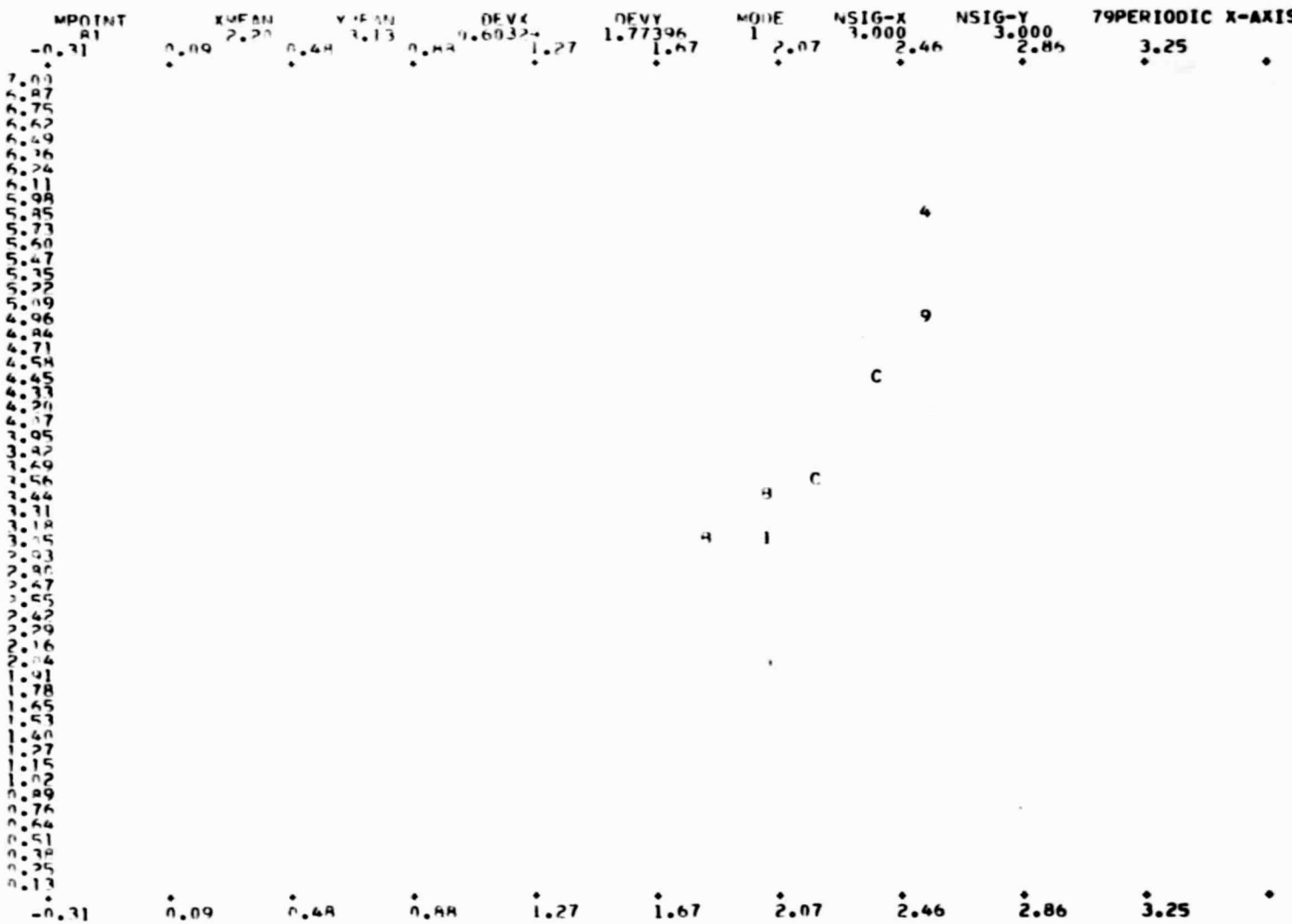
NEBRASKA

MPOINT 137 XMEAN 2.47 YMEAN 4.03 DEVX 0.61744 DEVY 2.03334 MODE 1 NSIG-X 3.000 NSIG-Y 3.000 79PERIODIC X-AXIS=DOY YAXIS=



E-47


MPOINT 487
XMEAN 2.41
YMEAN 4.67
DEVX 0.45432
DEVY 1.52238
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00 6.87 6.75 6.62 6.49 6.36 6.24 6.11 5.98 5.85 5.73 5.60 5.47 5.35 5.22 5.09 4.96 4.84 4.71 4.58 4.45 4.33 4.20 4.07 3.95 3.82 3.69 3.56 3.44 3.31 3.18 3.05 2.93 2.80 2.67 2.55 2.42 2.29 2.16 2.04 1.91 1.78 1.65 1.53 1.40 1.27 1.15 1.02 0.89 0.76 0.64 0.51 0.38 0.25 0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25


MPOINT 81
XMEAN 2.20
YMEAN 3.13
DEVX 0.60324
DEVY 1.77396
MODE 1
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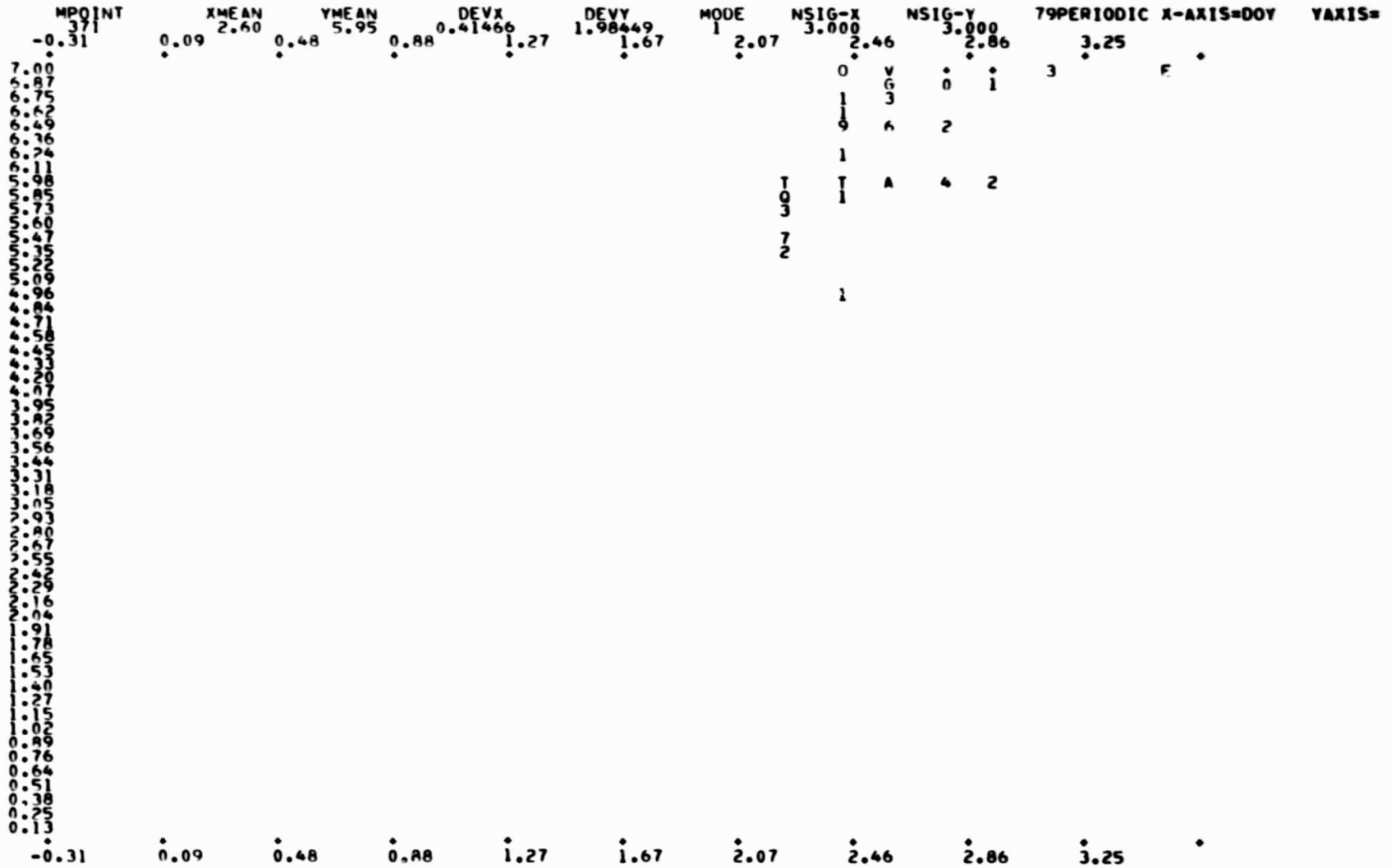
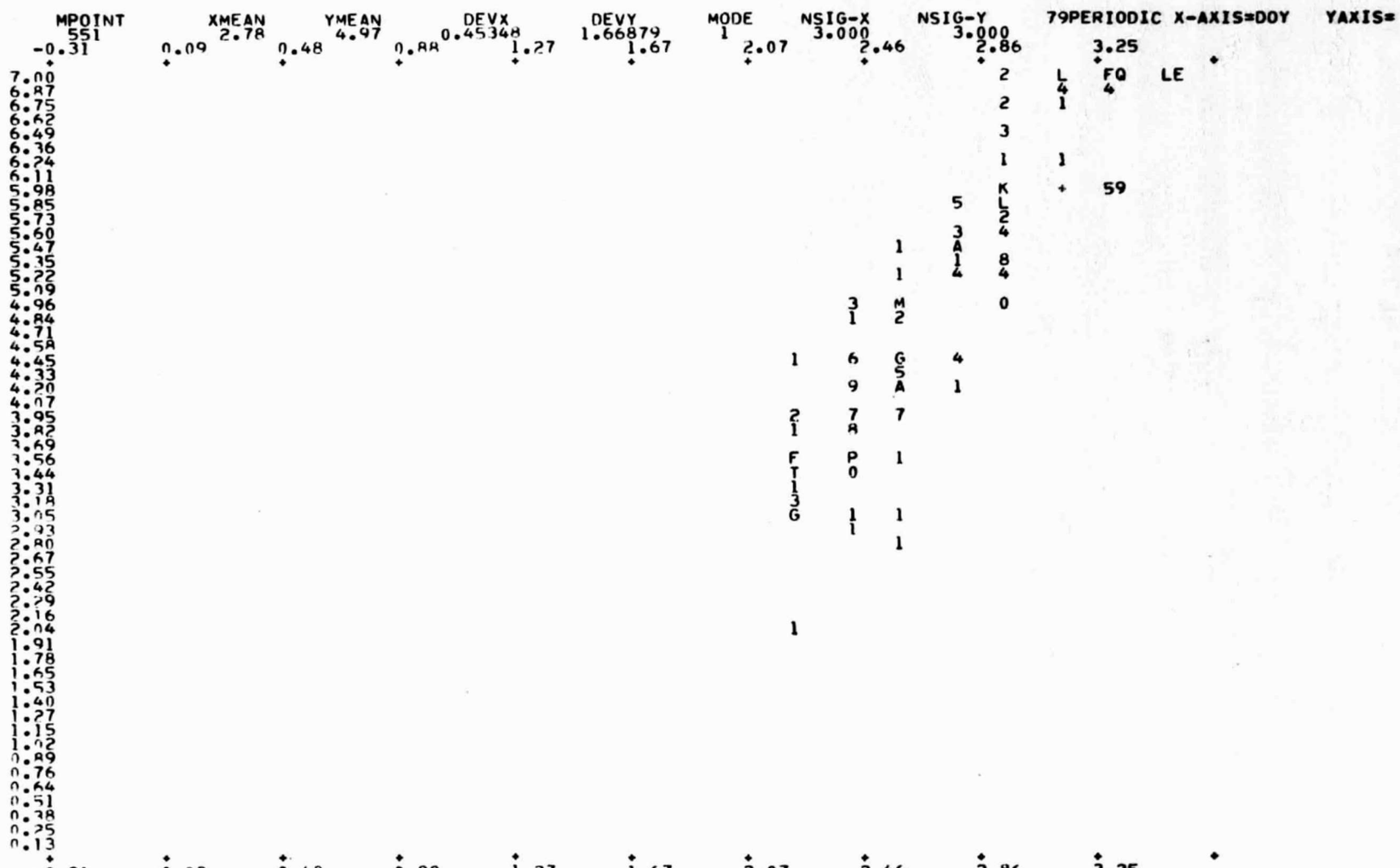
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

NORTH CAROLINA


MPOINT 371
XMEAN 2.60
YMEAN 5.95
DEVX 0.41466
DEVY 1.98449
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

