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SCIENCE APPLICATIONS INC MONTEREY CA
TROPICAL CYCLONE WIND THREAT FOR THE BAY OF BENGAL.(U)

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6 TROPICAL CYCLONE WIND THREAT FOR THE
BAY OF BENGAL .
Progress Report
11 June 1979
15 Contract # AID-SOD-PDC-C-0110
14 SAI-#1-042-02-219-00

Science Applications, Inc.
2999 Monterey-Salinas Highway
Monterey, California 93940

9 Progress rept.

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TROPICAL CYCLONE WIND THREAT FOR THE BAY OF BENGAL

Progress Report

June 1979

A. Objectives:

The ultimate objective of this effort is to provide the OFDA with reliable estimates of damage and casualties that will result from a particular tropical cyclone in the Bay of Bengal.

The contract objective is to design, develop, program and test a system suitable for automation to provide wind threat information from tropical cyclones in the Bay of Bengal.

Task 1. Analyze forecast errors to tailor an existing U.S. Navy model to the conditions encountered in the Bay of Bengal.

Task 2. Modify that model to apply it specifically to the geographical points on the periphery of the Bay of Bengal.

Task 3. Conduct a wind forecast error analysis which will form the basis of the estimate of the probability of cyclones exceeding 65 and 100 knots given that winds of a certain level were forecast.

Task 4. Devise a wind threat model which uses the modified Navy model and the probabilities of winds over 65 and 100 knots to determine the joint probability of both the cyclone striking a point and having winds in excess of 65 knots.

Accession For	DIS CMMI	DC TAB	Announced	Classification	Distribution/	Availability Codes	Avail and/or special
				U on file			25 44

Task 5. Conduct real time (or near real time) tests of the model (Task 4) during the Fall 1978 and Spring 1979 Bay of Bengal cyclone seasons. Correct any detected deficiencies in any previous tasks.

Task 6. Report on test results with recommendations.

B. Work Performed to Date:

Task	% of Total	% Completed	% of Total Completed
1	20	95	19
2	10	100	10
3	15	100	15
4	15	100	15
5	25	75	19
6	15	50	<u>8</u>
			85

C. Work has progressed on schedule. It was expected that more than 75% of the work would be done during the first three quarters.

D. Analysis of Progress:

A suitable wind profile has been incorporated into the model. This model is after Riehl (1963). The input is maximum wind, which is then related linearly to radius of maximum wind. This relationship, is based on a study of western Pacific typhoons where (unlike the Bay of Bengal) wind radius information is available.

Summary and Problem Areas:

The work is on schedule. Cyclone 17-79 offered an excellent opportunity for testing. A report of those tests is enclosed.

REPORT ON INDIAN CYCLONE 17-79 (May 1979)

June 1979

Jerry D. Jarrell

Science Applications, Inc.
2999 Monterey-Salinas Highway
Monterey, California 93940



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REPORT ON INDIAN CYCLONE 17-79 (May 1979)

INTRODUCTION

During early May 1979, a cyclone (Number 17-79) formed in the Bay of Bengal and ultimately struck the coast of the Indian State Andhra Pradesh. The damage was extensive but loss of life, while substantial, was surprisingly light. The latter point seems certain to be in part a reflection of preventive measures taken by the Indian government (GOI).

Science Applications, Inc. (SAI) in its Monterey, California office was tracking the cyclone and making wind threat calculations for demonstration and testing purposes. This was required by a contract with the Office of Foreign Disaster Assistance (OFDA), Agency of International Development (AID), U.S. Department of State.

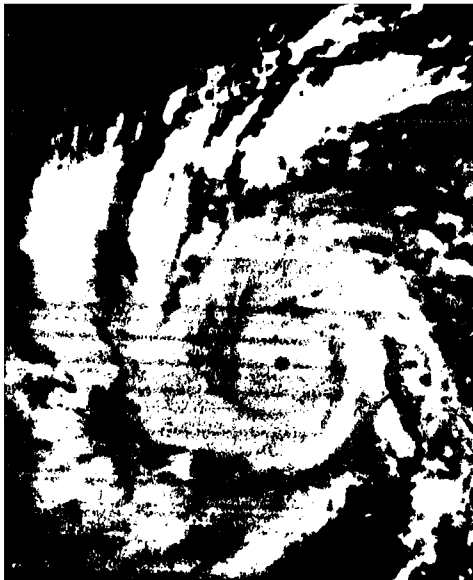
The purpose of this report is to document the behavior of the wind threat model, relate any apparent weaknesses as well as remedial action taken, and to assess the value of this type information to officials facing crucial decisions relative to disaster prevention actions.

For background purposes, only the information available in the bulletins issued by the U.S. Fleet Weather Central/Joint Typhoon Warning Center Guam (JTWC) was used in real time. Forecasts from any agency could have been used so long as their statistical error distribution was understood.

The cyclone lasted from 6 May to 12 May, a total of 25 6-hourly bulletins were received. Wind threat estimates were derived from 23 of the 25 bulletins after the fact. During the cyclone, in near real time, wind threats were derived on 11 warnings. The wind threat estimate requires a total of about 5 minutes to make with a few seconds of this time actually devoted to the computer run. Since SAI is using the Navy's R&D computer at the Fleet Numerical Weather Central (Monterey, California) on a not-to-interfere basis, there were occasions when the computer was not available. For the most part the real-time estimates were discussed with OFDA. Typically this was once per day but became more frequent as landfall approached.

The reason for wind threat estimates is that forecasts are imperfect, and that it is necessary to allow for error when using cyclone forecasts. The wind threat model considers all error possibilities and arrives at a sequence of probabilities that at least 65 kt winds will be observed within a geographic region and within an elapsed time.

Cyclone Description: Figure 1 shows a preliminary post-analysis track of Cyclone #17-79. This was provided through the courtesy of the JTWC. The cyclone formed in the vicinity of the southern Nicobar Islands in the eastern Bay of Bengal. Its ensuing track described a cycloid on 8 May, then a rather routine northwest track making landfall north of Nellore, Andhra Pradesh, on 12 May. Figure 1 gives estimated maximum winds (kts) daily at 0000 GMT along the track. Post analysis indicates winds of 120-130 kts may have been present at landfall.



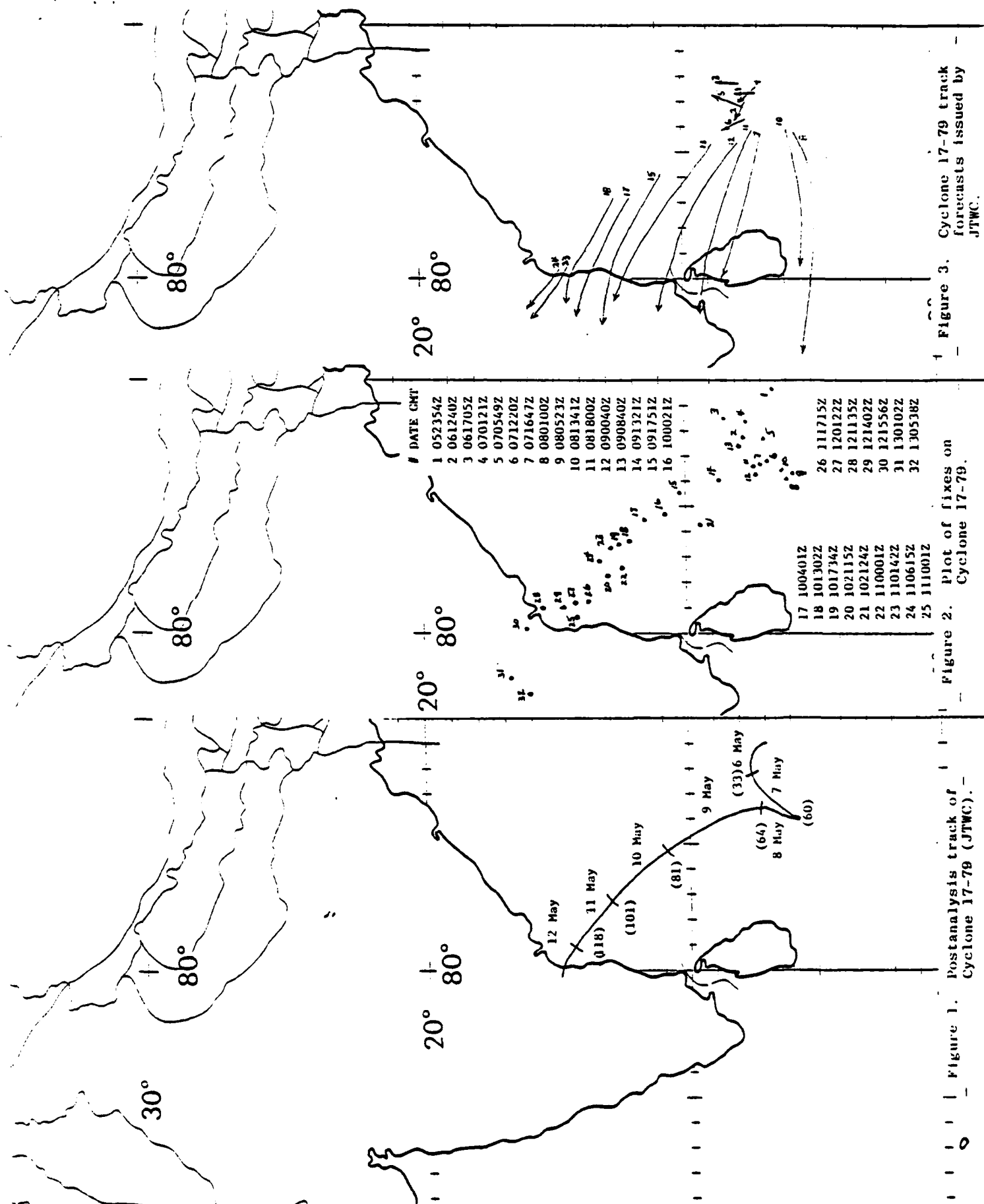


Figure 2 shows a plot of the "fixes" on Cyclone #17-79 received by the JTWC. All fixes were satellite based remotely interpreted either by U.S. Naval Personnel on Diego Garcia or the USAF Global Weather Central (GWC), Offut AFB at Omaha, Nebraska. The Diego Garcia readout is TIROS-N, it is our understanding that the readout equipment at Diego Garcia is not compatible with that satellite and consequently considerable picture distortion results. GWC on the other hand uses stored readout from the Defence Meteorological Satellite Program (DMSP). There are some time delays and occasional distortion problems associated with the cyclone center being far removed from the satellite swath center but this support is generally excellent. To our knowledge other satellite fixes (NESS stored readout, or Japanese GOES for example) nor coastal radar fixes were received by Guam in real time.

Figure 3 shows the track forecasts that were issued by the JTWC. To reduce an already cluttered diagram, only the first 12 hours of the early forecasts are shown, thereafter, until landfall, entire forecasts are shown although some of the late forecasts are omitted for readability. The small numbers are sequential bulletin number, #1 is 1400 GMT on 6 May and they are at 6-hourly intervals, #24 is 0800 GMT on 12 May. The indecision reflected in the first ten forecasts can be related directly to the noise in the satellite fixes (see figure 2) which in turn illustrates the limitation of our current satellite cyclone fixing capability in the Bay of Bengal. This limitation was particularly evident when Cyclone #17-79 was weak since typically in weak cyclones there are no readily identifiable centers.

Overall the forecasts were average, but those which were issued after the center became better defined (and the positioning became regular and reliable) were in general excellent. After an initial forecast of recurvature toward Burma, the thinking then swung to the west southwest along the path of Cyclone #21-78 into Sri Lanka. Thereafter the forecast track inched northward across Sri Lanka and Tamil Nadu into Andhra Pradesh and actually came close to the path of the devastating cyclone of November 1977. The forecast at one time or another called for landfall on virtually every point on the 600 mile coast from Sri Lanka to 15°N latitude.

We will examine the wind threat estimates derived from the forecasts. Our point will be that even though the forecasts were constantly changing the wind threat for each point followed a conservative pattern of rising to a maximum and then falling as the threat passed.

