Chapter 2 - Encounter Overview

Contents

Introduction to Chapter 2

This chapter gives an overview of the entire Venus Encounter.

The table on page 3 lists Galileo's Venus Science Objectives. The tables on pages 4 and 5 summarize the principal NIMS Venus observations. The table on page 6 shows NIMS' Venus tape allocation.

The figure on page 7 shows the areal coverage of the NIMS VPDIN1 observation on a PVO Venus topographic map (mercator projection). The shaded trapezoid in the center of the map shows the sub-mosaic that was to be returned in the early Venus data return. The figure on page 8 shows the areal coverage of the NIMS VJBARS observation on the same map as for VPDIN1. The figure on page 9 shows the areal coverage of the NIMS VPDIN2 observation on the same topographic map.

The table on page 10 lists the principal Galileo observations near Venus Closest Approach (VCA). The figure on page 11 is a summary timeline of the Galileo Venus Encounter science observations. The numbers of the observations in the table on page 10 correspond to the numbered events on the timeline on page 11.

The timeline on page 12 shows the timing of the principal Venus observation campaigns. The figure on page 13 is a pole view of the spacecraft's trajectory past Venus at closest approach (+/- 2 hours) with the timing of the principal Venus observations marked along the trajectory.

GALILEO

VENUS SCIENCE OBJECTIVES

<u>First Time</u>

1. Darkside IR mapping of features and motions in and below cloud deck (NIMS)

2. Small scale feature track, mid-latitude or equatorial (SSI,NIMS)

3. Spectroscopy of middle and deep atmosphere (NIMS)

<u>Collaborative (GLL and PVO During Flyby</u>)

4. Global feature tracking (SSI, NIMS, UVS, PPR)

5. Auroral excitation mechanism (UVS, MAG,PLS, EPD)

6. Ionospheric magnetization/interplanetary field (MAG)

7. Ion pickup (MAG,PLS,EPD)

8. Bowshock upstream particles and waves (MAG,PLS,EPD,PWS)

<u>Collaborative (GLL and Previous S/C</u>)

9. Limb studies (SSI, NIMS)

10. Lightning (SSI,PWS)

11. Cloud top temperatures (NIMS, PPR)

12. Spatial variability of H20, H2SO4, O/CO, in and above clouds (NIMS, PPR,UVS)

13. Planetary energy budget (PPR)

14. UV/Visible nightglow distribution (UVS)

NIMS/VENUS

TIMELINE SUMMARY

(revised 11/11/90)

Observation	Oapel Name	Start Times Target Setup	End Mosaic	Duration OAPEL	Tape
Partial Disk Imaging (1 gp, contiguous)	VPDIN1	41/01:48:22	41/02:31:44	44 mins	42 mins
Jail Bars (Longmap, non-contiguous)	VJBARS	41/03:40:22	41/04:02:00	22 mins	20 mins
Partial Disk Imaging (1 gp, contiguous)	VPDIN2	41/04:02:08	41/05:03:48	62 mins	60 mins
Limbscan Nightside	VLSN	41/05:31:44	41/05:38:55	7 mins	6 mins
Limbscan Dayside	VLSD	41/06:07:45	41/06:13:00	5 mins	4 mins
			Totals:	140 mins	132 mins

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NIMS/VENUS

OBSERVATION SUMMARY

(Revised 11/11/90)

OAPEL	Spatial Resolution (Km/Nimsel) Start	End	NIMS Mode	Sub-S/C Latitude Start	End	Territory Covered Lat	Lon	Slew Rate (urad/sec)	Overlap (nimsels)
VPDIN1	51	49	XM	17.9	17.5	90N -90S	280W -30W	1500	10
VJBARS	28	24	LM	10.2	7.5	3 non-contiguous stripes: ~ 5 W ~ 357 W ~ 339 w Maxwell Montes sampled		0 (~4 integrations/sample)	0 (May be several nimsels between samples)
VPDIN2	24	13	XM	7.2	-9.5	90N -7S	335W -15W	1500	10
VLSN	12.3	11.9	LS	-27.7	-32.7	1 scan from -20 to +230 km altitude Near anti-sub-solar point		29	N/A
VLSD	10.2	10.4	LS	-52.6	-52.9	1 scan from -10 to +260 km altitude Near sub-solar point		55	N/A

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NIMS/VENUS

TAPE RECORDER ALLOCATION

OAPEL name	Km/Nimsel	Tracks	Percent of NIMS allocation of 1.01 tracks
VPDIN1	51-49	0.32	31.8
VJBARS	26-22	0.15	15.2
VPDIN2	22-11	0.46	45.5
VLSN	12	0.05	4.5
VLSD	10	0.03	3.0
Totals:		1.01	100.0

68.2% of NIMS tape used to acquire spatial resolutions better than 28 km.

