GRIDDED ENVIRONMENTAL DATA COMPACTION: AN INVESTIGATION

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Both graphical examples and tabulated statistics clearly indicate that regional environmental gridded data may be compacted with either delta-type or double fast Fourier transforms, when the field data approximate values that are continuous in the first derivative. The smoother the original field values are, the more the data can be compacted. Results also show that fields derived from compacted fields can retain required accuracy. The Fourier transforms take twice as long as the delta schemes, but provide better results for light (2:1) compaction. The delta scheme is better than the Fourier transforms for heavy (7:1) compaction. The heavily compacted fields, however, may not be operationally useful.

This study reaches the following conclusions: (1) FFT packing provides better results than delta packing for light (2:1) compaction. (2) Delta packing seems better, with the end

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Block 19, Abstract, continued.

result looking more representative, for heavy (7:1) compaction. (3) The need exists to consider operational usefulness (TDA input or C^2 aid) prior to determination of compaction ratio (or to understand the impact of the default option). (4) Products could be built on the other end; instead of two fields and thickness, one field and thickness could be transmitted. (5) No geographic area dependence was found in initial tests. (6) The delta results could be applied immediately for the "Ocean-Met Data Compaction For Transmission" program for SUBLANT; if the transmission takes a hit, the error can be corrected with software, which is not possible with FFT coefficients. (7) Discontinuous fields (precipitation/evaporation duct height) do not compact well with either technique. (8) Sea height is not worth packing for coastal regions without significant preprocessing; there is no problem over water.

CONTENTS

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CONTENTS (continued)

1. INTRODUCTION

The purpose of this investigation was to evaluate and report on the compaction provided by delta-packing and double Fast Fourier Transforms (FFT's) of regions extracted from standard spherical (latitude/longitude) Fleet Numerical Oceanography Center (FNOC) grid fields, assuming all compacted data must be sent via AUTODIN. The conclusions of this report are not affected by this AUTODIN constraint. However, the 30-day average errors tabulated in Appendix A. are slightly greater because of this constraint. Data compression at the bit level was not investigated.

2. BACKGROUND

The transmission of data requires an amount of time that is proportional to the data rate and the amount of data to be transmitted. With AUTODIN and other similar transmission restrictions, the data rate is fixed and all time savings must be accomplished with a reduction in the amount of data to be transmitted. This data reduction must be accomplished through some form of data compaction. Additionally, the AUTODIN restriction requires all data to be transmitted in character (baud-o) format with certain combination of characters being prohibited. All compacted field data was reduced to scaled integer representation prior to the simulated transmission. Upon simulated receipt the numbers (characters) were unscaled, returned to real (floating point) numbers and uncompacted for evaluation. The two forms of gridded environmental data compaction that were evaluated were delta-packing and double FFT's.

2.1 Delta-packing. Delta-packing (Held, 1987) means only the first value is a direct representation of the original data and all subsequent values are the difference (single or double) between consecutively sampled values. The consecutive nature of gridded data is obtained through serpentine sampling - processing consecutive rows of a grid in opposite directions. Single or first order differencing is calculating the difference between adjacent values. Second order differencing is calculating the difference between the first order differences (which is the three-point numerical approximation of the second derivative of the central field value). After differencing (either first or second order), the resulting values are band indexed by dividing by a number which will keep the dynamic range of the differences within some desired limit.

2.2 FFT-packing. A Fourier transform (Brigham, 1974) represents a series of grid-point values as the mean value plus the contribution of weighted (amplitude) sines and cosines for the number of waves represented by the data. Thus the value at a particular grid point is the mean plus the sum of the magnitudes (both positive and negative) of all the sines and cosines for waves 1, 2, 3, ... N for the location of the grid point (where N is the number of the highest wave represented (or retained)). A double FFT is merely the FFT of the coefficients of the first FFT. That is, in grid-point space, one may perform the FFT of each row of a grid and then perform the FFT of each column value of the coefficients of the first FFT. One is then left with the coefficients that represent all the means of the rows, the coefficients that represent the magnitudes of all the sines for wave one, the coefficients that represent the magnitudes of all the cosines for wave one, etc. In addition, if one desires that the waves in wave number space represent the true waves of grid point space, one must first adjust the grid-point values to have cyclic boundary conditions. This is accomplished by ensuring that the last value in a row (column) is the same as the first value in the row (column). Numerically one takes the difference between the end values and prorates this difference, based upon distance from the first grid point, to the values in the row or column. These biased grid-point values are then processed by the FFT software. Upon returning to grid point space, one must unbias the recovered (double backward transformed) values. As in the delta method, the resulting coefficients and cyclic weighting factors must be band indexed by dividing by a number which will keep the dynamic range of the coefficients and factors within some desired limit for transmission.

2.3 Size and Location of Areas. The representative size of the required regional areas was defined to be 31-by-31 grid points. Three different areas were picked to determine if there is a noticeable difference between the areas for a given packing scheme and between the two packing schemes being evaluated. The first area is the western Pacific, from 30.0S to 45.0N in latitude and from 105.0E to 180.0 in longitude. The second area is the eastern Pacific, from the equator to 75.0N in latitude and from 177.5W to 102.5W in longitude. The third and last area is the North Atlantic from the equator to 75.0N in latitude and from 80.0W to 5.0W in longitude.

2.4 Environmental Parameters. The environmental parameters that were specified in reference 1 for the 30-day (once a day) processing were: the sea level pressure; precipitation accumulation; significant sea height; 1000 mb, 500 mb and 300 mb height fields; and 1000 mb, 850 mb, 500 mb and 300 mb temperature fields. Additionally, the effect of deriving the 1000 mb to 500 mb thickness field from the unpacked 1000 mb and 500 mb fields, and the 500 mb to 300 mb thickness field from the unpacked 500 mb and 300 mb fields, were to be investigated. The other side effect to be measured was the difference in the temperature lapse (difference) in the 1000 mb to 850 mb layer, the 850 mb to 500 mb layer, and the 500 mb to 300 mb layer using unpacked fields.

Additional fields in reference 1 that were desired to be evaluated were the surface wind components; the height of the evaporative duct; and the 500 mb wind components, vertical motion, vorticity and divergence.

2.5 Software. The FFT software to be used was provided by the government. In addition, reference 1 required cyclic boundary conditions (row-wise and column-wise) to be used. The remaining software was generated by the contractor. All software was provided to the government at the conclusion of the task order.

3. PROCESSING

3.1 Double FFT. The first processing was with the double FFT, progressively keeping fewer and fewer wave numbers for evaluation. The maximum number of 2-d waves which may be retained in 31 grid points is 15 (d represents the grid length). The number of waves retained in the longitudinal direction is the same as the number retained in the latitudinal direction. (Note, this wave reduction takes place after the first FFT.) The first field picked for testing was the sea level pressure. This field was picked to represent the anticipated level of difficulty of the environmental fields.

In order to provide some measure of the relative smoothness of the field, the variance of the original field and all subsequent unpacked fields was calculated. To provide a useful measure of comparison, the percent of the original variance that remains in the recovered field was calculated. Depending upon the number of waves retained in the recovered field, this percentage may be over 100%. That is, a field that has been truncated in wave space, packed and then unpacked may have a slight increase in the variance.

In order to provide further comparisons between the original field values and the recovered field values, the minimum, average and maximum grid-point values of the original and recovered fields were collected or calculated. Absolute measures of accuracy in the recovered field were calculated or collected in terms of the average grid-point absolute error-value (root-mean-square-error, RMSE) and the maximum grid-point absolute error-value. As an additional measure that can be related to other types of fields, the percent of the dynamic range of the original field values that the average RMSE and the maximum grid-point error-value represent were calculated. The 30-day averages of these values are tabulated in Appendix A for the main environmental parameters of this investigation.

The resulting sea level pressure fields for the three areas were carefully evaluated to obtain some relationship between the numbers being calculated and the visual representation of the contours, reproduced as Varians. It appeared that when the RMSE was greater than 0.1 mb or the maximum absolute error was greater than 1.0 mb the contours were different enough to indicate that a subjective forecast of winds and pressure would begin to significantly diverge from forecasts based upon the original contours. The wave numbers being retained were between 11 and 9. This was interesting, so a full global grid of sea level pressures was evaluated to see what wave numbers would produce about the same respective errors. The 0.1 mb RMSE occurred with about 29 waves retained and the 1.0 maximum grid-point absolute error occurred with about 35 waves being retained.

The next parameter evaluated was the accumulated precipitation field, which was anticipated to be the hardest field to compact (double FFT's and delta) because of its sharp discontinuities in the first derivative. The accumulated precipitation fields do not retain any usefulness when packed and unpacked with the double FFT compaction method.

The significant sea height field was the next parameter to be tested. The results were disappointing, because almost any compaction resulted in a degraded field. After a careful study, it was estimated that the zero sea heights over the land were causing the poor results. A test of a 31-by-31 field over the central Pacific was tried and the results showed that the zero sea height values were the cause of the poor results in the three regions selected for the main testing.

The height fields for the 1000 mb, 500 mb, and 300 mb were next, and they are very good candidates for data compression. Likewise, the temperature fields (specifically the 1000 mb, 850 mb, 500 mb and 300 mb) are good for data compression techniques.

The differences between the two thickness fields (1000 mb to 500 mb and 500 mb to 300 mb) derived from the uncompacted fields and the original fields were calculated to show the side effects of data compaction. Likewise, the three temperature lapses (1000 mb to 850 mb, 850 mb to 500 mb and 500 mb to 300 mb) were calculated from the uncompacted fields and compared with the original field differences. Again only absolute errors were calculated.

3.2 Delta Schemes. The delta-packing scheme was initially bread-boarded at both first and second order differences, but the magnitude of the second order terms were usually as large or larger than the first order terms, so the second order evaluation was not continued.

The first order delta packing was tried with the data sampling being every other, every third, every fourth and every fifth value of a serpentine loaded single dimensioned array of grid point values. The results were not that encouraging with a simple linear interpolation to recover omitted grid-point values. The results improved when a cubic spline was used in the interpolation of omitted values. An experiment was conducted to determine if the knowledge of the grid would help in the interpolation scheme. Namely, use single cubic spline interpolation on the boundary values, but use double cubic spline interpolation on the interior points for a delta packing based upon every other grid-point value being retained. The results were greatly improved, so this technique was expanded to the four approaches illustrated in Figure 1. Note, Scheme 1, which is not shown, is without data omission and was only used for software validation. Scheme 2, in the upper left hand corner of the figure, illustrates the use of every other point of the grid.

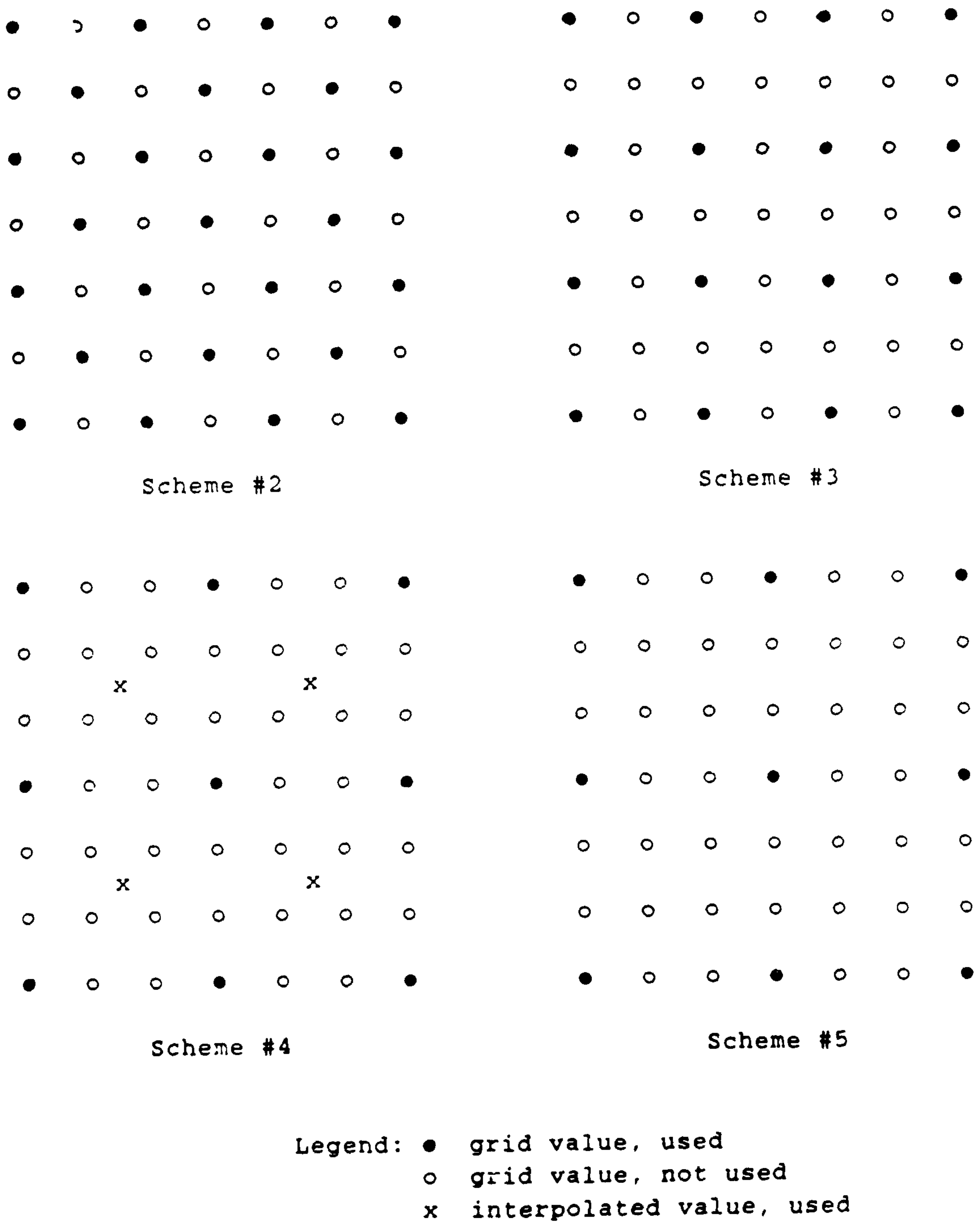

Figure 1. Delta Compaction Schemes.

Scheme 3, demonstrates the approach when every other row and column are omitted from the grid. Scheme 5, in the lower right corner of the figure, shows every second and third row and column omitted from the original data set. Scheme 4 was invented in order to fill the big step in data omission between Schemes 3 and 5. Scheme 4 is the same as Scheme 5 except the "X's" are values interpolated from the field values and are included in the set of numbers that are compacted, uncompacted and used to recover the omitted grid-point values. The values at the X's are obtained from double diagonal cubic splines. It should be noted that for the best results in all these schemes, the four corner points of the grid must be included in the set of values to be compacted.

The same parameters and additional side effects were measured using delta packing techniques as were used in the double FFT work.

3.3 Additional Fields. In accordance with reference 1, the following fields were also tested to see if compaction could be applied without problems:

1. sea level u and v wind components,
2. height of the evaporative duct,
3. 500 mb vorticity,
4. 500 mb vertical motion, and
5. 500 mb u and v wind components.

The 500 mb divergence field, which is in the list of additional fields to be evaluated, was not available for testing on the FNOC mainframe computers.

3.4 Negative Enhancement. Both the height of the evaporative duct and the significant sea height fields that cover land areas are discontinuous fields and are not particularly good candidates for compaction. Therefore, in an attempt at creating continuous values in order to assist the cubic spline and FFT's in their surface fitting requirement, software was developed that uses cubic splines to generate spurious negative values in the zero filled areas of the grid. The "enhanced" field values are then compacted, uncompacted and "de-enhanced" to recover the field. "De-enhanced" means all negative values are returned to their original zero value. Likewise, positive values from cubic spline interpolation/extrapolation can be allowed over land, if all land values on a grid are zero and a land/sea table is available during uncompaction to return all positive values over land to zero.

3.5 Barnes Enhancement. Subsequently, it was decided to determine if transmitting the location and central values of maximums and minimums of the original field, besides the selected grid-point values of the packing schemes, would improve the recovered field values by using a Barnes-type analysis, (Barnes, 1964, 1973; Benjamin and Seaman 1985) in the recovery process. The "first guess" field in the analysis is the recovered field values from the compacted set, and the "observed data" are the central values and their locations. This experiment was tried on a sea level pressure field.

4. RESULTS

4.1 Packing Factors. A field of 31 by 31 points is 961 grid point values. In the delta packing schemes, six numbers are required in the "overhead" - the minimum value and its associated multiplier, the base value and its associated multiplier, and the delta amplification factor and its associated multiplier. Therefore, a delta 2 packing scheme will require 481 grid-point values plus six more "overhead" values for a total of 487 values. This produces a packing factor of 1.97, which is nearly two to one (the total number of values that need to be transmitted are about half the number of the original grid-point values).

Similarly the double FFT packing with 14 waves retained, results in 396 coefficients and an "overhead" of 70 more numbers. Cyclic boundary conditions are applied to the grid boundary values, which accounts for 62 of these 70 numbers. Then each set of numbers, two cyclic and two FFT's, have their amplitude factor and associated decode multiplier. This brings the total number of values which must be transmitted to 466, which is a packing factor of 2.06. That is, a number of values that is a little less than half of the grid-point values need to be transmitted in this case.

Table I. shows the resulting packing factor for the number of waves retained in the double FFT's and delta schemes 2 through 5.

Table I. Packing Factors for Double FFT's and Delta Schemes for 31-by-31 grid

FFT Wave	No. of points or FFT coefficients	Total No. of Values	Packing Factor	Delta Scheme
15	454	524	1.83	
	481	487	1.97	2
14	396	466	2.06	
13	342	412	2.33	
12	292	362	2.65	
11	246	316	3.04	
10	204	274	3.51	
	256	262	3.67	3
9	166	236	4.07	
	221	227	4.23	4
8	132	202	4.76	
7	102	172	5.59	
6	76	146	6.58	
	121	127	7.57	5
5	54	124	7.75	

4.2 Tabulated Results. Appendix A. presents the averaged 30-case results of all four packing schemes (2 through 5, illustrated in Figure 1.) and the double FFT packing (15 waves through 5 waves being retained) for:

1. sea level pressure (mb),
2. accumulated precipitation (cm),
3. significant sea height (ft),
4. 1000 mb height (m),
5. 500 mb height (m),
6. 300 mb height (m),
7. 1000 mb temperature (°C),
8. 850 mb temperature (°C),
9. 500 mb temperature (°C),
10. 300 mb temperature (°C),
11. calculated 500 - 1000 mb layer thicknesses (m),
12. calculated 300 - 500 mb layer thicknesses (m),
13. calculated 1000 - 850 mb temperature lapses (°C),
14. calculated 850 - 500 mb temperature lapses (°C),
15. calculated 500 - 300 mb temperature lapses (°C),

in each of the three areas:

1. western Pacific (105E to 180 longitude and 30S to 45N latitude),
2. eastern Pacific (177.5W to 102.5W longitude and the equator to 75N latitude), and
3. North Atlantic (80W to 5W longitude and the equator to 75N latitude).

It should be noted that the results of single cubic spline interpolation generally leads to greater errors than double cubic spline interpolation. Therefore, the edge-values of the unpacked grid-values will generally show more error than the interior values when double cubic spline interpolation is possible in the delta schemes.

Excluding the precipitation and 300 mb temperature fields, the least variances were in the tropics of the western Pacific and the greatest variances were in the North Atlantic. In general the largest average errors and average maximum errors are positively correlated with the initial variance. However there are exceptions, especially with light packing with double FFT's. In all cases with delta packing and in almost all cases with double FFT's (exceptions are only with very light packing) the error differences between the three areas is less than the error differences associated with the next higher level of packing.

4.3 Contoured Examples. In all the graphic examples shown in the following figures, the solid lines are the contours of the original field and the dashed lines are the contours of the field recovered from the compaction and uncompaction processes.

4.3.1 Surface Pressure. Figures 2 through 5 show the results of delta packing schemes 2 through 5, respectively, for the same initial surface pressure field in the eastern Pacific. The contours are in mb with the prominent features being a 976 low and a 1032 high. As one would expect, the deviations increase as the packing factor is increased. Figures 6 through 9 show the results of double FFT packing for wave retention of 14, 12, 9 and 5, respectively for the same location and time as Figures 2 through 5. As with the delta schemes, as the packing factor is increased the deviations from the initial values increase. In Figure 9, with only five waves being retained, one can notice the extra "bubble" of 1036 (not labeled) appearing in the center of the high pressure cell. This "bubble" is characteristic of the double FFT when high packing factors are used. These two sets of figures provide a good side by side comparison of the results from delta and double FFT packing. Refer to Table I for packing factors.

4.3.2 Significant Sea Height. Figures 10 through 13 illustrate the problems the delta schemes (2 through 5, respectively) have with discontinuous sea height fields in coastal regions of the

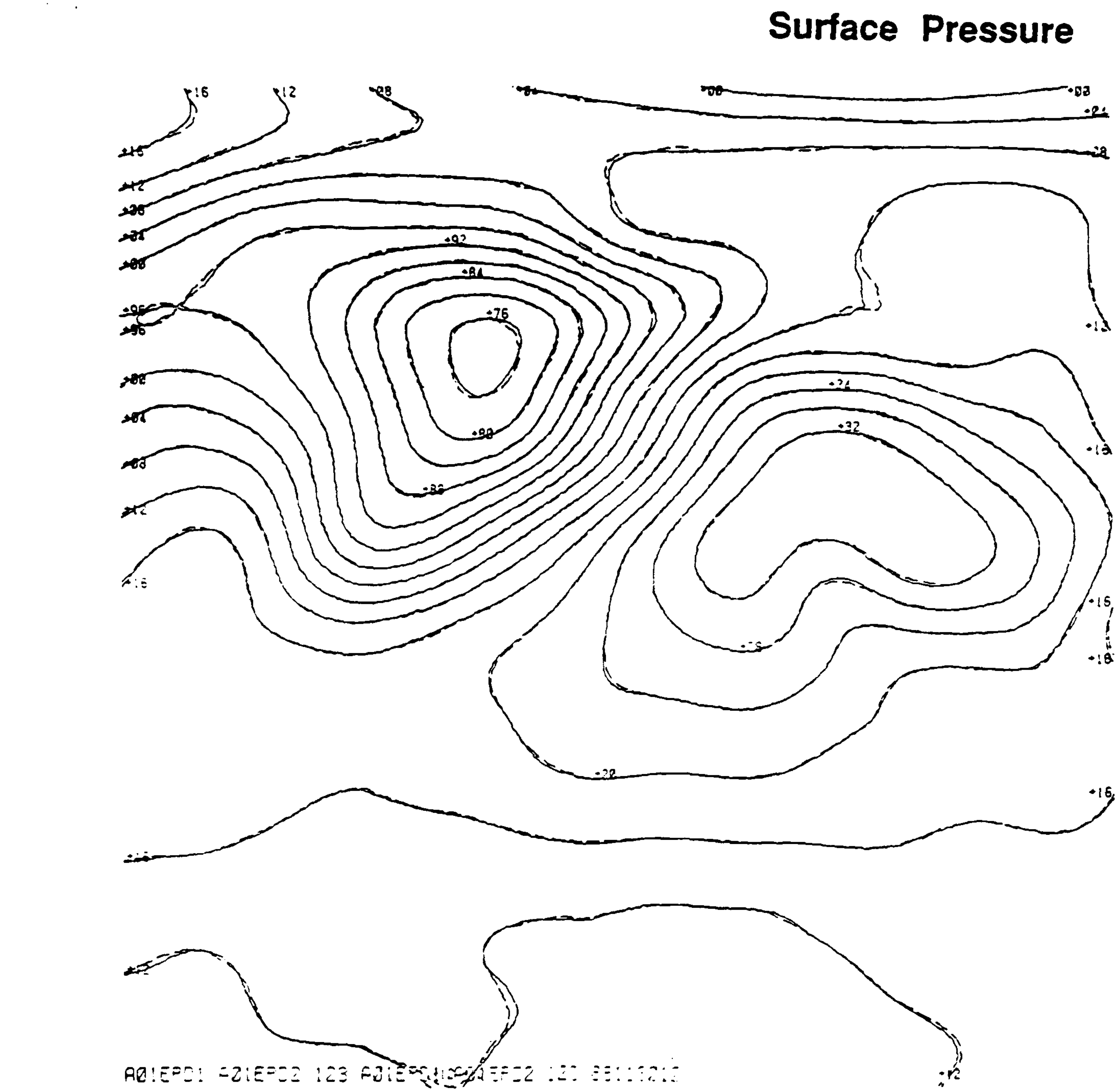

Figure 2. Surface Pressure, Delta Scheme 2 (mb)

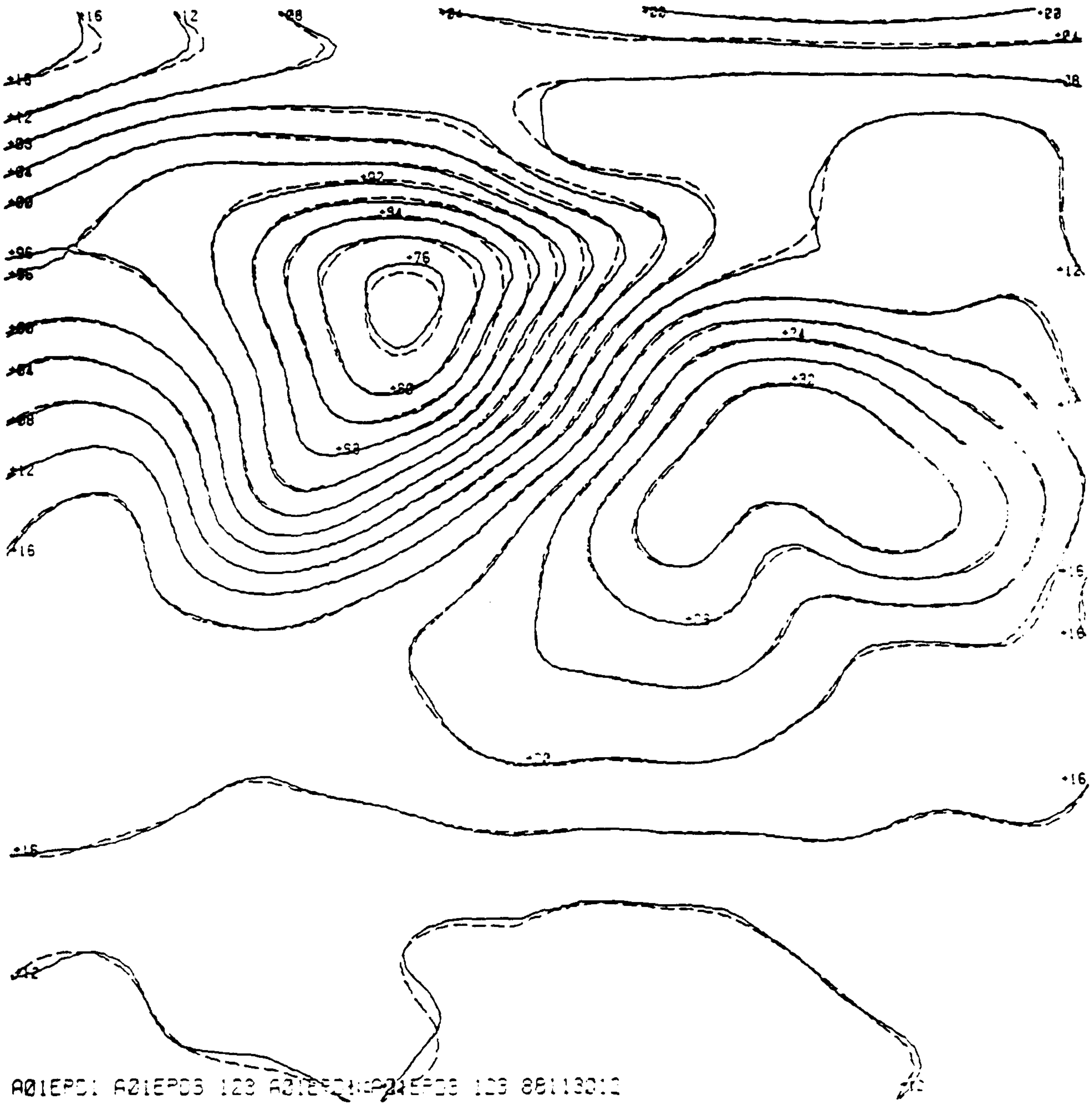

Figure 3. Surface Pressure, Delta Scheme 3 (mb)

Surface Pressure

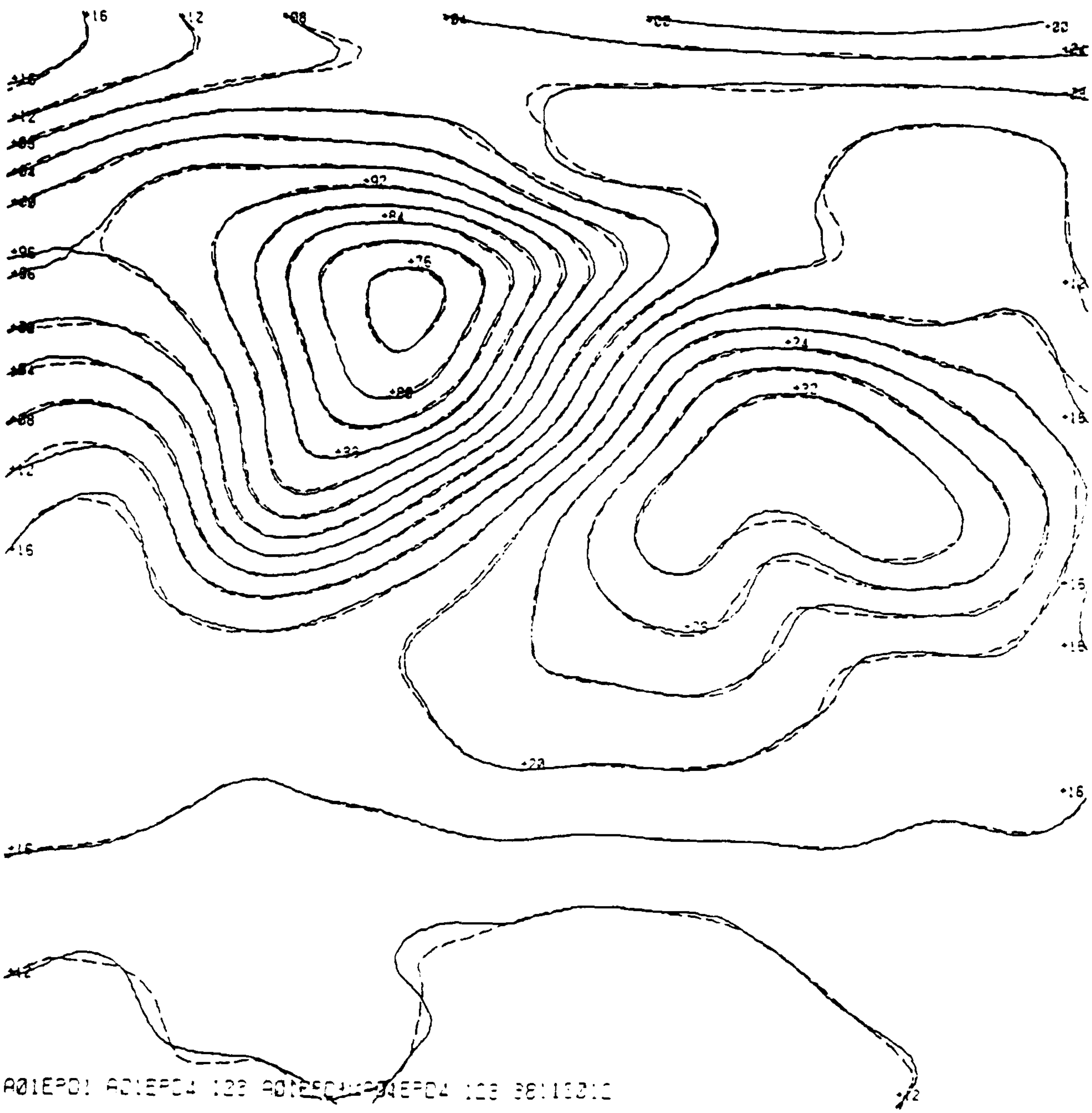

Figure 4. Surface Pressure, Delta Scheme 4 (mb)

Surface Pressure

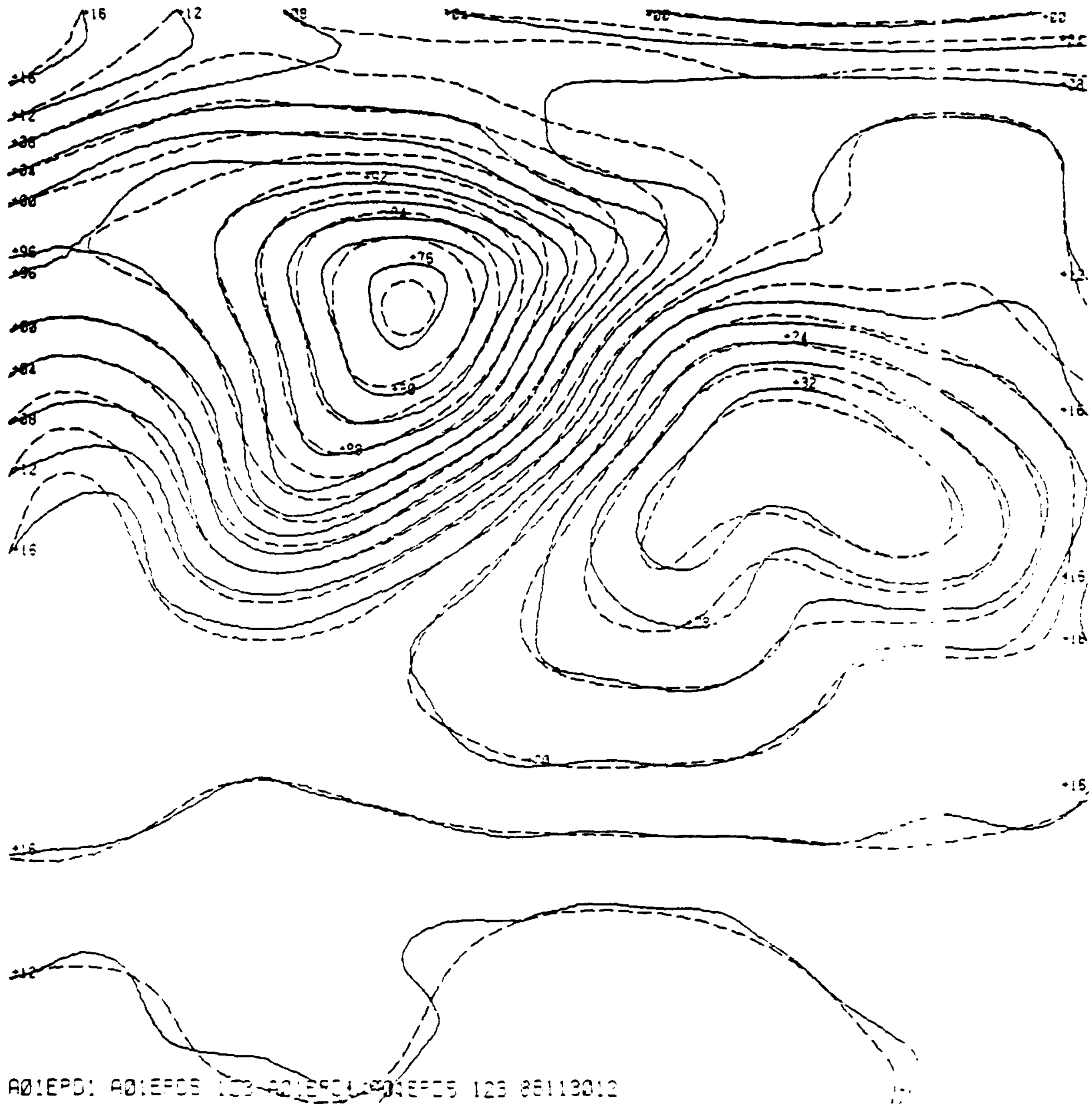

Figure 5. Surface Pressure, Delta Scheme 5 (mb)

Surface Pressure

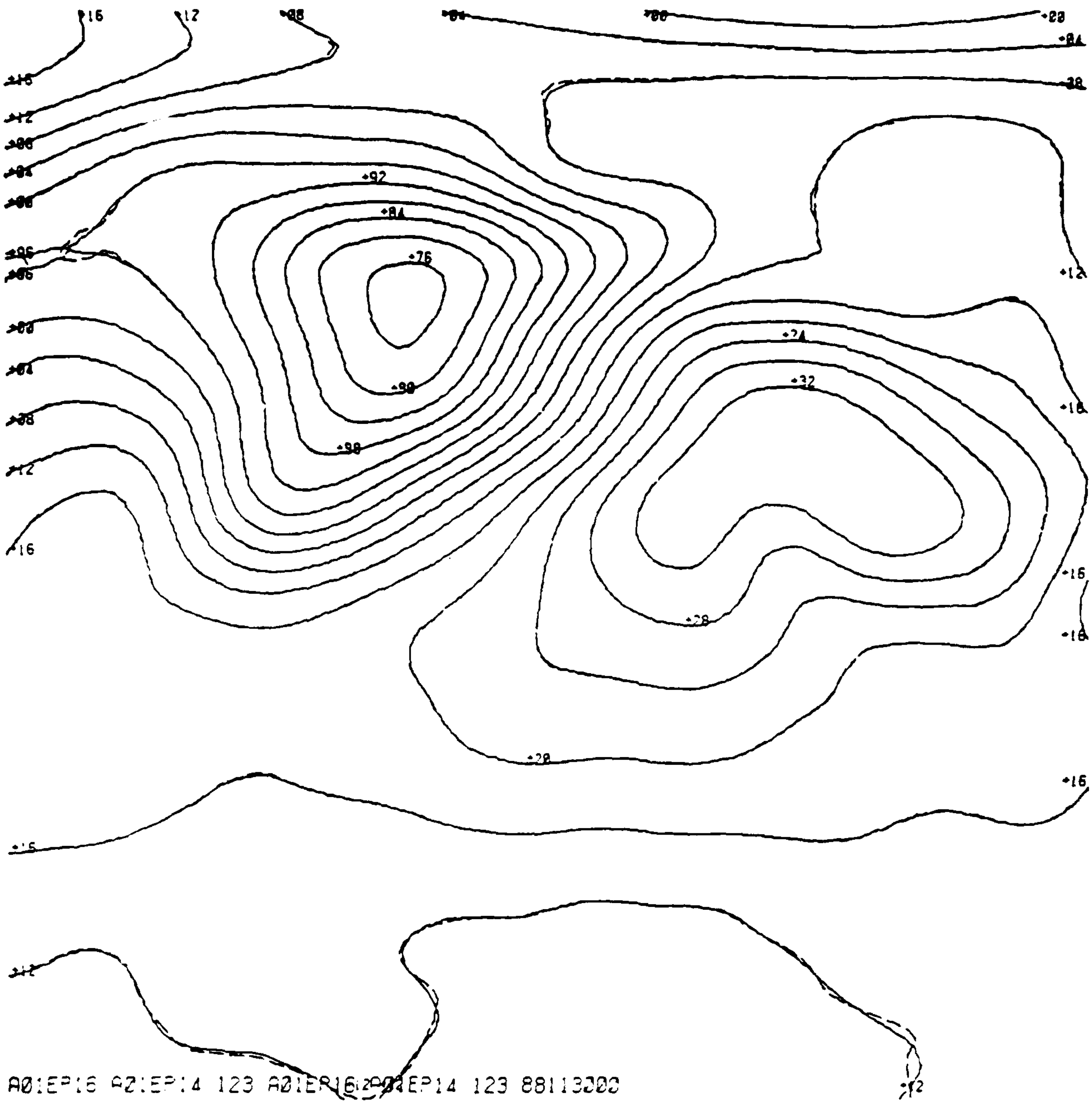

Figure 6. Surface Pressure, Double FFT Wave 14 (mb)

