

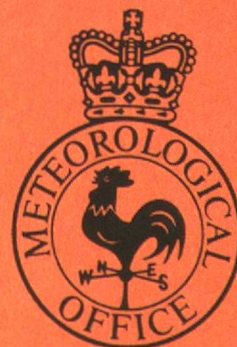
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# Monthly and Seasonal Mean Analyses

## December, January, February 1987/88

ORGS UKMO M

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# **Monthly and Seasonal Mean Analyses**

**December, January, February  
1987/88**

**Mean fields obtained from the  
archive of operational analyses**

Met O 20 (Dynamical Climatology Branch)  
Meteorological Office  
London Road  
Bracknell  
Berkshire RG12 2SZ

**March 1988**

Note: Permission to quote from this document should be obtained from the Assistant Director of the above Meteorological Branch.



## Monthly and Seasonal Mean Analyses

### Introduction

The archive of operational analyses contains a continuous record of global analyses every 12 hours (00 and 12 GMT) from May 1983 onwards. They are copies of the update analyses produced in the operational numerical weather prediction system using the 15-level model (Bell and Dickinson 1987). In this booklet there are presented monthly and seasonal mean fields computed from the archived analyses for a single season. Since a season spans three calendar months, there are four sections. Sections 1, 2 and 3 contain charts of the monthly mean fields for each month, and section 4 contains charts of the seasonal mean fields. The seasonal means are the means of the fields in the first three sections, weighted according to the number of days in each month.

Each section contains a set of charts for the northern and southern hemispheres and a set for the tropics. In each hemisphere, polar stereographic projects have been used to prepare a chart of pressure at mean sea level and composite charts showing both height (contours) and wind (vectors and isotachs) at 850, 500, 250 and 100 mb. In the tropics the charts are presented on a latitude-longitude projection encircling the globe in three sections covering the longitudes  $0^{\circ}$ – $120^{\circ}$  E,  $120^{\circ}$  E– $120^{\circ}$  W and  $120^{\circ}$  W– $0^{\circ}$ . This projection has been used to produce a series of charts of wind vectors and isotachs at 850 and 250 mb. On all charts, contours are depicted as solid lines, wind vectors as arrows and isotachs as dashed lines.

When archiving was first undertaken, for May 1983, global fields were stored according to their coefficients in a series of spherical harmonics up to a triangular truncation of T40 (Swinbank 1984). Since this is roughly equivalent to a latitude-longitude grid with a resolution of  $4.5^{\circ}$  by  $4.5^{\circ}$ , the conversion from the model's standard grid of  $1.5^{\circ}$  by  $1.875^{\circ}$  to the spectral representation results in some smoothing of the fields. Subsequently, a new method for storing the archived fields was developed as a result of discussions within the Working Group on the Development of the Operational Suite (WGDOS). This method uses a compressed digital coding of the original model field, on its standard latitude-longitude grid, but with fewer significant figures (Lowther 1986). It was implemented on 18 December 1985 in a limited version. After the inclusion of more fields, and following monitoring to ensure that the two representations (i.e. truncated spectral and compressed grid-point) of the archived analyses were consistent, the spectral archive was terminated on 31 October 1986.

The contents of the archives may be examined by consulting the computer data set 'M20.NARCHIND', where the tape number, file number and data set name for each archived day may be found. The fields in the spectral archive are stored in the format required by the post-processing (p-p) package. Details of the format and of the subroutines to be used for accessing the data are described in the manual for the p-p package. Some examples are shown in Swinbank (1984). The fields in the daily grid-point archive are stored as printfiles (Lowther 1986). A list of the fields in each of the two versions of the daily archive is given in the relevant documentation.



The monthly and seasonal mean fields have been computed from the spectral archive up to the end of October 1986. Thereafter, they have been computed from the grid-point archive. The mean fields are held as computer data sets in Met O 20, in spectral or grid-point format, as appropriate, and are available for general use. Means for each month and season over three years of the spectral archive are also available. The mean fields that are held are as follows:

Field		Pressure level (mb)					
Westerly wind component	(m/s)						
Southerly wind component	(m/s)	1000*	850	700	500	400	300
Height	(dam)	250	200	150	100	70	50
Temperature	(K)						
Relative humidity	(%)	1000*	850	700	500	400	300
Pressure at mean sea level	(mb)						

\* Fields at 1000 mb are held in the spectral archive. In the grid-point archive this level has been omitted and fields at 950 mb are held instead.

#### References

- |                              |      |  |
|------------------------------|------|--|
| Bell, R.S. and Dickinson, A. | 1987 | The Meteorological Office operational numerical weather prediction system, Meteorological Office Scientific Paper No. 41, Met.O.979, HMSO. |
| Lowther, D.                  | 1986 | WGDOS Printfile Archive, Operational NWP Scheme, Documentation Paper No.9.1, Met O 2b, Meteorological Office, Bracknell.                   |
| Swinbank, R.                 | 1984 | A system to archive operational analyses for research purposes. Met O 20 Technical Note No. 11/218. Meteorological Office, Bracknell.      |

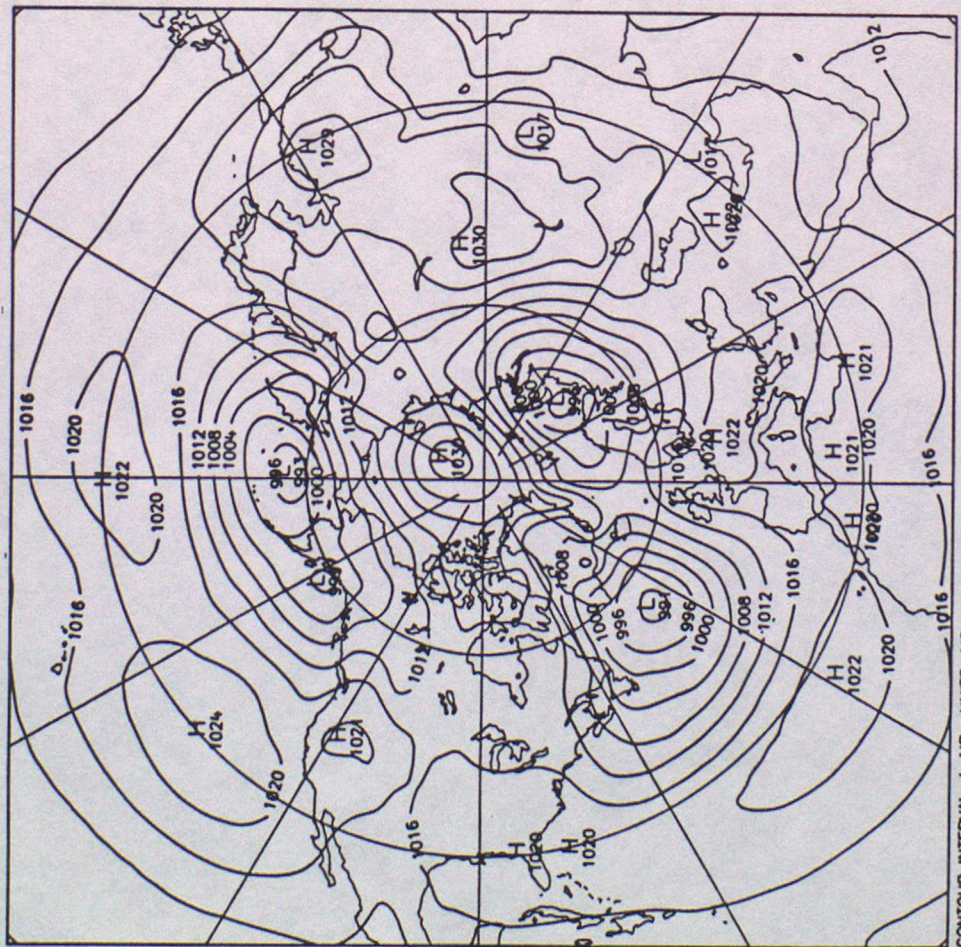


**DECEMBER**  
**1987**



OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
PMSL

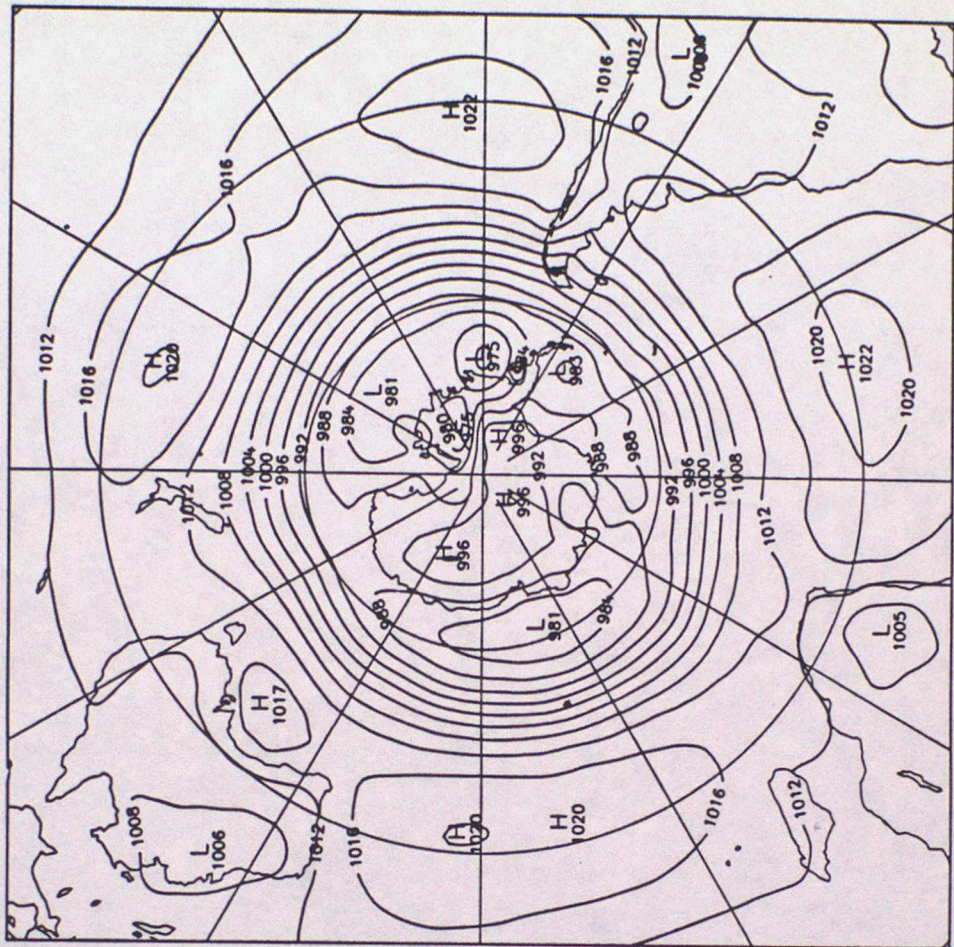
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SEA LEVEL



CONTOUR INTERVAL: 4 MB UNITS: MB

OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
PMSL

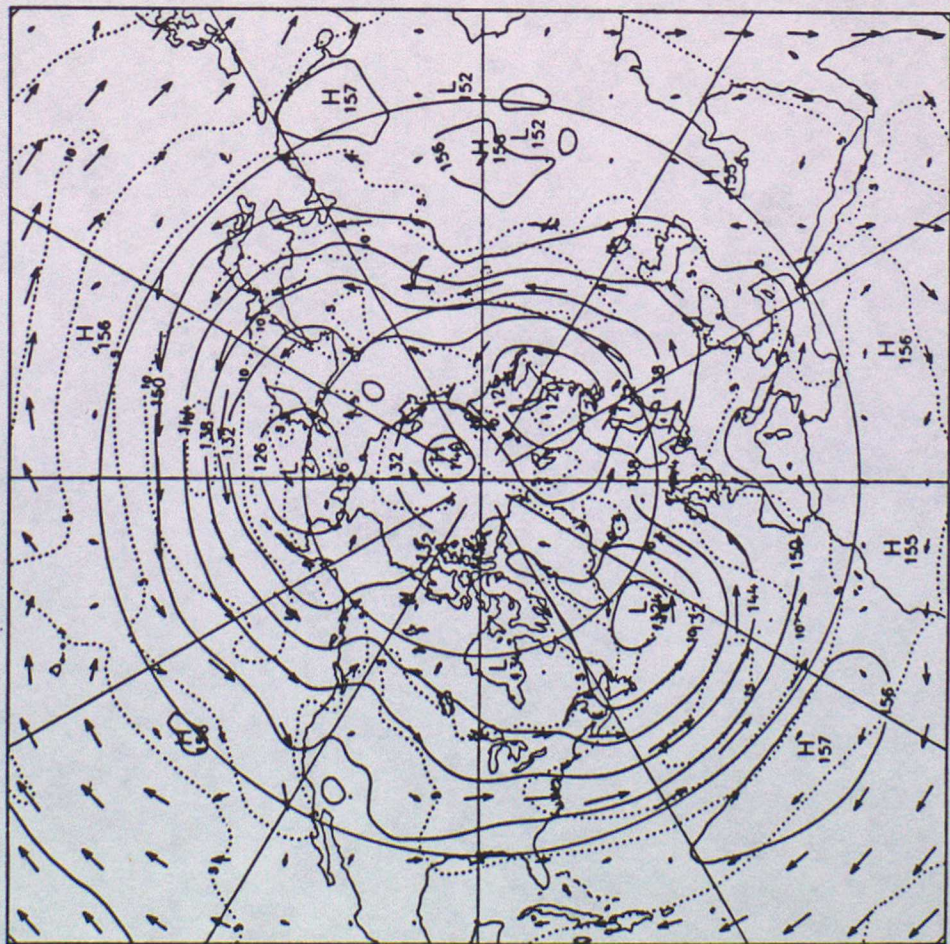
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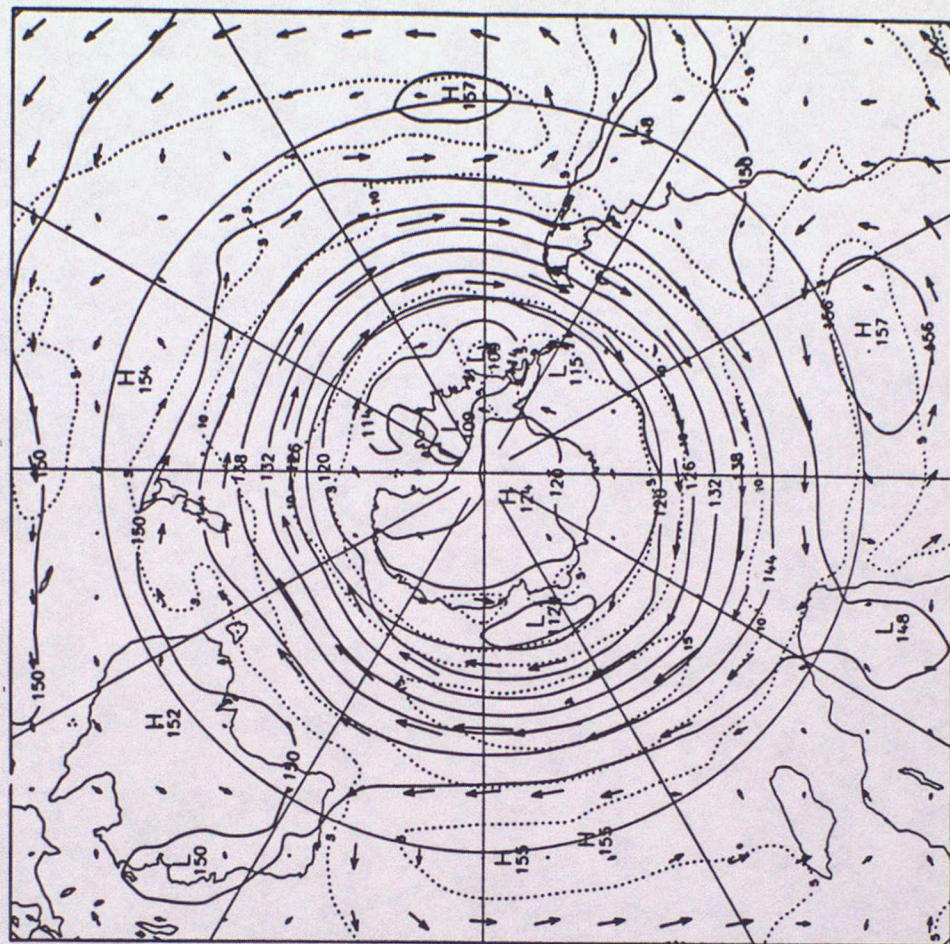


OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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 LEVEL: 850 MB



→ REPRESENTS 10 M/S CONTOUR INTERVAL: 60 M UNITS: 10 M

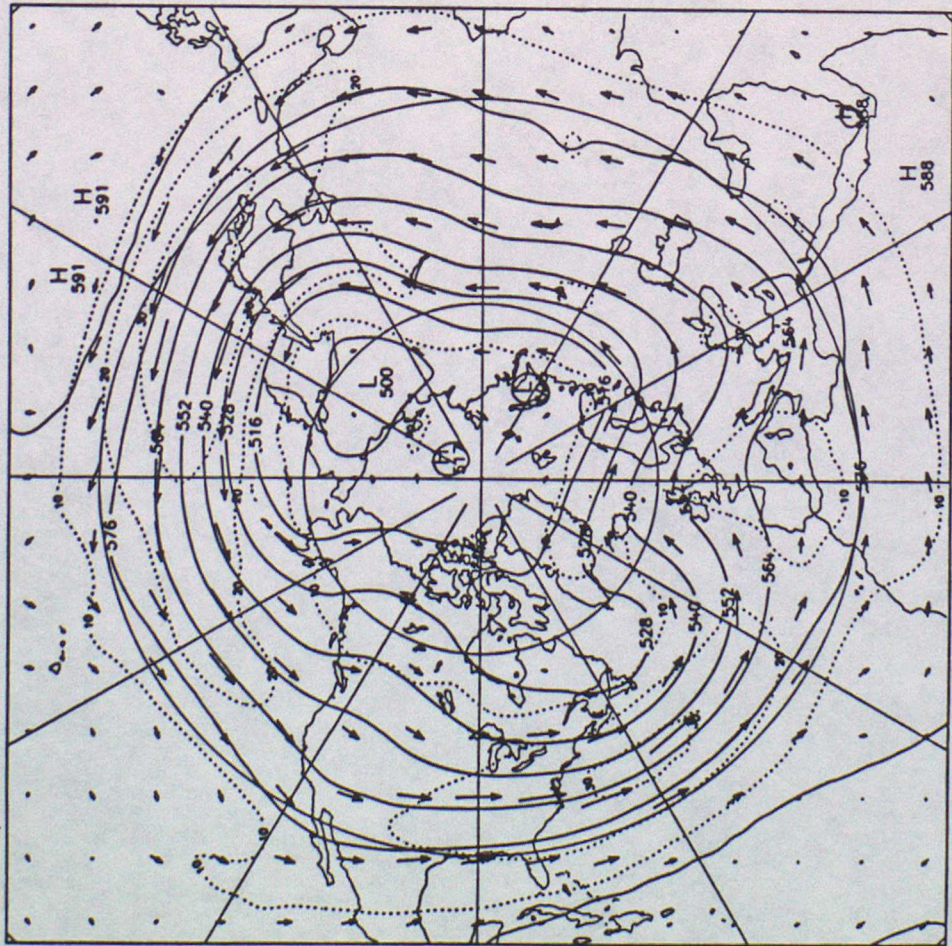
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 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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 LEVEL: 850 MB



→ REPRESENTS 10 M/S CONTOUR INTERVAL: 60 M UNITS: 10 M

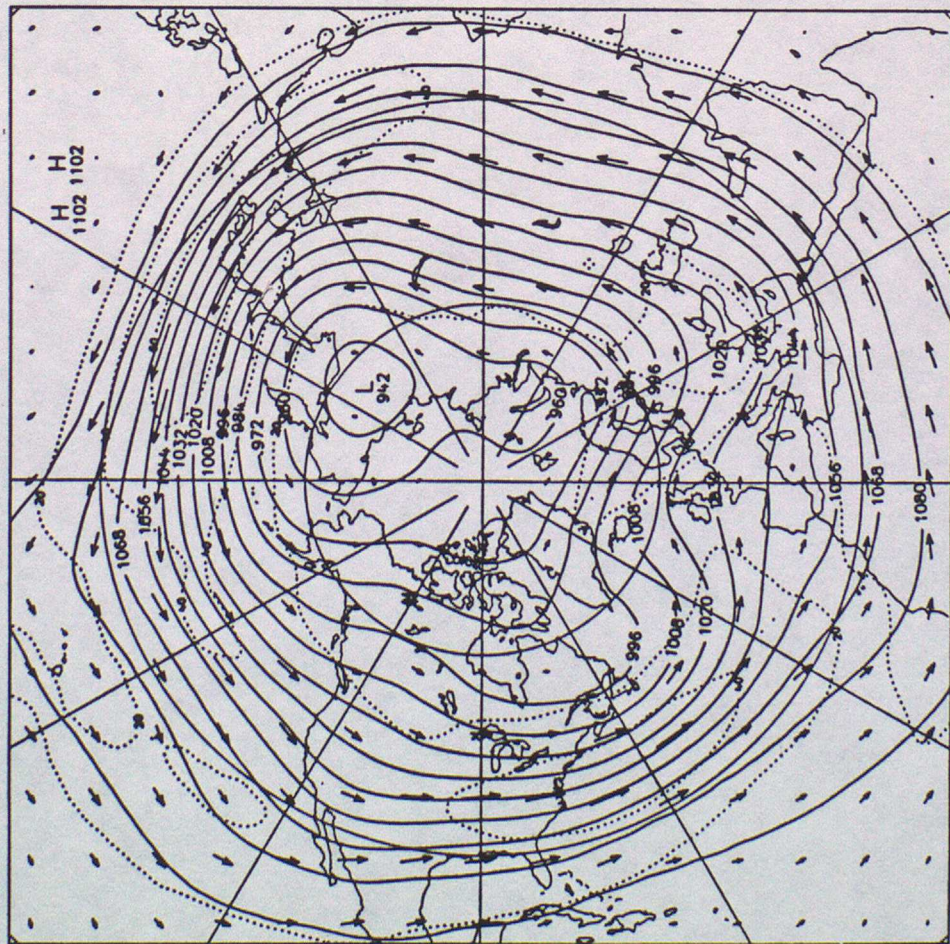


OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
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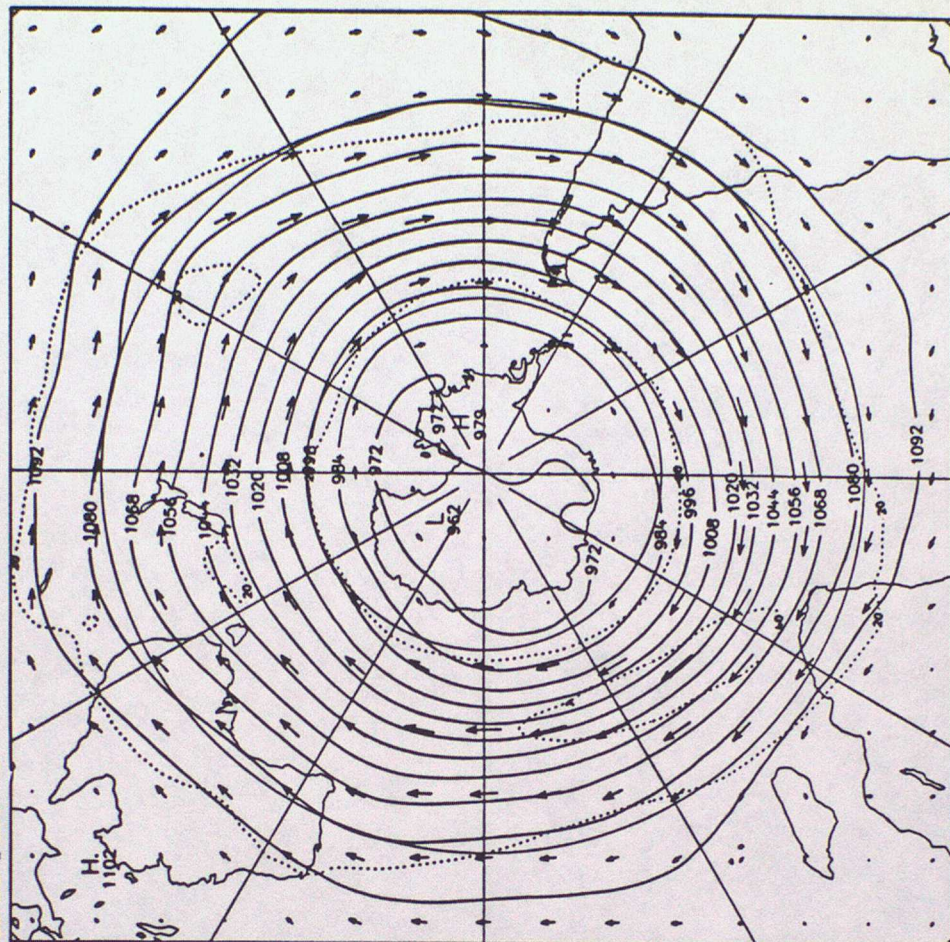