AREA THREAT

Figure 4 shows these threats integrated over the coasts of Sri Lanka, Tamil Nadu and Andhra Pradesh. These plots are the threat of at least 65 kt (hurricane force) winds occurring within 36 hours after the issuance of each JTWC bulletin. Dates are shown across the top. Shaded bars indicate times when the most recent warning predicted landfall on that coast within 36 hours. The crosshatched area represents the approximate time when 65 kt (or greater) winds were probably occurring. This information can be inferred partly from the forecasts of figure 3. In addition to track forecast changes the threat increases or decreases with forecast speed of motion and forecast

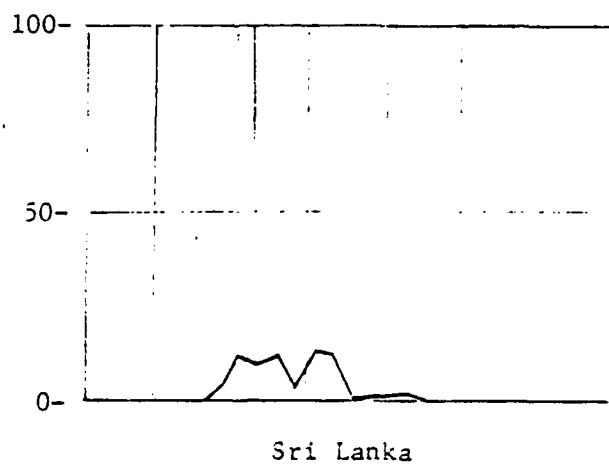
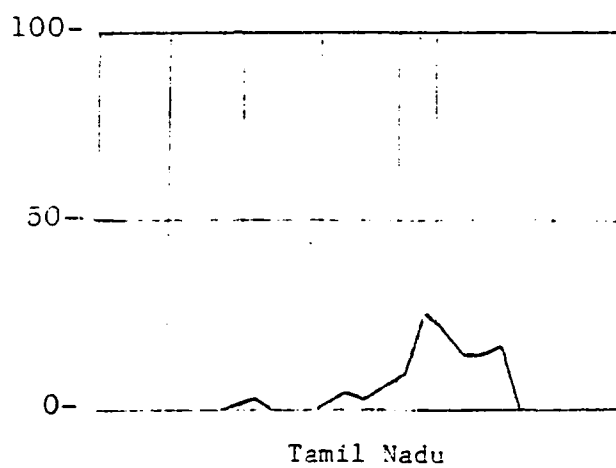
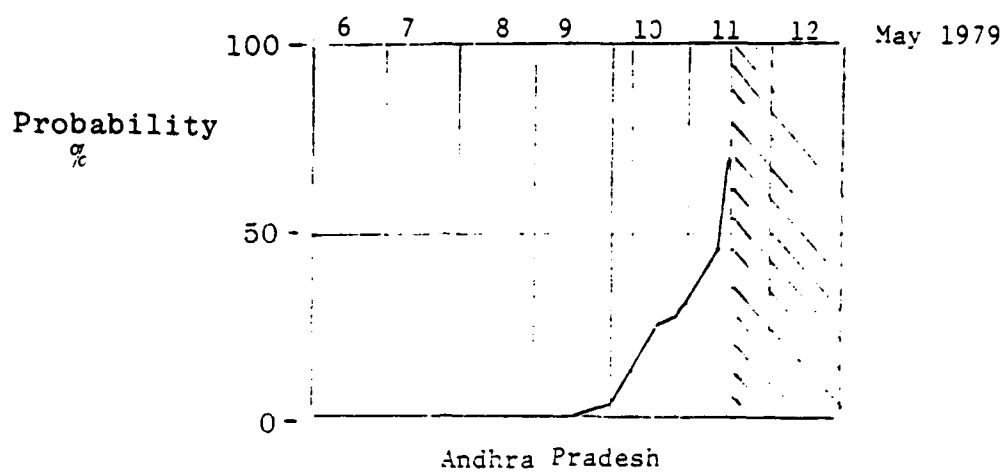


Figure 4. Area summed 36 hour 65 kt wind threat from Cyclone 17-79.

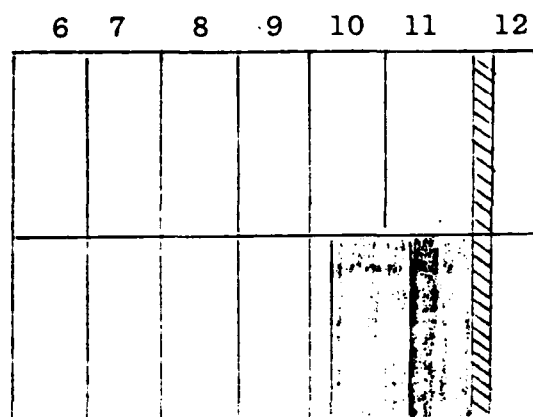
wind speeds. The sharp drop in threat to Sri Lanka on 8 May is due to a much slower motion forecast. Although the forecast at 2000 GMT 8 May was closer to the island than was the previous forecast, its arrival at that point was forecast 72 hours away compared to about 36 hours in the earlier bulletin, thus the uncertainty was greater (farther into the future) and the possibility of a correct forecast was less.

The impact of forecast maximum winds on the wind threat is manifest by the wind threat derived from Warning 13 (1400 GMT 9 May). The cyclones forecast intensity was significantly reduced compared to the forecasts immediately preceeding and following. As a result, the threat to Sri Lanka dropped sharply as this was combined with a much more northward landfall forecast. That same dip is reflected for Tamil Nadu. In addition, we expected the track change to greatly increase the threat to Andhra Pradesh, but that was completely offset by the decreased wind forecast. We believe that the wind threat value is much more descriptive of the relative degree of threat than is the deterministic yes or no derived from the forecast.

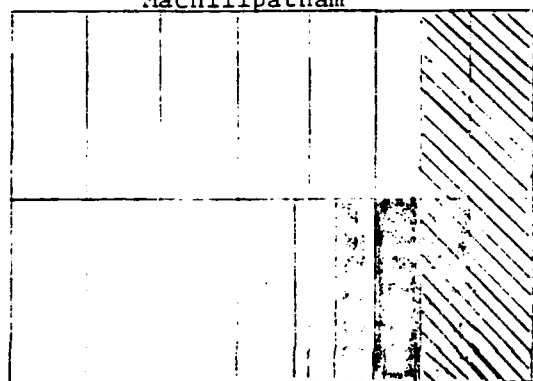
POINT THREAT

Figure 5 illustrates the operation of an arbitrary set of rules keying an increasing degree of alertness simultaneously to an increasing threat of hurricane force winds and decreasing lead time as follows.

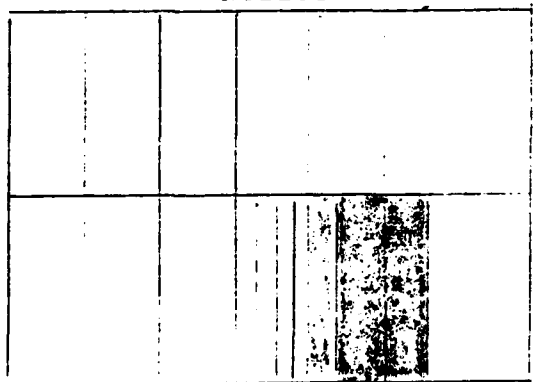
	P ₆₅	within the next
1st Alert (Green)	> 2.5%	48 hours
2nd Alert (Yellow)	> 5.0%	48 hours
3rd Alert (Orange)	>10.0%	48 hours
4th Alert (Red)	>20.0%	24 hours



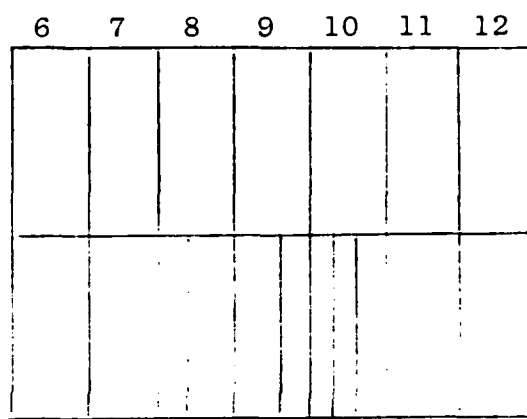
Machilipatnam



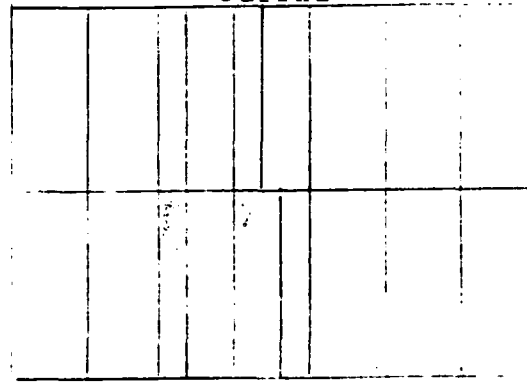
Nellore



Madras



Jaffna



Batticaloa

Figure 5. Color coded wind threat to selected cities from Cyclone 17-79.

Presumably first alert would be simply an admonition for the public to keep advised, officials would break out plans and go over them, but virtually no physical actions would be ordered.

The actions would increase until the fourth alert which would signal the point beyond which extensive preparations would be impossible, evacuation, if it were to be completed would in most cases have to be underway.

In figure 5 each small graph represents a coastal city. Times (dates GMT) are indicated across the top. The bottom half of the graph shows the color coded transition through the four alerts. The top half of the graph is shaded when the cyclone is forecast to pass within 100 nmi of the city within 36 hours. The cross hatched area represents the time when the cyclone was actually within 100 nmi of the city (based on figure 1).

We believe the evolution through the alerts to be orderly and timely. We would have hoped to see a few hours of red before the cyclone actually caused winds so strong as to stop preparations. This was not the case at Nellore. This is true because the forecast errors are so large in the Bay of Bengal. The probability around the forecast point is diluted so that the cyclone's future is known with reasonable confidence (error compared to the width of the "destructive swath is small) only in very short range forecasts. Here we are assuming the winds extended 100 nmi from the cyclone center, or 20 hours (at 5 kts) before landfall. We expect a 20 hour forecast to have an error in excess of 100 nmi.

CONCLUSION

We believe the wind threat estimates were realistic and would have been useful in dealing with the disaster preparedness problem. In particular the area summed threat should be extremely valuable to alert disaster assistance forces as to the pending occurrence of a disaster within a broad region. The Point threats would be useful to gauge the relative distribution of the threat in space, particularly with regard to population concentrations.

The Point threats could also be used directly by local government officials in considering what actions to order, and more specifically when to order such actions. It is noted that from this remote distance, the presence or absence of daylight, which is always an important consideration, is a constant source of confusion. Since this is a simple computation, it was added to the program output.

No other deficiencies were noted.

APPENDIX 1

This appendix contains copies of the computer output giving estimates of wind threats.

After-The Fact Runs: The output is described below:

Line 1: Printout of the input data - cyclone number, date-time group (Z=GMT), Latitude, Longitude, and maximum winds at forecast time, +24 hours and +48 hours. (48 at the end indicates 48 hours of forecast was given).

Lines 2 and 3: Self explanatory, events are strike or that winds of at least 40, 65 or 100 kts will be observed.

Line 4: Hours of darkness, (*) indicates dark. Darkness is assumed between 1800 and 0600 local and a -6 time zone was used. This is provided because darkness is such an important consideration in disaster potential evaluation.

Strike Lines: These are probabilities that the cyclone center will cross the coast within these areas.

Wind Lines: These are the probabilities that cyclone location, intensity and size will combine to cause winds of at least 40, 65, 100 kts to be observed at some point on the coast of these areas.

Map: This is a map of the outline of the Bay of Bengal. Each asterisk represents a point for which the wind threat is computed. These asterisks will be replaced in order by the letters G, Y, O, R as 65 kt wind threat (P65) increases according to the following rules.

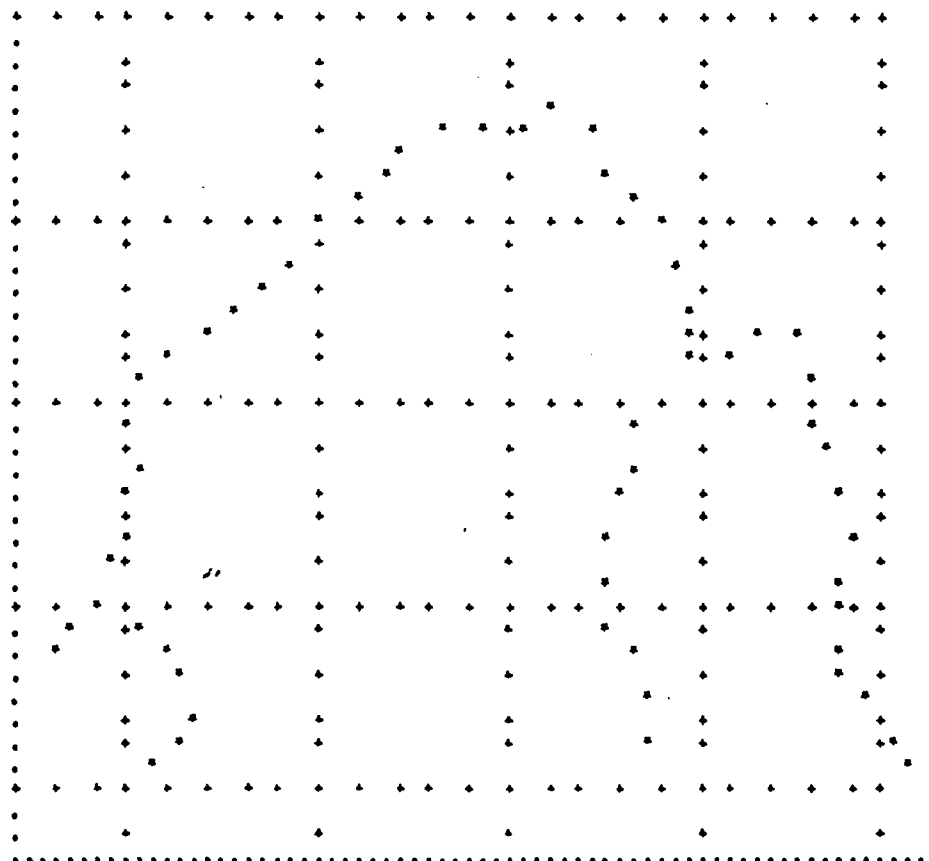
Symbol	P ₆₅	Time Limitation
*	< 2.5%	None
G	> 2.5%	Within 48 hours
Y	> 5.0%	Within 48 hours
O	>10.0%	Within 36 hours
R	>20.0%	Within 24 hours

Real Time Runs:

Provided to OFDA separately are output from runs made in near real time. These are exact duplicates of the enclosed output copies except they do not contain the "hours of darkness" line, and they retain the GMT run time annotation affixed by the Fleet Numerical Weather Central's Computer Center.

