U. S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
WEATHER BUREAU

OFFICE NOTE 43

STRUCTURE OF TROPICAL DATA TAPE

by

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The Tropical Data Tape* contains analysis and forecast data for 700, 500, 300, 250 and 200 mb levels. The tape format is as follows:

Front of tape

File 1 - Date record and analyses for 700, 500, 300, 250 and 200 mb levels.

Date Record
700 mb data

1. Wind speed in knots x 2^{-9} - 73x23 point grid (See figure 1)
2. U (positive west to east) wind component in knots x 2^{-9} - 73x23 point grid
3. V (positive south to north) wind component in knots x 2^{-9} - 73x23 point grid
4. Temperature in degrees centigrade x 2^{-7} - 73x23 point grid (Added in February 1970)
5. Stream in cm x 2^{-17} - 73x23 point grid (These stream function values have been interpolated from the offset 73x24 point grid to the 73x23 point grid. See figure 4)
6. Offset stream in cm x 2^{-17} - 73x24 point grid (See figure 1)

500 mb data
300 mb data
250 mb data
200 mb data

The format for the 500, 300, 250, and 200 mb data is the same as for the 700 mb data except that the stream and offset stream fields for 300, 250 and 200 mb are in cm x 2^{-18}.

End of File

File 2 - Forecast data to 36 hours in 6 hourly intervals for 700, 500, 300, 250 and 200 mb levels. The units and scaling are the same as those of the analyses.

700 mb data

6 hrs. 12 hrs. 18 hrs.	U and V components
24 hrs.	Wind speed U component V component Stream Offset stream (dummy field of zeros)
30 hrs. 36 hrs.	U and V components

500 mb data
300 mb data
250 mb data
200 mb data

The format of the 500, 300, 250 and 200 mb data is the same as for the 700 mb data.

End of File

*Referred to in the Operations Branch as the B6 #2 output tape.

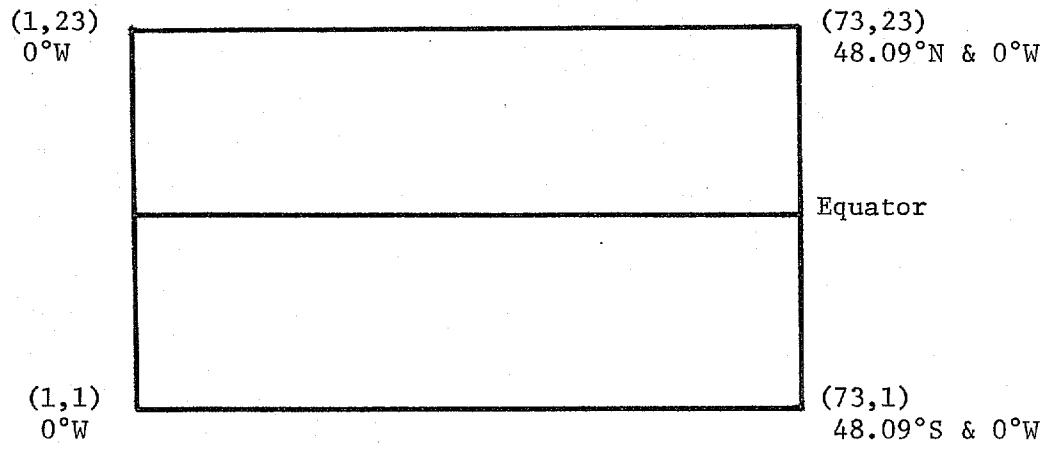
Except for the offset stream function fields, all data are defined on a 73x23 point grid, the points shown with crosses in figure 4. Their latitude and longitude positions are tabled in figure 3. The offset stream function values are defined on the intermediate points indicated by dots in figure 4. Their latitude and longitude positions are given in figure 2.

The date group (record 1 of file 1) is contained in six 36-bit words. When the tropical analysis program is run on the CDC 6600 computer, which is normal for the 'operational' (3+30) run, the date record is increased to ten 36-bit words. The extra four words contain nothing useful, being used only to maintain compatibility between the CDC 6600 and the IBM 7094 computers. Information in the date group is given in 6-bit hollerith characters.

