METEOROLOGICAL SOUNDING ROCKET PROGRAM

AT NATAL

Brazilian participation on EXAMETNET
Status Report to the Executive Committee
Meeting at São José dos Campos - October 1967

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1. INTRODUCTION

In a meeting in August 1965 in Wallops Island Station, the Comission Nacional de Investigaciones Espaciales (CNIE) of Argentina, the Comissão Nacional de Atividades Espaciais (CNAE) of Brazil and the National Aeronautics and Space Administration (NASA) of the United States decided to establish a program of meteorological research with sounding rockets. This program, named Experimental Inter-American Meteorological Rocket Network (EXAMETNET) started in Brazil on 12 January 1966.

During the period 12 January through 17 August of 1966 there were 15 launchings of HASP and ARCAS rockets including two failures. The preliminary results of these experiments were reported in the EXAMETNET's meeting at Ascochinga (Argentina) on September 1966.

From 14 September 1966 through 13 September 1967 there were only 17 launchings of meteorological sounding rockets from Barreira do Inferno at Natal. These soundings are reported herein for presentation at the EXAMETNET's meeting of 23-27 October 1967 to take place at CNAE in São José dos Campos (SP) Brazil.

Difficulties with procurement precluded us from executing a more frequent schedule of operations.

2. SCHEDULE OF LAUNCHINGS

Table 2.1 shows the schedule for the last four months of 1966 and table 2.2 shows the complete schedule for 1967.

Up to date of preparation of this report 14 HASP-CHAFF, 1 HASP-INSTRUMENTED and 2 ARCAS were launched from Barreira do Inferno Launching Camp, Natal Brazil. From these firings 14 successes and 3 partial successes were obtained.

Criteria for success and partial success are the same adapted in the Ascochinga meeting in September 1966 and subsequent modifications.

Due to difficulties with rocket procurement we have been forced to cancel some firings, trying to keep at least the 26 firings plan instead the 50 firings plan suggested for 1967.

Even this way, it was not possible to carry out the complete 26 firings plan and no launchings took place in April and May 1967.

Table 2.3 shows the proposed schedule for 1968.

TABLE 2.1

SCHEDULE DURING THE LAST FOUR MONTHS OF 1966

MONTH	AUG	SEP				OCT					NOV				DEC			
WEEK	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Proposed date	31		14		28		12		26	02		16		30		14		
Firing date	-		14		-		12		-	-		16		-		14		
Rocket type	-		A		-		HI		-	-		A		-		HP		
Result	-		P		-		P		-	-		S				P		

LEGEND:

A - ARCAS

HI - HASP-INSTRUMENTED

HD - HASP-CHAFF

S - SUCCESS

P - PARTIAL SUCCESS

TABLE 2.2

1967 SCHEDULE

MONTH	JAN					FEB				MAR				APR				MAY		
WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Proposed date			18	25	01	08	15	22	01	08	15	22	29	05	12	19	26	03	10	17
Firing date			18	-	01	-	15	22	01	-	-	22	29	-	-	-	-	-	-	-
Rocket type			HD	-	HD	-	HD	HD	HD	-	-	HD	HD	-	-	-	-	-	-	-
Result			S	-	S	-	S	S	S	-	-	S	S	-	-	-	-	-	-	-

MONTH	MAY		JUN				JUL				AUG					SEPT			
WEEK	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Proposed date	24	31	07	14	21	28	05	12	19	26	02	09	16	23	30	06	13	20	27
Firing date	-	-	-	14	-	-	05	12	-	-	02	-	16	-	-	-	13	-	-
Rocket type	-	-	-	HD	-	-	HD	HD	-	-	HD	-	HD	-	-	-	HD	-	-
Result	-	-	-	S	-	-	S	S	-	-	S	-	S	-	-	-	S	-	-

MONTH	OCT					NOV							
WEEK	40	41	42	43	44	45	46	47	48	49	50	51	52
Proposed date				25			15						

LEGEND:

A - ARCAS
HI - HASP-INSTRUMENTED
HD - HASP CHAFF
S - SUCCESS
P - PARTIAL SUCCESS

TABLE 2.3

1968 SCHEDULE

MONTH		JAN				FEB				MAR				APR				MAY		
WEEK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
50 Firings plan	Proposed date	-	-	17	24	31	7	14	21	28	6	13	20	27	3	10	17	24	1	8	15

MONTH		MAY		JUN				JUL					AUG				SEPT				OCT
WEEK		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
30 Firings plan	Proposed date	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2

MONTH		OCT				NOV				DEC			
WEEK		41	42	43	44	45	46	47	48	49	50	51	52
30 Firings plan	Proposed date	9	16	23	30	6	13	20	27	4	11		

3. GROUND INSTRUMENTATION

The ground instrumentation for support of meteorological rocket launchings at the Barreira do Inferno Range at Natal consists of:

a - MPS-19 Radar System

S - Band

b - Ground Meteorological Detector
(GMD-1A)
Operation frequency - 1680 MHz

c - Meteorological Data Receiving and Recording System
Operation frequency - 403 MHz

d - Double Theodolite Warren-Knight Model WK-84

e - A rail and a tubular launcher

4 - DATA PACKAGE EXCHANGE

1966

ROCKET Nº	DATE OF MAILING	
	ARGENTINA	U.S.A.
23 CNAE 6620 BI 6620 AR 08	10 SEPT	19 SEPT 27 SEPT
29 CNAE 6626 BI 6626 HASP 09	17 NOV	17 NOV
49 CNAE 6646 BI 6627 AR 09	21 NOV	21 NOV
51 CNAE 6648 BI 6629 HASP 10	28 DEC	28 DEC

1967

ROCKET Nº	DATE OF MAILING	
	ARGENTINA	U.S.A.
52 CNAE 6701 BI 6701 HASP 11	14 FEB	14 FEB
54 CNAE 6703 BI 6702 HASP 12	13 FEB	13 FEB 17 FEB
57 CNAE 6706 BI 6703 HASP 13	17 FEB	17 FEB 24 FEB
58 CNAE 6707 BI 6704 HASP 14	27 FEB	27 FEB
59 CNAE 6708 BI 6705 HASP 15	07 MAR	07 MAR

4 - DATA PACKAGE EXCHANGE (Cont.)

	DATE OF MAILING	
ROCKET Nº	ARGENTINA	U.S.A.
60 CNAE 6709 BI 6706 HASP 16	28 MAR	28 MAR
61 CNAE 6710 BI 6708 HASP 17	03 APR	03 APR 11 APR
-	-	19 JUL All 1967 data packages duplicates were sent to Wallops Island
67 CNAE 6716 BI 6711 HASP 18	19 JUN	22 JUN
68 CNAE 6717 BI 6715 HASP 19	18 JUL	18 JUL
81 CNAE 6730 BI 6716 HASP 20	02 AUG	02 AUG
82 CNAE 6731 BI 6717 HASP 21	11 AUG	11 AUG
83 CNAE 6732 BI 6721 HASP 22	29 AUG	29 AUG
84 CNAE 6733 BI 6723 HASP 23	21 SEPT	21 SEPT

5. WIND AND TEMPERATURE DATA ANALYSIS

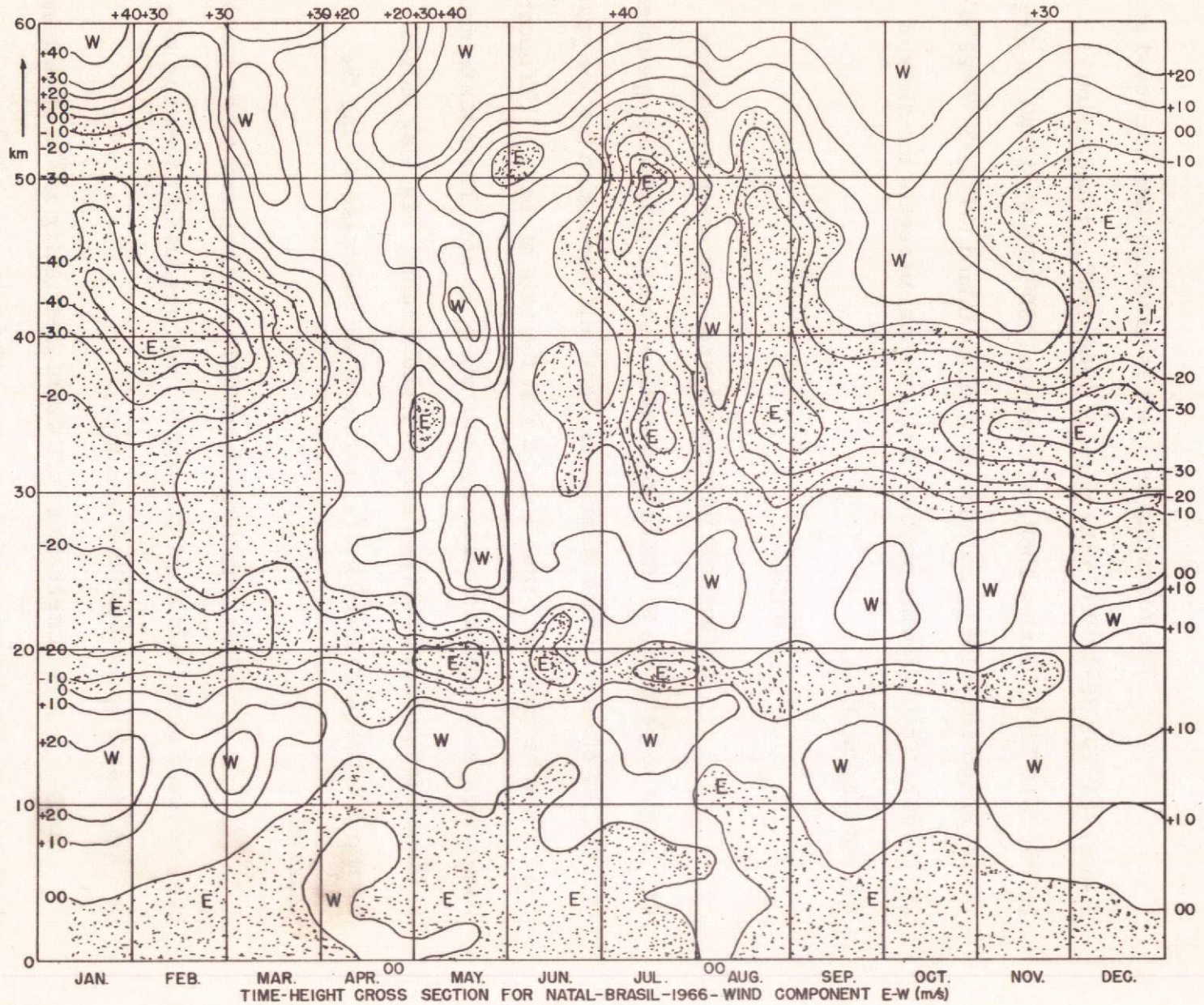
The following analysis is based on data collected at Natal, Brazil (05°55'S 35°10'W) in the period 1966-1967, at Ascension Island (07°59'S 14°25'W) during 1966, at Chamical (30°22'S 67°17'W) in Argentina in the period 1966-1967, and also in Wallops Island (37°51'N 75°29'W) in 1966-1967. The following section of this report presents the plots of the meteorological data.

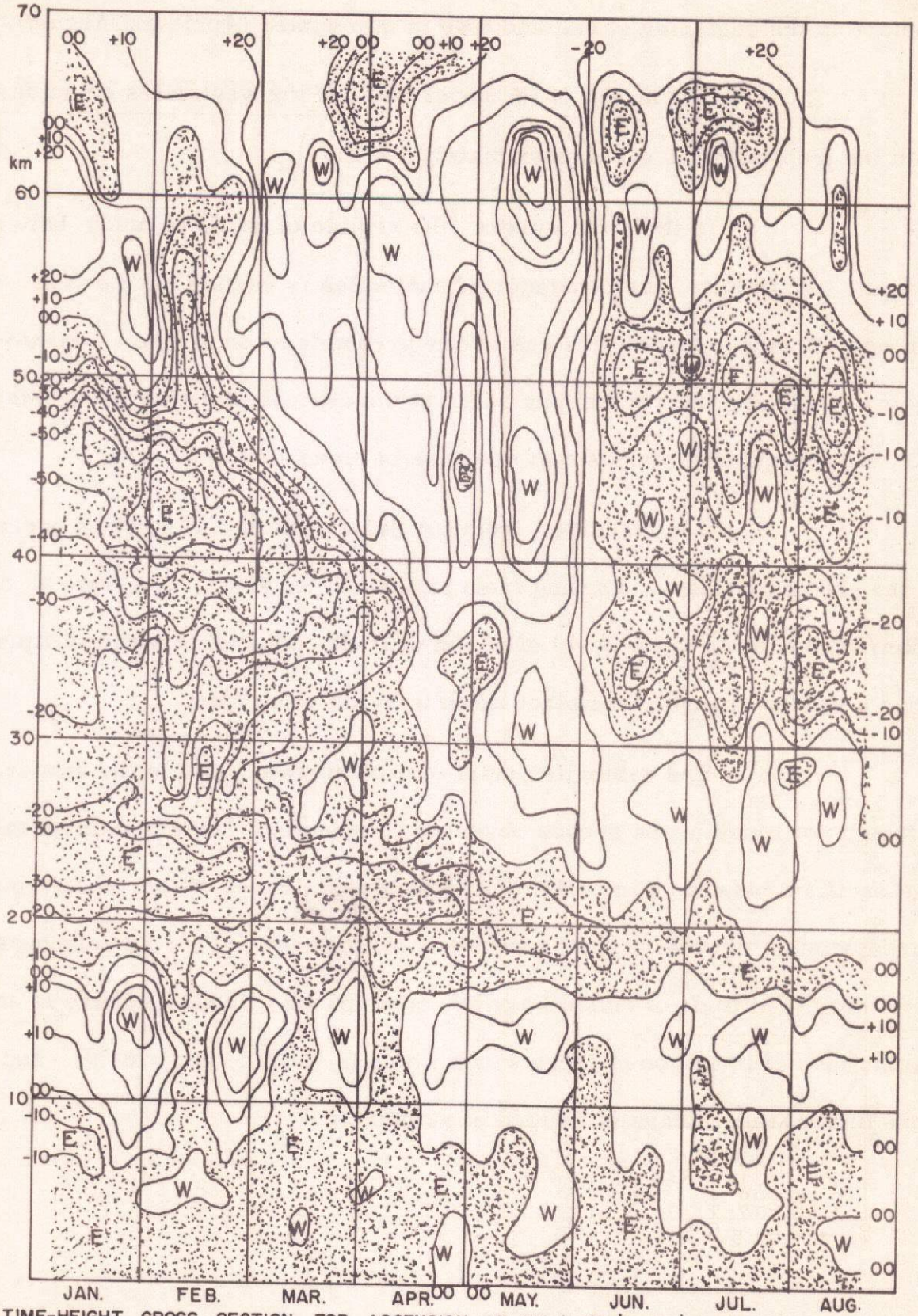
5.1 WIND

Throughout this report whenever refer to seasons they are meant to be in the Southern Hemisphere unless otherwise specified. In the graphs of components obtained in Natal and Ascension for the year of 1966 it can be noted on Figs. 1 and 2 that the axis of the Tropospheric Westerlies is located at an average altitude of 13 km. Their maximum speed of these winds occurs between summer and autumn, reaching values which oscillate between 20 and 25 m/s, with a slight decrease during the other seasons.

In the beginning of summer, the tropospheric westerlies base is found at its minimum altitude (6 km), gradually ascending at a rate of 2 km/month up to the end of summer.

An interesting fact worth mentioning is the appearance of west cells within the trade winds regime. These west cells reach the


km
JAN.
FEB.
MAR.
APR.
MAY.
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
TIME-HEIGHT CROSS SECTION FOR NATAL-BRASIL-1966-WIND COMPONENT E-W (m/s)



TIME-HEIGHT CROSS SECTION FOR ASCENSION ISLAND (07°59'S 14°25'W) 1966 - WIND COMPONENT E-W(m/s)

Fig. 2

surface in the beginning of fall and also in mid-winter (April and August).

The height of the upper limit of the westerlies coincide with the tropopause, i.e., approximately 17 km.

In the stratosphere, the regime of winds is much better defined. On its base, the constancy of easterlies is verified all the year through. During summer, the easterlies predominate in all the stratosphere, reaching their maximum value at the altitude of 42 km in the later part of January, with values that oscillate between 70 and 80 m/s.

The transition from the easterlies into westerlies begins at the end of February, starting from an altitude of 50 km, at a rate of 6 km/month, down to the level of 40 km altitude, coinciding with mid-April, when a sudden change takes place down to 26 km of altitude.

The easterlies start to predominate again in the winter, although not reaching the speeds observed in summer. Their maximum values oscillate between 35 and 40 m/s. The predominance of the easterlies during winter, however, is not verified in all extension of the stratosphere, but from the altitude of 30 km up to the stratopause (55 km). There is an occurrence of inversion of these winds which is sudden, and which happens in a matter of days at the end of autumn.

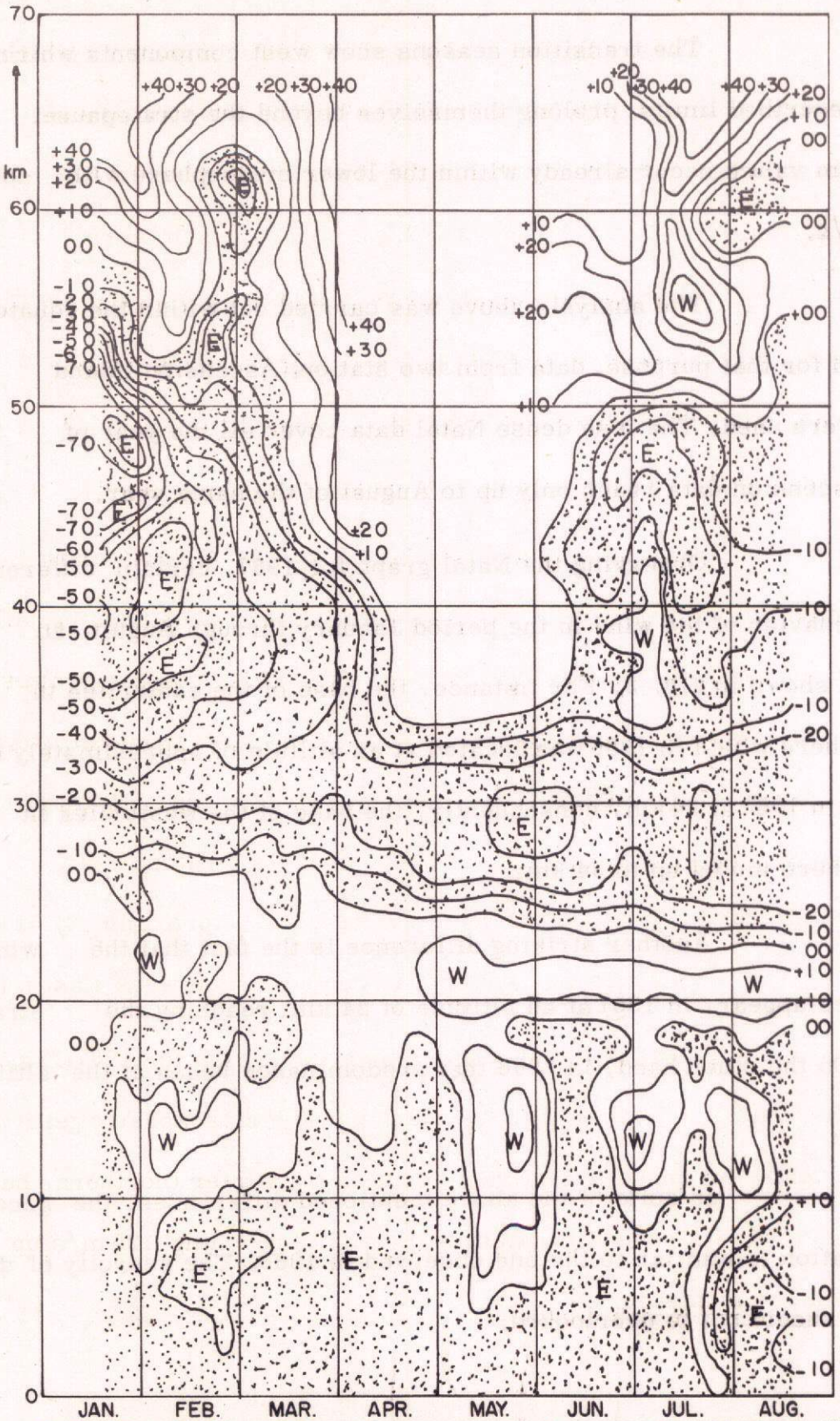
The transition seasons show west components which, with in the described limits, prolong themselves beyond the stratopause. The maximum values occur already within the lower mesosphere with speeds of 90 m/s.

The analysis above was carried out within the equatorial zone and for that purpose, data from two stations (Ascension Island and Natal) were used. The less dense Natal data cover all the year of 1966 while Ascension data reach only up to August of the same year.

Observing the Natal graph for 1967, certain differences in the behavior of the wind in the period January through August can be noted as shown in Fig. 3. For instance, the base of the easterlies in the stratosphere which in 1966 was located at an altitude of approximately 17 km, appears in 1967 at 24 km, consequently, the base of the westerlies in the stratosphere moved up to 34 km.

