HEALTH AND SAFETY EXECUTIVE

HEAVY GAS DISPERSION TRIALS
THORNEY ISLAND 1982-3

DATA FOR TRIAL 009/1

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THORNEY ISLAND TRIALS SPILL 009 15 SEPTEMBER 1982

SUMMARY INFORMATION AT THE TIME OF THE SPILL

Gas released at:	18:45:20 hrs
Freon 12/Nitrogen mixture: relative density	1.73
Number of smoke canisters discharged:	4
Mean Wind Speed at 10 m height:	
During main data collection period:	1.7 m/s
From 5 minute cyclic data just before the release:	1.8 m/s
Mean Wind Heading ('A' station) (relative to the centre line of the array)	-26.9°

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)	87.3%
Insolation	12W/m^2
Ambient Air Temperature (at 9 m height)	18.55°C
Treated Runway Surface Temperature	21.55
Grass Surface Temperature	—
Observed Cloud Cover	0/8

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: F.

THORNEY ISLAND TRIALS SPILL 008 9 SEPTEMBER 1982

HISTORY

About five hours before the gas was released the wind speed was 4.4 m/s and the heading about 11° to the left of the centre line of the array. Insolation was moderate, about 600W/m^2 (which incidentally was the highest for that day), giving a stability condition of about 'B'. From this time on, the wind gradually reduced in speed though its heading remained roughly the same; insolation also gradually decreased. Thus, by the time gas was released there was no sunshine and the wind speed was low; a stable condition was therefore achieved.

An interesting observation to note was that, a short time after being released, the orange coloured gas cloud appeared to be transformed to a white low-lying mist which persisted for several hours after the spill.

THORNEY ISLAND HEAVY GAS DISPERSION TRIALS

Notes on information presented in the Summary Sheets

1 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:

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

$\frac{DU}{DZ}$ 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:

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

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

Here again the limits of R_{i_∞} 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 $\pm 2°$ 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 (>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 cateogry 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 1454 to 1154 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 3676 to 3976 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 1.674 m/s.

U' RMS = 0.096 (component in the wind direction)
V' RMS = 0.091 (crosswind component)
W' RMS = 0.049 (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 009

1. The windspeed during Trial 009 was low and the gas cloud remained close to the ground over much of the trials site. On many of the masts the upper sensors did not detect gas. Except where stated, these sensors were functioning correctly, implying that the gas concentration at these points was less than 0.1%.

2. Drift is apparent on a few of the standard gas sensors which did detect gas. In particular, caution must be exercised when assessing the time of arrival or peak concentration from the traces shown on pages G35, G44 and G55. In addition, the first peak on trace G53 is anomolous and should be ignored, as should the drift towards the end of trace G56.

3. The fast gas sensor at location (300, 350, 2.4) had a peak to peak noise level equivalent to a gas concentration of about 0.5%. No signal due to the presence of gas could be identified above this noise level.

4. The lowest standard gas sensor on the M2(b) mast, location (300, 550, 0.4), was apparently functioning correctly but did not detect gas although higher sensors on this mast did.

5. Of the RLSD smoke sensors at (300, 550, 2.0), one was malfunctioning and the other did not detect the presence of gas.

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26 April 1983

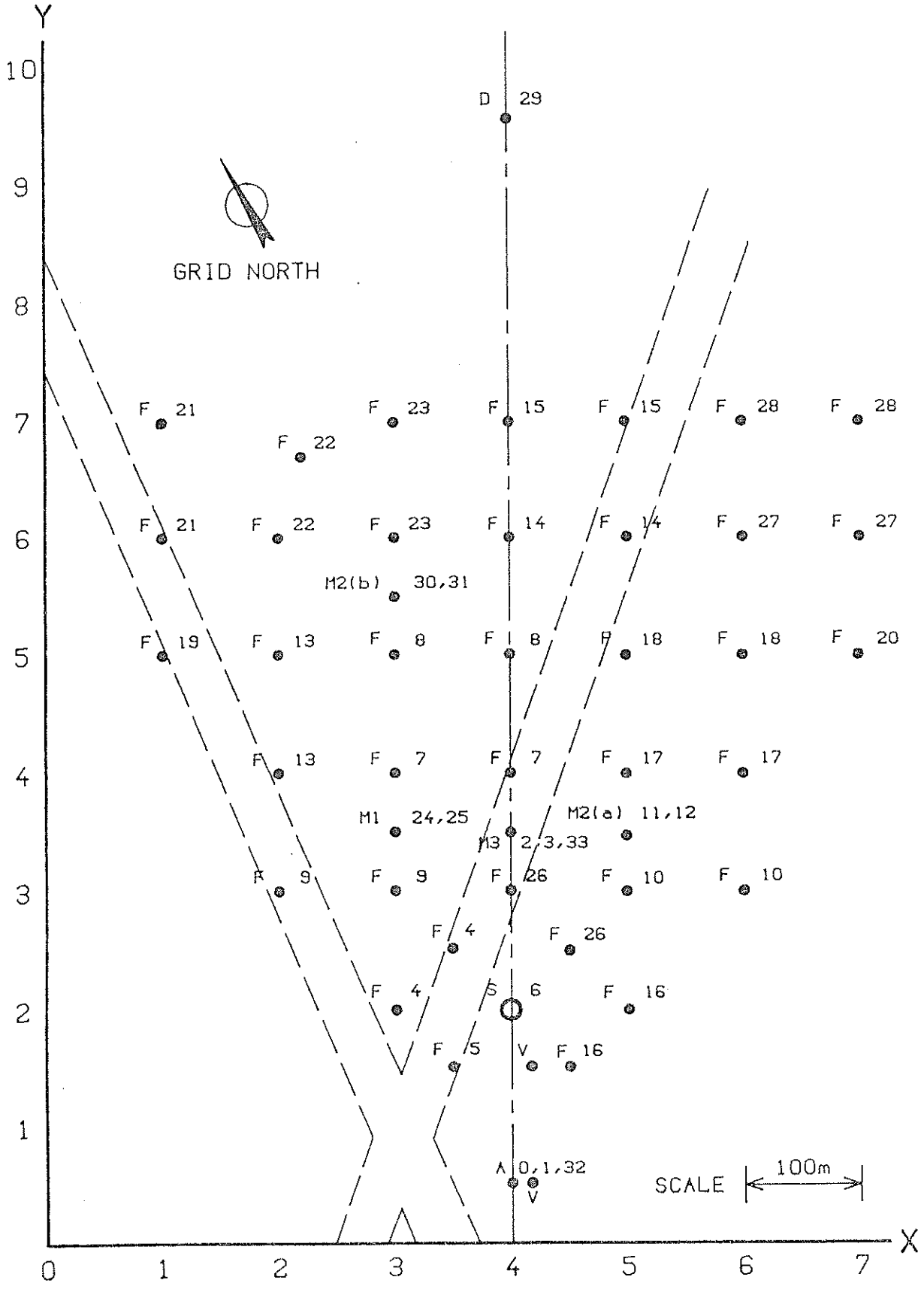
NSTRUMENT STATIONS AND DISTRIBUTIONS (EFFECTIVE FOR TRIAL 009)

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		G01
		5	2	1.4	Gas Sensor		G02
		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		G03
		16	2	1.4	Gas Sensor		G04
		16	3	2.4	Gas Sensor		
3.0, 2.0	F	4	0	0.4	Gas Sensor		G05
		4	2	1.4	Gas Sensor		G06
		4	3	2.4	Gas Sensor		G07
.0, 2.0	S	6	0	0.4	Thermometer		E26
		6	1	0.4	Gas Sensor		
4.0, 2.0		6	2	12.0	Thermometer		E27
		6	3	12.0	Gas Sensor		
.0, 2.0	F	16	4	0.4	Gas Sensor		G08
		16	6	1.4	Gas Sensor		
		16	7	2.4	Gas Sensor		
5, 2.5	F	4	4	0.4	Gas Sensor		G09
3.5, 2.5		4	5	2.4	Gas Sensor		G10
		4	6	4.4	Gas Sensor		
4.5, 2.5		4	7	6.4	Gas Sensor		
5, 2.5	F	26	0	0.4	Gas Sensor		G11
		26	1	2.4	Gas Sensor		G12
		26	2	4.4	Gas Sensor		
2.0, 3.0		26	3	6.4	Gas Sensor		
0, 3.0	F	9	0	0.4	Gas Sensor		G13
		9	1	2.4	Gas Sensor		G14
		9	2	4.4	Gas Sensor		G15
		9	3	6.4	Gas Sensor		G16
0, 3.0	F	9	4	0.4	Gas Sensor		G17
3.0, 3.0		9	5	2.4	Gas Sensor		G18
		9	6	4.4	Gas Sensor		G19
		9	7	6.4	Gas Sensor		
0, 3.0	F	26	4	0.4	Gas Sensor		G20
4.0, 3.0		26	5	2.4	Gas Sensor		G21
		26	6	4.4	Gas Sensor		
		26	7	6.4	Gas Sensor		
0, 3.0	F	10	0	0.4	Gas Sensor		G22
5.0, 3.0		10	1	2.4	Gas Sensor		G23
		10	2	4.4	Gas Sensor		
		10	3	6.4	Gas Sensor		
0, 3.0	F	10	4	0.4	Gas Sensor		
		10	5	2.4	Gas Sensor		
		10	6	4.4	Gas Sensor		
		10	7	6.4	Gas Sensor		

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		G24
		24	5	2.0	High Speed Gas Sensor		G25
		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		G26
		24	4	2.4	High Speed Gas Sensor		
		24	2	4.4	Gas Sensor		G27
		24	6	5.0	RLSD Smoke Detector		
		24	3	6.4	Gas Sensor		
4.0, 3.5	M3	3	0	0.4	Gas Sensor		
		33	3	0.4	RLSD Smoke Detector		G28
		33	4	2.0	RLSD Smoke Detector		G29
		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		G30
		3	2	4.4	Gas Sensor		
		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		
		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		G31
		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		G32
		12	6	2.0	RLSD Smoke Detector		
		12	1	2.4	Gas Sensor		G33
		12	5	2.4	High Speed Gas Sensor		G34
		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		G35
		13	1	2.4	Gas Sensor		G36
		13	2	4.4	Gas Sensor		G37
		13	3	6.4	Gas Sensor		G38
3.0, 4.0	F	7	0	0.4	Gas Sensor		G39
		7	1	2.4	Gas Sensor		G40
		7	2	4.4	Gas Sensor		
		7	3	6.4	Gas Sensor		
4.0, 4.0	F	7	4	0.4	Gas Sensor		G41
		7	5	2.4	Gas Sensor		
		7	6	4.4	Gas Sensor		
		7	7	6.4	Gas Sensor		
5.0, 4.0	F	17	0	0.4	Gas Sensor		G42
		17	1	2.4	Gas Sensor		G43
		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		G44
		19	1	2.4	Gas Sensor	Not connected	
		19	2	4.4	Gas Sensor	Not connected	
		19	3	6.4	Gas Sensor	Not connected	
2.0, 5.0	F	13	4	0.4	Gas Sensor		G45
		13	5	2.4	Gas Sensor		G46
		13	6	4.4	Gas Sensor		G47
		13	7	6.4	Gas Sensor		G48
3.0, 5.0	F	8	0	0.4	Gas Sensor		G49
		8	1	2.4	Gas Sensor		G50
		8	2	4.4	Gas Sensor		
		8	3	6.4	Gas Sensor		
4.0, 5.0	F	8	4	0.4	Gas Sensor		
		8	5	2.4	Gas Sensor		
		8	6	4.4	Gas Sensor		
		8	7	6.4	Gas Sensor		
5.0, 5.0	F	18	0	0.4	Gas Sensor		
		18	1	2.4	Gas Sensor		
		18	2	4.4	Gas Sensor		

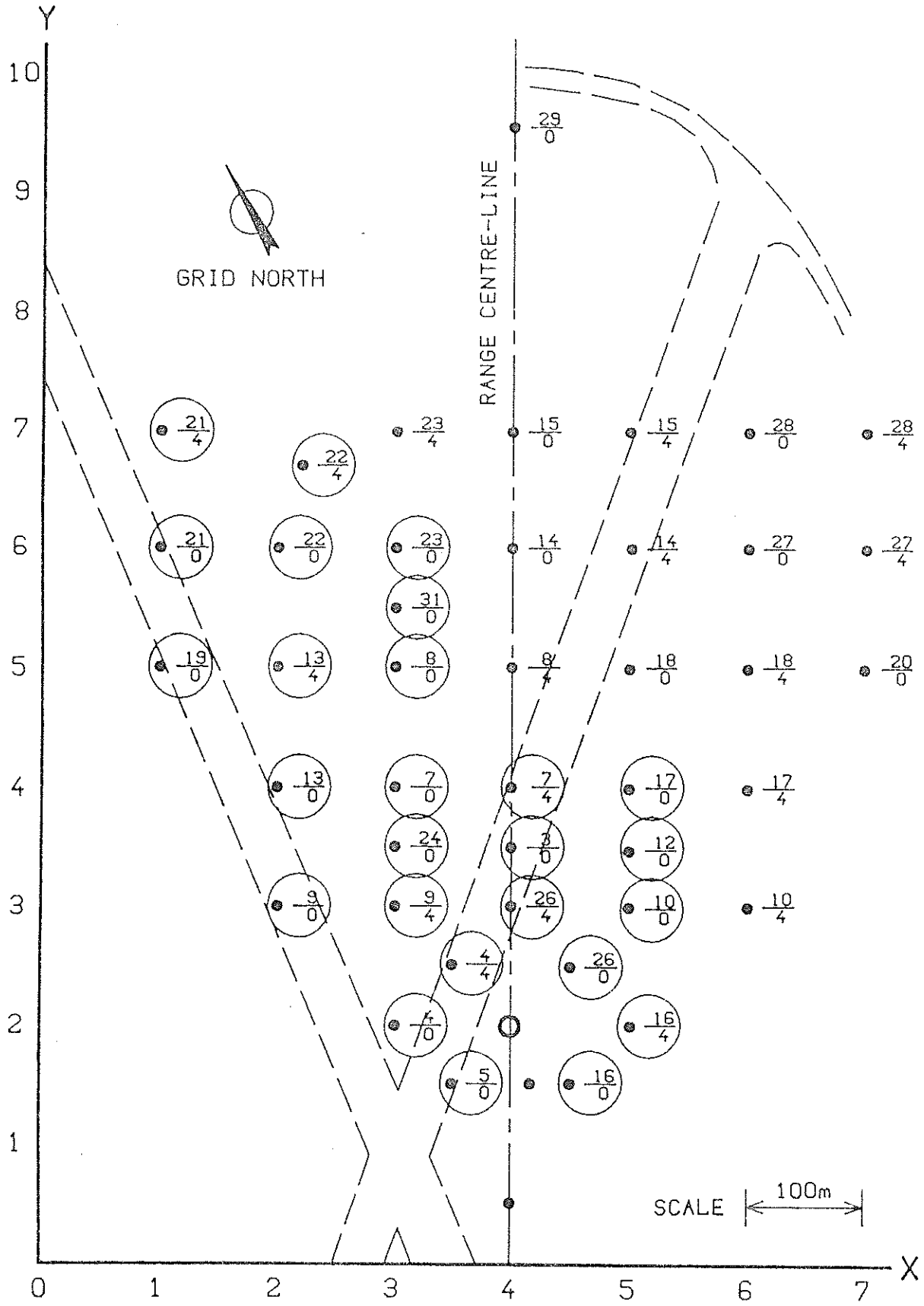
LOCATION COORDINATES	TYPE OF MAST	DATA TERMINAL NUMBER	CHANNEL NUMBER	HEIGHT ABOVE GROUND m	TYPE OF SENSOR	REMARKS	PAGE NUMBER
6.0, 5.0	F	18	4	0.4	Gas Sensor		
		18	5	2.4	Gas Sensor		
		18	6	4.4 -	Gas Sensor		
		18	7	6.4	Gas Sensor		
7.0, 5.0	F	20	4	0.4	Solarimeter		E50
		20	0	0.4	Gas Sensor		
		20	1	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		
		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		G51
		31	1	2.4	Gas Sensor		G52
		31	2	4.4 -	Gas Sensor		
		31	3	6.4	Gas Sensor		
		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		G53
		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		G54
		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		G55
		23	1	2.4	Gas Sensor		G56
		23	2	4.4 -	Gas Sensor		
		23	3	6.4	Gas Sensor		
4.0, 6.0	F	14	0	0.4	Gas Sensor		
		14	1	2.4	Gas Sensor		
		14	2	4.4 -	Gas Sensor		
		14	3	6.4	Gas Sensor		
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		G57
		21	5	2.4	Gas Sensor		G58
		21	6	4.4 -	Gas Sensor		G59
		21	7	6.4	Gas Sensor		G60
2.2, 6.7	F	22	4	0.4	Gas Sensor		G61
		22	5	2.4	Gas Sensor		G62
		22	6	4.4 -	Gas Sensor		
		22	7	6.4	Gas Sensor		
3.0, 7.0	F	23	4	0.4	Gas Sensor		
		23	5	2.4	Gas Sensor		
		23	6	4.4 -	Gas Sensor		
		23	7	6.4	Gas Sensor		
4.0, 7.0	F	15	0	0.4	Gas Sensor		
		15	1	2.4	Gas Sensor		
		15	2	4.4 -	Gas Sensor		
		15	3	6.4	Gas Sensor		
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	Not connected	
		29	2	4.4 -	Gas Sensor	Not connected	
		29	3	10.0	Wind Vane		E59
		29	4	10.0	Wind Speed		E60
		29	5	10.0	Relative Humidity		E61
		29	6	10.0	Thermometer		E62



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

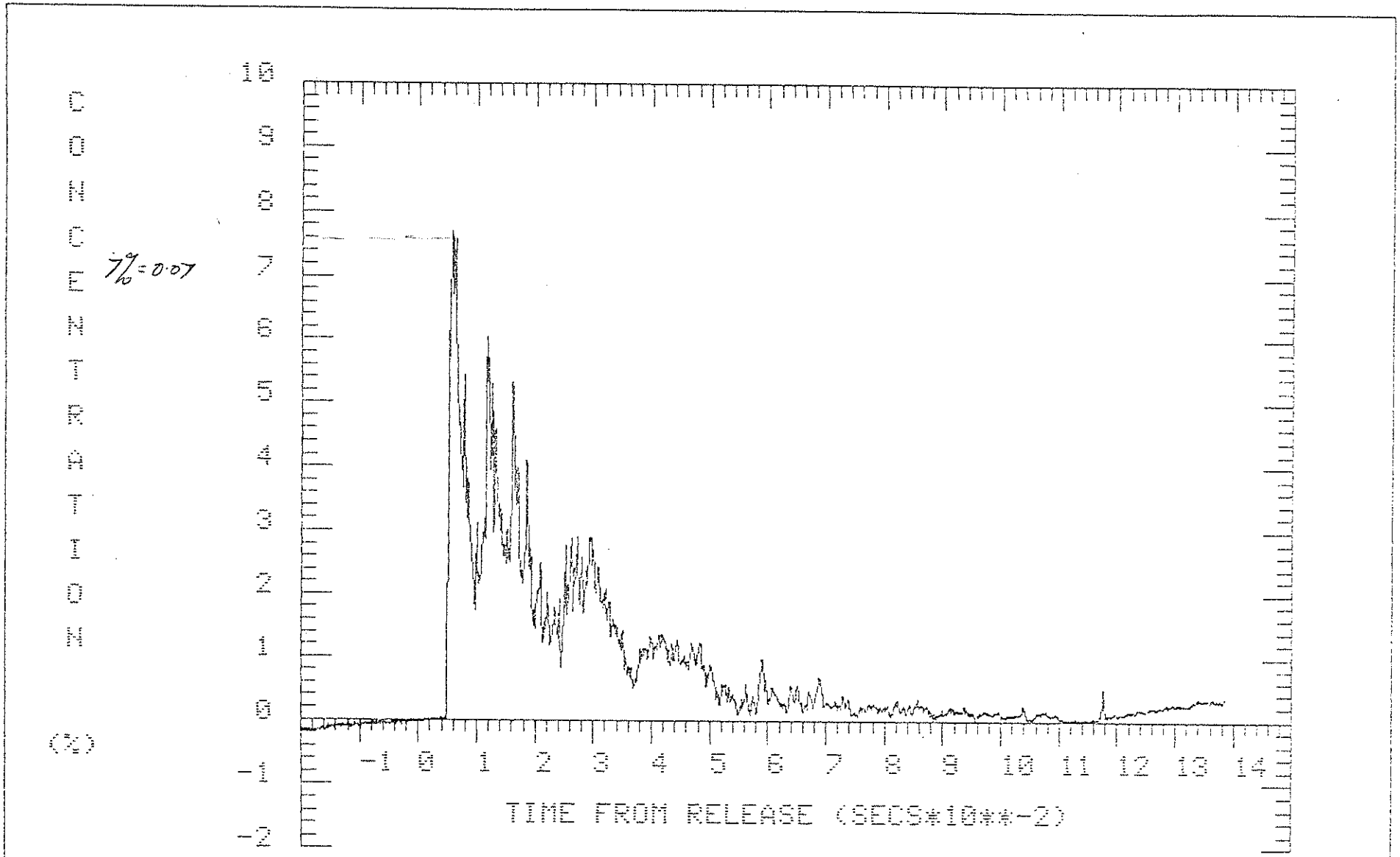
TRIAL No. - 009 DATE - 15/9/82 62 SENSORS SAW GAS

WIND SPEED (U_{10}) 1-2 m/sec PASQUILL CATEGORY - F



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

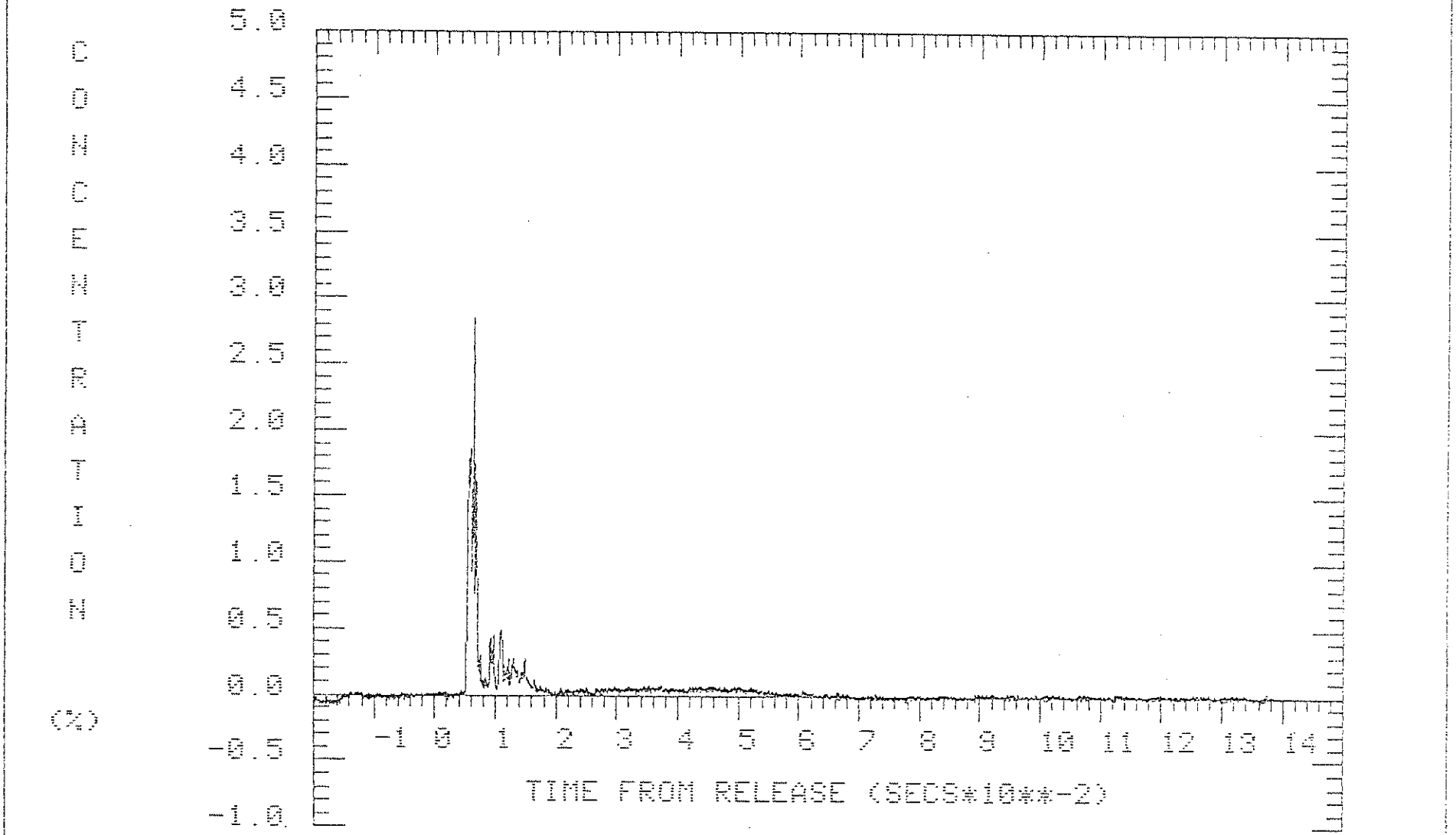
○ = SENSORS AT 0.4m HEIGHT VERIFIED TO HAVE SEEN GAS



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 350 M Y: 150 M Z: 0.4 M

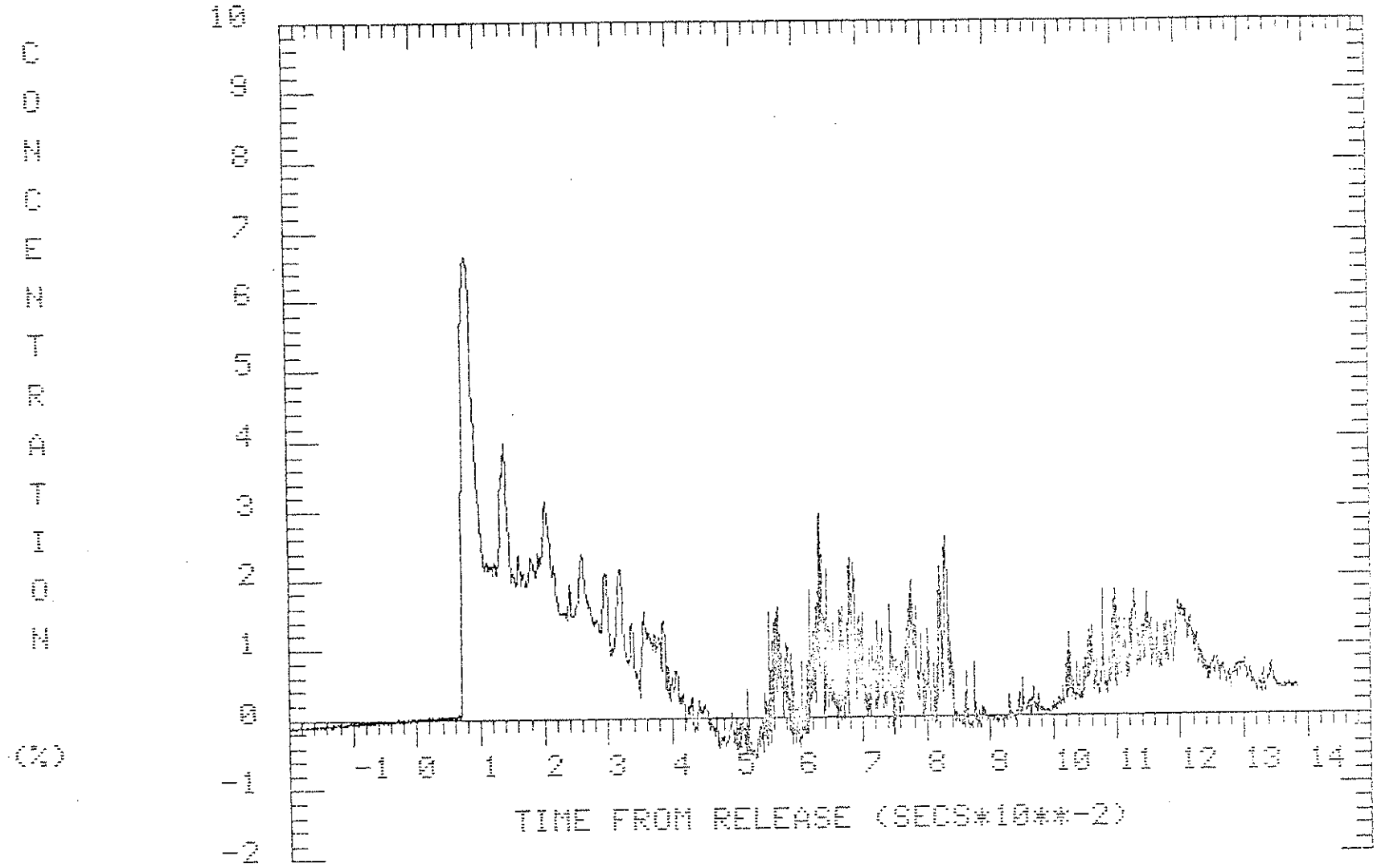
G01



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 350 M Y: 150 M Z: 1.4 M

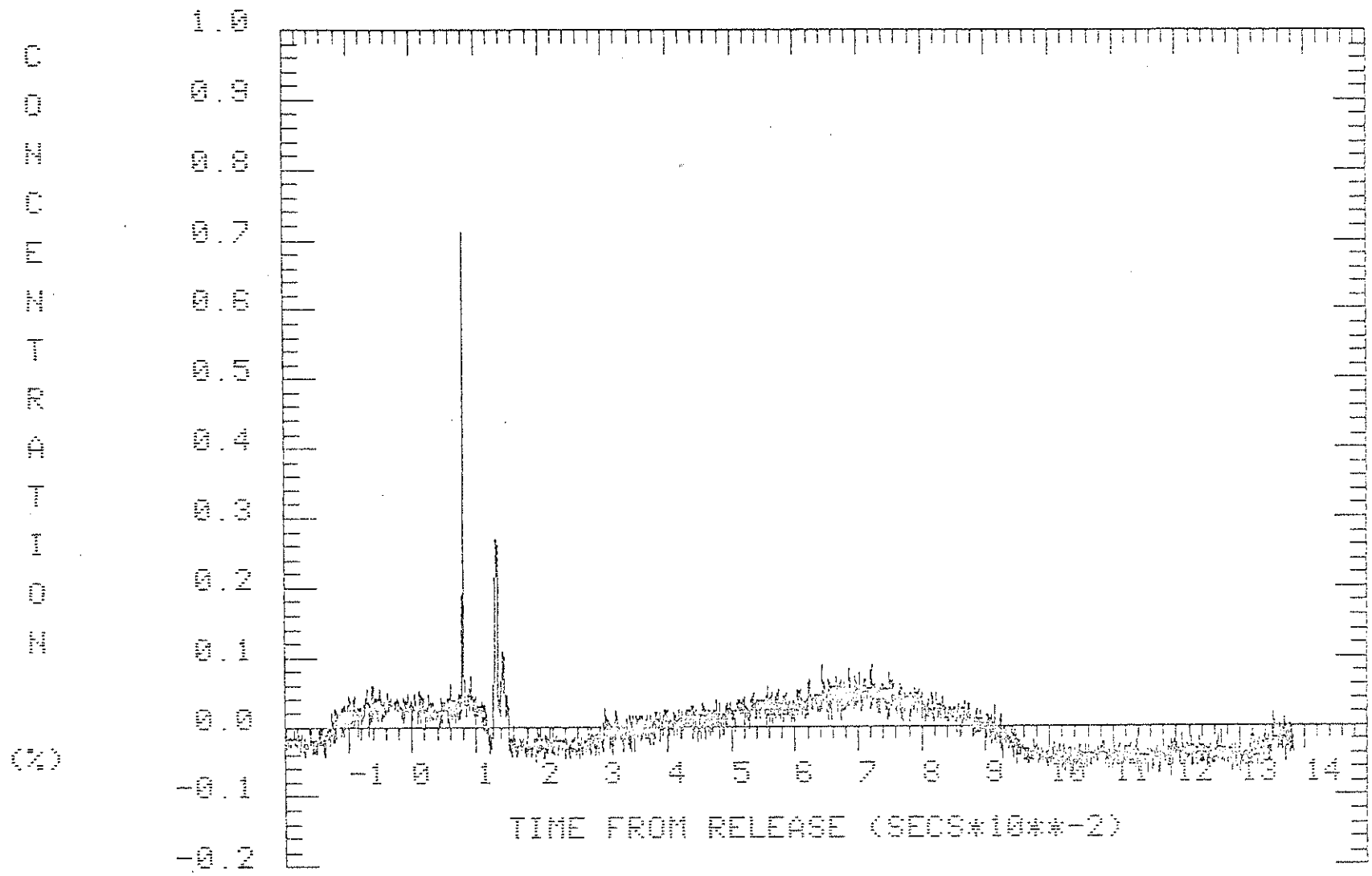
G02



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 150 M Z: 0.4 M

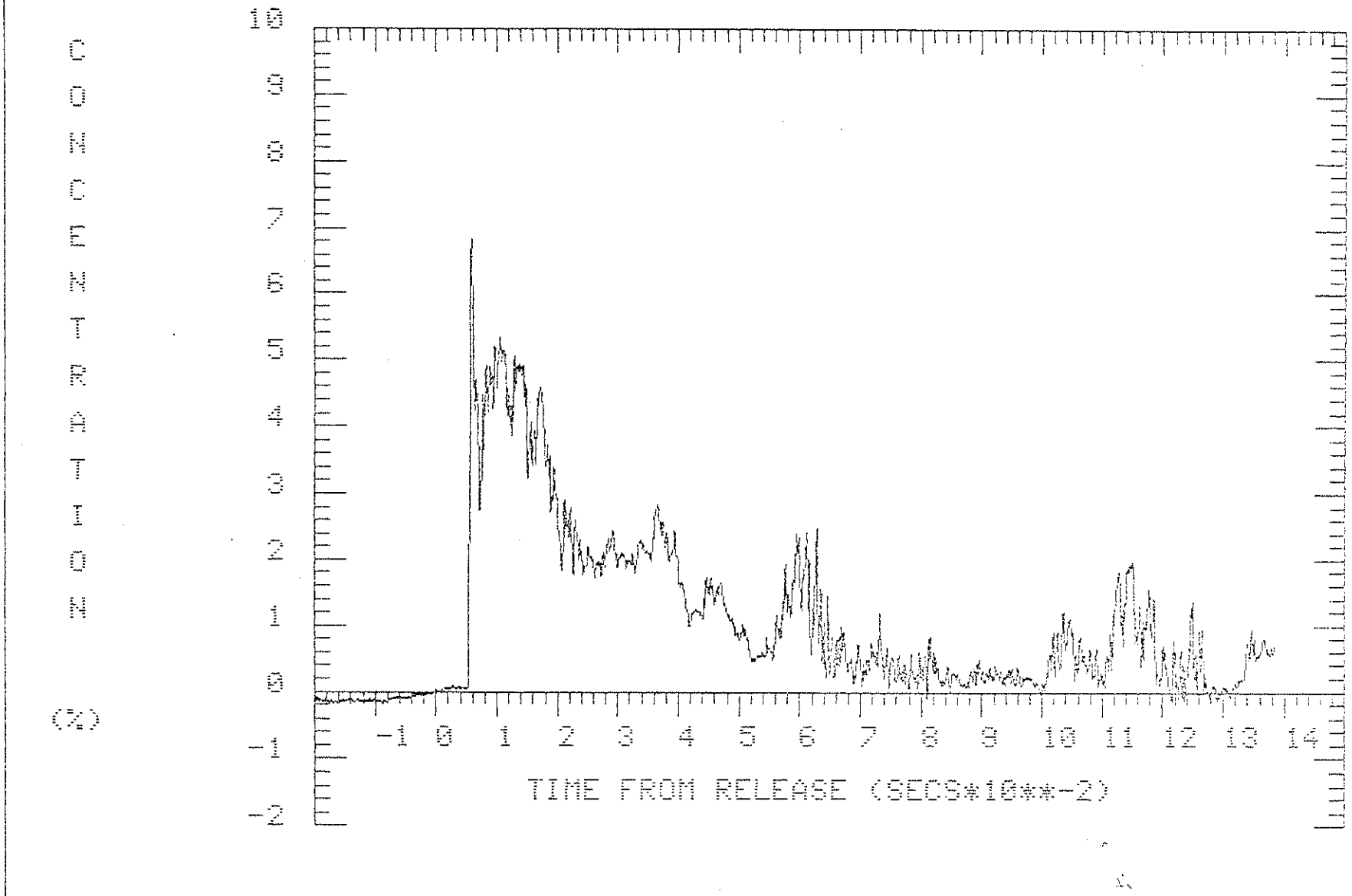
G03



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 450 M Y: 150 M Z: 1.4 M

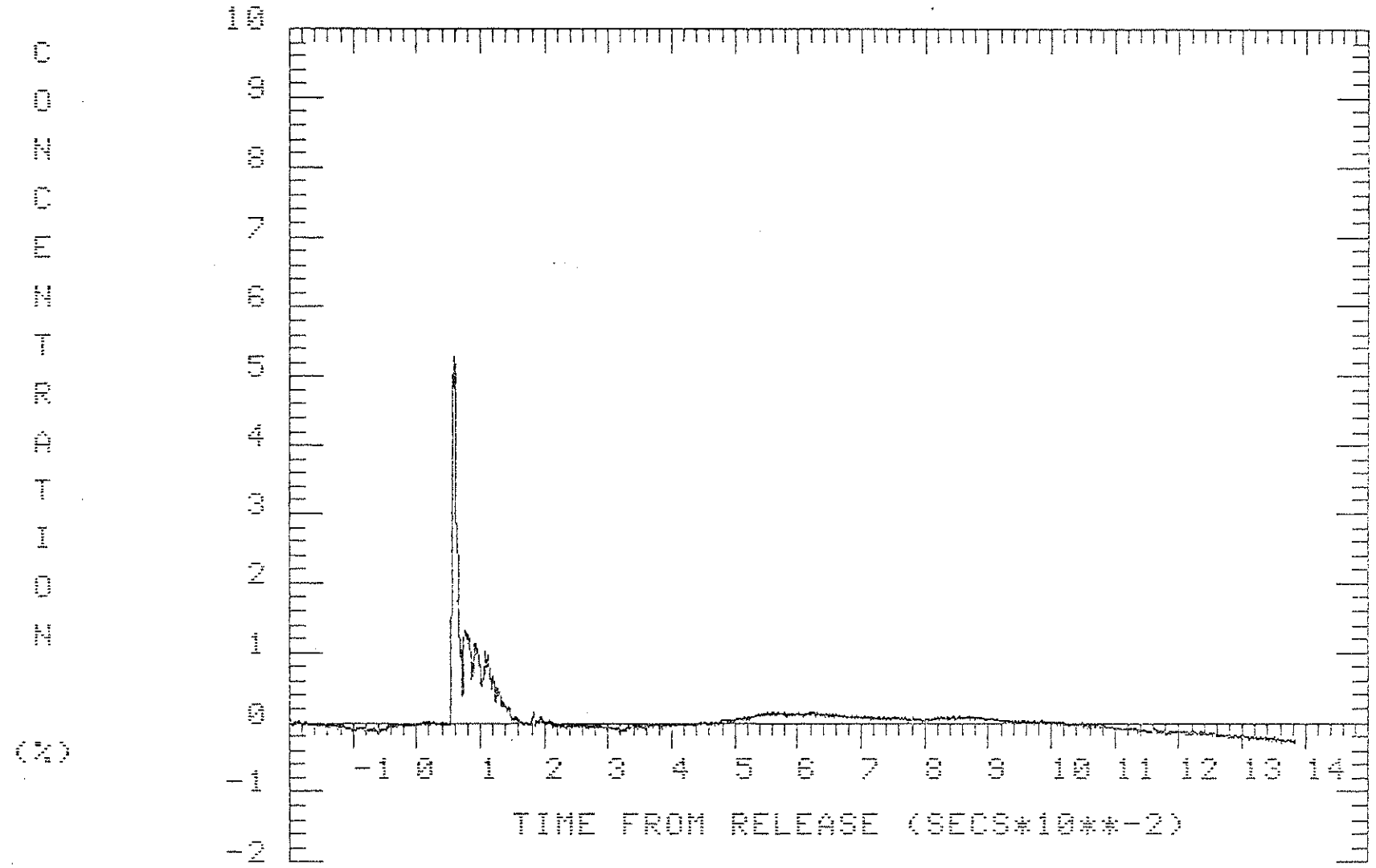
G04



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

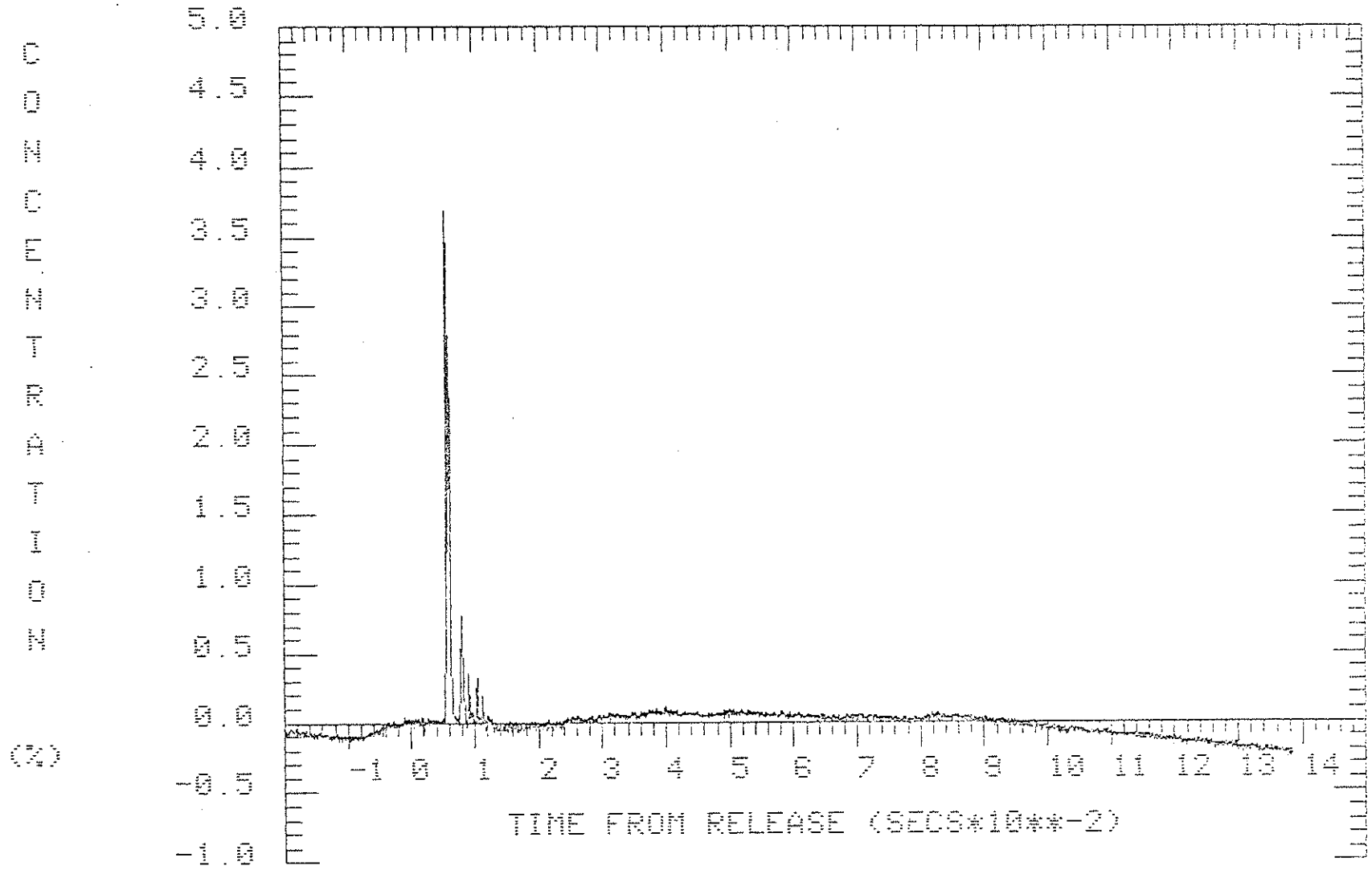
X: 300 M Y: 200 M Z: 0.4 M

G05



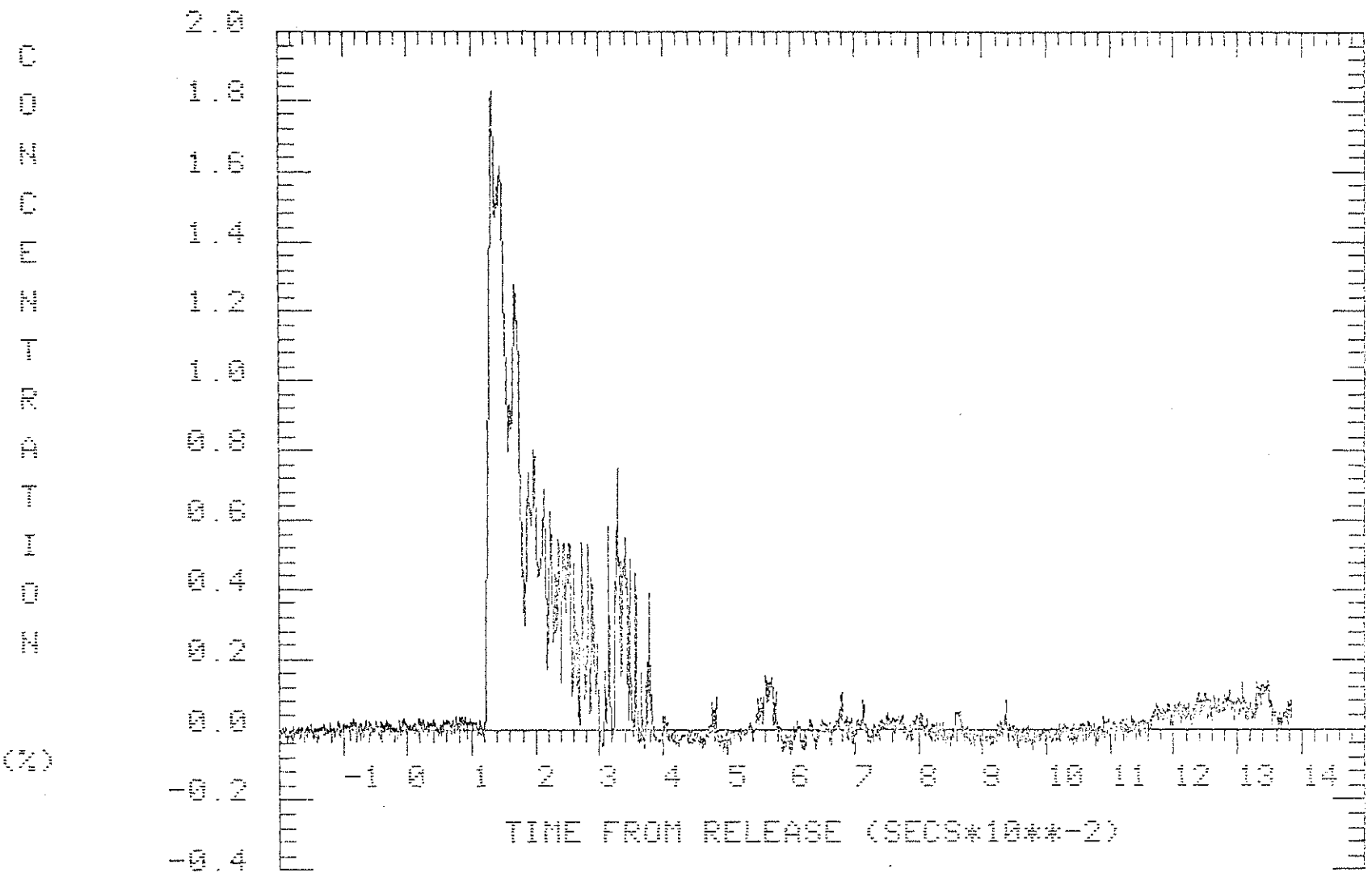
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 200 M Z: 1.4 M



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

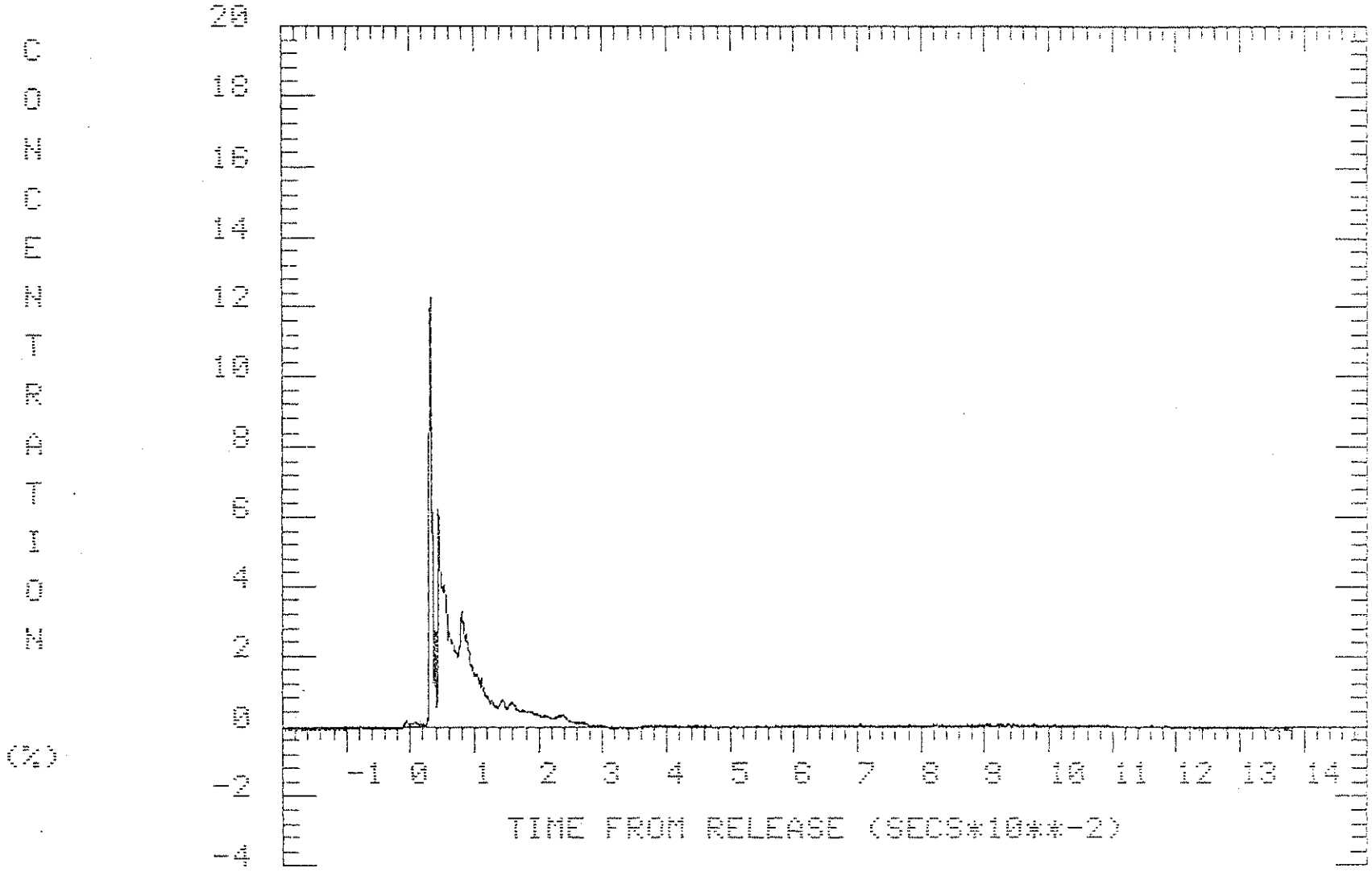
X: 300 M Y: 200 M Z: 2.4 M



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

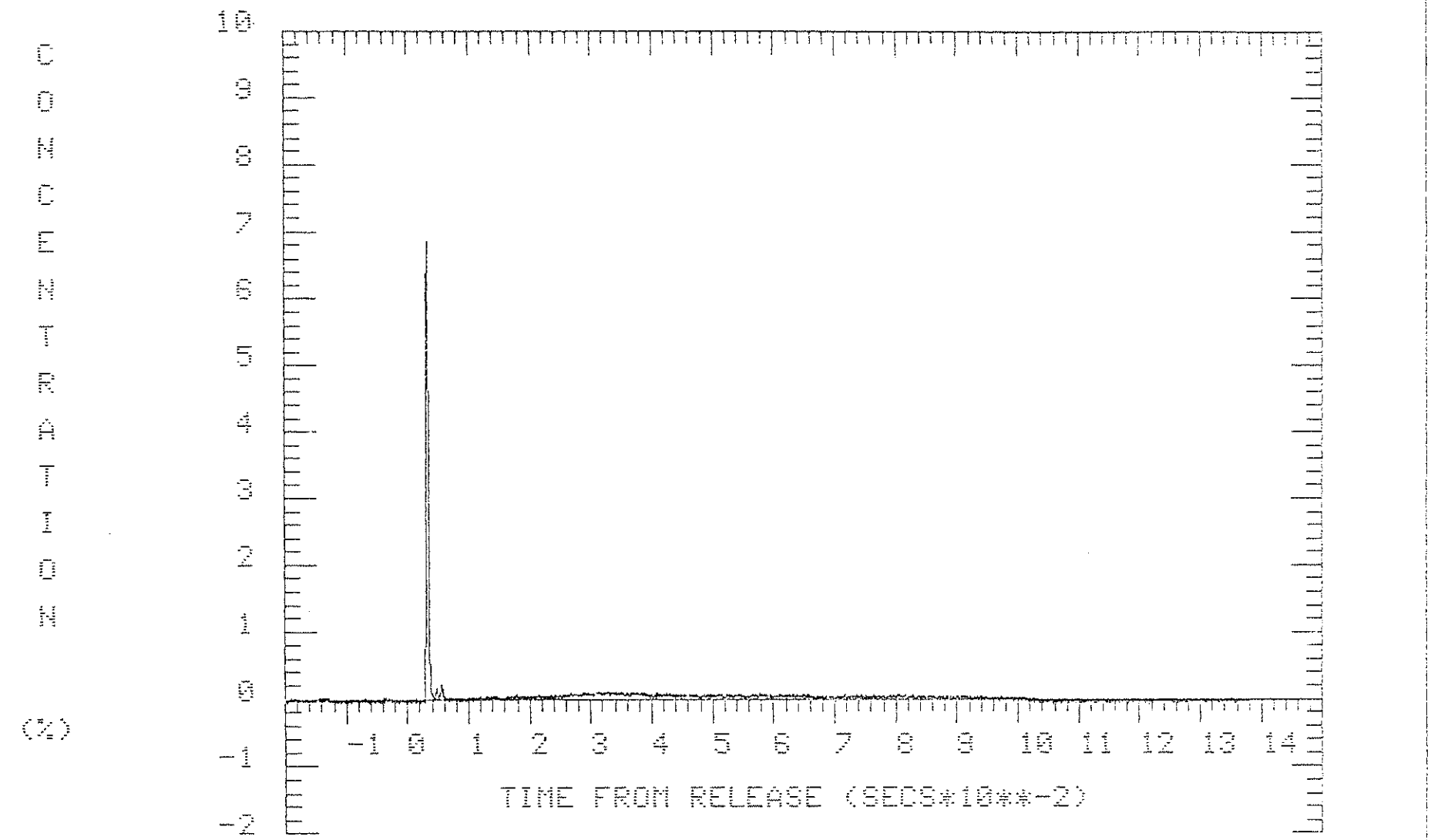
X: 500 M Y: 200 M Z: 0.4 M

G08



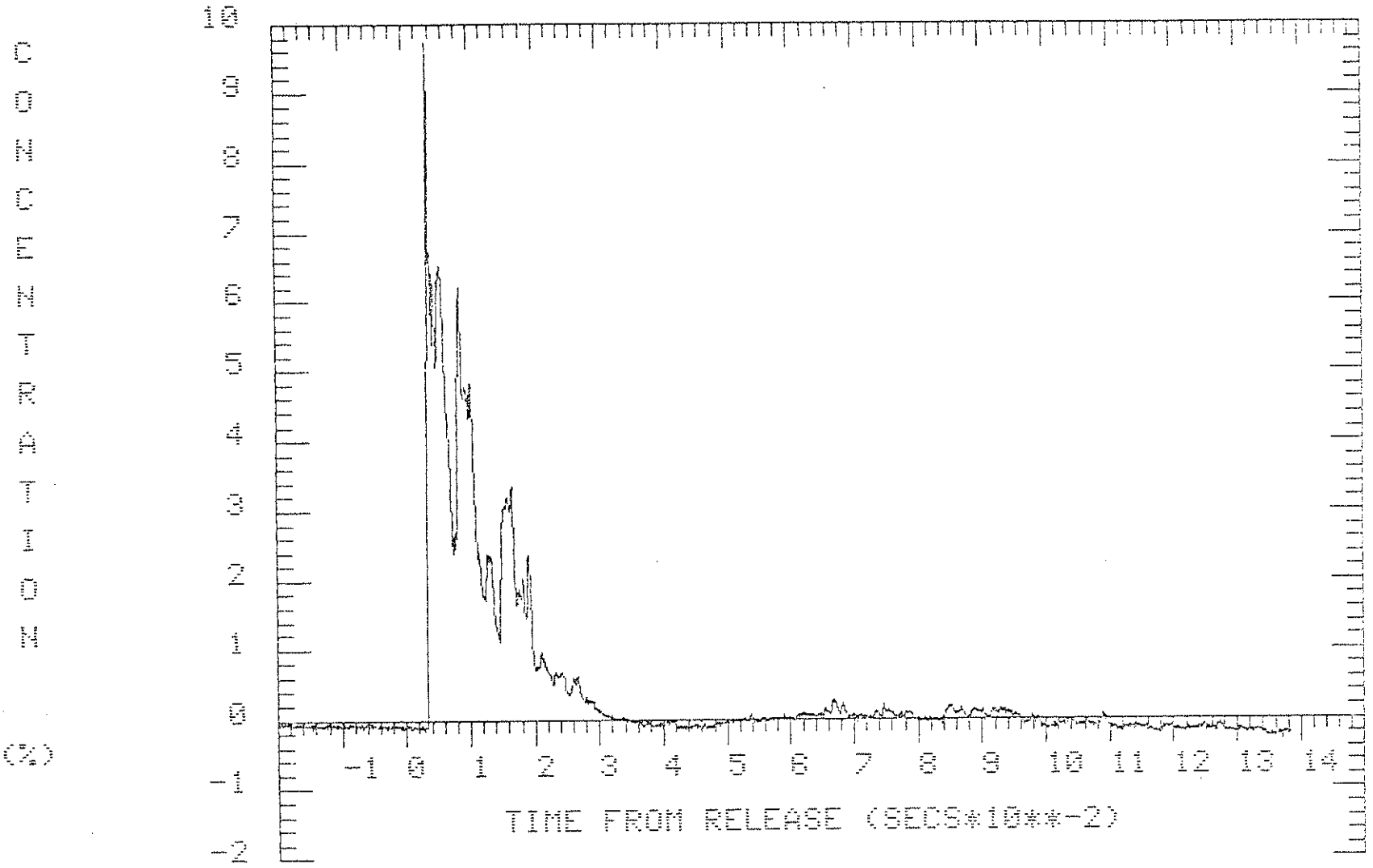
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



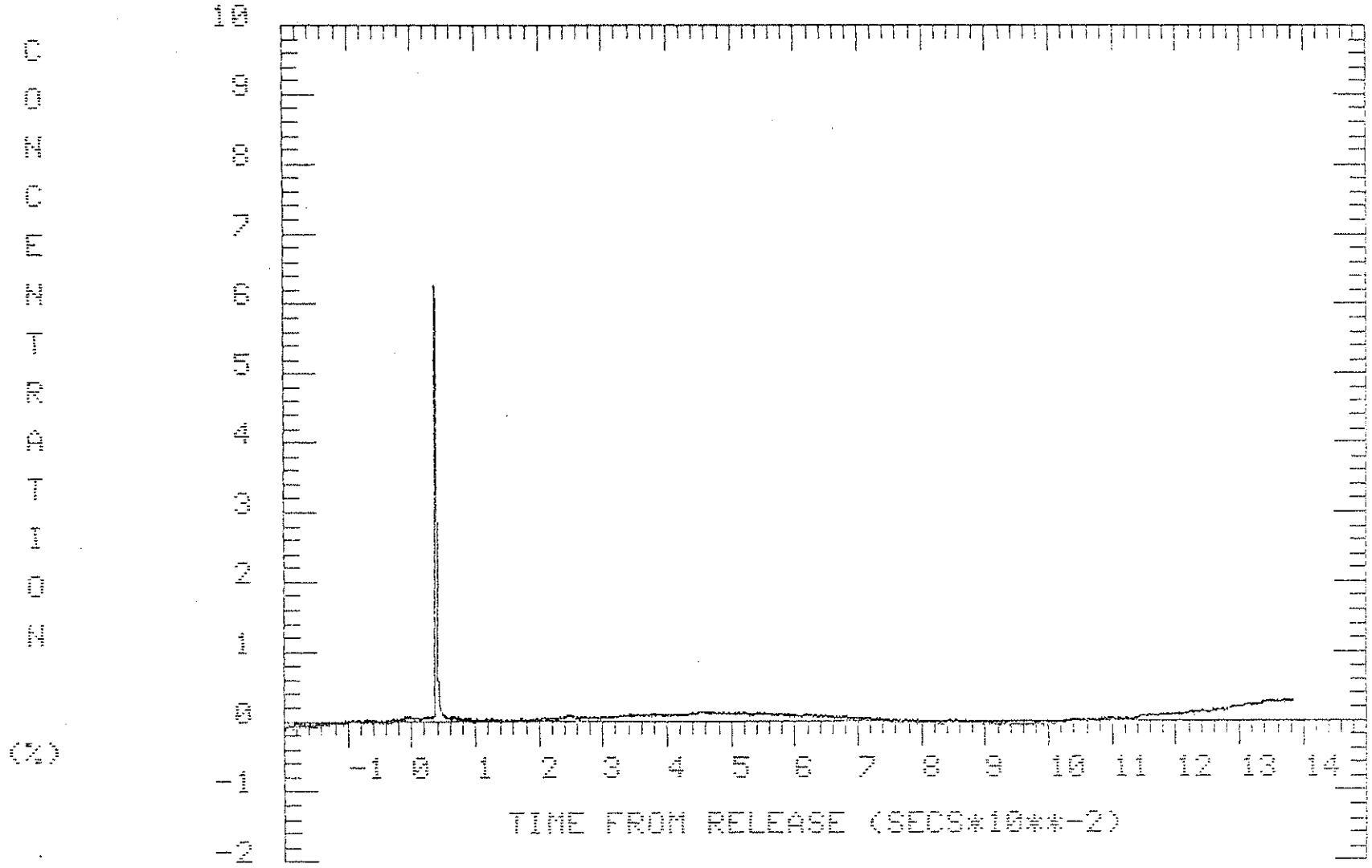
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 350 M Y: 250 M Z: 2.4 M



