



HEALTH AND SAFETY EXECUTIVE

**HEAVY GAS DISPERSION TRIALS
THORNEY ISLAND 1982-3**

DATA FOR TRIAL 008/1

Research and Laboratory Services Division
Red Hill, Sheffield S3 7HQ Tel: 0742 78141

8 Trials 24 to 29

The correct heights for the gas sensors on the mast at (372,228) are 0.4, 2.4 and 4.4 metres, not 0.4, 1.4 and 2.4 as shown. In trials 26 and 27, where the mast was in the cloud, gas was detected at a height 2.4 m as shown on page G05. The height shown on page G05 is therefore correct.

9 Trial 23

Pages E05 and E17 have been inverted. Although the page numbers are incorrect, the positional information on the plots is correct.

10 Trials 26 to 28

The key to the instrument list shows

BE = Building east side i.e. to right of axis

BW = Building west side i.e. to left of axis

This should be

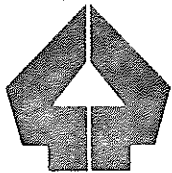
BE = Building east side i.e. to left of axis

BW = Building west side i.e. to right of axis

I shall be pleased to answer any queries arising from the above changes.

B ROEBUCK
HGDT Project Manager
Health and Safety Executive
Safety Engineering Laboratory
Broad Lane, Sheffield S3 7HQ

Tel 0742 78141



Health & Safety Executive

Red Hill
Broad Lane
Sheffield S3 7HQ
Telephone 0742 78141
ext
Telex 668113

Your reference

Our reference

Date

COMMERCIAL IN CONFIDENCE

This report is issued to sponsors of the trials on a commercial in confidence basis and must not be released before 1 January 1984.

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	17:49:58 hrs
Freon 12/Nitrogen mixture: relative density	1.72
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	2.4 m/s
From 5 minute cyclic data just before the release:	2.9 m/s
Mean Wind Heading ('A' station) (relative to the centre line of the array)	-15.8°
NB Positive angles are to the right (clockwise) of the centre line when looking downwind of the gas bag.	
Relative Humidity (at 10 m height)	87.6%
Insolation	158W/m ²
Ambient Air Temperature (at 9 m height)	17.12°C
Treated Runway Surface Temperature	18.4°C
Grass Surface Temperature	18.4°C
Observed Cloud Cover	2/8

STABILITY CONDITION

E (From Observations)
E (From DT/DZ)
G (From Solarimeter)
G (From Heat Flux)
E (From Richardson No)
D (From Bulk Richardson No)
D/E (From Standard Deviation of Wind Heading)

Stability condition inferred from data during the release and just before the release: D.

HISTORY

This was not a very sunny day so insolation was generally slight. At about three hours before the spill, insolation was 135 W/m^2 , the wind speed was about 4.9 m/s and the wind heading about 18° to the left of the centre line of the array. These conditions gave a stability at that time of 'D'. During the following two hours insolation increased and the wind speed dropped gradually but the wind direction remained roughly the same. Thus, at about one hour before the spill, insolation was moderate (approximately 450 W/m^2), the wind speed was about 4 m/s at a heading of about 29° to the left of the array, but the stability condition was still judged to be about 'D'. During the hour leading up to the spill insolation decreased, the speed dropped further and the wind heading swung around back to about 16° to the left, giving the conditions listed above by the time the gas was released.

THORNEY ISLAND HEAVY GAS DISPERSION TRIALS

Notes on information presented in the Summary Sheets

I ATMOSPHERIC STABILITY

The atmospheric stability during the period of the experiment was obtained from the following methods:

i) Visual Observation

This is based on the amount of cloud cover, or the judged level of incoming solar radiation and the value of the wind speed (see attached table provided by the Meteorological Office).

ii) Temperature Difference (DT/DZ)

This method is one of the two suggested by the US Nuclear Regulatory Commission and in the present exercise was calculated as:

$$\frac{DT}{DZ} = \frac{T_{30} - T_9}{21} * 100.0$$

The NRC tables, see e.g. Sedefian and Bennett^[1] or McQuaid^[2] were then consulted to determine the appropriate stability.

iii) Solarimeter

The measured insolation, from the solarimeter, was used together with the wind speed to determine the stability based on the information presented in Pasquill^[3] (Figure 6.13).

iv) Heat Flux

Heat flux (H) was calculated from the insolation (R) by the formula $H = 0.4(R-100)$ based on the suggestion by Smith^[4]. Pasquill's^[3] Figure 6.13 was then consulted to determine the stability. This method therefore agrees generally with the previous method.

v) Richardson Number

The Richardson number is calculated according to Sedefian and Bennett^[1] as:

$$R_i = \frac{g(D\theta/DZ)}{T(DU/DZ)^2}$$

where θ is the potential temperature and T is the actual temperature; in this case, the temperature at 16 m above the ground. $D\theta/DZ$ was calculated as:

$$\frac{T_{30} - T_9}{21} + 0.00986$$

$$\frac{DU}{DZ} \text{ was calculated as } \frac{U_{30} - U_{10}}{20}$$

Sedefian and Bennett calculate the limits of Richardson number for the various stability categories, however the limits they presented were valid for measurements at heights whose geometric mean was 22 m. Since the measurement stations were at 30 m, 9 m and 16 m the limits of Richardson number for the various stability categories were recalculated to correspond to a geometric mean height of 16 m.

vi) Bulk Richardson Number

The bulk Richardson number was also calculated according to Sedefian and Bennett^[1] as:

$$R_{i\infty} = \frac{g(D\theta/DZ)\bar{Z}^2}{T \bar{U}^2}$$

where $\bar{Z}$ is the geometric mean height = $\sqrt{9 \times 30}$
 T is the temperature at 16 m above the ground
and $\bar{U}$ is the mean wind speed at 30 m.

Here again the limits of $R_{i\infty}$ were recalculated to correspond to a geometric mean height of 16 m.

vii) Standard Deviation of Wind Heading

The standard deviation of wind heading was calculated from the Porton wind vane, which has a resolution bandwidth of 11°. The resulting accuracy is predicted to be around $\pm 2^\circ$ or so, assuming a Gaussian distribution of wind direction. These estimates were compared with the simple assumption that the standard deviation is approximately 1/6 (maximum-minimum angle).

The NRC limits for σ_θ are then used to determine the appropriate stability category.

2 WIND SPEED

Two values of wind speed are presented. The first is the mean value at the 10 m height for the first 10 minutes of the data collection period, which generally began about one minute before the gas bag was dropped.

The second wind speed is also a mean value obtained at the 10 m height, but corresponds to data taken over a five minute period just before main data collection began; data during this period is termed the 'cyclic' data.

REFERENCES

- 1 Sedefian L and Bennett E (1980) "A comparison of Turbulence classification schemes". Atmospheric Environment, Vol 14, No 7, pp 741-750.
- 2 McQuaid J (1981) "Climatological records from the Thorney Island mast". Commercial in Confidence HGDT Report 1981/6.
- 3 Pasquill F (1974) "Atmospheric Diffusion". 2nd Ed. Published by Ellis Horwood Ltd, Chichester.
- 4 Smith F B (1979) "The relation between Pasquill stability P and Kazanski-Monin stability (in neutral and unstable conditions). Atmospheric Environment, Vol 13, pp 879-881.

MODIFIED PASQUILL STABILITY CATEGORIES

Wind Speed (kt)	DAYTIME (excluding 1 hour after sunrise and 1 hour before sunset)				Within 1 hour before sunset or after sunrise	NIGHT-TIME		
	Incoming Solar Radiation (W m^{-2})					Cloud Amount (oktas)		
	Strong (5 600)	Mod (300-600)	Slt (<300)	Overcast		0-3	4-7	8
≤3	A	A-B	B	C	D	F or G see note 2 below	F	D
4-5	A-B	B	C	C	D	F	E	D
6-9	B	B-C	C	C	D	E	D	D
10-12	C	C-D	D	D	D	D	D	D
≥12	C	D	D	D	D	D	D	D

Notes

- 1 Night was originally defined to include periods of one hour before sunset and after sunrise. These two hours are always categorised here as D.
- 2 Pasquill said that in light winds on clear nights the vertical spread may be less than for category F but excluded such cases because the surface plume is unlikely to have any definable travel. However, they are important from the point of view of the build up of pollution and category G (night-time, 0 or 1 okta of cloud, wind speed 0 or 1 kt) has been added.
- 3 1 kt = 0.52 m/s.

KEY TO GRAPHS

1 AVERAGING TIME

Length of the time window over which mean values have been calculated for the purpose of the plots. Since the full record contains 20 samples per second, an averaging time of 0.6 seconds gives the arithmetic mean of 12 samples of the original signal. Note that it is not a running average but a 'box' window which is moved through the data in increments of the averaging time.

2 X:Y:Z

The location in metres of the sensor on the trials site. The (X,Y) axes are defined by the grid of fixed masts, the release point is at X = 400 metres, Y = 200 metres. The Z axis defines the height of the sensor on the mast at location (X, Y) - see mast array. Note that the axis is defined by measurement from the mast base and is not absolute in the sense that it takes no account of any slope of the trials site.

3 TYPE

Defines the type of sensor which generated the data shown in the plots.

GAS:	Standard oxygen deficiency sensor Frequency response 1 Hz (at - 3 dB point)
HGAS	High speed oxygen deficiency sensor Frequency response 10 Hz (at - 3 dB point)
SMOK	High speed light scattering smoke sensor Frequency response 10 Hz (at - 3 dB point)
WSPD:	Wind heading as indicated by wind vanes in degrees relative to the site axis. Positive values are to the right of the site axis (looking 'downwind' for the source) and negative values to the left.
AIRT:	Air temperature in degrees centigrade
SOLA:	Solar radiation as measured by solarimeter in watts/square metre.
BROM:	Barometric pressure measured in millibars.
UANA:	Velocity component A of tri-axial anemometers in the horizontal (X Y) plane.
UANB:	Velocity component B of tri-axial anemometer in the horizontal (X Y) plane.
UANW:	Velocity component W of tri-axial anemometer in the vertical (Z) direction.

UANT: Temperature, as measured by tri-axial anemometer with this facility.

RUN UP MEAN: The mean value of the appropriate sensor output averaged over the run up period i.e. in the period 1371 to 1071 seconds before the gas container release.

RUN DOWN MEAN: The mean value of the appropriate sensor output averaged over the run down period i.e. in the period 1940 to 2240 seconds after the gas container release.

4 GAS SENSORS

The readings of the GAS and HGAS sensors are in terms of the % concentration of the released gas mixture with an associated error band of either 10% of reading or as determined by calibration checks with a standard gas mixture. An estimate of the accuracy of each sensor for each test will be sent out separately. Note that the SMOK sensors have no absolute calibration in terms of gas concentration but have been included because of the potential high frequency information their outputs contain. An approximate calibration may be obtained by comparing their output to that of the nearest oxygen deficiency sensor.

5 SONIC ANEMOMETERS

Prints of the sonic anemometer outputs are included for completeness but it will be appreciated that analysis of records can only be performed using the data tapes. The three wind velocity components A, B and W can be transposed into components corresponding with the X, Y and Z coordinates of the mast array as follows:

$$X = \frac{1}{\sqrt{3}} (A - B)$$

$$Y = A + B$$

$$Z = W$$

RMS turbulence values measured at 10 m height on 'A' mast are given below. The values are non-dimensionalised i.e. original values have been divided by U_{10} , the mean wind speed at 10 m height during the main data collection period which was 2.248 m/s.

U' RMS = 0.161 (component in the wind direction)

V' RMS = 0.163 (crosswind component)

W' RMS = 0.110 (vertical component)

6 RUNNING MEANS

In order to assist analysis, a three minute running mean has been superimposed on all environmental records except the sonic anemometers. The points plotted represent the mean of 300 values (0.6 second averages) and are plotted at 0.6 second intervals.

NOTES ON VALIDATION OF GAS SENSOR DATA FOR TRIAL 008

- 1 The signal from the gas sensor at co-ordinates (450,150, 2.4) shown at page G01 is probably anomalous. Neither sensors immediately above or below it responded, and the time of recorded peak concentration is not consistent with the responses of other sensors on the site.
- 2 The following sensors have not been included in the plots:
 - a) The high speed gas sensor at co-ordinates (300, 350, 2.4) was not functioning correctly and had a peak-to-peak noise level equivalent to about $\pm 1.2\%$ gas concentration. Any response to gas could not be distinguished from the noise.
 - b) The RLSD smoke sensor at co-ordinates (300, 350, 5.0) was functioning correctly but no response to smoke could be observed above the noise level.
 - c) The RLSD smoke sensor at co-ordinates (400, 350, 0.4) was not functioning correctly. Bright sunlight had caused the output to saturate.
 - d) The high speed gas sensor at co-ordinates (300, 550, 2.0) was not functioning correctly and had a peak-to-peak noise level equivalent to about $\pm 0.5\%$ gas concentration. Any response to gas could not be distinguished from the noise.
 - e) One of the RLSD smoke sensors at (300, 550, 2.0) was not functioning correctly. Bright sunlight had caused its output to saturate. A second RLSD smoke sensor at this location was functioning correctly but no response to smoke could be detected above the noise level.

M J Leck
Safety Engineering Laboratory
RLSD/HSE

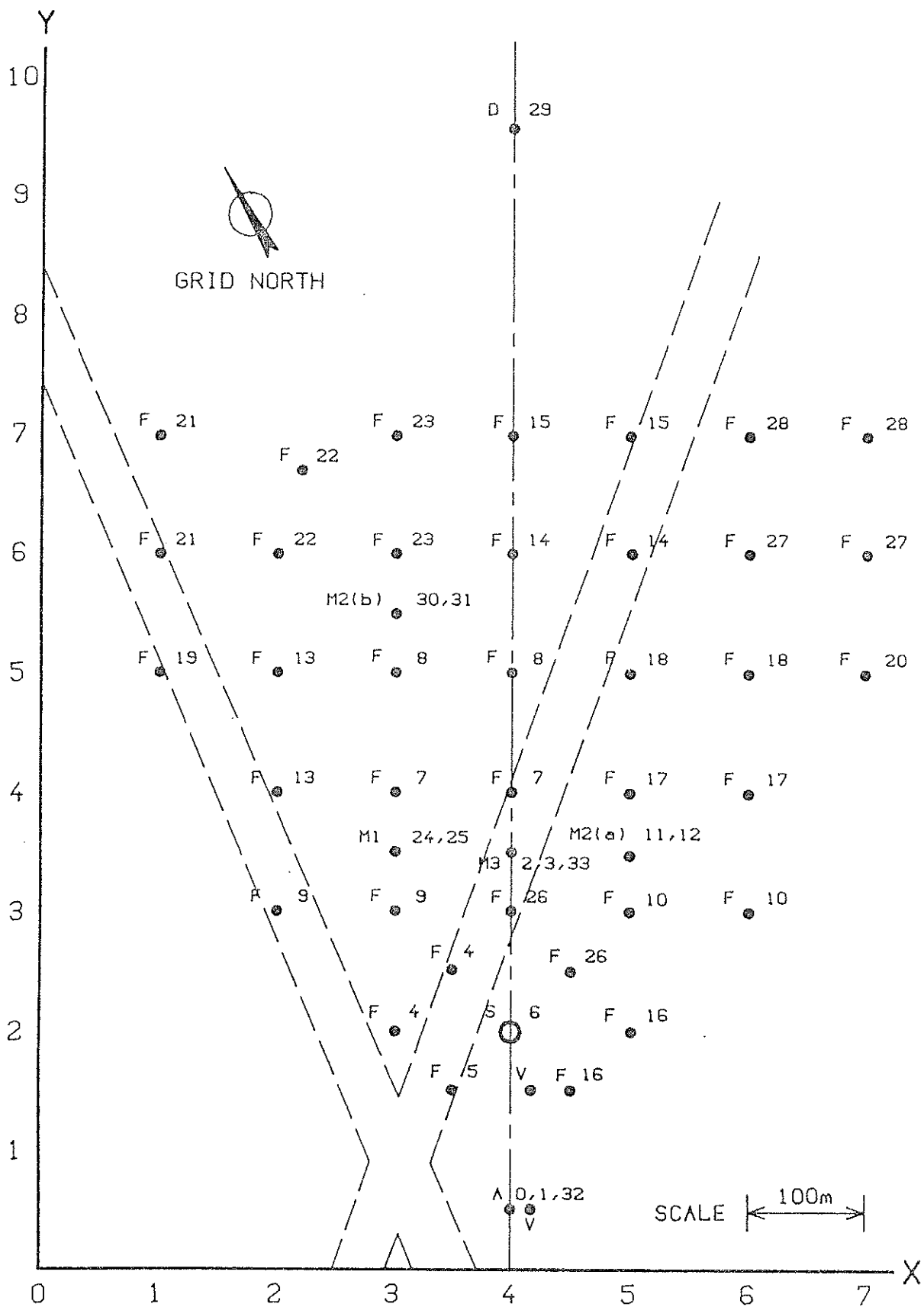
INSTRUMENT STATIONS AND DISTRIBUTIONS (EFFECTIVE FOR TRIAL 008)

Note: The Location Coordinates are the X, Y coordinates in metres at 1/100 scale. The source is at (4.0, 2.0).
The table scans the layout by successive rows (i.e. at constant Y) of masts.

LOCATION COORDINATES	TYPE OF MAST	DATA TERMINAL NUMBER	CHANNEL NUMBER	HEIGHT ABOVE GROUND m	TYPE OF SENSOR	REMARKS	PAGE NUMBER
4.0, 0.5	A	32	5	0.4	Solarimeter		E01
		32	6	0.4	Barometric Pressure		E02
		0	0	2.0	Cup Anemometer		E03
		0	1	2.0	Thermometer		E04
		0	4	2.0	Sonic Anemometer - XY		E05
		0	5	2.0	Sonic Anemometer - XY		E06
		0	6	2.0	Sonic Anemometer - Z		E07
		0	7	2.0	Sonic Anemometer - Temp		E08
		0	2	4.5	Cup Anemometer		E09
		0	3	9.0	Thermometer		E10
		1	0	10.0	Cup Anemometer		E11
		32	0	10.0	Sonic Anemometer - XY		E12
		32	1	10.0	Sonic Anemometer - XY		E13
		32	2	10.0	Sonic Anemometer - Z		E14
		32	3	10.0	Sonic Anemometer - Temp		E15
		32	4	10.0	Relative Humidity		E16
		1	6	10.0	Wind Vane		E17
		1	1	16.0	Thermometer		E18
		1	2	17.3	Cup Anemometer		E19
		1	3	22.0	Thermometer		E20
		1	4	30.0	Cup Anemometer		E21
		1	5	30.0	Thermometer		E22
		32	7	30.0	Relative Humidity		E23
4.2, 0.5	V	1	7	10.0	Wind Vane		E24
3.5, 1.5	F	5	0	0.4	Gas Sensor		
		5	2	1.4	Gas Sensor		
		5	3	2.4	Gas Sensor		
4.0, 1.5	V	6	4	10.0	Wind Vane		E25
4.5, 1.5	F	16	0	0.4	Gas Sensor		
		16	2	1.4	Gas Sensor		
		16	3	2.4	Gas Sensor		G01
3.0, 2.0	F	4	0	0.4	Gas Sensor		
		4	2	1.4	Gas Sensor		
		4	3	2.4	Gas Sensor		
4.0, 2.0	S	6	0	0.4	Thermometer		E26
		6	1	0.4	Gas Sensor		
		6	2	12.0	Thermometer		E27
5.0, 2.0	F	6	3	12.0	Gas Sensor		
		16	4	0.4	Gas Sensor		
		16	6	1.4	Gas Sensor		
3.5, 2.5	F	16	7	2.4	Gas Sensor		
		4	4	0.4	Gas Sensor		G02
		4	5	2.4	Gas Sensor		G03
4.5, 2.5	F	4	6	4.4	Gas Sensor		
		4	7	6.4	Gas Sensor		
		26	0	0.4	Gas Sensor		G04
2.0, 3.0	F	26	1	2.4	Gas Sensor		G05
		26	2	4.4	Gas Sensor		G06
		26	3	6.4	Gas Sensor		G07
3.0, 3.0	F	9	0	0.4	Gas Sensor		
		9	1	2.4	Gas Sensor		
		9	2	4.4	Gas Sensor		
4.0, 3.0	F	9	3	6.4	Gas Sensor		
		9	4	0.4	Gas Sensor		G08
		9	5	2.4	Gas Sensor		G09
5.0, 3.0	F	9	6	4.4	Gas Sensor		G10
		9	7	6.4	Gas Sensor		G11
		26	4	0.4	Gas Sensor		G12
6.0, 3.0	F	26	5	2.4	Gas Sensor		G13
		26	6	4.4	Gas Sensor		G14
		26	7	6.4	Gas Sensor		G15

LOCATION COORDINATES	TYPE OF MAST	DATA TERMINAL NUMBER	CHANNEL NUMBER	HEIGHT ABOVE GROUND m	TYPE OF SENSOR	REMARKS	PAGE NUMBER
3.0, 3.5	M1	24	0	0.4	Gas Sensor		G16
		24	5	2.0	High Speed Gas Sensor		G17
		25	2	2.0	Sonic Anemometer - XY		E28
		25	3	2.0	Sonic Anemometer - XY		E29
		25	4	2.0	Sonic Anemometer - Z		E30
		25	0	2.0	Sonic Anemometer - Temp		E31
		24	1	2.4	Gas Sensor		G18
		24	4	2.4	High Speed Gas Sensor		
		24	2	4.4	Gas Sensor		G19
		24	6	5.0	RLSD Smoke Detector		
4.0, 3.5	M3	24	3	6.4	Gas Sensor		G20
		3	0	0.4	Gas Sensor		G21
		33	3	0.4	RLSD Smoke Detector		
		33	4	2.0	RLSD Smoke Detector		G22
		3	5	2.0	Sonic Anemometer - XY		E32
		3	6	2.0	Sonic Anemometer - XY		E33
		3	7	2.0	Sonic Anemometer - Z		E34
		3	1	2.4	Gas Sensor		G23
		3	2	4.4	Gas Sensor		G24
		2	2	5.0	Sonic Anemometer - XY		E35
		2	3	5.0	Sonic Anemometer - XY		E36
		2	4	5.0	Sonic Anemometer - Z		E37
		2	1	5.0	Sonic Anemometer - Temp		E38
		33	1	5.0	High Speed Gas Sensor	Not connected	
		3	3	6.4	Gas Sensor		G25
		33	2	10.0	High Speed Gas Sensor	Not connected	
		33	5	10.0	RLSD Smoke Detector	Not connected	
		2	5	20.0	Sonic Anemometer - XY		E39
		2	6	20.0	Sonic Anemometer - XY		E40
		2	7	20.0	Sonic Anemometer - Z		E41
5.0, 3.5	M2(a)	12	0	0.4	Gas Sensor		
		11	2	2.0	Sonic Anemometer - XY		E42
		11	3	2.0	Sonic Anemometer - XY		E43
		11	4	2.0	Sonic Anemometer - Z		E44
		11	0	2.0	Sonic Anemometer - Temp		E45
		12	4	2.0	High Speed Gas Sensor		
		12	6	2.0	RLSD Smoke Detector		
		12	1	2.4	Gas Sensor		
		12	5	2.4	High Speed Gas Sensor		
		12	2	4.4	Gas Sensor		
		12	3	6.4	Gas Sensor		
		11	5	15.0	Sonic Anemometer - XY		E46
		11	6	15.0	Sonic Anemometer - XY		E47
		11	7	15.0	Sonic Anemometer - Z		E48
		11	1	15.0	Sonic Anemometer - Temp		E49
2.0, 4.0	F	13	0	0.4	Gas Sensor		G26
		13	1	2.4	Gas Sensor		G27
		13	2	4.4	Gas Sensor		G28
		13	3	6.4	Gas Sensor		G29
3.0, 4.0	F	7	0	0.4	Gas Sensor		G30
		7	1	2.4	Gas Sensor		G31
		7	2	4.4	Gas Sensor		G32
		7	3	6.4	Gas Sensor		G33
4.0, 4.0	F	7	4	0.4	Gas Sensor		G34
		7	5	2.4	Gas Sensor		G35
		7	6	4.4	Gas Sensor		G36
		7	7	6.4	Gas Sensor		G37
5.0, 4.0	F	17	0	0.4	Gas Sensor		
		17	1	2.4	Gas Sensor		
		17	2	4.4	Gas Sensor		
		17	3	6.4	Gas Sensor		
6.0, 4.0	F	17	4	0.4	Gas Sensor		
		17	5	2.4	Gas Sensor		
		17	6	4.4	Gas Sensor		
		17	7	6.4	Gas Sensor		
1.0, 5.0	F	19	0	0.4	Gas Sensor		
		19	1	2.4	Gas Sensor		
		19	2	4.4	Gas Sensor		
		19	3	6.4	Gas Sensor		
2.0, 5.0	F	13	4	0.4	Gas Sensor		G38
		13	5	2.4	Gas Sensor		G39
		13	6	4.4	Gas Sensor		G40
		13	7	6.4	Gas Sensor		G41
3.0, 5.0	F	8	0	0.4	Gas Sensor		G42
		8	1	2.4	Gas Sensor		G43
		8	2	4.4	Gas Sensor		G44
		8	3	6.4	Gas Sensor		G45
4.0, 5.0	F	8	4	0.4	Gas Sensor		G46
		8	5	2.4	Gas Sensor		G47
		8	6	4.4	Gas Sensor		G48
		8	7	6.4	Gas Sensor		G49
5.0, 5.0	F	18	0	0.4	Gas Sensor		
		18	1	2.4	Gas Sensor		
		18	2	4.4	Gas Sensor		
		18	3	6.4	Gas Sensor		

LOCATION COORDINATES	TYPE OF MAST	DATA TERMINAL NUMBER	CHANNEL NUMBER	HEIGHT ABOVE GROUND m	TYPE OF SENSOR	REMARKS	PAGE NUMBER
6.0, 5.0	F	18	4	0.4	Gas Sensor		
		18	5	2.4	Gas Sensor		
		18	6	4.4	Gas Sensor		
		18	7	6.4	Gas Sensor		
7.0, 5.0	F	20	4	0.4	Solarimeter		E50
		20	0	0.4	Gas Sensor		
		20	1	2.4	Gas Sensor		
		20	2	4.4	Gas Sensor		
		20	3	6.4	Gas Sensor		
3.0, 5.5	M2(b)	31	0	0.4	Gas Sensor		G50
		31	5	2.0	RLSD Smoke Detector		
		30	2	2.0	Sonic Anemometer - XY		E51
		30	3	2.0	Sonic Anemometer - XY		E52
		30	4	2.0	Sonic Anemometer - Z		E53
		30	0	2.0	Sonic Anemometer - Temp		E54
		31	6	2.0	RLSD Smoke Detector		
		31	4	2.0	High Speed Gas Sensor		
		31	1	2.4	Gas Sensor		G51
		31	2	4.4	Gas Sensor		G52
		31	3	6.4	Gas Sensor		G53
		30	5	15.0	Sonic Anemometer - XY		E55
		30	6	15.0	Sonic Anemometer - XY		E56
		30	7	15.0	Sonic Anemometer - Z		E57
		30	1	15.0	Sonic Anemometer - Temp		E58
1.0, 6.0	F	21	0	0.4	Gas Sensor		
		21	1	2.4	Gas Sensor		
		21	2	4.4	Gas Sensor		
		21	3	6.4	Gas Sensor		
2.0, 6.0	F	22	0	0.4	Gas Sensor		
		22	1	2.4	Gas Sensor		
		22	2	4.4	Gas Sensor		
		22	3	6.4	Gas Sensor		
3.0, 6.0	F	23	0	0.4	Gas Sensor		G54
		23	1	2.4	Gas Sensor		G55
		23	2	4.4	Gas Sensor		G56
		23	3	6.4	Gas Sensor		G57
4.0, 6.0	F	14	0	0.4	Gas Sensor		G58
		14	1	2.4	Gas Sensor		G59
		14	2	4.4	Gas Sensor		G60
		14	3	6.4	Gas Sensor		G61
5.0, 6.0	F	14	4	0.4	Gas Sensor		
		14	5	2.4	Gas Sensor		
		14	6	4.4	Gas Sensor		
		14	7	6.4	Gas Sensor		
6.0, 6.0	F	27	0	0.4	Gas Sensor		
		27	1	2.4	Gas Sensor		
		27	2	4.4	Gas Sensor		
		27	3	6.4	Gas Sensor		
7.0, 6.0	F	27	4	0.4	Gas Sensor		
		27	5	2.4	Gas Sensor		
		27	6	4.4	Gas Sensor		
		27	7	6.4	Gas Sensor	Not connected	
1.0, 7.0	F	21	4	0.4	Gas Sensor		
		21	5	2.4	Gas Sensor		
		21	6	4.4	Gas Sensor		
		21	7	6.4	Gas Sensor		
2.2, 6.7	F	22	4	0.4	Gas Sensor		G62
		22	5	2.4	Gas Sensor		G63
		22	6	4.4	Gas Sensor		G64
		22	7	6.4	Gas Sensor		G65
3.0, 7.0	F	23	4	0.4	Gas Sensor		G66
		23	5	2.4	Gas Sensor		G67
		23	6	4.4	Gas Sensor		G68
		23	7	6.4	Gas Sensor		G69
4.0, 7.0	F	15	0	0.4	Gas Sensor		G70
		15	1	2.4	Gas Sensor		G71
		15	2	4.4	Gas Sensor		G72
		15	3	6.4	Gas Sensor		G73
5.0, 7.0	F	15	4	0.4	Gas Sensor		
		15	5	2.4	Gas Sensor		
		15	6	4.4	Gas Sensor		
		15	7	6.4	Gas Sensor		
6.0, 7.0	F	28	0	0.4	Gas Sensor		
		28	1	2.4	Gas Sensor		
		28	2	4.4	Gas Sensor		
		28	3	6.4	Gas Sensor		
7.0, 7.0	F	28	4	0.4	Gas Sensor		
		28	5	2.4	Gas Sensor		
		28	6	4.4	Gas Sensor		
		28	7	6.4	Gas Sensor	Not connected	
4.0, 9.5	D	29	0	0.4	Gas Sensor		
		29	1	2.4	Gas Sensor		
		29	2	4.4	Gas Sensor		
		29	3	10.0	Wind Vane		E59
		29	4	10.0	Wind Speed		E60
		29	5	10.0	Relative Humidity		E61



LAYOUT OF MASTS
 ALPHABETIC CODE = MAST TYPE
 NUMERIC CODE = DATA TERMINAL NUMBER

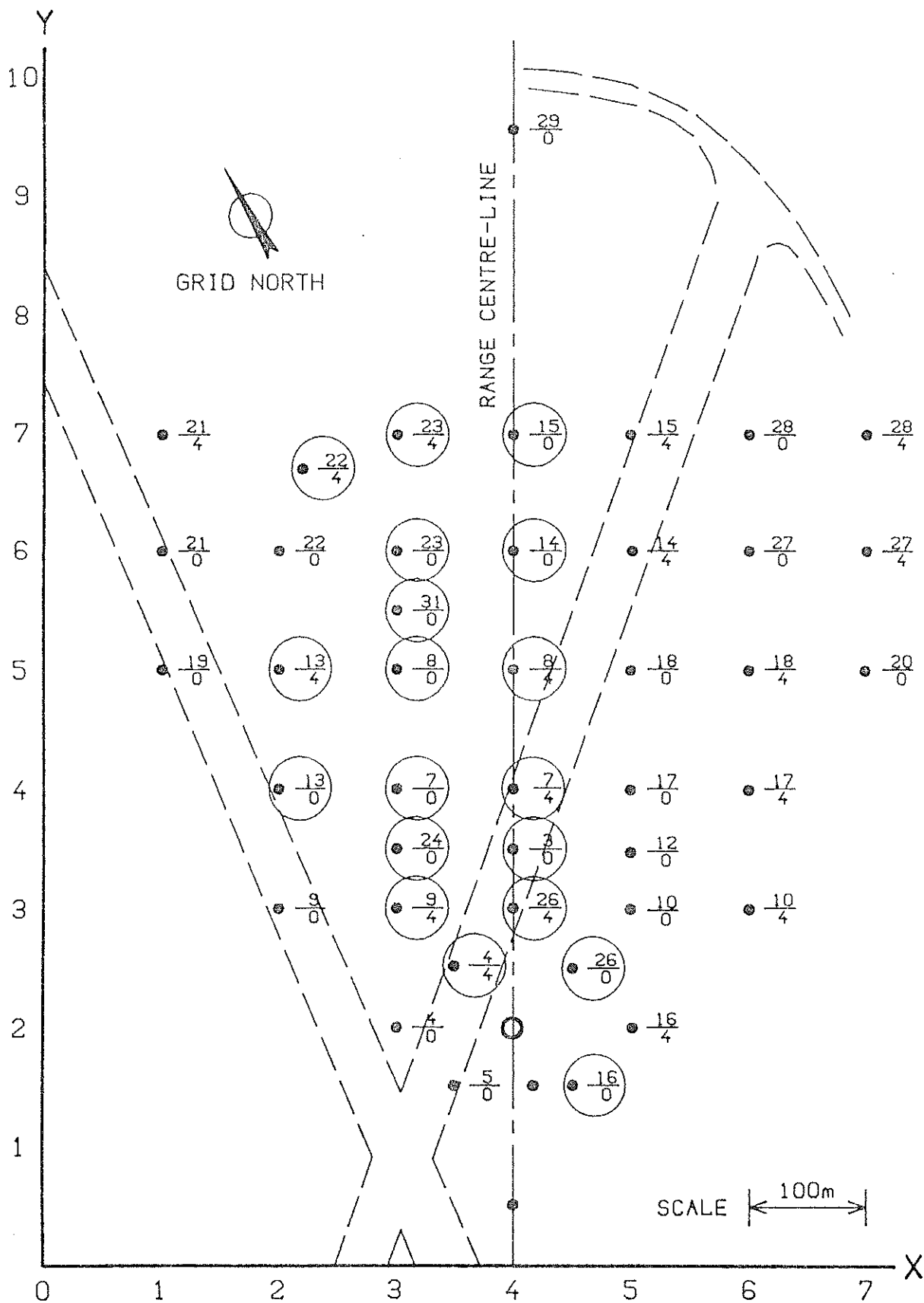
TRIAL No. - 008

DATE - 9/9/82

73 SENSORS SAW GAS

WIND SPEED (U_{10}) 2-3 m/sec

PASQUILL CATEGORY - D

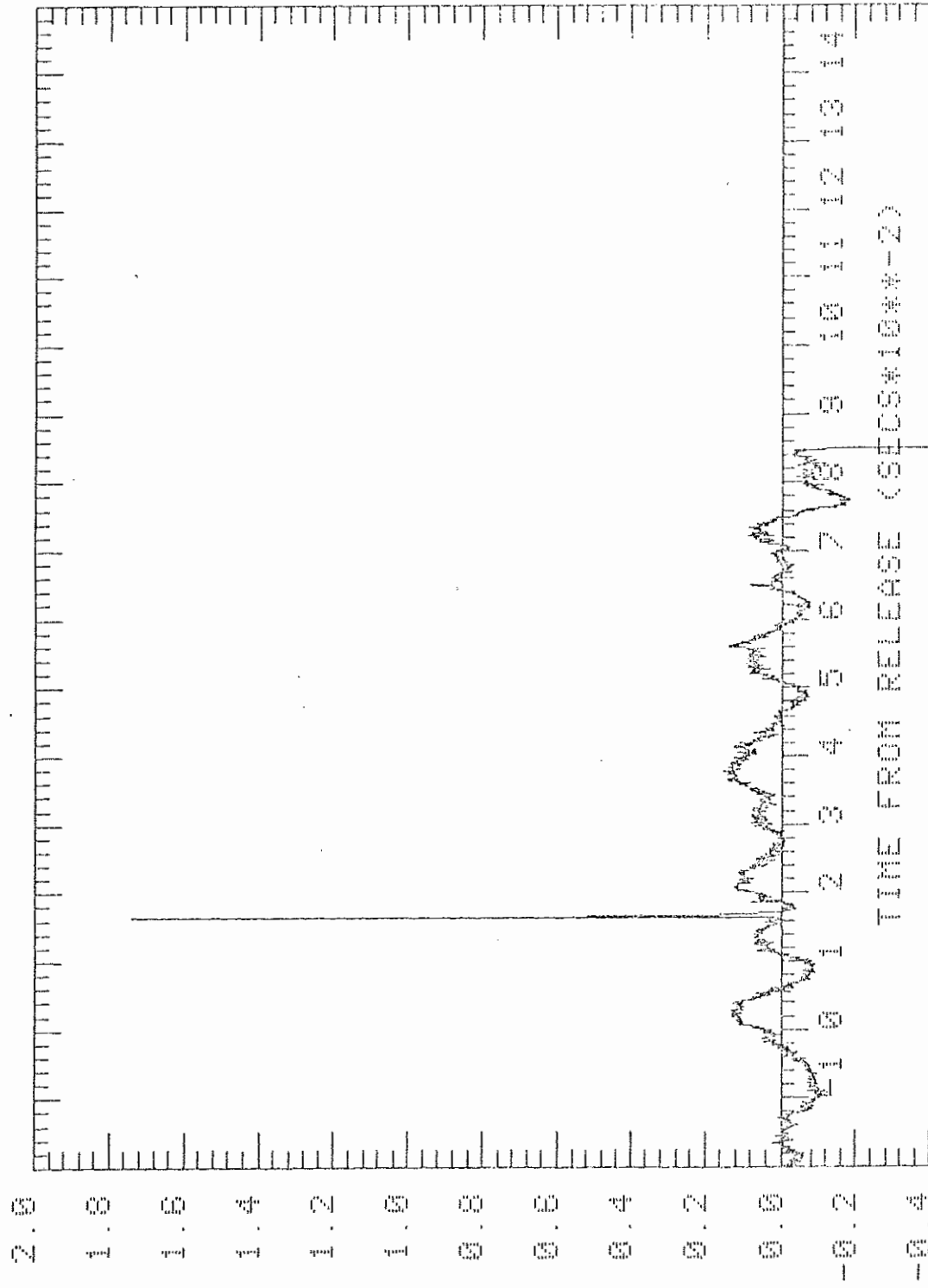


$\frac{21}{4}$ = DATA TERMINAL / CHANNEL NUMBER OF GAS SENSORS AT 0.4m HEIGHT

○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS

C O N T R O L L E R F I C H

(%)

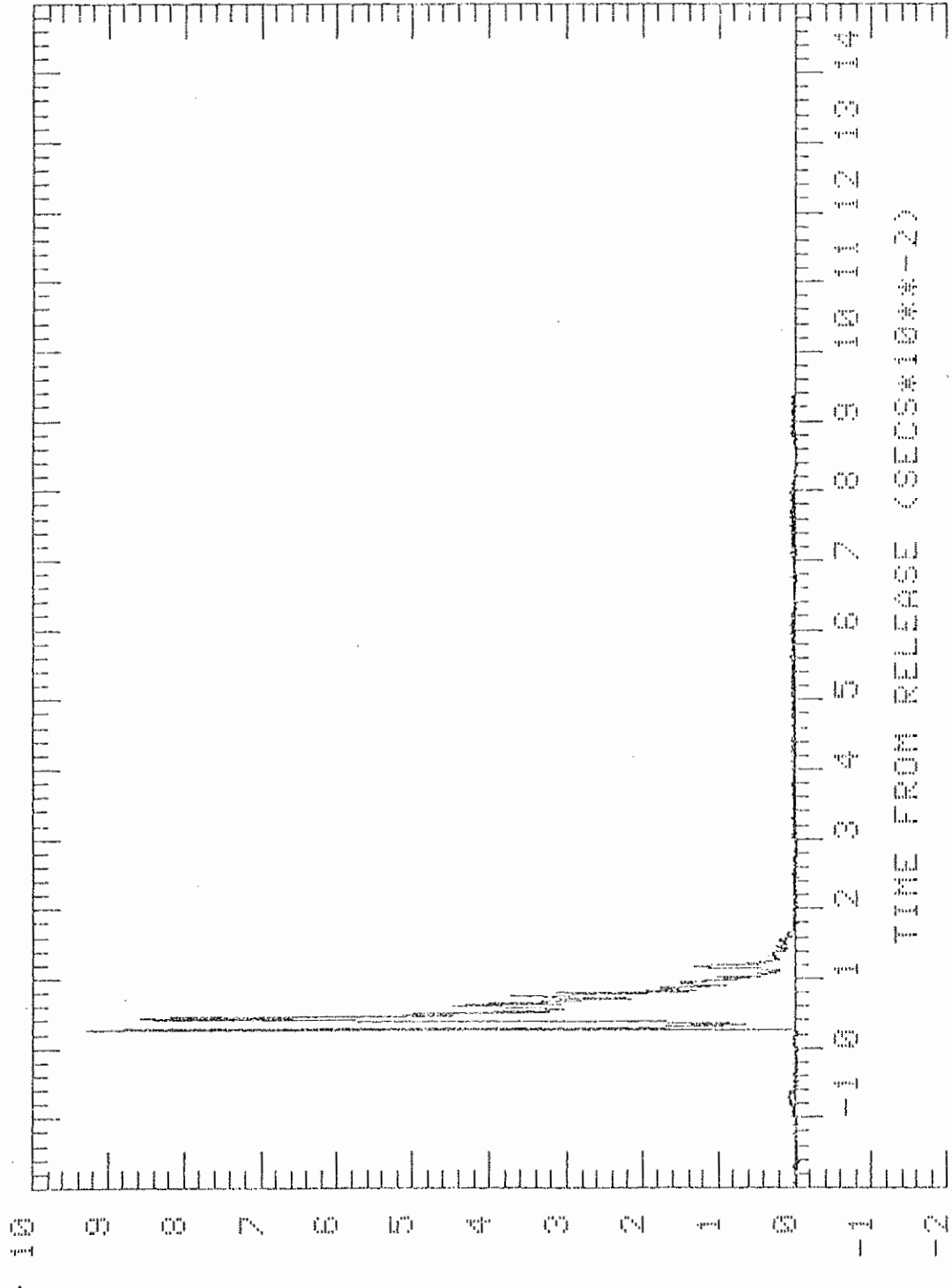


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 150 H Z: 2.4 M

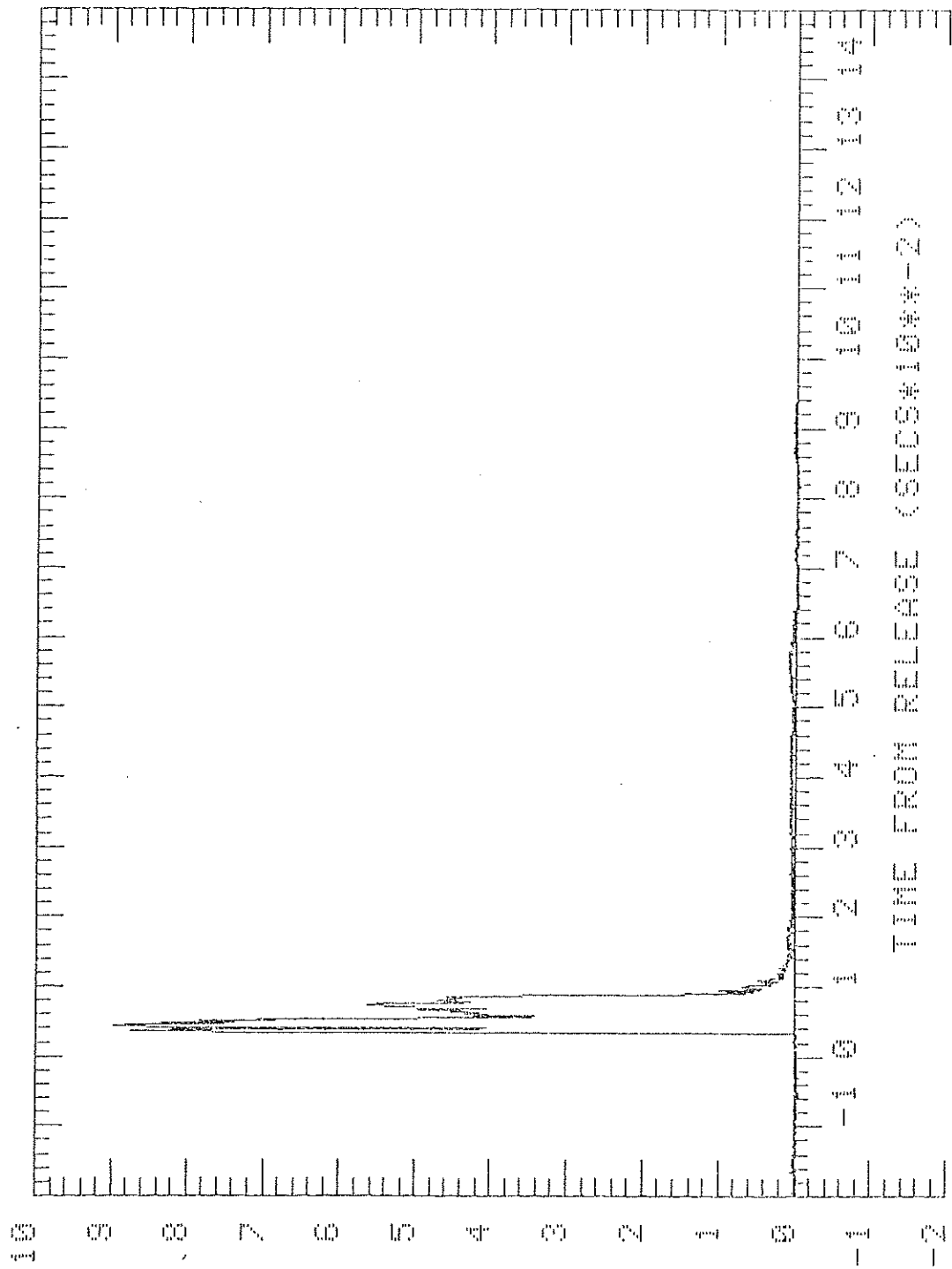
G01

COZOWZFAFHON



TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

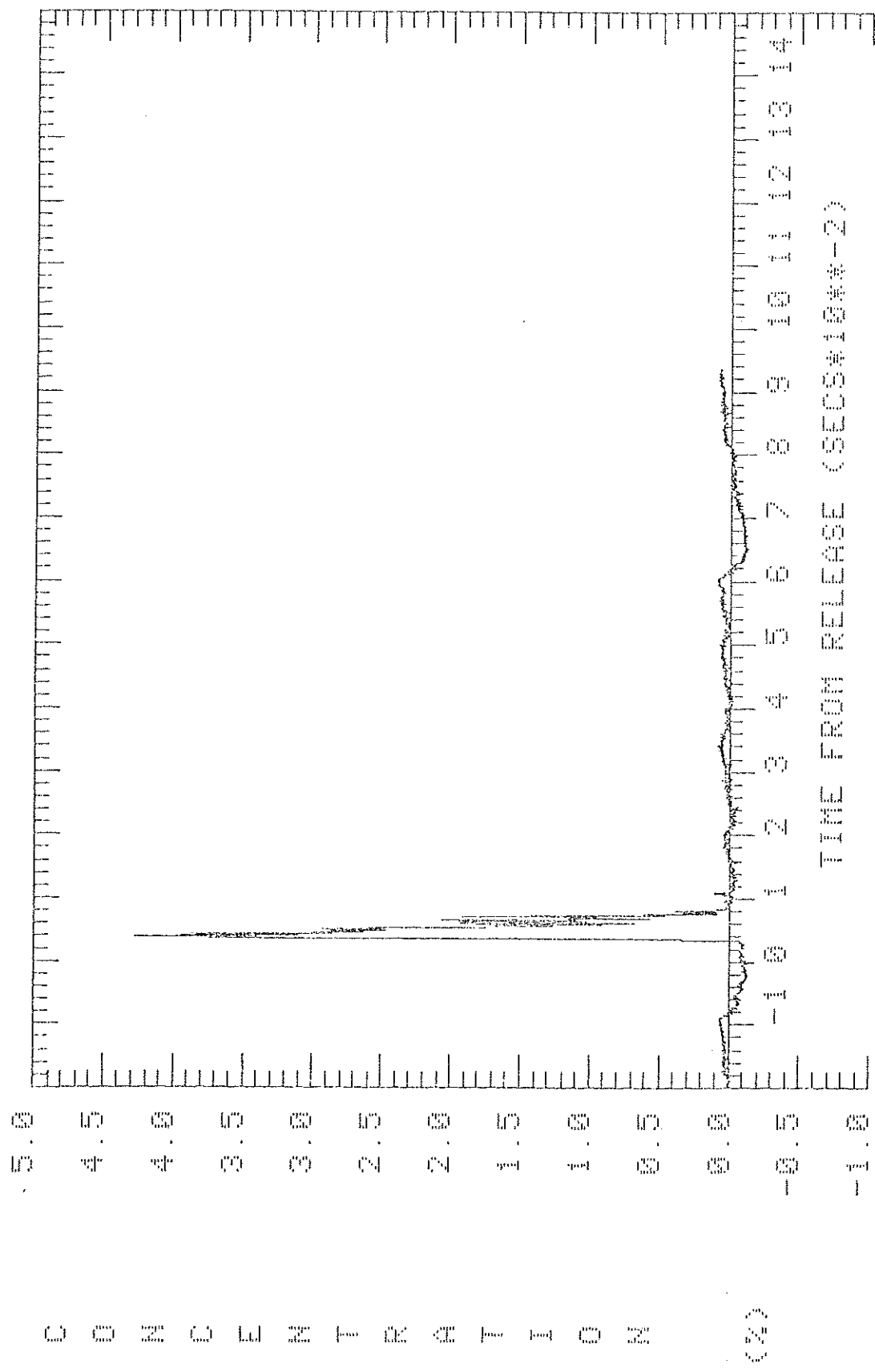
X: 350 M Y: 250 M Z: 0.4 M



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 250 M Z: 0.4 M

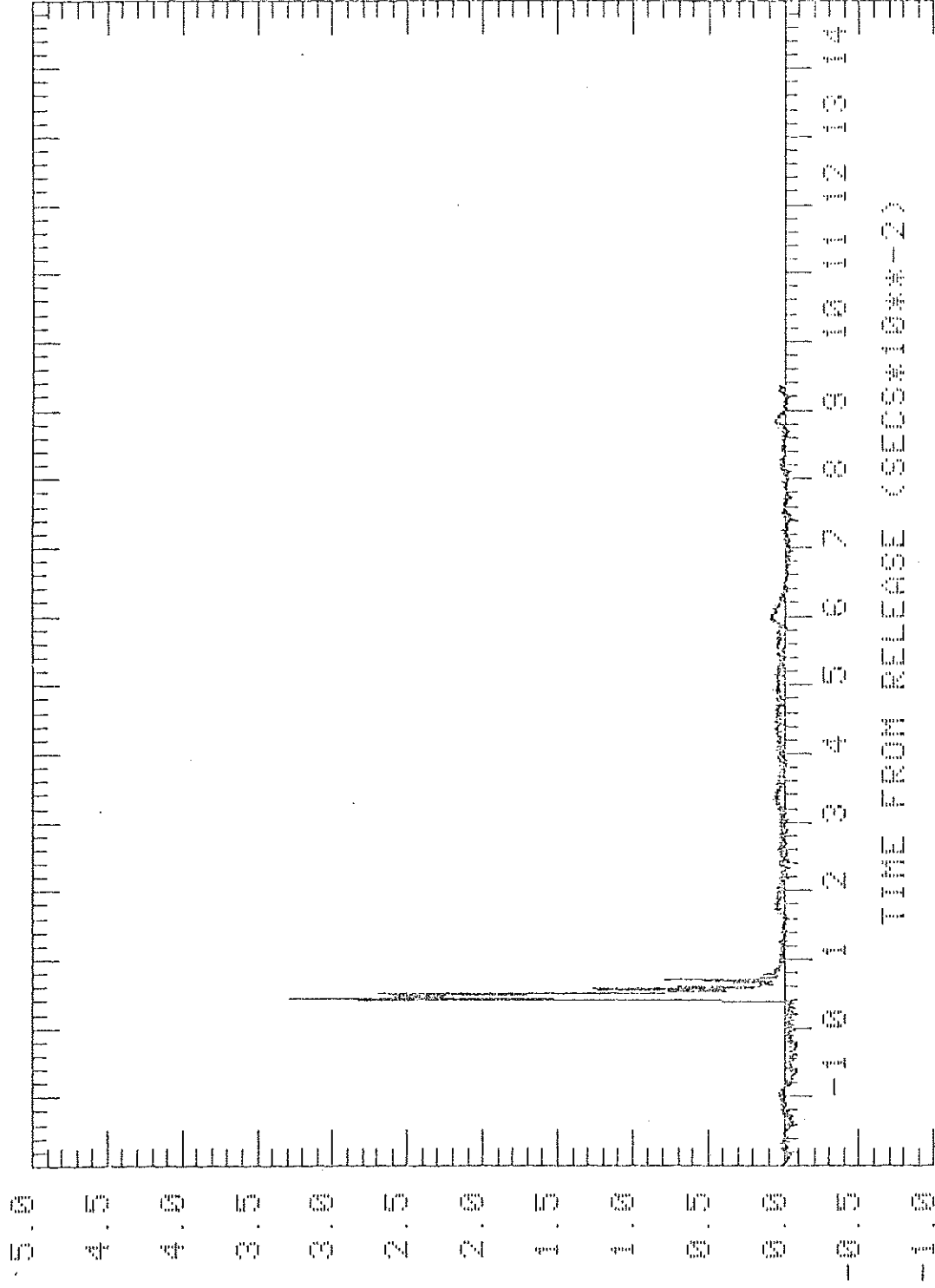


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 250 M Z: 2.4 M

COZOLZTRCFFCZ

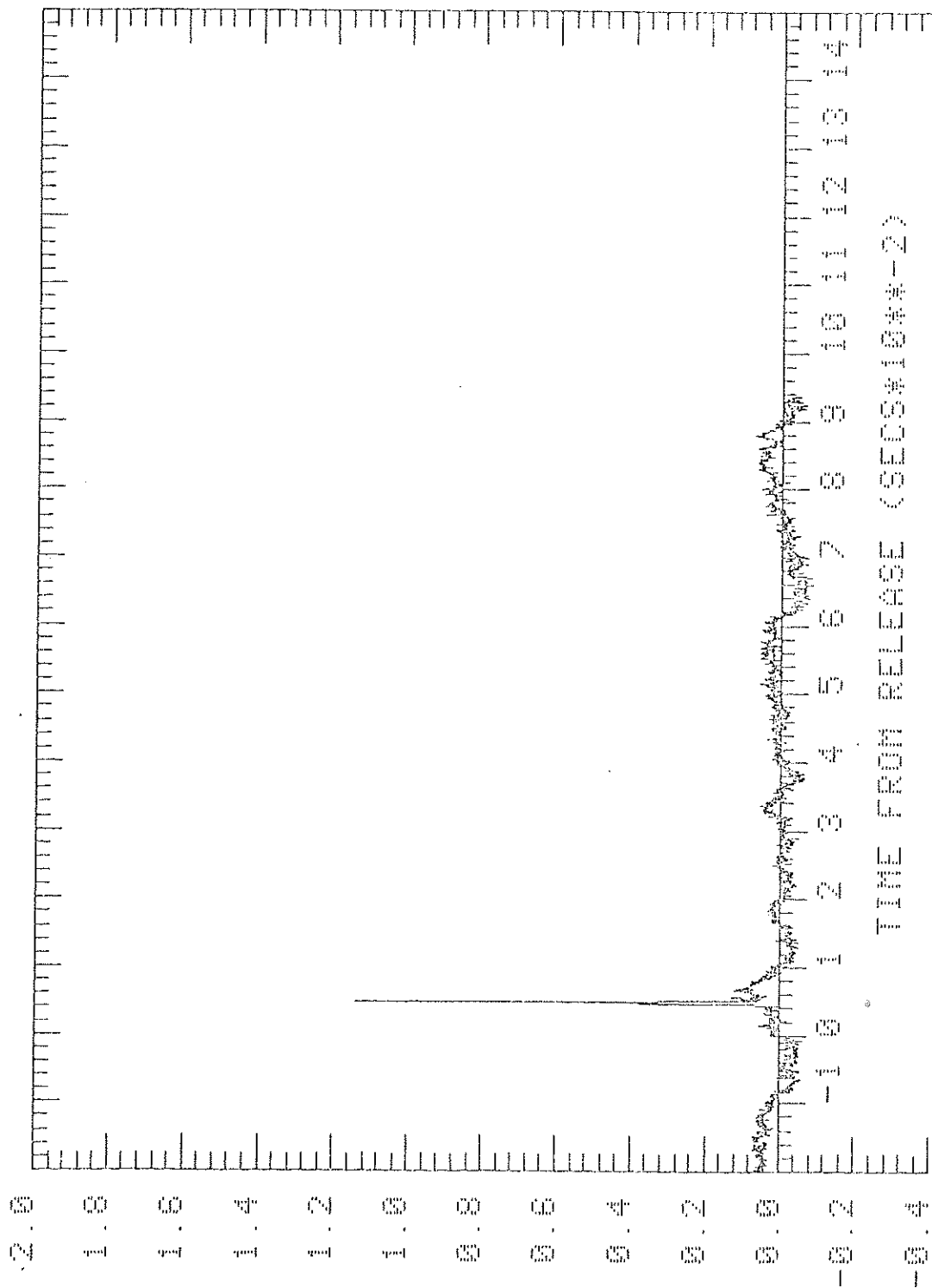
(20)



TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 N Y: 250 N Z: 4.4 N

G06

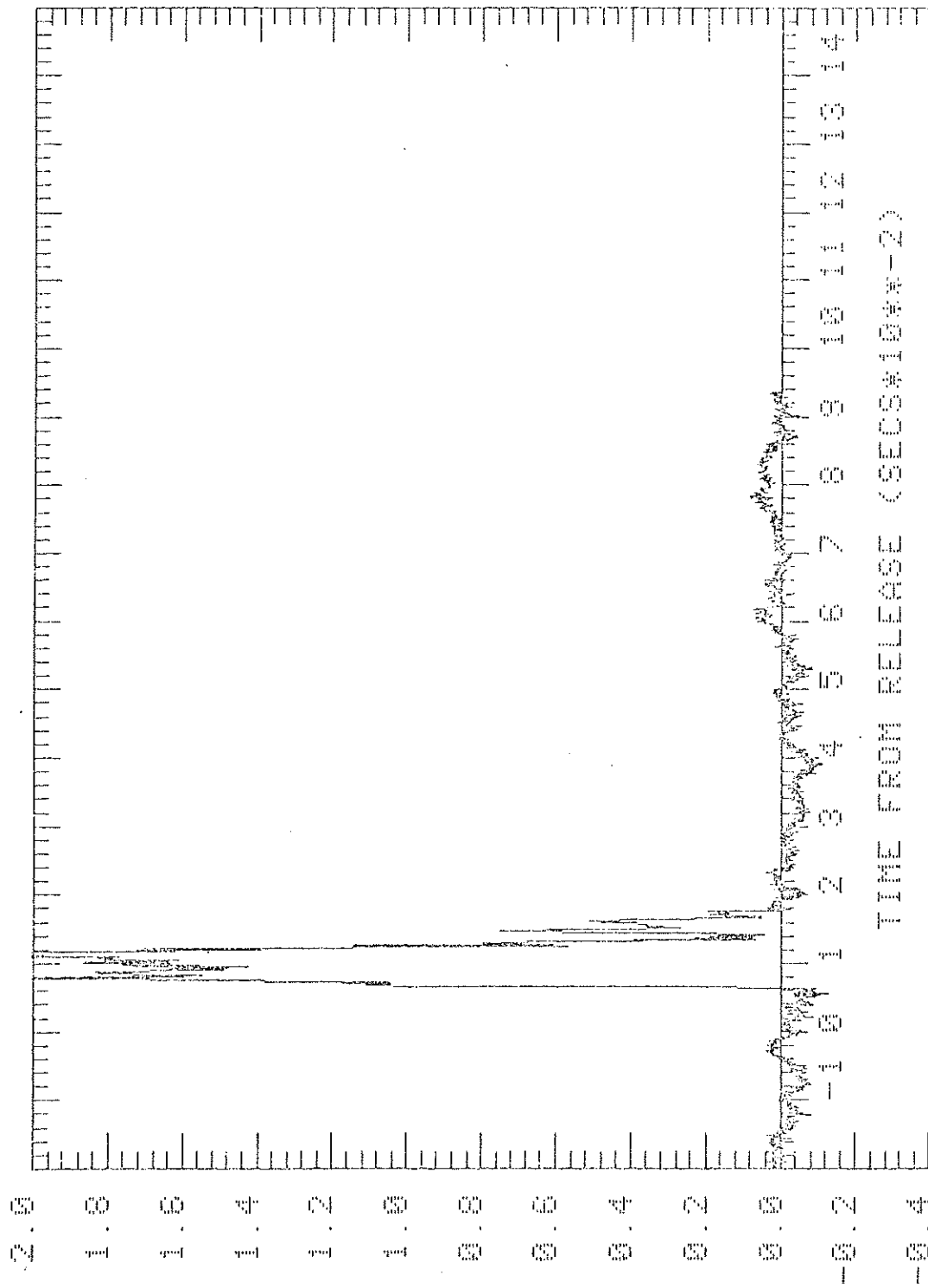


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 250 M Z: 6.4 M

C O E L E F E I C H

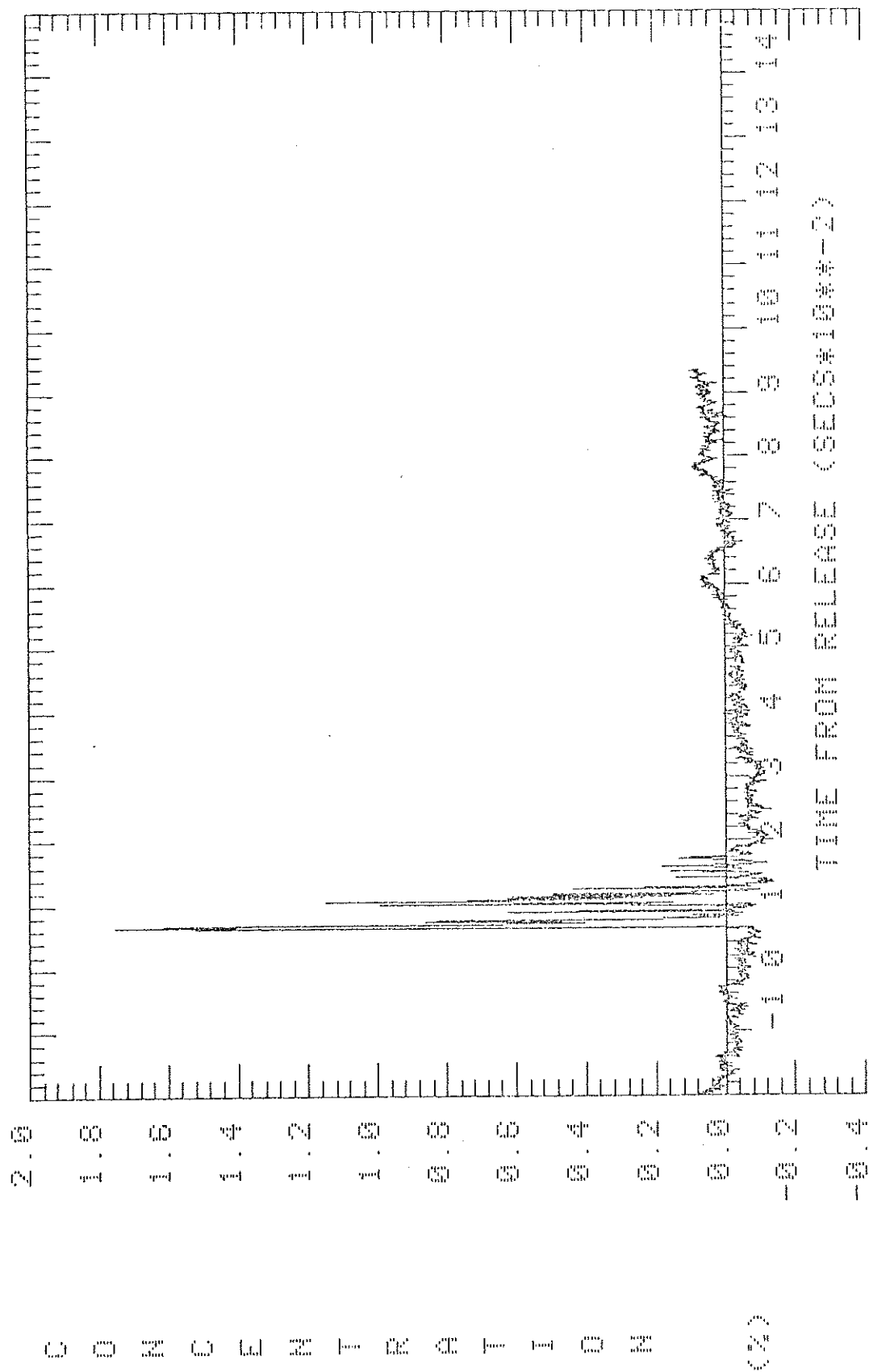
(%)