Another striking difference is the fact that the winter easterlies appear, in 1967 at an altitude of 24 km, reaching the stratopause. On the other hand, in 1966 that predominance began at the altitude of 30 km.

In spite of the above mentioned differences, the general configuration is similar to the one observed in 1966. The scarcity of data for 1967 should not be overlooked.



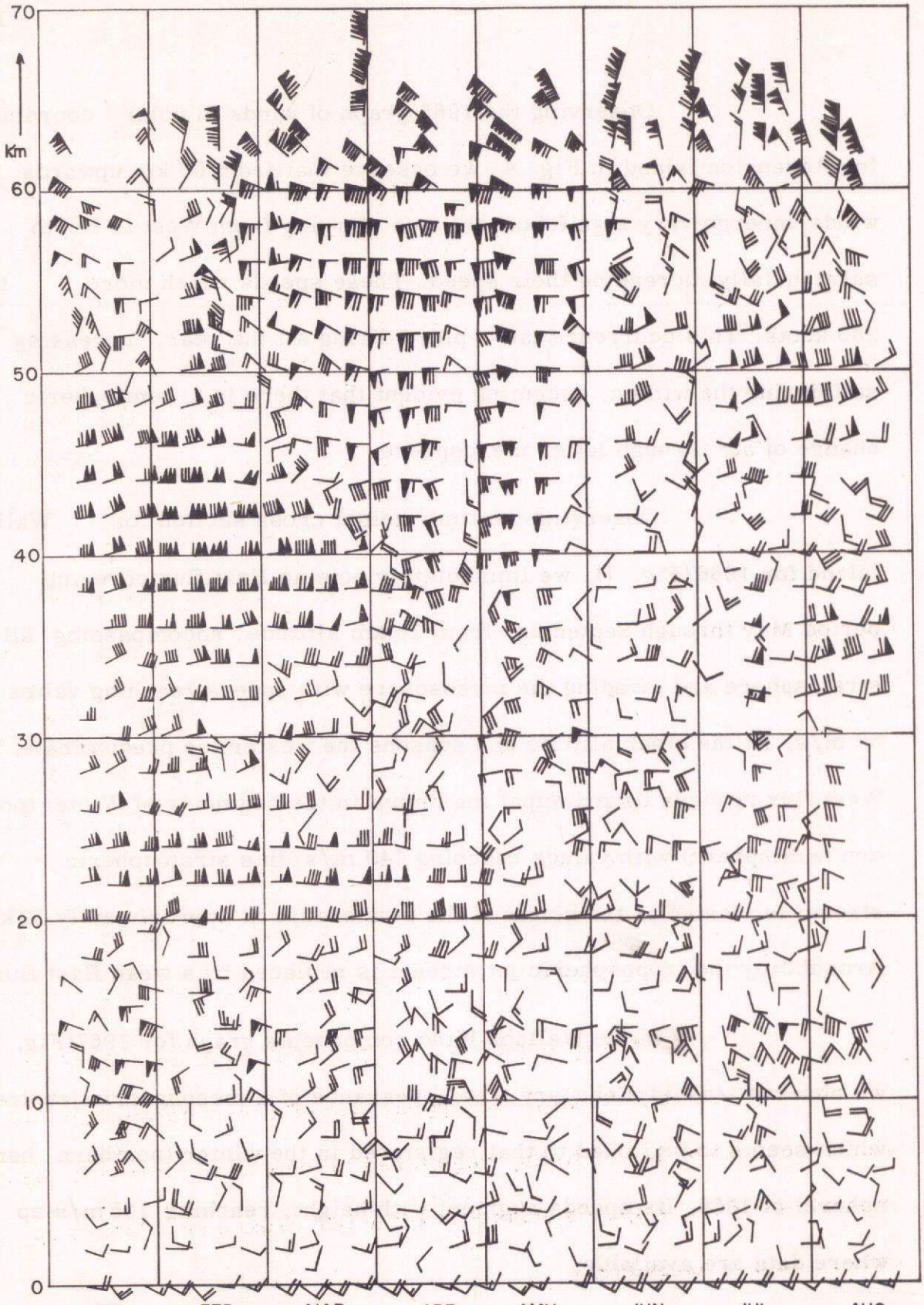
TIME-HEIGHT CROSS SECTION FOR NATAL-BRASIL 1967 - WIND COMPONENT E-W(m/s)

Fig. 3

Observing the 1966 graph of winds in polar coordinates for Ascension Island in Fig. 4, we observe that from 60 km upwards the winds undergo very significant changes, turning from West to North and substancially increasing their speed. These speeds reach more than 200 knots. This ocurrence takes place during all the year, increasing itself during the winter, becoming evident that there is a hemispheric exchange of air through lower mesosphere.

Observing the time-height cross section for Wallops Island for 1966 (Fig. 7), we immediately note an East flux covering the period May through September from 18 km altitude, encompassing all the stratosphere and invading the mesosphere with speeds reaching values of 50 m/s. At the other altitude and seasons the westerlies predominate. The West flux reaches its principal maximum in the beginning of Winter (northern hemisphere) with values reaching 140 m/s; this stratospheric jet stream is located at the height of the stratopause at approximately 52 km. Around July the tropospheric jet stream is replaced by a weak East flux.

In the Wallops Wind components graph for 1967 (Fig. 8) we observe, in mid-February, the appearance of a mesospheric jet stream which seems to be linked to that registered in the winter (northern hemisphere) of 1966. Its speeds augment with height, reaching 125 m/s up to where data are available.



TIME-HEIGHT CROSS SECTION FOR ASCENCION ISLAND (07°45'S 14°25'W) 1966-POLAR WINDS

Fig. 4

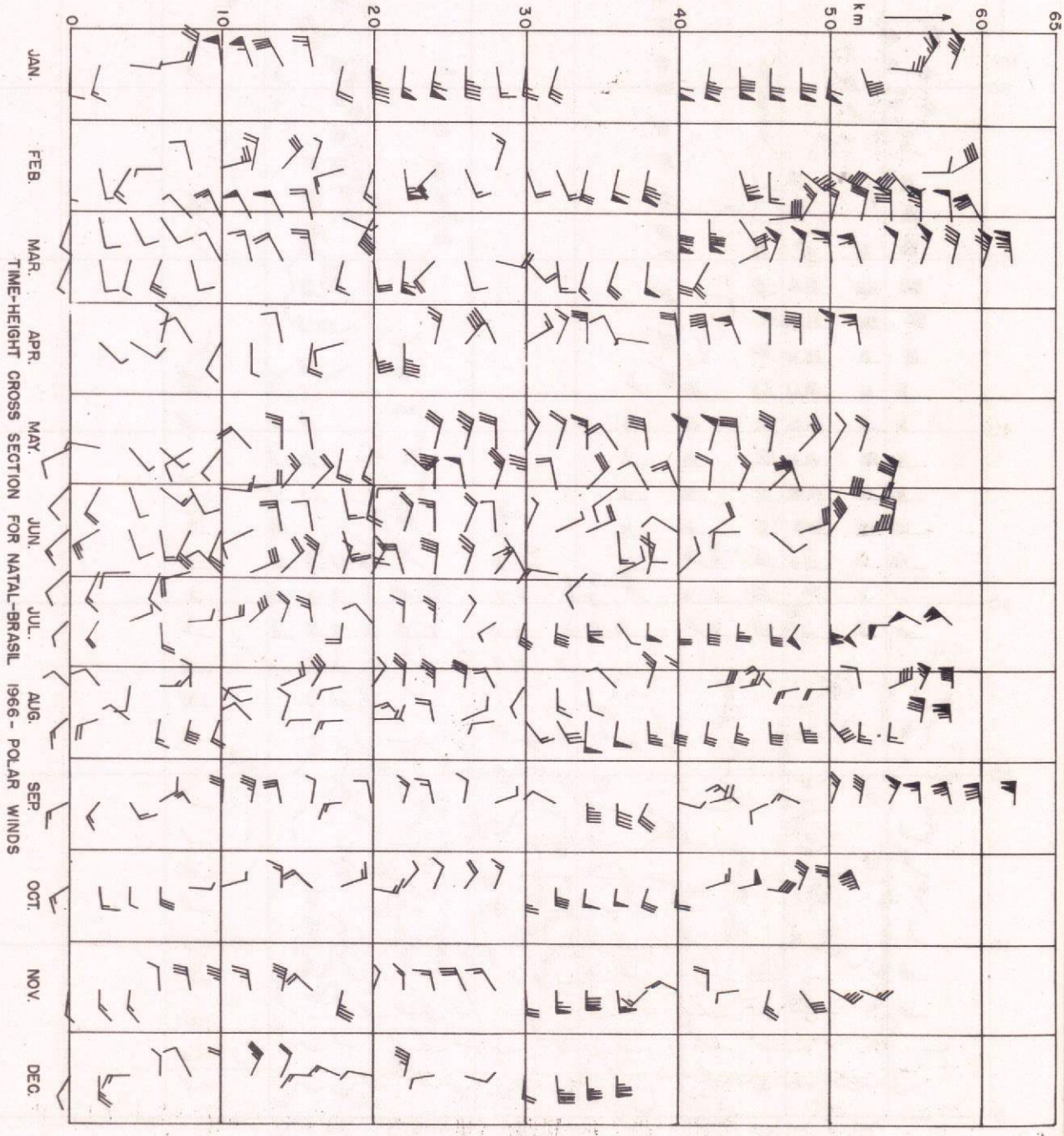
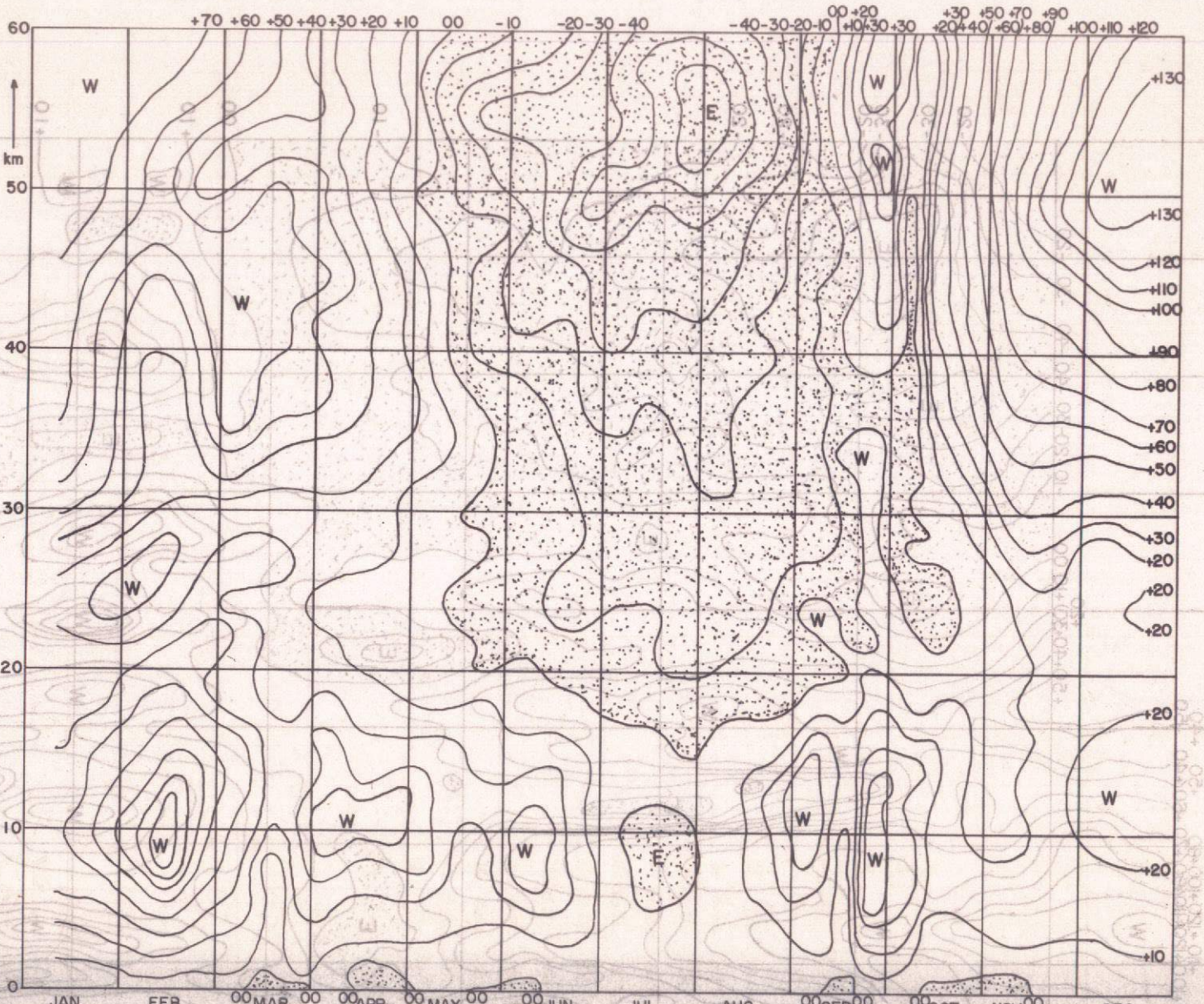

TIME-HEIGHT CROSS SECTION FOR NATAL-BRASIL 1966 - POLAR WINDS
JAN.
FEB.
MAR.
APR.
MAY.
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
0
10
20
30
40
50
km
60
65

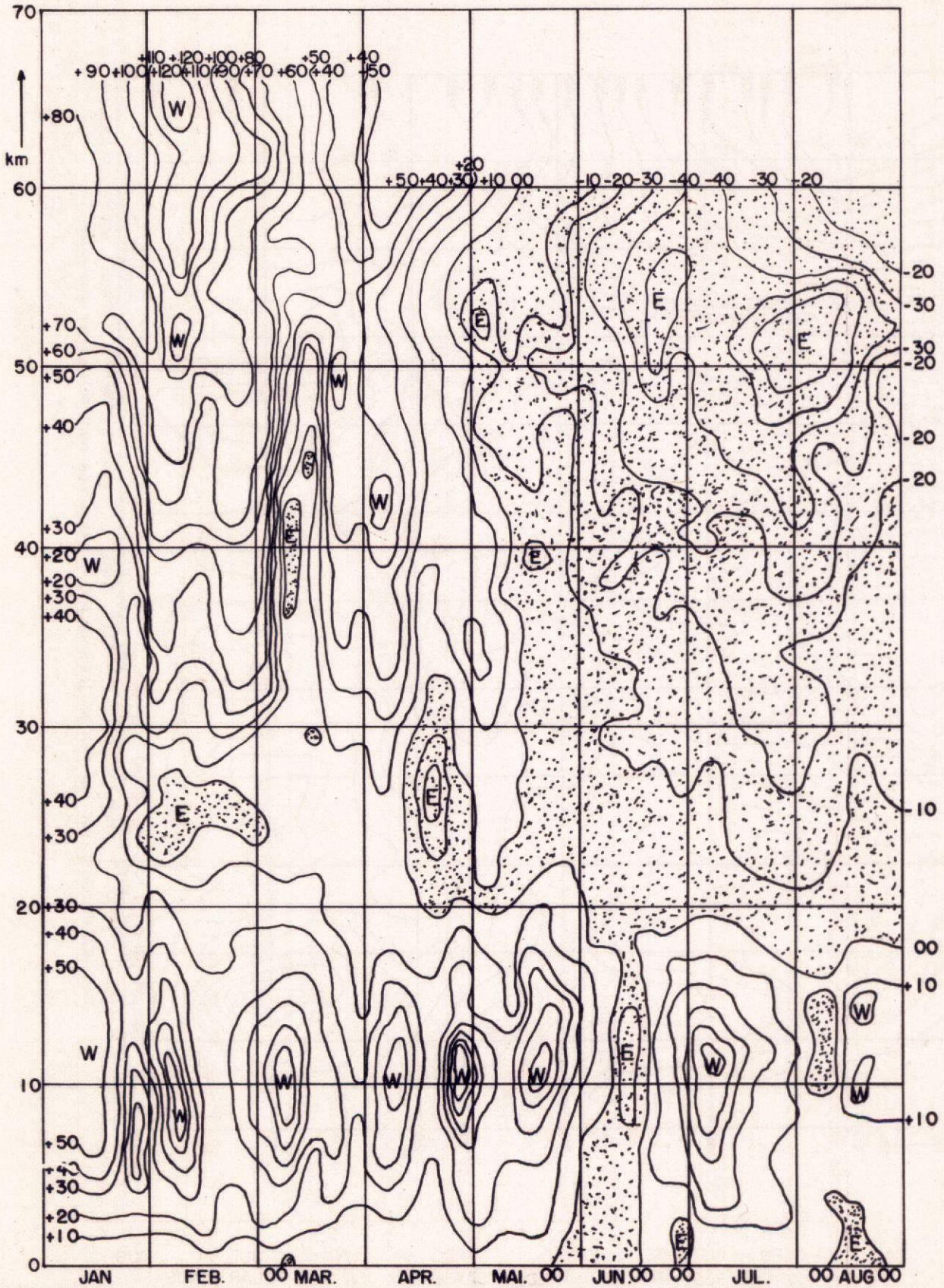
Fig. 5

TIME-HEIGT CROSS SECTION FOR NATAL-BRASIL 1967 – POLAR WINDS

Fig. 6

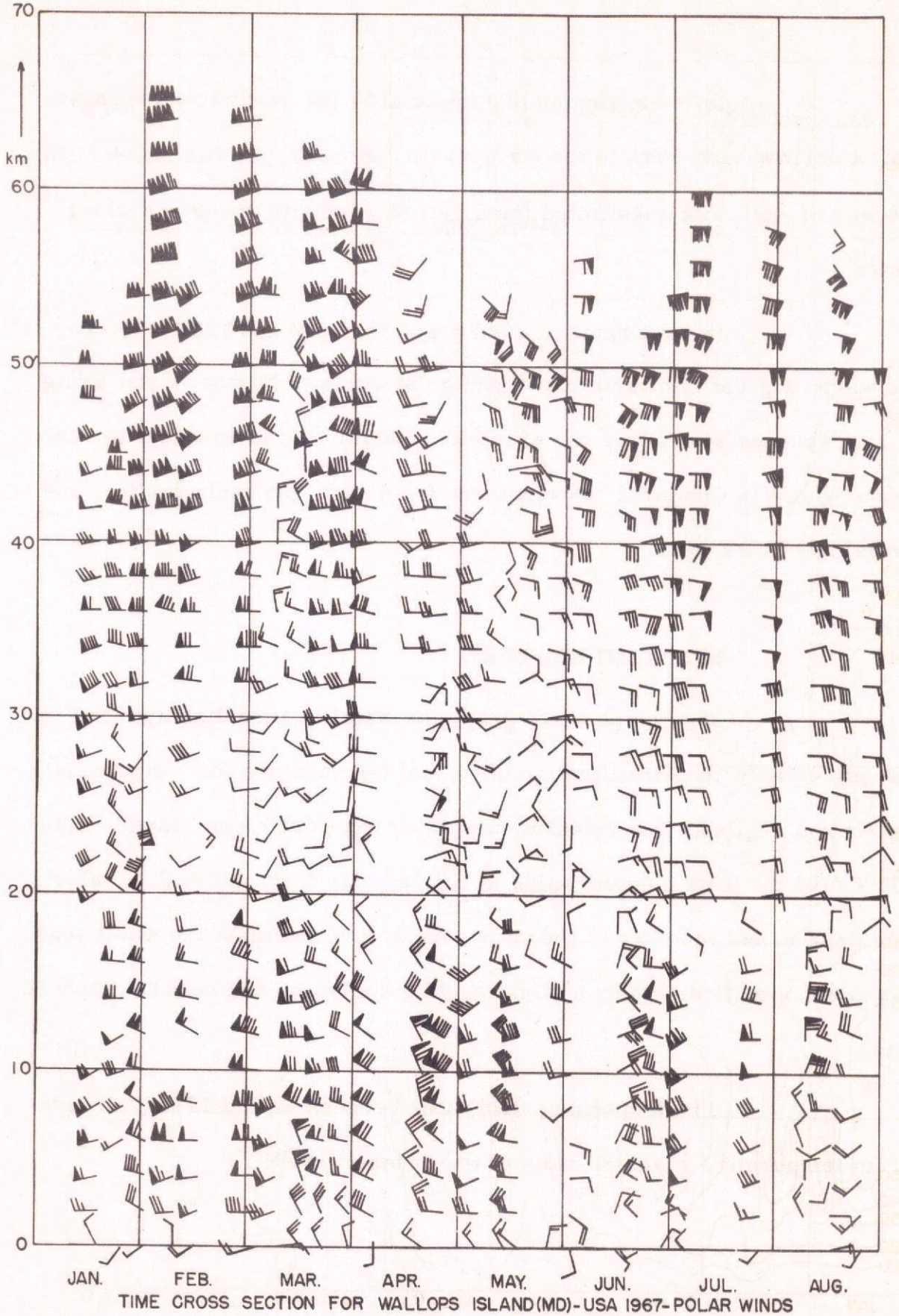


TIME-HEIGHT CROSS SECTION FOR WALLOPS ISLAND (MD)-USA 1966-WIND COMPONENT E-W (m/s)



TIME-HEIGHT CROSS SECTION FOR WALLOPS ISLAND (MD)-USA 1967-WIND COMPONENT E-W (m/s)

