DAMOS

DISPOSAL AREA MONINITORING SYSTEM

ANNUAL DATA REPORT - 1978

SUPPLEMENT H

NEW HAVEN DISPOSAL SITE

Naval Underwater Systems Center
Newport, Rhode Island

New England Division
Corps of Engineers
Waltham, Massachusetts

May 1979

DAMOS

DISPOSAL AREA MONITORING SYSTEM
ANNUAL DATA REPORT - 1978

SUPPLEMENT H
SITE REPORT - NEW HAVEN

Naval Underwater Systems Center
Newport, Rhode Island

New England Division
Corps of Engineers
Waltham, Massachusetts

May 1979

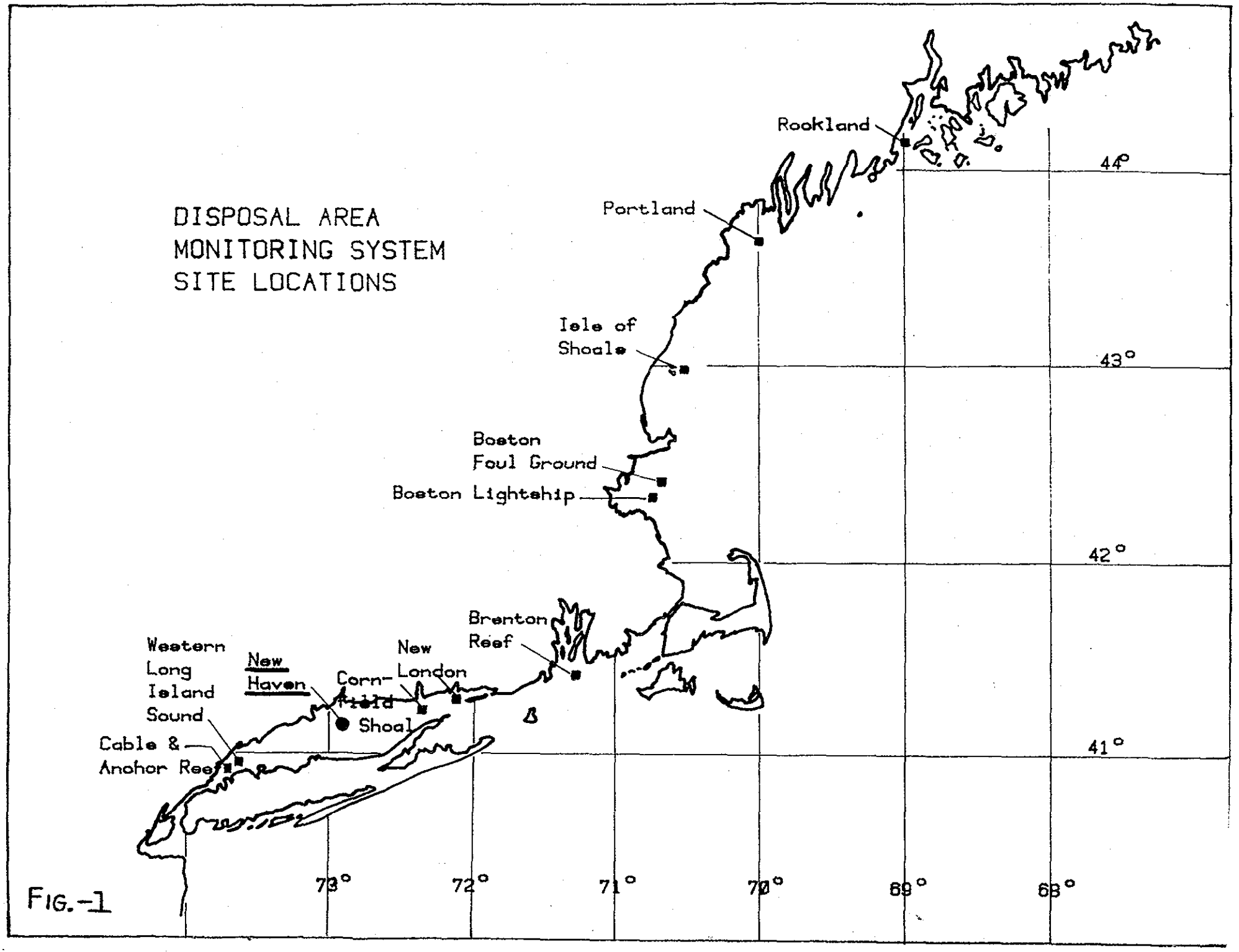

DISPOSAL AREA
MONITORING SYSTEM
SITE LOCATIONS
Rookland
Portland
Isle of
Shoals
Boston
Foul Ground
Boston Lightship
Brenton
Reef
New
London
Corn-
field
Shoal
New
Haven
Western
Long
Island
Sound
Cable &
Anchor Reef
44°
43°
42°
41°
73°
72°
71°
70°
69°
68°

FIG.-1

DISPOSAL AREA MONITORING SYSTEM

This is one of a series of site specific data reports resulting from the DAMOS program, now two years in progress. DAMOS is the culmination of nearly a decade of prior study efforts, actually preceding NEPA, which have been directed towards the understanding of the effects of and the responsible management of the ocean disposal of dredged materials in New England waters as they fall under the authority of the New England Division of the Corps of Engineers. The individual site reports henceforth will be updated approximately on an annual bases as additional knowledge is gained, at least with respect to those sites where significant disposal activities will have occurred.

NEW HAVEN

The New Haven disposal site (Figure H-1) is located approximately 5 nautical miles south of the entrance to New Haven harbor. The site covers a bottom composed of soft silts that slope gently and smoothly to the south throughout the study area.

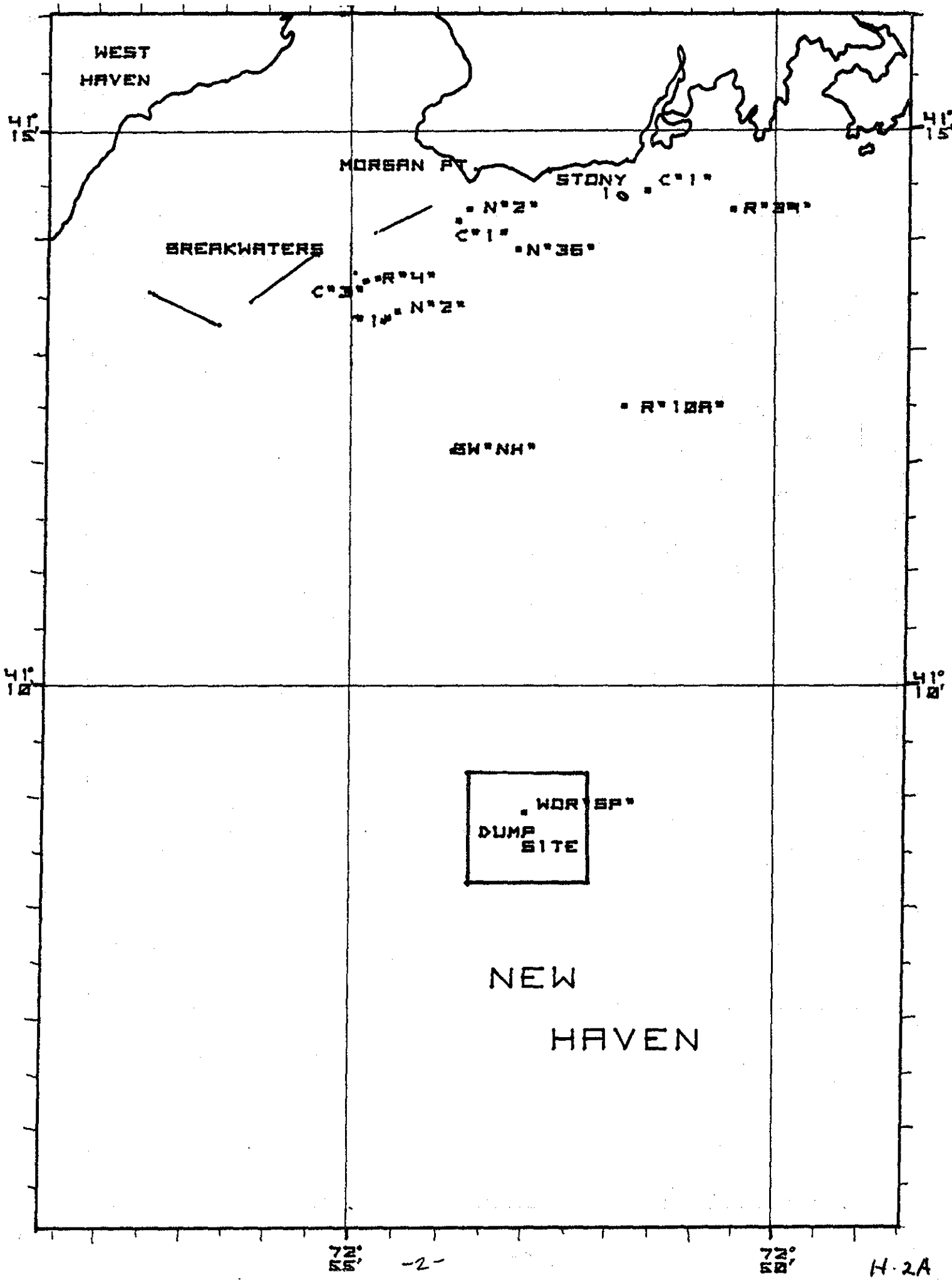
Between October, 1973, and March, 1977 1.5 million cubic yards of material were dumped at this site from dredging of New Haven harbor. These spoils formed a symmetrical mound in the center of the disposal site. Subsequent to completion of the New Haven project, additional small volumes of spoil have been dumped at a buoyed point southwest of the original site.

Bathymetry

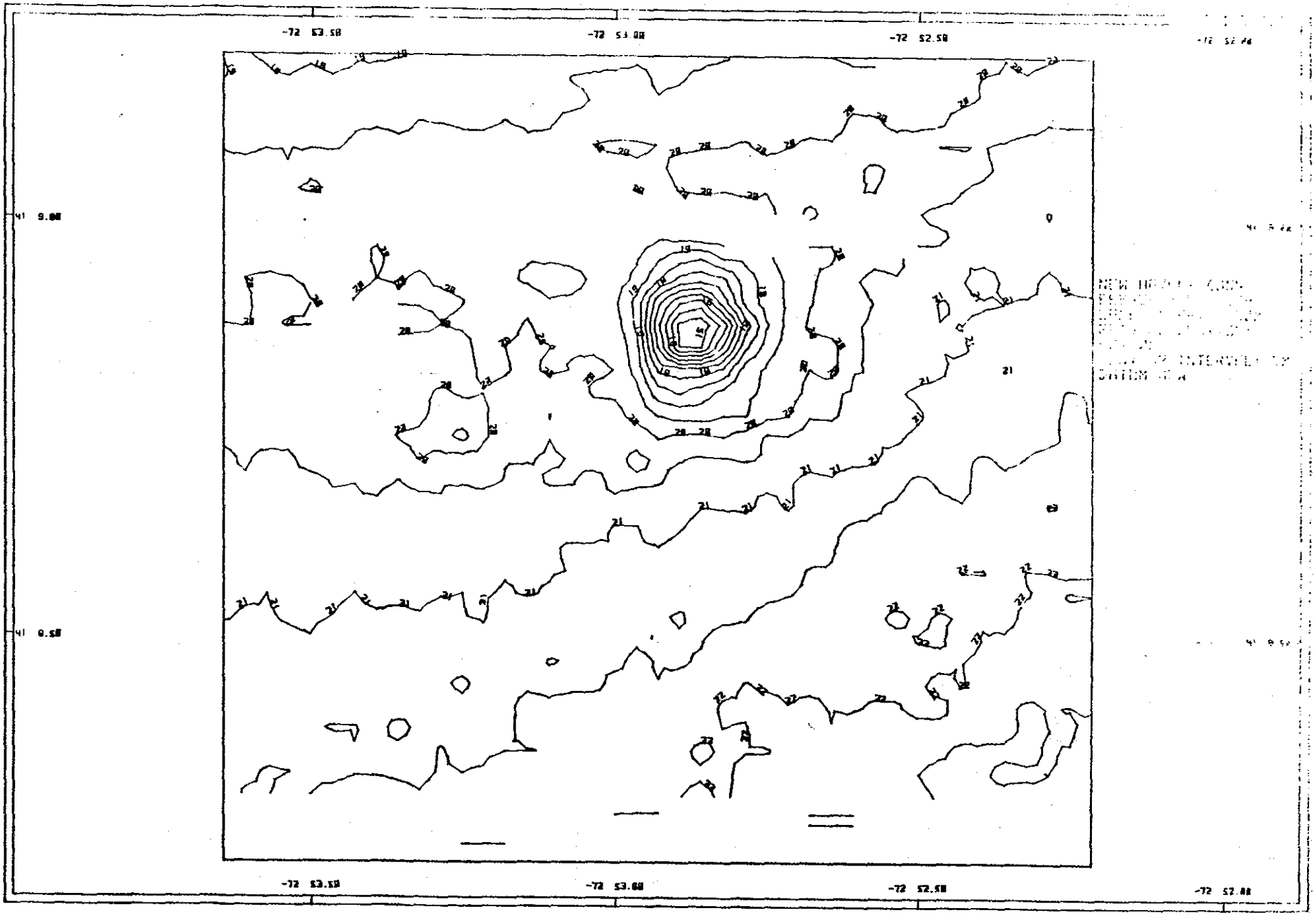
Navigation for surveys in the vicinity of the New Haven disposal site is provided by trisponder stations at the Old New Haven Lighthouse and Stratford Point Lighthouse.

Two surveys have been made at the New Haven site since the inception of the DAMOS program, the first on February 4, 1978, (Figure H-2(a-j)) and the second on July 28, 1978 (Figure H-3(a-k)). Both of these surveys showed the conical shaped spoil pile with a minimum depth of 15-15.5 meters located approximately in the center of the disposal area.

Southwest of this mound a slight rise in the bottom can be seen, particularly on Lane 18 (Figures H-2 f and H-3 f), that is located just west of the present position of the disposal buoy. This rise is the only topographic expression of spoils that have been dumped in this area since the conclusion of the New Haven project.


WEST
HAVEN
41° 15'
MORGAN PT
STONY
C"1"
N"2"
R"3A"
C"1"
N"36"
BREAKWATERS
R"4"
C"3"
N"2"
R"10A"
SW"NH"
41° 10'
WOR"SP"
DUMP
SITE
NEW
HAVEN
72° 55'
72° 50'