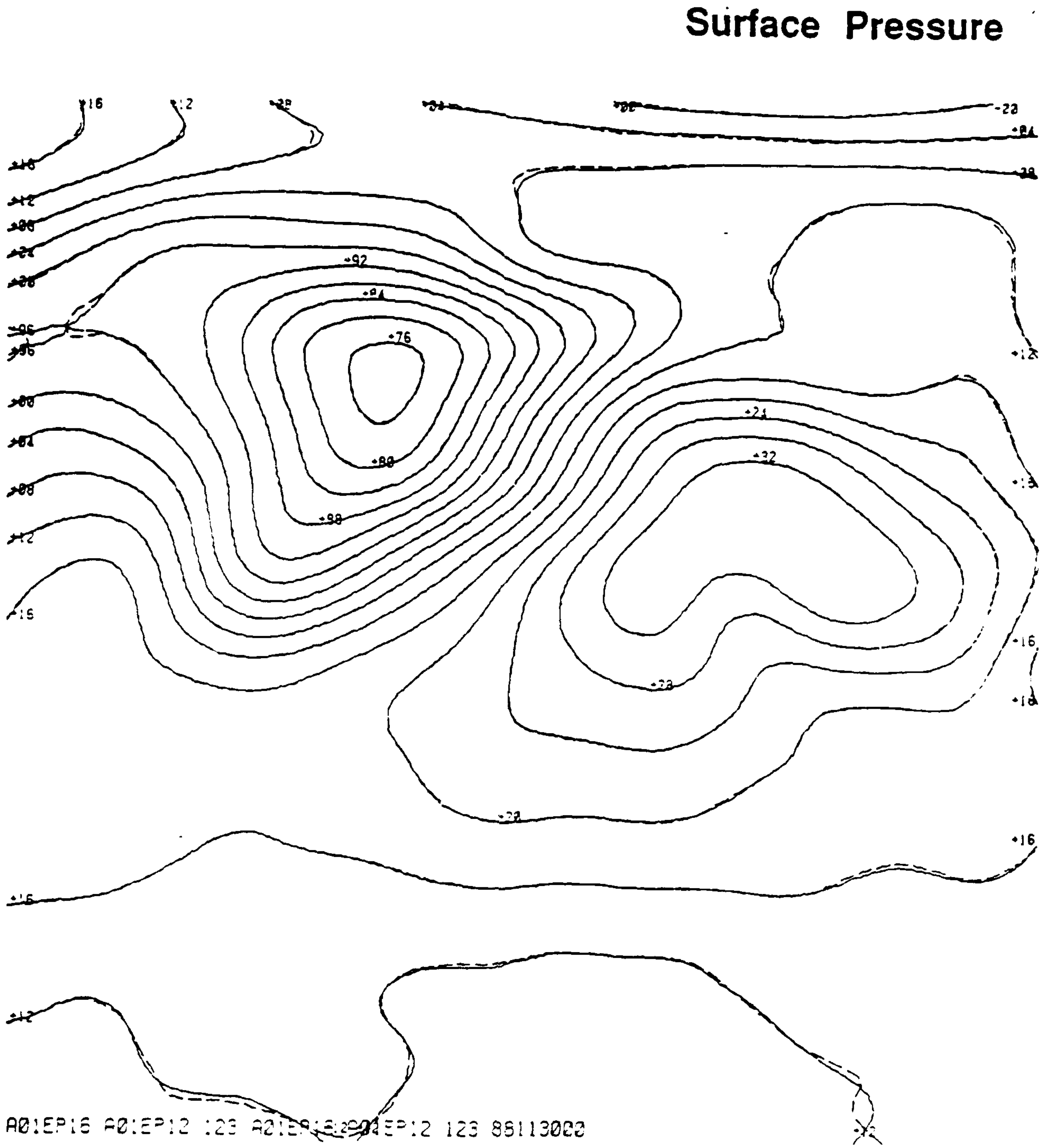

Figure 7. Surface Pressure, Double FFT Wave 12 (mb)

Surface Pressure

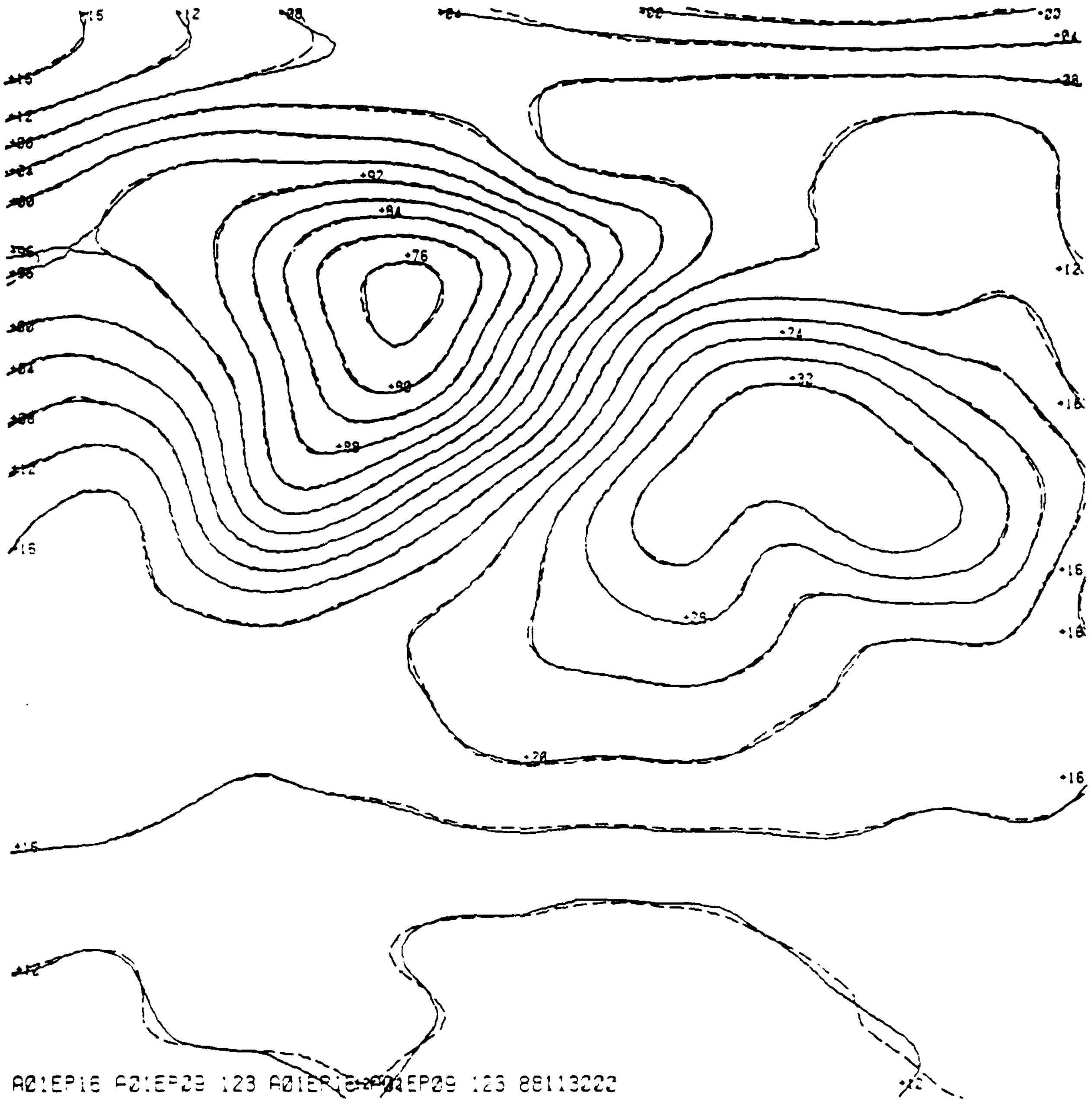

Figure 8. Surface Pressure, Double FFT Wave 9 (mb)

Surface Pressure

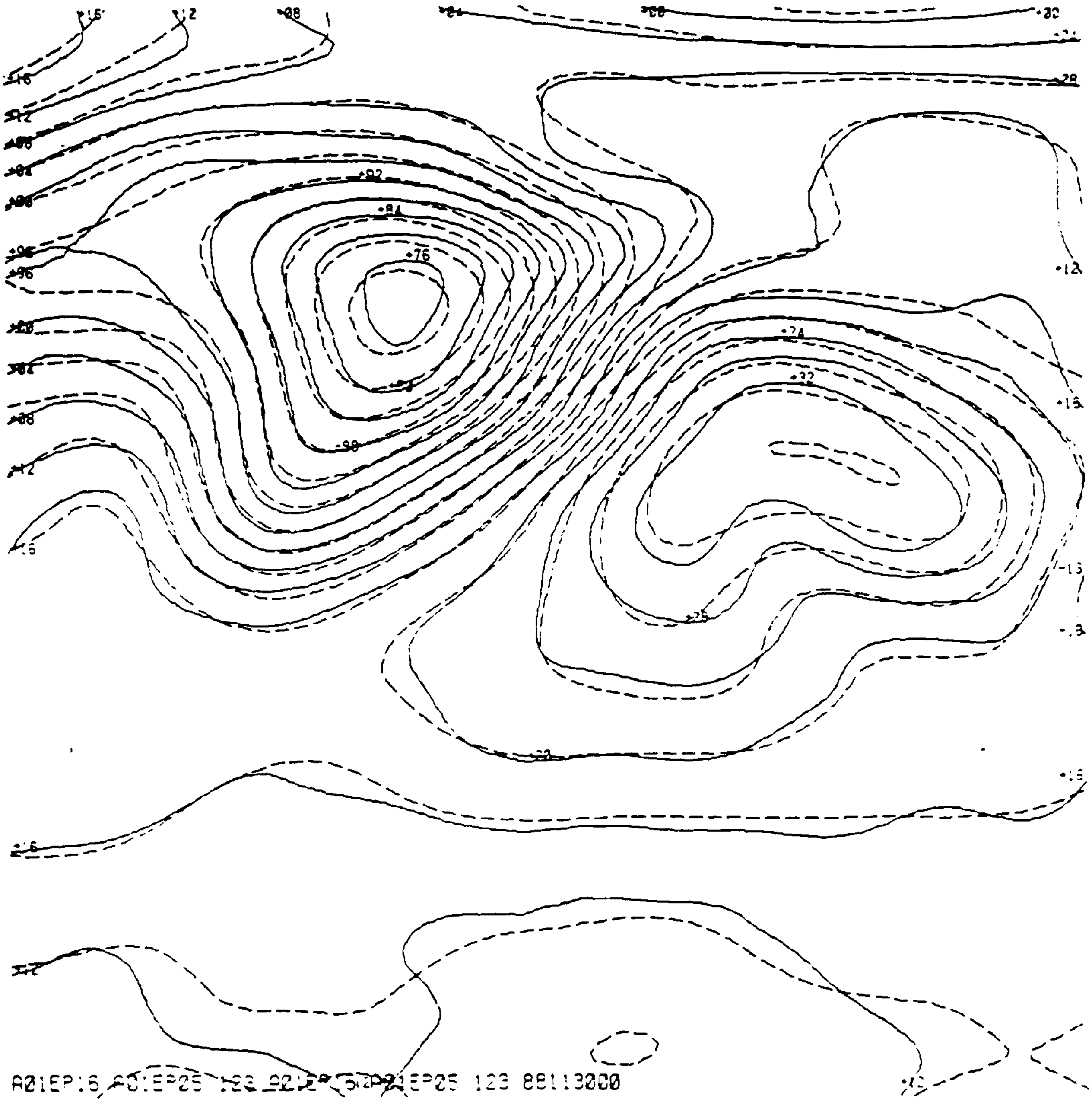

Figure 9. Surface Pressure, Double FFT Wave 5 (mb)

eastern Pacific. Figures 14 through 17 demonstrate the problems the double FFT (for waves 14, 12, 9 and 5, respectively) has with the same discontinuous conditions of sea height. As in all these figures, the continuous contours are for the original field and the dashed contours are for processed field values. The contours are for a three foot interval.

Figures 18 through 21 for the delta schemes 2 through 5, respectively, and Figures 22 through 25 for the double FFT with waves 14, 12, 9 and 5 being retained, respectively, aptly show the success of processing sea height fields that are fairly continuous (in an ocean basin, the central Pacific in this case). One notices that both compaction methods do much better in the northern Pacific than in the equatorial area.

4.3.3 1000 mb Heights. Figures 26 and 27 illustrate the 1000 mb heights (anomaly) with a 30 meter contour interval for the North Atlantic with delta schemes 3 and 4. As appendix A shows, delta 3 does better than delta 4 in terms of RMSE and absolute error. But note that the closed 240 m contour in the central part of the figures is misplaced by hundreds of miles to the west in scheme 3, but not in scheme 4. Scheme 3 attempts to represent the 210 m low with an inverted trough, while scheme 4 basically misses it all together. However, for most meteorological uses either Figure 26 or 27 would do equally well.

4.3.4 500 mb Heights. Figures 28 and 29 illustrate the 500 mb heights (anomaly) with a 60 meter contour interval for the North Atlantic with delta schemes 3 and 4. Notice that as the fields become more continuous and the gradients increase the packing methods improve in their ability to represent the original field values.

4.3.5 300 mb Heights. Figures 30 and 31 illustrate the 300 mb heights (anomaly) with a 120 meter contour interval for the North Atlantic with delta schemes 3 and 4.

Coastal Region

Sea Height

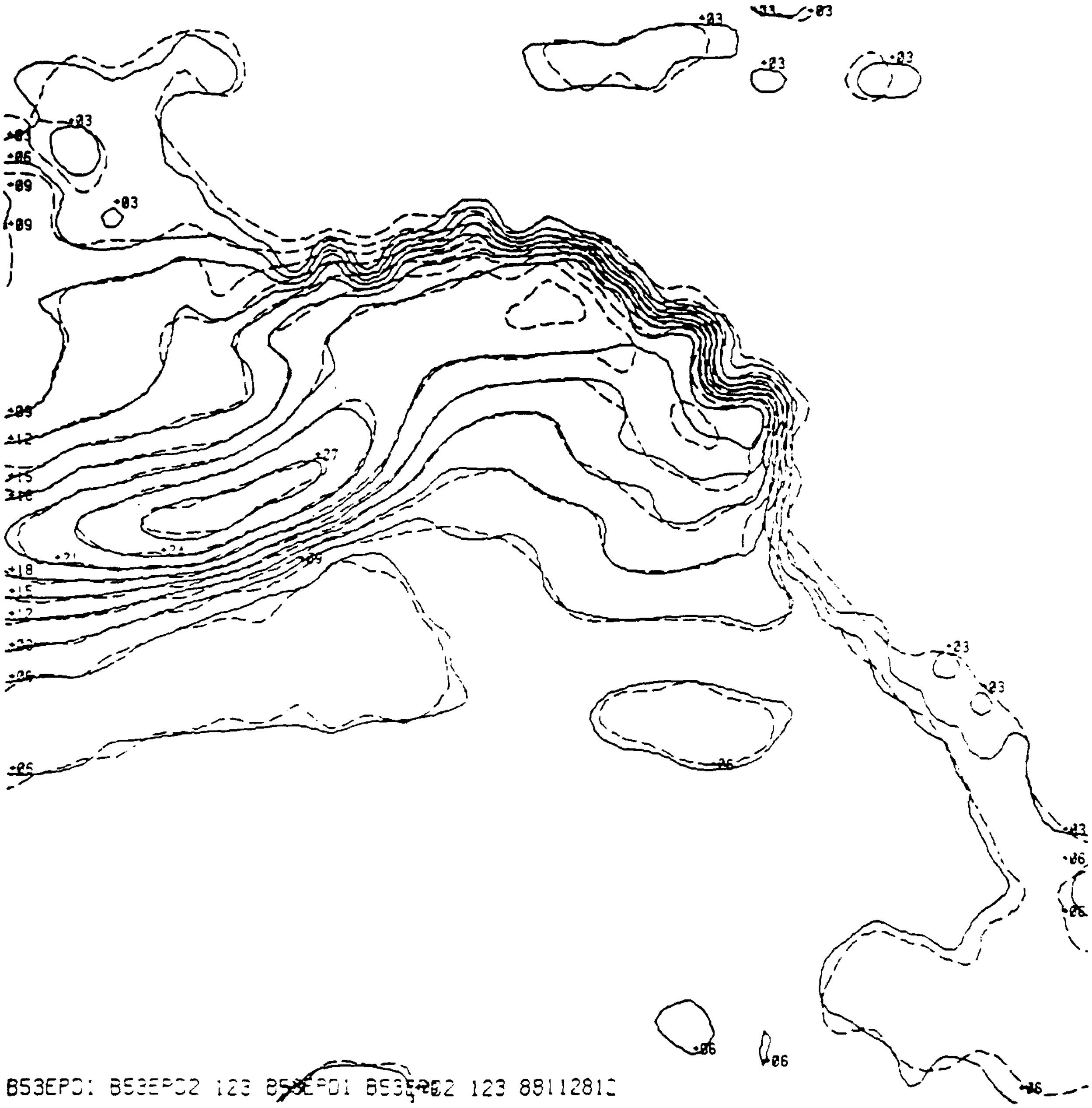

Figure 10. Coastal Region Sea Height, Delta Scheme 2 (ft)

Coastal Region

Sea Height

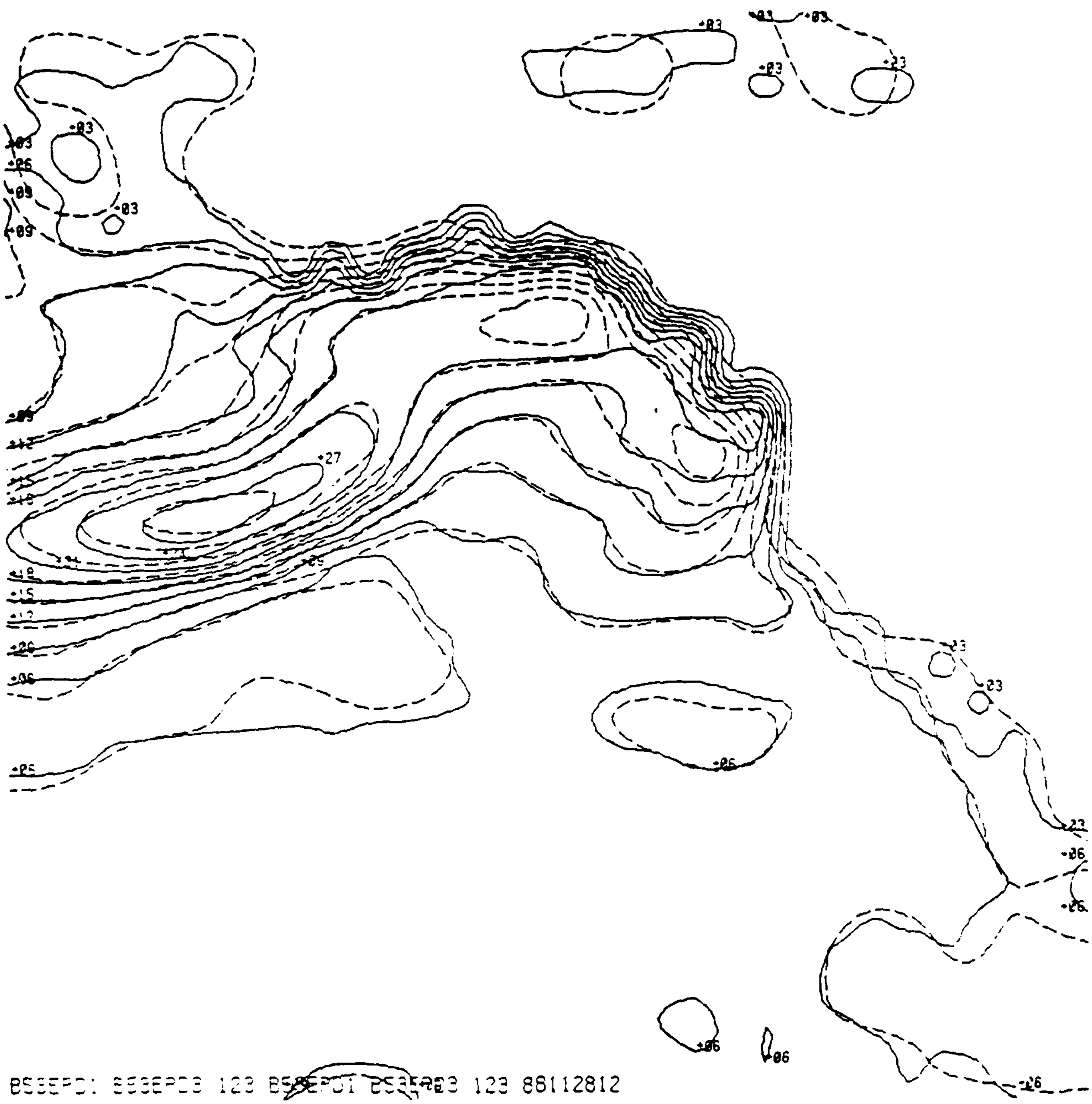

Figure 11. Coastal Region Sea Height, Delta Scheme 3 (ft)

Coastal Region

Sea Height

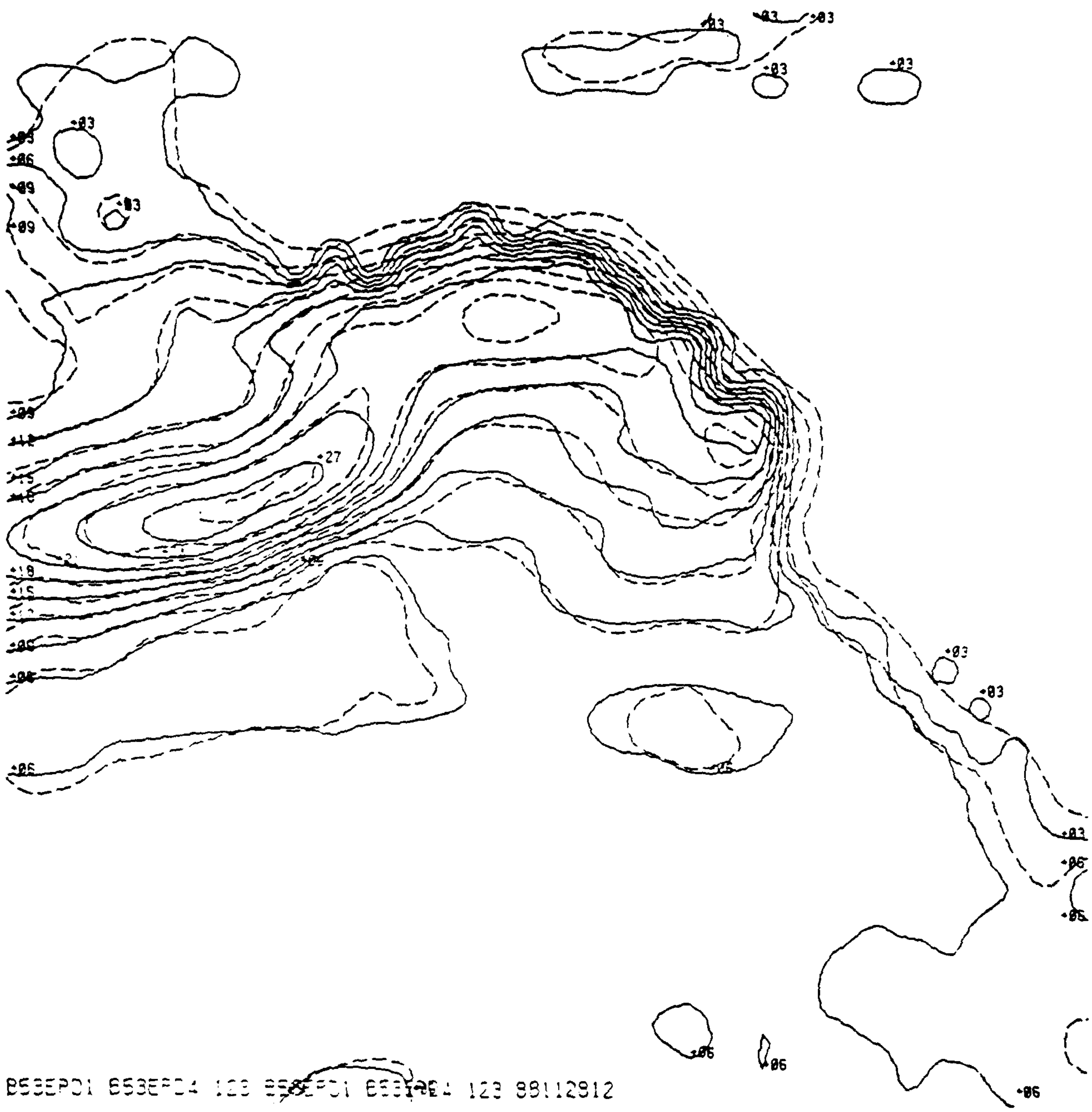

Figure 12. Coastal Region Sea Height, Delta Scheme 4 (ft)

Coastal Region

Sea Height

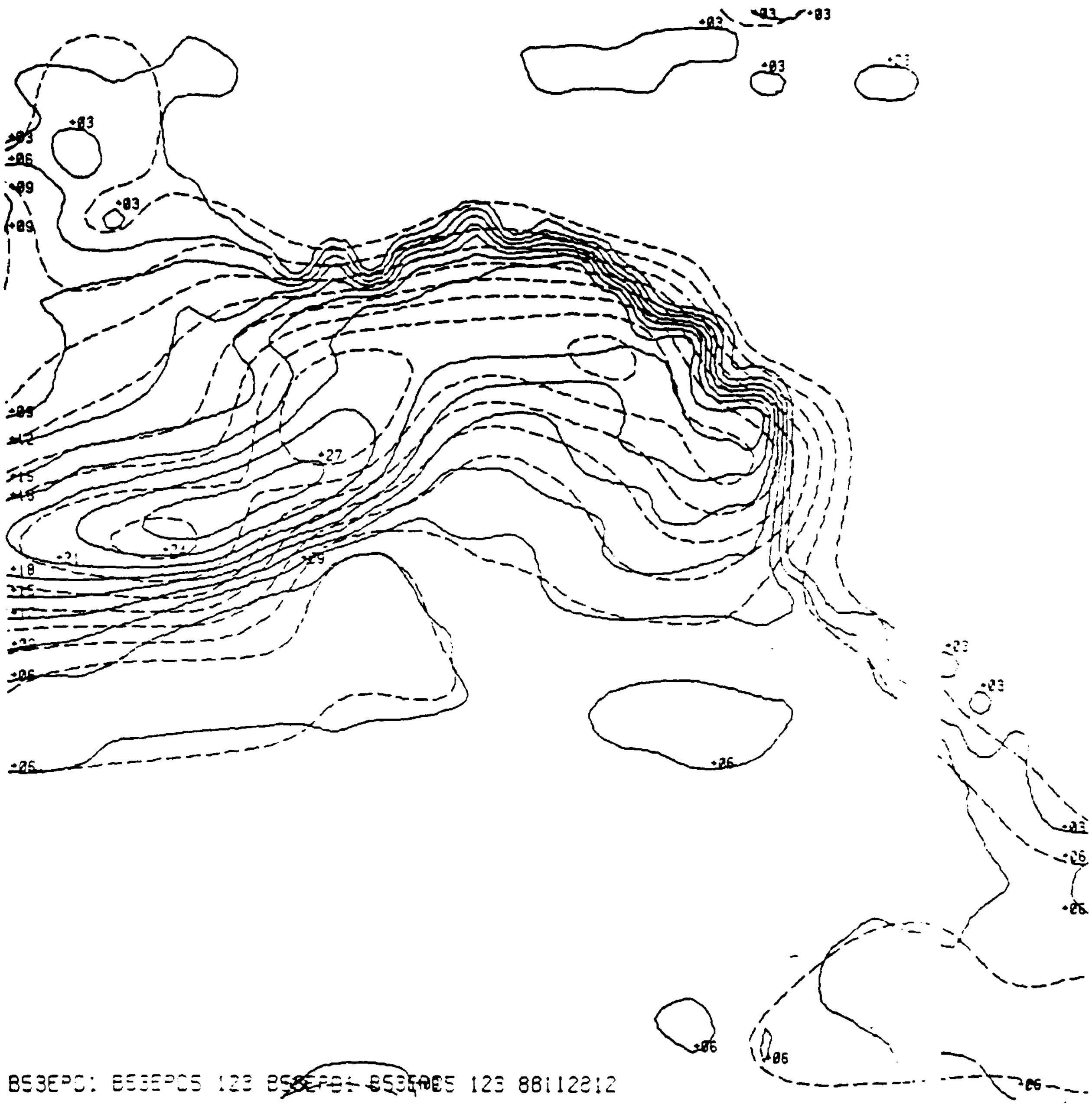

Figure 13. Coastal Region Sea Height, Delta Scheme 5 (ft)

Coastal Region

Sea Height

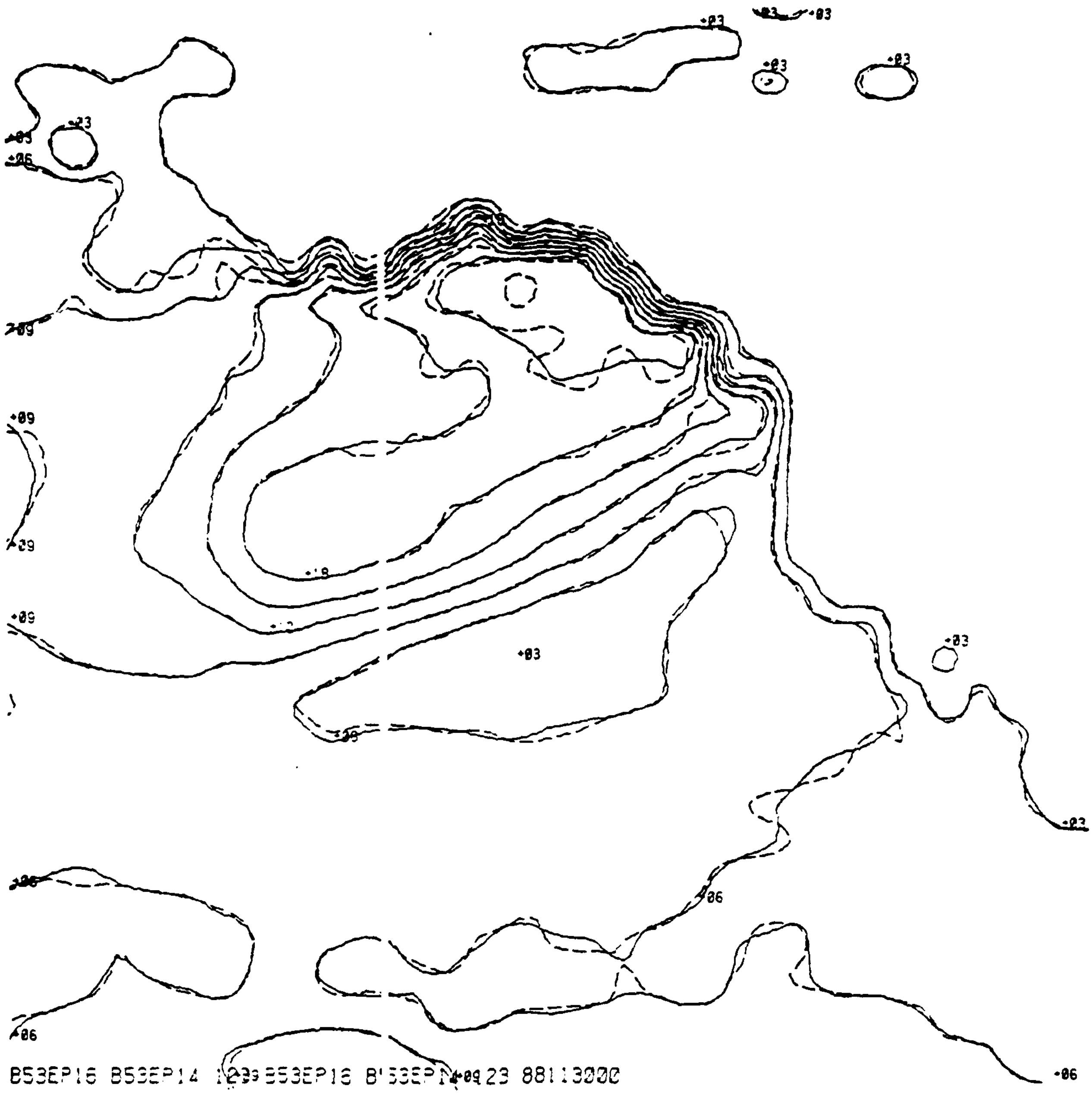

Figure 14. Coastal Region Sea Height, Double FFT Wave 14 (ft)

Coastal Region

Sea Height

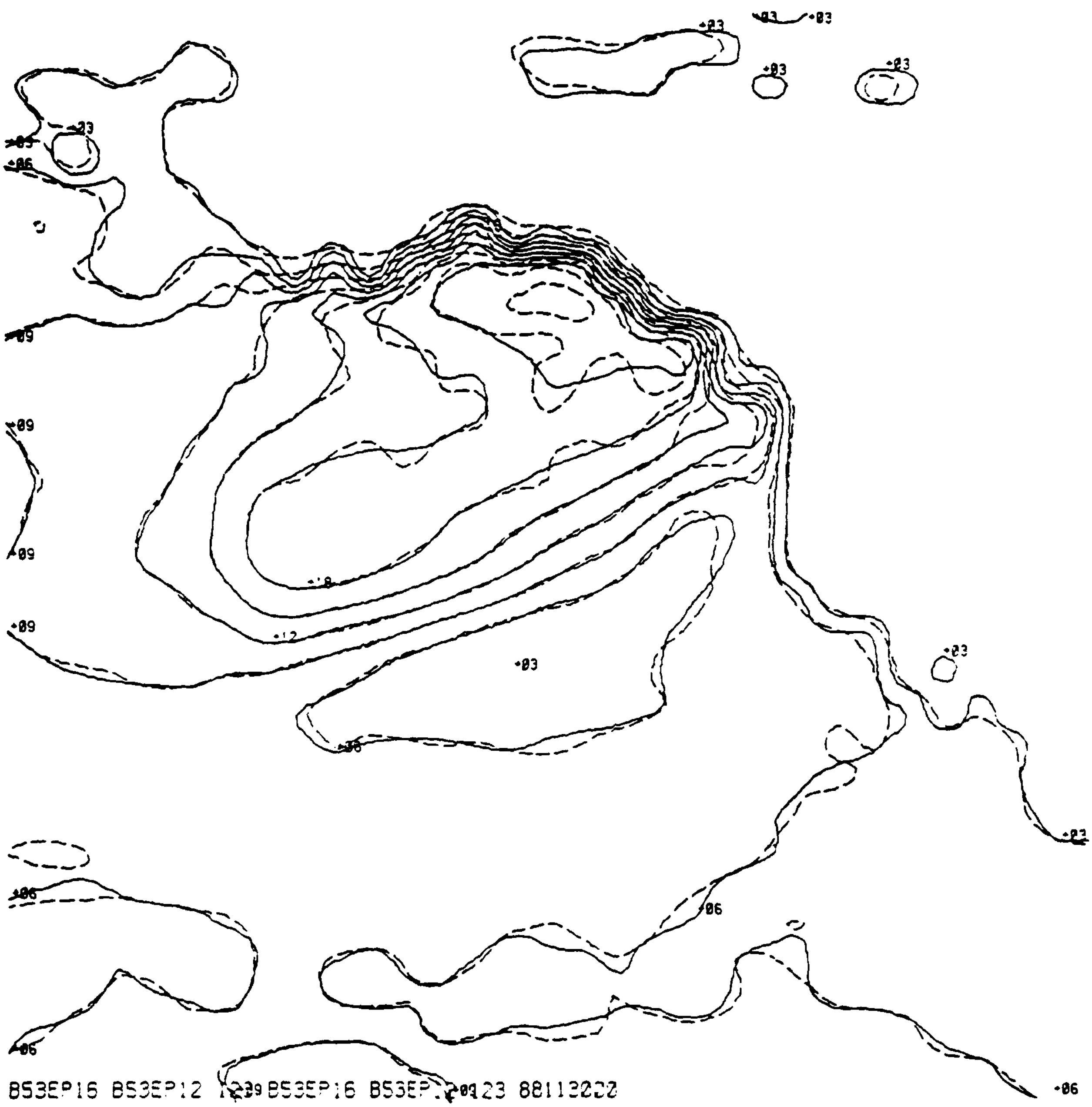

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Figure 15. Coastal Region Sea Height, Double FFT Wave 12 (ft)

Coastal Region

Sea Height

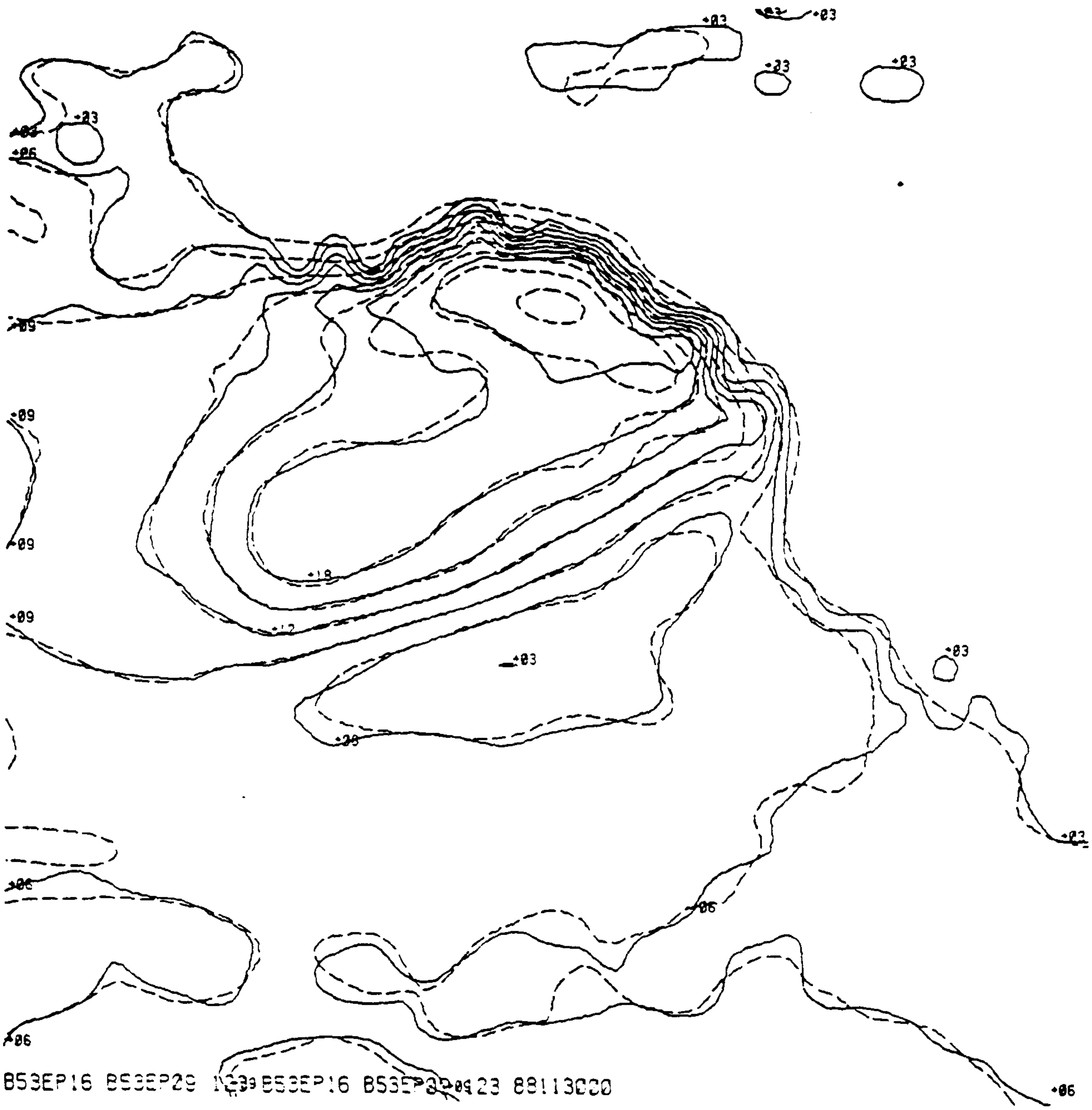

Figure 16. Coastal Region Sea Height, Double FFT Wave 9 (ft)

Coastal Region

Sea Height

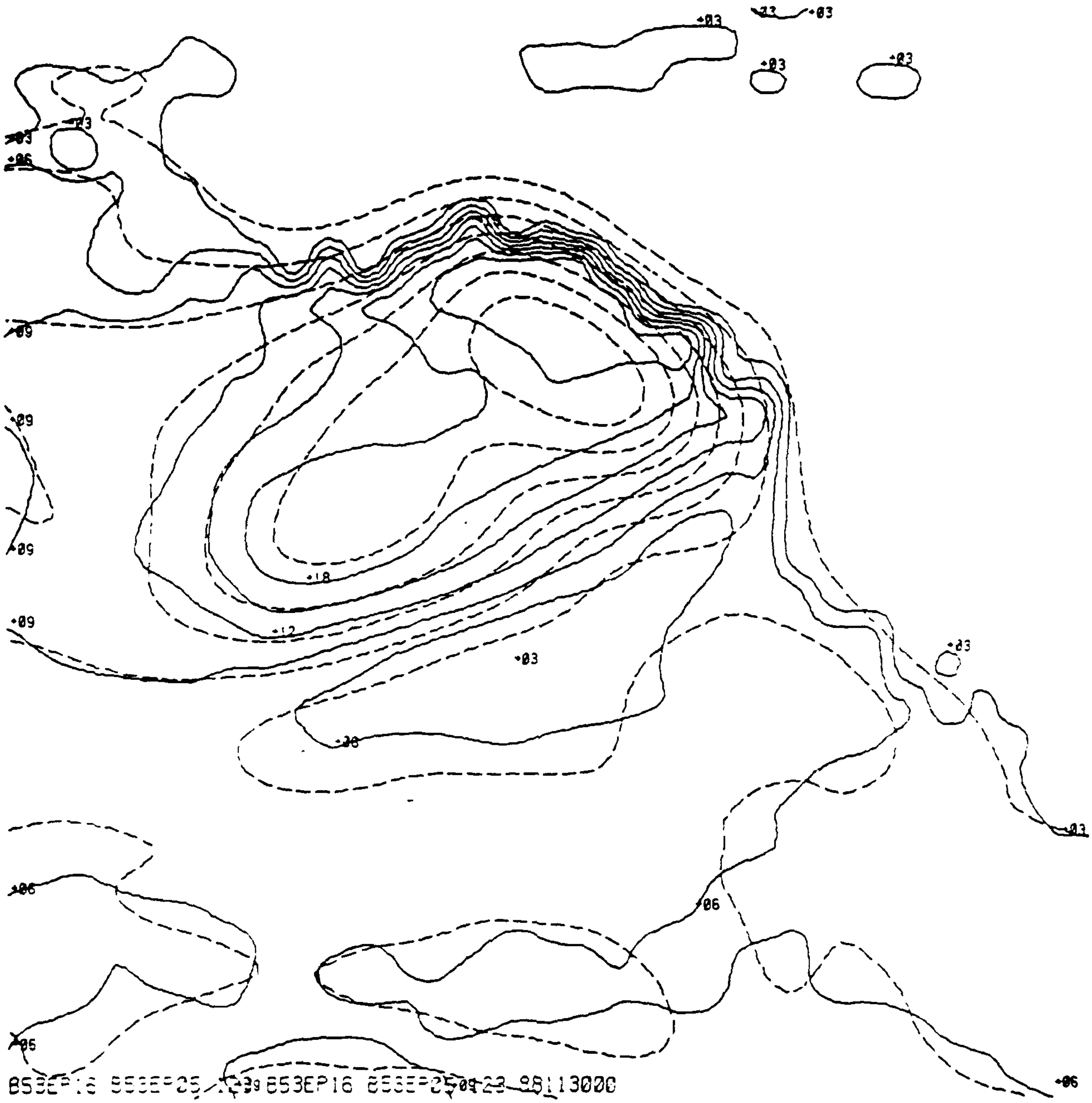

Figure 17. Coastal Region Sea Height, Double FFT Wave 5 (ft)