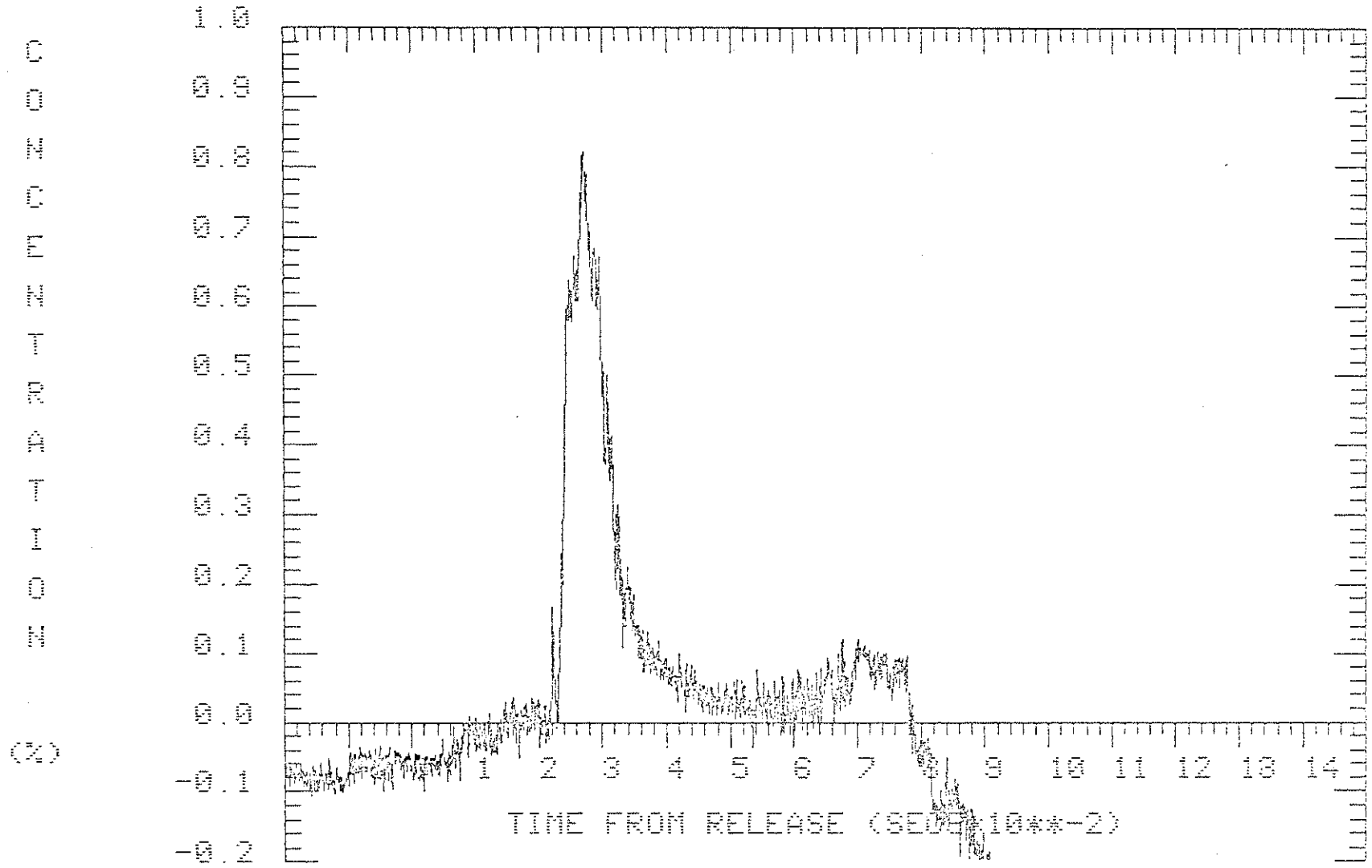
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



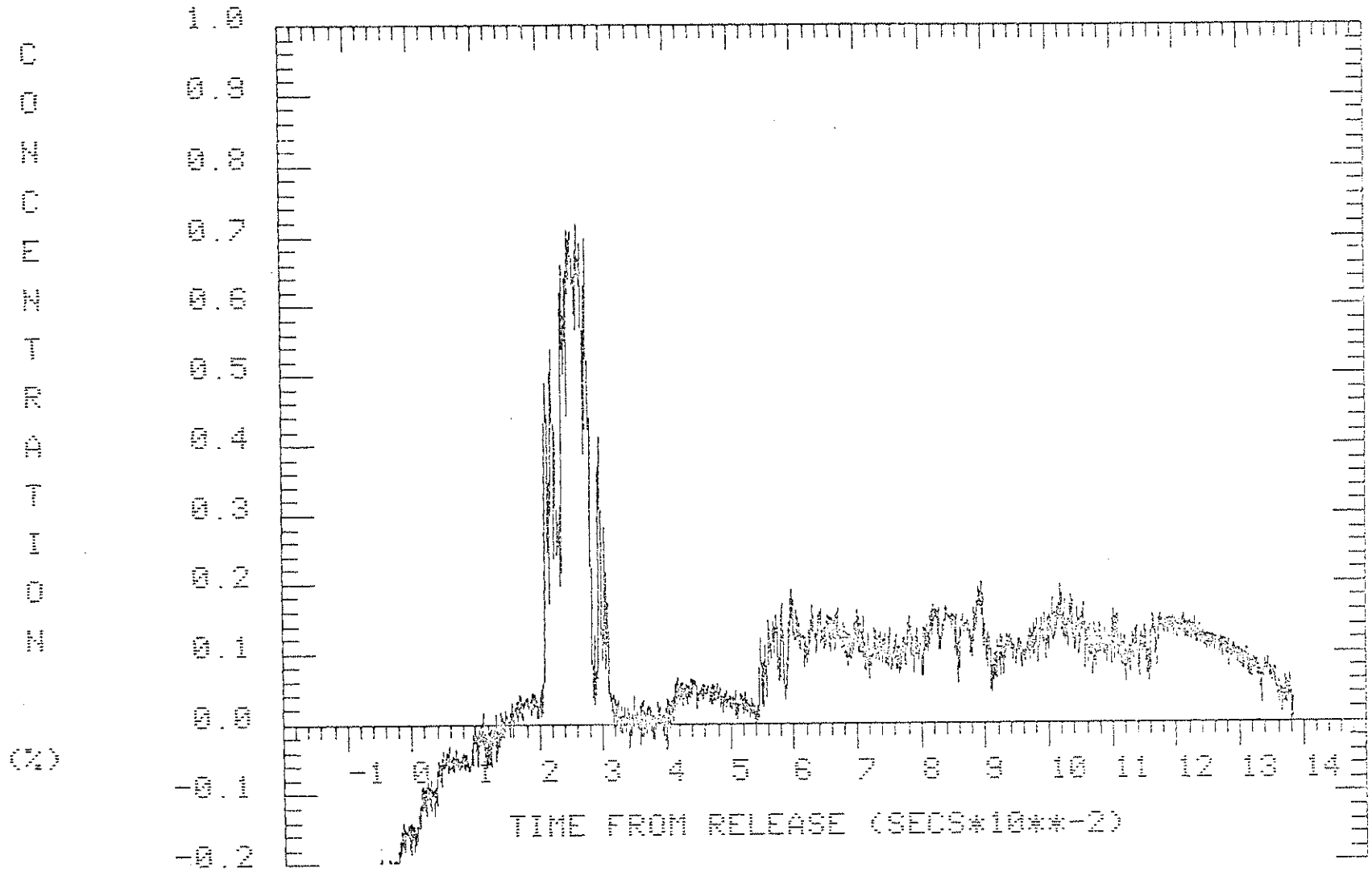
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.5 SECS

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



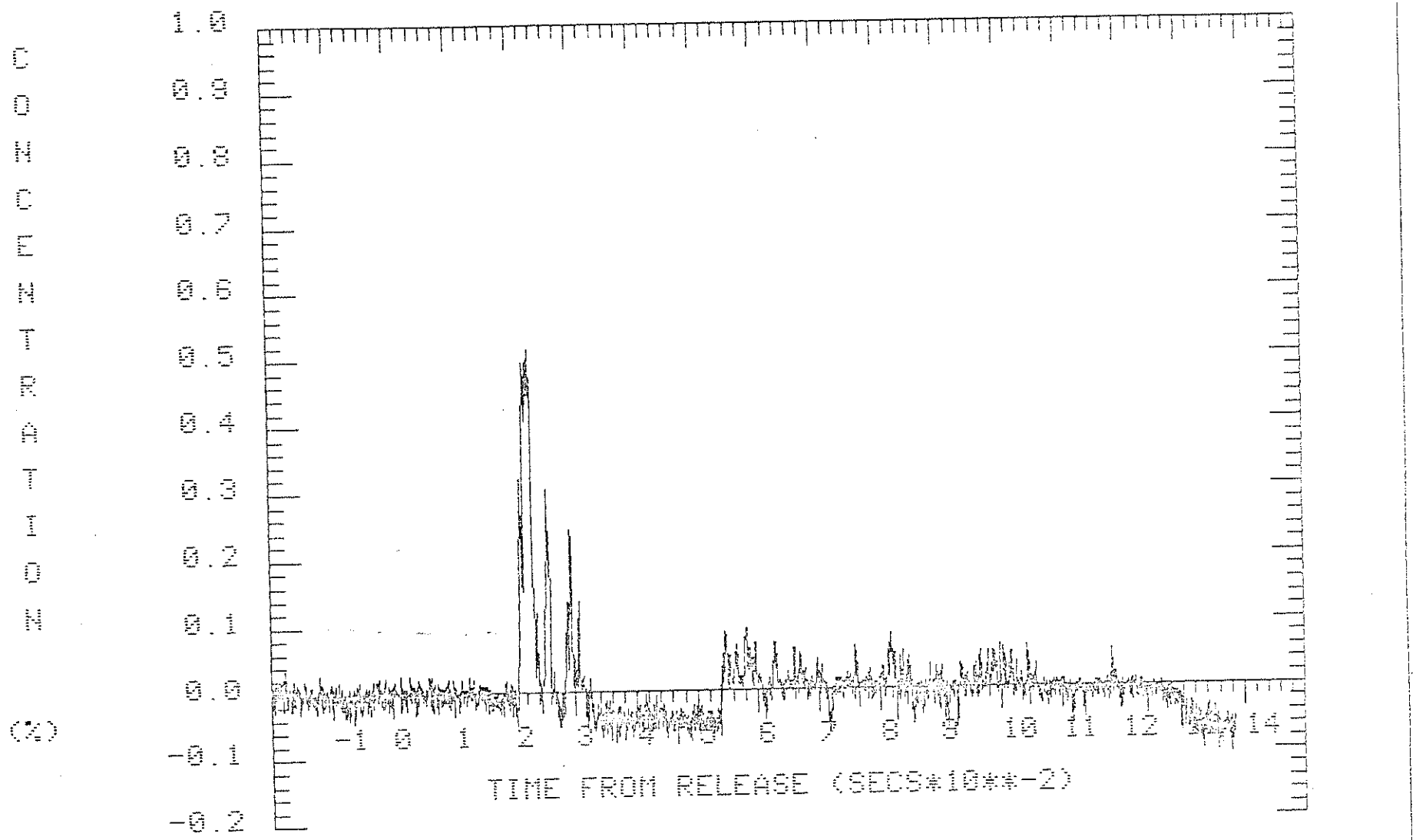
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 300 M Z: 0.4 M



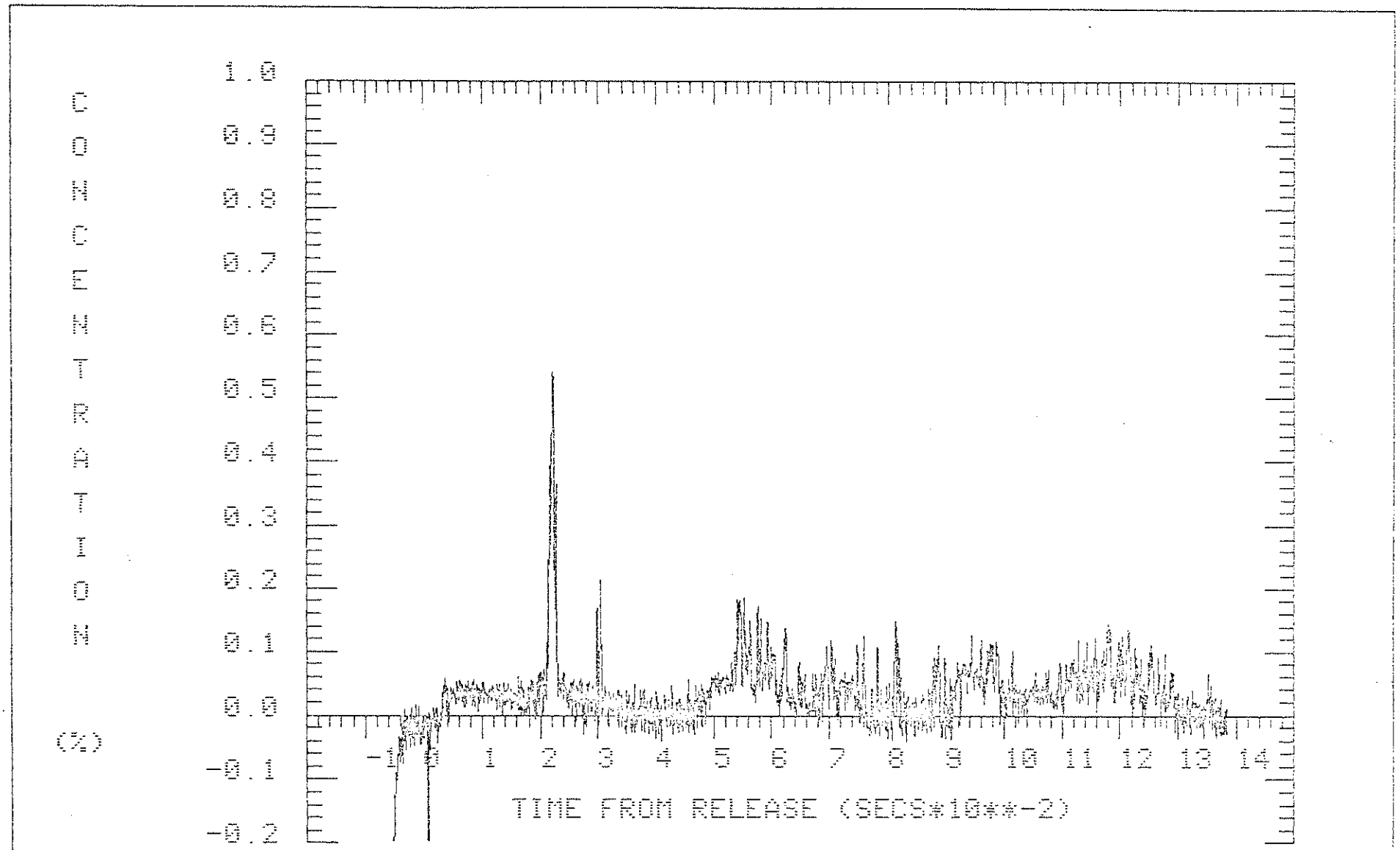
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 300 M Z: 2.4 M



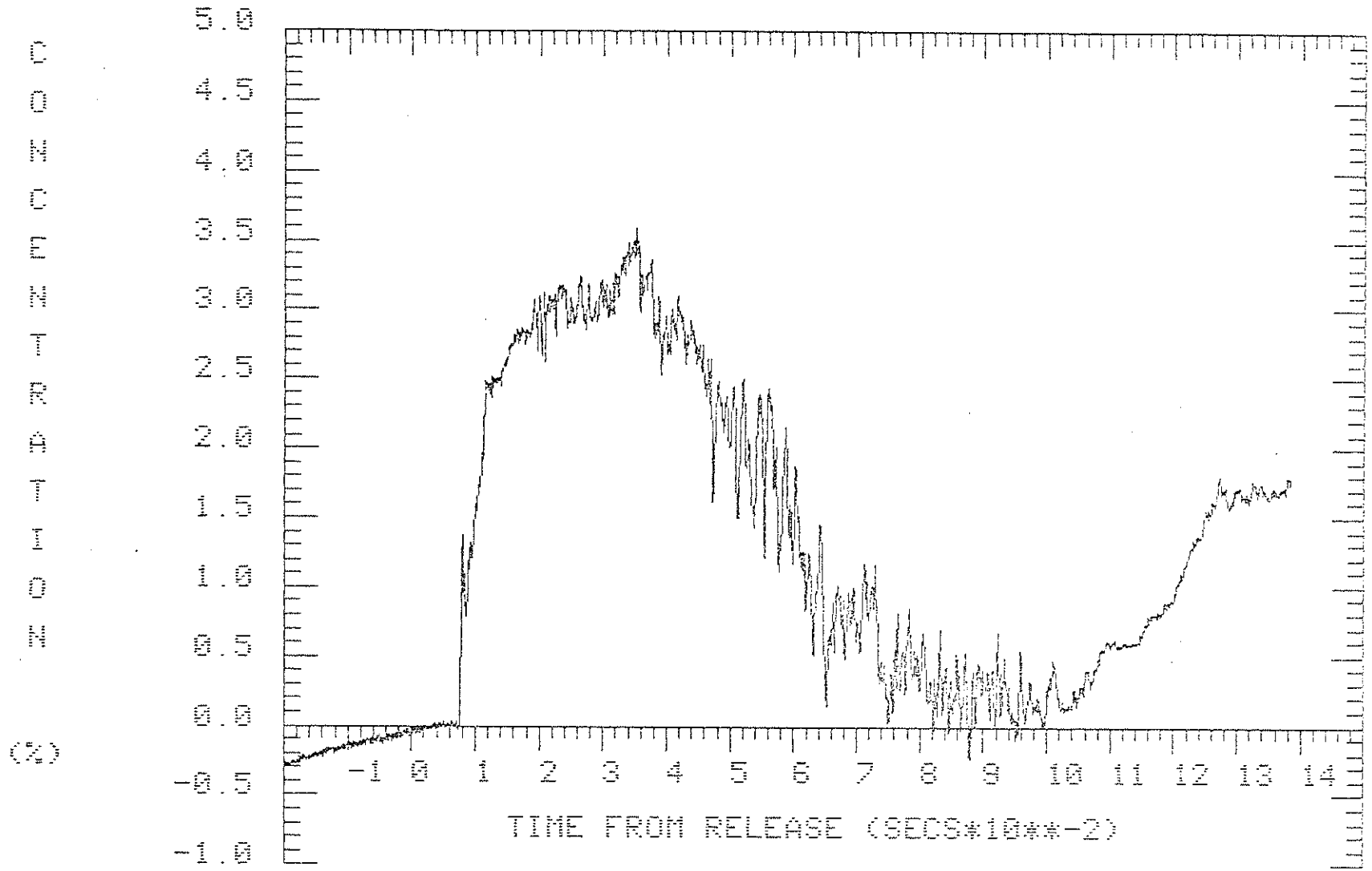
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 300 M Z: 4.4 M



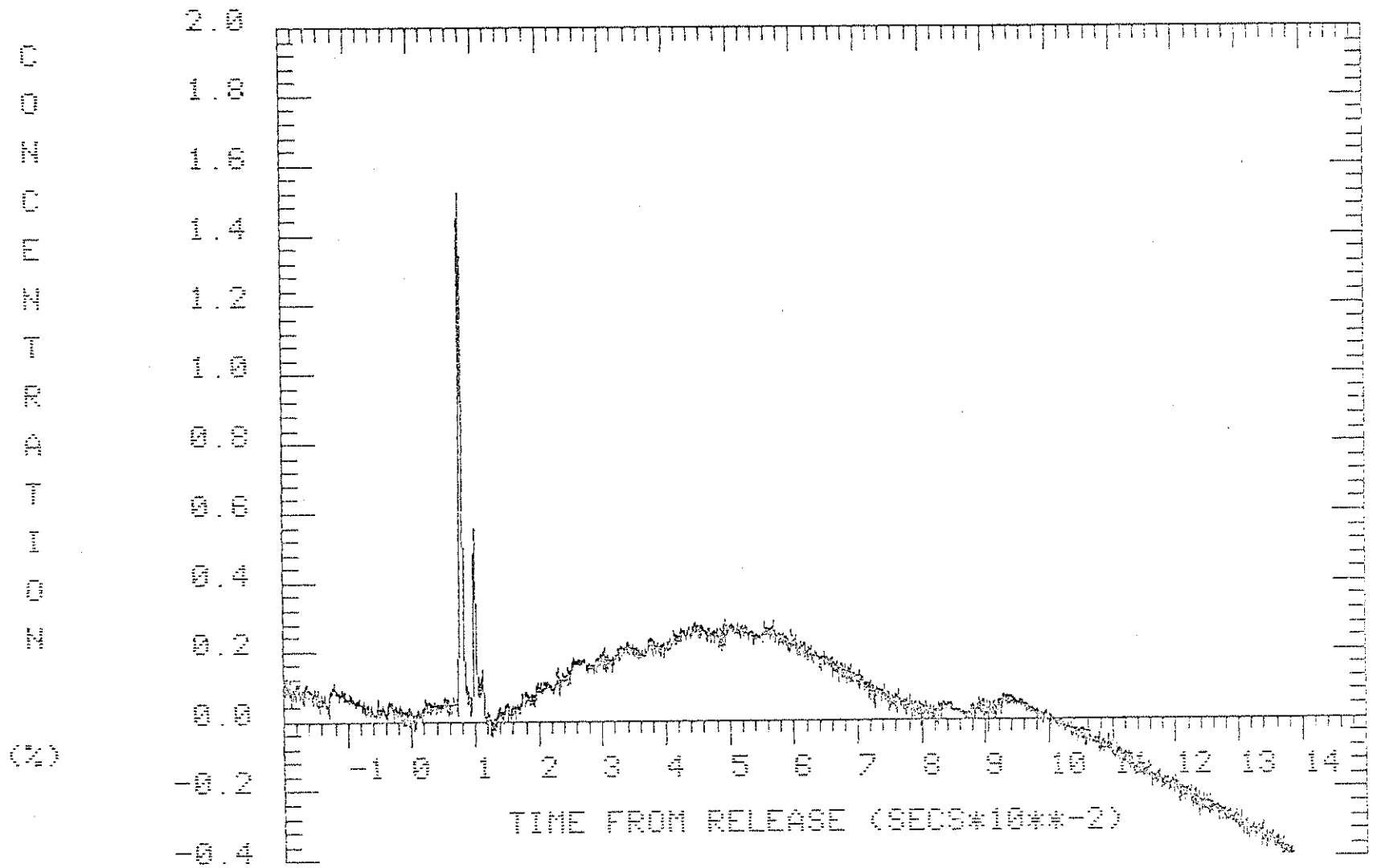
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 300 M Z: 6.4 M



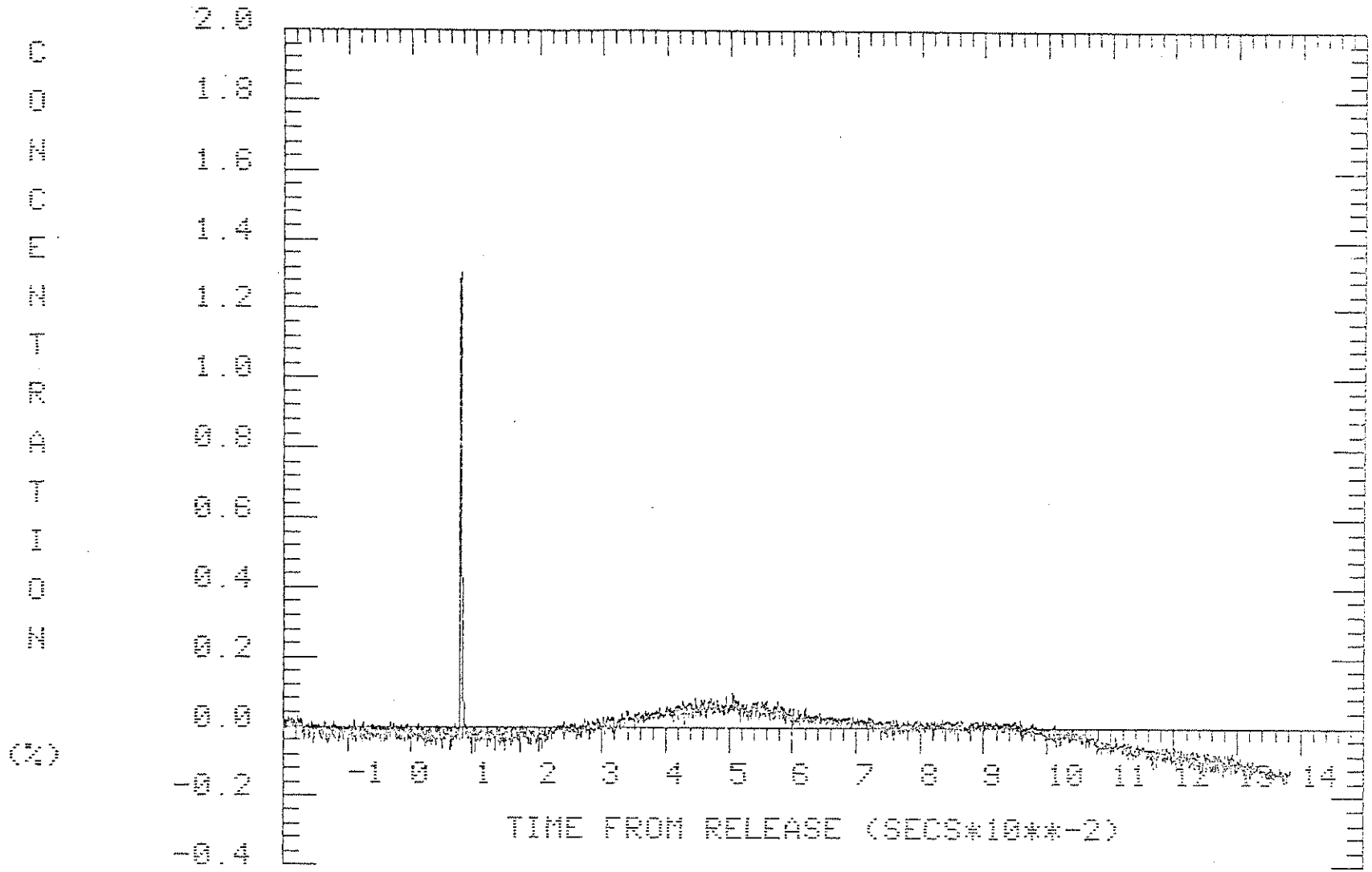
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



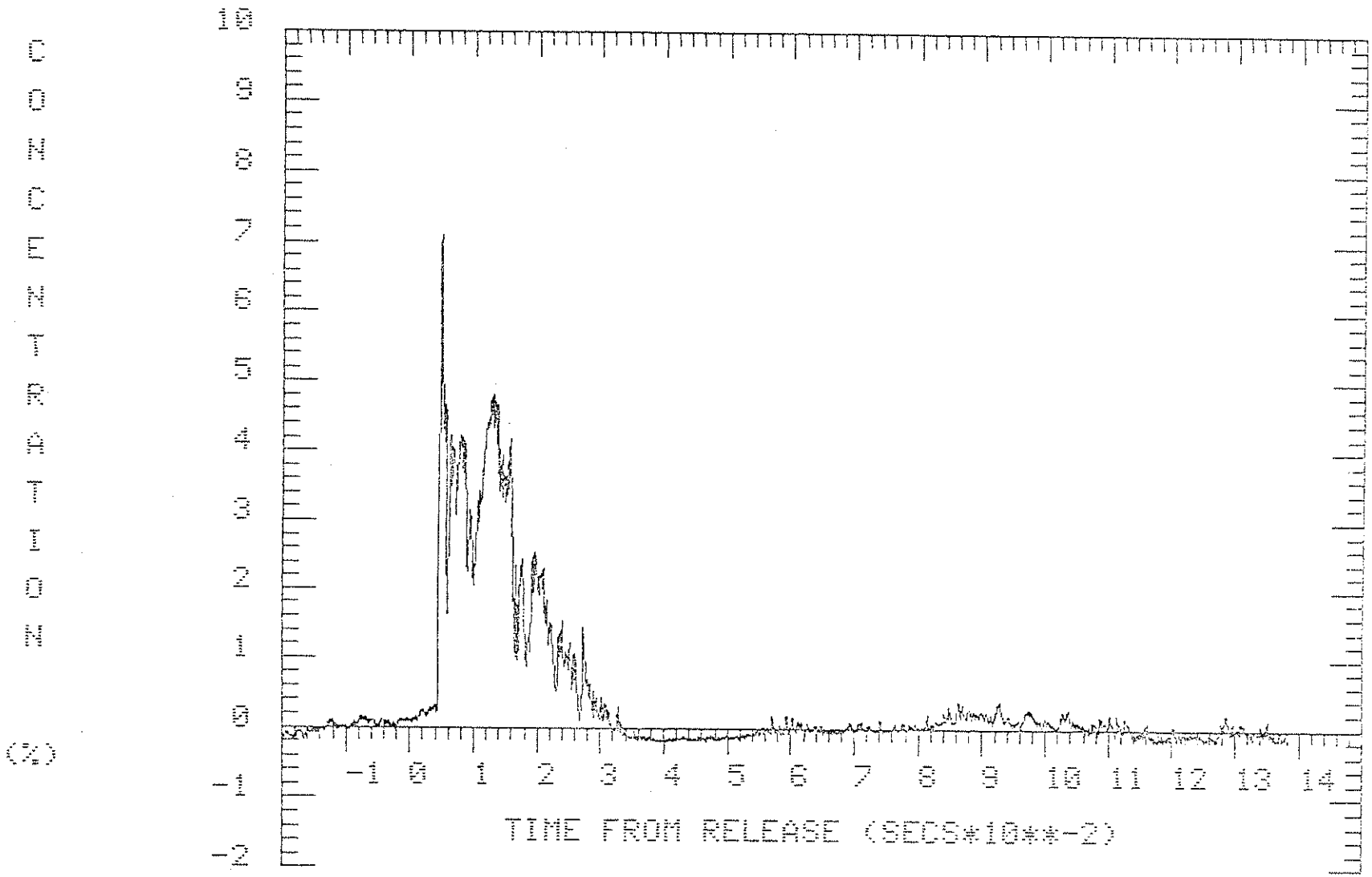
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



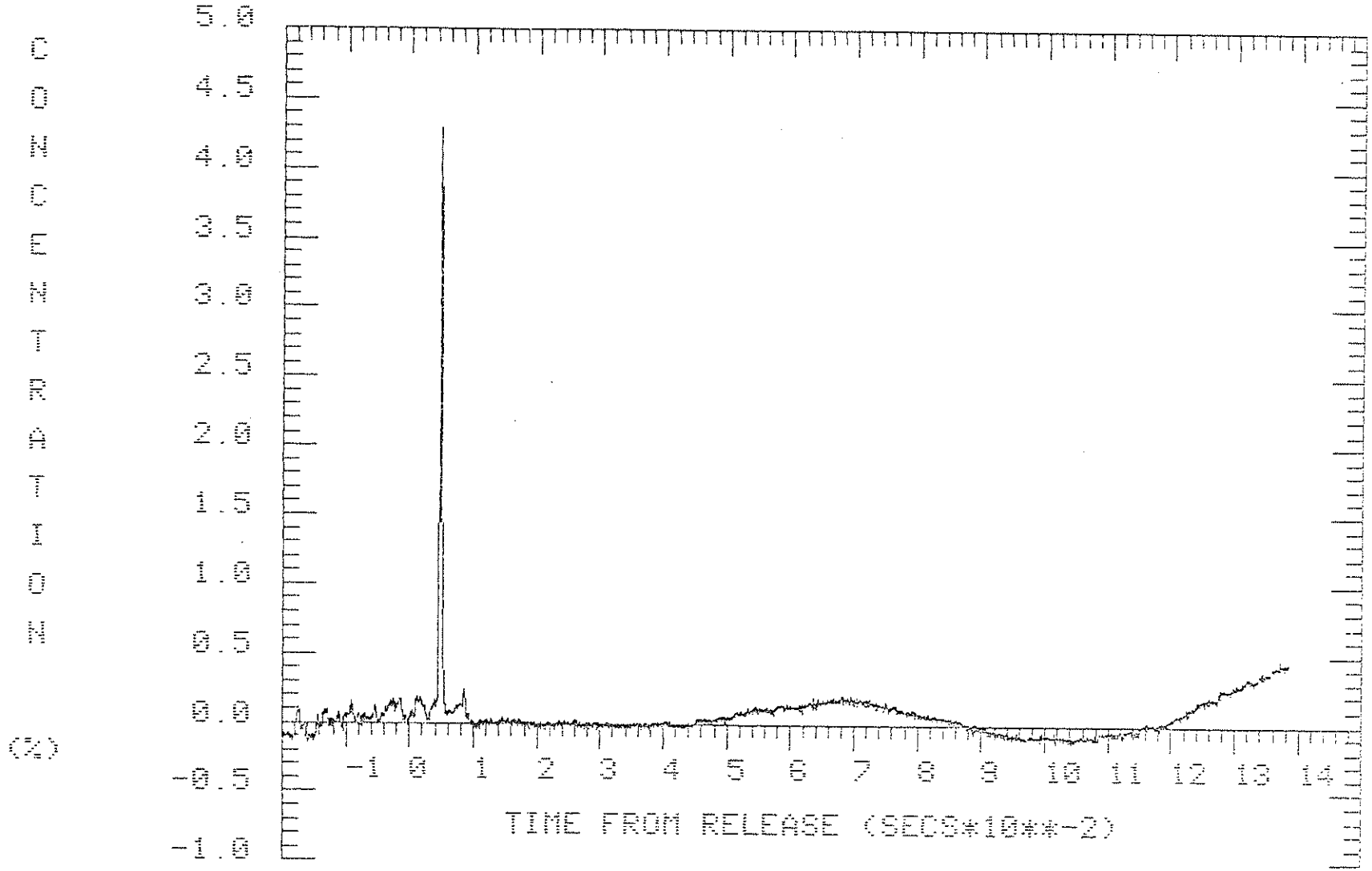
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



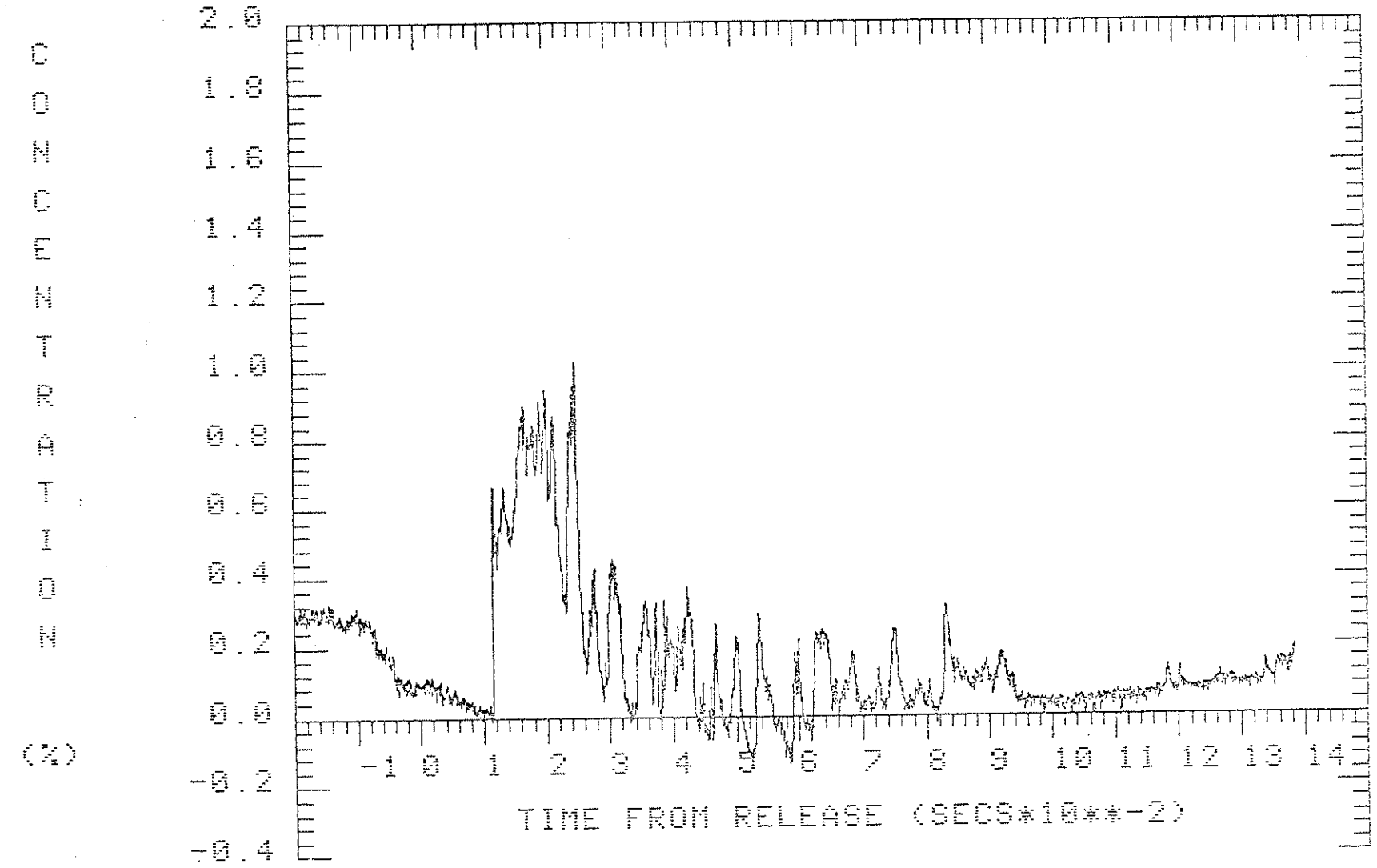
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

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



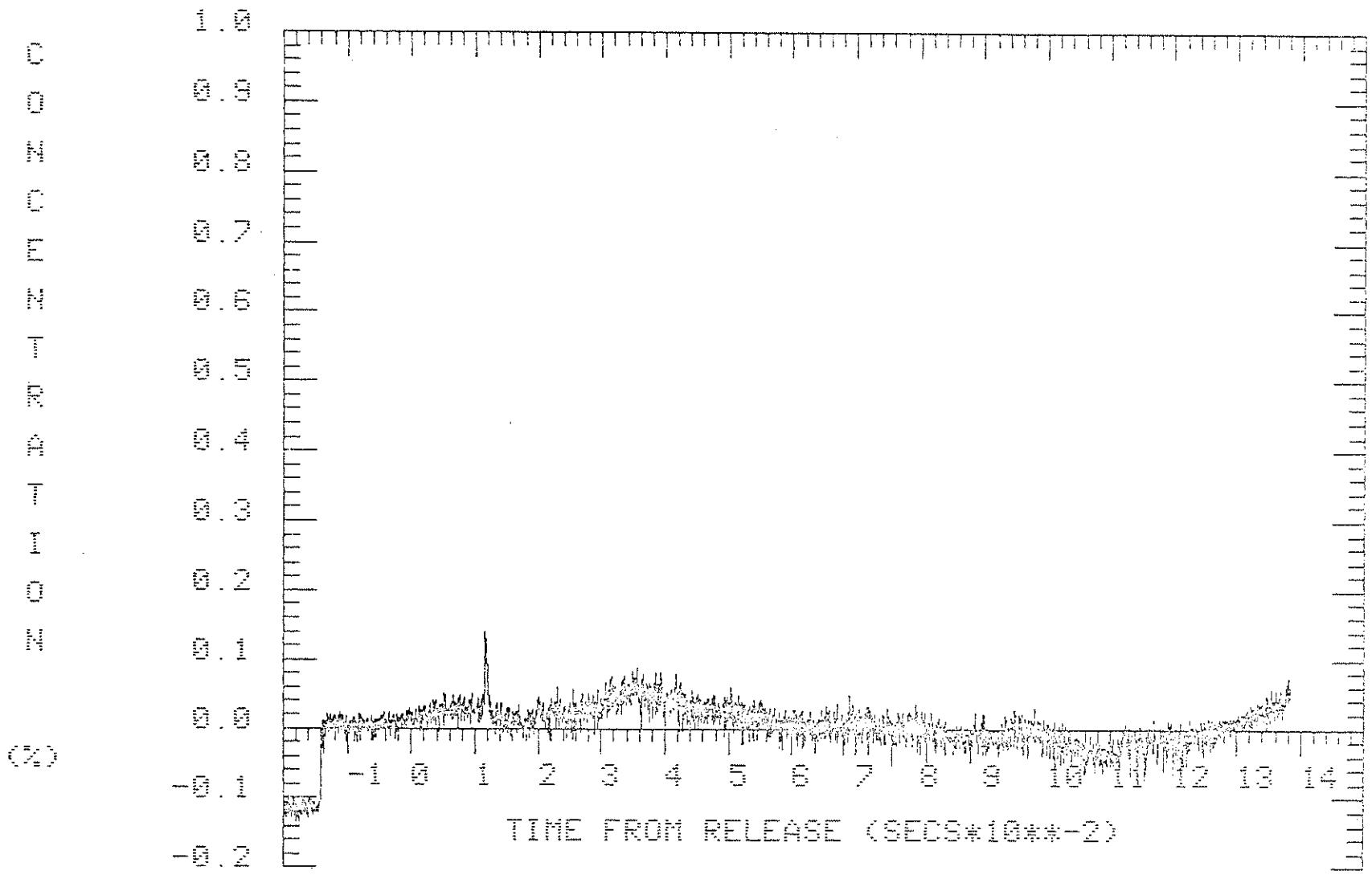
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



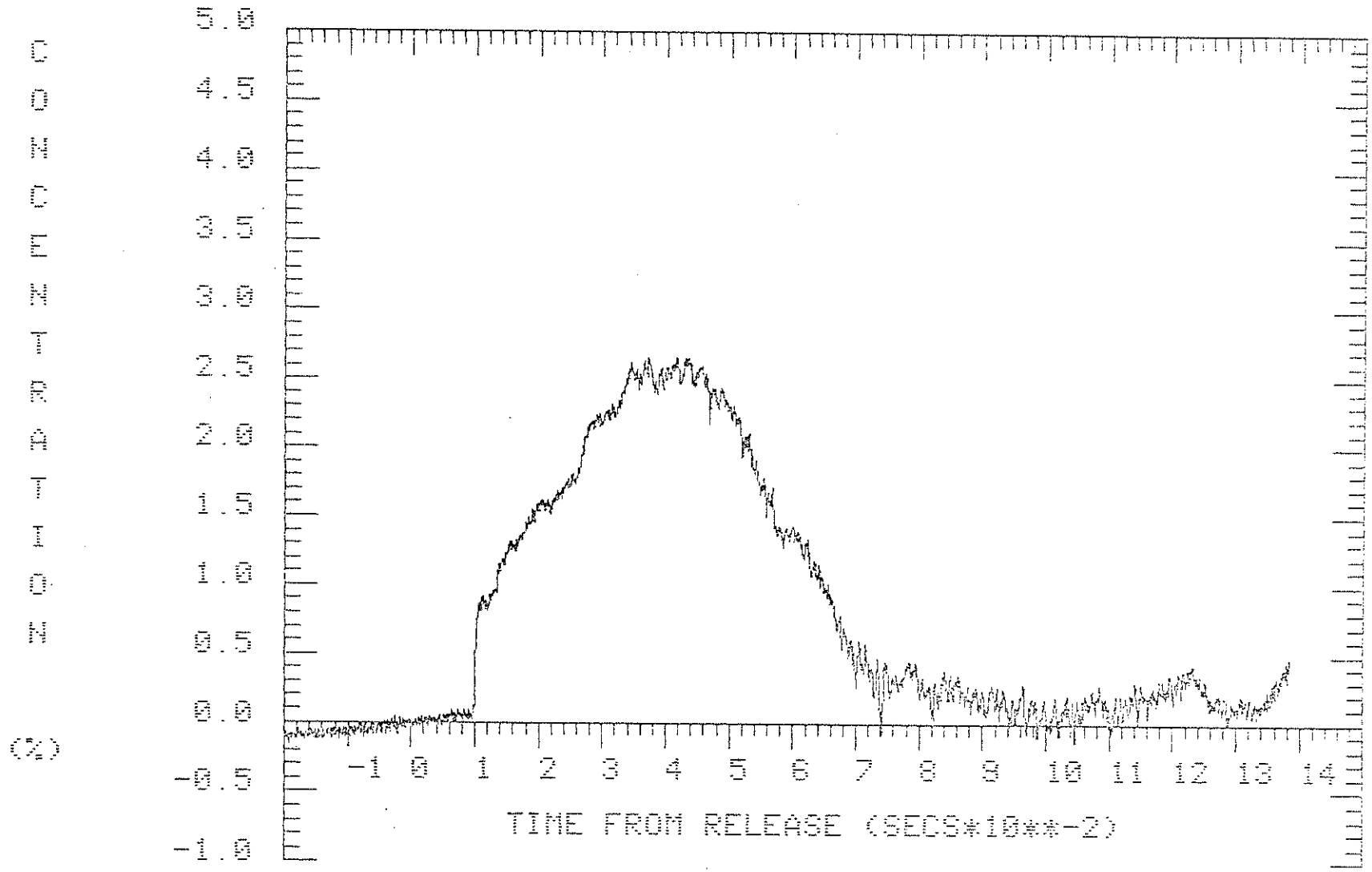
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



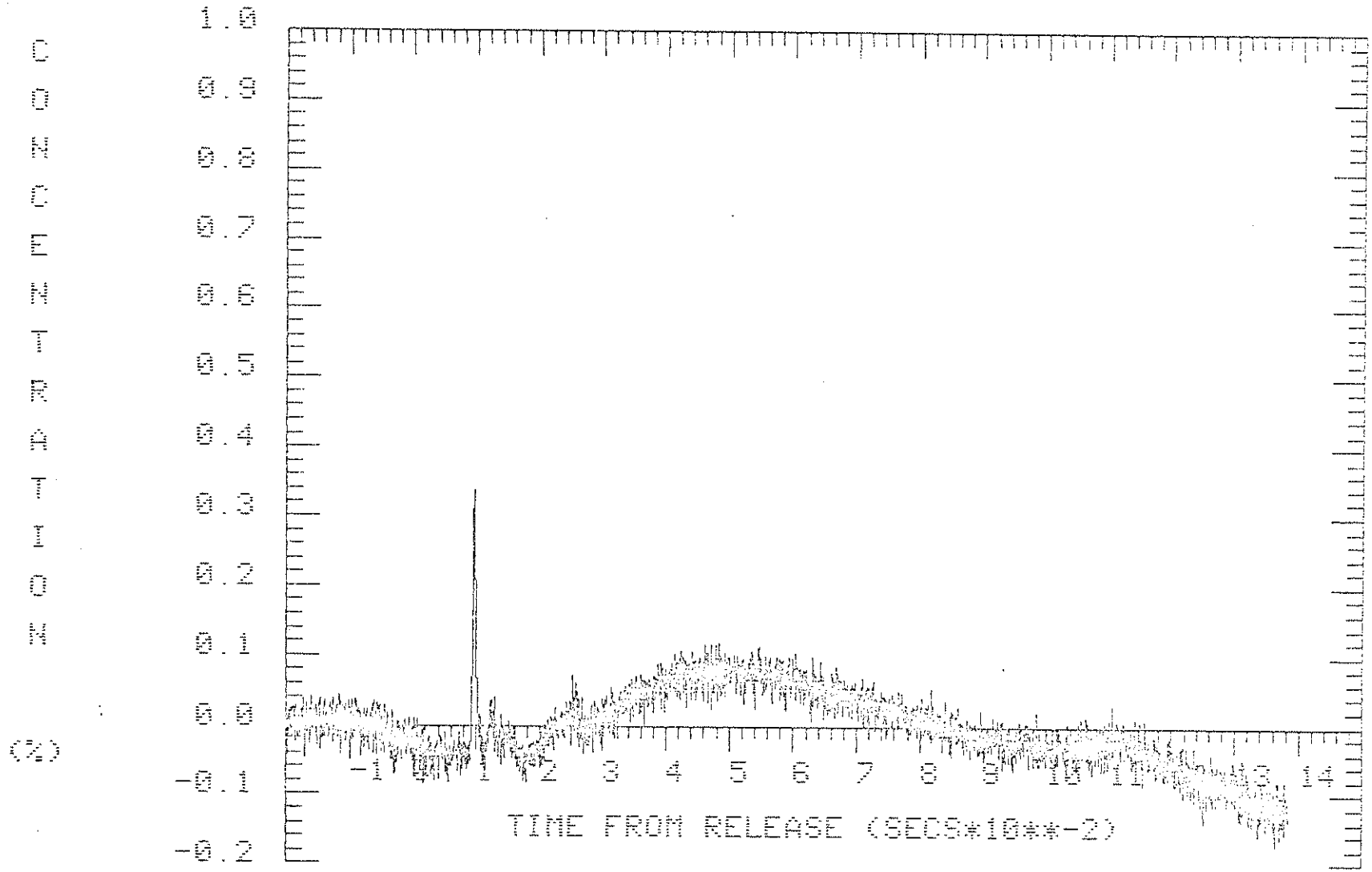
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



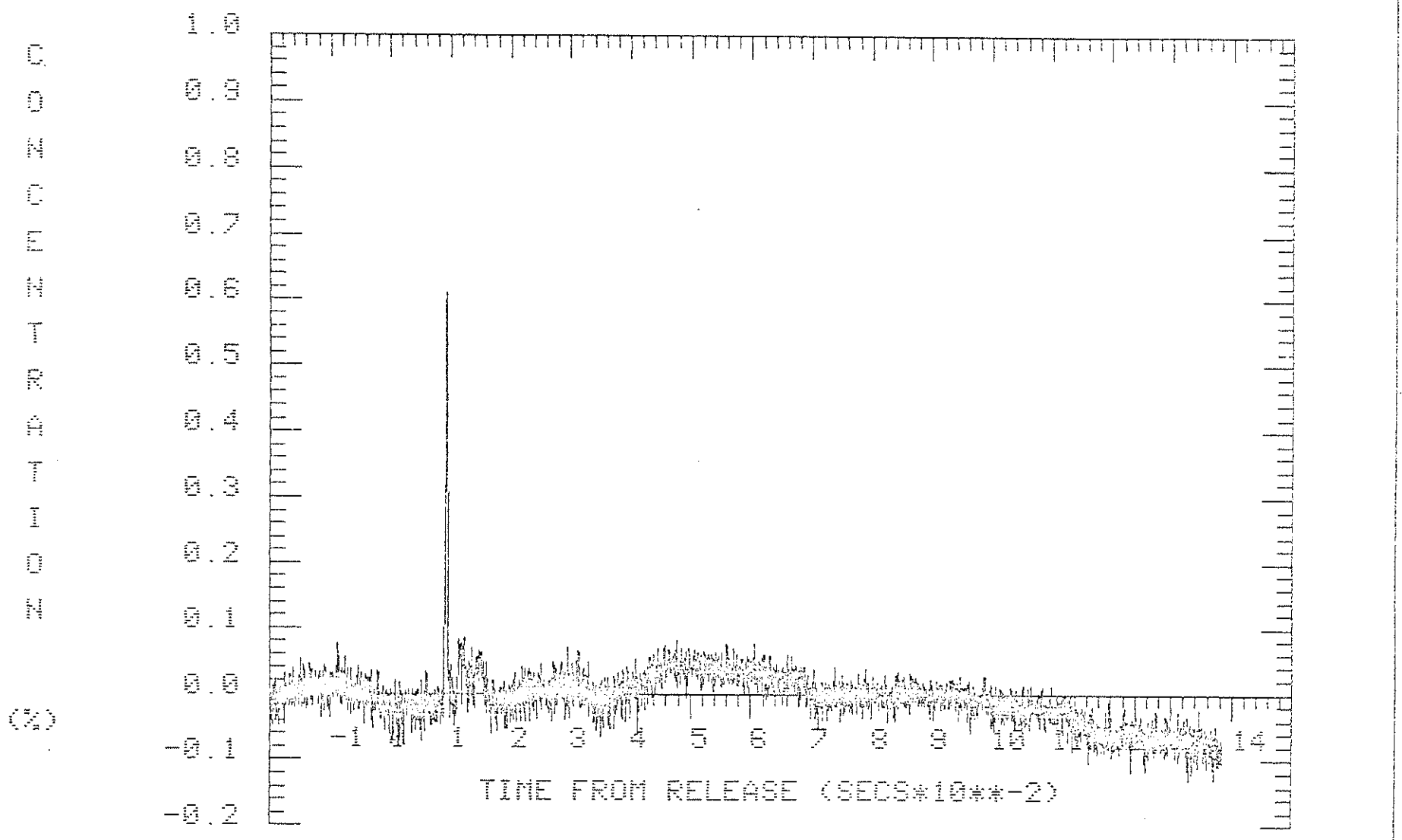
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 300 M Y: 350 M Z: 0.4 M



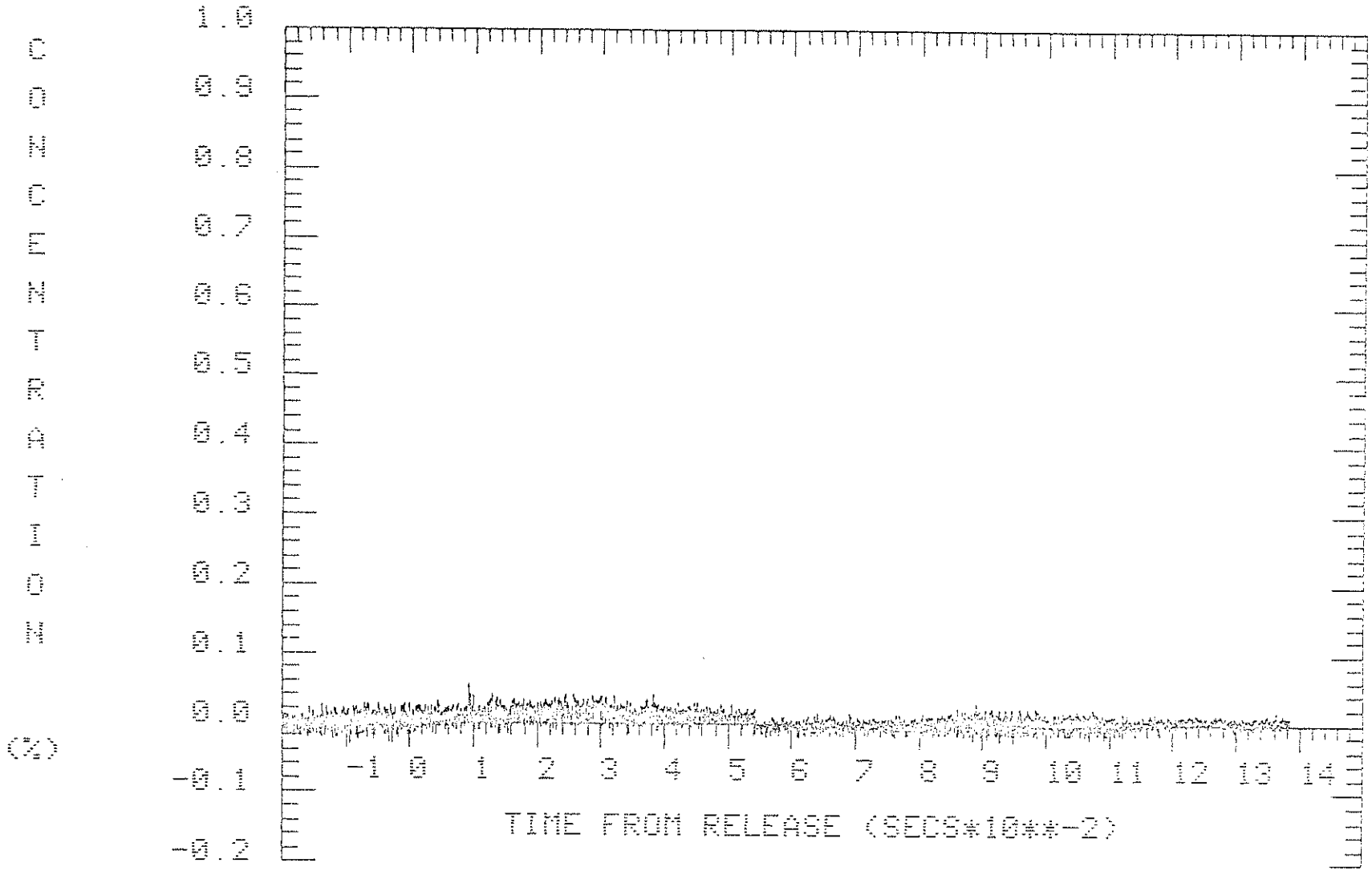
TRIAL: 009 TYPE: HGAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 350 M Z: 2.0 M



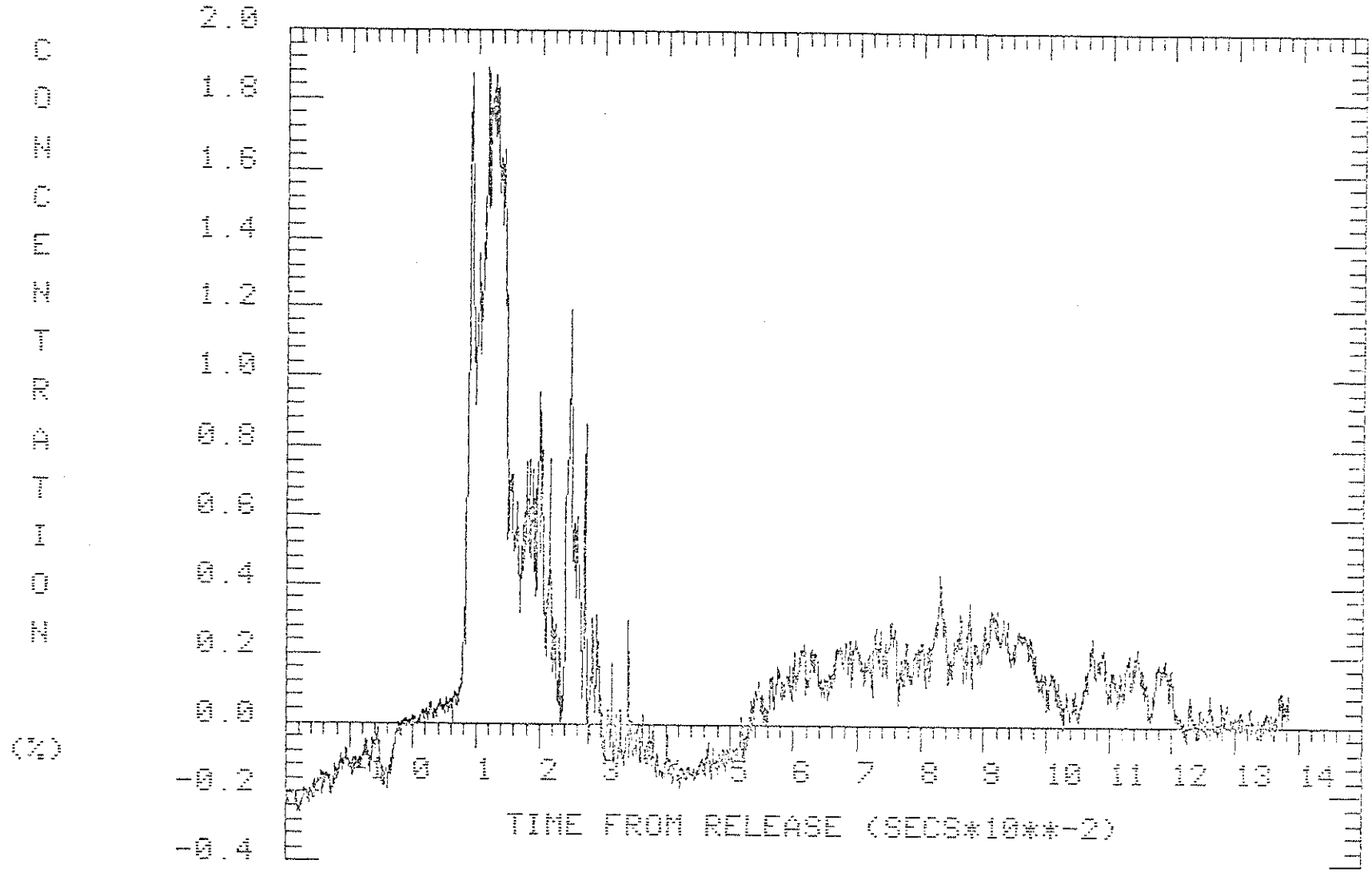
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 350 M Z: 2.4 M