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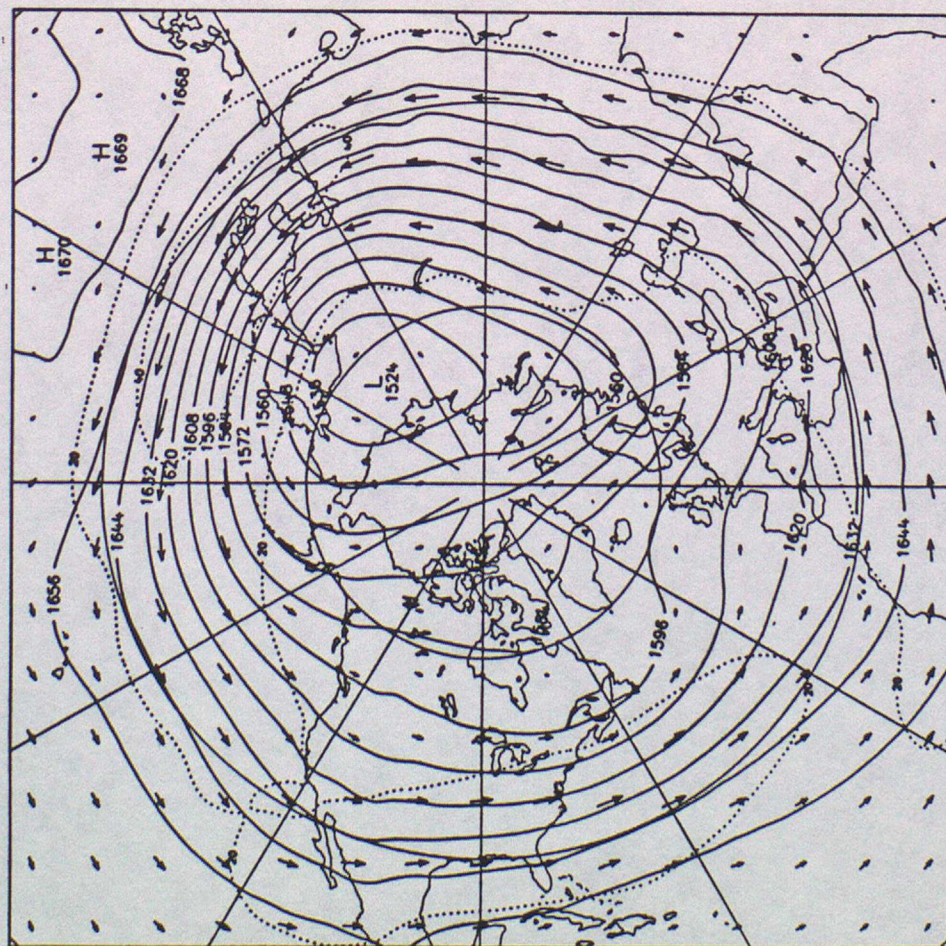
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 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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— REPRESENTS 40 M/S CONTOUR INTERVAL: 120 M UNITS: 10 M

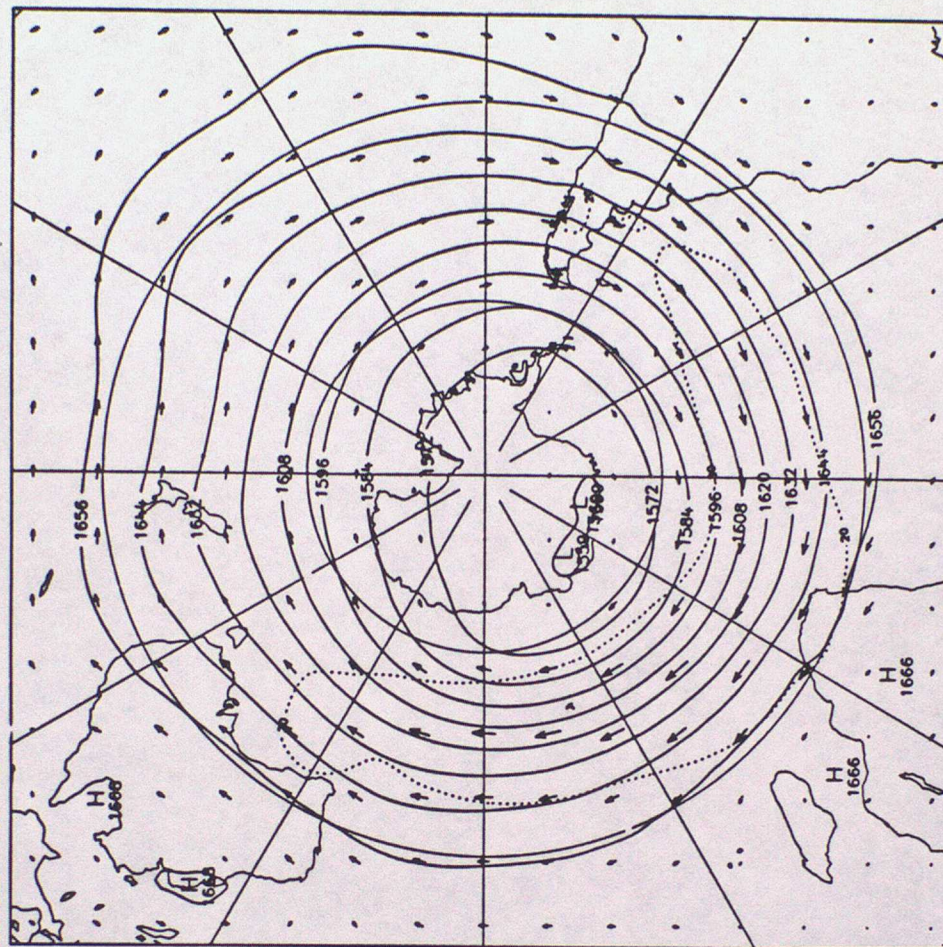


OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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→ REPRESENTS 40 M/S CONTOUR INTERVAL: 120 M UNITS: 10 M

OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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 LEVEL: 100 MB



→ REPRESENTS 40 M/S CONTOUR INTERVAL: 120 M UNITS: 10 M



OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
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 BETWEEN LONGS. 0 E - 120 E

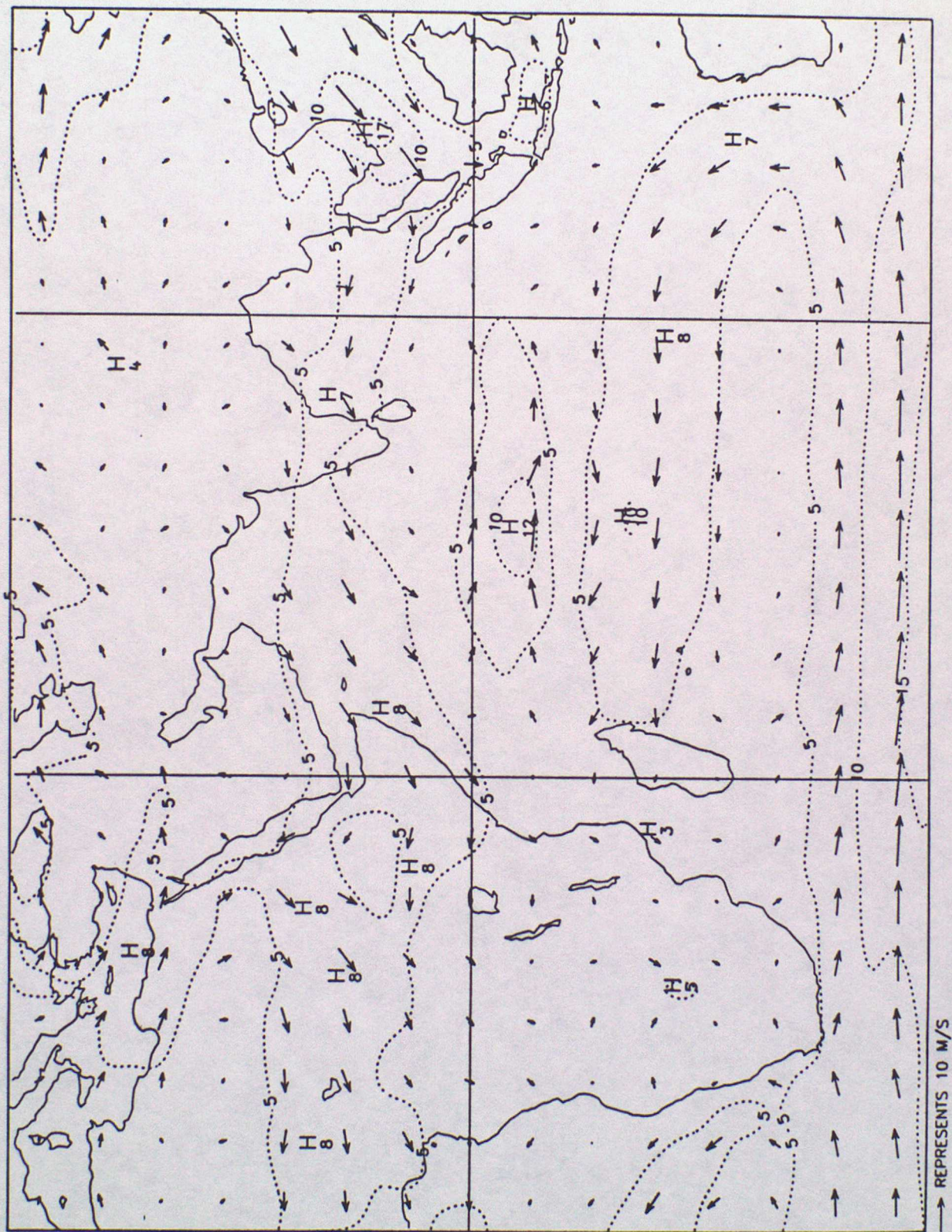


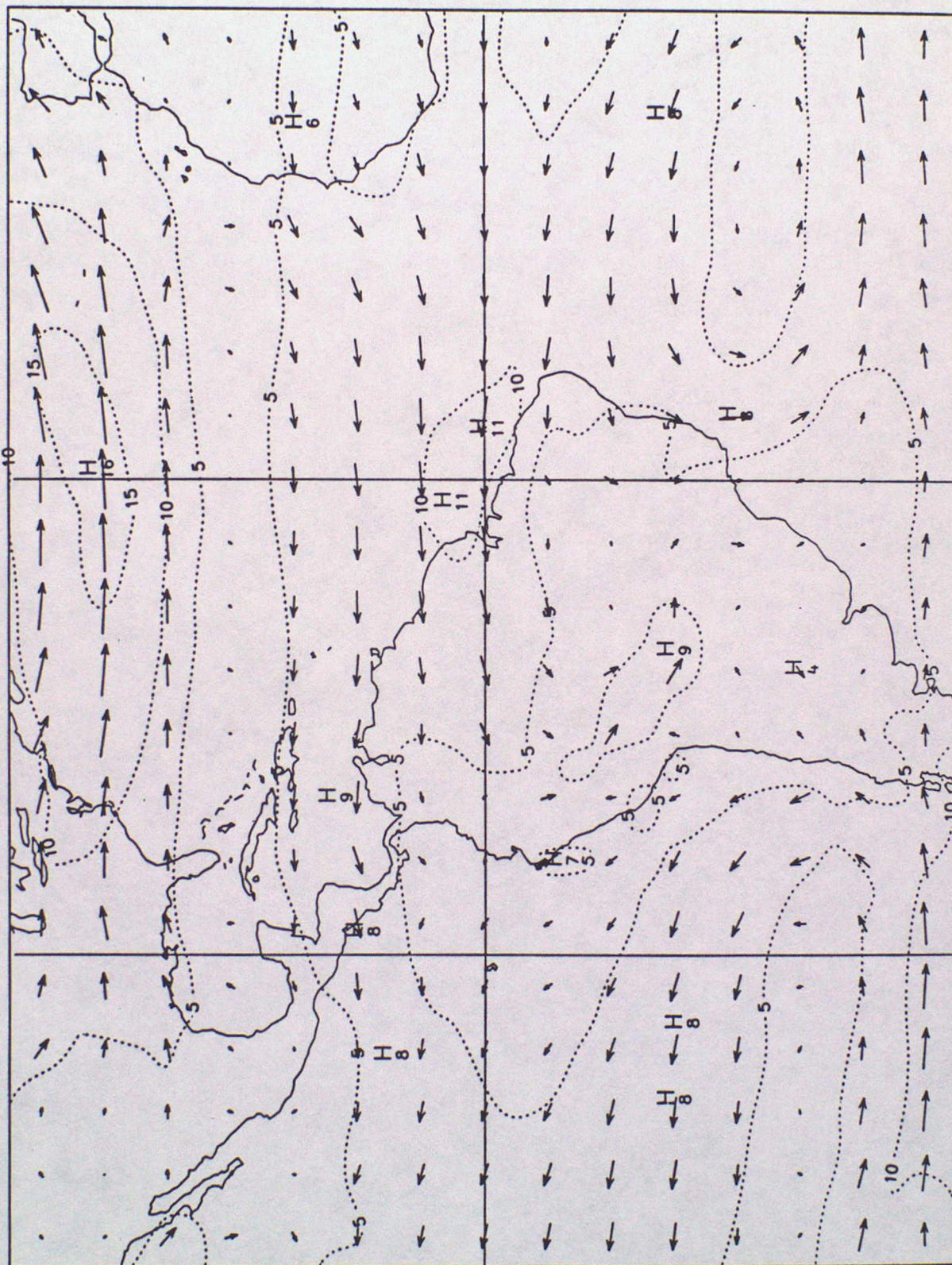


Figure 1 is a map of the North Pacific Ocean showing the distribution of surface water masses. The map includes contour lines with values 5, 10, 15, and 20, and arrows indicating flow direction. Key features include the Kuroshio Current, the North Pacific Current, and the North Pacific High. The map is bounded by 10°N to 40°N latitude and 120°E to 120°W longitude. A scale bar at the bottom right indicates 10 M/S.

1



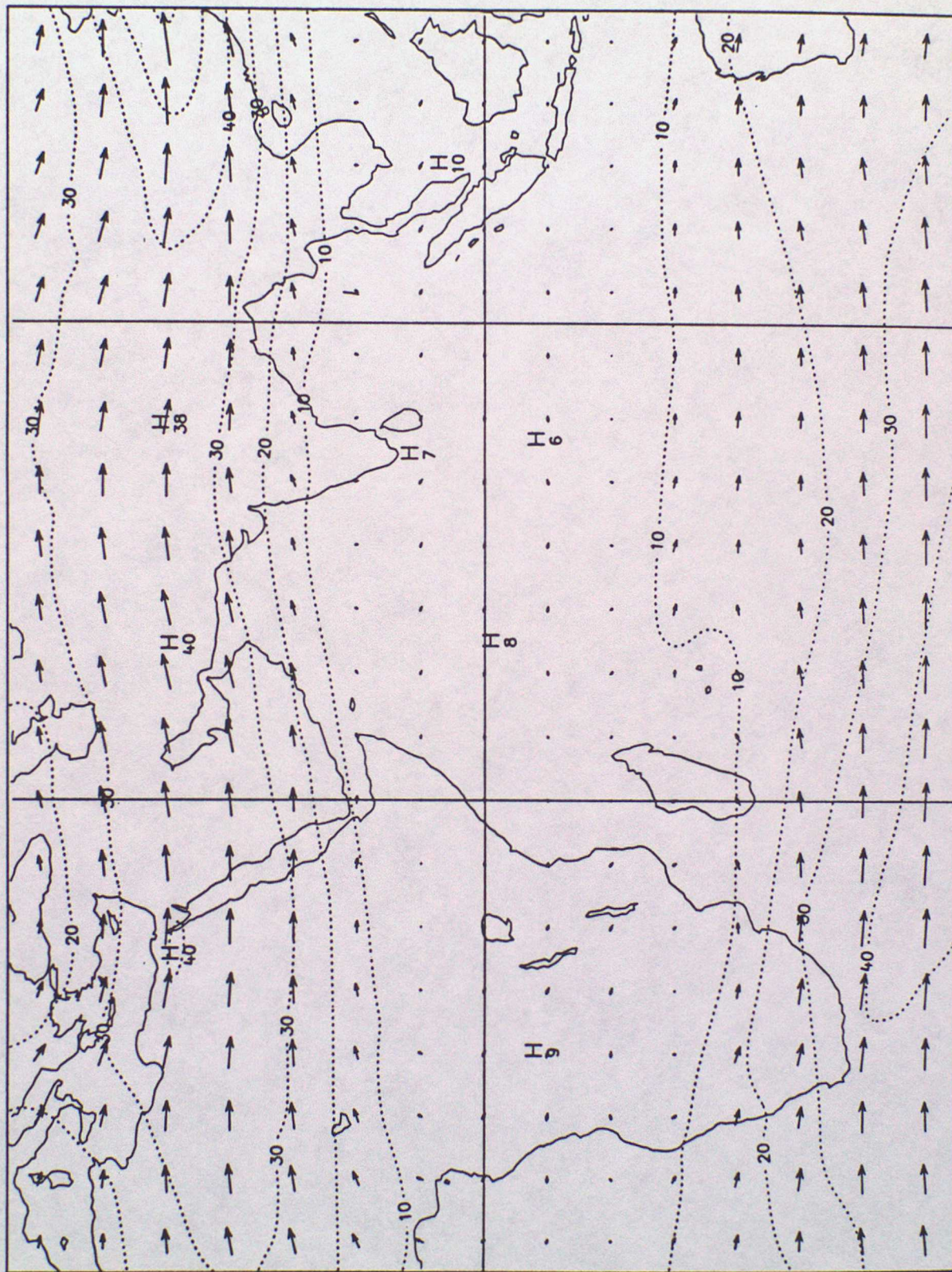
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BETWEEN LONGS. 120 W - 0 W



→ REPRESENTS 10 M/S



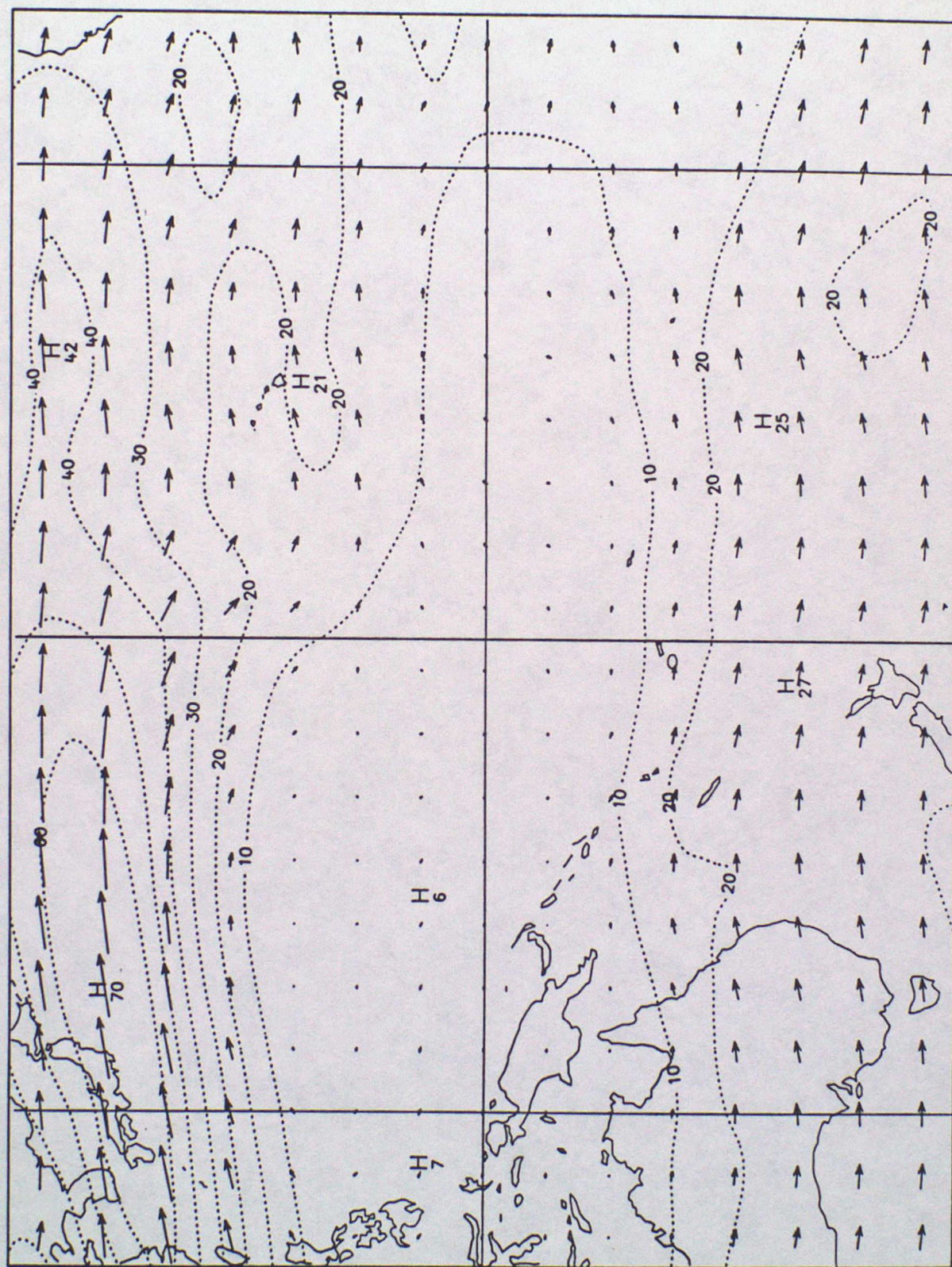
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 BETWEEN LONGS. 0 E - 120 E



→ REPRESENTS 40 M/S



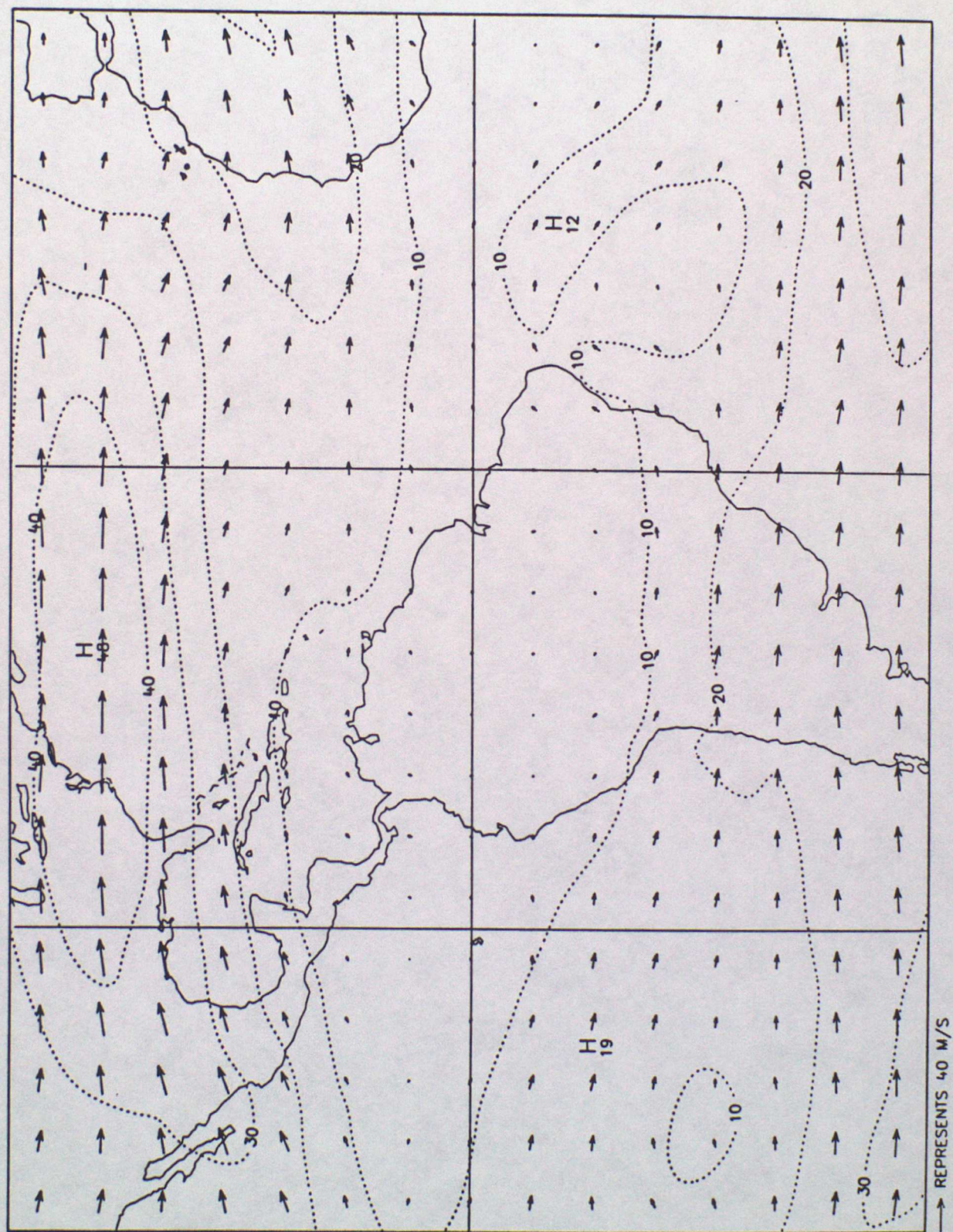
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 250 MBS. BETWEEN LONGS. 120 E - 120 W