Fig. 8



TIME CROSS SECTION FOR WALLOPS ISLAND (MD) - USA 1967 - POLAR WINDS

Fig. 9

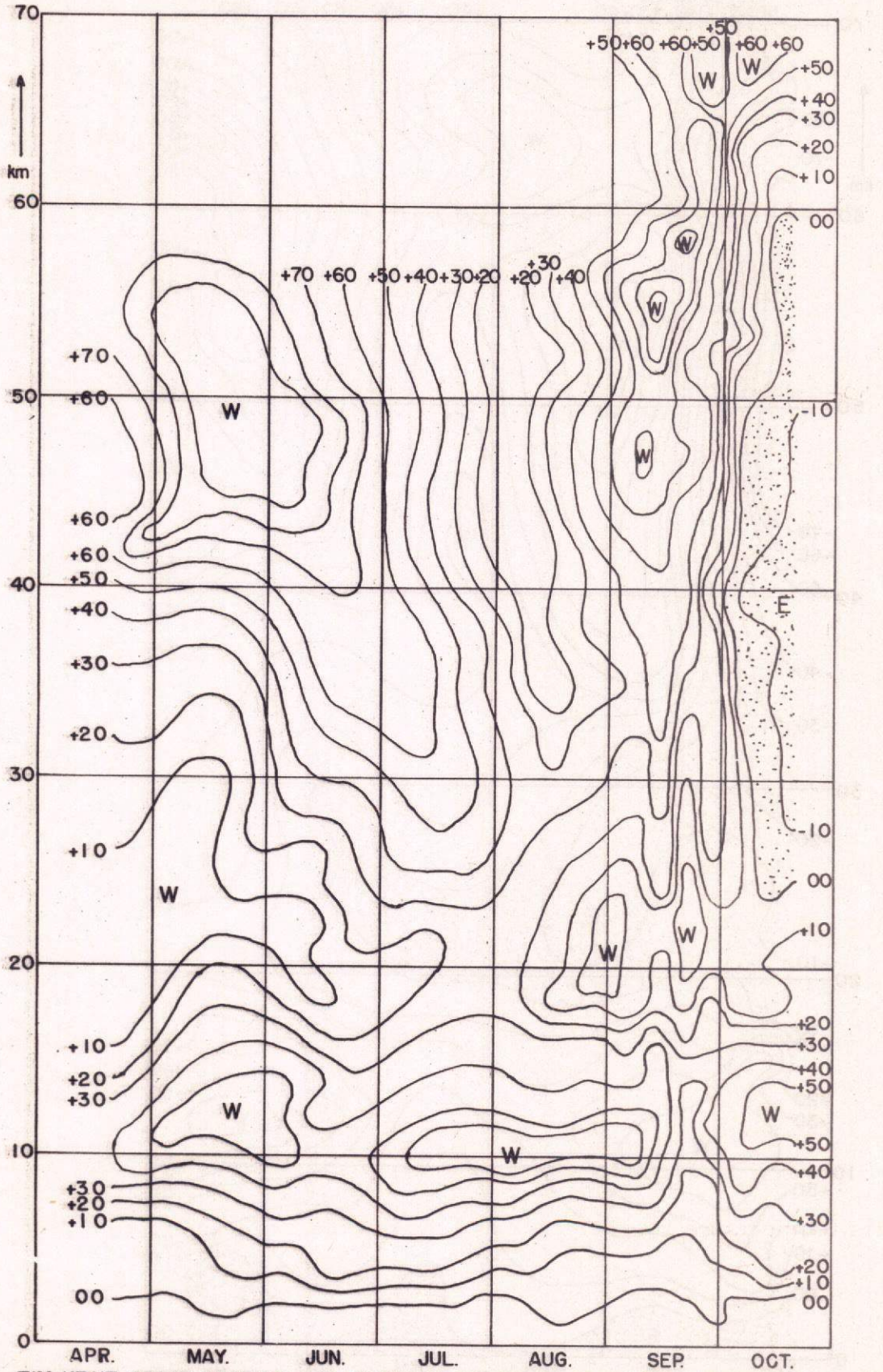
In the beginning of June of 1967 the easterlies propagate within a narrow band down to the surface. In July 1967, the flux which in 1966 was of east, was substituted for a cell of west with speeds reaching 50 m/s.

In the Chamical wind graph for 1966 and 1967 (Fig. 10 - 11) we observe a great similarity concerning the winds of Northern and South ern hemispheres which only one exception, namely the layers next to the surface where in Chamical the winds are from east, probably due to the thermal low in the area.

5.2 TEMPERATURE

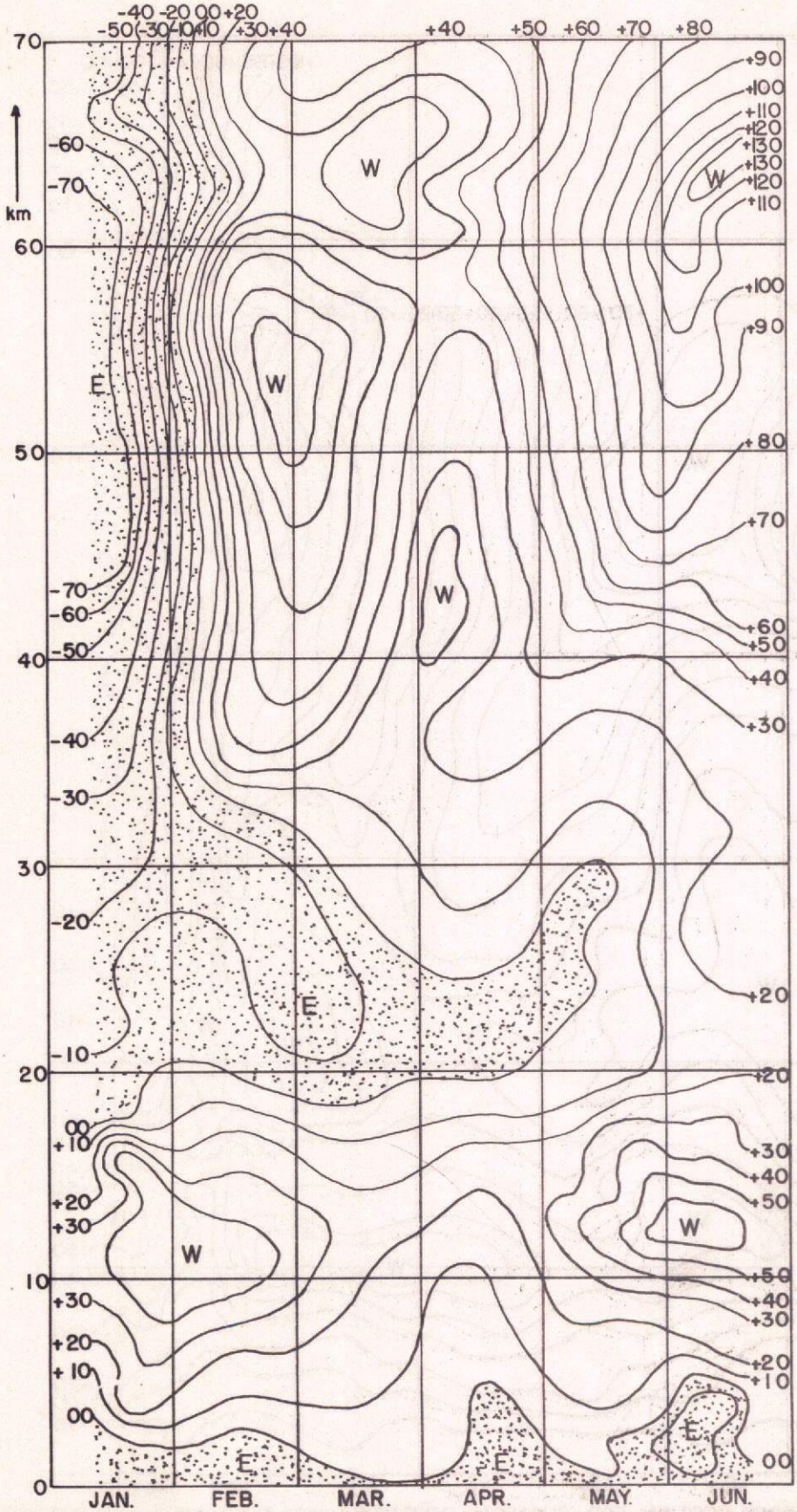
The temperature graph for Natal in 1966 displayed in Fig. 12 shows clearly the stratification of typical temperature for equatorial and tropical regions. The annual tropospheric vertical mean lapse rate is 65°C/100 m. This medium value is not very far from the real value, since the thermal stability of the troposphere during almost the whole year is absolute, modified only by a slight cooling during the Southern hemisphere winter.

The tropopause oscillates between 16 and 17 km altitude and its temperature reaches values of the order of -80°C.



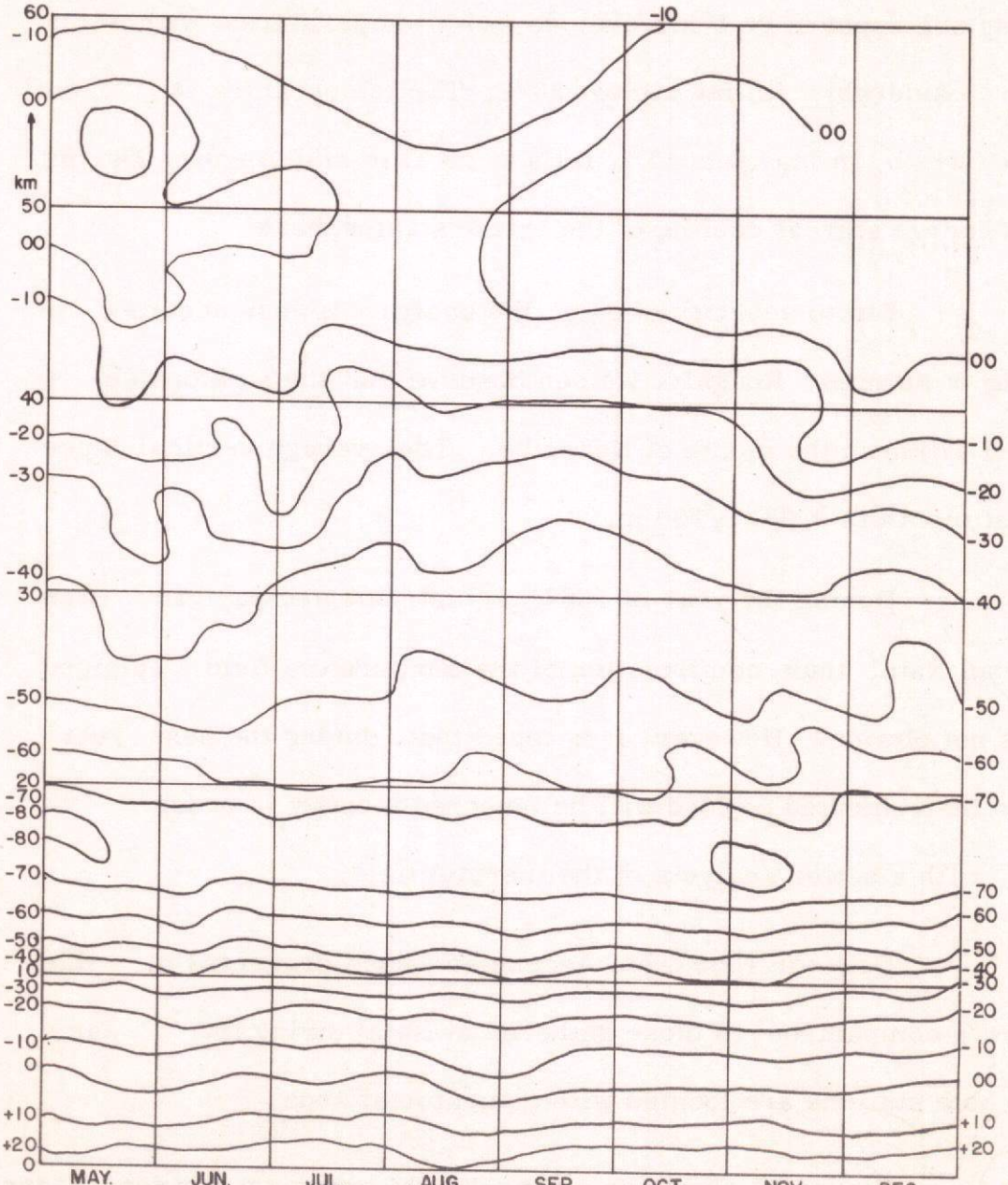
TIM-HEIHT CROSS SECTION FOR CHAMICAL-ARGENTINA 1966-WIND COMPONET E-W(m/s)

Fig. 10



TIME-HEIGHT CROSS SECTION FOR CHAMICAL-ARGENTINA 1967-WIND COMPONENT E-W(m/s)

Fig. 11



TIME-HEIGHT CROSS SECTION FOR NATAL-BRASIL - 1966 - TEMPERATURE (°C)

Fig. 12

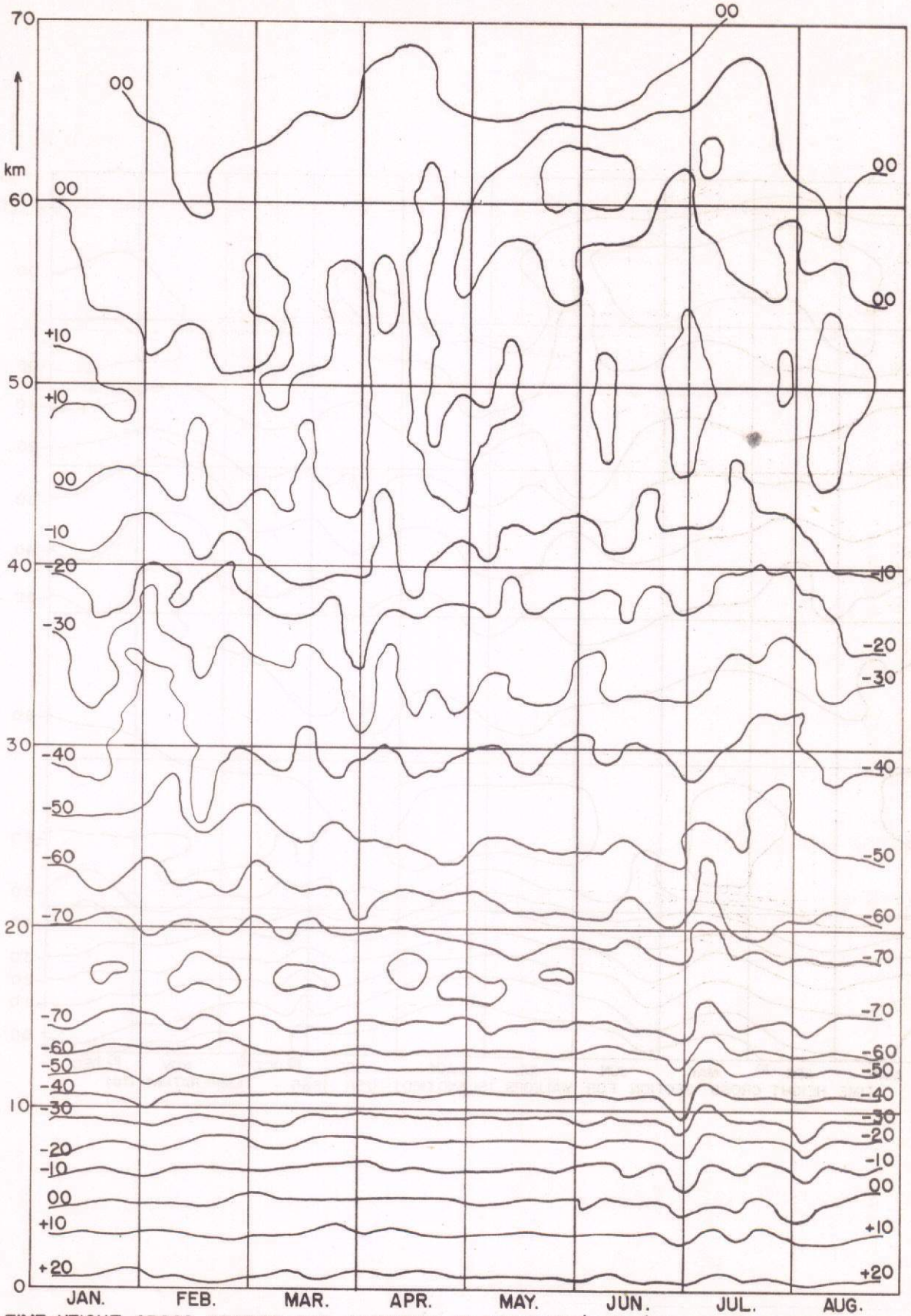
The average temperature vertical lapse rate for autumn in the stratosphere is 0,25°C/100 m, while that same gradient for winter is 0,22°C/100 m. The stratopause in winter is at a height of 49 km and at the end of spring appears at 47 km altitude, with temperatures within it which vary considerably, falling almost 20°C. The temperature at the stratopause, which, in May was 11°C falls to -5°C in mid-August. During winter we observe a great cooling of the entire stratosphere.

Due to scarcity of data, the analysis is less accurate in the beginning of summer. Roughly, we can observe that the stratopause is found around 47 km in the month of November. The average vertical lapse rate for that month is 0,28°C/100 m.

During the year of 1967, no instrumented payload was launched from Natal thus, confirmation of the temperature field obtained in 1966 was not obtained. However, it is hoped that, during the next year, at least one instrumented payload will be launched monthly in order to provide us with a better analysis of the thermal field.

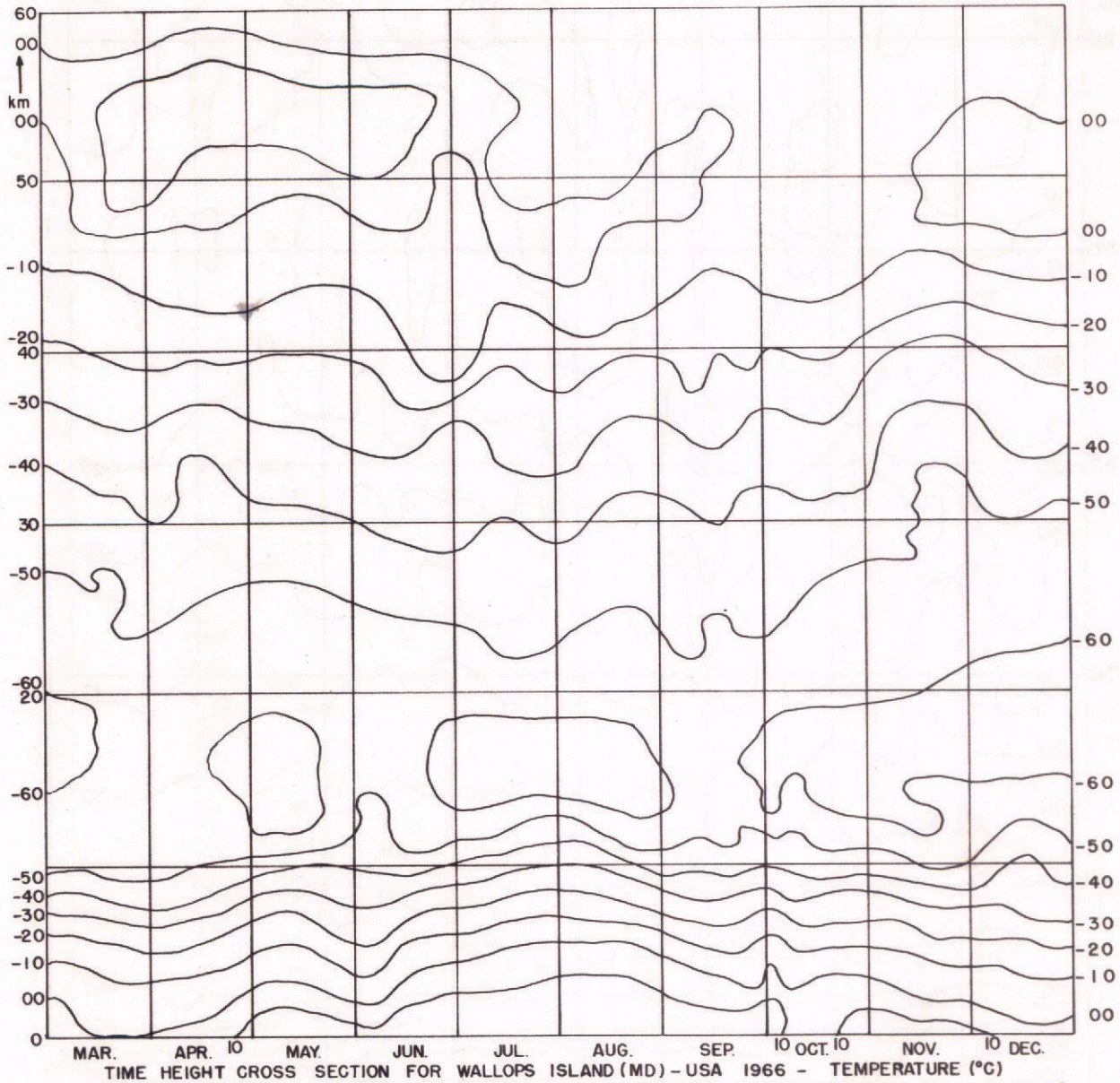
Data for 1966 from Ascension Island presented in this report allow a comparison to those gathered at Natal during the same year since both stations are located within equatorial zone.