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 300 H Z: 0.4 H

G08

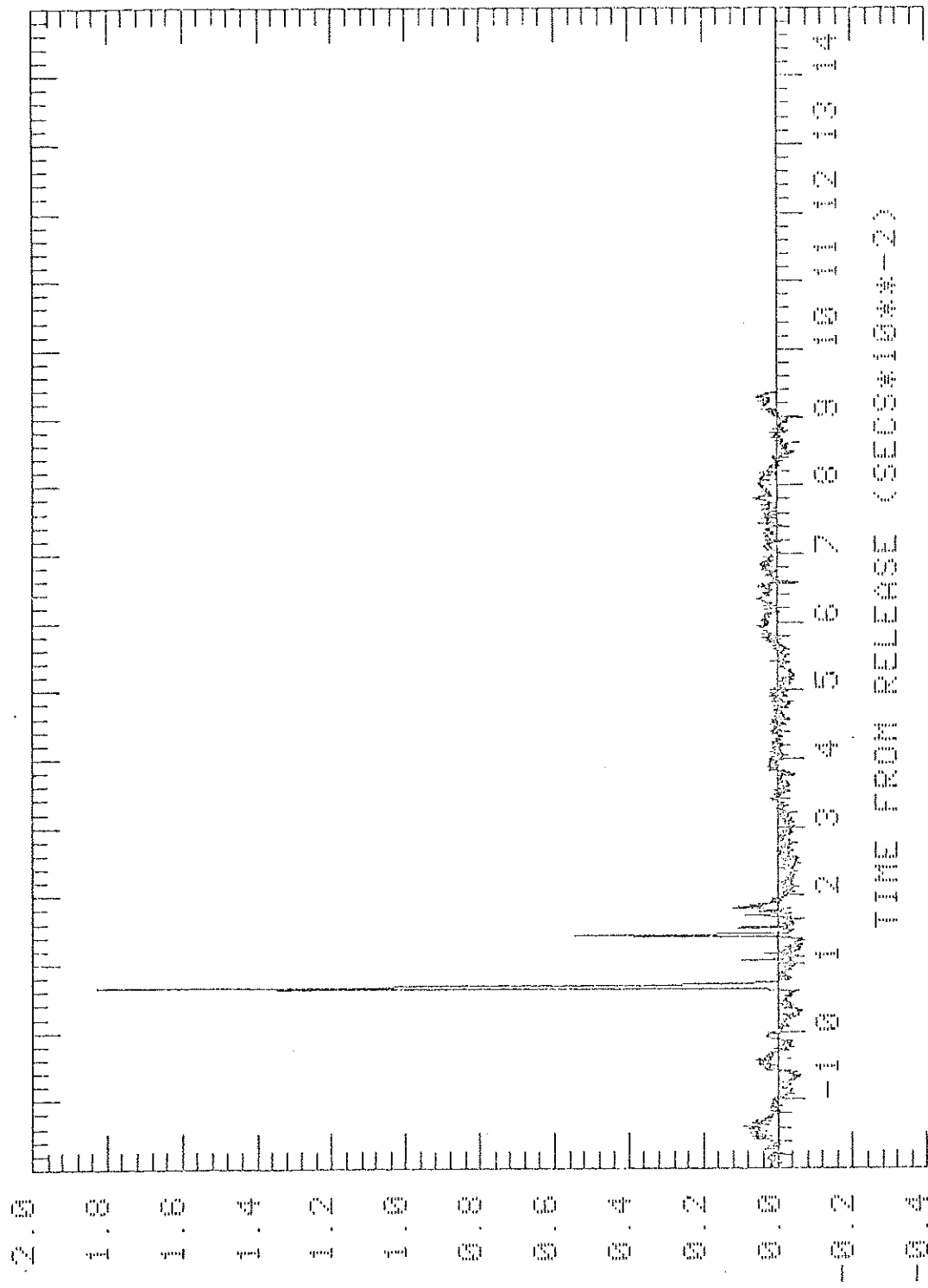


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 390 N Y: 300 N Z: 2.4 N

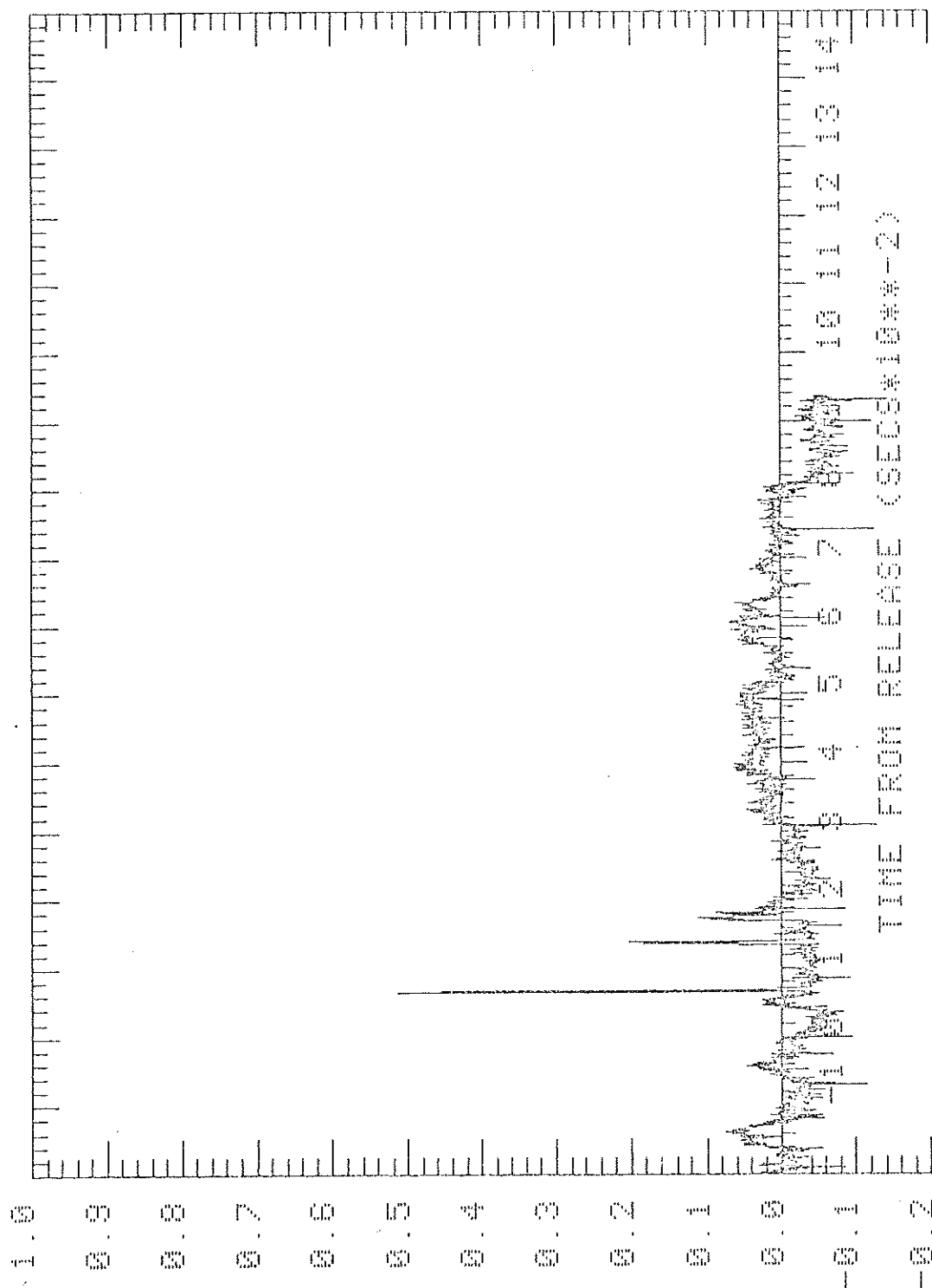
C O N T R O L F R E Q U E N C Y

(%)



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 300 M Z: 4.4 M

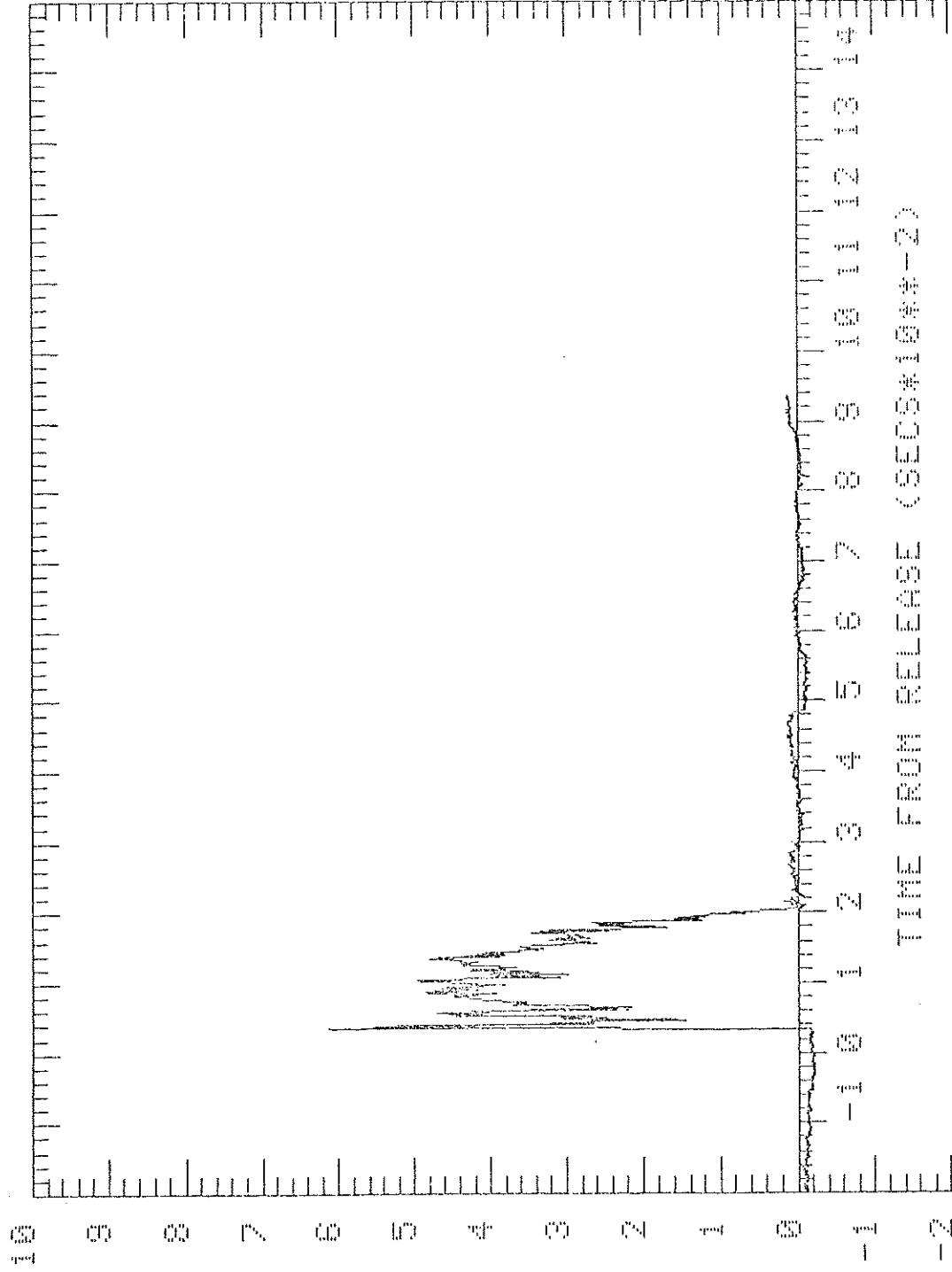


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 300 M Z: 6.4 M

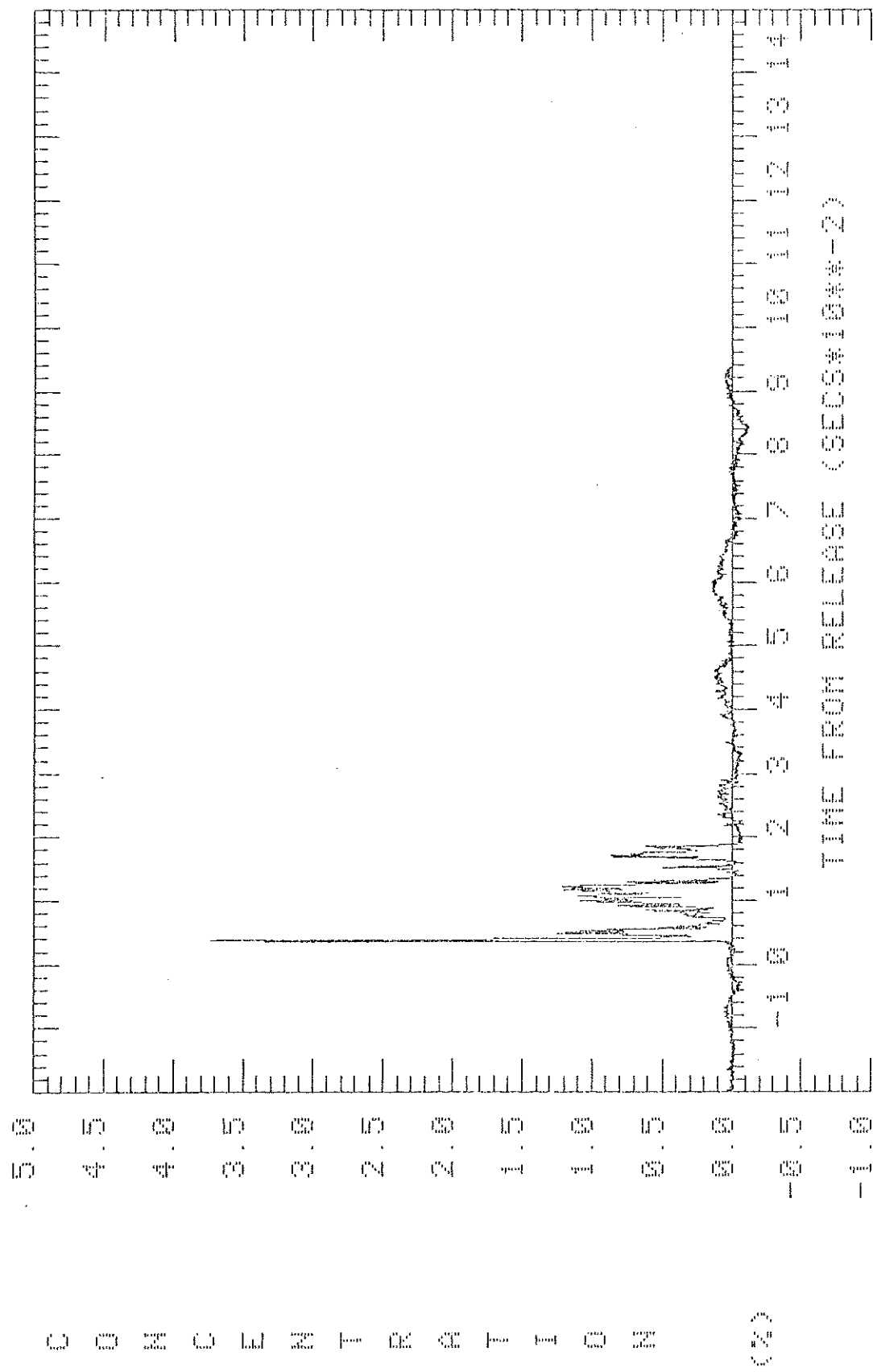
0 0 2 0 1 2 1 2 1 2 1 2 1 2

(20)



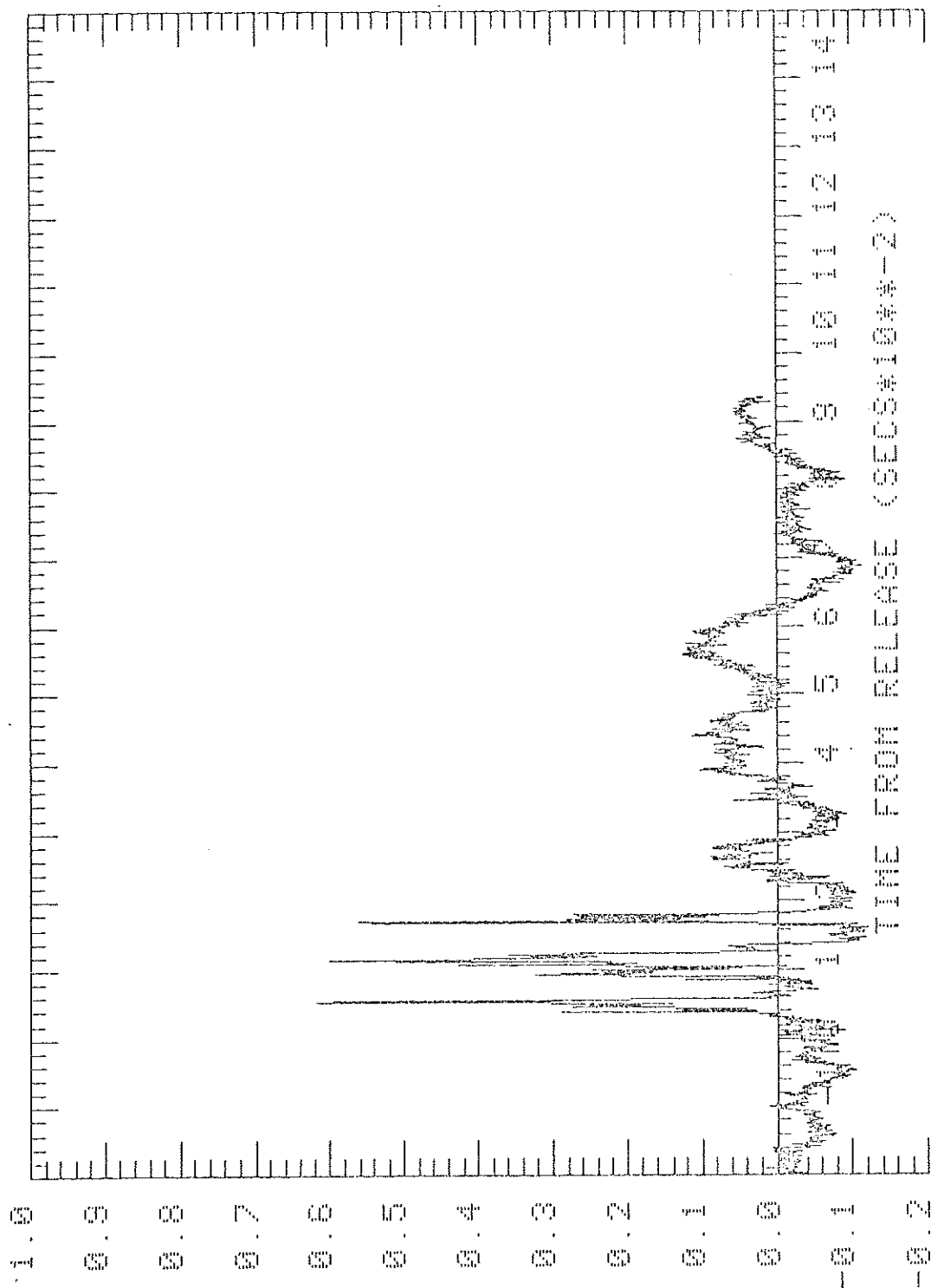
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 300 M Z: 0.4 M



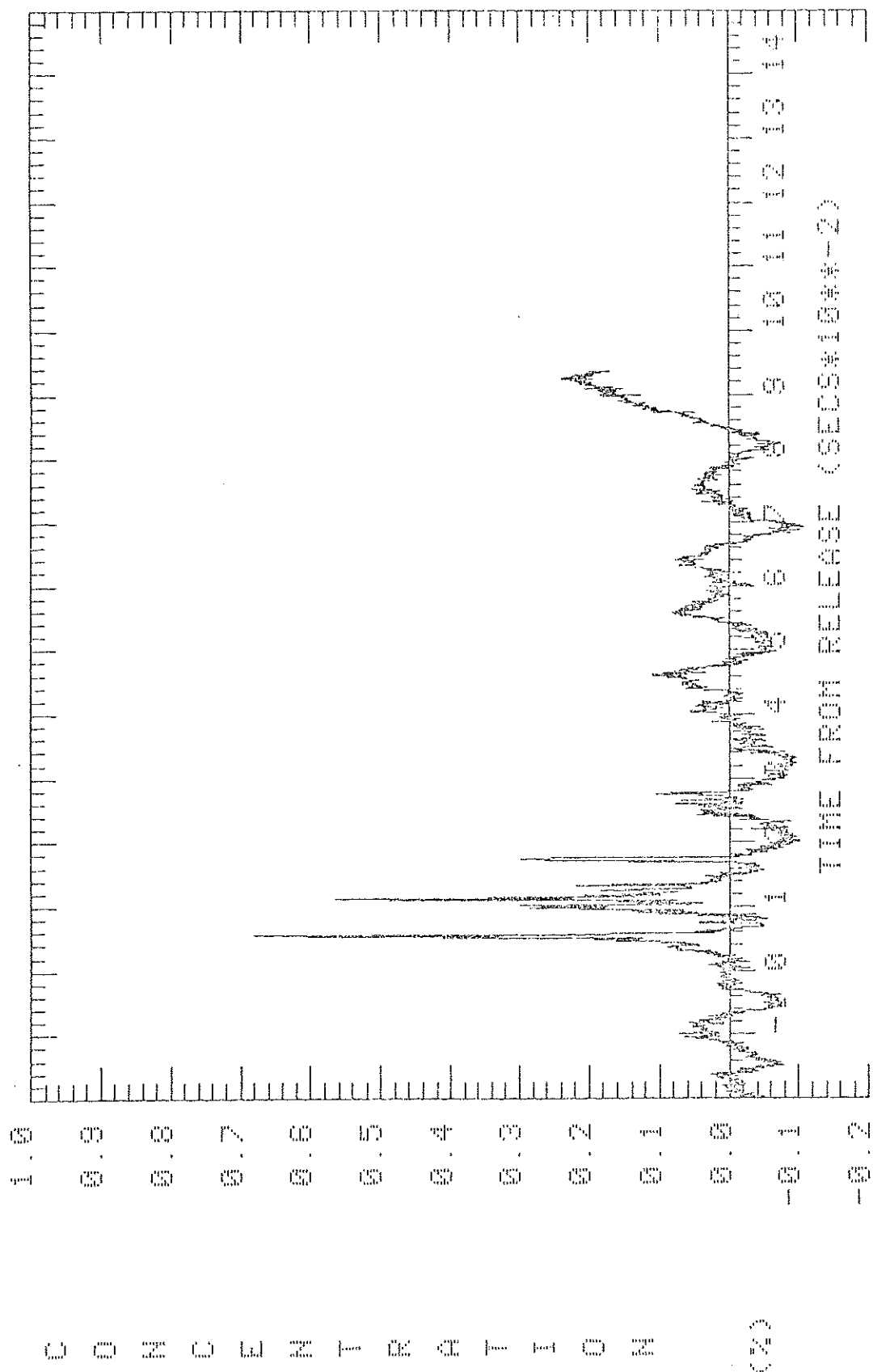
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 400 M Y: 300 M Z: 2.4 M



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 300 M Z: 4.4 M

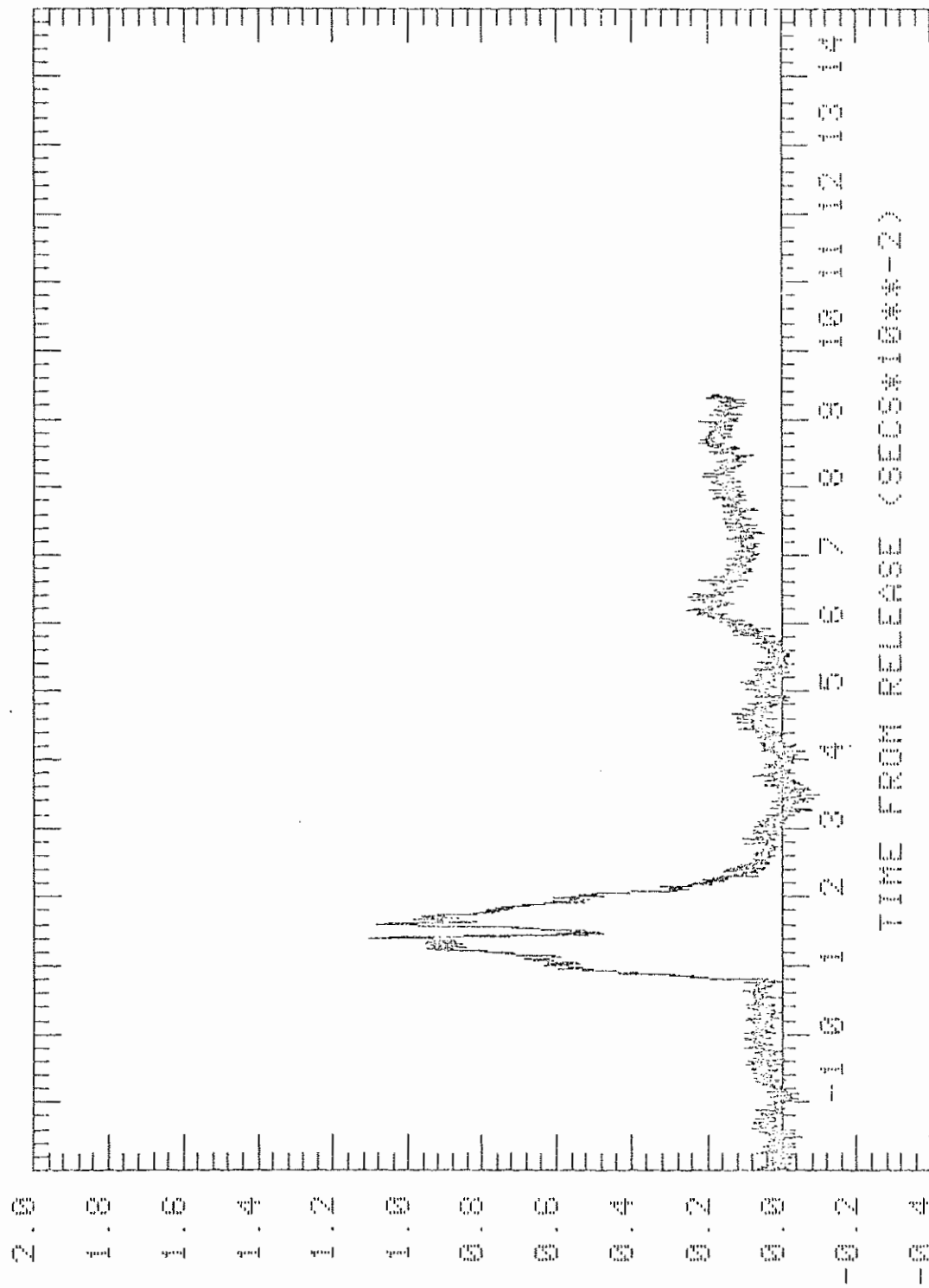


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 300 M Z: 6.4 M

CONCENTRATION

(%)

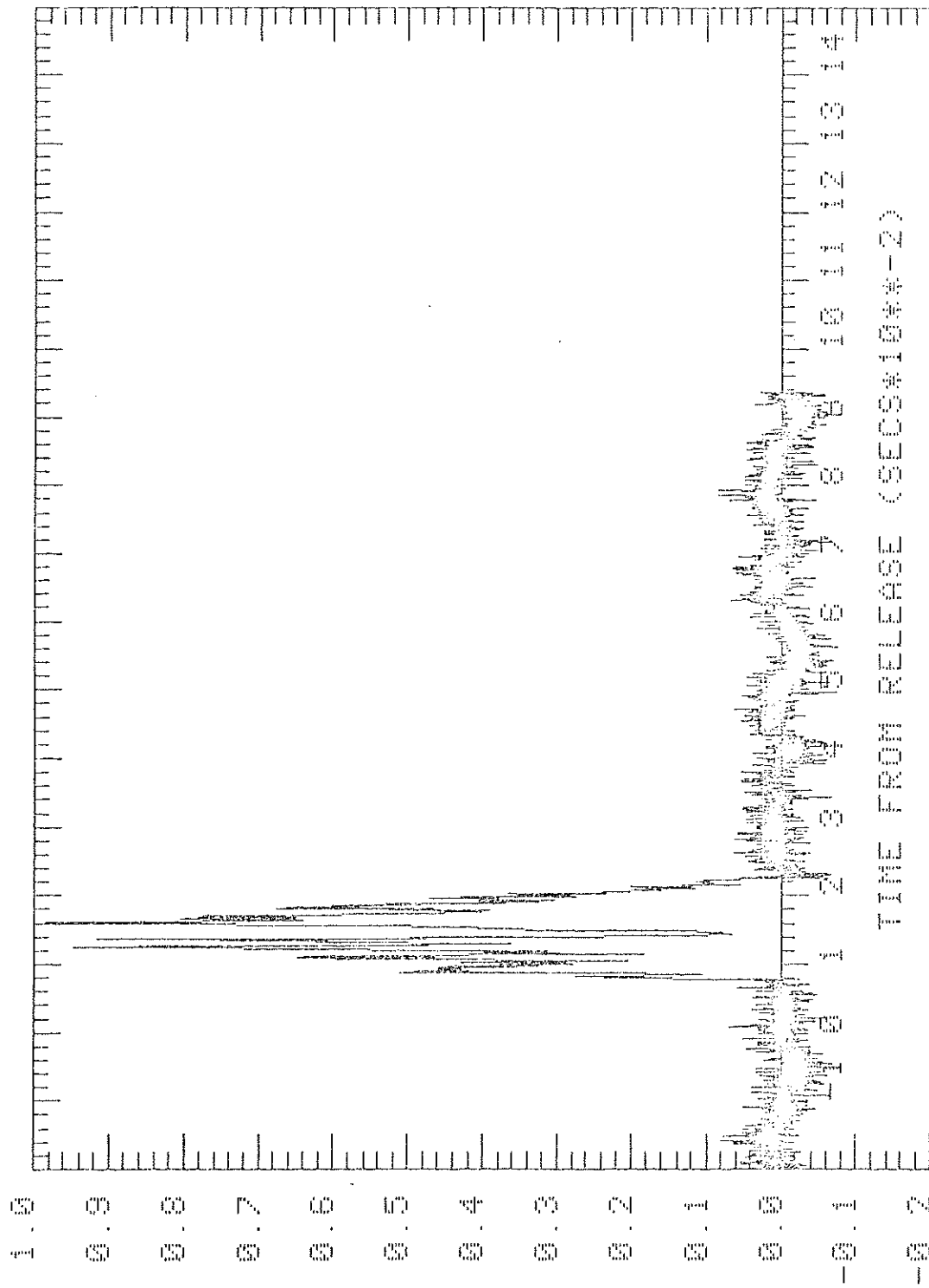


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 H Y: 350 H Z: 0.4 H

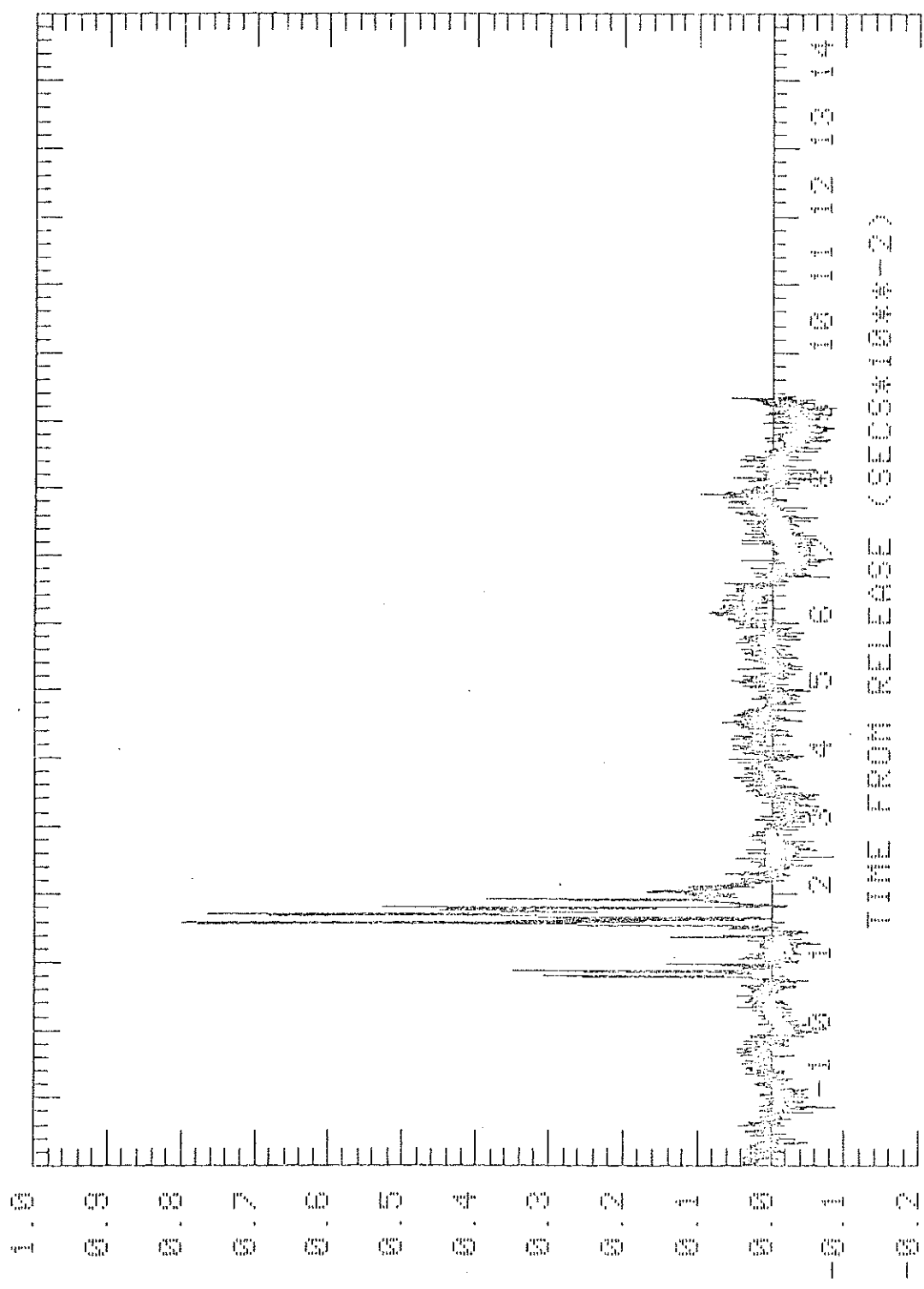
COEFFICIENT

(%)



TRIAL: 000 TYPE: HGAS AVERAGING TIME: 0.6 SECS

X: 300 H Y: 350 H Z: 2.0 H



COZOLZEFERCOZ

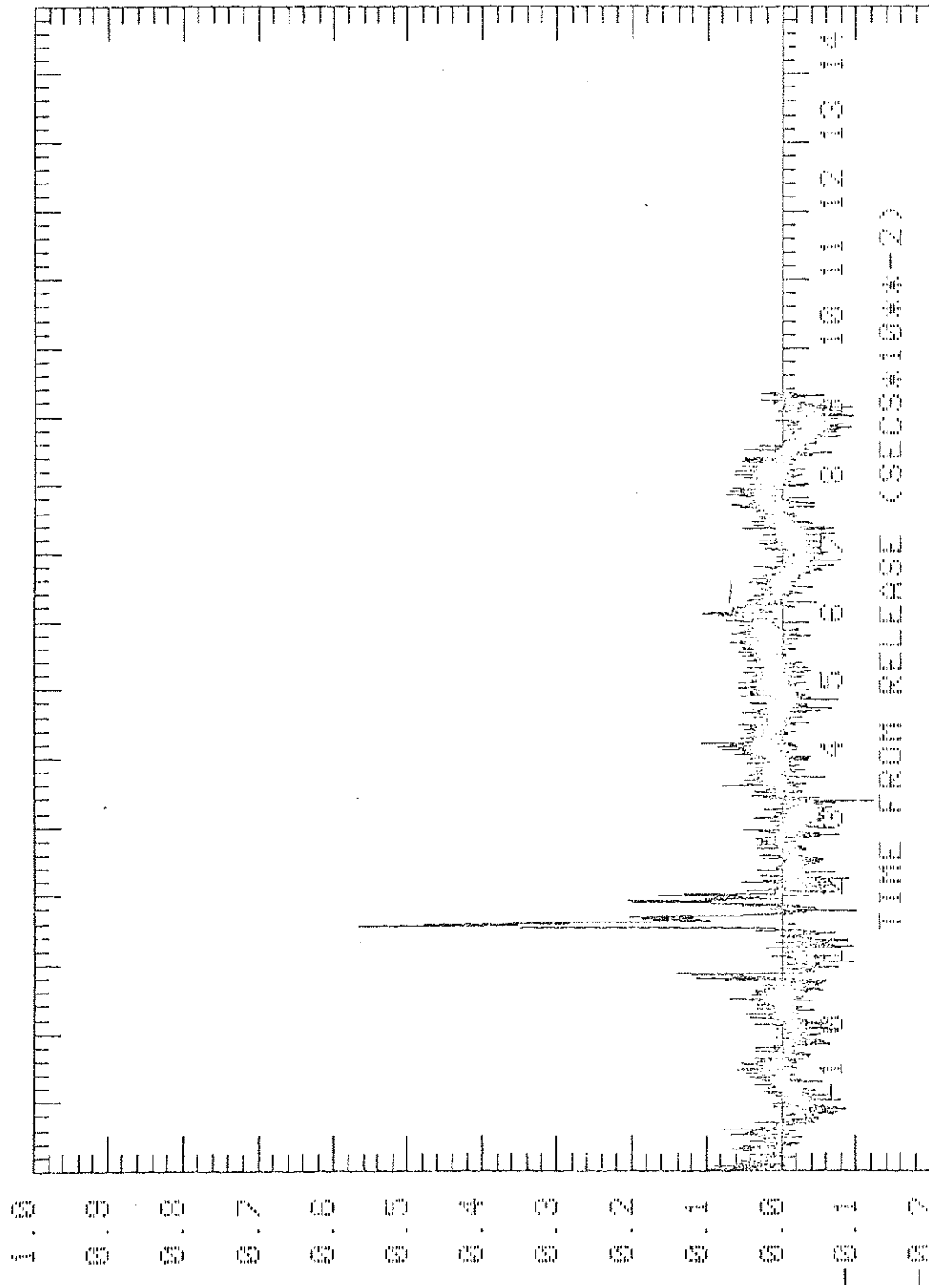
(Z)

TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 350 M Z: 4.4 M

CO2 COLLECTOR

(2)



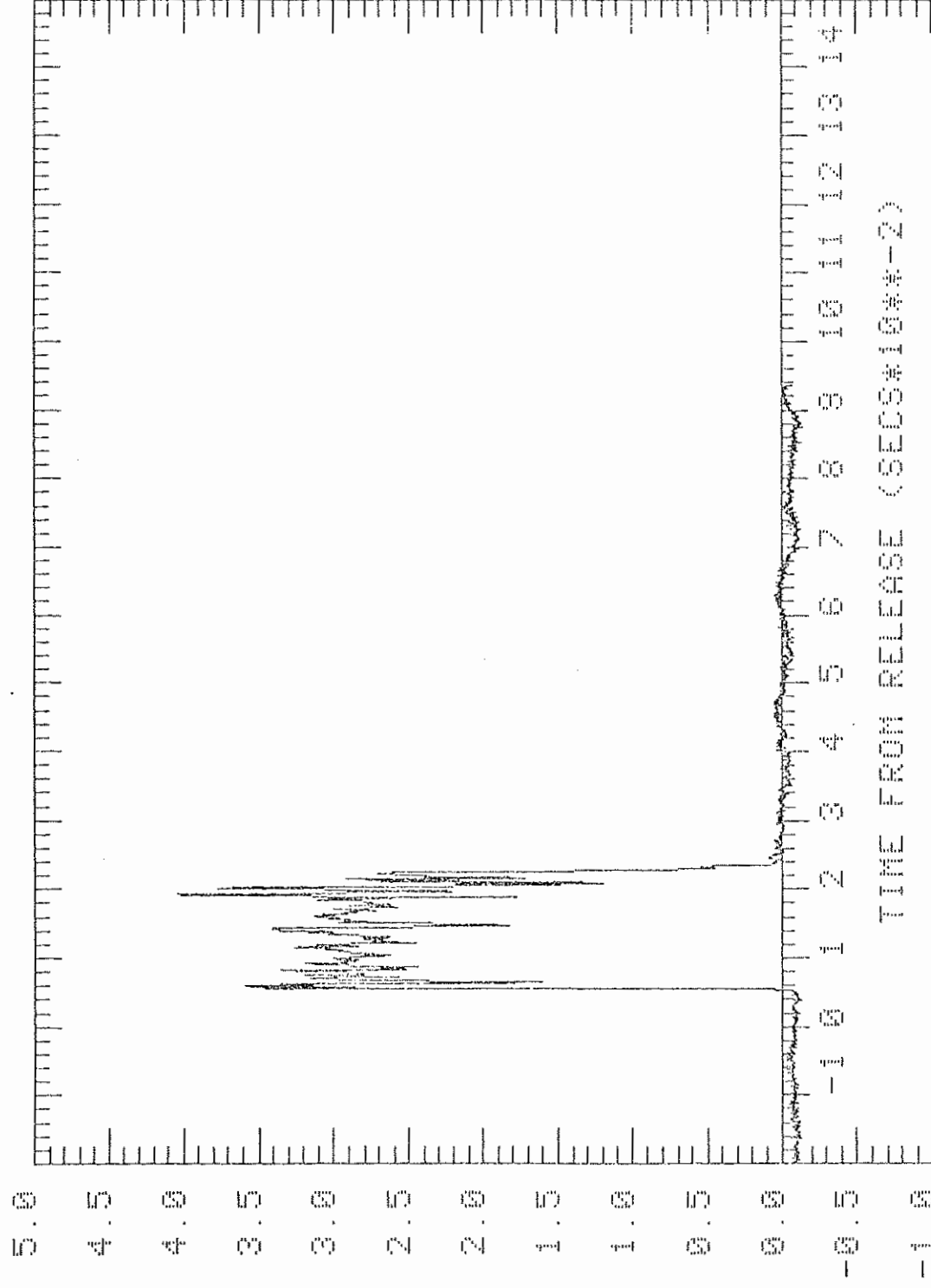
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 H Y: 350 H Z: 6.4 H

G20

COZOLZFRZFRZ

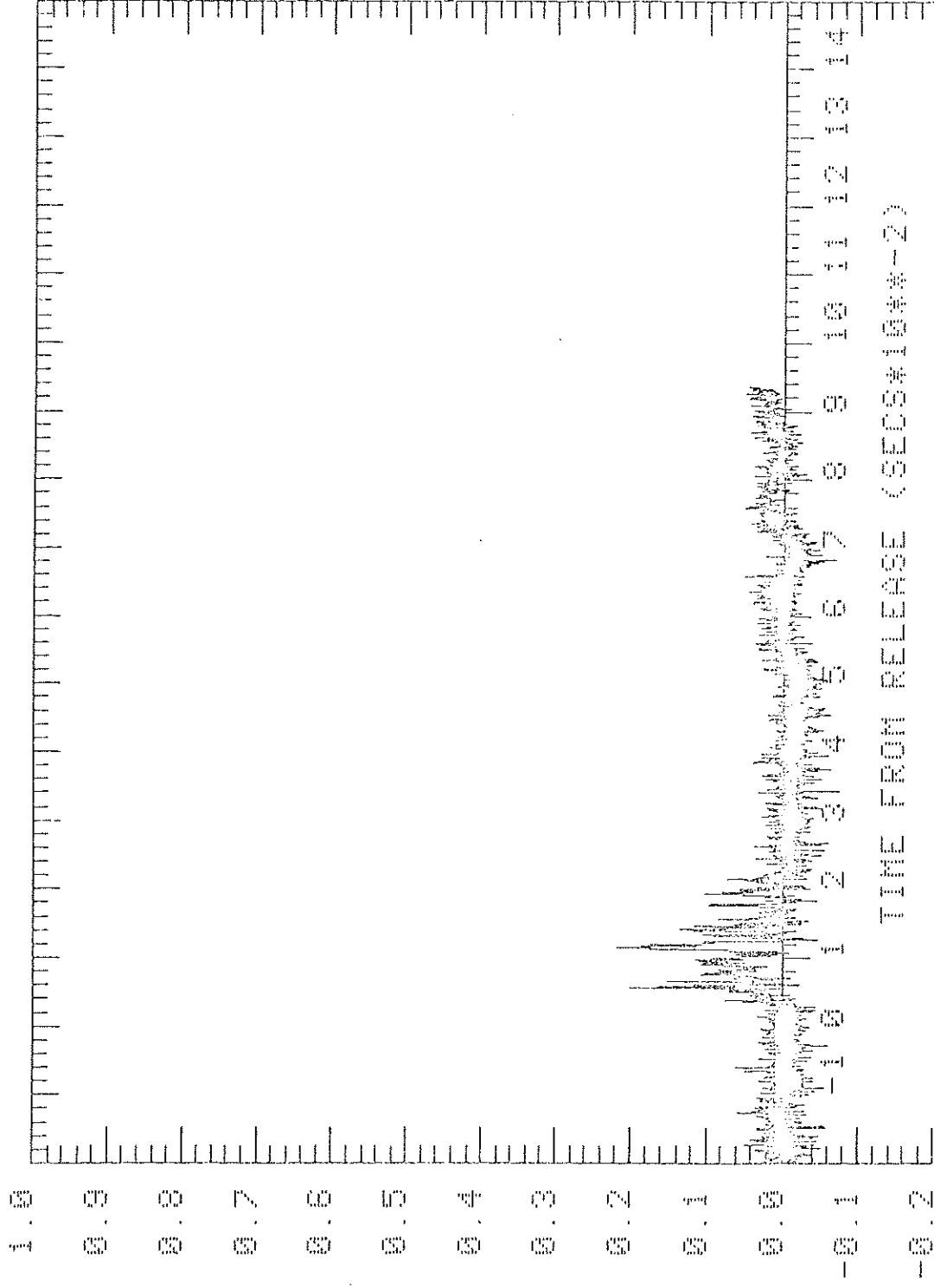
(%)



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 350 M Z: 0.4 M

CONTOUR PLOT

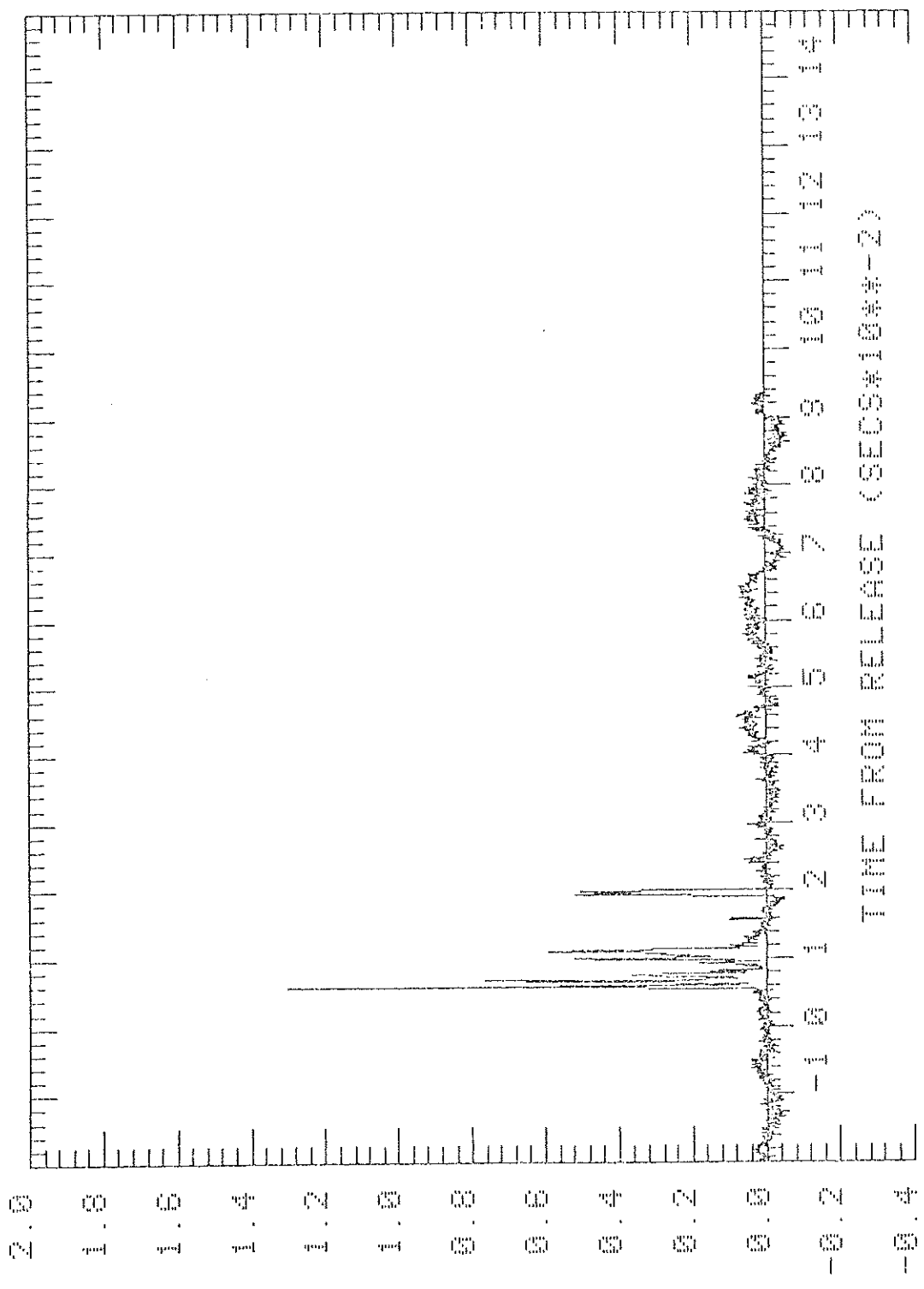


TRIAL: 000 TYPE: SHOCK AVERAGING TIME: 0.5 SECS

X: 400 N Y: 350 N Z: 2.0 N

CO2 FID

(2)

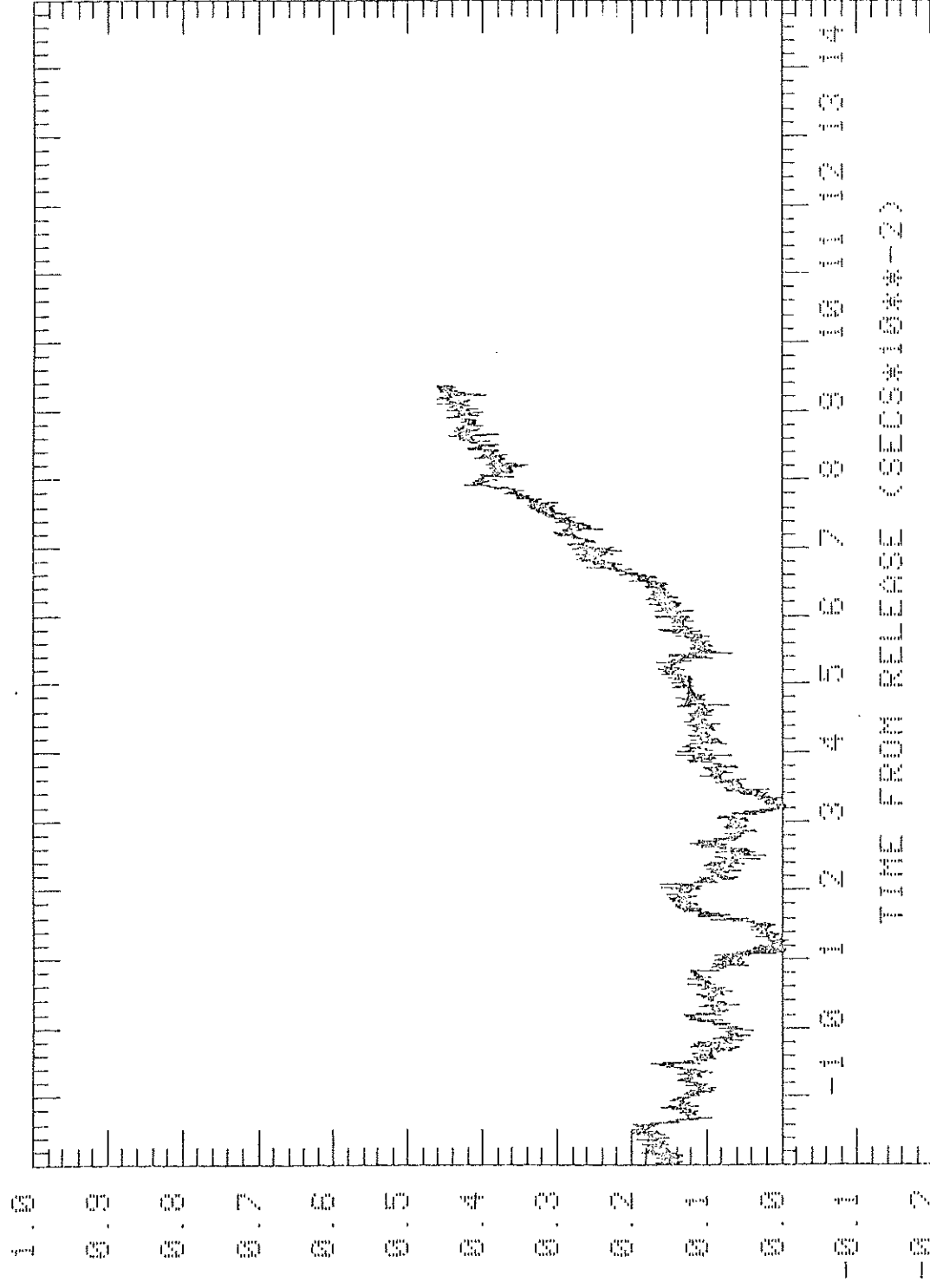


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 H Y: 350 H Z: 6.4 H

COOLANT FLOW

(%)

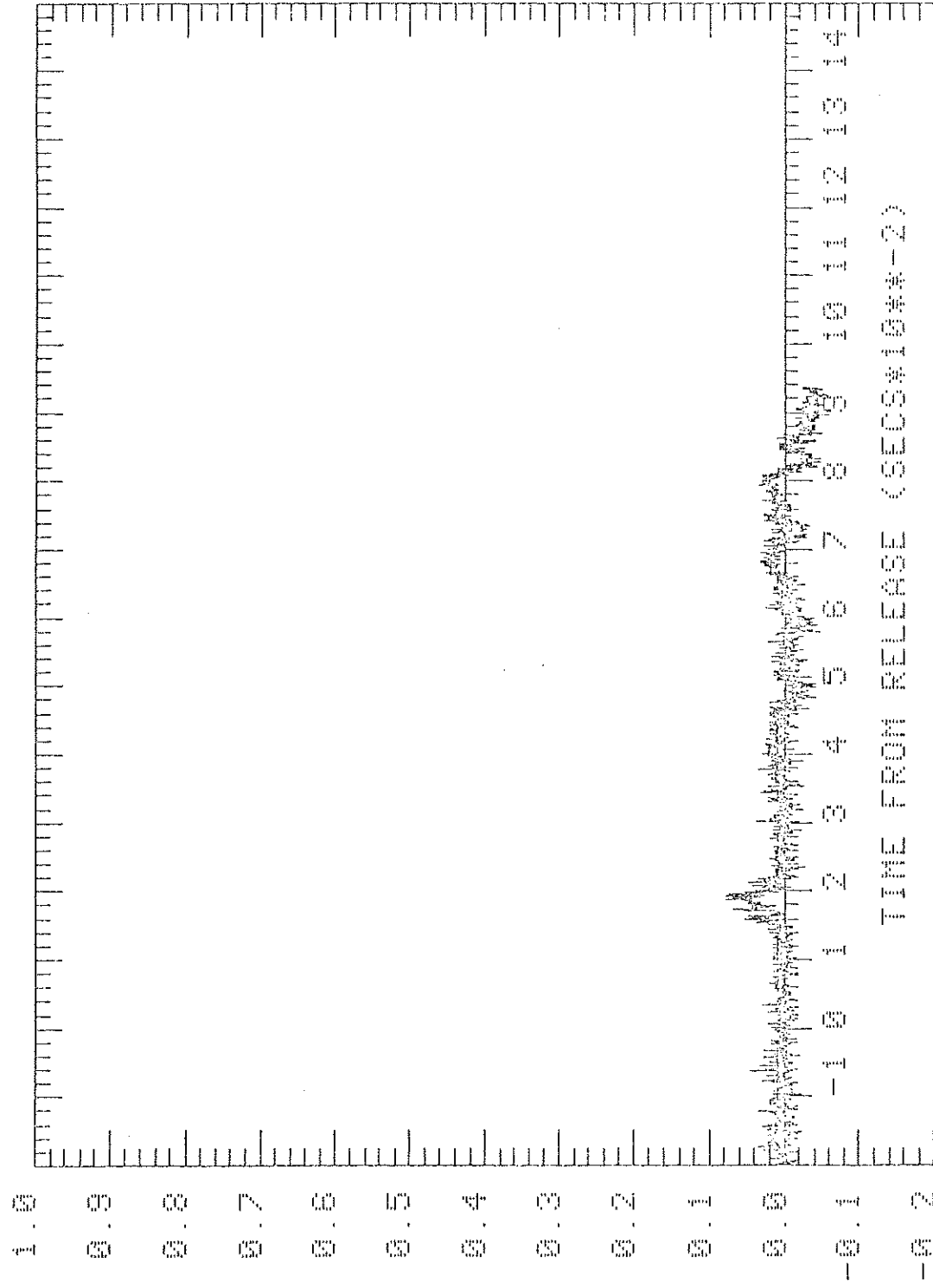


TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 400 M Z: 0.4 M

0 0 2 0 1 2 1 2 1 1 0 2

(%)

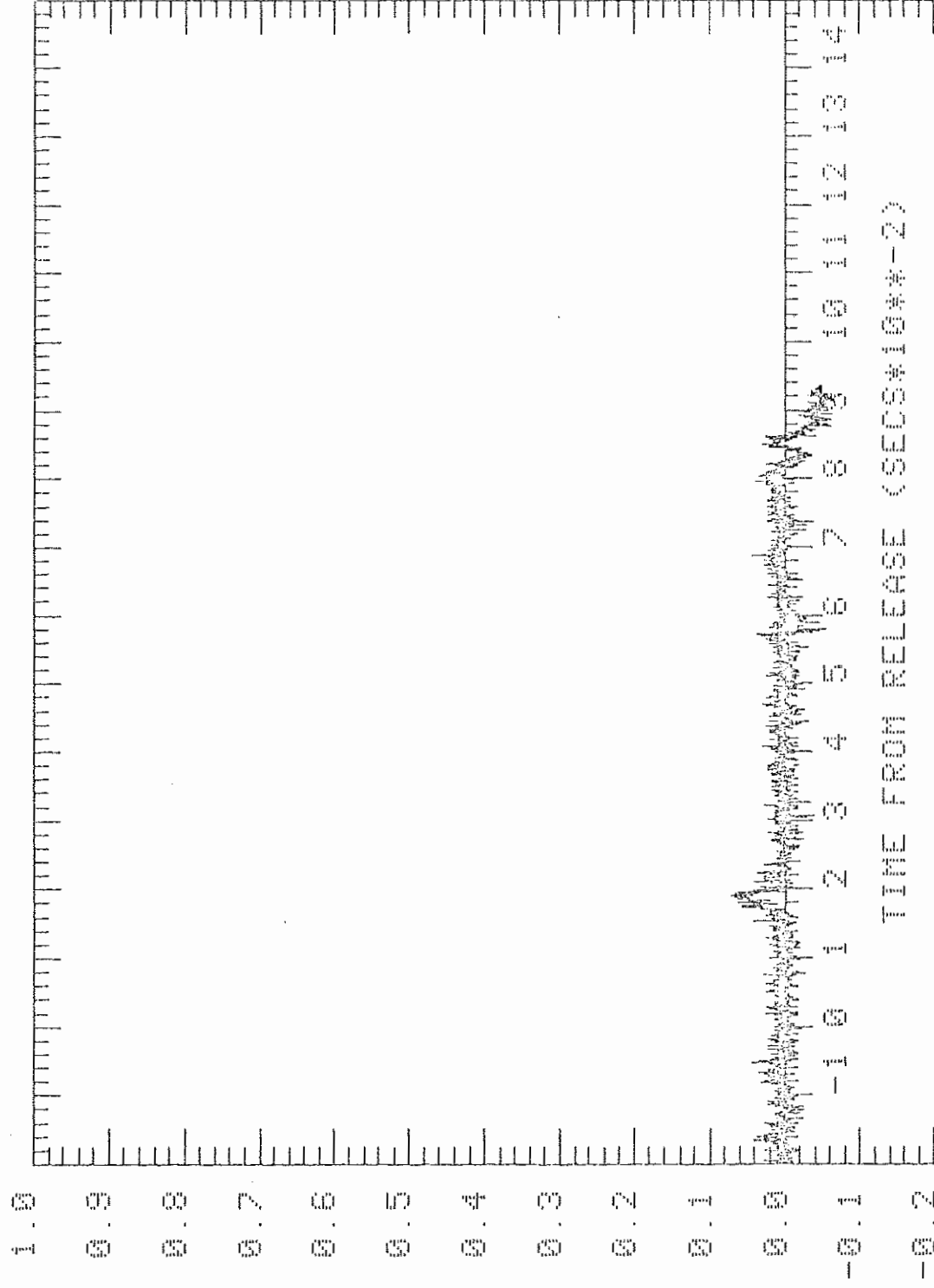


TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 H Y: 400 H Z: 2.4 H

C O L L E C T I O N

(%)

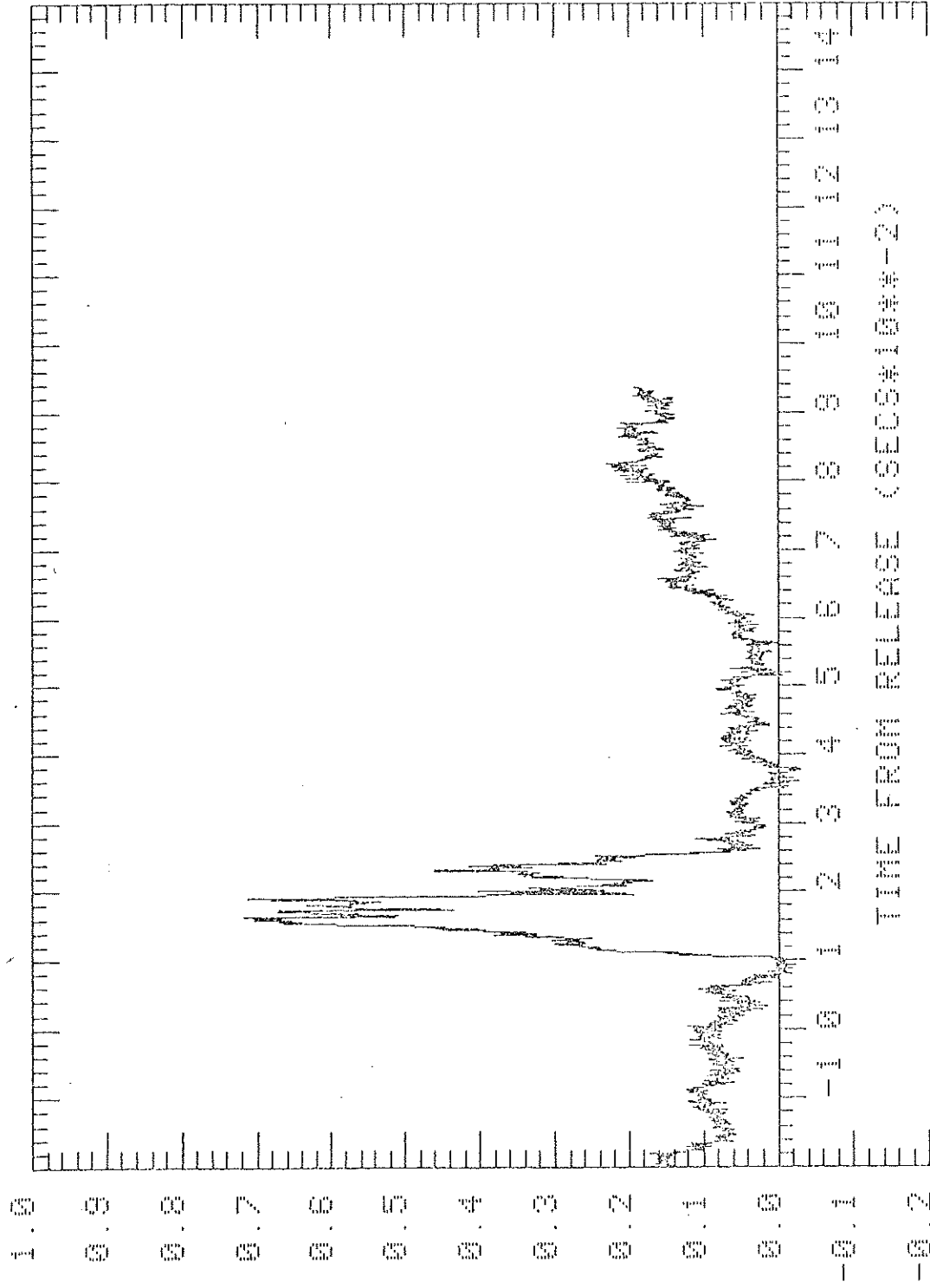


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.5 SECS

X: 200 H Y: 400 H Z: 6.4 H

C O E F F I C I E N T

(%)