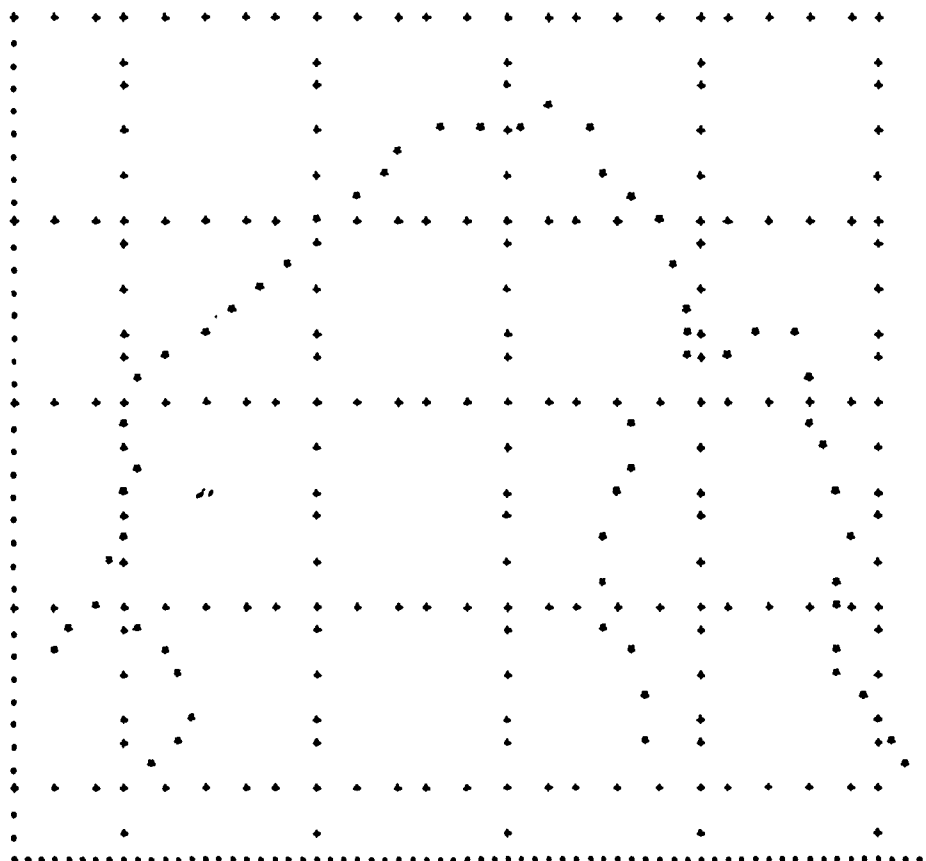
17-79 11051-007 72N 477E 30K 47N 454E 35K 111N 445E 45K 44
 FOR CYCLONE 17-79 FROM 151400Z
 PROBABILITIES OF EVENTS WITHIN 24HRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS *****

STRIKE WITHIN SRI LANKA	0.000	0.000	0.024	0.049	0.147
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.009	0.041	0.041
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.004	0.013
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	0.015	0.065
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.004	0.041
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.001	0.004
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	0.001	0.020
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	0.012
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	0.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	0.017	0.046
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.004	0.047
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.001	0.011
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000
STRIKE WITHIN AN ISLANDS	0.000	0.000	0.001	0.022	0.033
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.001	0.031
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	0.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000



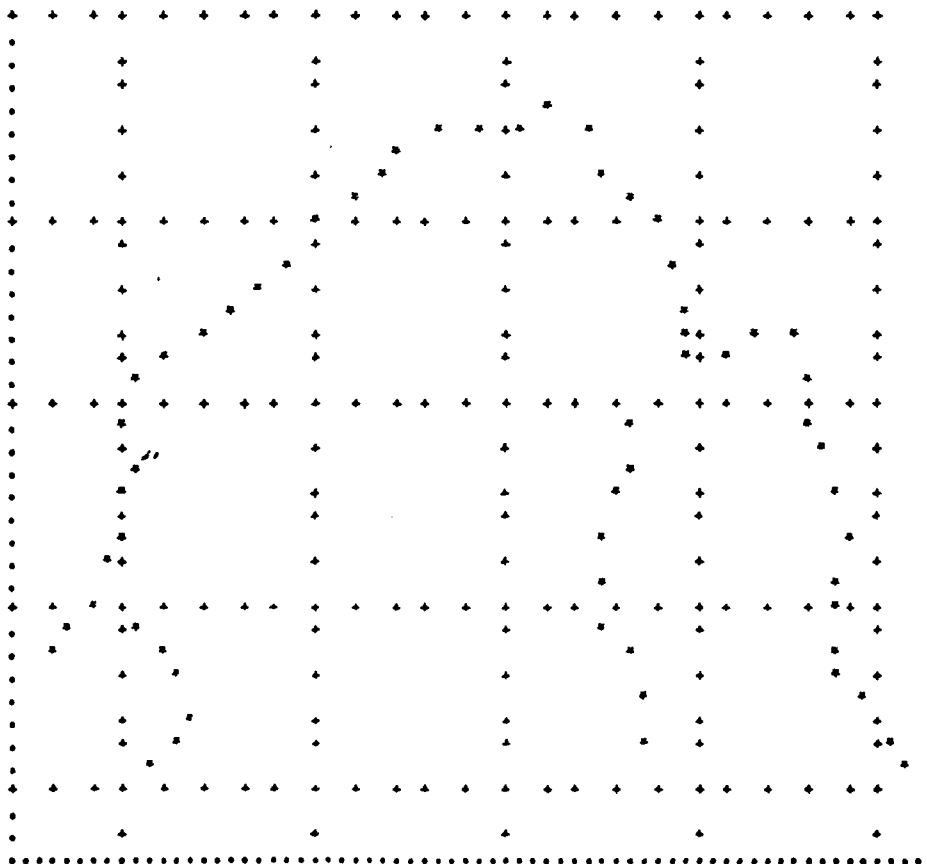
17-79 110620007 74N 475E 10K 14N 455E 35K 104N 441E 45K 48
 FOR CYCLONE 17-79 FROM 0621007
 PROBABILITIES OF EVENTS WITHIN 6HRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS ** + ****+ + ****+

STRIKE WITHIN SRI LANKA	0.000	.001	.032	.104	.176
WINDS OF AT LEAST 40KNOTS	0.000	.000	.011	.050	.096
WINDS OF AT LEAST 65KNOTS	0.000	.000	.001	.005	.014
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	.001	.024	.035
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.012	.059
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.012
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ORADESH	0.000	0.000	0.000	.002	.035
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.020
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.005
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN ORSAW.3FW	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.001	.025	.130
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.012	.071
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.016
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	0.000	.000	.001	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.001	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000



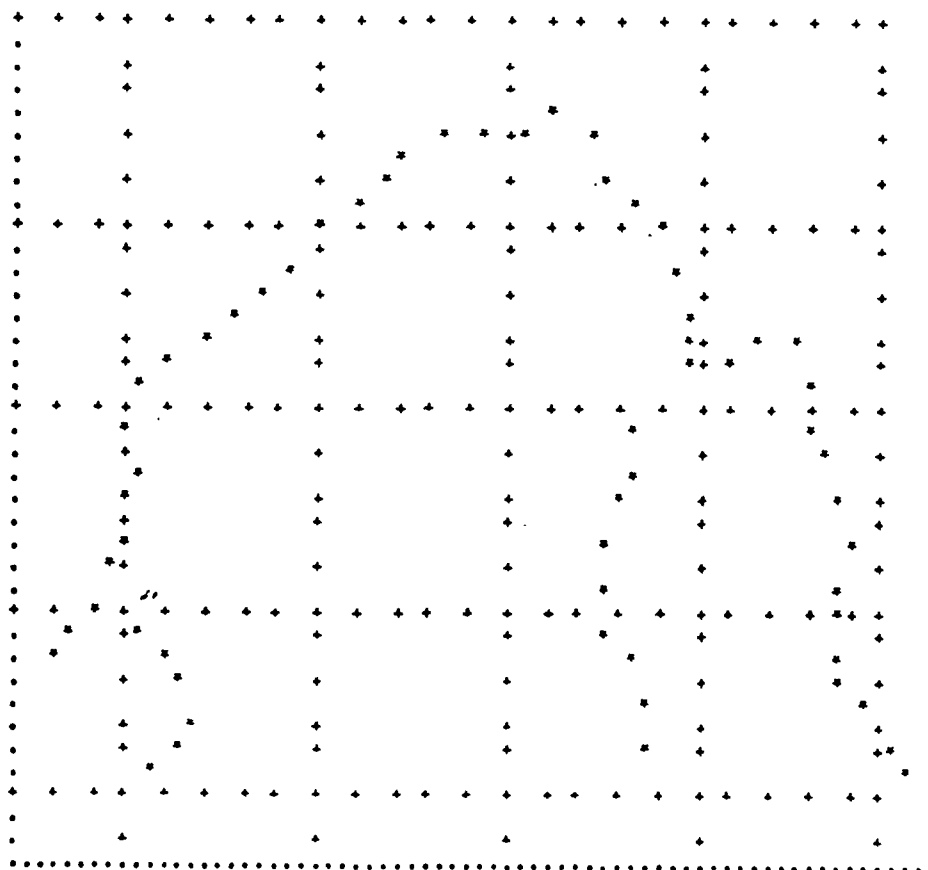
17-79 110703007 79N 84E 75K 86N 82E 45K 112N 87E 55K 48
 FOR CYCLONE 17-79 FROM 0703007
 PROBABILITIES OF EVENTS WITHIN HOURS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS + + + + + + + + + +

STRIKE WITHIN SRI LANKA	0.000	0.000	.001	.004	.021
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.001	.006	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.005
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.005
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.005
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PPADESH	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN OPS4+W. BEN	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.010
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN BURMA	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	.001	.015	.046	.054
WINDS OF AT LEAST 40KNOTS	0.000	.000	.009	.031	.049
WINDS OF AT LEAST 65KNOTS	0.000	.000	.001	.006	.012
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000



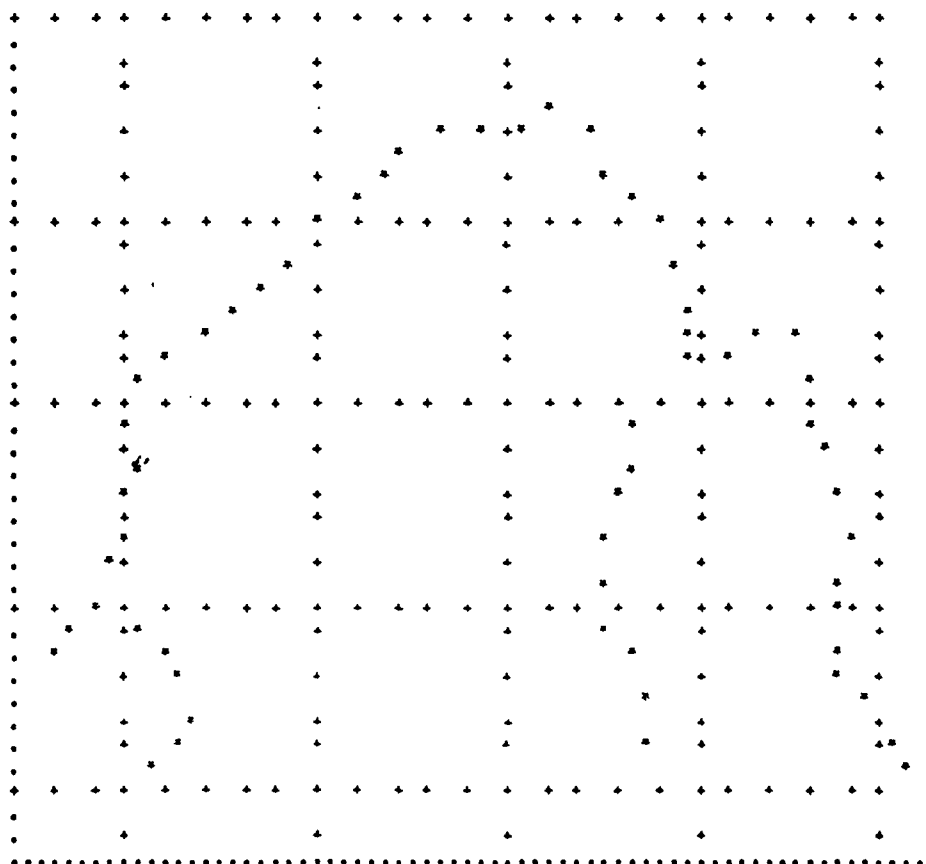
17-79 1107000Z 72N 87E 35K 87N 87E 45K 105N 82E 55K 4A
 FOR CYCLONE 17-79 FROM 370000Z
 PROBABILITIES OF EVENTS WITHIN 1HRS 12HRS 24HRS 72HRS 48HRS
 HOURS OF DARKNESS + **** + **** + ***