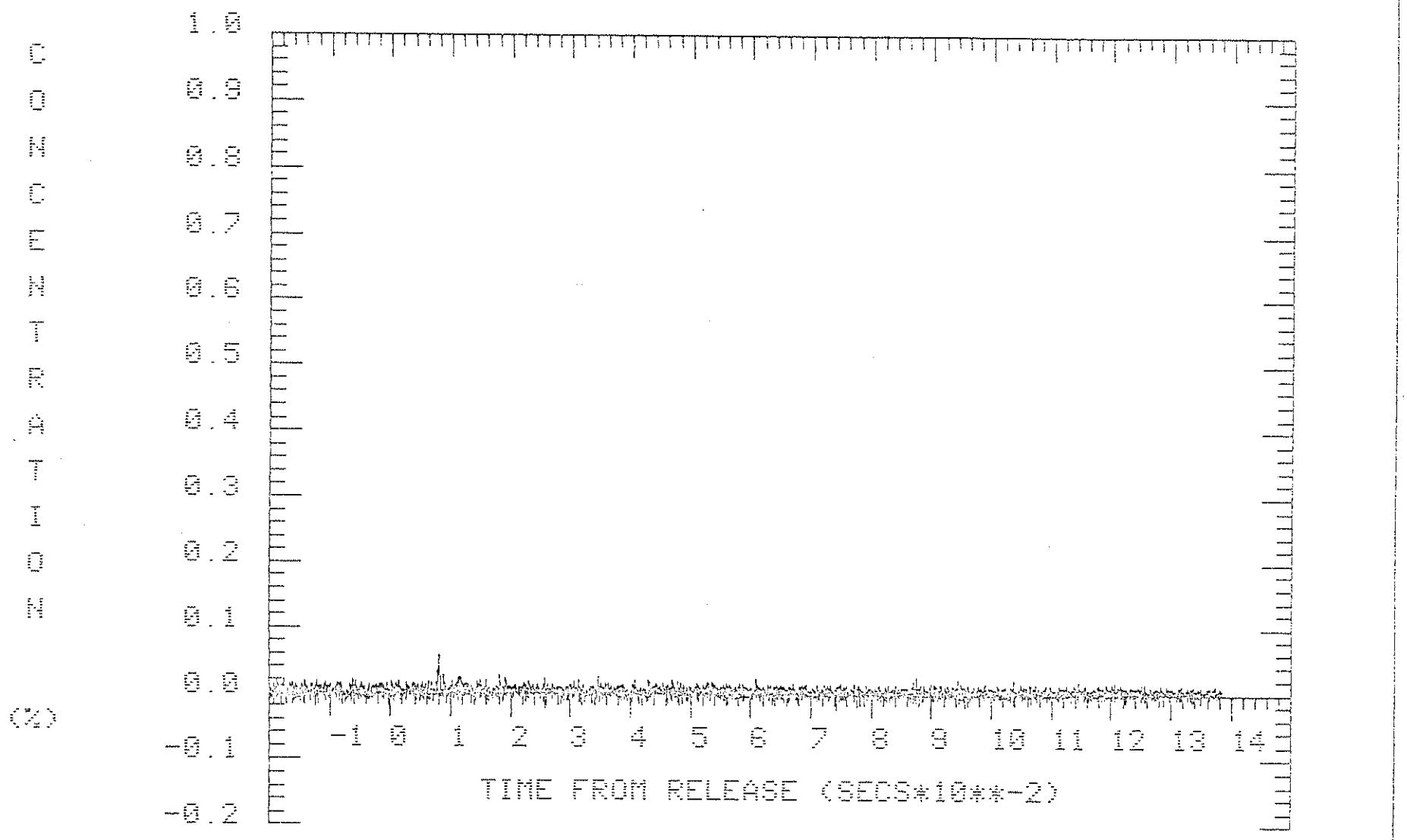
TRIAL: 009 TYPE: SMOK AVERAGING TIME: 0.5 SECS

X: 300 M Y: 350 M Z: 5.0 M



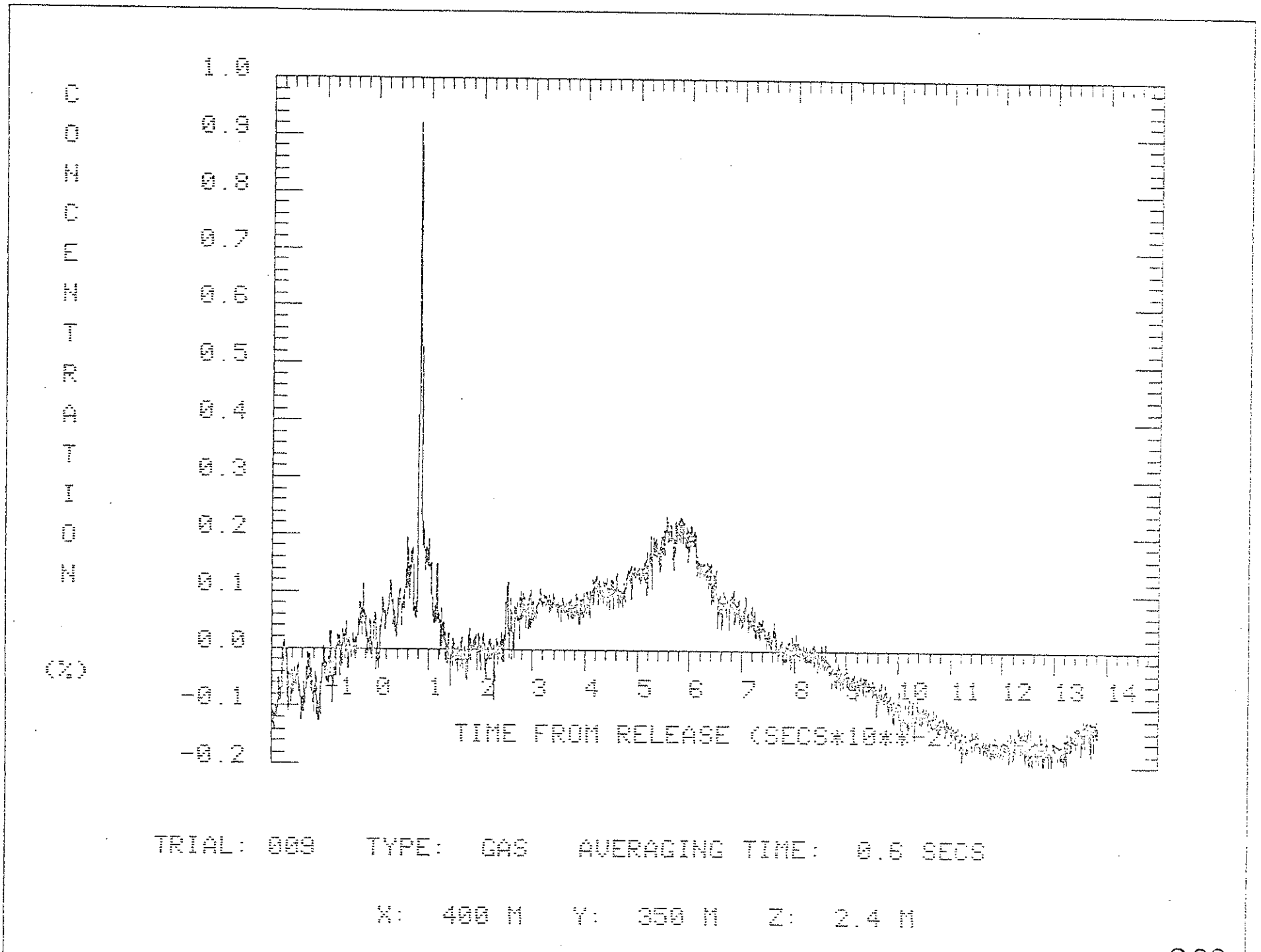
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

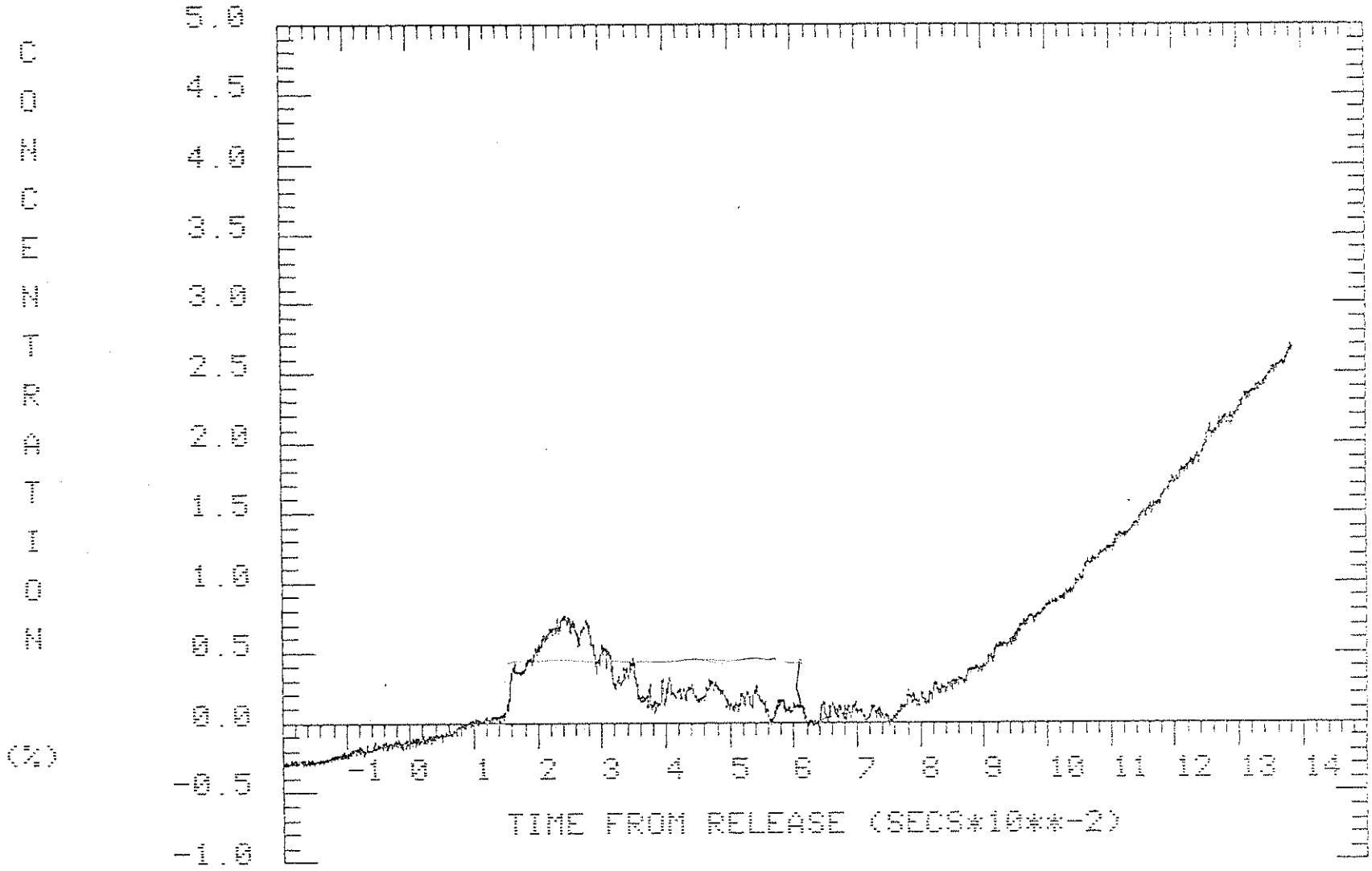
X: 400 M Y: 350 M Z: 0.4 M



TRIAL: 009 TYPE: SMOK AVERAGING TIME: 0.6 SECS

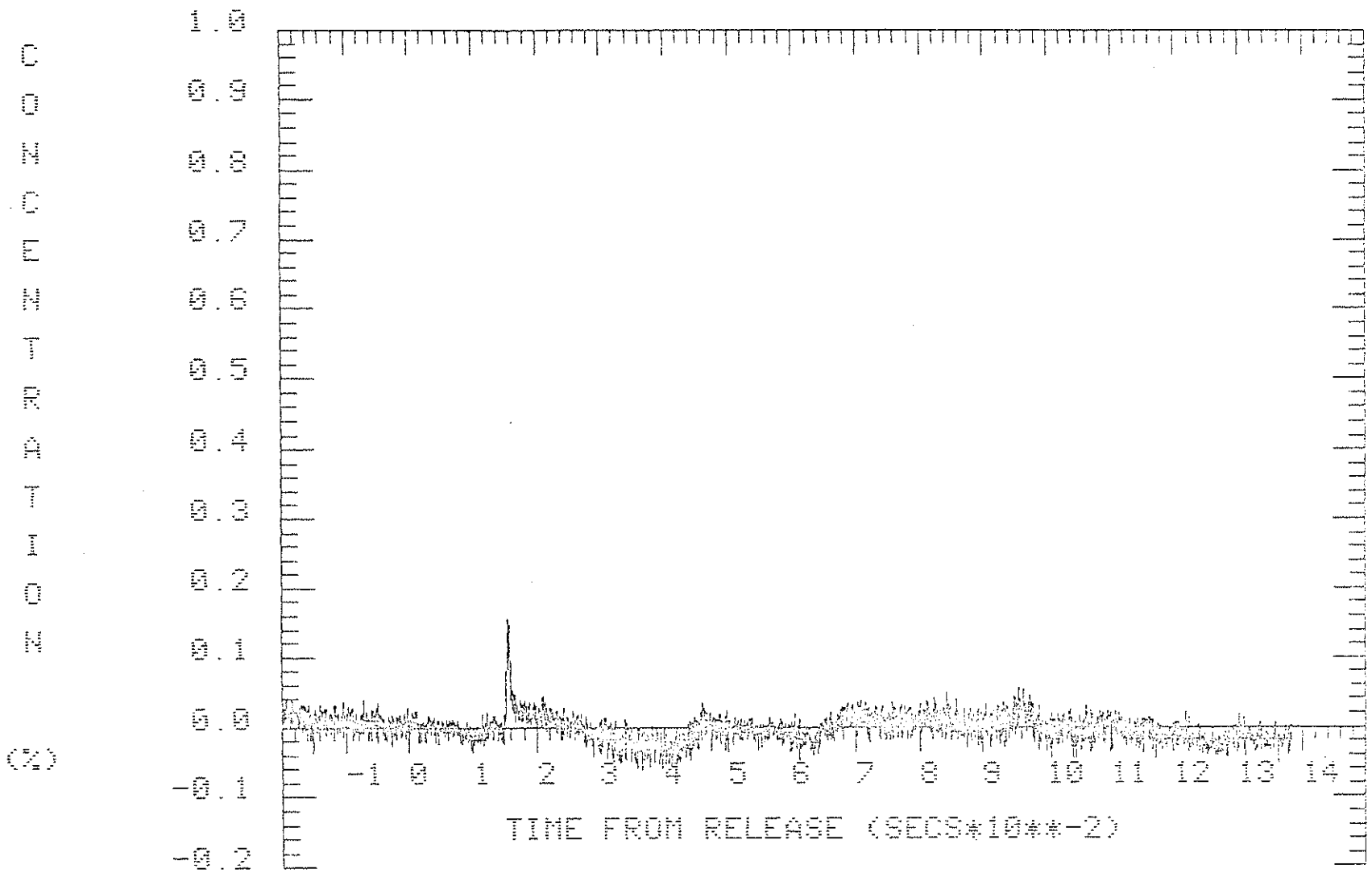
X: 400 M Y: 350 M Z: 2.0 M


CONCENTRATION (%)
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
1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
TIME FROM RELEASE (SECS*10**-2)
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS
X: 400 M Y: 350 M Z: 2.4 M



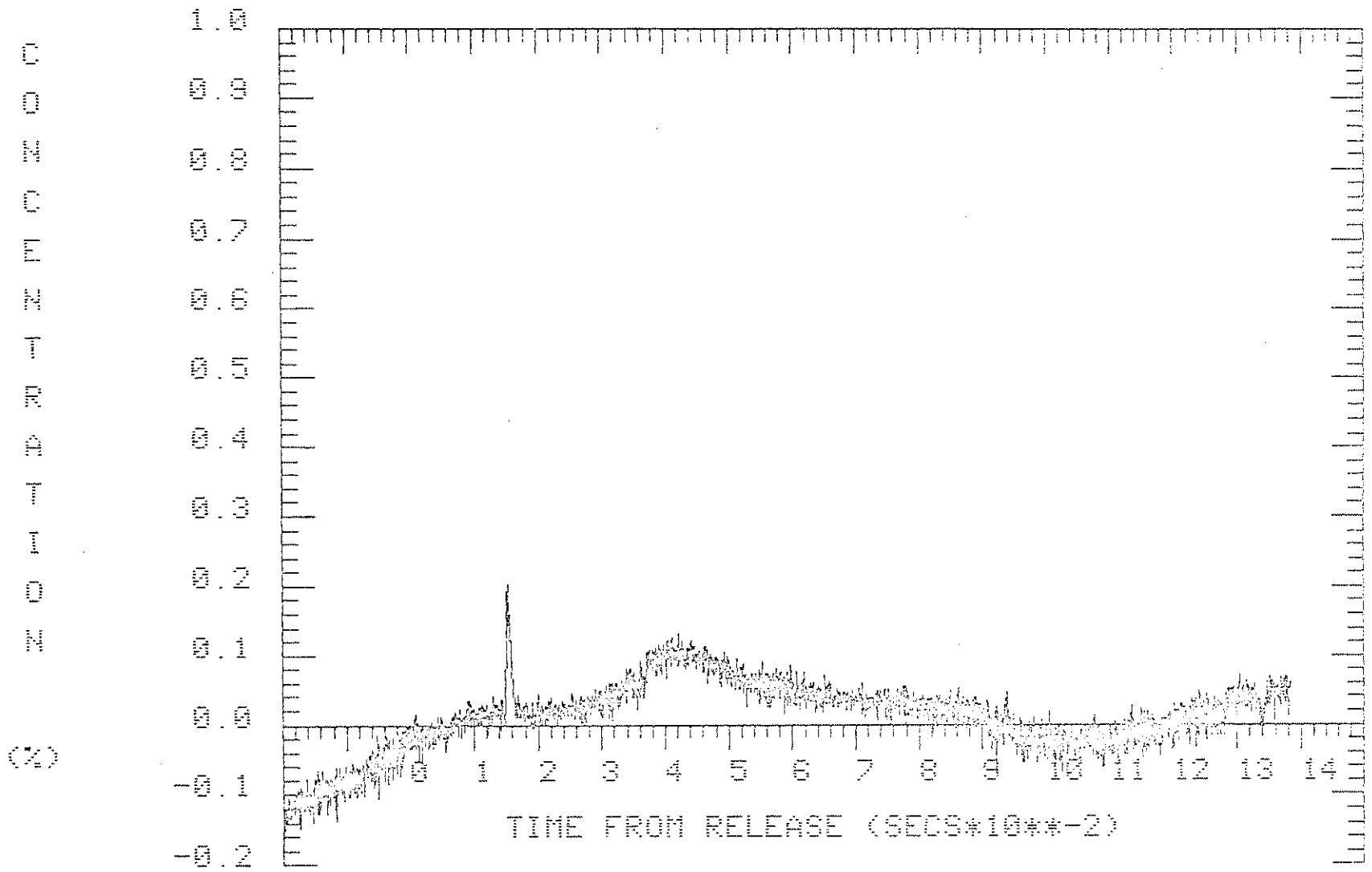
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 500 M Y: 350 M Z: 0.4 M



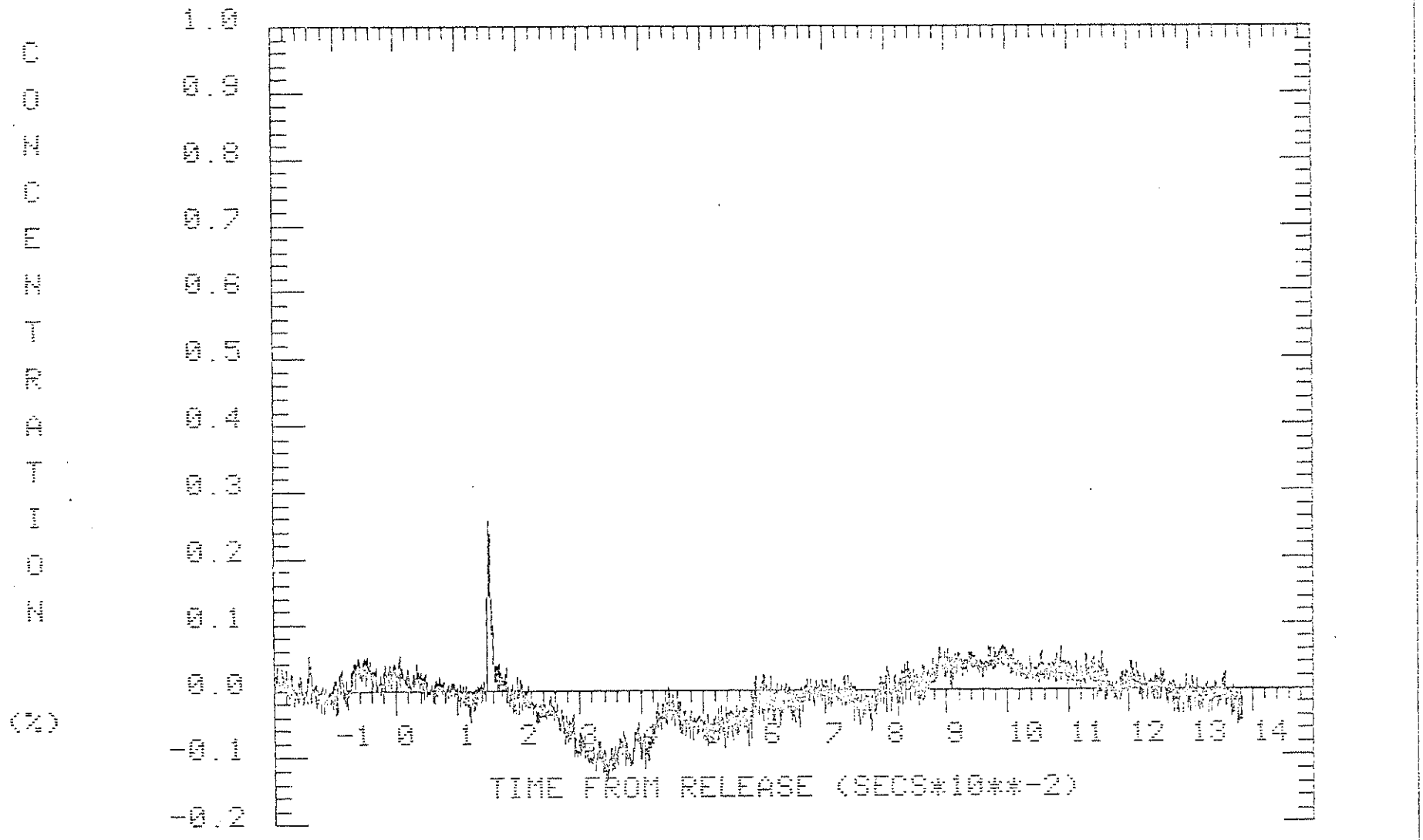
TRIAL: 009 TYPE: HGAS AVERAGING TIME: 0.6 SECS

X: 500 M Y: 350 M Z: 2.0 M



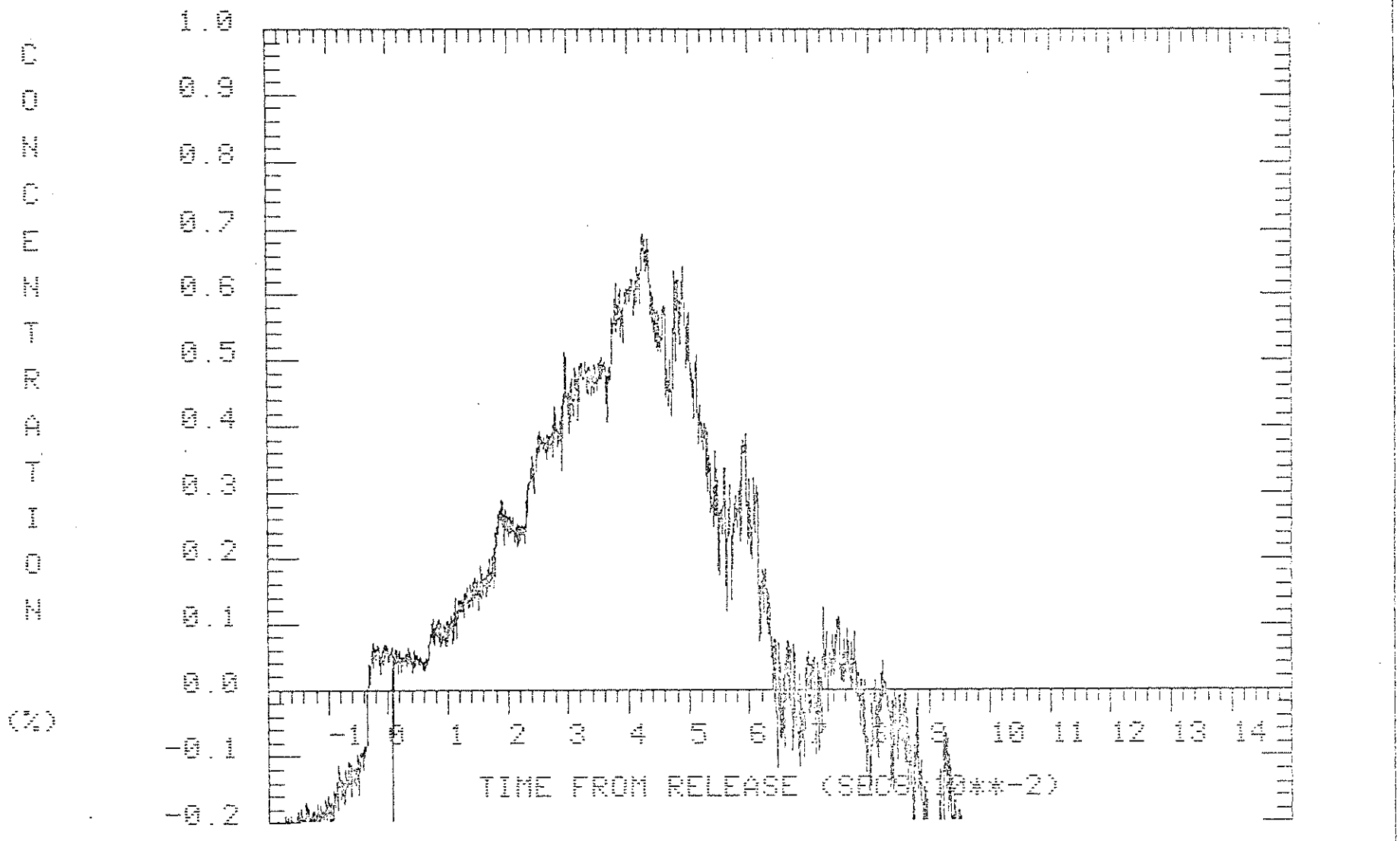
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 500 M Y: 350 M Z: 2.4 M



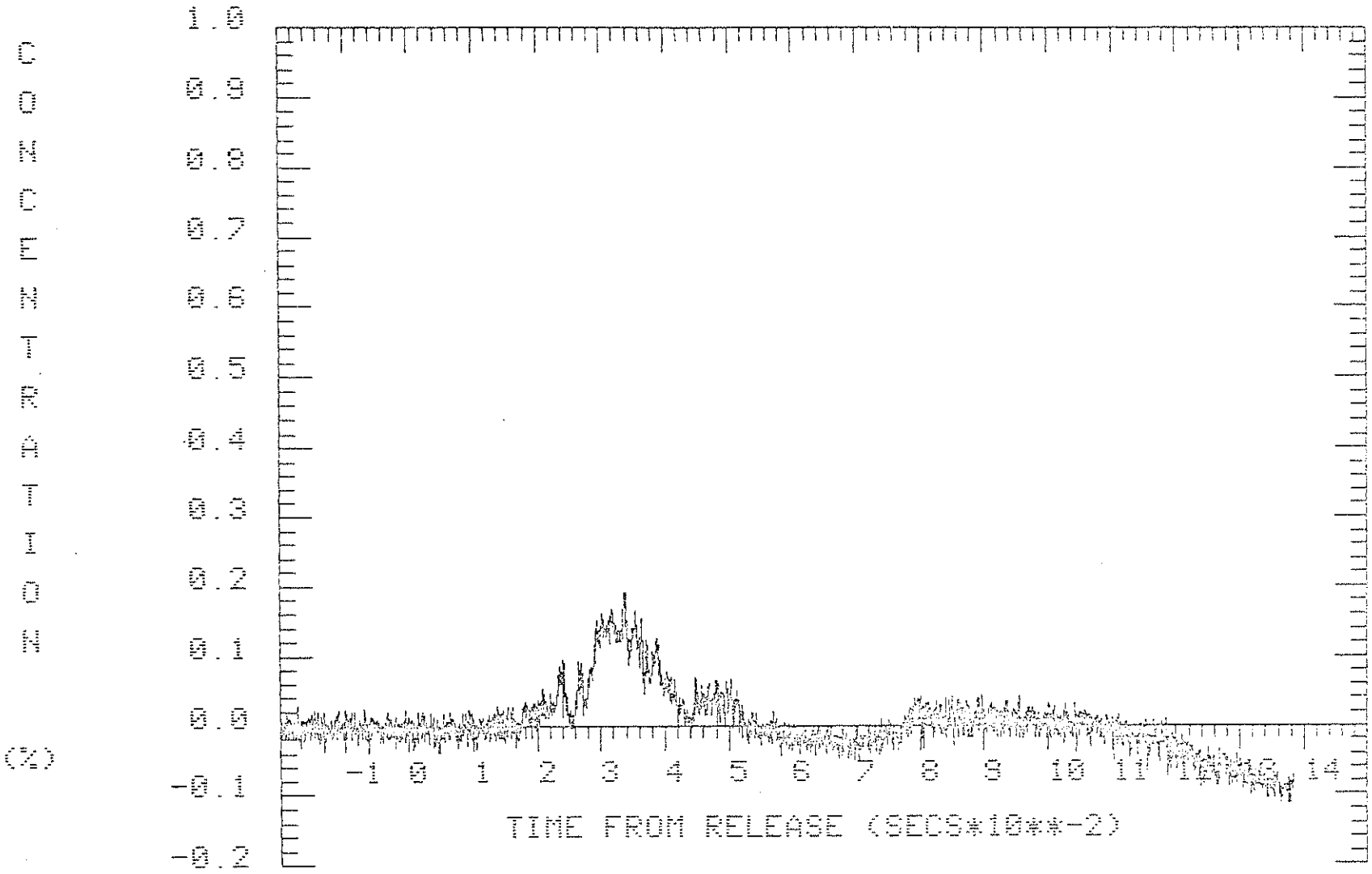
TRIAL: 009 TYPE: HGAS AVERAGING TIME: 0.6 SECS

X: 500 M Y: 350 M Z: 2.4 M



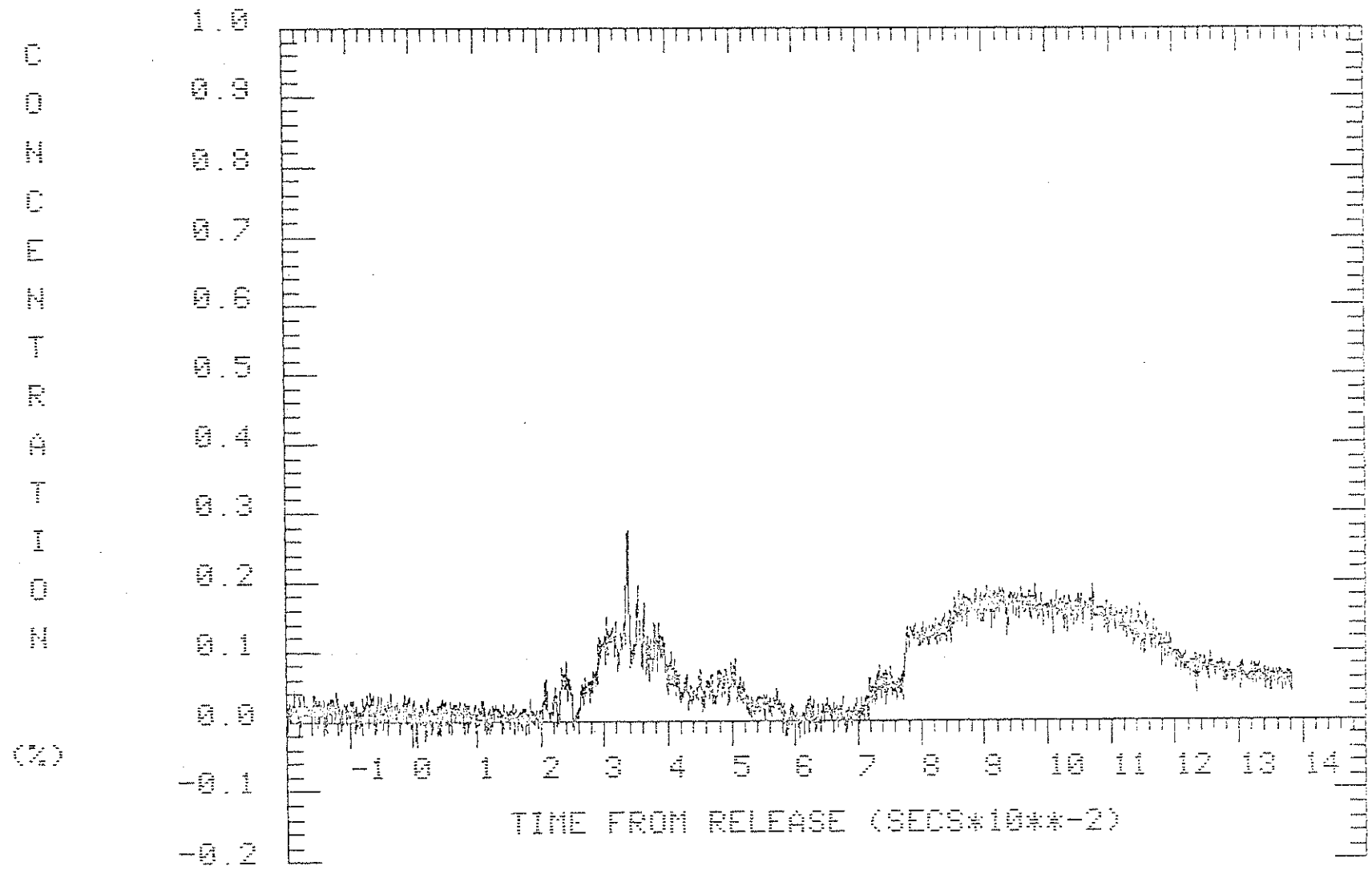
TRIAL: 008 TYPE: GAS AVERAGING TIME: 0.8 SECS

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



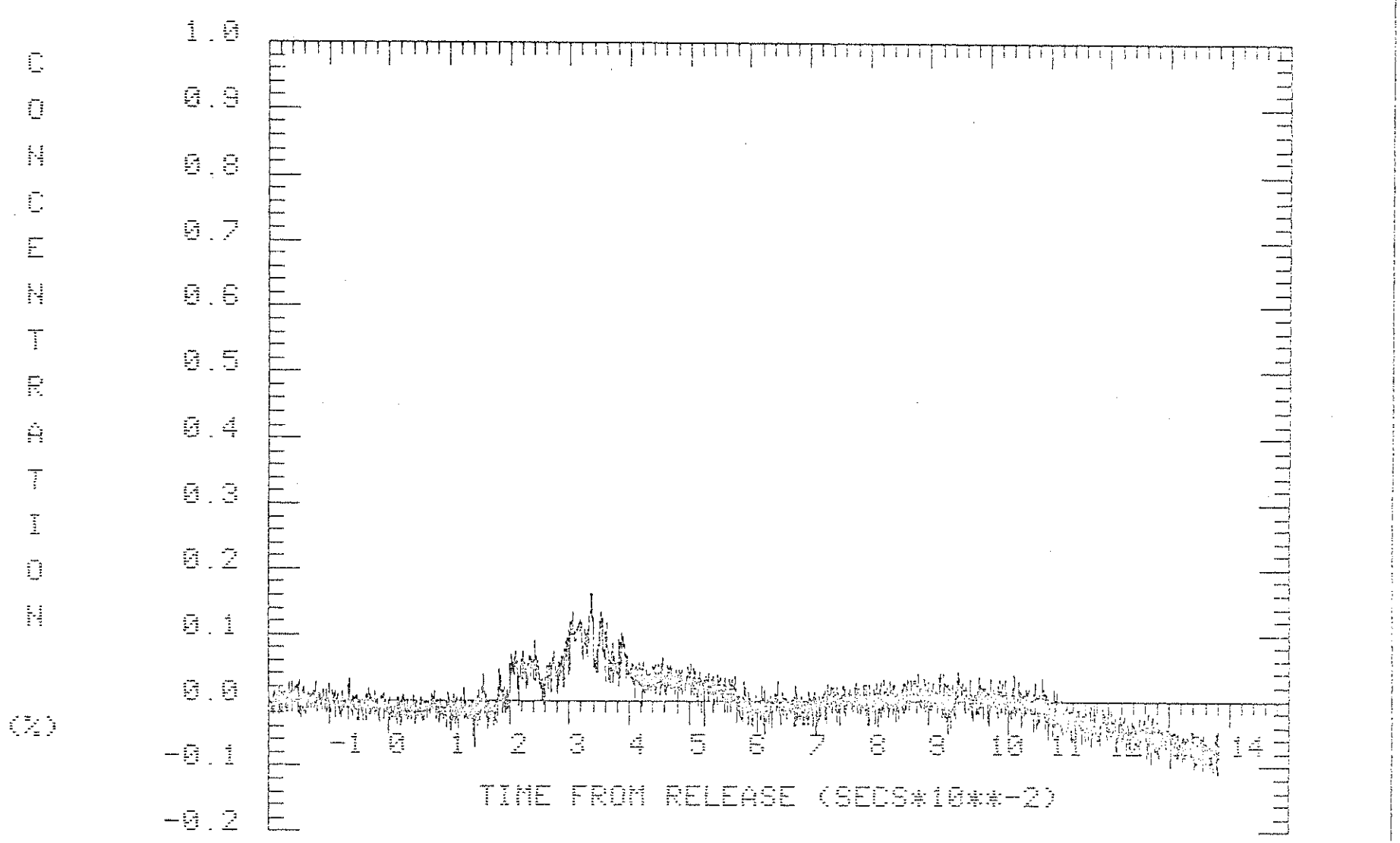
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 400 M Z: 2.4 M



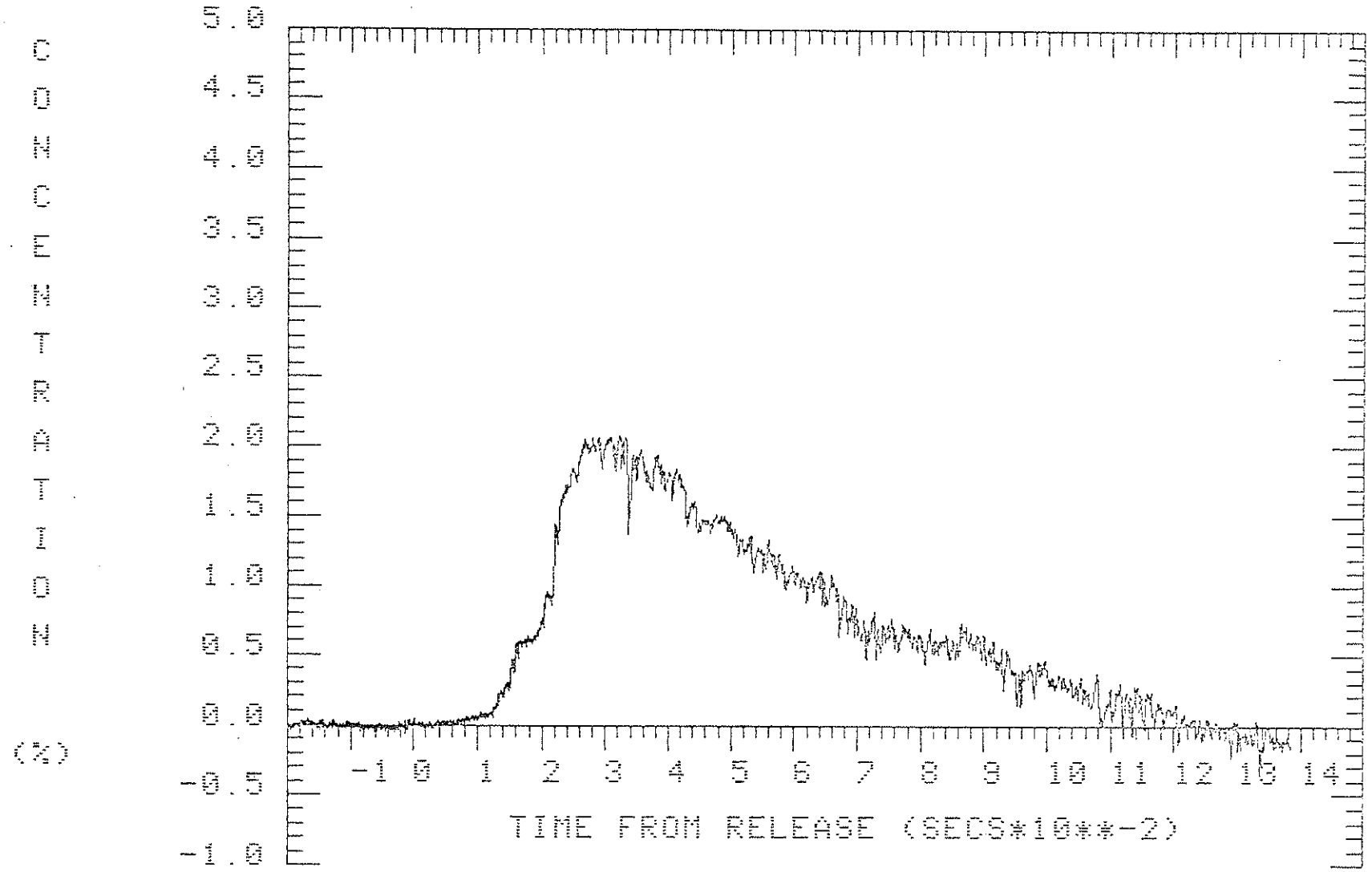
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 200 M Y: 400 M Z: 4.4 M



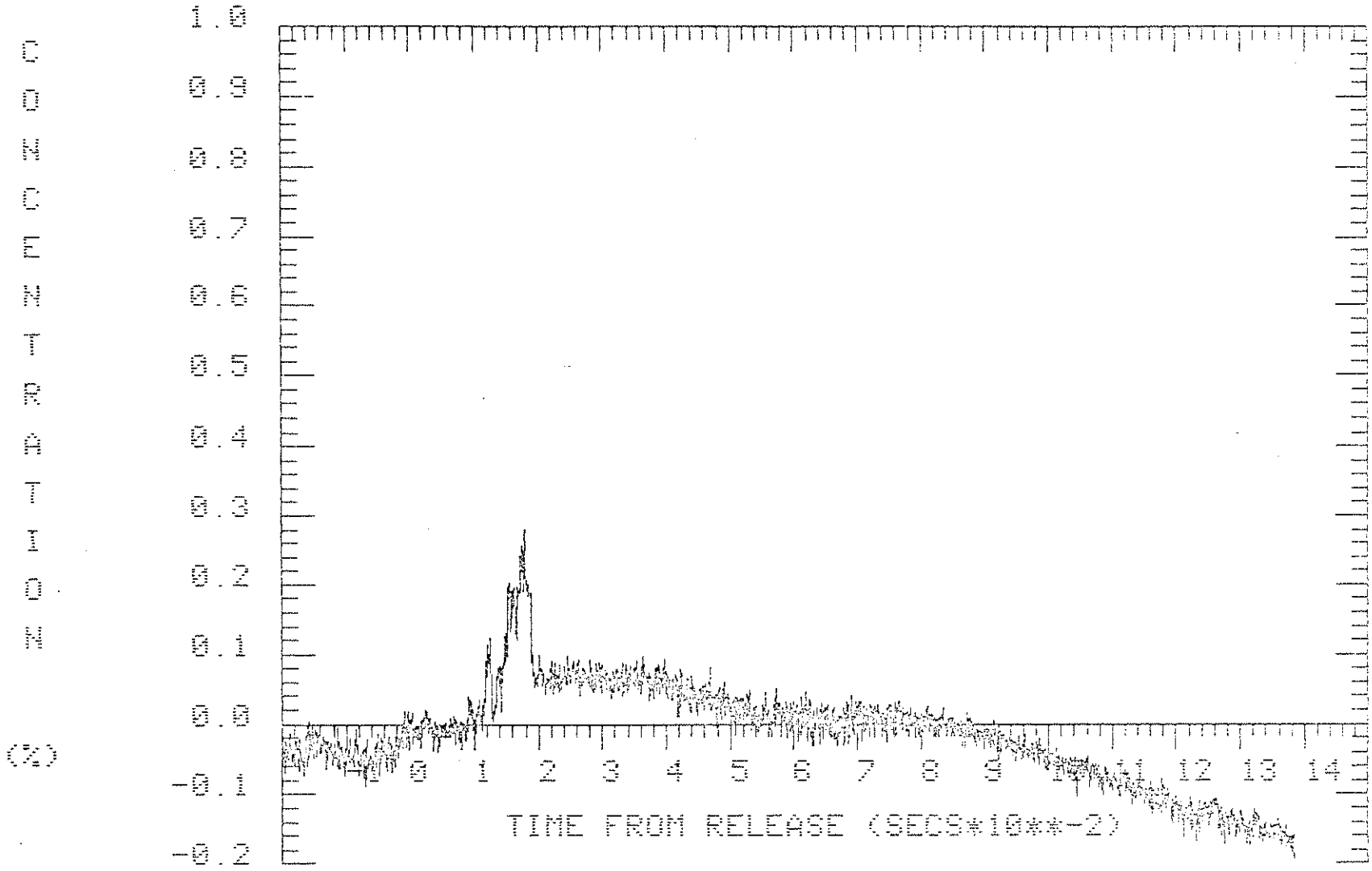
TRIAL: 809 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 400 M Z: 6.4 M



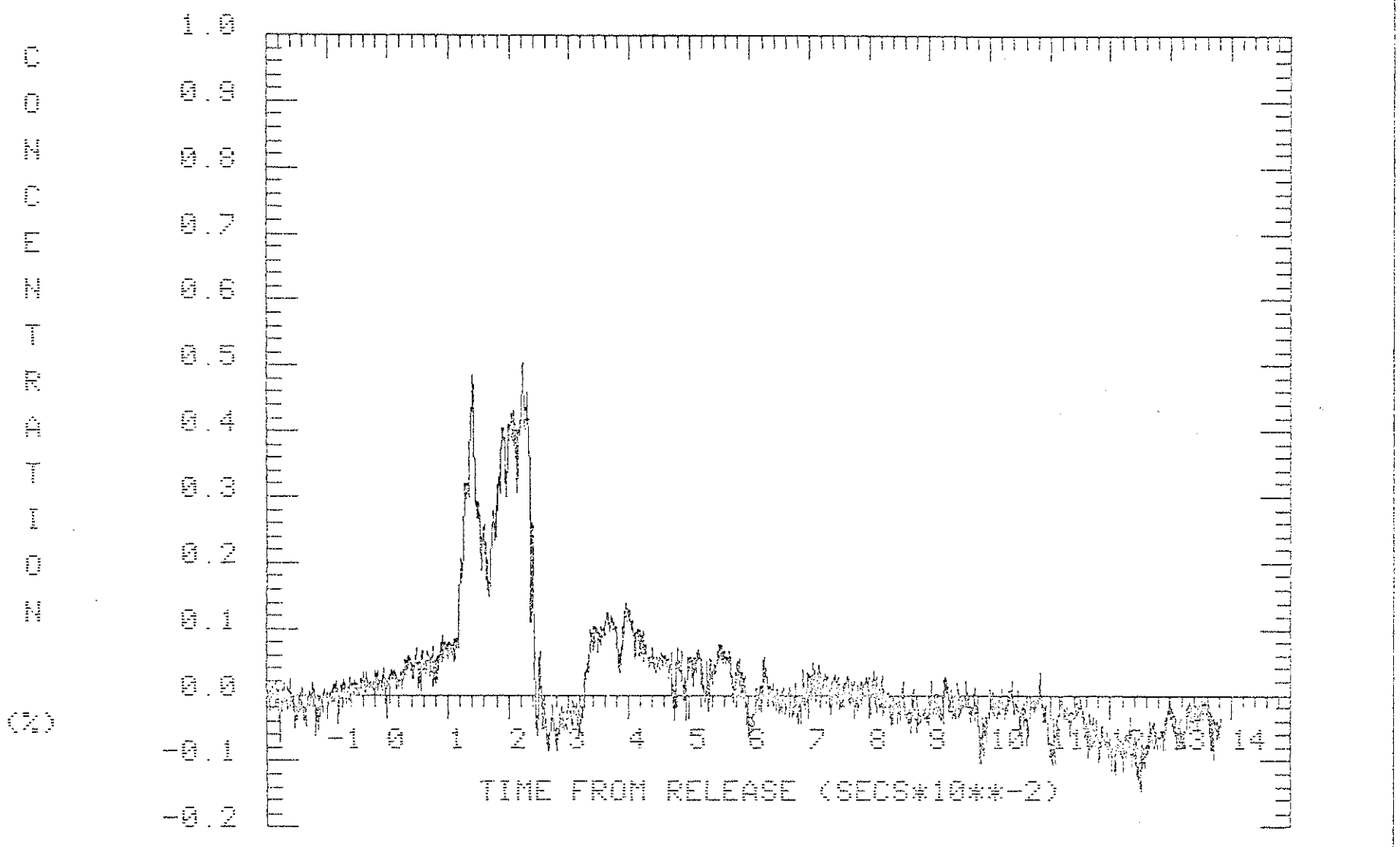
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



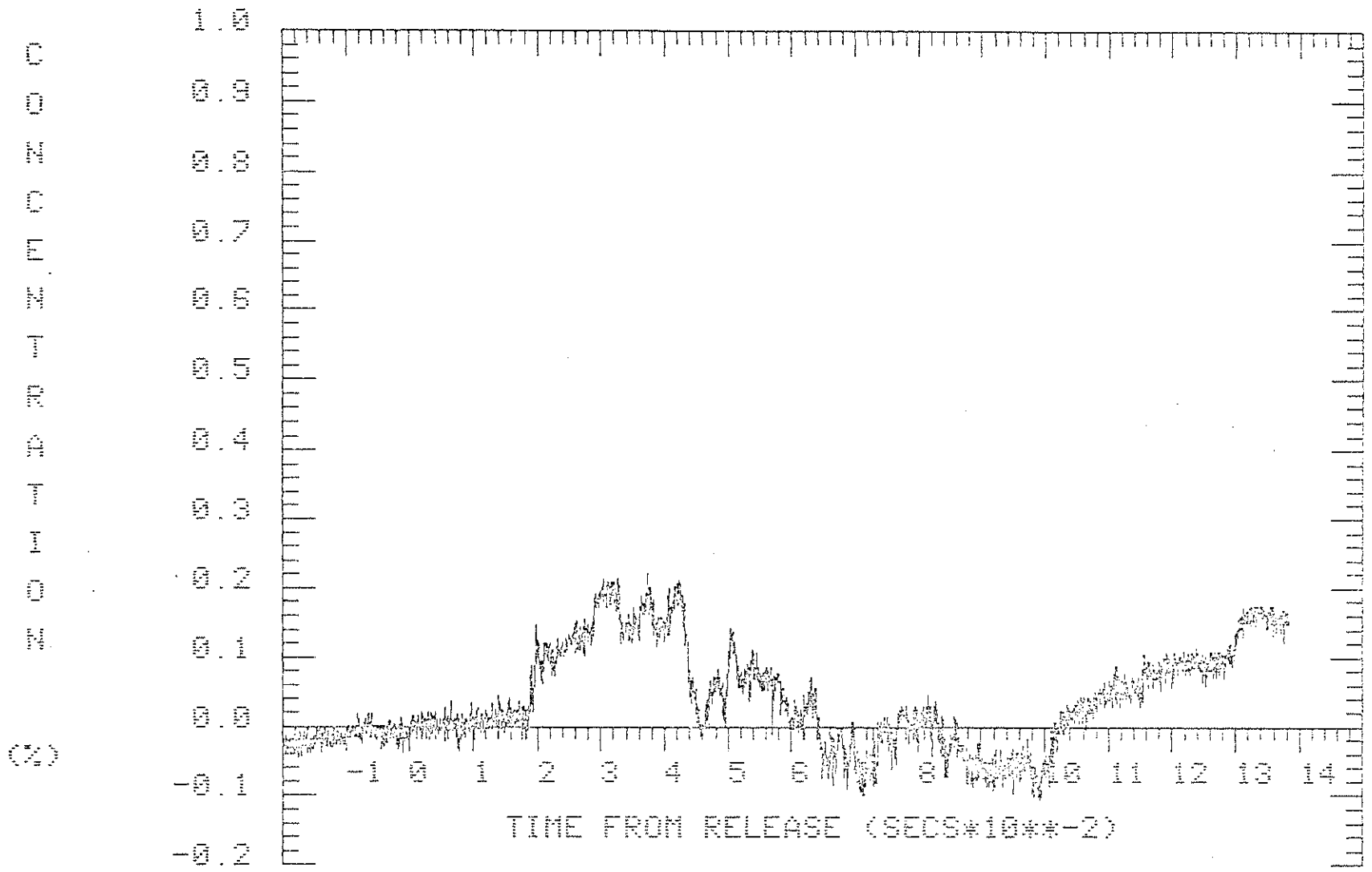
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



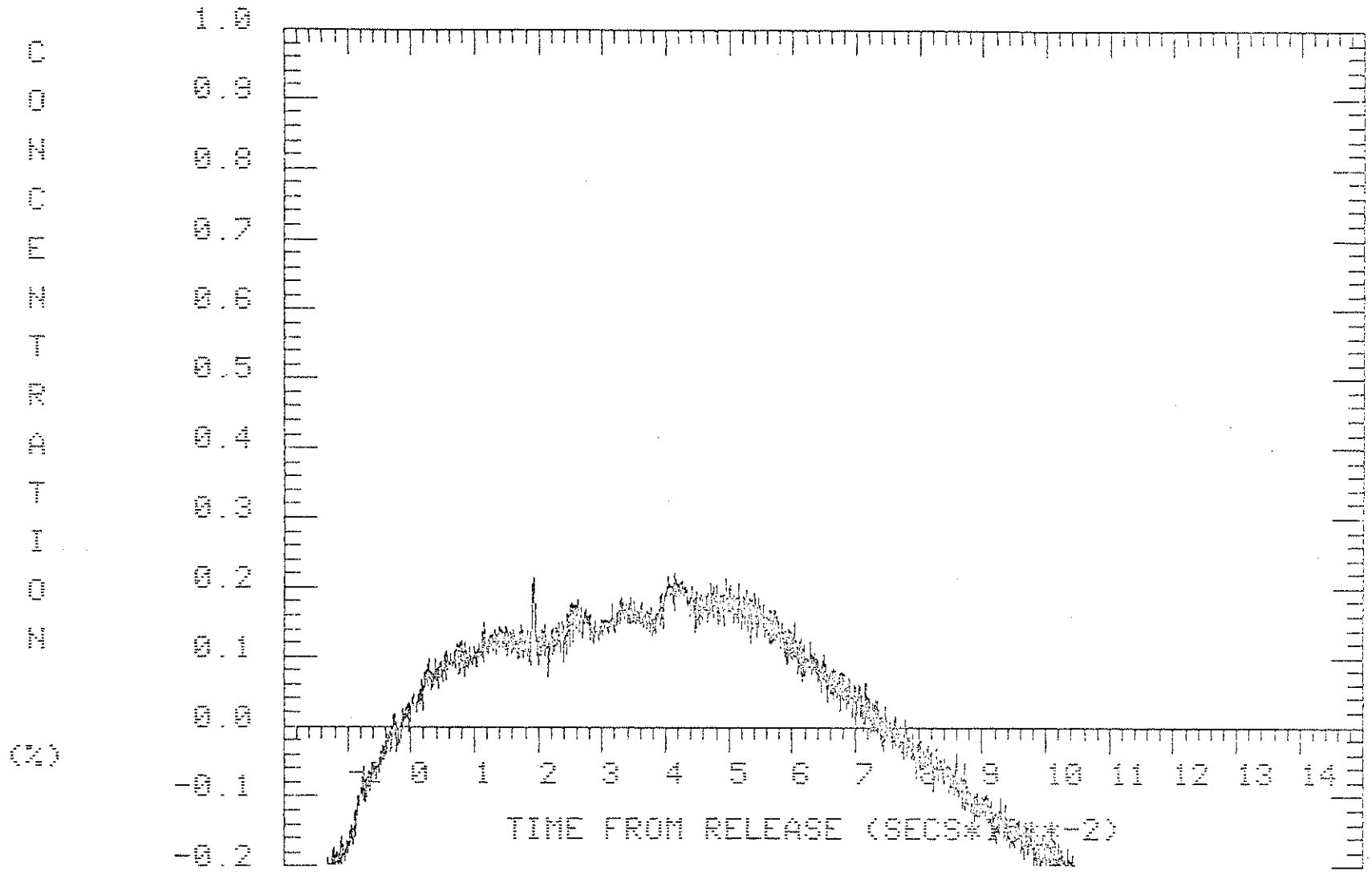
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.5 SECS

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



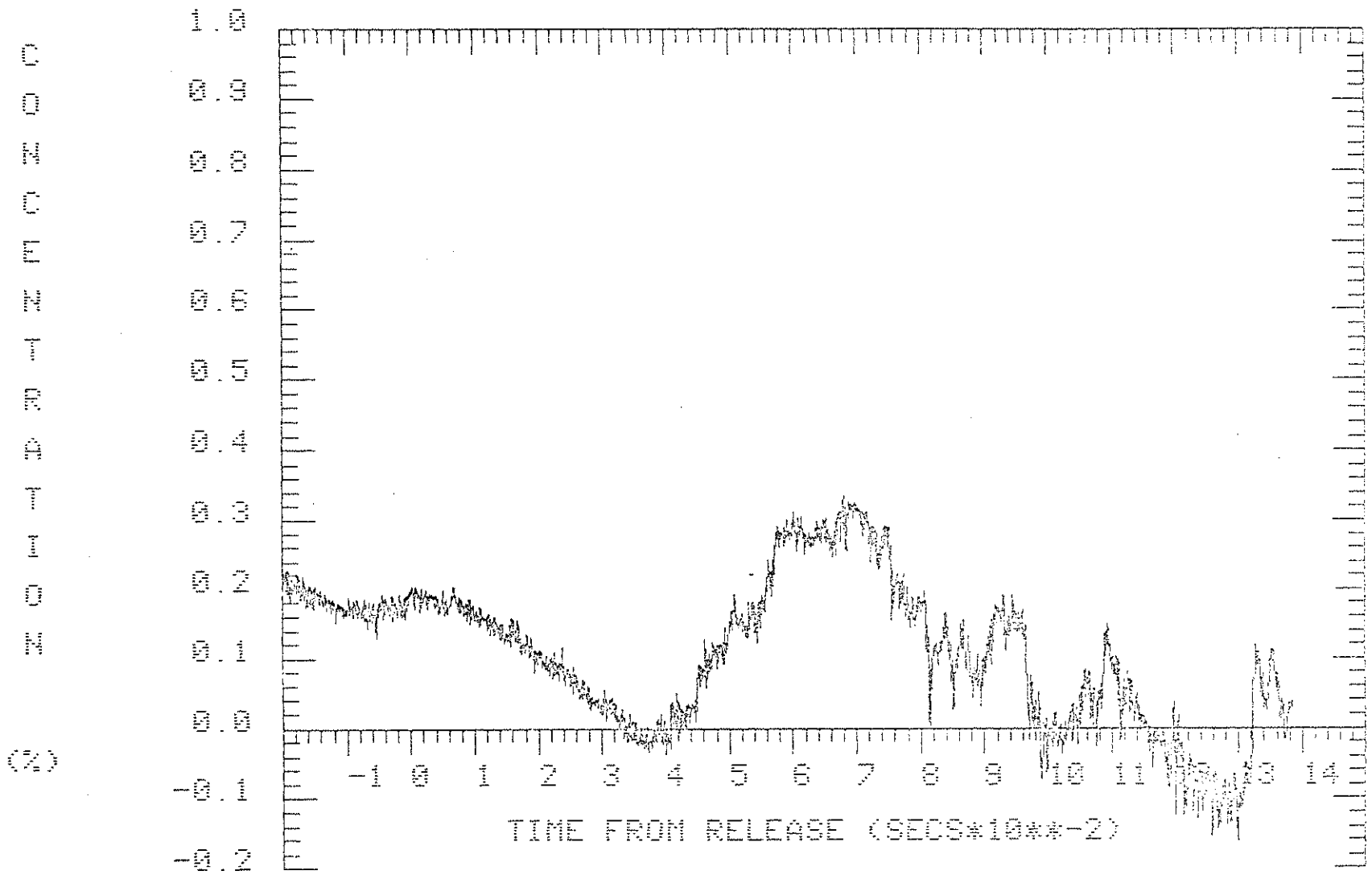
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