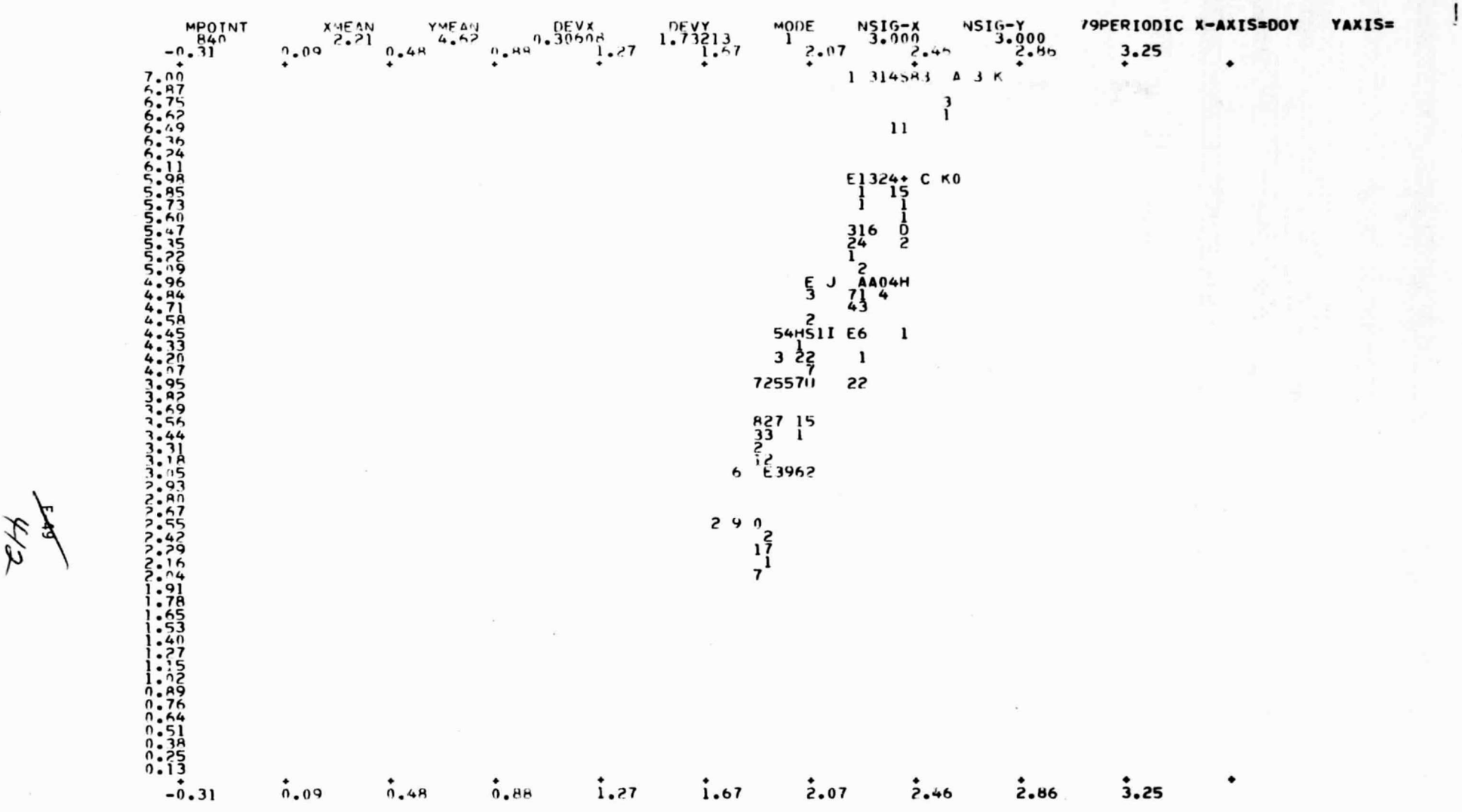

MPOINT 551
XMEAN 2.78
YMEAN 4.97
DEVX 0.45348
DEVY 1.66879
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00 6.87 6.75 6.62 6.49 6.36 6.24 6.11 5.98 5.85 5.73 5.60 5.47 5.35 5.22 5.09 4.96 4.84 4.71 4.58 4.45 4.33 4.20 4.07 3.95 3.82 3.69 3.56 3.44 3.31 3.18 3.05 2.93 2.80 2.67 2.55 2.42 2.29 2.16 2.04 1.91 1.78 1.65 1.53 1.40 1.27 1.15 1.02 0.89 0.76 0.64 0.51 0.38 0.25 0.13
L FQ LE
4 4
59

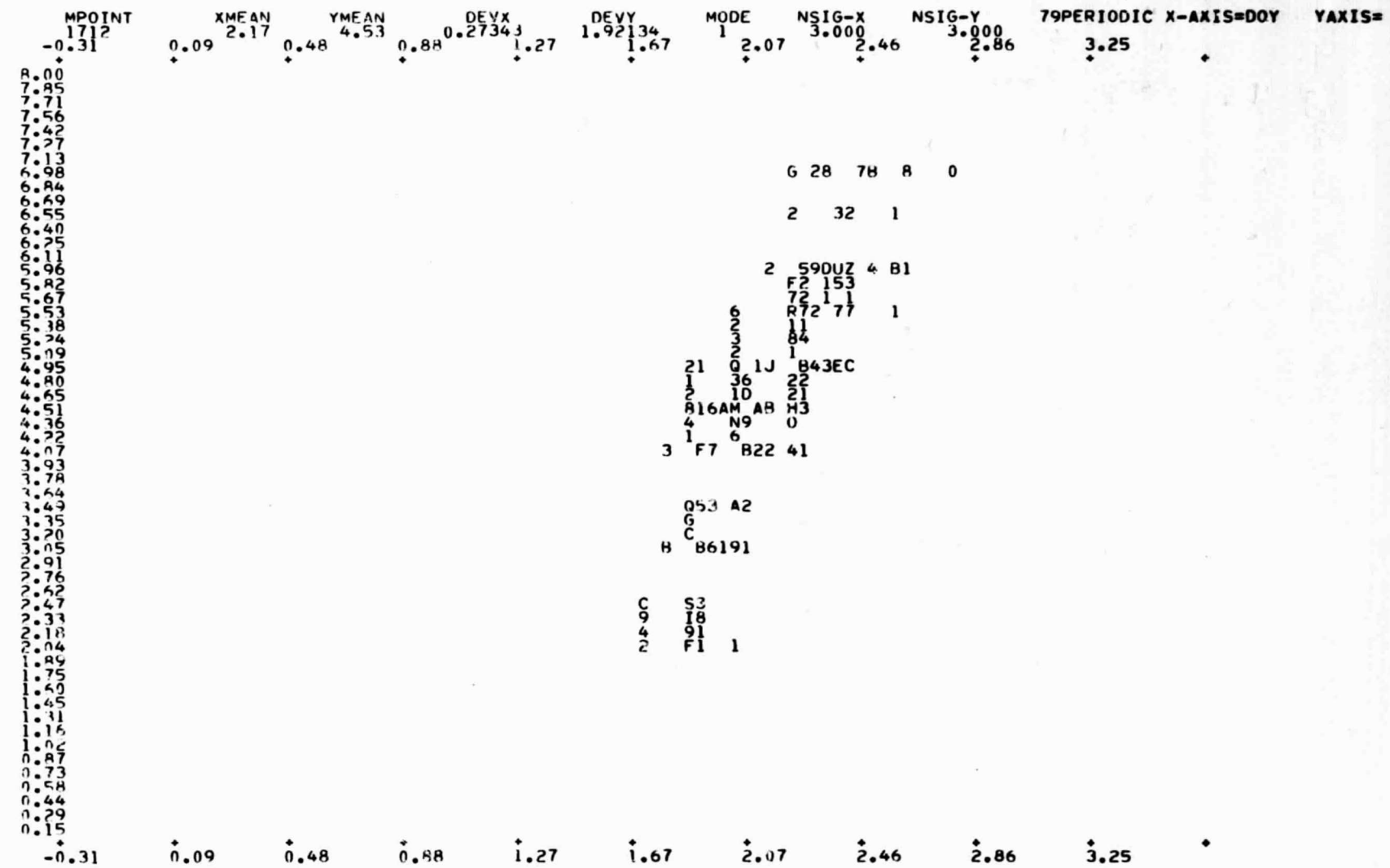
E-46
KCS

NORTH DAKOTA

E-47

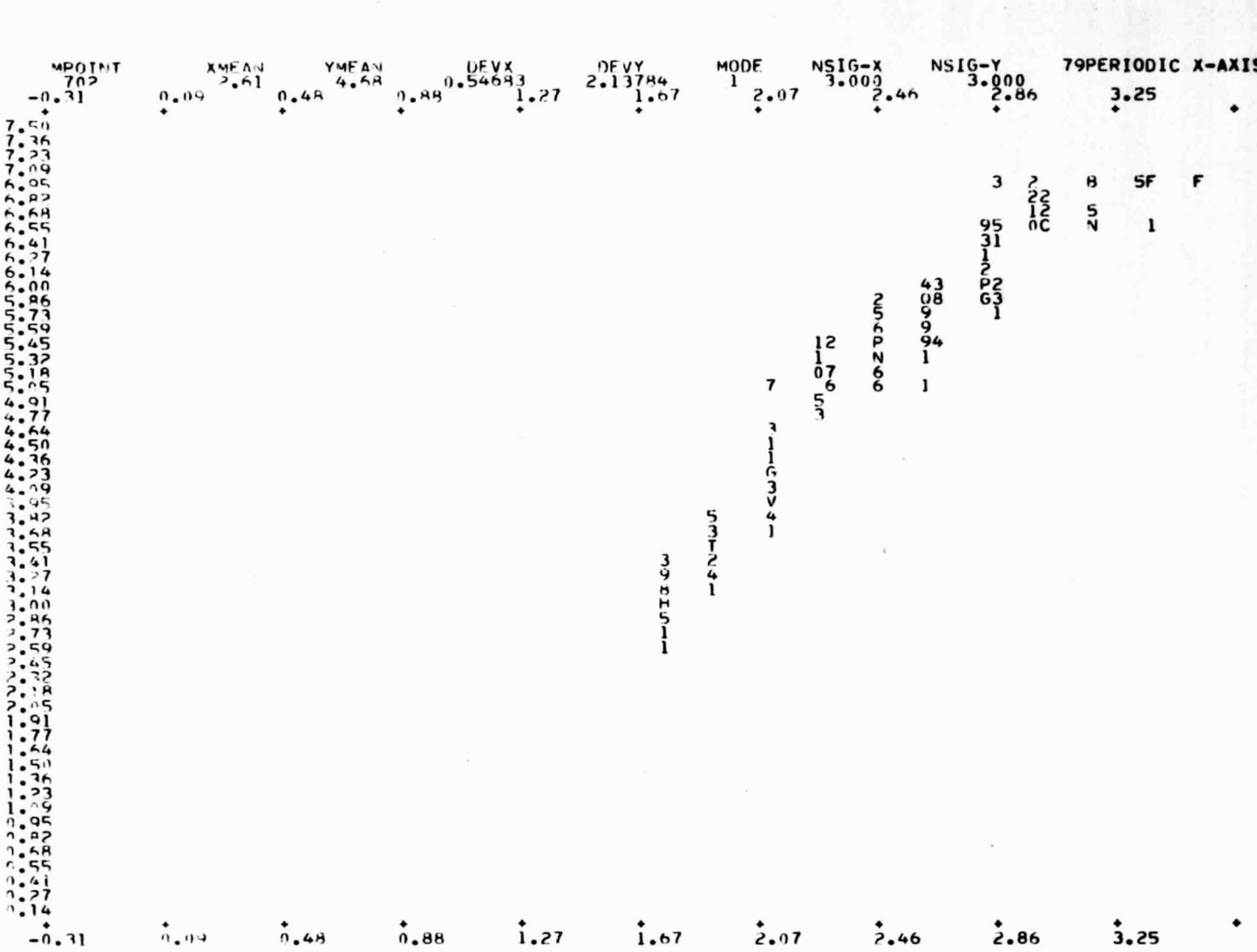
410


MPOINT 840
XMEAN 2.21
YMEAN 4.62
DEVX 0.30608
DEVY 1.73213
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25


MPOINT 1712
XMEAN 2.17
YMEAN 4.53
DEVX 0.27343
DEVY 1.92134
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
8.00 7.85 7.71 7.56 7.42 7.27 7.13 6.98 6.84 6.69 6.55 6.40 6.25 6.11 5.96 5.82 5.67 5.53 5.38 5.24 5.09 4.95 4.80 4.65 4.51 4.36 4.22 4.07 3.93 3.78 3.64 3.49 3.35 3.20 3.05 2.91 2.76 2.62 2.47 2.33 2.18 2.04 1.89 1.75 1.60 1.45 1.31 1.16 1.02 0.87 0.73 0.58 0.44 0.29 0.15
G 28 78 8 0
2 32 1
2 59DUZ 4 B1
F2 153
72 1 1
6 R72 77 1
2 11
3 84
2 1
21 Q 1J B43EC
1 36 22
2 1D 21
816AM AB M3
4 N9 0
1 6
3 F7 B22 41
Q53 A2
G
C
8 B6191
C S3
9 I8
4 91
2 F1 1