STRIKE WITHIN SRI LANKA	0.000	0.000	.004	.021	.045
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.015	.035
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.003	.010
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.012
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.009
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	.000	.006	.023	.038
WINDS OF AT LEAST 40KNOTS	0.000	.000	.003	.015	.027
WINDS OF AT LEAST 65KNOTS	0.000	.000	.000	.003	.007
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000



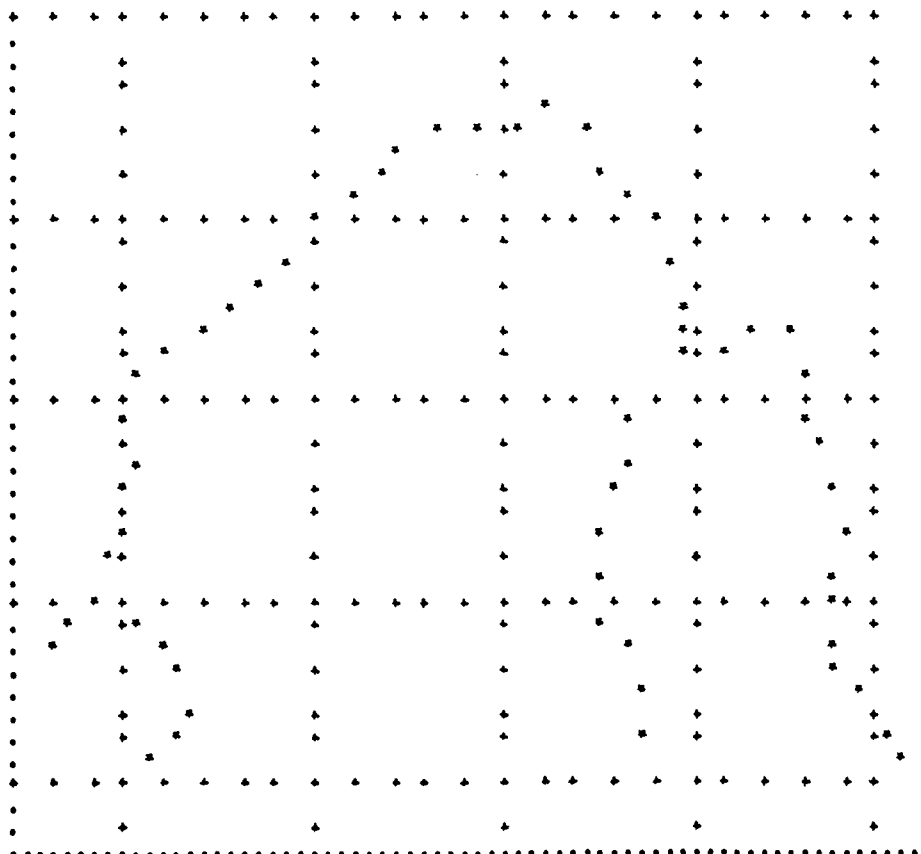
17-79 110714007 76N 871E 40K 99N 879E 50K 120N 890E 65K 48
 FOR CYCLONE 17-79 FROM 071400Z
 PROBABILITIES OF EVENTS WITHIN 0MRS 12MRS 24MRS 36MRS 48MRS
 HOURS OF DARKNESS +**** + +**** + +****

STRIKE WITHIN SRI LANKA	0.000	0.000	.002	.019	.018
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.018	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.012	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.005
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.000	.006
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN ORSA4+W. BEN	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.013
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.011
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN BURMA	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	.000	.009	.036	.059
WINDS OF AT LEAST 40KNOTS	0.000	.000	.006	.030	.053
WINDS OF AT LEAST 65KNOTS	0.000	.000	.001	.004	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000



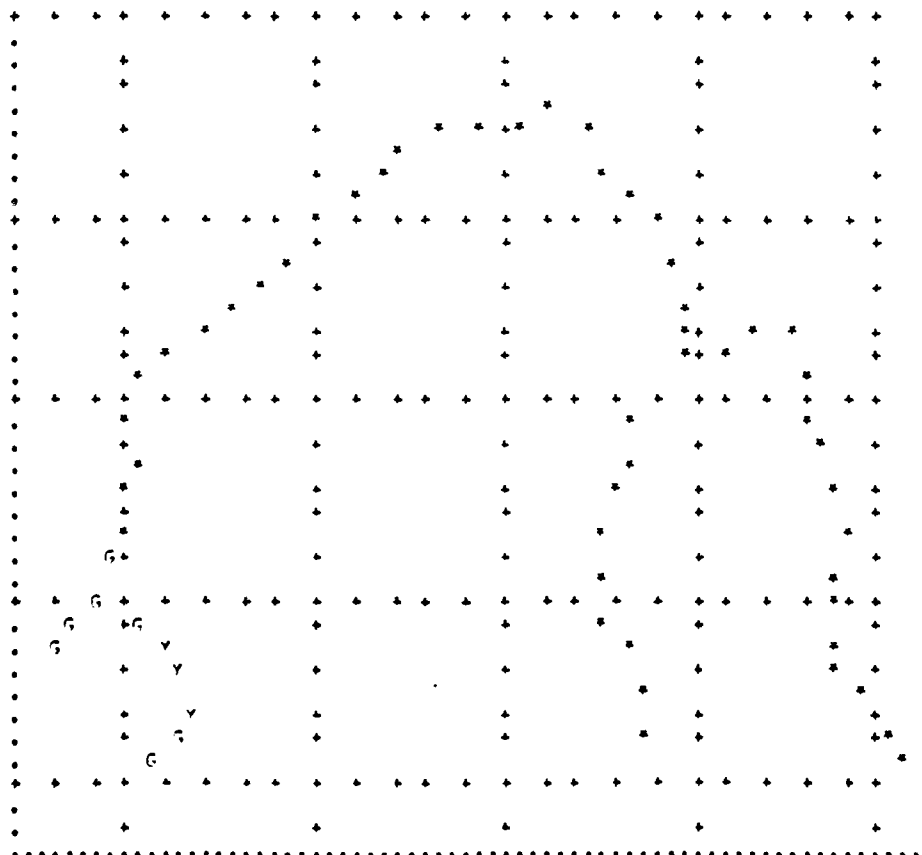
17-79 110720017 75N 46E 44K 95N 45E 60K 116N 46E 70K 49
 FOR CYCLONE 17-79 FROM 172001Z
 PROBABILITIES OF EVENTS WITHIN 14HS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS ** * **** * ****

STRIKE WITHIN SRI LANKA	0.000	0.002	0.024	0.070	0.106
WINDS OF AT LEAST 40KNOTS	0.000	0.001	0.027	0.072	0.115
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.008	0.028	0.050
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.002
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.001	0.016	0.046
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.001	0.015	0.051
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.007	0.025
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.002
STRIKE WITHIN IN PRADESH	0.000	0.000	0.000	0.002	0.024
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.004	0.032
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.001	0.014
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.001
STRIKE WITHIN ORISSA+W. BEN	0.000	0.000	0.000	0.000	0.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	0.003
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	0.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.001	0.017	0.071
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.001	0.015	0.065
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.008	0.038
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.003
STRIKE WITHIN AN ISLANDS	0.000	0.000	0.000	0.003	0.006
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.003	0.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.001	0.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000



17-79 110472007 69N 86E 50K 76N 83E 60K 89N 80E 55K 4A
 FOR CYCLONE 17-79 FROM 110472007
 PROBABILITIES OF EVENTS WITHIN 14HRS 12HRS 24HRS 76HRS 14HRS
 HOURS OF DARKNESS + ***** +

STRIKE WITHIN SRI LANKA	0.000	.015	.122	.352	.461
WINDS OF AT LEAST 40KNOTS	0.000	.014	.159	.351	.456
WINDS OF AT LEAST 55KNOTS	0.000	.003	.155	.129	.174
WINDS OF AT LEAST 101KNOTS	0.000	.000	.000	.002	.003
STRIKE WITHIN TAMIL NADU	0.000	0.000	.004	.074	.204
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.066	.194
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.002	.029	.093
WINDS OF AT LEAST 101KNOTS	0.000	0.000	.000	.001	.004
STRIKE WITHIN AN ANDAMAN	0.000	0.000	0.000	.001	.018
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.004	.029
WINDS OF AT LEAST 55KNOTS	0.000	0.000	0.000	.001	.007
WINDS OF AT LEAST 101KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.004	.075	.221
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.066	.188
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.002	.029	.088
WINDS OF AT LEAST 101KNOTS	0.000	0.000	.000	.001	.004



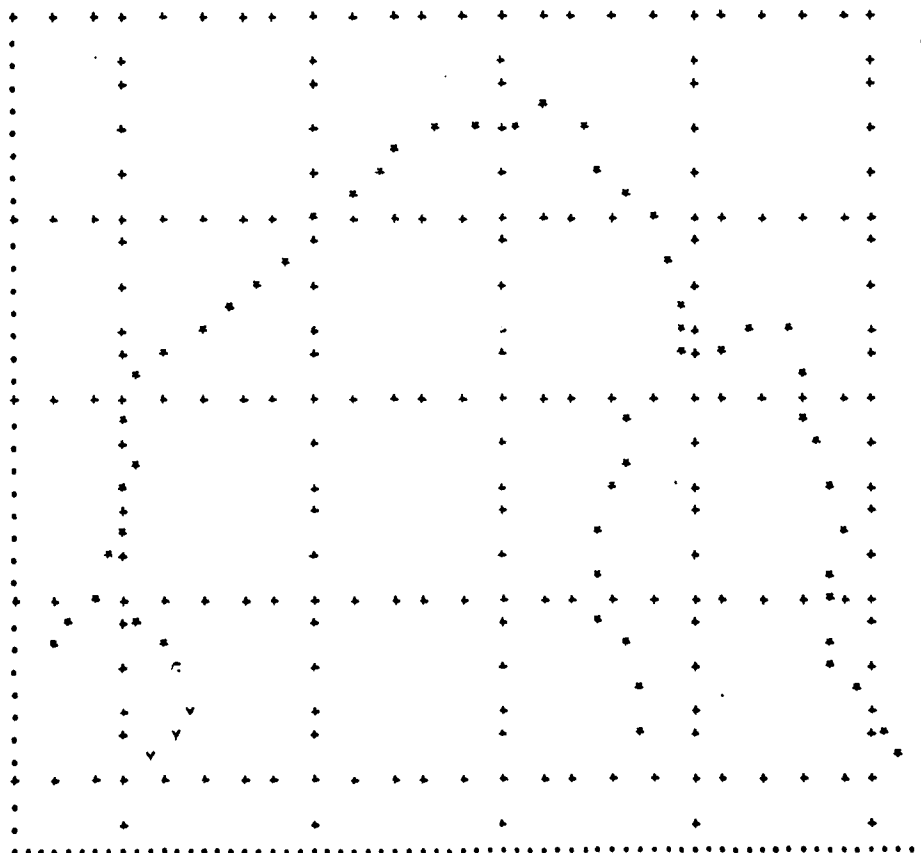
17-79 113474017 65K 4025 60K 40N 4345 65K 40N 4025 70K 43
 FOR CYCLONE 17-79 FROM 140200Z
 PROBABILITIES OF EVENTS WITHIN 12HRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS + ****+ + ****+ + ***

STRIKE WITHIN SRI LANKA	0.000	0.003	0.071	0.190	0.290
WINDS OF AT LEAST 40KNOTS	0.000	0.003	0.168	0.182	0.235
WINDS OF AT LEAST 65KNOTS	0.000	0.001	0.033	0.098	0.150
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.003	0.009

STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	0.004	0.040
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.004	0.038
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.002	0.023
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.002