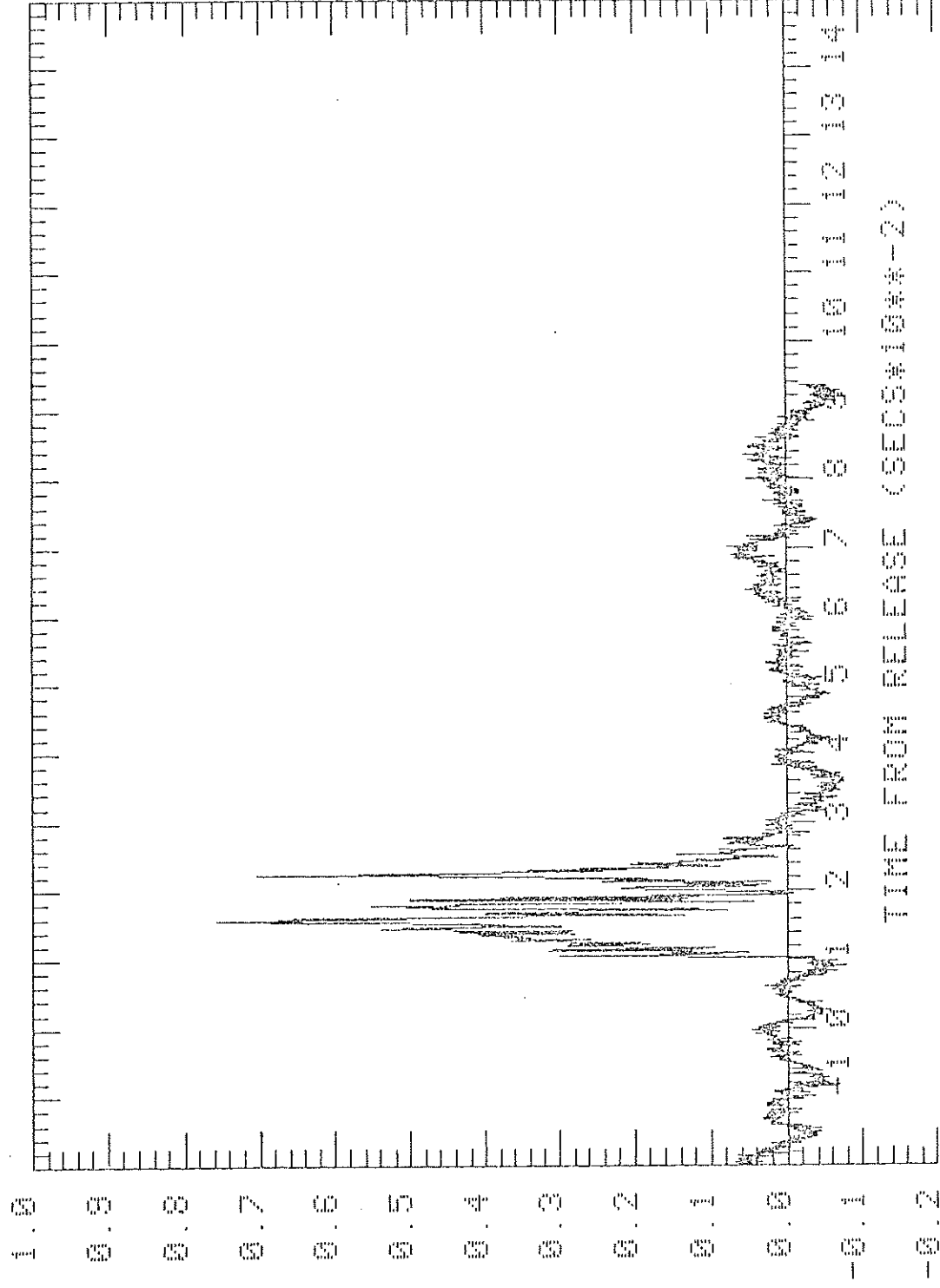


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 400 M Z: 0.4 M

C O N T R O L Z E R C I F F O N

(%)

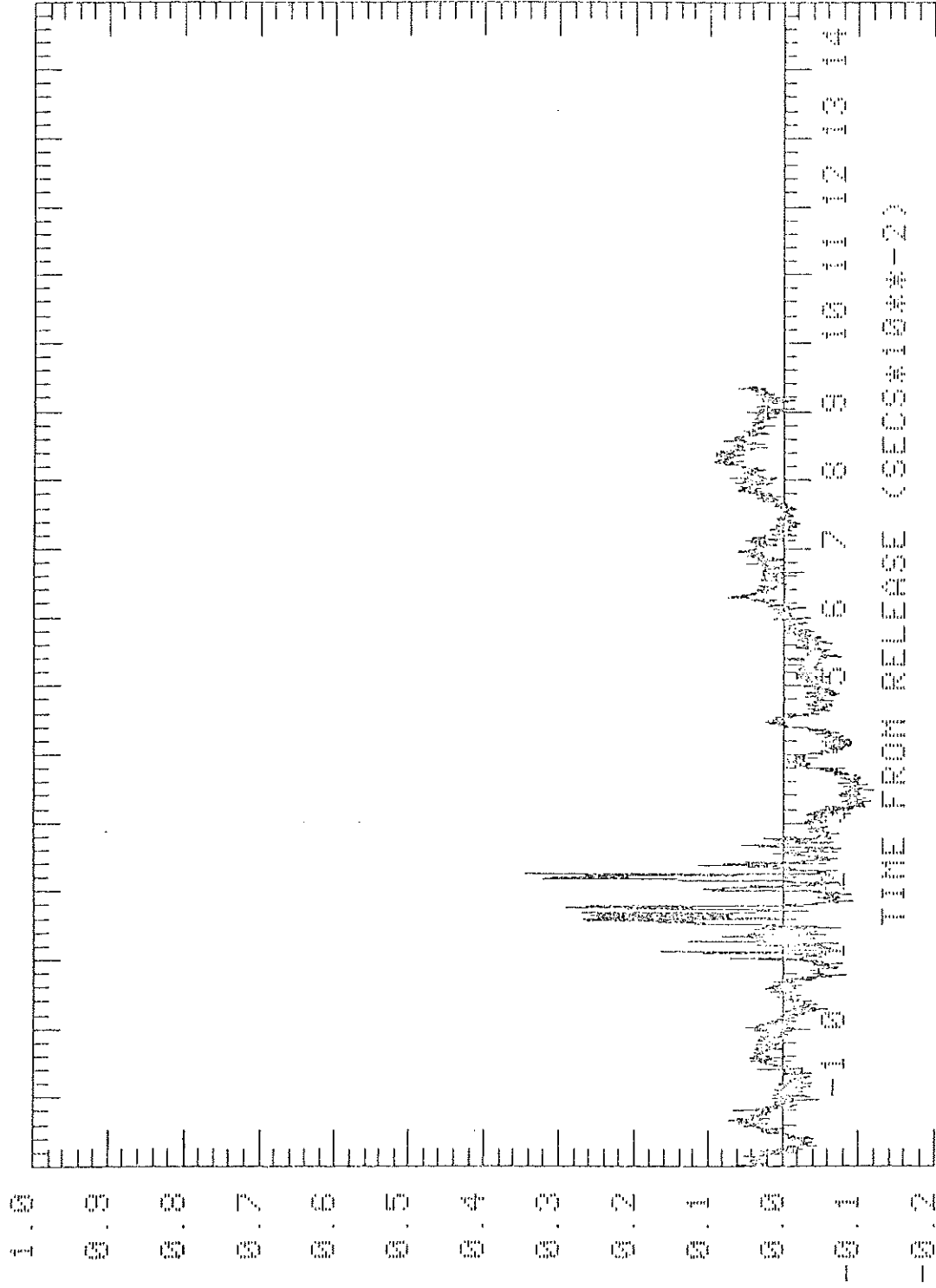


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 390 M Y: 400 M Z: 2.4 M

0 0 2 0 1 1 2 1 2 1 2 1

(2)

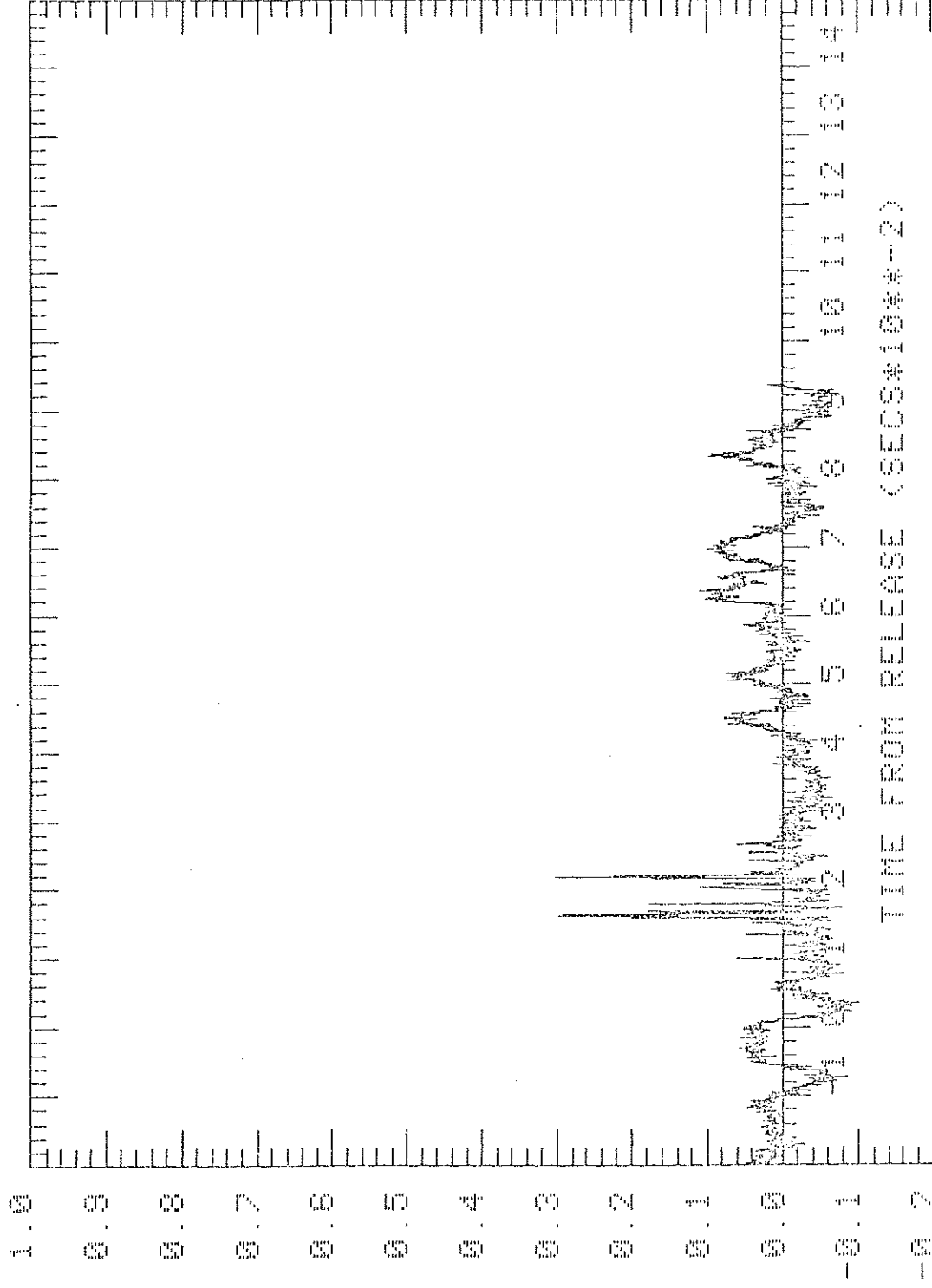


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 400 M Z: 4.4 M

C O E C E F E C F E C

(2)



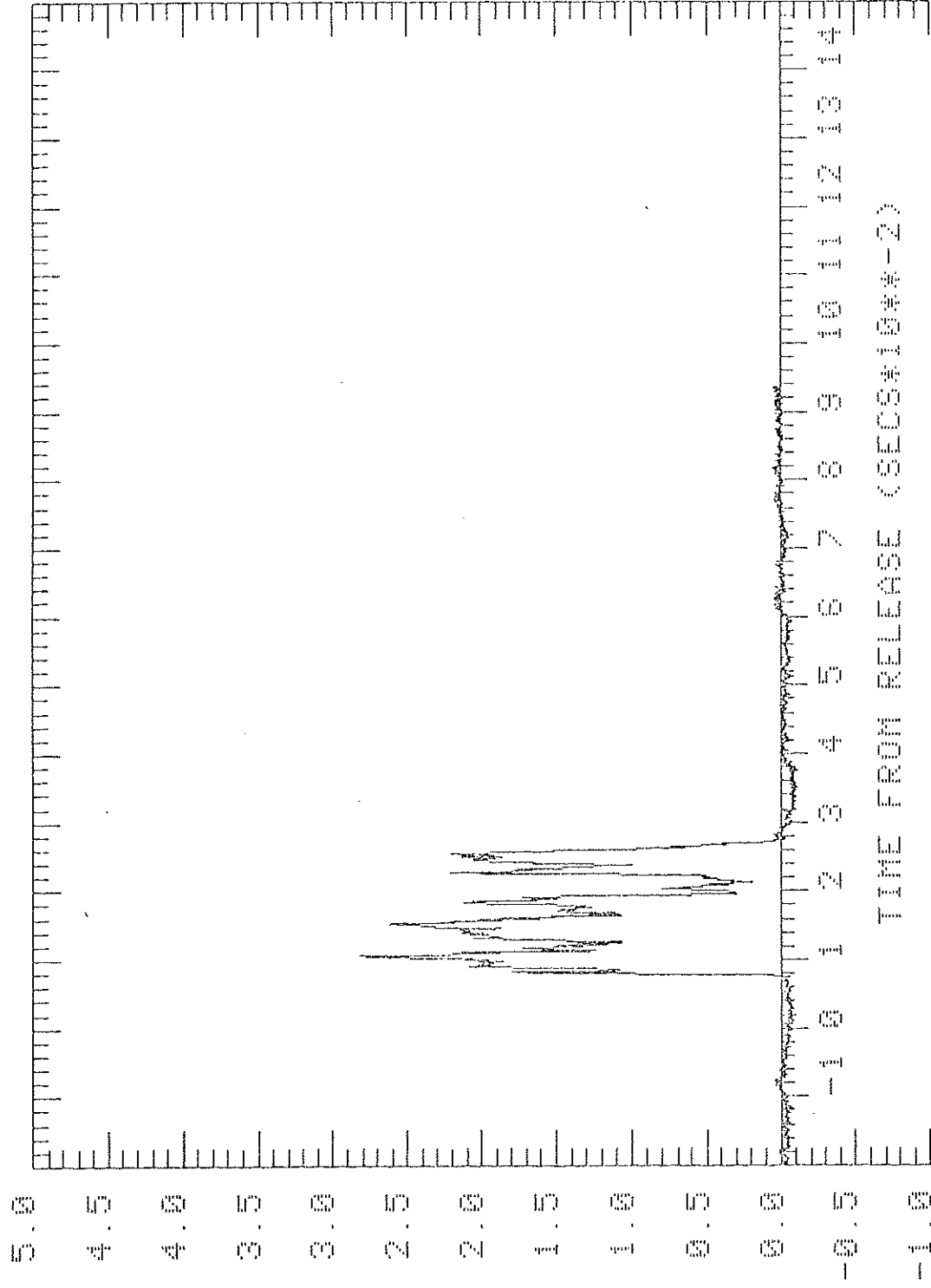
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 400 M Z: 0.4 M

G33

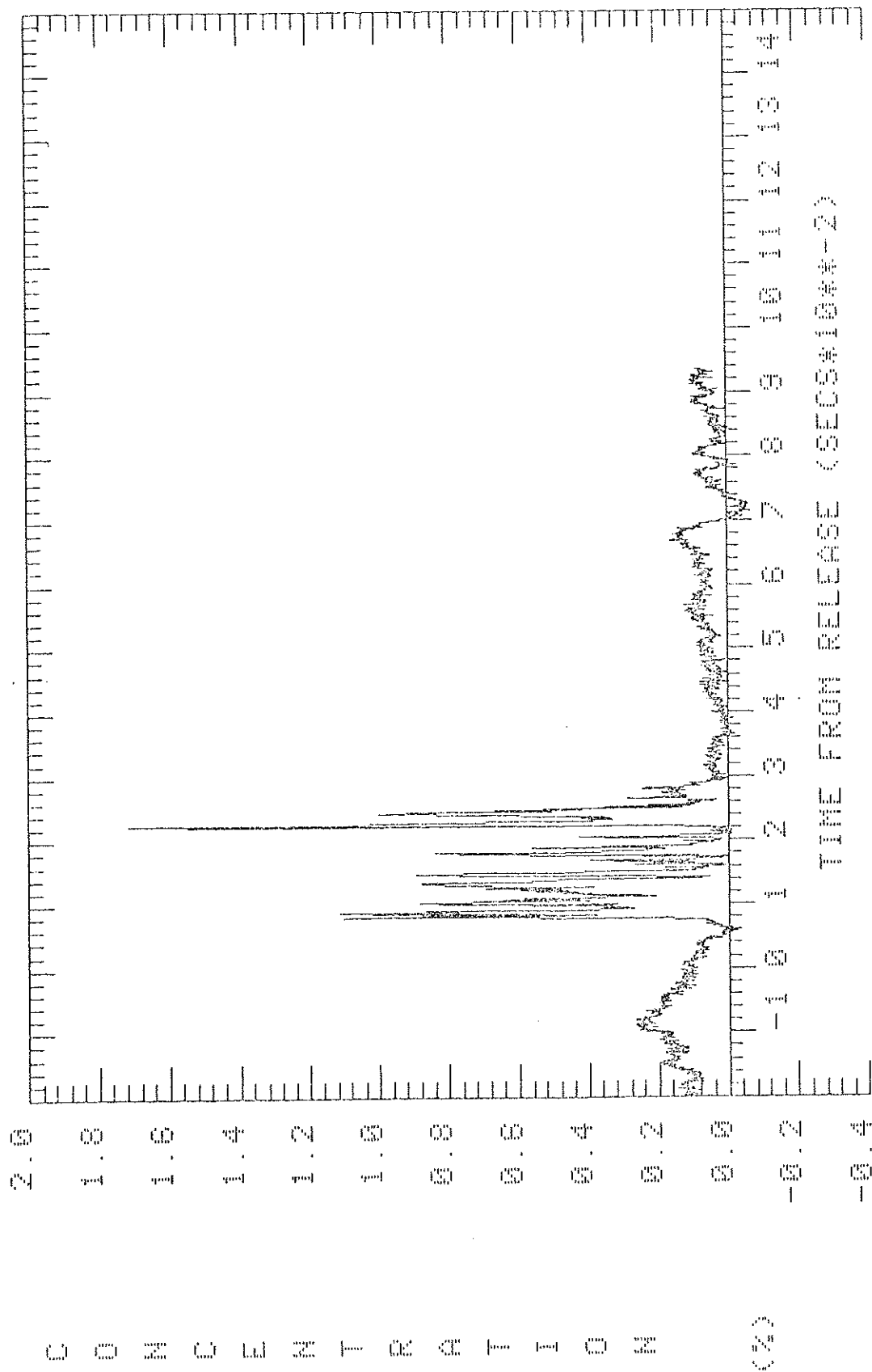
COINTEGRATED

(2)



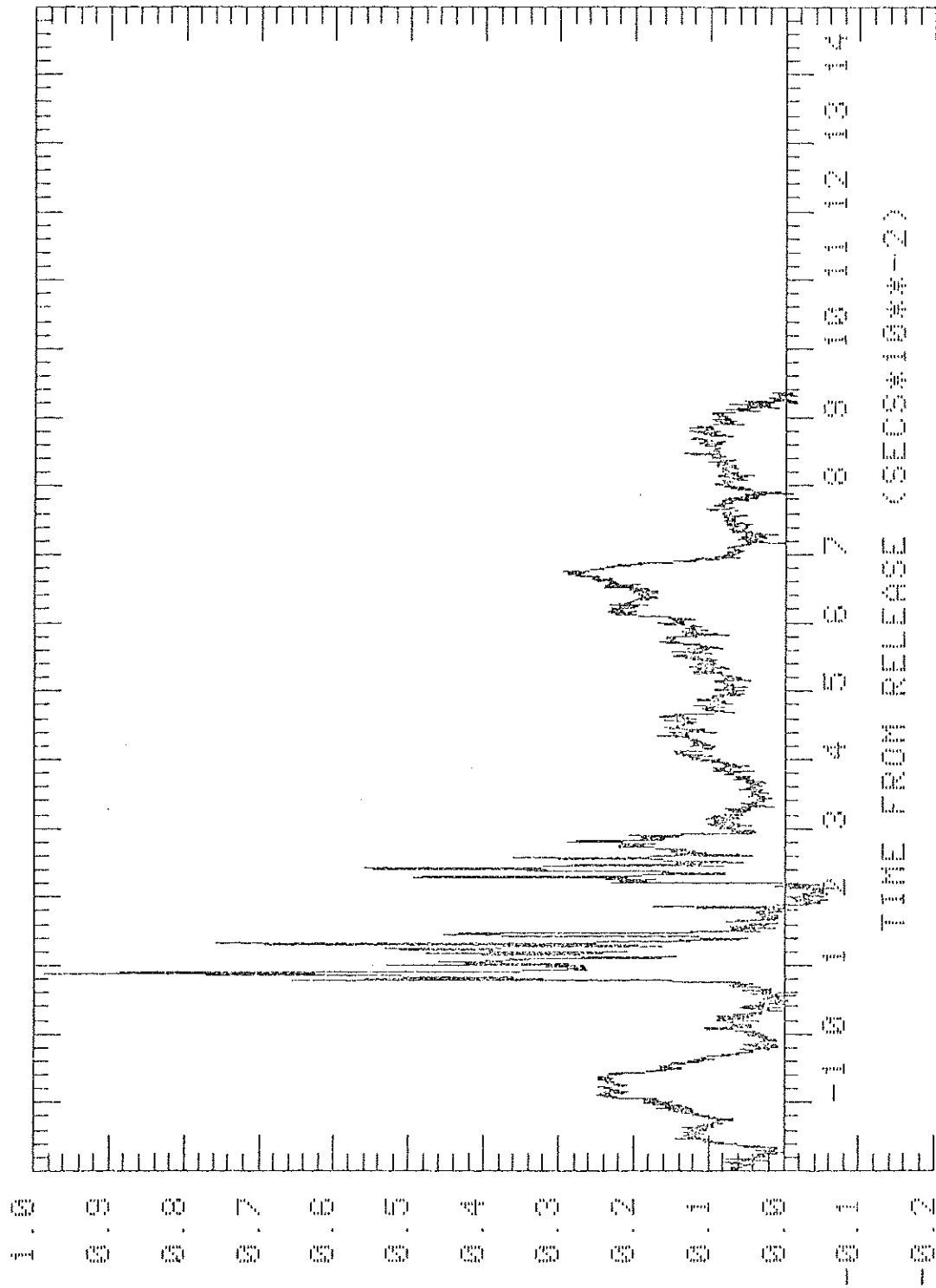
TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 400 M Z: 0.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 N Y: 400 N Z: 2.4 N



0 0 2 0 4 2 1 0 1 1 0 2

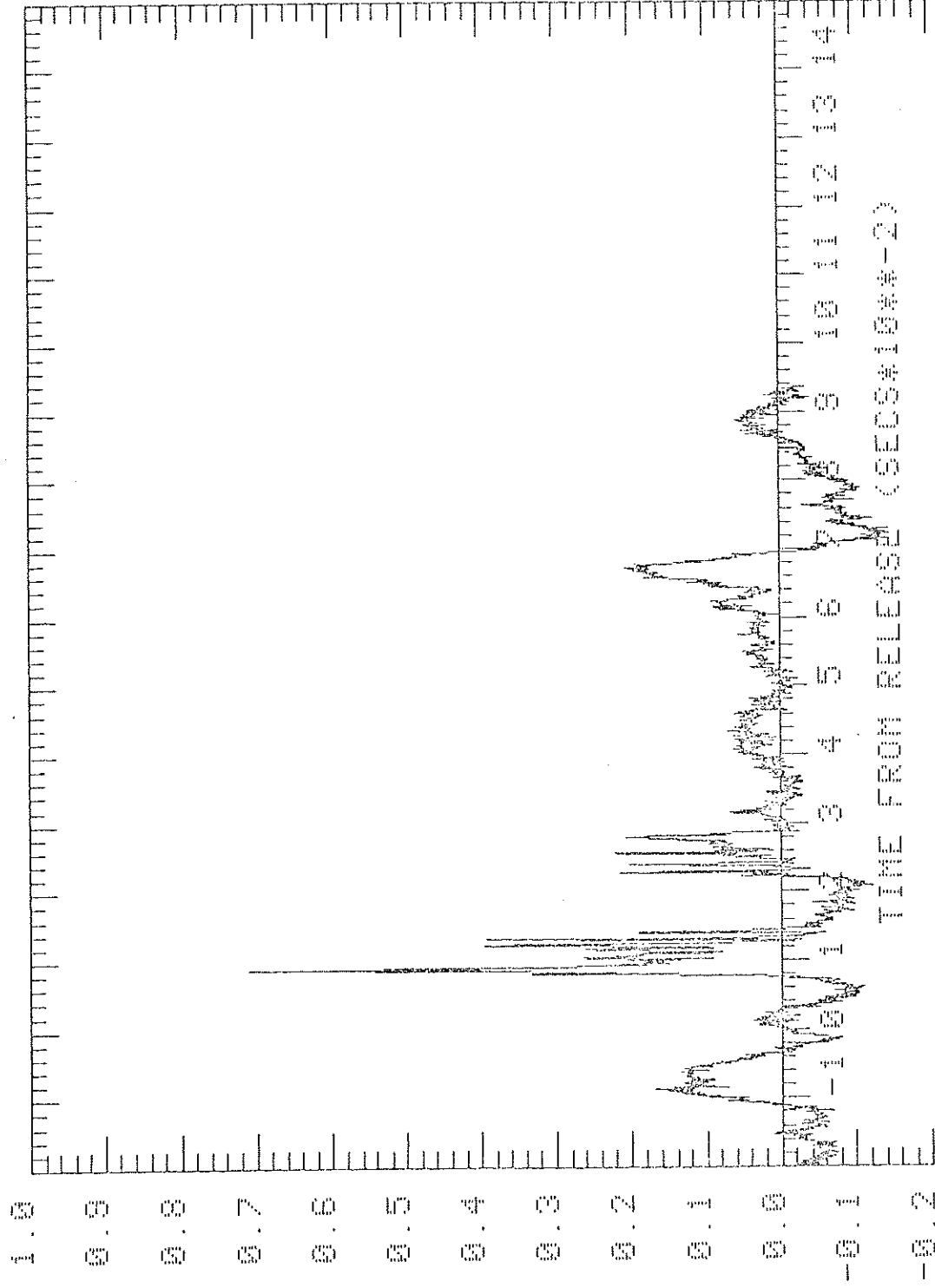
(2)

TRIAL: 005 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 400 H Y: 400 H Z: 4.4 M

COEFFICIENT

(%)



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

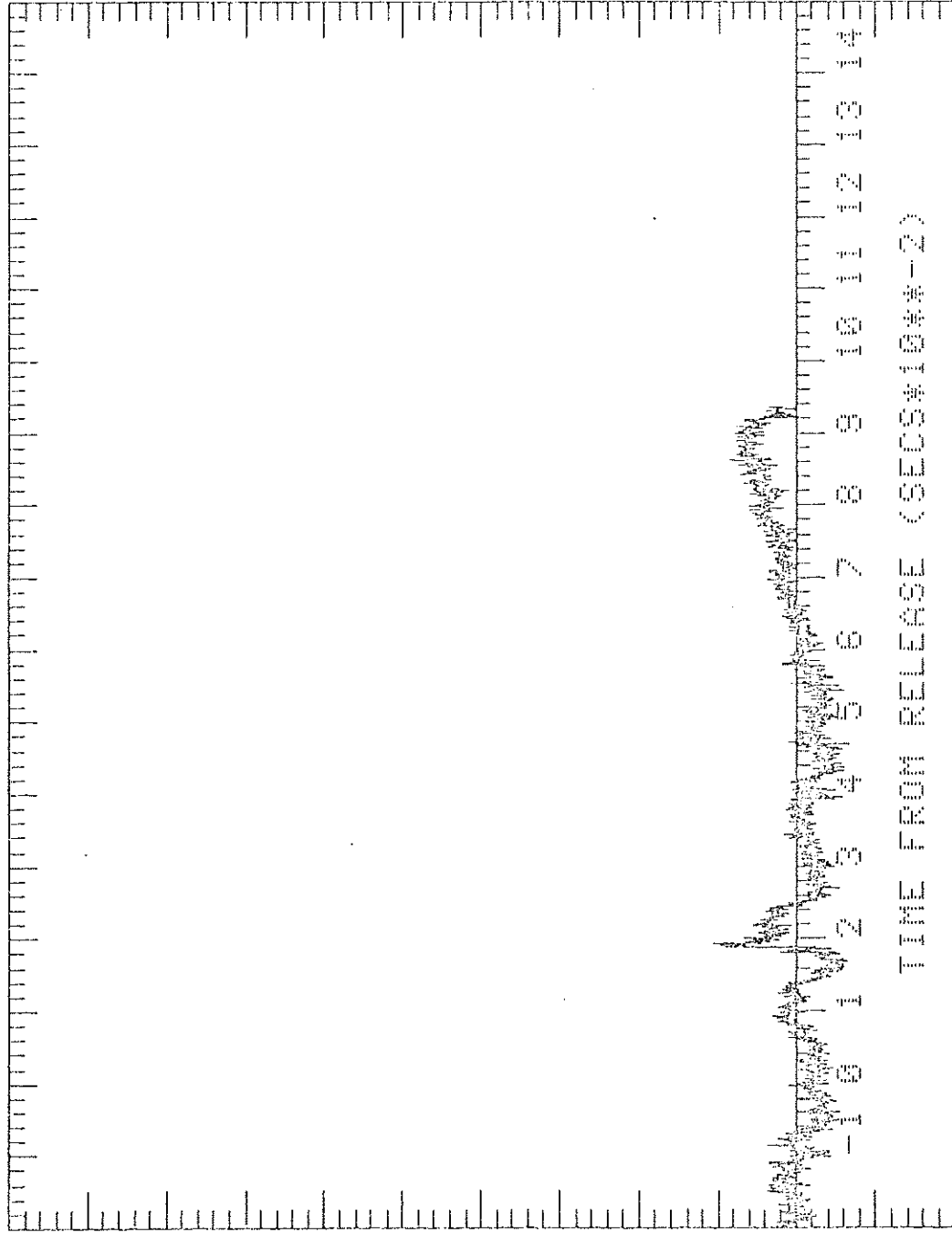
X: 400 M Y: 400 M Z: 0.4 M

G37

1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2

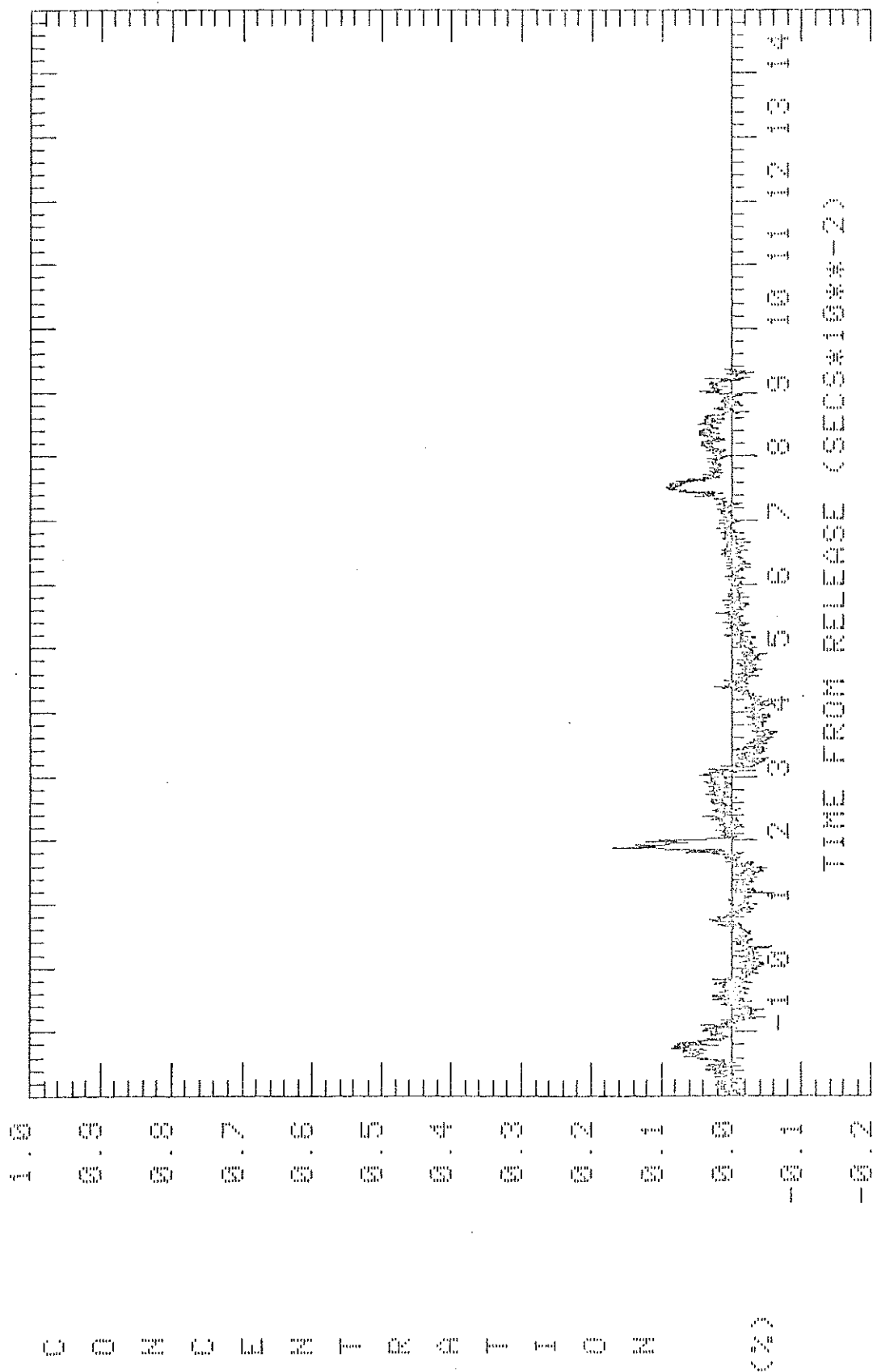
COLLECTOR

(%)



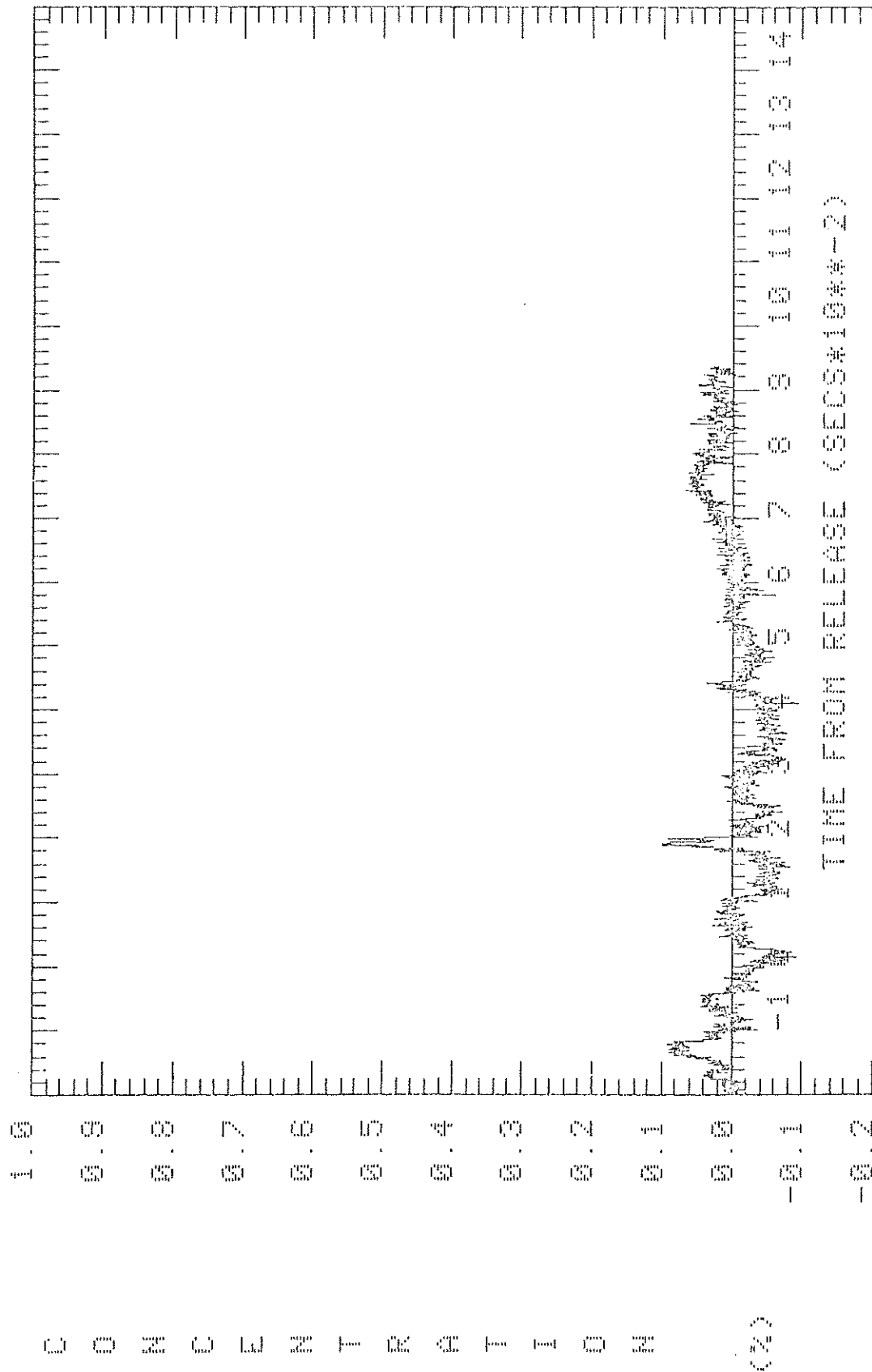
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.5 SECS

X: 200 M Y: 500 M Z: 0.4 M



TRIAL: 998 TYPE: GAS AVERAGING TIME: 0.6 SECS

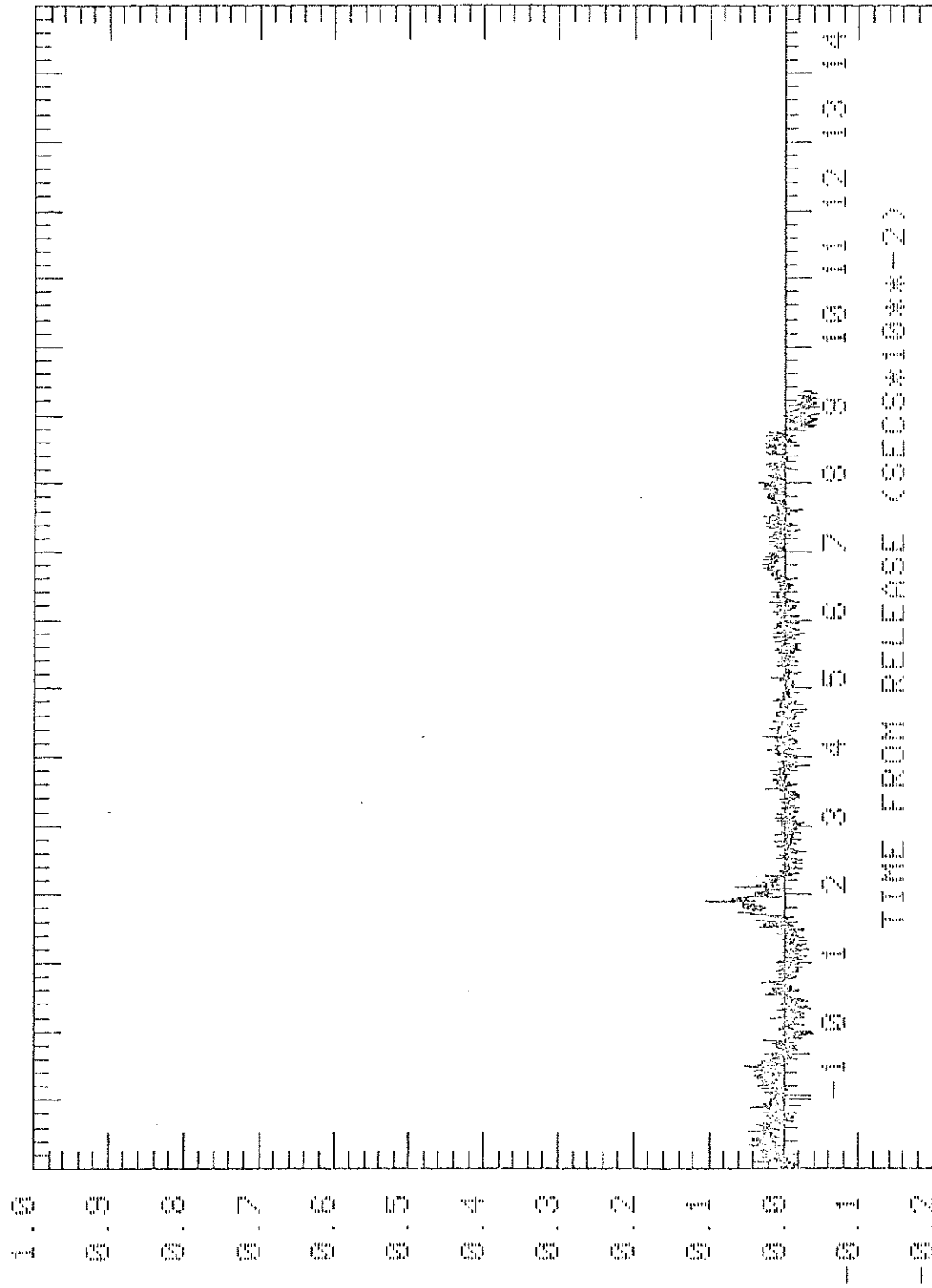
X: 200 M Y: 500 M Z: 2.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

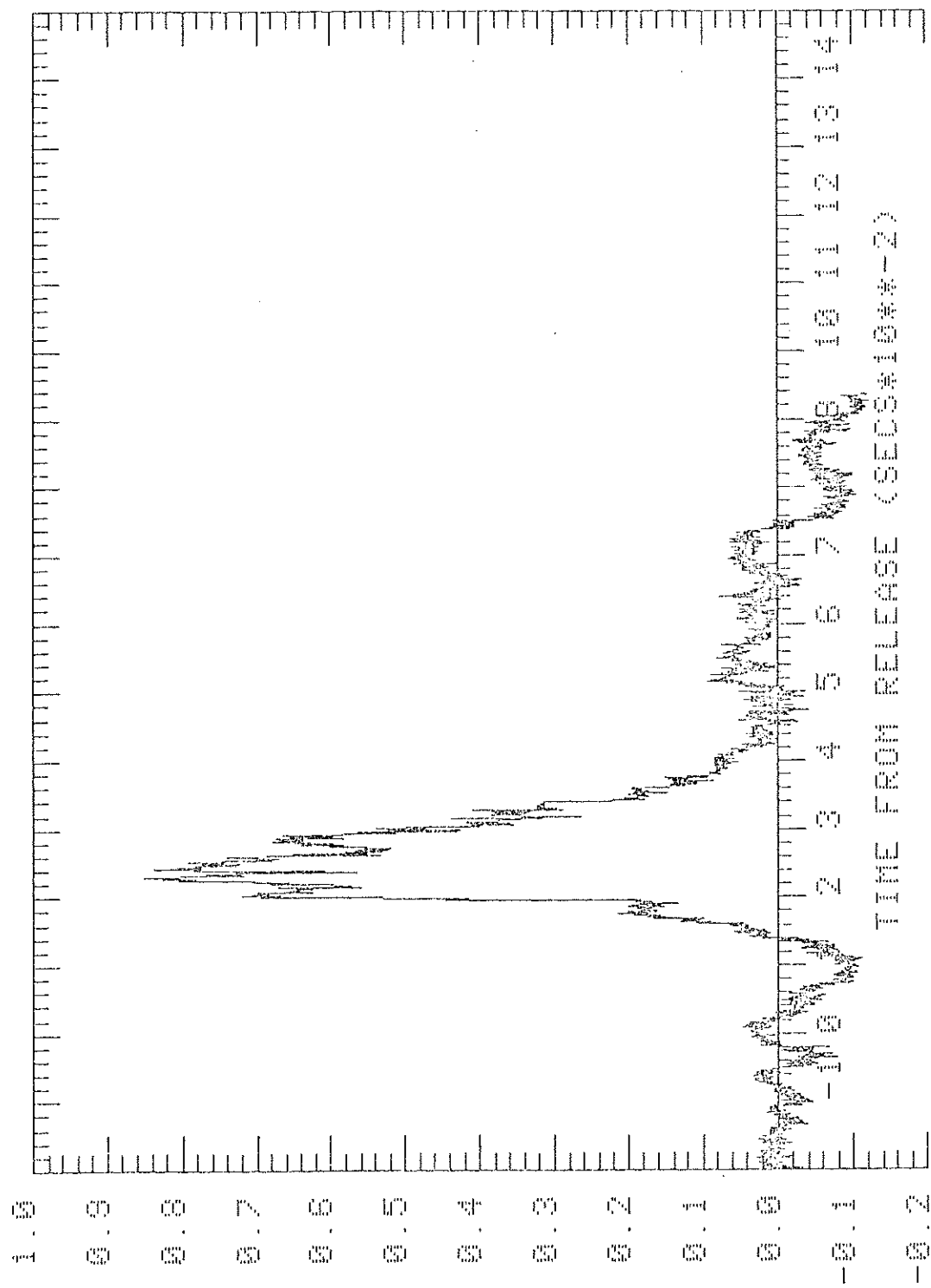
X: 200 M Y: 500 M Z: 4.4 M

O O Z O L Z F E C F F O Z



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 H Y: 500 H Z: 0.4 H

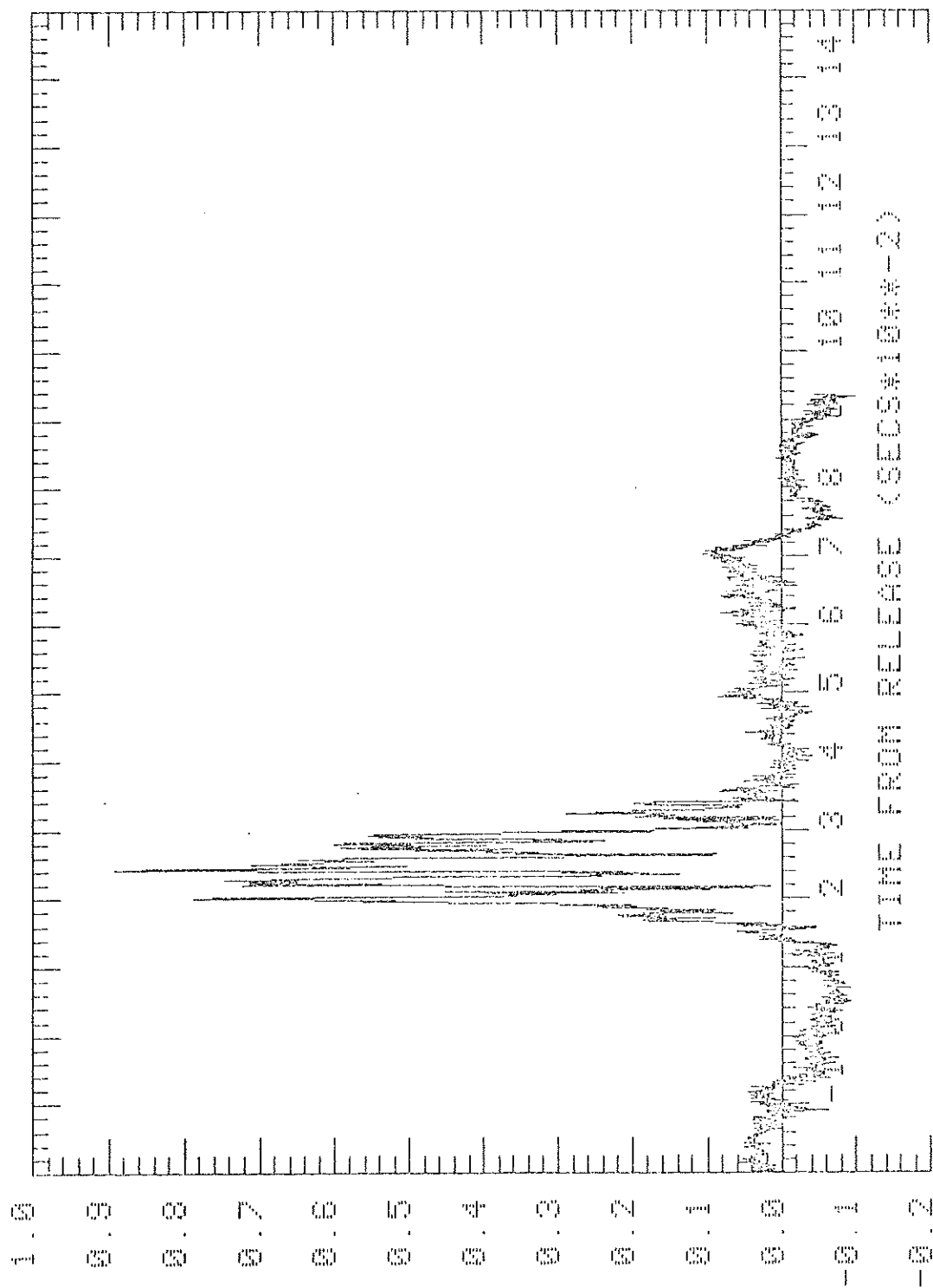


COXLOWZFRQTFQX

(%)

TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 500 M Z: 0.4 M

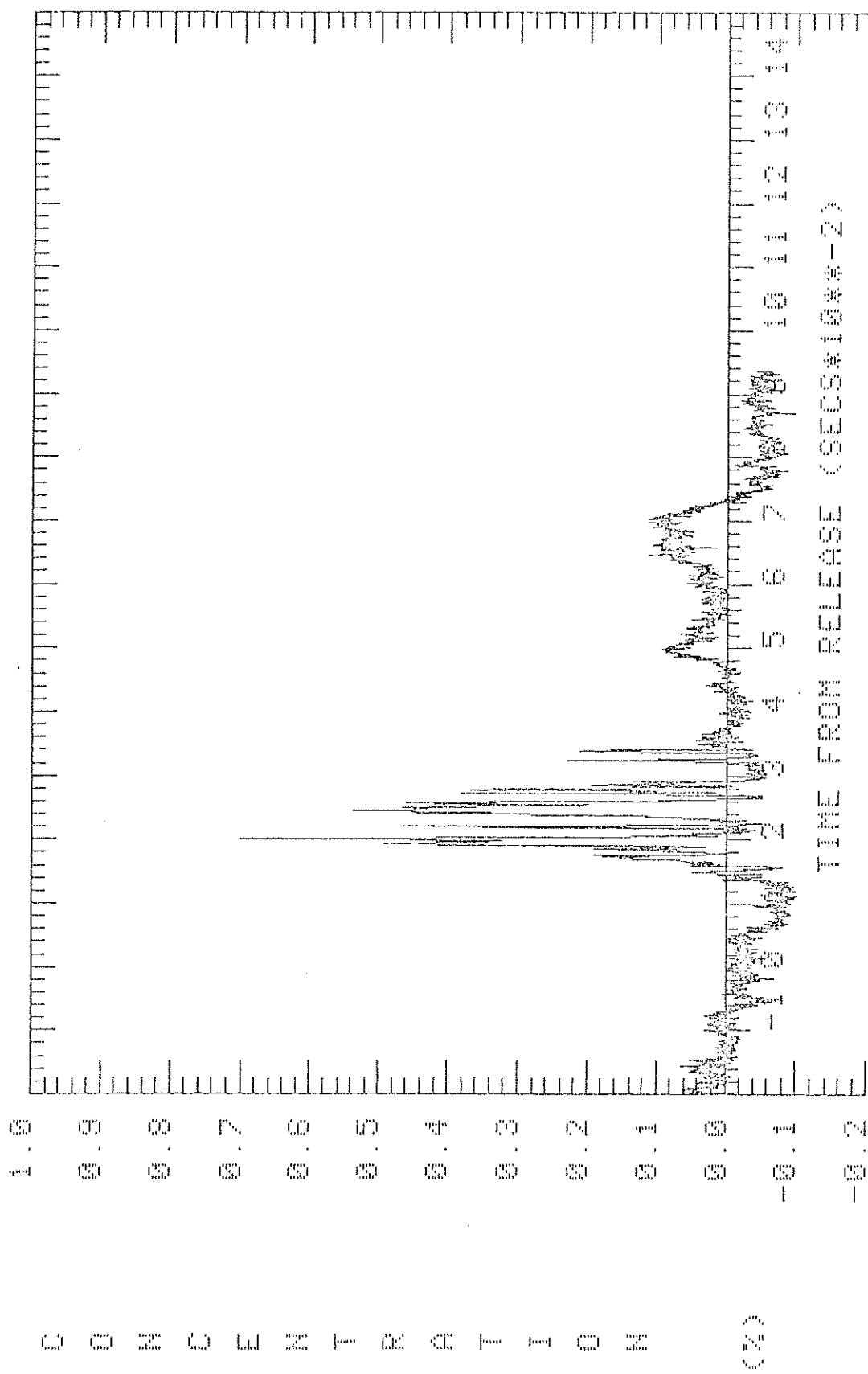


0 0 2 0 1 2 3 4 5 6 7 8 9 0 1 2

(2)

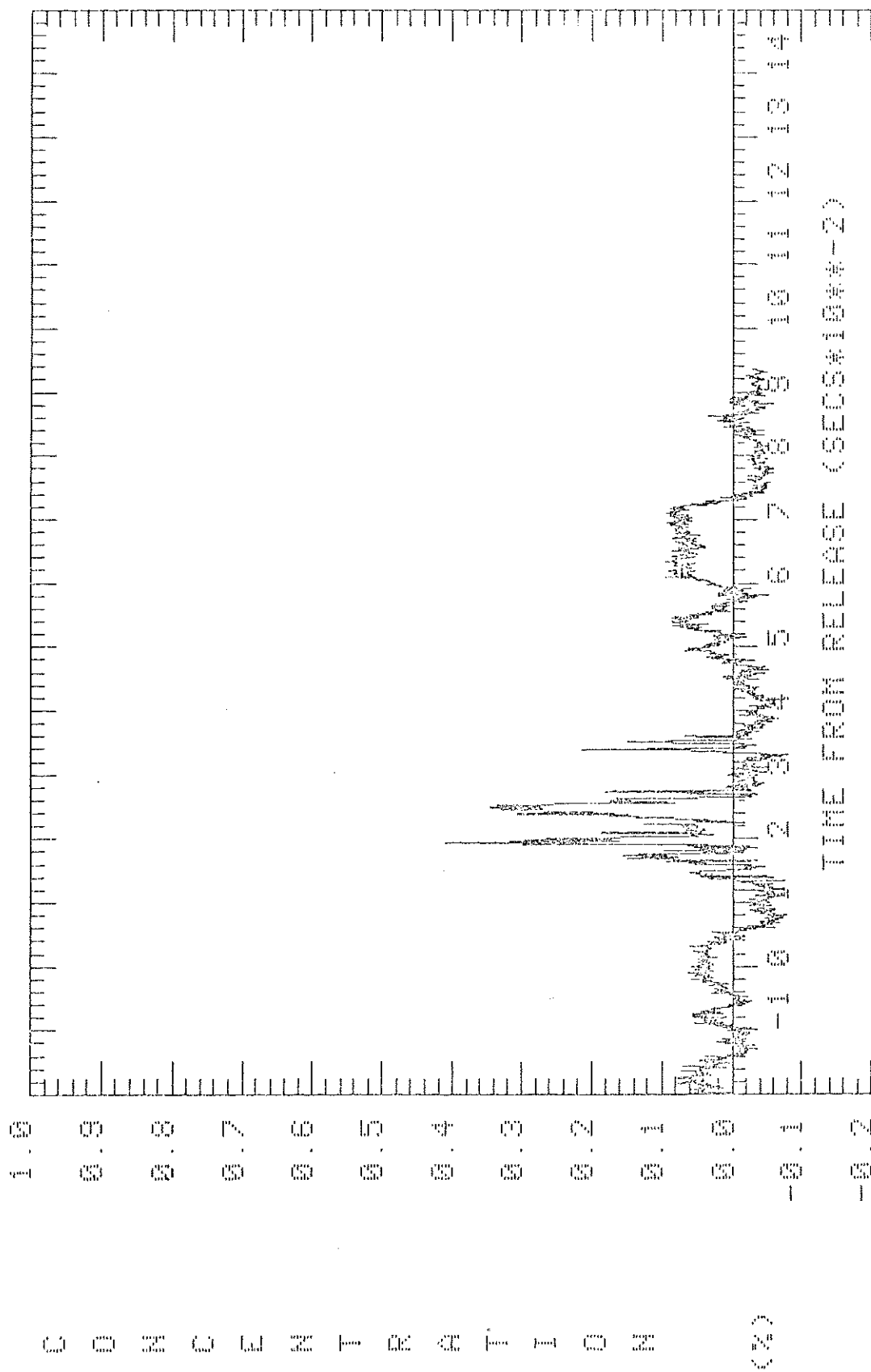
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.5 SECS

X: 300 M Y: 500 M Z: 2.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 H Y: 500 H Z: 4.4 H

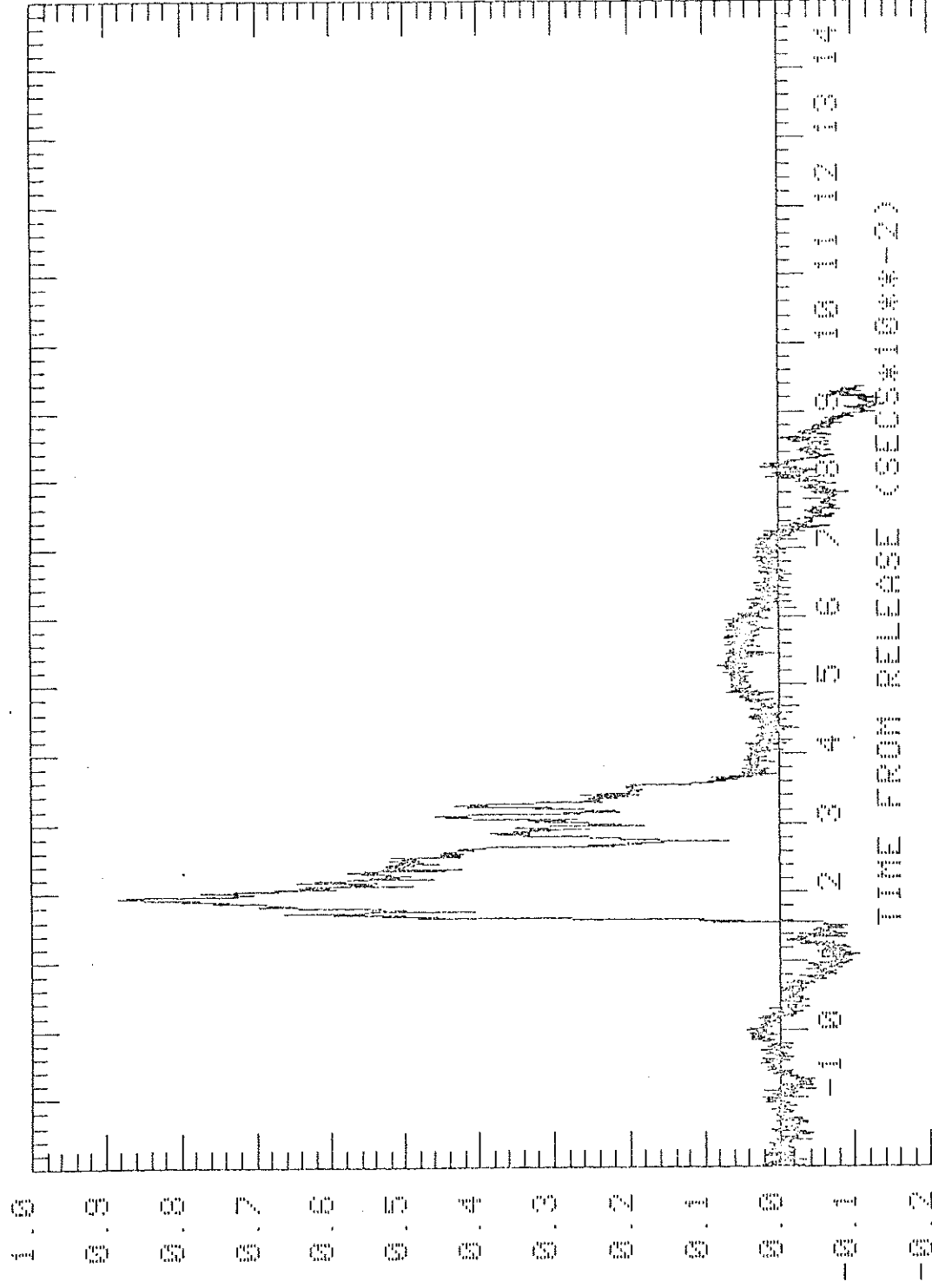


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 590 N Y: 590 N Z: 0.4 N

COXWZTFEATFOH

(%)



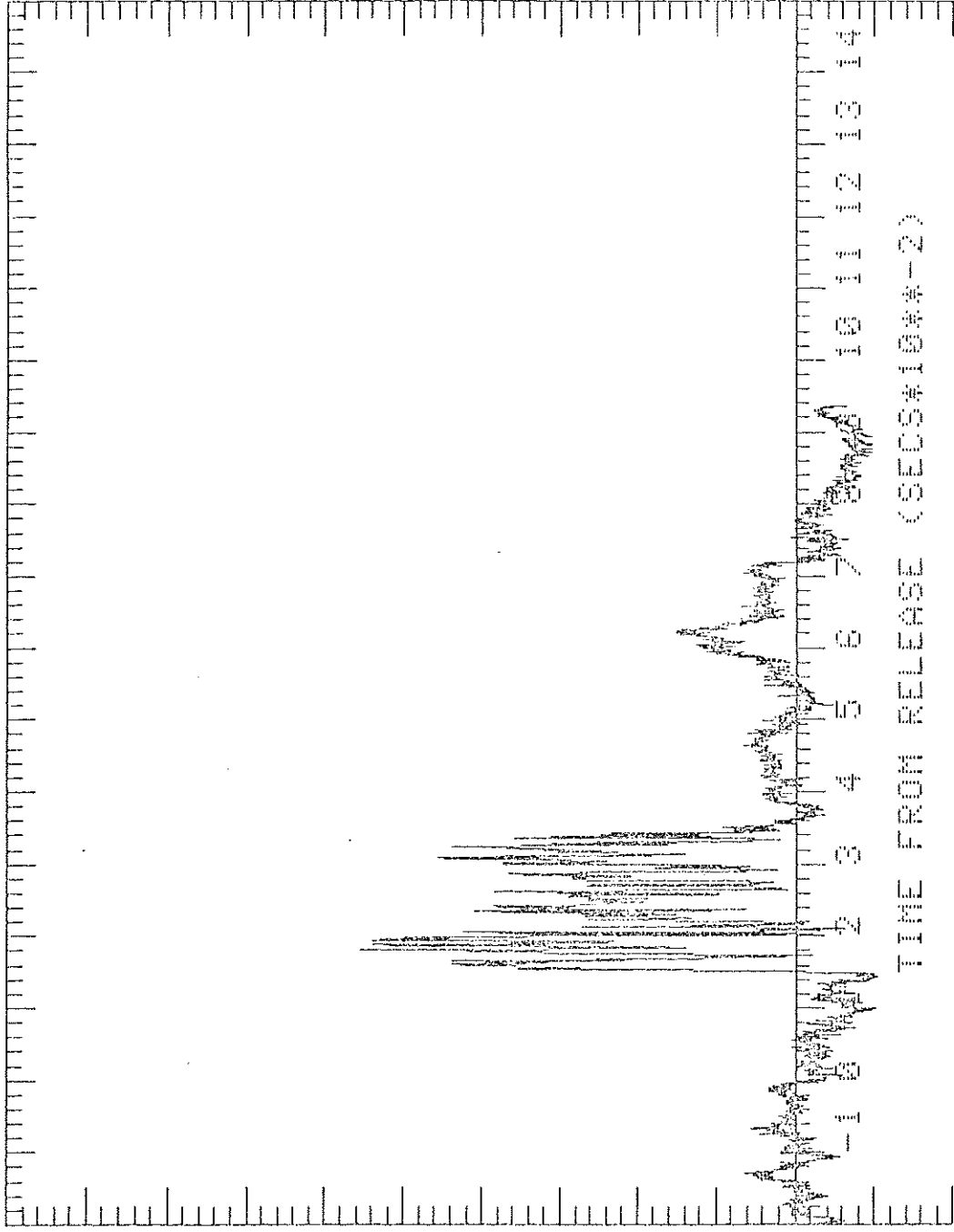
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 H Y: 500 H Z: 0.4 H

1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2

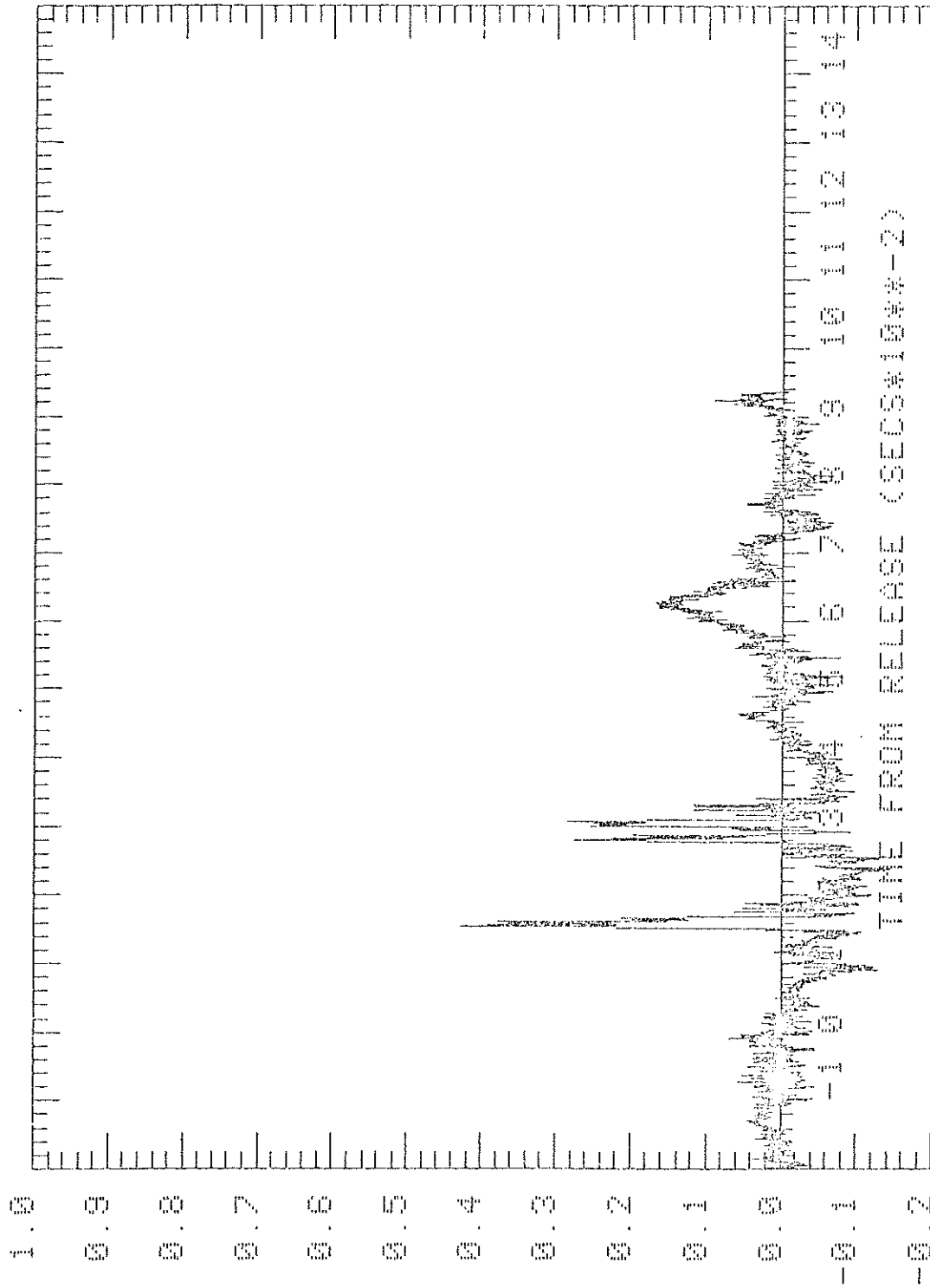
COLLECTOR

(%)