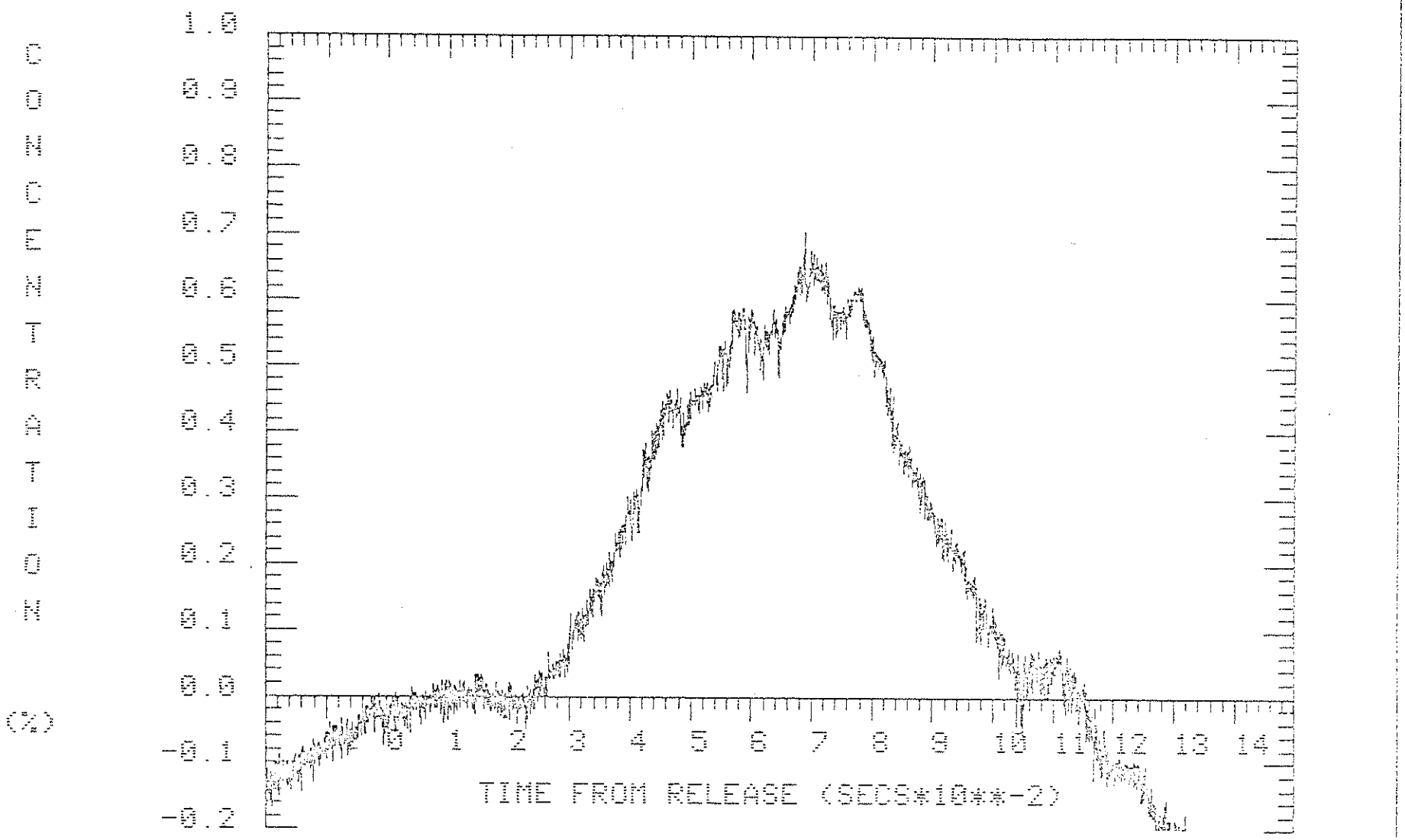
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



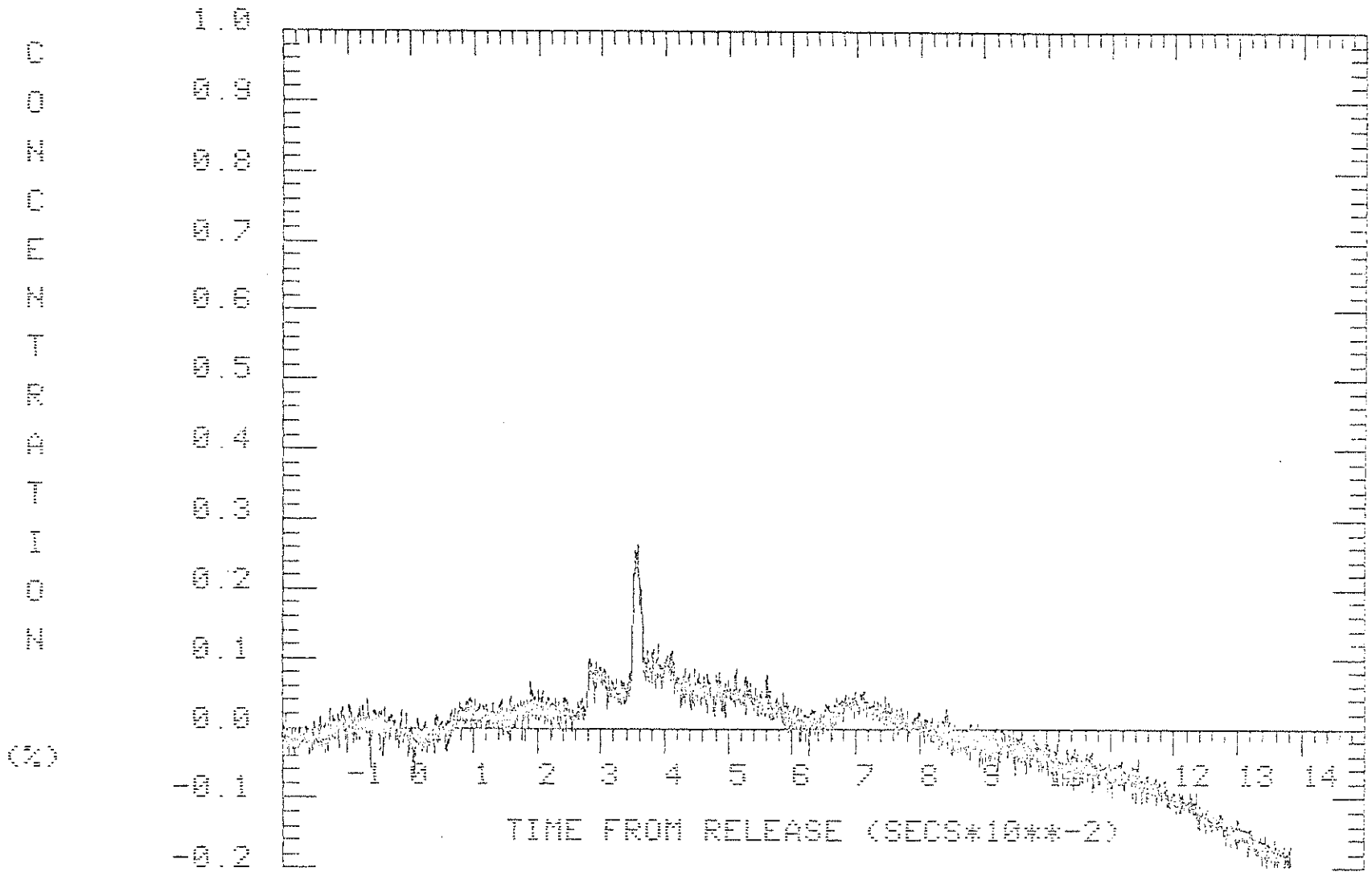
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 100 M Y: 500 M Z: 0.4 M



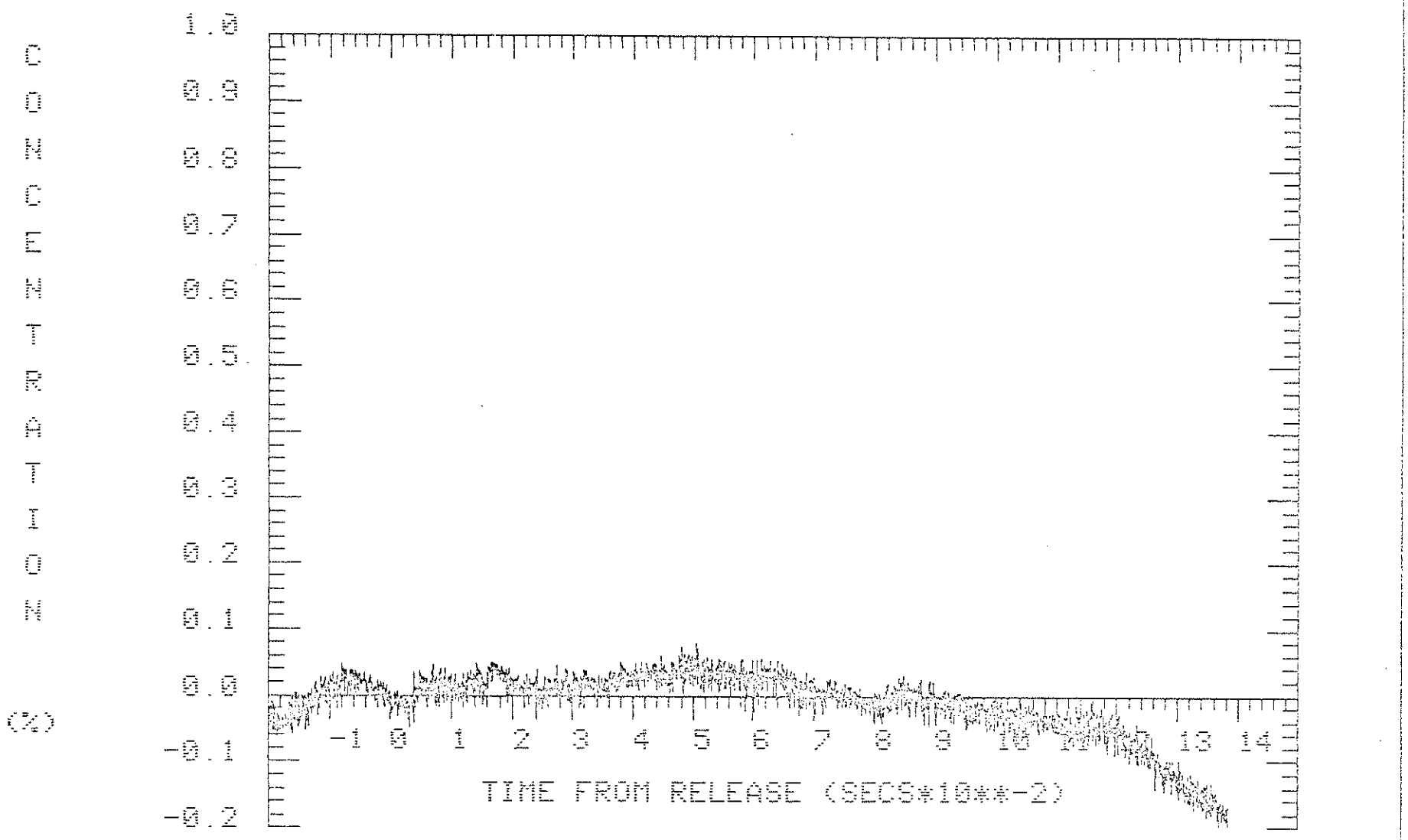
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



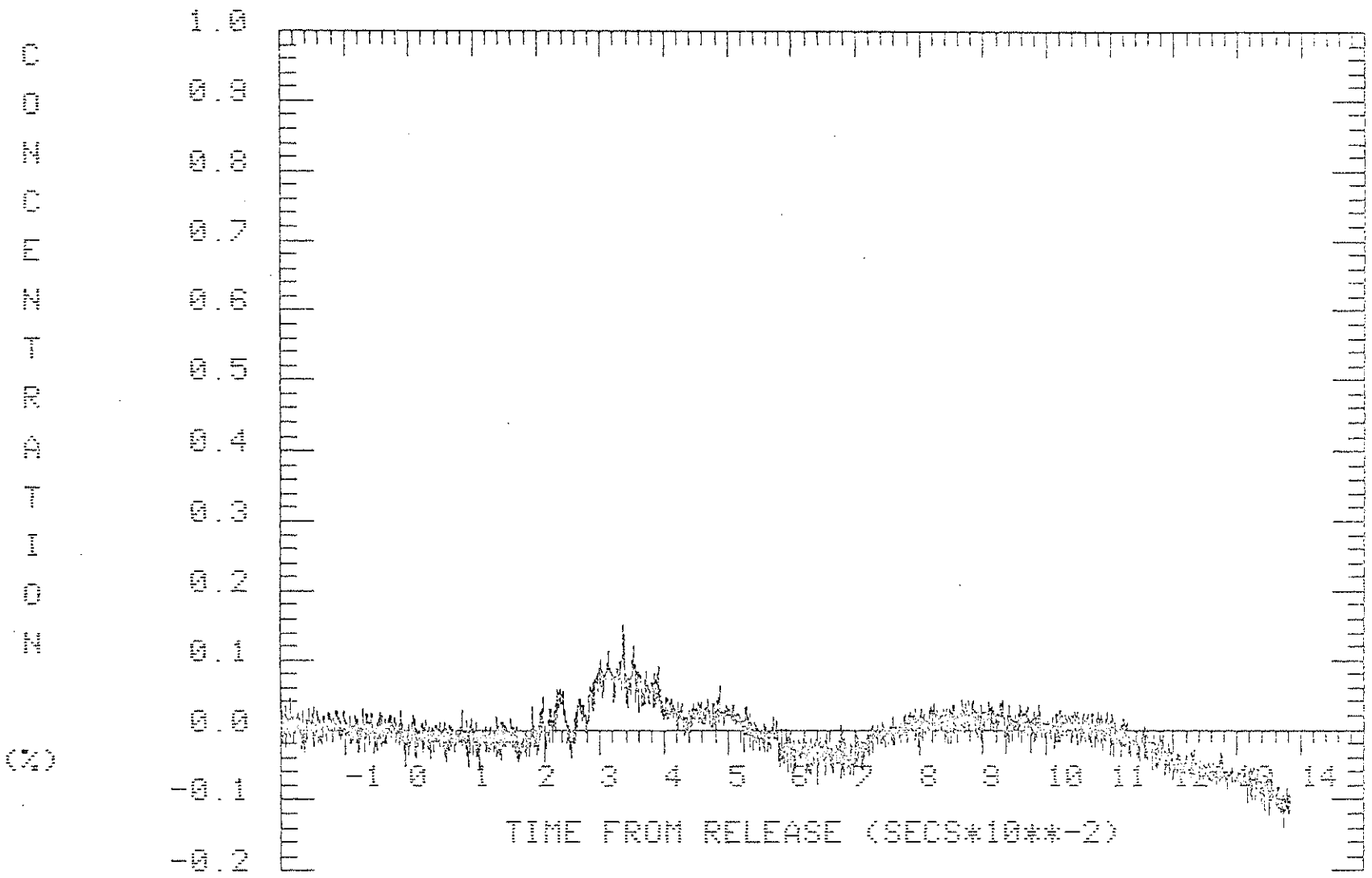
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



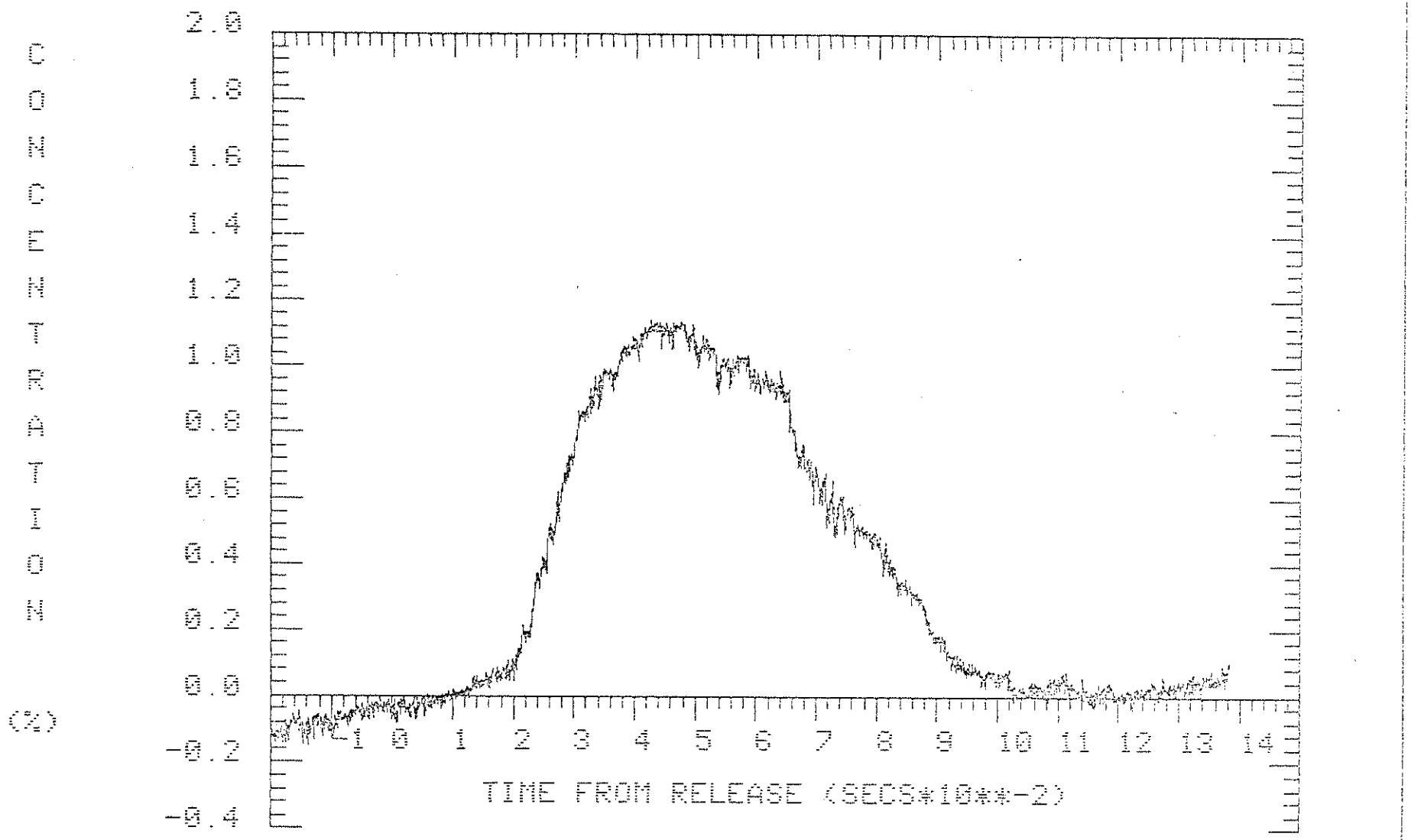
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



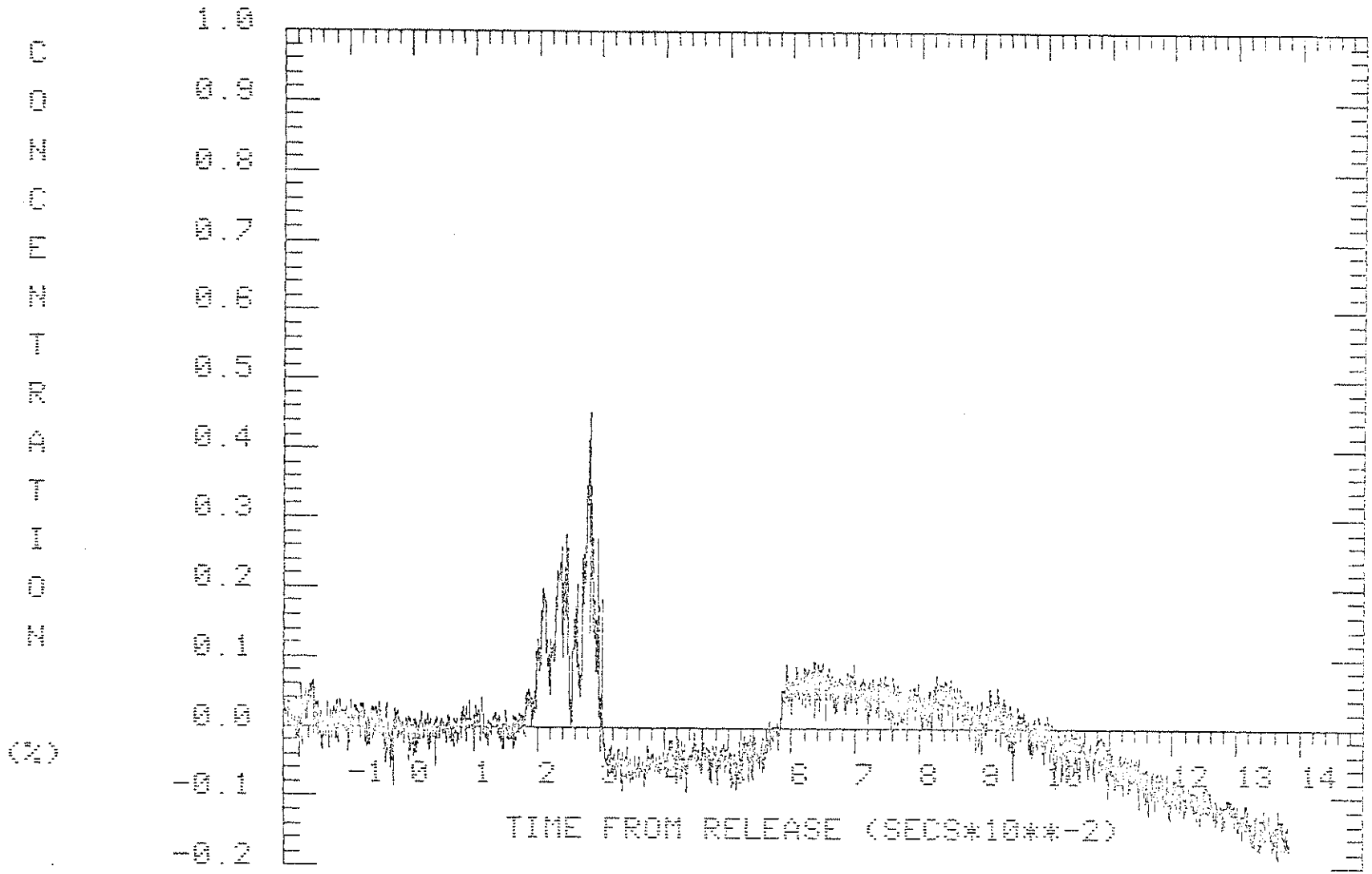
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 500 M Z: 6.4 M



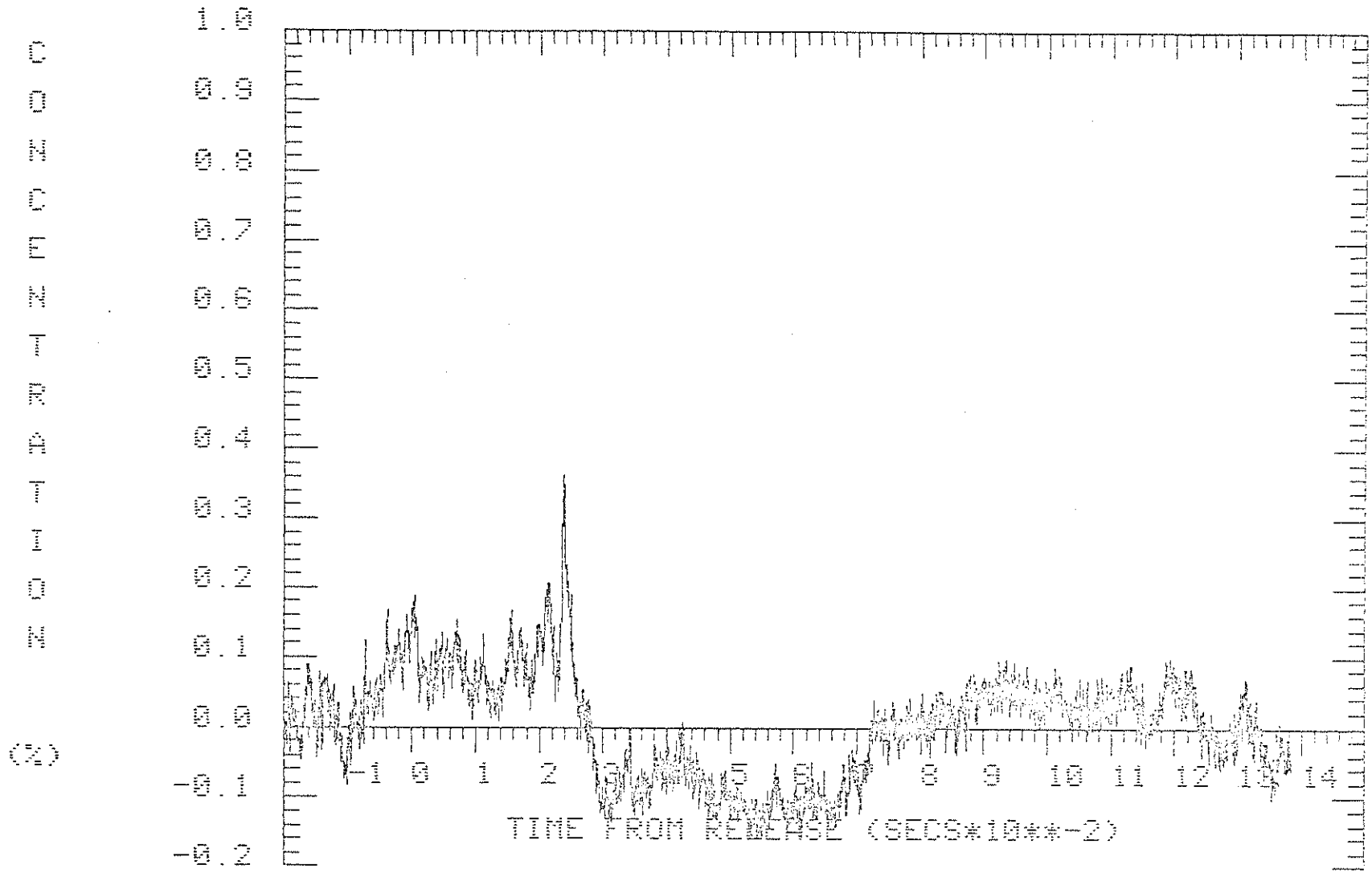
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



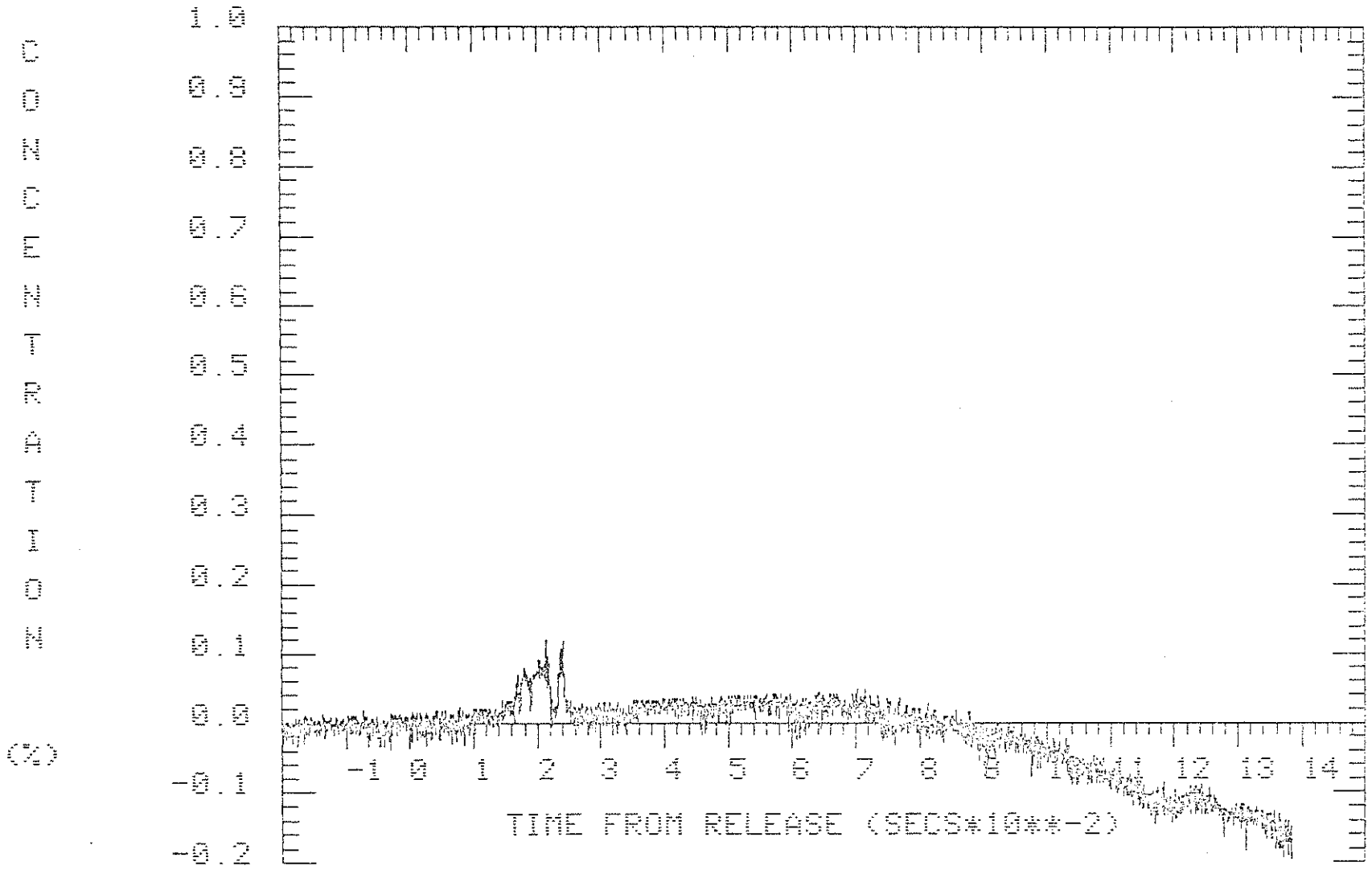
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



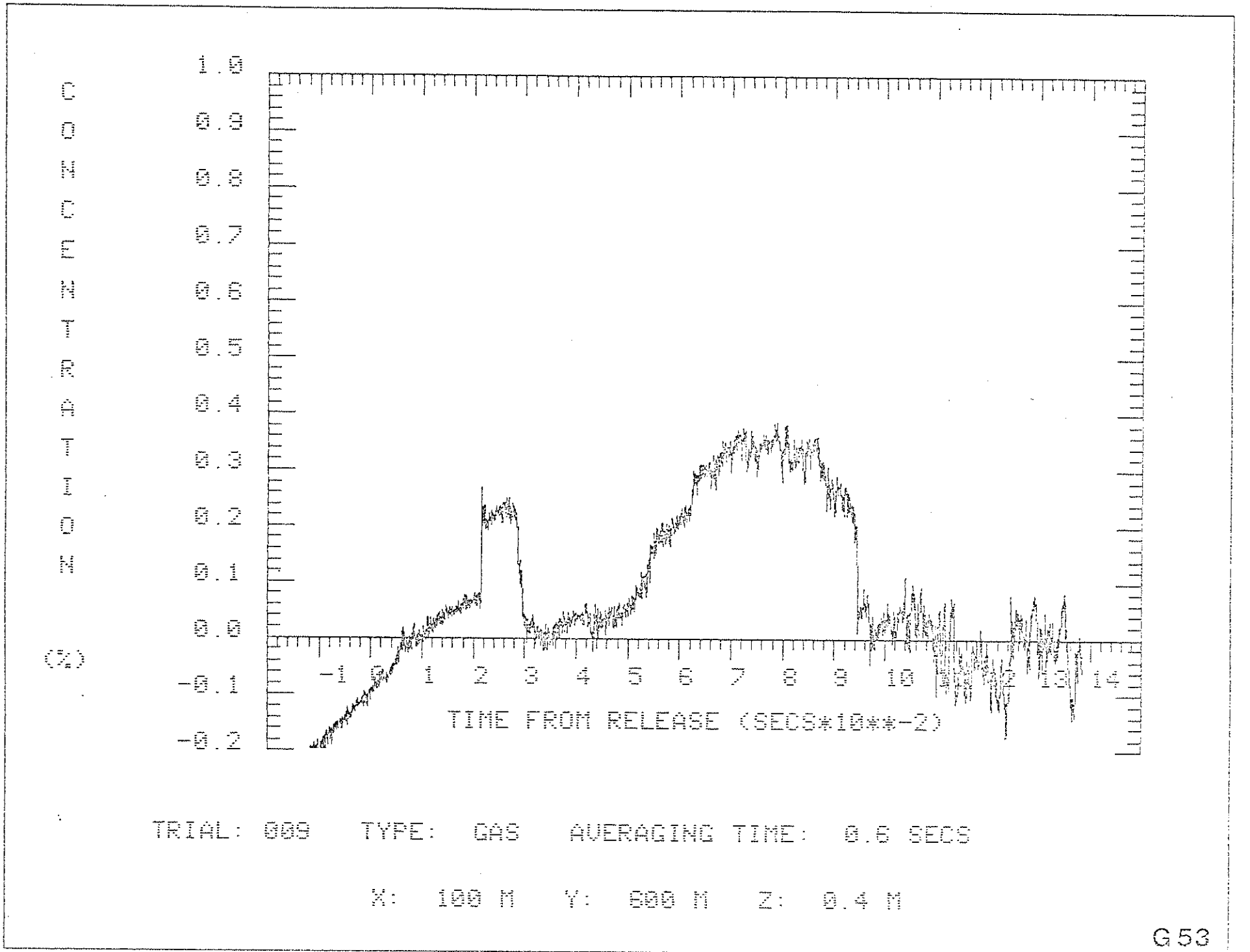
TRIAL: 009 TYPE: HGAS AVERAGING TIME: 0.6 SECS

X: 300 M Y: 550 M Z: 2.0 M



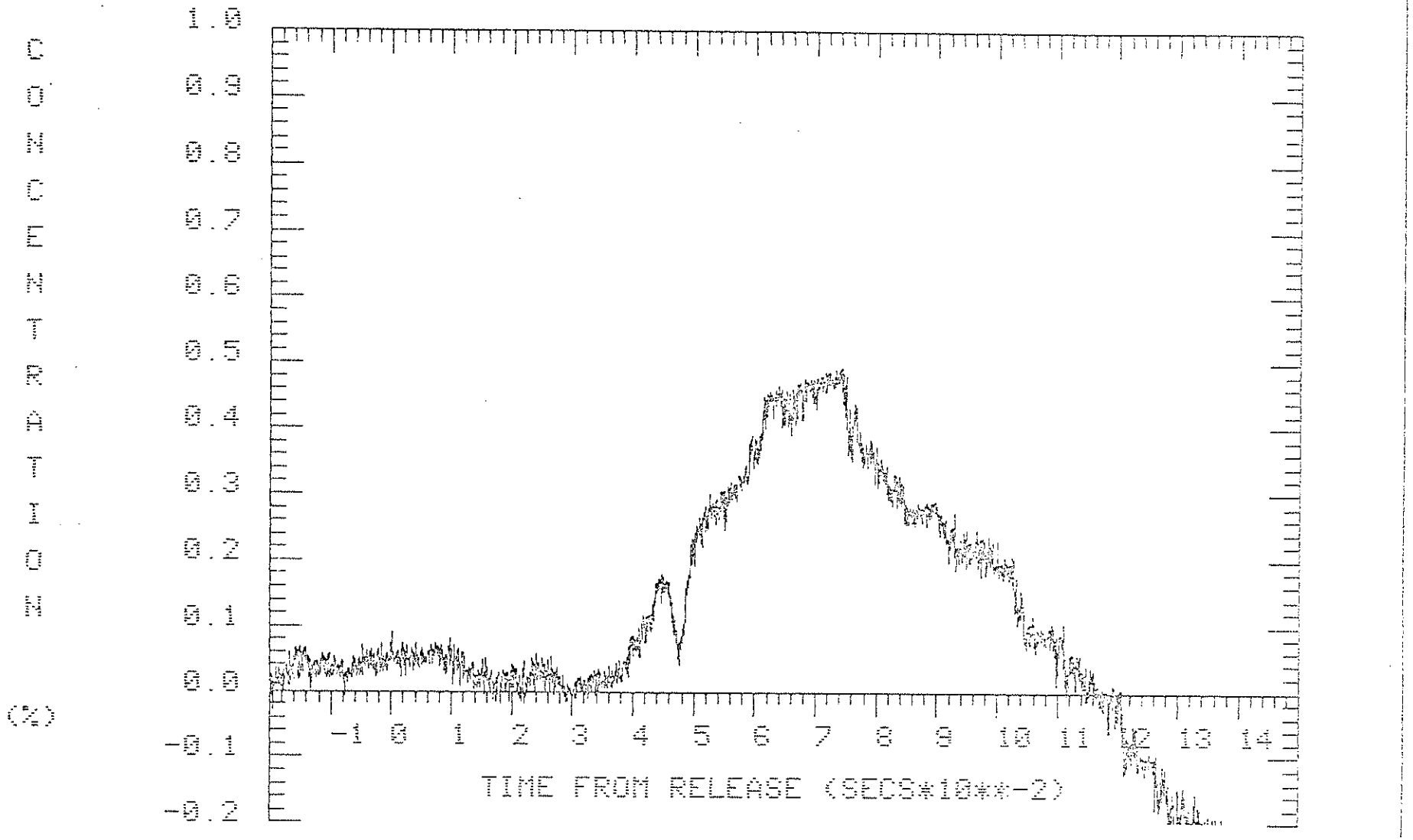
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



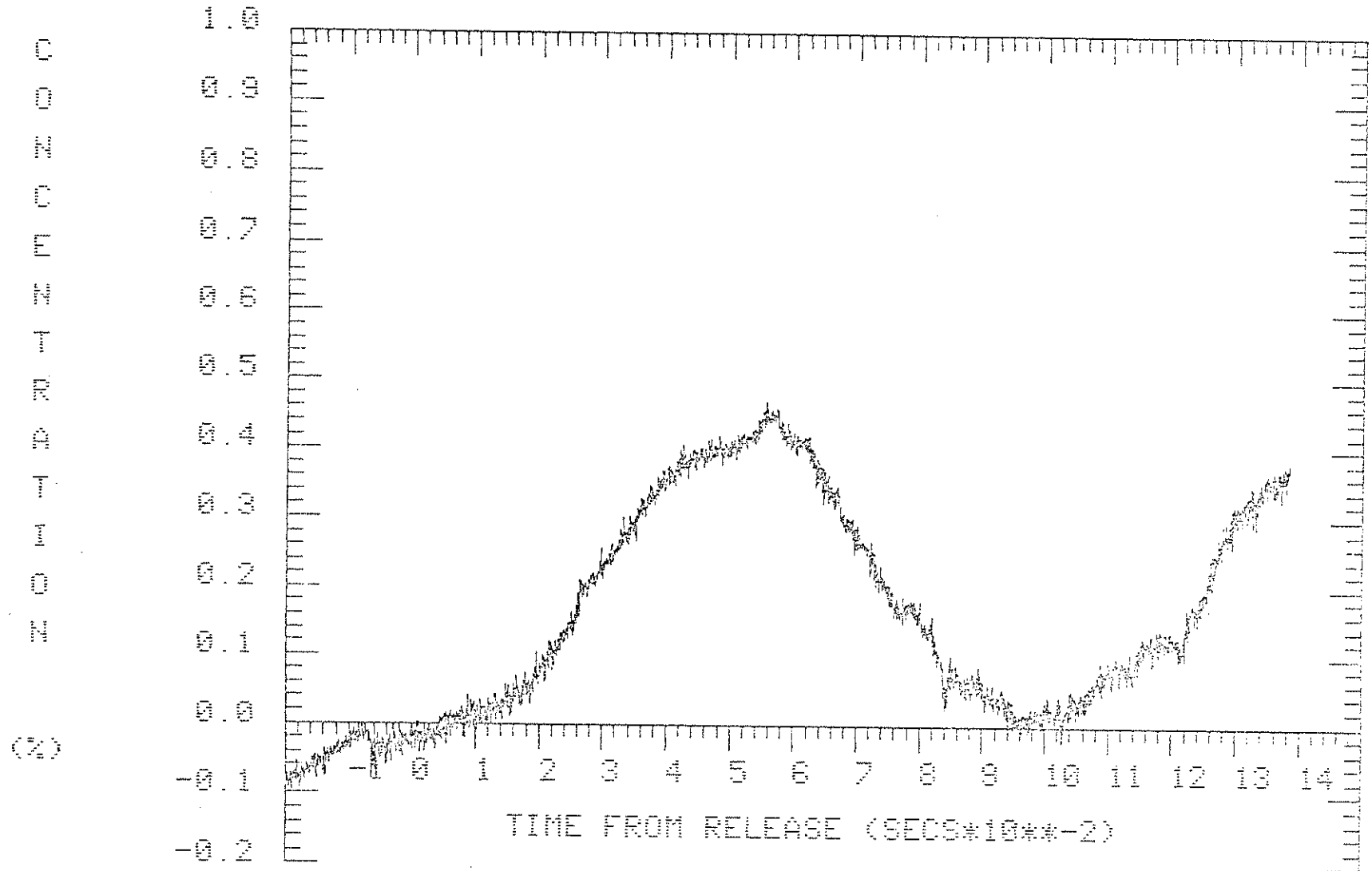
TRIAL: 089 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 100 M Y: 800 M Z: 0.4 M



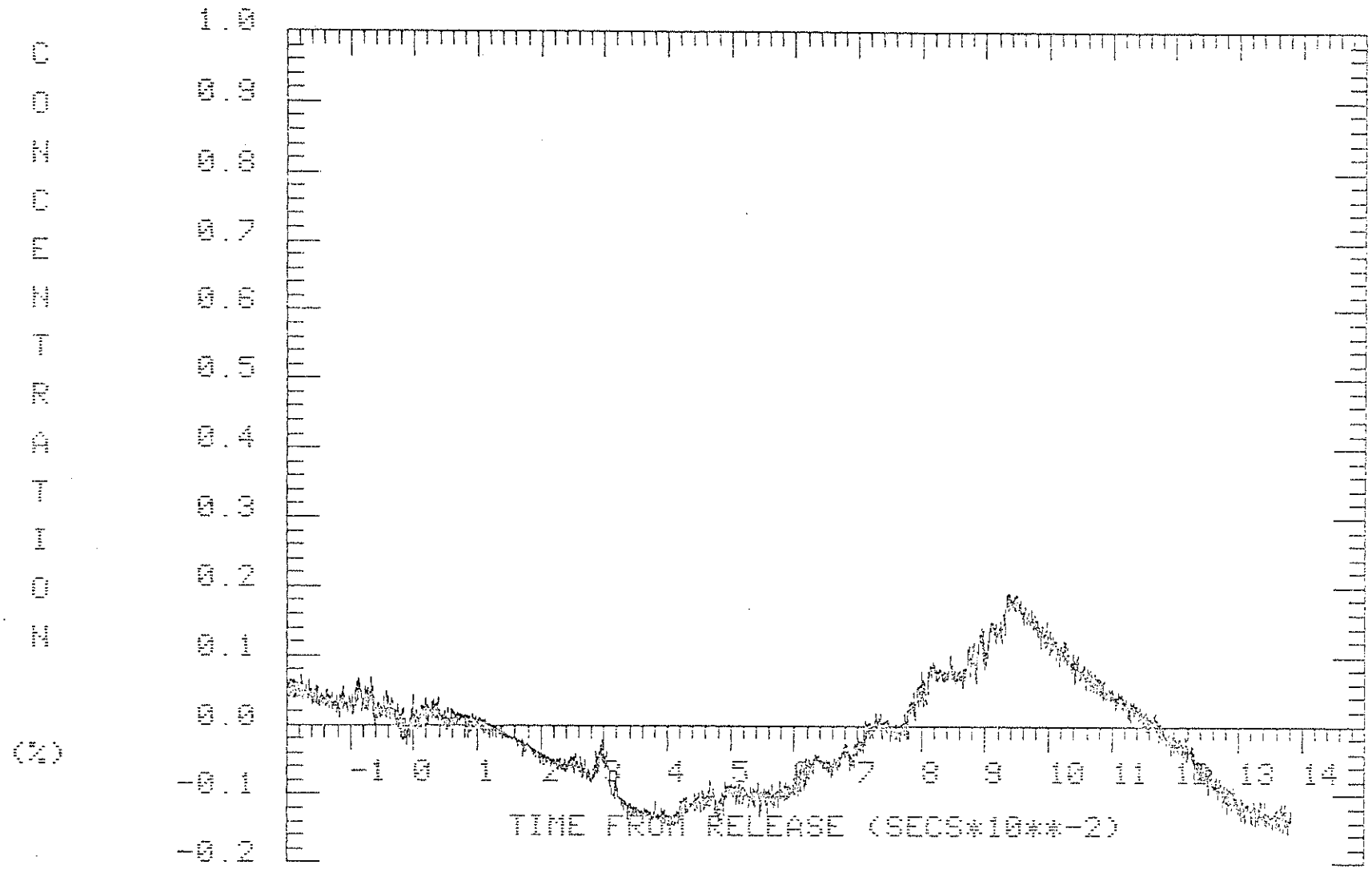
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 200 M Y: 600 M Z: 0.4 M



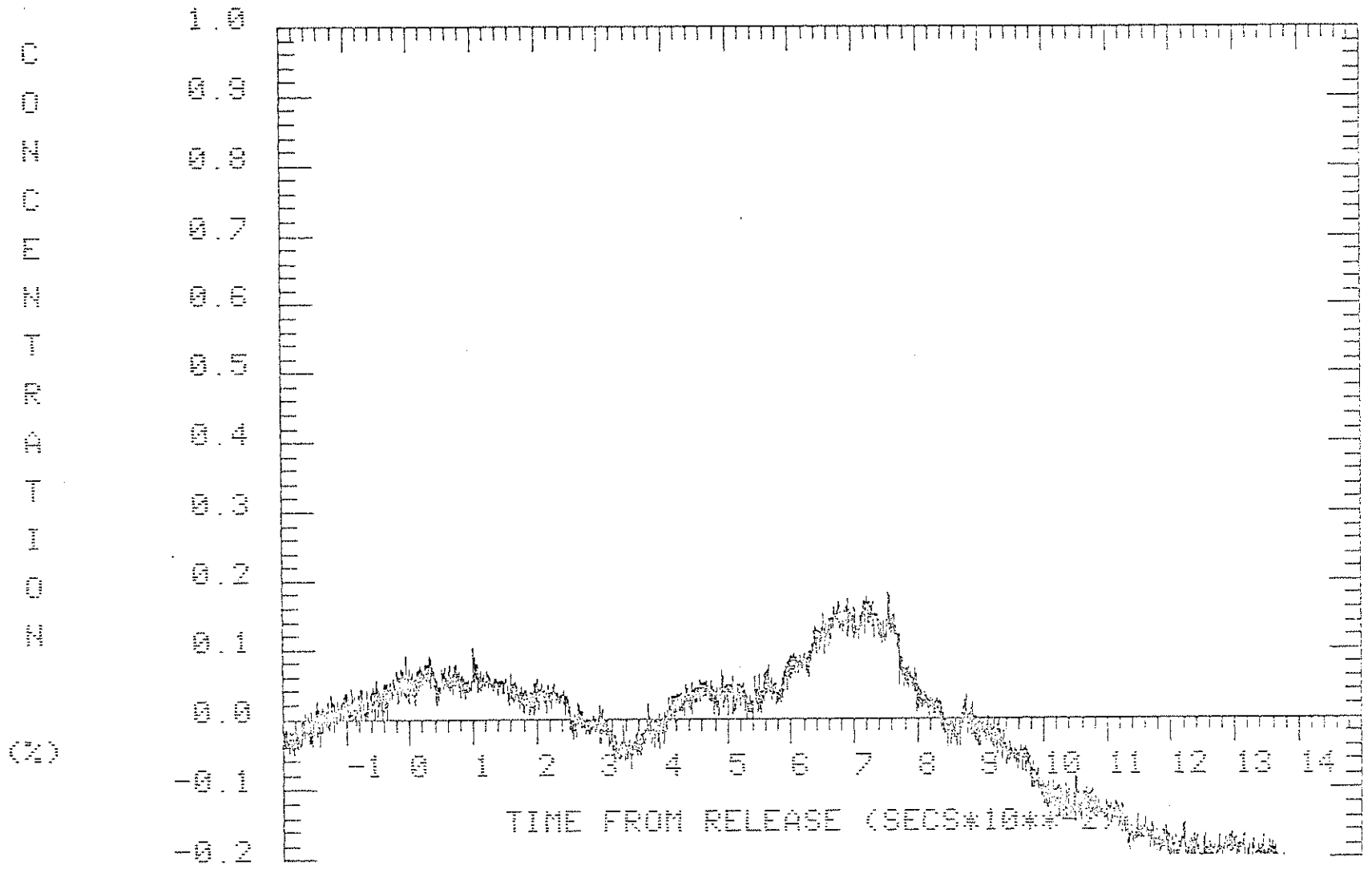
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

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



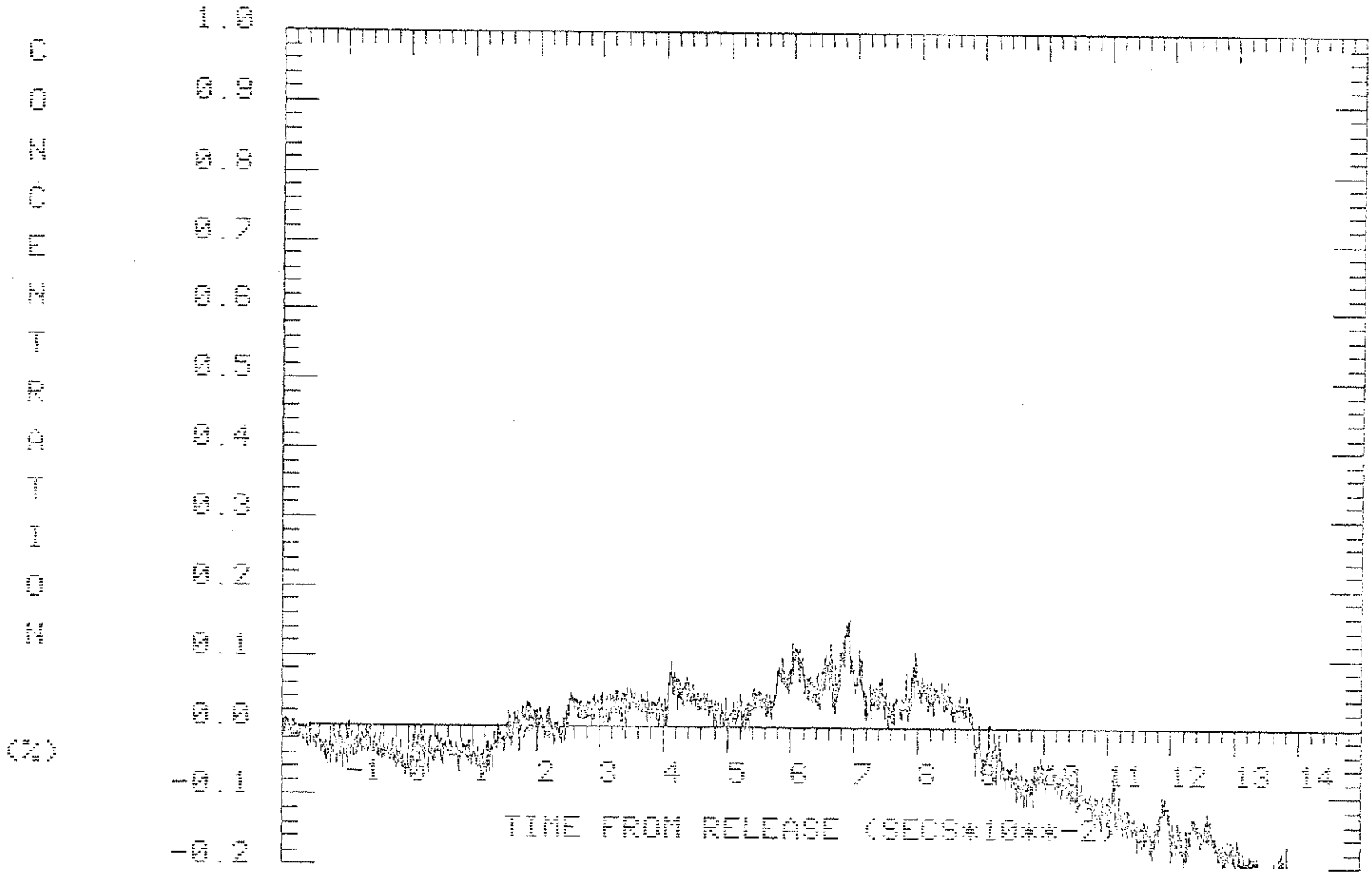
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



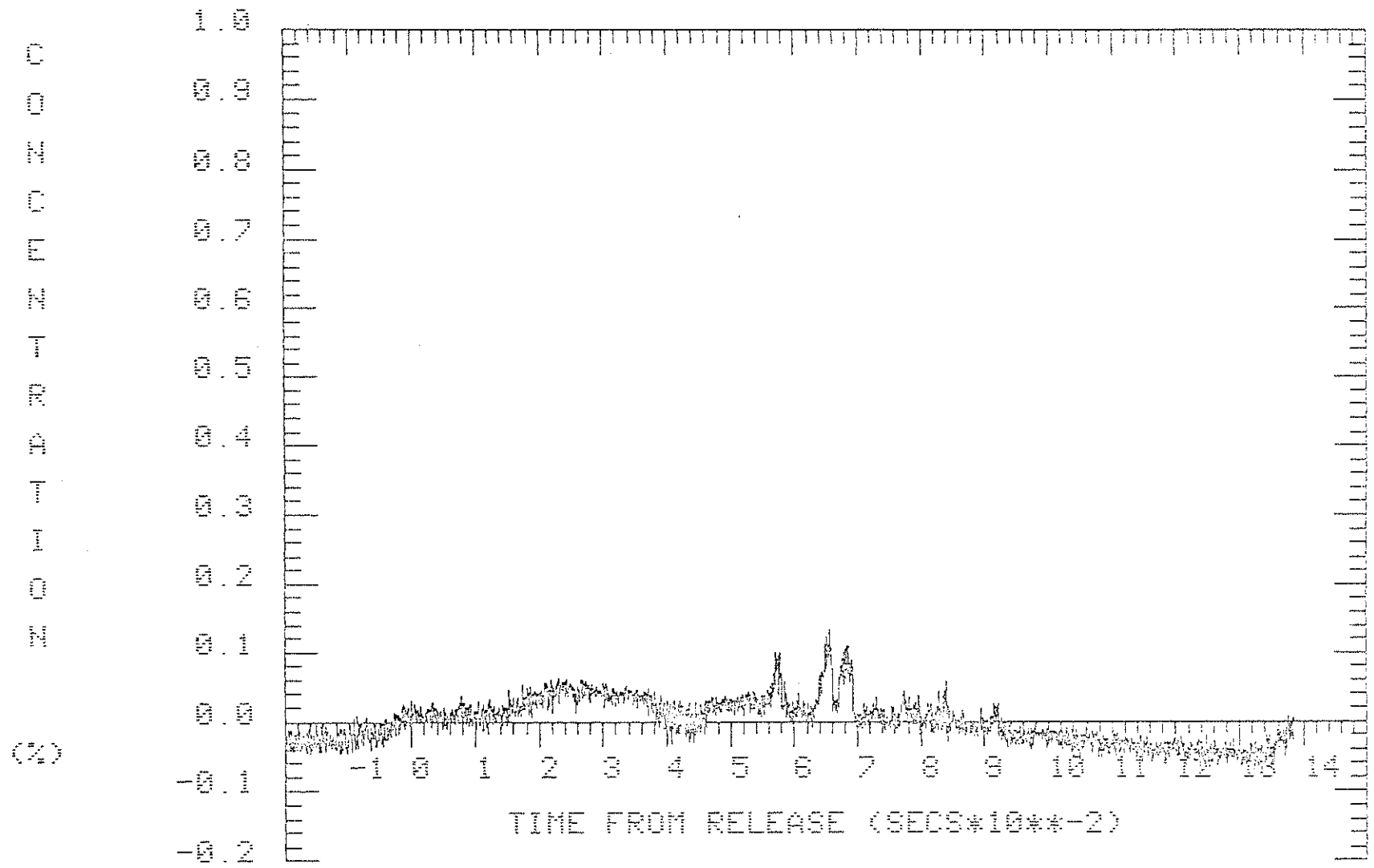
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 100 M Y: 700 M Z: 0.4 M



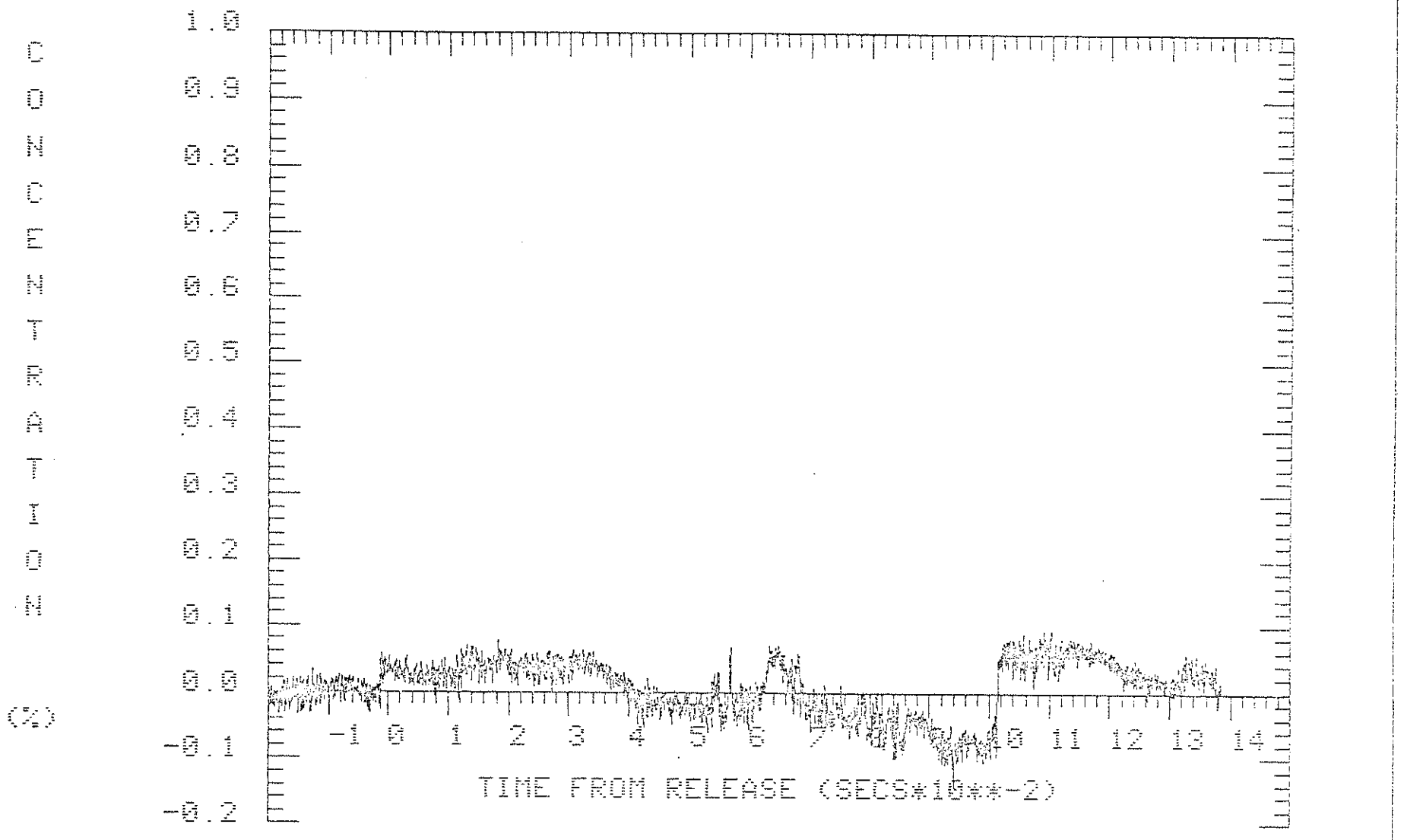
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 100 M Y: 700 M Z: 2.4 M



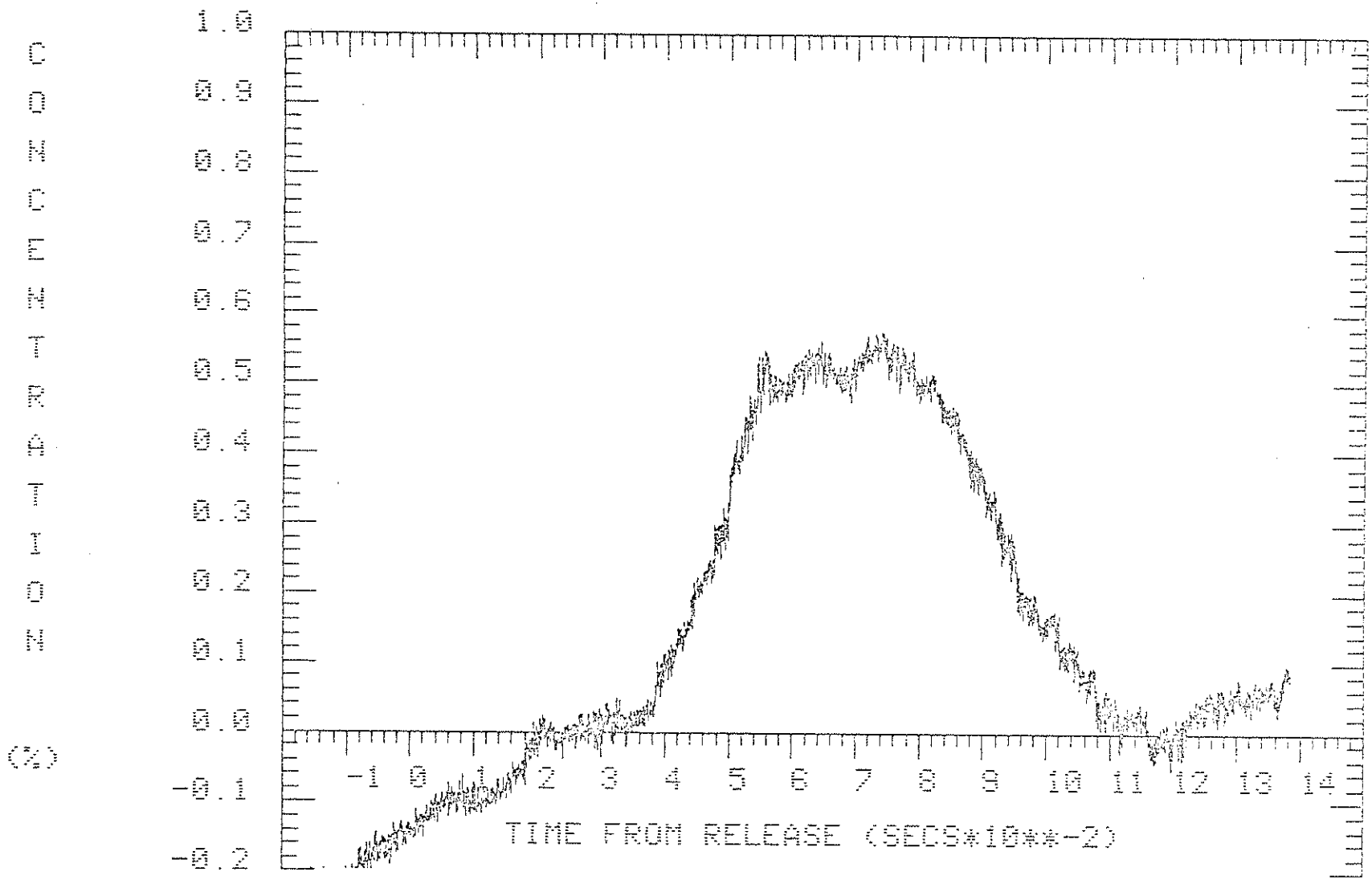
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.8 SECS