→ REPRESENTS 40 M/S



OPERATIONAL ARCHIVE MEANS. DECEMBER 1987  
WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 31/12/1987 DAY 365  
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BETWEEN LONGS. 120 W - 0 W

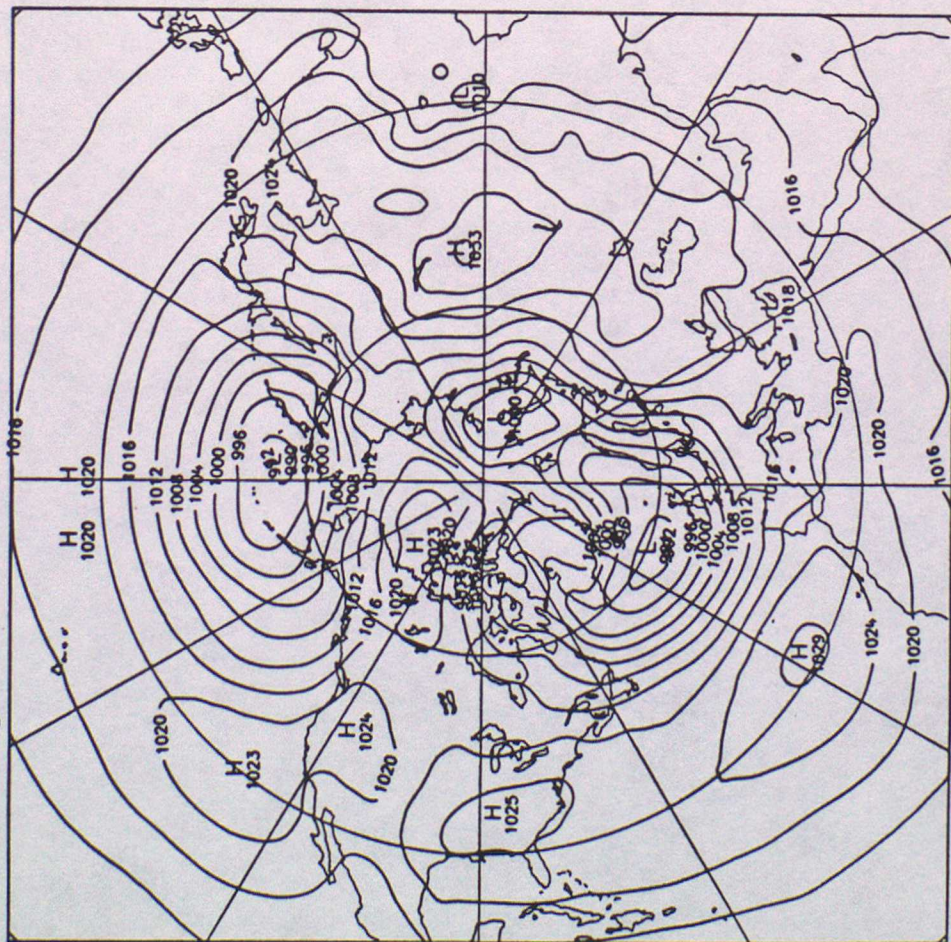




**JANUARY**  
**1988**

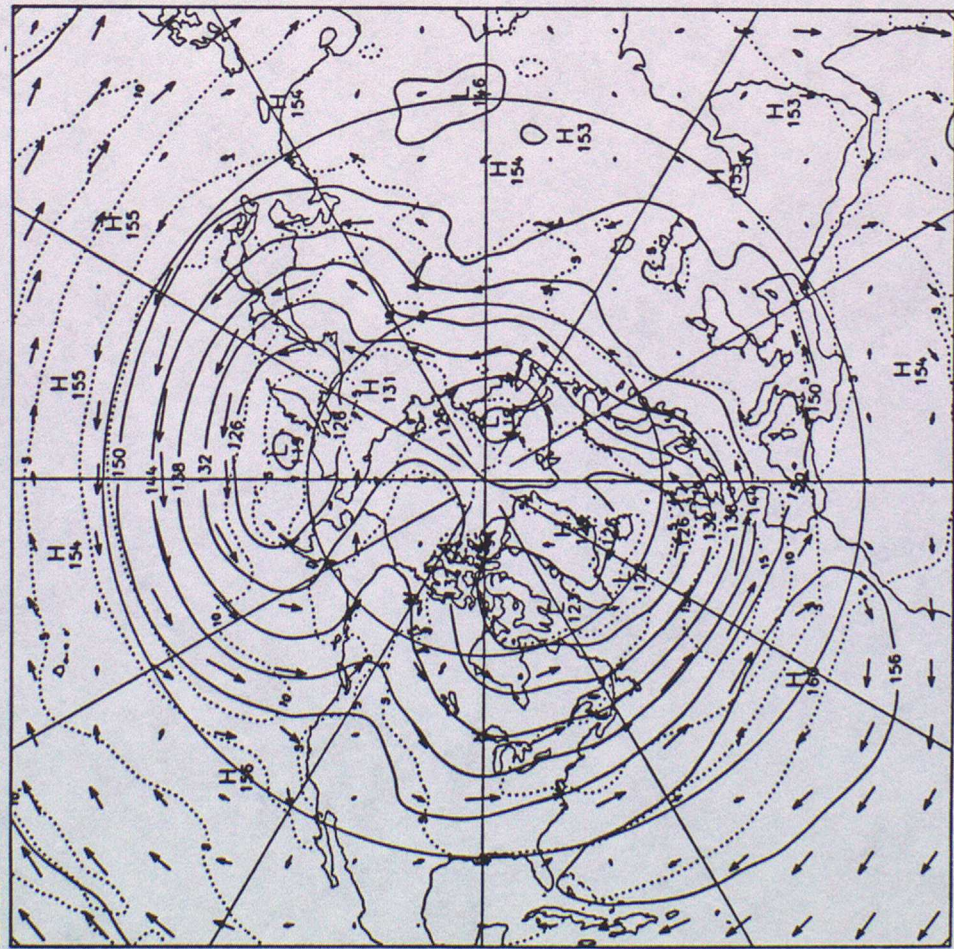


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 PMSL  
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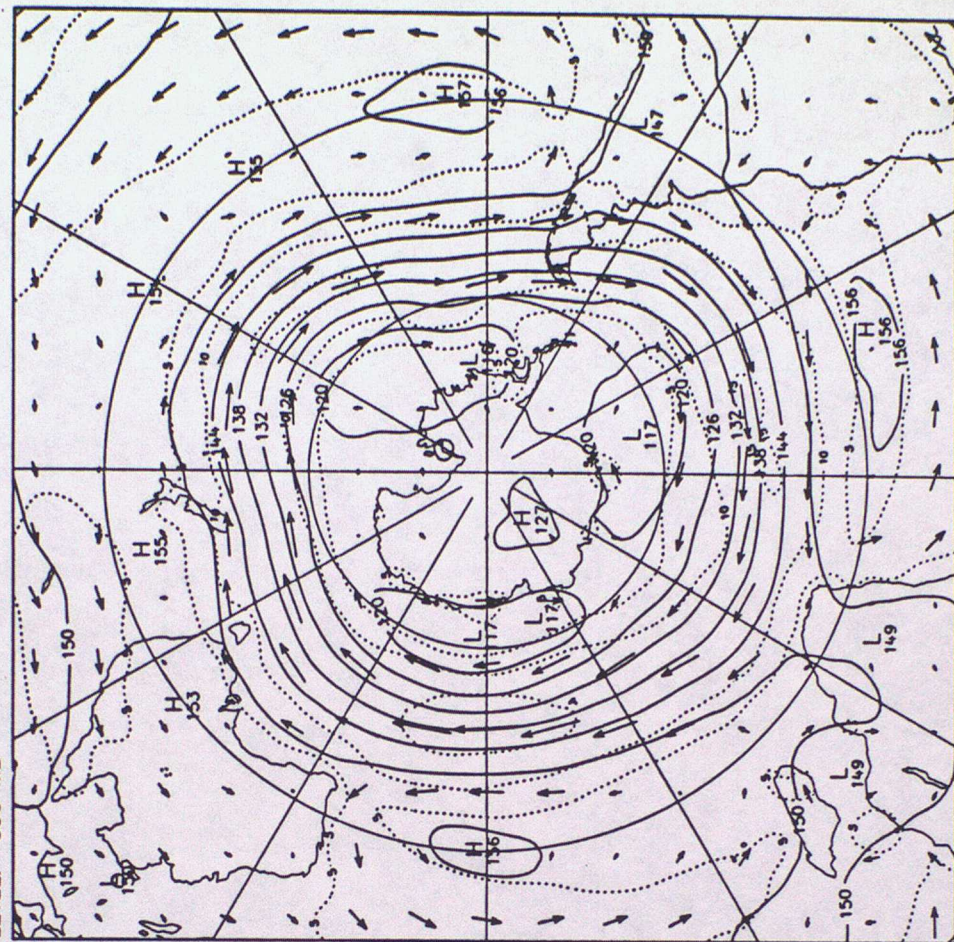




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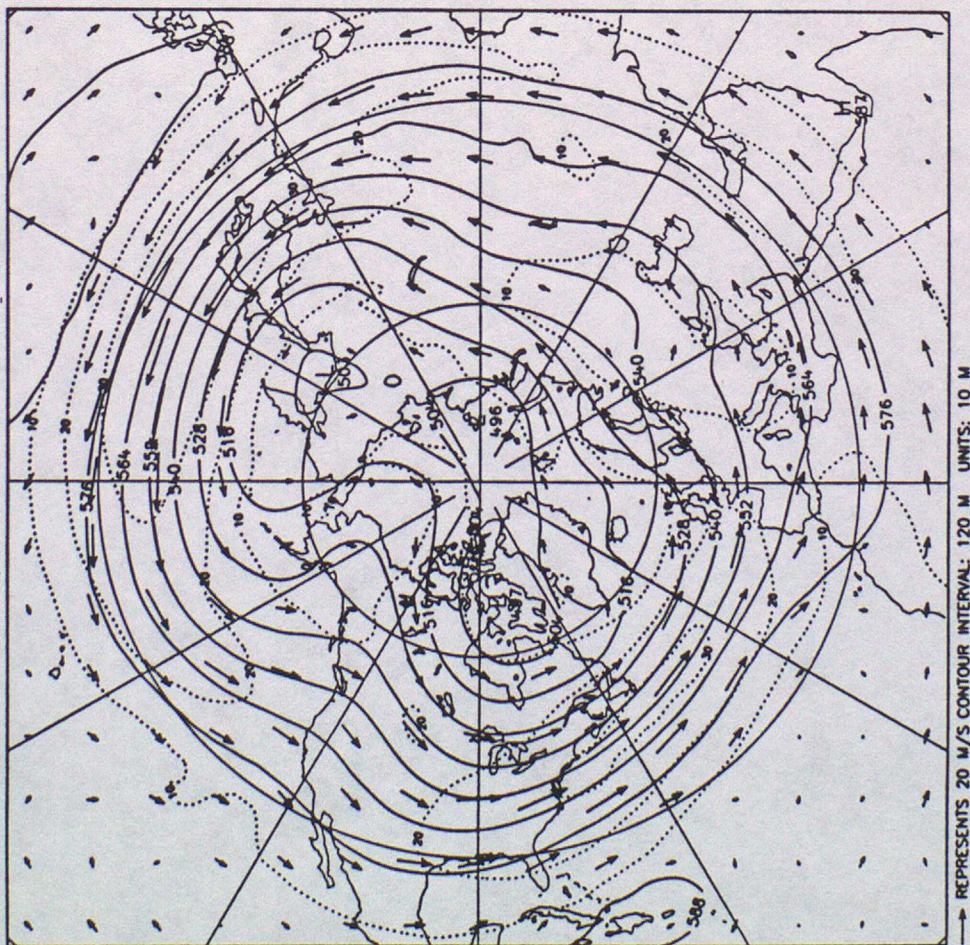


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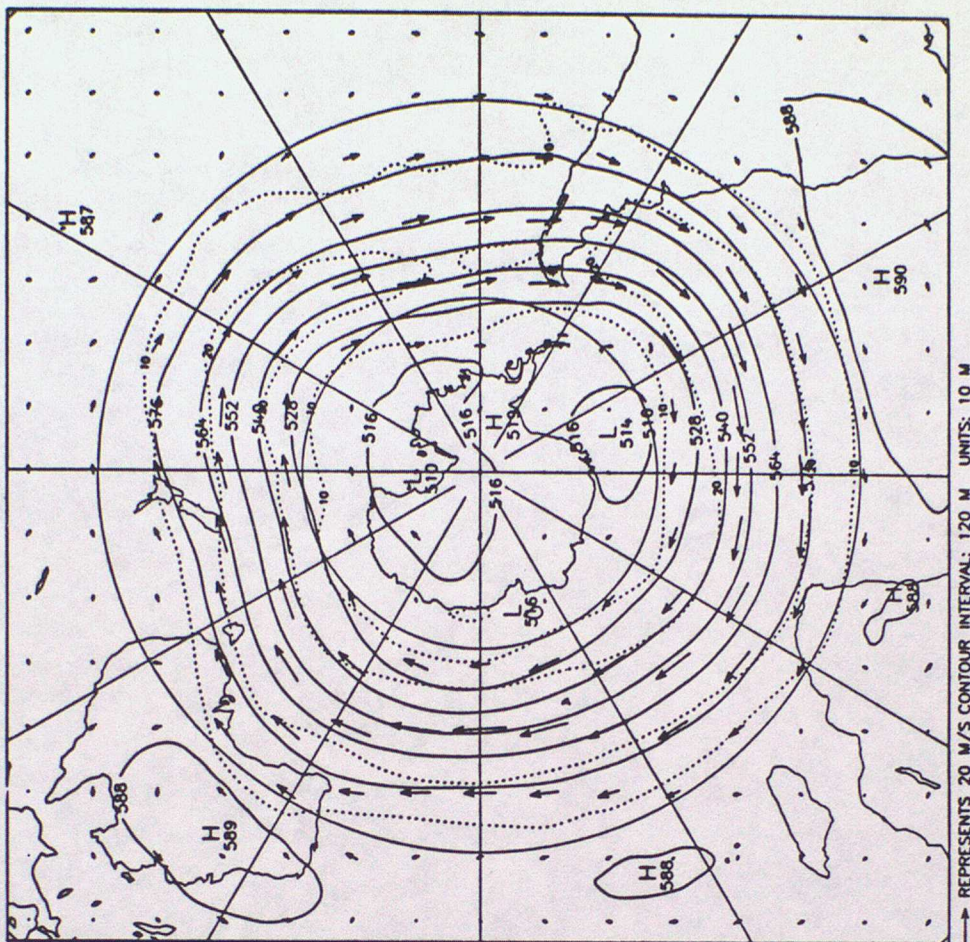




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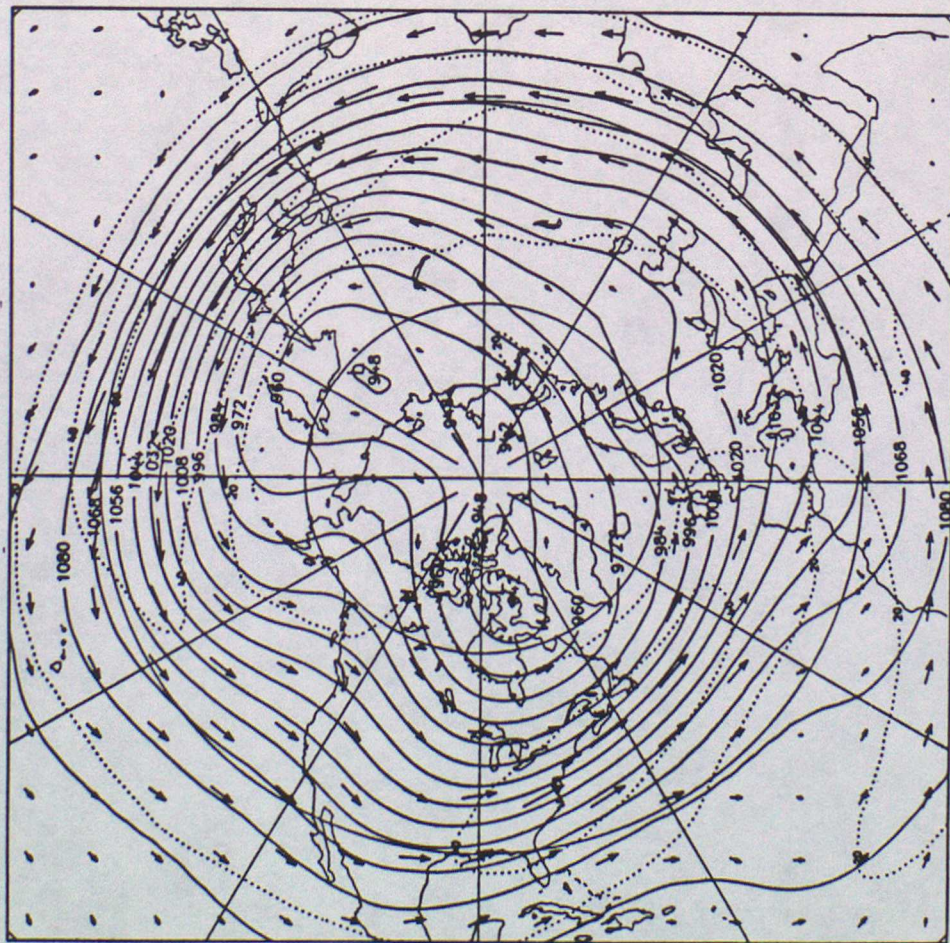


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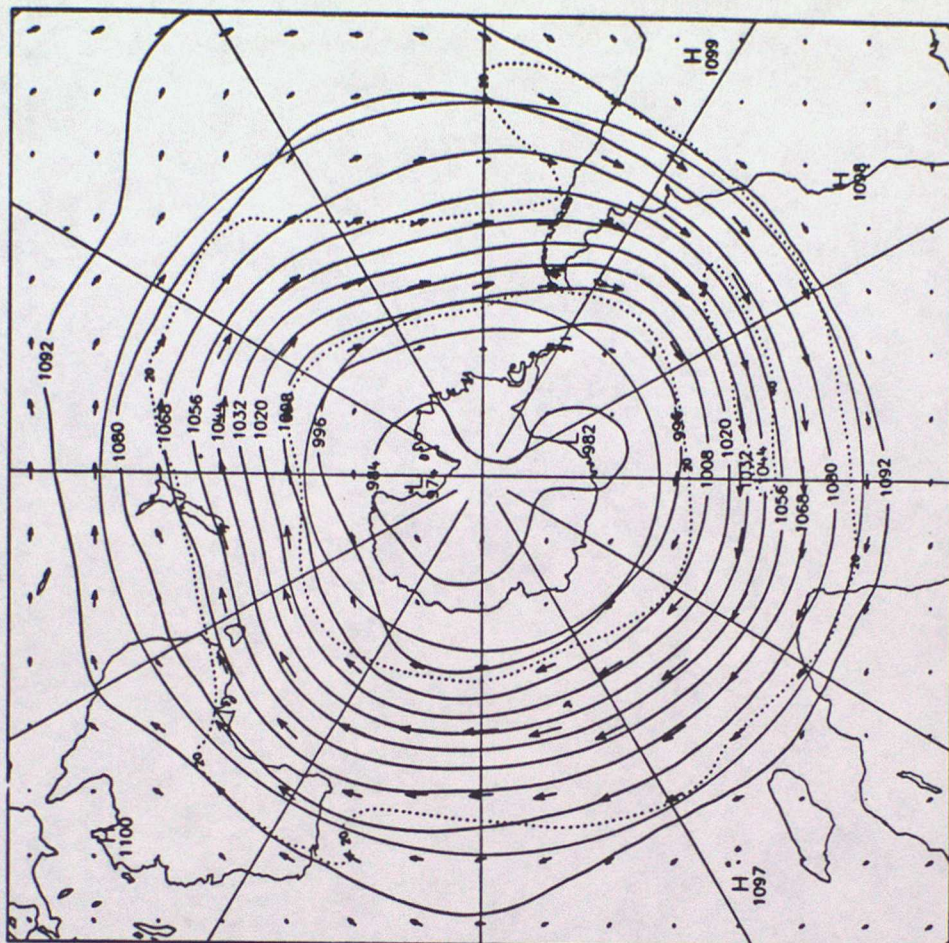




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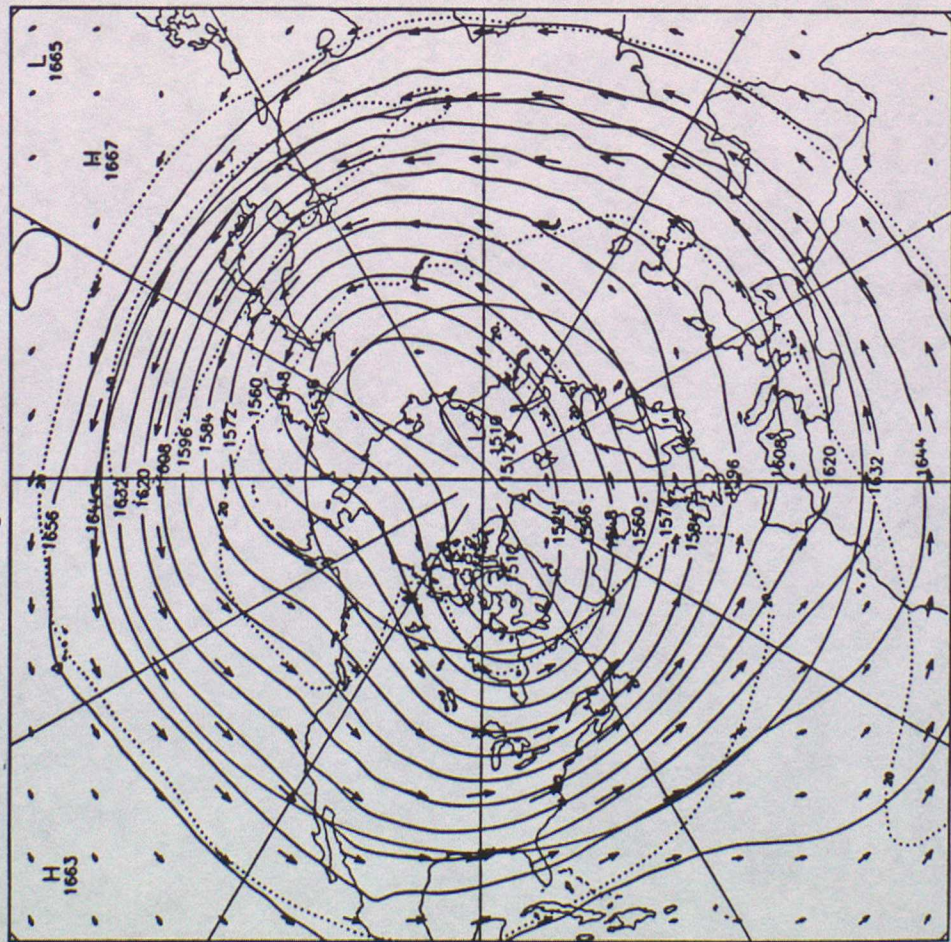