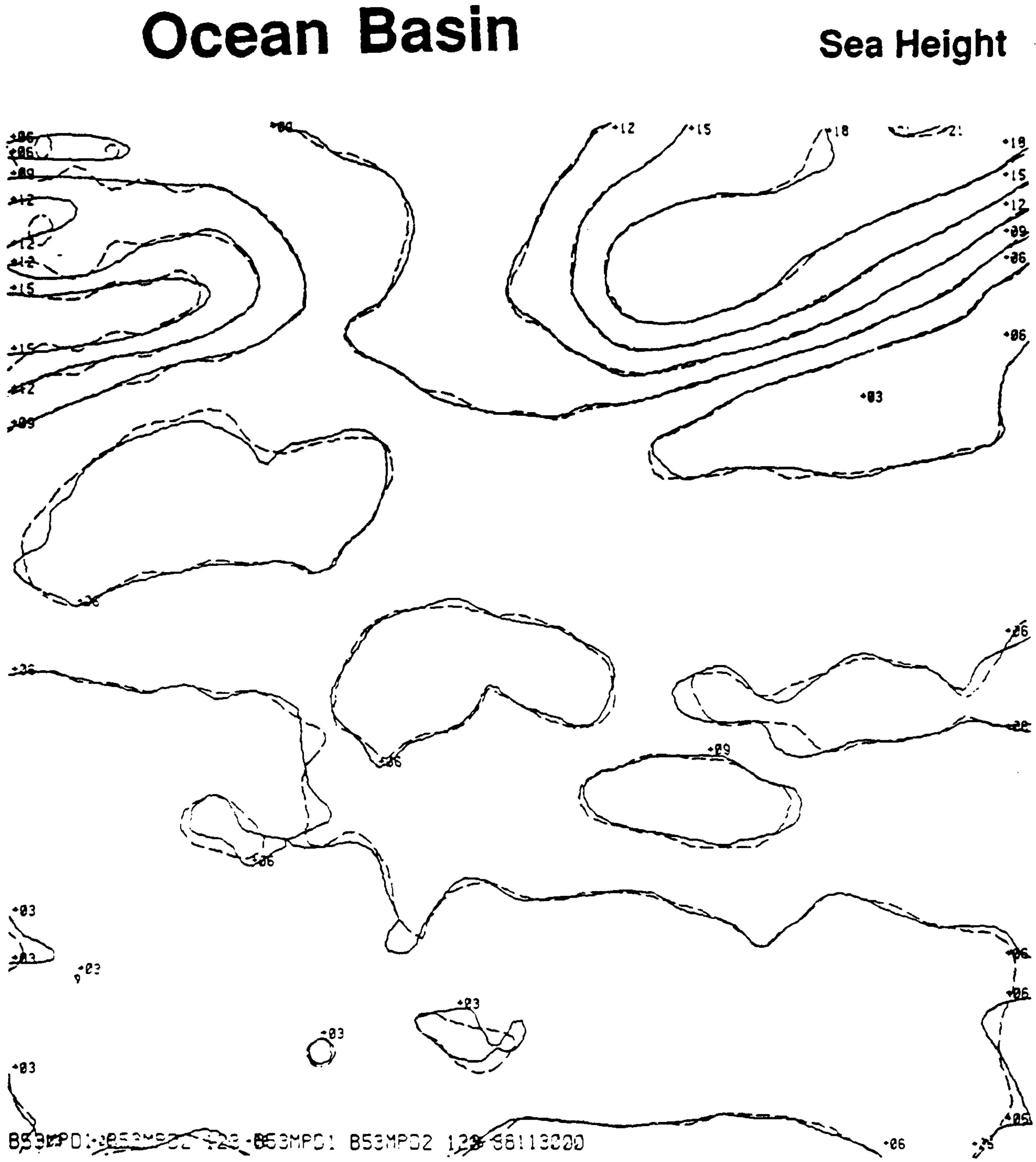

Figure 18. Ocean Basin Sea Height, Delta Scheme 2 (ft)

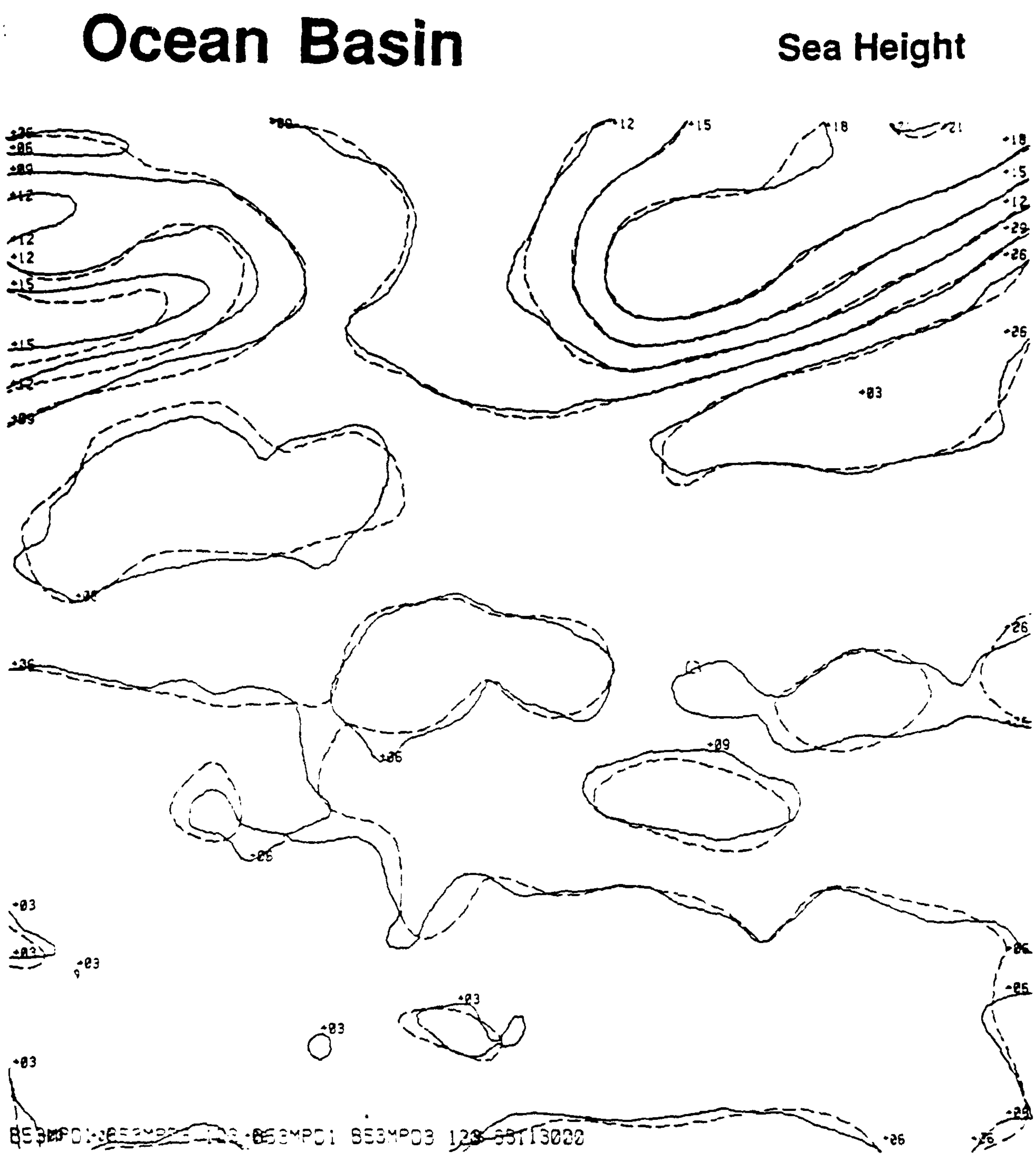

Figure 19. Ocean Basin Sea Height, Delta Scheme 3 (ft)

Ocean Basin

Sea Height

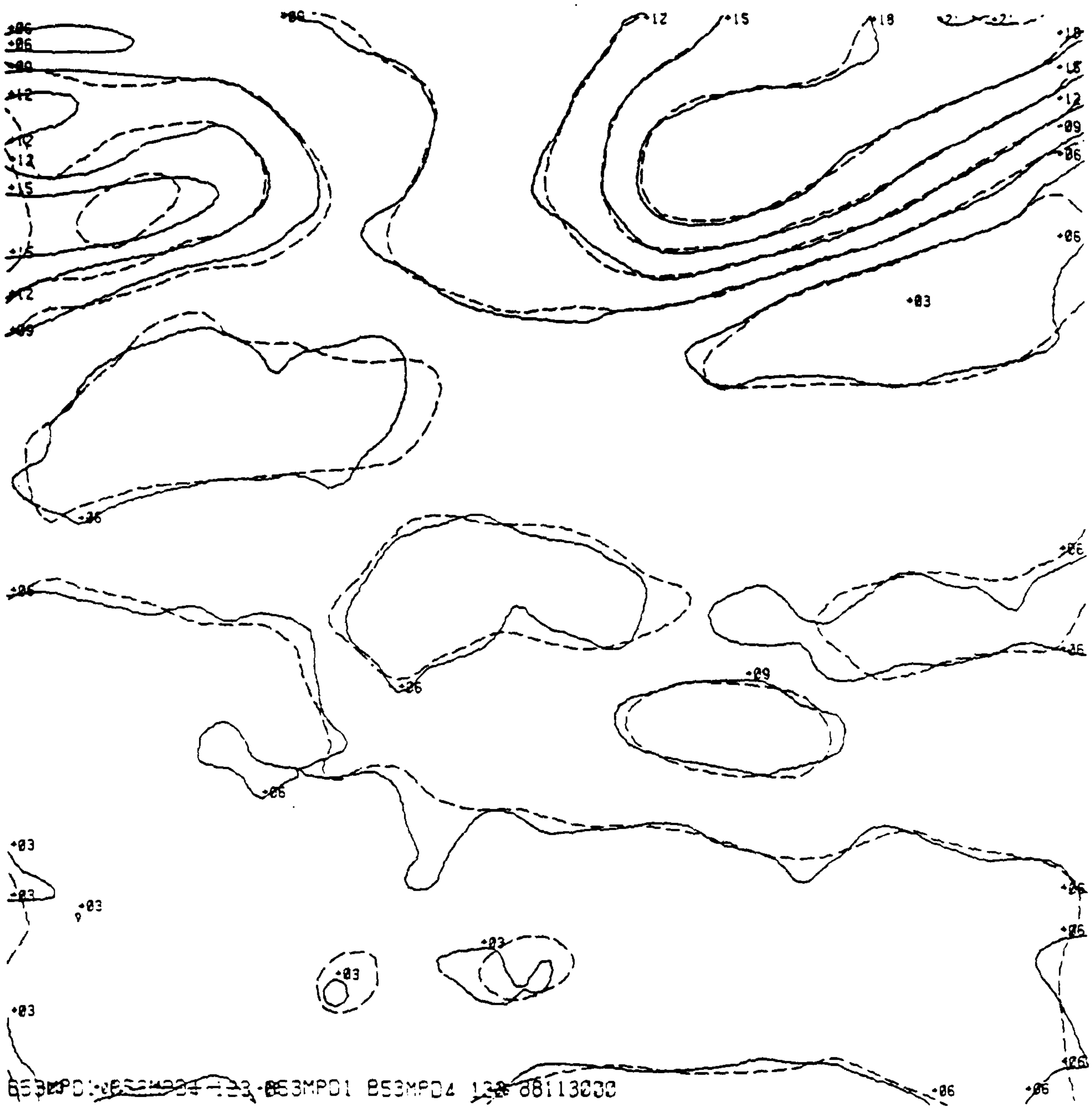

Figure 20. Ocean Basin Sea Height, Delta Scheme 4 (ft)

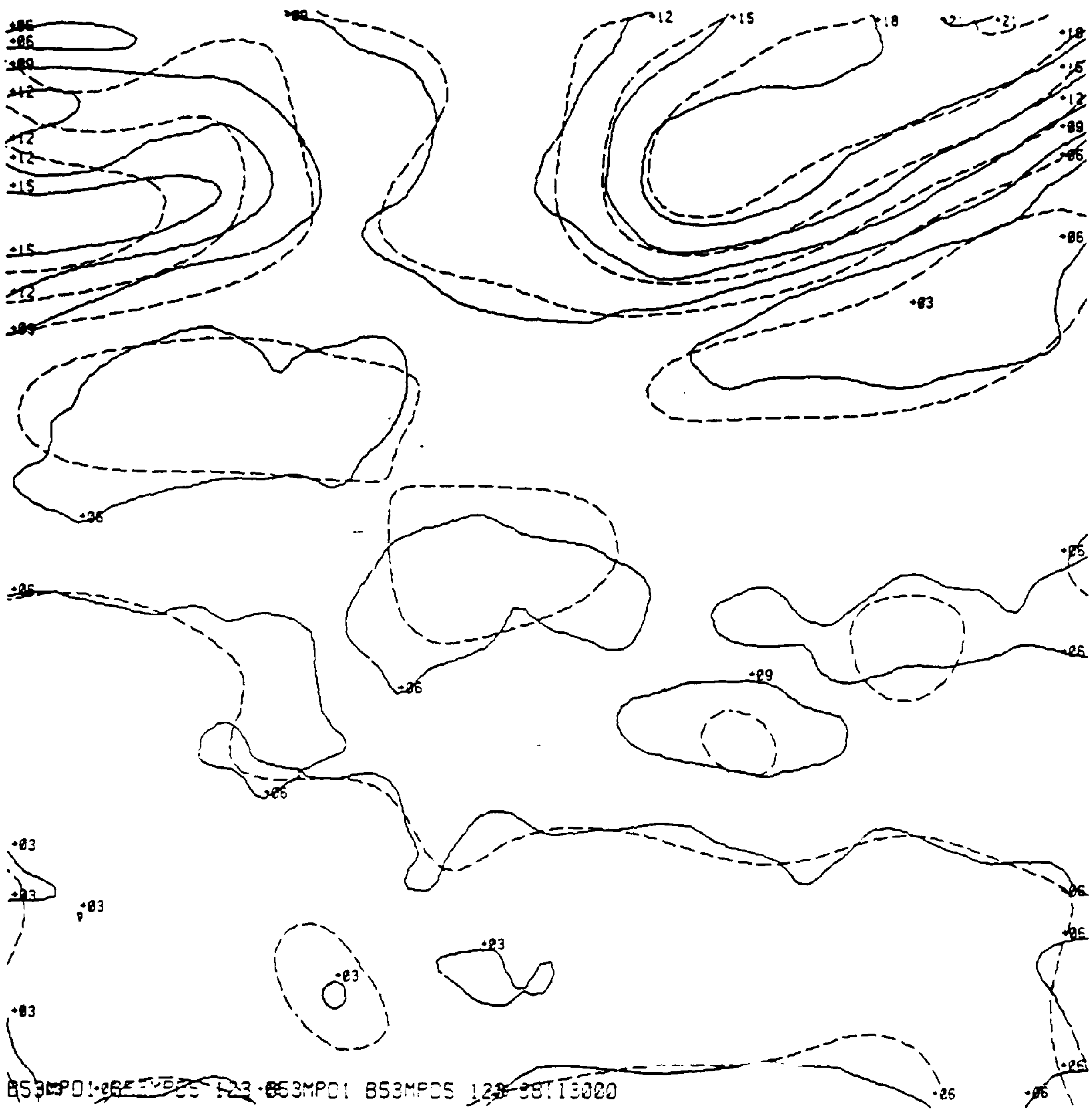

Figure 21. Ocean Basin Sea Height, Delta Scheme 5 (ft)

Ocean Basin

Sea Height

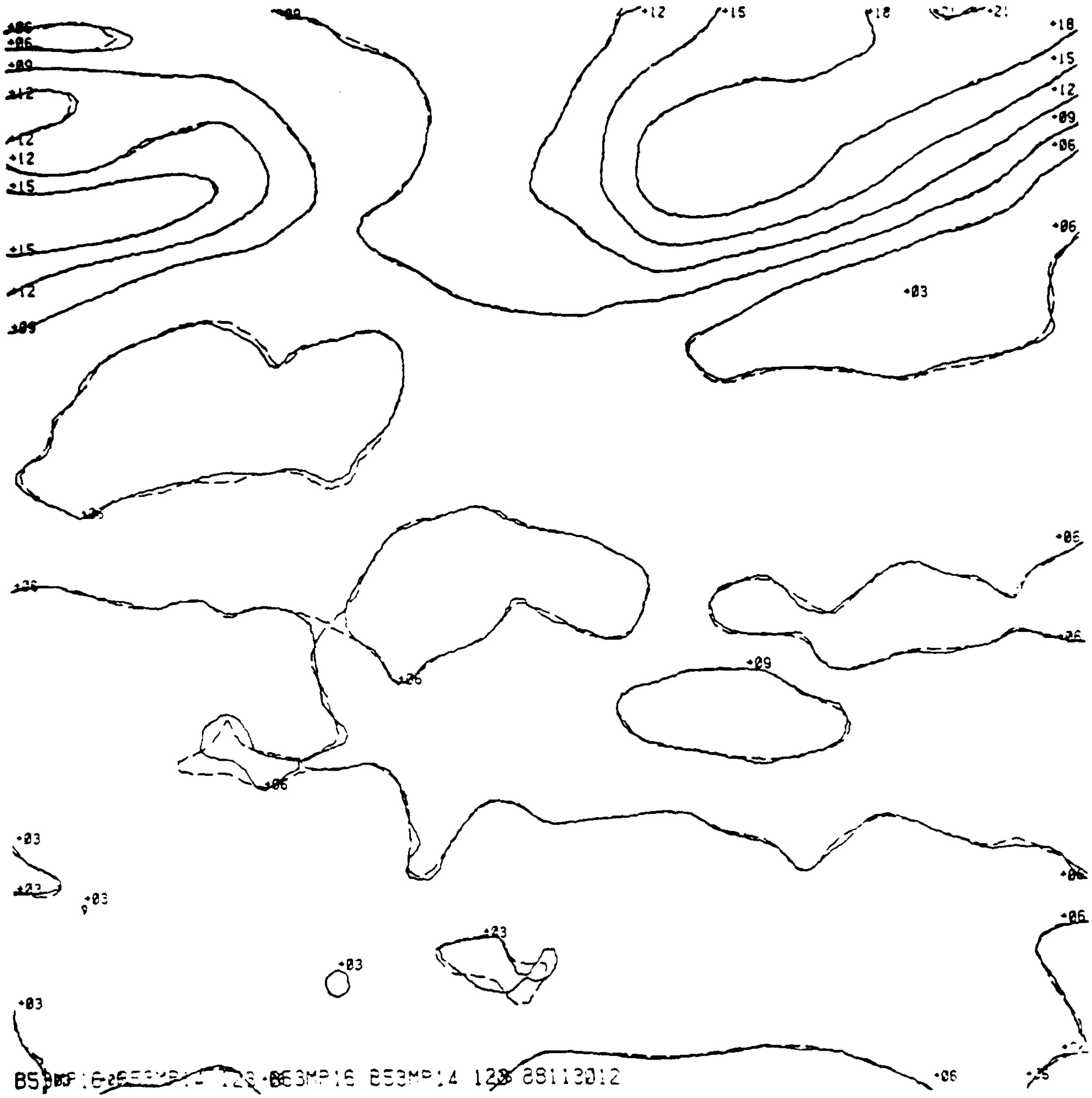

Figure 22. Ocean Basin Sea Height, Double FFT Wave 14 (ft)

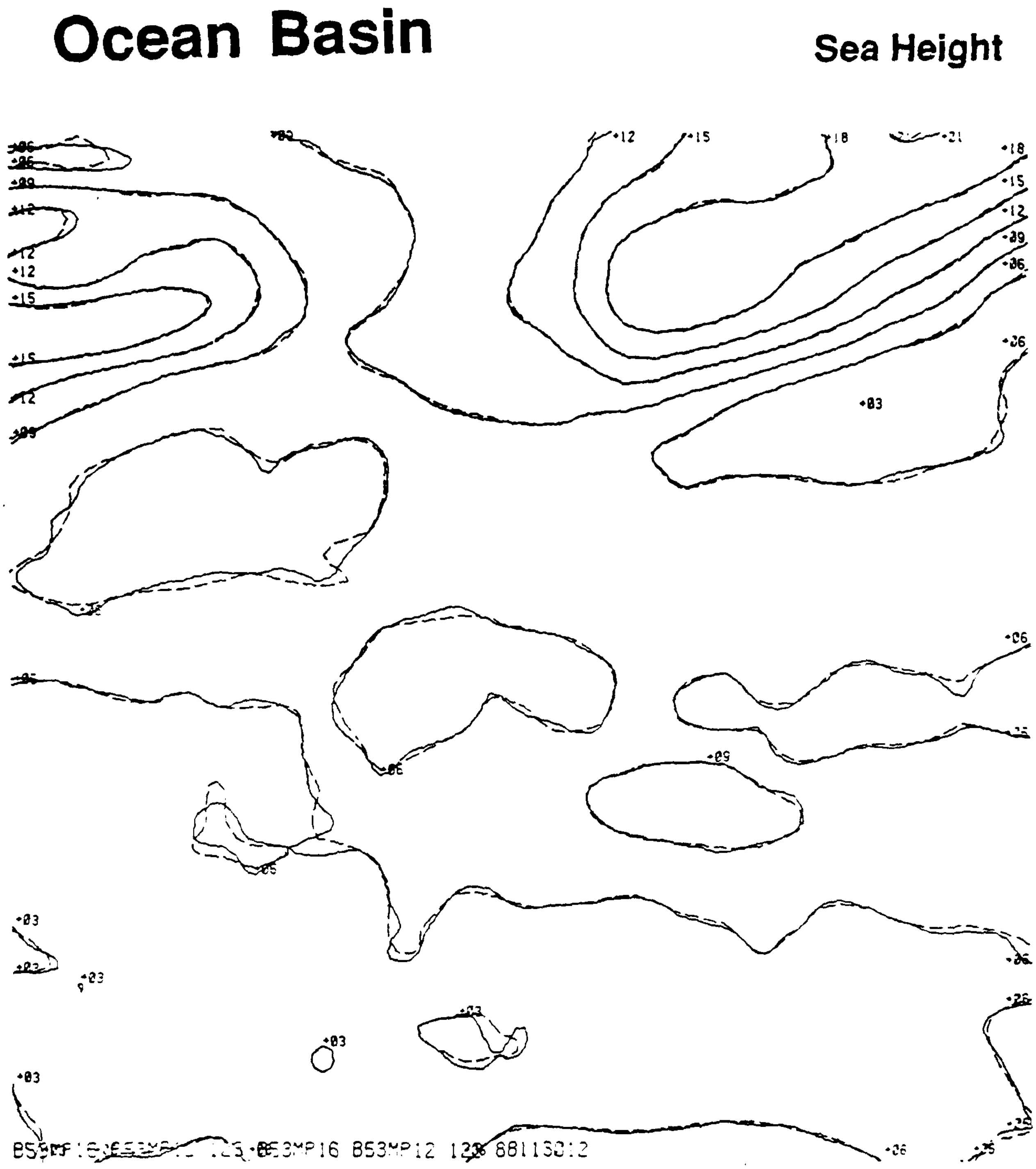

Figure 23. Ocean Basin Sea Height, Double FFT Wave 12 (ft)

Ocean Basin

Sea Height

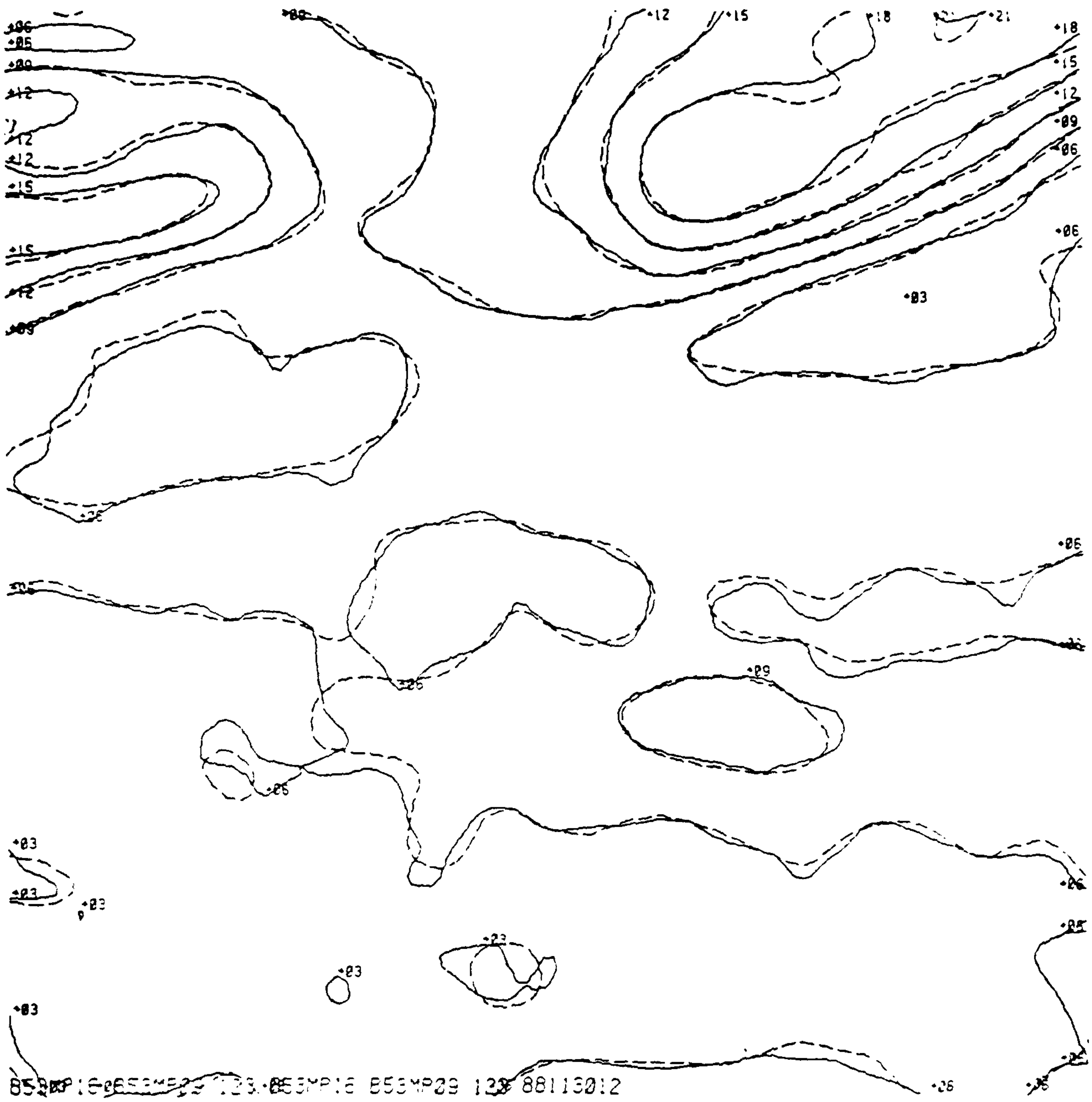

Figure 24. Ocean Basin Sea Height, Double FFT Wave 9 (ft)

Ocean Basin

Sea Height

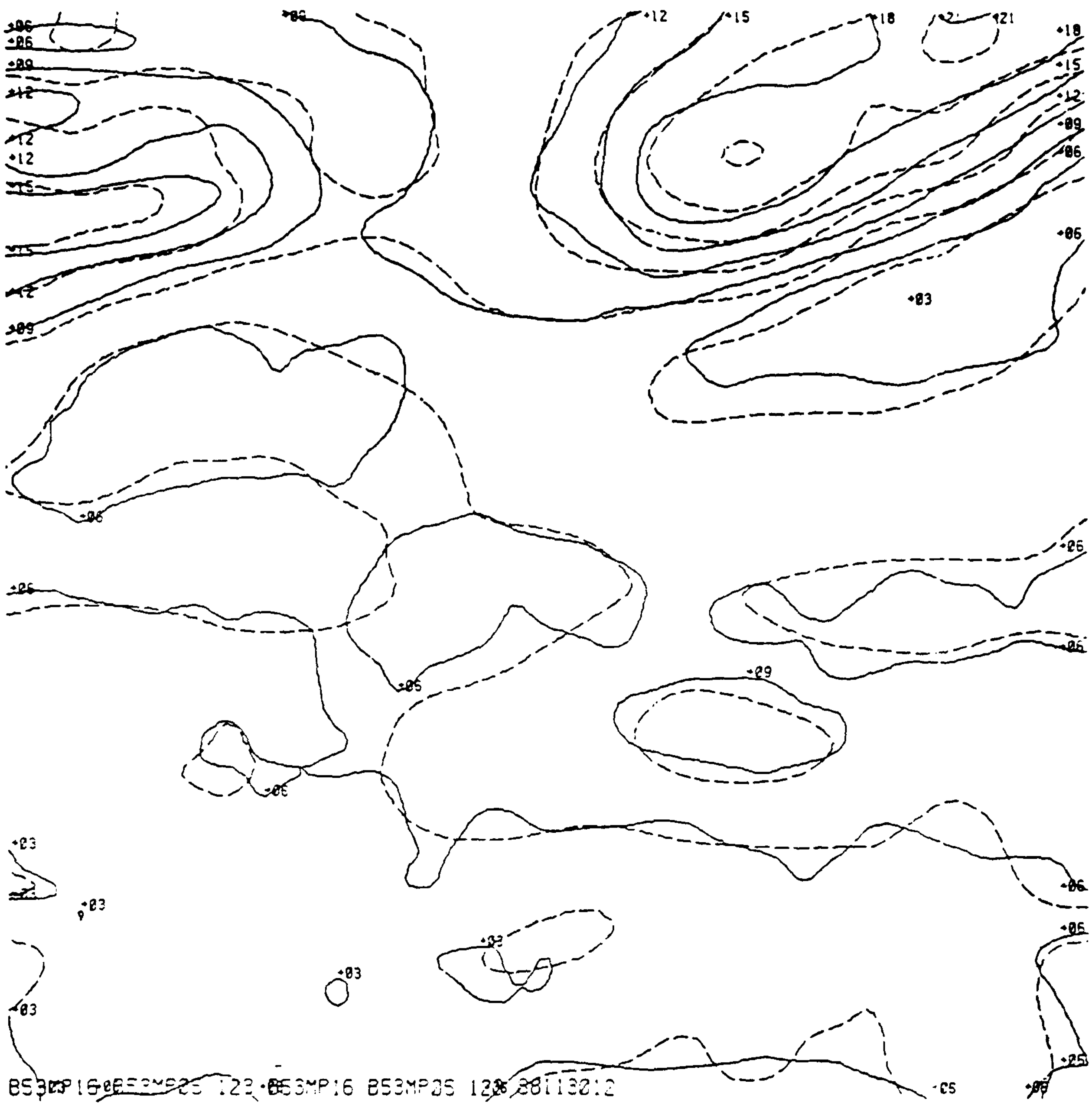

Figure 25. Ocean Basin Sea Height, Double FFT Wave 5 (ft)

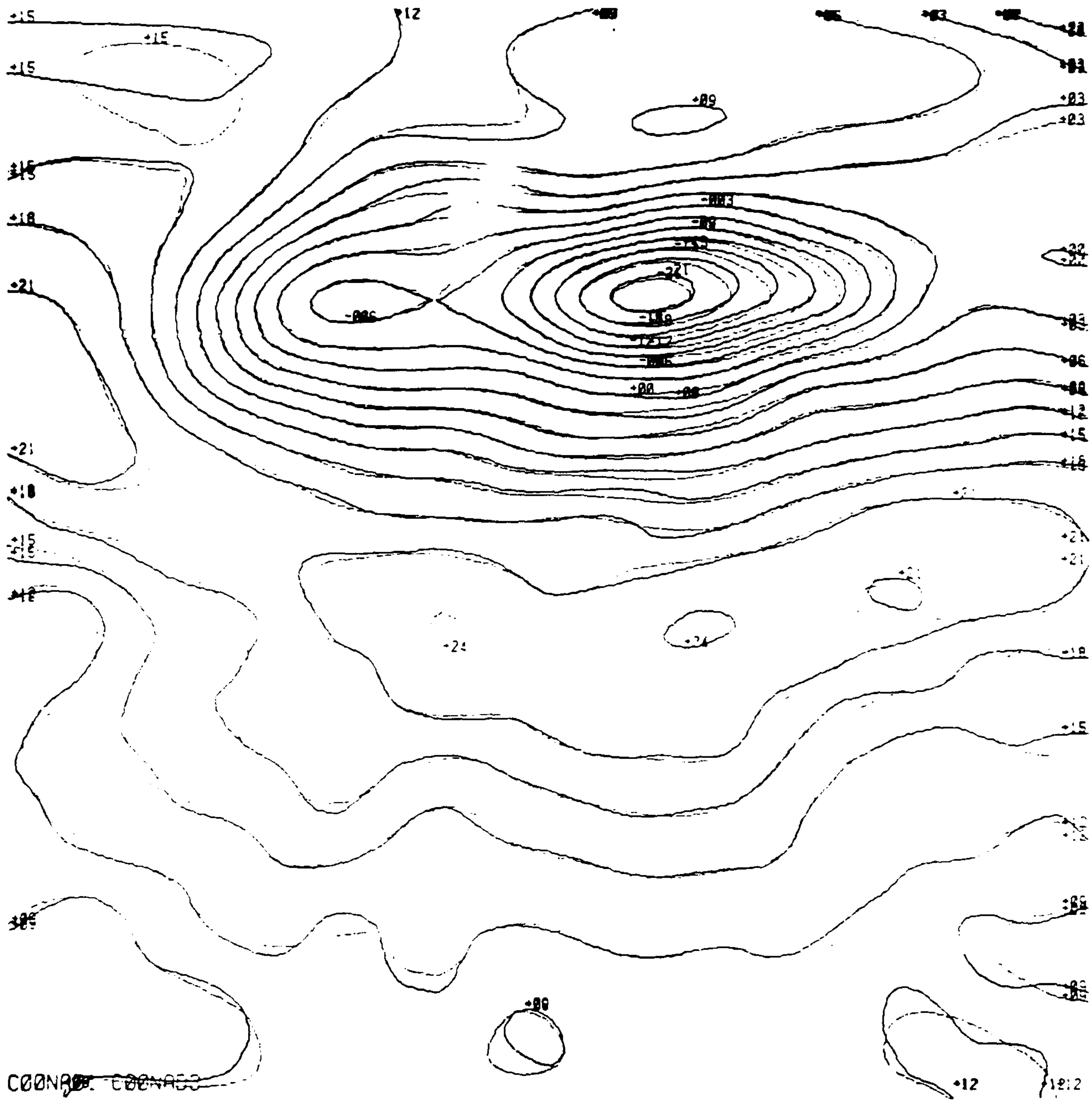

Figure 26. 1000 mb Height, Delta Scheme 3 (m)

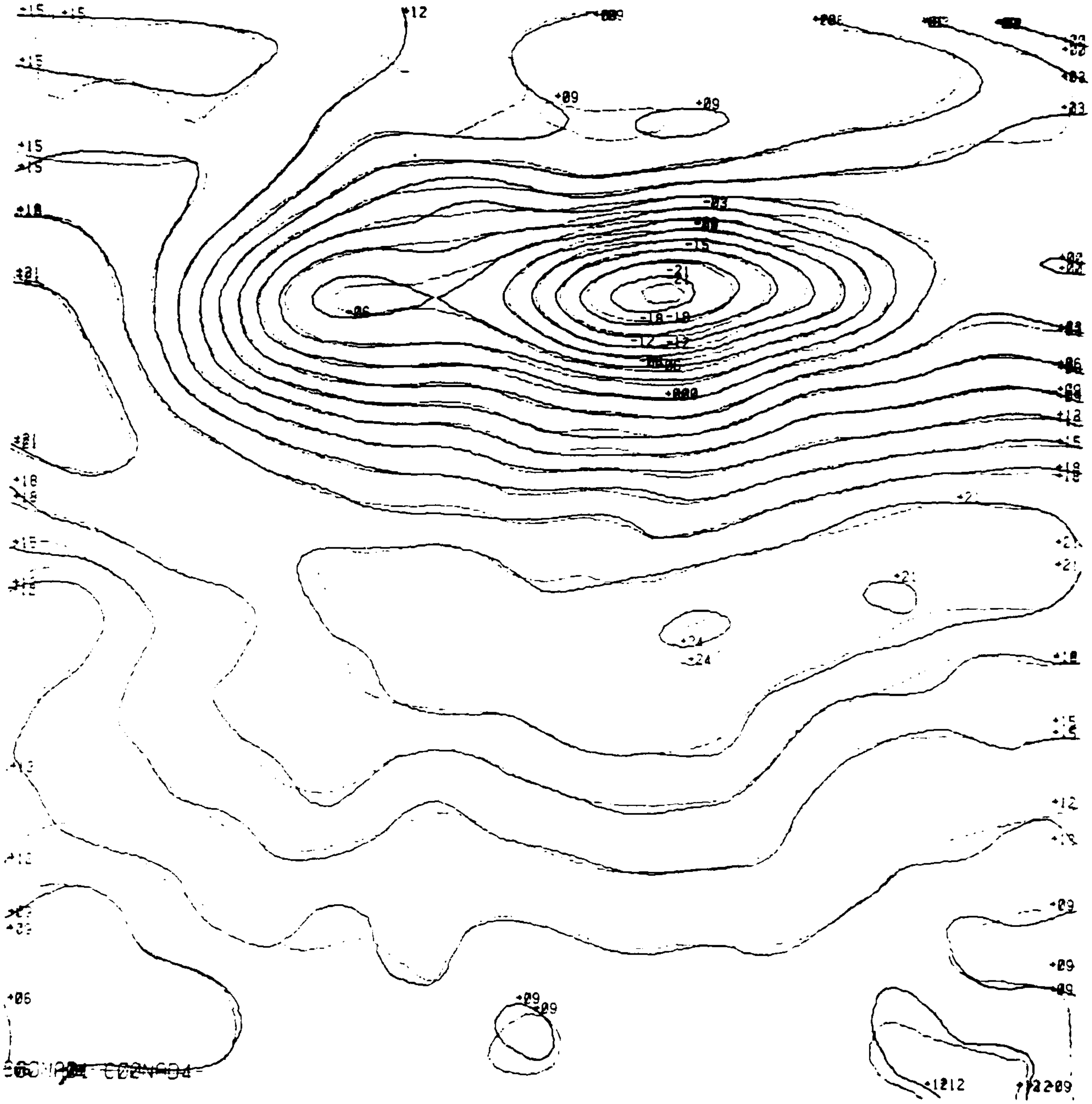

Figure 27. 1000 mb Height, Delta Scheme 4 (m)

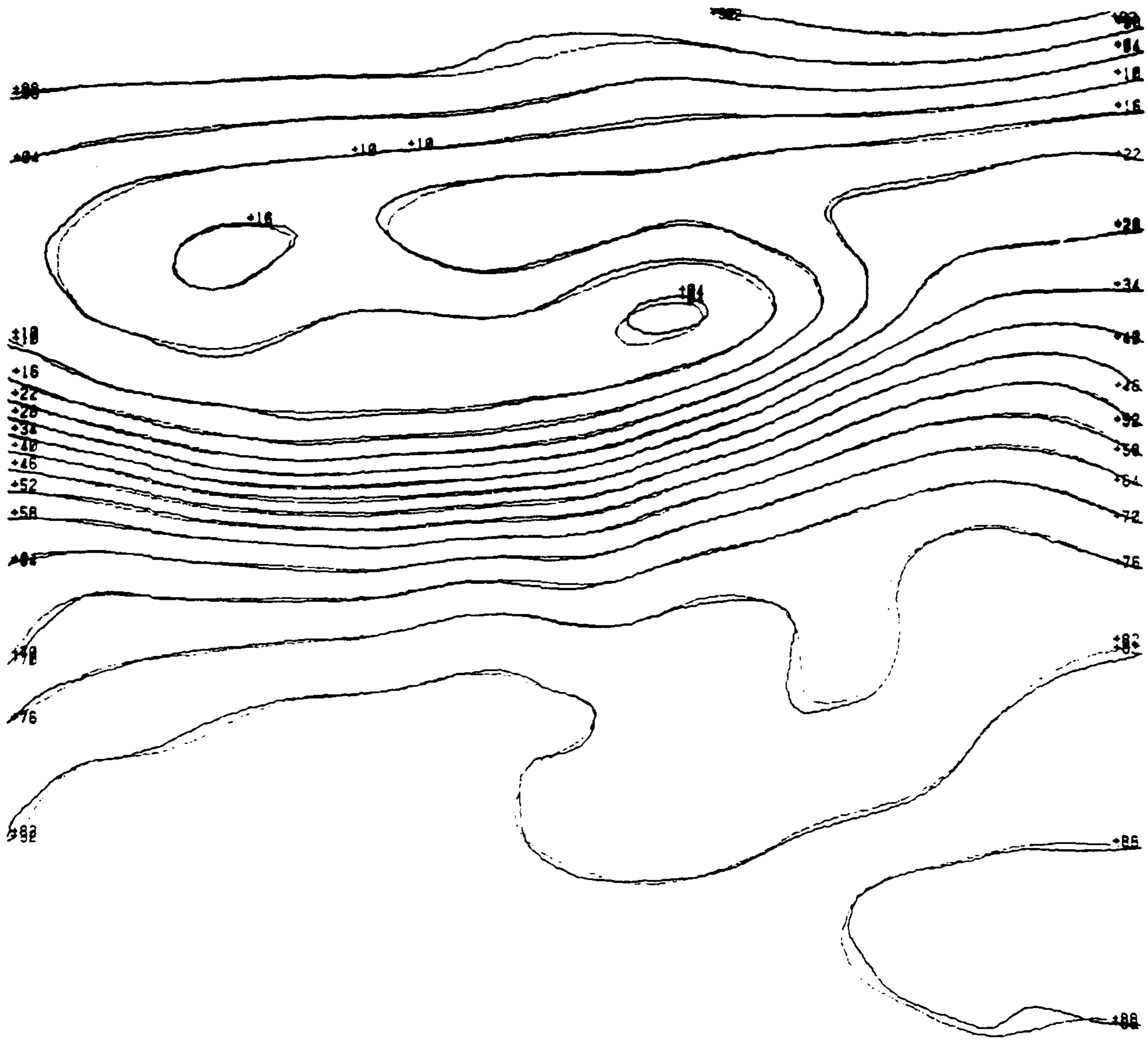

Figure 28. 500 mb Height, Delta Scheme 3 (m)