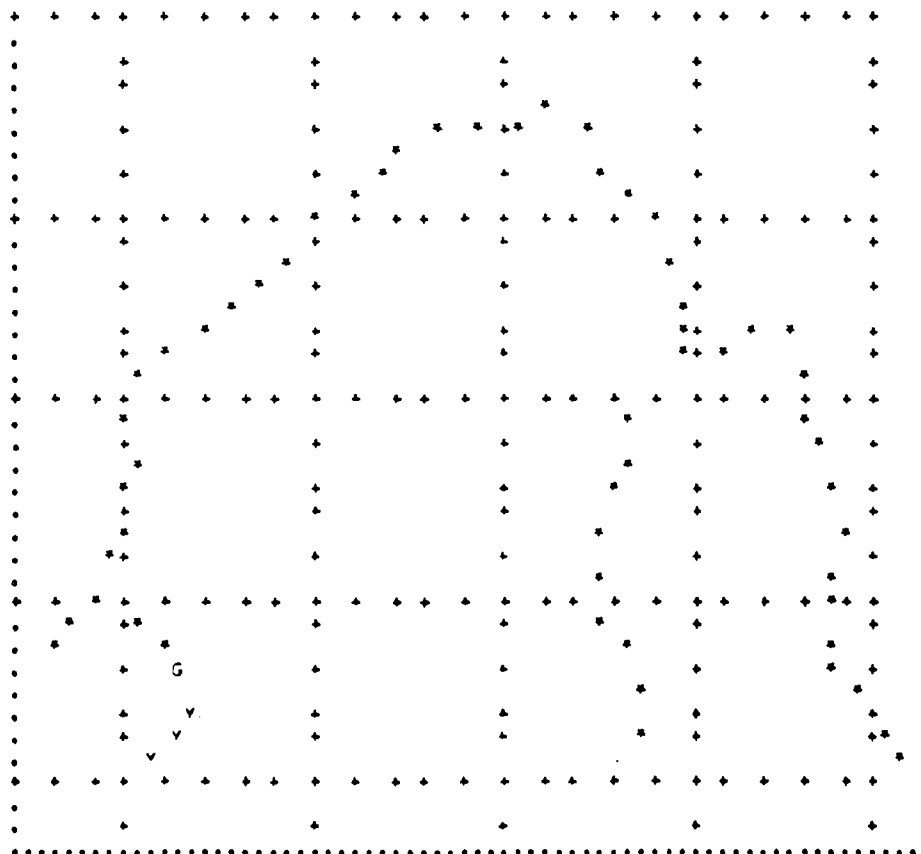
STRIKE WITHIN AN ANDAMAN	0.000	0.000	0.000	0.000	0.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	0.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	0.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.000

STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	0.004	0.041
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.004	0.039
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.002	0.024
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	0.002



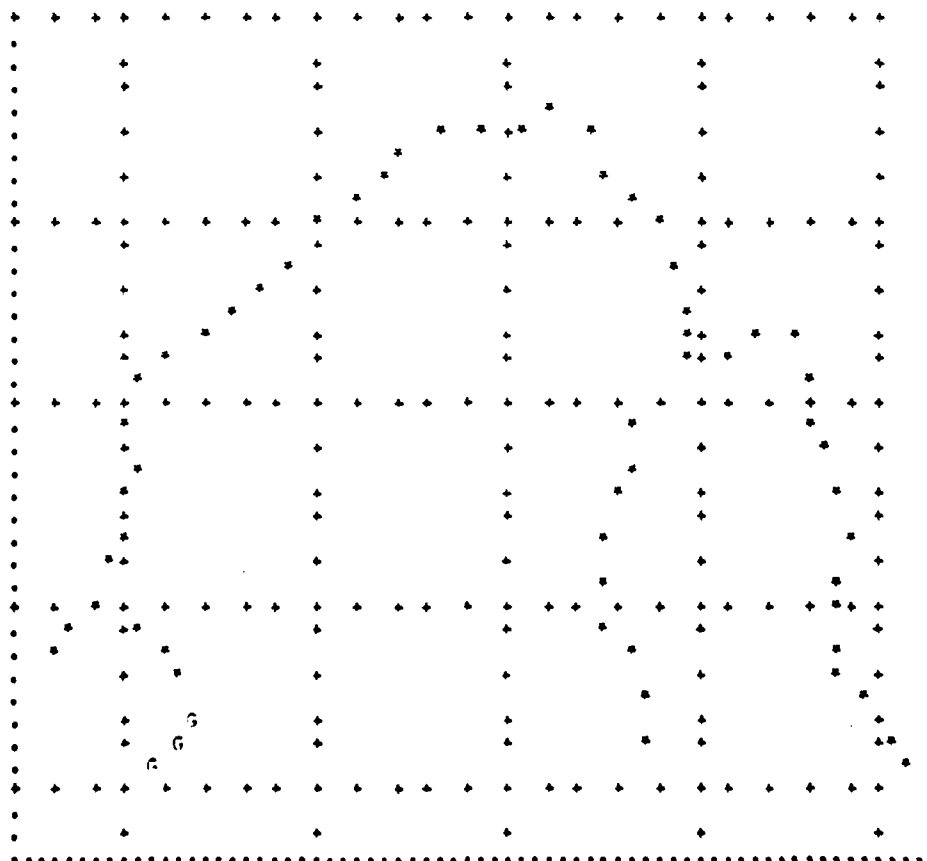
17-79 110916007 60N 155E 5K 13N 124E 5K 50N 792E 70K 4A
 FOR CYCLONE 17-79 FROM 110017
 PROBABILITIES OF EVENTS WITHIN HRS 12HRS 24HRS 76HRS 64HRS
 HOURS OF DURATION *****

STRIKE WITHIN SRI LANKA	0.000	.015	.139	.264	.349
WINDS OF AT LEAST 40KNOTS	0.000	.015	.133	.254	.342
WINDS OF AT LEAST 65KNOTS	0.000	.006	.046	.135	.195
WINDS OF AT LEAST 100KNOTS	0.000	.000	.101	.033	.007
STRIKE WITHIN TAMIL NADU	0.000	0.000	.030	.038	.049
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.030	.034	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.004	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.003
STRIKE WITHIN AN PRADESH	0.100	1.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	1.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.000	.004	.050
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.004	.046
WINDS OF AT LEAST 65KNOTS	0.000	1.000	.000	.004	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.003



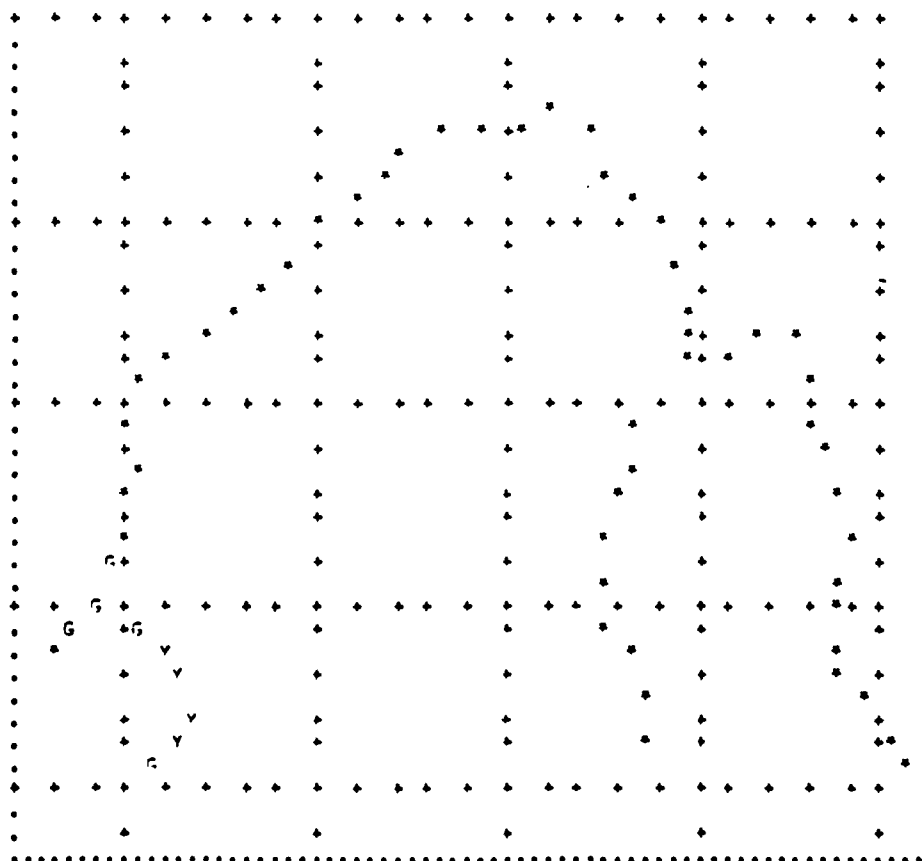
17-79 11392007 50N 84E 55K 57N 85E 65K 64N 84E 70K 44
 FOR CYCLONE 17-79 FROM 11392007
 PROBABILITIES OF EVENTS WITHIN 6HRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DISCREPANCY ** * ***** * *****

STRIKE WITHIN SRI LANKA	0.170	.001	.024	.070	.125
WINDS OF AT LEAST 40KNOTS	0.000	.001	.023	.064	.125
WINDS OF AT LEAST 65KNOTS	0.000	.000	.011	.037	.071
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.005
STRIKE WITHIN TAMIL NADU	0.000	1.000	0.000	.001	.016
WINDS OF AT LEAST 40KNOTS	0.000	1.000	0.000	.001	.015
WINDS OF AT LEAST 65KNOTS	0.000	1.000	0.000	.001	.009
WINDS OF AT LEAST 100KNOTS	1.000	0.000	0.000	.000	.001
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	1.000	0.000	.001	.016
WINDS OF AT LEAST 40KNOTS	0.000	1.000	0.000	.001	.015
WINDS OF AT LEAST 65KNOTS	0.000	1.000	0.000	.001	.009
WINDS OF AT LEAST 100KNOTS	0.000	1.000	0.000	.000	.001
STRIKE WITHIN AN ISLANDS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000



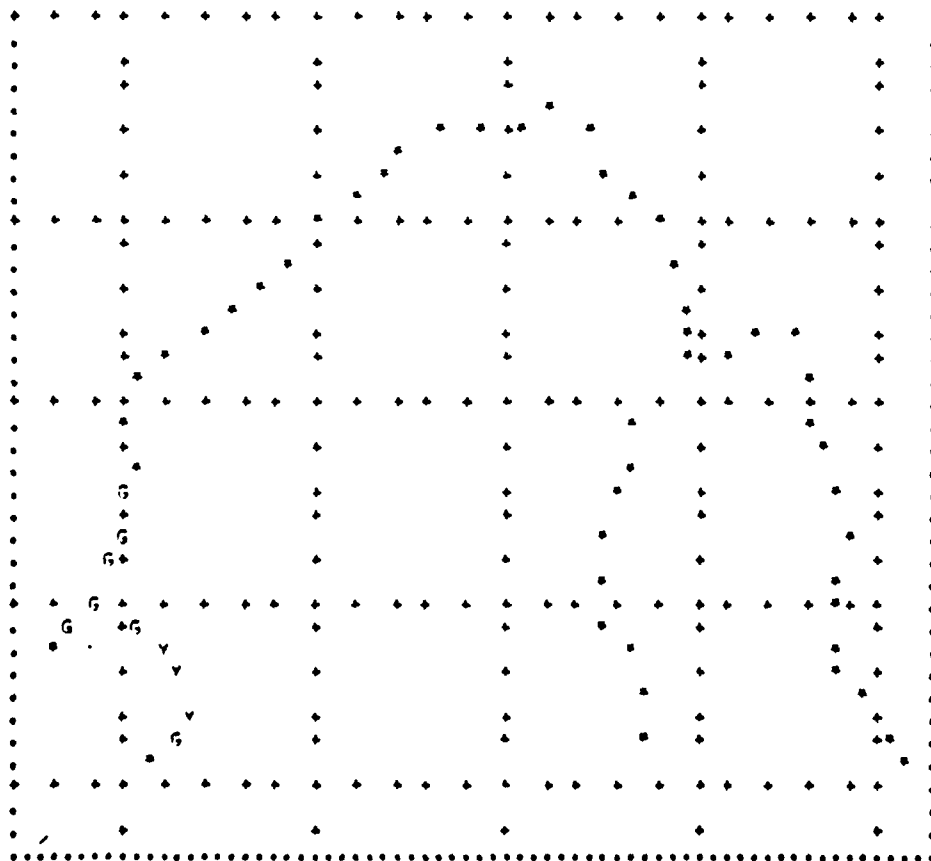
17-79 1100000000 7TH 4625 45K 12N 4425 70K 90N 4150 65K 44
 FOR CYCLONE 17-79 FROM 00000000
 PROBABILITIES OF EVENTS WITHIN HOURS 12HRS 24HRS 72HRS 48HRS
 HOURS OF DISCREPANCY *****