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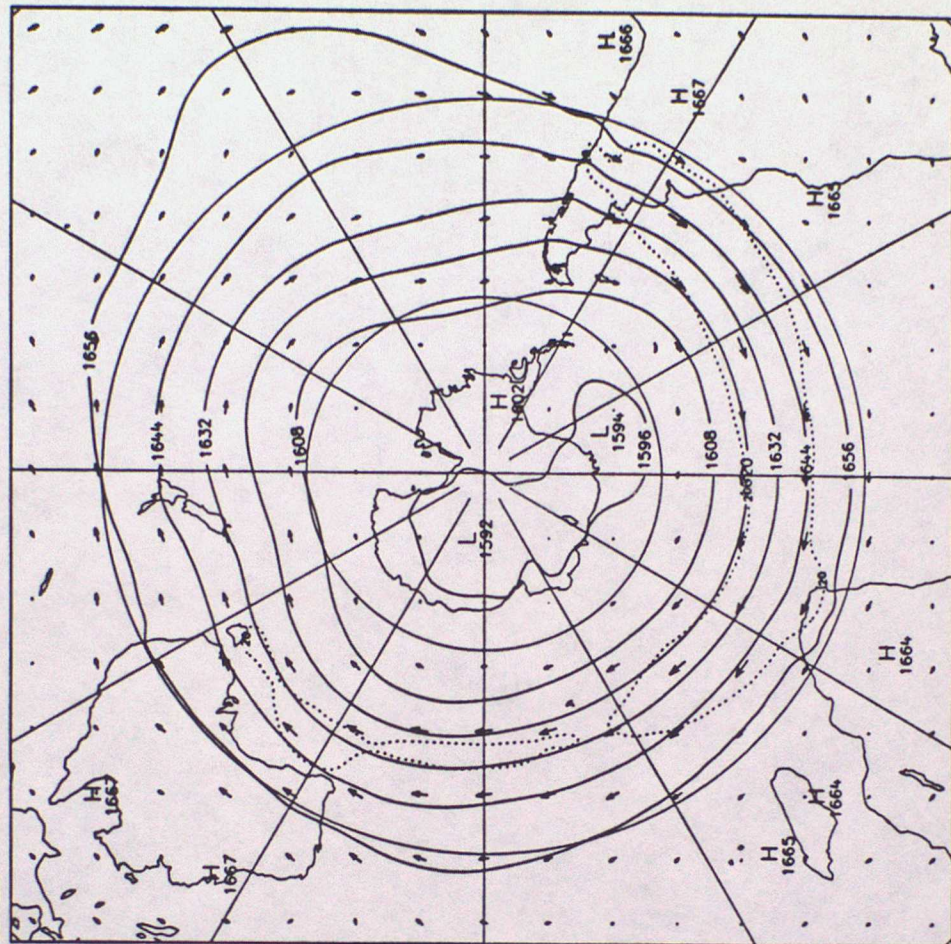




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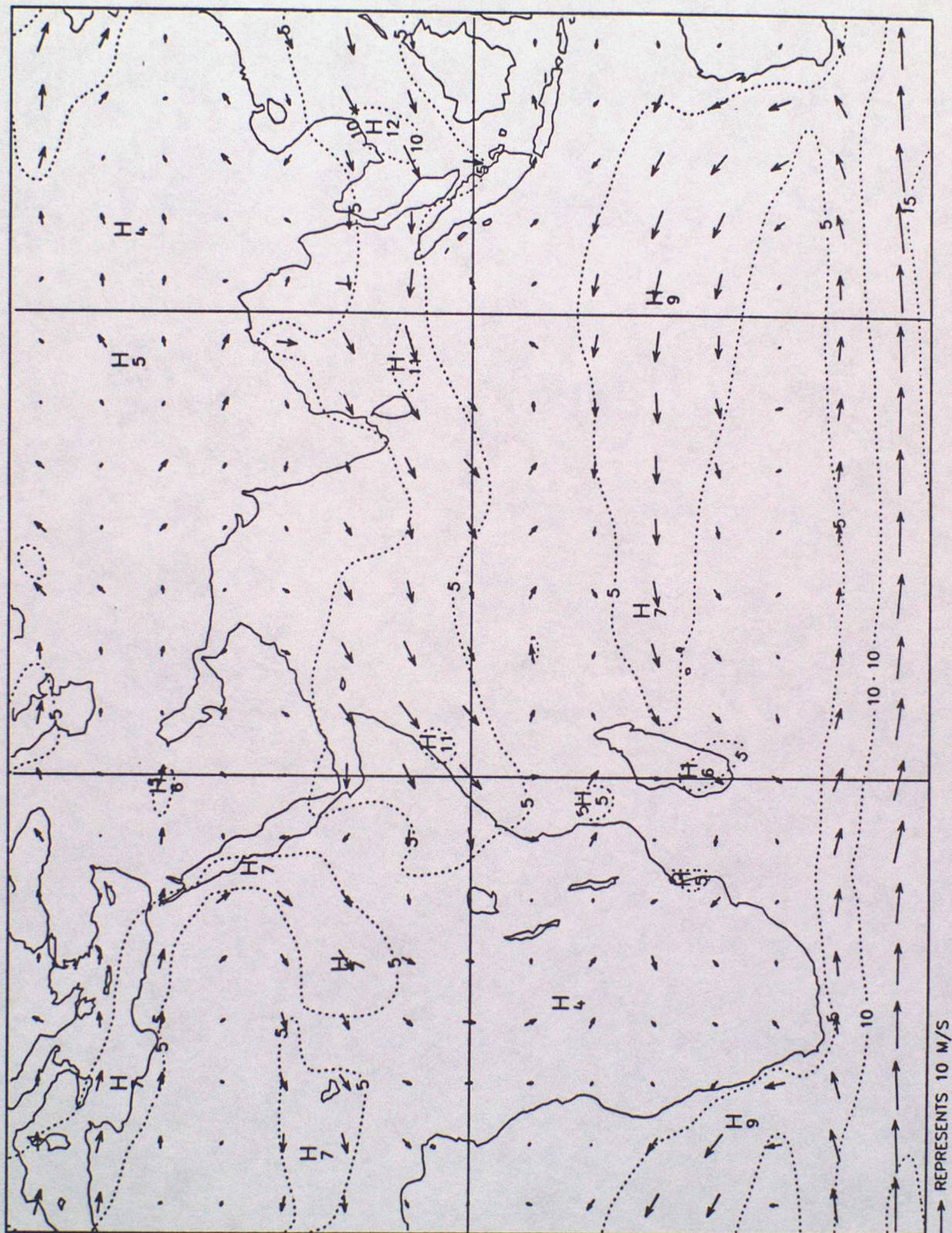


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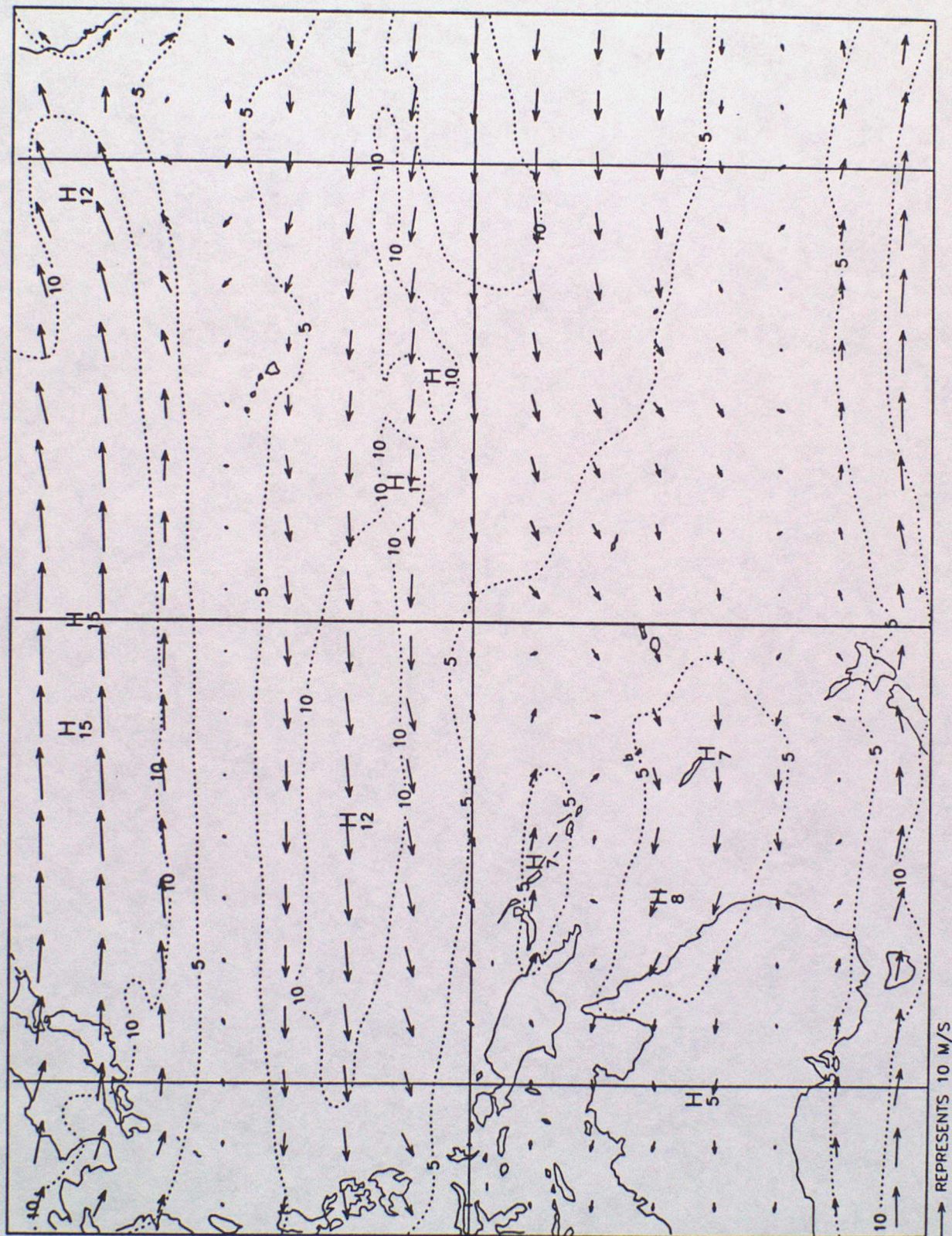


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WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
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850 MBS. BETWEEN LONGS. 0 E - 120 E



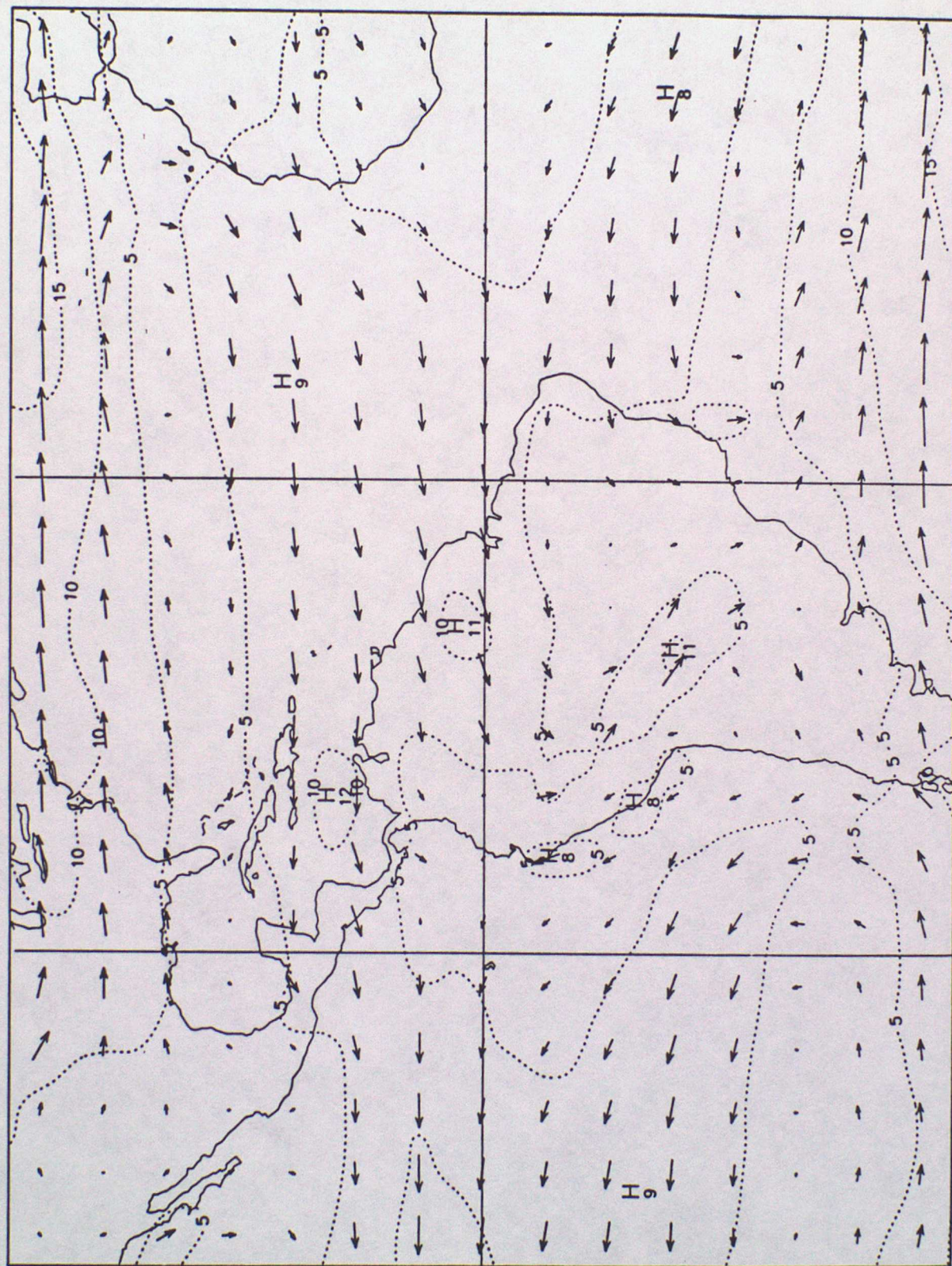


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 850 MBS.  
 BETWEEN LONGS. 120 E - 120 W





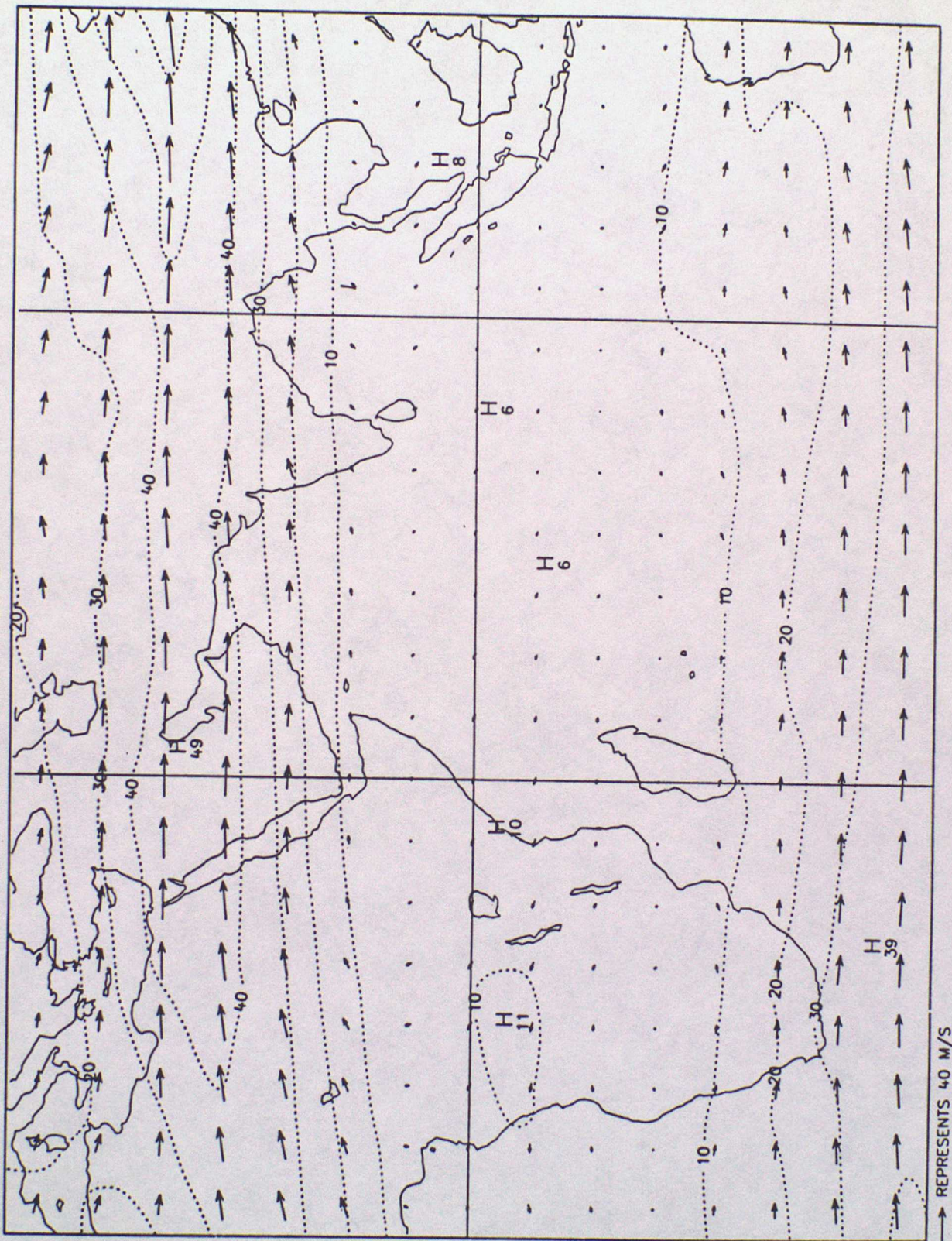
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 850 MBS.  
 BETWEEN LONGS. 120 W - 0 W



→ REPRESENTS 10 M/S

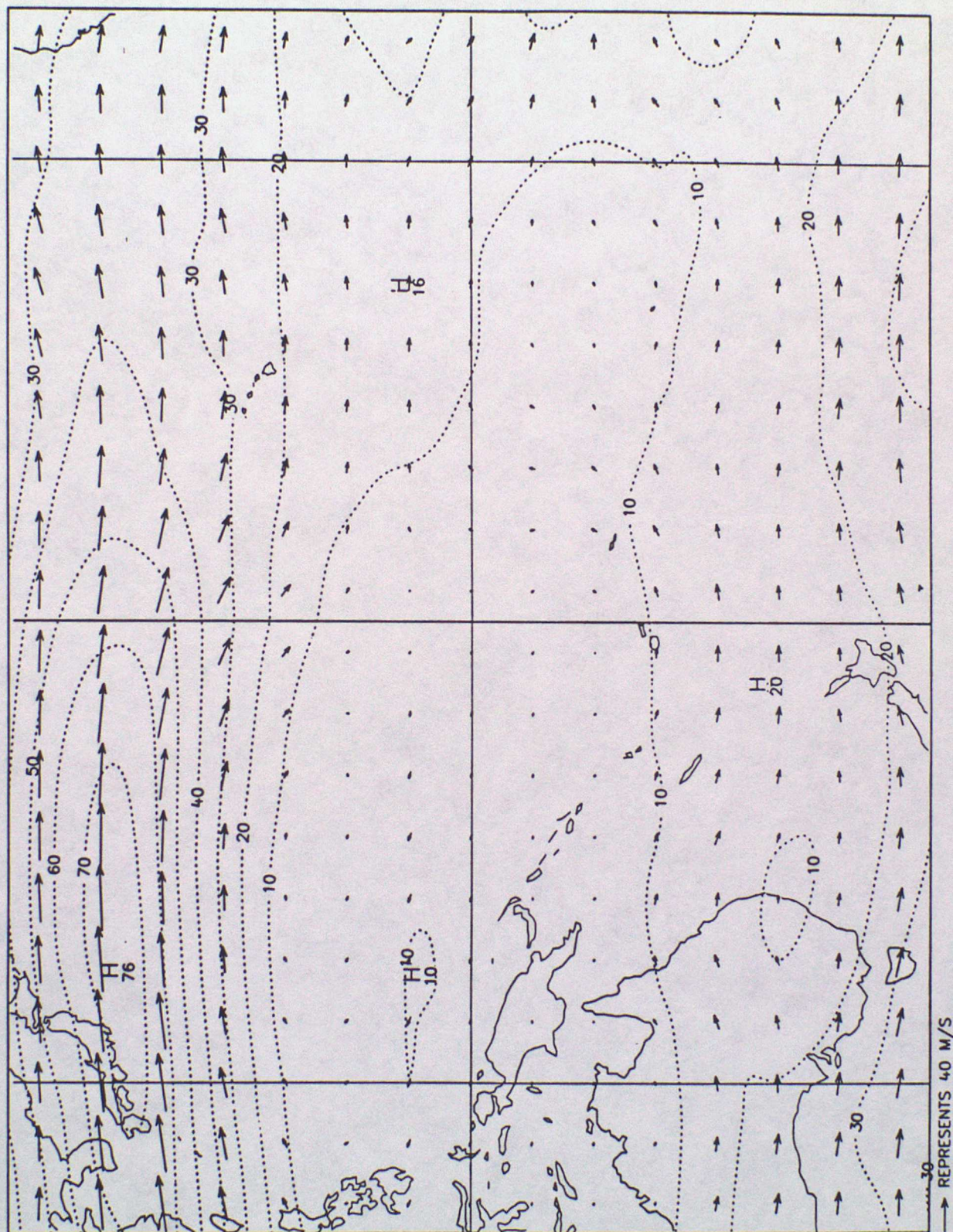


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 BETWEEN LONGS. 0 E - 120 E



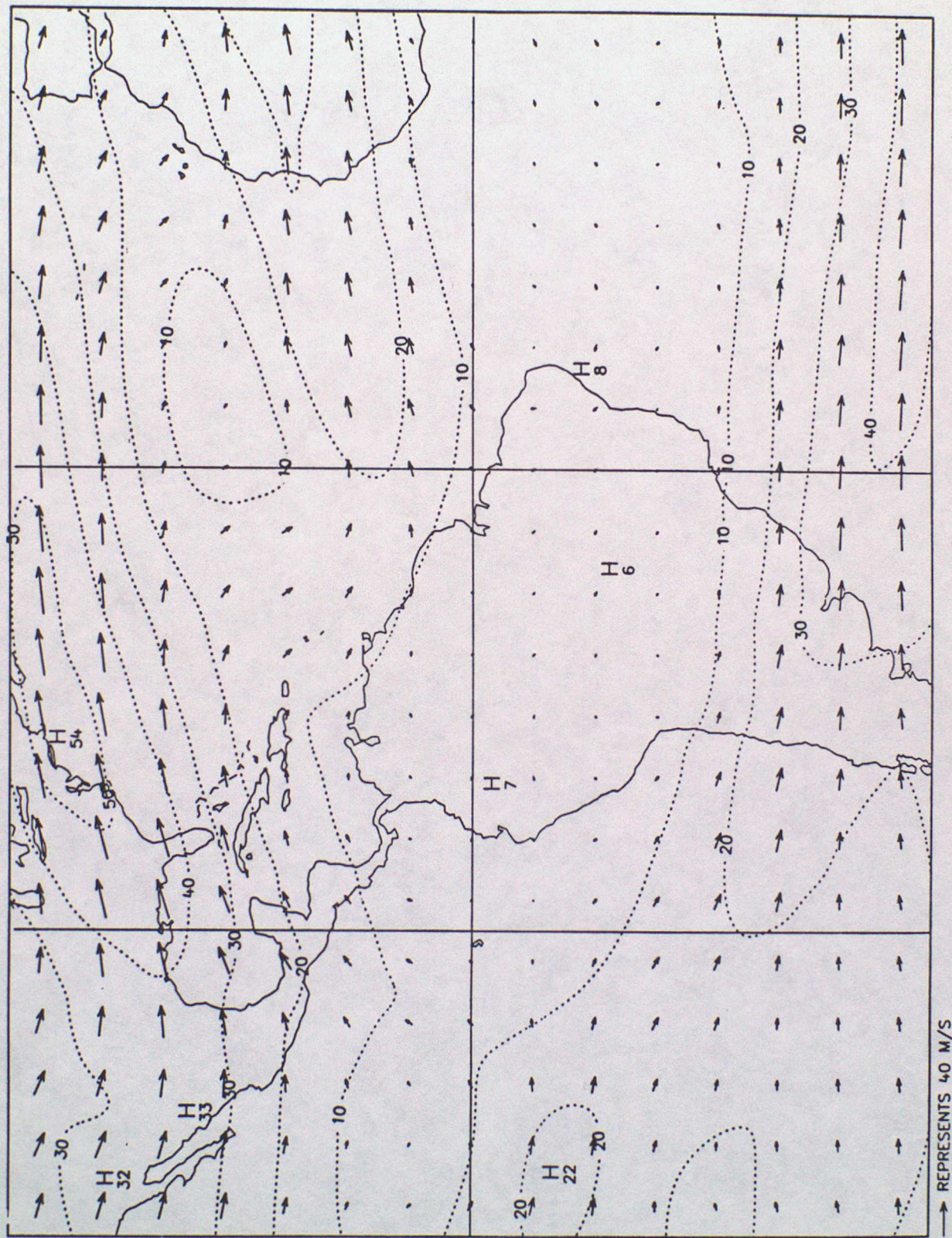


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250 MBS. BETWEEN LONGS. 120 E - 120 W





OPERATIONAL ARCHIVE MEANS. JANUARY 1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATs. 45 N - 45 S.  
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 BETWEEN LONGS. 120 W - 0 W  
 250 MBS.