100% of NIMS tape used to acquire spatial resolutions better than 51 km.

=> 100% of NIMS tape applicable to small-scale cloud structure.

22.7% of NIMS tape used to acquire high-spectral resolution data (either Long Map or Long Spectrometer modes).

=> 22.7% of NIMS tape applicable to atmospheric composition.

77.3% of NIMS tape used to acquire contiguous maps.

=> 77.3% of NIMS tape applicable to dynamics.

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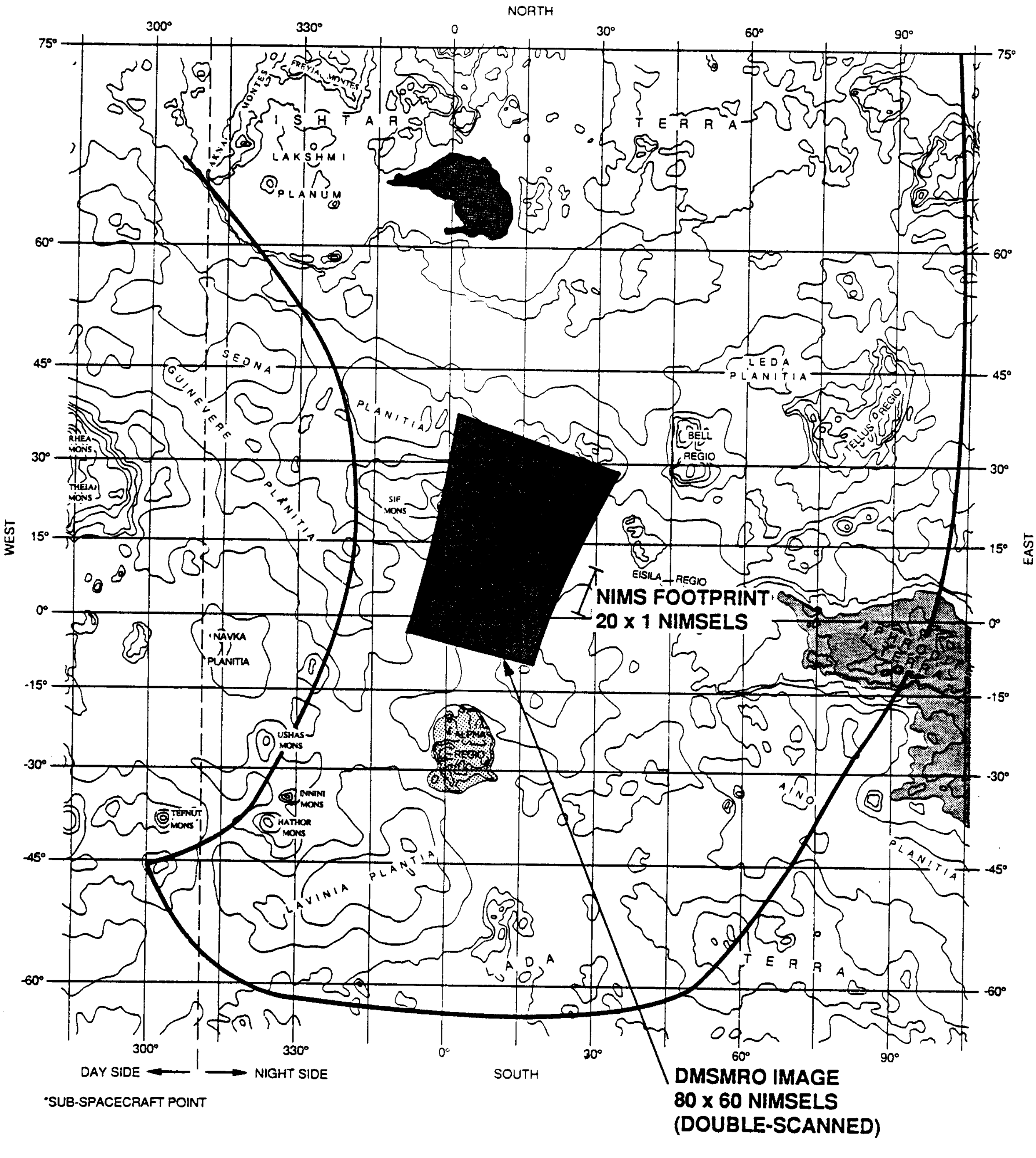
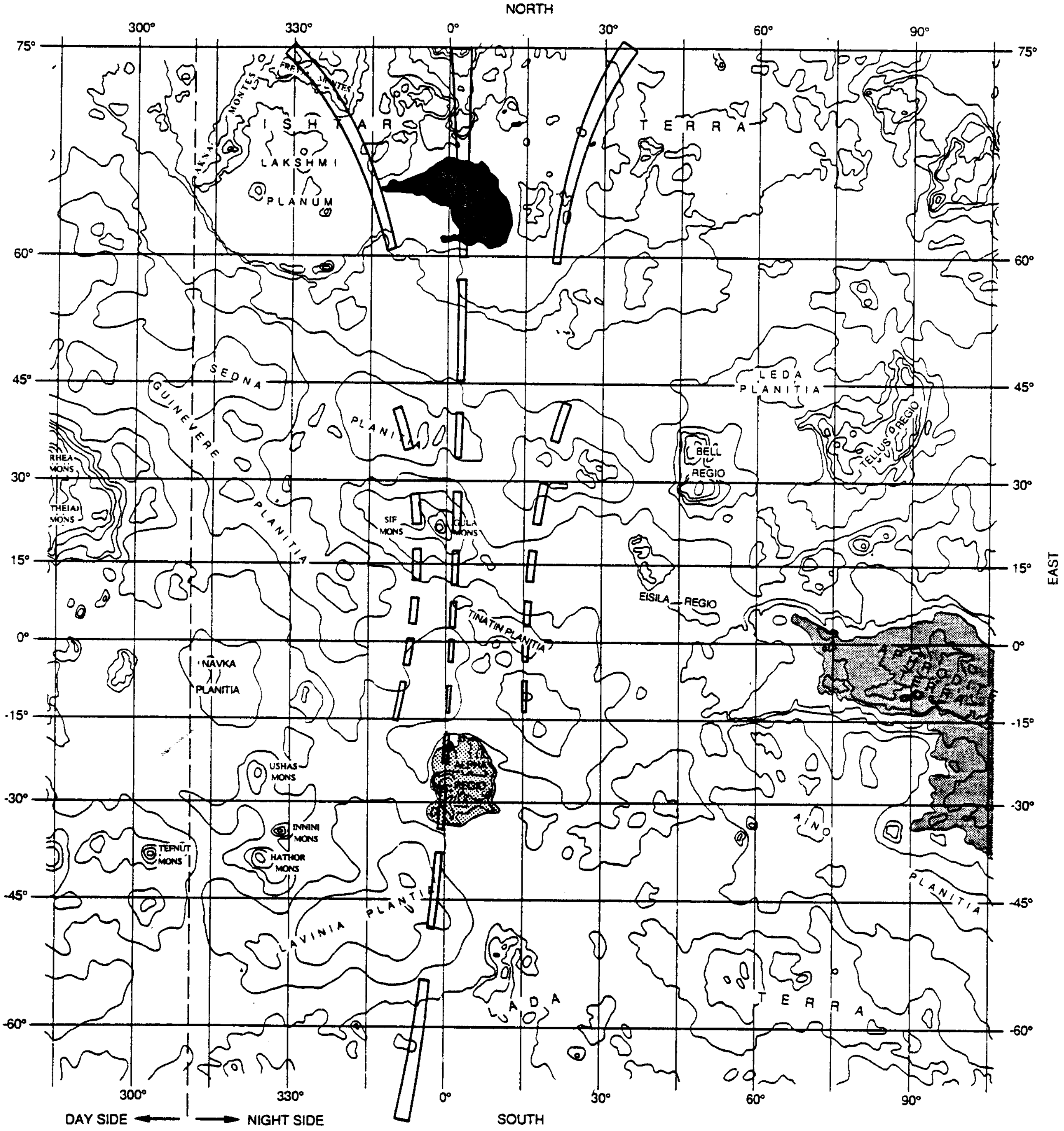
GALILEO/NIMS VENUS MAP No. 1
AREAL COVERAGE
45 - 50 km RESOLUTION