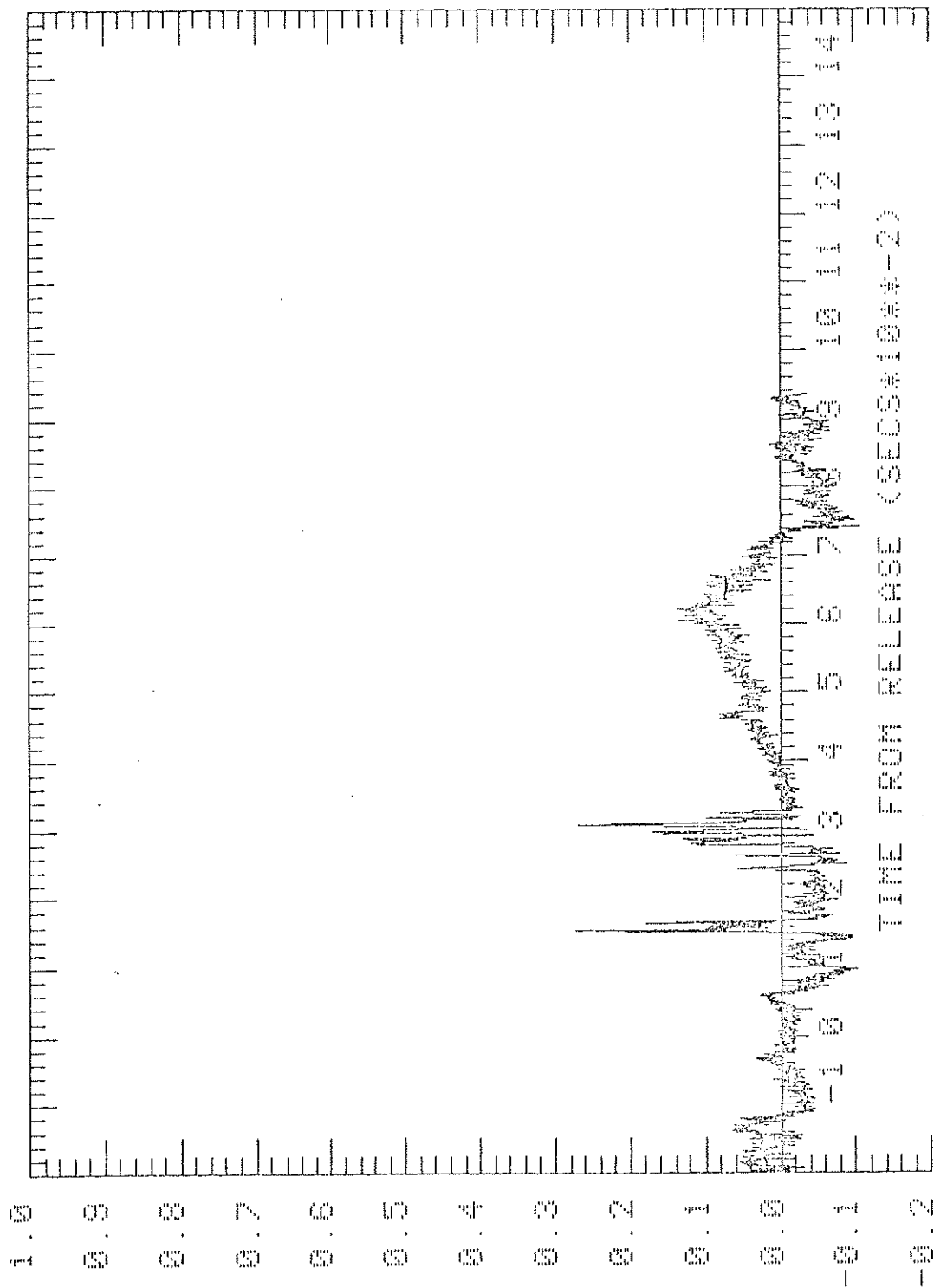
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 500 M Z: 2.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

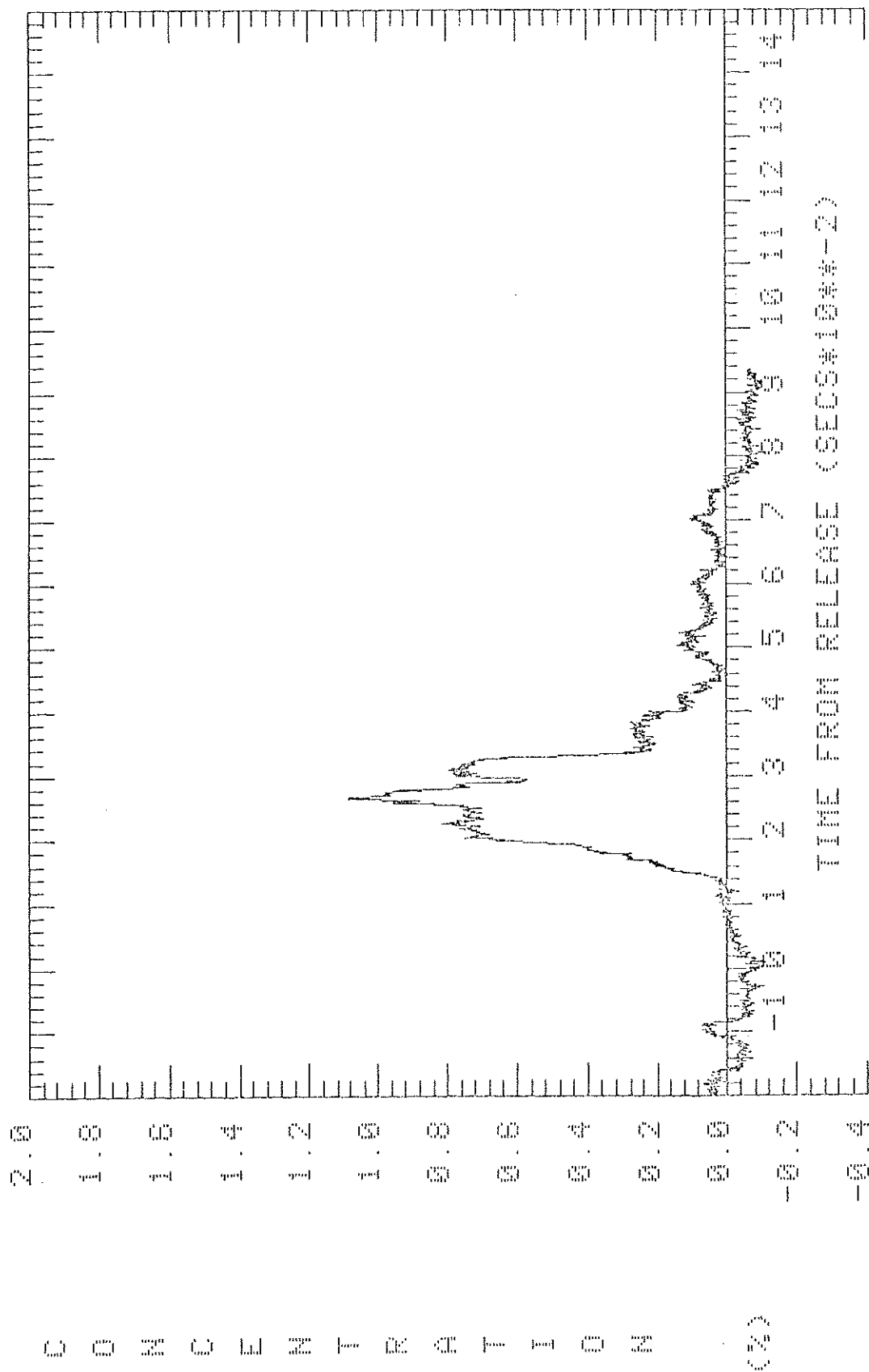
X: 400 M Y: 500 M Z: 4.4 M



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 500 M Z: 6.4 M

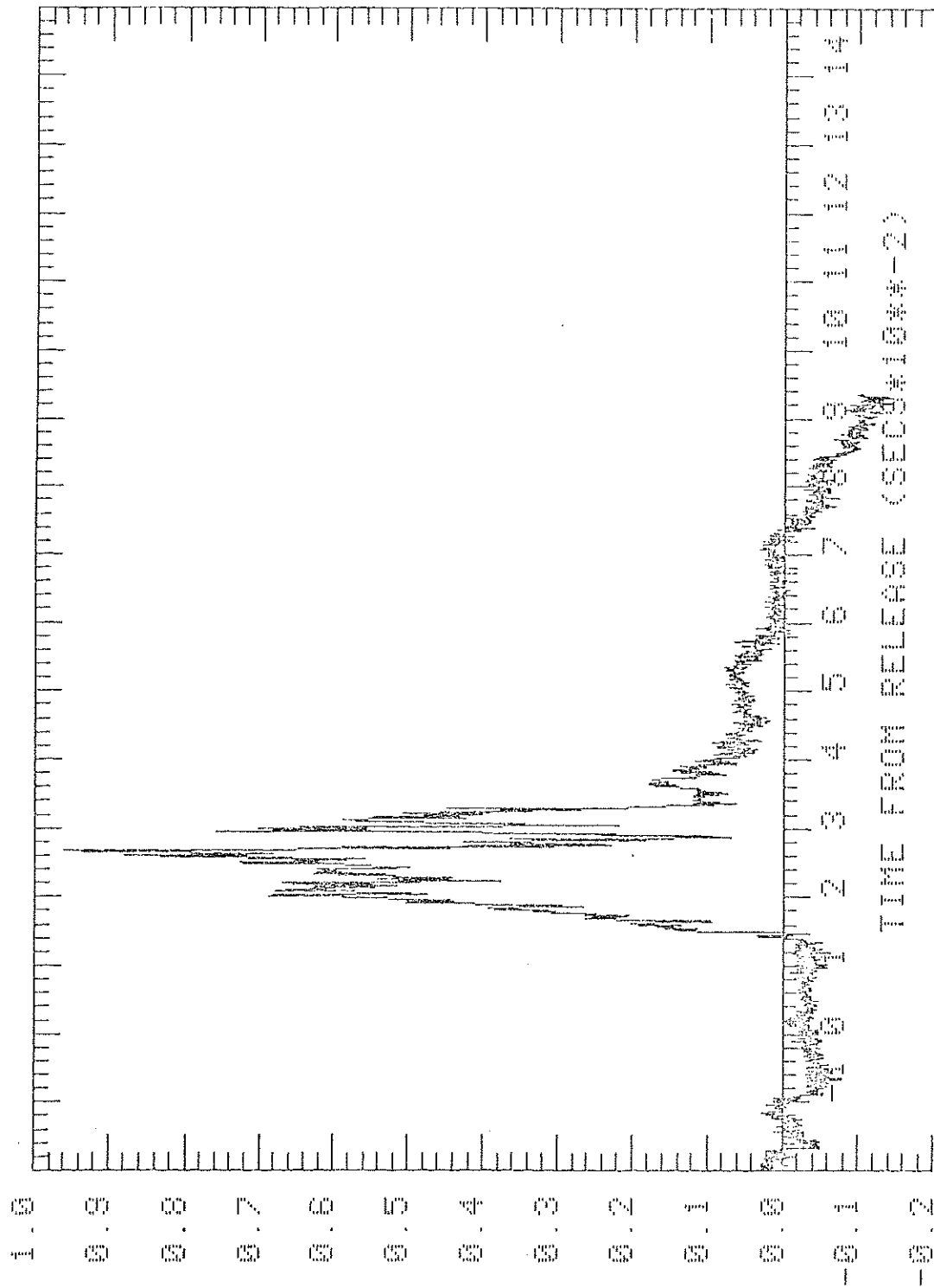


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 300 M Y: 550 M Z: 0.4 M

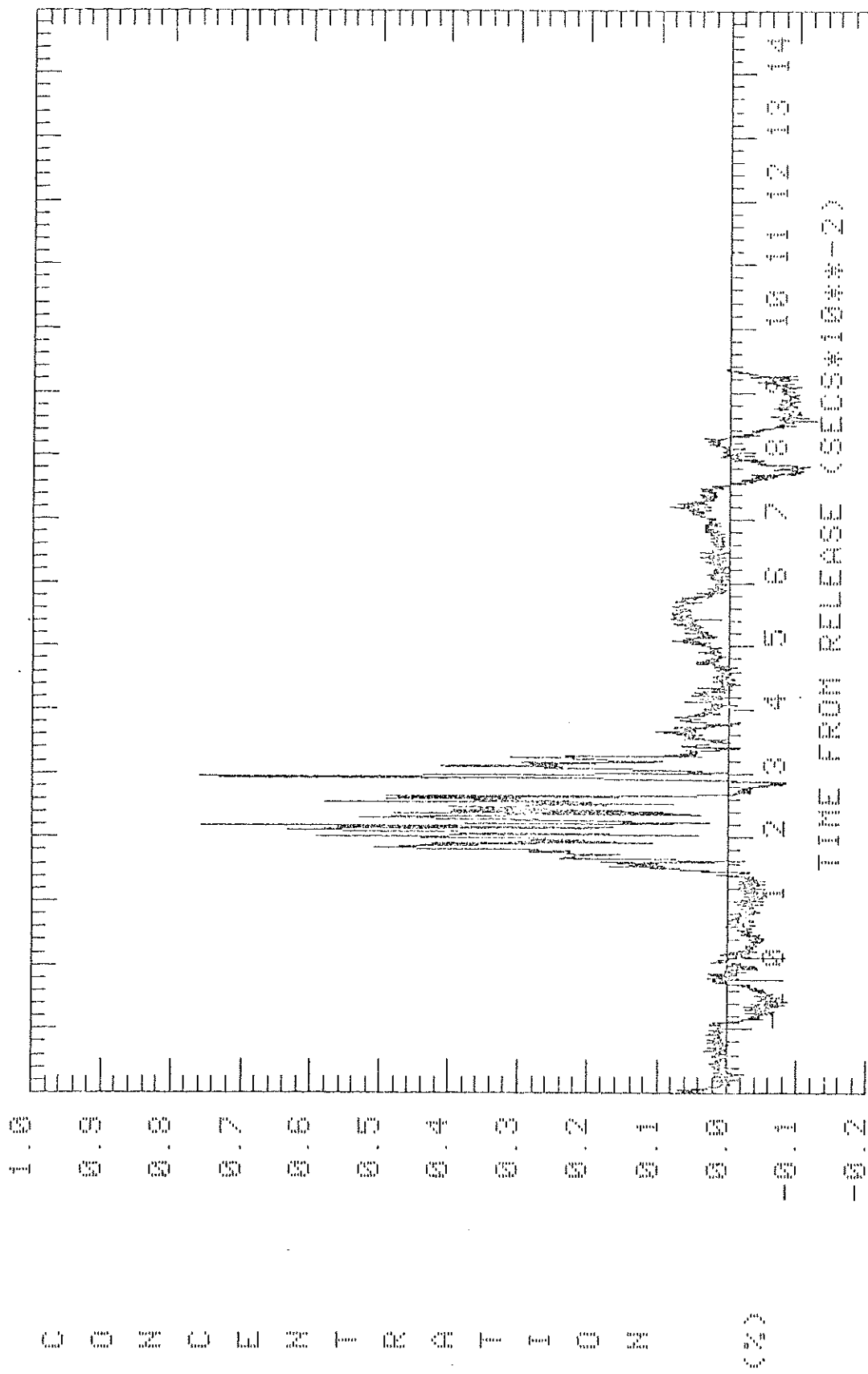
0 0 2 0 1 2 1 2 1 1 0 2

(%)



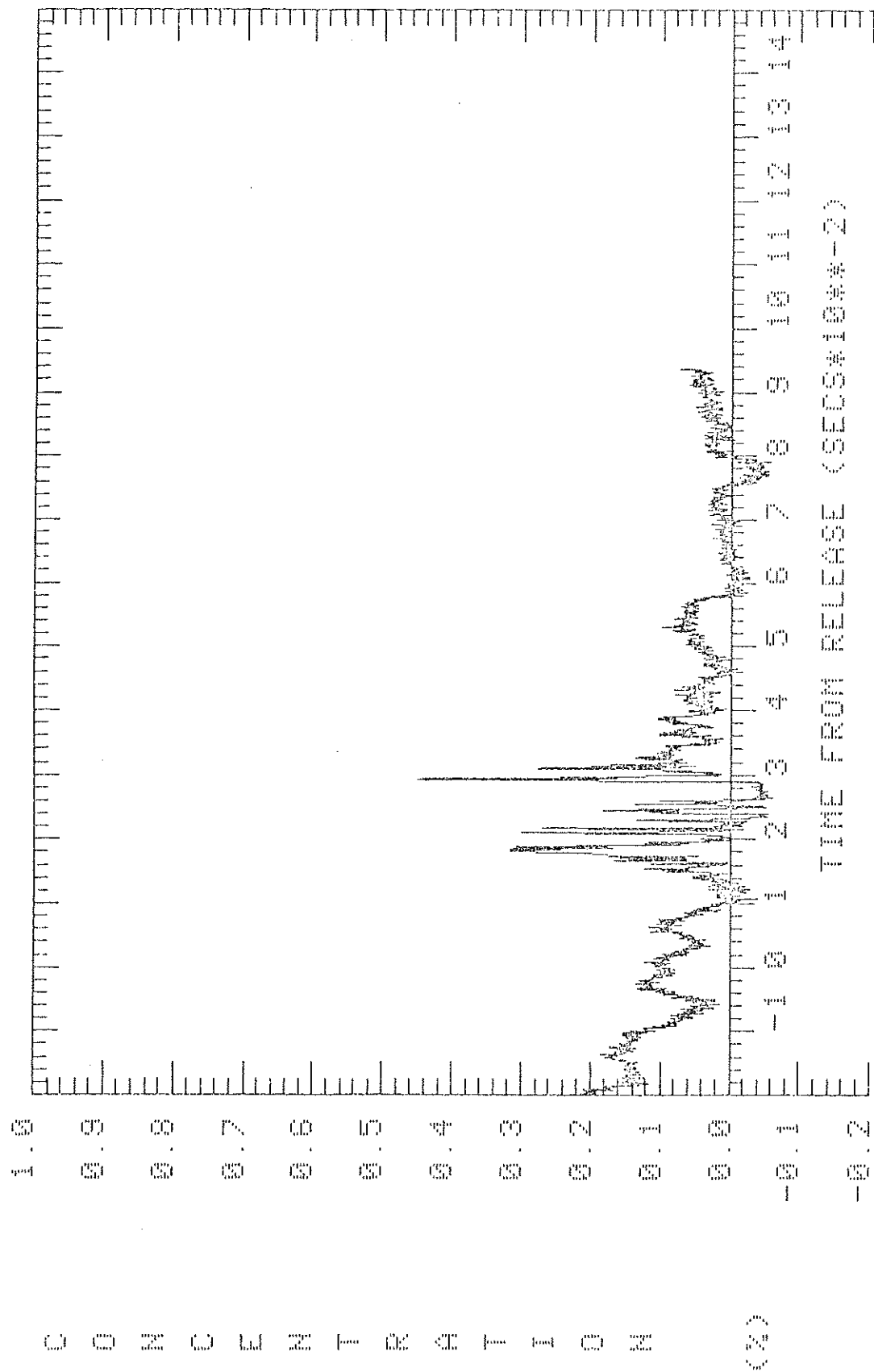
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 550 M Z: 2.4 M



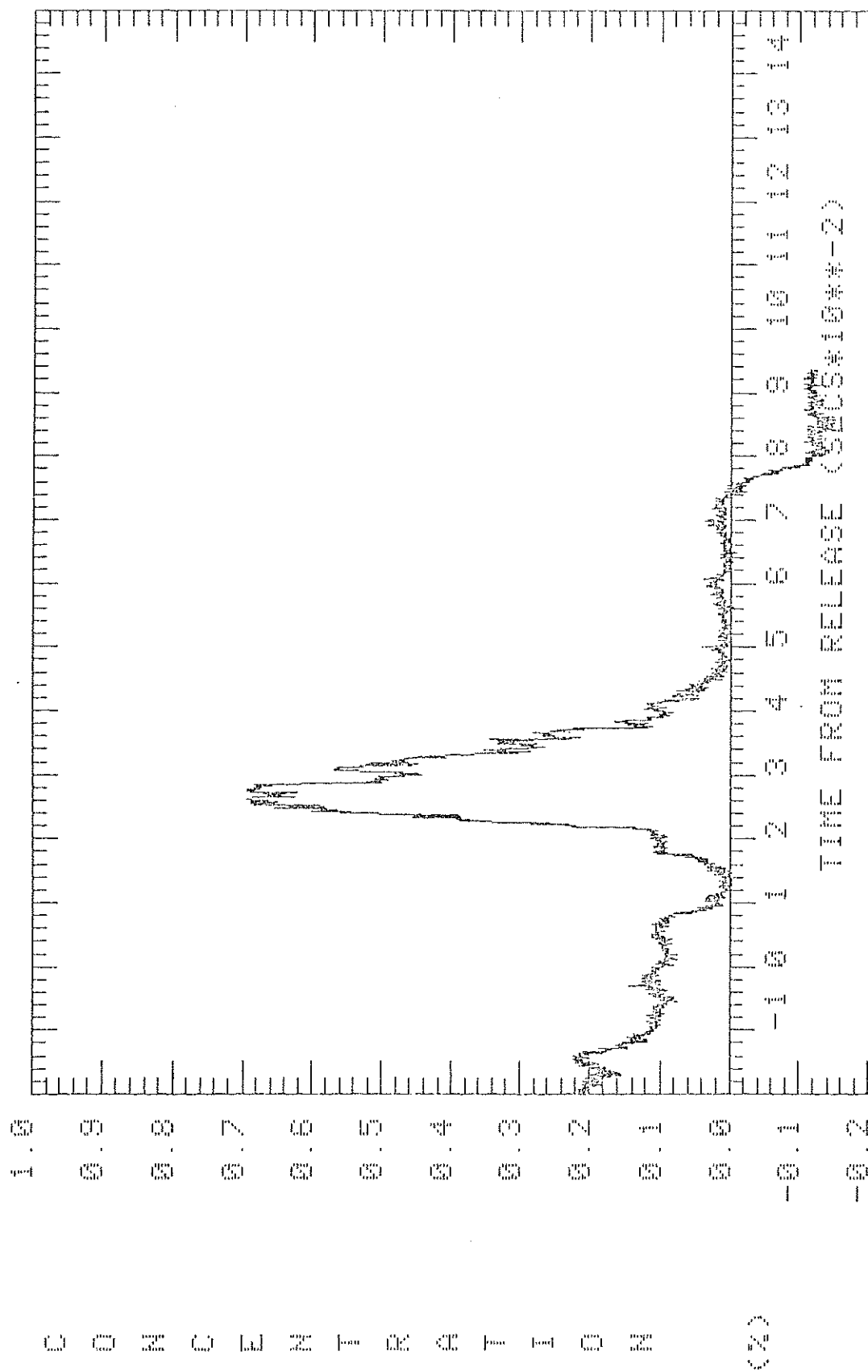
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 550 M Z: 4.4 H



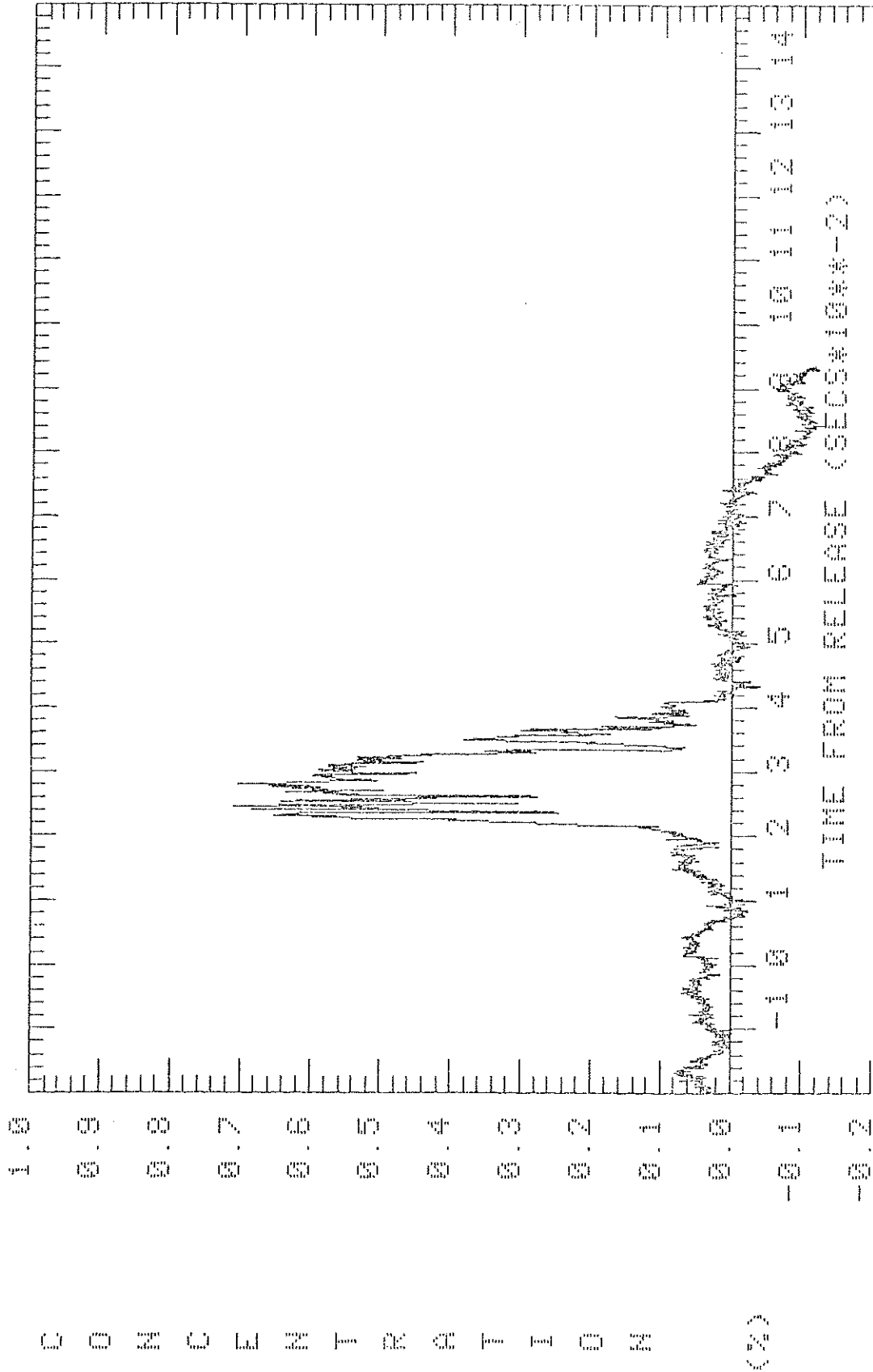
TRIAL: 999 TYPE: GAS AVERAGING TIME: 9.6 SECS

X: 399 M Y: 550 M Z: 6.4 M



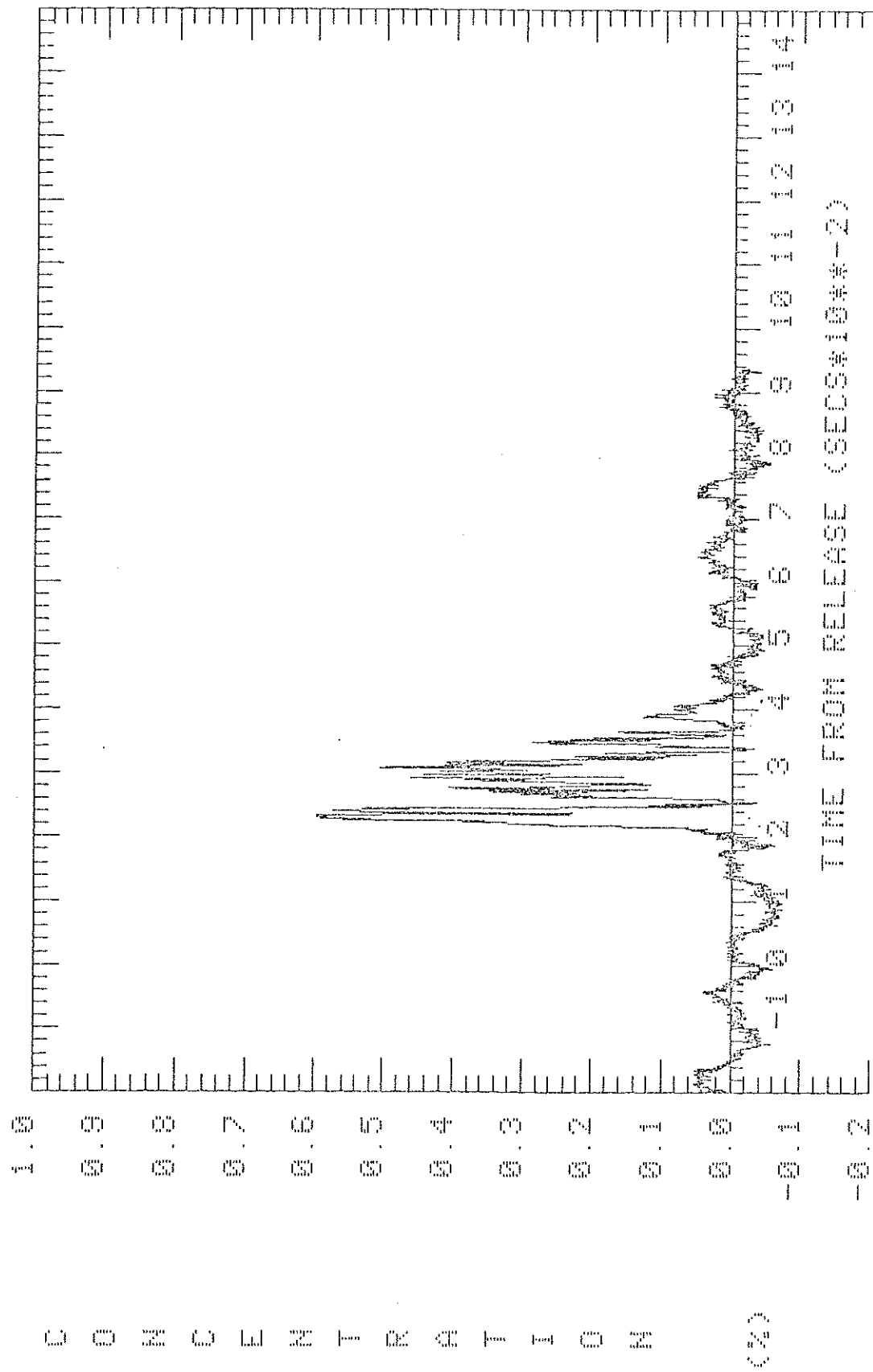
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 600 M Z: 0.4 M



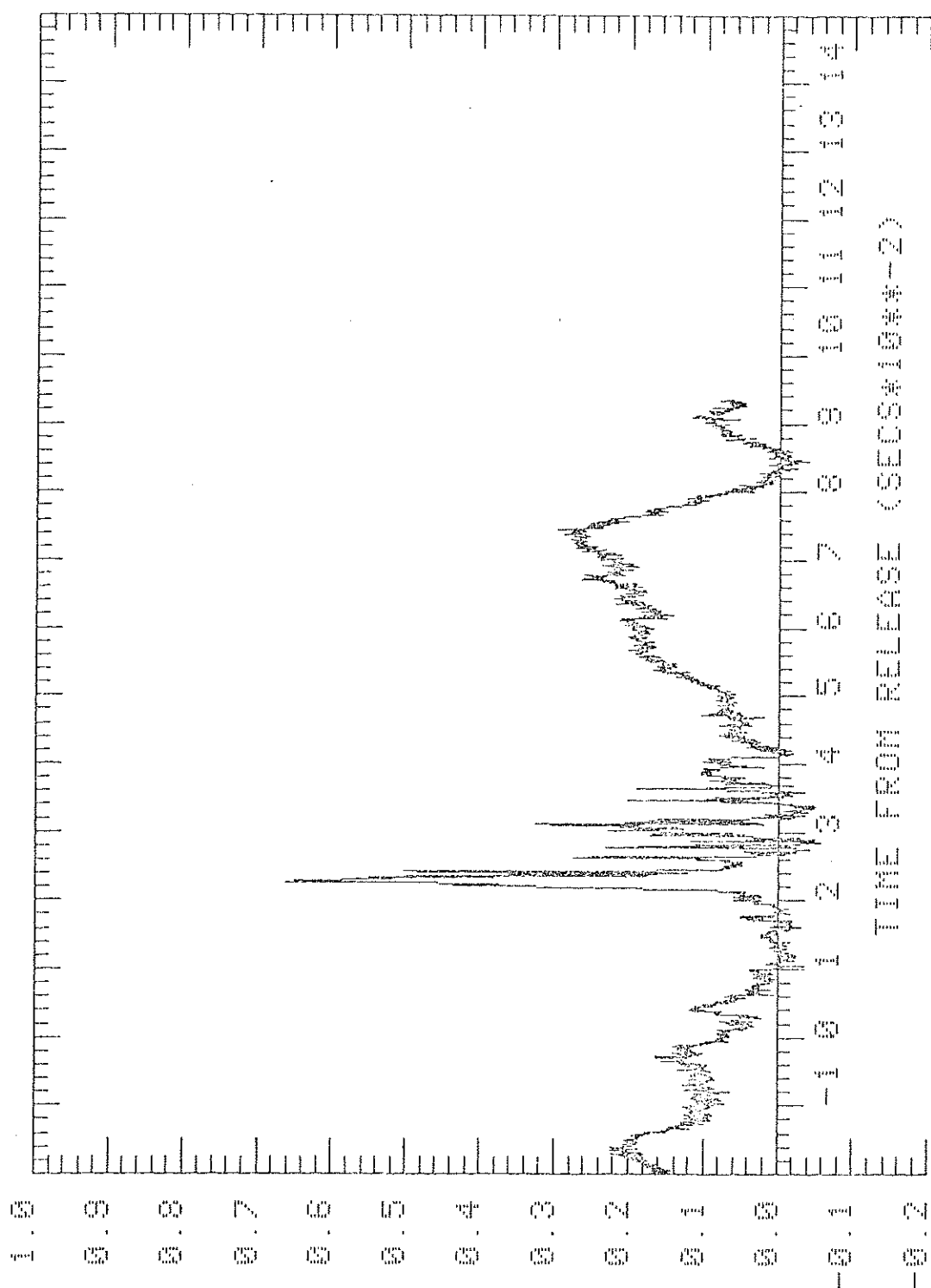
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 600 M Z: 2.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 390 M Y: 600 M Z: 4.4 M



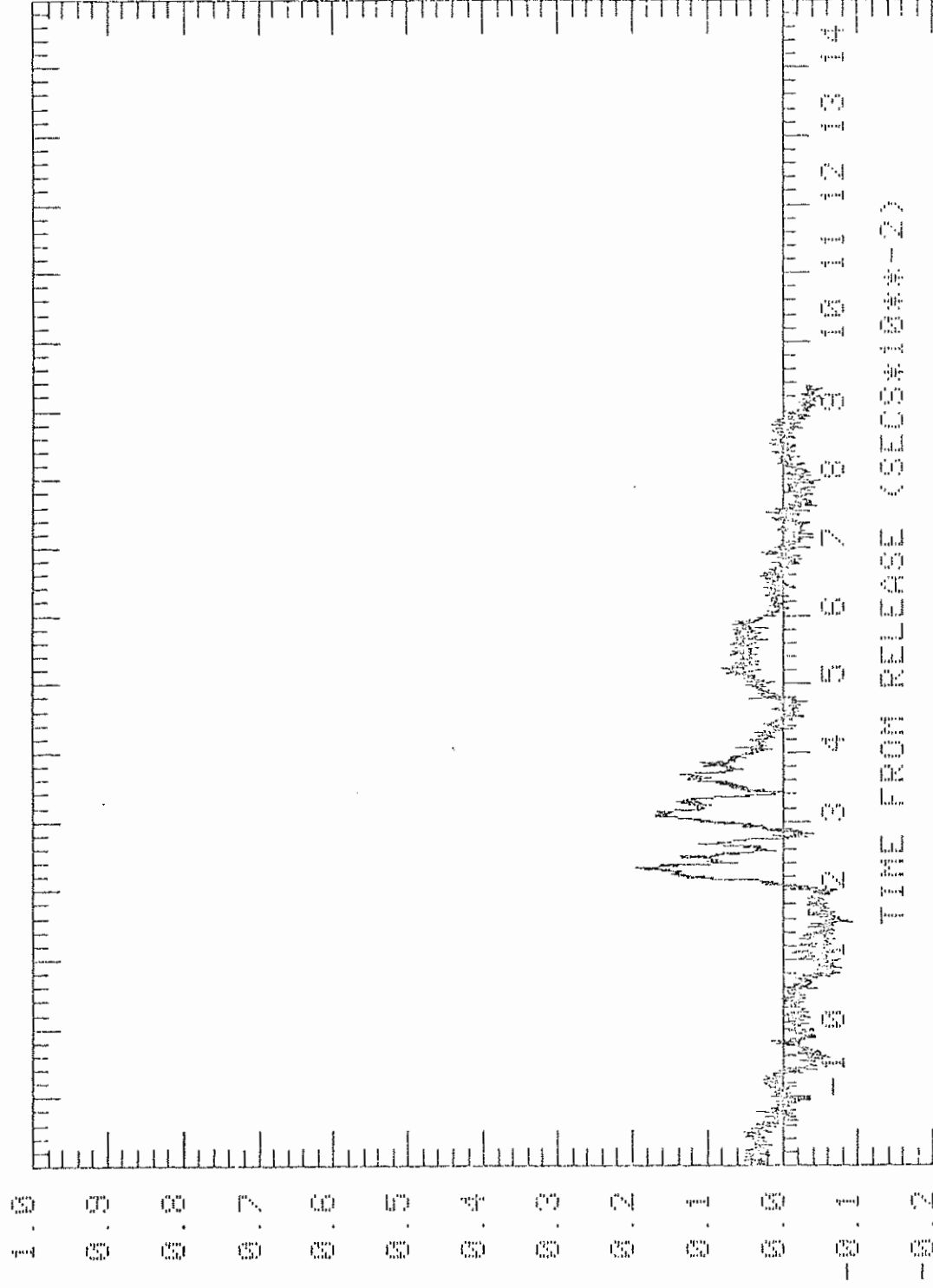
CONTROL F R Q T F C N (2)

TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 600 M Z: 6.4 M

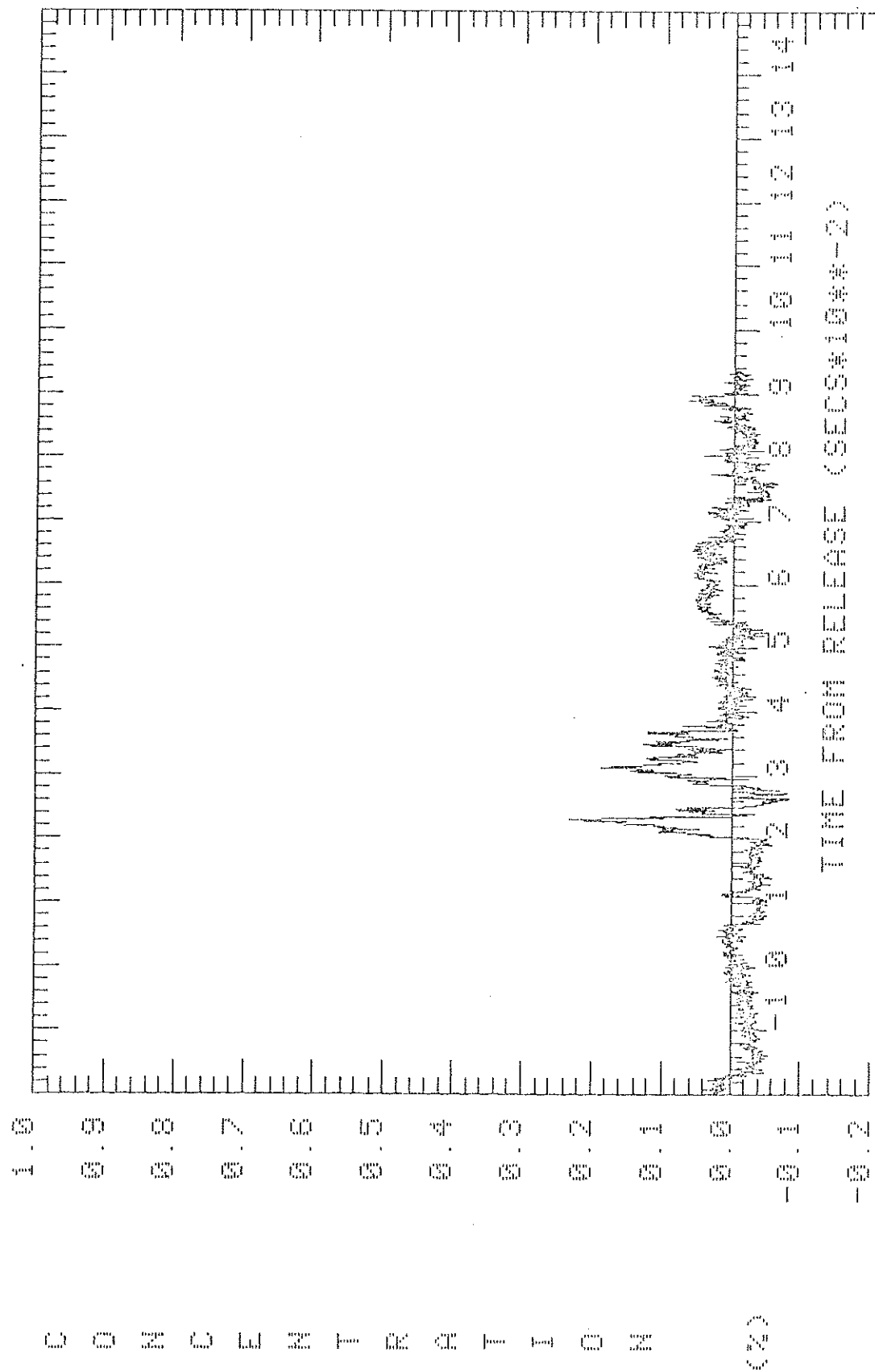
C O N C E N T R A T I O N

(%)



TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

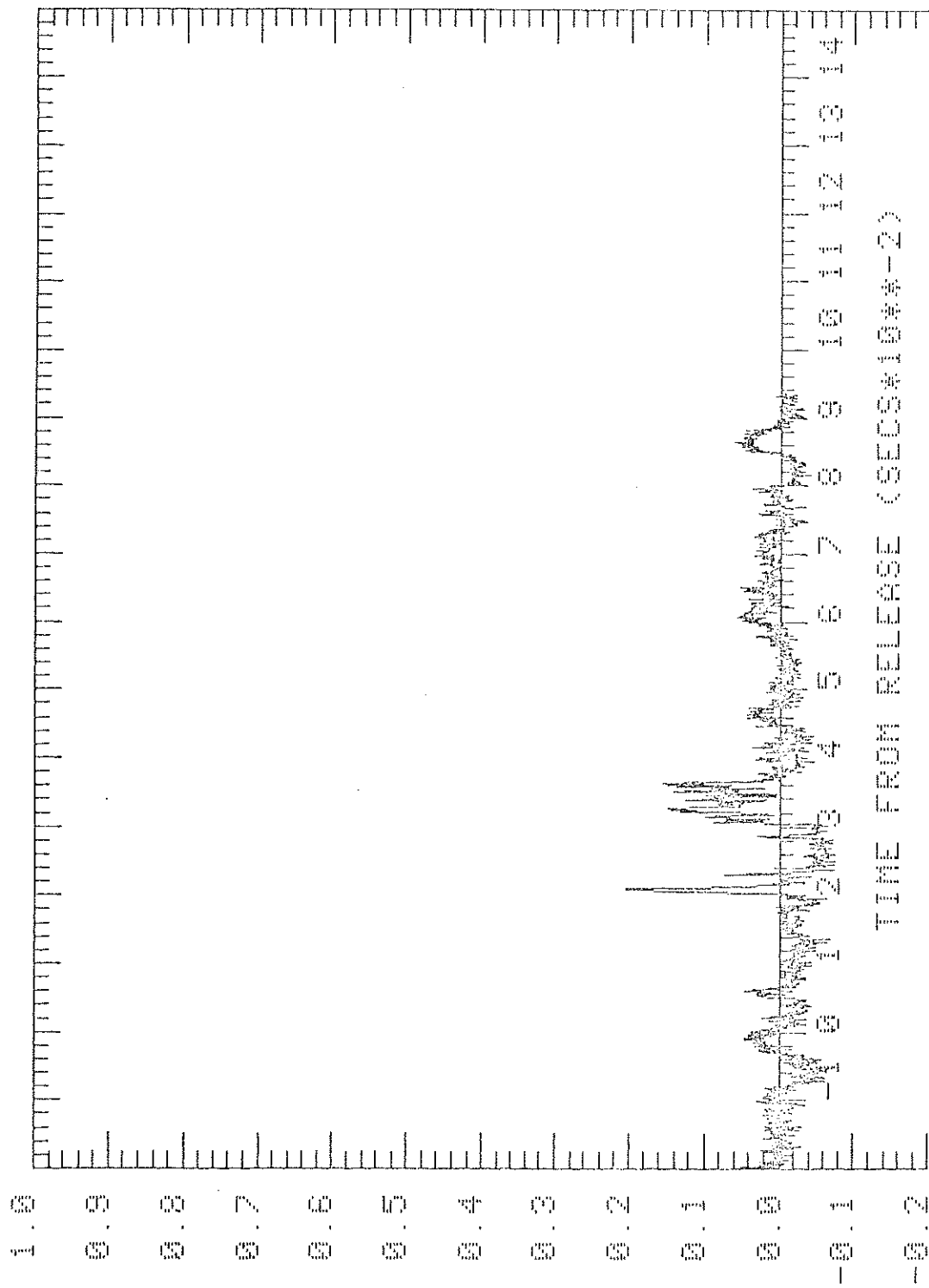
X: 400 M Y: 500 M Z: 0.4 M



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 H Y: 600 M Z: 2.4 M

CO2 COLLECTOR



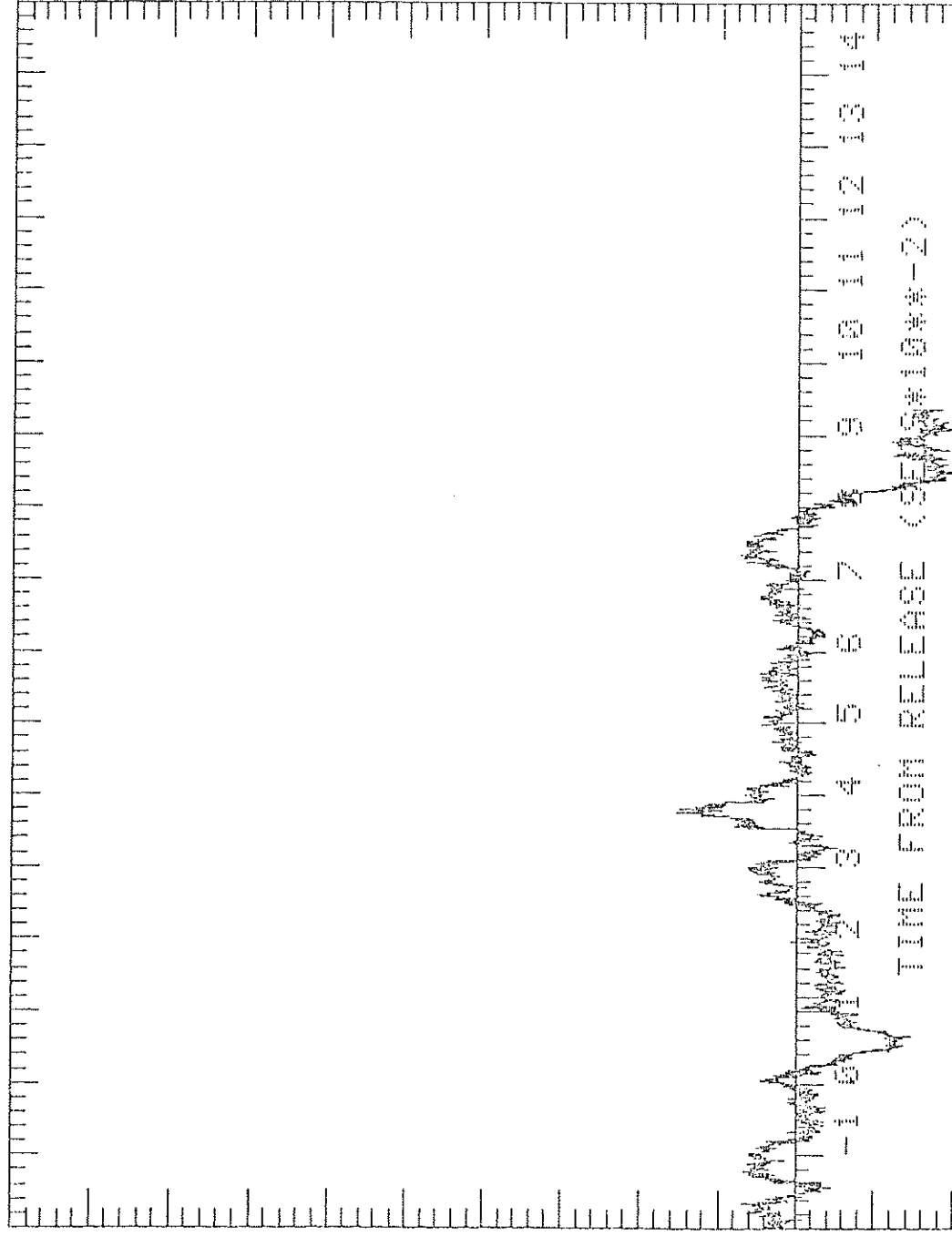
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.5 SECS

X: 400 M Y: 600 M Z: 6.4 M

1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2

COOLANT FLOW

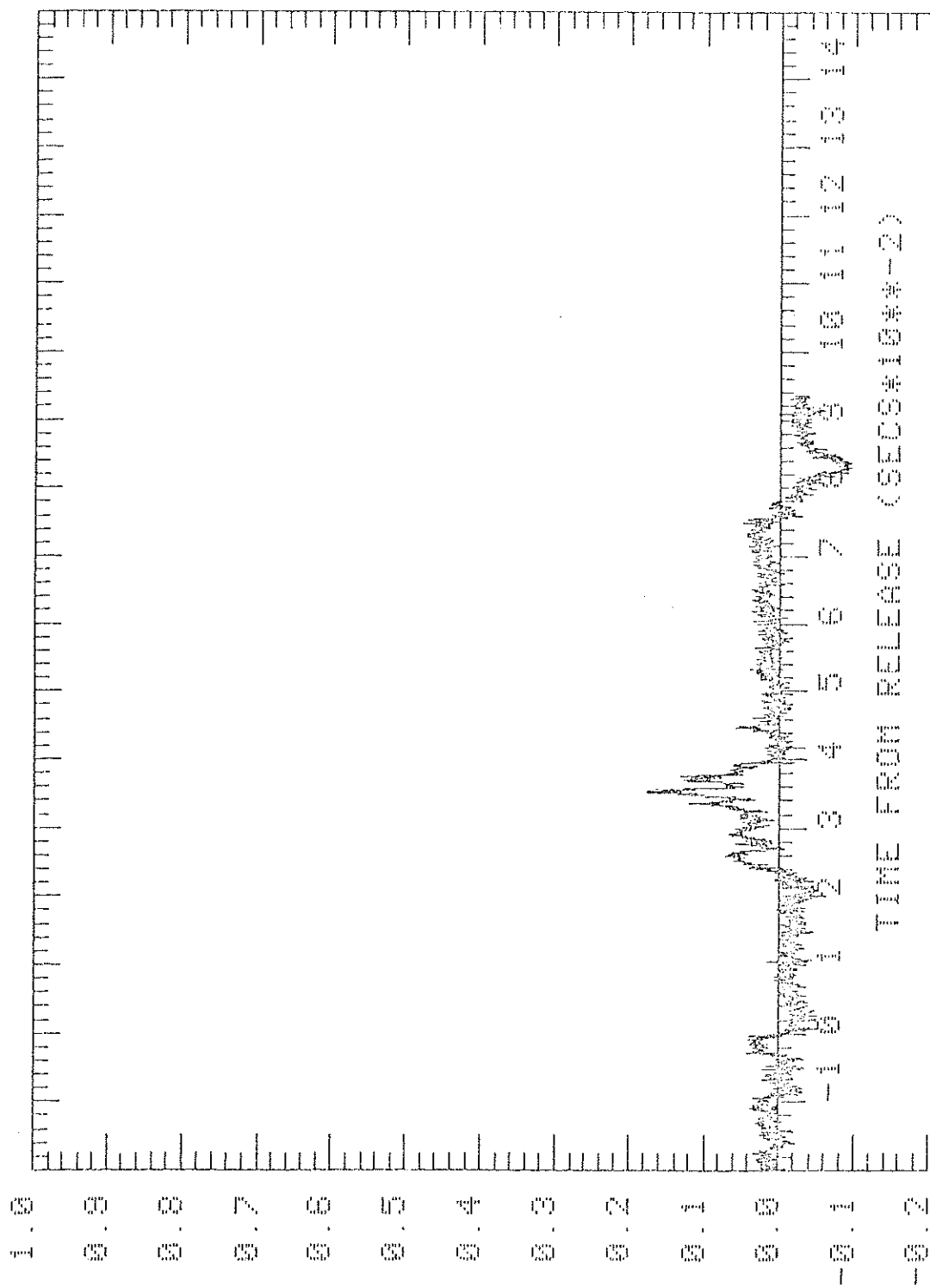
(%)



TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 220 M Y: 670 M Z: 0.4 M

COZOLZFRCTFCZ

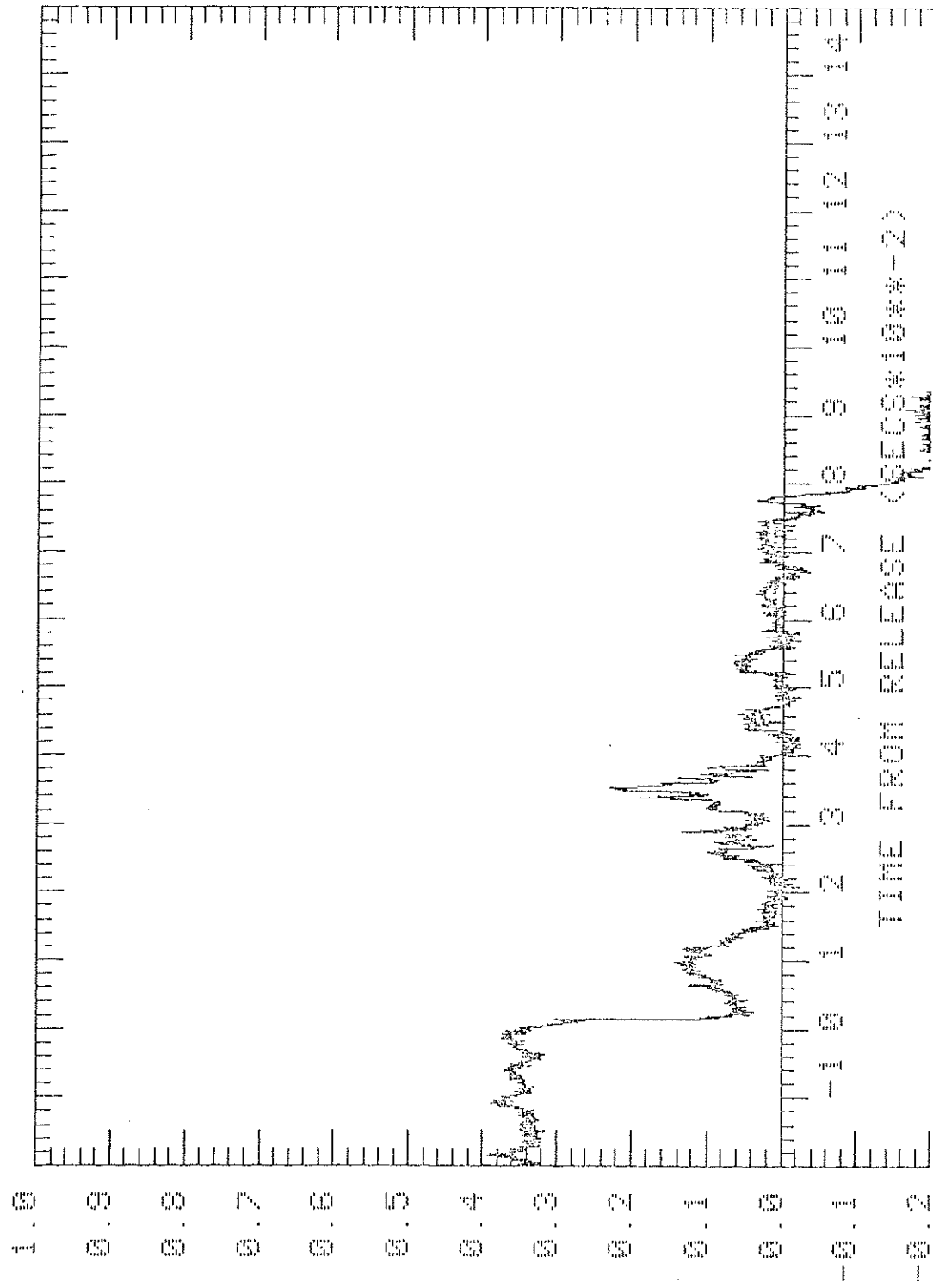


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 220 H Y: 670 H Z: 2.4 H

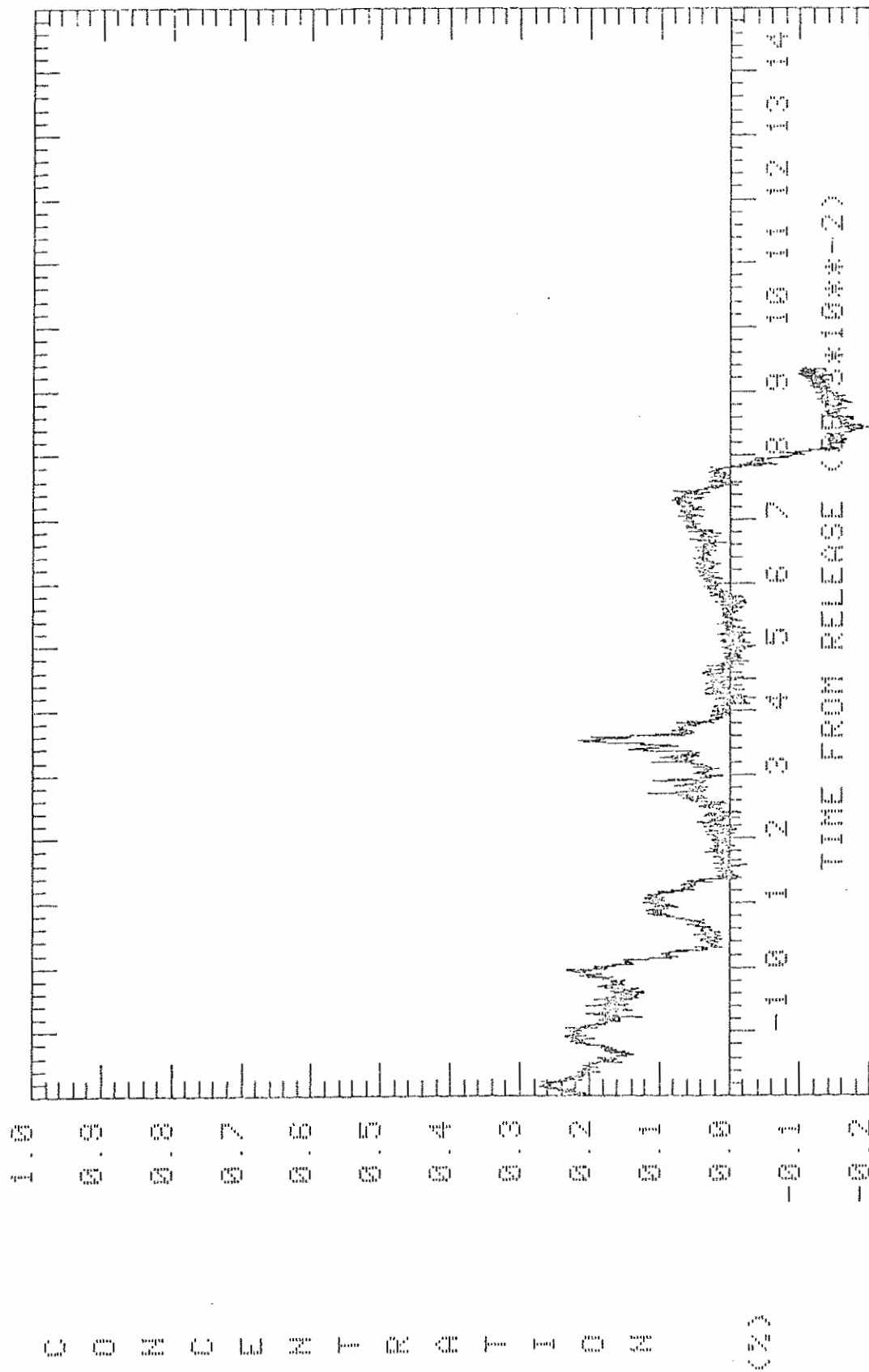
C O L L E C T I O N

(2)



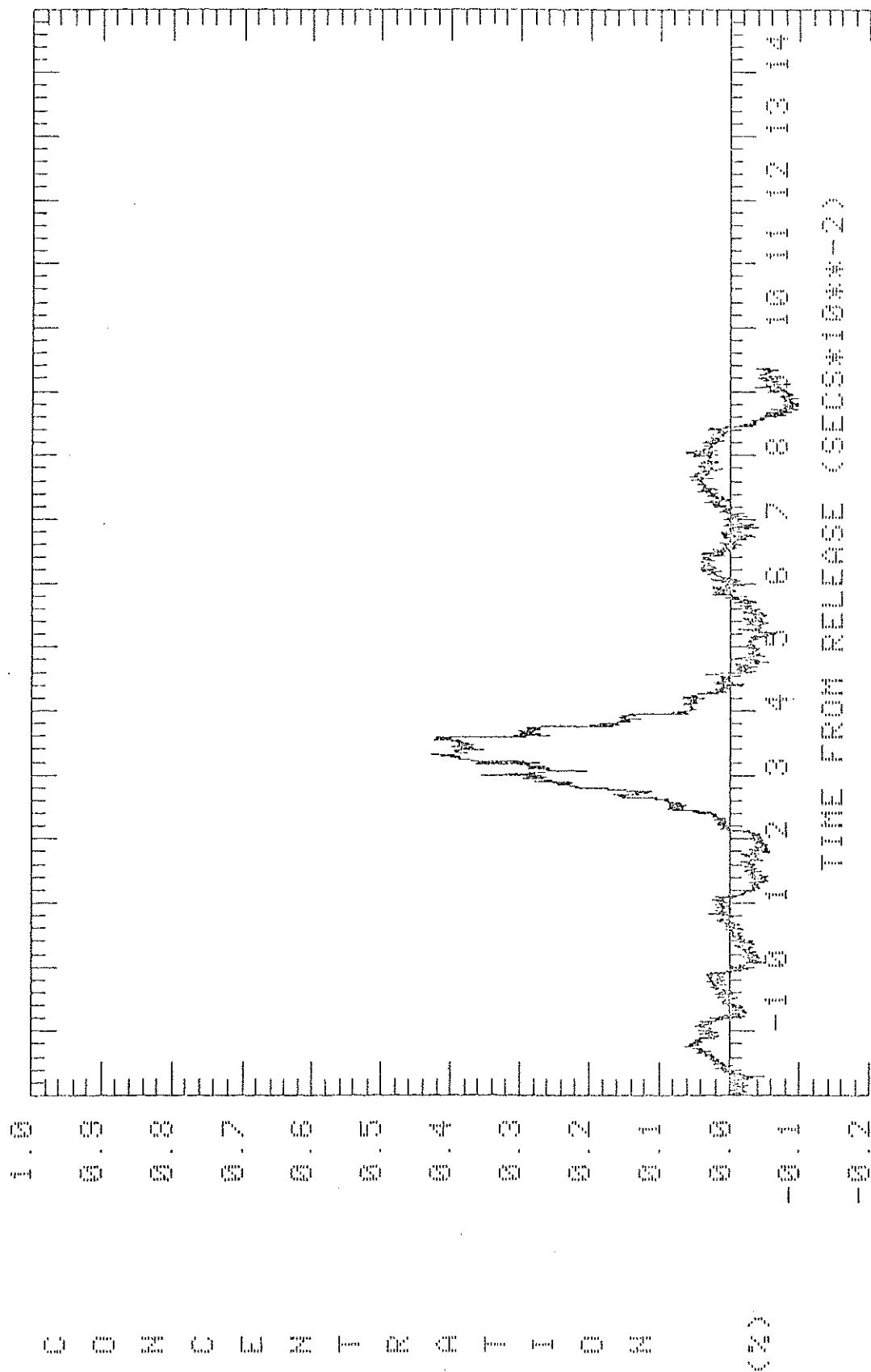
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 229 M Y: 670 M Z: 4.4 M



TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 220 M Y: 670 M Z: 6.4 M

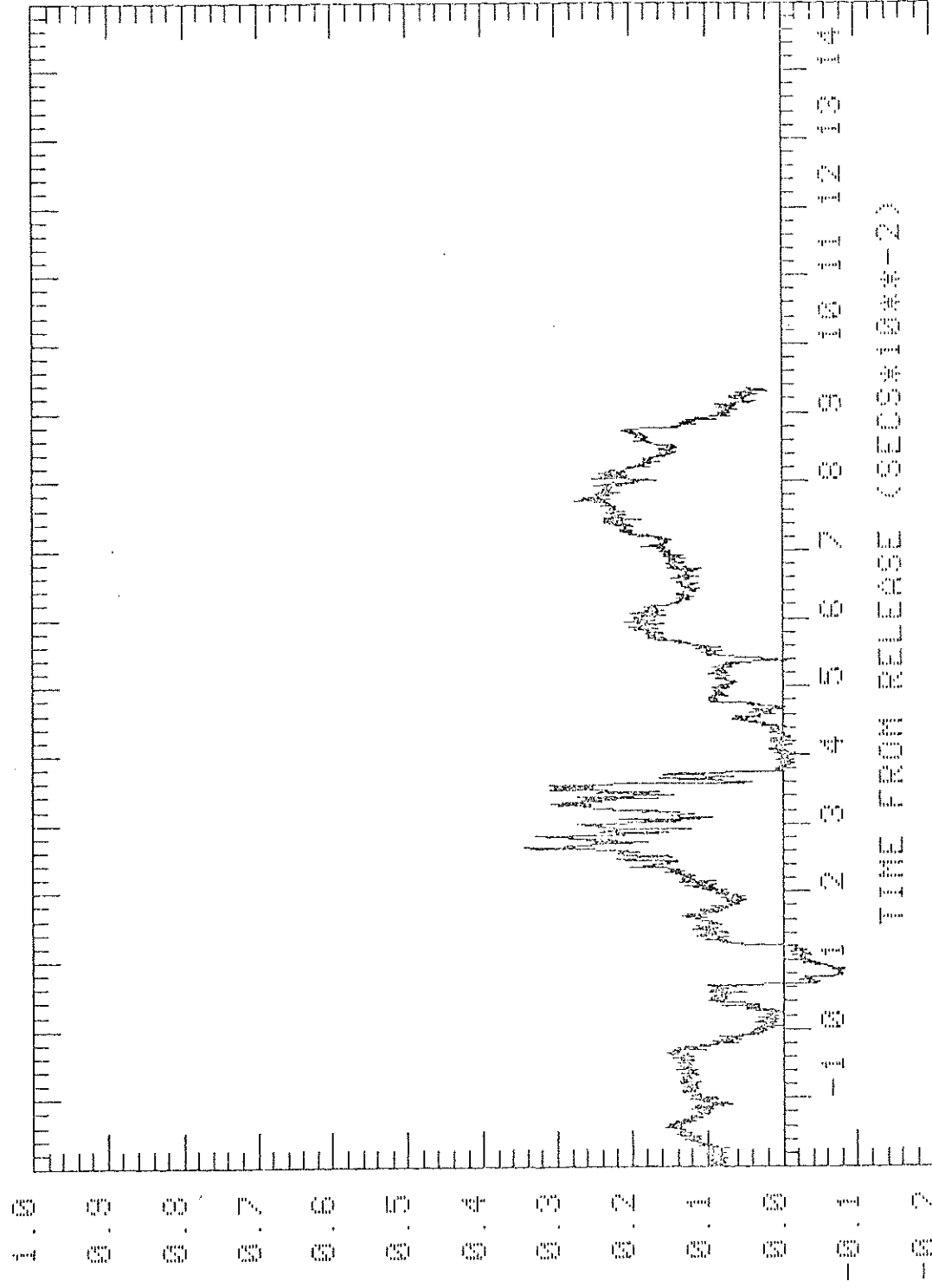


TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 399 M Y: 700 M Z: 9.4 M

CONTROL EFFECT

(%)

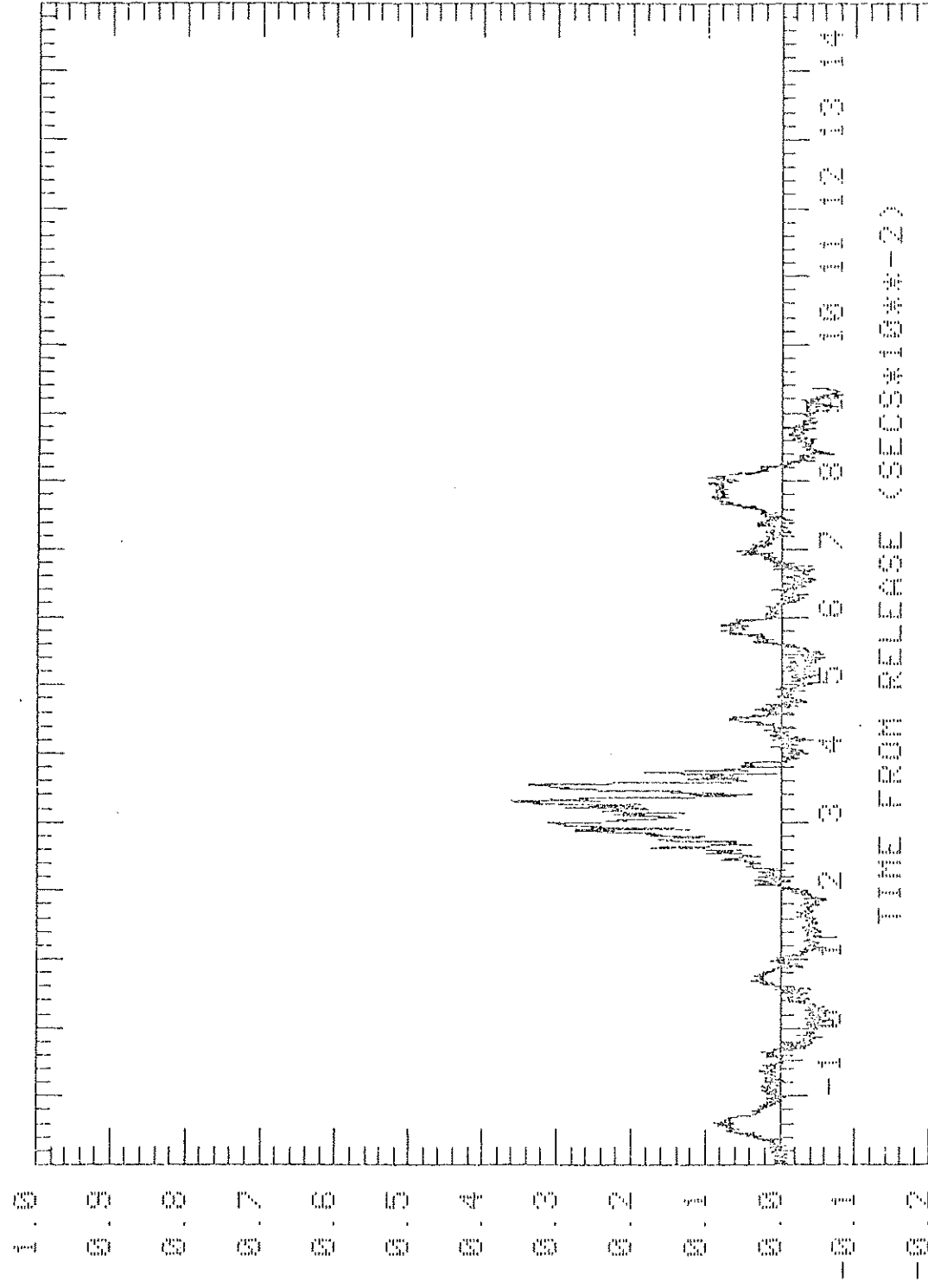


TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 399 N Y: 799 N Z: 2.4 M

COHERENCE

(%)

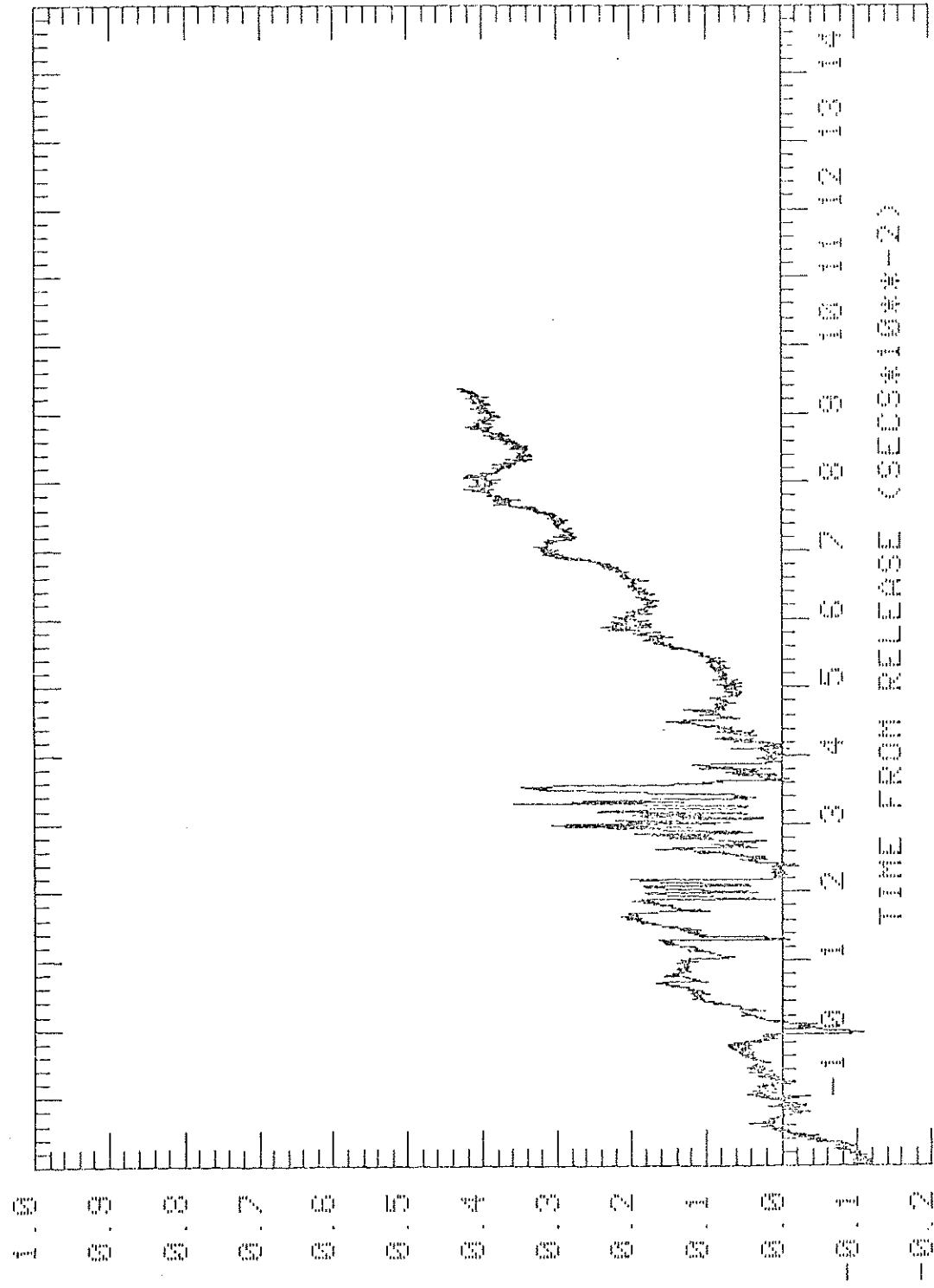


TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 399 M Y: 700 M Z: 4.4 M

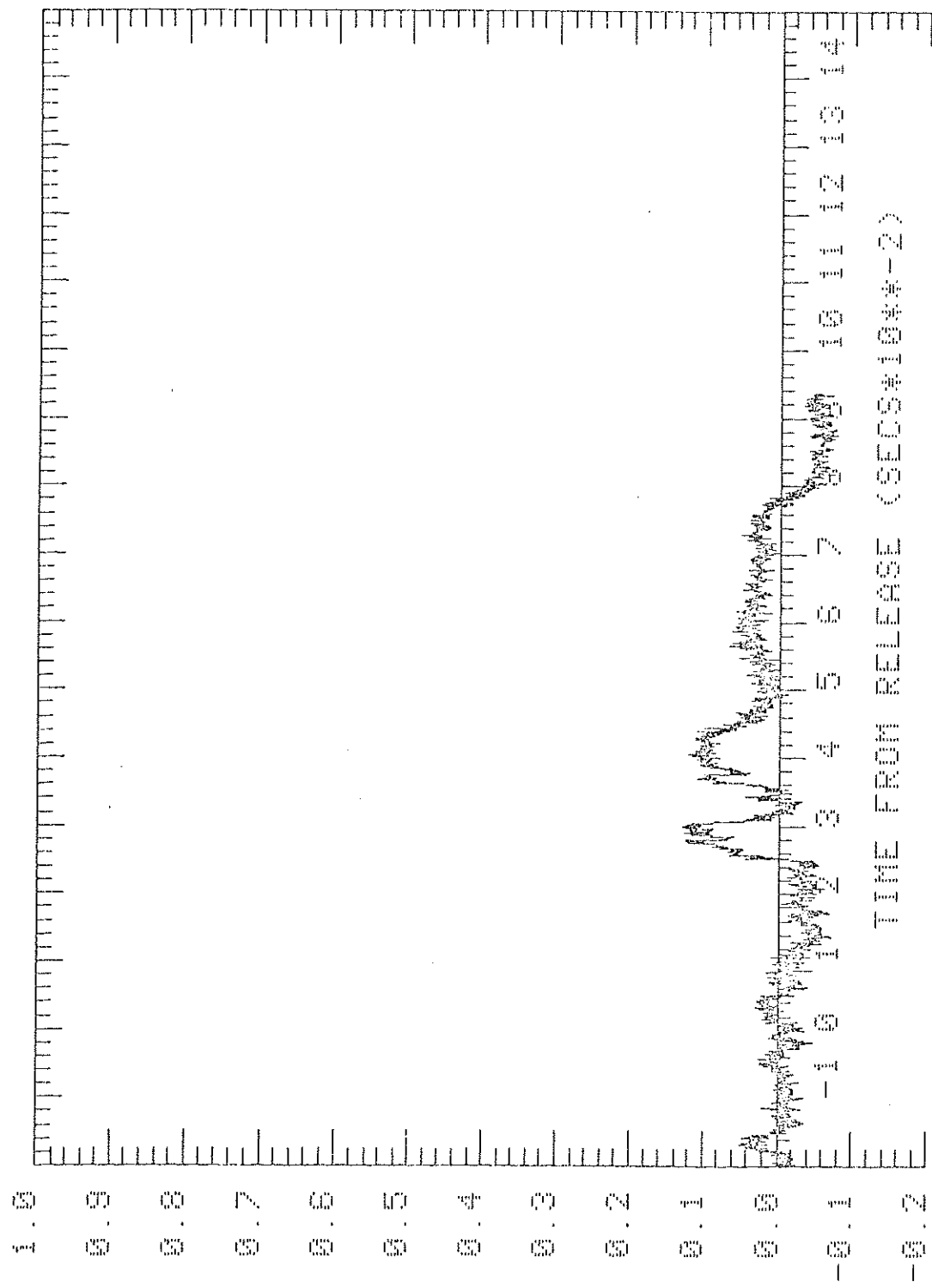
C O L O R I M E T R I C

(%)



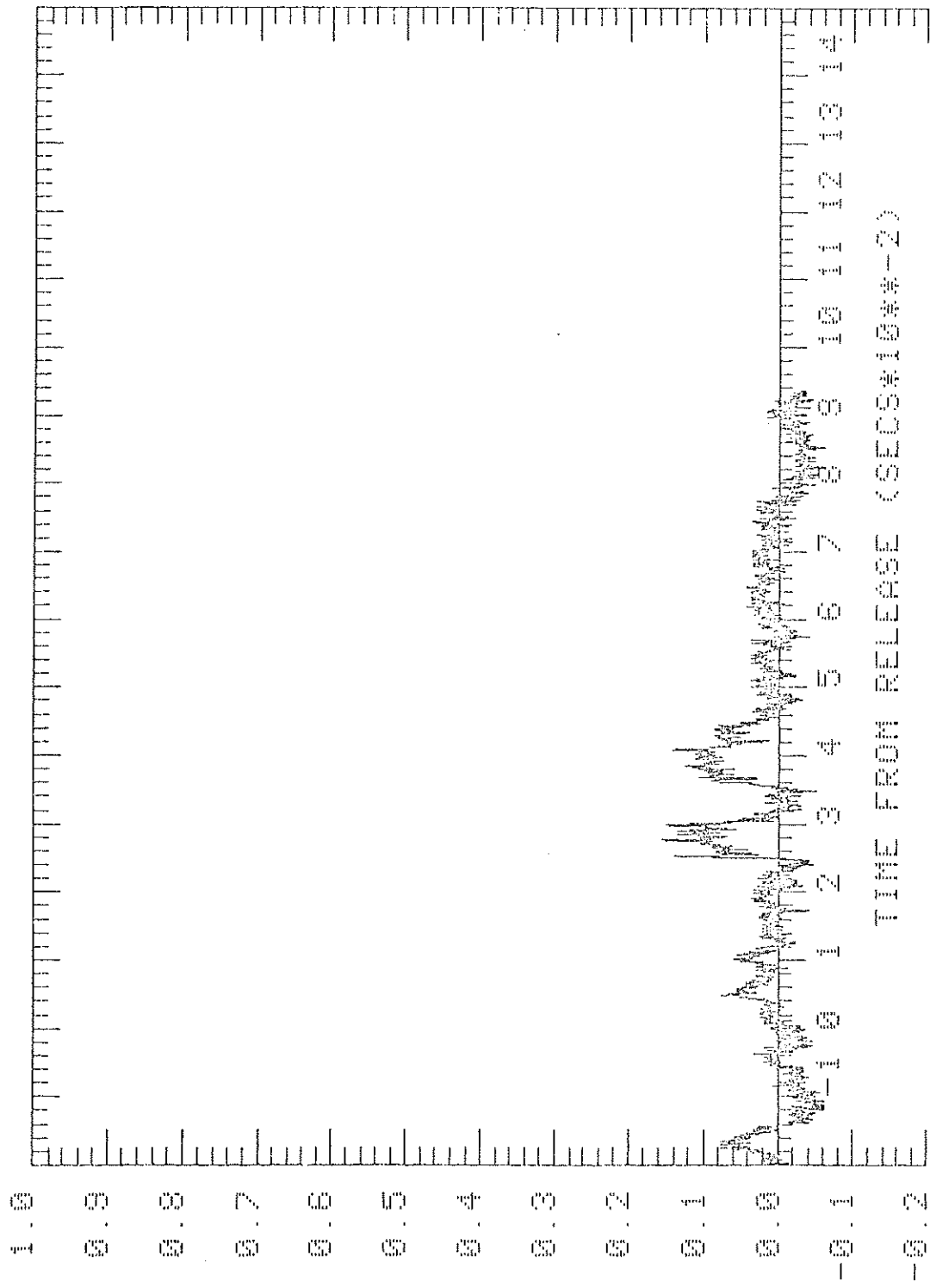
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.5 SECS

X: 300 M Y: 700 M Z: 6.4 M



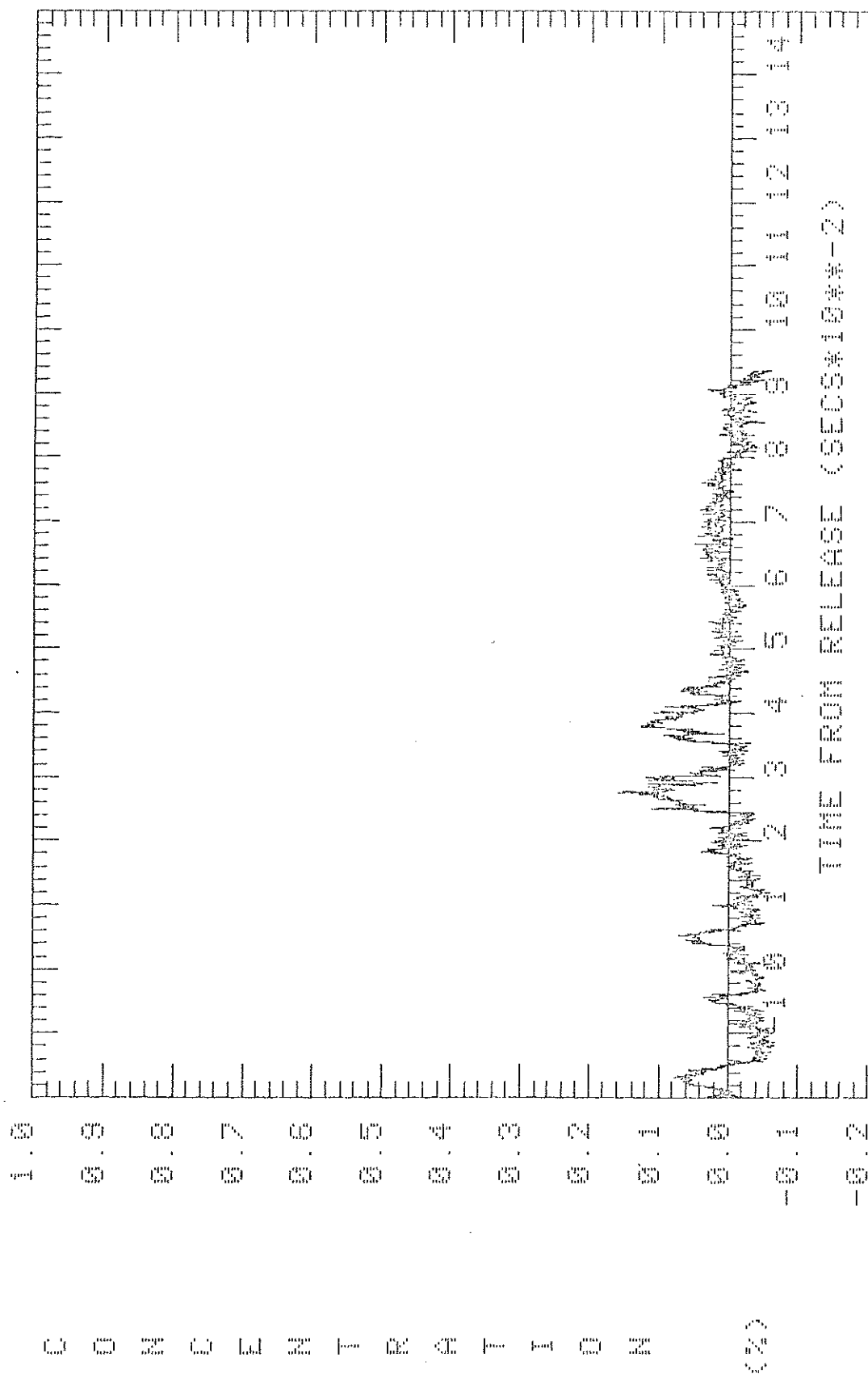
TRIAL: 088 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 480 H Y: 700 H Z: 0.4 H



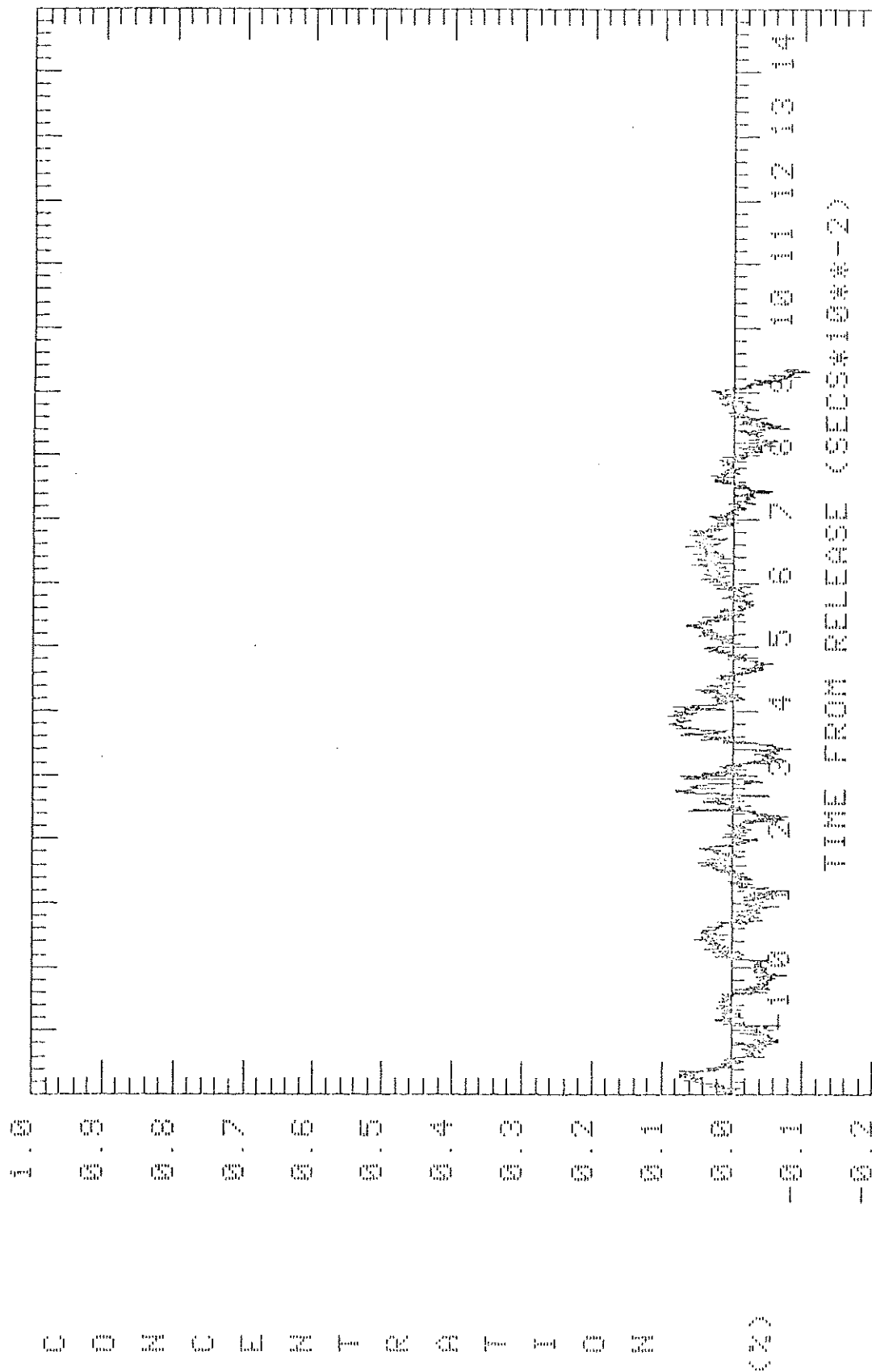
TRIAL: 000 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 400 M Y: 700 M Z: 2.4 M



TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

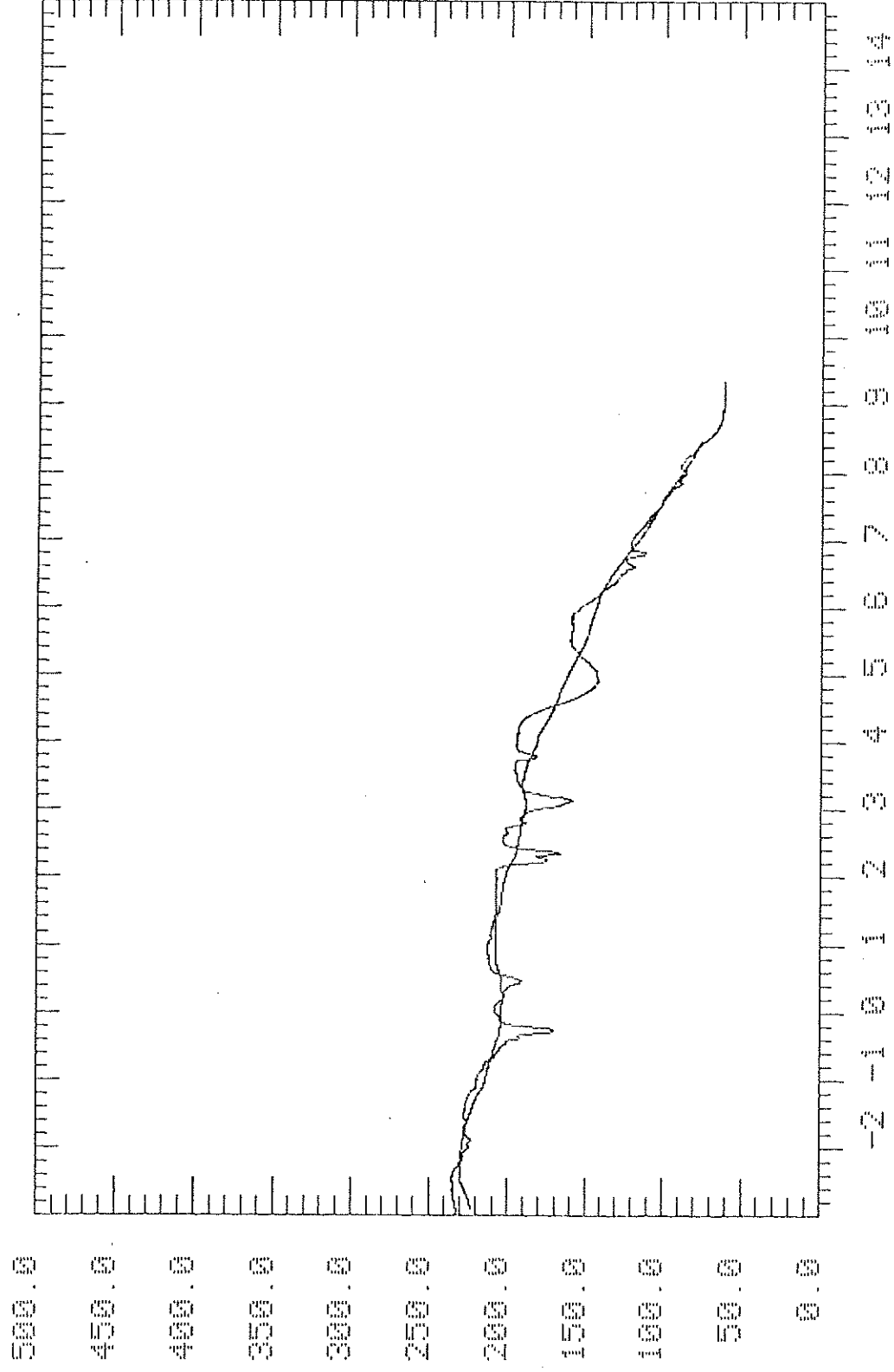
X: 400 H Y: 700 H Z: 4.4 H



TRIAL: 898 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 400 M Y: 700 M Z: 6.4 M

I N S O L I T I O N



TIME FROM RELEASE (SECS*10**2)

TRIAL: 008 TYPE: SOLA UNITS: W/M*2
AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 0.4 M
MEAN OF RUN UP: 252.50 MEAN OF RUN DOWN: 197.69

1023.0

1022.9

1022.8

1022.7

1022.6

1022.5

1022.4

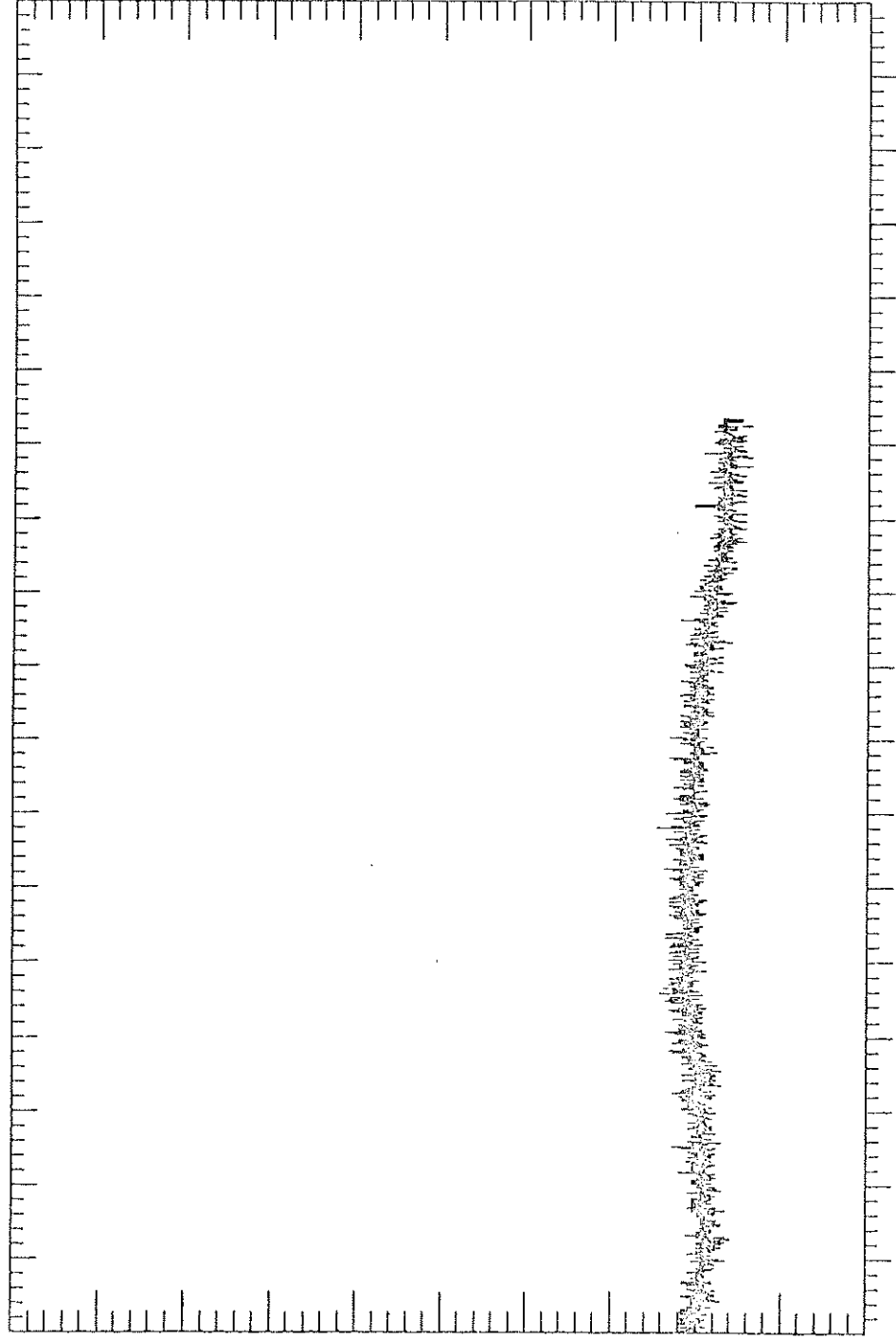
1022.3

1022.2

1022.1

1022.0

P R E S S U R E



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

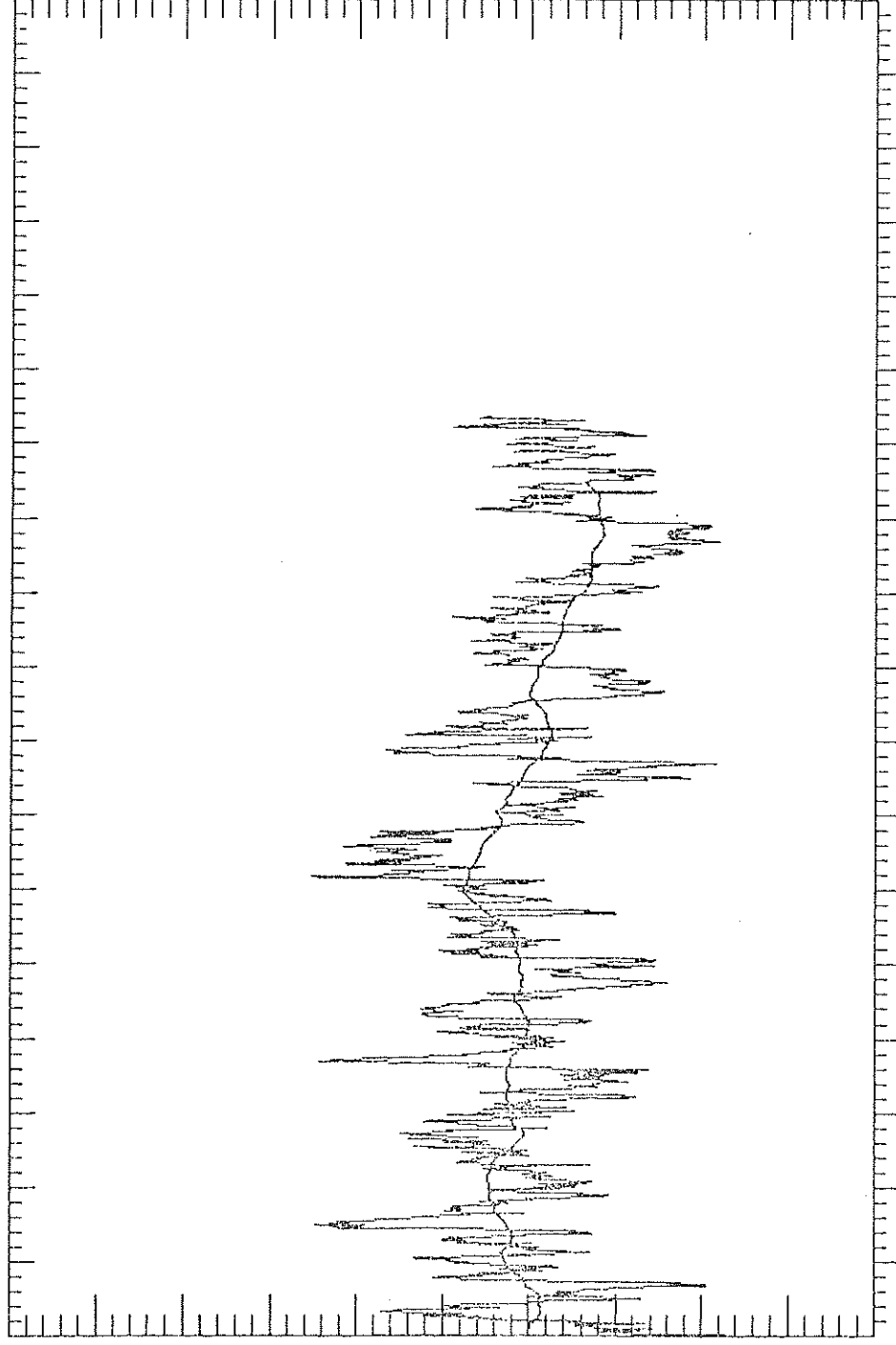
TRIAL: 008 TYPE: BRON UNITS: MBAR

AVERAGING TIME: 0.6 SEC X: 408 M Y: 50 M Z: 0.4 M

MEAN OF RUN UP: 1022 MEAN OF RUN DOWN: 1022

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0

2 1 2 3 4 5 6 7 8



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

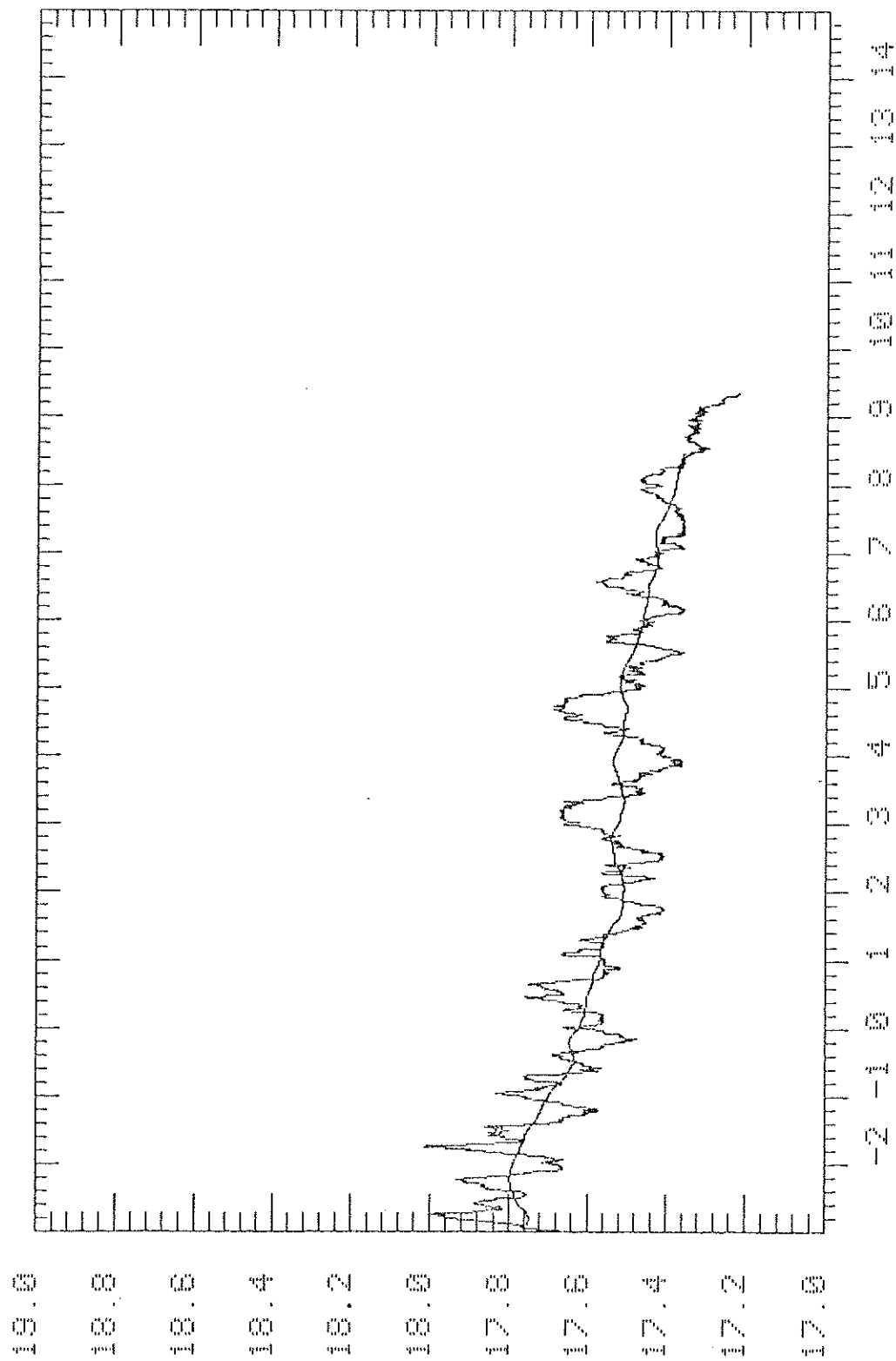
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: USPD UNITS: M/S

AVERAGING TIME: 0.8 SEC X: 400 M Y: 50 M Z: 2.0 M

MEAN OF RUN UP: 2.40 MEAN OF RUN DOWN: 1.48

T E L L E R C T U R E

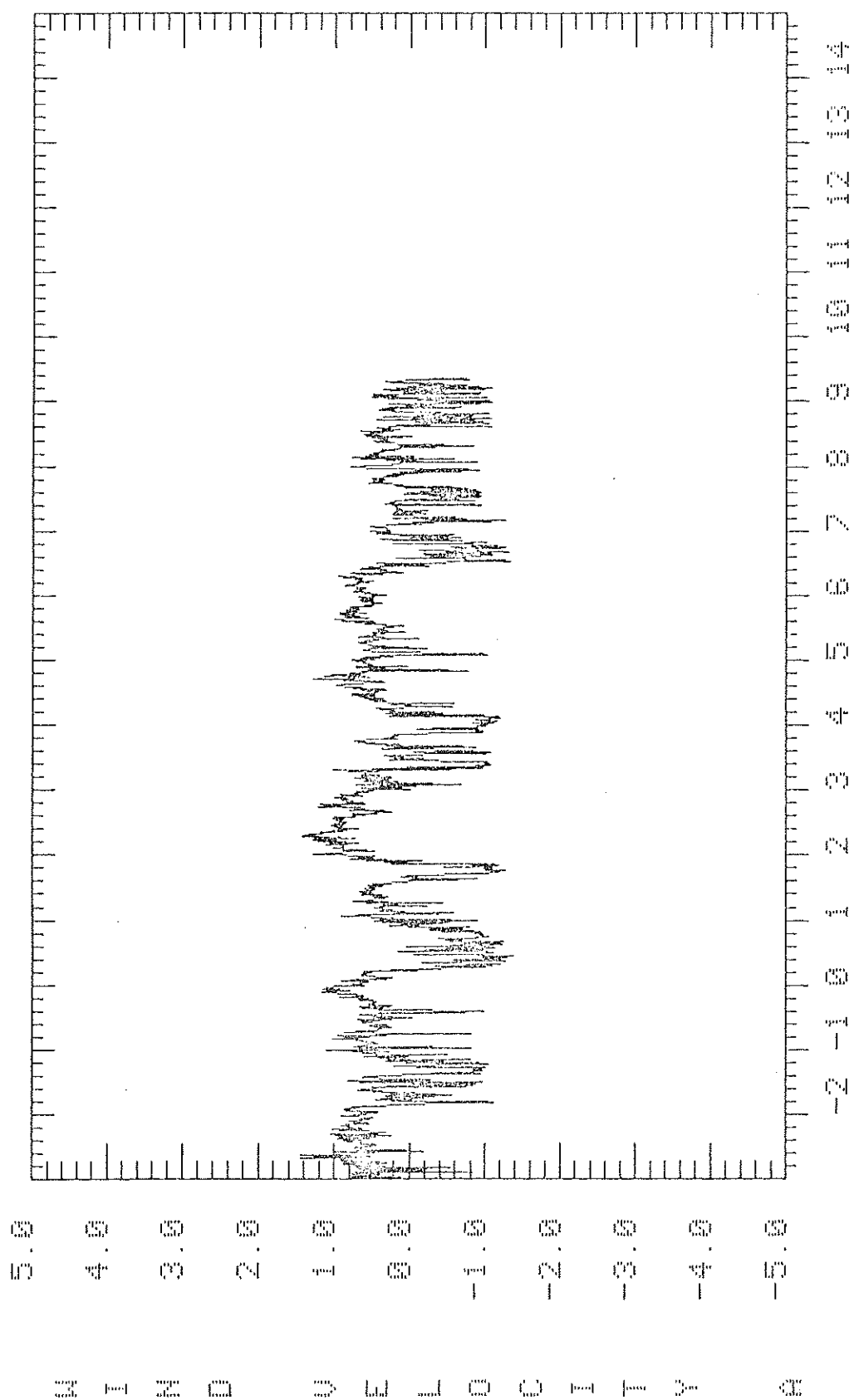


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: AIRT UNITS: DEGREES C

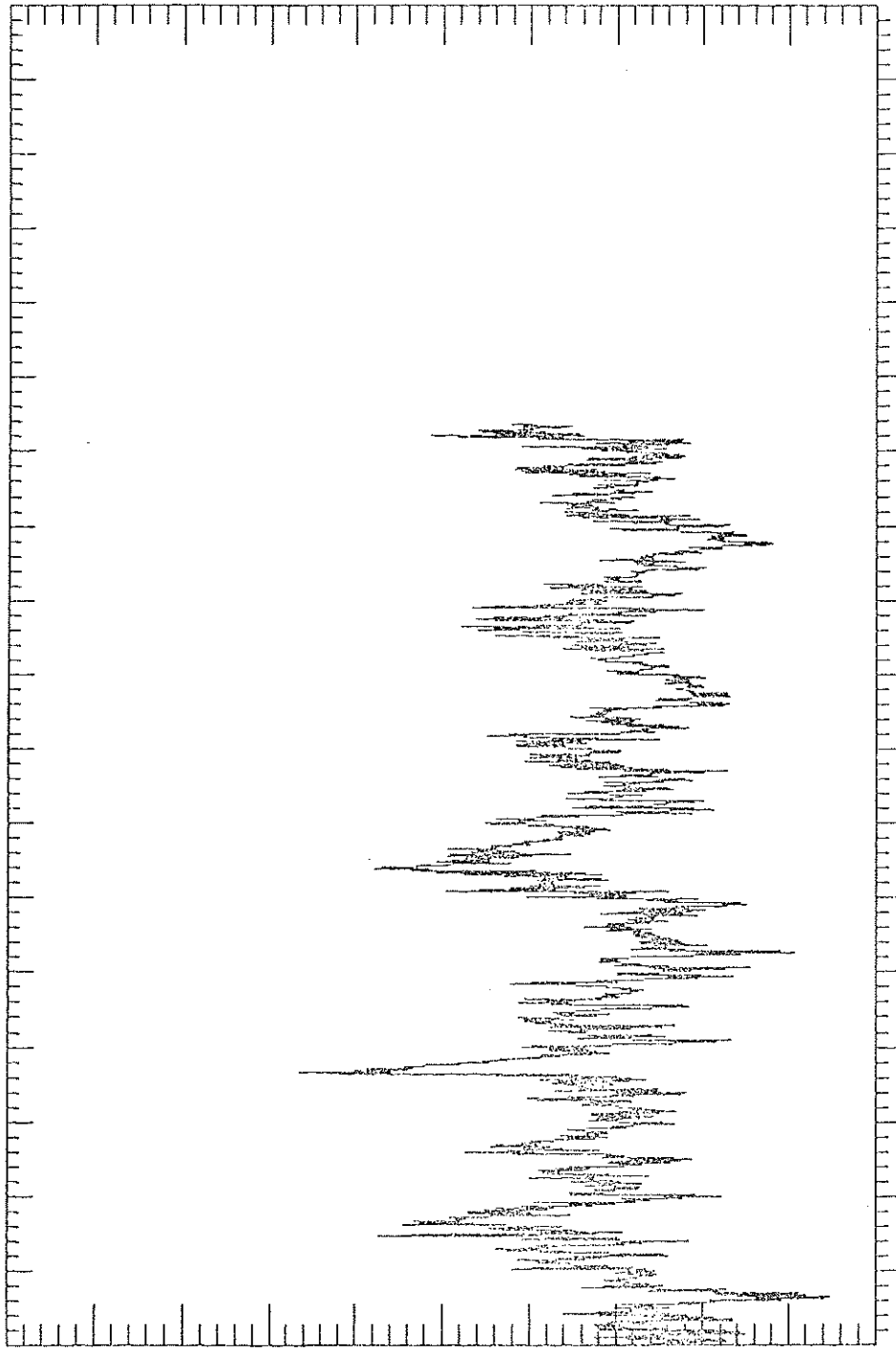
AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 2.0 M

MEAN OF RUN UP: 17.69 MEAN OF RUN DOWN: 17.16



TRIAL: 000 TYPE: UANA UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 2.0 M
 MEAN OF RUN UP: 0.14 MEAN OF RUN DOWN: -0.42

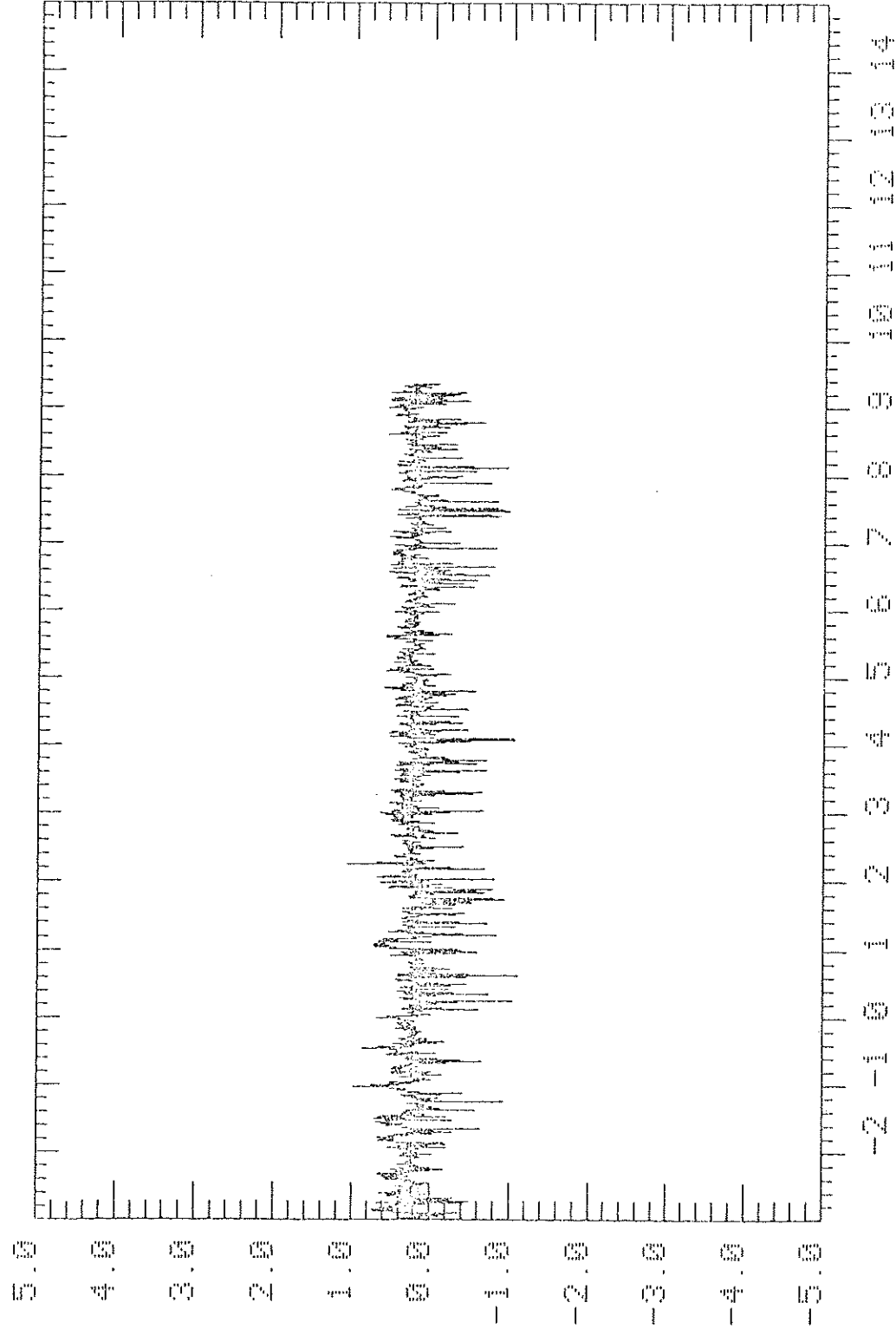
3 4 5 6 7 8 9 10 11 12 13 14
 15 16 17 18 19 20 21 22 23 24 25 26



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UANB UNITS: M/S
 AVERAGING TIME: 0.8 SEC X: 400 M Y: 50 M Z: 2.0 M
 MEAN OF RUN UP: 1.89 MEAN OF RUN DOWN: 1.46

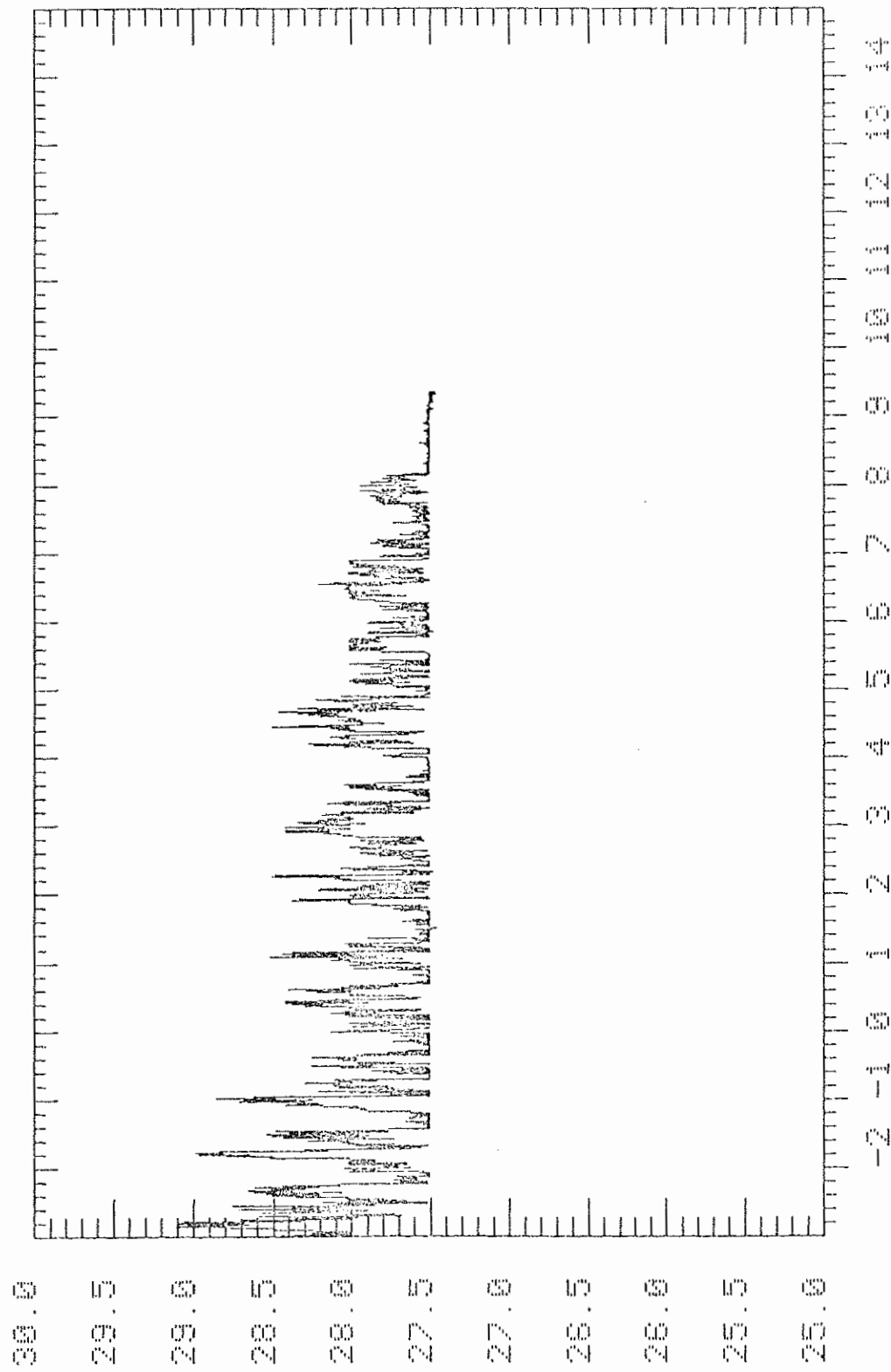
3 1 2 3 4 5 6 7 8 9 10 11 12 13 14



TIME FROM RELEASE (SECS*10**4-2)

TRIAL: 000 TYPE: UAHN UNITS: N/S
AVERAGING TIME: 0.6 SEC X: 400 N Y: 50 N Z: 2.9 N
MEAN OF RUN UP: 0.22 MEAN OF RUN DOWN: 0.18

T E M P E R A T U R E



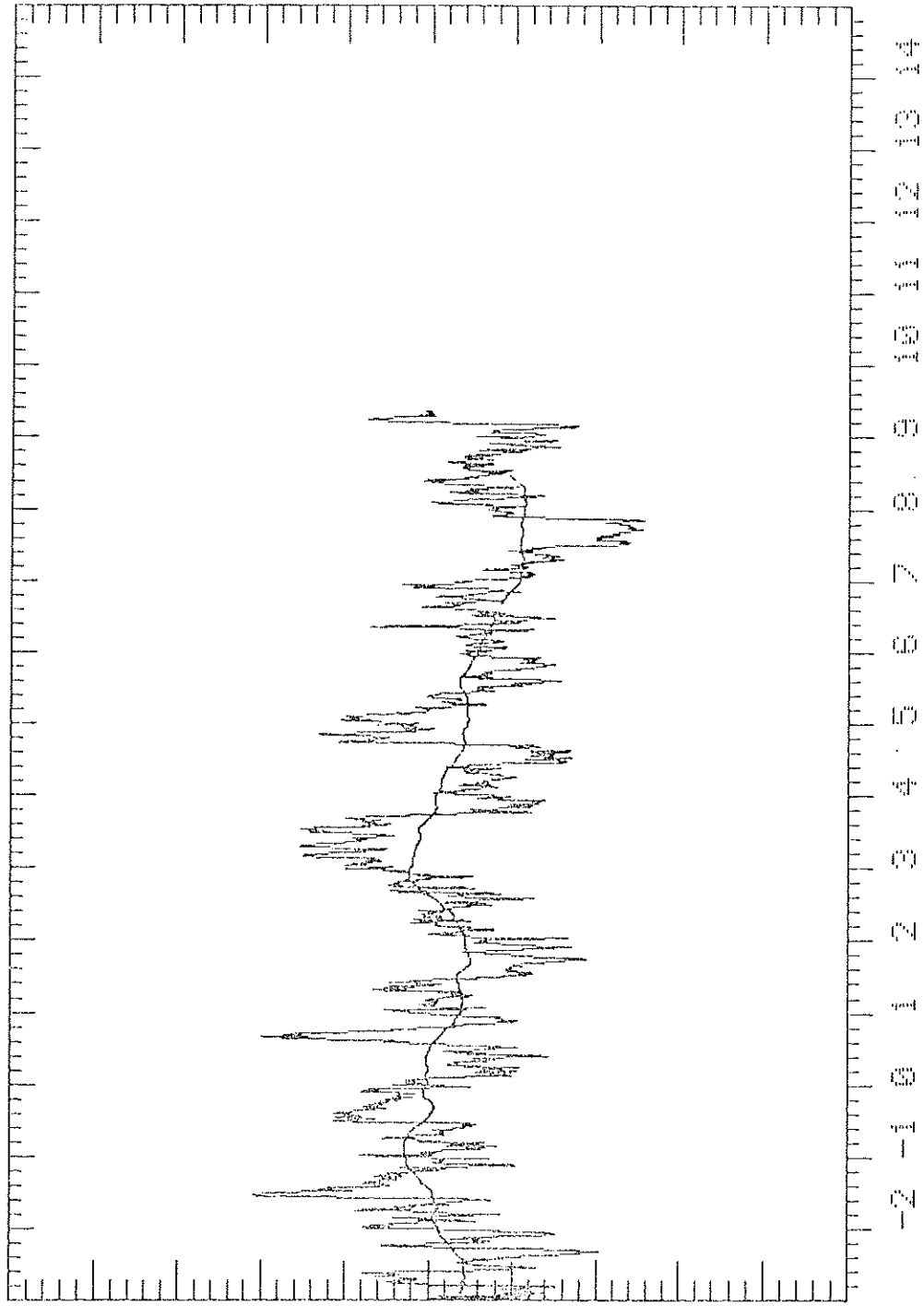
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UNIT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 2.0 M

MEAN OF RUN UP: 28.00 MEAN OF RUN DOWN: 27.50

5	10	5	10	5	10	5	10	5	10	5
10	4	4	0	0	4	4	4	4	5	5



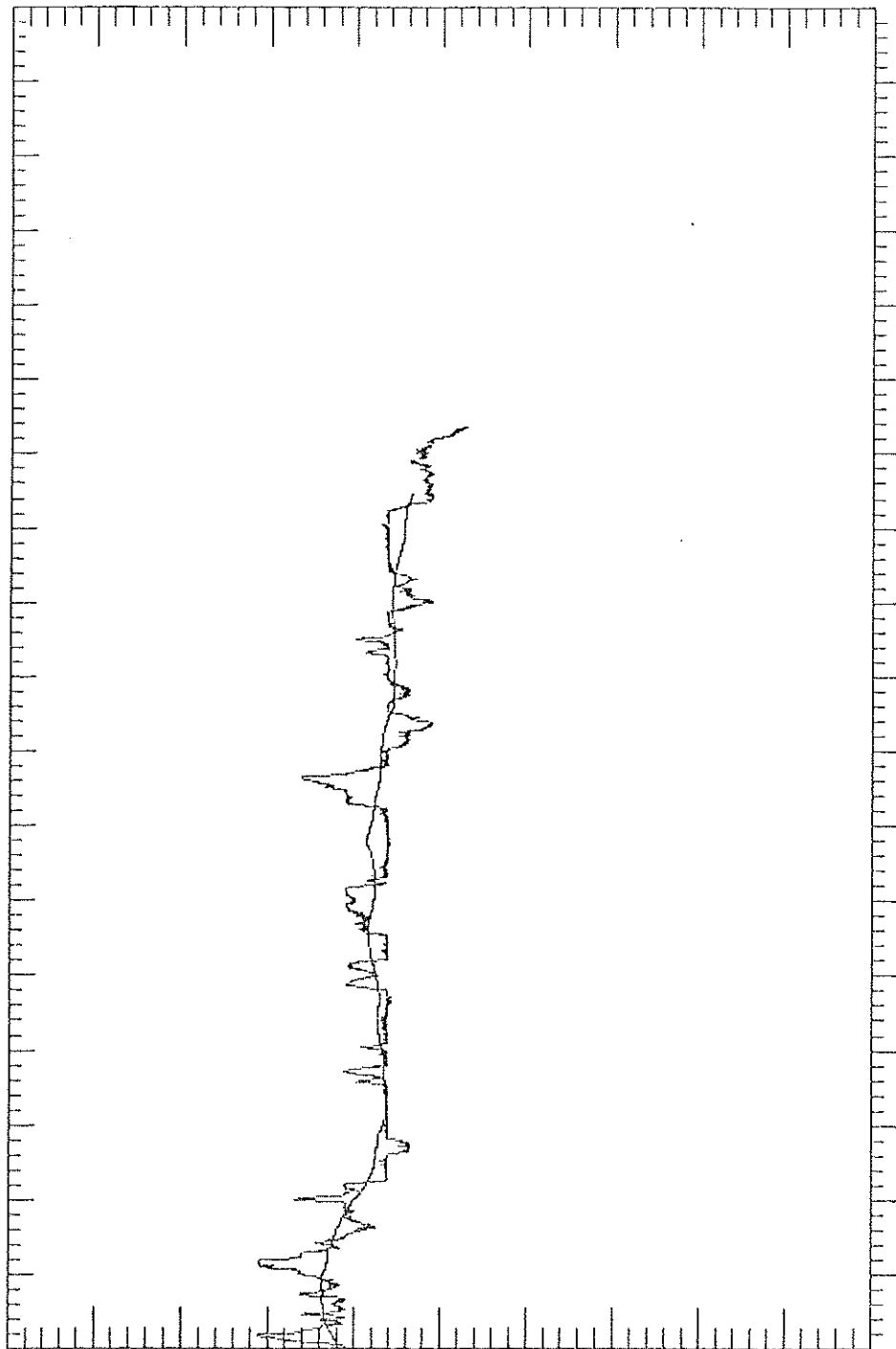
0
1
2
3
4
5
6
7
8
9

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

[illegible]