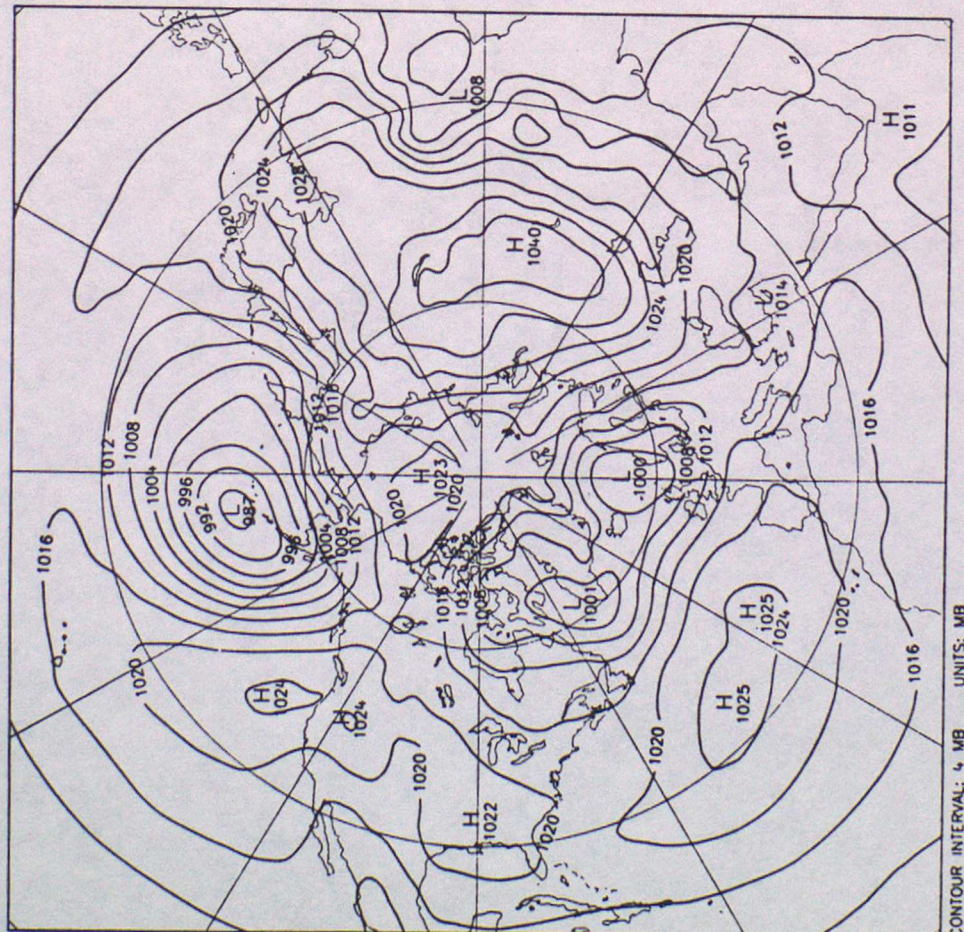


**FEBRUARY**  
**1988**



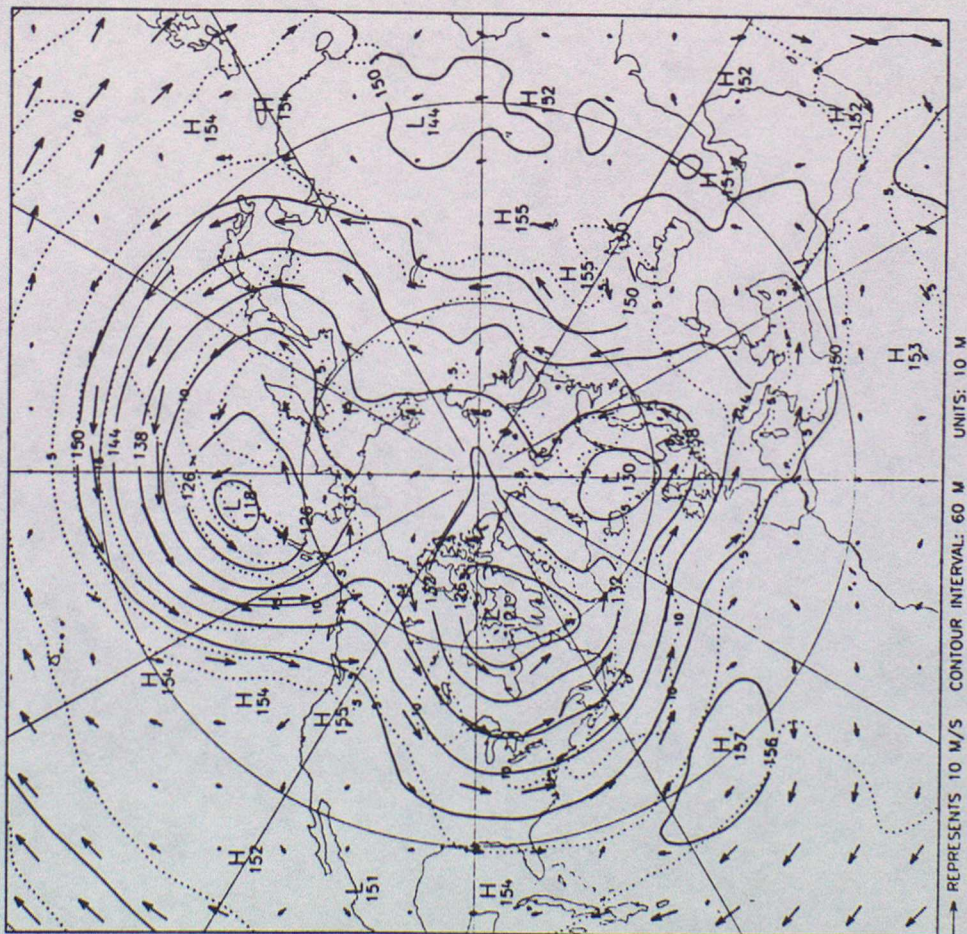
OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
PMSL

AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
SEA LEVEL

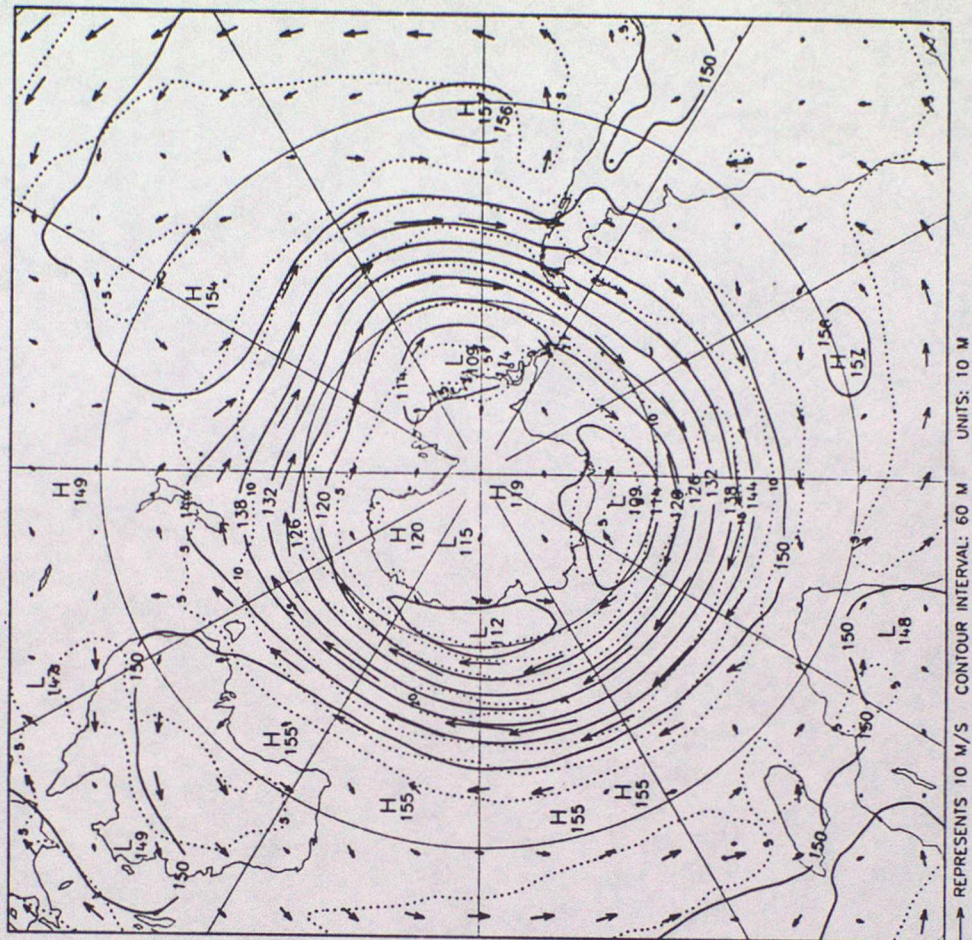




OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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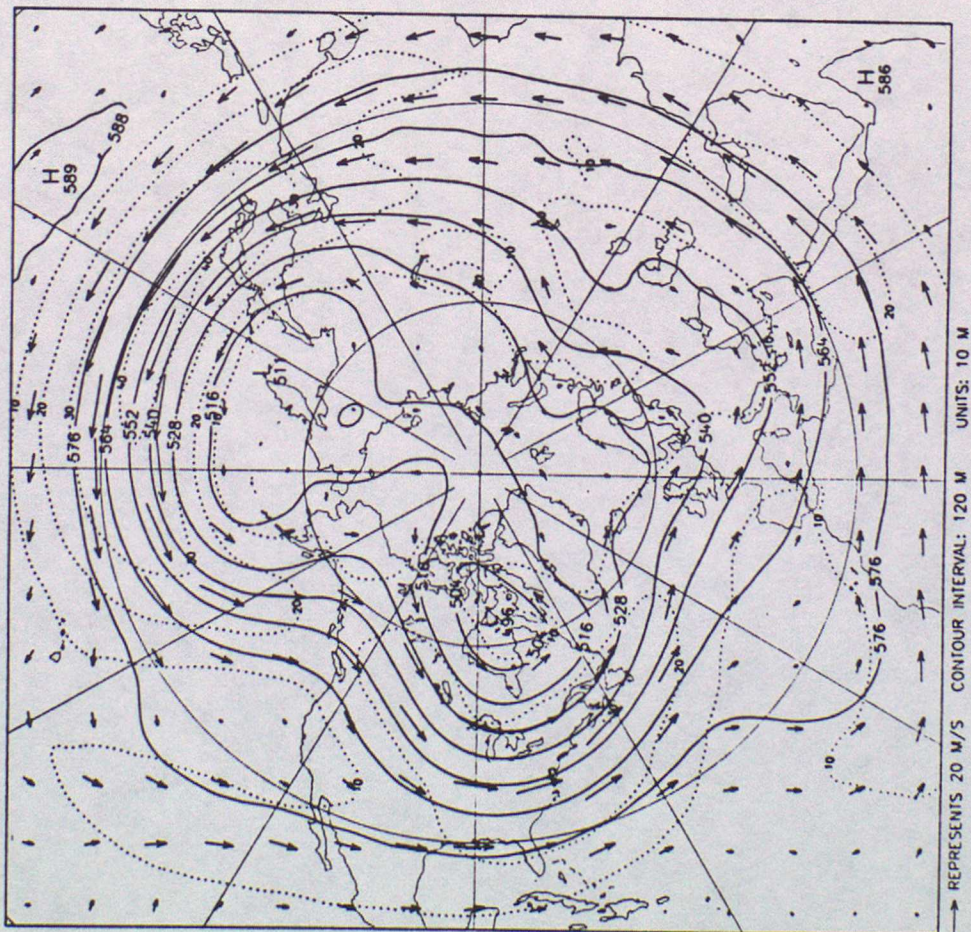


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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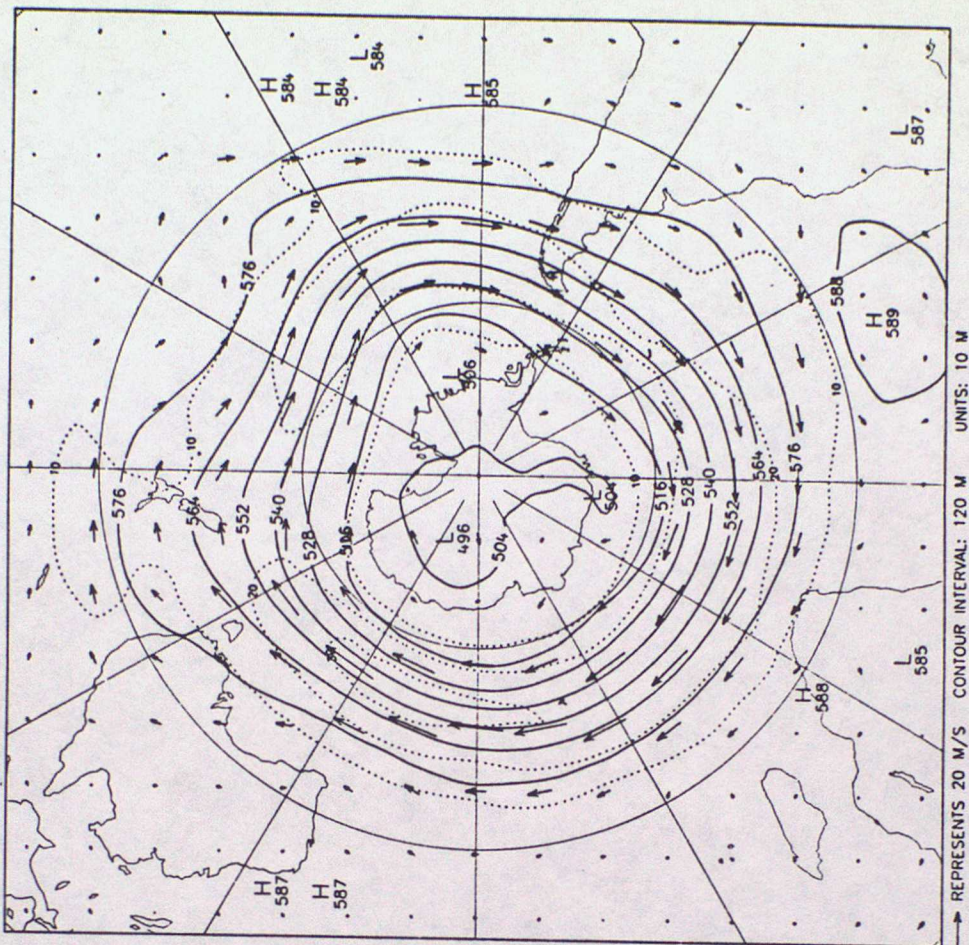




OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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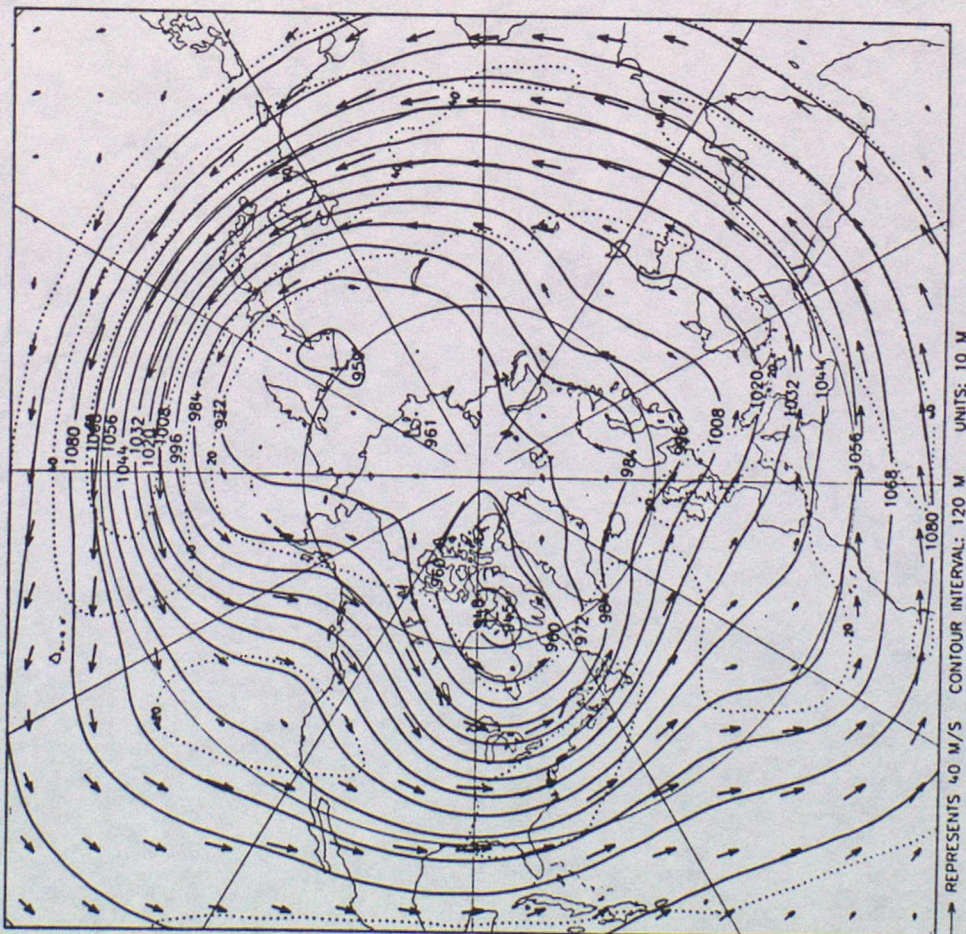


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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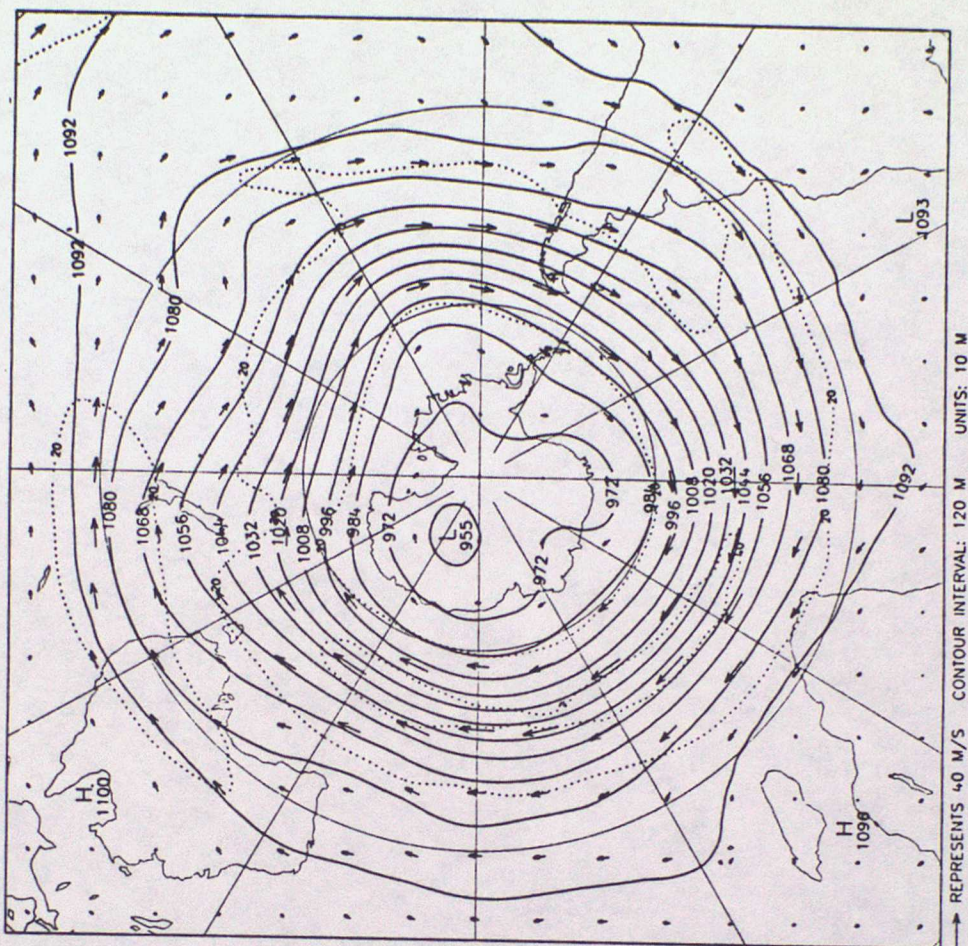




OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
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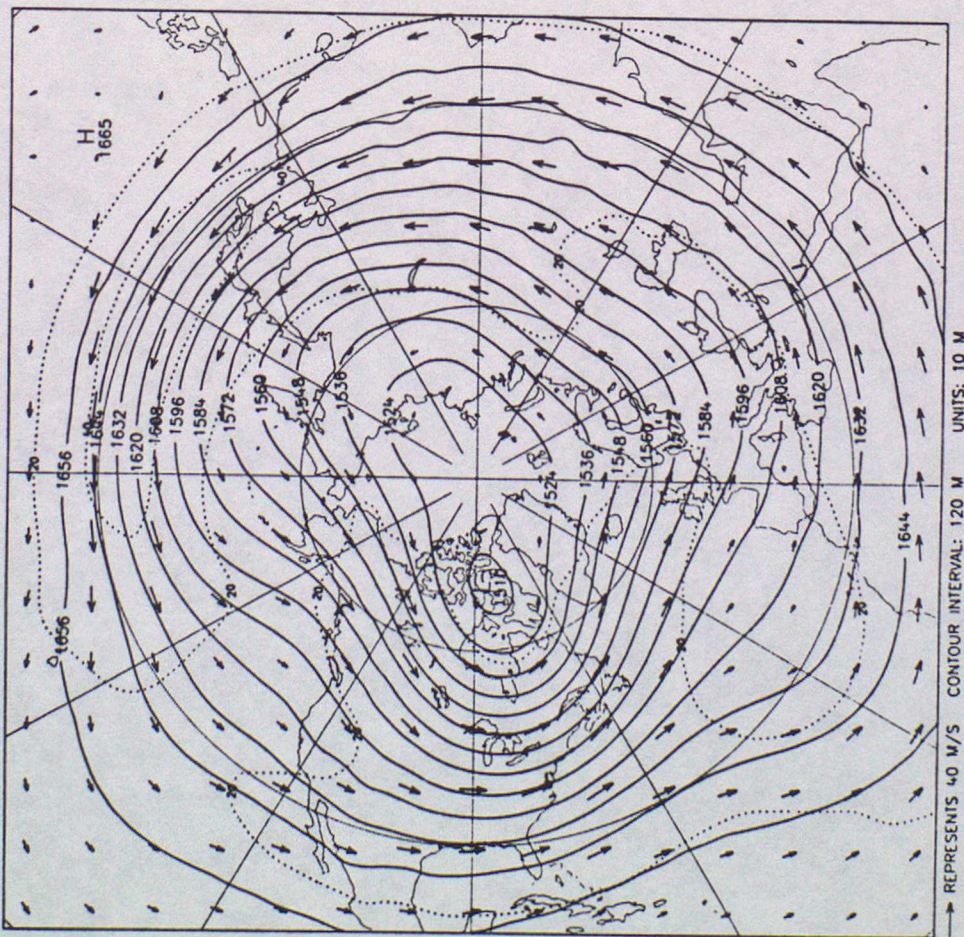