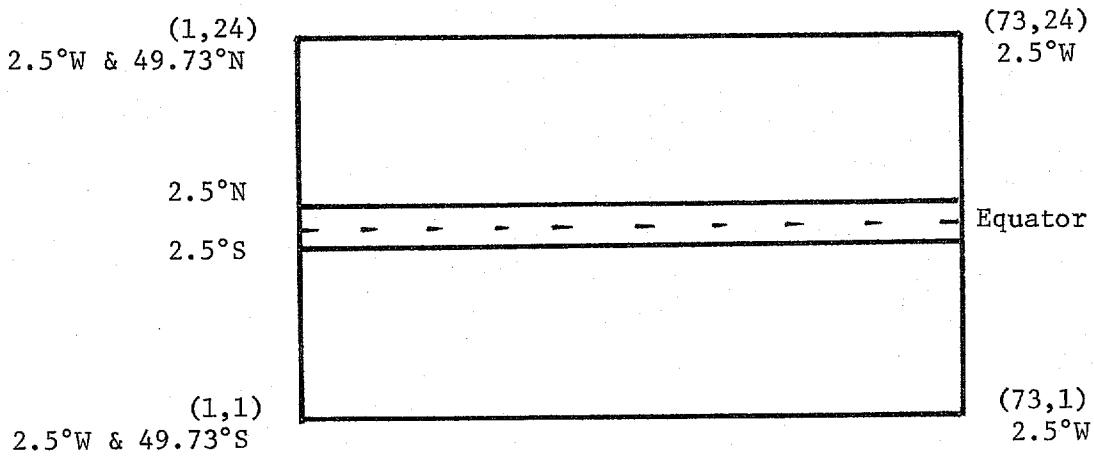
Word 1	bits 0-11	day of month
	bits 12-23	day of week
	bits 24-35	Z time
Word 2	bits 0-11	day of month
	bits 12-23	month (numerical value)
	bits 24-35	year (tens and unit digits)
Word 3	bits 0-5	blank character
	bits 6-17	day of month
	bits 18-23	blank character
	bits 24-35	First 2 alphanumeric characters of month
Word 4	bits 0-5	Third alphanumeric character of month
	bits 6-11	blank character
	bits 12-23	Thousands and hundreds digits of year
	bits 24-35	Tens and unit digits of year
Word 5	bits 0-5	blank character
	bits 5-29	Z time in hundreds (4 digits)
	bits 30-35	the character Z
Word 6	bits 0-35	the six characters TRPANL
Word 7 thru 10	(if present)	nothing useful

When the tropical analysis program is run on the IBM 7094, either as an 'operational' recovery or routinely the 'final' (10+00) run, the analyzed temperature fields are not available. Programming to handle the temperature analysis is available only for the CDC 6600.

Each datum record (assuming 36 bit words) is in the NMC Triple Packed Data Field format described in Appendix 2 and attachment of Office Note 25.



U and V Wind Component and Temperature Fields
(73 x 23)



Offset Stream Field
(73 x 24)

Tropical Grids
(Mercator Projection true at 22.5N)

Figure 1

0°E			0°W
(I,J)			(I,J)
(1,23)	≡ LATITUDE ≡	48.0943890°N	(73,23)
(1,22)		44.6460762°N	(73,22)
(1,21)		40.9798965°N	(73,21)
(1,20)		37.0980301°N	(73,20)
(1,19)		33.0066166°N	(73,19)
(1,18)		28.7162848°N	(73,18)
(1,17)		24.2425127°N	(73.17)
(1,16)		19.6057940°N	(73,16)
(1,15)		14.8315315°N	(73,15)
(1,14)		9.9496145°N	(73,14)
(1,13)		4.9936657°N	(73,13)
J (1,12)		0.0°	(73,12)
(1,11)		4.9936657°S	(73,11)
(1,10)		9.9496145°S	(73,10)
(1,09)		14.8315315°S	(73,09)
(1,08)		19.6057940°S	(73,08)
(1,07)		24.2425127°S	(73,07)
(1,06)		28.7162848°S	(73,06)
(1,05)		33.0066166°S	(73,05)
(1,04)		37.0980301°S	(73,04)
(1,03)		40.9798965°S	(73,03)
(1,02)		44.6460762°S	(73,02)
(1,01)		48.0943890°S	(73,01)
0°E ←	I →	(WHERE I UNIT ≡ 5° LONGITUDE)	0°W