T E L E R E C T D E F

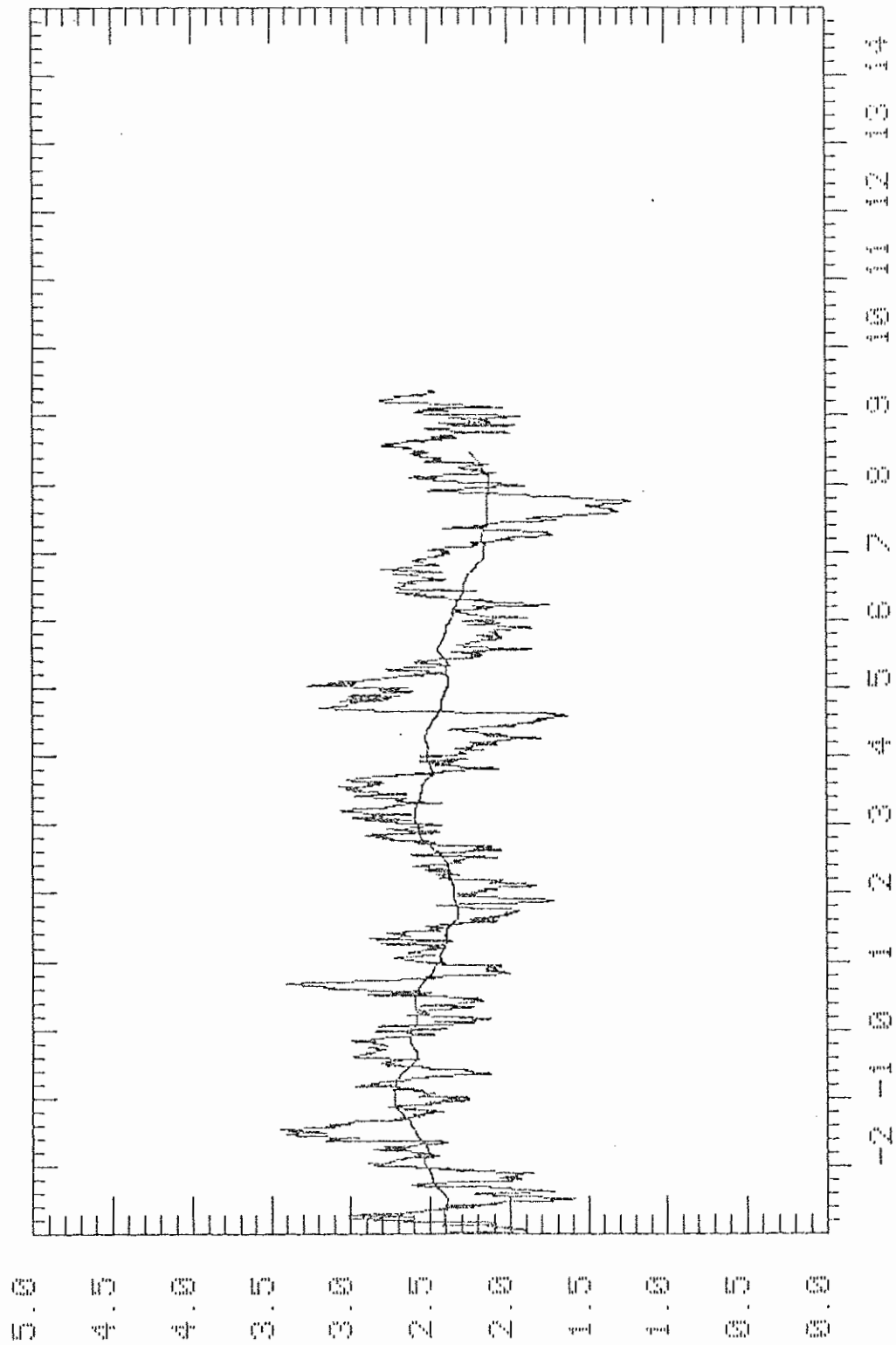
18.8
17.8
17.6
17.4
17.2
17.0
16.8
16.6
16.4
16.2
16.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

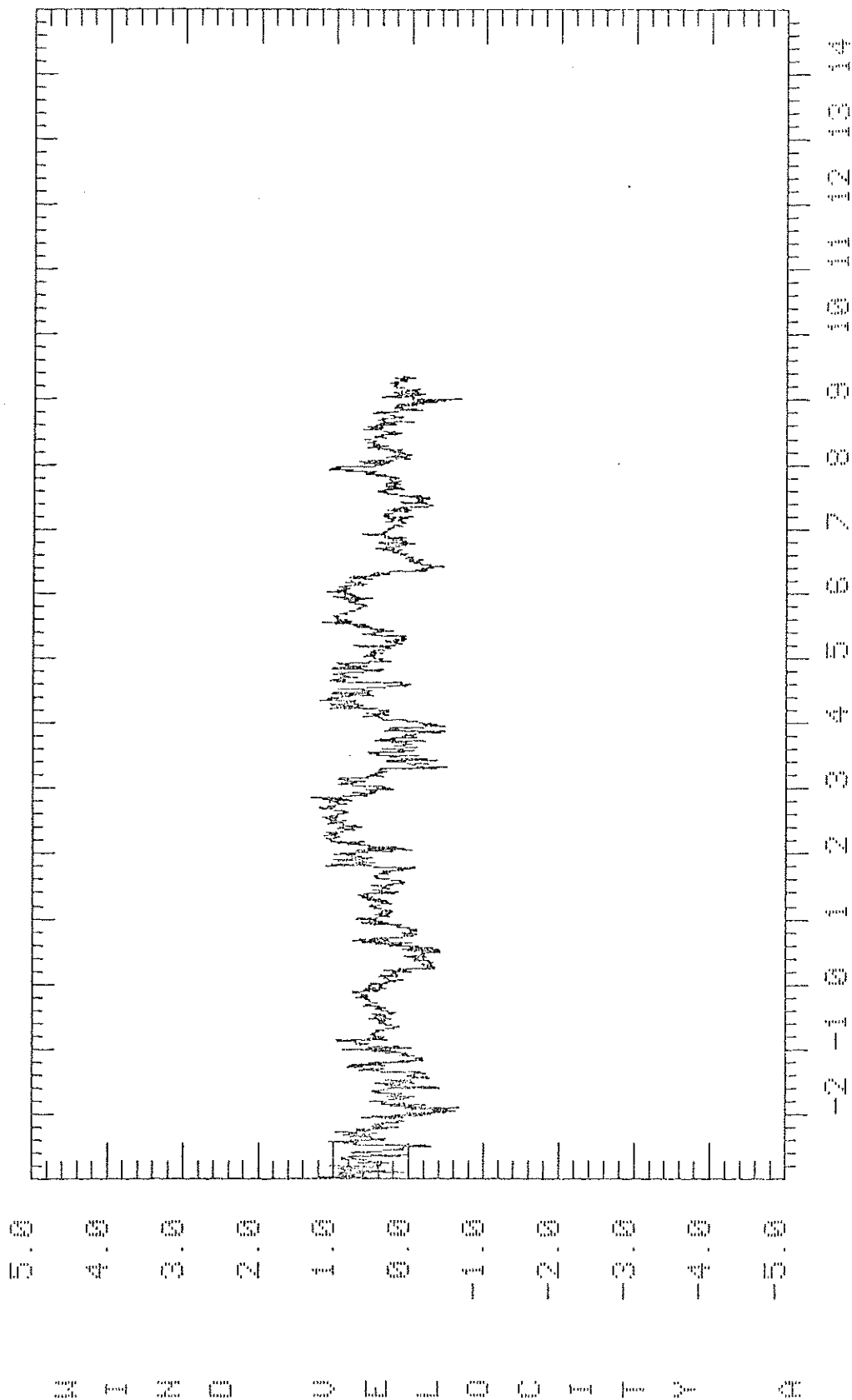
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: AIRT UNITS: DEGREES C
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 9.0 M
 MEAN OF RUN UP: 17.20 MEAN OF RUN DOWN: 16.98



TIME FROM RELEASE (SECS*10**-2)

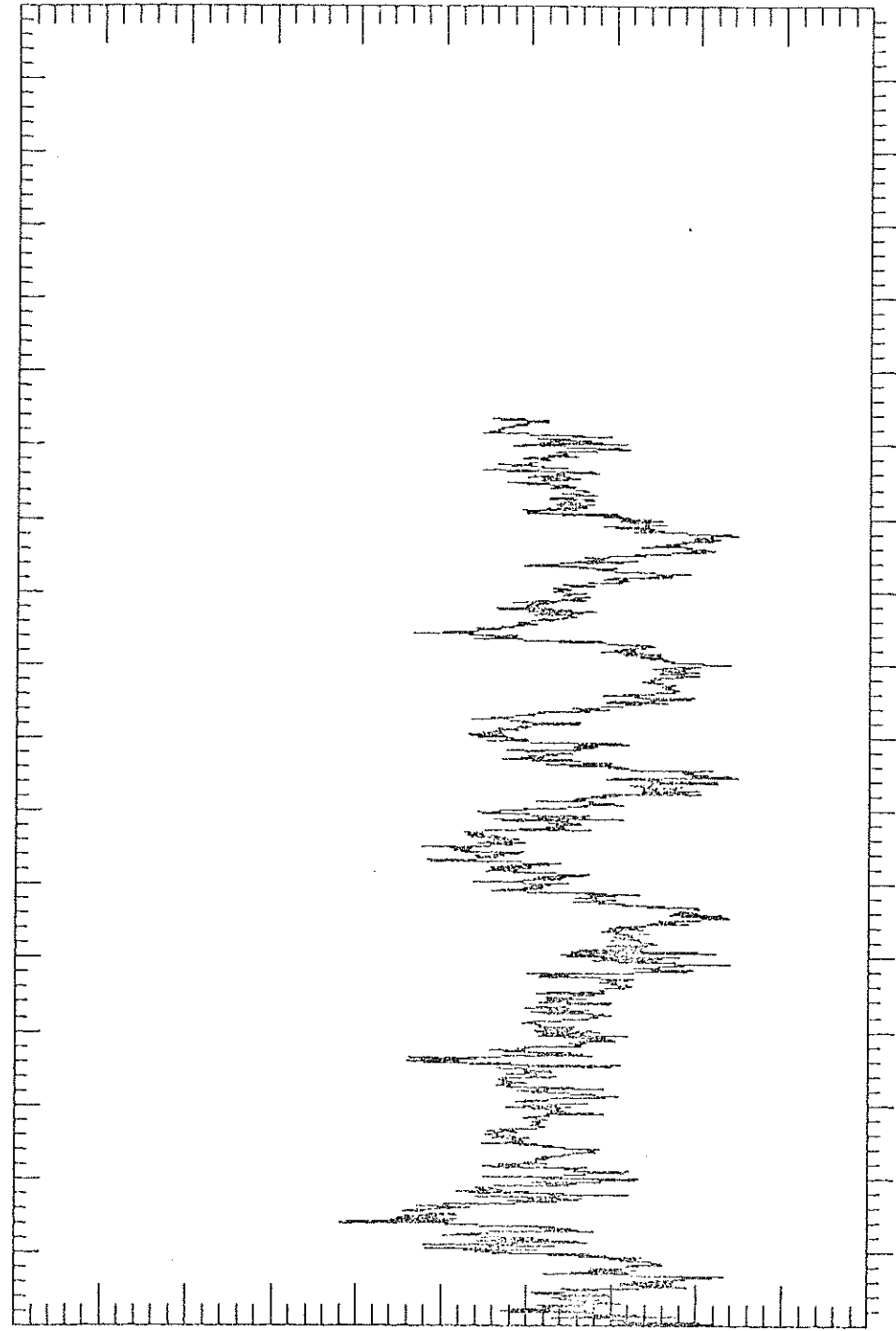
TRIAL: 000 TYPE: WSPD UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 10.0 M
 MEAN OF RUN UP: 2.91 MEAN OF RUN DOWN: 2.14



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 003 TYPE: UANA UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 10.0 M
 MEAN OF RUN UP: 0.30 MEAN OF RUN DOWN: -0.00

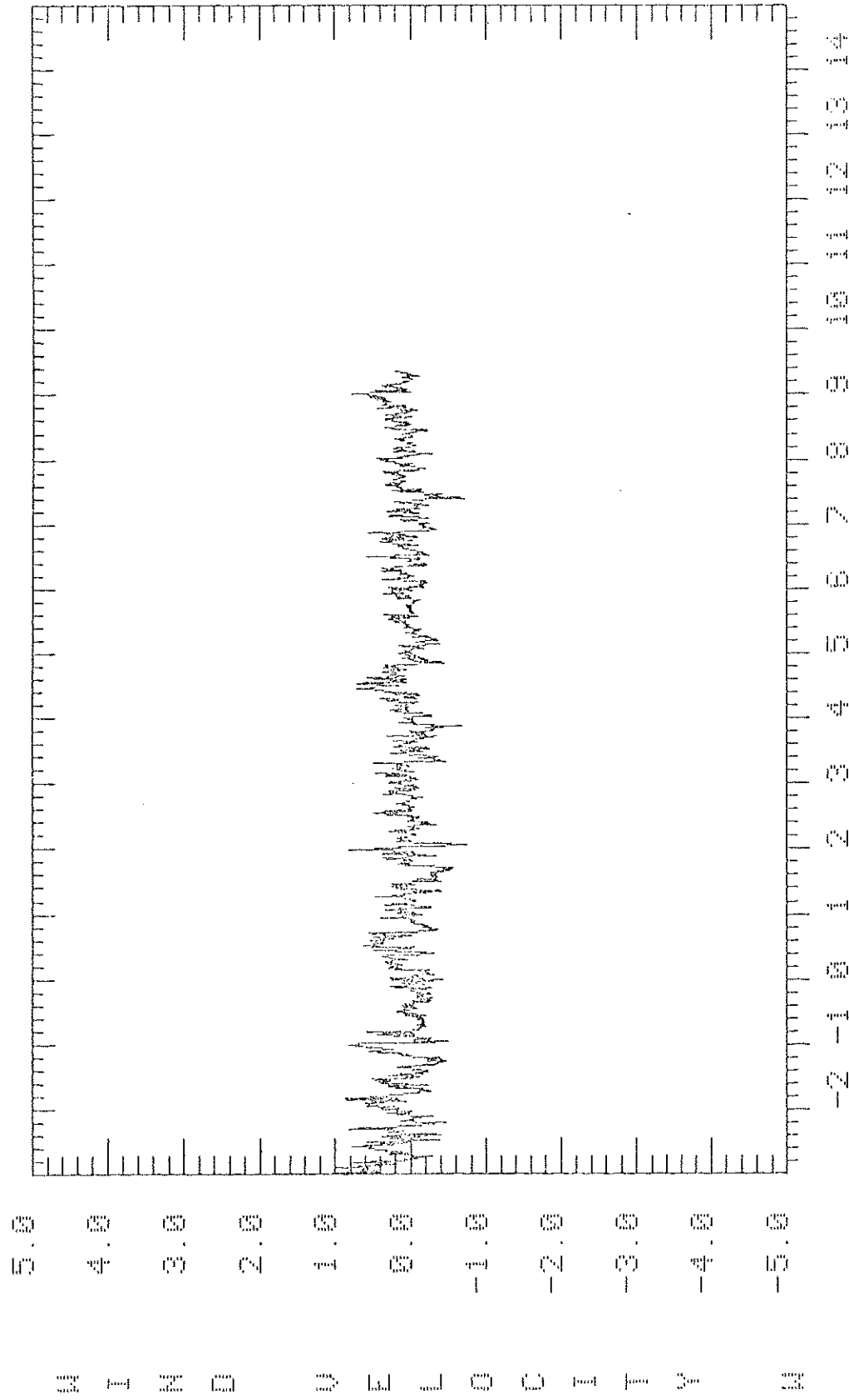
5.0
 4.0
 3.0
 2.0
 1.0
 0.0
 -1.0
 -2.0
 -3.0
 -4.0
 -5.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

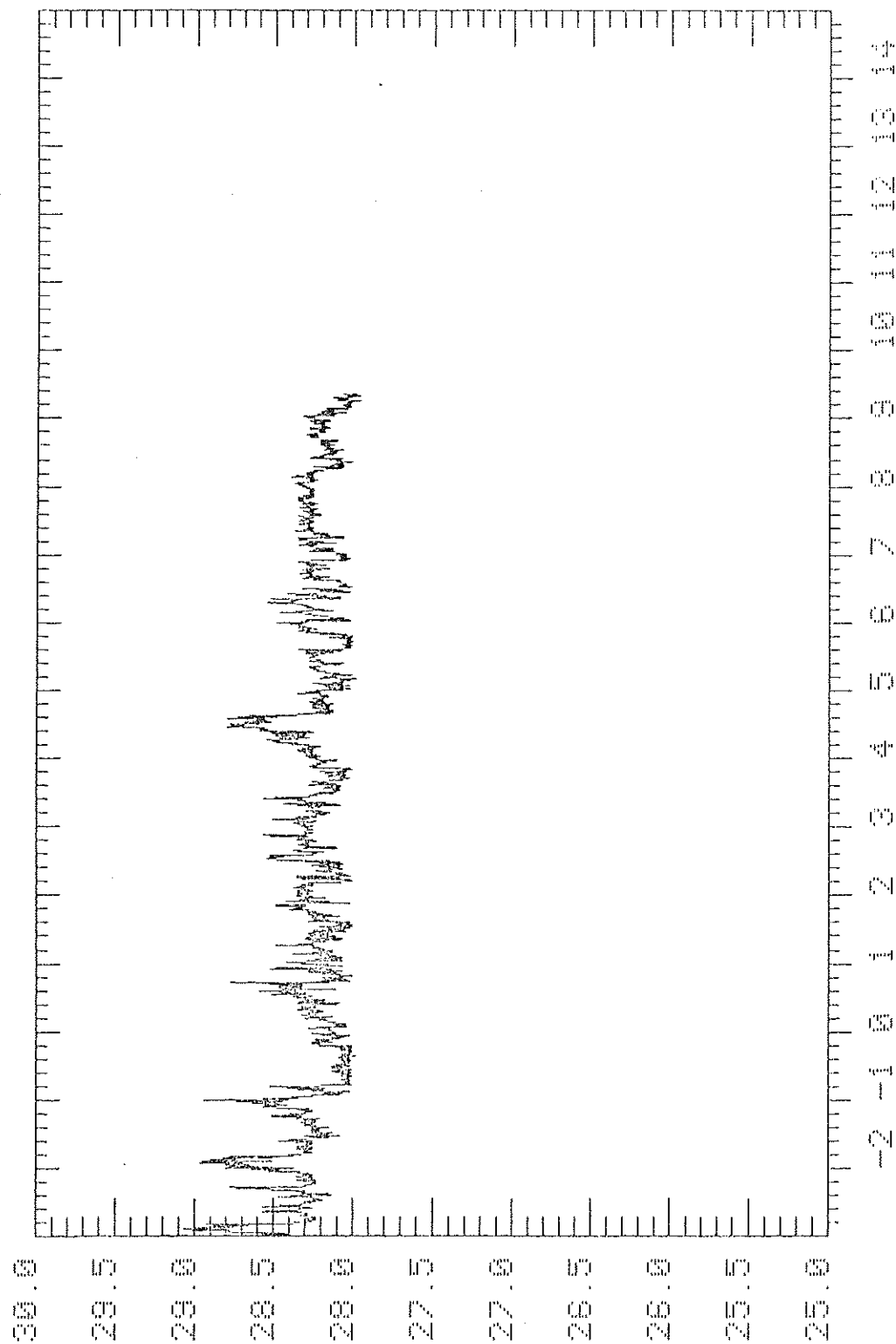
TRIAL: 008 TYPE: UAHB UNITS: N/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 10.0 M
 MEAN OF RUN UP: 2.15 MEAN OF RUN DOWN: 1.78



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UAHW UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 10.0 M
 MEAN OF RUN UP: 0.09 MEAN OF RUN DOWN: 0.09

T E L L E R A T O R E



TIME FROM RELEASE (SECS*10**-2)

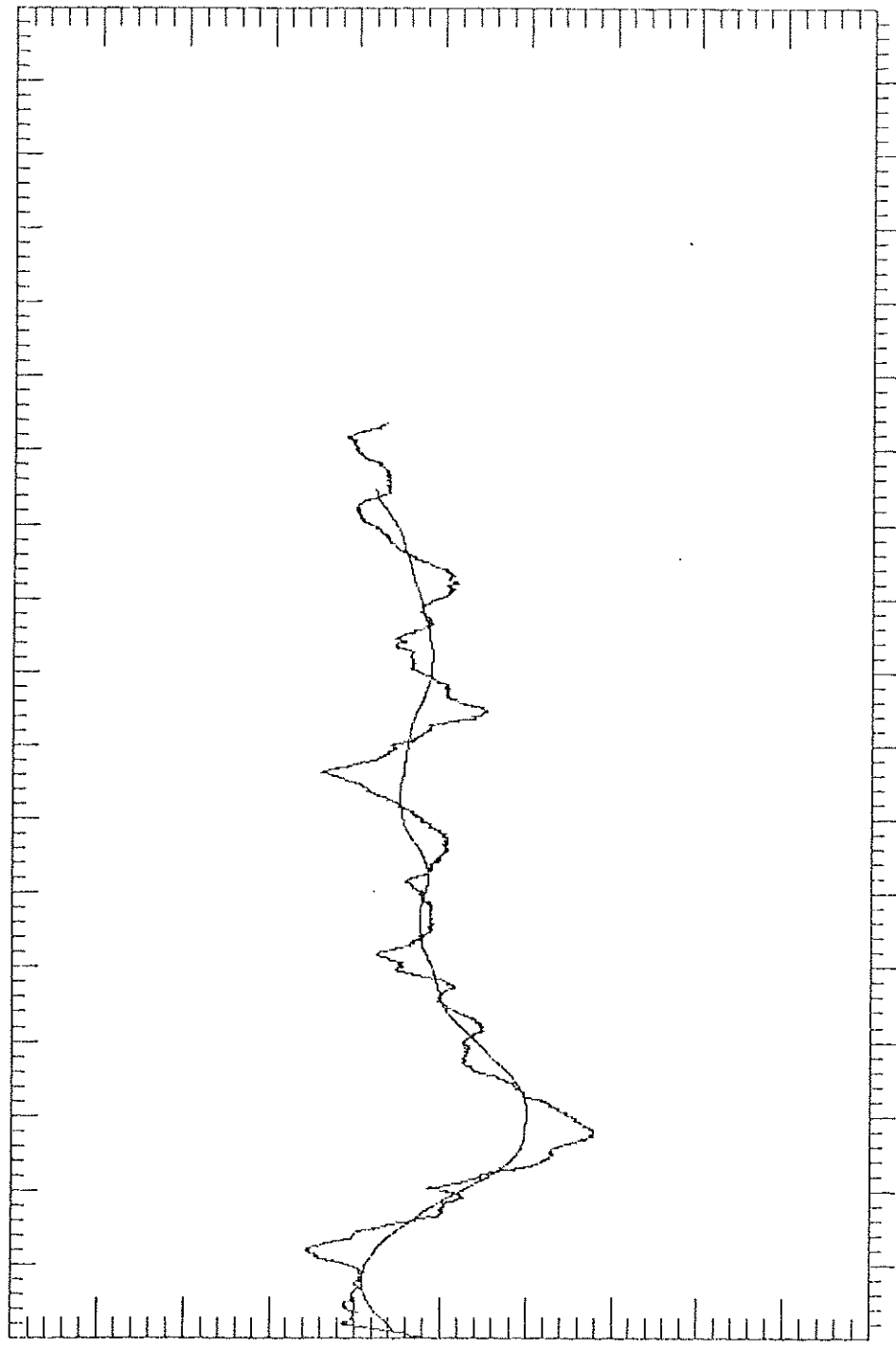
TRIAL: 000 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 N Y: 50 N Z: 10.0 N

MEAN OF RUN UP: 28.29 MEAN OF RUN DOWN: 28.12

U N I T Y

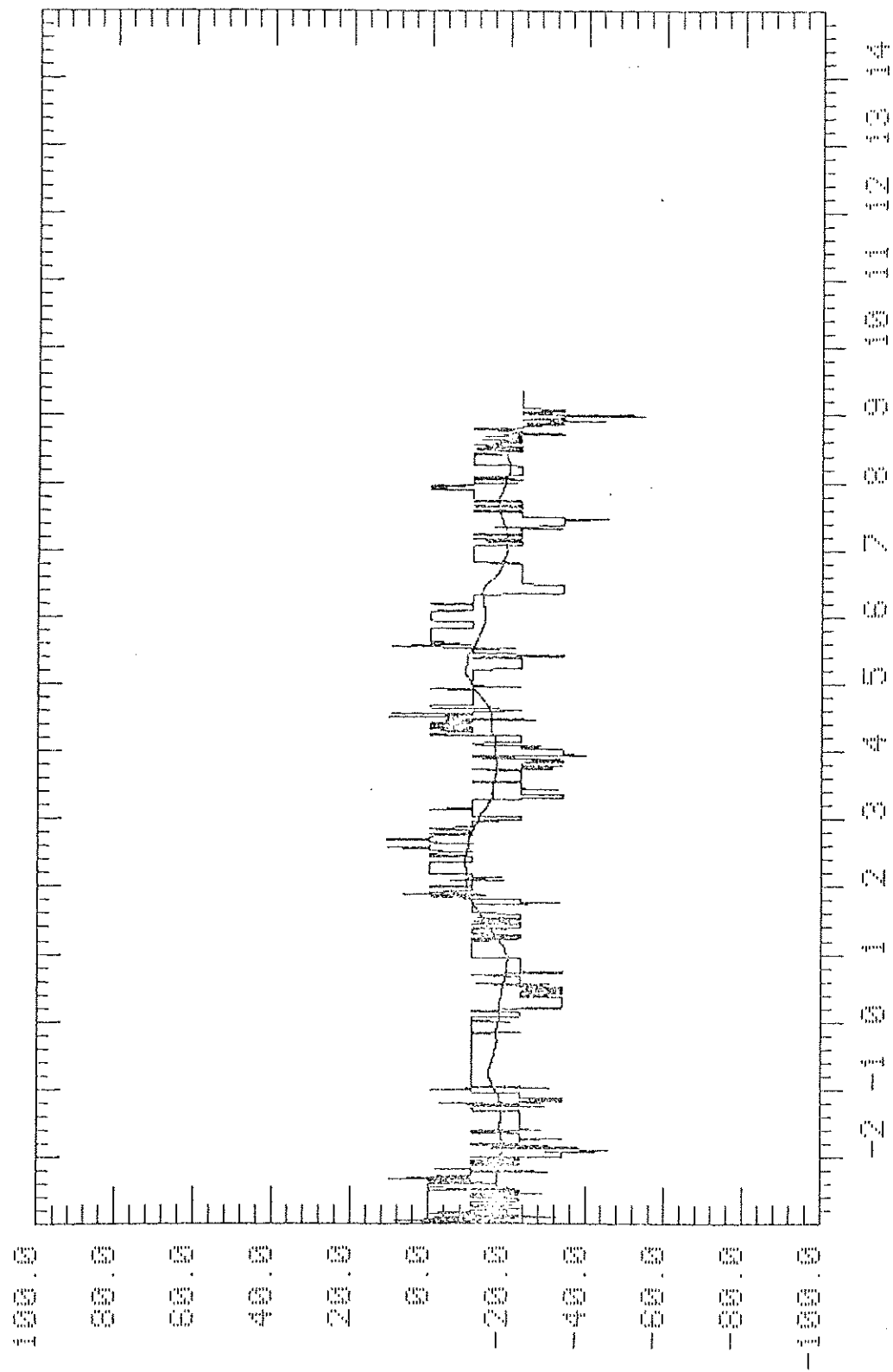
09.0
08.5
08.0
07.5
07.0
06.5
06.0
05.5
05.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: RHUM UNITS: PER CENT
AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 10.0 M
MEAN OF RUN UP: 88.35 MEAN OF RUN DOWN: 87.52



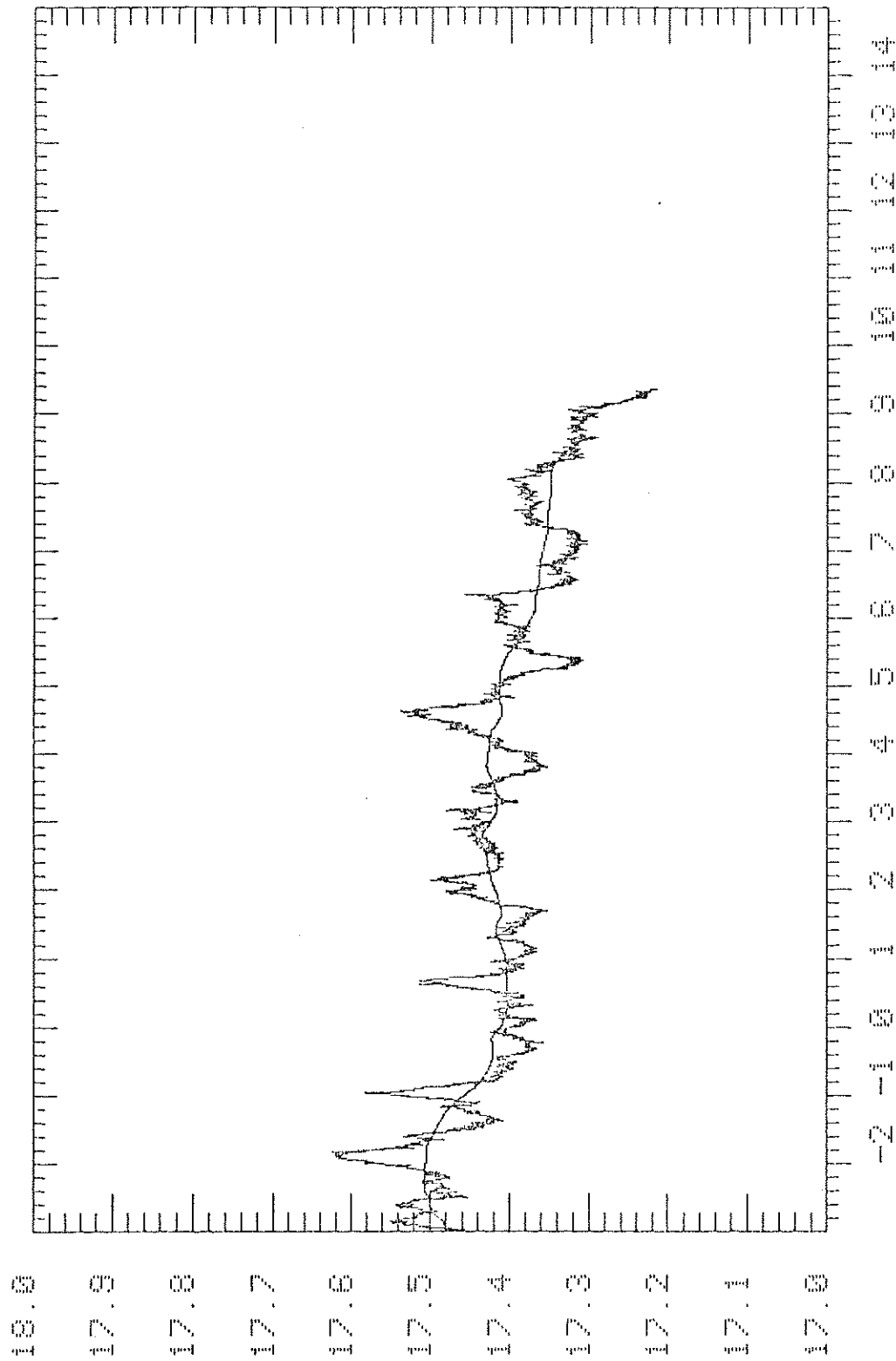
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: WHOG UNITS: DEGREES

AVERAGING TIME: 0.6 SEC X: 400 N Y: 50 N Z: 10.0 N

MEAN OF RUN UP: -17.88 MEAN OF RUN DOWN: -27.85

T E M P E R A T U R E

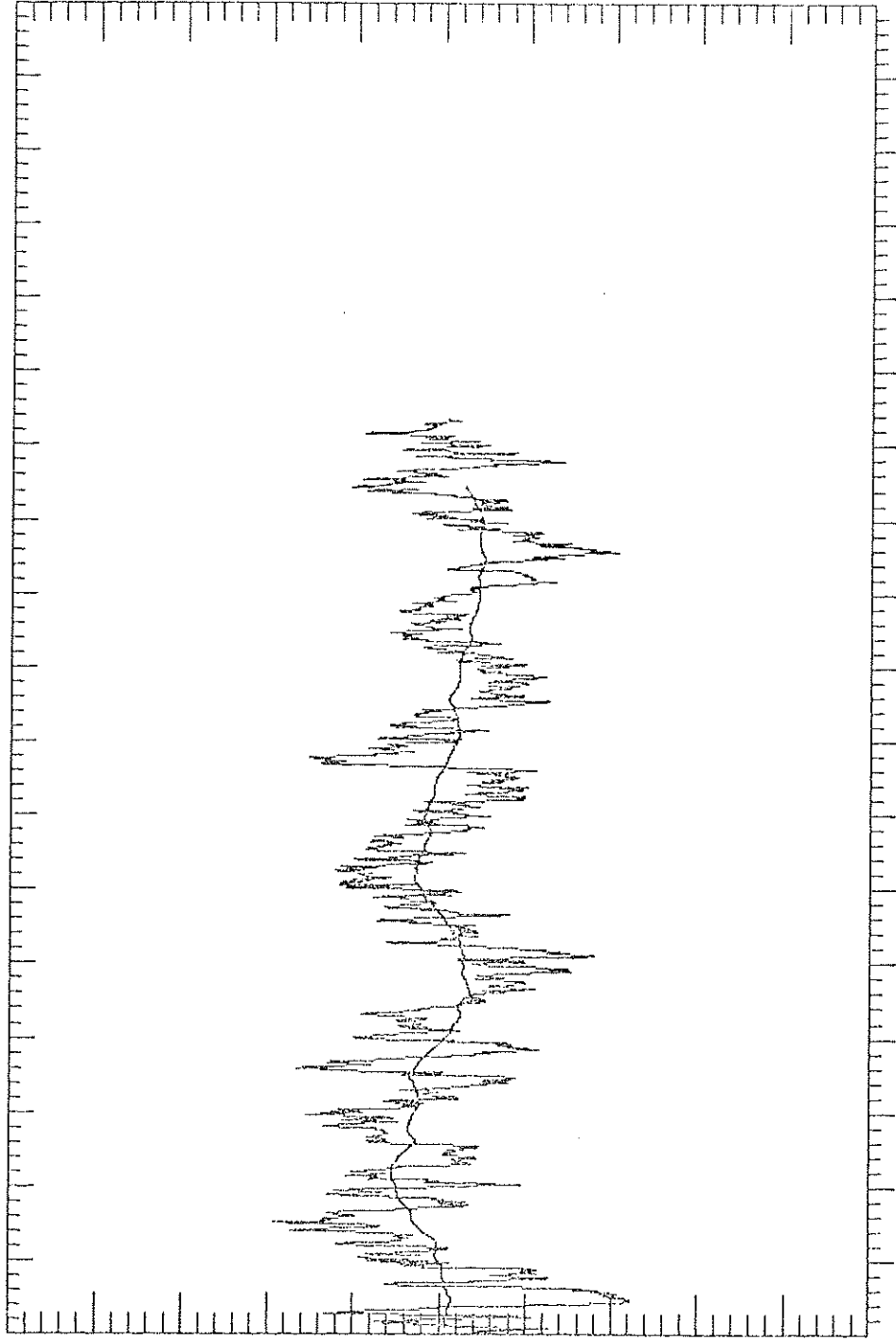


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: AIRT UNITS: DEGREES C
 AVERAGING TIME: 0.6 SEC X: 400 H Y: 50 H Z: 10.0 H
 MEAN OF RUN UP: 17.39 MEAN OF RUN DOWN: 17.20

0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

C F F F C
C F F C
C F F C

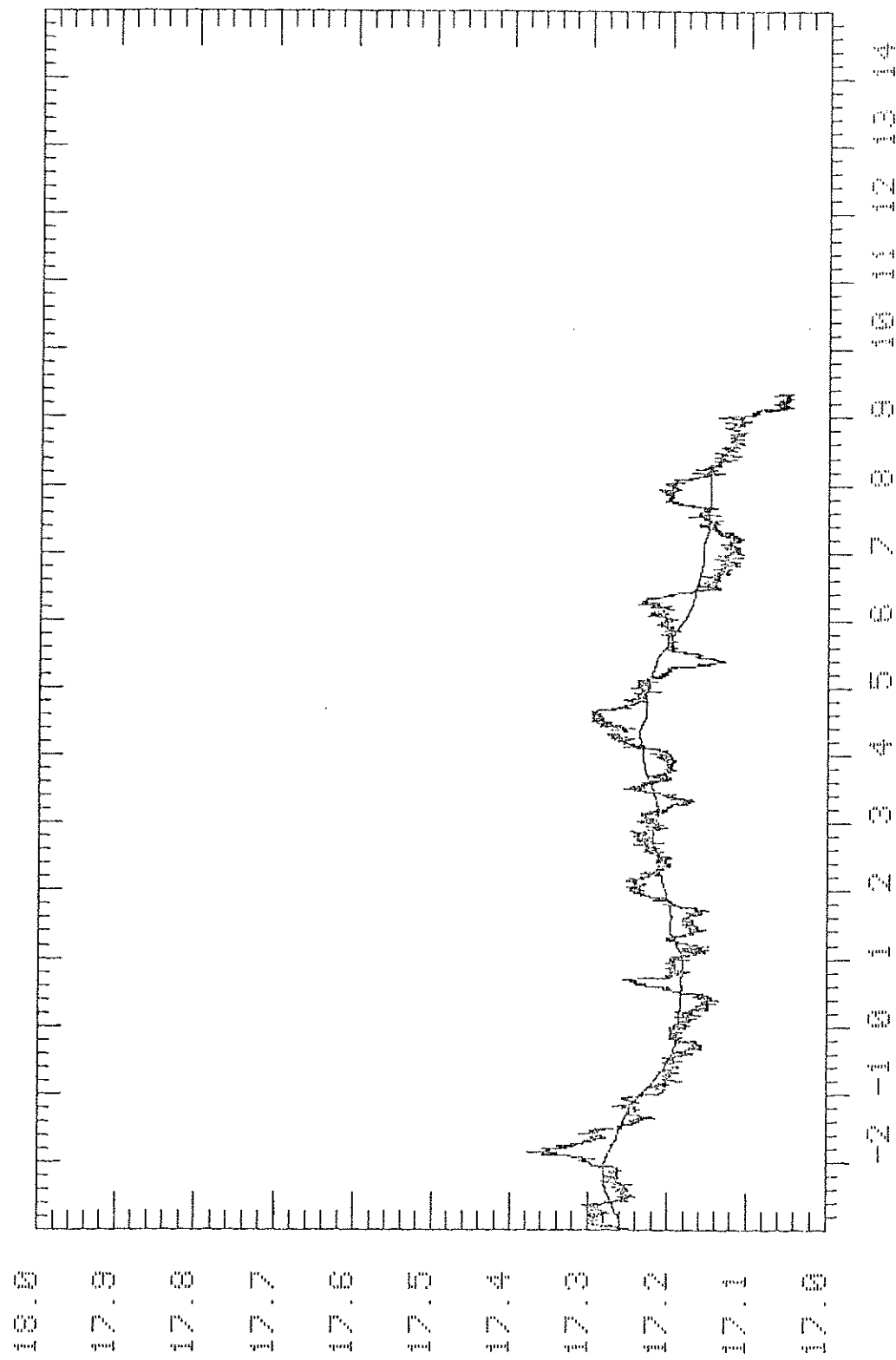


-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: USPD UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 17.3 M
 MEAN OF RUN UP: 3.03 MEAN OF RUN DOWN: 2.23

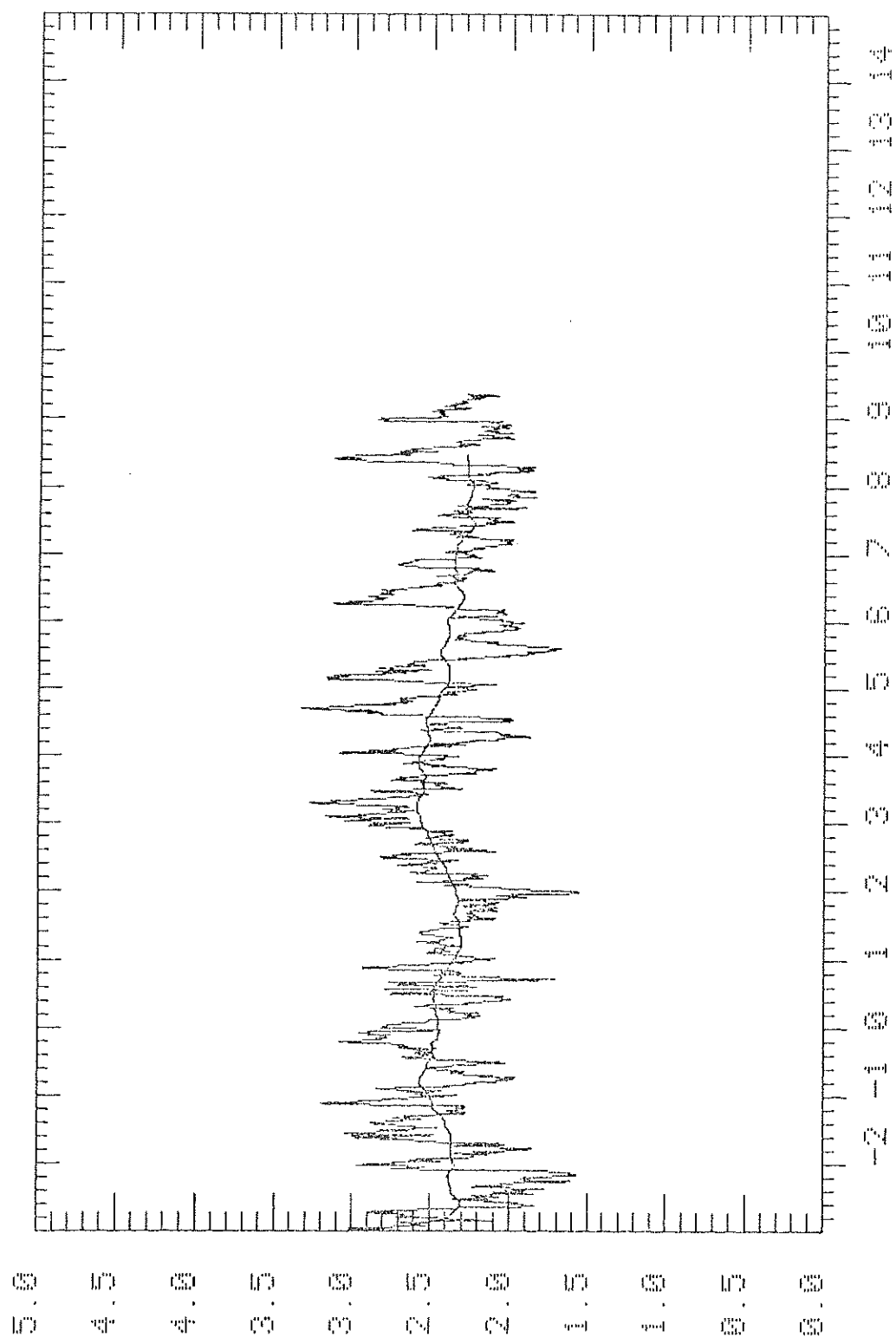
F E R A T D R L



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: AIRT UNITS: DEGREES C
AVERAGING TIME: 0.6 SEC X: 499 N Y: 50 N Z: 22.0 M
MEAN OF RUN UP: 17.18 MEAN OF RUN DOWN: 17.01

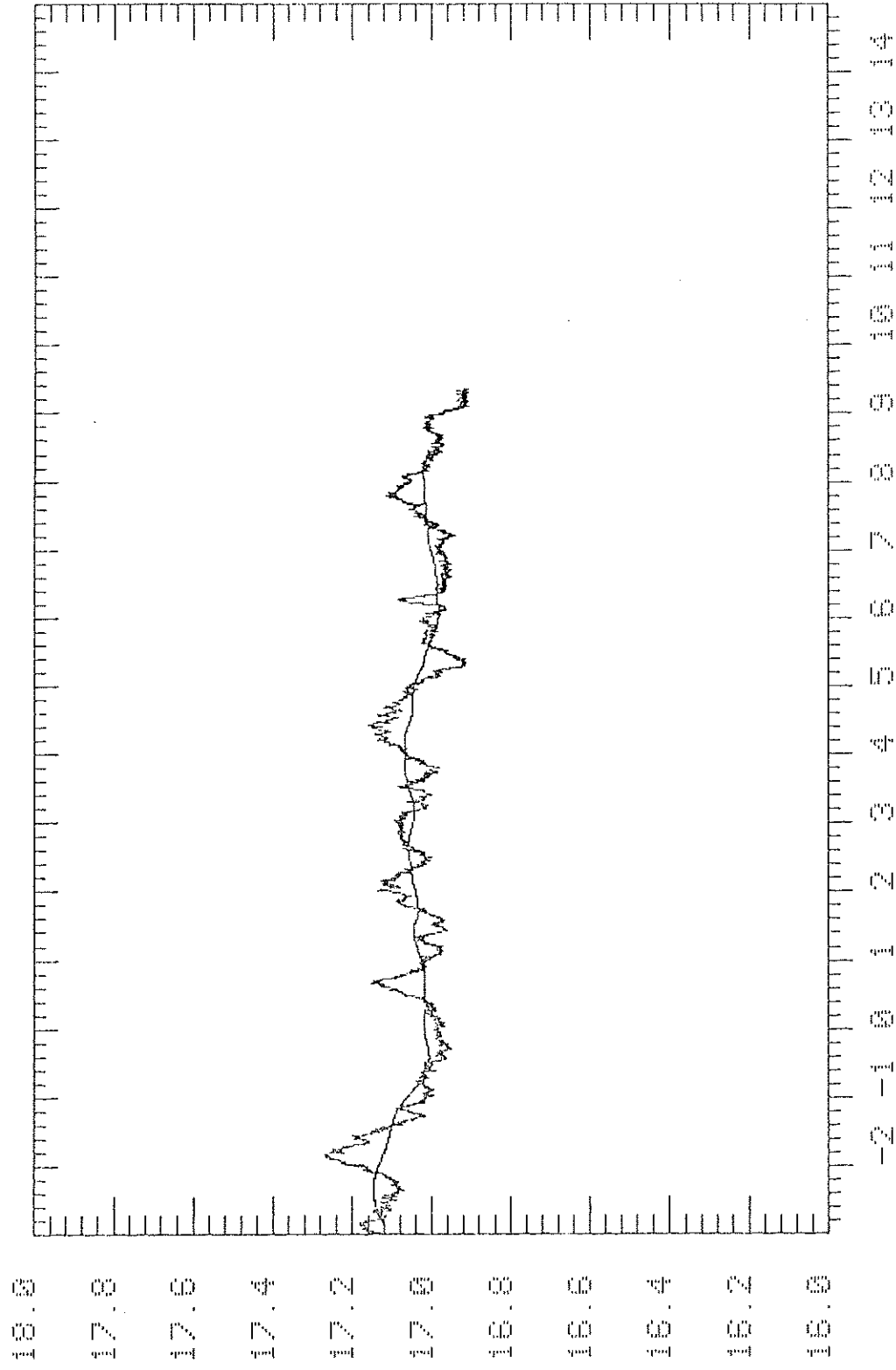
3 1 2 0 0 2 3 0



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: WSPD UNITS: M/S
AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 30.0 M
MEAN OF RUN UP: 2.97 MEAN OF RUN DOWN: 2.10

T E M P E R A T U R E



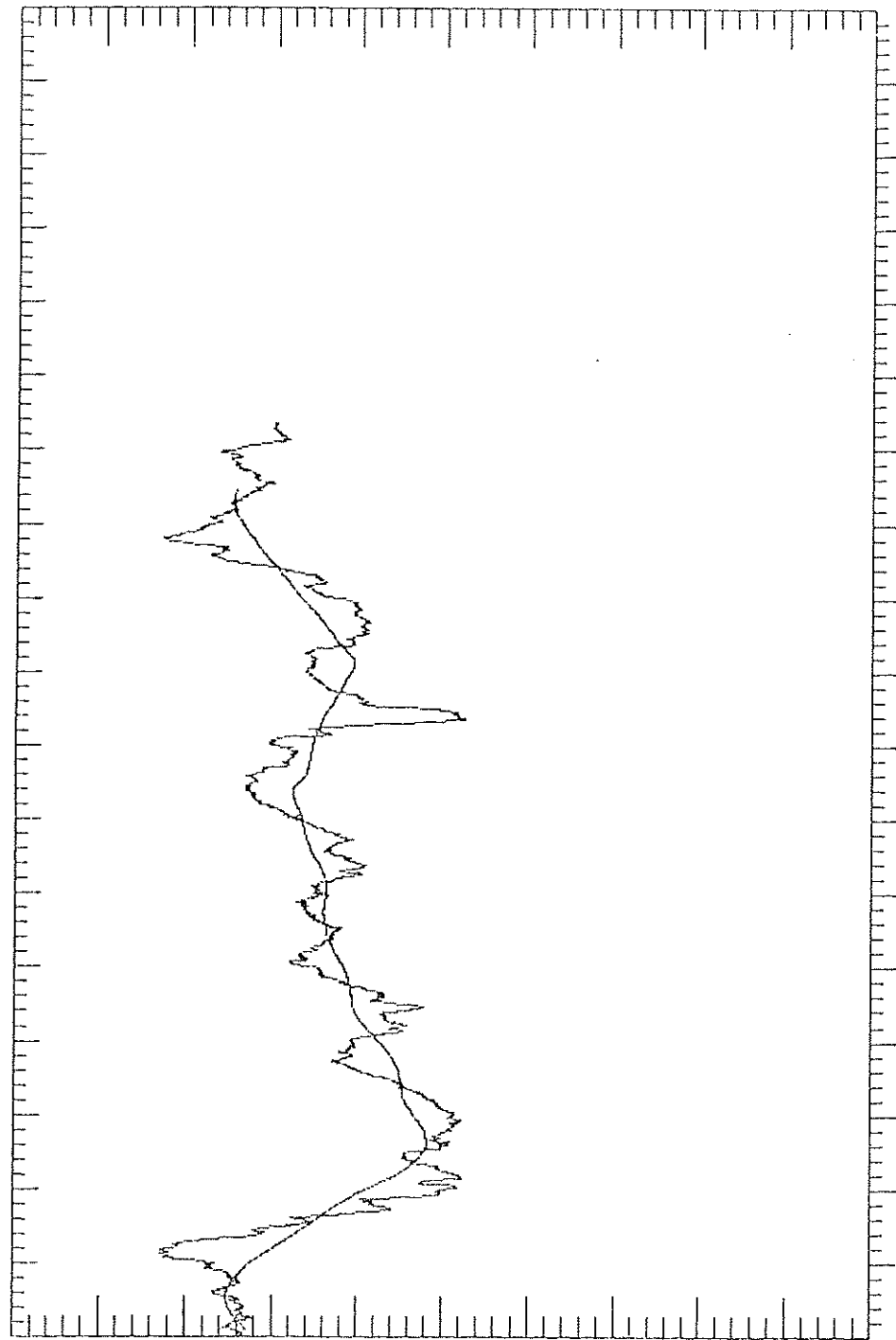
TRIAL: 999 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 30.0 M

MEAN OF RUN UP: 17.98 MEAN OF RUN DOWN: 16.92

I O E F D H T Y

99.5
99.5
99.5
99.5
99.5
97.5
97.5
99.5
99.5
99.5
95.5



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

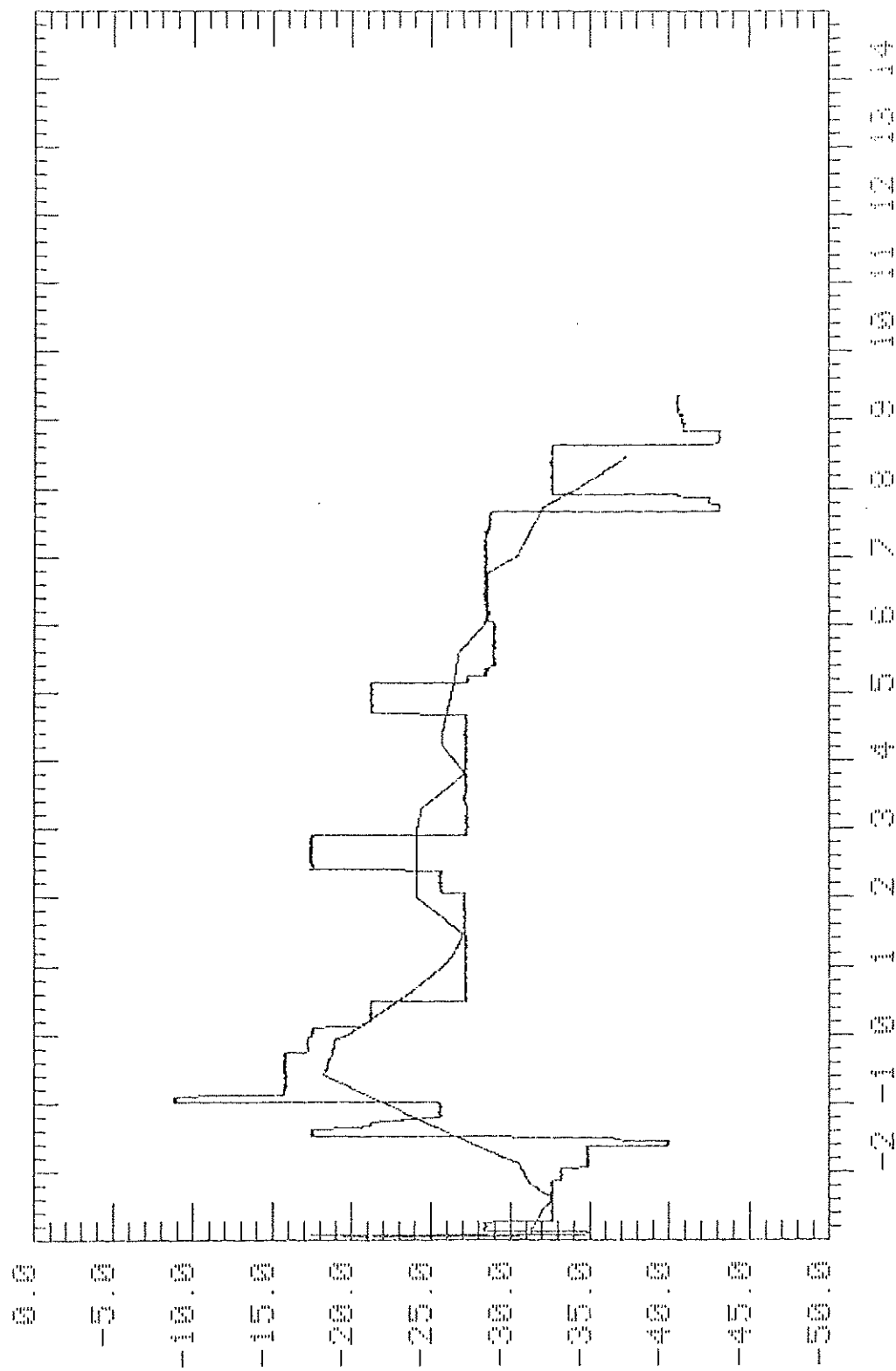
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: RHUM UNITS: PER CENT

AVERAGING TIME: 0.6 SEC X: 400 N Y: 50 N Z: 30.0 N

MEAN OF RUN UP: 89.59 MEAN OF RUN DOWN: 87.82

W I N D D I R E C T I O N



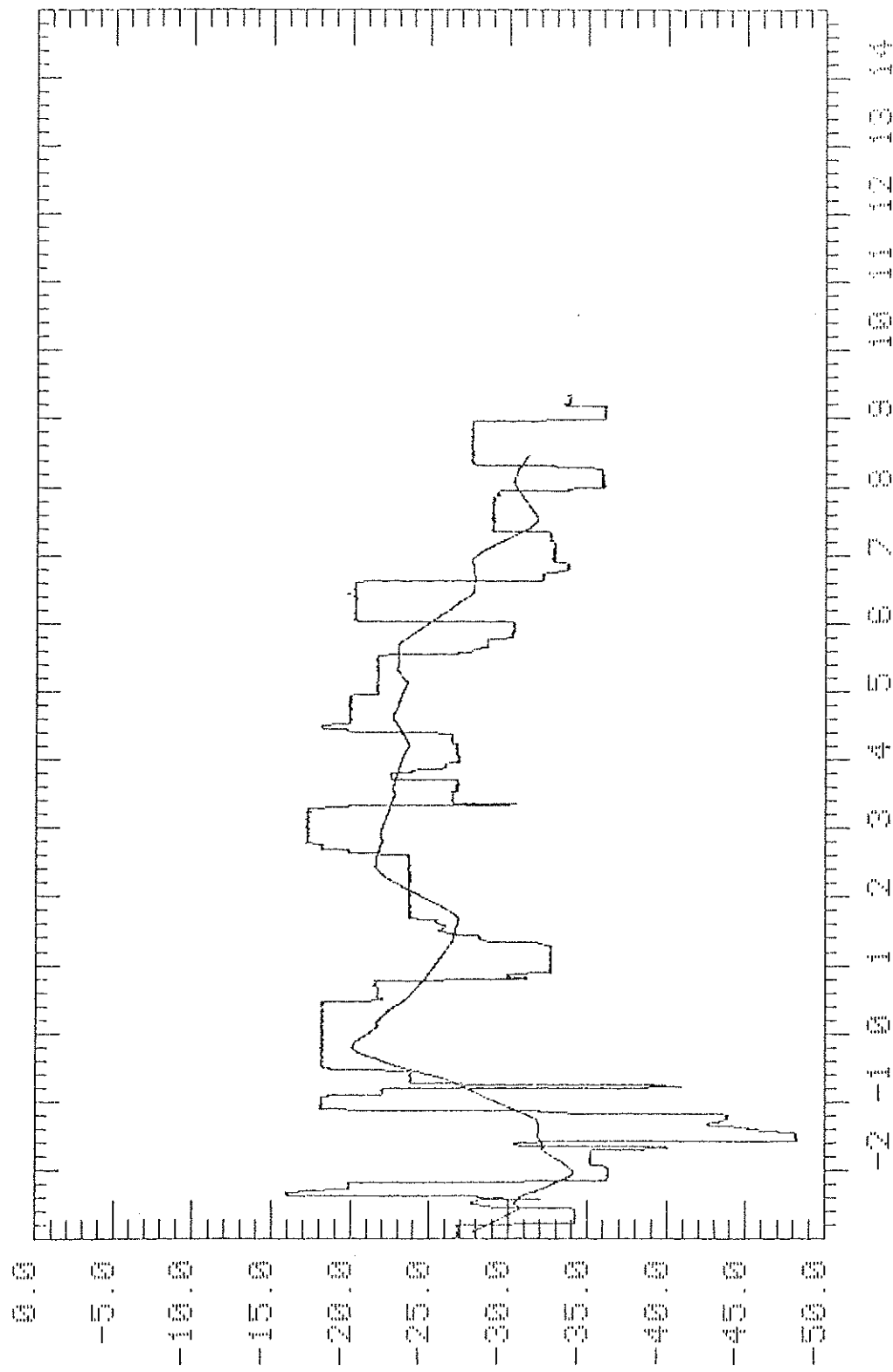
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: WDC UNITS: DEGREES

AVERAGING TIME: 0.6 SEC X: 420 N Y: 50 N Z: 10.0 N

MEAN OF RUN UP: -25.85 MEAN OF RUN DOWN: -31.91

W I N D D I R E C T I O N



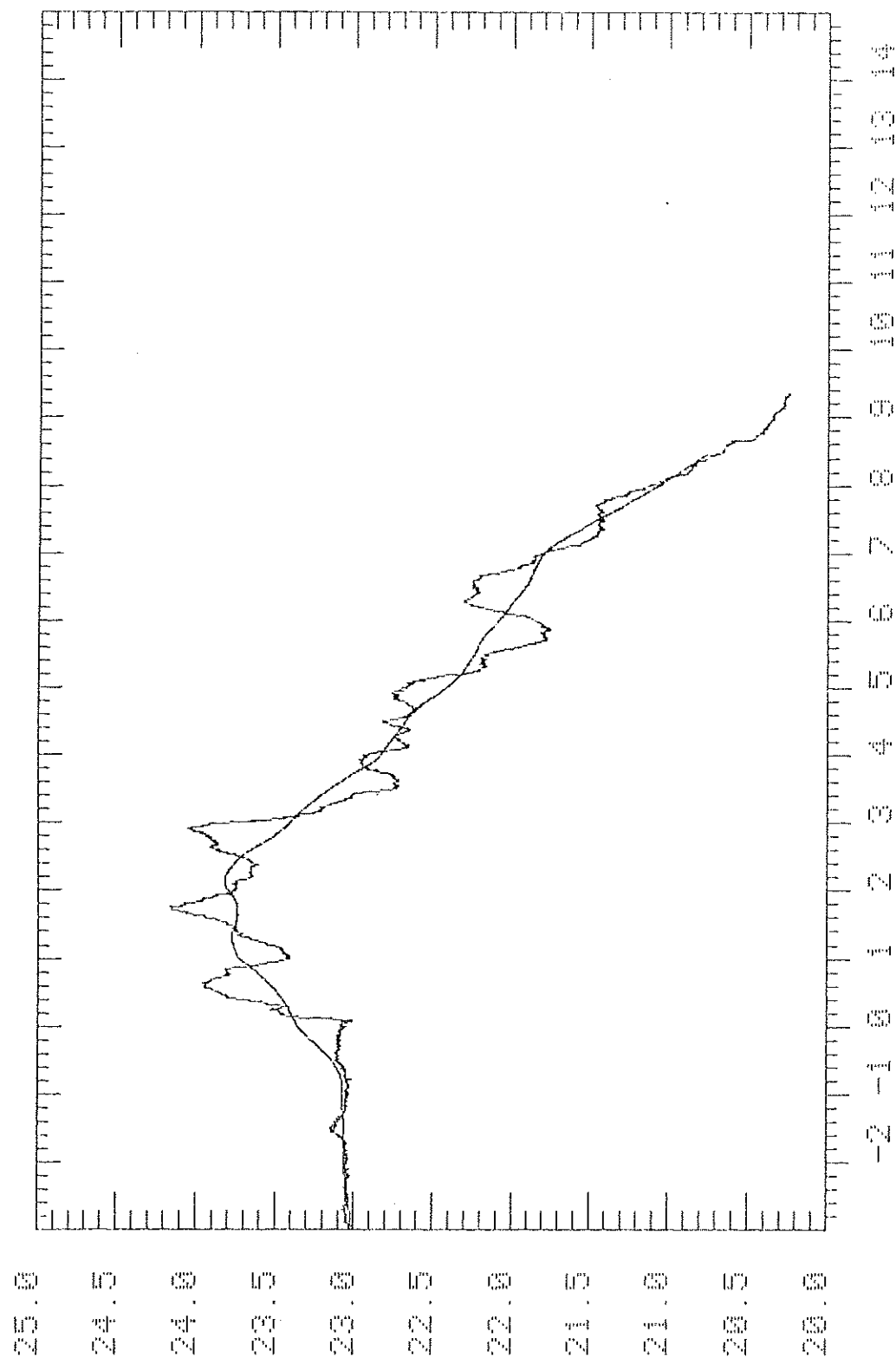
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 930 TYPE: WHDC UNITS: DEGREES