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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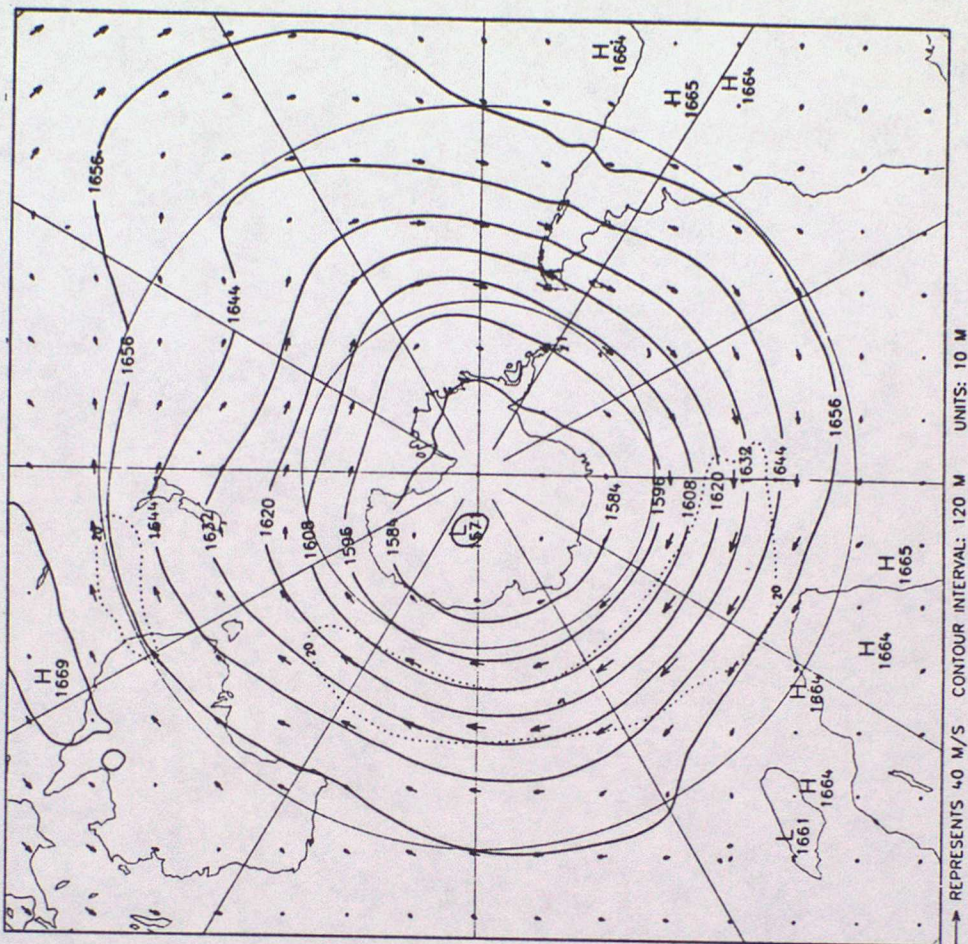




OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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 AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
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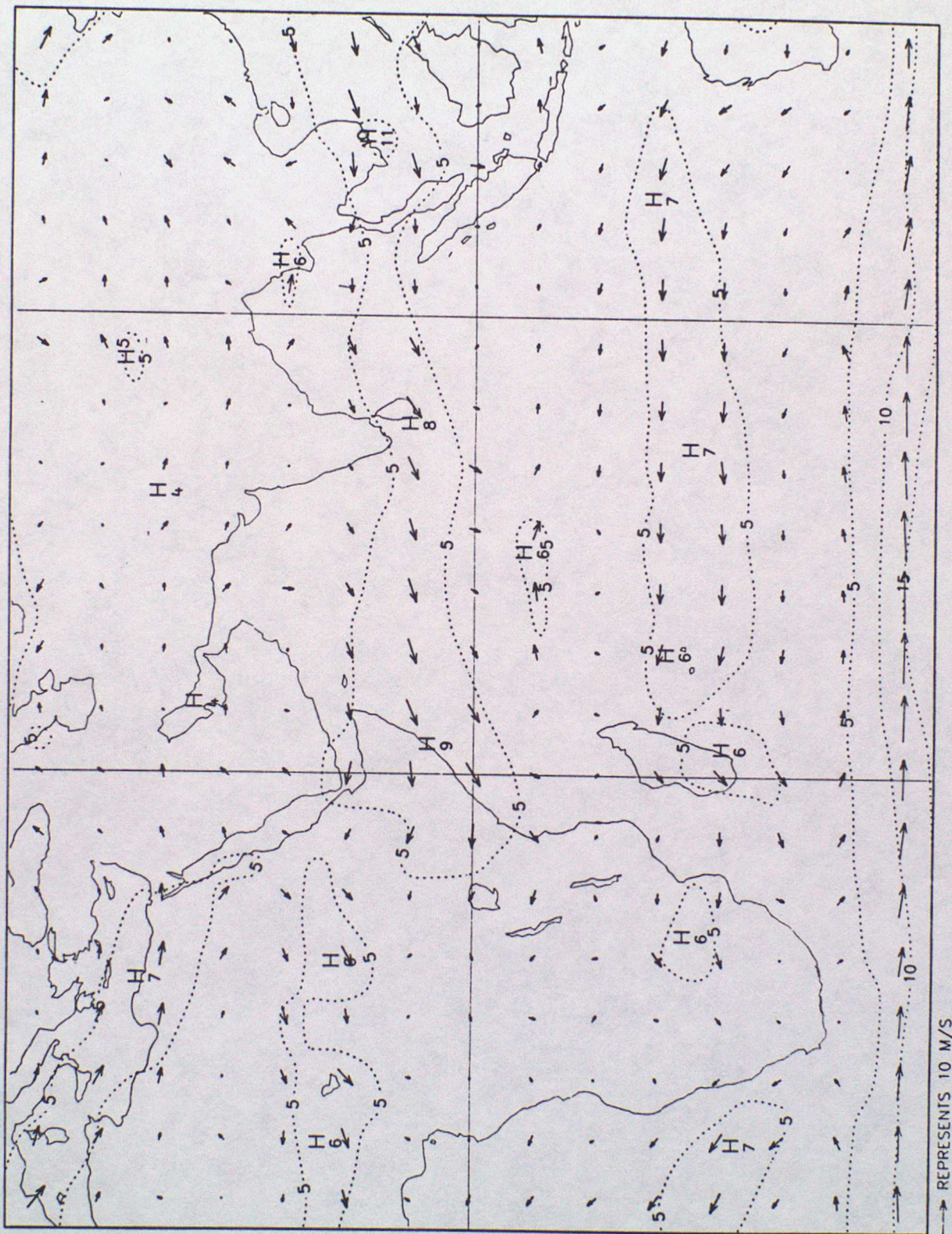


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
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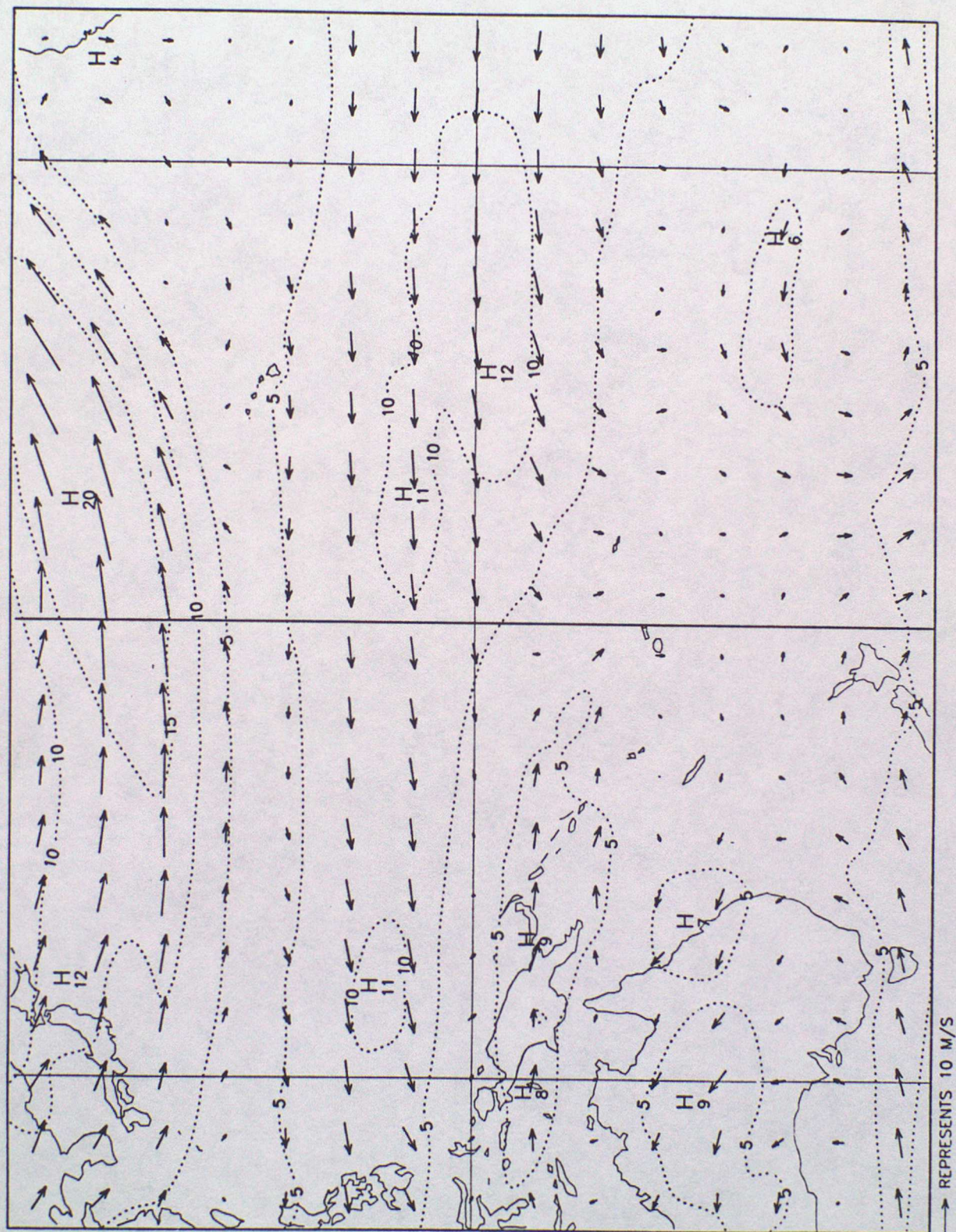
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WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
850 MBS.  
BETWEEN LONGS. 0 E - 120 E



---> REPRESENTS 10 M/S

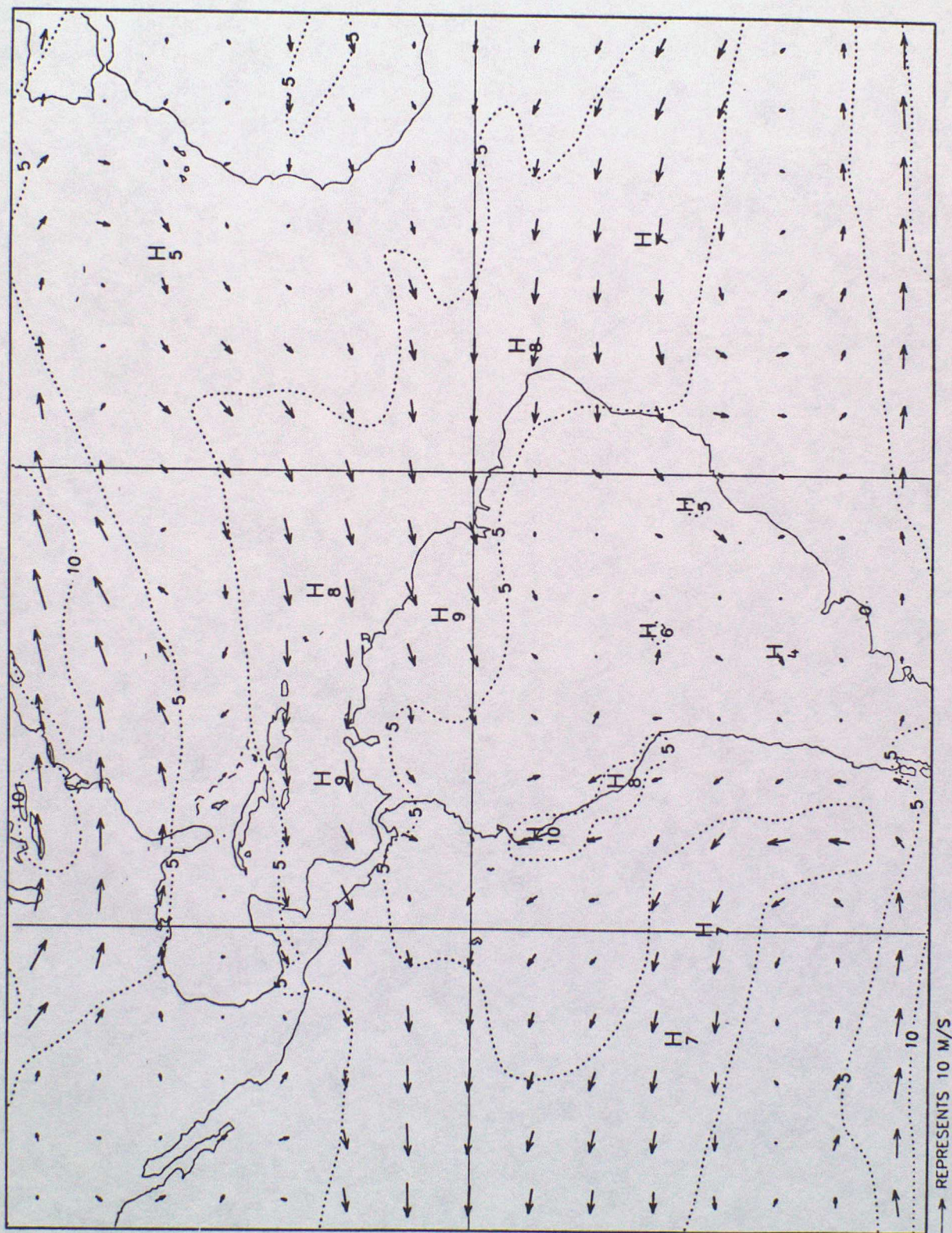


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WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
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850 MBs.  
BETWEEN LONGS. 120 E - 120 W



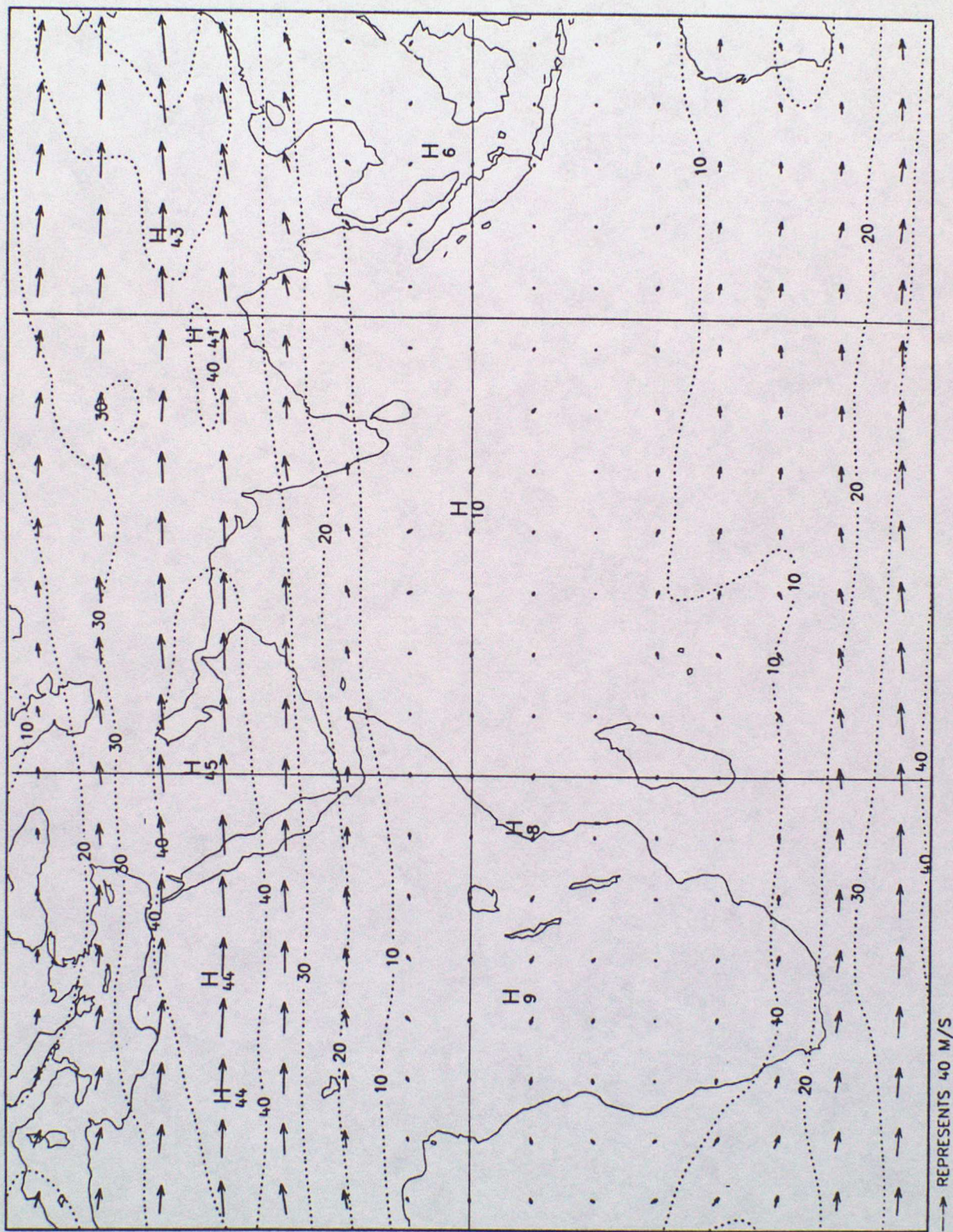


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 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
 850 MBS.  
 BETWEEN LONGS. 120 W - 0 W



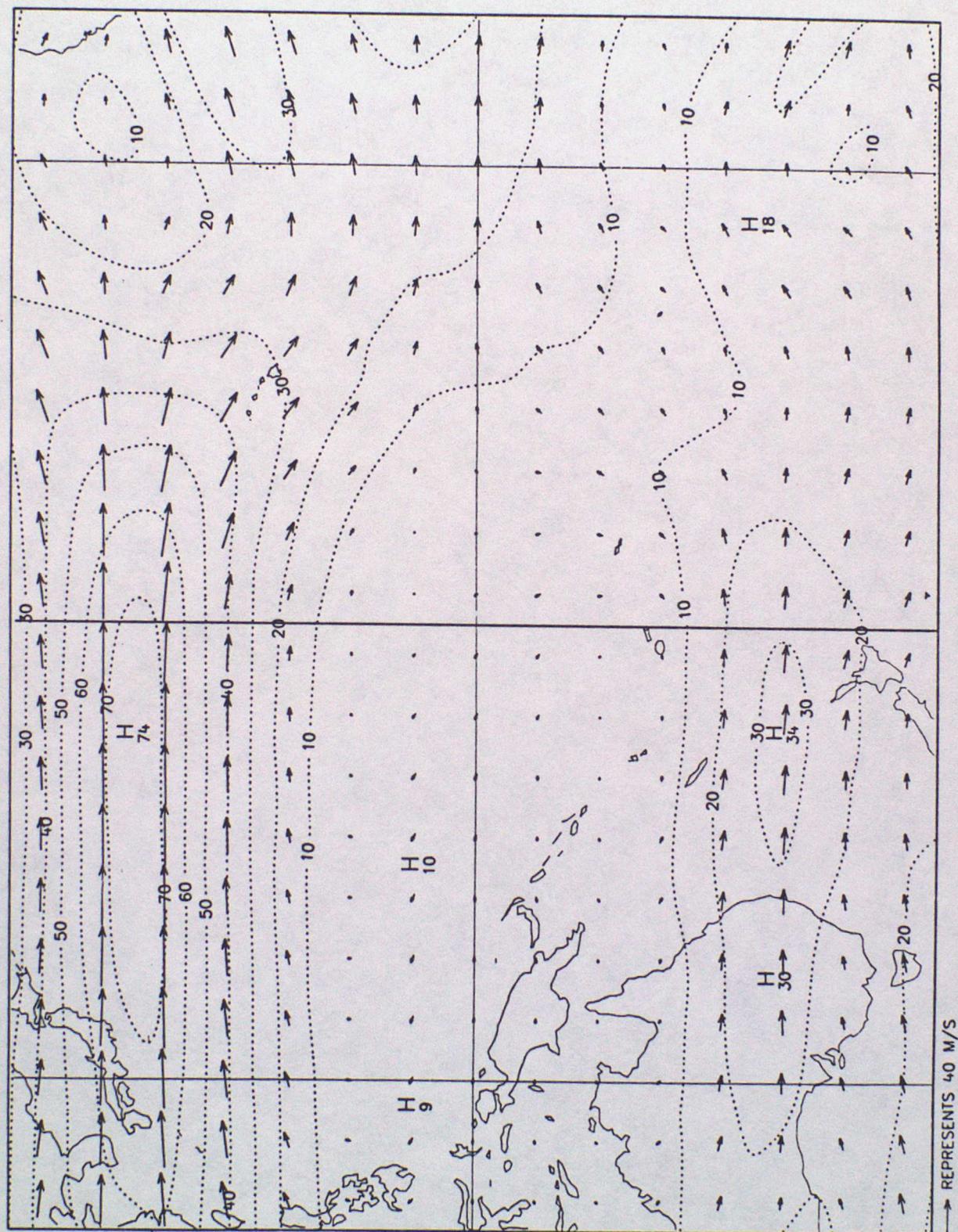


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
 BETWEEN LONGS. 0 E - 120 E  
 250 MBS.



