Weather and Synoptic Situation during Winter Weddell Sea Project 1986 (ANT V/2) July 16—September 10, 1986

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Summary

The meteorological situation during the cruise of RV POLARSTERN into the deep Antarctic ice pack in winter 1986 is described. Handmade analyses of surface pressure charts over the Atlantic sector of the Southern Ocean, radiosonde data and three hourly weather observations give an overview for each day from 16 July to 10 September.

Typical periods in development and behaviour of synoptic systems are discussed, and mean surface pressure charts and storm tracks are presented.

1. Introduction

1.1. General

The pack ice zone of the Southern Ocean is one of the least explored regions of the earth. Allthough the great importance of this area for oceanic and atmospheric circulations as well as for the biological and biochemical processes within and beneath the ice is well known, little data is available, especially in winter. The Alfred-Wegener-Institute für Polar and Marine Research initiated a winter expedition to the Weddell Sea, called WWSP 86 (Winter Weddell Sea Project 1986). This expedition was divided in two legs. The first one started end of June 1986 in Bahia Blanca (Argentine) and ended on 20. September 1986 in Cape Town (South Africa). The course is plotted in fig. 1.

Besides of a large number of scientific personnel, a meteorological group from the Seewetteramt in Hamburg participated and was responsible for synoptic services. Routine observations of meteorological surface and upper air data as well as forecasts for ship, helicopters and support of other groups in meteorological questions were the main tasks.

This atlas is based on material produced during the cruise by this synoptic group. The charts and data were revised afterwards and are presented to give an overview of the synoptic situation. The atlas has the following content:

- daily surface pressure charts
- daily radiosonde plots
- three hourly weather observations
- mean surface pressure charts for
    - the whole period of the leg
    - special synoptic periods
- tracks of pressure systems
- description of the synoptic situation
- some conclusions.

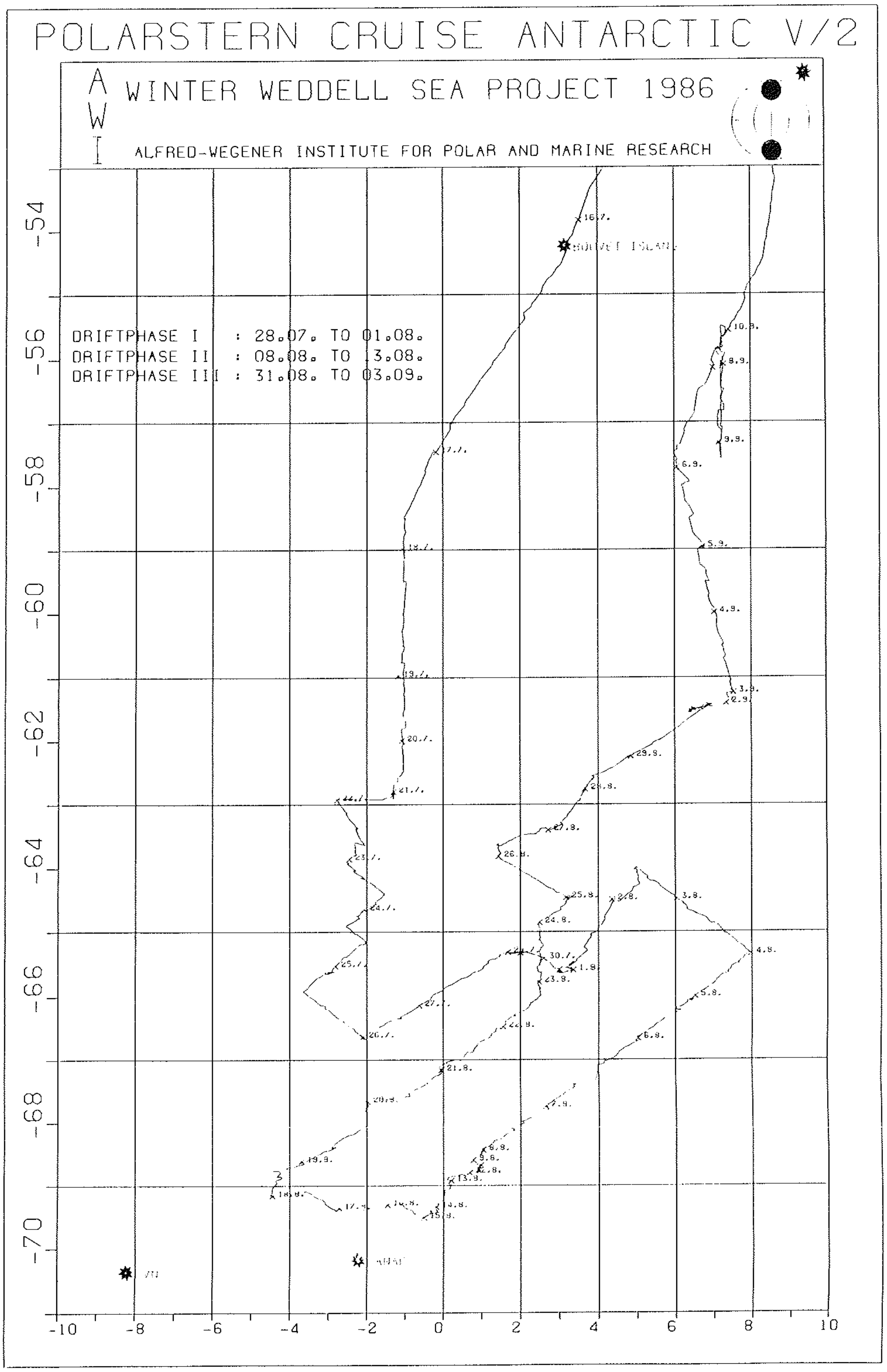


Fig. 1: Course of R.V. POLARSTERN during WWSP 86, leg one. Positions are daily at 12.00 UTC.

1.2. Daily weather charts

The analyses of the charts are handmade and based on synoptic observations of Antarctic, South American and South African stations as well as ships as far as available. Data from 10 drifting buoys launched from RV POLARSTERN, two others in the Weddell Sea from the British Scott Polar Research Institute and satellite images formed a second set of useful material. Especially the buoy data, which are normally not available in such a number, and the continuous interpretation of satellite images make the present charts of a high accuracy, keeping in mind that it is a data sparse area, nevertheless.

Comparisons with objective analyses of the European Center for MediumRange Weather Forecasts (ECMWF) in Reading, UK, and of the British Meteorological Office in Bracknell, which were received on board, too, showed deviations from time to time, which may be explained by missing the information contained in the satellite images. The quality of the analyses and, as a consequence, of the predicted fields became better, when all buoys from RV POLARSTERN were launched, and six hourly radiosonde data were delivered via the Global Telecommunication System for worldwide use.

In this context it must be mentioned that numerical products from these global prediction models were a reliable source for medium-range planning of weather-dependent projects. Their improving quality due to a denser data coverage proves the importance of such a drifting buoy network.

1.3. Radiosonde data and three hourly weather observations

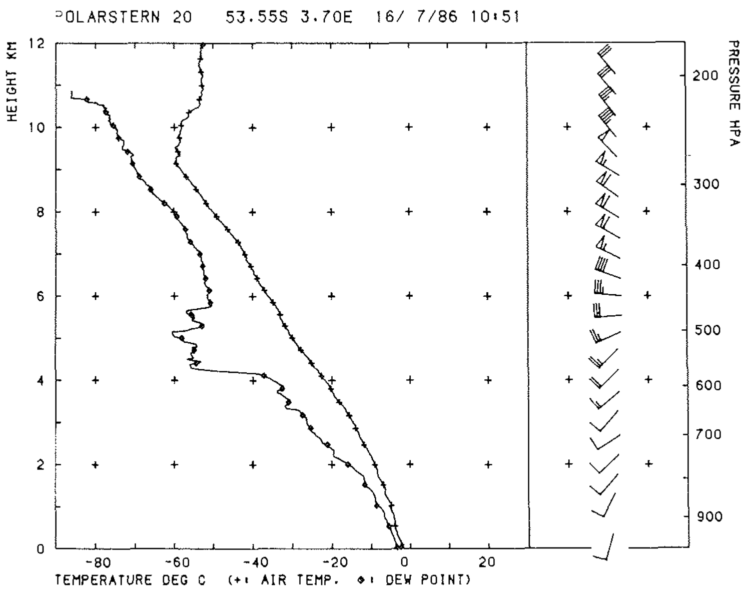
Radiosondes were launched every six hours. As far as available the midnight and noon ascents are plotted. The Vaisala MicroCora system used with RS 80 sondes calculates winds by the Omega navaid signals which track the sonde. Due to poor signals in surface layers, the winds beneath 1000 meters are of low quality most of the time, but should be accurate to 1 m/s above this level.

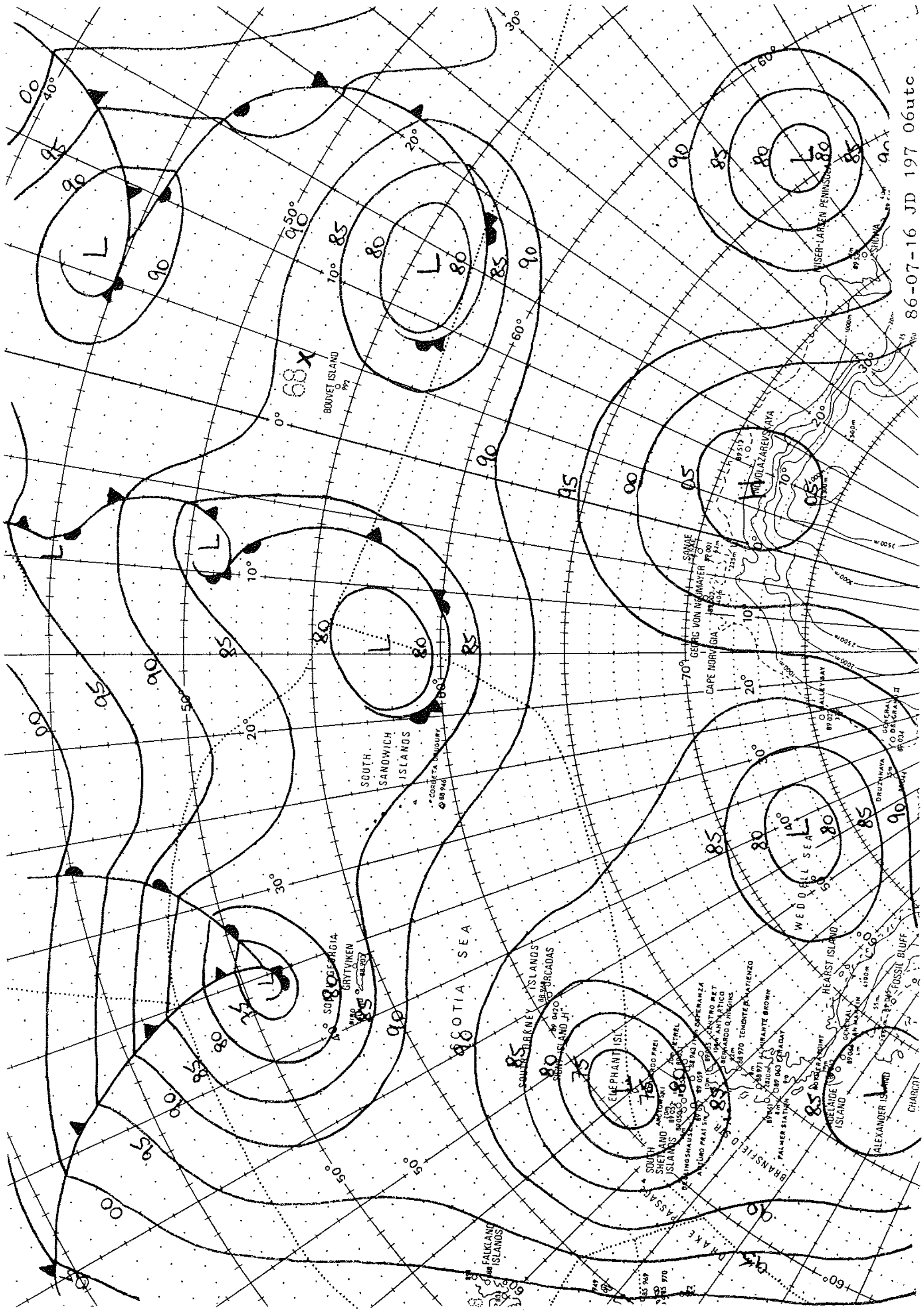
Three hourly weather observations include visual information, like clouds and significant weather. Several WMO codes necessary to interpret the data are provided in the Appendix.

2. Daily weather charts, radiosonde plots and SYNOP weather observations (16 July - 10 September 1986)

16. JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	52.1S	4.9E	987.6	230	17	-.4	-4.5	1.2	9		/				10.00	02	/	/
6	52.6S	4.4E	987.2	230	16	-1.3	-3.9	.9	9		/				10.00	02	7	2
9	53.2S	4.0E	986.8	230	10	-2.3	-3.4	-.3	7	7	2	6	0	0	1.00	10	7	4
12	53.8S	3.6E	986.5	200	9	-2.4	-3.2	-.4	6	6	1	6	0	0	2.00	44	7	4
15	54.4S	3.2E	986.3	180	9	-2.3	-3.7	-.3	7	7	2	8	0	0	4.00	15	8	7
18	54.9S	2.6E	986.6	990	1	-2.4	-4.0	-.5	8	3	3	6	1	/	10.00	26	8	7

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SCOTIA SEA
WEDDELL SEA
ELEPHANT ISL.
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FALKLAND ISLANDS
ALEXANDER ISLAND
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
HALLEY BAY
HEARST ISLAND
FOSSIL BLUFF
BRANSFIELD STR.
DRAKE PASSAGE

17. JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
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6	56.7S	.6E	986.5	150	7	-3.5	-5.7	-1.2	9 /	10.00	02 8 2
9	57.0S	.2E	987.3	150	7	-3.6	-6.7	-1.1	8 8 3 8 / /	20.00	02 8 2
12	57.4S	.1W	987.8	160	11	-3.7	-7.2	-1.4	7 4 4 3 0 2	20.00	15 8 2
15	58.0S	.6W	988.0	160	7	-3.9	-8.3	-1.2	7 7 4 8 0 0	20.00	02 8 2
18	58.5S	1.0W	989.0	990	2	-3.6	-5.9	-1.4	9 /	4.00	70 8 7

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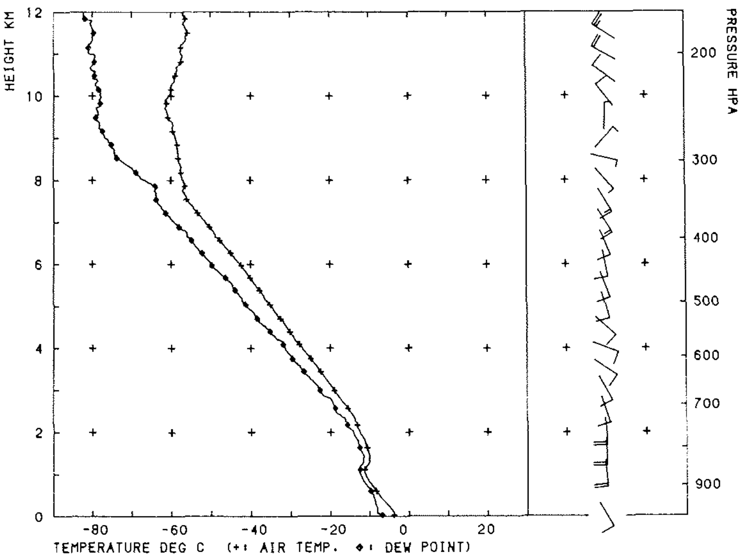

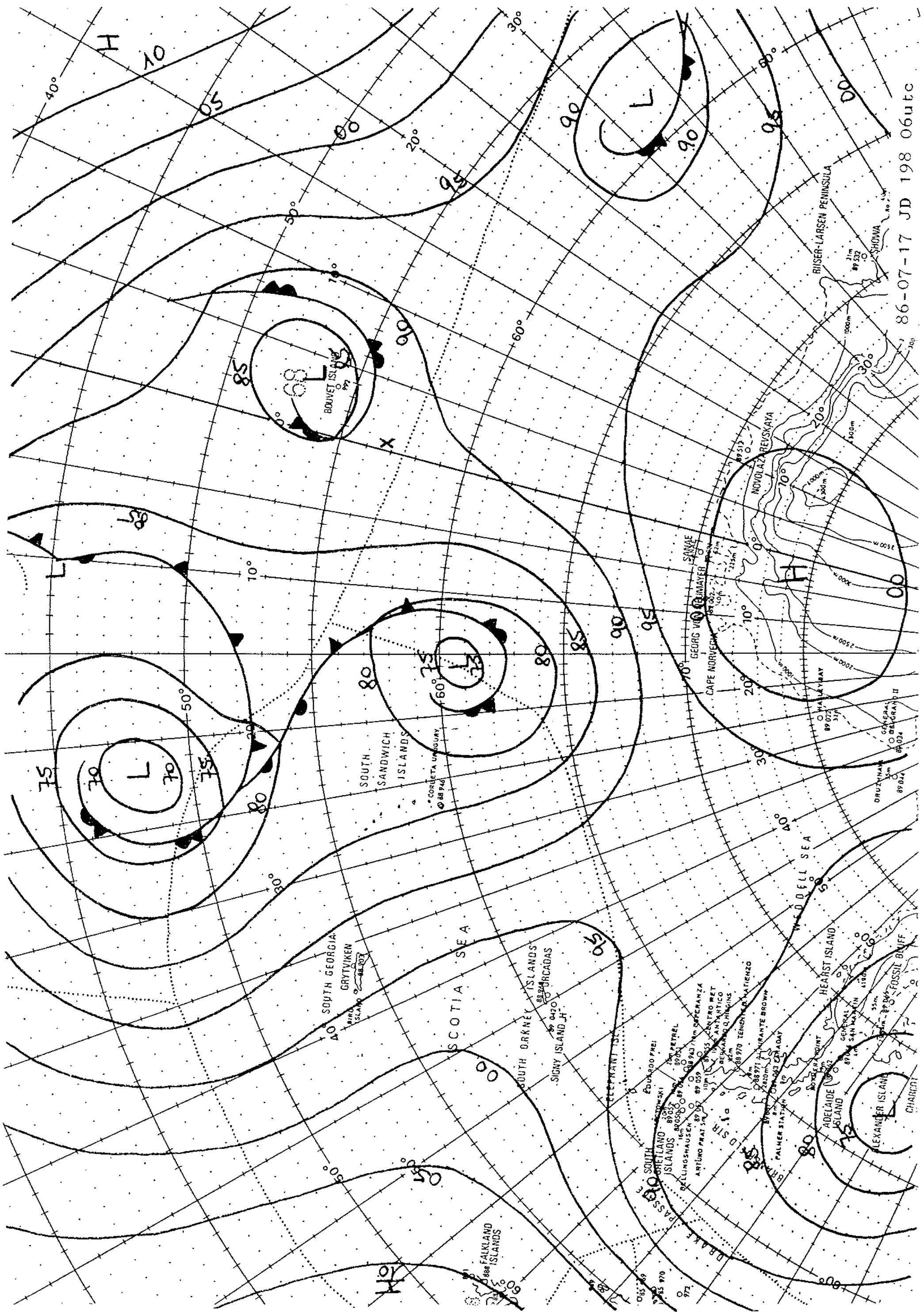
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SIGNY ISLAND
ORCADAS
FALKLAND ISLANDS
SOUTH SHETLAND ISLANDS
RIISER-LARSEN PENINSULA
NOVOLAZAREVSKAYA
SANAE
GEORG VON NEUMAYER
CAPE NORVEGIA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND

18.JULI 1986

TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N Nh h CL CM CH	VIS km	WEATHER ww W1 W2
3	58.5S	1.0W	989.8	110	5	-4.7	-8.8	-1.3	9 /	10.00	02 / /
6	58.5S	1.0W	990.1	200	6	-4.8	-8.3	-1.6	9 /	10.00	02 2 2
9	59.1S	1.0W	499.0	200	10	-5.0	-6.5	-1.9	8 8 1 8 / /	10.00	70 8 7
12	59.0S	1.0W	990.9	200	8	-5.8	-6.7	-1.7	5 5 2 6 0 0	4.00	26 8 7
15	59.0S	1.0W	990.9	230	5	-5.8	-6.8	-1.7	6 6 1 6 0 0	4.00	16 8 2
18	59.4S	1.0W	991.2	210	4	-5.3	-6.0	-1.9	9 /	10.00	02 8 2

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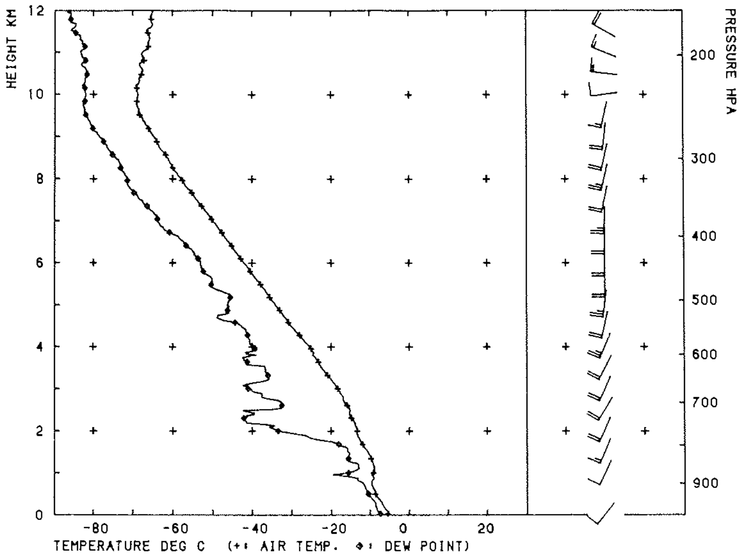

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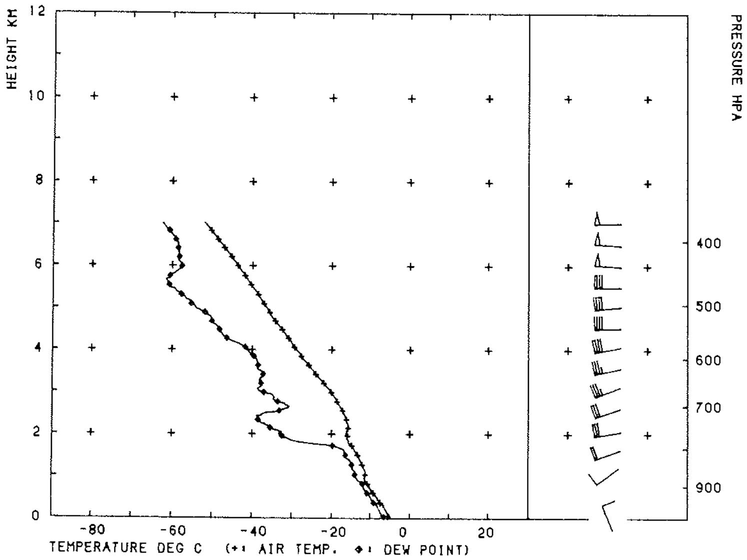

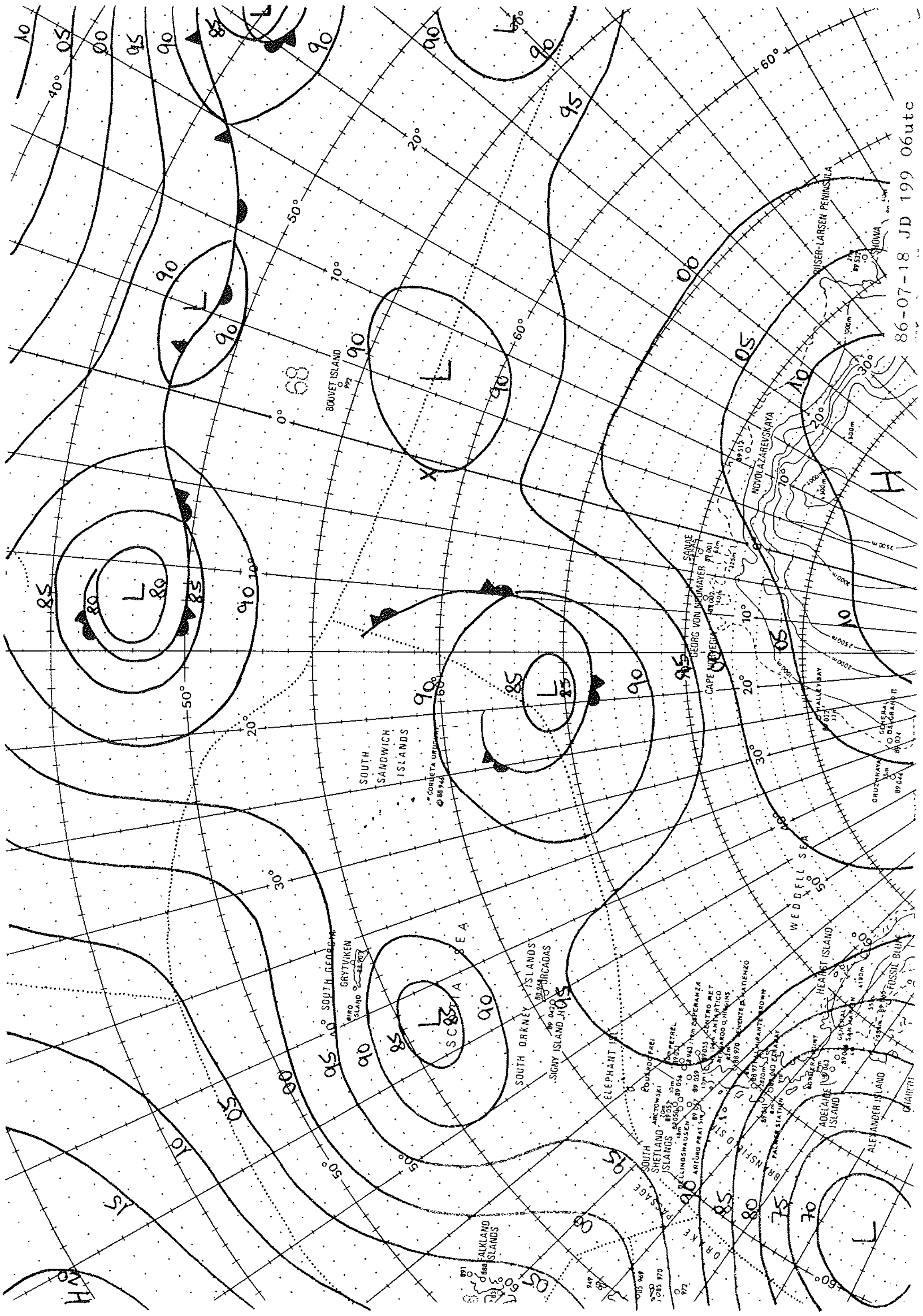
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DRUZHNAYA
WEDDELL SEA
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GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT I
SOUTH SHETLAND ISLANDS
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FALKLAND ISLANDS

19. JULI 1986

TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N	CLOUDS N_h	CLOUDS h	CLOUDS C_L	CLOUDS C_M	CLOUDS C_H	VIS km	WEATHER ww	WEATHER W_1	WEATHER W_2
3	60.3S	1.0W	993.1	310	10	-5.2	-6.7	-1.9	9		/				10.00	02	/	/
6	60.5S	1.0W	993.2	340	8	-5.1	-6.3	-1.9	0		9				10.00	02	0	0
9	60.8S	1.0W	993.2	350	12	-5.0	-5.8	-1.9	7	7	2	6	0	0	4.00	10	1	1
12	61.0S	1.1W	993.0	10	12	-4.9	-5.8	-1.9	7	4	2	6	2	0	4.00	02	2	2
15	61.0S	1.0W	992.3	340	15	-4.0	-5.3	-1.9	8	6	3	8	3	/	10.00	02	2	2
18	61.2S	1.0W	992.3	350	17	-4.0	-5.4	-1.9	6	6	3	8	0	0	10.00	77	2	2

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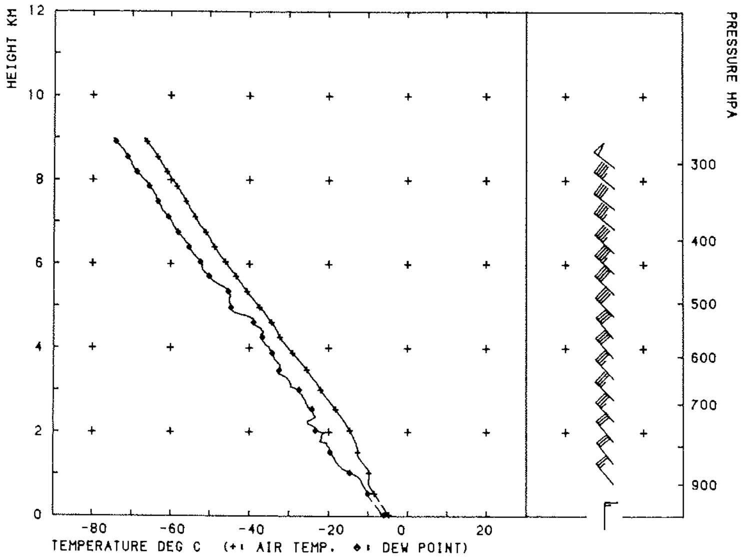

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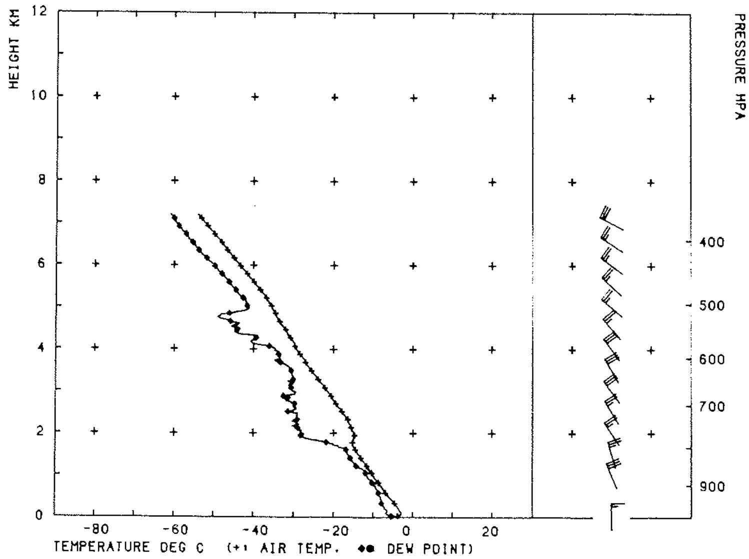

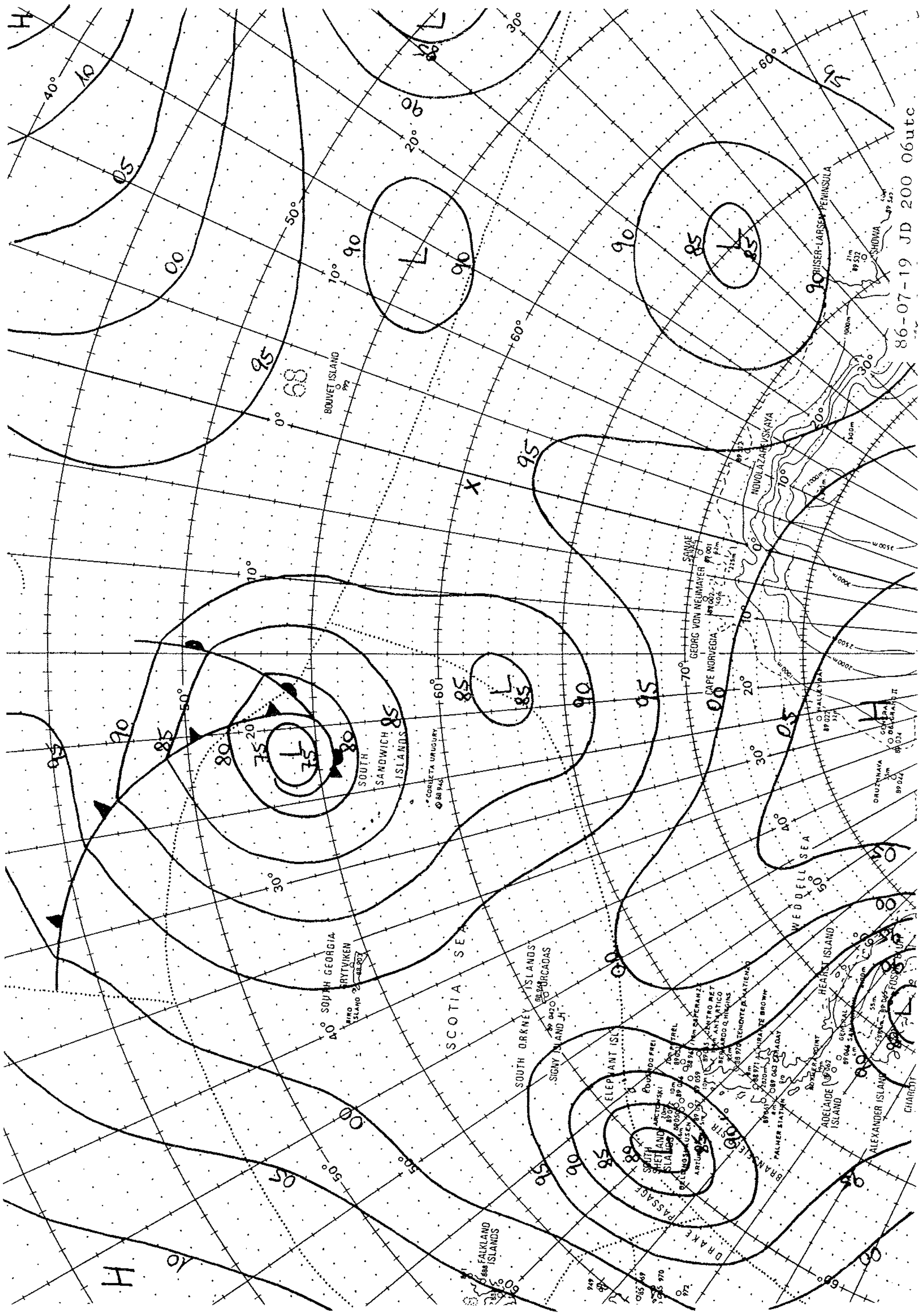
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ADELAIDE ISLAND
ALEXANDER ISLAND
PALMER STATION
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RISER-LARSEN PENINSULA
SYOWA
HALLEY BAY
DRUZHNAYA

20. JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	61.5S	1.0W	990.0	360	19	-4.0	-5.2	-1.9	9 /	10.00	02 7 /
6	61.5S	1.0W	989.1	10	17	-4.3	-5.4	-1.9	3 3 3 8 0 2	10.00	02 7 1
9	61.6S	1.0W	987.2	20	18	-3.6	-4.7	-1.9	9 2	2.00	77 7 2
12	62.0S	1.0W	986.2	30	18	-3.6	-4.3	-1.9	8 8 1 6 / /	1.00	77 7 2
15	62.0S	1.0W	984.2	30	17	-3.1	-3.9	-1.8	8 8 3 6 / /	2.00	77 7 2
18	62.0S	1.0W	983.1	30	19	-3.4	-4.1	-1.7	9 /	10.00	02 7 2

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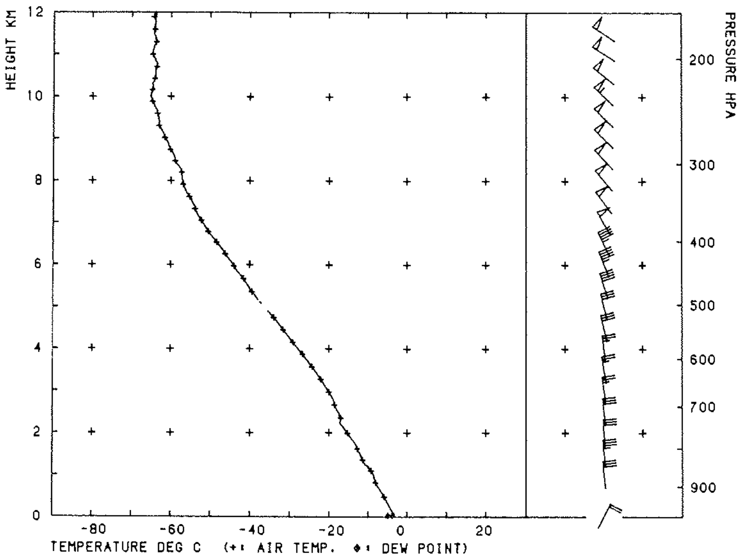

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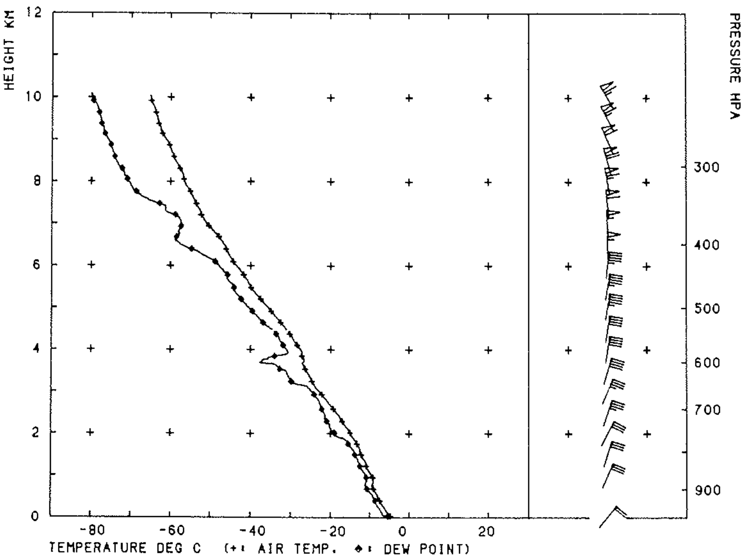

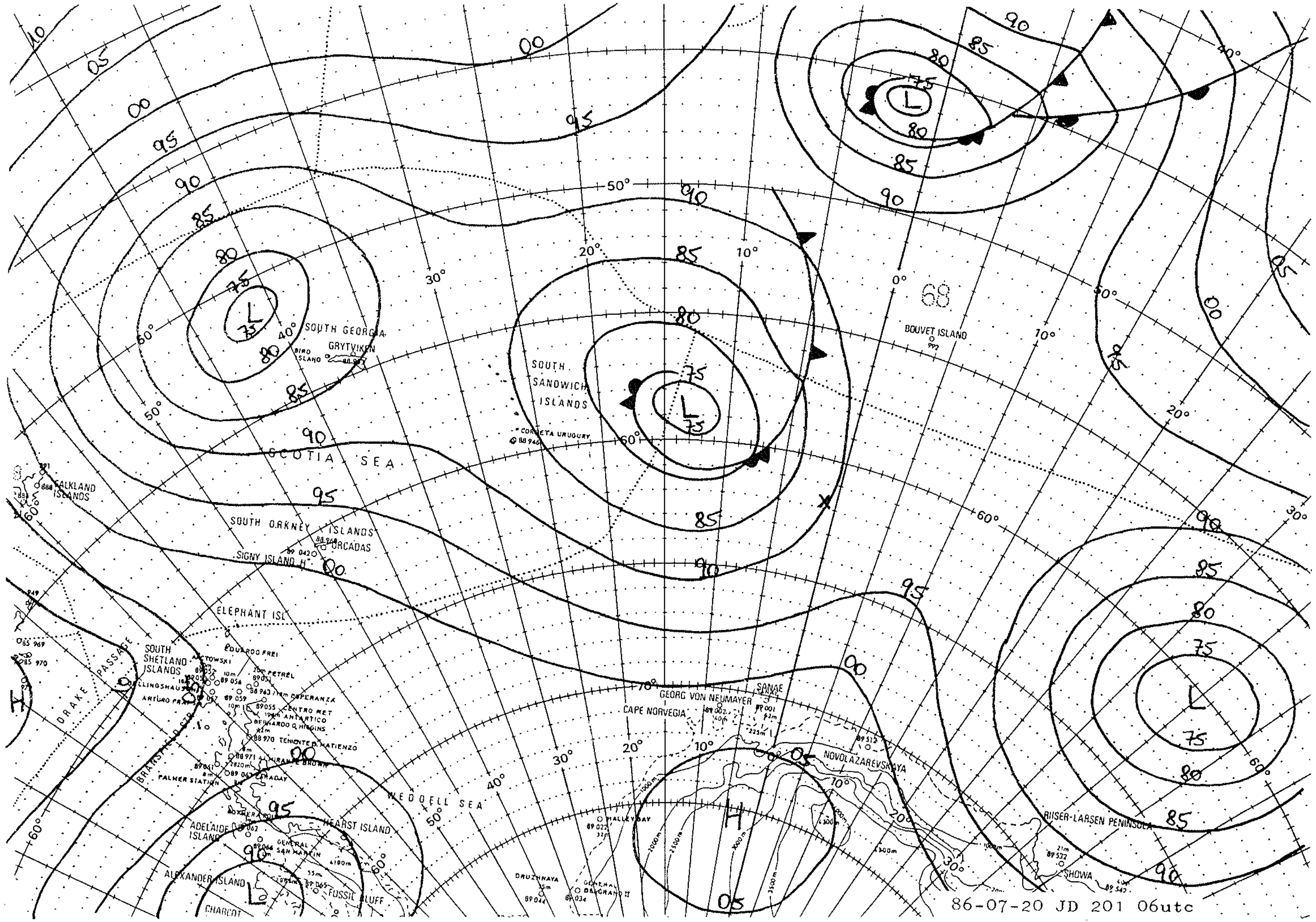
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SIGNY ISLAND
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RIISER-LARSEN PENINSULA
SHOWA
WEDDELL SEA
HALLEY BAY
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
FOSSIL BLUFF
CHARCOT
PALMER STATION
DRUZHNAYA
86-07-20 JD 201 06utc

21. JULI 1986

TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	62.5S	1.1W	978.8	40	18	-5.6	-6.4	-1.9	9 /	1.00	72 7 2
6	62.5S	1.1W	977.2	50	16	-5.6	-6.2	-1.9	9 /	2.00	72 7 2
9	62.6S	1.2W	977.0	60	19	-6.2	-6.8	-1.9	8 8 3 6 / /	2.00	71 7 2
12	62.8S	1.3W	976.8	70	19	-7.0	-7.7	-1.9	8 8 3 6 / /	10.00	71 7 7
15	62.8S	1.3W	976.2	70	14	-8.5	-9.3	-1.9	8 8 1 6 / /	2.00	71 7 7
18	62.8S	1.3W	976.0	80	10	-9.3	-10.1	-1.8	8 8 2 6 / /	4.00	71 7 7

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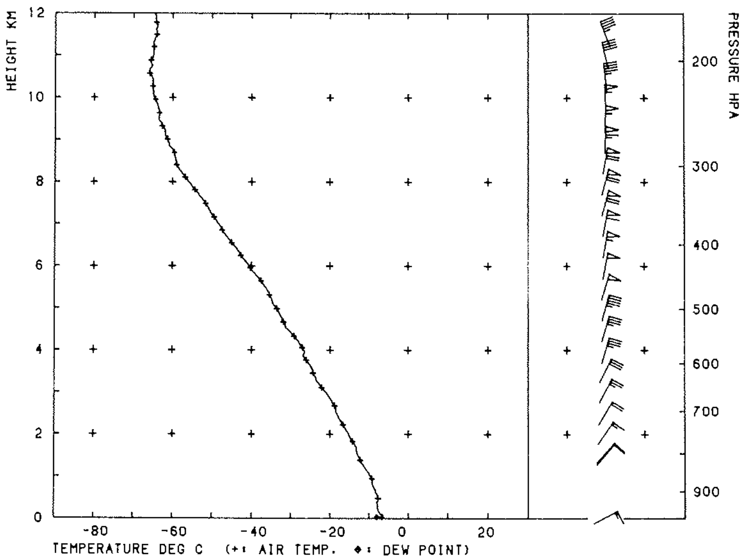

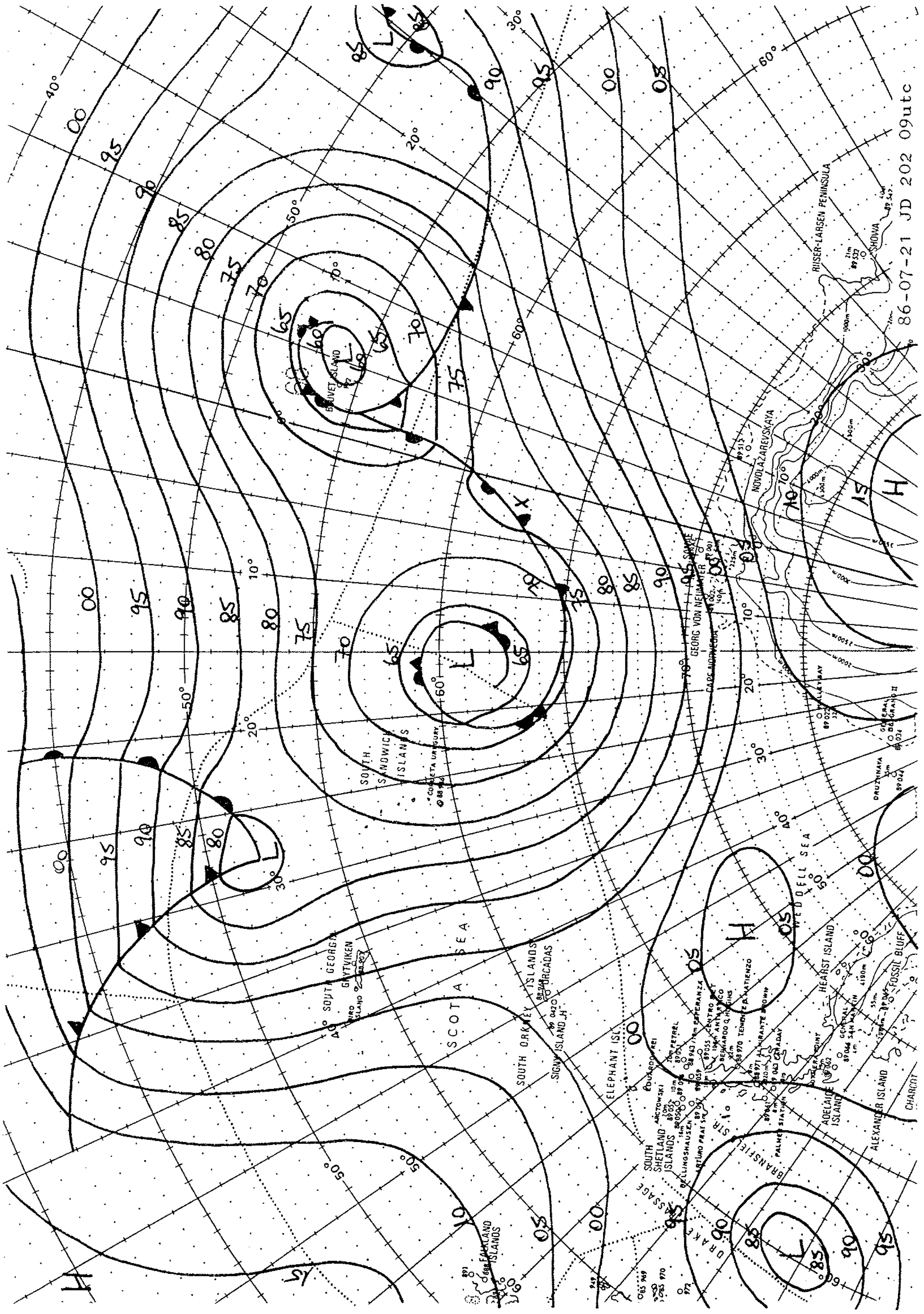
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GRYTVIKEN
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DRAKE PASSAGE
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ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT

22.JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	62.9S	2.0W	976.0	360	4	-10.8	-11.5	-1.7	9	8	/	6	/	/	1.00	73	7	7
6	62.9S	2.6W	976.0	60	4	-12.3	-12.4	-1.6	8	8	4	6	/	/	4.00	72	7	7
9	62.9S	2.7W	975.1	60	3	-11.3	-12.1	-1.7	1	1	5	8	0	0	10.00	02	7	7
12	62.9S	2.7W	974.2	40	3	-14.3	-14.9	-1.7	2	1	5	8	0	2	10.00	02	1	1
15	63.2S	2.5W	972.0	20	6	-16.5	-16.7	-1.9	6	3	4	8	0	2	4.00	71	1	1
18	63.4S	2.2W	969.0	20	5	-15.3	-13.9	-1.7	9		/				4.00	71	7	1

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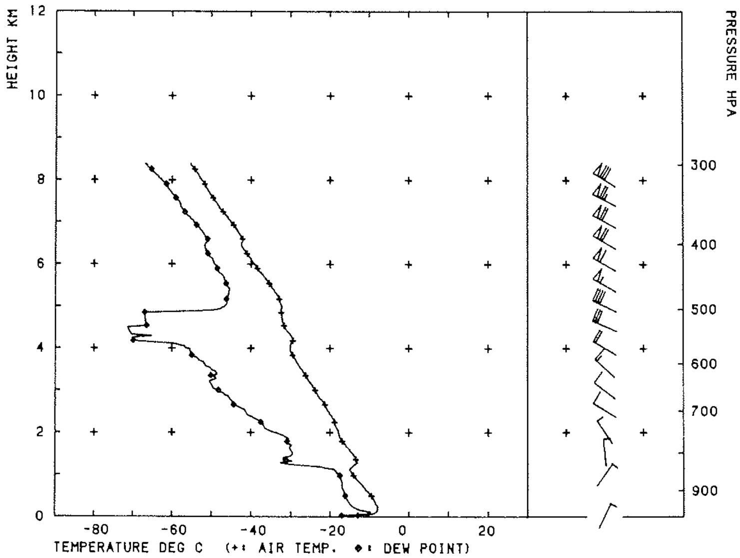

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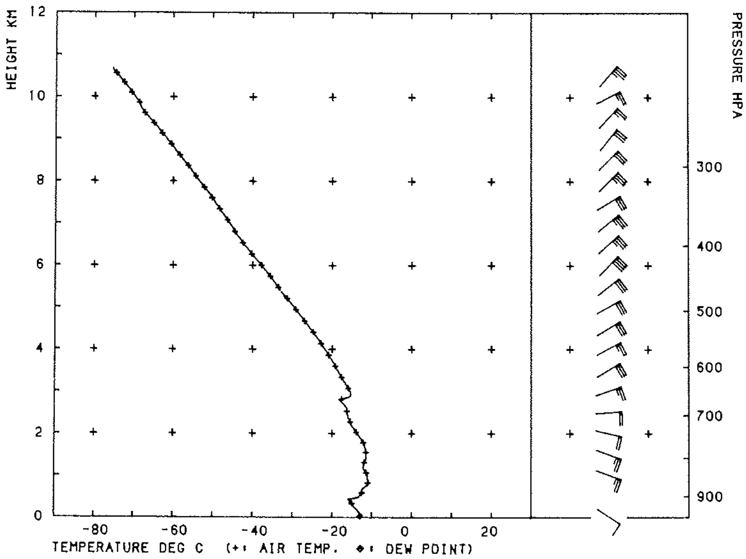

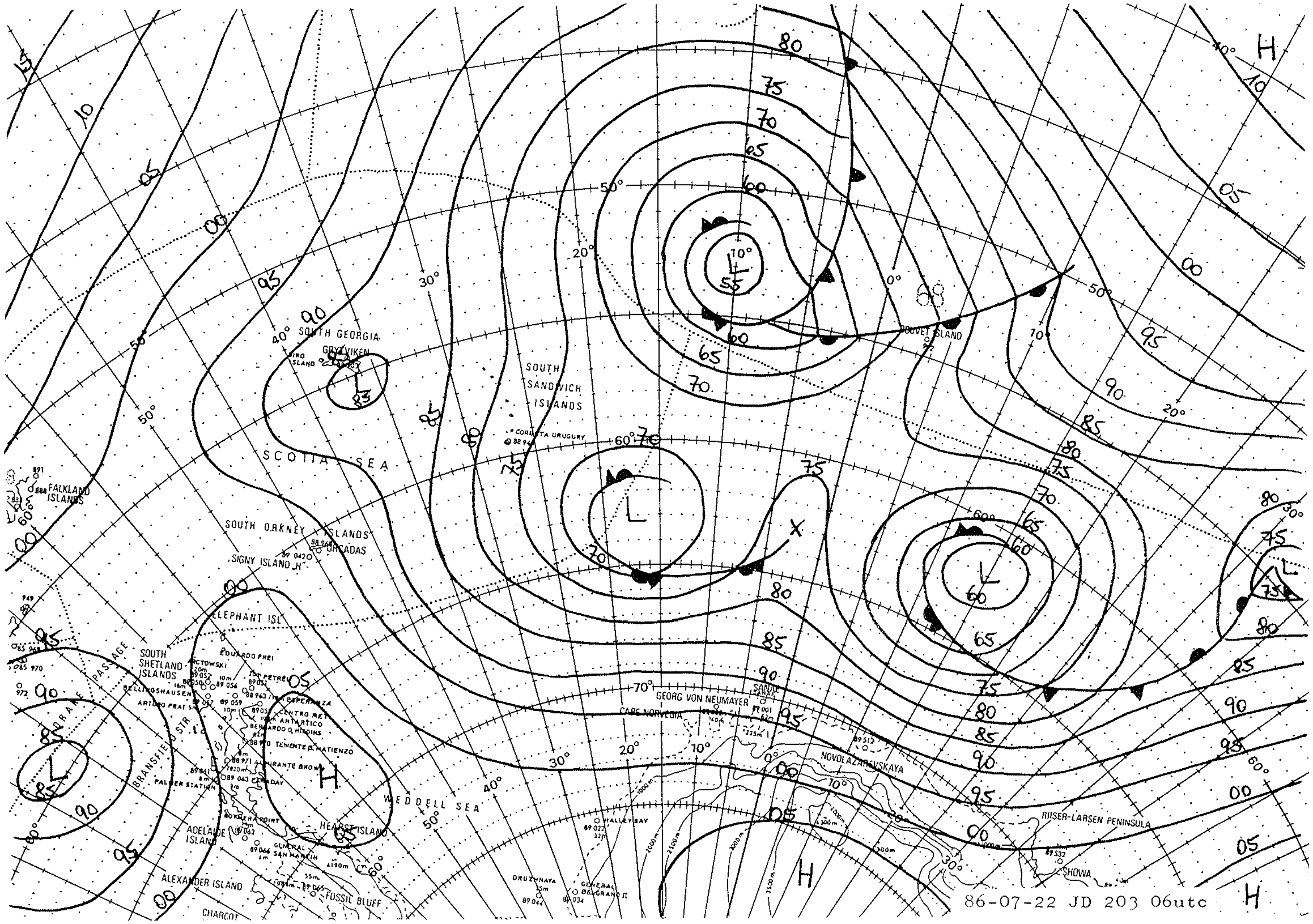
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CAPE NORVEGIA
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SHOWA
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DRUZHNAYA
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PALMER STATION
HEARST ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
86-07-22 JD 203 06utc

23.JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N Nh h CL CM CH	VIS km	WEATHER ww W1 W2
3	63.6S	2.2W	957.6	130	14	-11.7	-12.3	-1.7	9 /	4.00	02 / /
6	63.6S	2.2W	954.8	140	17	-11.9	-12.4	-1.7	9 /	4.00	71 7 2
9	63.7S	2.3W	952.3	90	26	-12.5	-13.0	-1.9	9 /	.50	73 7 2
12	63.8S	2.4W	952.0	120	20	-11.8	-12.7	-1.8	9 /	.20	38 7 2
15	63.9S	2.5W	952.2	120	19	-10.9	-11.5	-1.7	8 8 1 6 / /	1.00	71 7 2
16	64.0S	2.3W	953.3	120	21	-11.6	-12.1	-1.7	9 /	4.00	71 7 2

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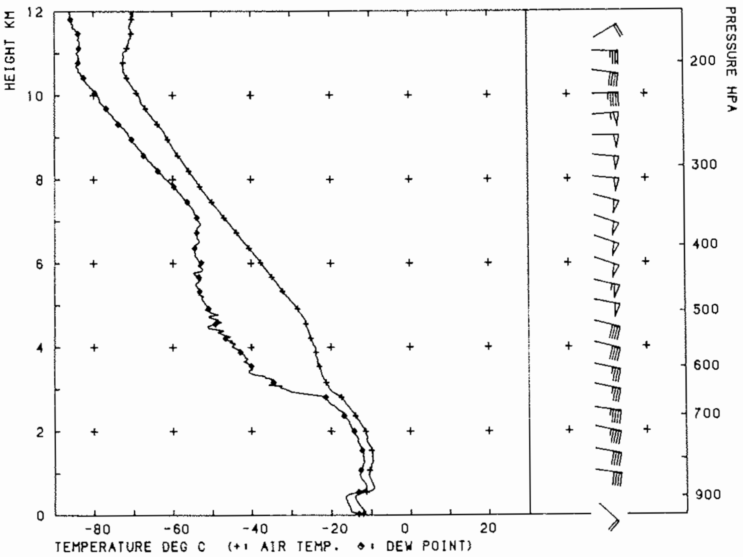

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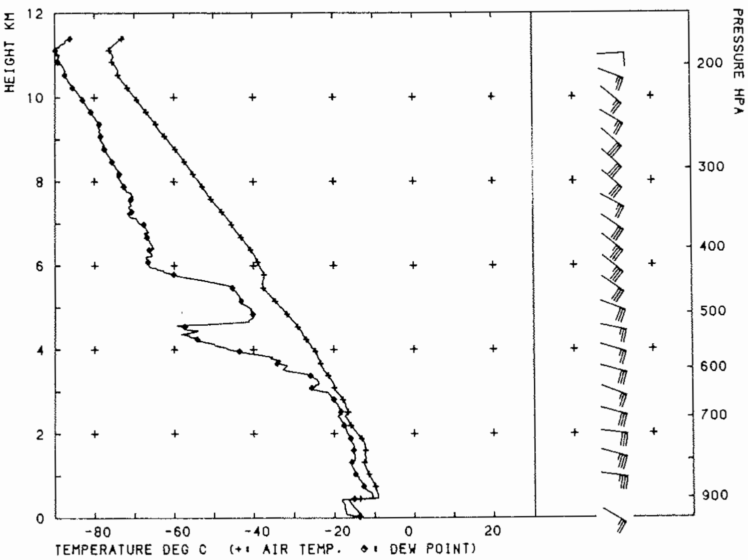

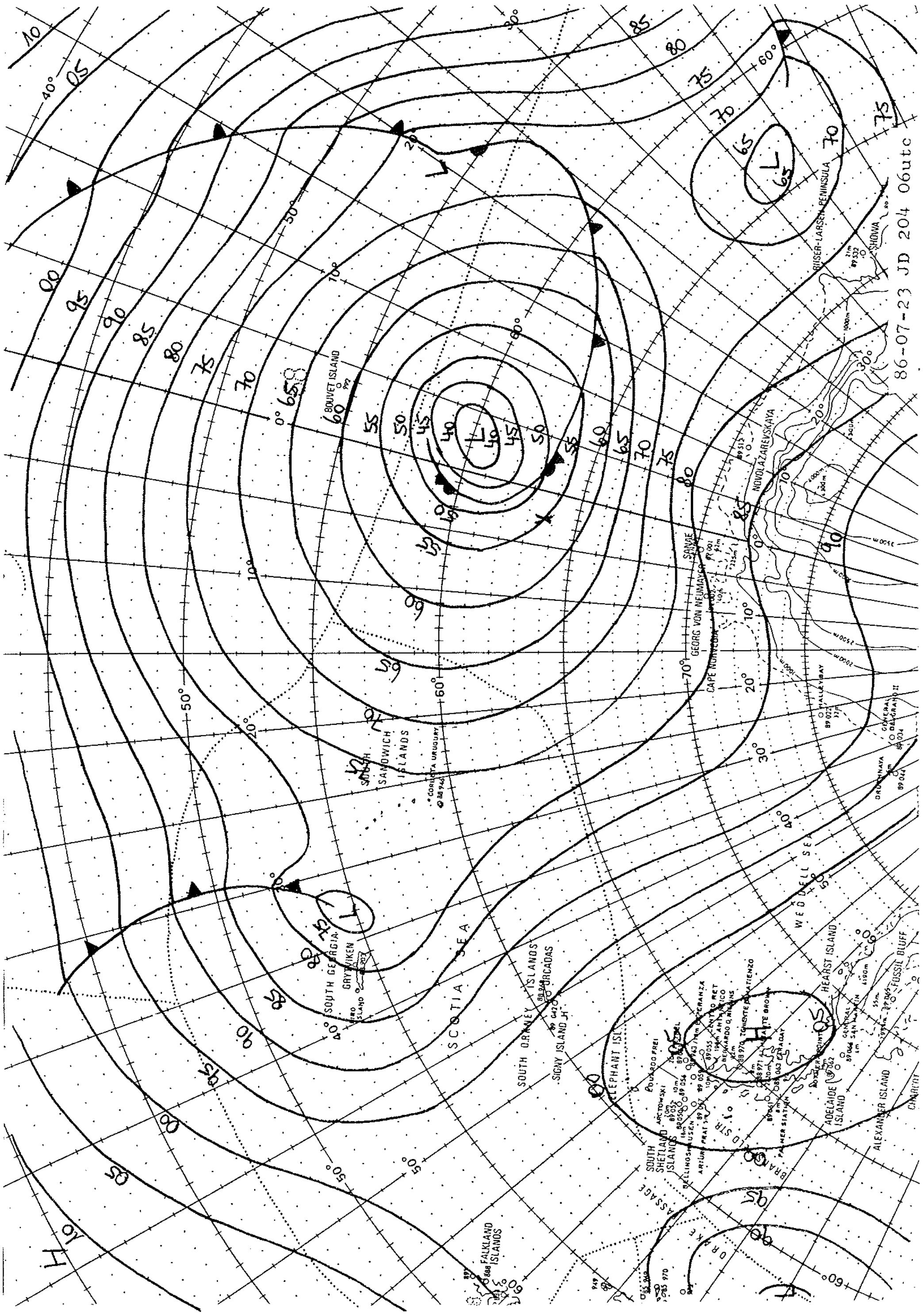
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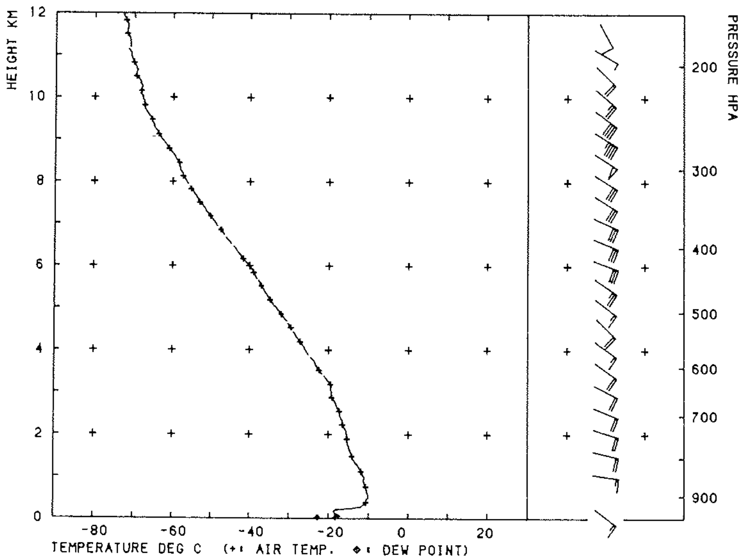
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
FALKLAND ISLANDS
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
HALLEY BAY
NOVOLAZAREVSKAYA
RISER-LARSEN PENINSULA
SHOWA