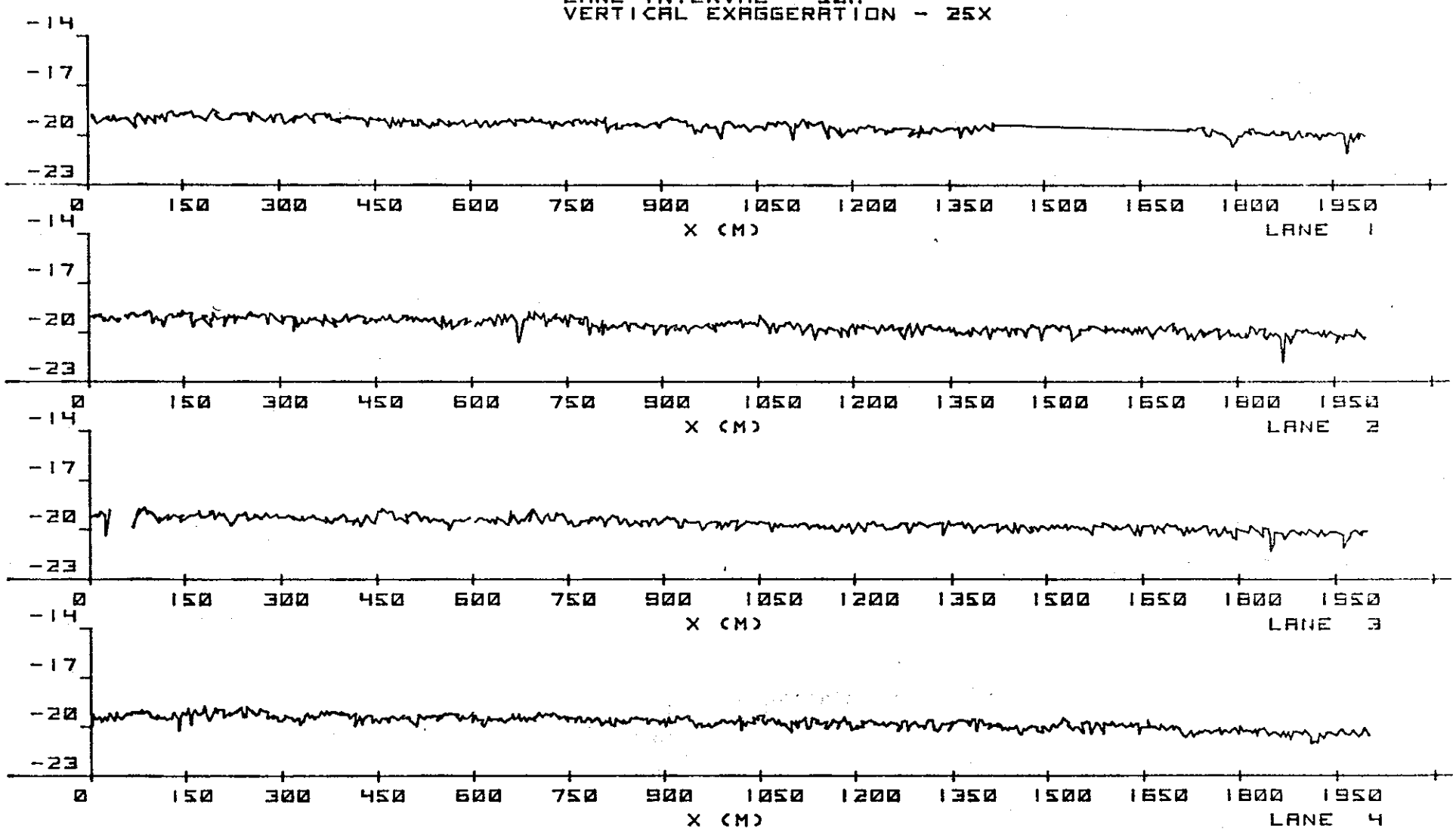
H·2A



H-2B

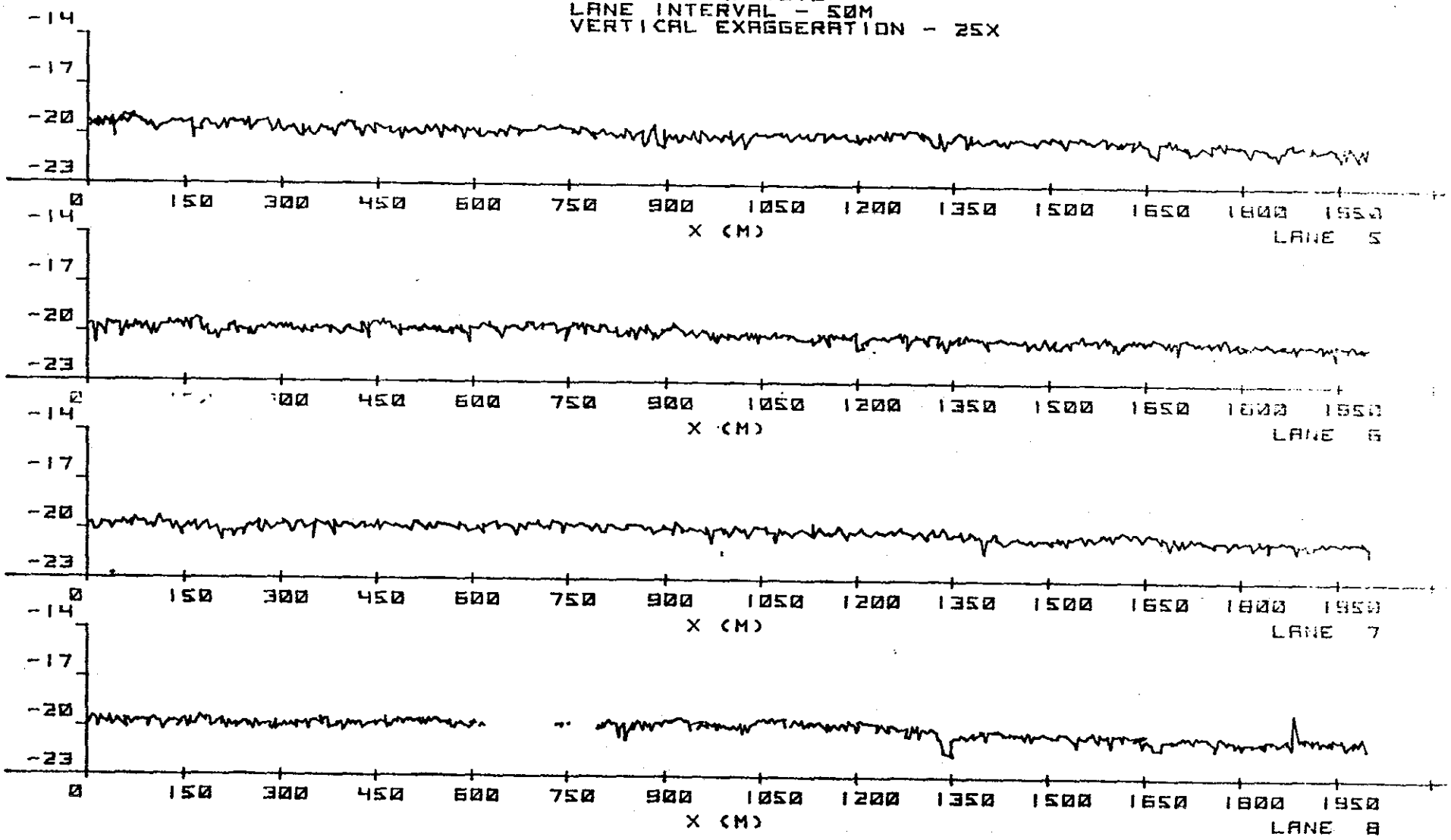
H-2a

NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X

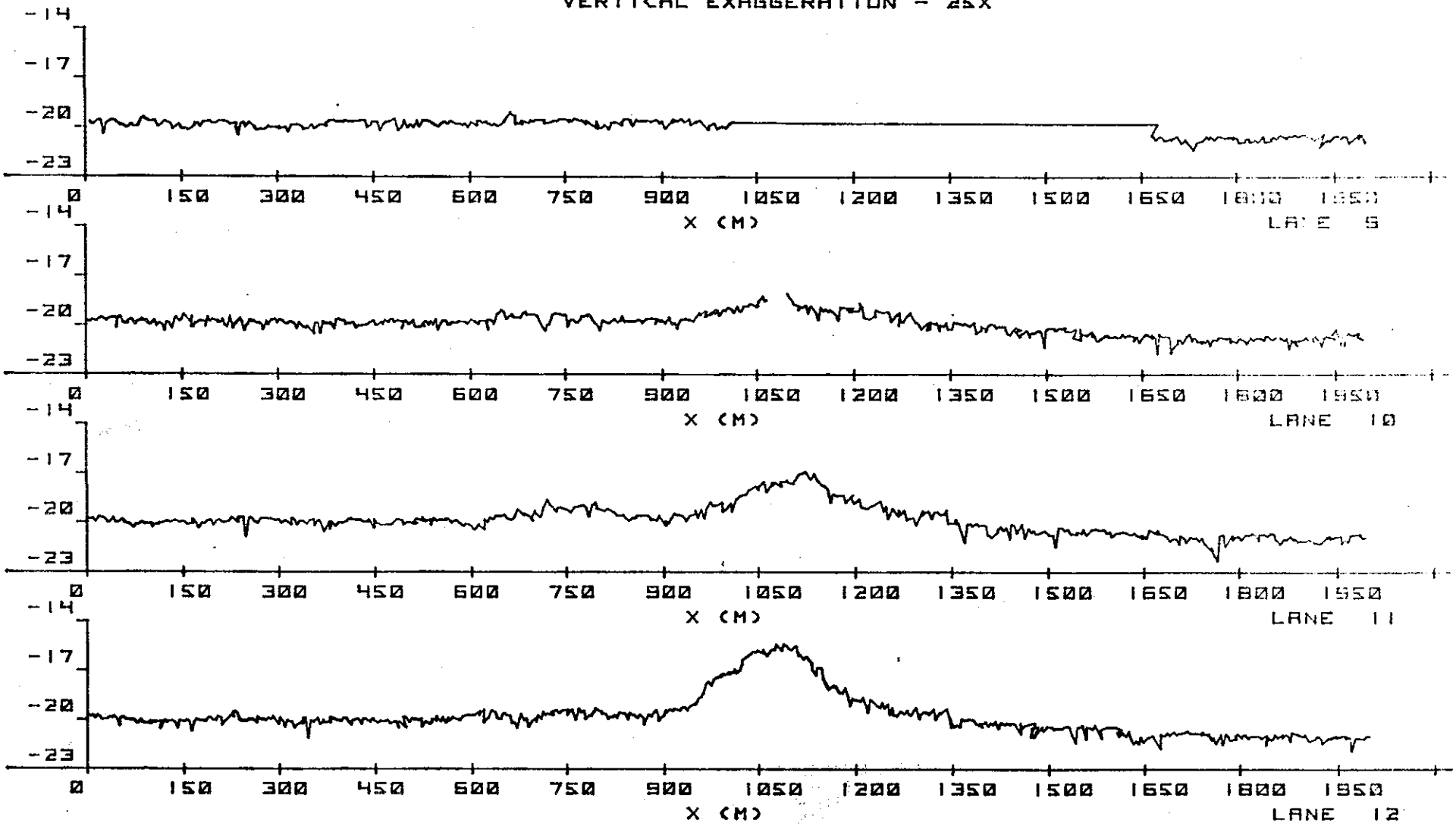


H-26

NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X

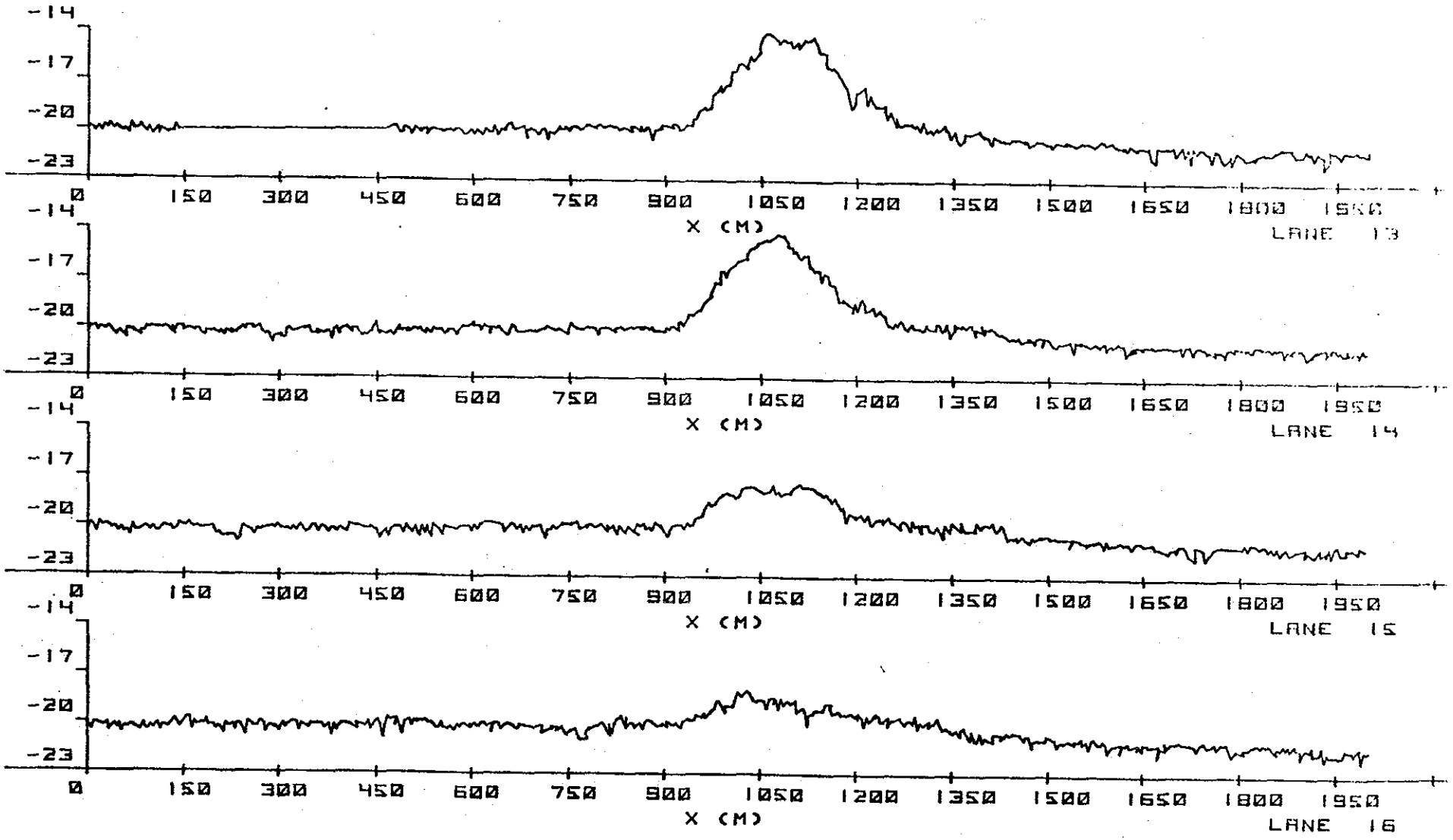


-6-

H-2E

H-2d

NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X

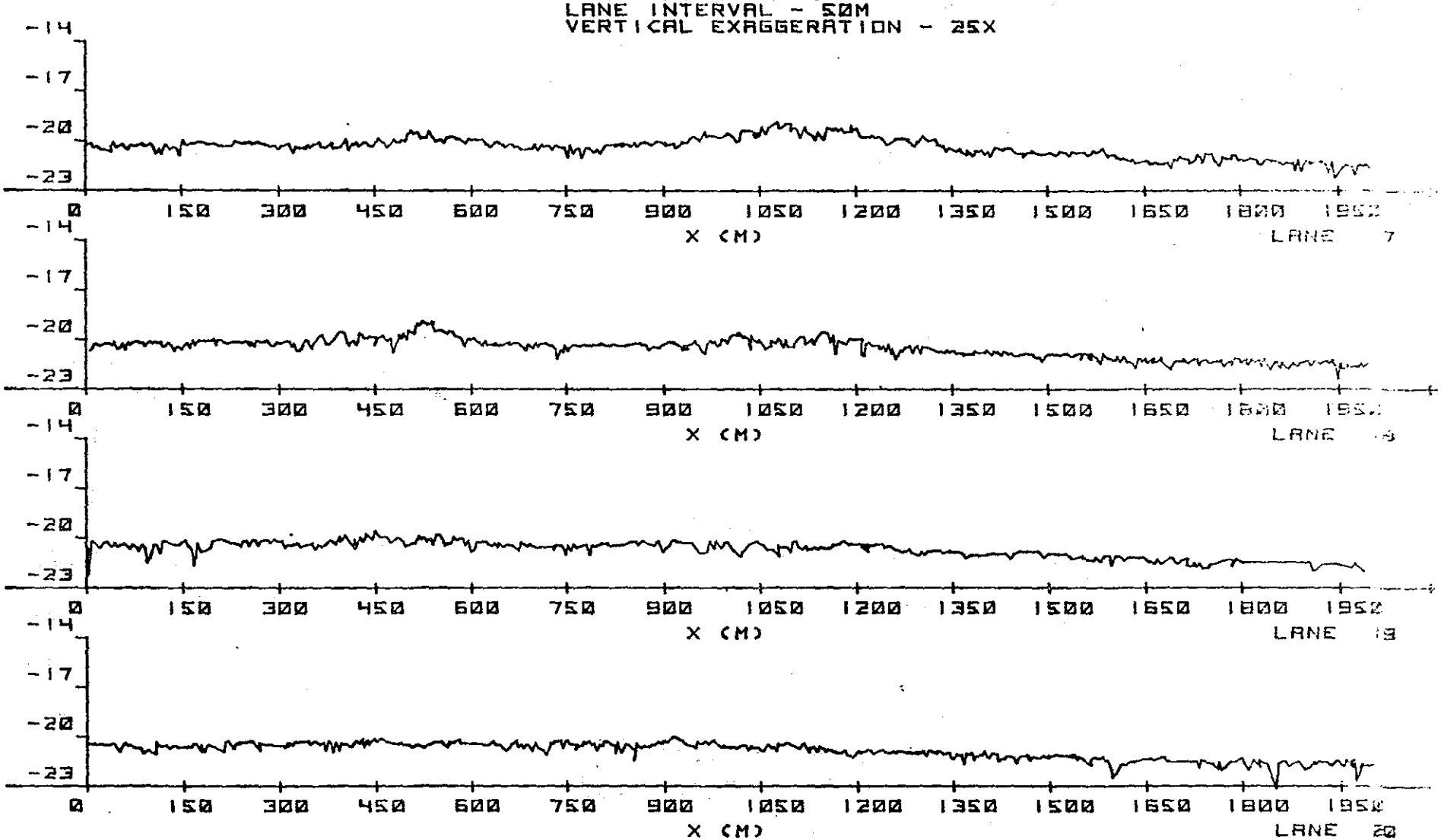


-7-

H-2F

H-2e

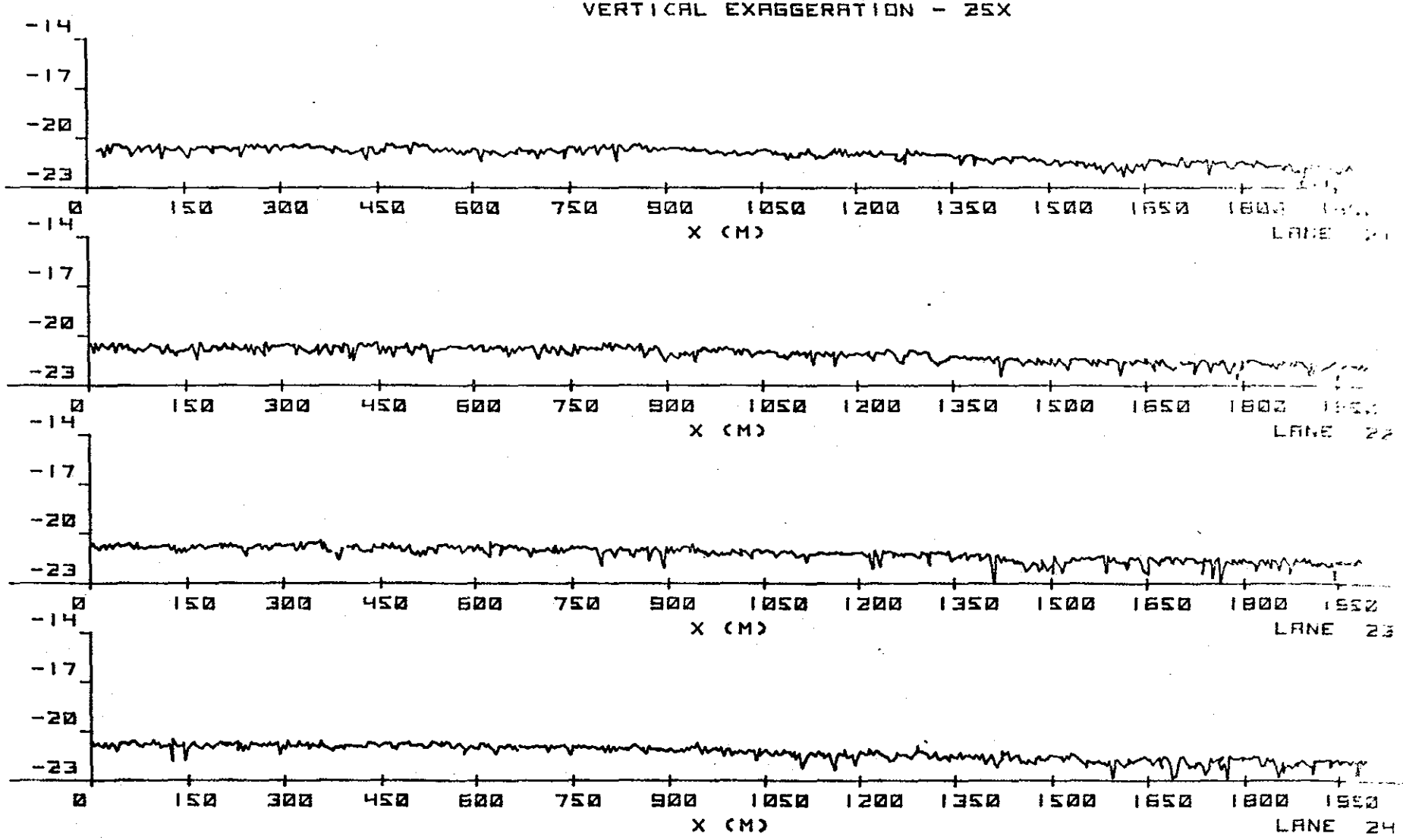
NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



8

H.21

