

U. of Iowa 66-15

GRAPHIC SUMMARY OF THE RESPONSES
OF THE UNIVERSITY OF IOWA
CHARGED PARTICLE DETECTORS
ON EXPLORER 12*

by

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Abstract

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Graphs of the responses of the University of Iowa charged particle detectors on Explorer 12 are displayed for the period extending from launch on 16 August 1961 to 6 December 1961 when transmission of data terminated. This graphic summary provides a convenient abridged dictionary of available data and a convenient guide for further processing of the data.

Description of the Instrumentation

Explorer 12 was launched on 16 August 1961 into an orbit with initial apogee 83,600 km and perigee 6,700 km geocentric radial distances, inclination 33° and period 26.5 hours. Transmission of data extended from launch to 6 December 1961. At launch the line of apsides of the spacecraft orbit was within $\sim 5^\circ$ of the solar direction as viewed from the center of the earth; hence the ranges of local times of the spacecraft position in the outer radiation zone ($L \sim 4$) were approximately $\sim 7:00$ to $1:00$ and $14:00$ to $8:00$ for outbound and inbound passes, respectively, over the period of data reception.

The University of Iowa complement of detectors included a shielded ($\sim 1 \text{ gm (cm)}^{-2}$) Anton type 302 G.M. tube, a magnetic spectrometer utilizing three thin-windowed (1.2 mg (cm)^{-2} mica) Anton type 213 G.M. tubes, and three cadmium sulfide crystals for measurements of the total energy flux of protons $E_p \gtrsim 1 \text{ keV}$ and electrons $E_e \gtrsim 200 \text{ eV}$. A summary of the characteristics of these various detectors is given in Table I. A more complete description has been given previously by Freeman [1964].

Table I
 Geometric Factors And Particle Energy Thresholds
 For The University Of Iowa Detectors On
 Explorer 12

Detector	Symbol	Omnidirectional		Unidirectional		Geometric Factor (cm ² -sr)
		Shielding	Penetrating Particles	Shielding	Penetrating Particles Detected	
302 G.M. Tube	302	265 mg(cm) ⁻² Mg 400 mg(cm) ⁻² Stainless Steel	Protons > 23 MeV Electrons ≥ 1.6 MeV	-----	-----	-----
Electron Magnetic Spectrometer	SPL	3.5 g(cm) ⁻² Pb	**Protons > 70 MeV	1.2 mg(cm) ⁻² mica	Electrons 40 keV ≤ E _e ≤ 50 keV	10 ⁻⁵
	SPH	1 g(cm) ⁻² Mg	Electrons ≥ 20 MeV	1.2 mg(cm) ⁻² mica	Electrons 80 keV ≤ E _e ≤ 100 keV	10 ⁻⁵
	SPB	860 mg(cm) ⁻² Stainless Steel	0.2	-----	-----	-----
Cds Total Energy Flux Detector	CDSSTE***	~ 1 g(cm) ⁻² Mg	Protons ≥ 25 MeV Electrons ≥ 3 MeV	-----	Electrons 200 eV ≤ E _e ≤ 500 keV Protons 1 keV ≤ E _p ≤ 10 MeV (LIGHT)	3 × 10 ⁻⁴
	CDSB***	~ 2.6 g(cm) ⁻² Pb	Protons ≥ 50 MeV Electrons ≥ 6 MeV	(MAGNET)	Protons 1 keV ≤ E _p ≤ 10 MeV Electrons E _e ≥ 250 keV (LIGHT)	3 × 10 ⁻⁴
Cds Light Monitor	CDSO***			550 mg(cm) ⁻² Quartz	(LIGHT)	3 × 10 ⁻⁴

* For detailed description, see Frank, Van Allen and Hills [1964]

** Ackerson [private communication, 1966]

*** Freeman [1964]

The response of each detector was accumulated for 10.24 seconds by the on-board experiment encoder and the contents of the accumulators redundantly telemetered at the end of each sampling interval. The encoder accumulators were time-shared such that each detector response was sampled once every 79 seconds.

All unidirectional detectors were mounted on the spacecraft such that the axes of their fields-of-view were perpendicular to the spacecraft spin axis. Since the spin period of Explorer 12 was ~ 2 seconds and the accumulation interval was 10.24 seconds, the telemetered response of the detectors is essentially a spin-average over several spacecraft rotations with the responses of all unidirectional detectors averaged over a common circle of directions on the celestial sphere. The spin axis of Explorer 12 was directed toward right ascension 47° and declination -27.5° at launch. In the outer radiation zone the detectors were averaging predominantly over trapped particle pitch angles (the half-angle of the dumping cone at $L = 5$ is $\sim 5^\circ$).

All of the University of Iowa detectors operated satisfactorily over the period of data transmission with the exception of the background detector, SPB, of the

electron magnetic spectrometer. Failure of this G.M. tube occurred on 20 September 1961 during orbit 33 (compare with orbit 32 as shown in summary graphs); this detector provided usable data during the first 32 Explorer 12 orbits.

Notes on the Interpretation of the Graphs

The responses of each of the seven University of Iowa detectors are shown in chronological order in the following Figures. The data for each orbit of the satellite have been included on a single graph labelled with the corresponding orbit number and the Universal Times for the beginning and end times of data for each orbit (orbits begin and end at perigee). The responses of the detectors are in units of counts $(\text{sec})^{-1}$ and are plotted as a function of U.T. during a given orbit. Each of these graphs is accompanied by a graph of several useful trajectory coordinates: SELAT and SELONG, solar ecliptic latitude and longitude; SMLAT and SMLONG, solar magnetospheric latitude and longitude; R, geocentric radial distance; M, geomagnetic latitude; and L, [McIlwain, 1961]. Reference to the plots of detector responses for orbit 2, as an example, shows that the count-rate profiles are characterized by occasional 'spikes' of two types; (1) the high count-rate 'spikes' of $\sim 10^4$ counts $(\text{sec})^{-1}$ in SPL, SPH, and SPB at ~ 1200 U.T. 17 August and (2) 'inverted spikes' extending to 1 count $(\text{sec})^{-1}$ at ~ 1500 U.T. and ~ 2030 U.T. in the CDSO

response. These 'spikes' are not to be accepted as trustworthy data and are attributable to improper records in the decommutated experimenter data tape and nonredundant read-outs of the corresponding detector, respectively. Periods during which telemetry is not available are indicated in the graph containing the trajectory information by the omission of these coordinates. For example, at ~ 1440 U.T. 17 August (orbit 2) a small segment of Explorer 12 transmissions either was not received or could not be processed.

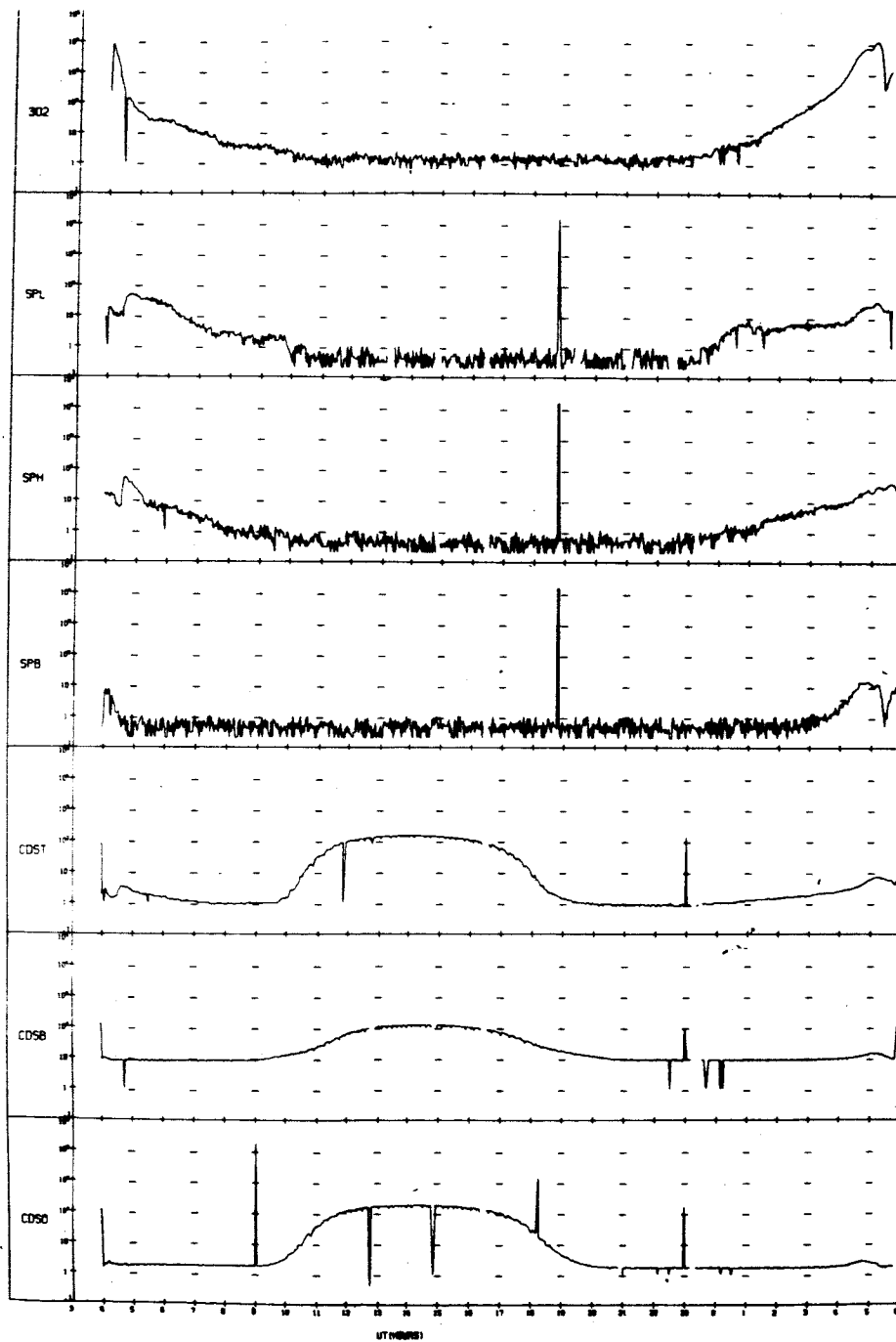
Interpretation of the responses of the various detectors has been previously discussed by O'Brien, Van Allen, Laughlin and Frank [1962], Freeman, Van Allen and Cahill [1963], Freeman [1964], Ackerson and Frank [1966], and Frank [1966].

References

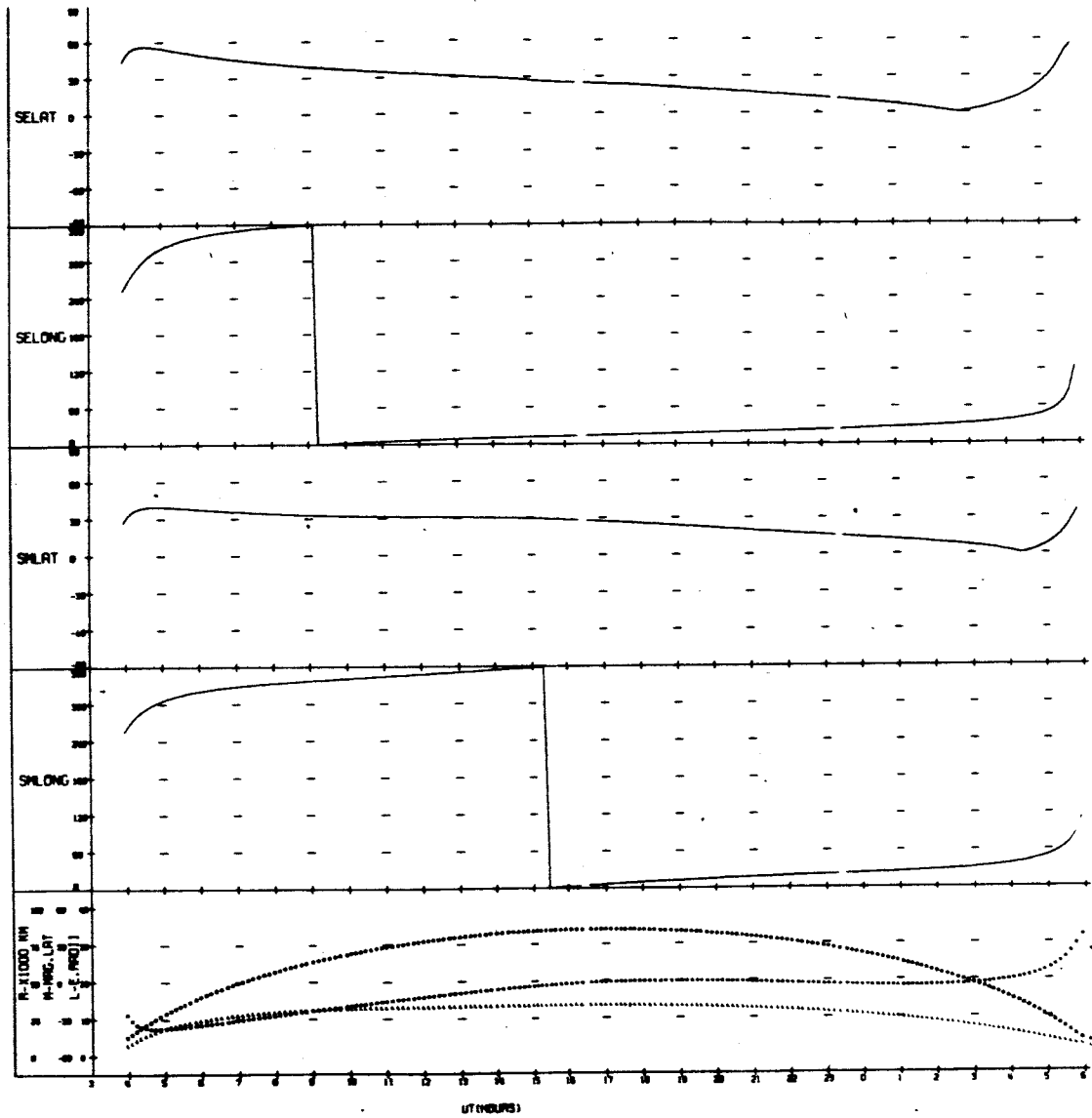
- Ackerson, K. L., and L. A. Frank, Explorer 12 observations of energetic protons in the inner radiation zone, University of Iowa Research Report, 66-13, May 1966
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- McIlwain, C. E., Coordinates for mapping the distribution of magnetically trapped particles, J. Geophys. Res., 66, 3681-3691, 1961.
- O'Brien, B. J., J. A. Van Allen, C. D. Laughlin, and L. A. Frank, Absolute electron intensities in the heart of the earth's outer radiation zone, J. Geophys. Res., 67, 397-403, 1962.

UNIVERSITY OF IOWA

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UNIVERSITY OF IOWA
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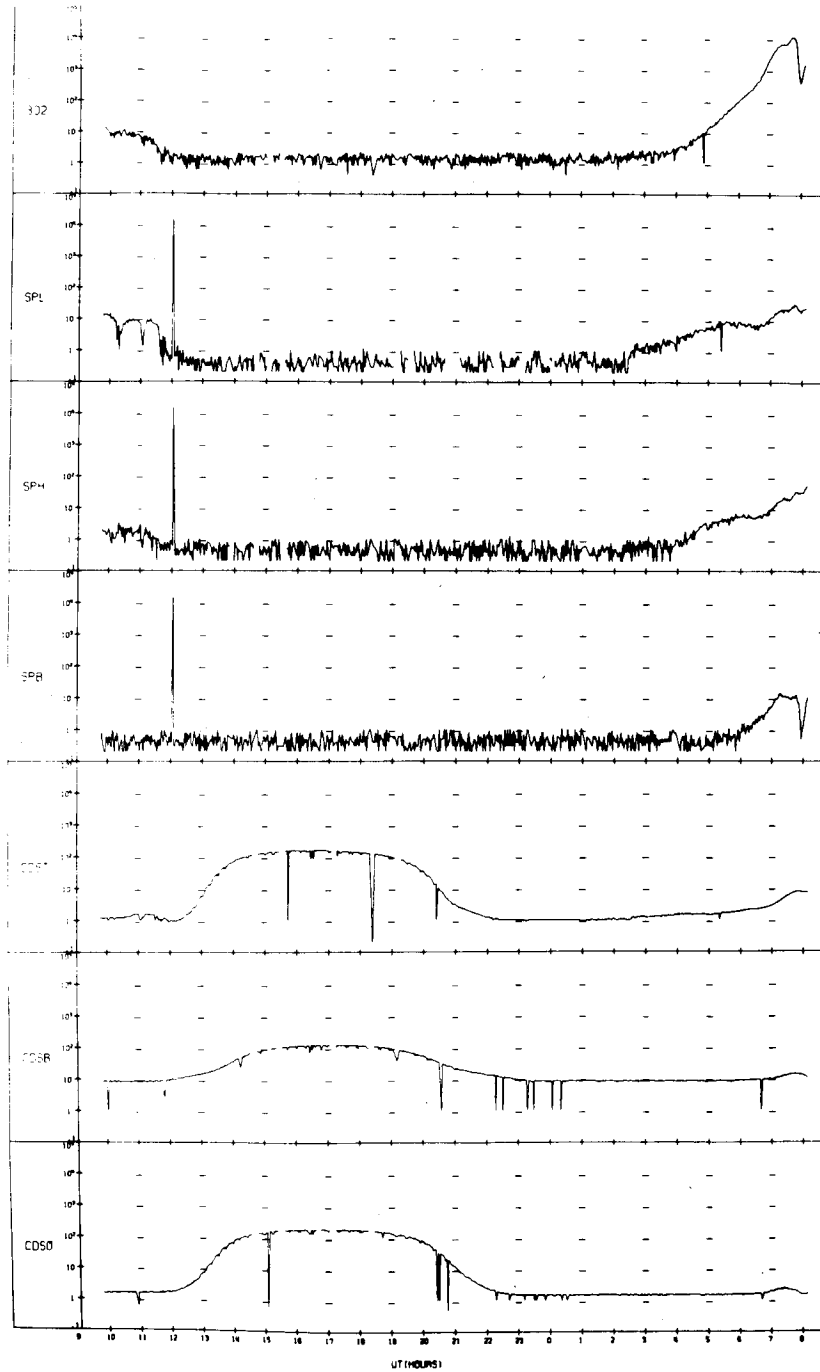


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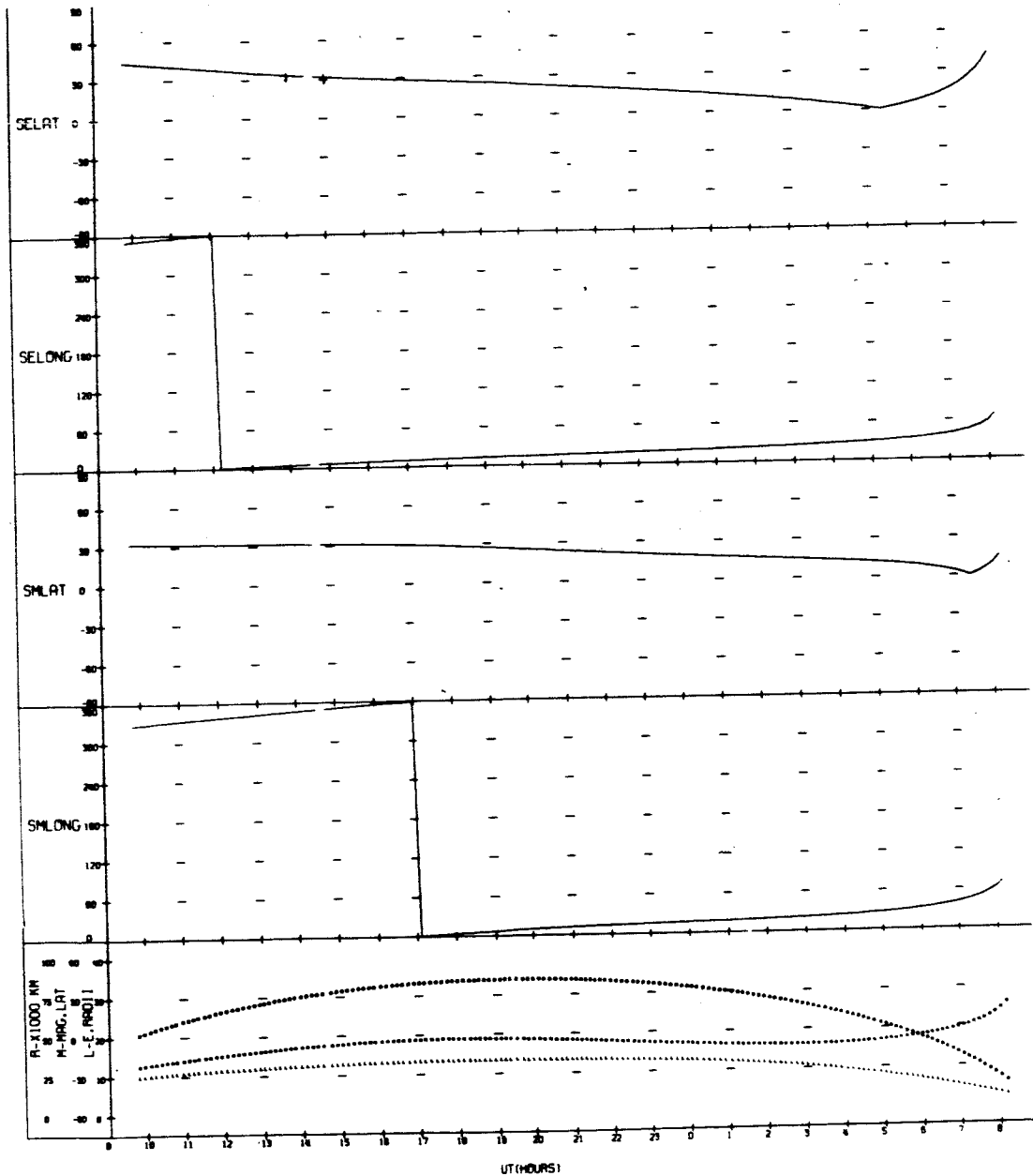
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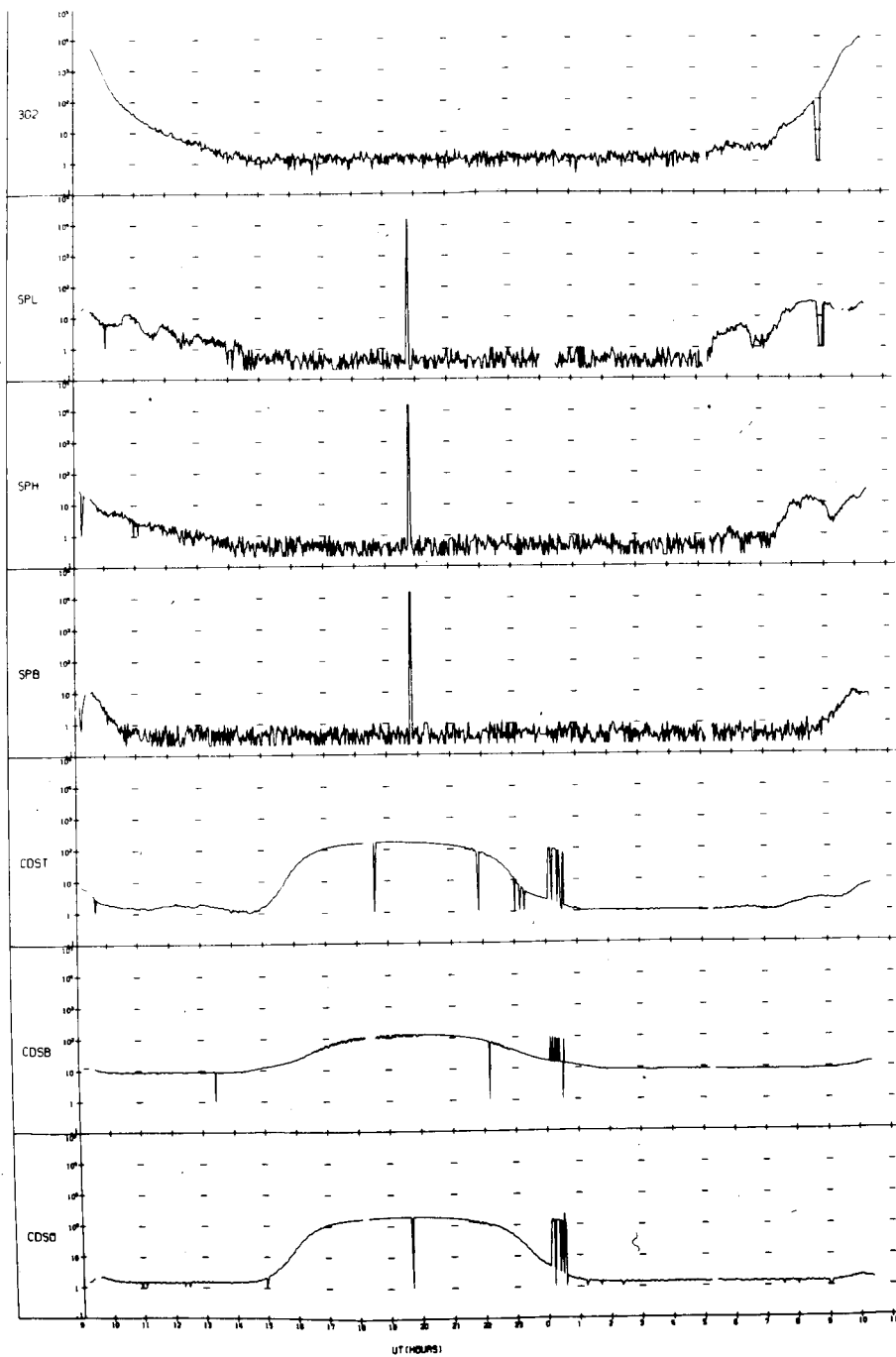


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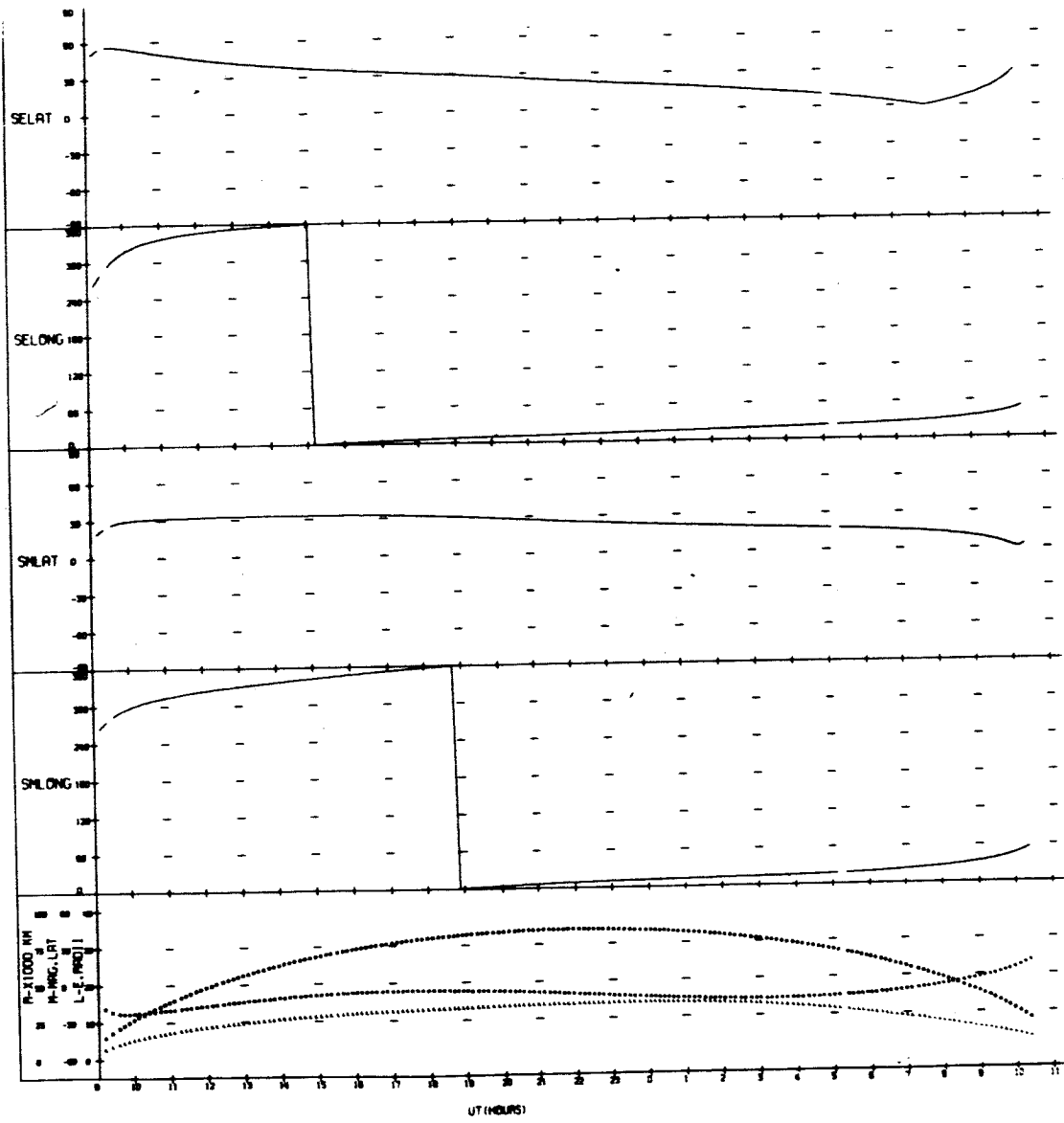
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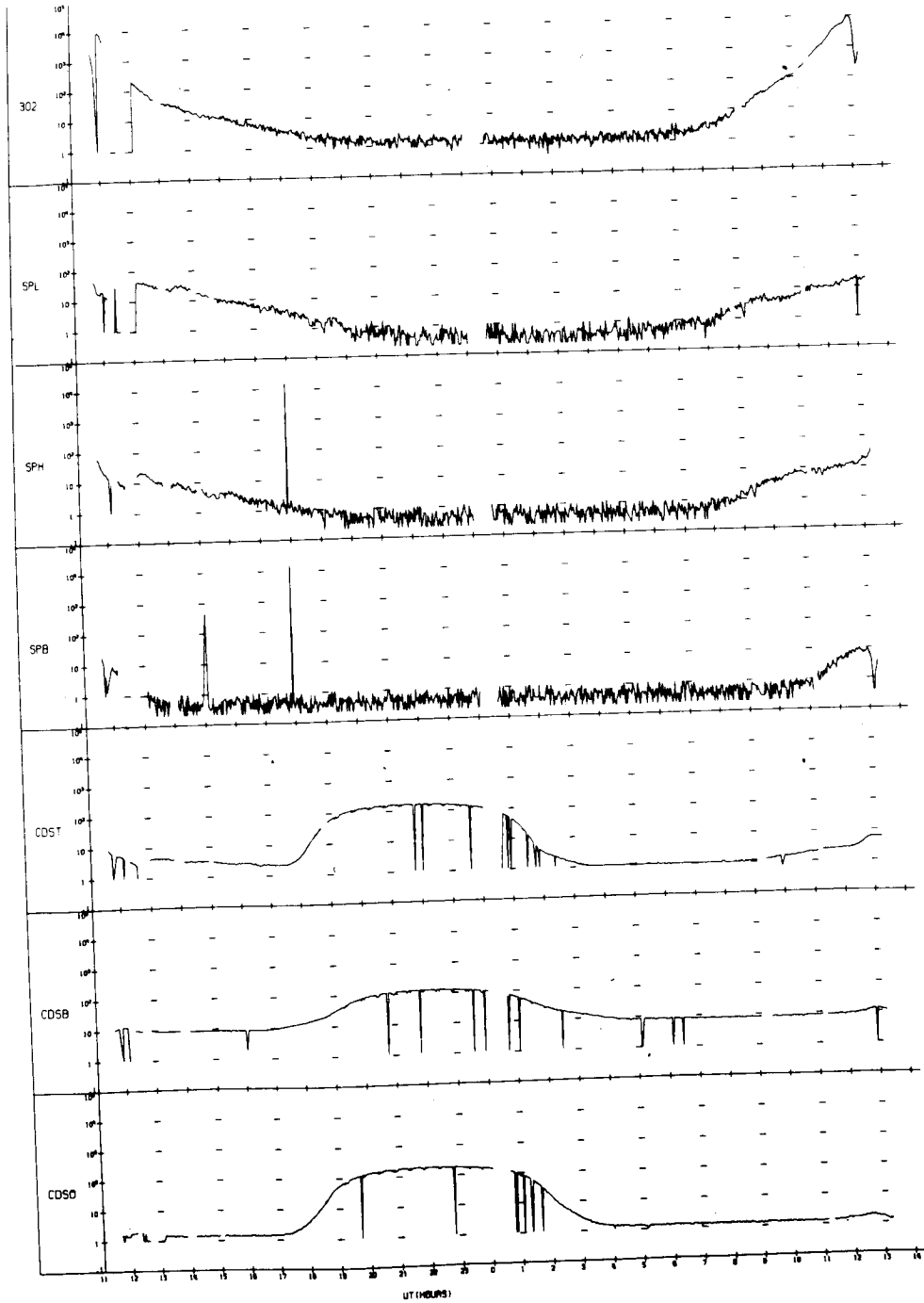
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UNIVERSITY OF IOWA
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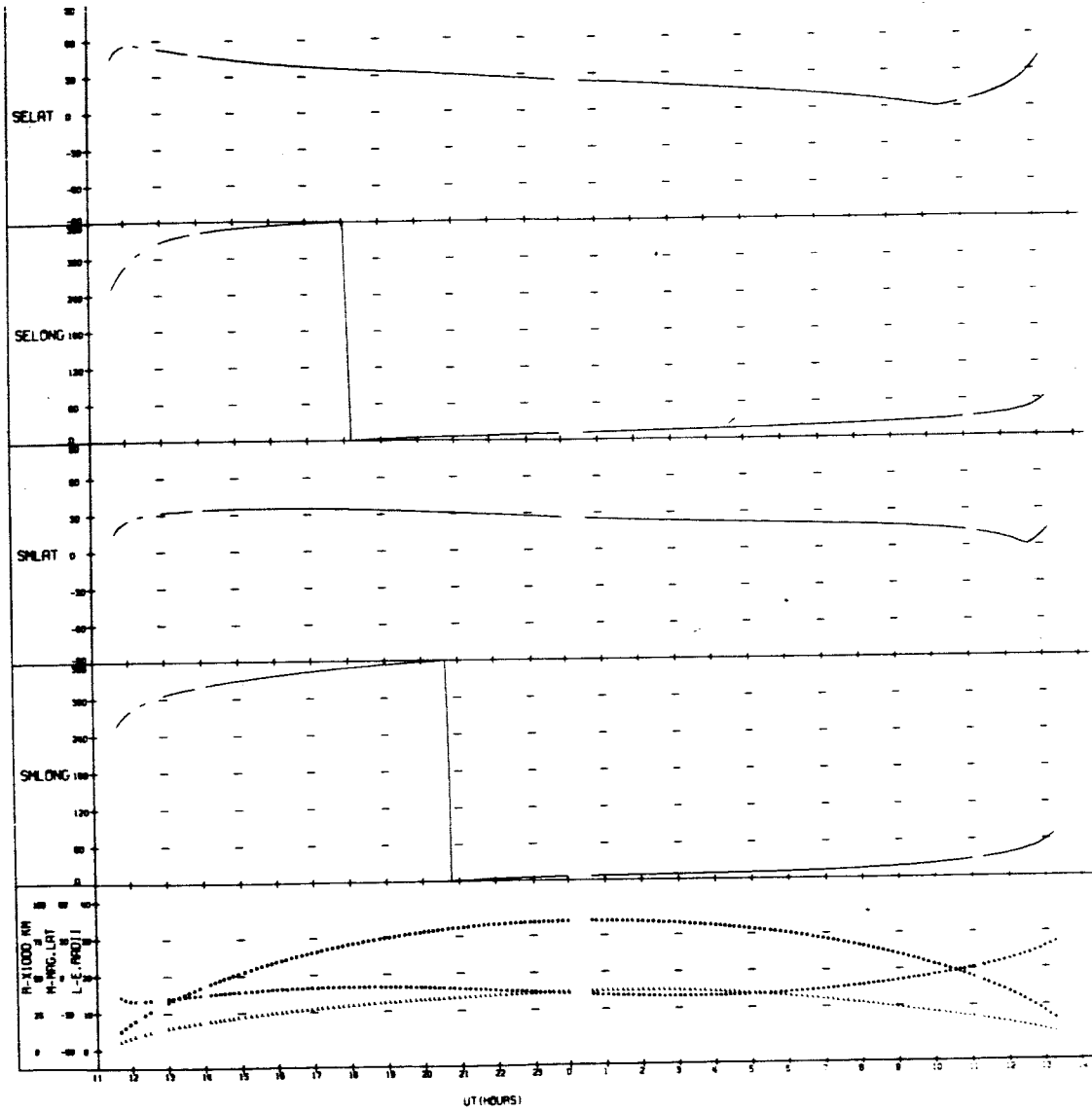


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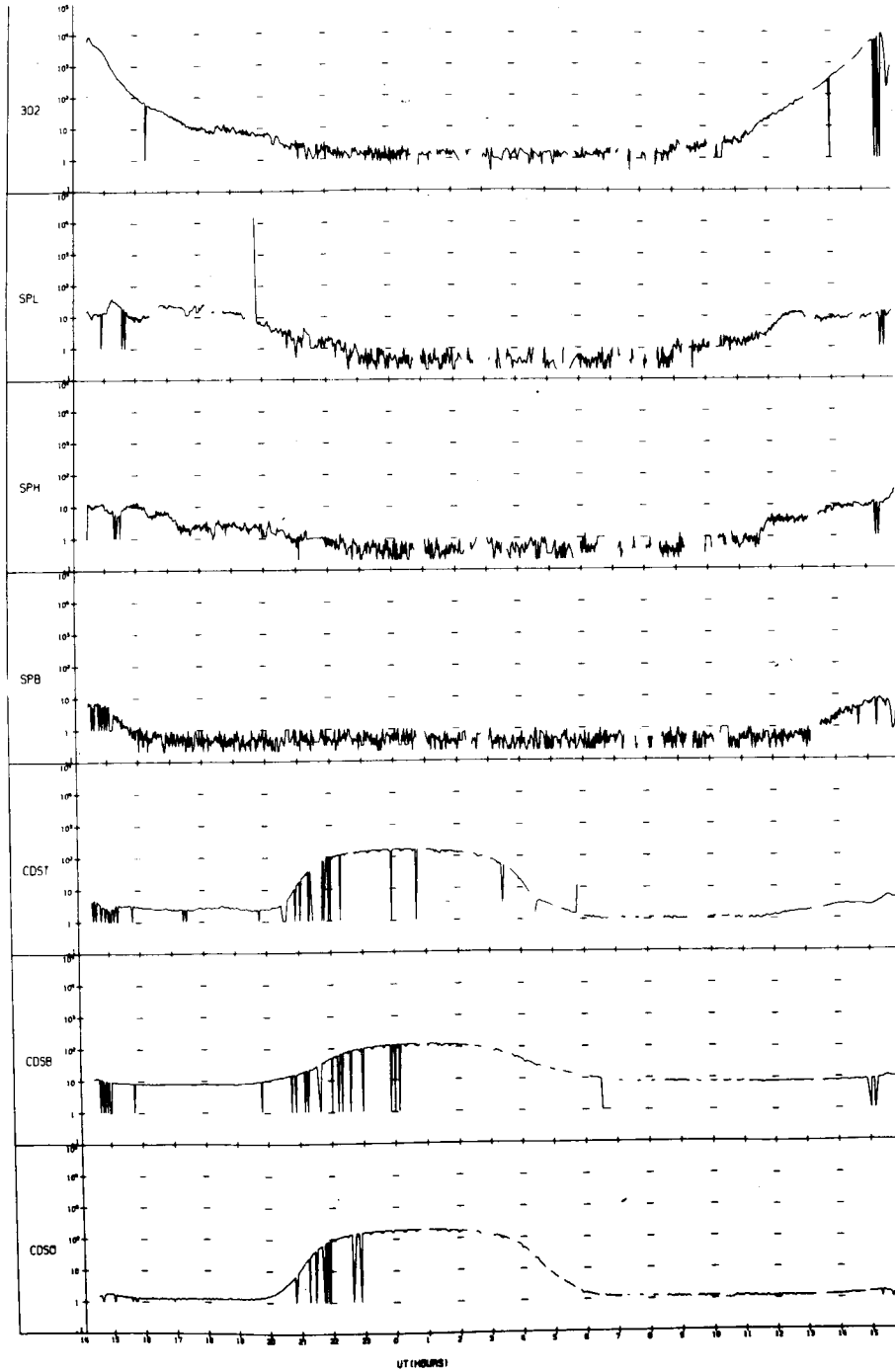


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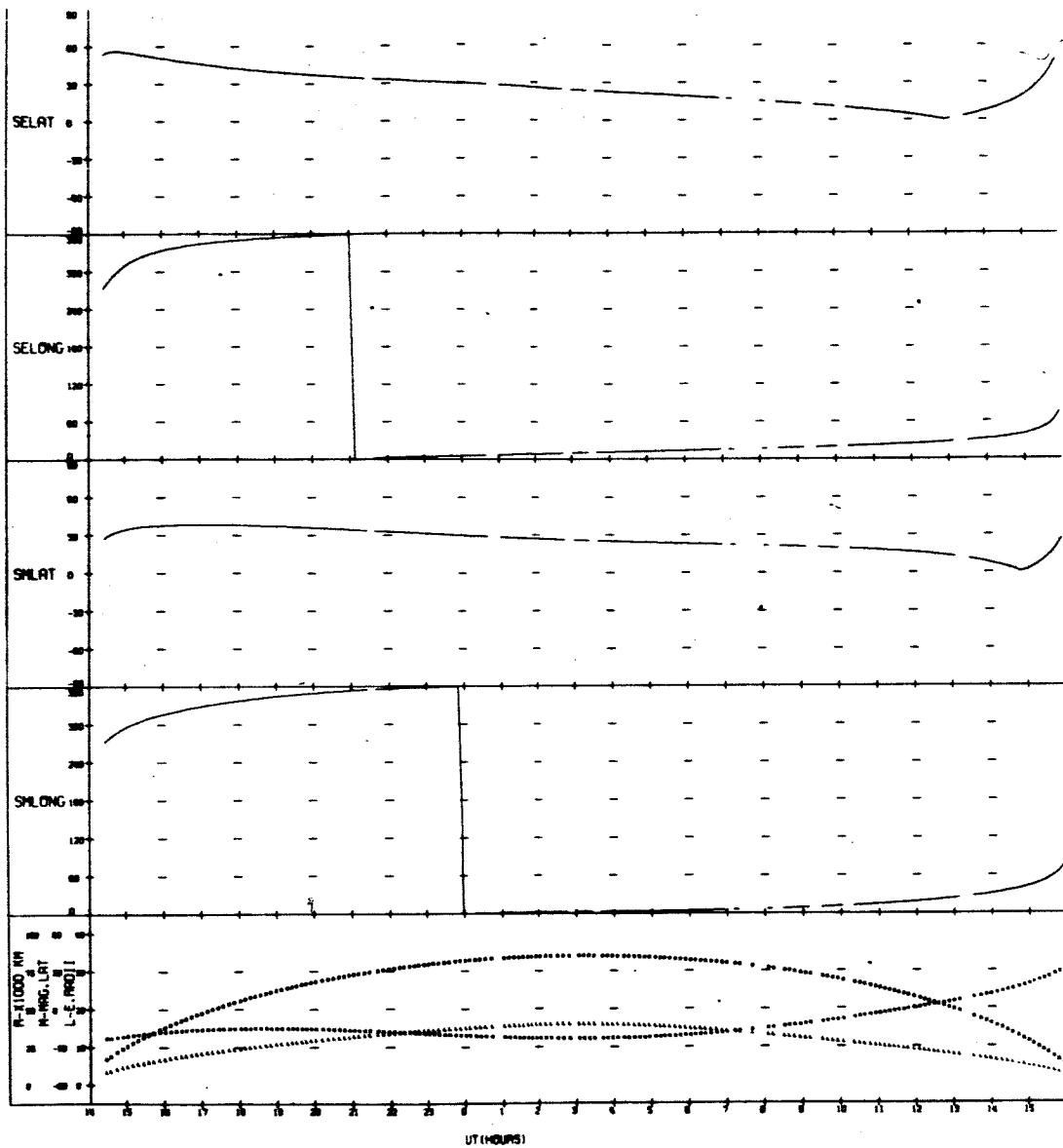
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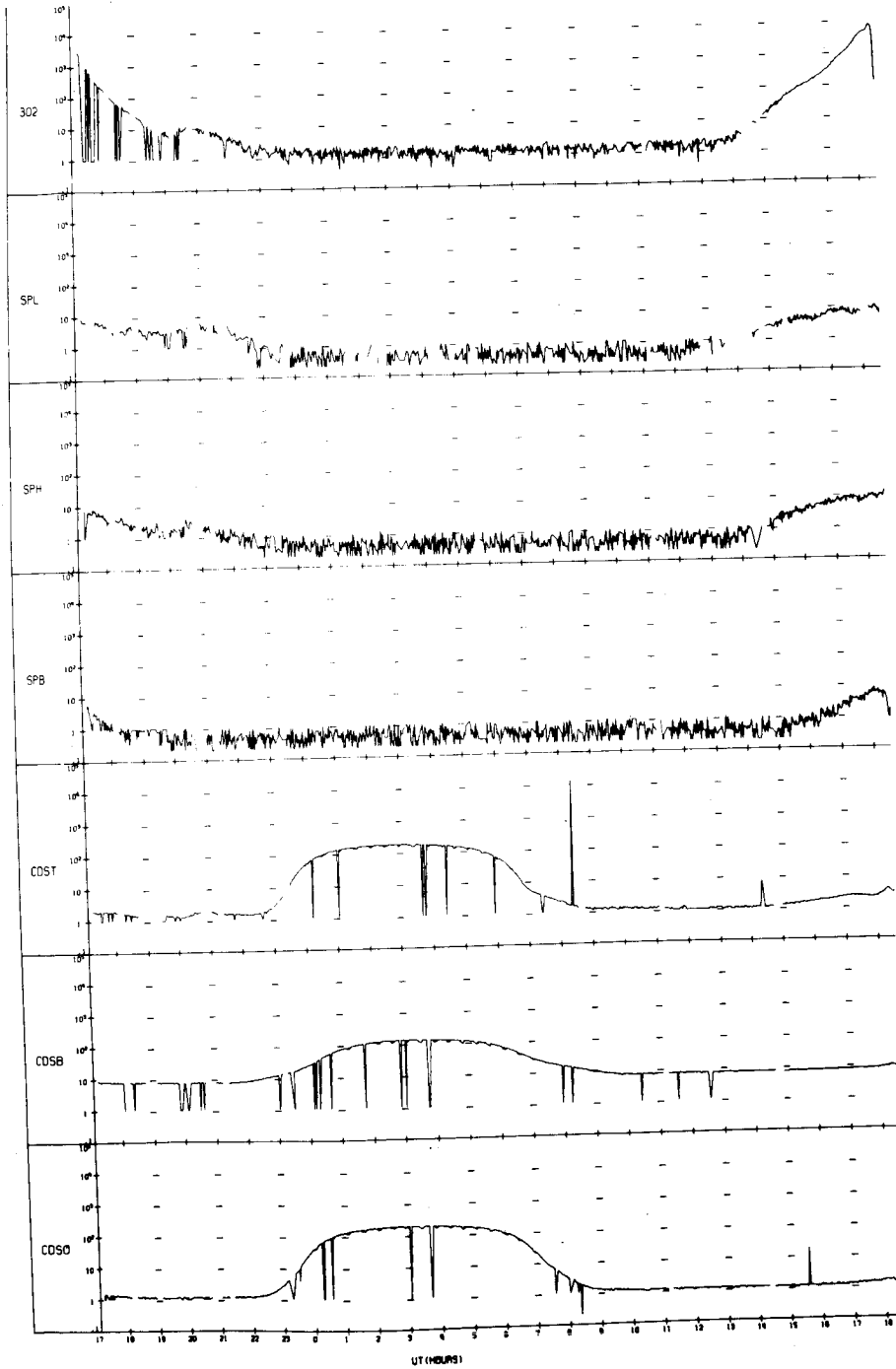
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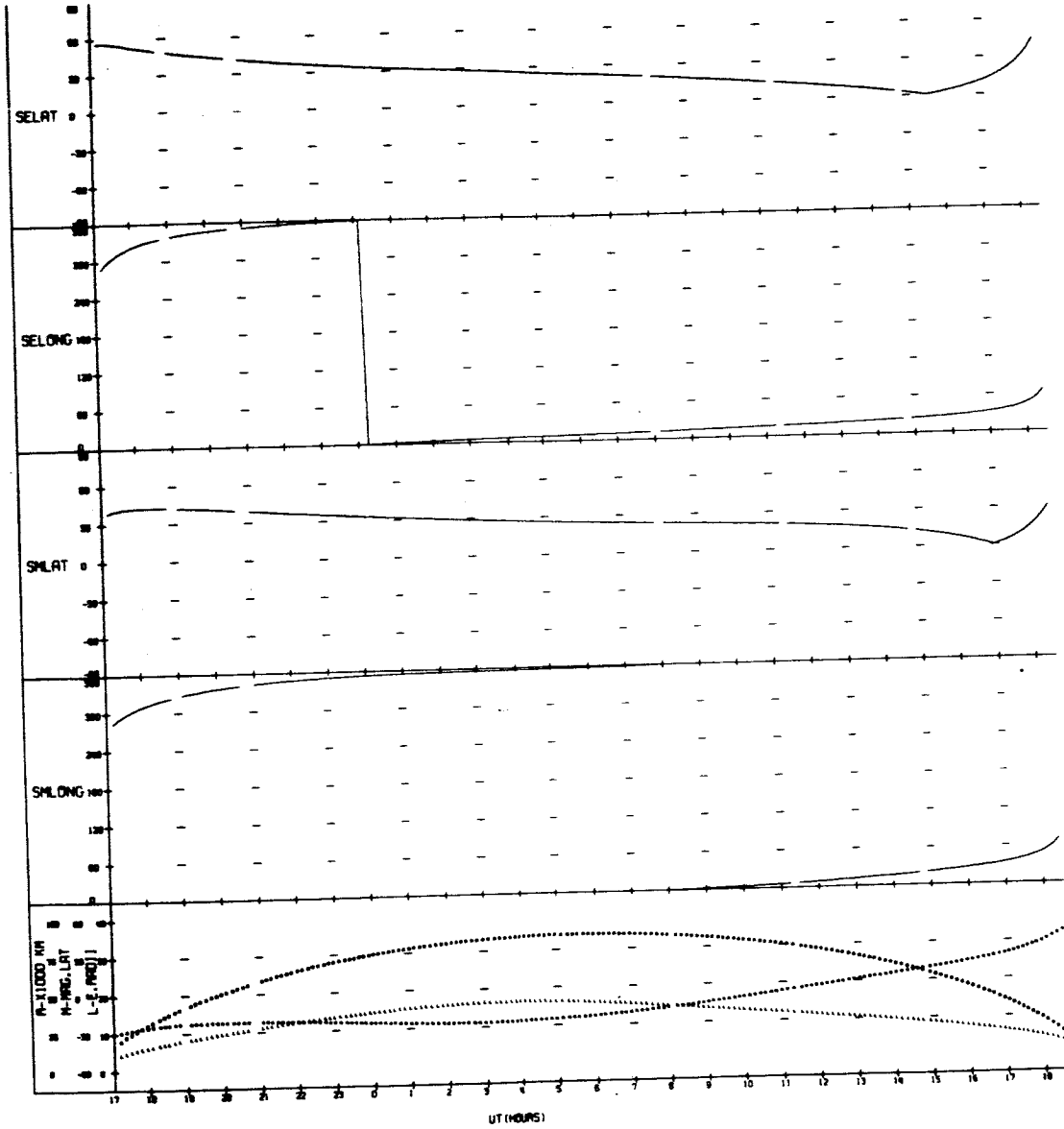


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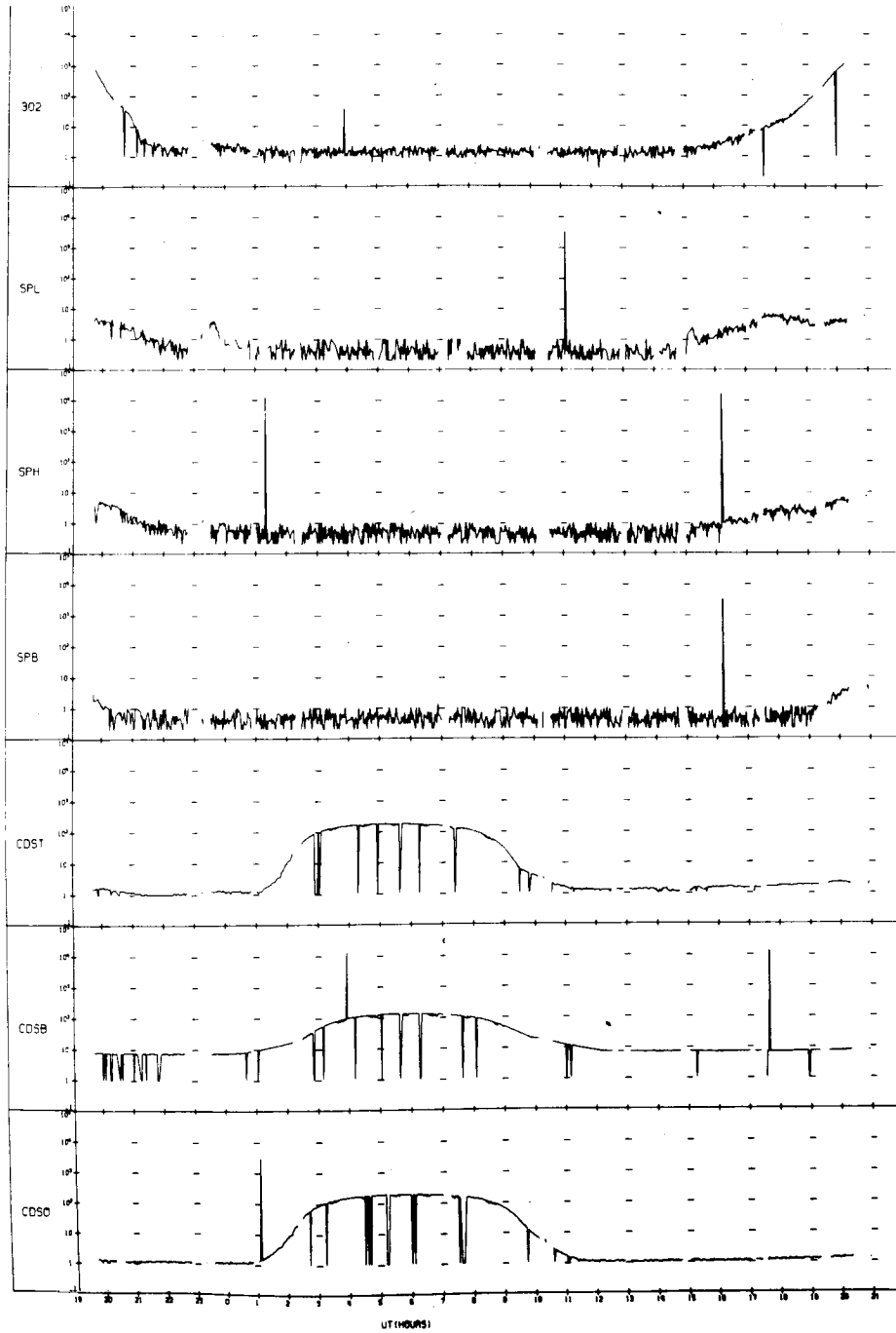


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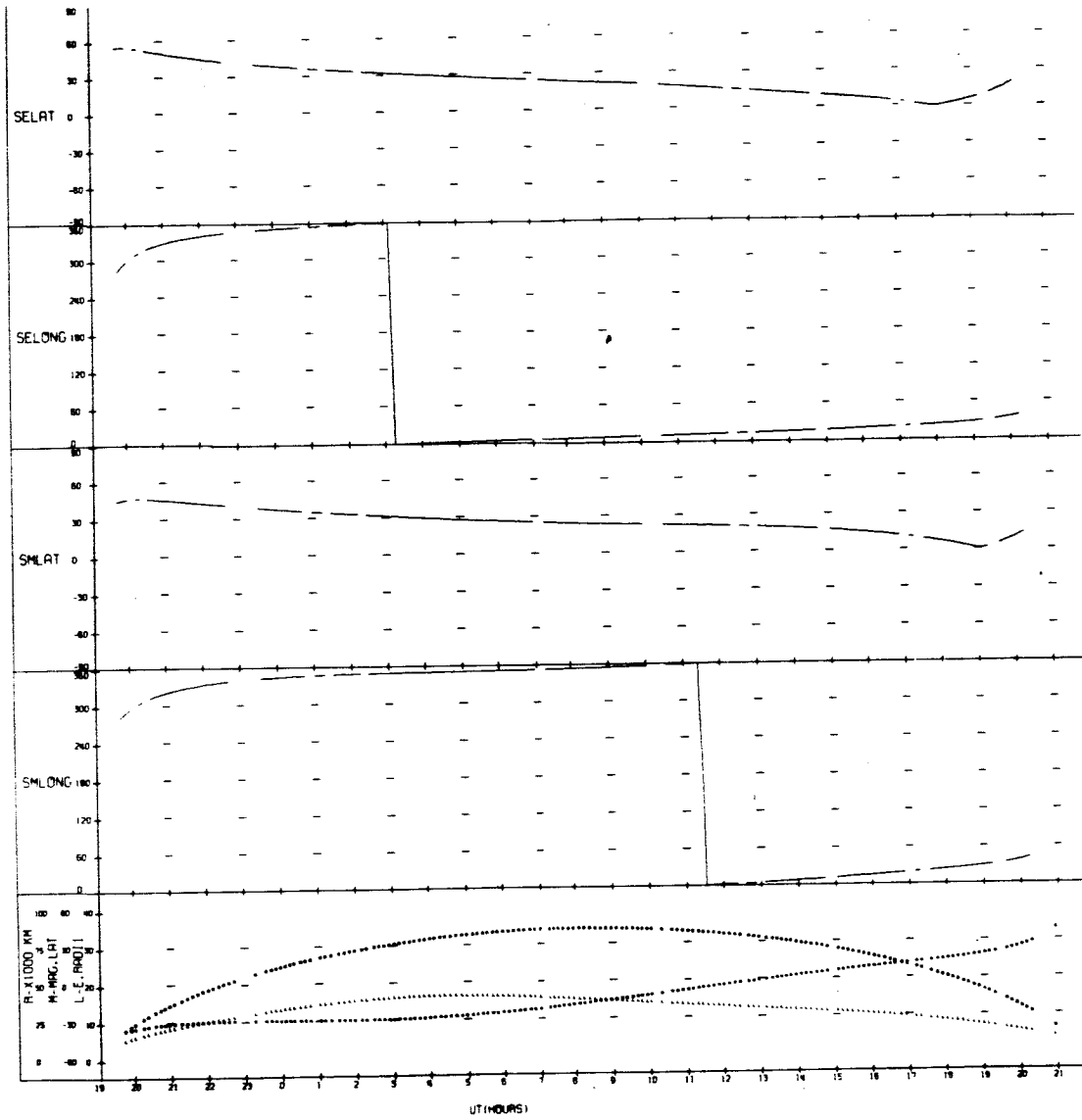
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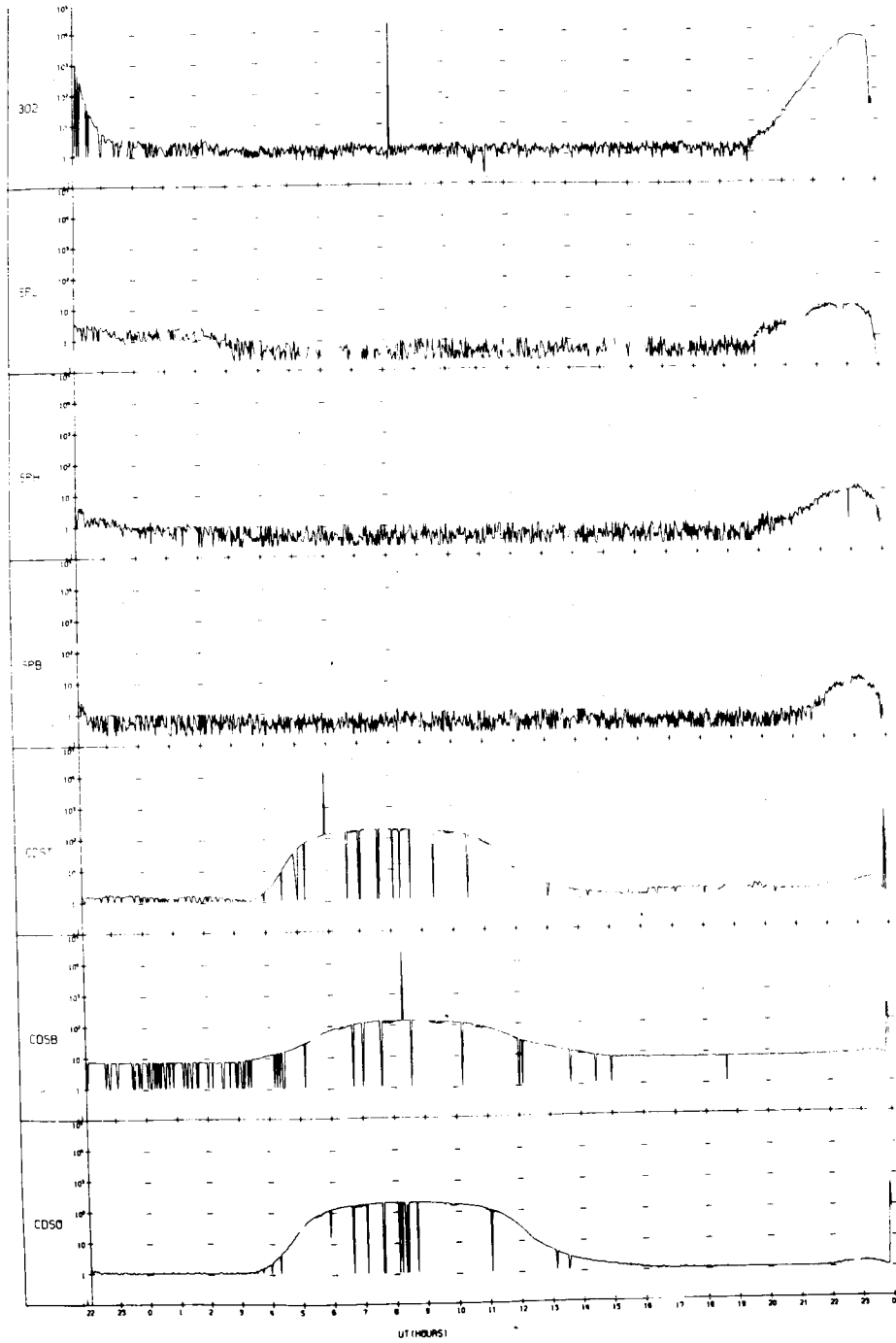
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 BEGIN 8/22/61/19:43
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UNIVERSITY OF IOWA
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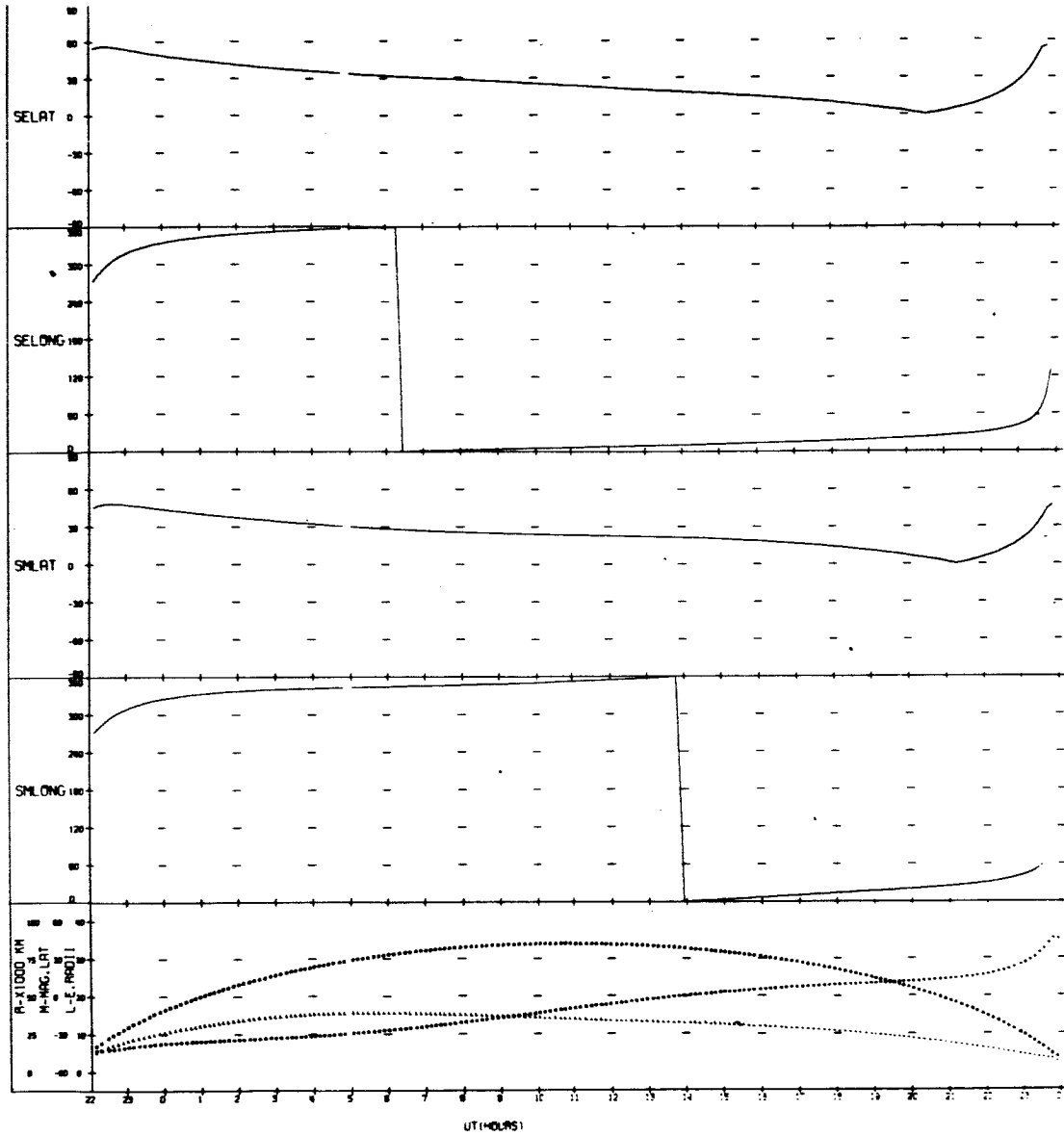


UNIVERSITY OF IOWA

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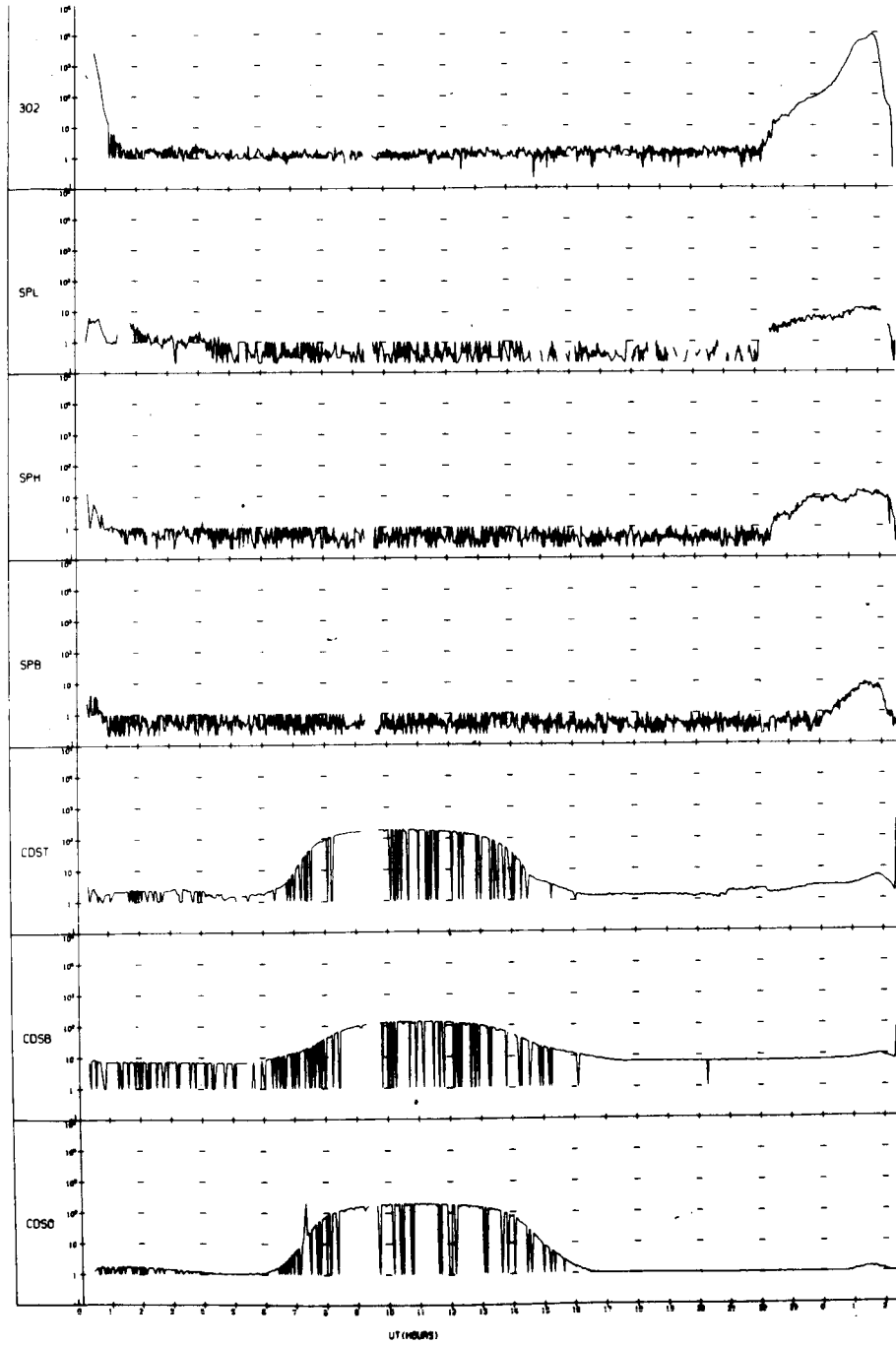
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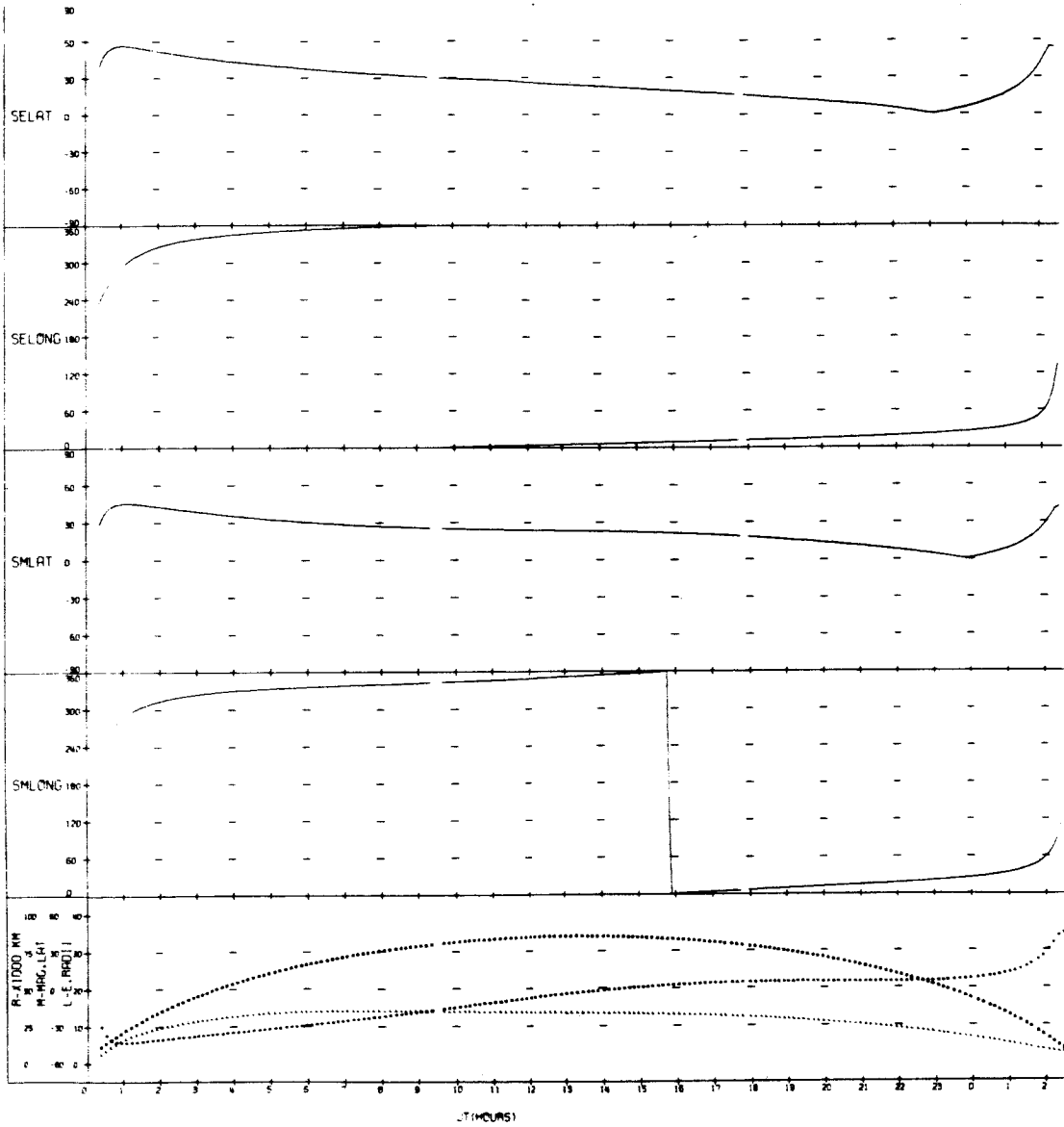
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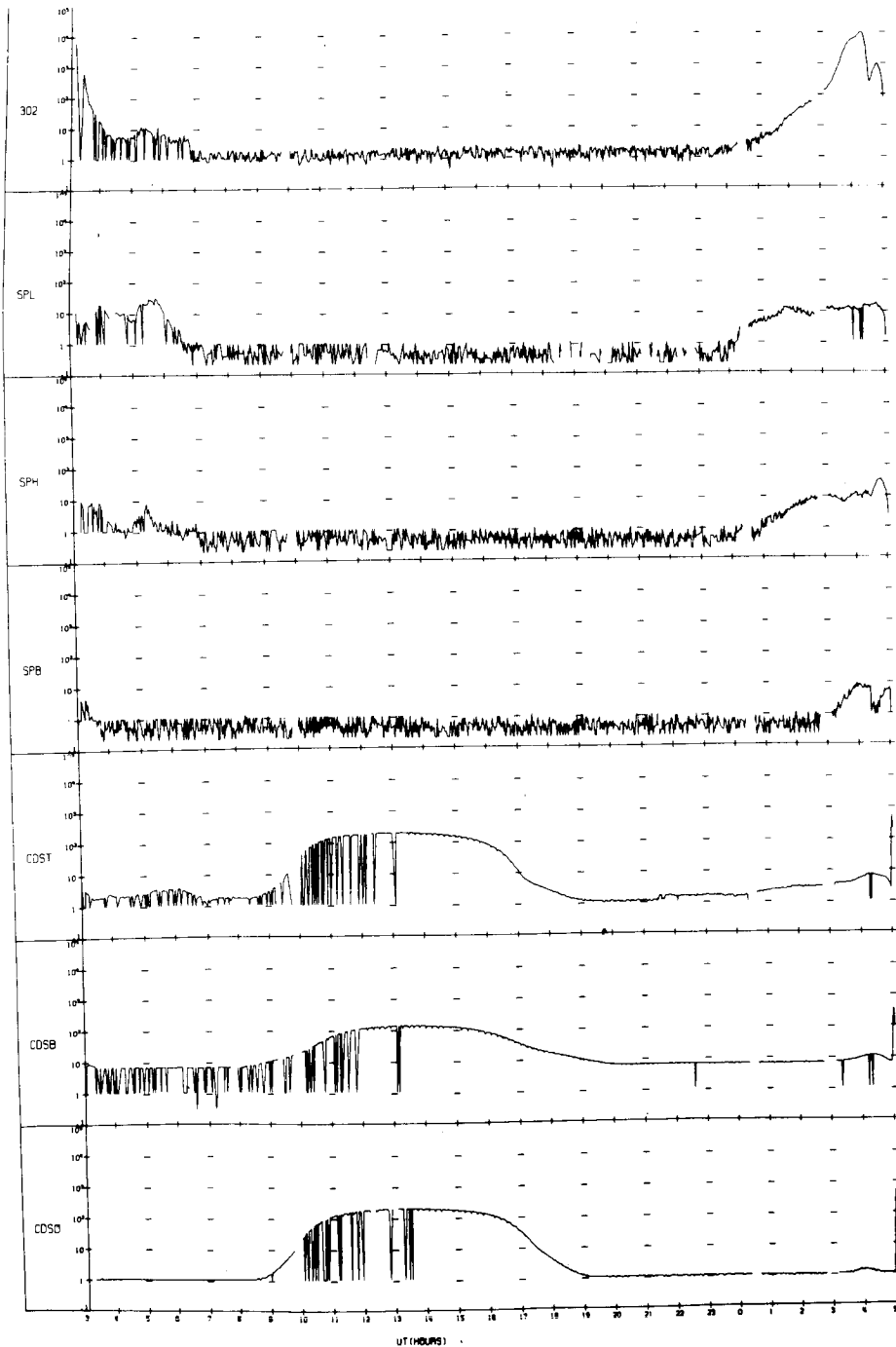
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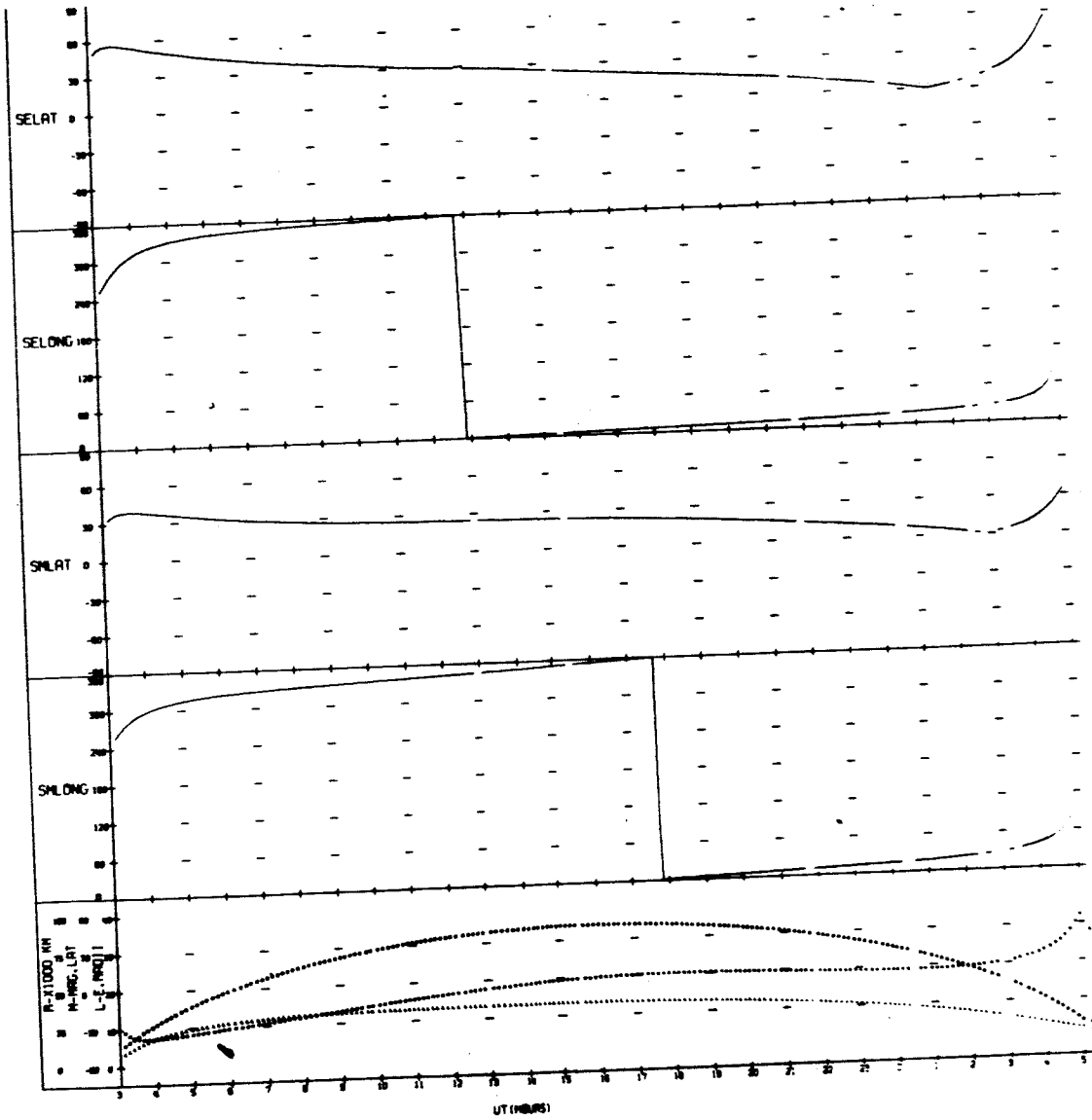


UNIVERSITY OF IOWA

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UNIVERSITY OF IOWA
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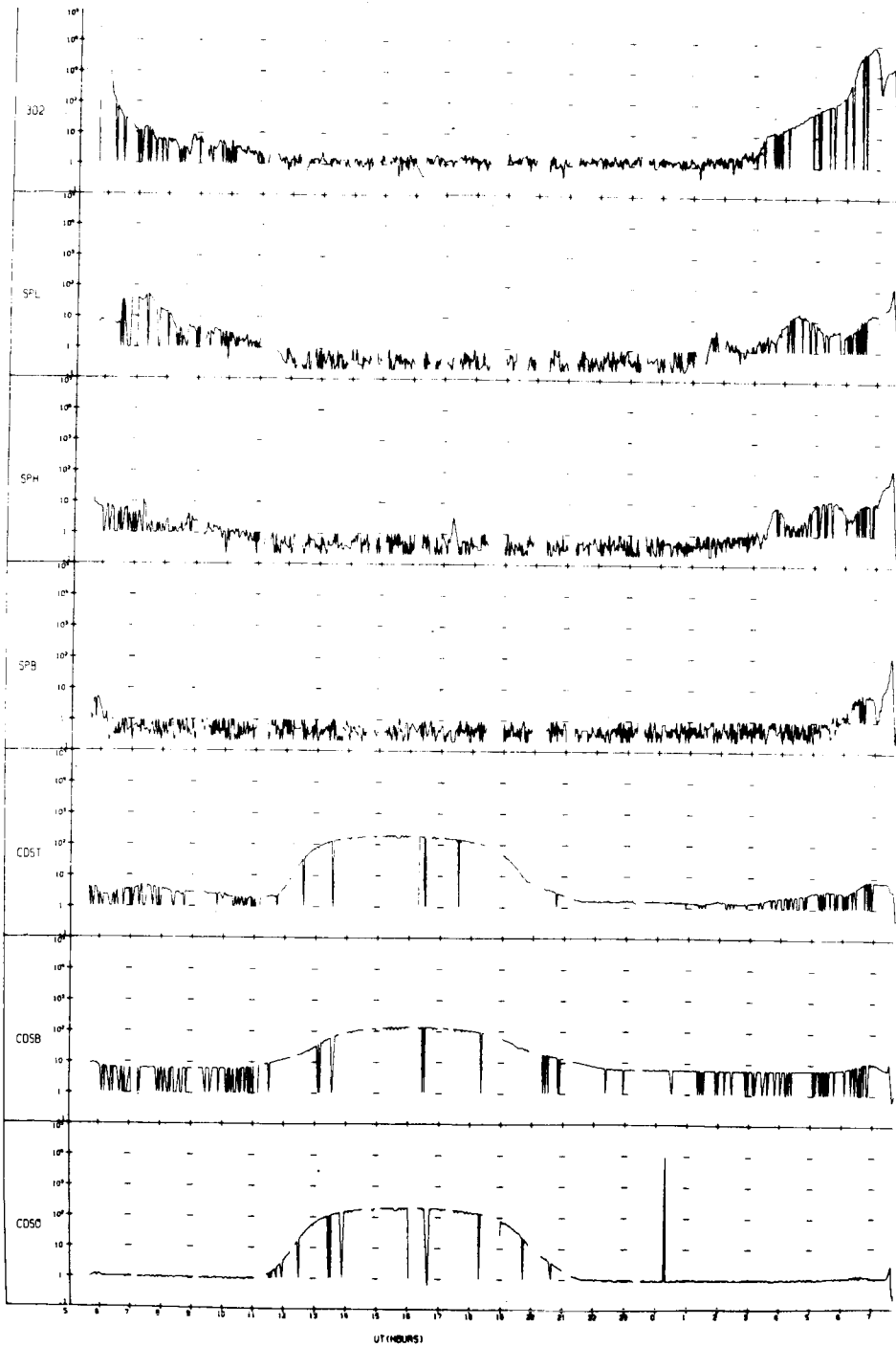


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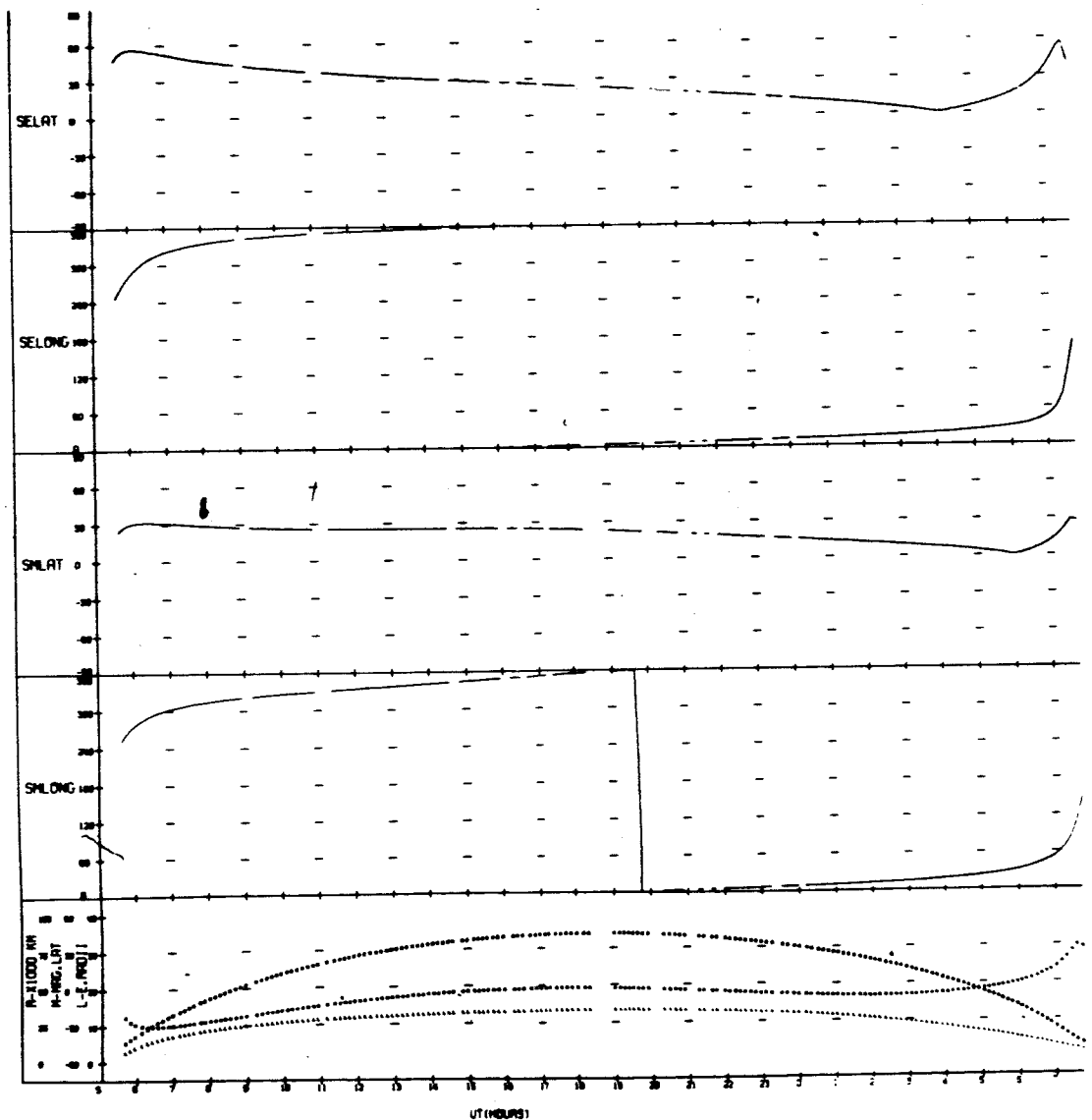
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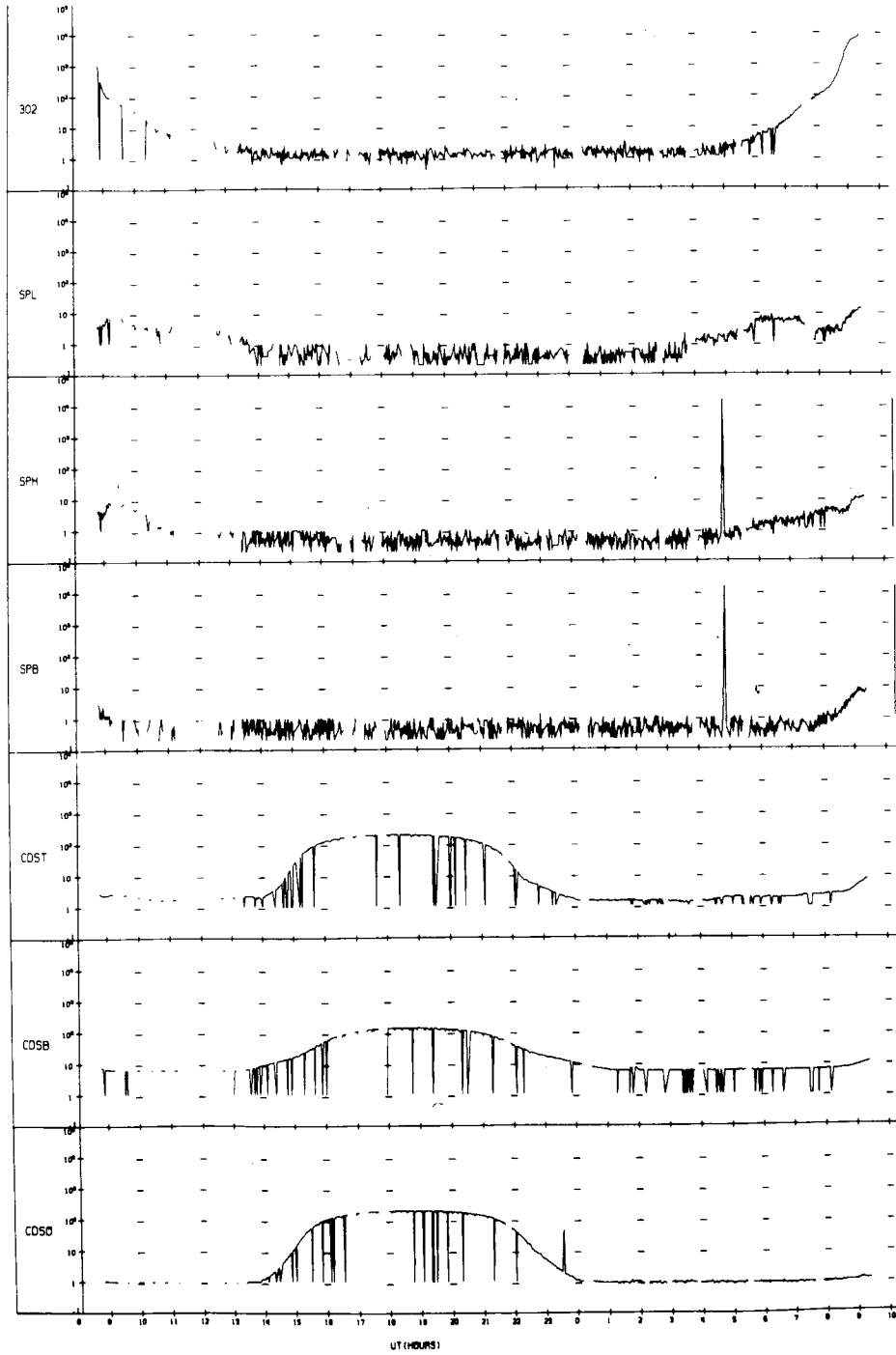
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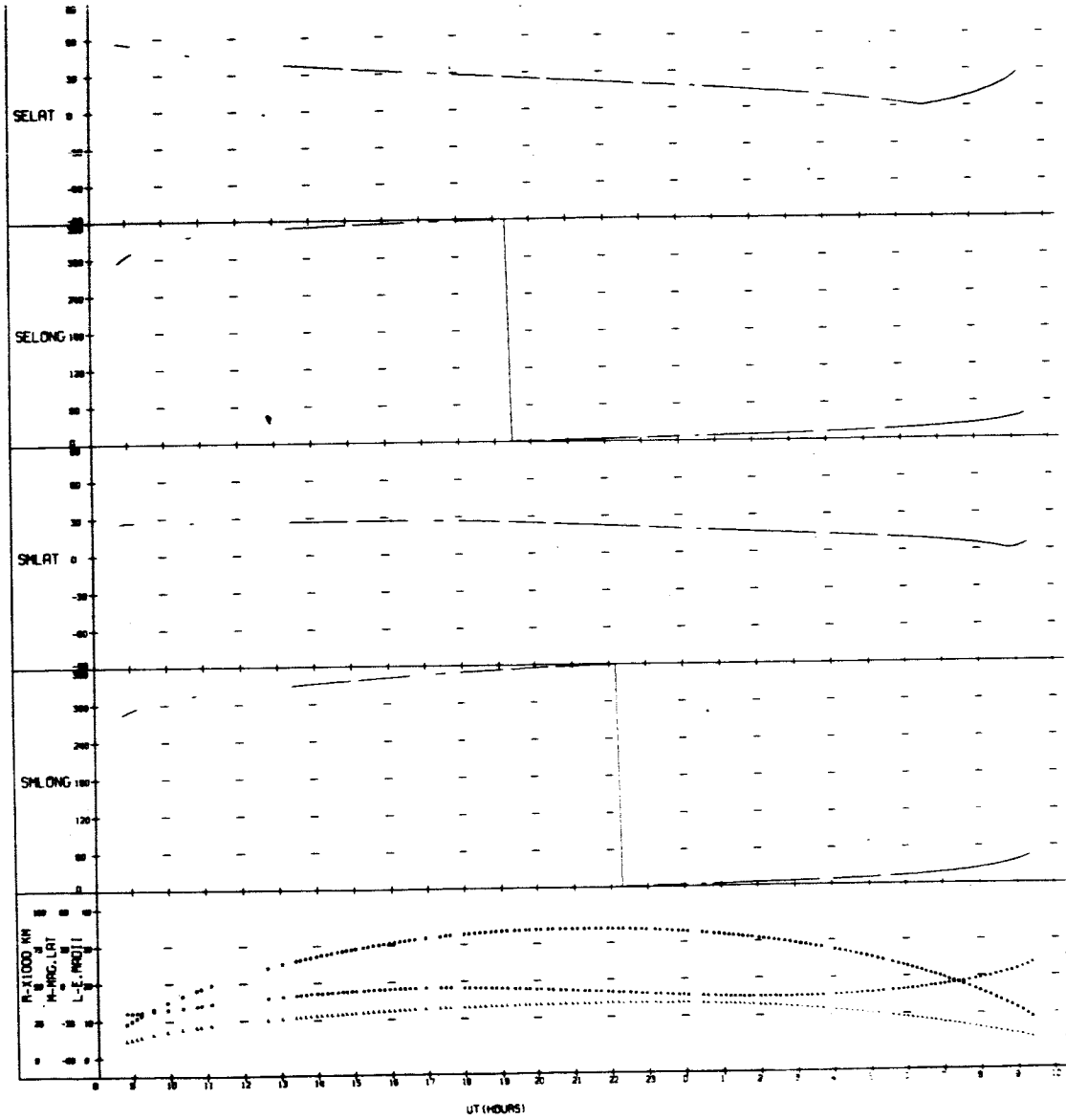