GALILEO/NIMS VENUS WATER SPECTRA

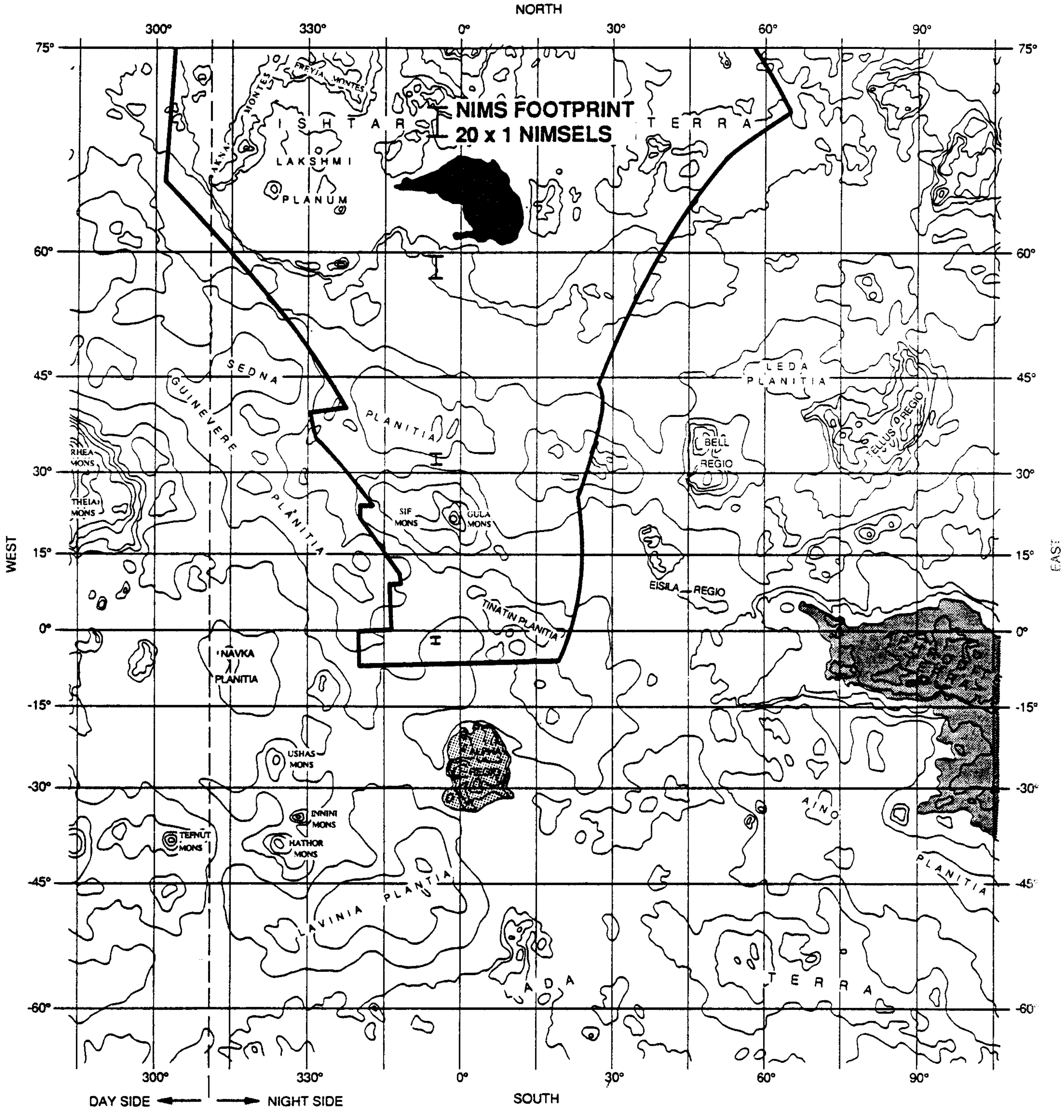
AREAL COVERAGE

24 - 26 km RESOLUTION



*SUB-SPACECRAFT POINT

GALILEO/NIMS VENUS MAP No. 2
AREAL COVERAGE
12 - 24 km RESOLUTION



*SUB-SPACECRAFT POINT

VENUS ENCOUNTER

KEY TO ACTIVITIES

[VCA $\pm$ 6 HOURS]

VENUS OBSERVATIONS		
No.	**Observation Name**	**OAPel**
1	Venus Partial Disk Imaging, Nightside	VPDIN1
2	N/S Radiometry Map	VNSMAP2
3	Jail Bars	VJBARS
4	Venus Partial Disk Imaging, Nightside	VPDIN2
5	Fast N/S Radiometry Map (1)	VFNSMAP1
6	Venus Lightning Search	VLTNG1
7	Fast N/S Radiometry Map (2)	VFNSMAP2
8	Venus Limb Scans, Night	VLSN
9	Fast N/S Radiometry Map (3)	VFNSMAP3
10	UVS Limb Drift (1)	VLMBDFT1
11	Venus Limb Scans, Day	VLSD
12	UVS Limb Drift (3)	VLMBDFT3
13	Fast N/S Radiometry Map	VFNSMAP4
14	Venus Limb Scans (1)	VLMBØ1
15	N/E/W/S Map	VNEWS
16	Venus Limb Scans (2)	VLMBØ2
Not Numbered:		
	Ion Pickup	VIONPIC
	EUV Drift Observation	EUVDFT
	PWS Venus High Rate Frames	PWSHRS

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2/6/90