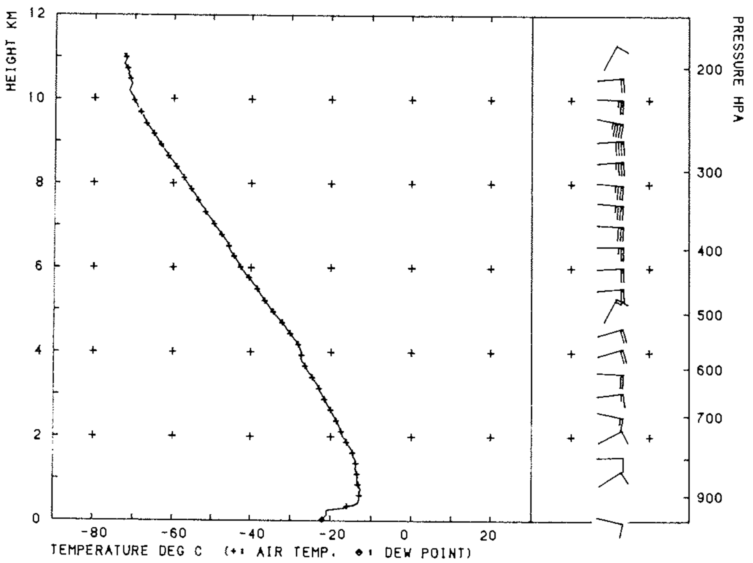
24. JULI 1986

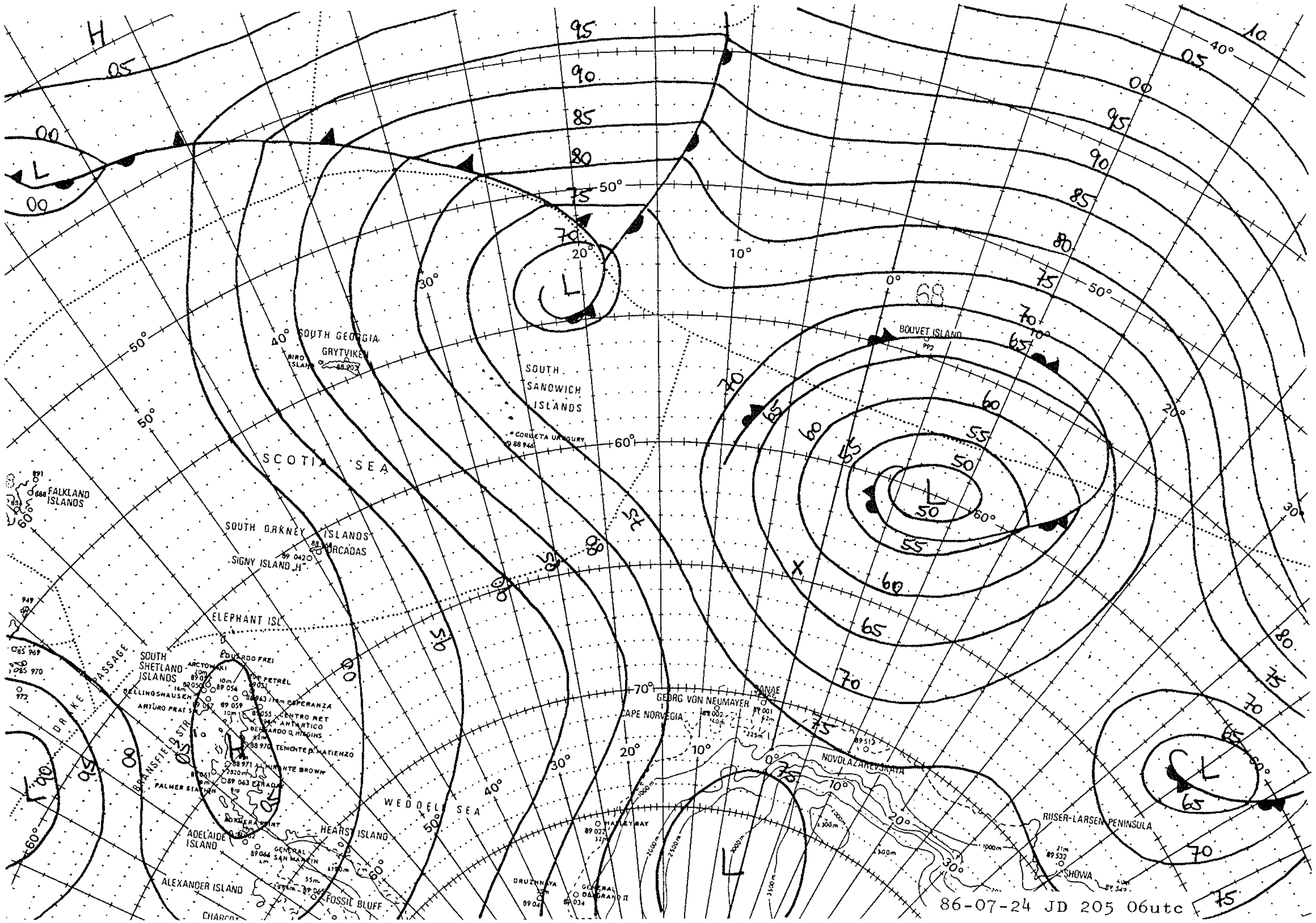
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	64.3S	1.8W	960.9	130	21	-14.6	-15.1	-1.9	9		/				4.00	02	/	/
6	64.5S	1.7W	962.8	130	22	-17.1	-17.9	-1.9	1	1	4	8	0	0	10.00	02	1	1
9	64.7S	2.0W	965.1	130	18	-18.3	-21.8	-1.9	0		9				20.00	02	1	1
12	64.7S	2.0W	967.0	120	16	-18.4	-20.6	-1.9	0		9				20.00	02	1	1
15	64.7S	2.2W	968.2	120	15	-19.8	-20.7	-1.9	0		9				20.00	02	1	1
18	64.8S	2.1W	970.1	110	12	-20.3	-23.4	-1.9	0		9				20.00	02	1	1

POLARSTERN 53 64.65S 2.00W 24/ 7/86 10:48



POLARSTERN 55 65.13S 2.03W 24/ 7/86 23:17

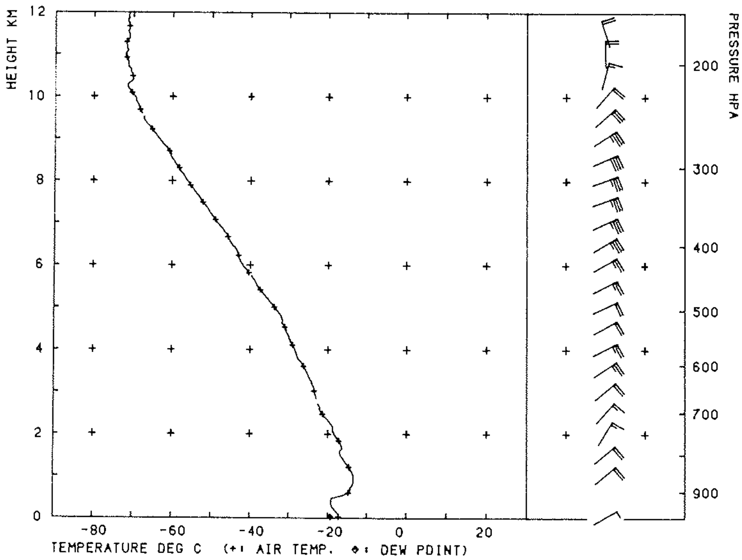



SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HEARST ISLAND
WEDDELL SEA
HALLEY BAY
BOUVET ISLAND
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-07-24 JD 205 06utc

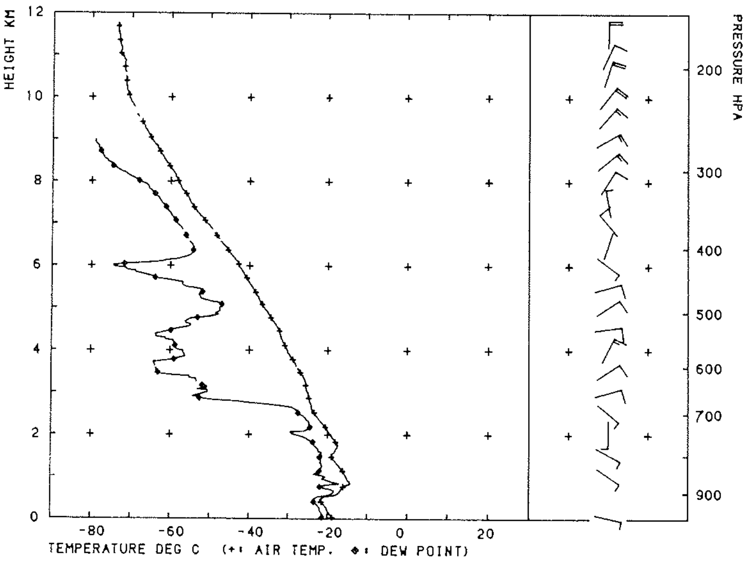
25.JULI 1986

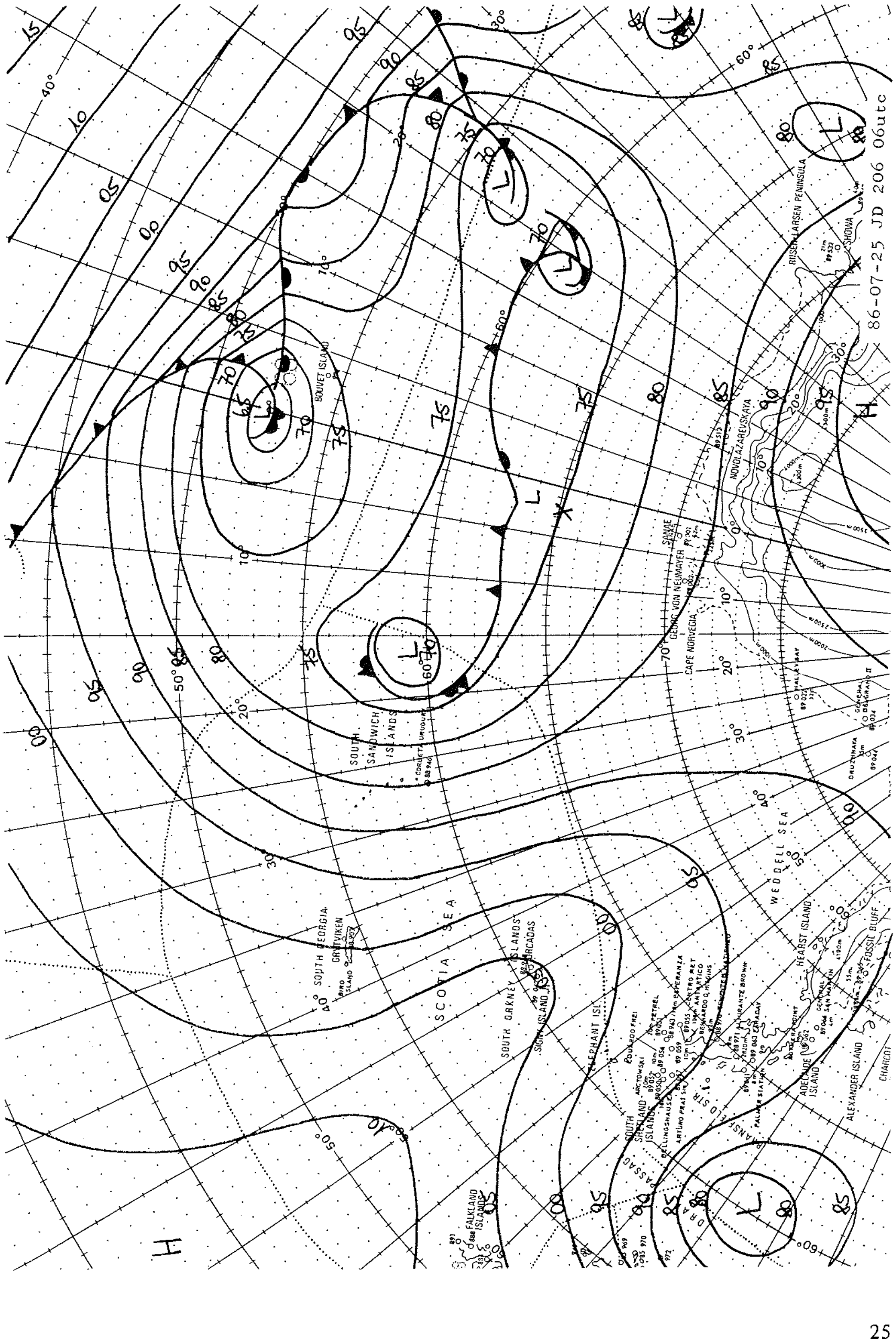
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.2S	2.1W	975.1	80	9	-20.5	-21.6	-1.9	9		/				10.00	02	/	/
6	65.2S	2.1W	975.3	80	7	-18.4	-20.4	-1.9	9		/				10.00	70	7	1
9	65.3S	2.4W	976.2	70	8	-17.7	-19.7	-1.9	8	8	1	6	/	/	2.00	71	7	2
12	65.5S	2.7W	977.0	60	10	-17.2	-19.1	-1.9	8	8	2	6	/	/	4.00	02	7	2
15	65.6S	3.0W	977.0	100	5	-17.3	-19.3	-1.9	8	8	1	6	/	/	2.00	70	7	2
18	65.6S	3.1W	976.9	80	6	-16.9	-19.7	-1.9	9		/				10.00	02	7	2

POLARSTERN 57 65.40S 2.60W 25/ 7/86 10:52



POLARSTERN 59 65.90S 3.60W 25/ 7/86 23: 1

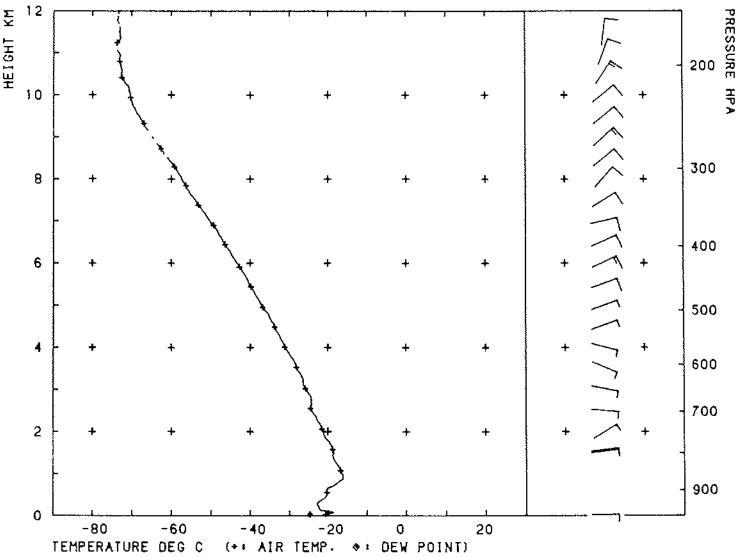


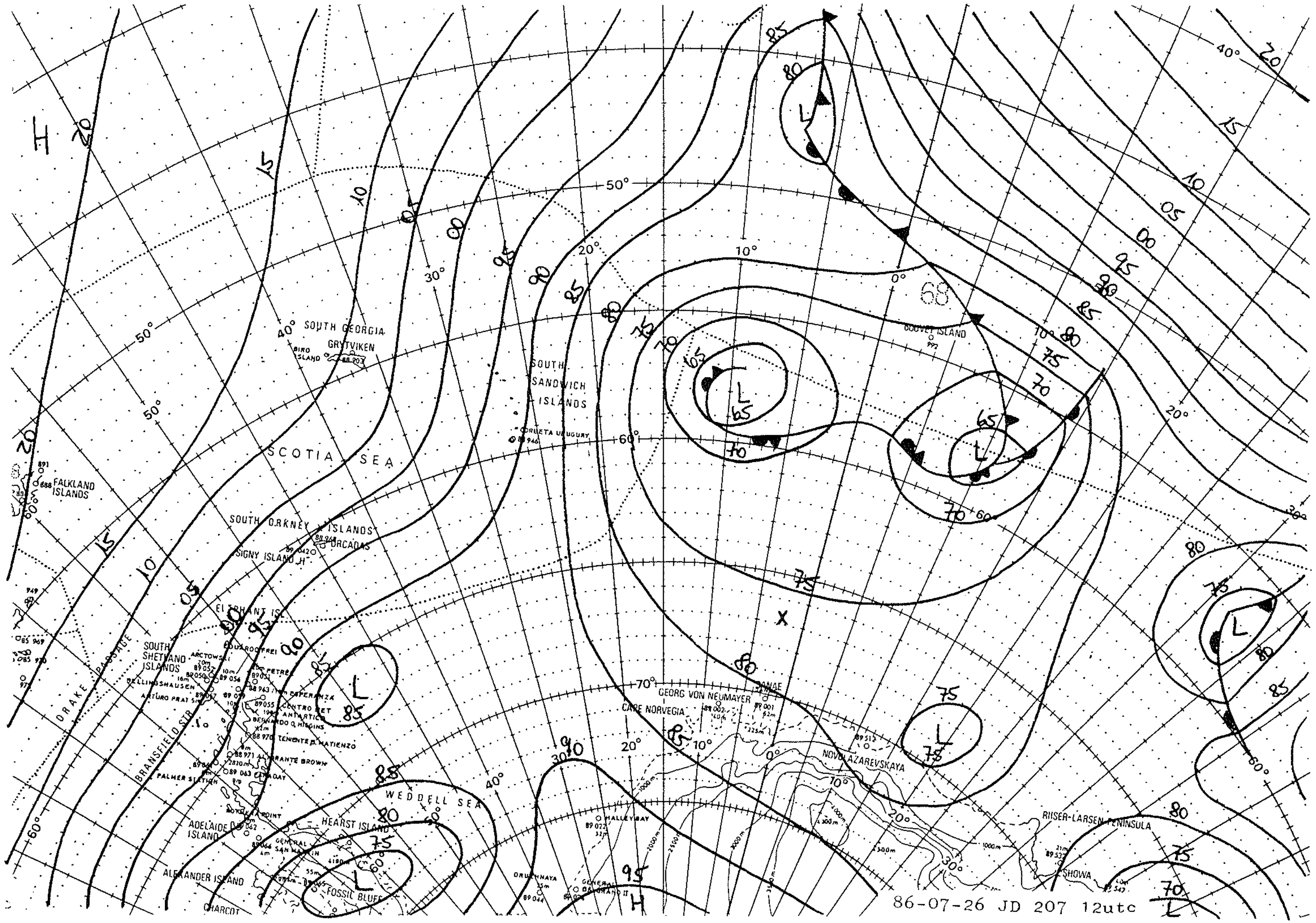

86-07-25 JD 206 06utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
FALKLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
RIISER-LARSEN PENINSULA
SHOWA
NOVOLAZAREVSKAYA
SANAE
GEORG VON NEUMAYER
CAPE NORVEGIA
HALLEY BAY
DRUZHNAYA
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE

26. JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	66.2S	3.0W	977.2	990	3	-20.0	-22.3	-1.9	9		/				10.00	02	7	2
6	66.3S	2.7W	977.0	990	2	-21.3	-23.7	-1.9	9		/				10.00	02	7	2
9	66.4S	2.5W	976.3	990	2	-20.5	-23.4	-1.9	8	8	3	6	/	/	20.00	02	7	2
12	66.6S	2.1W	976.1	130	4	-21.3	-23.4	-1.9	8	8	2	6	/	/	10.00	02	7	2
15	66.7S	2.1W	975.8	140	5	-21.2	-25.3	-1.6	8	8	1	6	/	/	4.00	02	7	2
18	66.7S	2.1W	975.3	150	5	-22.6	-25.1	-1.9	8	8	2	6	/	/	4.00	02	7	2

POLARSTERN 61 66.60S 2.10W 26/ 7/86 11: 8

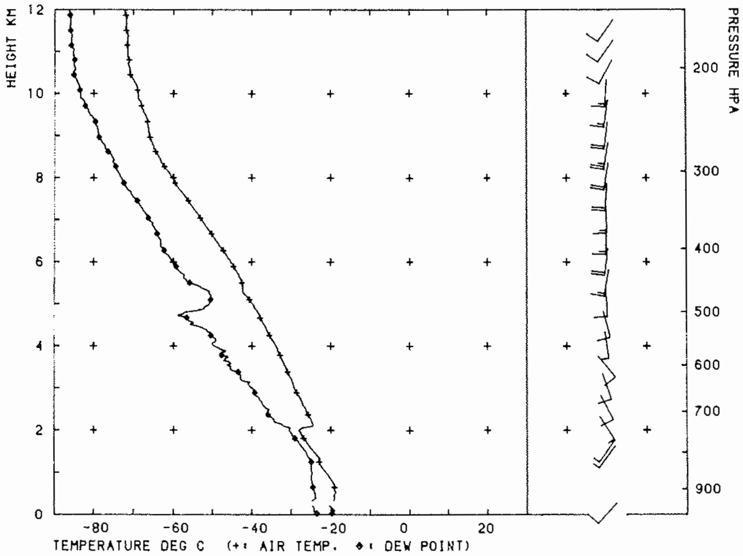



SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT IS.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
ARTURO PRAT
BELLINGSHAUSEN
PALMER STATION
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
BOUVET ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
HALLEY BAY
RIISER-LARSEN PENINSULA
SHOWA
86-07-26 JD 207 12utc

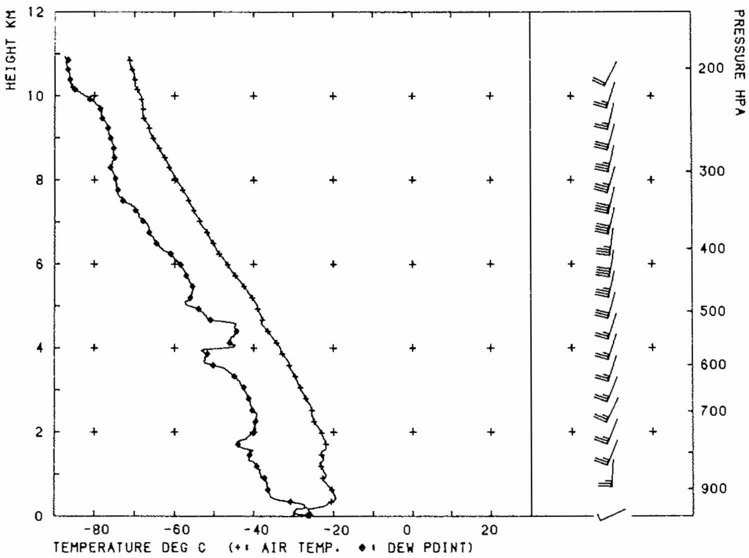
27.JULI 1986

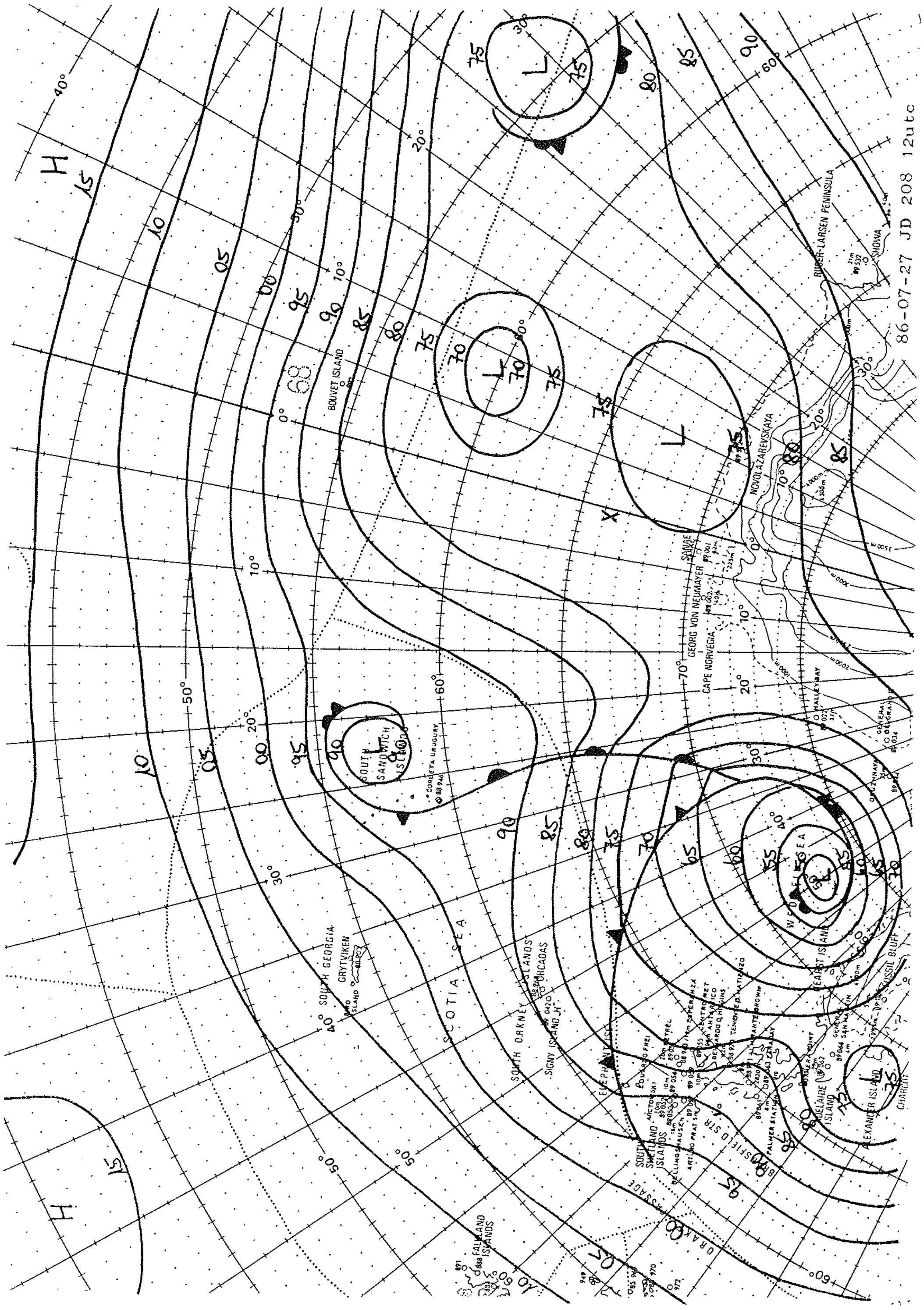
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	66.5S	1.6W	974.2	220	10	-20.0	-23.9	-1.9	9		/				2.00	70	2	2
6	66.3S	1.0W	974.0	300	15	-19.4	-23.1	-1.9	9		/				4.00	70	7	2
9	66.3S	1.1W	975.0	170	6	-19.5	-23.2	-1.9	8	8	2	6	/	/	4.00	70	7	2
12	66.2S	.7W	976.0	220	10	-19.6	-22.3	-1.9	8	8	3	6	/	/	10.00	02	7	2
15	66.0S	.3W	977.0	210	8	-21.4	-24.6	-1.9	8	8	4	8	/	/	10.00	02	7	2
18	65.9S	.2W	979.0	220	10	-24.5	-28.4	-1.7	0		9				10.00	02	7	1

POLARSTERN 65 66.25S 0.90W 27/ 7/86 11: 5



POLARSTERN 67 65.65S 0.73E 27/ 7/86 23: 3

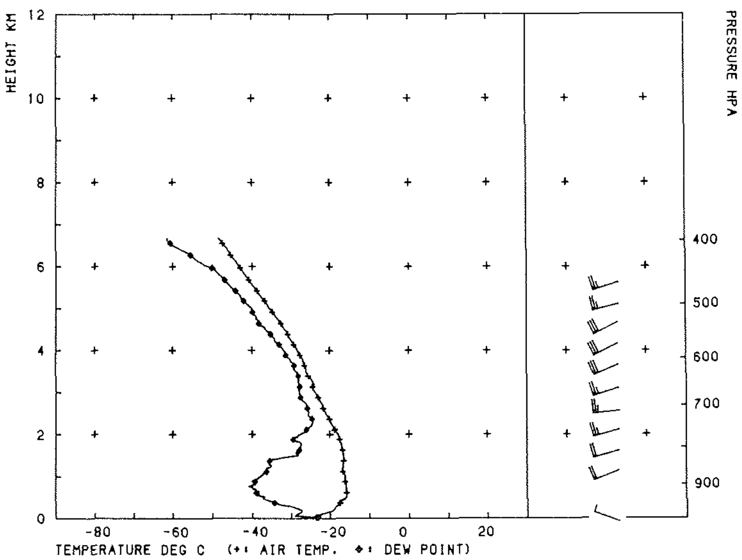


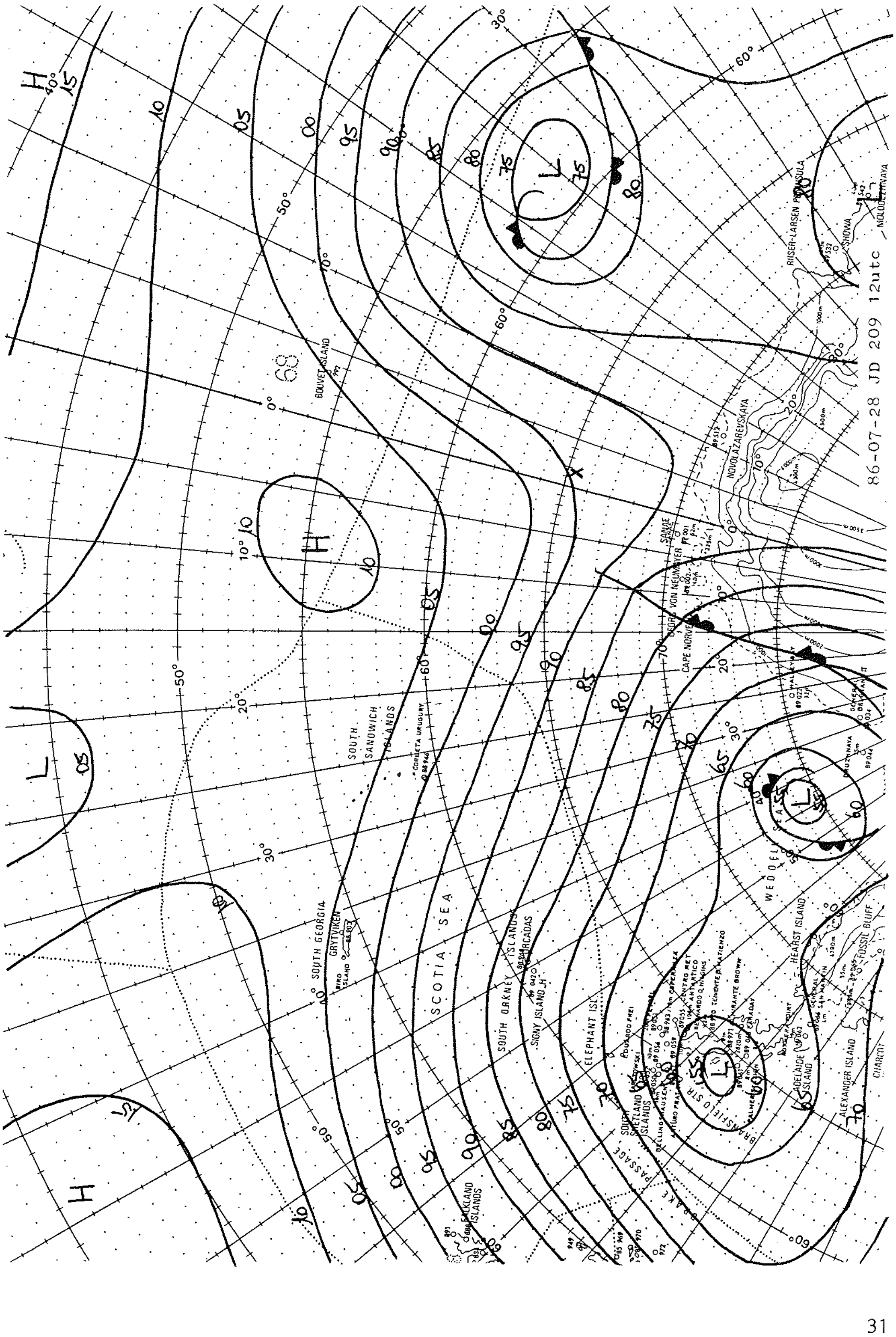

86-07-27 JD 208 12utc
SCOTIA SEA
SOUTH GEORGIA
BOUVET ISLAND
SOUTH ORKNEY ISLANDS
SOUTH SANDWICH ISLANDS
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
NOVOLAZAREVSKAYA
GEORG VON NEUMAYER
CAPE NORVEGIA
BUDER-LARSEN PENINSULA
SHOWA
HALLEY BAY
ALEXANDER ISLAND
ADELAIDE ISLAND
ELEPHANT ISLAND
SIGNY ISLAND
GRYTVIKEN

28.JULI 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.5S	1.2E	985.2	240	12	-26.0	-30.0	-1.9	9		/				10.00	02	/	/
6	65.4S	1.5E	987.2	240	14	-25.8	-30.7	-1.8	9		/				10.00	02	7	2
9	65.3S	1.6E	990.0	230	13	-26.4	-30.5	-1.8	0		9				20.00	02	1	1
12	65.3S	1.7E	992.1	220	14	-25.8	-29.0	-1.8	6	6	3	6	/	/	4.00	70	1	1
15	65.3S	1.7E	996.0	230	14	-25.8	-28.9	-1.9	4	3	3	6	0	2	20.00	02	7	1
18	65.3S	1.8E	999.1	240	12	-25.2	-29.1	-1.8	9		/				10.00	02	7	1

POLARSTERN 71 65.33S 1.81E 28/ 7/86 23: 2

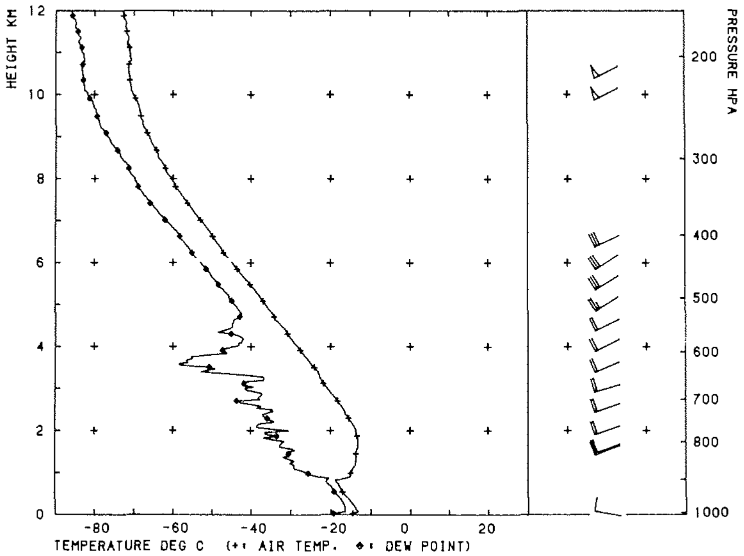



86-07-28 JD 209 12utc
SCOTIA SEA
SOUTH GEORGIA
SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
BOUVET ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HEARST ISLAND
WEDDELL
CAPE NORVEGIA
SANAE
GEORG VON NEUMAYER
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SIGNY ISLAND
GRYTVIKEN

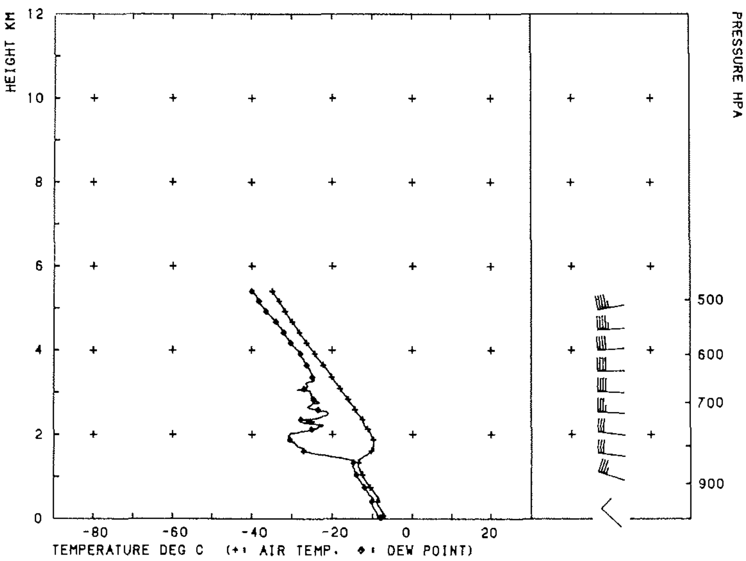
29. JULI 1986

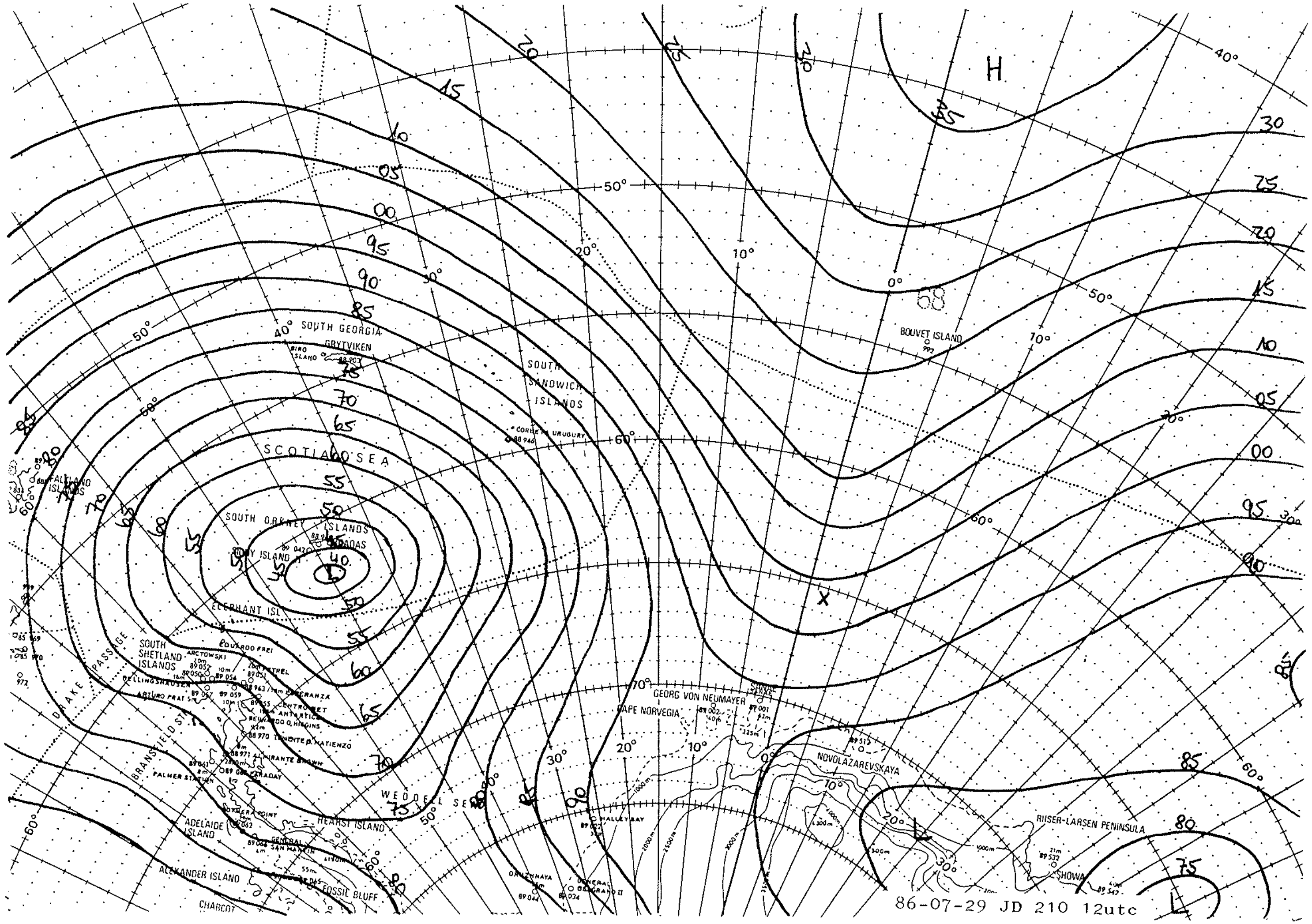
TIME	POSITION		PRESS.	WIND		TEMPERATURE			CLOUDS						VIS	WEATHER		
UTC h	φ	λ	hPa	deg	kts	AIR °C	DEW PT. °C	WATER °C	N	N_h	h	C_L	C_M	C_H	km	ww	W_1	W_2
3	65.3S	1.9E	1003.0	270	14	-20.2	-25.0	-1.8	9		/				10.00	02	/	/
6	65.3S	1.9E	1004.0	270	15	-17.8	-21.9	-1.9	9		/				10.00	02	2	2
9	65.3S	2.0E	1005.0	280	8	-15.8	-19.5	-1.9	8	8	2	6	/	/	10.00	02	2	2
12	65.3S	2.0E	1005.0	280	10	-13.5	-17.8	-1.9	8	8	3	6	/	/	10.00	02	2	2
15	65.3S	2.1E	1005.2	280	12	-12.7	-16.2	-1.9	8	8	3	8	/	/	10.00	70	7	2
18	65.3S	2.1E	1005.0	290	14	-11.2	-14.4	-1.9	8	8	3	6	/	/	4.00	02	7	2

POLARSTERN 73   65.30S 2.00E   29/ 7/86 10:42



POLARSTERN 75   65.33S 2.26E   29/ 7/86 23:11

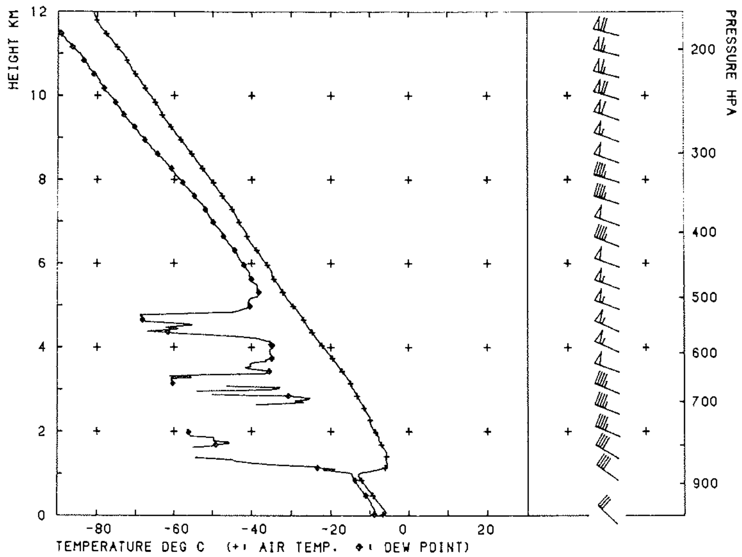



H
L
SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD ST.
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
WEDDELL SEA
HEARST ISLAND
HALLEY BAY
GEORG VON NEUMAYER
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-07-29 JD 210 12utc

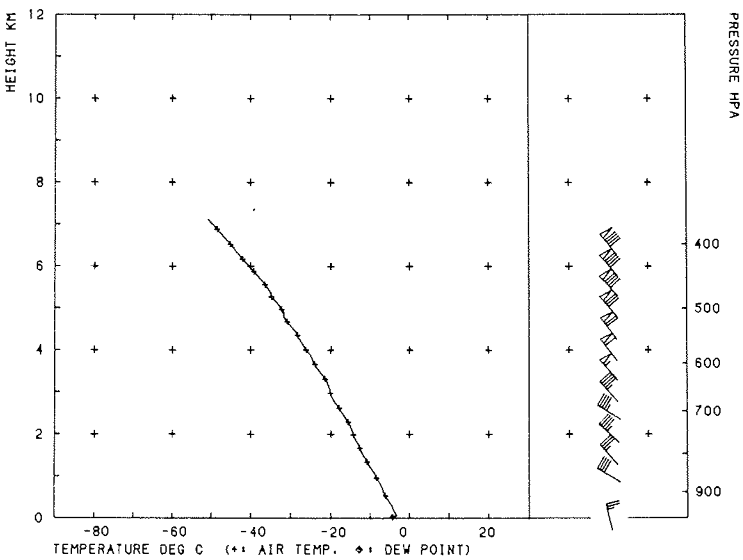
30. JULI 1985

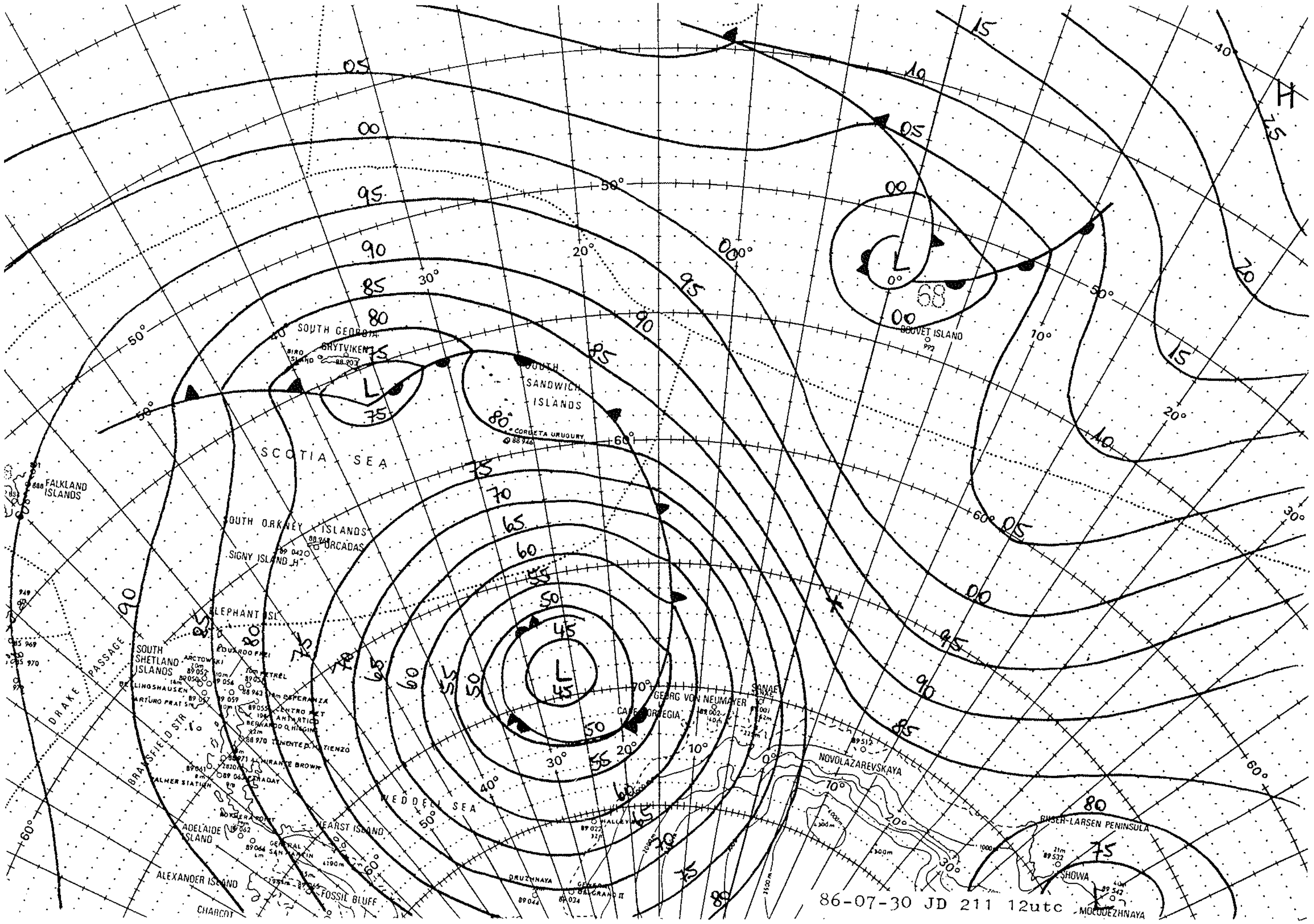
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	65.3S	2.4E	999.0	320	16	-7.9	-8.2	-1.9	9 /	4.00	02 / /
6	65.3S	2.4E	996.3	320	15	-7.2	-9.5	-1.9	9 /	4.00	02 2 2
9	65.4S	2.5E	993.9	310	20	-6.5	-8.7	-1.9	3 8 3 8 / /	10.00	02 7 2
12	65.4S	2.6E	991.2	320	33	-7.4	-9.8	-1.9	3 8 2 8 / /	10.00	02 7 2
15	65.4S	2.7E	987.0	340	31	-7.0	-9.7	-1.9	8 8 3 6 / /	10.00	02 7 2
18	65.5S	2.8E	983.0	350	30	-6.3	-8.5	-1.9	9 /	10.00	02 7 2

POLARSTERN 77 65.40S 2.60E 30/ 7/86 10:25



POLARSTERN 79 65.55S 2.89E 31/ 7/86 0: 7



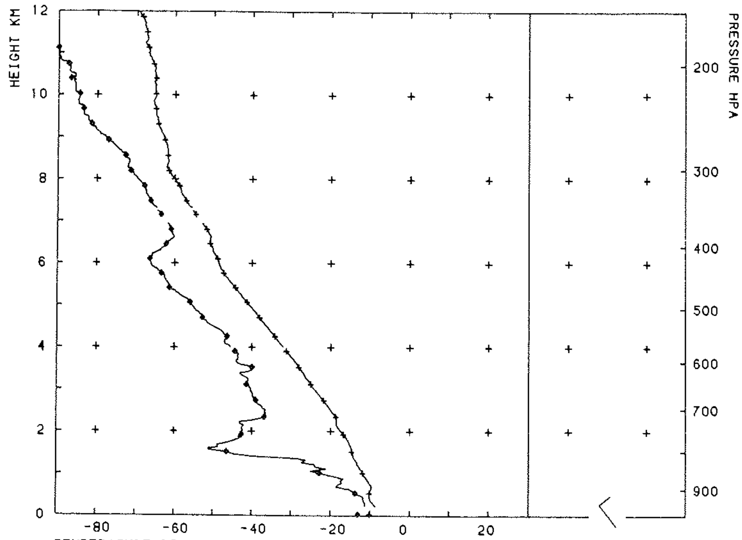


SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
CORBETA URUGUAY
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
ARCTOWSKI
BELLINGSHAUSEN
ARTURO PRAT
ESPERANZA
DRAKE PASSAGE
BRANSFIELD STR.
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
HEARST ISLAND
WEDDELL SEA
HALLEY
DRUZHNAYA
GENERAL BELGRANO II
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
BOUVET ISLAND
RIISER-LARSEN PENINSULA
SHOWA
MOLODEZHNAYA
86-07-30 JD 211 12utc

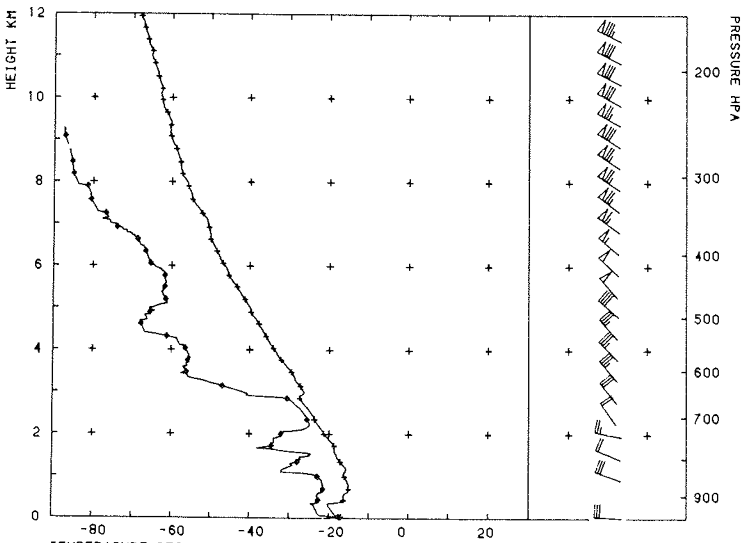
31.JULI 1986

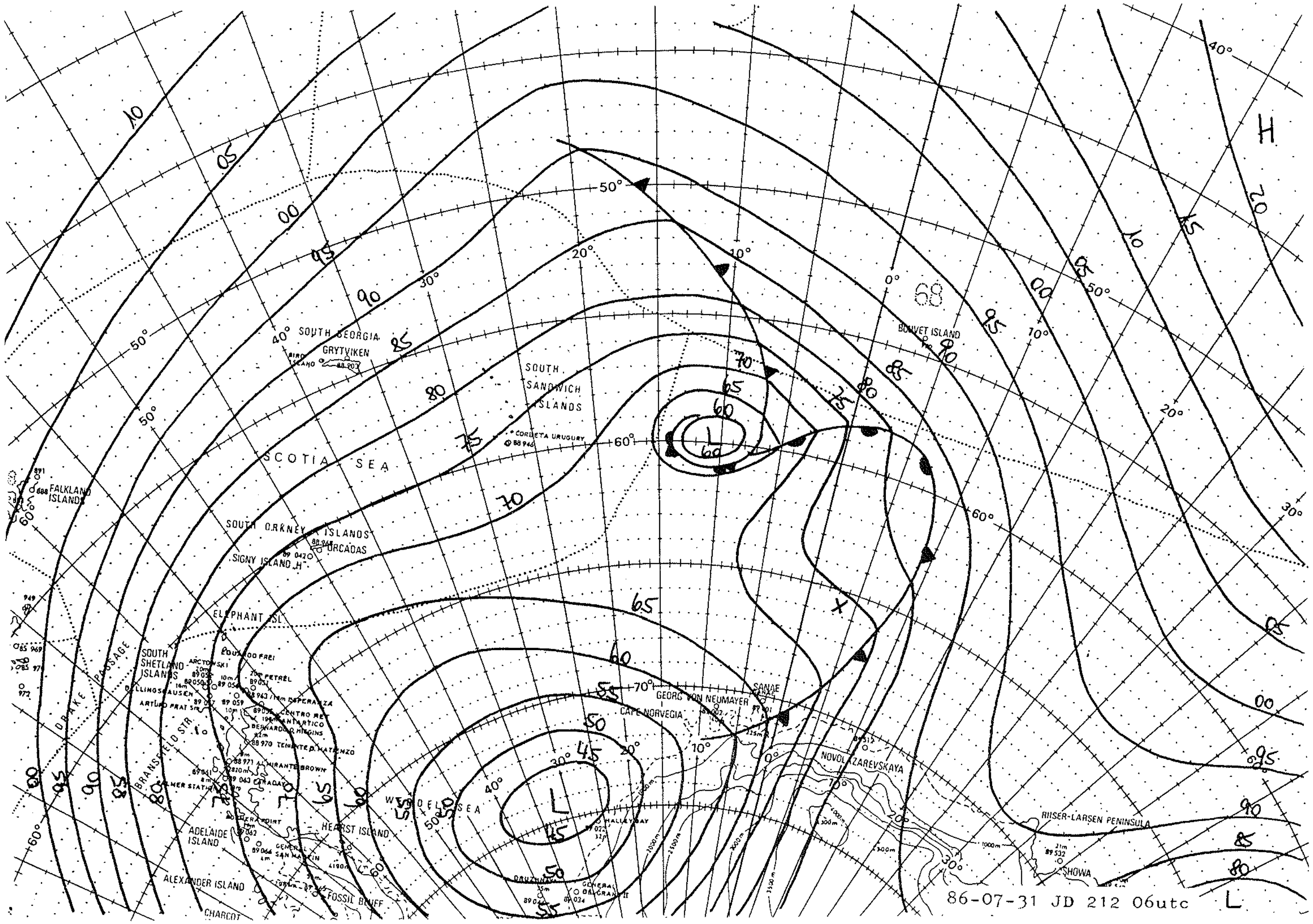
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.6S	3.0E	975.0	280	19	-4.7	-6.9	-1.9	9		/				10.00	02	/	/
6	65.6S	3.0E	975.9	300	13	-9.8	-11.6	-1.9	0		9				10.00	02	1	1
9	65.6S	3.0E	976.2	330	10	-11.2	-13.9	-1.9	7	7	5	8	0	0	10.00	02	1	1
12	65.6S	3.0E	976.0	330	11	-10.9	-14.0	-1.9	7	5	4	8	3	0	20.00	02	1	1
15	65.6S	3.0E	973.3	20	11	-13.1	-16.2	-1.9	7	7	5	8	0	0	20.00	02	2	2
18	65.6S	3.0E	969.1	40	13	-12.4	-14.8	-1.9	9		/				10.00	02	2	2

POLARSTERN 81 65.58S 3.00E 31/ 7/86 10:43



POLARSTERN 83 65.63S 2.98E 31/ 7/86 23:47

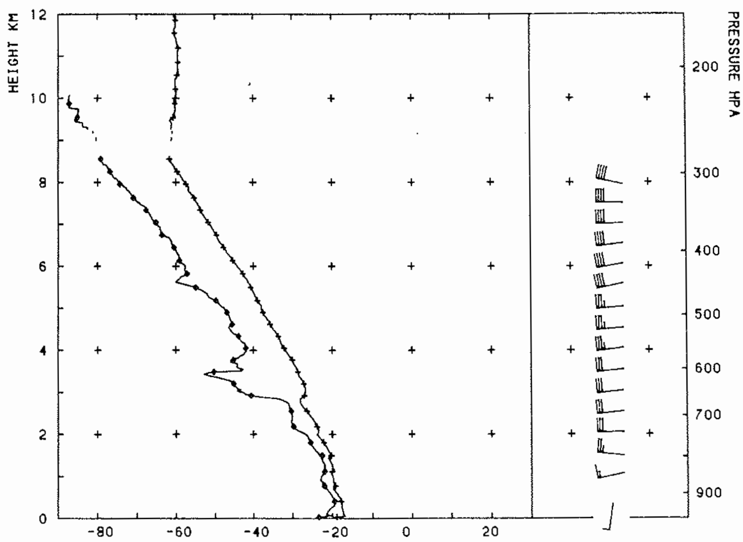



86-07-31 JD 212 06utc
SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
CORBETA URUGUAY
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT IS.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
ARCTOWSKI
BELLINGSHAUSEN
ARTURO PRAT
ESPERANZA
CENTRO MET ANTARTICO
BERNARDO O'HIGGINS
TENIENTE MATIENZO
ALMIRANTE BROWN
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
HEARST ISLAND
FOSSIL BLUFF
WEDDELL SEA
HALLEY BAY
DRUZHNAJA
GENERAL BELGRANO II
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
BOUVET ISLAND
RIISER-LARSEN PENINSULA
SHOWA
H
L

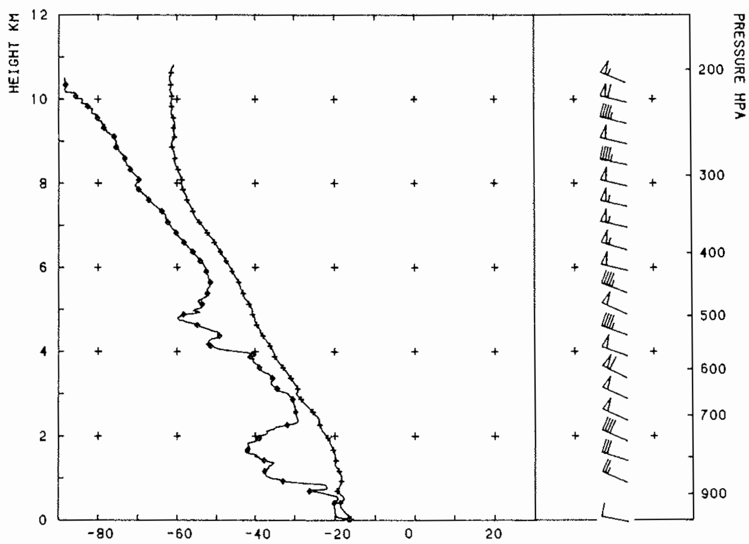
1.AUGUST 1986

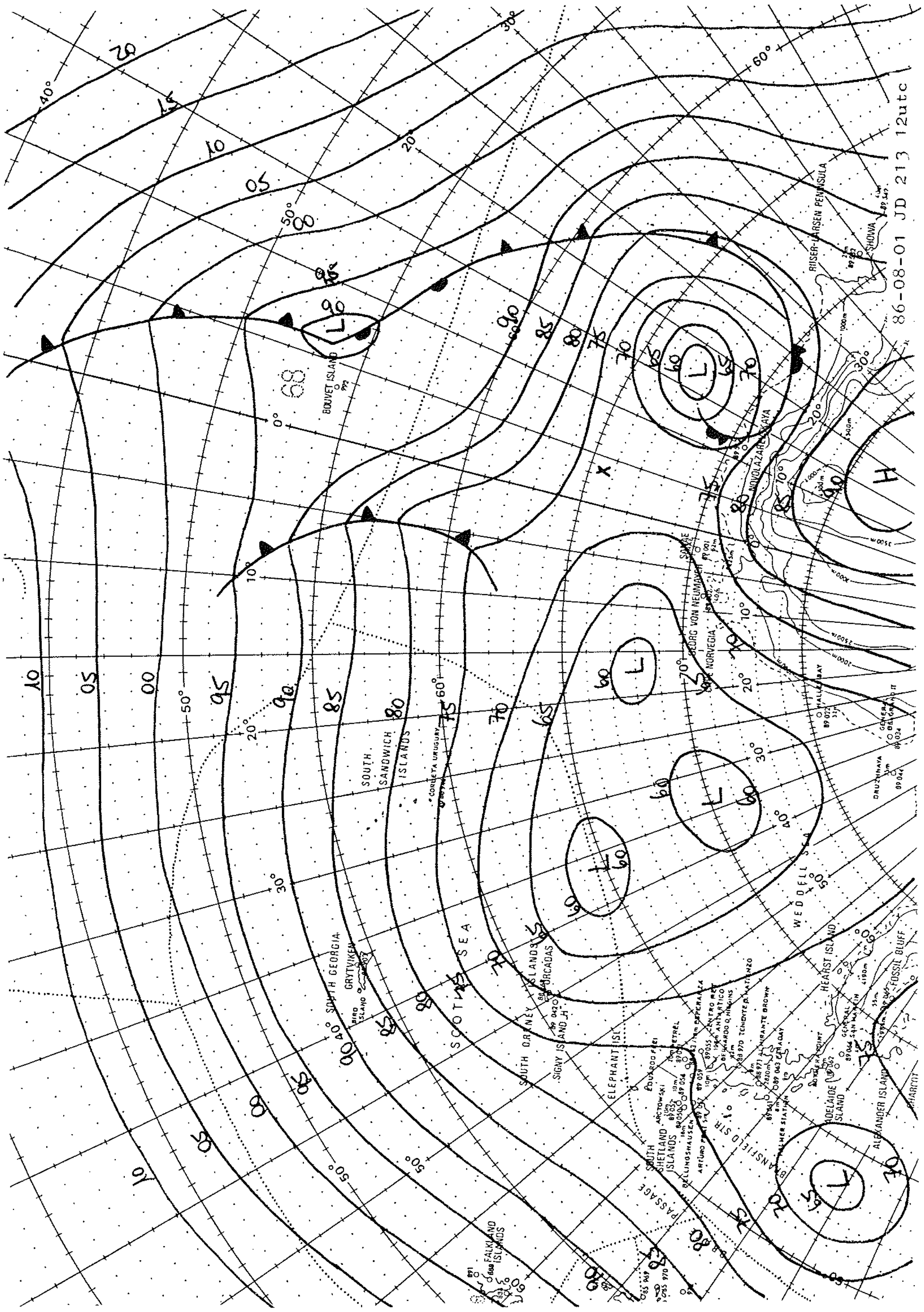
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	65.6S	3.2E	971.0	270	21	-21.9	-25.2	-1.9	9 /	4.00	02 7 2
6	65.6S	3.2E	972.2	300	10	-20.6	-24.6	-1.9	9 /	10.00	02 7 2
9	65.6S	3.2E	972.8	310	7	-19.5	-23.2	-1.9	8 8 4 6 / /	10.00	02 7 2
12	65.6S	3.3E	973.2	50	4	-18.6	-23.0	-1.9	7 7 4 8 0 0	10.00	02 7 2
15	65.6S	3.3E	975.2	280	4	-18.0	-23.0	-1.9	4 2 5 8 3 0	20.00	02 1 1
18	65.6S	3.3E	976.9	340	4	-17.3	-23.4	-1.9	9 /	20.00	02 1 1

POLARSTERN 85 65.60S 3.20E 1/ 8/86 10:59



POLARSTERN 87 65.52S 3.31E 1/ 8/86 23: 1

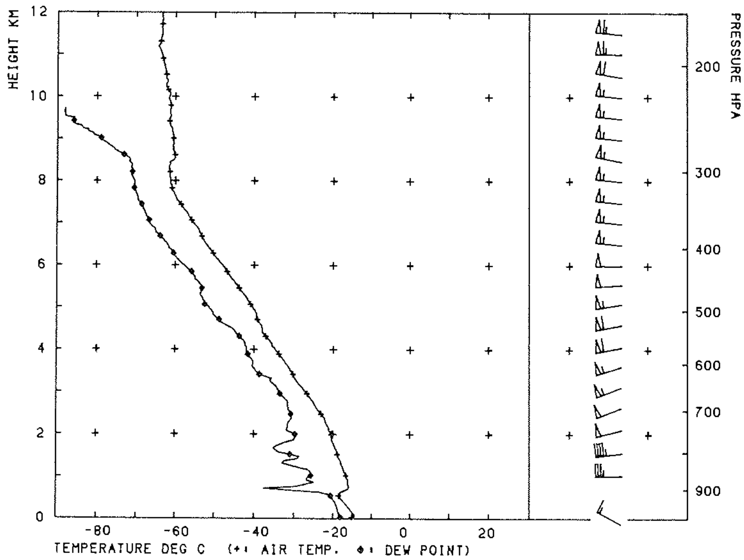



86-08-01 JD 213 12utc
RIISER-LARSEN PENINSULA
SHOWA
BOUVET ISLAND
NOVOLAZAREVSKAYA
SANAE
NORVEGIA
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
PASSAGE
FALKLAND ISLANDS
WEDDELL
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF

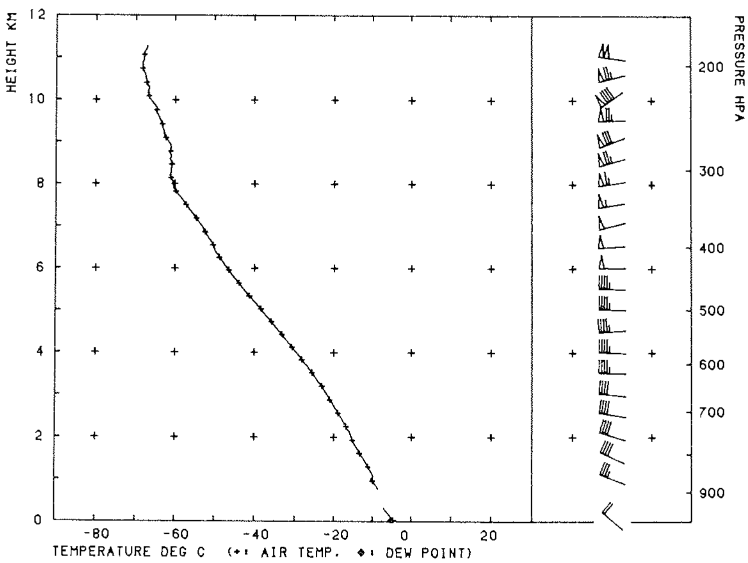
2. AUGUST 1986

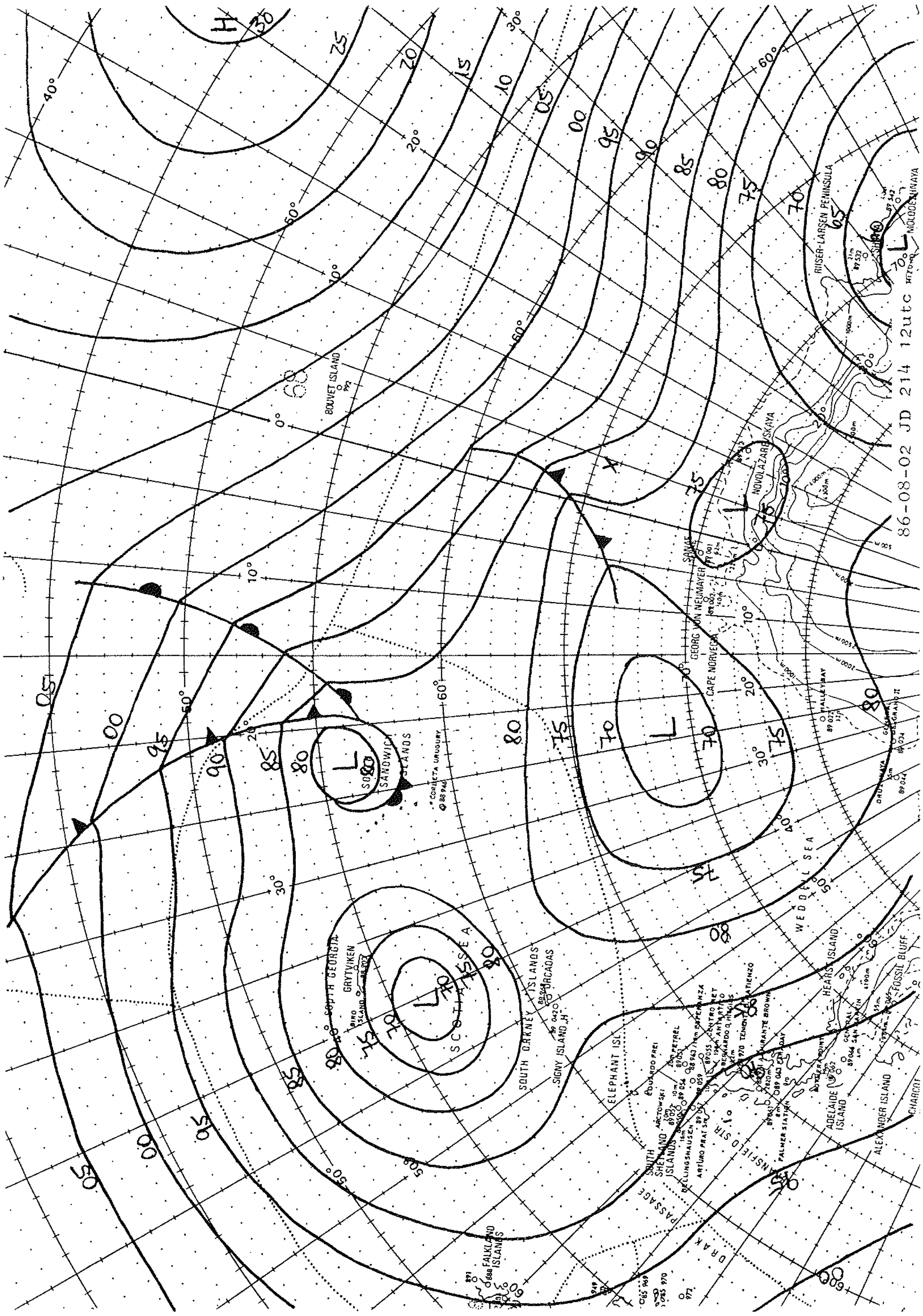
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.1S	3.8E	982.0	280	24	-20.5	-22.8	-1.9	9		/				4.00	02	7	2
6	65.0S	3.9E	984.0	270	21	-19.2	-22.1	-1.9	9		/				4.00	02	7	2
9	64.8S	4.2E	985.3	290	19	-17.2	-19.8	-1.9	8	8	3	6	/	/	4.00	02	7	2
12	64.5S	4.4E	986.2	300	15	-14.6	-18.6	-1.9	7	7	4	8	0	0	20.00	02	7	2
15	64.5S	4.4E	985.0	350	14	-14.4	-17.2	-1.9	8	8	5	6	/	/	10.00	02	2	2
18	64.4S	4.8E	983.0	310	23	-8.6	-10.8	-1.9	9		/				4.00	70	7	2

POLARSTERN 89 64.60S 4.35E 2/ 8/86 10:54



POLARSTERN 90 65.04S 4.95E 2/ 8/86 23: 0

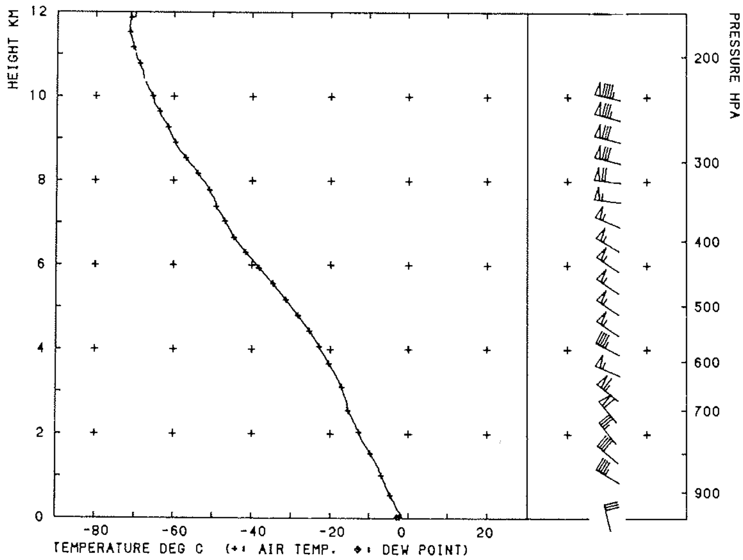



86-08-02 JD 214 12utc
BOUVET ISLAND
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
RIISER-LARSEN PENINSULA
MOLODEZHNAYA
NOVOLAZAREVSKAYA
SANAE
GEORG VON NEUMAYER
CAPE NORVEGIA
HALLEY BAY

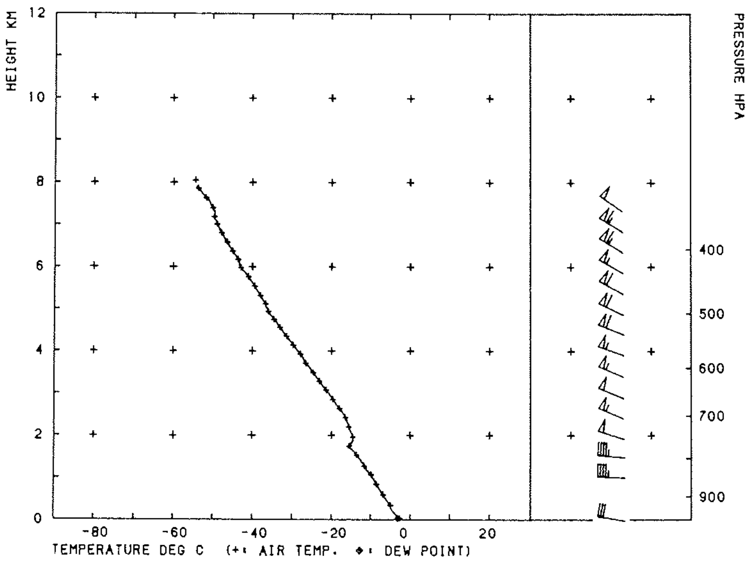
3.AUGUST 1986

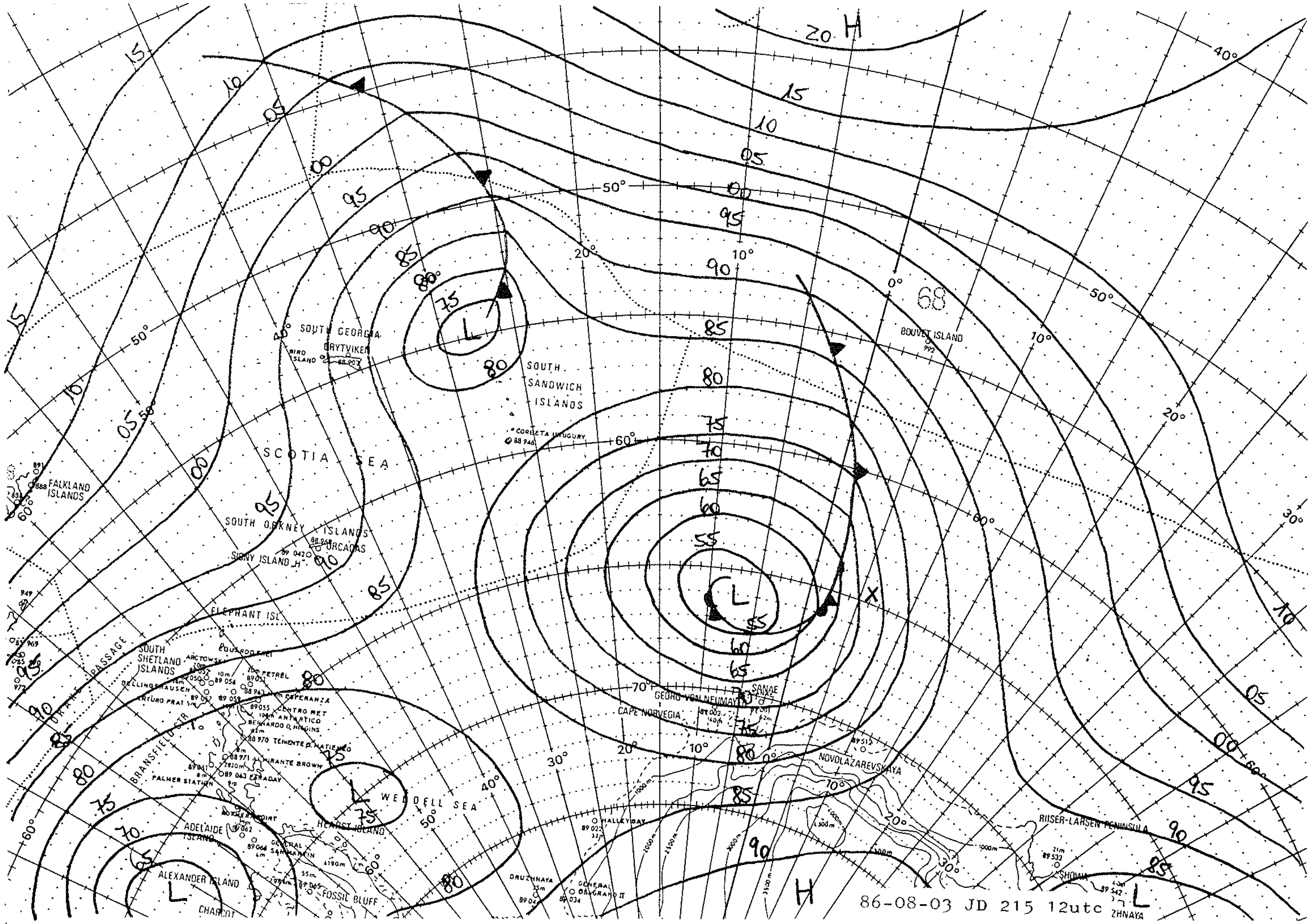
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N Nh h CL CM CH	VIS km	WEATHER ww W1 W2
3	64.1S	5.2E	983.2	320	20	-2.3	-4.6	-1.9	9 /	4.00	02 7 2
6	64.3S	5.6E	982.1	320	21	-2.1	-4.1	-1.9	9 /	4.00	71 7 2
9	64.3S	5.6E	982.1	320	21	-2.1	-4.1	-1.9	9 /	4.00	71 7 2
12	64.5S	6.0E	973.3	340	37	-2.1	-3.2	-1.9	8 8 2 6 / /	.50	73 7 2
15	64.6S	6.3E	968.3	340	37	-2.1	-3.2	-1.9	8 8 1 6 / /	.50	73 7 2
18	64.7S	6.6E	964.2	340	35	-1.9	-2.4	-1.9	8 8 2 6 / /	10.00	71 7 7

POLARSTERN 92 64.45S 6.05E 3/ 8/86 10:52



POLARSTERN 94 64.87S 7.05E 3/ 8/86 23: 5

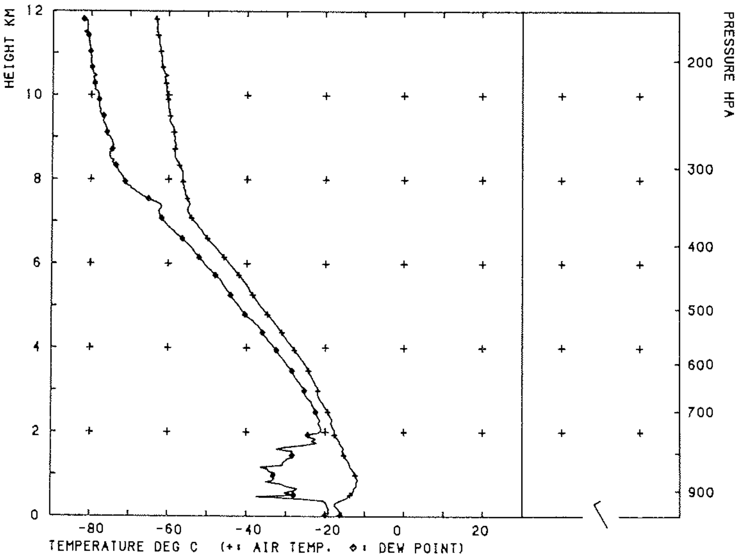



SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
BELLINGSHAUSEN
BRANSFIELD STR.
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FOSSIL BLUFF
HEARST ISLAND
WEDDELL SEA
HALLEY BAY
GENERAL BELGRANO II
DRUZHNAYA
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
68
86-08-03 JD 215 12utc

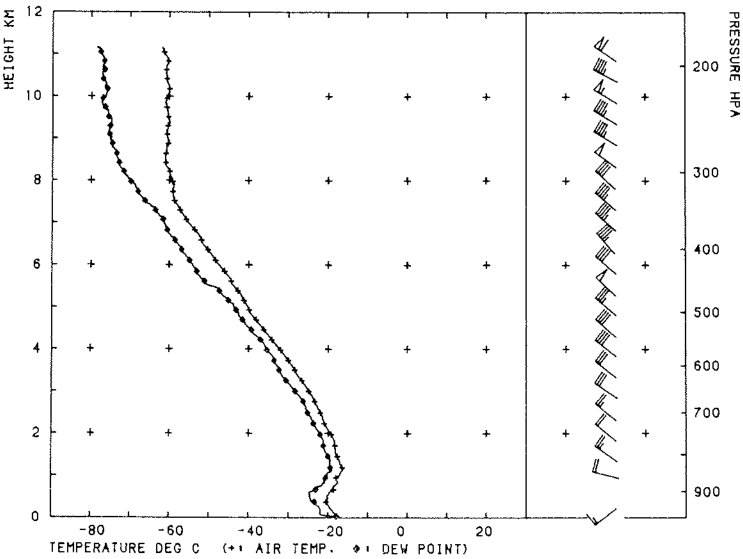
4. AUGUST 1986

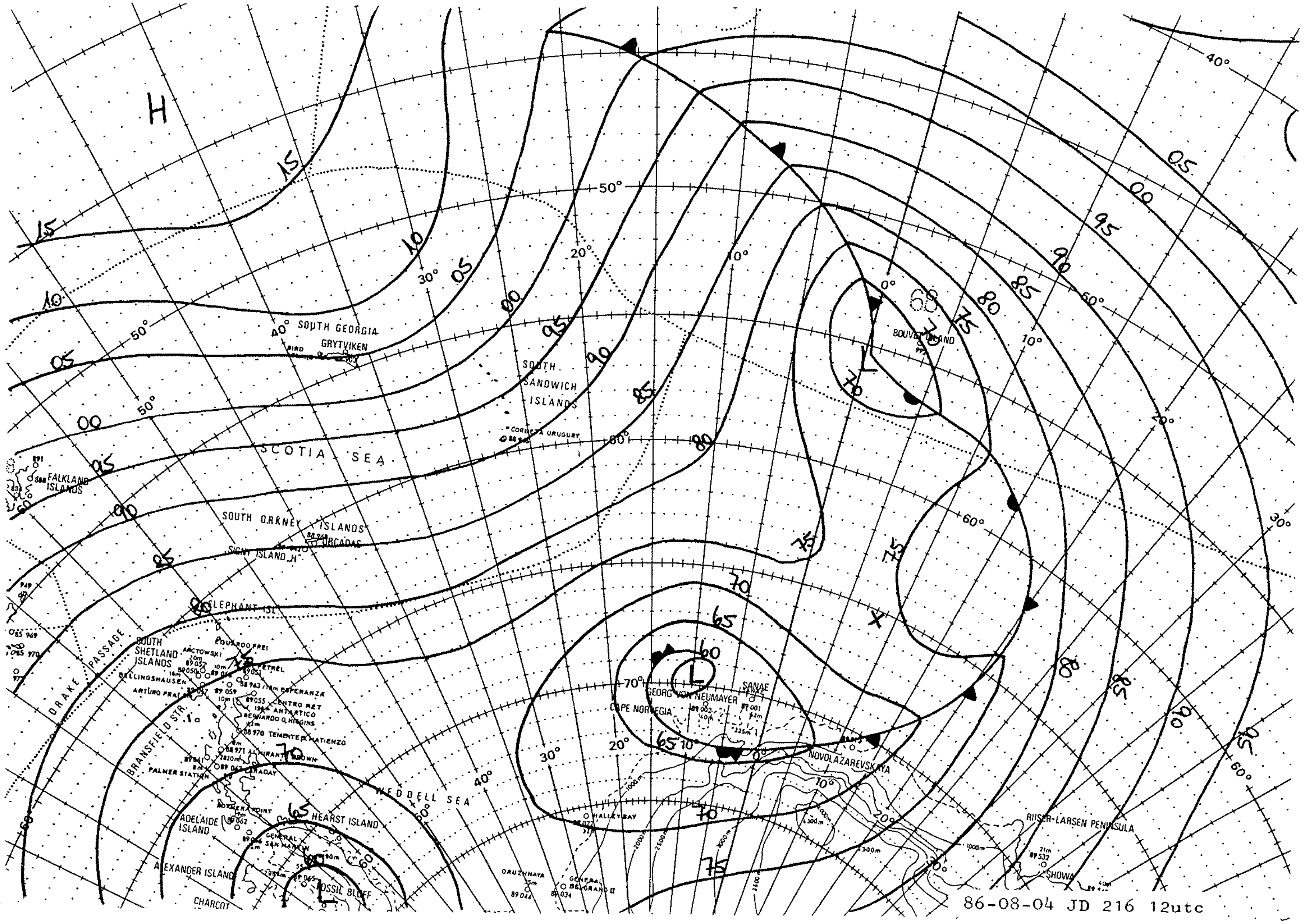
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.0S	7.3E	973.0	280	28	-15.0	-18.5	-1.9	9		/				4.00	02	7	2
6	65.2S	7.6E	975.9	280	20	-16.6	-19.8	-1.9	9		/				4.00	02	7	2
9	65.4S	7.9E	976.0	290	9	-16.5	-19.5	-1.9	7	7	3	8	/	/	20.00	02	7	2
12	65.3S	8.0E	974.9	990	1	-15.8	-19.6	-1.9	8	8	8	0	1	/	20.00	02	7	2
15	65.3S	8.0E	973.3	180	6	-16.5	-20.5	-1.9	5	3	9	8	1	0	20.00	01	7	2
18	65.3S	8.0E	974.1	190	7	-16.8	-20.4	-1.9	9		/				10.00	02	7	1

POLARSTERN 96 65.30S 8.00E 4/ 8/86 10:52



POLARSTERN 98 65.49S 7.69E 4/ 8/86 22:59



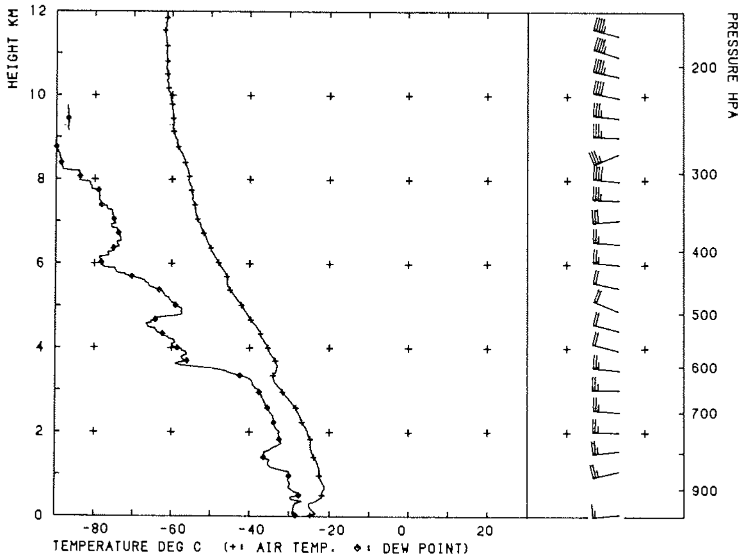


H
L
SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
DRAKE PASSAGE
SOUTH SHETLAND ISLANDS
BRANSFIELD STR.
ESPERANZA
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FOSSIL BLUFF
HEARST ISLAND
WEDDELL SEA
BOUVET ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO II
RIISER-LARSEN PENINSULA
SHOWA
86-08-04 JD 216 12utc

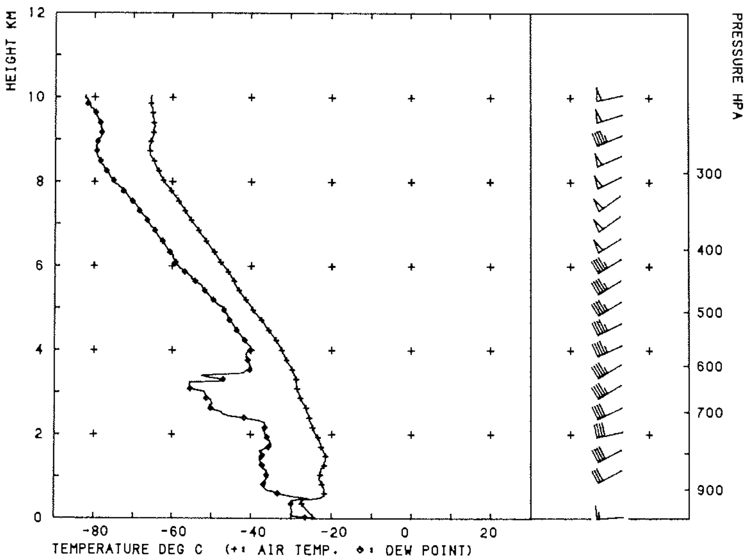
5.AUGUST 1986

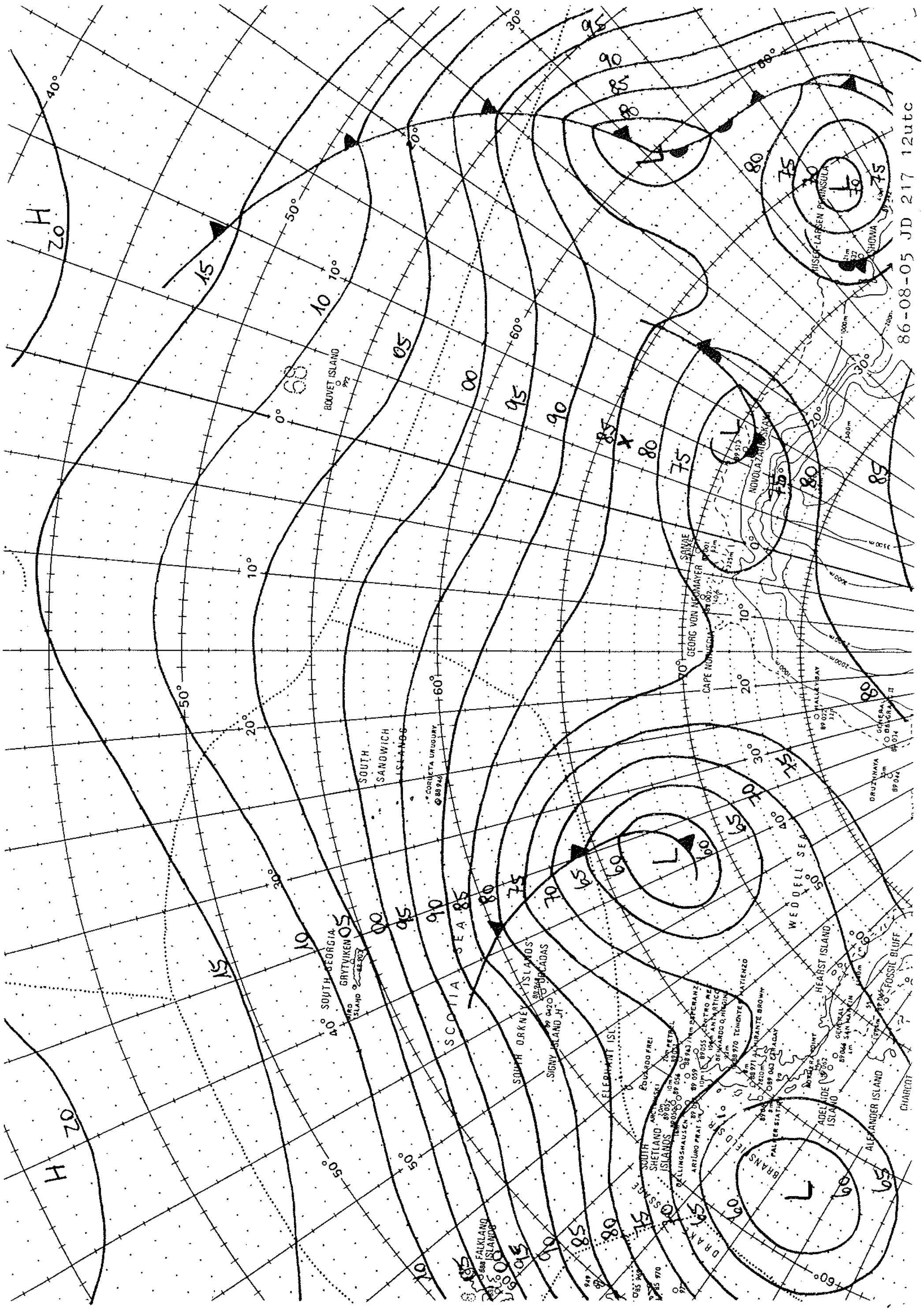
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	65.7S	7.2E	980.0	250	15	-22.0	-25.3	-1.9	9 /	10.00	02 / /
6	65.8S	7.0E	981.2	270	16	-24.7	-23.5	-1.9	9 /	10.00	02 7 /
9	65.9S	6.8E	982.8	260	21	-25.1	-29.0	-1.9	0 9	10.00	28 1 1
12	65.9S	6.6E	984.2	310	15	-24.7	-28.4	-1.9	0 9	20.00	02 4 1
15	66.1S	6.5E	986.0	270	19	-25.2	-29.1	-1.6	0 9	10.00	02 0 0
18	66.2S	6.2E	987.3	280	21	-26.1	-29.0	-1.8	9 /	10.00	02 7 1

POLARSTERN 100 65.90S 6.70E 5/ 8/86 10:52



POLARSTERN 102 66.21S 6.16E 5/ 8/86 23: 3



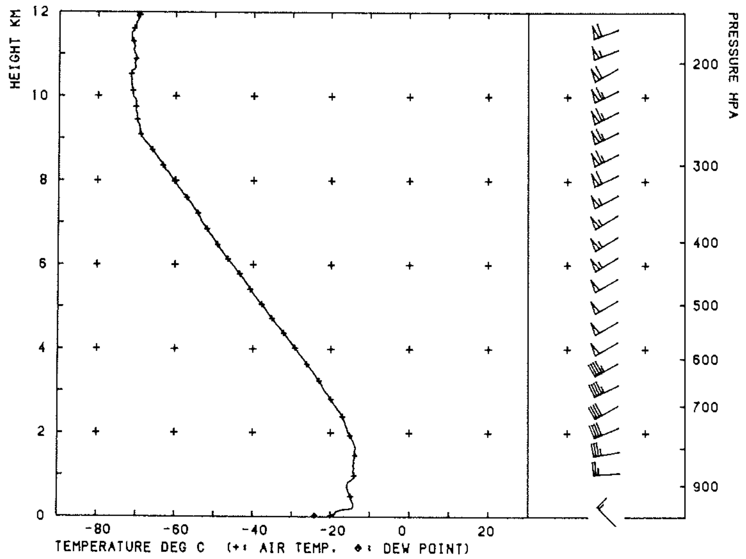


86-08-05 JD 217 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
SHOWA
CAPE NORVEGIA

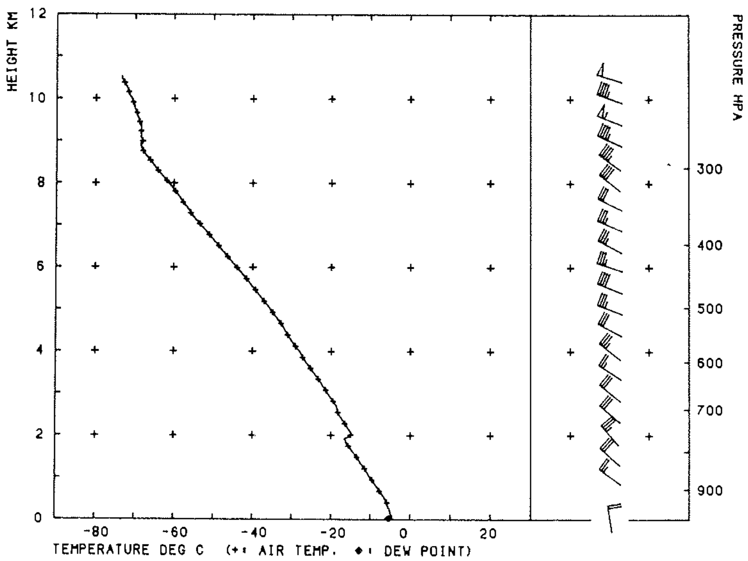
6. AUGUST 1986

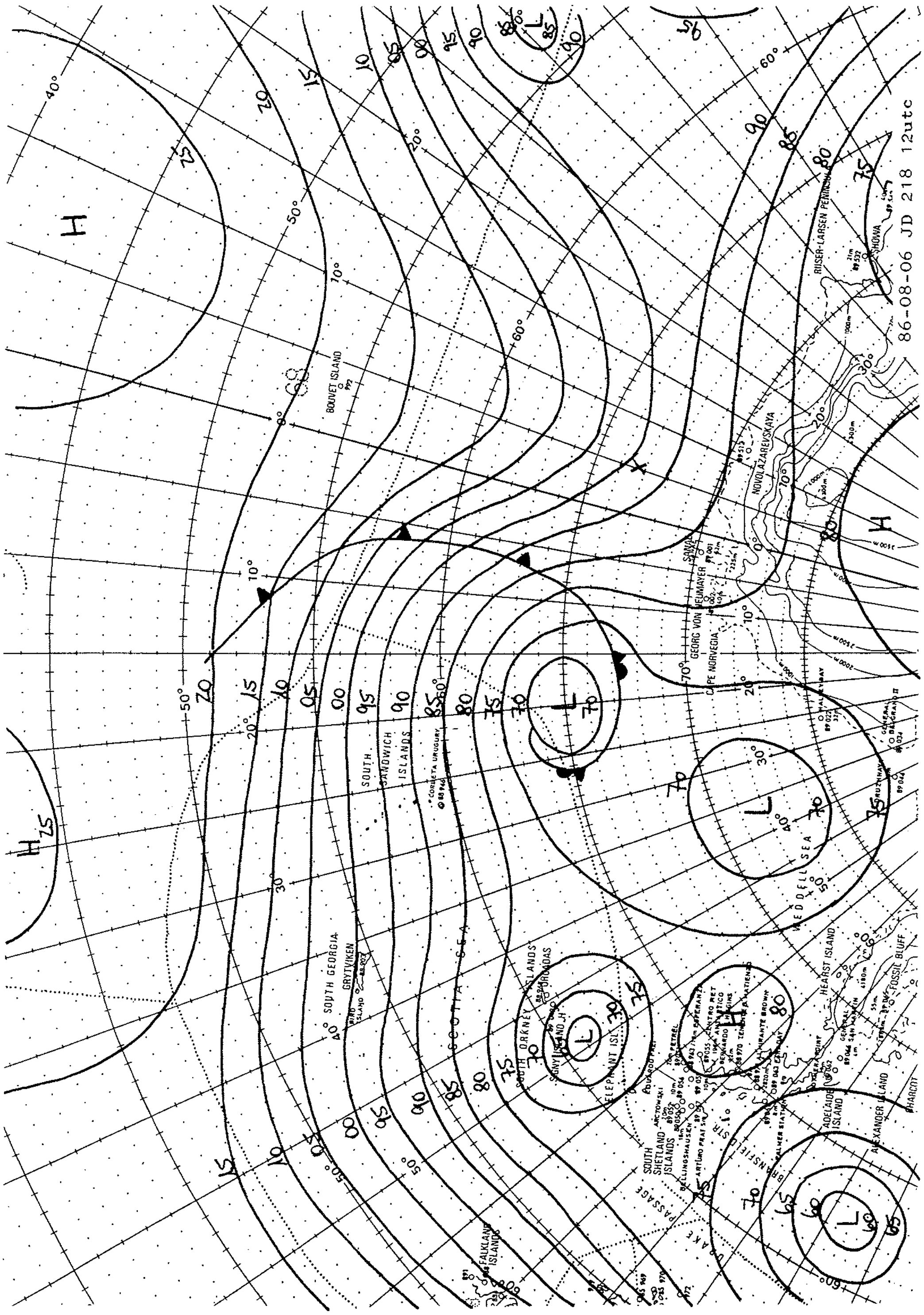
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	66.4S	5.7E	993.2	280	18	-27.4	-31.7	-1.8	9		/				10.00	02	7	/
6	66.5S	5.4E	993.9	28C	15	-26.4	-31.3	-1.7	9		/				10.00	02	7	2
9	66.7S	5.0E	994.1	300	16	-22.4	-24.9	-1.8	8	8	1	6	/	/	1.00	77	7	2
12	66.7S	5.0E	993.2	340	12	-19.1	-22.8	-1.8	8	8	1	6	/	/	1.00	71	7	7
15	66.7S	5.0E	991.1	350	13	-13.0	-16.0	-1.8	8	8	2	6	/	/	2.00	71	7	7
18	66.9S	4.5E	989.3	320	21	-7.8	-9.9	-1.8	9		/				4.00	70	7	7

POLARSTERN 104   66.67S 5.05E   6/ 8/86 10:57



POLARSTERN 106   67.20S 3.76E   6/ 8/86 23:16

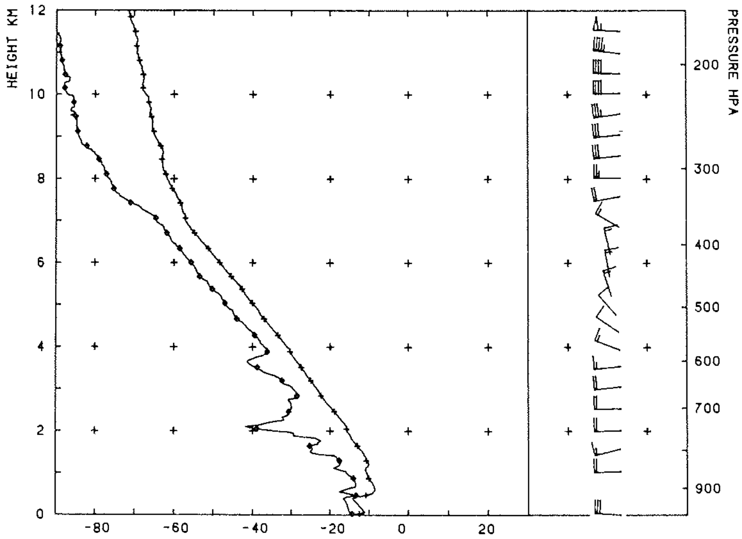



86-08-06 JD 218 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
GEORG VON NEUMAYER
SANAE
HEARST ISLAND
FOSSIL BLUFF
ADELAIDE ISLAND
ALEXANDER ISLAND
BRANSFIELD STR

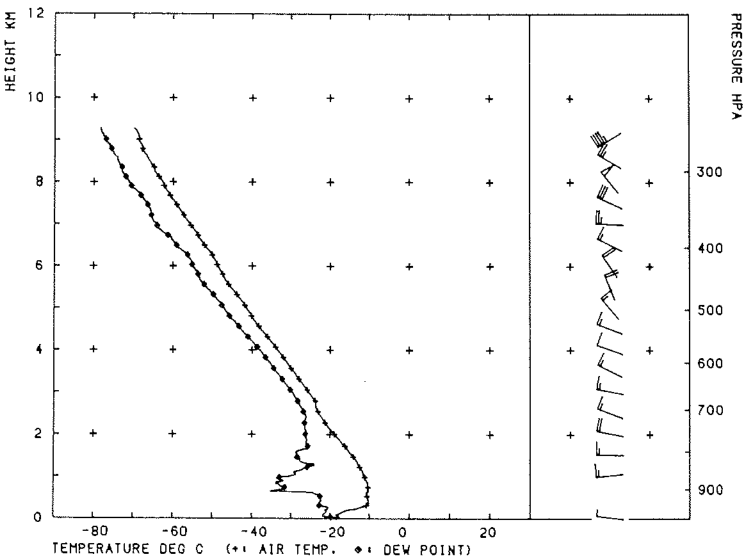
7. AUGUST 1986

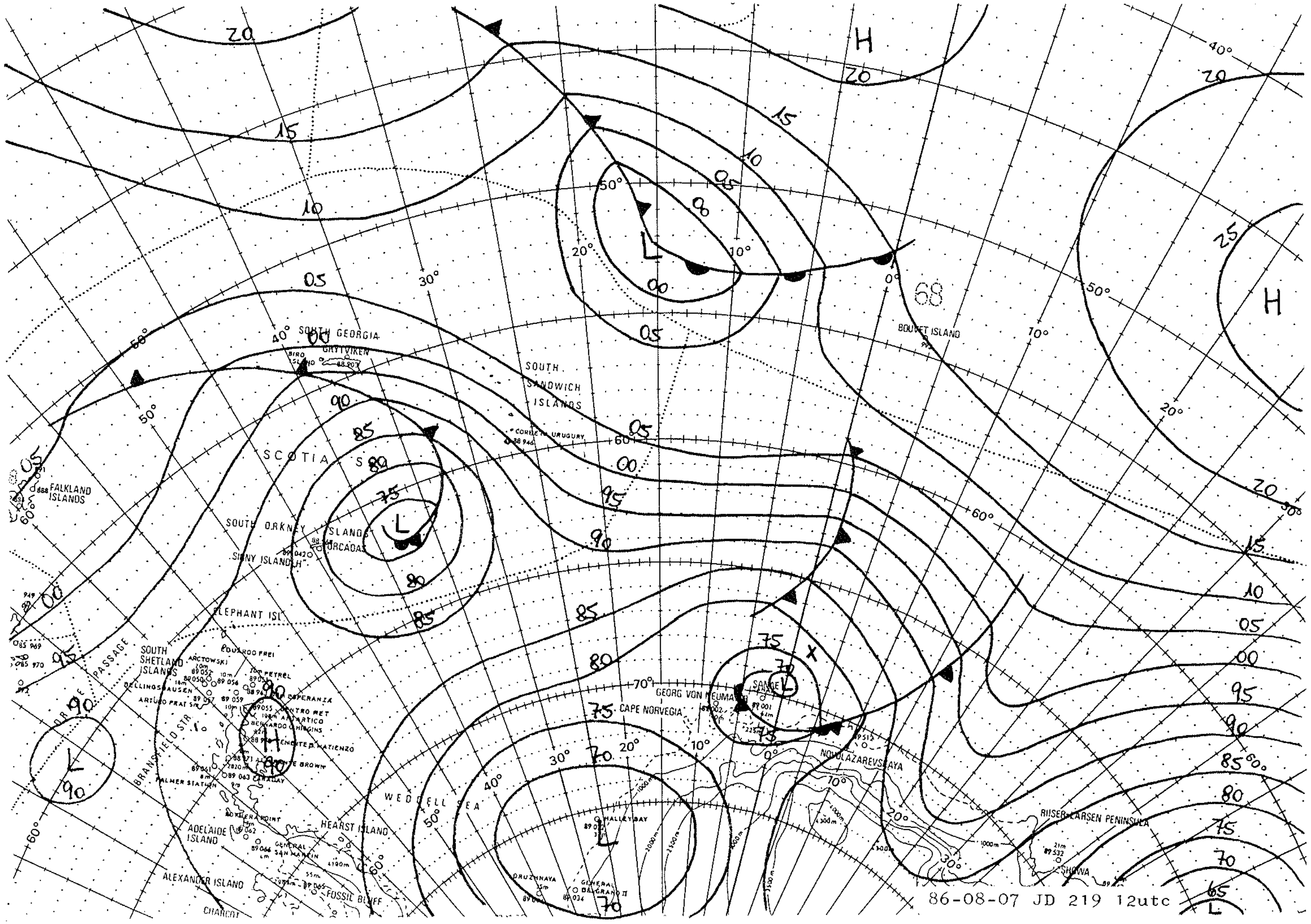
TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	67.3S	3.7E	978.6	340	17	-4.9	-7.1	-1.8	9		/				2.00	02	/	/
6	67.4S	3.4E	974.3	340	15	-4.4	-6.2	-1.8	8	8	2	6	/	/	1.00	73	7	2
9	67.5S	3.2E	975.2	280	32	-9.2	-10.7	-1.8	8	8	2	6	/	/	2.00	71	7	7
12	67.7S	2.7E	978.6	280	23	-12.0	-14.8	-1.8	6	2	3	5	3	2	10.00	01	7	7
15	67.7S	2.7E	981.9	280	25	-12.7	-14.7	-1.8	8	8	2	6	/	/	2.00	77	7	7
18	67.9S	2.5E	984.2	280	21	-17.7	-21.1	-1.8	9		/				4.00	77	7	7

POLARSTERN 108 67.70S 2.80E 7/ 8/86 11: 0



POLARSTERN 110 68.12S 1.84E 7/ 8/86 23:20

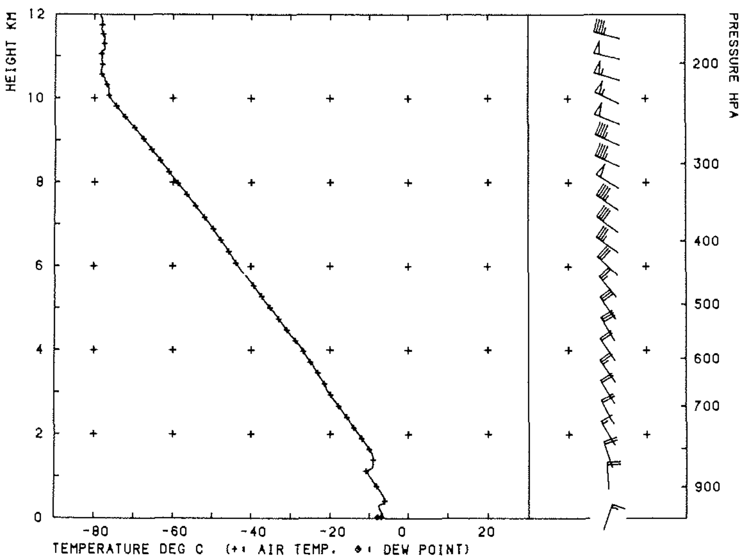


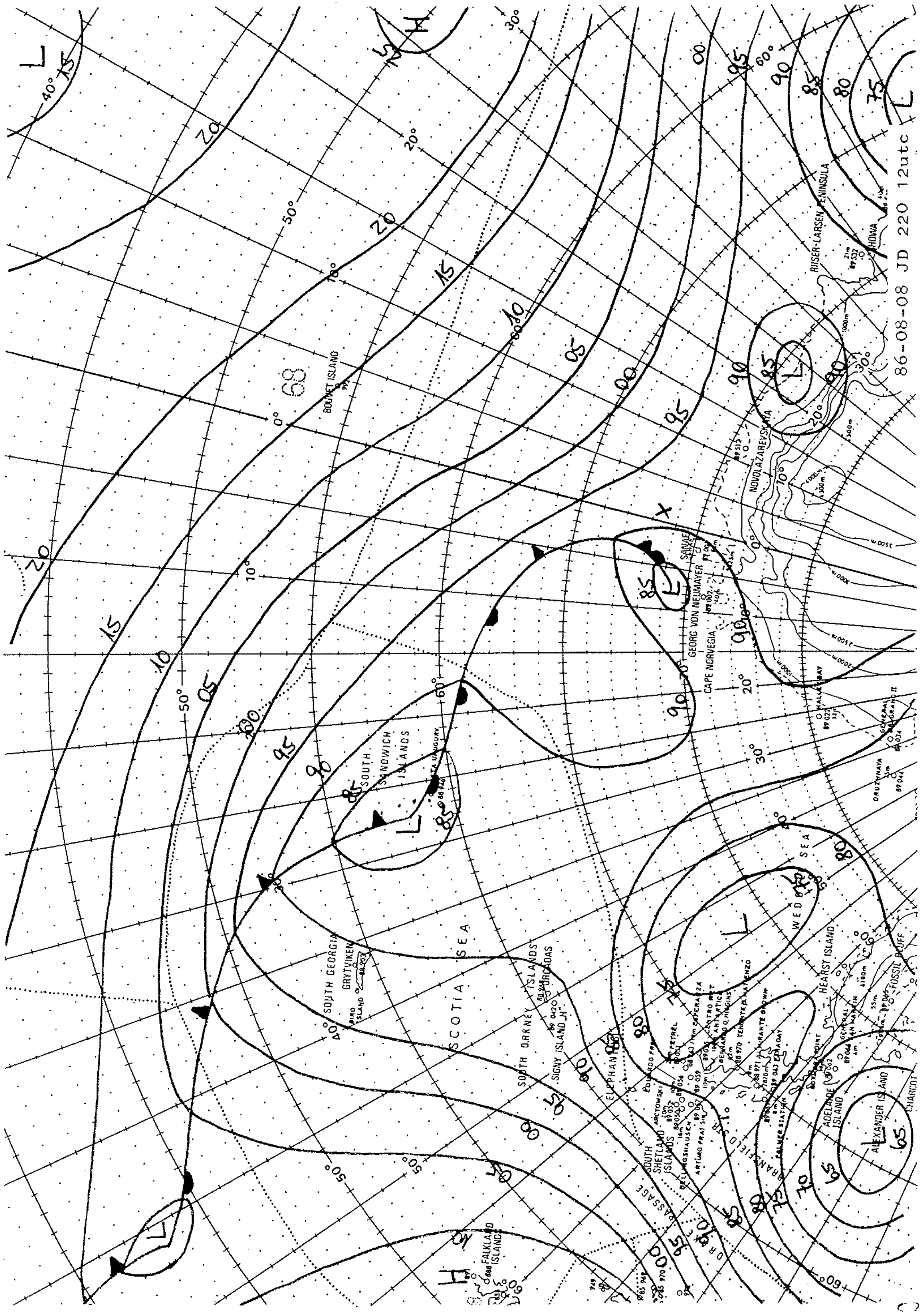

86-08-07 JD 219 12utc
SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
WEDDELL SEA
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
HALLEY BAY
DRUZHNAYA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
PALMER STATION
ESPERANZA
CHARCOT

8.AUGUST 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.2S	1.6E	988.2	210	7	-19.0	-22.6	-1.8	9		/				4.00	02	/	/
6	68.3S	1.3E	990.2	290	6	-20.0	-23.9	-1.8	9		/				10.00	02	/	/
9	68.4S	1.2E	992.0	320	6	-19.8	-22.8	-1.8	8	8	2	6	/	/	4.00	02	1	1
12	68.4S	1.1E	992.0	30	8	-15.6	-18.0	-1.8	8	8	2	6	/	/	4.00	70	7	1
15	68.4S	1.1E	991.2	40	11	-11.0	-13.2	-1.8	8	8	1	6	/	/	2.00	71	7	2
18	68.4S	1.1E	989.9	10	18	-7.1	-9.0	-1.8	9	8	2	6	/	/	2.00	70	7	2

POLARSTERN 114 68.50S 1.03E 8/ 8/86 23: 5

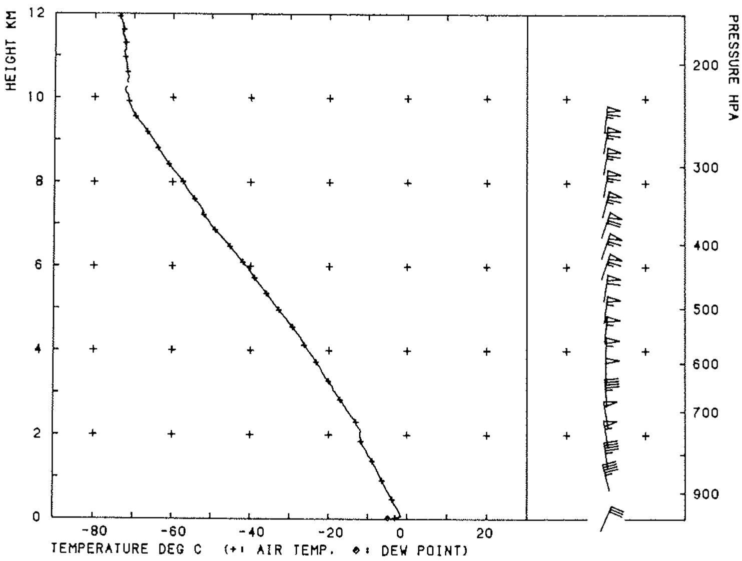



86-08-08 JD 220 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
SOUTH SHETLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
FOSSIL BLUFF
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FALKLAND ISLANDS
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
DRUZHNAYA

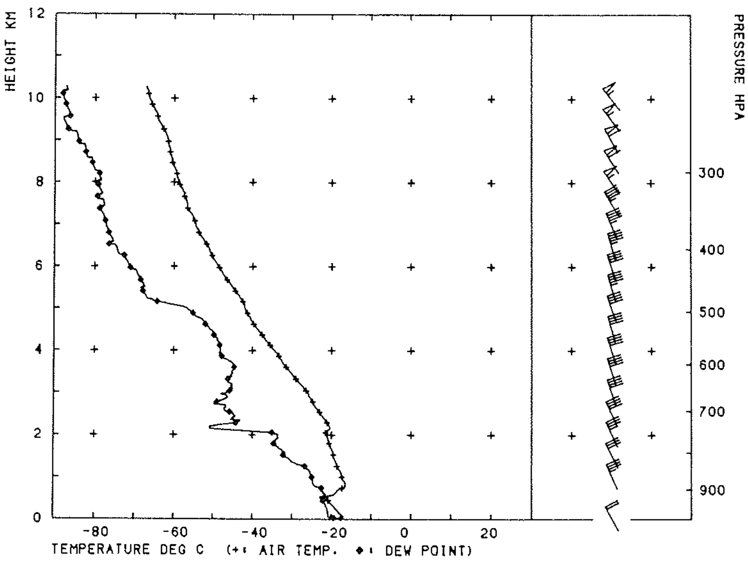
9.AUGUST 1986

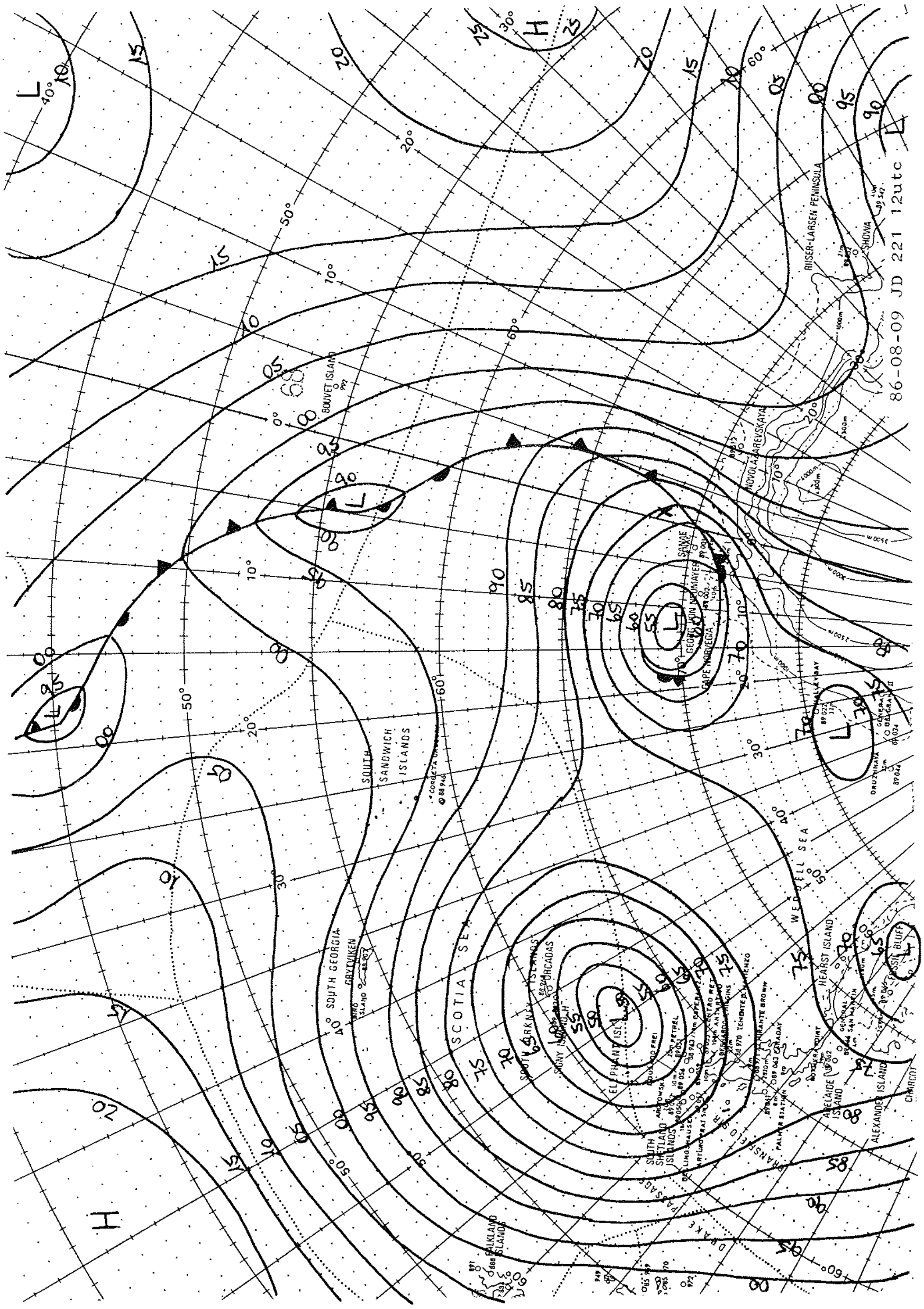
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.5S	.9E	984.1	50	14	-6.3	-8.5	-1.8	9		/				2.00	73	7	/
6	68.5S	.9E	980.2	60	22	-4.7	-6.9	-1.8	8	8	2	6	/	/	2.00	73	7	7
9	68.6S	.8E	975.1	40	33	-3.1	-5.0	-1.8	8	8	2	6	/	/	2.00	71	7	7
12	68.6S	.8E	974.0	360	32	-2.4	-4.7	-1.8	8	8	3	8	/	/	4.00	22	7	7
15	68.6S	.9E	978.9	350	33	-10.1	-12.6	-1.8	7	7	2	6	0	0	1.00	22	7	7
18	68.6S	.9E	982.2	360	30	-13.3	-16.4	-1.8	9		/				4.00	22	7	7

POLARSTERN 116 68.60S 0.80E 9/ 8/86 10:43



POLARSTERN 118 68.67S 0.91E 9/ 8/86 23: 8

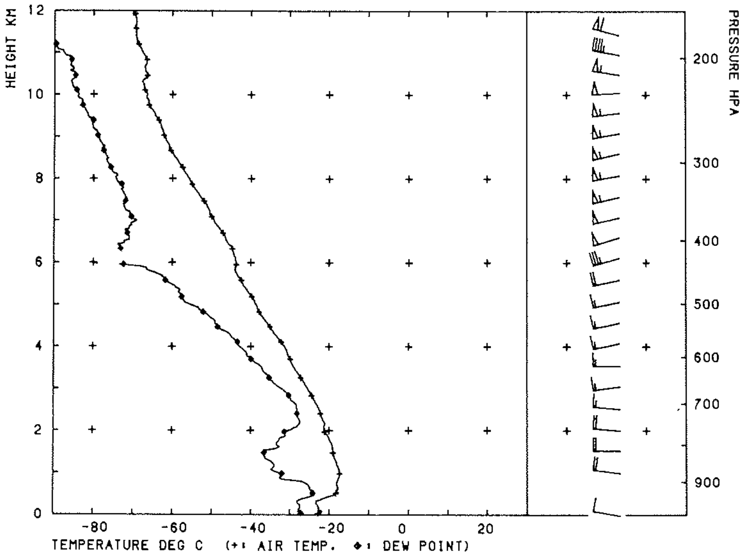



86-08-09 JD 221 12utc
SCOTIA SEA
WEDDELL SEA
SOUTH GEORGIA
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
RIISER-LARSEN PENINSULA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FALKLAND ISLANDS
DRAKE PASSAGE

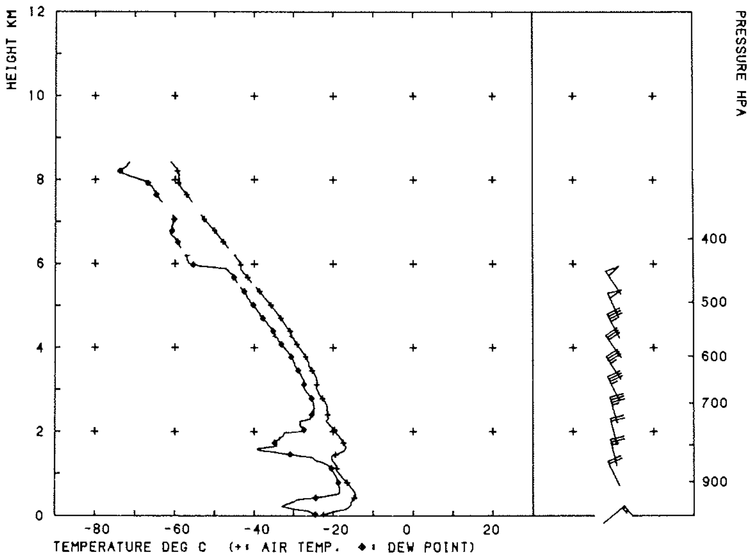
10. AUGUST 1986

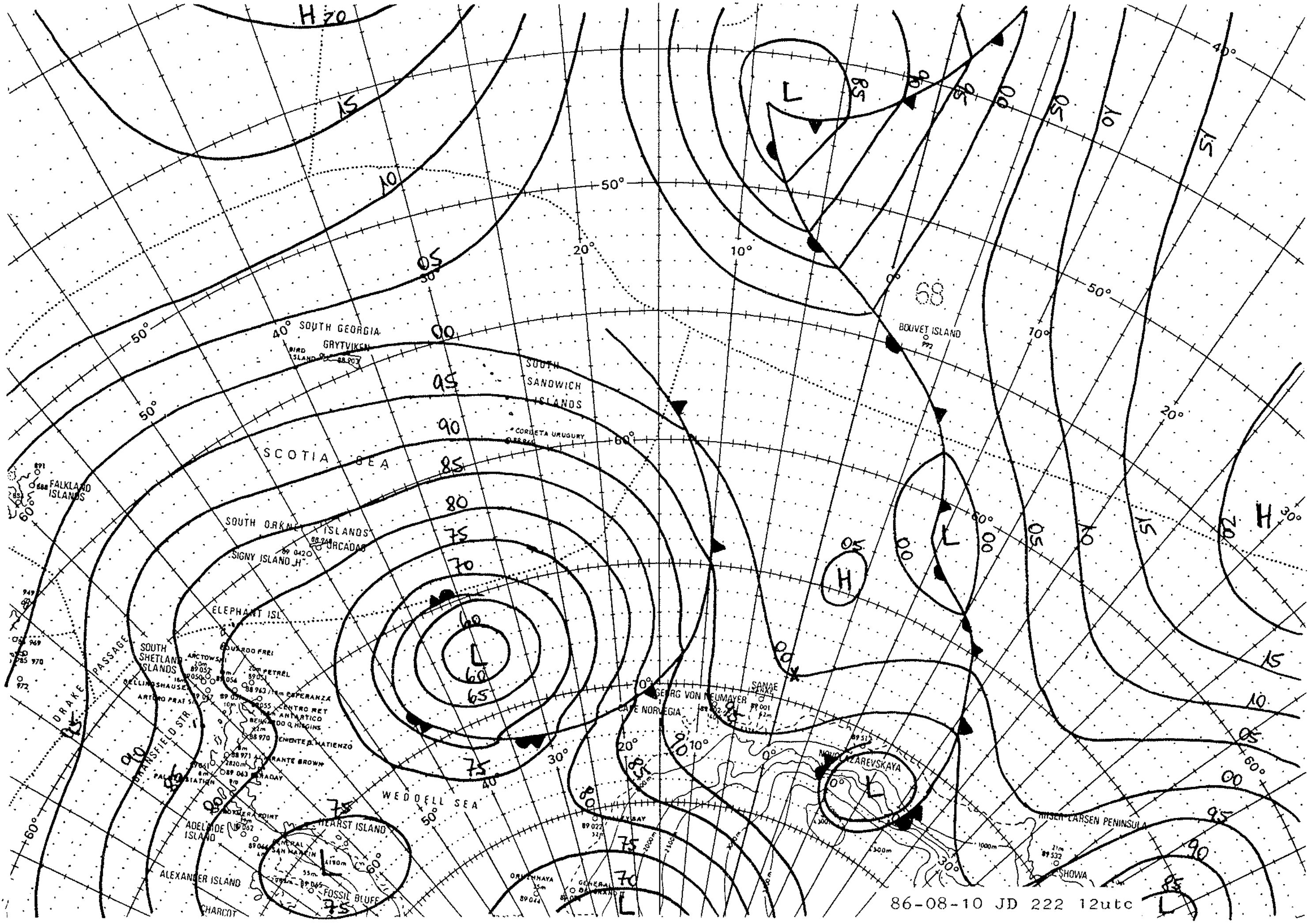
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.7S	1.0E	993.0	330	18	-19.6	-23.4	-1.7	9		/				4.00	70	7	/
6	68.7S	1.0E	995.0	320	15	-21.1	-24.6	-1.8	9		/				4.00	71	7	2
9	68.7S	1.0E	997.5	310	10	-22.1	-26.0	-1.8	3	3	2	5	0	0	4.00	77	7	1
12	68.7S	1.0E	1000.1	290	9	-23.2	-27.8	-1.8	0		9				10.00	02	7	1
15	68.7S	1.0E	1001.2	990	1	-24.4	-29.4	-1.8	6	2	4	5	0	2	10.00	03	7	1
18	68.7S	1.0E	1002.2	20	6	-25.2	-30.4	-1.8	9		/				10.00	02	7	1

POLARSTERN 120 68.68S 1.00E 10/ 8/86 10:53



POLARSTERN 122 68.69S 0.99E 10/ 8/86 23:18



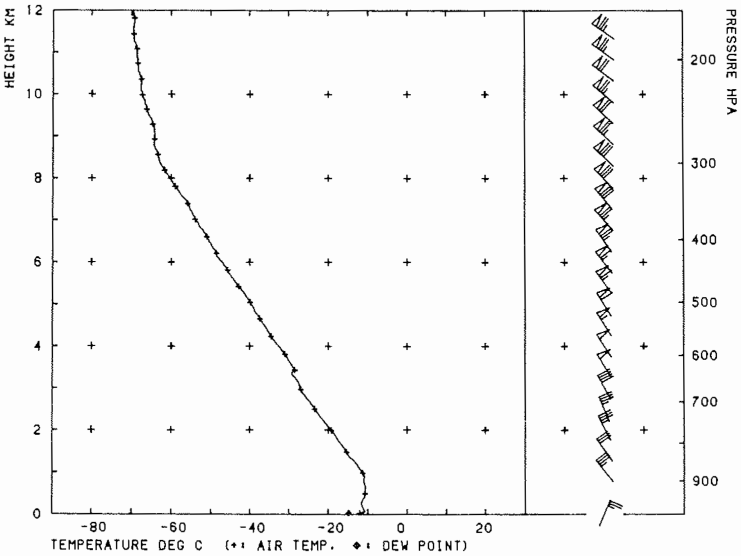


SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
ESPERANZA
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HEARST ISLAND
CHARCOT
WEDDELL SEA
BOUVET ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-08-10 JD 222 12utc