E-50
4/13

OHIO

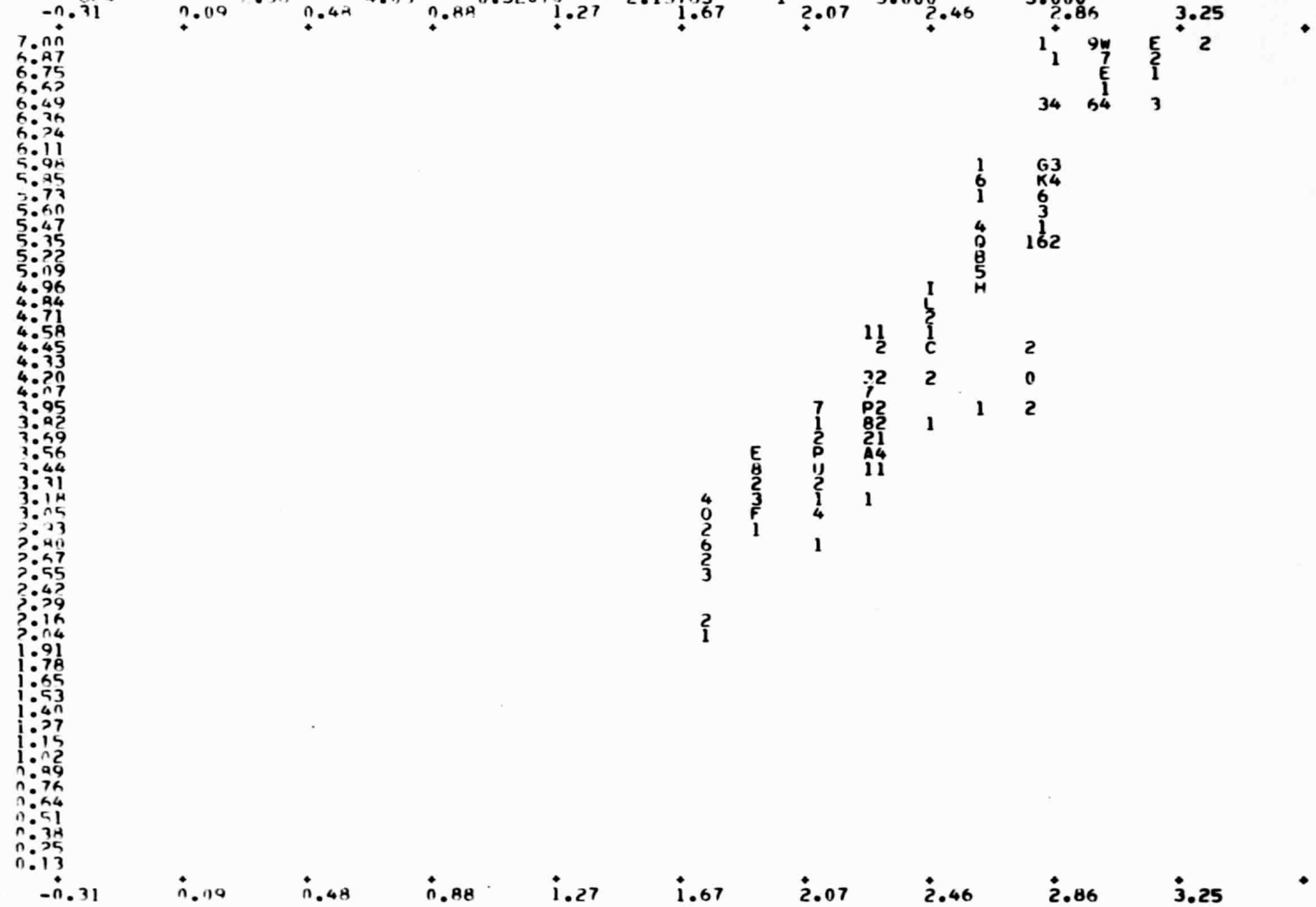

MPOINT 702
XMEAN 2.61
YMEAN 4.68
DEVX 0.54683
DEVY 2.13784
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.59 7.36 7.23 7.09 6.95 6.82 6.68 6.55 6.41 6.27 6.14 6.00 5.86 5.73 5.59 5.45 5.32 5.18 5.05 4.91 4.77 4.64 4.50 4.36 4.23 4.09 3.95 3.82 3.68 3.55 3.41 3.27 3.14 3.00 2.86 2.73 2.59 2.45 2.32 2.18 2.05 1.91 1.77 1.64 1.50 1.36 1.23 1.09 0.95 0.82 0.68 0.55 0.41 0.27 0.14
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

OK

Sth
25-3

50

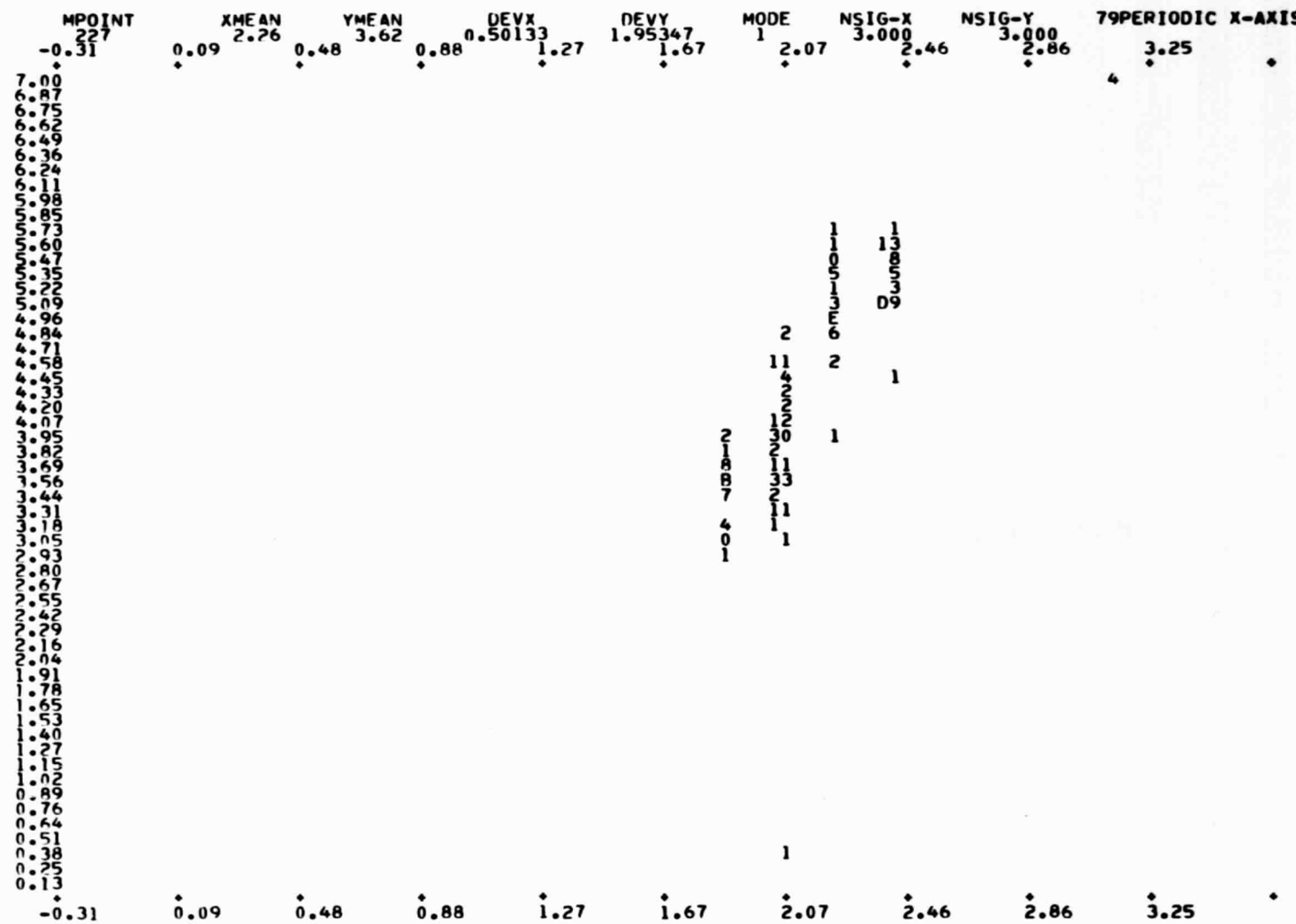
MPOINT	XMEAN	YMEAN	DEVX	DEVY	MODE	NSIG-X	NSIG-Y	79PERIODIC X-AXIS=DOY	YAXIS=
664	2.56	4.03	0.52076	2.13763	1	3.000	3.000		



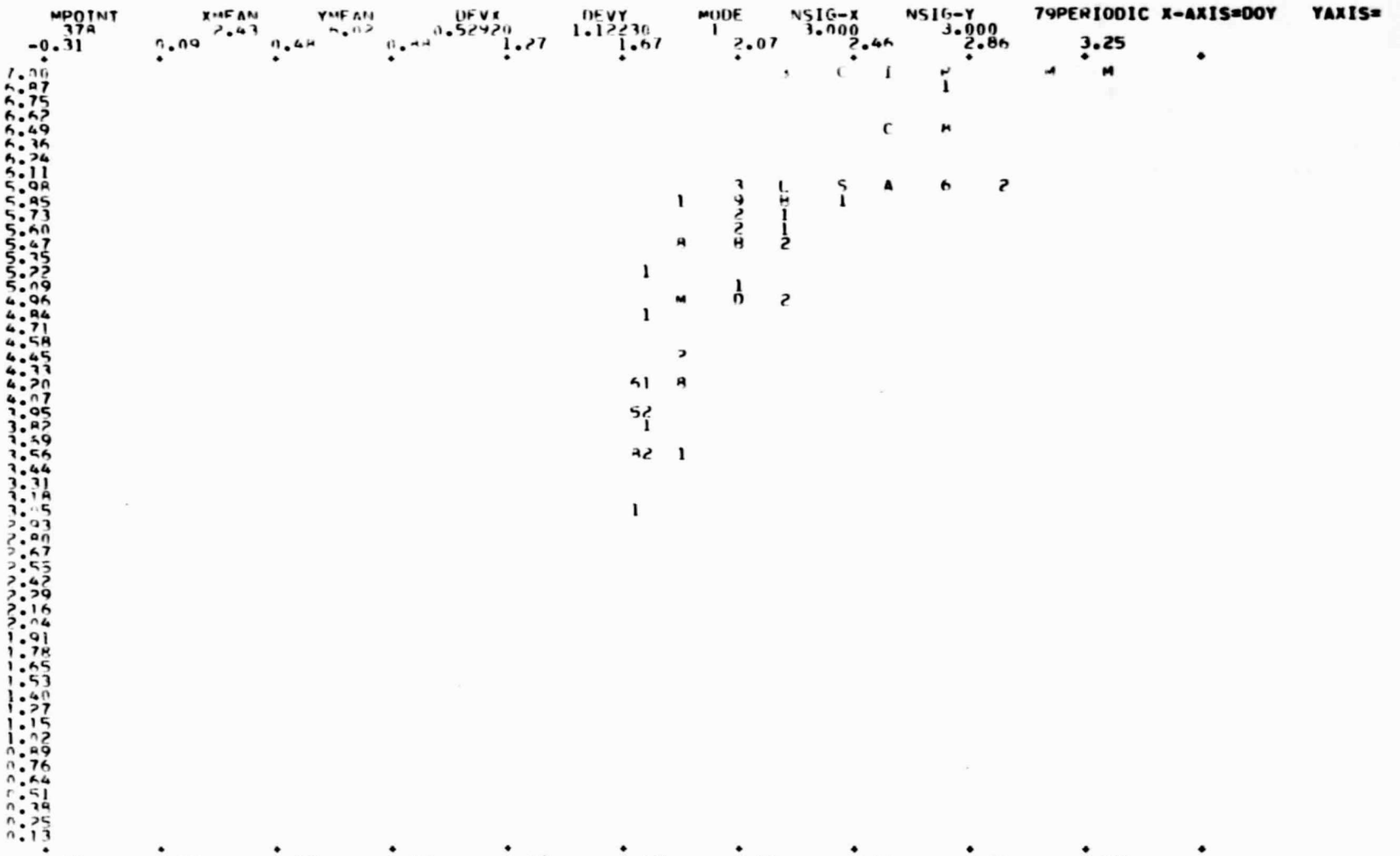
E-53 416

PENNSYLVANIA

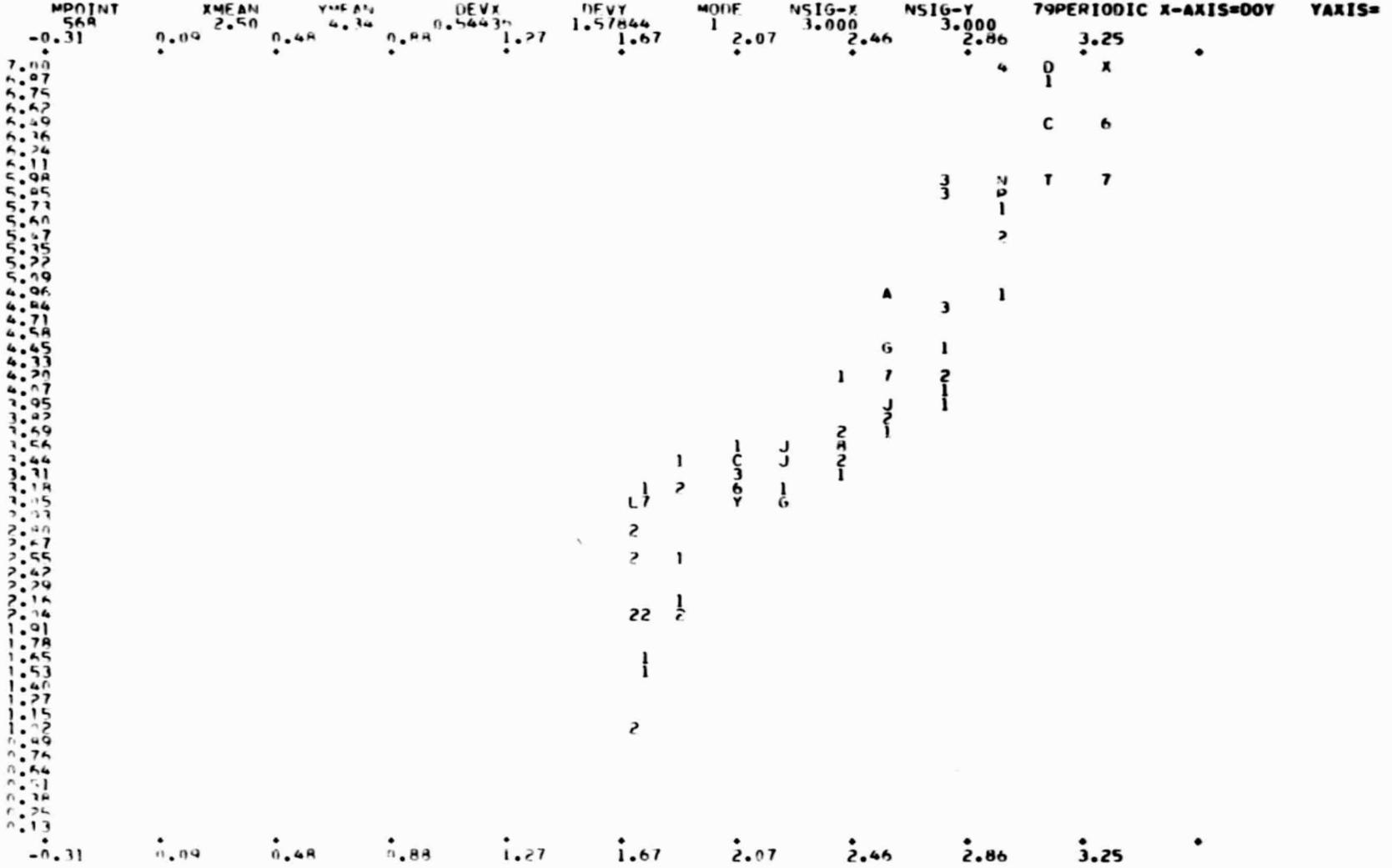
~~E-54~~
417


MPOINT 227
XMEAN 2.26
YMEAN 3.62
DEVX 0.50133
DEVY 1.95347
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