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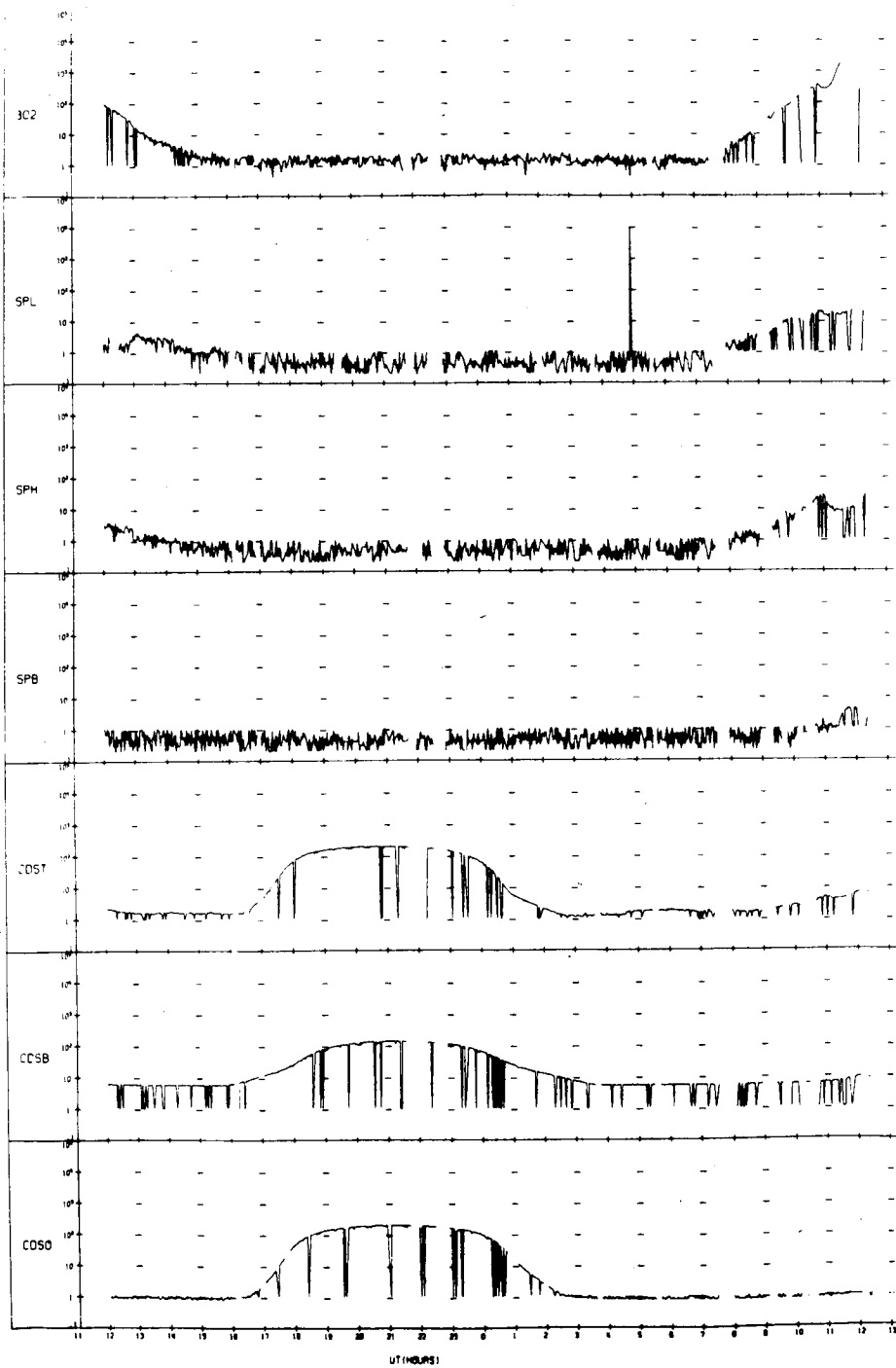


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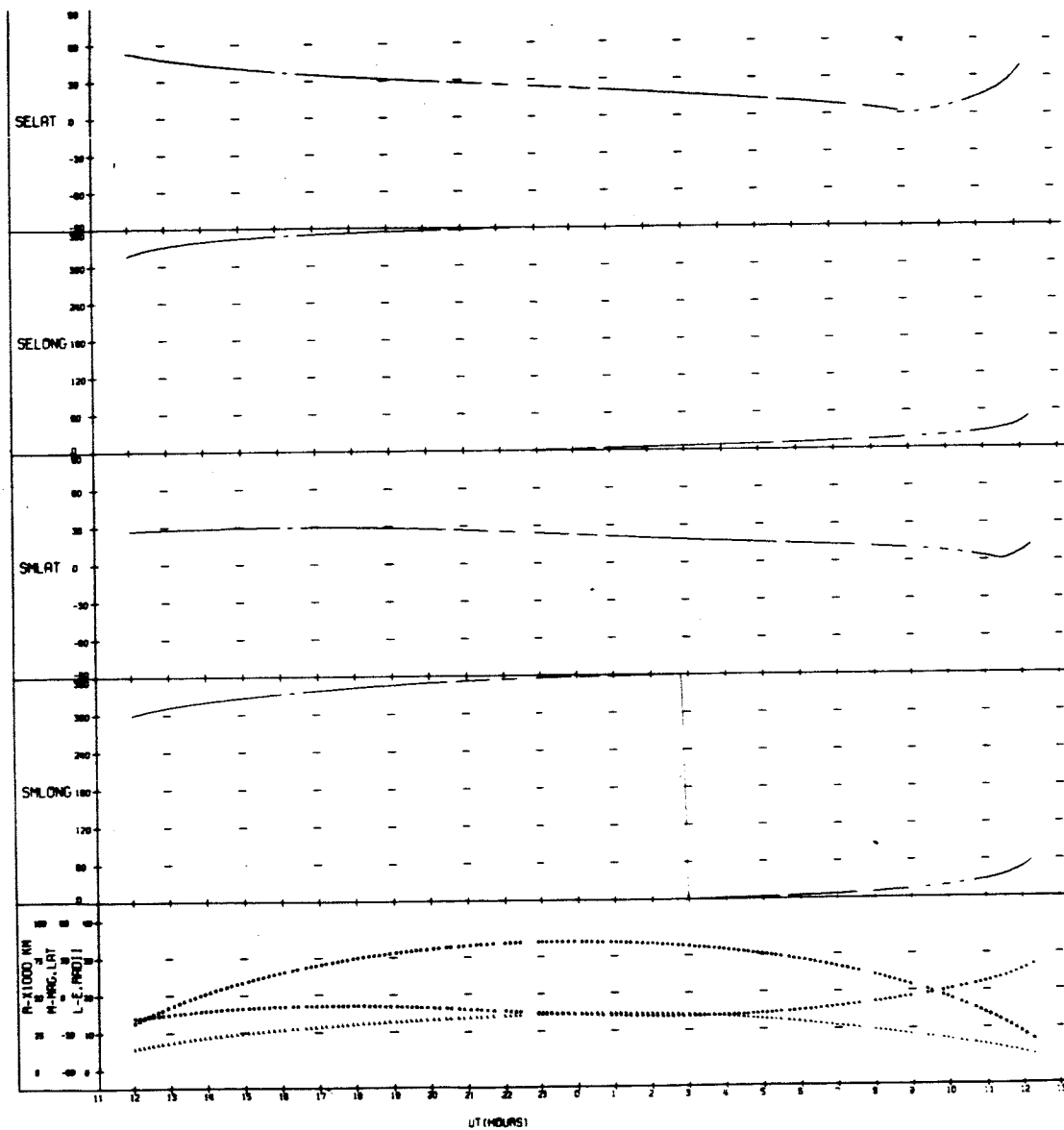
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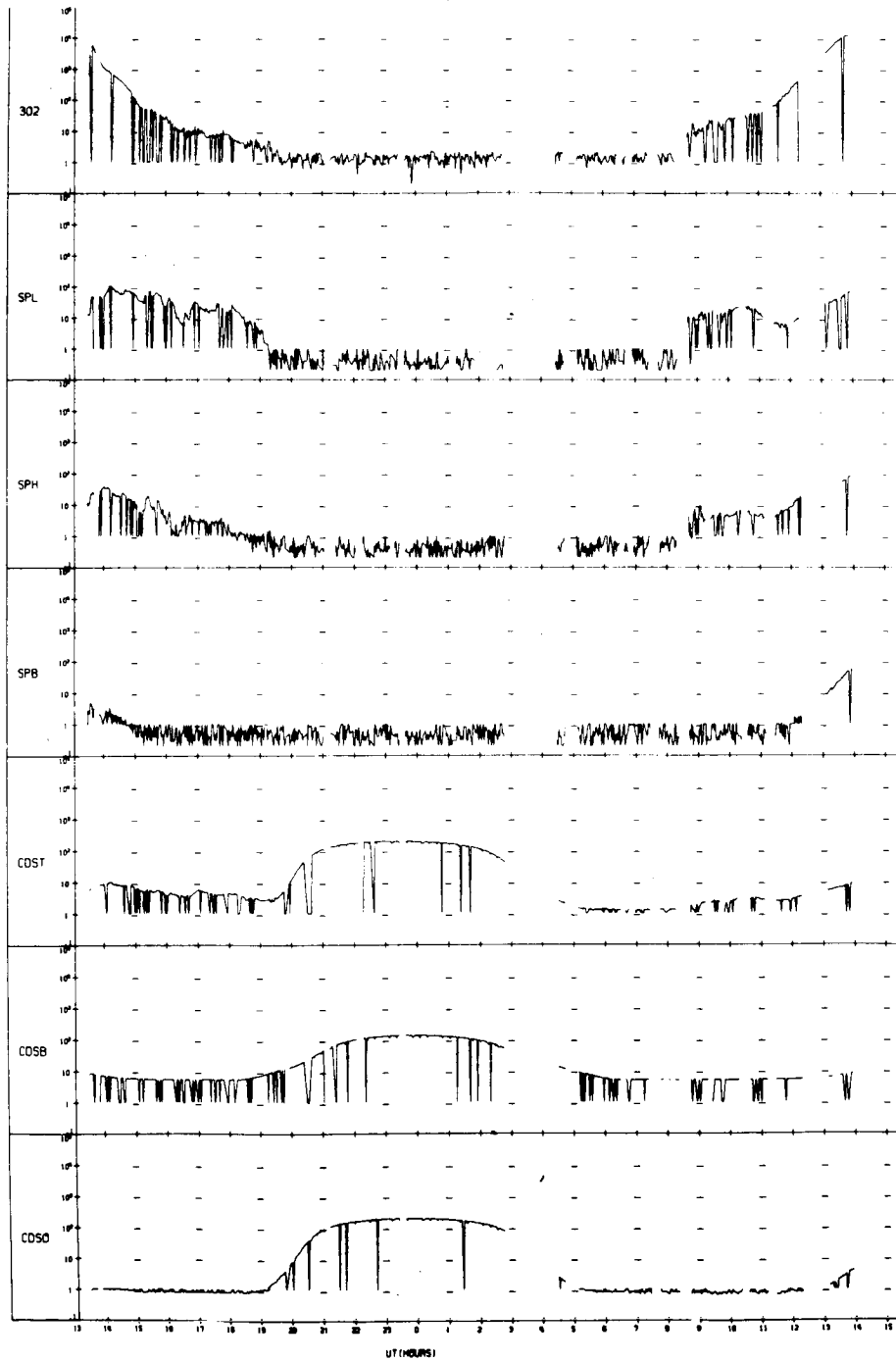


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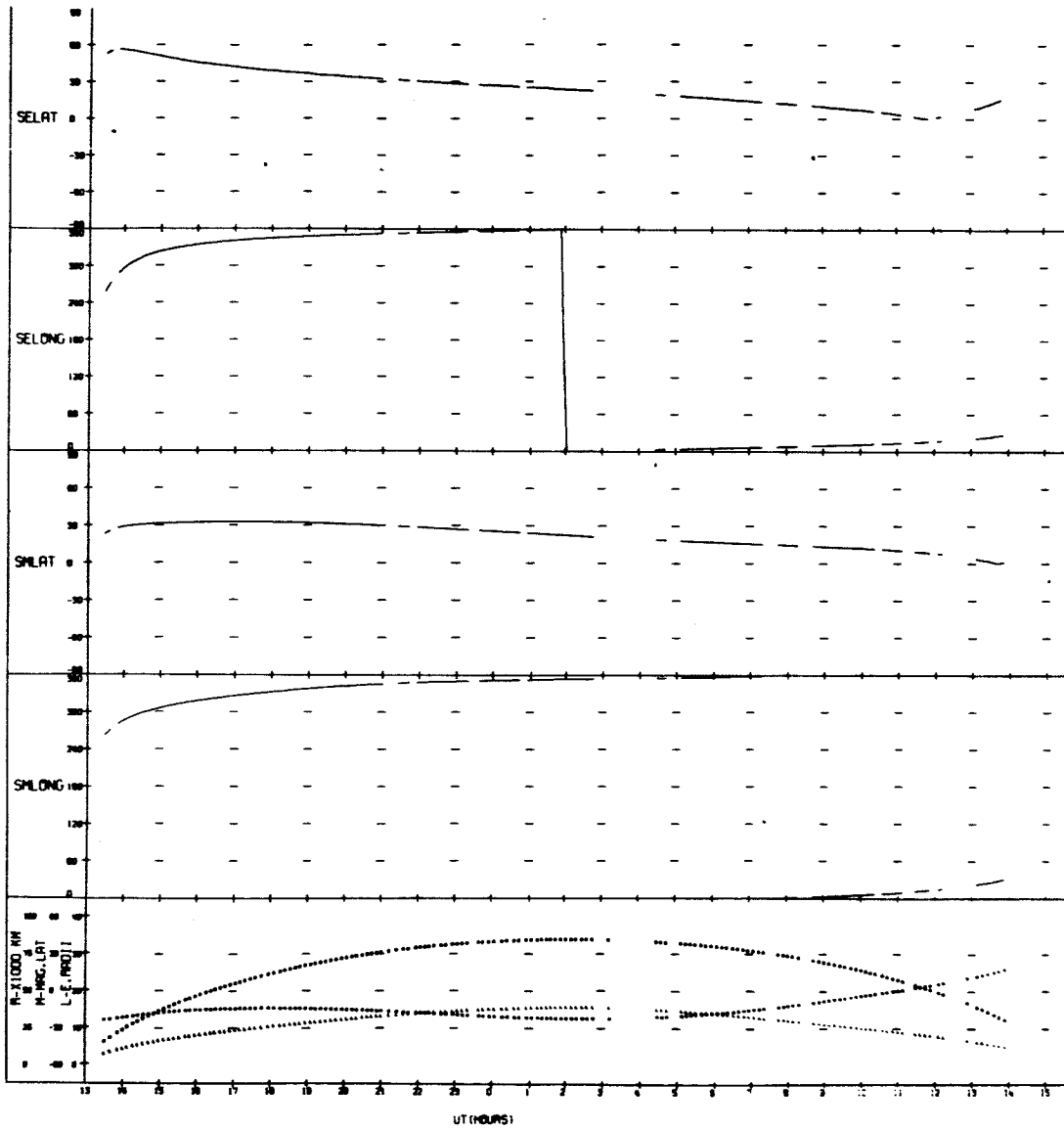
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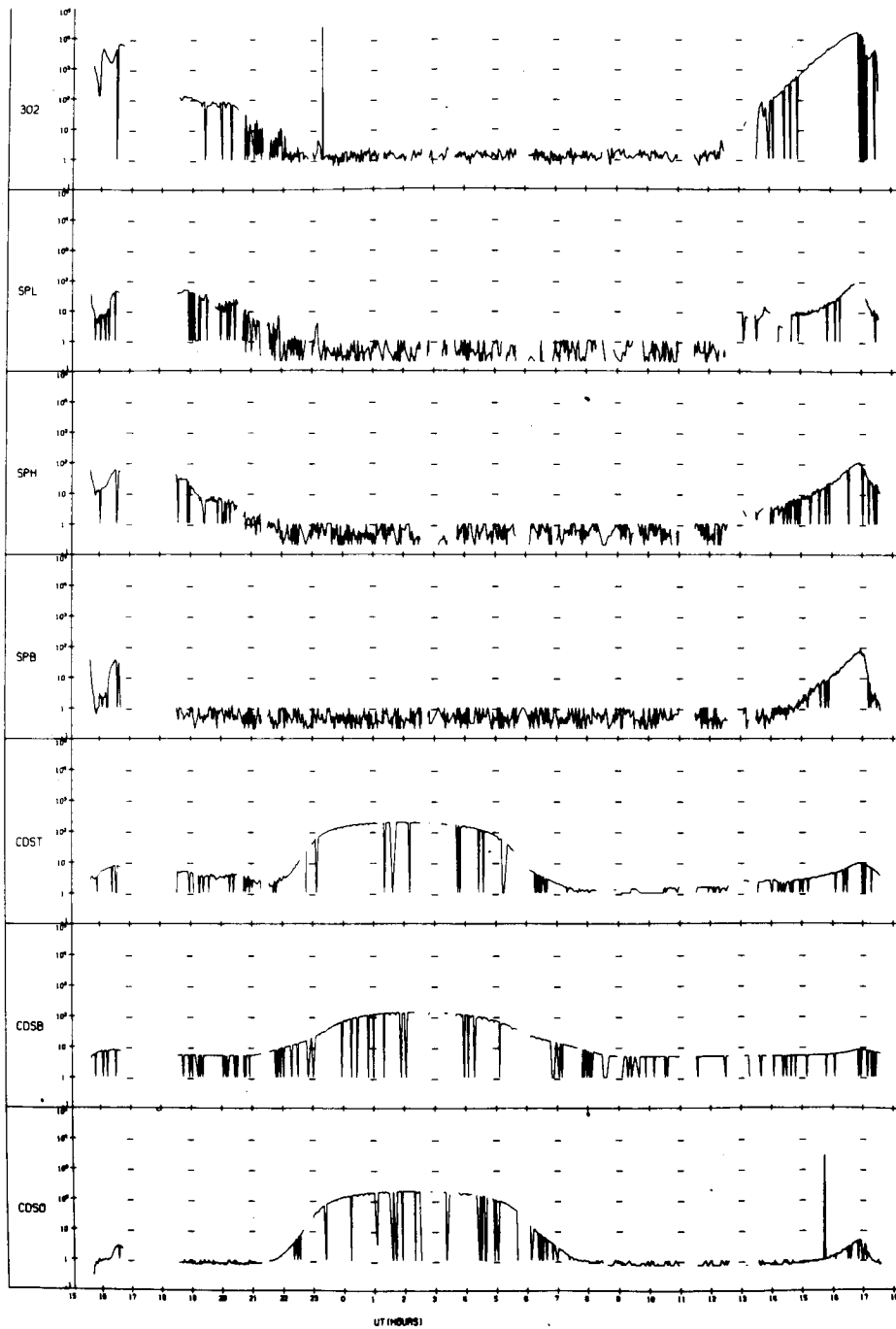
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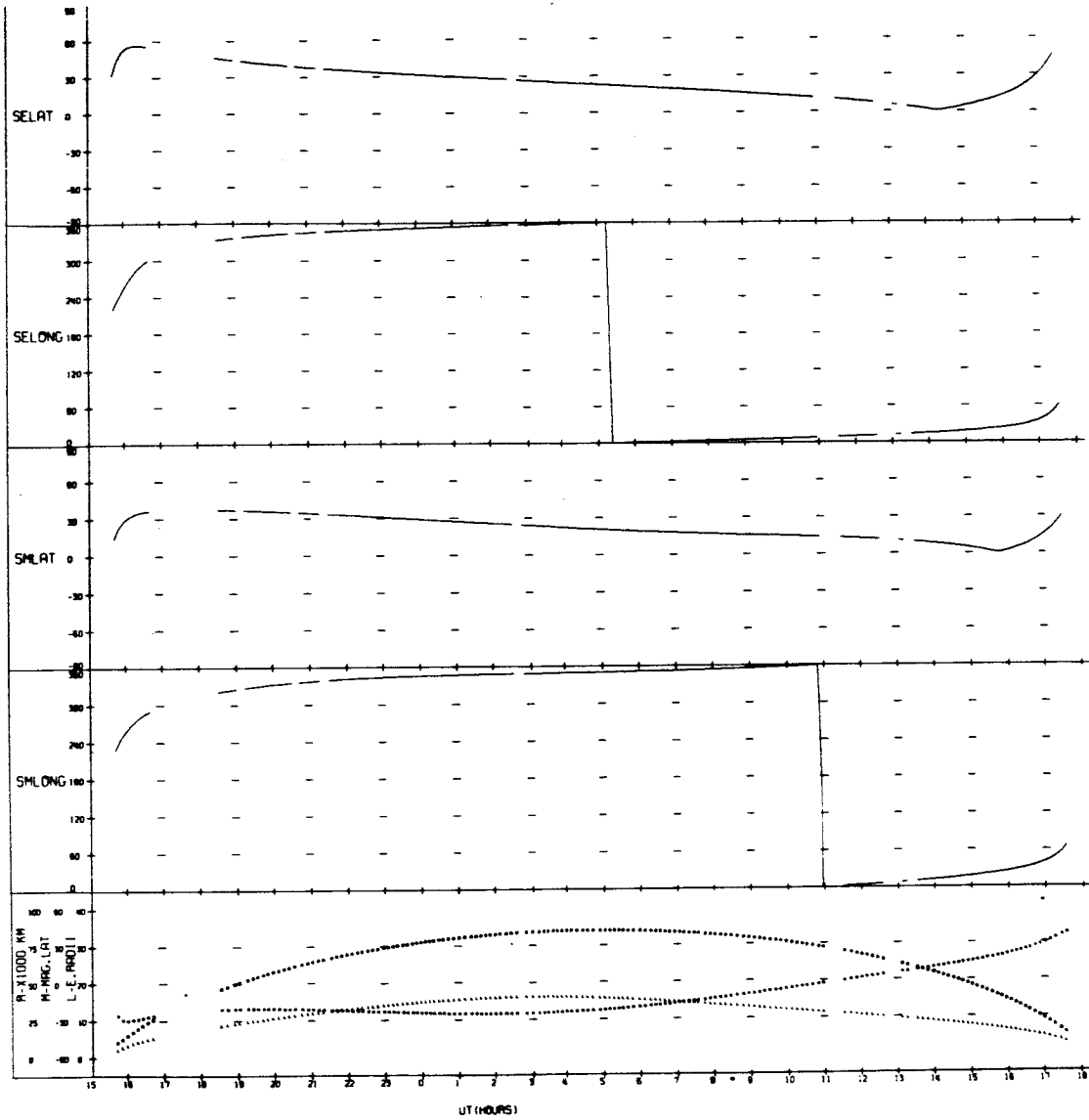
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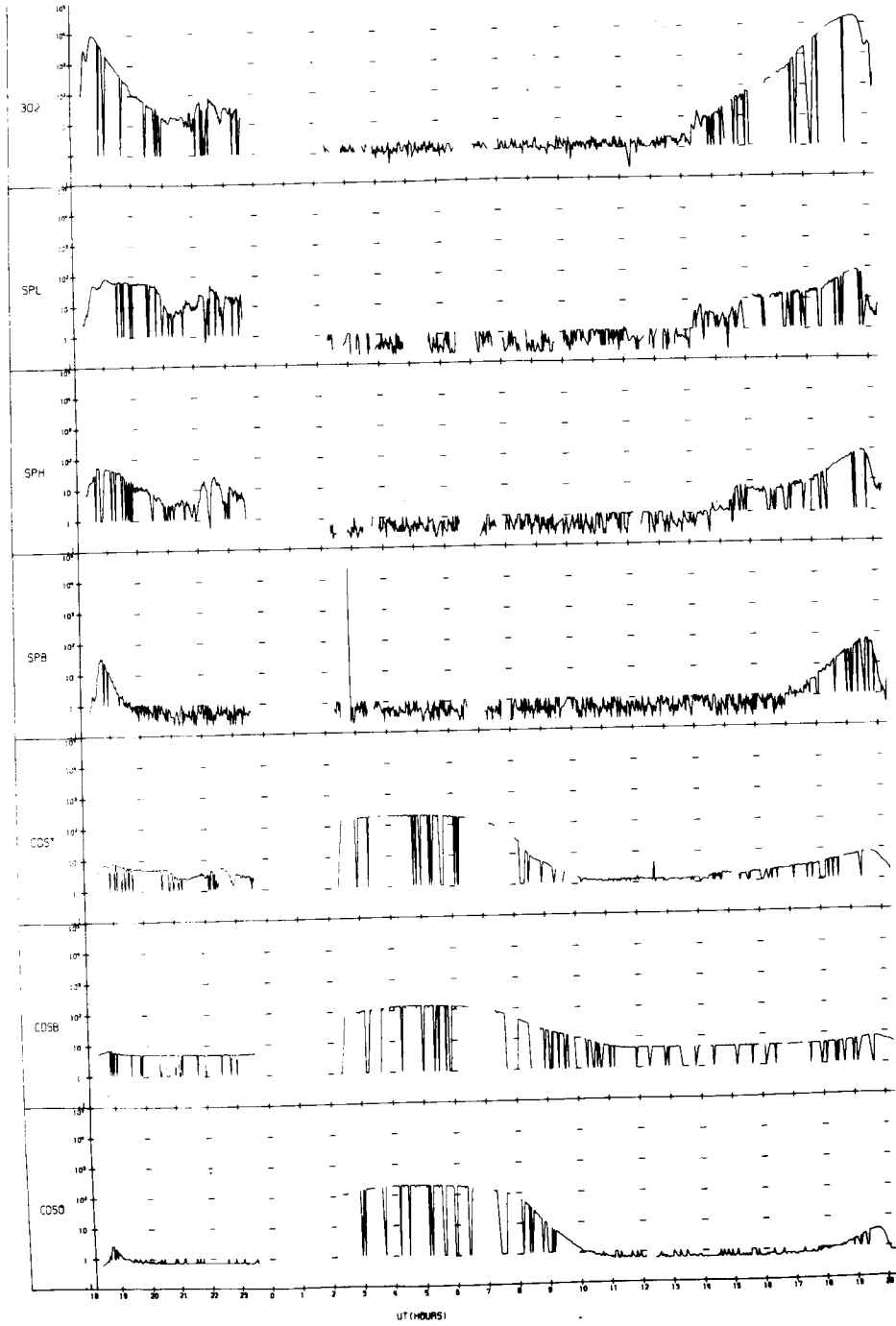
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UNIVERSITY OF IOWA
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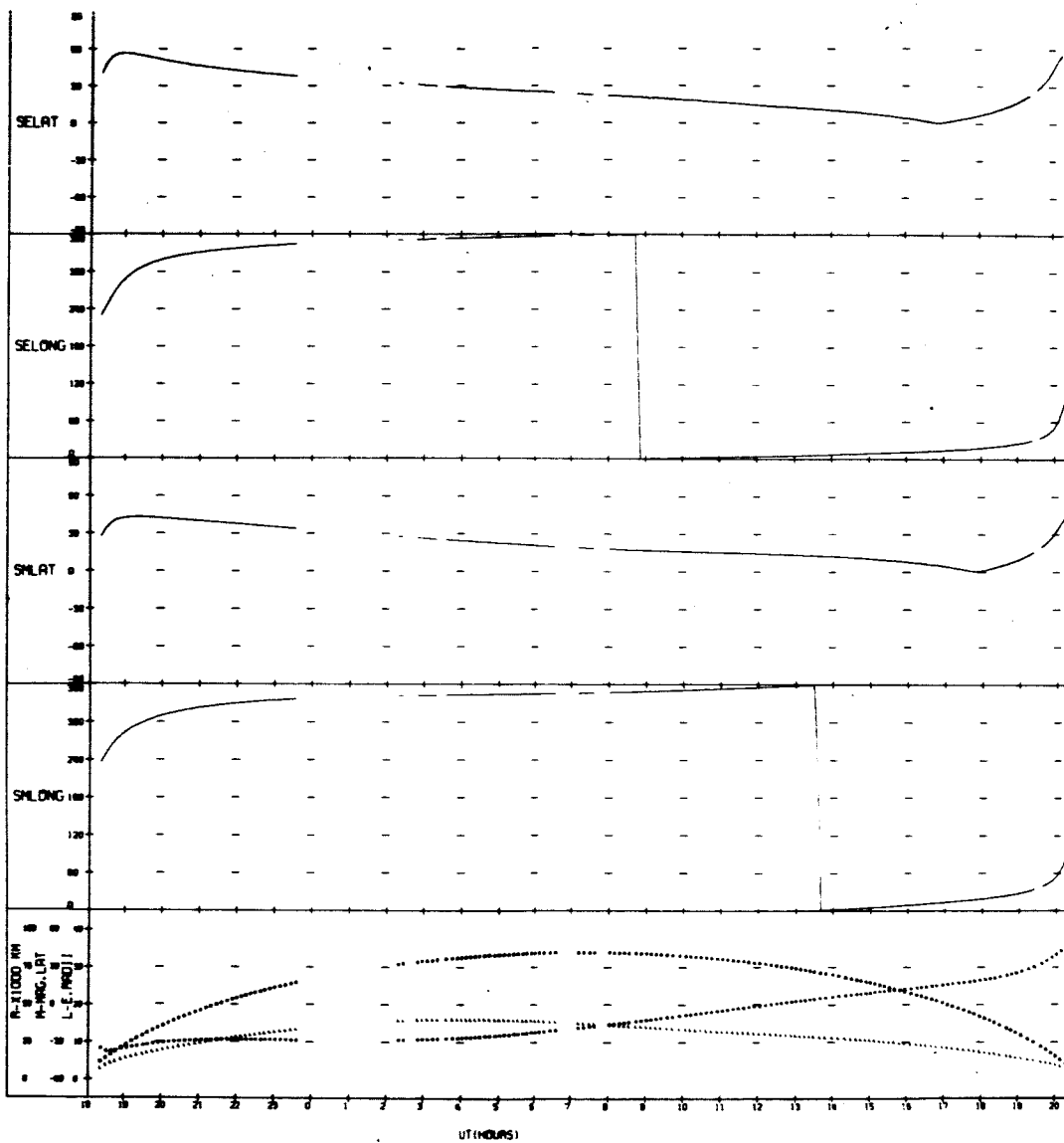


UNIVERSITY OF IOWA

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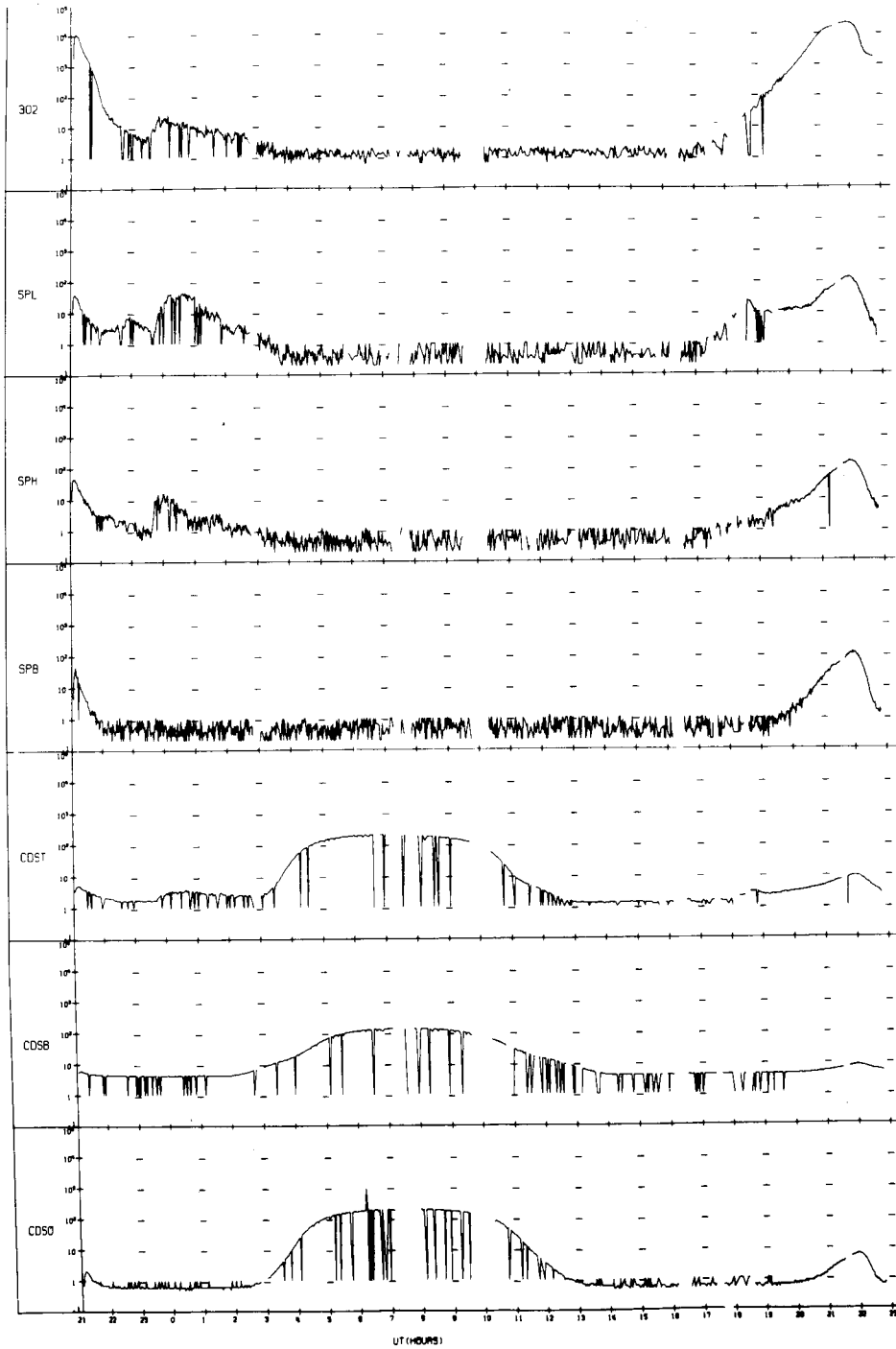
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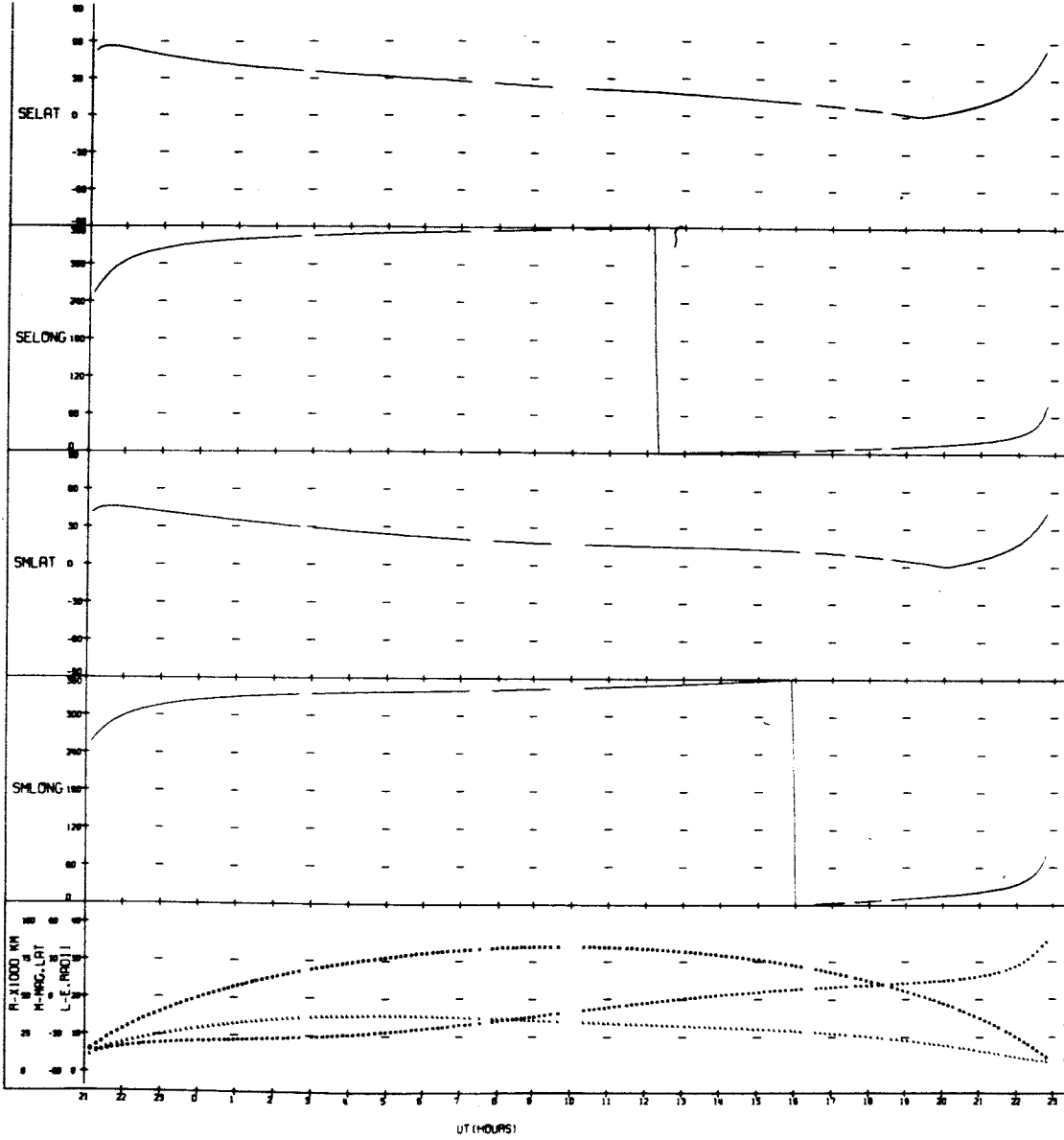


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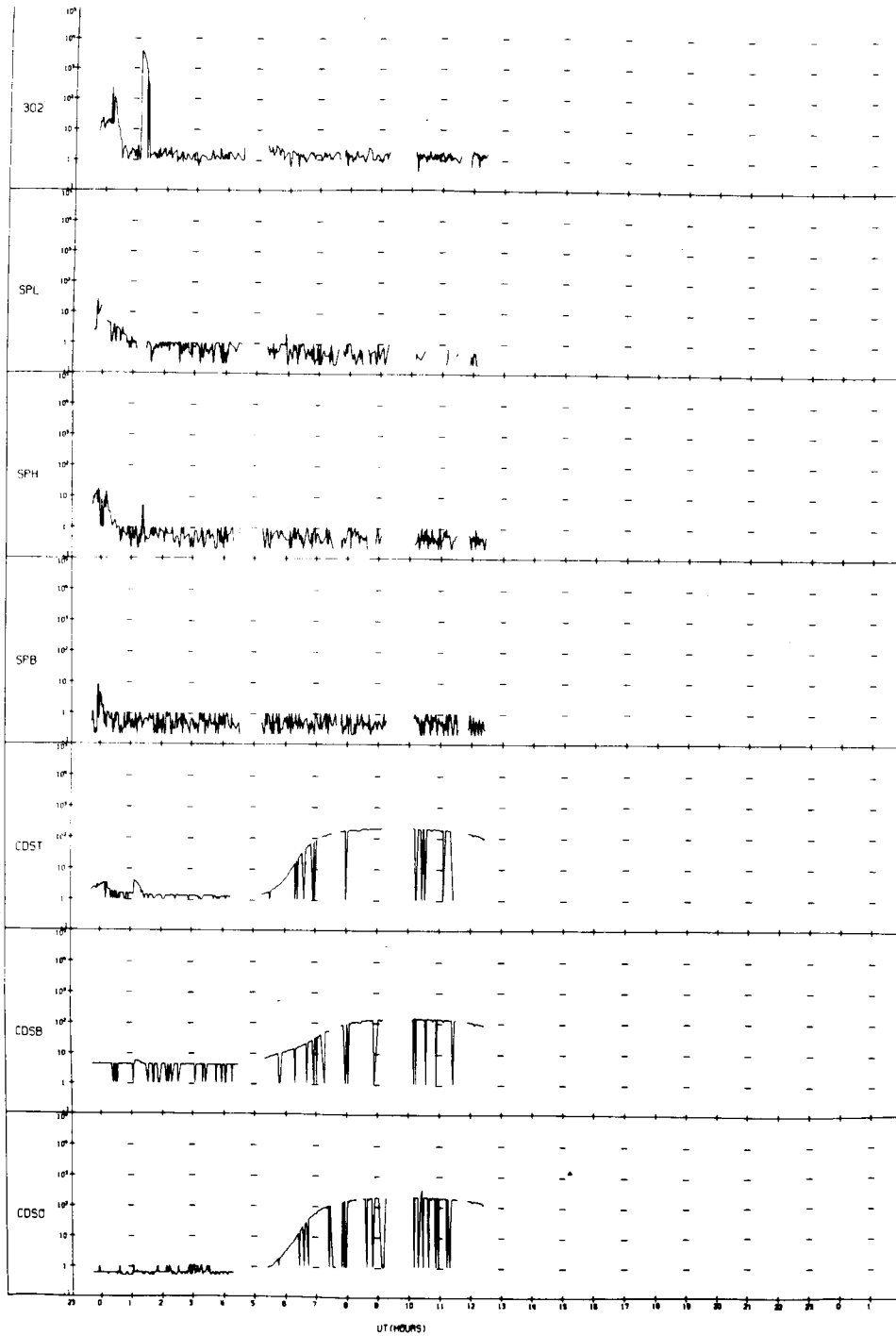
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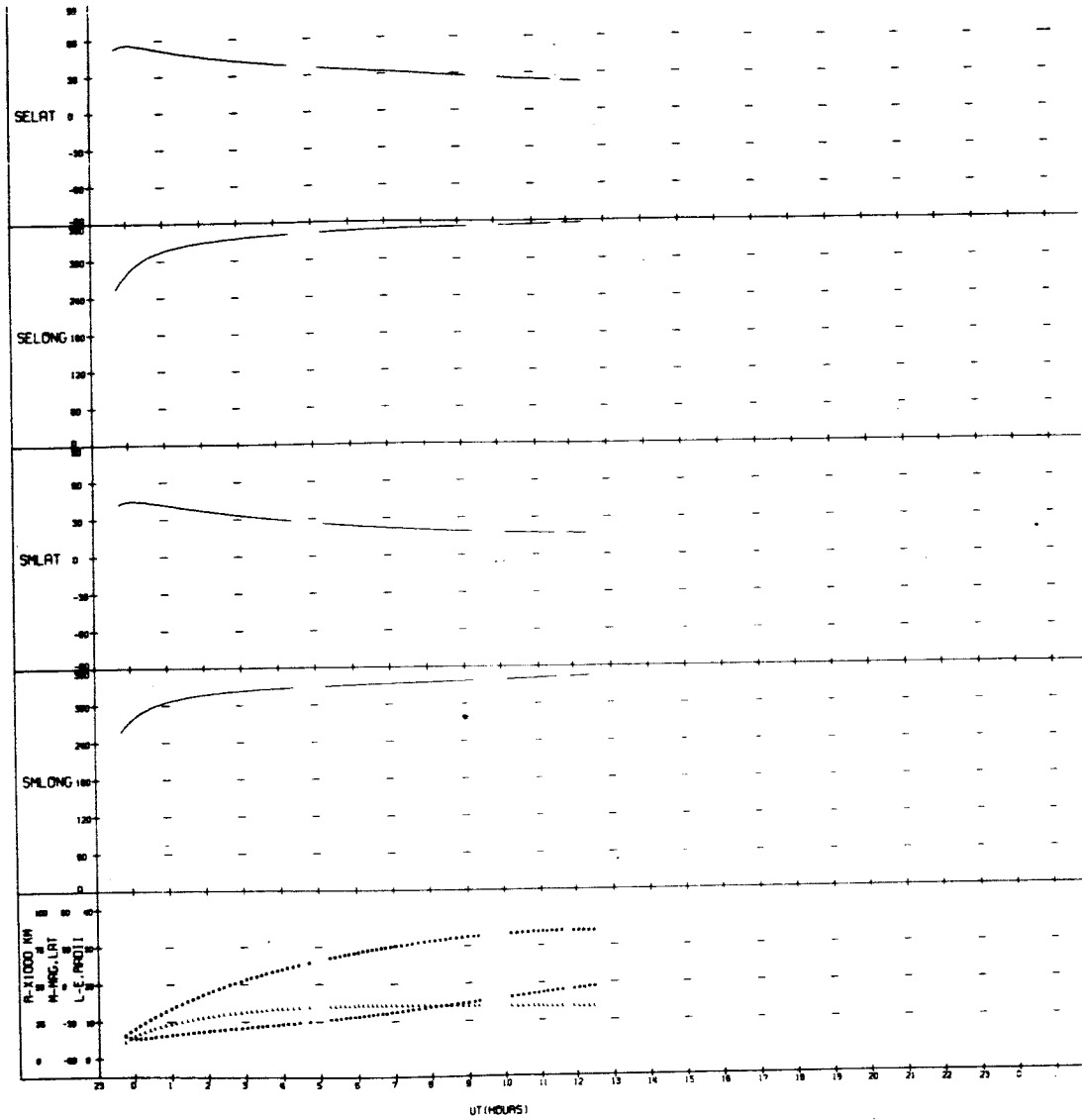
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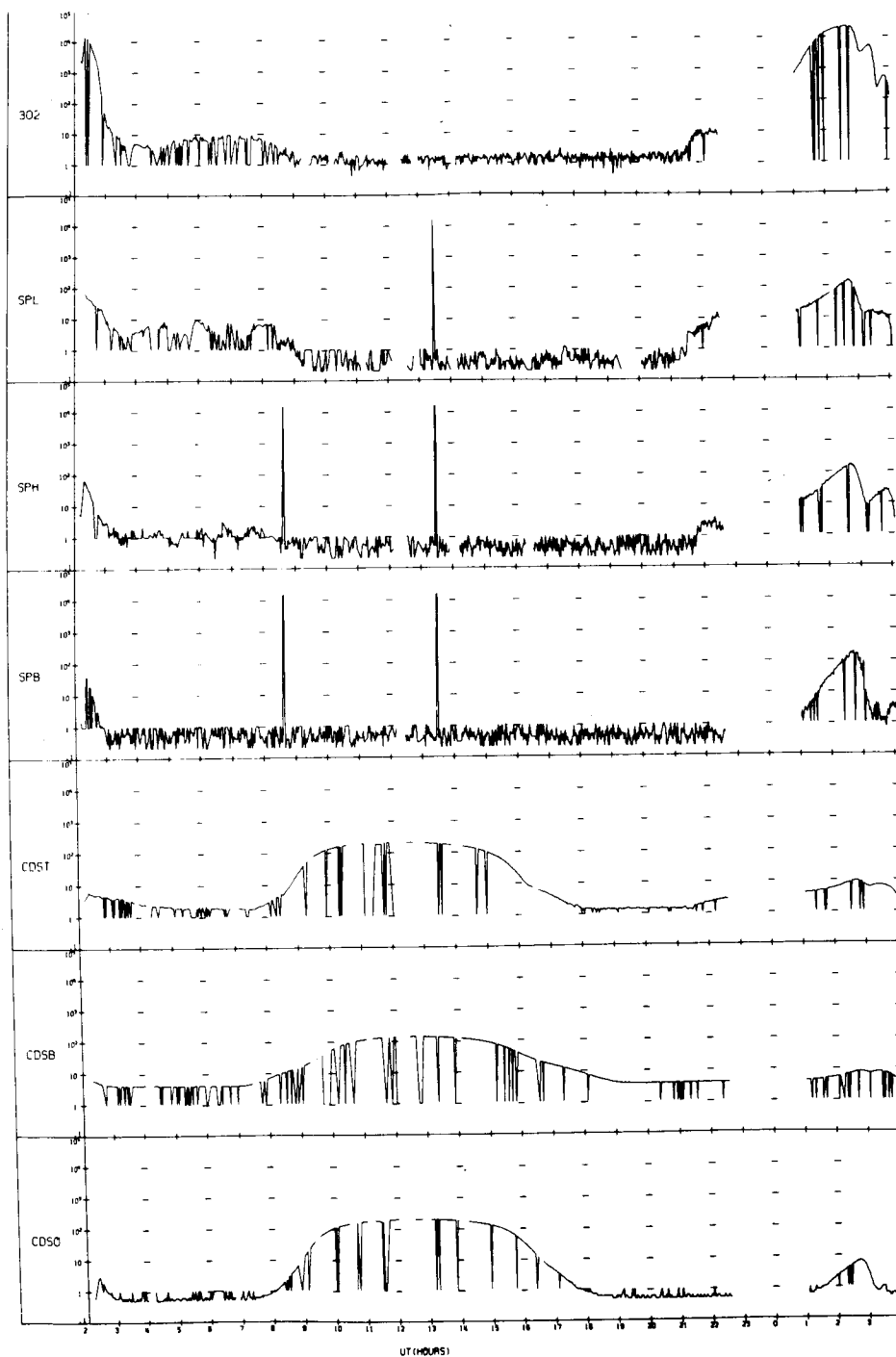
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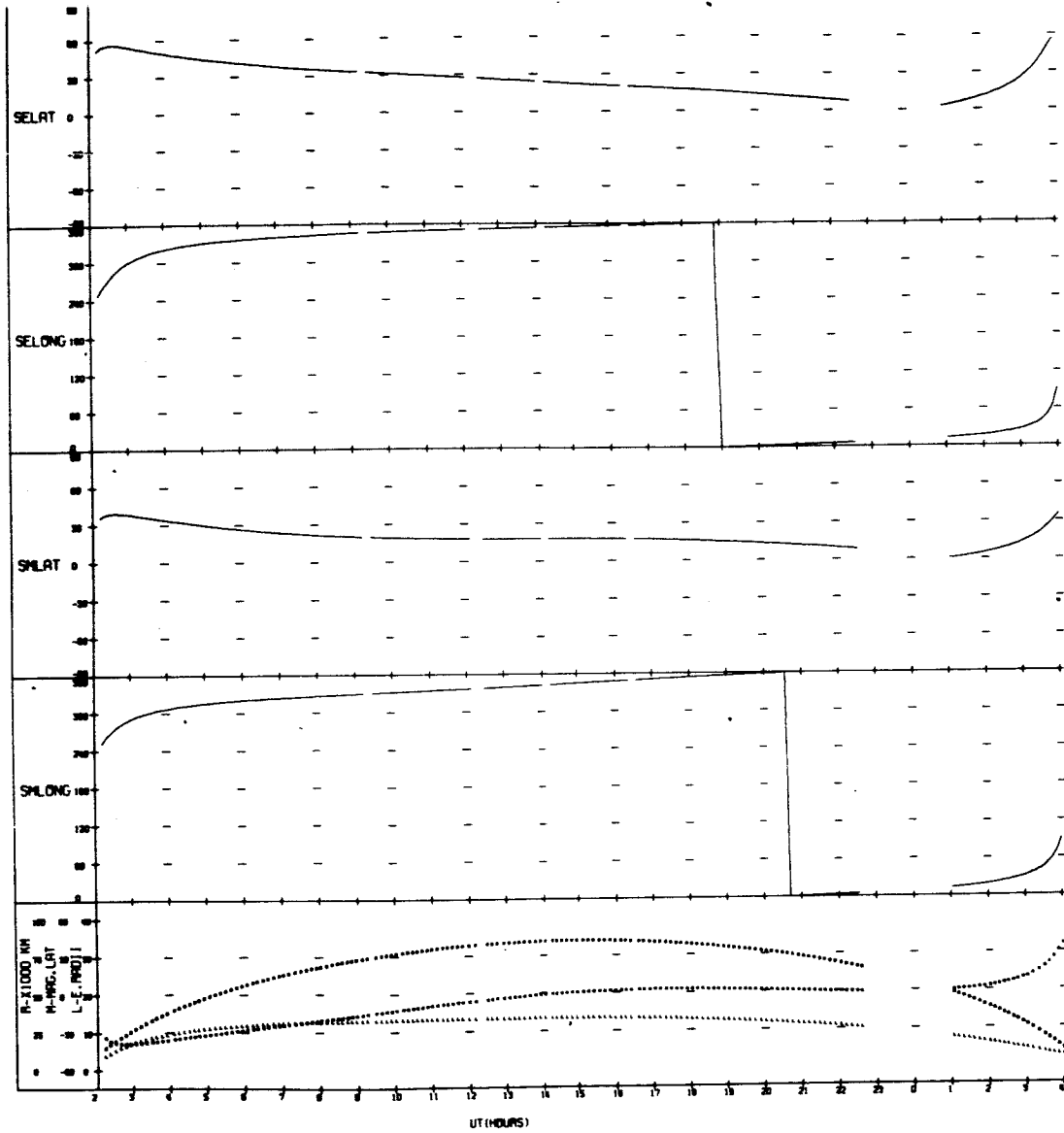
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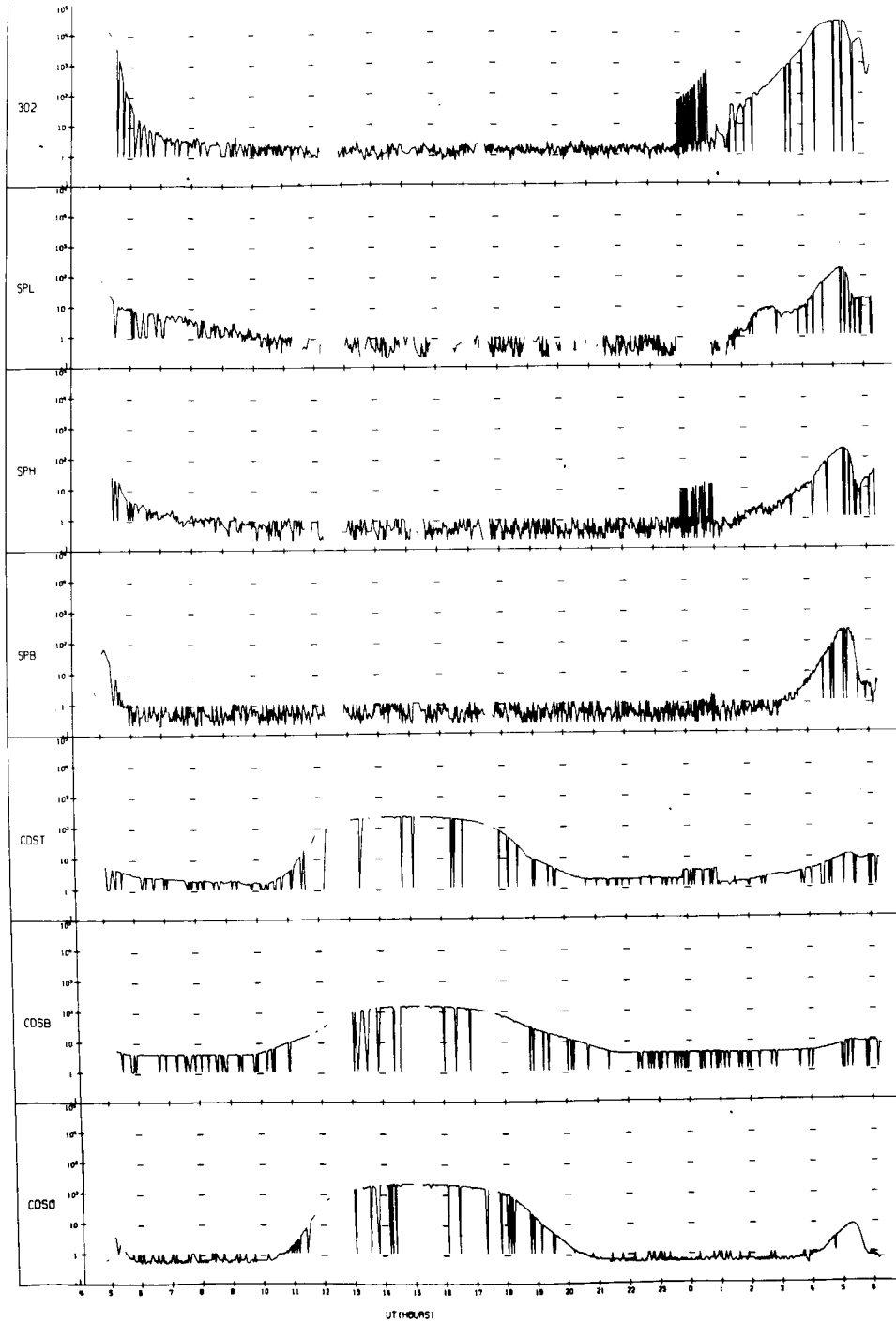
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UNIVERSITY OF IOWA
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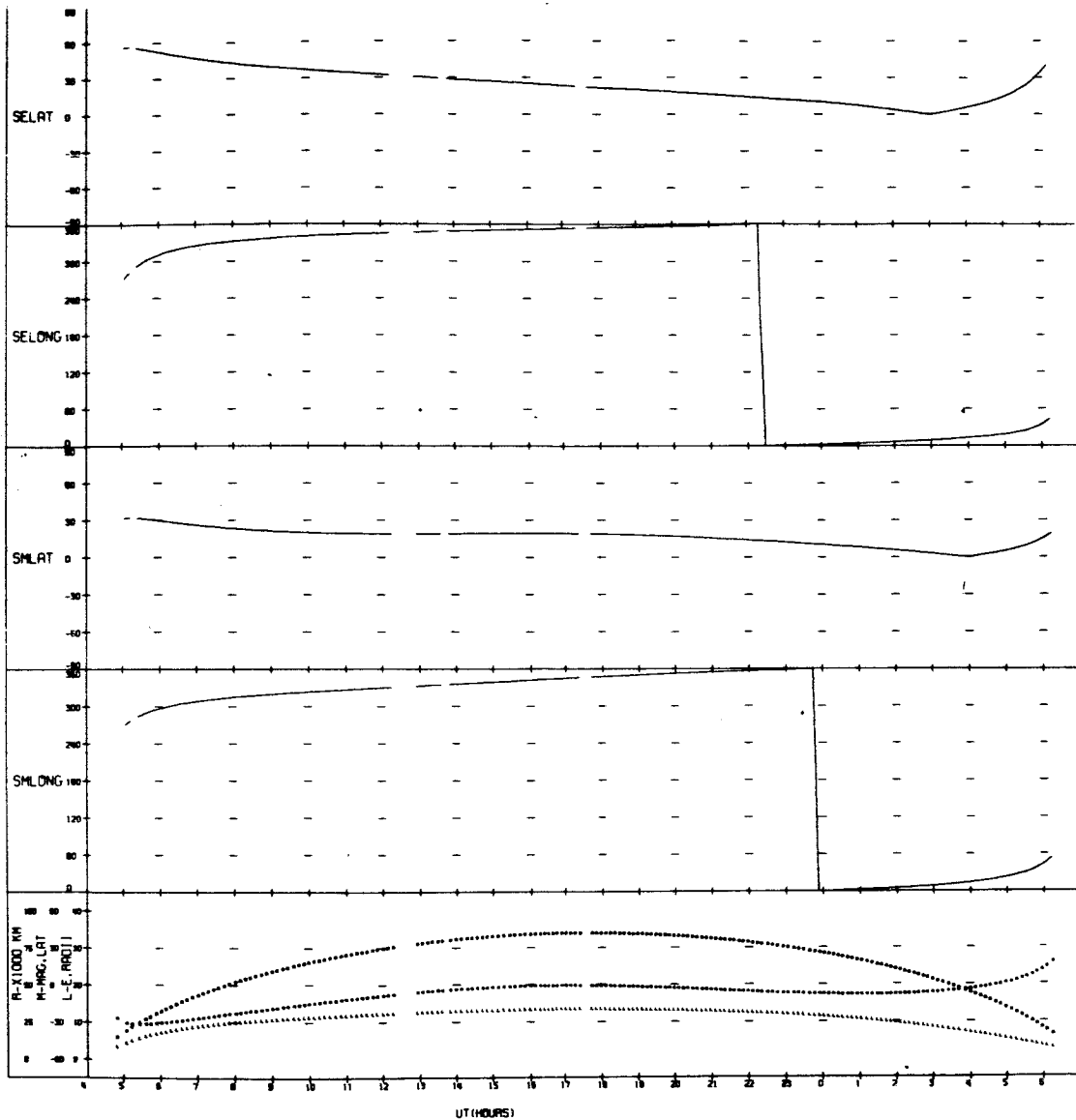


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UNIVERSITY OF IOWA

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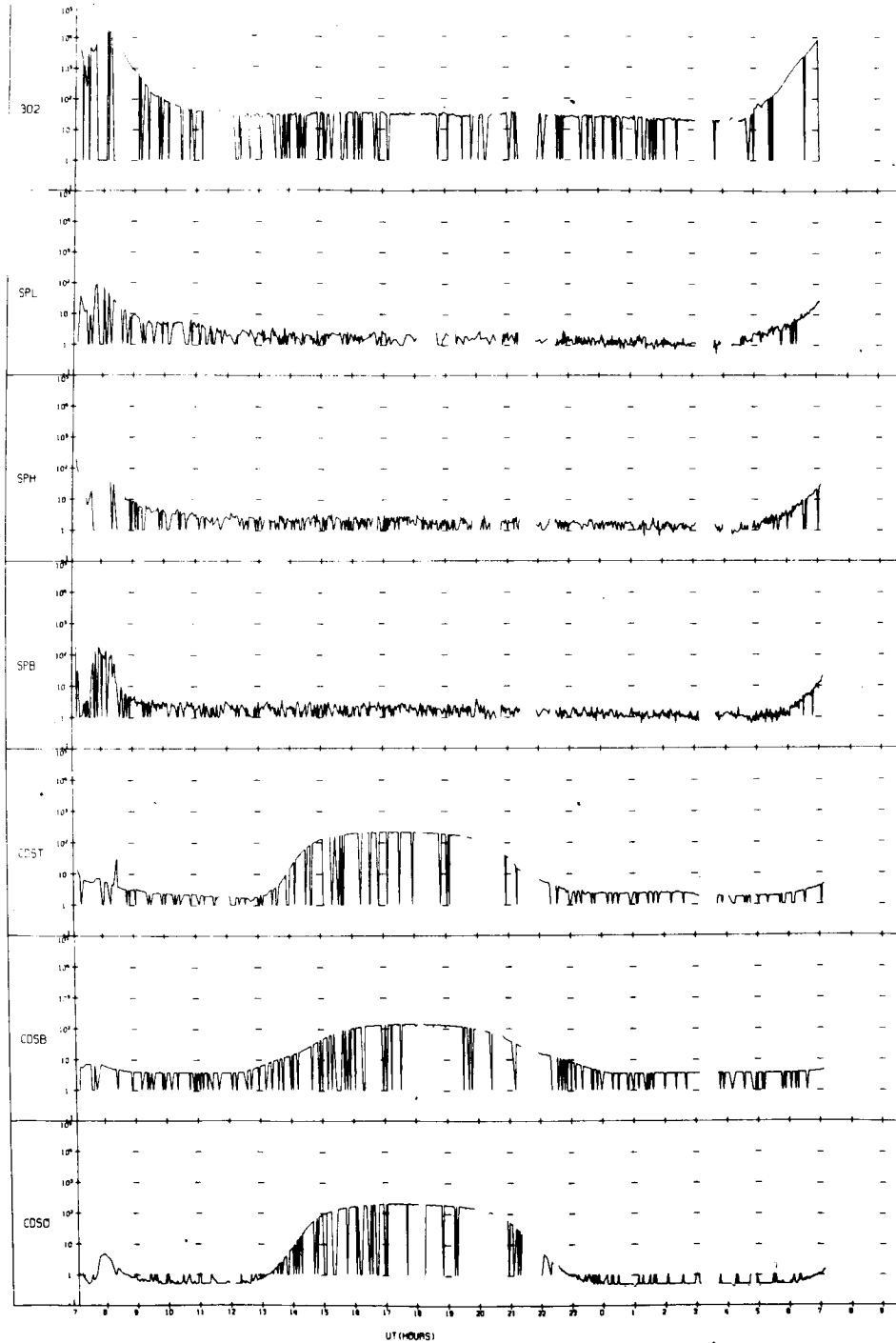


UNIVERSITY OF IOWA

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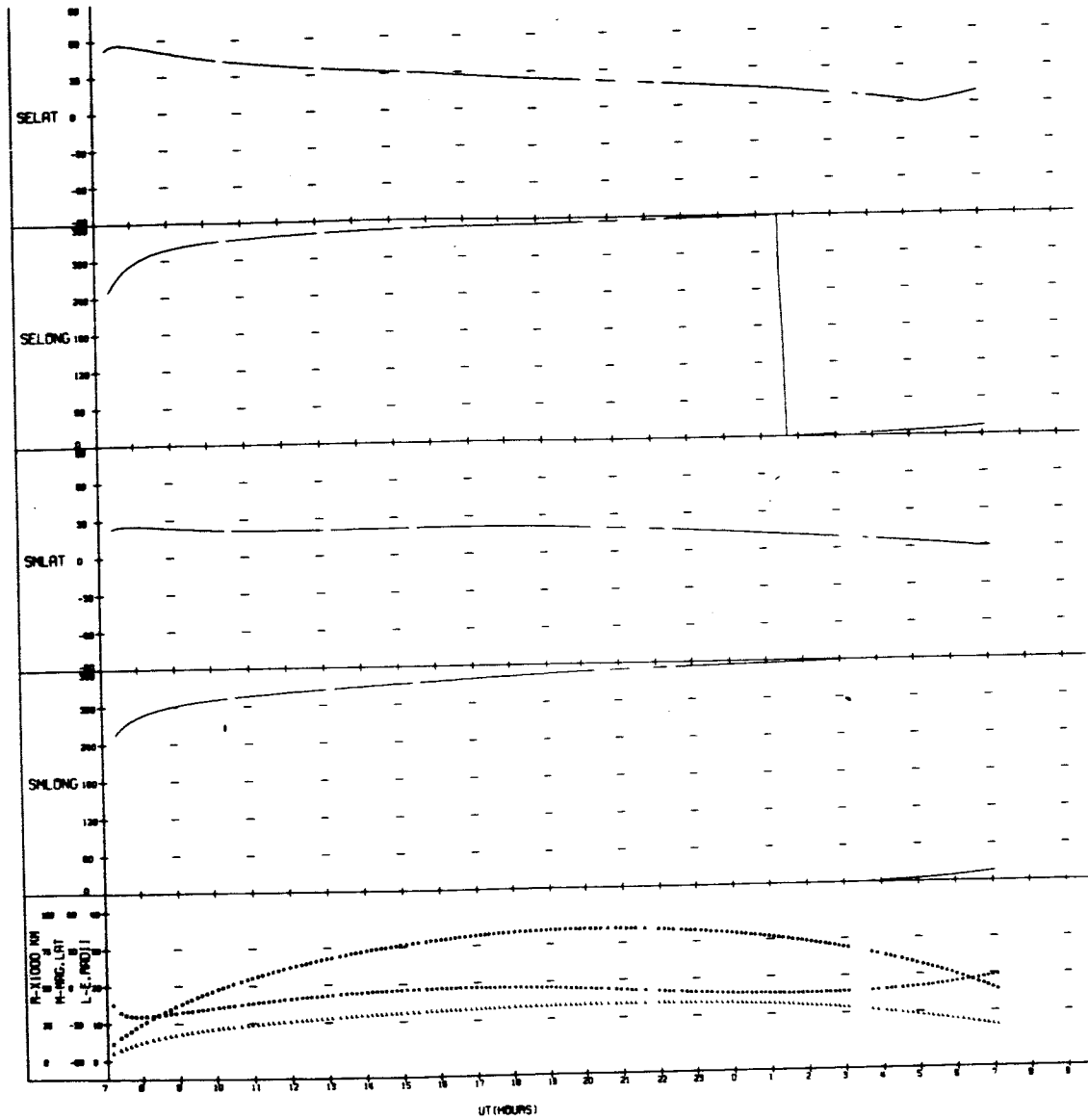
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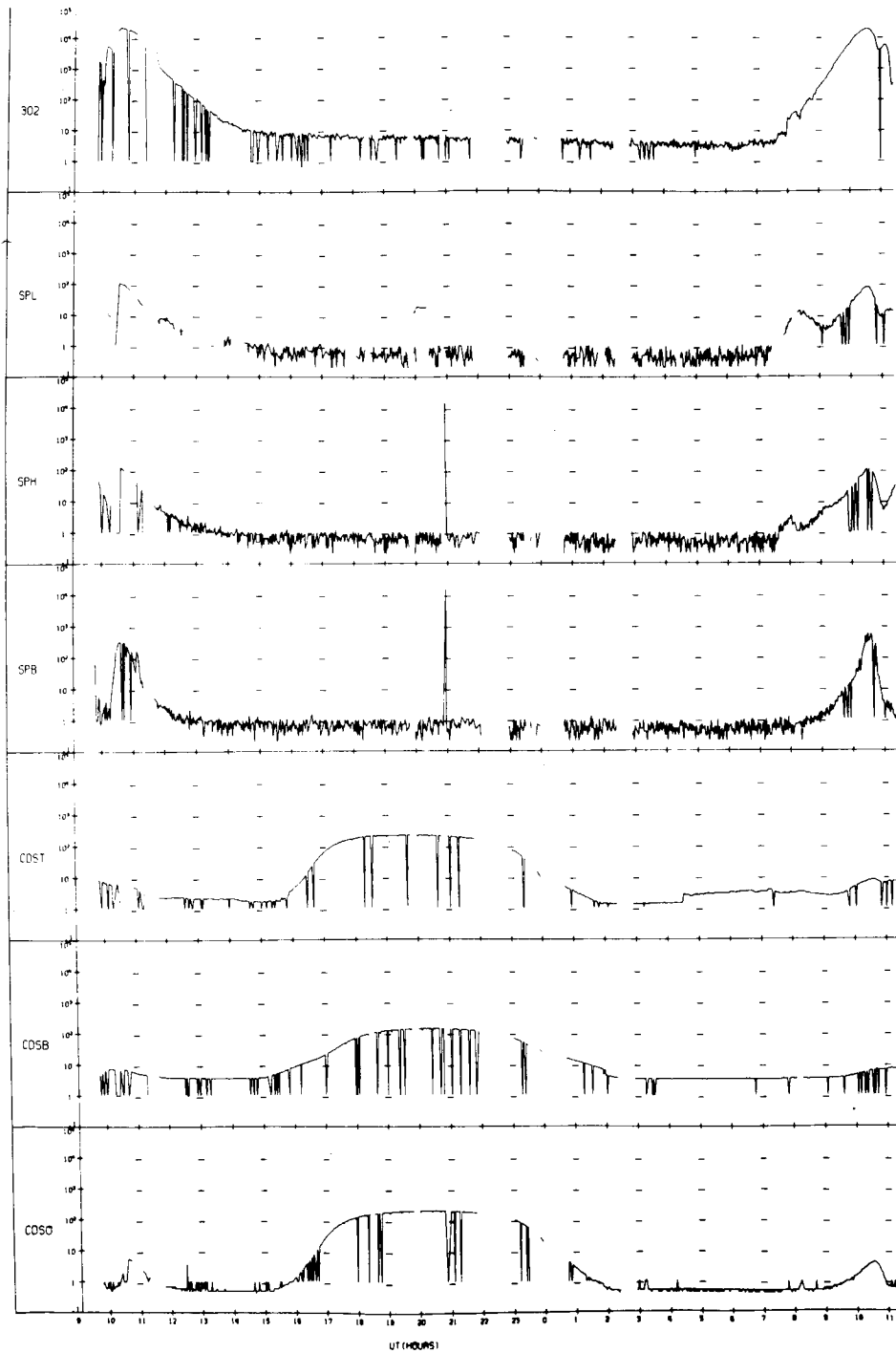
UNIVERSITY OF IOWA

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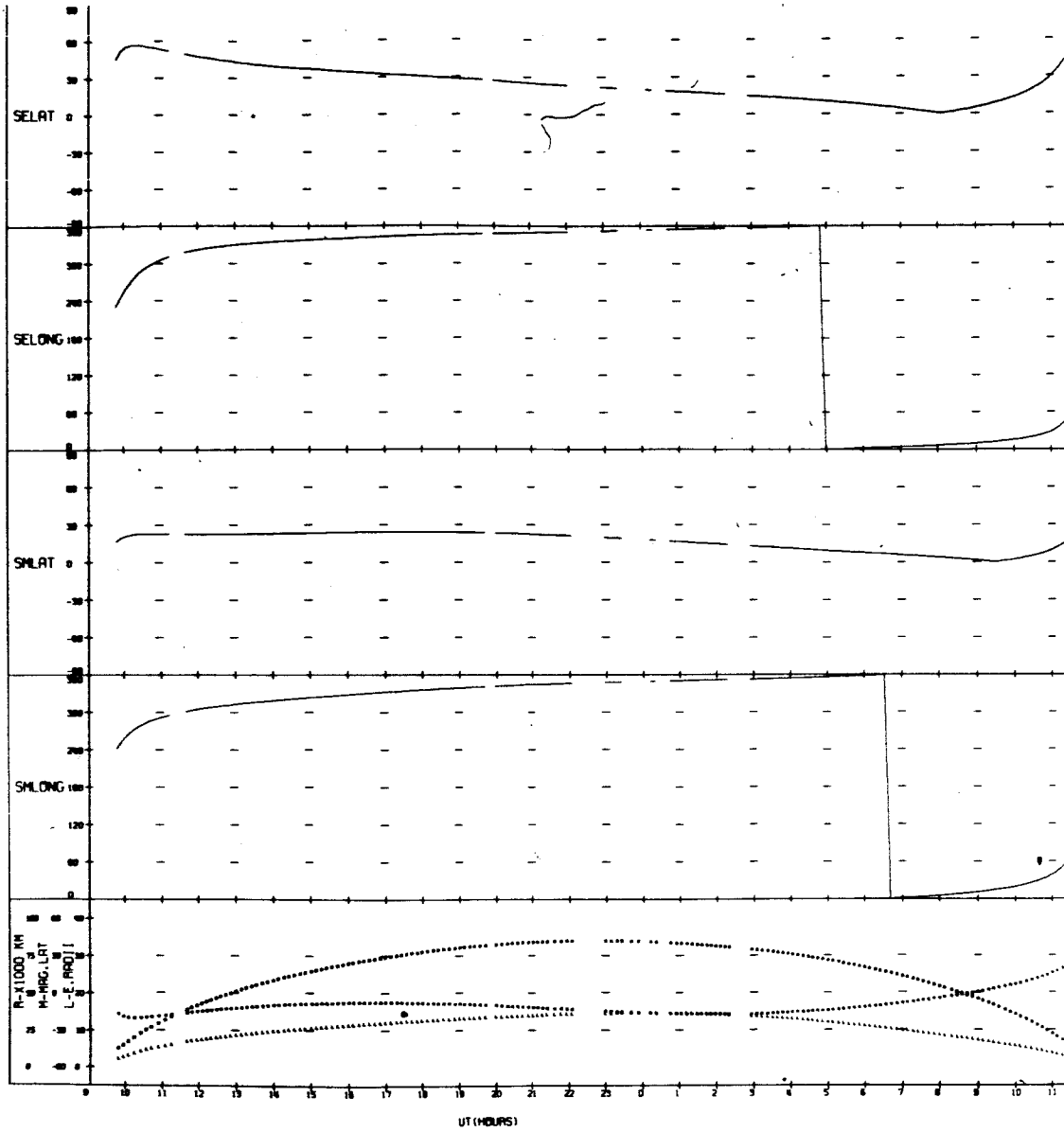


UNIVERSITY OF IOWA

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UNIVERSITY OF IOWA
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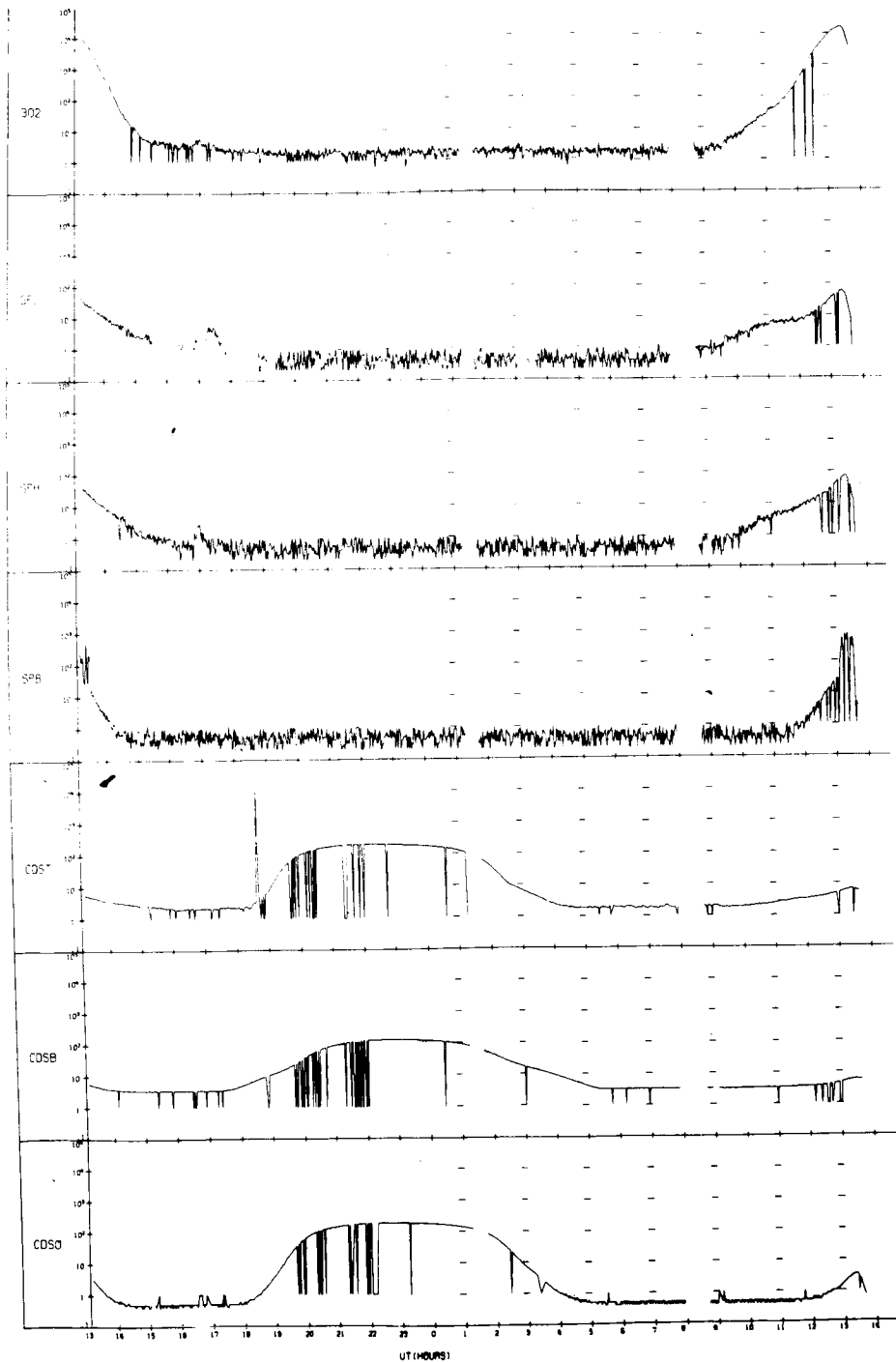


UNIVERSITY OF IOWA

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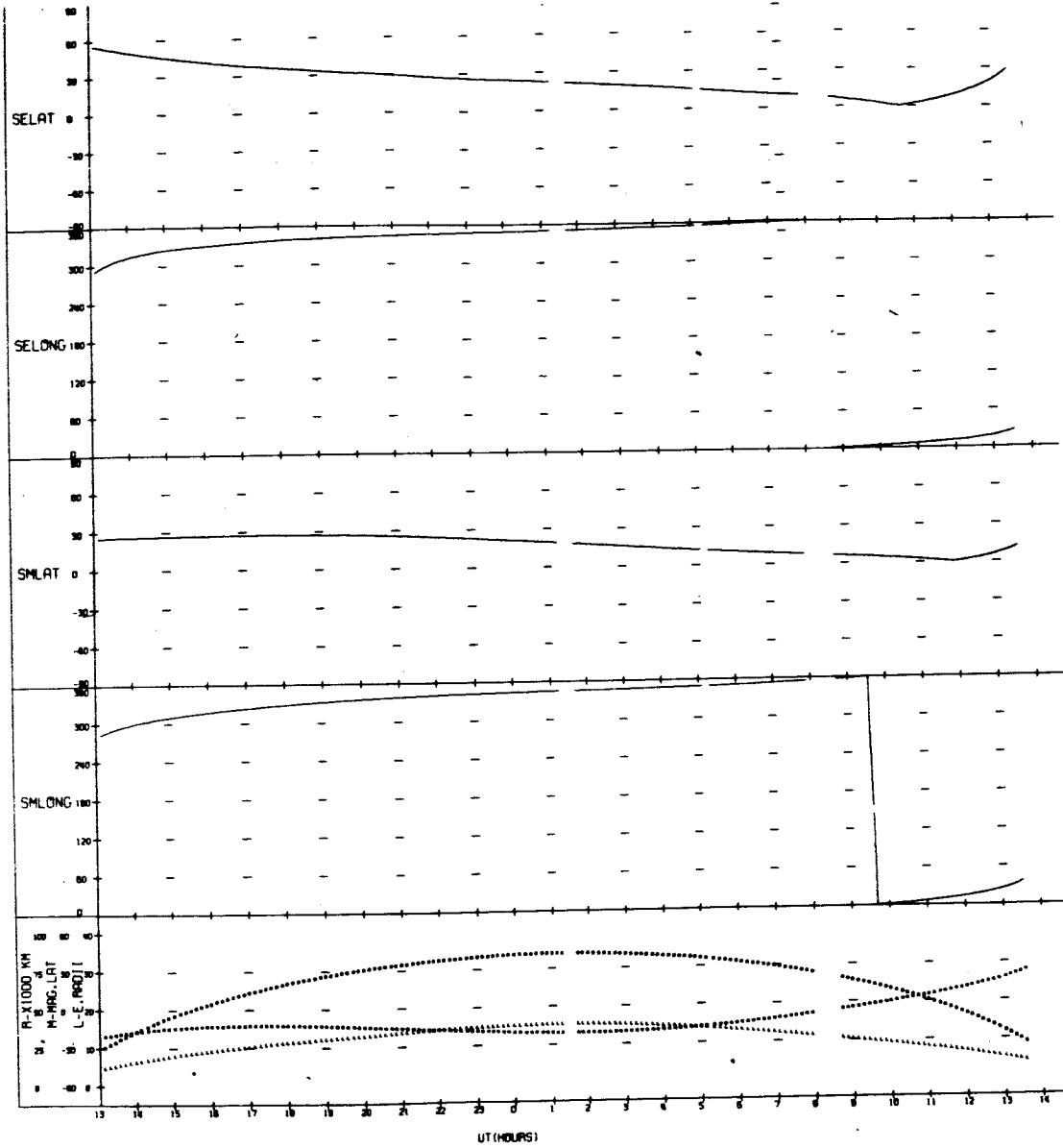
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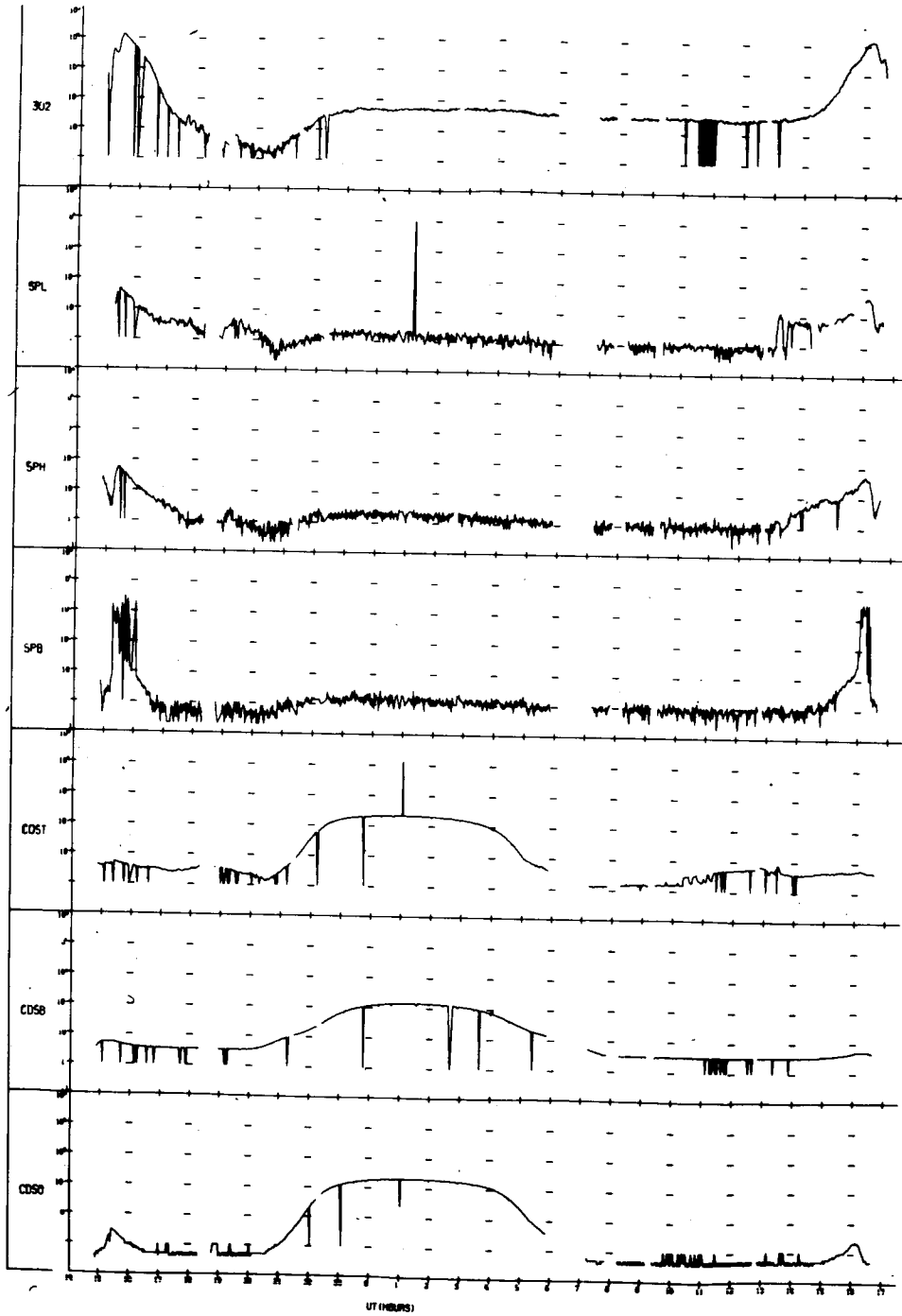


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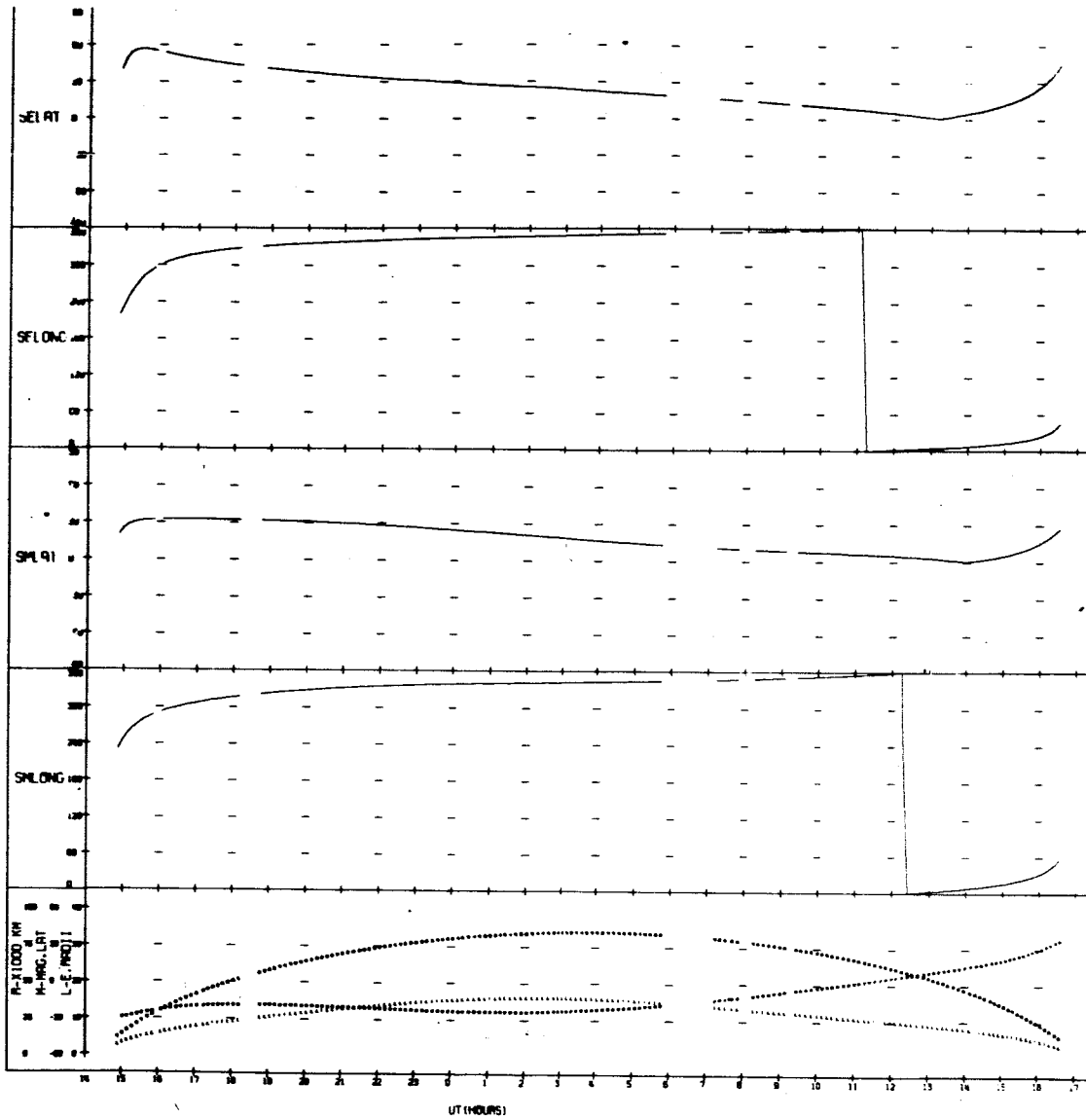
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BEGIN 9/09/61/13:09
END 9/10/61/14:43



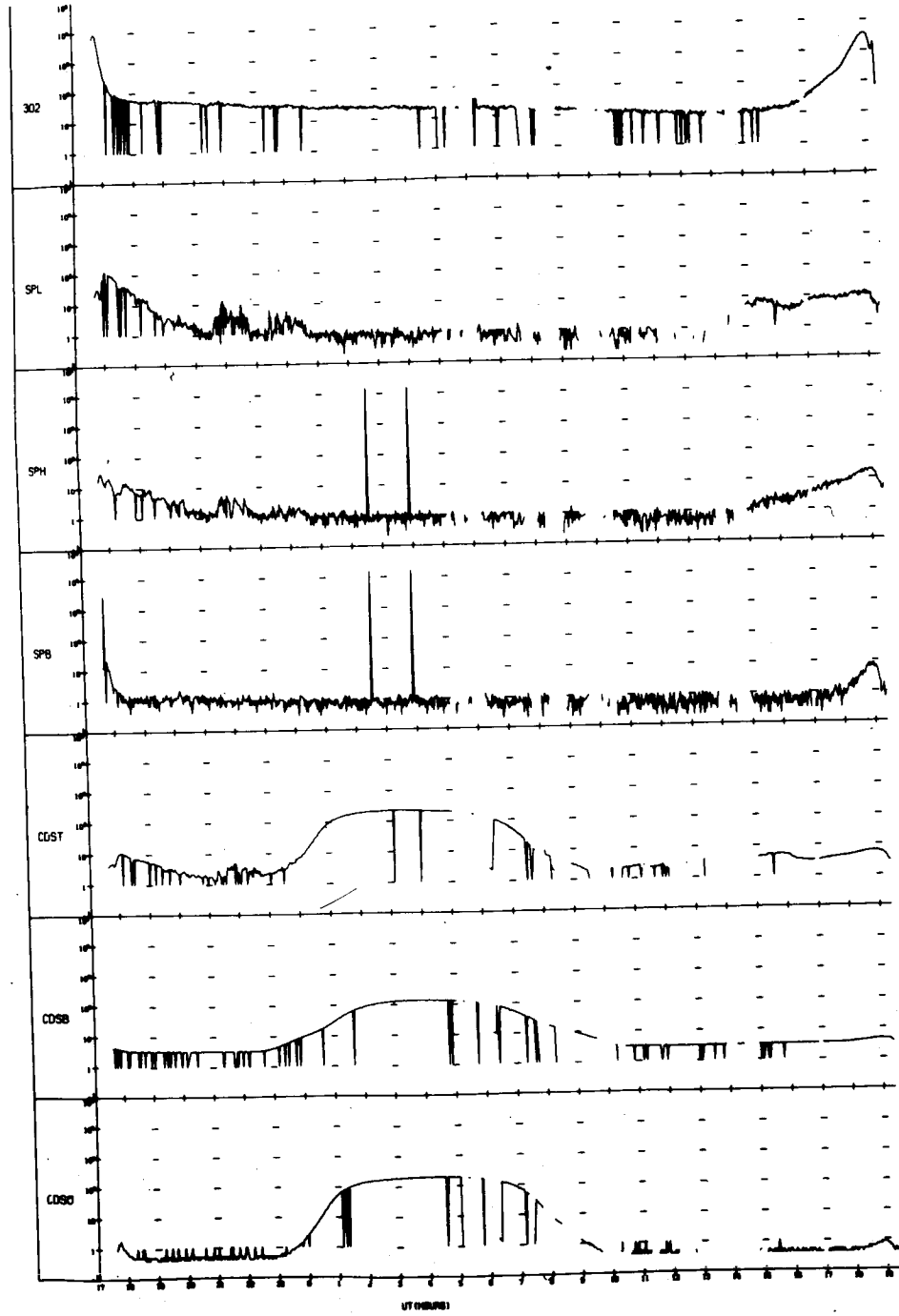
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 24
REGIN 9/10/61/14:51
END 9/11/61/17:31



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 24
BEGIN 9/10/61/14:51
END 9/11/61/17:31