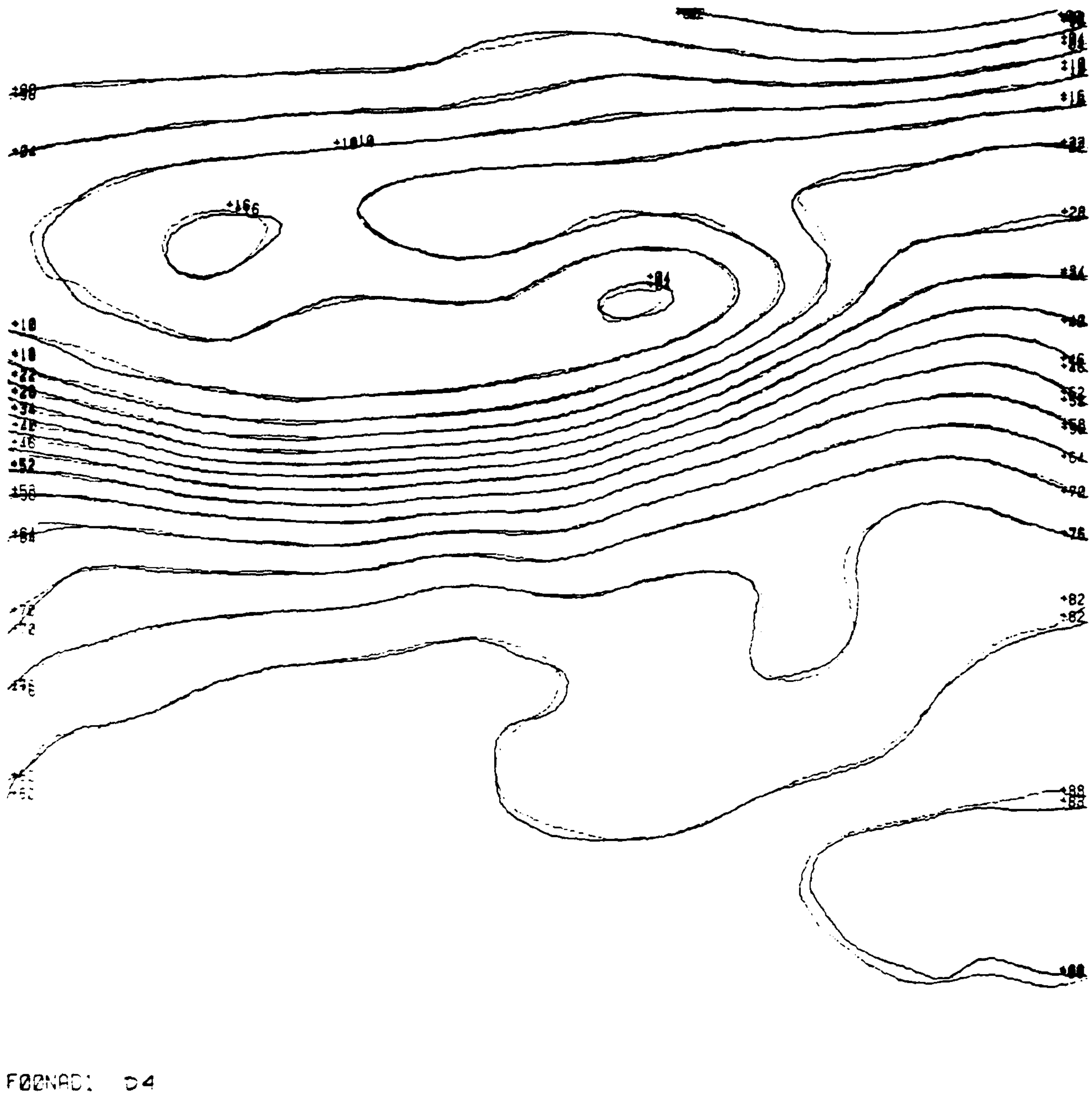

Figure 29. 500 mb Height, Delta Scheme 4 (m)

HØØNAD1 HØØNAD3

Figure 30. 300 mb Height, Delta Scheme 3 (m)

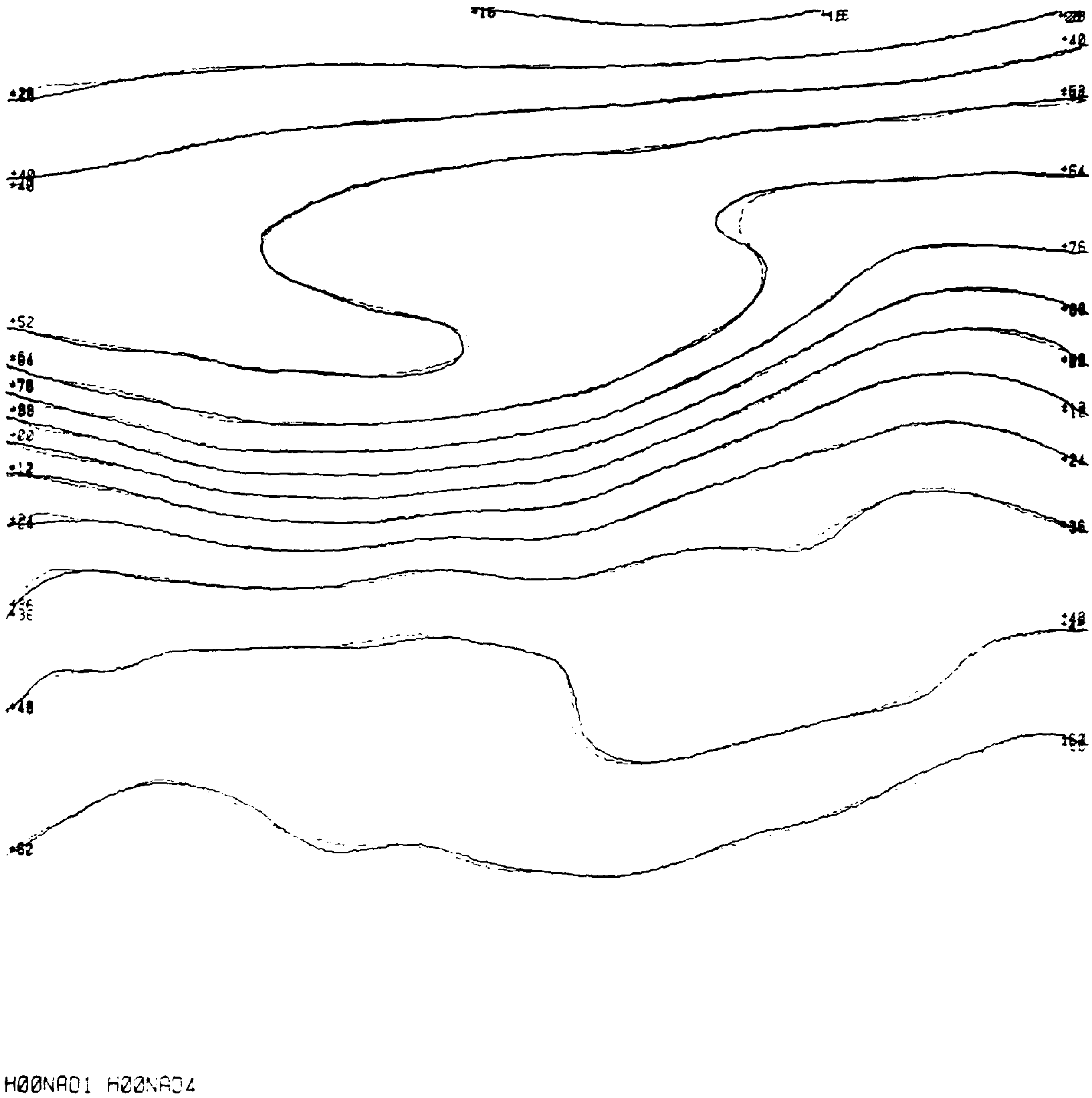

Figure 31. 300 mb Height, Delta Scheme 4 (m)

4.3.6 1000 mb Temperature. Figures 32 and 33 illustrate the 1000 mb temperature contours at a 5° (C) interval for the North Atlantic with double FFT at wave retention at 12 and 9, respectively. Keeping 12 waves produces an excellent rendition and keeping only 9 waves results in a good approximation to the original contours.

4.3.7 850 mb Temperature. Figures 34 and 35 illustrate the 850 mb temperature contours at a 5° (C) interval with double FFT at wave retention at 12 and 9, respectively. Keeping 12 waves produces an excellent rendition and keeping only 9 waves results in a very good approximation to the original contours.

4.3.8 500 mb Temperature. Figures 36 and 37 illustrate the 500 mb temperature contours at a 5° (C) interval with double FFT at wave retention at 12 and 9, respectively. Keeping 12 waves produces an outstanding rendition, except for the lower left corner area which is excellent, and keeping only 9 waves results in an excellent approximation to the original contours, except for the lower left corner area which is very good rendition.

4.3.9 300 mb Temperature. Figures 38 and 39 illustrate the 300 mb temperature contours at a 5° (C) interval with double FFT at wave retention at 12 and 9, respectively. Keeping 12 waves produces an outstanding to excellent rendition over the whole grid, and keeping only 9 waves results in an excellent to good approximation to the original contours.

4.3.10 Accumulated Precipitation. Figure 40 demonstrates that with light compaction, double FFT with 14 waves retained, the precipitation field under the best conditions (western Pacific and an accumulation for 72 hours) cannot be successfully compacted without extraneous locations of precipitation being evident. Likewise the delta packing schemes have the same type of problems with this type of field because of the discontinuities. However, if one concentrates on only 2 or more cm of precipitation this light packing works fairly well in this

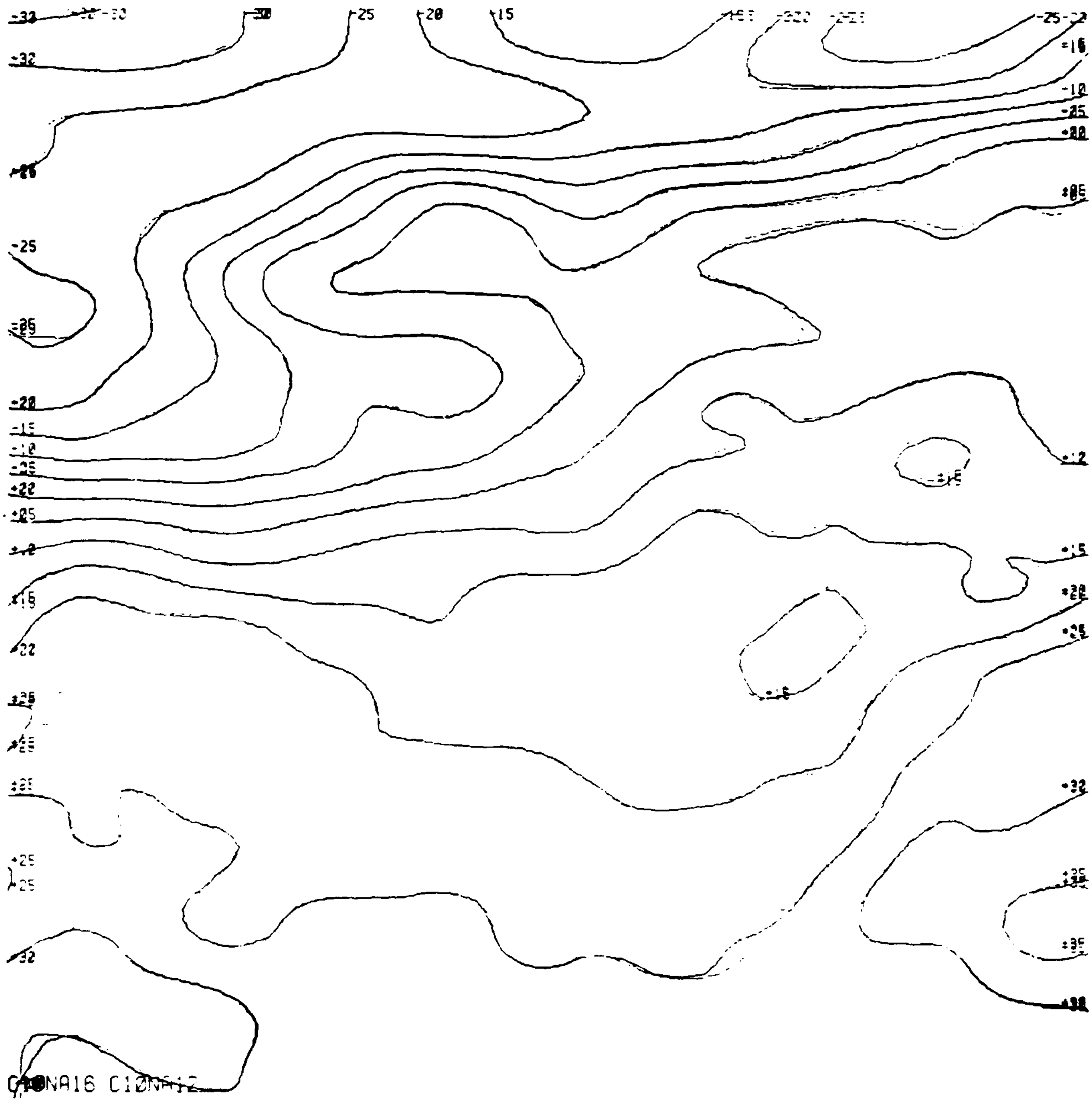

Figure 32. 1000 mb Temperature, Double FFT Wave 12 (C)

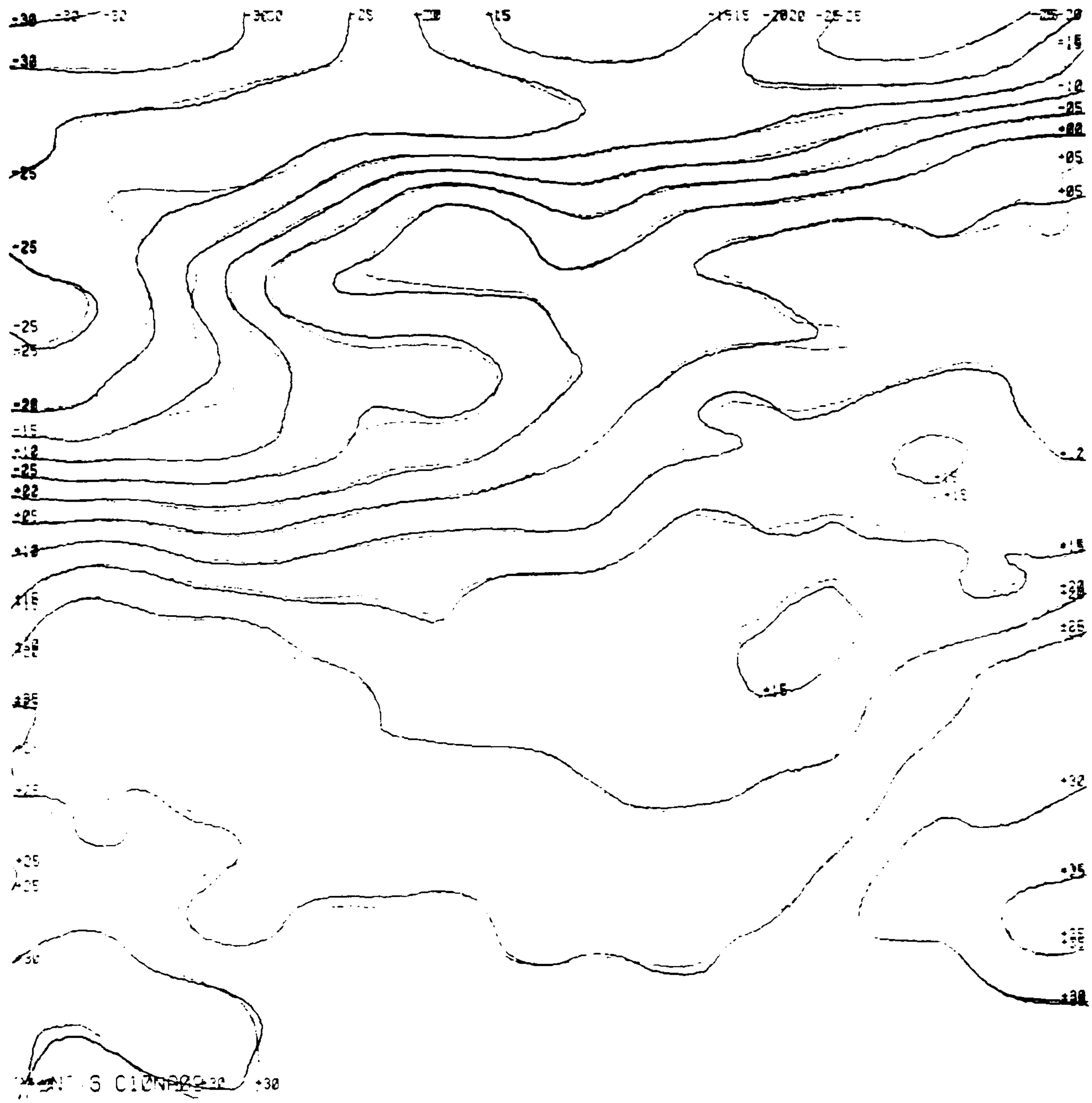

Figure 33. 1000 mb Temperature, Double FFT Wave 9 (C)

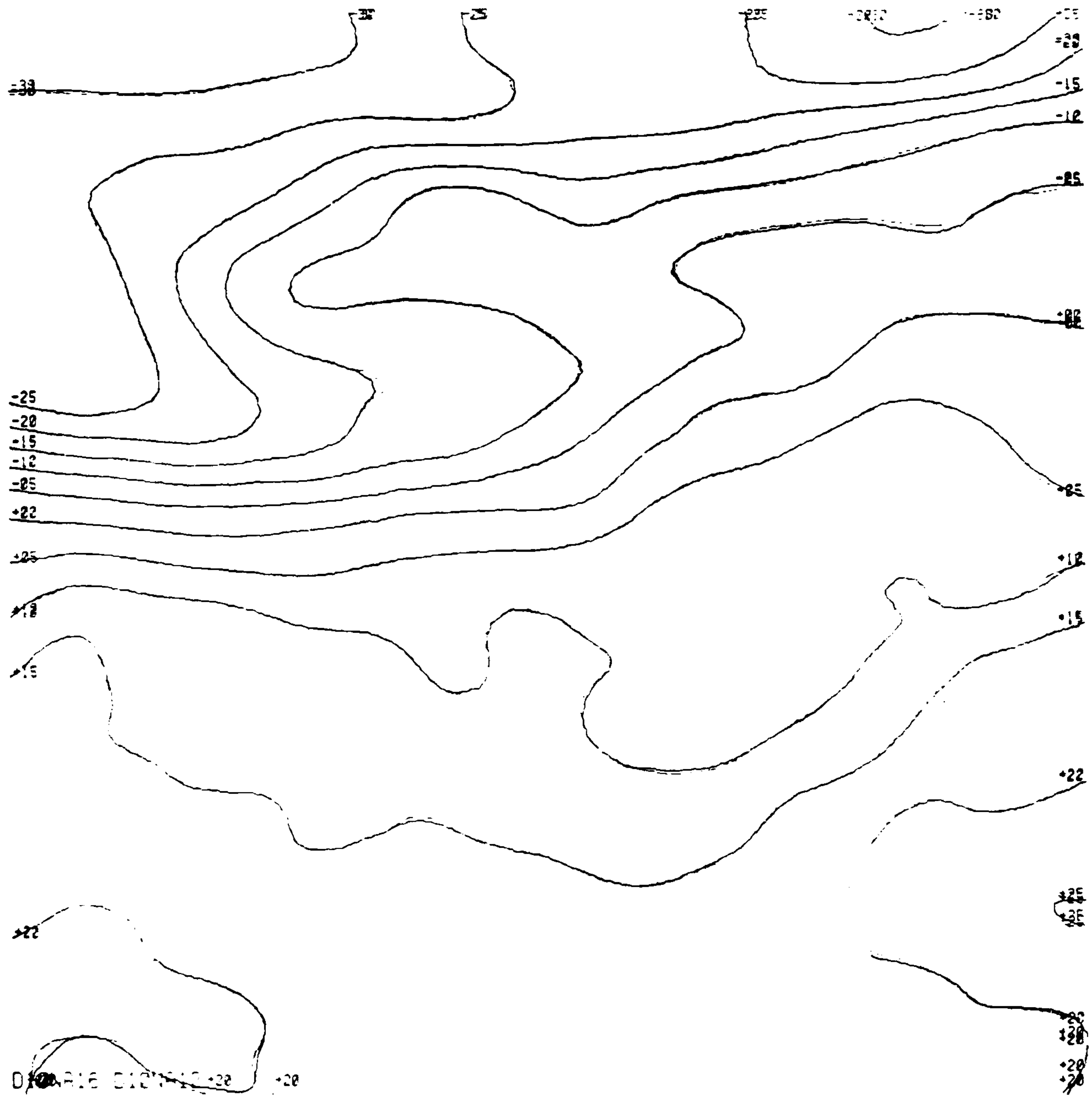

Figure 34. 850 mb Temperature, Double FFT Wave 12 (C)

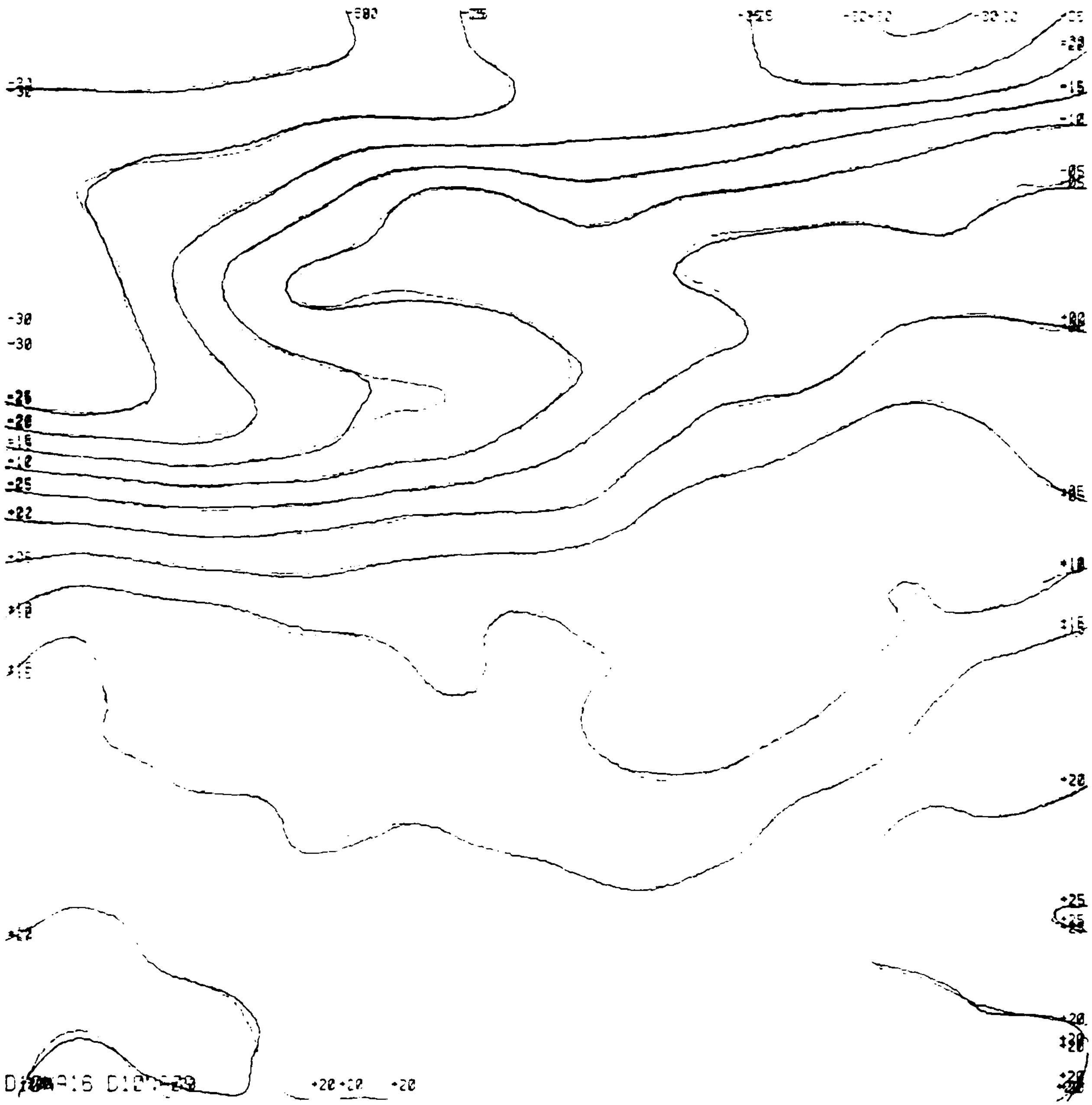

Figure 35. 850 mb Temperature, Double FFT Wave 9 (C)

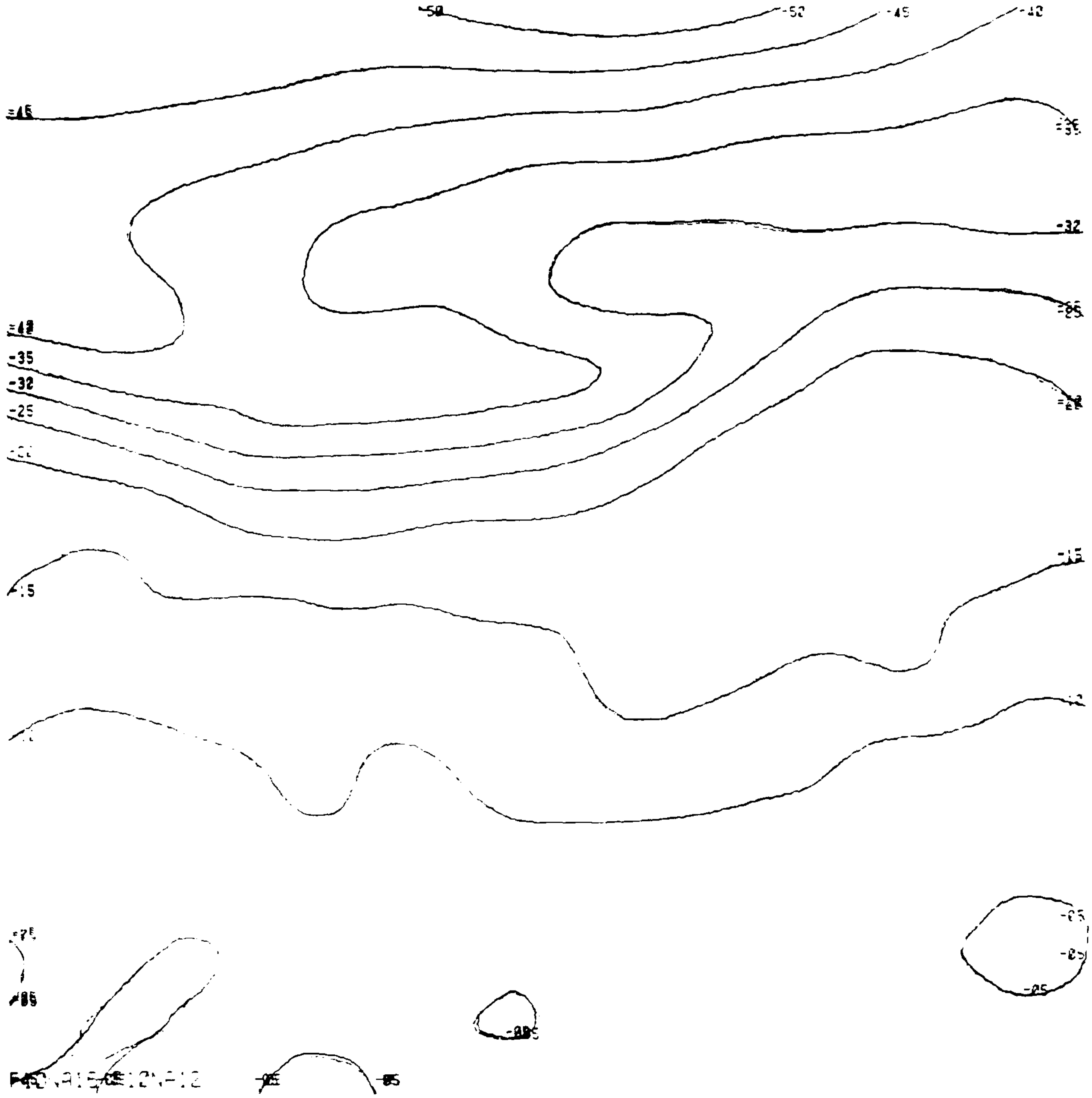

Figure 36. 500 mb Temperature, Double FFT Wave 12 (C)

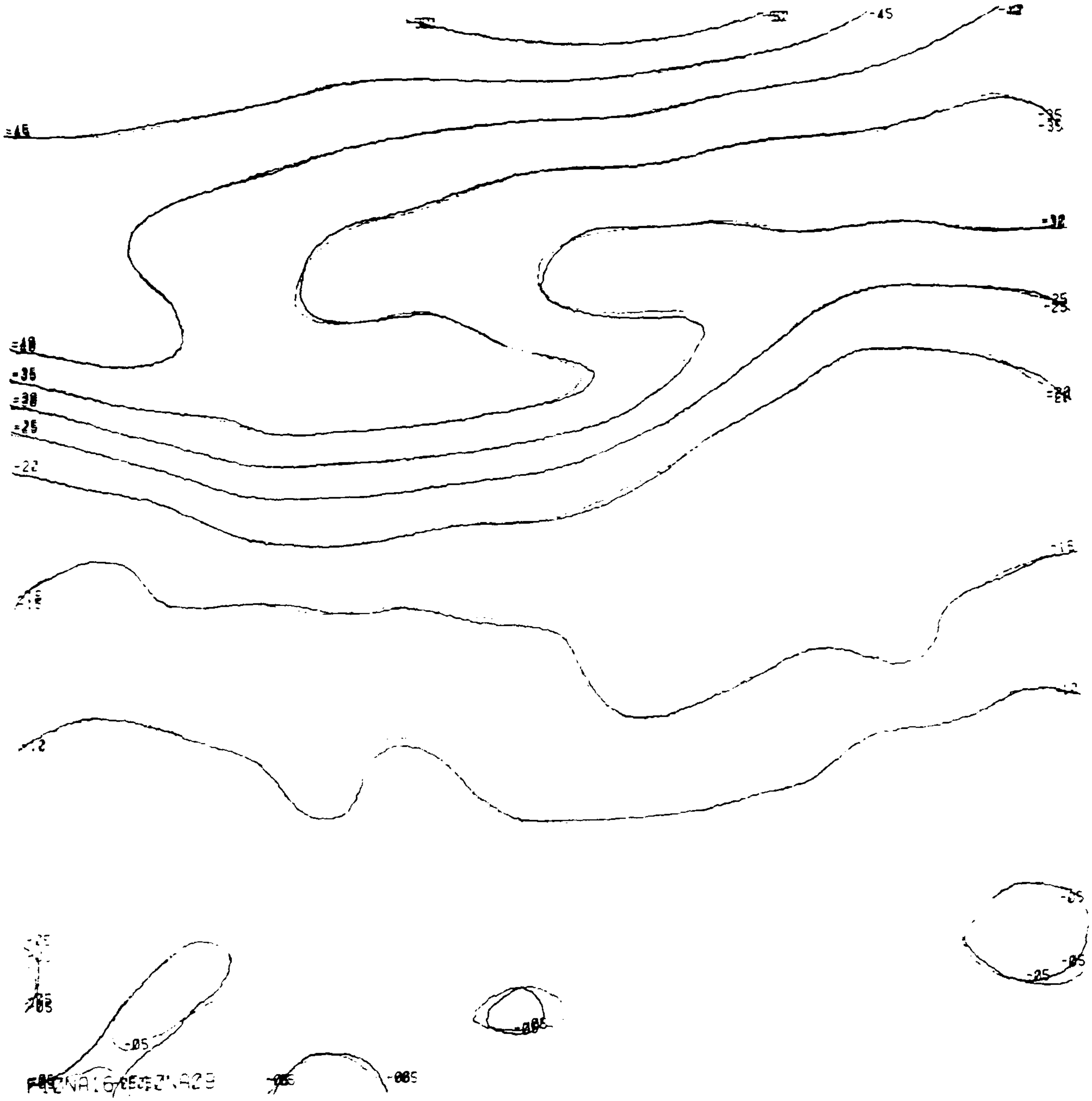

Figure 37. 500 mb Temperature, Double FFT Wave 9 (C)

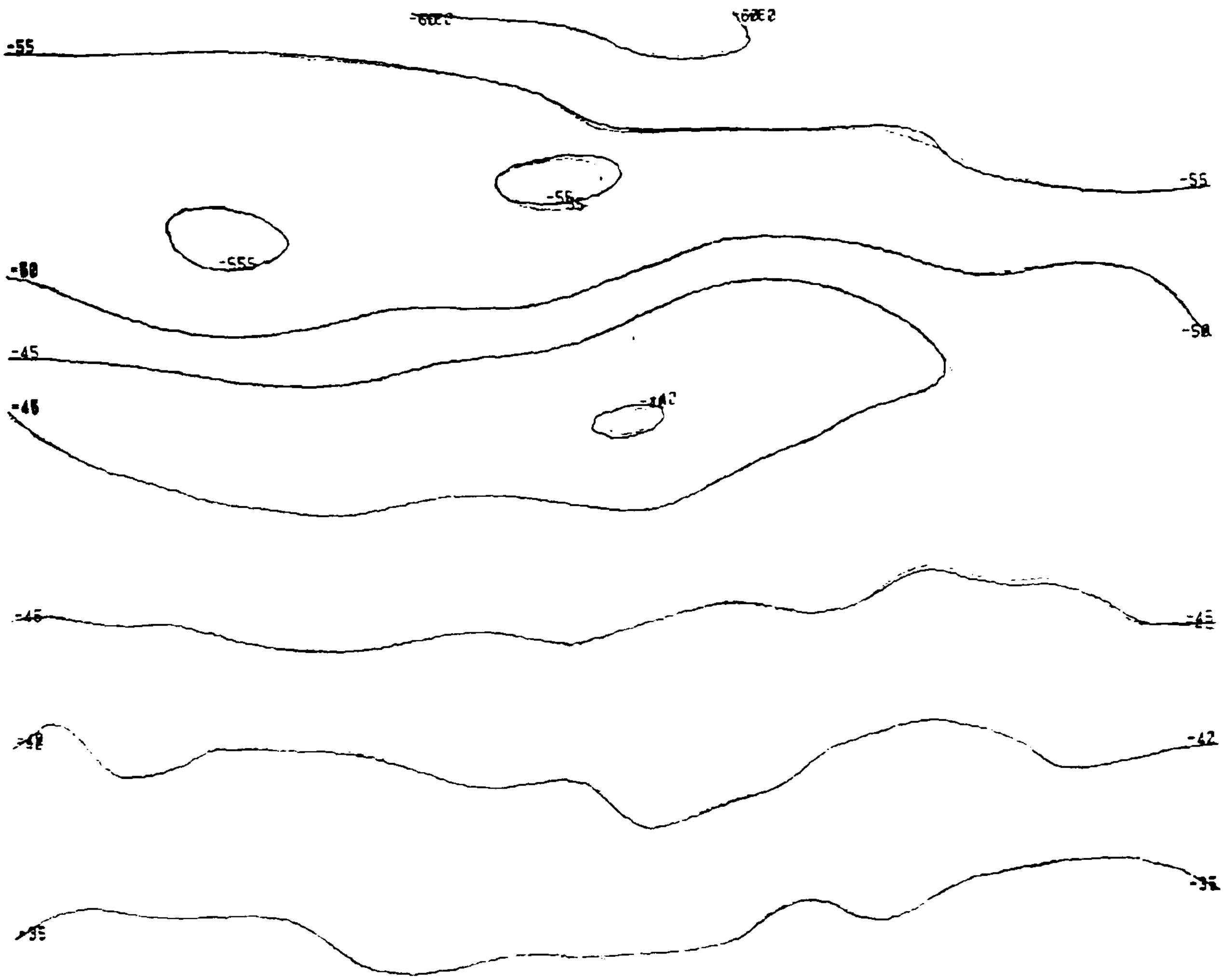

Figure 38. 300 mb Temperature, Double FFT Wave 12 (C)

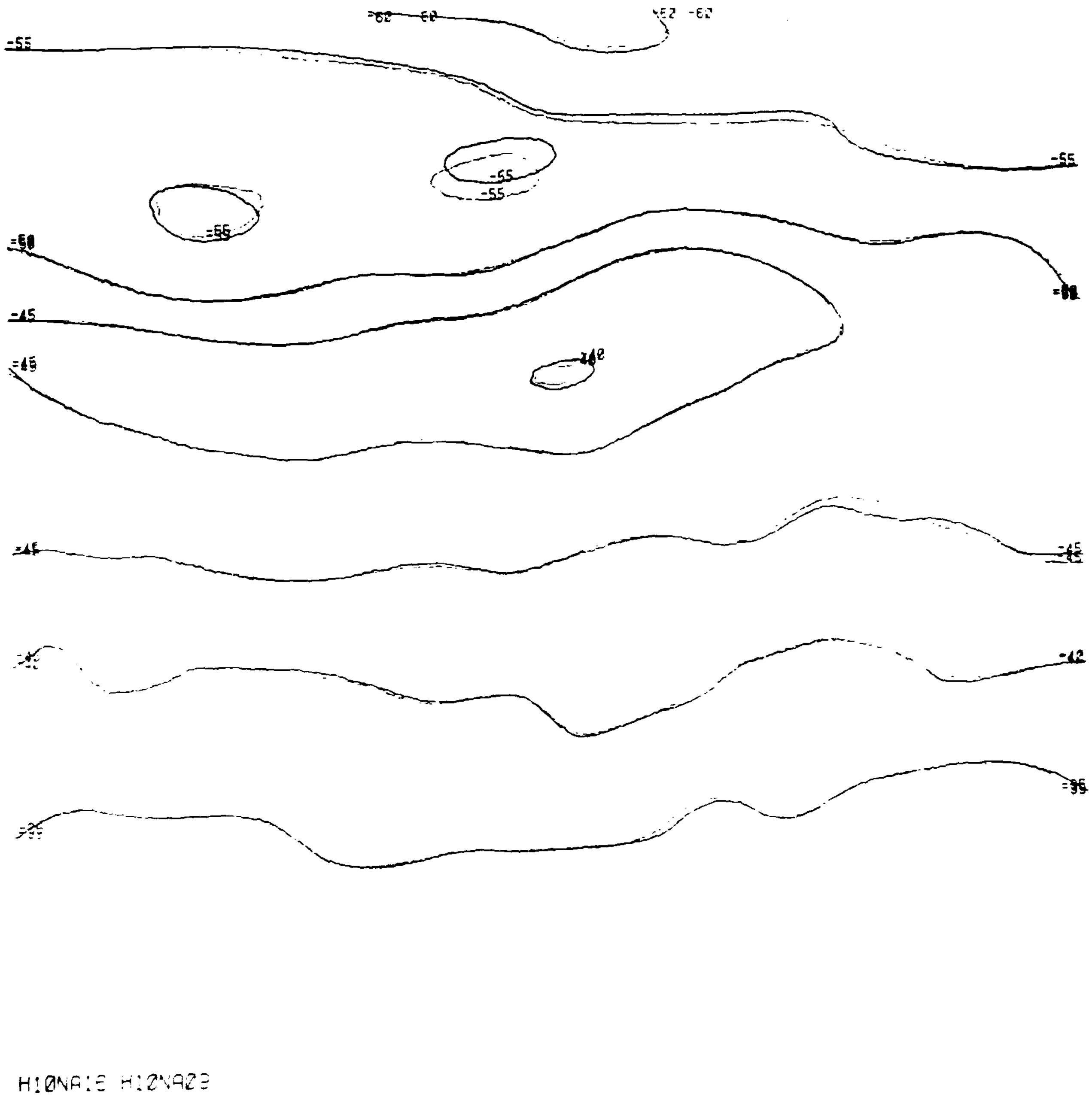

Figure 39. 300 mb Temperature, Double FFT Wave 9 (C)

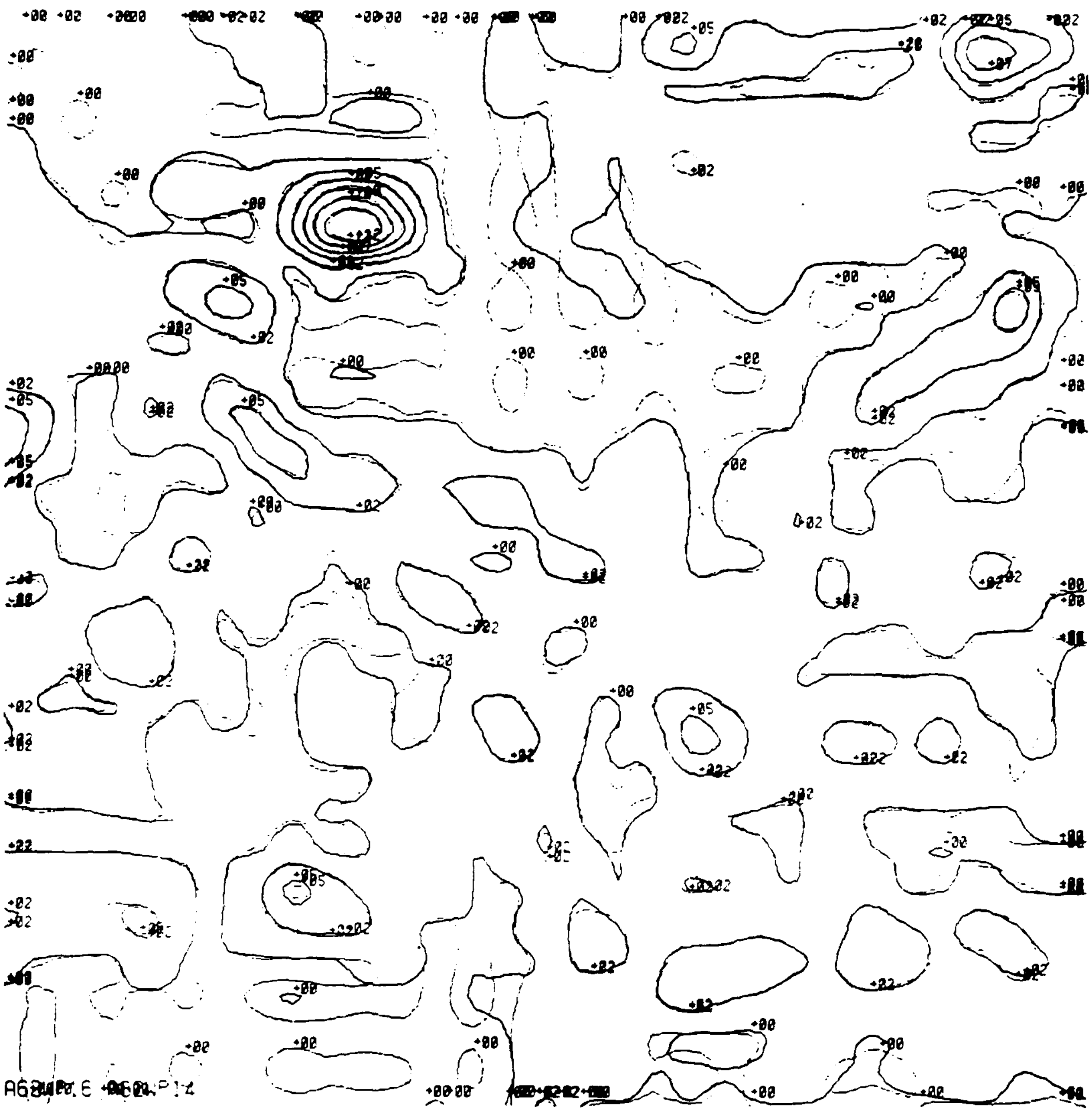

Figure 40. Accumulated Precipitation, Double FFT Wave 14 (cm)

example. One should note that even with this light packing there is the potential of extraneous values at and above this 2 cm cutoff and for the omission of actual centers. A nonexisting area of greater than 2 cm is evident in the upper right center part of the figure. There is a 5 plus cm center directly above this bogus center (near the upper boundary) that is missed entirely.