STRIKE WITHIN SRI LANKA	0.000	.006	.004	.231	.333
WINDS OF AT LEAST 40KNOTS	0.000	.006	.102	.255	.372
WINDS OF AT LEAST 65KNOTS	0.000	.003	.061	.142	.197
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.006	.011
STRIKE WITHIN TAMIL NADU	0.000	0.001	.003	.051	.065
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.050	.167
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.030	.092
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.002	.007
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.002	.024
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.005	.034
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.013
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN EAST INDIA	0.000	0.000	.003	.153	.140
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.050	.173
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.031	.101
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.002	.008



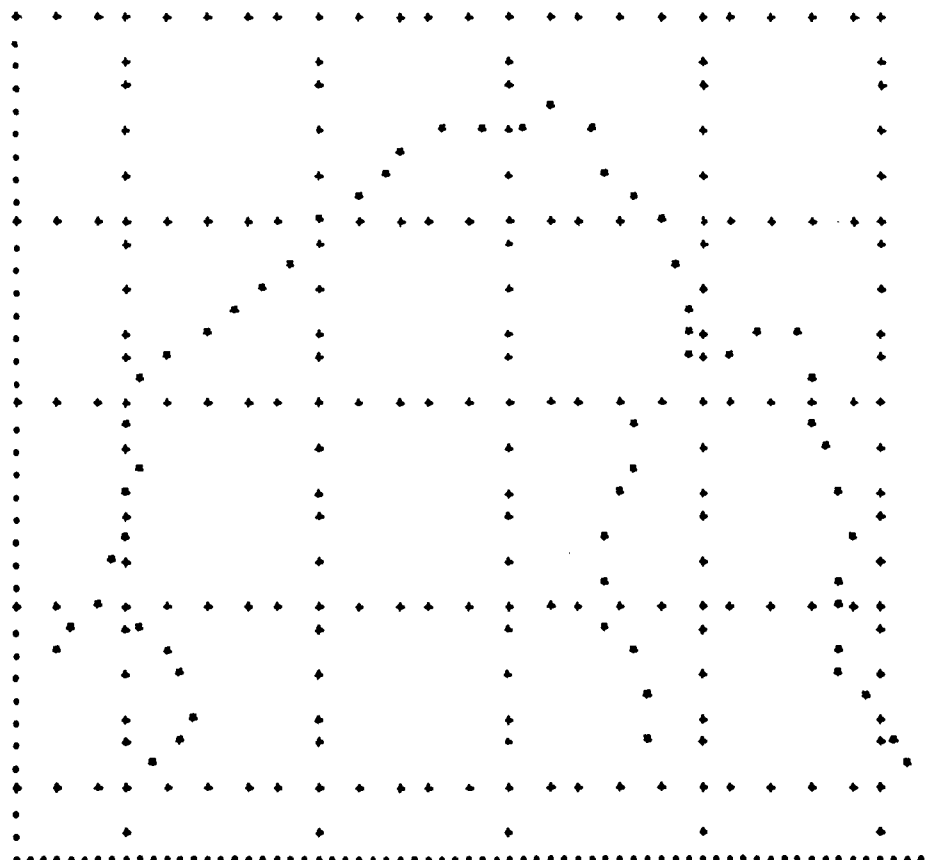
17-79 1100000000 74N 45E 55K 90N 24E 70K 103N 41E 55K 48
 FOR CYCLONE 17-79 FROM 197907
 PROBABILITIES OF EVENTS WITHIN 1400 12400 24400 36400 48400
 HOURS OF DANGER *****

STRIKE WITHIN SPT LAND	0.000	0.000	0.005	0.005	.284
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.105	.240	.339
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.059	.123	.174
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.001	.005	.009
STRIKE WITHIN TAMIL NADU	0.100	0.000	.006	.070	.206
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.006	.040	.214
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.004	.044	.117
WINDS OF AT LEAST 100KNOTS	0.100	0.000	.000	.003	.009
STRIKE WITHIN AN ANDAMAN	0.000	0.000	0.000	.006	.051
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.013	.073
WINDS OF AT LEAST 55KNOTS	0.000	0.000	0.000	.003	.027
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.002
STRIKE WITHIN OSA+H, BEN	0.100	0.000	0.000	0.000	.000
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 55KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.006	.045	.257
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.006	.041	.236
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.004	.040	.138
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.003	.011



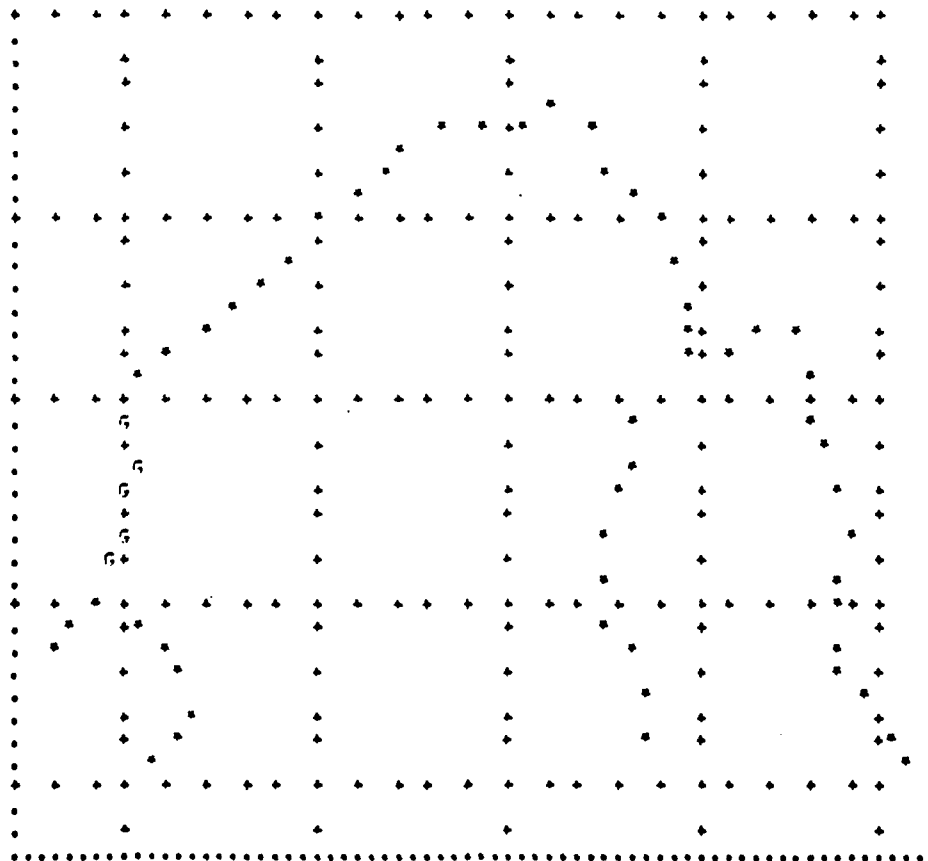
17-79 113914007 44N 45E 50K 174N 175E 55K 114N 112E 50K 4A
 FOR CYCLOPS 17-79 2204 113914007
 PROBABILITIES OF EVENTS WITHIN THRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS *****

STRIKE WITHIN SRI LANKA	0.000	0.004	.173	.133	.191
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.040	.143	.138
WINDS OF AT LEAST 55KNOTS	0.000	0.002	.121	.139	.150
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN TAMIL NADU	0.000	0.000	.130	.144	.254
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.027	.131	.222
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.009	.039	.067
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN AN PRADESH	0.000	0.000	.001	.032	.116
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.045	.120
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.000	.009	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN OCEAN W. PEN	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 55KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.031	.178	.371
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.027	.142	.276
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.008	.045	.093
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002



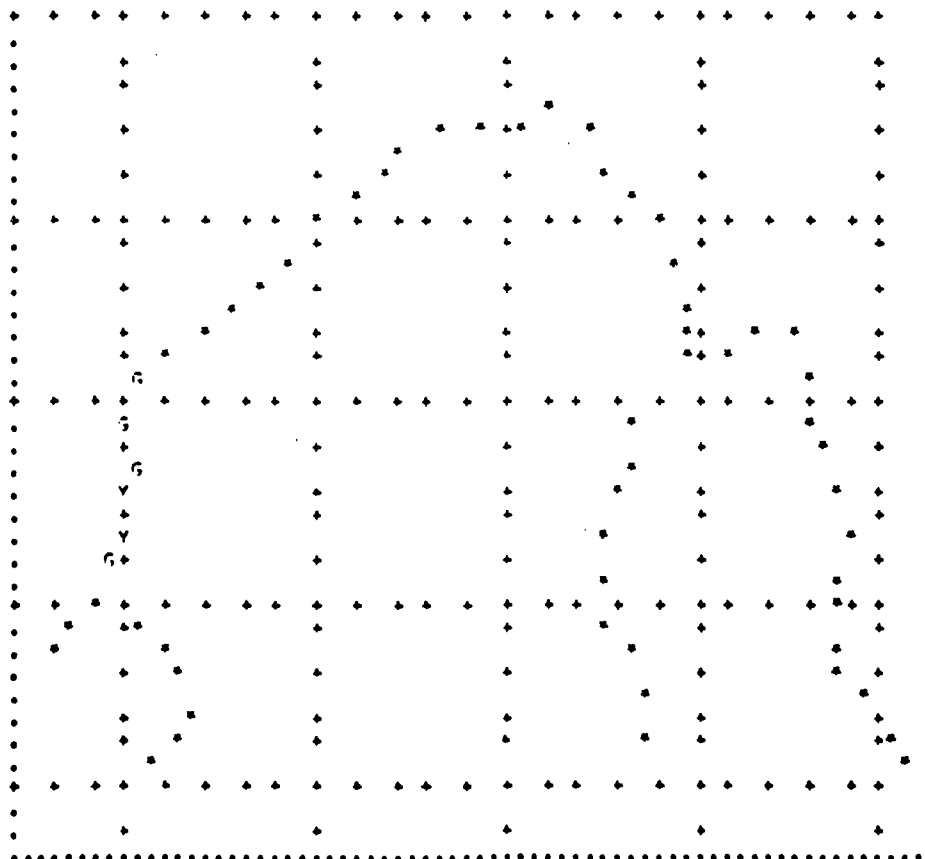
17-79 11092000Z 104N 152E 60K 123N 127E 60K 130N 134E 55K 4A
 FOR CYCLONE 17-79 FROM 1000007
 PROBABILITY OF EVENTS WITHIN 1HRS 12HRS 24HRS 72HRS 14HRS
 HOURS OF DARKNESS 11 11 11 11 11

STRIKE WITHIN SPI LANKA	0.000	.002	.014	.031	.048
WINDS OF AT LEAST 40KNOTS	0.000	.003	.027	.044	.064
WINDS OF AT LEAST 65KNOTS	0.000	.001	.006	.013	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	.003	.031	.177	.237
WINDS OF AT LEAST 40KNOTS	0.000	.003	.034	.205	.263
WINDS OF AT LEAST 65KNOTS	0.000	.001	.012	.070	.090
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.001	.002
STRIKE WITHIN AN PRADESH	0.000	.000	.029	.125	.203
WINDS OF AT LEAST 40KNOTS	0.000	.001	.051	.154	.228
WINDS OF AT LEAST 65KNOTS	0.000	.000	.011	.045	.070
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.002
STRIKE WITHIN ORISSA W. IND	0.000	0.000	0.000	.001	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.002	.019
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	.003	.110	.393	.444
WINDS OF AT LEAST 40KNOTS	0.000	.003	.102	.266	.373
WINDS OF AT LEAST 65KNOTS	0.000	.001	.040	.108	.153
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.002	.004