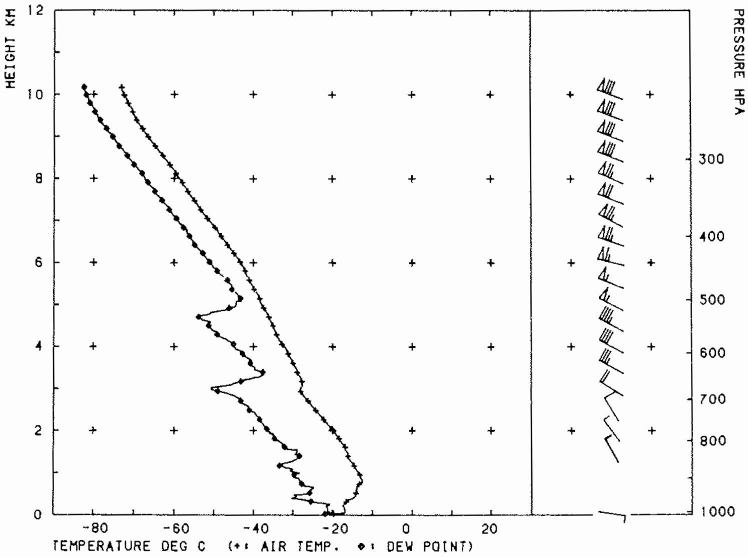
11.AUGUST 1986

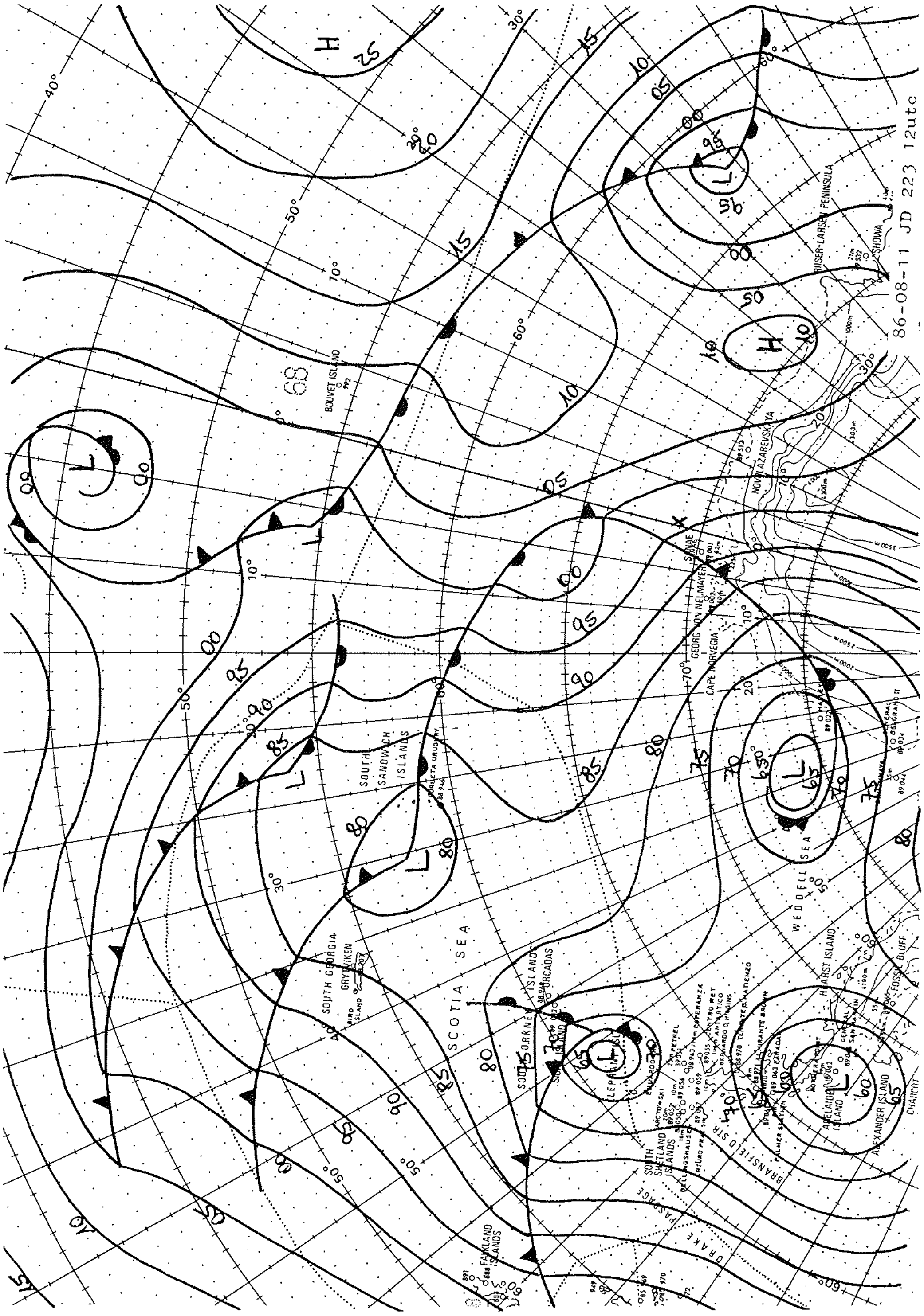
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.7S	.9E	1000.0	40	20	-18.7	-21.5	-1.8	9		/				2.00	73	7	2
6	68.7S	.9E	998.2	40	24	-15.5	-13.5	-1.8	9		/				2.00	71	7	7
9	68.7S	.9E	997.2	30	22	-13.2	-16.2	-1.8	8	8	1	6	/	/	1.00	71	7	7
12	68.8S	.9E	997.2	10	23	-11.0	-13.6	-1.8	8	8	2	6	/	/	2.00	22	7	7
15	68.8S	.9E	1000.2	290	17	-10.6	-12.5	-1.8	8	8	2	6	/	/	.50	73	7	2
18	68.8S	.9E	1003.9	290	15	-15.4	-19.6	-1.8	9		/				10.00	02	7	2

POLARSTERN 124 68.75S 0.94E 11/ 8/86 10:50



POLARSTERN 126 68.75S 0.89E 11/ 8/86 22:56

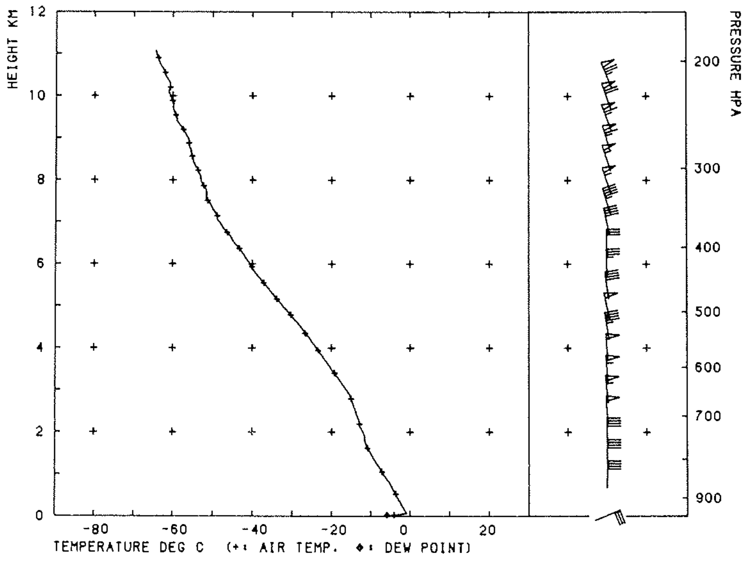


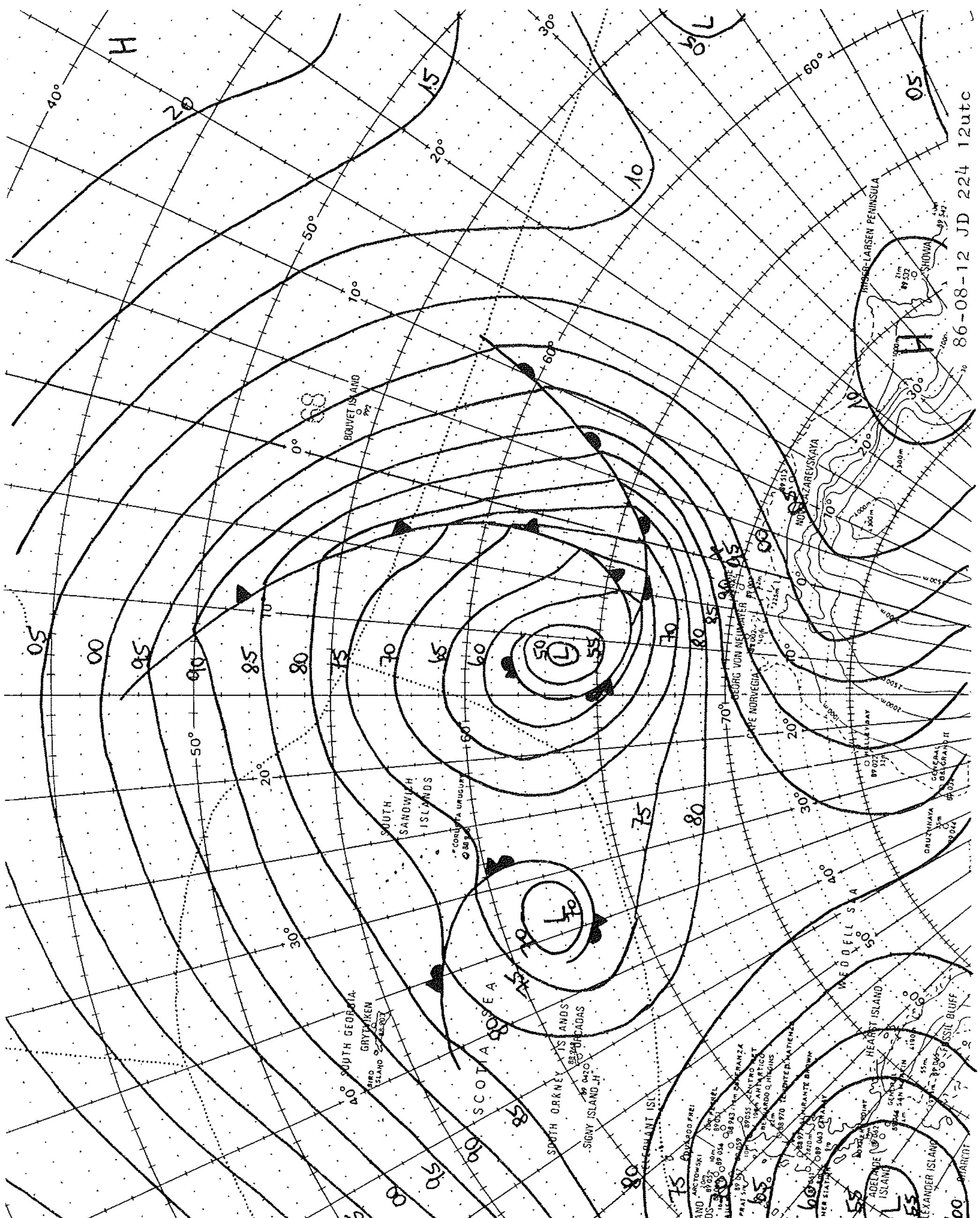

86-08-11 JD 223 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
WEDDELL SEA
SOUTH ORKNEY ISLANDS
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA

12.AUGUST 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	68.85	.9E	1008.2	80	17	-21.3	-24.5	-1.8	9 /	10.00	02 / /
6	68.85	.9E	1004.0	80	22	-16.8	-20.0	-1.8	9 /	10.00	02 2 2
9	68.85	.9E	997.1	80	32	-11.1	-14.2	-1.8	8 8 1 6 / /	.20	75 7 7
12	68.85	.7E	990.6	70	35	-8.8	-10.6	-1.8	8 8 2 6 / /	.20	73 7 7
15	68.85	.7E	978.0	80	53	-9.1	-11.0	-1.8	9 /	.00	39 7 7
18	68.85	.4E	967.3	80	59	-9.9	-11.9	-1.8	9 /	.00	39 7 7

POLARSTERN 129 68.88S 0.15E 12/ 8/86 23: 5

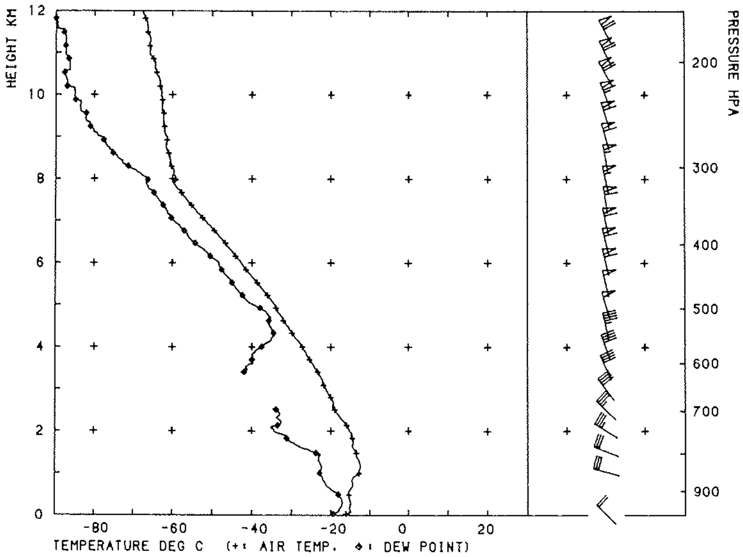



86-08-12 JD 224 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SOUTH ORKNEY ISLANDS
SCOTIA SEA
WEDDELL SEA
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
GEORG VON NEUMAYER
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA

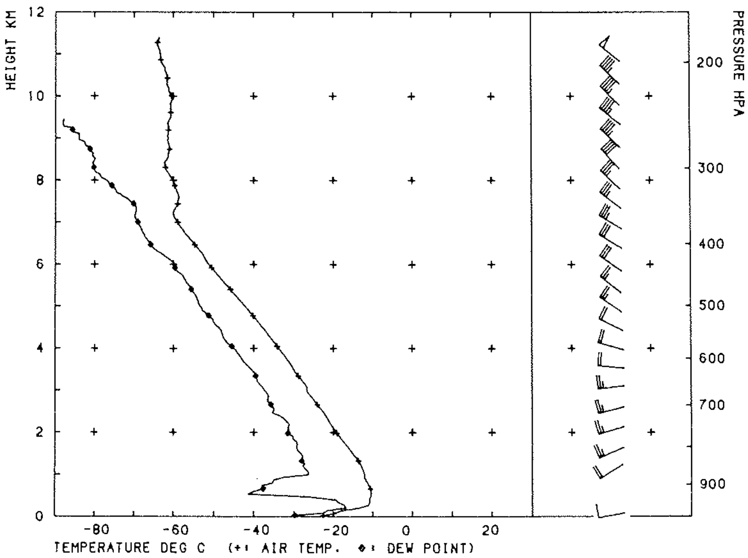
13.AUGUST 1986

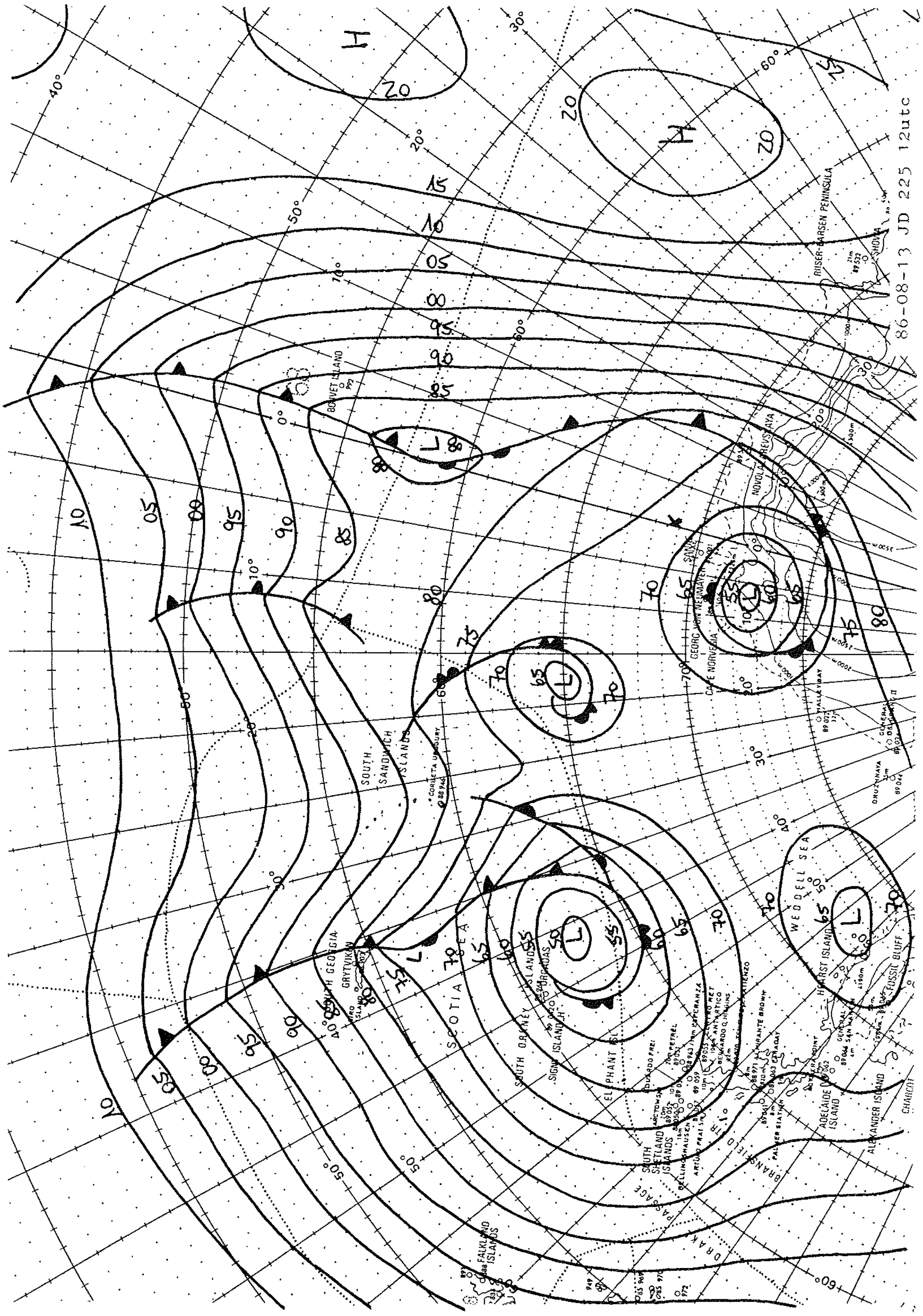
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.9S	.2E	950.5	360	22	-2.2	-5.1	-1.8	9		/				10.00	02	/	/
6	68.9S	.2E	956.0	340	25	-10.8	-13.4	-1.8	9		/				4.00	70	7	2
9	68.9S	.2E	965.1	320	20	-15.1	-18.0	-1.8	5	3	2	5	3	0	10.00	02	7	2
12	68.9S	.2E	973.0	310	17	-16.2	-19.3	-1.8	6	4	5	8	0	2	10.00	03	7	1
15	68.9S	.2E	980.2	290	16	-17.6	-21.2	-1.8	2	0	9	0	0	2	20.00	02	1	1
18	68.9S	.2E	985.6	270	16	-19.3	-23.2	-1.8	0		9				20.00	02	1	1

POLARSTERN 131 68.93S 0.20E 13/ 8/86 10:49



POLARSTERN 133 69.00S 0.20E 13/ 8/86 22:54

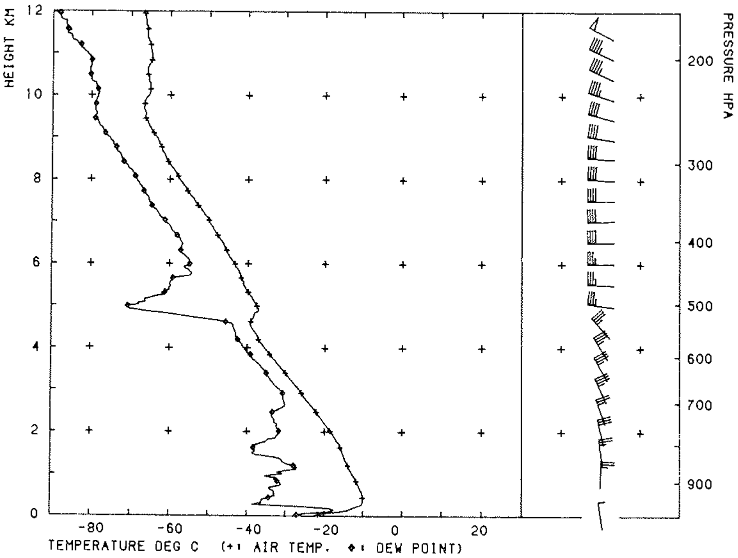



86-08-13 JD 225 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
RIISER-LARSEN PENINSULA

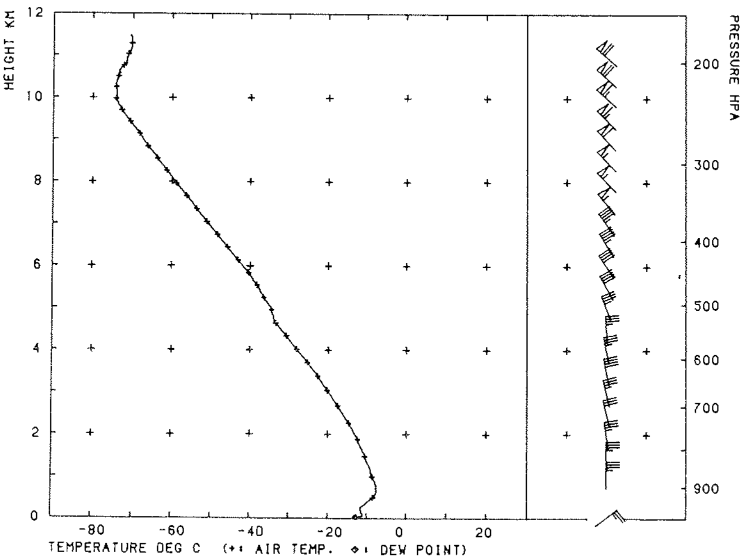
14.AUGUST 1986

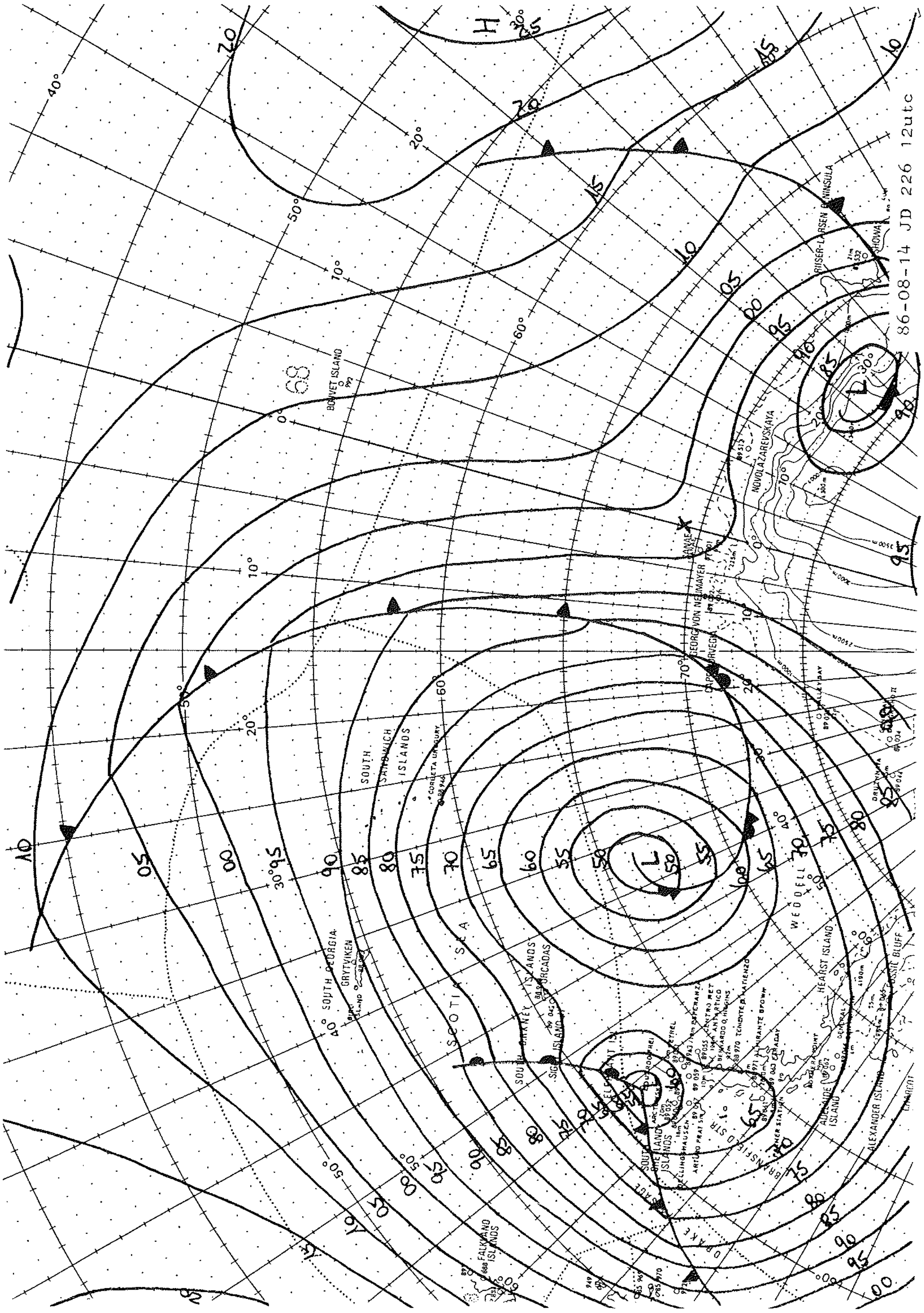
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	69.1S	.0E	997.3	260	7	-22.5	-26.9	-1.8	9		/				10.00	02	/	/
6	69.2S	.0E	999.0	260	5	-22.6	-26.8	-1.8	9		/				10.00	02	2	2
9	69.2S	.0W	999.1	30	10	-21.8	-26.1	-1.8	2	2	5	5	0	0	20.00	02	1	1
12	69.3S	.1W	1000.2	360	8	-21.7	-25.9	-1.8	7	3	6	5	3	2	20.00	03	1	1
15	69.3S	.2W	998.2	50	15	-20.3	-24.2	-1.8	7	3	6	5	3	2	10.00	02	2	2
18	69.4S	.3W	996.2	40	18	-18.6	-21.4	-1.8	9		/				10.00	02	2	2

POLARSTERN 135 69.25S 0.10W 14/ 8/86 10:56



POLARSTERN 137 69.49S 0.40W 14/ 8/86 23: 2

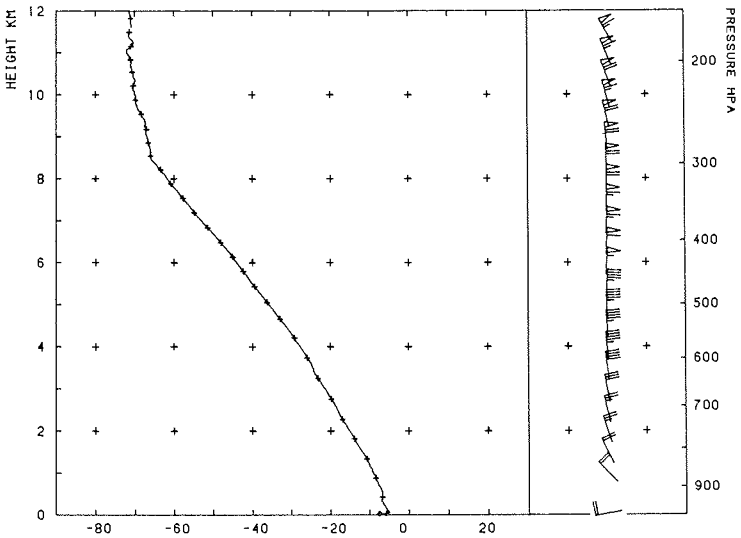



86-08-14 JD 226 12utc
BOUVET ISLAND
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SOUTH GEORGIA
SOUTH SANDWICH ISLANDS
SCOTIA SEA
SOUTH ORKNEY ISLANDS
WEDDELL
HEARST ISLAND
ALEXANDER ISLAND
FALKLAND ISLANDS
DRAKE

15.AUGUST 1986

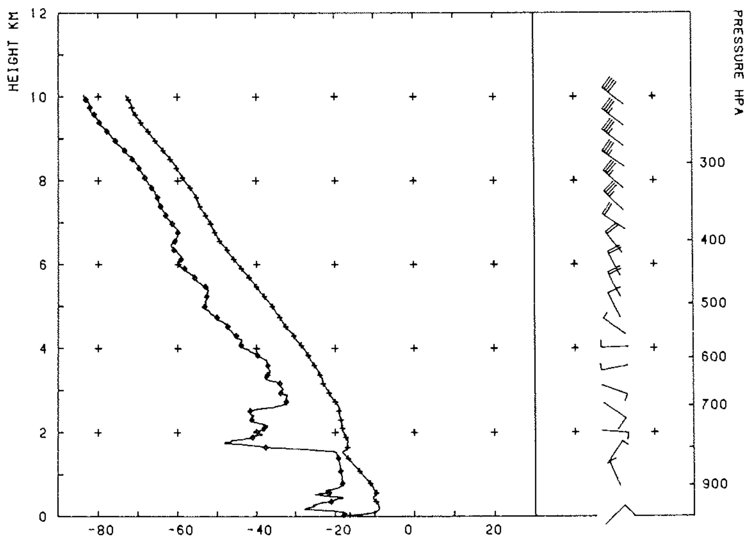
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	69.5S	.4W	986.0	50	29	-7.5	-9.5	-1.8	9		/				2.00	71	7	/
6	69.5S	.4W	982.0	40	32	-5.5	-7.5	-1.8	9		/				2.00	73	7	7
9	69.5S	.5W	980.0	40	32	-5.1	-7.4	-1.8	8	8	2	6	/	/	1.00	71	7	7
12	69.5S	.5W	982.6	260	19	-6.6	-8.5	-1.8	8	8	2	6	/	/	2.00	71	7	7
15	69.5S	.5W	987.6	280	15	-10.9	-13.5	-1.8	4	1	6	5	0	5	20.00	02	7	1
18	69.4S	.7W	990.3	330	6	-13.6	-16.8	-1.8	0		9				20.00	02	7	1

POLARSTERN 139 69.50S 0.45W 15/ 8/86 10:50

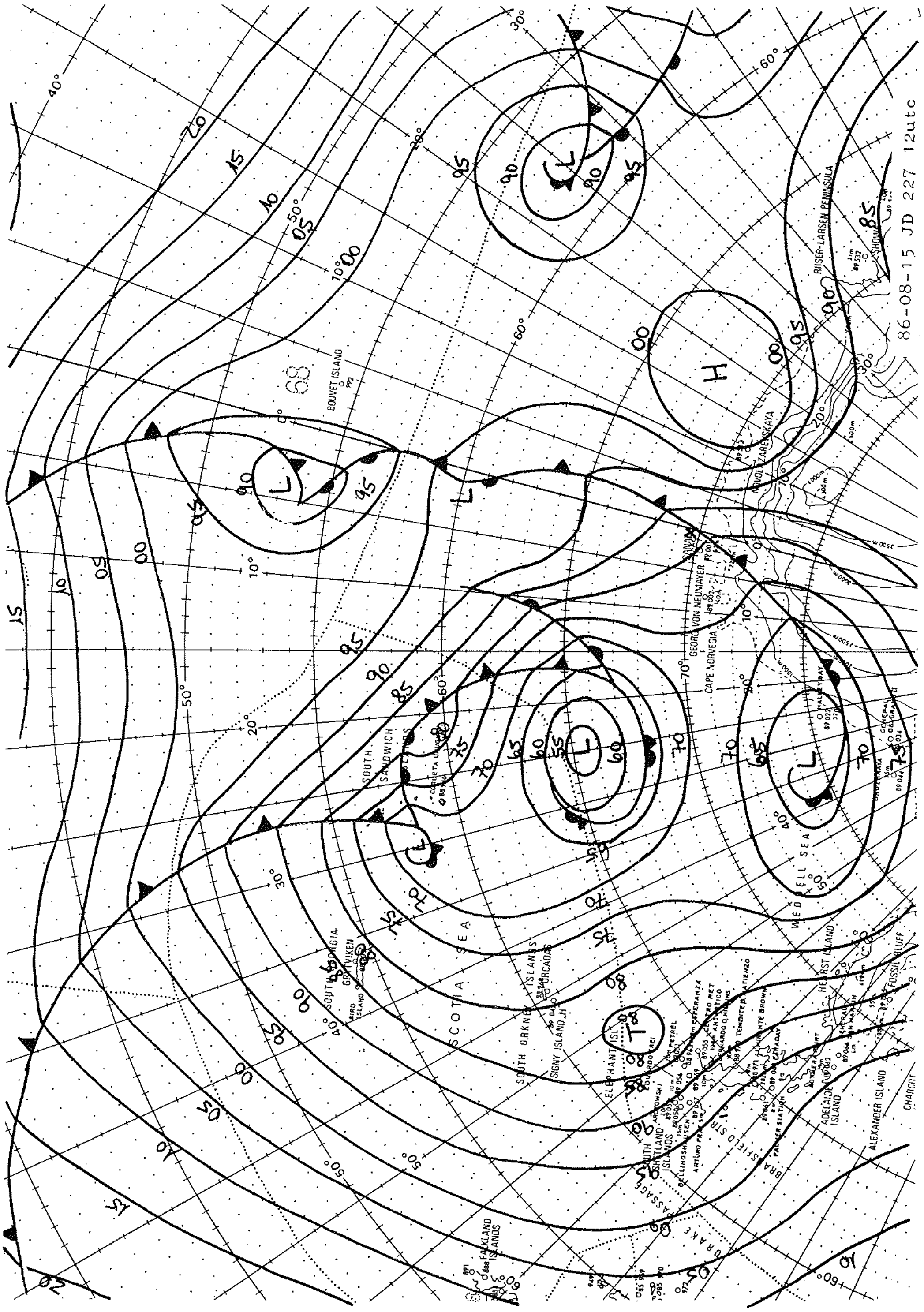


TEMPERATURE DEG C (+: AIR TEMP. ◆: DEW POINT)

POLARSTERN 141 69.32S 1.02W 15/ 8/86 23: 1



TEMPERATURE DEG C (+: AIR TEMP. ◆: DEW POINT)

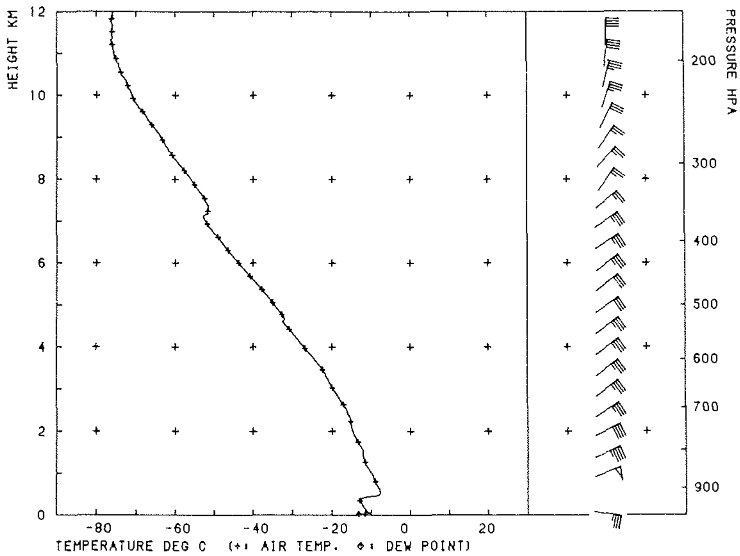


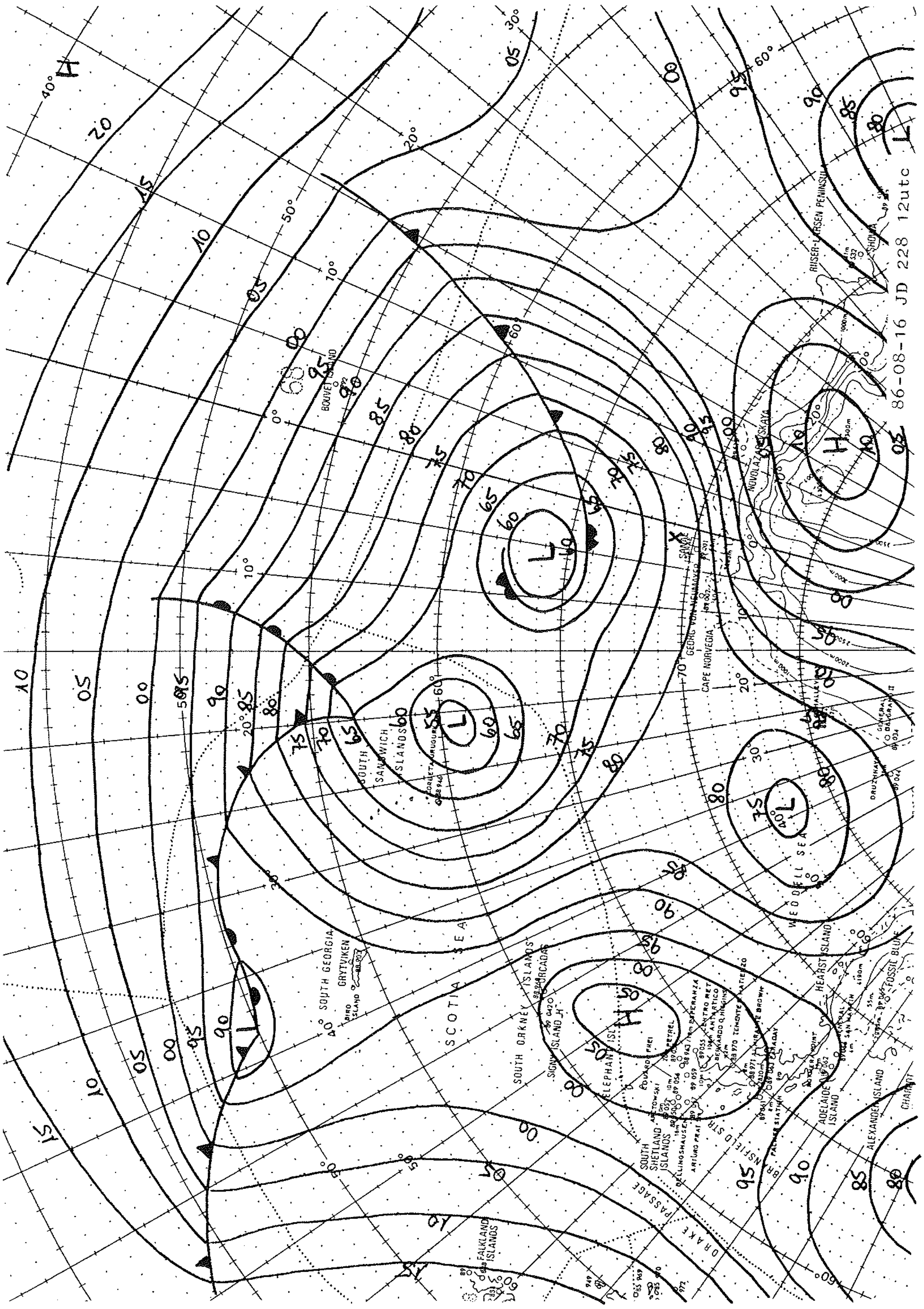
86-08-15 JD 227 12utc
RIISER-LARSEN PENINSULA
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
CAPE NORVEGIA
GEORG VON NEUMAYER
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
BRANSFIELD STR

16.AUGUST 1986

TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	69.3S	1.2W	988.2	110	7	-17.1	-19.3	-1.8	9 /	2.00	02 7 /
6	69.3S	1.2W	984.2	100	12	-12.3	-14.2	-1.8	9 /	2.00	71 7 2
9	69.3S	1.3W	981.2	100	27	-12.3	-14.2	-1.8	8 8 1 6 / /	2.00	71 7 2
12	69.3S	1.4W	977.5	100	41	-11.9	-14.2	-1.8	8 8 1 6 / /	1.00	73 7 2
15	69.3S	1.6W	974.1	100	44	-12.0	-13.9	-1.8	8 8 2 6 / /	1.00	73 7 7
18	69.3S	1.8W	972.0	90	44	-12.1	-14.0	-1.8	9 /	.50	73 7 7

POLARSTERN 143 69.30S 1.36W 16/ 8/86 10:50

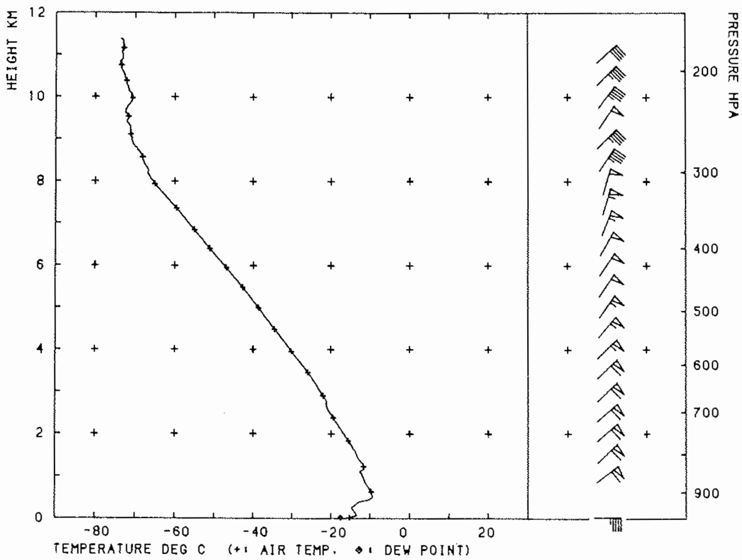



86-08-16 JD 228 12utc
SCOTIA SEA
SOUTH GEORGIA
GRYTVIKEN
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
CAPE NORVEGIA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
RIISER-LARSEN PENINSULA
NOVOLAZAREVSKAYA

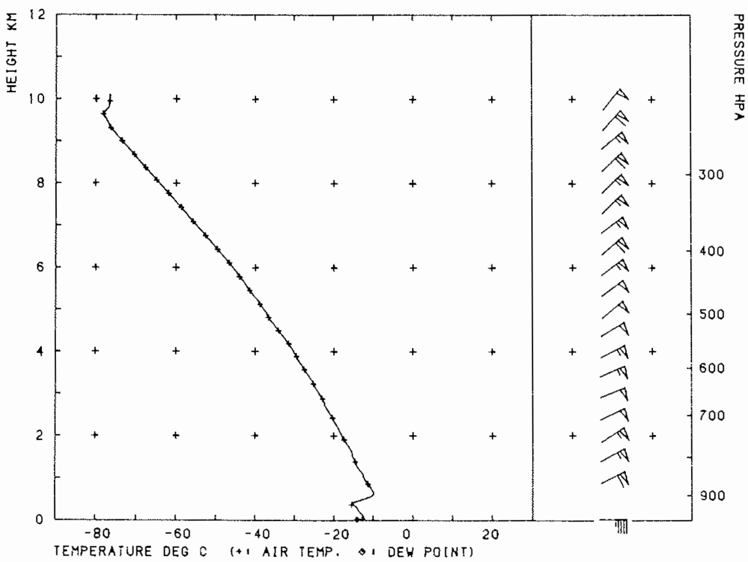
17.AUGUST 1986

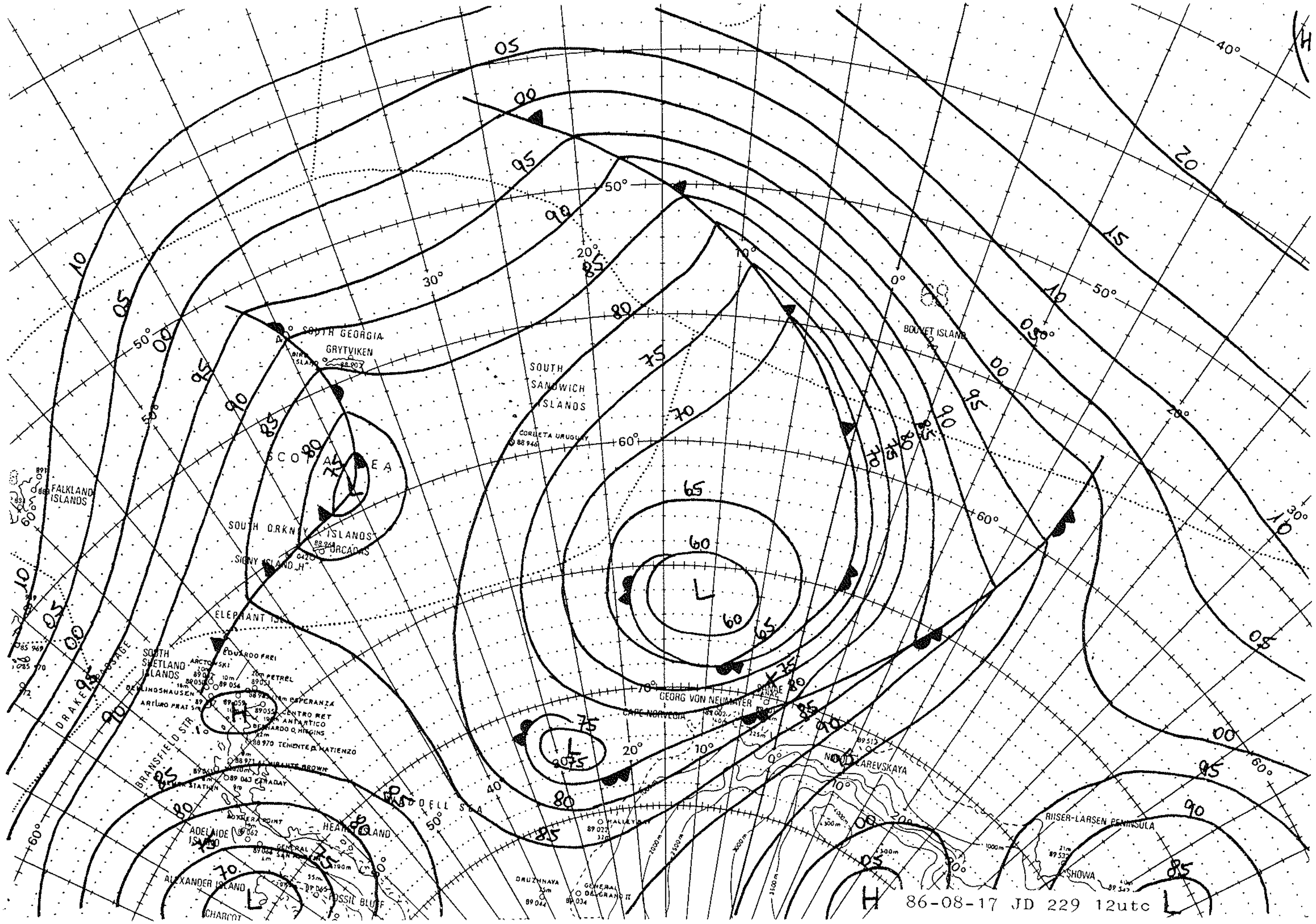
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N Nh h CL CM CH	VIS km	WEATHER ww W1 W2
3	69.4S	2.3W	974.1	90	44	-12.5	-14.4	-1.8	9 /	.50	73 7 7
6	69.4S	2.3W	973.0	80	45	-12.7	-14.7	-1.8	9 /	.50	73 7 7
9	69.5S	2.5W	975.8	60	34	-15.1	-16.9	-1.8	7 7 2 6 0 0	2.00	71 7 7
12	69.4S	2.6W	974.1	90	47	-14.0	-16.2	-1.8	8 8 2 6 / /	2.00	73 7 7
15	69.2S	3.1W	971.2	80	54	-11.9	-13.8	-1.8	9 /	.00	39 7 7
18	69.1S	3.6W	971.2	80	46	-10.9	-13.1	-1.8	9 /	2.00	73 7 7

POLARSTERN 146 69.40S 2.50W 17/ 8/86 11:20



POLARSTERN 148 69.12S 3.70W 17/ 8/86 23: 3

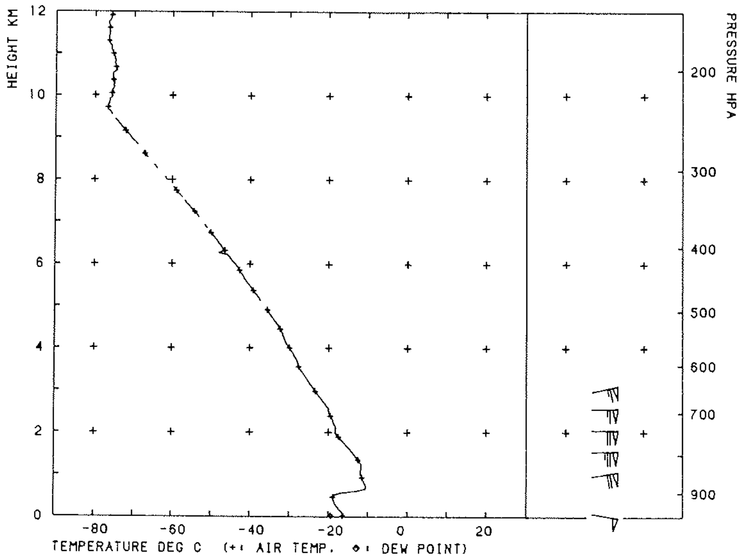


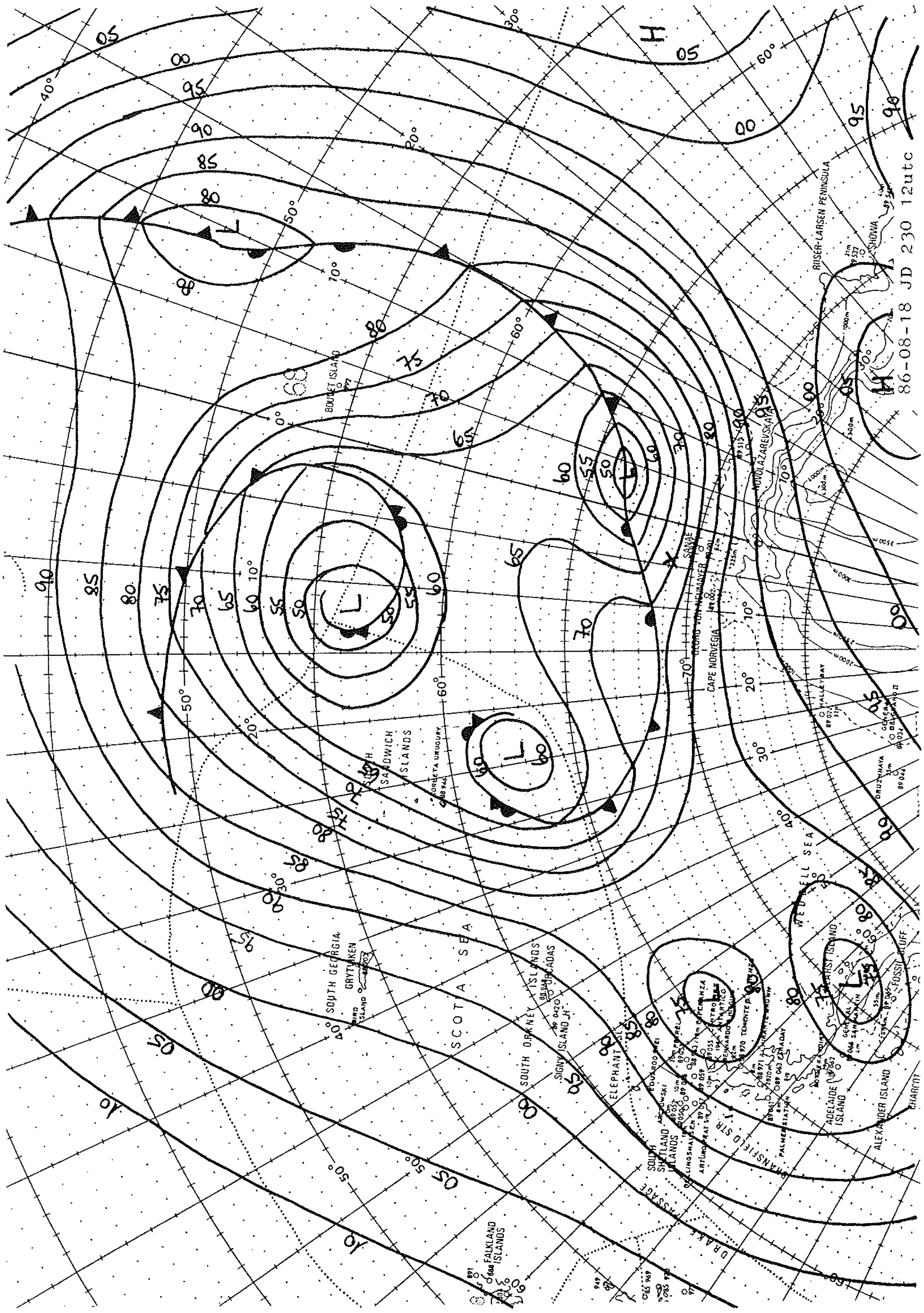

SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
SOUTH SHETLAND ISLANDS
BELLINGSHAUSEN
ESPERANZA
BRANSFIELD STR
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FOSSIL BLUFF
GEORG VON NEUMAYER
CAPE NORVEGIA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO II
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-08-17 JD 229 12utc

18.AUGUST 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	69.1S	4.1W	971.0	100	48	-14.2	-16.9	-1.8	9		/				.50	73	7	7
6	69.1S	4.1W	969.8	100	45	-14.8	-17.6	-1.8	9		/				4.00	71	7	7
9	69.2S	4.3W	970.5	100	47	-15.9	-18.3	-1.8	9		/				2.00	71	7	7
12	69.2S	4.4W	970.0	100	47	-16.6	-19.8	-1.8	9		/				2.00	71	7	7
15	69.1S	4.5W	968.3	100	48	-16.7	-19.9	-1.8	9		/				.05	71	7	7
18	68.9S	4.3W	965.2	110	49	-17.1	-19.8	-1.8	9		/				.50	73	7	7

POLARSTERN 150 69.15S 4.35W 18/ 8/86 11:24

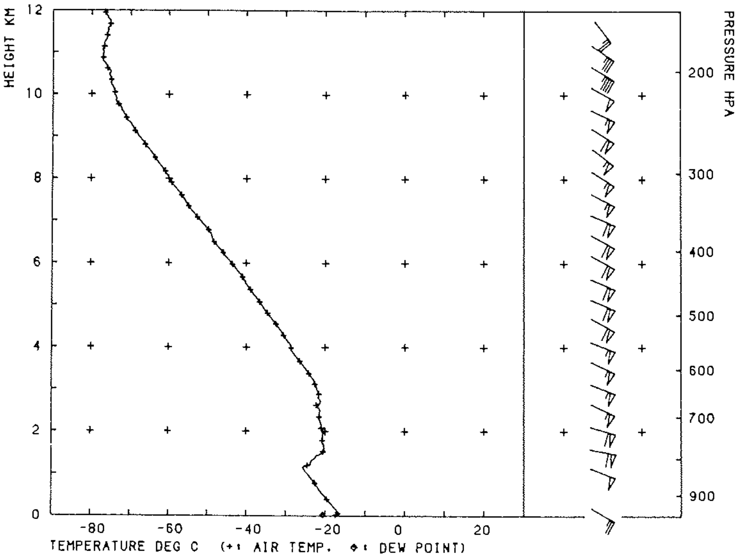



86-08-18 JD 230 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
FALKLAND ISLANDS
DRAKE PASSAGE
SOUTH SHETLAND ISLANDS
ELEPHANT I.
WEDDELL SEA
CAPE NORVEGIA
HALLEY BAY
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF

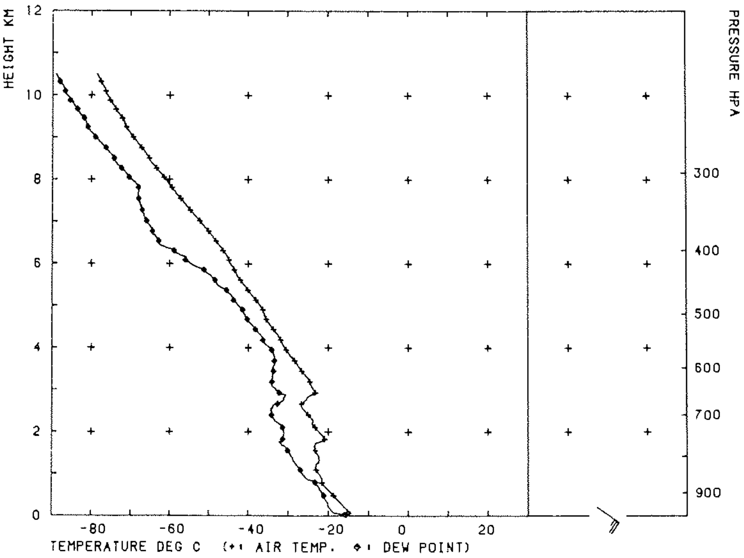
19.AUGUST 1986

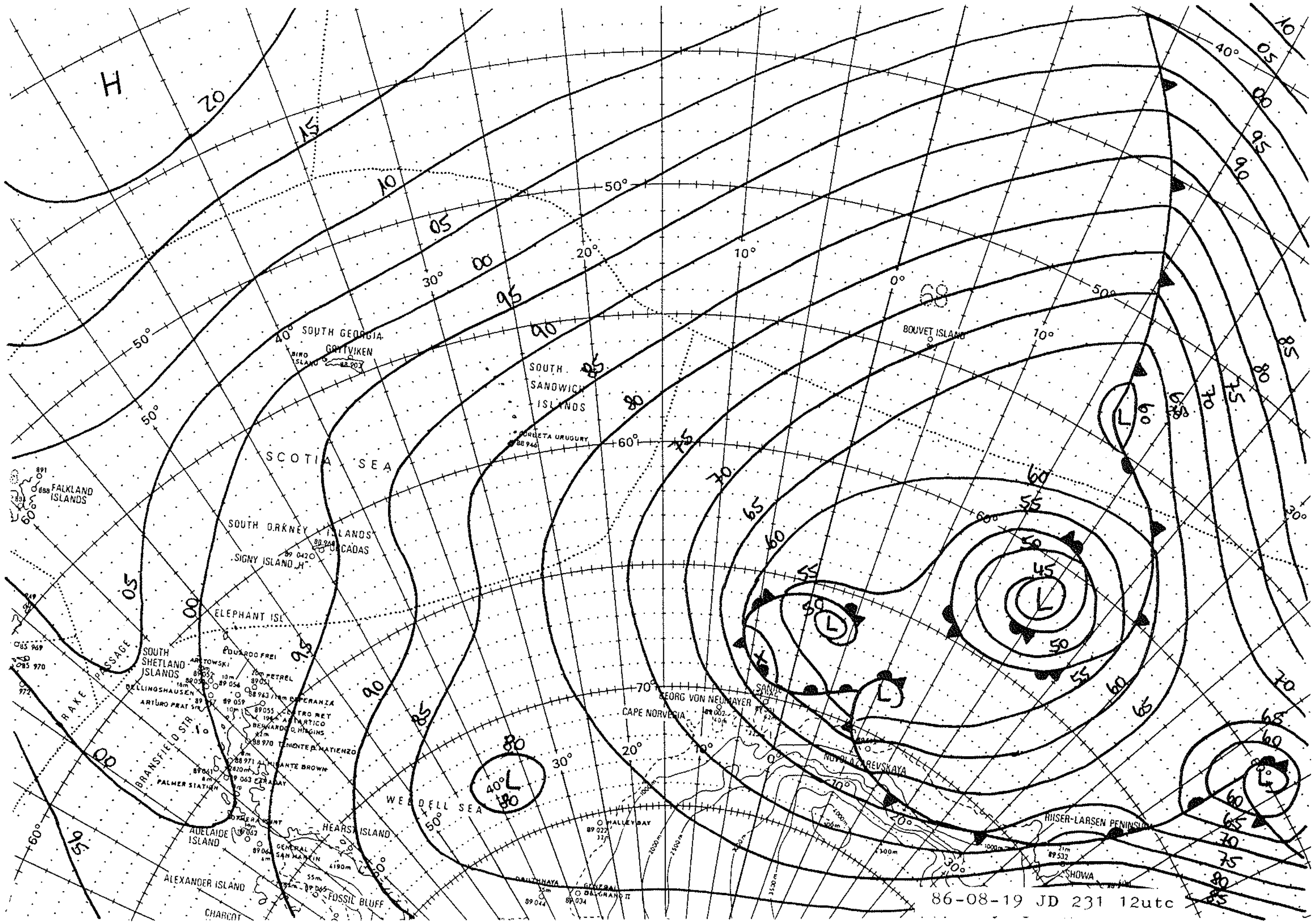
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	68.8S	4.4W	963.1	110	38	-18.0	-20.7	-1.8	9		/				.50	02	7	/
6	68.7S	4.3W	962.2	110	38	-18.1	-20.6	-1.8	9		/				.50	73	7	2
9	68.7S	3.8W	961.6	120	36	-17.7	-20.4	-1.8	8	8	2	6	/	/	1.00	71	7	2
12	68.6S	3.7W	961.1	120	36	-17.4	-20.7	-1.8	8	8	3	6	/	/	2.00	70	7	2
15	68.6S	3.5W	962.3	120	23	-17.1	-20.4	-1.8	8	8	3	8	/	/	4.00	22	7	2
18	68.5S	3.0W	963.6	120	31	-16.7	-21.3	-1.8	8	8	3	6	/	/	4.00	02	7	2

POLARSTERN 152 68.60S 3.60W 19/ 8/86 10:40



POLARSTERN 154 86.40S 2.86W 19/ 8/86 23: 0

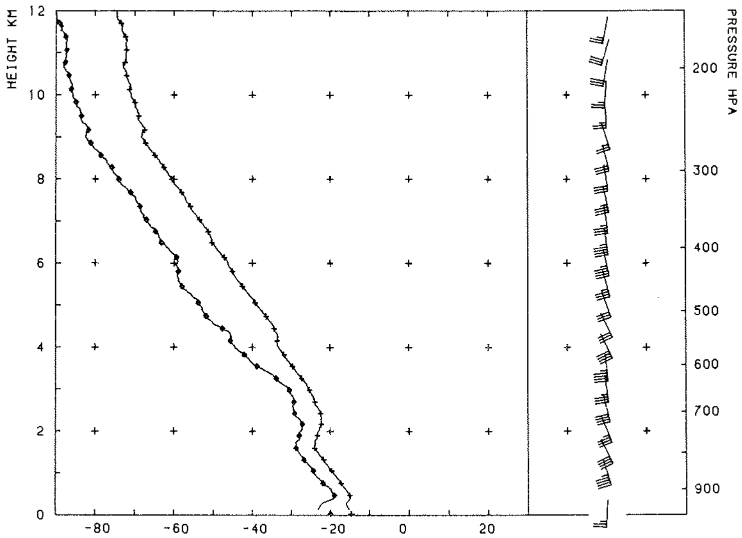



SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ORCADAS
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR
BELLINGSHAUSEN
ARTURO PRAT
ESPERANZA
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HEARST ISLAND
WEDDELL SEA
HALLEY BAY
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
CHARCOT
86-08-19 JD 231 12utc

20.AUGUST 1986

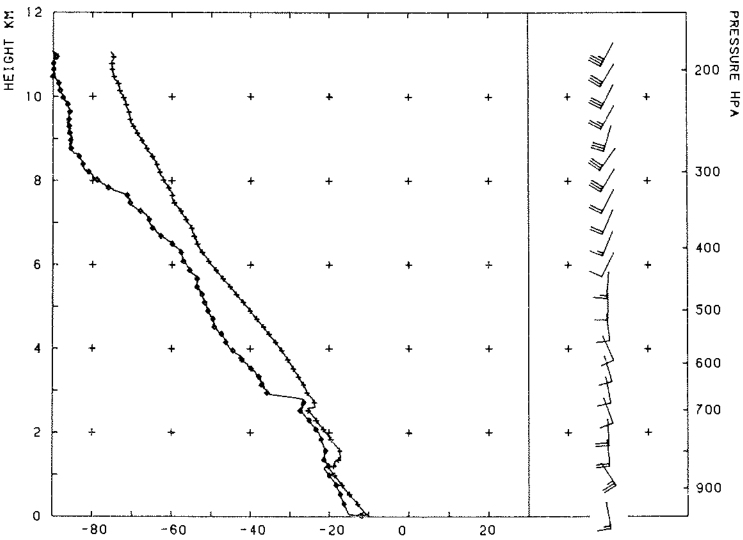
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
0	68.1S	2.1W	972.2	140	26	-15.6	-20.5	-1.8	9		4				10.00	02	/	/
6	68.0S	1.8W	973.0	160	33	-13.6	-19.2	-1.8	6	6	4	5	0	0	10.00	02	2	2
9	67.9S	1.9W	975.1	180	31	-15.5	-20.4	-1.8	3	3	5	5	0	0	10.00	01	2	2
12	67.7S	1.9W	976.2	170	32	-15.3	-20.8	-1.8	3	2	6	0	3	2	20.00	02	1	1
15	67.6S	2.0W	978.2	180	30	-13.0	-18.3	-1.8	8	6	6	5	/	/	20.00	02	1	1
18	67.6S	1.9W	980.2	200	20	-12.8	-17.4	-1.8	8	8	2	8	/	/	20.00	02	1	1

POLARSTERN 156 67.75S 1.96W 20/ 8/86 10:50

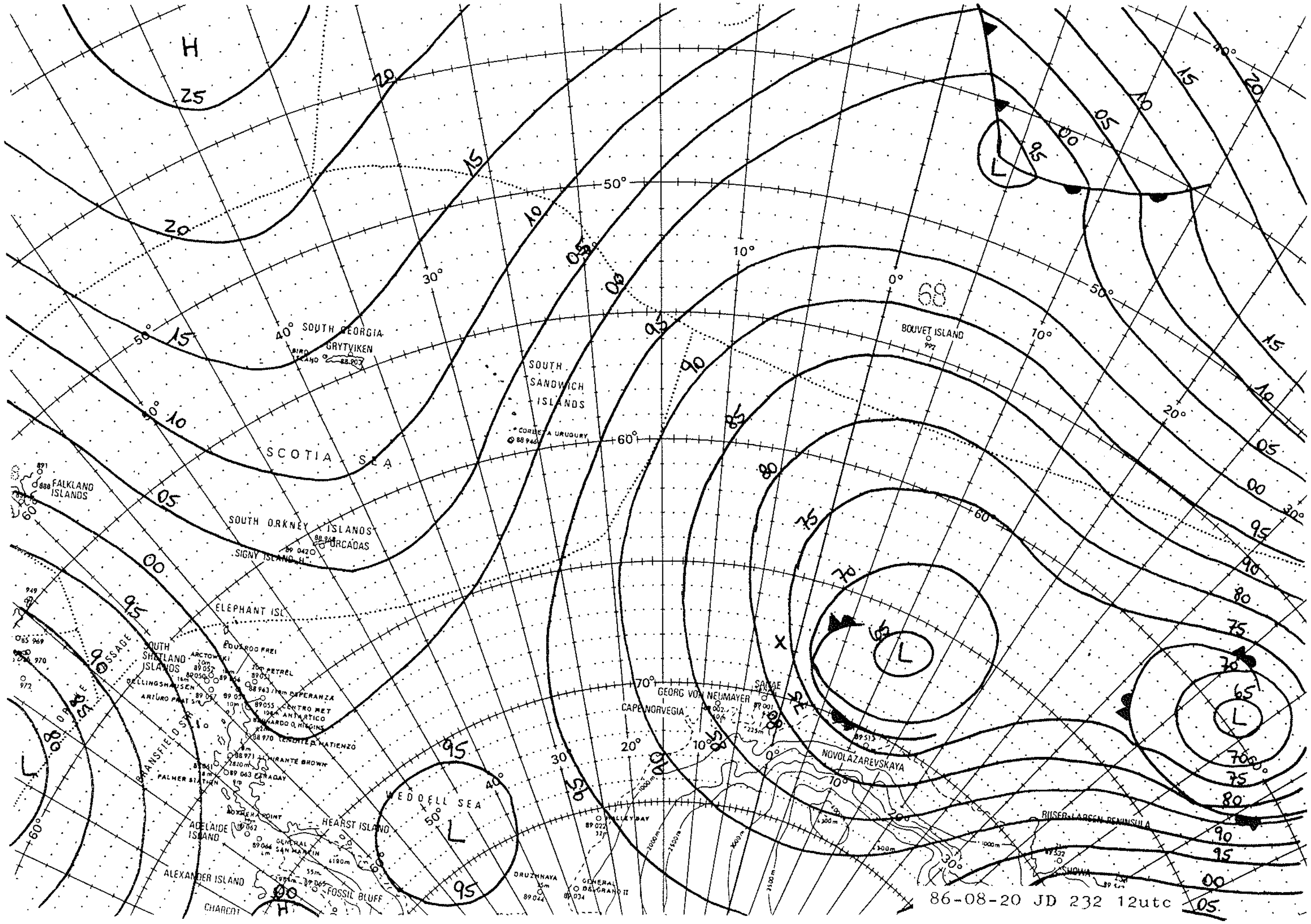


TEMPERATURE DEG C (+: AIR TEMP. ◊: DEW POINT)