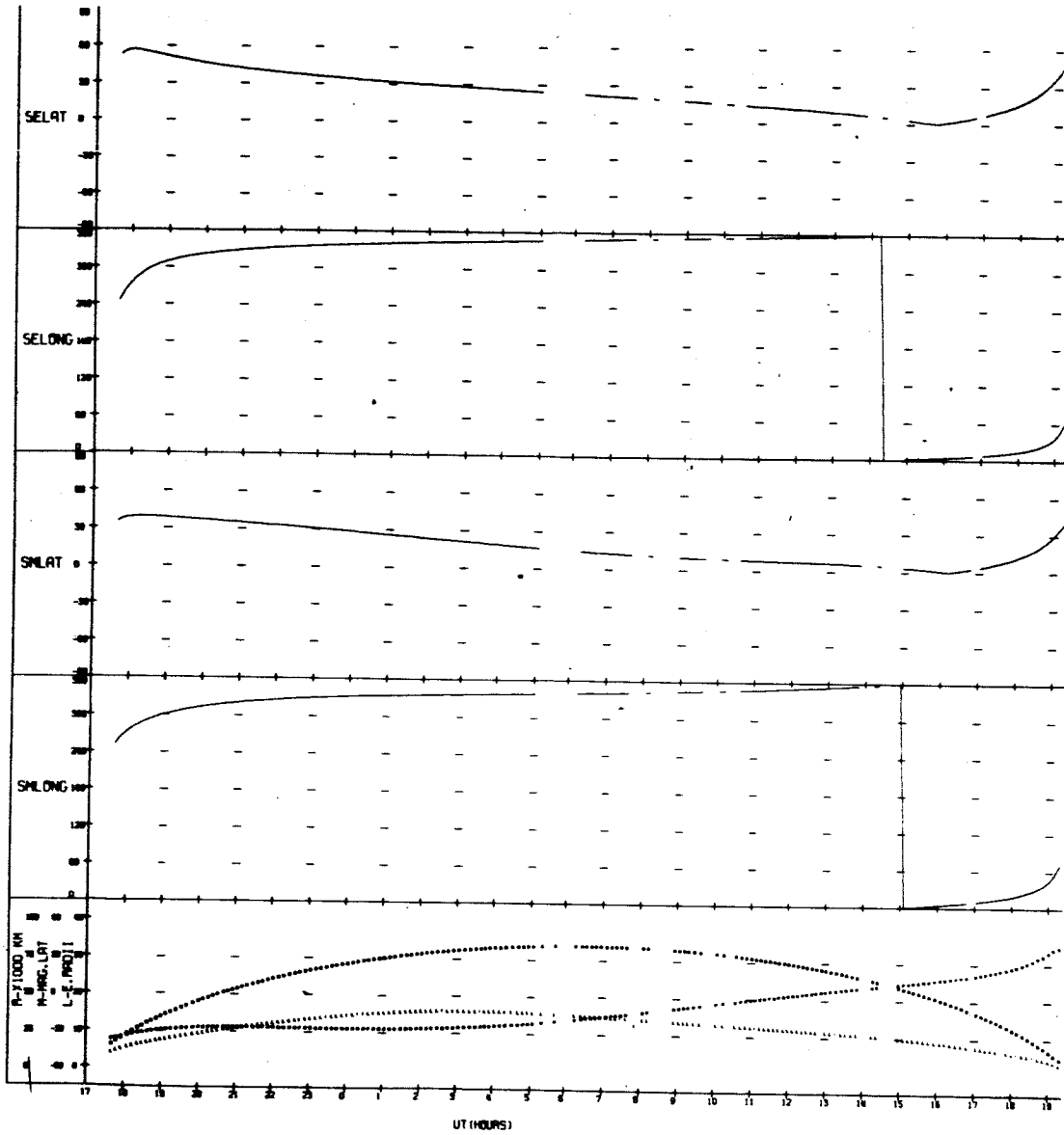


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 25
BEGIN 9/11/61/17:39
END 9/12/61/19:23

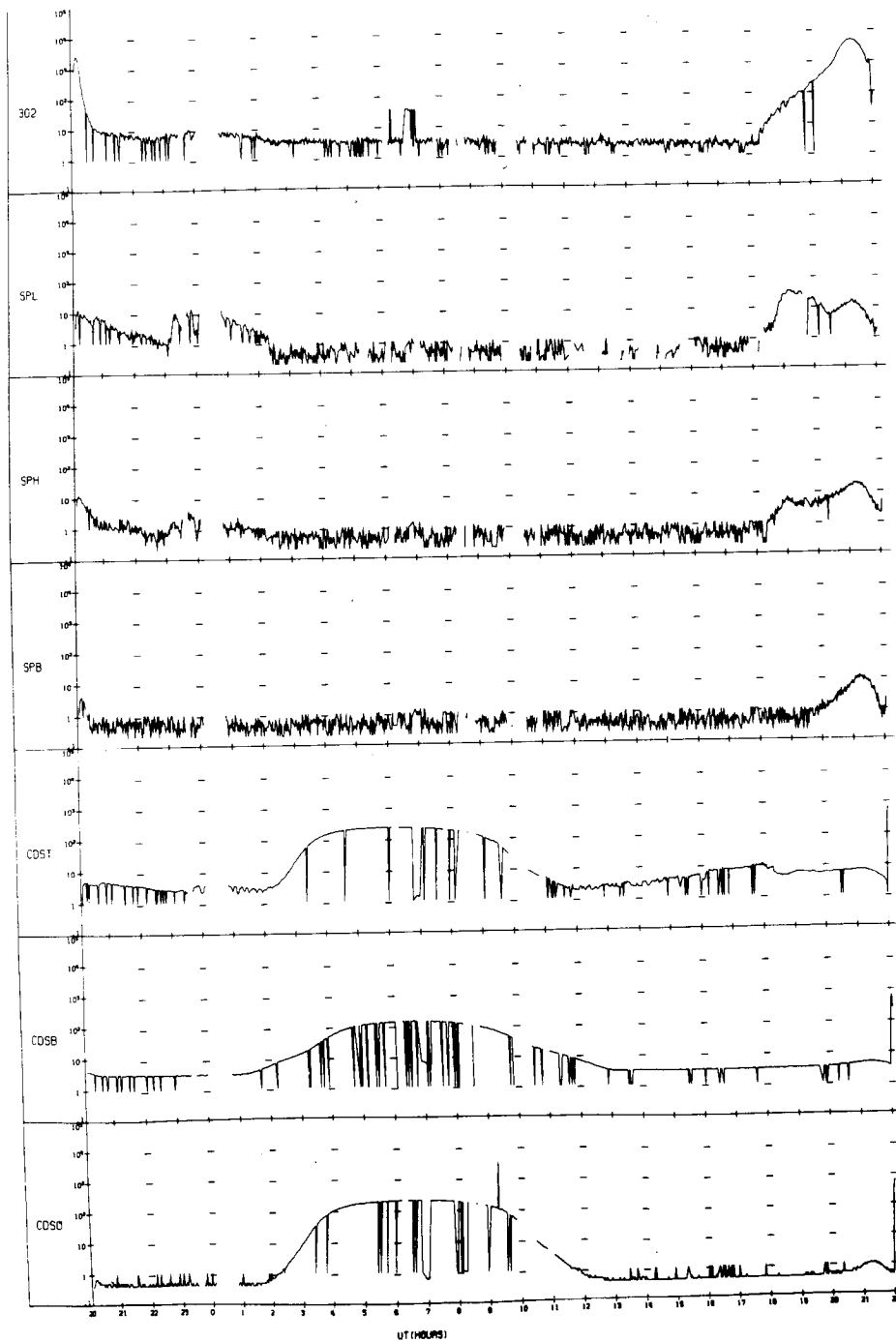


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 25
BEGIN 9/11/61/17:39
END 9/12/61/19:23



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 26
BEGIN 9/12/61/20:05
END 9/13/61/22:20

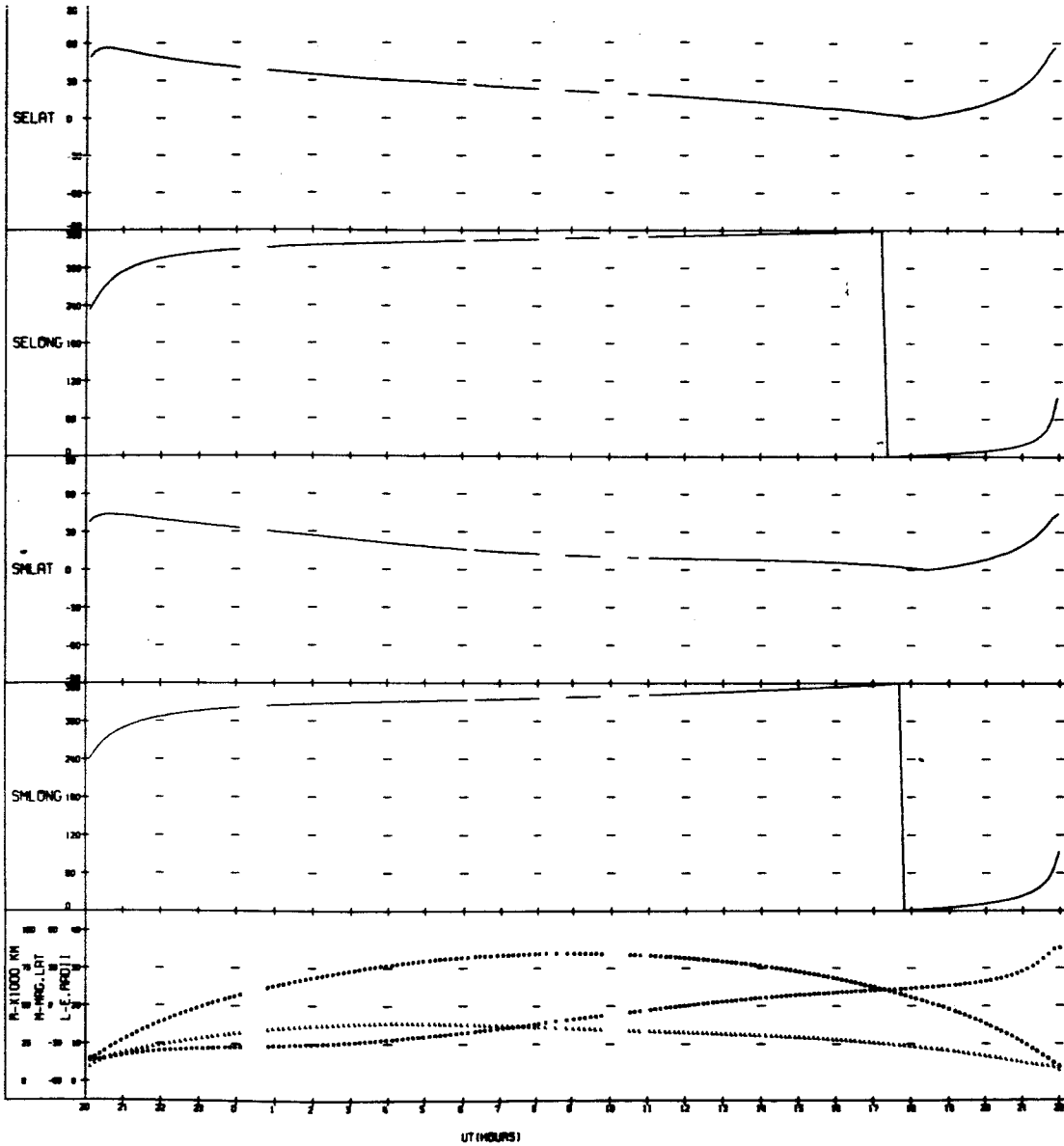


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 26

BEGIN 9/12/61/20:05

END 9/13/61/22:20

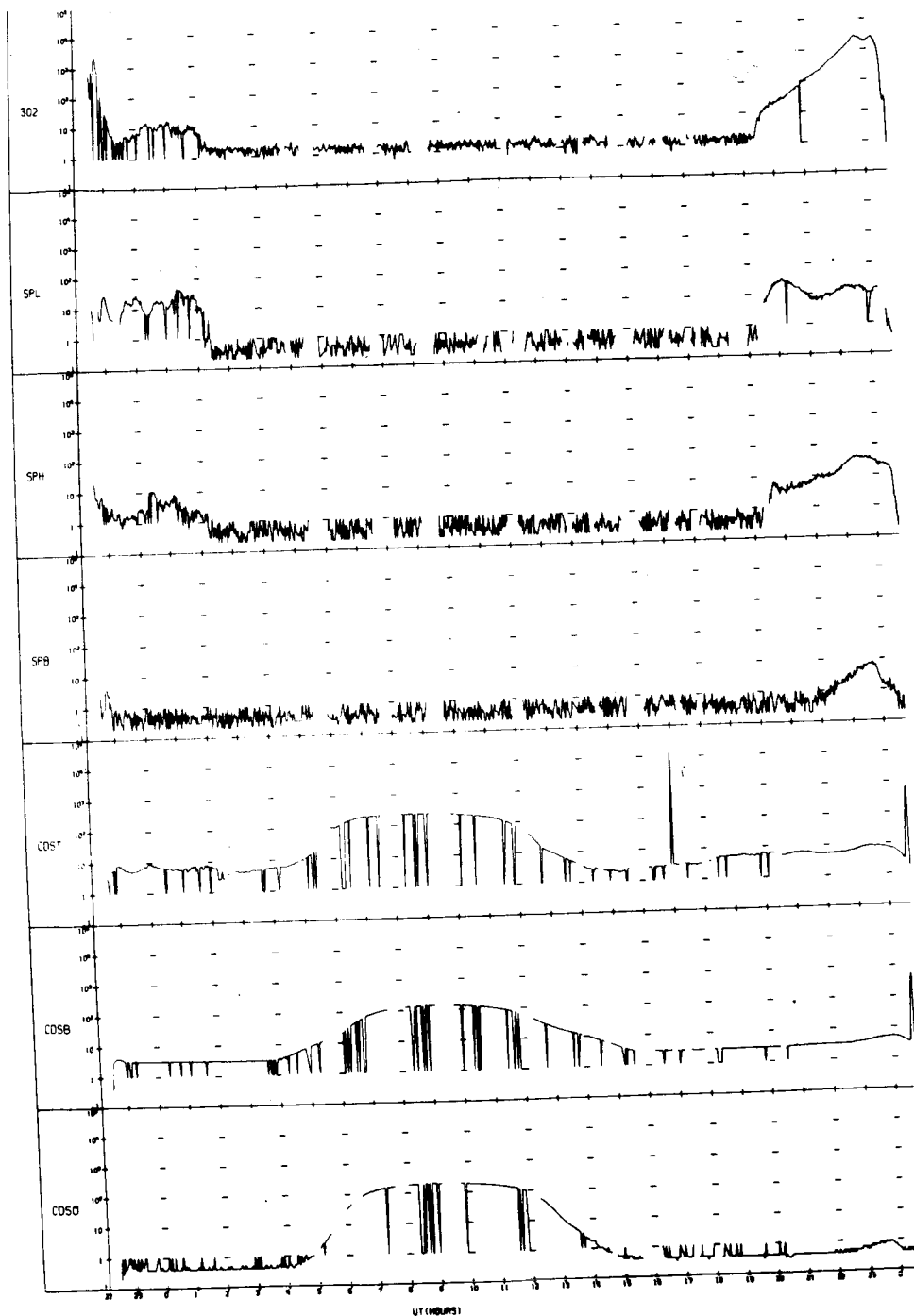


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 27

BEGIN 9/13/61/22:29

END 9/15/61/00:42

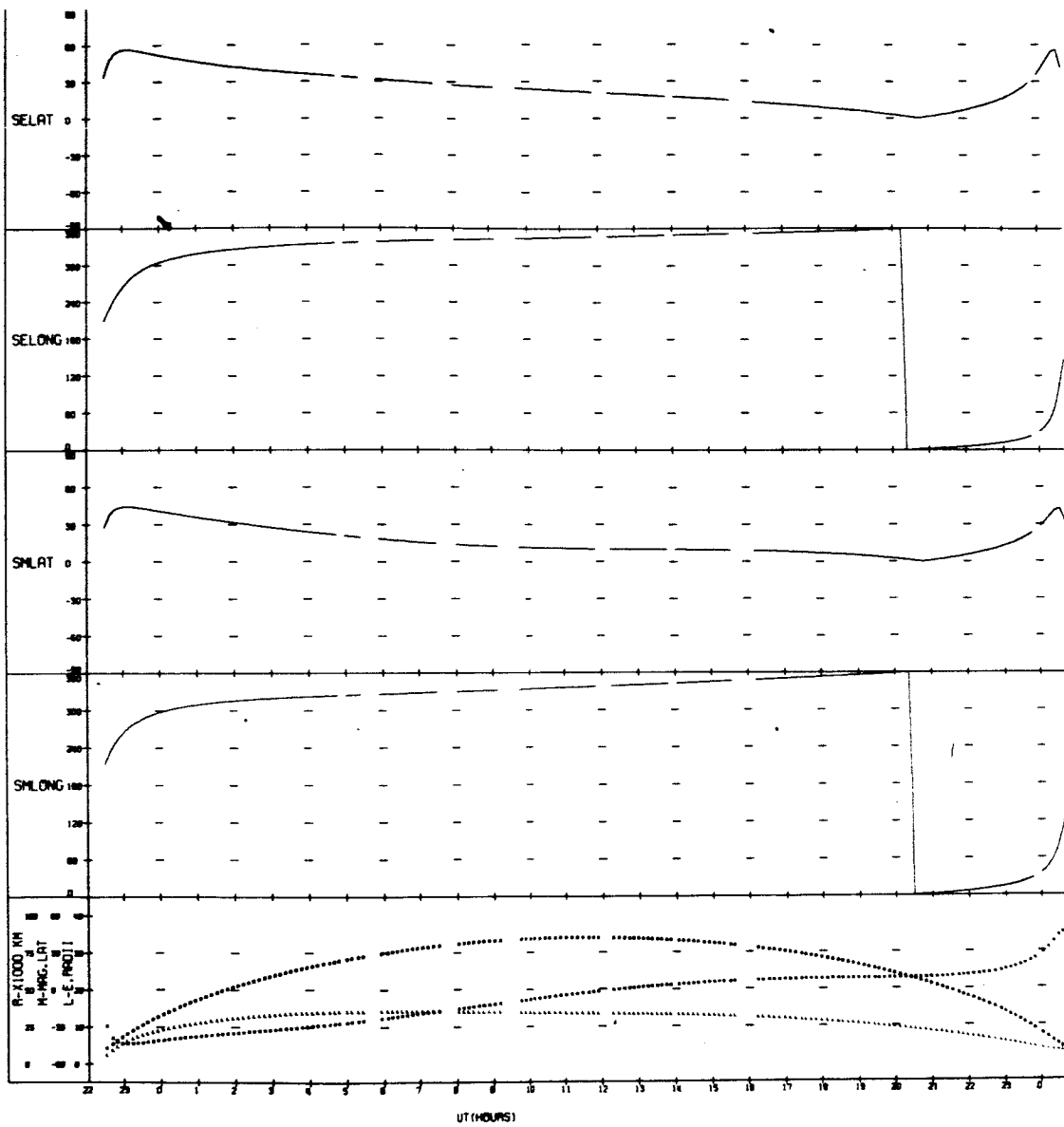


UNIVERSITY OF IOWA

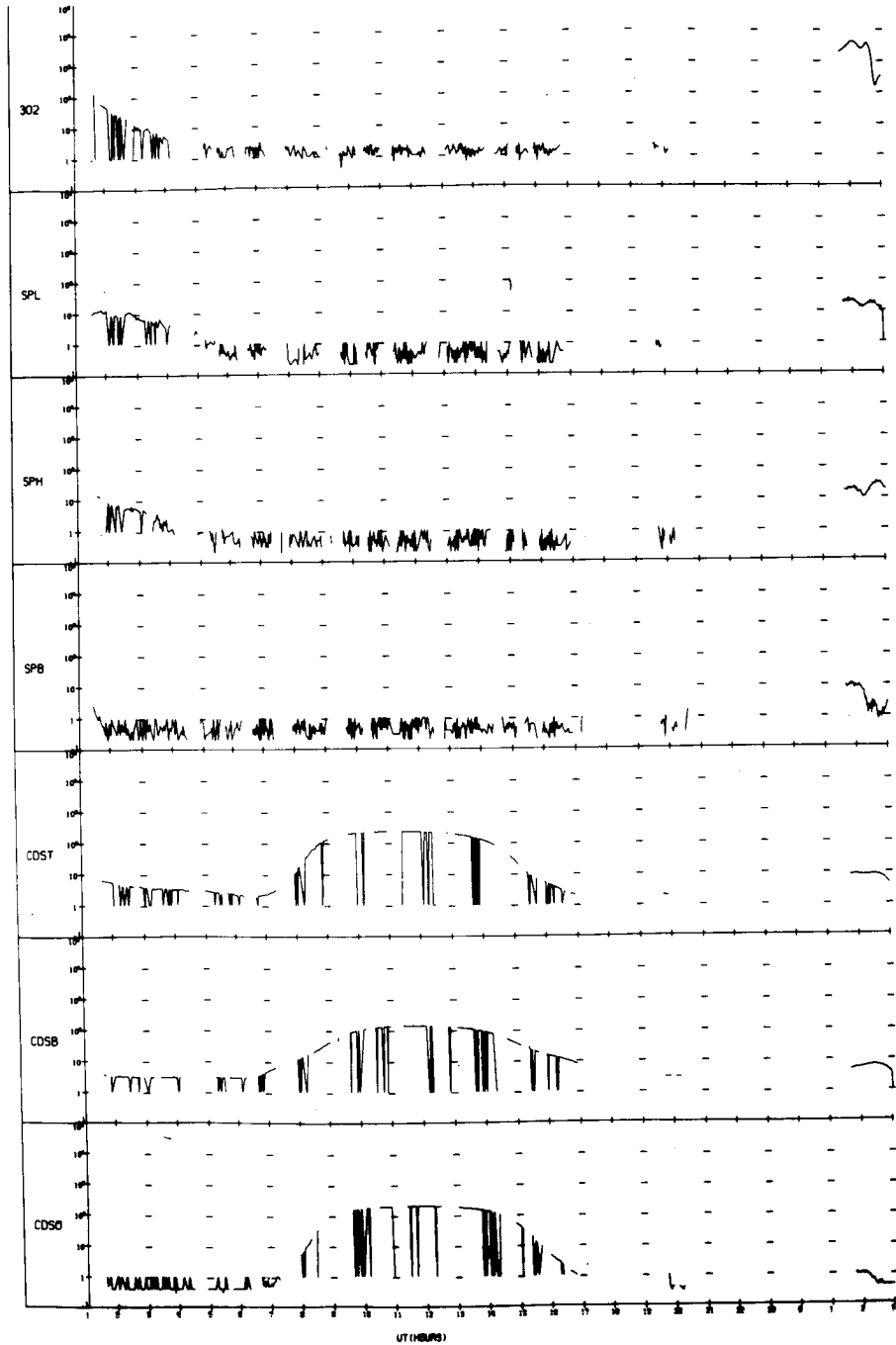
EXPLORER 12 ORBIT 27

BEGIN 9/13/61/22:29

END 9/15/61/00:42



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 28
BEGIN 9/15/61/01:29
END 9/16/61/03:02

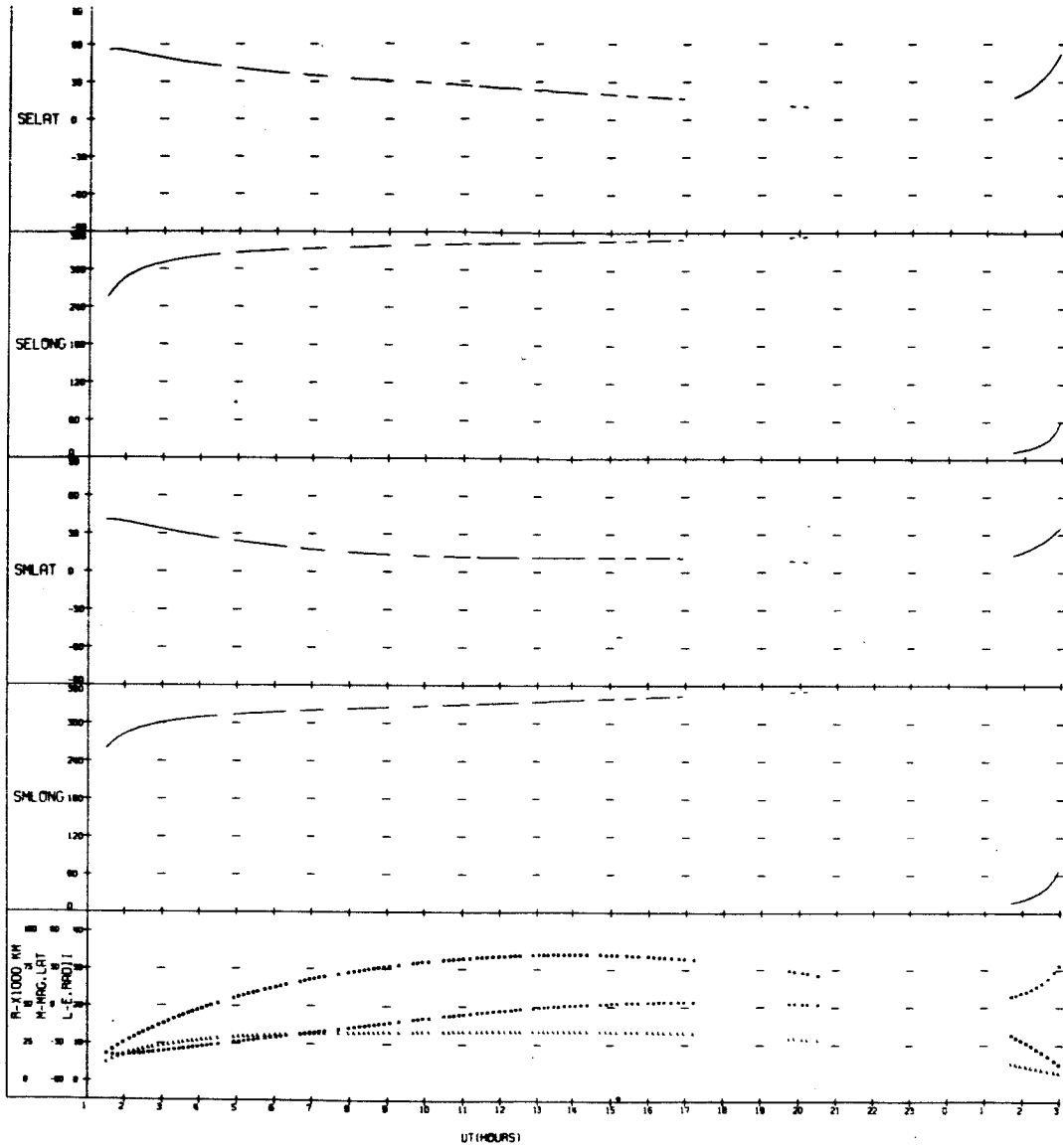


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 28

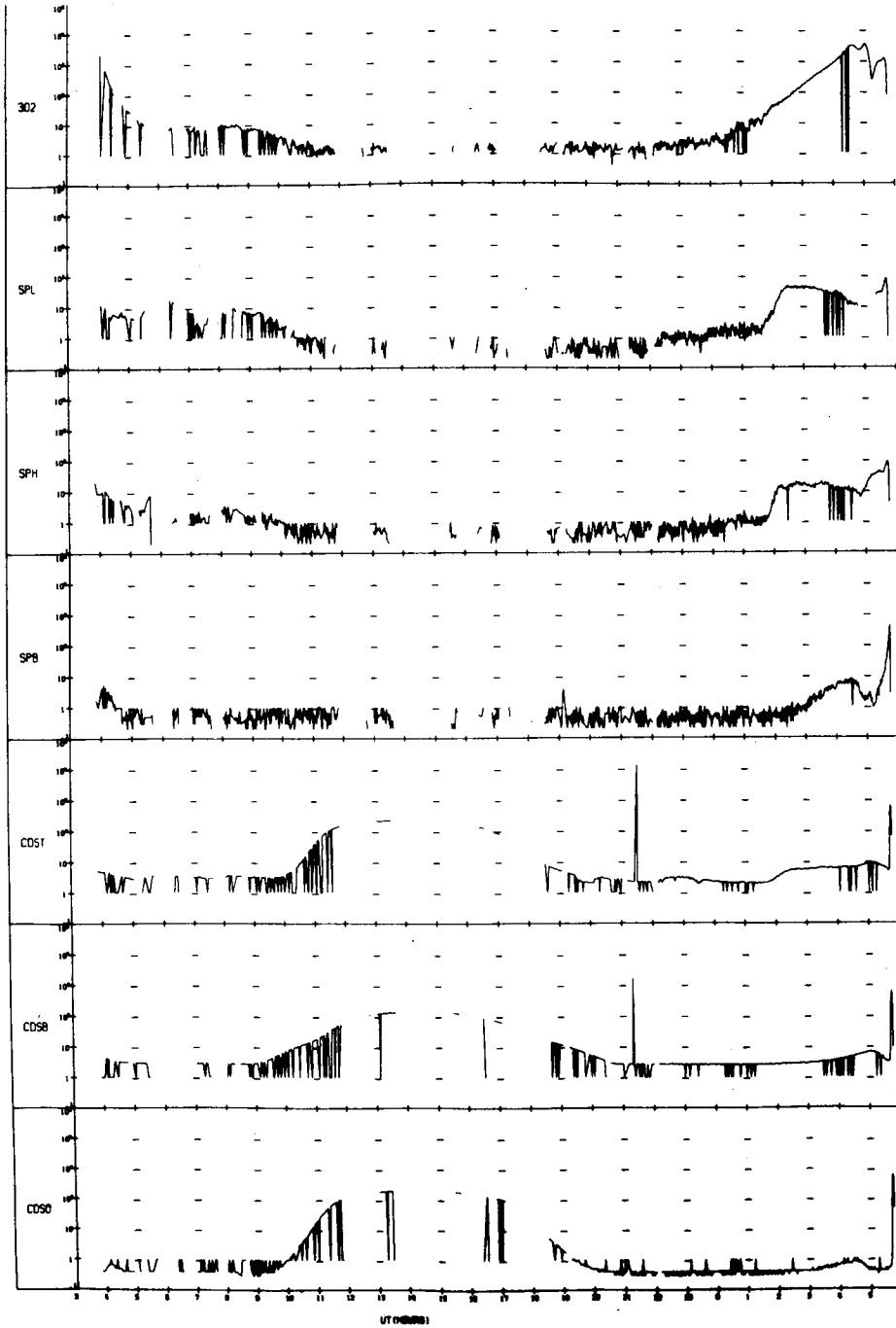
BEGIN 9/15/61/01:29

END 9/16/61/03:02



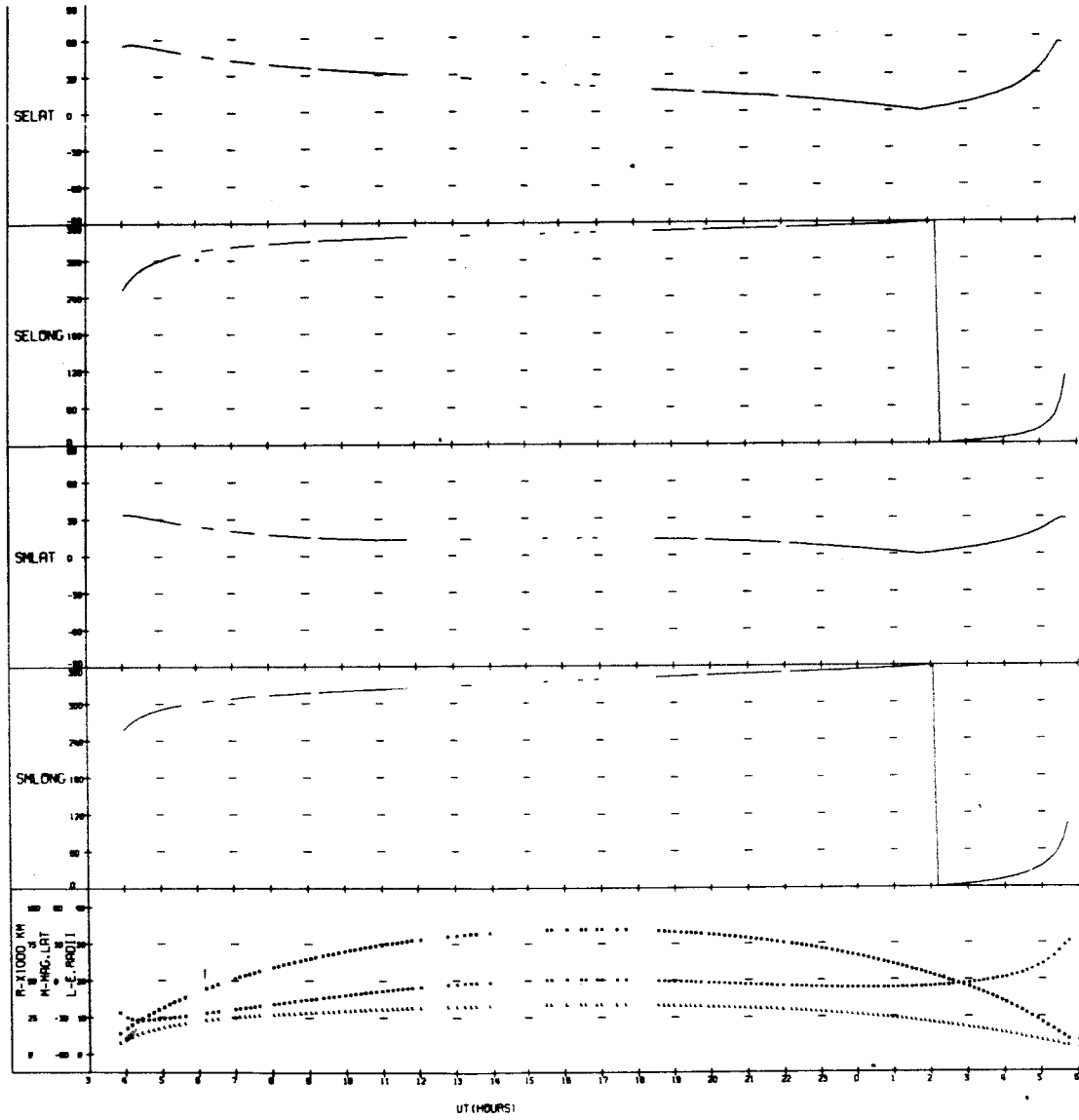
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 29
BEGIN 9/16/61/03:49
END 9/17/61/06:01

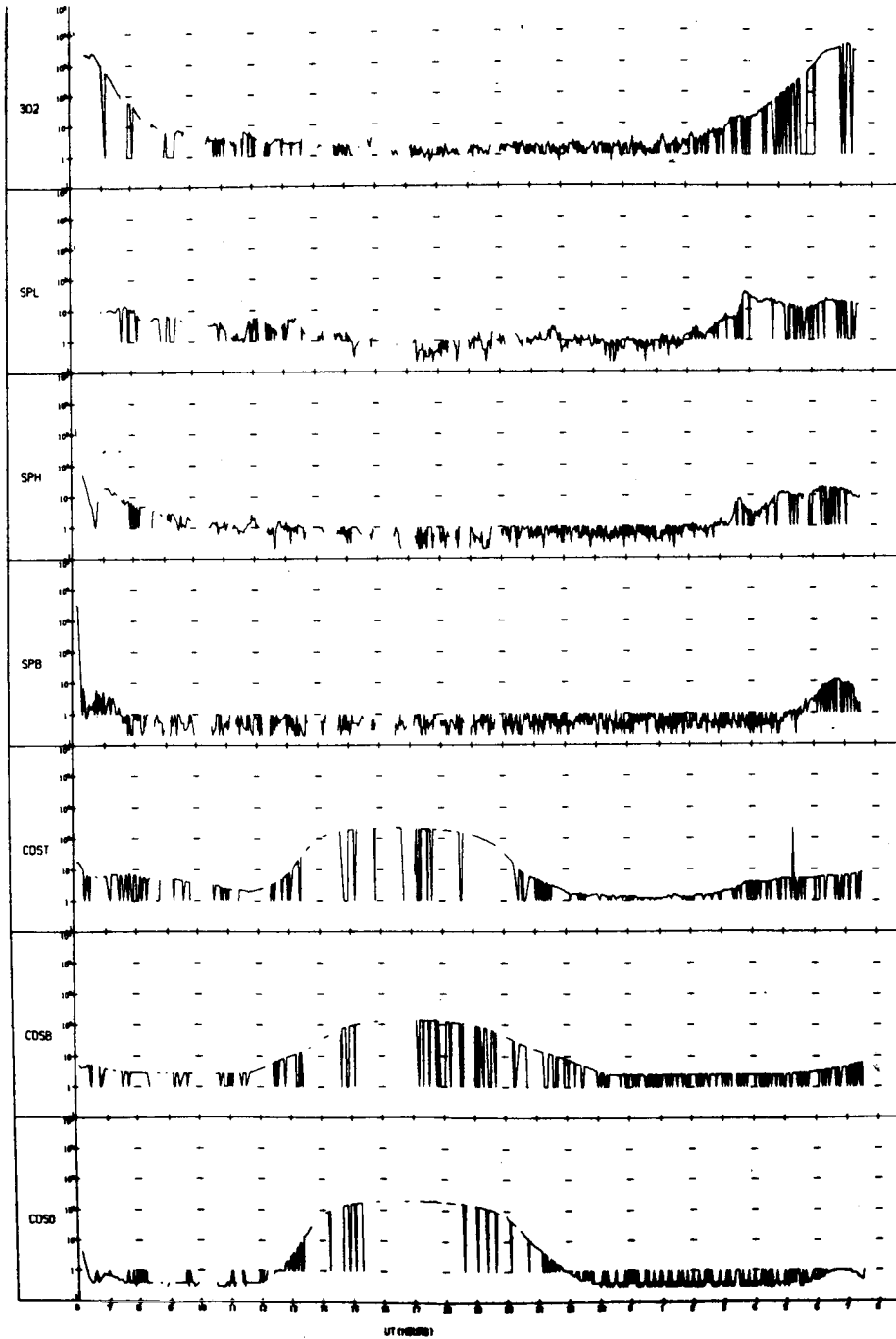


UNIVERSITY OF IOWA

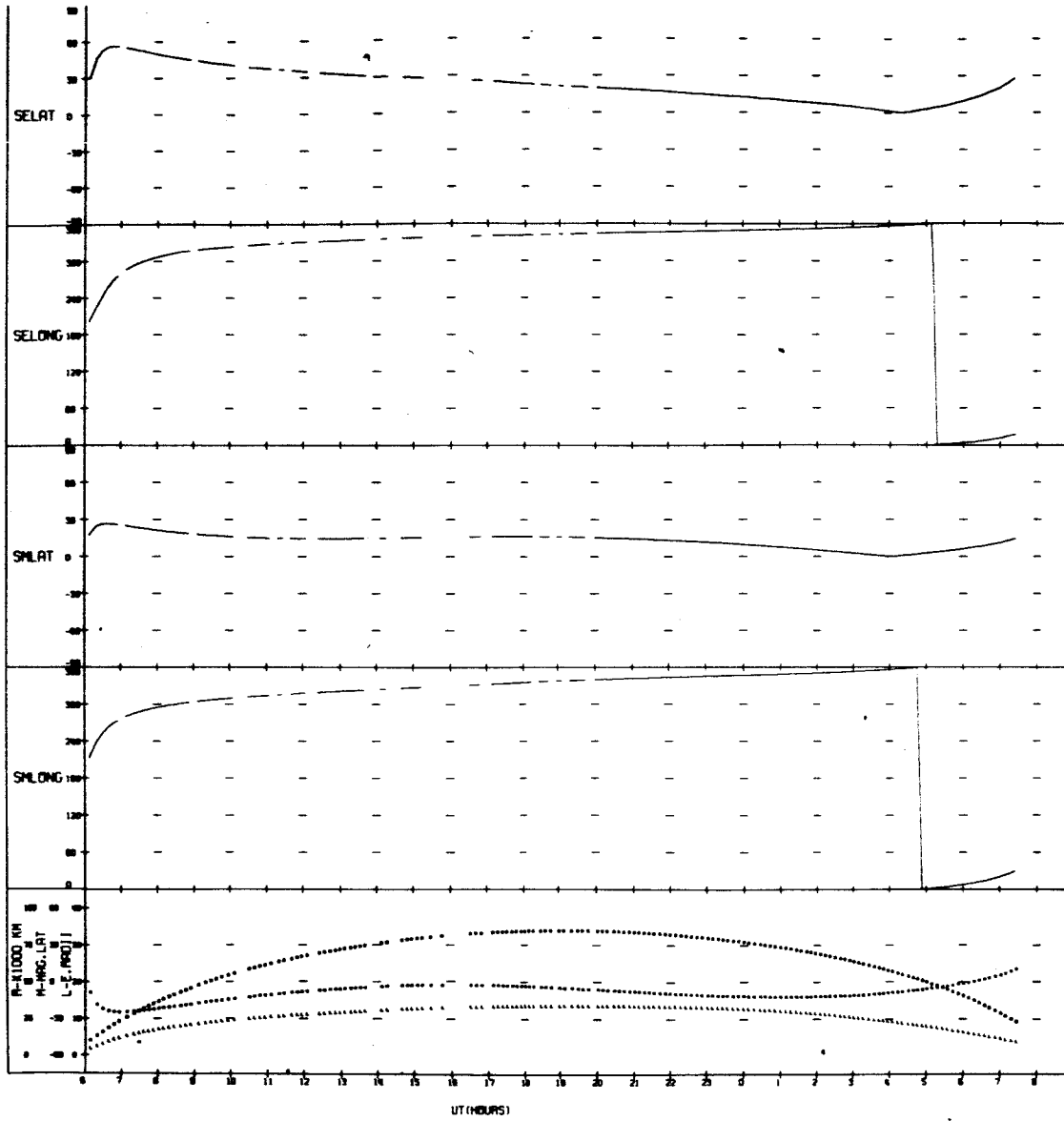
EXPLORER 12 ORBIT 29
BEGIN 9/16/61/03:49
END 9/17/61/06:01



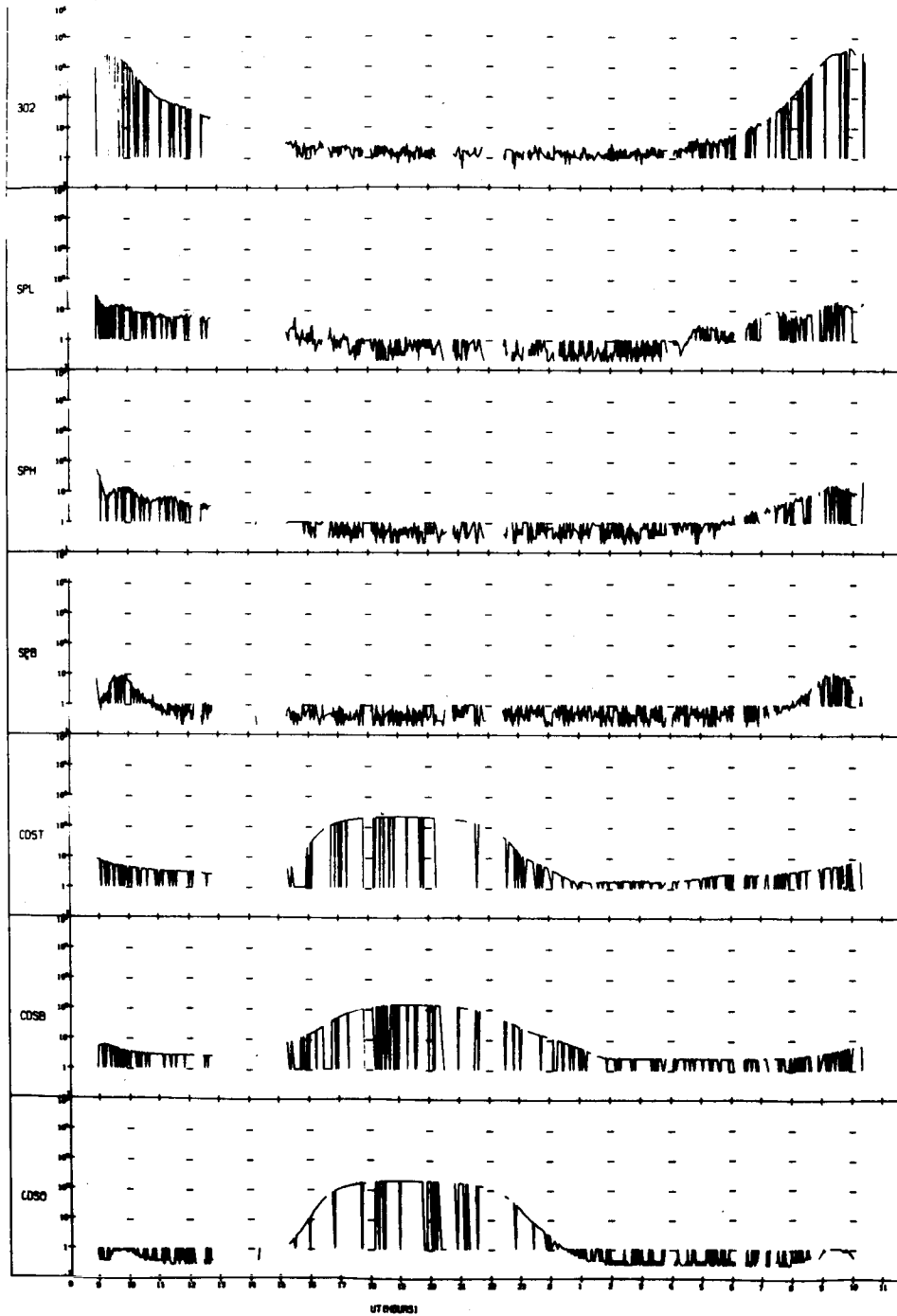
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 30
BEGIN 9/17/61/06:07
END 9/18/61/08:53



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 30
 BEGIN 9/17/61/06:07
 END 9/18/61/08:53

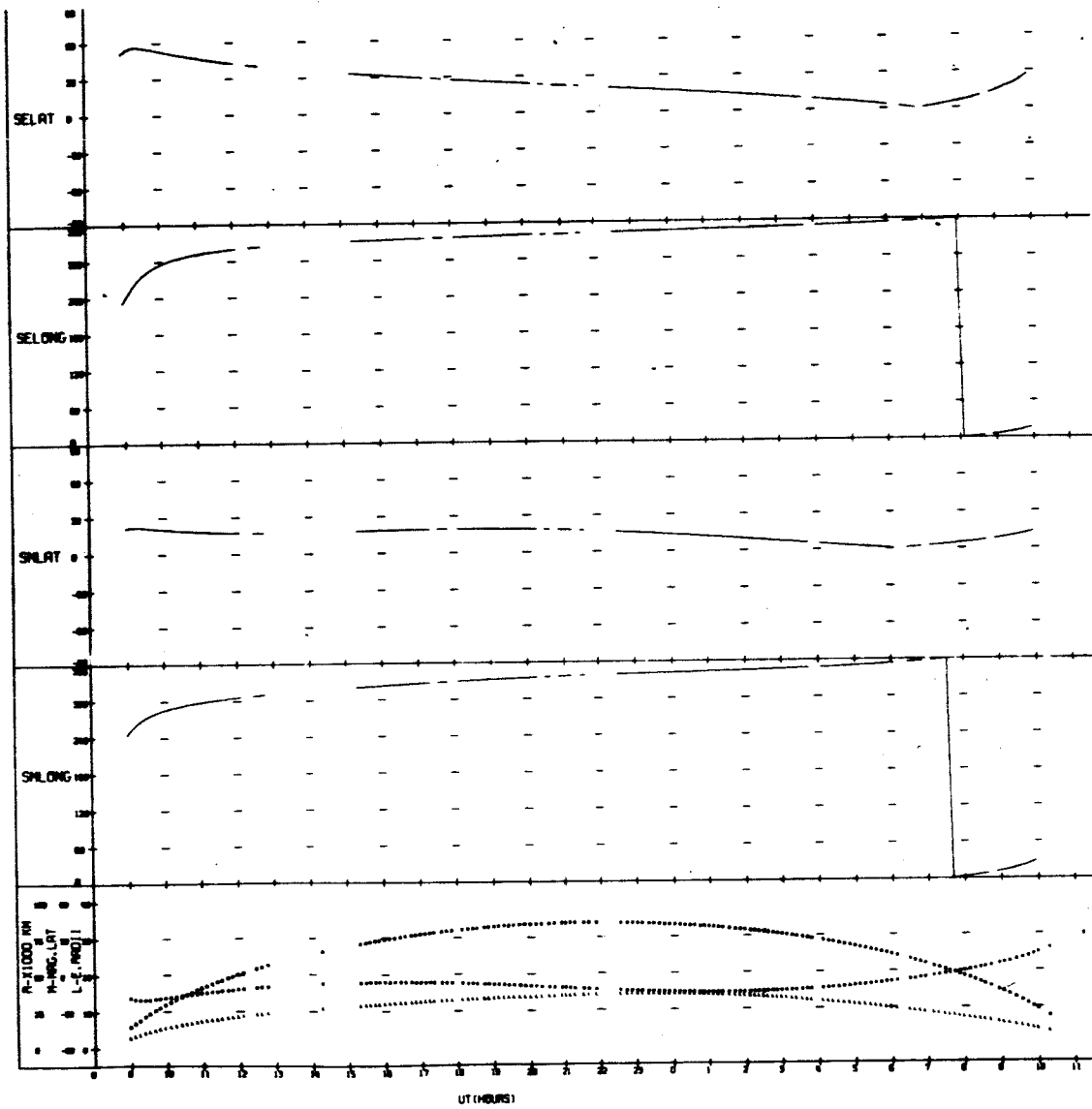


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 31
BEGIN 9/18/61/08:57
END 9/19/61/11:39

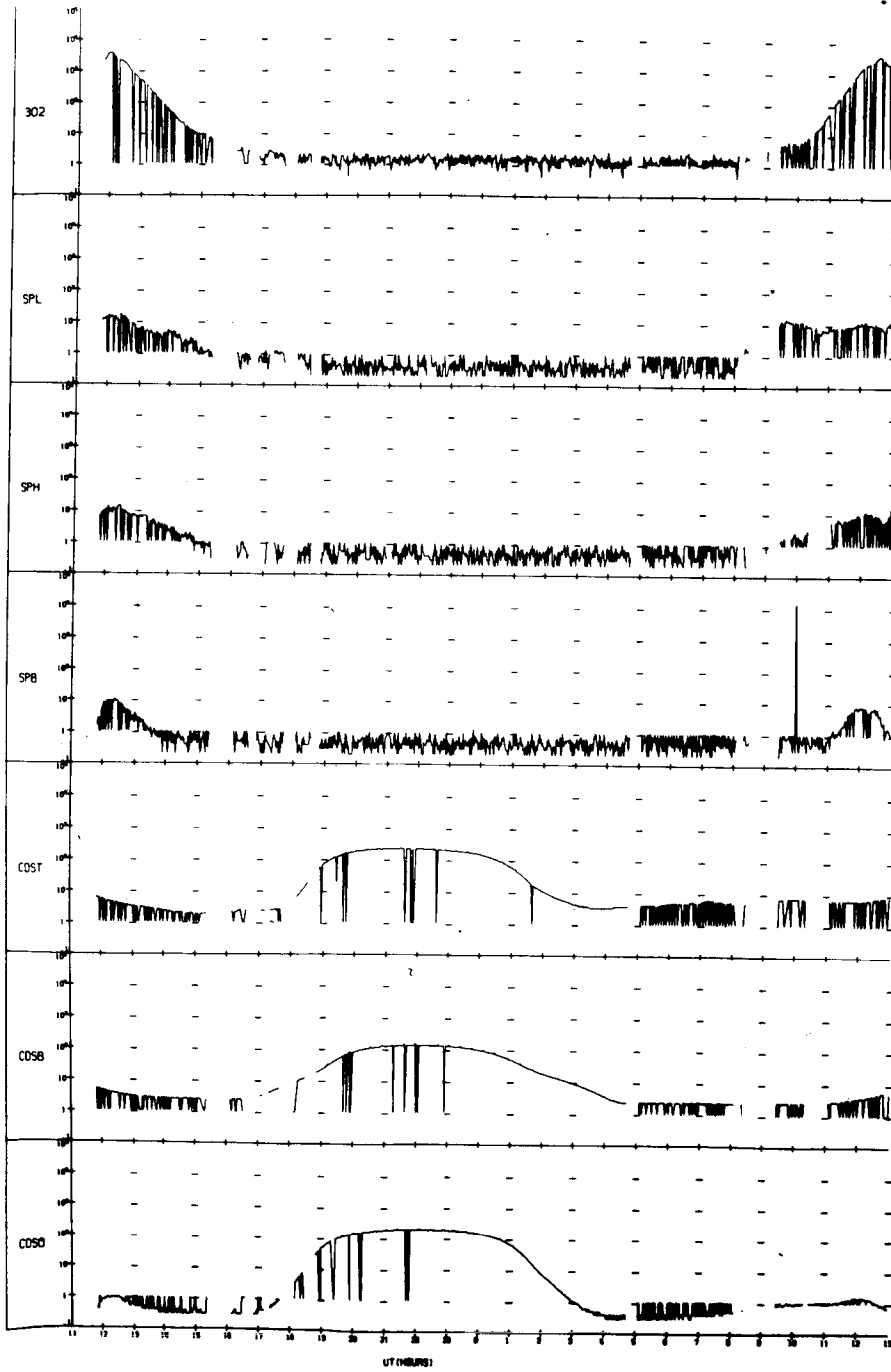


UNIVERSITY OF IOWA

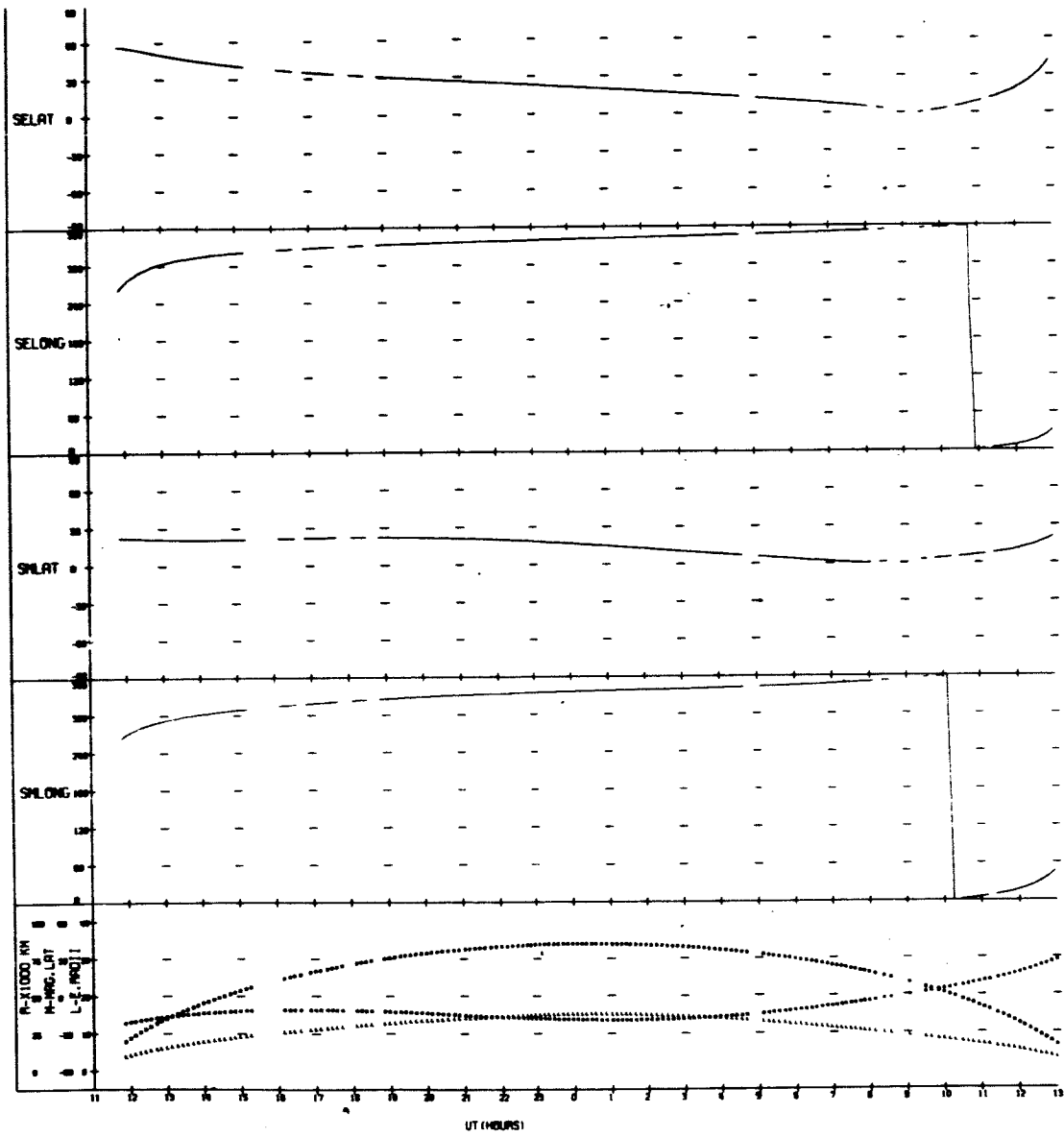
EXPLORER 12 ORBIT 31
BEGIN 9/18/61/08:57
END 9/19/61/11:39



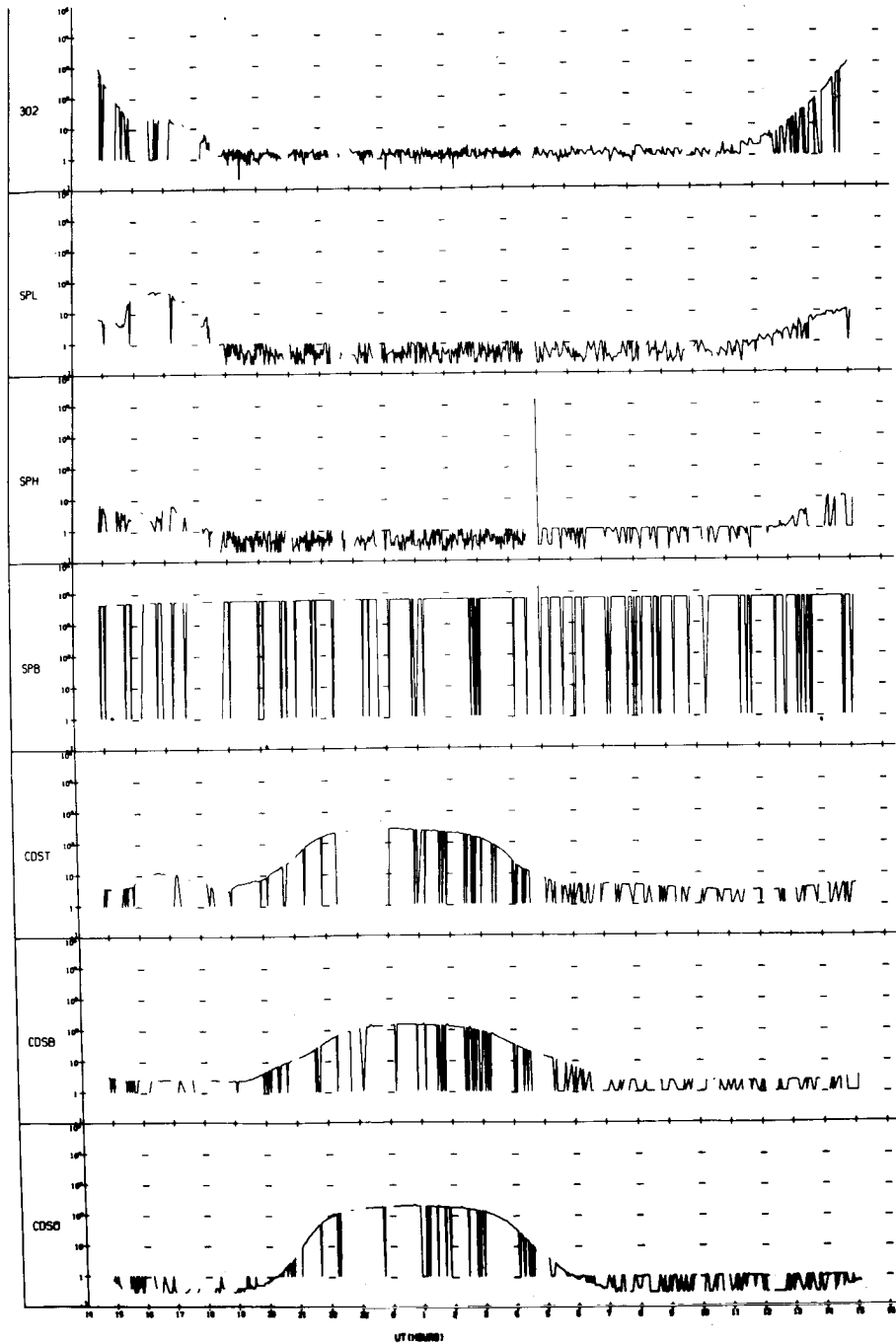
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 32
BEGIN 9/19/61/11:47
END 9/20/61/13:00



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 32
 BEGIN 9/19/61/11:47
 END 9/20/61/13:00

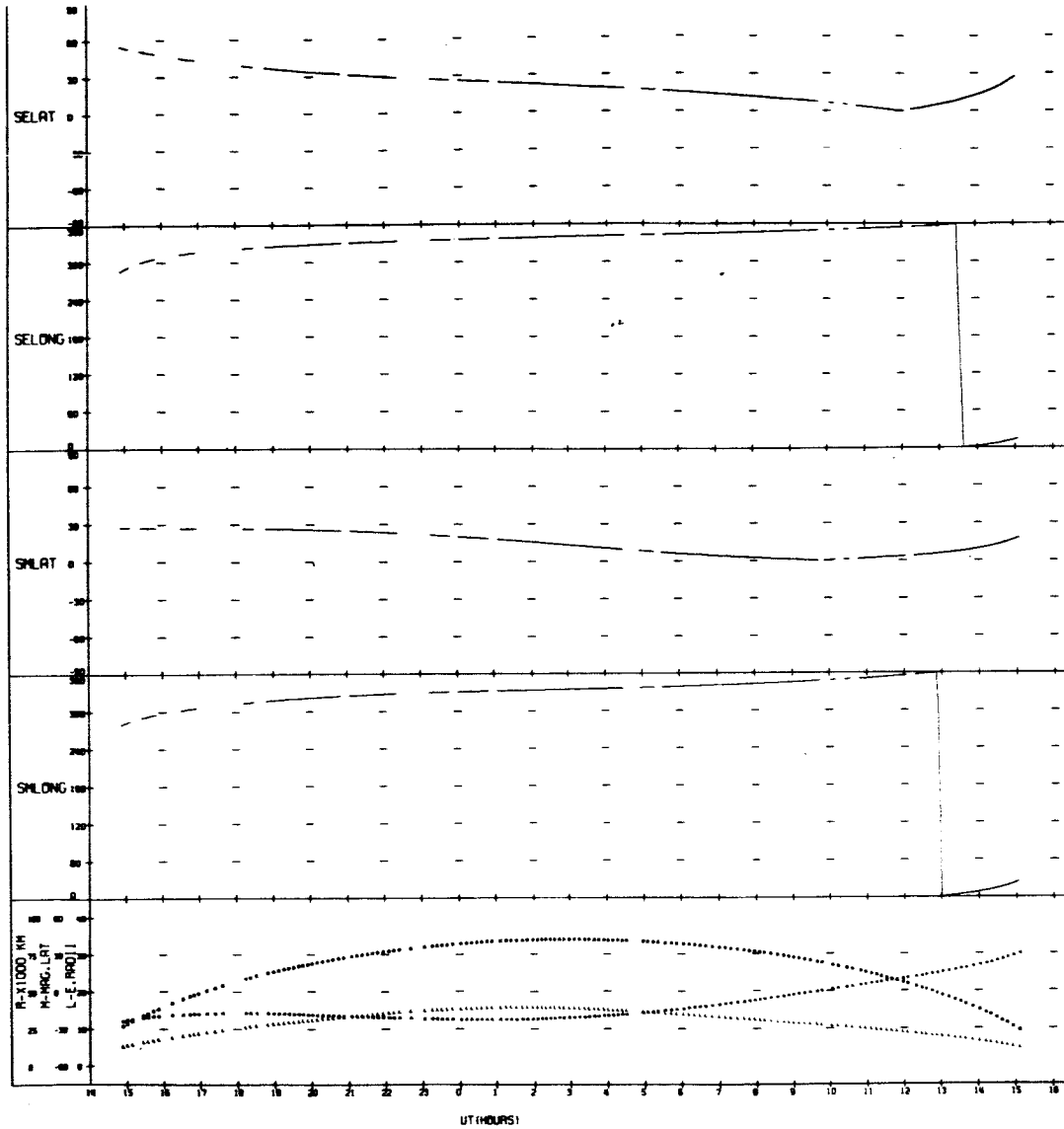


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 33
BEGIN 9/20/61/14:52
END 9/21/61/16:25

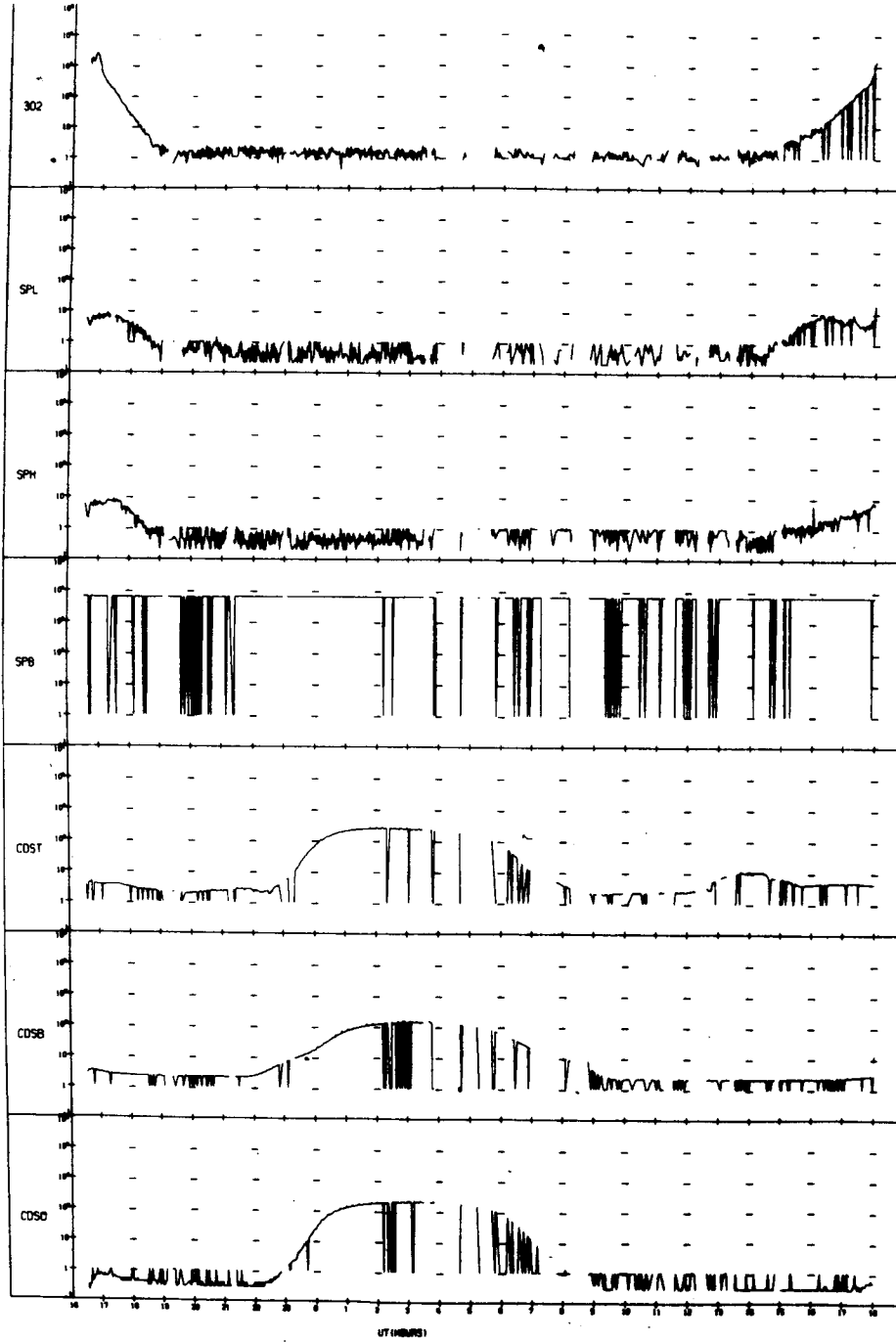


UNIVERSITY OF IOWA

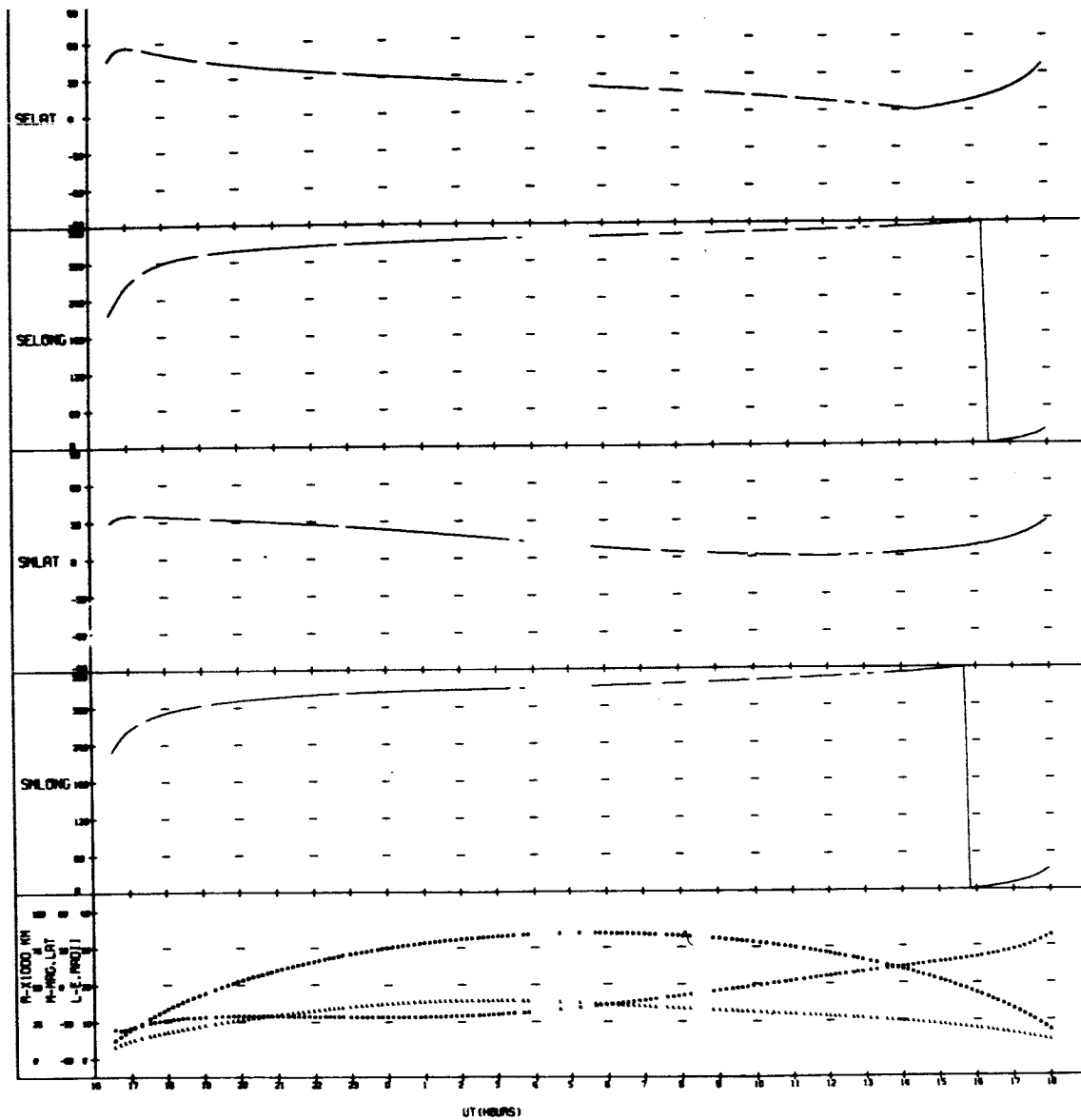
EXPLORER 12 ORBIT 33
BEGIN 9/20/61/14:52
END 9/21/61/16:25



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 34
BEGIN 9/21/61/16:32
END 9/22/61/18:58



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 34
 BEGIN 9/21/61/16:32
 END 9/22/61/18:58

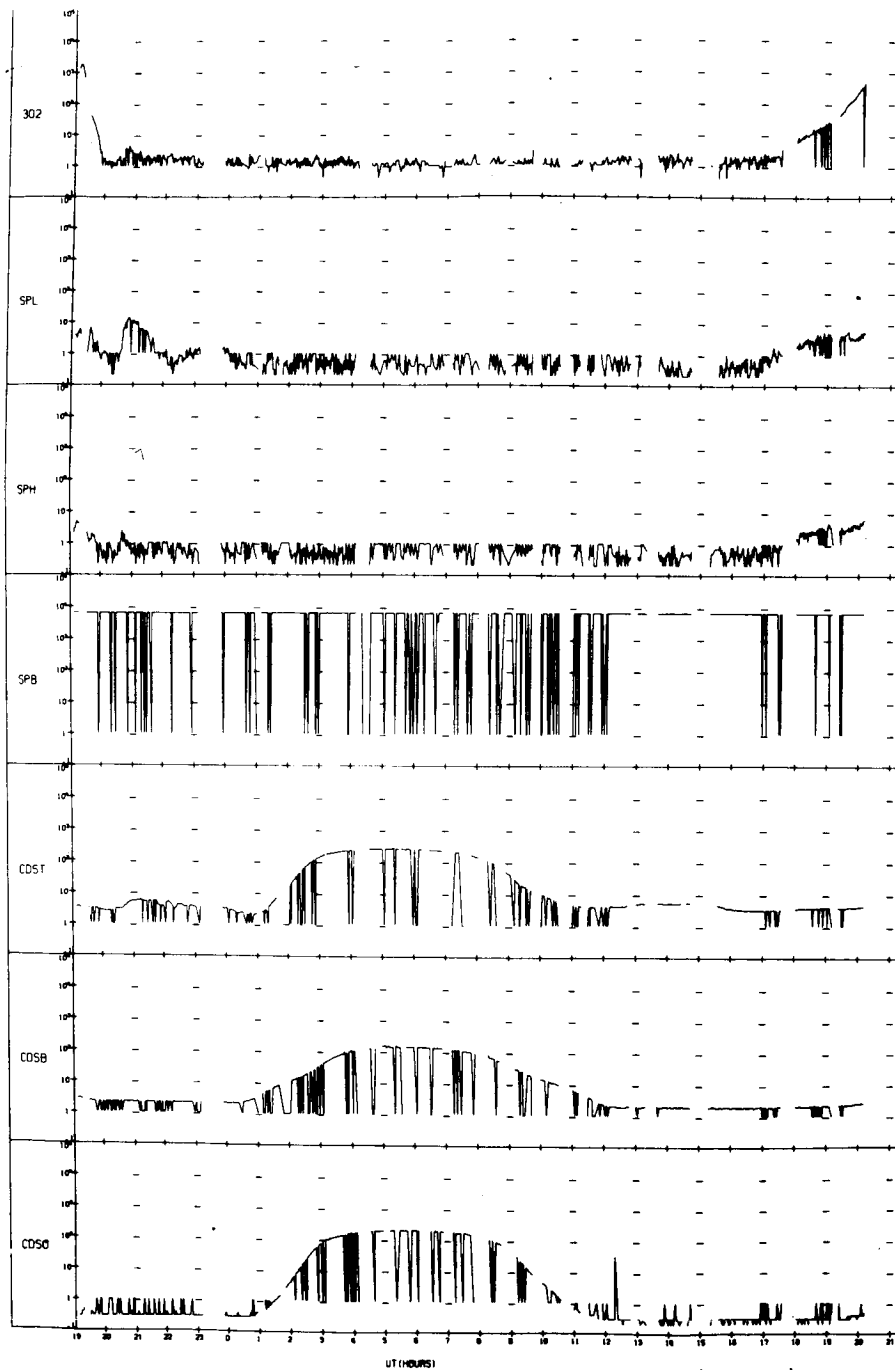


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 35

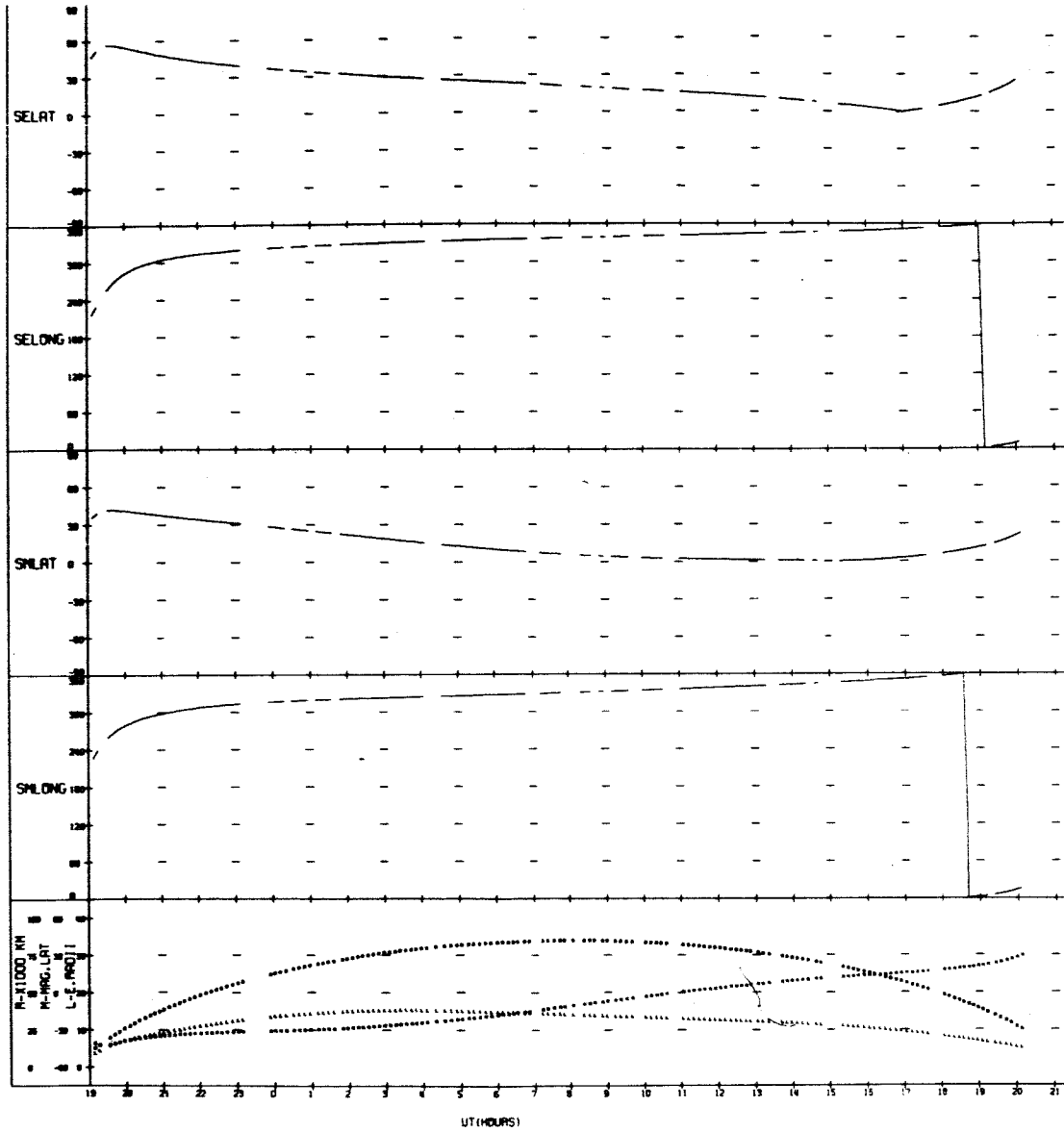
BEGIN 9/22/61/19:05

END 9/23/61/21:22

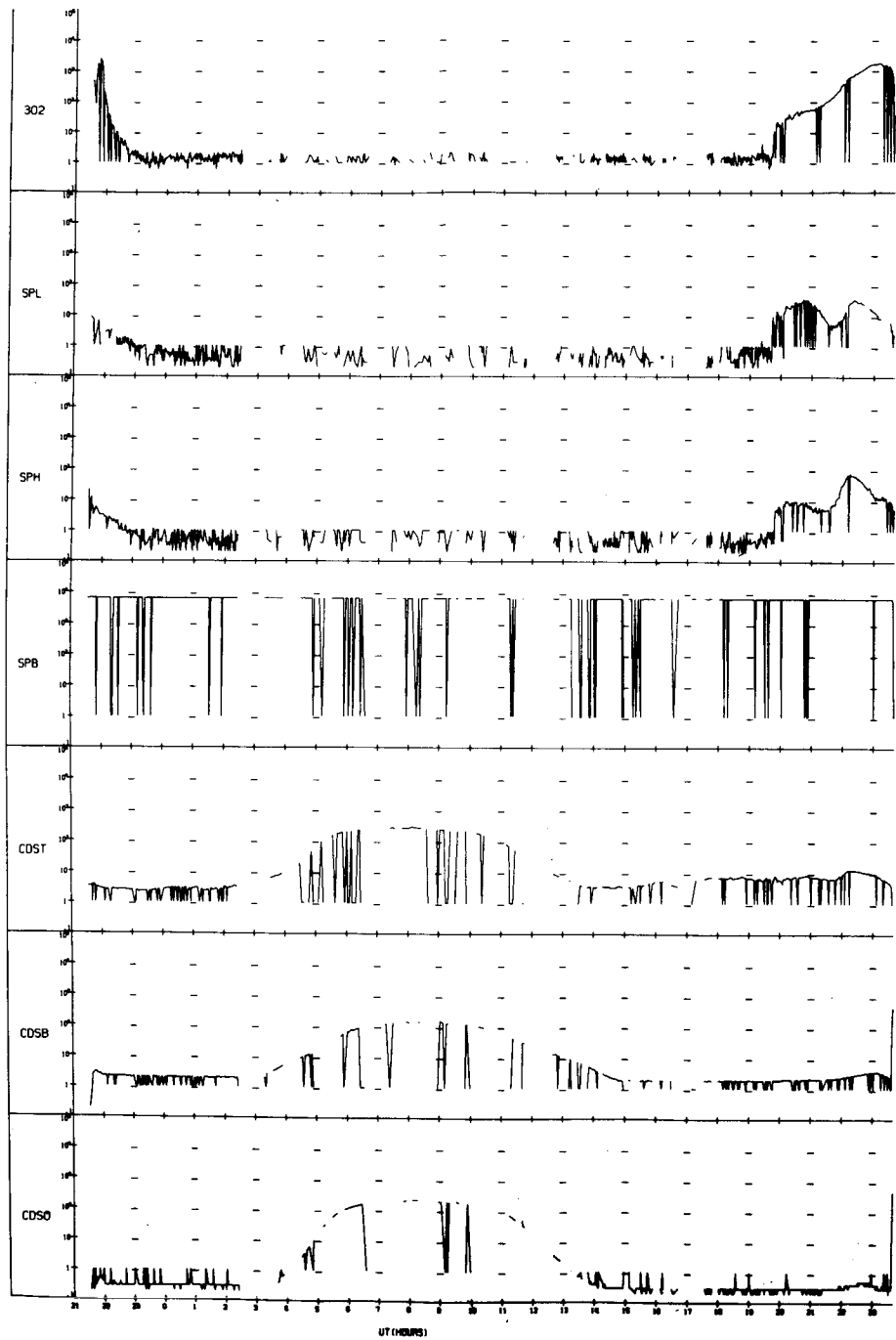


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 35
BEGIN 9/22/61/19:05
END 9/23/61/21:22

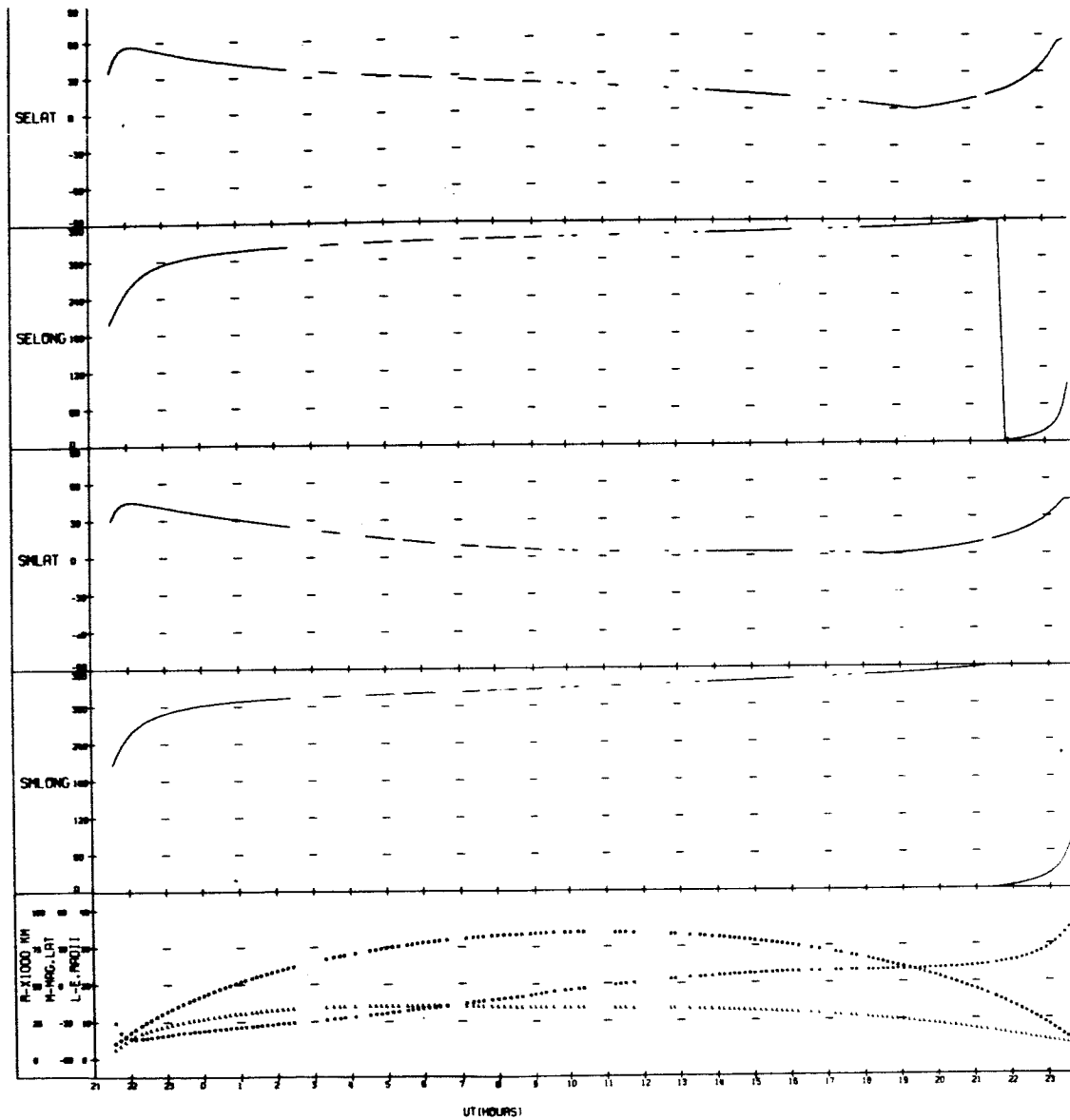


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 36
BEGIN 9/23/61/21:33
END 9/24/61/23:40

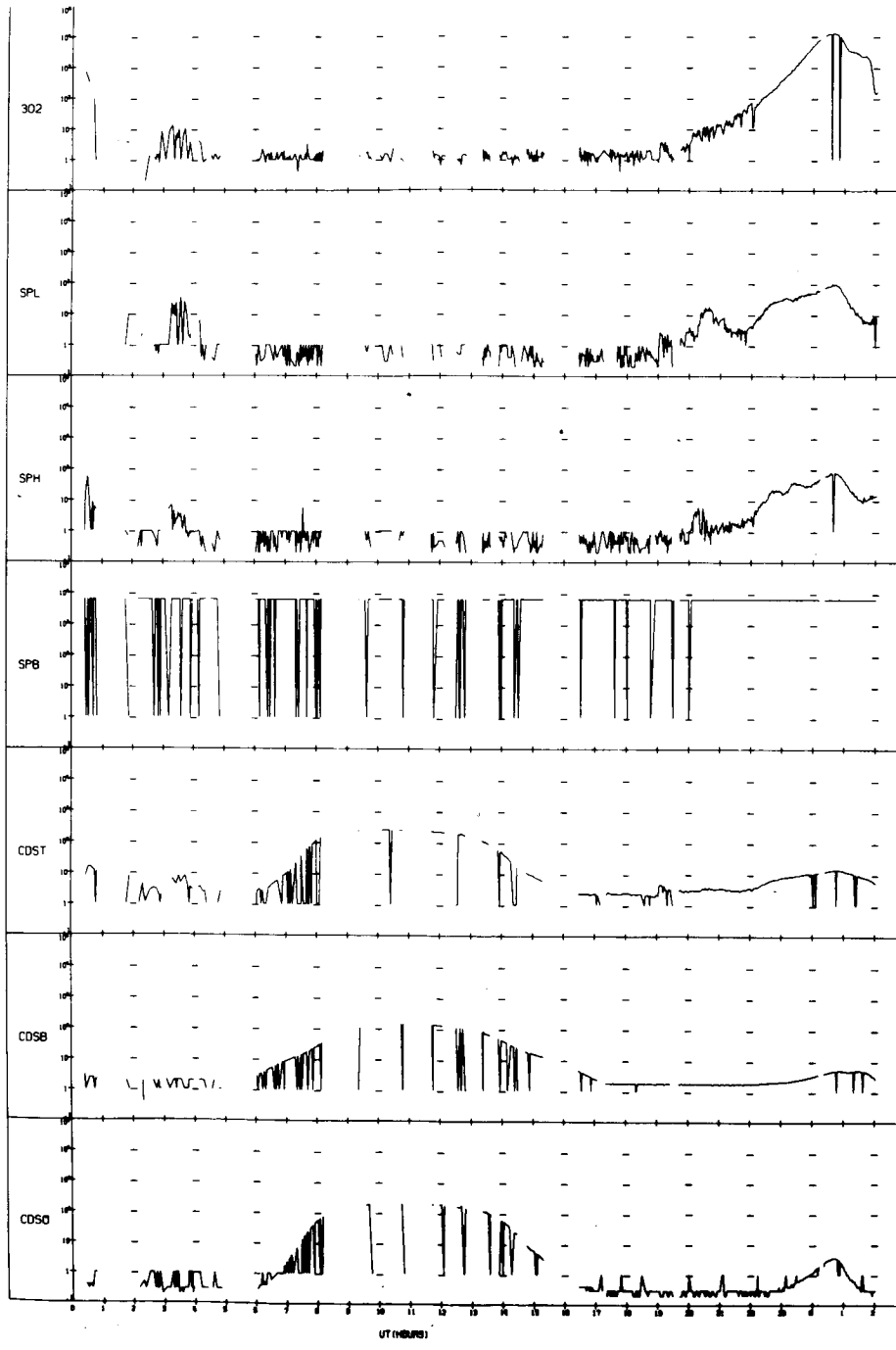


UNIVERSITY OF IOWA

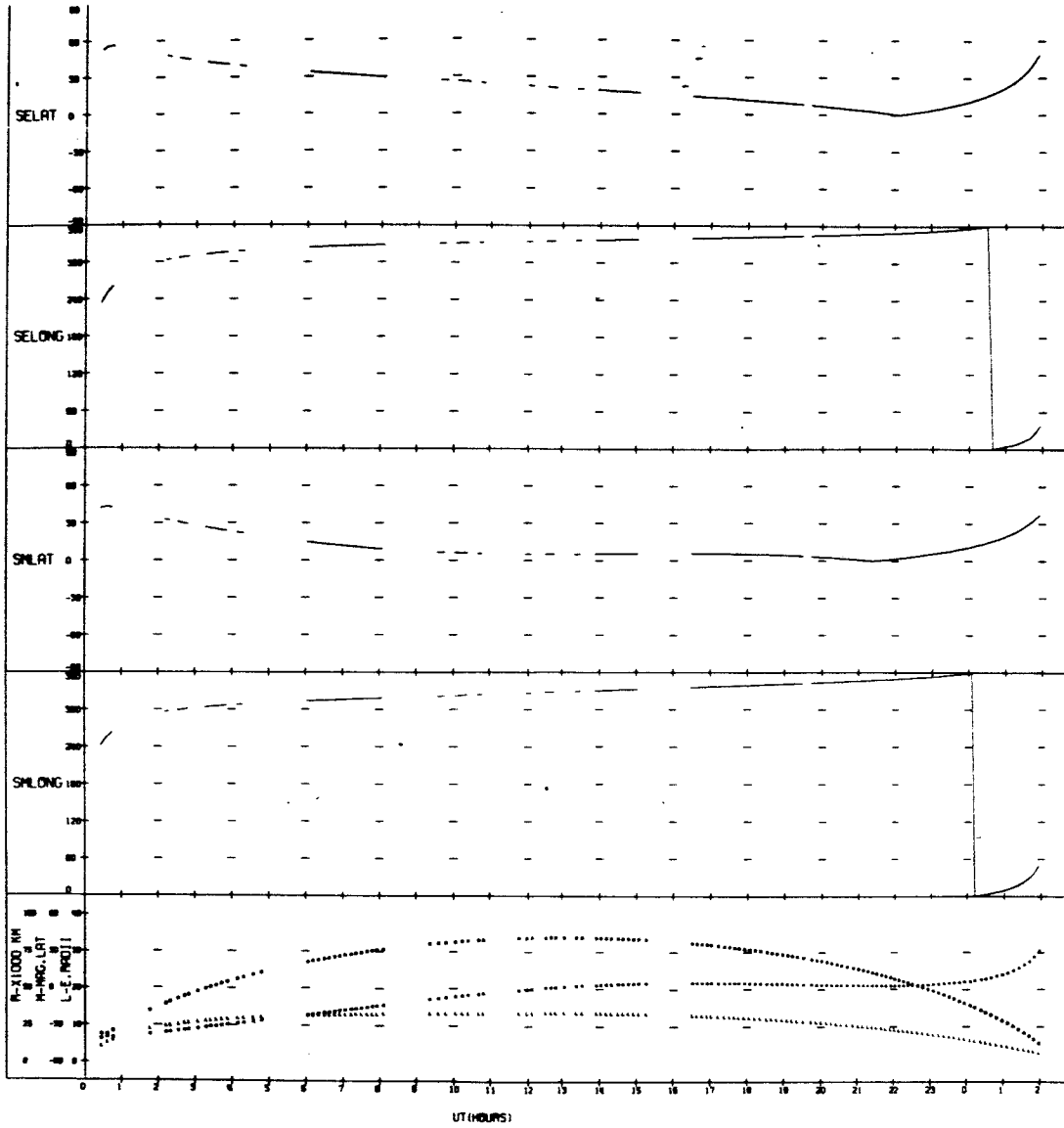
EXPLORER 12 ORBIT 36
BEGIN 9/23/61/21:33
END 9/24/61/23:40



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 37
BEGIN 9/25/61/00:08
END 9/26/61/02:42