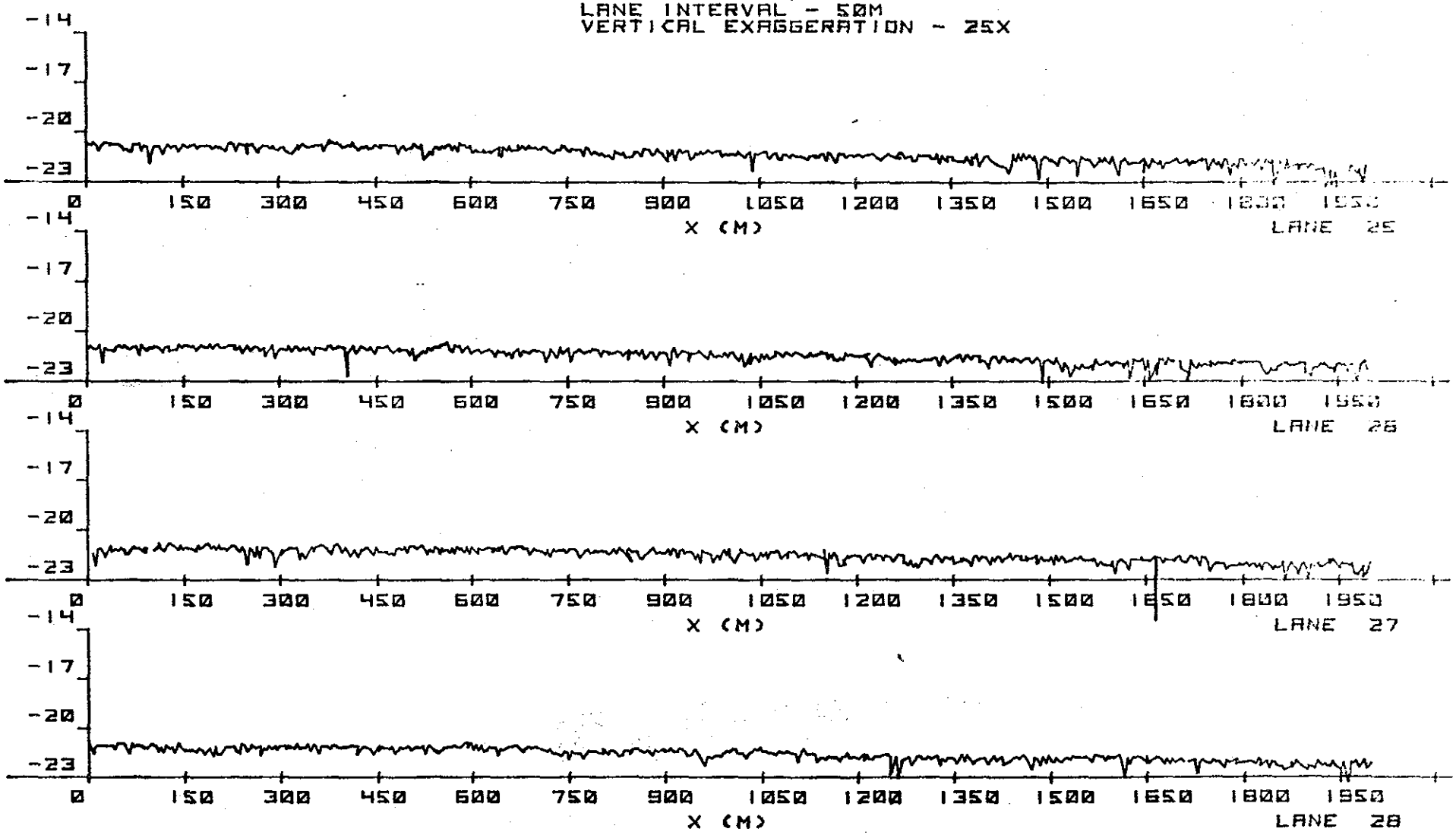
NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



H-2H

H-2g

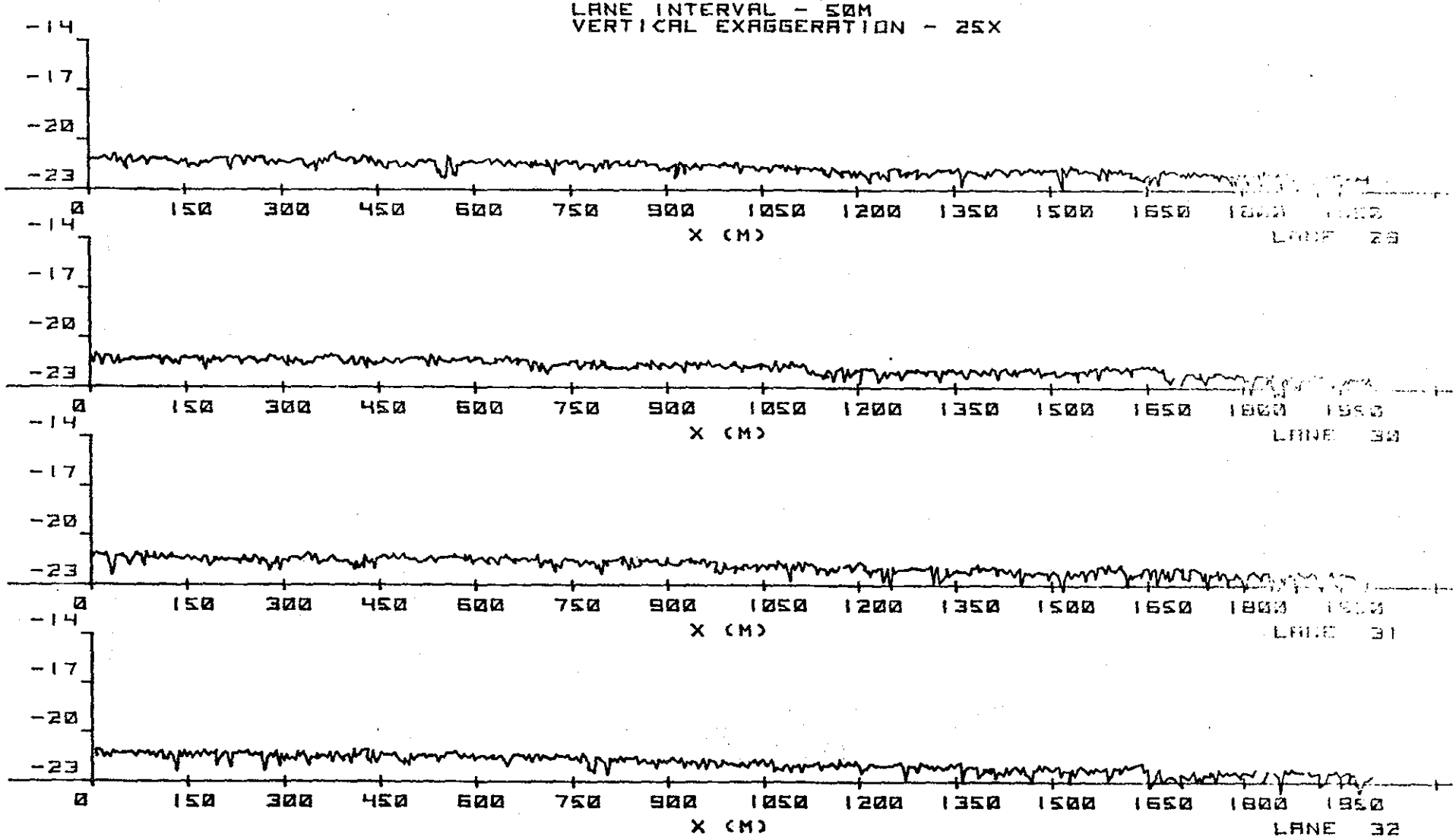
NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



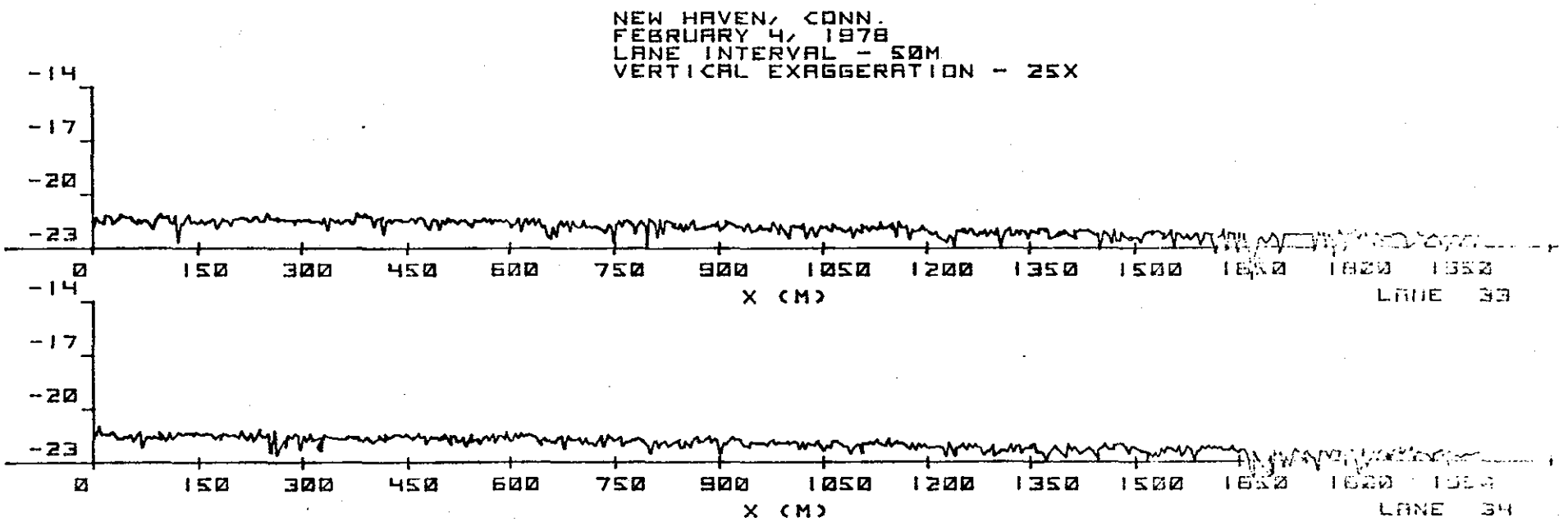
H-21

H-21

NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



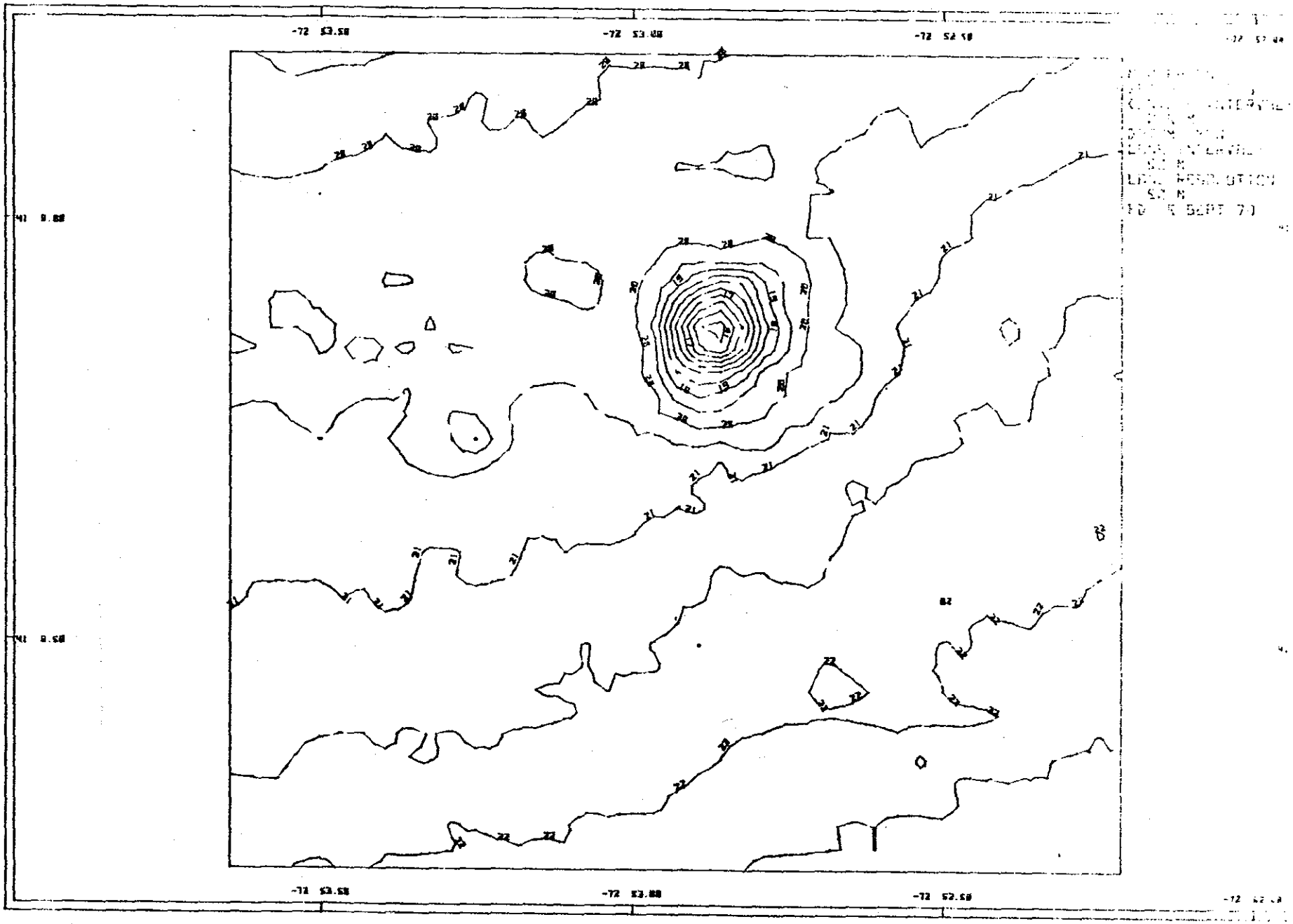
H-25


NEW HAVEN, CONN.
FEBRUARY 4, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X
-14
-17
-20
-23
0
150
300
450
600
750
900
1050
1200
1350
1500
1650
1800
1950
X (M)
LANE 33
LANE 34