SOUTH CAROLINA


MPOINT 378
XMEAN 2.43
YMEAN 2.02
DEVX 0.52920
DEVY 1.12230
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.06
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
3.95
3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13

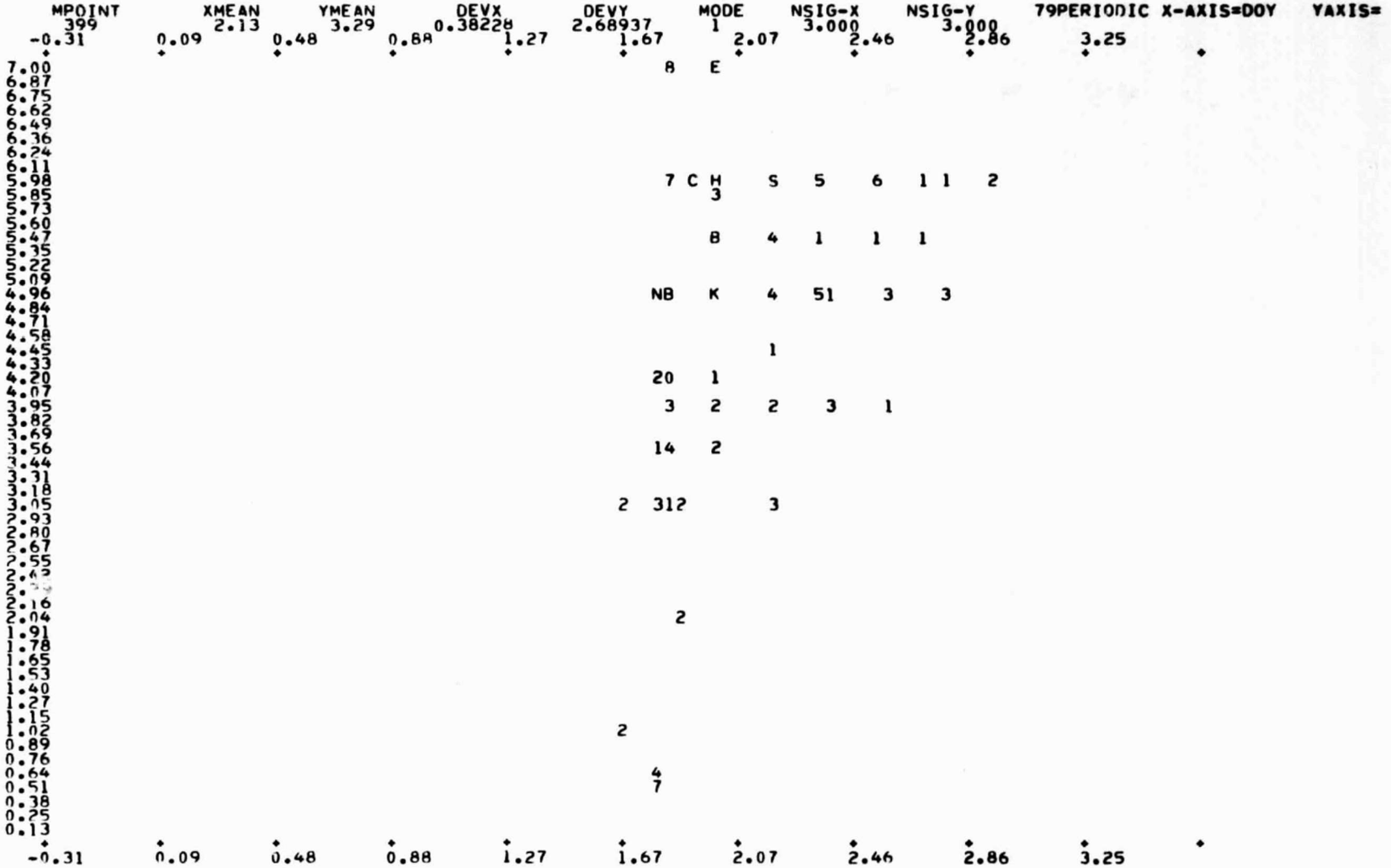
E-54
420


MPOINT 568
XMEAN 2.50
YMEAN 4.34
DEVX 0.54435
DEVY 1.57844
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31
0.09
0.48
0.88
1.27
1.67
2.07
2.46
2.86
3.25

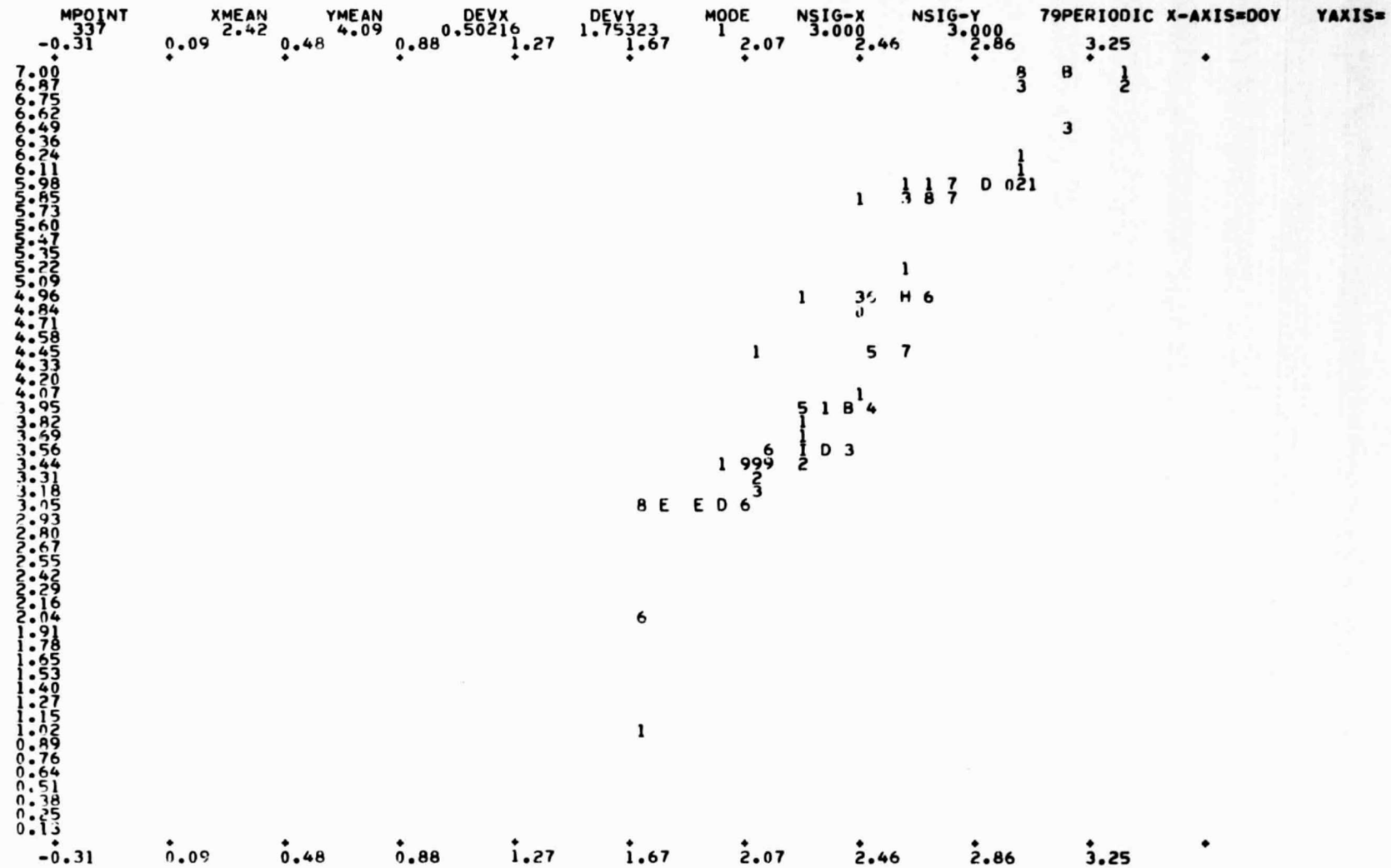
TEXAS

```
   MPOINT        XMEAN        YMEAN         DEVX         DEVY        MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
     649         2.41         4.80      0.54249      2.04209           1      3.000      3.000
  -0.31        0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
     +            +            +            +            +            +            +            +            +            +            +
7.00                                                                          9   A                        2 1  5 B B  E
6.87
6.75
6.62
6.49
6.36
6.24                                                                  F   J    6              3 3  8 8 5 0  0 3 3
6.11                                                                      0          3 A  C A B K7 K8 E8  I
5.98                                                                      1
5.85
5.73
5.60                                                                    E
5.47
5.35                                                                  D   5 8  B D A 4  2 1
5.22
5.09                                                                  1   1 4  5 1 18   E8     2  1
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07                                                                      7 7 2  0
3.95
3.82
3.69                                                                      3      1
3.56
3.44
3.31
3.18                                                                   2  7 4 171  9
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04                                                                  CA  8L1  8
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02                                                                  2    1
0.89
0.76
0.64
0.51
0.38
0.25
0.13
     +            +            +            +            +            +            +            +            +            +            +
  -0.31        0.09         0.48         0.88         1.27         1.67         2.07         2.46         2.86         3.25
```

```
 MPOINT      XMEAN      YMEAN       DEVX       DEVY      MODE     NSIG-X     NSIG-Y     79PERIODIC X-AXIS=DOY   YAXIS=
   1052       2.47       3.62    0.45921    2.49590         1      3.000      3.000
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
    +          +          +          +          +          +          +          +          +          +          +
7.00                                                                  I  0HJ 3 +    3 1 1    4 8 37
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98                                                                  0 F 0  36E 2 9  1 1 3 14 J M 7  2
5.85
5.73
5.60
5.47                                                                  5 7 0  223 3           5 2   2
5.35
5.22
5.09
4.96                                                                1 2 J 8 L  3 4 1 1  1 B D 4E 4 2
4.84
4.71
4.58
4.45                                                                B 7 H 3 E  431   2  5 4 6 25 1
4.33
4.20
4.07
3.95                                                              1 D 4 4 5 1    1 4 9  D 9 6  1
3.82
3.69
3.56                                                              1 4 1 6   3 1     8 6 0 3
3.44
3.31
3.18
3.05                                                              C V 1 A 6 2      P G  6 3
2.93
2.80
2.67
2.55                                                                B
2.42
2.29
2.16
2.04                                                                           2
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
    +          +          +          +          +          +          +          +          +          +          +
  -0.31       0.09       0.48       0.88       1.27       1.67       2.07       2.46       2.86       3.25
```


MPOINT 399
XMEAN 2.13
YMEAN 3.29
DEVX 0.38228
DEVY 2.68937
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00 8 E
7 C H S 5 6 1 1 2
3
8 4 1 1 1
NB K 4 51 3 3
1
20 1
3 2 2 3 1
14 2
2 312 3
2
2
4
7

E-62
435


MPOINT 337
XMEAN 2.42
YMEAN 4.09
DEVX 0.50216
DEVY 1.75323
MODE 1
NSIG-X 3.000
NSIG-Y 3.000
79PERIODIC X-AXIS=DOY YAXIS=
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25
7.00
6.87
6.75
6.62
6.49
6.36
6.24
6.11
5.98
5.85
5.73
5.60
5.47
5.35
5.22
5.09
4.96
4.84
4.71
4.58
4.45
4.33
4.20
4.07
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3.82
3.69
3.56
3.44
3.31
3.18
3.05
2.93
2.80
2.67
2.55
2.42
2.29
2.16
2.04
1.91
1.78
1.65
1.53
1.40
1.27
1.15
1.02
0.89
0.76
0.64
0.51
0.38
0.25
0.13
-0.31 0.09 0.48 0.88 1.27 1.67 2.07 2.46 2.86 3.25