Figure 13 shows us a time-height cross section for Ascension Island for 1966, where the thermal distribution of Ascension is quite sim-



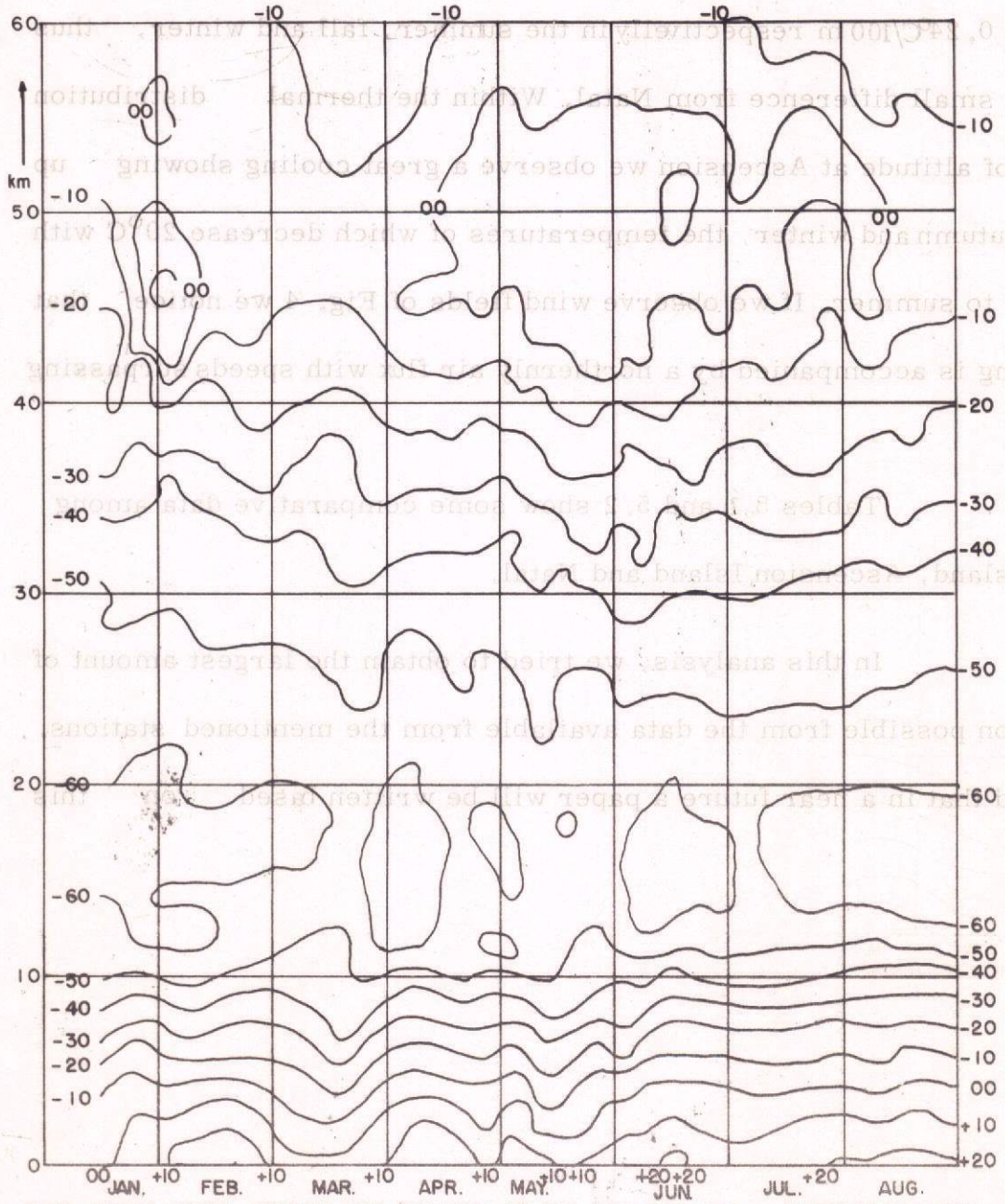
TIME-HEIGHT CROSS SECTION FOR ASCENSION ISLAND (07°59's 14°25'W) 1966-TEMPERATURE (°C)

Fig. 13



TIME HEIGHT CROSS SECTION FOR WALLOPS ISLAND (MD) - USA 1966 - TEMPERATURE (°C)

Fig. 14



TIME-HEIGHT CROSS SECTION FOR WALLOPS ISLAND (MD)-USA 1967 - TEMPERATURE (°C)

Fig. 15

ilar to that of Natal. The stratification of the troposphere is the same as that of Natal with the tropopause also maintained between 16 and 17 km. The vertical lapse rates within the stratosphere are 0.28°C/100 m, 0.26°C/100 m and 0.24°C/100 m respectivelly in the summer, fall and winter, thus showing a small difference from Natal. Within the thermal distribution at 62 km of altitude at Ascension we observe a great cooling showing up between autumn and winter, the temperatures of which decrease 20°C with reference to summer. If we observe wind fields of Fig. 4 we notice that this cooling is accompanied by a northernly air flux with speeds surpassing 200 knots.

Tables 5.1 and 5.2 show some comparative data among Wallops Island, Ascension Island and Natal.

In this analysis, we tried to obtain the largest amount of information possible from the data available from the mentioned stations. It is hoped that in a near future a paper will be written based on this report.

Table 5.1

Values for the Tropopause

	Mean Vertical Lapse Rate (°C/km)			Mean Temperature (°C)			Mean Altitude (km)		
	Natal	Ascen-sion	Wallops	Natal	Ascen sion	Wallops	Natal	Ascen sion	Wallops
Summer	-	6.5	6.2	-	-80.0	-64.1	-	16.6	13.2
Autumn	6.3	6.3	4.8	-78.6	-80.1	-62.3	17.0	16.6	13.3
Winter	6.6	6.1	5.0	-77.2	-76.9	-63.0	16.0	16.5	10.9
Spring	6.5	-	5.9	-77.3	-	-60.7	16.0	-	11.2

Table 5.2

Values for the Stratopause

	Mean Vertical Lapse Rate (°C/km)			Mean Temperature (°C)			Mean Altitude (km)		
	Natal	Ascen sion	Wallops	Natal	Ascen sion	Wallops	Natal	Ascen sion	Wallops
Summer	-	2.8	2.0	-	6.8	4.1	-	48	51
Autumn	2.5	2.6	1.7	8.0	0.5	-1.7	50	49	50
Winter	2.2	2.4	2.1	-4.0	1.5	3.4	49	50	50
Spring	2.8	-	2.0	5.0	-	6.9	47	-	50

Notes:

- Natal and Ascension: Based on 1966 data
- Wallops: Based on 1966 and 1967 data
- The seasons are related to the hemisphere of the station

ROCKET DATA

Date: SEPT 14, 1966 Time: 1535Z

Rocket Type: ARCAS Payload: ARCASONDE

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
56	037	105	260	56	05	28
54	041	083	300	54	- 14	24
52	045	077	285	38	- 05	19
50	049	071	196	21	- 04	10
48	054	065	211	15	07	04
46	060	053	153	09	04	- 02
44	067	048	218	17	07	05
42	074	041	352	21	- 11	02
40	083	036	011	11	- 06	- 01
38	093	030	121	27	07	- 12
36	105	027	115	37	08	- 17
34	118	022	027	46	- 01	- 22
32	135	019	076	33	04	- 11
30	154	016	173	05	03	00
28	177	012	302	09	- 02	04
26	207	010	295	18	- 03	06
24	244	009	278	17	- 01	09
22	288	007	282	23	- 02	11
20	343	005	247	13	03	06
18	408	005	163	10	05	- 01

COMMENT: No temperature data

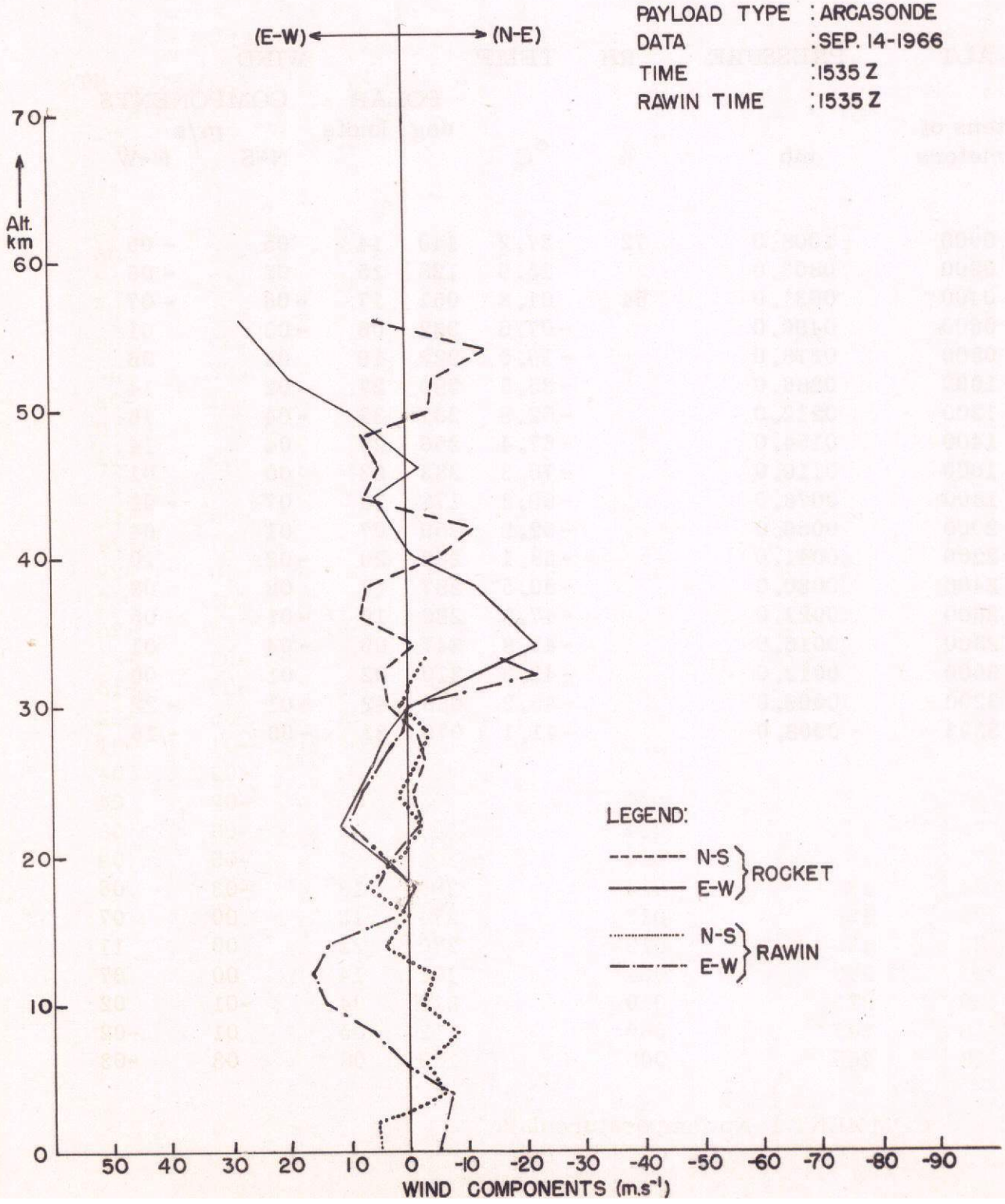
RAWIN DATA

Date: SEPT 14, 1966 Time: 1535 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1008.0	72	27.2	140	14	05	- 05
0200	0803.0		15.9	128	15	05	- 06
0400	0631.0	54	01.3	051	17	- 06	- 07
0600	0490.0		- 07.6	332	06	- 03	01
0800	0378.0		- 19.0	222	19	08	06
1000	0286.0		- 35.5	280	27	- 02	14
1200	0212.0		- 52.9	287	32	- 04	16
1400	0154.0		- 67.4	256	28	04	14
1600	0110.0		- 76.3	283	03	00	01
1800	0078.0		- 69.8	171	13	07	- 01
2000	0056.0		- 62.2	259	07	01	04
2200	0041.0		- 58.1	282	20	- 02	10
2400	0030.0		- 50.5	257	17	02	08
2600	0022.0		- 47.8	280	10	- 01	05
2800	0016.0		- 45.8	347	09	- 04	01
3000	0012.0		- 43.3	210	02	01	00
3200	0009.0		- 46.2	088	42	- 01	- 22
3323	0008.0		- 41.1	079	31	- 03	- 16

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : ARCAS
PAYLOAD TYPE : ARCASONDE
DATA : SEP. 14-1966
TIME : 1535 Z
RAWIN TIME : 1535 Z



ROCKET DATA

Date: OCT 12, 1966

Time: 1500 Z

Payload: WOX-1A

Rocket Type: JUDI

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
47	030	095	025	50	-23	-11
46	032	087	018	37	-18	-06
45	034	078	331	36	-12	07
44	037	067	345	47	-23	07
43	039	062	351	25	-12	02
42	042	059	339	12	-06	02
41	045	051	031	09	-04	-02
40	049	043	101	19	02	-10
39	053	035	118	26	06	-12
38	058	032	113	30	06	-14
37	063	031	098	36	02	-18
36	069	027	107	49	07	-24
35	075	026	109	60	10	-29
34	082	025	102	54	06	-27
33	089	023	097	50	03	-25
32	096	022	084	41	-02	-21
31	104	021	064	38	-09	-18
30	112	020	064	27	-06	-12
29	120	019	062	04	-01	-01
28	130	017	299	08	+02	04
27	140	016	302	09	-02	04
26	151	015	306	19	-06	08
25	162	014	302	21	-05	09
24	174	014	295	13	-03	06
23	186	013	274	13	00	07
22	199	012	270	22	00	11
21	213	011	272	14	00	07
20	229	010	312	04	-01	02
19	247	009	112	05	01	-02
18	265	009	139	08	03	-03

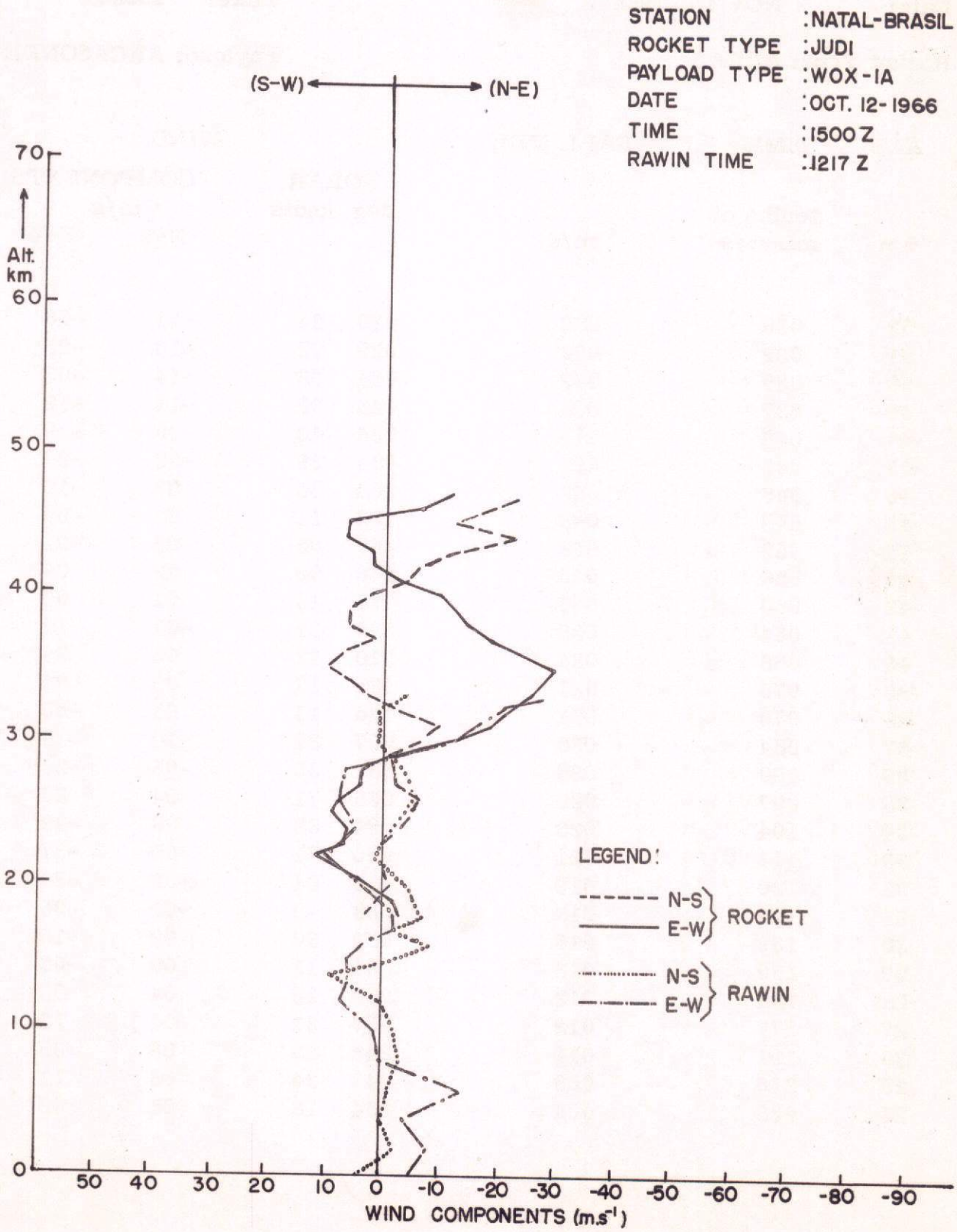
COMMENT : No temperature data

RAWIN DATA

Date: OCT 12, 1966 Time: 1217 Z

ALT	PRESSURE	RH	TEMP	WIND POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1007.0	63	28.5	130		04	-05
0200	0802.0	34	14.4	078		-02	-08
0400	0628.0	19	03.2	095		00	-04
0600	0489.0		-06.3	086		-01	-14
0800	0376.0		-20.2	008		-03	00
1000	0285.0		-36.3	343		-02	01
1200	0211.0		-51.8	267		00	07
1400	0153.2		-70.0	215		09	06
1560	0116.0		-80.0	284	13	-02	06
1600	0108.3		-75.3	340		-08	03
1732	0086.0		-79.2	049	06	-02	-02
1800	0076.6		-73.2	018		-07	-02
2000	0054.8		-60.5	328		-04	03
2200	0039.7		-56.9	268		01	10
2400	0029.2		-53.5	292		-02	05
2600	0021.4		-46.6	311		-06	08
2800	0015.8		-46.4	291		-03	07
3000	0011.7		-42.0	094		01	-12
3200	0008.8		-40.7	094		01	-20
3356	0007.0		-36.8	083	54	-04	-27

GRAPHIC DATA



ROCKET DATA

WINDS

Date: NOV 16, 1966 Time: 1505 Z

Rocket Type: ARCAS Payload: ARCASONDE

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minutes	m/s	deg	knots	N-S	E-W
52	030	080	029	24	-11	-06
51	032	074	029	22	-10	-05
50	035	069	031	33	-14	-09
49	037	064	046	32	-11	-12
48	040	071	066	40	-08	-19
47	042	061	084	39	-02	-20
46	045	048	104	25	03	-12
45	049	048	122	11	03	-05
44	052	048	167	05	03	-01
43	056	045	248	09	02	04
42	060	043	267	18	01	09
41	064	039	274	21	-01	11
40	068	034	210	17	08	04
39	075	031	185	17	09	01
38	079	031	135	14	05	-05
37	084	030	057	34	-10	-15
36	090	026	081	56	-05	-28
35	097	024	096	71	04	36
34	104	023	094	82	03	-42
33	111	021	090	71	00	-37
32	120	019	086	64	-02	-33
31	129	018	088	49	-01	-25
30	139	016	083	30	-02	-15
29	150	013	094	11	00	-06
28	164	012	236	15	04	06
27	177	012	257	31	04	16
26	191	011	248	28	06	03
25	210	009	243	24	06	11
24	228	008	254	18	03	09

ERRATA - (Rep. LAFE-62)

Page	line	where it reads	should be
2	8	...adapted...	...adopted...
9	7	...whenever refer...	...whenever we refer...
16	Fig. 4	Ascencion	Ascension
18	Fig. 6	TIME-HEIGT	TIME-HEIGHT
22	13	...65°C/100m...	...0.65°C/100m...
23	Fig. 10	TIM-HEIHT	TIME-HEIGHT
36	1st column	Tenths of meters	Tens of meter
40	"	"	"
41	"	"	"
44	"	"	"
48	"	"	"
52	"	"	"
56	"	"	"
60	"	"	"
64	"	"	"
68	"	"	"

ROCKET DATA

WINDS

Cont.