12

H-2K

H-2j

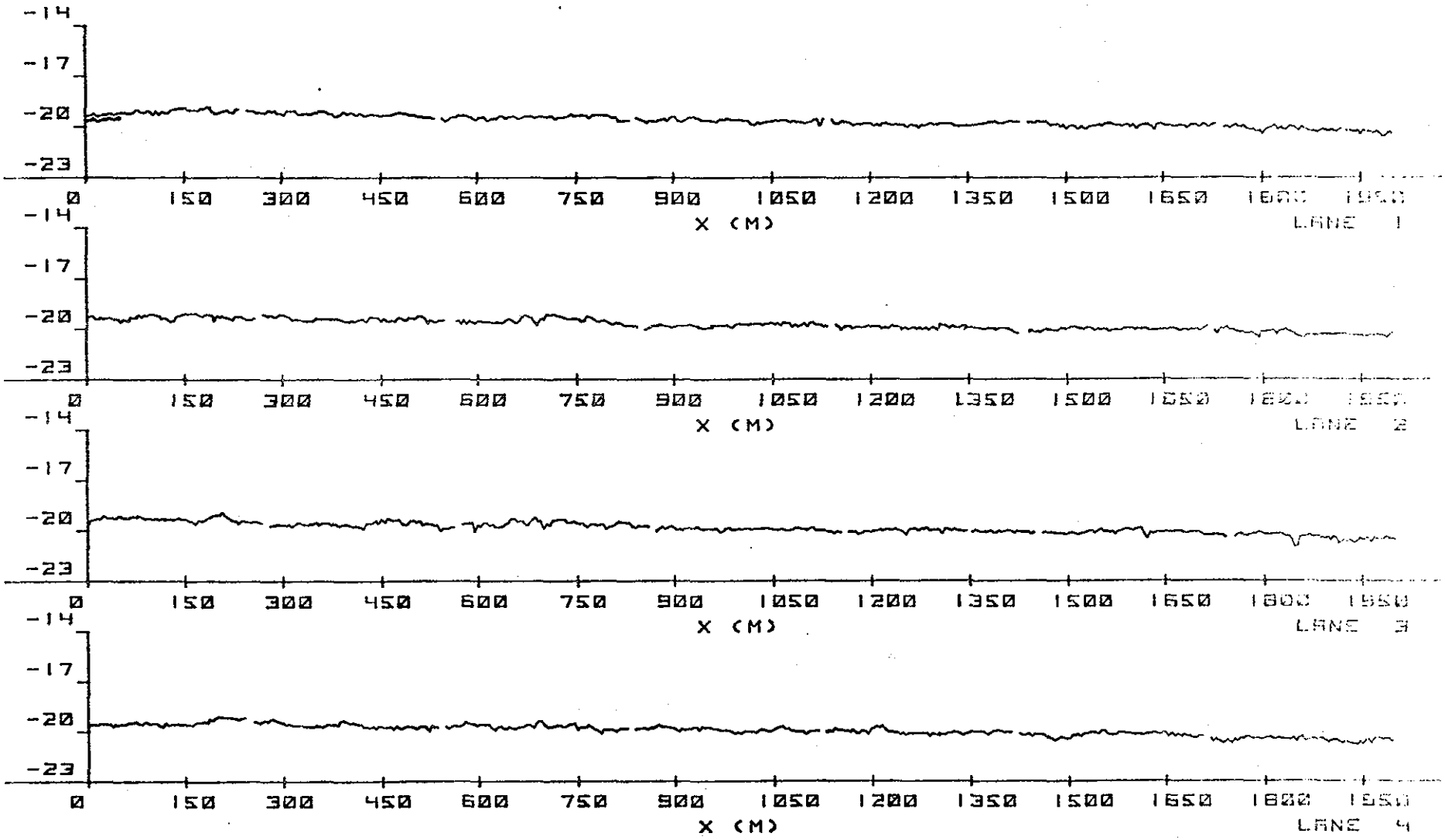


13

H-3A

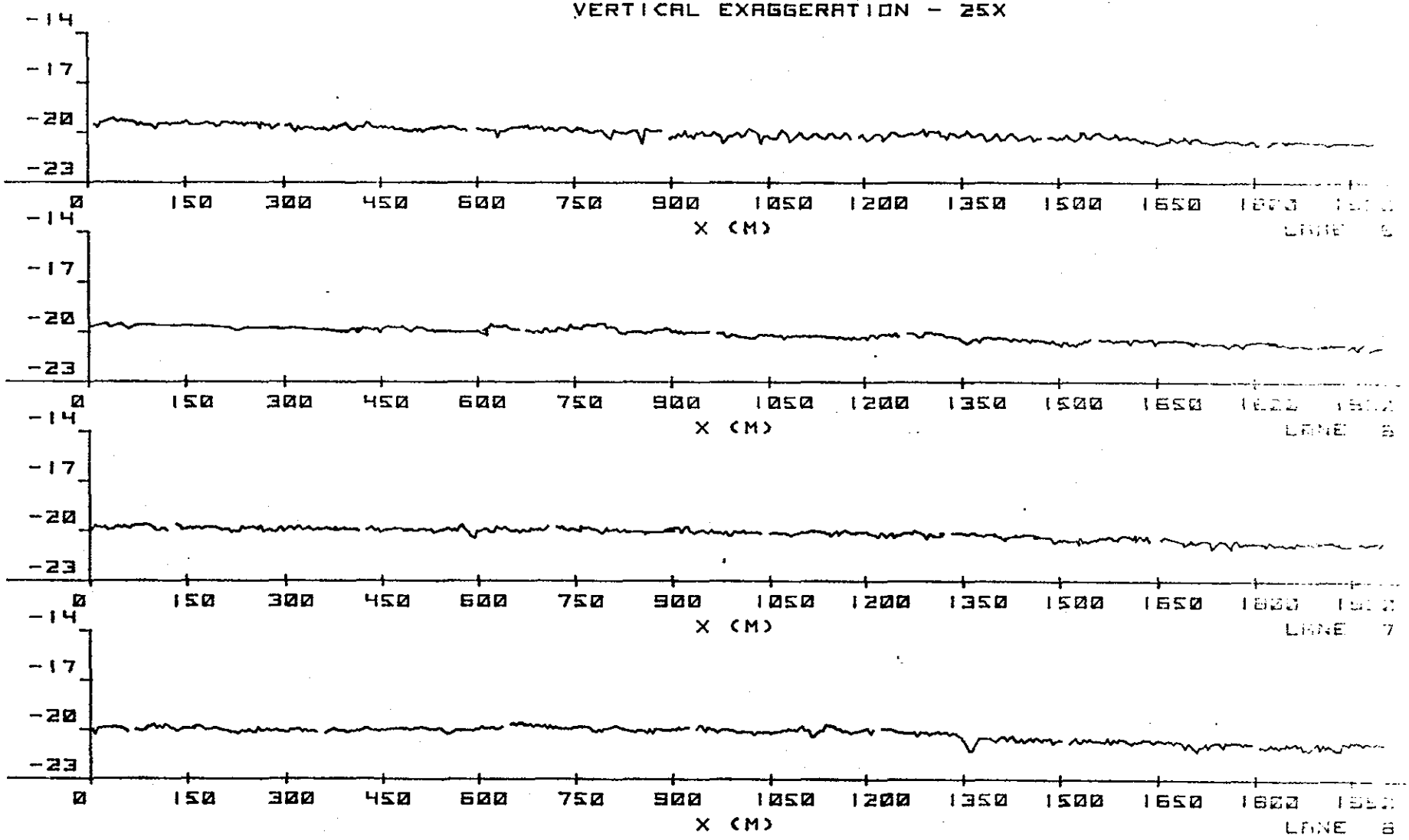
H-3a

NEW HAVEN, CONN.
JULY 28 &29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



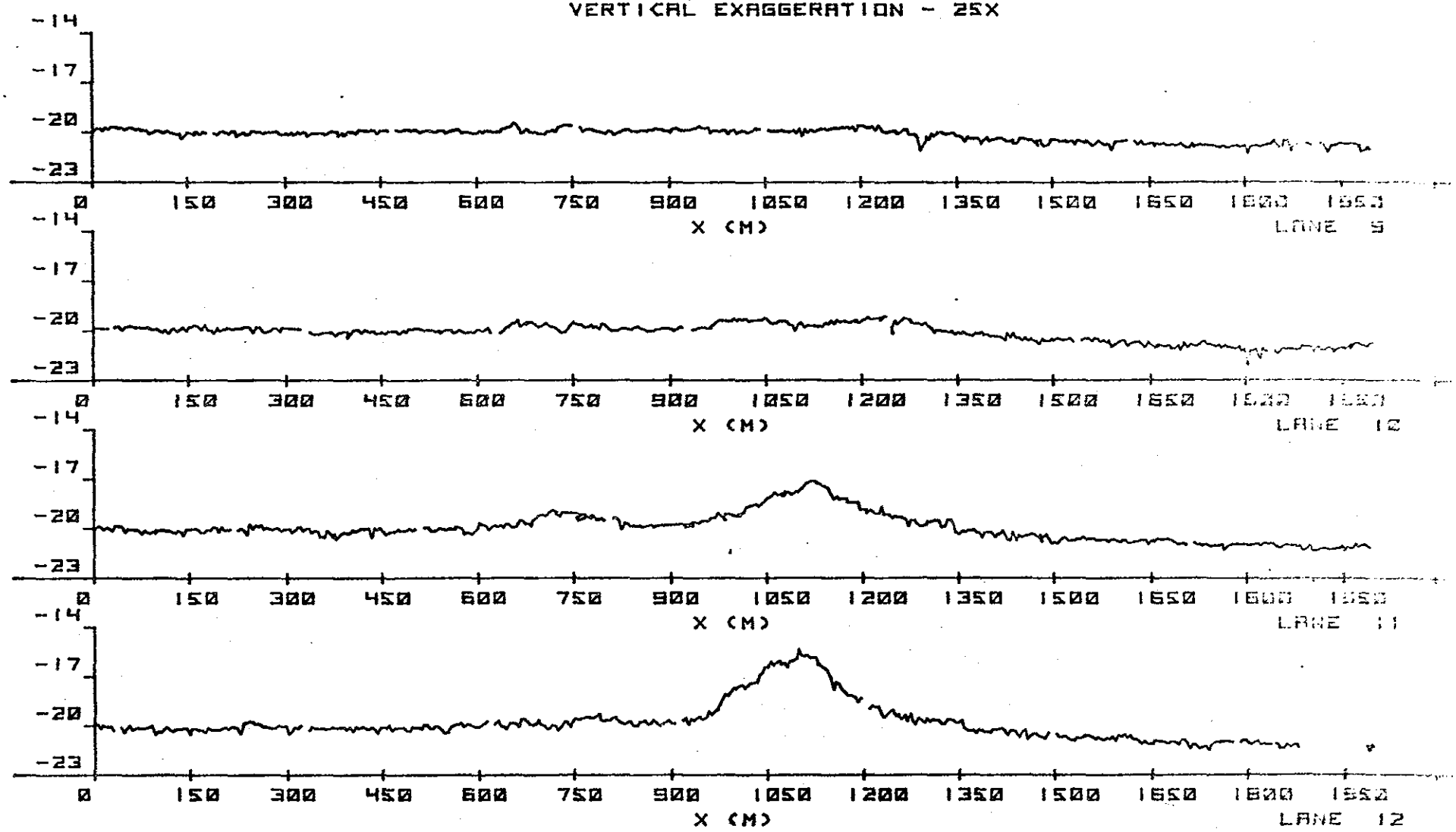
H-38

NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



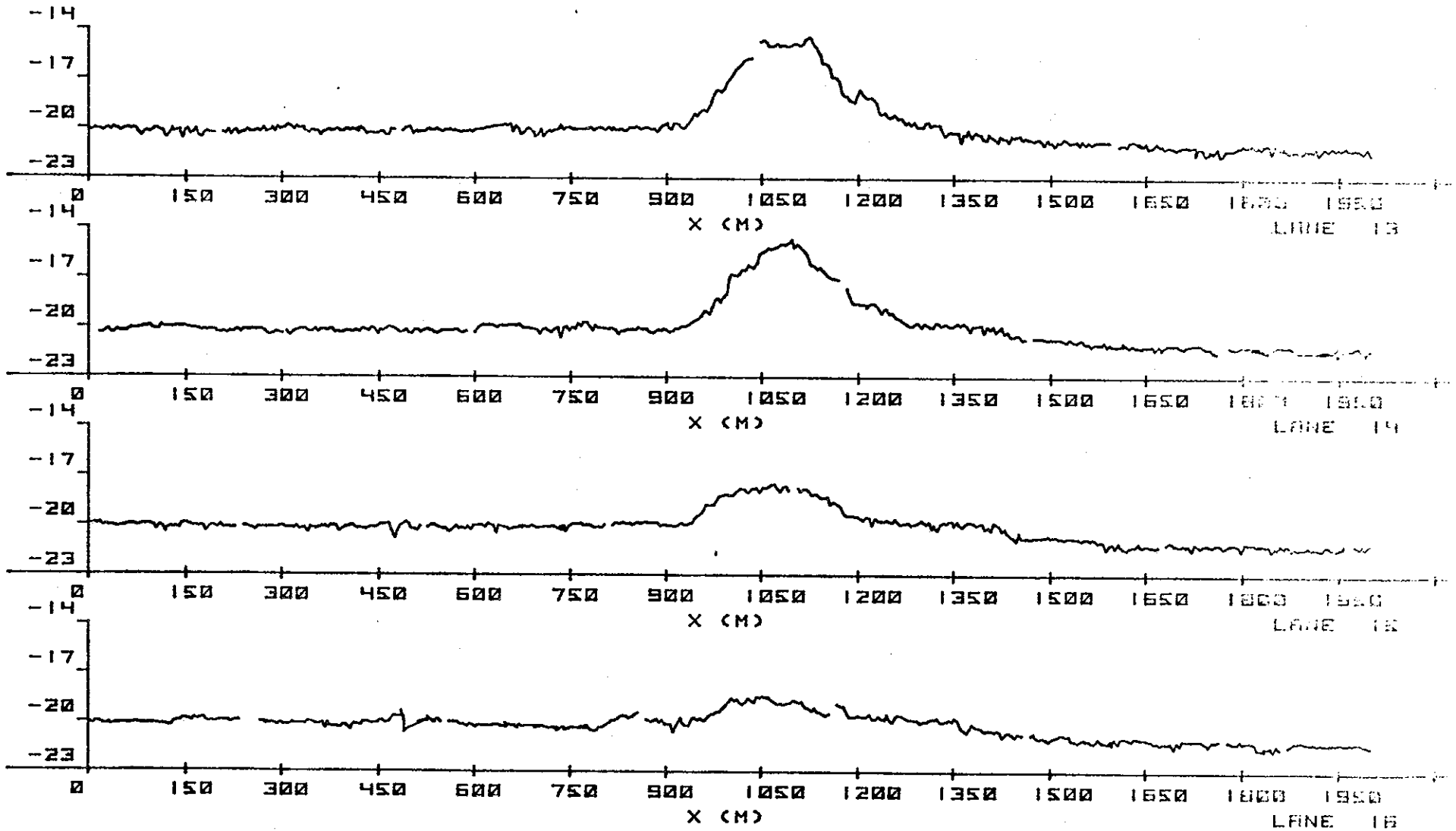
H-3C

NEW HAVEN, CONN.
JANUARY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



H-31

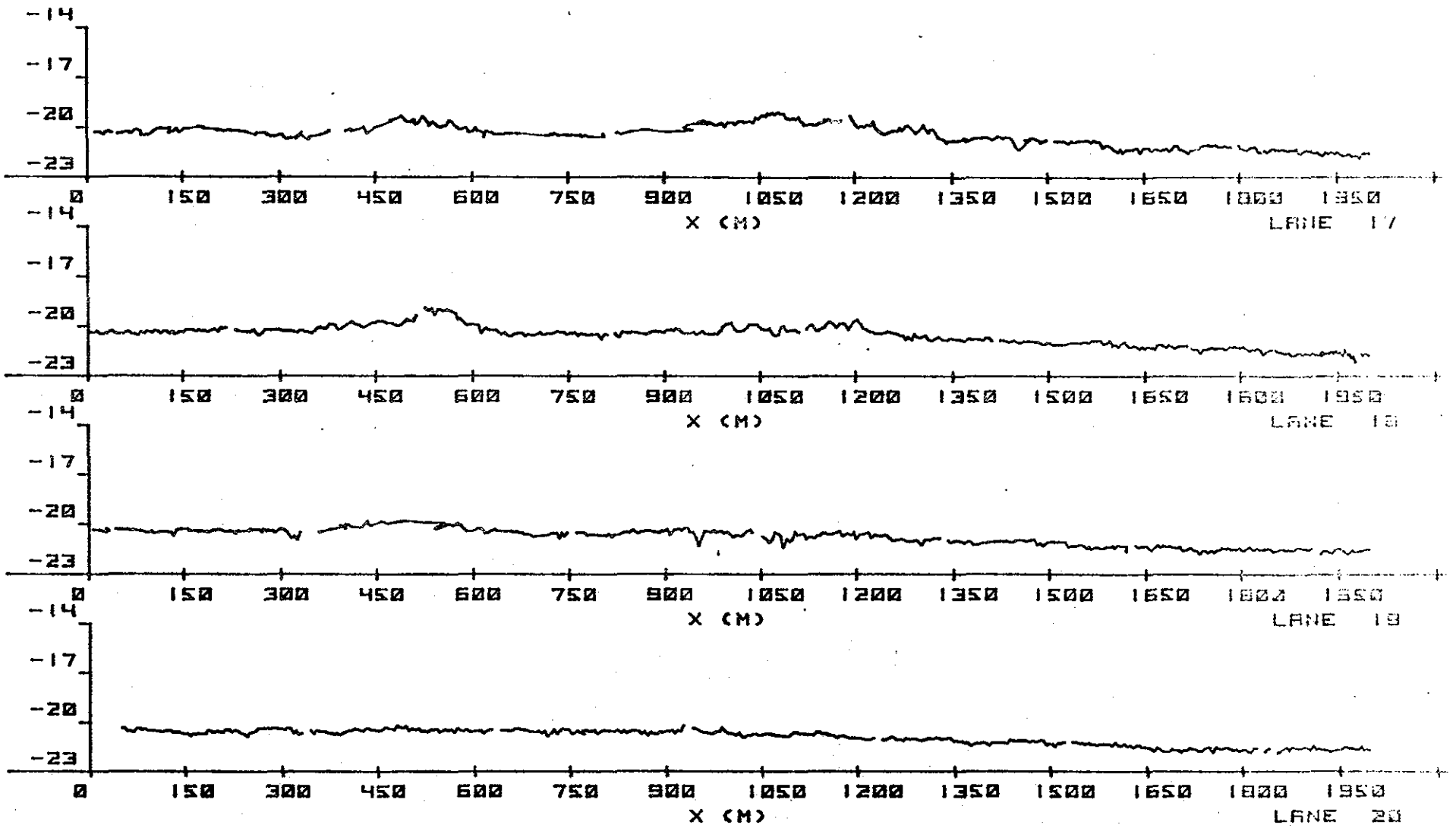
NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