X: 100 M Y: 700 M Z: 4.4 M



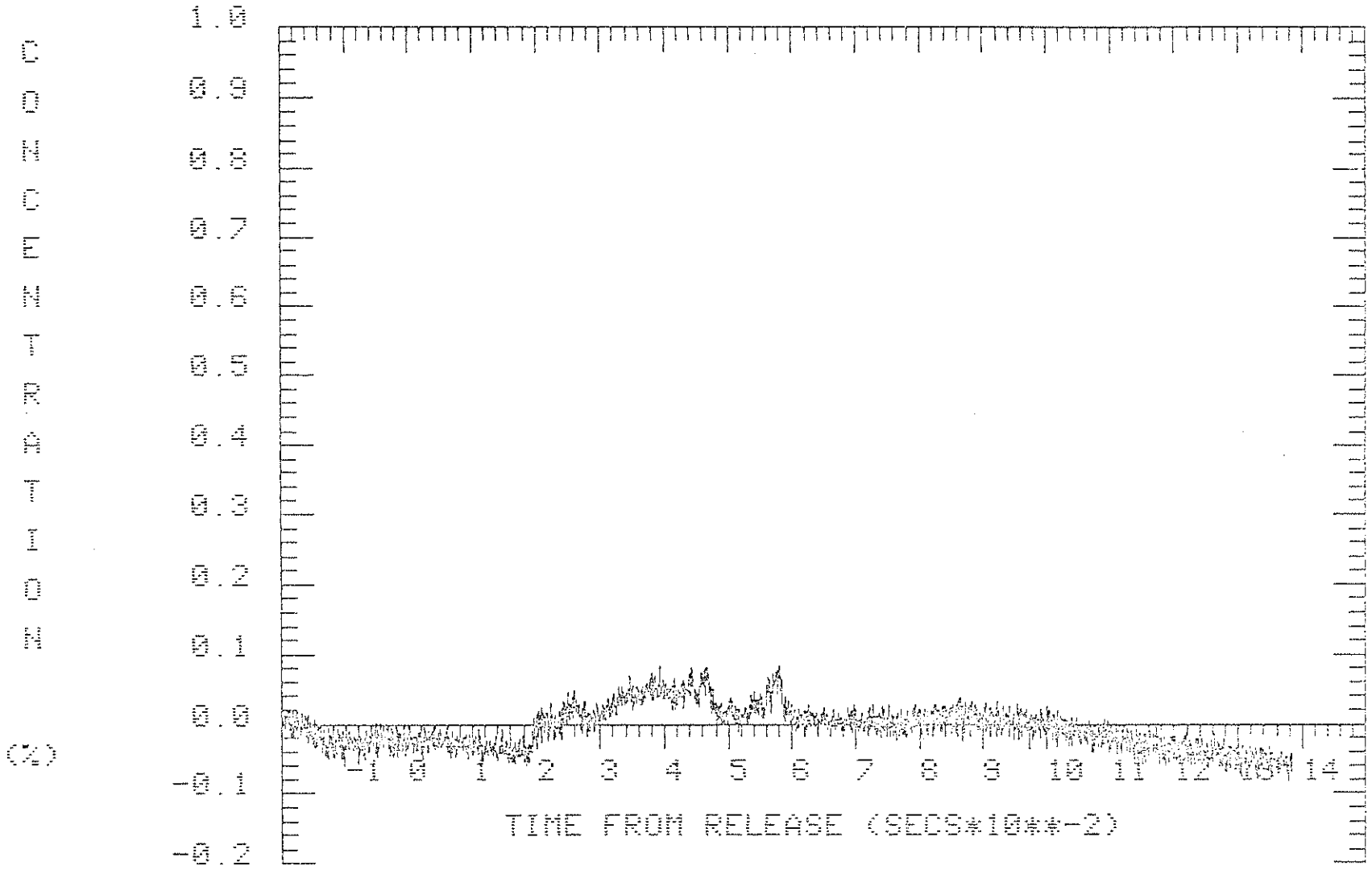
TRIAL: 003 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 100 M Y: 700 M Z: 6.4 M



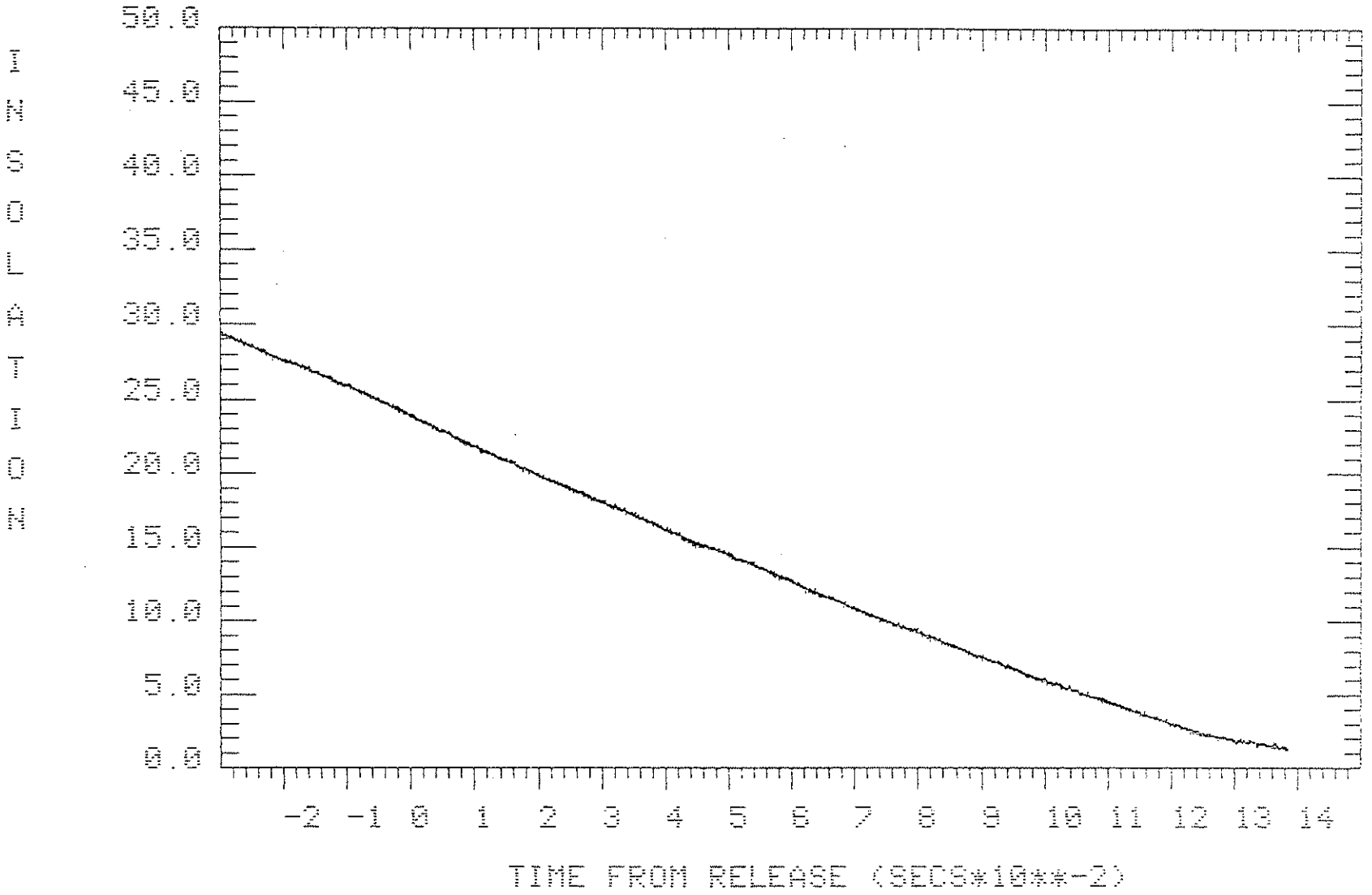
TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

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



TRIAL: 009 TYPE: GAS AVERAGING TIME: 0.6 SECS

X: 220 M Y: 670 M Z: 2.4 M

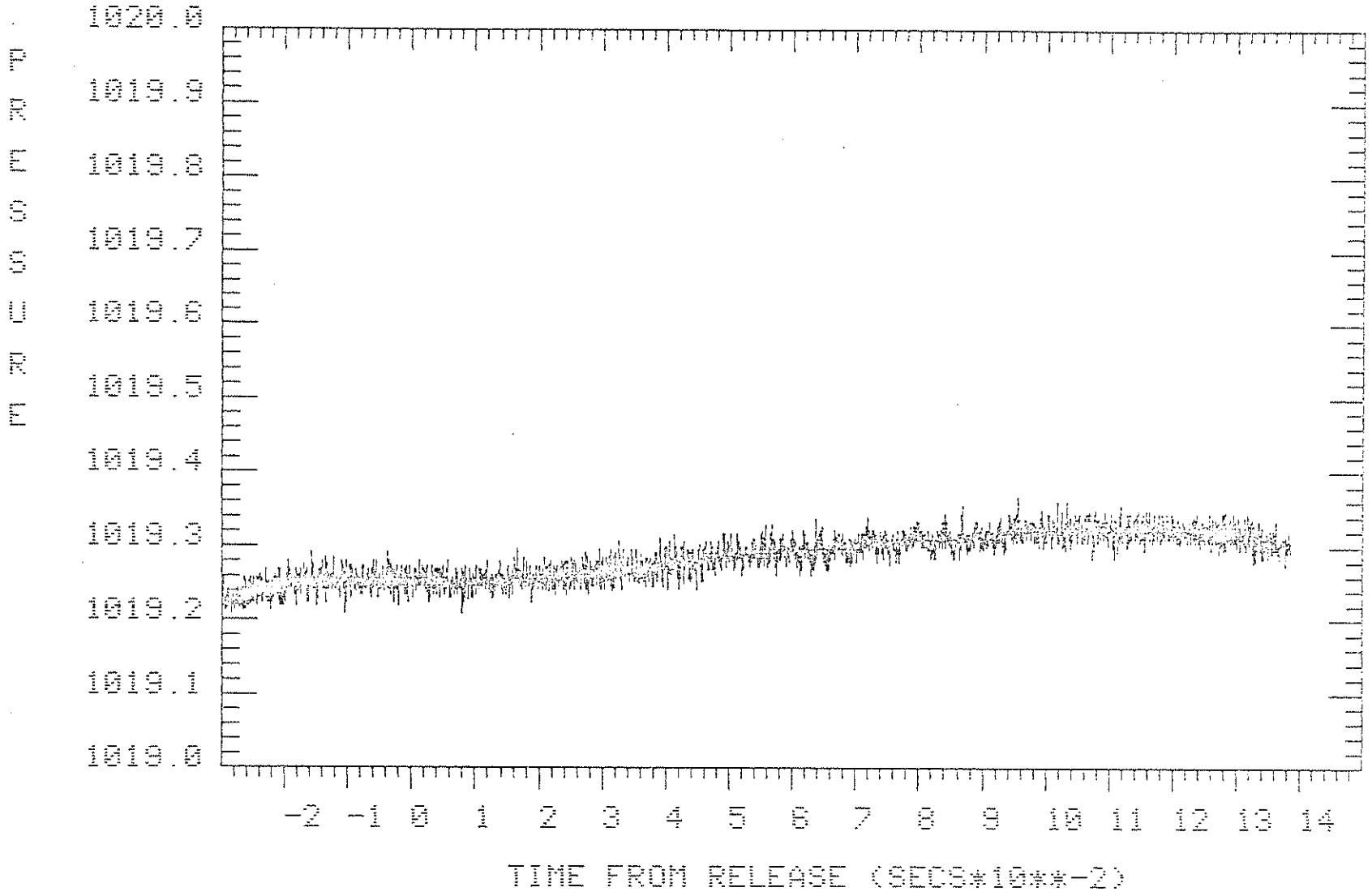


TRIAL: 009 TYPE: SOLA UNITS: M/M**2

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 0.4 M

MEAN OF RUN UP: 56.44 MEAN OF RUN DOWN: -1.50

E01

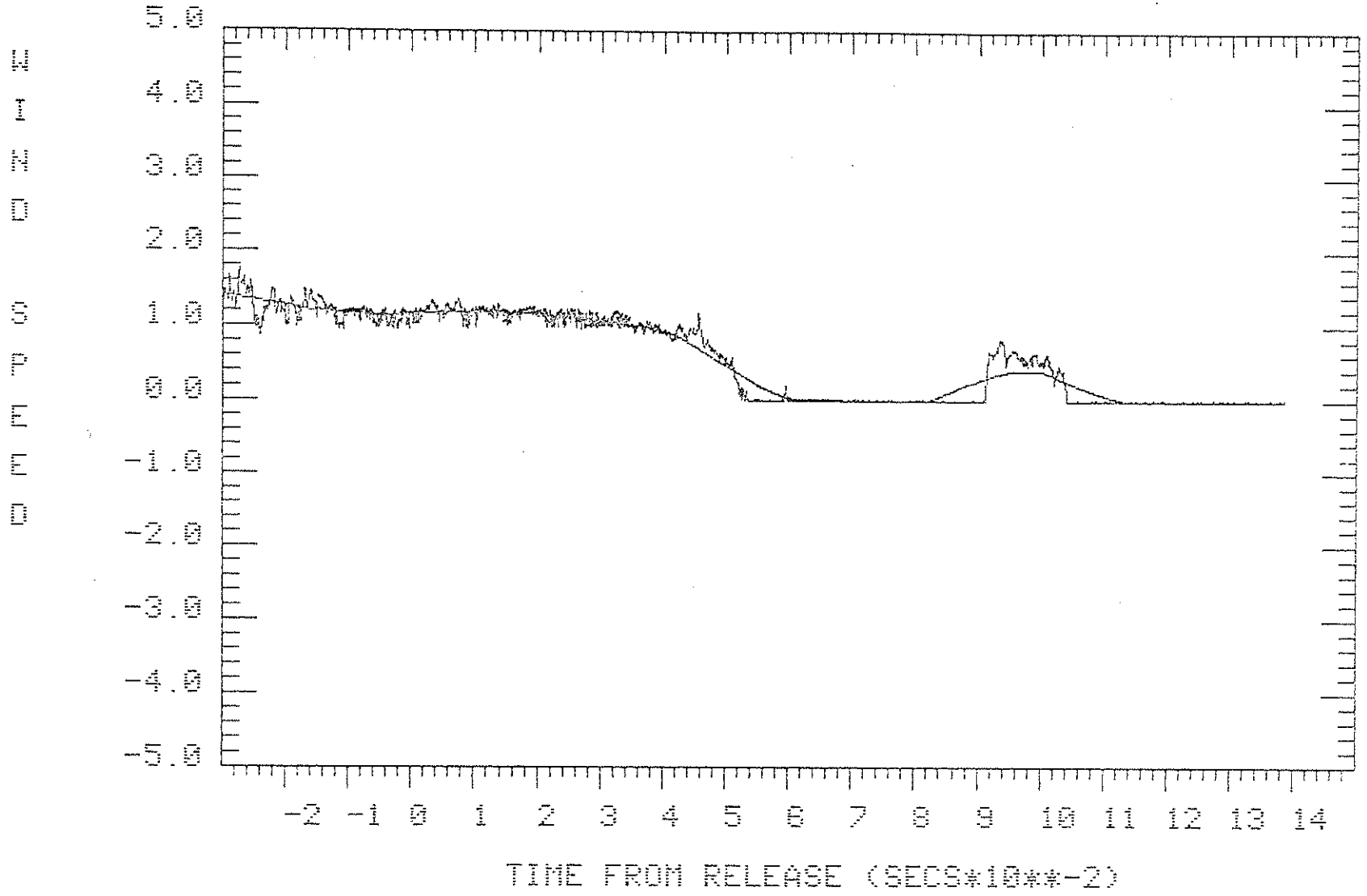


TRIAL: 009 TYPE: BROM UNITS: MBAR

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 0.4 M

MEAN OF RUN UP: 1019 MEAN OF RUN DOWN: 1020

E02

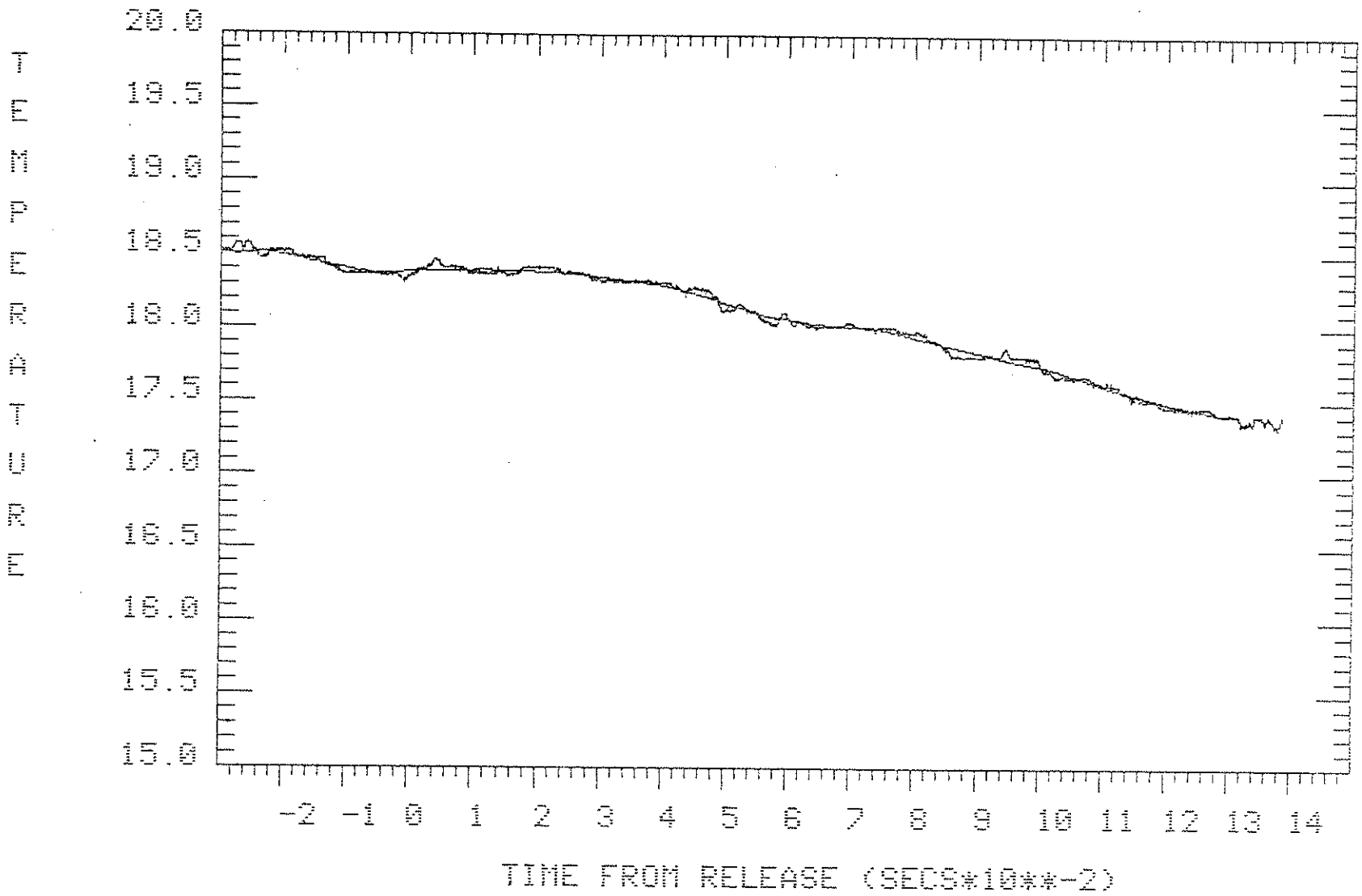


TRIAL: 009 TYPE: WSPD UNITS: M/S

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

MEAN OF RUN UP: 1.64 MEAN OF RUN DOWN: -0.01

E03

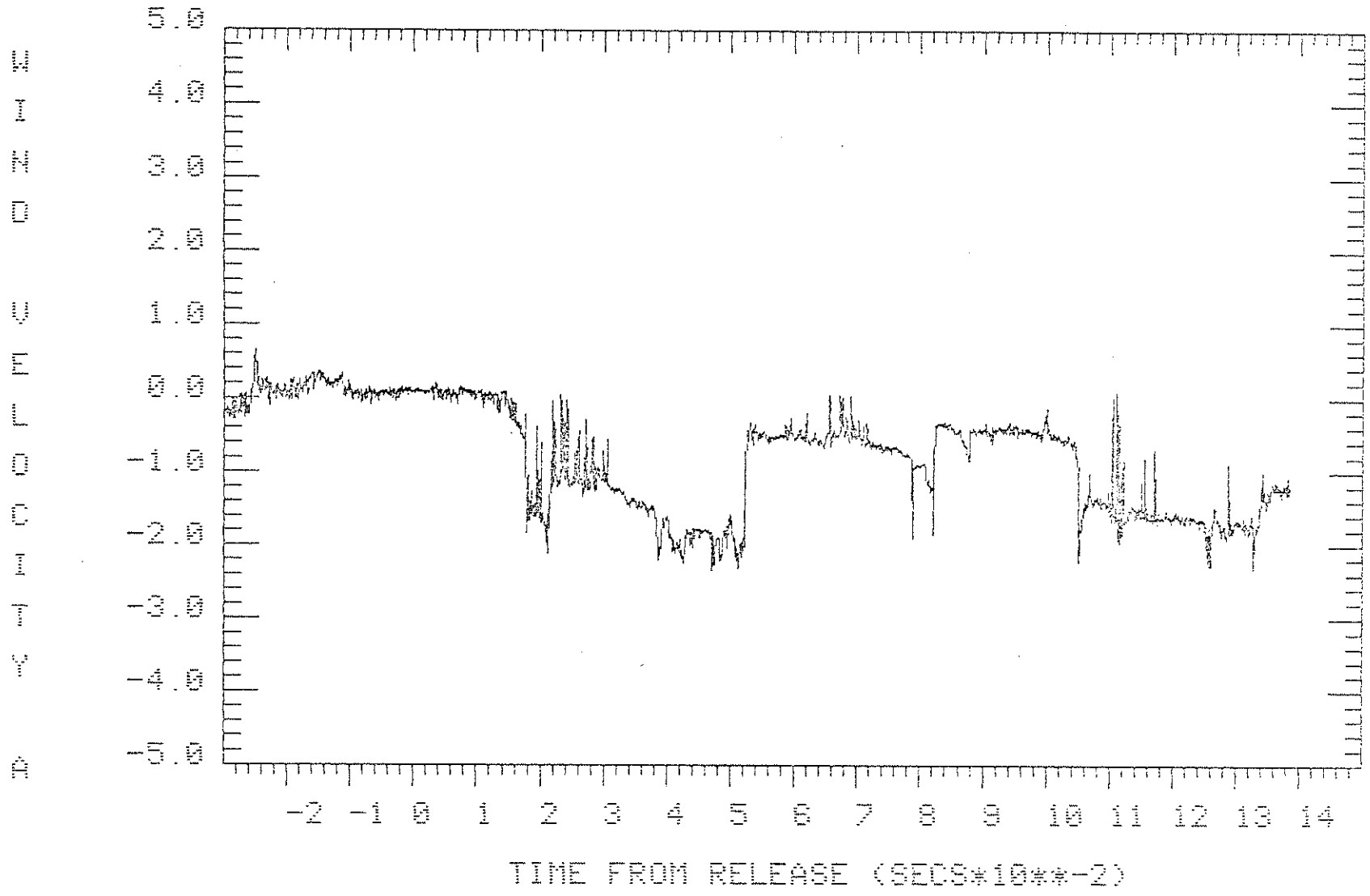


TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

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

MEAN OF RUN UP: 18.76 MEAN OF RUN DOWN: 16.97

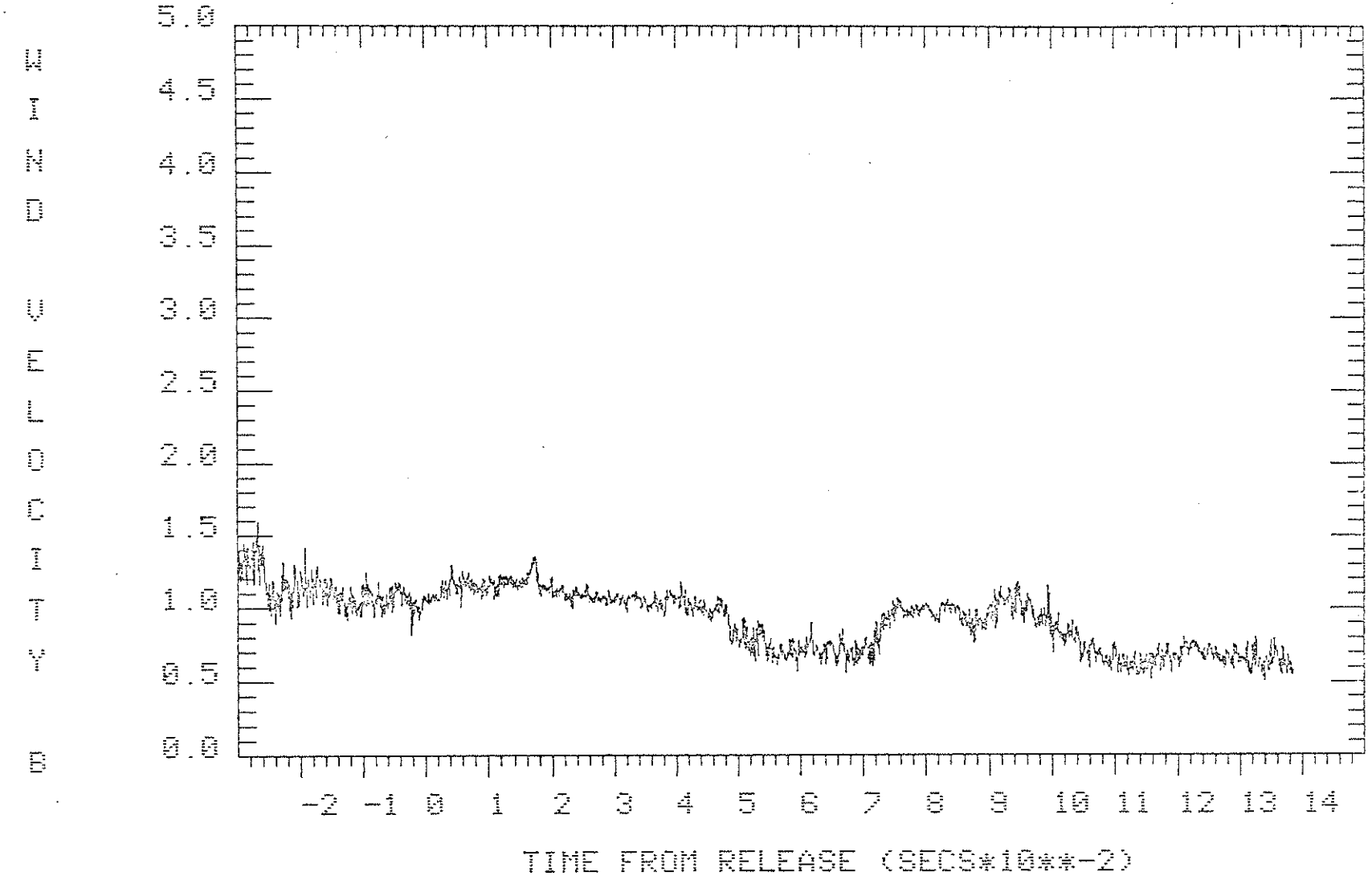
E04



TRIAL: 009 TYPE: UANA UNITS: M/S

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

MEAN OF RUN UP: -0.75 MEAN OF RUN DOWN: -0.24

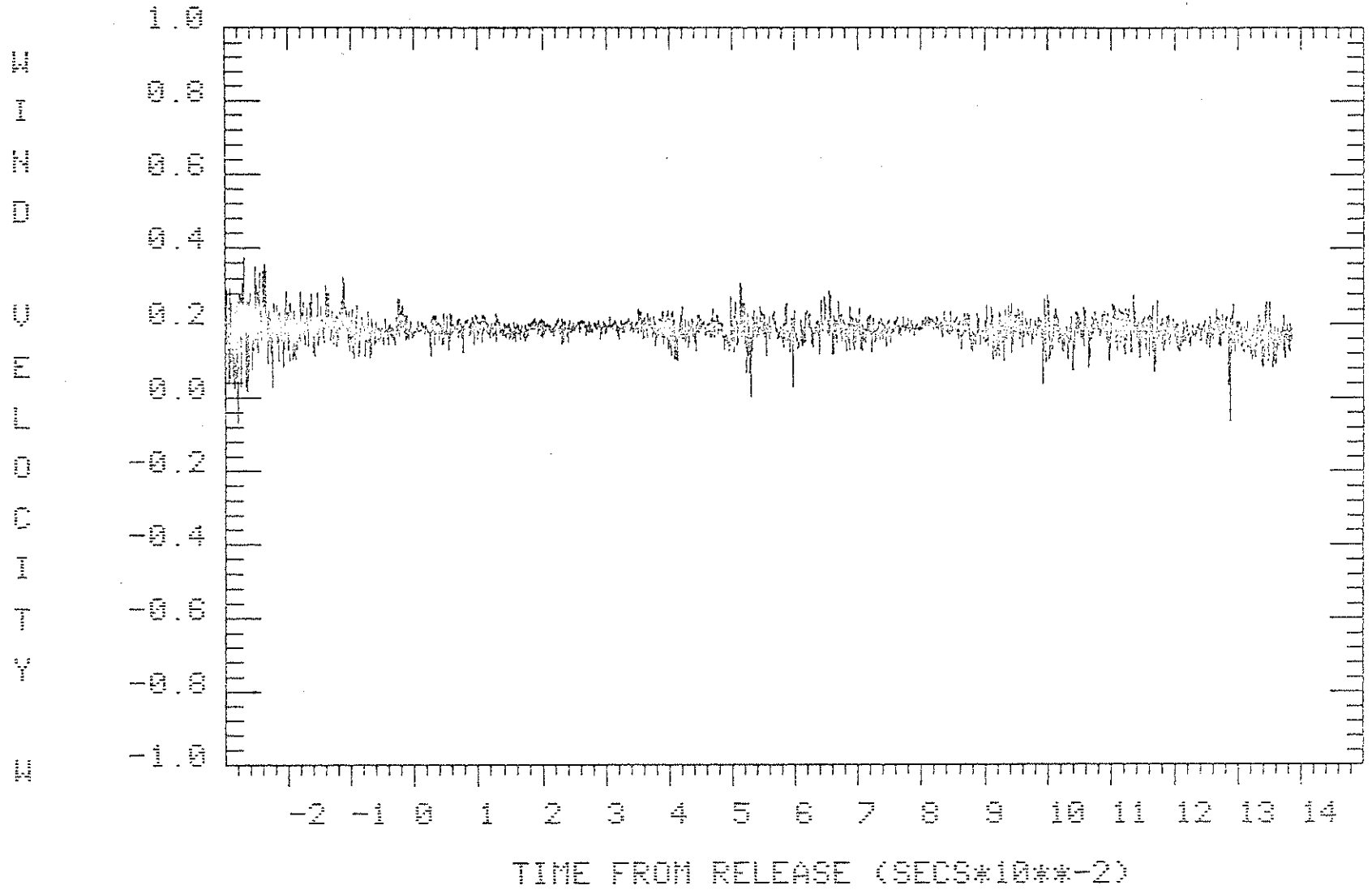


TRIAL: 009 TYPE: UANB UNITS: M/S

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

MEAN OF RUN UP: 1.53 MEAN OF RUN DOWN: 0.23

E06

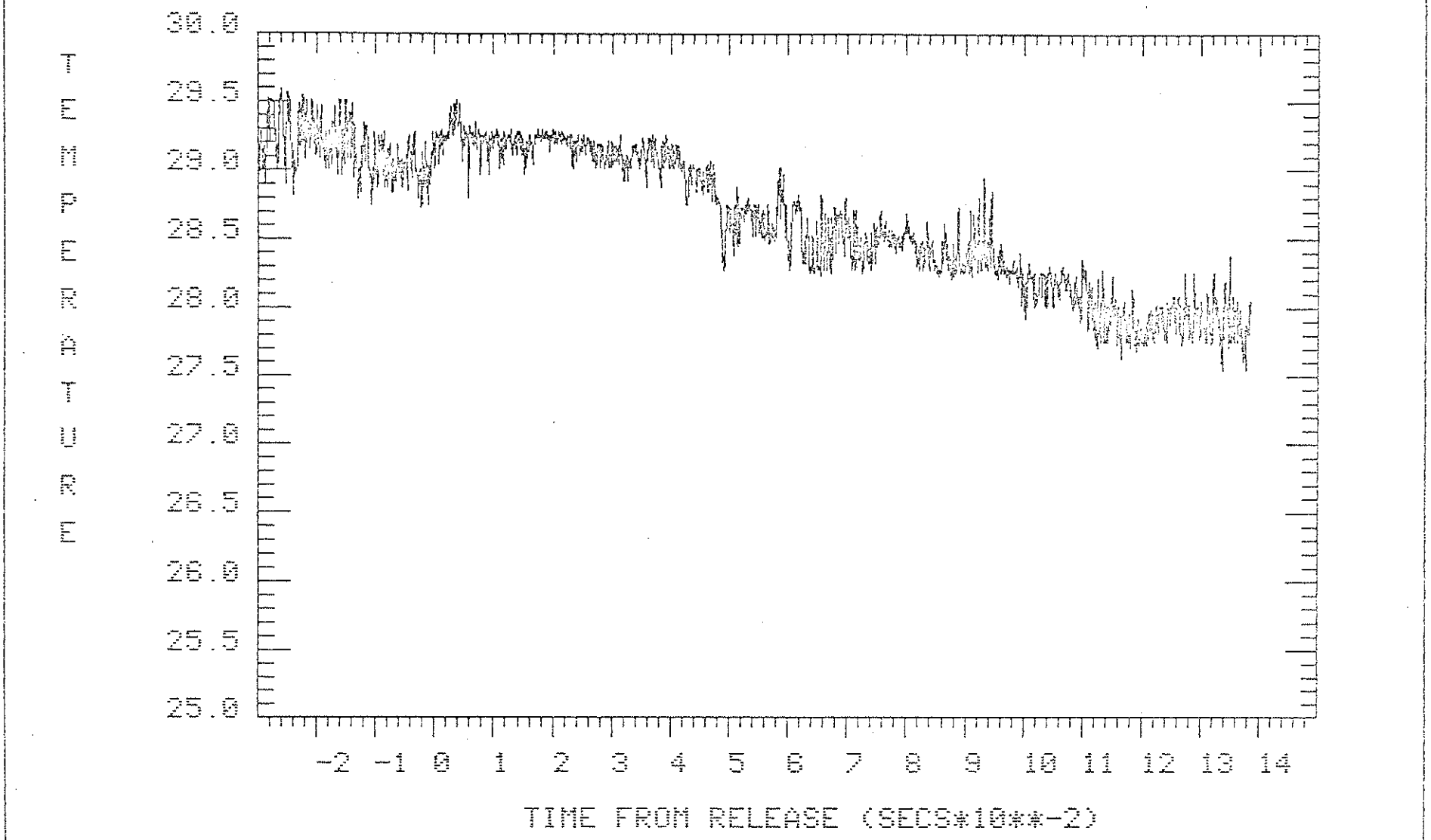


TRIAL: 008 TYPE: UANW UNITS: M/S

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

MEAN OF RUN UP: 0.09 MEAN OF RUN DOWN: 0.14

E07

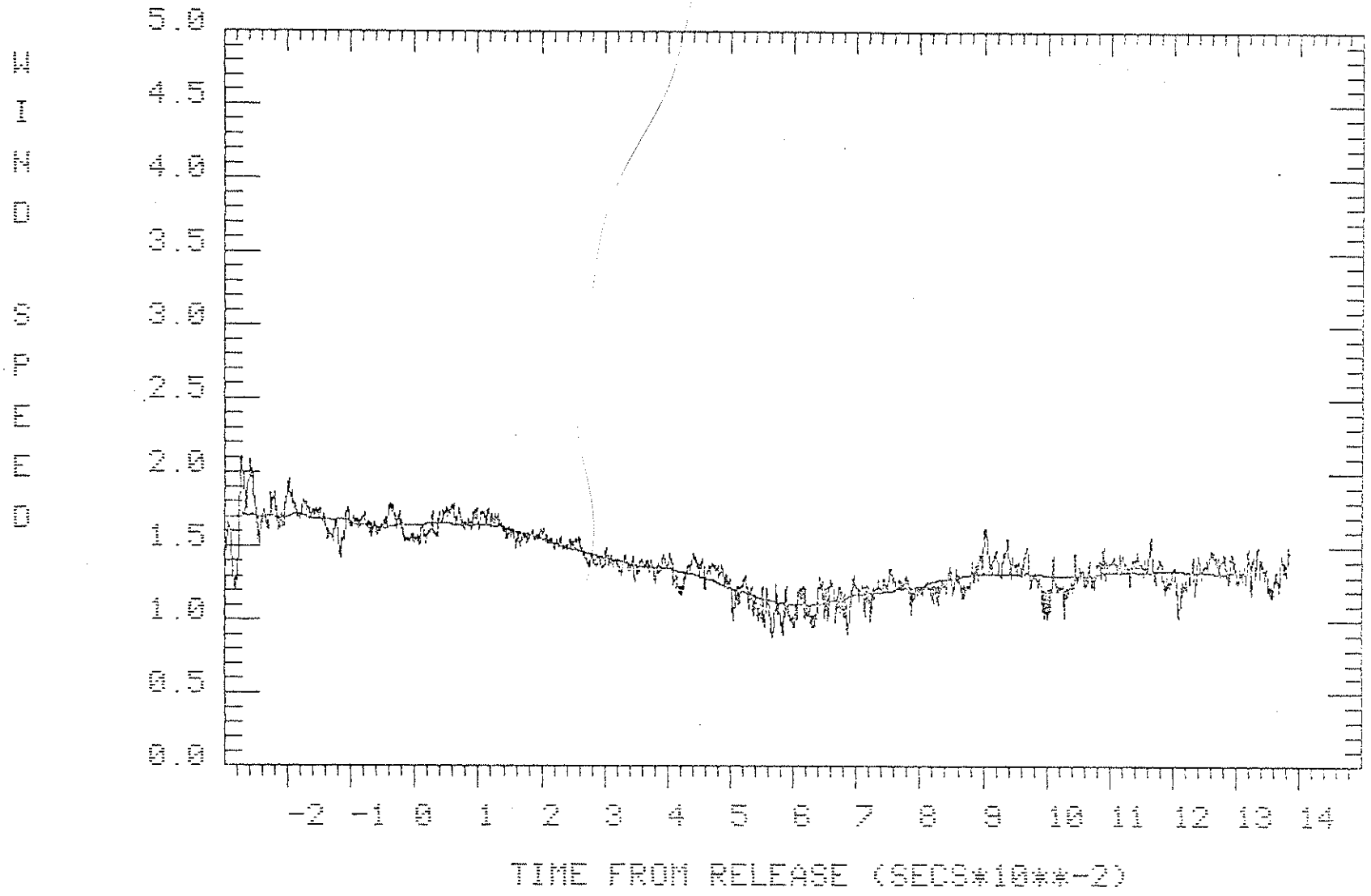


TRIAL: 009 TYPE: UANT UNITS: DEGREES C

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

MEAN OF RUN UP: 29.41 MEAN OF RUN DOWN: 27.83

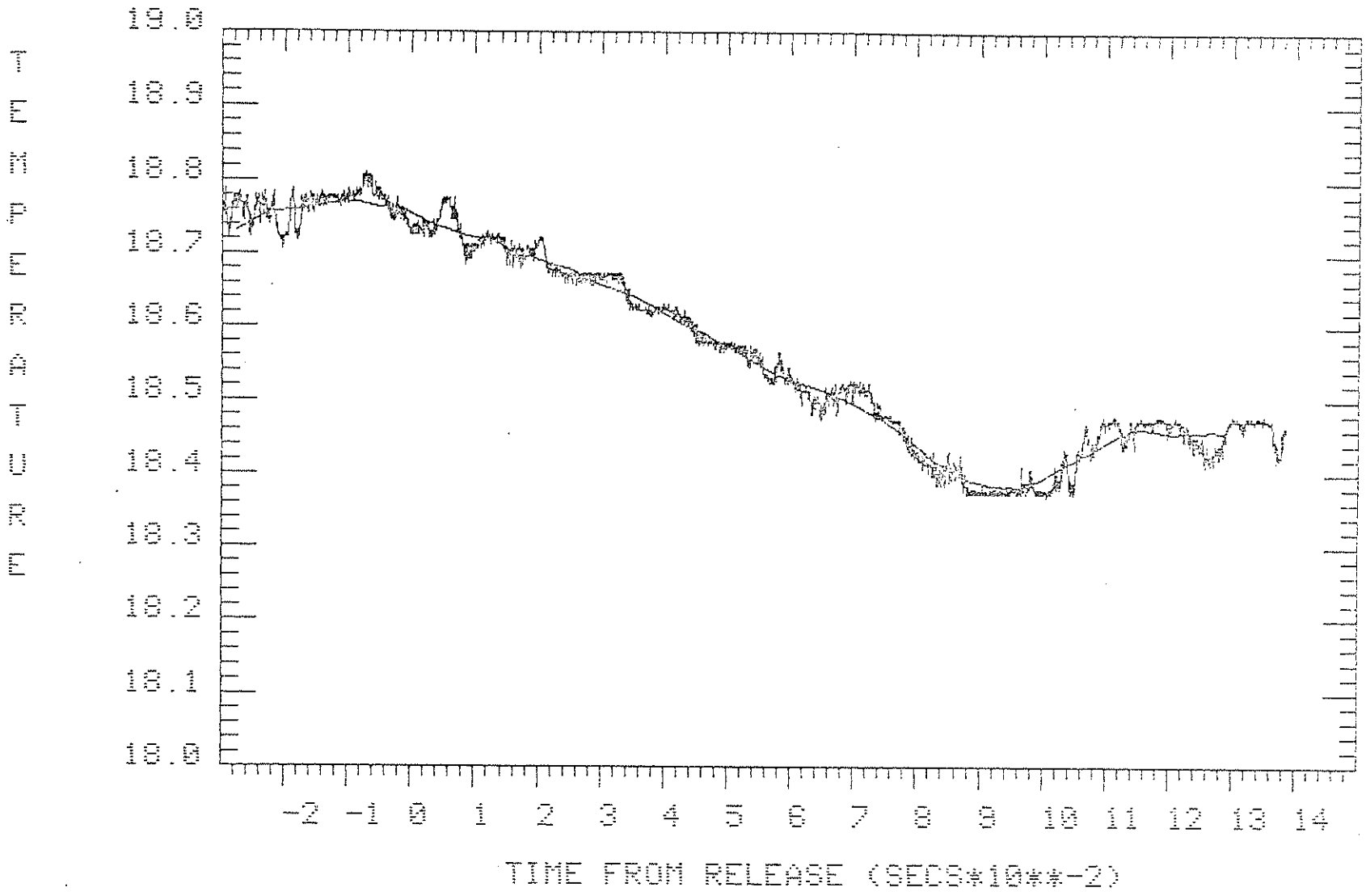
E08



TRIAL: 009 TYPE: WSPD UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 4.5 M

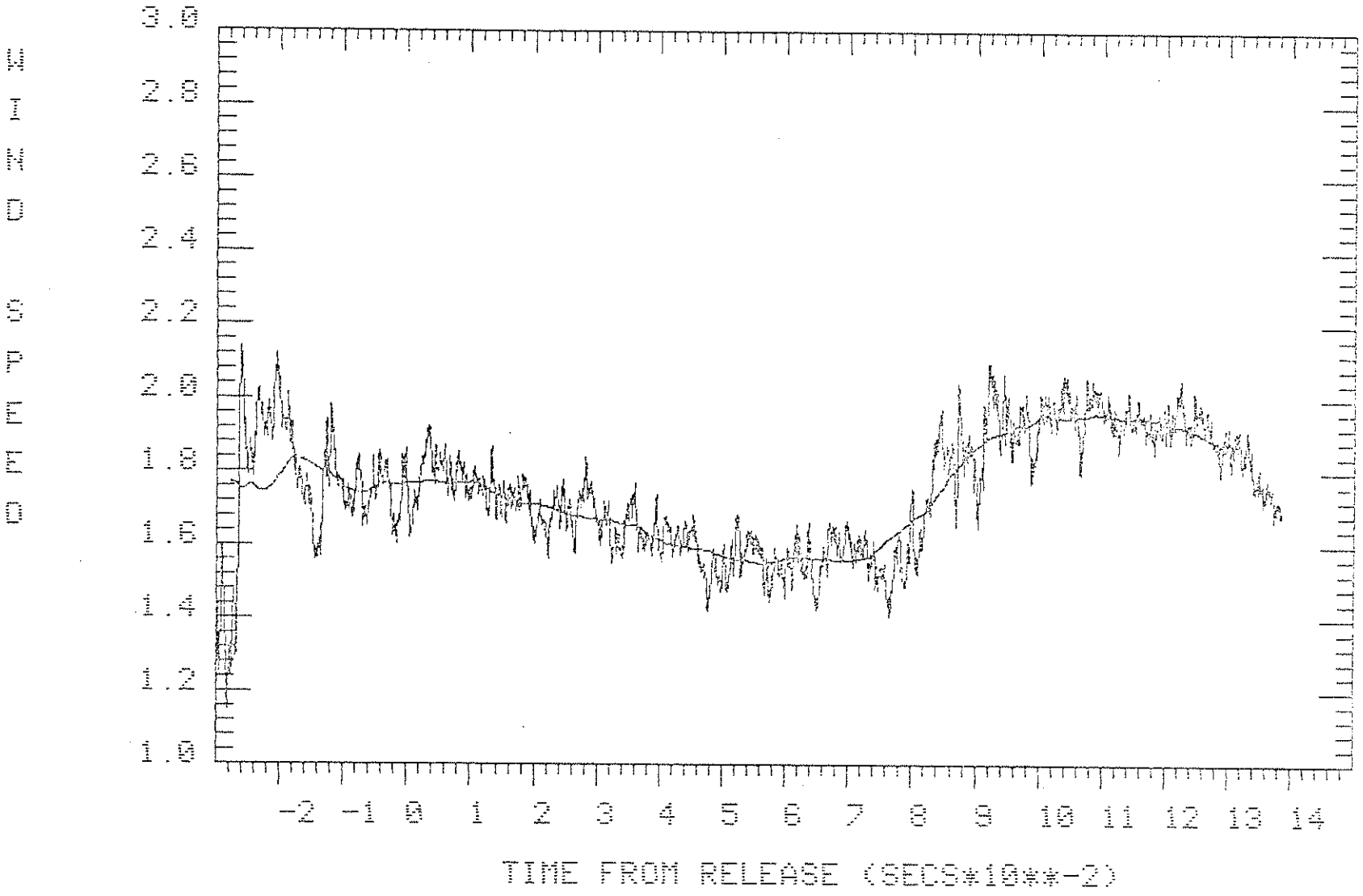
MEAN OF RUN UP: 2.28 MEAN OF RUN DOWN: 0.33



TRIAL: 008 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 9.6 M

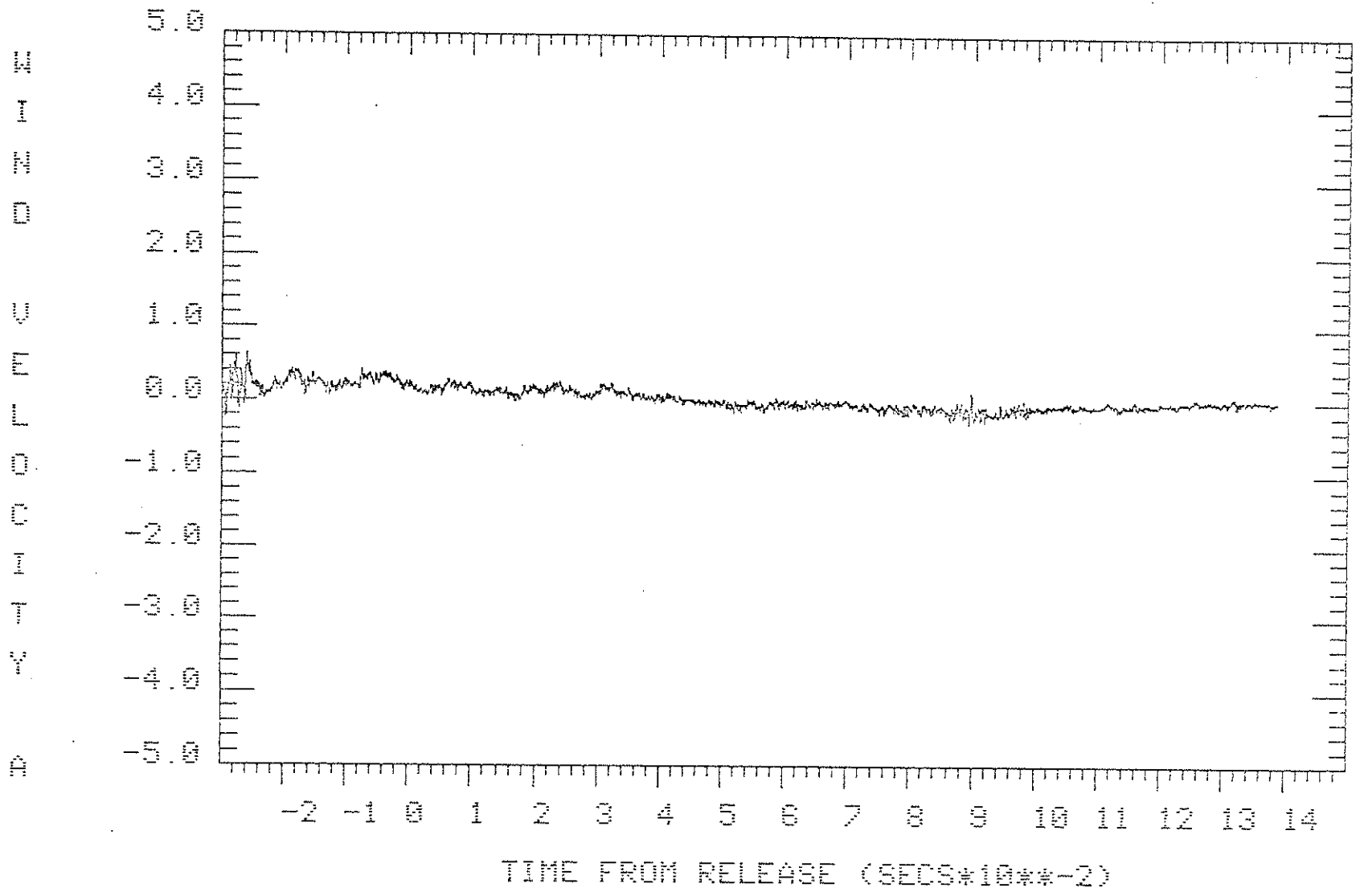
MEAN OF RUN UP: 18.87 MEAN OF RUN DOWN: 17.84



TRIAL: 009 TYPE: WSPD UNITS: M/S

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

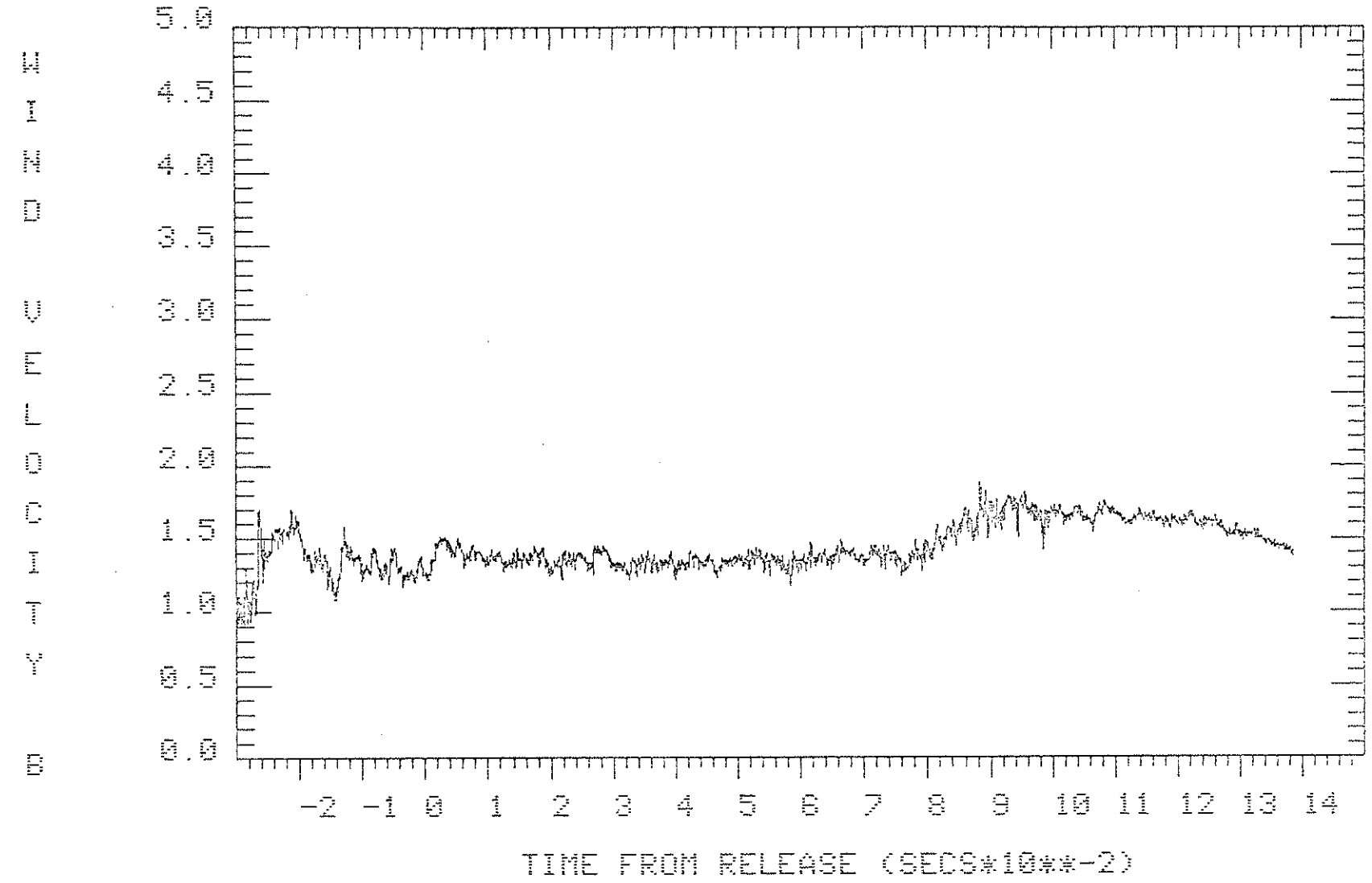
MEAN OF RUN UP: 2.61 MEAN OF RUN DOWN: 0.91



TRIAL: 009 TYPE: UANA UNITS: M/S

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

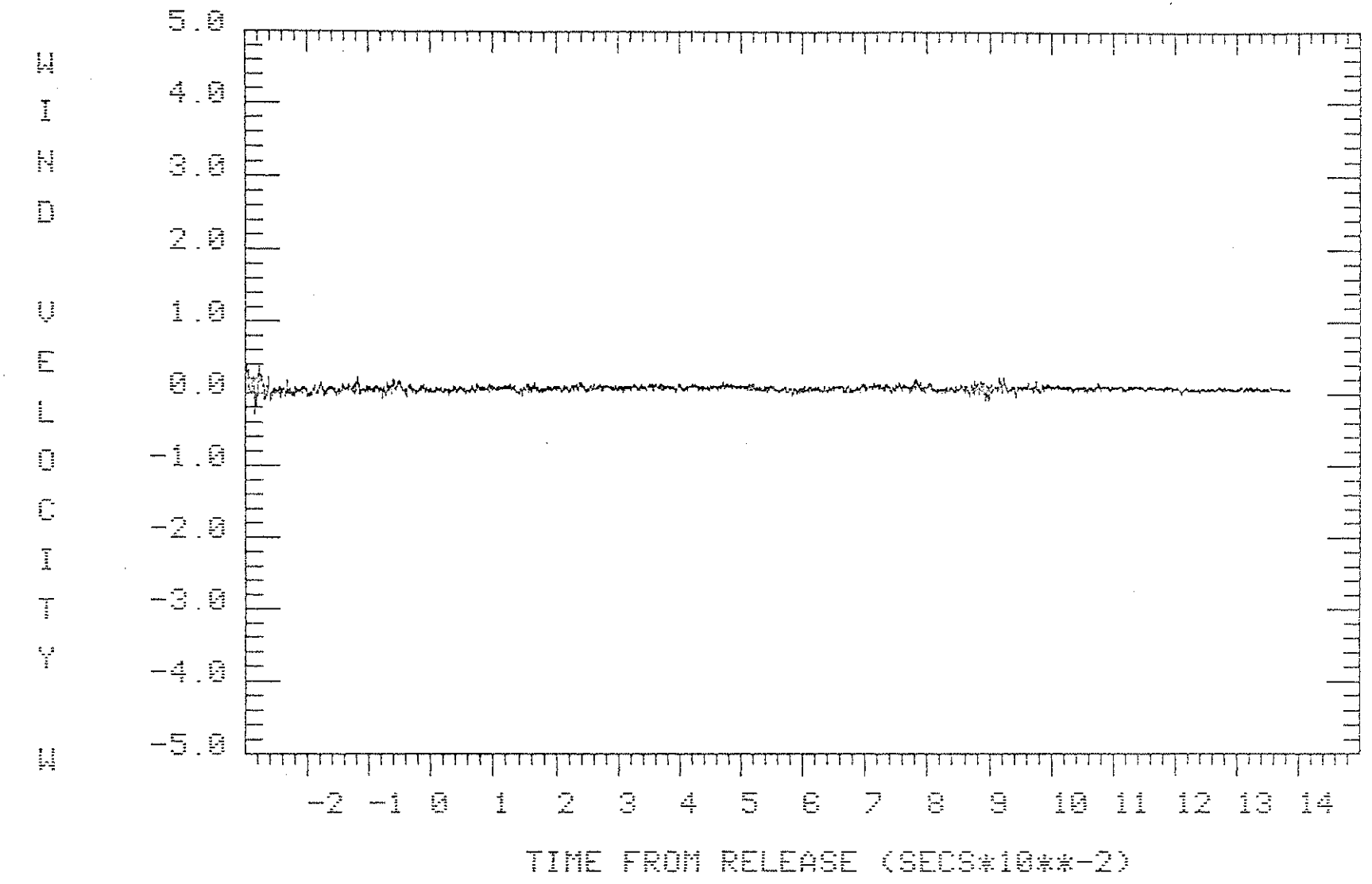
MEAN OF RUN UP: 0.12 MEAN OF RUN DOWN: -0.45



TRIAL: 009 TYPE: UANB UNITS: M/S

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

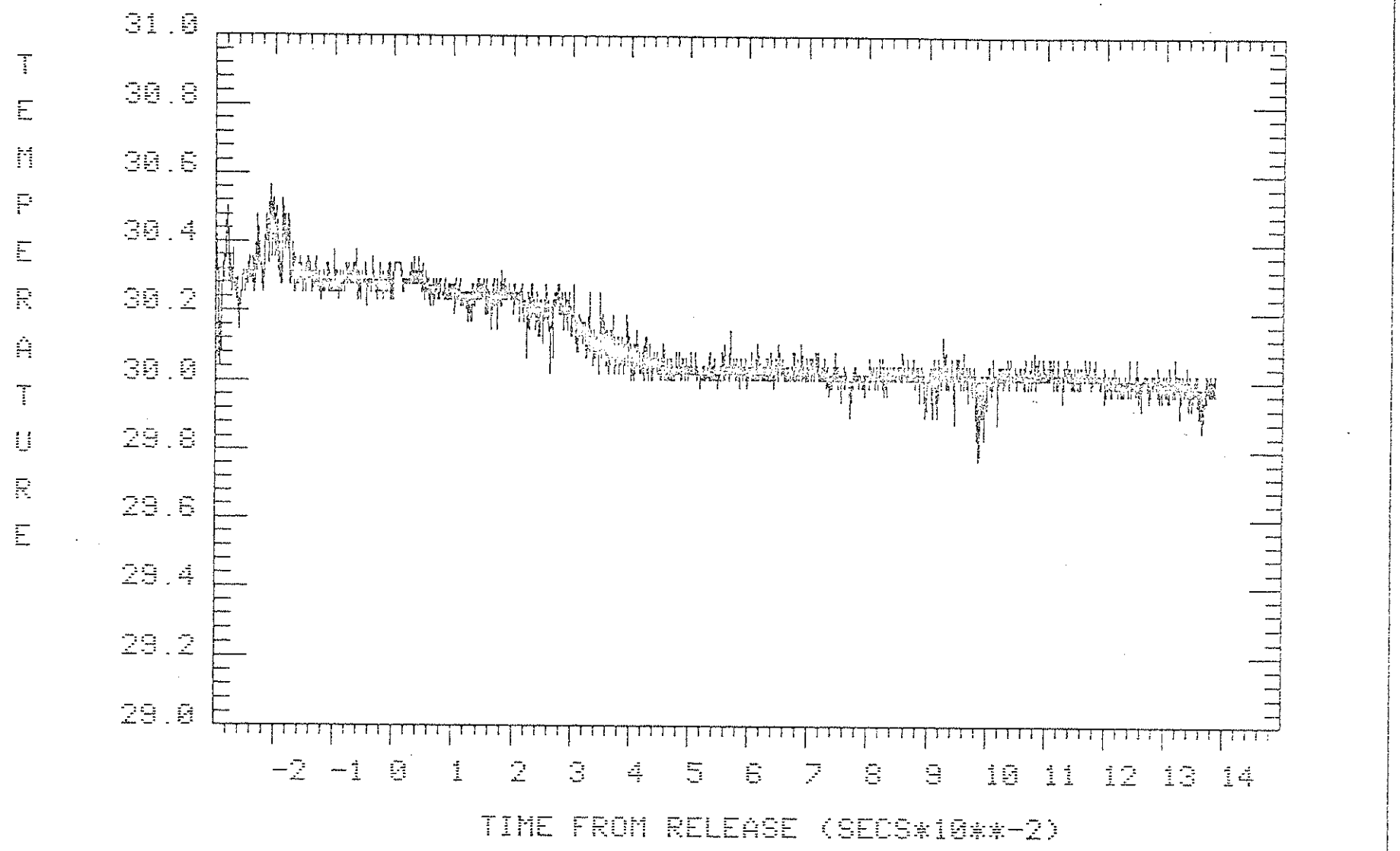
MEAN OF RUN UP: 2.07 MEAN OF RUN DOWN: 0.85