AVERAGING TIME: 0.6 SEC X: 400 M Y: 150 M Z: 10.0 M

MEAN OF RUN UP: -25.33 MEAN OF RUN DOWN: -29.89

T E M P E R A T U R E



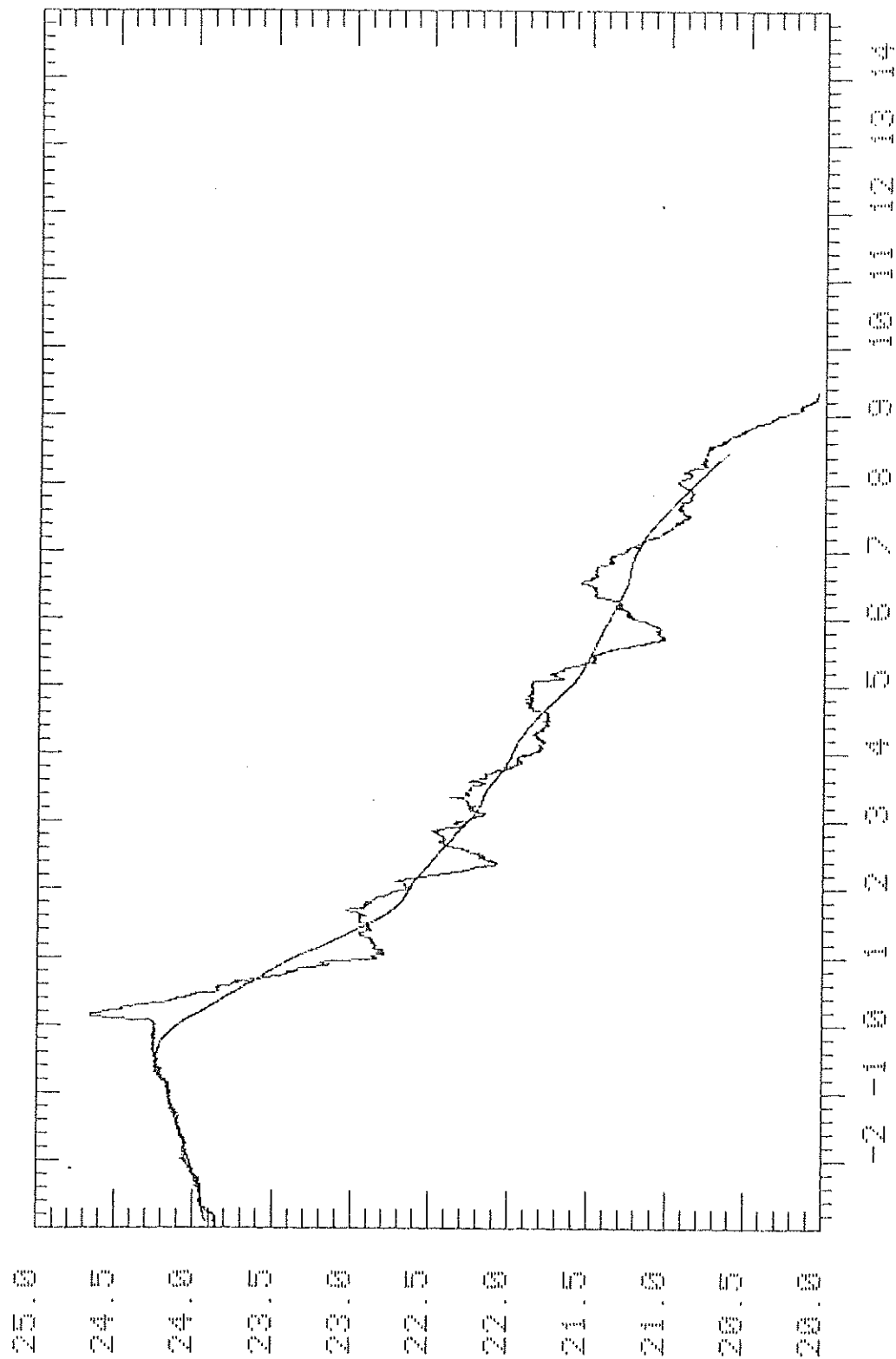
TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 200 M Z: 0.4 M

MEAN OF RUN UP: 22.93 MEAN OF RUN DOWN: 22.47

T E M P E R A T U R E

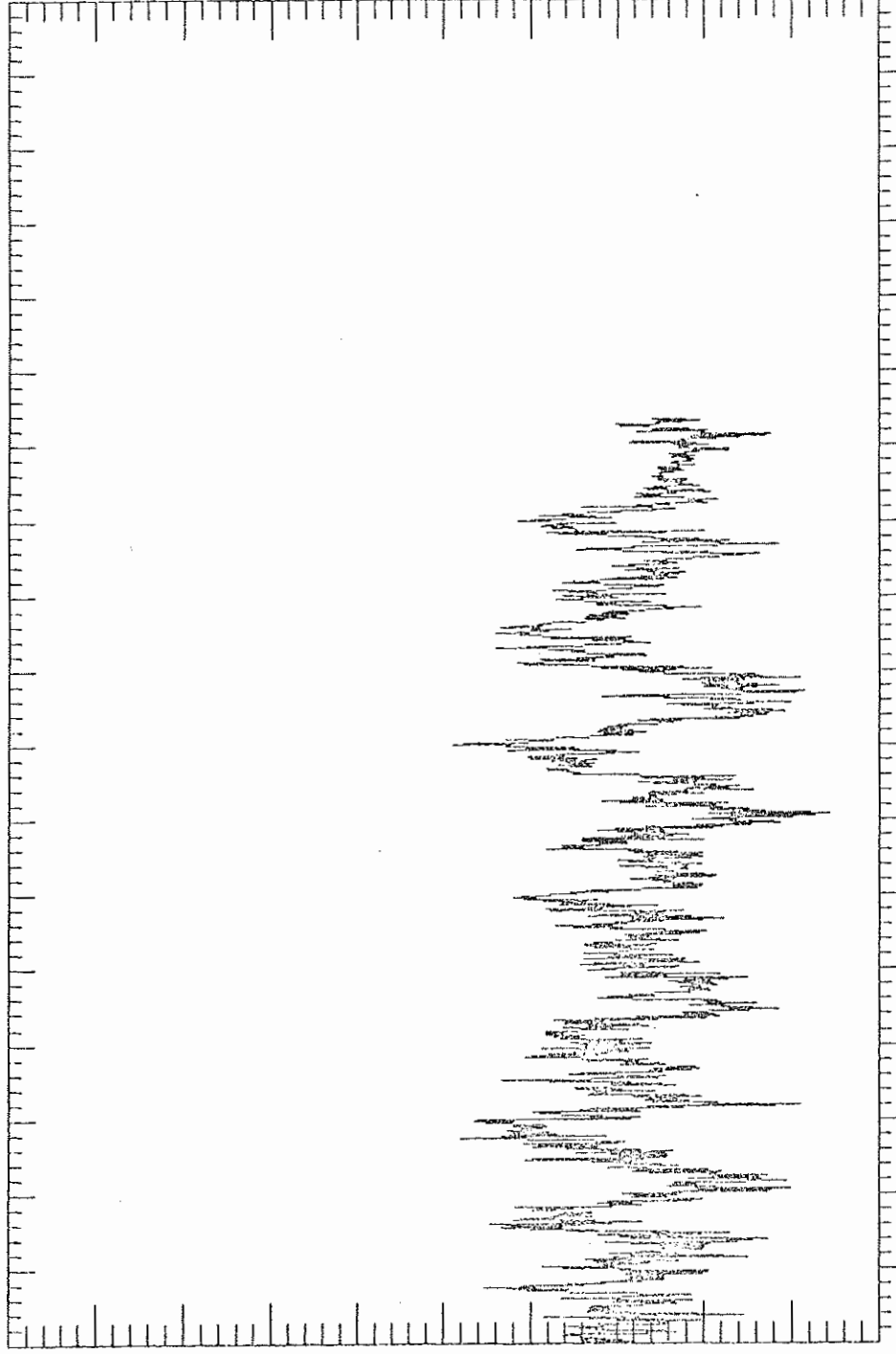


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: AIRT UNITS: DEGREES C
 AVERAGING TIME: 0.6 SEC X: 400 H Y: 200 H Z: 12.0 M
 MEAN OF RUN UP: 23.01 MEAN OF RUN DOWN: 20.96

W I K D U F L O C I T Y B

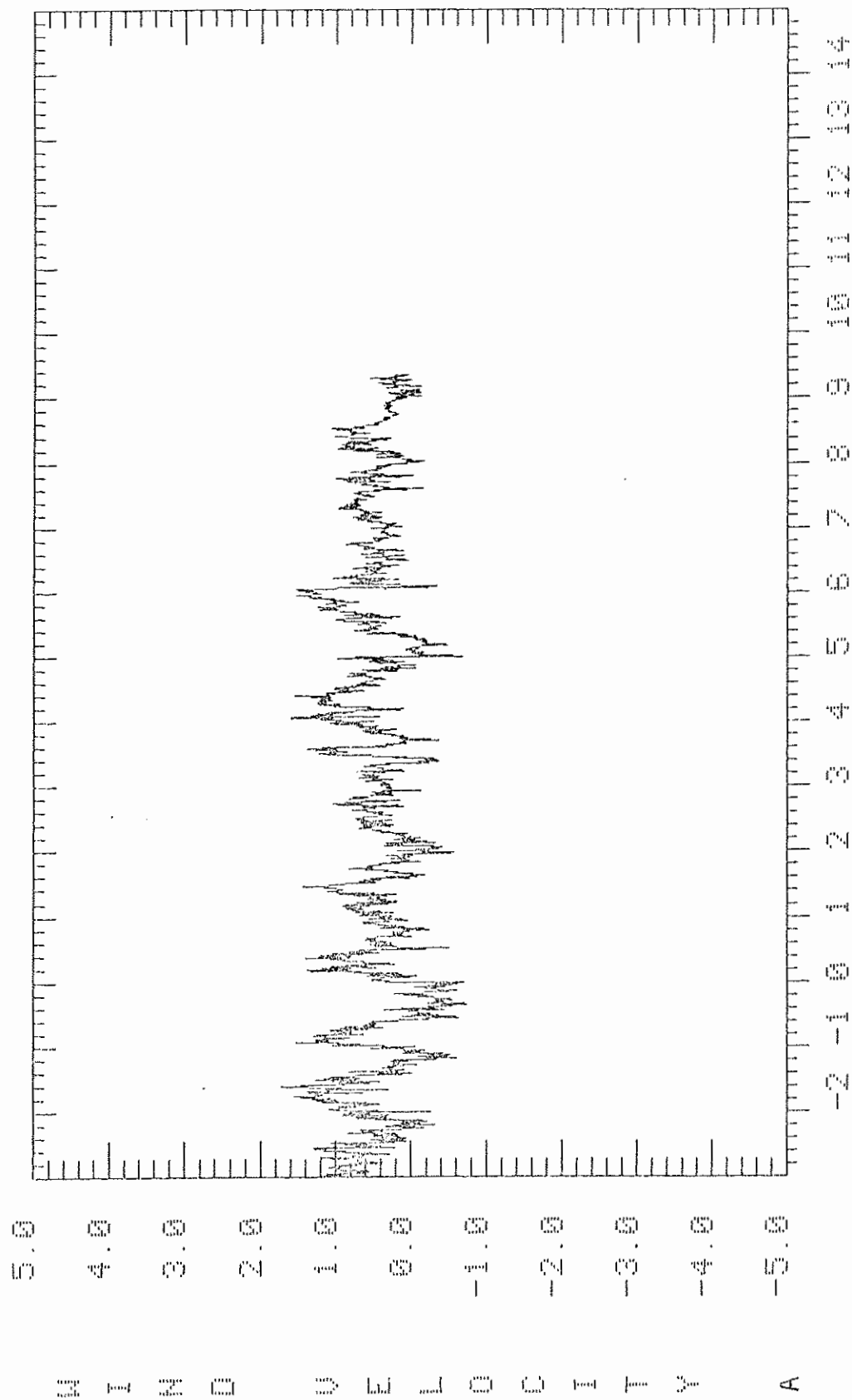
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: UNAB UNITS: M/S
AVERAGING TIME: 0.6 SEC X: 390 N Y: 350 N Z: 2.0 N
MEAN OF RUN UP: 1.64 MEAN OF RUN DOWN: 0.99



TIME FROM RELEASE (SECS*10**-2)

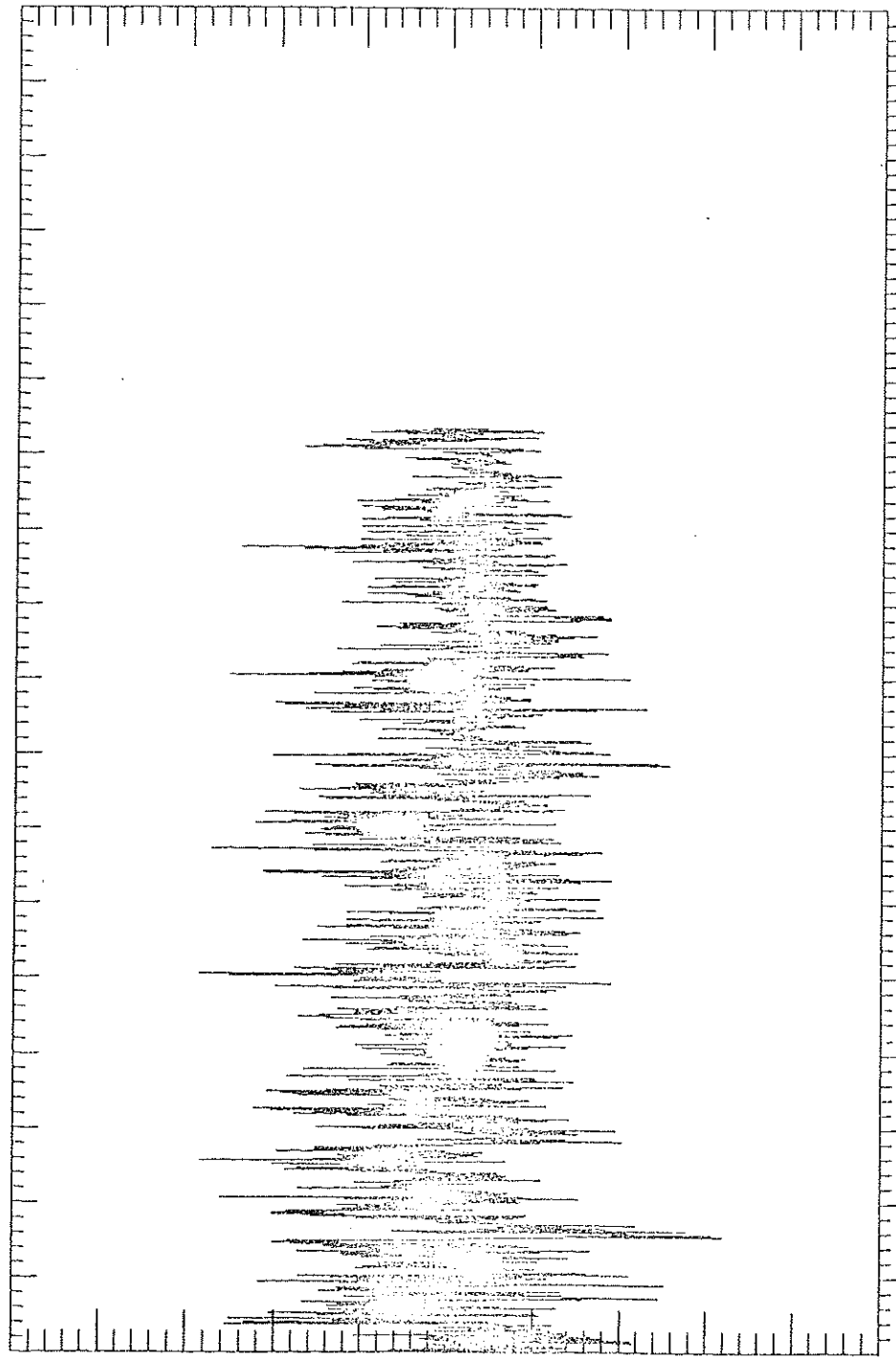
TRIAL: 000 TYPE: UAHN UNITS: N/S

AVERAGING TIME: 0.6 SEC X: 300 N Y: 350 N Z: 2.0 N

MEAN OF RUN UP: 0.34 MEAN OF RUN DOWN: 0.11

1.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
-1.0

3 4 5 6 7 8 9 10 11 12 13 14



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

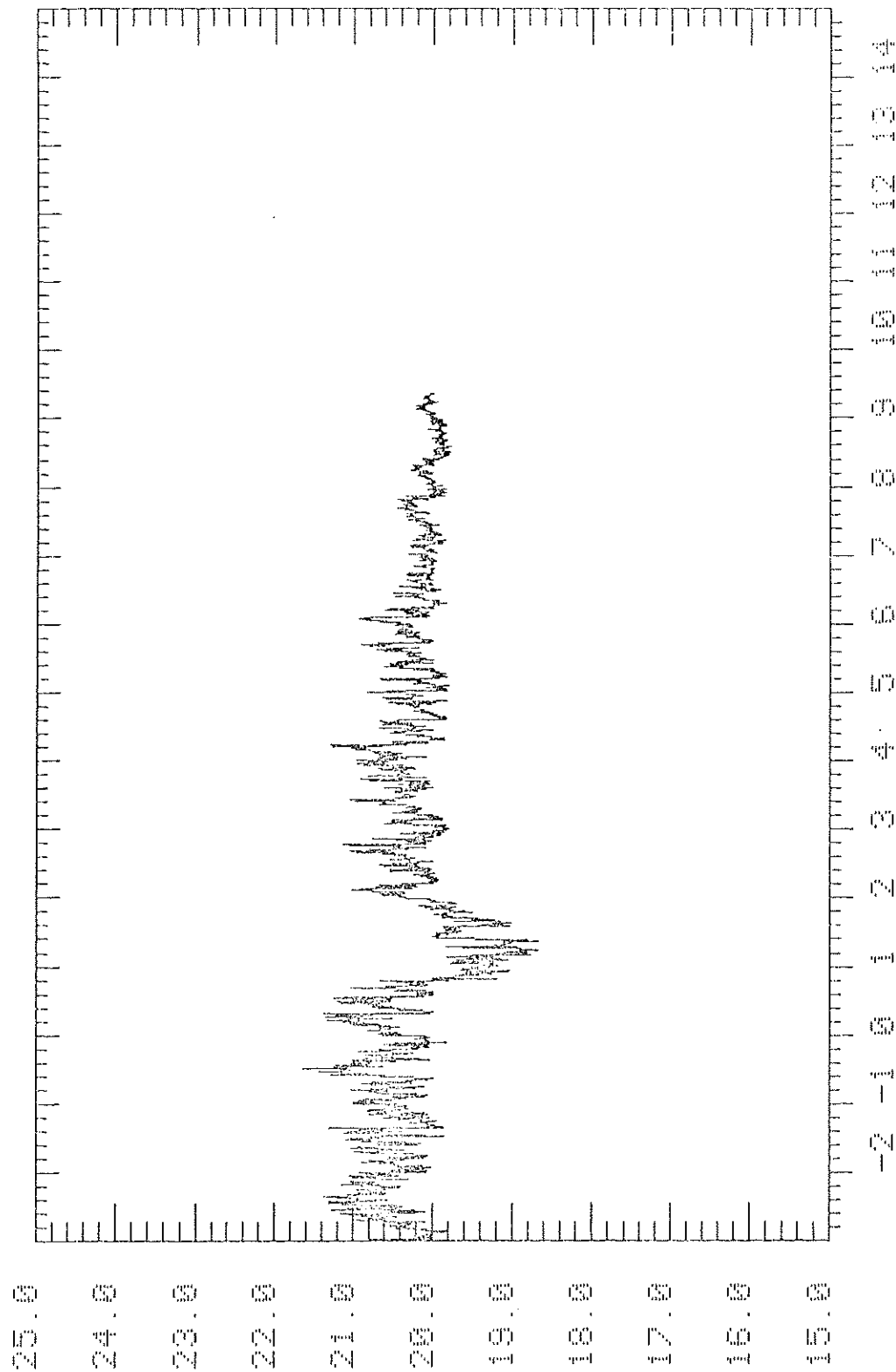
TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: UAHN UNITS: M/S

AVERAGING TIME: 0.0 SEC X: 390 N Y: 350 N Z: 2.0 N

MEAN OF RUN UP: -0.03 MEAN OF RUN DOWN: -0.02

T E R R A T U R E

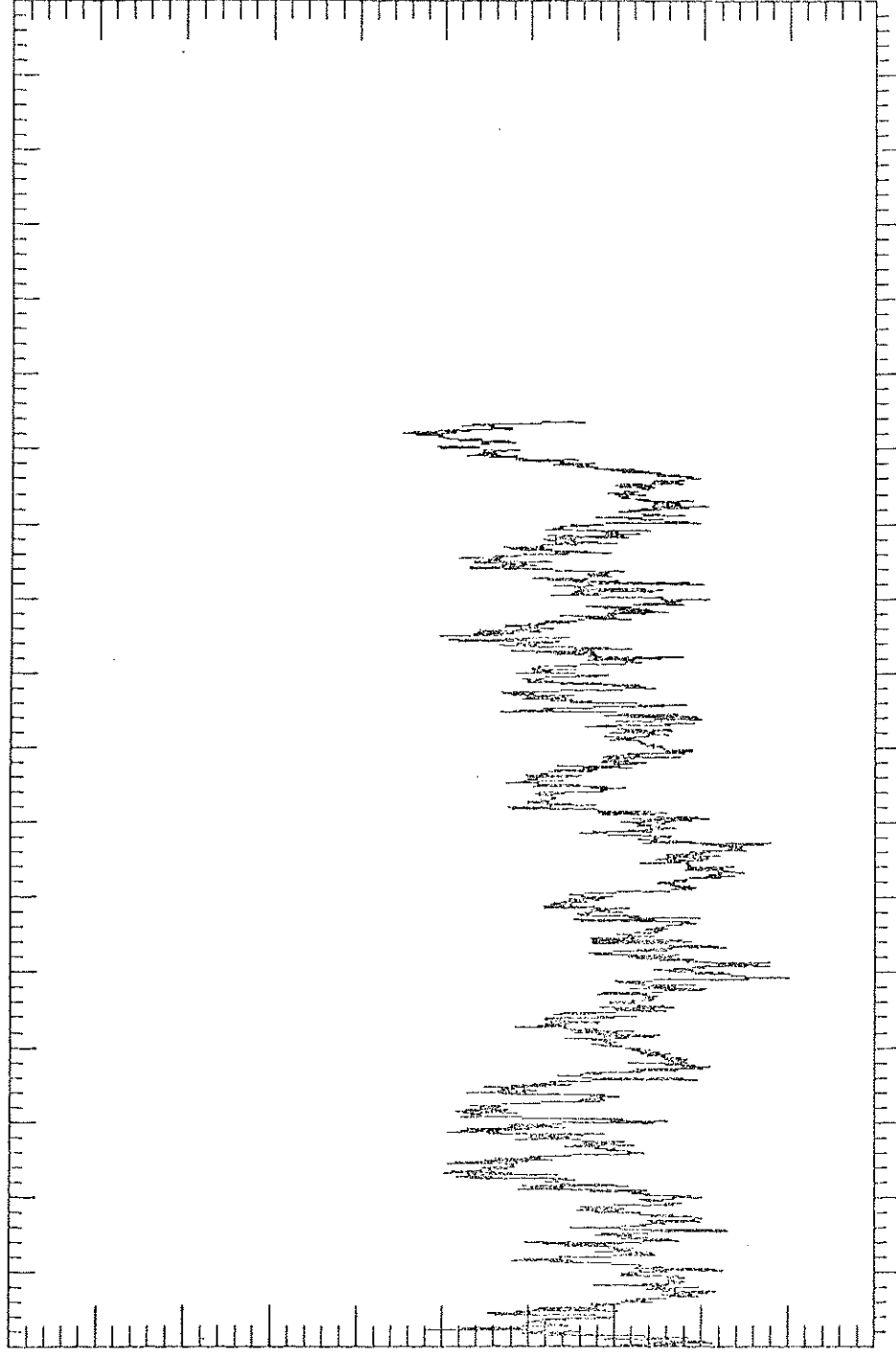


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 888 TYPE: UAH T UNITS: DEGREES C
AVERAGING TIME: 0.6 SEC X: 380 H Y: 350 H Z: 2.0 H
MEAN OF RUN UP: 20.38 MEAN OF RUN DOWN: 19.85

3 4 5 6 7 8 9 10 11 12 13 14

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0

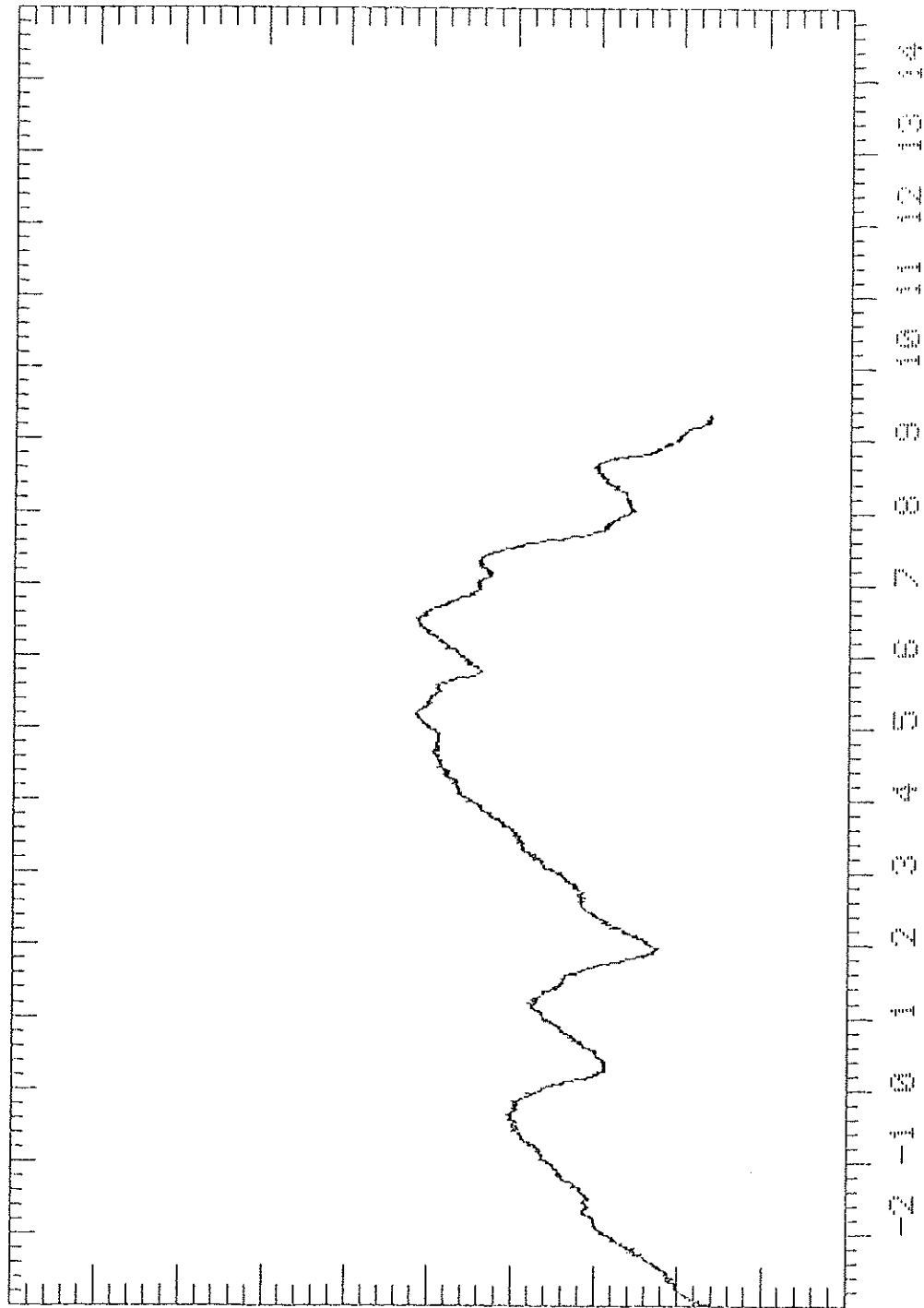


-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**2)

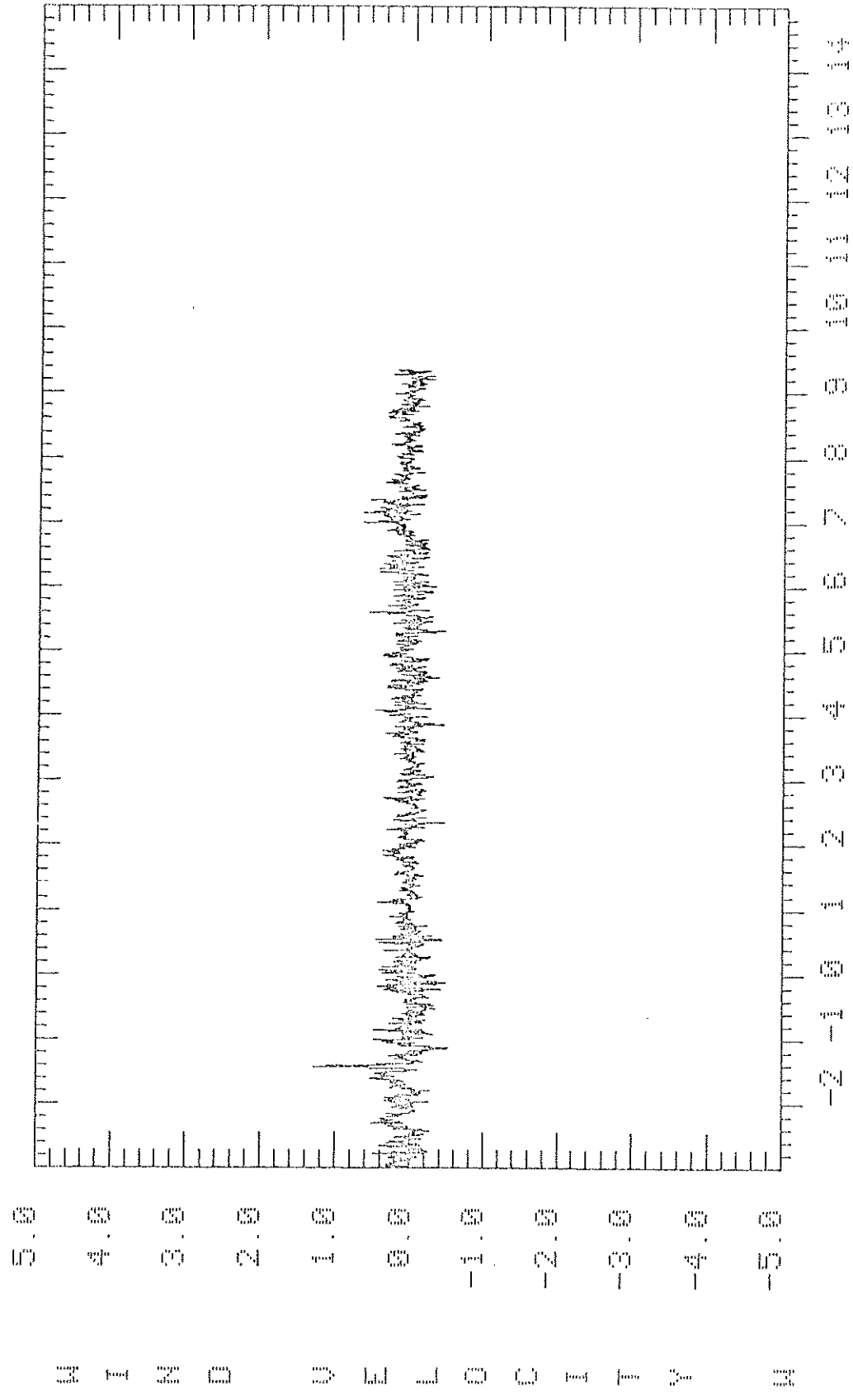
TRIAL: 000 TYPE: UAHB UNITS: N/S
 AVERAGING TIME: 0.6 SEC X: 400 N Y: 350 N Z: 2.0 N
 MEAN OF RUN UP: 1.61 MEAN OF RUN DOWN: 1.26

2.0
 1.6
 1.2
 0.8
 0.4
 0.0
 -0.4
 -0.8
 -1.2
 -1.6
 -2.0
 A



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UAHG UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 H Y: 350 H Z: 2.0 H
 MEAN OF RUN UP: 0.59 MEAN OF RUN DOWN: 0.62

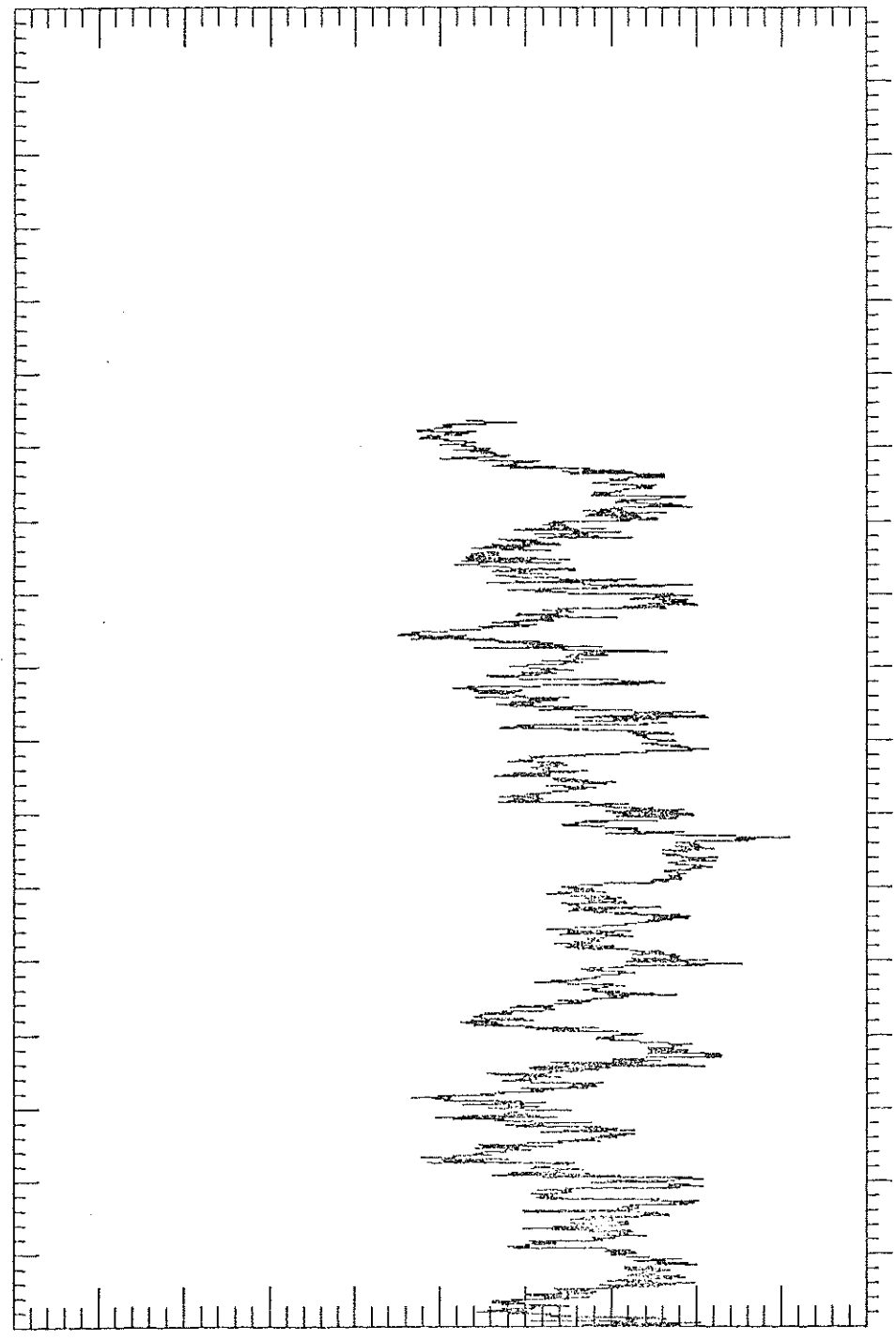


TRIAL: 000 TYPE: WIND UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 350 M Z: 2.0 M

MEAN OF RUN UP: 0.00 MEAN OF RUN DOWN: 0.00

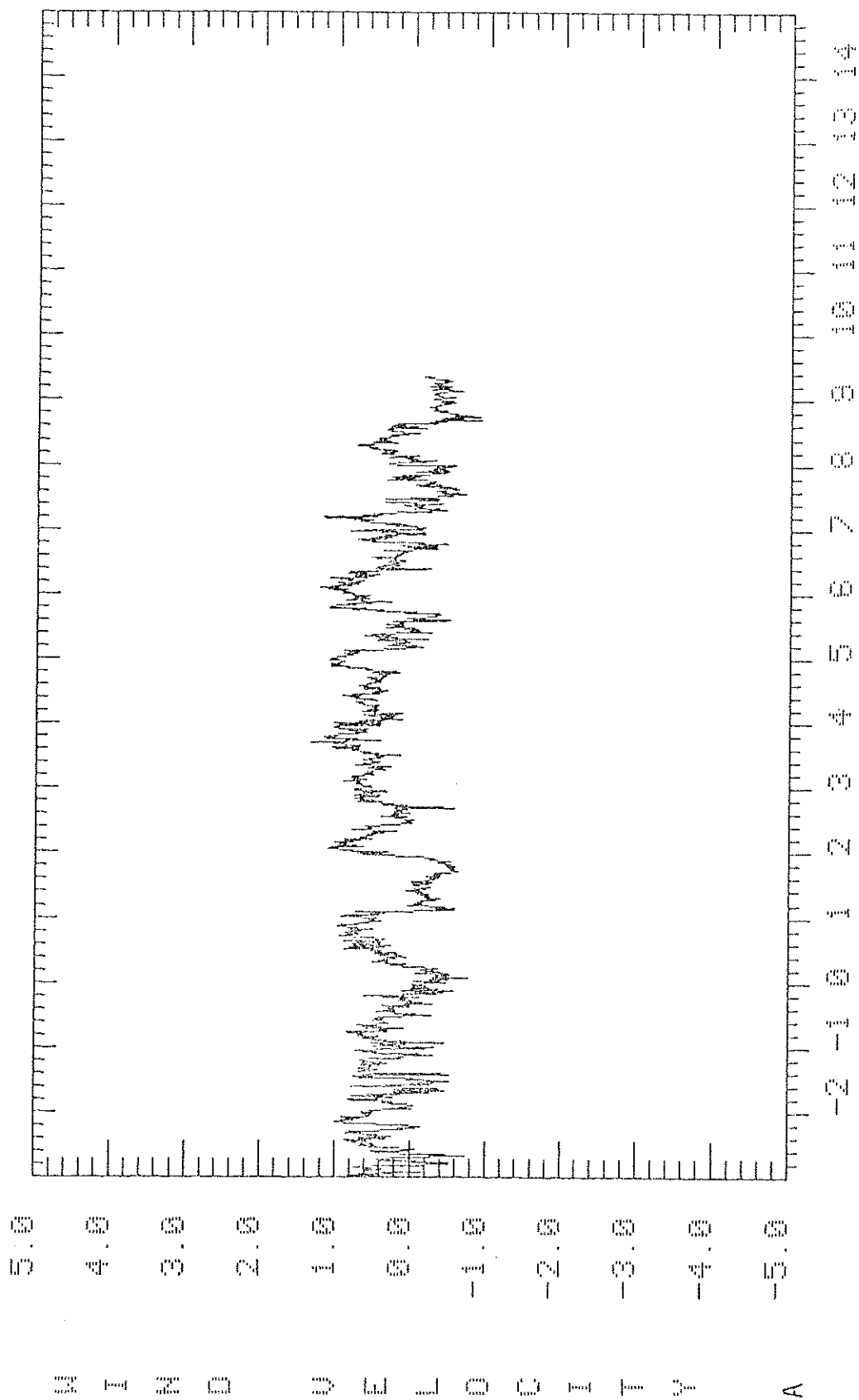
5.0
 4.0
 3.0
 2.0
 1.0
 0.0
 -1.0
 -2.0
 -3.0
 -4.0
 -5.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UAHB UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 490 N Y: 350 N Z: 5.0 N
 MEAN OF RUN UP: 1.00 MEAN OF RUN DOWN: 1.43

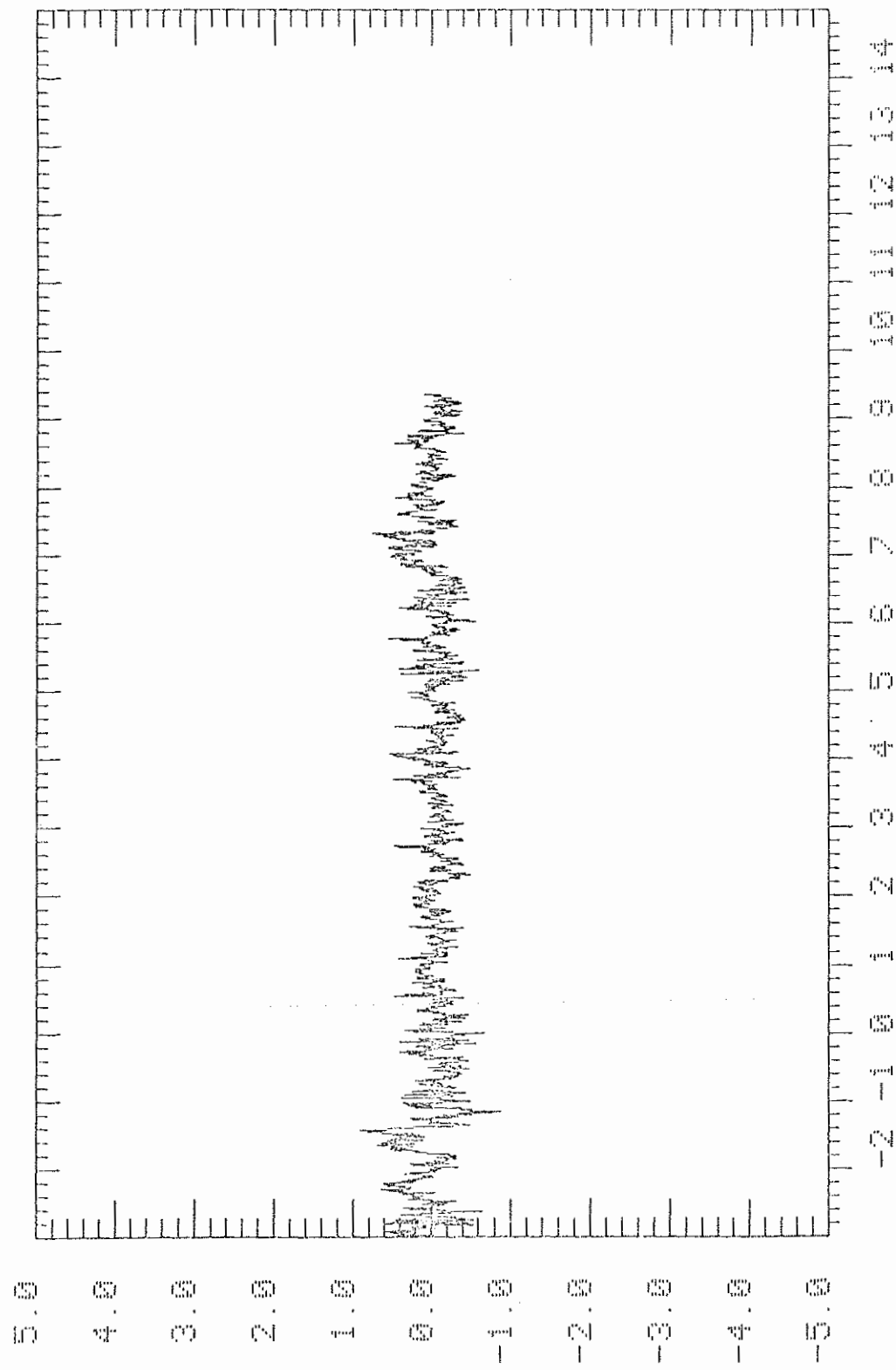


TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: UH4 UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 350 M Z: 5.0 M

MEAN OF RUN UP: 0.48 MEAN OF RUN DOWN: -0.86

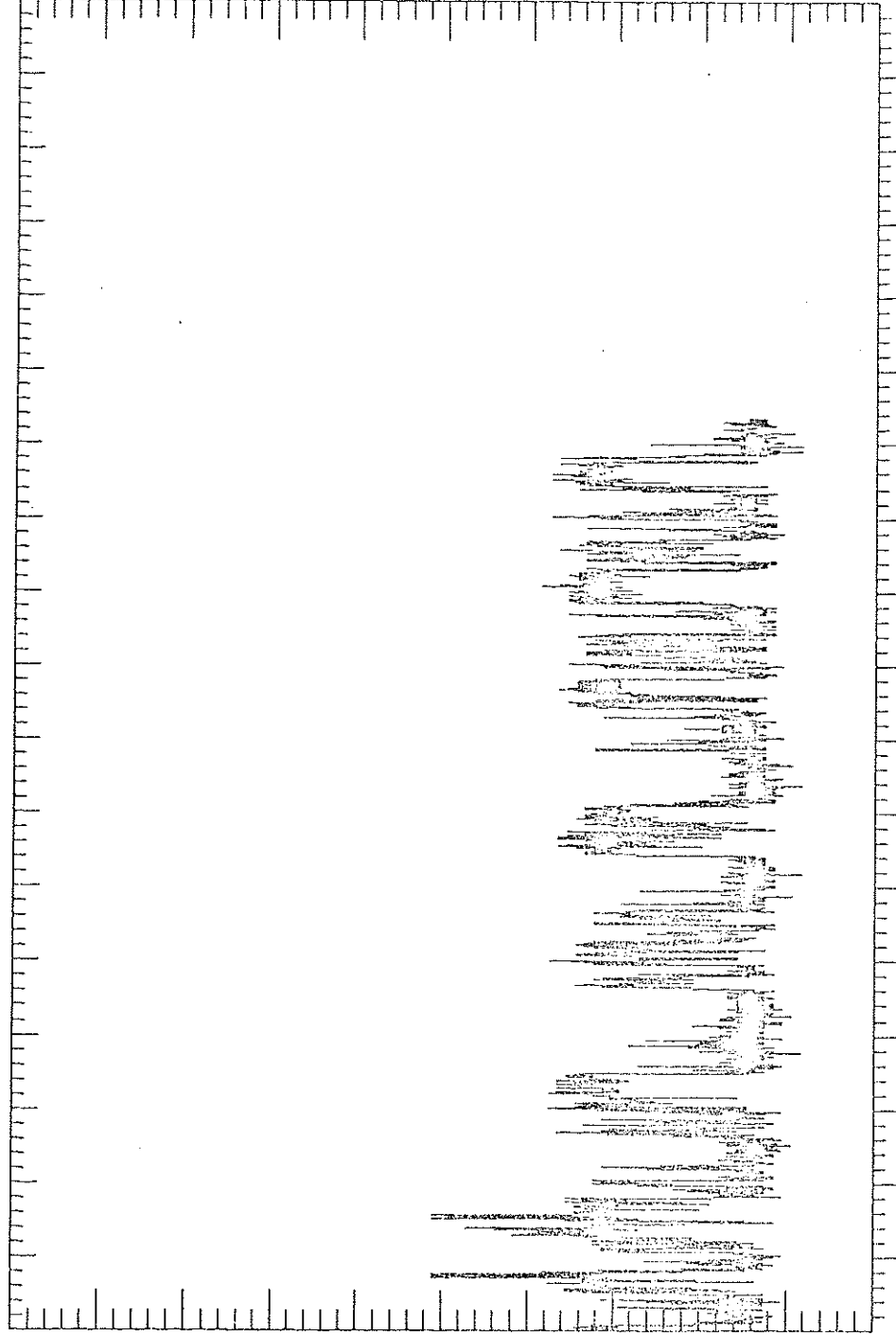


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UAHN UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 400 M Y: 350 M Z: 5.0 M
 MEAN OF RUN UP: 0.00 MEAN OF RUN DOWN: 0.00

22.0
21.8
21.6
21.4
21.2
21.0
20.8
20.6
20.4
20.2
20.0

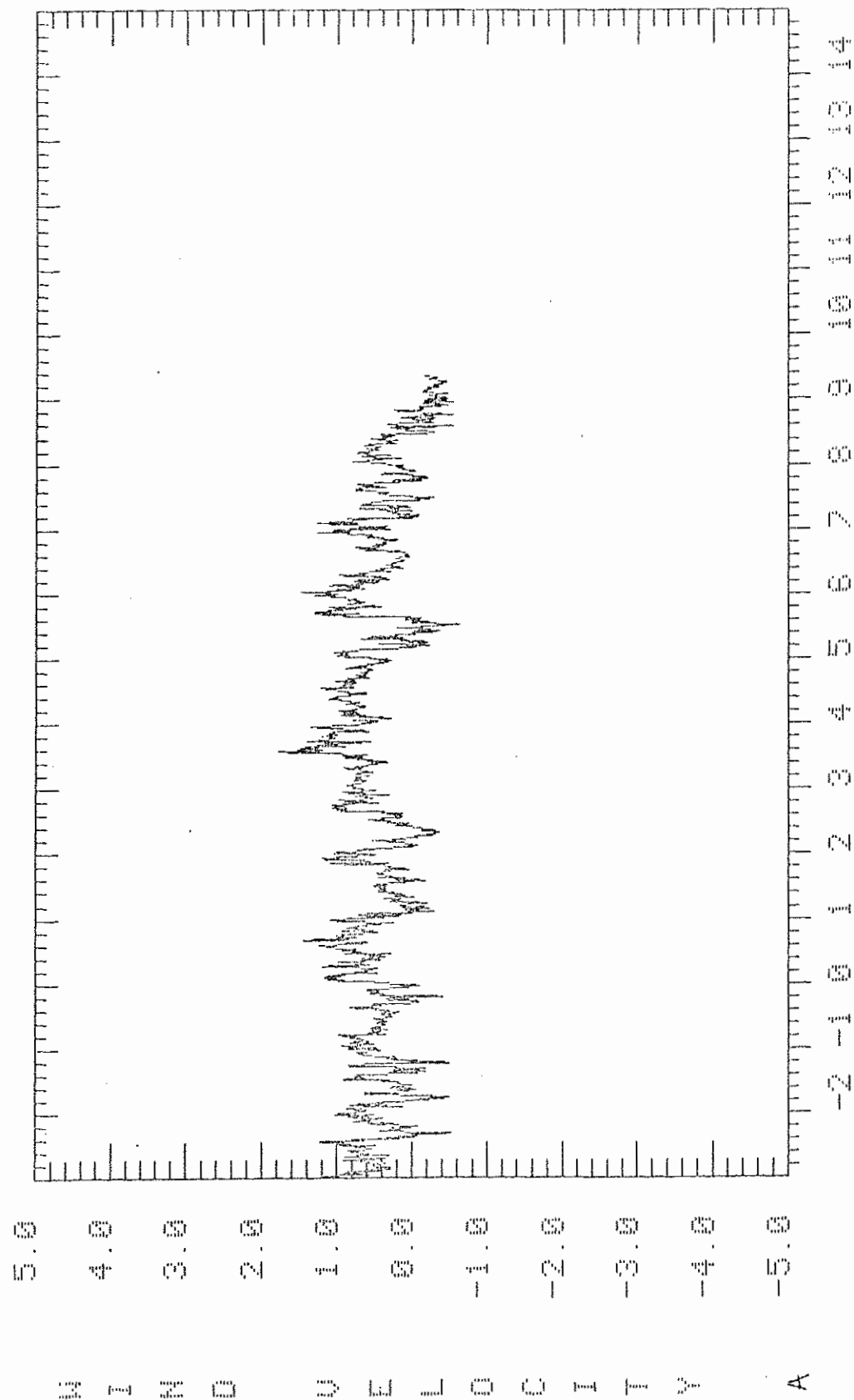
T E M P E R A T U R E



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

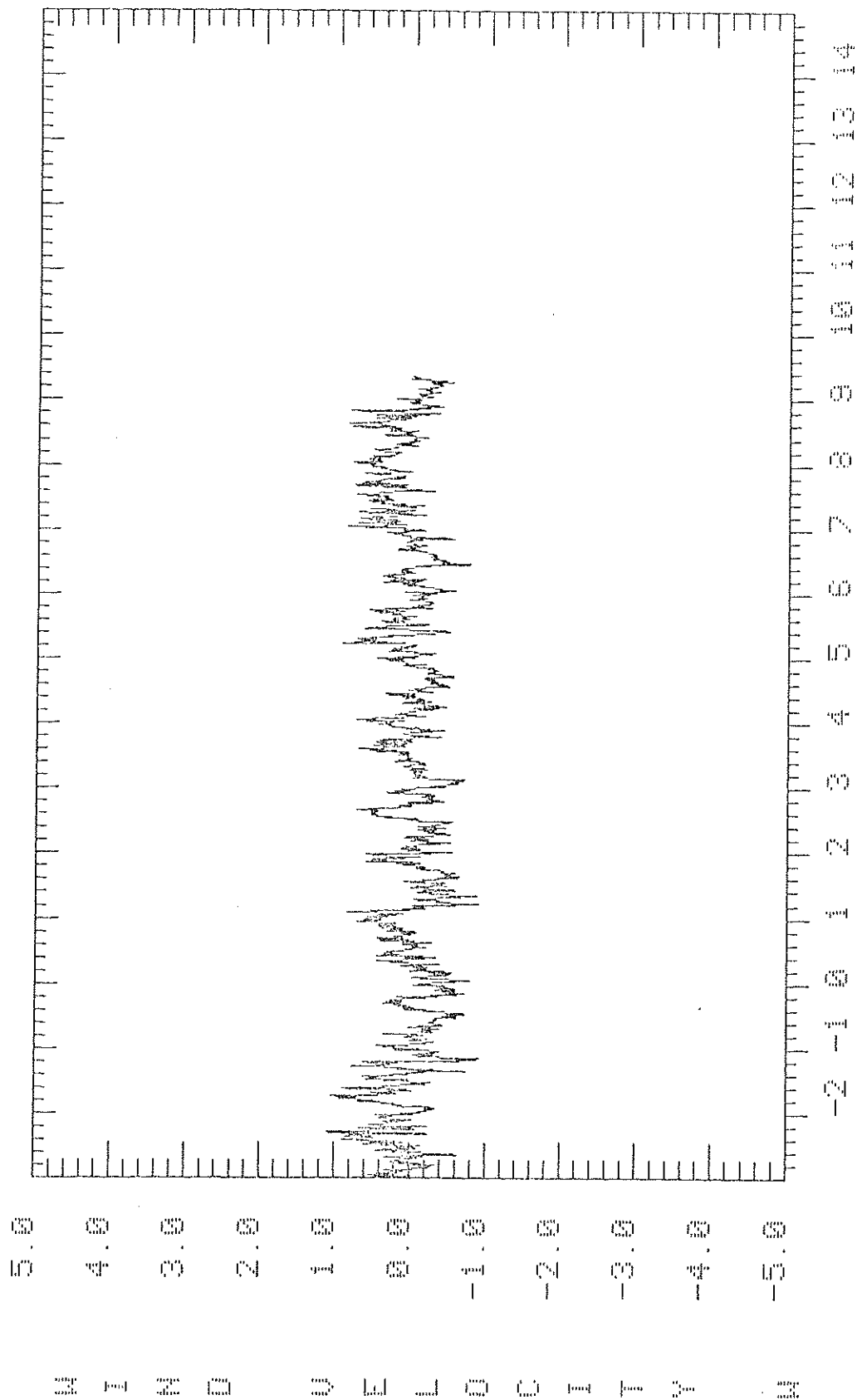
TRIAL: 999 TYPE: UAHN UNITS: DEGREES C
AVERAGING TIME: 0.6 SEC X: 499 N Y: 359 N Z: 5.0 N
MEAN OF RUN UP: 20.36 MEAN OF RUN DOWN: 20.39



TRIAL: 000 TYPE: UANA UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 350 M Z: 20.0 M

MEAN OF RUN UP: 0.65 MEAN OF RUN DOWN: -0.12

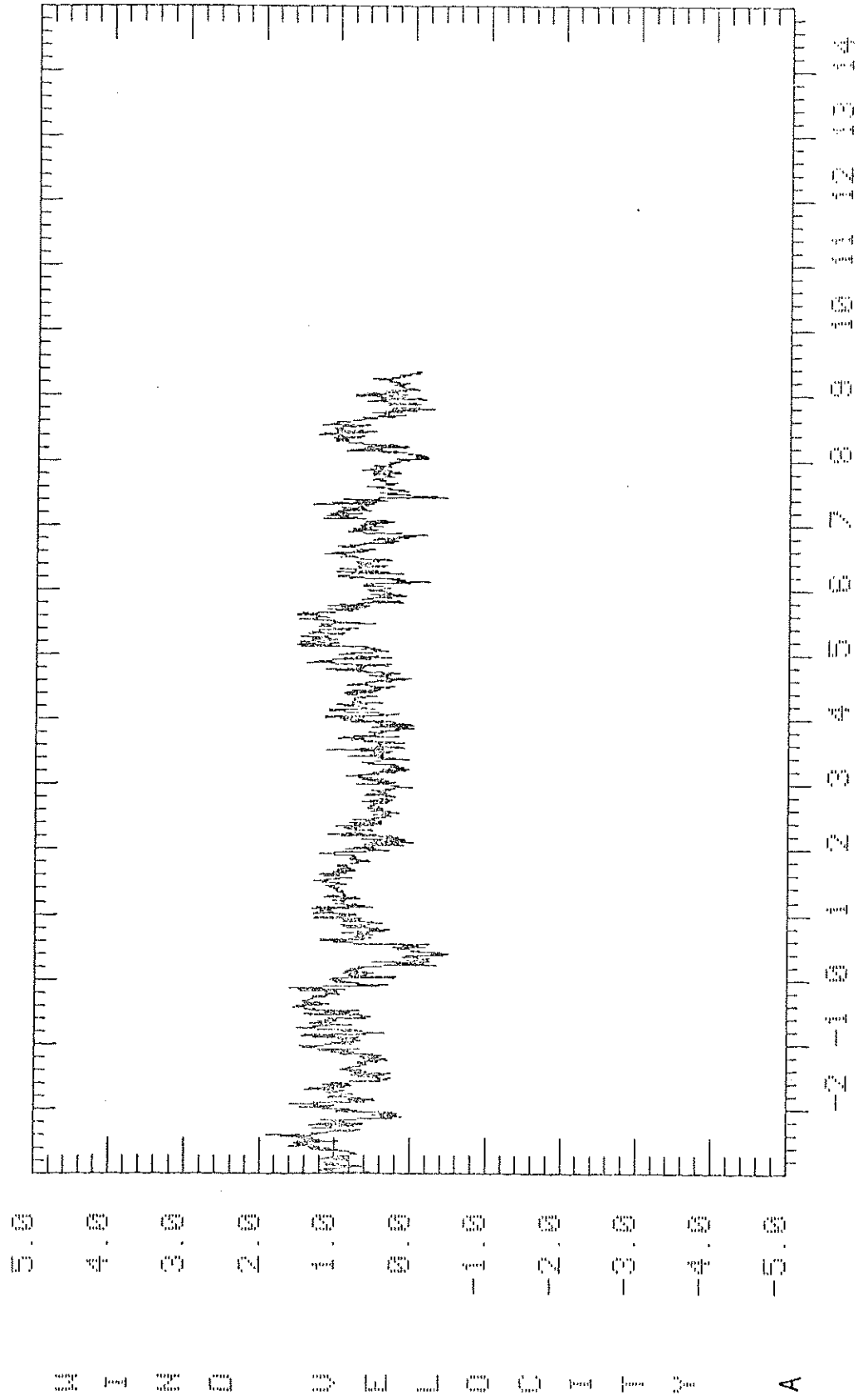


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UAHW UNITS: N/S

AVERAGING TIME: 0.6 SEC X: 400 N Y: 350 N Z: 29.0 N

MEAN OF RUN UP: -0.09 MEAN OF RUN DOWN: 0.07

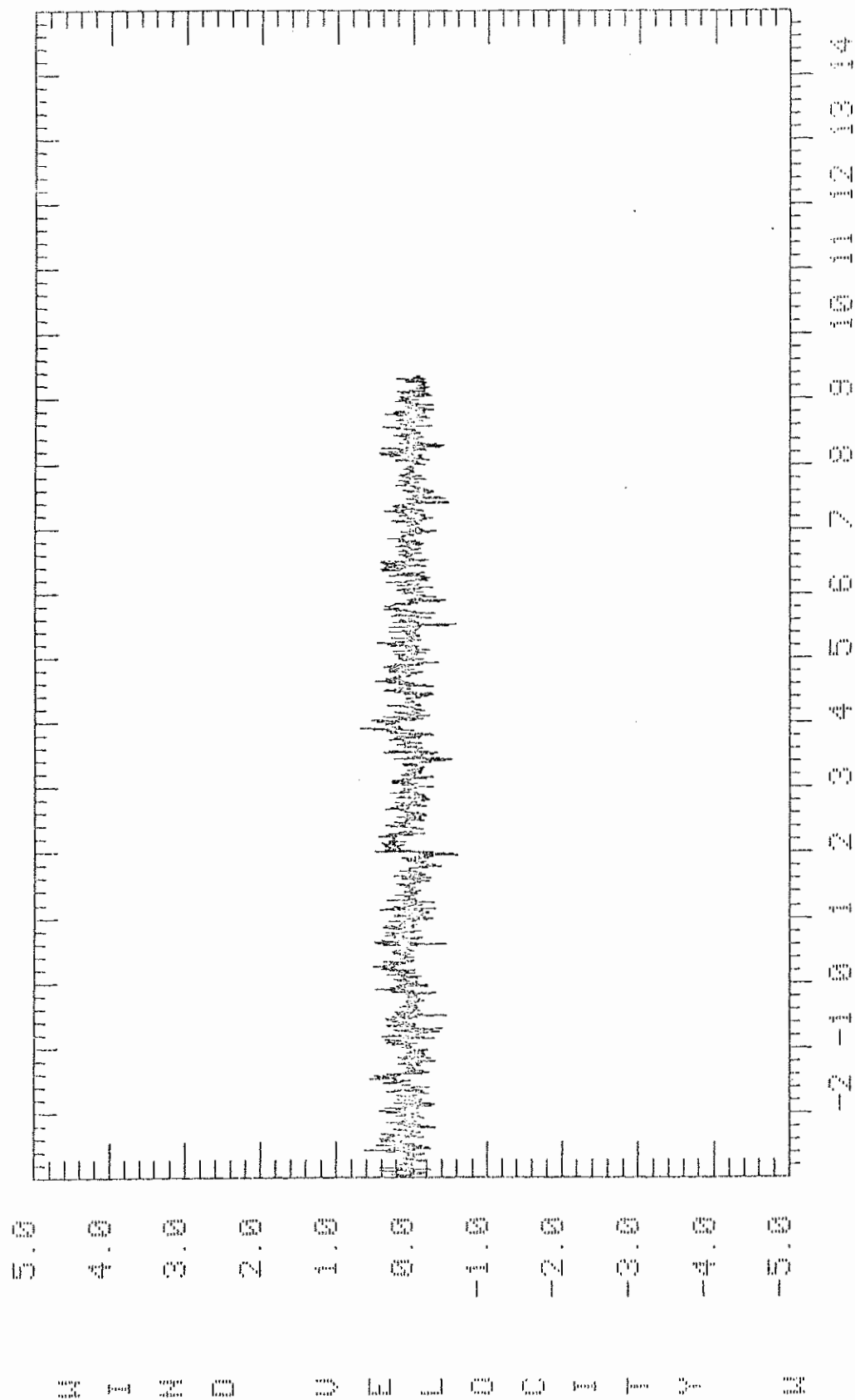


TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: UAHG UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 500 H Y: 350 H Z: 2.0 H