17

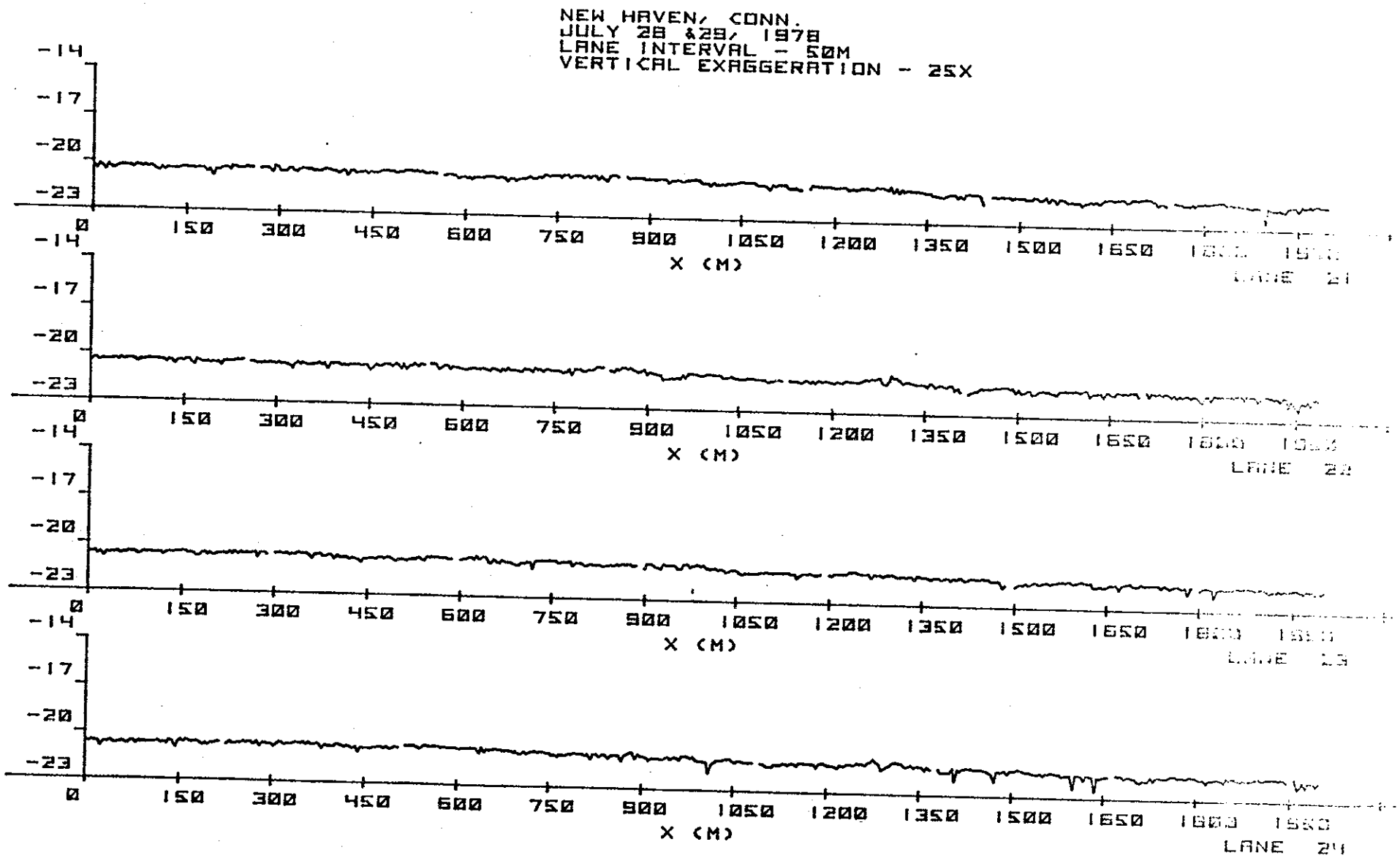
H-3E

NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X

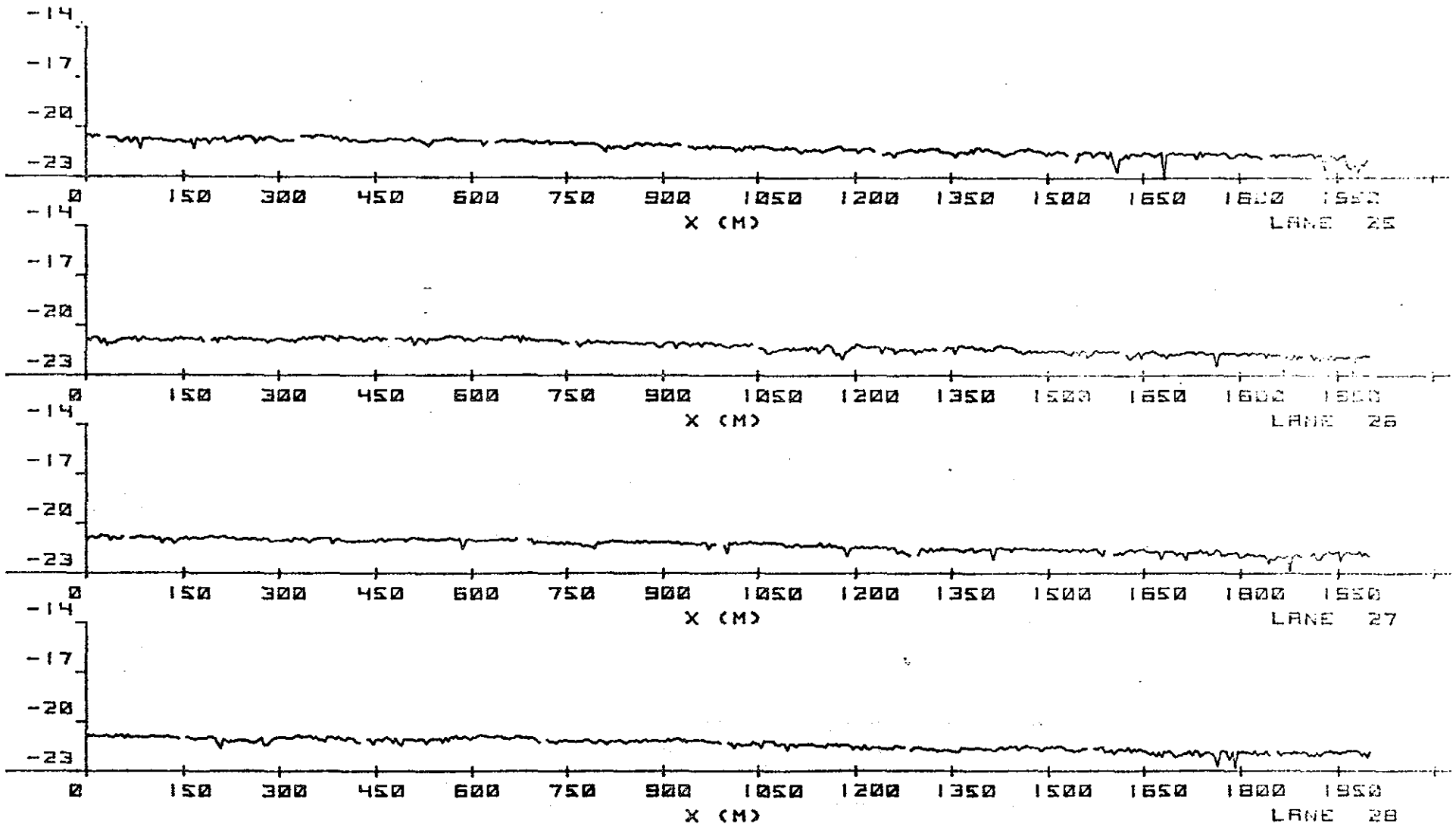


18

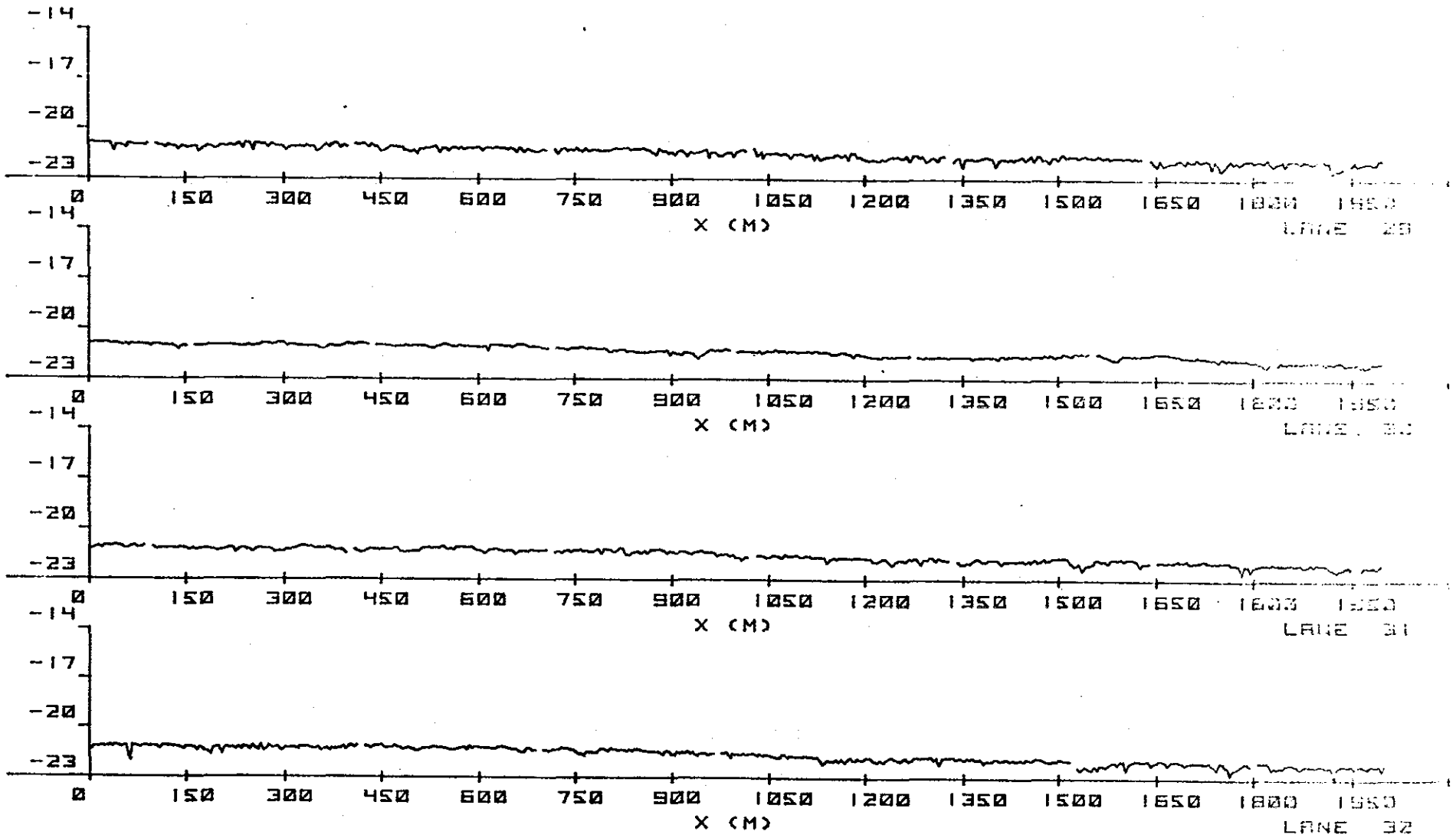
H-3A


NEW HAVEN, CONN.
JULY 28 &29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X
-14
-17
-20
-23
0
150
300
450
600
750
900
1050
1200
1350
1500
1650
X (M)
LANE 21
LANE 22
LANE 23
LANE 24

NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X

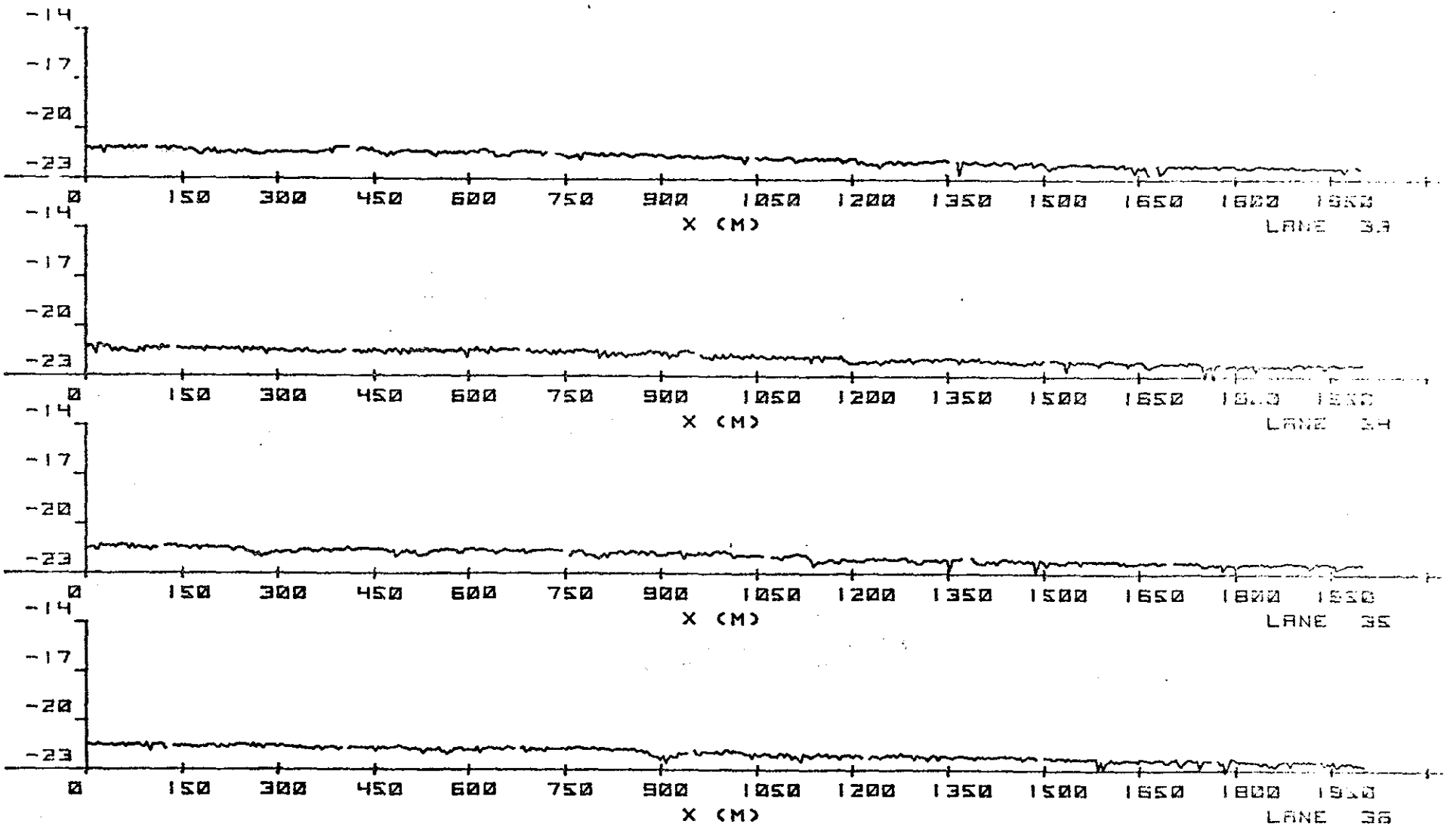


21

H-3I

H-3i

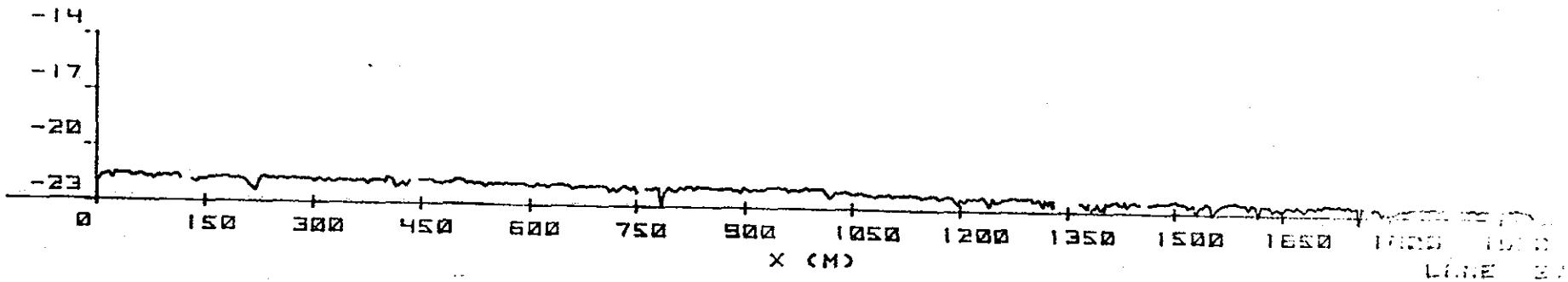
NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



H-3T

H-2

NEW HAVEN, CONN.
JULY 28 & 29, 1978
LANE INTERVAL - 50M
VERTICAL EXAGGERATION - 25X



23

H-3K

H-3K

The extreme flatness of the bottom in this area provides an opportunity to test volume calculations relative to losses of spoil material over the period of time between surveys. However, the flatness also causes small vertical changes in depth measurement to result in large horizontal changes in contour locations. Consequently, programs are being developed to calculate volume of spoil based on integration of vertical profiles, or inversely by calculation of water volume over a given area. This work is currently in progress and will be evaluated for application to this and other disposal sites.