Date: NOV. 16, 1966

Time: 1505 Z

Rocket Type: ARCAS

Payload: ARCASONDE

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minutes	m/s	deg	knots	N-S	E-W
23	248	007	259	15	01	08
22	273	006	266	16	01	08
21	300	006	271	14	00	07
20	329	005	291	11	-02	05
19	363	005	008	13	-07	-01
18	395	005	081	27	-02	-14

THERMODYNAMICS

Date: NOV 16 , 1966 Time: 1505 Z

Rocket Type: ARCAS Payload: ARCASONDE

ALT	PRESSURE	TEMP	DENSITY	SPEED OF SOUND	WIND POLAR		COMPONENTS m/s	
tenths of meters	mb	°C	g/m^3	m/s	deg	knots	N-S	E-W
5075	001.39	03.2	001.751	333.5	024	29	-13	-06
4935	001.64	09.2	002.027	337.1	059	37	-09	-16
4791	001.95	03.5	002.460	333.7	069	40	-07	-19
4645	002.33	05.0	002.920	334.6	097	29	02	-15
4496	002.79	04.7	003.499	334.4	122	11	03	-05
4249	003.79	-08.0	004.979	326.7	260	14	01	07
4228	003.89	-10.0	005.153	325.4	263	16	01	08
4039	004.97	-17.8	006.786	320.6	231	18	06	07
3938	005.66	-08.0	007.447	326.7	194	17	08	02
3825	006.54	-10.0	008.667	325.4	147	15	06	-04
3761	007.10	-10.1	009.410	325.4	096	24	01	-12
3694	007.74	-13.5	010.394	323.3	057	34	-09	-14
3545	009.39	-13.8	012.627	323.1	091	64	01	-32
3502	009.94	-24.0	013.916	316.7	096	71	04	-35
3432	010.93	-26.2	015.441	315.3	095	79	03	-40
3255	014.02	-39.2	020.894	306.8	088	67	-01	-33
3133	016.70	-36.8	024.639	308.4	087	54	-01	-27
2917	022.85	-44.0	034.766	303.7	092	12	00	-06
2713	030.97	-49.2	048.223	300.2	254	28	04	14
2573	038.23	-47.4	059.047	301.4	246	27	05	12
2283	059.78	-60.0	097.787	292.9	259	15	01	07
2231	064.90	-57.8	105.076	294.4	263	16	08	01
2198	068.40	-63.0	113.485	290.8	266	16	01	08
2069	084.09	-60.2	137.680	292.7	277	13	-01	06
1926	105.96	-67.0	179.220	288.0	340	12	-06	02
1817	126.73	-66.5	213.832	288.4	073	25	-04	-12

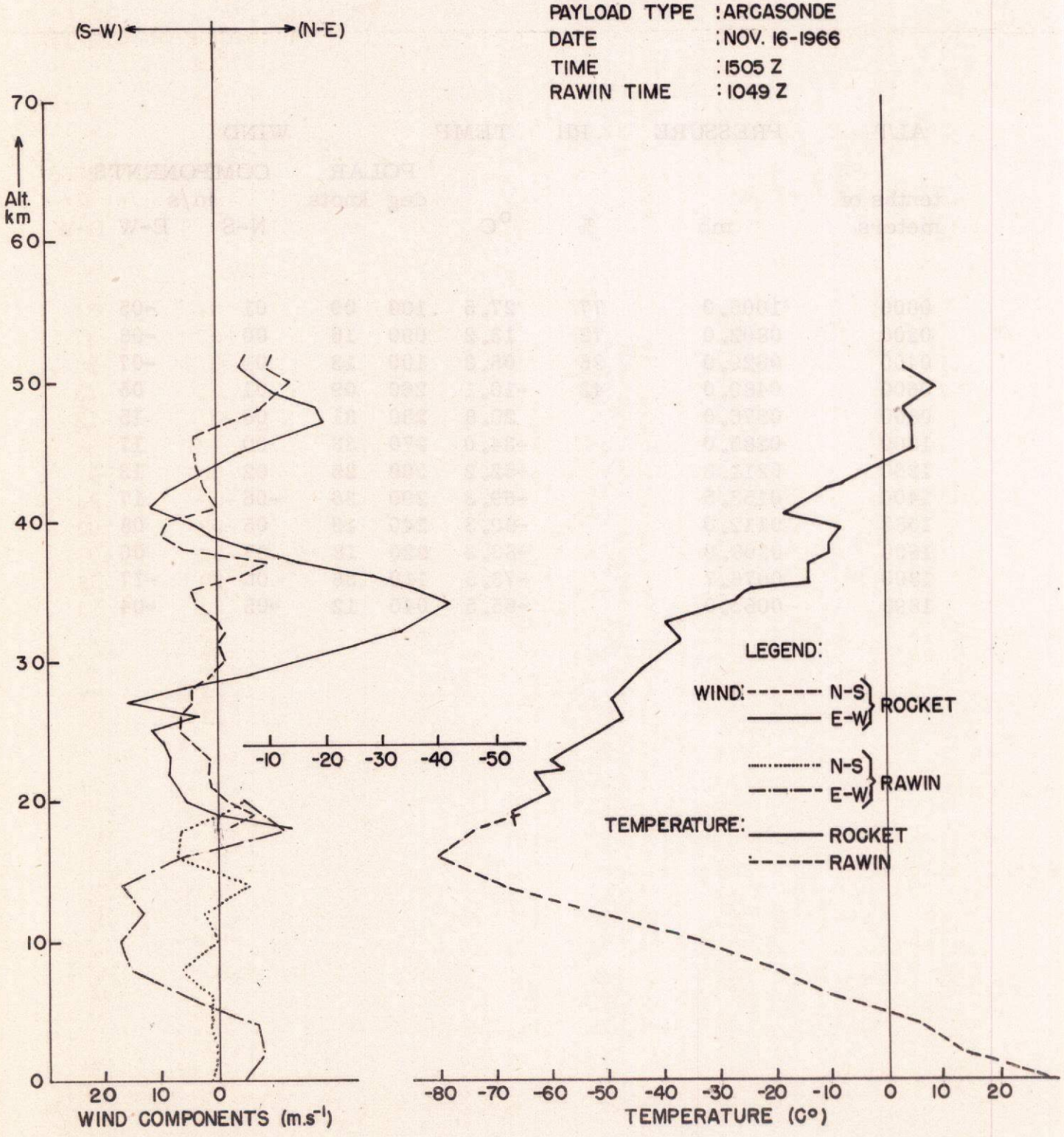
RAWIN DATA

Date: NOV 16, 1966 Time: 1049Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1005.0	77	27.5	100	09	01	-05
0200	0802.0	72	13.2	090	16	00	-08
0400	0629.0	26	05.3	100	13	01	-07
0600	0489.0	42	-10.1	260	09	01	05
0800	0376.0		20.8	250	31	06	15
1000	0285.0		-34.0	270	33	00	17
1200	0211.3		-52.2	260	25	02	13
1400	0153.5		-69.3	290	36	-06	17
1582	0112.0		-80.3	240	19	05	08
1600	0108.9		-80.3	220	18	07	06
1800	0076.7		-73.5	110	36	06	-17
1898	0065.0		-65.5	040	12	-05	-04

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : ARCAS
PAYLOAD TYPE : ARCASONDE
DATE : NOV. 16-1966
TIME : 1505 Z
RAWIN TIME : 1049 Z



ROCKET DATA

Date: DEC 14, 1966 Time: 500 Z

Rocket Type: MK 32 Payload: PARACHUTE

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
33	042	077	096	66	04	-34
32	045	071	086	72	-03	-37
31	047	062	087	55	-01	-28
30	050	061	093	44	01	-23
29	052	059	085	30	-01	-15
28	056	053	074	16	-02	-08
27	059	051	009	06	-05	-01
26	062	049	305	10	-03	04
25	066	044	325	08	-03	02
24	070	042	043	04	-02	-01
23	074	036	260	16	02	08
22	079	033	270	26	00	13
21	084	033	279	22	-02	11
20	089	029	278	15	-01	08
19	095	027	257	09	01	04
18	101	026	211	05	02	01

RAWIN DATA

Date: DEC 14, 1966 Time: 1140 Z

ALT	PRESSURE	RH	TEMP	WIND POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1003.0	49	28.2	120	08	02	-04
0200	0800.0	68	14.3	090	21	00	-11
0400	0630.0	33	05.2	182	12	06	00
0600	0489.0		-06.1	268	05	00	03
0800	0377.0		-19.9	243	08	02	04
1000	0285.0		-35.1	273	20	00	10
1200	0212.0		-51.7	294	36	-07	17
1400	0154.5		-66.4	292	20	-04	10
1600	0110.0		-75.8	188	11	06	01
1722	0089.0		-82.8	340	09	-04	02
1800	0078.9		-77.0	213	13	06	04
2000	0055.9		-68.4	215	08	03	02
2200	0040.5		-59.9	285	34	-04	17
2400	0029.4		-57.2	162	04	02	-01
2600	0021.7		-47.8	020	10	-05	-02
2800	0015.8		-49.9	101	18	02	-09
2923	0013.0		-49.9	086	36	-01	-18
3000				080	45	-04	-25
3200				082	72	-05	-36
3400				089	75	-01	-39
3510				100	79	07	-40

ROCKET DATA

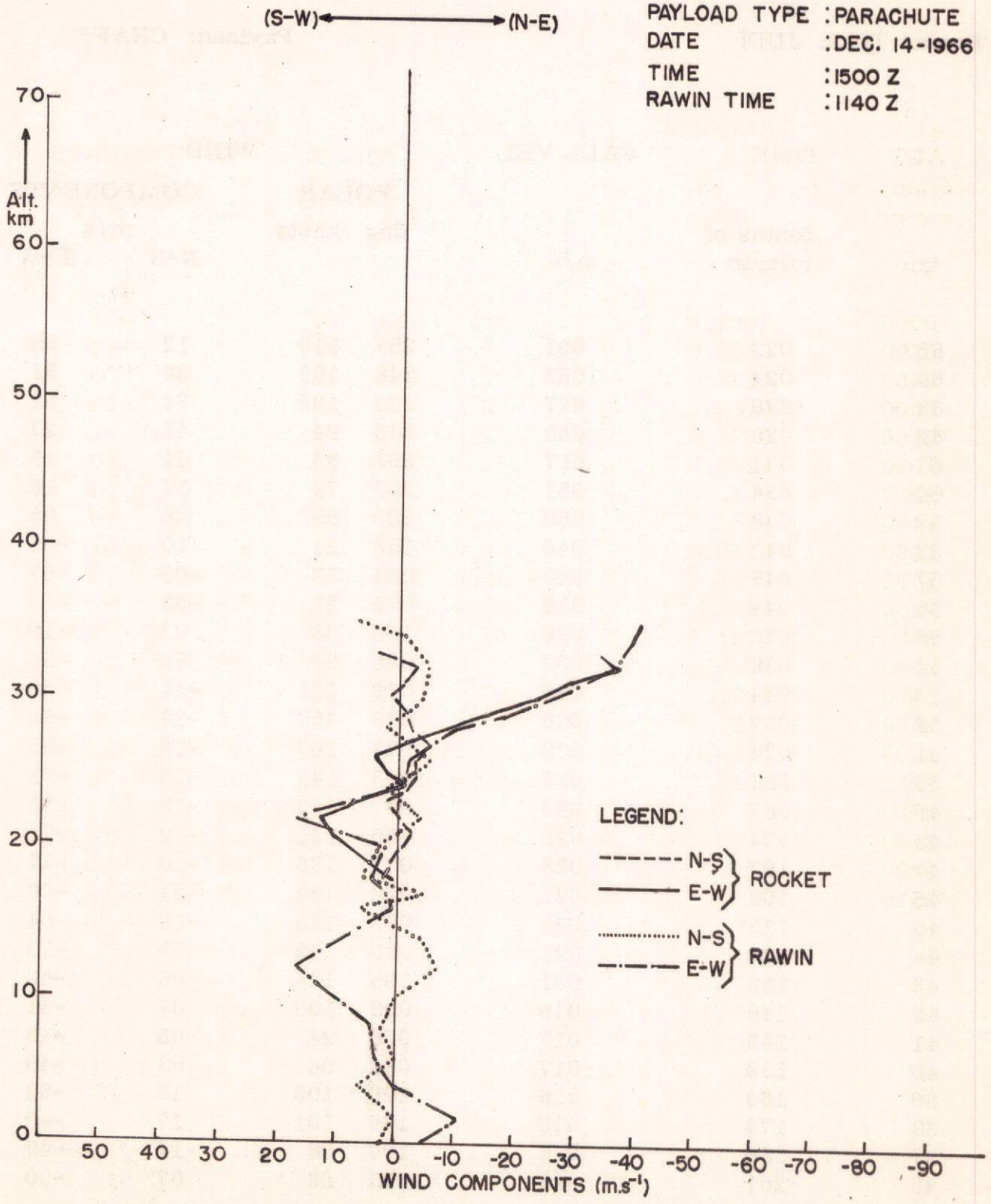
Date: JAN 18, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
65	022	091	257	110	12	55
64	024	083	248	105	20	51
63	026	077	231	105	34	52
62	028	065	213	94	41	27
61	031	057	201	86	41	16
60	034	051	203	78	37	16
59	038	050	193	55	28	06
58	041	046	153	21	10	-05
57	045	042	054	17	-05	-07
56	049	039	075	21	-03	-10
55	053	036	109	38	03	-19
54	058	032	096	67	04	-34
53	064	030	079	111	-11	-56
52	069	030	078	157	-18	-79
51	075	029	078	167	-19	-85
50	081	027	075	143	-19	-71
49	087	025	077	132	-15	-76
48	094	025	080	141	-12	-71
47	101	023	073	136	-10	-67
46	108	021	072	134	-21	-66
45	116	021	073	130	-19	-64
44	124	021	095	142	07	-73
43	132	021	095	124	06	-63
42	140	019	098	100	07	-51
41	149	017	096	94	05	-48
40	159	017	093	96	03	-49
39	169	016	106	106	15	-52
38	179	016	109	101	17	-49
37	189	016	106	98	14	-48
36	201	015	098	98	07	-50

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : MK 32
PAYLOAD TYPE : PARACHUTE
DATE : DEC. 14-1966
TIME : 1500 Z
RAWIN TIME : 1140 Z



ROCKET DATA

Cont.

Date: JAN 18, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

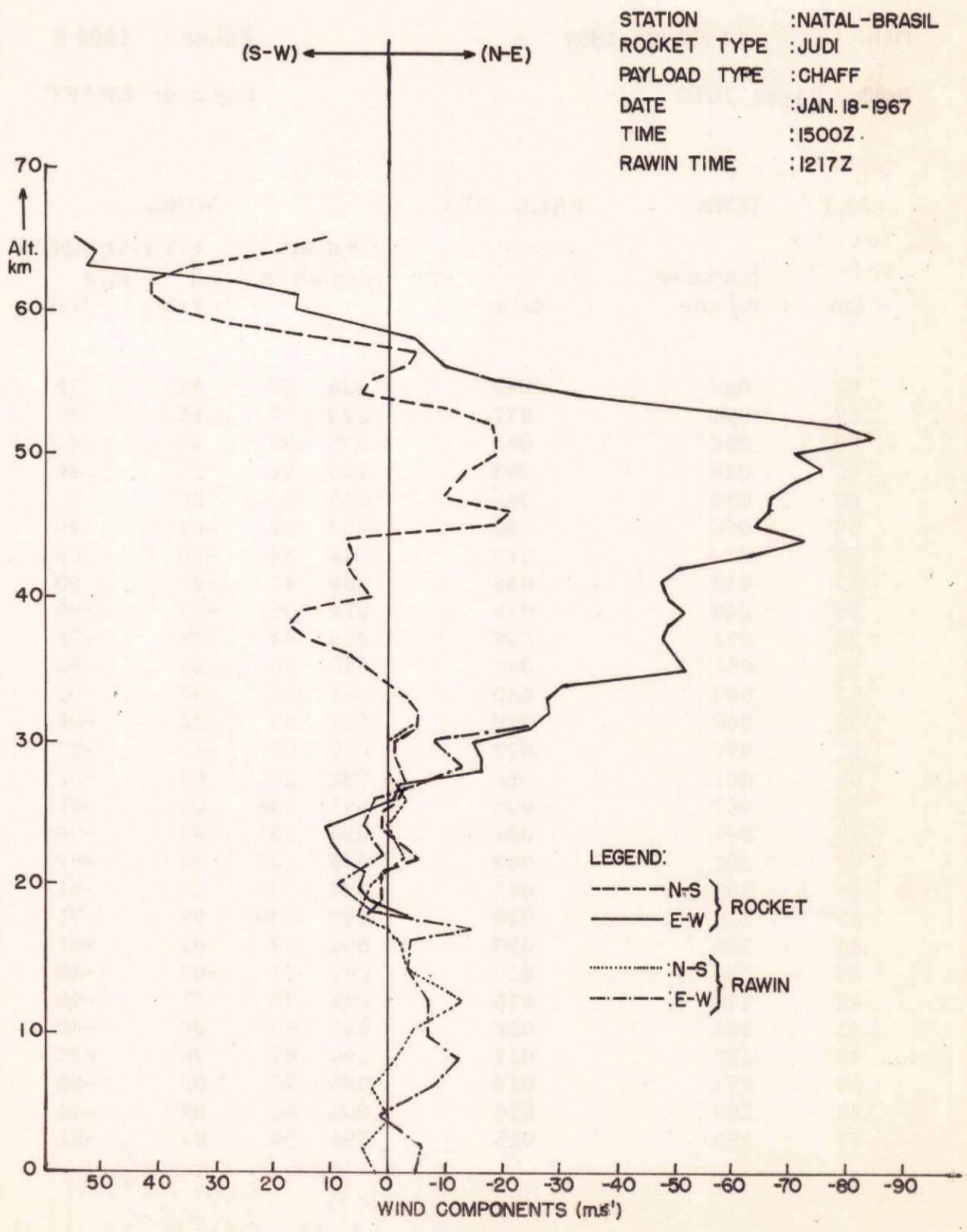
ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
35	212	015	093	101	03	-52
34	223	014	090	78	00	-40
33	236	013	086	75	-03	-38
32	249	013	083	75	-05	-38
31	261	013	082	68	-05	-35
30	275	012	088	49	-01	-25
29	287	012	088	31	-01	-16
28	303	011	083	31	-02	-16
27	318	010	030	06	-03	-02
26	335	009	040	04	-02	-01
25	353	009	261	09	01	05
24	371	009	265	22	01	11
23	391	008	285	20	-02	10
22	412	008	304	18	-05	08
21	432	008	260	07	01	04
20	455	007	264	10	01	05
19	478	007	248	07	01	03
18	503	007	120	11	03	-03

RAWIN DATA

Date: JAN 18, 1967 Time: 1217 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1005.0	67	29.5	110	10	02	-05
0200	0801.0	28	16.4	123	15	04	-06
0400	0629.0		03.6	260	02	00	01
0600	0430.0		-13.2	112	17	03	-08
0800	0377.0		-19.0	087	24	-01	-12
1000	0284.5		-36.2	057	15	-04	-07
1200	0211.8		-53.5	030	29	-13	-07
1400	0153.5		-67.6	046	12	-04	-04
1600	0109.7		-76.1	070	09	-02	-04
1735	0086.0		-83.5	090	27	00	-14
1800	0076.8		-78.3	195	11	05	01
2000	0054.8		-70.6	250	18	03	09
2200	0039.5		-62.0	350	06	-03	01
2400	0028.7		-58.2	270	22	00	04
2600	0020.8		-55.5	330	07	-03	02
2800	0015.4		-49.2	090	26	00	-13
3000	0011.3		-47.3	093	16	00	-08
3082	0010.0		-45.3	100	50	04	-25

GRAPHIC DATA



ROCKET DATA

Date: FEB 01, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
64	022	087	225	87	32	32
63	024	077	229	77	26	30
62	026	062	238	98	27	43
61	029	053	250	94	17	45
60	032	049	255	63	09	31
59	036	048	282	39	-04	20
58	039	043	343	34	-16	05
57	043	039	360	41	-21	00
56	048	038	012	46	-23	-05
55	052	036	014	44	-22	-05
54	057	031	360	50	-26	-00
53	063	030	355	58	-30	02
52	068	030	017	53	-26	-08
51	074	027	068	57	-11	-27
50	081	026	092	101	02	-52
49	087	025	097	136	09	-69
48	094	024	094	157	06	-79
47	101	023	093	156	04	-82
46	108	021	094	133	05	-61
45	116	020	093	139	04	-71
44	125	020	092	92	02	-47
43	134	019	087	77	-02	-40
42	143	018	092	78	01	-40
41	152	018	099	80	06	-40
40	162	017	100	67	06	-34
39	173	016	095	70	03	-36
38	183	016	092	85	02	-44
37	193	015	094	99	04	-51

ROCKET DATA

Cont.