MEAN OF RUN UP: 0.33 MEAN OF RUN DOWN: -0.99

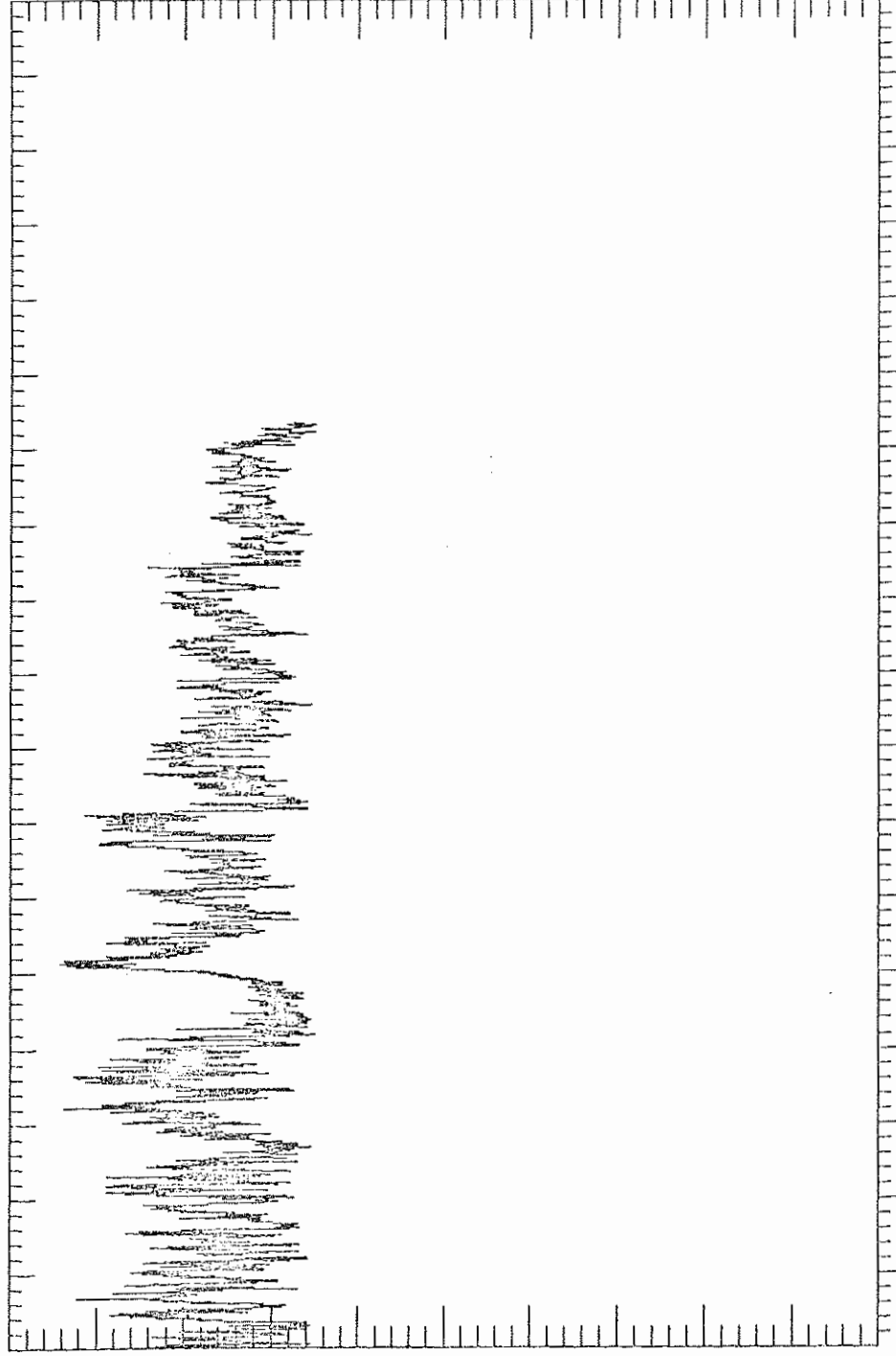


TRIAL: 000 TYPE: UAHN UNITS: N/S

AVERAGING TIME: 0.6 SEC X: 500 M Y: 350 M Z: 2.0 M

MEAN OF RUN UP: -0.01 MEAN OF RUN DOWN: 0.00

20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

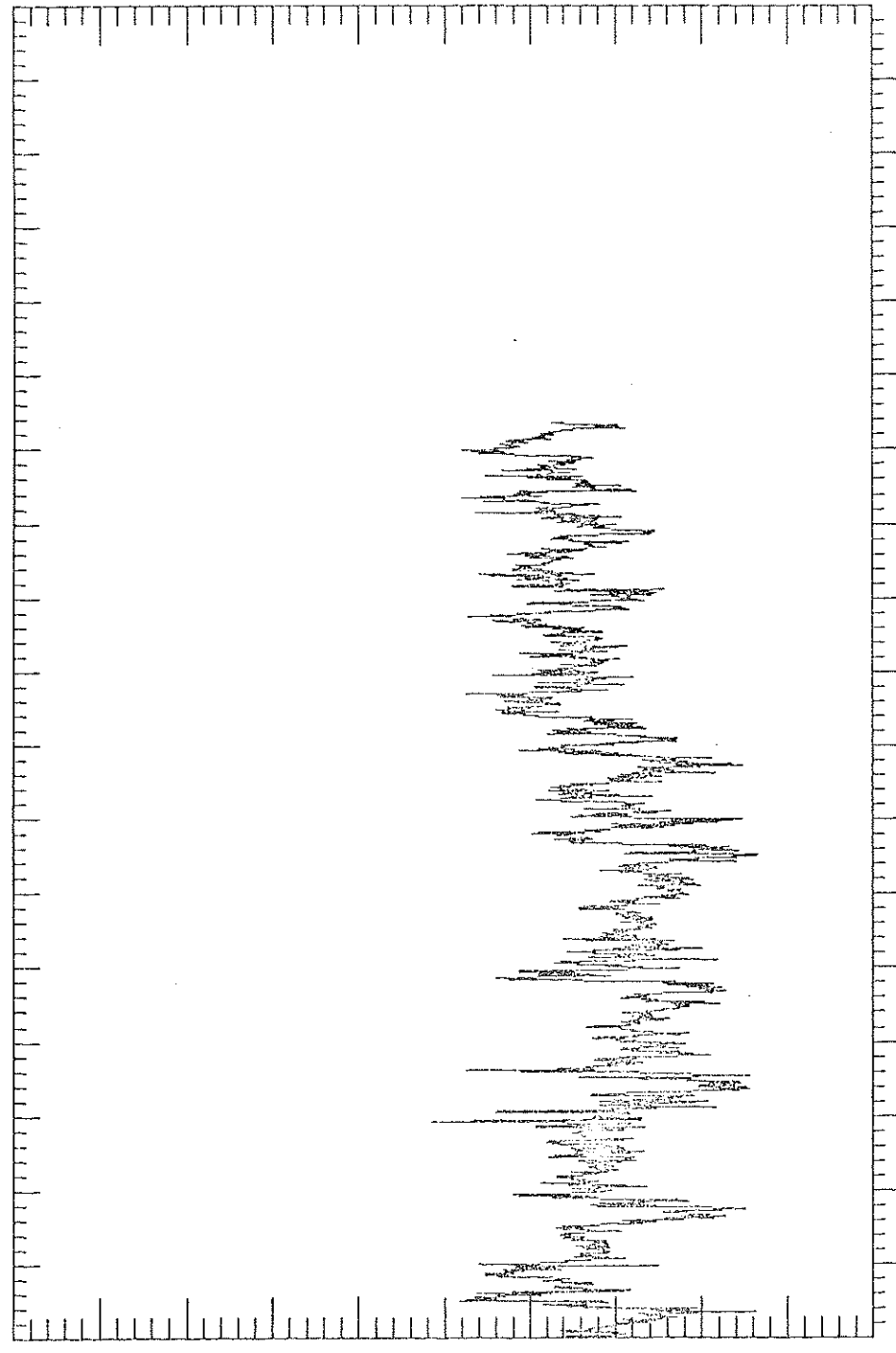
TIME FROM RELEASE (SECS*10**2)

TRIAL: 999 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.0 SEC X: 500 M Y: 350 M Z: 2.0 M

MEAN OF RUN UP: 18.95 MEAN OF RUN DOWN: 18.48

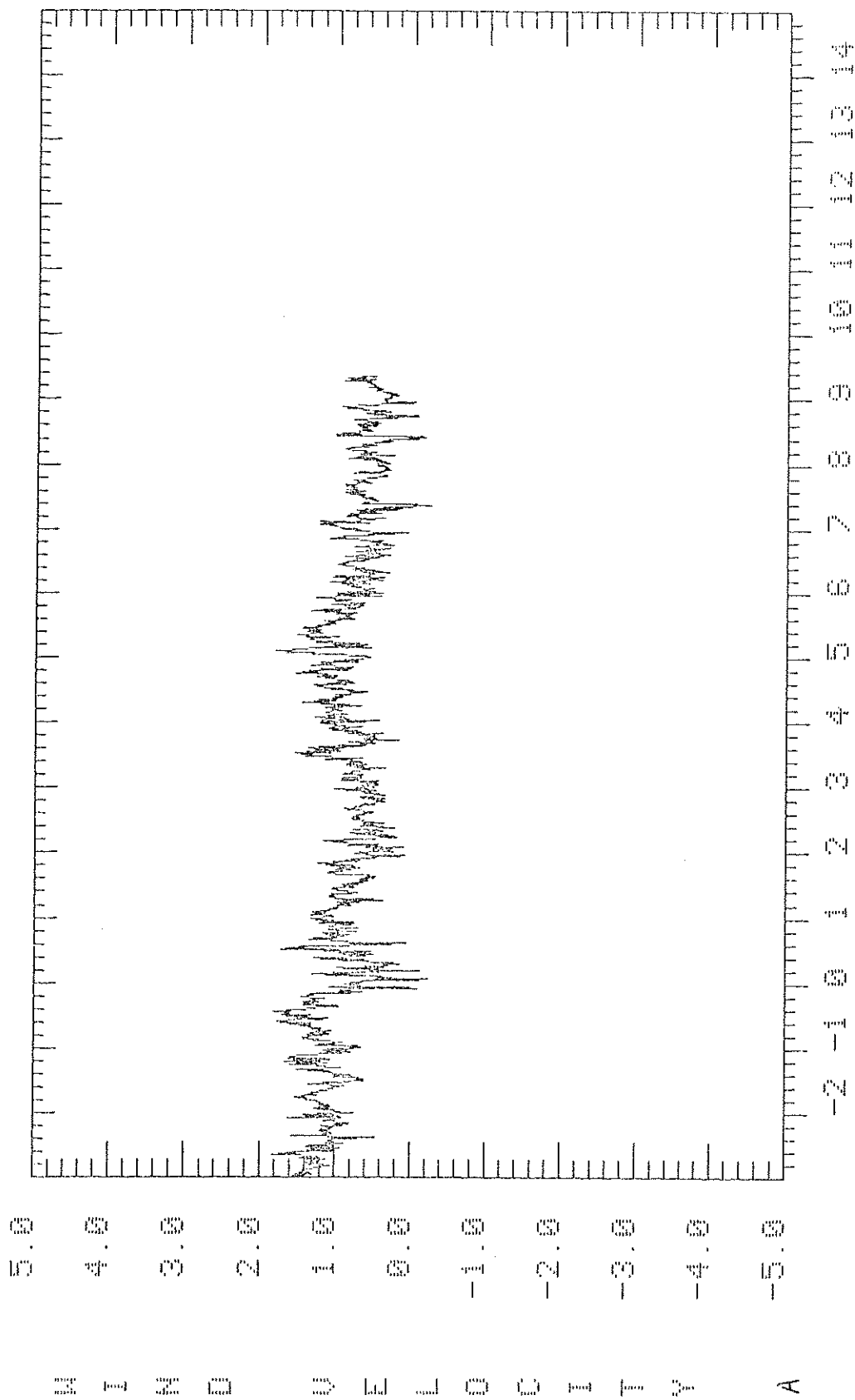
5.0
 4.5
 4.0
 3.5
 3.0
 2.5
 2.0
 1.5
 1.0
 0.5
 0.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UAHB UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 500 M Y: 350 M Z: 15.0 M
 MEAN OF RUN UP: 1.89 MEAN OF RUN DOWN: 1.57

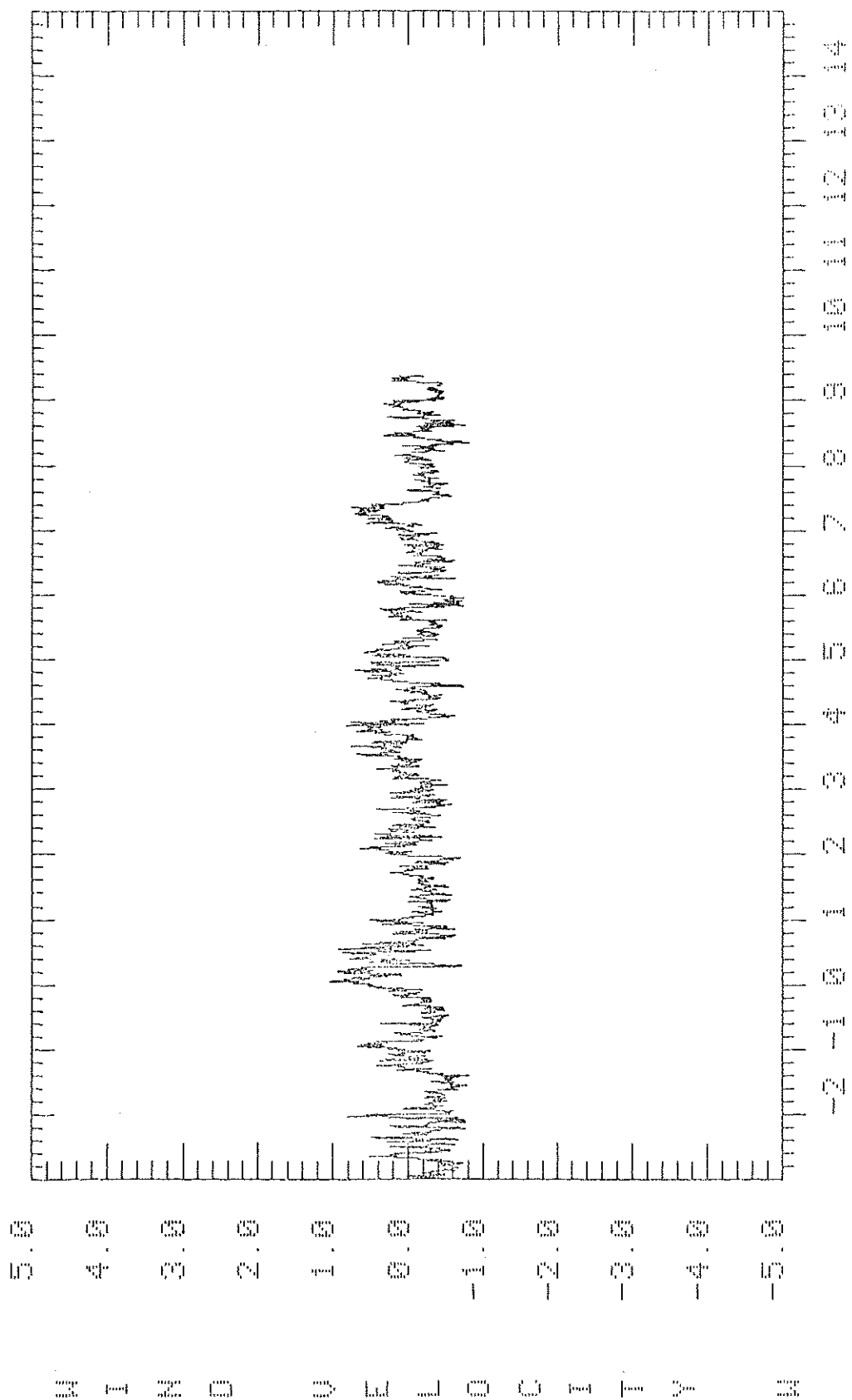


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UAHN UNITS: N/S

AVERAGING TIME: 0.6 SEC X: 500 N Y: 350 N Z: 15.0 N

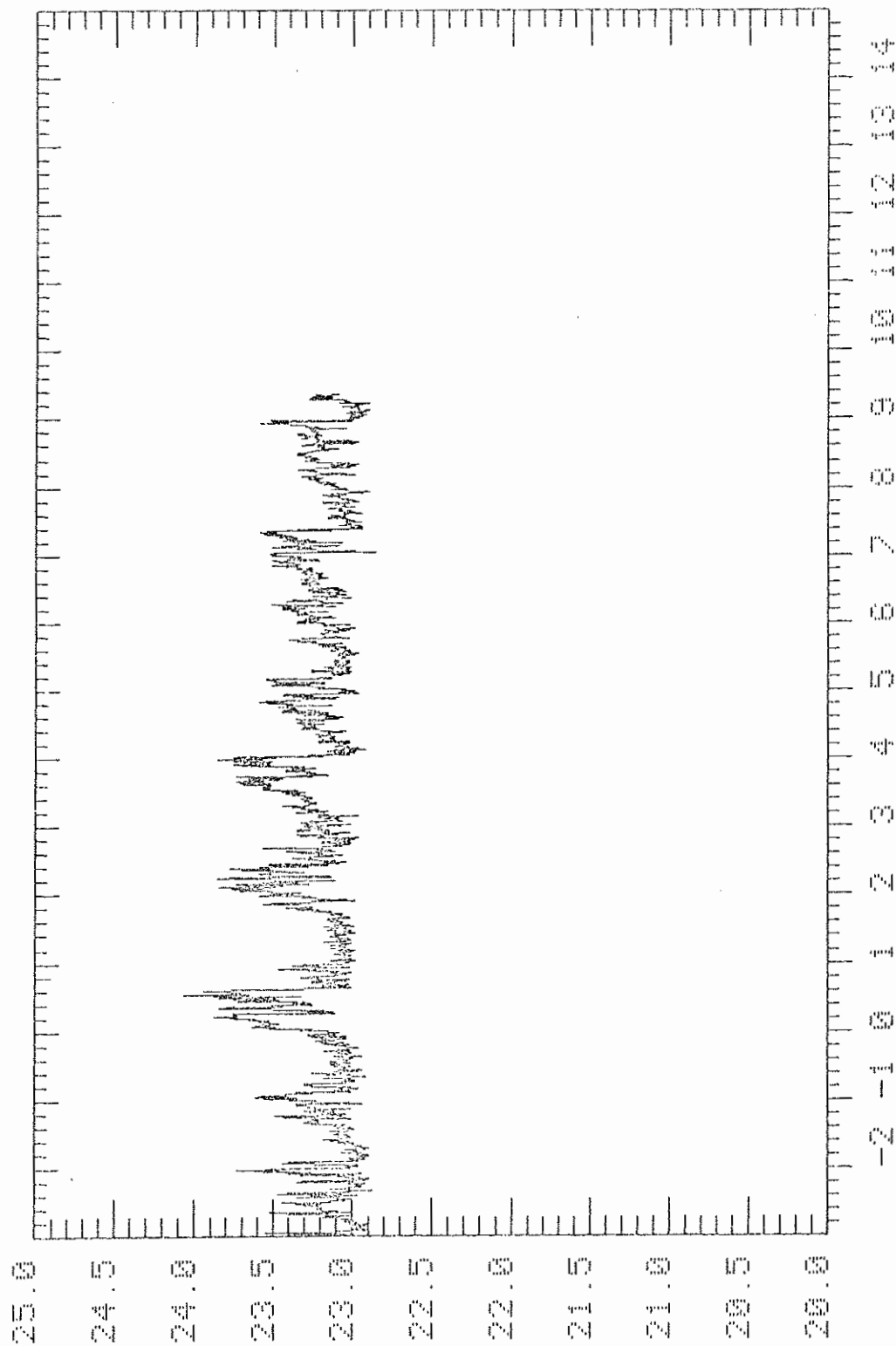
MEAN OF RUN UP: 0.53 MEAN OF RUN DOWN: 0.10



TIME FROM RELEASE (SECS*10**2)

TRIAL: 000 TYPE: UAWN UNITS: M/S
 AVERAGING TIME: 0.6 SEC X: 500 M Y: 350 M Z: 15.0 M
 MEAN OF RUN UP: -0.13 MEAN OF RUN DOWN: -0.13

T E M P E R A T U R E

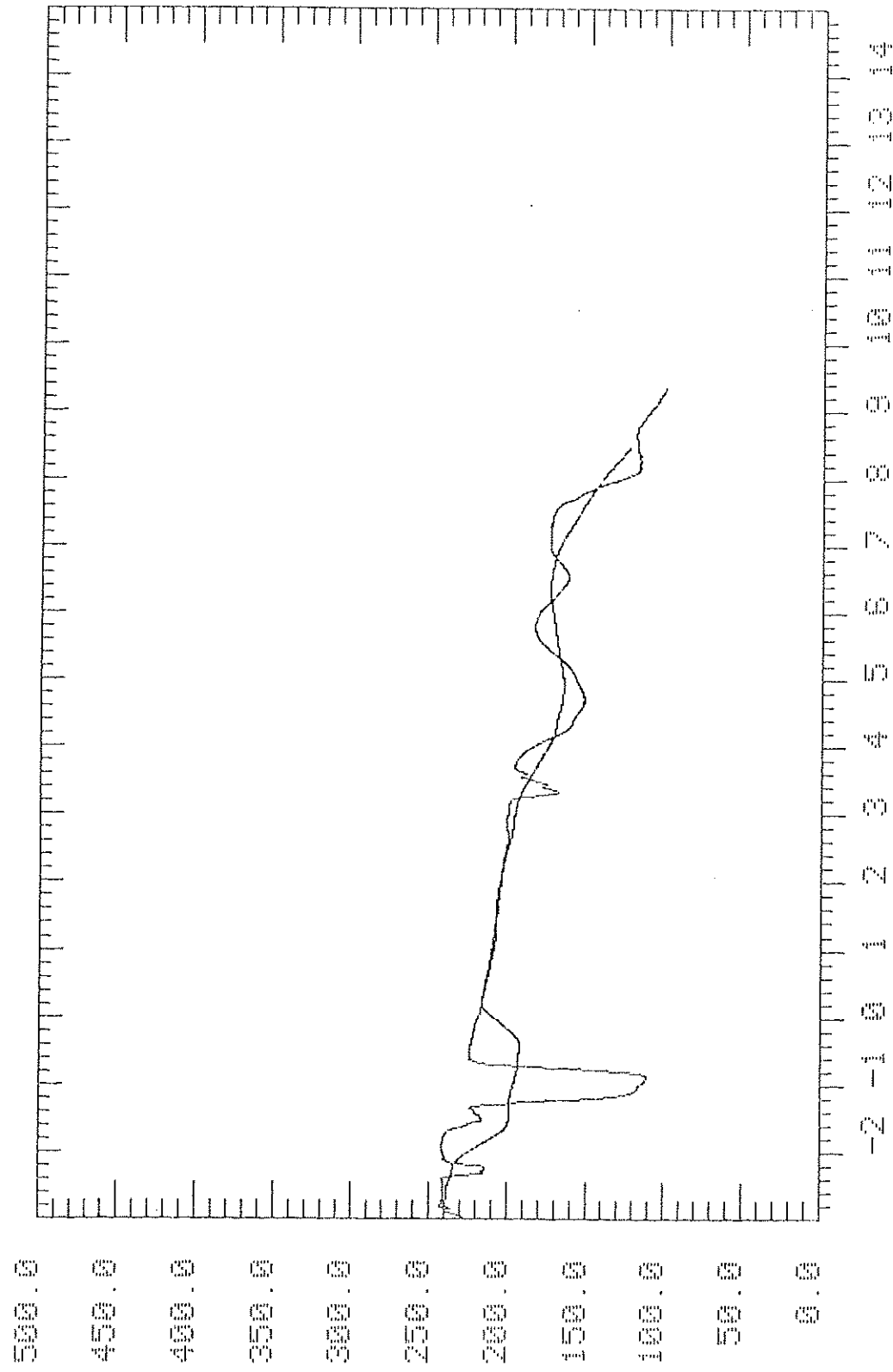


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 500 M Y: 350 M Z: 15.0 M

MEAN OF RUN UP: 23.33 MEAN OF RUN DOWN: 23.08



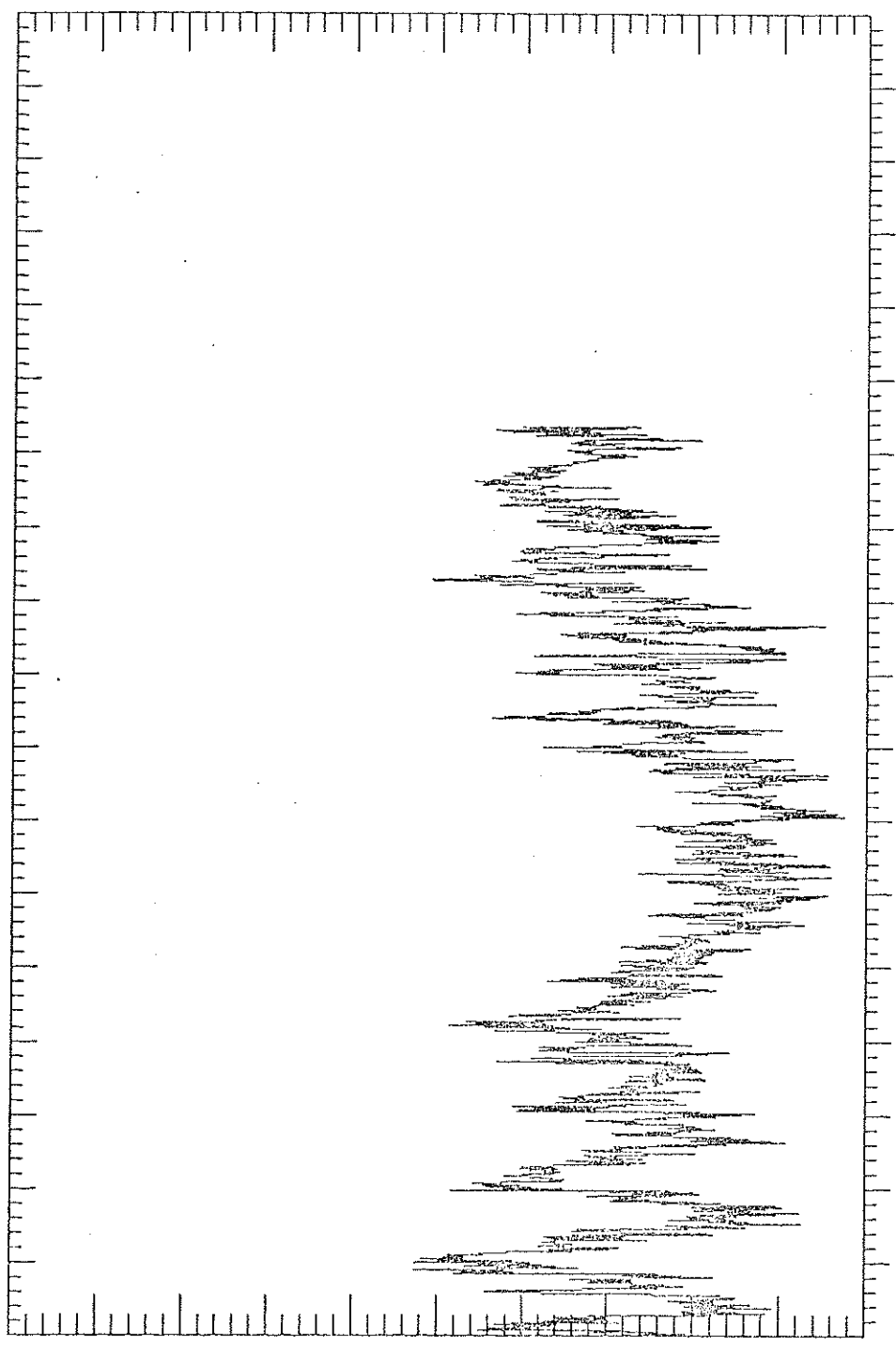
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: SOLA UNITS: W/M*2

AVERAGING TIME: 0.6 SEC X: 700 M Y: 500 M Z: 0.4 M

MEAN OF RUN UP: 312.00 MEAN OF RUN DOWN: 198.40

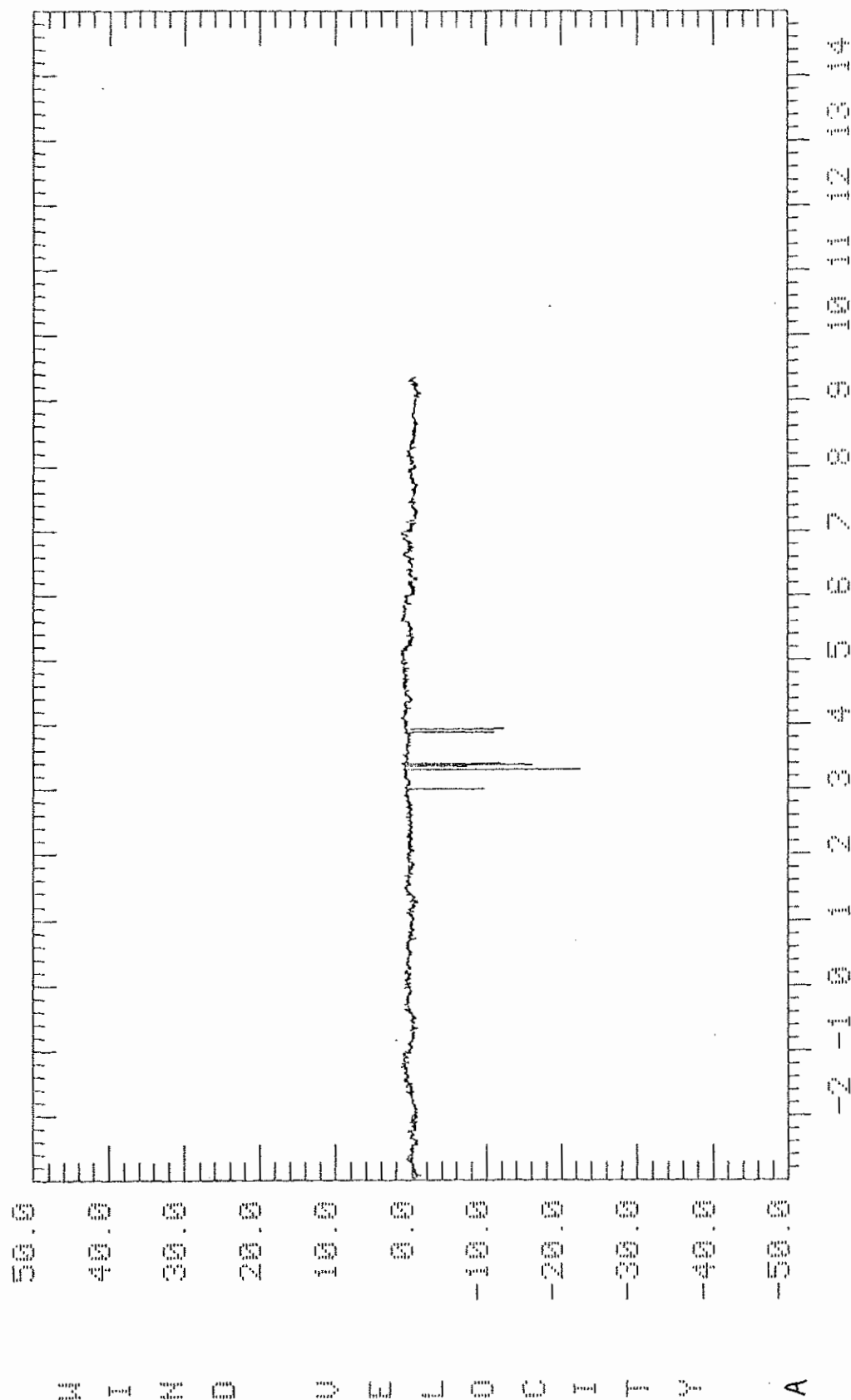
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

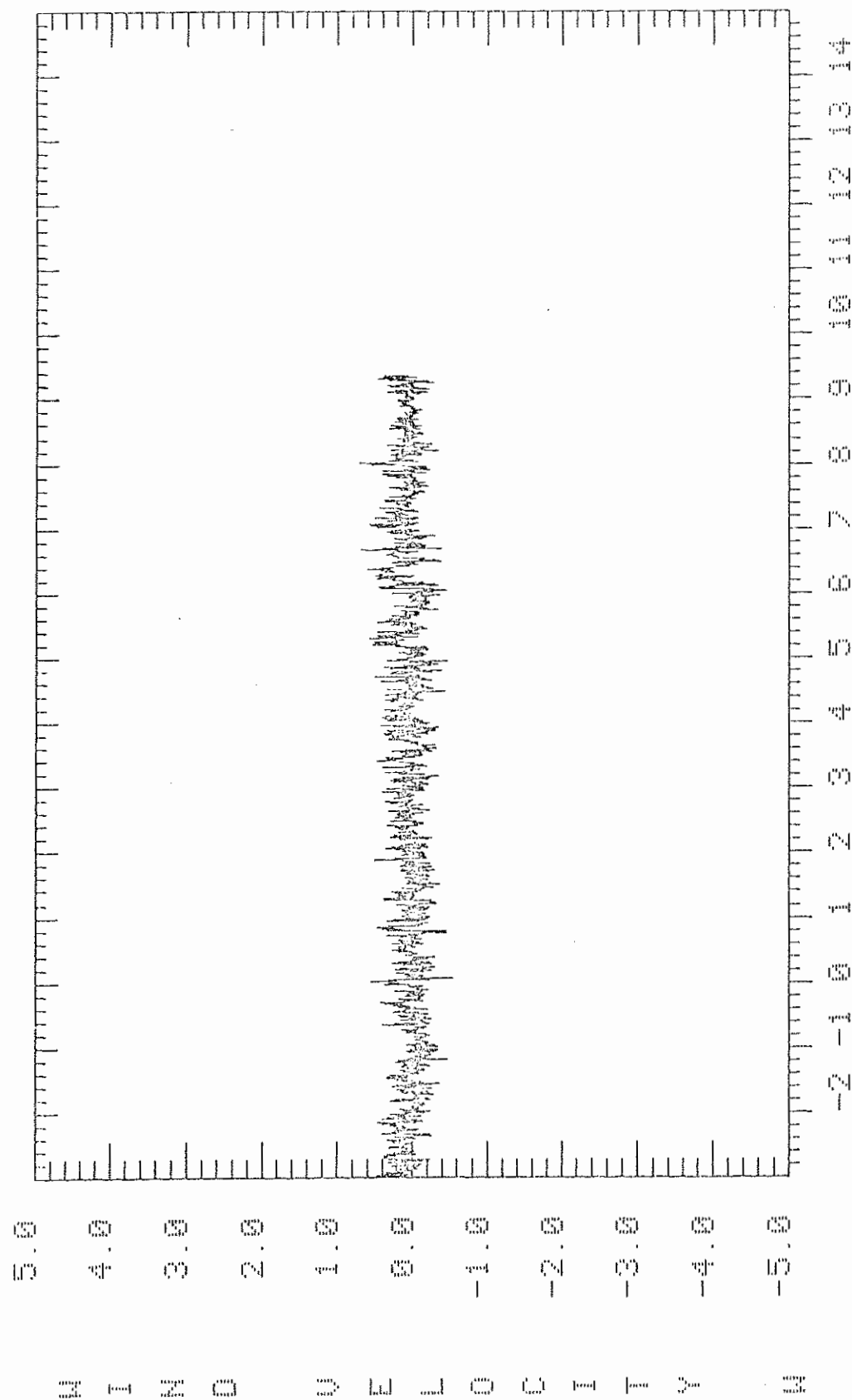
TRIAL: 500 TYPE: UMB UNITS: N/S
 AVERAGING TIME: 0.6 SEC X: 390 N Y: 550 N Z: 2.0 N
 MEAN OF RUN UP: 1.43 MEAN OF RUN DOWN: 1.11



TRIAL: 008 TYPE: UANA UNITS: M/S

AVERAGING TIME: 0.8 SEC X: 300 M Y: 550 M Z: 2.0 M

MEAN OF RUN UP: 0.06 MEAN OF RUN DOWN: -0.22



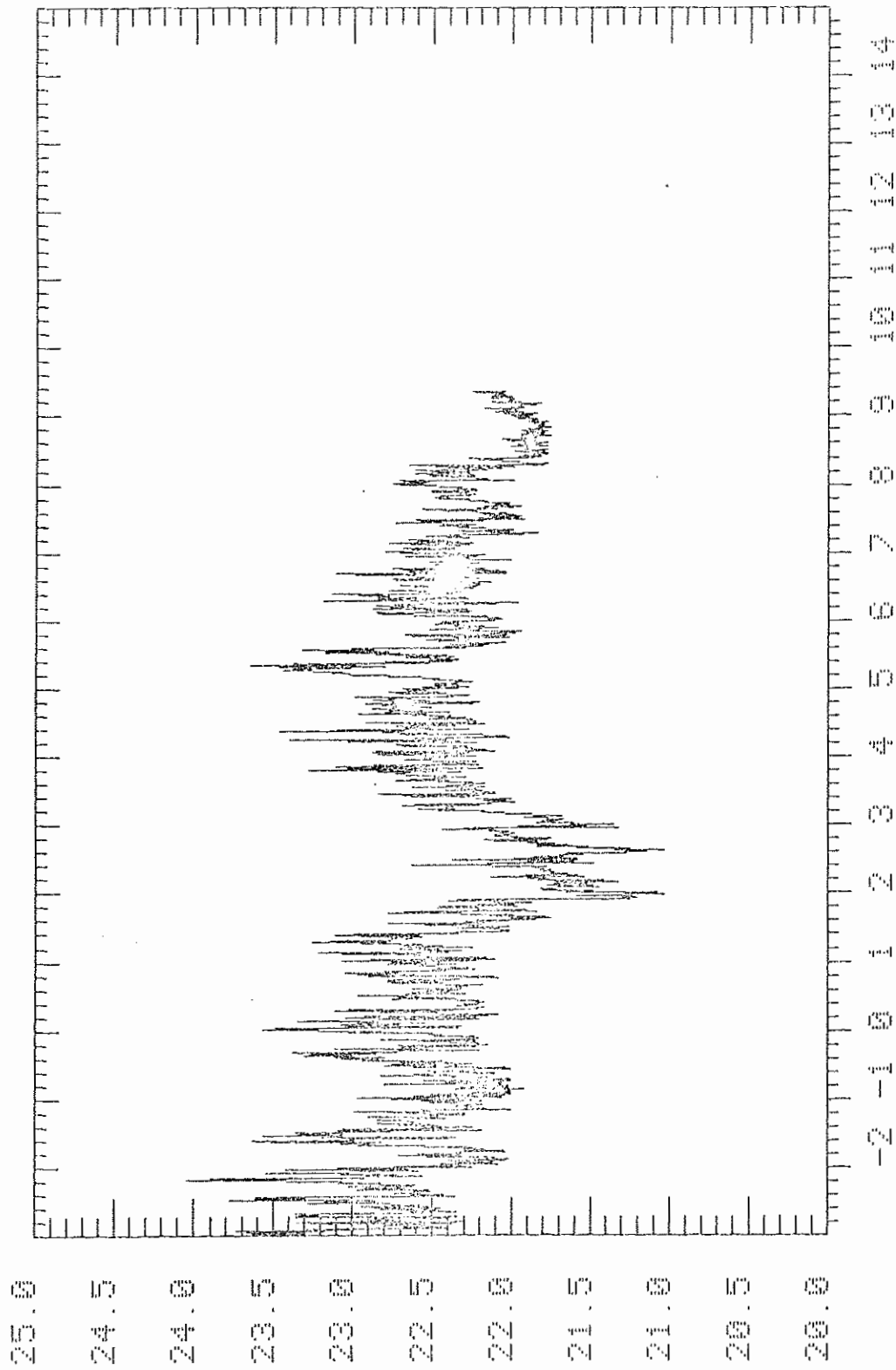
TIME FROM RELEASE (SECS*10**4-2)

TRIAL: 003 TYPE: UAHN UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 300 M Y: 550 M Z: 2.0 M

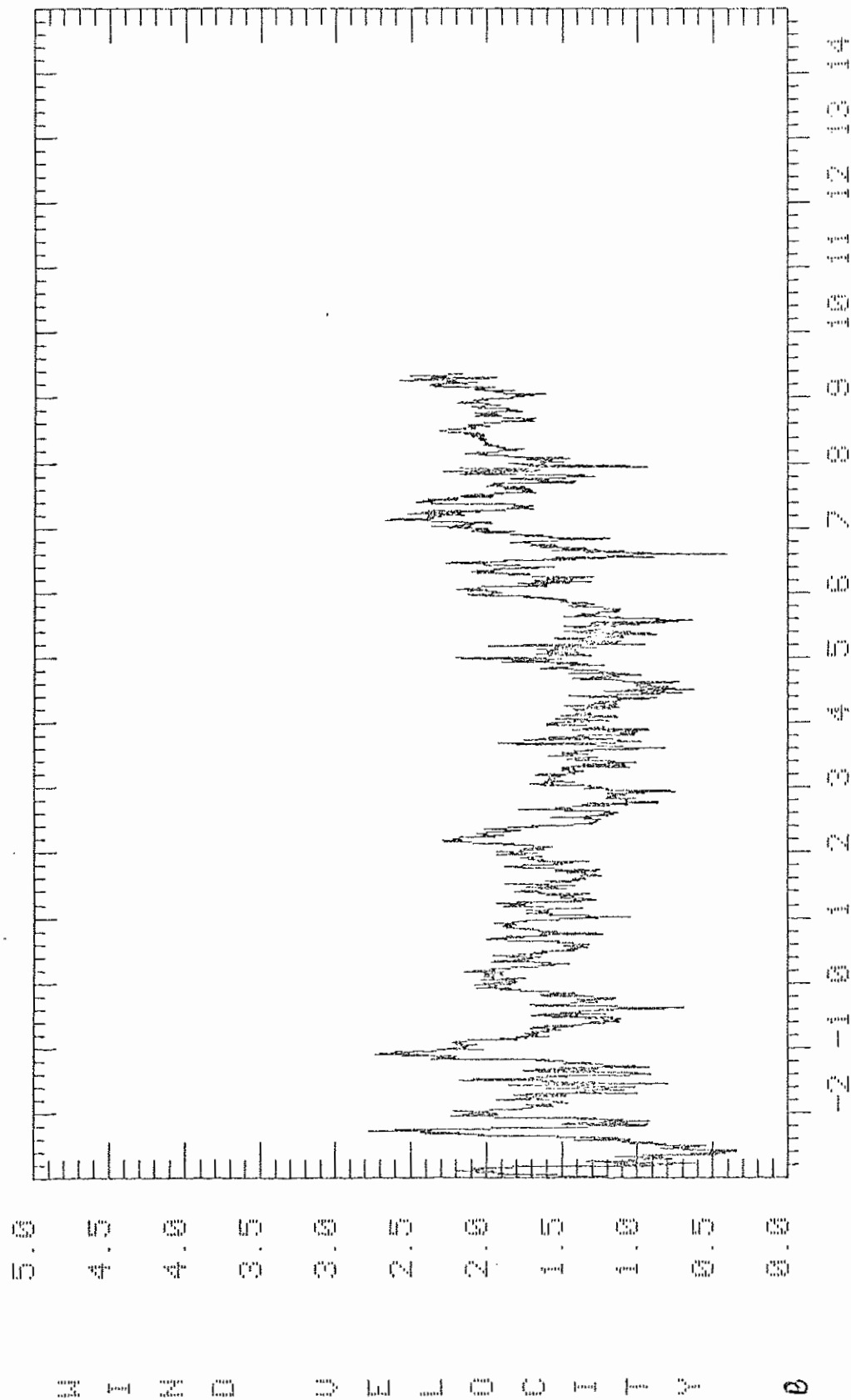
MEAN OF RUN UP: -0.01 MEAN OF RUN DOWN: 0.03

T E M P E R A T U R E



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UAHT UNITS: DEGREES C
AVERAGING TIME: 0.6 SEC X: 399 N Y: 559 N Z: 2.9 H
MEAN OF RUN UP: 22.70 MEAN OF RUN DOWN: 21.84

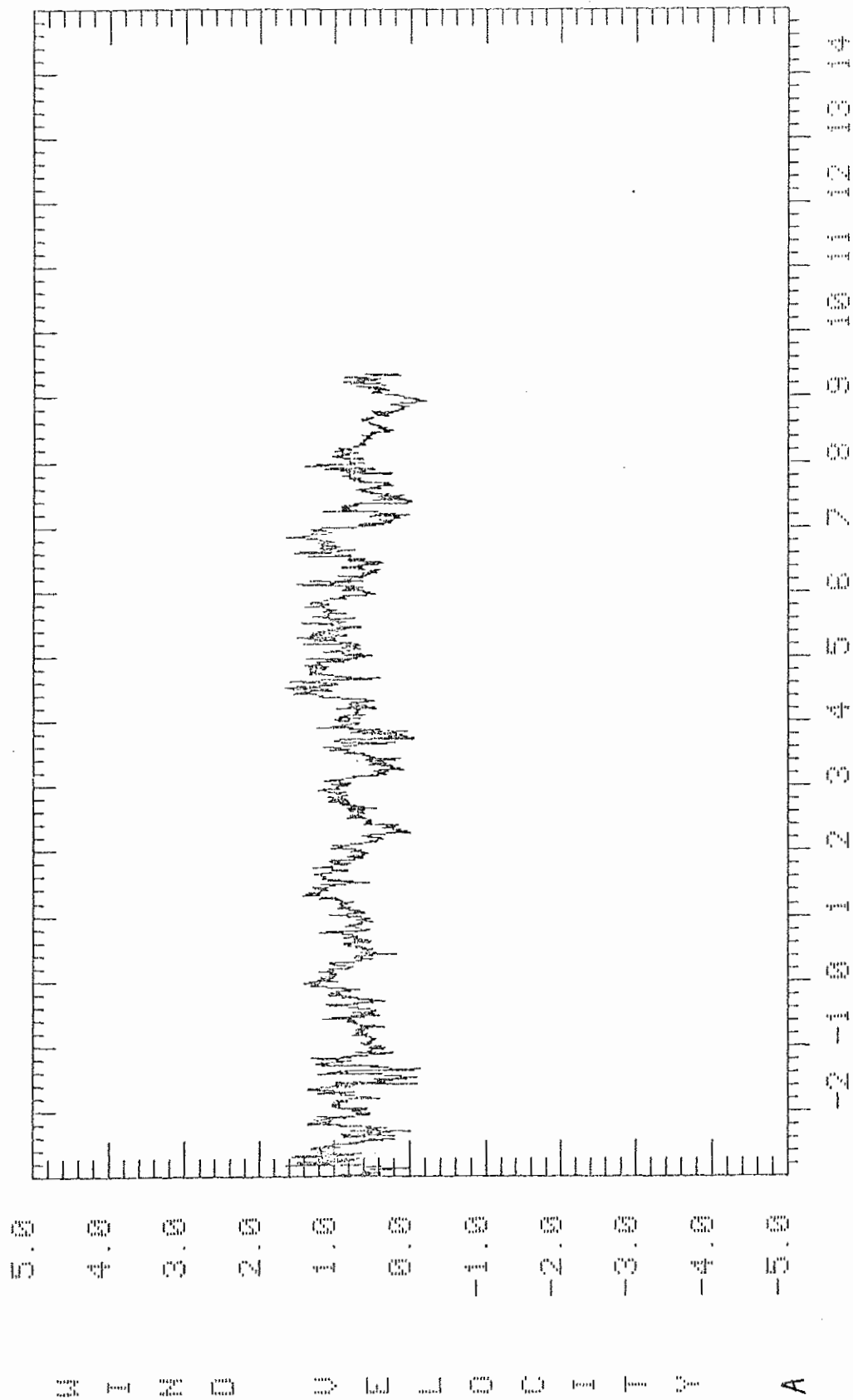


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UAHB UNITS: M/S

AVERAGING TIME: 0.8 SEC X: 300 M Y: 550 M Z: 15.0 M

MEAN OF RUN UP: 1.68 MEAN OF RUN DOWN: 1.55

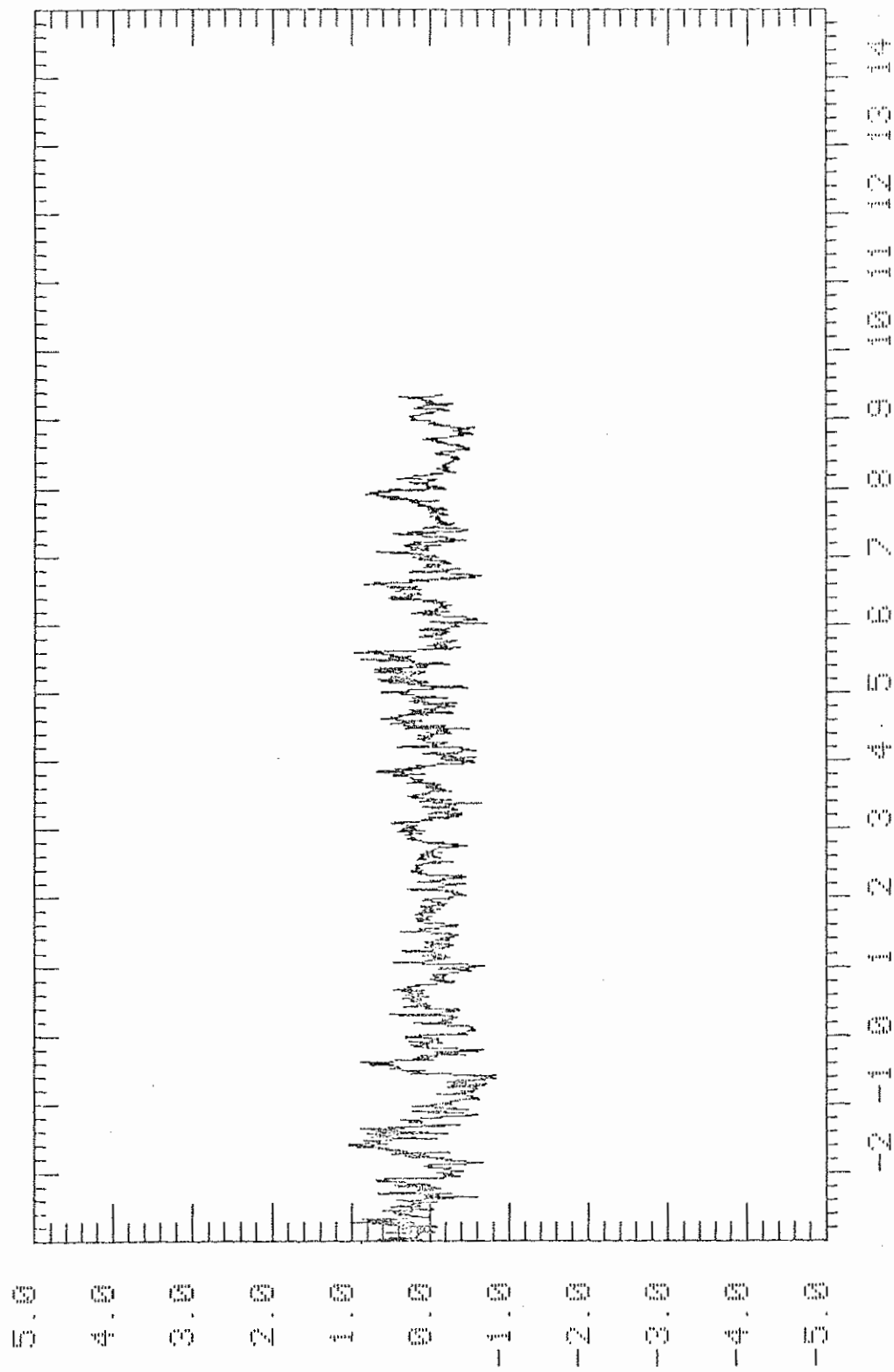


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: UANA UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 300 M Y: 550 M Z: 15.0 M

MEAN OF RUN UP: 0.82 MEAN OF RUN DOWN: 0.24



TIME FROM RELEASE (SECS*10**-2)

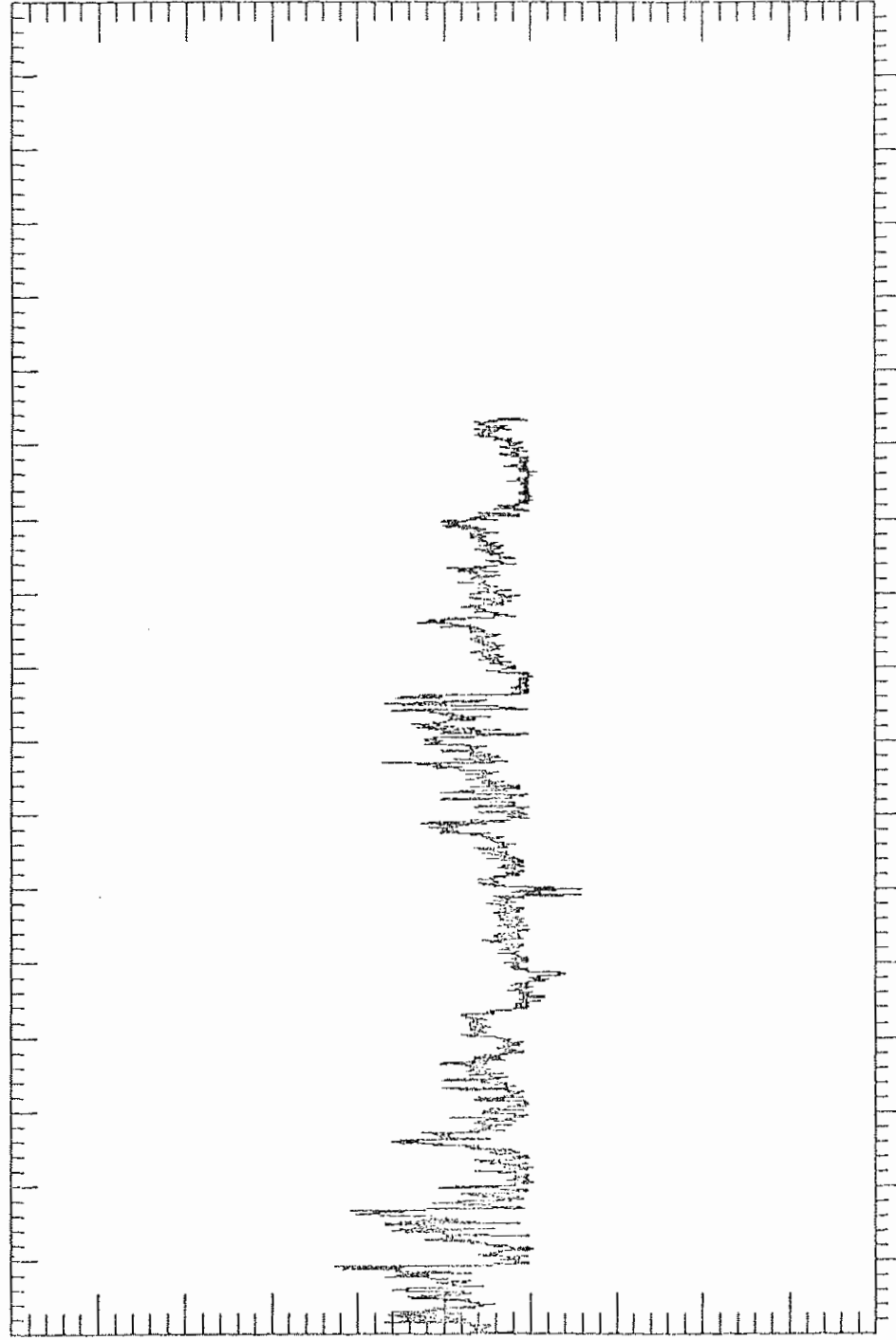
TRIAL: 000 TYPE: UAHN UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 300 M Y: 550 M Z: 15.0 M

MEAN OF RUN UP: -0.10 MEAN OF RUN DOWN: -0.05

25.0
24.5
24.0
23.5
23.0
22.5
22.0
21.5
21.0
20.5
20.0

T E M P E R A T U R E



-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 300 N Y: 550 N Z: 15.0 N

MEAN OF RUN UP: 22.20 MEAN OF RUN DOWN: 22.04

100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0

W I N D D I R E C T I O N

-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

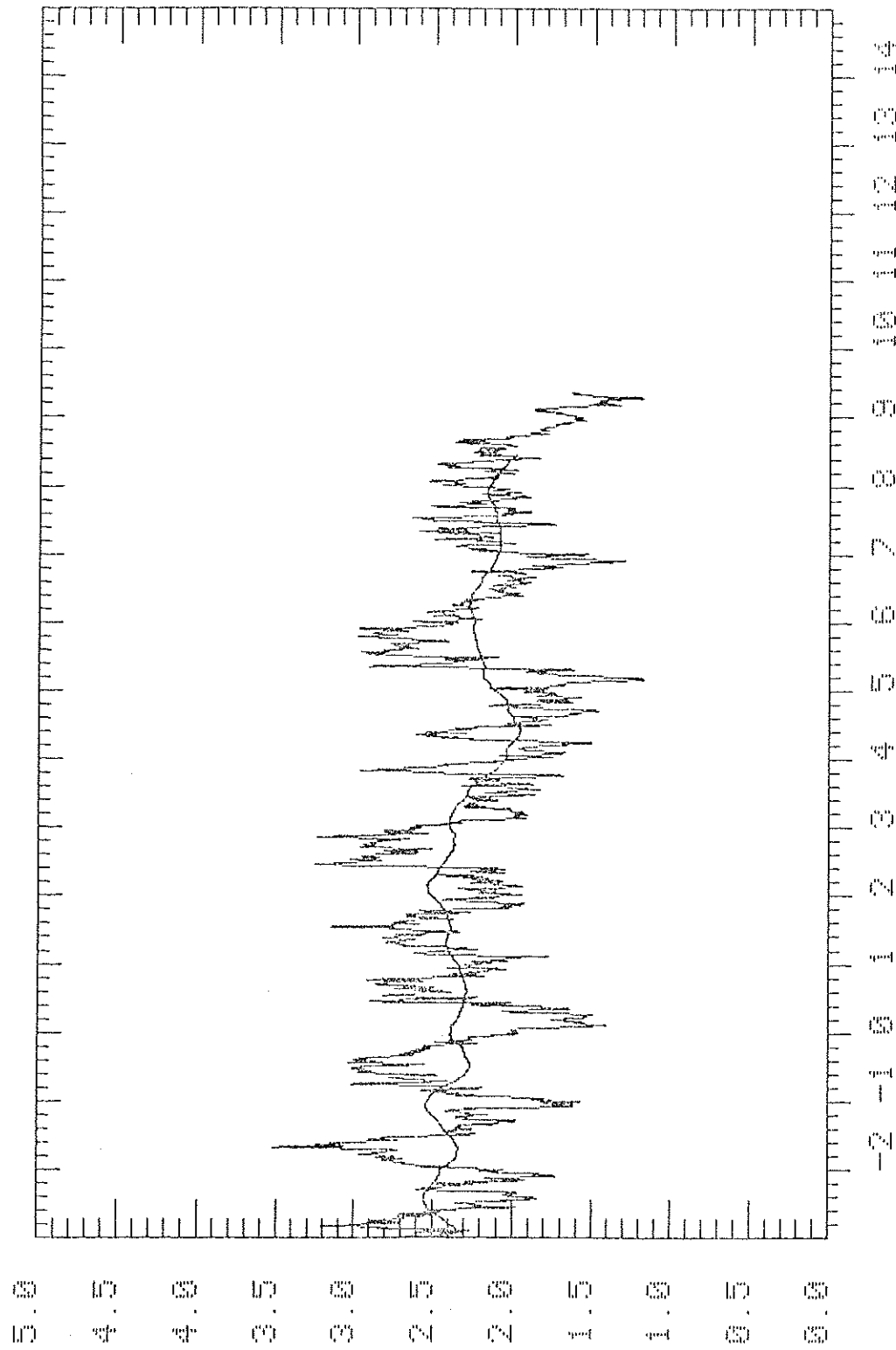
TIME FROM RELEASE (SECS*(10**+2))

TRIAL: 008 TYPE: WIND UNITS: DEGREES

AVERAGING TIME: 0.6 SEC X: 400 M Y: 950 M Z: 10.0 M

MEAN OF RUN UP: -16.36 MEAN OF RUN DOWN: -53.73

W I T H S E L E C T

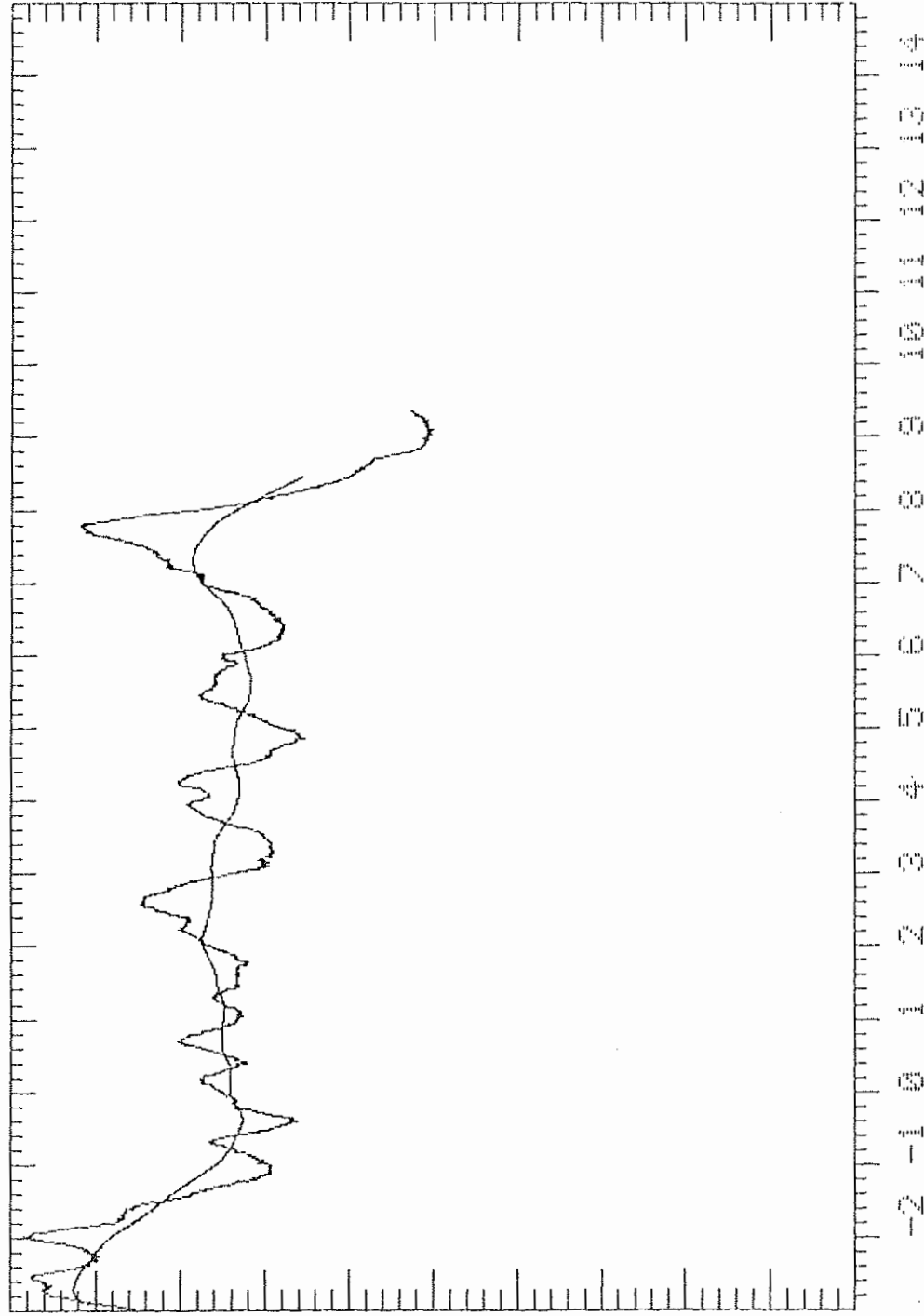


TIME FROM RELEASE (SECS*10**-2)

TRIAL: 000 TYPE: WSPD UNITS: M/S
AVERAGING TIME: 0.6 SEC X: 490 N Y: 959 N Z: 19.9 N
MEAN OF RUN UP: 2.36 MEAN OF RUN DOWN: 1.26

H
I
I
I
I
I
I
T
Y

75.0
74.5
74.0
73.5
73.0
72.5
72.0
71.5
71.0
70.5
70.0



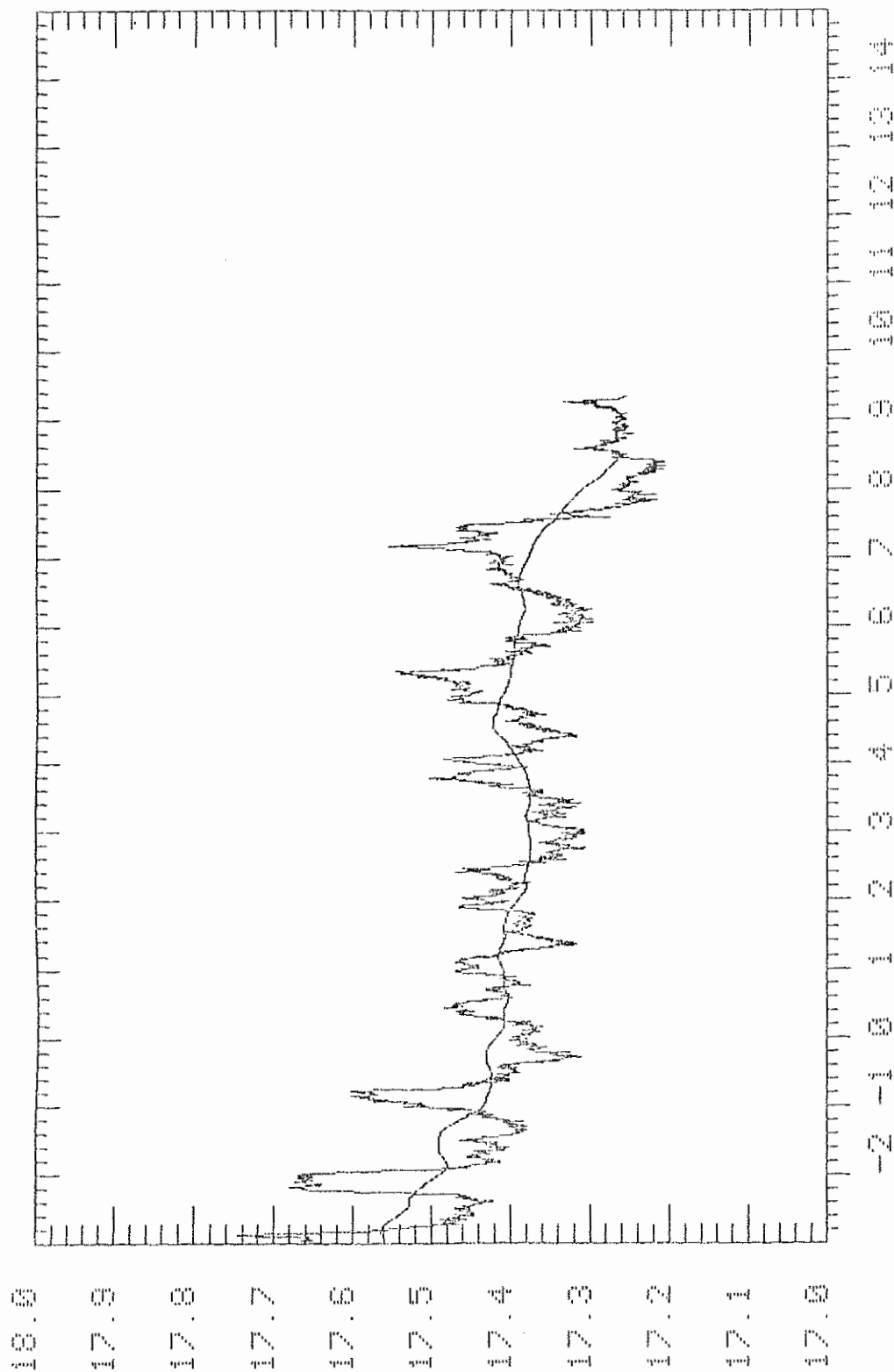
TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: RUN UNITS: PER CENT

AVERAGING TIME: 0.6 SEC X: 400 M Y: 950 H Z: 10.0 M

MEAN OF RUN UP: 74.42 MEAN OF RUN DOWN: 75.85

T E M P E R A T U R E



TIME FROM RELEASE (SECS*10**-2)

TRIAL: 008 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 499 N Y: 950 N Z: 19.9 M

MEAN OF RUN UP: 17.47 MEAN OF RUN DOWN: 17.20