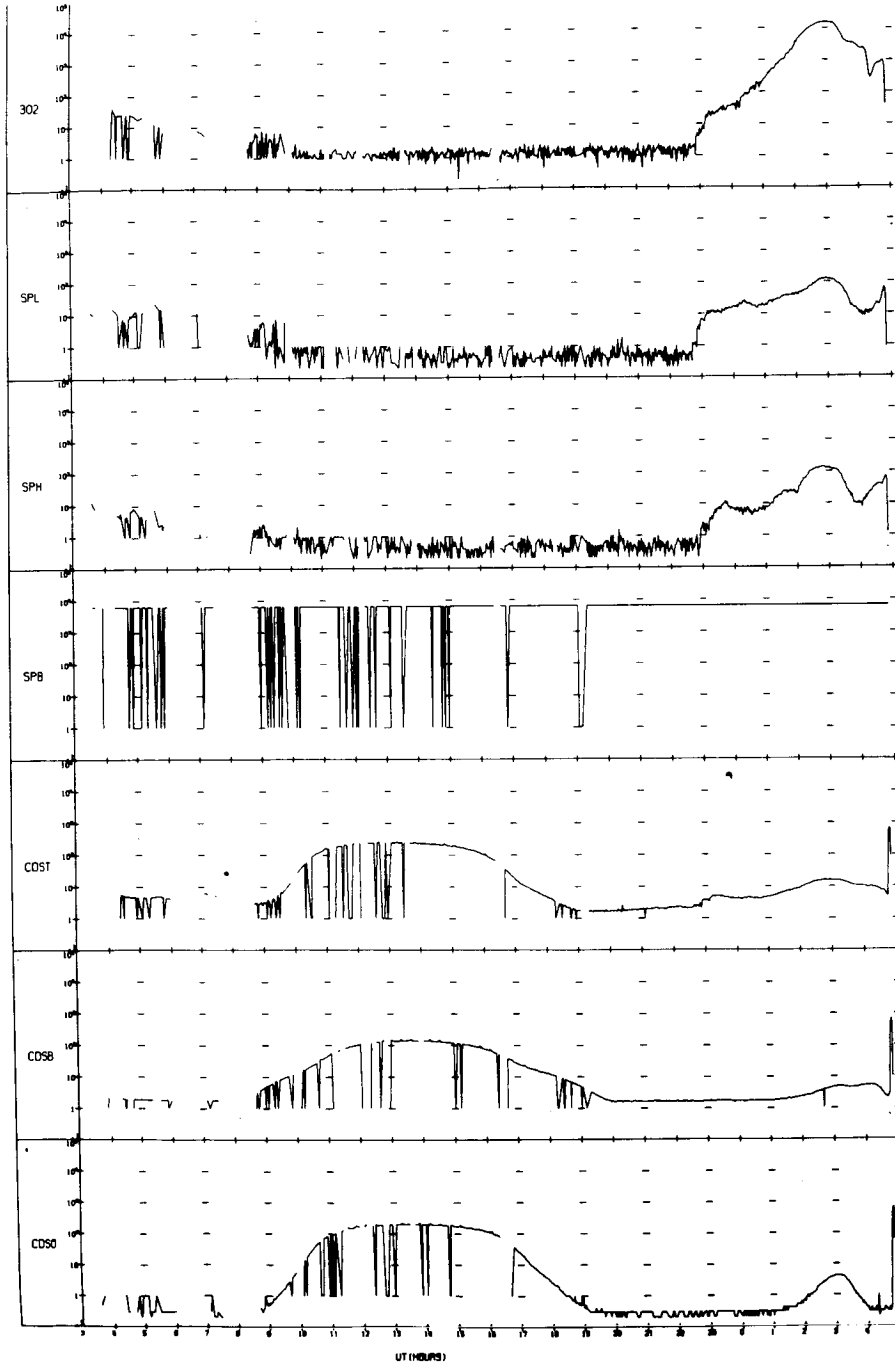


UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 37
 BEGIN 9/25/61/00:08
 END 9/26/61/02:42



UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 38
BEGIN 9/26/61/03:32
END 9/27/61/05:06

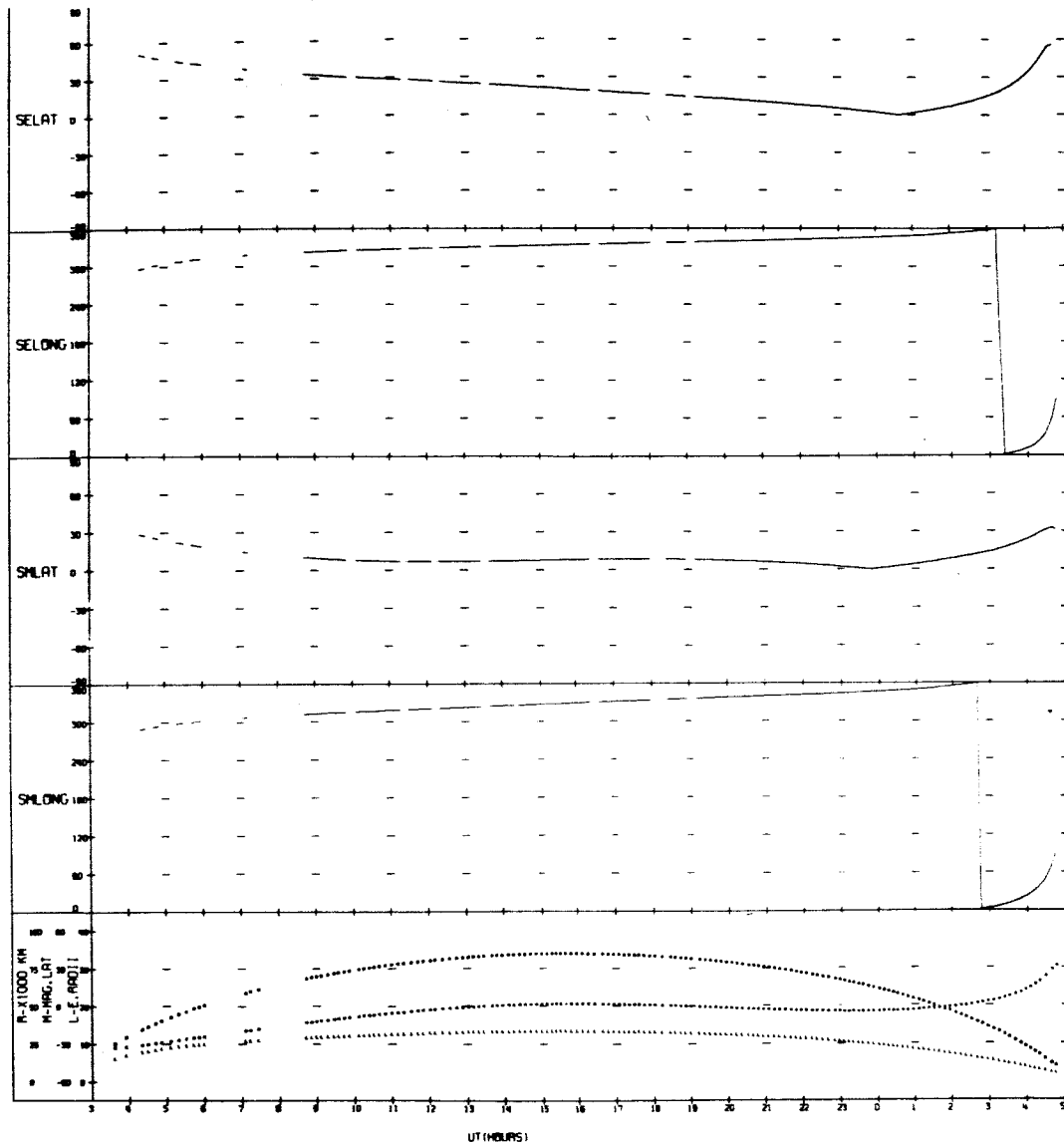


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 38

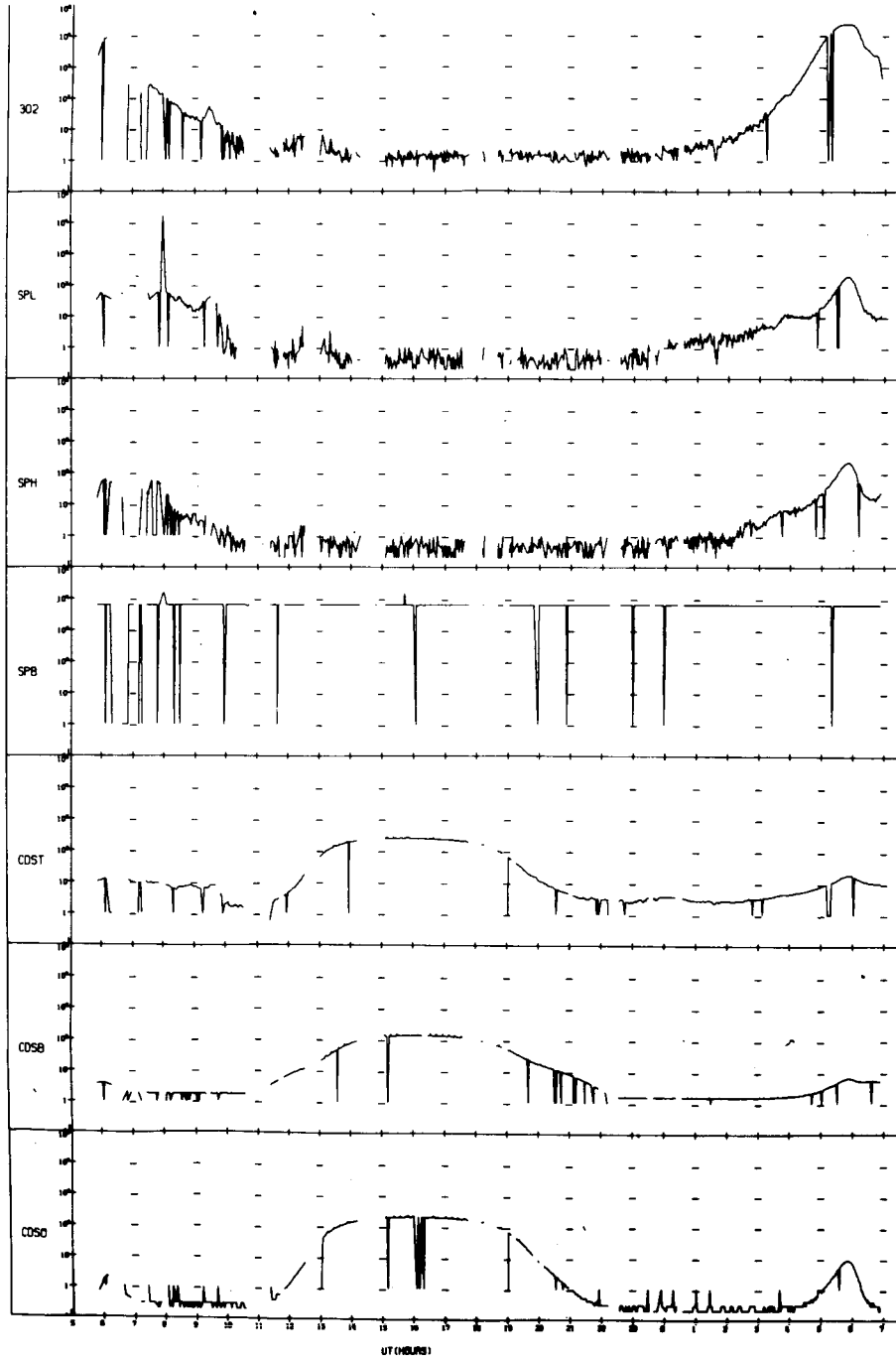
BEGIN 9/26/61/03:32

END 9/27/61/05:06



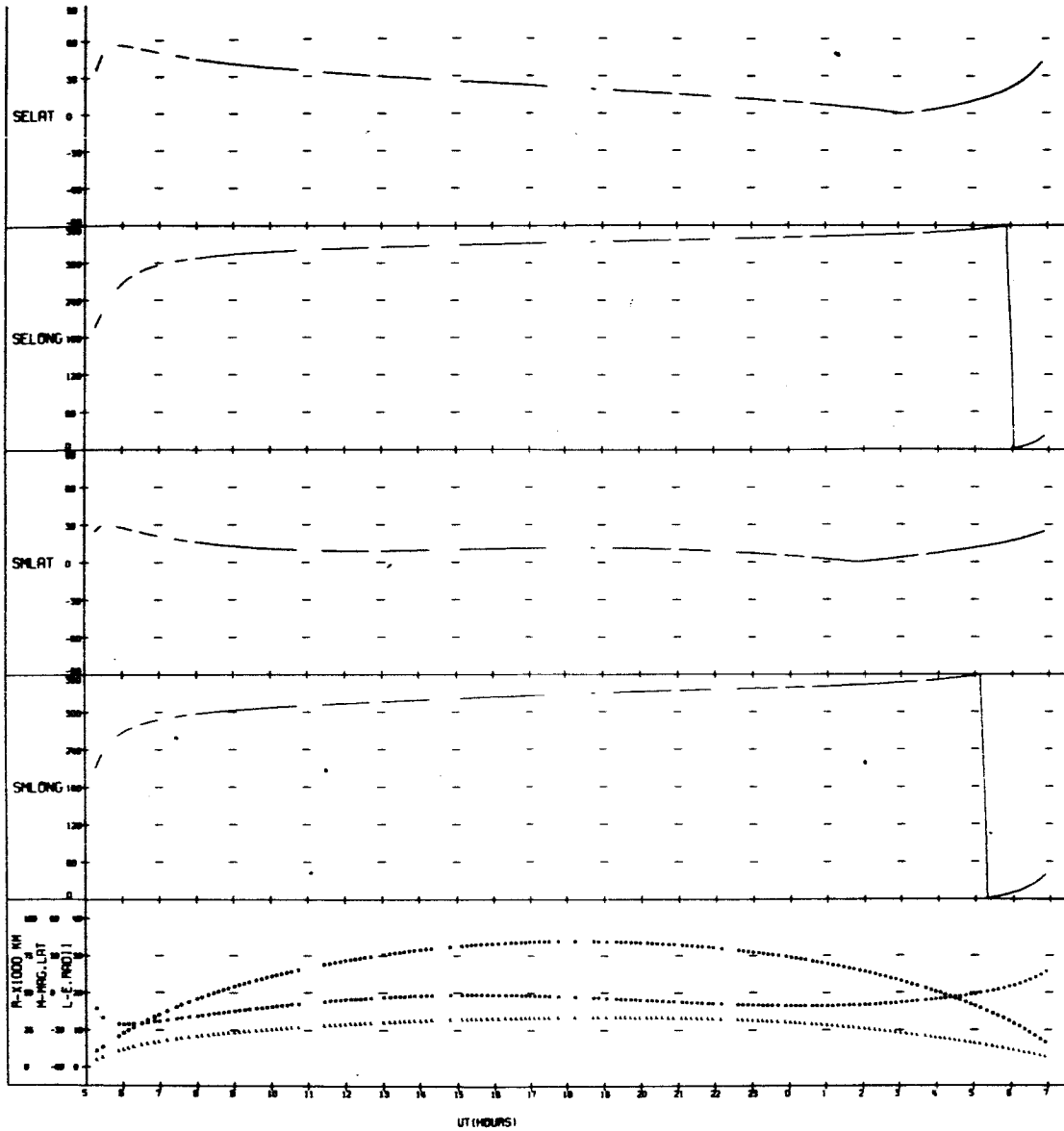
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 39
BEGIN 9/27/61/05:15
END 9/28/61/07:33



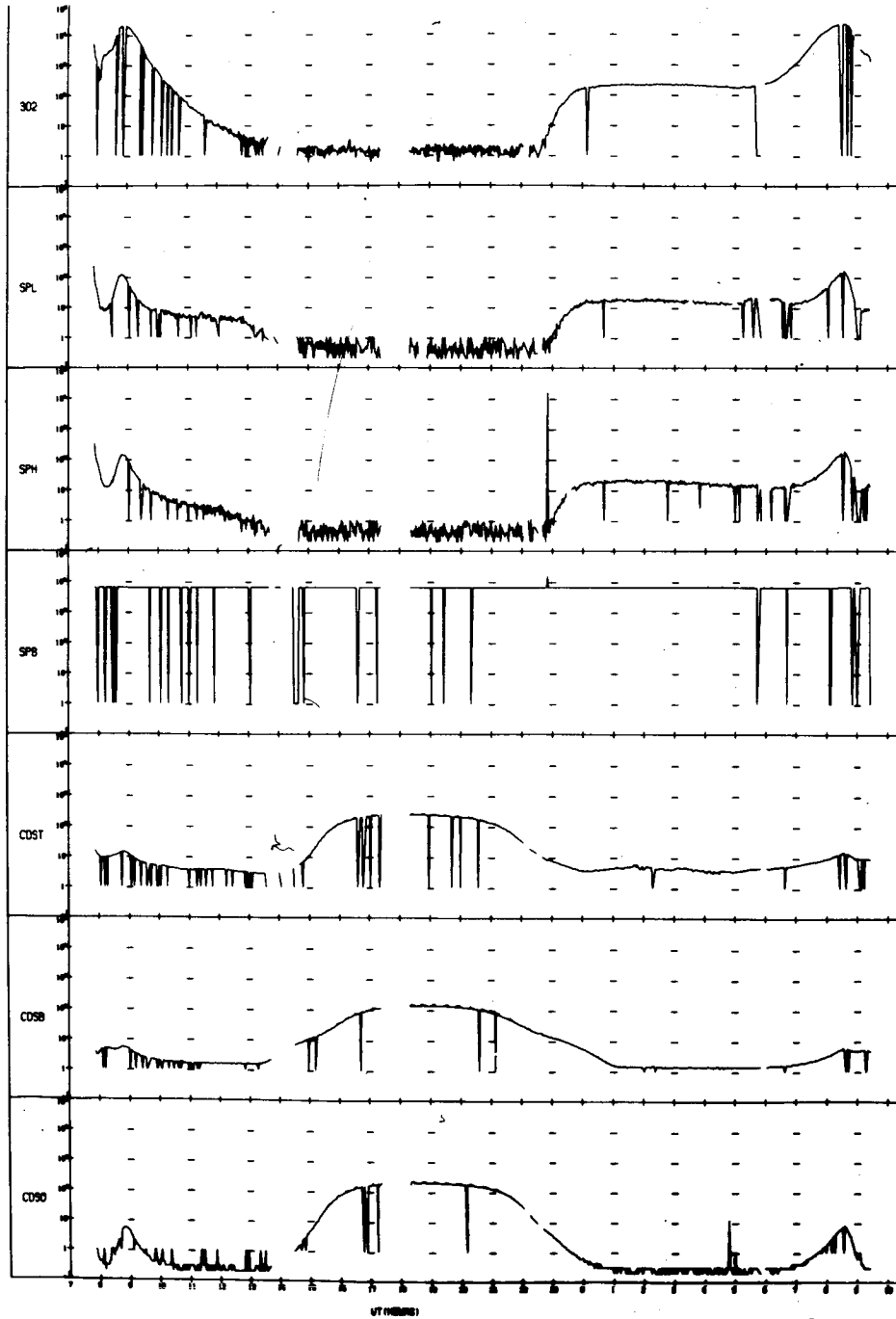
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 39
BEGIN 9/27/61/05:15
END 9/28/61/07:33

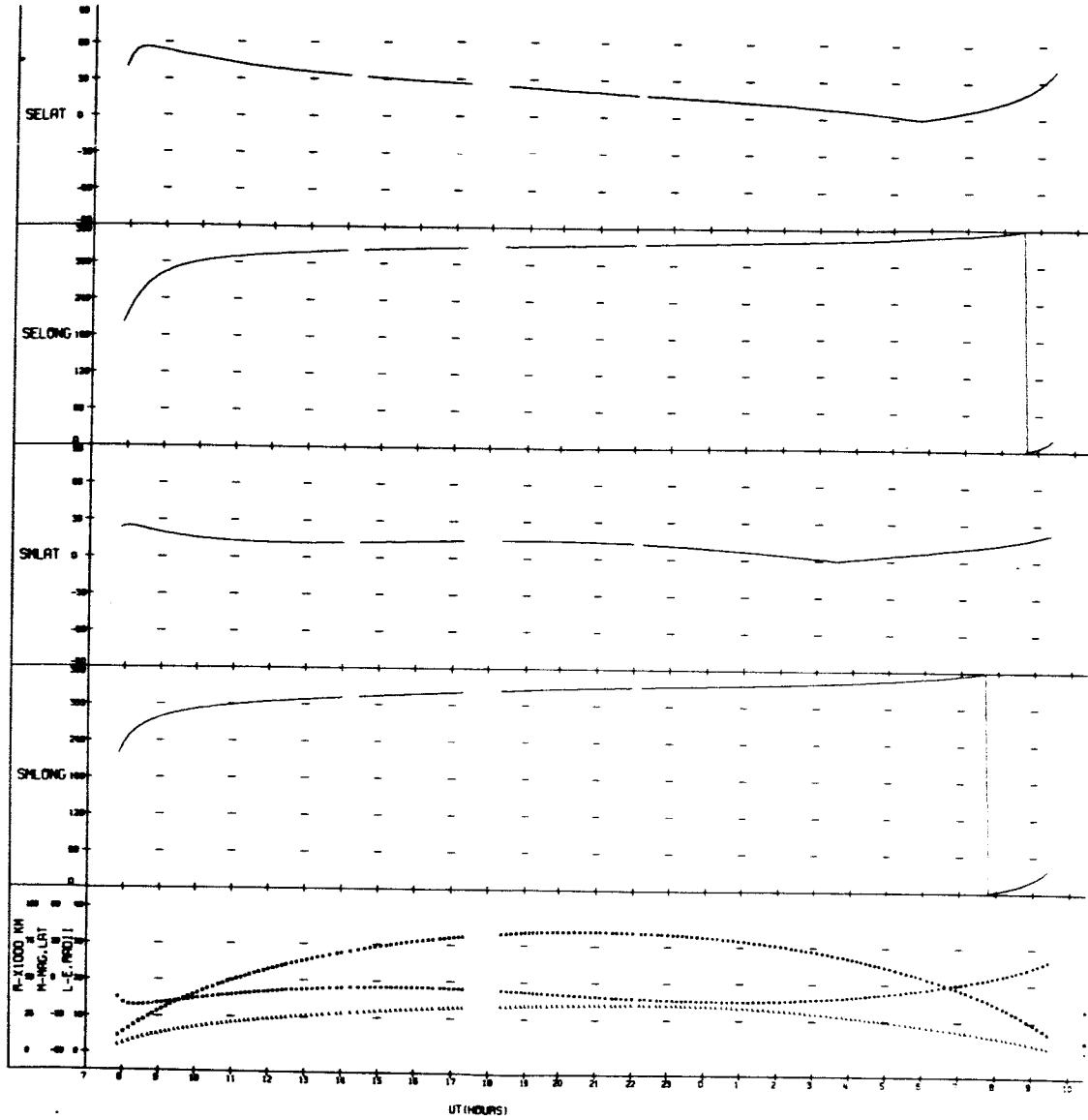


UNIVERSITY OF IOWA

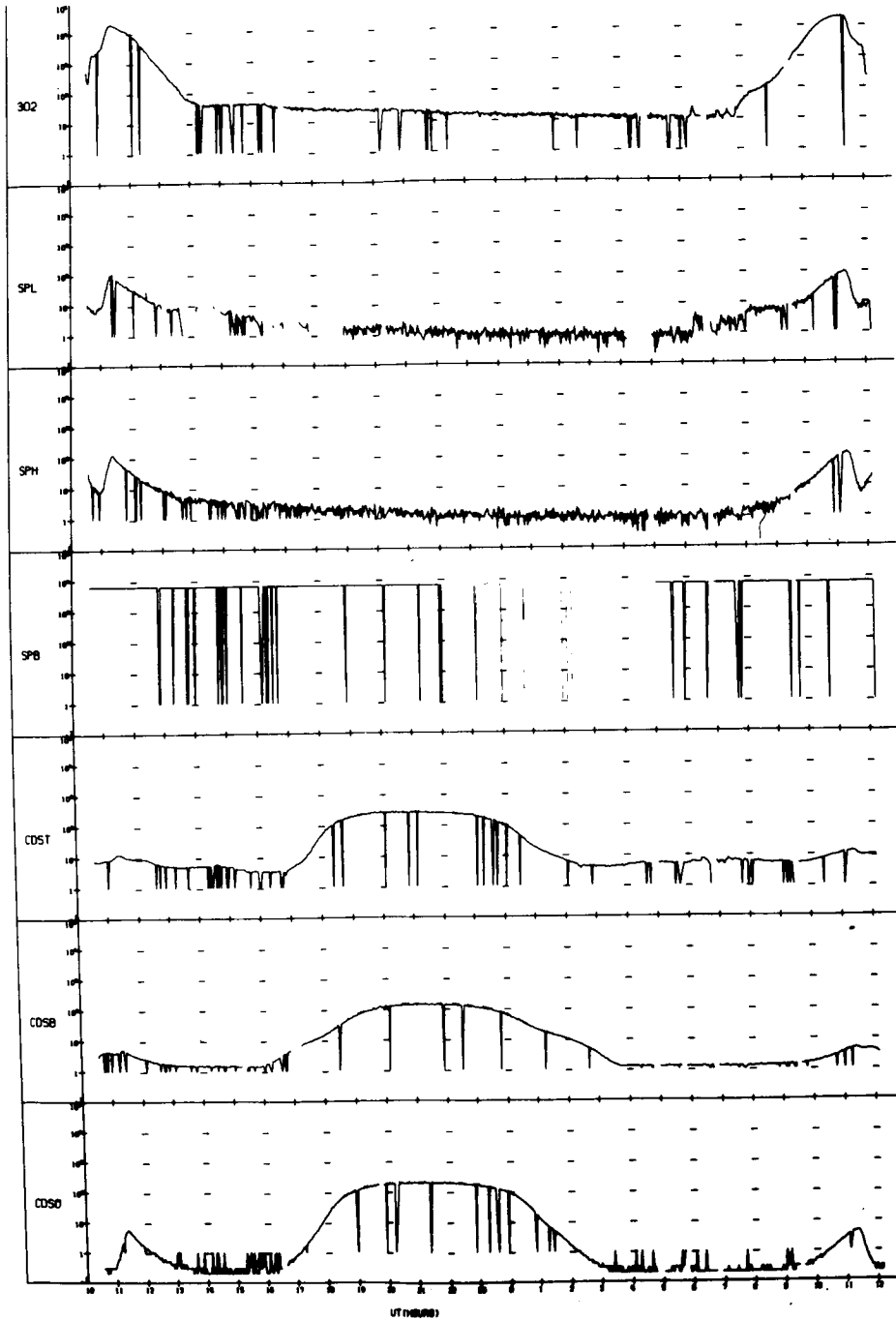
EXPLORER 12 ORBIT 40
BEGIN 9/28/61/07:51
END 9/29/61/10:27



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 40
 BEGIN 9/28/61/07:51
 END 9/29/61/10:27

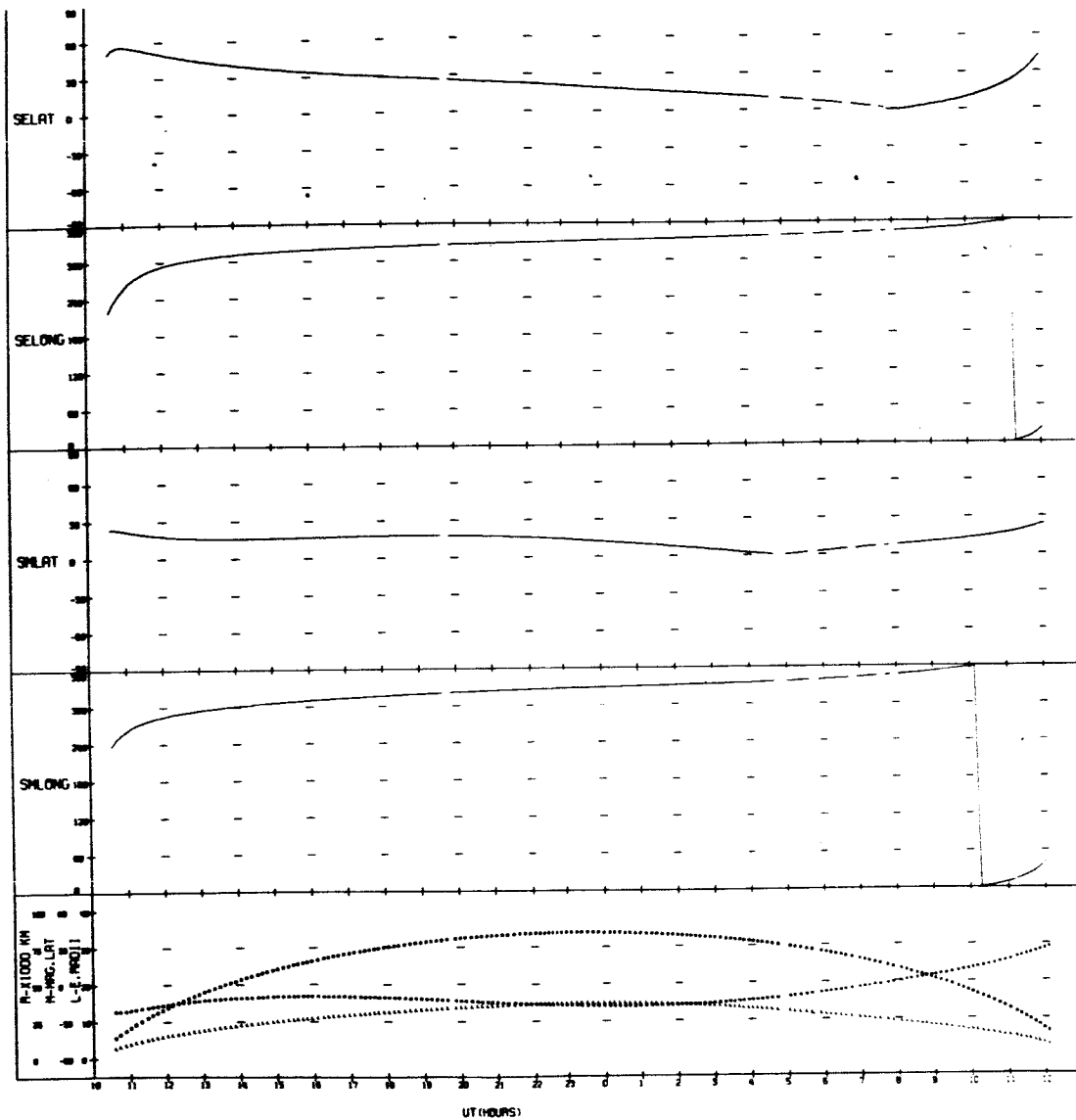


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 41
BEGIN 9/29/61/10:33
END 9/30/61/12:56



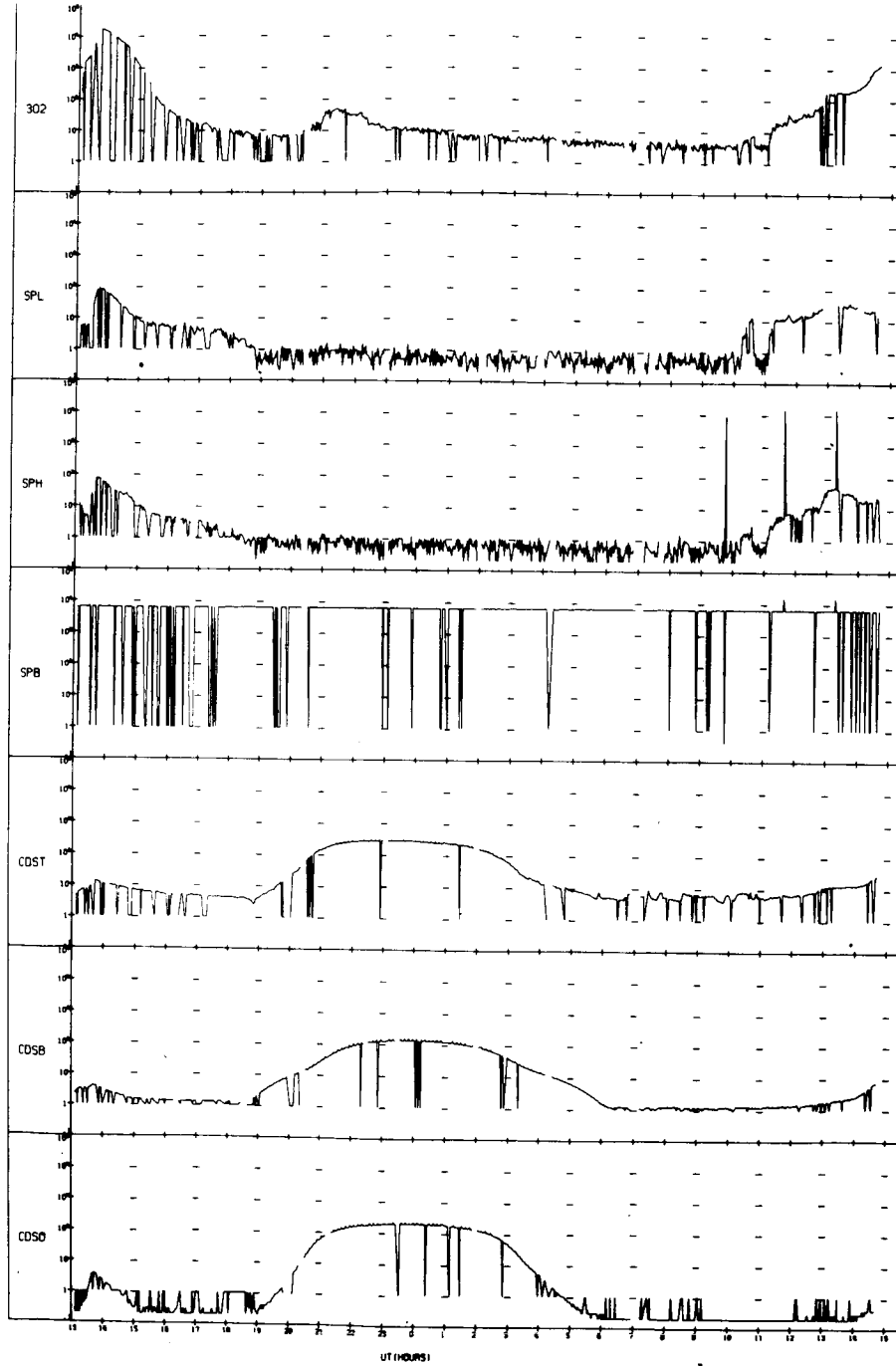
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 41
BEGIN 9/29/61/10:33
END 9/30/61/12:56

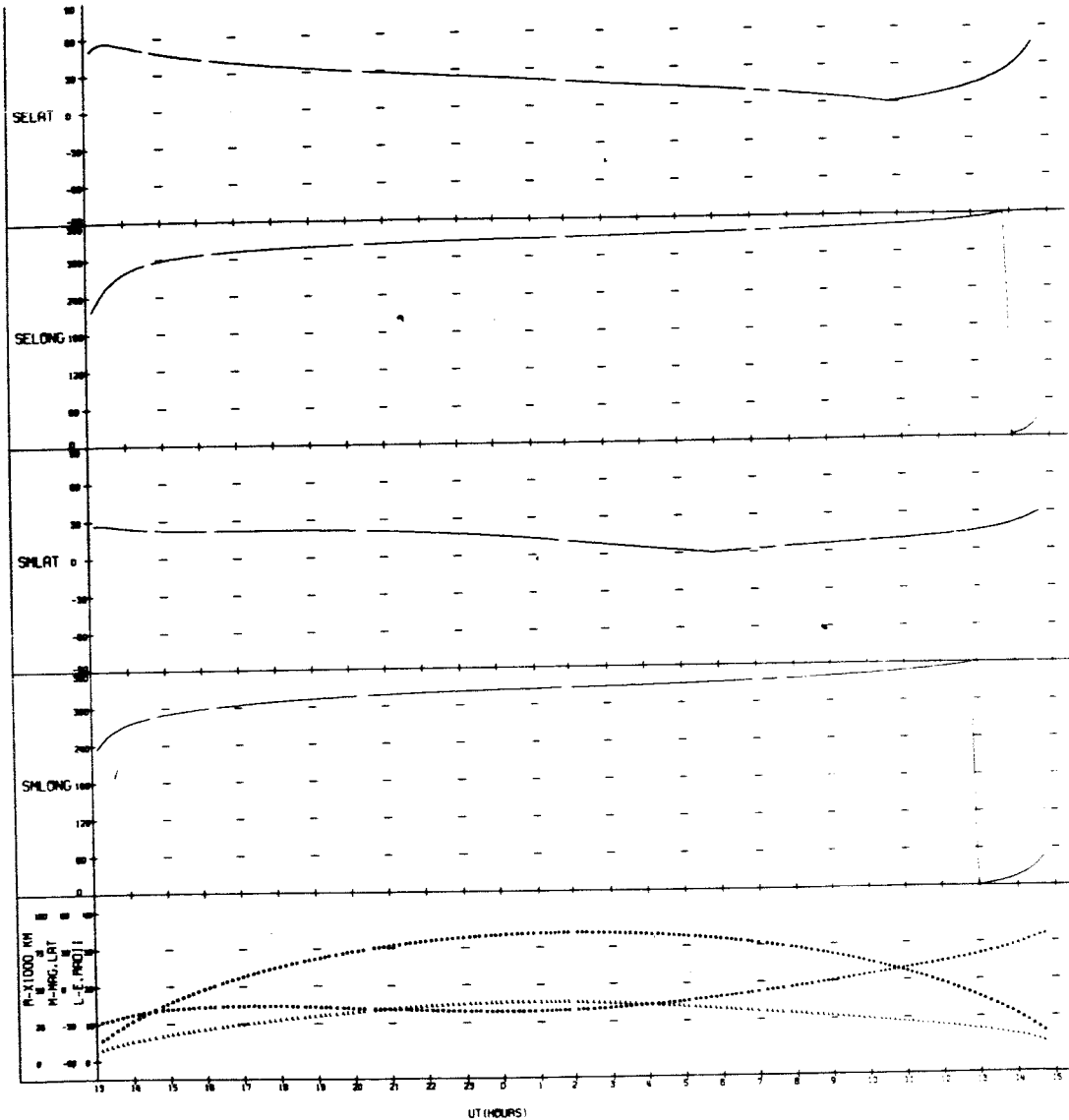


UNIVERSITY OF IOWA

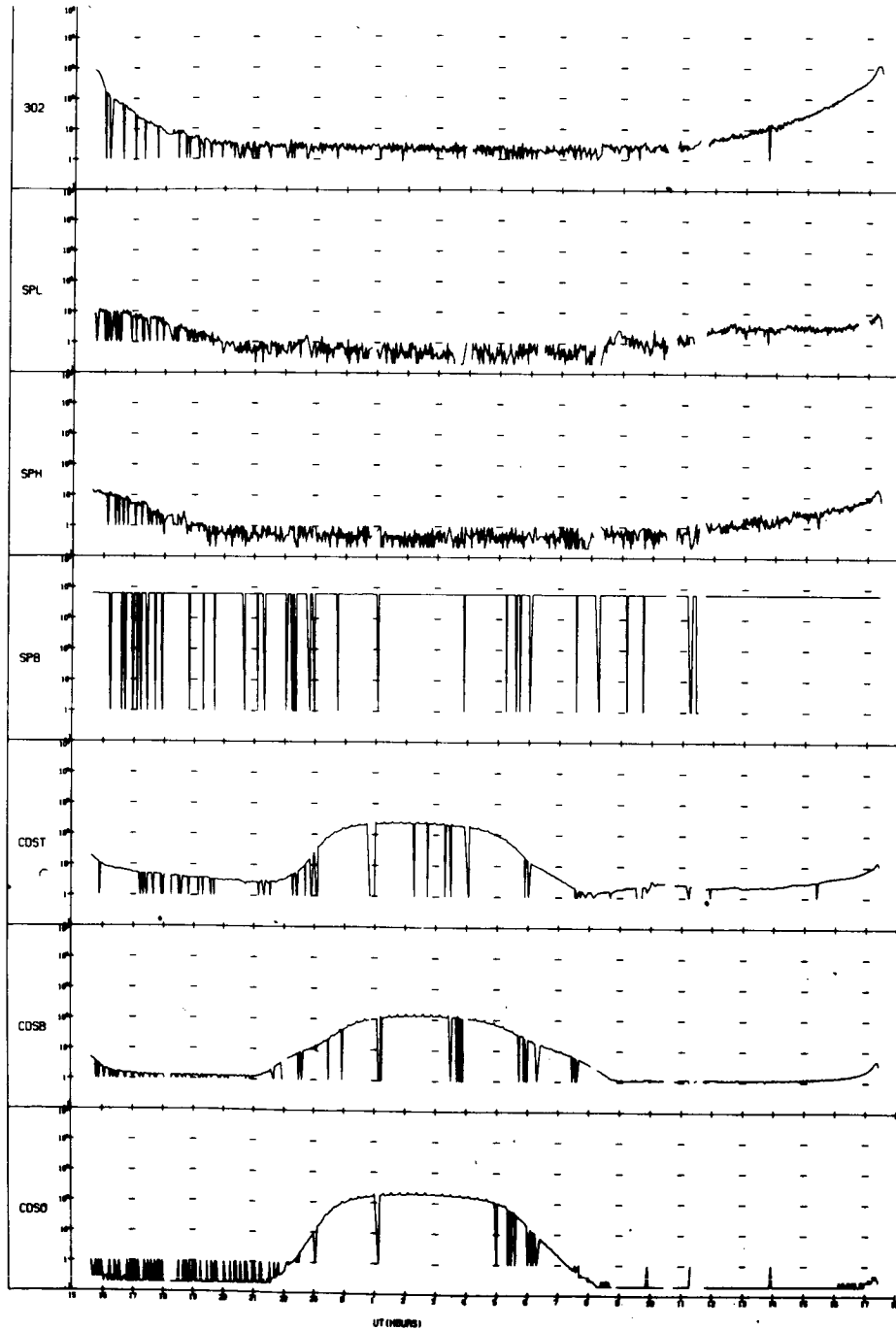
EXPLORER 12 ORBIT 42
BEGIN 9/30/61/13:06
END 10/01/61/15:30



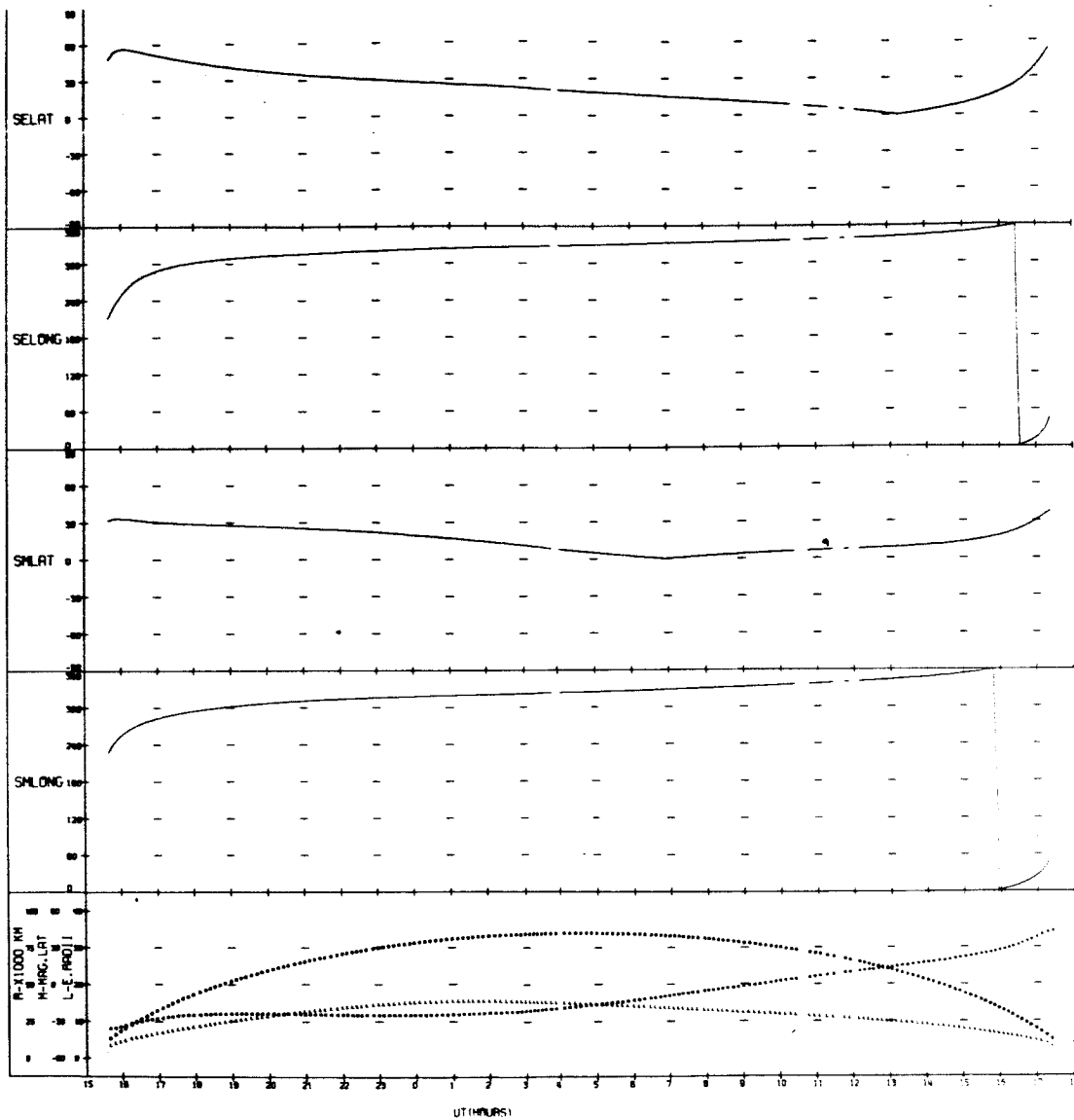
UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 42
 BEGIN 9/30/61/13:06
 END 10/01/61/15:30



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 43
BEGIN 10/01/61/15:36
END 10/02/61/18:01



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 43
 BEGIN 10/01/61/15:36
 END 10/02/61/18:01

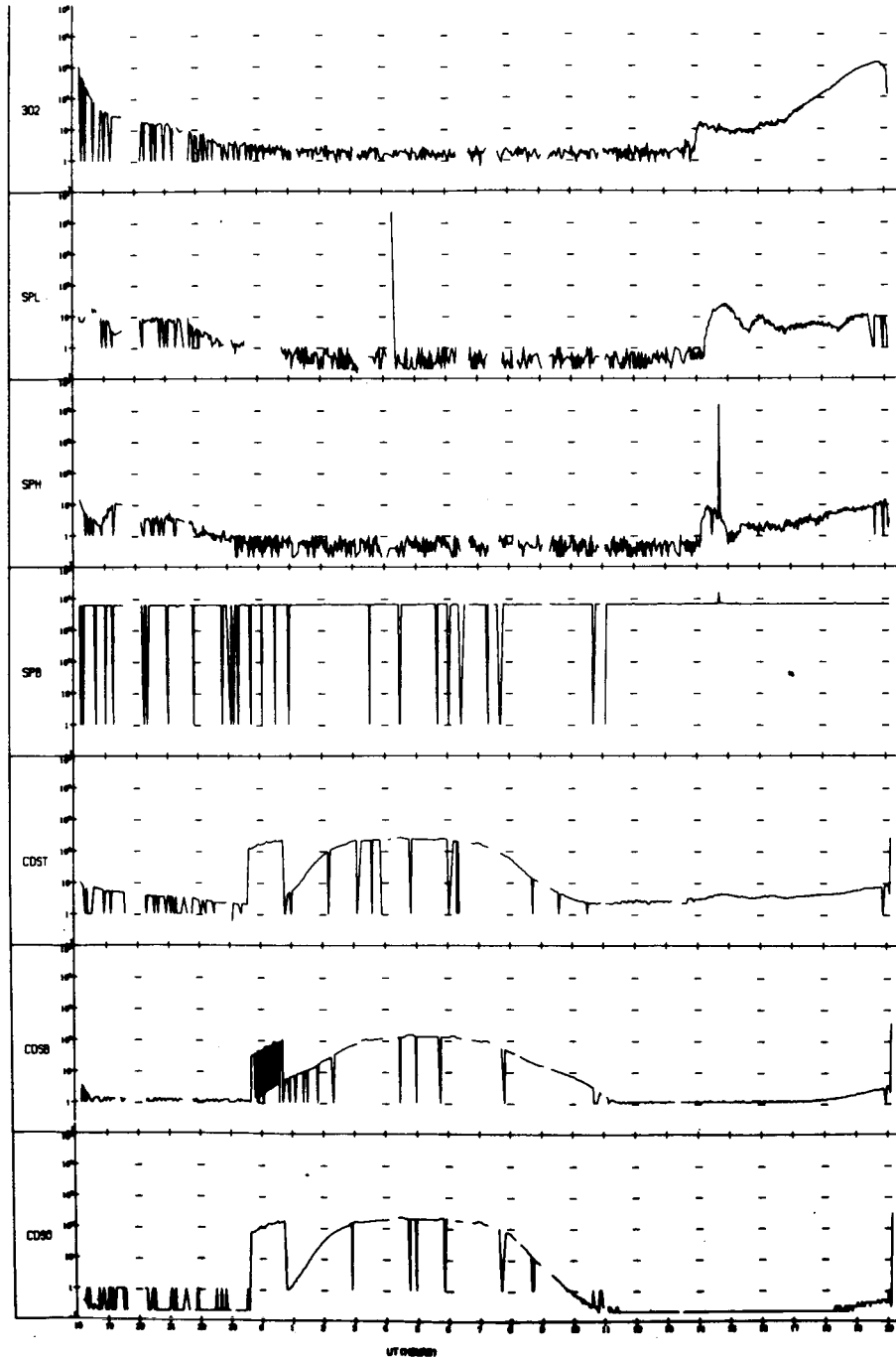


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 44

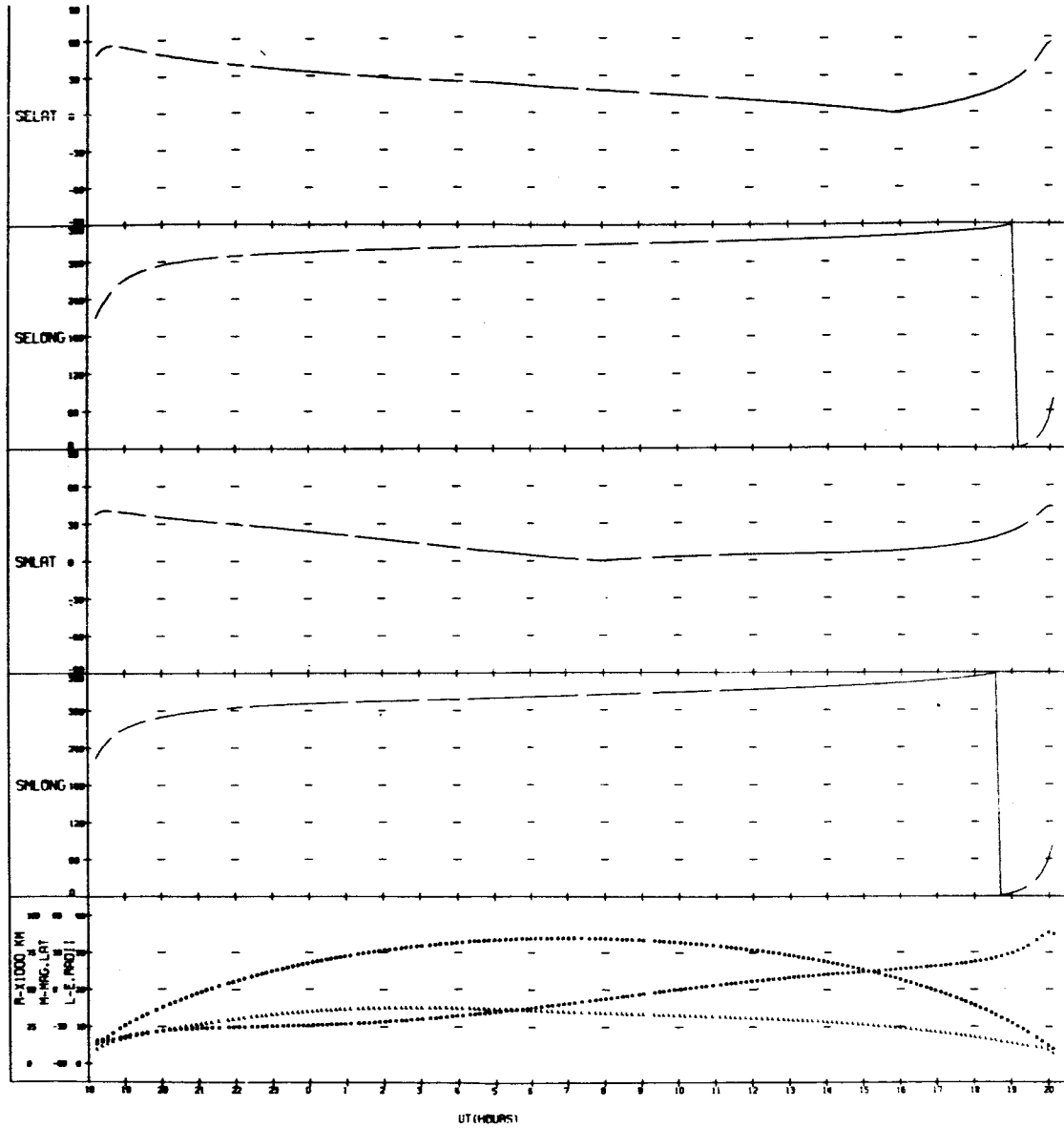
BEGIN 10/02/61/18:12

END 10/03/61/20:28



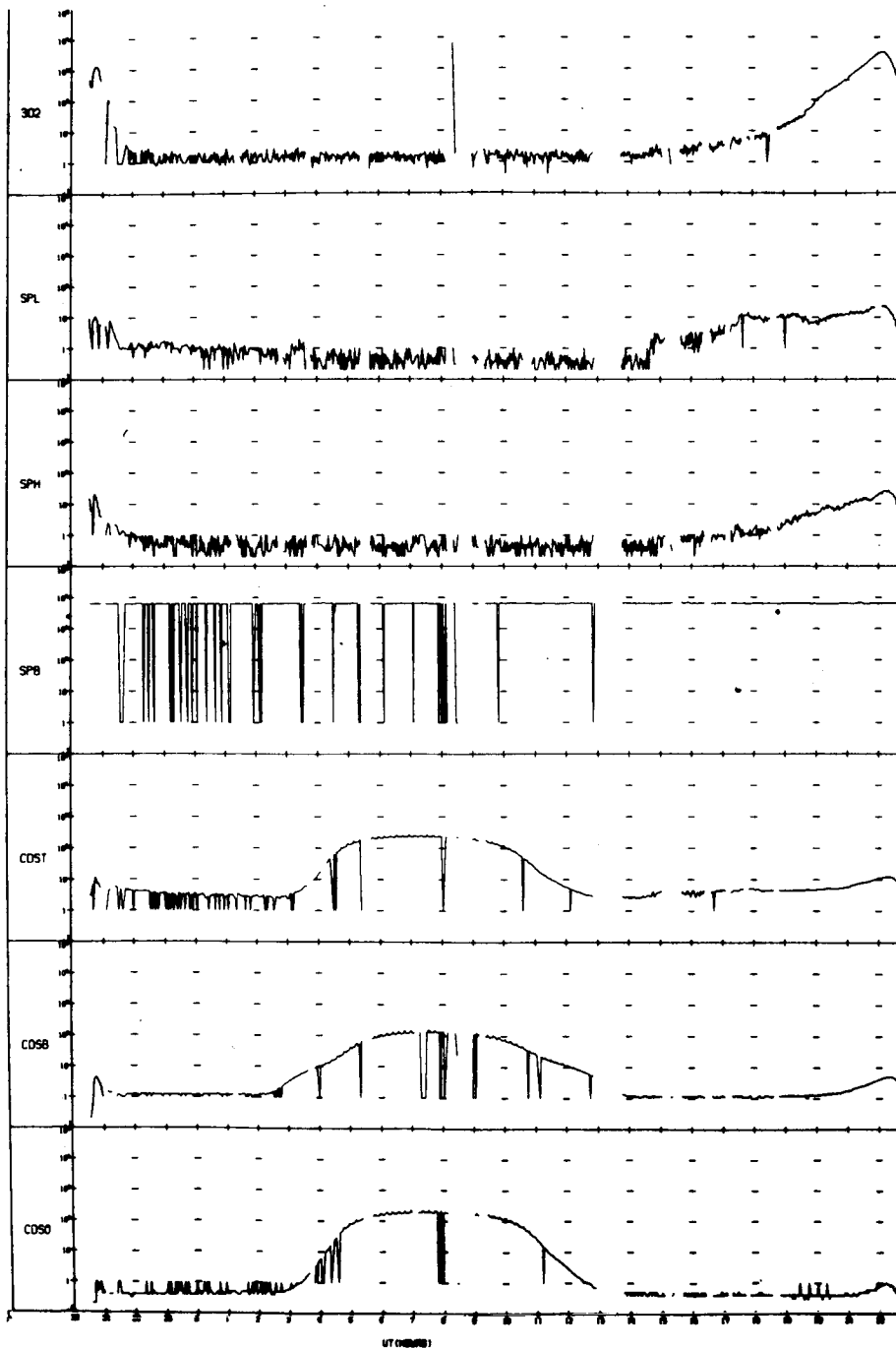
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 44
BEGIN 10/02/61/18:12
END 10/03/61/20:28



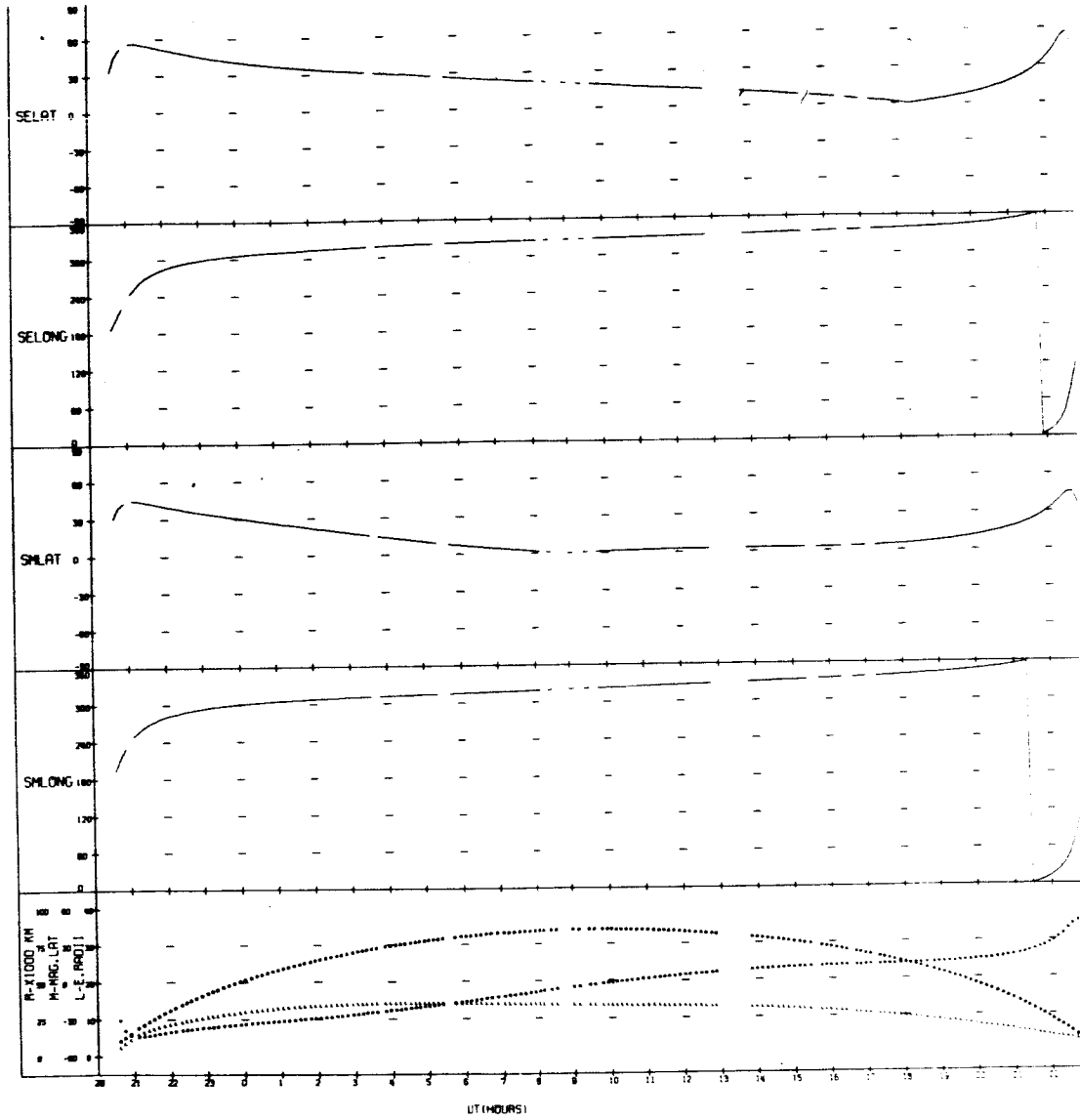
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 45
BEGIN 10/03/61/20:34
END 10/04/61/22:48



UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 45
BEGIN 10/03/61/20:34
END 10/04/61/22:48

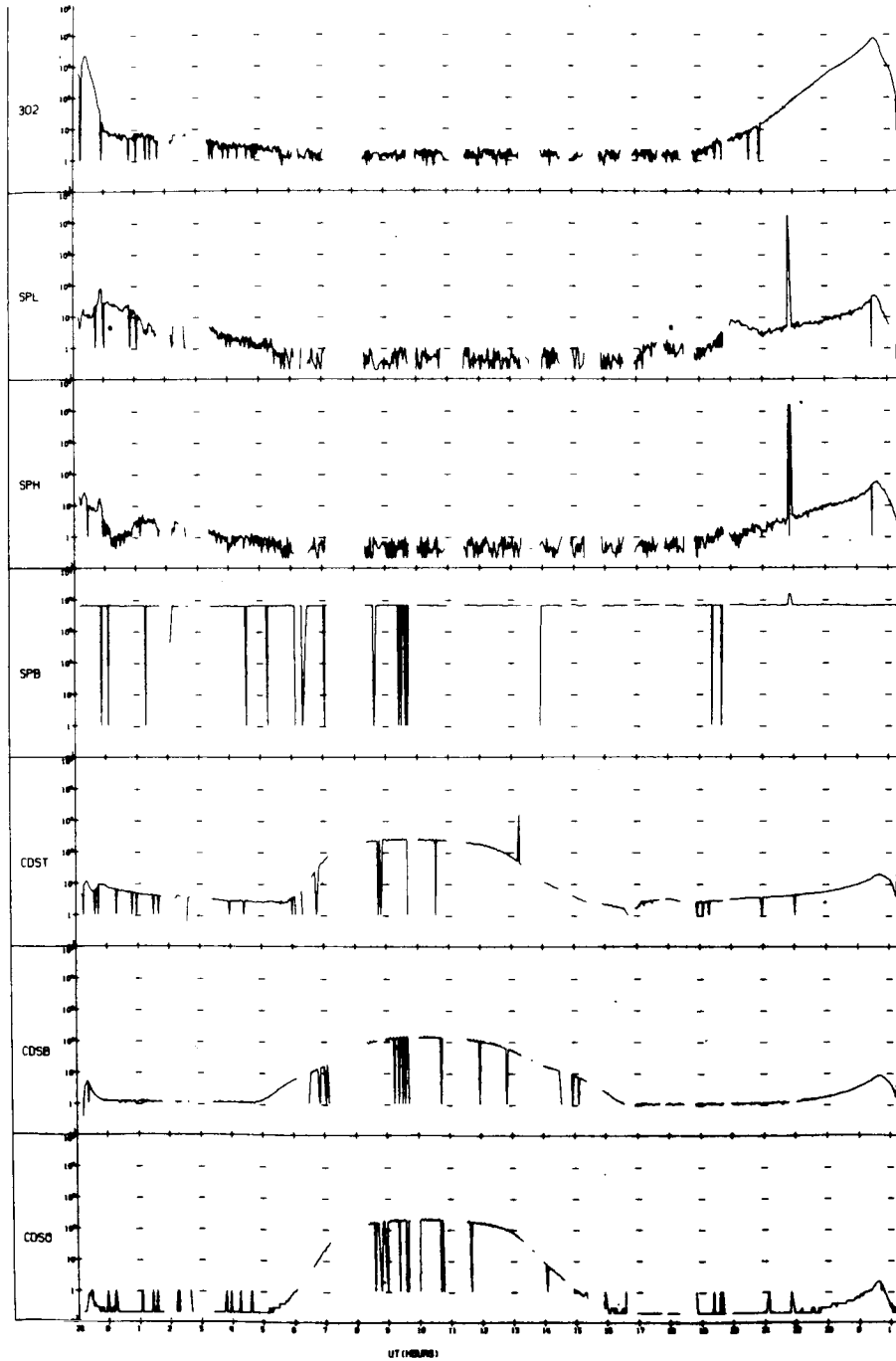


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 46

BEGIN 10/04/61/23:10

END 10/06/61/01:28

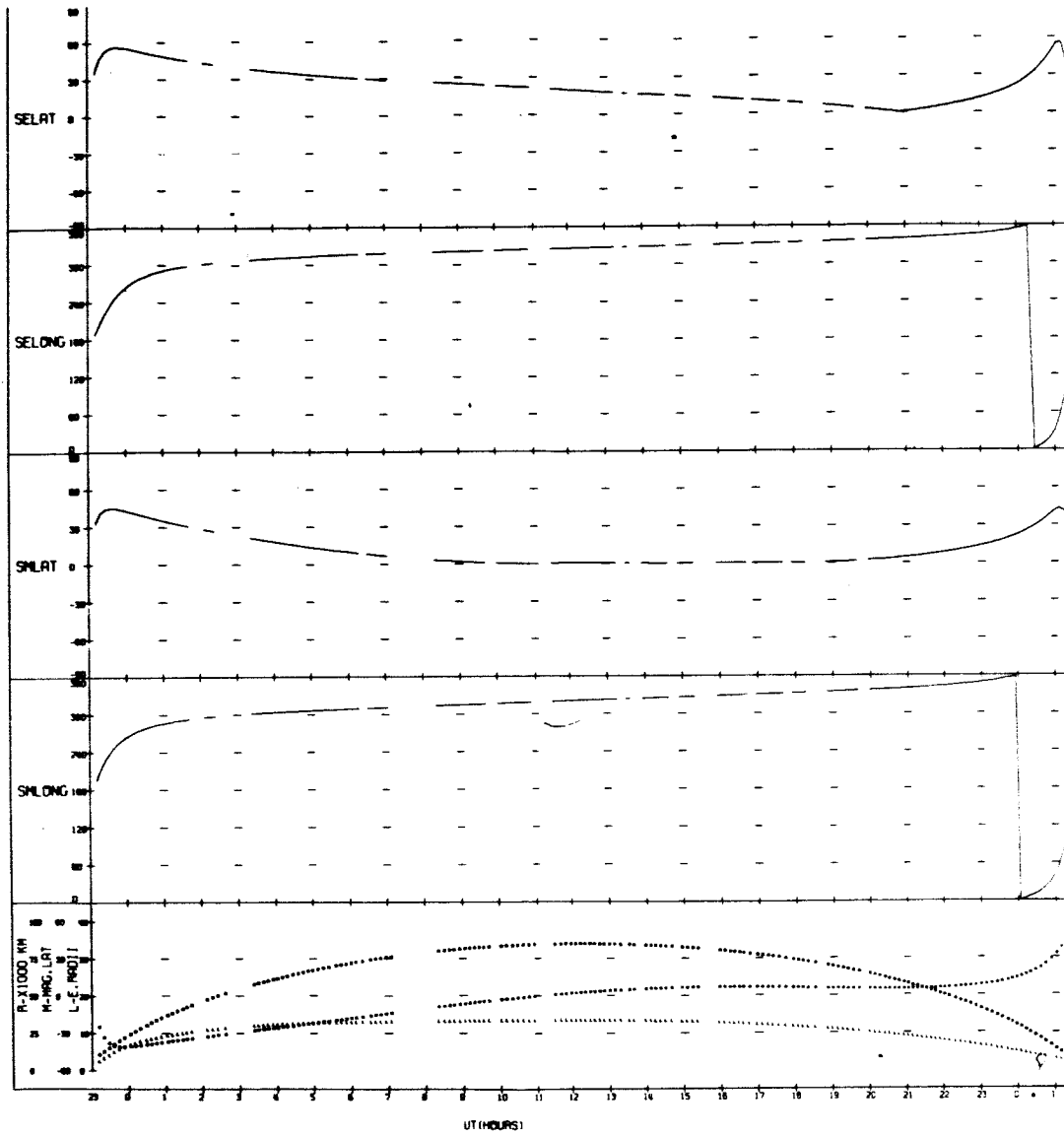


UNIVERSITY OF IOWA

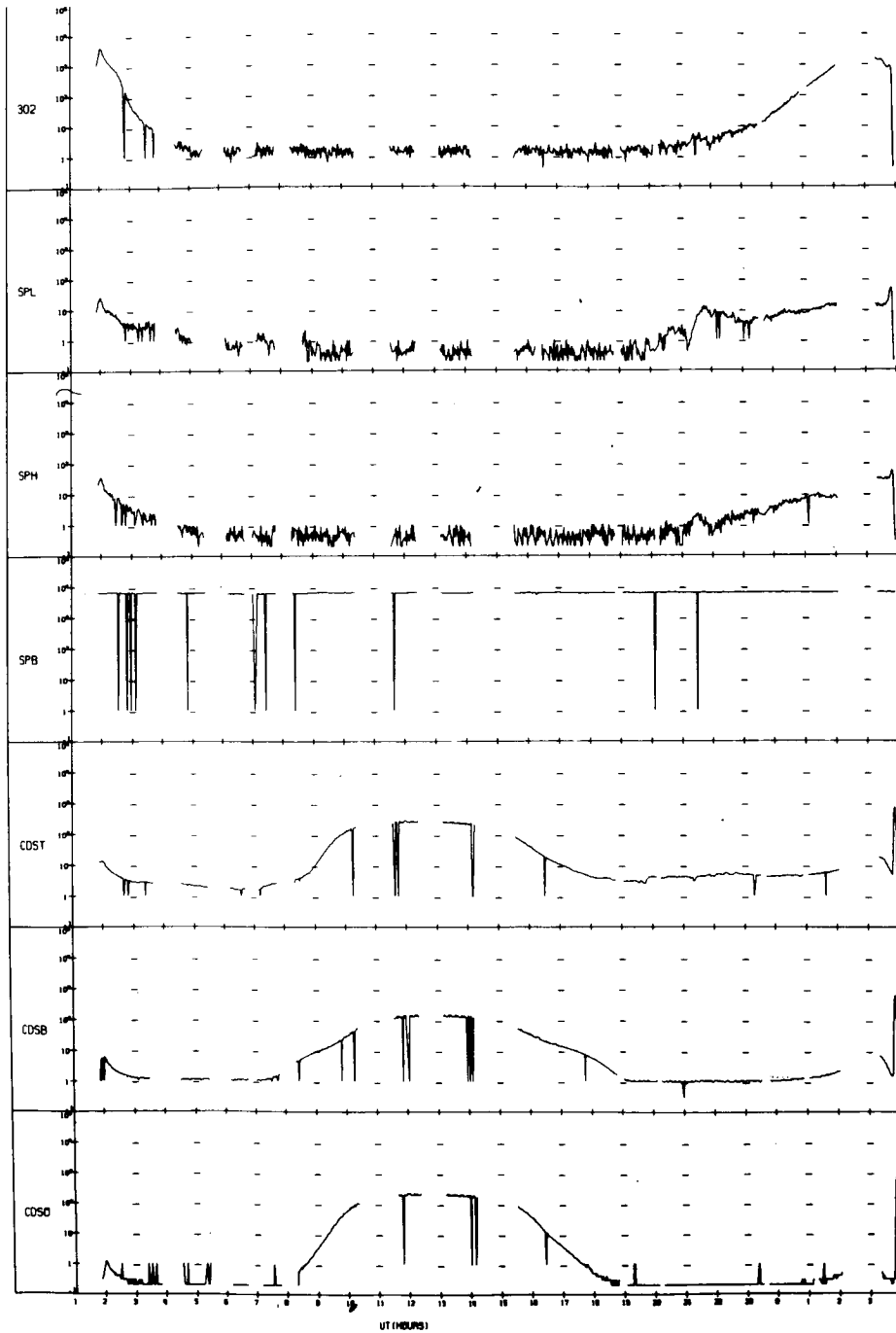
EXPLORER 12 ORBIT 46

BEGIN 10/04/61/23:10

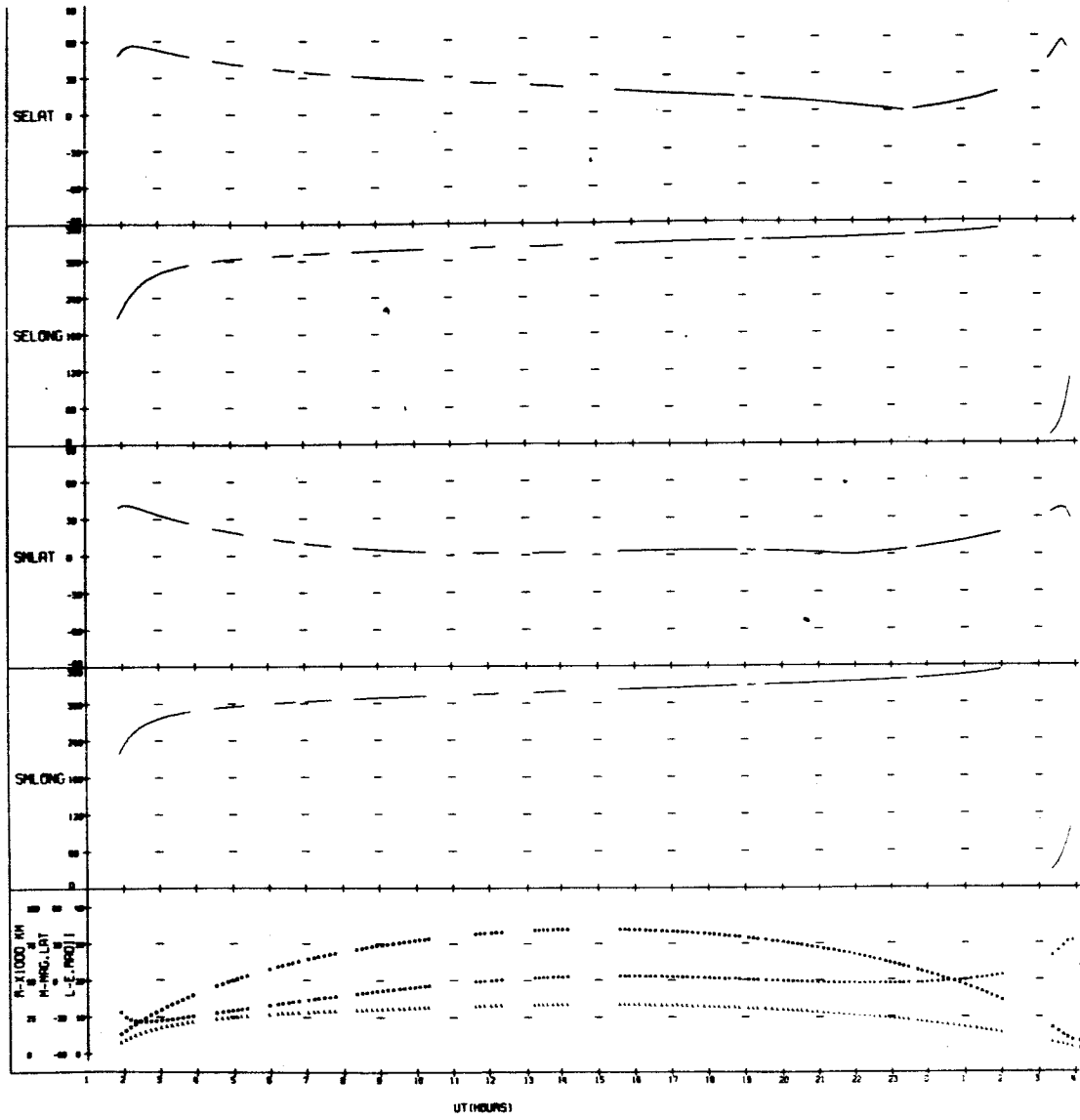
END 10/06/61/01:28



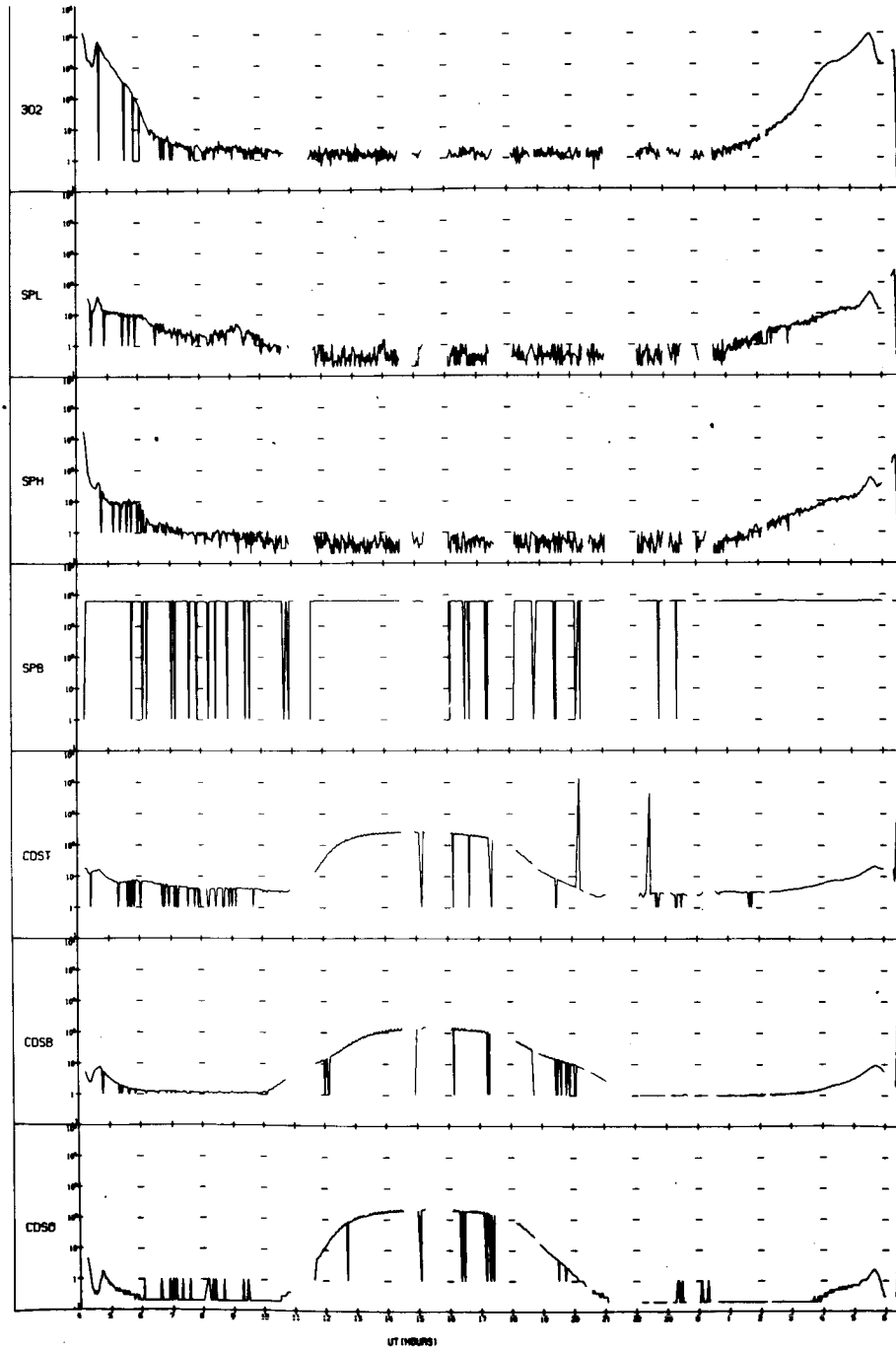
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 47
BEGIN 10/06/61/01:53
END 10/07/61/04:06



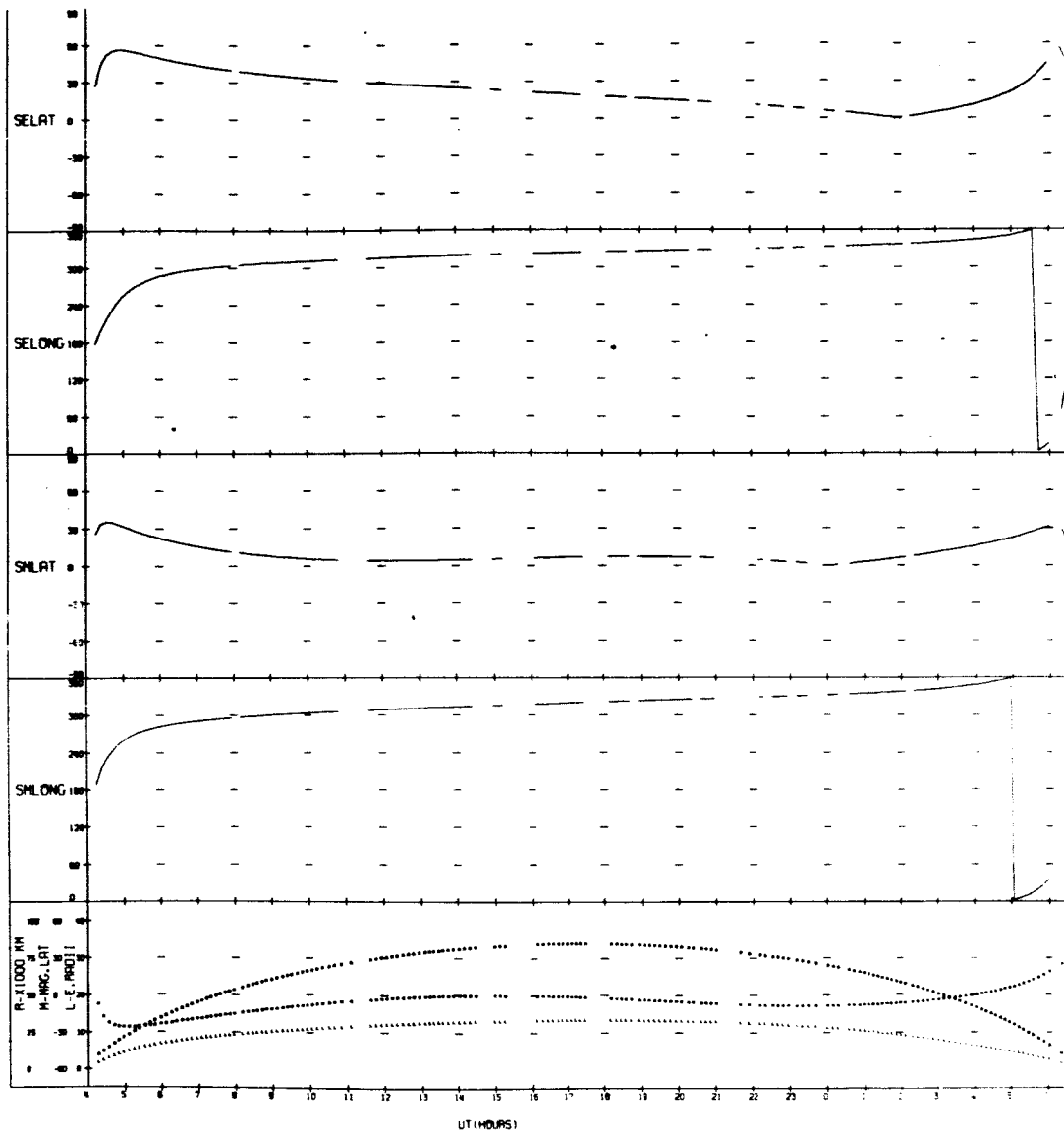
UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 47
 BEGIN 10/06/61/01:53
 END 10/07/61/04:06



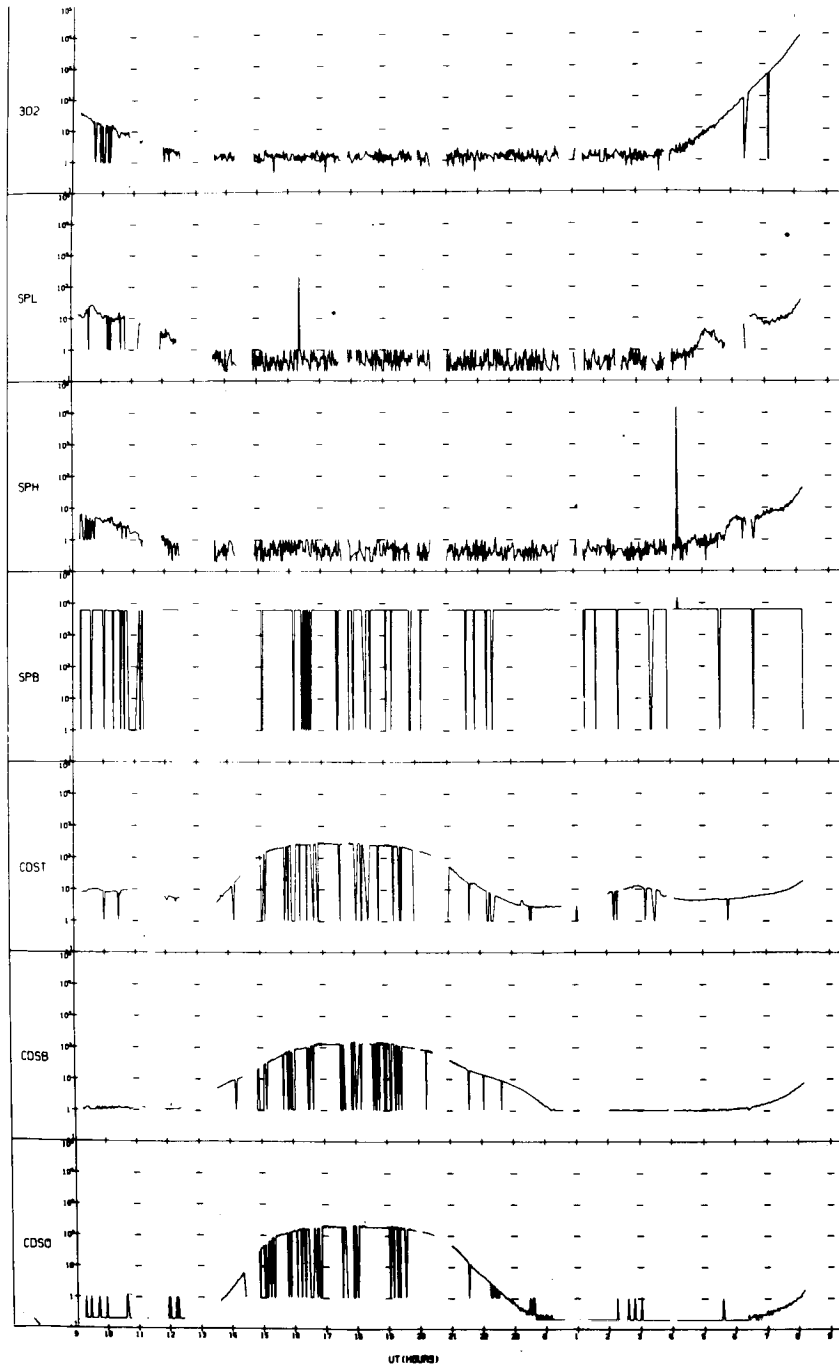
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 48
BEGIN 10/07/61/04:14
END 10/08/61/06:35



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 48
BEGIN 10/07/61/04:14
END 10/08/61/06:35

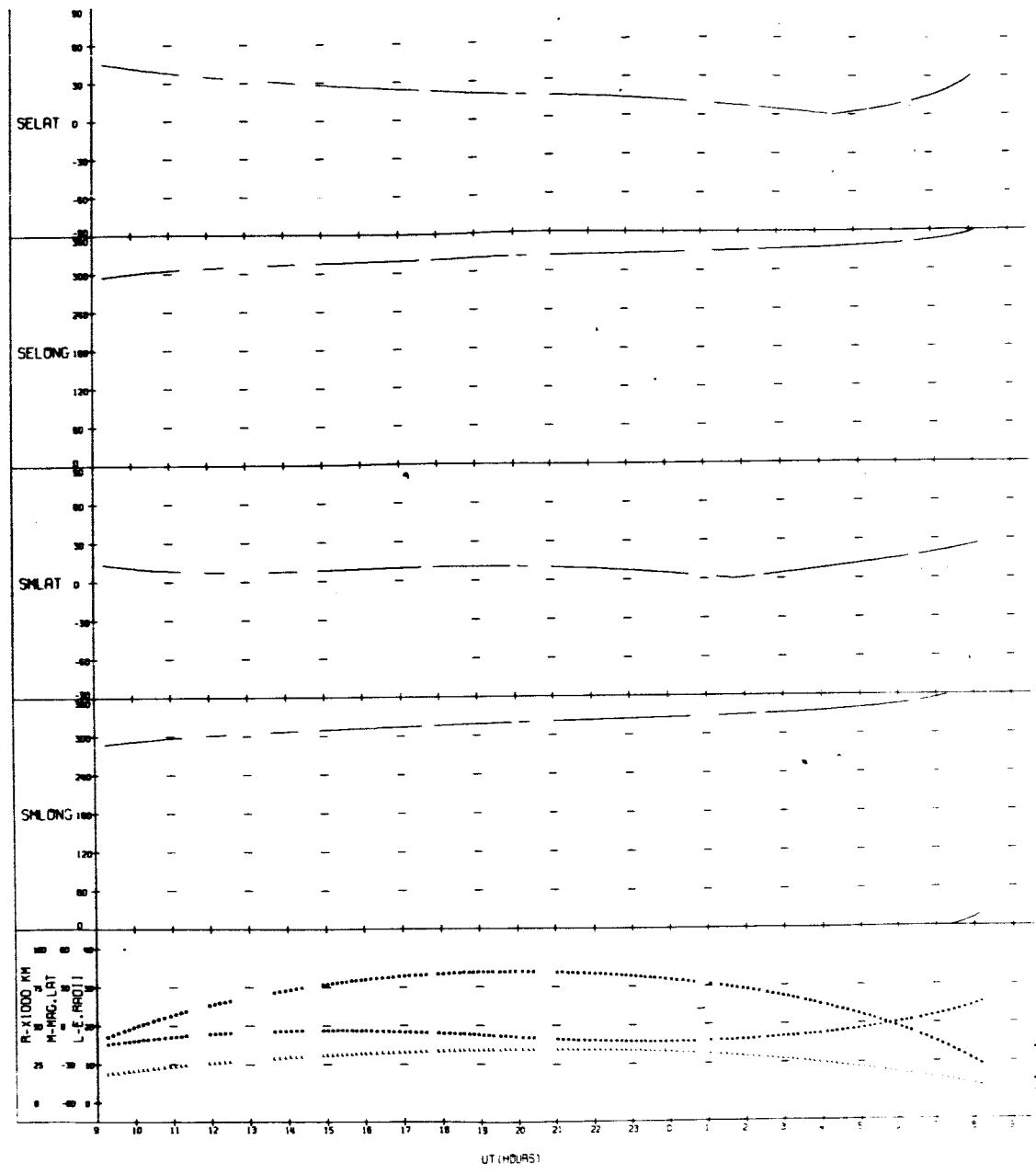


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 49
BEGIN 10/08/61/09:15
END 10/09/61/09:32

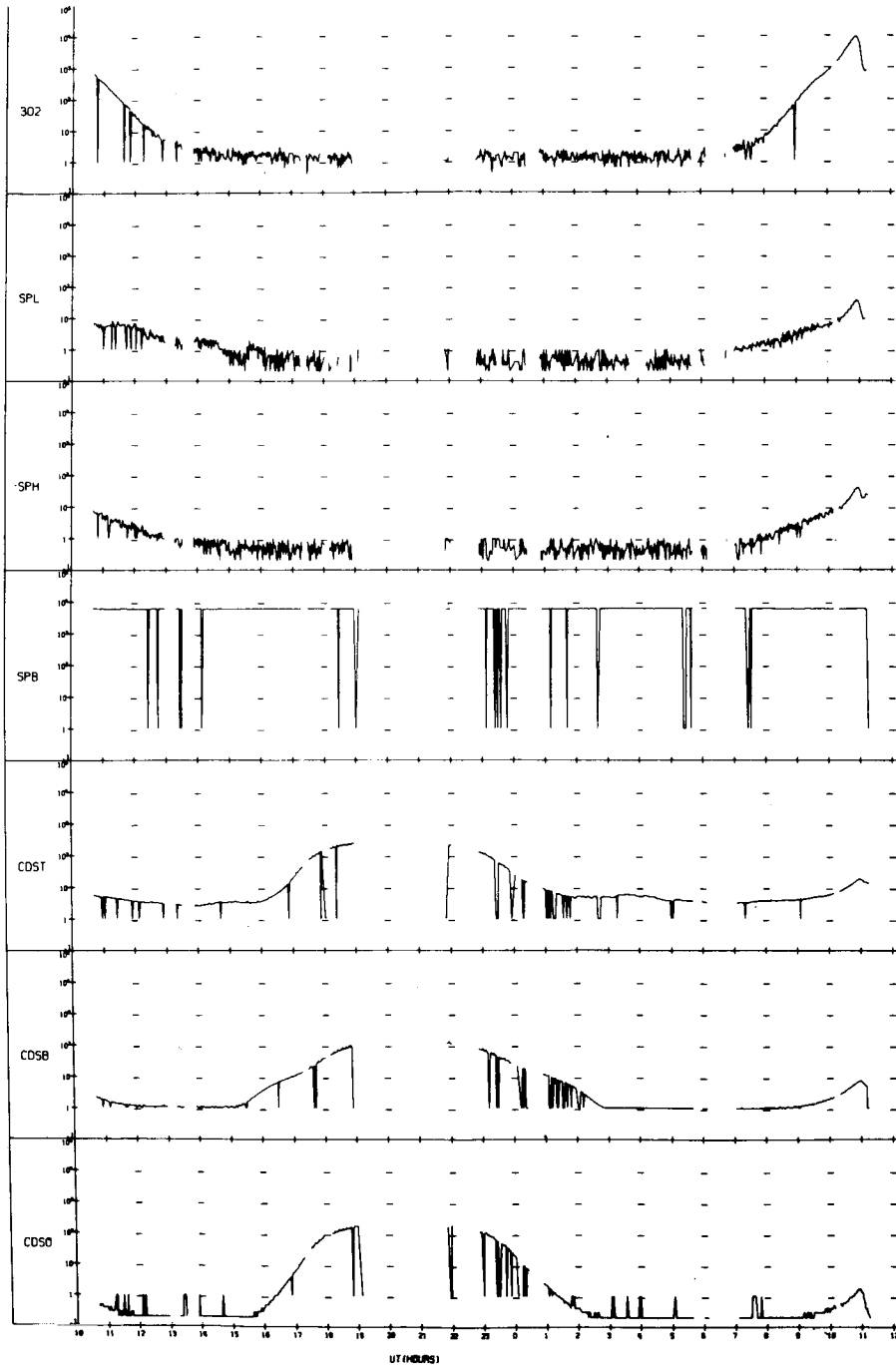


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 49
 BEGIN 10/08/61/09:15
 END 10/09/61/09:32



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 50
BEGIN 10/09/61/10:40
END 10/10/61/12:09