Date: FEB 01, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

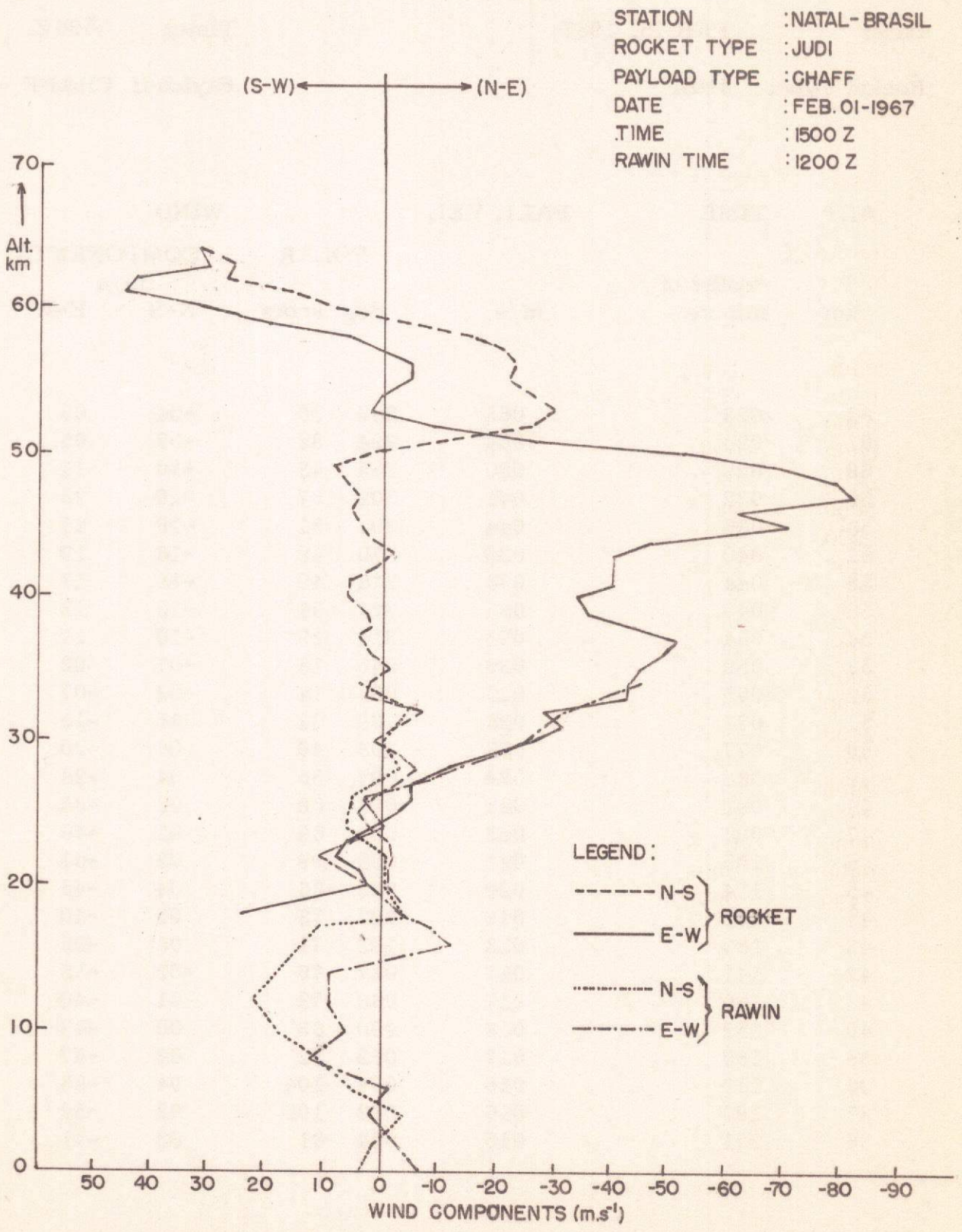
ALT	TIME	FALL VEL	WIND POLAR		COMPONENTS m/s	
			deg	knots		
km	tenths of minute	m/s			N-S	E-W
36	205	015	092	96	02	-49
35	216	014	089	88	-01	-45
34	228	014	092	83	02	-43
33	240	013	094	81	03	-42
32	253	013	076	57	-07	-28
31	266	012	086	61	-02	-31
30	281	012	093	50	01	-26
29	295	011	079	35	-03	-18
28	311	010	060	24	-06	-11
27	328	011	066	11	-02	-05
26	342	010	113	11	02	-05
25	360	009	143	09	04	-03
24	378	009	198	04	02	01
23	397	009	275	12	-01	06
22	417	008	287	16	-02	08
21	438	007	288	08	-01	04
20	462	007	291	04	-01	02
19	485	007	282	28	-03	14
18	509	006	278	47	-03	24

RAWIN DATA

Date: FEB 01, 1967 Time: 1200 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1005.0	74	29.0	120	14	04	-07
0200	0803.0	52	14.9	108	07	01	-03
0400	0629.0	24	03.8	338	08	-04	02
0600	0490.0		-06.1	173	09	05	-01
0800	0377.0		-20.8	189	21	11	12
1000	0274.3		-36.0	198	37	18	06
1200	0211.0		-51.6	201	47	22	09
1400	0154.1		-65.7	207	37	18	09
1600	0109.7		-78.6	172	27	13	-12
1710	0090.0		-84.0	143	28	11	-09
1800	0076.6		-73.2	051	11	-04	-04
2000	0054.9		-66.3	286	04	-01	02
2200	0039.6		-63.1	276	22	-01	11
2400	0028.7		-58.2	180	12	06	00
2600	0021.0		-55.3	213	12	05	03
2800	0015.4		-52.8	078	25	-03	-12
3000	0011.3		-49.9	090	48	00	-25
3200	0008.3		-40.6	080	61	-05	-31
3400	0006.2		-39.7	095	88	04	-45
3490	0005.5		-39.0	089	91	-01	-47

GRAPHIC DATA



ROCKET DATA

Date: FEB 15, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
62	023	065	286	30	-04	05
61	025	054	294	32	-07	05
60	029	050	295	43	-10	11
59	032	048	302	57	-16	25
58	036	044	307	51	-16	21
57	040	039	310	49	-16	19
56	044	038	318	49	-19	17
55	049	035	321	38	-15	12
54	054	033	314	29	-10	11
53	059	030	345	15	-07	02
52	065	028	068	14	-03	-07
51	071	028	109	31	05	-15
50	077	026	108	40	06	-20
49	083	024	097	55	04	-28
48	091	023	093	69	02	-35
47	098	023	091	89	01	-46
46	105	021	092	99	02	-51
45	114	020	095	88	04	-45
44	122	019	097	78	05	-40
43	131	018	102	71	08	-36
42	141	017	087	76	-02	-39
41	150	017	088	78	-01	-40
40	159	018	090	83	00	-43
39	169	017	092	92	02	-47
38	179	016	094	104	04	-53
37	190	016	092	102	02	-52
36	201	015	094	81	03	-41

ROCKET DATA

Cont.

Date: FEB 15, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

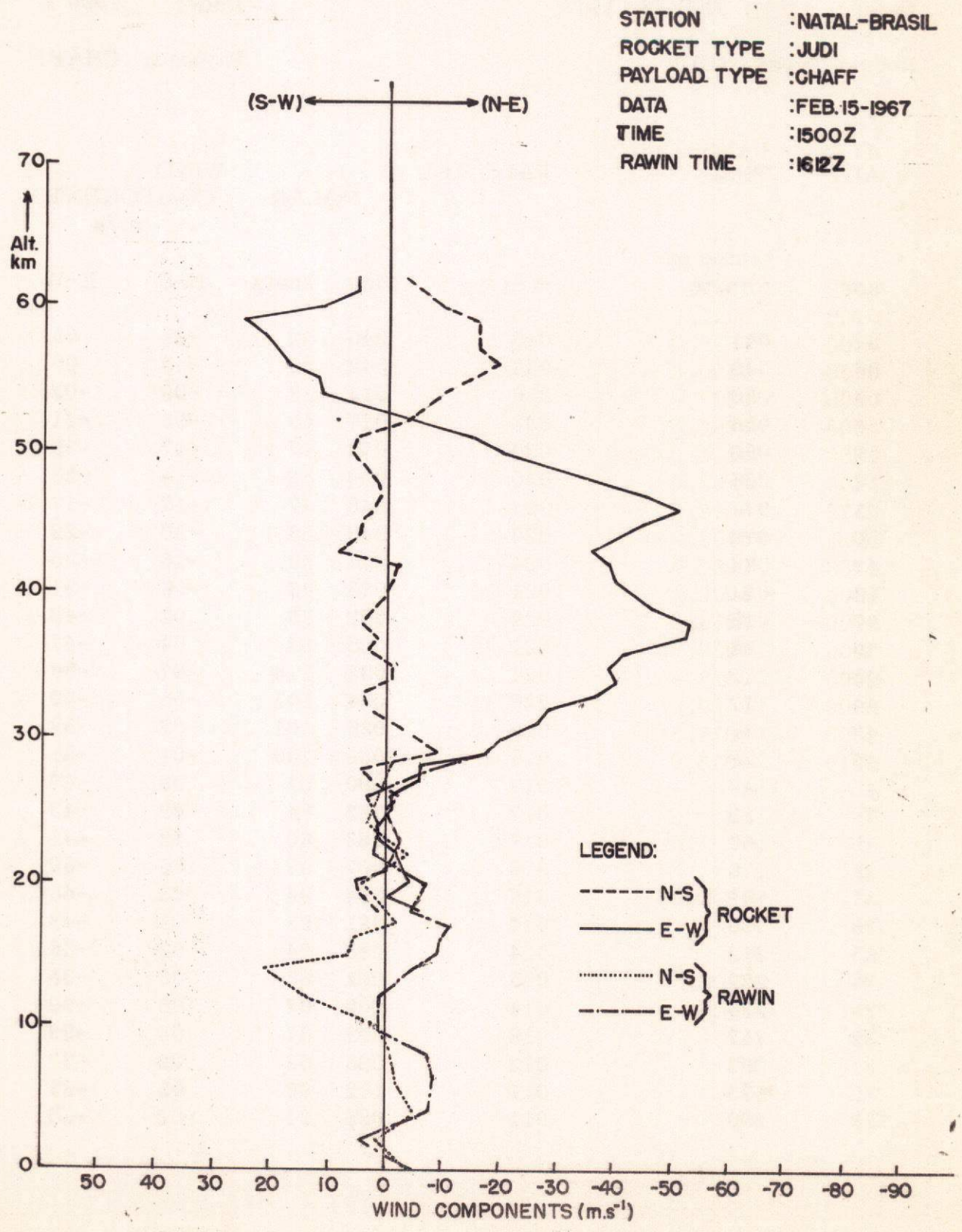
ALT	TIME	FALL VEL	POLAR		WIND COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
35	212	014	089	76	-01	-39
34	225	015	089	77	-01	-40
33	236	013	096	73	04	-37
32	251	012	095	65	03	-28
31	264	012	088	50	-01	-26
30	278	011	074	40	-06	-20
29	293	011	064	39	-09	-18
28	309	011	124	13	04	-06
27	325	010	104	12	02	-06
26	341	010	020	04	-02	-01
25	358	010	130	01	00	-01
24	376	009	294	03	-01	01
23	395	009	349	05	-03	01
22	415	008	049	06	-02	-02
21	438	008	080	05	00	-03
20	458	008	147	12	05	-04
19	483	007	166	08	04	-01
18	506	007	103	11	01	-06

RAWIN DATA

Date: FEB 15, 1967 Time: 1612 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1002.9	68	30.0	050	12	-04	-05
0200	0801.0	76	15.0	257	09	01	04
0400	0629.0	64	03.8	055	18	-05	-08
0600	0490.0		-07.1	078	18	-02	-09
0800	0377.0		-21.1	083	15	-01	-08
1000	0285.5		-36.7	235	02	01	01
1200	0211.0		-53.2	183	28	14	01
1400	0153.0		-67.9	168	42	21	-05
1579	0112.0		-81.2	123	21	06	-09
1600	0108.2		-80.9	116	22	05	-10
1763	0081.0		-81.2	078	21	-02	-11
1800	0076.2		-76.2	090	10	00	-05
2000	0054.5		-68.0	119	15	04	-07
2200	0039.3		-60.3	335	08	-04	02
2400	0028.4		-56.2	202	06	03	01
2600	0020.8		-51.4	245	06	01	03
2800	0015.3		-47.1	086	25	-01	-13
2910	0013.0		-46.1	068	35	-02	-17

GRAPHIC DATA



ROCKET DATA

Date: FEB 22, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	POLAR		WIND COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
57	041	043	346	42	-21	05
56	045	038	342	30	-15	05
55	050	038	014	18	-09	-02
54	054	033	077	43	-05	-21
53	060	030	072	47	-07	-23
52	065	030	059	52	-14	-23
51	071	027	046	47	-17	-17
50	078	026	047	58	-20	-22
49	084	024	057	58	-16	-25
48	091	024	075	63	-08	-31
47	098	022	092	83	02	-43
46	106	021	095	94	04	-47
45	113	021	083	114	-07	-58
44	122	020	084	101	-05	-52
43	130	019	088	101	-02	-52
42	139	018	089	100	-01	-51
41	149	017	090	91	00	-47
40	159	017	092	84	02	-43
39	168	017	093	80	02	-41
38	178	016	097	99	06	-50
37	189	016	094	94	03	-48
36	190	014	091	83	01	-43
35	212	014	093	74	02	-38
34	223	015	098	68	05	-35
33	234	014	100	67	05	-29
32	247	013	098	67	04	-29
31	260	012	095	52	02	-27
30	275	011	102	46	05	-23
29	290	011	086	31	-01	-16

ROCKET DATA

Cont.

Date: FEB 22, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

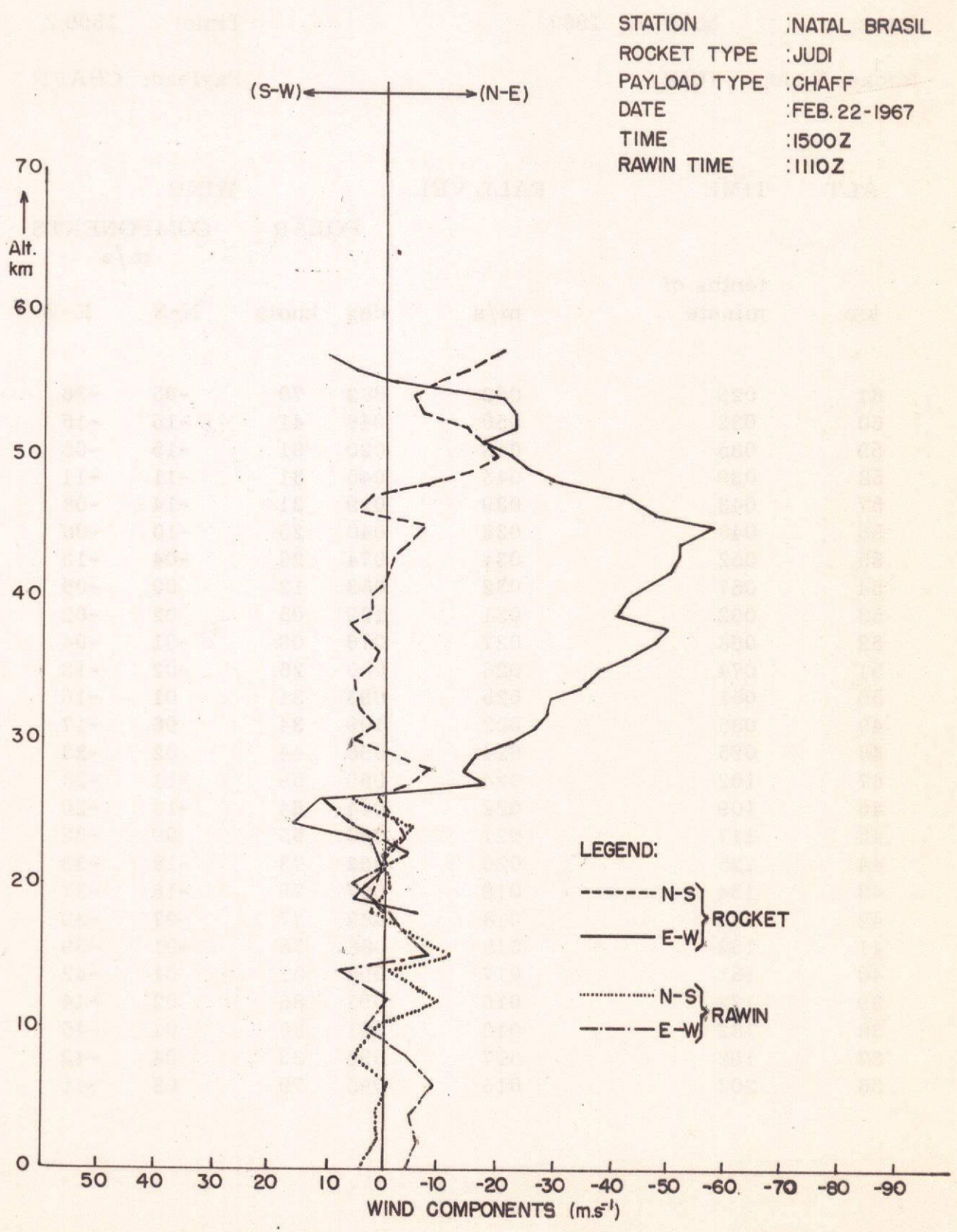
ALT	TIME	FALL VEL	WIND POLAR		WIND COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
28	305	011	062	31	-08	-14
27	320	010	073	36	-05	-18
26	337	010	264	22	01	11
25	353	009	276	27	-01	14
24	373	009	282	31	-03	16
23	392	008	328	09	-04	02
22	412	008	316	04	-01	01
21	432	008	238	01	00	00
20	454	007	254	07	01	03
19	477	007	254	11	02	05
18	502	007	086	12	00	-06

RAWIN DATA

Date: FEB 22, 1967 Time: 1110 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1005.2	75	28.2	140	11	04	-04
0200	0802.0	60	13.9	100	12	01	-06
0400	0630.0	31	03.8	106	10	01	-05
0600	0489.0		-07.6	086	18	-01	-09
0800	0377.0	28	-19.6	141	12	05	-04
1000	0285.0	44	-36.5	254	06	01	03
1200	0211.2		-53.2	009	19	-10	-01
1400	0153.4		-71.7	281	16	-01	08
1570	0114.0		-79.6	036	26	-11	-08
1600	0108.2		-78.9	036	20	-08	-06
1800	0076.5		-70.3	150	05	02	-01
2000	0054.7		-65.1	277	09	-01	05
2200	0039.6		-57.0	084	07	00	-04
2400	0028.9		-55.8	315	14	-05	05
2600	0021.2		-55.3	240	24	06	11
2668	0019.0		-56.9	195	22	11	03

GRAPHIC DATA



ROCKET DATA

Date: MAR 01, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
61	029	062	082	70	-05	-36
60	032	050	046	41	-15	-15
59	035	046	020	31	-15	-05
58	039	043	045	31	-11	-11
57	043	039	029	31	-14	-08
56	048	038	040	25	-10	-08
55	052	034	074	26	-04	-13
54	057	032	086	12	00	-06
53	062	031	129	05	02	-02
52	068	027	076	09	-01	-04
51	074	026	080	26	-02	-13
50	081	025	093	31	01	-16
49	088	023	109	34	06	-17
48	095	024	096	44	02	-23
47	102	024	069	59	-11	-28
46	109	022	064	64	-14	-29
45	117	021	066	65	09	-32
44	125	020	062	73	-18	-33
43	134	019	067	79	-16	-37
42	143	018	082	77	-07	-39
41	152	018	088	76	-01	-39
40	161	017	092	81	01	-42
39	172	016	093	86	02	-44
38	182	016	091	88	01	-45
37	192	017	095	83	04	-42
36	203	015	095	79	03	-41

ROCKET DATA

Cont.