APPENDIX F

COMPUTER PROGRAM LISTING

```
FILE: WFIRD     FORTRAN X     PURDUE/LARS 3031

      DIMENSION XX(3000),YY(3000),PLNT7(3000),COVER(3000),CRPSTG(3000)   WEI00010
      DIMENSION MONTH(3000),IDAY(3000),ZZ(3000),AZ(3000)                 WEI00020
      DIMENSION E (100)                                                  WEI00030
      INTEGER*4 FIELD (3000),IDUM(25),PLTM(100),PLTD(100),EMRGD(100)     WEI00040
     *,EMRGM(100),SEEDAT(100),WIDTH(100),IFIN(8),I(11)                   WEI00050
      DIMENSION ISEG(45)                                                 WEI00060
      DIMENSION A(3),DUCK(500),SIGMAA(3000),DUMMY(3000),YFIT(3000)       WEI00070
      LOGICAL*1 LWR(7),INFO(3000),LQ(2),ICRP(2),NCRP(2),LD(2),LK5(2)     WEI00080
      LOGICAL*1 MEL(8),INT1(2),IRLL(2),XA(11)                            WEI00090
      REAL*8 ALMEL(5)                                                    WEI00100
      REAL*8 TITLE(5),TITLE1(5),TITLE2(5),TITLE3(5)                      WEI00110
      DATA TITLE /'PLANT','ING D','ATE  ','     ','     '/               WEI00120
      DATA TITLE1 /'EMERG','ENCE ','DATE ','     ','     '/              WEI00130
      DATA TITLE2 /'SEEDI','NG RA','TE - ','LB/AC','RE   '/              WEI00140
      DATA TITLE3 /'ROW W','IDTH ','- INC','HES  ','     '/              WEI00150
      DATA ALABEL /'79PER','IODIC','DOY  ','     ','     '/              WEI00160
      EQUIVALENCE (LQ(1),ILQ),(LWR(4),NLQ),(NCRP(1),XNCRP)               WEI00170
     *,(KLQ,LD(1)),(ICRP(1),XICRP),(KK5,LK5(1))                          WEI00180
      EQUIVALENCE (INT2,INT1(1)),(IRL,IRLL(1))                           WEI00190
      EQUIVALENCE (MEL(7),IWD1),(LWR(6),IWD2)                            WEI00200
      INTEGER*2 ILQ,NLQ,XNCRP,XICRP,KLQ,KK5,IRL,INT2,IWD1,IWD2           WEI00210
      DATA XA /' ','0','1','2','3','4','5','6','7','8','9'/             WEI00220
      DATA ID /0,0,1,2,3,4,5,6,7,8,9/                                    WEI00230
      DATA LWR/'0','D','A','8',' ',' ',' ',' '/                          WEI00240
      I=0                                                                WEI00250
      LQ(2)=LWR(5)                                                       WEI00260
      LQ(1)=LWR(2)                                                       WEI00270
      LD(2)=LWR(5)                                                       WEI00280
      LK5(1)=LWR(3)                                                      WEI00290
      LK5(2)=LWR(5)                                                      WEI00300
      INT1(2) = LWR(5)                                                   WEI00310
      IRLL(2) = LWR(5)                                                   WEI00320
      WRITE (16,500)                                                     WEI00330
  500 FORMAT (5X,'INPUT GUESSES FOR A')                                  WEI00340
      READ (15,510) (A(I), I = 1,3)                                      WEI00350
  510 FORMAT (2(F10.3/),F10.3)                                           WEI00360
      WRITE (16,520)                                                     WEI00370
  520 FORMAT ('INPUT SEGMENT VALUES')                                    WEI00380
   40 READ(15,1) NSAM,ICRP(1),ICRP(2),NPROC,(ISEG(ISS),ISS=1,NSAM)       WEI00390
    1 FORMAT (I2,2A1,14,160(/,I4))                                       WEI00400
C  ***************************************************                 WEI00410
C IF YOU WANT TO USE A DISK FILE ALREADY CREATED ON                     WEI00420
C UNIT 7 CALLED DUMMY DATA, SET NPROC=9999                              WEI00430
C***************************************************                   WEI00440
      WRITE (6,550) NSAM,ICRP(1),ICRP(2),(ISEG(ISS),ISS=1,NSAM)          WEI00450
  550 FORMAT (1H ,20X,I5,5X,2A1,10(16I5,/))                              WEI00460
      IF (NPROC .EQ. 9999) GO TO 3                                       WEI00470
      CALL GNREAD(KLQ,LWR(5),NSAM,ISEG)                                  WEI00480
      JOK=0                                                              WEI00490
    3 I=I+1                                                              WEI00500
    4 READ (7,2,END=44) LQ(1),NSEG,MONTH(I),IDAY(I),IFLD,NCRP(1),NCRP(2) WEI00510
     *,(IDUM(JH),JH=1,14),(MEL(IL),IL = 1,8)                             WEI00520
    2 FORMAT (A1,I4,8X,2I2,2X,I2,1X,2A1,1X,9I1,1X,5I1,8A1)               WEI00530
      IF (NSEG.GT.ISEG(NSAM)) GO TO 44                                   WEI00540
      DO 750 IX=1,NSAM                                                   WEI00550
      IF(ISEG(IX).EQ.NSEG) GO TO 751                                     WEI00560
  750 CONTINUE                                                           WEI00570
      GO TO 4                                                            WEI00580
  751 IF (XNCRP.NE.XICRP) GO TO 4                                        WEI00590
      IF (ILQ.EQ.KK5) GO TO 530                                          WEI00600
      GO TO 531                                                          WEI00610
  530 DO 200 K = 1,8                                                     WEI00620
      DO 210 J = 1,11                                                    WEI00630
      INT1(1) = MEL(K)                                                   WEI00640
      IRLL(1) = XA(J)                                                    WEI00650
      IF (INT2 .EQ. IRL) IFIN(K) = ID(J)                                 WEI00660
  210 CONTINUE                                                           WEI00670
  200 CONTINUE                                                           WEI00680
      PLTM(IFLD)=10*IDUM(6)+IDUM(7)                                      WEI00690
      PLTD(IFLD)=10*IDUM(8)+IDUM(9)                                      WEI00700
      EMRGM(IFLD)=10*IDUM(10)+IDUM(11)                                   WEI00710
      EMRGD(IFLD)=10*IDUM(12)+IDUM(13)                                   WEI00720
      SEEDAT(IFLD) = 100 * IFIN(1) + 10 * IFIN(2) + IFIN(3)              WEI00730
      WIDTH(IFLD) = 10 * IFIN(7) + IFIN(8)                               WEI00740
      LLDUM=IDOY(PLTM(IFLD),PLTD(IFLD))                                  WEI00750
      IF (LLDUM.LT.1) GO TO 4                                            WEI00760
      PLTD(IFLD)=LLDUM                                                   WEI00770
      LLDUM=IDOY(EMRGM(IFLD),EMRGD(IFLD))                                WEI00780
      IF (LLDUM.LT.1) GO TO 4                                            WEI00790
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      EMRGD(IFLD)=LLDUM                                                      WEI00800
      IF (SEEDRT(IFLD) .LT. 1) GO TO 4                                       WEI00810
      IF (IWD1 .EQ. IWD2) RWDTH(IFLD) = -2                                   WEI00820
      JQK=JQK+1                                                              WEI00830
      ZZ(JQK)=EMRGD(IFLD)                                                    WEI00840
      XZ(JQK)=PLTD(IFLD)                                                     WEI00850
      DUCK(JQK) = SEEDRT(IFLD)                                               WEI00860
      DUMMY(JQK) = RWDTH(IFLD)                                               WEI00870
      GO TO 532                                                              WEI00880
  531 IF(ILQ.EQ.NLQ) GO TO 533                                               WEI00890
      GO TO 4                                                                WEI00900
  533 CONTINUE                                                               WEI00910
      IF (MONTH(I) .LT. 1 .OR. IDAY(I) .LT. 1) GO TO 4                       WEI00920
C                                                                            WEI00930
COMMENT:  IF ALL FIELDS ARE TO BE PLOTTED UPON TAPE READ,                    WEI00940
C         MAKE FOLLOWING STATEMENT A COMMENT CARD.                           WEI00950
C                                                                            WEI00960
C*************************************************                           WEI00970
C     IF (PLTD(IFLD).LT.1.OR.EMRGD(IFLD).LT.1) GO TO 4                       WEI00980
C*************************************************                           WEI00990
C                                                                            WEI01000
 1241 PLNTZ(I)=10*IDUM(2)+IDUM(3)+100*IDUM(1)                                WEI01010
      PLNTZ(I) = PLNTZ(I) + 1.0E-04                                          WEI01020
      IF (PLNTZ(I) .GT. 998.0) GO TO 4                                       WEI01030
      COVER(I)=10*IDUM(5)+IDUM(6)                                            WEI01040
      CRPSTG(I)=FLOAT(IDUM(9))+FLOAT(IDUM(10))/10.0                          WEI01050
      FIELD(I)=IFLD                                                          WEI01060
  532 CONTINUE                                                               WEI01070
      IF (ILQ.EQ.KK5) GO TO 4                                                WEI01080
      IF (COVER(I).GT.10.0) WRITE (6,666) NSEG                               WEI01090
      IF (COVER(I).GT.10.0) COVER(I)=COVER(I)/10.0+.5                        WEI01100
      IF (CRPSTG(I).GE.10.0) WRITE (6,667) NSEG                              WEI01110
  667 FORMAT (1H ,30X,' SEGMENT',I4,' HAS CROP STAGE .GE. 10')               WEI01120
      IF (CRPSTG(I).GE.10.0) CRPSTG(I)=CRPSTG(I)/10.0                        WEI01130
  666 FORMAT (1H ,'SEGMENT ',I4,' HAS CROP COVER .GT. 10')                   WEI01140
C THE ABOVE STATEMENTS ARE TO CORRECT ENUMERATORS THAT USE % IN PLACE        WEI01150
C OF THE 1 - 10 CODE OR THAT FAIL TO PUT A DECIMAL IN THE CROP STAGE         WEI01160
      IF (I.EQ.2995) GO TO 44                                                WEI01170
      GO TO 3                                                                WEI01180
   44 N=I-1                                                                  WEI01190
      DO 20 I=1,N                                                            WEI01200
      XX(I)=IDOY(MONTH(I),IDAY(I))                                           WEI01210
C                                                                            WEI01220
COMMENT:  NORMALIZATION OF PLANT HEIGHT AND GROUND COVER BY                  WEI01230
C         PLANTING OR EMERGENCE DATE CAN ONLY BE DONE FOR 1 SEGMENT          WEI01240
C         AT A TIME WITH THE PRESENT PROGRAM.                                WEI01250
C                                                                            WEI01260
C     IF (NPROC.EQ.9999.AND.PLTD(FIELD(I)).GT.0) XX(I)=XX(I)                 WEI01270
C    *-PLTD(FIELD(I))                                                        WEI01280
C     IF (NPROC.EQ.9999.AND.EMRGD(FIELD(I)).GT.0) XX(I)=XX(I)                WEI01290
C    *-EMRGD(FIELD(I))                                                       WEI01300
      YY(I)=PLNTZ(I)                                                         WEI01310
      INFO(I)=LWR(1)                                                         WEI01320
C     WRITE (6,700) I,FIELD(I),XX(I),YY(I)                                   WEI01330
C 700 FORMAT (1H ,'I=',I5,5X,'FIELD=',I5,' XX= ',F10.3,' YY= ',F10.3)        WEI01340
   20 CONTINUE                                                               WEI01350
C     DO 9173 IIII=1,JQK                                                     WEI01360
C9173 WRITE (6,9174) IIII,XZ(IIII),ZZ(IIII),DUCK(IIII),DUMMY(IIII)           WEI01370
 9174 FORMAT (1H ,I10,4F15.5)                                                WEI01380
      CALL HIS1 (XZ,JQK,10,XMIN,XMAX,F,TITLE,0,0,0,6,ISEG,NSAM,ICRP)         WEI01390
      CALL HIS1 (ZZ,JQK,10,XMIN,XMAX,F,TITLE1,0,0,0,6,ISEG,NSAM,ICRP)        WEI01400
      CALL HIS1 (DUCK,JQK,10,XMIN,XMAX,F,TITLE2,0,0,0,6,ISEG,NSAM,ICRP)      WEI01410
      CALL HIS1 (DUMMY,JQK,10,XMIN,XMAX,F,TITLE3,0,0,0,6,ISEG,NSAM,ICRP)     WEI01420
      MNN = 0                                                                WEI01430
      DO 630 IFL = 1,N                                                       WEI01440
      IF ((YY(IFL) .LT. 1.0)  .OR. (XX(IFL) .LT. 0.01)) GO TO 620            WEI01450
      MNN = MNN + 1                                                          WEI01460
      ZZ(MNN) = YY(IFL)                                                      WEI01470
      XZ(MNN) = XX(IFL)/100.0                                                WEI01480
  620 XX(IFL) = XX(IFL)/100.                                                 WEI01490
  630 CONTINUE                                                               WEI01500
      XX(N+1)=1.5                                                            WEI01510
      XX(N+2)=3.65                                                           WEI01520
      YY(N+1)=-1.0                                                           WEI01530
      YY(N+2)=50                                                             WEI01540
C     IF (NPROC.EQ.9999) XX(N+1)=0.0                                         WEI01550
C     IF (NPROC. EQ.9999) XX(N+2)=1.5                                        WEI01560
      NNN=N+2                                                                WEI01570
      CALL TPICT7 (XX,YY,INFO,NNN,XCENT,YCENT,3.0,3.0,55,100,1,1,2,          WEI01580
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     &ALABEL,6)                                                                 WFI01540
C      DO 640 I = 1,MNN                                                         WFI01600
C      ZZ(I) = ALOG (ZZ(I))                                                     WFI01610
C 640 CONTINUE                                                                  WFI01620
      XCHI = 200.                                                               WFI01630
      FLAMDA = 1.E-03                                                           WFI01640
      LA = 0                                                                    WFI01650
  600 LA = LA + 1                                                               WFI01660
C                                                                               WFI01670
COMMENT:  FOR THE GIVEN SET OF DATA ONLY 100 ITERATIONS ARE                     WFI01680
C         NECESSARY FOR CONVERGENCE.  THE LIMIT MAY NEED                        WFI01690
C         TO BE CHANGED FOR A DIFFERENT SET OF DATA VALUES.                     WFI01700
C                                                                               WFI01710
      IF (LA .GE. 10) GO TO 601                                                 WFI01720
C     CALL  CURFIT (XZ,ZZ,DUMMY,MNN,3.0,A,DUCK,SIGMAA,FLAMDA,YFIT,              WFI01730
C    &CHISQR)                                                                   WFI01740
      XDIF = XCHI - CHISQR                                                      WFI01750
      XTH = (3. * E-04) * CHISQR                                                WFI01760
      IF (ABS(XDIF) .LE. XTH) GO TO 601                                         WFI01770
      XCHI = CHISQR                                                             WFI01780
      GO TO 600                                                                 WFI01790
  601 CONTINUE                                                                  WFI01800
C     WRITE (6,27) (A(I),I = 1,3),(SIGMAA(I),I = 1,3),CHISQR                   WFI01810
C  27 FORMAT (1H ,5X,'A = ',3(1PE15.3,2X),/,5X,'SIGMAA = ',3(F9.3,2X),/,       WFI01820
C    &5X,'CHISQR = ',1PE15.6)                                                   WFI01830
C     WRITE (6,35) (I,XZ(I),YFIT(I),ZZ(I),I = 1,MNN)                           WFI01840
C  35  FORMAT (5X,'I = ',I5,5X,'XZ = ',F10.3,5X,'YFIT = ',F10.3,5X,            WFI01850
C    &'ZZ = ',F10.3)                                                            WFI01860
      DO 29 I = 1,N                                                             WFI01870
      YY(I)=COVER(I)*10.0-5.0                                                   WFI01880
      INFO(I)=LWR(2)                                                            WFI01890
   29 CONTINUE                                                                  WFI01900
      MNN = 0                                                                   WFI01910
      DO 645 IFL = 1,N                                                          WFI01920
      IF ((YY(IFL) .LT. 1.0)  .OR. (XX(IFL) .LT. 0.01)) GO TO 645               WFI01930
      MNN = MNN + 1                                                             WFI01940
      ZZ(MNN) = YY(IFL)                                                         WFI01950
      XZ(MNN) = XX(IFL)                                                         WFI01960
  645 CONTINUE                                                                  WFI01970
      YY(N+1)=-1.0                                                              WFI01980
      YY(N+2)=100                                                               WFI01990
      CALL TPICT7 (XX,YY,INFO,NNN,XCENT,YCENT,3.0,3.0,55,100,1,1,2,             WFI02000
     &ALABEL,6)                                                                 WFI02010
C     DO 650 I = 1,MNN                                                          WFI02020
C     ZZ(I) = ALOG (ZZ(I))                                                      WFI02030
C650 CONTINUE                                                                   WFI02040
      XCHI = 200.                                                               WFI02050
      FLAMDA = 1.E-03                                                           WFI02060
      LA = 0                                                                    WFI02070
  602 LA = LA + 1                                                               WFI02080
C                                                                               WFI02090
COMMENT:  THE ITERATION LIMIT MAY NEED TO BE ADJUSTED DEPENDING                 WFI02100
C         ON THE SET OF DATA USED.                                              WFI02110
C                                                                               WFI02120
      IF (LA .GE. 10) GO TO 603                                                 WFI02130
C     CALL CURFIT(XZ,ZZ,DUMMY,MNN,3.0,A,DUCK,SIGMAA,FLAMDA,YFIT,                WFI02140
C    &CHISQR)                                                                   WFI02150
      XDIF = XCHI - CHISQR                                                      WFI02160
      XTH = (3. * E-04) * CHISQR                                                WFI02170
      IF (ABS (XDIF) .LE. XTH) GO TO 603                                        WFI02180
      XCHI = CHISQR                                                             WFI02190
      GO TO 602                                                                 WFI02200
  603 CONTINUE                                                                  WFI02210
C     WRITE (6,30) (A(I),I = 1,3),(SIGMAA(I),I = 1,3),                         WFI02220
C    &CHISQR                                                                    WFI02230
C  30 FORMAT (1H ,5X,'A = ',3(1PE15.3,2X),/,5X,'SIGMAA = ',3(F9.3,2X),/,       WFI02240