POLARSTERN 158 67.58S 0.85W 20/ 8/86 23: 6



TEMPERATURE DEG C (+: AIR TEMP. ◊: DEW POINT)

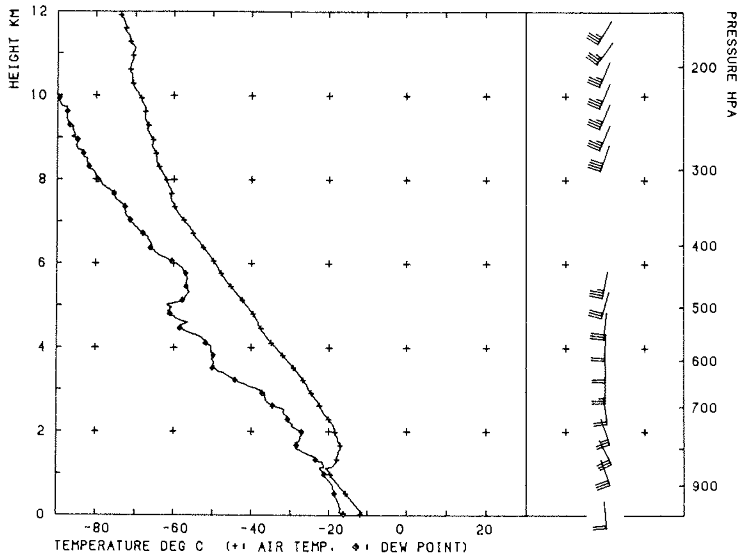


SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
BOUVET ISLAND
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
GEORG VON NEUMAYER
CAPE NORVEGIA
NOVOLAZAREVSKAYA
HALLEY BAY
DRUZHNAYA
SHOWA
86-08-20 JD 232 12utc

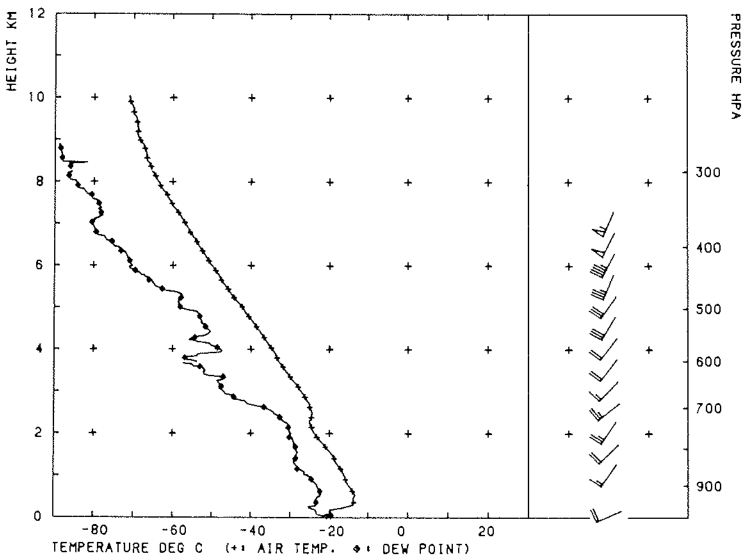
21.AUGUST 1986

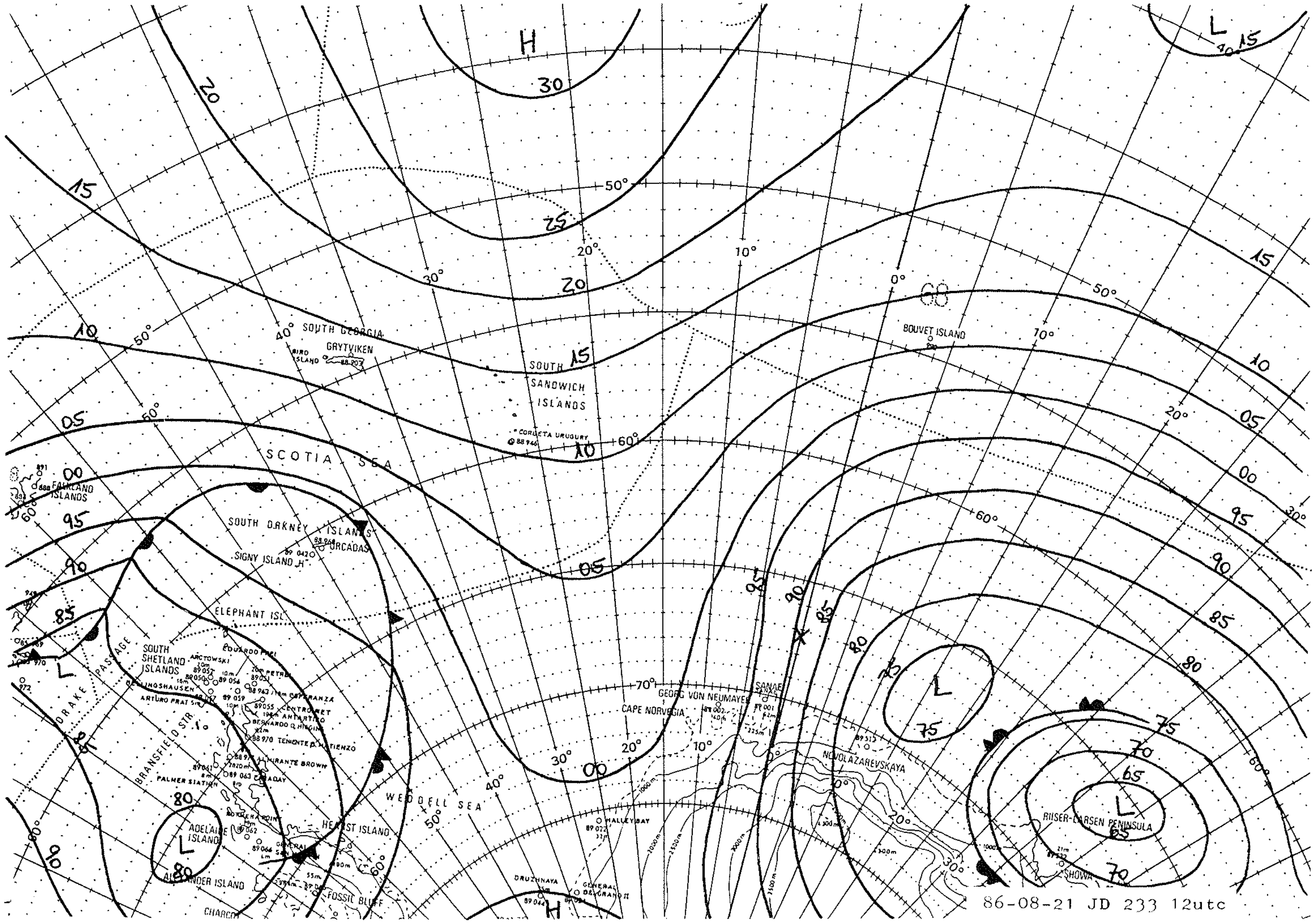
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	67.5S	.9W	985.9	160	20	-11.2	-15.4	-1.8	9		/				10.00	02	/	/
6	67.4S	.6W	987.1	190	20	-13.5	-17.8	-1.6	9		/				10.00	02	2	/
9	67.4S	.4W	989.0	170	22	-12.4	-16.9	-1.8	7	7	5	8	0	0	10.00	01	2	2
12	67.2S	.0W	989.8	180	25	-12.2	-16.1	-1.8	8	8	4	6	/	/	10.00	02	2	2
15	67.1S	.1W	992.0	200	18	-12.9	-17.0	-1.8	0		9				20.00	02	1	1
18	67.1S	.1W	994.0	200	19	-13.8	-17.5	-1.8	0		9				20.00	02	0	0

POLARSTERN 160 67.20S 0.02W 21/ 8/86 10:57



POLARSTERN 162 66.89S 0.64E 21/ 8/86 23:36

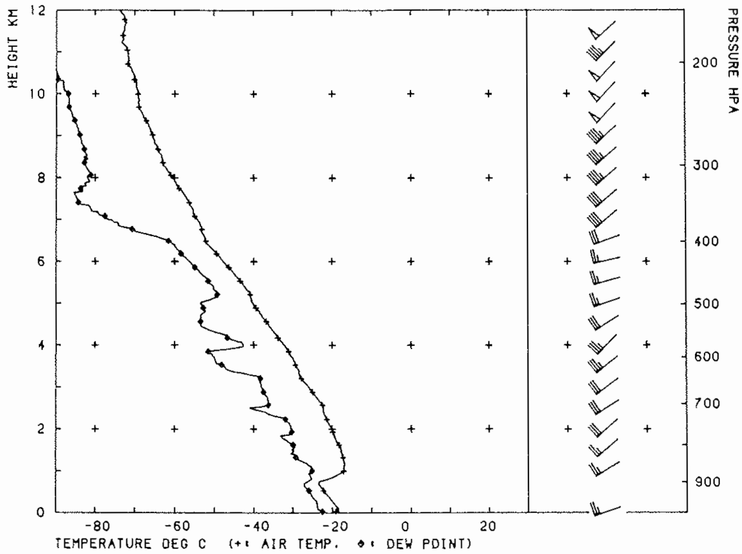



H
L
SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
FALKLAND ISLANDS
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HEARST ISLAND
WEDDELL SEA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO II
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-08-21 JD 233 12utc

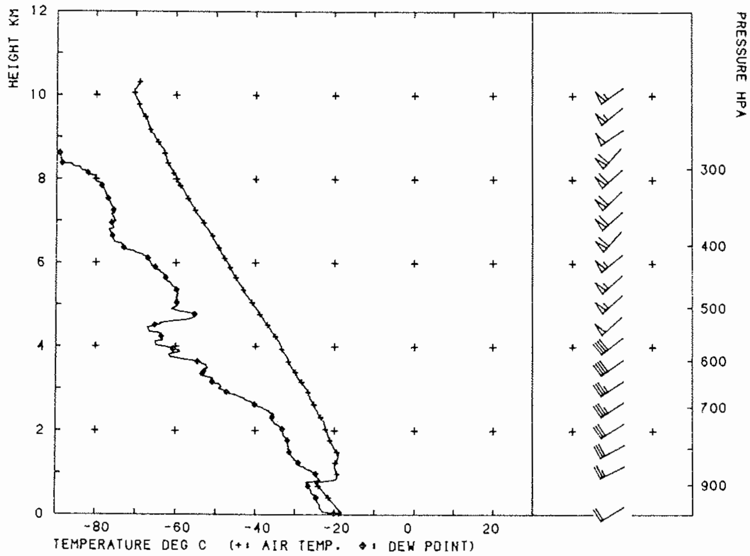
22.AUGUST 1986

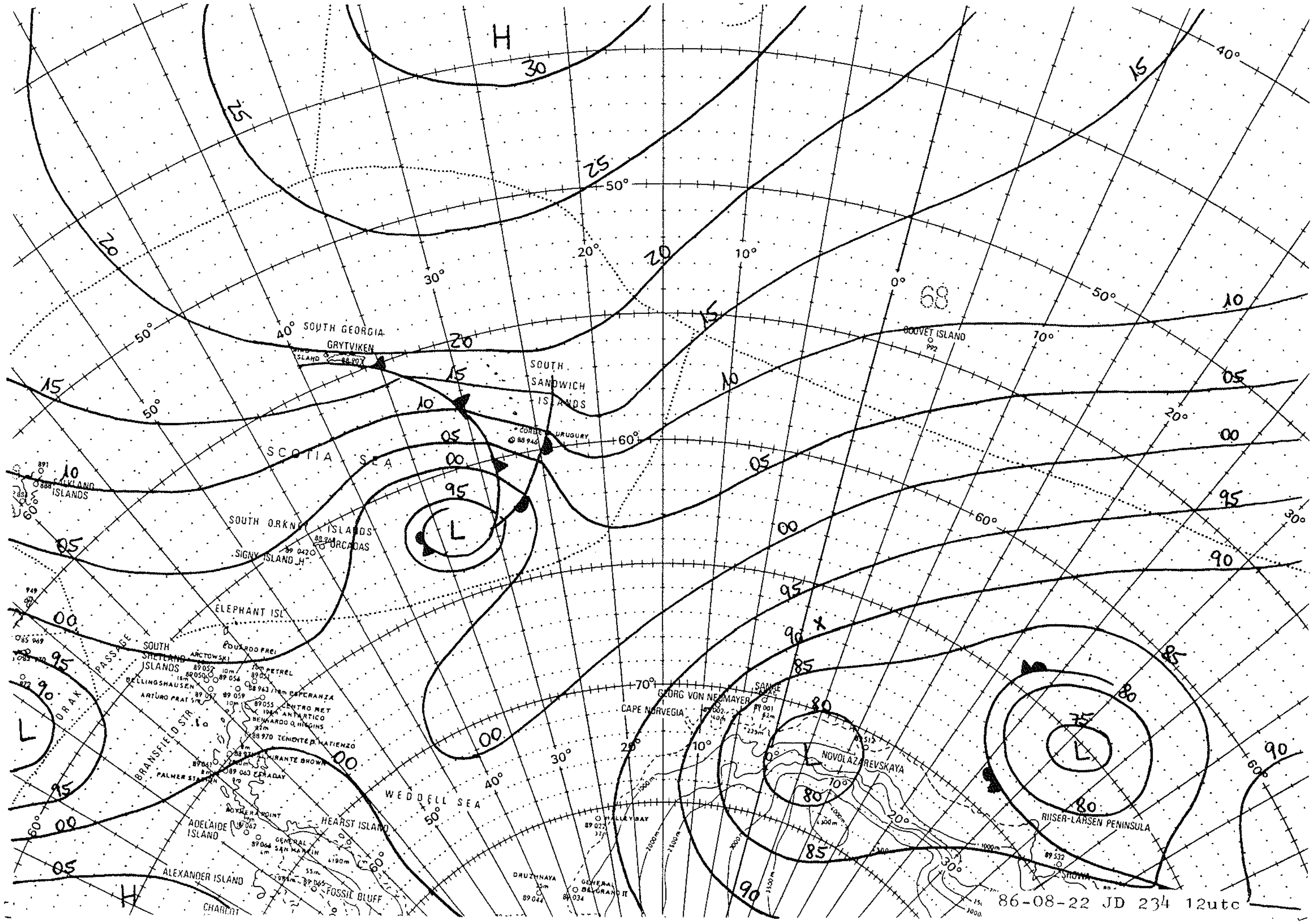
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	66.8S	.9E	994.9	240	24	-17.5	-21.6	-1.8	9		/				4.00	02	/	/
6	66.7S	1.1E	993.8	250	28	-17.5	-20.2	-1.8	9		/				4.00	71	7	2
9	66.6S	1.3E	993.2	250	26	-19.4	-23.1	-1.8	3	2	4	8	0	2	20.00	01	2	2
12	66.5S	1.5E	993.0	240	28	-18.9	-22.5	-1.8	6	6	3	8	0	0	2.00	02	1	1
15	66.4S	1.7E	992.8	240	27	-18.5	-22.0	-1.8	7	7	3	8	0	0	2.00	02	1	1
18	66.3S	1.9E	992.8	250	19	-17.7	-20.4	-1.8	8	8	3	8	/	/	4.00	02	2	2

POLARSTERN 164 66.50S 1.50E 22/ 8/86 11:13



POLARSTERN 166 66.09S 2.28E 22/ 8/86 23: 4

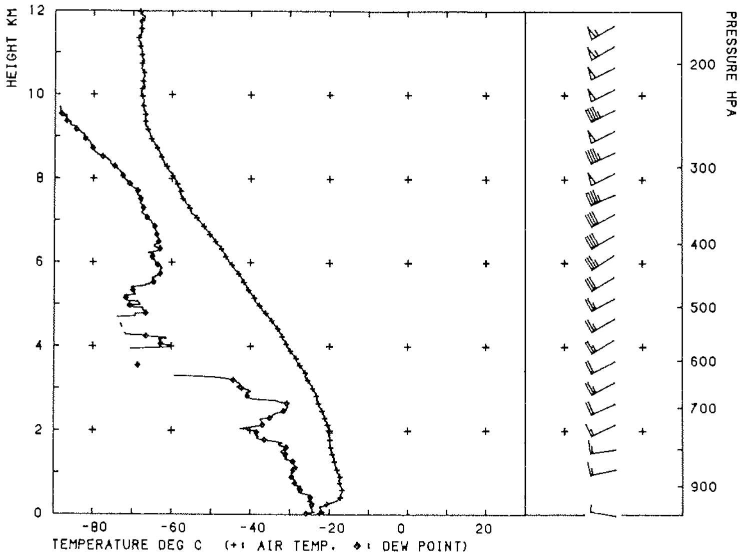



SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
FOSSIL BLUFF
WEDDELL SEA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO II
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SYOWA
BOUVET ISLAND
68
86-08-22 JD 234 12utc

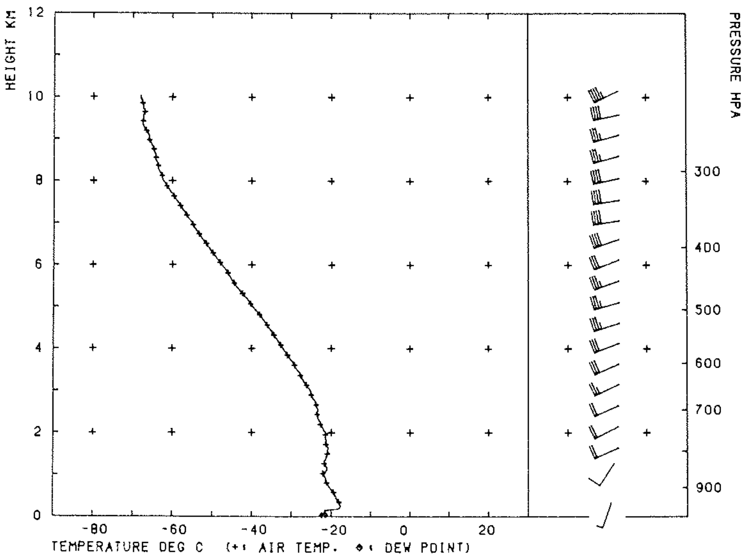
23. AUGUST 1986

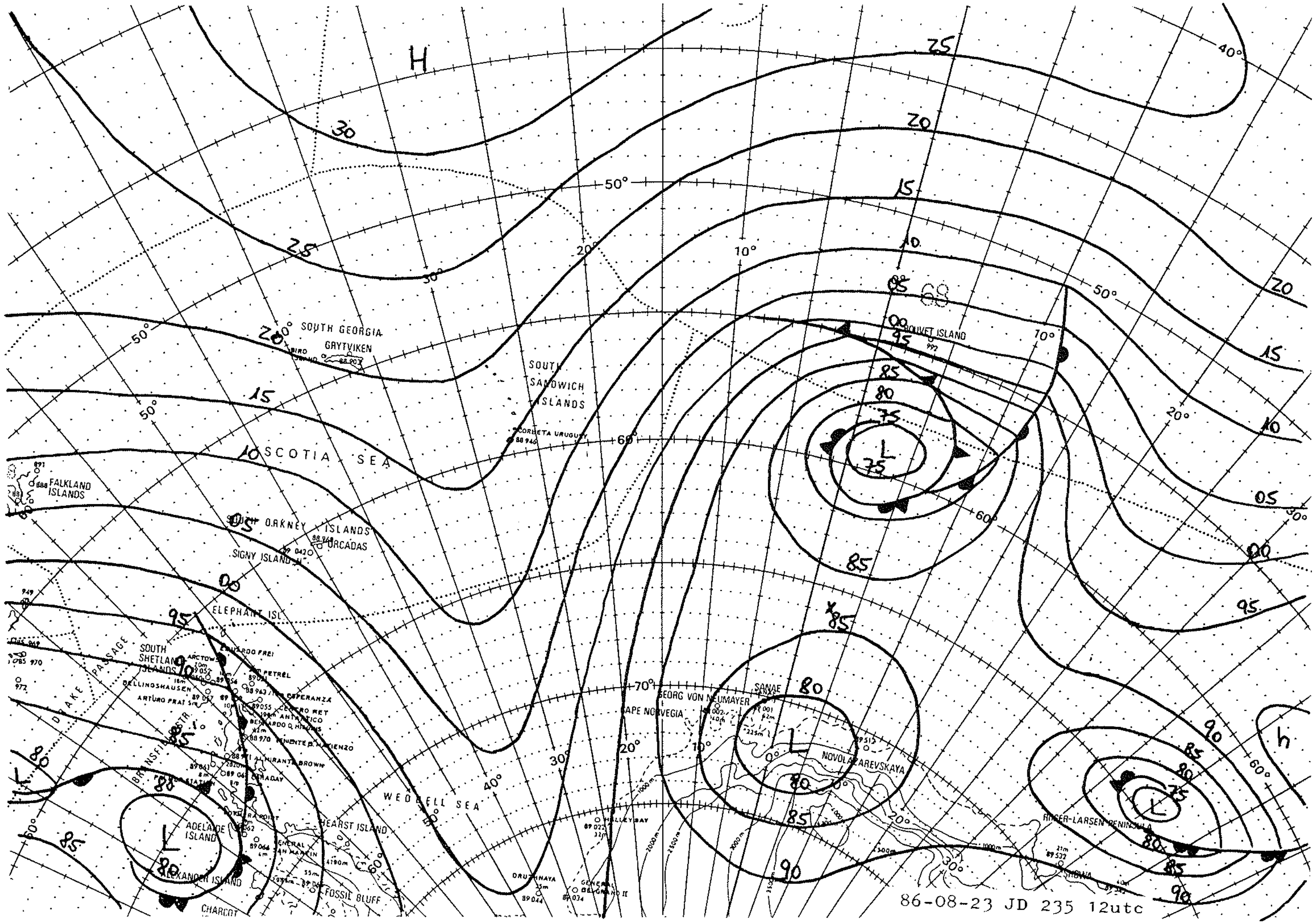
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	66.0S	2.5E	990.3	270	19	-20.1	-23.5	-1.8	9		/				10.00	02	/	/
6	65.9S	2.5E	989.2	290	11	-21.7	-25.1	-1.8	5	5	3	8	0	0	10.00	02	2	2
9	65.8S	2.5E	987.8	280	8	-22.4	-25.8	-1.8	1	0	9	0	0	2	20.00	02	1	1
12	65.8S	2.5E	987.0	270	4	-22.2	-24.0	-1.8	6	6	1	6	0	0	2.00	10	1	1
15	65.6S	2.6E	985.5	990	3	-21.4	-23.5	-1.8	6	6	1	6	0	0	2.00	10	2	2
18	65.5S	2.4E	986.0	990	4	-21.9	-23.5	-1.8	6	6	1	6	0	0	4.00	10	2	2

POLARSTERN 168 65.75S 2.50E 23/ 8/86 10:50



POLARSTERN 170 65.36S 2.54E 23/ 8/86 23: 6



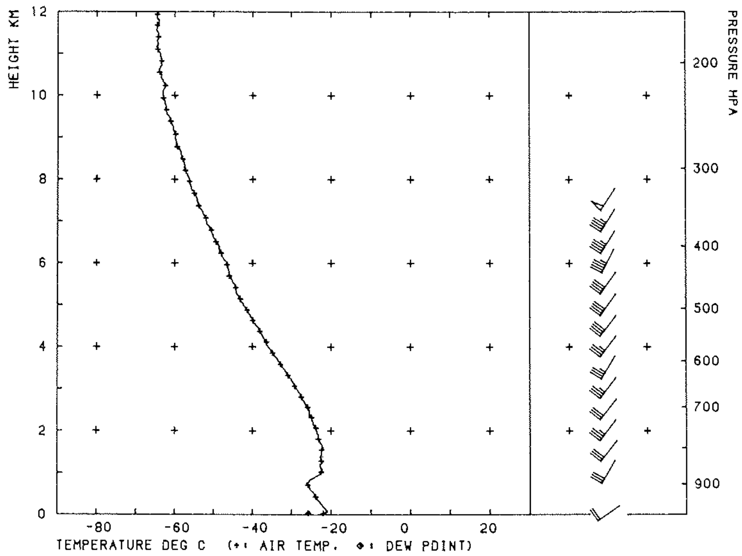


SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BOUVET ISLAND
WEDDELL SEA
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FOSSIL BLUFF
HALLEY BAY
RIISER-LARSEN PENINSULA
SHOWA
86-08-23 JD 235 12utc

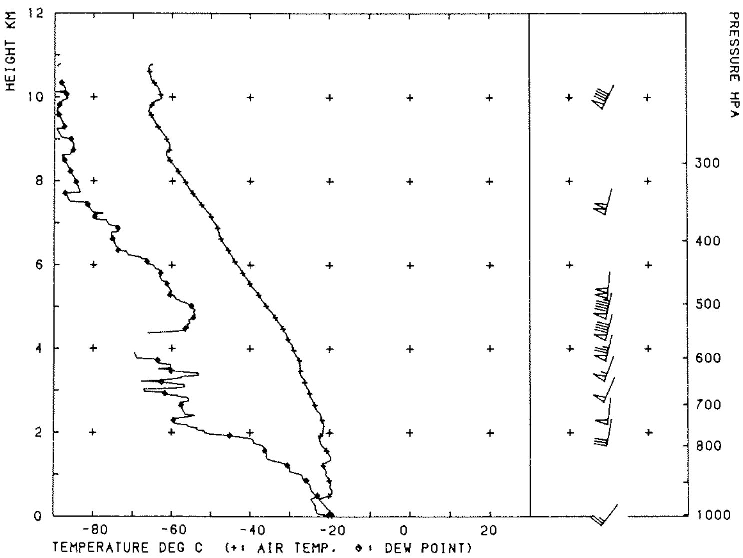
24.AUGUST 1986

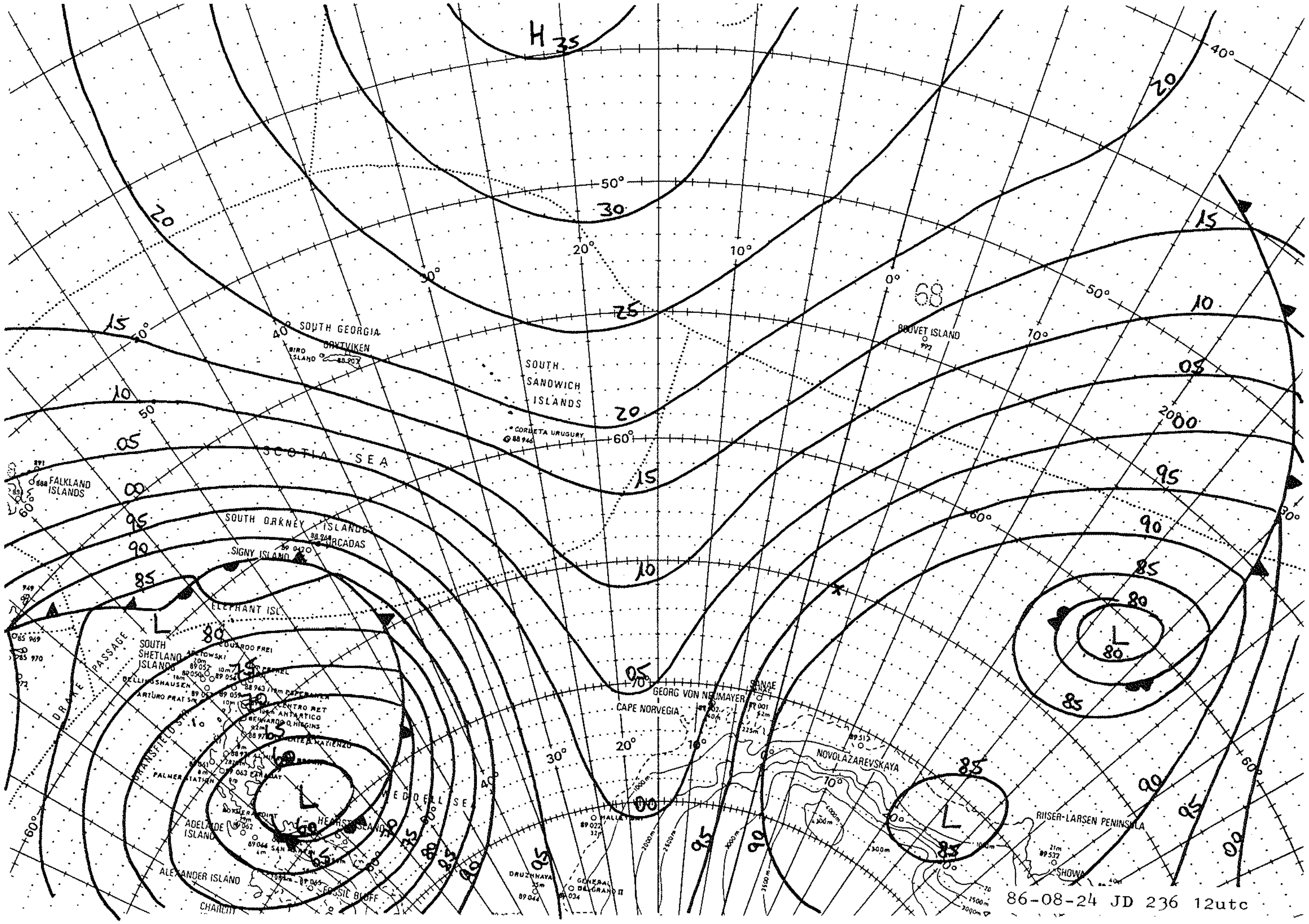
TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	65.1S	2.5E	989.8	240	7	-21.6	-24.3	-1.8	9		/				10.00	02	/	/
6	65.0S	2.5E	991.0	240	9	-18.1	-21.6	-1.8	9		/				10.00	02	2	2
9	64.9S	2.5E	993.0	230	16	-19.1	-22.8	-1.8	8	8	4	6	/	/	4.00	02	2	2
12	64.9S	2.5E	995.0	220	24	-21.5	-24.8	-1.8	7	7	4	8	0	0	20.00	02	2	2
15	64.8S	2.6E	995.9	220	27	-21.5	-24.8	-1.8	7	7	4	8	0	0	10.00	02	2	2
18	64.8S	2.8E	997.8	210	32	-19.1	-22.0	-1.8	9		/				10.00	02	2	2

POLARSTERN 172 64.90S 2.50E 24/ 8/86 10:57



POLARSTERN 174 64.63S 3.07E 24/ 8/86 23: 0



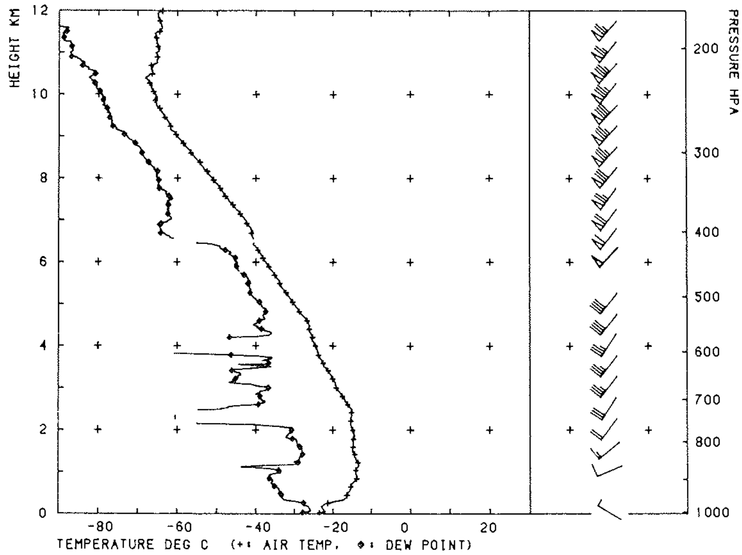


SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
CORBETA URUGUAY
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BELLINGSHAUSEN
ARTURO PRAT
ADELAIDE ISLAND
ALEXANDER ISLAND
PALMER STATION
WEDDELL SEA
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
HALLEY
DRUZHNAYA
GENERAL BELGRANO II
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-08-24 JD 236 12utc

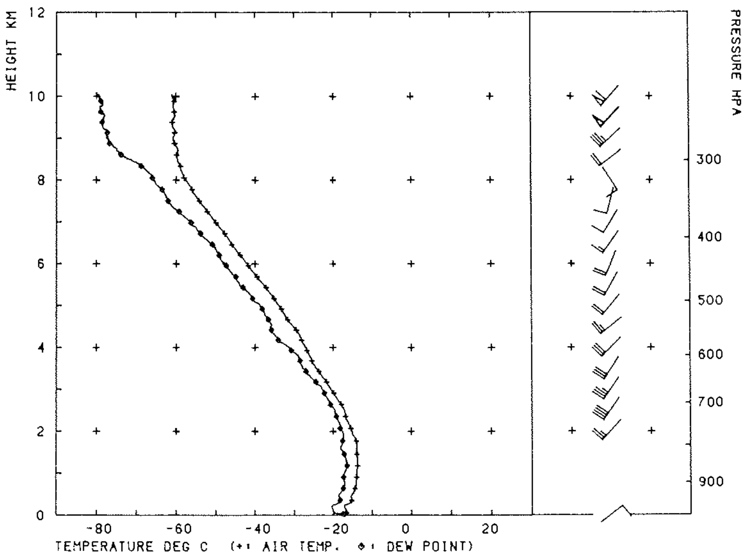
25.AUGUST 1986

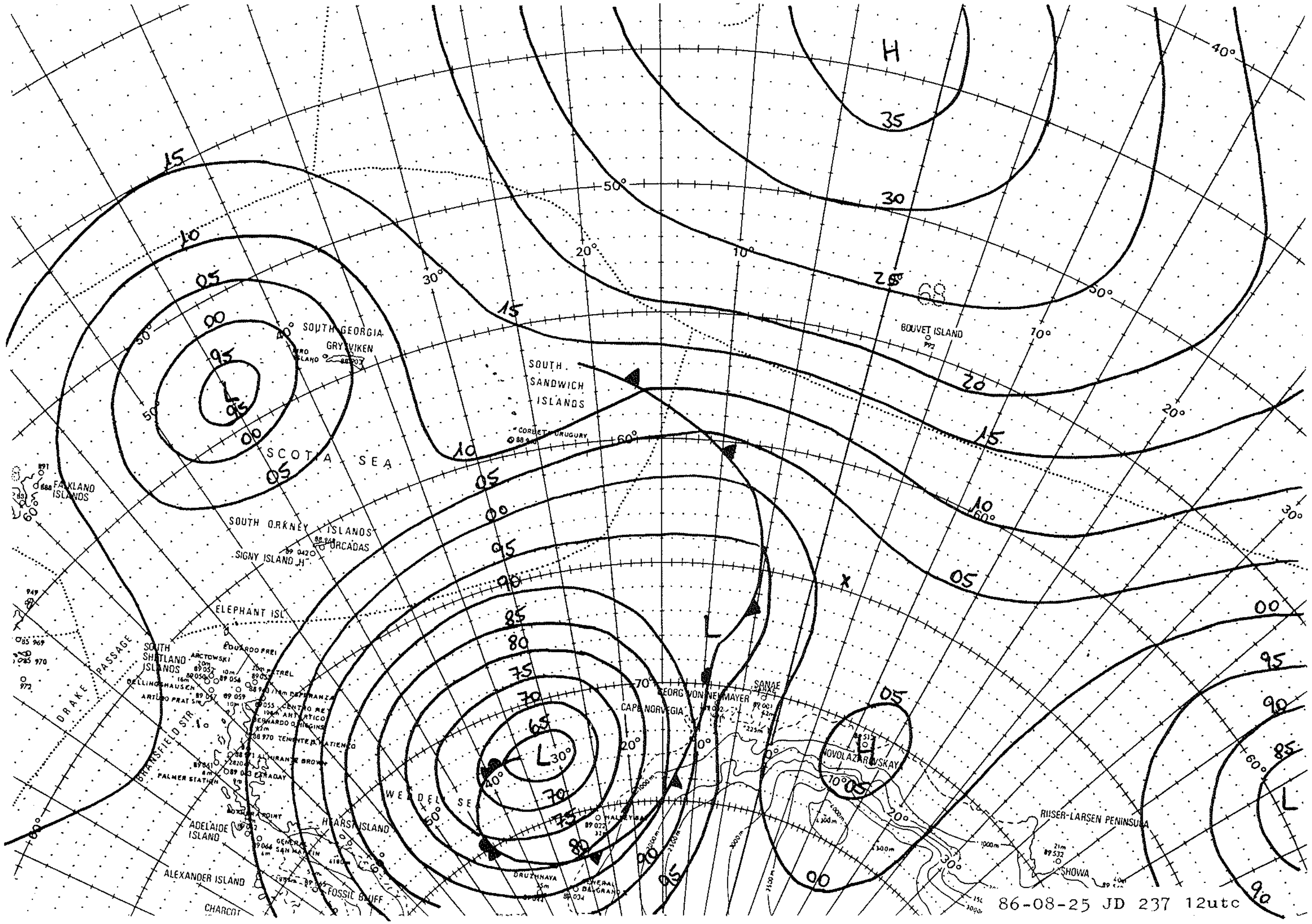
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	64.6S	3.1E	1006.2	240	15	-22.5	-25.0	-1.8	9		/				10.00	02	/	/
6	64.6S	3.1E	1006.3	260	13	-23.6	-27.2	-1.8	9		/				10.00	02	2	2
9	64.5S	3.2E	1005.3	280	9	-24.1	-27.8	-1.8	1	0	9	0	0	2	20.00	02	1	1
12	64.5S	3.2E	1003.9	310	8	-23.3	-28.2	-1.8	2	0	9	0	0	5	20.00	02	1	1
15	64.4S	3.1E	1001.3	330	10	-21.7	-25.0	-1.8	8	8	6	6	/	/	10.00	02	1	1
18	64.3S	2.8E	998.2	20	15	-19.3	-23.0	-1.8	8	8	2	6	/	/	2.00	71	7	1

POLARSTERN 176 64.50S 3.30E 25/ 8/86 10:44



POLARSTERN 178 64.23S 2.54E 25/ 8/86 23: 2

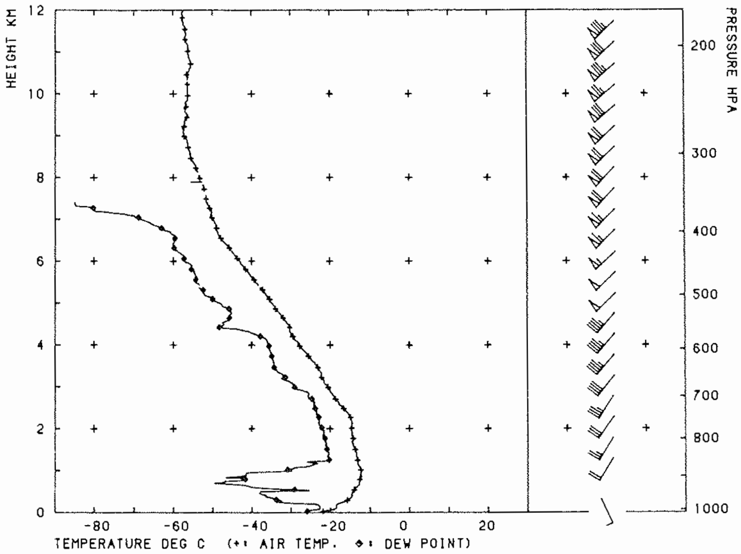



H
L
SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT
FOSSIL BLUFF
HEARST ISLAND
WEDDEL SEA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO
CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
BOUVET ISLAND
RIISER-LARSEN PENINSULA
SHOWA
86-08-25 JD 237 12utc

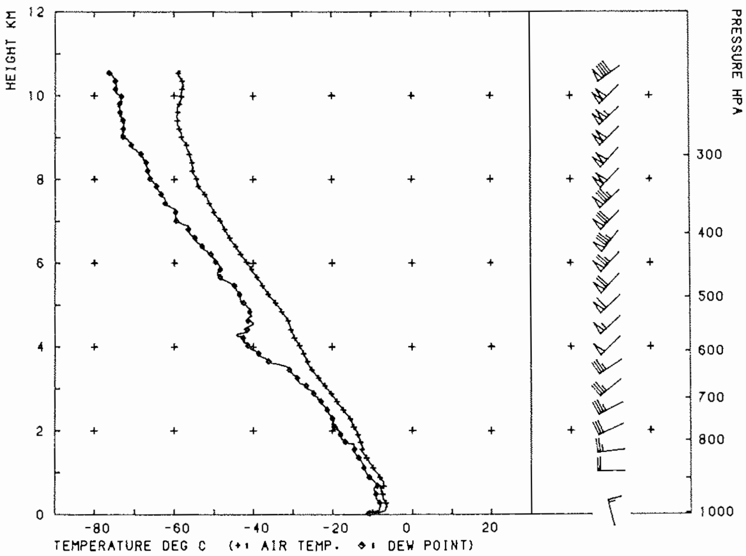
26. AUGUST 1986

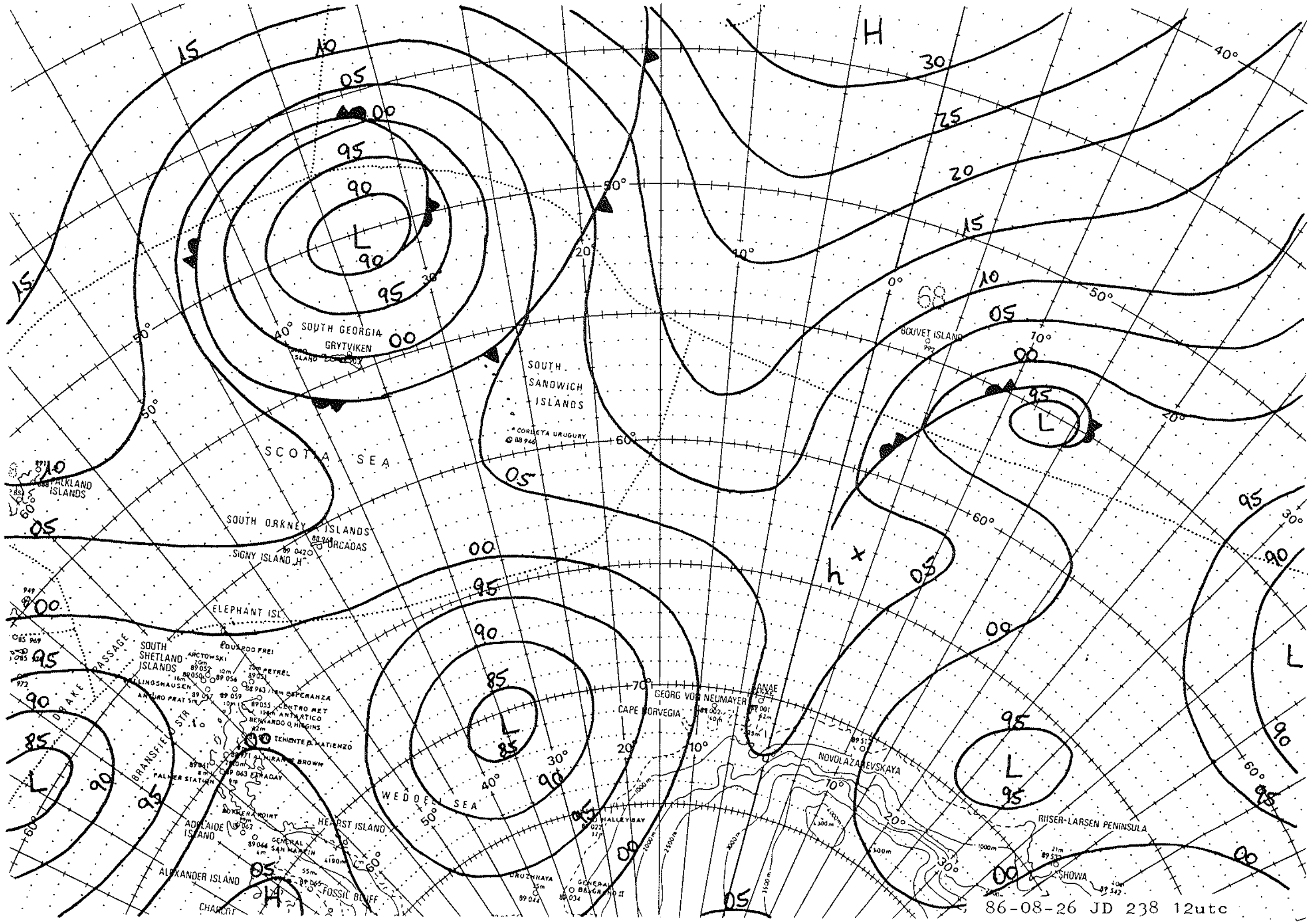
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	64.1S	2.1E	999.4	130	11	-17.8	-21.9	-1.8	9		/				10.00	02	7	/
6	64.0S	1.9E	1003.0	150	11	-19.5	-24.1	-1.8	9		/				20.00	02	7	2
9	63.9S	1.7E	1006.3	160	10	-21.2	-24.1	-1.8	0		9				20.00	02	1	1
12	63.8S	1.5E	1008.0	140	7	-21.3	-25.0	-1.8	0		9				20.00	02	1	0
15	63.6S	1.5E	1009.0	990	1	-19.6	-24.2	-1.8	1	0	9	0	0	2	20.00	02	0	0
18	63.6S	1.4E	1008.3	990	2	-18.4	-21.9	-1.8	7	7	4	8	0	0	20.00	03	0	0

POLARSTERN 180 63.85S 1.55E 26/ 8/86 10:43



POLARSTERN 182 63.65S 1.47E 26/ 8/86 23: 2

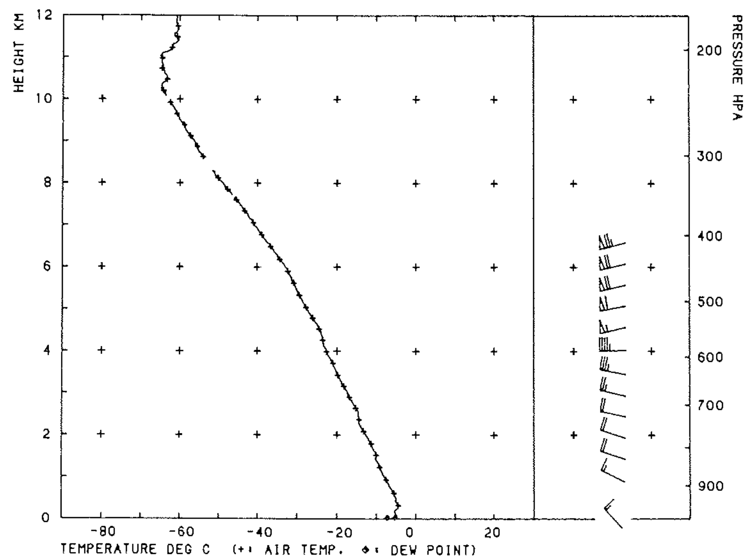



SOUTH GEORGIA
GRYTVIKEN
SOUTH SANDWICH ISLANDS
CORBETA URUGUAY
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
WEDDELL SEA
BOUVET ISLAND
GEORG VON NEUMAYER
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
HALLEY BAY
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
86-08-26 JD 238 12utc

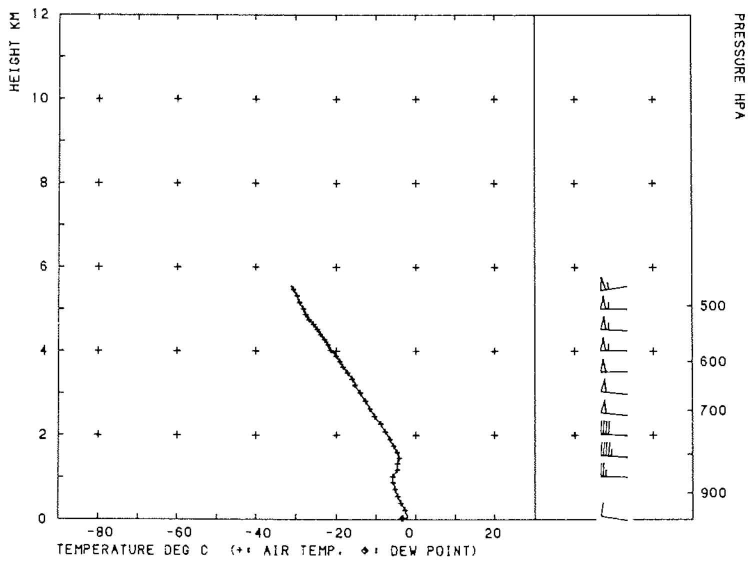
27.AUGUST 1986

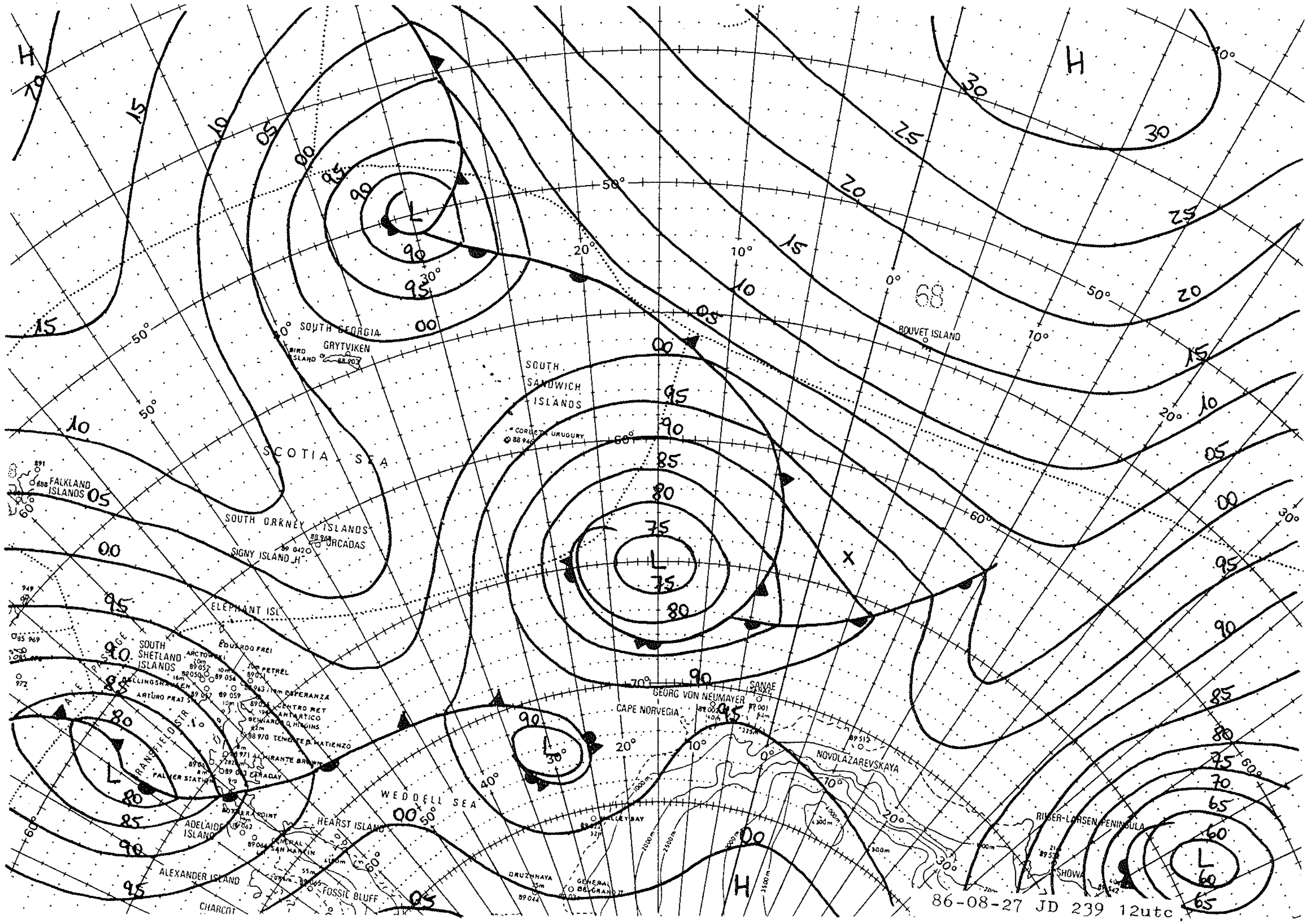
TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	63.5S	1.9E	1002.2	280	18	-6.6	-8.1	-1.8	9 /	2.00	71 / /
6	63.5S	2.3E	1000.3	300	13	-6.5	-8.0	-1.8	9 /	2.00	73 7 2
9	63.5S	2.3E	997.3	310	14	-5.5	-7.8	-1.8	8 8 1 6 / /	4.00	70 7 2
12	63.4S	2.7E	994.0	310	14	-5.4	-7.4	-1.8	8 8 1 6 / /	2.00	70 7 2
15	63.3S	3.1E	988.6	340	14	-5.7	-7.7	-1.8	8 8 2 6 / /	2.00	71 7 2
18	63.3S	3.1E	983.3	10	11	-5.9	-7.0	-1.8	8 8 1 6 / /	2.00	71 7 2

POLARSTERN 184 63.35S 2.65E 27/ 8/86 10:45



POLARSTERN 186 62.94S 3.51E 27/ 8/86 23:24



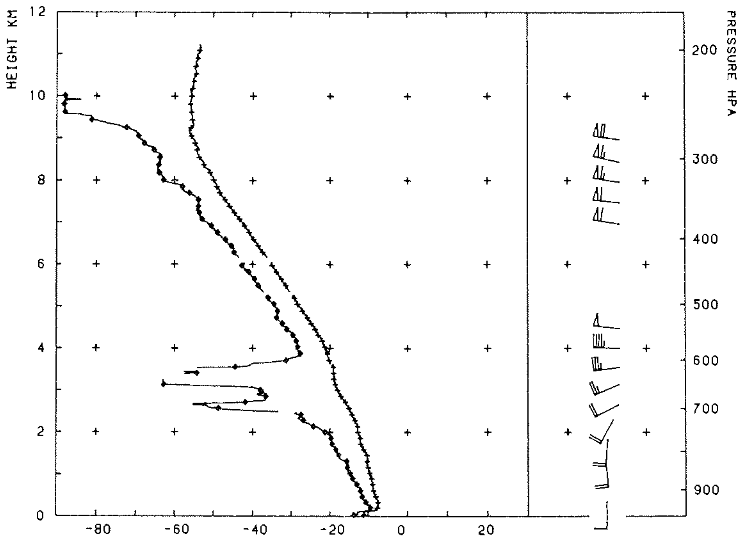


SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
BOUVET ISLAND
SCOTIA SEA
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RISER-LARSEN PENINSULA
SHOWA
DRUZHNAYA
86-08-27 JD 239 12utc

28.AUGUST 1986

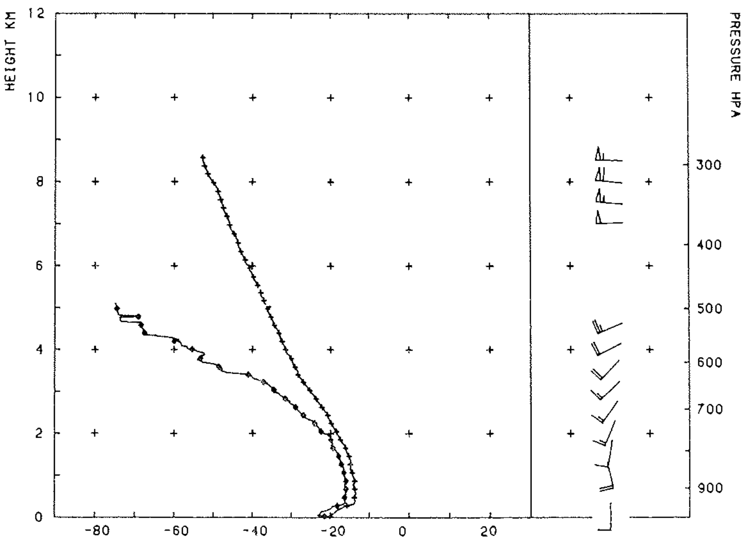
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	62.9S	3.6E	973.0	270	6	-2.7	-4.5	-1.8	9		/				4.00	02	7	/
6	62.9S	3.6E	974.0	180	11	-5.8	-7.5	-1.7	9		/				10.00	02	7	2
9	62.8S	3.7E	975.3	180	10	-10.3	-12.4	-1.7	7	5	4	8	0	2	20.00	02	2	2
12	62.8S	3.7E	977.0	170	9	-11.3	-12.7	-1.7	6	5	1	6	0	2	2.00	10	2	2
15	62.7S	3.7E	979.1	170	10	-13.6	-15.7	-1.7	7	6	2	6	0	2	10.00	02	2	2
18	62.6S	3.9E	981.8	170	14	-14.4	-16.1	-1.8	8	8	1	6	/	/	2.00	71	7	2

POLARSTERN 188 62.75S 3.70E 28/ 8/86 10:48

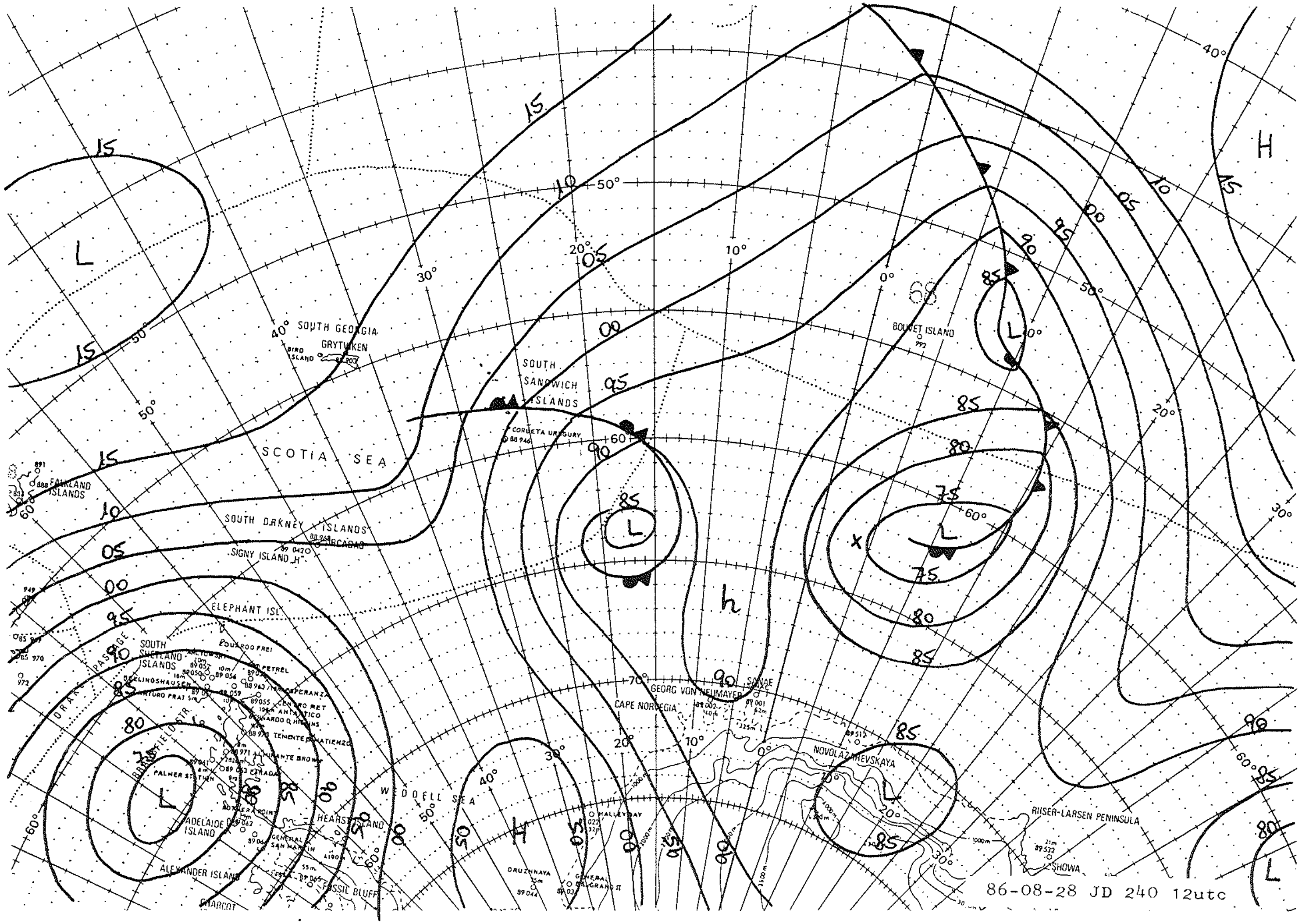


TEMPERATURE DEG C (+: AIR TEMP. ◆: DEW POINT)

POLARSTERN 190 62.51S 4.12E 28/ 8/86 23:17



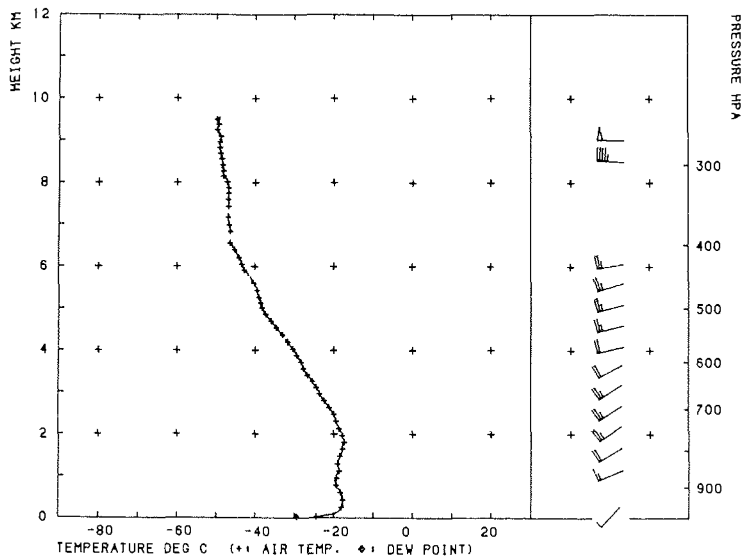
TEMPERATURE DEG C (+: AIR TEMP. ◆: DEW POINT)


SCOTIA SEA
SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SOUTH SANDWICH ISLANDS
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
FOSSIL BLUFF
CHARCOT
WEDDELL SEA
HALLEY BAY
DRUZHNAYA
BOUVET ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-08-28 JD 240 12utc

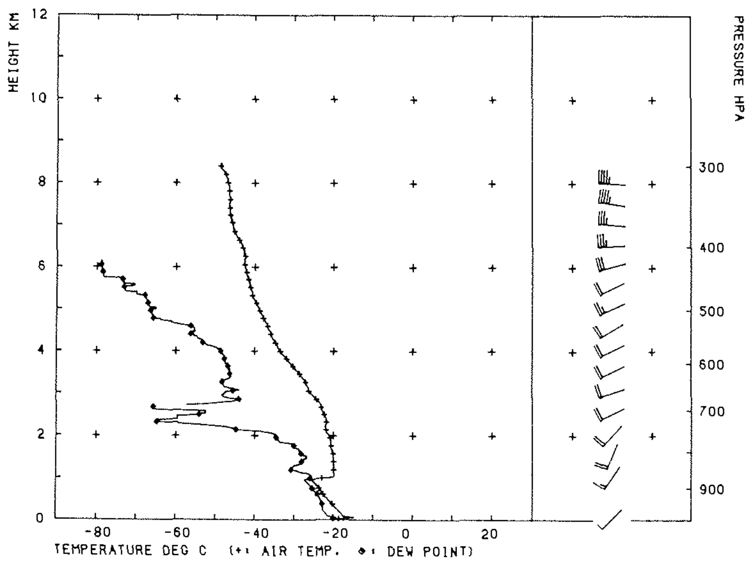
29.AUGUST 1986

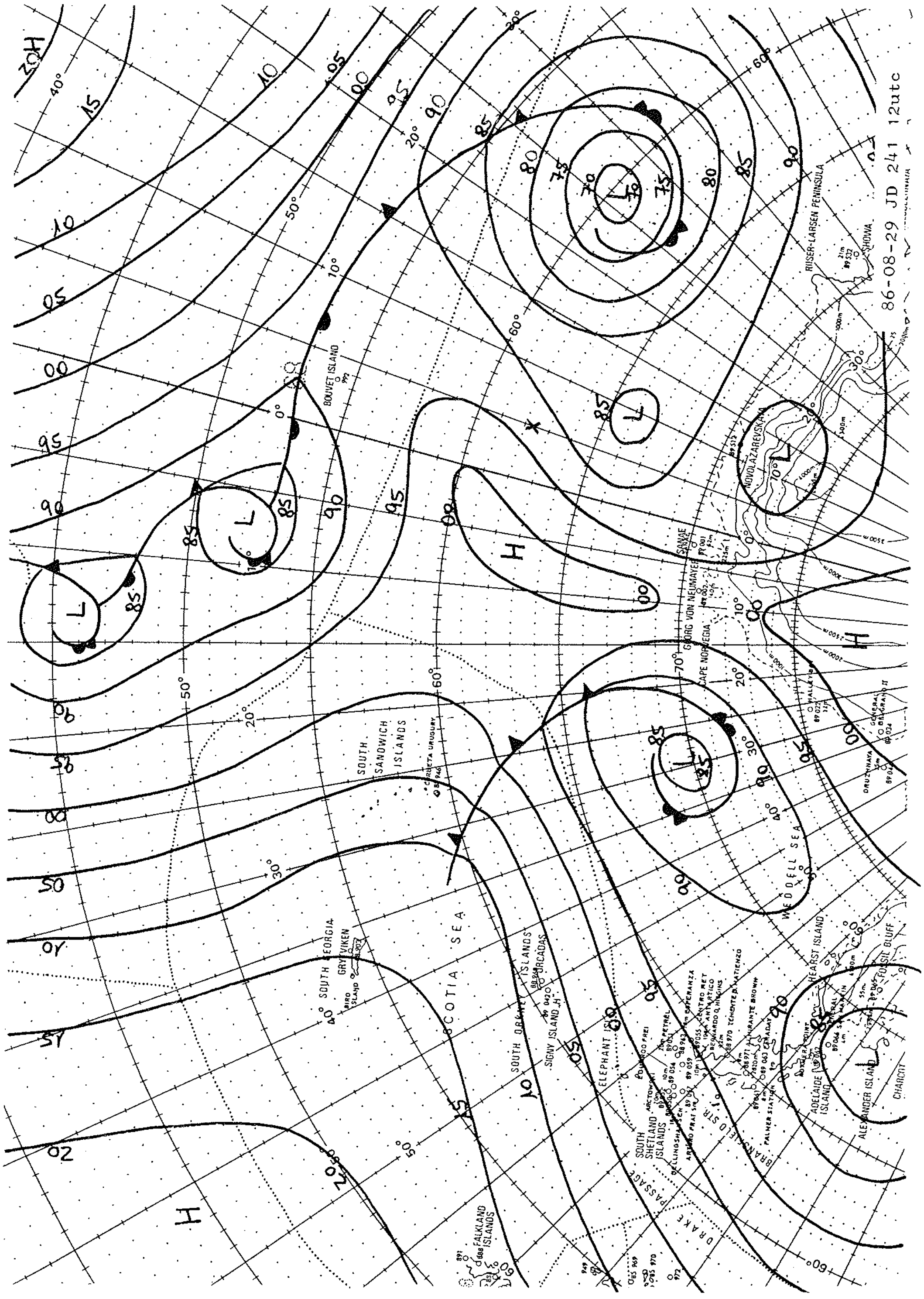
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	62.4S	4.5E	989.2	200	11	-22.8	-27.3	-1.8	9		/				10.00	02	/	/
6	62.2S	4.8E	991.0	210	10	-25.0	-29.0	-1.8	9		/				10.00	02	2	2
9	62.2S	4.8E	992.2	230	6	-26.6	-30.7	-1.8	0		9				20.00	02	0	0
12	62.2S	4.8E	993.9	220	6	-23.4	-28.1	-1.8	0		9				20.00	02	0	0
15	62.1S	5.2E	994.3	220	6	-21.0	-26.1	-1.8	5	4	2	8	0	2	10.00	03	7	1
18	62.1S	5.4E	995.0	230	5	-20.2	-23.3	-1.8	8	8	3	6	/	/	10.00	02	7	1