Date: MAR 01, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

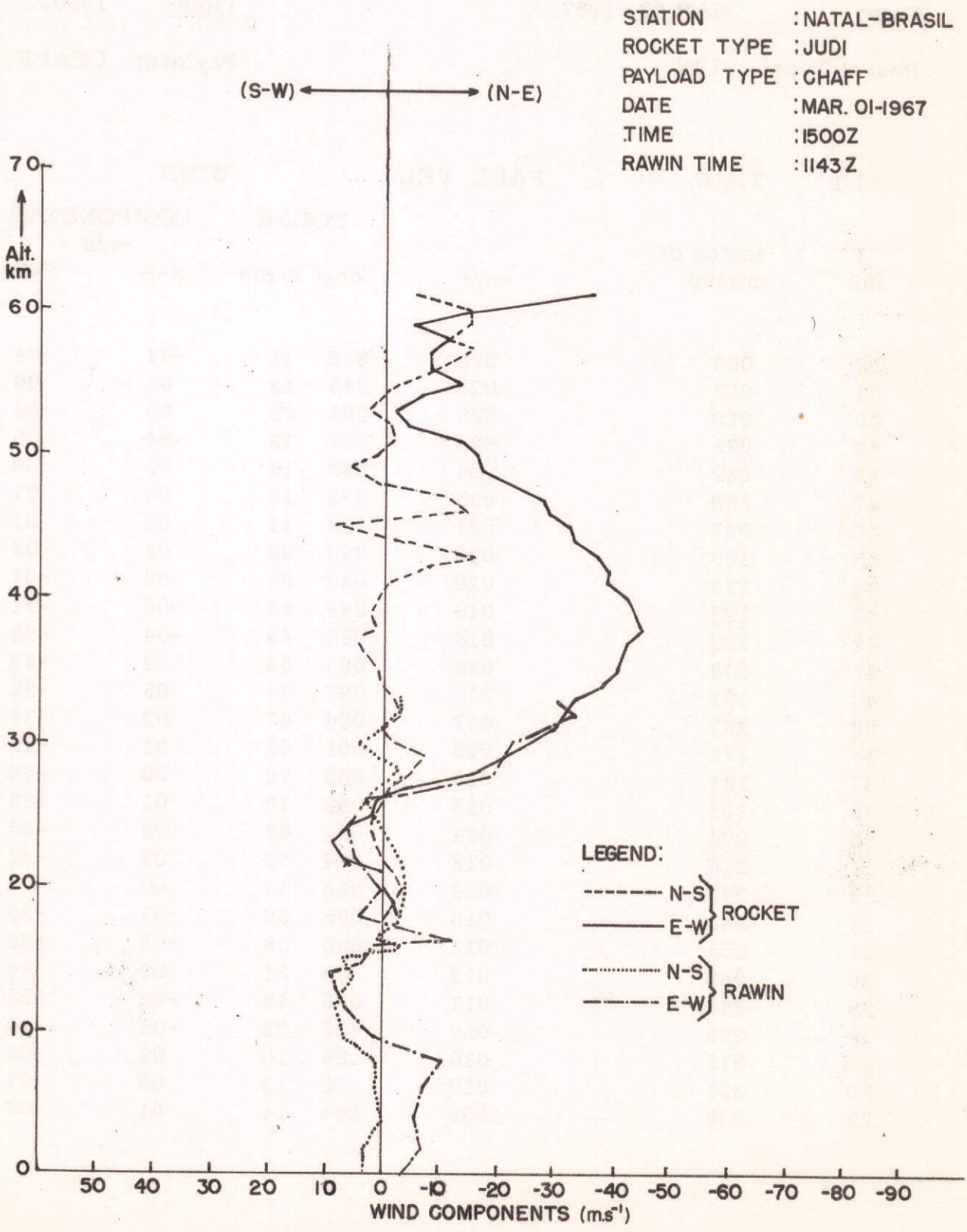
ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
35	214	014	092	78	01	-40
34	227	013	090	73	00	-38
33	240	013	086	65	-02	-33
32	252	013	084	61	-03	-31
31	265	013	090	57	00	-29
30	278	012	086	48	-02	-25
29	292	011	071	42	-07	-20
28	307	010	071	32	-05	-16
27	325	010	076	10	-01	-05
26	341	010	278	01	00	01
25	359	009	220	05	02	02
24	377	009	253	12	02	06
23	396	009	267	17	01	09
22	415	009	268	13	00	07
21	434	008	354	04	-02	00
20	457	007	360	05	-03	00
19	483	007	043	05	-02	-02
18	508	007	071	06	-01	-03

RAWIN DATA

DATE: MAR 01, 1967 TIME: 1143 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1004.4	72	28.5	140	08	03	-03
0200	0802.0	30	16.4	112	14	03	-07
0400	0630.0		06.3	093	11	00	-06
0600	0491.0		-05.0	094	14	01	-07
0800	0379.0		-17.7	096	20	01	-10
1000	0306.5		-25.4	193	13	07	02
1200	0213.5		-50.8	222	21	08	07
1400	0155.0		-68.4	241	20	05	09
1527	0125.0		-77.8	213	16	07	04
1600	0110.3		-78.1	332	06	-03	01
1696	0093.0		-82.0	096	25	01	-13
1800	0077.3		-77.0	300	10	-03	04
2000	0055.2		-64.1	360	08	-04	00
2200	0040.0		-59.3	300	12	-03	05
2400	0029.3		-55.9	272	12	00	06
2600	0021.4		-52.1	225	09	03	03
2800	0015.7		-50.3	080	37	-03	-19
3000	0011.6		-45.8	080	45	-04	-23
3200	0008.7		-42.0	085	65	-03	-33
3341	0007.0		-40.1	085	68	-03	-30

GRAPHIC DATA



ROCKET DATA

Date: MAR 22, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
52	056	028	312	11	-04	04
51	062	026	243	12	03	06
50	069	025	268	08	00	04
49	075	025	307	12	-04	05
48	082	024	260	18	02	09
47	089	022	233	18	06	07
46	097	021	188	11	06	01
45	105	020	208	08	04	02
44	114	019	028	04	-02	-01
43	123	018	063	25	-06	-11
42	132	018	080	43	-04	-22
41	142	018	093	64	02	-33
40	151	018	097	74	05	-38
39	161	017	094	67	02	-35
38	171	016	091	63	01	-32
37	181	015	090	70	00	-36
36	193	015	092	70	01	-36
35	204	014	094	67	02	-35
34	216	013	094	63	02	-32
33	229	013	093	57	02	-29
32	242	013	085	58	-03	-30
31	255	012	080	58	-05	-29
30	269	012	085	51	-02	-26
29	283	011	086	43	-02	-22
28	299	010	074	33	-05	-16
27	315	010	098	16	01	-08
26	331	010	190	12	06	01
25	348	009	261	14	01	07

ROCKET DATA

Cont.

Date: MAR 22, 1967 Time: 1500 Z

Rocket Type: JUDI Payload CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
24	367	009	278	15	01	08
23	385	009	289	12	-02	06
22	405	008	314	09	-03	03
21	428	008	290	05	-01	02
20	449	007	259	14	01	07
19	474	007	280	19	-02	10
18	499	007	299	12	-03	05

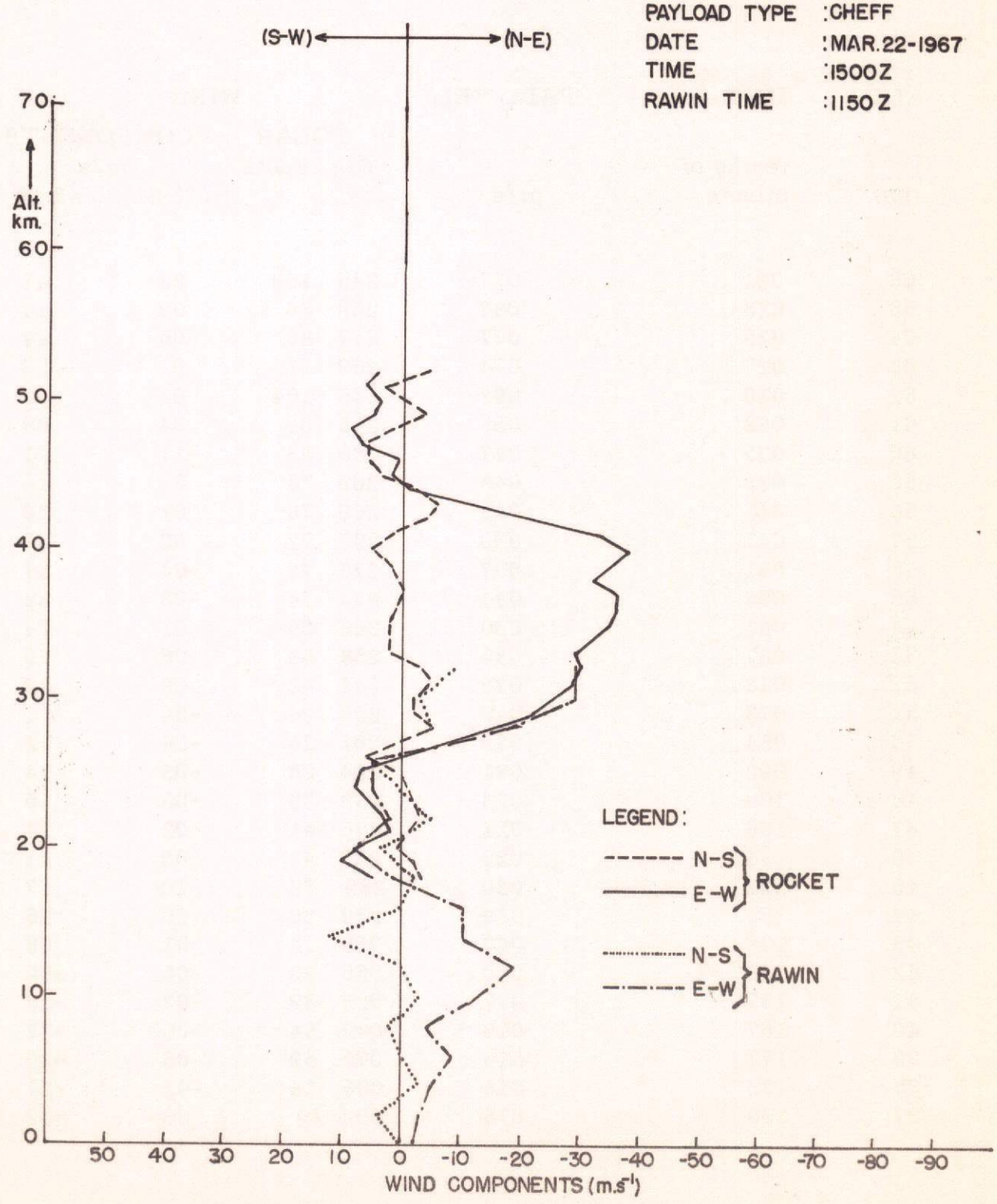
RAWIN DATA

Date: MAR 22, 1967 Time: 1150 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tenths of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1005.5	73	28.3	100	04	00	-02
0200	0804.0	50	15.6	149	10	04	-03
0400	0631.0	61	04.5	061	11	-03	-05
0600	0491.0	46	-07.0	091	18	00	-09
0800	0377.0		-20.1	113	08	02	-04
1000	0285.4		-34.9	078	27	-03	-13
1200	0211.8		-52.2	090	36	00	-19
1400	0154.0		-67.8	142	30	12	-10
1600	0108.9		-84.7	093	20	00	-10
1615	0106.0		-85.8	090	20	00	-10
1800	0076.9		-76.4	308	06	-02	02
2000	0054.8		-68.5	248	16	03	08
2200	0039.5		-58.4	342	10	-05	02
2400	0028.7		-53.3	272	10	00	05
2600	0021.2		-56.3	220	15	06	05
2800	0015.6		-47.9	075	34	-05	-17
3000	0011.4		-45.0	084	56	-03	-29
3200	0008.6		-41.1	075	58	-08	-29

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : JUDI
PAYLOAD TYPE : CHEFF
DATE : MAR. 22-1967
TIME : 1500 Z
RAWIN TIME : 1150 Z



ROCKET DATA

Date: MAR 29, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
66	021	077	245	100	22	47
56	023	083	259	86	09	14
64	025	077	277	86	-05	44
63	027	074	269	111	01	57
62	030	062	256	104	03	53
61	032	056	275	96	04	49
60	035	047	285	83	-11	41
59	039	045	269	78	01	40
58	043	043	269	76	01	39
57	047	039	267	72	02	37
56	051	037	276	73	-04	37
55	056	034	274	74	-03	38
54	061	030	268	66	01	34
53	067	030	258	58	06	29
52	072	029	264	42	02	22
51	079	028	293	24	-04	11
50	084	025	291	25	-04	12
49	092	021	284	28	-03	14
48	100	023	283	30	-03	15
47	106	024	275	41	-02	21
46	114	022	263	41	03	21
45	122	020	239	38	10	17
44	131	019	239	36	10	16
43	139	020	258	12	01	06
42	148	019	066	22	-05	-10
41	157	017	083	52	-03	-23
40	167	016	082	64	-05	-32
39	177	016	078	59	-06	-30
38	188	016	085	54	-02	-27
37	198	015	090	62	00	-32

ROCKET DATA

Cont.

Date: MAR 29, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
36	210	014	093	63	02	-32
35	221	014	097	60	04	-31
34	233	014	105	56	08	-28
33	245	013	106	54	08	-27
32	258	013	099	52	04	-27
31	271	012	088	53	-01	-27
30	285	012	086	50	-02	-26
29	299	011	078	40	-04	-20
28	315	011	063	27	-06	-12
27	330	010	050	16	-05	-06
26	347	010	019	09	-04	-02
25	365	010	330	05	-02	01
24	382	009	255	10	01	05
23	402	008	248	13	02	06
22	423	008	261	08	01	04
21	444	008	284	10	-01	05
20	466	007	281	17	-01	09
19	491	007	271	17	00	09
18	513	007	268	08	00	04

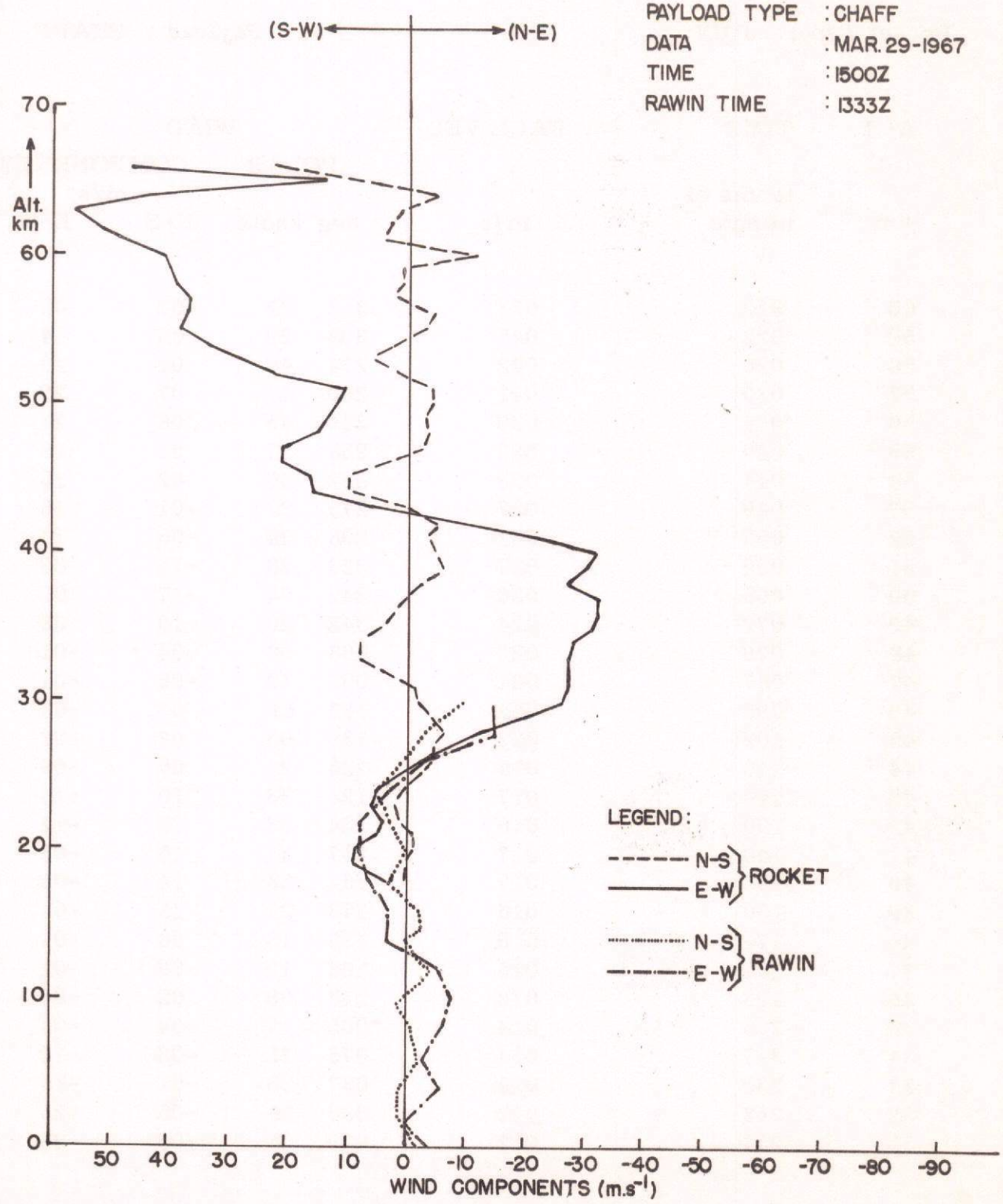
RAWIN DATA

Date: MAR 29, 1967 Time: 1333 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1004.7	72	29.4	060	09	-02	-04
0200	0802.0	78	13.7	190	03	01	00
0400	0629.0	67	03.6	100	11	01	-06
0600	0490.0	53	-07.4	050	07	-02	-03
0800	0376.0	35	-21.3	080	11	-01	-06
1000	0285.5		-36.7	100	16	01	-08
1200	0210.8		-53.3	060	14	-04	-06
1400	0152.8		-68.9	260	05	00	03
1598	0109.0		-82.5	300	07	-02	03
1600	0108.5		-82.4	300	06	-02	03
1800	0076.0		-78.0	240	13	03	06
2000	0054.2		-69.2	270	16	00	08
2200	0039.0		-58.8	250	17	03	08
2400	0028.4		-55.8	210	11	05	03
2600	0020.7		-56.2	110	07	01	-03
2800	0015.3		-46.7	080	29	-03	-15
3000	0011.1		-46.7	060	33	-09	-15
3003	0011.0		-46.6	060	33	-09	-15

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : JUDI
PAYLOAD TYPE : CHAFF
DATA : MAR. 29-1967
TIME : 1500Z
RAWIN TIME : 1333Z



ROCKET DATA

Date: JUN 14, 1967 Time: 1511 Z

Rocket Type: JUDI Payload : CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
60	019	077	313	22	-07	08
59	022	047	293	29	-06	14
58	026	042	274	46	-02	23
57	030	041	250	41	07	20
56	034	039	249	45	08	21
55	039	033	258	37	04	18
54	044	033	262	30	02	15
53	049	037	275	31	-01	16
52	053	031	298	24	-05	11
51	059	027	323	28	-11	09
50	065	026	342	34	-17	05
49	072	024	342	20	-10	03
48	079	023	008	08	-04	-01
47	087	021	009	12	-06	-01
46	095	022	123	06	03	-03
45	102	022	139	05	02	-02
44	110	018	125	21	06	-09
43	120	017	124	33	10	-14
42	130	016	134	33	12	-12
41	140	017	157	31	15	-06
40	150	017	161	28	14	-05
39	160	016	173	21	11	-01
38	171	016	176	15	08	-01
37	181	015	168	12	06	-01
36	193	013	118	06	02	-03
35	205	014	065	17	-04	-08
34	217	014	075	25	-03	-12
33	230	014	087	35	-01	-18
32	242	012	080	51	-05	-26
31	257	012	079	56	-05	-28

ROCKET DATA

Cont.

Date: JUN 14, 1967 Time: 1511 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
30	271	013	087	57	-01	-29
29	284	011	092	47	01	-24
28	300	010	086	39	-01	-20
27	316	010	078	39	-04	-20
26	333	009	082	37	-03	-19
25	351	009	097	28	02	-14
24	370	009	079	05	-01	-03
23	391	009	322	12	-05	04
22	408	009	005	07	-04	00
21	430	007	165	02	01	00
20	453	007	218	11	04	04
19	477	007	205	05	02	01
18	502	006	062	09	-02	-04

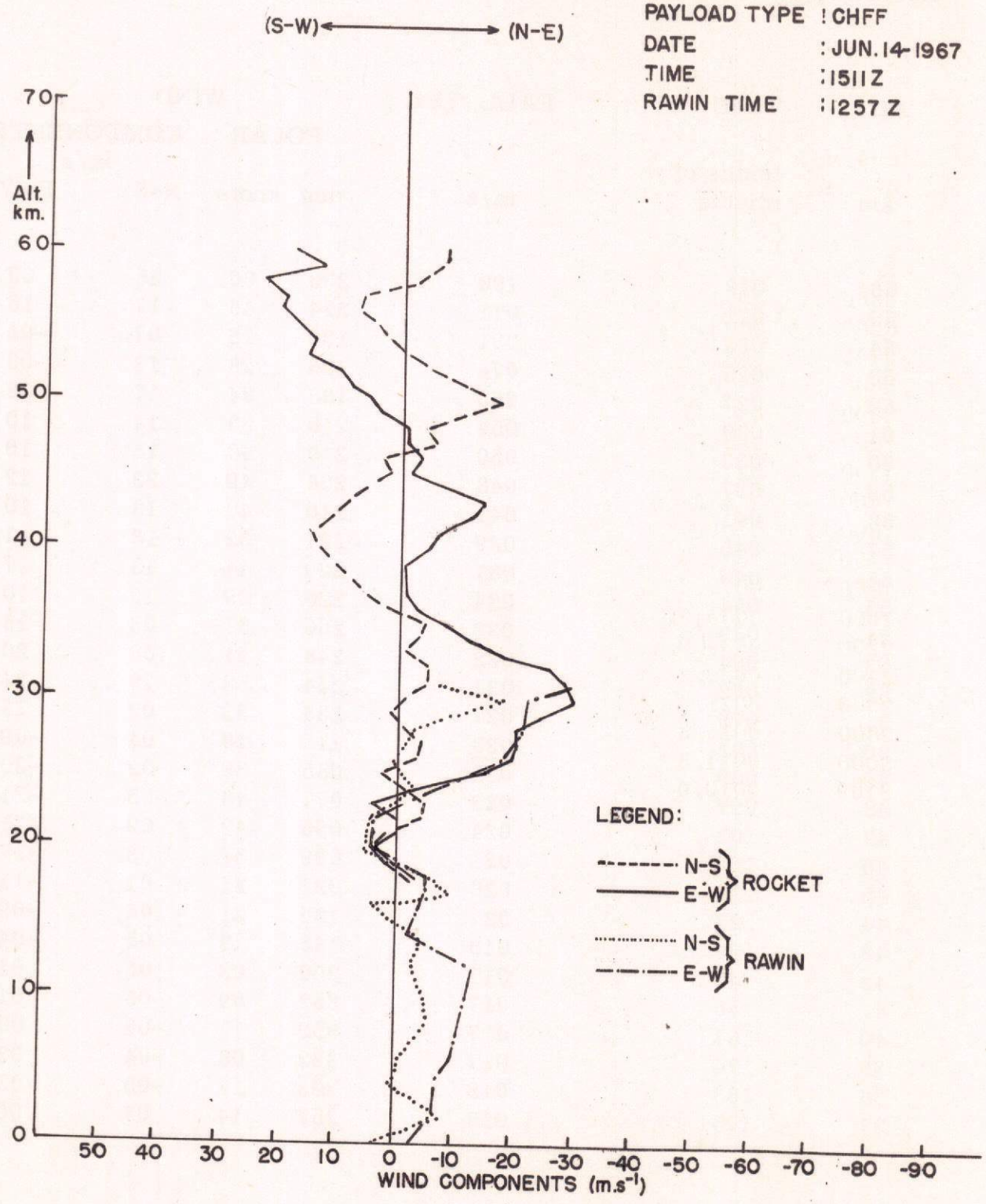
RAWIN DATA

Date: JUN 14, 1967 Time: 1257 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1008.1	64	28.1	140	09	04	-03
0200	0802.0	64	12.9	073	20	-08	-07
0400	0630.2		05.6	090	14	00	-07
0600	0490.8		-07.2	087	19	-01	-10
0800	0377.7		-21.3	065	24	-05	-11
1000	0285.1		-36.7	069	26	-05	-12
1200	0211.9		-52.9	078	26	-03	-13
1400	0153.8		-66.8	030	08	-04	-02
1600	0109.8		-73.9	136	11	04	-04
1759	0083.0		-79.5	030	20	-09	-05
1800	0077.3		-76.1	037	18	-07	-05
2000	0055.3		-66.4	218	13	05	04
2200	0039.9		-57.1	046	11	04	04
2400	0029.2		-58.9	061	13	-03	-06
2600	0021.4		-46.3	089	36	00	-18
2800	0015.8		-45.6	083	42	-03	-21
3000	0011.8		-41.2	051	55	-18	-22
3109	0010.0		-38.5	077	58	-07	-29

GRAPHIC DATA

STATION	: NATAL-BRASIL
ROCKET TYPE	: JUDI
PAYLOAD TYPE	: CHFF
DATE	: JUN. 14-1967
TIME	: 1511 Z
RAWIN TIME	: 1257 Z



ROCKET DATA

Date: JUL 05, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
66	018	100	233	80	25	33
65	021	071	224	46	17	16
64	023	091	130	16	07	-05
63	025	074	126	28	12	-08
62	027	065	188	34	17	02
61	030	054	216	32	14	10
60	033	050	210	40	18	10
59	037	048	208	49	22	12
58	041	041	210	40	18	10
57	045	039	221	32	13	11
56	049	037	229	44	15	17
55	054	034	226	29	10	10
54	059	032	260	31	03	16
53	064	032	248	41	08	20
52	069	031	244	53	12	24
51	075	027	238	31	09	14
50	082	025	118	19	04	-09
49	089	022	085	39	-02	-20
48	097	023	077	43	-05	-21
47	103	024	095	42	02	-21
46	111	021	099	34	03	-17
45	119	020	097	22	01	-11
44	127	021	120	21	05	-09
43	135	019	145	12	05	-04
42	145	017	290	03	00	01
41	155	017	352	09	-05	01
40	164	017	359	11	-06	00
39	174	017	332	08	-04	02
38	183	016	303	11	-05	03
37	195	015	257	14	07	00

ROCKET DATA

Cont.