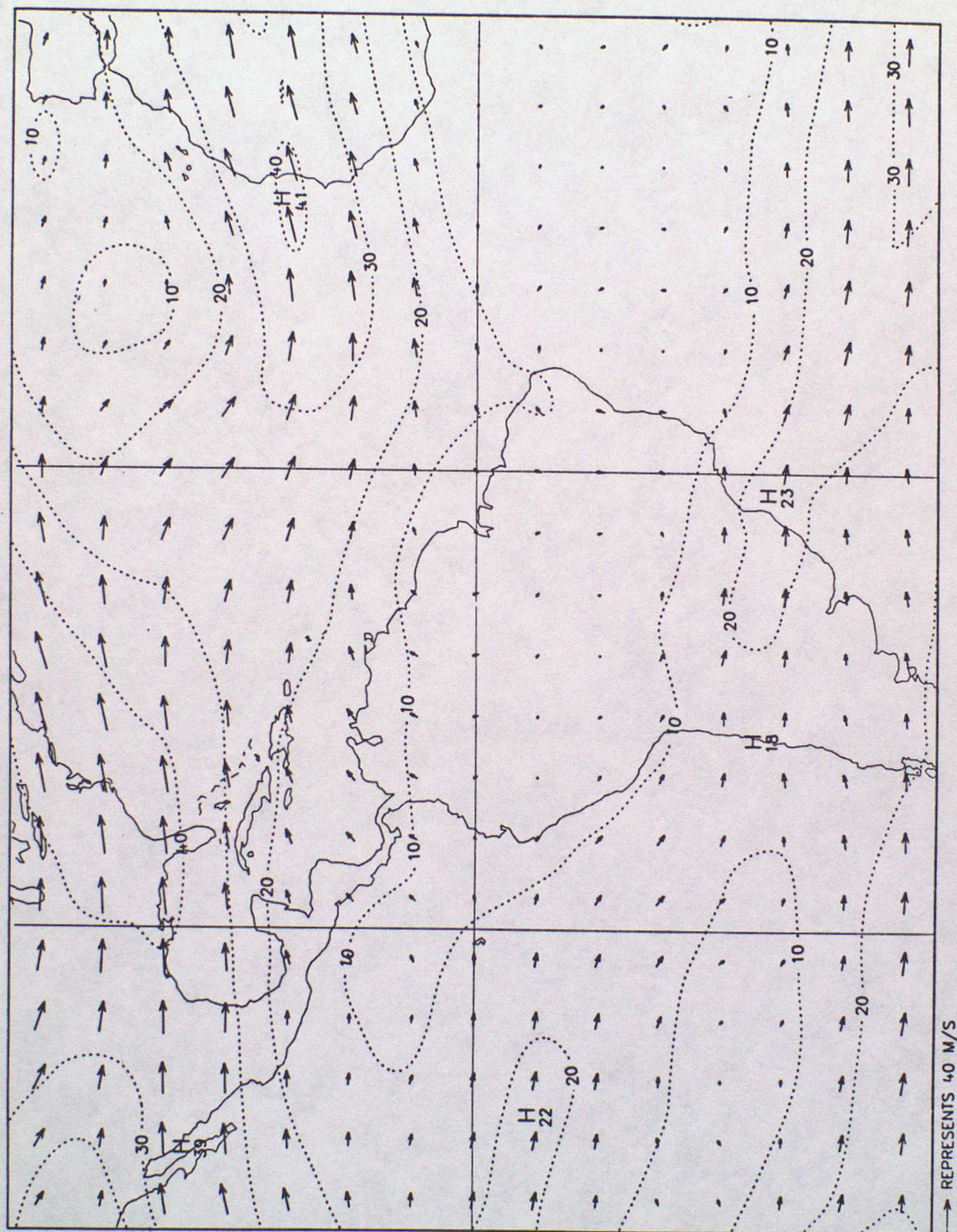


OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
250 MBS.  
BETWEEN LONGS. 120 E - 120 W





OPERATIONAL ARCHIVE MEANS. FEBRUARY 1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 AVERAGE FROM 0Z ON 1/2/1988 DAY 32 TO 12Z ON 29/2/1988 DAY 60  
 250 MBS.  
 BETWEEN LONGS. 120 W - 0 W



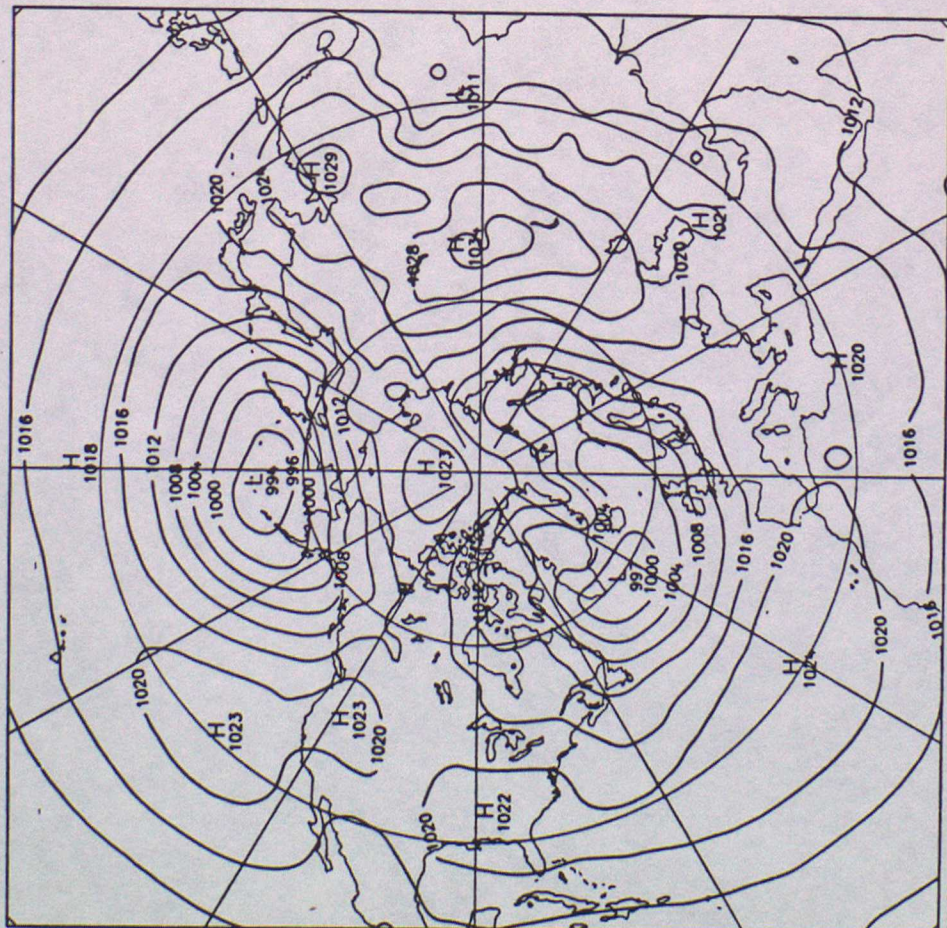


**DECEMBER/JANUARY/FEBRUARY  
1987/88**



OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
PMSL

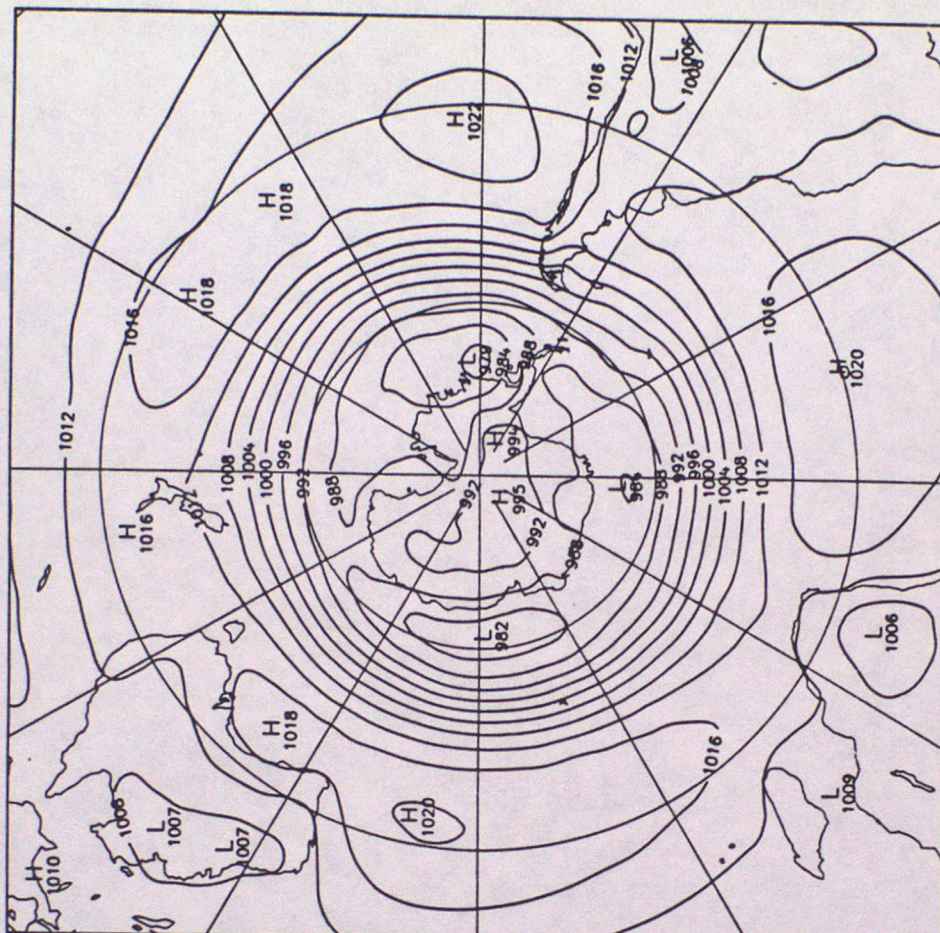
VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
SEA LEVEL



CONTOUR INTERVAL: 4 MB UNITS: MB

OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
PMSL

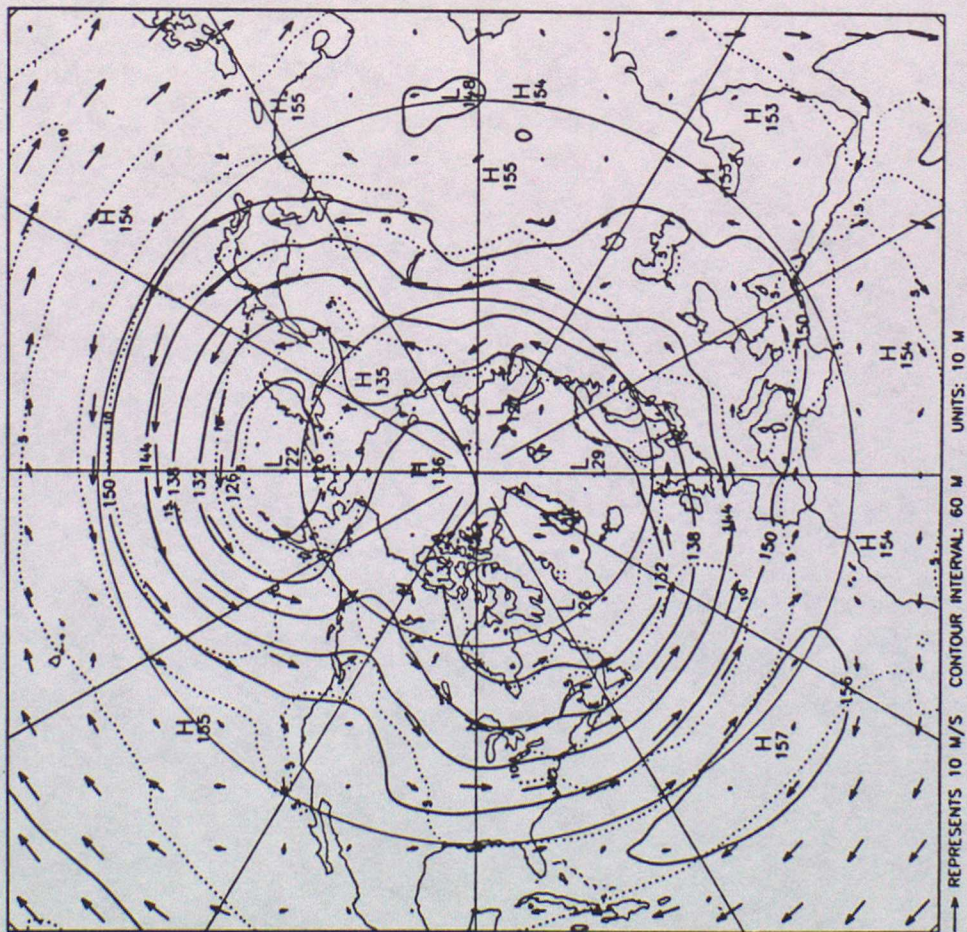
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SEA LEVEL



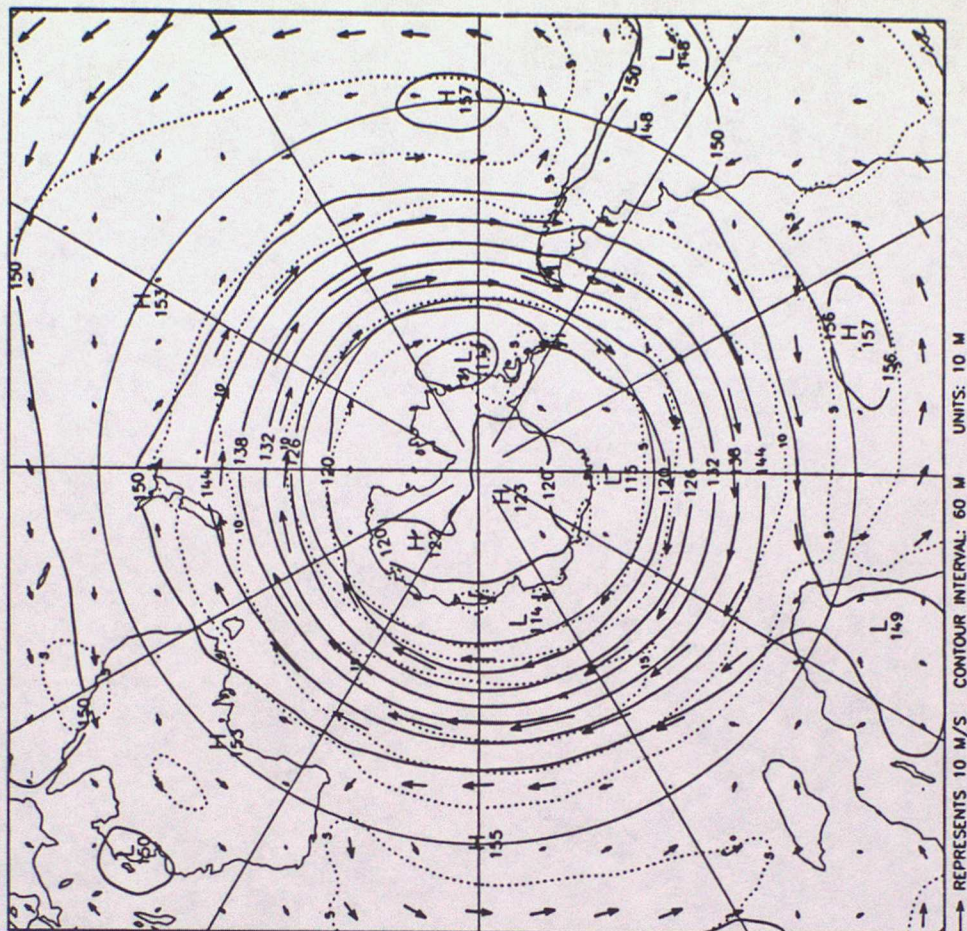
CONTOUR INTERVAL: 4 MB UNITS: MB



OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 850 MB

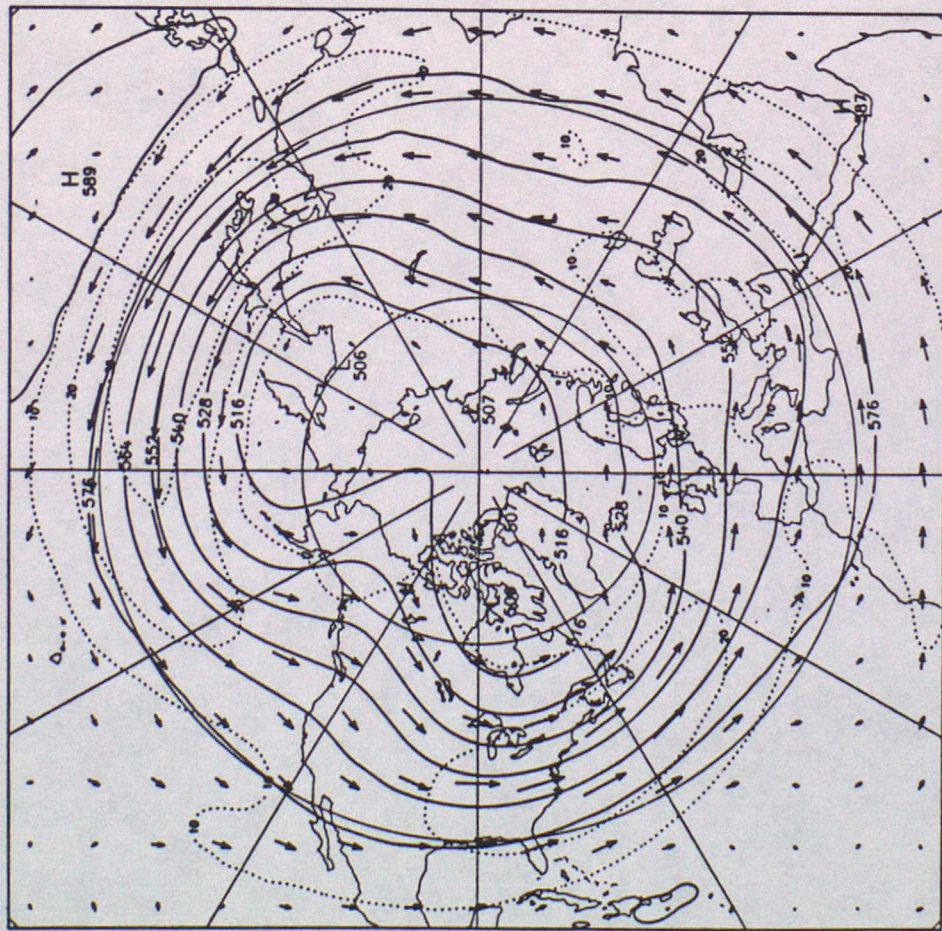


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 850 MB

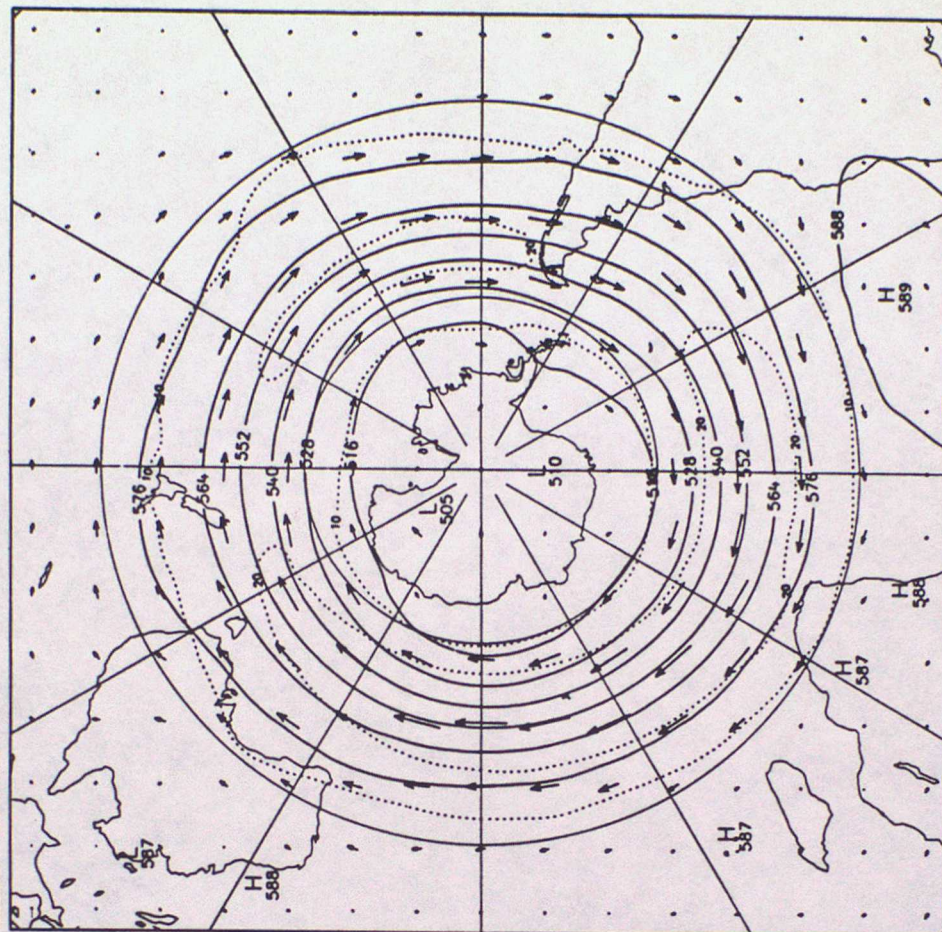




OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 500 MB

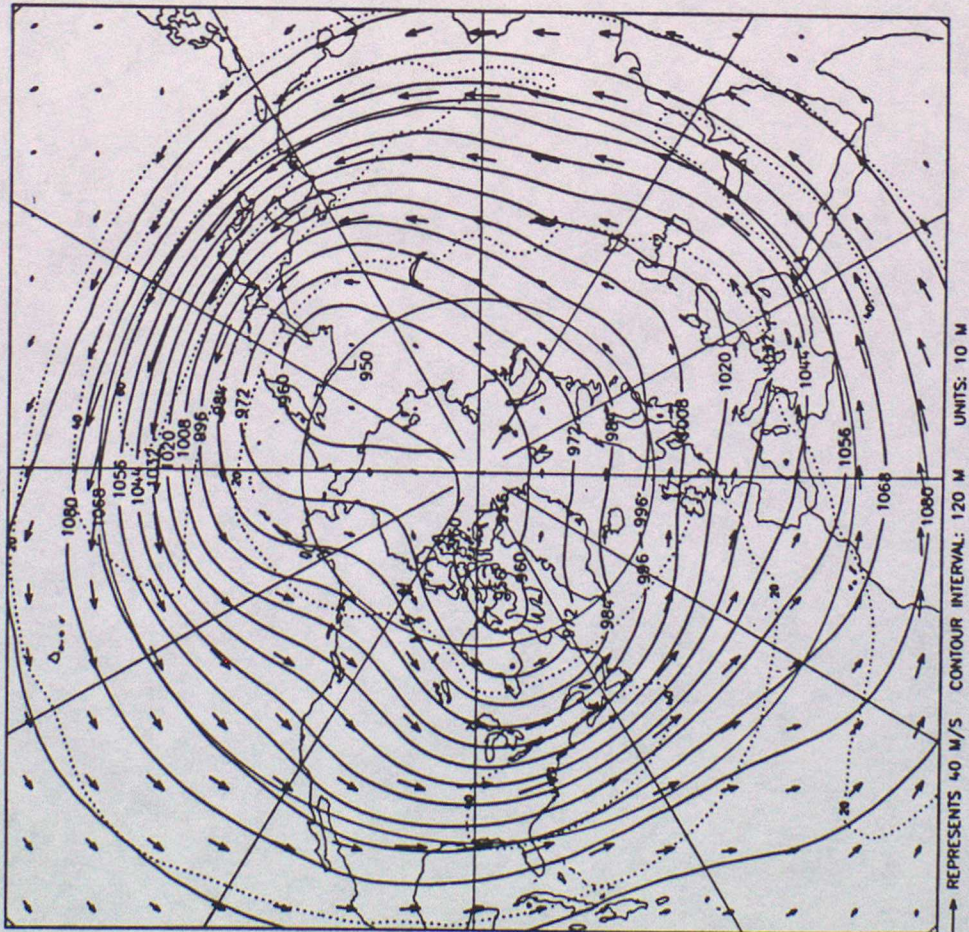


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 500 MB

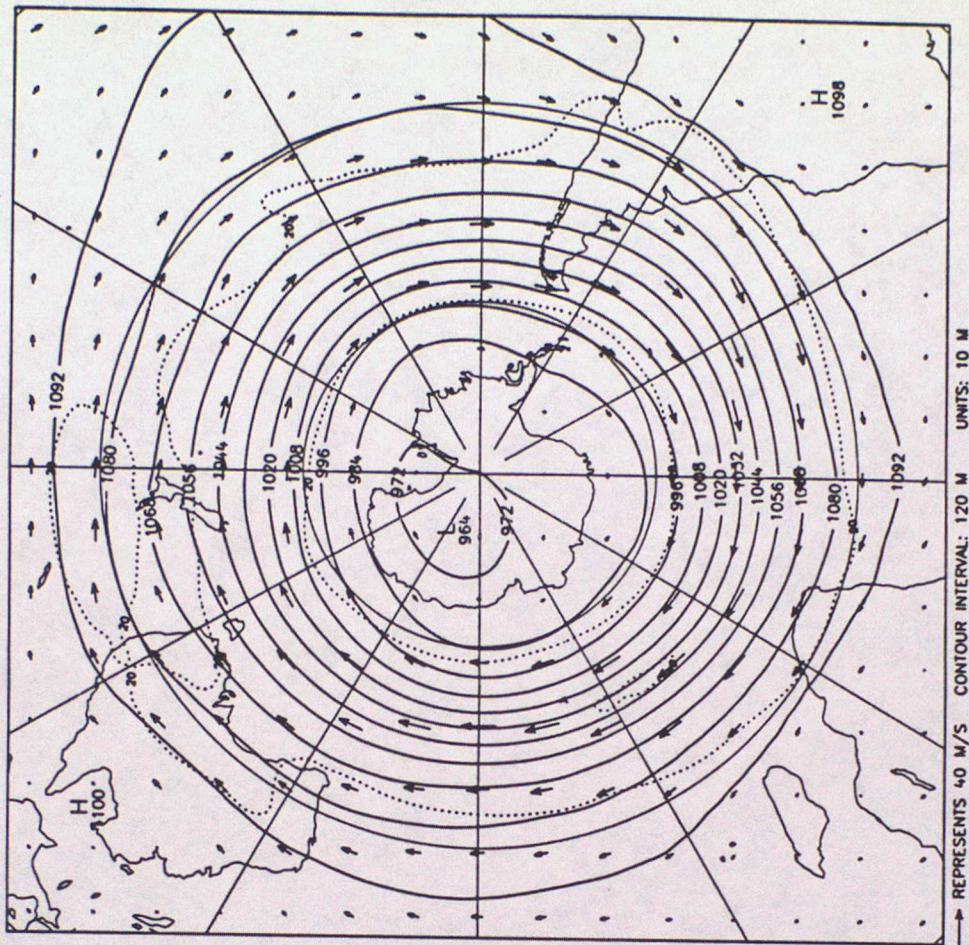




OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 250 MB

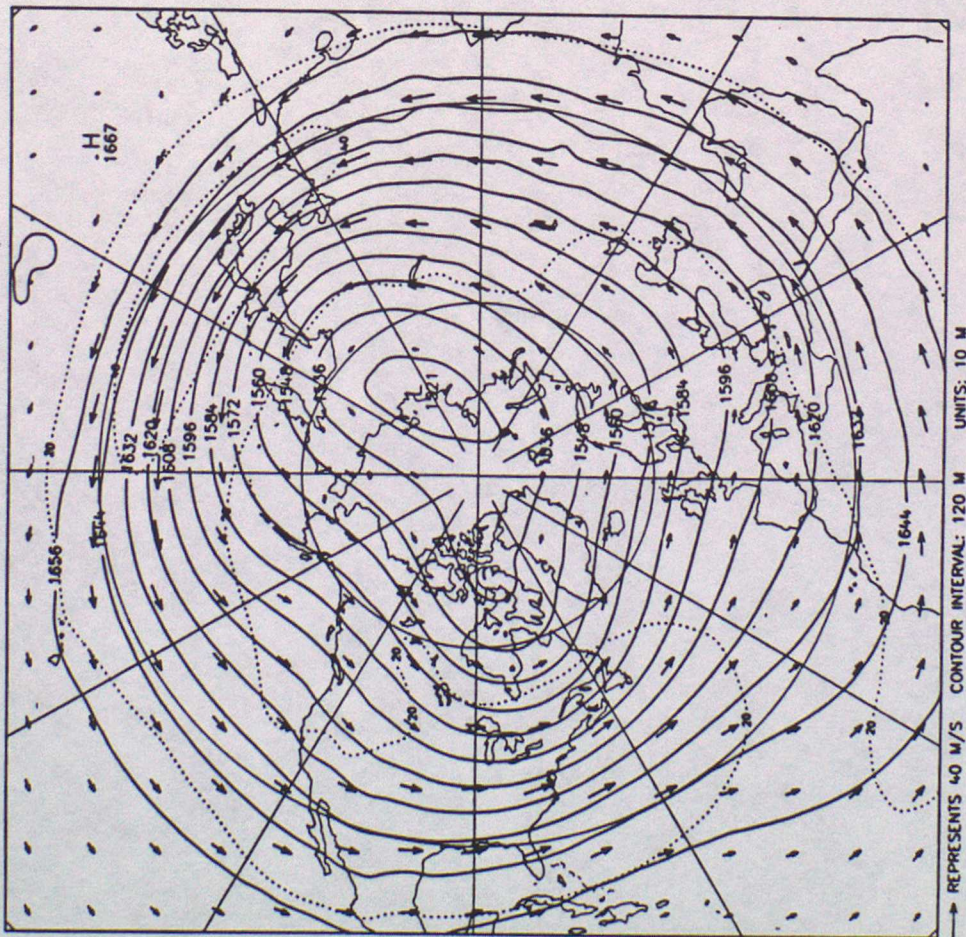


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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 LEVEL: 250 MB