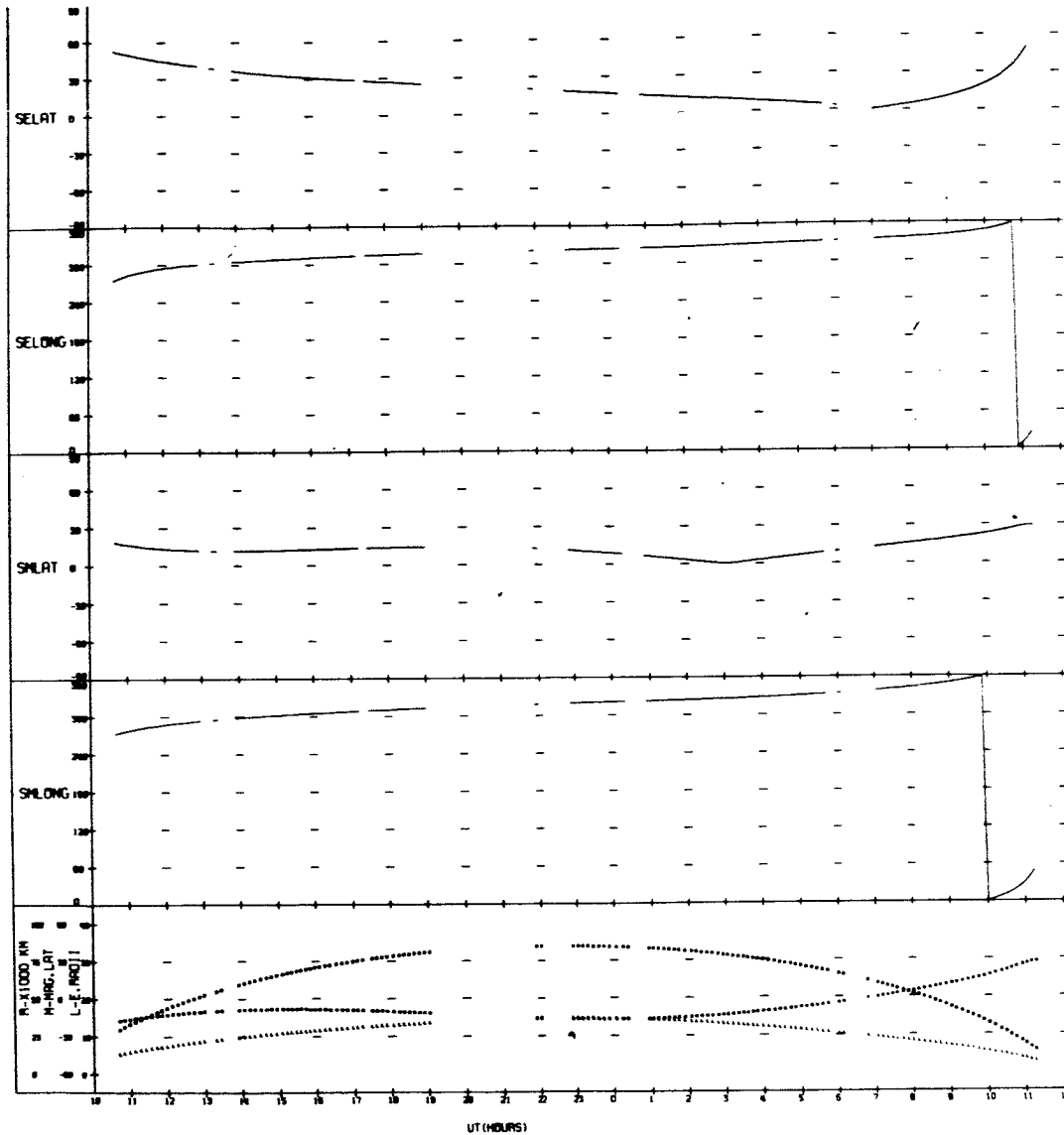


UNIVERSITY OF IOWA

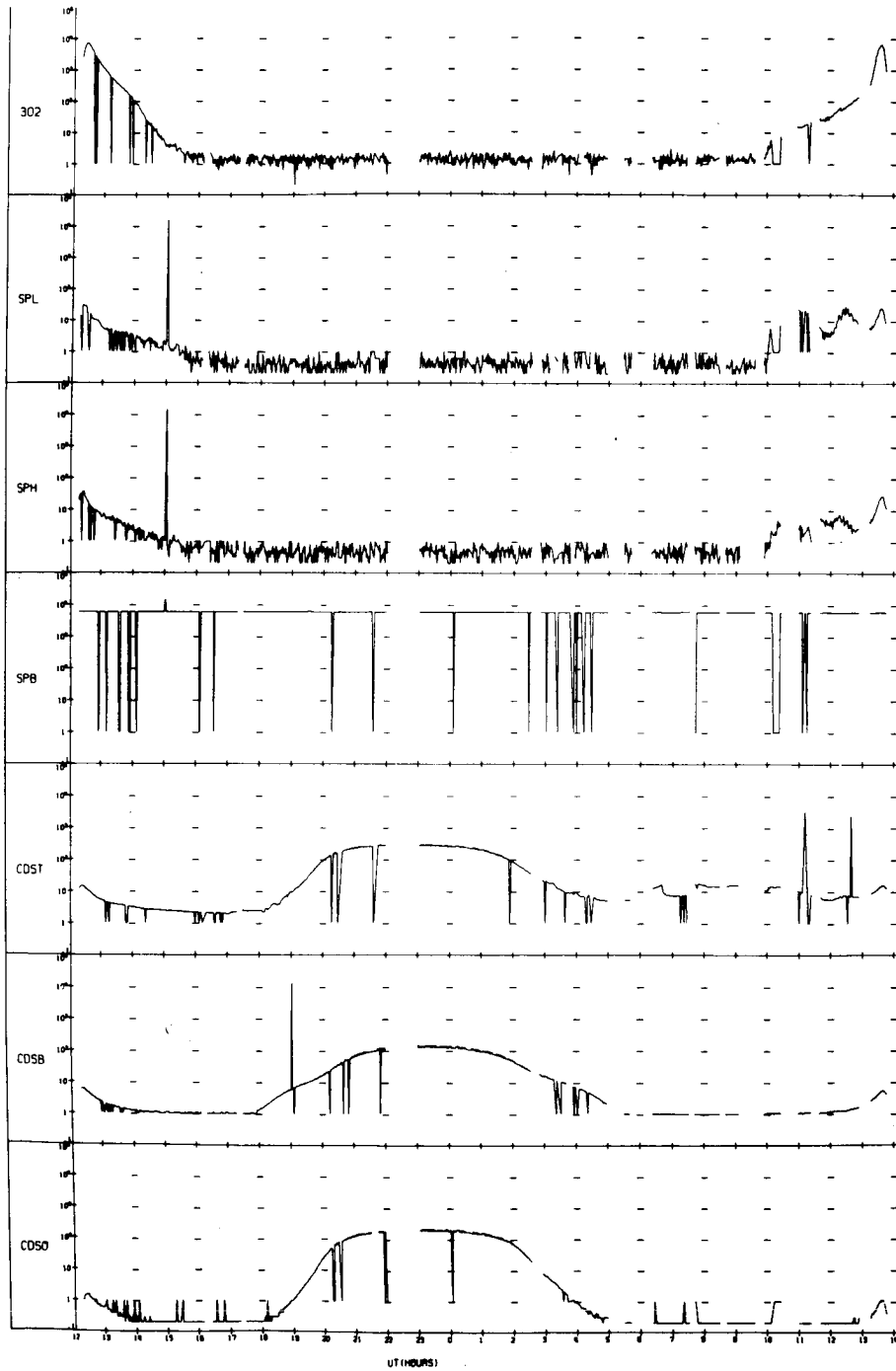
EXPLORER 12 ORBIT 50

BEGIN 10/09/61/10:40

END 10/10/61/12:09

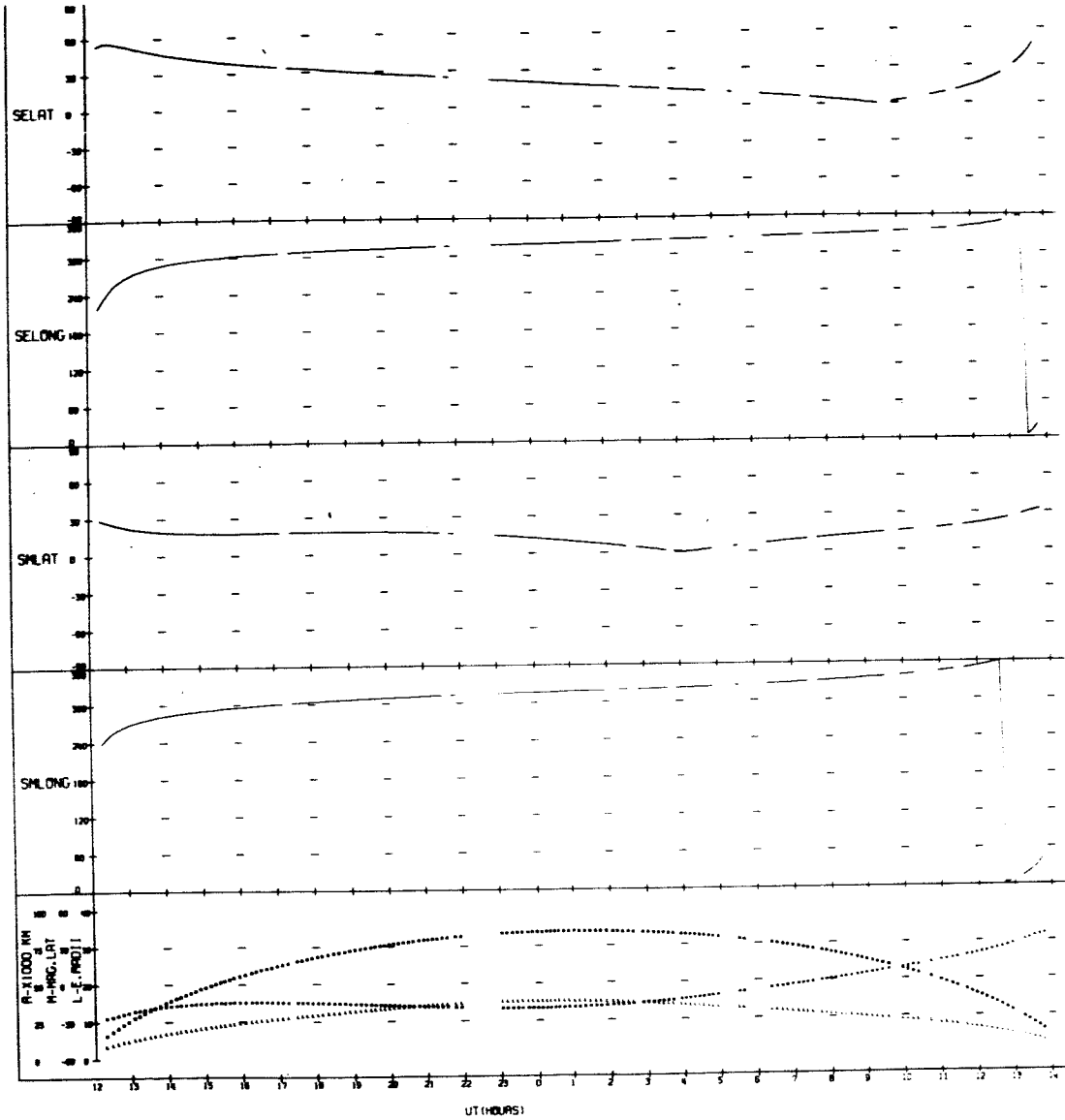


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 51
BEGIN 10/10/61/12:17
END 10/11/61/14:24



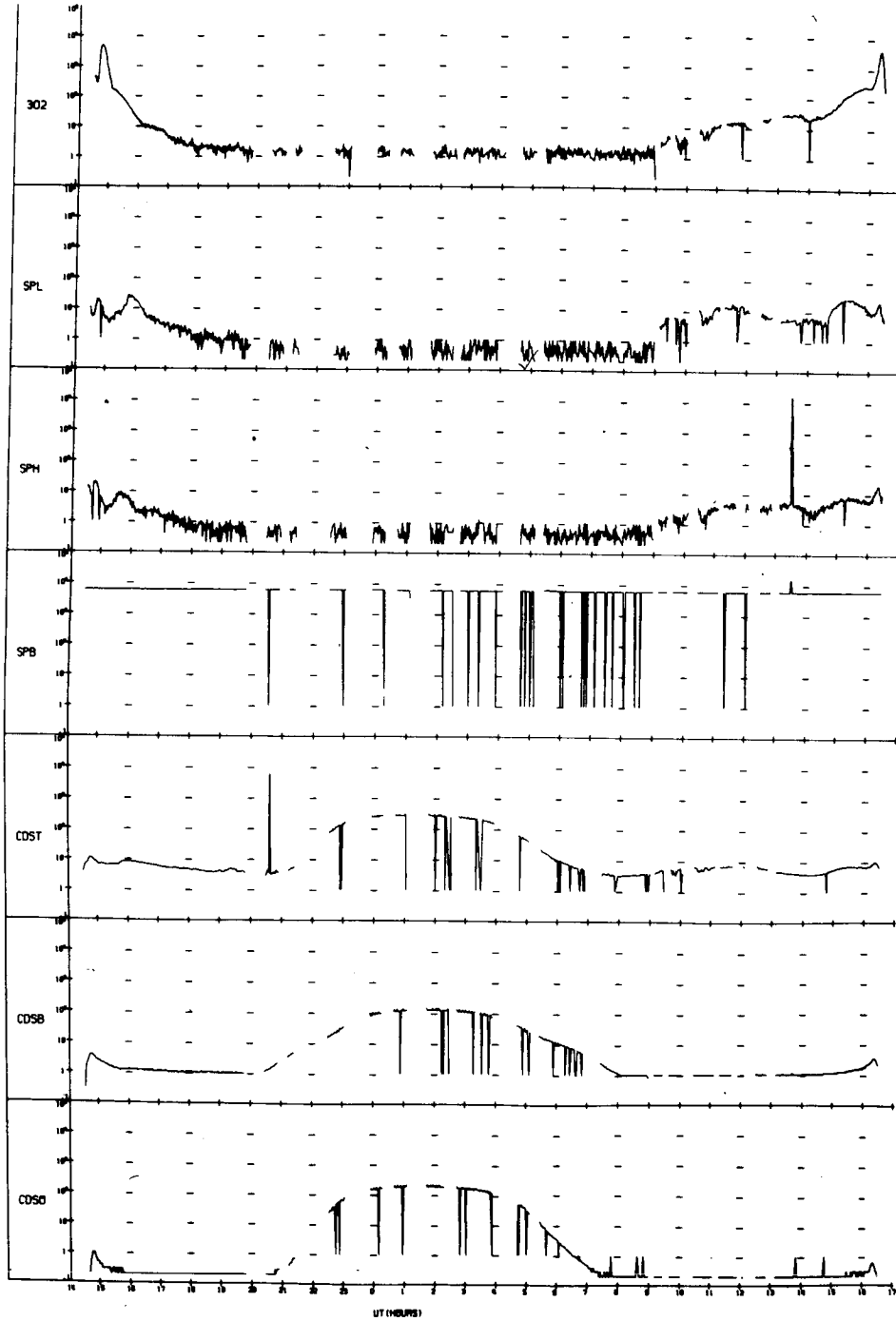
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 51
BEGIN 10/10/61/12:17
END 10/11/61/14:24

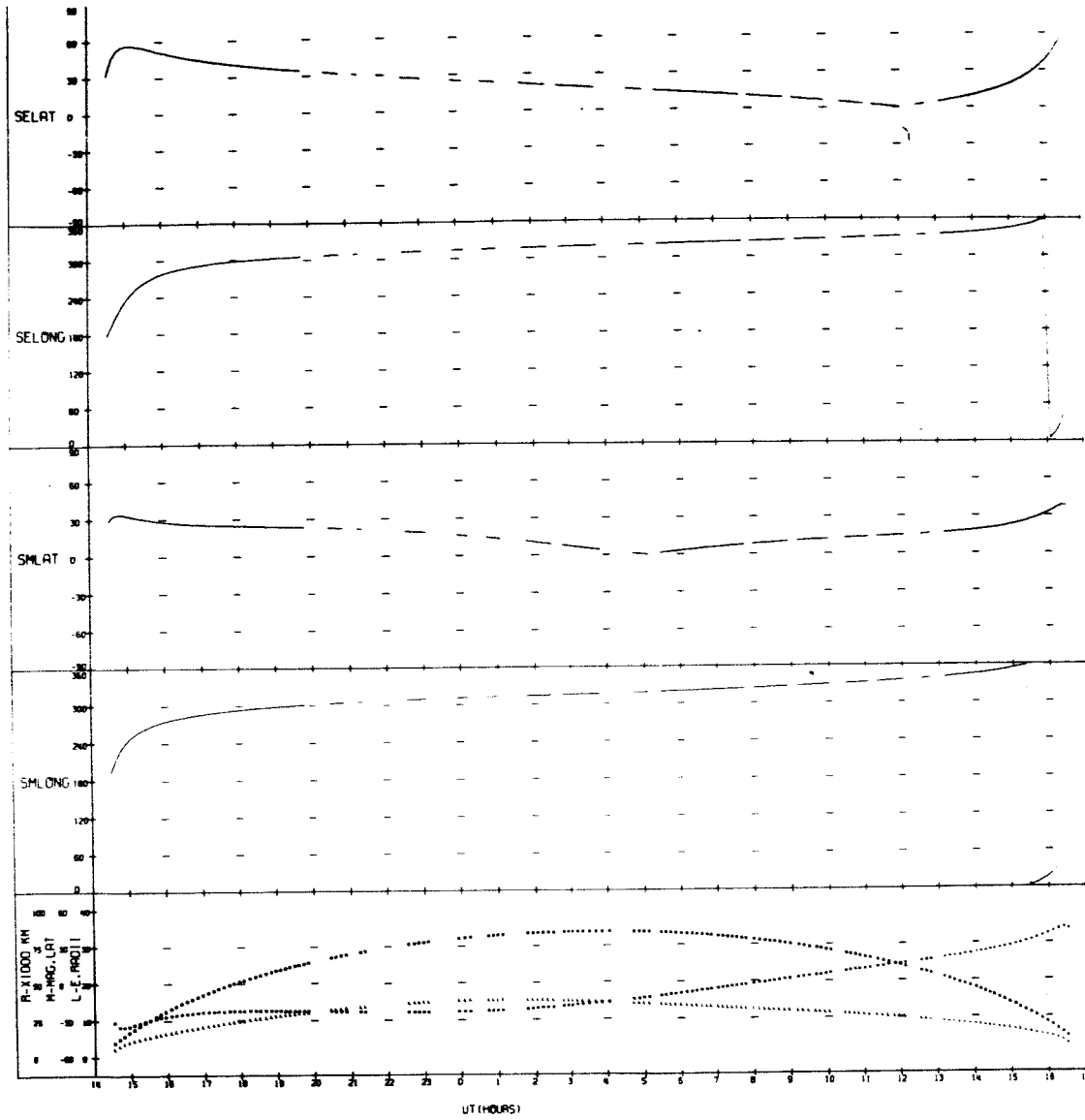


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 52
BEGIN 10/11/61/14:31
END 10/12/61/17:03

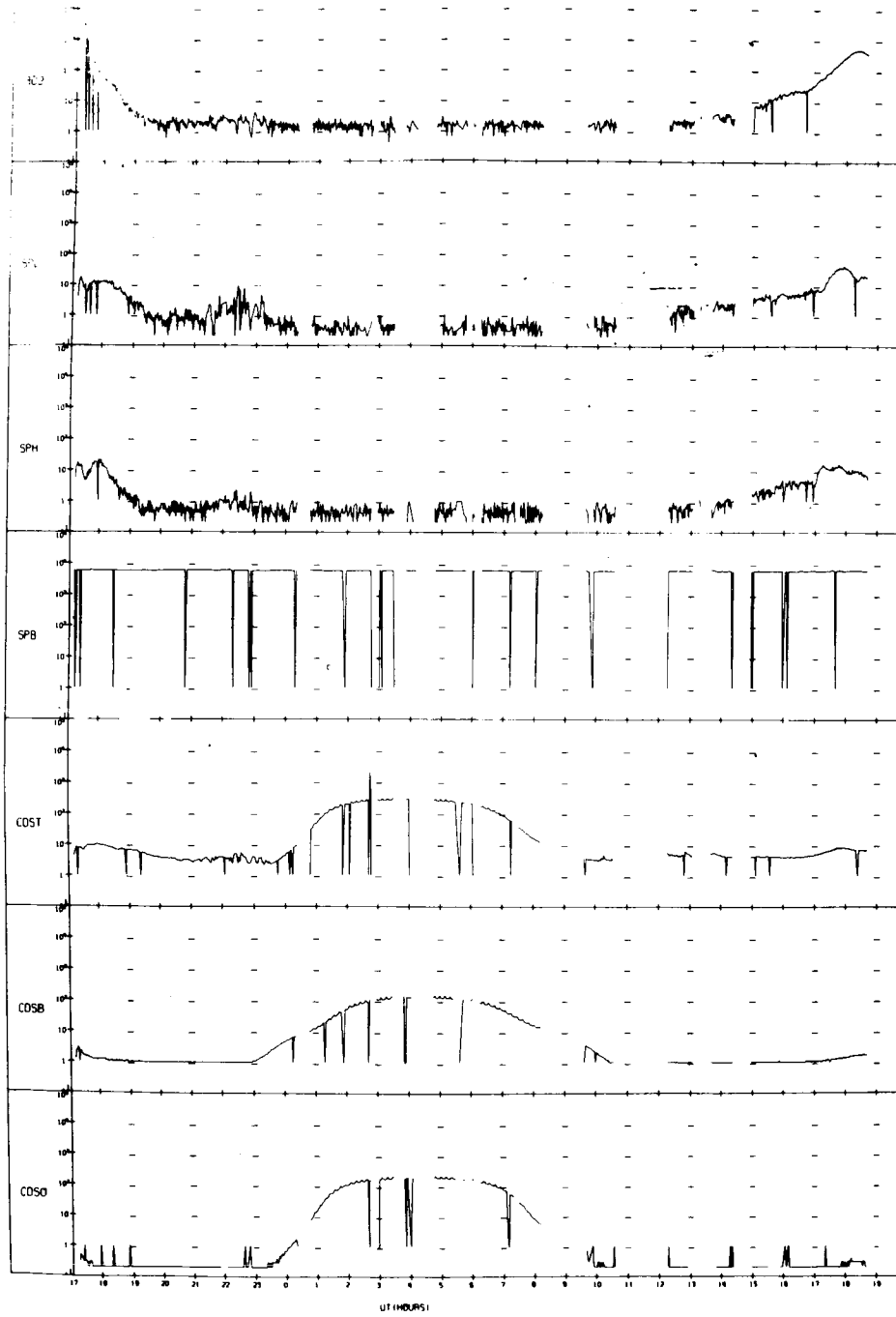


UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 52
 BEGIN 10/11/61/14:31
 END 10/12/61/17:03



UNIVERSITY OF IOWA

EXP. ORG# 12 ORG# 11 53
BEGIN 10/12/61/17:10
END 10/13/61/19:48

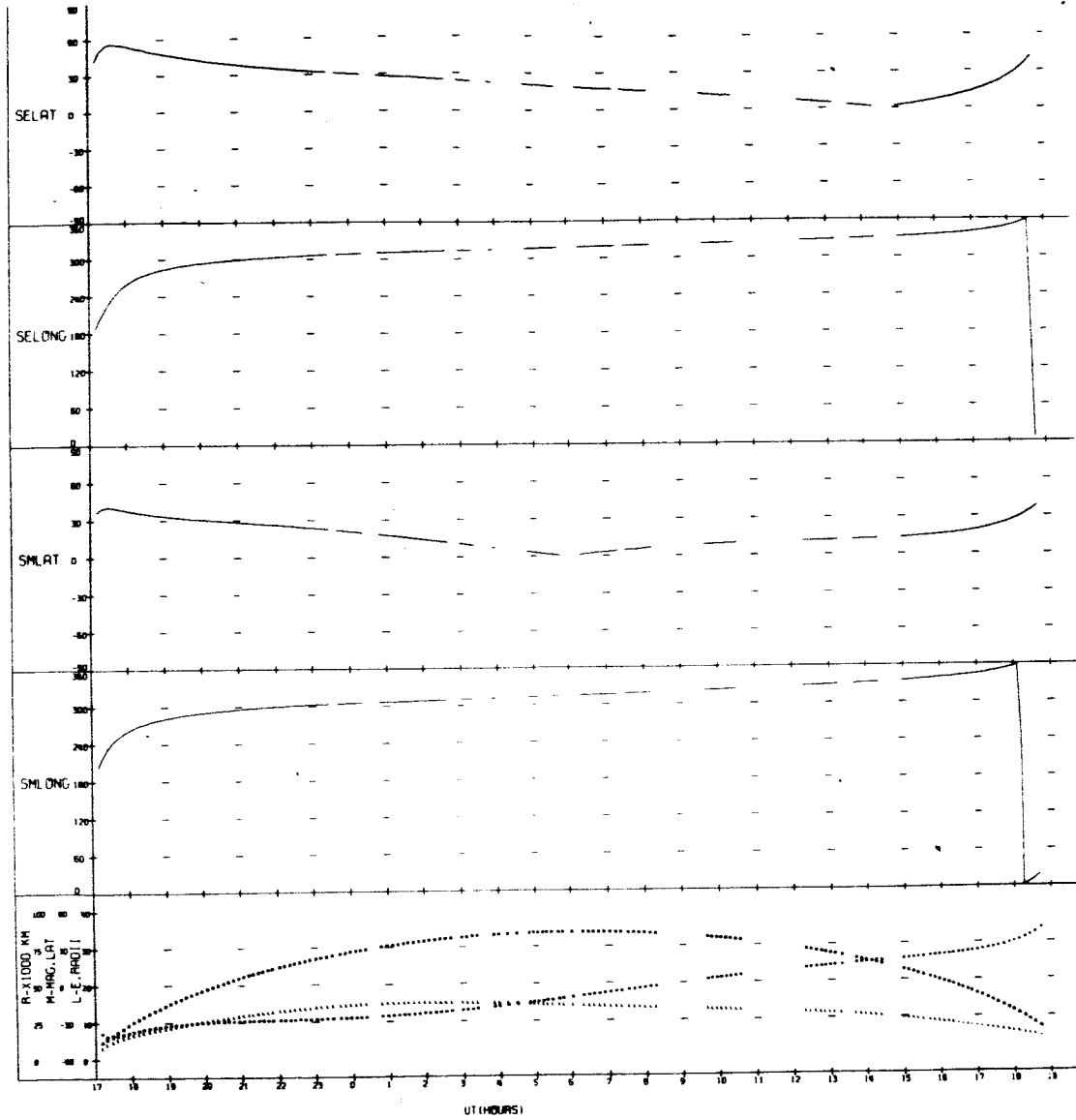


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 53

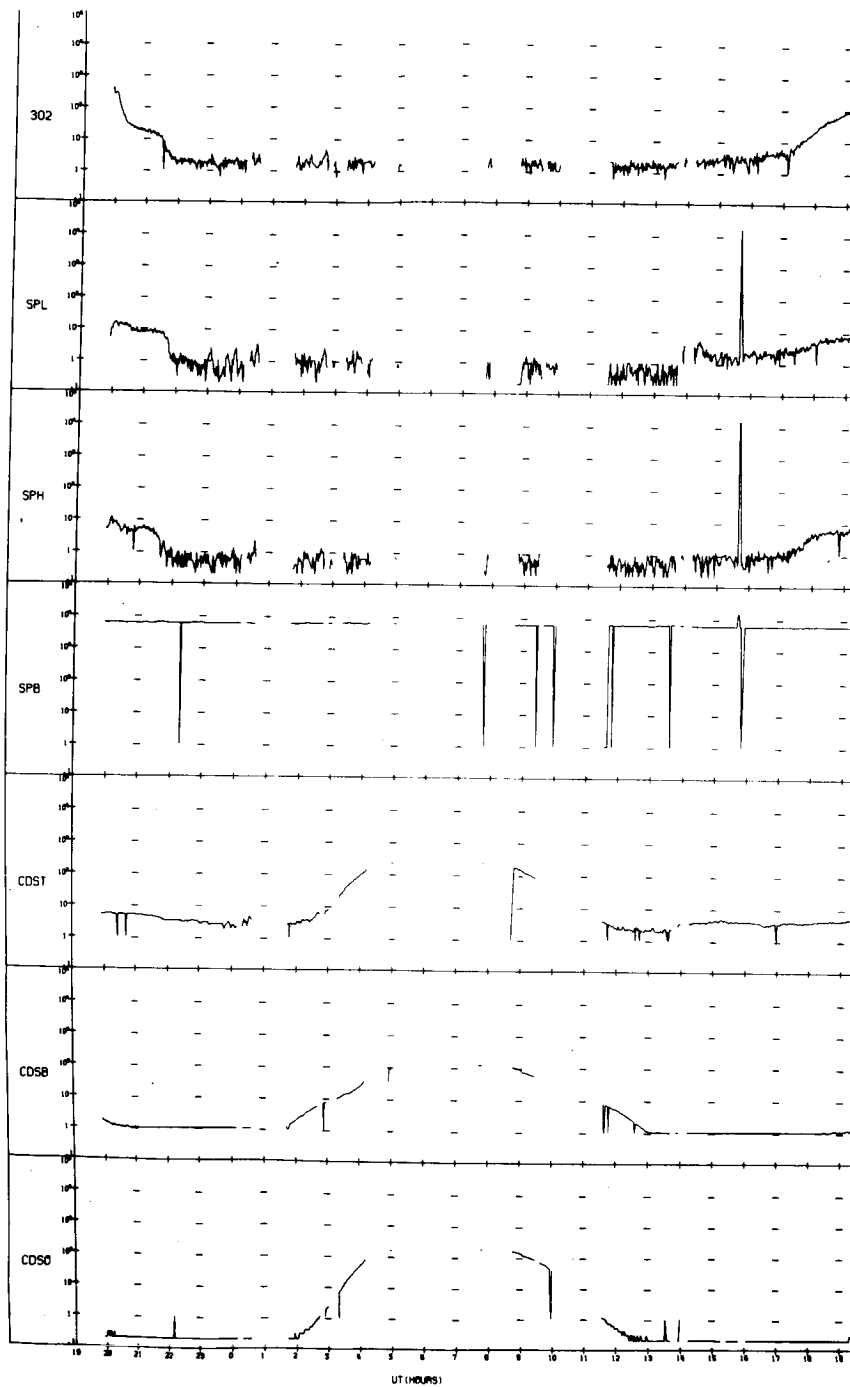
BEGIN 10/12/61/17:10

END 10/13/61/19:48

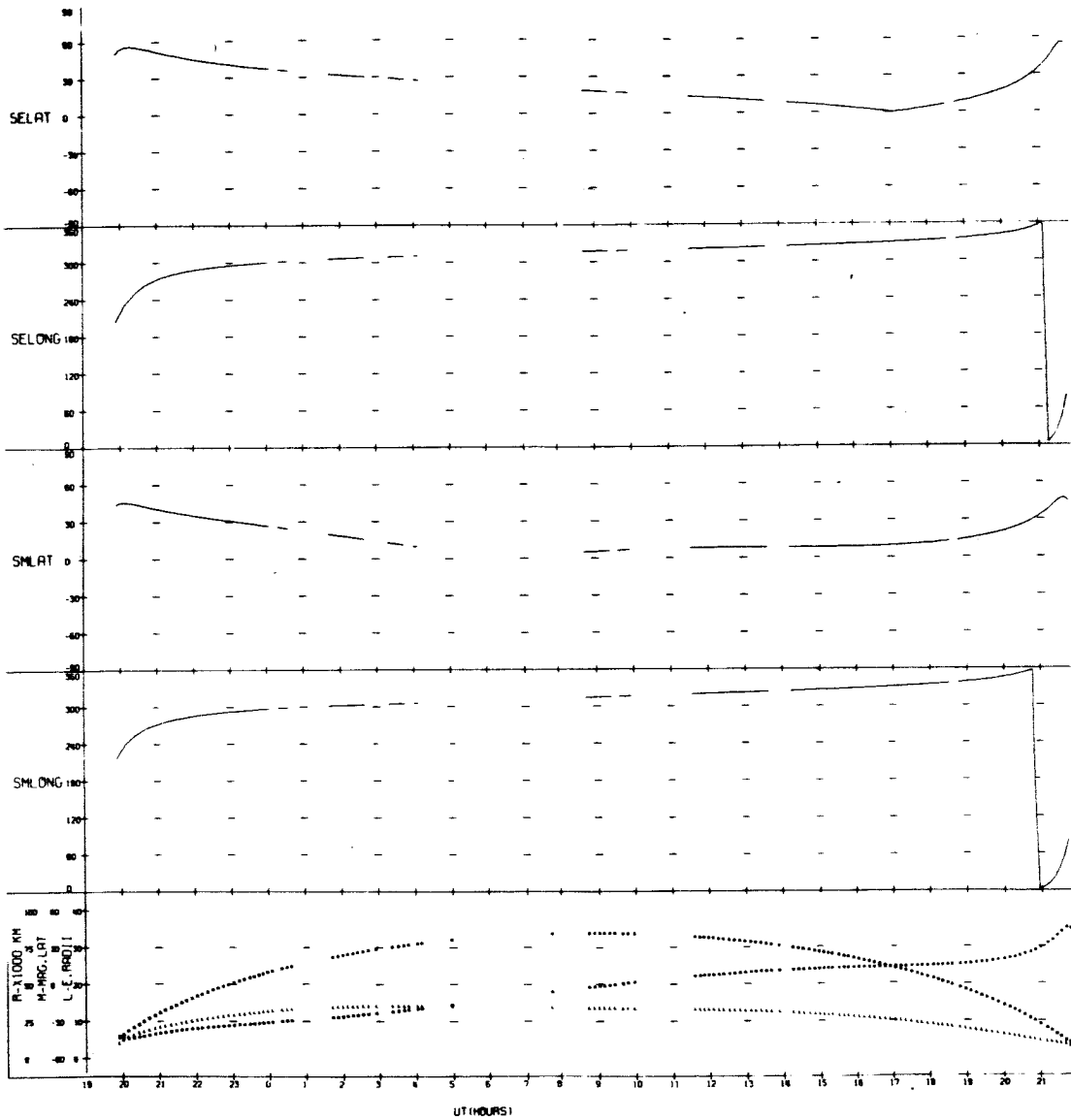


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 54
BEGIN 10/13/61/19:54
END 10/14/61/19:22

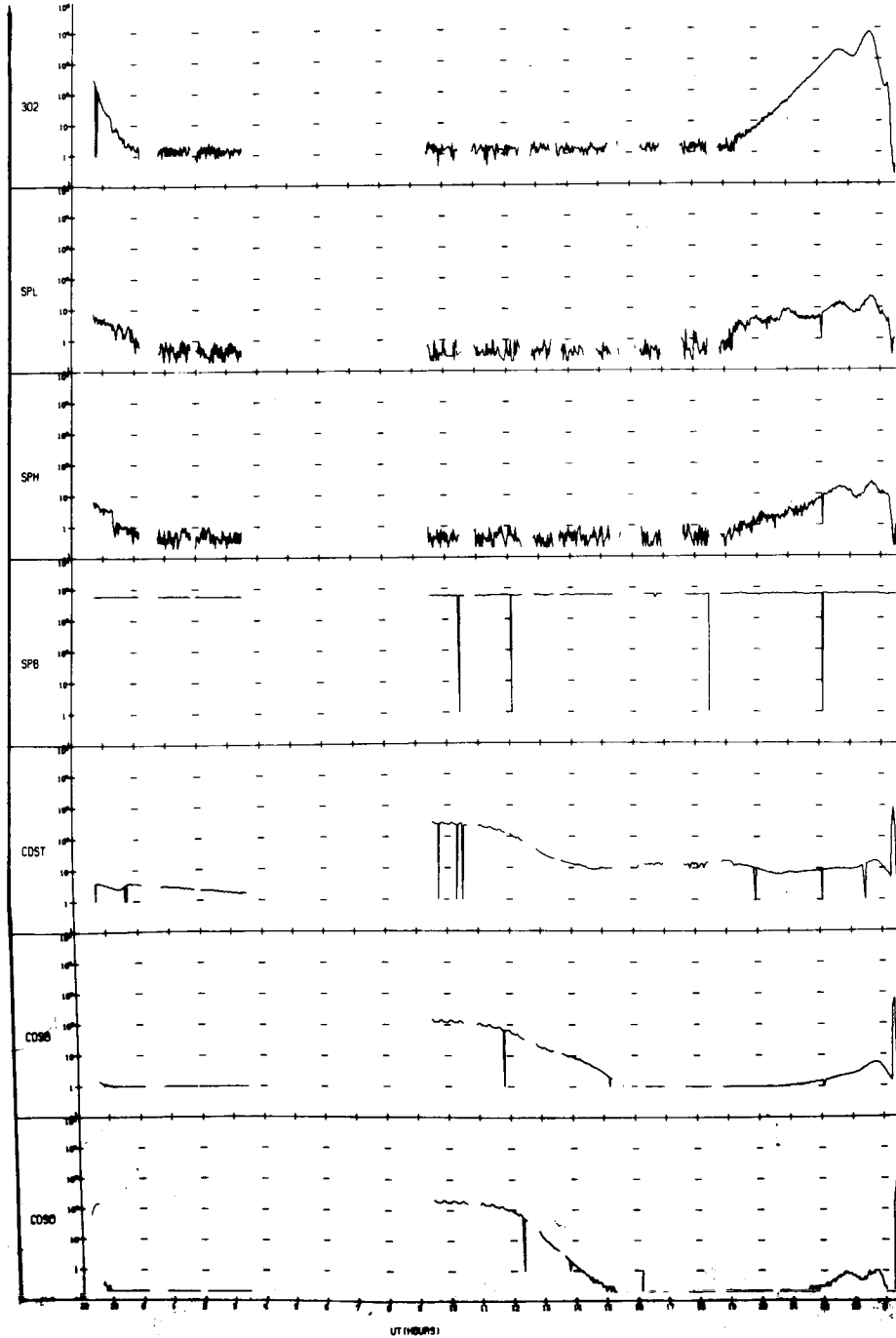


UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 54
 BEGIN 10/13/61/19:52
 END 10/14/61/21:51

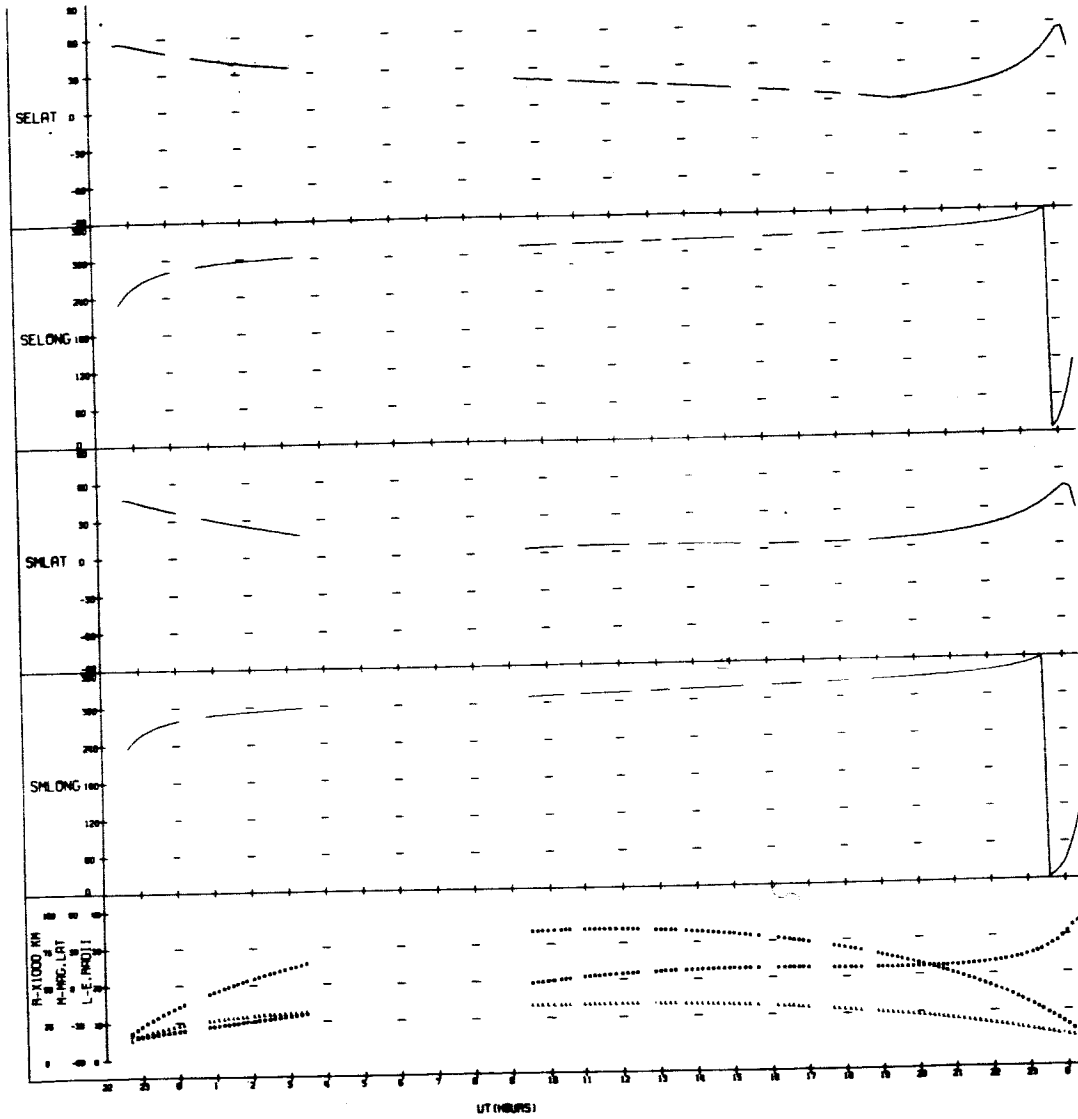


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 55
BEGIN 10/14/61/22:39
END 10/16/61/00:31



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 55
 BEGIN 10/14/61/22:39
 END 10/16/61/00:31

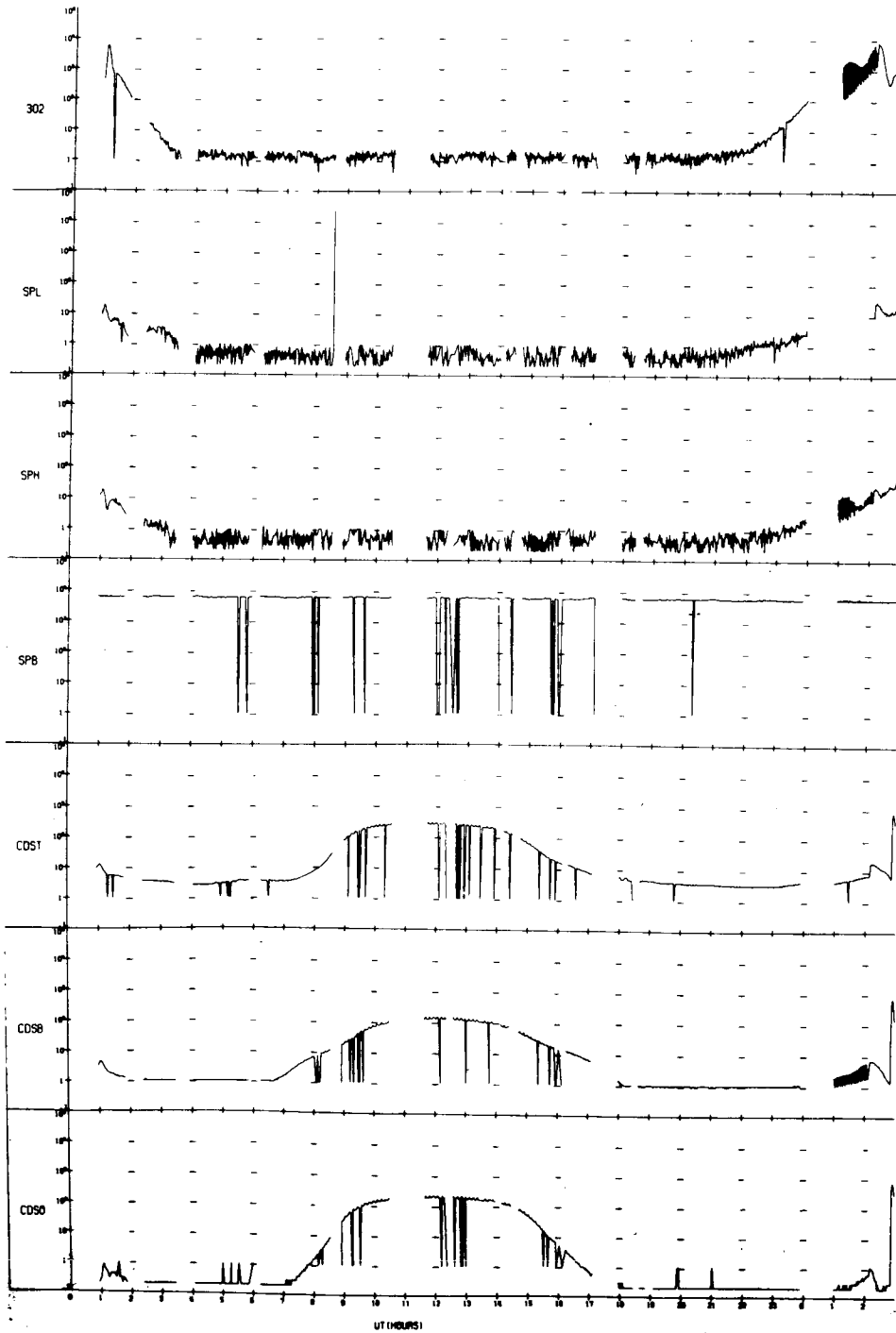


UNIVERSITY OF IOWA

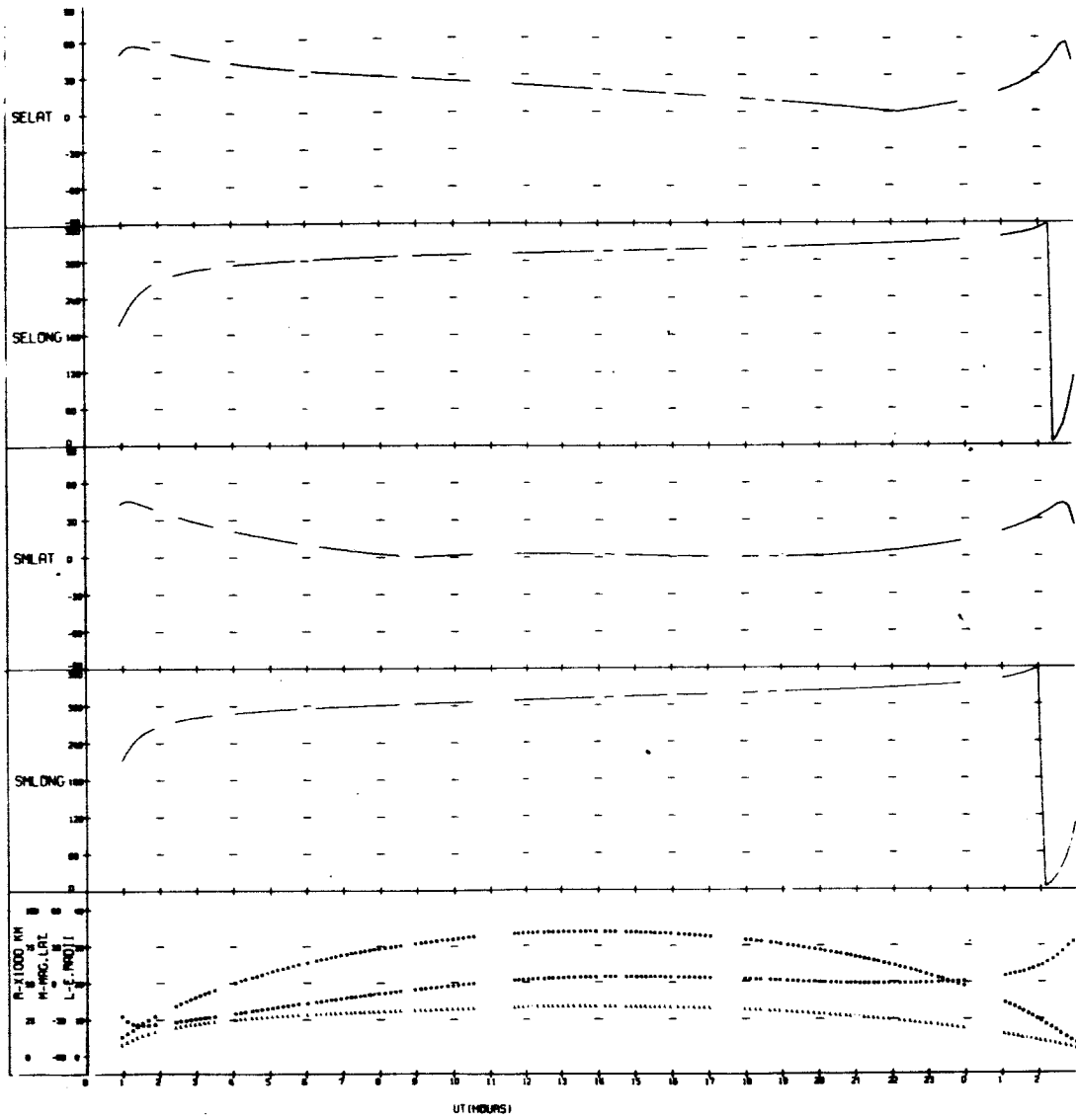
EXPLORER 12 ORBIT 56

BEGIN 10/16/61/00:54

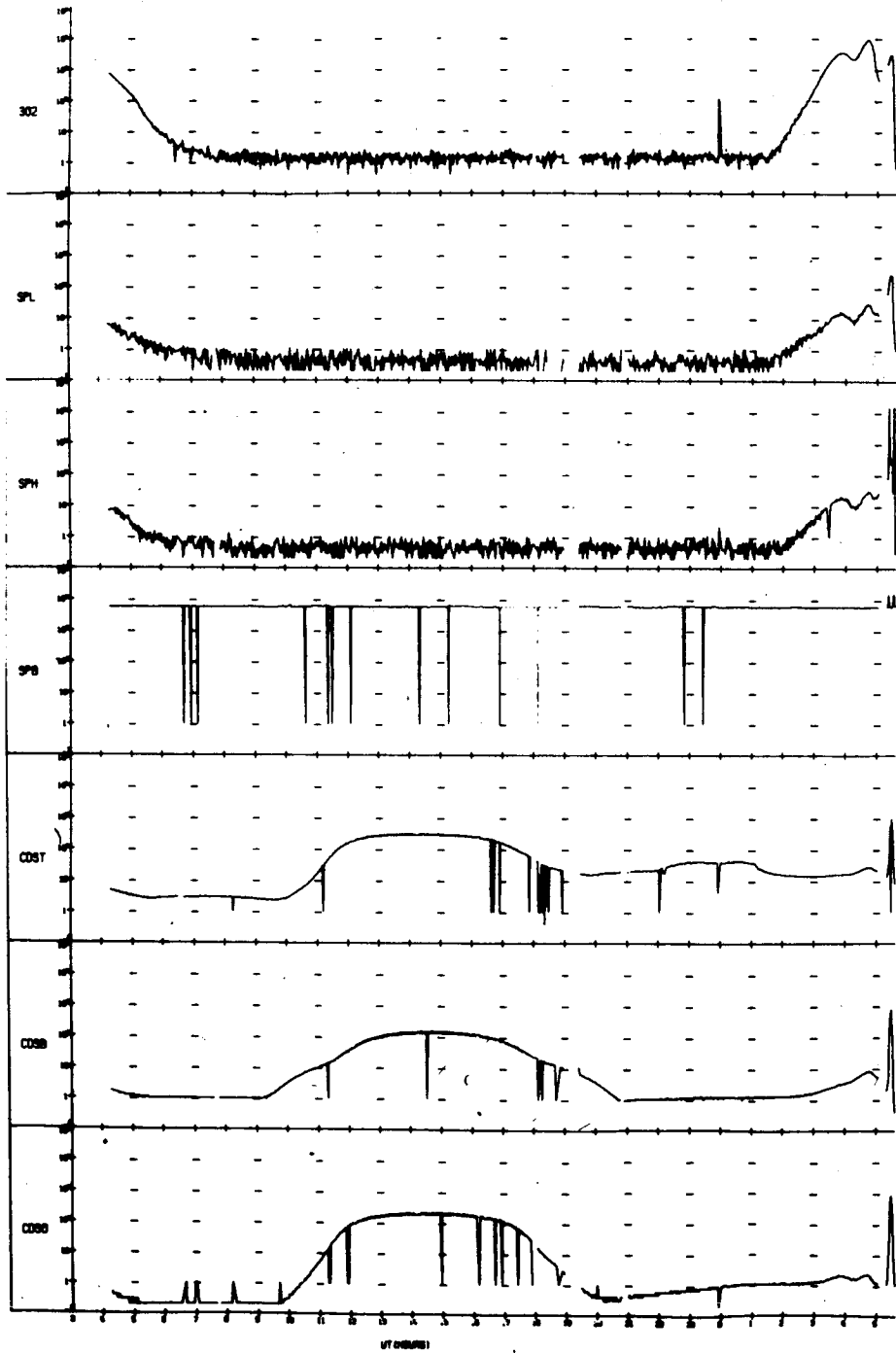
END 10/17/61/02:59



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 56
 BEGIN 10/16/61/00:54
 END 10/17/61/02:59

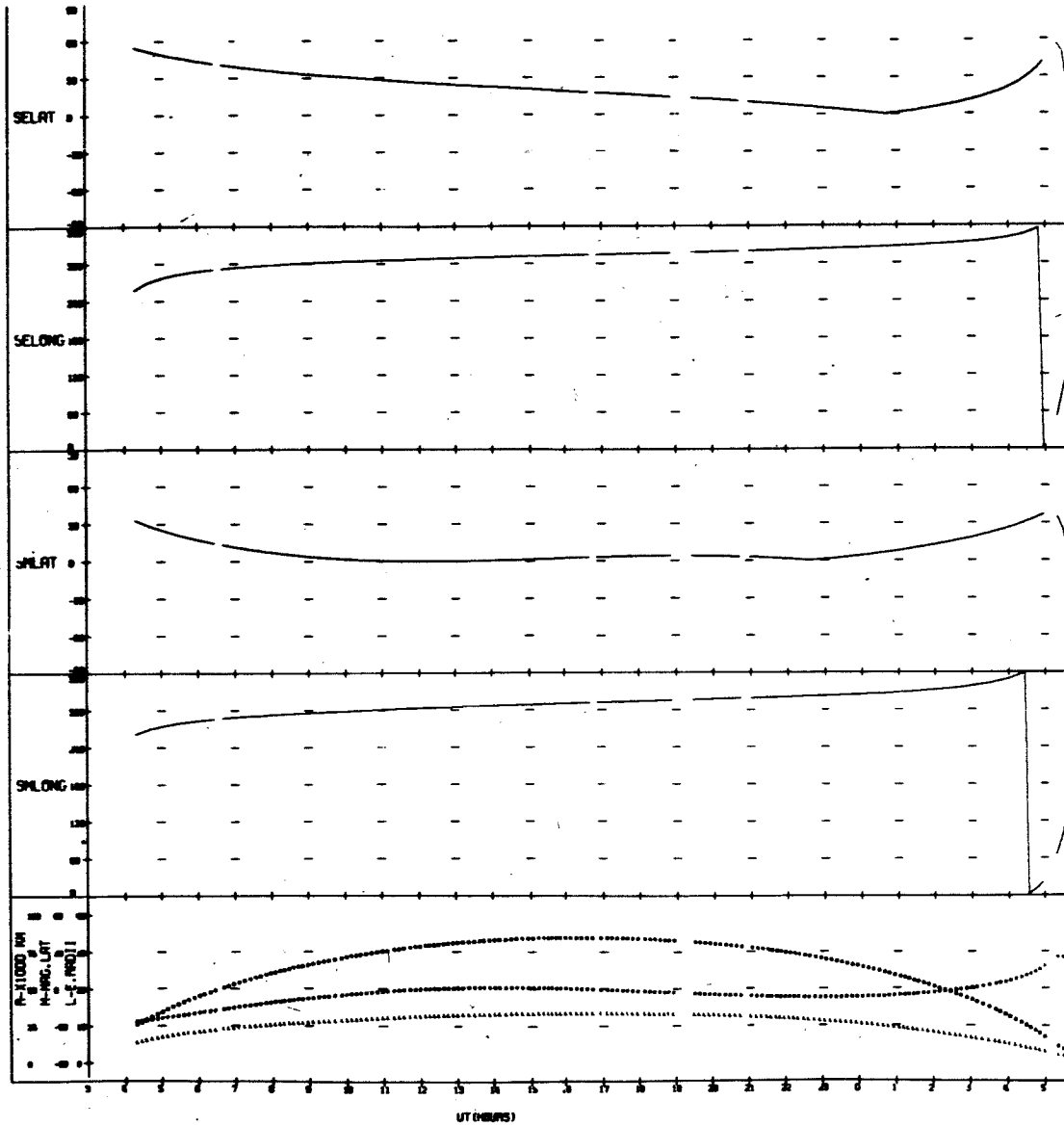


UNIVERSITY OF IOWA
EXPLORER 2 ORBIT 57
BEGIN 10/17/61/03:27
END 10/18/61/05:37

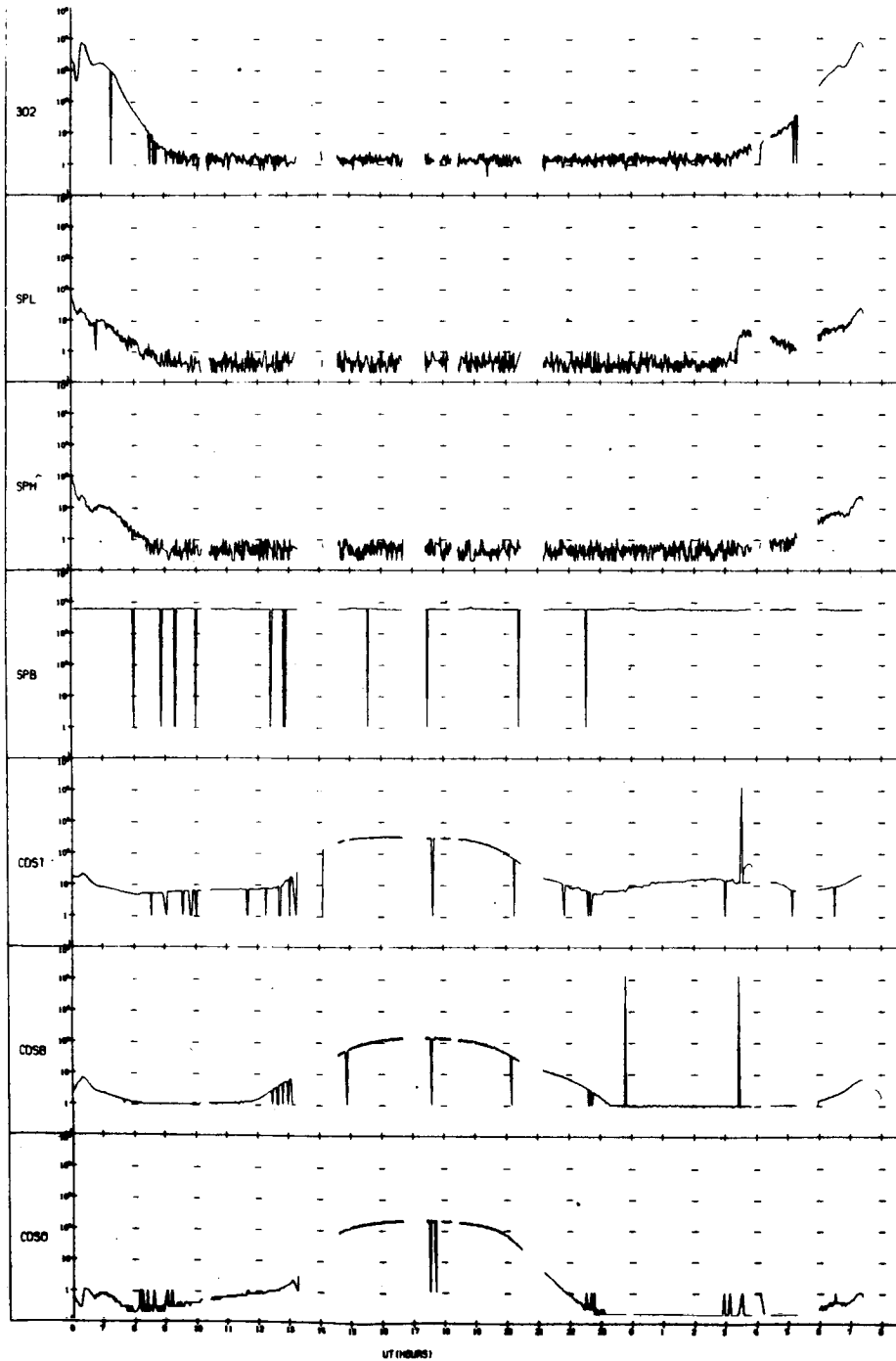


UNIVERSITY OF IOWA

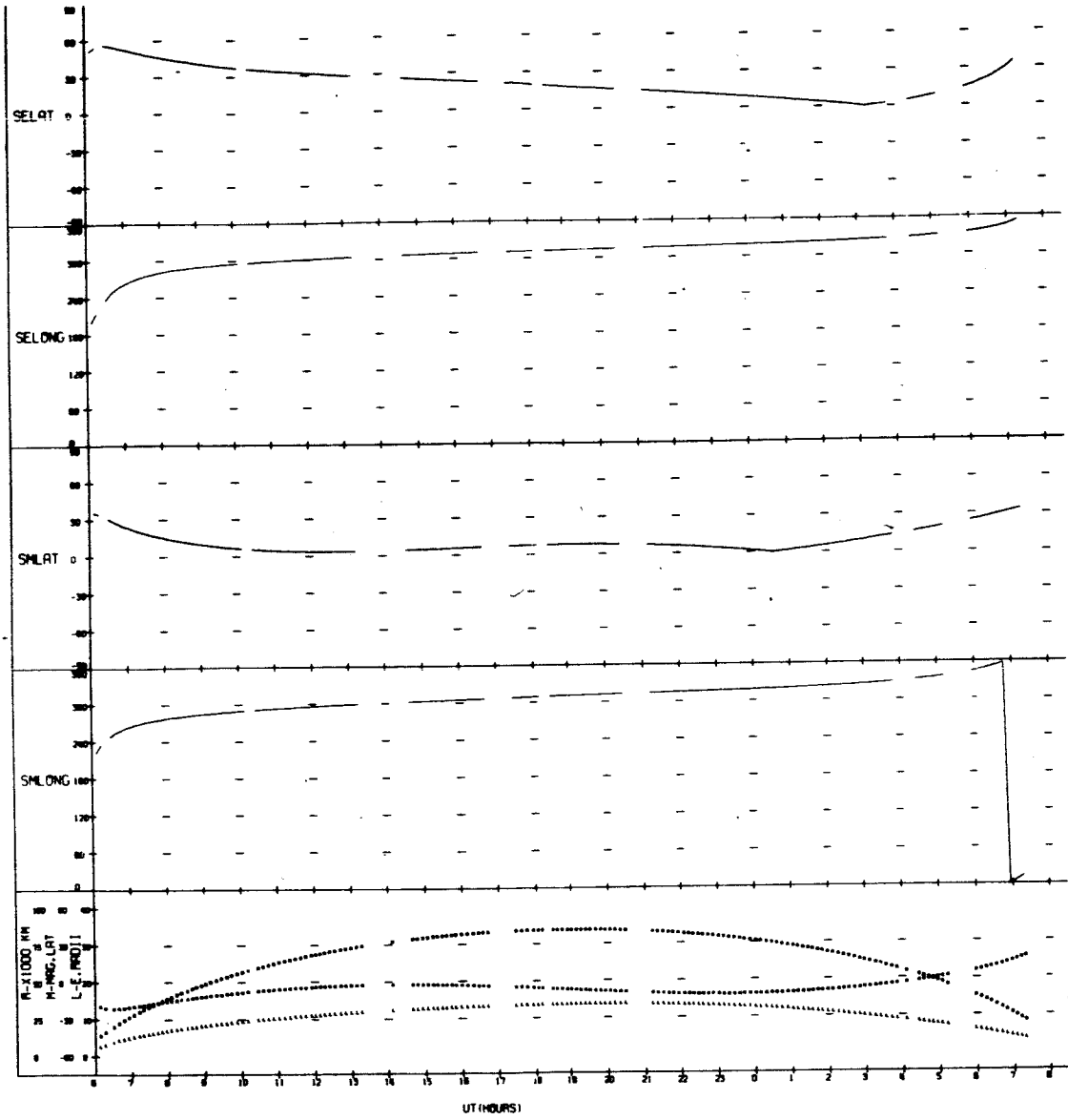
EXPLORER 12 ORBIT 57
BEGIN 10/17/61/03:27
END 10/18/61/05:37



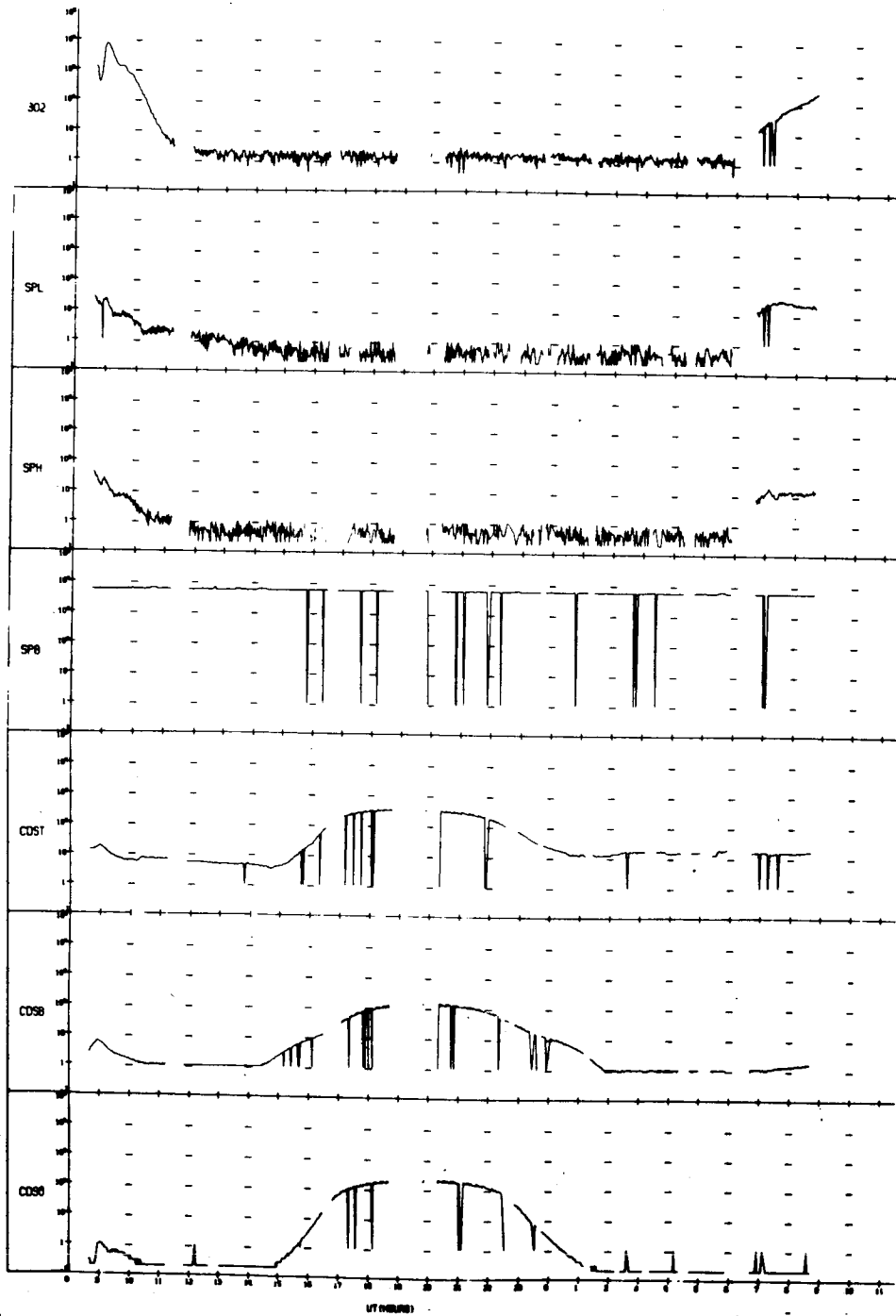
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 58
BEGIN 10/18/61/06:00
END 10/19/61/08:31



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 58
 BEGIN 10/18/61/06:00
 END 10/19/61/08:31

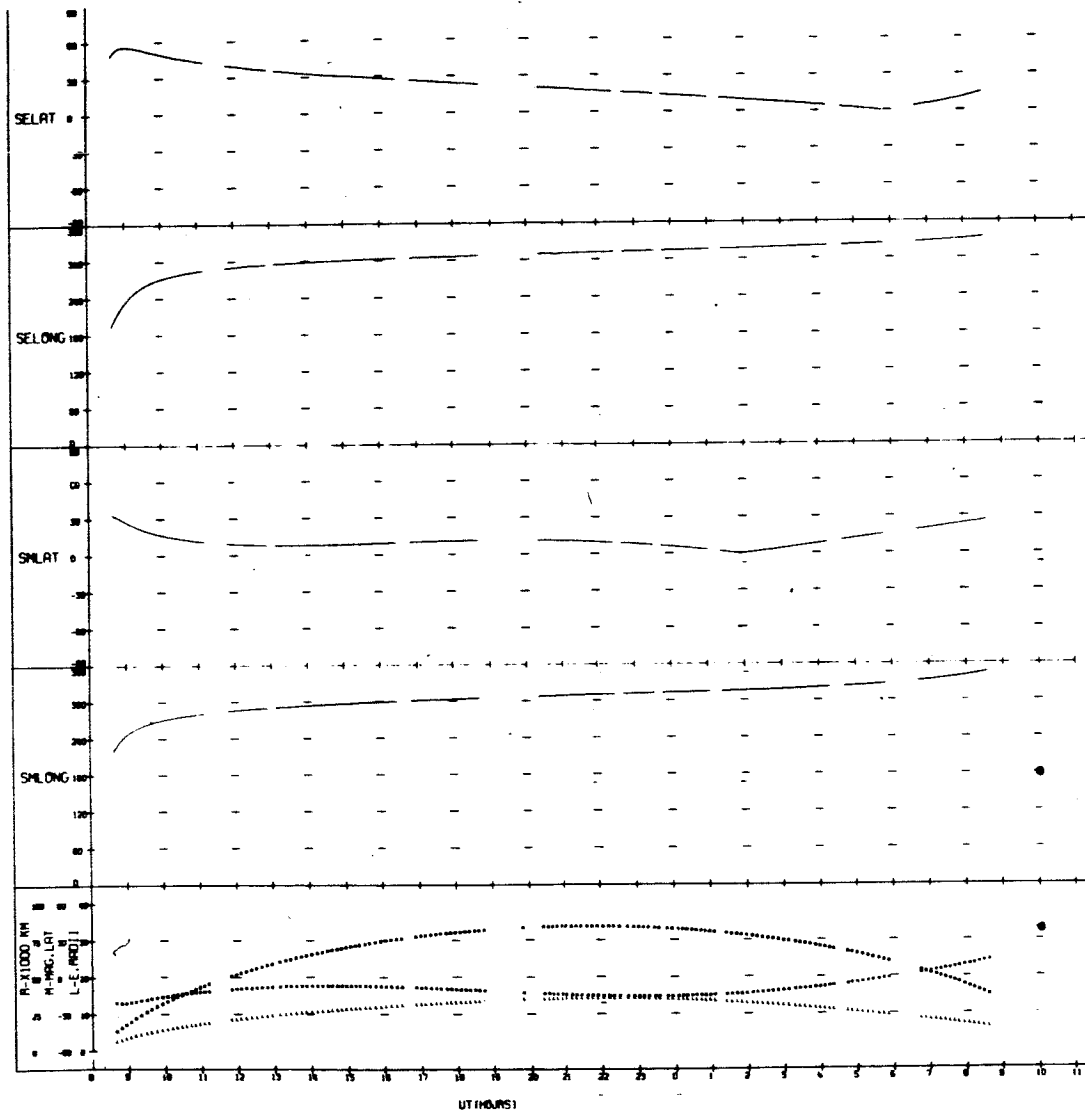


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 59
BEGIN 10/19/61/08:38
END 10/20/61/11:31

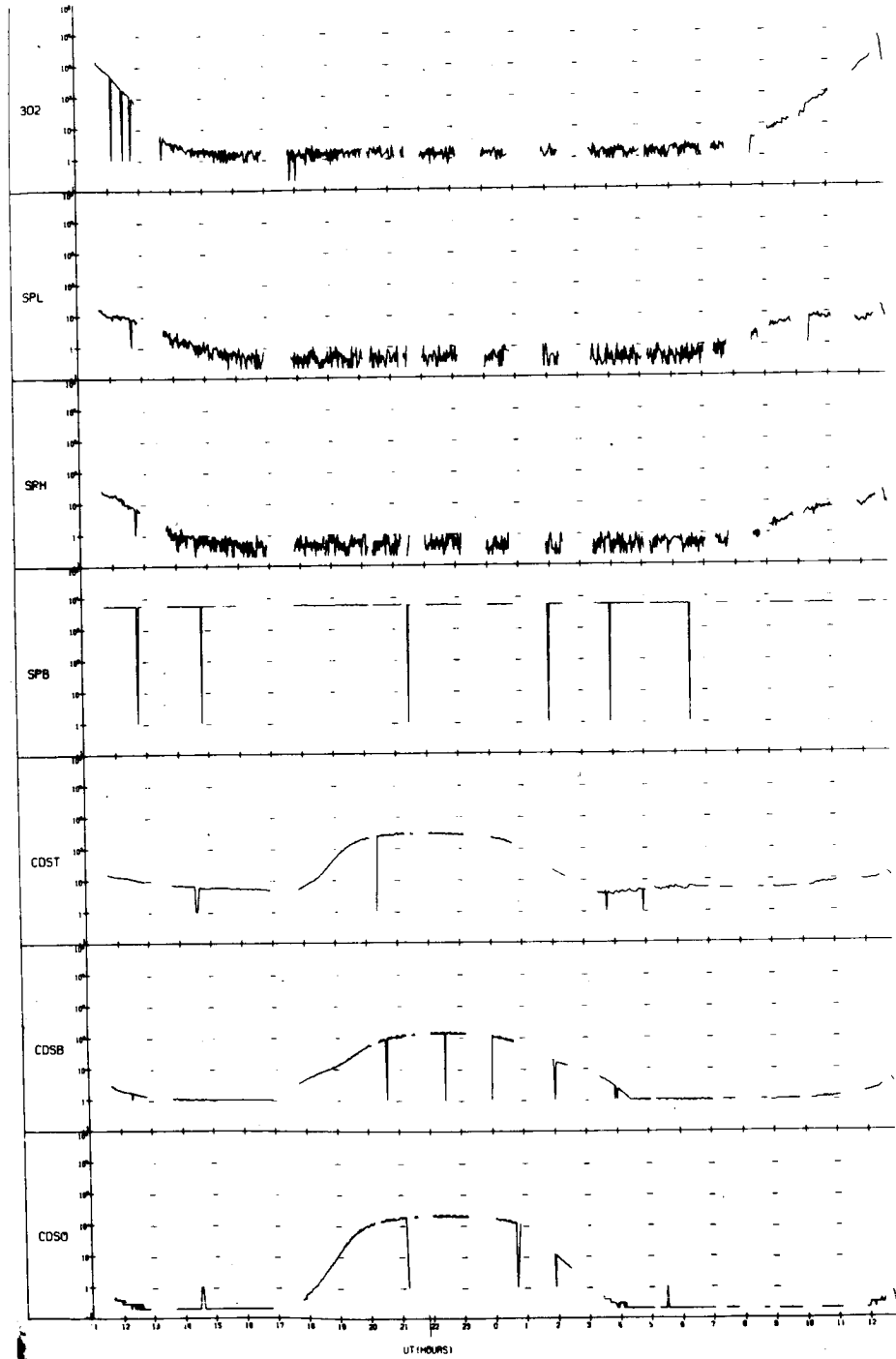


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 59
BEGIN 10/19/61/08:38
END 10/20/61/11:31



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 60
BEGIN 10/20/61/11:40
END 10/21/61/12:50

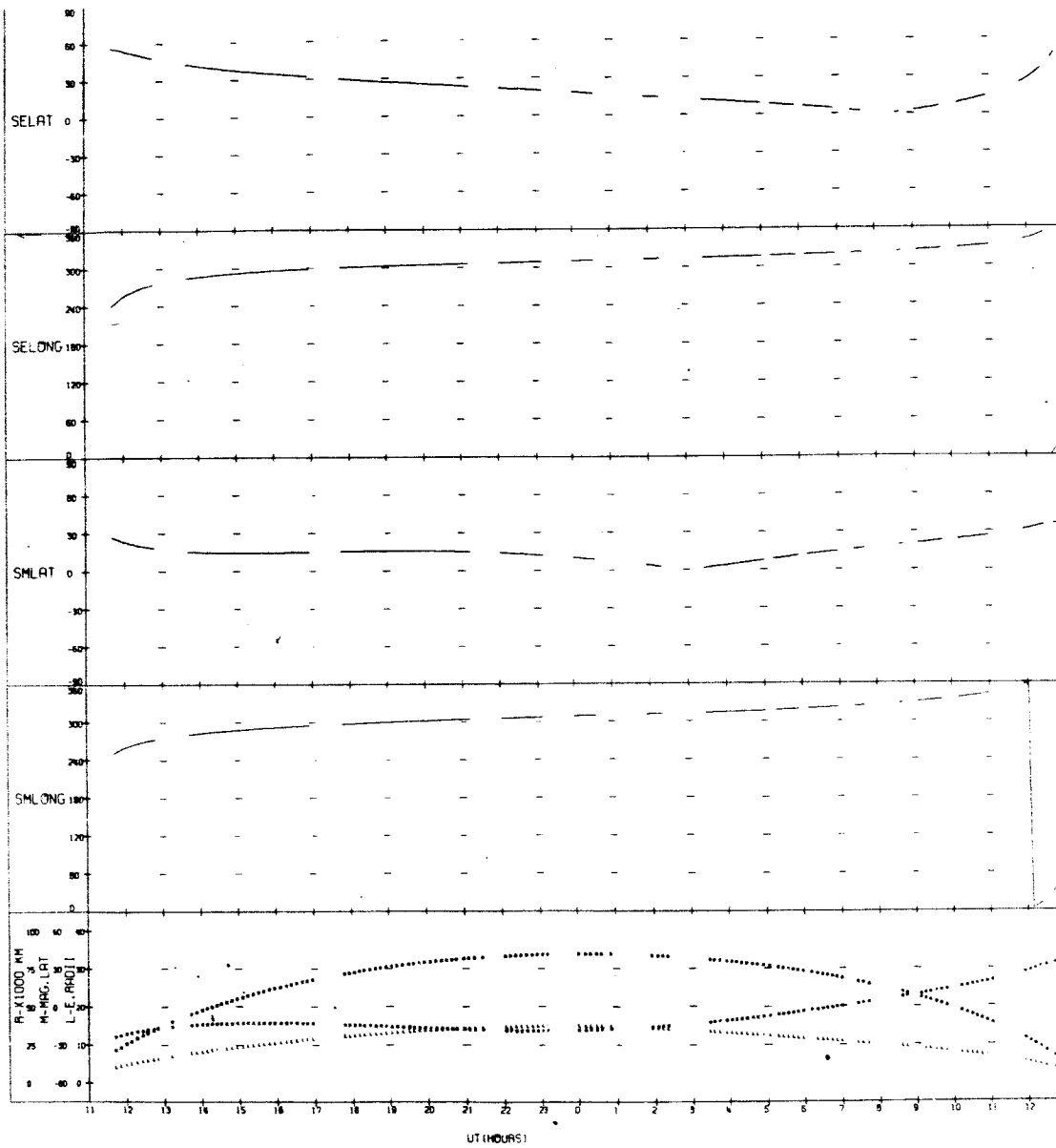


UNIVERSITY OF IOWA

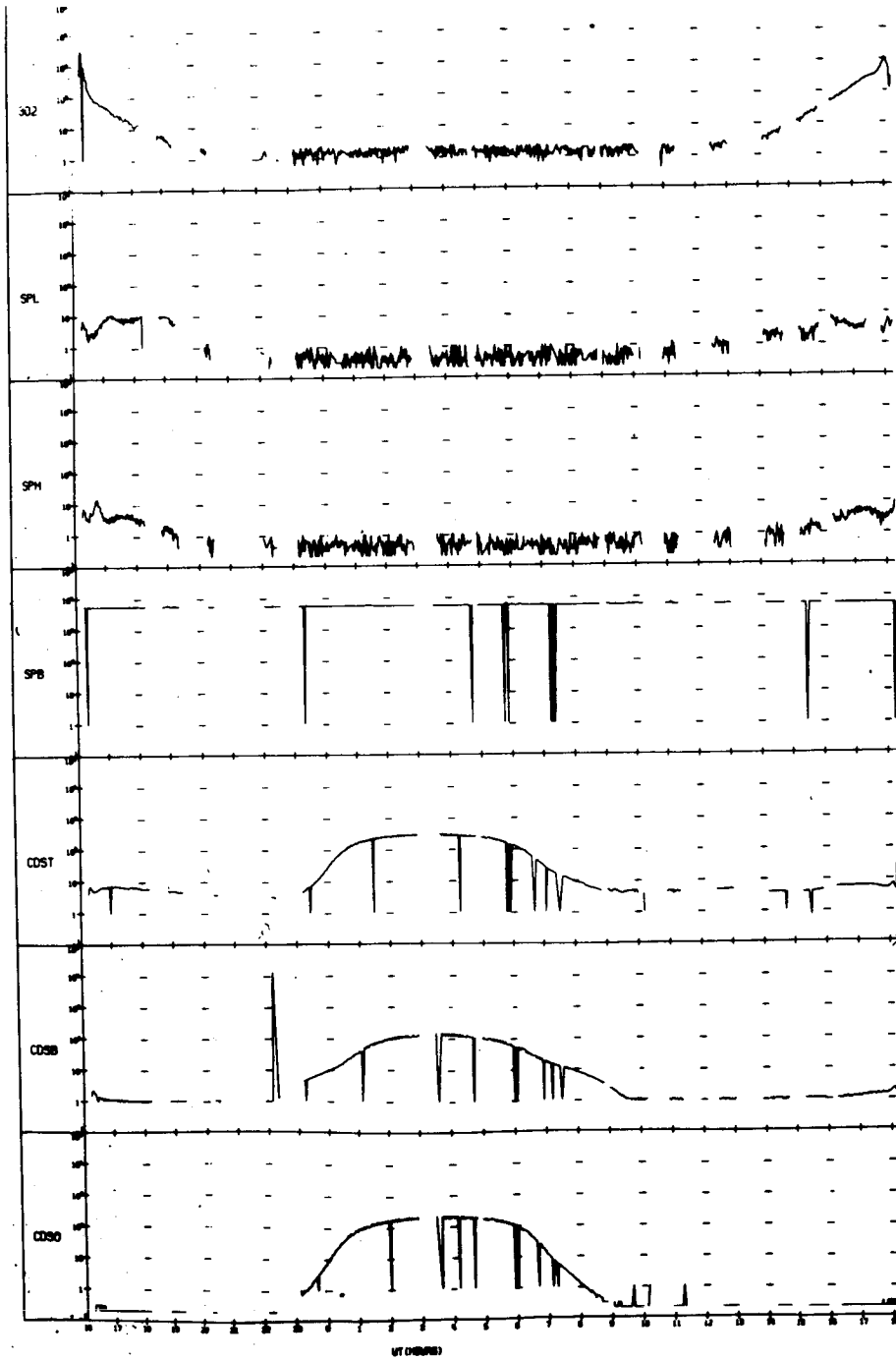
EXPLORER 12 ORBIT 60

BEGIN 10/20/61/11:40

END 10/21/61/12:50

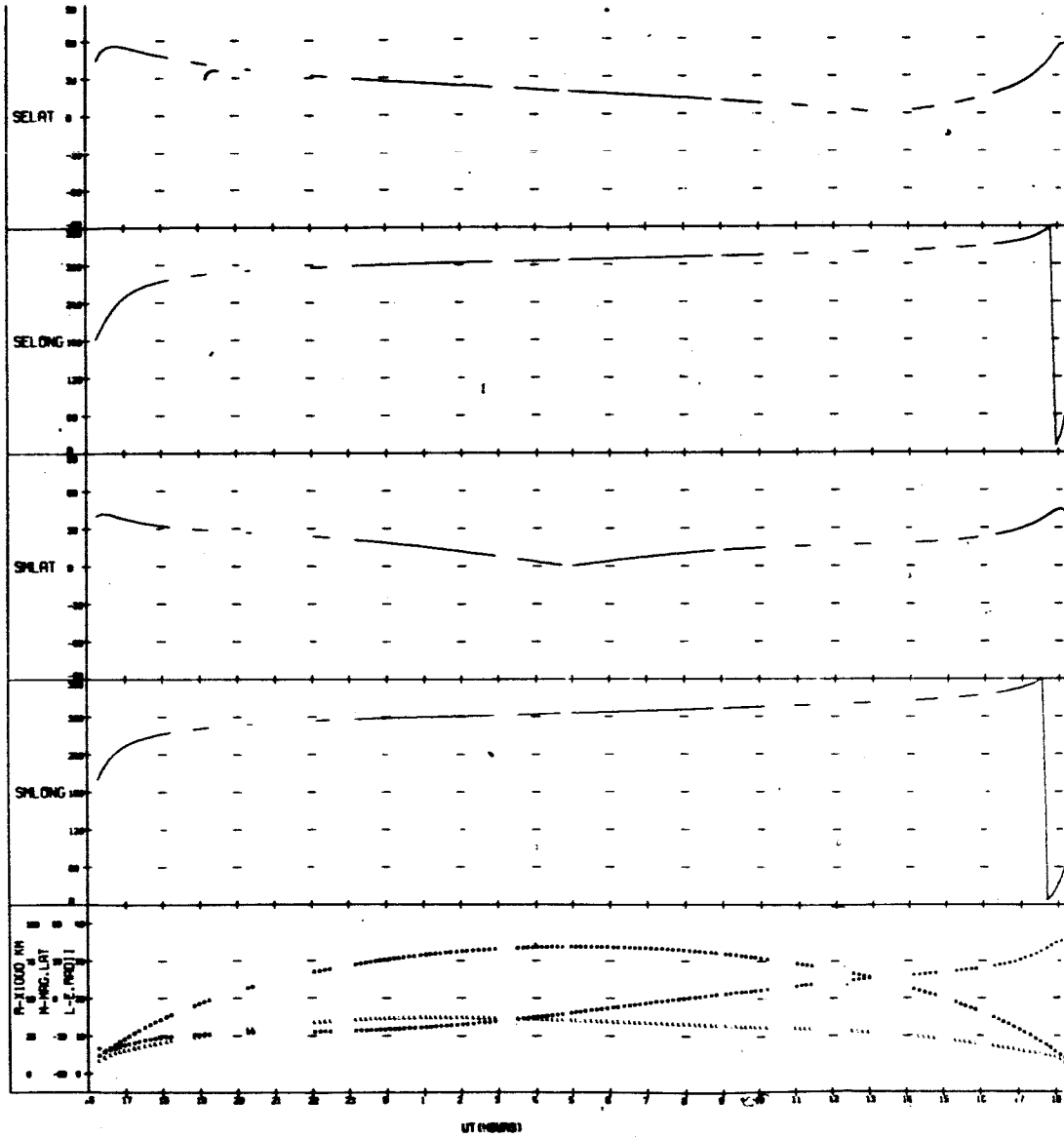


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 62
BEGIN 10/22/61/16:14
END 10/23/61/18:15

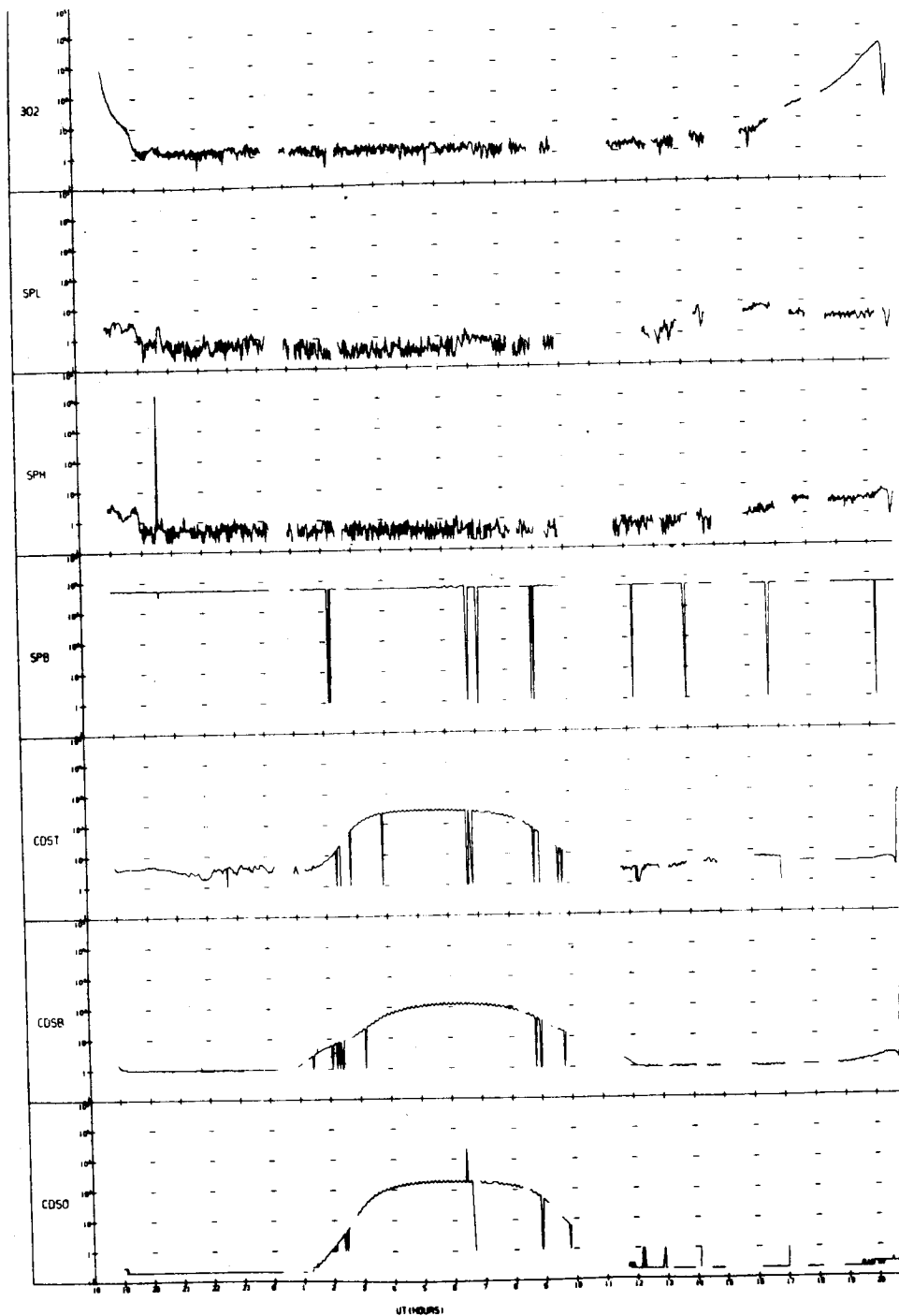


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 62
BEGIN 10/22/61/16:14
END 10/23/61/18:15



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 63
BEGIN 10/23/61/18:56
END 10/24/61/20:54

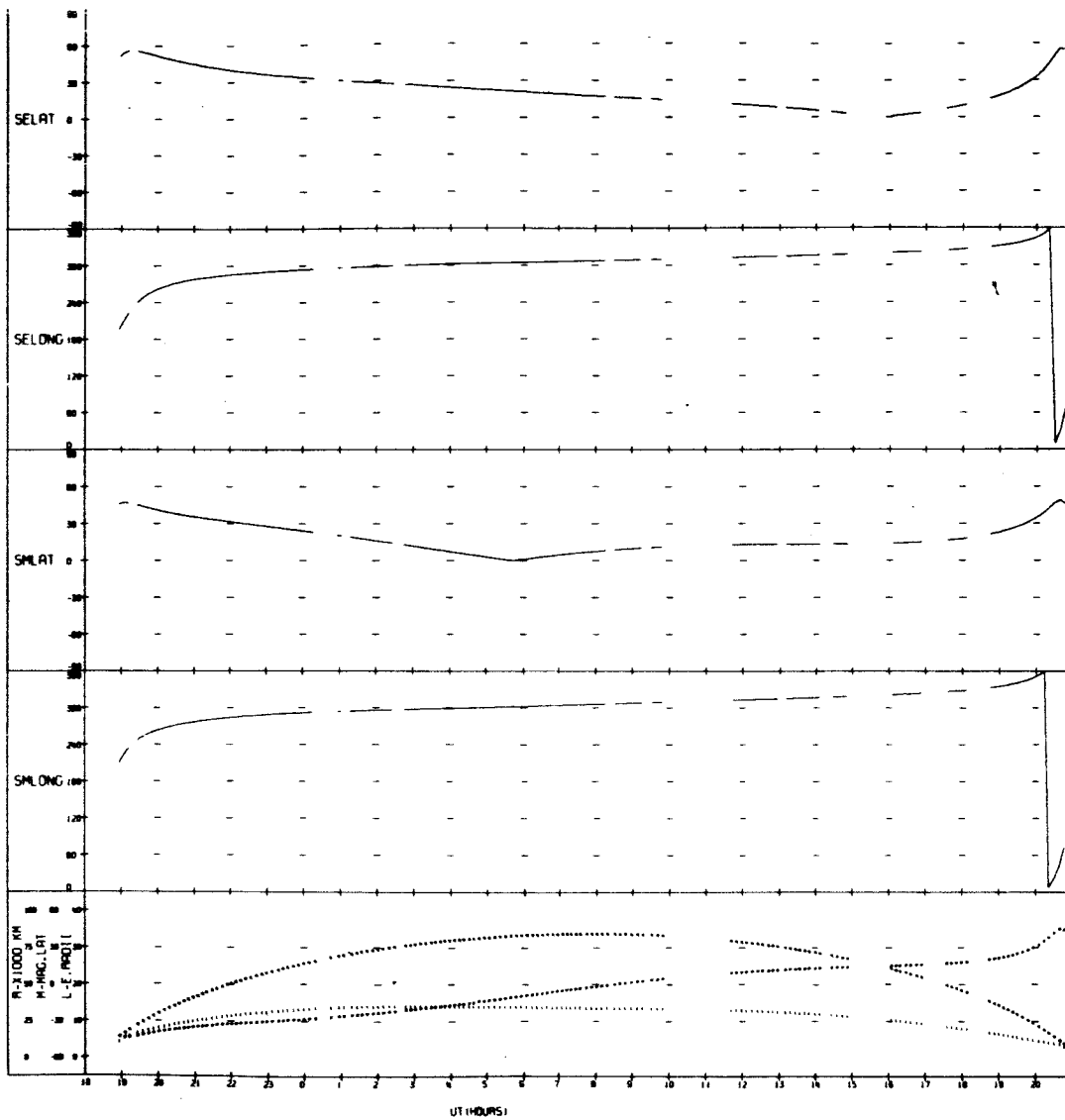


UNIVERSITY OF IOWA

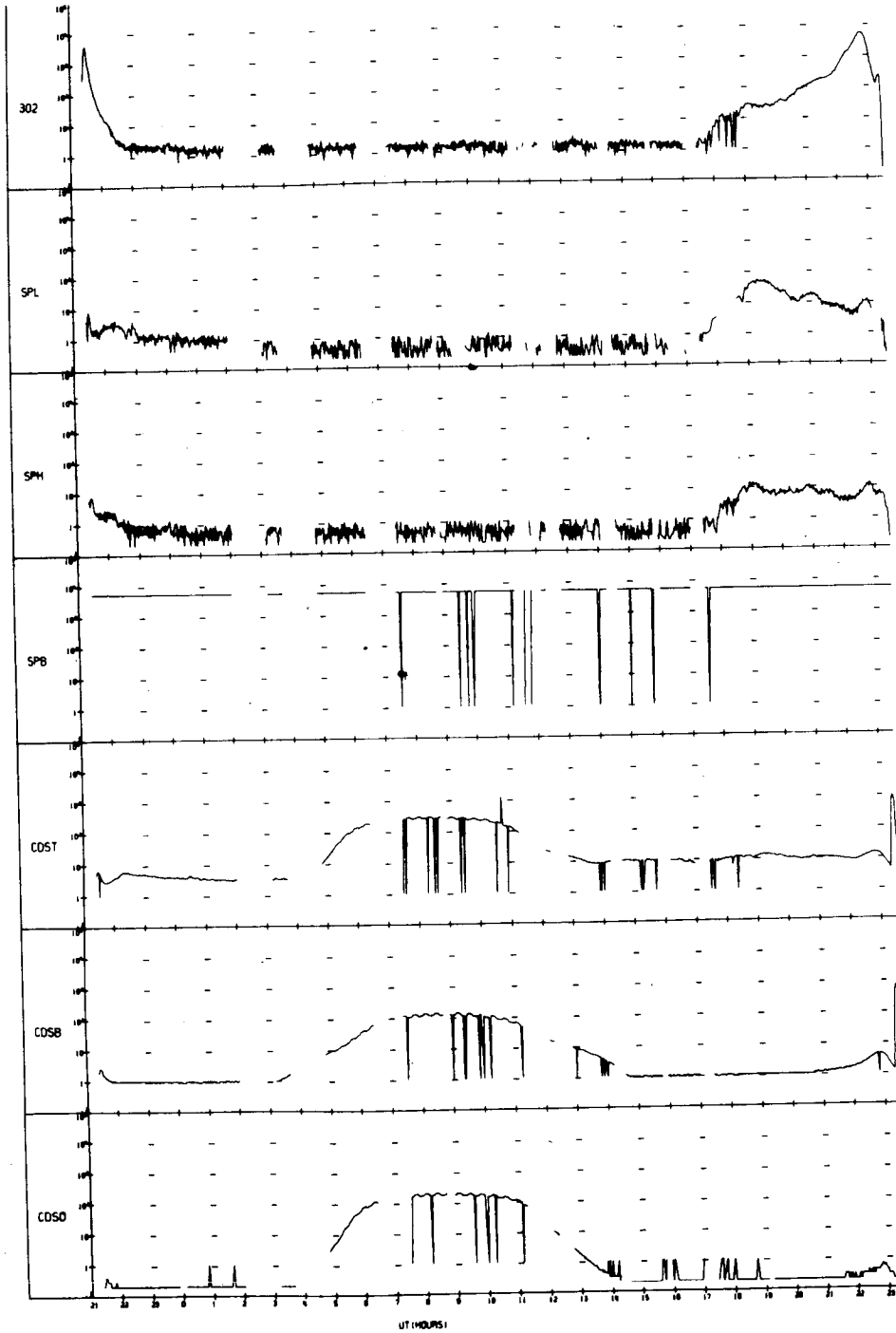
EXPLORER 12 ORBIT 63

BEGIN 10/23/61/18:56

END 10/24/61/20:54

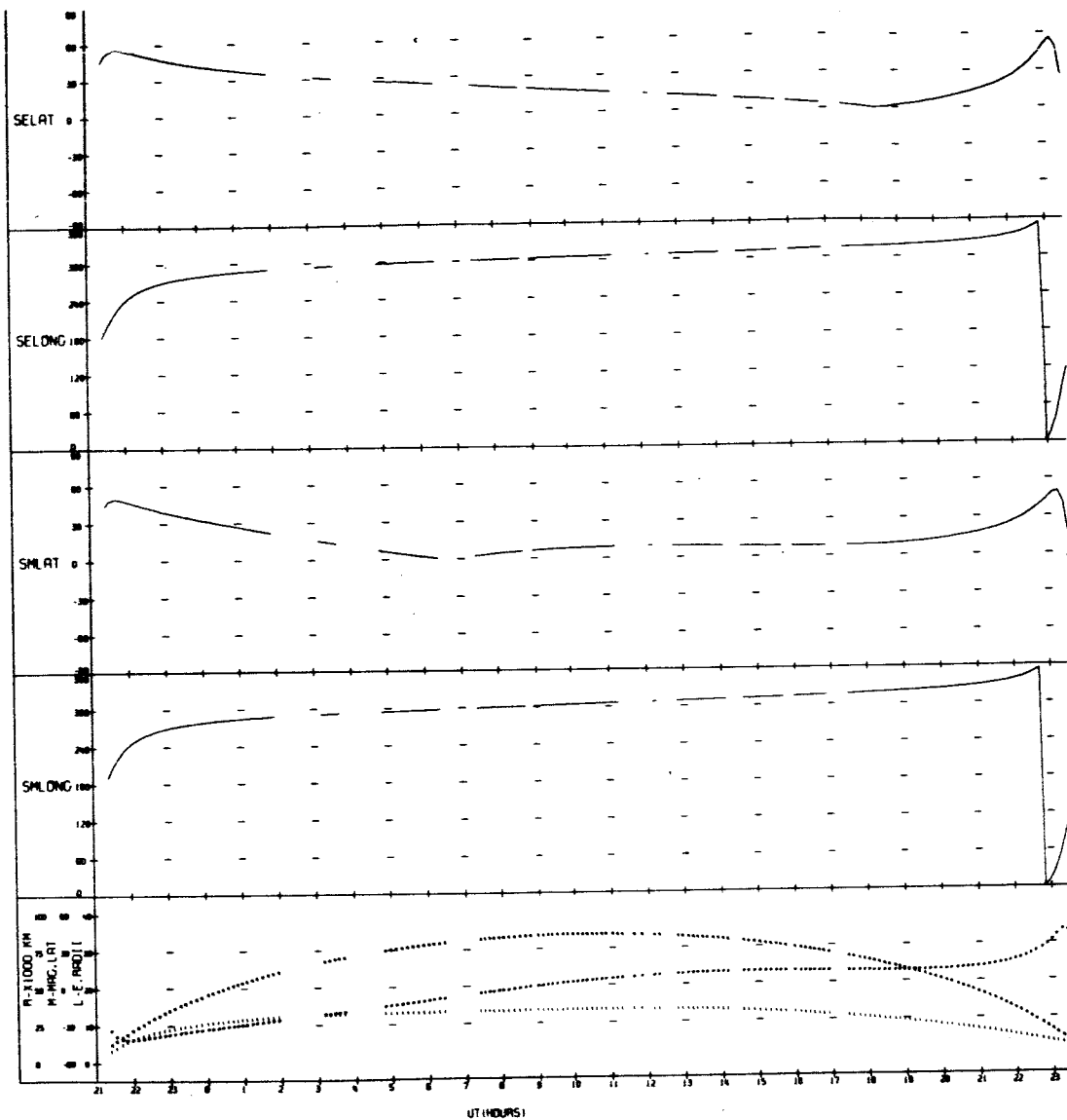


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 64
BEGIN 10/24/61/21:23
END 10/25/61/23:33



UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 64
 BEGIN 10/24/61/21:23
 END 10/25/61/23:33

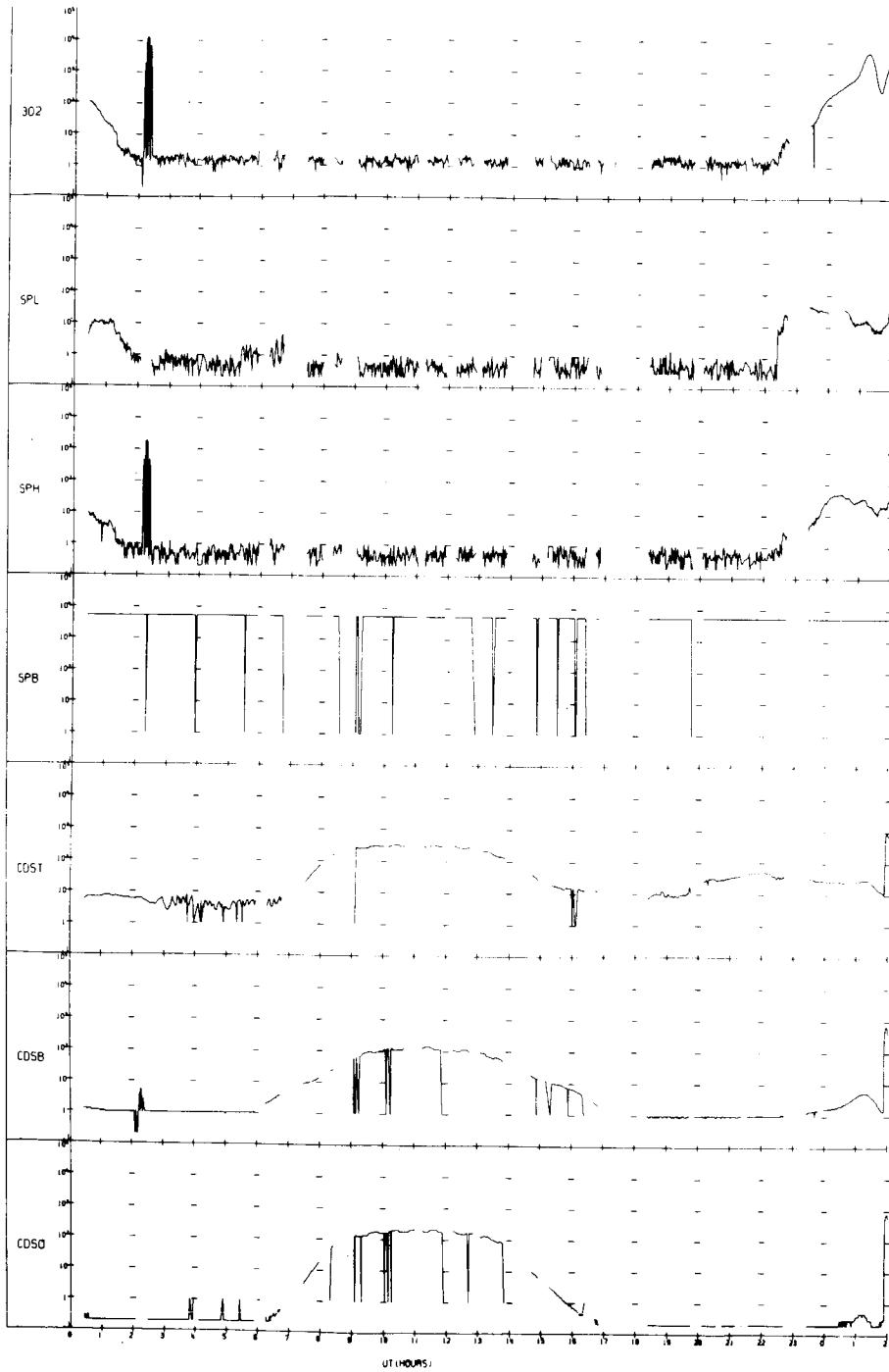


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 05

REG'N 10/26/C1/G0+26

FNO 10/27/61/02:02

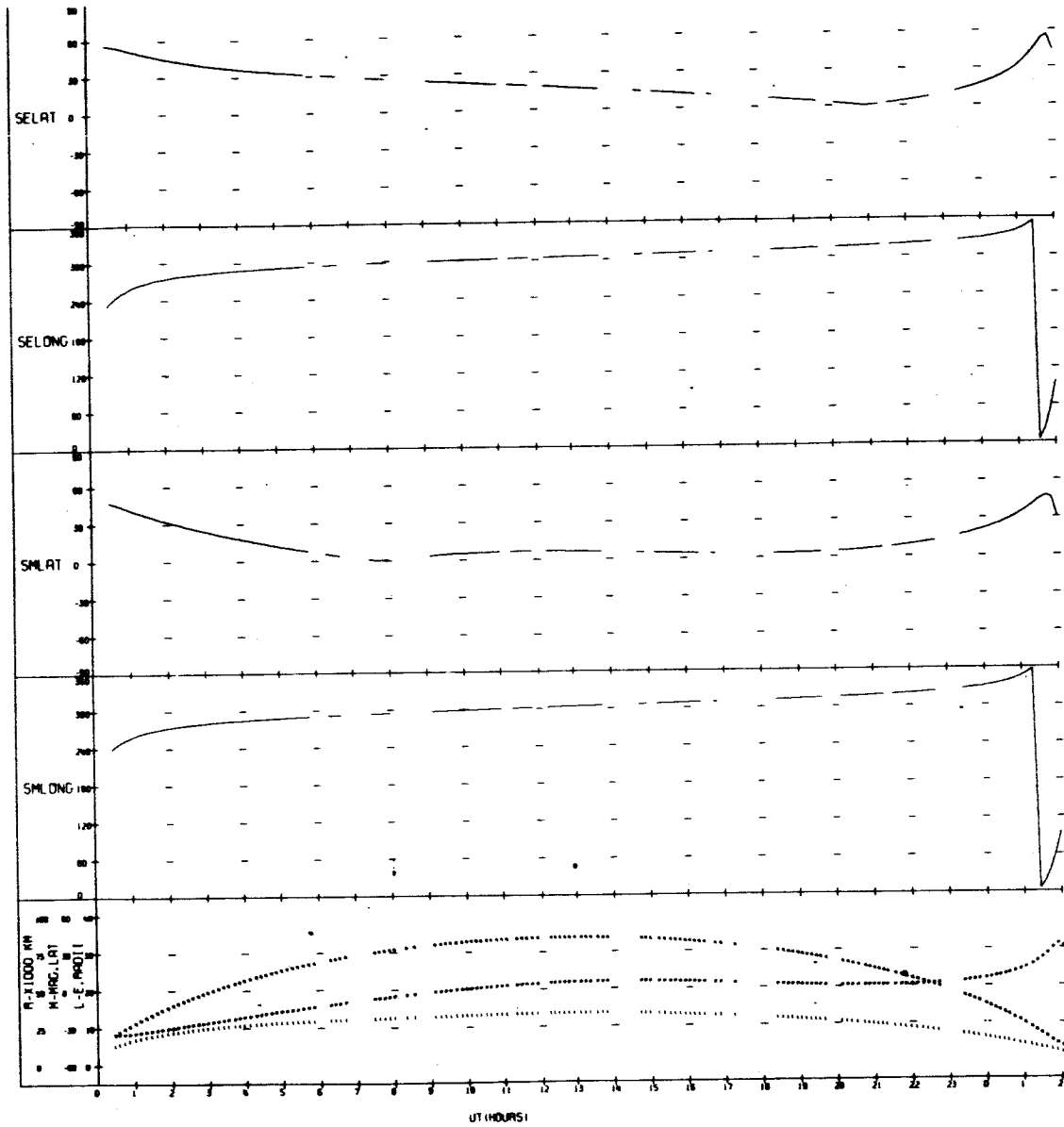


UNIVERSITY OF IOWA

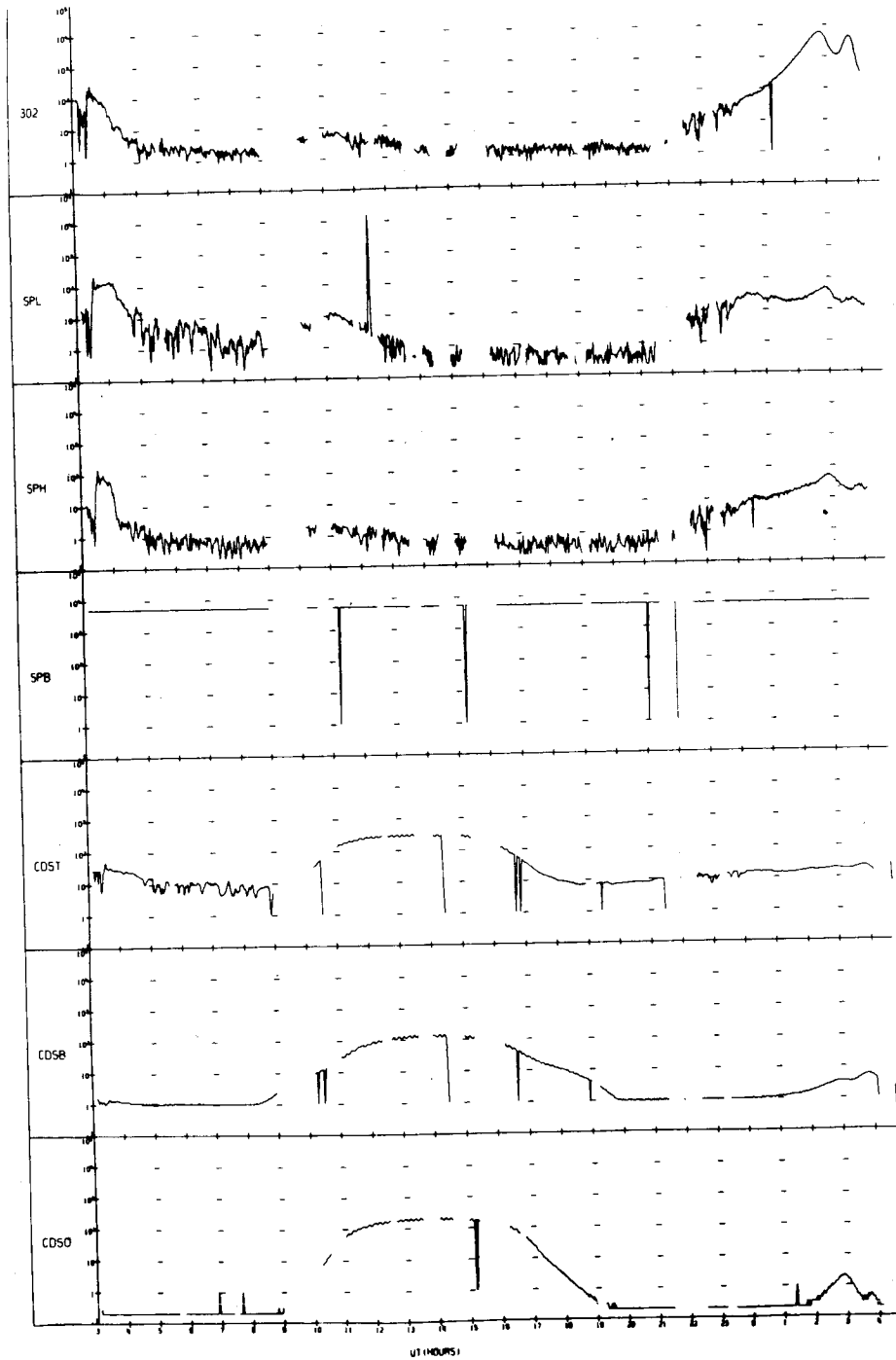
EXPLORER 12 ORBIT 65

BEGIN 10/26/61/00:26

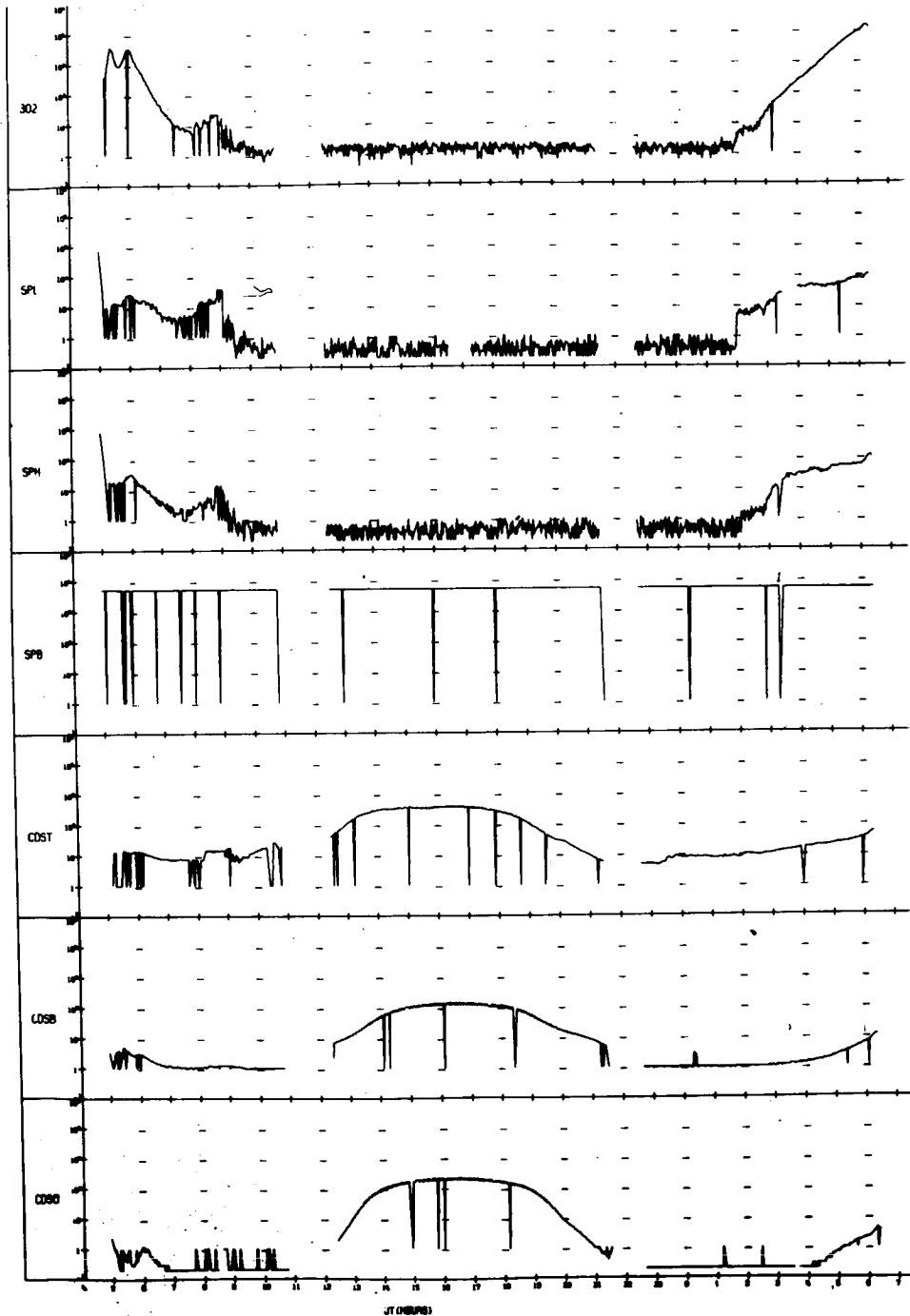
END 10/27/61/02:02



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 66
BEGIN 10/27/61/03:07
END 10/28/61/04:42



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 67
BEGIN 10/28/61/04:57
END 10/29/61/07:33

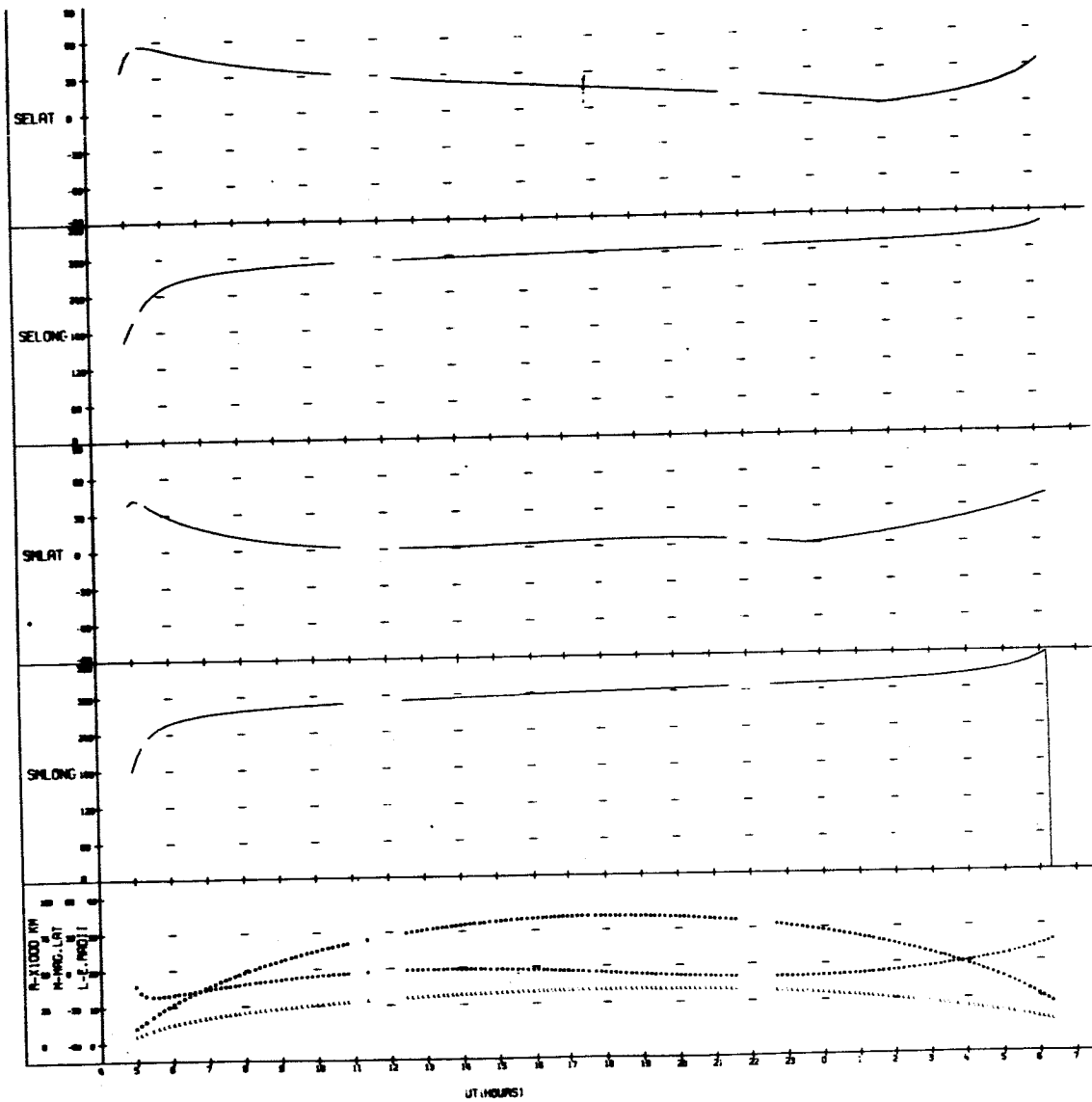


UNIVERSITY OF IOWA

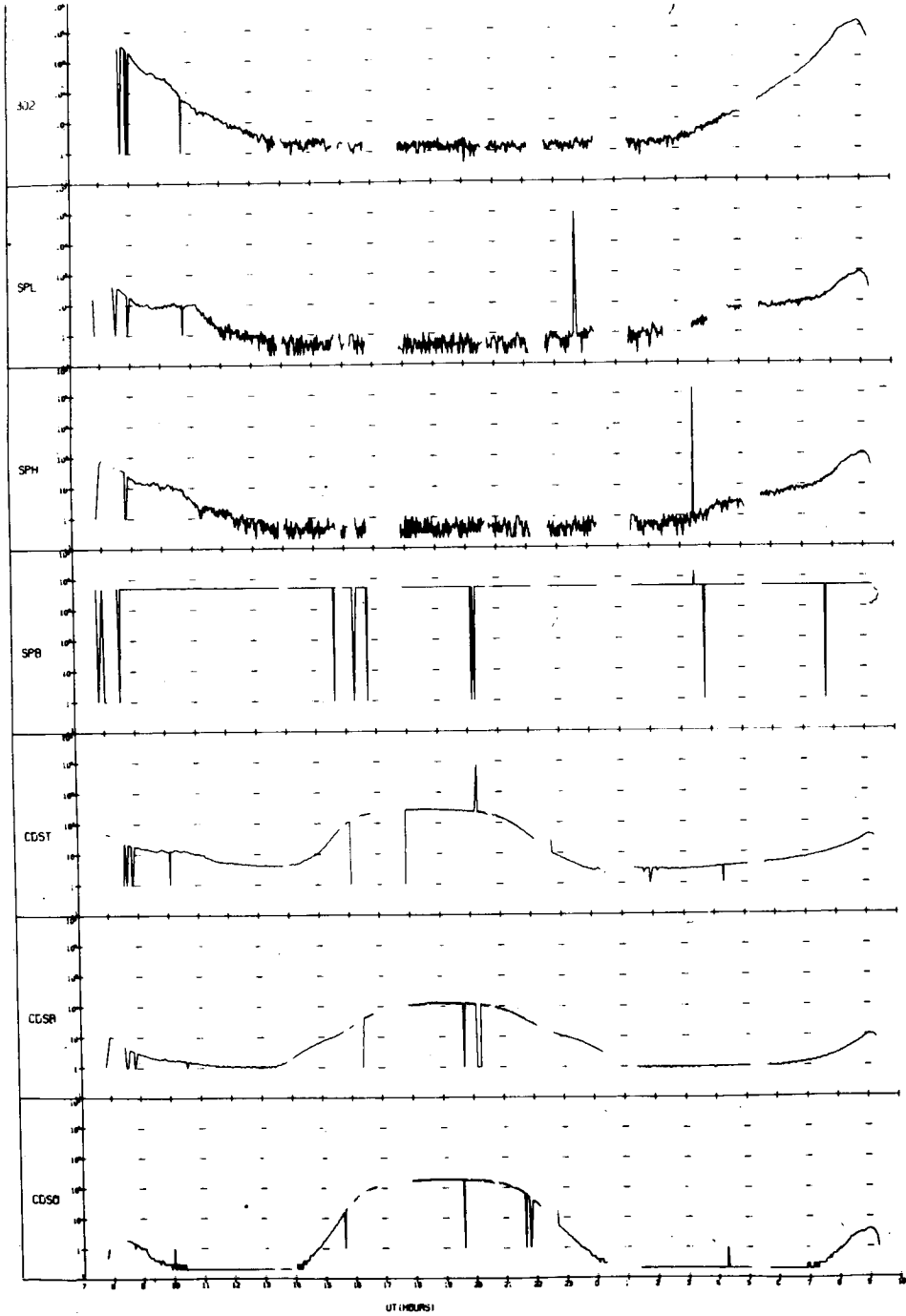
EXPLORER 12 ORBIT 67

BEGIN 10/28/61/04:57

END 10/29/61/07:33

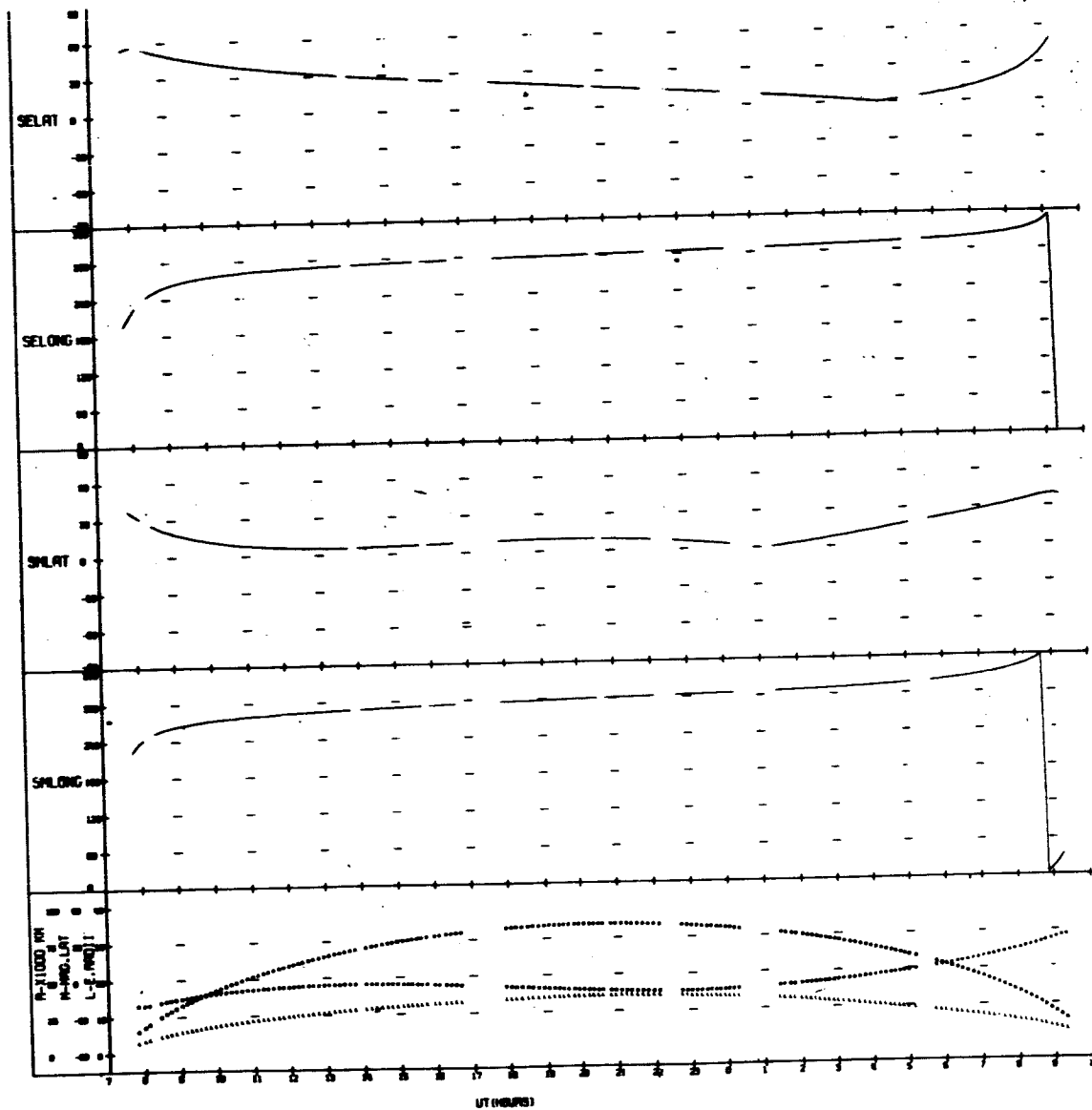


UNIVERSITY OF IOWA
EXPLORES 12 ORBIT 08
BFCTN 10 20 01 10:47
END 10:30 01/10:02

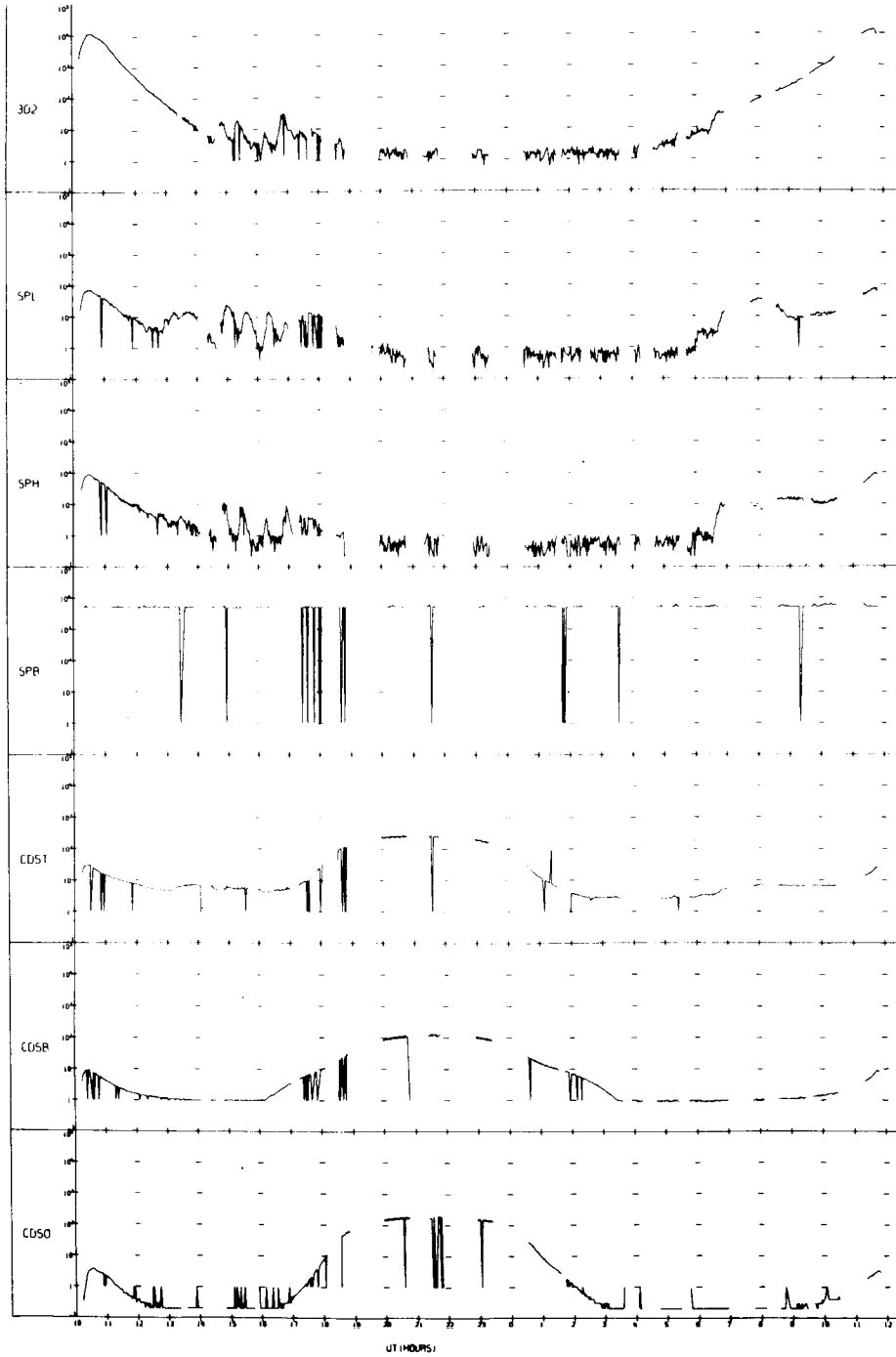


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 68
BEGIN 10/29/61/07:47
END 10/30/61/10:02

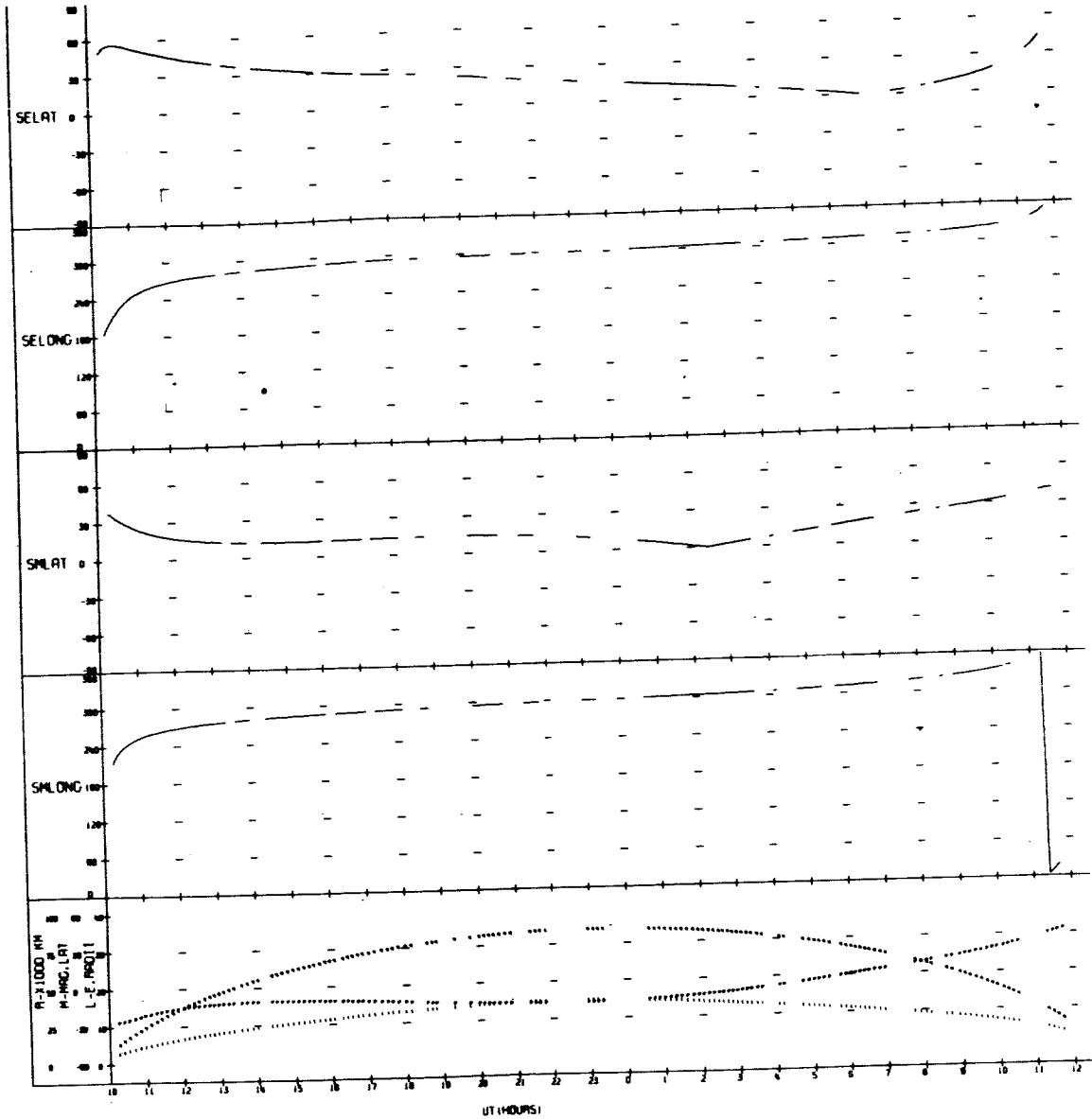


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 69
BEGIN 10/30/61/10:13
END 10/31/61/12:32

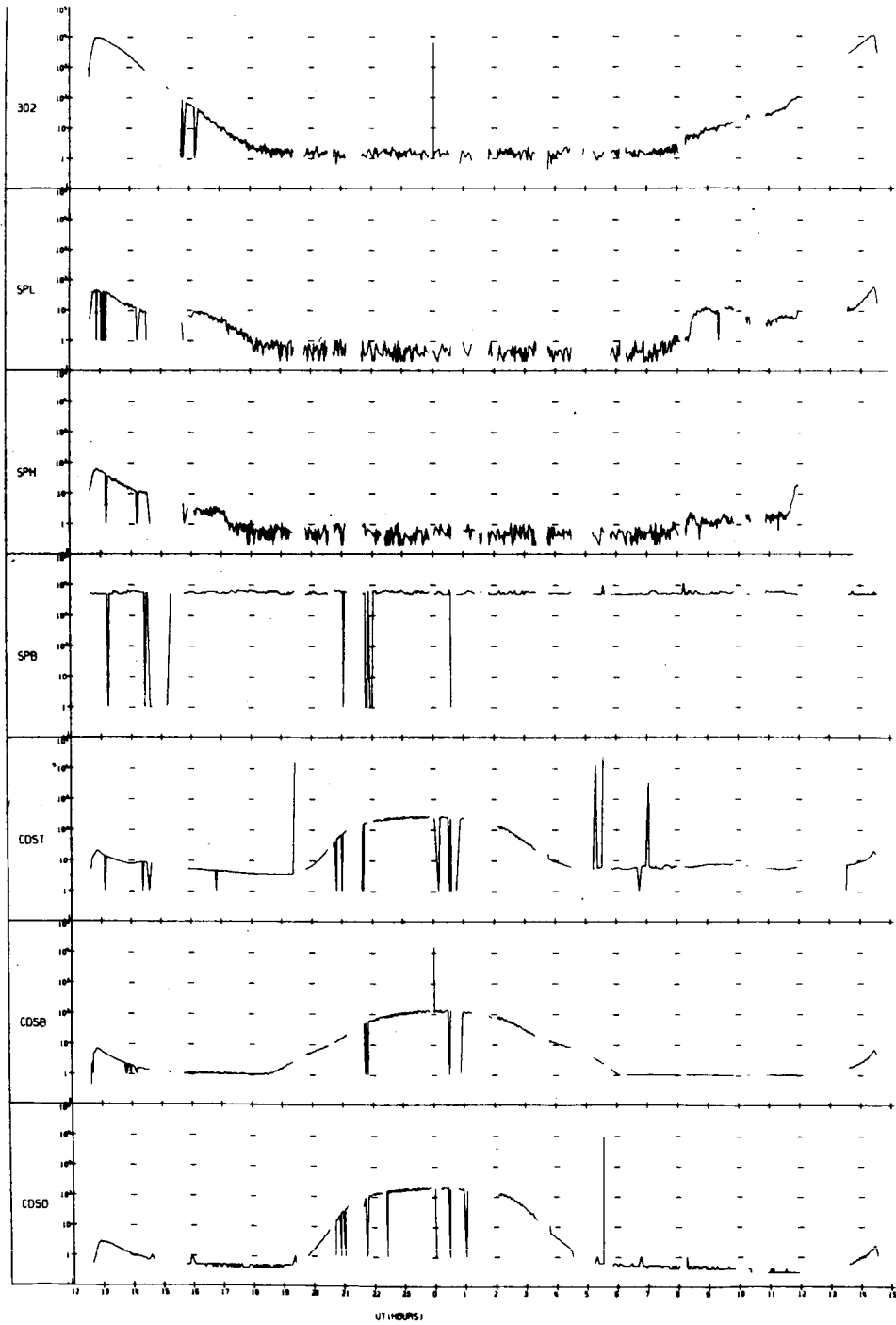


UNIVERSITY OF IOWA

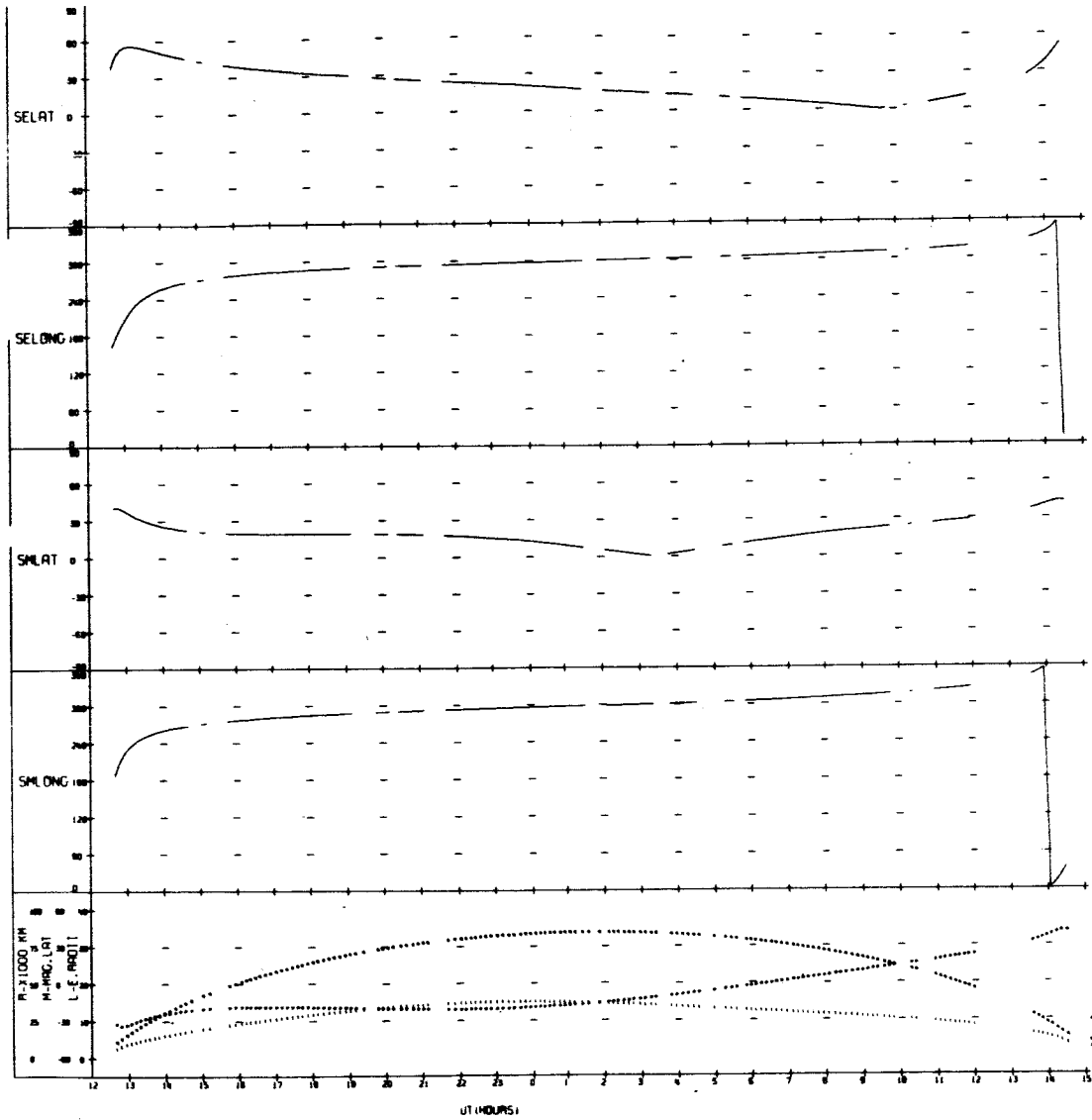
EXPLORER 12 ORBIT 69
BEGIN 10/30/61/10:13
END 10/31/61/12:32



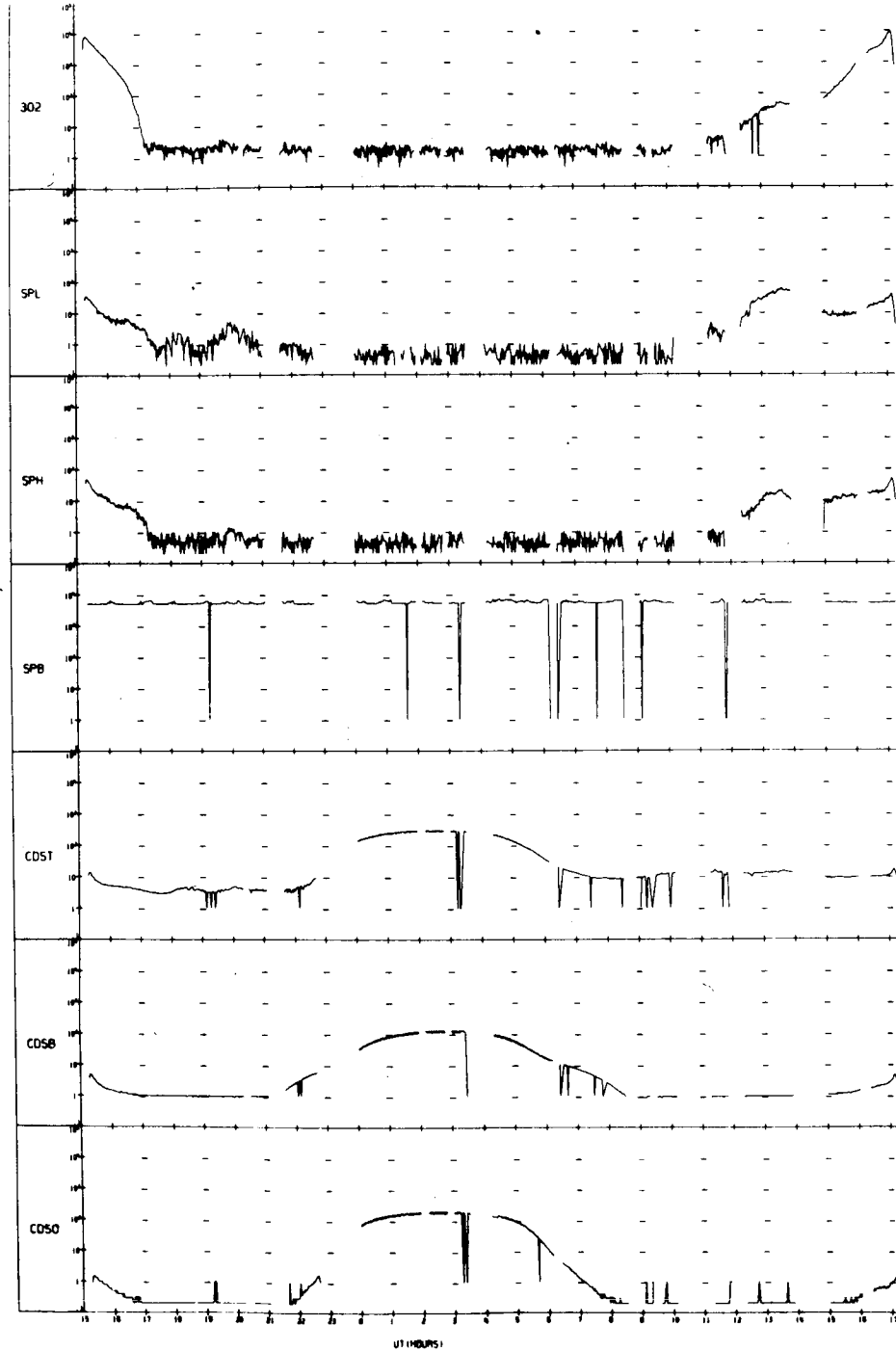
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 70
BEGIN 10/31/61/12:38
END 11/01/61/15:09



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 70
BEGIN 10/31/61/12:38
END 11/01/61/15:09

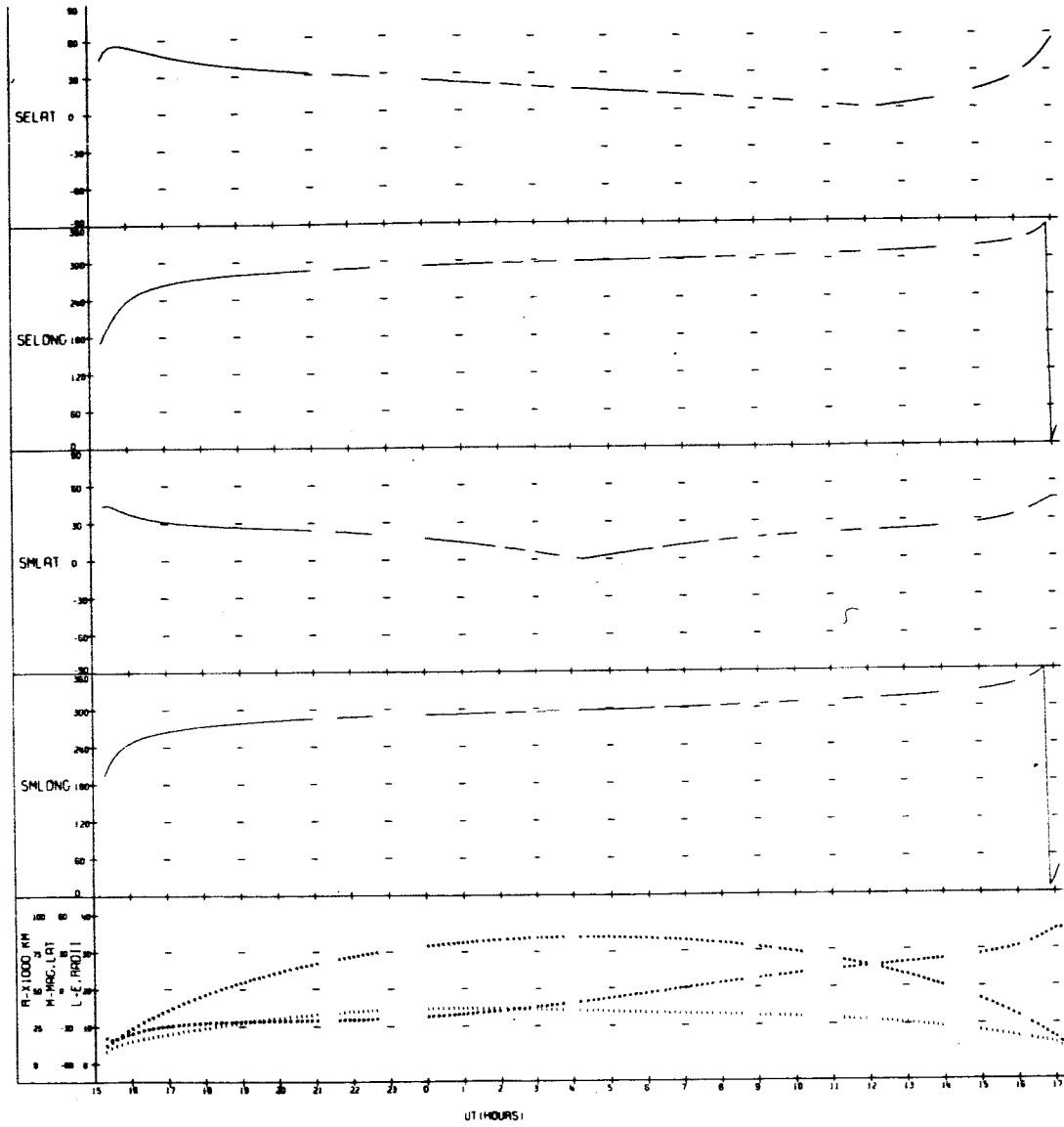


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 71
BEGIN 11/01/61/15:15
END 11/02/61/17:15

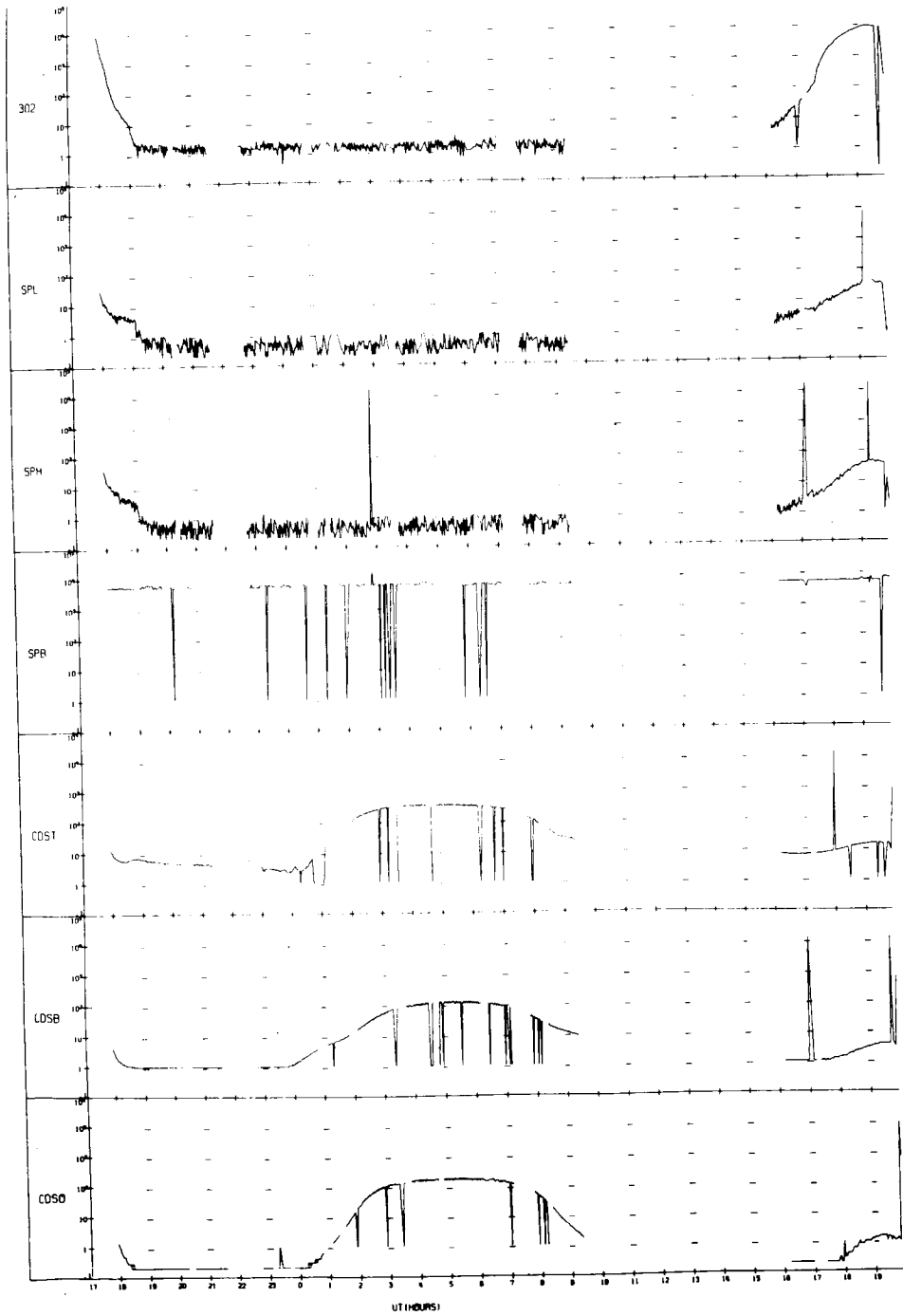


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 71
BEGIN 11/01/61/15:15
END 11/02/61/17:15



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 72
BEGIN 11/02/61/17:55
END 11/03/61/19:54

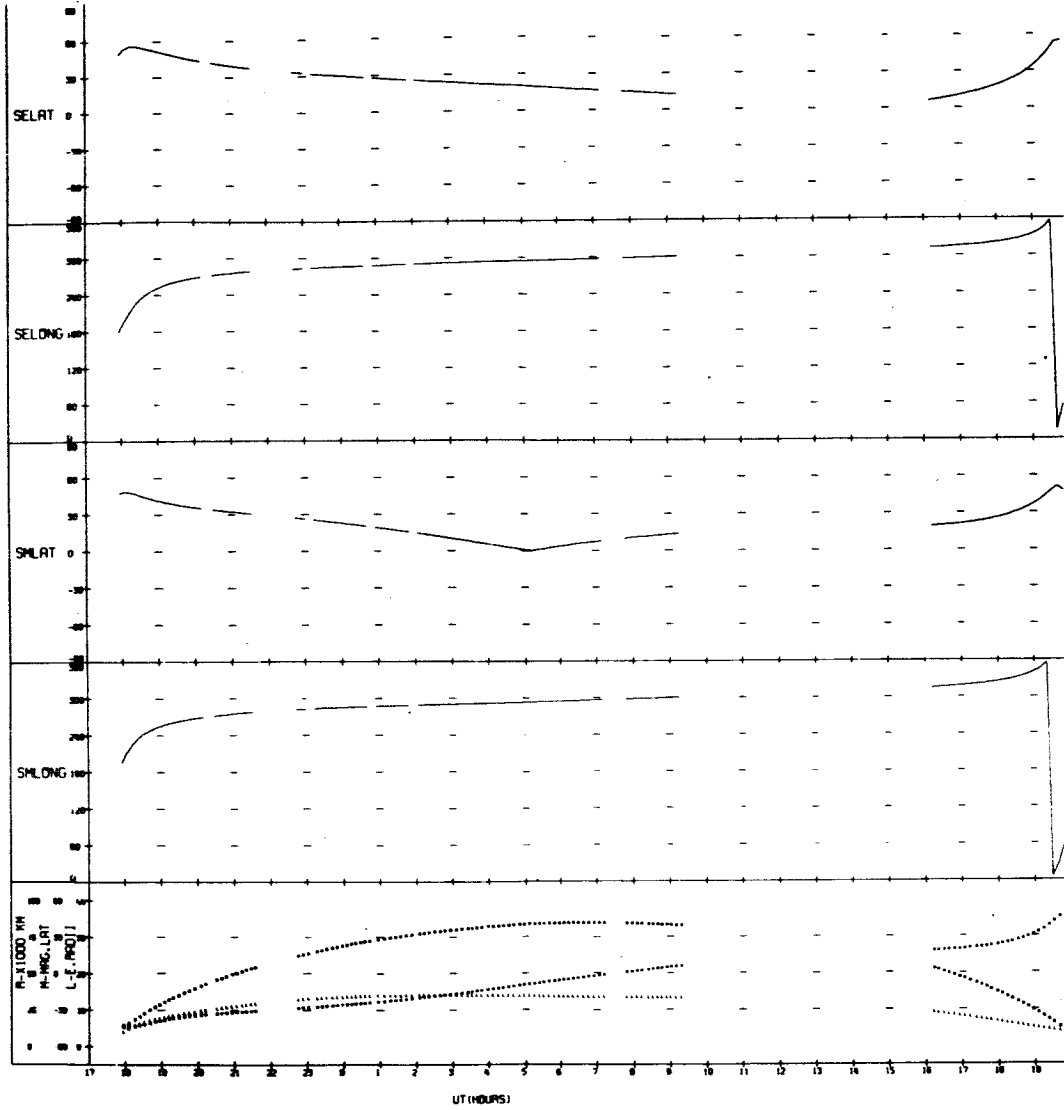


UNIVERSITY OF IOWA

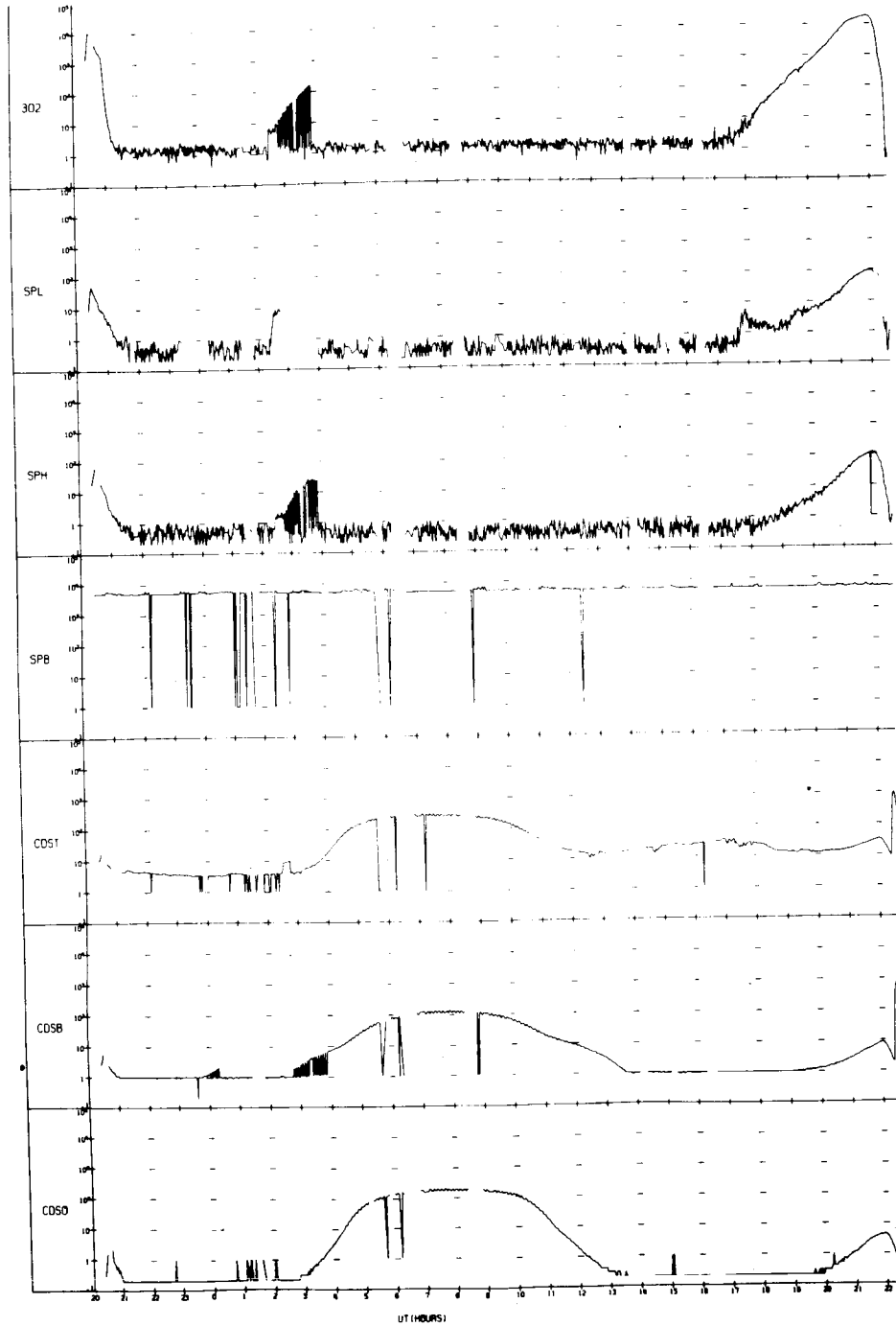
EXPLORER 12 ORBIT 72

BEGIN 11/02/61/17:55

END 11/03/61/19:54

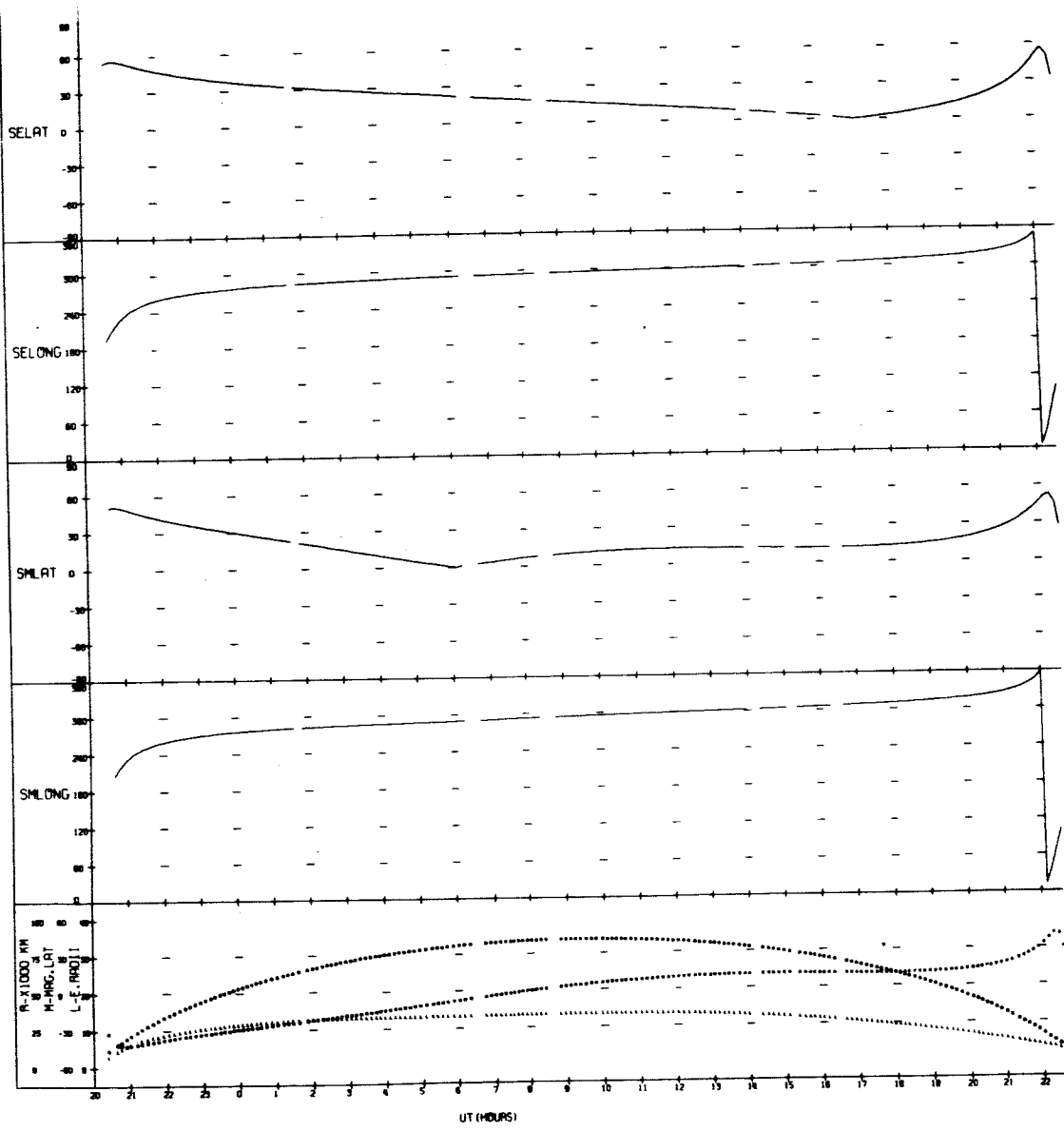


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 73
BEGIN 11/01/61/20:21
END 11/04/61/22:36

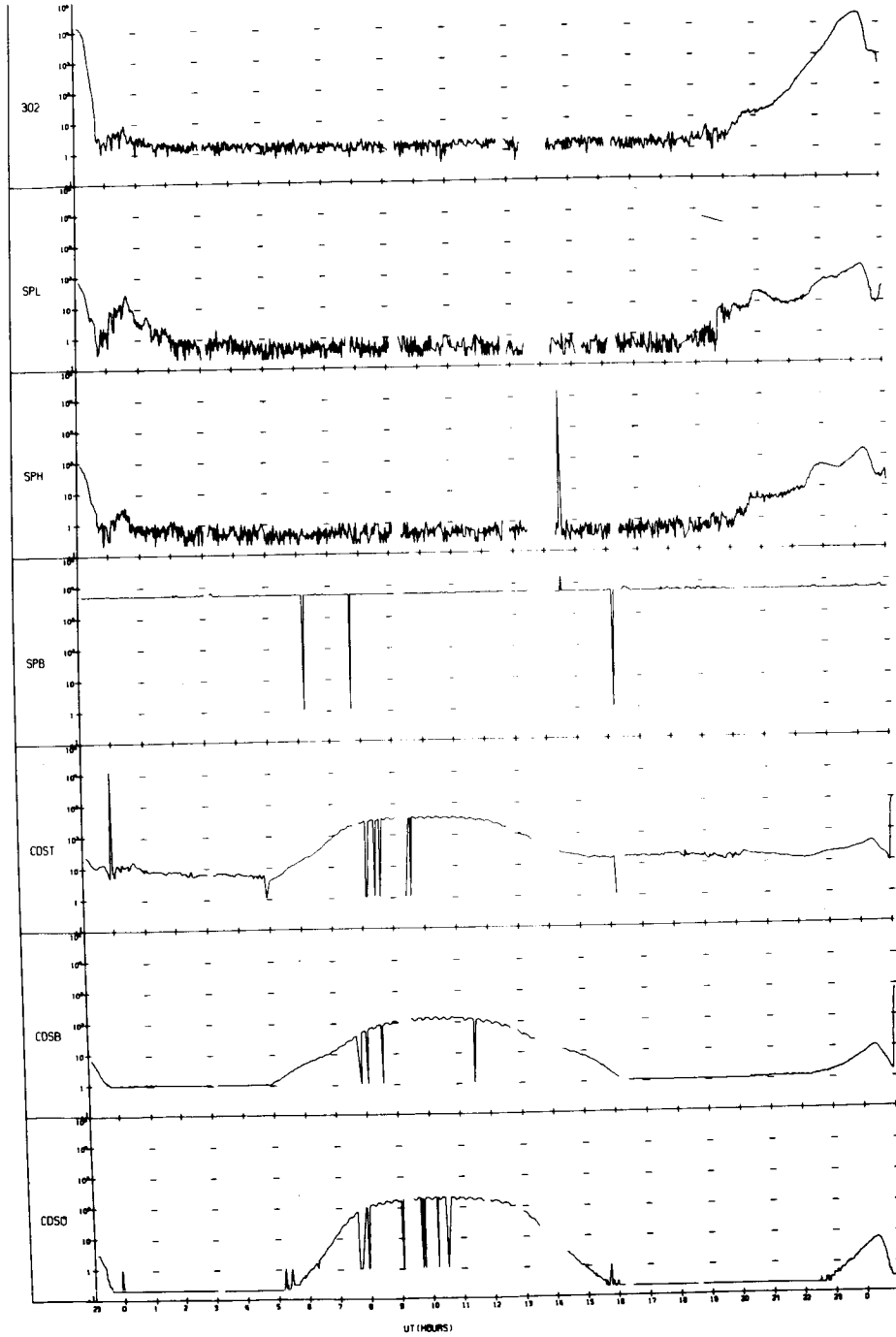


UNIVERSITY OF IOWA

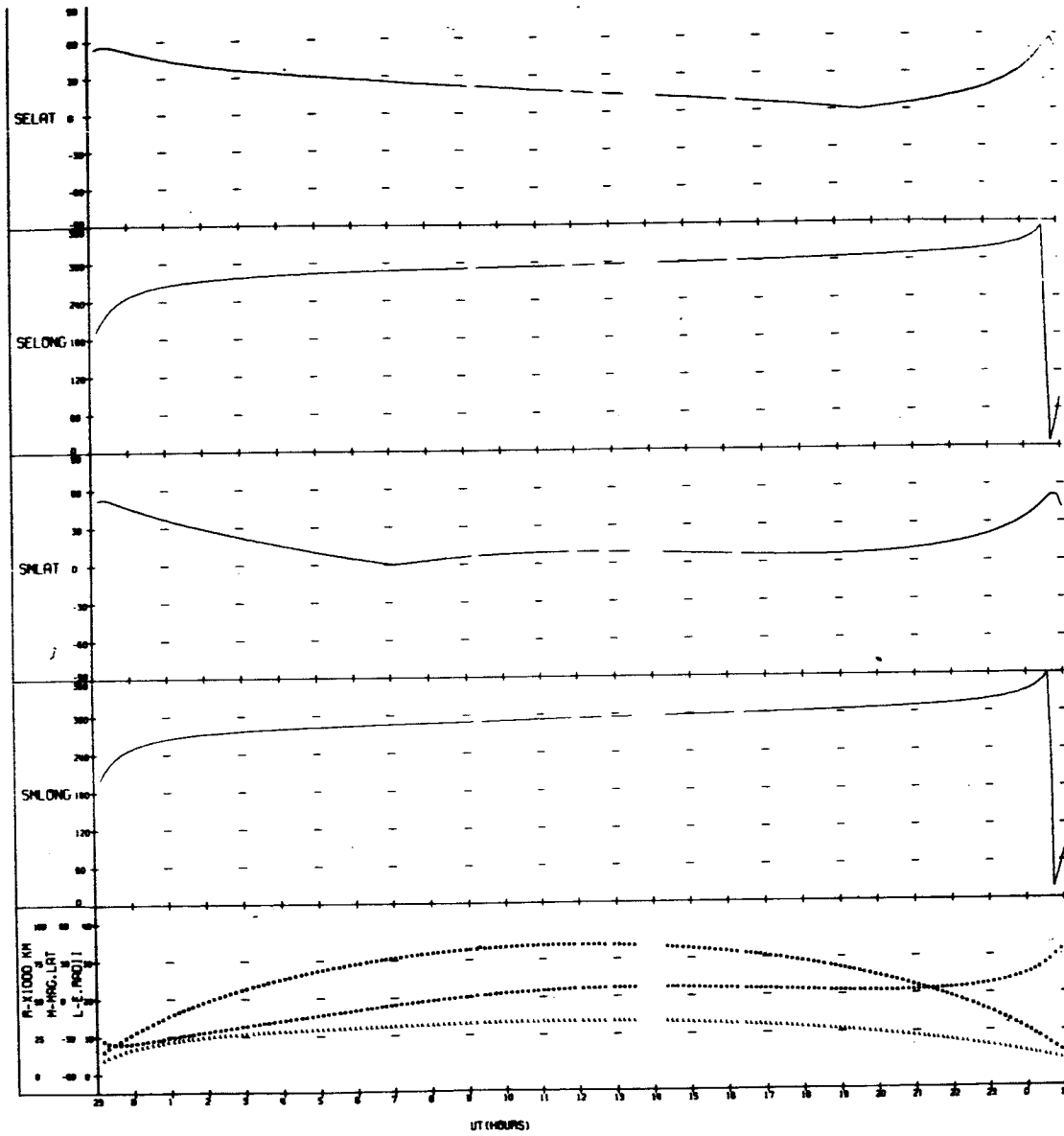
EXPLORER 12 ORBIT 73
 BEGIN 11/03/61/20:21
 END 11/04/61/22:36



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 74
BEGIN 11/04/61/23:05
END 11/06/61/01:04

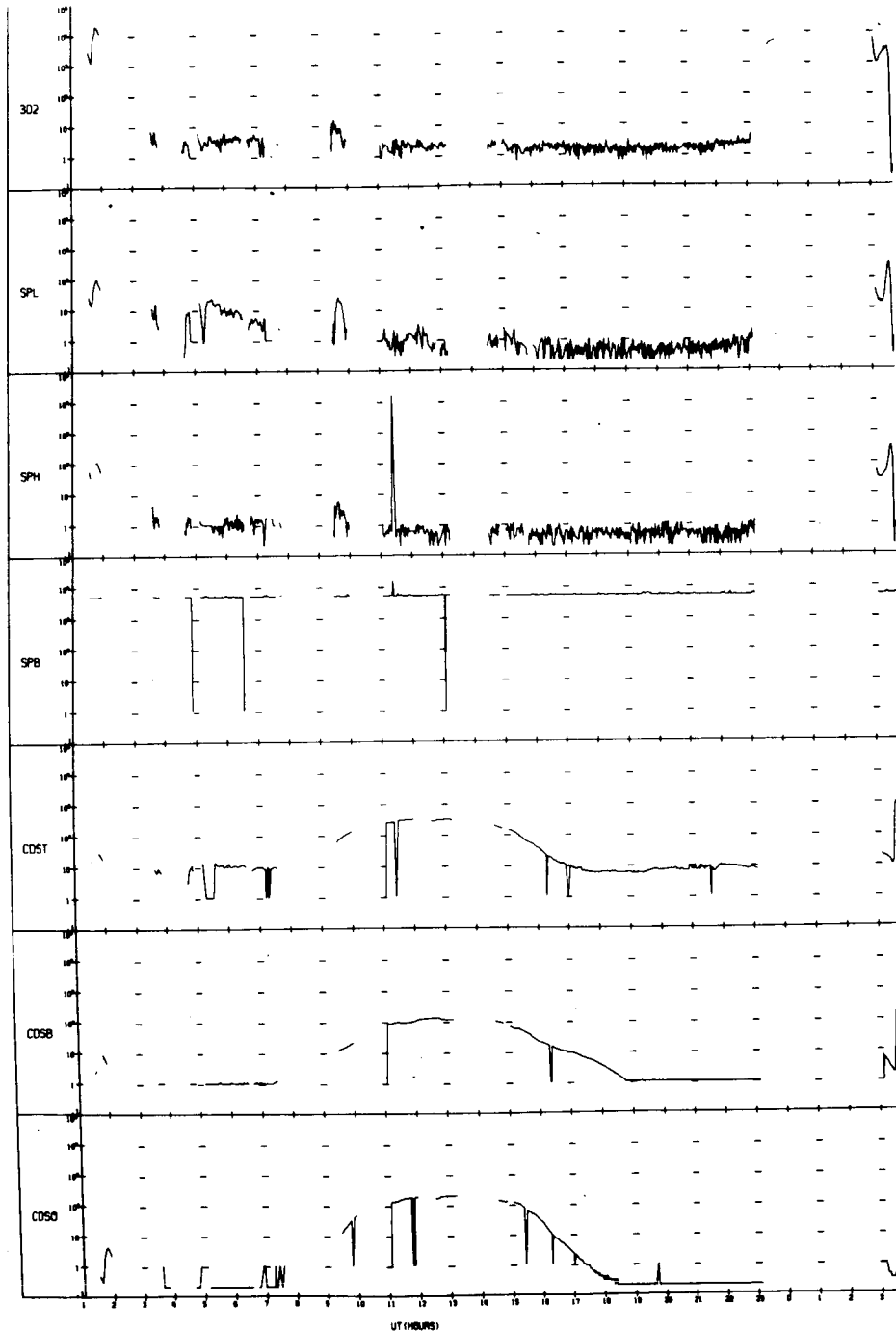


UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 74
 BEGIN 11/04/61/23:05
 END 11/06/61/01:04



UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 75
BEGIN 11/06/61/01:31
END 11/07/61/03:44

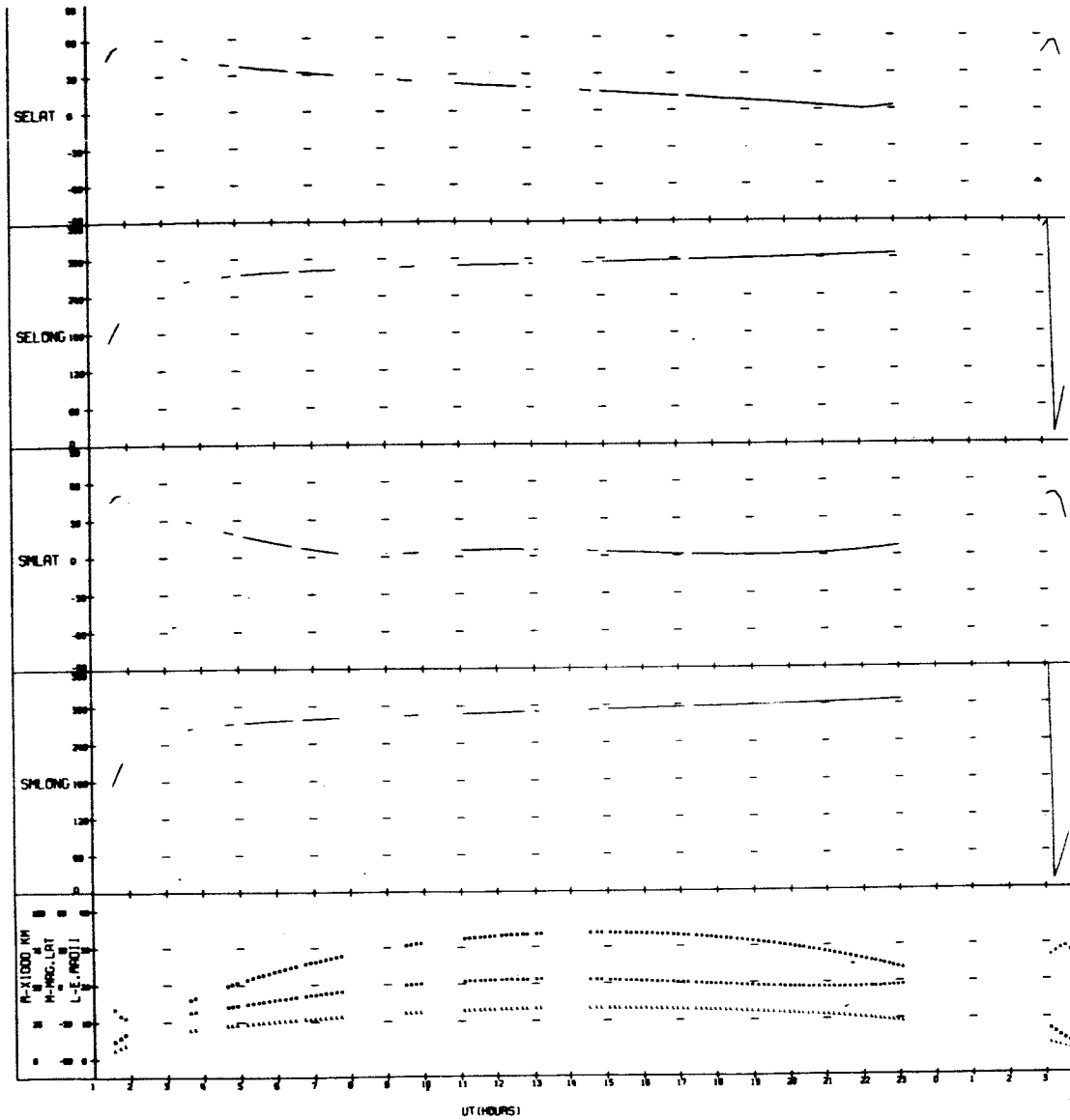


UNIVERSITY OF IOWA

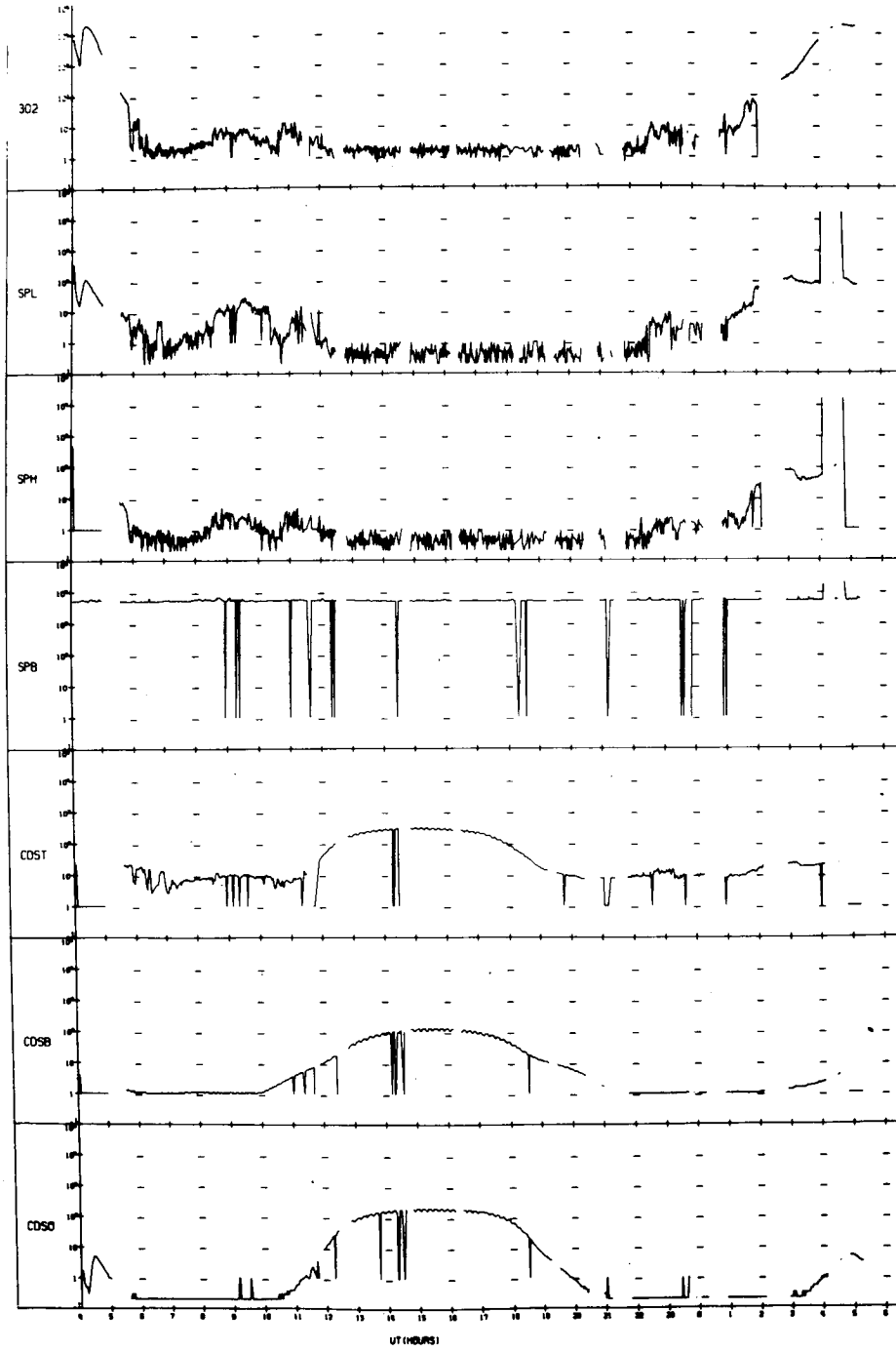
EXPLORER 12 ORBIT 75

BEGIN 11/06/61/01:31

END 11/07/61/03:44

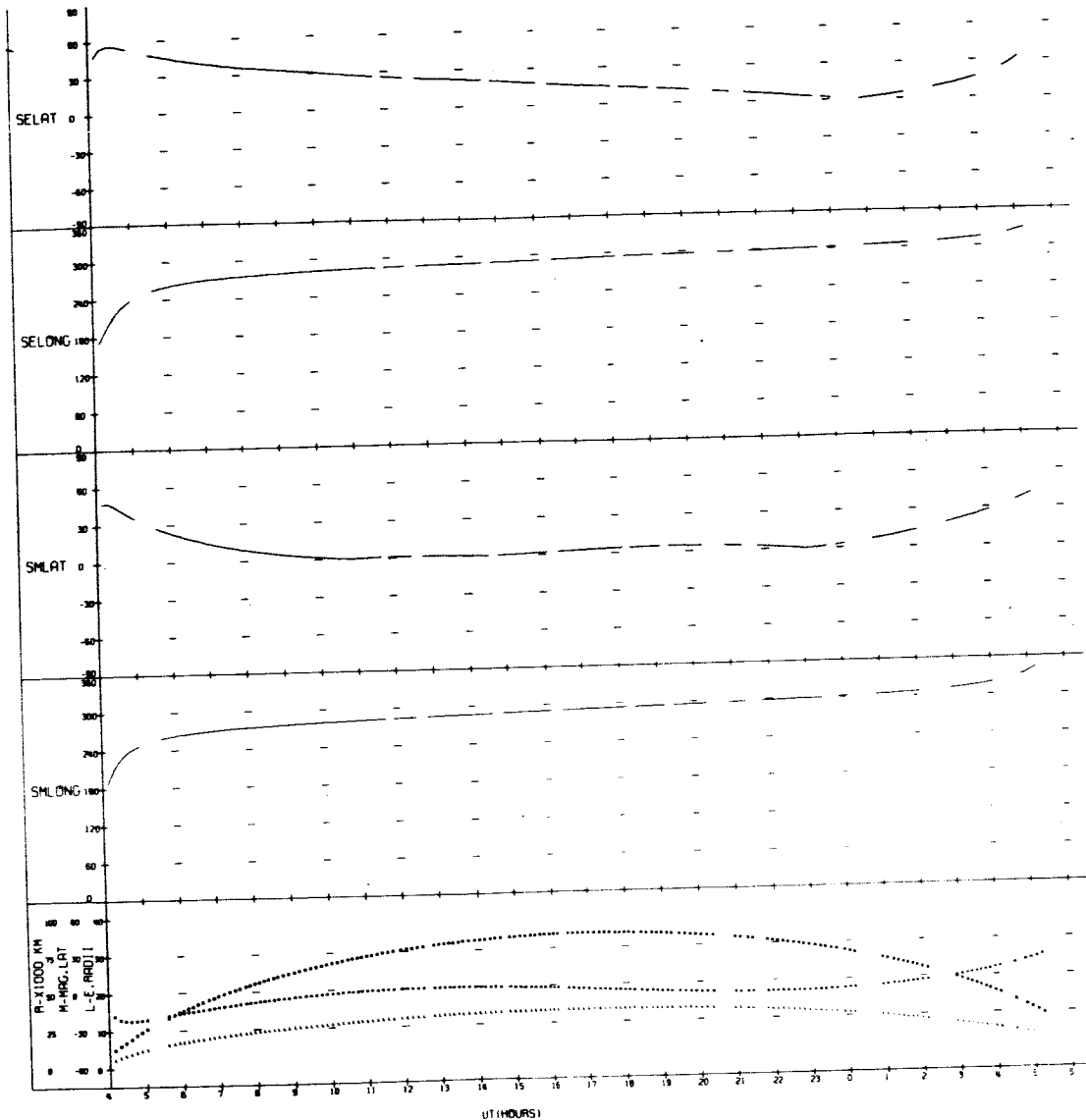


UNIVERSITY OF IOWA
EXPLORER 12 ORB: T 76
BEGIN 11/07/61/04:02
END 11/08/61/06:35



UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 75
BEGIN 11/07/61/04:02
END 11/08/61/06:35