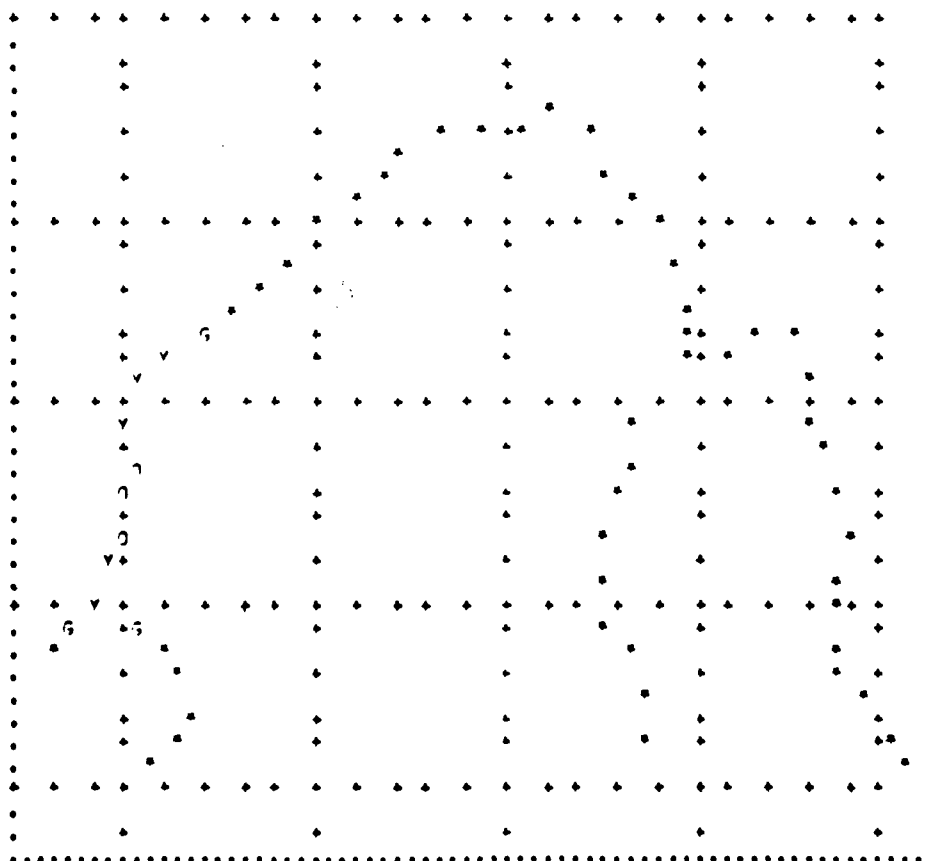
17-79 111002017 104N 143E 65K 123N 113E 60K 130N 100E 60K 44
 FOR CYCLONE 17-79 FROM 1012017
 PROBABILITIES OF EVENTS WITHIN 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS *****

STRIKE WITHIN SRI LANKA	0.000	.003	.014	.024	.041
WINDS OF AT LEAST 40KNOTS	0.000	.005	.025	.045	.061
WINDS OF AT LEAST 65KNOTS	0.000	.001	.007	.013	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	.016	.142	.235	.284
WINDS OF AT LEAST 40KNOTS	0.000	.014	.173	.292	.337
WINDS OF AT LEAST 65KNOTS	0.000	.004	.062	.101	.124
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.003
STRIKE WITHIN AN POLISH	0.000	.002	.058	.153	.221
WINDS OF AT LEAST 40KNOTS	0.000	.007	.099	.203	.270
WINDS OF AT LEAST 65KNOTS	0.000	.001	.023	.061	.094
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.003
STRIKE WITHIN ORSA+W. BEN	0.000	0.000	0.000	.001	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.002	.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	.018	.200	.394	.512
WINDS OF AT LEAST 40KNOTS	0.000	.014	.147	.355	.451
WINDS OF AT LEAST 65KNOTS	0.000	.008	.079	.153	.201
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.003	.006



17-73 11100007 1161 4705 75K 175N 114E 45K 171N 704E 55K 44
 FOR CYCLONE 17-73 FROM 11100007
 POSSIBILITIES OF EVENTS WITHIN 1240S 2640S 7640S 6440S
 HOURS OF DARKNESS + ***** + ***** + ****

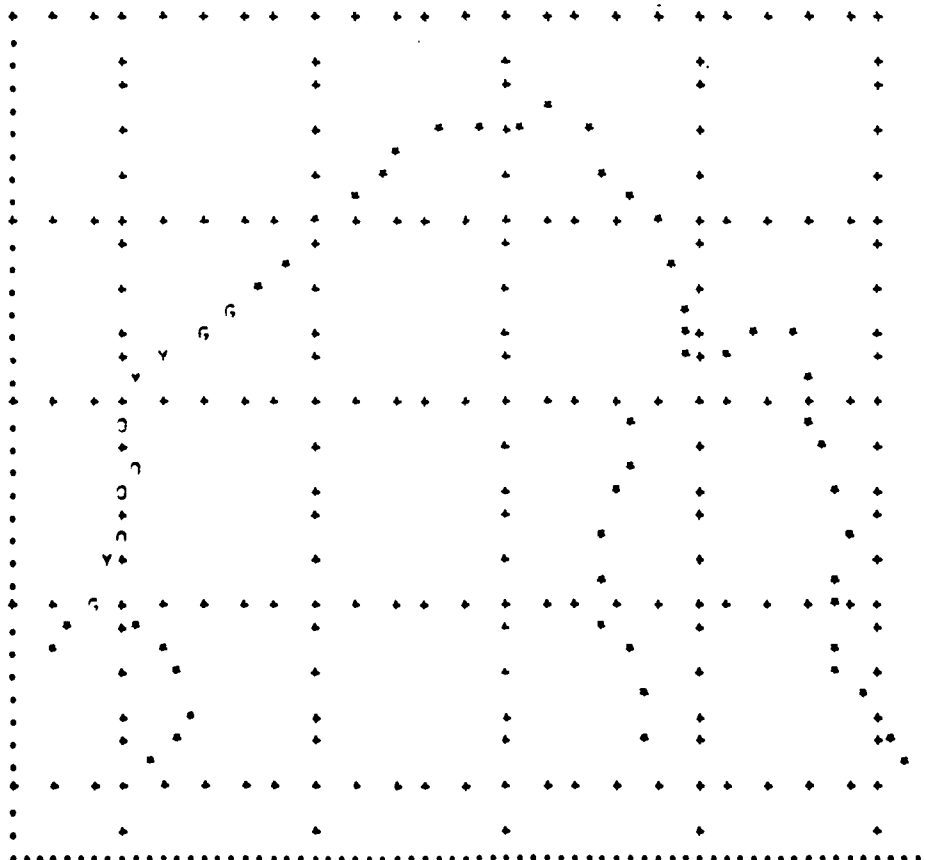
STRIKE WITHIN SPI LANE	0.000	.001	.008	.012	.029
WINDS OF AT LEAST 40KNOTS	0.000	.003	.020	.043	.062
WINDS OF AT LEAST 65KNOTS	0.000	.001	.010	.022	.032
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.003	.005
STRIKE WITHIN TAMIL NADU	0.000	.031	.162	.292	.306
WINDS OF AT LEAST 40KNOTS	0.000	.042	.256	.377	.455
WINDS OF AT LEAST 65KNOTS	0.000	.032	.173	.260	.309
WINDS OF AT LEAST 100KNOTS	0.000	.001	.016	.035	.049
STRIKE WITHIN AN ANDAMAN	0.000	.007	.049	.104	.258
WINDS OF AT LEAST 40KNOTS	0.000	.021	.152	.353	.444
WINDS OF AT LEAST 65KNOTS	0.000	.006	.041	.173	.226
WINDS OF AT LEAST 100KNOTS	0.000	.000	.010	.032	.048
STRIKE WITHIN OPSA+W. BEN	0.000	0.000	0.000	.001	.012
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN EAST INDIA	0.000	.038	.251	.467	.566
WINDS OF AT LEAST 40KNOTS	0.000	.038	.250	.446	.563
WINDS OF AT LEAST 65KNOTS	0.000	.033	.224	.396	.493
WINDS OF AT LEAST 100KNOTS	0.000	.001	.026	.067	.098



17-79 111714017 1214 8345 754 1374 4125 854 1434 7345 834 43
 FOR CYCLONE 17-79 FROM 111714017

PROBABILITIES OF EVENTS WITHIN 1405 1245 2445 7445 1445
 HOURS OF INTERESS *****

STRIKE WITHIN SRI LANKA	0.000	.000	.002	.006	.011
WINDS OF AT LEAST 40KNOTS	0.000	.001	.006	.015	.024
WINDS OF AT LEAST 65KNOTS	0.000	.000	.003	.007	.012
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.002
STRIKE WITHIN TAMIL NADU	0.000	.046	.146	.209	.249
WINDS OF AT LEAST 40KNOTS	0.000	.044	.230	.388	.450
WINDS OF AT LEAST 65KNOTS	0.000	.051	.159	.224	.260
WINDS OF AT LEAST 100KNOTS	0.000	.012	.012	.025	.037
STRIKE WITHIN AN ANDAMAN	0.000	.027	.156	.275	.337
WINDS OF AT LEAST 40KNOTS	0.000	.054	.229	.369	.517
WINDS OF AT LEAST 65KNOTS	0.000	.023	.140	.245	.297
WINDS OF AT LEAST 100KNOTS	0.000	.001	.015	.041	.058
STRIKE WITHIN ORISSA+4.15N	0.000	0.000	.000	.002	.005
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.016	.029
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.004
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN EAST INDIA	0.000	.073	.302	.486	.591
WINDS OF AT LEAST 40KNOTS	0.000	.073	.302	.484	.589
WINDS OF AT LEAST 65KNOTS	0.000	.064	.270	.430	.516
WINDS OF AT LEAST 100KNOTS	0.000	.002	.029	.063	.096



17-79 111120007 127N 434E 75K 177N 416E 45K 145N 724E 50K 44
 FOR CYCLONE 17-79 FROM 1120007

PROBABILITIES OF EVENTS WITHIN THRS 12HRS 24HRS 36HRS 48HRS
 HOURS OF DARKNESS ** * ***** * *****

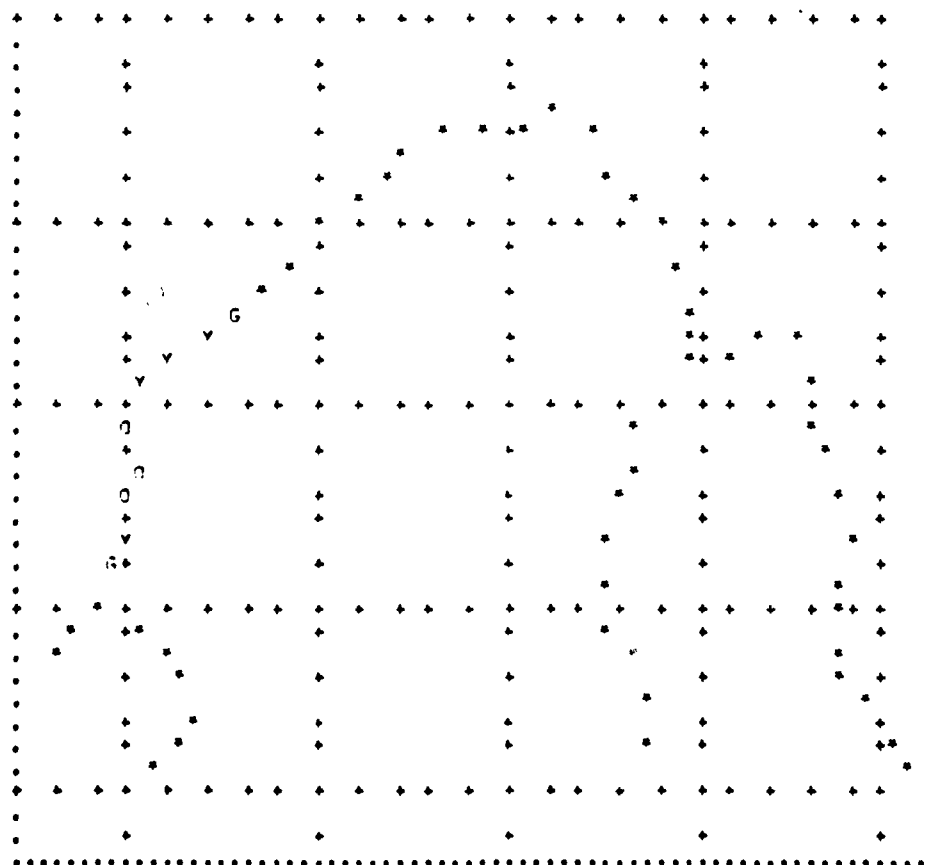
	1.000	0.000	.001	.003	.007
STRIKE WITHIN SRI LANKA	0.000	0.000	.002	.003	.019
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.003	.019
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.001	.003	.008
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.001

	0.000	.027	.090	.140	.178
STRIKE WITHIN TAMIL NADU	0.000	.069	.213	.304	.364
WINDS OF AT LEAST 40KNOTS	0.000	.031	.102	.154	.199
WINDS OF AT LEAST 55KNOTS	0.000	.001	.008	.019	.028

	0.000	.075	.178	.305	.377
STRIKE WITHIN AN ANDAMAN	0.000	.055	.232	.380	.465
WINDS OF AT LEAST 40KNOTS	0.000	.031	.157	.274	.334
WINDS OF AT LEAST 55KNOTS	0.000	.001	.018	.045	.064