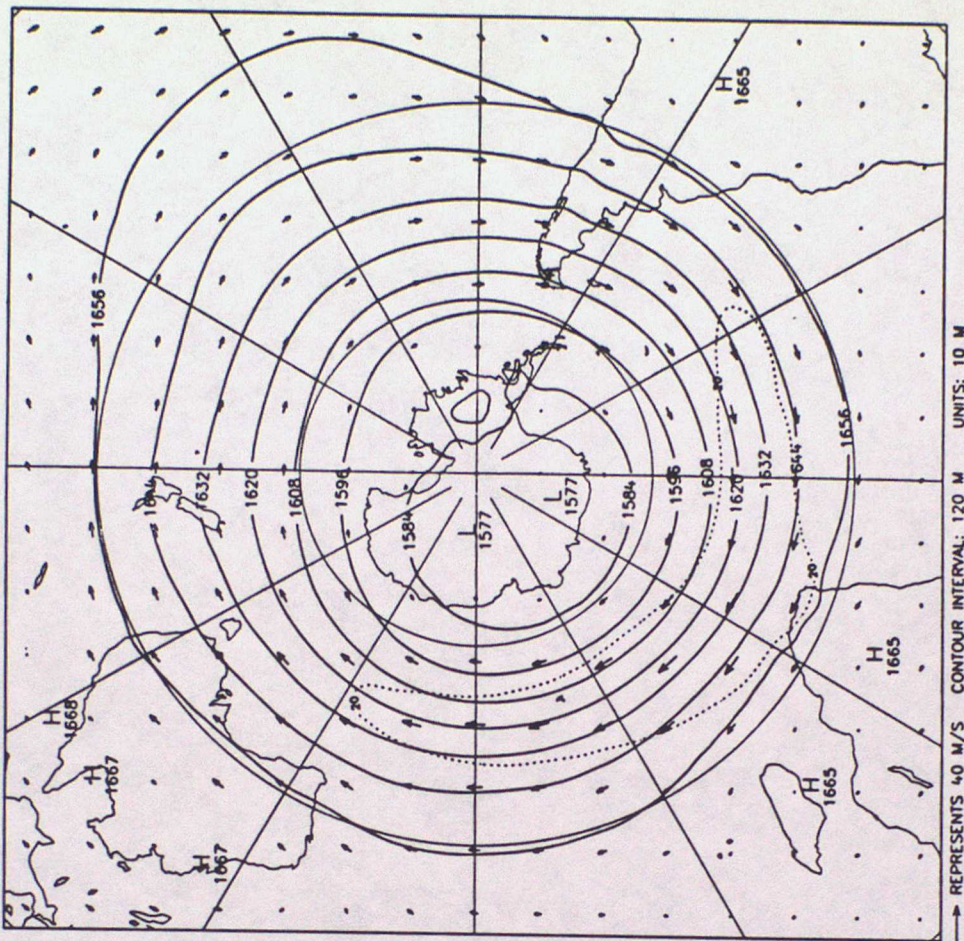




OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
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 LEVEL: 100 MB

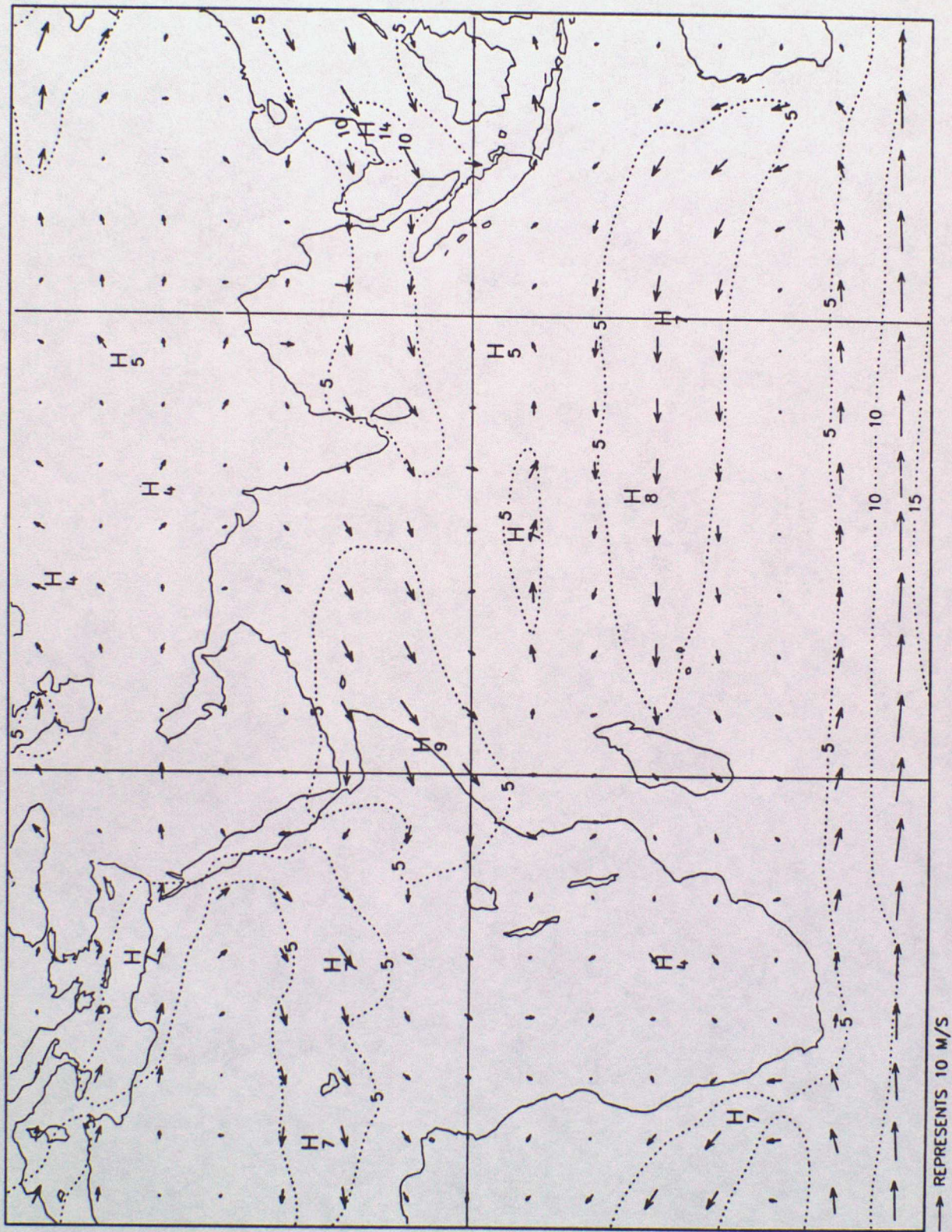


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 HEIGHTS, WIND ARROWS AND ISOTACHS.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 LEVEL: 100 MB



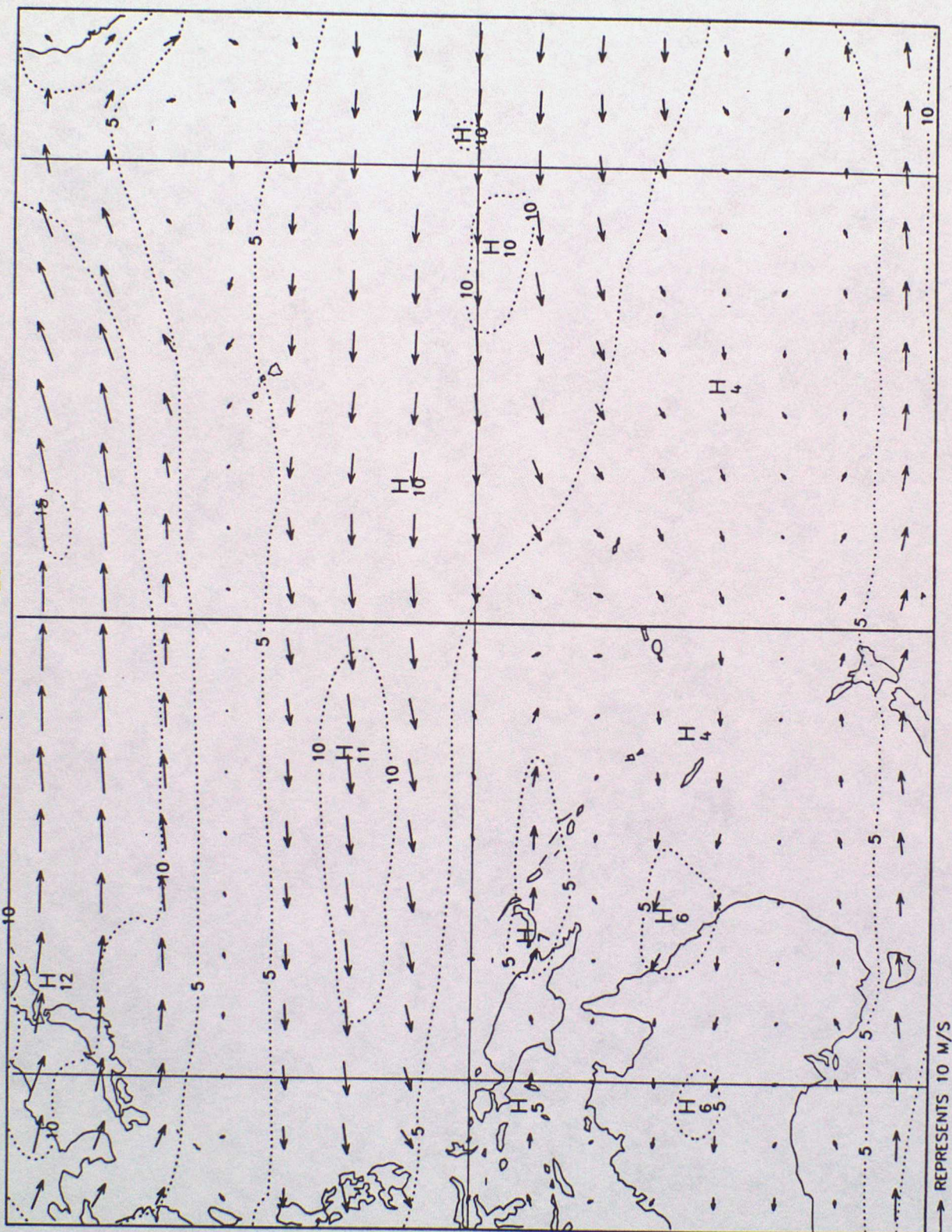


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988.  
WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
850 MBS.  
BETWEEN LONGS. 0 E - 120 E



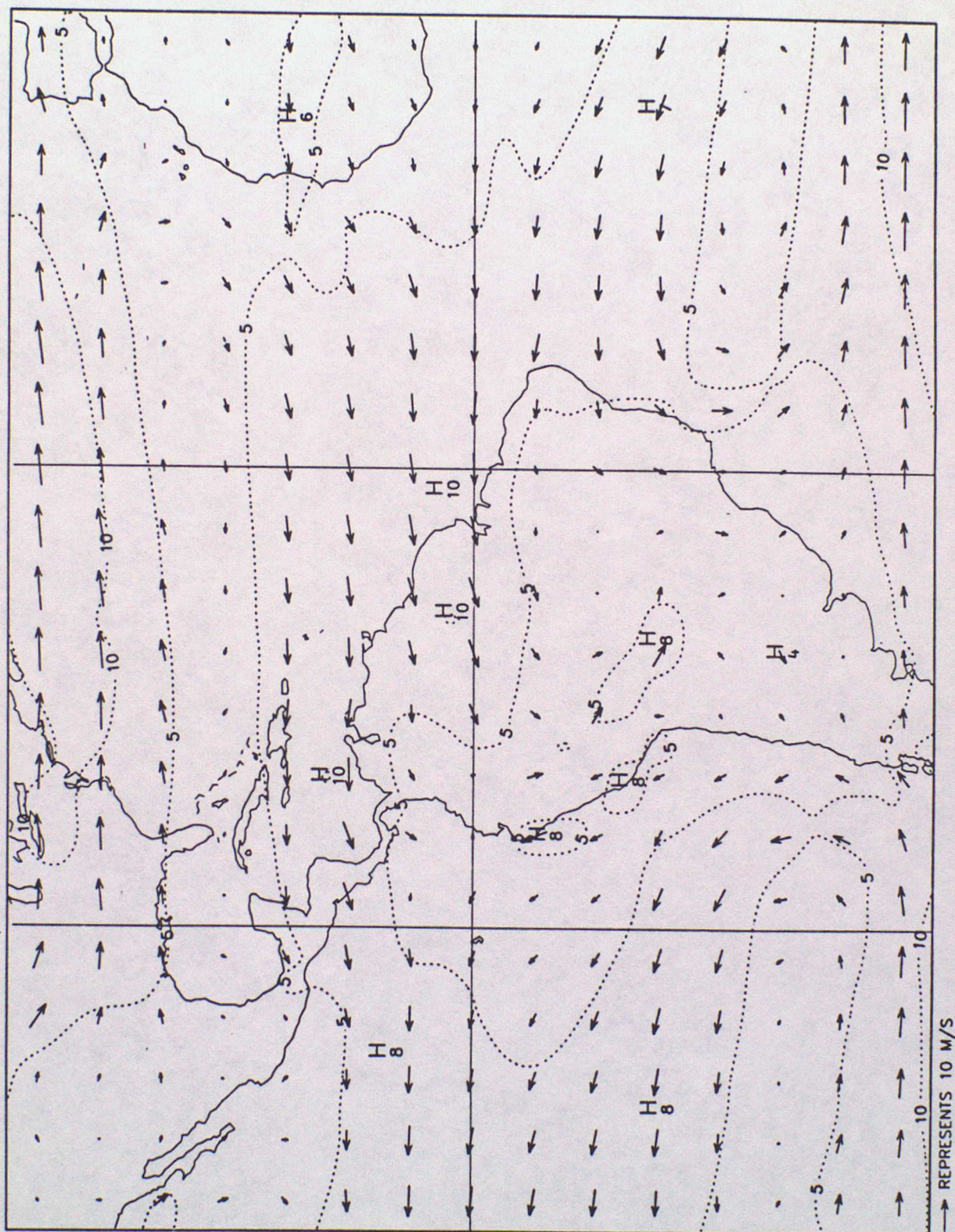


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 850 MBS.  
 BETWEEN LONGS. 120 E - 120 W



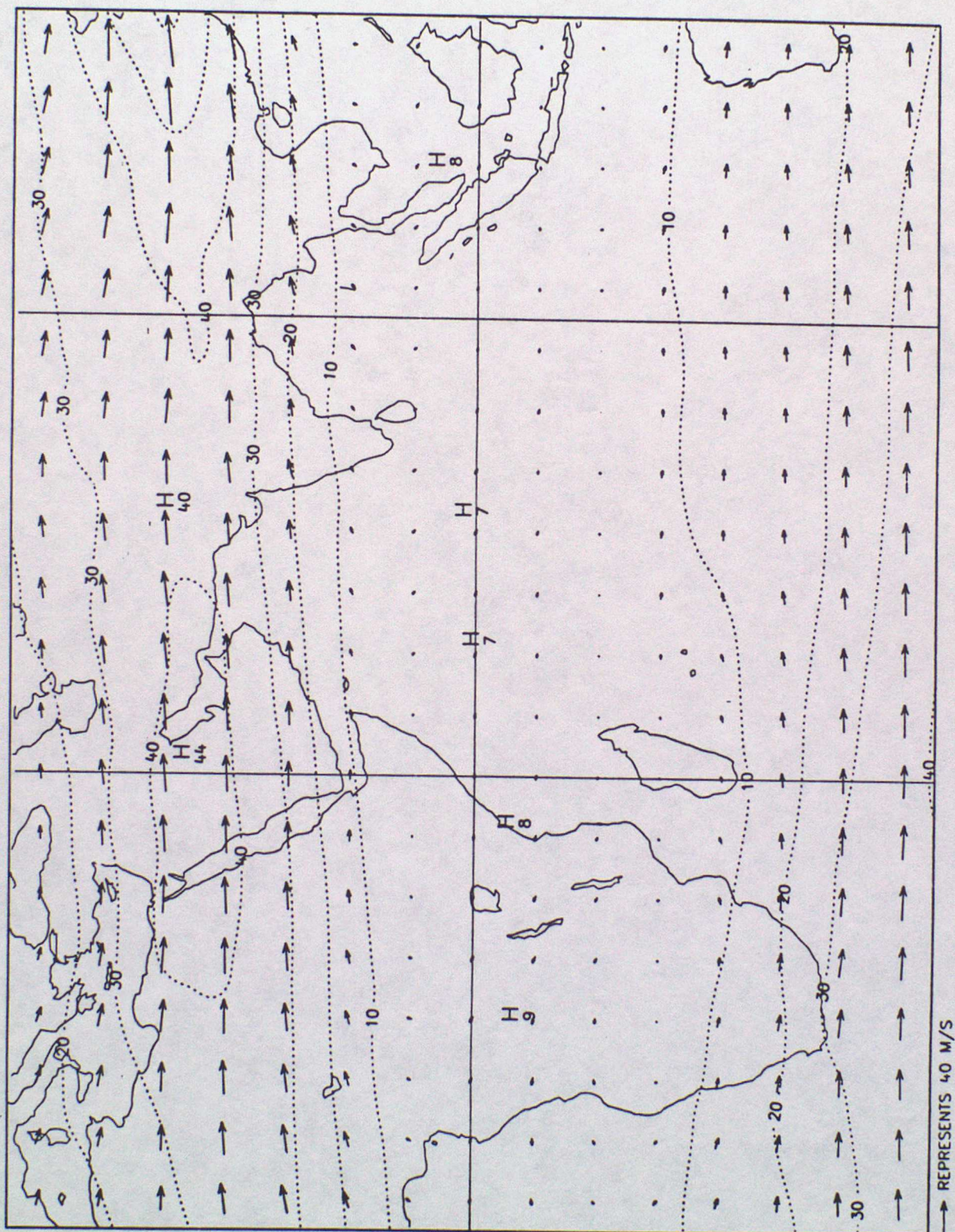


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 850 MBS.  
 BETWEEN LONGS. 120 W - 0 W



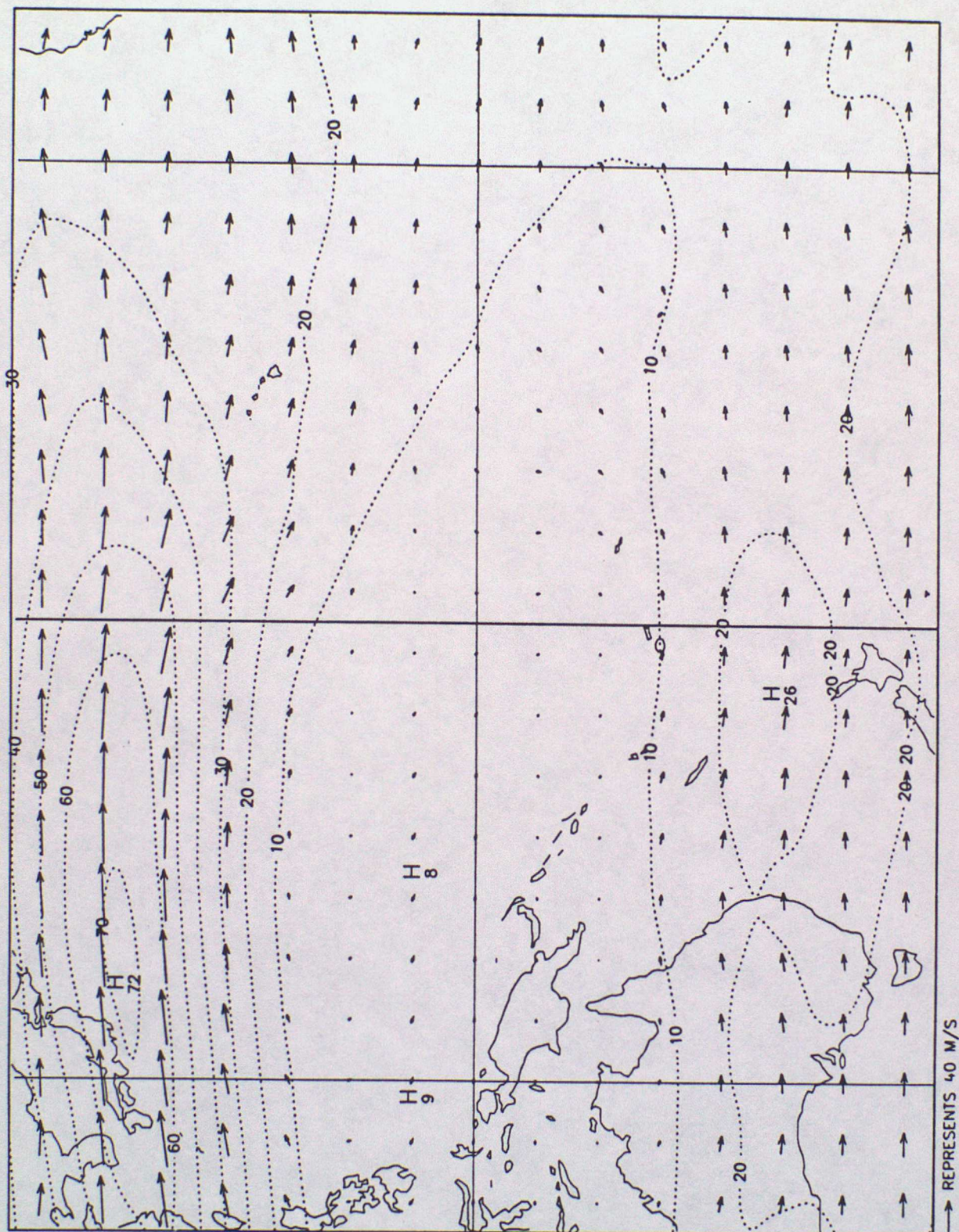


OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
250 MBS. BETWEEN LONGS. 0 E - 120 E





OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988.  
WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
250 MBS.  
BETWEEN LONGS. 120 E - 120 W





OPERATIONAL ARCHIVE MEANS. DEC/JAN/FEB1988  
 WIND ARROWS AND ISOTACHS BETWEEN LATS. 45 N - 45 S.  
 VALID AT 0Z ON 1/12/1987 DAY 335 DATA TIME 12Z ON 29/2/1988 DAY 60  
 250 MBS.  
 BETWEEN LONGS. 120 W - 0 W