C    &5X,'CHISQR =',1PE15.6)                                                    WFI02250
C     WRITE (6,41) (I,XZ(I),YFIT(I),ZZ(I),I = 1,MNN)                           WFI02260
C  41  FORMAT (5X,'I = ',I4,5X,'XZ = ',F10.3,5X,'YFIT = ',F10.3,               WFI02270
C    &5X,'ZZ = ',F10.3)                                                         WFI02280
      DO 28 I=1,N                                                               WFI02290
      YY(I)=CRPSTG(I)                                                           WFI02300
      INFO(I)=LWR(3)                                                            WFI02310
   28 CONTINUE                                                                  WFI02320
      YY(N+1)=1.0E-06                                                           WFI02330
      YY(N+2)=7                                                                 WFI02340
      CALL TPICT7(XX,YY,INFO,NNN,XCENT,YCENT,3.0,3.0,55,100,1,1,2,ALABEL        WFI02350
     1,6)                                                                       WFI02360
      STOP                                                                      WFI02370
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FILE: WFIRD    FORTRAN  A   PURDUE/LARS 3031

      END                                                                WE102380
      FUNCTION IDOY(MONTH,IDAY)                                          WE102390
      IF (MONTH.GE.3) GO TO 3                                            WE102400
      IDOY=MONTH*31-31+IDAY                                              WE102410
      RETURN                                                             WE102420
    3 IDOY=ABS(MONTH*30.6-32.3+IDAY)                                     WE102430
      RETURN                                                             WE102440
      END                                                                WE102450
C                                                                        WE102460
C*******************************************************               WE102470
C                                                                        WE102480
      SUBROUTINE GNREAD (KLQ,T1,NSAM,ISEG)                               WE102490
      DIMENSION ISEG(160),IY(11)                                         WE102500
      EQUIVALENCE (NLQ,X(1)),(J2,J1(1)),(K2,K1(1))                       WE102510
      INTEGER*2 J2,K2                                                    WE102520
      LOGICAL*1 A(80),T1,X(2),J1(2),K1(2)                                WE102530
      LOGICAL*1 Q(800),YA(11)                                            WE102540
      INTEGER*2 NLQ,KLQ                                                  WE102550
      DATA YA/' ','0','1','2','3','4','5','6','7','8','9'/              WE102560
      DATA IY/0,0,1,2,3,4,5,6,7,8,9/                                     WE102570
      X(2)=T1                                                            WE102580
      J1(2)=T1                                                           WE102590
      K1(2)=T1                                                           WE102600
      MAX=0                                                              WE102610
      DO 5 K=1,NSAM                                                      WE102620
      IF (ISEG(K).GT.MAX) MAX=ISEG(K)                                    WE102630
      WRITE (16,77) NSAM,MAX                                             WE102640
   77 FORMAT (1H ,2I5)                                                   WE102650
    5 CONTINUE                                                           WE102660
    2 ICOUNT=800                                                         WE102670
      CALL TOPRD (5,ICOUNT,IERROR,Q)                                     WE102680
      IF (IERROR.EQ.1) GO TO 55                                          WE102690
      IF (IERROR.LT.1) GO TO 199                                         WE102700
      WRITE (16,666) IERROR                                              WE102710
  666 FORMAT (1H ,'END OF FILE ENCOUNTERED, ERROR CODE =',I4)            WE102720
  199 DO 888 L=1,10                                                      WE102730
      LQ=(L-1)*80                                                        WE102740
      CALL MOVBYT (Q,LQ,1,A,0,1,80)                                      WE102750
      X(1)=A(1)                                                          WE102760
      NSEG=0                                                             WE102770
      DO 802 K=1,4                                                       WE102780
      DO 802 KK=1,11                                                     WE102790
      J1(1)=A(K+1)                                                       WE102800
      K1(1)=YA(KK)                                                       WE102810
      IF (J2.EQ.K2) NSEG=NSEG+IY(KK)*(10**(4-K))                         WE102820
  802 CONTINUE                                                           WE102830
      IF (NSEG.GT.MAX) GO TO 66                                          WE102840
      IF (KLQ.EQ.NLQ) GO TO 888                                          WE102850
      DO 3 J=1,NSAM                                                      WE102860
      IF (ISEG(J).EQ.NSEG) WRITE (7,1) (A(I),I=1,80)                     WE102870
    3 CONTINUE                                                           WE102880
  888 CONTINUE                                                           WE102890
      GO TO 2                                                            WE102900
   66 DO 67 I=1,70                                                       WE102910
   67 A(I)=YA(1)                                                         WE102920
      WRITE (7,1) (A(I),I=1,80)                                          WE102930
    1 FORMAT (80A1)                                                      WE102940
      REWIND 7                                                           WE102950
      RETURN                                                             WE102960
   55 GO TO 2                                                            WE102970
      END                                                                WE102980
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FILE: HIS1     FORTRAN A  PURDUE/CAMS 3031

      SUBROUTINE HIS1 (X,N,NG,XMIN,XMAX,F,TITLE,IG,INDG,IS,NT,ISEG,NSAM,HIS00010
     &ICRP)                                                             HIS00020
C                                                                       HIS00030
CC  TO CALCULATE AND PLOT ON THE PRINTER A HISTOGRAM FROM A SET OF      HIS00040
CC  DATA POINTS.                                                        HIS00050
C                                                                       HIS00060
CC  X        ARRAY OF DATA POINTS (INPUT IFIG=0)                        HIS00070
CC  N        NUMBER OF DATA POINTS IN X                                 HIS00080
CC  NG       NUMBER OF GROUPS                                           HIS00090
CC  XMIN     MIDPOINT OF THE LEFT GROUP (IF INDG = 1)                   HIS00100
CC  XMAX     MIDPOINT OF THE RIGHT GROUP (IF INDG=1)                    HIS00110
CC  F        ARRAY OF GROUP FREQUENCIES (IF IG = 1)                     HIS00120
CC  TITLE    A 25 CHARACTER TITLE ARRAY WITH DIMENSION 5                 HIS00130
CC  IG=0.    IF THE GROUP FREQUENCIES MUST BE COMPUTED                   HIS00140
CC    =1.    IF  THE GROUP FREQUENCIES ARE KNOWN                        HIS00150
CC  INDG=0.  IF XMIN AND XMAX ARE TO BE COMPUTED                        HIS00160
CC  INDG=1.  IF XMIN AND XMAX ARE USER SUPPLIED                         HIS00170
CC  IS=1.    IF GRID LINES ARE TO BE PRINTED                            HIS00180
CC    =0.    IF NOT                                                     HIS00190
CC  NT UNIT NUMBER OF THE PRINTER                                       HIS00200
C                                                                       HIS00210
      DIMENSION X(1),F(1),FF(101),IR(3)                                 HIS00220
      DIMENSION XXP(10),ISEG(45)                                        HIS00230
      REAL*8 TITLE (5)                                                  HIS00240
      LOGICAL*1 ICRP(2)                                                 HIS00250
      DATA IR/1,0,1/                                                    HIS00260
C                                                                       HIS00270
CCC                                                                     HIS00280
CCC                                                                     HIS00290
C  TEST WHETHER THE DATA POINTS ARE GROUPED OR UNGROUPED. IF THE        HIS00300
C  LATTER, CALLS GROUP SUBROUTINE TO GROUP THE DATA POINTS.             HIS00310
C                                                                       HIS00320
      WRITE (NT,30) TITLE                                               HIS00330
   30 FORMAT (1H1,5A5,//)                                               HIS00340
      WRITE (6,100) ICRP(1),ICRP(2)                                     HIS00350
  100 FORMAT (1H ,'GROUP TYPE IS ',2A1)                                 HIS00360
      WRITE (6,200) (ISEG(I),I = 1,NSAM)                                HIS00370
  200 FORMAT (1H ,'SEGMENTS = ',15I5,/,15I5,/,15I5)                     HIS00380
      IF (IG .EQ. 1) GO TO 939                                          HIS00390
      CALL GROP1 (X,N,NG,XMIN,XMAX,F,INDG)                              HIS00400
  939 STEP = (XMAX - XMIN)/FLOAT(NG - 1)                                HIS00410
C                                                                       HIS00420
CC  FINDS MAXIMUM FREQUENCY AND COMPUTES THE K FACTOR FOR EXPANDING     HIS00430
CC  OF PLOT                                                             HIS00440
      VK = 1.                                                           HIS00450
      R = F(1)                                                          HIS00460
      DO 3 I = 2,NG                                                     HIS00470
    3 R = AMAX1 (R,F(I))                                                HIS00480
      K = 10                                                            HIS00490
      IF (K * R/N .GT. 1.) K = 5                                        HIS00500
      IF (K * R/N .GT. 1.) K = 2                                        HIS00510
      IF (K * R/N .GT. 1.) K = 1                                        HIS00520
      KV = 100/K                                                        HIS00530
      KVT = KV/10                                                       HIS00540
C                                                                       HIS00550
CC  WRITE OUT ARGUMENTS AND HEADING FOR PLOT.                           HIS00560
      WRITE (NT,20) STEP,XMIN,N,XMAX,NG                                 HIS00570
   20 FORMAT (20X,'STEP = ',F15.8/20X,'CENTERPOINT OF INITIAL GROUP= '  HIS00580
     &,F15.8,10X,'NUMBER OF OBSERVATIONS = ',I5  ,/,20X,                HIS00590
     &'CENTERPOINT OF FINAL GROUP = ',F15.8,10X,'NUMBER OF GROUPS       HIS00600
     &= ',I5///)                                                        HIS00610
      DO 1 I = 1,101                                                    HIS00620
    1 FF(I) = I - 1.5                                                   HIS00630
      WRITE (NT,21) (I,I = KVT,KV,KVT)                                  HIS00640
   21 FORMAT (8X,'PERCENTAGE',5X,10(I10,10(7X,I3)/23X,10(1H+,           HIS00650
     &'''''''''')),1H+)                                                 HIS00660
C                                                                       HIS00670
CC  COMPUTES VALUE FOR EACH GROUP AND PLOTS THREE LINES FOR EACH        HIS00680
CC  GROUP                                                               HIS00690
C                                                                       HIS00700
      DO 2 I = 1,NG                                                     HIS00710
      NN = 100 * (F(I)/R) + 1.5                                         HIS00720
      XX = XMIN + (I - 1) * STEP                                        HIS00730
      XXP (I) = XX                                                      HIS00740
      DO 2 J = 1,3                                                      HIS00750
      IND = IR(J)                                                       HIS00760
    2 CALL PLOT3 (IND,IS,XX,FF,NN,I)                                    HIS00770
C                                                                       HIS00780
CC  WRITE                                                               HIS00790
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FILE: HIS1     FORTRAN  A   PURDUE/LARS 3031

C                                                                       HIS00800
      WRITE (NT,23) (I,I = KVT,KV,KVT)                                  HIS00810
   23 FORMAT (23X,10(1H+,9H*********),1H+/8X,10HPERCENTAGE,             HIS00820
     &5X,1H0,10(7X,I3))                                                 HIS00830
      WRITE (NT,26)                                                     HIS00840
   26 FORMAT (1H// )                                                    HIS00850
      WRITE (NT,24) XXD                                                 HIS00860
   24 FORMAT (23X,'MIN',3X,10F7.2)                                      HIS00870
      WRITE (NT,25) (F(IQQ),IQQ=1,NG)                                   HIS00880
   25 FORMAT (19X,'CONTENT',3X,10F7.2)                                  HIS00890
      RETURN                                                            HIS00900
      END                                                               HIS00910
C                                                                       HIS00920
C                                                                       HIS00930
      SUBROUTINE PLOT3 (IND,IS,X,F,N,NT)                                HIS00940
      DIMENSION F(1)                                                    HIS00950
      INTEGER*2 HWR,RWR                                                 HIS00960
      EQUIVALENCE (HWR,LWR),(RWR,KWR)                                   HIS00970
      LOGICAL*1 LWR,KWR                                                 HIS00980
      LOGICAL*1 SYMBL1,SYMBL2,ONE,ZERO,STAR,PLUS,AXIS                   HIS00990
      LOGICAL*1 A(101),BLANK                                            HIS01000
      DATA BLANK /' '/,AXIS/'!'/,PLUS/'+'/,STAR/'-'/,ZERO/'0'/,         HIS01010
     &ONE/'1'/                                                          HIS01020
      A(101) = AXIS                                                     HIS01030
      IF (IND .EQ. 0) A(101) = PLUS                                     HIS01040
      IF (IS .EQ. 1) GO TO 2                                            HIS01050
      DO    I = 2,100                                                   HIS01060
    1 A(I   = BLANK                                                     HIS01070
      A(1, = AXIS                                                       HIS01080
      IF (IND .EQ. 0) A(1) = PLUS                                       HIS01090
      GO TO 6                                                           HIS01100
    2 IF (IND .EQ. 1) GO TO 3                                           HIS01110
      SYMBL1 = PLUS                                                     HIS01120
      SYMBL2 = STAR                                                     HIS01130
      GO TO 4                                                           HIS01140
    3 SYMBL1 = AXIS                                                     HIS01150
      SYMBL2 = BLANK                                                    HIS01160
    4 DO 5 I = 1,91,10                                                  HIS01170
      A(I) = SYMBL1                                                     HIS01180
      DO 5 J = 1,9                                                      HIS01190
    5 A(I + J) = SYMBL2                                                 HIS01200
    6 DO 7 I = 1,N                                                      HIS01210
      J = F(I) + 1.5                                                    HIS01220
      IF ((J .LT. 1) .OR. (J .GT. 101)) GO TO 7                         HIS01230
      LWR = A(J)                                                        HIS01240
      KWR = BLANK                                                       HIS01250
      IF (HWR .NE. RWR) GO TO 9                                         HIS01260
      A(J) = ONE                                                        HIS01270
      GO TO 7                                                           HIS01280
    9 A(J) = ZERO                                                       HIS01290
    7 CONTINUE                                                          HIS01300
      IF (IND .EQ. 0) GO TO 10                                          HIS01310
      WRITE (NT,101) A                                                  HIS01320
  101 FORMAT (23X,101A1)                                                HIS01330
      RETURN                                                            HIS01340
   10 WRITE (NT,25) X,A                                                 HIS01350
   25 FORMAT (11X,1PE10.3,2X,101A1)                                     HIS01360
      RETURN                                                            HIS01370
      END                                                               HIS01380
C                                                                       HIS01390
CC                                                                      HIS01400
C                                                                       HIS01410
      SUBROUTINE GROP1 (X,N,NG,XMIN,XMAX,F ,IND)                        HIS01420
      DIMENSION X(1),F(1)                                               HIS01430
  234 IF (IND .EQ. 1) GO TO 2                                           HIS01440
      Z = X(1)                                                          HIS01450
      ZK = X(1)                                                         HIS01460
  237 DO 1 I = 2,N                                                      HIS01470
      IF (X(I) .LT. Z) Z = X(I)                                         HIS01480
      IF (X(I) .GT. ZK) ZK = X(I)                                       HIS01490
    1 CONTINUE                                                          HIS01500
  241 S = (ZK - Z)/FLOAT (2 * (NG))                                     HIS01510
      XMIN = Z + S -1.0E-06                                             HIS01520
      XMAX = ZK - S + 1.0E-06                                           HIS01530
    2 STEP = (XMAX - XMIN)/(NG - 1)                                     HIS01540
      IF (STEP .GT. 0.0) GO TO 250                                      HIS01550
      DUM = X(1)                                                        HIS01560
      IF (XMAX .EQ. XMIN) DUM = 1.0                                     HIS01570
      STEP = DUM /FLOAT(NG)                                             HIS01580
```