4.3.11 Surface u-Wind Component. Figures 41 and 42 illustrate the surface u-wind component with a 5 kt contouring interval for the North Atlantic area with delta schemes 2 and 3, respectively. Statistically scheme 2 is better than 3, but 2 does produce some sinusoidal oscillation about the mean position of the correct contour location at times, as is evident in the upper right corner of Figure 41.

4.3.12 Surface v-Wind Component. Figures 43 and 44 illustrate the surface v-wind component with a 5 kt contouring interval for the North Atlantic area with delta schemes 2 and 3, respectively.

4.3.13 Height of Evaporative Duct. Figures 45 and 46 illustrate the height of the evaporative duct in tens of meters for the western Pacific area with delta schemes 2 and 3, respectively. The results shown by scheme 2 may or may not be acceptable. The rendition produced by scheme 3 probably would not be acceptable.

4.3.14 500 mb u-Wind Component. Figures 47 and 48 illustrate the 500 mb u-wind component with a 5 kt contouring interval for the eastern Pacific area with delta schemes 2 and 3, respectively.

4.3.15 500 mb v-Wind Component. Figures 49 and 50 illustrate the 500 mb v-wind component with a 5 kt contouring interval for the eastern Pacific area with delta schemes 2 and 3, respectively.

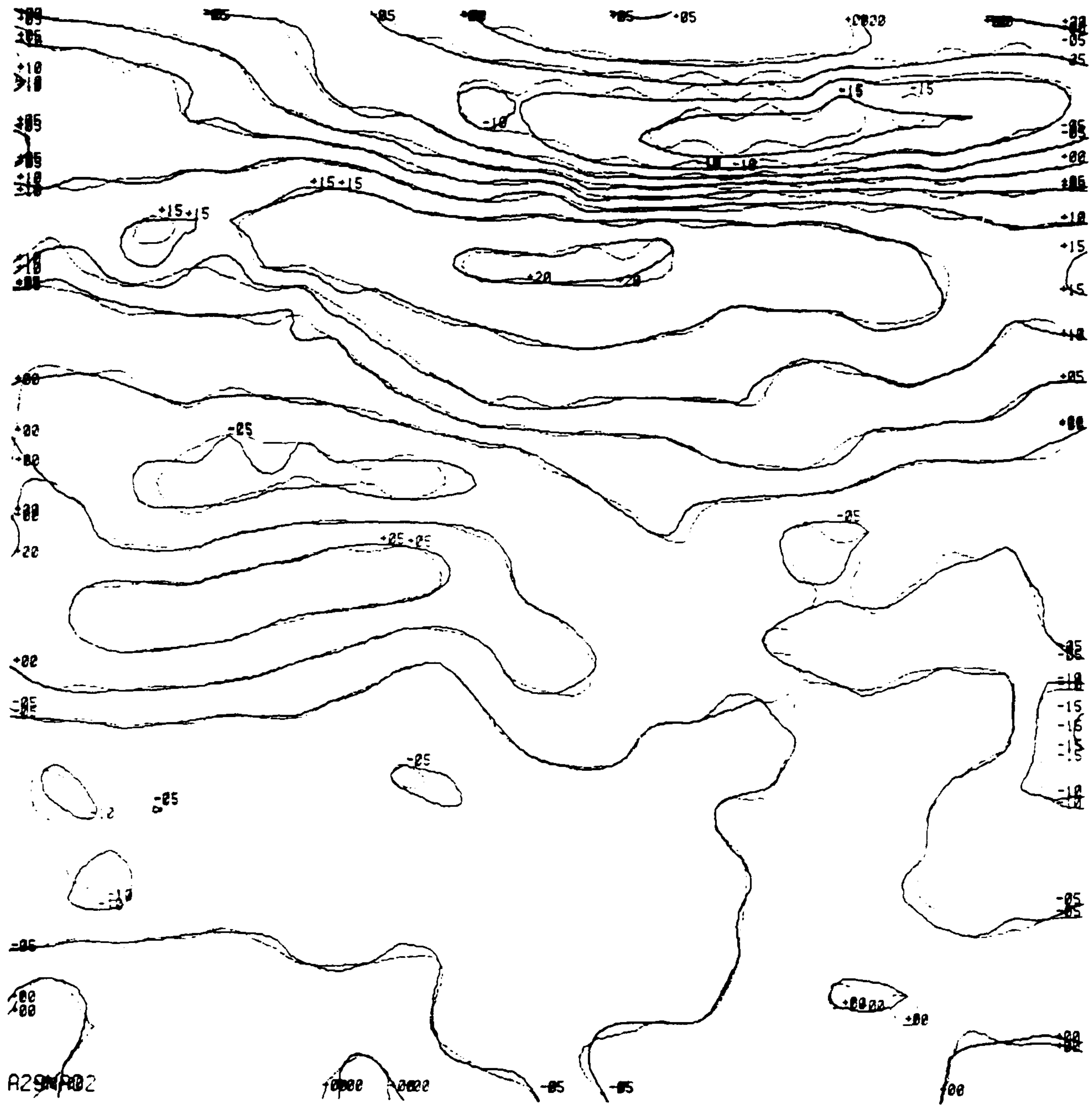

Figure 41. Surface u-Wind Component, Delta Scheme 2 (kt)

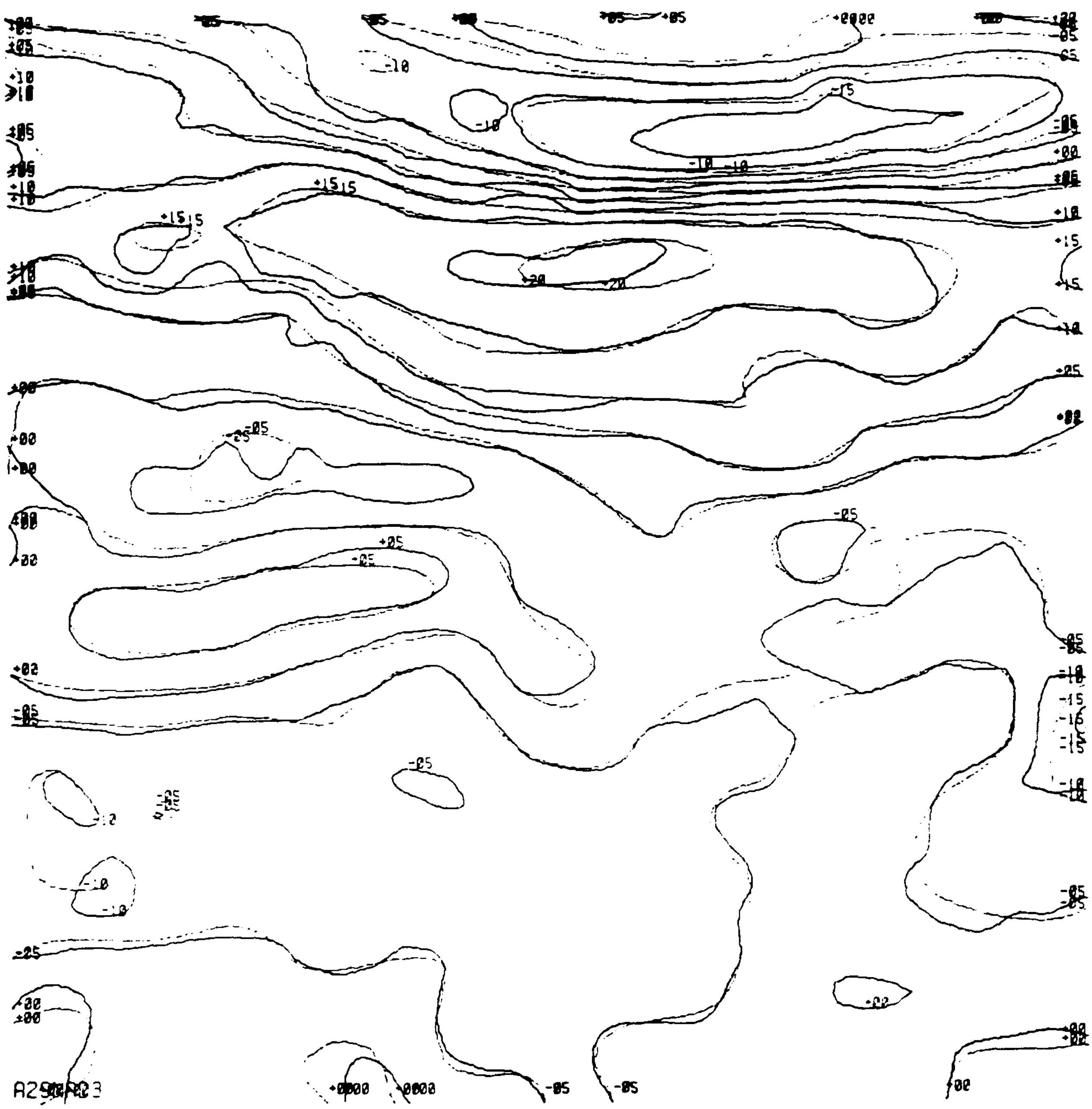

Figure 42. Surface u-Wind Component, Delta Scheme 3 (kt)

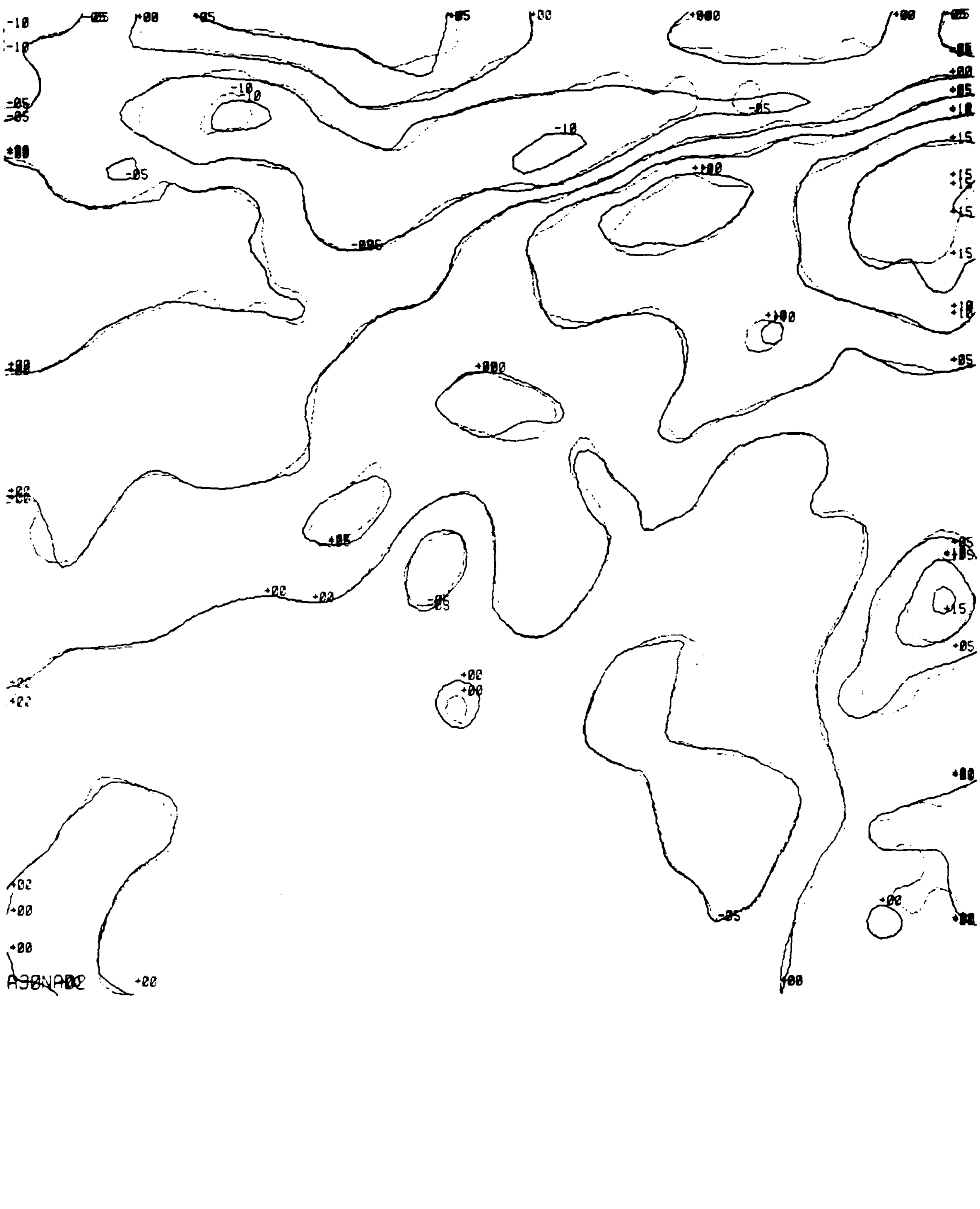

Figure 43. Surface v-Wind Component, Delta Scheme 2 (kt)

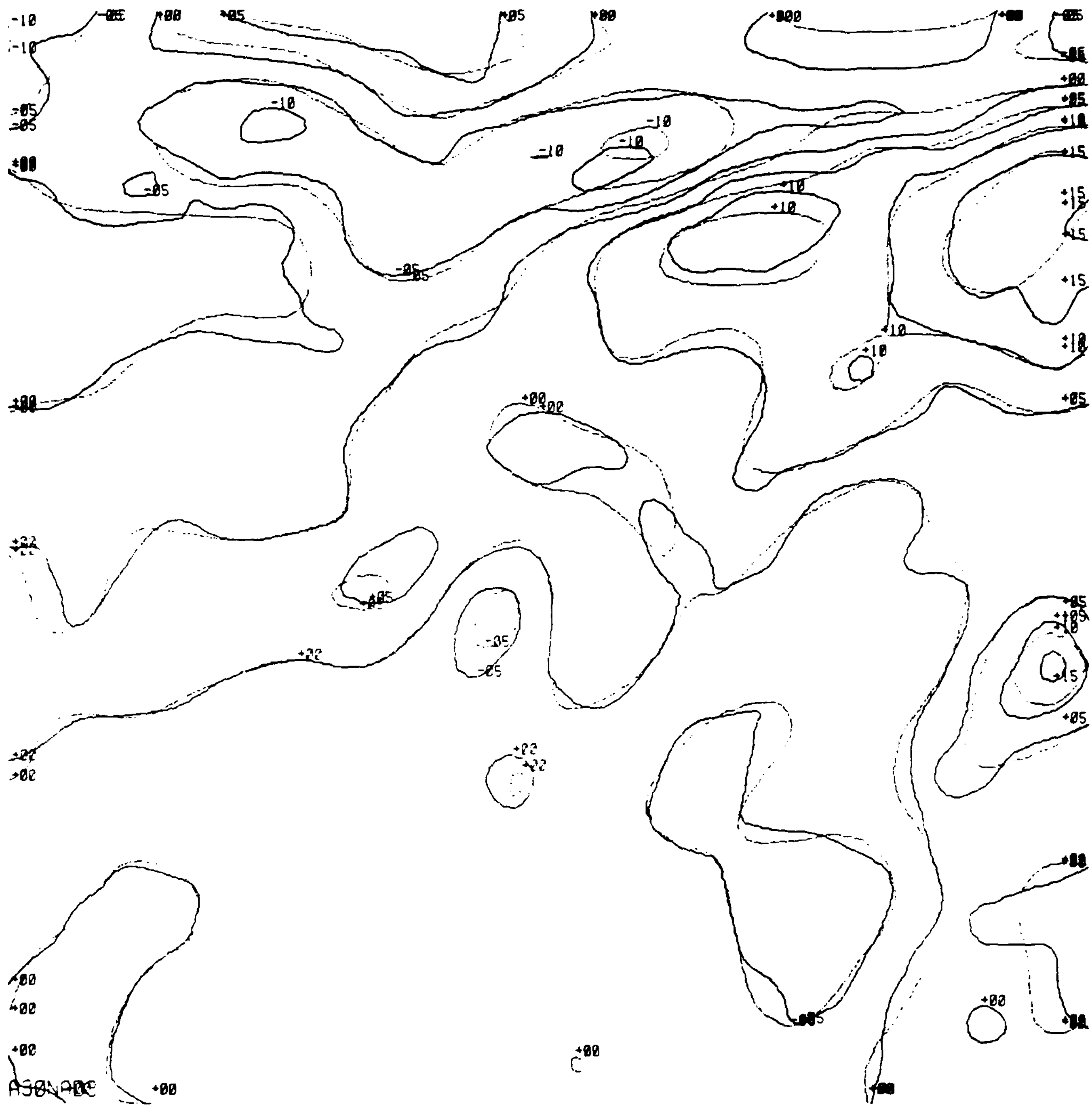

Figure 44. Surface v-Wind Component, Delta Scheme 3 (kt)

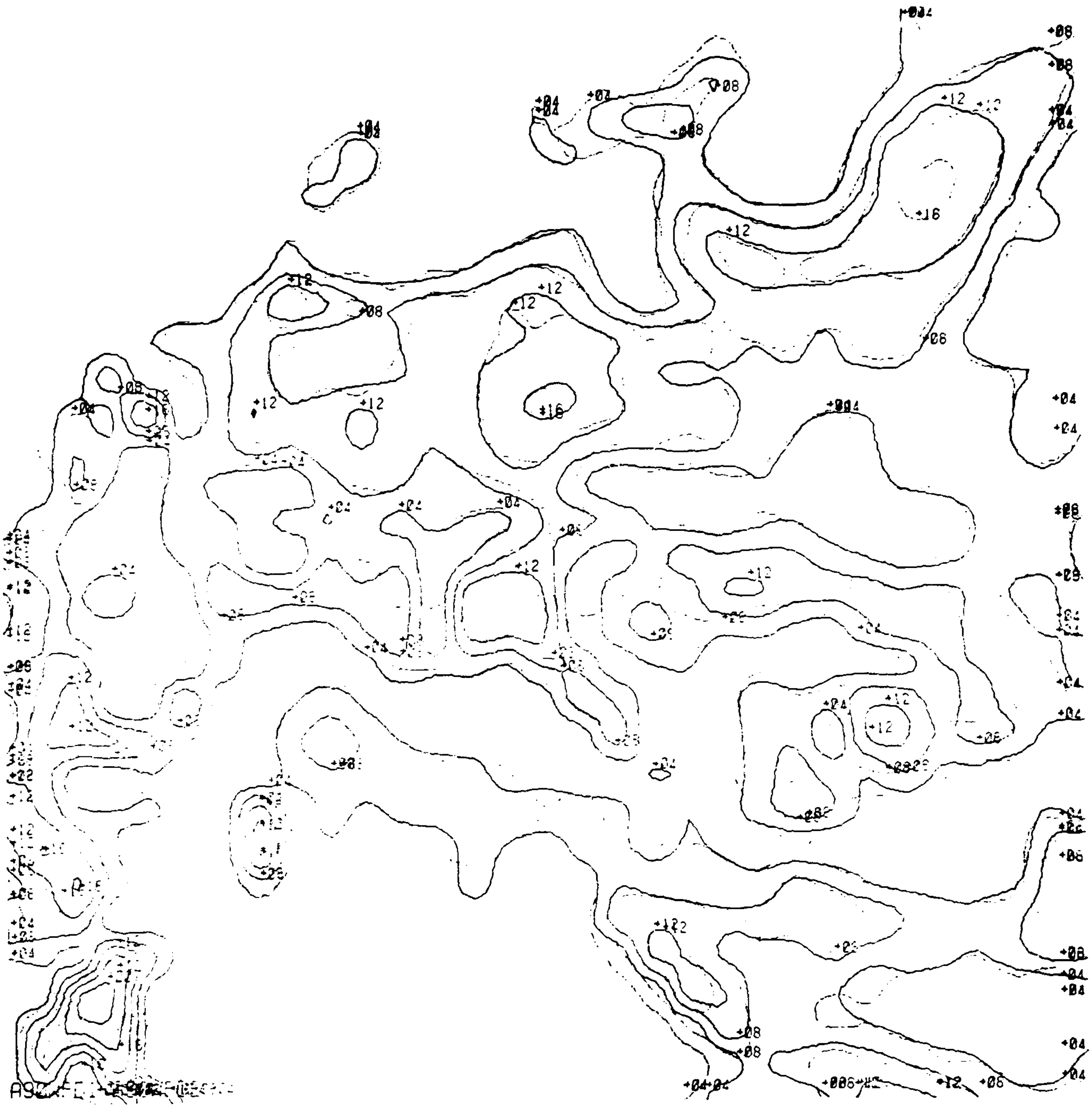

Figure 45. Height of Evaporative Duct, Delta Scheme 2 (m)

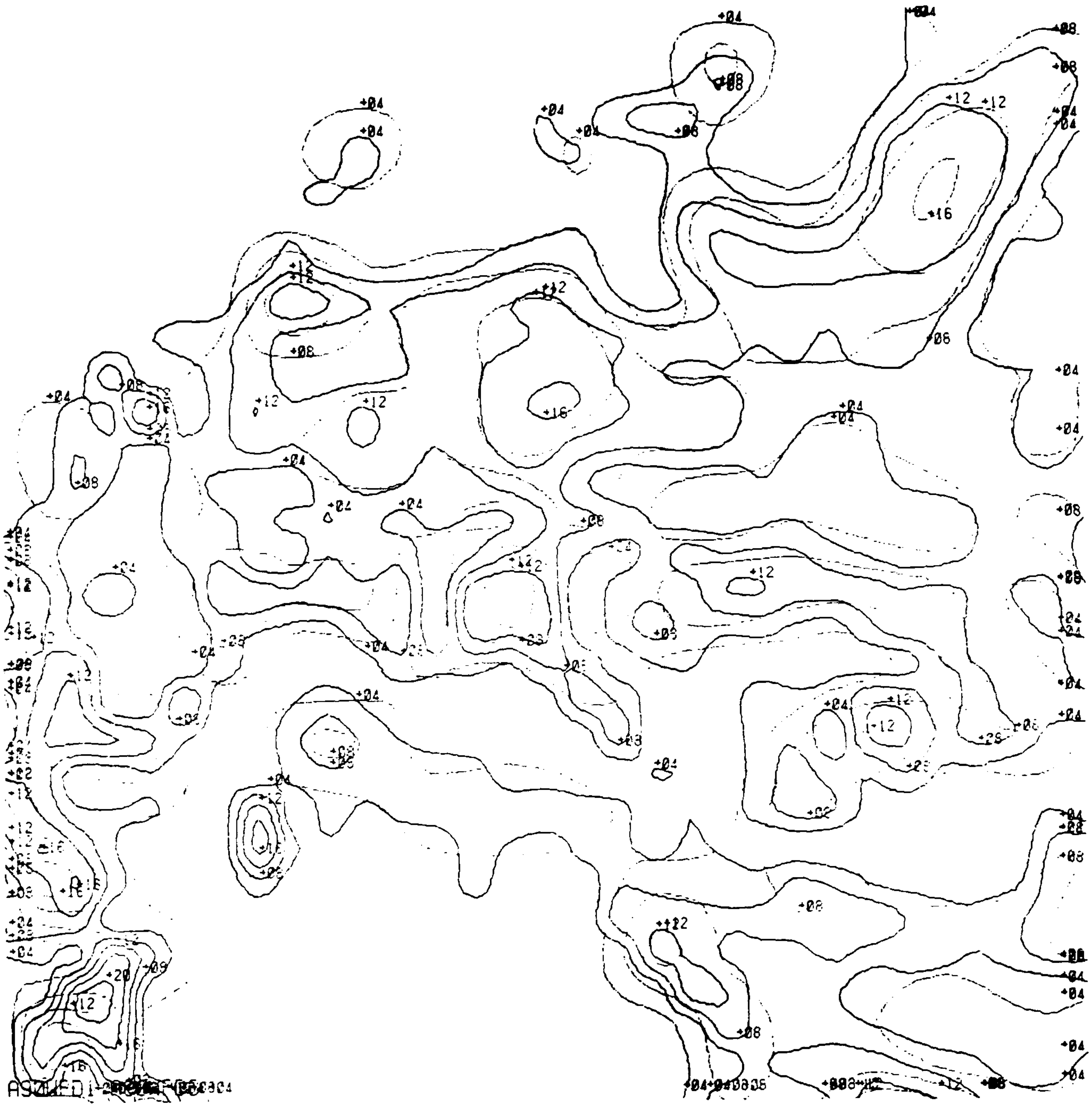

Figure 46. Height of Evaporative Duct, Delta Scheme 3 (m)

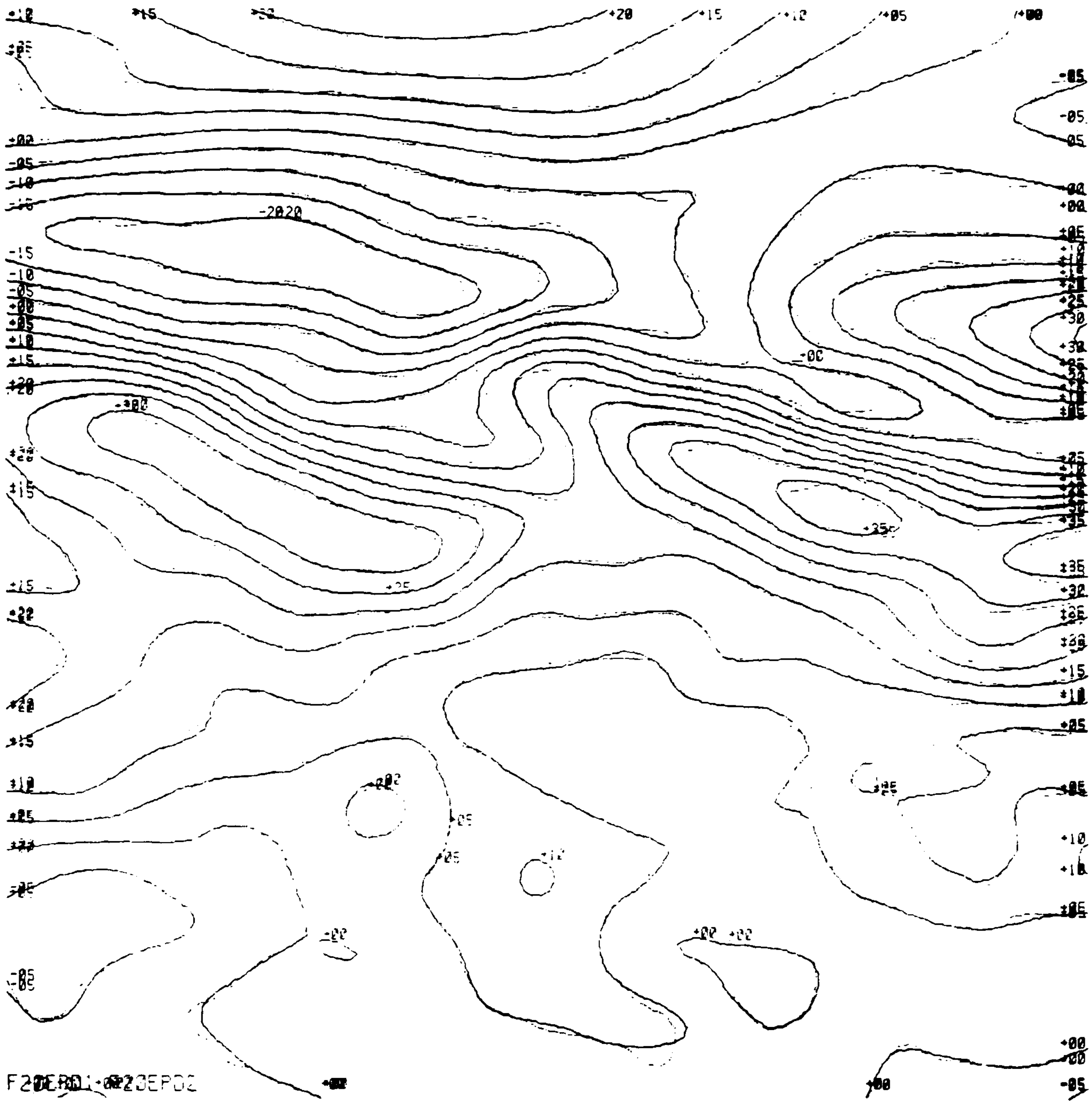

Figure 47. 500 mb u-Wind Component, Delta Scheme 2 (kt)

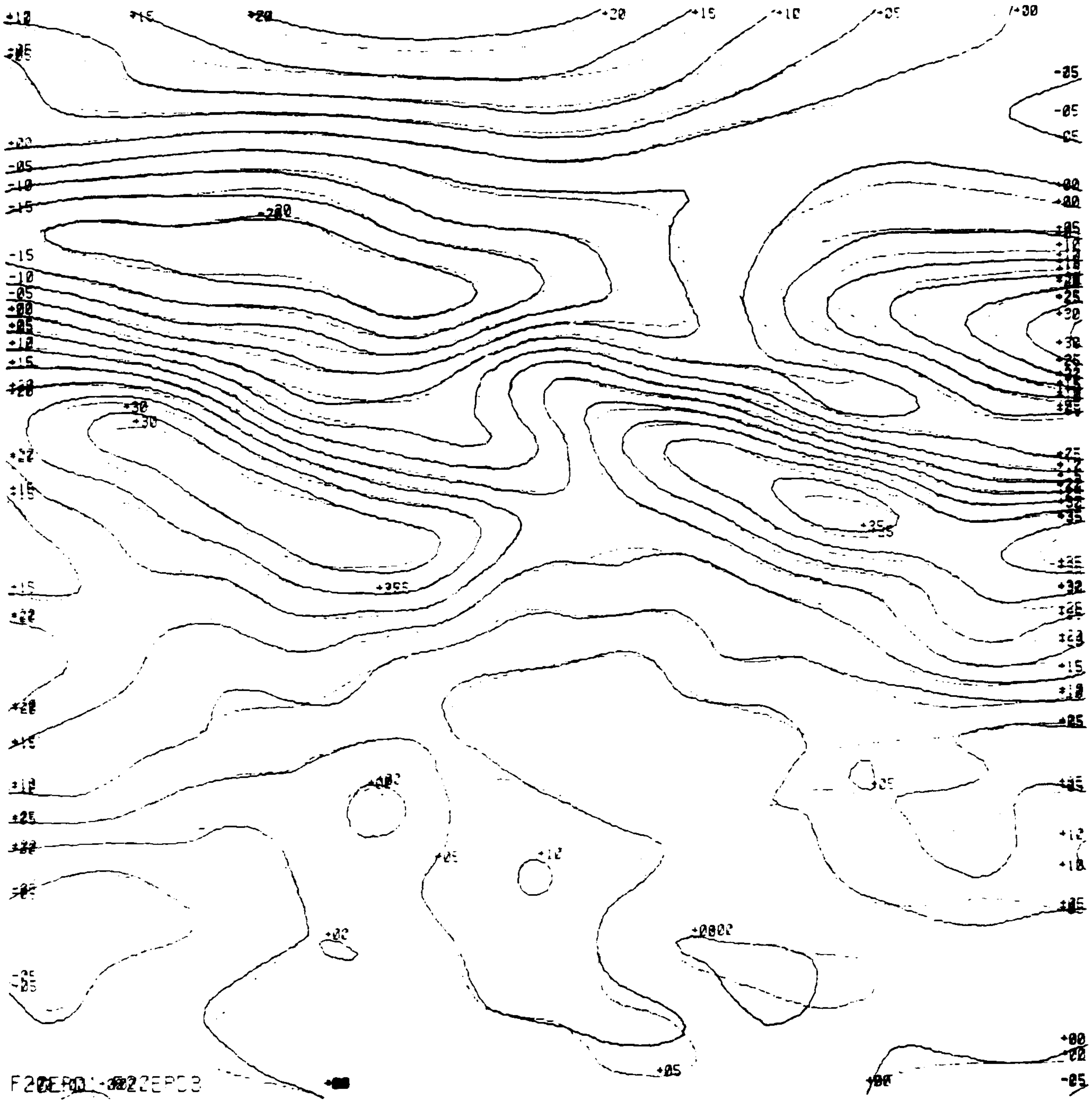

Figure 48. 500 mb u-Wind Component, Delta Scheme 3 (kt)

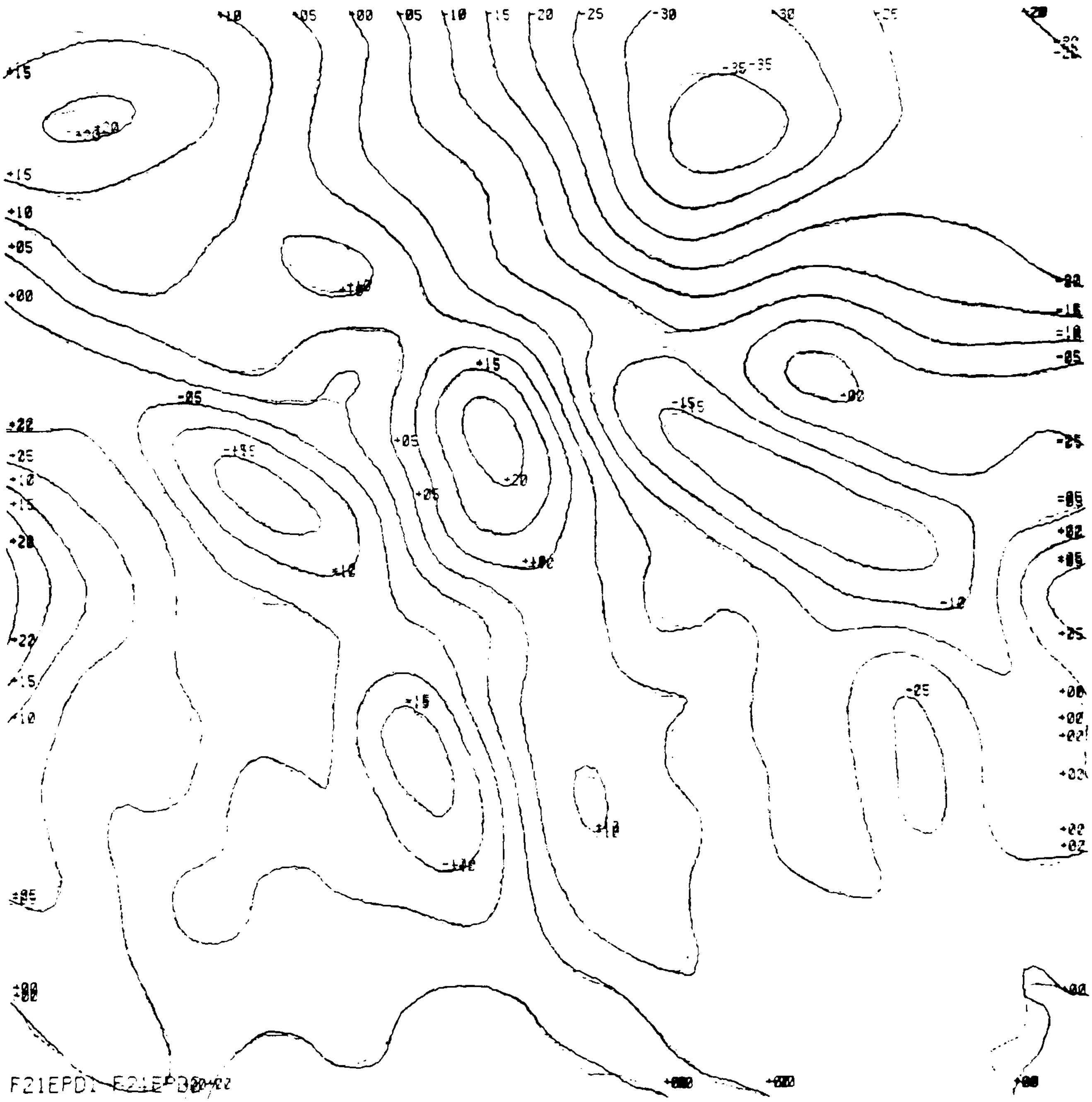

Figure 49. 500 mb v-Wind Component, Delta Scheme 2 (kt)

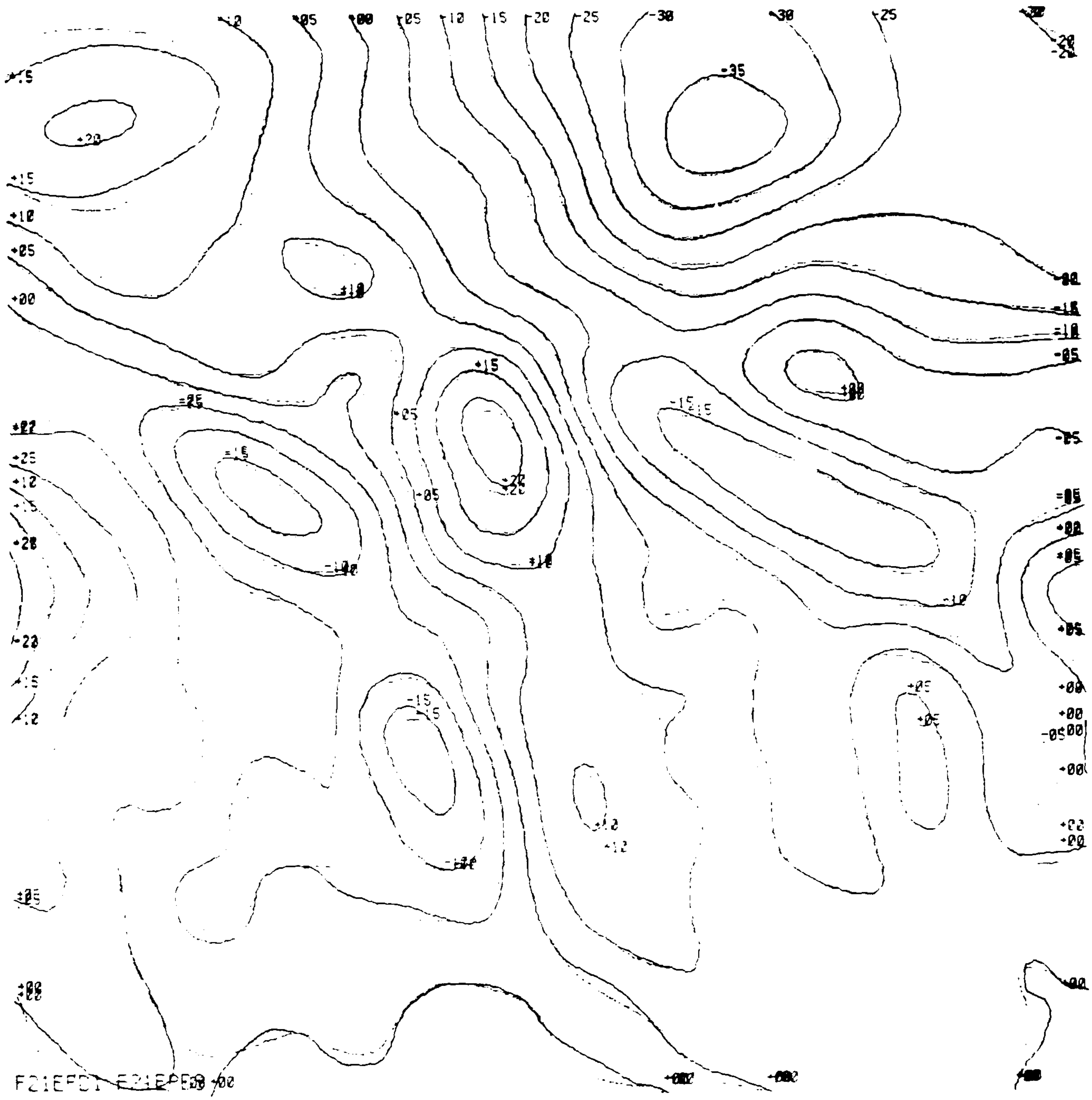

Figure 50. 500 mb v-wind Component, Delta Scheme 3 (kt)

4.3.16 500 mb Vorticity. Figures 51 and 52 illustrate the 500 mb vorticity for the eastern Pacific area with delta schemes 2 and 3, respectively. Figure 51 is probably adequate for subjective use, but is probably not good enough for subsequent numerical calculations. The FFT compaction should be used for this field when more numerical calculations are required. Figure 52 is probably not good enough even for subjective use.