POLARSTERN 192 62.21S 4.80E 29/ 8/86 10:45



POLARSTERN 194 61.97S 5.68E 29/ 8/86 23: 9

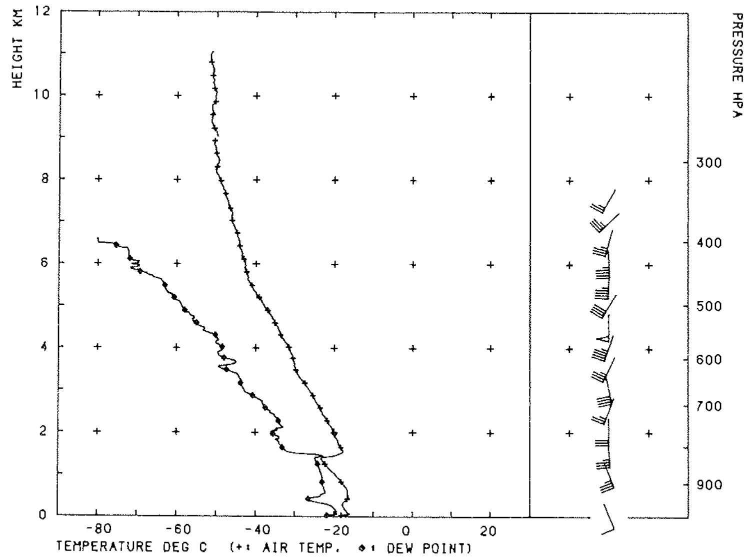



86-08-29 JD 241 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ELEPHANT ISLAND
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
WEDDELL SEA
ADELAIDE ISLAND
ALEXANDER ISLAND
RIISER-LARSEN PENINSULA
NOVOLAZAREVSKAYA
SHOWA

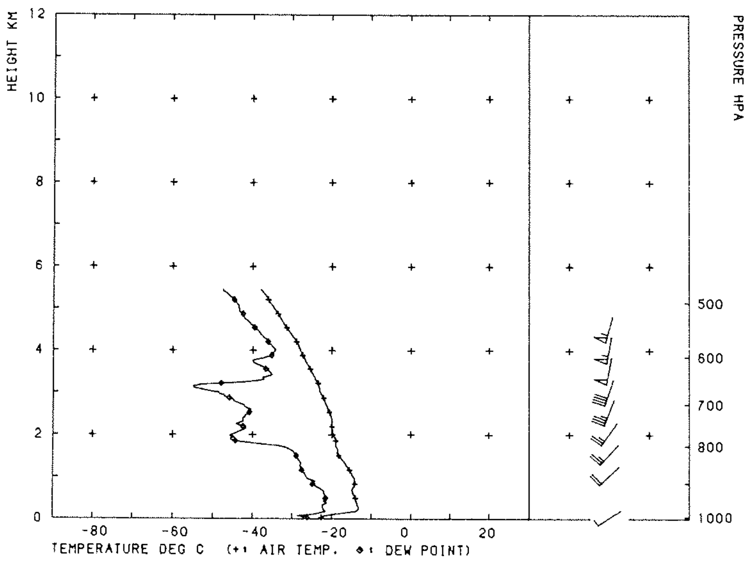
30.AUGUST 1986

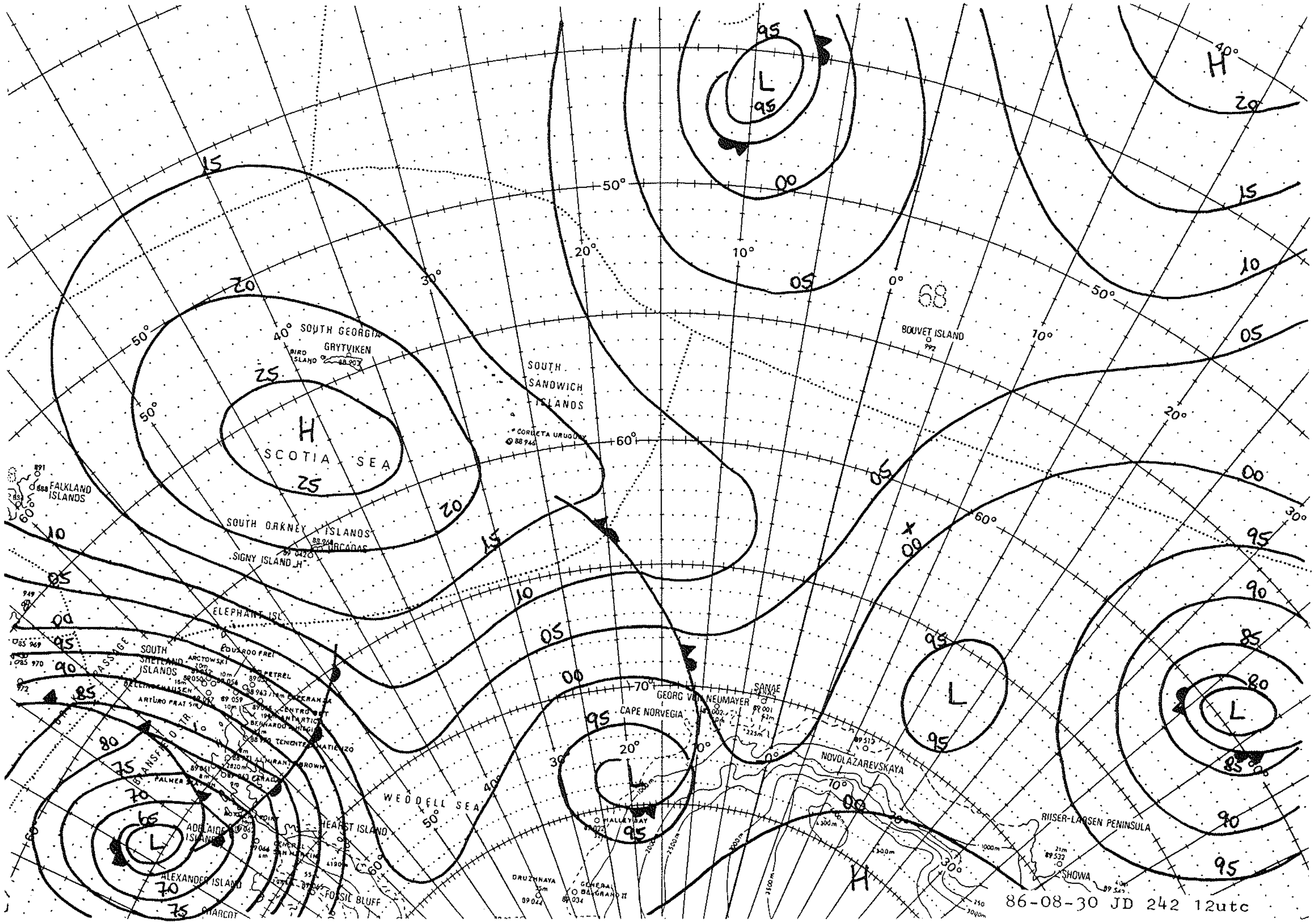
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	61.7S	6.2E	996.2	220	14	-17.9	-21.3	-1.8	9		/				10.00	02	/	/
6	61.5S	6.7E	997.9	210	14	-18.6	-22.2	-1.8	8		/				10.00	02	2	2
9	61.4S	7.0E	999.0	190	9	-20.5	-23.6	-1.8	4	4	4	8	0	0	20.00	02	1	1
12	61.5S	6.5E	1001.0	170	9	-16.2	-19.9	-1.8	8	8	1	6	/	/	2.00	10	7	1
15	61.5S	6.5E	1002.3	200	7	-14.5	-18.5	-1.8	7	7	3	8	0	0	20.00	02	2	2
18	61.5S	6.5E	1004.0	180	10	-19.3	-23.0	-1.8	0		9				20.00	02	1	1

POLARSTERN 196 61.50S 6.55E 30/ 8/86 10:47



POLARSTERN 198 61.50S 6.60E 30/ 8/86 22:48



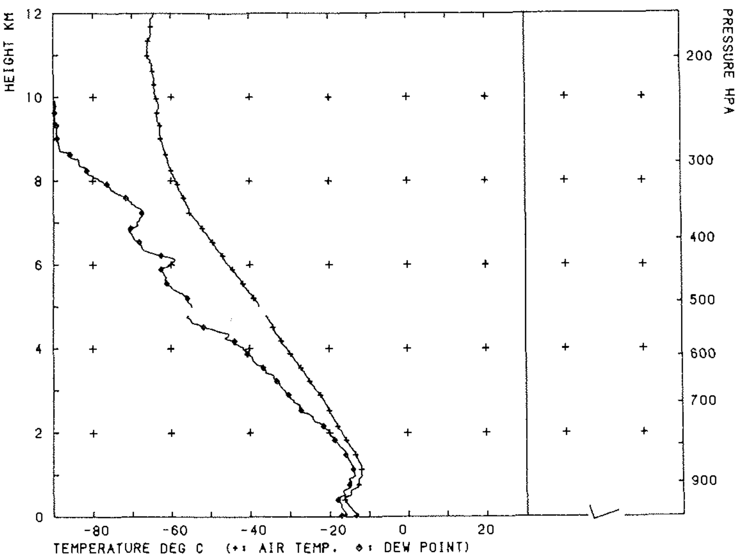


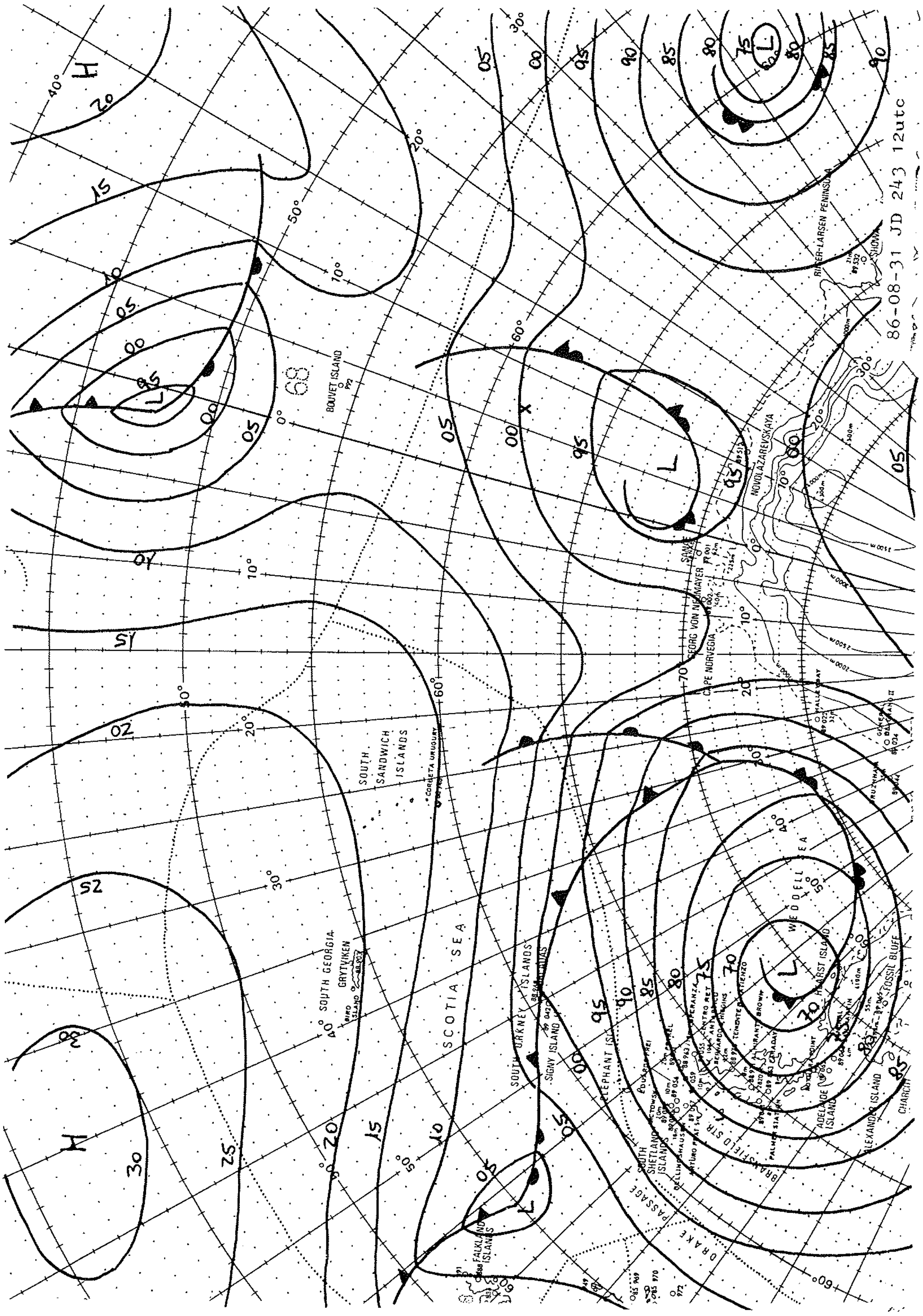
SOUTH GEORGIA
GRYTVIKEN
BIRD ISLAND
SCOTIA SEA
SOUTH SANDWICH ISLANDS
FALKLAND ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
BOUVET ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
WEDDELL SEA
HALLEY BAY
DRUZHNAYA
GENERAL BELGRANO II
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
CHARCOT
PALMER STATION
ARCTOWSKI
BELLINGSHAUSEN
ARTURO PRAT
ESPERANZA
68
86-08-30 JD 242 12utc

31.AUGUST 1985

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	61.5S	6.6E	1005.0	260	6	-20.1	-24.5	-1.8	9		/				10.00	02	7	2
6	61.5S	6.6E	1003.2	260	9	-18.8	-23.2	-1.8	9		/				10.00	70	7	2
9	61.5S	6.6E	1001.7	300	9	-16.6	-20.4	-1.8	7	7	4	8	0	0	20.00	02	7	2
12	61.5S	6.7E	1000.3	240	12	-13.9	-17.7	-1.8	8	8	3	8	/	/	10.00	02	7	2
15	61.5S	6.7E	998.8	230	12	-15.0	-19.1	-1.8	8	8	3	6	/	/	10.00	02	7	2
18	61.5S	6.8E	997.4	240	15	-15.3	-18.8	-1.8	8	8	3	6	/	/	10.00	02	7	2

POLARSTERN 200 61.50S 6.70E 31/ 8/86 10:52

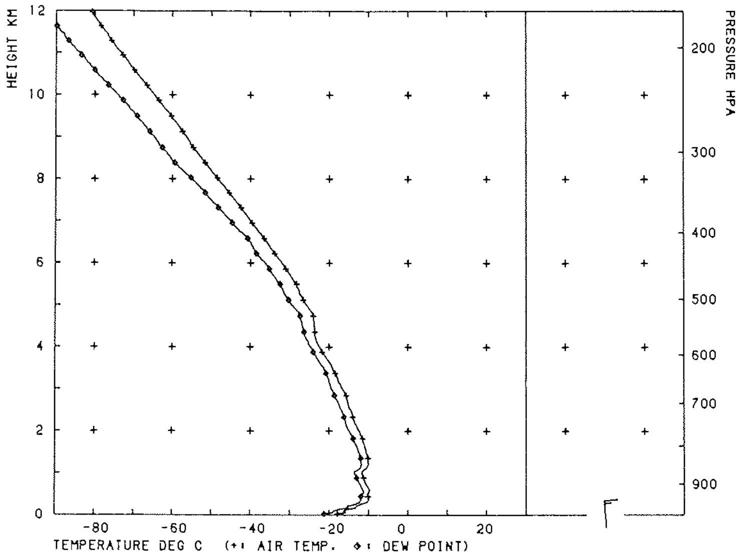



86-08-31 JD 243 12utc
SCOTIA SEA
WEDDELL SEA
SOUTH GEORGIA
GRYTVIKEN
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
FALKLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
HALLEY BAY
GEORG VON NEUMAYER
CAPE NORVEGIA
SANAE
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SYOWA

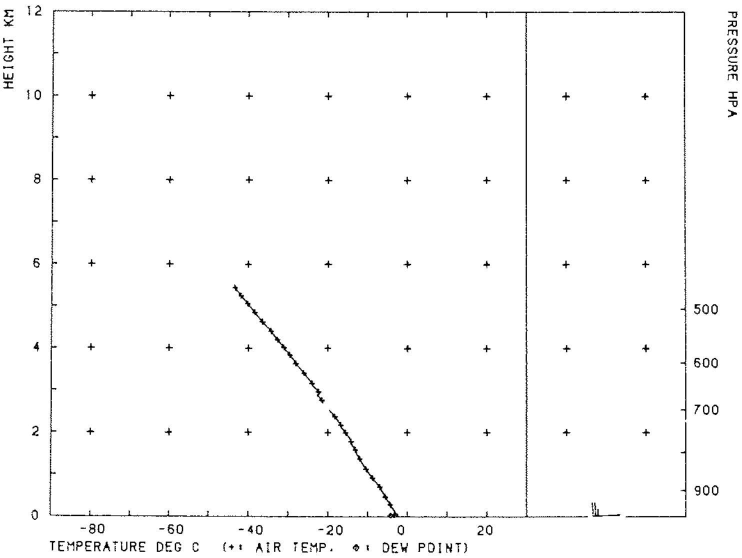
1.SEPTEMBER 1986

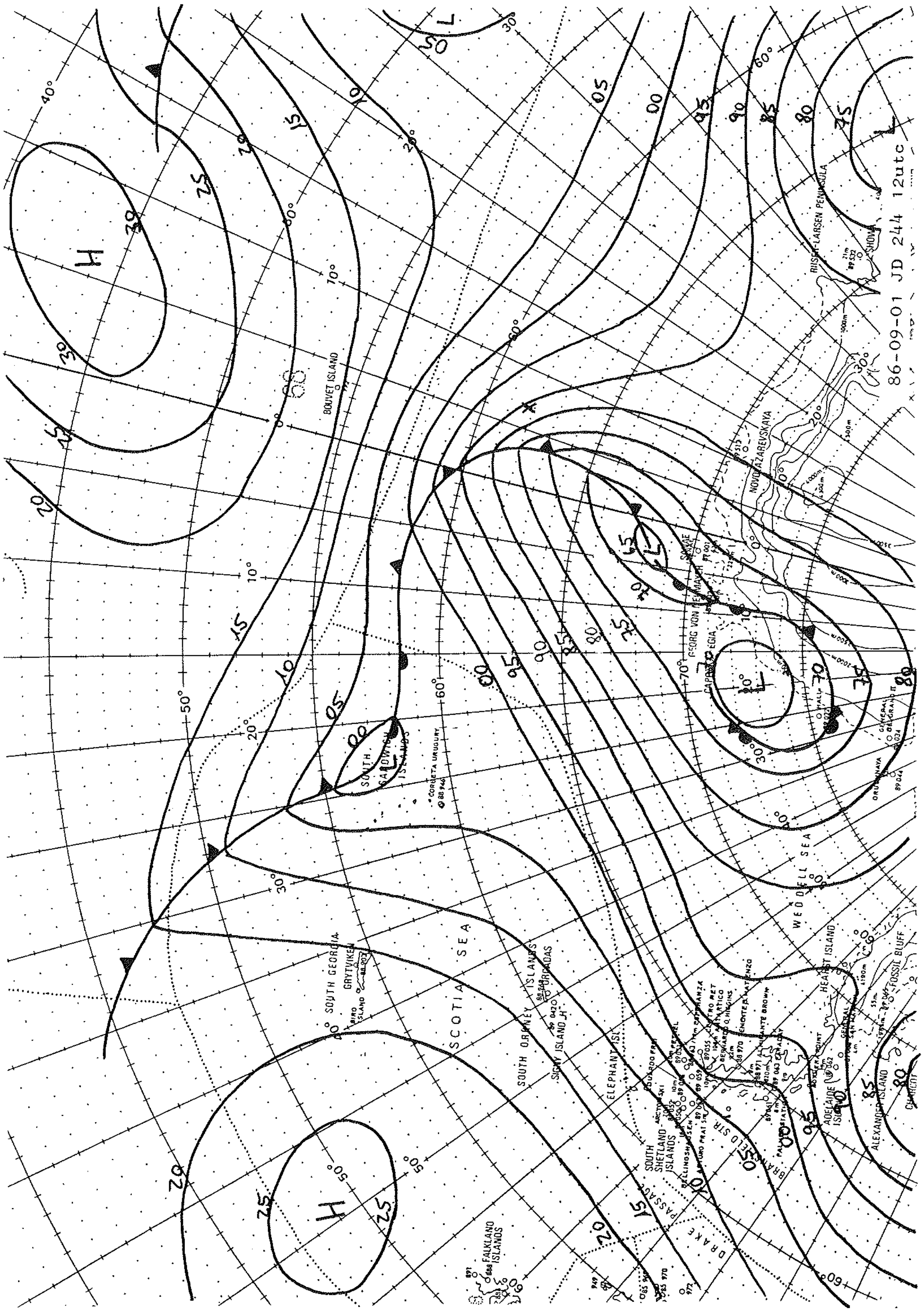
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	61.4S	6.9E	997.3	220	11	-18.3	-21.8	-1.8	9		/				10.00	02	7	2
6	61.4S	6.9E	997.3	250	10	-20.8	-23.9	-1.8	4	4	2	8	0	0	10.00	02	7	2
9	61.4S	6.9E	995.0	310	8	-20.8	-24.8	-1.8	3	3	3	6	1	/	10.00	02	2	2
12	61.4S	6.9E	989.2	360	16	-16.2	-19.3	-1.8	8	8	2	6	/	/	4.00	10	2	2
15	61.4S	6.9E	981.9	340	18	-7.6	-11.2	-1.8	8	8	3	6	/	/	2.00	10	7	2
18	61.5S	7.0E	976.3	290	26	-3.5	-4.8	-1.8	8	8	2	6	/	/	1.00	71	7	2

POLARSTERN 204 61.40S 6.90E 1/ 9/86 10:48



POLARSTERN 206 61.46S 7.13E 1/ 9/86 23: 3

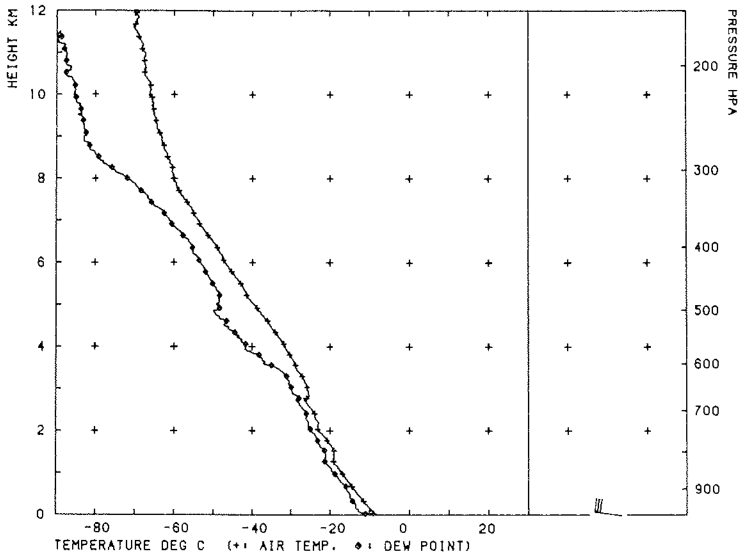



86-09-01 JD 244 12utc
BOUVET ISLAND
SOUTH GEORGIA
GRYTVIKEN
SCOTIA SEA
SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
ORCADAS
SIGNY ISLAND
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
GEORG VON NEUMAYER
SANAE
H
L

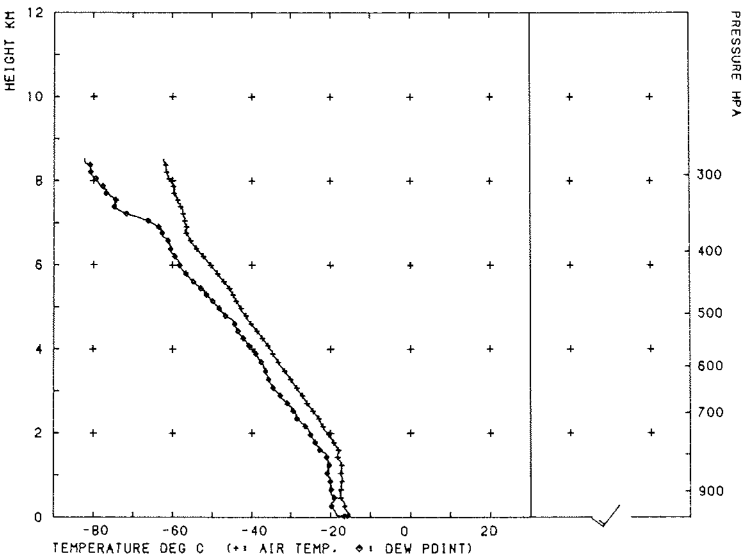
2.SEPTEMBER 1986

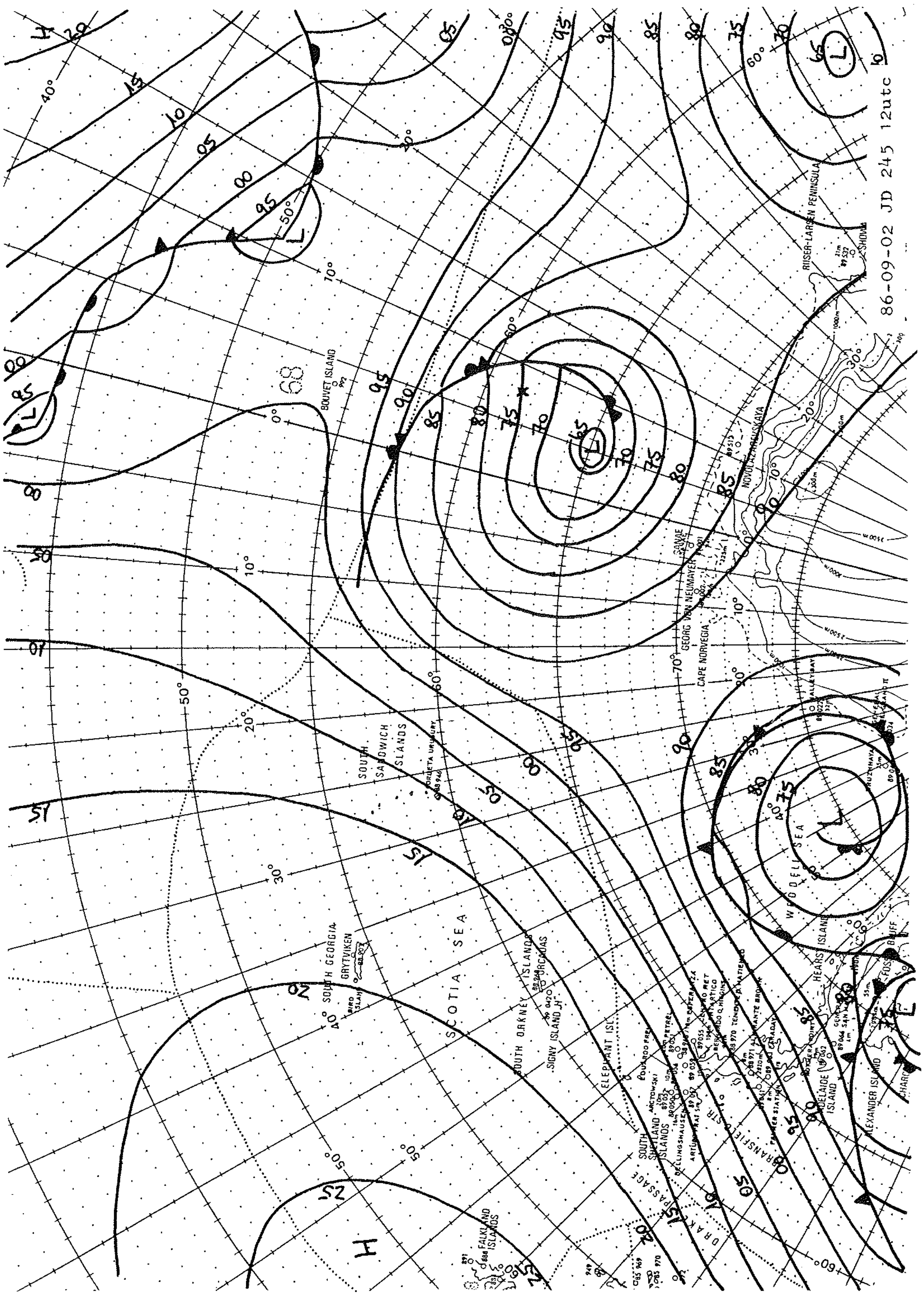
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	61.4S	7.2E	975.0	270	26	-3.5	-5.4	-1.8	9		/				10.00	02	2	2
6	61.4S	7.2E	975.8	270	30	-4.3	-6.4	-1.8	9		/				10.00	02	2	2
9	61.4S	7.3E	975.0	260	30	-6.5	-8.3	-1.8	8	8	2	6	/	/	2.00	71	7	2
12	61.4S	7.4E	975.0	240	27	-11.5	-13.8	-1.8	8	8	2	6	/	/	2.00	71	7	1
15	61.4S	7.4E	974.0	250	18	-13.7	-15.8	-1.8	8	8	3	6	/	/	2.00	10	7	2
18	61.4S	7.4E	973.3	280	26	-16.7	-19.9	-1.8	8	8	3	6	/	/	4.00	02	7	2

POLARSTERN 208 61.40S 7.35E 2/ 9/86 10:48



POLARSTERN 210 61.37S 7.51E 2/ 9/86 23: 6

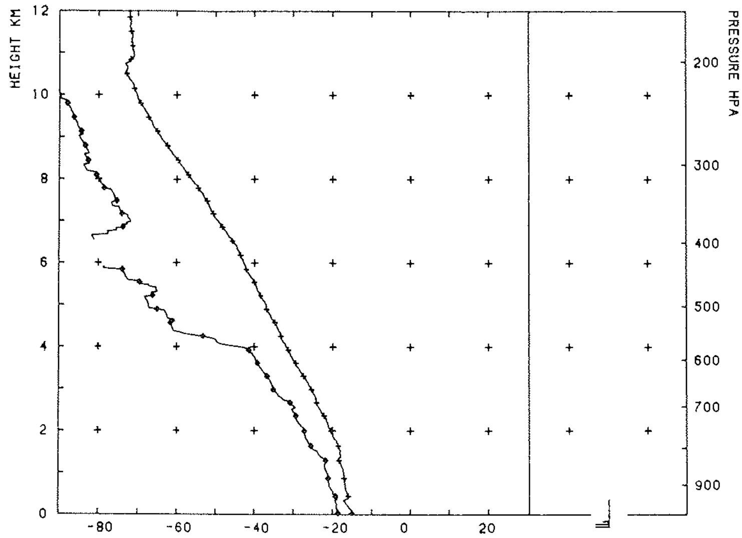



86-09-02 JD 245 12utc
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
ALEXANDER ISLAND
ADELAIDE ISLAND
CAPE NORVEGIA
GEORG VON NEUMAYER
RIISER-LARSEN PENINSULA

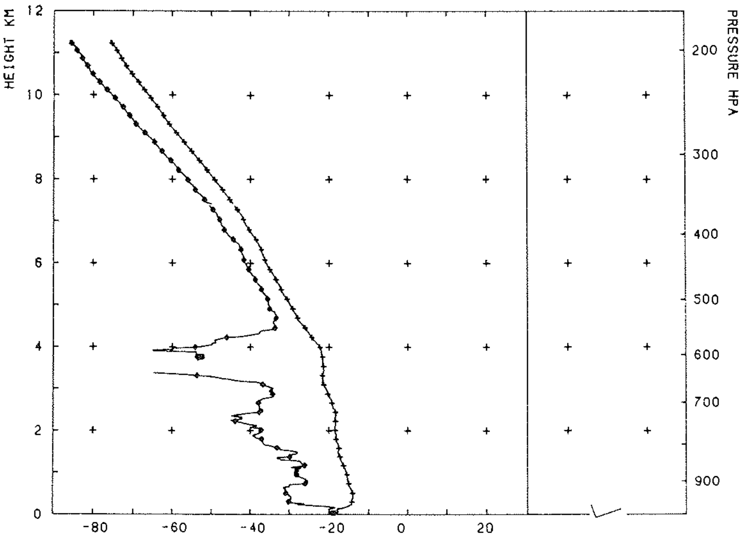
3.SEPTEMBER 1986

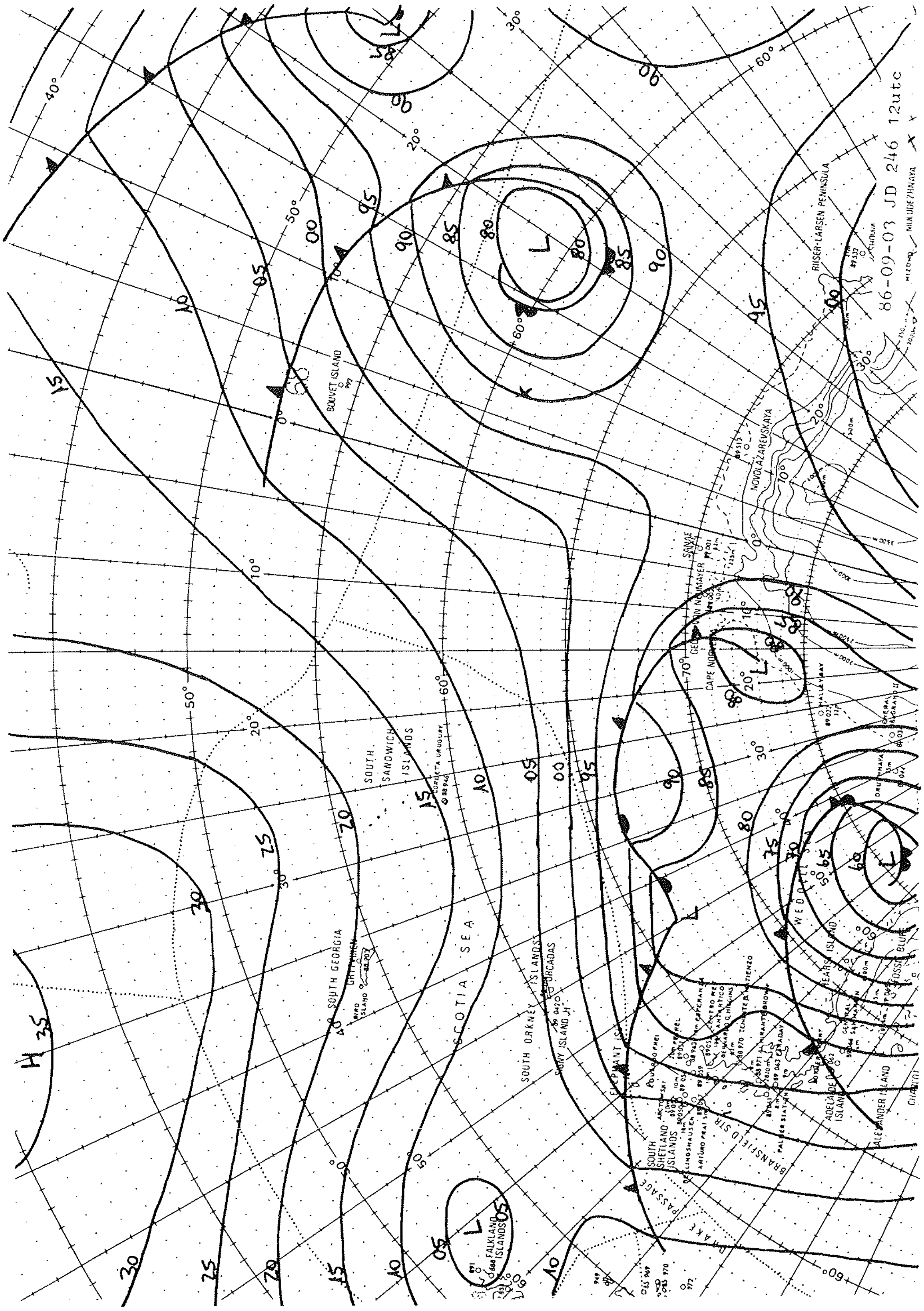
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	61.3S	7.5E	979.2	240	20	-12.9	-15.4	-1.8	9		/				4.00	02	/	/
6	61.3S	7.5E	981.0	220	21	-12.1	-15.0	-1.8	8	8	3	6	/	/	10.00	02	2	2
9	61.3S	7.5E	985.7	180	25	-13.6	-16.2	-1.8	8	8	2	6	/	/	4.00	02	2	2
12	61.2S	7.5E	989.9	170	25	-15.4	-18.3	-1.8	2	2	4	5	0	0	10.00	02	1	1
15	61.1S	7.5E	993.9	200	15	-14.4	-17.7	-1.8	0		9				20.00	02	0	0
18	61.0S	7.4E	997.0	220	16	-17.0	-21.7	-1.8	0		9				20.00	02	0	0

POLARSTERN 212 61.20S 7.50E 3/ 9/86 10:55



POLARSTERN 214 60.61S 7.33E 3/ 9/86 23: 3




86-09-03 JD 246 12utc
RISER-LARSEN PENINSULA
NOVOLAZAREVSKAYA
BOUVET ISLAND
SOUTH SANDWICH ISLANDS
SOUTH GEORGIA
SCOTIA SEA
SOUTH ORKNEY ISLANDS
ELEPHANT IS.
SOUTH SHETLAND ISLANDS
BRANSFIELD STR
DRAKE PASSAGE
FALKLAND ISLANDS
WEDDELL SEA
ALEXANDER ISLAND
ADELAIDE ISLAND

4.SEPTEMBER 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N Nh h CL CM CH	VIS km	WEATHER ww W1 W2
3	60.5S	7.3E	998.1	290	10	-16.0	-20.4	-1.8	9 /	4.00	02 7 2
6	60.4S	7.2E	993.5	300	27	-14.4	-18.6	-1.8	9 /	2.00	71 7 2
9	60.2S	7.1E	989.1	280	34	-9.6	-12.0	-1.8	8 8 1 6 / /	2.00	71 7 2
12	60.0S	7.1E	989.8	240	31	-6.1	-8.2	-1.8	8 8 3 6 / /	4.00	02 7 2
15	59.9S	7.1E	991.2	250	28	-4.7	-6.9	-1.8	8 8 3 6 / /	4.00	02 7 2
18	59.8S	6.9E	992.0	250	32	-4.9	-6.8	-1.8	8 8 3 5 / /	4.00	02 7 2

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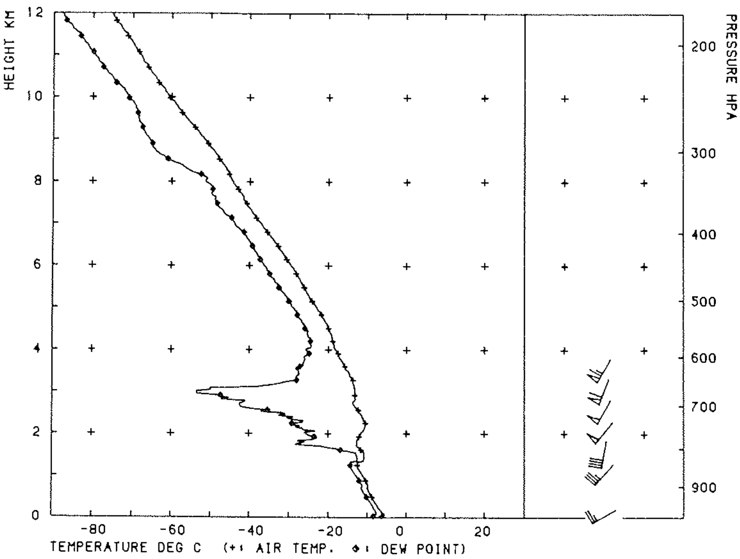

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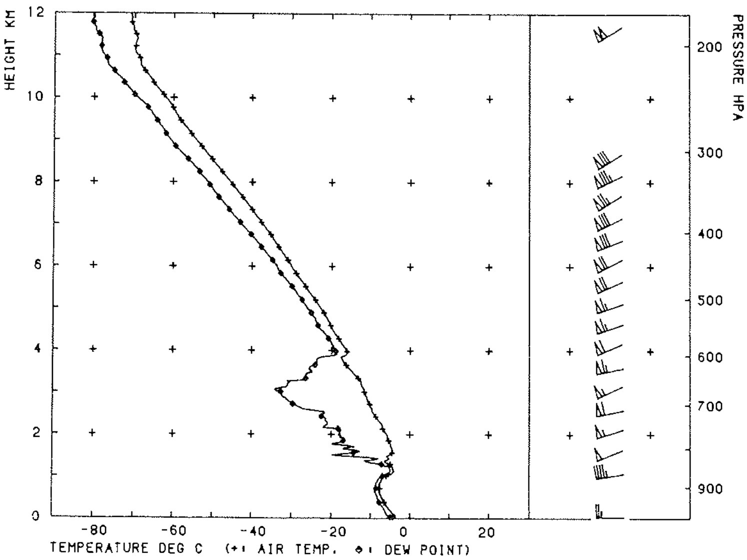

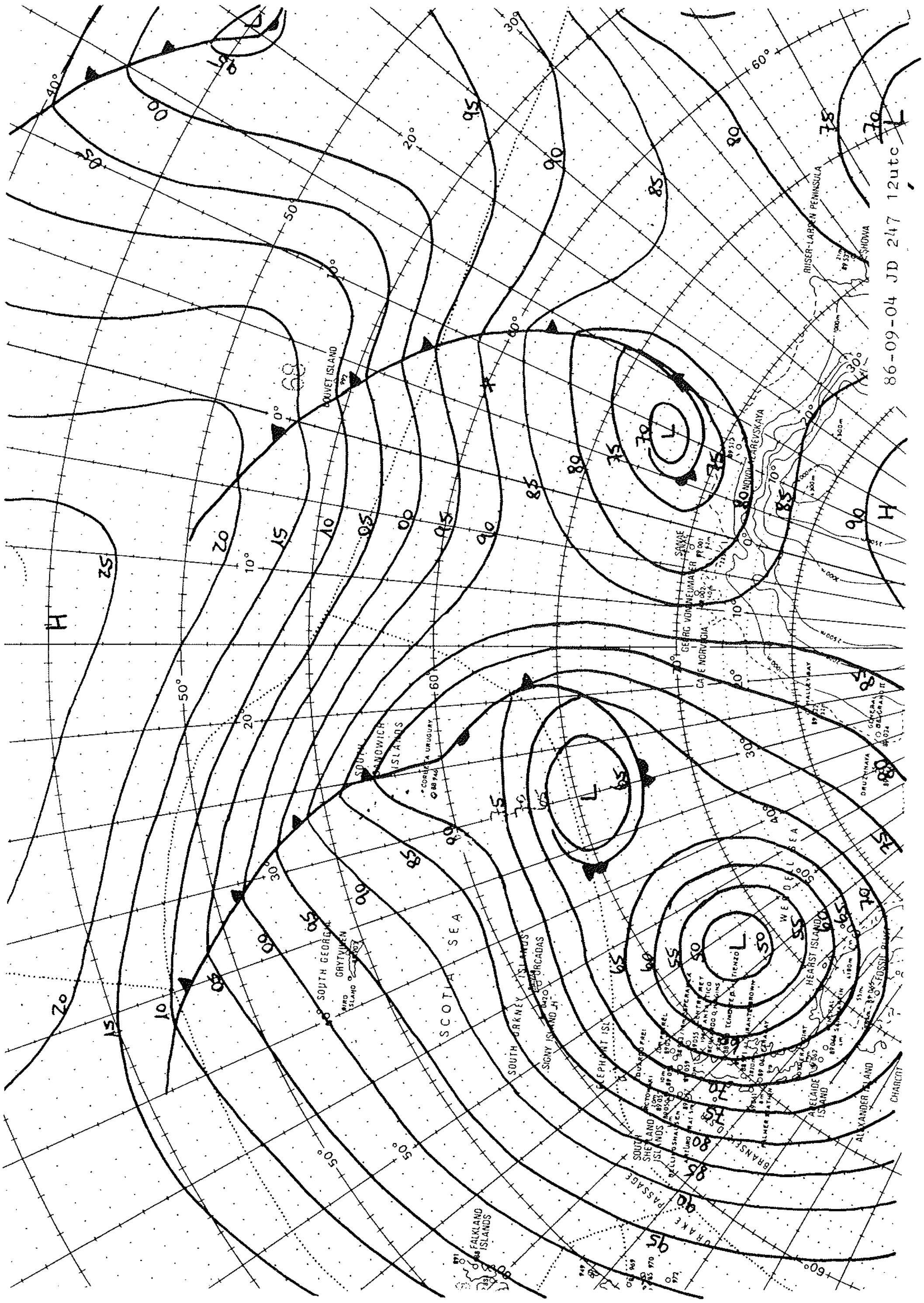
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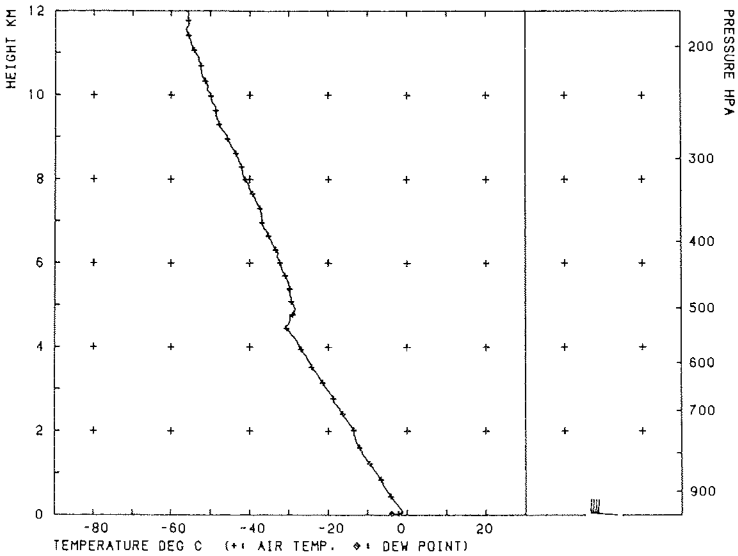
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
RISER-LARSEN PENINSULA

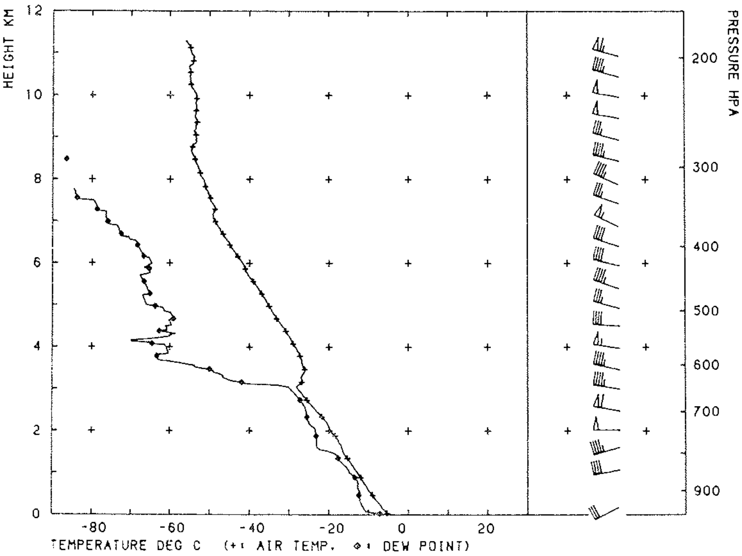
5.SEPTEMBER 1986

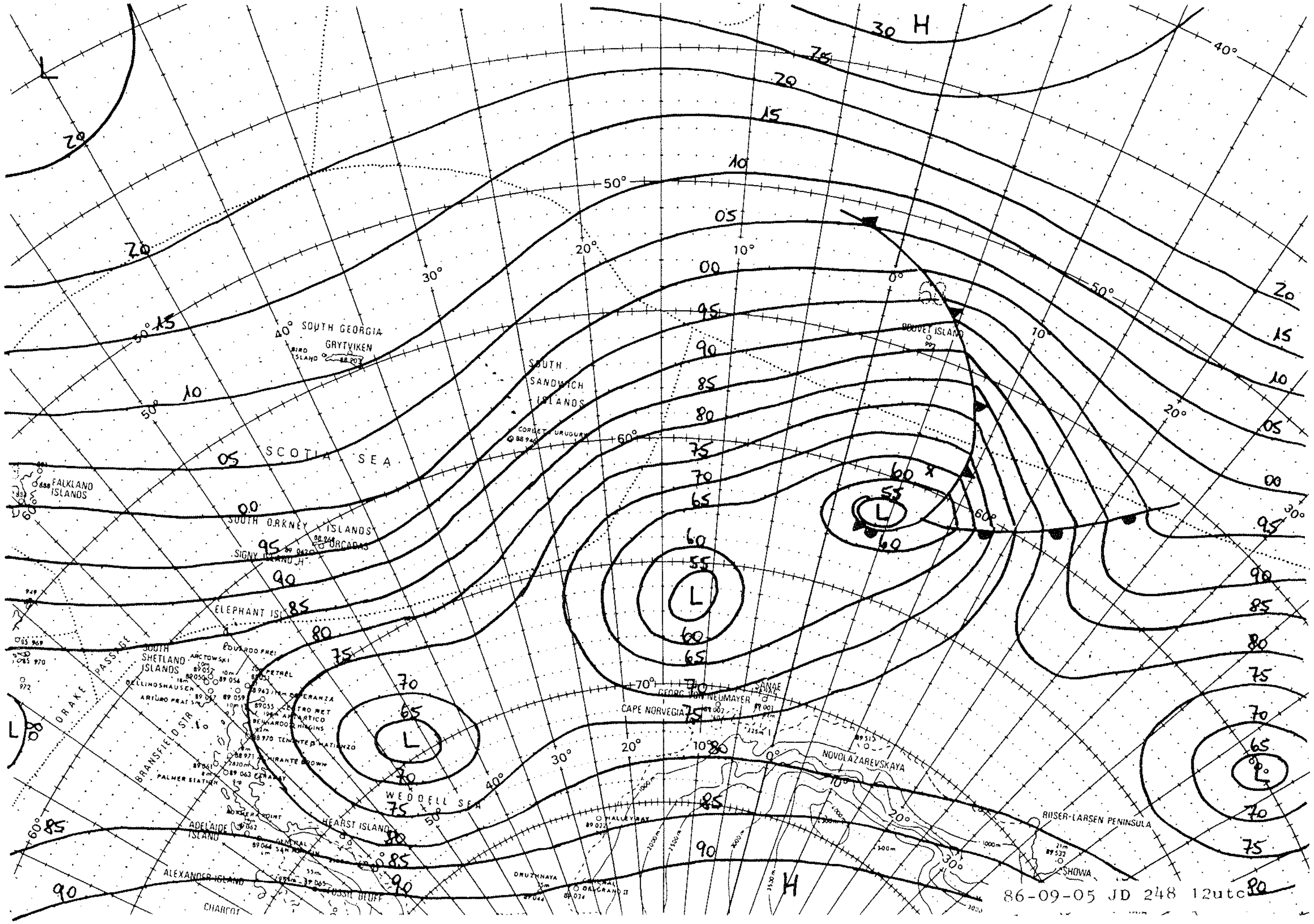
TIME UTC h	POSITION φ	POSITION λ	PRESS. hPa	WIND deg	WIND kts	TEMPERATURE AIR °C	TEMPERATURE DEW PT. °C	TEMPERATURE WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	59.4S	6.8E	981.3	310	22	-4.4	-6.2	-1.8	9 /	1.00	73 7 2
6	59.3S	6.8E	972.5	310	30	-2.3	-4.0	-1.8	8 8 2 6 / /	2.00	71 7 2
9	59.1S	6.7E	965.3	270	43	-1.7	-3.6	-1.8	8 8 2 6 / /	2.00	71 7 2
12	59.0S	6.7E	966.0	270	41	-2.3	-4.0	-1.8	8 8 3 6 / /	4.00	71 7 2
15	58.9S	6.8E	964.4	250	47	-2.3	-4.3	-1.8	8 8 2 6 / /	4.00	71 7 2
18	58.7S	6.5E	967.9	260	48	-3.4	-5.5	-1.8	8 8 4 6 / /	4.00	02 7 2

POLARSTERN 220 58.95S 6.70E 5/ 9/86 10:45



POLARSTERN 222 58.47S 6.50E 5/ 9/86 23: 0





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SIGNY ISLAND
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BELLINGSHAUSEN
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ESPERANZA
PALMER STATION
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
WEDDELL SEA
CAPE NORVEGIA
GEORG VON NEUMAYER
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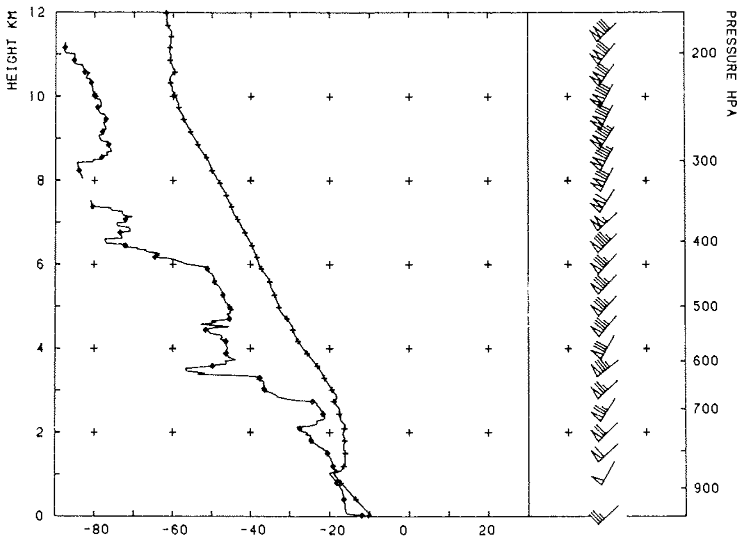
BOUVET ISLAND
HALLEY BAY
DRUZHNAYA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-09-05 JD 248 12utc

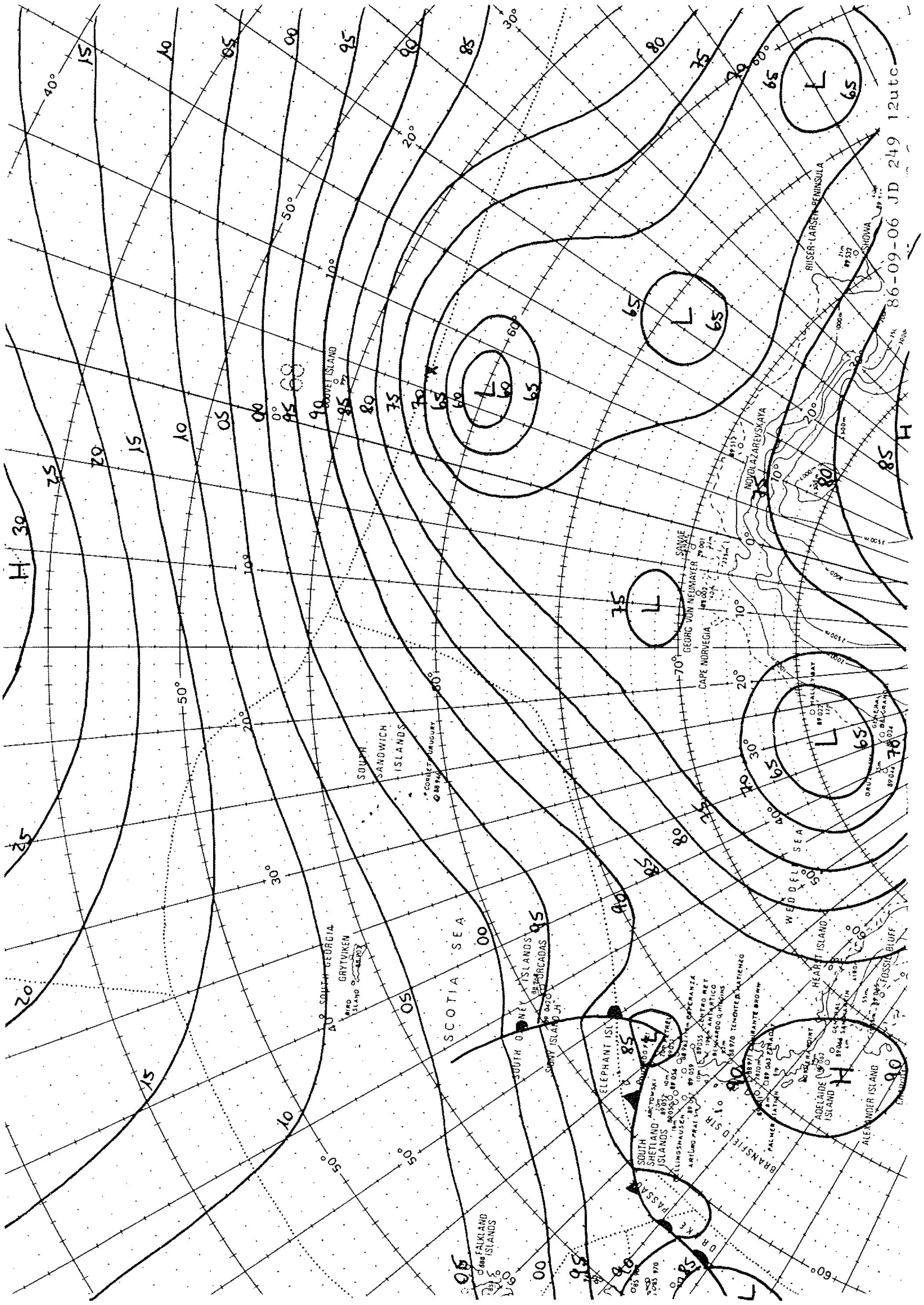
6.SEPTEMBER 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N N_h h C_L C_M C_H	VIS km	WEATHER ww W_1 W_2
3	58.2S	6.3E	966.9	240	41	-8.3	-12.5	-1.8	9 /	4.00	02 7 2
6	58.0S	6.2E	967.8	240	44	-10.6	-14.6	-1.8	8 8 3 6 / /	4.00	71 7 2
9	57.9S	6.4E	967.6	240	49	-10.9	-14.5	-1.8	8 8 4 6 / /	4.00	71 7 2
12	57.7S	6.1E	970.0	250	50	-11.1	-14.7	-1.8	8 8 4 6 / /	10.00	02 7 2
15	57.5S	6.0E	973.3	240	51	-11.3	-14.0	-1.8	8 8 3 6 / /	4.00	02 7 2
18	57.5S	6.0E	976.6	220	48	-10.9	-13.5	-1.8	8 8 3 6 / /	4.00	02 7 2

POLARSTERN 226 57.33S 6.19E 7/ 9/86 0: 2



TEMPERATURE DEG C (+: AIR TEMP. ◇: DEW POINT)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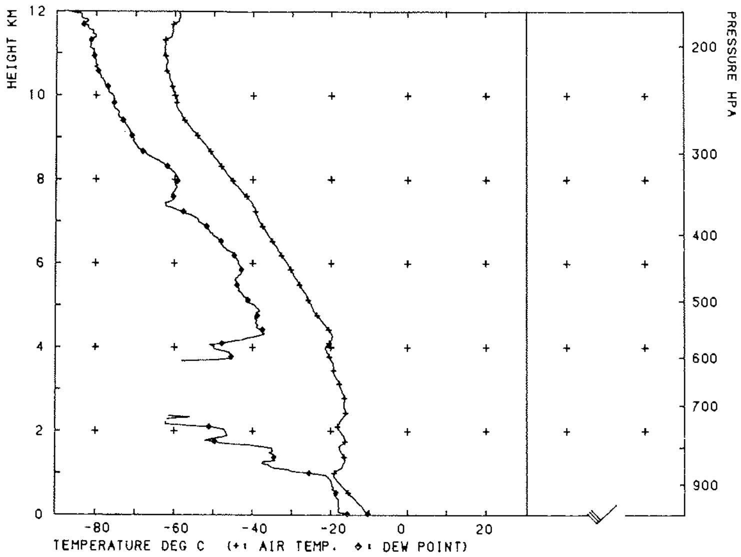
SOUTH ORKNEY ISLANDS
ELEPHANT ISL.
SOUTH SHETLAND ISLANDS
BRANSFIELD STR.
ADELAIDE ISLAND
ALEXANDER ISLAND
WEDDELL SEA
HEARST ISLAND
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
FALKLAND ISLANDS
BOUVET ISLAND

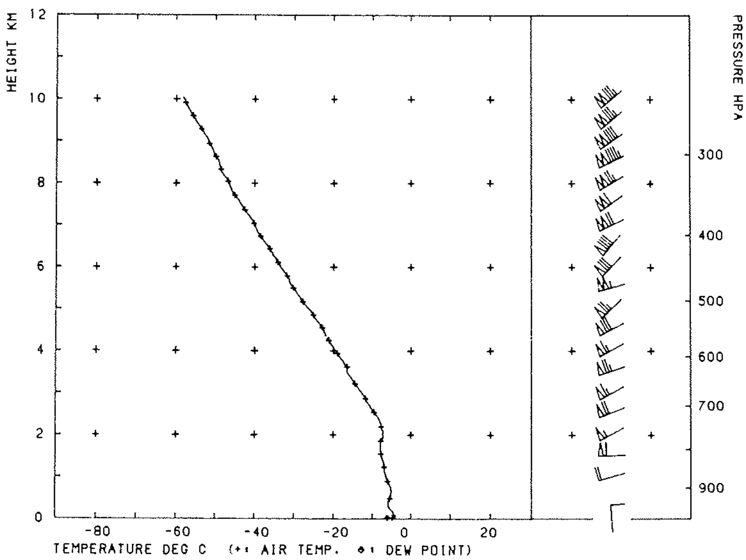
7.SEPTEMBER 1986

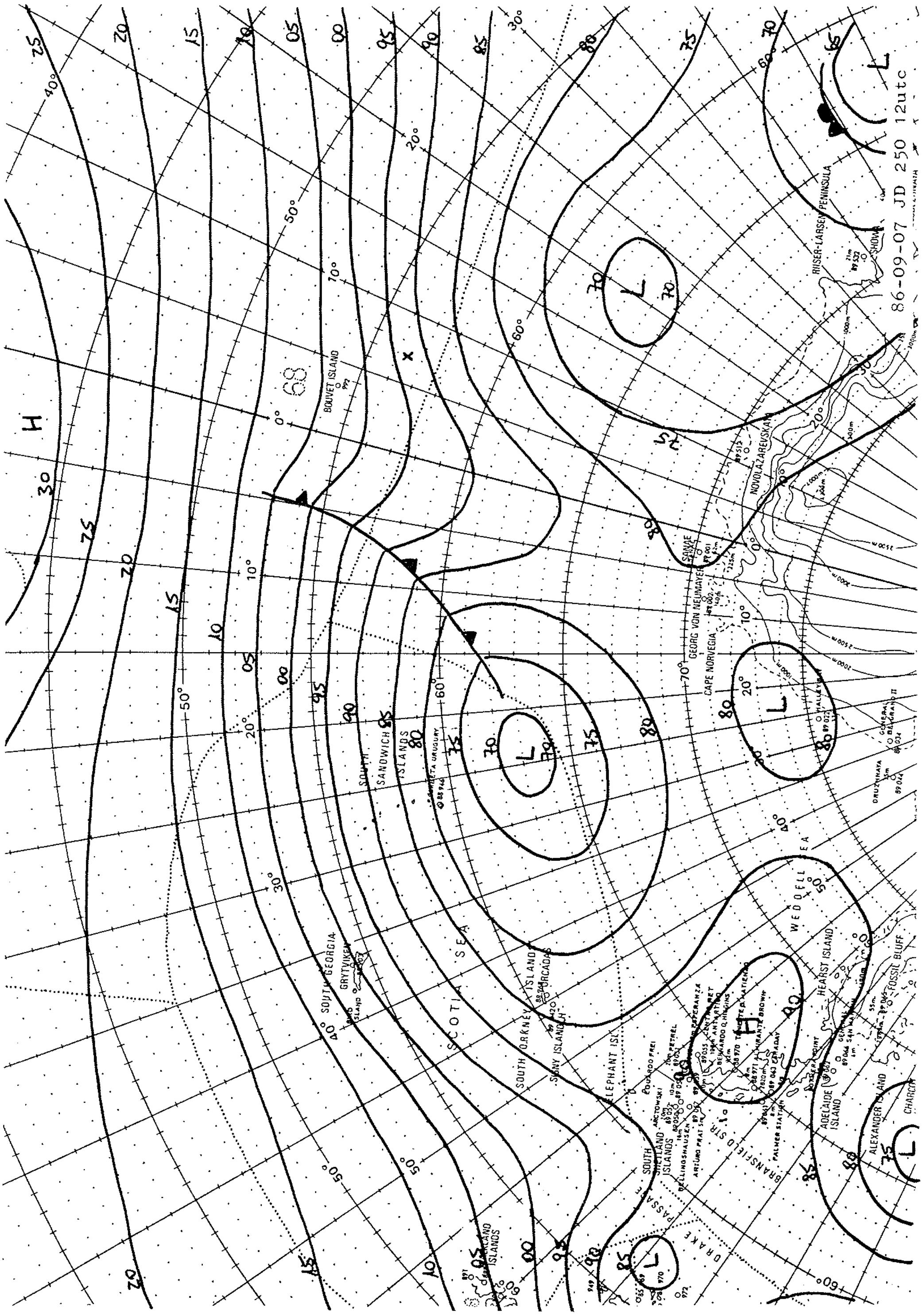
TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	56.9S	6.5E	983.8	230	33	-9.4	-15.0	-1.8	9		/				4.00	02	2	2
6	56.8S	6.6E	985.3	220	35	-8.7	-14.0	-1.8	8	8	4	5	/	/	10.00	02	2	2
9	56.5S	6.7E	988.5	220	37	-9.8	-14.1	-1.8	3	1	5	3	0	2	20.00	01	1	1
12	56.2S	6.9E	991.7	230	31	-10.3	-15.2	-1.8	2	2	5	8	0	0	20.00	02	1	1
15	55.9S	7.1E	994.4	220	28	-9.3	-13.8	-1.7	6	2	5	5	0	2	20.00	02	1	1
18	55.9S	7.1E	994.8	240	17	-8.4	-12.7	-1.7	8	4	5	5	7	/	10.00	02	1	1