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FILE: HIS1 FORTRAN A PURDUE/LARS 3031

```
      XMAX = X(1) + DUM/2.0                                              HIS01590
      XMIN = X(1) - DUM/2.0                                              HIS01600
250   DO 6 I = 1,NG                                                      HIS01610
  6   F(I) = 0.0                                                         HIS01620
      DO 9 I = 1,N                                                       HIS01630
      K = (X(I) - XMIN)/STEP + 1.5                                       HIS01640
      IF (A(I) .EQ. (XMAX + 0.5 * STEP)) K = NG                          HIS01650
      IF (K .LE. 0) K = 1                                                HIS01660
      IF ( K .GT. NG) K = NG                                             HIS01670
C     WRITE (6,102)I,K                                                   HIS01680
C 102 FORMAT (5X,'I = ',I3,5X,'K = ',I3)                                 HIS01690
      F(K) = F(K) + 1.                                                   HIS01700
  9   CONTINUE                                                           HIS01710
C     WRITE (6,25) (F(K),K=1,NG)                                         HIS01720
C  25 FORMAT (10X,'CONTENT',10F9.2)                                      HIS01730
      RETURN                                                             HIS01740
      END                                                                HIS01750
```

FILE: TPICT7 FORTRAN A PURDUE/LARS 3031

```
      SUBROUTINE TPICT7(X,Y,INFO,NPOINT,XCENT,YCENT,                    TPI00010
     1  SIGXN,SIGYN,NLINE,NCOL,MODE1,MODE2,MODE3,ALABEL,IO)             TPI00020
      LOGICAL*1 IPICT(120,60),INFO(1),LINE(130),ISYM(37)               TPI00030
      LOGICAL*1 BLANK                                                  TPI00040
      INTEGER*2 HISYM(37),MM(120,60)                                   TPI00050
      DIMENSION XAXIS(12)                                              TPI00060
      REAL*8 ALABEL(5)                                                 TPI00070
      DIMENSION X(1),Y(1)                                              TPI00080
      DATA HISYM /1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,        TPI00090
     &19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37/        TPI00100
      DATA ISYM / '1' , '2' , '3' , '4' , '5' , '6' ,                  TPI00110
     1  '7' , '8' , '9' , '0' , 'A' , 'B' , 'C' , 'D' , 'E' , 'F' ,    TPI00120
     2  'G' , 'H' , 'I' , 'J' , 'K' , 'L' , 'M' , 'N' , 'O' , 'P' ,    TPI00130
     3  'Q' , 'R' , 'S' , 'T' , 'U' , 'V' , 'W' , 'X' , 'Y' ,          TPI00140
     4  'Z' , '+' , '-' /                                             TPI00150
      DATA BLANK/' '/                                                  TPI00160
C X AND Y ARE DATA TO BE PLOTTED                                       TPI00170
C NPOINT= NUMBER OF POINTS                                             TPI00180
C INFO=IS A VECTOR FOR NPOINTS,ASSIGNING CODE FOR EACH POINT, P=80,*=81.TPI00190
C XCENT=DUMMY VARIABLE FOR DEFAULT SCALING, OTHERWISE ASSIGN CENTER OF XTPI00200
C YCENT=DUMMY VARIABLE FOR DEFAULT SCALING, OTHERWISE ASSIGN CENTER OF YTPI00210
C SIGNX=3 FOR PLUS AND MINUS 3 STANDARD DEVIATIONS                      TPI00220
C SIGYN=3 FOR PLUS AND MINUS 3 STANDARD DEVIATIONS                      TPI00230
C NLINE=55 NORMALLY, SIZE OF GRAPH ON PRINTOUT                          TPI00240
C NCOL=110 NORMALLY, SIZE OF GRAPH ON PRINTOUT                          TPI00250
C MODE1=0, THEN SCALING IS USING MEAN AND STANDARD DEVIATION            TPI00260
C MODE2=.GT.0,THEN THE CONTENTS OF X,Y BIN IS PRINTED,EG.TWO D HISTOGRAMTPI00270
C MODE2=0, THEN USE CHARACTER ASSIGNED IN VECTOR 'INFO'.                TPI00280
C MODE3=2, THEN SCALING IS USING MAX AND MIN                            TPI00290
C         THEN ADD 2 POINTS AT END OF X & Y VECTORS TO DEFINE MAX & MIN TPI00300
C ALABEL=TITLE OF GRAPH, 5A5                                           TPI00310
C IO=UNIT NUMBER FOR PRINTOUT                                          TPI00320
      NXVAL=NCOL/10                                                    TPI00330
      MPOINT=NPOINT                                                    TPI00340
      IONE=1                                                           TPI00350
      SUMX=0.0                                                         TPI00360
      SUMY=0.0                                                         TPI00370
      SUMX2=0.0                                                        TPI00380
      SUMY2=0.0                                                        TPI00390
       XB=-1.E10                                                       TPI00400
       YB=-1.E10                                                       TPI00410
       XS=1.E10                                                        TPI00420
       YS=1.E10                                                        TPI00430
      DO 1600 I=1,MPOINT                                               TPI00440
       IF(X(I).GT.XB) XB=X(I)                                          TPI00450
       IF(X(I).LT.XS) XS=X(I)                                          TPI00460
       IF(Y(I).GT.YB) YB=Y(I)                                          TPI00470
 1600  IF(Y(I).LT.YS) YS=Y(I)                                          TPI00480
      IF (MODE3.EQ.2) MPOINT=MPOINT-2                                  TPI00490
      DO 1500 I=1,MPOINT                                               TPI00500
      SUMX=SUMX+X(I)                                                   TPI00510
      SUMY=SUMY+Y(I)                                                   TPI00520
      SUMX2=SUMX2 + X(I)*X(I)                                          TPI00530
      SUMY2=SUMY2 + Y(I)*Y(I)                                          TPI00540
 1500 CONTINUE                                                         TPI00550
      XMEAN=SUMX/MPOINT                                                TPI00560
      YMEAN=SUMY/MPOINT                                                TPI00570
      IF(MODE1 .EQ. 0)XCENT=XMEAN                                      TPI00580
      IF(MODE1 .EQ. 0)YCENT=YMEAN                                      TPI00590
      XVAR= (SUMX2 - 2.*XMEAN*SUMX + XMEAN*XMEAN*MPOINT) / MPOINT      TPI00600
      YVAR= (SUMY2 - 2.*YMEAN*SUMY + YMEAN*YMEAN*MPOINT) / MPOINT      TPI00610
      DEVX=SQRT(XVAR)                                                  TPI00620
      DEVY=SQRT(YVAR)                                                  TPI00630
      IF(DEVX.LT.1.E-10.OR.DEVY.LT.1.E-10)MODE3=1                      TPI00640
      BIGX=XCENT + SIGXN*DEVX                                          TPI00650
      SMALX=XCENT - SIGXN*DEVX                                         TPI00660
      BIGY=YCENT + SIGYN *DEVY                                         TPI00670
      SMALY=YCENT - SIGYN*DEVY                                         TPI00680
       IF(MODE3.EQ.2)BIGX=XB                                           TPI00690
       IF(MODE3.EQ.2)SMALX=XS                                          TPI00700
       IF(MODE3.EQ.2)BIGY=YB                                           TPI00710
       IF(MODE3.EQ.2)SMALY=YS                                          TPI00720
      DX= (BIGX-SMALX)/NCOL                                            TPI00730
      DY= (BIGY-SMALY)/NLINE                                           TPI00740
      IF(MODE3.EQ.1)DY=DX*1.50                                         TPI00750
      IF(MODE3.EQ.1)BIGY=YCENT + NLINE/2*DY                            TPI00760
      IF(MODE3.EQ.1)SMALY=YCENT - NLINE/2*DY                           TPI00770
      DO 1800 I=1,120                                                  TPI00780
      DO 1800 J=1,60                                                   TPI00790
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FILE: TPICT7 FORTRAN A PURDUE/LARS 3031