Currents

Two sets of current data have been obtained at the New Haven disposal site. The first set of data from 13 April, 1978 to 16 May, 1978 is presented in Table H-1 and Figure H-4(a-c), the second set from 29 July to 11 September is shown in Table H-2 and Figure H-5(a-c). Both sets of data are similar, however, in all respects, the second record has slightly higher energy content. This energy is contained mostly in the residual component. The residual component of the second record has more than twice as much energy as the April to May record, while the tidal component is only 10% greater. It should be noted however, that the entire residual component comprises only 10-15% of the energy contained in each record.

The 10% highest speeds for both of these records are less than the peak tidal speeds, which is also a reflection of the large component of tidal motion. It is significant that these speeds represent only the upper 4.7 and 6.5% respectively. Consequently, the residual component is not sufficient to cause many values higher than the tidal motion alone.

TABLE H-1

New Haven Current Data

13 April-16 May, 1978

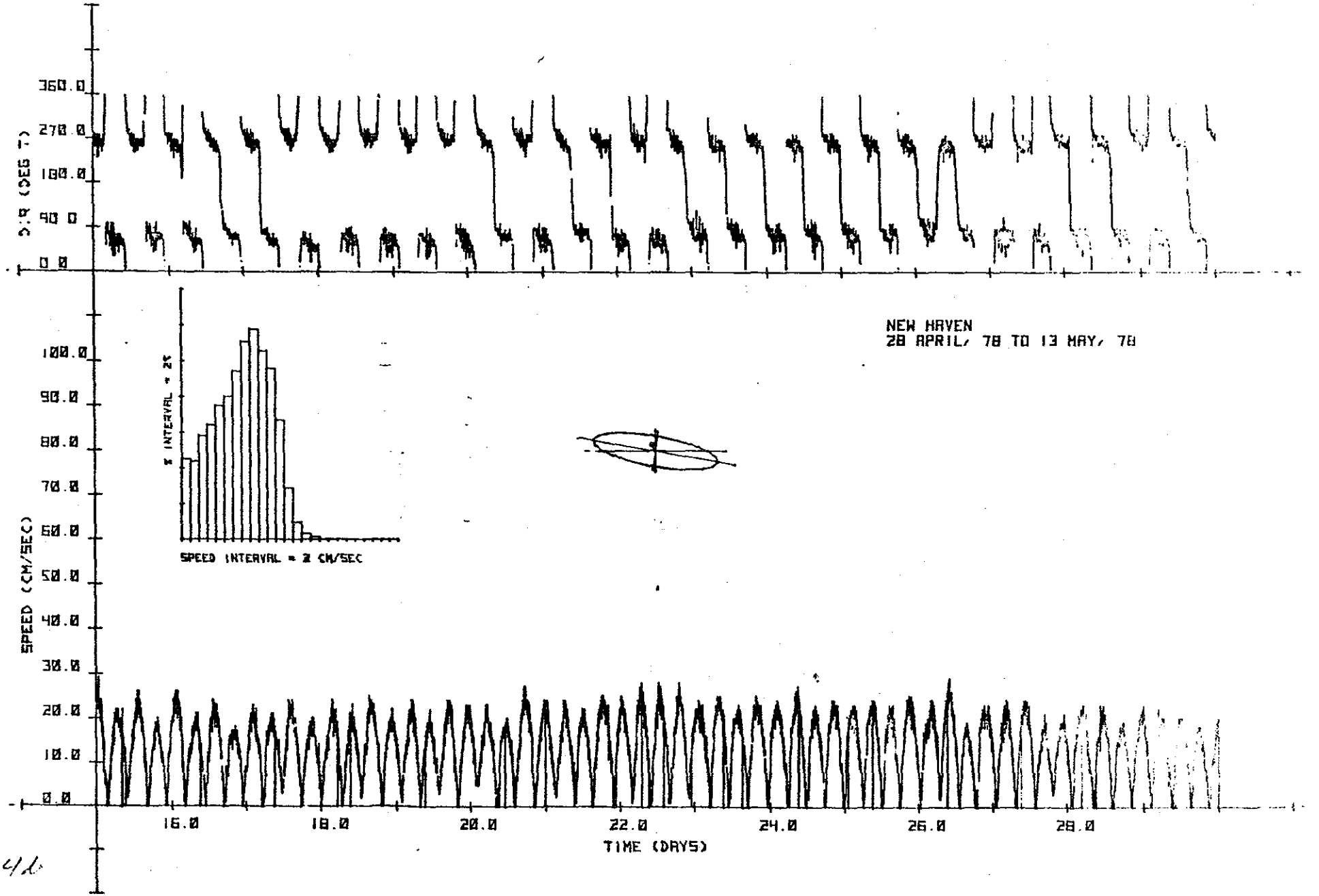
	Total OBS. Current	Tidal Current Inc. Mean	Residual Current	Mean Current
Semi-major axis (cm/sec)	14.6	14.6	3.65	-
Semi-minor axis (cm/sec)	3.4	1.99	3.05	-
Direction (°T)	099	099	083	-
Horizontal Kinetic energy (dynes/sec)	112.35	102.31	11.31	1.25
10% Highest speeds (cm/sec)	26.62 4.68	-	-	-
Peak Speed (cm/sec)	-	27.51	-	-
Average maximum speed (cm/sec)	-	20.23	-	-

TABLE H-2

NEW HAVEN CURRENT DATA

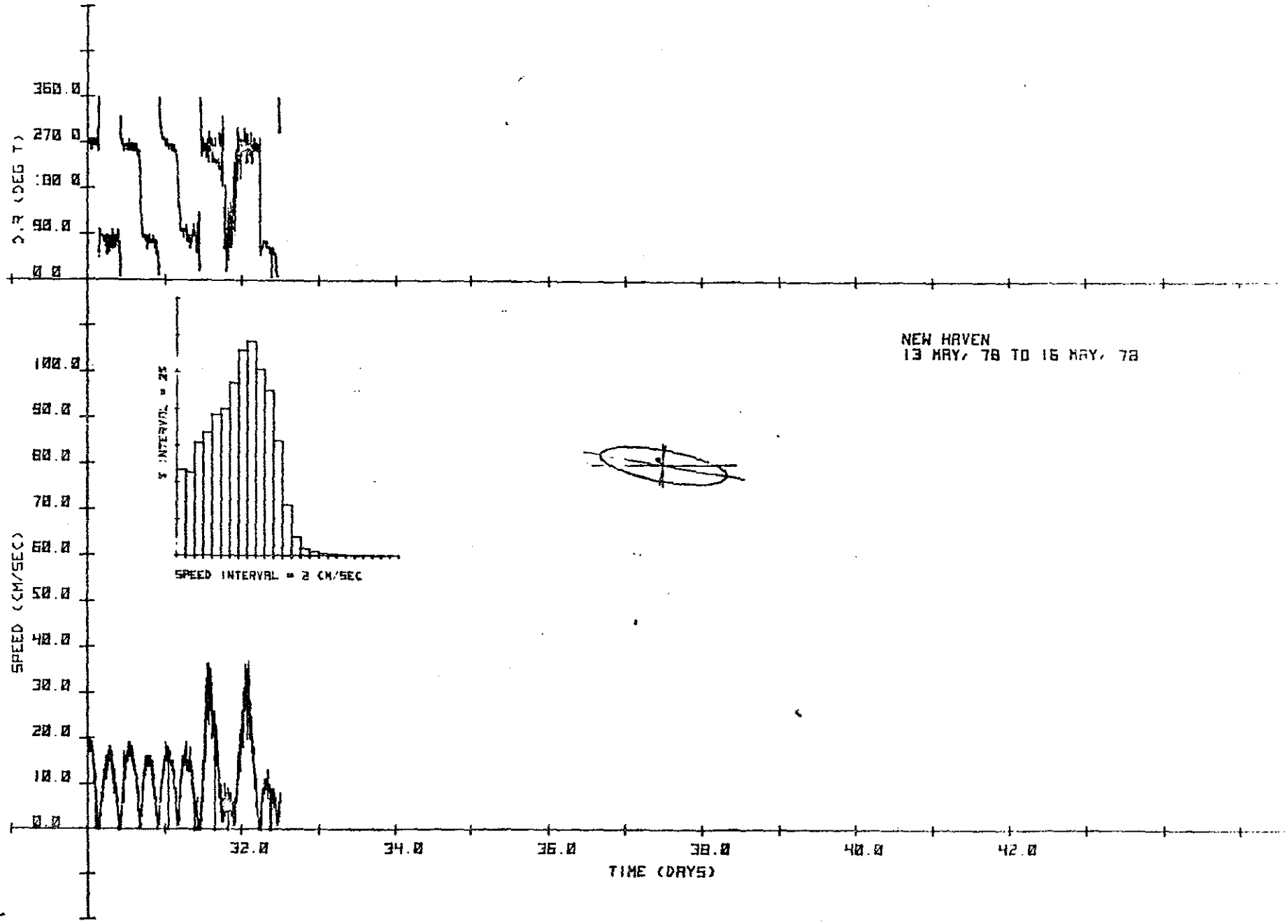
29 July-11 Sept., 1978

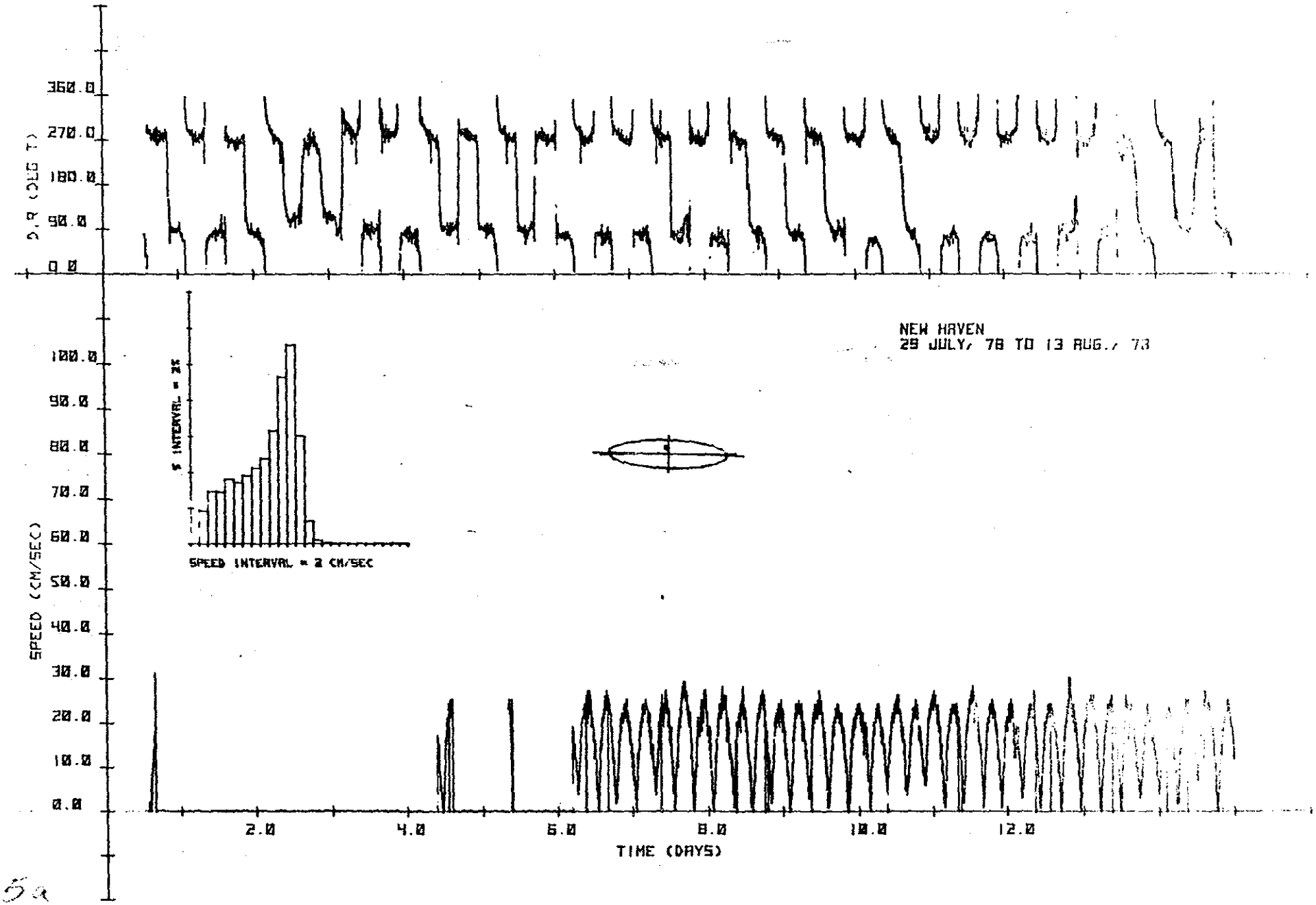
	Total OBS. Current	Tidal Current Inc. Mean	Residual Current	Mean Current
Semi-major axis (cm/sec)	16.30	14.93	6.57	-
Semi-minor axis (cm/sec)	3.62	2.26	3.34	-
Direction (°T)	089	089	086	-
Horizontal Kinetic energy (dynes/sec)	139.37	113.95	27.16	1.74
10% Highest speeds (cm/sec)	29.62 6.45%	-	-	-
Peak speed (cm/sec)	-	31.26	-	-
Average maximum speed (cm/sec)	-	21.35	-	-


NEW HAVEN
28 APRIL, 78 TO 13 MAY, 78
DIR (DEG T)
360.0
270.0
180.0
90.0
0.0
SPEED (CM/SEC)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
16.0
18.0
20.0
22.0
24.0
26.0
28.0
TIME (DAYS)