Date: JUL 05, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENT m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
36	206	014	251	19	09	02
35	218	014	262	21	02	11
34	230	013	236	12	03	05
33	243	012	087	21	-01	-11
32	257	012	094	46	02	-24
31	271	013	097	47	03	-24
30	283	013	095	47	02	-24
29	297	011	091	47	00	-24
28	313	010	091	48	00	-25
27	329	010	090	46	00	-24
26	346	009	087	44	-01	-23
25	364	009	087	44	-01	-23
24	383	009	083	30	-02	-15
23	402	008	104	04	01	-02
22	423	009	254	15	02	07
21	441	008	277	20	-01	10
20	463	007	281	18	-01	09
19	487	006	262	11	01	06
18	516	006	309	02	-01	01

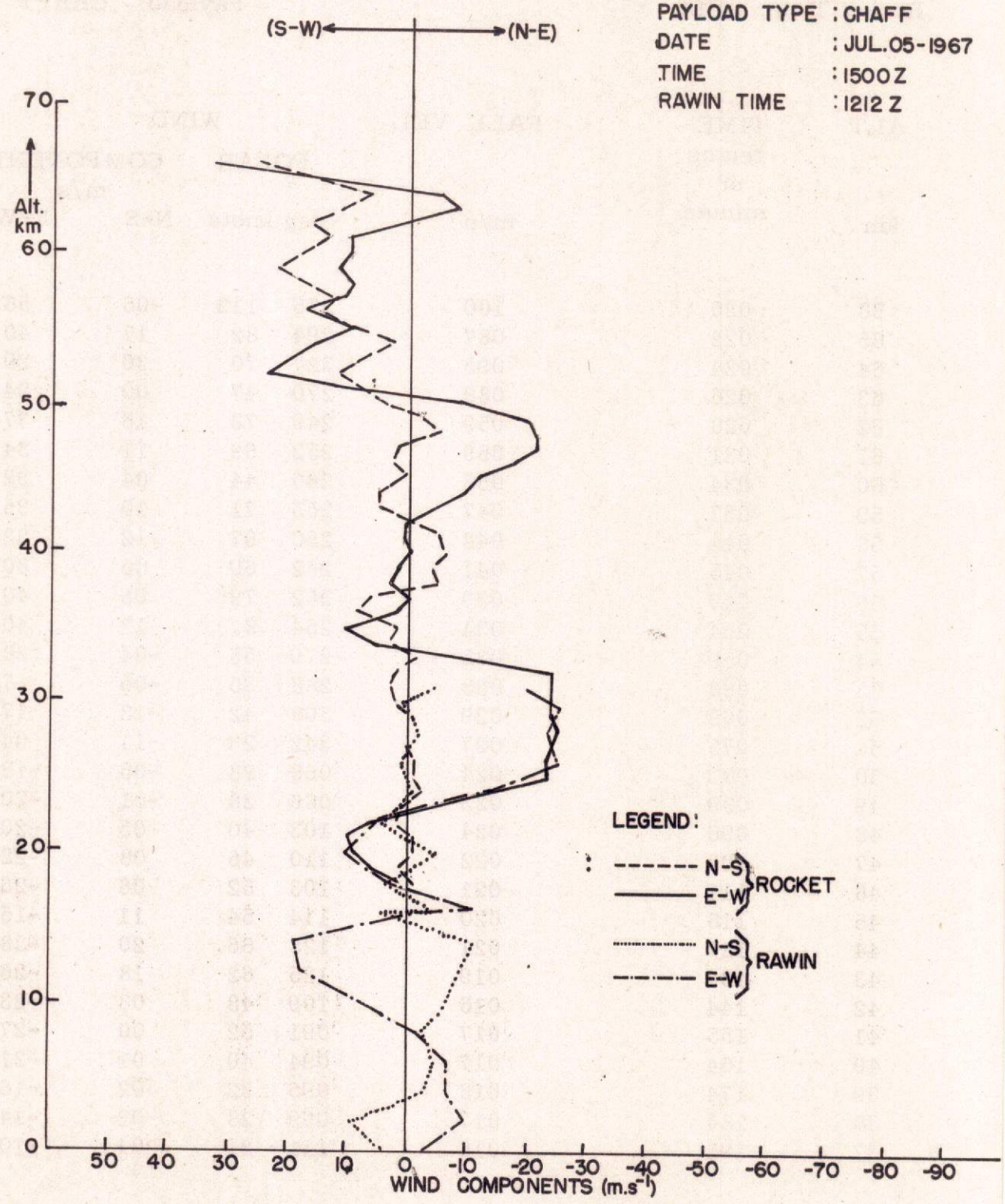
RAWIN DATA

Date: JUL 05, 1967 Time: 1212 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENT m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1009.1	92	23.5	130	08	03	-03
0200	0801.0	90	13.1	132	26	09	-10
0400	0630.0	79	02.4	069	15	-03	-07
0600	0489.0		-11.4	054	17	-05	-07
0800	0376.0		-21.9	038	07	-03	-02
1000	0283.0		-37.7	317	20	-07	07
1200	0210.0		-53.1	298	40	-09	18
1400	0152.8		-67.9	301	42	-11	19
1600	0108.2		-76.7	140	10	04	-03
1646	0100.0		-77.7	069	23	-04	-11
1800	0077.0		-67.7	231	08	03	03
2000	0055.4		-61.8	300	22	-05	10
2200	0040.2		-61.7	233	13	04	05
2400	0029.2		-55.9	086	26	-01	-13
2600	0021.5		-50.8	092	49	01	-25
2800	0015.8		-44.9	086	47	-02	-24
3000	0011.7		-45.3	093	49	01	-25
3177	0009.0		-42.2	077	40	-05	-20

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : JUDI
PAYLOAD TYPE : CHAFF
DATE : JUL.05-1967
TIME : 1500 Z
RAWIN TIME : 1212 Z



ROCKET DATA

Date: JUL 12, 1967 Time: 1658 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
	tenths of minute		POLAR		COMPONENTS m/s	
km		m/s	deg	knots	N-S	E-W
66	020	100	276	112	-06	56
65	022	087	294	82	17	40
64	024	095	327	70	30	20
63	026	080	270	47	00	24
62	028	059	249	78	16	37
61	031	059	252	69	11	34
60	034	056	260	44	04	22
59	037	047	255	71	10	35
58	041	042	250	67	12	32
57	045	041	262	60	05	30
56	049	039	262	79	06	40
55	054	034	254	81	12	40
54	059	035	279	55	-04	28
53	063	033	288	35	-05	17
52	069	029	308	42	-13	17
51	075	027	342	23	-11	04
50	081	024	068	28	-05	-13
49	089	023	086	38	-01	-20
48	096	024	103	40	05	-20
47	103	022	110	46	08	-22
46	111	021	103	52	06	-26
45	118	020	114	54	11	-15
44	127	021	125	66	20	-28
43	134	019	125	62	18	-26
42	144	016	109	48	08	-23
41	155	017	091	52	00	-27
40	164	017	094	40	01	-21
39	174	016	096	32	02	-16
38	184	017	099	28	02	-14
37	195	016	111	21	04	-10

ROCKET DATA

Cont.

Date: JUL 12, 1967 Time: 1658 Z

Rocket Type: JUDI Payload: CHAFF

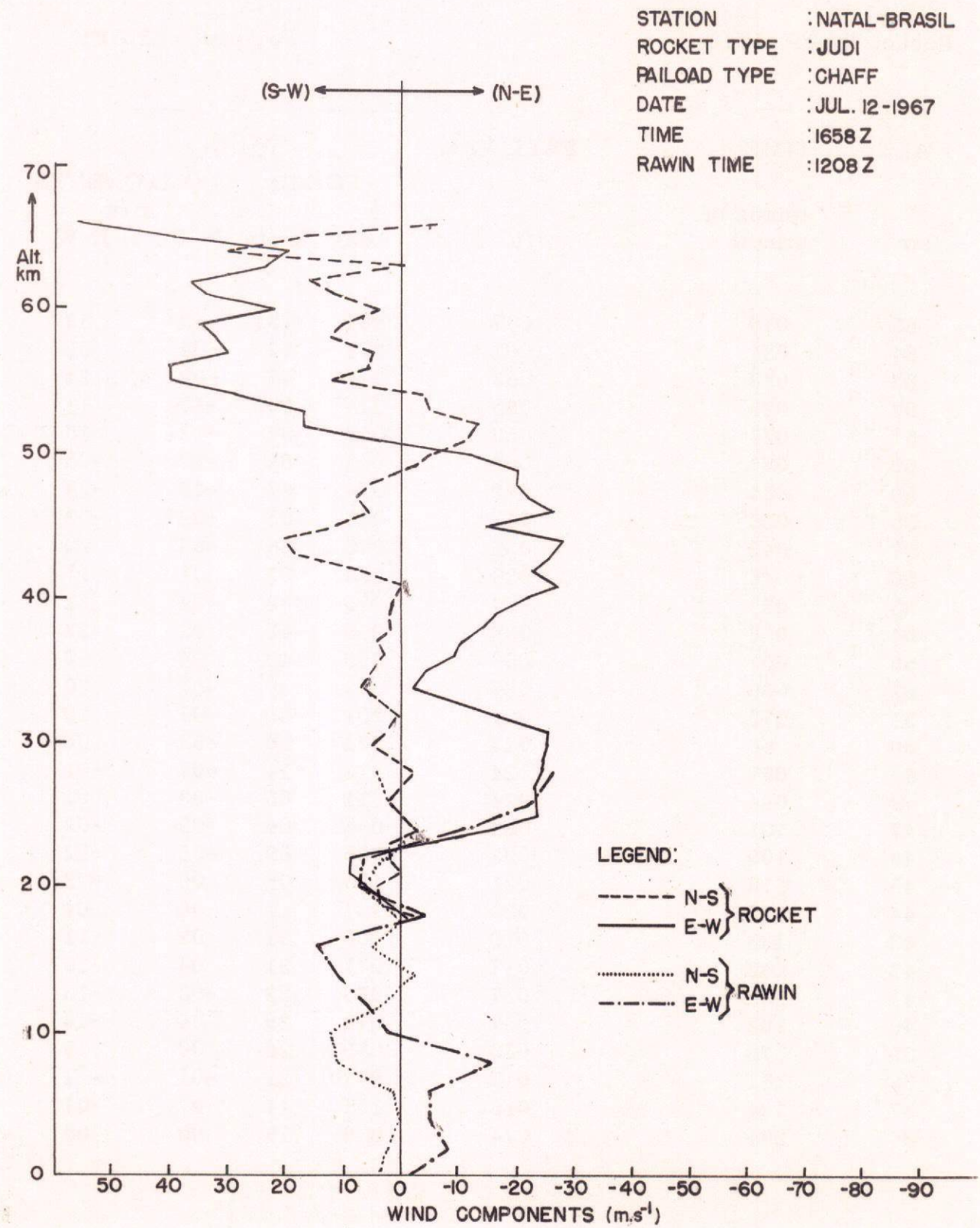
ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
36	205	015	112	18	03	-09
35	217	014	137	12	05	-04
34	229	013	165	14	07	-02
33	242	012	118	18	04	-08
32	256	012	092	36	01	-18
31	269	013	094	48	02	-25
30	282	012	101	49	05	-25
29	297	011	094	46	02	-24
28	313	010	084	46	-02	-24
27	330	010	089	46	00	-23
26	347	009	096	45	02	-23
25	365	009	090	44	00	-23
24	383	009	081	32	-32	-16
23	403	009	132	07	02	-03
22	422	008	258	18	02	09
21	443	008	272	18	00	09
20	466	007	239	14	04	06
19	490	007	225	07	03	03
18	516	006	025	04	-02	-01

RAWIN DATA

Date: JUL 12, 1967 TIME: 1208 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1009.6	81	26.2	160	08	04	-01
0200	0804.0	55	13.9	104	16	02	-08
0400	0631.0		03.8	094	10	00	-05
0600	0491.0		-07.4	107	10	01	-05
0800	0377.5		-21.3	151	25	11	-16
1000	0284.8		-38.1	190	24	12	02
1200	0210.5		-54.4	241	14	03	06
1400	0152.9		-67.6	281	21	-02	11
1600	0108.3		-78.5	250	29	05	14
1612	0106.0		-79.0	244	25	06	11
1800	0076.7		-69.3	004	09	00	-05
2000	0055.2		-66.0	228	18	06	07
2200	0039.9		-59.8	241	14	03	06
2400	0029.0		-55.7	078	24	-03	-12
2600	0021.3		-51.6	094	45	02	-23
2674	0019.0		-51.2	099	51	04	-26

GRAPHIC DATA



ROCKET DATA

Date: AUG 02, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
65	019	087	281	131	-13	83
64	021	091	278	72	-05	36
63	023	083	274	47	-02	24
62	025	065	314	30	-10	11
61	028	056	053	37	-12	-15
60	031	054	053	62	-19	-25
59	034	049	074	57	-08	-28
58	038	042	043	05	-02	-02
57	042	039	276	38	-02	20
56	046	038	268	33	01	17
55	051	034	275	42	-02	22
54	056	032	265	43	02	22
53	061	033	259	40	04	20
52	066	027	273	38	-01	20
51	073	024	291	39	-07	19
50	080	024	324	20	-08	06
49	087	024	012	14	-07	-01
48	094	024	011	05	-03	-01
47	101	022	034	06	-02	-02
46	109	022	025	09	-05	-02
45	116	021	178	05	00	-03
44	125	020	131	11	04	-04
43	133	019	100	21	02	-11
42	142	017	077	31	04	-15
41	152	017	063	33	-08	-15
40	162	017	074	29	-04	-14
39	172	018	089	26	00	-13
38	181	017	087	21	-01	-11
37	192	015	108	14	01	-07
36	204	014	089	16	00	-08

ROCKET DATA

Cont.

Date: AUG 02, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
35	216	013	091	19	00	-10
34	229	013	075	17	-03	-09
33	241	013	066	35	-07	-16
32	254	012	089	50	-01	-26
31	268	012	090	53	00	-27
30	280	012	085	56	-03	-29
29	296	011	090	54	00	-28
28	311	010	092	56	01	-29
27	328	010	088	54	-01	-28
26	345	009	089	50	-01	-26
25	364	009	086	47	-02	-24
24	382	009	087	35	-01	-18
23	401	009	111	11	02	-06
22	420	008	259	15	02	08
21	442	007	278	25	-02	13
20	465	007	280	31	-03	16
19	489	007	285	26	-01	13
18	514	006	322	08	-03	02

ROCKET DATA

Date: AUG 16, 1967 Time: 1500 Z

Rocket Type: JUDI Payload: CHAFF

ALT	TIME	FALL VEL	WIND			
			POLAR		COMPONENTS m/s	
km	tenths of minute	m/s	deg	knots	N-S	E-W
65	024	095	281	31	-03	15
64	026	087	334	10	-05	02
63	028	067	013	14	-07	-02
62	030	064	061	14	-03	-06
61	033	062	074	40	-06	-19
60	036	054	061	22	-11	-19
59	039	048	234	15	04	06
58	043	042	228	15	05	06
57	047	040	189	07	03	01
56	051	036	256	04	01	02
55	056	033	205	07	03	01
54	061	030	157	21	10	-14
53	067	030	078	24	-03	-12
52	072	027	047	35	-12	-13
51	079	027	012	20	-10	-02
50	085	025	044	07	-03	-02
49	092	024	124	10	03	-04
48	099	024	129	14	04	-05
47	106	021	136	15	05	-05
46	115	022	165	17	08	-02
45	122	021	170	18	09	-02
44	131	018	144	12	05	-04
43	140	019	068	17	-04	-07
42	149	018	070	34	-06	-16
41	158	017	073	36	-05	-17
40	168	017	090	22	00	-11
39	178	018	129	18	06	-07
38	187	016	119	10	02	-04
37	199	014	134	11	04	-04
36	210	014	130	10	03	-04

ROCKET DATA

Date: AUG 16, 1967

Time: 1500 Z Cont.

Rocket Type: JUDI

Payload : CHAFF

ALT	TIME	FALL VEL	WINDS			
			POLAR		COMPONENTS m/s	
km	tenths of minutes	m/s	deg	knots	N-S	E-W
35	222	013	083	17	-01	-08
34	235	013	080	28	-02	-14
33	247	013	083	38	-02	-19
32	260	013	084	55	-03	-27
31	273	013	085	50	-02	-25
30	286	012	090	47	00	-24
29	301	011	092	57	01	-28
28	318	010	090	54	00	-27
27	334	010	082	53	-04	-26
26	351	009	084	59	-03	-29
25	370	009	094	57	02	-28
24	388	009	097	40	02	-20
23	408	008	133	21	07	-08
22	427	008	213	17	07	05
21	449	008	271	22	00	11
20	471	007	283	24	-02	12
19	496	007	289	13	-02	06
18	521	007	097	06	00	-03

RAWIN DATA

Date: AUG 16, 1967 Time: 1152 Z

ALT	PRESSURE	RH	TEMP	WIND			
				POLAR		COMPONENTS m/s	
tens of meters	mb	%	°C	deg	knots	N-S	E-W
0000	1011.3	77	26.1	150	08	04	-02
0200	0805.0	78	12.0	100	22	02	-13
0400	0633.0	14	02.5	120	18	05	-08
0600	0482.5	14	-06.3	120	24	05	-11
0800	0380.0	14	-19.4	090	37	00	-19
1000	0287.5	15	-34.7	110	13	03	-06
1200	0213.0	17	-52.7	080	17	-02	-08
1400	0155.5		-65.7	090	26	00	-13
1578	0115.0		-75.8	060	07	-02	-03
1600	0111.3		-73.8	100	10	01	-05
1800	0078.3		-66.7	070	07	-01	-03
2000	0056.5		-59.7	300	25	-06	12
2200	0041.2		-60.6	250	16	03	08
2400	0030.2		-52.7	090	34	00	-18
2600	0022.3		-46.3	100	62	05	-31
2800	0016.6		-44.8	080	50	-04	-25
3000	0012.2		-43.4	090	49	00	-25
3200	0009.2		-41.4	090	58	00	-30
3271	0007.0		-37.4	090	57	00	-29

GRAPHIC DATA

STATION : NATAL-BRASIL
ROCKET TYPE : JUDI
PAYLOAD TYPE : CHAFF
DATE : AUG. 16-1967
TIME : 1500 Z
RAWIN TIME : 1152 Z