POLARSTERN 228 56.40S 6.80E 7/ 9/86 10:38



POLARSTERN 232 55.49S 7.29E 7/ 9/86 22:48

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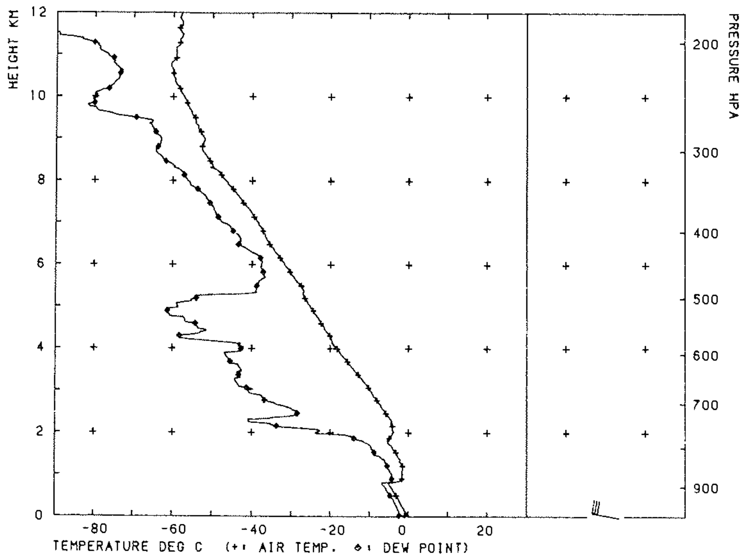
ELEPHANT ISL.
DRAKE PASSAGE
WEDDELL SEA
HEARST ISLAND
ADELAIDE ISLAND
ALEXANDER ISLAND
RIISER-LARSEN PENINSULA
NOVOLAZAREVSKAJA
SANAE
GEORG VON NEUMAYER
CAPE NORVEGIA

8.SEPTEMBER 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	55.7S	7.3E	986.8	270	28	-1.3	-2.5	-1.5	9		/				4.00	10	2	/
6	55.8S	7.2E	986.3	270	32	-1.1	-2.9	-1.6	9		1				2.00	10	2	2
9	55.9S	7.4E	985.1	280	32	-.9	-2.3	-1.7	8	8	1	6	/	/	2.00	68	7	2
12	56.1S	7.3E	983.6	270	28	-1.3	-3.1	-1.8	8	2	3	6	1	/	4.00	10	7	2
15	56.4S	7.3E	980.8	290	25	-1.4	-2.9	-1.8	8	8	2	6	/	/	2.00	10	7	2
18	56.5S	7.3E	976.2	300	26	-1.6	-2.2	-1.8	8	8	2	6	/	/	2.00	68	7	2

POLARSTERN 236 56.10S 7.25E 8/ 9/86 10:45



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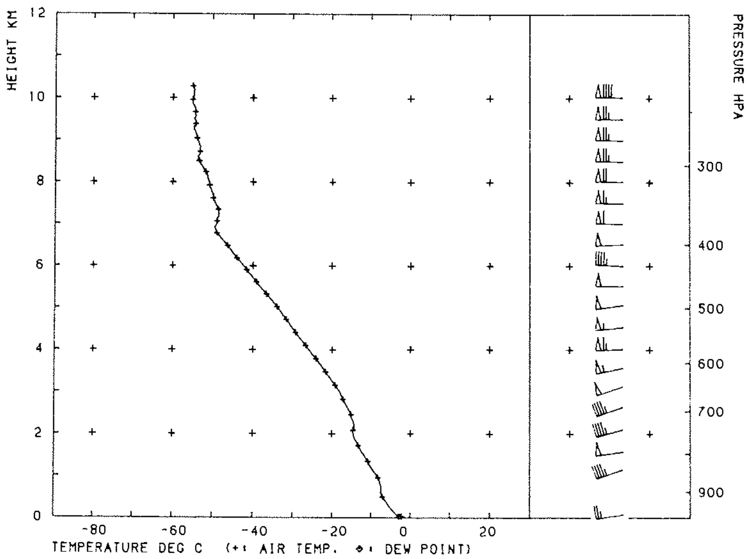

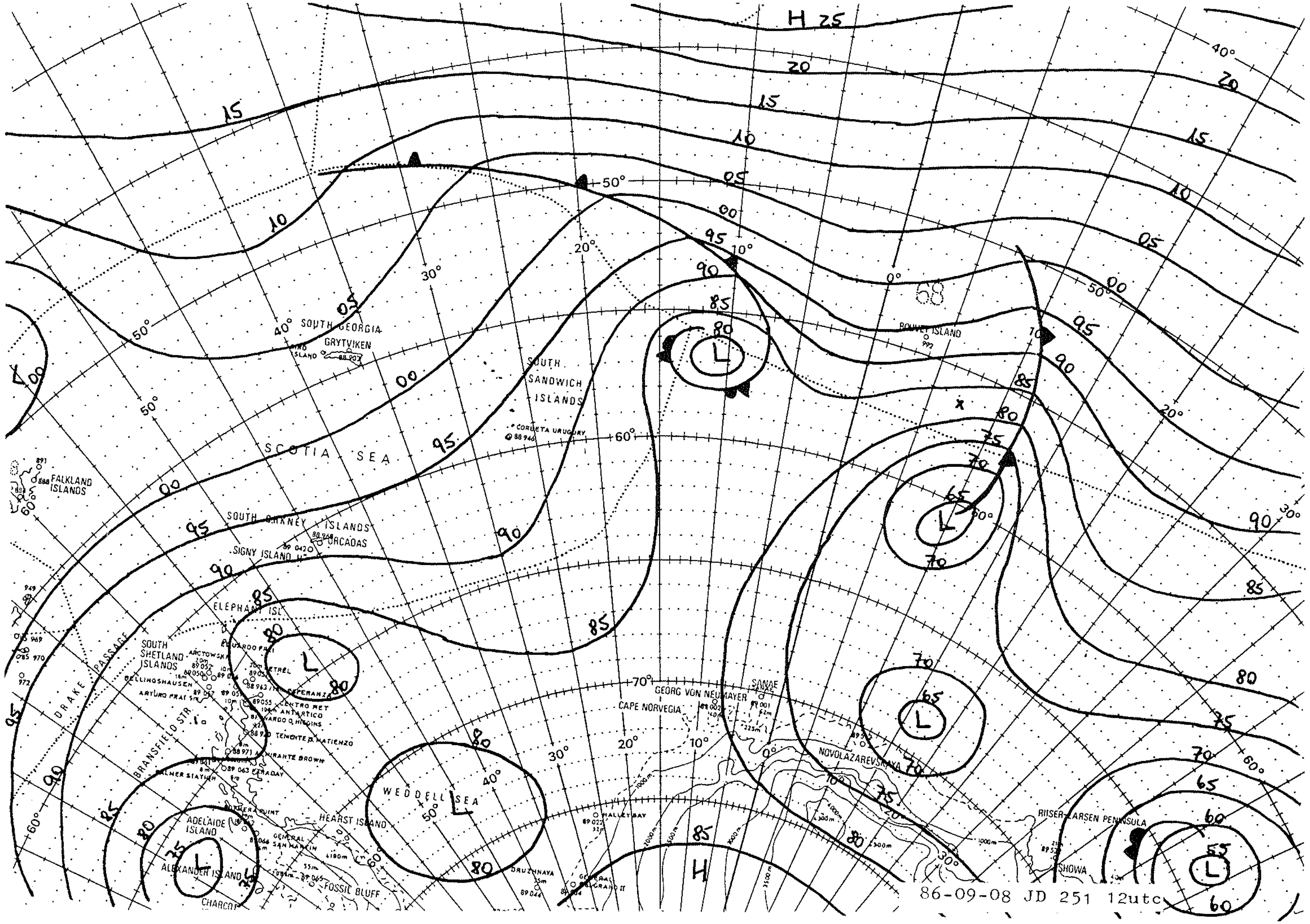
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ALMIRANTE BROWN
FARADAY
PALMER STATION
DRAKE PASSAGE
BRANSFIELD STR.
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ADELAIDE ISLAND
ALEXANDER ISLAND
FOSSIL BLUFF
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GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
HALLEY BAY
DRUZHNAYA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-09-08 JD 251 12utc

9. SEPTEMBER 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT. °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	57.3S	7.2E	983.6	200	30	-15.1	-18.6	-1.8	9		/				10.00	02	7	2
6	57.5S	7.2E	989.2	210	26	-17.8	-21.9	-1.8	6	6	3	5	0	0	10.00	02	7	2
9	57.4S	7.3E	995.1	210	25	-18.2	-21.0	-1.8	2	2	4	5	0	0	20.00	02	1	1
12	57.3S	7.2E	998.6	230	24	-17.0	-21.7	-1.8	5	5	4	8	0	0	20.00	02	1	1
15	57.0S	7.2E	1001.0	260	16	-14.9	-19.6	-1.8	3	3	4	8	0	0	20.00	02	1	1
18	56.8S	7.3E	1001.2	270	12	-13.9	-17.7	-1.8	8	8	4	5	/	/	10.00	02	1	1

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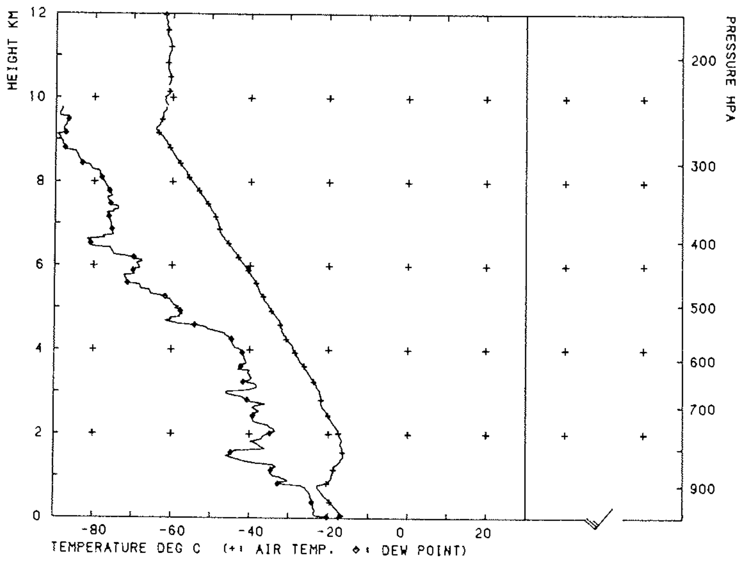
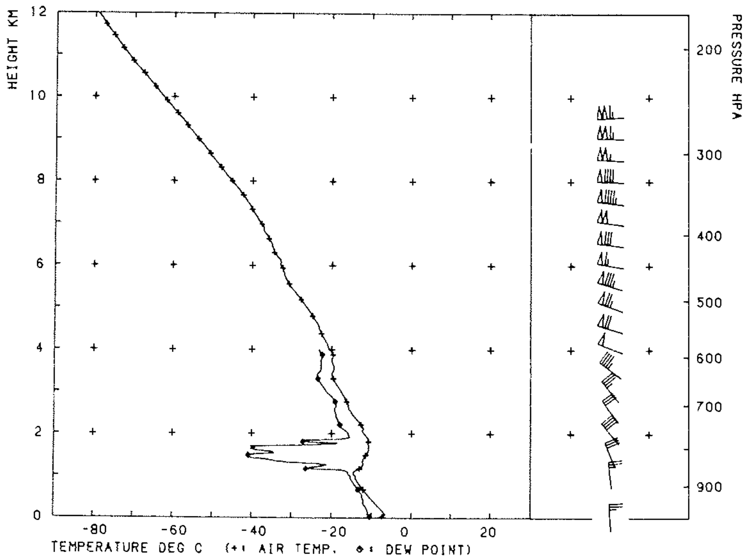
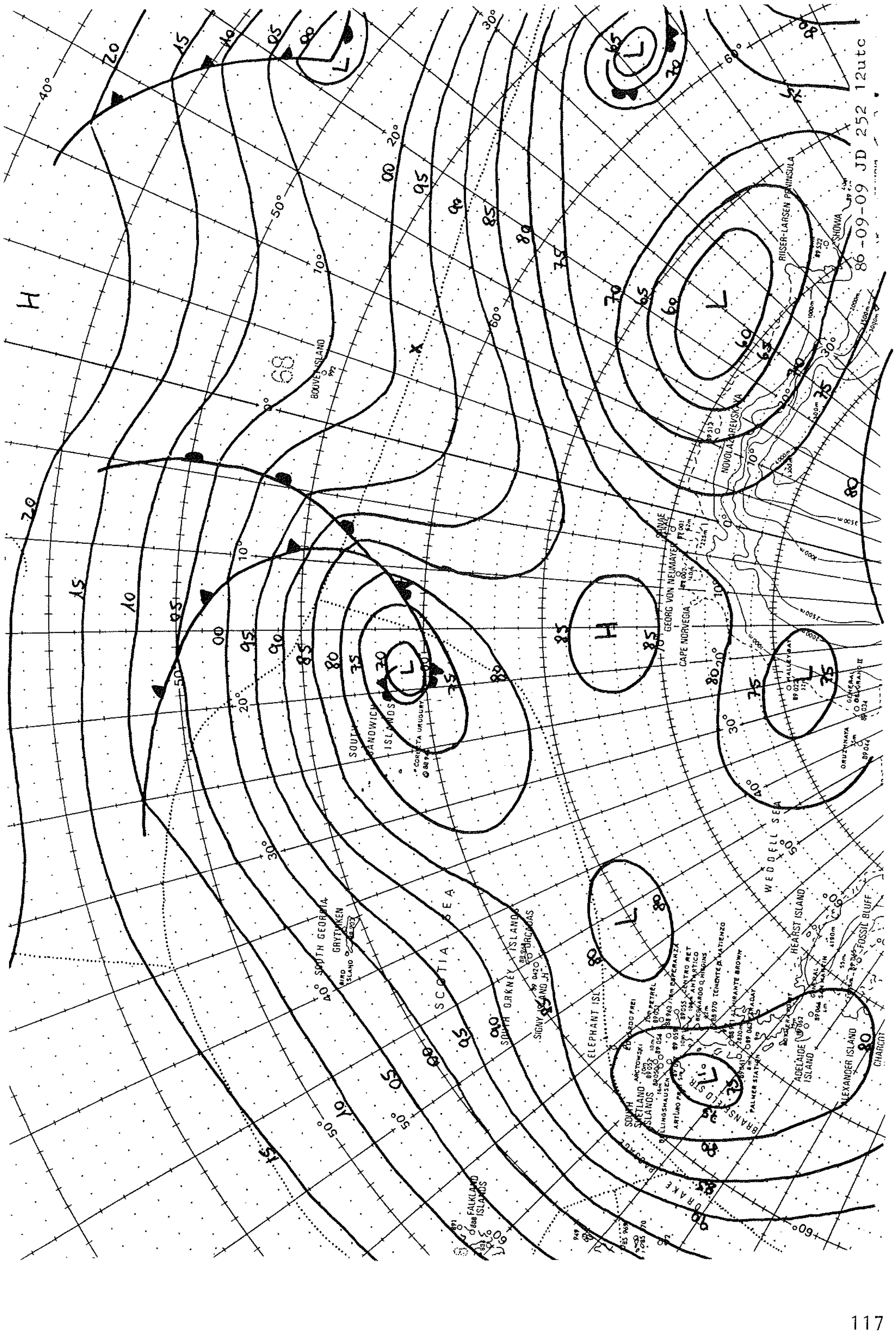


POLARSTERN 248   56.33S 7.25E   9/ 9/86 23: 6




86-09-09 JD 252 12utc
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FALKLAND ISLANDS
DRAKE
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CAPE NORVEGIA
GEORG VON NEUMAYER
SANAE
NOVOLAZAREVSKAYA
RISER-LARSEN PENINSULA
SHOWA
HALLEY BAY
GENERAL BELGRANO II
DRUZHNAYA
PALMER STATION
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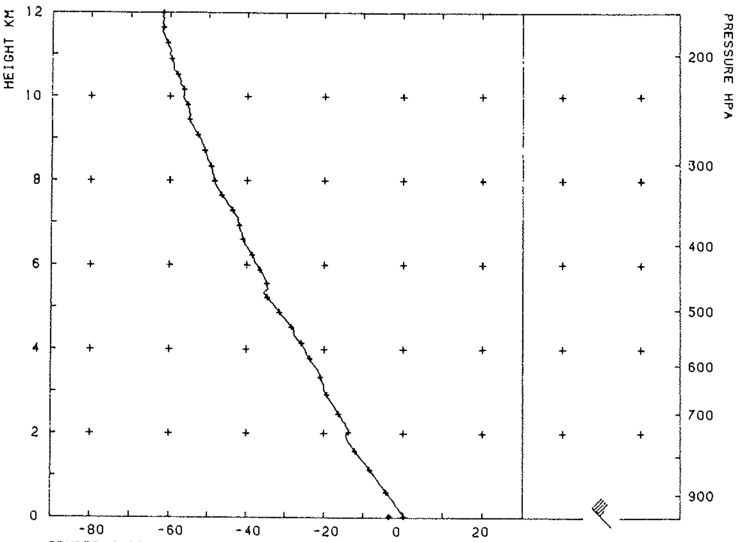
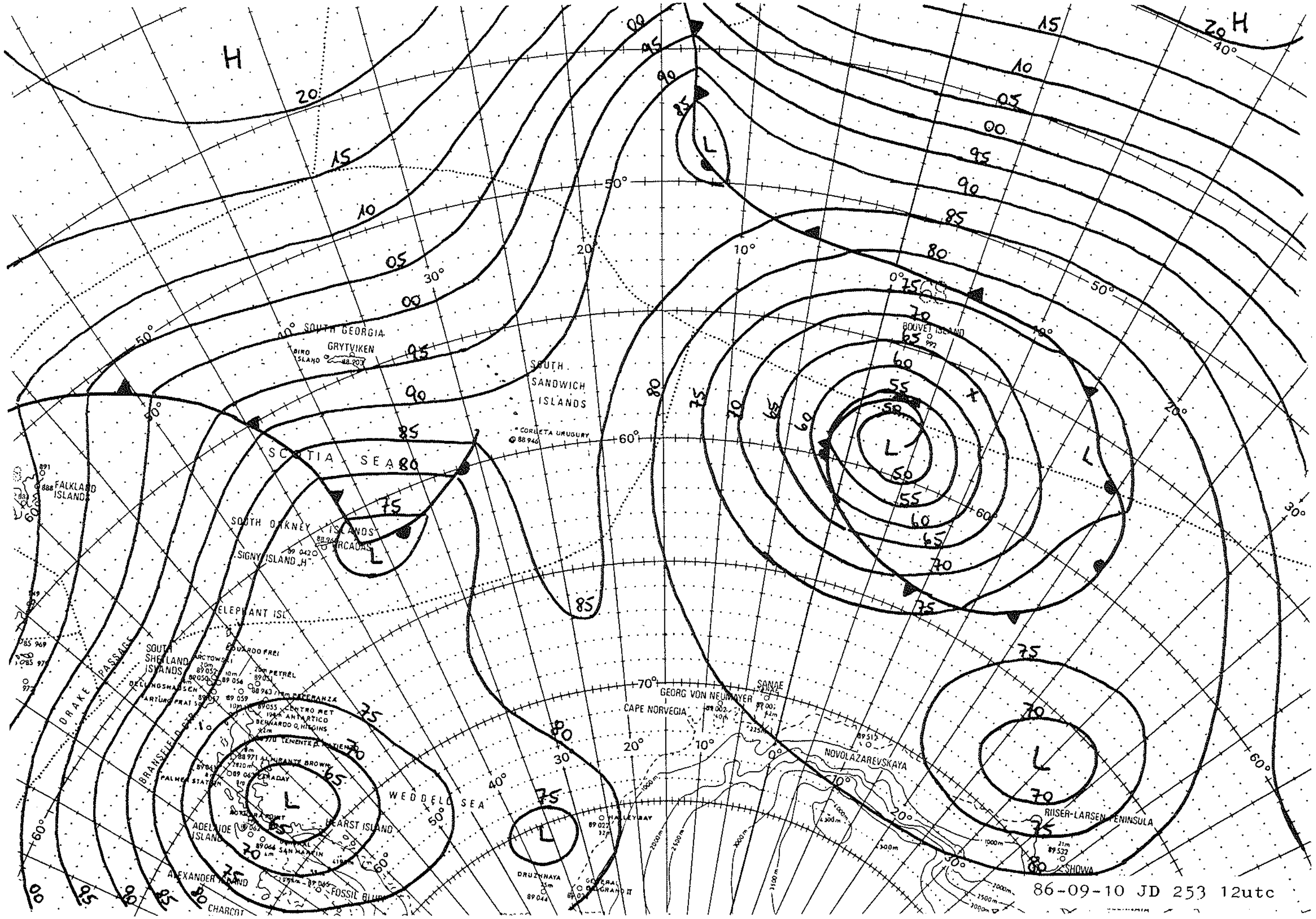
10. SEPTEMBER 1986

TIME UTC h	POSITION φ	λ	PRESS. hPa	WIND deg	kts	TEMPERATURE AIR °C	DEW PT °C	WATER °C	CLOUDS N	N_h	h	C_L	C_M	C_H	VIS km	WEATHER ww	W_1	W_2
3	56.1S	7.2E	976.5	10	42	-2.8	-4.3	-1.8	9		/				4.00	02	7	2
6	56.0S	7.3E	968.4	320	40	-.8	-2.5	-1.8	9		/				4.00	02	7	2
9	55.9S	7.1E	964.4	330	41	-.5	-1.3	-1.8	6	6	3	8	0	0	10.00	02	7	2
12	55.6S	7.4E	963.4	310	46	-.2	-3.2	-1.2	7	7	5	8	0	0	10.00	02	2	2
15	55.3S	7.7E	961.3	310	52	-.5	-3.2	-.9	8	8	5	6	/	/	4.00	02	7	2
18	55.0S	7.9E	962.8	300	50	-.7	-3.2	-.7	8	8	4	6	/	/	4.00	02	7	2

POLARSTERN 251 55.70S 7.25E 10/ 9/86 10:48



TEMPERATURE DEG C (+: AIR TEMP. ◆: DEW POINT)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ORCADAS
SIGNY ISLAND
ELEPHANT ISL
SOUTH SHETLAND ISLANDS
DRAKE PASSAGE
BRANSFIELD STR.
ARCTOWSKI
EDUARDO FREI
BELLINGSHAUSEN
ARTURO PRAT
ESPERANZA
BERNARDO O. HIGGINS
PALMER STATION
FARADAY
ADELAIDE ISLAND
ALEXANDER ISLAND
HEARST ISLAND
SAN MARTIN
FOSSIL BLUFF
CHARCOT
WEDDELL SEA
DRUZHNAYA
HALLEY BAY
GENERAL BELGRANO II
GEORG VON NEUMAYER
SANAE
CAPE NORVEGIA
NOVOLAZAREVSKAYA
RIISER-LARSEN PENINSULA
SHOWA
86-09-10 JD 253 12utc

3. Synoptic discussion

3.1. Introduction

To calculate mean surface pressure fields, the daily weather charts are covered by two grids of 5 by 5 degrees distance. Both grids differ by 2.5 degrees in latitude and longitude. The boundaries are 75W and 45E in longitude and 45S and 80S in latitude; east of the Greenwich meridian, the southern boundary is 75S, in view of the unreliable analysis over the Antarctic continent.

Due to the high variability of synoptic systems there is no great value in the discussion of long term mean surface pressure charts. Rather, we intend to compare short term intervals under the aspect of synoptic scale variability, i.e. days with similar meteorological conditions.

In addition to mean surface pressure charts, corresponding storm tracks (single line arrow) and movements of high pressure systems (double line arrow) give a closer view on the dynamics over the Weddell Sea area.

For each synoptic interval the tracks are shown, giving the position marked by a crossed circle.To add more information the marking is supplied with two numbers showing the date in the upper position and the center pressure beneath. In each track chart the whole track of a system is plotted to show the total history of it. Tracks not falling into the synoptic interval are marked by interrupted lines. It must be mentioned that the positions plotted are transferred directly from the daily weather charts. So the length of one arrow does not show a daily movement, necessarily. The time interval must be confirmed by looking into the particular daily weather chart.

3.2. Mean surface pressure chart 16 July - 10 September 1986

The chart shows three low centers. The absolute minimum is at the grid point 72.5S and 37.5W with a center value of 981.1 hPa. The second one is located near 67.5S and 17.5W with 981.9 hPa. The third low in the eastern part seems to have its center east of the calculated area. North of 60S there is a zonal flow with a weak trough at 10W and a weak wedge at 45W.

As mentioned above this chart is not very meaningful in synoptic terms. Calculations with this pressure field would not allow simulations of meridional transports of heat and momentum. The discussion below will show absolutely reversed conditions in pressure gradients and locations of pressure centers.

The selection of time intervals with similar synoptic conditions does not fit with weather periods observed on board RV POLARSTERN, necessarily. Most of the time the beginning and end of an interval is determined by the life cycle of a dominating pressure system, e.g. a Weddell Sea depression or a blocking high.

Before starting to describe weather phases in more detail, the important role of the South American continent and the Antarctic peninsula for the weather over the Atlantic sector must be brought back in mind. From the northern hemisphere the impact of mountain ranges on the dynamics of the westerly flow is well known. Due to the distribution of land- and watermasses on the southern hemisphere, the Andes and - as their southern continuation - the Antarctic peninsula are the only meridionally oriented mountain ranges within the westerly flow. The presence of the Weddell Sea basin with its western boundary formed by the peninsula proves to be the special feature of this geographic area responsible for the weather over the Atlantic sector of the southern ocean and perhaps the whole circulation around Antarctica. Due to the channelling effect of the peninsula and the presence of a favourite pressure field (e.g. Weddell Sea depression) cold air from the continent can flow far north and increase baroclinic instability, meeting with warm air of suptropical origin. So the Scotia Sea is a favourite site for cyclogenesis for dynamic as well as thermodynamic reasons.

3.3. Synoptic periods, mean pressure charts, movements of pressure centers

3.3.1. High over the continent, wedge over Weddell Sea

16 July - 20 July 1986

The continental high with a wedge into the Weddell Sea dominates this period. The low activity is relatively weak, no central pressure under 973 hPa is observed. The mean circulation is opposite to the Weddell Gyre and should slow it down a litte. This constellation does not support developments in the Scotia Sea because of missing lee effects and missing cold air supply from the continent.

The operation area of RV POLARSTERN south of Bouvet Island is situated right in the frontal zone north of 60S and is passed by some lows without any significant wind.

3.3.2. High over peninsula, low 60S and 20W to 20E

21 July - 24 July 1986

The mean surface chart shows a huge depression with a center near 60S and 05E. A small but nevertheless important high over the peninsula initiated this development. The high built up due to strong advection of warm air ahead of the stationary low over the Bellingshausen Sea, shown in the period before. On the eastern side of this high cold air out of the Weddell Sea area moved northward and formed a baroclinic zone over the Scotia Sea, supporting the deepening of a low, which started on July 18th southwest of South Georgia and became stationary at 62S and 18W. On the rear of this system the southerly flow increased. So a second wave moving eastwart north of South Sandwich Islands met even stronger baroclinic conditions, deepened and slowed down after reaching hurricane force near 60S and 05E.

The investigation area of RV POLARSTERN was influenced by both systems. Obscured sky and snowfall prevailed, with northeasterly winds in the beginning of this period. Later, when the second development reached hurricane force just northeast of RV POLARSTERN the winds turned to easterly and southeasterly directions. Although the hurricane center passed the ship relatively close, the observed winds did not match the actual pressure gradient, which is confirmed by buoy data. One reason might be icing of anemometers. But the same phenomenon was observed by Ackley and Hibler (1983) when they compared actual with geostrophic winds derived from Australian pressure analyses over Antarctic sea ice. They found discrepancies of about 50%, nearly the same magnitude observed here. Looking into other cases of this cruise, this overestimation of actual wind speeds by geostrohpic calculation does not hold in the same way. A closer look considering boundary layer aspects in connection with air mass analyses should bring a better understanding.

3.3.3. Weddel Sea depression

25 July - 3 August 1986

The mean surface pressure chart from this period looks similar to the longterm one. The mean facts shown are the low center in the central Weddell Sea and a belt of low pressure right north of the continental ice shelf. North of 65S we have a nearly zonal flow with a weak trough at 25W. Looking into the track chart, we see that this trough is caused by waves moving out of the area around south Sandwich Islands while deepening and turning southeast to the shelf ice edge.

On July 26th a low crosses the peninsula relatively far south while deepening rapidly and turning right. This low assumes a steering function under two aspects. First, advection of cold continental air is initiated and continued to the north. Second, a westerly flow causes leewaves at the nothern part of the peninsula. Both reasons together form most favourable conditions around south Shetland Islands for developments with rapid deepening. This occurs at July 28/29th. With a center pressure of 938 hPa this hurricane turns southeast, later south due to dynamic reasons. It takes over the steering function of the southern low, but in more northeasterly position just northwest of Halley Bay. At its rear, cold air is still led northward causing new storms to develop which turn to the shelf ice edge. As a whole, the steering system moves from the southern Weddell Sea slowly northeastwards, later at the end of this period eastward.

In contrast to the mean chart, which shows a zonal flow north of 65S, wide ranges of meridional transport of air masses occur. This time intervall was chosen to show a whole life cycle of a Weddell Sea depression. Better results in estimating the meridional transports should be expected when dividing the period at July 30th.

In the beginning, the area of operation of RV POLARSTERN is still influenced by the slowly eastward moving pressure system of the period before. A mainly easterly flow with some weak disturbances prevails. After a short high pressure influcence the winds turn to westerly and northwesterly directions on July 29/30th and warm air is led into the area, reaching about minus 5°C. On August 3rd winds reach gale force due to the continuous eastwards moving of the steering Weddell Sea depression. On this day temperature rises up to minus 2°C for a longer period.

3.3.4. High over peninsula, low Halley Bay

04 August - 07 August 1986

Strong advection of warm air in the area west of the peninsula builds up a high which is marked by a wedge shown in the mean surface pressure chart. At 30 W a strong frontal zone is formed. A low moving rapidly south from the area of South Orkney at August 5th assumes the role as a steering center. The results are similar tracks of storm centers as in the period before, hitting the shelf ice edge near Neumayer/Sanae. In contrast to the intervall of 25 July - 3 August 1986 the center values are much higher. This indicates unfavourable constellations in the upper level flow. Although cold air on the rear of the steering center is led northwards, this effect is compensated by subsidence due to negative vorticity advection within a ridge/rear system of upper flow over Scotia Sea. Lows without exception fill up while moving through this area.

RV POLARSTERN operates north of the belt of low pressure most of the time. Northwesterly flow prevails turning to north on August 6th, with a remarkable advection of warm air (minus 27°C to minus 4°C) ahead of a frontal system which crosses the area on August 7th.

3.3.5. Weddell Sea depression

8 August - 12 August 1986 and 13 August - 17 August 1986

Both intervals have similar developments. The first period starts with weakening high pressure due to missing advection of warm air west of the peninsula. Although the Halley Bay low existing in the period before weakened, it is still strong enough to initiate an advection of cold air northwards due to the leading effect of the peninsula. Increasing baroclinic conditions and favourate upper air flow form a hurricane east of south Shetland Islands and regenerate the Weddell Sea depression. The result is a similar development like in the period from 25 July - 3 August 1986.

The period from 13 August - 17 August 1986 reacts like that from 4 August - 7 August 1986. The steering center moves in a region northwest of Halley Bay and a high builds up over the peninsula.

The investigation area of RV POLARSTERN is influenced by a well defined change between advection of cold and warm air. A characteristic variation between minus 4°C and minus 25°C within two or three days is observed. The main wind direction varies from northwest to east with an extended period of wind speeds with gale force, from August 12th to 18th even hurricane force.

3.3.6. Low over eastern Weddell Sea, moving east slowly

18 August - 24 August 1986

This period terminates the regime of the Weddell Sea depression. Later on, high pressure influence dominates over the Central Weddell Sea. This fact is clearly shown by the mean surface pressure chart, having a ridge from the subtropic high to the continental high over Antarctica.

The steering center is related to the hurricane northeast of Sanae on August 18th, which moves northeast. So the low crossing the peninsula on August 18th fails to regenerate the Weddell Sea system because it runs into an area with a ridge/rear constellation of upper flow, which is supposed to create subsidence due to advection of negative vorticity.

The steering center becomes quasi-stationary near Novolazarevskaja; the main track of low centers is along 60S eastward to 40E. The end of this period is initiated by a low, which crosses the peninsula on August 23rd.

The investigation area of RV POLARSTERN during this period is influenced by the slowly eastward moving low. The winds calm down from hurricane force and turn to mainly southeasterly directions afterwards. Since the beginning of this period, variability in advection of different air masses is no longer observed. Cold air from the continent dominates.

3.3.7. Weddell Sea depression

25 August - 27 August 1986

The mean surface pressure chart shows some differences to earlier Weddell Sea depressions, having an additional low center northeast of South Georgia and a wedge from the continental high to the area east of Sanae.

The reason might be the more northerly track of the low crossing the peninsula on August 23rd. Looking into earlier crossings the track was more southerly and had a more southerly component. The consequence is a southwesterly flow over the peninsula, which does not create lee effects. Waves observed earlier, with rapid deepening in the South Shetland area, are not possible. While the Weddell Sea depression fills up slowsly, waves to the north of the steering center have a track too for north to involve cold air from the continent. To the same extend as no cold air is led northward, warm air does not penetrate far south.

High pressure prevails in the beginning in the investigation area of RV POLARSTERN. On August 27th a frontal system crosses the ship with temperatures rising to minus 3°C. The ships position was, however, at 63.5S and 3.5E; the warm air did not reach the continent.

3.3.8. High over Greenwich Meridian

28 August - 30 August 1986

This constellation resembles a blocking situation and enhances meridional air exhange. A high pressure ridge connecting the subtropical with the continental high weakens the lows moving east into the Weddell Sea. A trough extends from 45S and 10W to the quasi-stationary system around 60S and 30E.

Weather around RV POLARSTERN is dominated by a southwesterly flow with advection of cold air.

3.3.9. Weddell Sea depression

31 August - 10 September 1986

The previous development is terminated by a low crossing the peninsula on August 30th. Like an earlier track in the period from 25 August - 27 August 1986 it crosses the peninsula too far north and with an enhanced westerly component, preventing intense lee effects in northern parts. A comparison with the period 8 August - 17 August 1986 shows the differences. Earlier we had two secondary low centers east of Bransfield Strait and at 65S and 35W. East of them, a long range northwesterly to northerly flow transports warm air and subtropical origin far south to the shelf ice edge. This feature is missing in the September period. A belt of low pressure is extending all around the shelf ice front in a distance of approximately 300 nautical miles. North of it we have a nearly westerly flow, which prevents meridional exchange. This fact is confirmed by the storm tracks too. In the example of the earlier Weddell Sea depression, the tracks turned south to the region around Neumayer/Sanae and moved slowly east along the shelf ice front. In the September event, the tracks lay between 60S and 65S.

The investigation area of RV POLARSTERN was situated between 62S and 55S. As seen in the storm track charts, the ship operated right in the main frontal zone with frequent gale winds reaching hurricane force on September 6th and 10th.

4. Conclusions

The meridional mountain chain on the southern hemisphere, the Andes and its southerly continuation, the Antarctic peninsula, are the only barrier in the westerly flow. They play a significant role in the dynamics of cyclogenesis due to lee effects. In addition, the orographic effect on the eastern side of the peninsula forces cold air masses from the Antarctic continent far into the north. Thus, the area of the eastern sector of the southern Atlantic is a favourable site for rapid and intense cyclogenesis. Developments in this area play a major role for the synoptic situation at least in the investigated area.

The most significant system is the Weddell Sea depression, which ought to have a forcing impact onto the Weddell Gyre. It shows in the overall average pressure distribution (16 July to 10 September). However, long term pressure charts do not and cannot give a satisfying description of the synoptic events: they are not useful to simulate dynamics of sea ice, because they do not consider the high variability of pressure systems with the consequence of missing meridional air mass exchange.

Looking at the investigated period as a whole, it shows two different phases. From end of July to mid of August, in the area around the Greenwich Meridian, a large variability of the meridional exchange of heat and momentum occurs. Subtropical air masses advance south to the shelf ice front, while cold air from the continent penetrates to the north. These events repeat with a significant time scale of two to three days. In contrast to these observations no large-scale meridional transport occurs in the second phase.

An explanation for this change can be given from the synoptic viewpoint considering the behaviour of the dominating Weddell Sea depression in connection with orographic effects east of the Andes and the Antarctic peninsula.During the first period Weddell Sea depressions were initiated by a low crossing from the Bellingshausen Sea southwest to south over the peninsula into the southern Weddell Sea. This constellation is followed by orographically triggered lee waves at the northern part of the peninsula, which deepen rapidly and turn south, regenerating the steering system in the Weddell Sea. The typical track of waves north of it is from Scotia Sea south-eastwards to the area Neumayer/Sanae. Further on, they are led by the shelf ice front to the east, slowing down and filling.

That means a more or less continuous change in the advection of warm and cold air around Greenwich Meridian as described above.

During the second period from mid of August to September the Weddell Sea depression was still observed rather often, but did not have the same effect on meridional flow. The explanation must be sought in the initial phase of a Weddell Sea depression, i.e. when it crosses the peninsula. If this happens more to the north, e.g. around 65S to 67S with a more westerly ot southwesterly component, lee effects at the northern part of the peninsula are missed due to an unfavourable southwesterly stream. As a consequence the Weddell Sea depression is not regenerated by these lee effects and fills up. Lee waves are formed further north at the Andes and have a track too far to the north to involve cold air from the continent, which would improve the baroclinic conditions. Now the main track of depressions is between 60S and 65S eastwards, the mean trough is along 65S, which does not allow large scale meridional exchnge.

Acknowledgement

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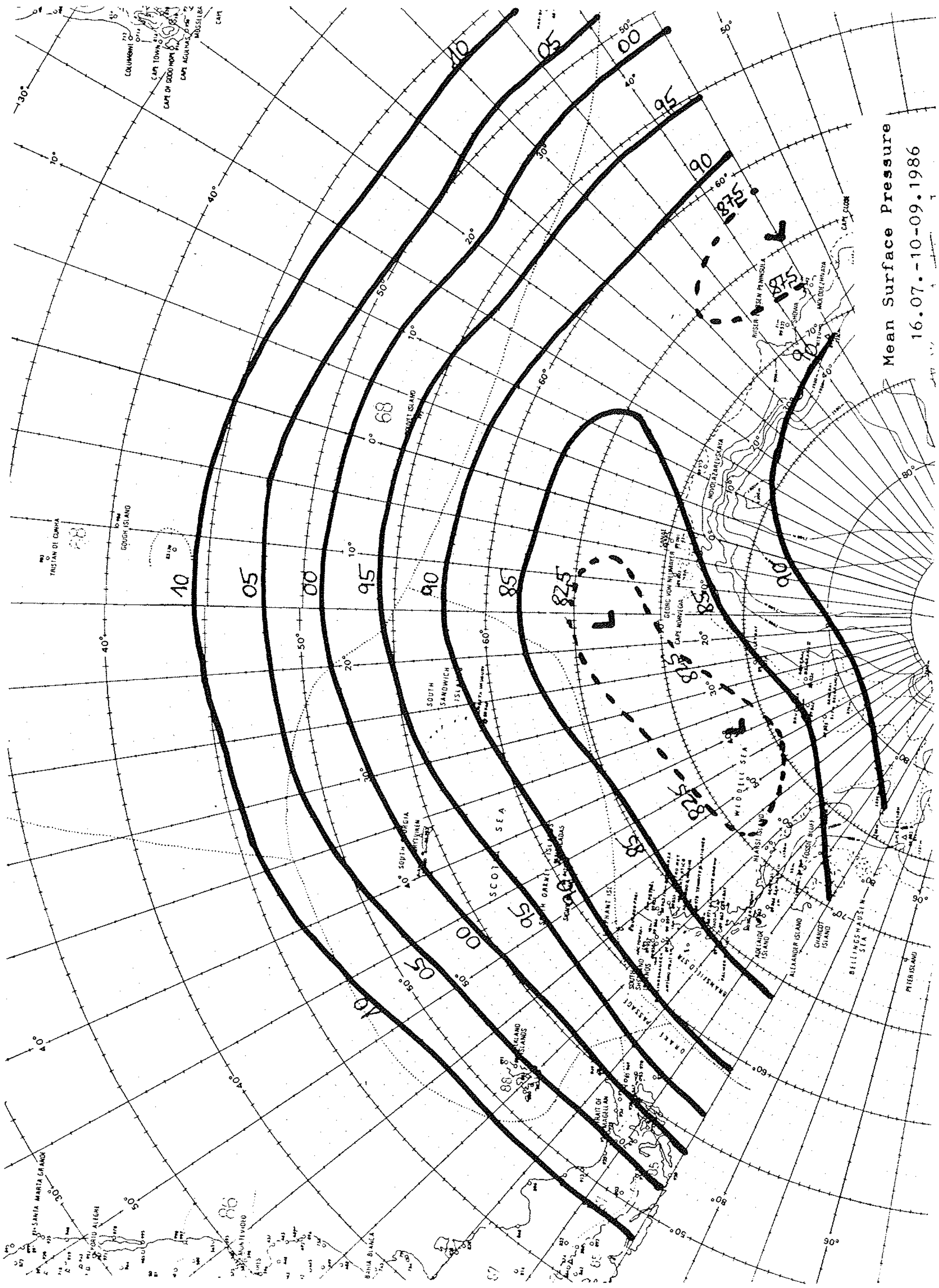

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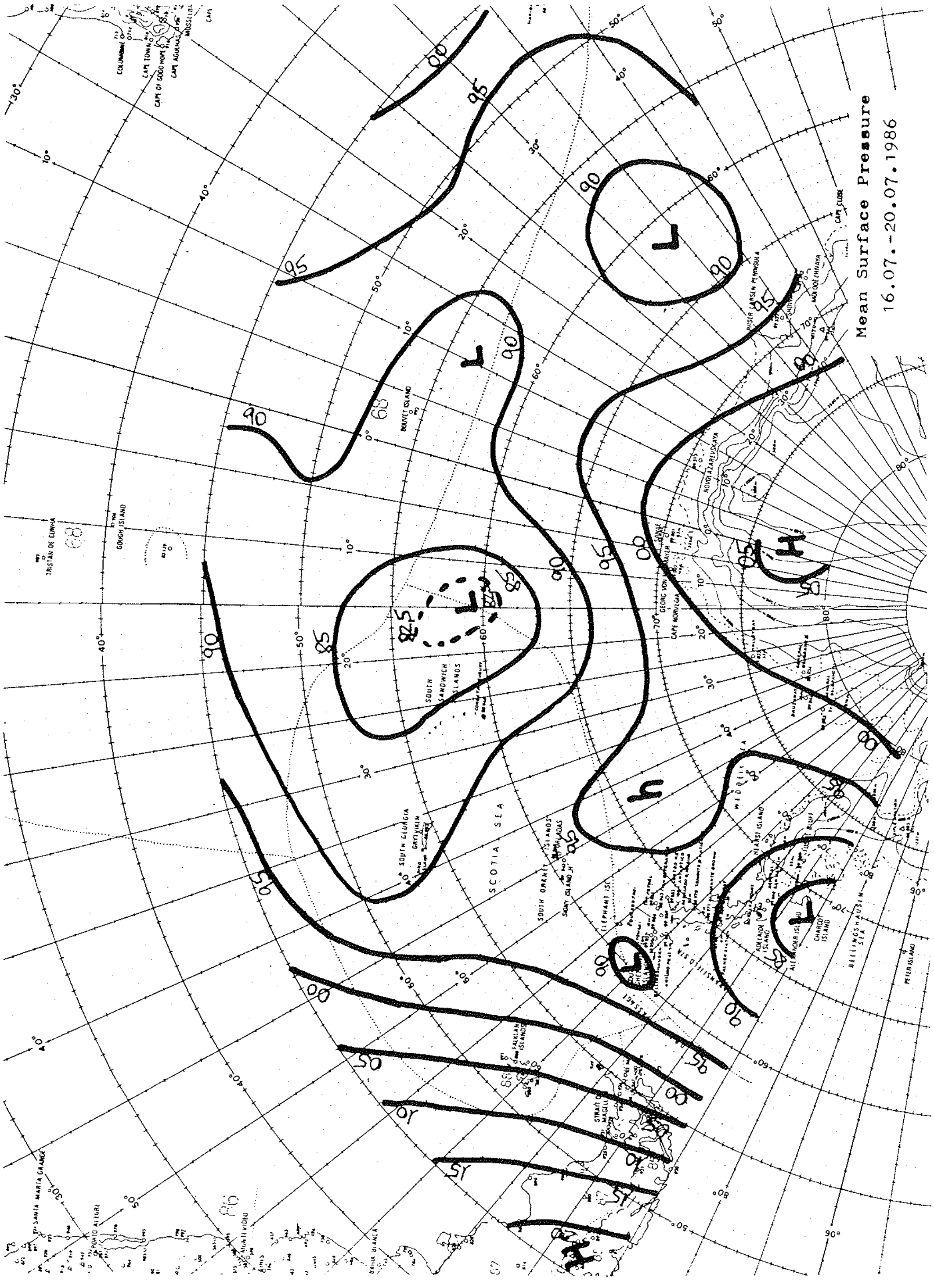

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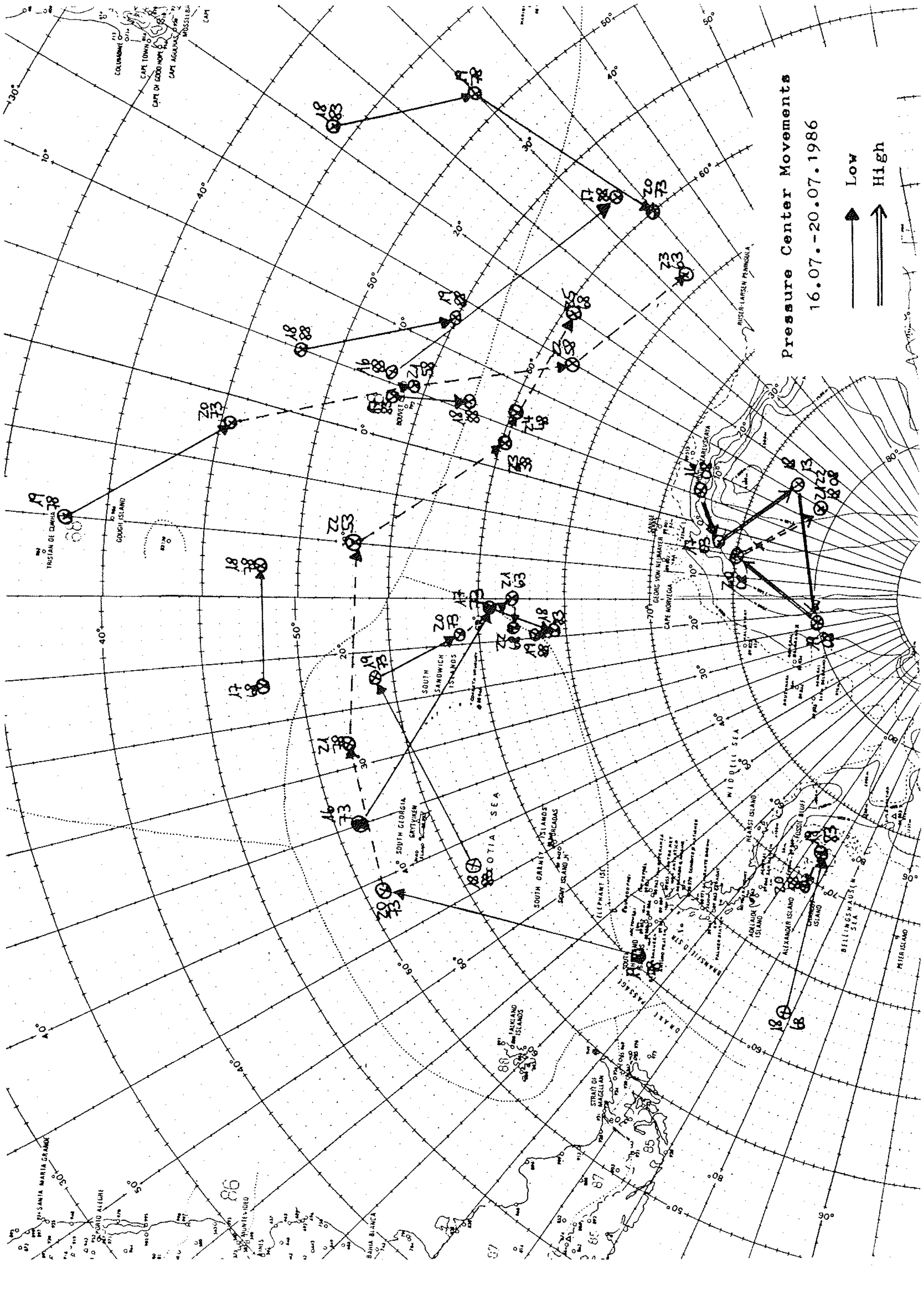
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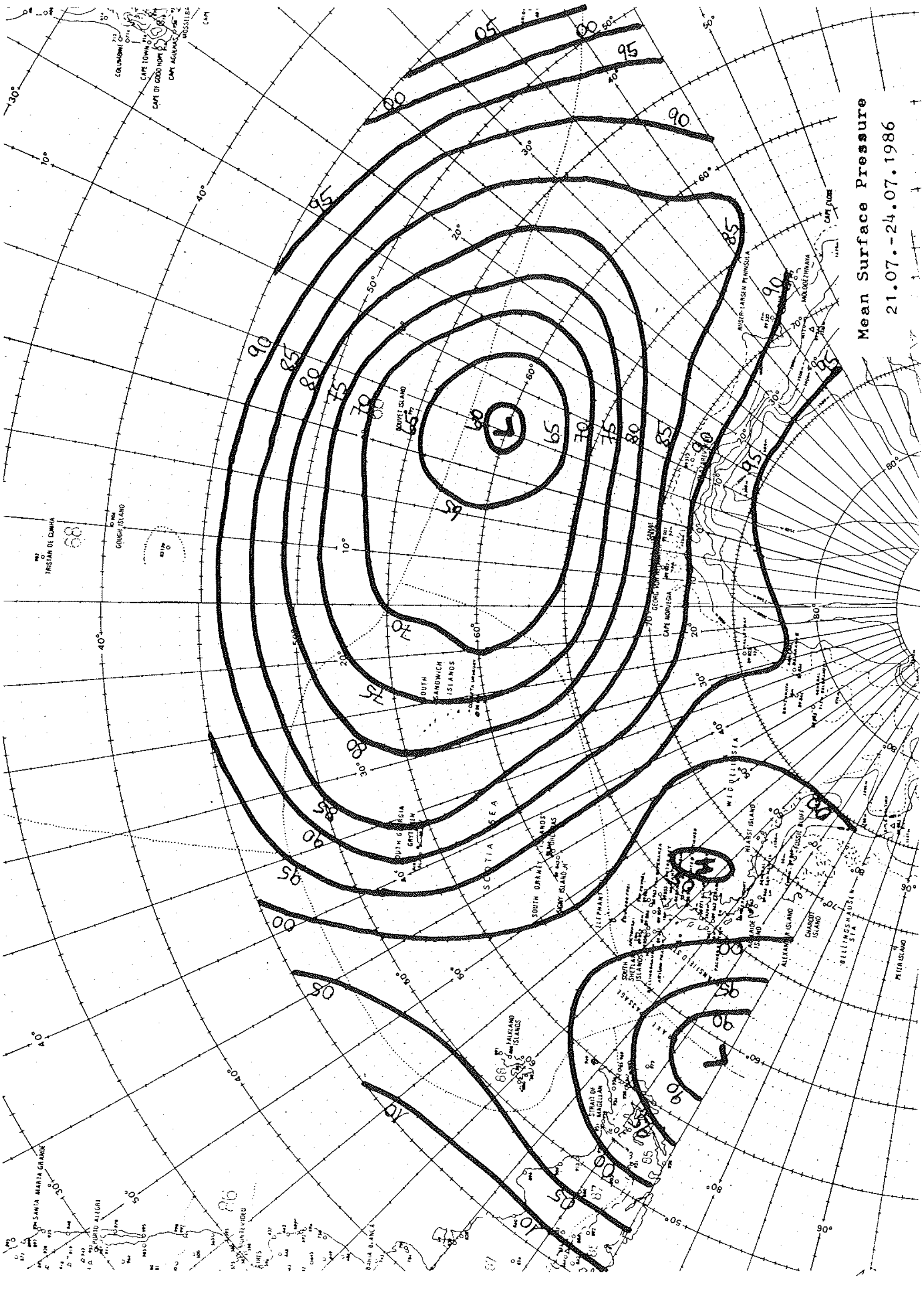
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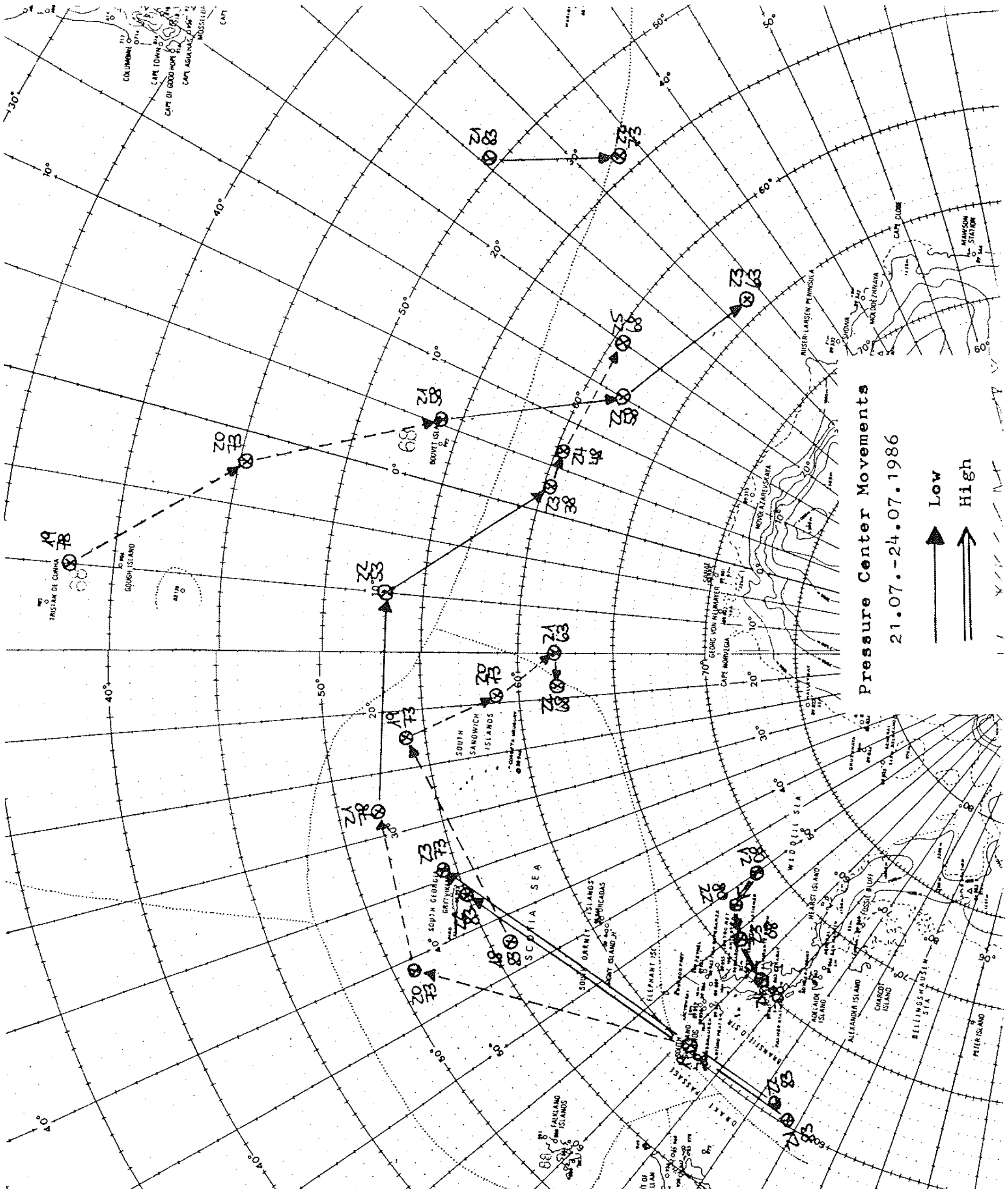
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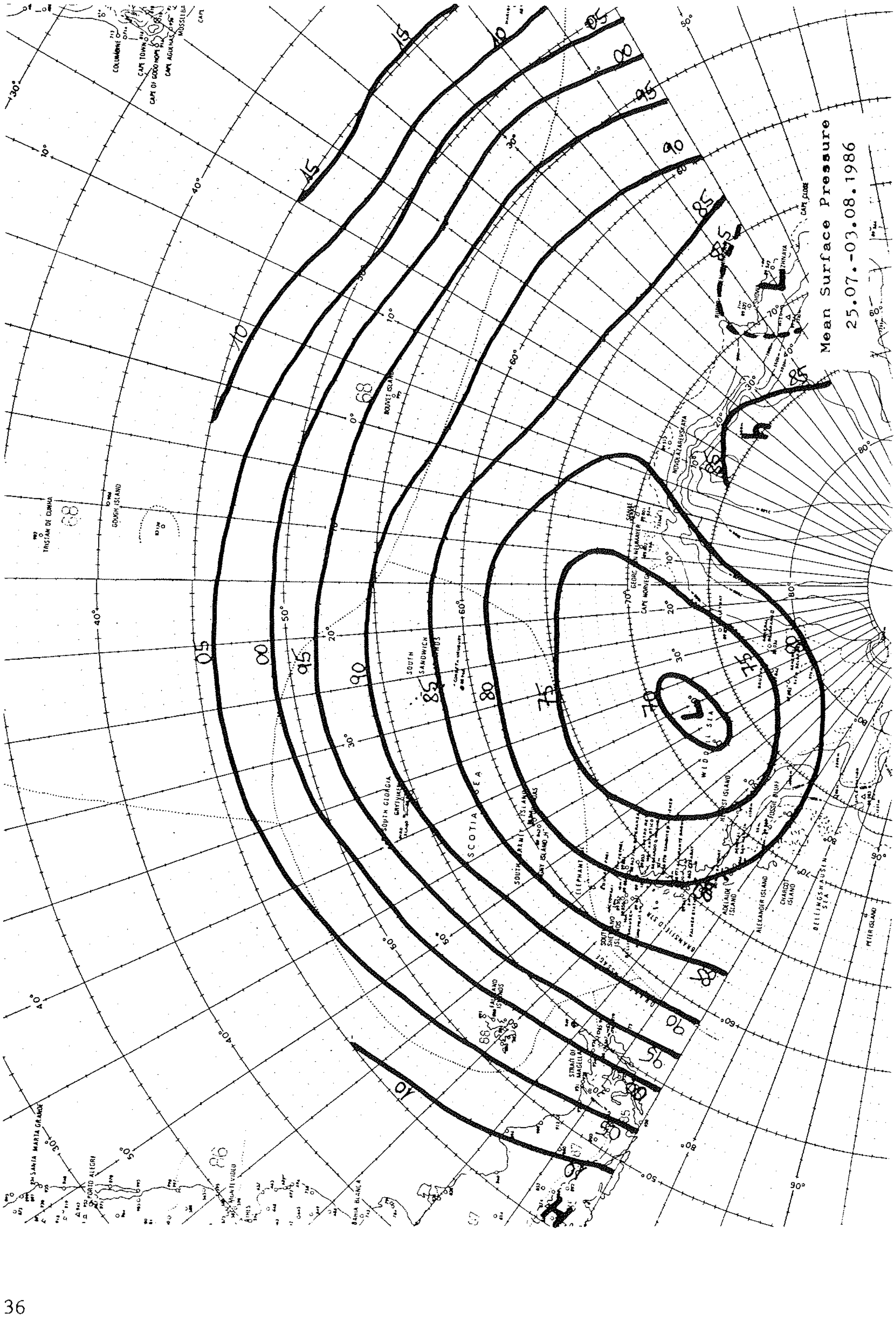
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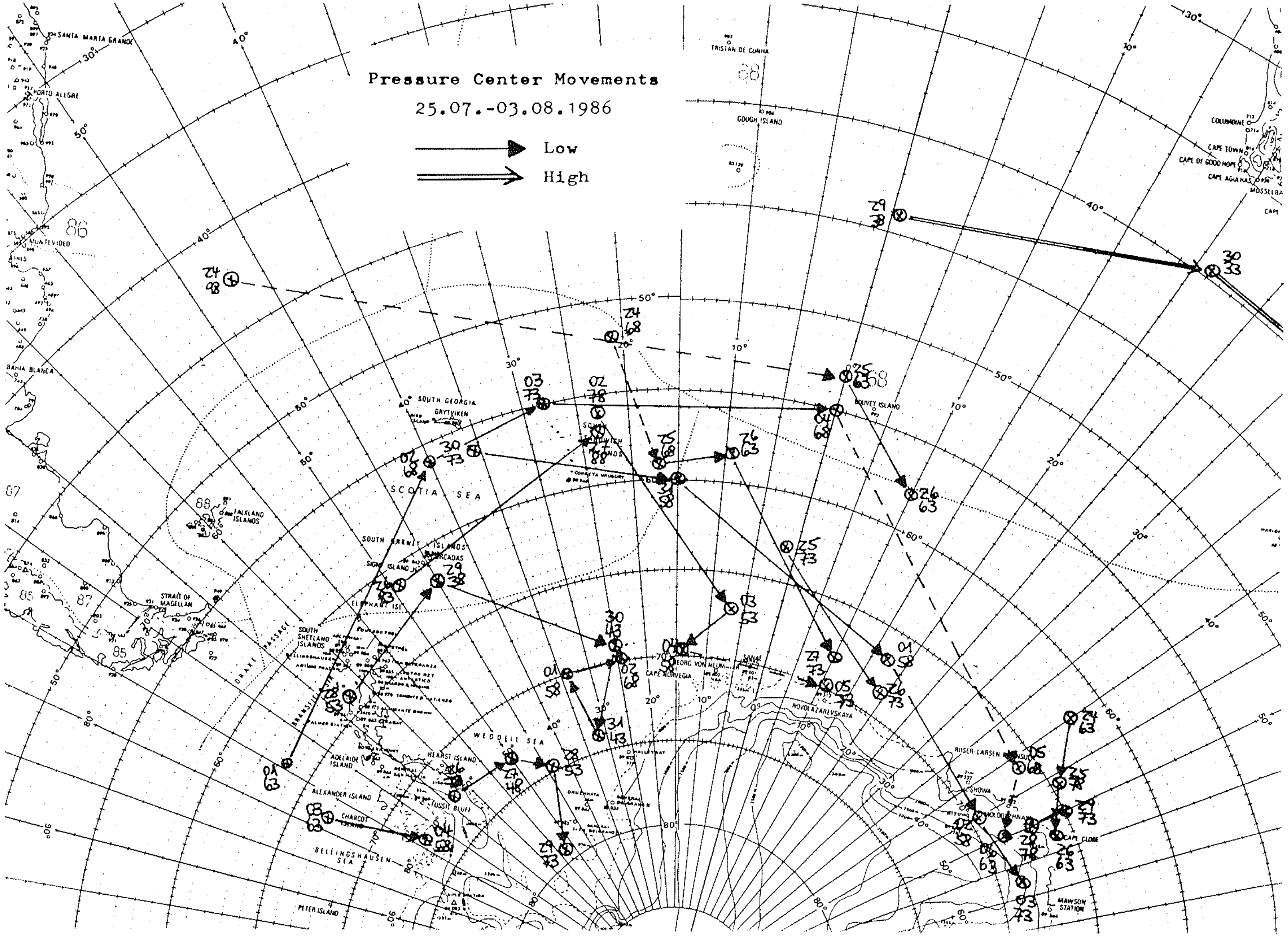
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BAHIA BLANCA
CAPE TOWN
CAPE OF GOOD HOPE
CAPE AGULHAS
SOUTH GEORGIA
SCOTIA SEA
FALKLAND ISLANDS
STRAIT OF MAGELLAN
DRAKE PASSAGE
SOUTH SHETLAND ISLANDS
SOUTH ORKNEY ISLANDS
BOUVET ISLAND
WEDDELL SEA
ADELAIDE ISLAND
ALEXANDER ISLAND
CHARCOT ISLAND
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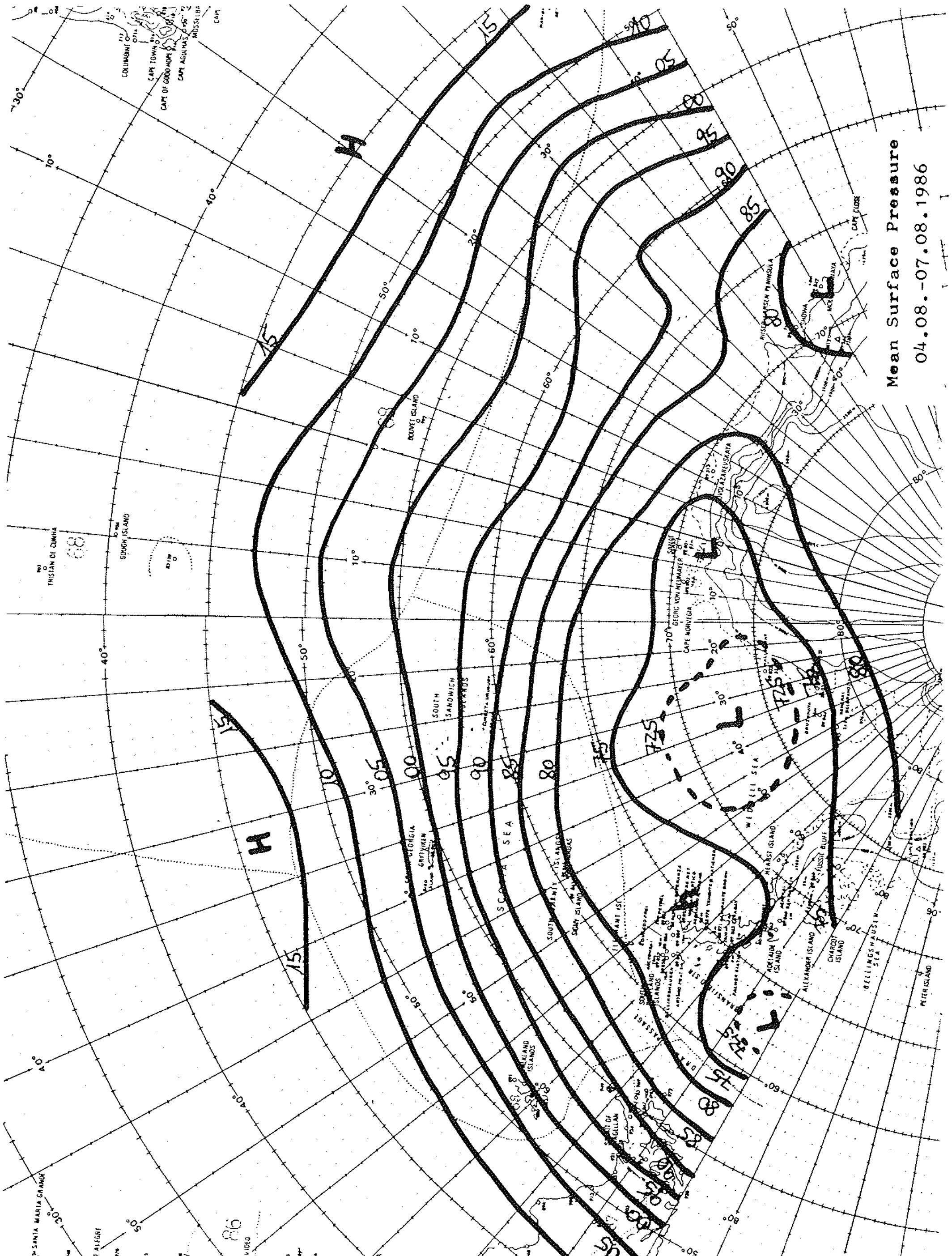
PETER ISLAND
HEARST ISLAND
CAPE NORVEGIA
NOVOLAZAREVSKAYA
SHOWA
MAWSON STATION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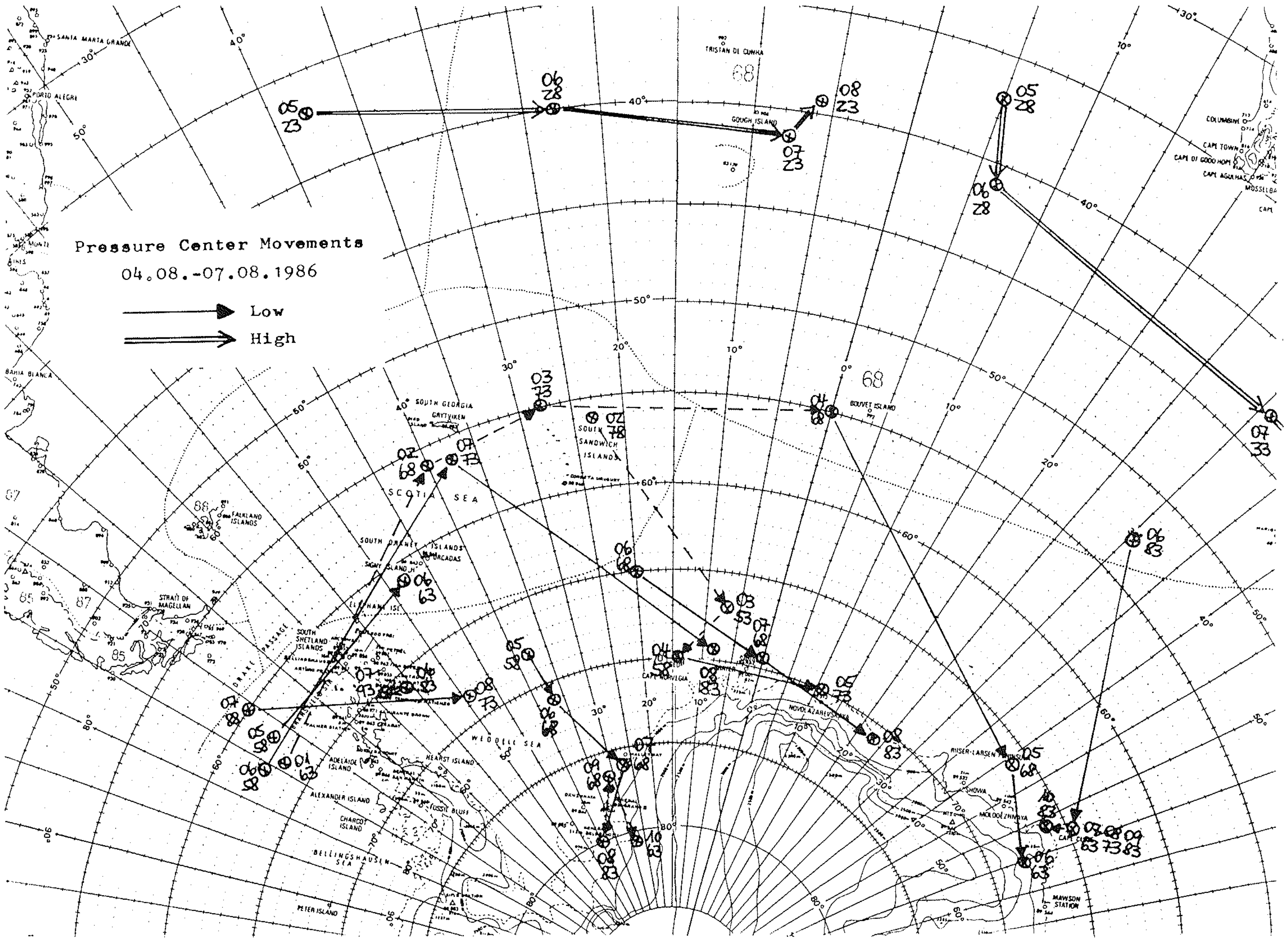
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04.08.-07.08.1986
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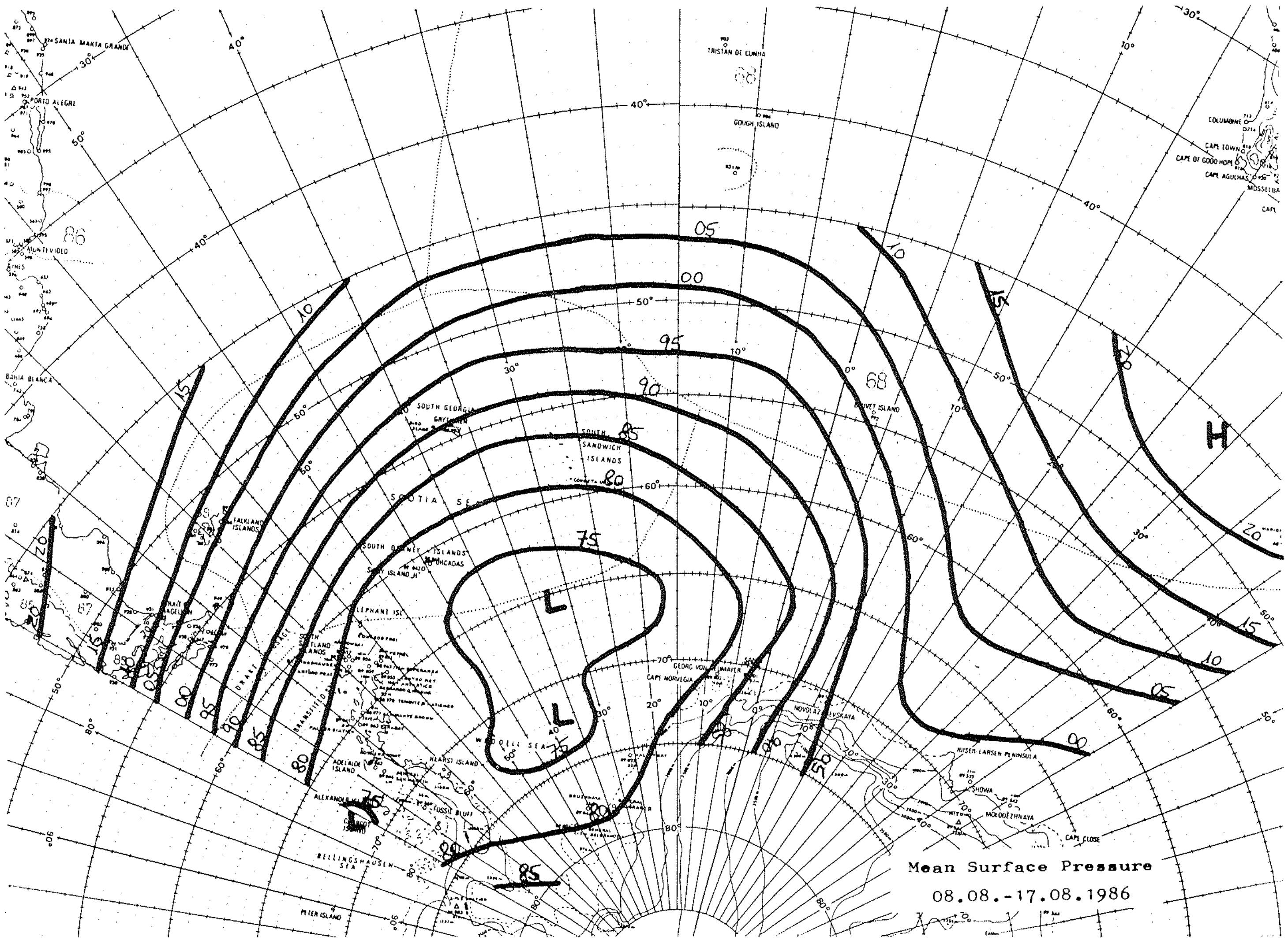
BOUVET ISLAND
GOUGH ISLAND
TRISTAN DA CUNHA
FALKLAND ISLANDS
MAWSON STATION
ALEXANDER ISLAND
PETER ISLAND