H-4B

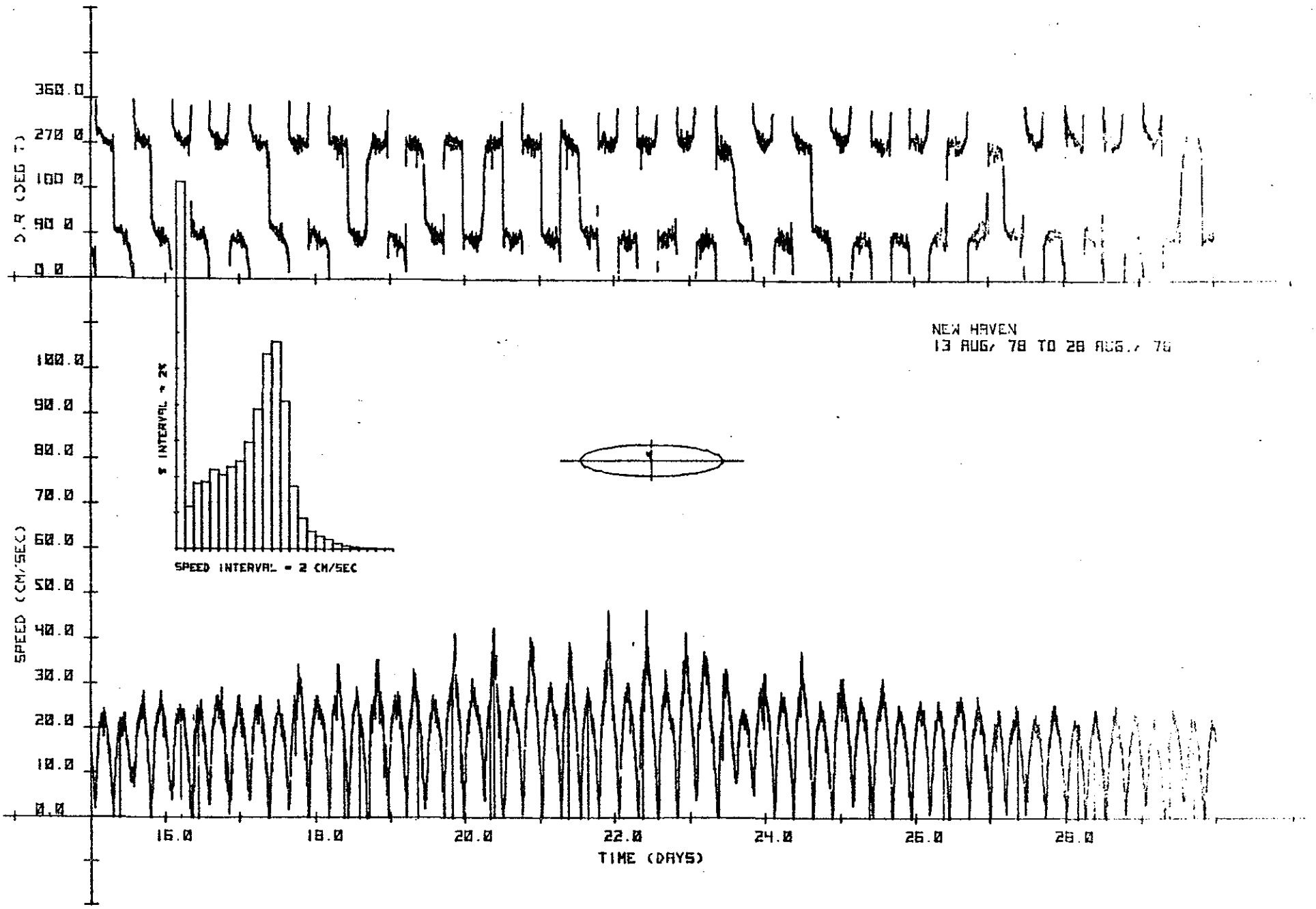
H-4b

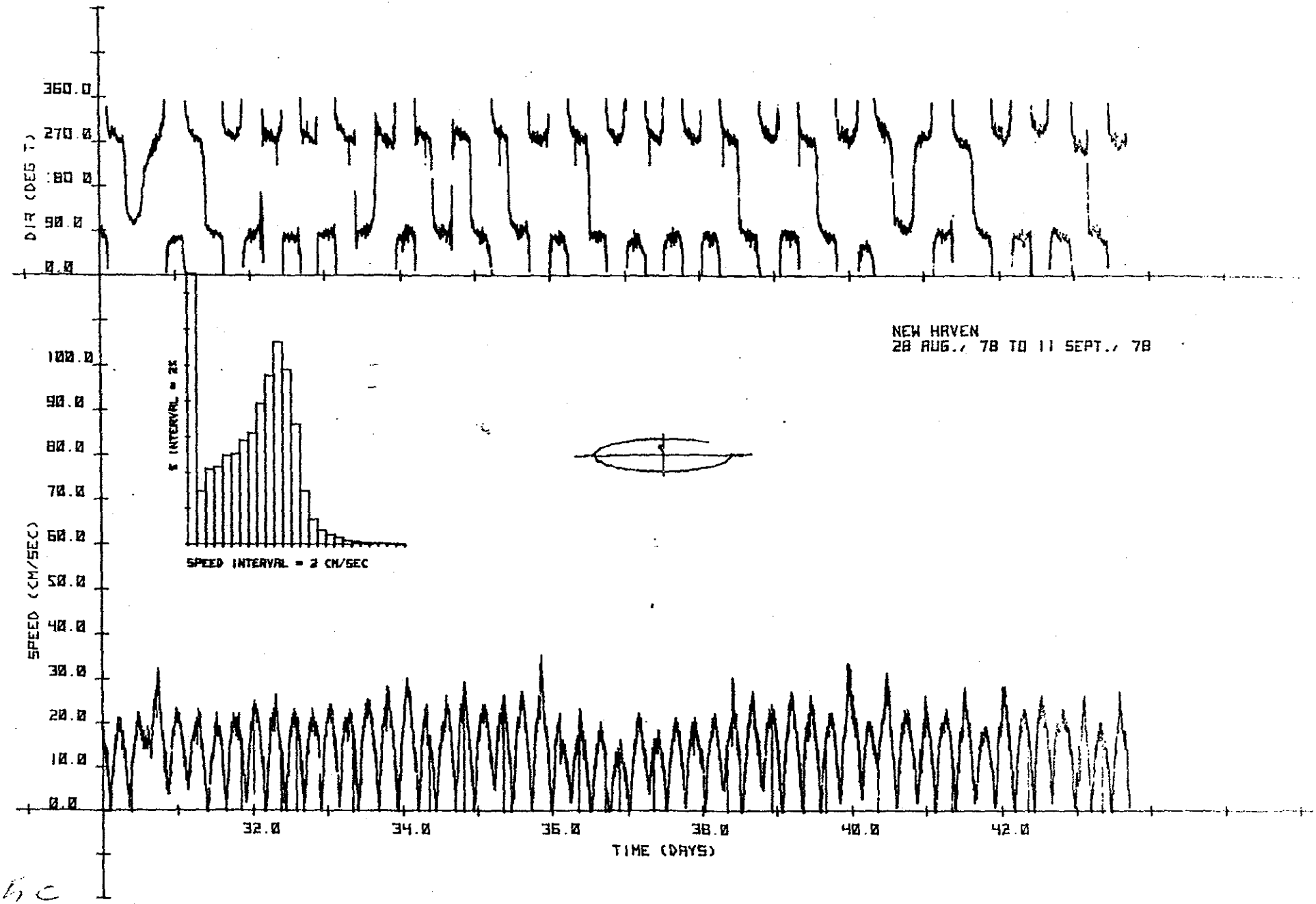

NEW HAVEN
13 MAY, 78 TO 16 MAY, 78
360.0
270.0
180.0
90.0
0.0
DIR (DEG T)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
SPEED (CM/SEC)
% INTERVAL = 25
SPEED INTERVAL = 2 CM/SEC
32.0
34.0
36.0
38.0
40.0
42.0
TIME (DAYS)


NEW HAVEN
29 JULY, 78 TO 13 AUG., 78
D.R (DEG T)
360.0
270.0
180.0
90.0
0.0
SPEED (CM/SEC)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
2.0
4.0
6.0
8.0
10.0
12.0
TIME (DAYS)

H-5A

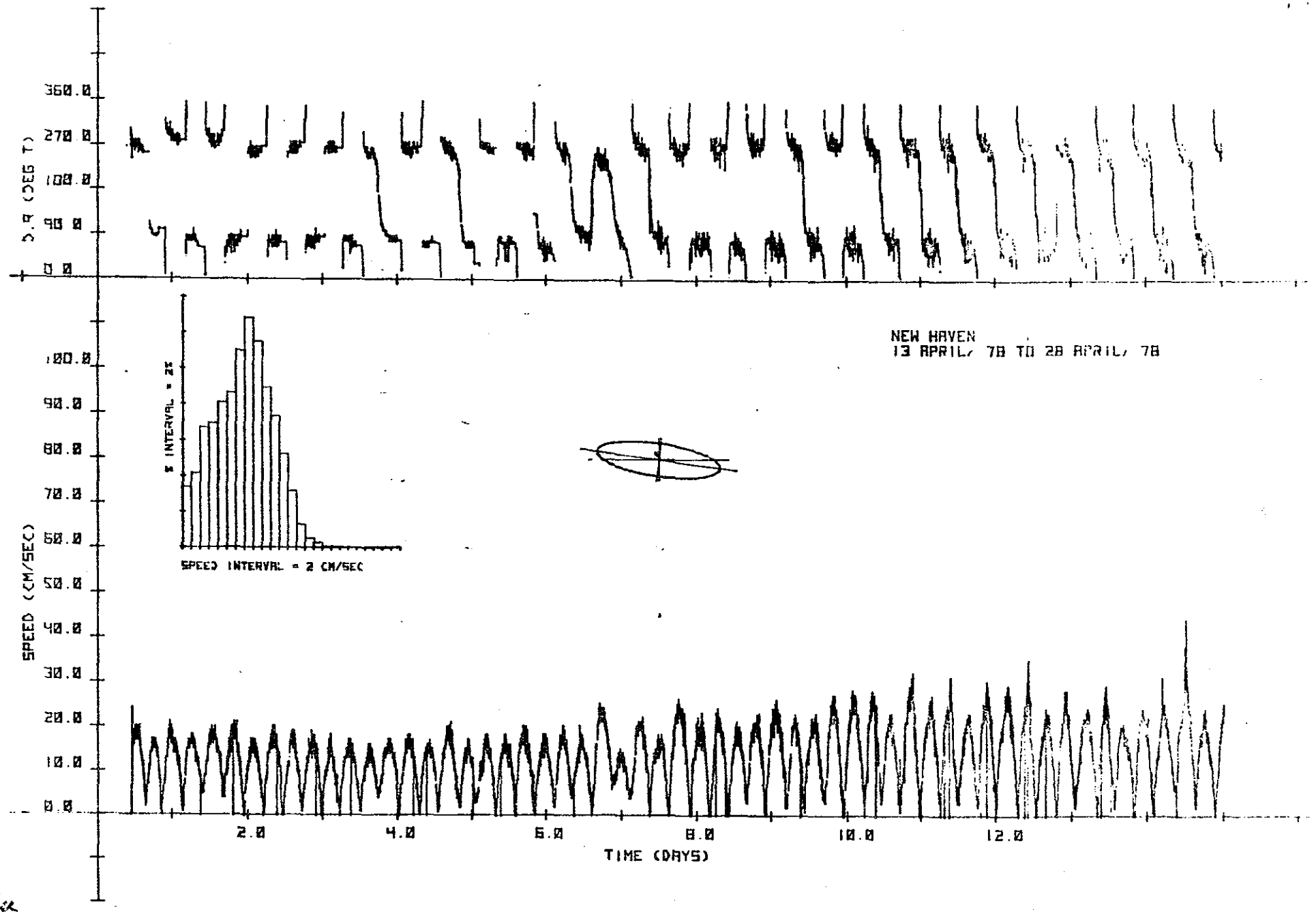
H-5a


NEW HAVEN
13 AUG, 78 TO 28 AUG., 78
360.0
270.0
180.0
90.0
0.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
SPEED (CM/SEC)
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
16.0
18.0
20.0
22.0
24.0
26.0
28.0
TIME (DAYS)


NEW HAVEN
28 AUG., 78 TO 11 SEPT., 78
DIR (DEG T)
360.0
270.0
180.0
90.0
0.0
SPEED (CM/SEC)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
32.0
34.0
36.0
38.0
40.0
42.0
TIME (DAYS)

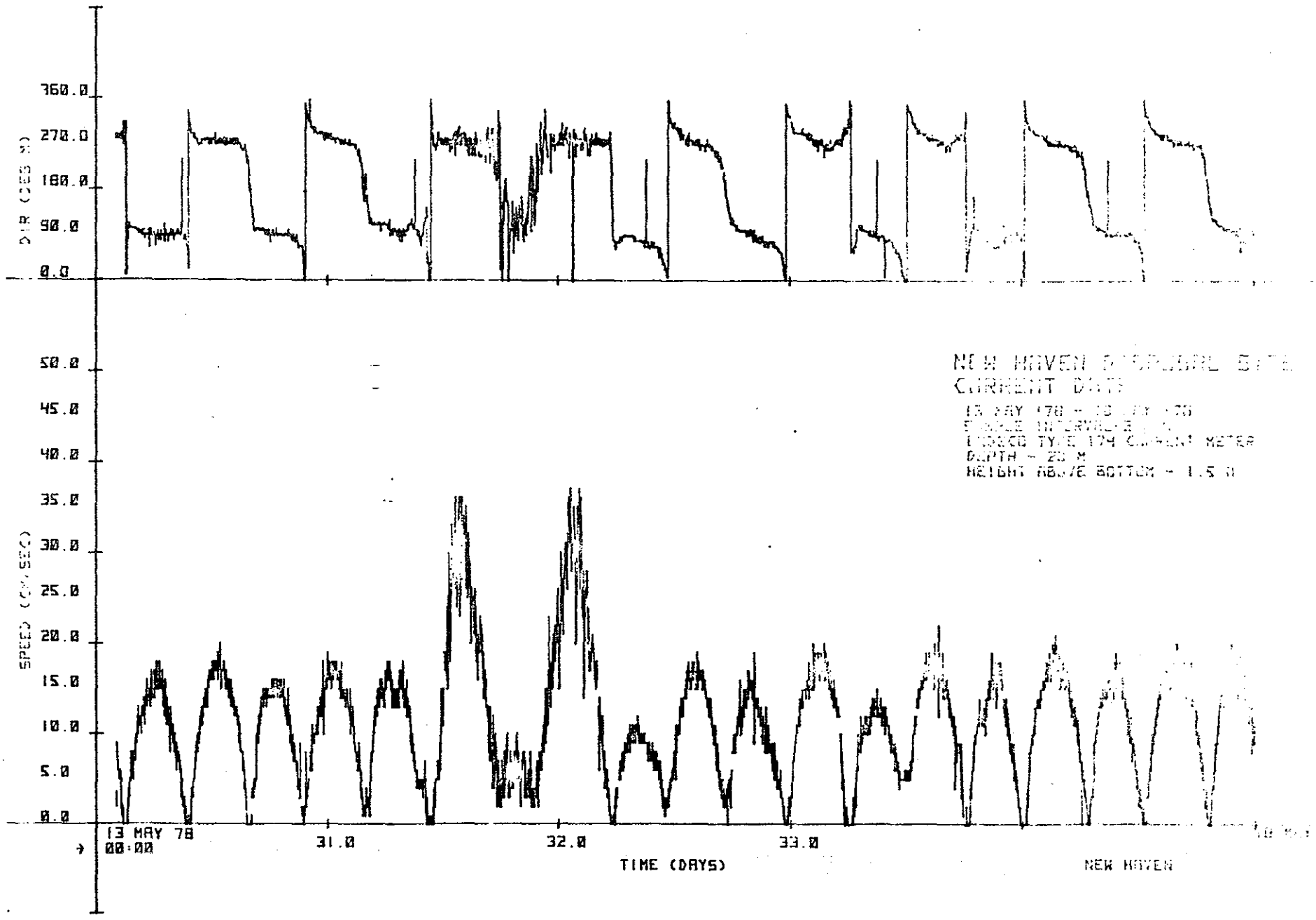
H-5C

H-6C


NEW HAVEN
13 APRIL, 78 TO 28 APRIL, 78
D.R (DEG T)
360.0
270.0
180.0
90.0
0.0
% INTERVAL = 2%
SPEED INTERVAL = 2 CM/SEC
SPEED (CM/SEC)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
TIME (DAYS)

H-4A

H-4a


360.0
270.0
180.0
90.0
0.0
DIR (DEG M)
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
SPEED (CM/SEC)
13 MAY 78
00:00
31.0
32.0
33.0
TIME (DAYS)
NEW HAVEN
CURRENT DATA

4-6

Most of these data indicate that the tidal energy is the only significant factor in current flow at the New Haven site. However, during the period from 14 to 15 May, 1978, a storm passed through the area that completely altered the pattern of flow and more than doubled the velocities encountered on the bottom (Fig. H-6). This storm had strong easterly winds that affected the water column such that the westerly component of the tide on day "31" and "32" almost doubled in speed while the easterly component was essentially eliminated. Although this westerly drift must have moved significant amounts of water towards the western end of the sound, no rebound or reverse flow was observed following the storm. Events such as this must be monitored with the BOLT system to evaluate the stress and potential for erosion of spoils that may occur.

Sediments

Heavy metal contents of sediments from the New Haven area are presented in Table H-3. These samples have relatively high concentrations both on and off the spoil mound that compare with values measured in Western Long Island Sound. Although concentrations are high, the enrichment relative to iron is not as great as found in the western sound. Identification of spoil material on the basis of chemical content will be more difficult at New Haven, than at other locations because of the lack of contrast with baseline conditions.