GRID #1 MERCATOR

Fig. 2

2.5°W 2.5°W

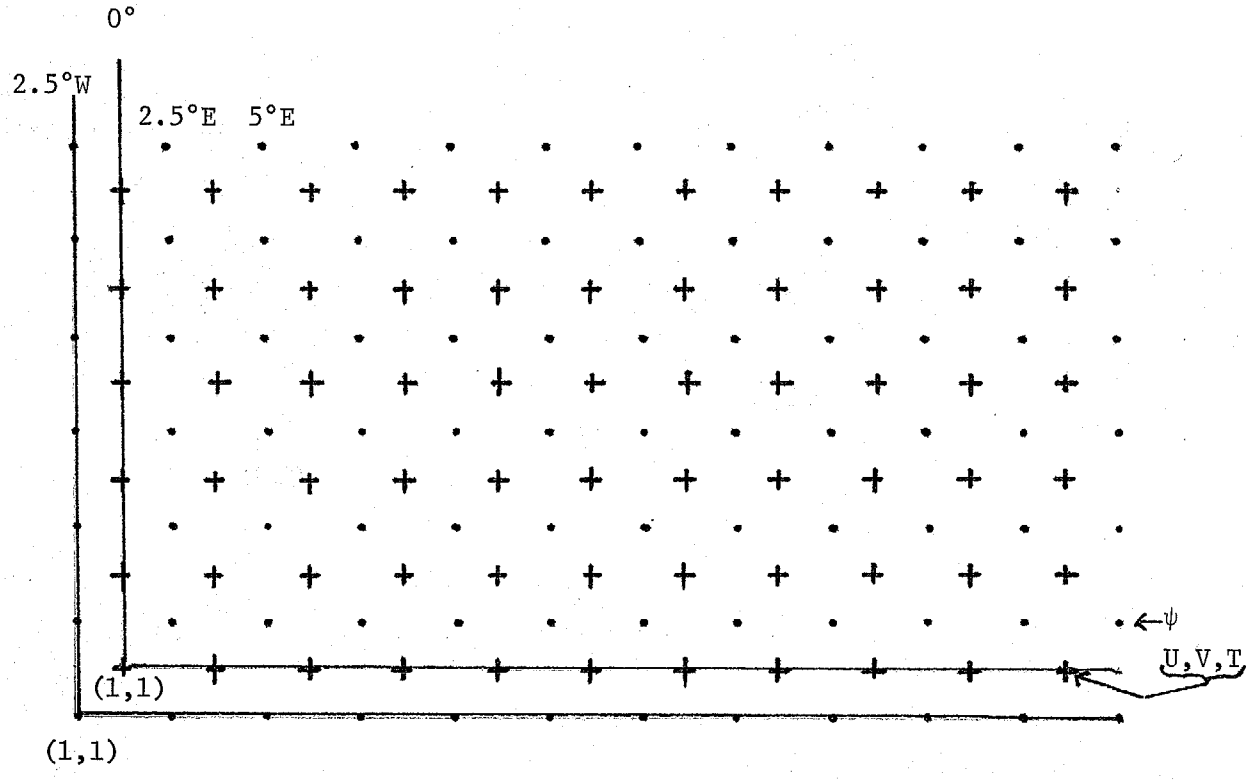
(I,J)	≡ LATITUDE ≡	(I,J)
(1,24)	49.73720042977°N	(73,24)
(1,23)	46.39755707634°N	(73,23)
(1,22)	42.84026228833°N	(73,22)
(1,21)	39.06572702518°N	(73,21)
(1,20)	35.07804267080°N	(73,20)
(1,19)	30.88553814565°N	(73,19)
(1,18)	26.50123042435°N	(73,18)
(1,17)	21.94310079780°N	(73,17)
(1,16)	17.23412992904°N	(73,16)
(1,15)	12.40203692013°N	(73,15)
(1,14)	7.47869263084°N	(73,14)
(1,13)	2.49921373766°N	(73,13)
(1,12)	2.49921373766°S	(73,12)
(1,11)	7.47869263084°S	(73,11)
(1,10)	12.40203692013°S	(73,10)
(1,09)	17.23412992904°S	(73,09)
(1,08)	21.94310079780°S	(73,08)
(1,07)	26.50123042435°S	(73,07)
(1,06)	30.88553814565°S	(73,06)
(1,05)	35.07804267080°S	(73,05)
(1,04)	39.06572702518°S	(73,04)
(1,03)	42.84026228833°S	(73,03)
(1,02)	46.39755707634°S	(73,02)
(1,01)	49.73720042977°S	(73,01)

J ↑ ↓

2.5°W ← I → (WHERE I UNIT ≡ 5° LONGITUDE) 2.5°W

GRID #2 MERCATOR

Fig. 3



The wind component (U and V) data and the temperature (T) data are defined on a 73x23 point grid represented on the diagram by crosses. The offset stream function (ψ) is defined on a 73x24 point grid represented on the diagram by dots.

Figure 4