4.3.17 500 mb Vertical Wind. Figures 53 and 54 illustrate the 500 mb vertical wind in cm/s for the eastern Pacific area with delta schemes 2 and 3, respectively. Figure 53 would probably suffice for most applications, but Figure 54 is most likely suitable only for general display.

4.3.18 Derived 1000-500 Thickness. Figures 55, 56 and 57 present the thickness field for the North Atlantic calculated from compacted 1000 mb and 500 mb height fields using double FFT's with a maximum wave number of 14, 9 and 5 being retained, respectively. When both the 1000 mb and 500 mb fields are processed with 14 waves remaining the resulting thickness field is outstanding. Please note the apparent problem in the lower right corner is a minor problem with FNOC Varian software. When the maximum wave number is reduced to 9, the result remains acceptable, but at wave number 5 the result is probably not acceptable for most applications.

4.3.19 Derived 500-300 Thickness. Figures 58, 59 and 60 present the thickness field for the North Atlantic calculated from compacted 500 mb and 300 mb height fields using double FFT's with a maximum wave number of 14, 9 and 5 being retained, respectively. When both the 500 mb and 300 mb fields are processed with 14 waves remaining the resulting thickness field is outstanding. When the maximum wave number is reduced to 9, the result remains acceptable, but at wave number 5 the result is probably not acceptable for most applications.

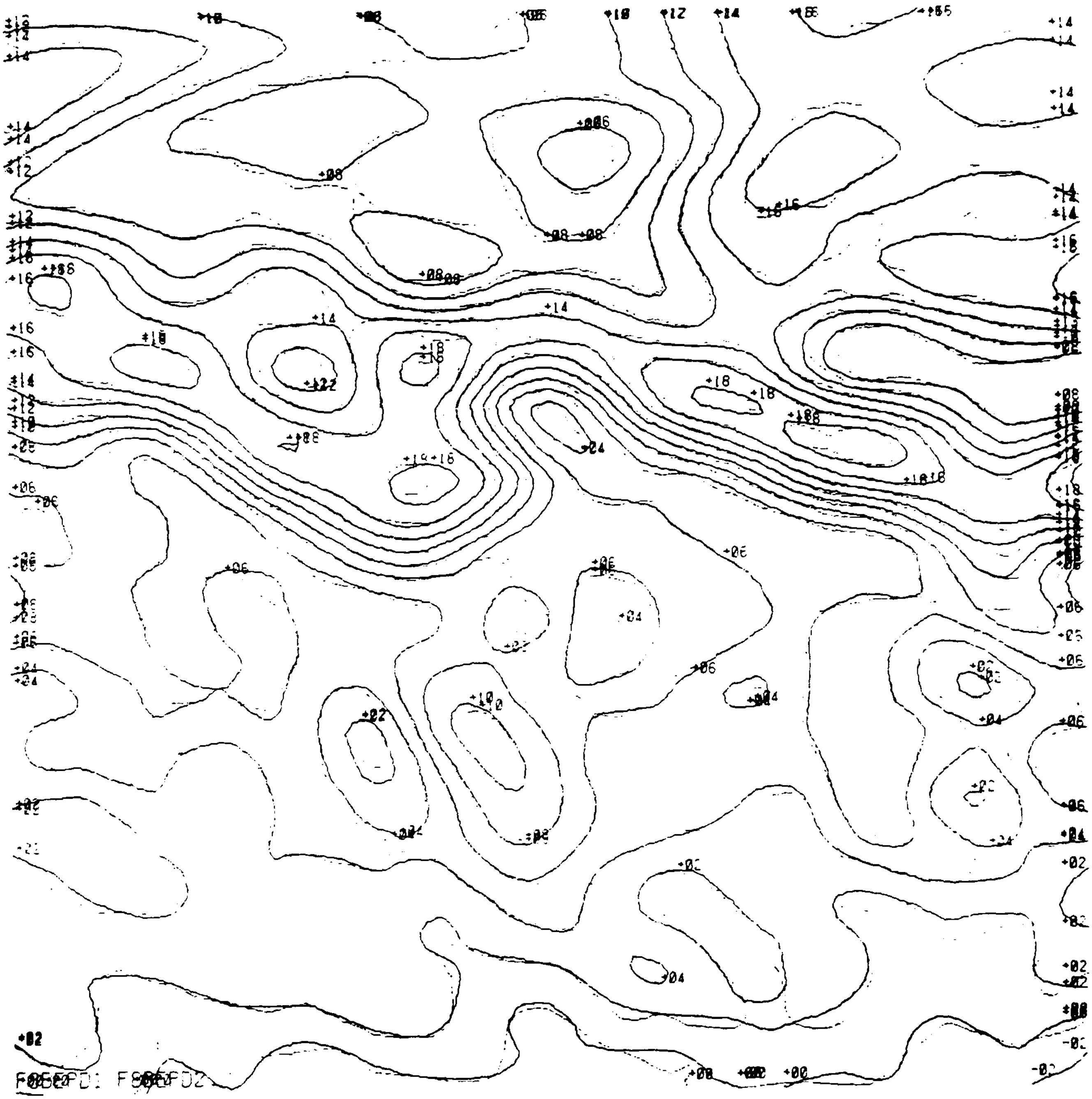

Figure 51. 500 mb Vorticity, Delta Scheme 2

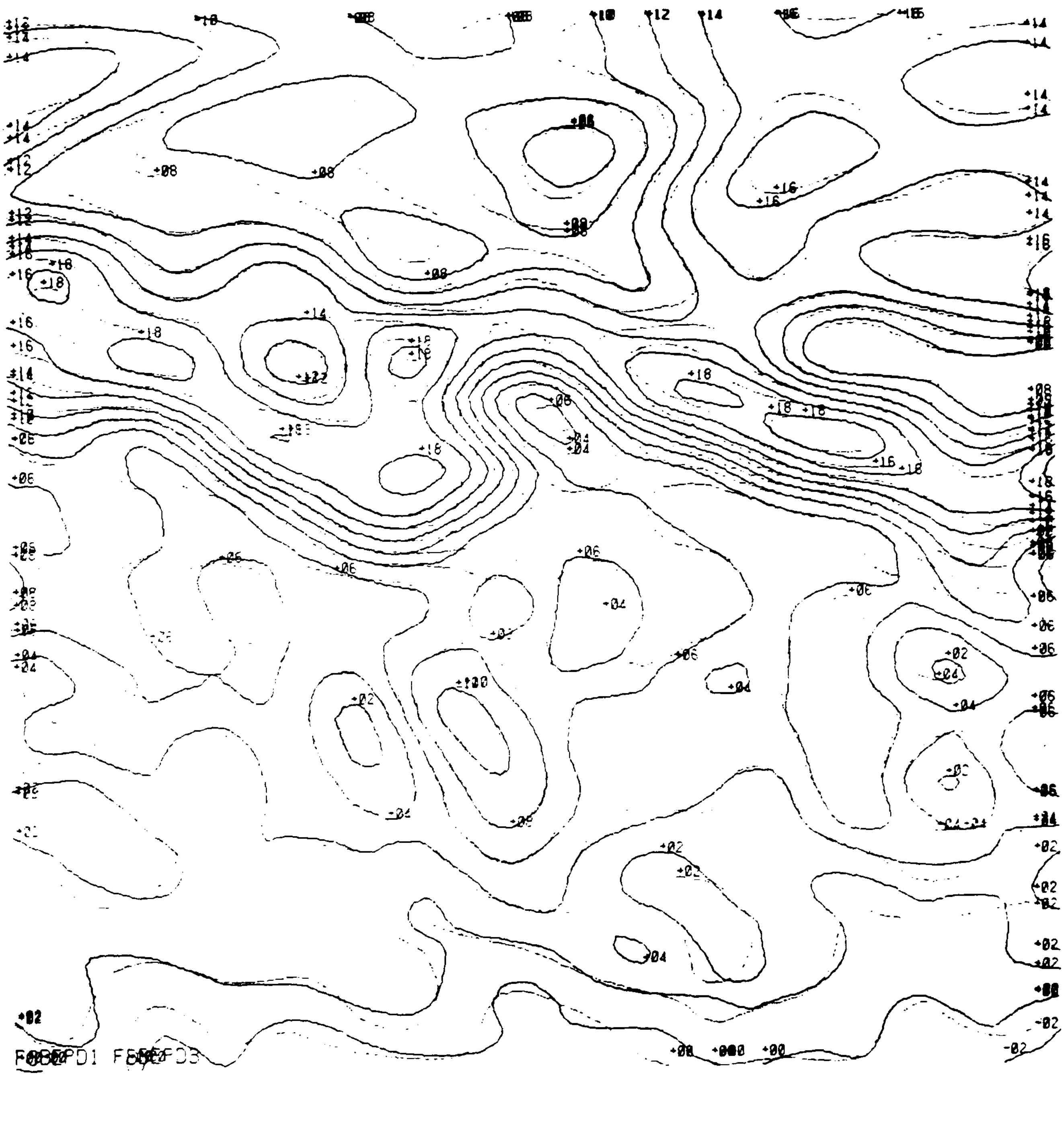

Figure 52. 500 mb Vorticity, Delta Scheme 3

Figure 53. 500 mb Vertical Wind, Delta Scheme 2 (cm/s)

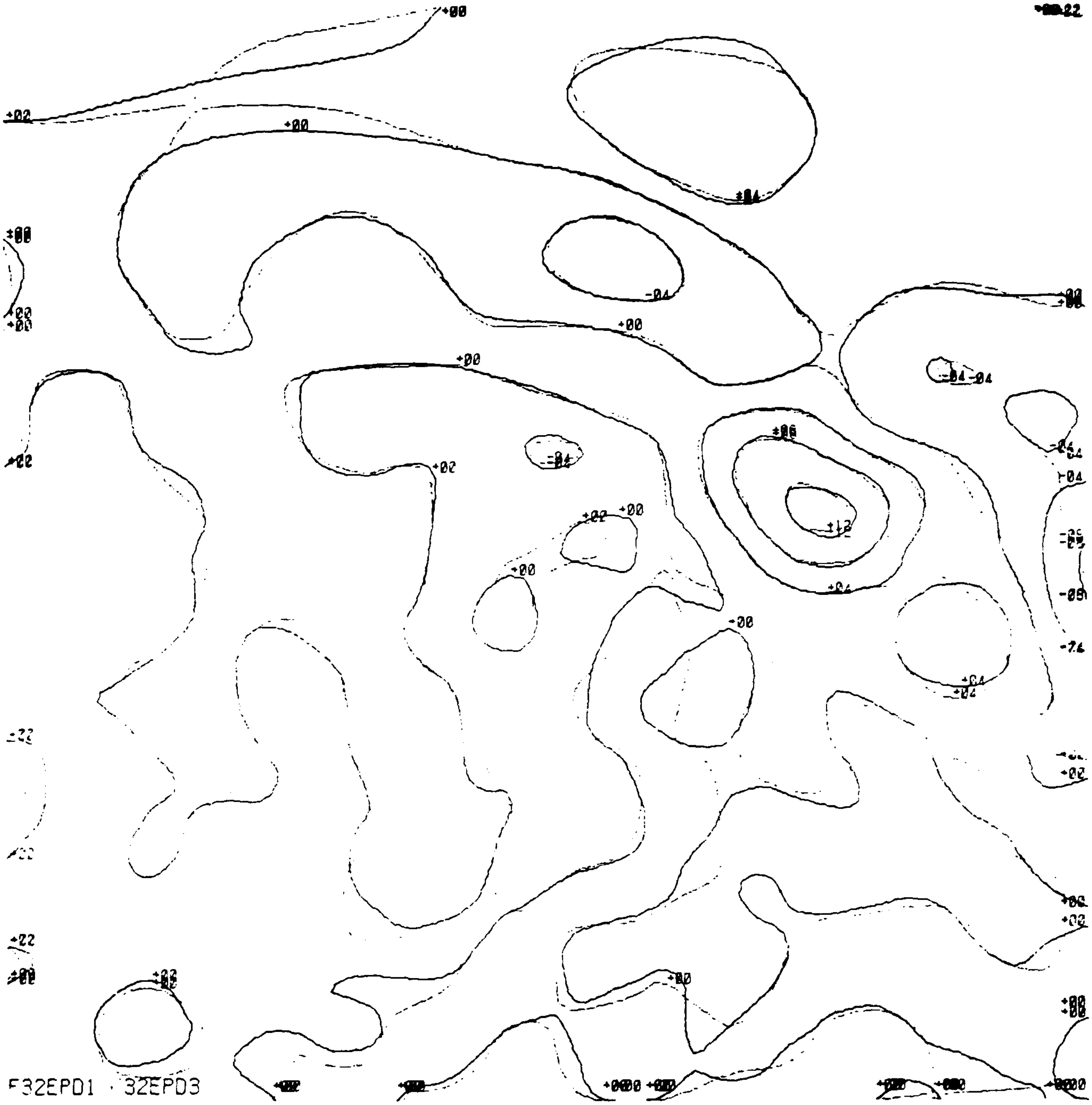

Figure 54. 500 mb Vertical Wind, Delta Scheme 3 (cm/s)

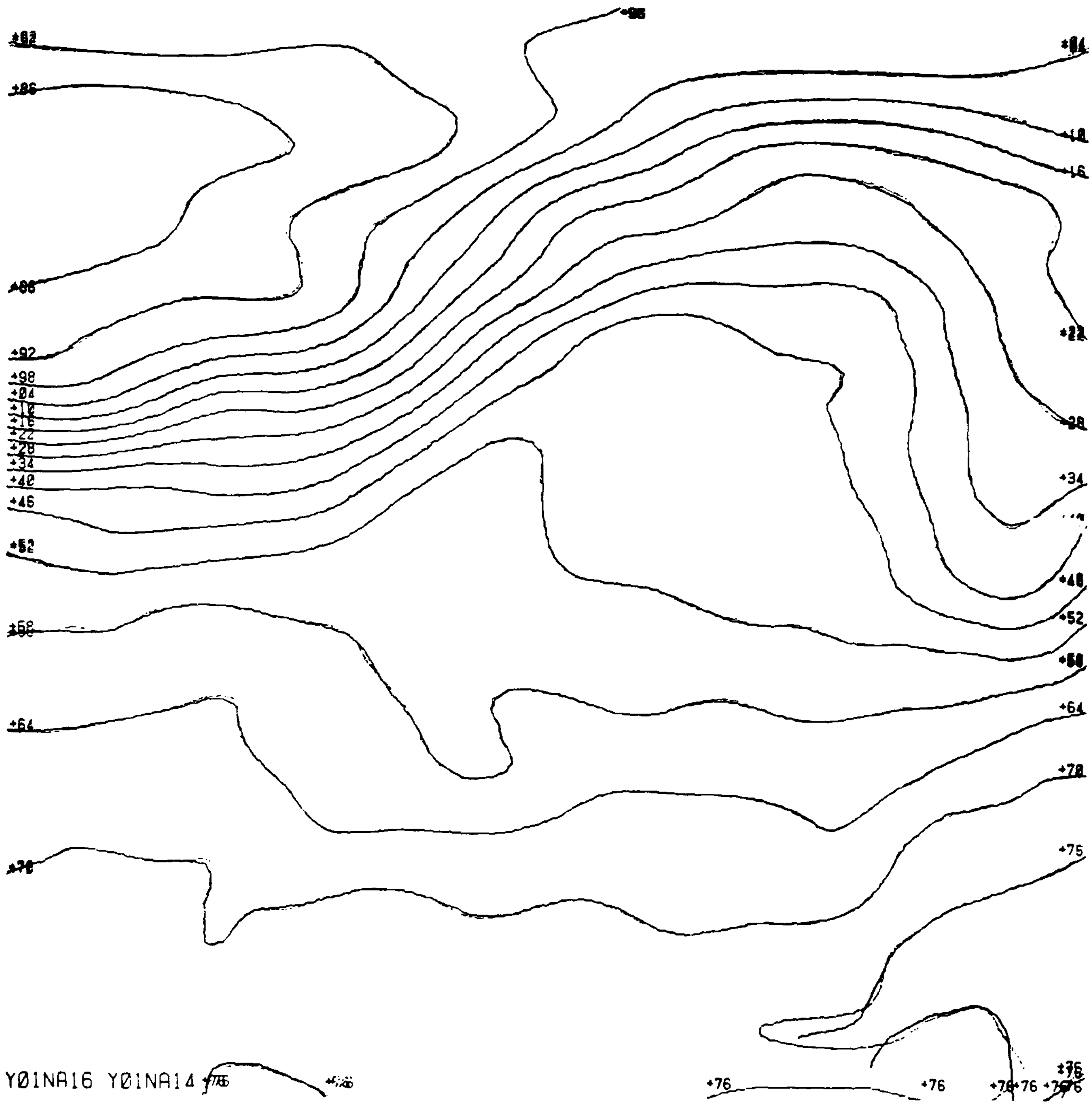

Figure 55. Derived 1000-500 Thickness, Double FFT Wave 14 (m)

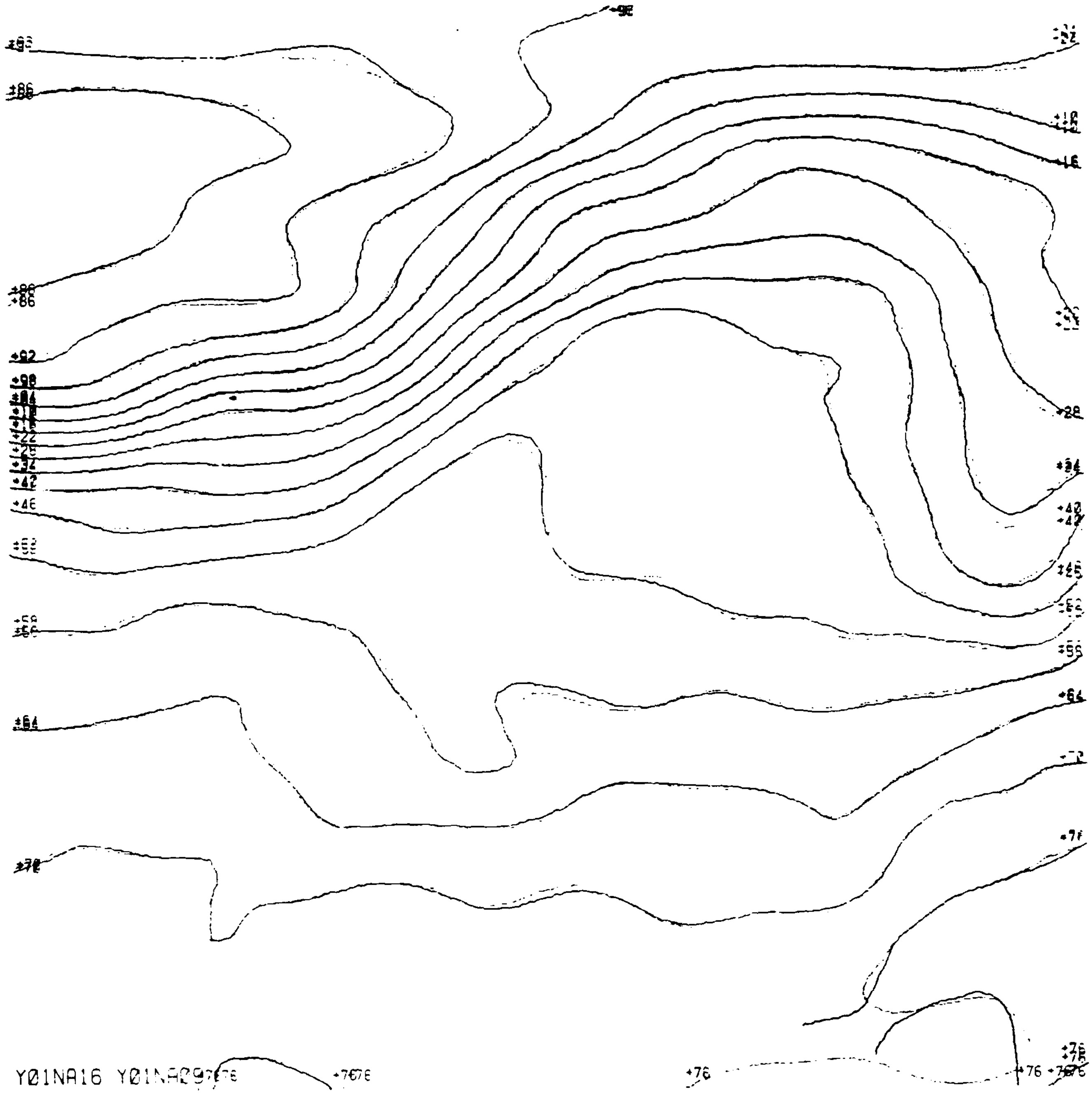

Figure 56. Derived 1000-500 Thickness, Double FFT Wave 9 (m)

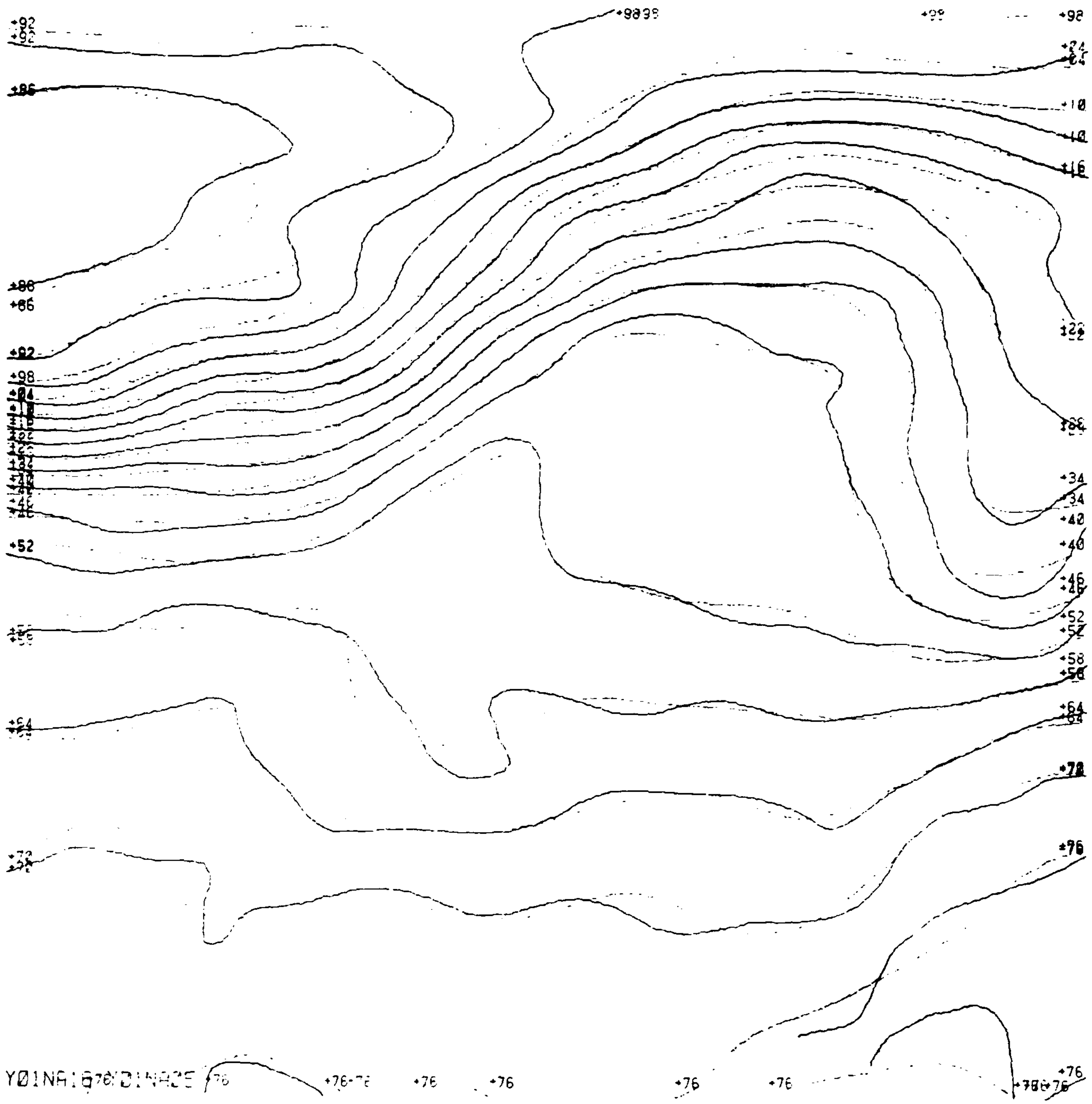

Figure 57. Derived 1000-500 Thickness, Double FFT Wave 5 (m)

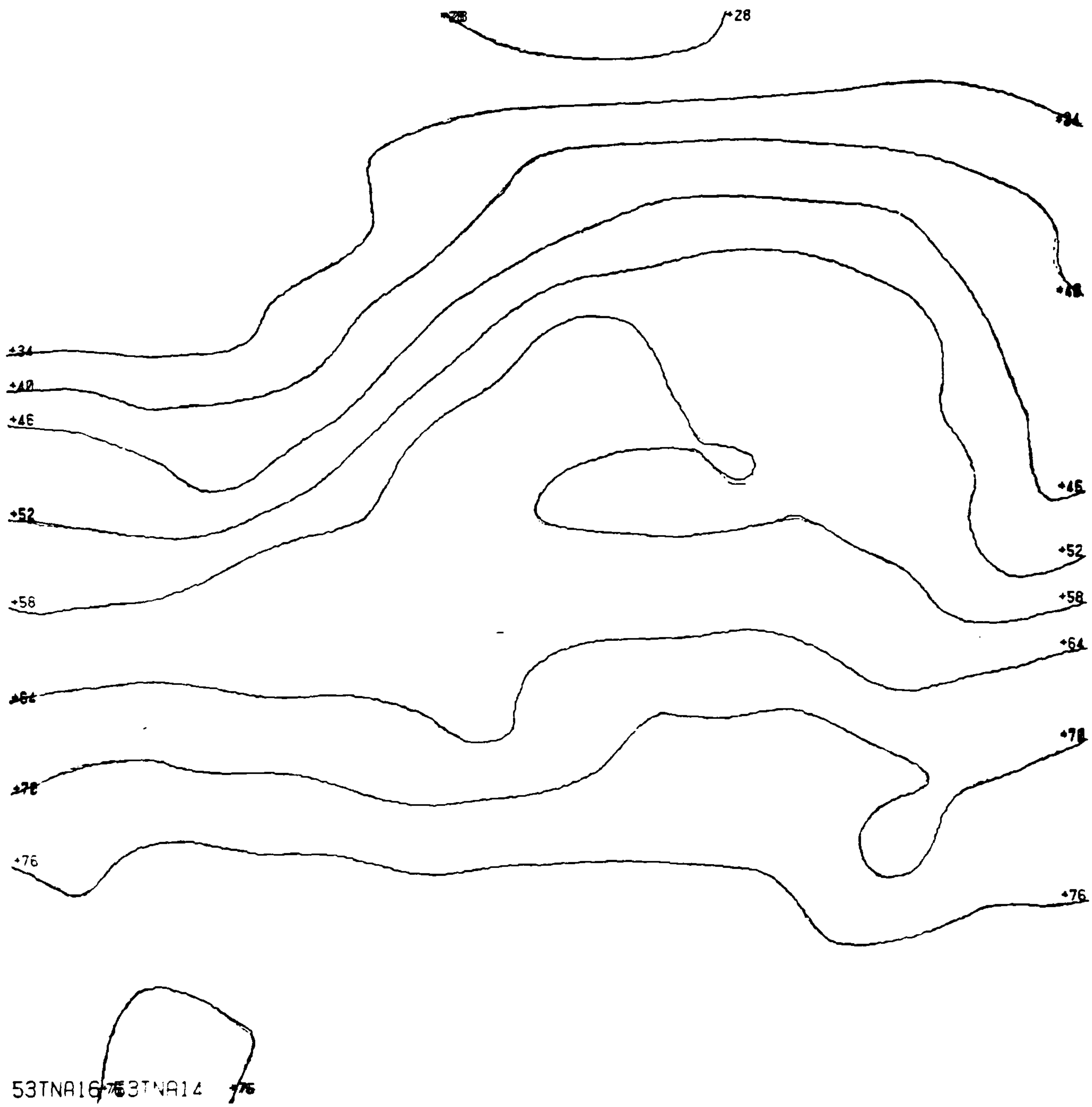

Figure 58. Derived 500-300 Thickness, Double FFT Wave 14 (m)

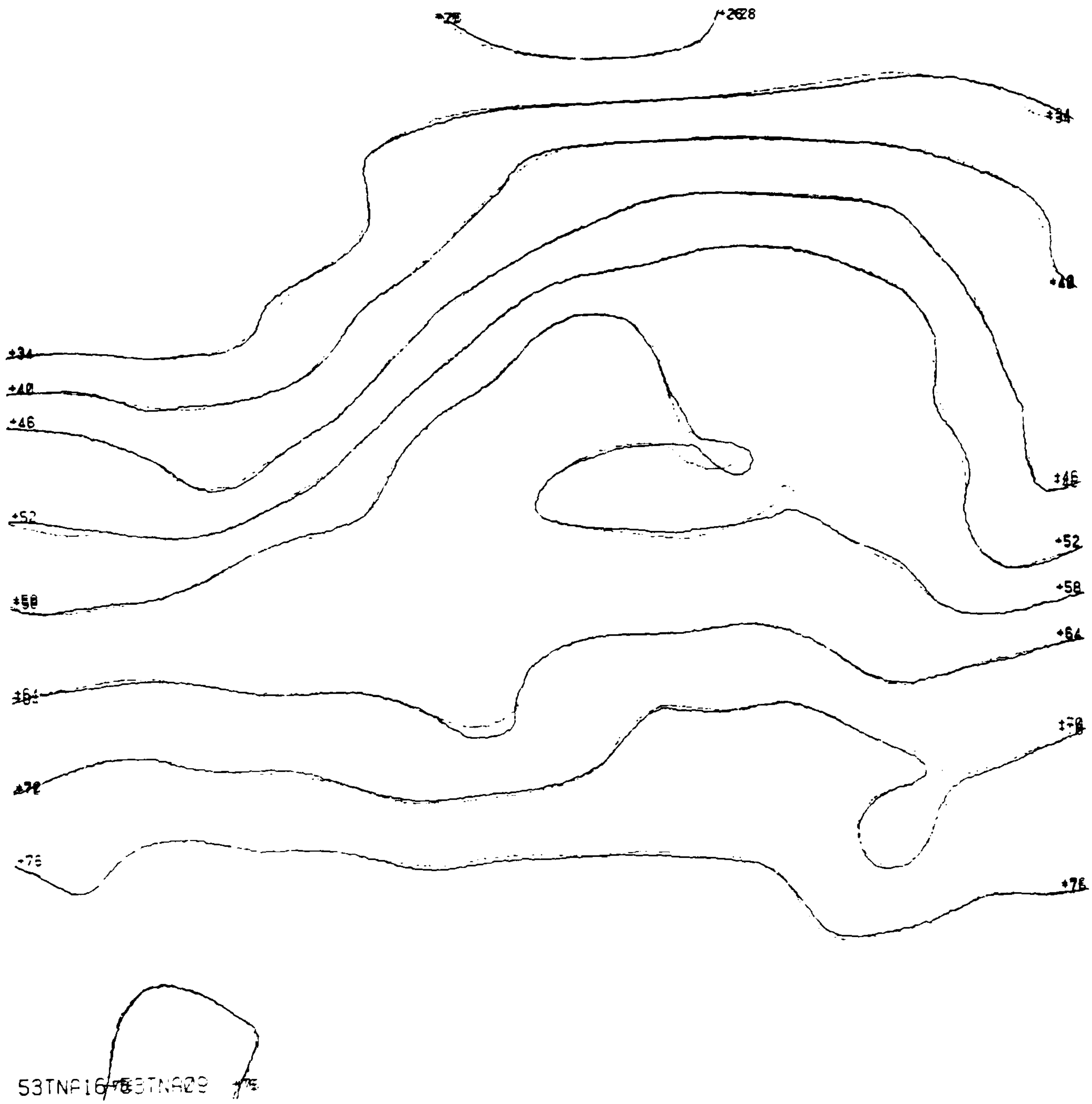

Figure 59. Derived 500-300 Thickness, Double FFT Wave 9 (m)

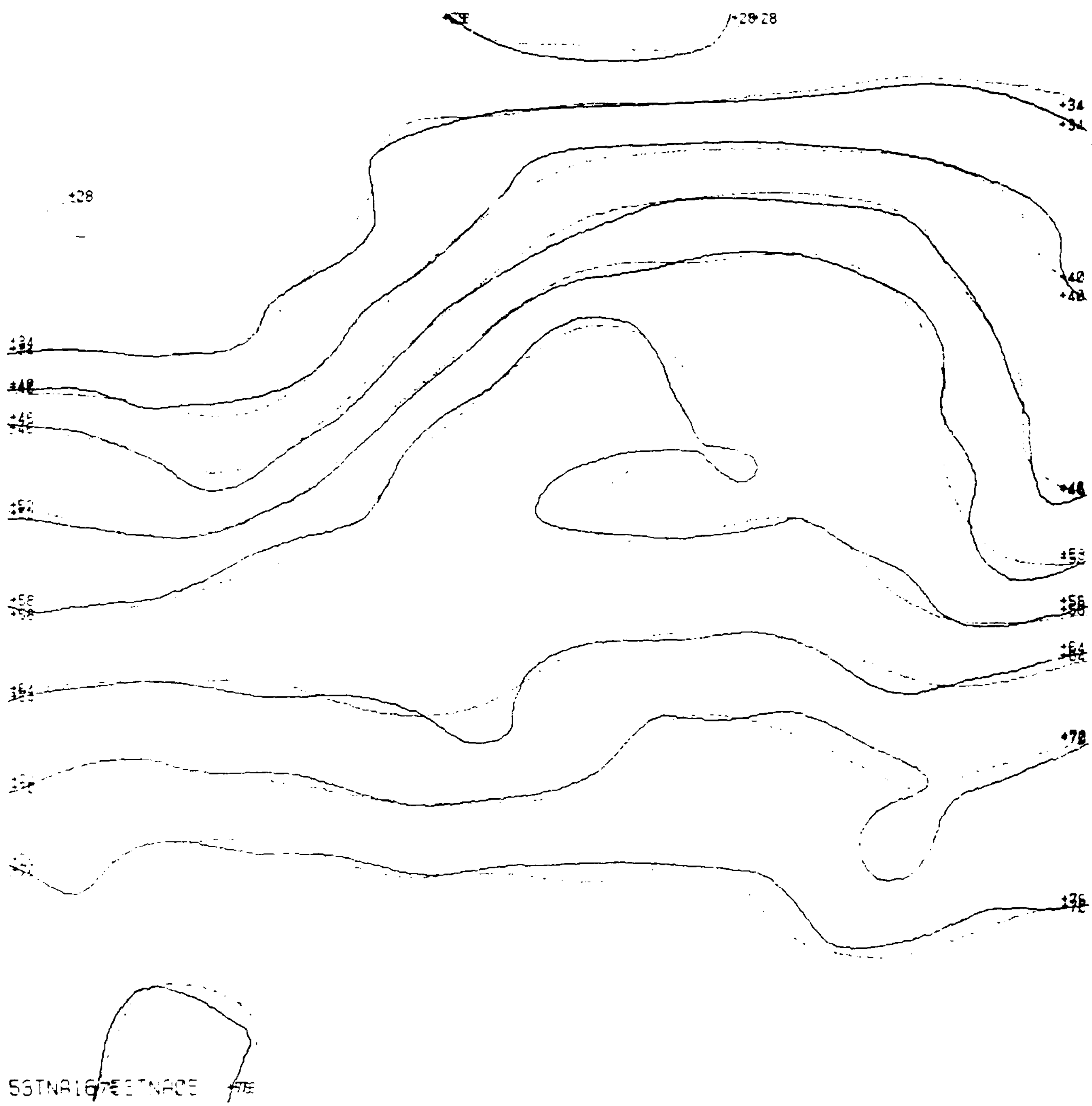

Figure 60. Derived 500-300 Thickness, Double FFT Wave 5 (m)

4.4 Post/Pre-Processing Post-processing involving removing negative values from fields which must be positive (precipitation, sea heights, evaporative duct heights, etc.) must be accomplished to improve the results of these two compression techniques. All the above examples have had this post-processing performed. Pre-processing involving negative value generation for these type fields (see subsection 3.4) may be worthwhile. No harm has been seen from this pre-processing, provided positive generation of values has not had to be repressed during this pre-processing. If positive generation has had to be repressed, processing the original field rather than the pre-processed field is the safest and usually the best approach.

4.5 Barnes-Type Analysis. The results of the Barnes-type analysis applied to delta packing schemes 2 through 5 for a single sea level pressure (mb) field is presented in Table II. for the western Pacific (WP), eastern Pacific (EP) and North Atlantic (NA) regions. The values in the "Scan" column are the multipliers of the grid length for the radius of the first scan for data about each grid point. A Barnes analysis normally uses two scans with the second scan being less than the first. In this analysis the second scan length was 75% of the first scan length. The other column values are the RMSE in mb. The last row in each area is the RMSE without a Barnes analysis.

It is interesting to note that there does not seem to be any correlation of scan length to delta scheme. In this example, a scan of 1.5 times the grid length will produce an improved final product in all regions for all delta packing schemes. The visual differences in the contours with and without Barnes with light compaction (scheme 2) is almost indistinguishable. With high compaction (scheme 5) the visual differences become more noticeable, but only around the centers, as expected. The biggest differences appear around centers which are not well defined in the initial field. If a deep synoptic-scale low exists in the initial field the compaction techniques will properly display this feature without the addition of a Barnes type analysis. However, a small tropical storm or hurricane/typhoon would probably be much better defined with the aid of a Barnes-type analysis.