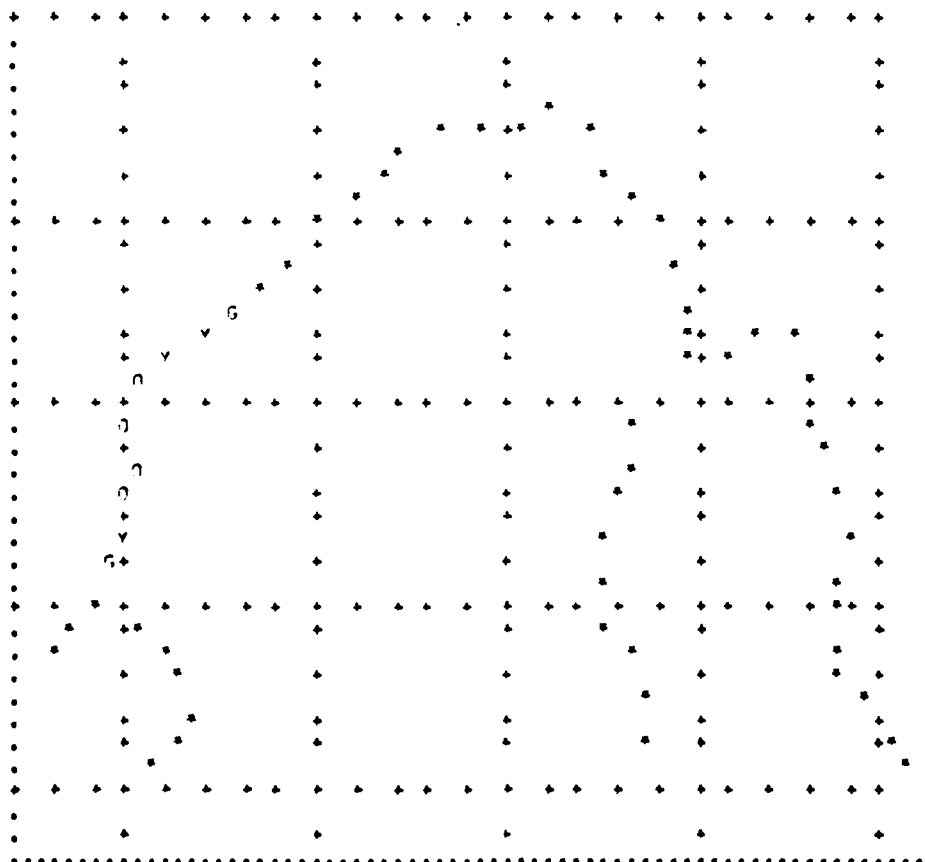
	0.000	0.000	.000	.004	.009
STRIKE WITHIN ORISSA+MIZORAM	0.000	0.000	.000	.004	.009
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.002	.006
WINDS OF AT LEAST 55KNOTS	0.000	0.000	.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002

	0.000	.062	.269	.443	.563
STRIKE WITHIN EAST INDIA	0.000 <td>.062 <td>.269 <td>.443 <td>.563</td> </td></td></td>	.062 <td>.269 <td>.443 <td>.563</td> </td></td>	.269 <td>.443 <td>.563</td> </td>	.443 <td>.563</td>	.563
WINDS OF AT LEAST 40KNOTS	0.000 <td>.062 <td>.269 <td>.443 <td>.563</td> </td></td></td>	.062 <td>.269 <td>.443 <td>.563</td> </td></td>	.269 <td>.443 <td>.563</td> </td>	.443 <td>.563</td>	.563
WINDS OF AT LEAST 55KNOTS	0.000 <td>.055 <td>.240 <td>.393 <td>.491</td> </td></td></td>	.055 <td>.240 <td>.393 <td>.491</td> </td></td>	.240 <td>.393 <td>.491</td> </td>	.393 <td>.491</td>	.491
WINDS OF AT LEAST 100KNOTS	0.000 <td>.002 <td>.026 <td>.065 <td>.094</td> </td></td></td>	.002 <td>.026 <td>.065 <td>.094</td> </td></td>	.026 <td>.065 <td>.094</td> </td>	.065 <td>.094</td>	.094



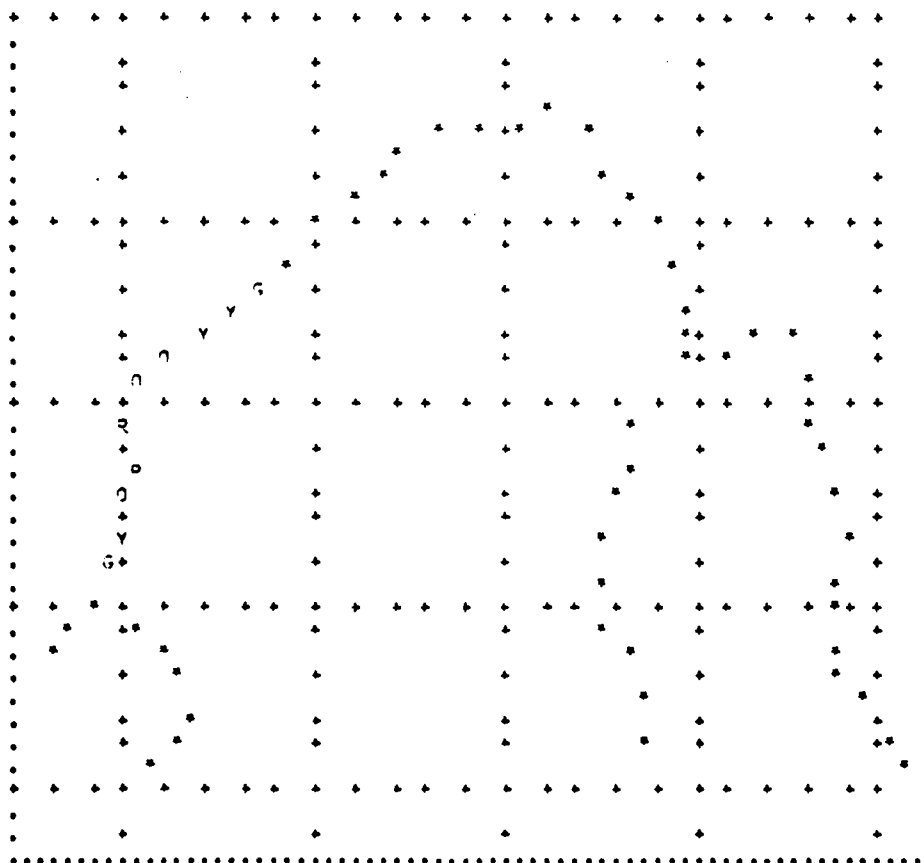
17-79 111102007 1317 4265 204 1417 2095 45K 1447 7315 30K 49
 FOR CYCLOPE 17-79 FROM 1102007
 PROBABILITIES OF EVENTS WITHIN 1400 12400 21400 36400 49400
 GROUPS OF DISCRETS + + + + +

STRIKE WITHIN SRI LANKA	0.000	0.000	.000	.001	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.003	.014
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.014
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN TAMIL NADU	.001	.041	.091	.129	.159
WINDS OF AT LEAST 40KNOTS	.004	.151	.273	.337	.346
WINDS OF AT LEAST 65KNOTS	.001	.052	.109	.143	.177
WINDS OF AT LEAST 100KNOTS	.000	.002	.009	.017	.025
STRIKE WITHIN AN PRADESH	.002	.111	.247	.399	.456
WINDS OF AT LEAST 40KNOTS	.002	.145	.350	.514	.586
WINDS OF AT LEAST 65KNOTS	.002	.103	.263	.362	.410
WINDS OF AT LEAST 100KNOTS	.000	.006	.030	.056	.071
STRIKE WITHIN OSA+4.2EN	0.000	0.000	.001	.004	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.010	.033	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.007	.004	.007
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002
STRIKE WITHIN EAST INDIA	.002	.152	.374	.532	.623
WINDS OF AT LEAST 40KNOTS	.002	.152	.374	.531	.621
WINDS OF AT LEAST 65KNOTS	.002	.141	.346	.473	.552
WINDS OF AT LEAST 100KNOTS	.000	.004	.039	.073	.097



POSSIBILITIES OF EVENTS WITHIN 4 HOURS 12 HRS 24 HRS 75 HRS 48 HRS
+ + + + + + + + + +

STRIKE WITHIN EAST INOT4	.008	.214	.442	.577	.659
WINDS OF AT LEAST 65KNOTS	.039	.214	.442	.577	.659
WINDS OF AT LEAST 55KNOTS	.108	.213	.440	.573	.645
WINDS OF AT LEAST 100KNOTS	.021	.069	.205	.392	.350



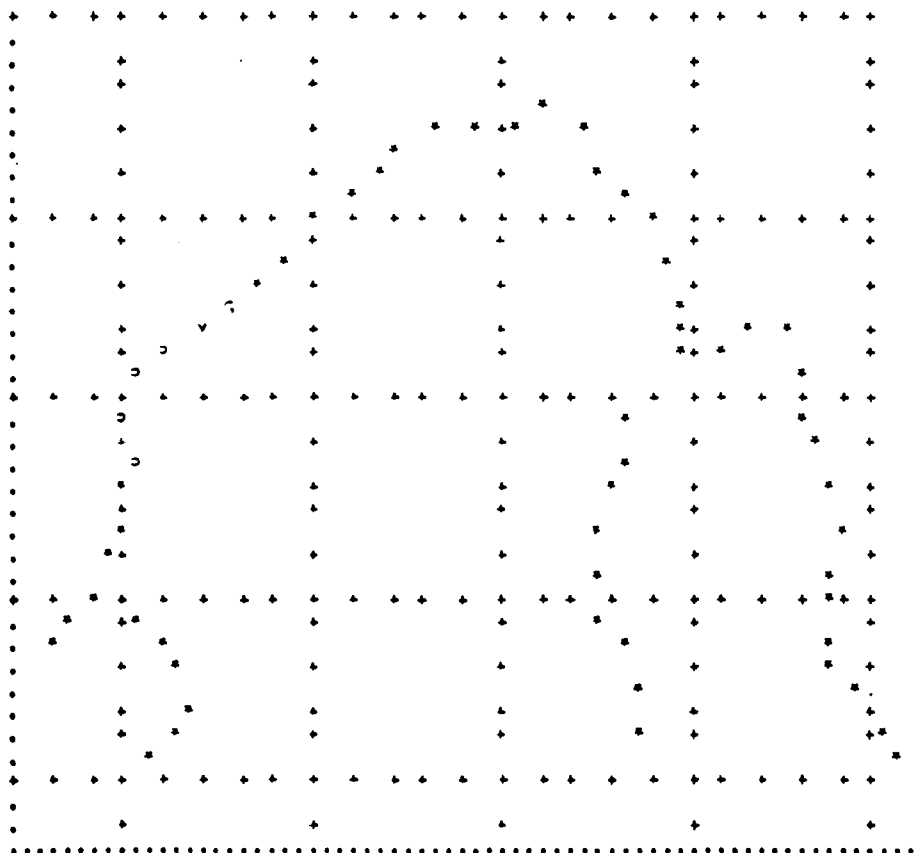
17-79 11111400Z 142N 105E 154 145N 742E 774 0N 1E 0K 24
 FOR CYCLONE 17-79 FROM 111400Z
 PROBABILITIES OF EVENTS WITHIN 12HRS 124HRS 244HRS
 WINDS OF 10KNOTS *****

STRIKE WITHIN TAMIL NADU	.002	.007	.003
WINDS OF AT LEAST 40KNOTS	.148	.511	.757
WINDS OF AT LEAST 65KNOTS	.007	.011	.013
WINDS OF AT LEAST 100KNOTS	.001	.002	.003

STRIKE WITHIN AN ANDAMAN	.192	.612	.757
WINDS OF AT LEAST 40KNOTS	.144	.519	.776
WINDS OF AT LEAST 65KNOTS	.192	.610	.766
WINDS OF AT LEAST 100KNOTS	.053	.194	.251

STRIKE WITHIN ORISSA+W. BENG	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000

STRIKE WITHIN EAST INDIA	.194	.619	.776
WINDS OF AT LEAST 40KNOTS	.144	.519	.776
WINDS OF AT LEAST 65KNOTS	.194	.617	.773
WINDS OF AT LEAST 100KNOTS	.053	.196	.254



17-73 111202017 1440 4155 314 1400 7455 314 04 05 06 24
 FOR CYCLONE 17-70 FROM 1200017
 PROBABILITIES OF EVENTS WITHIN 12HRS 12HRS 24HRS
 HOURS OF DISKNESS *****

STRIKE WITHIN TAMIL NADU	.001	.005	.007
WINDS OF AT LEAST 40KNOTS	.213	.330	.373
WINDS OF AT LEAST 65KNOTS	.001	.007	.011
WINDS OF AT LEAST 100KNOTS	.000	.001	.001

STRIKE WITHIN AN ANDHRA	.253	.545	.688
WINDS OF AT LEAST 40KNOTS	.254	.549	.696
WINDS OF AT LEAST 65KNOTS	.252	.541	.680
WINDS OF AT LEAST 100KNOTS	.034	.091	.129

STRIKE WITHIN ORISSA+WARREN	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.016
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000

STRIKE WITHIN EAST INDIA	.254	.549	.696
WINDS OF AT LEAST 40KNOTS	.254	.549	.696
WINDS OF AT LEAST 65KNOTS	.253	.545	.687
WINDS OF AT LEAST 100KNOTS	.034	.092	.130