TRIAL: 009 TYPE: UANW UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50.M Z: 10.0 M

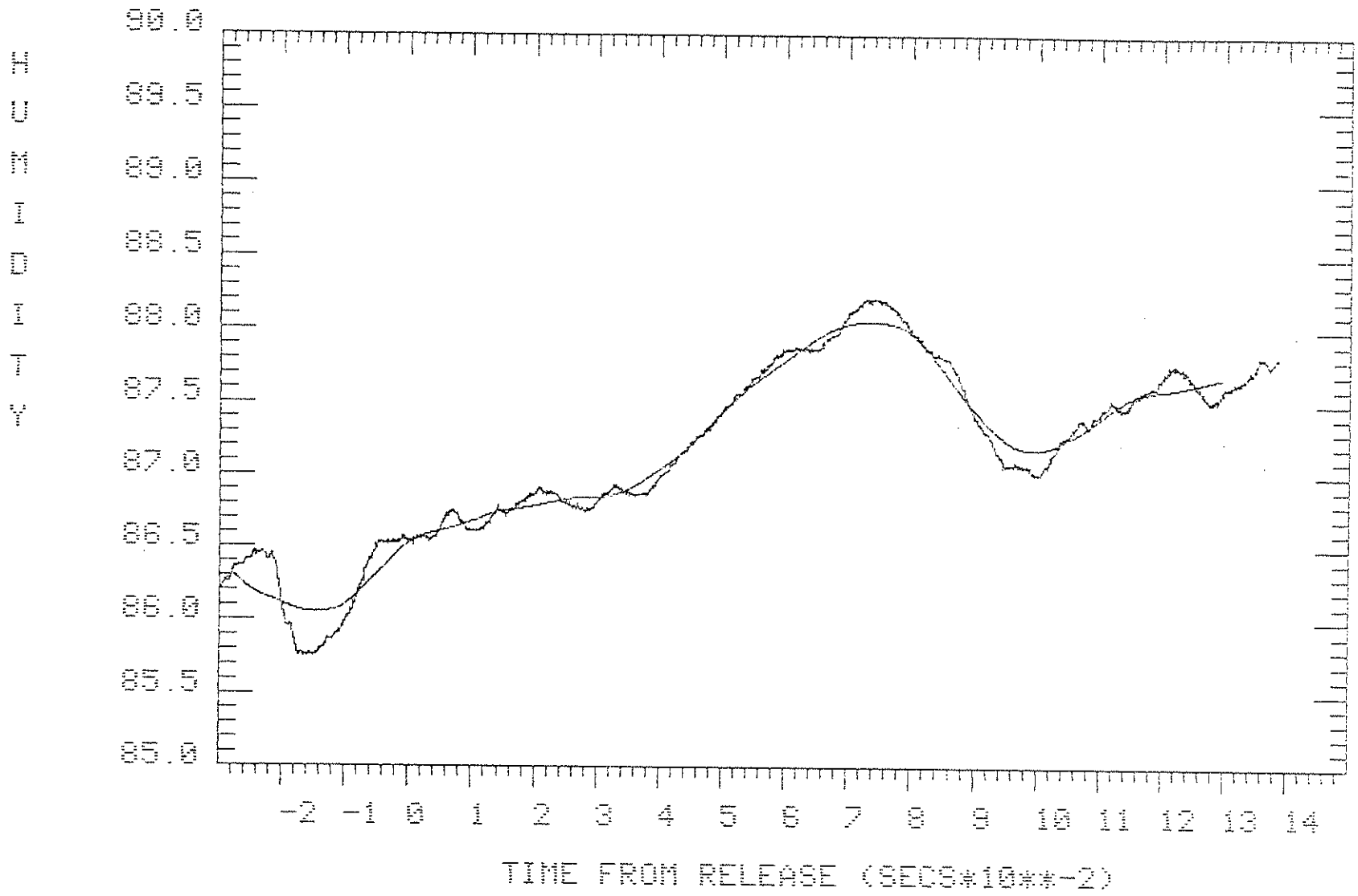
MEAN OF RUN UP: 0.04 MEAN OF RUN DOWN: 0.04



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.5 SEC X: 400 M Y: 50 M Z: 10.0 M

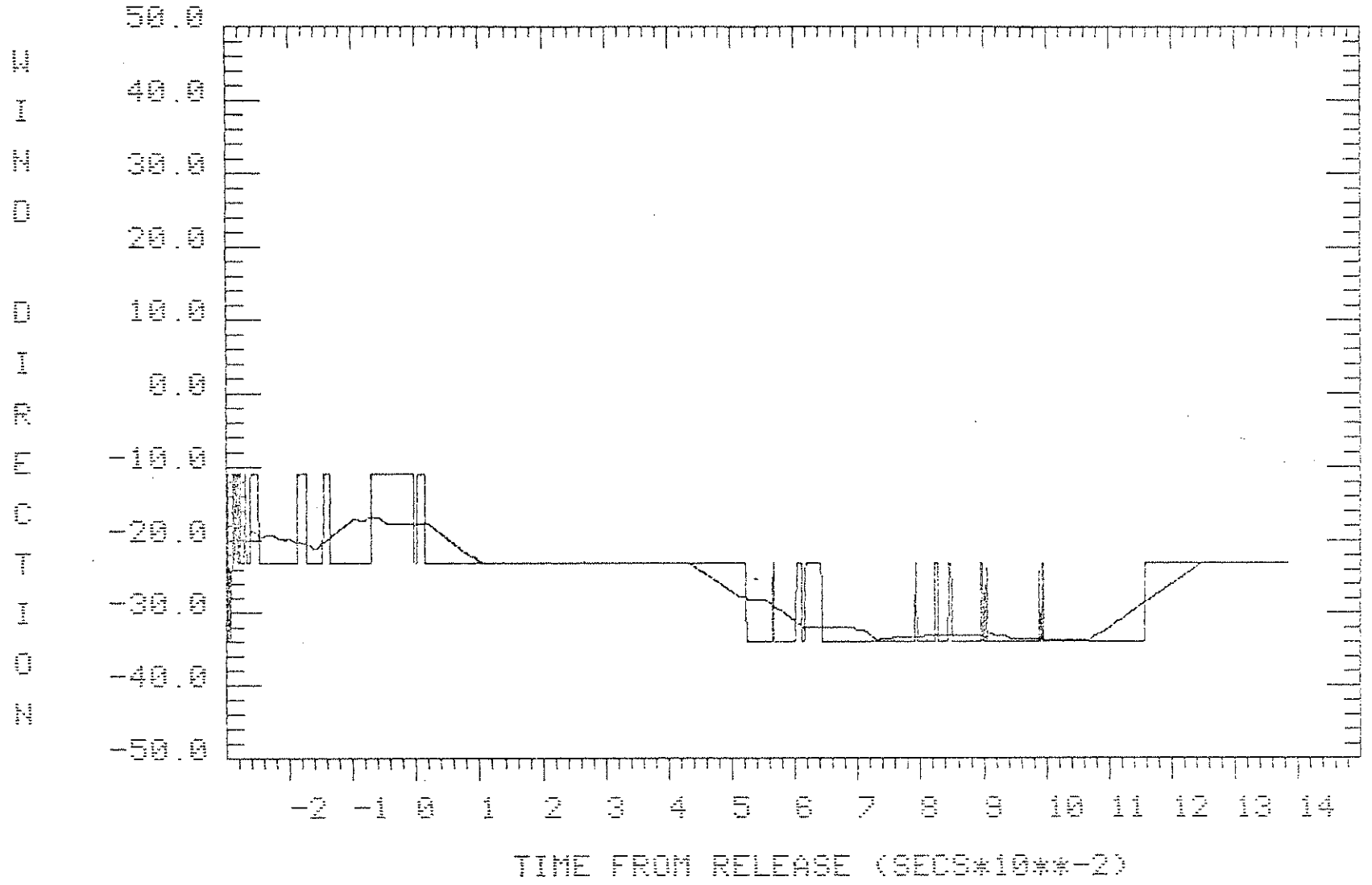
MEAN OF RUN UP: 30.42 MEAN OF RUN DOWN: 29.32



TRIAL: 003 TYPE: RHUM UNITS: PER CENT

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

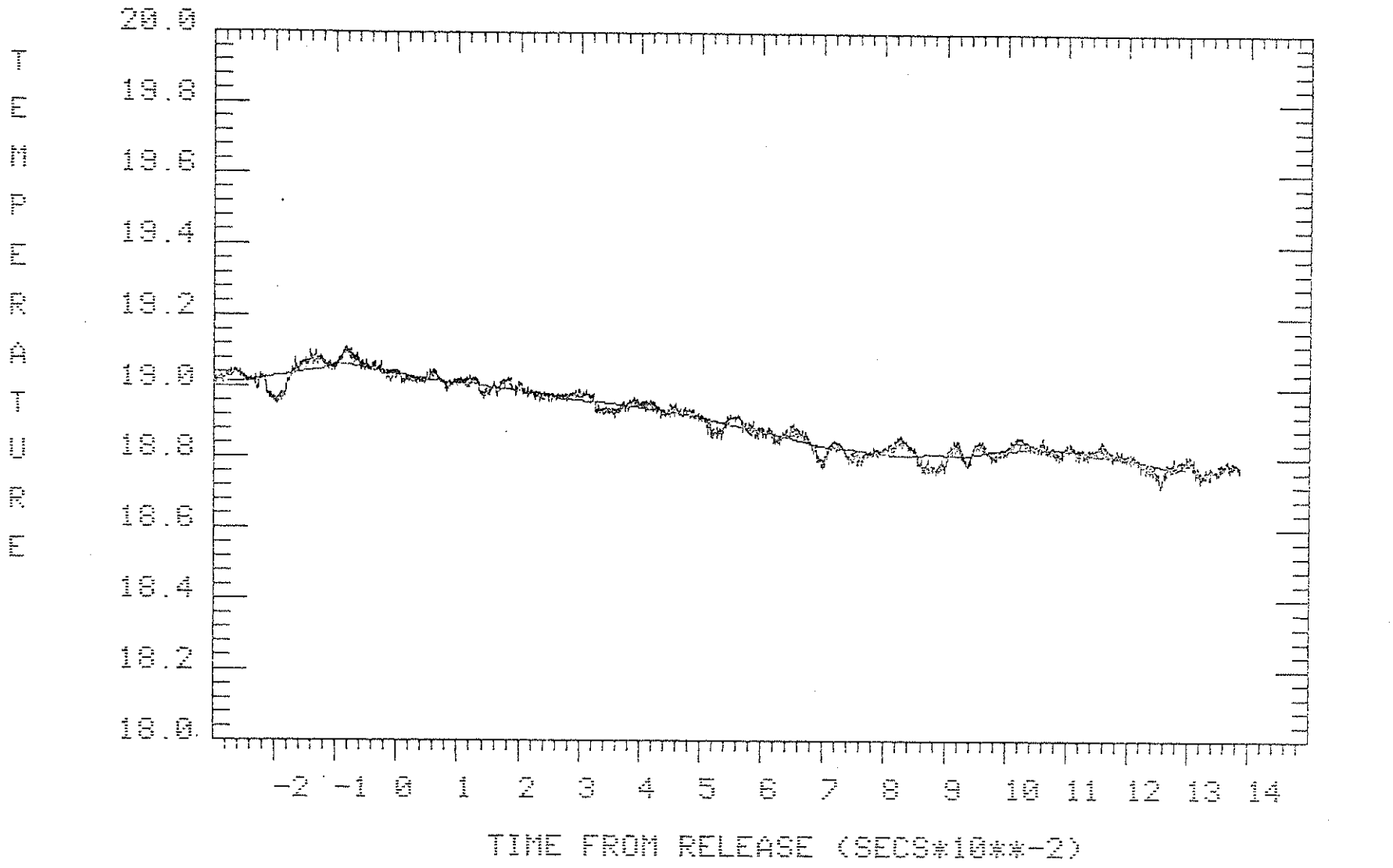
MEAN OF RUN UP: 84.59 MEAN OF RUN DOWN: 92.04



TRIAL: 009 TYPE: WHDG UNITS: DEGREES

AVERAGING TIME: 0.8 SEC X: 400 M Y: 50 M Z: 10.0 M

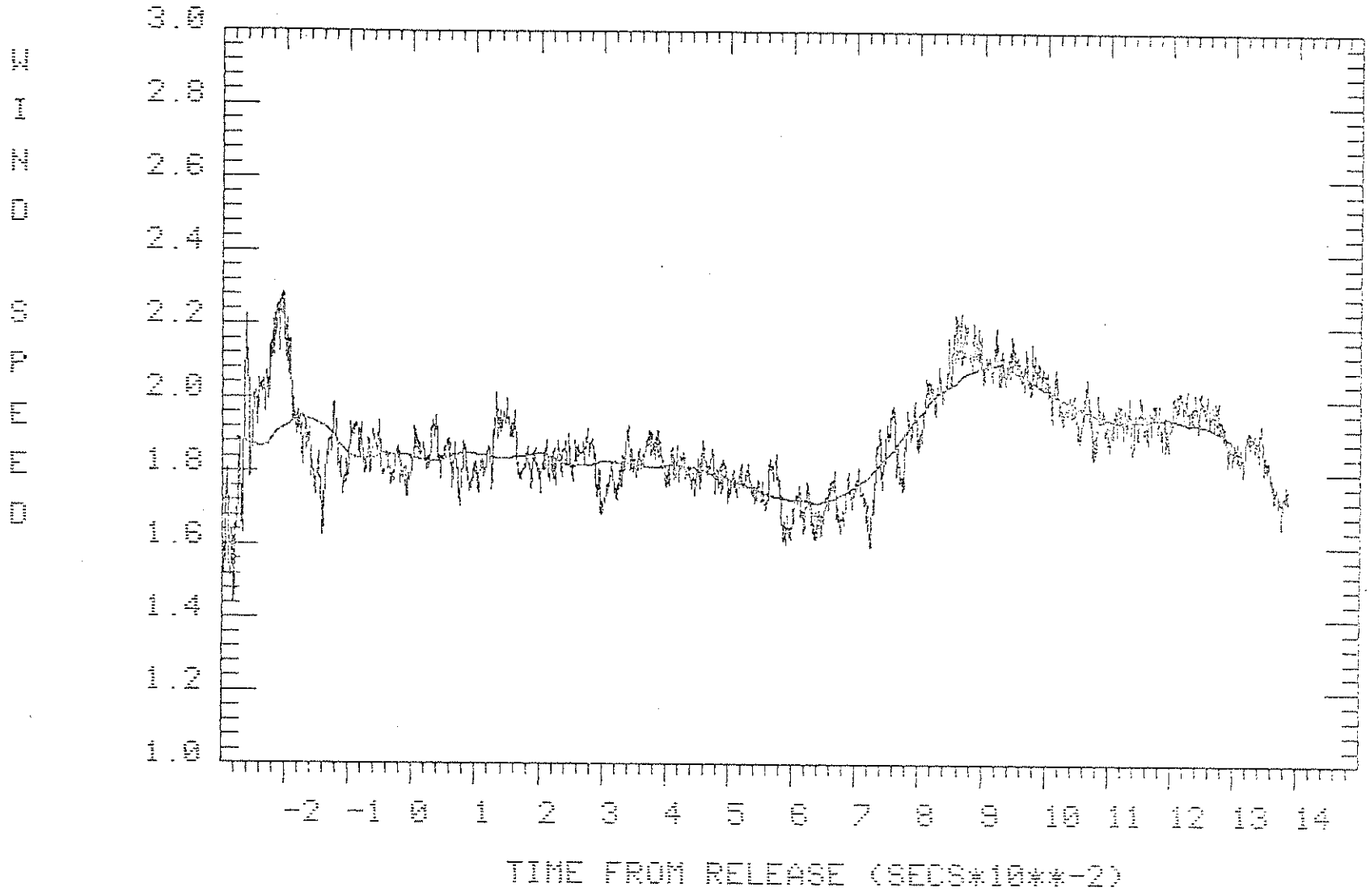
MEAN OF RUN UP: -23.78 MEAN OF RUN DOWN: -57.67



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 18.0 M

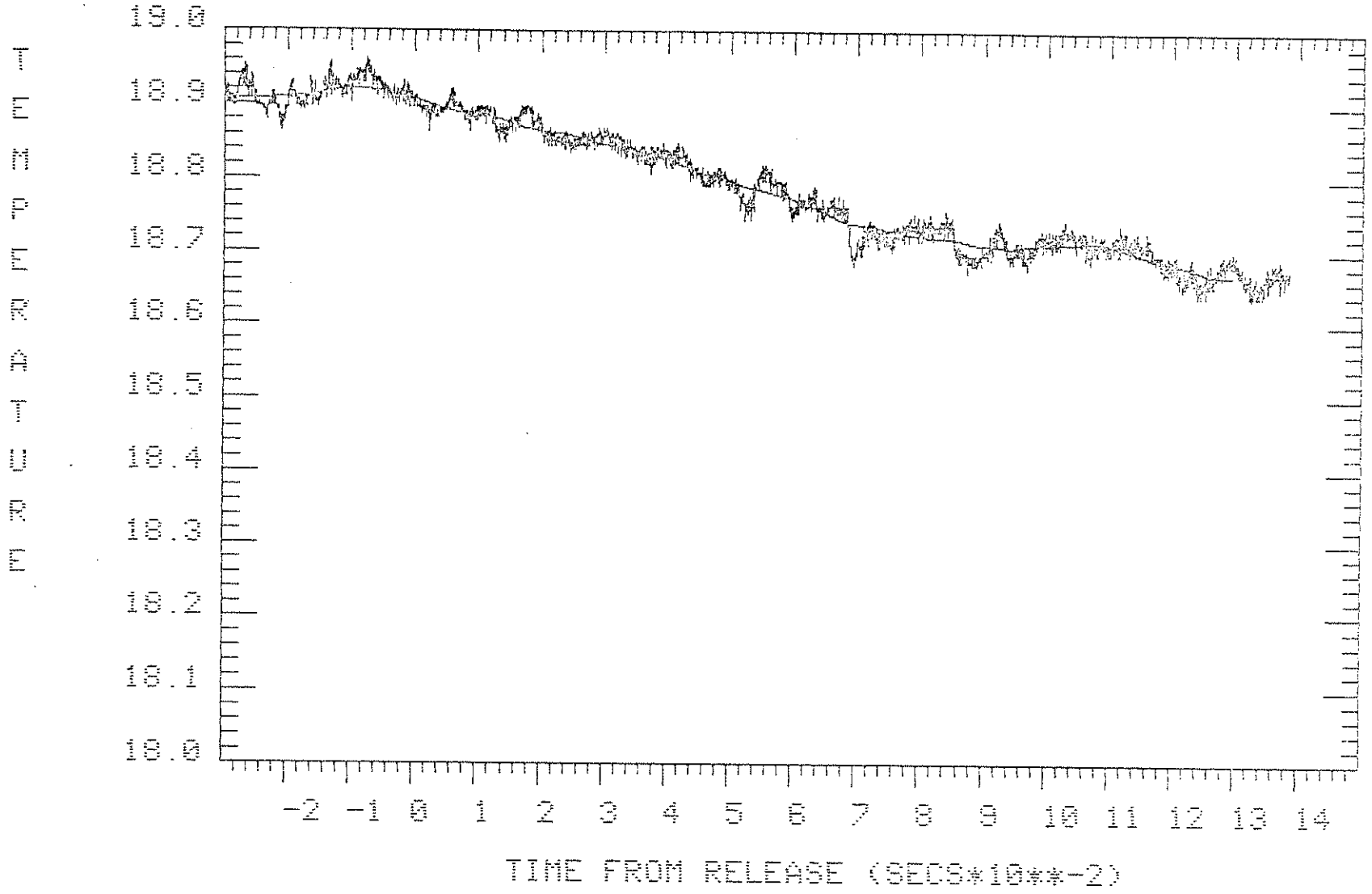
MEAN OF RUN UP: 19.25 MEAN OF RUN DOWN: 18.27



TRIAL: 009 TYPE: WSPD UNITS: M/S

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 17.3 M

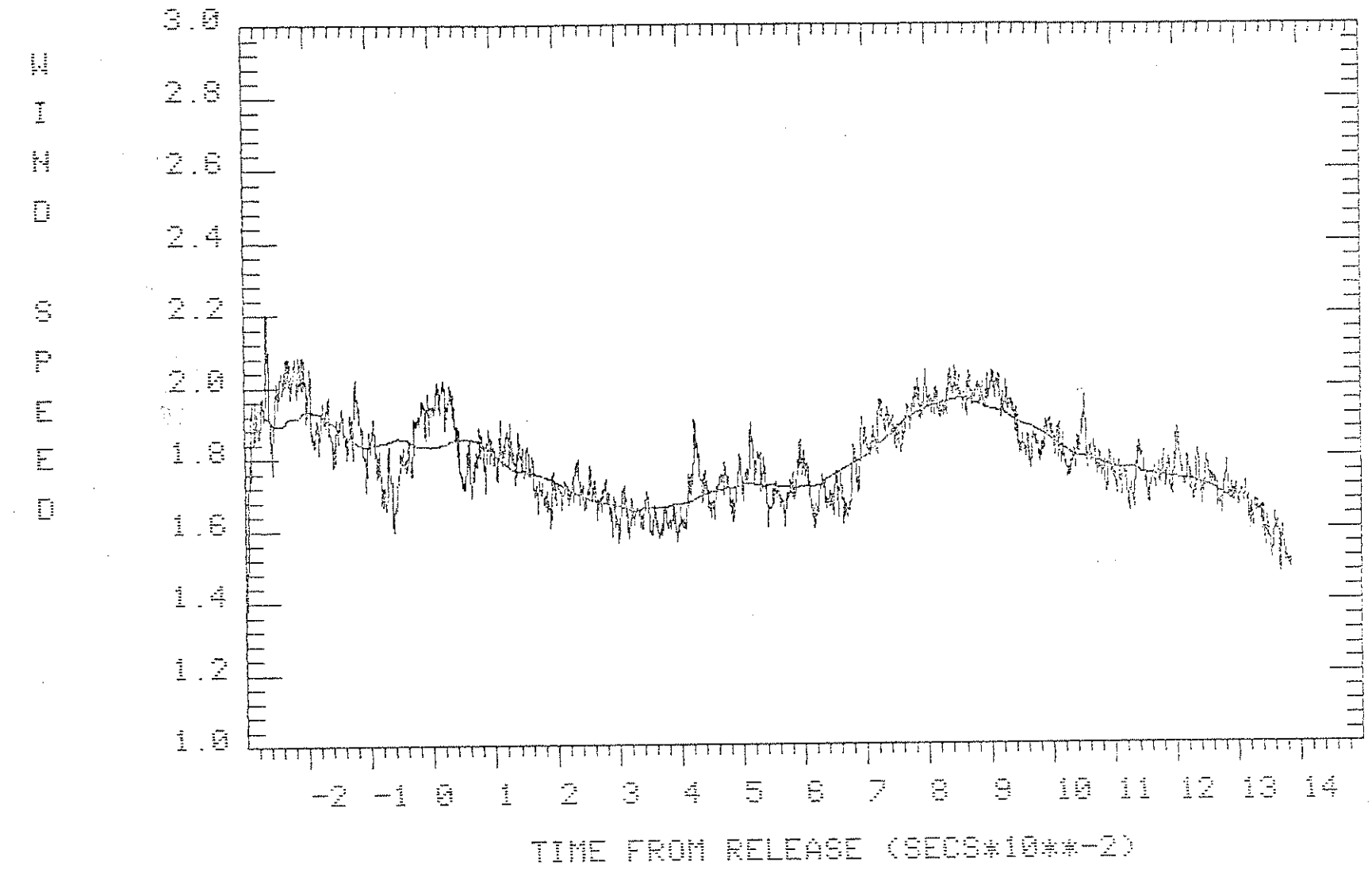
MEAN OF RUN UP: 2.79 MEAN OF RUN DOWN: 1.18



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 50 M Z: 22.0 M

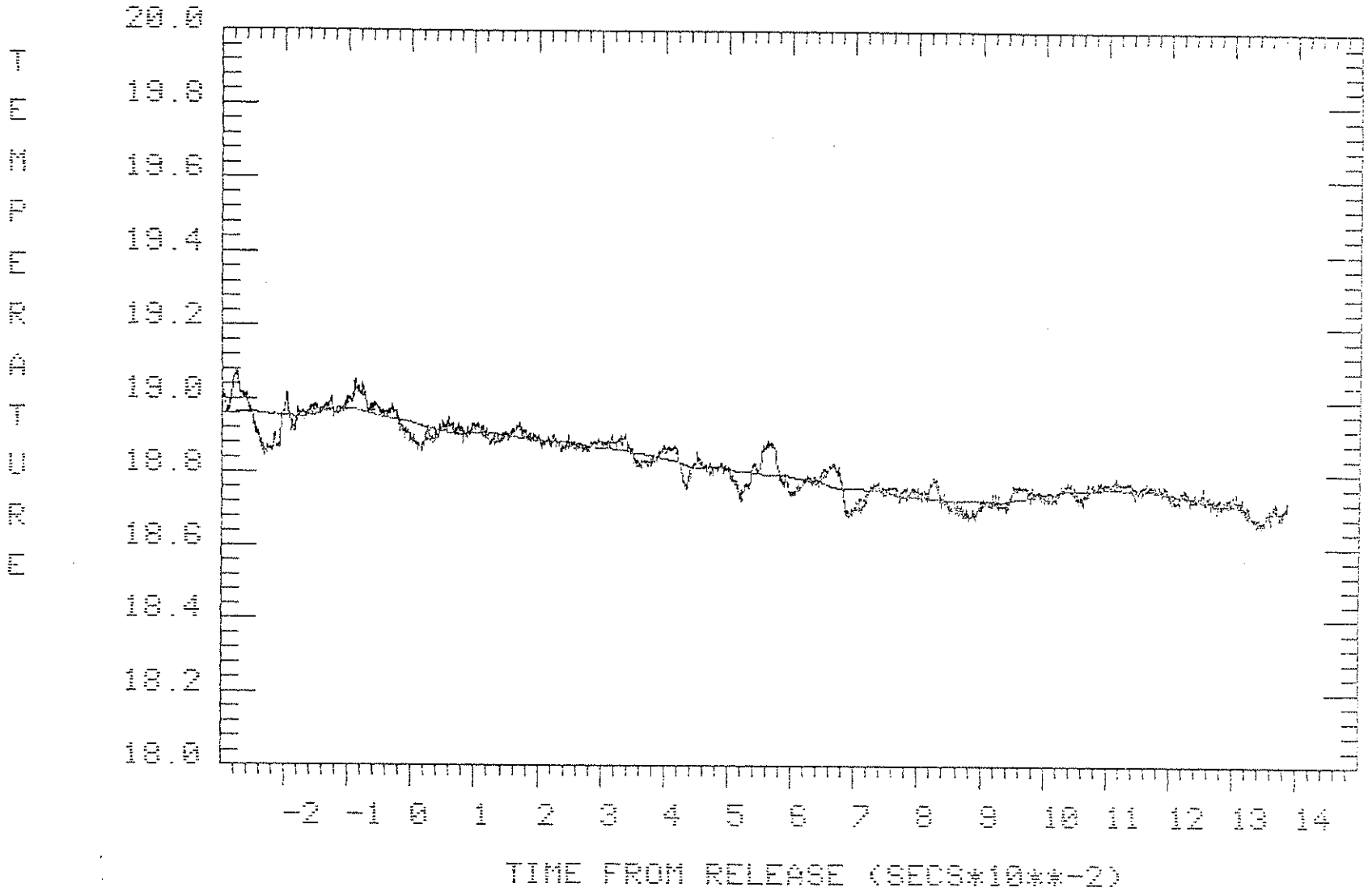
MEAN OF RUN UP: 19.15 MEAN OF RUN DOWN: 18.24



TRIAL: 009 TYPE: WSPD UNITS: M/S

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

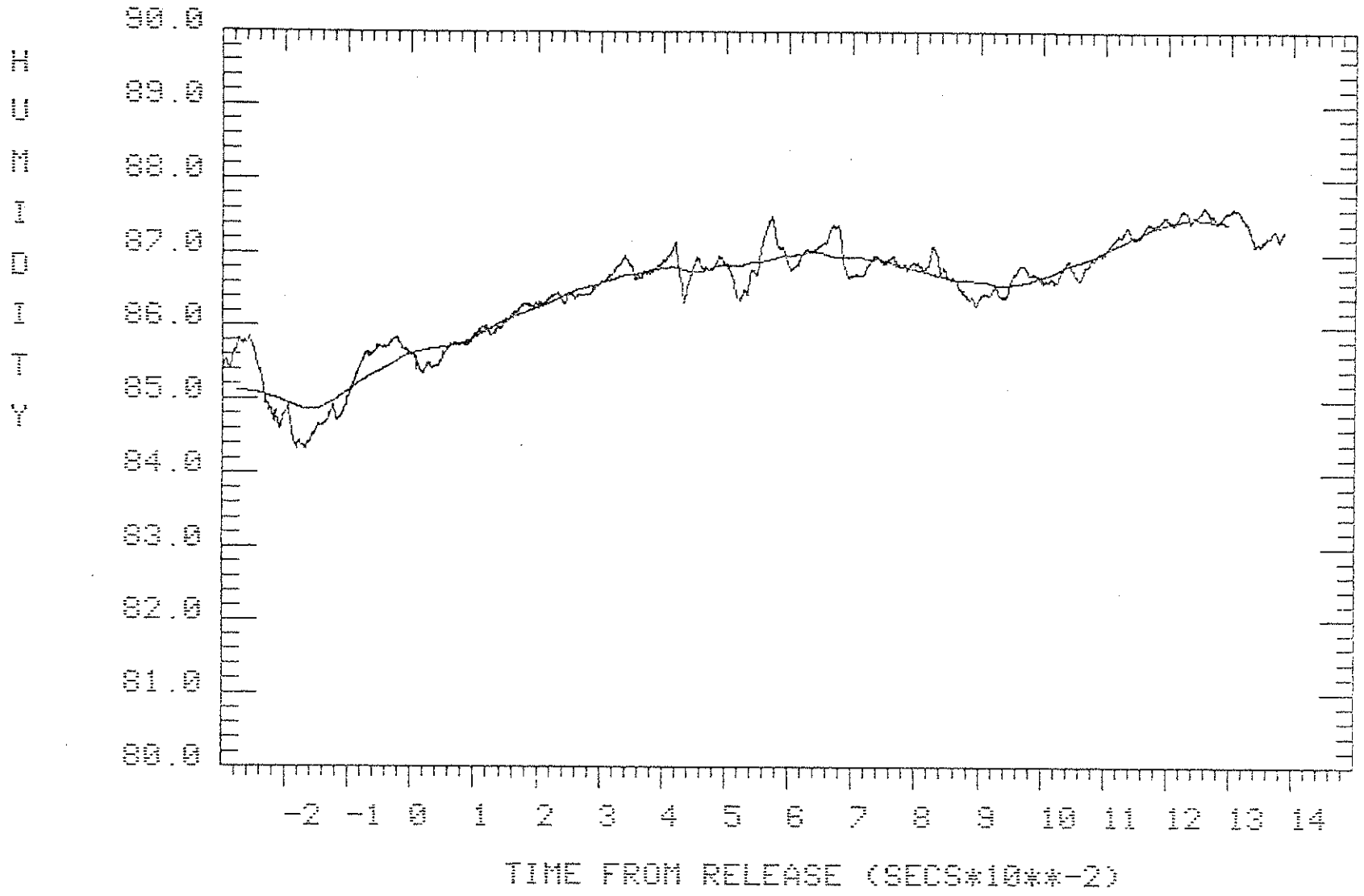
MEAN OF RUN UP: 2.79 MEAN OF RUN DOWN: 1.30



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

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

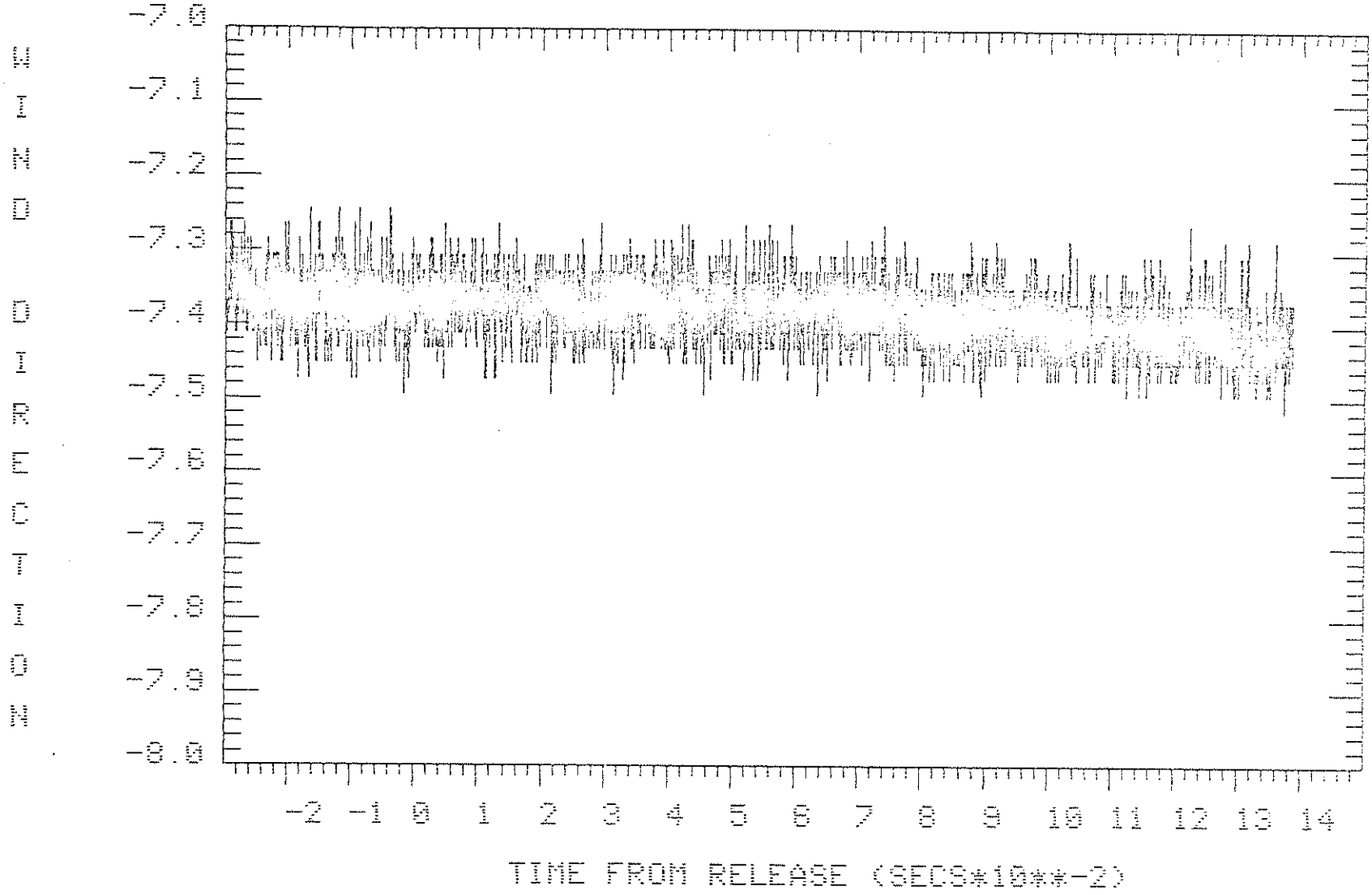
MEAN OF RUN UP: 19.23 MEAN OF RUN DOWN: 18.35



TRIAL: 009 TYPE: RHUM UNITS: PER CENT

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

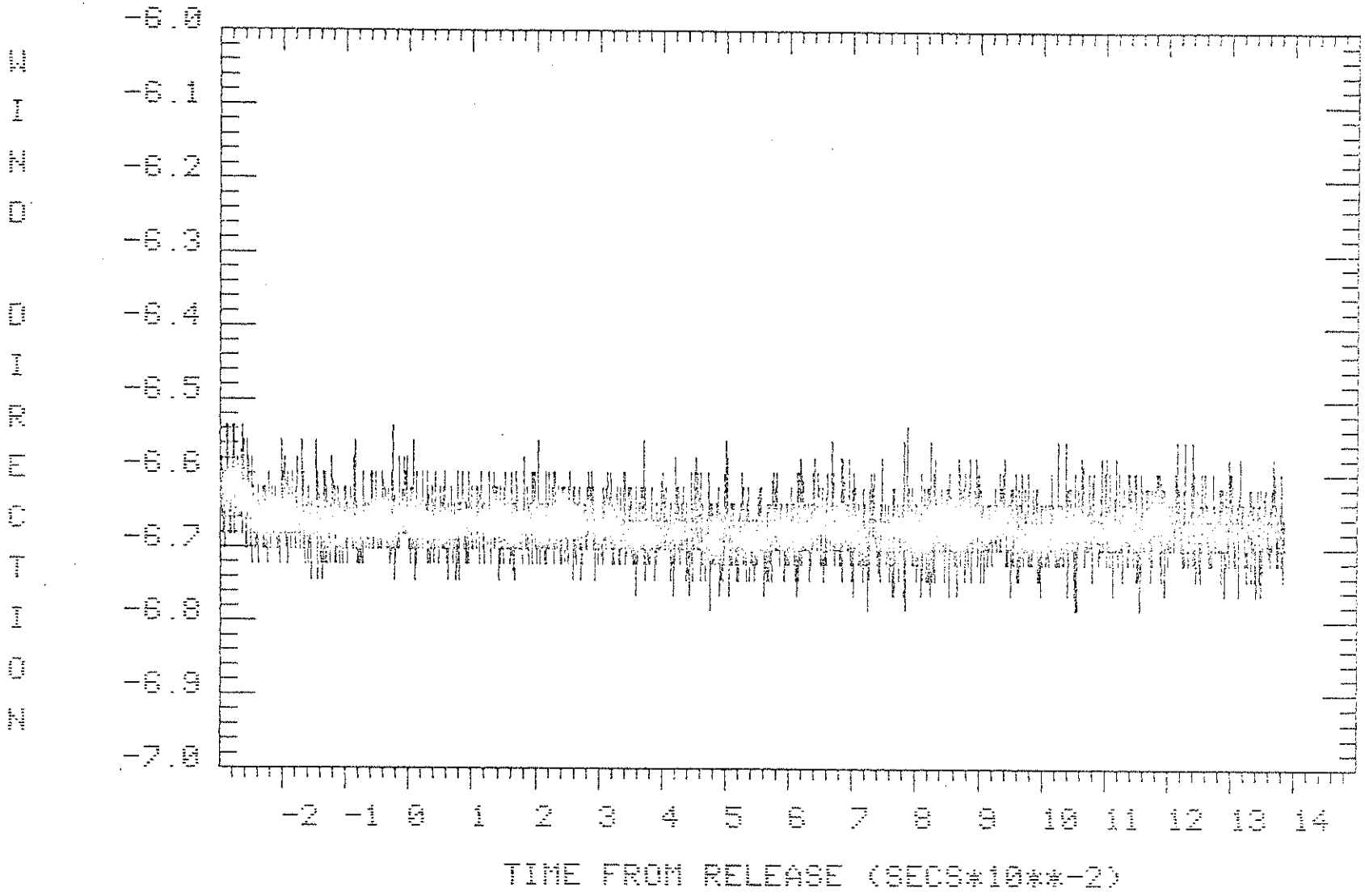
MEAN OF RUN UP: 78.59 MEAN OF RUN DOWN: 90.36



TRIAL: 009 TYPE: WMDG UNITS: DEGREES

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

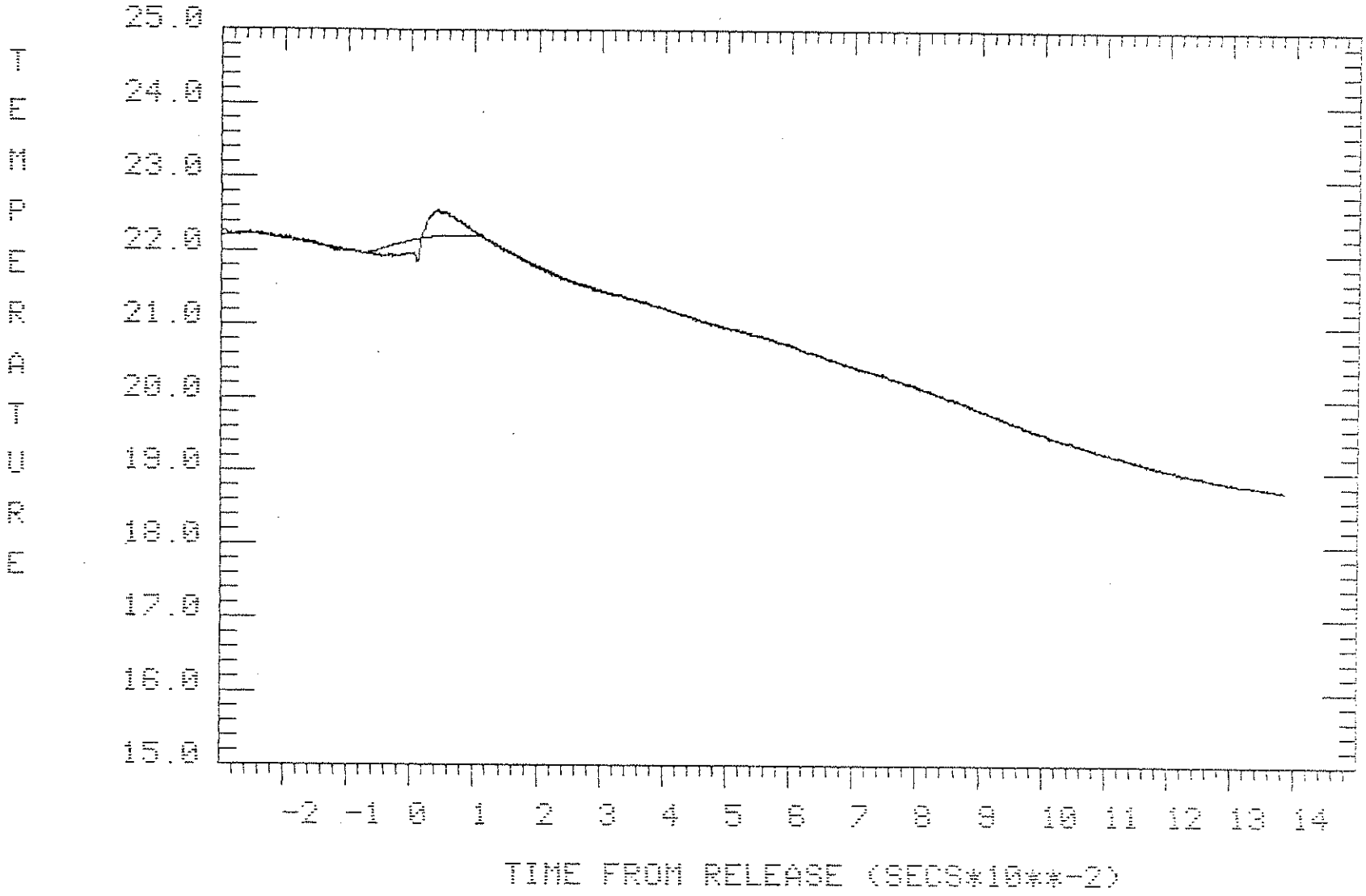
MEAN OF RUN UP: -11.28 MEAN OF RUN DOWN: -7.47



TRIAL: 009 TYPE: WHDG UNITS: DEGREES

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

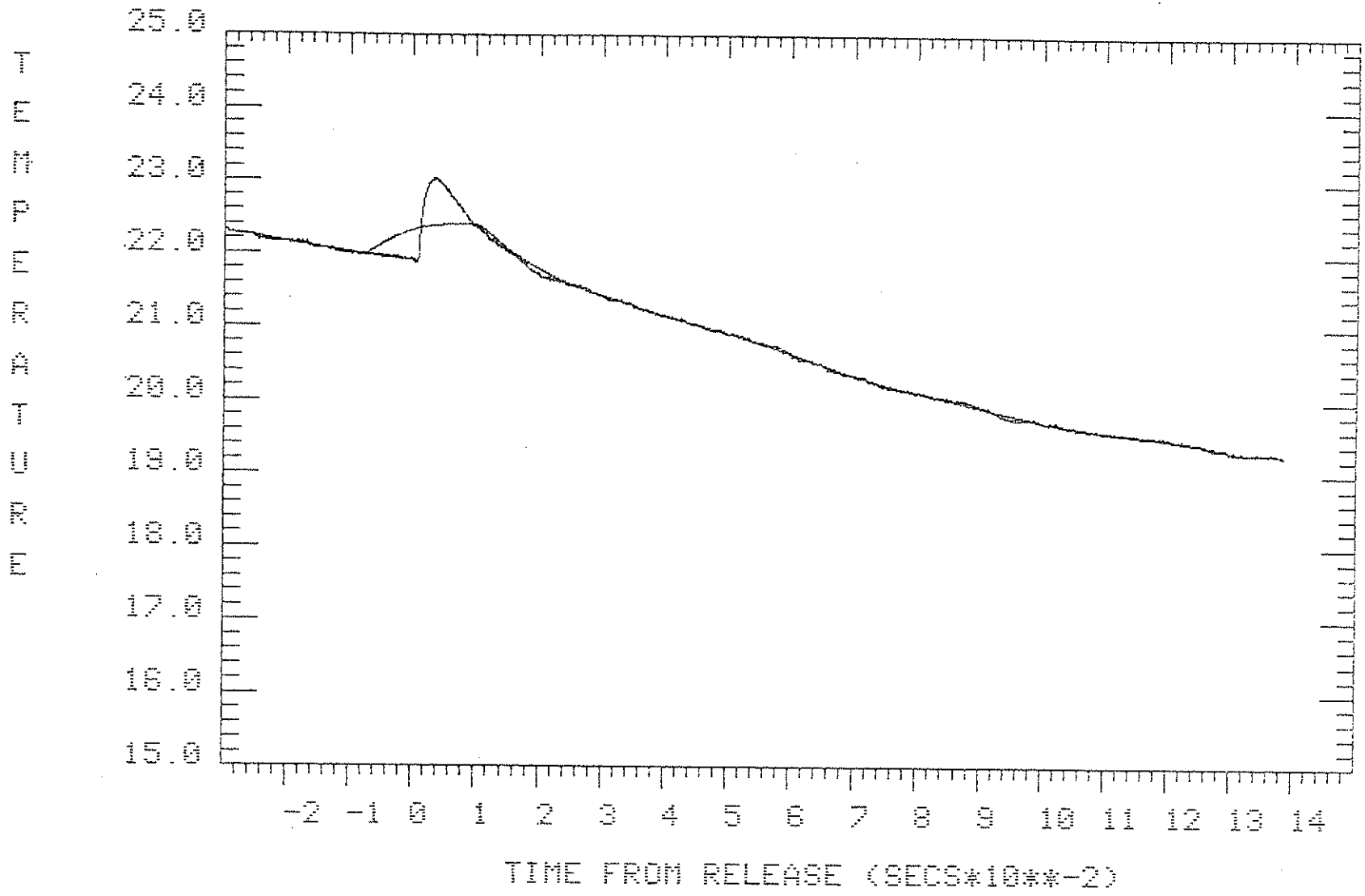
MEAN OF RUN UP: -6.65 MEAN OF RUN DOWN: -6.66



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

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

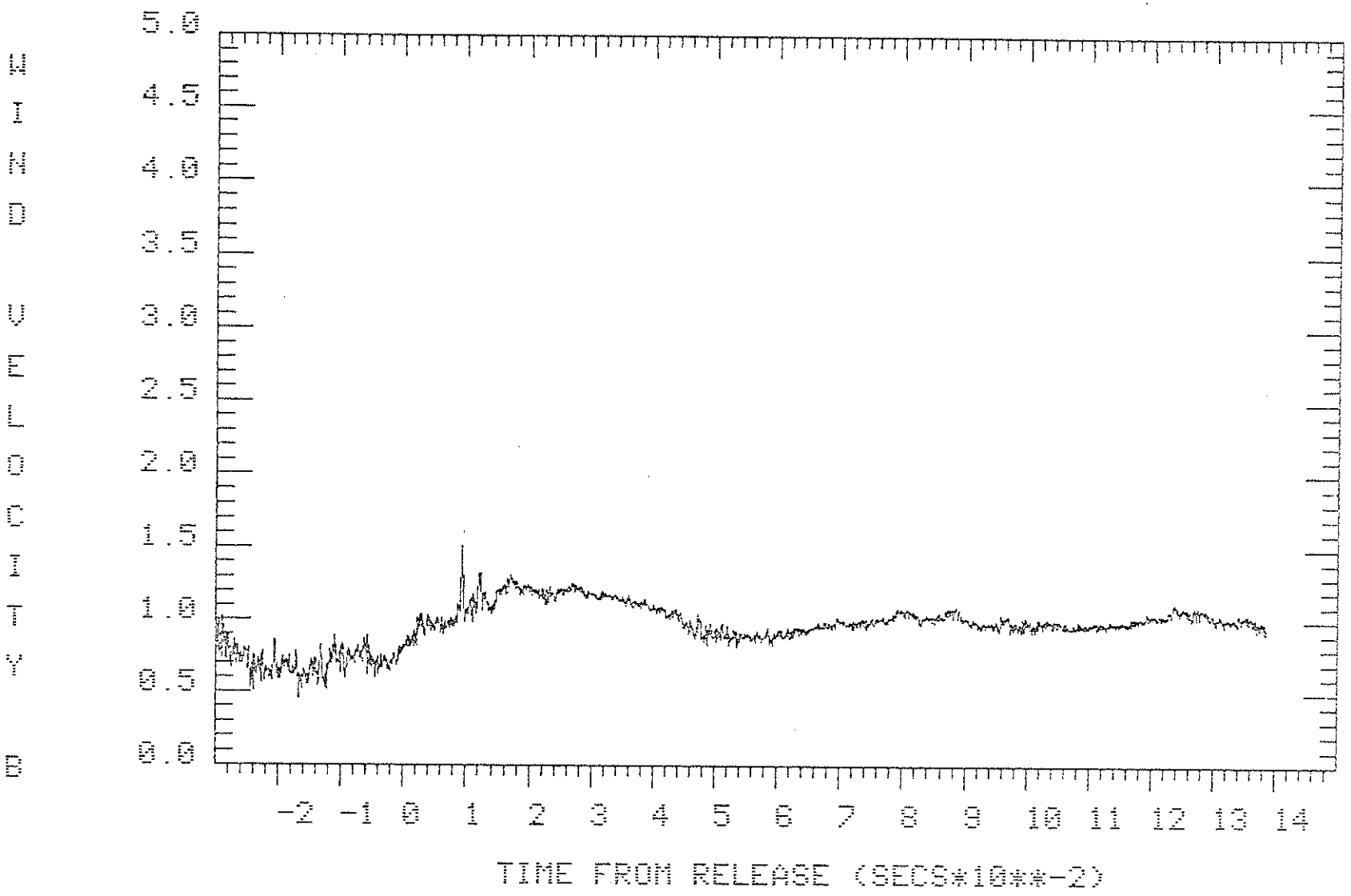
MEAN OF RUN UP: 23.29 MEAN OF RUN DOWN: 17.05



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.6 SEC X: 400 M Y: 200 M Z: 12.0 M

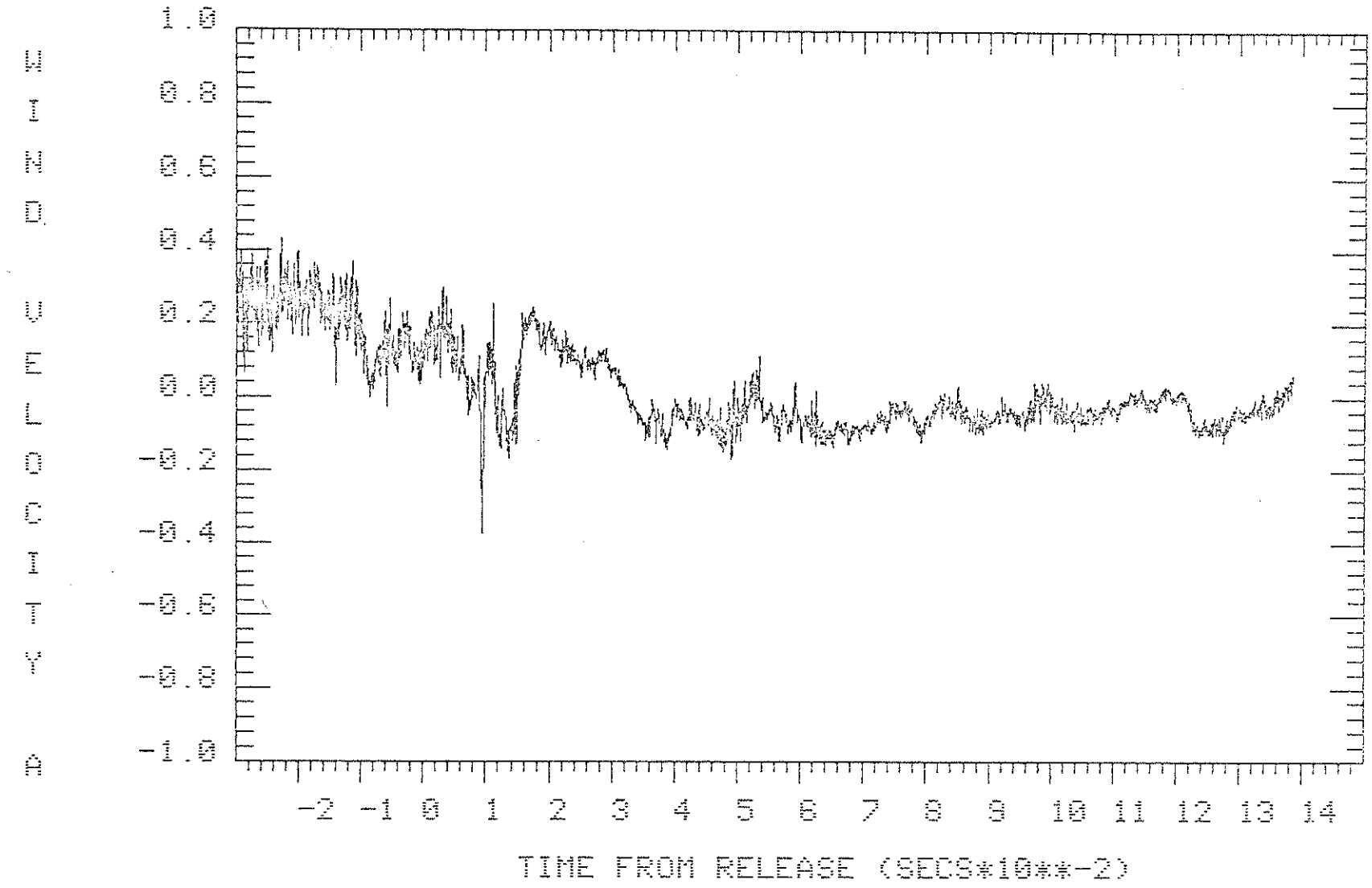
MEAN OF RUN UP: 23.36 MEAN OF RUN DOWN: 18.22



TRIAL: 009 TYPE: UANB UNITS: M/S

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

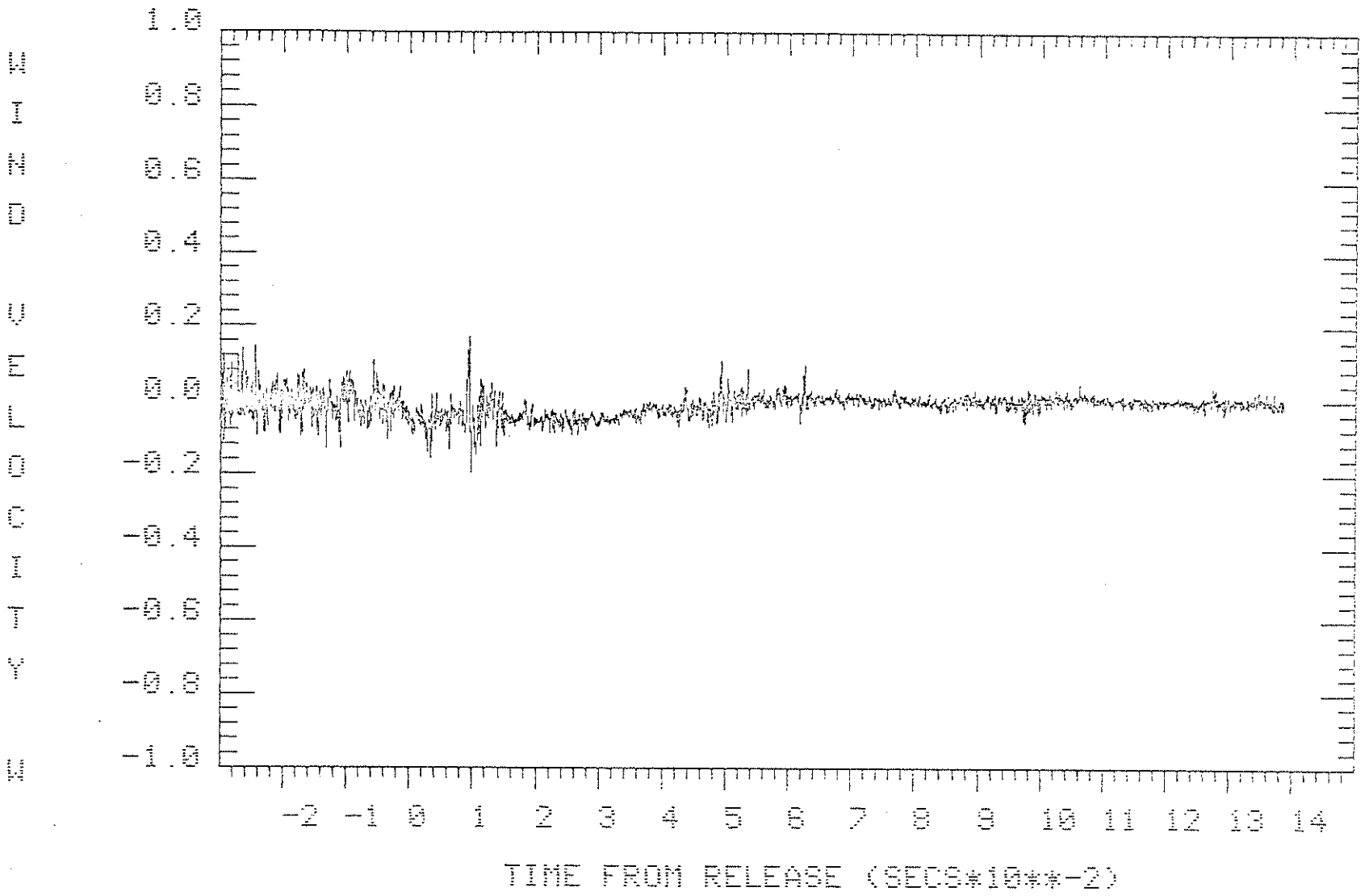
MEAN OF RUN UP: 1.46 MEAN OF RUN DOWN: -0.01