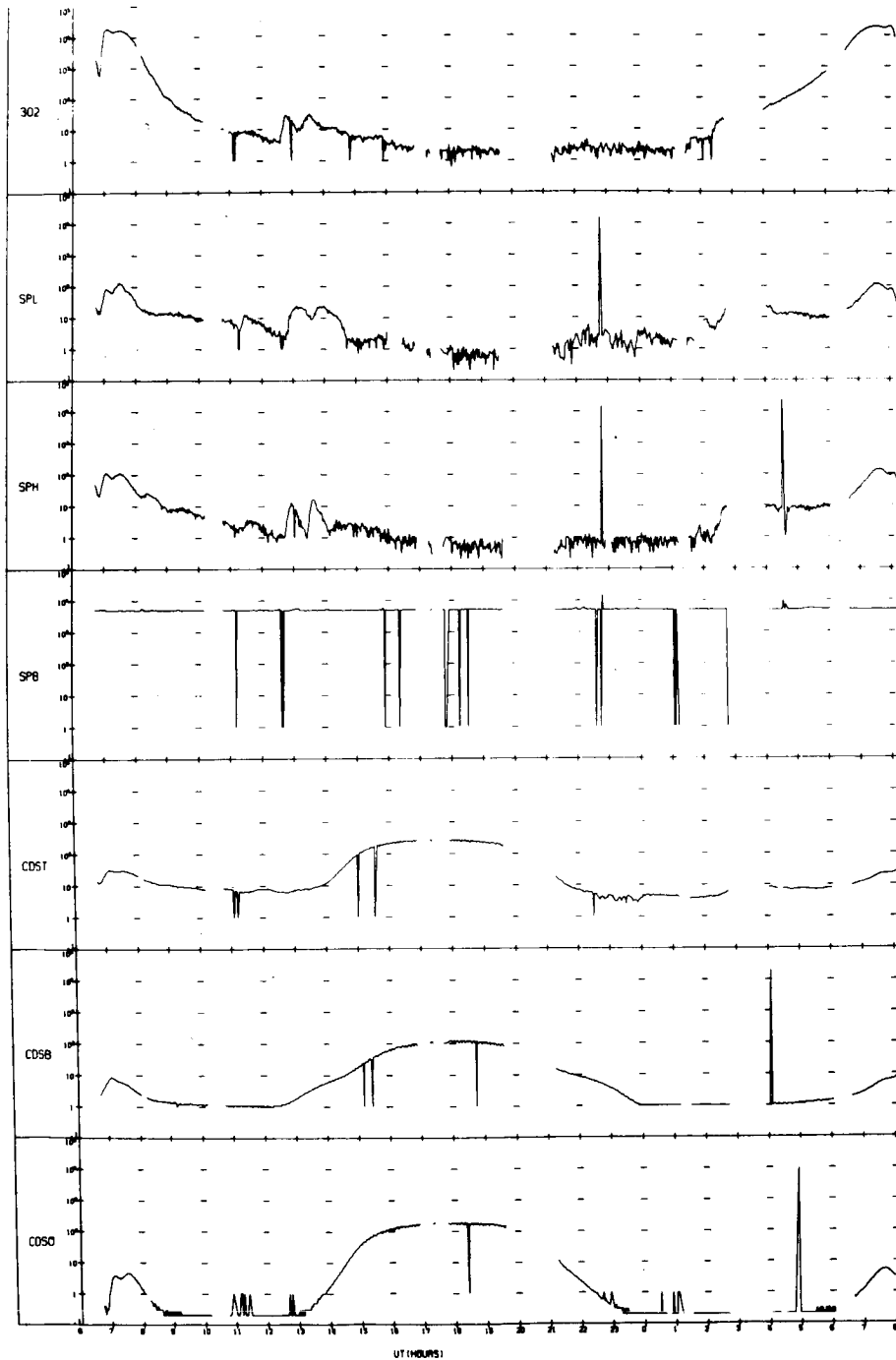


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 77

BEGIN 11/08/61/06:42

END 11/09/61/08:15

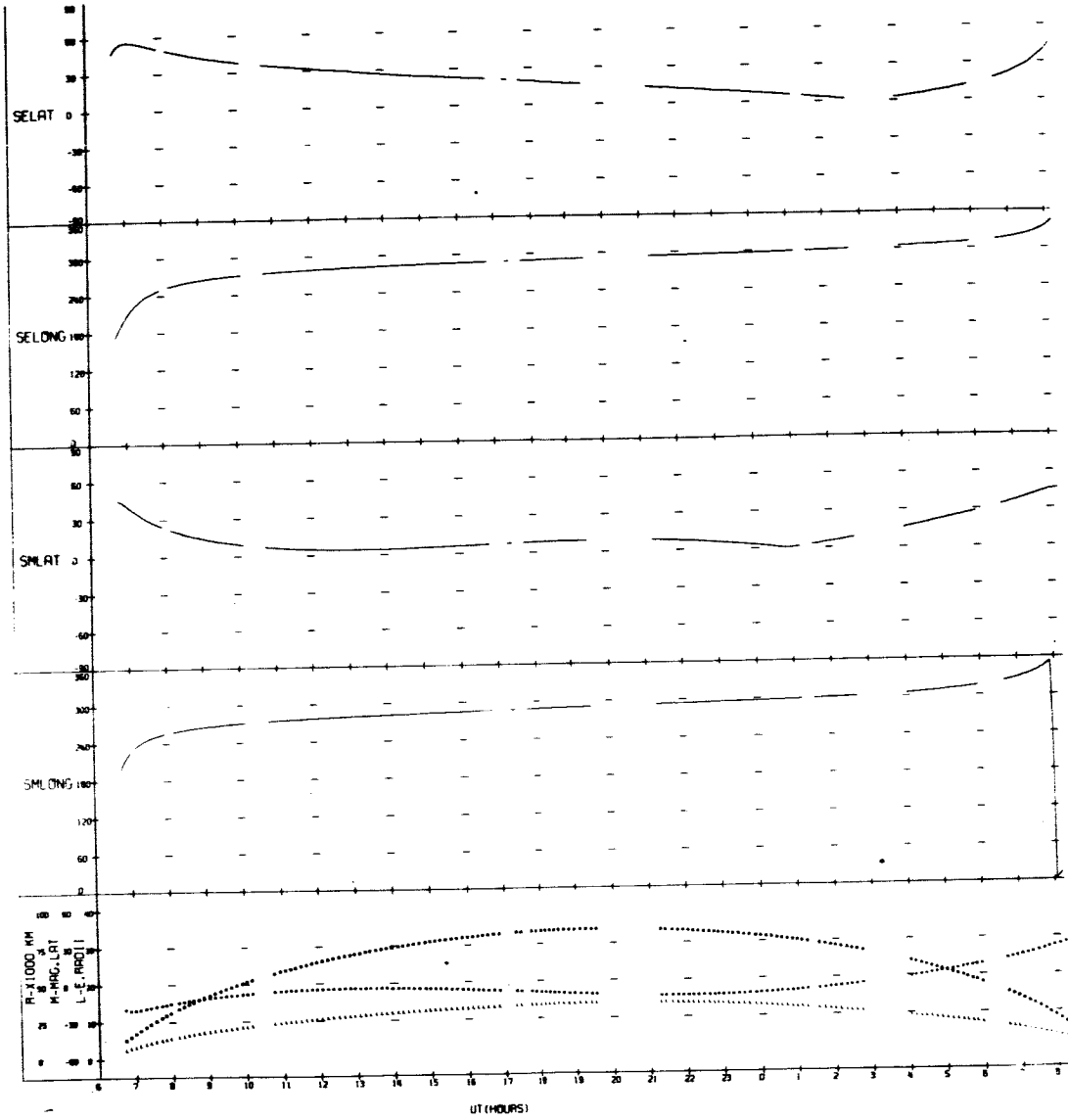


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 77

BEGIN 11/08/61/06:42

END 11/09/61/08:15

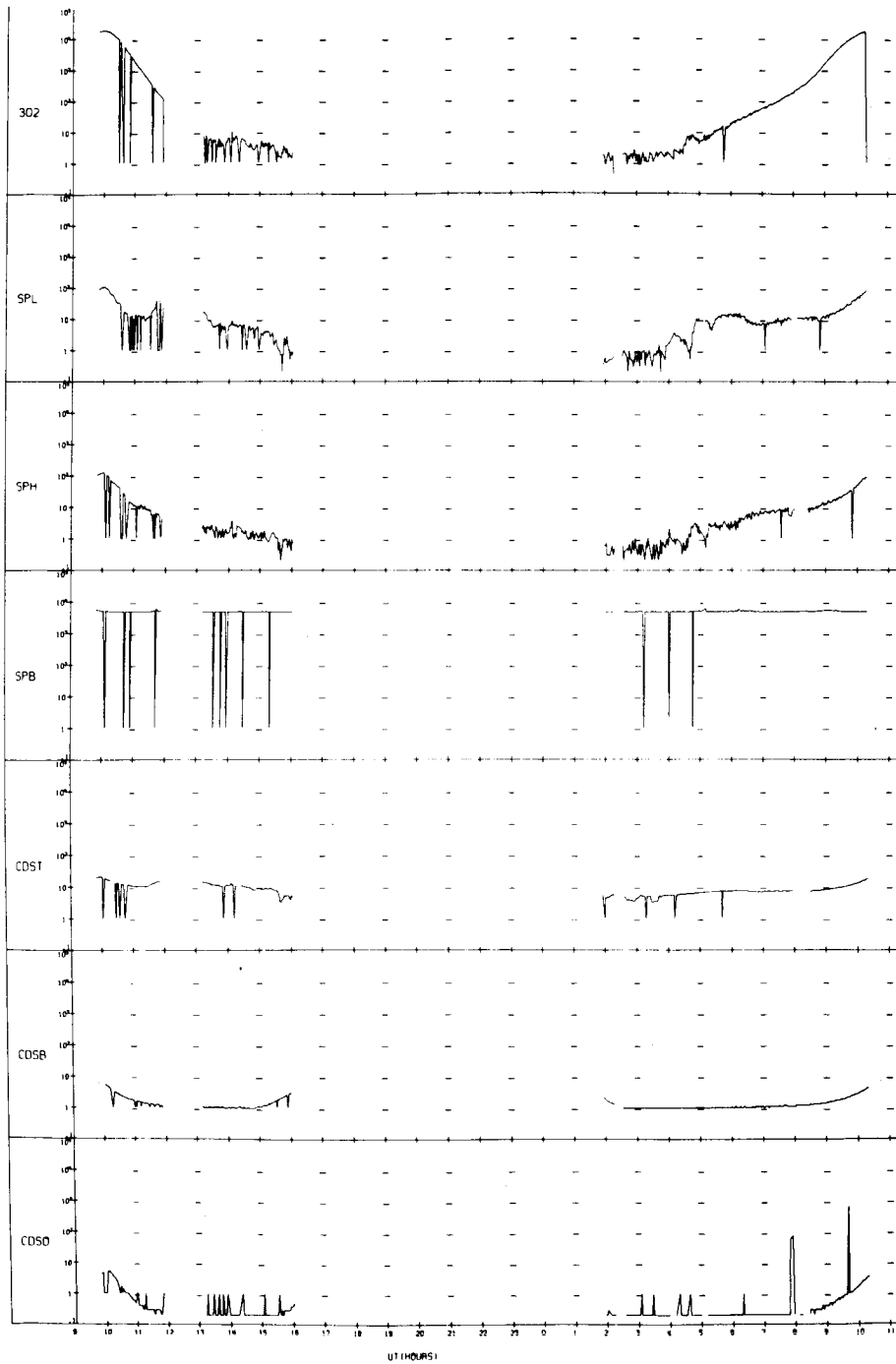


UNIVERSITY OF IOWA

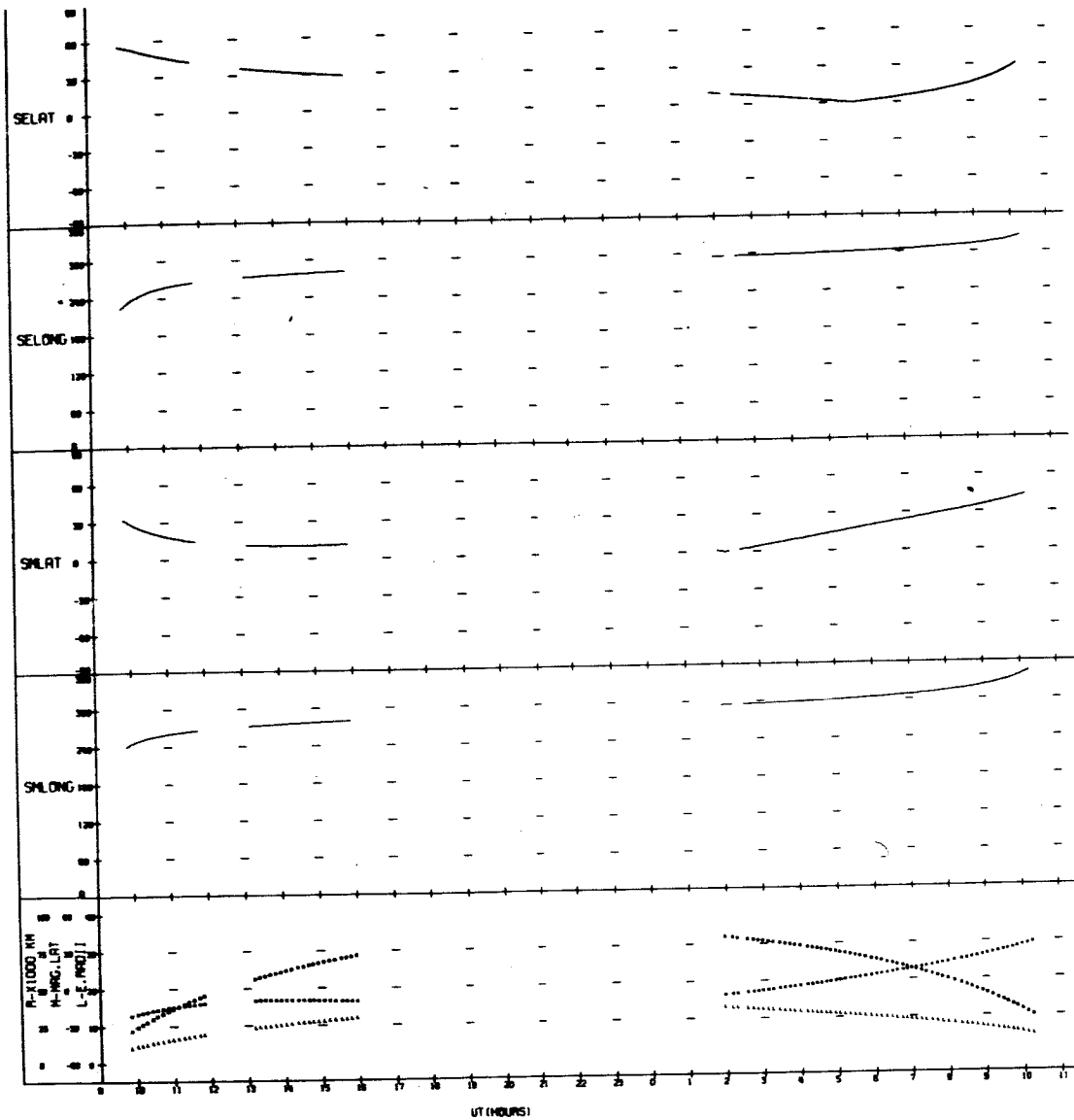
EXPLORER 12 ORBIT 78

BEGIN 11/09/61/09:49

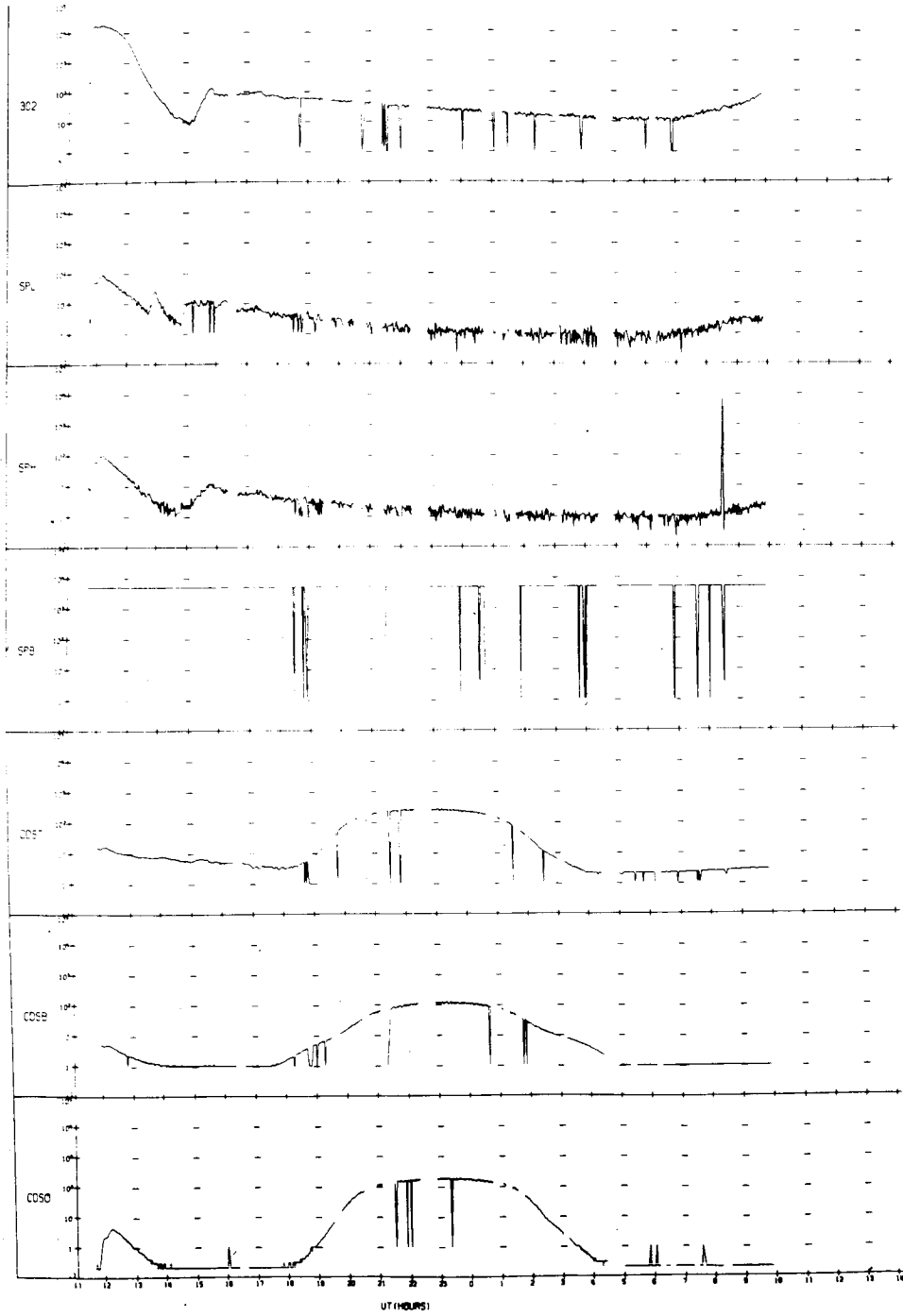
END 11/10/61/11:31



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 78
 BEGIN 11/09/61/09:49
 END 11/10/61/11:31

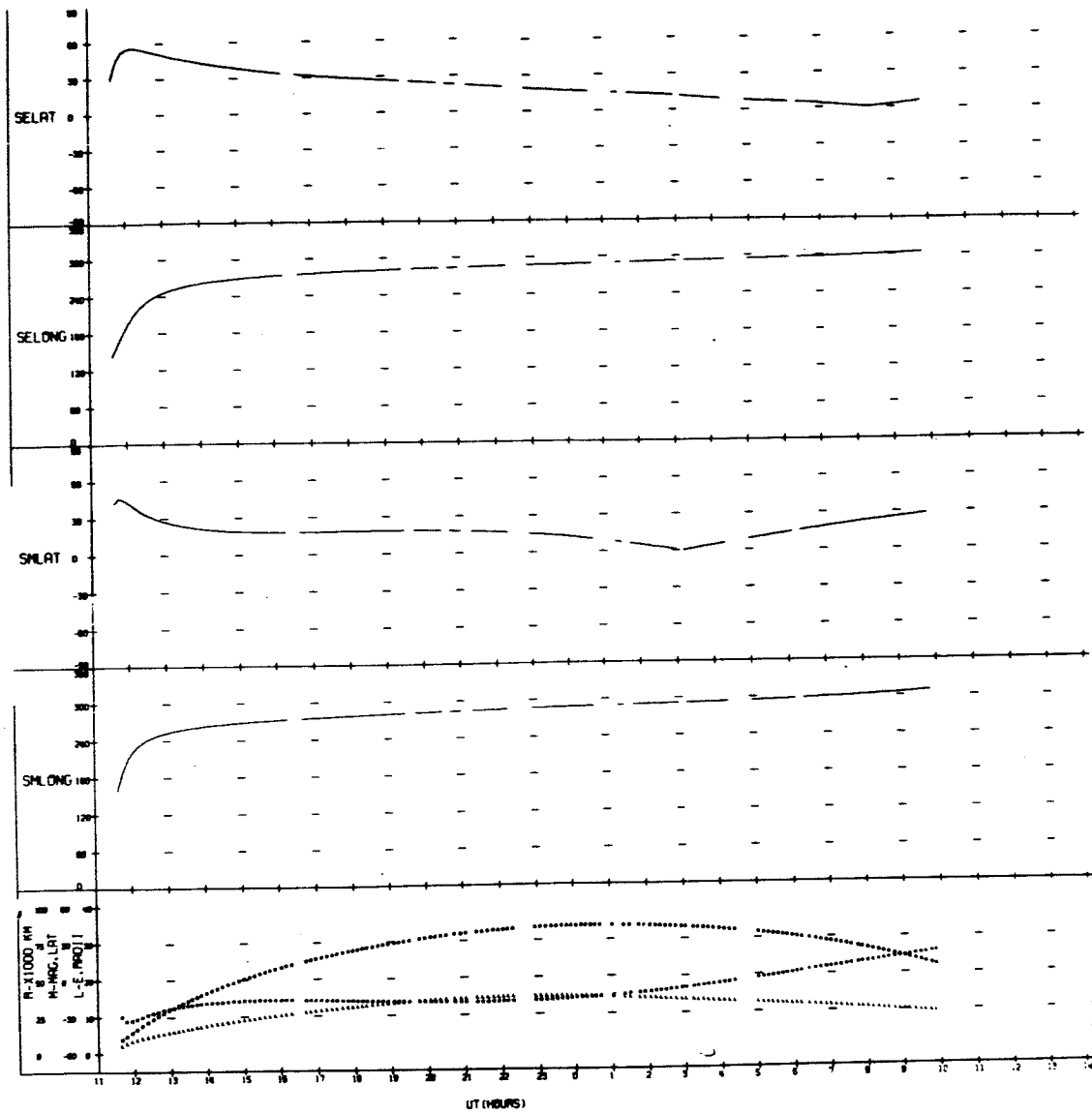


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT: 79
BEGIN 11/10/61 11:38
END 11/11 01:44:00

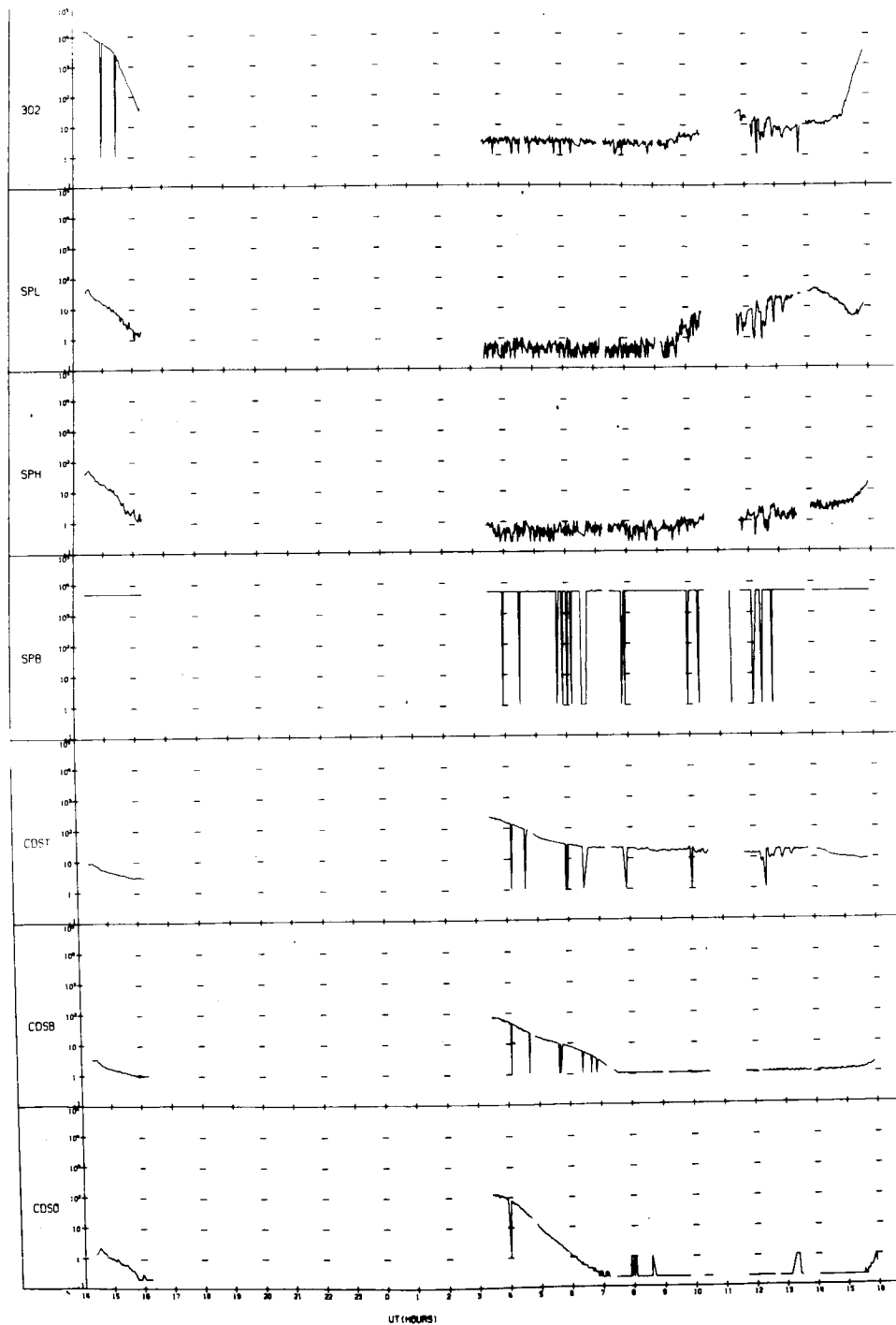


UNIVERSITY OF IOWA

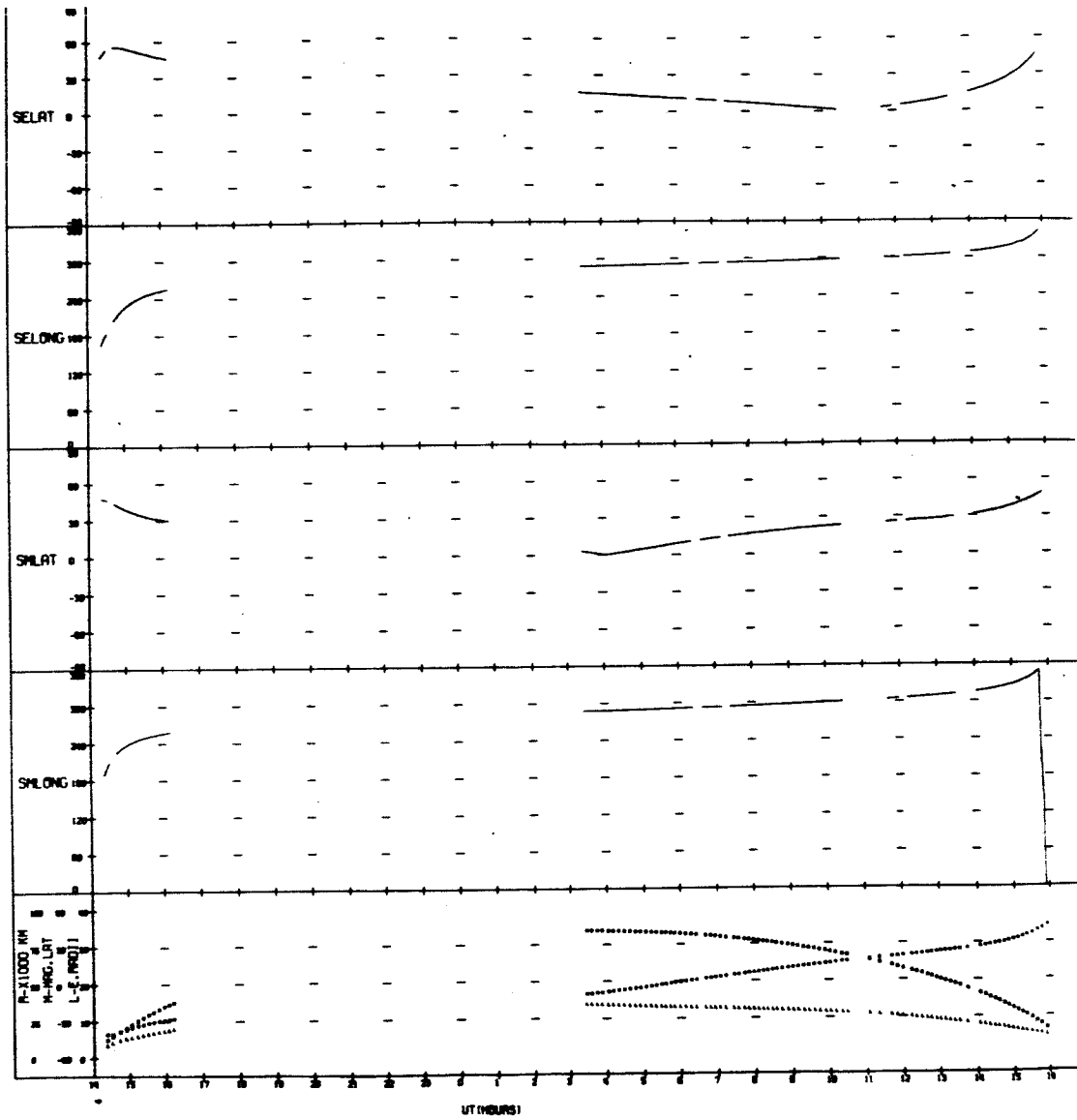
EXPLORER 12 ORBIT 79
BEGIN 11/10/61/11:38
END 11/11/61/14:10



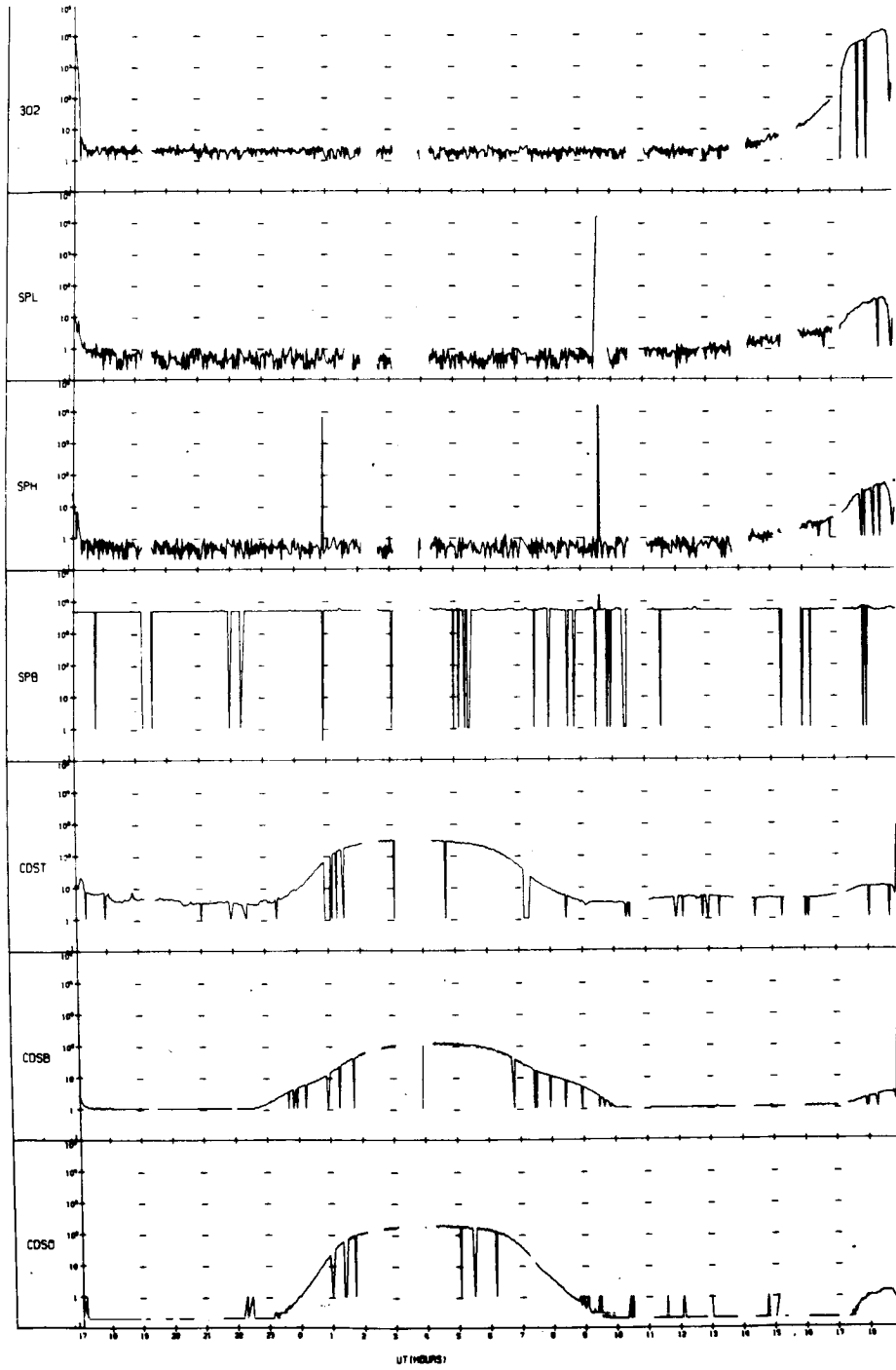
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 80
BEGIN 11/11/61/14:22
END 11/12/61/16:53



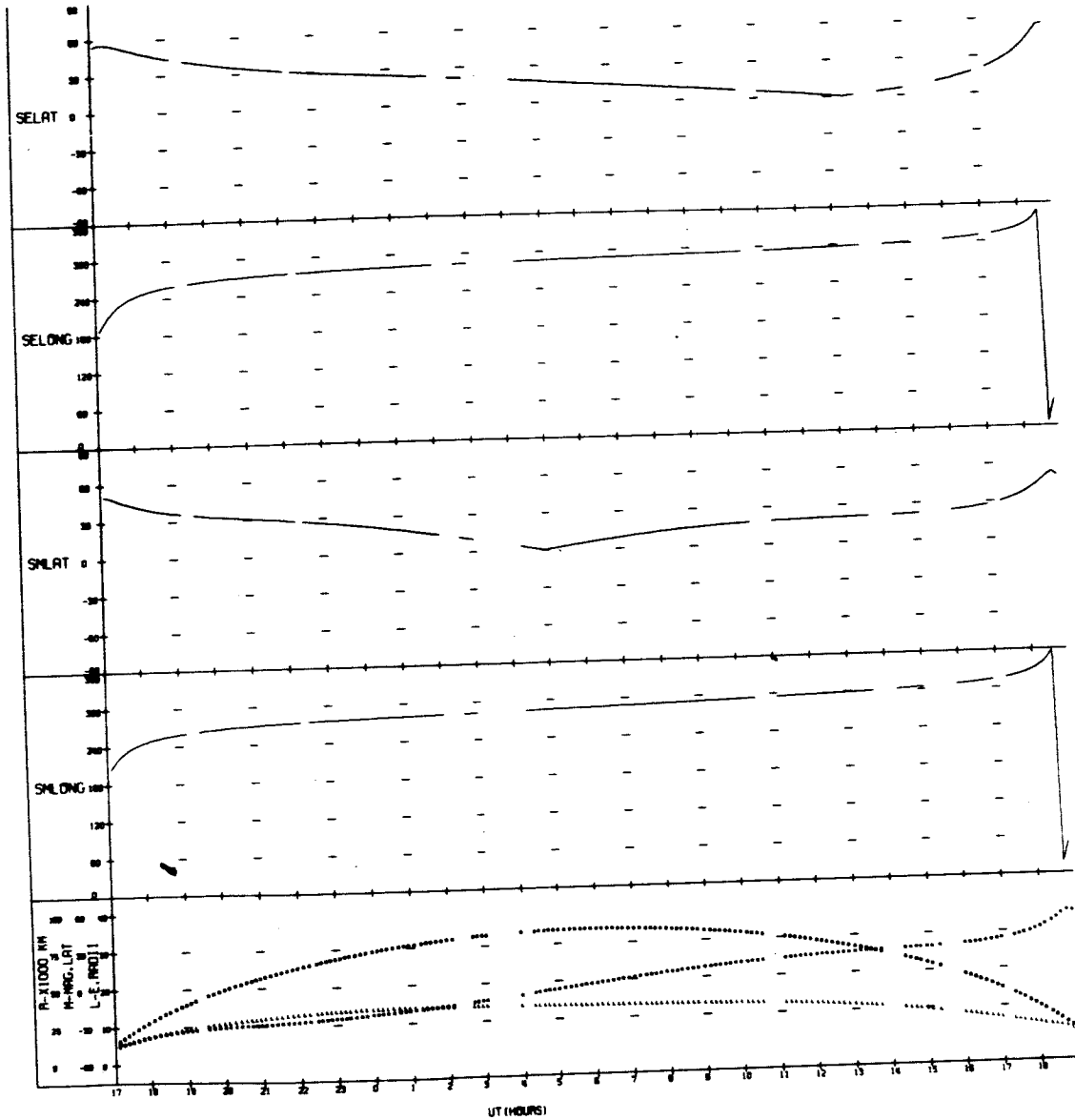
UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 80
 BEGIN 11/11/61/14:22
 END 11/12/61/16:53



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 81
BEGIN 11/12/61/17:00
END 11/13/61/18:57



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 81
 BEGIN 11/12/61/17:00
 END 11/13/61/18:57

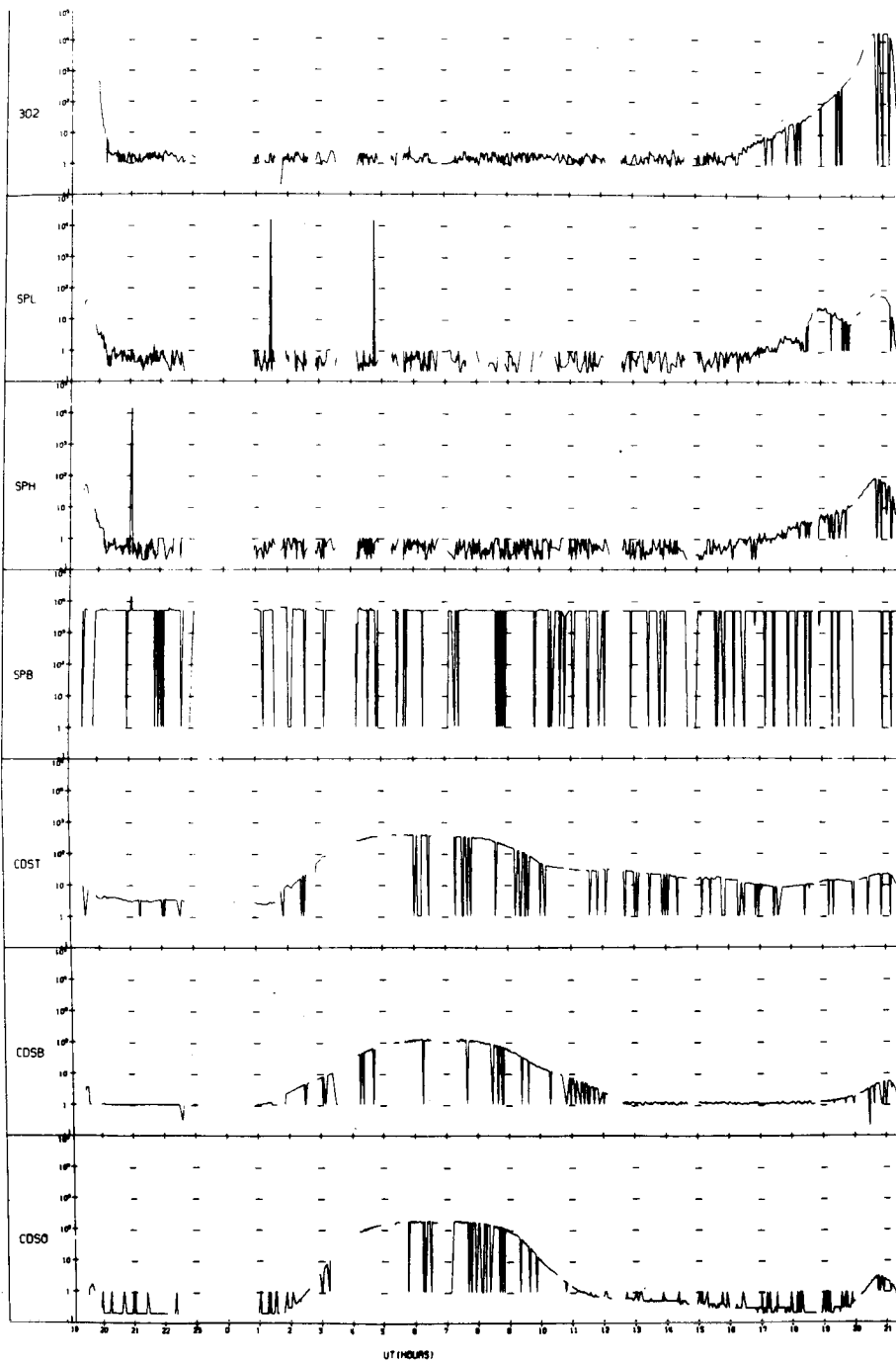


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 82

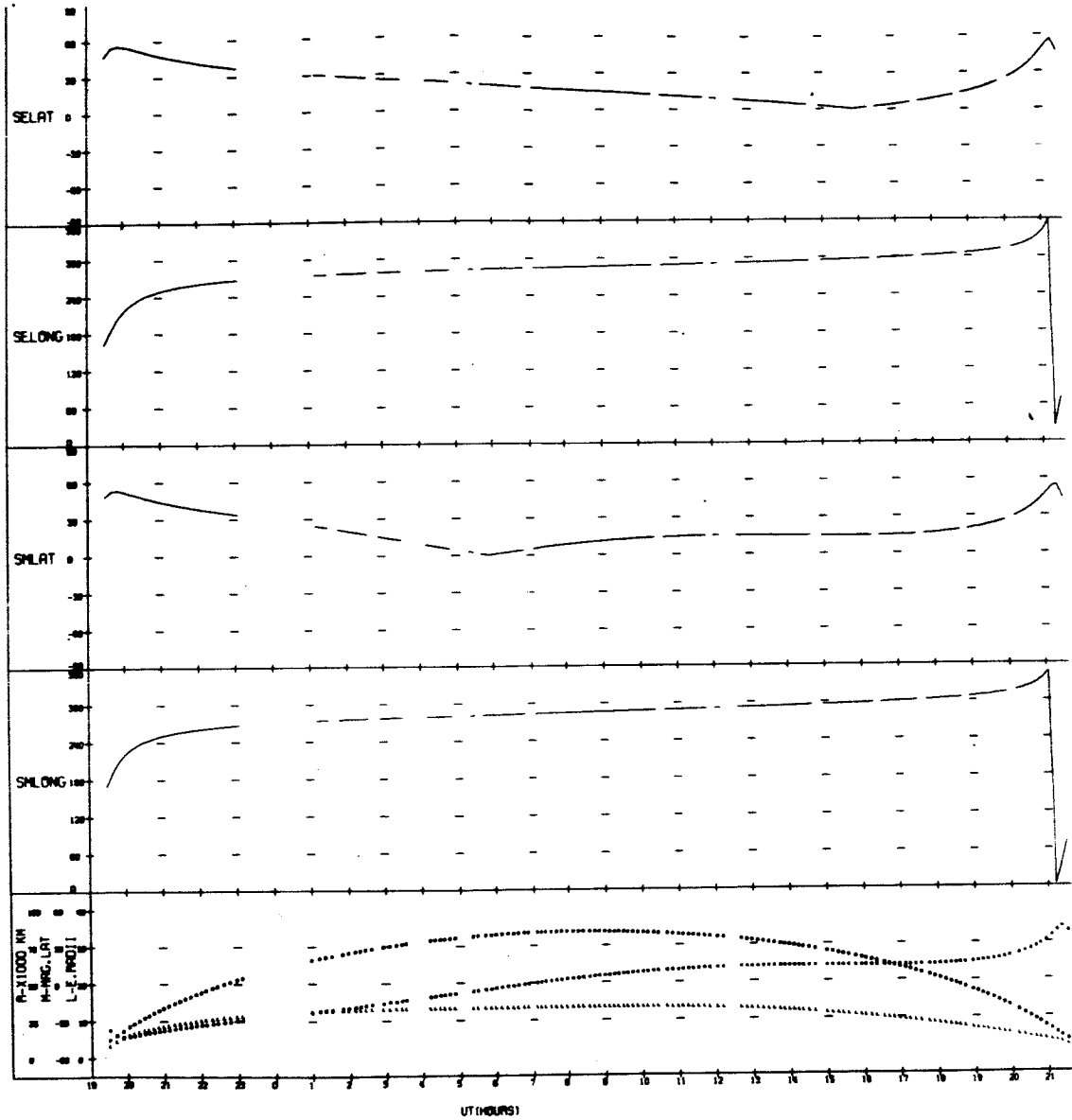
BEGIN 11/13/61/19:27

END 11/14/61/21:37



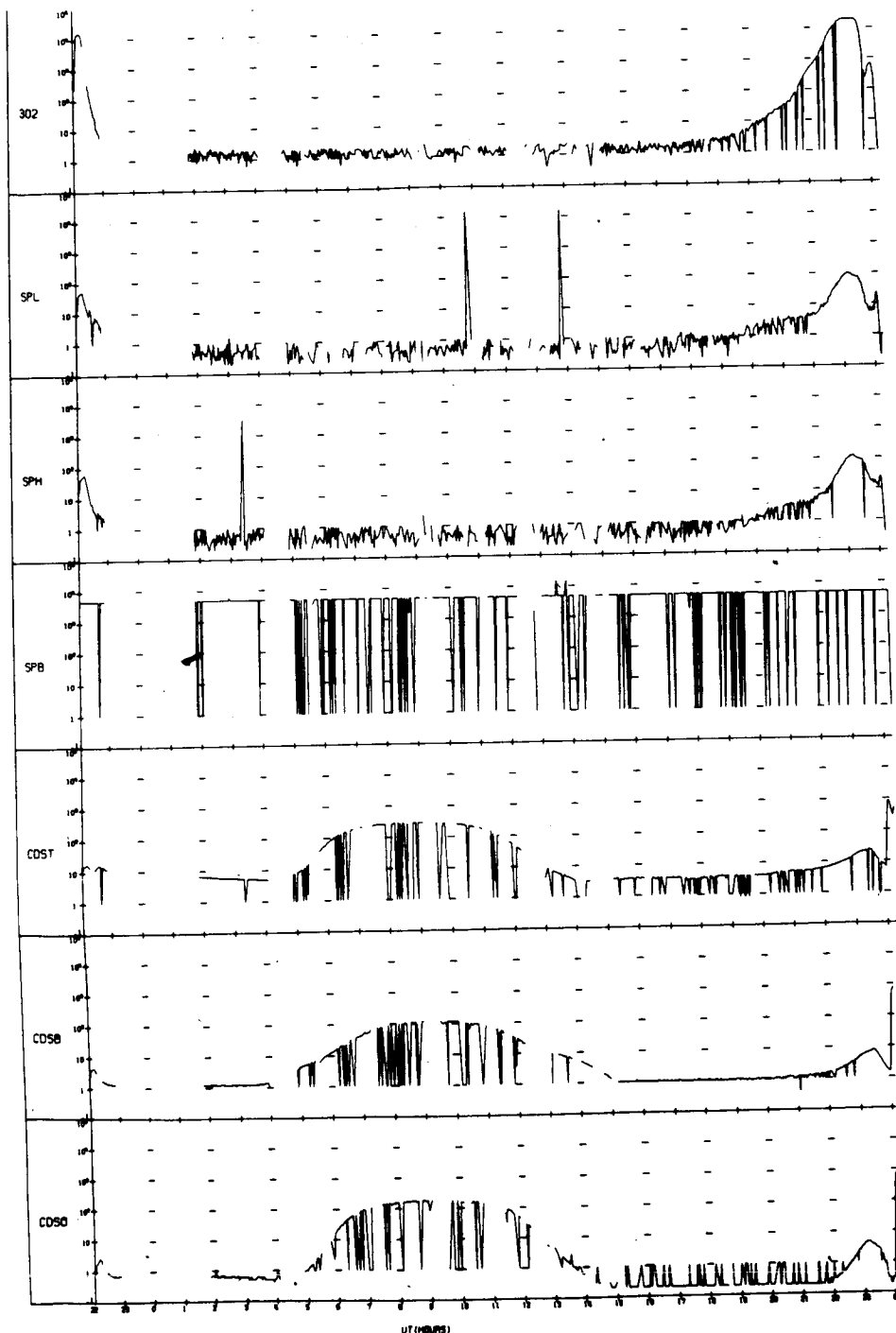
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 82
 BEGIN 11/13/61/19:27
 END 11/14/61/21:37

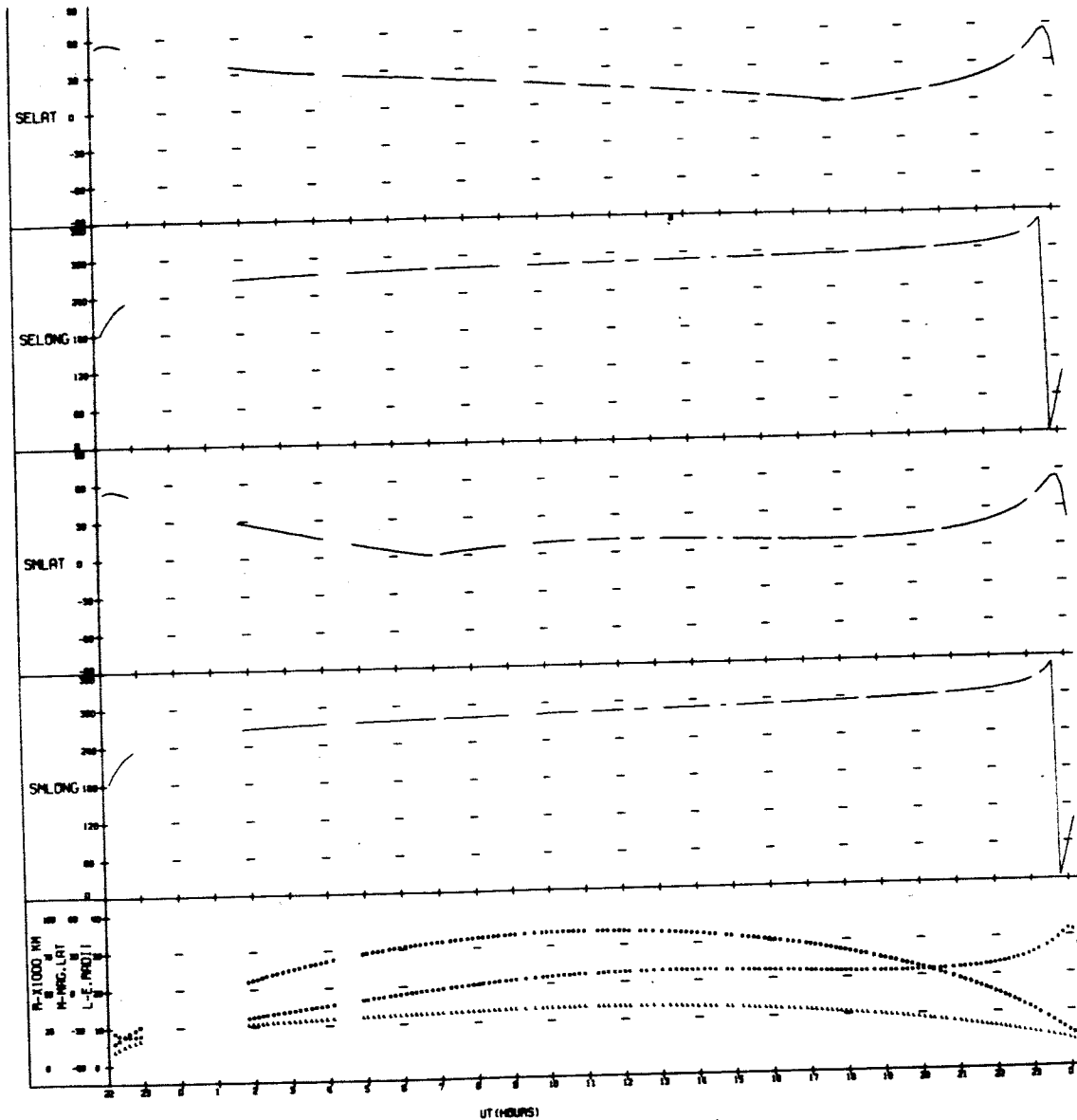


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 83
BEGIN 11/14/61/22:01
END 11/16/61/00:15



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 83
 BEGIN 11/14/61/22:01
 END 11/16/61/00:15

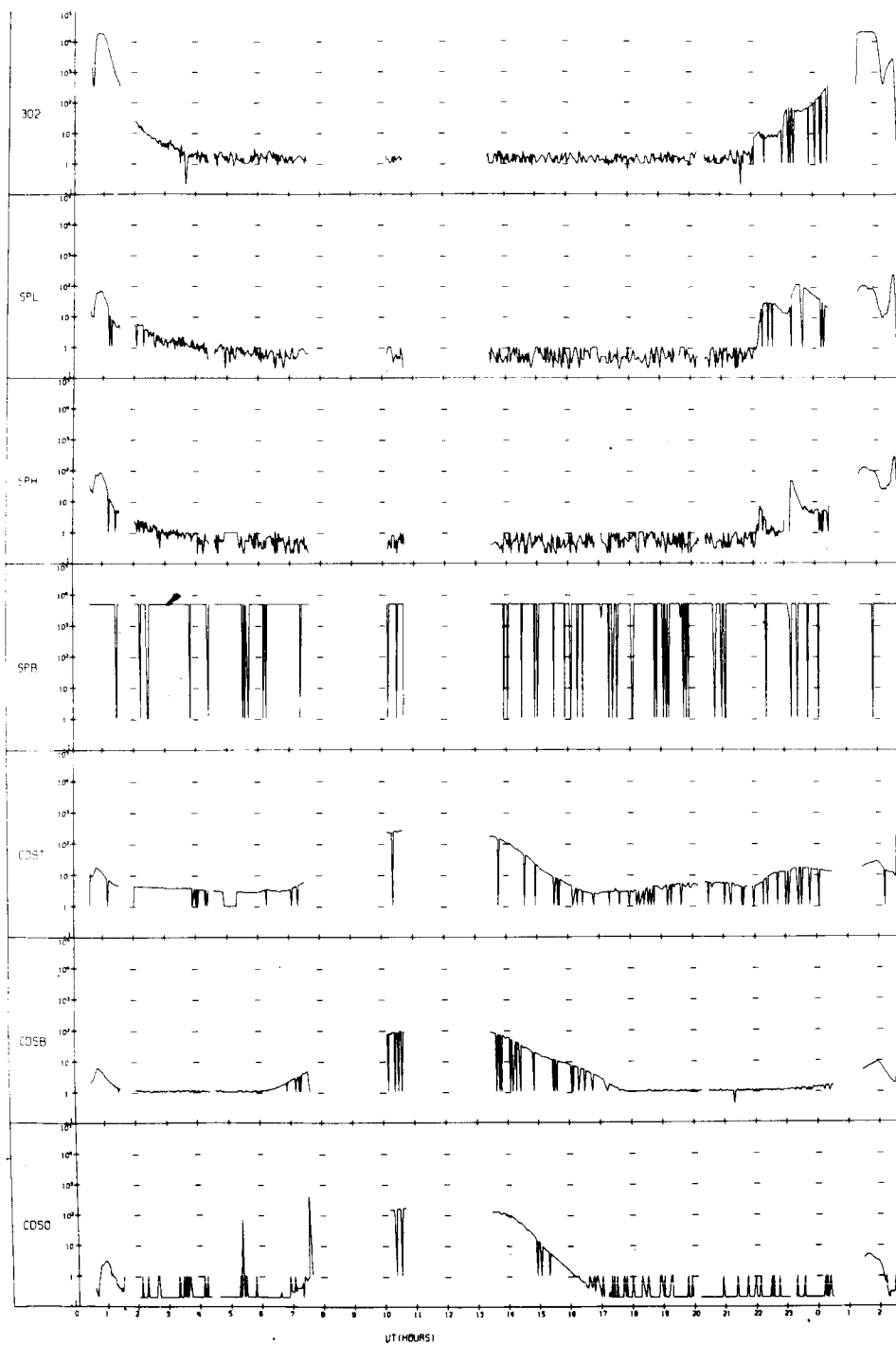


UNIVERSITY OF IOWA

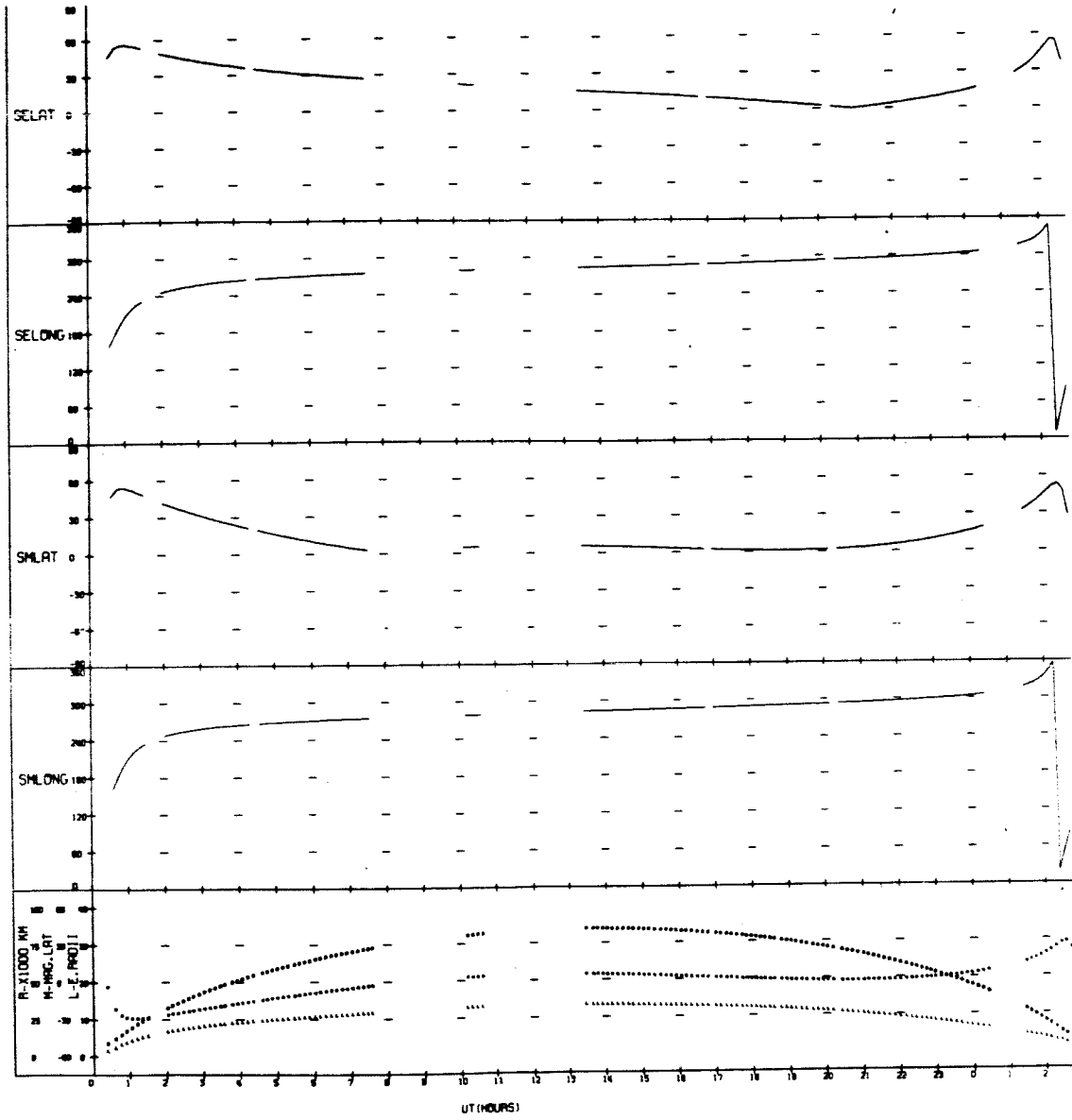
EXPLORER 12 ORBIT 84

BEGIN 11/16/61/00:21

END 11/17/61/02:45



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 84
 BEGIN 11/16/61/00:21
 END 11/17/61/02:45

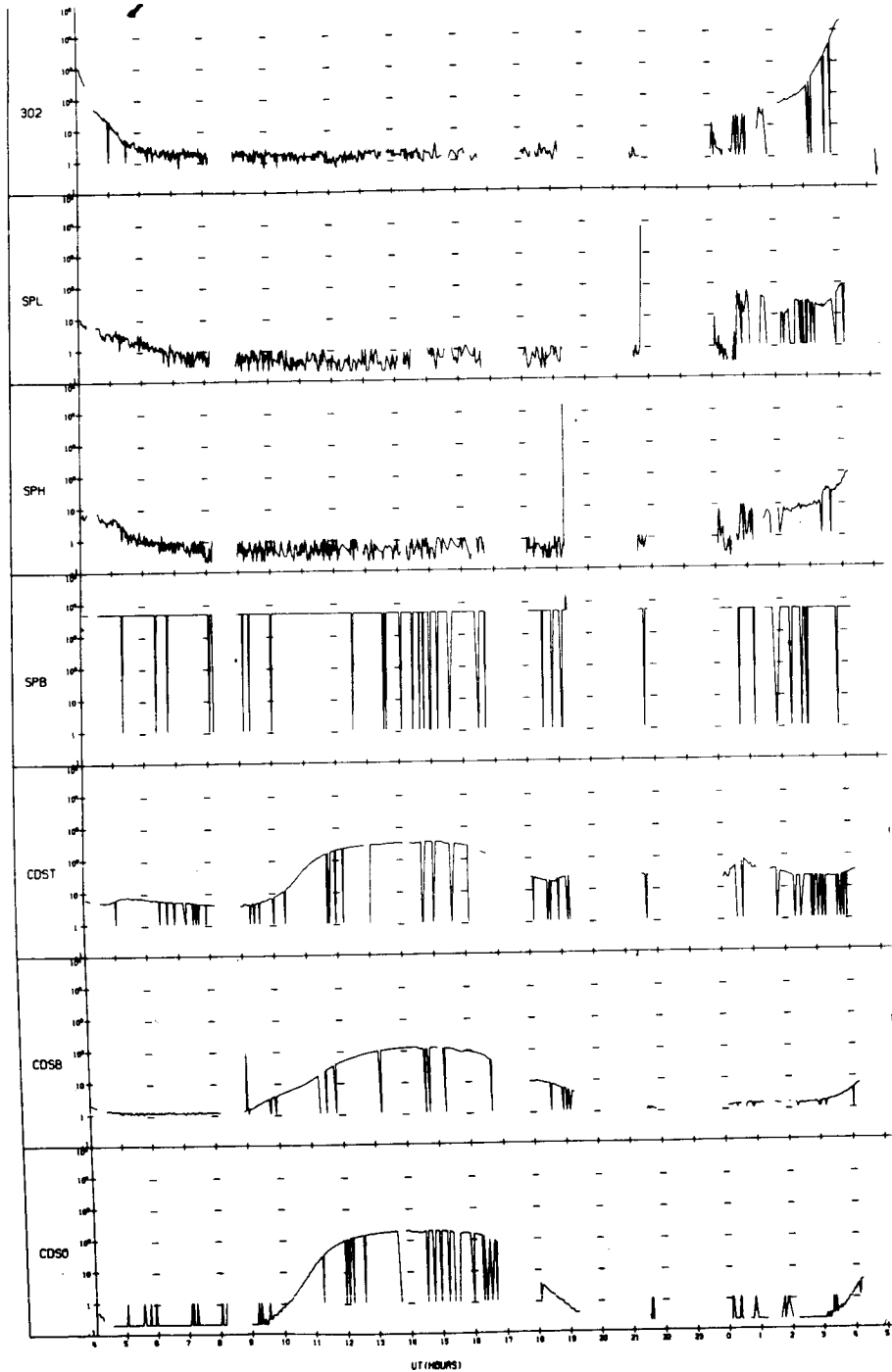


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 85

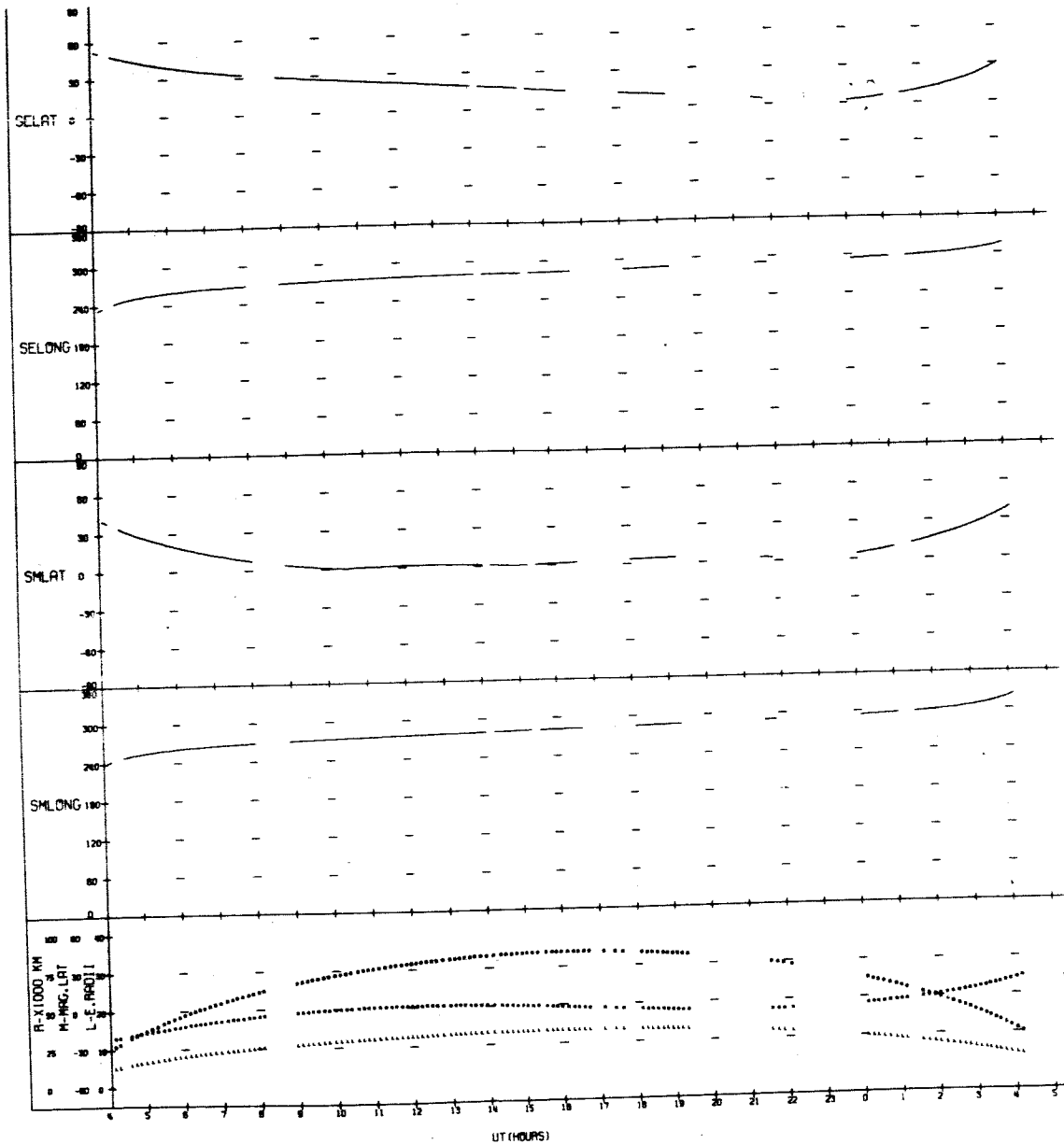
BEGIN 11/17/61/04:05

END 11/18/61/05:21



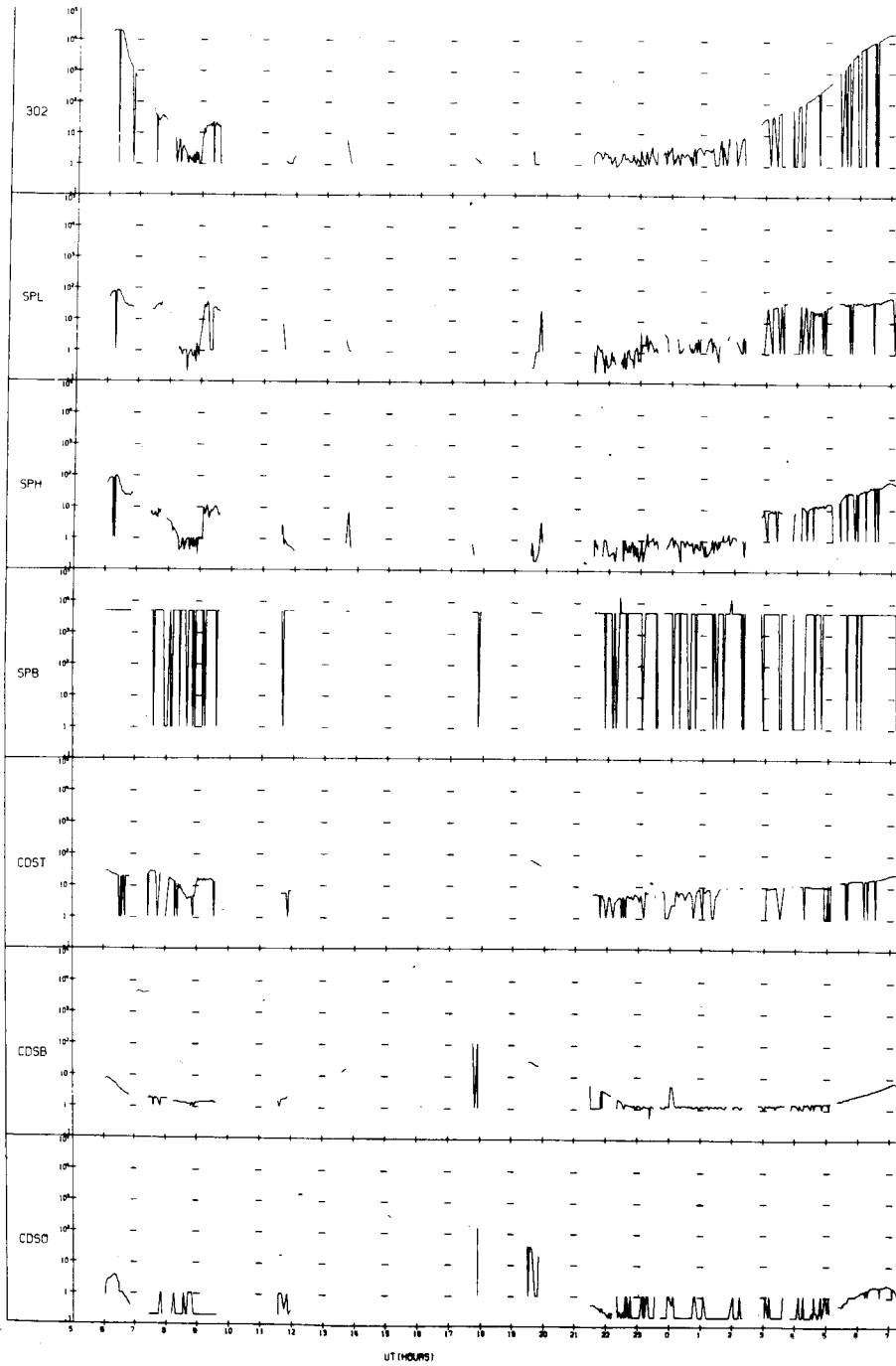
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 85
BEGIN 11/17/61/04:05
END 11/18/61/05:21



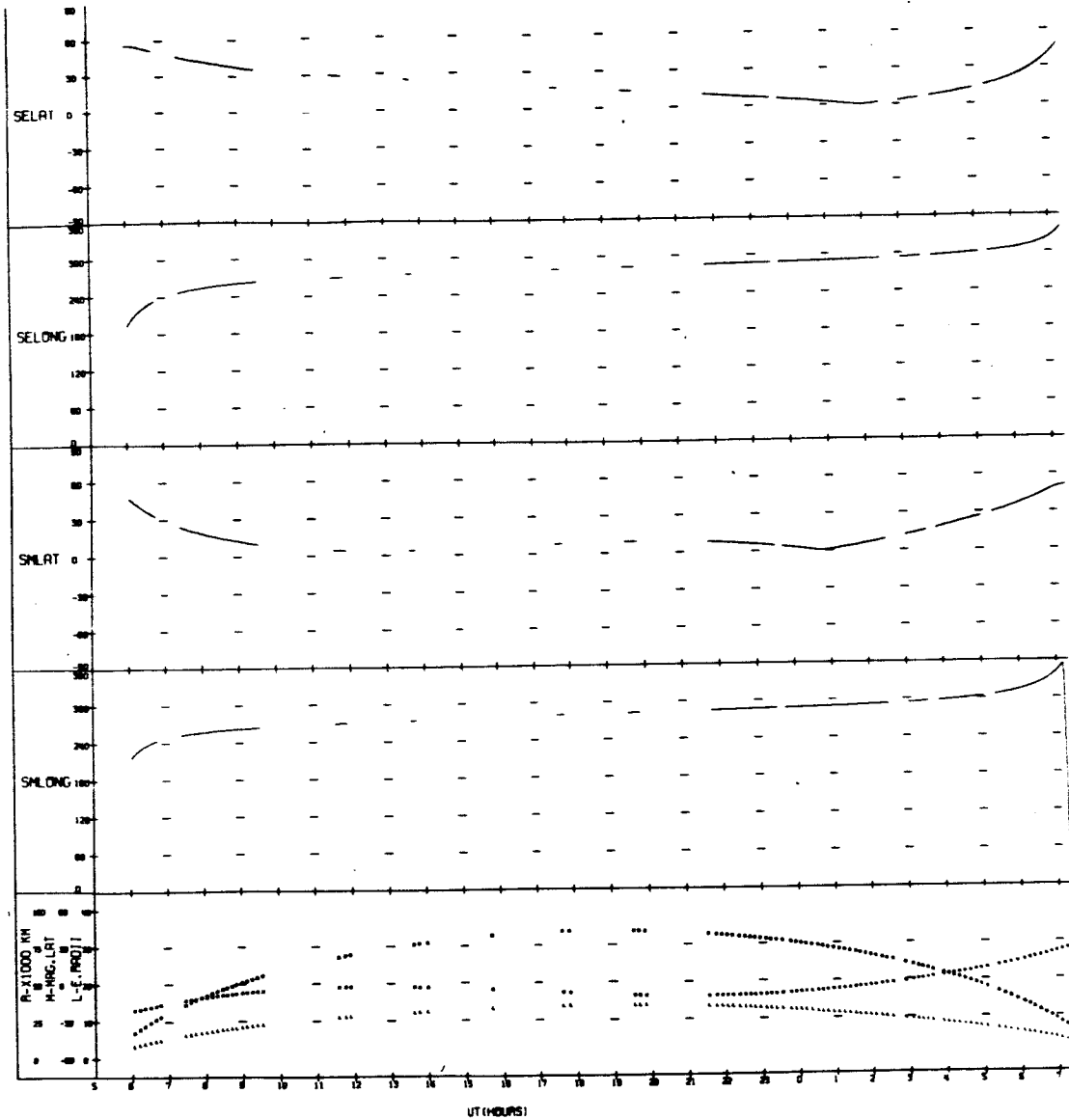
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 86
BEGIN 11/18/61/05:28
END 11/19/61/07:20

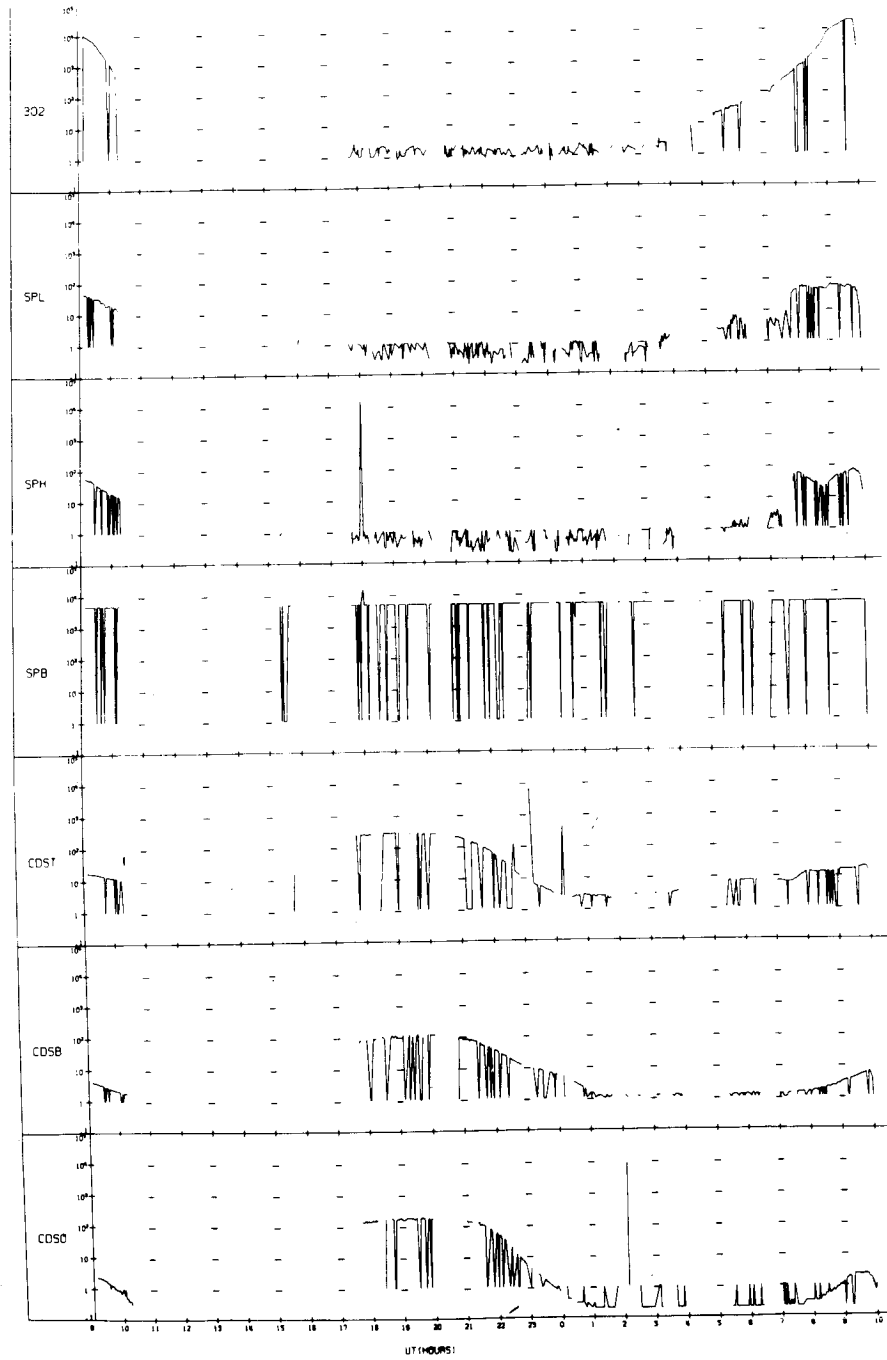


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 86
BEGIN 11/18/61/05:28
END 11/19/61/07:20

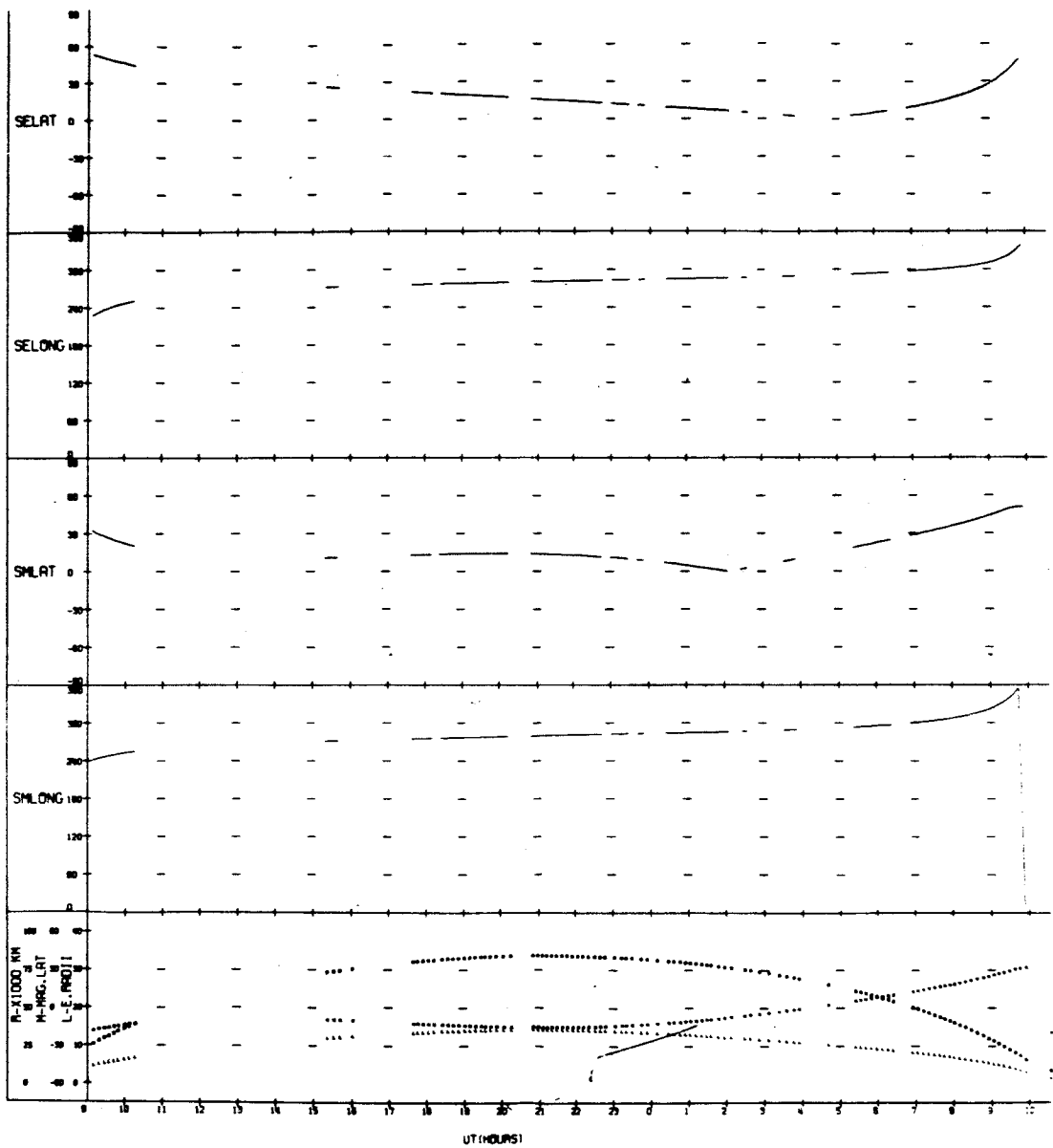


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 87
BEGIN 11/19/81/09:08
END 11/20/81/10:35

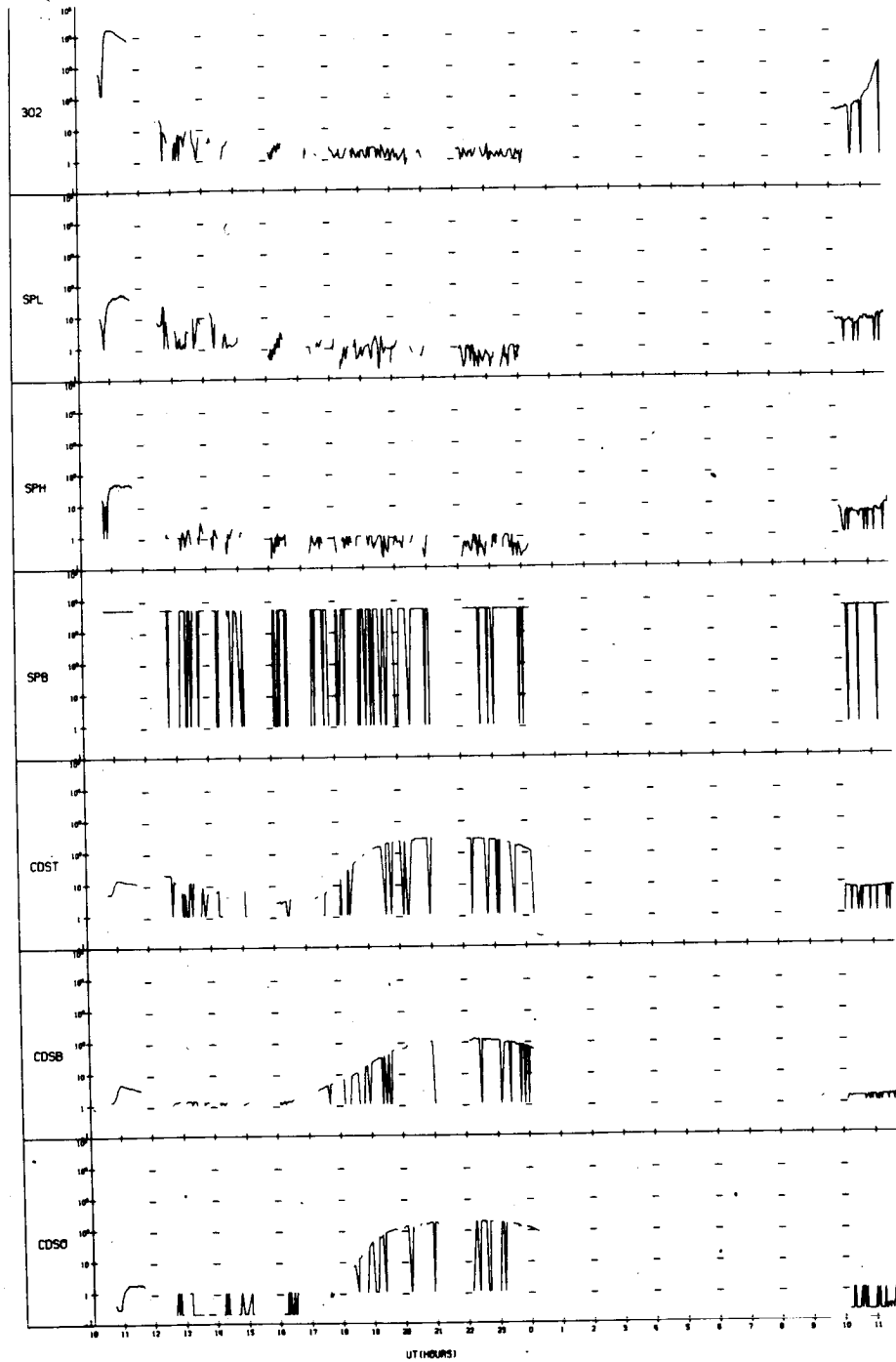


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 87
 BEGIN 11/19/61/09:08
 END 11/20/61/10:35



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 88
BEGIN 11/20/61/10:42
END 11/21/61/11:40

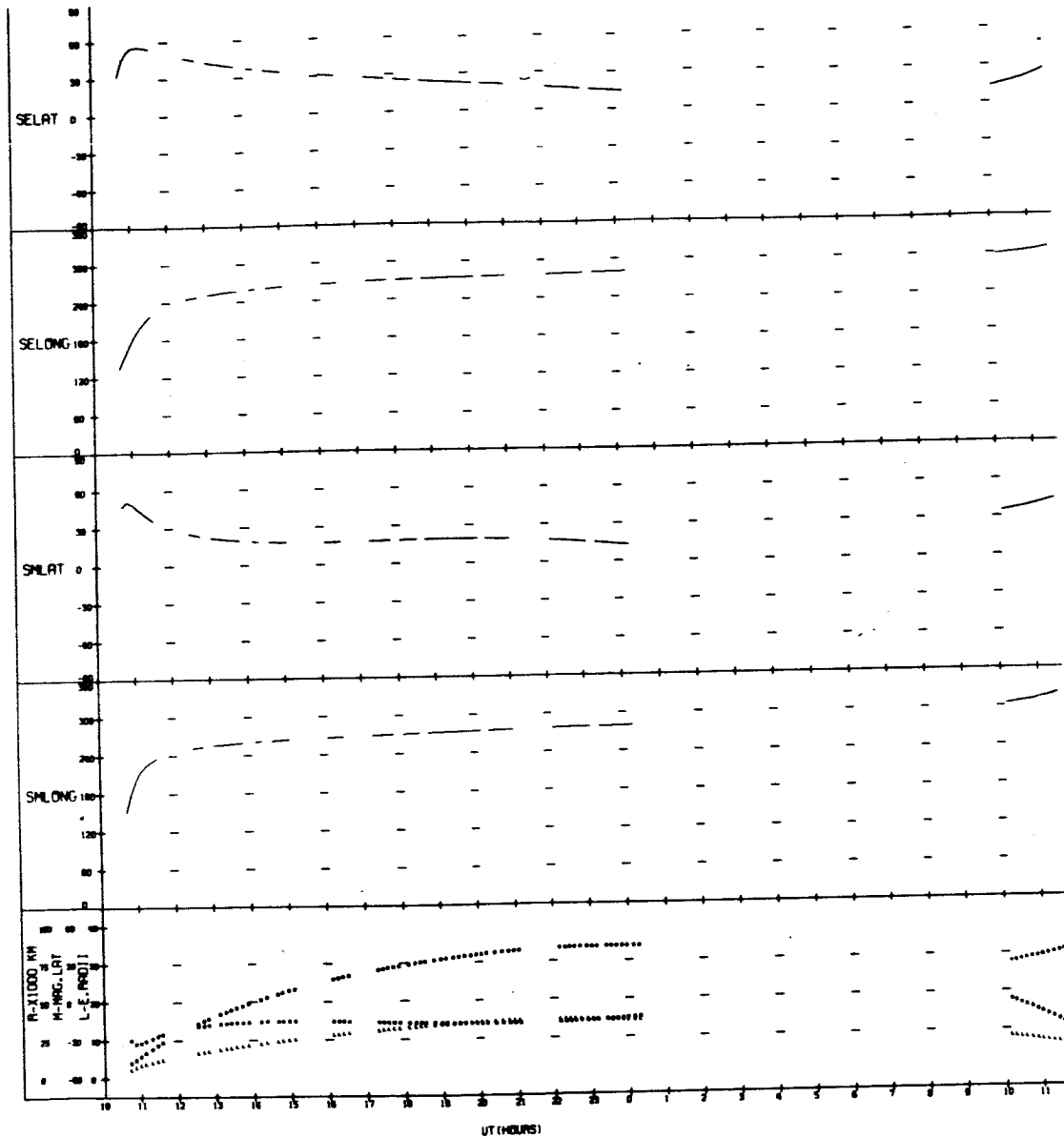


UNIVERSITY OF IOWA

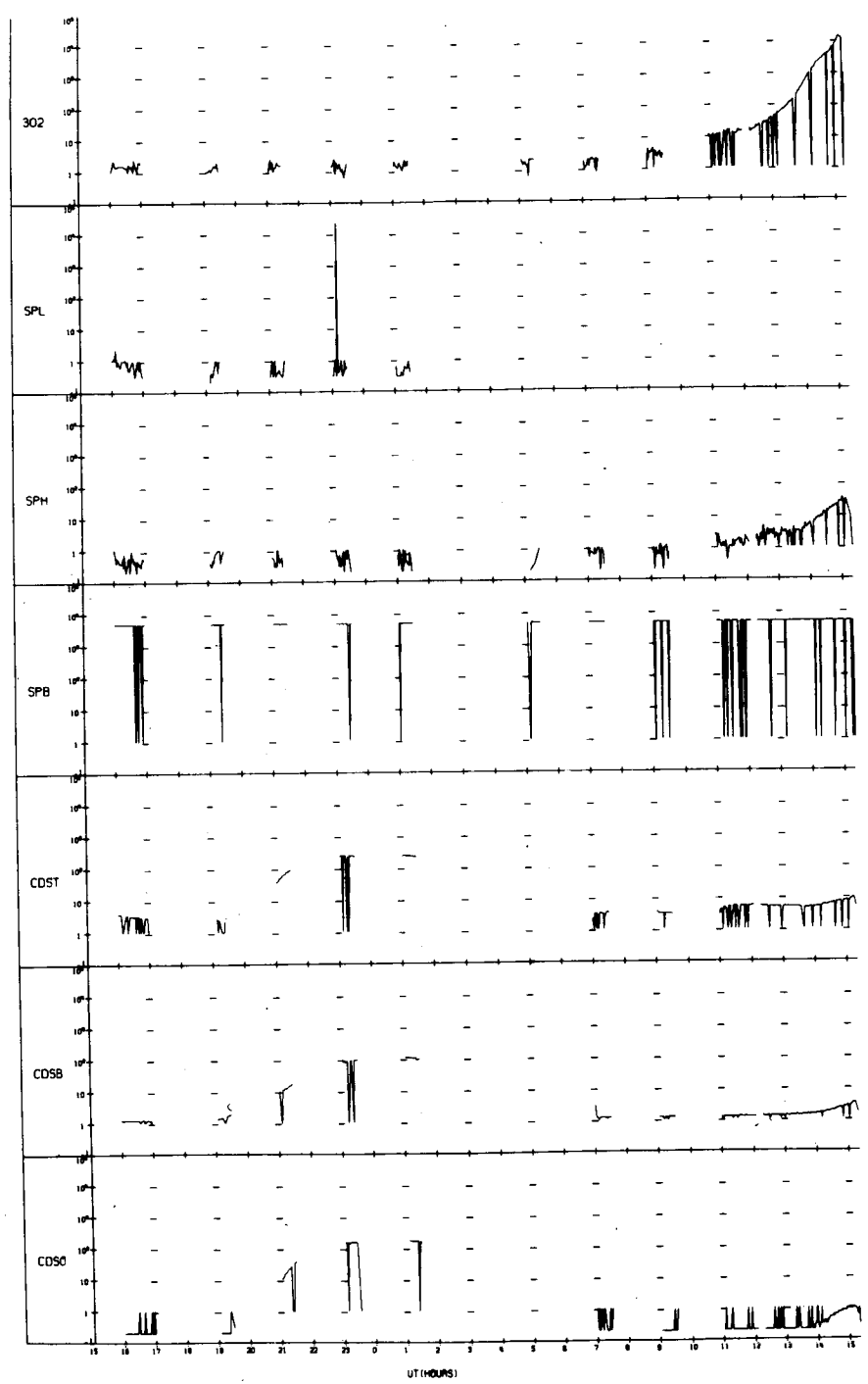
EXPLORER 12 ORBIT 88

BEGIN 11/20/61/10:42

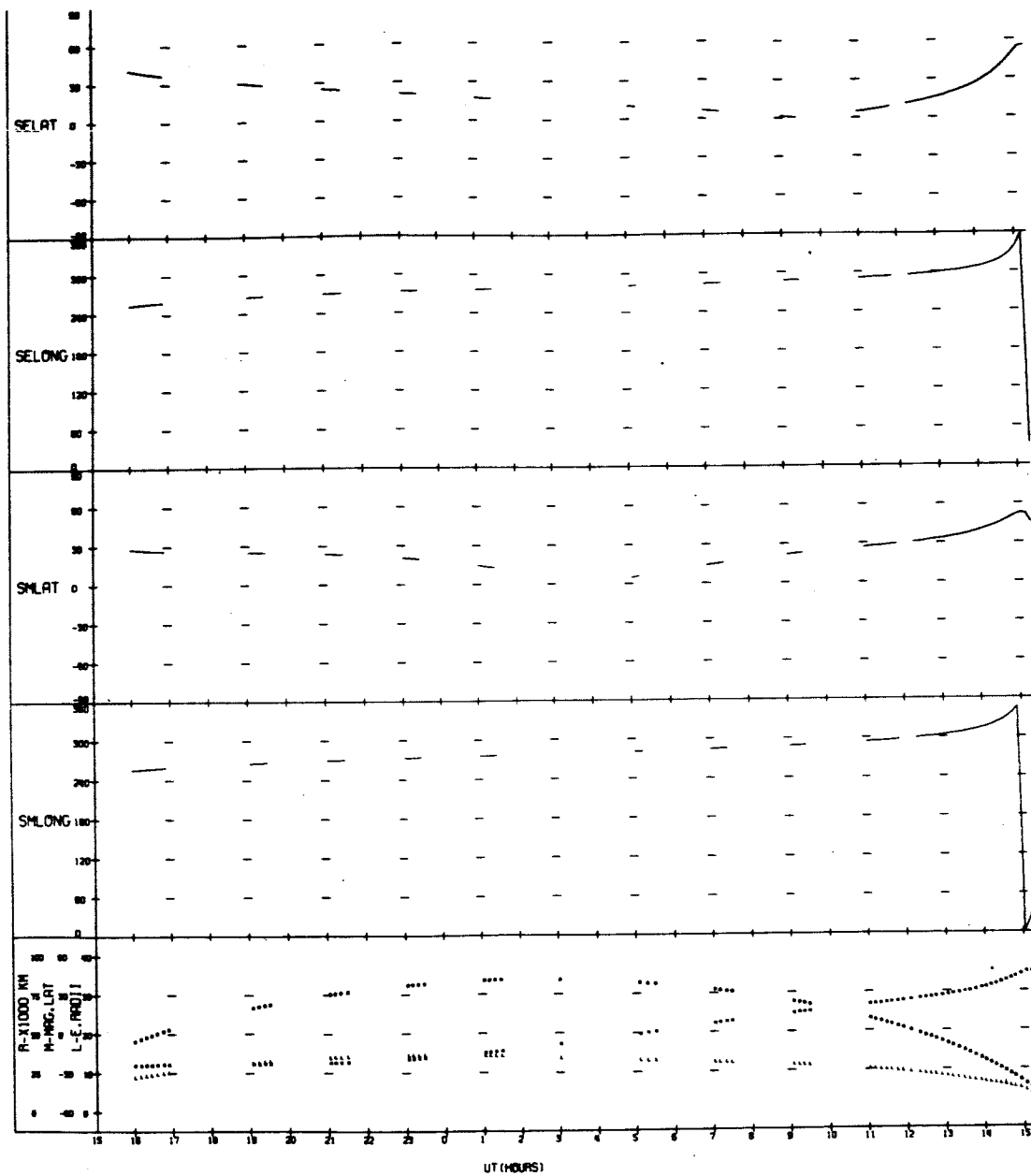
END 11/21/61/11:40



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 89
 BEGIN 11/21/61/15:57
 END 11/22/61/15:20