Table II. Results of Barnes-Type Analysis with Central Values (RMSE mb)

WP

Scan	#2	#3	#4	#5
4.0	0.06337	0.10928	0.15582	0.31544
3.5	0.06239	0.10871	0.15283	0.31190
3.0	0.06221	0.10544	0.15218	0.31313
2.5	0.06222	0.10328	0.15105	0.31064
2.0	0.06203	0.10314	0.15113	0.31272
1.5	0.06158	0.10288	0.15084	0.31467
1.0	0.06165	0.10380	0.15196	0.31557
0.5	0.06175	0.10414	0.15235	0.31509
w/o Barnes	0.06183	0.10451	0.15308	0.31659

EP

Scan	#2	#3	#4	#5
4.0	0.15389	0.21552	0.26098	0.73527
3.5	0.15487	0.21088	0.25516	0.72617
3.0	0.15475	0.20755	0.25332	0.69410
2.5	0.15626	0.20619	0.24858	0.69861
2.0	0.15614	0.20187	0.24546	0.70651
1.5	0.15666	0.20110	0.24505	0.71932
1.0	0.15652	0.20099	0.24547	0.72950
0.5	0.15666	0.20098	0.24665	0.73533
w/o Barnes	0.15802	0.20348	0.24904	0.73836

NA

Scan	#2	#3	#4	#5
4.0	0.08158	0.14662	0.19448	0.44298
3.5	0.08147	0.14432	0.19269	0.43525
3.0	0.08118	0.14339	0.19226	0.43480
2.5	0.08134	0.13775	0.19309	0.44156
2.0	0.07971	0.13030	0.19278	0.43073
1.5	0.07985	0.12830	0.19367	0.43104
1.0	0.08028	0.12902	0.19352	0.43393
0.5	0.08004	0.13037	0.19318	0.43745
w/o Barnes	0.08030	0.13269	0.19476	0.44132

5. CONCLUSIONS

Regional environmental gridded data may be compacted with either delta-type or double fast Fourier transforms when the field data approximates values which are continuous in the first derivative. The smoother the original field values are the more the data can be compacted. The results also show that fields derived from compacted fields can retain required accuracy. The Fourier transforms take twice as long as the delta schemes, but provide better results for light (2:1) compaction. The delta scheme for heavy (7:1) compaction is better than the Fourier transforms. However, the heavily compacted fields may not be operationally useful.

When environmental fields are to be packed, one must consider the ultimate use of these fields. Field values intended only for general display can be packed more than field values that will be used in calculations. Also, if thickness fields are required, one may pack and transmit three (two height and one thickness) fields or pack (to a lesser extent) and transmit only two height fields. Likewise, if the temperature differences (lapses) in a layer are required one can either pack and transmit two (temperature) or three (two temperature and one lapse) fields.

Applying cubic interpolation/extrapolation to an original field that must have positive values, such as wave heights or the height of the evaporative duct, in order to remove discontinuities in the first derivative prior to compaction may be worthwhile. During this process only negative values can replace zero values (over water) because there is no way of removing false positive values from the uncompacted field (over water). However, when false positives must be rejected during this pre-processing the discontinuity problem may have become worse rather than better. In an automated mode, when positive values have had to be rejected it is best to use the original field values rather the enhanced values. However, positive values over land can be allowed during extrapolation, if these values are subsequently removed by using a land/sea table after recovery. By allowing negative values in the field prior to compaction permits both the double FFT and the delta packing schemes the opportunity to produce more accurate fields upon uncompaction (when all negative values are made zero). This approach cannot make it worse and under certain conditions it will improve the result.

In general, it is not satisfactory to increase the packing (delta or double FFT) of a field until maximum acceptable error values (RMSE or maximum) are obtained by the packing method without also doing a visual inspection of the resulting unpacked field, because the statistics can be misleading. However, this process can be automated (no visual inspection) if the acceptable error values are not set at the maximum limit. Also, the degree of FFT packing (in wave number space) that works well on one grid will not necessarily be satisfactory on a different sized grid.

However, usually a level of packing that is good in one area (western Pacific, eastern Pacific or North Atlantic) will be good in another area, provided the environmental parameters are the same and the size of the areas are the same.

If minimal compaction (scheme 2 or waves 13 and 14 for a 31-by-31 grid) is warranted, the double FFT packing seems to be better than the delta packing. If maximum packing (scheme 5 or waves 5 and 6 for a 31-by-31 grid) is desired, the delta packing will often be better at retaining the general synoptic shapes than the FFT packing. Moderate packing (scheme 3 or waves 9, 10 or 11 for a 31-by-31 grid) results are about the same for both packing schemes.

One advantage of the delta schemes is that they may be applied with or without the "delta" in an Ocean-Meteorology Data Compaction for Transmission (OMDCFT) type program. The OMDCFT program includes error detection terms in the columns and rows of the message. If the transmission of the data takes a "hit", the error can be corrected with error correction software; this is not possible with double FFT coefficients.

A disadvantage of the delta packing is that slightly curved contours can have small sinusoidal oscillations about the "true" position of the contour, most prevalent with delta scheme 2. Likewise, small "bubbles" may appear in the highly compacted FFT's.

A Barnes-type analysis based upon the central values as "observations" and the unpacked grid point values as the "first guess" field will result in an improved recovered field of values. However, the differences (visual and numeric) are so slight for light to moderate compaction of synoptic-scale features that the Barnes step would probably not be warranted, except for highly compacted fields or small intense features, such as a tropical storm or hurricane/typhoon.

Generally the greater the variance of the original field the greater the error (average or maximum) will be in a delta packing scheme, but this relationship does not always hold for the double FFT's.

Anytime the base environmental field is significantly discontinuous in the first derivative (like accumulated precipitation values) no compaction technique that is based upon sines and cosines or cubic equations will do well. The tabulated values of the unpacked precipitation fields show that the grid point values would not be good for either display or more numerical processing without significant post-processing. Even then some of the resulting values may be suspect.

Significant sea heights are not worth packing for areas of combined land and sea without successful special pre-processing (negative enhancement). The zero height values over land present a discontinuity that neither the FFT nor cubic spline can handle well. However, when the area is all water, the significant wave heights can be packed to the same extent as low level meteorological height and temperature fields.

6. RECOMMENDATIONS

One or two end users of the Ocean-Meteorology Data Compaction for Transmission (OMDCFT) program, such as the Joint Typhoon Warning Center on Guam, should be contacted and involved in establishing an operational implementation of the delta schemes and the double FFT compactions of specified environmental parameters. The end user could then evaluate which compaction scheme is best for his particular use of the product for his area of interest.

Further evaluations of compaction should be tried in both two-dimensions (2-D) and three dimensions (3-D). In 2-D one could try "transmitting" all the boundary values and a selected set of values (and locations), of which all the maximum and minimum values would at least be a subset. Upon "receipt" the Laplace equation would be solved with the boundary values. The solution would result in a smoothed field that is completely accurate on the boundary. This field would then serve as the "first guess" field for a Barnes-type analysis with the selected set of values as "observations". The smoother the original field values were, the better this approach would work.

A 3-D approach could involve converting a "cube" of space, such as 10 levels of 30-by-30 grids, into a 2-D array (20 by 450 for the example given) by using vertical and horizontal serpentine loading of a single environmental parameter. The resulting array could then be processed by double FFT's (or some other packing method). The resulting size of the transmission would be less than for ten 30-by-30 grids.

Another 3-D approach could involve converting a "cube", composed of two dimensions of space and one dimension of time, into a 2-D array by using time and horizontal serpentine delta loading. Thus the analysis and forecast fields of a parameter, such as the 500 mb temperature, would be represented in terms of the change of the parameter rather than the parameter itself. The resulting array could then be processed by double FFT's (or another packing method).

Besides knowing which environmental parameters are required, one must ascertain the maximum required accuracy of each parameter for each end user. This requires doing sensitivity analyses on the application programs that require specific environmental data to either establish or validate accuracy requirements.

One should also explore alternative means of providing field data without transmitting it. An encompassing approach to the total environmental data base must be taken. For instance, if the mandatory height, temperature and moisture fields are required at a destination, not all these fields need be transmitted. At the destination one may calculate the grid-point values of the fields that were judiciously not transmitted. One would use the same approach as applied to missing values from a radiosonde report.

If the accuracy requirement of winds is much greater than height values, the height values may be reasonably obtained from the wind values provided the boundary height values of the grid are provided. This technique, which involves the solution of a Poisson equation, has been successfully used to modify height fields based upon satellite derived winds. If the accuracy requirements are reversed, the wind may be reasonably estimated from the height fields, especially the upper level winds. Another advantage to this latter situation is that two fields (u-wind and v-wind) are being estimated from only one transmitted field. Thus, if the height field were not compacted, there would still be a resulting effective data compaction of 3:1.

Concurrently with an in-depth evaluation of which environmental fields are required and to what accuracy is being conducted, other compaction methods besides delta and double FFT's should be tried, particularly on discontinuous fields (see Held, 1987).

APPENDIX A

30-DAY MEANS OF DELTA AND DOUBLE FFT COMPACTIONS OF REGIONAL ENVIRONMENTAL GRIDDED DATA FIELDS

1. Explanation of Tabular Values. The tabular values shown in the following tables are the mean of 30 calculated or observed values (variance, percent of variance, minimum grid point value, average grid point value, maximum grid point value, etc.) for the following parameters.

1. sea level pressure (mb)
2. accumulated precipitation (cm)
3. significant sea height (ft)
4. 1000 mb height (m)
5. 500 mb height (m)
6. 300 mb height (m)
7. 1000 mb temperature (°C)
8. 850 mb temperature (°C)
9. 500 mb temperature (°C)
10. 300 mb temperature (°C)
11. calculated 1000 - 500 mb layer thicknesses (m)
12. calculated 500 - 300 mb layer thicknesses (m)
13. calculated 1000 - 850 mb temperature lapses (°C)
14. calculated 850 - 500 mb temperature lapses (°C)
15. calculated 500 - 300 mb temperature lapses (°C)

Each set of parameters starts with the results of the delta schemes and finishes with the results of the FFT wave truncations. Thus Table I-A is the "DELTA PACKING SCHEMES OF THE SEA LEVEL PRESSURE" and Table II-A is the "FFT VALUES OF SEA LEVEL PRESSURE".

The results of the original field is titled "(ORIG)". The results of the processed fields is titled "SCHEME 2", "SCHEME 3" etc. for the delta packing, and "WAVE 15", "WAVE 14" etc. for the FFT packing.

The three locations are identified across the page, "WESTERN PACIFIC", "EASTERN PACIFIC" and "NORTH ATLANTIC". The next row is titled "VARIANCE", at the left of the page. Under each of the three location columns is the 30-day mean variance of the original field. Below each variance is the 30-day mean minimum, average and maximum of the field values within the respective areas. This completes the description of the original field.

The description of the processed field is similar. The row titled " " PRCNT " is the percent of the resulting 30-day mean variance to the original 30-day mean variance of the field. These percentages are directly below the 30-day mean variance value of the processed field. Then come the 30-day mean minimum, average and maximum field values for the respective areas. The row titled "DIFF" presents the 30-day mean average and maximum grid-point value differences (in an absolute sense) between the processed and the original values. The last row titled "PRCNT" lists these differences in terms of the percent of the dynamic range of the original field values.

Delta schemes 2, 3, 4 and 5 are illustrated in Figure 1. page 7 of this report.

On an FFT values page, the title "WAVE XX", where XX is a wave number, means the following results are with XX and all lower wave numbers being included in the second forward and both backward FFT calculations.

Table I-A

DELTA PACKING SCHEMES OF SEA LEVEL PRESSURE

---A01 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.36			90.85			120.83	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.57	1012.76	1040.72	979.67	1014.00	1035.69	975.40	1013.72	1037.13

---A01 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.36			90.72			120.71	
" PRCNT		99.98			99.84			99.88	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.62	1012.76	1040.63	979.92	1014.01	1035.69	975.66	1013.73	1037.16
DIFF		.09	1.64		.12	1.77		.14	2.21
PRCNT		.19	3.28		.21	3.14		.23	3.63

---A01 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.55			90.53			120.46	
" PRCNT		100.32			99.61			99.69	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.62	1012.74	1040.65	980.05	1014.00	1035.67	976.04	1013.72	1037.15
DIFF		.16	2.36		.19	2.33		.21	3.00
PRCNT		.33	4.78		.35	4.22		.36	4.91

---A01 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.17			90.27			120.17	
" PRCNT		99.66			99.29			99.43	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.86	1012.78	1040.44	980.42	1014.00	1035.71	976.13	1013.70	1036.81
DIFF		.21	2.95		.25	3.74		.27	4.42
PRCNT		.45	6.01		.46	6.77		.45	7.44

---A01 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.13			89.33			120.32	
" PRCNT		99.56			98.10			99.49	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.75	1012.76	1040.37	981.54	1014.01	1035.68	977.40	1013.67	1036.75
DIFF		.41	4.47		.65	5.63		.77	8.03
PRCNT		.85	9.16		1.22	10.38		1.28	13.23

Table II-A

FFT VALUES OF SEA LEVEL PRESSURE

---A01 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.36			90.85			120.83	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.57	1012.76	1040.72	979.67	1014.00	1035.69	975.40	1013.72	1037.13

---A01 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.37			90.87			120.84	
" PRCNT		100.01			100.02			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.56	1012.76	1040.72	979.68	1014.00	1035.72	975.43	1013.72	1037.14
DIFF		.04	.26		.04	.14		.04	.14
PRCNT		.09	.50		.07	.26		.07	.23

---A01 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.38			90.88			120.85	
" PRCNT		100.02			100.03			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.60	1012.76	1040.77	979.69	1014.00	1035.71	975.43	1013.72	1037.16
DIFF		.06	.45		.05	.24		.06	.24
PRCNT		.13	.88		.09	.43		.09	.40

---A01 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.39			90.90			120.86	
" PRCNT		100.05			100.04			100.02	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.65	1012.76	1040.82	979.69	1014.00	1035.71	975.43	1013.72	1037.16
DIFF		.08	.65		.06	.33		.06	.35
PRCNT		.17	1.28		.11	.60		.11	.58

---A01 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.40			90.91			120.87	
" PRCNT		100.07			100.06			100.03	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.72	1012.76	1040.86	979.70	1014.00	1035.73	975.43	1013.72	1037.18
DIFF		.09	.82		.07	.45		.07	.46
PRCNT		.19	1.63		.12	.82		.12	.77

Table II-A (Cont'd)

FFT VALUES OF SEA LEVEL PRESSURE (Cont'd)

---A01 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.42			90.93			120.88	
" PRCNT		100.11			100.07			100.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.79	1012.76	1040.92	979.71	1014.00	1035.72	975.42	1013.72	1037.19
DIFF		.11	1.02		.08	.58		.08	.60
PRCNT		.22	2.04		.14	1.04		.14	1.01

---A01 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.44			90.94			120.89	
" PRCNT		100.14			100.08			100.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	991.89	1012.76	1041.01	979.71	1014.00	1035.72	975.43	1013.72	1037.20
DIFF		.13	1.29		.09	.72		.10	.75
PRCNT		.27	2.58		.16	1.29		.17	1.25

---A01 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.44			90.96			120.89	
" PRCNT		100.14			100.10			100.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	992.02	1012.76	1041.09	979.72	1014.00	1035.78	975.46	1013.72	1037.12
DIFF		.15	1.53		.12	.88		.15	.98
PRCNT		.32	3.07		.22	1.59		[illegible]	1.64

---A01 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.44			90.95			120.86	
" PRCNT		100.15			100.08			100.00	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	992.15	1012.76	1041.10	979.76	1014.00	1035.78	975.60	1013.72	1037.21
DIFF		.21	1.80		.20	1.18		.24	1.37
PRCNT		.43	3.61		.36	2.15		.40	2.27

---A01 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.39			90.87			120.71	
" PRCNT		100.07			99.97			99.87	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	992.31	1012.76	1040.92	979.96	1014.00	1035.79	975.94	1013.72	1037.21
DIFF		.27	2.20		.33	1.74		.39	2.00
PRCNT		.57	4.41		.61	3.23		.64	3.30

Table II-A (Cont'd)

FFT VALUES OF SEA LEVEL PRESSURE (Cont'd)

---A01 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.36			90.61			120.35	
" PRCNT		100.01			99.68			99.57	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	992.45	1012.76	1040.76	980.51	1014.00	1035.44	976.77	1013.72	1037.23
DIFF		.36	2.73		.51	2.60		.59	3.18
PRCNT		.75	5.48		.94	4.79		.98	5.20

---A01 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		58.16			89.95			119.58	
" PRCNT		99.63			98.83			98.91	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	992.80	1012.76	1040.59	981.56	1014.00	1035.23	978.27	1013.72	1037.37
DIFF		.48	3.38		.80	4.17		.92	5.14
PRCNT		1.01	6.88		1.48	7.77		1.51	8.31

Table III-A

DELTA PACKING SCHEMES OF PRECIPITATION

---A62 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.14			.07			.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-.01	.23	2.91	.00	.13	2.11	-.01	.15	2.28

---A62 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.11			.06			.07	
" PRCNT		82.55			84.74			85.23	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.72	.00	.14	1.96	.00	.16	2.05
DIFF		.08	1.45		.04	.90		.05	1.08
PRCNT		2.76	50.83		2.01	44.15		2.16	51.01

---A62 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.12			.06			.06	
" PRCNT		83.22			81.29			82.72	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.50	.00	.15	1.82	.00	.16	1.85
DIFF		.13	1.89		.07	1.19		.08	1.29
PRCNT		4.83	65.97		3.56	58.21		3.74	61.67

---A62 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.11			.05			.06	
" PRCNT		82.49			73.77			74.70	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.24	2.42	.00	.15	1.67	.00	.17	1.73
DIFF		.32	2.79		.20	2.01		.23	2.10
PRCNT		11.54	95.25		9.85	94.87		10.99	92.12

---A62 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.12			.06			.06	
" PRCNT		85.16			85.37			84.39	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.18	.00	.16	1.65	.00	.17	1.59
DIFF		.19	2.25		.12	1.52		.12	1.70
PRCNT		6.98	78.14		5.70	73.93		5.88	76.10

Table IV-A

FFT VALUES OF PRECIPITATION

---A62 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.14			.07			.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-.01	.23	2.91	.00	.13	2.11	-.01	.15	2.28

---A62 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.13			.07			.07	
" PRCNT		95.88			97.47			97.05	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.24	2.82	.00	.14	2.10	.00	.16	2.24
DIFF		.03	.18		.01	.10		.02	.13
PRCNT		1.04	6.19		.71	5.11		.90	6.08

---A62 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.13			.07			.07	
" PRCNT		92.75			95.50			95.27	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.24	2.72	.00	.14	2.08	.00	.16	2.20
DIFF		.04	.32		.02	.18		.03	.21
PRCNT		1.53	11.12		1.05	8.97		1.23	10.38

---A62 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.12			.06			.07	
" PRCNT		89.45			93.13			93.02	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.24	2.61	.00	.14	2.06	.00	.16	2.15
DIFF		.06	.48		.03	.26		.03	.31
PRCNT		2.01	16.94		1.41	13.32		1.61	14.70

---A62 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.12			.06			.07	
" PRCNT		85.68			90.46			90.26	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.51	.00	.14	2.03	.00	.16	2.09
DIFF		.07	.62		.04	.36		.04	.41
PRCNT		2.48	22.14		1.77	17.93		2.02	19.50

Table IV-A (Cont'd)

FFT VALUES OF PRECIPITATION (Cont'd)

---A62 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.11			.06			.07	
" PRCNT		81.02			86.65			86.89	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.40	.00	.14	1.97	.00	.16	2.02
DIFF		.08	.80		.04	.47		.05	.50
PRCNT		3.02	28.50		2.22	23.51		2.46	24.07

---A62 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.10			.06			.06	
" PRCNT		75.37			82.57			82.89	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.24	.00	.15	1.90	.00	.17	1.94
DIFF		.10	.97		.05	.58		.06	.61
PRCNT		3.61	34.40		2.64	28.59		2.98	29.09

---A62 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.10			.05			.06	
" PRCNT		69.80			77.18			77.79	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	2.09	.00	.15	1.78	.00	.17	1.82
DIFF		.12	1.16		.06	.69		.07	.74
PRCNT		4.19	40.58		3.16	34.38		3.50	34.55

---A62 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.09			.05			.06	
" PRCNT		63.58			71.93			72.76	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	1.96	.00	.15	1.66	.00	.17	1.69
DIFF		.13	1.36		.07	.79		.08	.87
PRCNT		4.84	47.55		3.62	39.20		3.95	40.18

---A62 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.08			.05			.05	
" PRCNT		58.13			65.52			67.17	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	1.81	.00	.15	1.50	.00	.17	1.54
DIFF		.15	1.55		.08	.91		.09	1.02
PRCNT		5.39	54.34		4.15	45.19		4.47	46.02

Table IV-A (Cont'd)

FFT VALUES OF PRECIPITATION (Cont'd)

---A62 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.07			.04			.05	
" PRCNT		52.71			57.89			61.24	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	1.68	.00	.15	1.33	.00	.17	1.38
DIFF		.16	1.73		.09	1.08		.10	1.20
PRCNT		5.86	60.64		4.71	52.80		4.96	53.50

---A62 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		.07			.04			.04	
" PRCNT		47.46			50.09			53.65	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	.25	1.54	.00	.15	1.19	.00	.17	1.23
DIFF		.18	1.92		.11	1.24		.12	1.38
PRCNT		6.28	67.00		5.28	60.27		5.54	61.03

Table V-A

DELTA PACKING SCHEMES OF SIGNIFICANT WAVE HEIGHT

---B53 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		19.77			30.65			41.36	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.91	20.94	.00	6.60	23.42	.00	7.05	27.24

---B53 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		19.04			29.62			40.03	
" PRCNT		96.10			96.58			96.49	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.97	20.99	.00	6.68	23.58	.00	7.14	27.21
DIFF		.36	8.25		.29	11.06		.43	14.39
PRCNT		1.78	41.26		1.24	47.49		1.65	52.45

---B53 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.79			29.06			39.30	
" PRCNT		94.78			94.74			94.43	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	6.01	20.79	.00	6.61	23.95	.00	7.20	27.41
DIFF		.65	11.22		.51	11.64		.80	15.45
PRCNT		3.24	55.75		2.22	50.37		3.06	56.80

---B53 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.50			27.59			39.35	
" PRCNT		93.31			89.69			94.86	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	6.36	20.95	.00	6.91	23.72	.00	7.67	27.55
DIFF		.86	9.21		.66	9.71		1.15	15.25
PRCNT		4.27	45.89		2.90	41.24		4.39	57.65

---B53 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.49			28.48			39.06	
" PRCNT		92.98			92.93			93.84	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	6.03	20.39	.00	6.65	23.57	.00	7.20	26.44
DIFF		.95	11.08		.72	11.44		1.14	17.16
PRCNT		4.72	55.10		3.13	49.25		4.36	64.25

Table VI-A

FFT VALUES OF SIGNIFICANT WAVE HEIGHT

---B53 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		19.77			30.65			41.36	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.91	20.94	.00	6.60	23.42	.00	7.05	27.24

FFT VALUES OF SIGNIFICANT WAVE HEIGHT

---B53 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		19.25			29.98			40.47	
" PRCNT		97.28			97.78			97.62	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.94	21.04	.00	6.64	23.63	.00	7.09	27.70
DIFF		.24	1.39		.23	1.88		.41	2.55
PRCNT		1.21	6.93		1.01	8.03		1.55	9.57

---B53 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.99			29.70			40.13	
" PRCNT		95.92			96.84			96.73	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.95	21.14	.00	6.66	23.81	.00	7.11	28.18
DIFF		.35	2.82		.29	3.42		.51	3.93
PRCNT		1.77	14.14		1.27	14.65		1.93	14.46

---B53 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.82			29.55			39.75	
" PRCNT		95.03			96.35			95.73	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.95	21.31	.00	6.66	23.83	.00	7.12	28.36
DIFF		.42	4.11		.33	4.83		.56	5.51
PRCNT		2.10	20.57		1.42	20.76		2.13	20.16

---B53 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.69			29.43			39.56	
" PRCNT		94.35			95.96			95.24	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.95	21.42	.00	6.66	23.92	.00	7.12	28.52
DIFF		.47	5.14		.36	5.88		.61	6.80
PRCNT		2.34	25.68		1.57	25.26		2.34	24.81

Table VI-A (Cont'd)

FFT VALUES OF SIGNIFICANT WAVE HEIGHT (Cont'd)

---B53 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.50			29.31			39.34	
" PRCNT		93.34			95.52			94.65	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.95	21.41	.00	6.66	23.94	.00	7.12	28.53
DIFF		.53	6.14		.40	6.48		.66	8.14
PRCNT		2.63	30.70		1.73	27.88		2.50	29.71

---B53 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.36			29.18			39.11	
" PRCNT		92.57			95.09			94.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.96	21.17	.00	6.66	23.94	.00	7.13	28.57
DIFF		.58	6.69		.43	6.86		.72	8.90
PRCNT		2.89	33.41		1.89	29.49		2.76	32.54

---B53 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.27			28.98			38.82	
" PRCNT		92.06			94.44			93.27	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.95	20.93	.00	6.67	23.86	.00	7.13	28.21
DIFF		.64	6.96		.48	7.42		.77	10.28
PRCNT		3.16	34.85		2.08	31.96		2.95	37.54

---B53 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		18.04			28.82			38.61	
" PRCNT		90.86			93.88			92.71	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.96	20.75	.00	6.67	23.75	.00	7.12	27.92
DIFF		.71	7.43		.53	8.12		.86	11.04
PRCNT		3.53	37.16		2.32	34.99		3.27	40.33

---B53 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		17.64			28.61			38.09	
" PRCNT		88.73			93.20			91.35	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.96	20.39	.00	6.67	23.74	.00	7.13	27.63
DIFF		.79	7.74		.59	8.59		.94	12.13
PRCNT		3.94	38.64		2.56	37.01		3.55	44.39

Table VI-A (Cont'd)

FFT VALUES OF SIGNIFICANT WAVE HEIGHT (Cont'd)

---B53 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		17.48			28.22			37.81	
" PRCNT		87.90			91.89			90.65	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.96	20.27	.00	6.69	23.53	.00	7.13	26.89
DIFF		.89	8.39		.68	9.06		1.07	12.65
PRCNT		4.42	41.83		2.98	38.97		4.08	46.37

---B53 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		17.08			27.74			36.80	
" PRCNT		85.78			90.24			88.00	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	.00	5.96	20.05	.00	6.69	23.15	.00	7.15	26.02
DIFF		1.03	9.01		.81	9.45		1.25	13.53
PRCNT		5.12	44.96		3.55	40.60		4.75	49.70

Table VII-A

DELTA PACKING SCHEMES OF 1000 MB HEIGHT ANOMALY

---C00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3600.71			5865.79			8035.57	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.86	-5.42	196.77	-276.74	4.46	173.28	-319.13	1.59	189.45

---C00 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3597.76			5851.[illegible]7			8023.20	
" PRCNT		99.91			99.[illegible]			99.82	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.40	-5.50	196.74	-274.02	4.32	172.42	-316.37	1.50	188.99
DIFF		.98	11.06		1.29	17.39		1.50	23.73
PRCNT		.27	3.02		.30	3.92		.30	4.87

---C00 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3591.02			5855.99			8002.61	
" PRCNT		99.71			99.77			99.54	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.38	-5.42	196.02	-273.11	4.46	173.10	-314.99	1.57	188.47
DIFF		1.81	17.53		2.21	24.14		2.56	28.91
PRCNT		.50	4.77		.50	5.47		.52	5.83

---C00 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3584.88			5821.61			7988.15	
" PRCNT		99.55			99.19			99.39	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-175.94	-5.39	194.73	-268.17	4.49	171.73	-312.45	1.72	187.15
DIFF		2.41	21.31		2.63	34.02		3.01	38.38
PRCNT		.66	5.76		.60	7.55		.61	7.80

---C00 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3574.43			5790.36			8026.10	
" PRCNT		99.29			98.50			99.86	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-175.58	-5.68	193.61	-260.30	4.50	171.67	-298.02	1.33	186.85
DIFF		4.51	31.86		5.64	49.61		6.95	77.91
PRCNT		1.24	8.67		1.29	11.31		1.40	15.66

Table VIII-A

FFT VALUES OF 1000 MB HEIGHT ANOMALY

---C00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3603.04			5869.86			8041.65	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.82	-5.42	196.70	-276.52	4.43	173.14	-319.49	1.59	189.31

---C00 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3603.84			5870.49			8042.07	
" PRCNT		100.02			100.01			100.00	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.53	-5.42	196.70	-276.44	4.43	173.19	-319.37	1.59	189.35
DIFF		.43	1.76		.38	1.38		.37	1.37
PRCNT		.12	.48		.09	.31		.07	.27

---C00 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3604.55			5871.13			8042.60	
" PRCNT		100.04			100.02			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-177.25	-5.42	197.09	-276.43	4.43	173.08	-319.31	1.59	189.54
DIFF		.58	3.12		.53	2.31		.53	2.28
PRCNT		.16	.85		.12	.52		.11	.46

---C00 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3604.99			5871.74			8042.95	
" PRCNT		100.06			100.02			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-176.87	-5.42	197.46	-276.38	4.43	173.17	-319.50	1.59	189.66
DIFF		.68	4.35		.66	3.29		.68	3.41
PRCNT		.19	1.19		.15	.74		.14	.69

---C00 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3605.62			5872.20			8043.09	
" PRCNT		100.08			100.03			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-176.49	-5.42	197.81	-276.29	4.43	173.63	-319.46	1.59	189.88
DIFF		.80	5.69		.81	4.39		.86	4.45
PRCNT		.22	1.56		.19	.99		.17	.90

Table VIII-A (Cont'd)

FFT VALUES OF 1000 MB HEIGHT ANOMALY (Cont'd)

---C00 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3606.27			5872.51			8042.89	
" PRCNT		100.10			100.03			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-175.95	-5.42	198.25	-276.31	4.43	173.42	-319.34	1.59	189.89
DIFF		.96	7.17		1.00	5.49		1.10	5.90
PRCNT		.26	1.96		.23	1.24		.22	1.20

---C00 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3606.49			5872.76			8041.95	
" PRCNT		100.10			100.03			99.99	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-175.49	-5.42	198.53	-276.03	4.43	173.17	-318.83	1.59	190.15
DIFF		1.19	8.64		1.25	7.06		1.46	8.15
PRCNT		.32	2.36		.29	1.61		.29	1.66

---C00 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3605.48			5872.64			8040.27	
" PRCNT		100.08			100.02			99.97	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-174.83	-5.42	198.92	-275.33	4.43	173.25	-318.07	1.59	189.46
DIFF		1.51	10.04		1.71	9.25		2.02	10.88
PRCNT		.41	2.74		.39	2.11		.41	2.21

---C00 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3603.16			5870.58			8034.99	
" PRCNT		100.01			99.97			99.89	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-173.92	-5.42	198.79	-274.41	4.43	173.32	-315.95	1.59	189.81
DIFF		2.06	12.38		2.40	12.25		2.84	15.41
PRCNT		.56	3.37		.55	2.81		.58	3.13

---C00 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3600.24			5863.57			8021.57	
" PRCNT		99.93			99.83			99.71	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-172.94	-5.42	198.63	-272.62	4.43	173.72	-311.34	1.59	190.11
DIFF		2.77	14.93		3.33	16.90		3.98	22.20
PRCNT		.76	4.07		.76	3.90		.80	4.51

Table VIII-A (Cont'd)

FFT VALUES OF 1000 MB HEIGHT ANOMALY (Cont'd)

---C00 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3597.76			5845.60			7996.37	
" PRCNT		99.87			99.53			99.37	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-171.94	-5.42	198.46	-268.39	4.43	172.49	-303.56	1.59	189.87
DIFF		3.72	19.39		4.58	23.54		5.47	30.77
PRCNT		1.02	5.29		1.04	5.43		1.10	6.21

---C00 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		3578.47			5809.63			7955.49	
" PRCNT		99.31			98.83			98.84	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-167.55	-5.42	197.04	-260.02	4.43	171.17	-290.81	1.59	190.52
DIFF		4.86	25.52		6.51	35.26		7.77	46.59
PRCNT		1.33	6.93		1.49	8.17		1.56	9.24

Table IX-A

DELTA PACKING SCHEMES OF 500 MB HEIGHT ANOMALY

---F00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27626.73			79388.95			98369.24	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.20	192.34	328.47	-547.09	4.31	311.32	-629.72	-3.18	317.12

---F00 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27614.77			79386.88			98407.05	
" PRCNT		99.95			100.00			100.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.36	192.32	327.65	-546.17	4.26	311.15	-628.95	-3.07	316.06
DIFF		1.22	13.29		1.54	18.00		1.71	21.31
PRCNT		.15	1.66		.18	2.09		.18	2.25

---F00 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27620.26			79372.68			98502.64	
" PRCNT		99.98			99.98			100.14	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.24	192.48	327.91	-546.16	4.36	310.79	-629.06	-3.22	316.07
DIFF		1.94	21.50		2.23	23.40		2.49	26.48
PRCNT		.24	2.68		.26	2.74		.26	2.79

---F00 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27606.44			79331.15			98353.32	
" PRCNT		99.92			99.93			99.99	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-474.52	192.25	325.50	-544.53	4.25	310.71	-628.86	-3.20	315.91
DIFF		2.32	21.59		2.62	35.83		2.84	41.68
PRCNT		.29	2.69		.31	4.15		.30	4.40

---F00 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27557.21			79479.39			98647.37	
" PRCNT		99.70			100.13			100.28	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-472.86	192.40	325.23	-543.14	3.93	309.39	-626.47	-3.52	315.44
DIFF		4.61	45.51		6.07	53.68		6.76	59.18
PRCNT		.58	5.68		.71	6.25		.71	6.25

Table X-A

FFT VALUES OF 500 MB HEIGHT ANOMALY

---F00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27630.87			79379.47			98353.56	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.21	192.35	328.42	-546.96	4.33	311.39	-629.59	-3.19	317.17

---F00 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27631.19			79388.60			98358.32	
" PRCNT		100.00			100.01			100.00	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.64	192.35	328.23	-547.28	4.33	311.40	-629.67	-3.19	317.29
DIFF		.40	1.76		.49	1.81		.49	1.87
PRCNT		.05	.22		.06	.21		.05	.20

---F00 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27630.29			79398.59			98368.06	
" PRCNT		100.00			100.02			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.73	192.35	328.42	-547.39	4.33	311.25	-629.73	-3.19	317.22
DIFF		.55	3.06		.68	3.10		.69	3.07
PRCNT		.07	.38		.08	.36		.07	.32

---F00 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27630.25			79410.53			98378.71	
" PRCNT		99.99			100.04			100.02	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.06	192.35	328.29	-547.52	4.33	311.39	-629.94	-3.19	317.05
DIFF		.68	4.45		.84	4.42		.86	4.47
PRCNT		.08	.55		.10	.52		.09	.47

---F00 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		27630.90			79421.16			98390.51	
" PRCNT		99.99			100.05			100.03	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.52	192.35	328.20	-547.51	4.33	311.26	-630.00	-3.19	317.10
DIFF		.82	5.82		1.00	5.95		1.06	5.92
PRCNT		10	.72		.12	.70		.11	.62

Table X-A (Cont'd)

FFT VALUES OF 500 MB HEIGHT ANOMALY (Cont'd)

---F00 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27630.63			79433.03			98405.21		
" PRCNT	99.99			100.06			100.05		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.75	192.35	328.26	-547.48	4.33	311.25	-630.37	-3.19	317.16
DIFF		.97	7.34		1.20	7.67		1.30	7.58
PRCNT		.12	.92		.14	.90		.14	.80

---F00 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27628.17			79444.26			98426.65		
" PRCNT	99.98			100.08			100.07		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.84	192.35	328.24	-547.43	4.33	311.03	-630.54	-3.19	316.77
DIFF		1.22	9.26		1.50	9.48		1.61	9.70
PRCNT		.15	1.15		.18	1.11		.17	1.02

---F00 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27621.89			79459.79			98446.53		
" PRCNT	99.96			100.10			100.09		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.91	192.35	328.20	-547.39	4.33	310.87	-630.29	-3.19	317.04
DIFF		1.60	11.46		1.93	11.83		2.08	11.96
PRCNT		.20	1.43		.23	1.38		.22	1.26

---F00 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27609.56			79473.10			98463.58		
" PRCNT	99.91			100.11			100.10		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-477.31	192.35	327.09	-546.57	4.33	310.34	-630.32	-3.19	316.58
DIFF		2.16	14.12		2.55	14.56		2.80	15.18
PRCNT		.27	1.76		.30	1.70		.30	1.60

---F00 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27586.97			79494.40			98491.00		
" PRCNT	99.83			100.14			100.13		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-476.35	192.35	326.04	-545.18	4.33	310.88	-630.55	-3.19	316.88
DIFF		3.01	18.49		3.49	18.38		3.87	19.79
PRCNT		.38	2.31		.41	2.15		.41	2.09

Table X-A (Cont'd)

FFT VALUES OF 500 MB HEIGHT ANOMALY (Cont'd)

---FOO WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27546.45			79522.85			98556.09		
" PRCNT	99.67			100.18			100.19		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-473.44	192.35	325.77	-543.21	4.33	311.49	-629.35	-3.19	317.48
DIFF		4.24	24.23		5.03	25.69		5.45	28.16
PRCNT		.53	3.03		.59	3.01		.58	2.97

---FOO WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	27490.65			79600.96			98700.20		
" PRCNT	99.46			100.27			100.34		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-469.94	192.35	323.87	-542.85	4.33	312.22	-625.72	-3.19	318.23
DIFF		5.81	33.62		7.12	39.50		8.23	41.12
PRCNT		.73	4.20		.83	4.62		.87	4.33

Table XI-A

DELTA PACKING SCHEMES OF 300 MB HEIGHT ANOMALY

---H00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77461.71			191832.43			221685.54		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.41	358.35	568.93	-790.35	16.60	509.42	-907.26	11.49	533.91

---H00 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77475.72			191833.94			221734.60		
" PRCNT	100.02			100.00			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.67	358.72	569.00	-792.14	16.62	508.99	-906.49	11.69	532.62
DIFF		2.00	17.80		2.11	24.06		2.39	28.01
PRCNT		.16	1.45		.16	1.85		.17	1.94

---H00 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77514.83			192003.86			221931.80		
" PRCNT	100.07			100.09			100.11		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.87	358.42	568.55	-792.51	16.41	508.84	-908.42	11.24	531.18
DIFF		2.82	27.33		3.20	31.62		3.51	34.45
PRCNT		.23	2.22		.25	2.44		.24	2.39

---H00 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77406.72			191754.19			221630.59		
" PRCNT	99.93			99.96			99.98		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.21	358.39	563.21	-790.20	16.47	509.17	-907.85	11.27	532.72
DIFF		3.53	28.65		3.92	41.34		4.07	52.54
PRCNT		.29	2.32		.30	3.18		.28	3.66

---H00 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77686.67			192014.76			222006.50		
" PRCNT	100.25			100.11			100.15		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-667.75	358.51	562.56	-790.31	16.18	508.94	-905.73	11.79	528.35
DIFF		6.68	58.74		8.59	68.29		9.09	70.51
PRCNT		.54	4.76		.66	5.27		.63	4.90

Table XII-A

FFT VALUES OF 300 MB HEIGHT ANOMALY

---H00 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77462.43			191784.83			221634.40		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.33	358.38	569.11	-790.30	16.61	509.42	-907.22	11.52	533.68

---H00 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77470.46			191804.36			221645.30		
" PRCNT	100.01			100.01			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-665.39	358.38	569.06	-790.85	16.61	509.89	-907.55	11.52	533.82
DIFF		.57	2.47		.67	2.59		.70	2.60
PRCNT		.05	.20		.05	.20		.05	.18

---H00 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77476.86			191830.17			221663.46		
" PRCNT	100.02			100.02			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-666.17	358.38	569.02	-791.26	16.61	510.39	-907.56	11.52	533.67
DIFF		.79	4.23		1.00	4.37		.98	4.25
PRCNT		.06	.34		.08	.34		.07	.29

---H00 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77484.61			191865.25			221690.03		
" PRCNT	100.03			100.04			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-666.95	358.38	569.02	-791.76	16.61	510.95	-907.74	11.52	533.84
DIFF		1.01	6.15		1.30	6.33		1.25	6.30
PRCNT		.08	.50		.10	.49		.09	.44

---H00 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77497.55			191897.51			221717.08		
" PRCNT	100.04			100.06			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-667.87	358.38	569.17	-792.02	16.61	511.12	-908.17	11.52	533.94
DIFF		1.26	8.21		1.57	8.36		1.56	8.26
PRCNT		.10	.66		.12	.65		.11	.57

Table XII-A (Cont'd)

FFT VALUES OF 300 MB HEIGHT ANOMALY (Cont'd)

---H00 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		77509.65			191934.36			221755.13	
* PRCNT		100.06			100.07			100.05	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-668.87	358.38	568.65	-792.13	16.61	511.75	-908.66	11.52	533.79
DIFF		1.51	10.43		1.89	10.78		1.89	10.50
PRCNT		.12	.85		.15	.83		.13	.73

---H00 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		77517.98			191976.10			221791.03	
* PRCNT		100.07			100.10			100.07	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-669.44	358.38	569.10	-792.38	16.61	512.06	-909.28	11.52	533.36
DIFF		1.86	12.88		2.33	13.33		2.34	13.64
PRCNT		.15	1.04		.18	1.03		.16	.94

---H00 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		77506.89			192026.01			221821.96	
* PRCNT		100.05			100.12			100.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-669.36	358.38	568.41	-792.66	16.61	512.41	-909.10	11.52	532.91
DIFF		2.47	15.43		2.92	16.18		2.90	16.22
PRCNT		.20	1.25		.23	1.25		.20	1.12

---H00 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		77489.32			192068.15			221863.51	
* PRCNT		100.03			100.14			100.10	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-667.98	358.38	568.00	-792.08	16.61	513.12	-908.38	11.52	533.03
DIFF		3.31	19.14		3.80	19.43		3.89	20.74
PRCNT		.27	1.55		.29	1.50		.27	1.44

---H00 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		77460.20			192129.74			221903.80	
* PRCNT		99.99			100.17			100.11	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-666.99	358.38	566.81	-792.76	16.61	514.94	-908.08	11.52	532.94
DIFF		4.66	25.05		5.04	24.52		5.22	26.07
PRCNT		.38	2.04		.39	1.90		.36	1.81

Table XII-A (Cont'd)

FFT VALUES OF 300 MB HEIGHT ANOMALY (Cont'd)