TRIAL: 009 TYPE: UANA UNITS: M/S

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

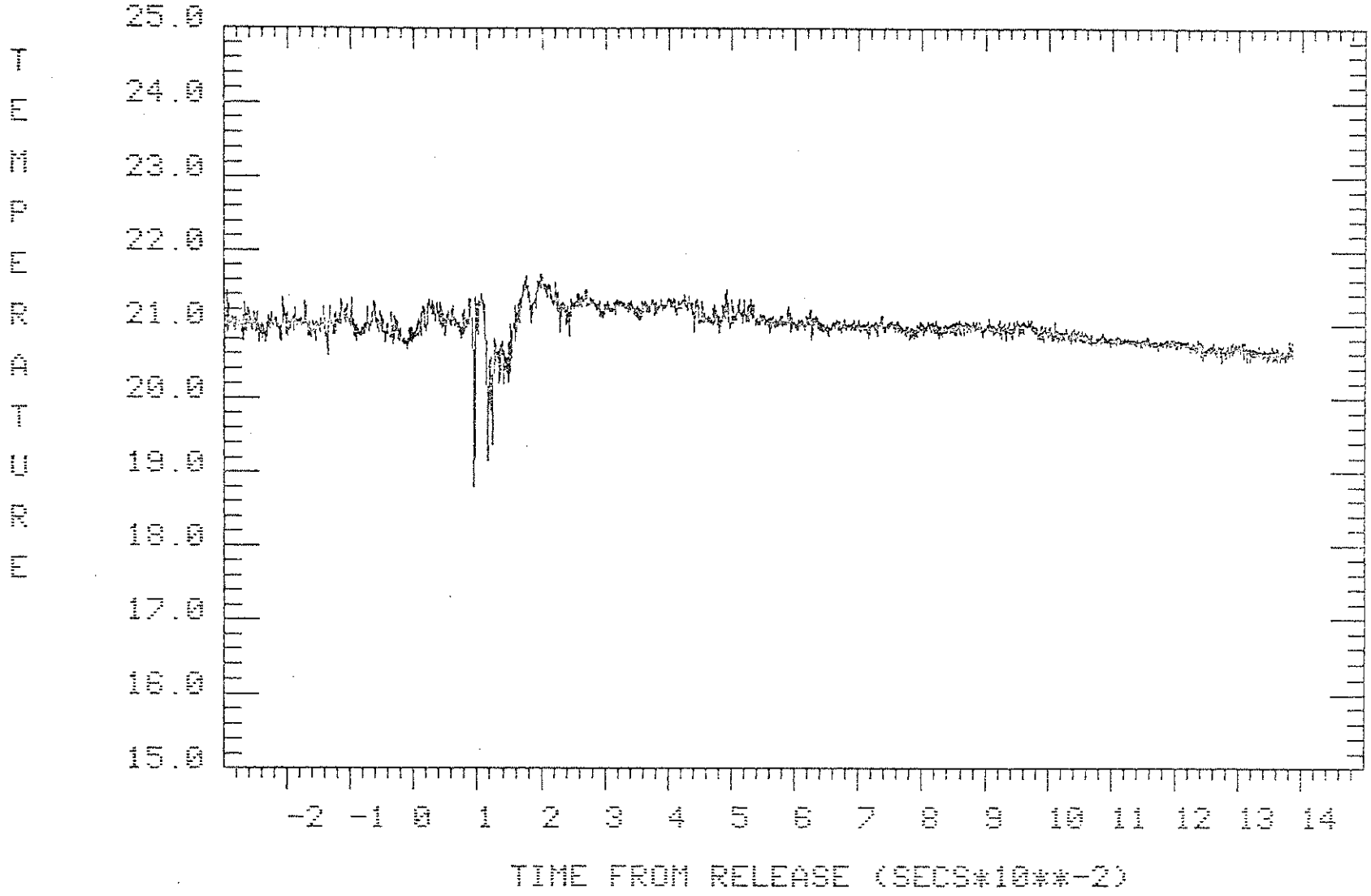
MEAN OF RUN UP: 0.09 MEAN OF RUN DOWN: 0.02



TRIAL: 009 TYPE: UAMW UNITS: M/S

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

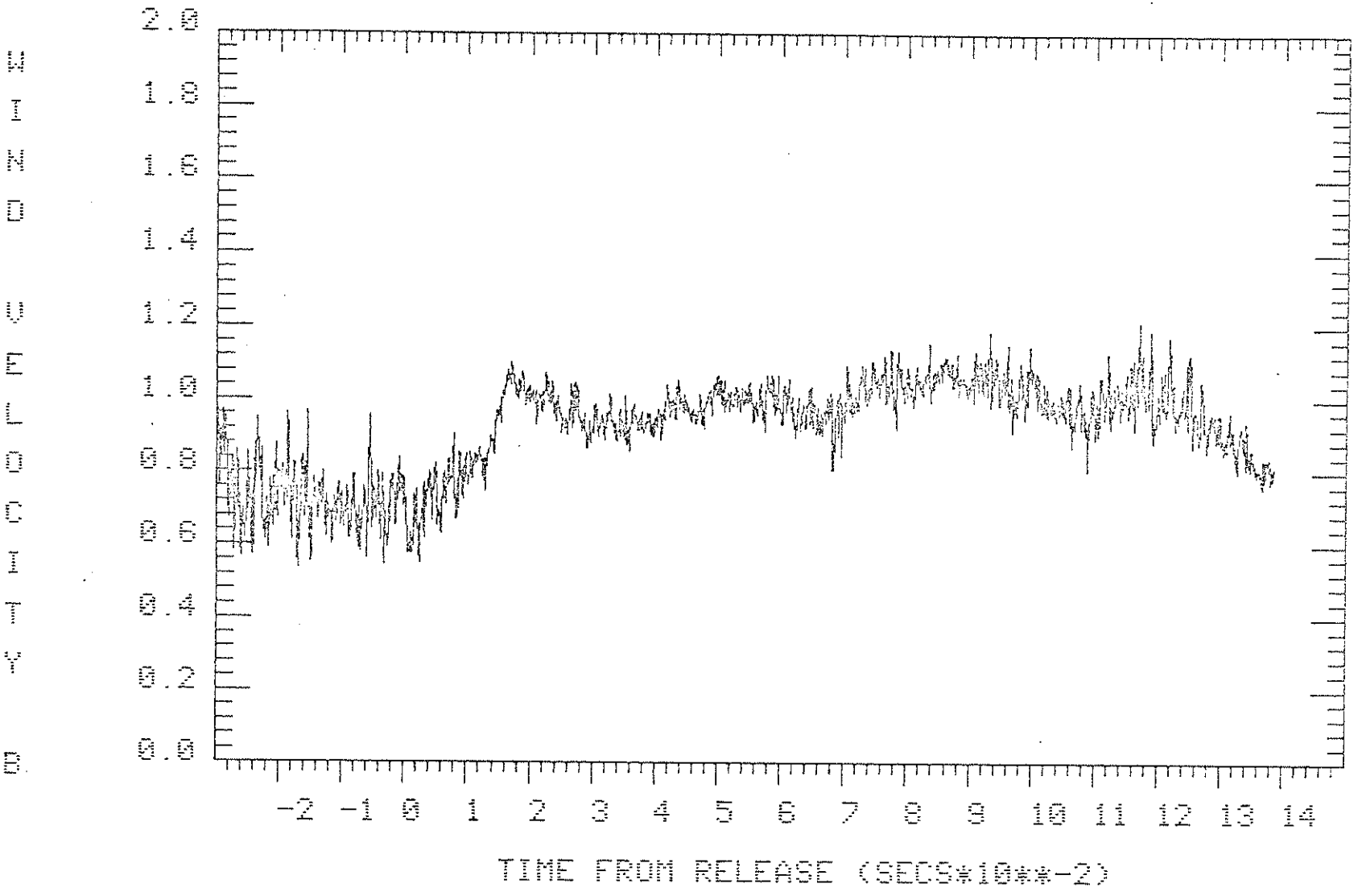
MEAN OF RUN UP: -0.03 MEAN OF RUN DOWN: 0.03



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

AVERAGING TIME: 0.8 SEC X: 300 M Y: 350 M Z: 2.0 M

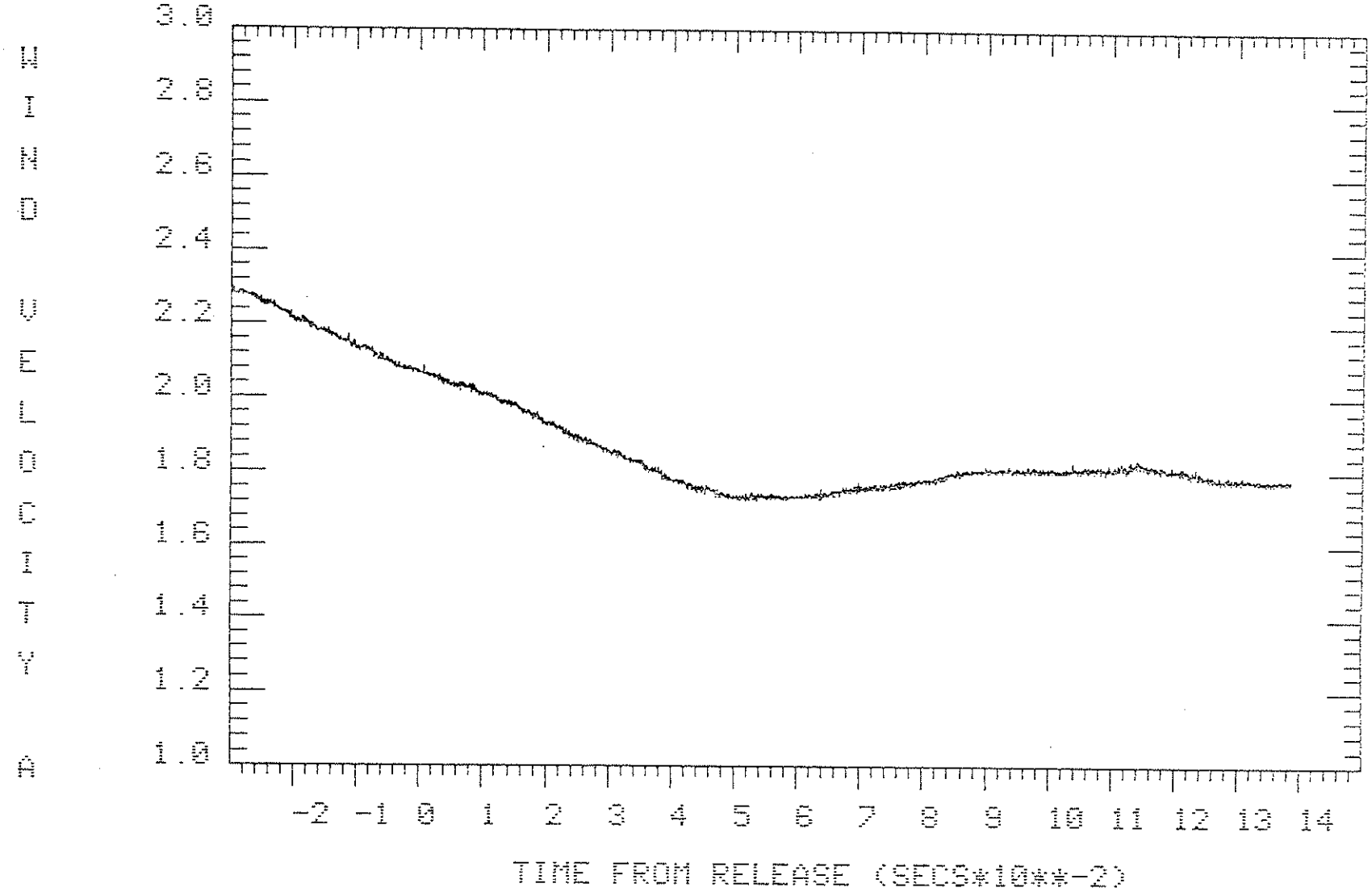
MEAN OF RUN UP: 21.63 MEAN OF RUN DOWN: 19.02



TRIAL: 009 TYPE: UANB UNITS: M/S

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

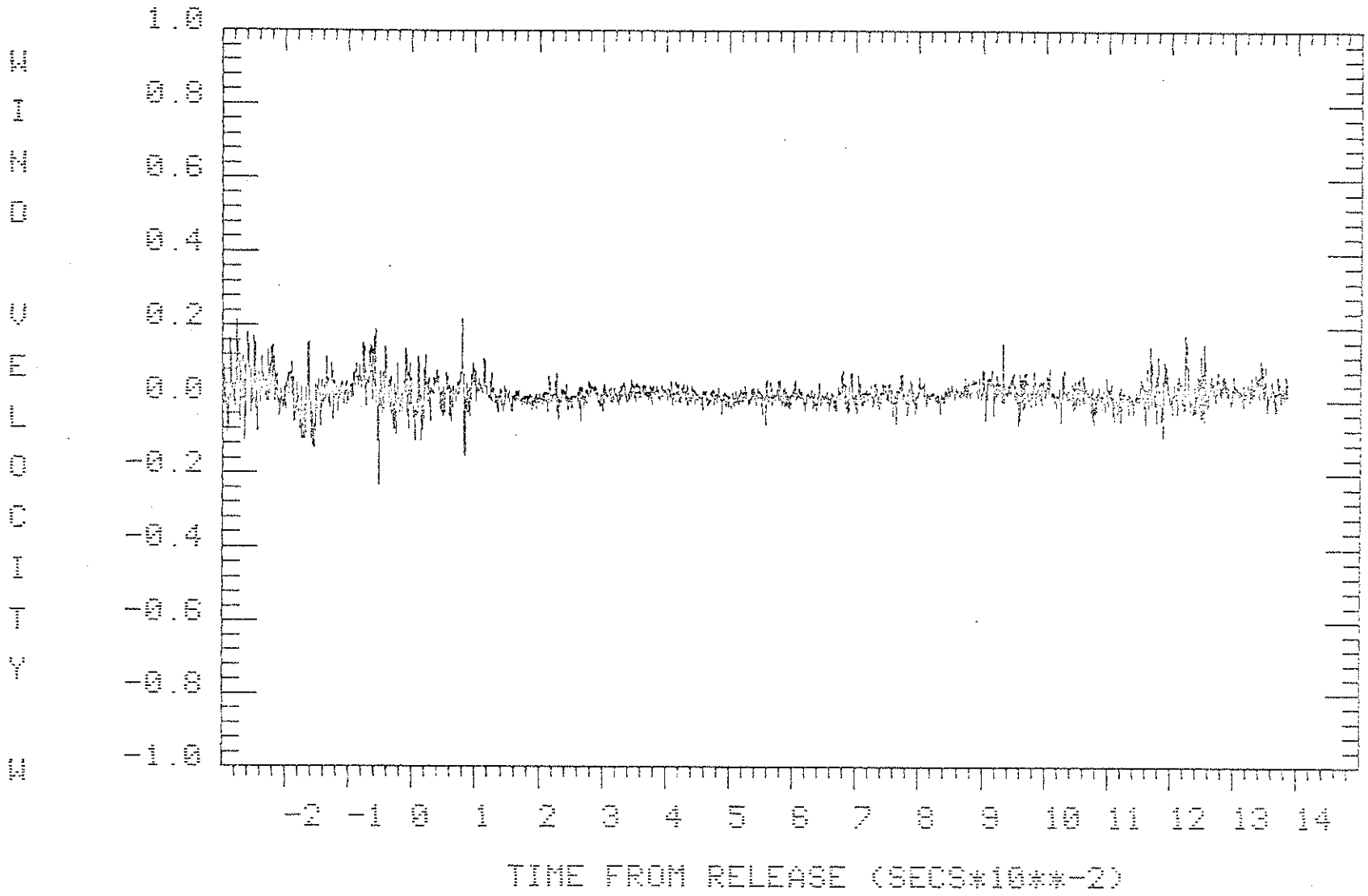
MEAN OF RUN UP: 1.53 MEAN OF RUN DOWN: 0.03



TRIAL: 009 TYPE: UANA UNITS: M/S

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

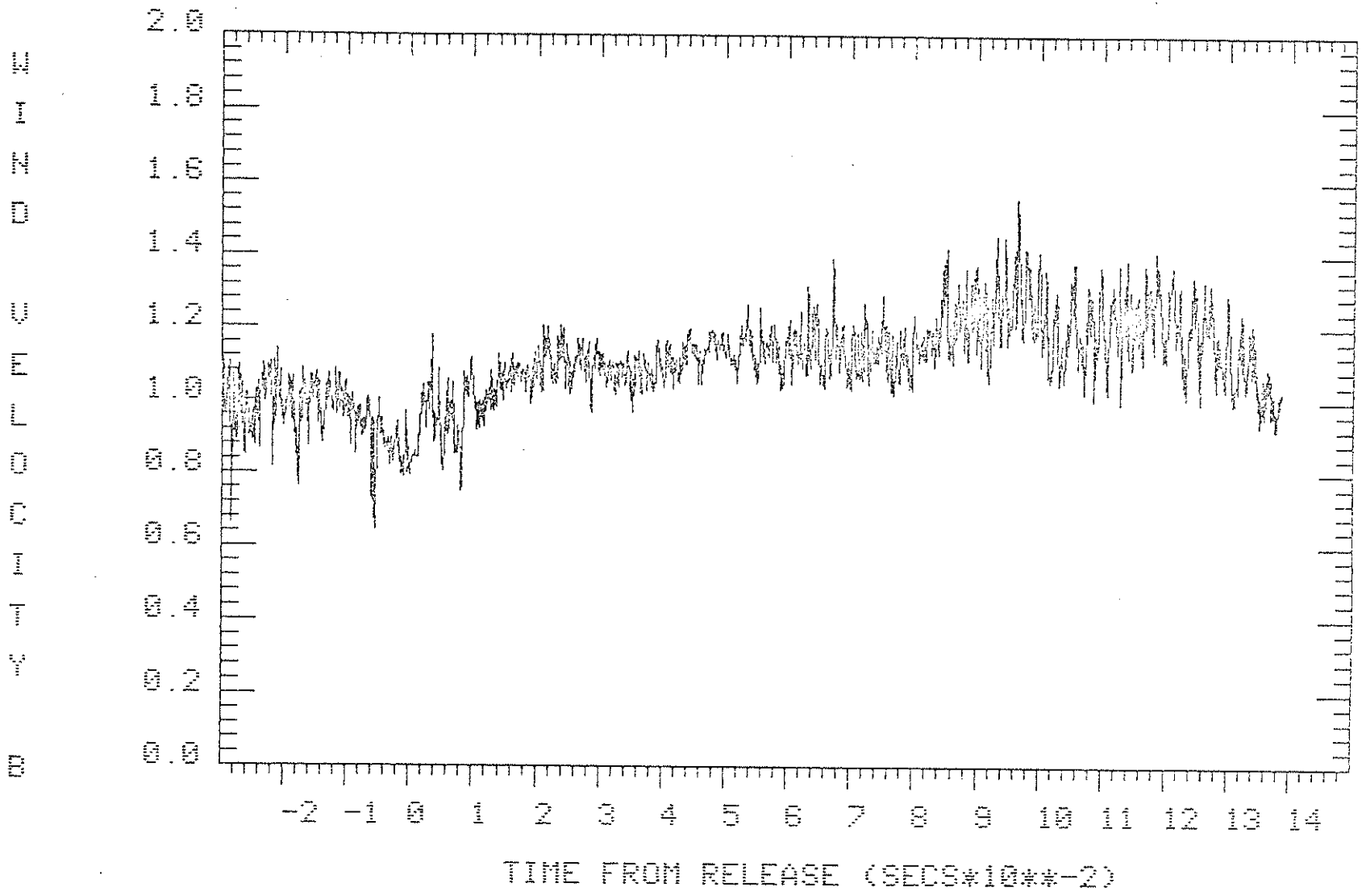
MEAN OF RUN UP: 2.23 MEAN OF RUN DOWN: 1.71



TRIAL: 009 TYPE: UANW UNITS: M/S

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

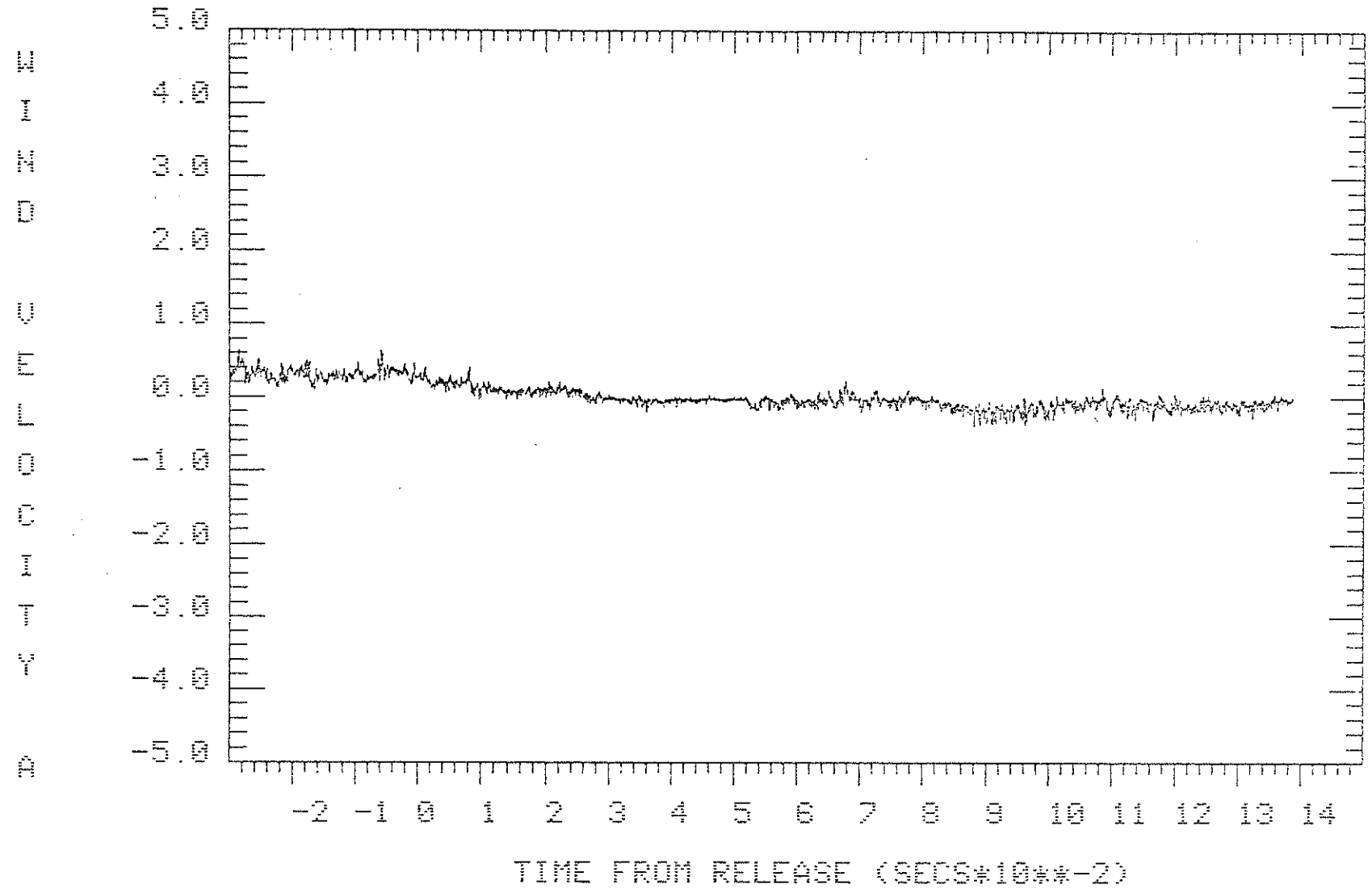
MEAN OF RUN UP: 0.01 MEAN OF RUN DOWN: 0.04



TRIAL: 009 TYPE: UANB UNITS: M/S

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

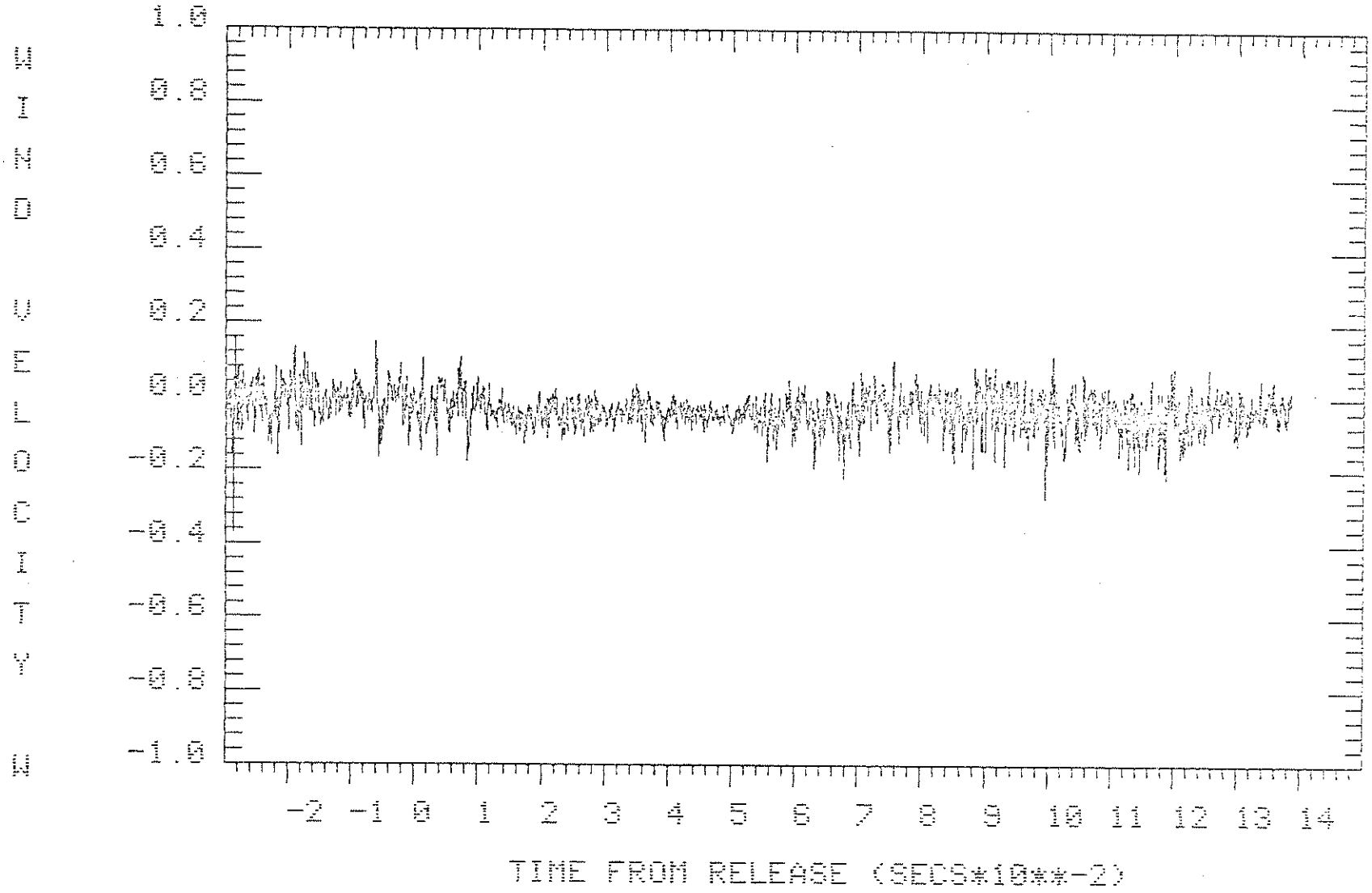
MEAN OF RUN UP: 1.81 MEAN OF RUN DOWN: 0.67



TRIAL: 009 TYPE: UANA UNITS: M/S

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

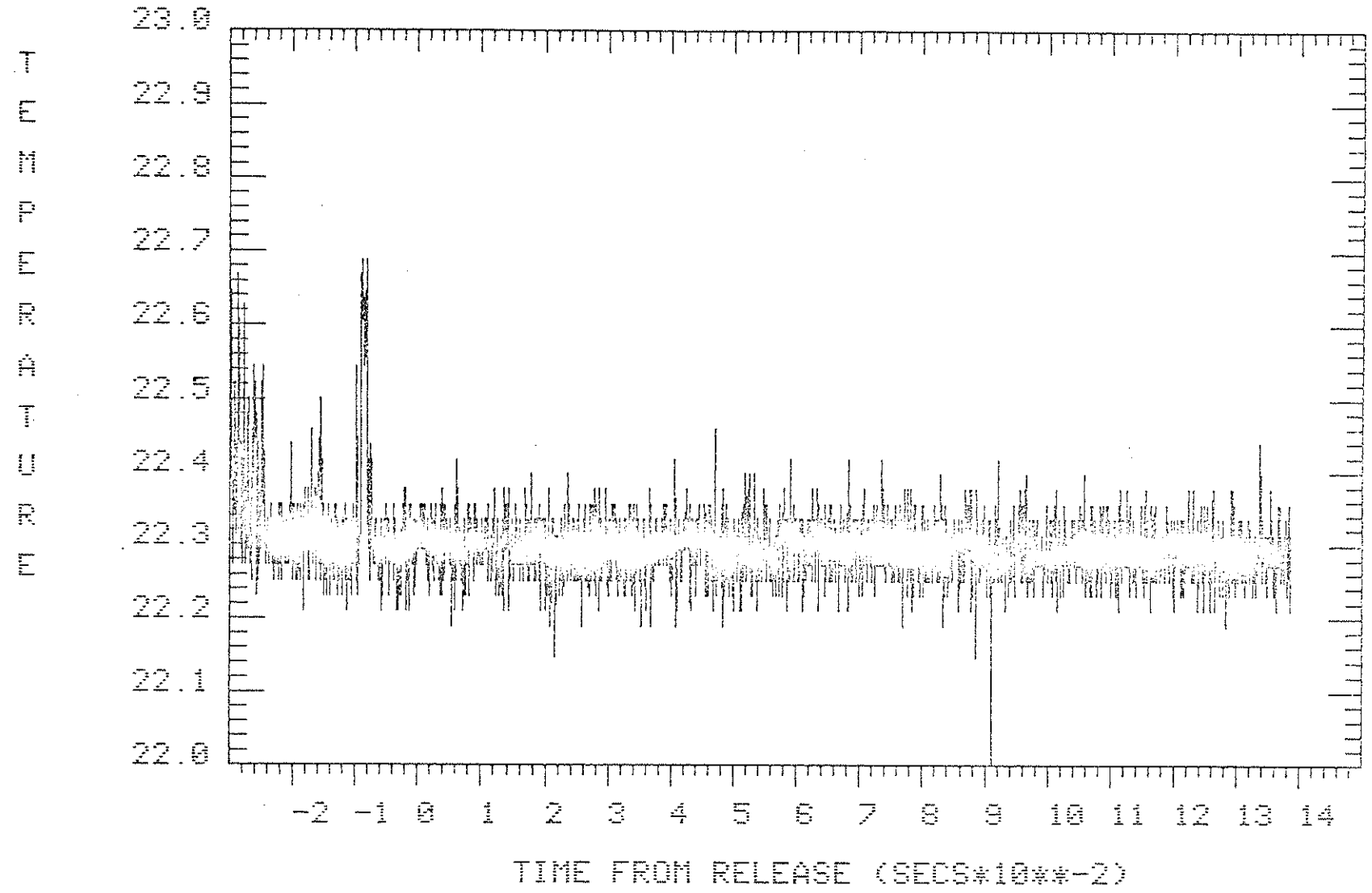
MEAN OF RUN UP: 0.23 MEAN OF RUN DOWN: -0.31



TRIAL: 009 TYPE: UANW UNITS: M/S

AVERAGING TIME: 0.8 SEC X: 400 M Y: 350 M Z: 5.0 M

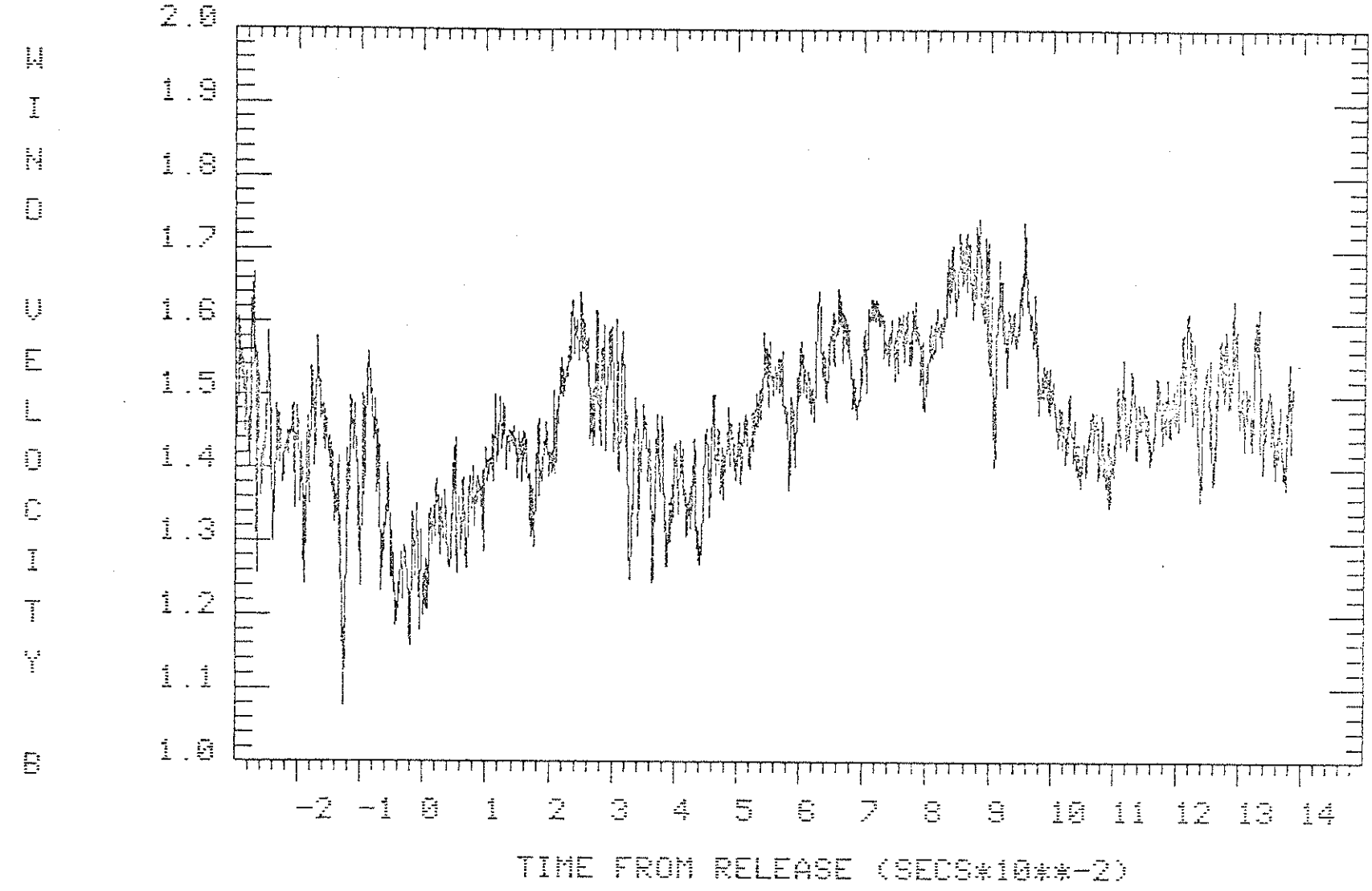
MEAN OF RUN UP: -0.00 MEAN OF RUN DOWN: -0.01



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

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

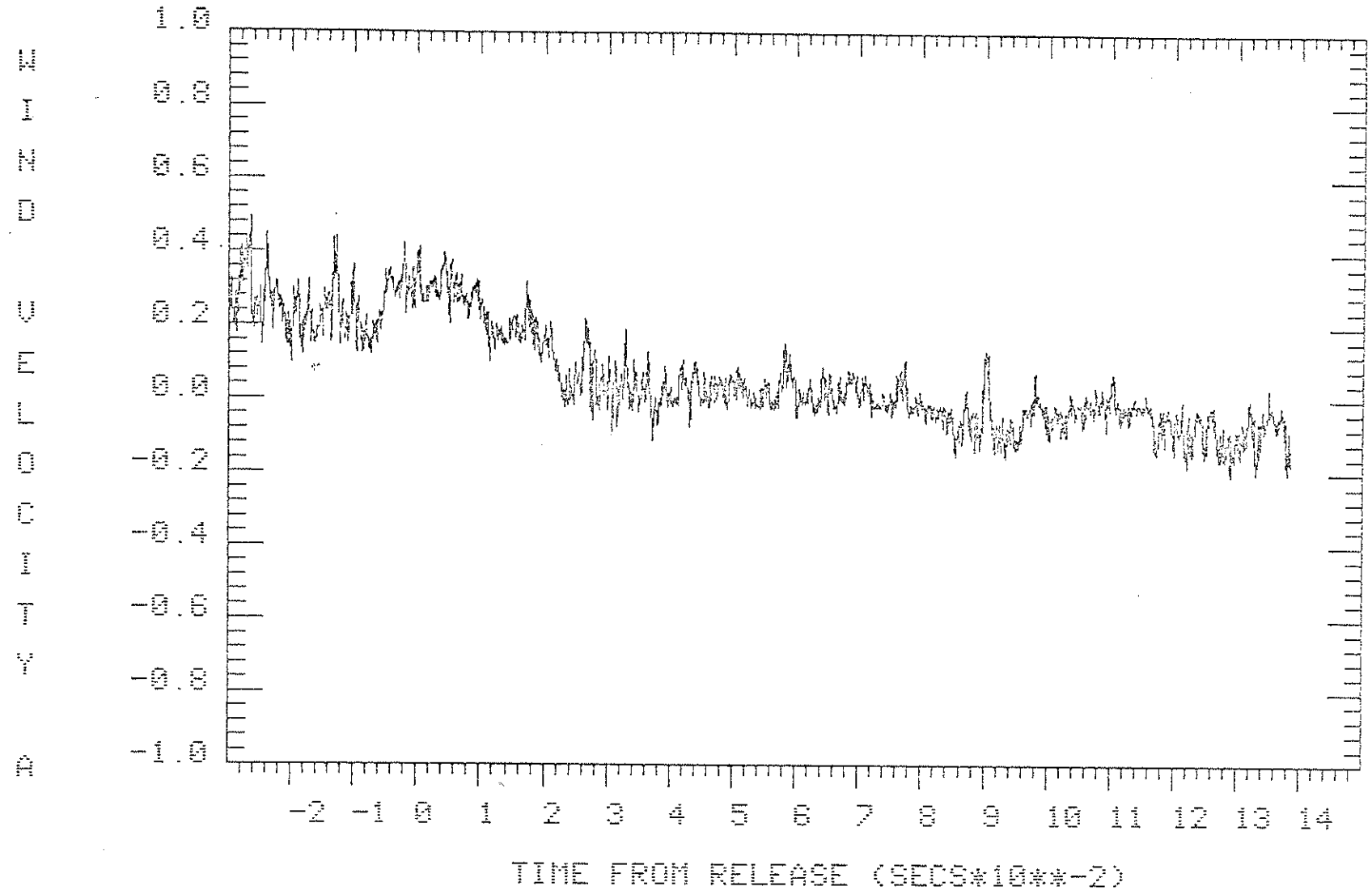
MEAN OF RUN UP: 22.58 MEAN OF RUN DOWN: 21.81



TRIAL: 009 TYPE: UANB UNITS: M/S

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

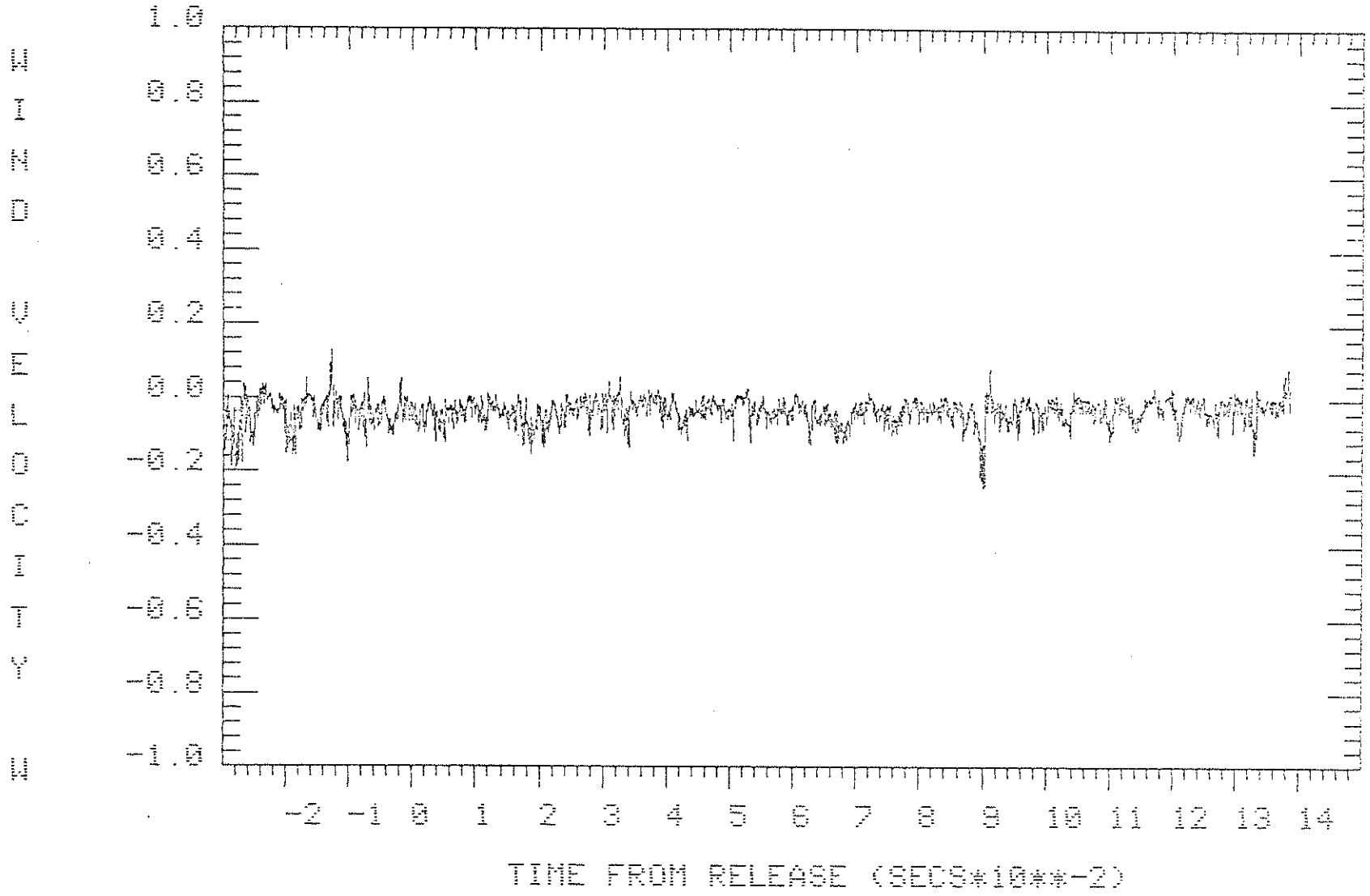
MEAN OF RUN UP: 2.00 MEAN OF RUN DOWN: 1.40



TRIAL: 009 TYPE: UANA UNITS: M/S

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

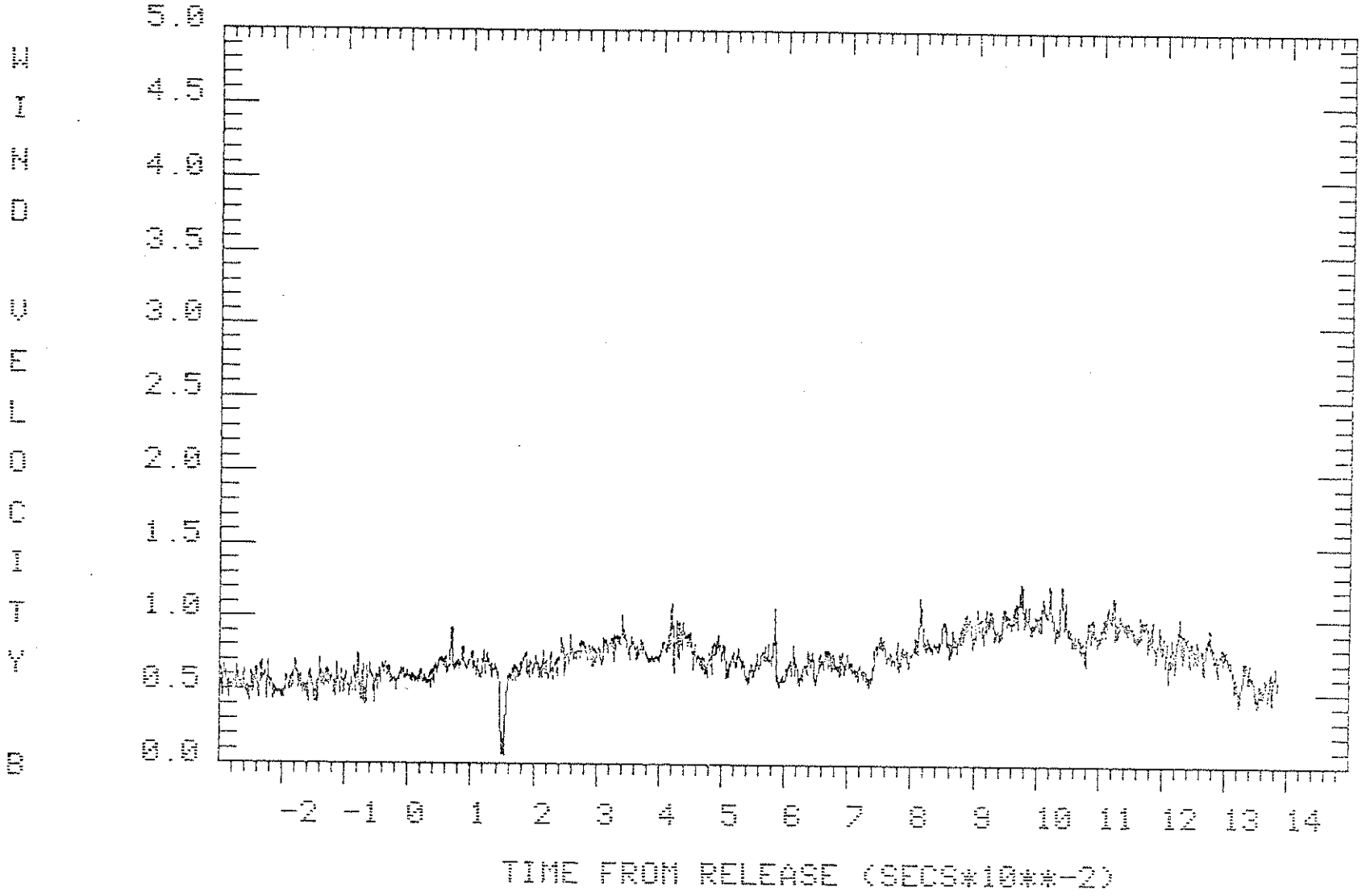
MEAN OF RUN UP: 0.41 MEAN OF RUN DOWN: -0.49



TRIAL: 009 TYPE: UANW UNITS: M/S

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

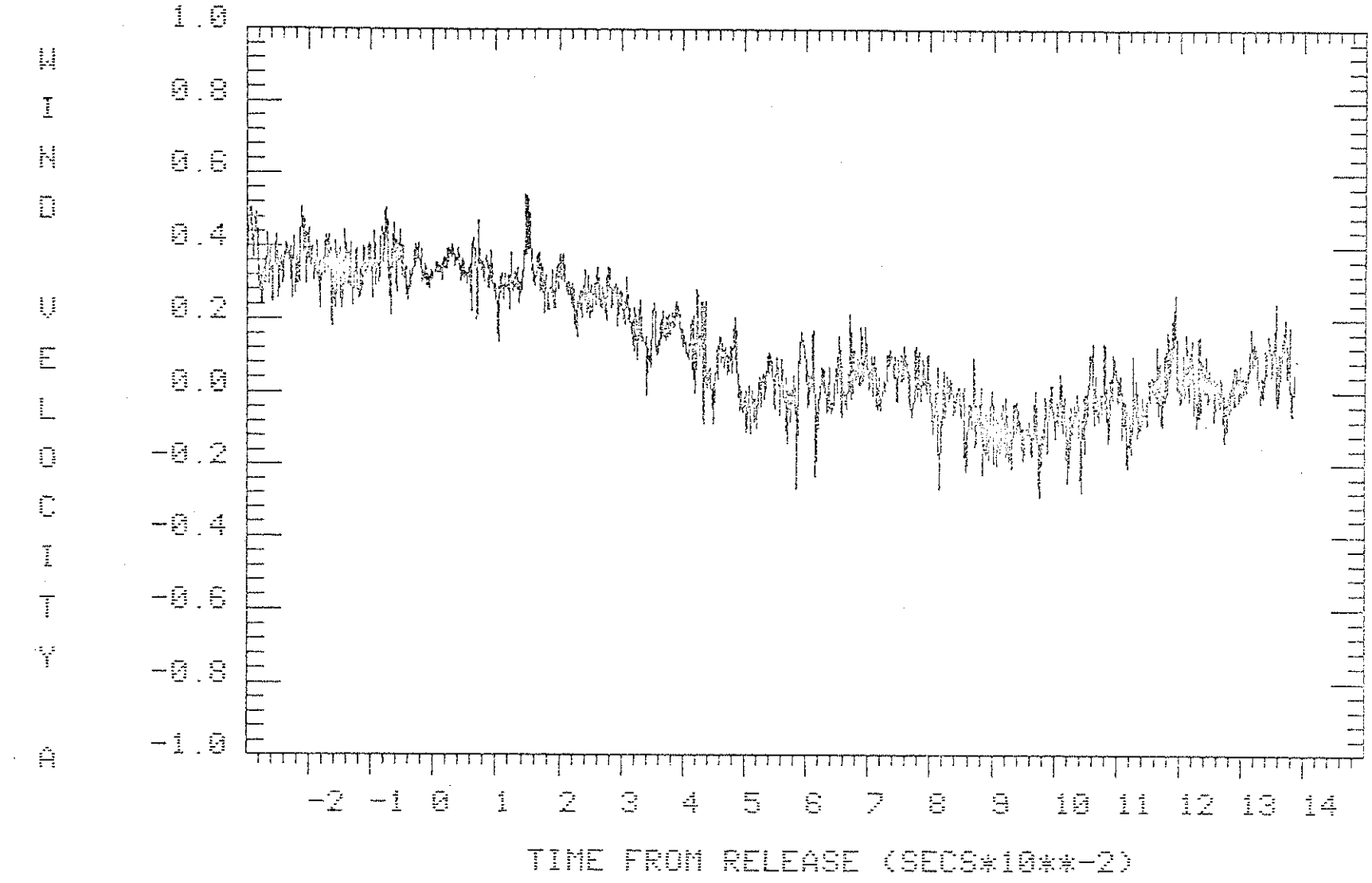
MEAN OF RUN UP: -0.00 MEAN OF RUN DOWN: 0.01



TRIAL: 009 TYPE: UANB UNITS: M/S

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

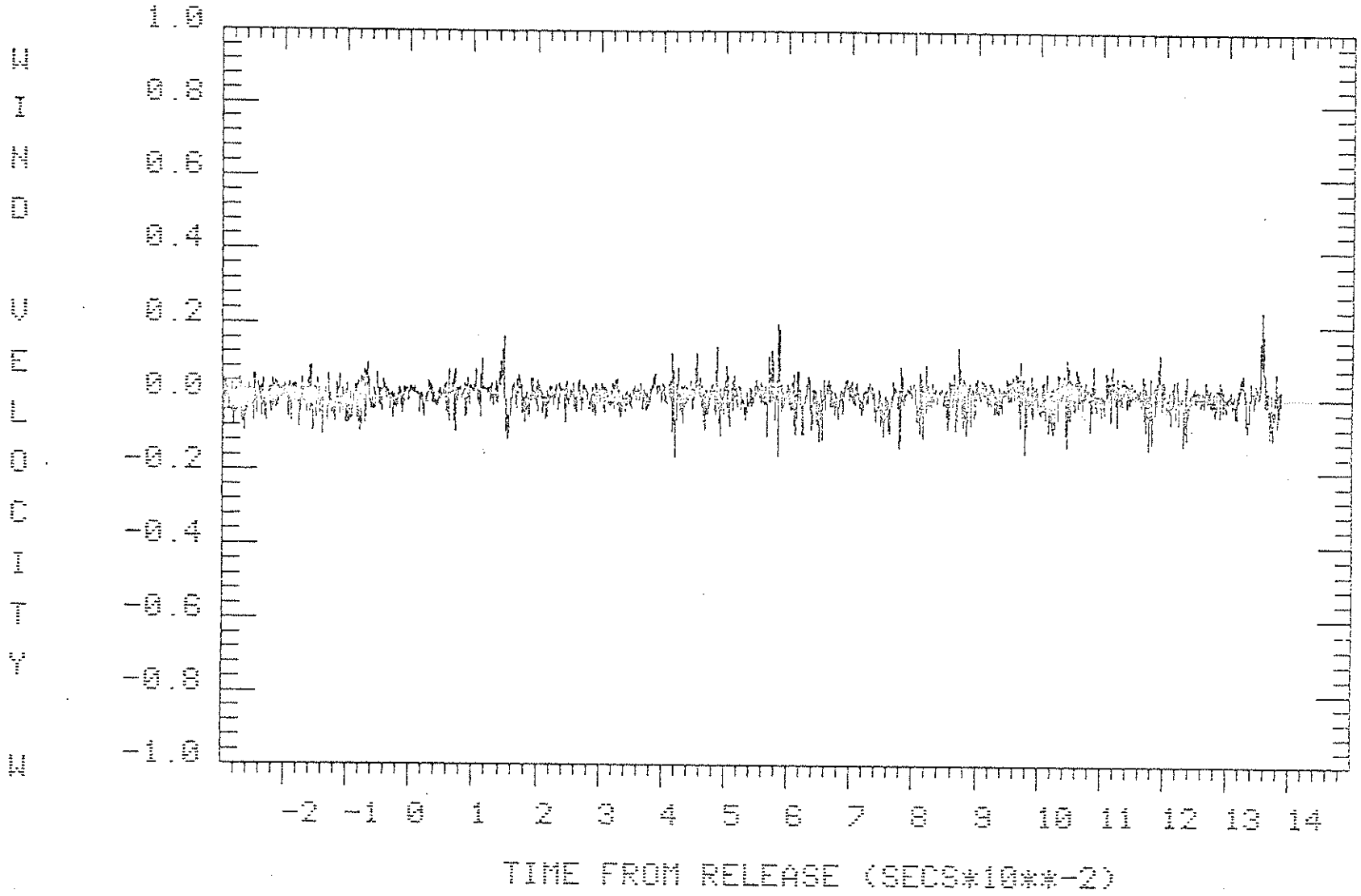
MEAN OF RUN UP: 1.17 MEAN OF RUN DOWN: 0.64



TRIAL: 009 TYPE: UANA UNITS: M/S

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

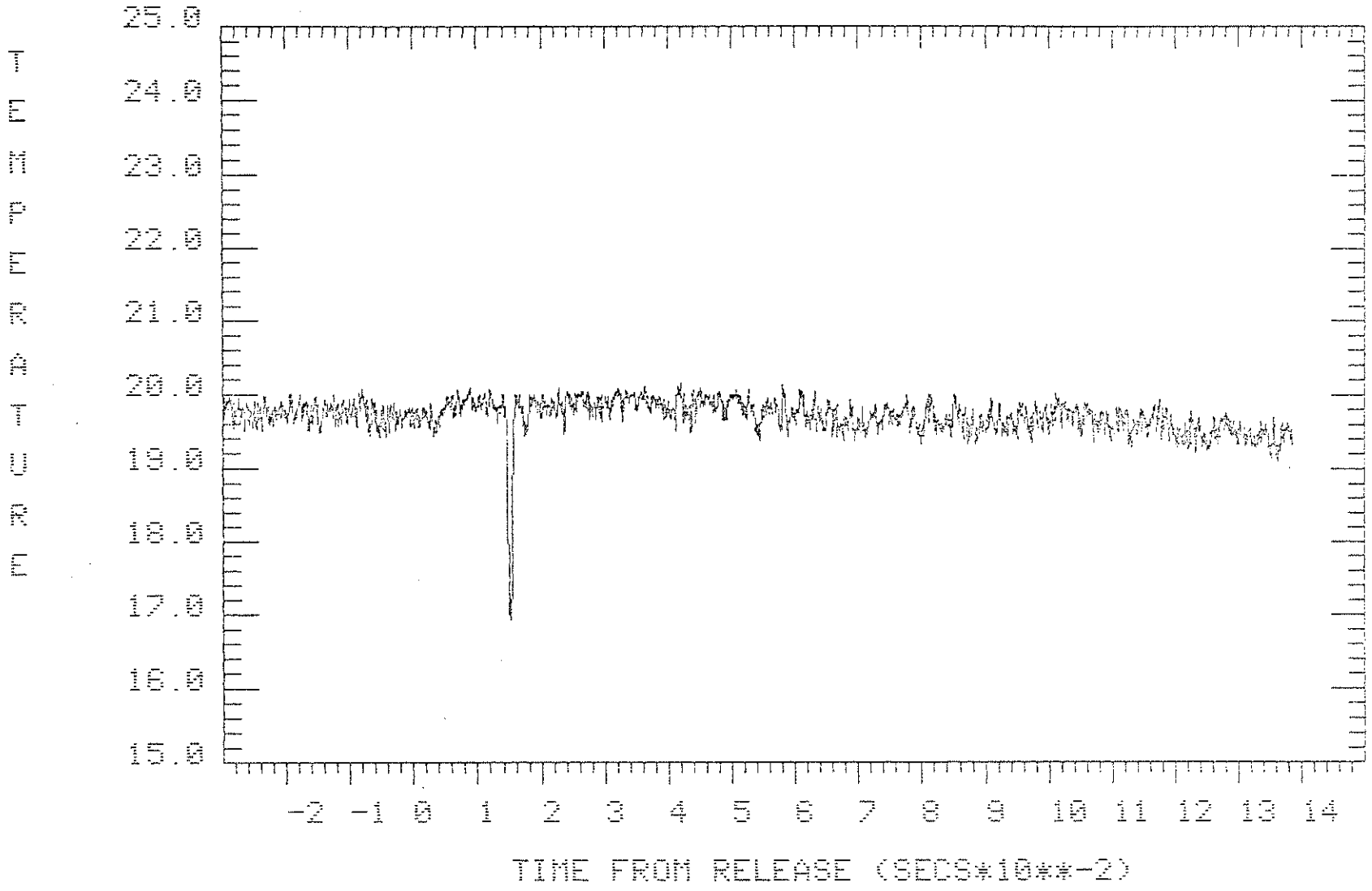
MEAN OF RUN UP: 0.37 MEAN OF RUN DOWN: -0.22



TRIAL: 009 TYPE: UANW UNITS: M/S

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

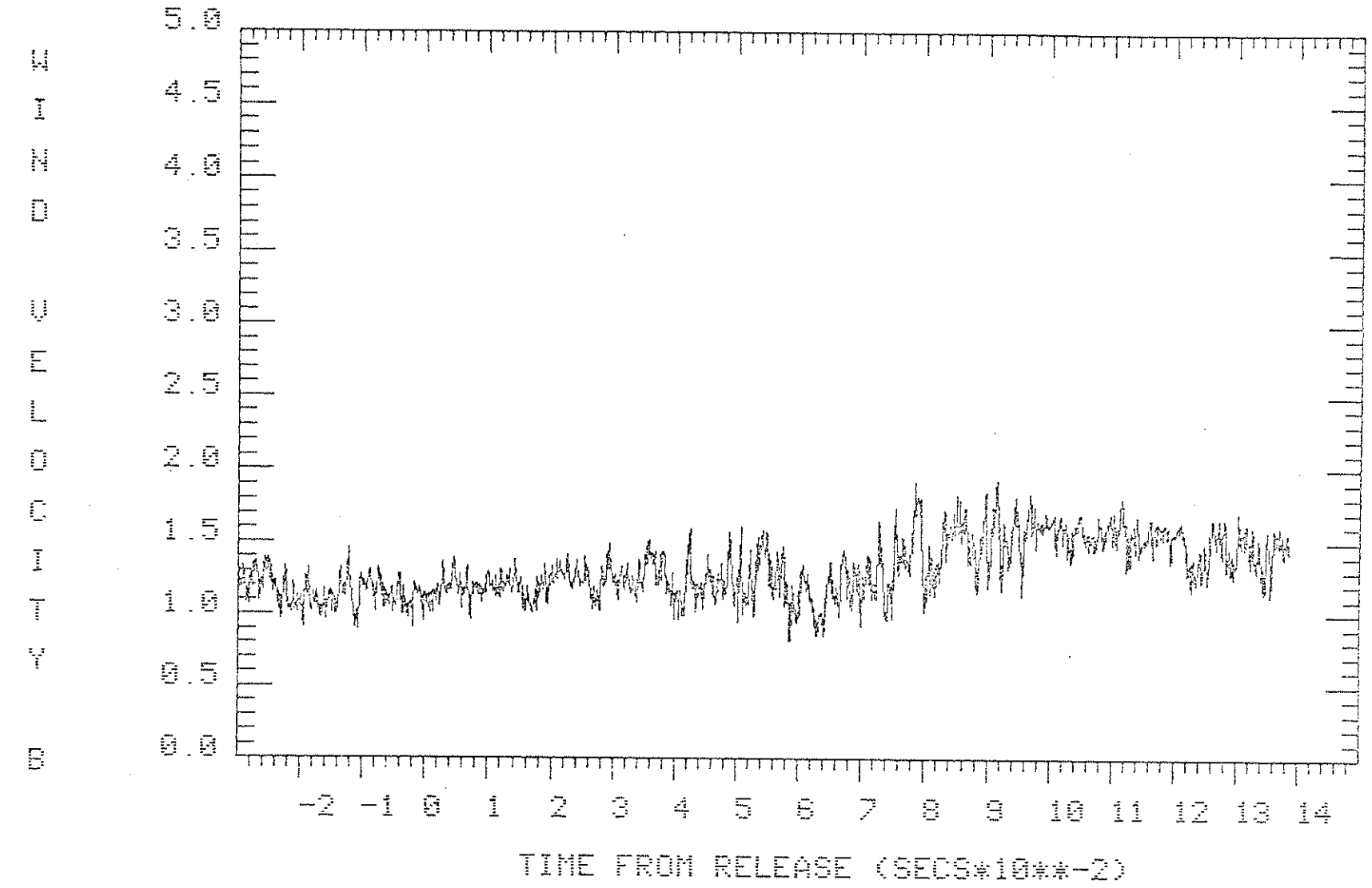
MEAN OF RUN UP: 0.01 MEAN OF RUN DOWN: 0.03