Mean Surface Pressure
08.08.-17.08.1986
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SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
FALKLAND ISLANDS
BOUVET ISLAND
GOUGH ISLAND
TRISTAN DE CUNHA
BELLINGSHAUSEN SEA
SCOTIA SEA
WEDDELL SEA
PETER ISLAND
PORTO ALEGRE
BAHIA BLANCA
CAPE TOWN
CAPE OF GOOD HOPE
CAPE AGULHAS
SHOWA
MOLODEZHNAYA
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ADELAIDE ISLAND
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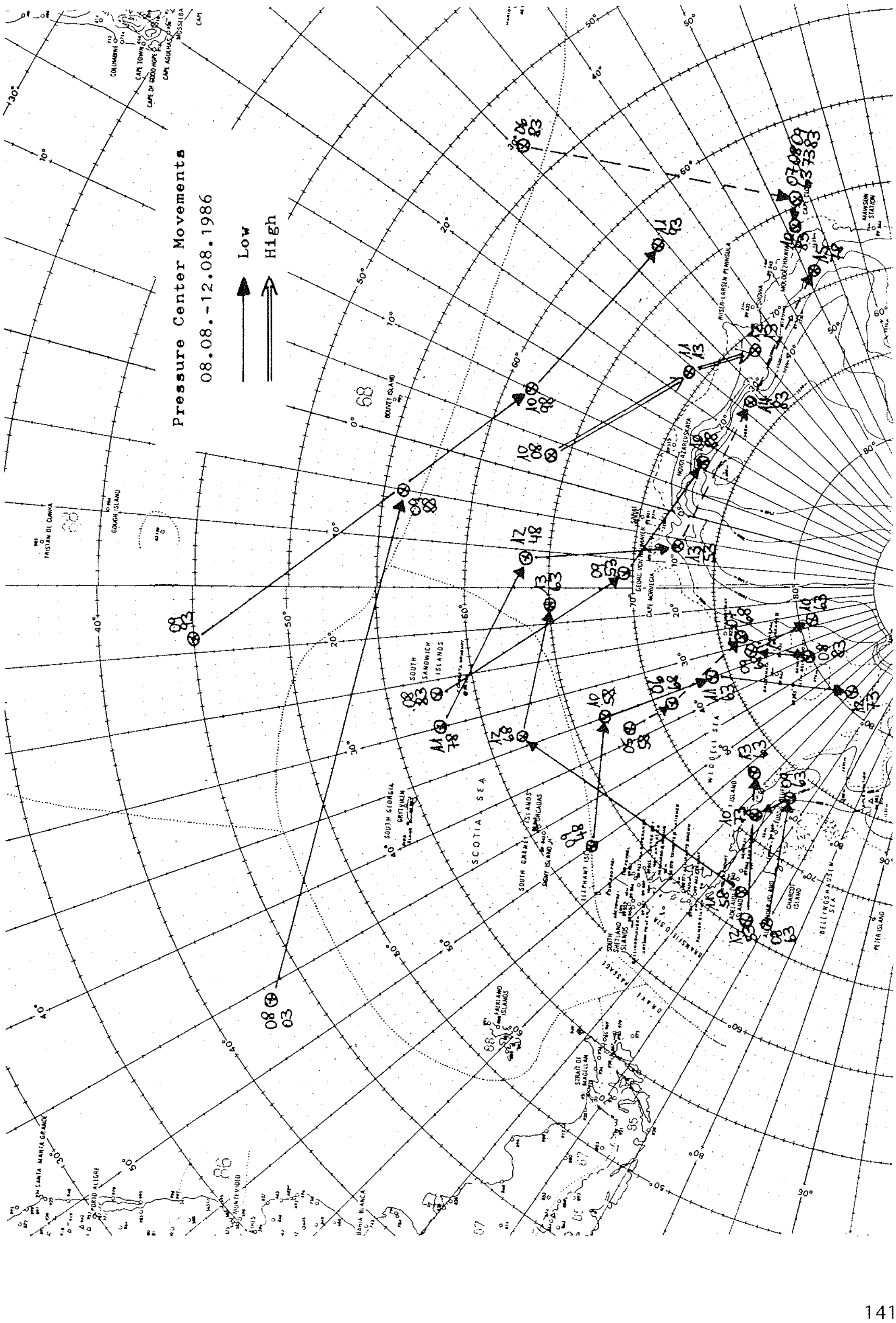
HEARST ISLAND
FOSSIL BLUFF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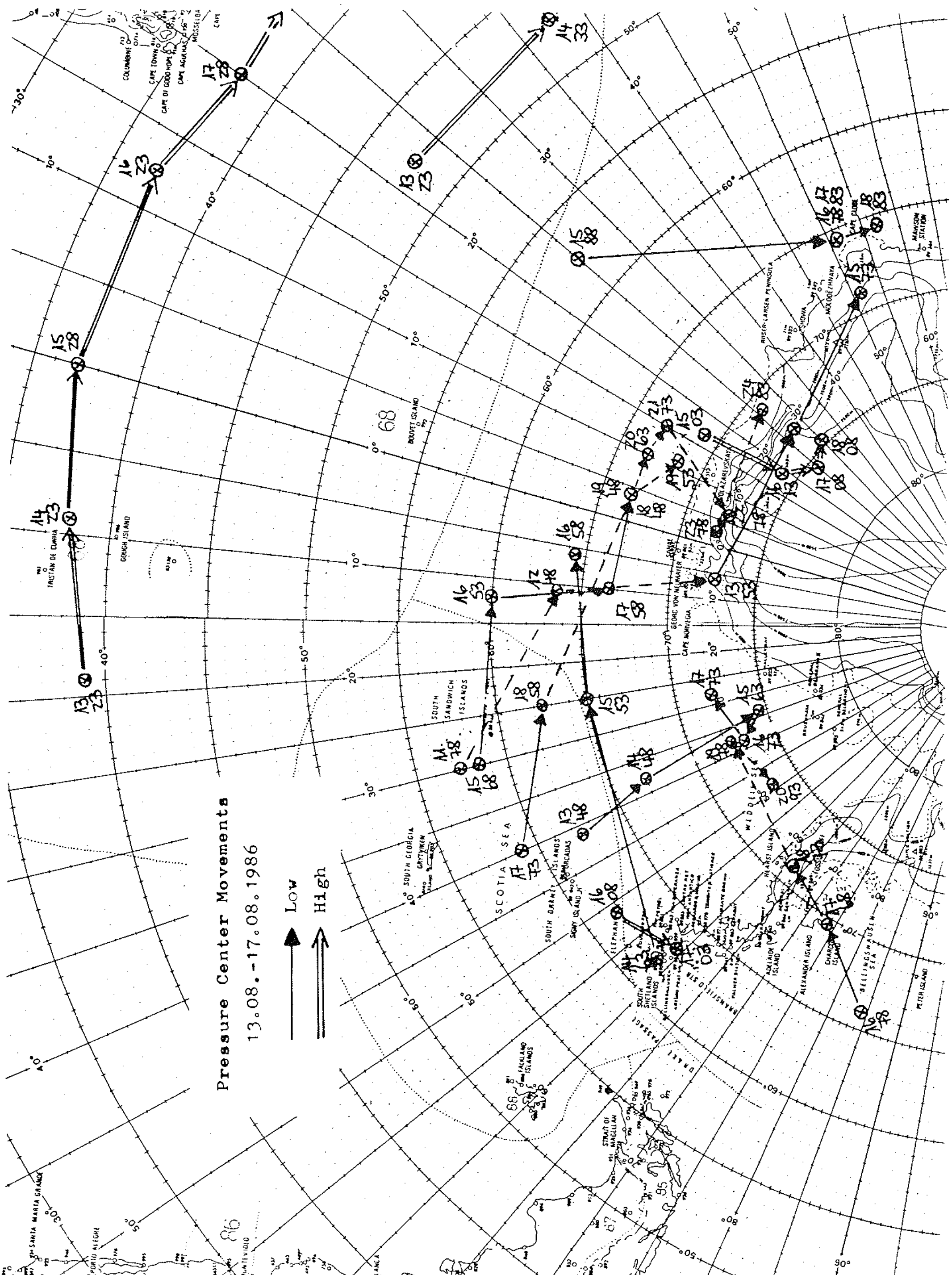
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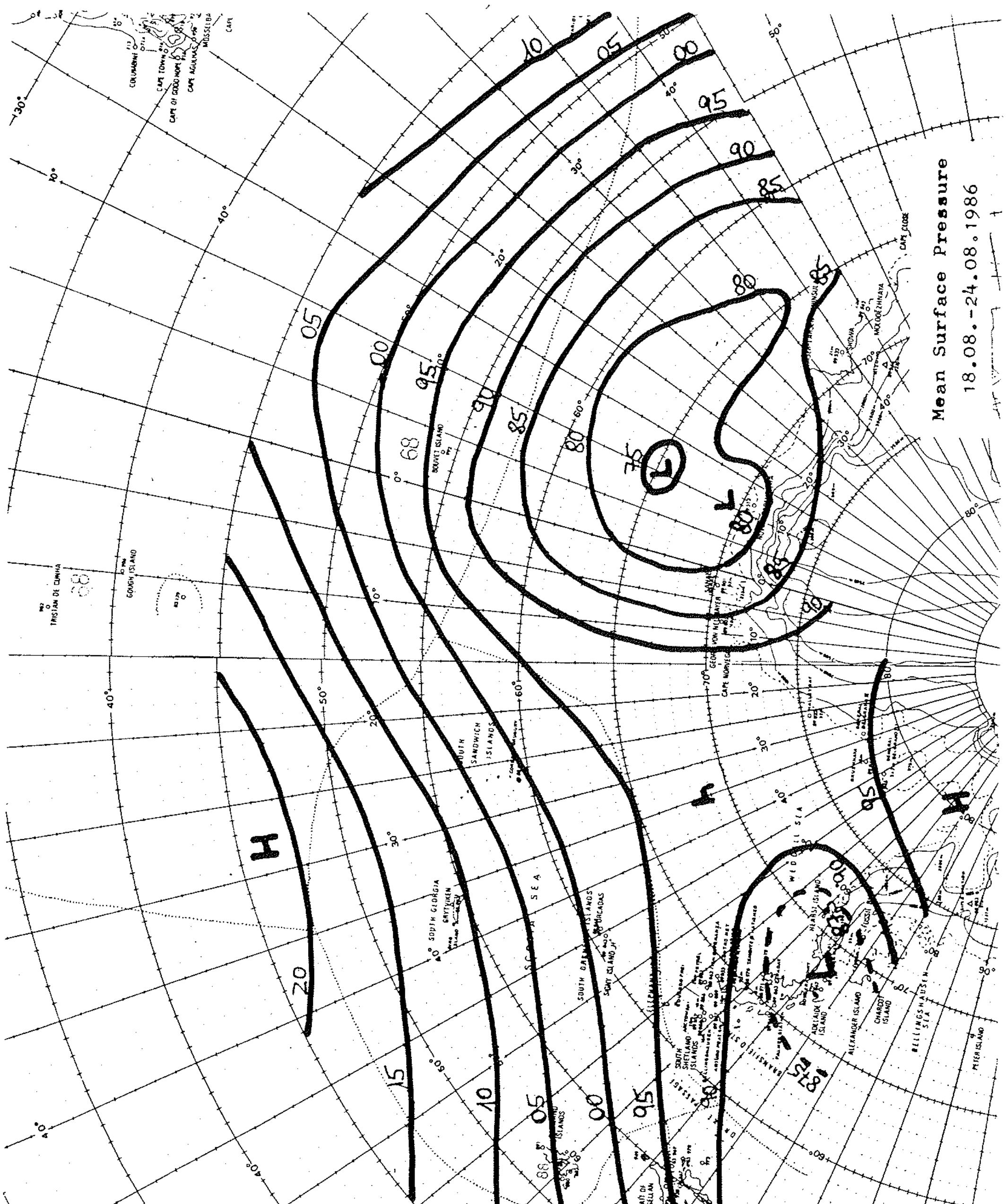
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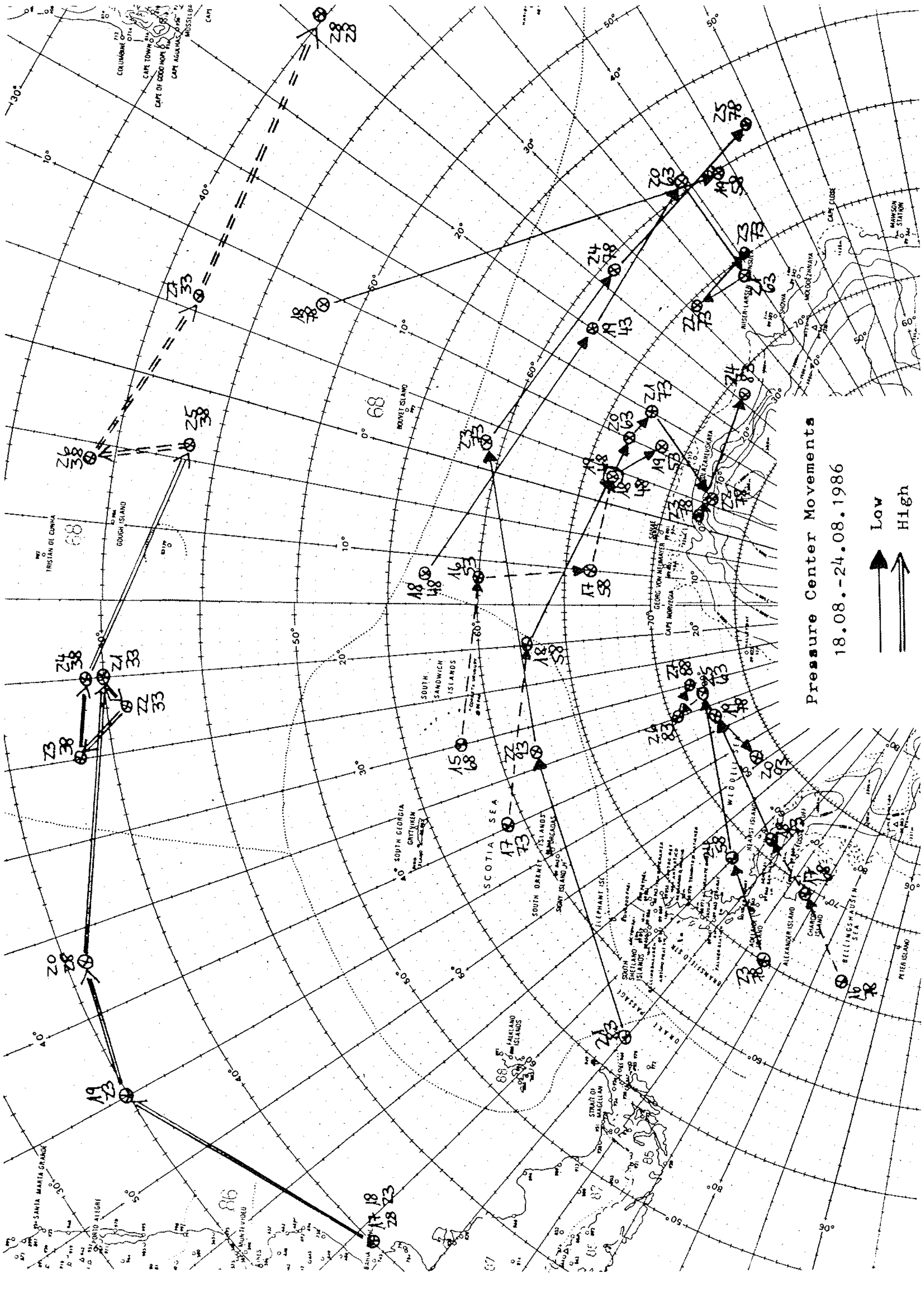
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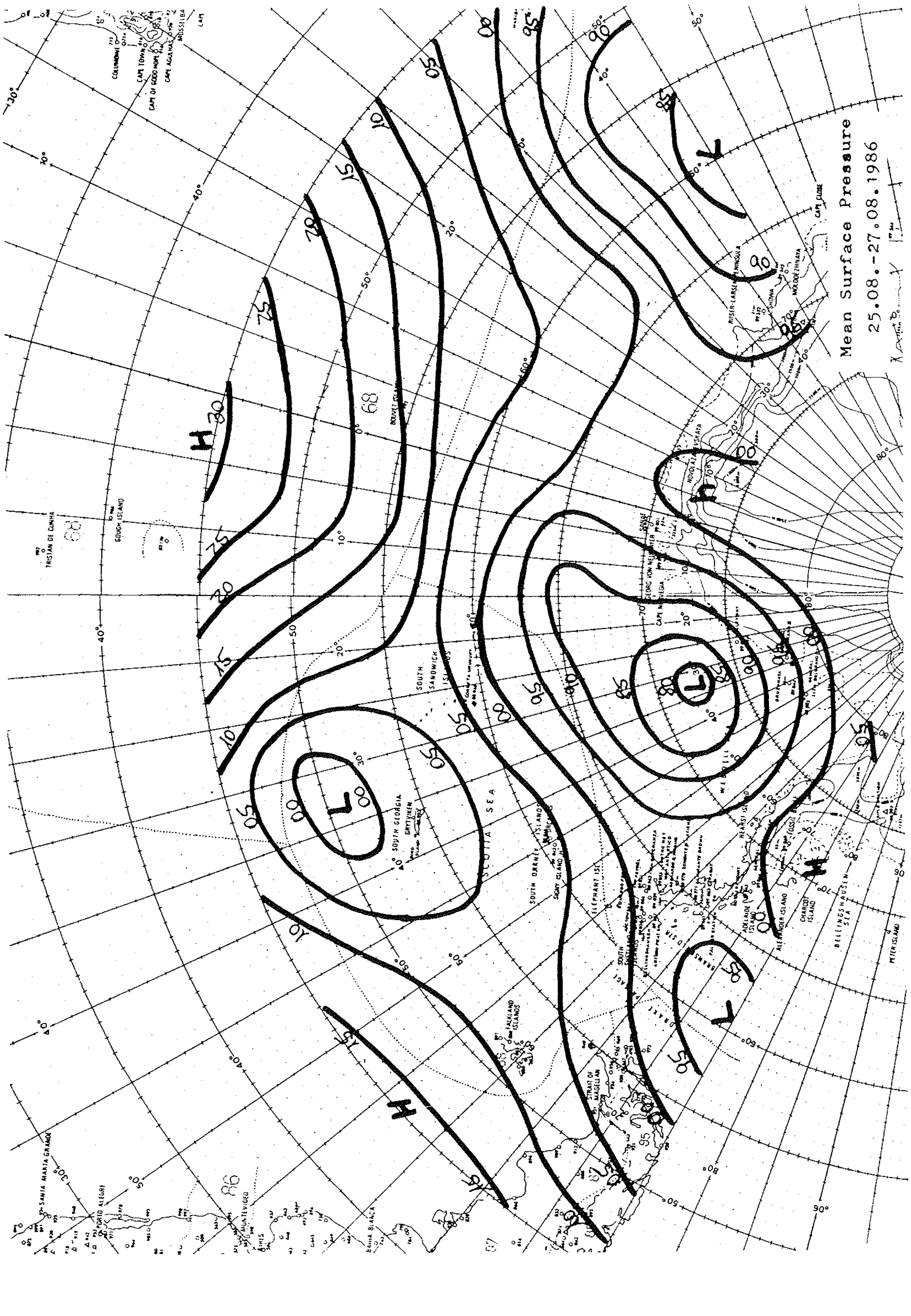
Mean Surface Pressure
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GOUGH ISLAND
TRISTAN DA CUNHA
BOUVET ISL.
BELLINGSHAUSEN SEA
PETER ISLAND
ADELAIDE ISLAND
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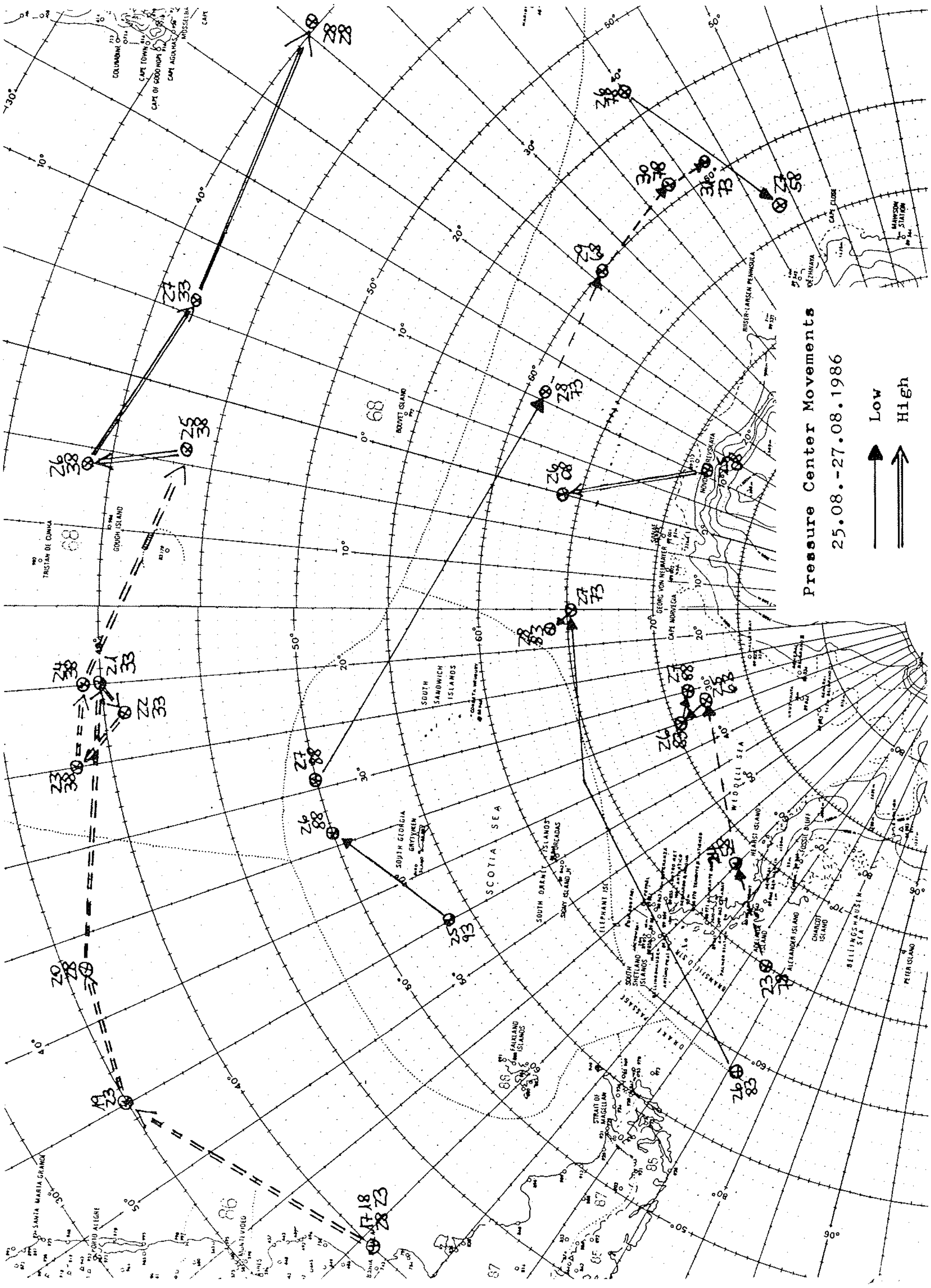
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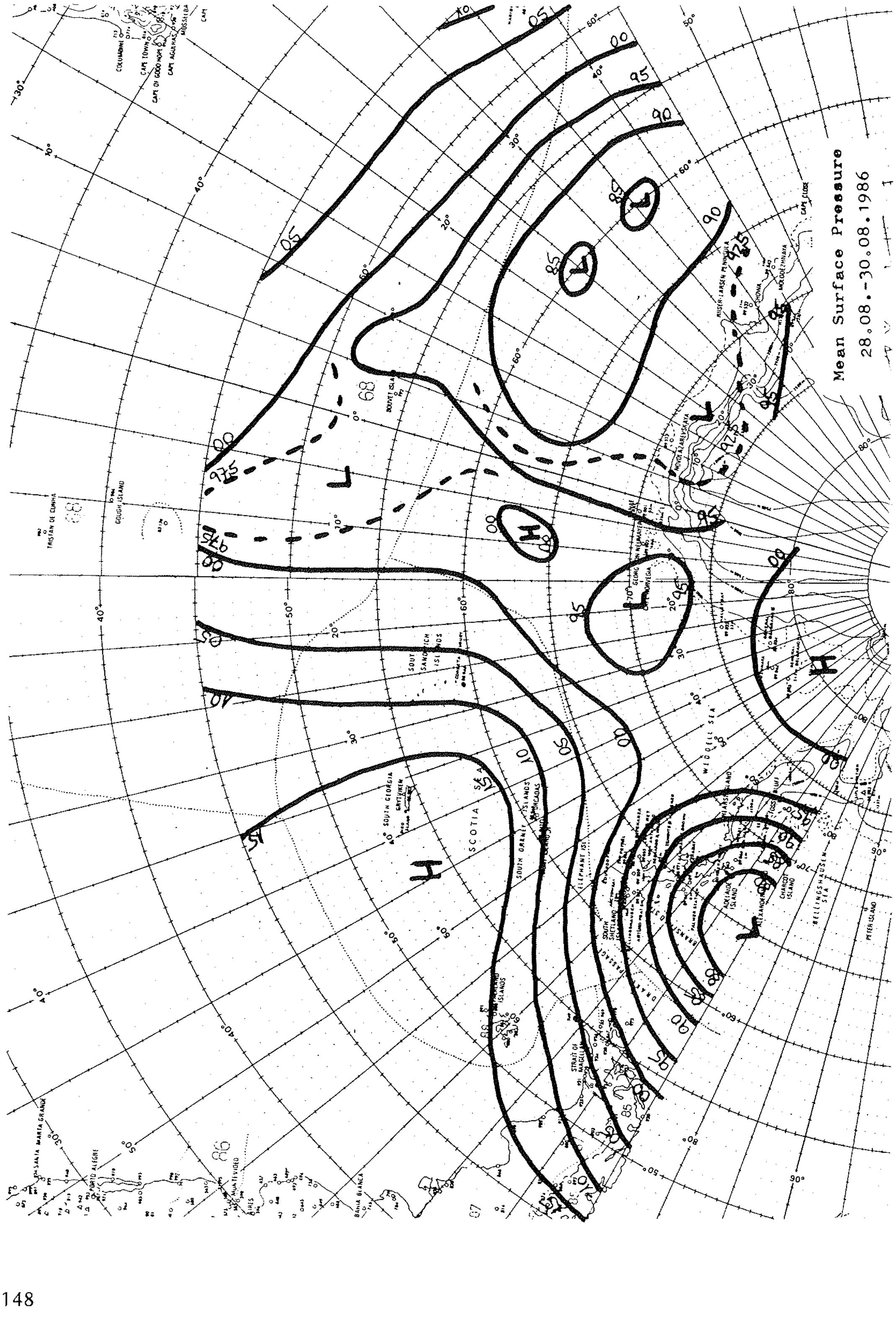
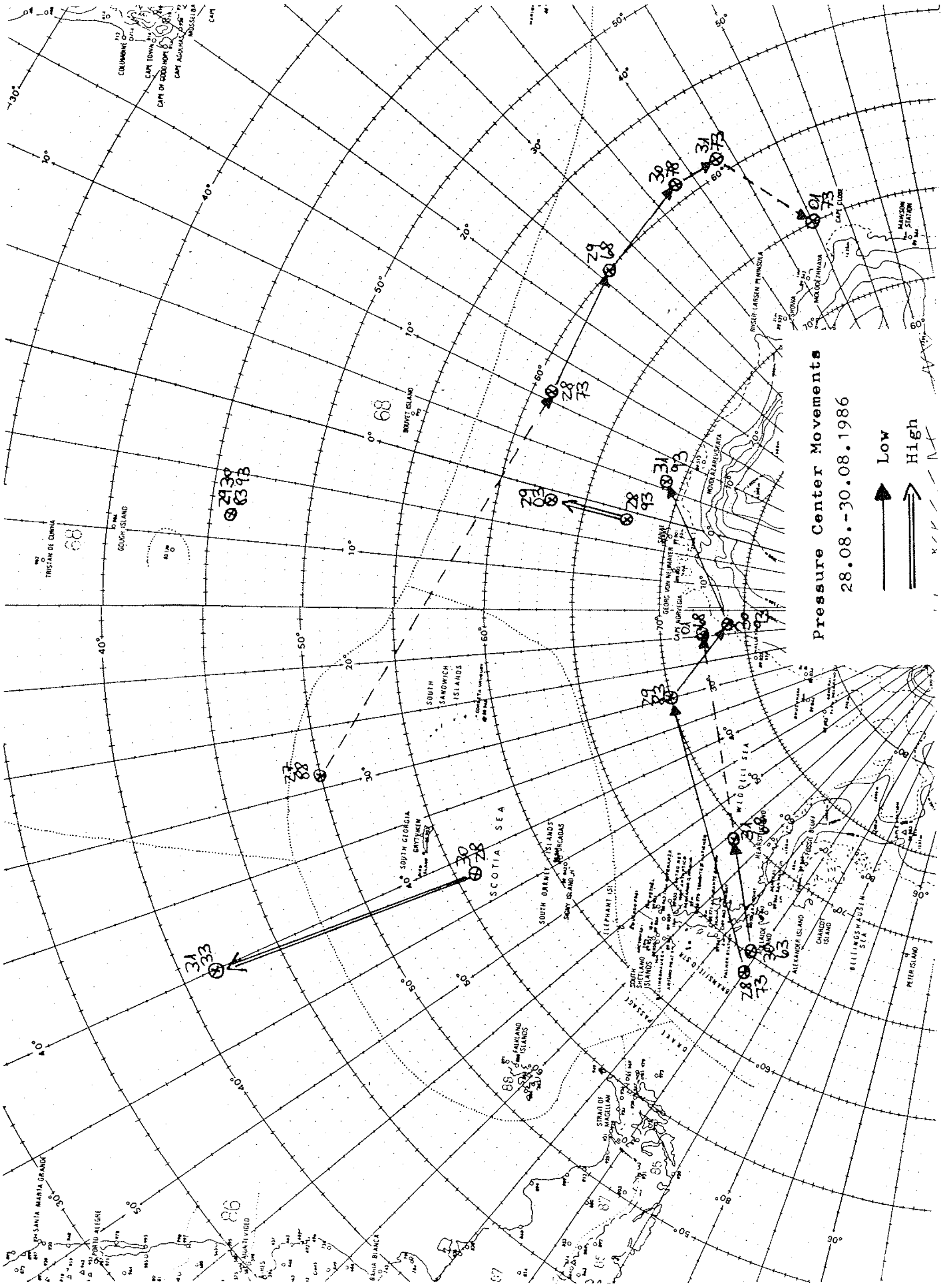


Mean Surface Pressure 28.08.-30.08.1986


Pressure Center Movements
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Low
High
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WEDDELL SEA
SOUTH GEORGIA
SOUTH SANDWICH ISLANDS
SOUTH ORKNEY ISLANDS
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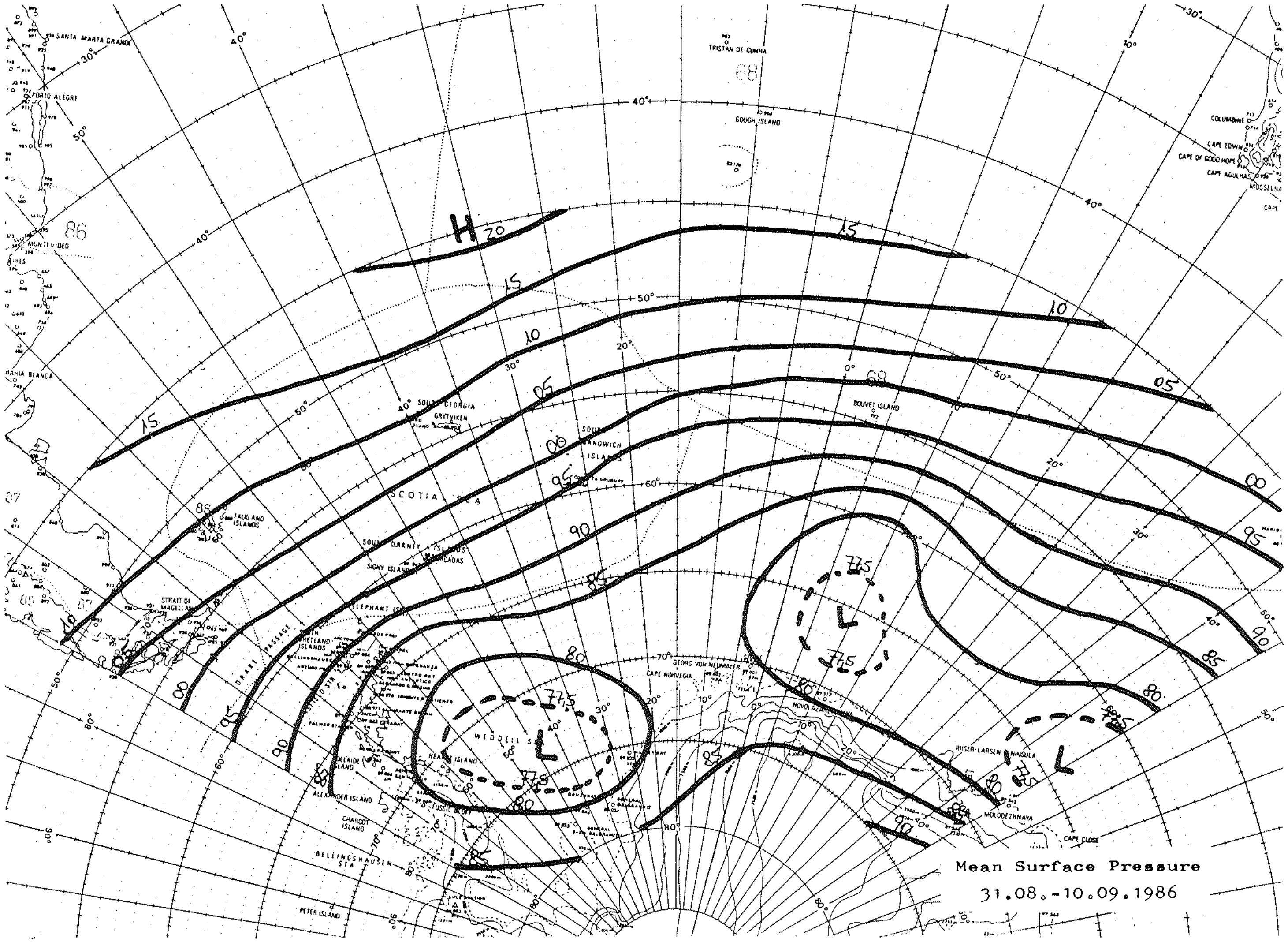
MAWSON STATION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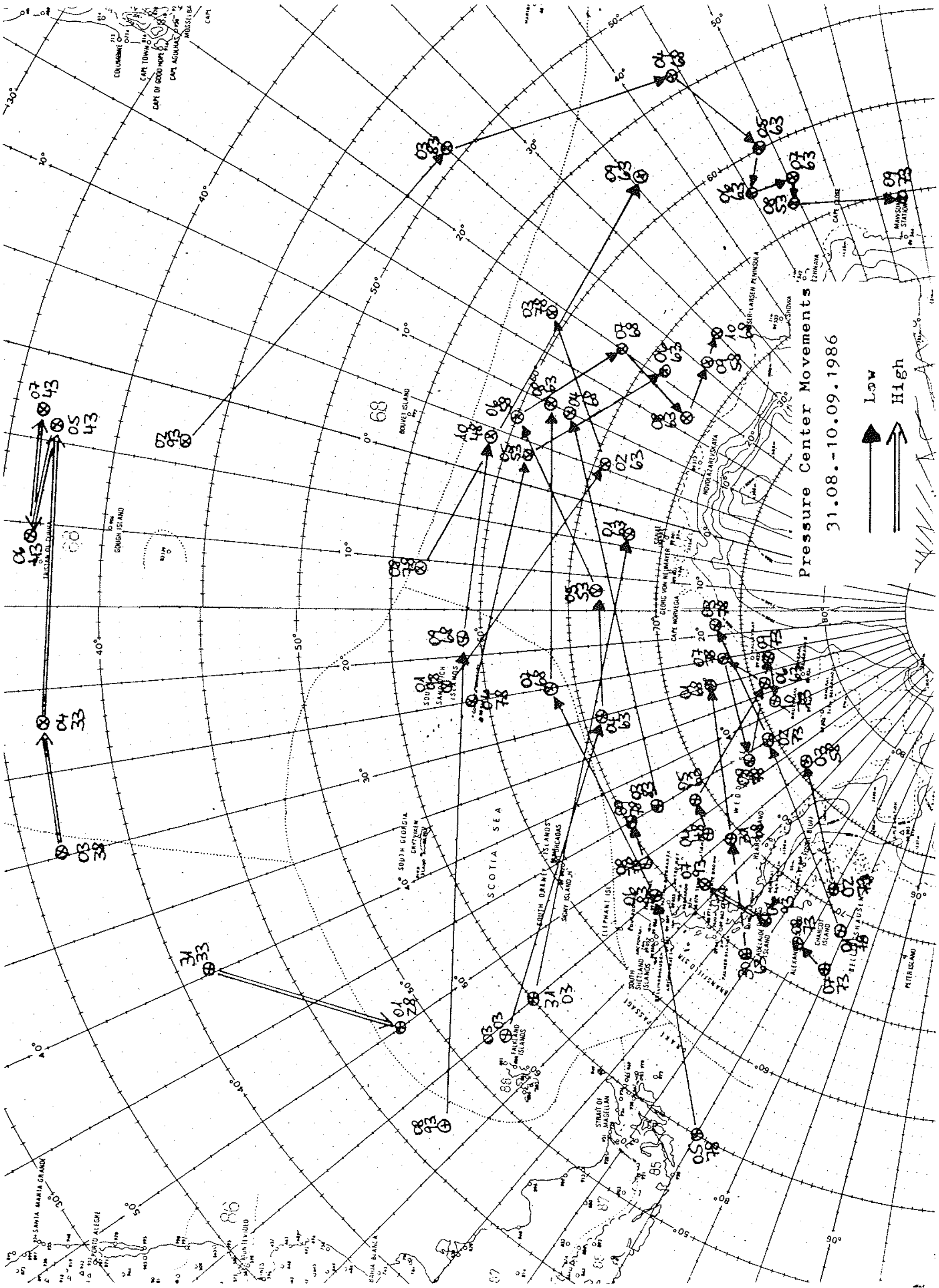
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31.08.-10.09.1986
Low
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SCOTIA SEA
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SOUTH ORKNEY ISLANDS
FALKLAND ISLANDS
STRAIT OF MAGELLAN
BOUVET ISLAND
GOUGH ISLAND
PETER ISLAND

APPENDIX

WMO Code Tables

h	-	Height above ground of the base of the lowest cloud seen
C_H	--	Clouds of genera Cirrus, Cirrocumulus and Cirrostratus
C_L	--	Clouds of genera Stratocumulus, Stratus, Cumulus and Cumulonimbus
C_M	--	Clouds of genera Atlociúmulus, Altostratus and Nimbostratus
ww	--	present weather
W	-	past weather (refers to W_1 and W_2, respectively)

h — *Height above ground of the base of the lowest cloud seen*

Code figure	
0	0 to 50 m
1	50 to 100 m
2	100 to 200 m
3	200 to 300 m
4	300 to 600 m
5	600 to 1 000 m
6	1 000 to 1 500 m
7	1 500 to 2 000 m
8	2 000 to 2 500 m
9	2 500 m or more, or no clouds
/	Height of base of cloud not known or base of clouds at a level lower and tops at a level higher than that of the station

Notes:

(1) A height exactly equal to one of the values at the ends of the ranges shall be coded in the higher range; e.g., a height of 600 m shall be reported by code figure 5.

(2) Due to the limitation in range of the cloud-sensing equipment used by an automatic station, the code figures reported for h could have one of the three following meanings;

(*a*) The actual height of the base of the cloud is within the range indicated by the code figure; or

(*b*) The height of the base of the cloud is greater than the range indicated by the code figure but cannot be determined due to instrumental limitations; or

(*c*) There are no clouds vertically above the station.

W — *Past weather*

Code figure	
0	Cloud covering ½ or less of the sky throughout the appropriate period
1	Cloud covering more than ½ of the sky during part of the appropriate period and covering ½ or less during part of the period
2	Cloud covering more than ½ of the sky throughout the appropriate period
3	Sandstorm, duststorm or blowing snow
4	Fog or ice fog or thick haze
5	Drizzle
6	Rain
7	Snow, or rain and snow mixed
8	Shower(s)
9	Thunderstorm(s) with or without precipitation

C_H — *Clouds of the genera Cirrus, Cirrocumulus and Cirrostratus*

Code figure	Technical specifications	Code figure	Non-technical specifications
0	No C_H clouds	0	No Cirrus, Cirrocumulus or Cirrostratus
1	Cirrus fibratus, sometimes uncinus, not progressively invading the sky	1	Cirrus in the form of filaments, strands or hooks, not progressively invading the sky
2	Cirrus spissatus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus castellanus or floccus	2	Dense Cirrus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus with sproutings in the form of small turrets or battlements, or Cirrus having the appearance of cumuliform tufts
3	Cirrus spissatus cumulonimbogenitus	3	Dense Cirrus, often in the form of an anvil, being the remains of the upper parts of Cumulonimbus
4	Cirrus uncinus or fibratus, or both, progressively invading the sky; they generally thicken as a whole	4	Cirrus in the form of hooks or of filaments, or both, progressively invading the sky; they generally become denser as a whole
5	Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole, but the continuous veil does not reach 45 degrees above the horizon	5	Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole, but the continuous veil does not reach 45 degrees above the horizon
6	Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered	6	Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered
7	Cirrostratus covering the whole sky	7	Veil of Cirrostratus covering the celestial dome

(continued)

(*Code 0509 — continued*)

Code figure	Technical specifications	Code figure	Non-technical specifications
8	Cirrostratus not progressively invading the sky and not entirely covering it	8	Cirrostratus not progressively invading the sky and not completely covering the celestial dome
9	Cirrocumulus alone, or Cirrocumulus predominant among the C_H clouds	9	Cirrocumulus alone, or Cirrocumulus accompanied by Cirrus or Cirrostratus, or both, but Cirrocumulus is predominant
/	C_H clouds invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena, or because of a continuous layer of lower clouds	/	Cirrus, Cirrocumulus and Cirrostratus invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds

C_L — *Clouds of the genera Stratocumulus, Stratus, Cumulus and Cumulonimbus*

Code figure	Technical specifications	Code figure	Non-technical specifications
0	No C_L clouds	0	No Stratocumulus, Stratus, Cumulus or Cumulonimbus
1	Cumulus humilis or Cumulus fractus other than of bad weather,* or both	1	Cumulus with little vertical extent and seemingly flattened, or ragged Cumulus other than of bad weather,* or both
2	Cumulus mediocris or congestus, with or without Cumulus of species fractus or humilis or Stratocumulus, all having their bases at the same level	2	Cumulus of moderate or strong vertical extent, generally with protuberances in the form of domes or towers, either accompanied or not by other Cumulus or by Stratocumulus, all having their bases at the same level
3	Cumulonimbus calvus, with or without Cumulus, Stratocumulus or Stratus	3	Cumulonimbus the summits of which, at least partially, lack sharp outlines, but are neither clearly fibrous (cirriform) nor in the form of an anvil; Cumulus, Stratocumulus or Stratus may also be present
4	Stratocumulus cumulogenitus	4	Stratocumulus formed by the spreading out of Cumulus; Cumulus may also be present
5	Stratocumulus other than Stratocumulus cumulogenitus	5	Stratocumulus not resulting from the spreading out of Cumulus

* "Bad weather" denotes the conditions which generally exist during precipitation and a short time before and after.

(*continued*)

(Code 0513 — continued)

Code figure	Technical specifications	Code figure	Non-technical specifications
6	Stratus nebulosus or Stratus fractus other than of bad weather,* or both	6	Stratus in a more or less continuous sheet or layer, or in ragged shreds, or both, but no Stratus fractus of bad weather *
7	Stratus fractus or Cumulus fractus of bad weather,* or both (pannus), usually below Altostratus or Nimbostratus	7	Stratus fractus of bad weather * or Cumulus fractus of bad weather, or both (pannus), usually below Altostratus or Nimbostratus
8	Cumulus and Stratocumulus other than Stratocumulus cumulogenitus, with bases at different levels	8	Cumulus and Stratocumulus other than that formed from the spreading out of Cumulus; the base of the Cumulus is at a different level from that of the Stratocumulus
9	Cumulonimbus capillatus (often with an anvil), with or without Cumulonimbus calvus, Cumulus, Stratocumulus, Stratus or pannus	9	Cumulonimbus, the upper part of which is clearly fibrous (cirriform), often in the form of an anvil; either accompanied or not by Cumulonimbus without anvil or fibrous upper part, by Cumulus, Stratocumulus, Stratus or pannus
/	C_L clouds invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena	/	Stratocumulus, Stratus, Cumulus and Cumulonimbus invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena

* "Bad weather" denotes the conditions which generally exist during precipitation and a short time before and after.

C_M — *Clouds of the genera Altocumulus, Altostratus and Nimbostratus*

Code figure	Technical specifications	Code figure	Non-technical specifications
0	No C_M clouds	0	No Altocumulus, Altostratus or Nimbostratus
1	Altostratus translucidus	1	Altostratus, the greater part of which is semi-transparent; through this part the sun or moon may be weakly visible, as through ground glass
2	Altostratus opacus or Nimbostratus	2	Altostratus, the greater part of which is sufficiently dense to hide the sun or moon, or Nimbostratus

(continued)

(Code 0515 — continued)

Code figure	Technical specifications	Code figure	Non-technical specifications
3	Altocumulus translucidus at a single level	3	Altocumulus, the greater part of which is semi-transparent; the various elements of the cloud change only slowly and are all at a single level
4	Patches (often lenticular) of Altocumulus translucidus, continually changing and occurring at one or more levels	4	Patches (often in the form of almonds or fishes) of Altocumulus, the greater part of which is semi-transparent; the clouds occur at one or more levels and the elements are continually changing in appearance
5	Altocumulus translucidus in bands, or one or more layers of Altocumulus translucidus or opacus, progressively invading the sky; these Altocumulus clouds generally thicken as a whole	5	Semi-transparent Altocumulus in bands, or Altocumulus in one or more fairly continuous layers (semi-transparent or opaque), progressively invading the sky; these Altocumulus clouds generally thicken as a whole
6	Altocumulus cumulogenitus (or cumulonimbogenitus)	6	Altocumulus resulting from the spreading out of Cumulus (or Cumulonimbus)
7	Altocumulus translucidus or opacus in two or more layers, or Altocumulus opacus in a single layer, not progressively invading the sky, or Altocumulus with Altostratus or Nimbostratus	7	Altocumulus in two or more layers, usually opaque in places, and not progressively invading the sky; or opaque layer of Altocumulus, not progressively invading the sky; or Altocumulus together with Altostratus or Nimbostratus
8	Altocumulus castellanus or floccus	8	Altocumulus with sproutings in the form of small towers or battlements, or Altocumulus having the appearance of cumuliform tufts
9	Altocumulus of a chaotic sky, generally at several levels	9	Altocumulus of a chaotic sky, generally at several levels
/	C_M clouds invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena, or because of a continuous layer of lower clouds	/	Altocumulus, Altostratus and Nimbostratus invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds

ww — *Present weather*

ww = 00 – 49	*No precipitation at the station at the time of observation*
ww = 00 – 19	No precipitation, fog, ice fog (except for 11 and 12), duststorm, sandstorm, drifting or blowing snow at the station * at the time of observation or, except for 09 and 17, during the preceding hour

	Code figure ww		
No meteors except photometeors	00	Cloud development not observed or not observable	characteristic change of the state of sky during the past hour
	01	Clouds generally dissolving or becoming less developed	
	02	State of sky on the whole unchanged	
	03	Clouds generally forming or developing	
Haze, dust, sand or smoke	04	Visibility reduced by smoke, e.g., veldt or forest fires, industrial smoke or volcanic ashes	
	05	Haze	
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well-developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen; or, in the case of ships, blowing spray at the station	
	08	Well-developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm	
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour	
	10	Mist	
	11	Patches of	shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
	12	More or less continuous	
	13	Lightning visible, no thunder heard	
	14	Precipitation within sight, not reaching the ground or the surface of the sea	
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant, i.e., estimated to be more than 5 km, from the station	
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	
	17	Thunderstorm, but no precipitation at the time of observation	
	18	Squalls	at or within sight of the station during the preceding hour or at the time of observation
	19	Funnel cloud(s) **	

* The expression "at the station" refers to a land station or a ship.
** Tornado cloud or waterspout.

(continued)

(Code table 4677 — continued)

ww = 20 – 29	Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation

Code figure ww		
20	Drizzle (not freezing) or snow grains	not falling as shower(s)
21	Rain (not freezing)	not falling as shower(s)
22	Snow	not falling as shower(s)
23	Rain and snow or ice pellets	not falling as shower(s)
24	Freezing drizzle or freezing rain	not falling as shower(s)
25	Shower(s) of rain	
26	Shower(s) of snow, or of rain and snow	
27	Shower(s) of hail*, or of rain and hail*	
28	Fog or ice fog	
29	Thunderstorm (with or without precipitation)	

* Hail, small hail, snow pellets. French: grêle, grésil ou neige roulée.

ww = 30 – 39	Duststorm, sandstorm, drifting or blowing snow

ww		
30	Slight or moderate duststorm or sandstorm	– has decreased during the preceding hour
31	Slight or moderate duststorm or sandstorm	– no appreciable change during the preceding hour
32	Slight or moderate duststorm or sandstorm	– has begun or has increased during the preceding hour
33	Severe duststorm or sandstorm	– has decreased during the preceding hour
34	Severe duststorm or sandstorm	– no appreciable change during the preceding hour
35	Severe duststorm or sandstorm	– has begun or has increased during the preceding hour
36	Slight or moderate drifting snow	generally low (below eye level)
37	Heavy drifting snow	generally low (below eye level)
38	Slight or moderate blowing snow	generally high (above eye level)
39	Heavy blowing snow	generally high (above eye level)

ww = 40 – 49	Fog or ice fog at the time of observation

ww		
40	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer	
41	Fog or ice fog in patches	
42	Fog or ice fog, sky visible	has become thinner during the preceding hour
43	Fog or ice fog, sky invisible	has become thinner during the preceding hour

(continued)

(Code table 4677 — continued)

Code figure		
44	Fog or ice fog, sky visible	no appreciable change during the preceding hour
45	Fog or ice fog, sky invisible	
46	Fog or ice fog, sky visible	has begun or has become thicker during the preceding hour
47	Fog or ice fog, sky invisible	
48	Fog, depositing rime, sky visible	
49	Fog, depositing rime, sky invisible	

ww = 50 - 99 *Precipitation at the station at the time of observation*

ww = 50 - 59 Drizzle

ww		
50	Drizzle, not freezing, intermittent	slight at time of observation
51	Drizzle, not freezing, continuous	
52	Drizzle, not freezing, intermittent	moderate at time of observation
53	Drizzle, not freezing, continuous	
54	Drizzle, not freezing, intermittent	heavy (dense) at time of observation
55	Drizzle, not freezing, continuous	
56	Drizzle, freezing, slight	
57	Drizzle, freezing, moderate or heavy (dense)	
58	Drizzle and rain, slight	
59	Drizzle and rain, moderate or heavy	

ww = 60 - 69 Rain

ww		
60	Rain, not freezing, intermittent	slight at time of observation
61	Rain, not freezing, continuous	
62	Rain, not freezing, intermittent	moderate at time of observation
63	Rain, not freezing, continuous	
64	Rain, not freezing, intermittent	heavy at time of observation
65	Rain, not freezing, continuous	
66	Rain, freezing, slight	
67	Rain, freezing, moderate or heavy	
68	Rain or drizzle and snow, slight	
69	Rain or drizzle and snow, moderate or heavy	

ww = 70 - 79 Solid precipitation not in showers

ww		
70	Intermittent fall of snowflakes	slight at time of observation
71	Continuous fall of snowflakes	
72	Intermittent fall of snowflakes	moderate at time of observation
73	Continuous fall of snowflakes	

(continued)

(Code table 4677 — continued)

Code figure		
74	Intermittent fall of snowflakes	heavy at time of observation
75	Continuous fall of snowflakes	heavy at time of observation
76	Diamond dust (with or without fog)	
77	Snow grains (with or without fog)	
78	Isolated star-like snow crystals (with or without fog)	
79	Ice pellets	

ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

ww		
80	Rain shower(s), slight	
81	Rain shower(s), moderate or heavy	
82	Rain shower(s), violent	
83	Shower(s) of rain and snow mixed, slight	
84	Shower(s) of rain and snow mixed, moderate or heavy	
85	Snow shower(s), slight	
86	Snow shower(s), moderate or heavy	
87	Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed	- slight
88	Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed	- moderate or heavy
89	Shower(s) of hail*, with or without rain or rain and snow mixed, not associated with thunder	- slight
90	Shower(s) of hail*, with or without rain or rain and snow mixed, not associated with thunder	- moderate or heavy
91	Slight rain at time of observation	thunderstorm during the preceding hour but not at time of observation
92	Moderate or heavy rain at time of observation	thunderstorm during the preceding hour but not at time of observation
93	Slight snow, or rain and snow mixed or hail** at time of observation	thunderstorm during the preceding hour but not at time of observation
94	Moderate or heavy snow, or rain and snow mixed or hail** at time of observation	thunderstorm during the preceding hour but not at time of observation
95	Thunderstorm, slight or moderate, without hail**, but with rain and/or snow at time of observation	thunderstorm at time of observation
96	Thunderstorm, slight or moderate, with hail** at time of observation	thunderstorm at time of observation
97	Thunderstorm, heavy, without hail**, but with rain and/or snow at time of observation	thunderstorm at time of observation
98	Thunderstorm combined with duststorm or sandstorm at time of observation	thunderstorm at time of observation
99	Thunderstorm, heavy, with hail** at time of observation	thunderstorm at time of observation

* French: grêle.

** Hail, small hail, snow pellets. French: grêle, grésil ou neige roulée.

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