---H00 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77444.78			192260.89			222019.62		
" PRCNT	99.97			100.24			100.16		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-665.53	358.38	564.13	-791.94	16.61	516.15	-907.87	11.52	533.75
DIFF		6.36	32.53		7.04	33.78		7.25	35.24
PRCNT		.52	2.65		.54	2.61		.50	2.45

---H00 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	77389.48			192445.21			222290.37		
" PRCNT	99.88			100.33			100.28		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-664.74	358.38	560.22	-790.52	16.61	517.83	-905.67	11.52	533.53
DIFF		8.47	44.89		9.93	50.40		10.53	49.61
PRCNT		.69	3.65		.77	3.90		.73	3.44

Table XIII-A

DELTA PACKING SCHEMES OF 1000 MB TEMPERATURE

---C10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.07			216.86			232.35	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.49	22.10	37.67	-23.16	10.68	29.73	-24.93	10.65	32.90

---C10 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		120.83			216.65			231.98	
" PRCNT		99.81			99.90			99.84	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.32	22.09	37.55	-23.07	10.67	29.65	-24.95	10.64	32.68
DIFF		.17	2.35		.20	3.13		.21	2.96
PRCNT		.32	4.43		.38	5.92		.37	5.15

---C10 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		120.29			216.80			232.57	
" PRCNT		99.37			99.97			100.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.36	22.10	37.47	-23.13	10.69	29.68	-24.94	10.64	32.74
DIFF		.31	3.41		.37	4.05		.39	3.83
PRCNT		.59	6.45		.70	7.67		.67	6.66

---C10 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		120.70			216.35			231.73	
" PRCNT		99.69			99.76			99.74	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-14.82	22.09	37.29	-23.55	10.69	29.31	-25.22	10.66	32.91
DIFF		.42	3.74		.43	4.62		.47	4.49
PRCNT		.80	7.11		.81	8.77		.81	7.78

---C10 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		120.37			217.55			231.89	
" PRCNT		99.41			100.30			99.73	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-14.80	22.14	36.89	-23.35	10.69	29.32	-25.14	10.64	32.55
DIFF		.75	5.12		.87	7.04		.93	7.34
PRCNT		1.41	9.69		1.64	13.32		1.61	12.75

Table XIV-A

FFT VALUES OF 1000 MB TEMPERATURE

---C10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.25			216.92			232.32	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.53	22.10	37.65	-23.18	10.69	29.72	-24.97	10.65	32.91

---C10 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.29			216.94			232.35	
" PRCNT		100.04			100.01			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.62	22.10	37.68	-23.17	10.69	29.70	-24.99	10.65	32.90
DIFF		.05	.25		.05	.20		.06	.22
PRCNT		.10	.46		.10	.39		.10	.37

---C10 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.34			216.97			232.40	
" PRCNT		100.07			100.02			100.03	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.74	22.10	37.71	-23.17	10.69	29.70	-24.98	10.65	32.93
DIFF		.07	.44		.08	.35		.08	.35
PRCNT		.14	.83		.15	.67		.15	.60

---C10 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.38			217.02			232.46	
" PRCNT		100.11			100.04			100.06	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.83	22.10	37.72	-23.19	10.69	29.69	-25.00	10.65	32.95
DIFF		.09	.60		.10	.50		.11	.52
PRCNT		.17	1.13		.19	.95		.19	.90

---C10 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		121.42			217.05			232.53	
" PRCNT		100.14			100.06			100.09	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.88	22.10	37.72	-23.21	10.69	29.65	-25.02	10.65	32.92
DIFF		.11	.75		.13	.69		.14	.69
PRCNT		.21	1.42		.24	1.30		.25	1.20

Table XIV-A (Cont'd)

FFT VALUES OF 1000 MB TEMPERATURE (Cont'd)

---C10 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.47			217.12			232.57		
" PRCNT	100.18			100.09			100.11		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.94	22.10	37.69	-23.23	10.69	29.67	-25.04	10.65	32.89
DIFF		.14	.94		.17	.91		.18	.89
PRCNT		.26	1.76		.32	1.73		.31	1.54

---C10 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.50			217.11			232.62		
" PRCNT	100.20			100.08			100.13		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.99	22.10	37.66	-23.25	10.69	29.64	-25.04	10.65	32.83
DIFF		.18	1.20		.22	1.20		.24	1.18
PRCNT		.34	2.27		.41	2.28		.41	2.05

---C10 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.47			217.15			232.65		
" PRCNT	100.18			100.09			100.14		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.94	22.10	37.75	-23.36	10.69	29.62	-25.12	10.65	32.75
DIFF		.24	1.48		.30	1.62		.32	1.59
PRCNT		.45	2.79		.57	3.07		.55	2.76

---C10 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.40			217.12			232.53		
" PRCNT	100.12			100.08			100.08		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.79	22.10	37.80	-23.42	10.69	29.59	-25.10	10.65	32.75
DIFF		.34	1.89		.40	2.13		.43	2.14
PRCNT		.64	3.56		.76	4.04		.75	3.72

---C10 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.30			216.83			232.37		
" PRCNT	100.04			99.95			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-15.36	22.10	37.83	-23.55	10.69	29.52	-25.07	10.65	32.69
DIFF		.46	2.44		.53	2.91		.58	2.83
PRCNT		.88	4.61		1.00	5.51		1.00	4.92

Table XIV-A (Cont'd)

FFT VALUES OF 1000 MB TEMPERATURE (Cont'd)

---C10 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	121.11			216.81			232.42		
* PRCNT	99.88			99.93			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-14.72	22.10	37.56	-23.62	10.69	29.42	-24.95	10.65	32.29
DIFF		.64	3.49		.70	3.80		.76	3.86
PRCNT		1.21	6.61		1.33	7.18		1.32	6.69

---C10 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	120.66			217.08			232.10		
* PRCNT	99.49			100.03			99.87		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-13.95	22.10	37.23	-23.35	10.69	29.54	-24.77	10.65	32.09
DIFF		.86	4.91		.93	4.96		.98	4.84
PRCNT		1.62	9.28		1.77	9.42		1.70	8.39

Table XV-A

DELTA PACKING SCHEMES OF 850 MB TEMPERATURE

---D10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.84			175.21			197.46	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.50	13.88	25.96	-25.14	3.74	20.14	-27.46	3.49	21.67

---D10 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.74			175.14			197.37	
" PRCNT		99.90			99.96			99.95	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.39	13.88	25.84	-25.08	3.74	20.07	-27.45	3.49	21.60
DIFF		.10	1.27		.12	1.86		.13	1.78
PRCNT		.23	2.80		.26	4.11		.27	3.64

---D10 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.54			175.03			197.79	
" PRCNT		99.70			99.90			100.17	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.38	13.89	25.79	-25.07	3.74	20.06	-27.40	3.46	21.60
DIFF		.19	1.93		.22	2.35		.24	2.35
PRCNT		.41	4.27		.48	5.22		.49	4.81

---D10 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.67			175.04			197.18	
" PRCNT		99.83			99.90			99.86	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.24	13.89	25.65	-25.25	3.74	20.01	-27.56	3.49	21.59
DIFF		.25	2.15		.26	3.02		.28	2.88
PRCNT		.55	4.77		.58	6.68		.58	5.85

---D10 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.67			175.66			197.48	
" PRCNT		99.82			100.23			99.96	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.28	13.92	25.34	-25.14	3.73	20.05	-27.56	3.49	21.50
DIFF		.46	3.31		.54	4.22		.58	4.81
PRCNT		1.01	7.32		1.21	9.34		1.18	9.77

Table XVI-A

FFT VALUES OF 850 MB TEMPERATURE

---D10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.90			175.25			197.38	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.51	13.88	25.95	-25.14	3.74	20.13	-27.46	3.48	21.67

---D10 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.93			175.28			197.39	
" PRCNT		100.03			100.01			100.00	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.58	13.88	25.97	-25.16	3.74	20.14	-27.46	3.48	21.67
DIFF		.04	.17		.03	.13		.03	.13
PRCNT		.08	.37		.08	.29		.07	.27

---D10 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.97			175.31			197.42	
" PRCNT		100.07			100.03			100.02	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.66	13.88	26.00	-25.18	3.74	20.16	-27.46	3.48	21.67
DIFF		.05	.30		.05	.21		.05	.22
PRCNT		.11	.65		.11	.48		.11	.46

---D10 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.00			175.33			197.45	
" PRCNT		100.10			100.04			100.03	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.73	13.88	26.01	-25.21	3.74	20.17	-27.47	3.48	21.68
DIFF		.06	.41		.06	.30		.07	.32
PRCNT		.13	.91		.14	.66		.14	.66

---D10 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.04			175.35			197.50	
" PRCNT		100.14			100.06			100.06	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.79	13.88	26.00	-25.22	3.74	20.17	-27.48	3.48	21.67
DIFF		.07	.52		.08	.40		.09	.42
PRCNT		.16	1.15		.17	.88		.17	.86

Table XVI-A (Cont'd)

FFT VALUES OF 850 MB TEMPERATURE (Cont'd)

---D10 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.08			175.39			197.53	
" PRCNT		100.18			100.08			100.07	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.84	13.88	25.99	-25.25	3.74	20.18	-27.52	3.48	21.67
DIFF		.09	.66		.10	.53		.11	.55
PRCNT		.20	1.46		.22	1.18		.22	1.12

---D10 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.11			175.40			197.58	
" PRCNT		100.21			100.08			100.10	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.89	13.88	25.98	-25.26	3.74	20.20	-27.54	3.48	21.67
DIFF		.12	.83		.13	.70		.14	.73
PRCNT		.26	1.83		.28	1.56		.29	1.50

---D10 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.11			175.44			197.62	
" PRCNT		100.21			100.10			100.11	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.85	13.88	25.99	-25.30	3.74	20.20	-27.56	3.48	21.66
DIFF		.15	.98		.18	.92		.19	.98
PRCNT		.33	2.17		.40	2.03		.40	1.99

---D10 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.12			175.44			197.59	
" PRCNT		100.22			100.10			100.10	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.78	13.88	25.97	-25.29	3.74	20.24	-27.57	3.48	21.65
DIFF		.21	1.24		.24	1.23		.26	1.31
PRCNT		.46	2.73		.53	2.73		.54	2.67

---D10 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.12			175.32			197.56	
" PRCNT		100.22			100.03			100.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.60	13.88	25.98	-25.29	3.74	20.27	-27.55	3.48	21.77
DIFF		.28	1.58		.32	1.67		.36	1.83
PRCNT		.62	3.49		.70	3.69		.74	3.73

Table XVI-A (Cont'd)

FFT VALUES OF 850 MB TEMPERATURE (Cont'd)

---D10 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		99.06			175.36			197.67	
" PRCNT		100.15			100.05			100.13	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-19.32	13.88	25.78	-25.34	3.74	20.34	-27.50	3.48	21.56
DIFF		.39	2.14		.43	2.25		.48	2.49
PRCNT		.87	4.72		.96	4.98		.97	5.08

---D10 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		98.87			175.64			197.65	
" PRCNT		99.95			100.19			100.12	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-18.97	13.88	25.55	-25.27	3.74	20.53	-27.47	3.48	21.57
DIFF		.52	2.94		.60	3.10		.63	3.33
PRCNT		1.16	6.48		1.33	6.89		1.28	6.78

Table XVII-A

DELTA PACKING SCHEMES OF 500 MB TEMPERATURE

---F10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.43			133.82			150.62	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-39.97	-9.50	-2.86	-41.15	-19.35	-4.56	-44.91	-19.42	-4.27

---F10 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.41			133.76			150.58	
" PRCNT		99.97			99.96			99.97	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-39.97	-9.50	-2.89	-41.20	-19.34	-4.56	-44.93	-19.42	-4.29
DIFF		.07	.90		.09	1.17		.09	1.15
PRCNT		.20	2.42		.24	3.21		.22	2.83

---F10 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.41			133.80			150.59	
" PRCNT		99.96			99.97			99.98	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.01	-9.50	-2.94	-41.21	-19.35	-4.55	-44.92	-19.43	-4.29
DIFF		.13	1.48		.15	1.56		.16	1.63
PRCNT		.35	4.03		.40	4.29		.39	4.04

---F10 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.33			133.69			150.48	
" PRCNT		99.85			99.90			99.90	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-39.84	-9.52	-3.01	-41.02	-19.34	-4.61	-44.91	-19.43	-4.34
DIFF		.16	1.40		.19	1.97		.18	2.07
PRCNT		.43	3.77		.51	5.38		.45	5.12

---F10 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.44			133.69			150.21	
" PRCNT		100.02			99.91			99.75	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.13	-9.50	-3.10	-41.05	-19.36	-4.57	-44.94	-19.42	-4.33
DIFF		.31	2.78		.41	3.39		.39	3.13
PRCNT		.83	7.50		1.13	9.29		.96	7.72

Table XVIII-A

FFT VALUES OF 500 MB TEMPERATURE

---F10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.44			133.73			150.55		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.01	-9.50	-2.86	-41.15	-19.35	-4.54	-44.94	-19.42	-4.27

---F10 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.46			133.74			150.56		
" PRCNT	100.02			100.01			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.04	-9.50	-2.84	-41.16	-19.35	-4.53	-44.94	-19.42	-4.25
DIFF		.02	.10		.02	.10		.03	.10
PRCNT		.06	.28		.06	.28		.06	.24

---F10 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.47			133.76			150.56		
" PRCNT	100.05			100.03			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.08	-9.50	-2.84	-41.17	-19.35	-4.51	-44.94	-19.42	-4.25
DIFF		.03	.18		.04	.16		.04	.15
PRCNT		.08	.48		.10	.44		.09	.38

---F10 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.49			133.79			150.58		
" PRCNT	100.07			100.05			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.13	-9.50	-2.84	-41.18	-19.35	-4.49	-44.95	-19.42	-4.25
DIFF		.04	.26		.05	.23		.05	.22
PRCNT		.10	.69		.12	.63		.11	.54

---F10 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.51			133.82			150.59		
" PRCNT	100.10			100.06			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.17	-9.50	-2.85	-41.20	-19.35	-4.47	-44.95	-19.42	-4.23
DIFF		.05	.33		.06	.31		.06	.29
PRCNT		.13	.90		.15	.85		.14	.73

Table XVIII-A (Cont'd)

FFT VALUES OF 500 MB TEMPERATURE (Cont'd)

---F10 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.53			133.84			150.61		
" PRCNT	100.13			100.08			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.20	-9.50	-2.87	-41.22	-19.35	-4.46	-44.99	-19.42	-4.23
DIFF		.06	.42		.07	.40		.07	.40
PRCNT		.15	1.14		.19	1.11		.17	.98

---F10 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.55			133.87			150.61		
" PRCNT	100.16			100.10			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.22	-9.50	-2.87	-41.22	-19.35	-4.44	-45.03	-19.42	-4.22
DIFF		.07	.52		.09	.52		.09	.52
PRCNT		.19	1.39		.24	1.41		.22	1.28

---F10 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.56			133.90			150.61		
" PRCNT	100.17			100.12			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.22	-9.50	-2.88	-41.22	-19.35	-4.41	-45.01	-19.42	-4.23
DIFF		.10	.63		.12	.66		.12	.65
PRCNT		.26	1.69		.32	1.79		.30	1.61

---F10 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.56			133.88			150.59		
" PRCNT	100.17			100.11			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.16	-9.50	-2.87	-41.20	-19.35	-4.40	-44.97	-19.42	-4.23
DIFF		.14	.80		.16	.84		.17	.83
PRCNT		.37	2.15		.45	2.28		.42	2.07

---F10 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	72.53			133.87			150.56		
" PRCNT	100.12			100.09			99.99		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-40.06	-9.50	-2.89	-41.16	-19.35	-4.35	-44.96	-19.42	-4.21
DIFF		.19	1.06		.23	1.14		.24	1.13
PRCNT		.52	2.86		.63	3.11		.58	2.80

Table XVIII-A (Cont'd)

FFT VALUES OF 500 MB TEMPERATURE (Cont'd)

---F10 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.50			133.92			150.53	
" PRCNT		100.09			100.12			99.97	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-39.95	-9.50	-2.93	-41.08	-19.35	-4.28	-44.92	-19.42	-4.21
DIFF		.26	1.39		.33	1.69		.32	1.60
PRCNT		.71	3.75		.90	4.64		.80	3.95

---F10 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		72.45			133.94			150.42	
" PRCNT		100.02			100.13			99.90	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-39.89	-9.50	-3.06	-41.02	-19.35	-4.26	-44.83	-19.42	-4.10
DIFF		.35	1.94		.45	2.56		.43	2.26
PRCNT		.95	5.24		1.25	7.05		1.07	5.57

Table XIX-A

DELTA PACKING SCHEMES OF 300 MB TEMPERATURE

---H10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		35.04			80.04			74.15	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.43	-34.13	-28.37	-60.46	-44.00	-30.79	-60.28	-43.68	-30.45

---H10 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		35.10			80.06			74.12	
" PRCNT		100.17			100.02			99.95	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.45	-34.13	-28.39	-60.47	-43.99	-30.79	-60.32	-43.67	-30.48
DIFF		.08	.91		.08	1.07		.08	1.12
PRCNT		.30	3.49		.28	3.60		.27	3.75

---H10 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		35.26			80.45			74.23	
" PRCNT		100.61			100.53			100.09	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.54	-34.13	-28.44	-60.53	-44.02	-30.76	-60.32	-43.68	-30.49
DIFF		.14	1.68		.16	1.50		.15	1.50
PRCNT		.54	6.45		.53	5.05		.49	5.04

---H10 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.98			79.94			74.06	
" PRCNT		99.82			99.87			99.88	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.48	-34.13	-28.52	-60.46	-44.00	-30.82	-60.32	-43.67	-30.55
DIFF		.17	1.70		.18	1.83		.18	1.84
PRCNT		.67	6.52		.62	6.18		.61	6.14

---H10 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		35.91			79.86			73.89	
" PRCNT		102.42			99.76			99.61	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.52	-34.15	-28.65	-60.35	-43.99	-30.81	-60.37	-43.67	-30.62
DIFF		.35	3.06		.37	2.69		.36	2.69
PRCNT		1.34	11.81		1.25	9.09		1.19	9.02

Table XX-A

FFT VALUES OF 300 MB TEMPERATURE

---H10 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.74			78.88			73.56	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.36	-34.18	-28.42	-60.43	-44.04	-30.87	-60.24	-43.68	-30.49

---H10 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.75			78.88			73.57	
" PRCNT		100.02			100.00			100.01	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.39	-34.18	-28.43	-60.43	-44.04	-30.86	-60.24	-43.68	-30.49
DIFF		.02	.10		.02	.09		.02	.08
PRCNT		.09	.41		.07	.30		.07	.28

---H10 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.75			78.89			73.58	
" PRCNT		100.04			100.01			100.02	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.42	-34.18	-28.43	-60.43	-44.04	-30.86	-60.25	-43.68	-30.49
DIFF		.03	.16		.03	.13		.03	.13
PRCNT		.12	.63		.11	.45		.10	.43

---H10 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.76			78.90			73.59	
" PRCNT		100.06			100.03			100.04	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.44	-34.18	-28.43	-60.43	-44.04	-30.86	-60.28	-43.68	-30.48
DIFF		.04	.23		.04	.20		.04	.18
PRCNT		.15	.89		.15	.67		.13	.60

---H10 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.77			78.92			73.61	
" PRCNT		100.09			100.05			100.06	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.46	-34.18	-28.43	-60.44	-44.04	-30.84	-60.28	-43.68	-30.47
DIFF		.05	.31		.06	.26		.05	.24
PRCNT		.20	1.20		.19	.90		.17	.80

Table XX-A (Cont'd)

FFT VALUES OF 300 MB TEMPERATURE (Cont'd)

---H10 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.79			78.95			73.63	
" PRCNT		100.13			100.08			100.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.48	-34.18	-28.44	-60.43	-44.04	-30.83	-60.30	-43.68	-30.46
DIFF		.06	.41		.07	.35		.06	.30
PRCNT		.25	1.59		.24	1.18		.22	1.00

---H10 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.79			78.98			73.63	
" PRCNT		100.15			100.13			100.09	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.50	-34.18	-28.45	-60.43	-44.04	-30.80	-60.33	-43.68	-30.47
DIFF		.08	.52		.09	.46		.08	.41
PRCNT		.32	2.02		.31	1.54		.28	1.37

---H10 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.78			79.02			73.63	
" PRCNT		100.12			100.17			100.08	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.48	-34.18	-28.46	-60.41	-44.04	-30.77	-60.34	-43.68	-30.46
DIFF		.11	.67		.12	.61		.11	.57
PRCNT		.44	2.60		.42	2.07		.39	1.91

---H10 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.78			79.05			73.64	
" PRCNT		100.10			100.21			100.10	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.40	-34.18	-28.46	-60.40	-44.04	-30.75	-60.33	-43.68	-30.44
DIFF		.16	.90		.17	.79		.16	.78
PRCNT		.60	3.47		.58	2.69		.54	2.63

---H10 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.79			79.09			73.62	
" PRCNT		100.12			100.26			100.07	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.26	-34.18	-28.49	-60.38	-44.04	-30.69	-60.34	-43.68	-30.47
DIFF		.22	1.24		.23	1.07		.22	1.07
PRCNT		.86	4.76		.77	3.63		.73	3.60

Table XX-A (Cont'd)

FFT VALUES OF 300 MB TEMPERATURE (Cont'd)

---H10 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.85			79.11			73.57	
" PRCNT		100.28			100.27			99.99	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.21	-34.18	-28.52	-60.43	-44.04	-30.73	-60.30	-43.68	-30.51
DIFF		.29	1.68		.30	1.52		.28	1.47
PRCNT		1.10	6.47		1.01	5.14		.95	4.96

---H10 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34.80			79.02			73.47	
" PRCNT		100.14			100.16			99.85	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-54.12	-34.18	-28.63	-60.40	-44.04	-30.76	-60.29	-43.68	-30.53
DIFF		.37	2.08		.38	2.04		.37	1.93
PRCNT		1.42	8.07		1.28	6.94		1.24	6.50

Table XXI-A

DIFFERENCE OF 500 -1000 MB HEIGHT ANOMALY FOR DELTA PACKING SCHEMES

---Y01 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34385.03			63298.54			72630.97		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-440.43	197.88	360.06	-516.10	-.54	307.57	-573.71	-4.84	322.02

---Y01 SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34385.06			63272.35			72622.50		
" PRCNT	100.00			99.95			99.99		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-439.28	197.82	359.40	-514.97	-.06	307.35	-572.72	-4.57	322.06
DIFF		2.30	21.47		2.96	29.90		3.15	27.08
PRCNT		.29	2.69		.36	3.65		.35	3.03

---Y01 SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34349.64			63222.39			72695.54		
" PRCNT	99.89			99.87			100.09		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-439.93	197.91	359.69	-515.27	-.10	307.04	-571.96	-4.79	322.20
DIFF		3.12	30.28		3.98	34.38		4.16	33.66
PRCNT		.39	3.81		.49	4.20		.47	3.76

---Y01 SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34354.88			63256.91			72554.57		
" PRCNT	99.91			99.93			99.90		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-438.32	197.64	357.56	-515.02	-.24	306.68	-573.94	-4.92	321.69
DIFF		3.67	30.07		4.33	42.65		4.53	43.54
PRCNT		.46	3.76		.53	5.20		.51	4.87

---Y01 SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34400.12			63380.69			72590.51		
" PRCNT	100.03			100.12			99.92		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-442.08	198.08	354.08	-514.32	-.56	307.13	-573.43	-4.85	320.52
DIFF		6.31	52.46		8.27	57.83		8.42	69.21
PRCNT		.79	6.58		1.01	7.08		.94	7.75

Table XXII-A

DIFFERENCE OF 500 -1000 MB HEIGHT ANOMALY FOR FFT VALUES

---Y01 (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34385.03			63298.54			72630.97		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-440.43	197.88	360.06	-516.10	-.54	307.57	-573.71	-4.84	322.02

---Y01 WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34414.91			63290.49			72578.04		
" PRCNT	100.08			99.98			99.93		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-441.93	197.77	360.92	-516.18	-.11	307.90	-573.06	-4.77	322.83
DIFF		1.71	11.97		1.98	17.93		2.10	13.17
PRCNT		.21	1.49		.24	2.21		.24	1.49

---Y01 WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34425.24			63300.83			72583.49		
" PRCNT	100.11			99.99			99.94		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-443.04	197.77	361.27	-516.57	-.11	308.26	-573.21	-4.77	322.82
DIFF		1.84	13.07		2.13	18.63		2.25	13.90
PRCNT		.23	1.63		.26	2.30		.25	1.57

---Y01 WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34435.50			63311.98			72593.63		
" PRCNT	100.14			100.01			99.95		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-443.98	197.77	361.31	-516.89	-.11	308.77	-573.34	-4.77	322.80
DIFF		1.95	14.17		2.27	19.49		2.41	14.70
PRCNT		.24	1.76		.28	2.40		.27	1.66

---Y01 WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34446.60			63320.39			72604.75		
" PRCNT	100.17			100.02			99.97		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-444.90	197.77	361.19	-517.13	-.11	308.92	-573.52	-4.77	322.88
DIFF		2.09	15.14		2.42	20.50		2.57	15.52
PRCNT		.26	1.89		.30	2.52		.29	1.75

Table XXII-A (Cont'd)

DIFFERENCE OF 500 -1000 MB HEIGHT ANOMALY FOR FFT VALUES (Cont'd)

---Y01 WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34457.77			63332.25			72615.43		
" PRCNT	100.20			100.04			99.98		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-445.61	197.77	361.03	-517.27	-.11	309.23	-573.96	-4.77	322.61
DIFF		2.25	16.31		2.60	21.38		2.79	16.88
PRCNT		.28	2.03		.32	2.63		.31	1.90

---Y01 WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34466.78			63340.87			72628.16		
" PRCNT	100.23			100.05			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-445.81	197.77	360.80	-517.53	-.11	309.52	-574.20	-4.77	322.75
DIFF		2.48	17.69		2.87	22.32		3.09	18.41
PRCNT		.31	2.20		.35	2.74		.35	2.07

---Y01 WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34472.13			63358.07			72639.73		
" PRCNT	100.24			100.08			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-445.48	197.77	360.34	-517.85	-.11	309.69	-573.70	-4.77	323.46
DIFF		2.82	18.94		3.39	23.89		3.58	20.70
PRCNT		.35	2.37		.42	2.94		.40	2.32

---Y01 WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34479.54			63355.60			72638.12		
" PRCNT	100.26			100.07			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-444.97	197.77	361.25	-517.86	-.11	310.47	-573.88	-4.77	323.50
DIFF		3.44	21.37		4.02	26.25		4.31	23.36
PRCNT		.43	2.67		.49	3.22		.48	2.62

---Y01 WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	34480.54			63337.71			72642.01		
" PRCNT	100.27			100.04			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-443.33	197.77	361.86	-518.20	-.11	312.22	-574.03	-4.77	323.94
DIFF		4.27	24.95		5.03	29.89		5.49	28.59
PRCNT		.54	3.12		.61	3.66		.61	3.20

Table XXII-A (Cont'd)

DIFFERENCE OF 500 -1000 MB HEIGHT ANOMALY FOR FFT VALUES (Cont'd)

---Y01 WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34466.88			63368.75			72682.33	
* PRCNT		100.22			100.09			100.06	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-440.65	197.77	361.70	-518.30	-.11	313.87	-574.22	-4.77	324.14
DIFF		5.60	30.11		6.66	37.28		7.01	37.23
PRCNT		.70	3.77		.81	4.56		.78	4.16

---Y01 WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE		34428.20			63456.34			72680.96	
* PRCNT		100.11			100.22			100.06	
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-438.41	197.77	359.90	-517.38	-.11	316.99	-572.42	-4.77	323.64
DIFF		7.33	40.18		9.12	48.31		9.11	49.01
PRCNT		.92	5.02		1.12	5.94		1.02	5.48

Table XXIII-A

DIFFERENCE OF 300 -500 MB THICKNESS ANOMALY FOR DELTA PACKING SCHEMES

---53T (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13376.19			25698.07			26684.36		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-225.89	166.01	262.58	-277.82	12.29	230.85	-310.52	14.67	238.30

---53T SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13381.26			25693.73			26677.31		
" PRCNT	100.04			99.99			99.98		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-225.70	166.40	262.23	-278.58	12.36	230.93	-310.81	14.76	237.77
DIFF		1.97	12.50		1.92	15.84		2.02	16.26
PRCNT		.40	2.57		.38	3.12		.37	2.97

---53T SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13390.22			25766.21			26688.01		
" PRCNT	100.10			100.26			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-226.37	165.94	260.81	-278.78	12.05	231.07	-310.81	14.46	236.67
DIFF		2.25	18.95		2.38	21.71		2.70	21.05
PRCNT		.46	3.89		.47	4.30		.49	3.85

---53T SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13357.18			25679.52			26662.73		
" PRCNT	99.86			99.92			99.92		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-224.04	166.14	261.07	-276.23	12.22	230.64	-311.86	14.47	237.19
DIFF		2.84	21.47		2.75	23.84		2.92	24.63
PRCNT		.58	4.40		.54	4.69		.53	4.50

---53T SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13492.70			25682.07			26616.35		
" PRCNT	100.85			99.95			99.78		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-227.05	166.11	258.61	-274.66	12.25	231.10	-311.61	15.31	236.26
DIFF		4.91	36.49		5.51	39.36		5.45	36.62
PRCNT		1.00	7.48		1.09	7.80		1.00	6.71

Table XXIV-A

DIFFERENCE OF 300 -500 MB HEIGHT ANOMALY FOR FFT VALUES

---53T (ORIG) ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13376.64			25684.99			26676.27		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-225.84	166.04	262.69	-277.82	12.28	230.76	-310.94	14.71	238.33

---53T WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13379.61			25686.91			26677.66		
" PRCNT	100.02			100.01			100.00		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-226.35	166.04	262.79	-277.99	12.28	230.95	-311.14	14.71	238.37
DIFF		.33	1.47		.32	1.31		.37	1.33
PRCNT		.07	.30		.06	.26		.07	.24

---53T WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13382.64			25690.67			26678.78		
" PRCNT	100.04			100.02			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-226.92	166.04	262.85	-278.17	12.28	231.28	-311.30	14.71	238.27
DIFF		.45	2.47		.52	2.24		.51	2.13
PRCNT		.09	.51		.10	.44		.09	.39

---53T WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13385.73			25696.62			26682.50		
" PRCNT	100.07			100.04			100.02		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-227.41	166.04	262.90	-278.28	12.28	231.58	-311.48	14.71	238.25
DIFF		.58	3.51		.70	3.06		.66	3.02
PRCNT		.12	.72		.14	.61		.12	.55

---53T WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13390.30			25702.21			26685.64		
" PRCNT	100.10			100.06			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-227.89	166.04	263.15	-278.20	12.28	231.83	-311.69	14.71	238.30
DIFF		.73	4.69		.86	4.05		.82	3.90
PRCNT		.15	.96		.17	.80		.15	.71

Table XXIV-A (Cont'd)

DIFFERENCE OF 300 -500 MB HEIGHT ANOMALY FOR FFT VALUES (Cont'd)

---53T WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13395.01			25708.68			26690.90		
" PRCNT	100.14			100.09			100.05		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-228.41	166.04	262.89	-277.84	12.28	232.14	-311.89	14.71	238.13
DIFF		.88	6.10		1.07	5.38		1.00	5.02
PRCNT		.18	1.25		.21	1.06		.18	.92

---53T WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13399.24			25717.03			26690.89		
" PRCNT	100.17			100.12			100.05		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-229.01	166.04	262.62	-277.73	12.28	232.23	-312.23	14.71	237.69
DIFF		1.12	7.66		1.37	7.07		1.32	6.61
PRCNT		.23	1.57		.27	1.40		.24	1.21

---53T WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13397.94			25724.99			26688.89		
" PRCNT	100.16			100.15			100.04		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-228.72	166.04	261.96	-277.65	12.28	232.68	-311.74	14.71	237.61
DIFF		1.51	9.50		1.77	9.34		1.69	8.46
PRCNT		.31	1.95		.35	1.84		.31	1.55

---53T WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13396.75			25730.00			26691.07		
" PRCNT	100.15			100.17			100.05		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-227.71	166.04	262.00	-277.39	12.28	233.23	-311.33	14.71	237.69
DIFF		2.07	11.80		2.36	12.05		2.29	10.77
PRCNT		.43	2.42		.47	2.38		.42	1.97

---53T WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13394.54			25734.91			26684.73		
" PRCNT	100.13			100.18			100.03		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-226.12	166.04	261.02	-276.51	12.28	234.23	-311.86	14.71	237.46
DIFF		2.95	15.23		3.17	15.33		3.02	14.37
PRCNT		.61	3.13		.63	3.03		.55	2.63

Table XXIV-A (Cont'd)

DIFFERENCE OF 300 -500 MB HEIGHT ANOMALY FOR FFT VALUES (Cont'd)

---53T WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13406.44			25756.96			26679.02		
" PRCNT	100.22			100.26			100.01		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-224.84	166.04	261.11	-277.06	12.28	234.31	-311.30	14.71	237.89
DIFF		3.93	19.94		4.24	19.84		3.95	19.37
PRCNT		.81	4.09		.84	3.93		.72	3.54

---53T WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
VARIANCE	13407.54			25763.22			26674.12		
" PRCNT	100.22			100.28			99.99		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
FIELD	-223.85	166.04	258.68	-276.75	12.28	234.43	-310.24	14.71	238.13
DIFF		5.08	25.56		5.59	27.47		5.15	24.76
PRCNT		1.04	5.24		1.11	5.44		.94	4.52

Table XXV-A

DIFFERENCE OF 850 -1000 MB TEMPERATURE LAPSES FOR DELTA PACKING SCHEMES

---DTL SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.11	1.38		.13	1.67		.14	1.58
PRCNT		.95	11.47		1.03	13.16		1.13	12.82

---DTL SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.18	1.94		.21	2.32		.22	2.05
PRCNT		1.51	15.93		1.68	18.27		1.80	16.46

---DTL SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.25	2.16		.25	2.30		.26	2.34
PRCNT		2.08	17.77		1.97	18.05		2.12	18.79

---DTL SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.43	3.12		.48	3.91		.50	3.60
PRCNT		3.57	25.75		3.79	30.45		3.99	29.09

Table XXVI-A

DIFFERENCE OF 850 -1000 MB TEMPERATURE LAPSES FOR FFT VALUES

---DTL WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.03	.13		.03	.11		.03	.12
PRCNT		.21	1.01		.21	.87		.24	.96

---DTL WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.03	.21		.04	.18		.04	.18
PRCNT		.29	1.67		.30	1.47		.34	1.47

---DTL WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.04	.28		.05	.27		.06	.27
PRCNT		.36	2.23		.40	2.15		.46	2.14

---DTL WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.05	.35		.07	.37		.07	.37
PRCNT		.44	2.80		.52	2.96		.58	2.98

---DTL WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.07	.44		.09	.51		.09	.48
PRCNT		.57	3.56		.69	4.04		.73	3.83

---DTL WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.09	.57		.12	.69		.12	.62
PRCNT		.76	4.62		.92	5.38		.96	4.97

---DTL WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.13	.72		.16	.95		.16	.85
PRCNT		1.04	5.89		1.26	7.40		1.31	6.84

Table XXVI-A (Cont'd)

DIFFERENCE OF 850 -1000 MB TEMPERATURE LAPSES FOR FFT VALUES (Cont'd)

---DTL WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.18	.98		.22	1.20		.22	1.10
PRCNT		1.52	8.23		1.69	9.46		1.79	8.85

---DTL WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.25	1.41		.29	1.63		.30	1.46
PRCNT		2.12	11.82		2.30	12.88		2.40	11.68

---DTL WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.35	1.97		.38	2.17		.40	1.95
PRCNT		2.90	16.33		3.00	17.12		3.20	15.63

---DTL WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.46	2.66		.49	2.80		.51	2.54
PRCNT		3.83	22.04		3.86	22.08		4.05	20.28

Table XXVII-A

DIFFERENCE OF 500 -850 MB TEMPERATURE LAPSES FOR DELTA PACKING SCHEMES

---DTM SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.13	1.48		.14	2.16		.15	2.18
PRCNT		.66	7.69		.76	11.27		.78	11.02

---DTM SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.23	2.33		.26	2.84		.28	3.14
PRCNT		1.18	12.10		1.35	14.71		1.42	15.88

---DTM SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.29	2.60		.32	3.40		.33	3.46
PRCNT		1.53	13.46		1.69	17.73		1.66	17.53

---DTM SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.53	3.89		.65	5.34		.66	5.67
PRCNT		2.74	20.08		3.42	27.97		3.32	28.72

Table XXVIII-A

DIFFERENCE OF 500 -850 MB TEMPERATURE LAPSES FOR FFT VALUES

---DTM WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.03	.15		.03	.14		.04	.15
PRCNT		.17	.77		.18	.74		.20	.78

---DTM WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.04	.25		.05	.23		.06	.25
PRCNT		.23	1.33		.26	1.18		.29	1.27

---DTM WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.06	.36		.06	.32		.07	.35
PRCNT		.29	1.88		.33	1.70		.38	1.79

---DTM WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.07	.47		.08	.44		.09	.46
PRCNT		.36	2.43		.42	2.28		.47	2.35

---DTM WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.09	.60		.10	.58		.12	.61
PRCNT		.45	3.13		.54	3.02		.60	3.10

---DTM WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.12	.77		.14	.79		.16	.85
PRCNT		.60	4.03		.74	4.10		.80	4.33

---DTM WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.16	.95		.20	1.11		.22	1.19
PRCNT		.81	4.92		1.05	5.75		1.11	6.01

Table XXVII-A (Cont'd)

DIFFERENCE OF 500 -850 MB TEMPERATURE LAPSES FOR FFT VALUES (Cont'd)

---DTM WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.22	1.25		.28	1.50		.30	1.56
PRCNT		1.15	6.49		1.45	7.85		1.52	7.94

---DTM WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.31	1.69		.38	2.05		.41	2.08
PRCNT		1.61	8.77		2.00	10.76		2.10	10.54

---DTM WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.43	2.33		.52	2.73		.54	2.80
PRCNT		2.22	12.12		2.74	14.42		2.73	14.06

---DTM WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.56	3.22		.69	3.70		.70	3.68
PRCNT		2.92	16.71		3.62	19.51		3.52	18.48

Table XXIX-A

DIFFERENCE OF 300 -500 MB TEMPERATURE LAPSES FOR DELTA PACKING SCHEMES

---DTH SCHEME 2 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.11	1.46		.13	1.75		.12	1.79
PRCNT		.52	7.06		.69	9.56		.58	8.36

---DTH SCHEME 3 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.19	2.60		.23	2.52		.22	2.52
PRCNT		.94	12.68		1.22	13.54		1.05	11.66

---DTH SCHEME 4 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.24	2.39		.28	3.14		.27	3.35
PRCNT		1.16	11.58		1.53	17.10		1.29	15.80

---DTH SCHEME 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.46	4.37		.60	5.05		.56	4.77
PRCNT		2.22	21.07		3.25	27.27		2.62	22.07

Table XXX-A

DIFFERENCE OF 300 -500 MB TEMPERATURE LAPSES FOR FFT VALUES

---DTH WAVE 15 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.03	.13		.03	.13		.03	.13
PRCNT		.14	.64		.16	.70		.15	.60

---DTH WAVE 14 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.04	.22		.04	.21		.04	.20
PRCNT		.19	1.07		.23	1.11		.21	.93

---DTH WAVE 13 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.05	.32		.05	.28		.06	.28
PRCNT		.24	1.57		.29	1.51		.26	1.31

---DTH WAVE 12 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.06	.43		.07	.38		.07	.38
PRCNT		.29	2.05		.37	2.02		.34	1.77

---DTH WAVE 11 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.08	.54		.09	.48		.10	.51
PRCNT		.36	2.58		.49	2.63		.45	2.39

---DTH WAVE 10 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.10	.70		.12	.64		.13	.65
PRCNT		.48	3.35		.64	3.45		.59	3.02

---DTH WAVE 9 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.14	.91		.17	.85		.17	.88
PRCNT		.68	4.39		.91	4.61		.82	4.14

Table XXX-A (Cont'd)

DIFFERENCE OF 300 -500 MB TEMPERATURE LAPSES FOR FFT VALUES (Cont'd)

---DTH WAVE 8 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.20	1.22		.24	1.22		.25	1.23
PRCNT		.96	5.86		1.31	6.63		1.16	5.77

---DTH WAVE 7 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.28	1.69		.34	1.79		.35	1.77
PRCNT		1.34	8.16		1.84	9.67		1.63	8.31

---DTH WAVE 6 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.37	2.34		.47	2.69		.47	2.56
PRCNT		1.81	11.31		2.57	14.47		2.22	11.94

---DTH WAVE 5 ---

	WESTERN PACIFIC			EASTERN PACIFIC			NORTH ATLANTIC		
	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
DIFF		.49	3.16		.64	3.94		.62	3.50
PRCNT		2.39	15.30		3.44	21.20		2.92	16.27

APPENDIX B

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APPENDIX C

ACRONYMS AND ABBREVIATIONS

1.	AUTODIN	Automated digital network
2.	C	Celsius
3.	cm	Centimeter
4.	E	East
5.	EP	Eastern Pacific area
6.	FFT	Fast Fourier Transform
7.	FNOC	Fleet Numerical Oceanography Center
8.	ft	Feet
9.	kt	Knot
10.	m	Meter
11.	mb	Millibar of pressure
12.	N	North
13.	NA	North Atlantic area
14.	RMSE	Root mean square error
15.	S	South
16.	u-Wind	East-west wind component, positive to East
17.	v-Wind	North-south wind component, positive to North
18.	W	West
19.	WP	Western Pacific area

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