```
      MM(I,J) = 0                                                                TPI00800
 1900 CONTINUE                                                                   TPI00810
      WRITE(IO,1900) (ALABEL(K),K=1,4),MPOINT,XMEAN,YMEAN,DEVX,DEVY              TPI00820
     1   ,  MODE),SIGXN,SIGYN                                                   TPI00830
 1900 FORMAT(1H1 , / , 10X , 'MPOINT' , 7X , 'XMEAN' , 5X ,                     TPI00840
     1   'YMEAN',7X,'DEVX',7X,'DEVY', 6X,'MODE',4X , 'NSIG-X' ,                 TPI00850
     2  4X,'NSIG-Y',5X,2A5,1X,'X-AXIS=',A5,1X,'YAXIS=',A5,                      TPI00860
     3 / ,10X,I4,6X,F8.2,2X,F8.2,2X,F10.5,2X,F10.5,5X,I1,2X,F10.3,2X,           TPI00870
     4  F10.3  )                                                                TPI00880
      DO 95 I=1,11                                                               TPI00890
   95 LINE(I)=ISYM(37)                                                           TPI00900
      DO 2100 I=1,NXVAL                                                          TPI00910
      XAXIS(I)=SMALX + (I-1)*10*DX                                               TPI00920
 2100 CONTINUE                                                                  TPI00930
      WRITE(IO,3500) (XAXIS(I),I=1,NXVAL)                                       TPI00940
      WRITE (IO,96) (LINE(I),I=1,11)                                            TPI00950
      DO 2500 I=1,MPOINT                                                        TPI00960
      IX=(X(I)-SMALX) / (BIGX-SMALX) * NCOL  +  1                               TPI00970
      IY=(Y(I)-SMALY) / (BIGY-SMALY) * NLINE  +  .5                             TPI00980
C     IF (I .LT. 50) WRITE (6,25) I,IX,IY,HWR,X(I),Y(I)                         TPI00990
   25 FORMAT (5X,'I = ',I6,5X,'IX = ',IA,5X,'IY = ',I8,5X,                      TPI01000
     &'HWR = ',I6,5X,'X = ',F10.3,5X,'Y = ',F10.3)                              TPI01010
      IF(IX .LT. 1    .OR.    IY .LT. 1) GO TO 2500                             TPI01020
      IF(IY .GT. 60   .OR.    IX .GT.120) GO TO 2500                            TPI01030
      IF(MODE2.EQ.0)IPICT(IX,IY)=INFO(I)                                        TPI01040
      IF (MM(IX,IY) .GT. 125) GO TO 2500                                        TPI01050
      IF (MODE2 .GT. 0) MM(IX,IY) = MM(IX,IY) + 1                               TPI01060
C     GO TO 2500                                                                TPI01070
CC 28 NC = NC + 1                                                               TPI01080
CC    IF (NC .LE. 20) WRITE (6,25) I,IX,IY,HWR,X(I),Y(I)                        TPI01090
C     IF ( I .GT. 1700) WRITE (6,25) I,IX,IY,HWR,X(I),Y(I)                      TPI01100
 2500 CONTINUE                                                                  TPI01110
C     WRITE (6,26) HWR                                                          TPI01120
   26 FORMAT (5X,'HWR = ',I8)                                                   TPI01130
      YVAL=R(GY+DY                                                              TPI01140
      DO 2900 K=1,NLINE                                                         TPI01150
      I=1+NLINE-K                                                               TPI01160
      YVAL=YVAL-DY                                                              TPI01170
      DO 2700 J=1,NCOL                                                          TPI01180
      LINE(J)=BLANK                                                             TPI01190
      IF(MODE2.EQ.0) LINE(J)=IPICT(J,I)                                         TPI01200
      IF (MODE2 .NE. 1) GO TO 5000                                              TPI01210
      DO 5010 K1 = 1,37                                                         TPI01220
      IF (MM(J,I) .EQ. MISYM(K1)) IPICT(J,I) = ISYM(K1)                         TPI01230
      IF (MM(J,I) .EQ. MISYM(K1)) LINE(J) = IPICT(J,I)                          TPI01240
      IF (MM(J,I) .GT. 37) LINE(J) = ISYM(37)                                   TPI01250
 5010 CONTINUE                                                                  TPI01260
 5000 CONTINUE                                                                  TPI01270
 2700 CONTINUE                                                                  TPI01280
      WRITE(IO,2600) YVAL , (LINE(J),J=1,NCOL)                                  TPI01290
 2600 FORMAT(1H , F9.2 , 120A1)                                                 TPI01300
 2900 CONTINUE                                                                  TPI01310
 3500 FORMAT(1H ,5X,F7.2 , 11F10.2)                                             TPI01320
      DO 97 I=1,11                                                              TPI01330
   97 LINE(I)=ISYM(37)                                                          TPI01340
      WRITE (IO,96) (LINE(I),I=1,11)                                            TPI01350
   96 FORMAT (9X,11(A1,9X))                                                     TPI01360
      WRITE(IO,3500) (XAXIS(I),I=1,NXVAL)                                       TPI01370
      WRITE(IO,3600)                                                            TPI01380
 3600 FORMAT(/)                                                                 TPI01390
      RETURN                                                                    TPI01400
      END                                                                       TPI01410
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FILE: TPICTS FORTRAN A PURDUE/LARS 3031

```
      SUBROUTINE CURFIT (X,Y,SIGMAY,NPTS,NTERMS,MODE,A,DELTAA,          TPI00010
     1SIGMAA,FLAMDA,YFIT,CHISQR)                                        TPI00020
C                                                                       TPI00030
C***************************************************************      TPI00040
C                                                                       TPI00050
COMMENT:  THIS PROGRAM NORMALIZES THE DATA FOR THE PROGRAMMER.          TPI00060
C         THIS FEATURE IS A MODIFICATION TO THE ORIGINAL                TPI00070
C         BARHWAR PROGRAM.                                              TPI00080
C                                                                       TPI00090
C***************************************************************      TPI00100
C       MAKE A LEAST-SQUARE FIT TO A NON-LINEAR FUNCTION                TPI00110
C       X-ARRAY OF DATA POINTS                                          TPI00120
C       Y-ARRAY OF DEPENDENT VARIABLE                                   TPI00130
C       SIGMAY  ARRAY OF ERRORS ON Y                                    TPI00140
C       NPTS NO. OF DATA POINTS                                         TPI00150
C       MODE- DETERMINES THE METHOD OF WEIGHTING                        TPI00160
C       MODE=+1 WEIGHT(I)=1./SIGMAY(I)**2                               TPI00170
C       MODE=0 WEIGHT(I)=1.                                             TPI00180
C       MODE=-1 WEIGHT(I)=1./Y(I)                                       TPI00190
C       A       ARRAY OF PARAMETERS                                     TPI00200
C       DELTAA ARRAY OF INCREMENTS FOR A                                TPI00210
C       FLAMDA PROPORTION OF GRADIENT SEARCH                            TPI00220
C       YFIT    ARRAY OF FITTED VALUES                                  TPI00230
C       CHISQR RESIDUAL CHISQ                                           TPI00240
C       REQUIRE THE FOLLOWING FUNCTIONS                                 TPI00250
C       FUNCTN(X,I,A)                                                   TPI00260
C       FDERIV(X,I,A,DELTAA,NTERMS,DERIV)                               TPI00270
C       FCHISQ(Y,SIGMAY,NPTS,NFREE,MODE,YFIT)                           TPI00280
      DOUBLE PRECISION ARRAY                                            TPI00290
C       MATINV(ARRAY,NTERMS,DET)--TO INVERT A SYMMMETRIC MATRIX         TPI00300
C       A MAXIMUM OF TEN PARAMETERS ALLOWED AND FLAMDA SHOULD           TPI00310
C       BE SET AT .001 AT THE BEGINING OF SEARCH. INTIAL VALUES         TPI00320
C       OF ARRAY SHOULD BE GUESSED AT AND SUPPLIED.                     TPI00330
C       IT IS RESPONSIBILITY OF THE MAIN PROGRAM TO DETERIME            TPI00340
C       CONVEGENCE OF THE FIT.                                          TPI00350
      DIMENSION X(1),Y(1),SIGMAY(1),A(1),DELTAA(1),SIGMAA(1),           TPI00360
     1YFIT(1)                                                           TPI00370
      DIMENSION WEIGHT(3000),ALPHA(10,10),BETA(10),DERIV(10),           TPI00380
     1ARRAY(10,10),R(10)                                                TPI00390
11    NFREE=NPTS-NTERMS                                                 TPI00400
      IF(NFREE)13,13,20                                                 TPI00410
13    CHISQR=0.                                                         TPI00420
      GO TO 110                                                         TPI00430
C                                                                       TPI00440
C     EVALUTE WEIGHTS                                                   TPI00450
C                                                                       TPI00460
20    DO 30 I=1,NPTS                                                    TPI00470
21    IF(MODE)22,27,29                                                  TPI00480
22    IF(Y(I))25,27,23                                                  TPI00490
23    WEIGHT(I)=1./Y(I)                                                 TPI00500
      GO TO 30                                                          TPI00510
25    WEIGHT(I)=1./(-Y(I))                                              TPI00520
      GO TO 30                                                          TPI00530
27    WEIGHT(I)=1.                                                      TPI00540
      GO TO 30                                                          TPI00550
29    WEIGHT(I)=1./SIGMAY(I)**2.                                        TPI00560
30    CONTINUE                                                          TPI00570
C                                                                       TPI00580
C       EVALUTE ALPHA AND BETA MATRICES                                 TPI00590
C                                                                       TPI00600
31    DO 34 J=1,NTERMS                                                  TPI00610
      BETA(J)=0.                                                        TPI00620
      DO 34 K=1,J                                                       TPI00630
34    ALPHA(J,K)=0.                                                     TPI00640
41    DO 50 I=1,NPTS                                                    TPI00650
      CALL FDERIV (X,I,A,DELTAA,NTERMS,DERIV)                           TPI00660
      DO 46 J=1,NTERMS                                                  TPI00670
      BETA(J)=BETA(J)+WEIGHT(I)*(Y(I)-FUNCTN(X,I,A))*DERIV(J)           TPI00680
     1FUNC = FUNCTN(X,I,A)                                              TPI00690
      DO 46 K=1,J                                                       TPI00700
46    ALPHA(J,K)=ALPHA(J,K)+WEIGHT(I)*DERIV(J)*DERIV(K)                 TPI00710
50    CONTINUE                                                          TPI00720
51    DO 53 J=1,NTERMS                                                  TPI00730
      DO 53 K=1,J                                                       TPI00740
53    ALPHA(K,J)=ALPHA(J,K)                                             TPI00750
C                                                                       TPI00760
C       EVALUTE CHI SQUARE AT STARTING POINT                            TPI00770
C                                                                       TPI00780
61    DO 62 I=1
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      IF(MODE)22,27,29                                                  TPI01590
22    IF(Y(I)) 25,27,23                                                 TPI01600
23    WEIGHT=1./Y(I)                                                    TPI01610
      GO TO 30                                                          TPI01620
25    WEIGHT=1./(-Y(I))                                                 TPI01630
      GO TO 30                                                          TPI01640
27    WEIGHT=1.                                                         TPI01650
      GO TO 30                                                          TPI01660
29    WEIGHT=1./SIGMAY(I)**2                                            TPI01670
30    CHISQ = CHISQ + WEIGHT * ((Y(I) - YFIT(I))/(YFIT(I)))**2          TPI01680
      ZCHISQ=DLOG(CHISQ)                                                TPI01690
      IF(ABS(ZCHISQ).GT.10.) CHISQ=1.E10                                TPI01700
      FREE=NFREE                                                        TPI01710
      FCHISQ=CHISQ/FREE                                                 TPI01720
40    RETURN                                                            TPI01730
      END                                                               TPI01740
C                                                                       TPI01750
C                                                                       TPI01760
C                                                                       TPI01770
      SUBROUTINE MATINV(ARRAY,NORDER,DET)                               TPI01780
      DOUBLE PRECISION ARRAY,AMAX,SAVE                                  TPI01790
      DIMENSION ARRAY(10,10),IK(10),JK(10)                              TPI01800
10    DET=1.                                                            TPI01810
11    DO 100 K=1,NORDER                                                 TPI01820
C                                                                       TPI01830
C     FIND LARGEST ELEMENT ARRAY(I,J) IN REST OF MATRIX                 TPI01840
C                                                                       TPI01850
      AMAX=0.                                                           TPI01860
21    DO 30 I=K,NORDER                                                  TPI01870
      DO 30 J=K,NORDER                                                  TPI01880
23    IF(DABS(AMAX)-DABS(ARRAY(I,J))) 24,24,30                          TPI01890
24    AMAX=ARRAY(I,J)                                                   TPI01900
      IK(K)=I                                                           TPI01910
      JK(K)=J                                                           TPI01920
30    CONTINUE                                                          TPI01930
C                                                                       TPI01940
C     INTERCHANGE ROWS AND COULOMNS TO PUT AMAX IN ARRAY(K,K)           TPI01950
C                                                                       TPI01960
31    IF(AMAX)41,32,41                                                  TPI01970
32    DET=0.                                                            TPI01980
      GO TO 140                                                         TPI01990
41    I=IK(K)                                                           TPI02000
      IF(I-K)21,51,43                                                   TPI02010
43    DO 50 J=1,NORDER                                                  TPI02020
      SAVE=ARRAY(K,J)                                                   TPI02030
      ARRAY(K,J)=ARRAY(I,J)                                             TPI02040
50    ARRAY(I,J)=-SAVE                                                  TPI02050
51    J=JK(K)                                                           TPI02060
      IF(J-K)21,61,53                                                   TPI02070
53    DO 60 I=1,NORDER                                                  TPI02080
      SAVE=ARRAY(I,K)                                                   TPI02090
      ARRAY(I,K)=ARRAY(I,J)                                             TPI02100
60    ARRAY(I,J)=-SAVE                                                  TPI02110
C                                                                       TPI02120
C     ACCUMULATE ELEMENTS OF INVERSE MATRIX                             TPI02130
C                                                                       TPI02140
61    DO 70 I=1,NORDER                                                  TPI02150
      IF(I-K)63,70,63                                                   TPI02160
63    ARRAY(I,K)=-ARRAY(I,K)/AMAX                                       TPI02170
70    CONTINUE                                                          TPI02180
71    DO 80 I=1,NORDER                                                  TPI02190
      DO 80 J=1,NORDER                                                  TPI02200
      IF(I-K)74,80,74                                                   TPI02210
74    IF(J-K)75,80,75                                                   TPI02220
75    ARRAY(I,J)=ARRAY(I,J)+ARRAY(I,K)*ARRAY(K,J)                       TPI02230
80    CONTINUE                                                          TPI02240
81    DO 90 J=1,NORDER                                                  TPI02250
      IF(J-K)83,90,83                                                   TPI02260
83    ARRAY(K,J)=ARRAY(K,J)/AMAX                                        TPI02270
90    CONTINUE                                                          TPI02280
      ARRAY(K,K)=1./AMAX                                                TPI02290
100   DET=DET*AMAX                                                      TPI02300
C                                                                       TPI02310
C     RESTORE ORDERING OF MATRIX                                        TPI02320
C                                                                       TPI02330
101   DO 130 L=1,NORDER                                                 TPI02340
      K=NORDER-L+1                                                      TPI02350
      J=IK(K)                                                           TPI02360
      IF(J-K)111,111,105                                                TPI02370
```

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```
105     DO 110 I=1,NORDER                                          TPI02380
        SAVE=ARRAY(I,K)                                            TPI02390
        ARRAY(I,K)=-ARRAY(I,J)                                     TPI02400
110     ARRAY(I,J)=SAVE                                            TPI02410
111     I=JK(K)                                                    TPI02420
        IF(I-K)130,130,113                                         TPI02430
113     DO 120 J=1,NORDER                                          TPI02440
        SAVE=ARRAY(K,J)                                            TPI02450
        ARRAY(K,J)=-ARRAY(I,J)                                     TPI02460
120     ARRAY(I,J)=SAVE                                            TPI02470
130     CONTINUE                                                   TPI02480
140     RETURN                                                     TPI02490
        END                                                        TPI02500
```

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