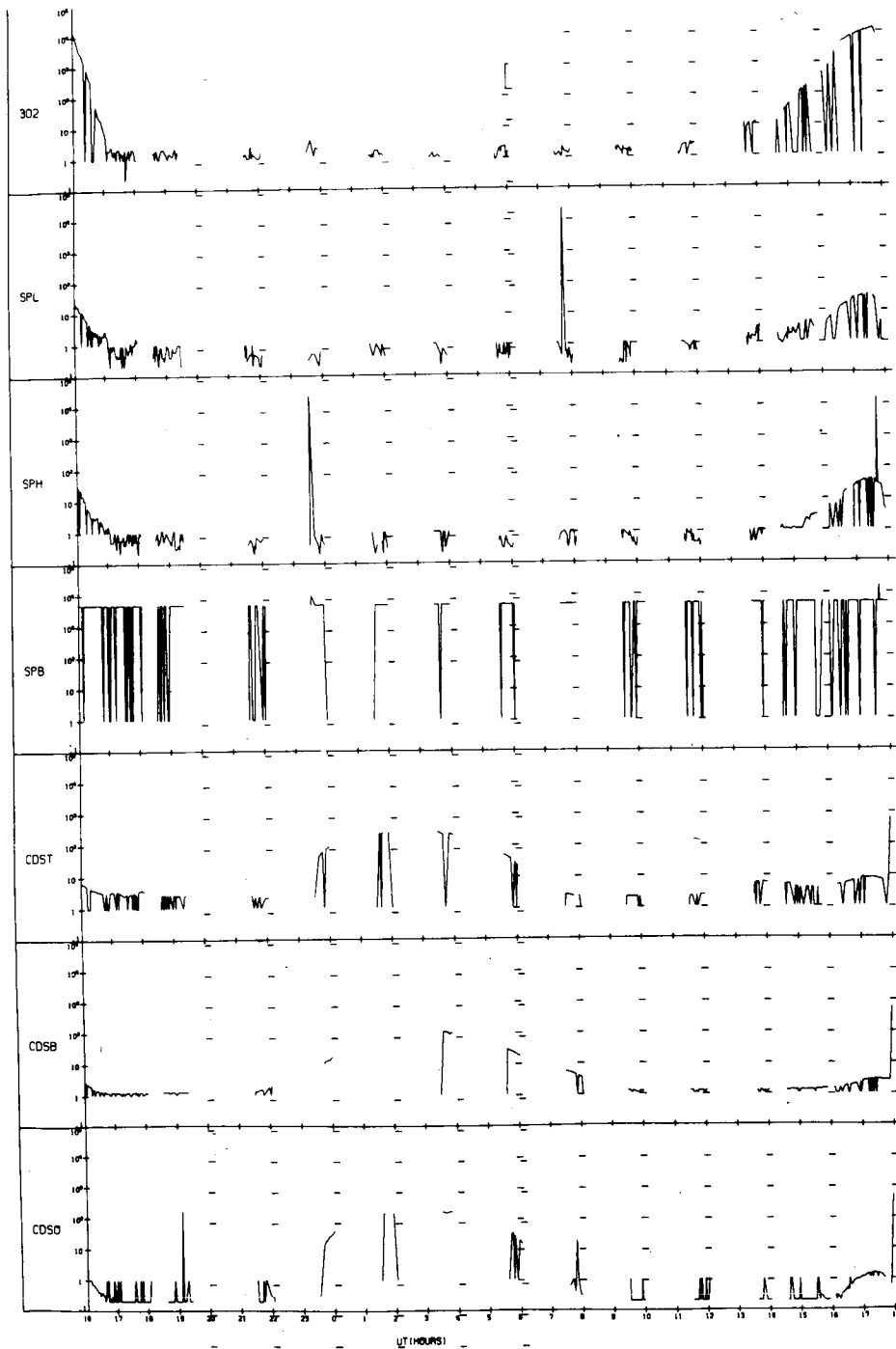


UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 89
 BEGIN 11/21/61/15:57
 END 11/22/61/15:20

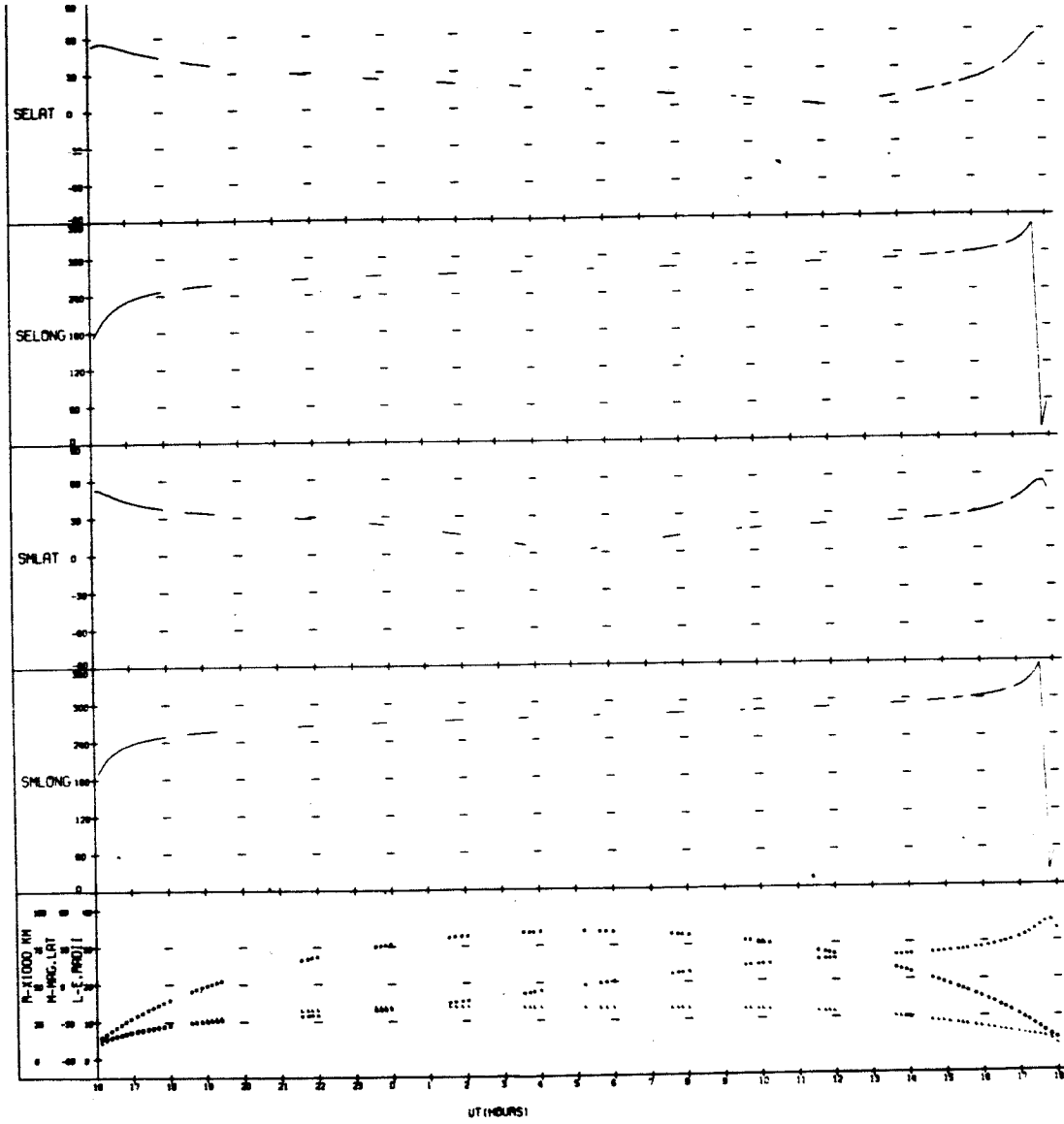


UNIVERSITY OF IOWA

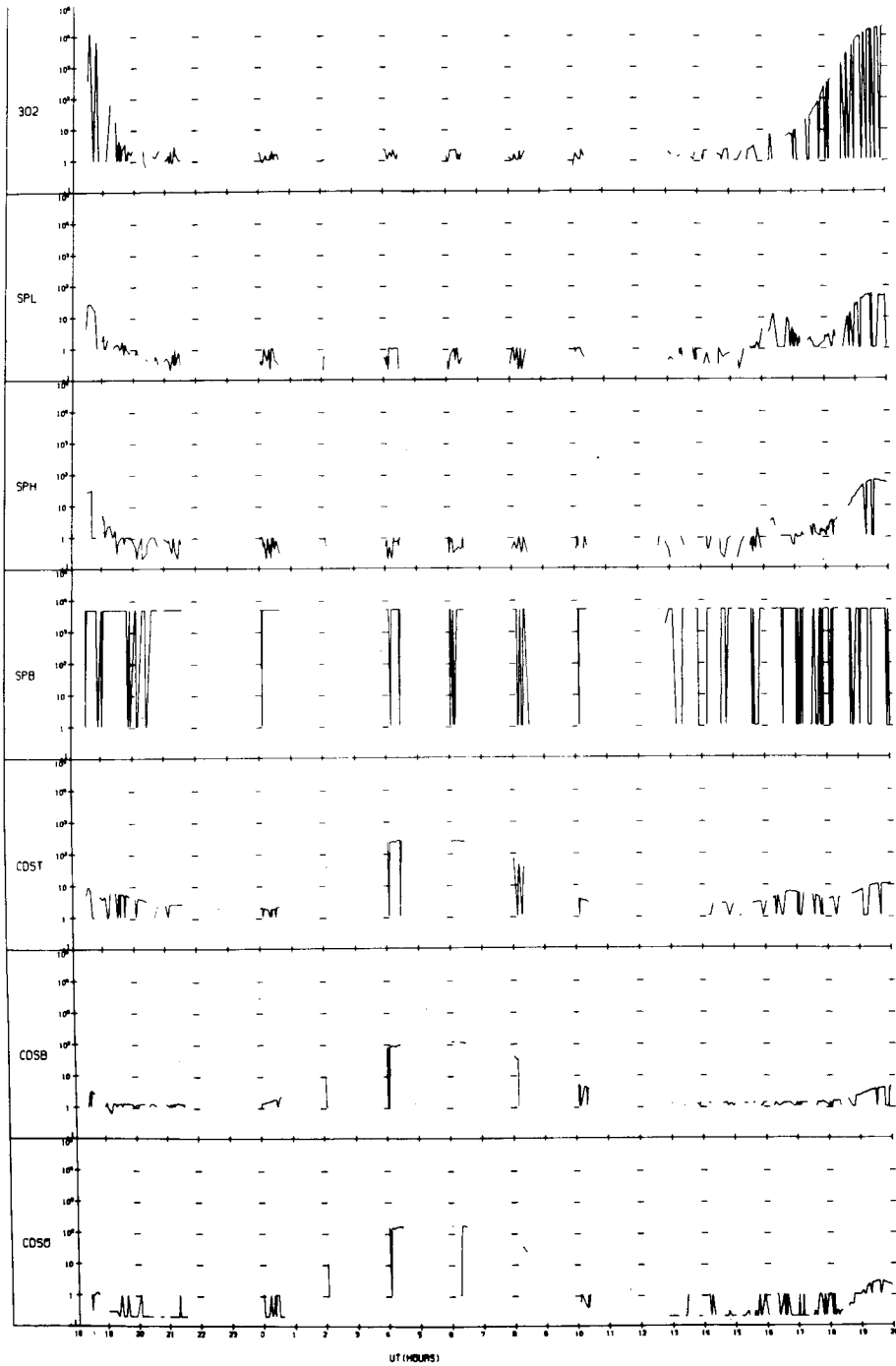
EXPLORER 12 ORBIT 90
BEGIN 11/22/61/16:01
END 11/23/61/18:15



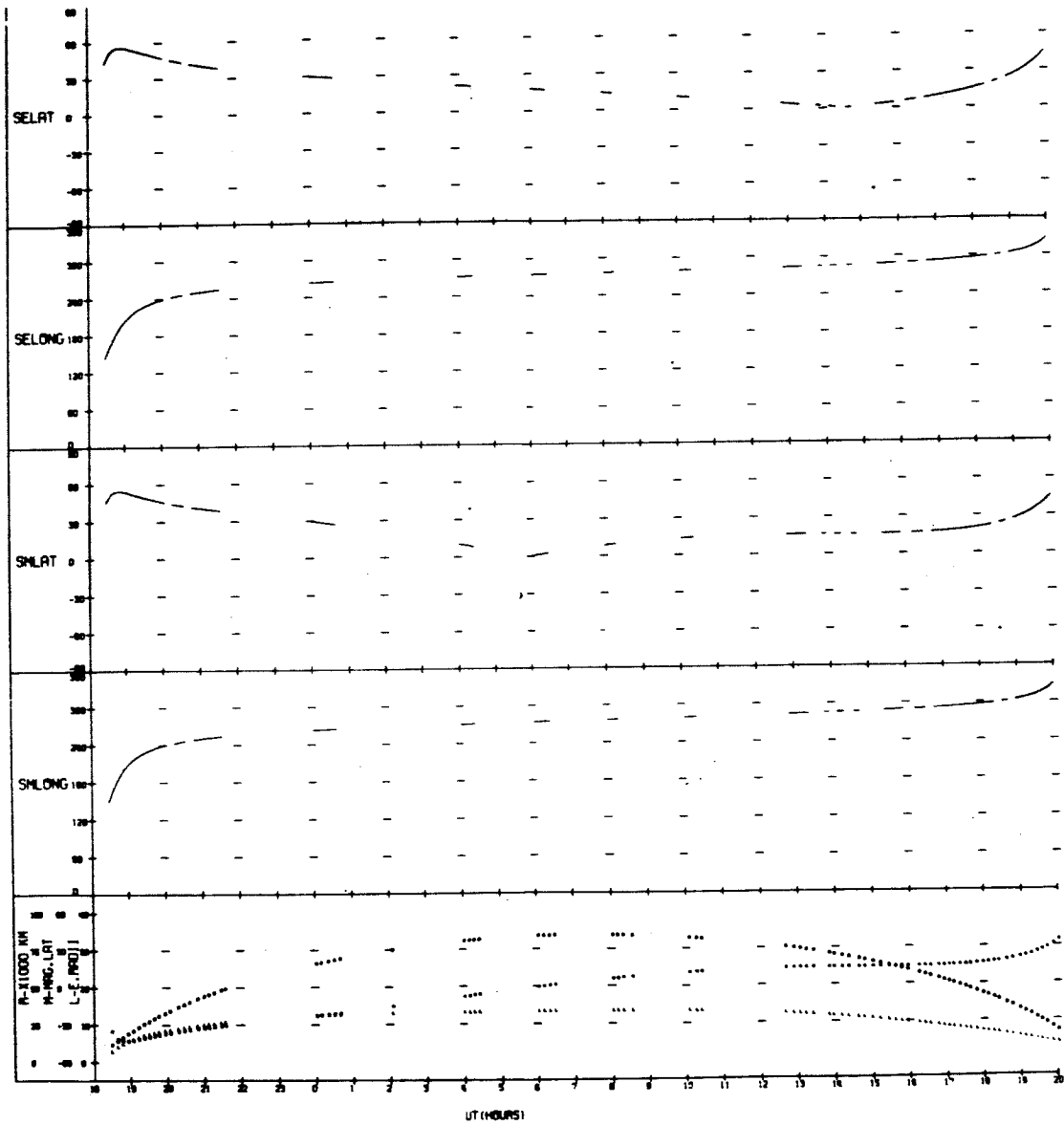
UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 90
 BEGIN 11/22/61/16:01
 END 11/23/61/18:15



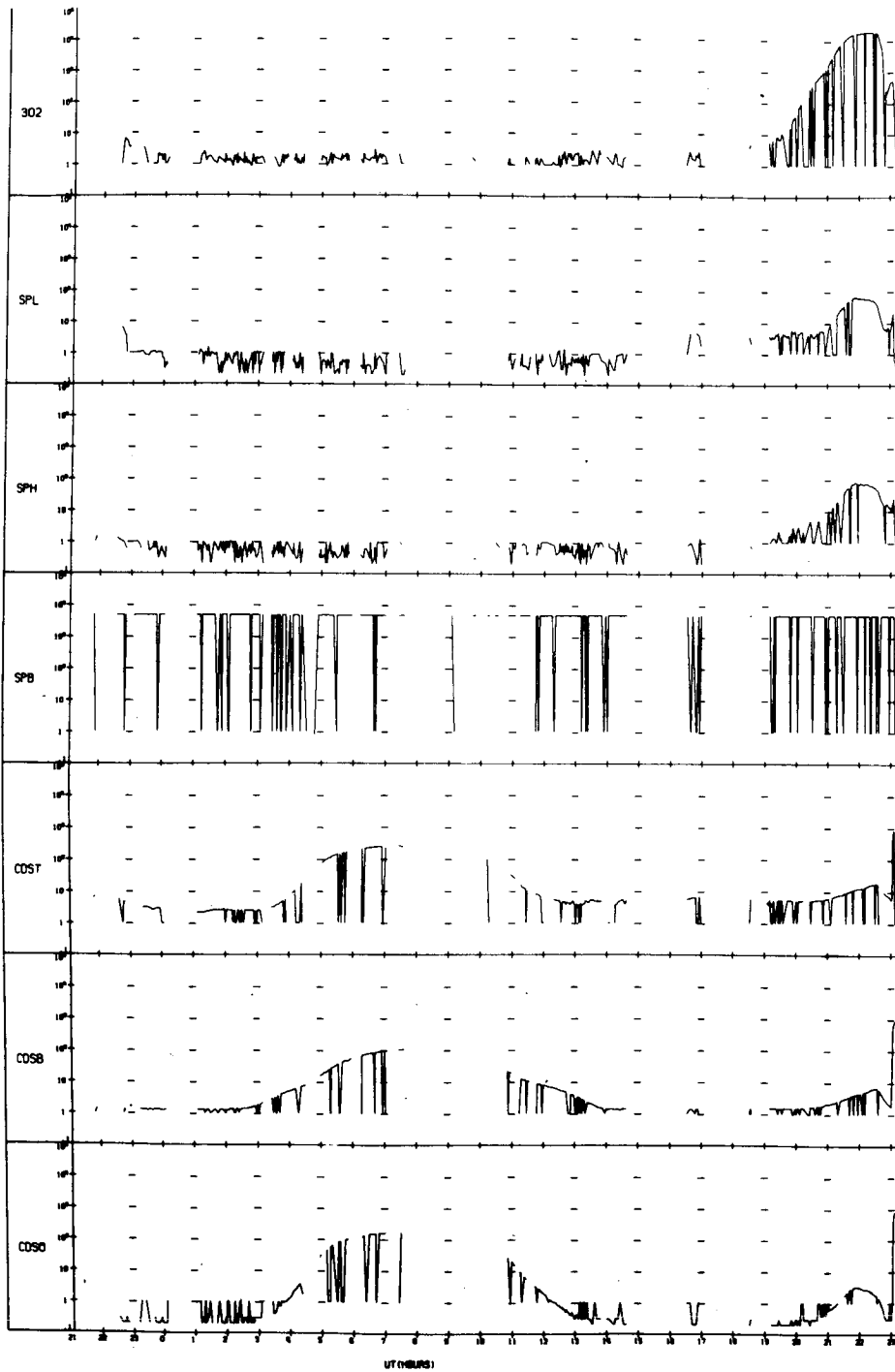
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 91
BEGIN 11/23/61/18:28
END 11/24/61/20:01



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 91
 BEGIN 11/23/61/18:28
 END 11/24/61/20:01

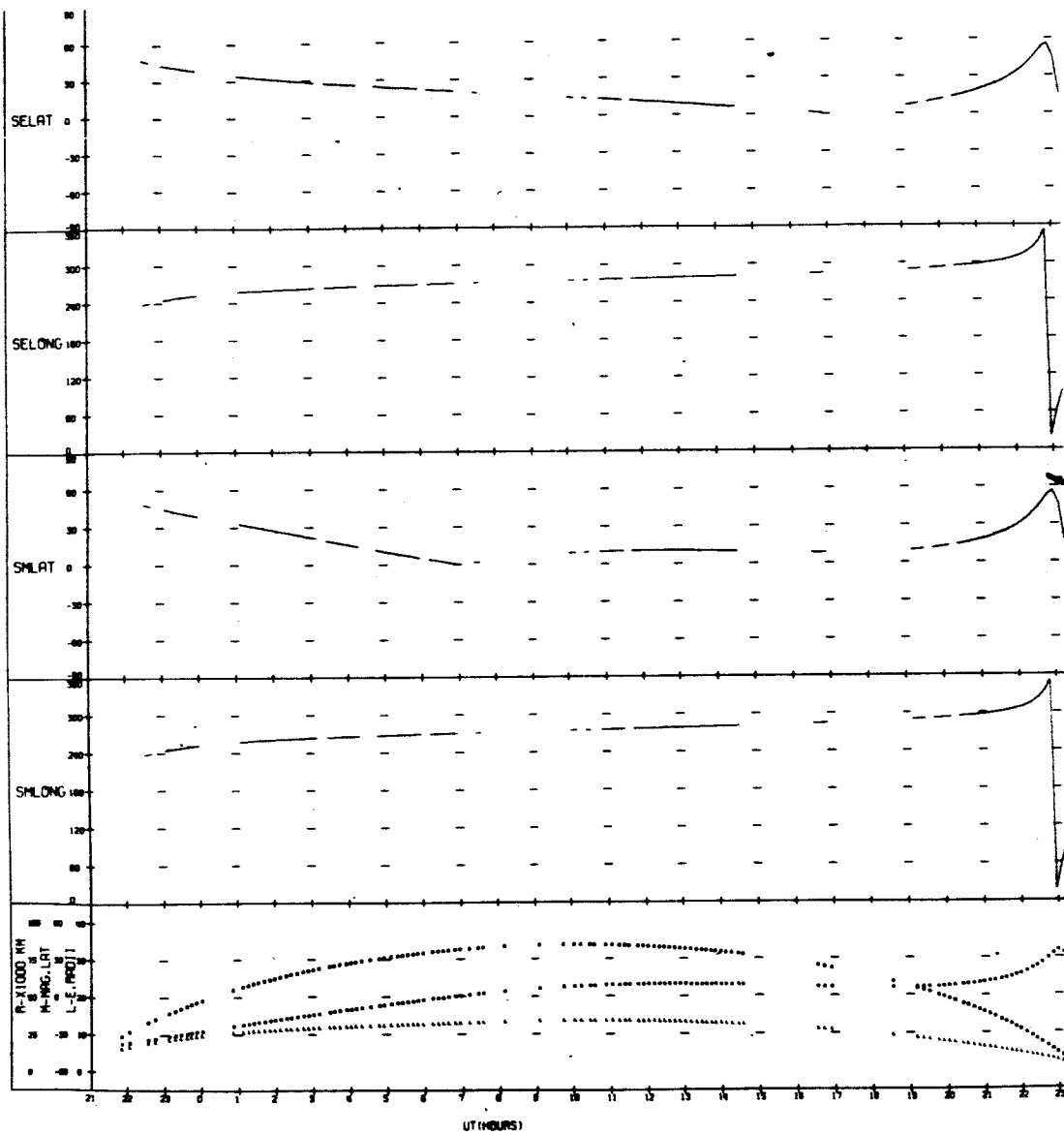


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 92
BEGIN 11/24/61/21:46
END 11/25/61/23:16



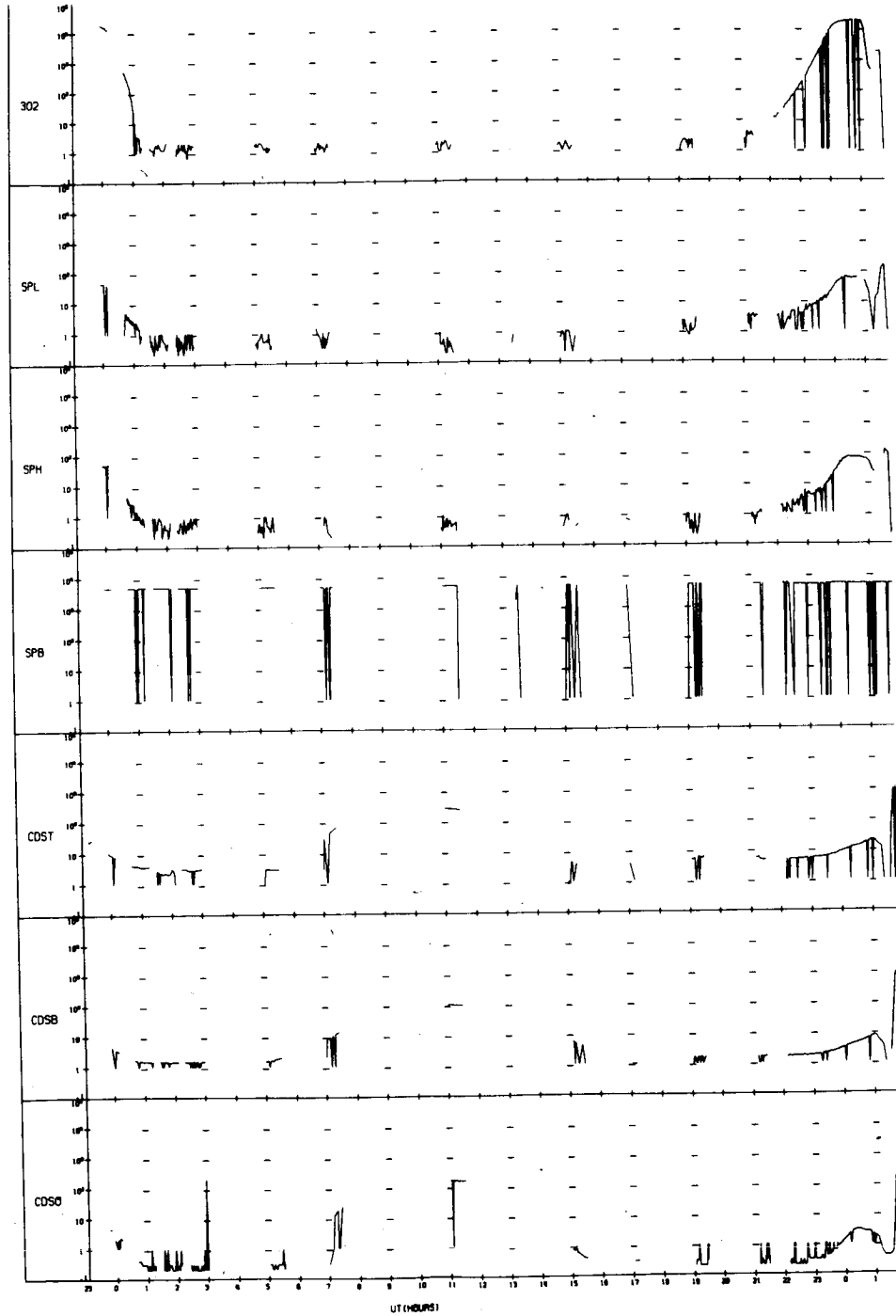
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 92
 BEGIN 11/24/61/21:46
 END 11/25/61/23:16



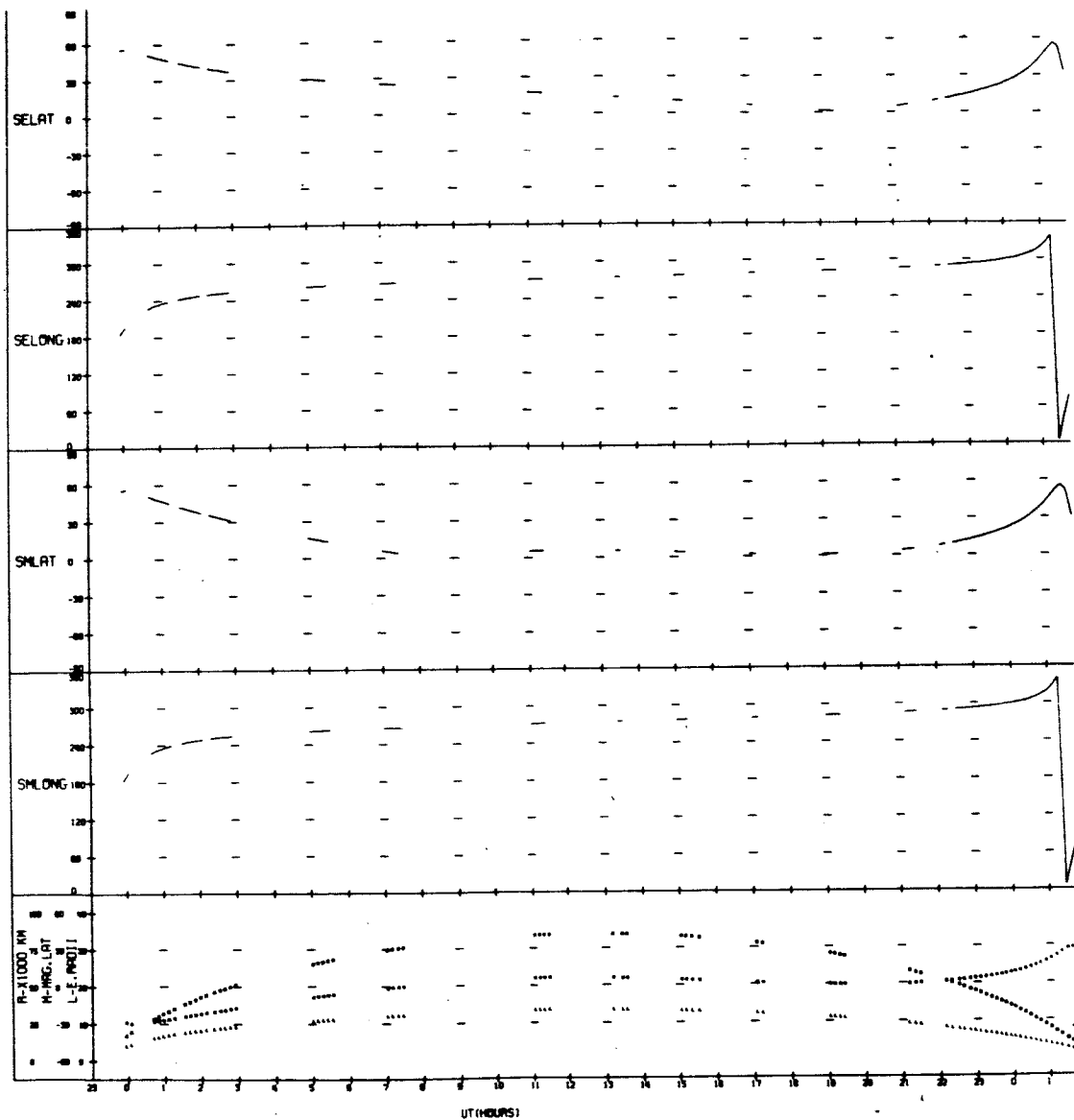
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 93
BEGIN 11/25/61/23:55
END 11/27/61/01:46

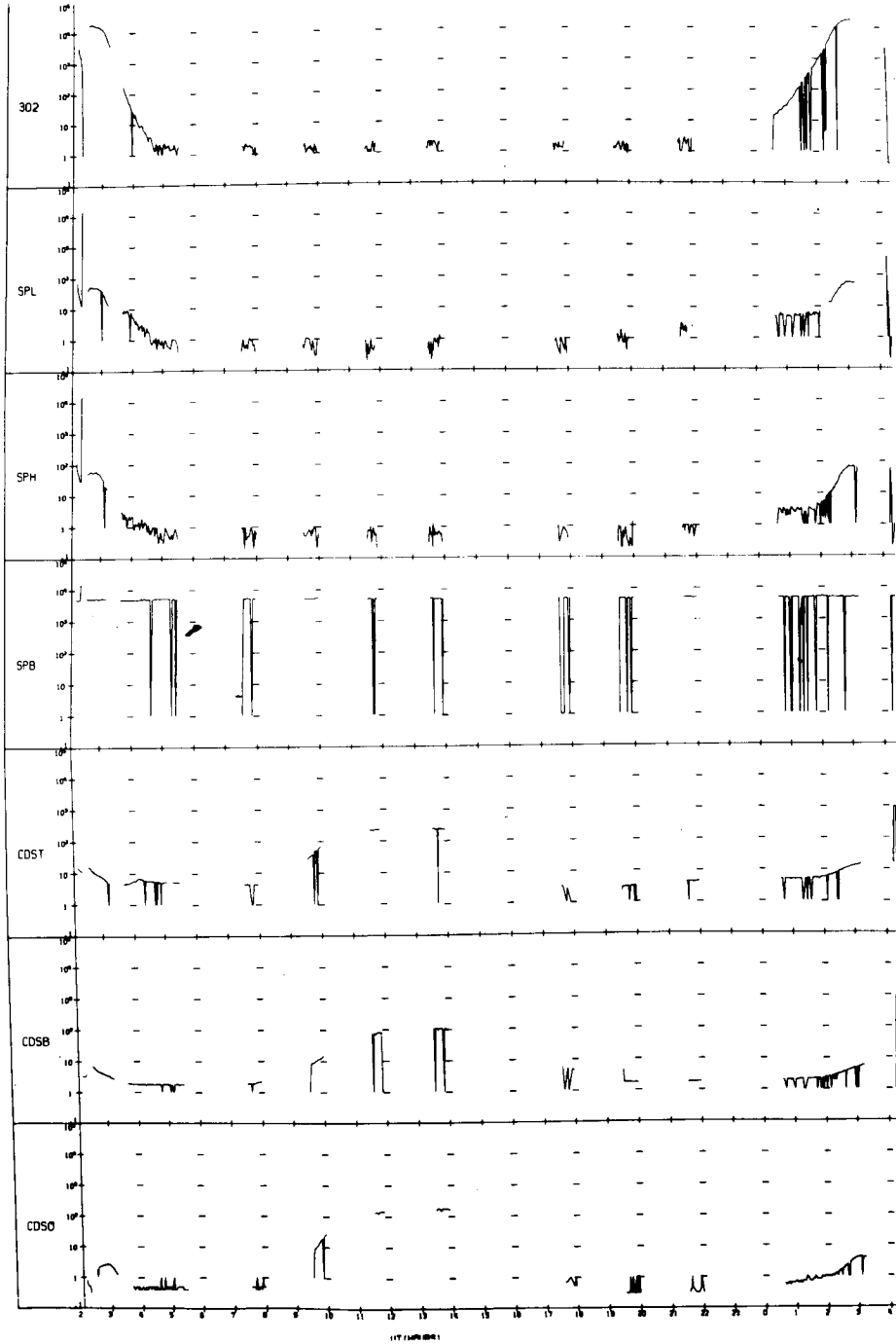


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 93
BEGIN 11/25/61/23:55
END 11/27/61/01:46

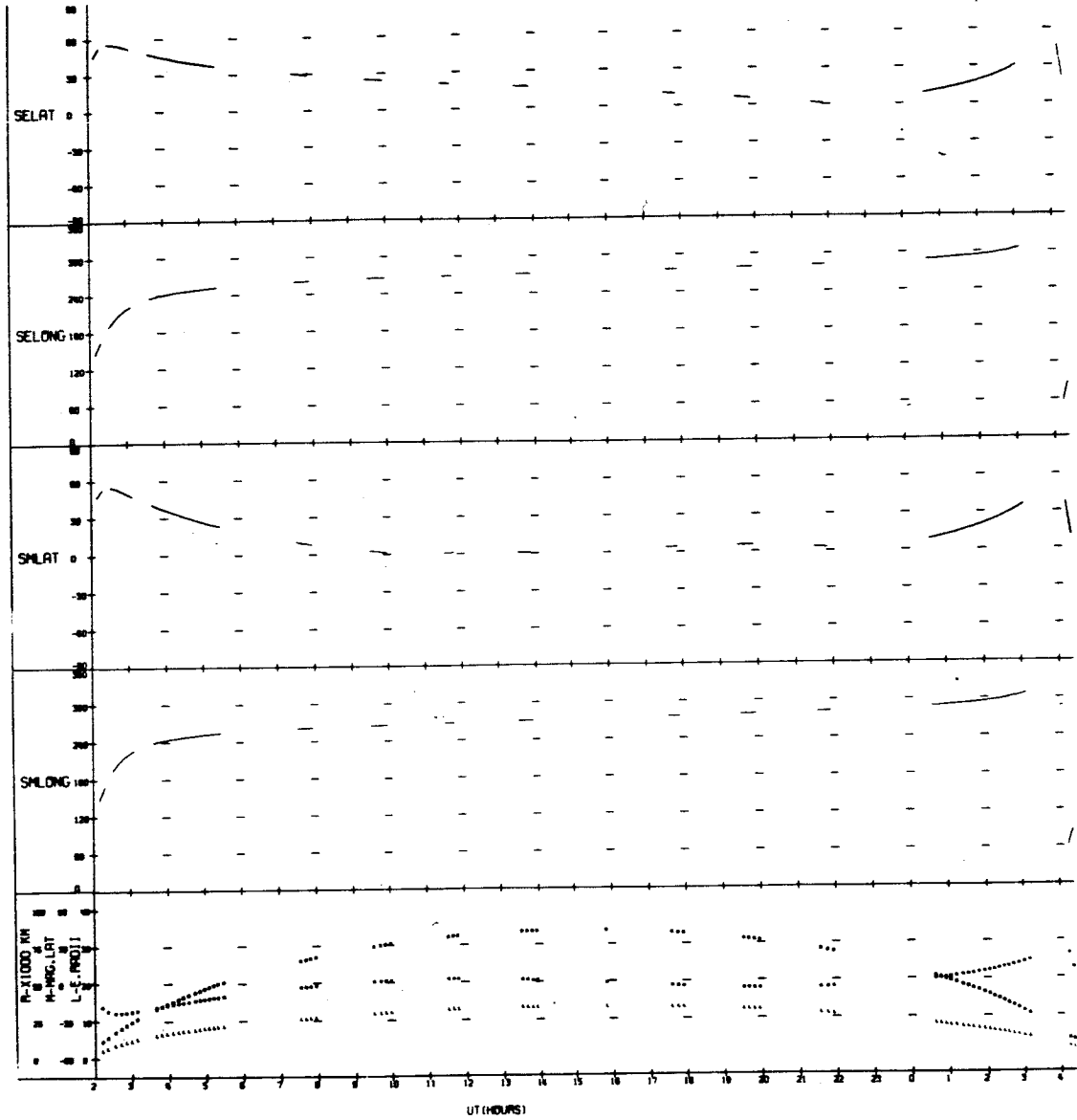


UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 94
BEGIN 11/27/61/02:08
END 11/28/61/04:24



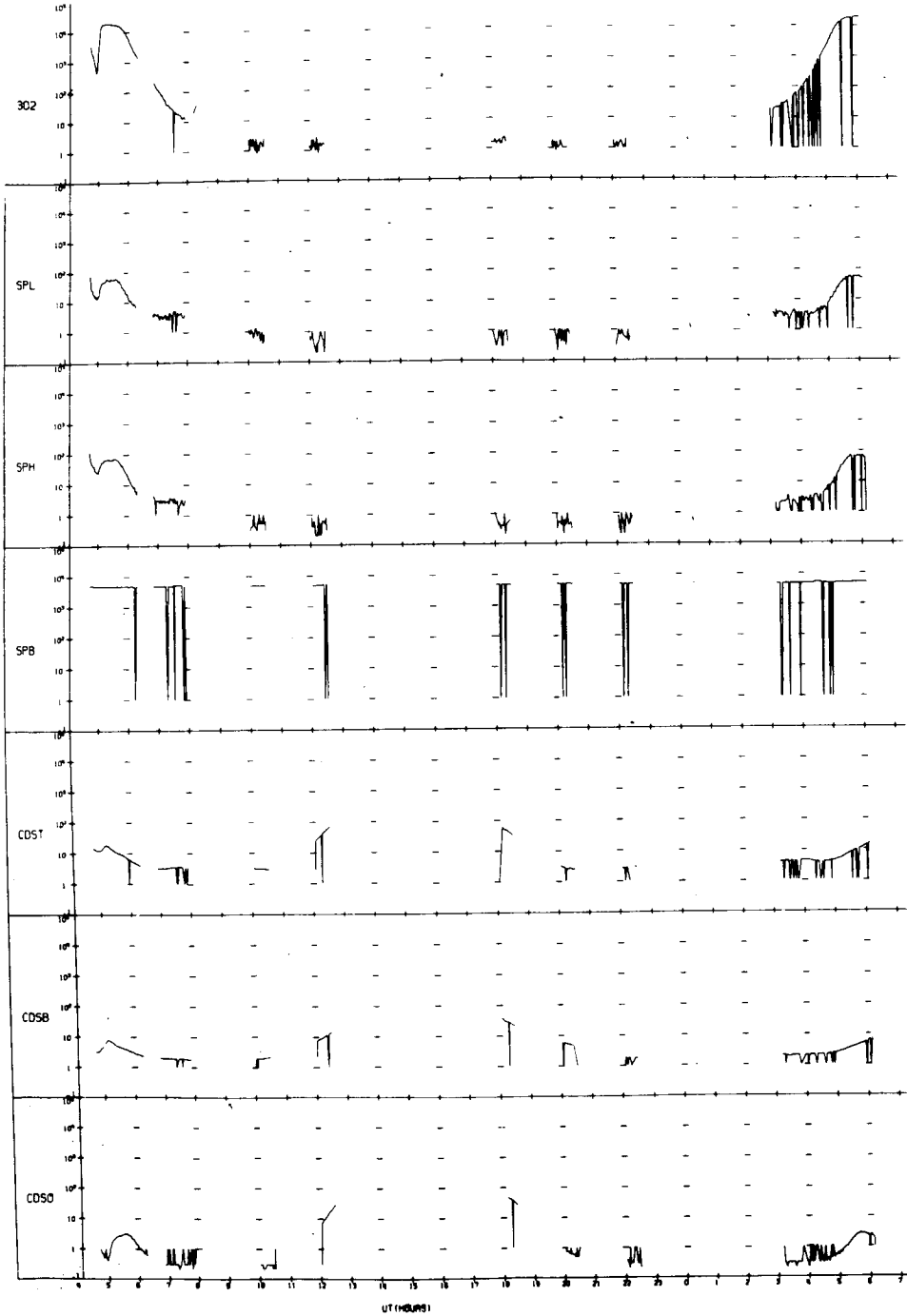
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 94
BEGIN 11/27/61/02:08
END 11/28/61/04:24



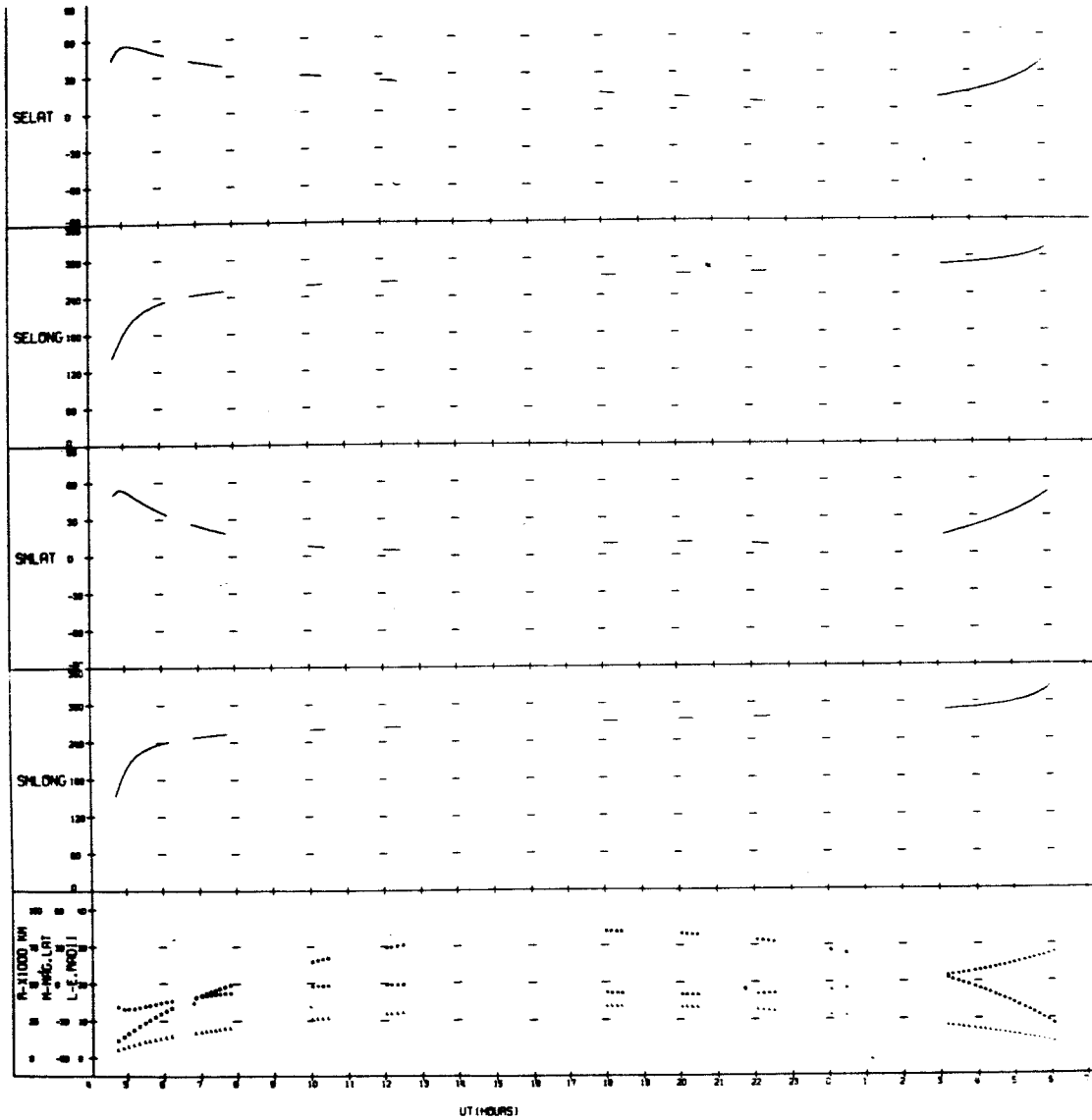
UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 95
BEGIN 11/28/61/04:42
END 11/29/61/07:21

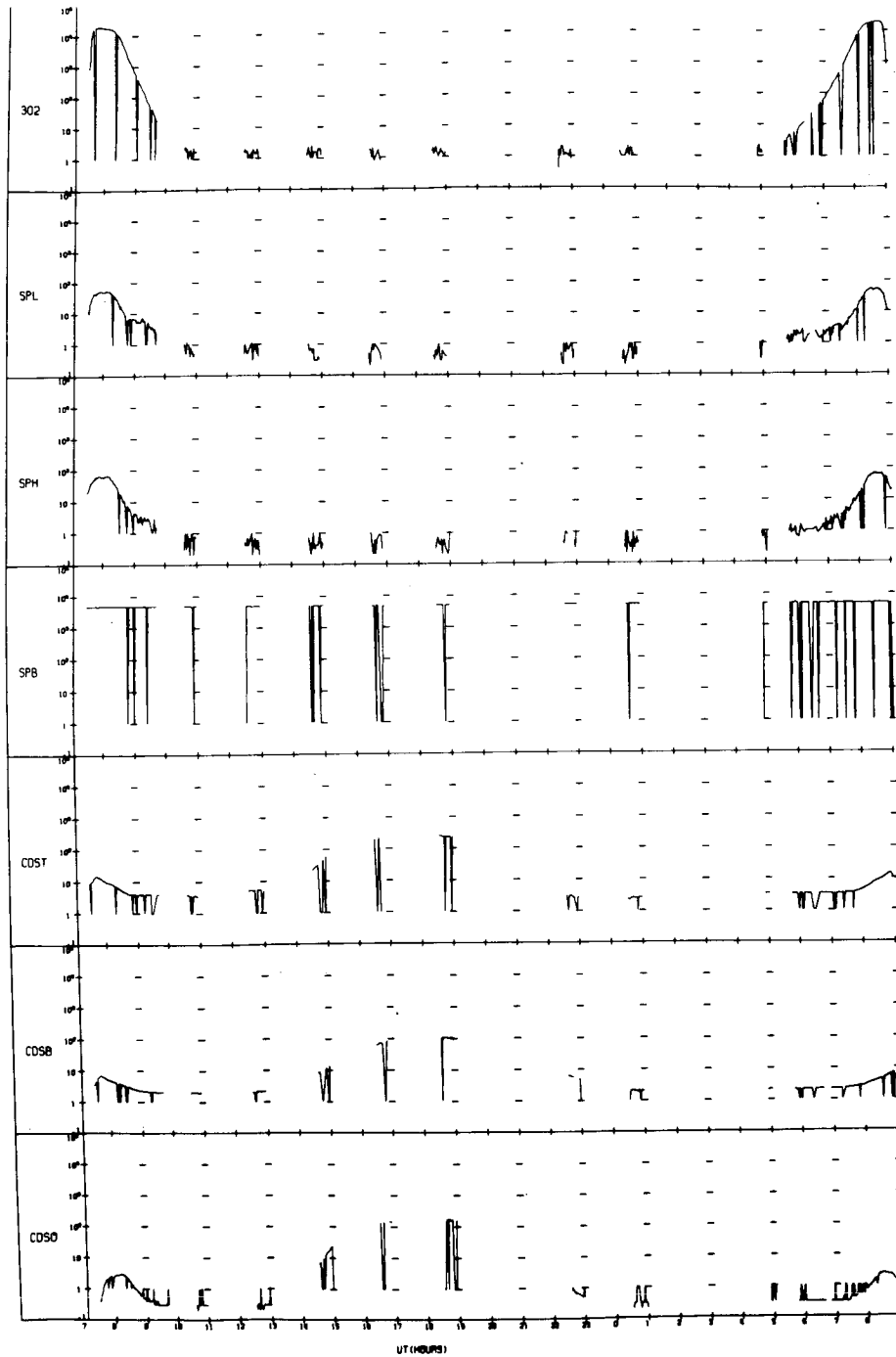


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 95
BEGIN 11/28/61/04:42
END 11/29/61/07:21



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 96
BEGIN 11/29/61/07:27
END 11/30/61/09:03

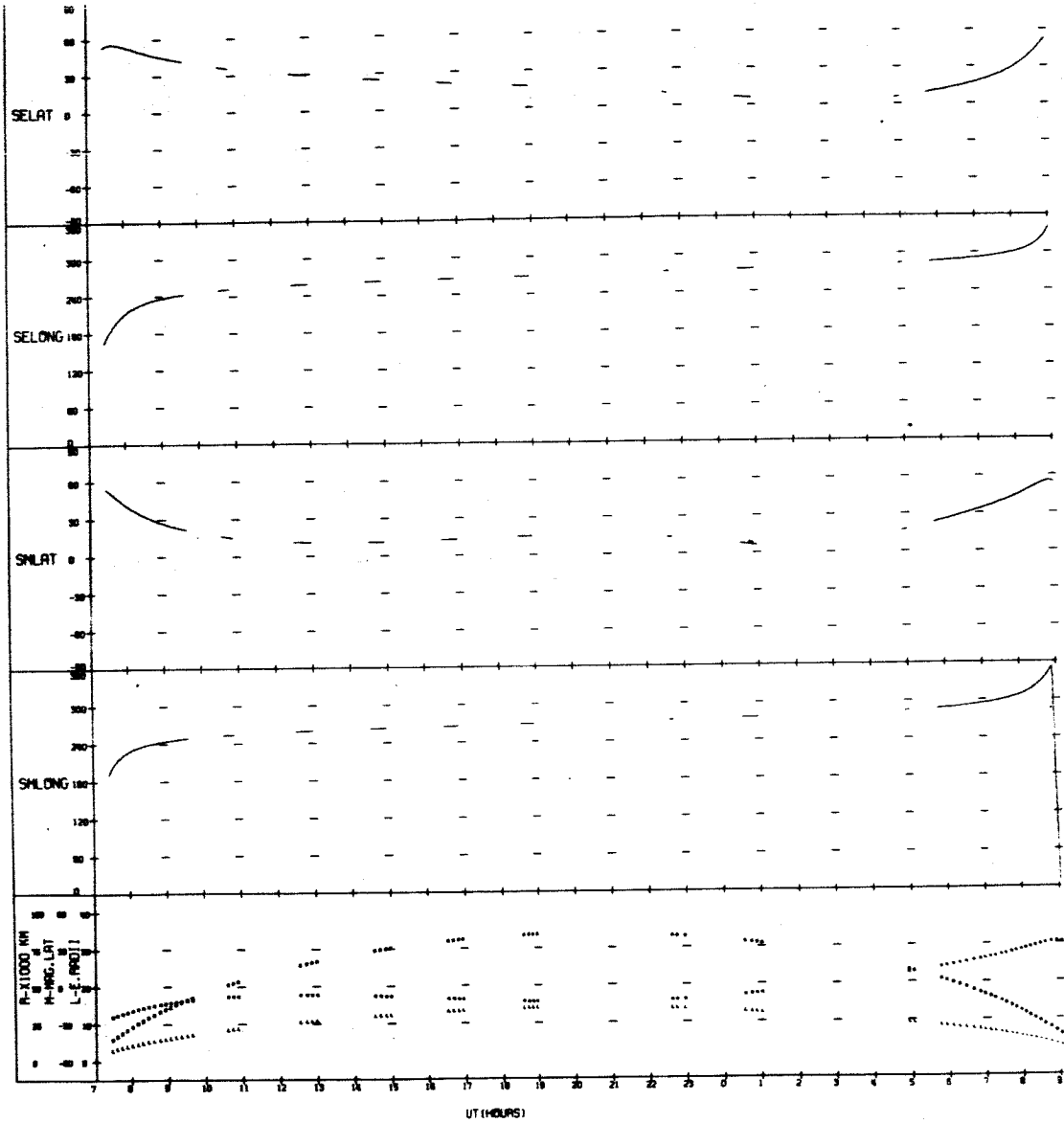


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 96

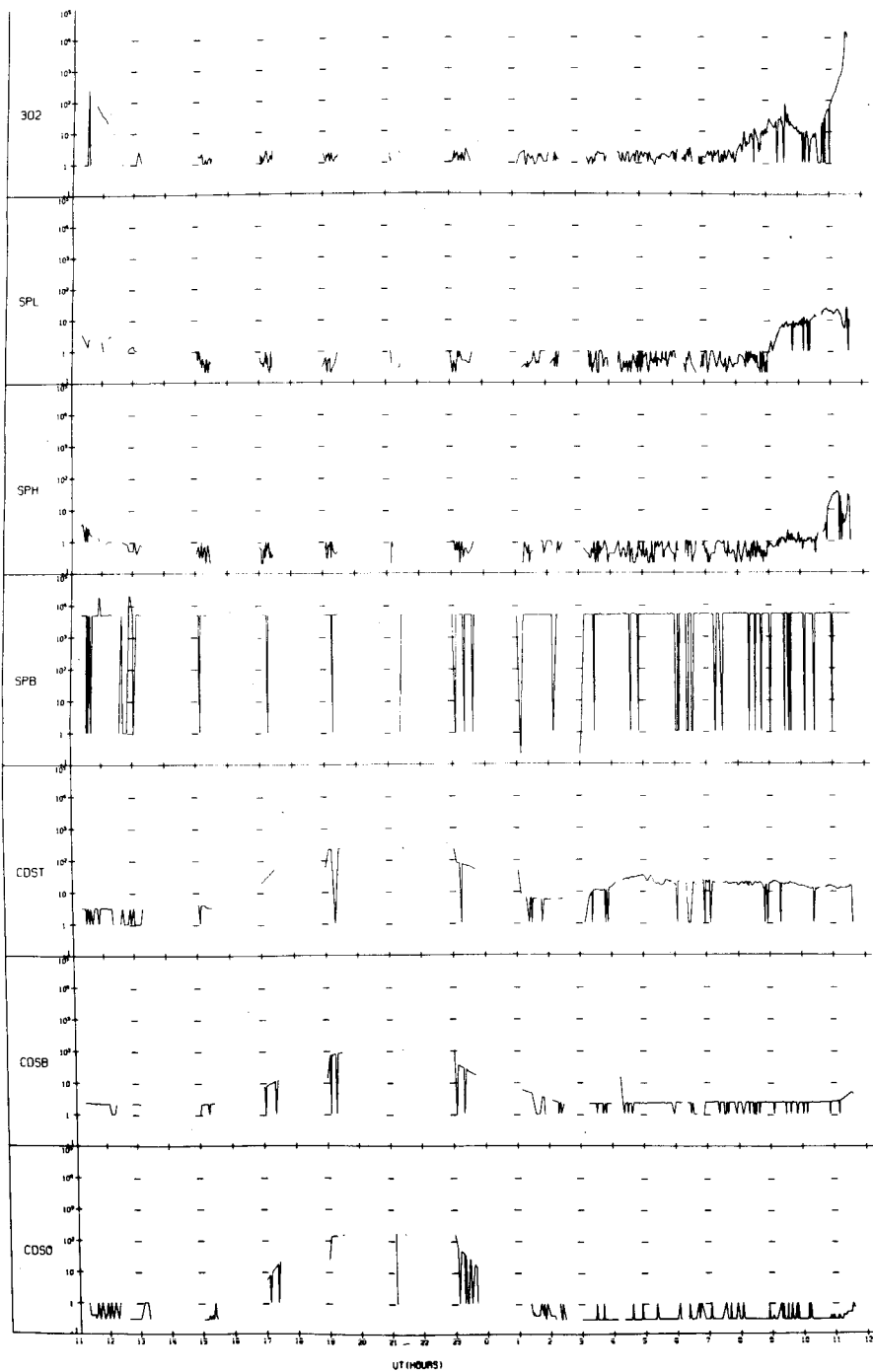
BEGIN 11/29/61/07:27

END 11/30/61/09:03

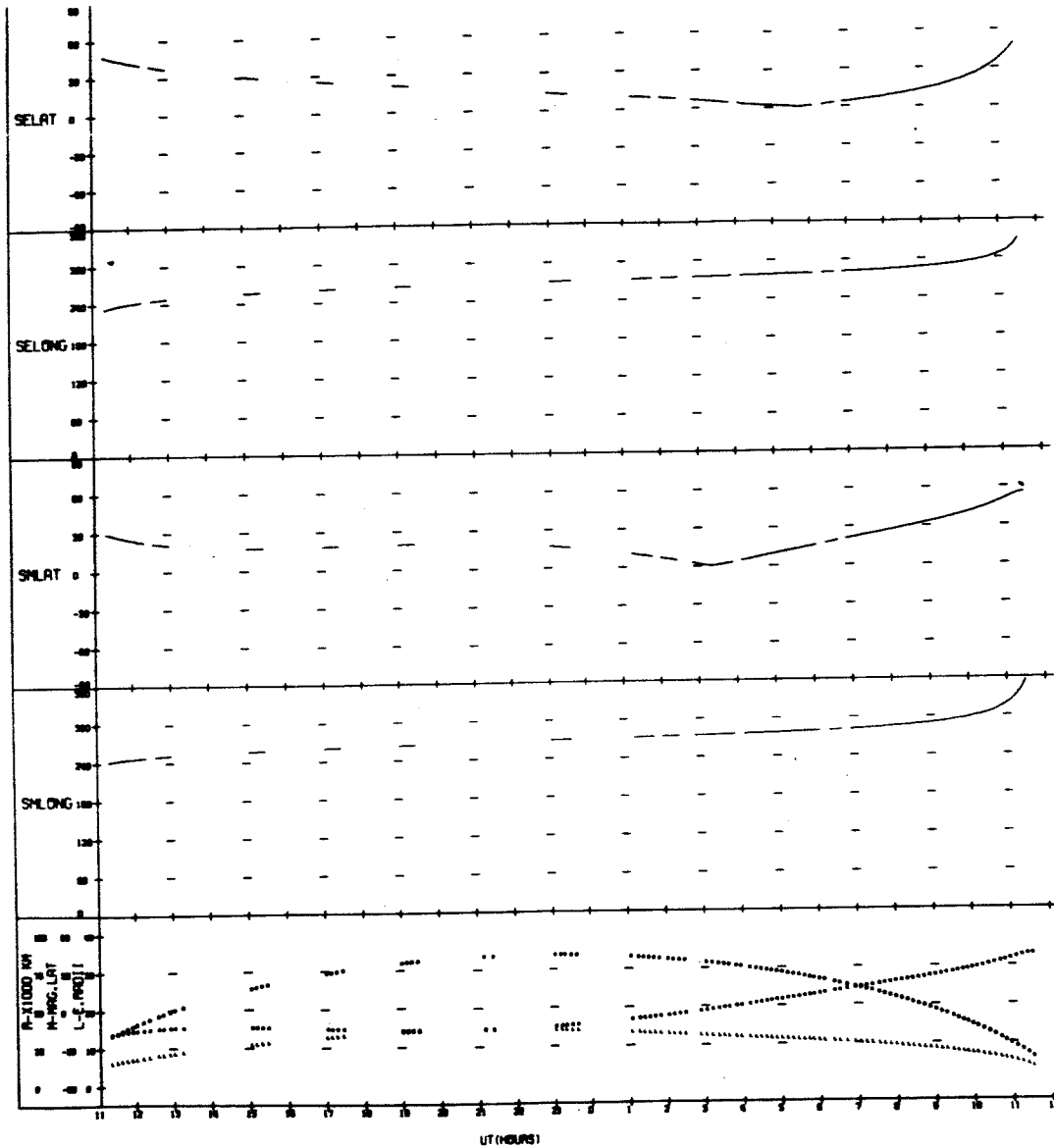


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EXPLORER 12 ORBIT 97
BEGIN 11/30/61/11:18
END 12/01/61/12:13



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 97
 BEGIN 11/30/61/11:18
 END 12/01/61/12:13

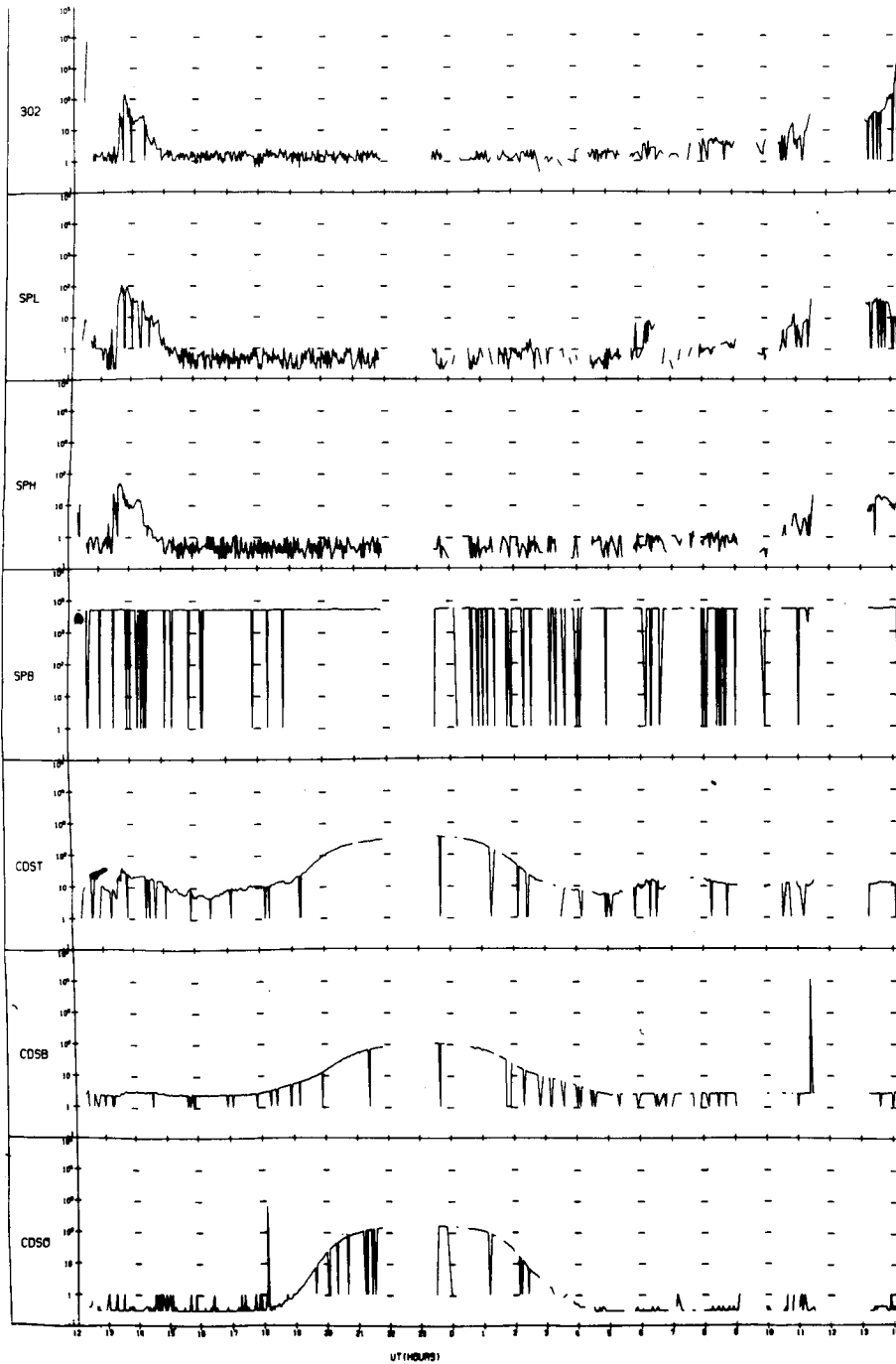


UNIVERSITY OF IOWA

EXPLORER 12 ORBIT 98

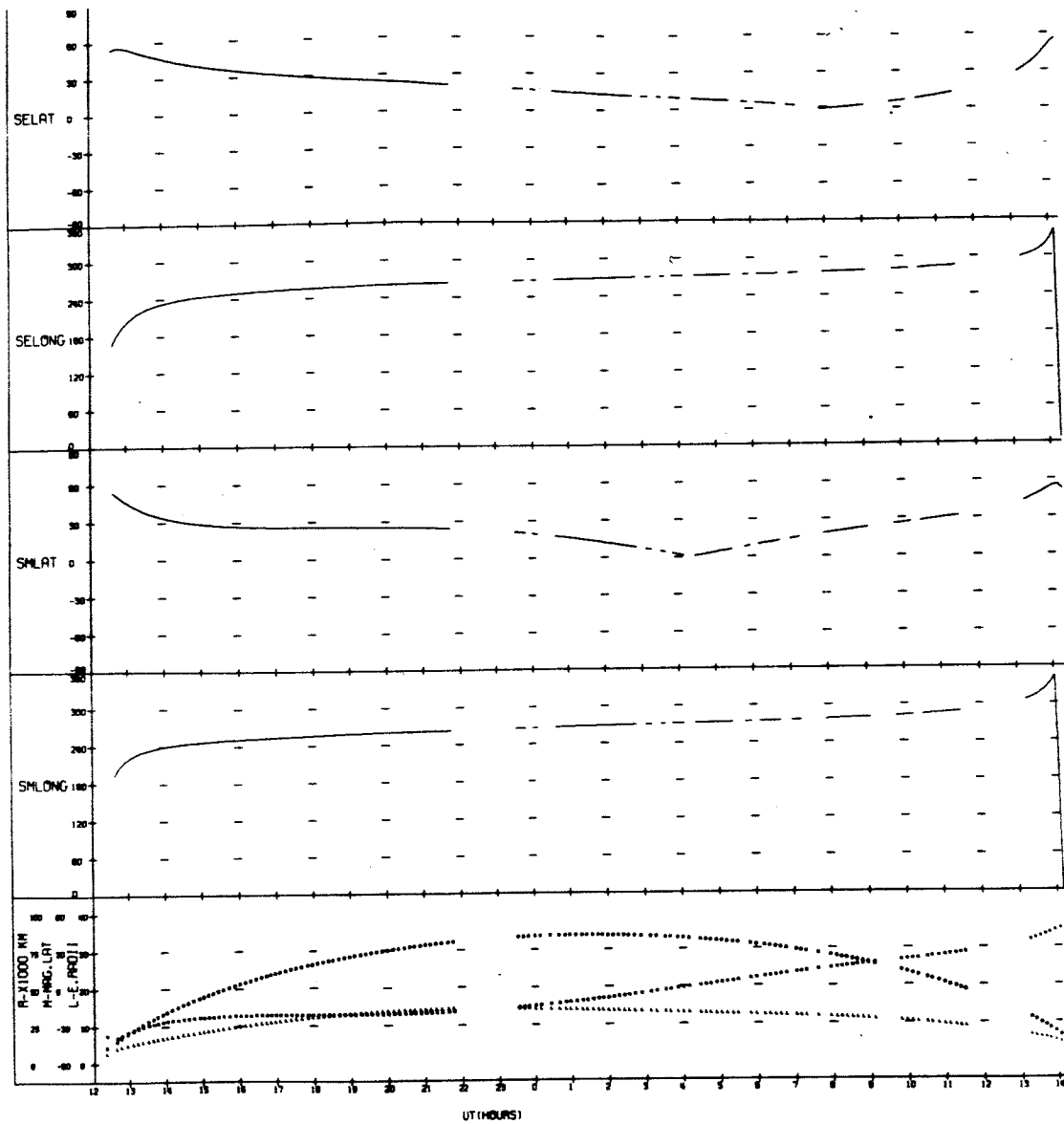
BEGIN 12/01/61/12:21

END 12/02/61/14:19

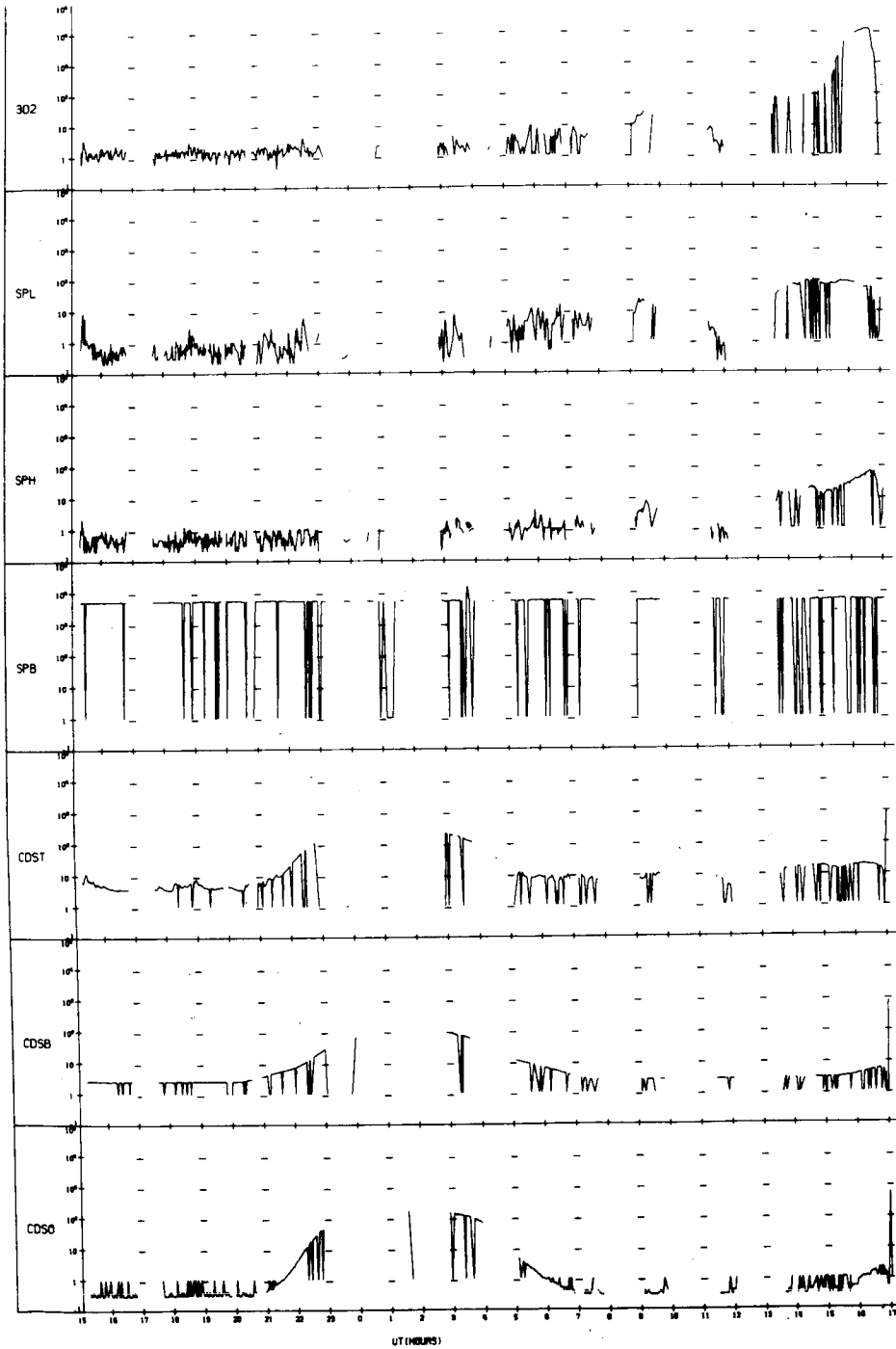


UNIVERSITY OF IOWA

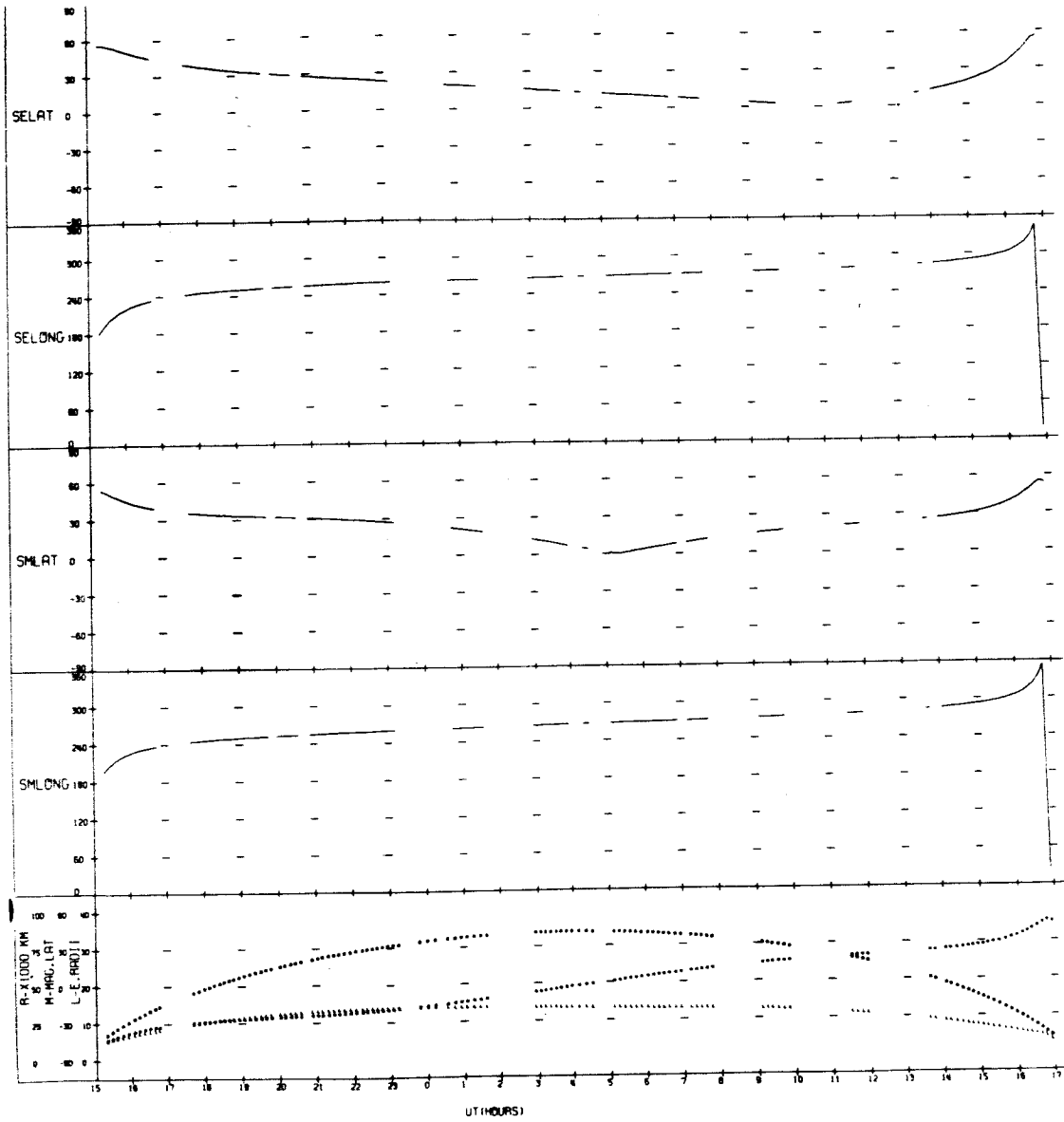
EXPLORER 12 ORBIT 98
BEGIN 12/01/61/12:21
END 12/02/61/14:19



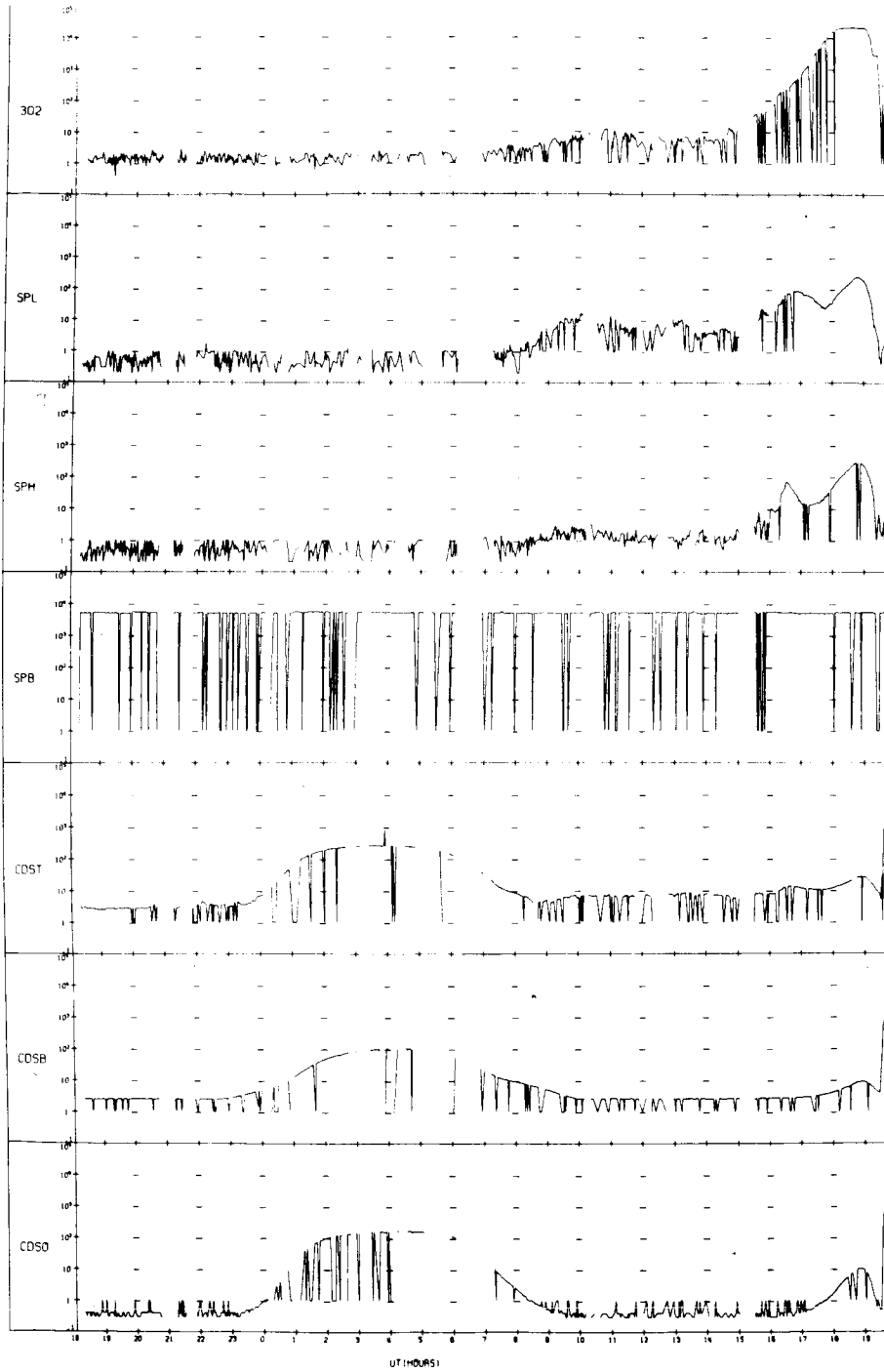
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 99
BEGIN 12/02/61/15:17
END 12/03/61/17:21



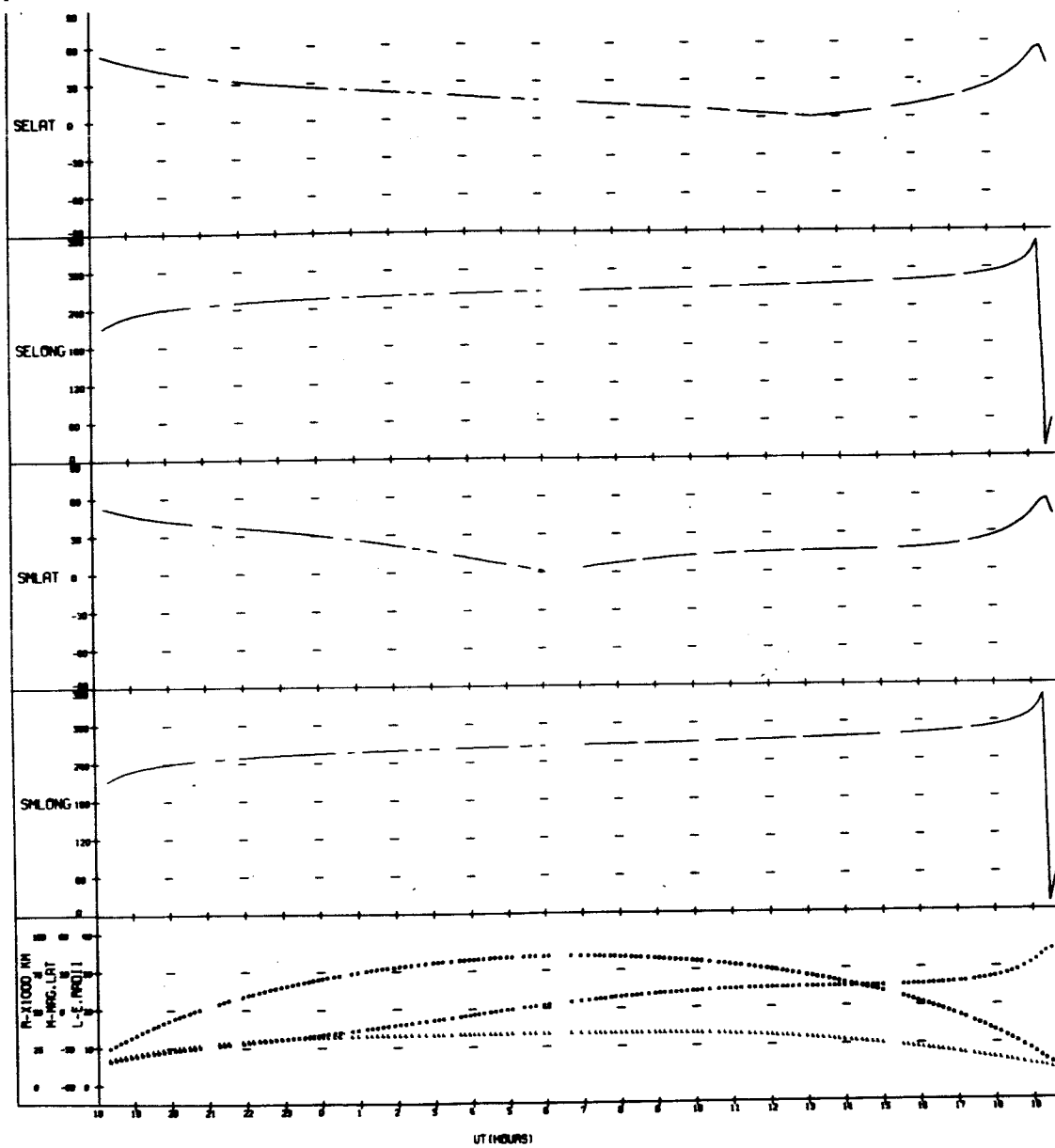
UNIVERSITY OF IOWA
 EXPLORER 12 DRBIT 99
 BEGIN 12/02/51/15:17
 END 12/03/61/17:21



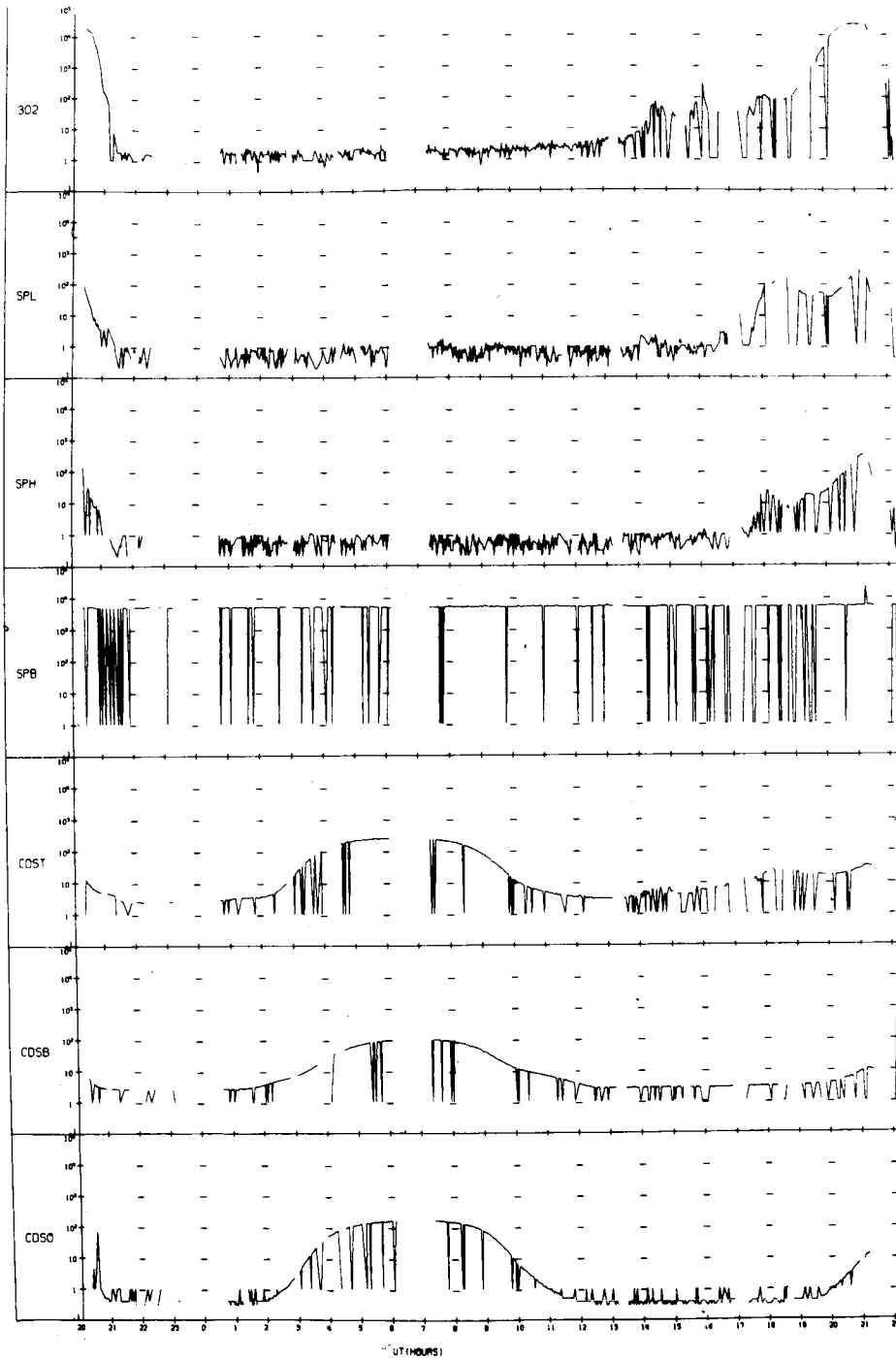
UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 100
BEGIN 12/03/61/18:20
END 12/04/61/13:43



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 100
 BEGIN 12/03/61/18:20
 END 12/04/61/19:42



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 101
BEGIN 12/04/61/20:19
END 12/05/61/22:17

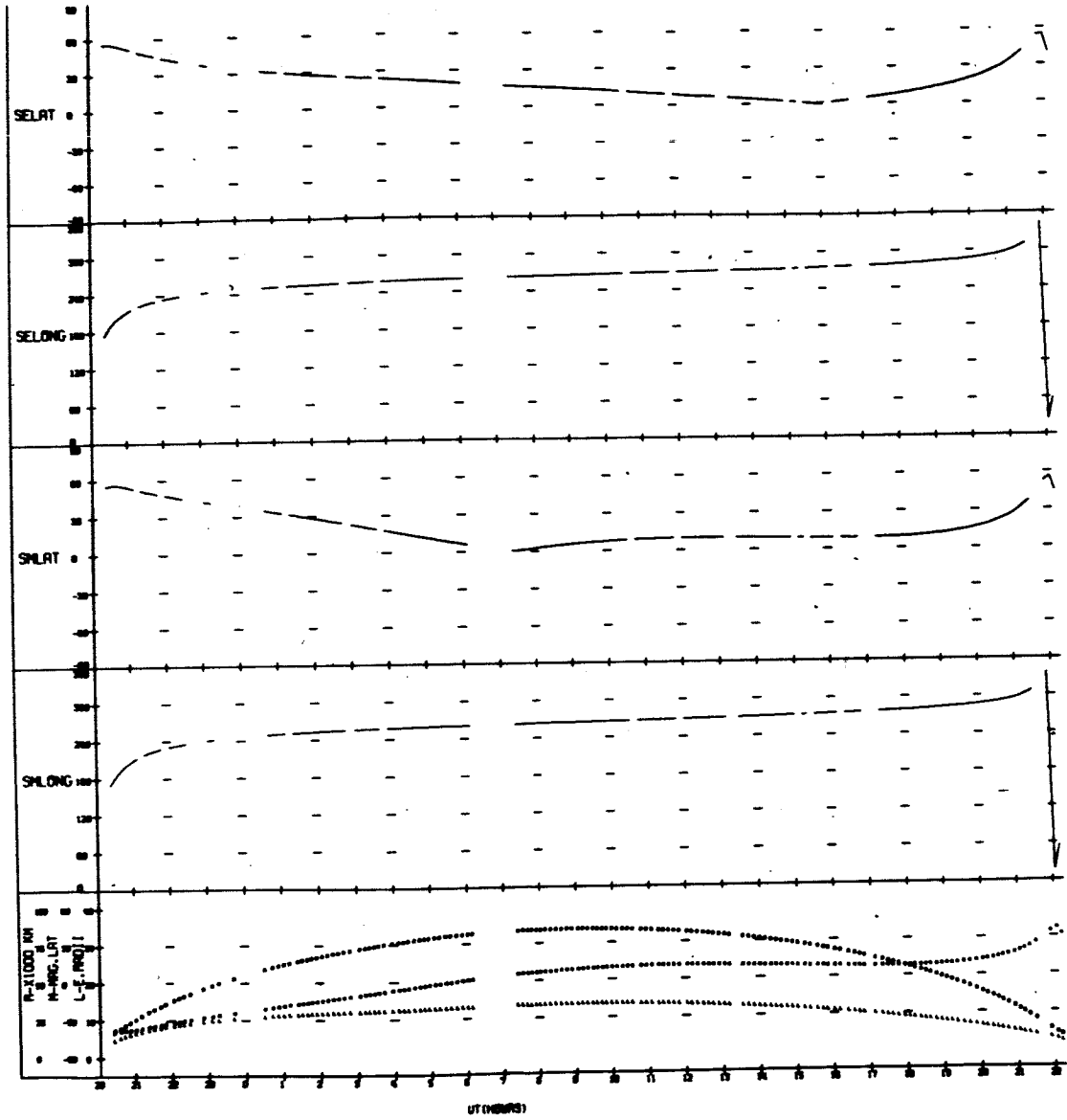


UNIVERSITY OF IOWA

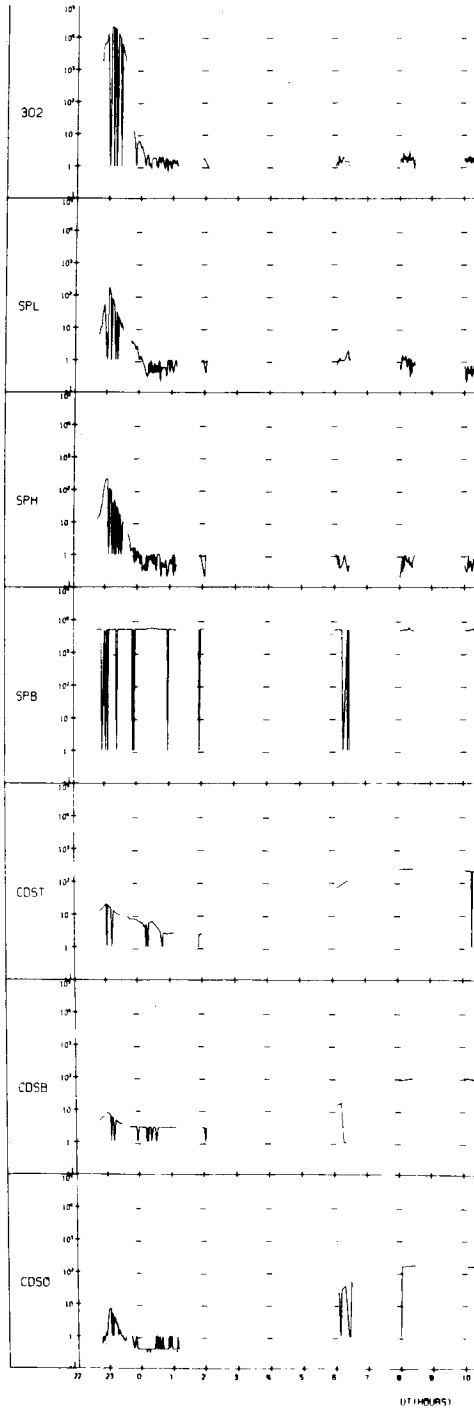
EXPLORER 12 ORBIT 101

BEGIN 12/04/61/20:19

END 12/05/61/22:17



UNIVERSITY OF IOWA
EXPLORER 12 ORBIT 102
BEGIN 12/05/51/22:43
END 12/06/61/10:29



UNIVERSITY OF IOWA
 EXPLORER 12 ORBIT 102
 BEGIN 12/05/61/22:43
 END 12/06/61/10:29