TRIAL: 009 TYPE: UAHT UNITS: DEGREES C

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

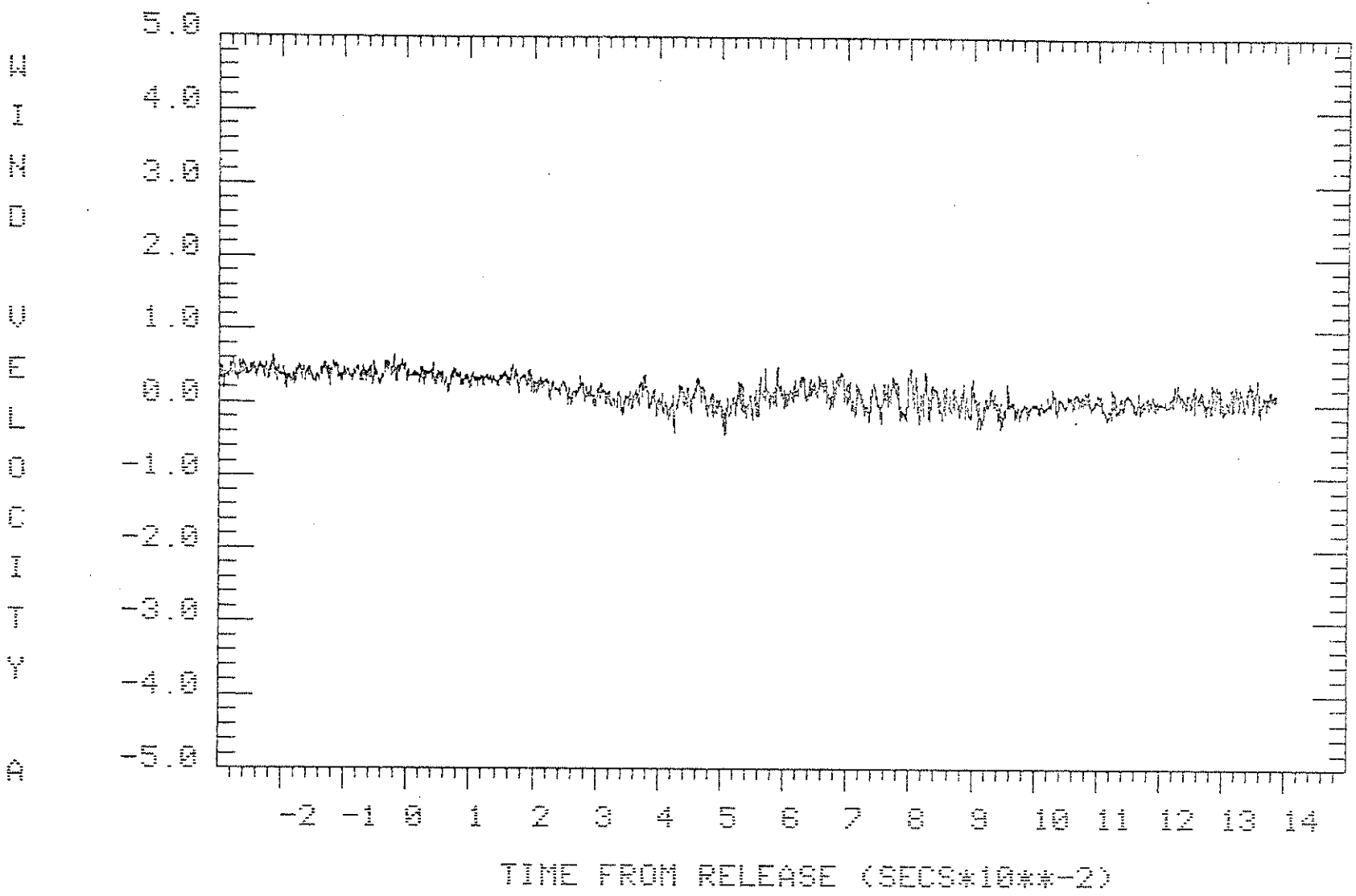
MEAN OF RUN UP: 20.22 MEAN OF RUN DOWN: 18.17



TRIAL: 009 TYPE: UANB UNITS: M/S

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

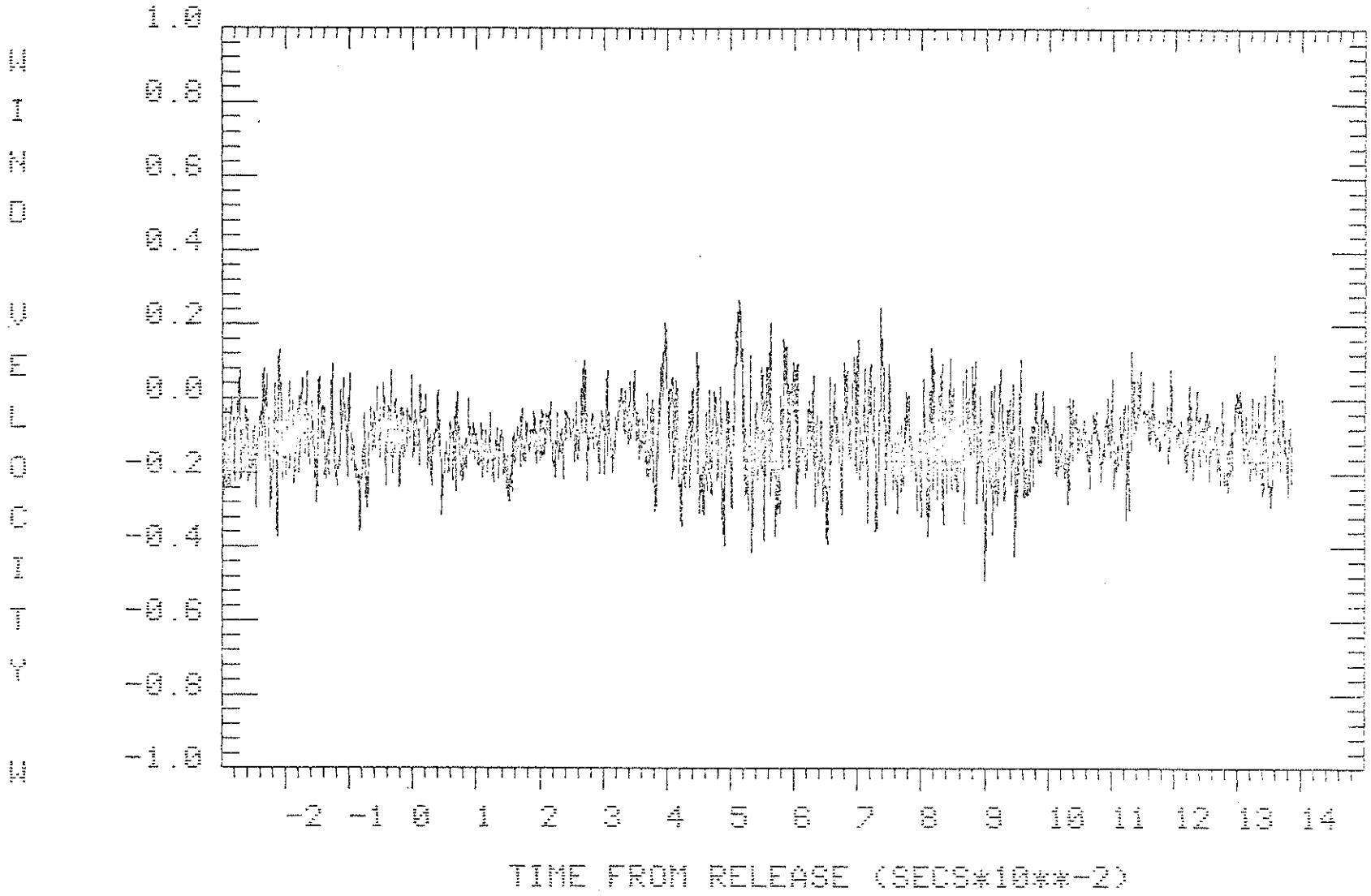
MEAN OF RUN UP: 1.71 MEAN OF RUN DOWN: 1.16



TRIAL: 009 TYPE: UANA UNITS: M/S

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

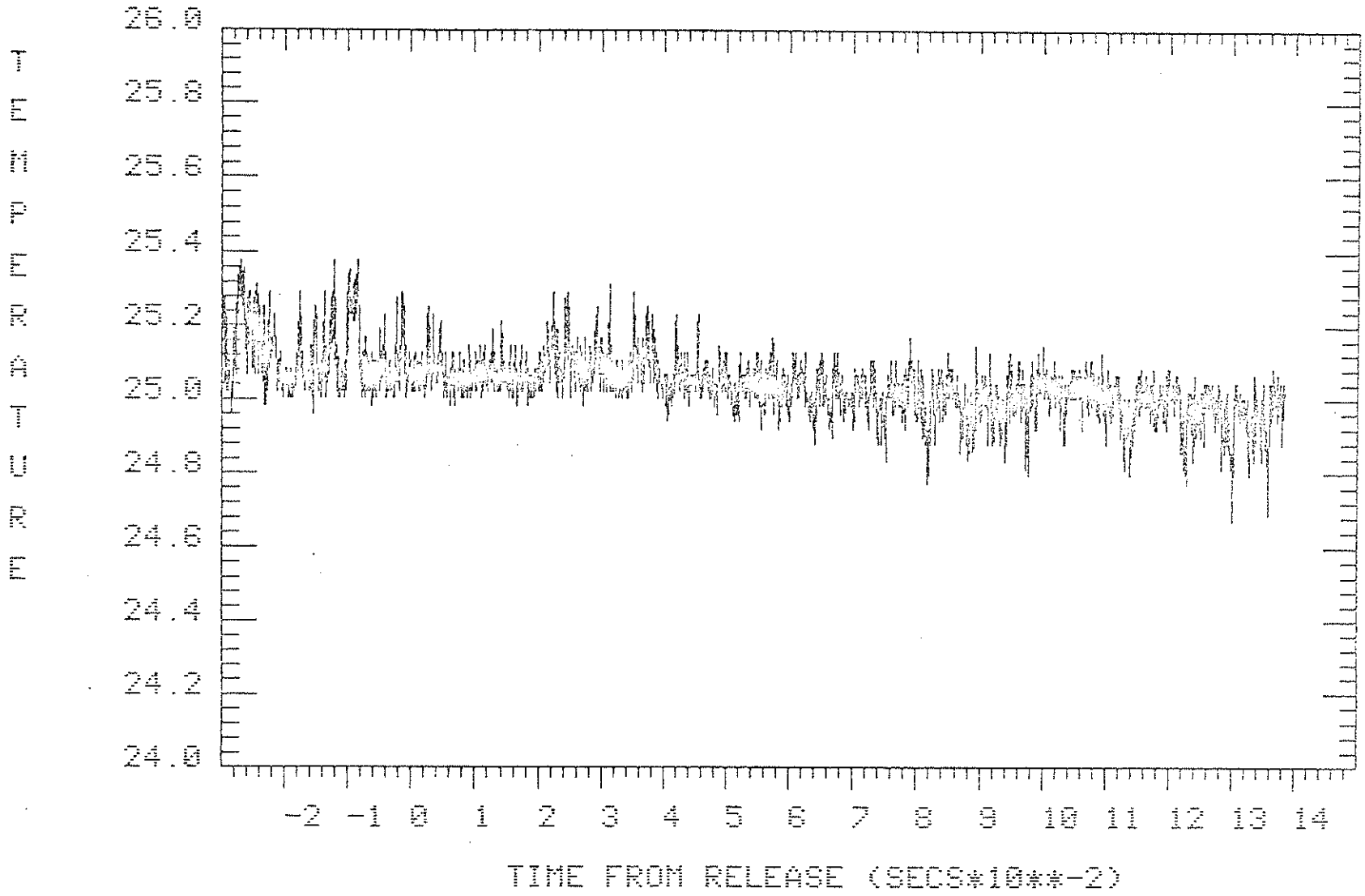
MEAN OF RUN UP: 0.49 MEAN OF RUN DOWN: -0.30



TRIAL: 009 TYPE: UANW UNITS: M/S

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

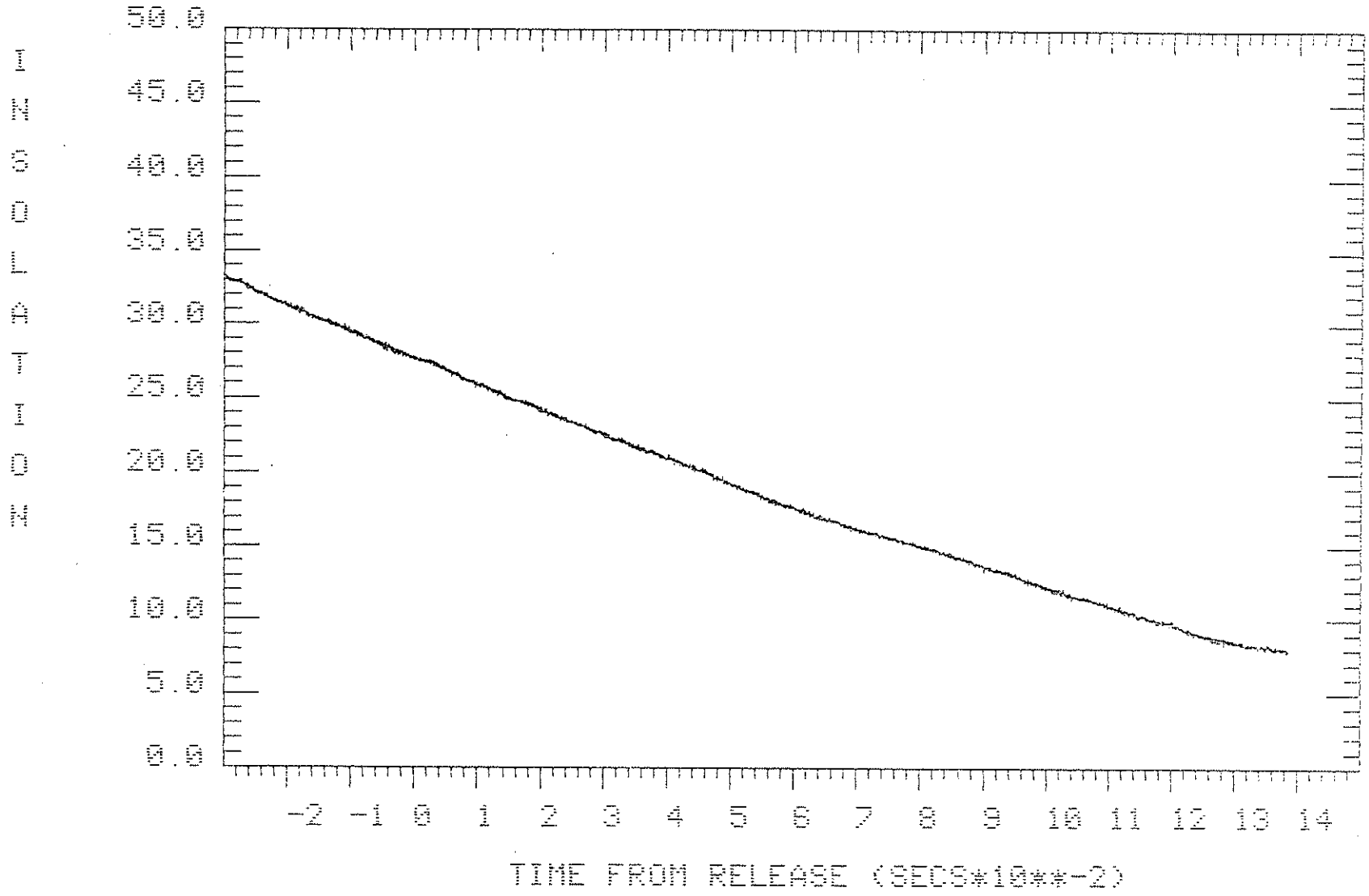
MEAN OF RUN UP: -0.09 MEAN OF RUN DOWN: -0.06



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

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

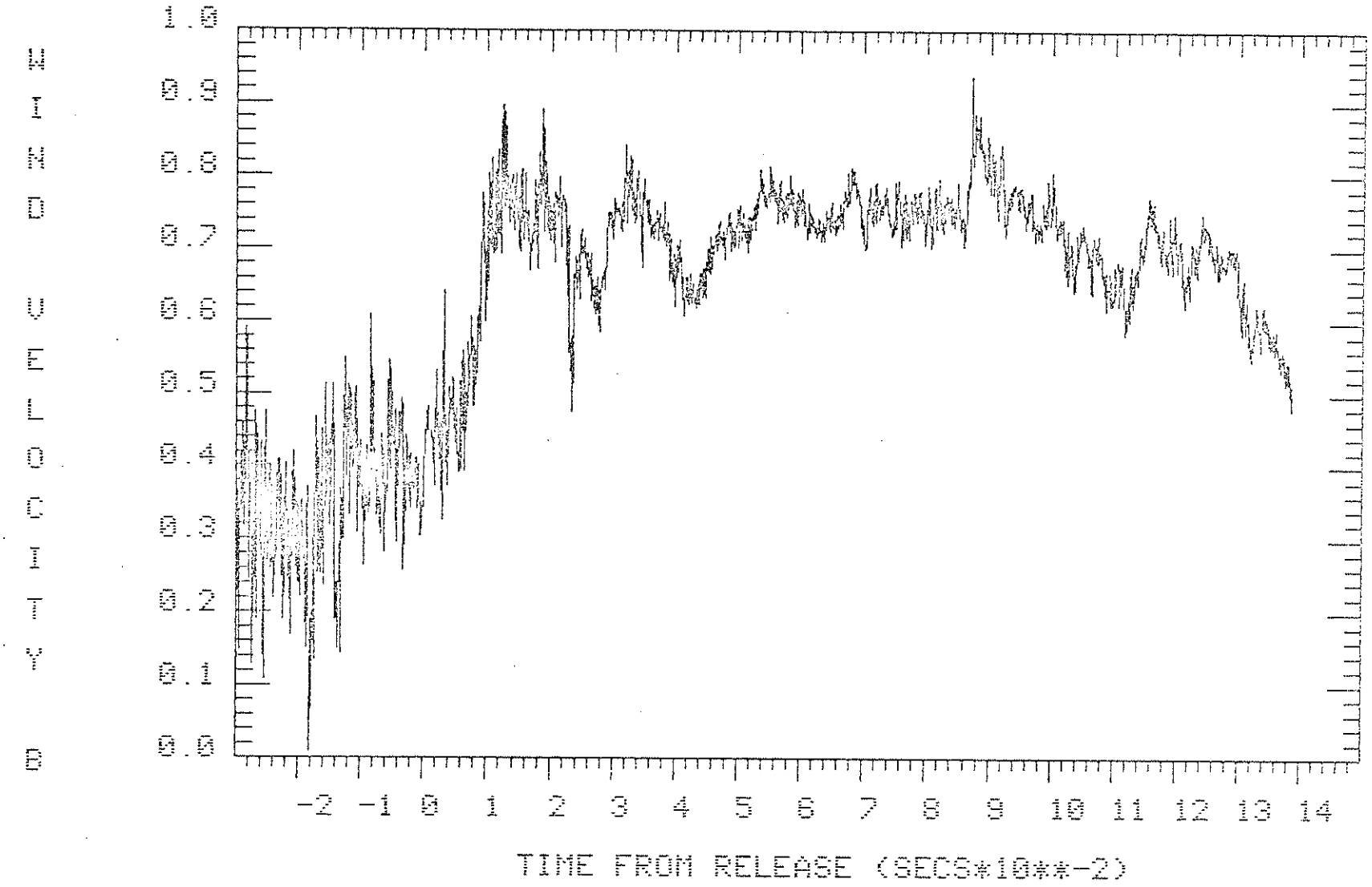
MEAN OF RUN UP: 25.32 MEAN OF RUN DOWN: 24.58



TRIAL: 009 TYPE: SOLA UNITS: W/M**2

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

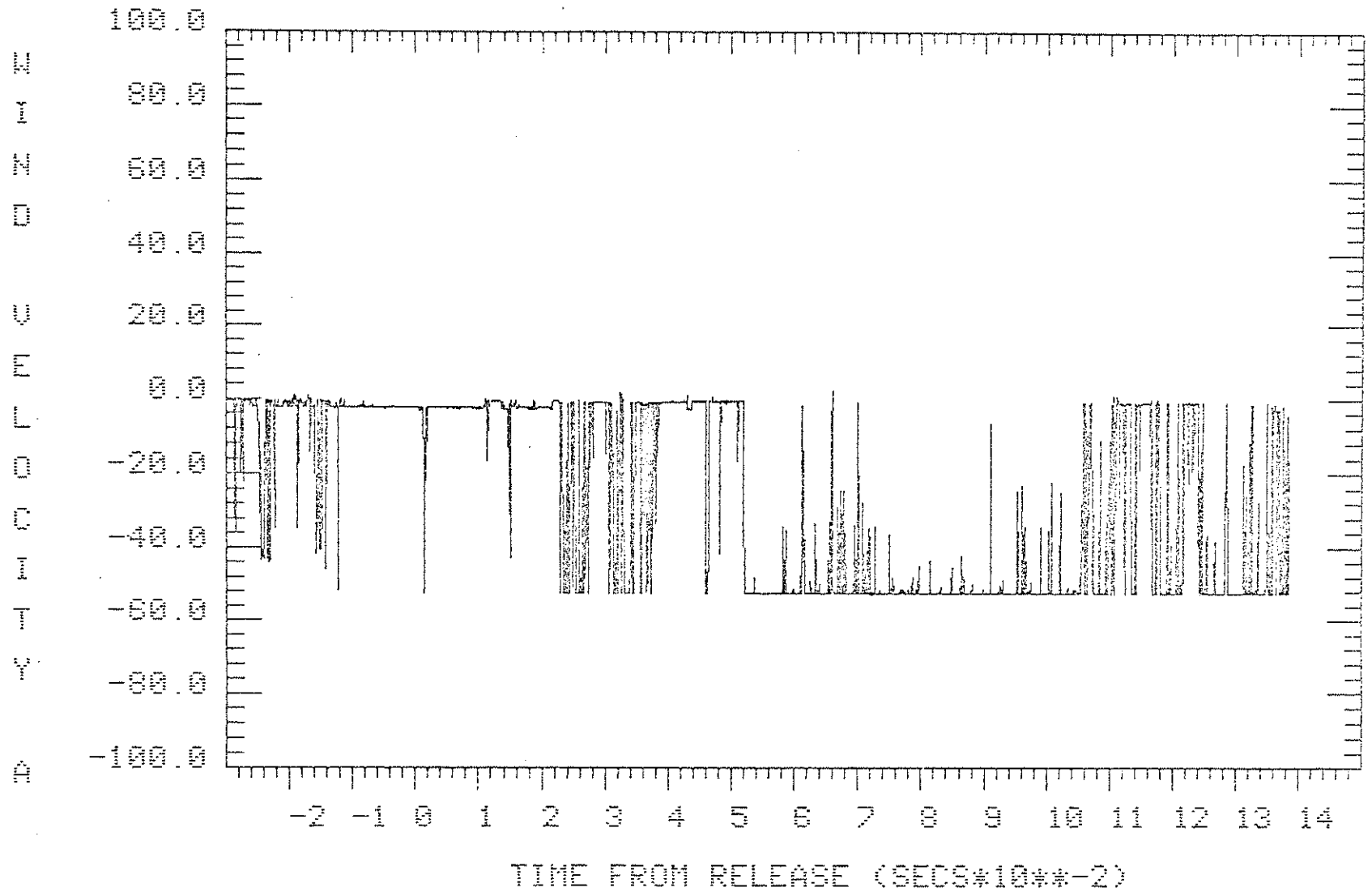
MEAN OF RUN UP: 60.24 MEAN OF RUN DOWN: 1.97



TRIAL: 008 TYPE: UANB UNITS: M/S

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

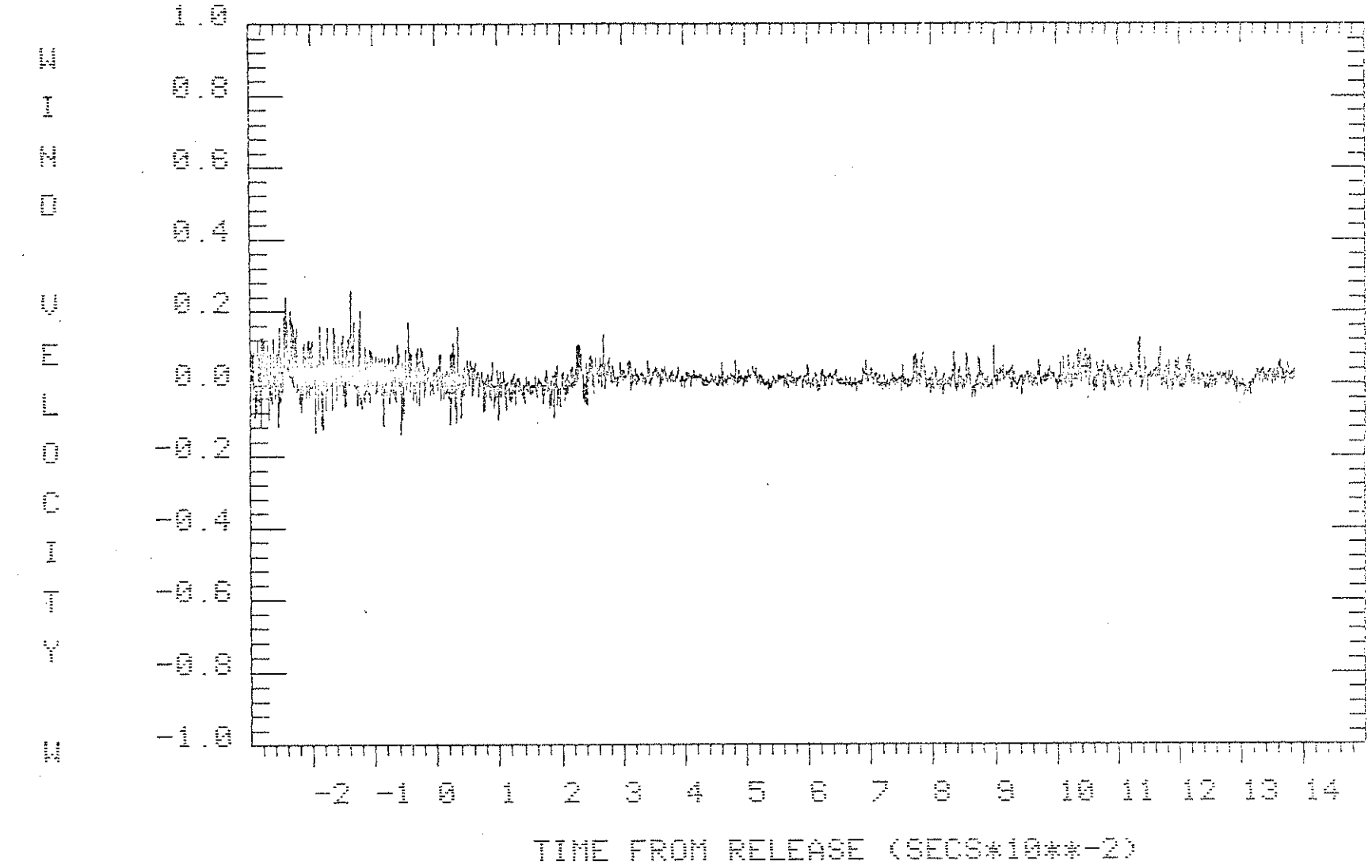
MEAN OF RUN UP: 1.14 MEAN OF RUN DOWN: -0.04



TRIAL: 009 TYPE: UANA UNITS: M/S

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

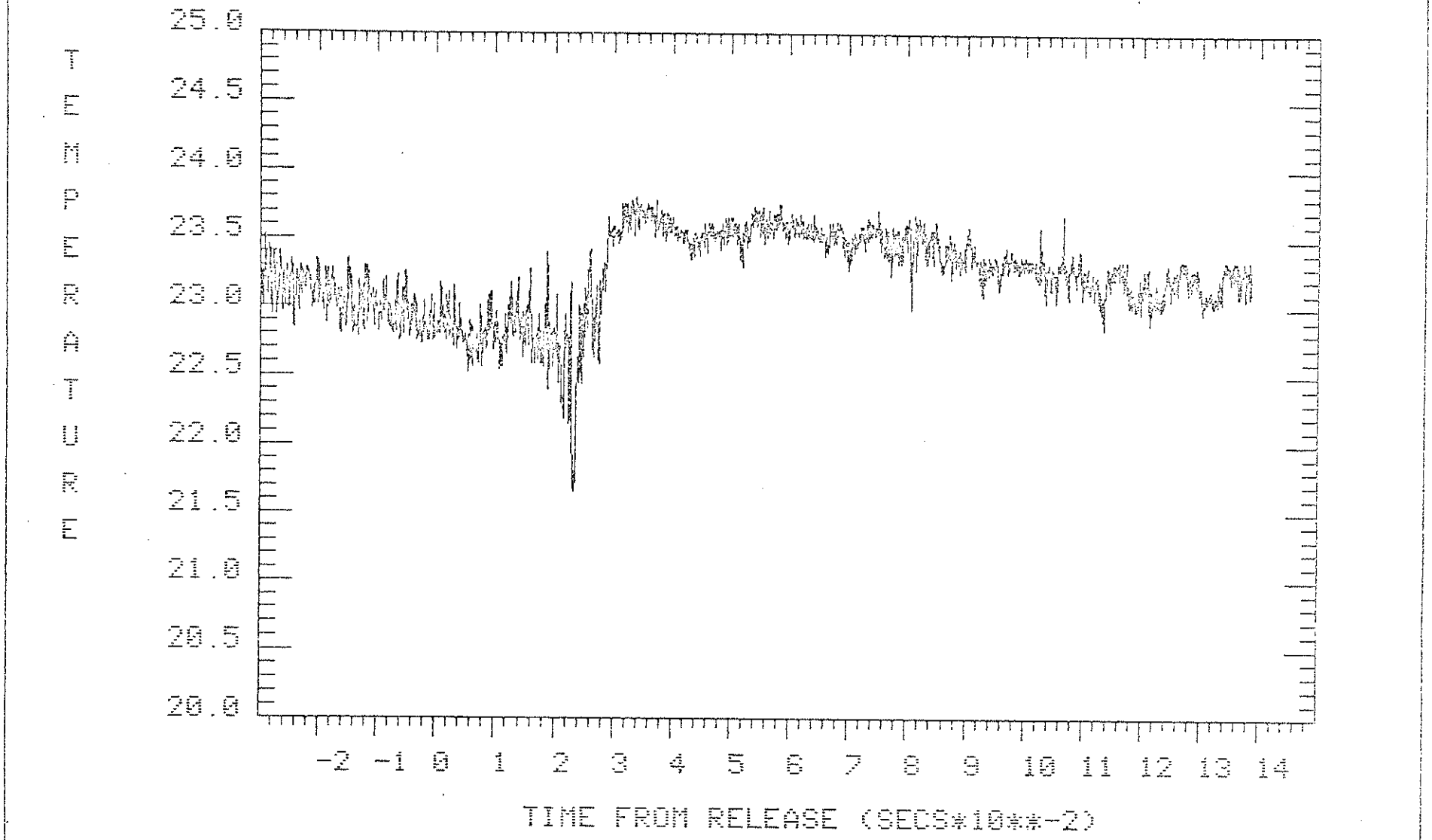
MEAN OF RUN UP: -15.13 MEAN OF RUN DOWN: -48.40



TRIAL: 009 TYPE: UANW UNITS: M/S

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

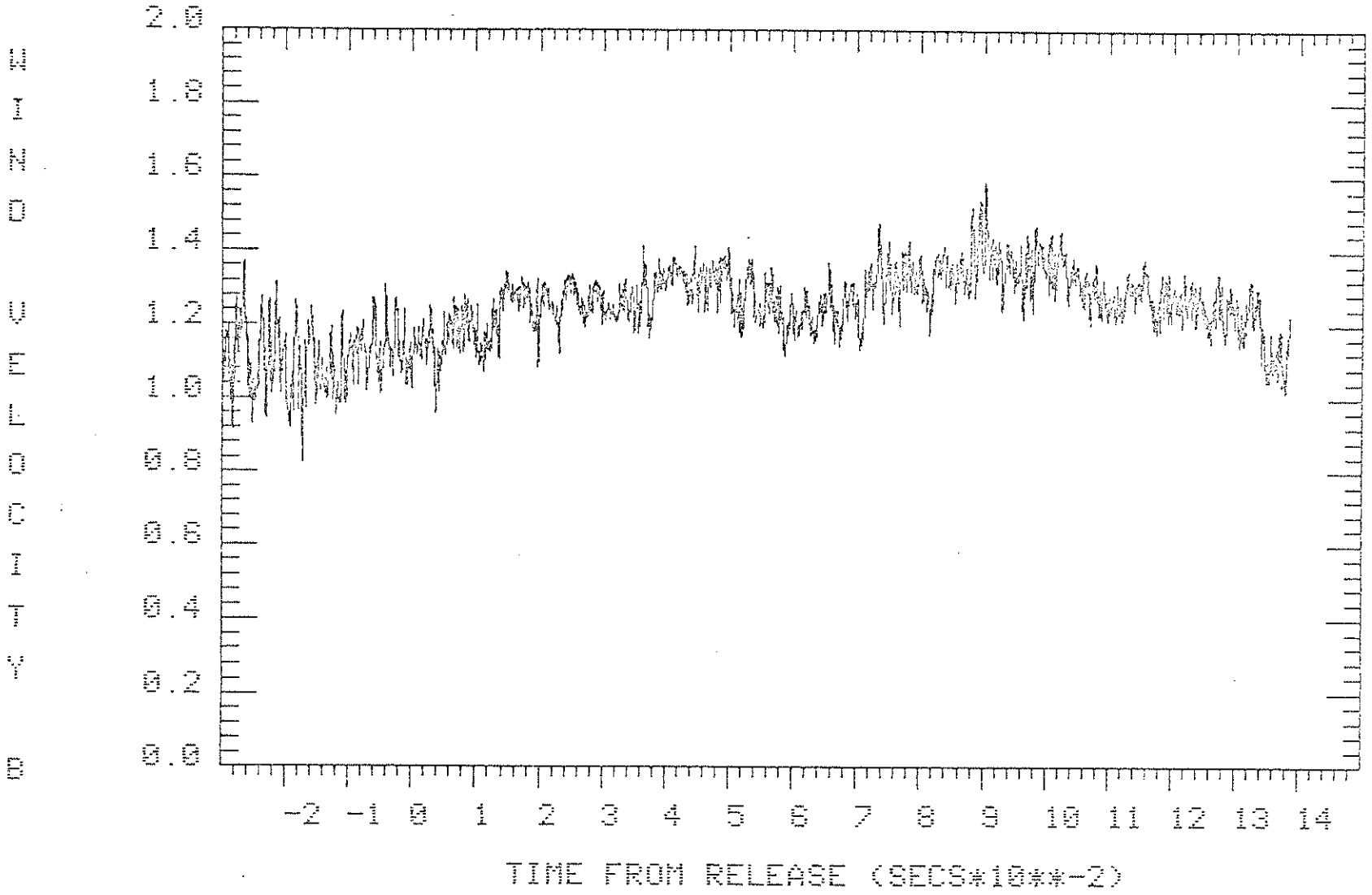
MEAN OF RUN UP: 0.02 MEAN OF RUN DOWN: 0.07



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

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

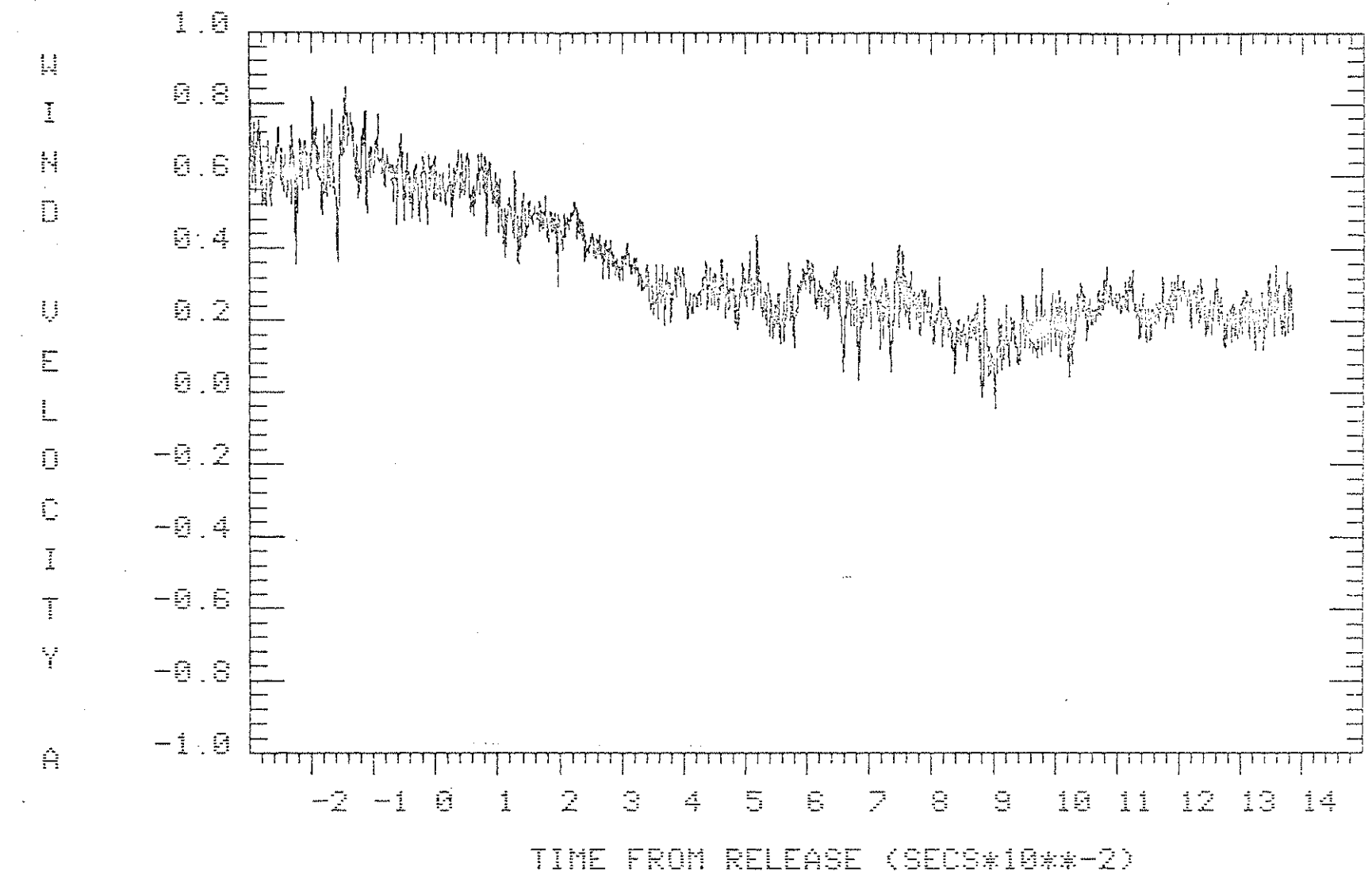
MEAN OF RUN UP: 24.01 MEAN OF RUN DOWN: 21.96



TRIAL: 009 TYPE: UANB UNITS: M/S

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

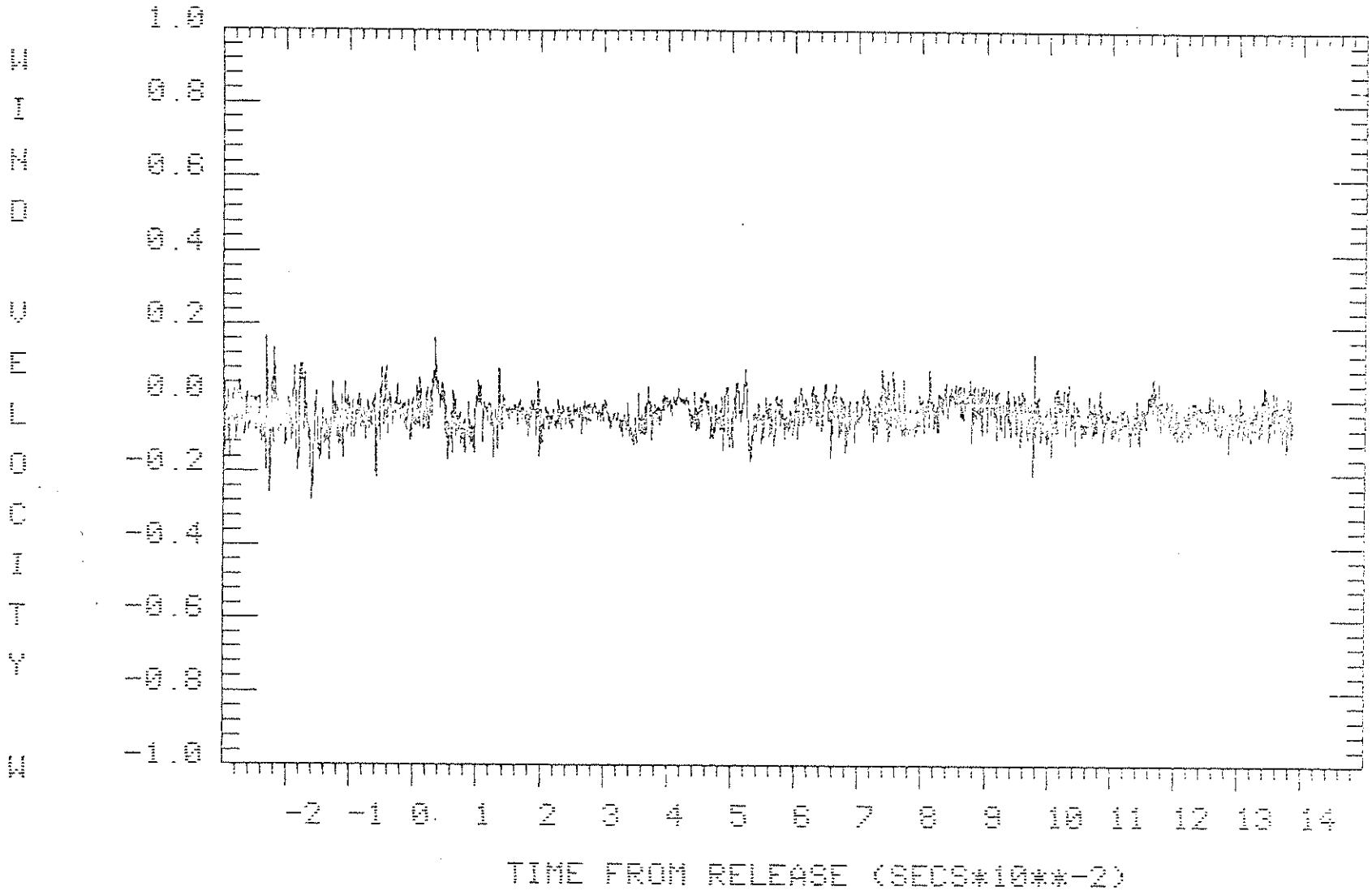
MEAN OF RUN UP: 1.84 MEAN OF RUN DOWN: 0.99



TRIAL: 009 TYPE: UANA UNITS: M/S

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

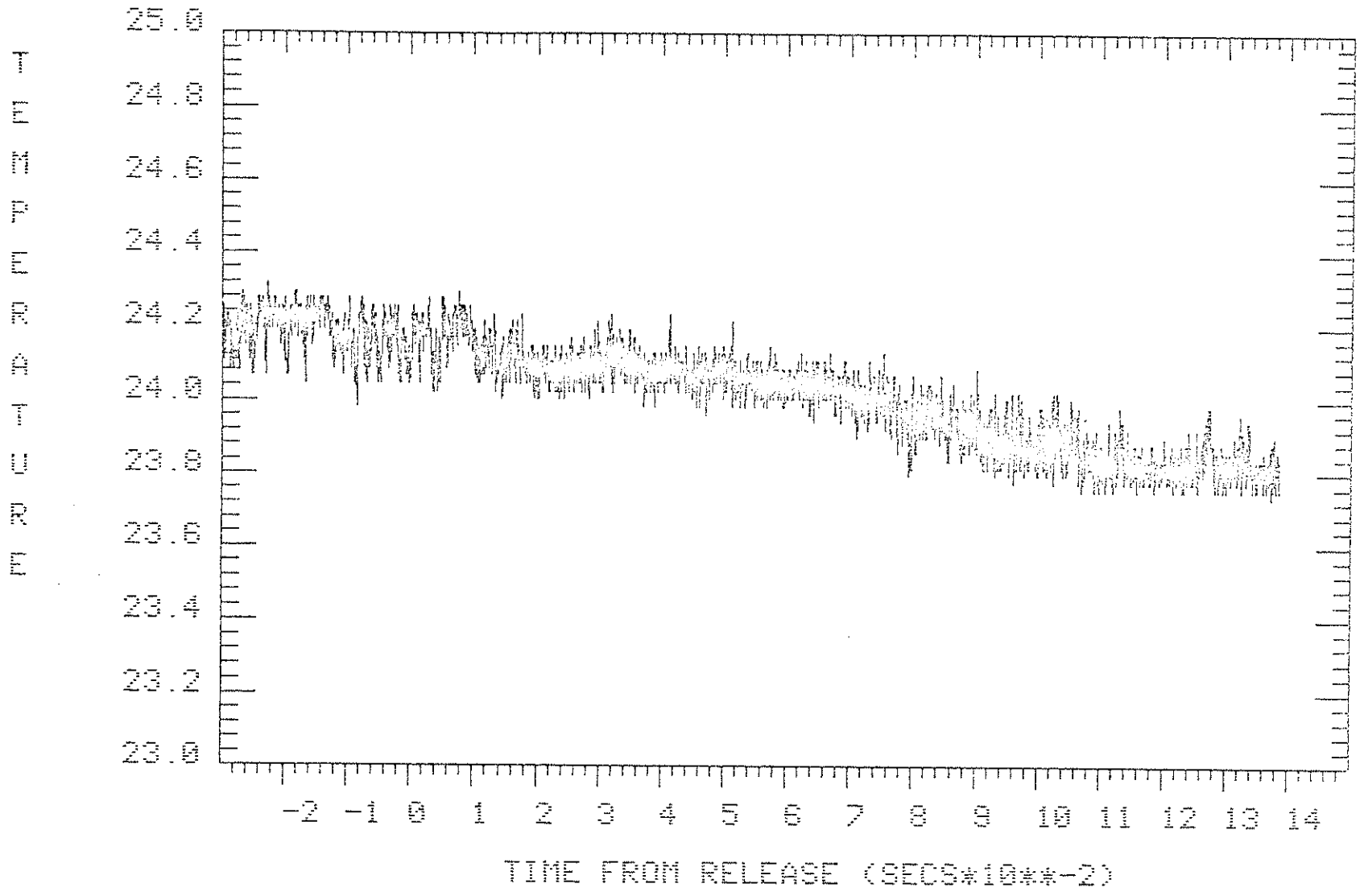
MEAN OF RUN UP: 0.72 MEAN OF RUN DOWN: -0.16



TRIAL: 009 TYPE: UANW UNITS: M/S

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

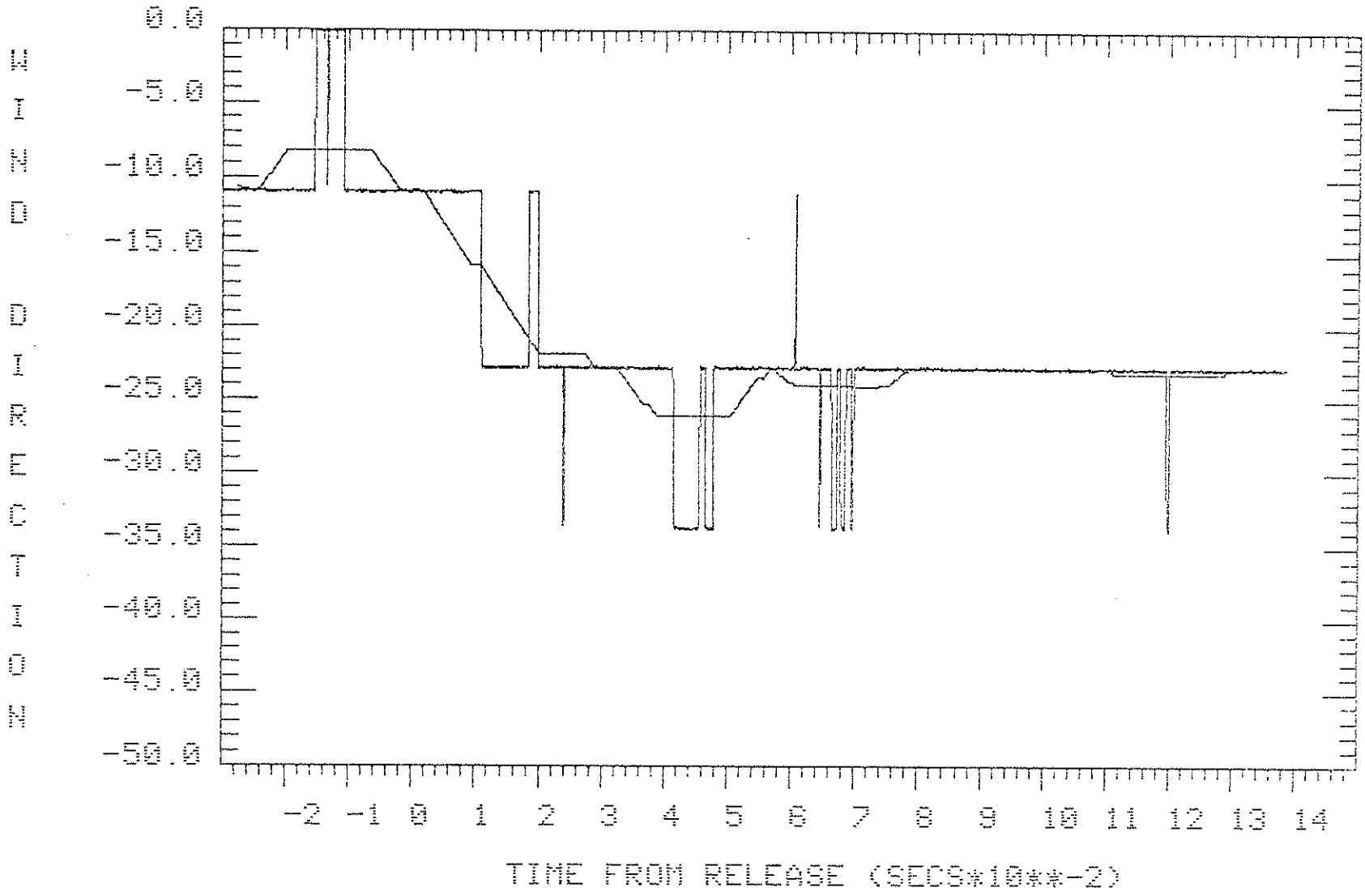
MEAN OF RUN UP: -0.07 MEAN OF RUN DOWN: -0.04



TRIAL: 009 TYPE: UANT UNITS: DEGREES C

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

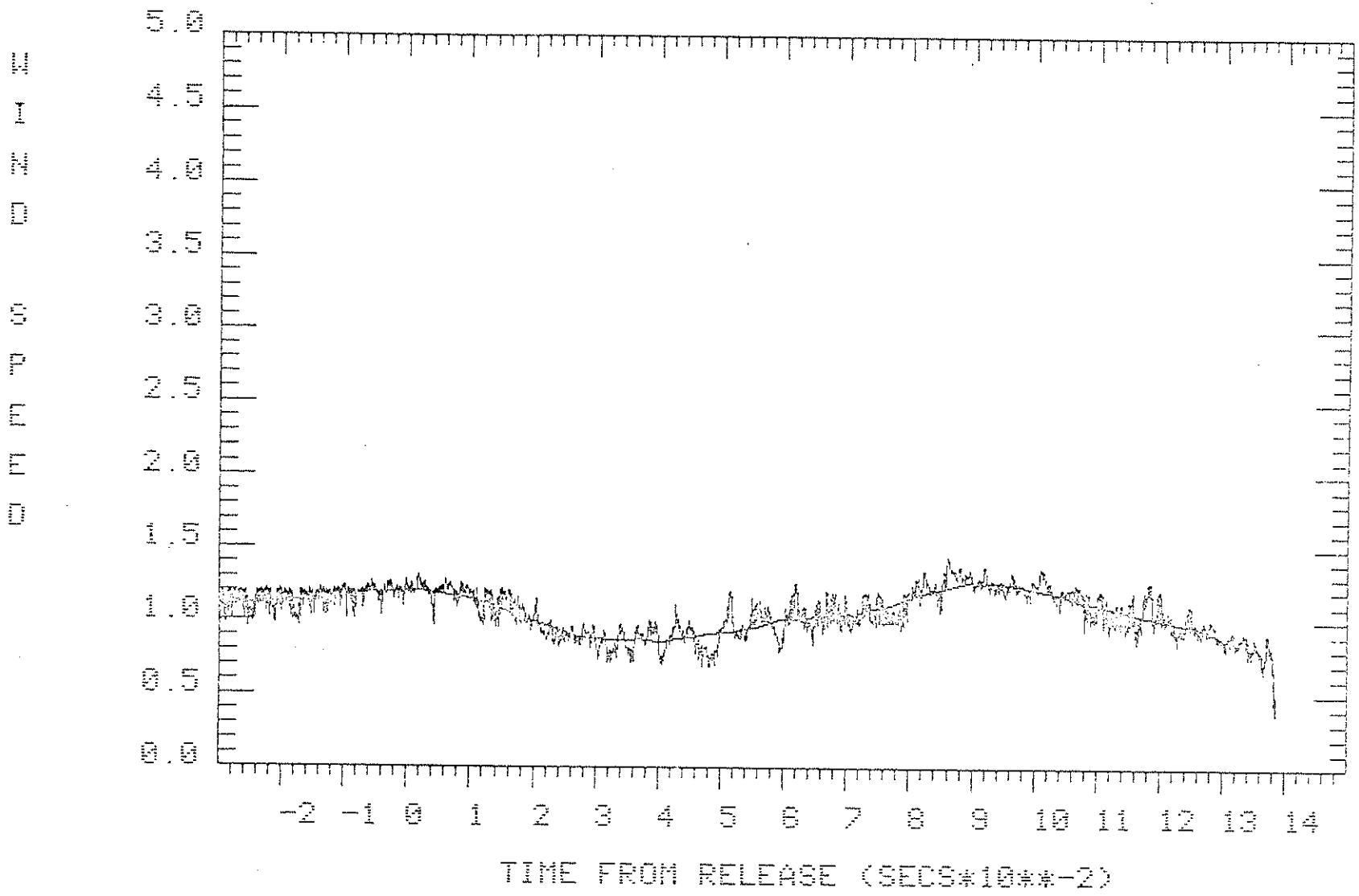
MEAN OF RUN UP: 24.36 MEAN OF RUN DOWN: 23.30



TRIAL: 009 TYPE: WHDG UNITS: DEGREES

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

MEAN OF RUN UP: -16.18 MEAN OF RUN DOWN: -45.56

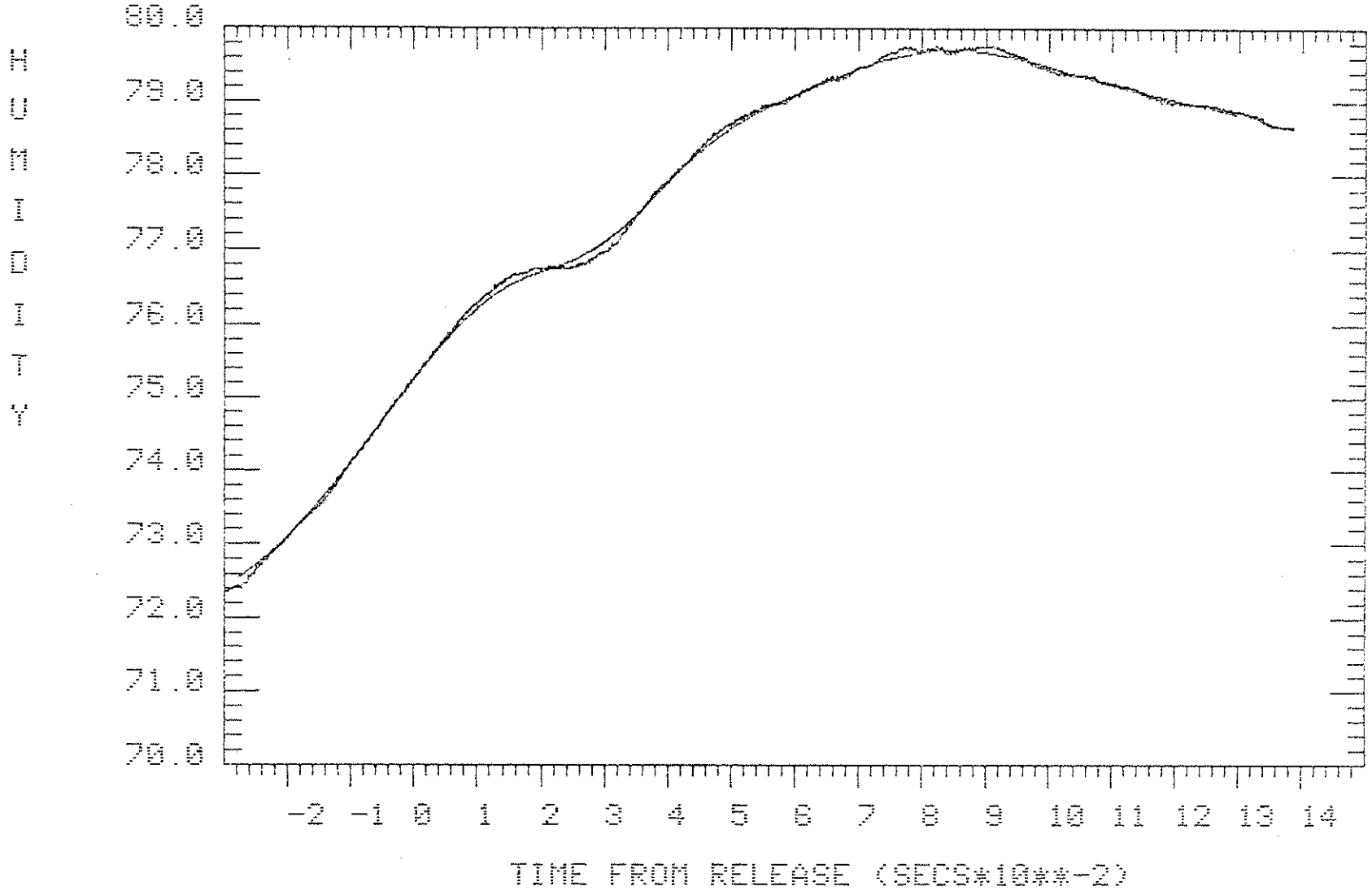


TRIAL: 009 TYPE: WSPD UNITS: M/S

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

MEAN OF RUN UP: 1.97 MEAN OF RUN DOWN: -0.01

E69

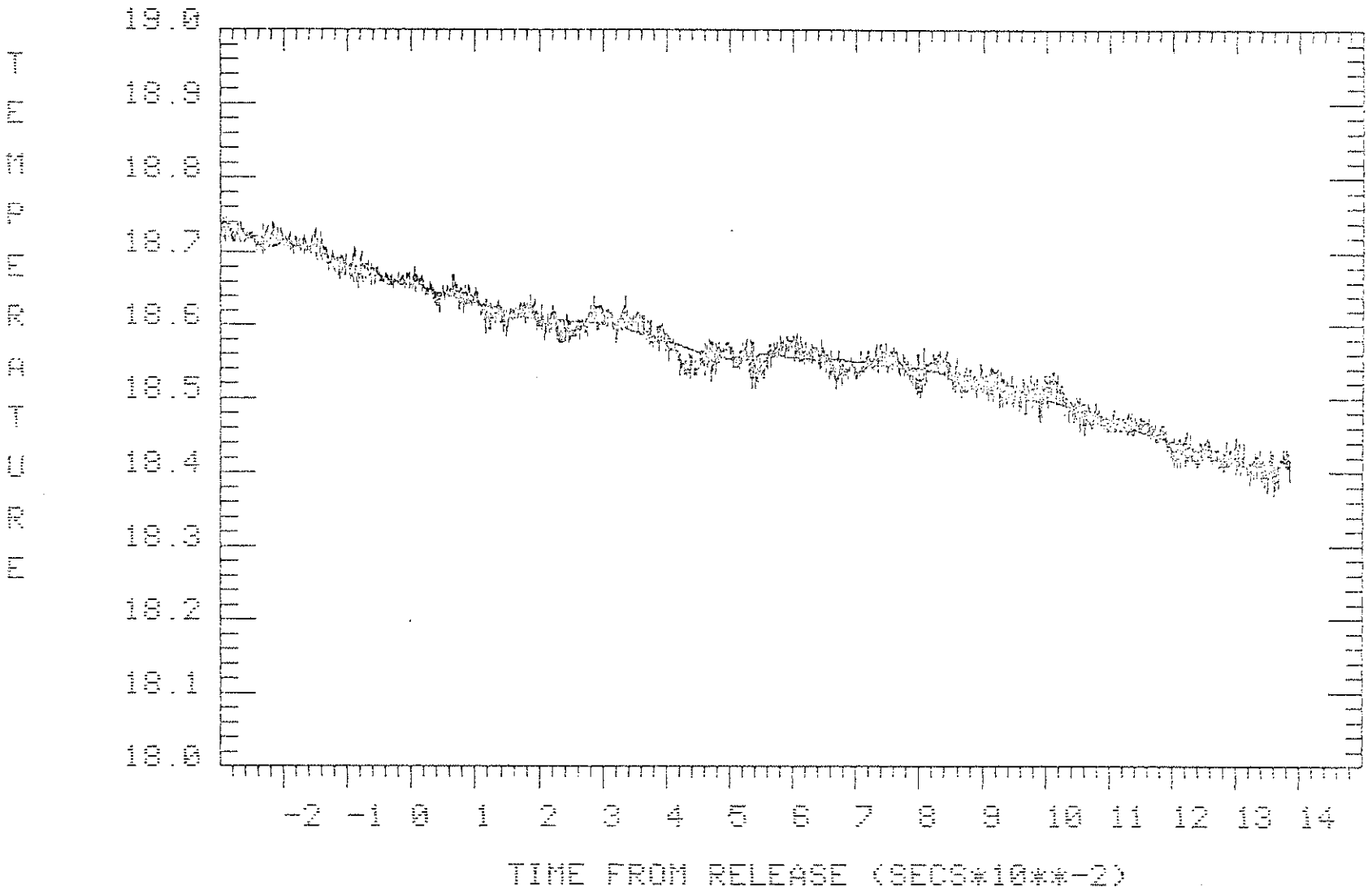


TRIAL: 009 TYPE: RHUM UNITS: PER CENT

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

MEAN OF RUN UP: 70.09 MEAN OF RUN DOWN: 81.11

E61



TRIAL: 009 TYPE: AIRT UNITS: DEGREES C

AVERAGING TIME: 0.0 SEC X: 400 M Y: 950 M Z: 10.0 M

MEAN OF RUN UP: 19.04 MEAN OF RUN DOWN: 17.75