Biochemical Studies

The Mytilus edulis samples from Latimer's Light used at the New Haven disposal site were collected on January 16, 1978. However, when ice in the Connecticut River caused a leak in the research vessel, the mussels were kept under flowing seawater conditions at Noank, Conn. until April 10, 1978. When

TABLE H-3

SURFACE SEDIMENT ANALYSIS

NEW HAVEN DUMP SITE

SAMPLING	Cd	Co	Cr	Cu	Fe*	Hg	Ni	Pb	Zn	Vol/Sol	Oil/Grease
				All metals ppm						(%)	(ppm) x 10^3
SW of Dump	2.6		185	146		.69		86	267	9.4	2.8
Dump NH 1	1.7		140	117		.66		76	226	9.9	2.6
NH Ref	nil		102	72		.97		49	138	9.3	.4
APRIL 1978											
NH Ref	.5	11	63	70	2.5	.25	52	57	161	11	1
NH 1	.49	5.3	36	50	1.1	.17	27	30	92	4.1	1.3
NH 2	.61	6.1	33	43	1.1	.20	30	28	82	3.1	1.9
NH 3	.83	5.8	43	72	1.2	.39	34	36	123	7.5	1.9
JULY 1978											
NH Ref	.75	9.5	87	81	1.8	.36	25	55	195	11	
NH 1	.62	7.1	44	43	1.2	.17	16	28	97	7.4	
% S. D. #	25	9	5	7	3	14	5	13	15	5	15

*All Fe Values multiply by 10^4

%S.D. = S.D. x 10^2/mean

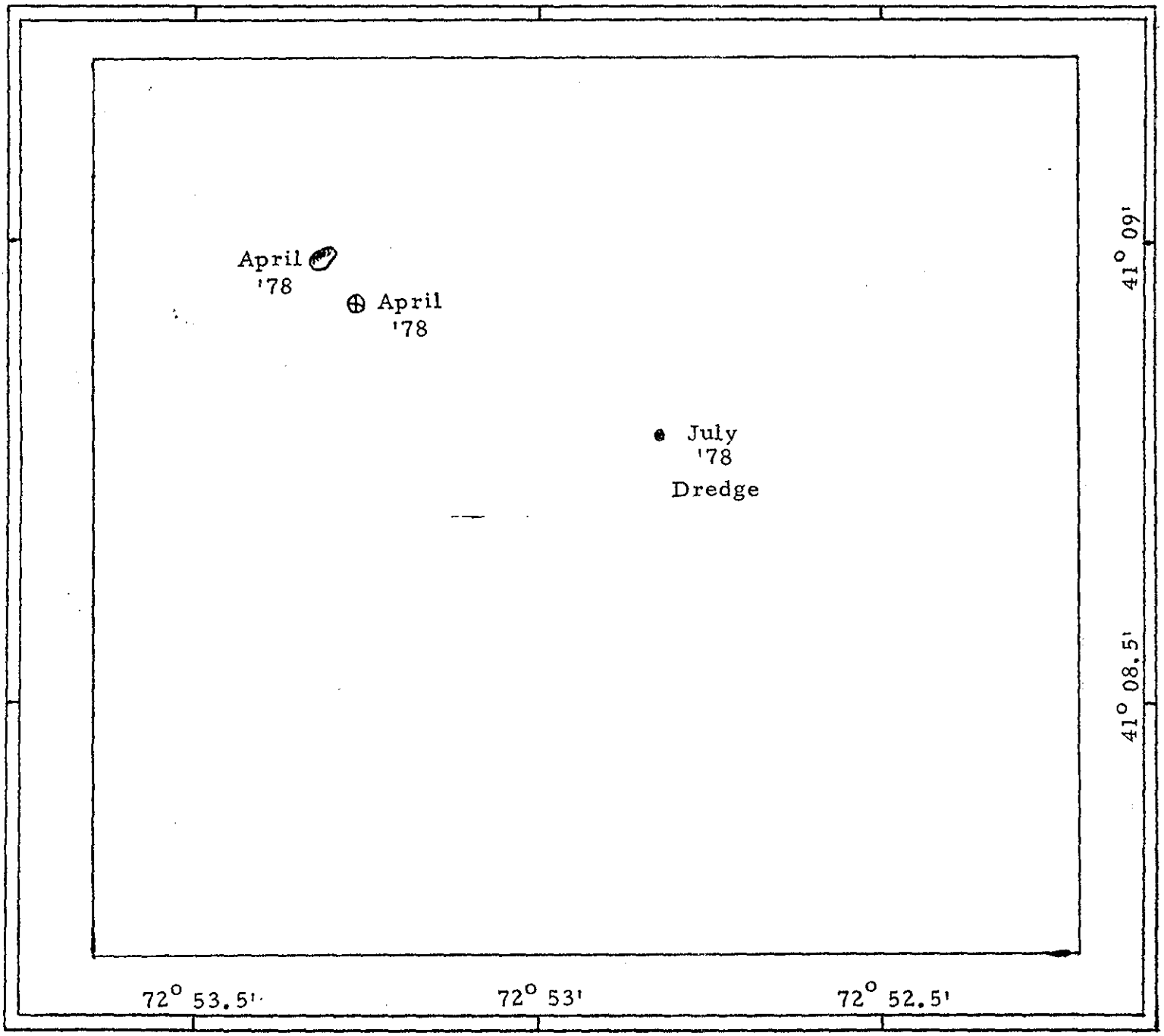
TABLE H-3a

SAMPLE LOCATIONS

SITE: New Haven

DATE	DISPOSAL SITE: CURRENT METER	MUSSELS	BENTHIC SAMPLES DREDGES	BENTHIC SAMPLES GRABS	REFERENCE SITE MUSSELS	BENTHIC SAMPLES DREDGES	BENTHIC SAMPLES GRABS
13/April/78	41°08'55.9" 72°53'15.9"	41°08'59.1" 72°53'19.1"			41°09'18.5" 72°54'26.2"		
29/July/1978			41°08'47.5" 72°52'49.9"		41°09'13.3" 72°54'27.9"	41°09'21.8" 72°54'40.6"	

New Haven



⊕ Current Meter Mussell Cage Benthic Sample

they were finally deployed, the disposal site mussels were located at 41°08'59.1"N, 72°53"19.1"W and the reference cage at 41°09'16.2"N, 72°54'26.0"W.

Table H-4 and Figure H-7 summarize changes in the ratios of Cd, Cr, Cu, Hg, Pb and Zn in mussels maintained at New Haven disposal and reference site. Notable increases in heavy metal concentrations are seen only in Cu and Zn. The concentration of Cu found in mussels from the New Haven disposal and reference sites, as well as Zn in those from the disposal site are significantly higher than that of the baseline. In general, even though the ratios are within the 95% confidence limits of the baseline concentrations, the ratios from the disposal area are always higher than those from the reference area.

Samples obtained from the disposal site cage in October "78 revealed that nearly all the mussels at the disposal site had died. Analysis of the mussels recovered is currently underway to determine the reasons for the high mortality. Replacement mussels from Latimer's Light will most likely be deployed during the next cruise to the New Haven area.

Additional problems have arisen at the New Haven reference site where a dragger has fouled the cage and caused damage, however at this time the problem does not appear to be severe.

Benthic Macrofauna

Tables H-5 and H-6 present the numerical density data for benthic macrofauna at the New Haven disposal site and reference station. Although there are greater numbers of individuals at the New Haven disposal site than at the reference station, other parameters, such as Diversity and Equitability are similar.

Fisheries

No comprehensive studies of fisheries have yet been made at this disposal area. In the DAMOS project, fishing activity in the dump site area will be

TABLE H-4. HEAVY METAL CONCENTRATIONS (PPM) IN *MYTILUS EDULIS* FROM LATIMER'S LIGHT DEPLOYED AT CORNFIELD SHOALS, NEW HAVEN, WLIS AND CABLE AND ANCHOR REEF DISPOSAL SITES (SOUTHERN NEW ENGLAND).

DATE	LOCATION		CD	CR	CU	HG	PB	ZN
1-16-78	LATIMER'S LIGHT	$\bar{x}$	2.18	4.34	10.80	0.210	8.58	162
		S.D.	0.32	0.50	0.54	0.028	1.61	23
4-10-78		$\bar{x}$	2.06	7.71	8.53	0.199	5.17	110
		S.D.	0.46	2.88	0.38	0.027	2.29	45
8-9-78		$\bar{x}$	1.37	2.45	8.68	0.169	5.52	112
		S.D.				0.009	1.44	
7-29-78	NEW HAVEN DISPOSAL SITE	$\bar{x}$	2.90	7.23	19.86	0.234	7.90	223
		S.D.	0.29	1.68	0.86	0.010	0.99	30
7-29-78	NEW HAVEN REFERENCE SITE	$\bar{x}$	2.25	4.46	10.20	0.160	5.53	119
		S.D.		1.41	0.53	0.004	0.48	14

TABLE H-5

DAMOS BENTHOS - TABLE OF NUMERIC DENSITY DATA

NEW HAVEN DUMP SITE - 13 APRIL 1978

PREDOMINANT SPECIES	DREDGE NUMBER #1	#2	#3	TOTAL	MEAN	STANDARD DEVIATION	COEFF. OF DISPERSION	95 PERCENT CONF. LIMITS OF MEAN	NUMERIC RANK	% OF TOTAL	CUMUL: % OF TOTAL
1. Autolytus cornutus	0	0	139	139	46.3	80.3	139.1	0-245.8	1	32.7	32.7
2. Nephthys incisa	40	13	49	102	34.0	18.7	10.3	0- 80.5	2	24.0	56.7
3. Actiniaria sp.	0	0	22	22	7.3	12.7	22.1	0- 38.9	3	5.2	61.9
4. Stenothoe minuta	0	0	22	22	7.3	9.8	22.1	0- 38.9	3	5.2	67.1
5. Parametopella cypris	0	0	17	17	5.7	9.2	16.9	0- 30.0	4	4.0	71.1
6. Dacrydium vitreum	0	0	16	16	5.3	4.4	16.1	0- 28.2	5	3.8	74.9
7. Loimia medusa	3	10	2	15	5.0	4.0	3.8	0- 15.9	6	3.5	78.4
8. Unciola irrorata	8	1	1	10	3.3	3.1	4.9	0- 13.2	7	2.4	80.8
9. Owenia fusiformis	0	6	2	8	2.7	1.5	3.5	0- 10.4	8	1.9	82.7
10. Hexapanopeus angustifrons	1	3	4	8	2.7		0.9	0- 6.4	8	1.9	84.6
TOTAL	52	33	274	359	119.7	134.0	150.0	0-452.6			
TOTAL # OF SPP PER DREDGE	13	17	26	37	18.7	6.7		2.2-35.2			
SPECIES DIVERSITY (H')	1.59	2.40	2.14	6.13	2.04	0.41					
EQUITABILITY (J')	0.62	0.85	0.66	21.3	0.71	0.12					

TOTAL # OF INDIVIDUALS THIS STATION = 425
(Corrected for nematode and cyclopoid SPP)

TABLE H-6

DAMOS BENTHOS - TABLE OF NUMERIC DENSITY DATA

STATION NEW HAVEN REFERENCE STN DATE 13 APRIL 1978

PREDOMINANT SPECIES	DREDGE NUMBER 1	2	3	TOTAL	MEAN	STD DEVIATION	COEFF.OF DISPERSION	95 PERCENT CONF.LIMITS OF MEAN	NUMERIC RANK	% OF TOTAL	CUMUL % OF TOTAL
1. Nephthys incisa	12	32	7	51	17.0	13.2	10.3	0-49.8	1	41.8	41.8
2. Cerianthus sp.	2	2	5	9	3.0	1.7	1.0	0- 7.2	2	7.4	49.2
3. Pherusa affinis	3	2	2	7	2.3	0.6	0.1	0.8- 3.8	3	5.7	54.9
4. Corymorpha pendula	4	1	1	6	2.0	1.7	1.5	0- 6.2	4	4.9	59.8
5. Yoldia limatula	3	3	0	6	2.0	1.7	1.5	0- 6.2	4	4.9	64.7
6. Polinices duplicatus	0	5	0	5	1.7	2.9	4.9	0- 8.9	5	4.1	68.8
7. Nucula proxima	2	1	2	5	1.7	0.6	0.2	0.2- 3.2	5	4.1	72.9
8. Pectinaria (gouldu)	0	4	0	4	1.3	2.3	4.1	0- 7.0	6	3.3	76.2
9. Cerebratulus sp.	0	3	0	3	1.0	1.7	3.0	0- 5.2	7	2.5	78.7
10. Loimia medusa	0	1	2	3	1.0	1.0	1.0	0- 3.5	7	2.5	81.2
11. Melinna cristata	1	1	1	3	1.0	0.0	0.0	1.0	7	2.5	83.7
12. Owenia fusiformis	0	0	3	3	1.0	1.7	3.0	0- 5.2	7	2.5	86.2
13. Nassarius trivittatus	2	0	0	2	0.7	1.2	1.9	0- 3.7	8	1.6	87.8
14. Mulinia lateralis	1	0	1	2	0.7	0.6	0.5	0- 2.2	8	1.6	89.4
15.											
16.											
17.											
18.											
TOTAL	30	55	24	109	36.3	16.4	7.5	0-77.0			
TOTAL NO. OF SPP. PER DREDGE	13	15	16	28	14.7	1.5		10.9-18.5			
SPECIES DIVERSITY (H')	2.21	1.81	2.49	6.51	2.17	0.34					
EQUITABILITY (J')	0.86	0.67	0.90	2.43	0.81	0.12					

TOTAL NO. OF INDIVIDUALS THIS STN = 122
(CORRECTED FOR CALANUS SP)

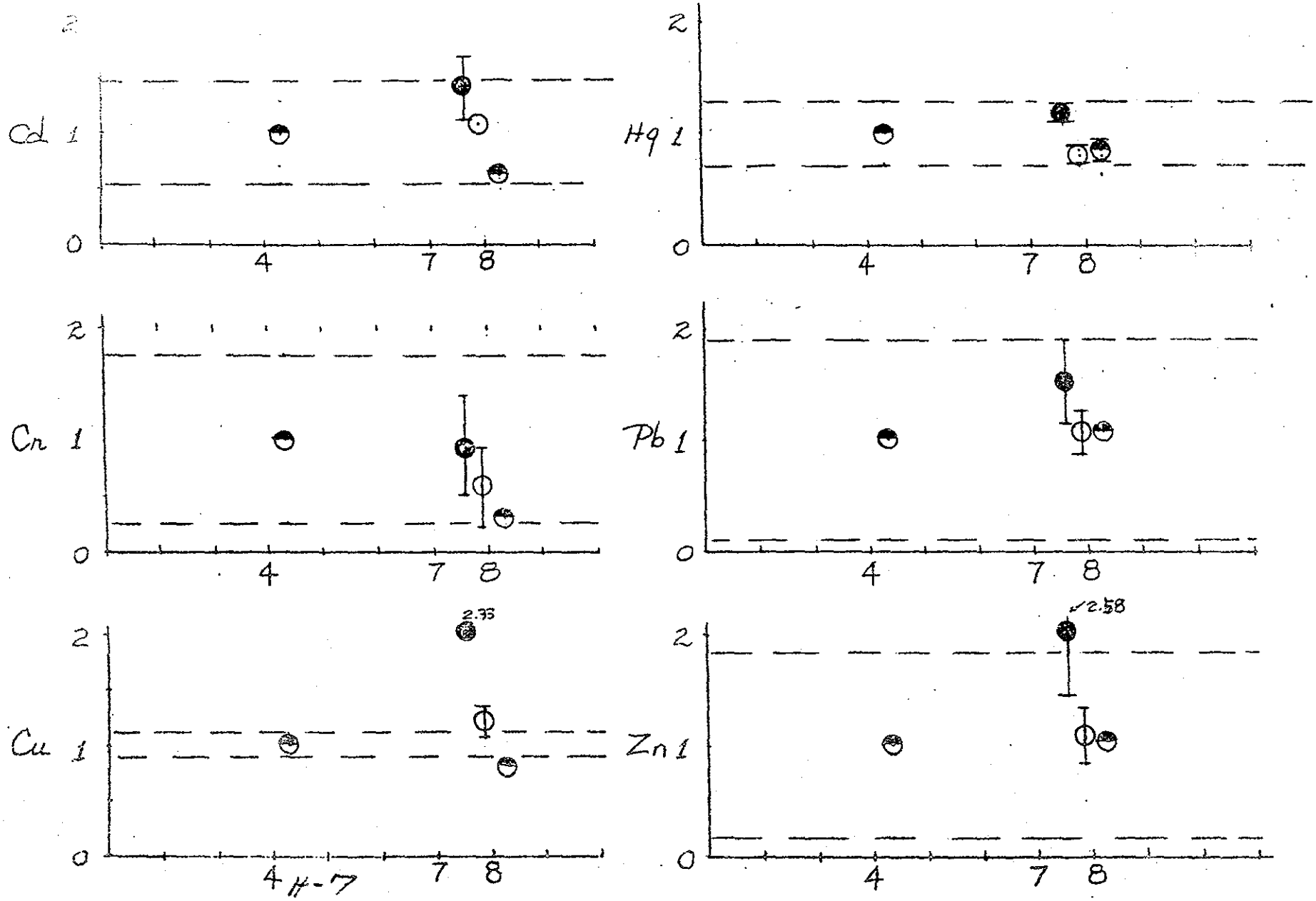


Figure 8. Temporal variation in the ratios of heavy metals in Mytilus edulis from Latimer's Light (⊖) deployed at New Haven disposal (●) and reference (O) site.

mapped and described by interviewing fishermen and personnel of state and federal resource agencies. The area of interest is within a mile of the disposal buoy. Emphasis will be on direct interference, changes in catches, and condition of catches. Potential pollution problems will also be examined.

Lobster. Lobstering is the major fishery in the disposal site area. On July 21, 1978 lobster buoys within one-half mile of the disposal buoy were identified by number and mapped. About 30 buoys were seen and four identification numbers were recorded. These were fished by three vessels. Buoy strings were concentrated on the northen edge of the spoil mound. There were two strings on the northeast part of the mound, a few buoys southeast of the mound, and none were seen on the southwest portion of the mound.

The two fishermen operating most of the pots seen in the area were interviewed by telephone. The following description is drawn from these conversations and should be considred as a starting point to be corrected and expanded.

It was reported that in addition to the three fishermen whose buoys were seen at the dump site two others have large numbers of pots close enough to the west to be concerned with dump site management.

One fisherman reported placing pots at the site in April and remaining there until September or November; another fishes the site from March 15th to Labor Day and from October 15th to January. Pots are moved relatively little as compared to other parts of New England where fishing follows inshore-offshore migrations. The preference for leaving pots in place has resulted in fishing close to the site while dumping was taking place.

One fisherman reported that previous to the 1973 disposal, catches were better in the dump site area than east or west of it. Egg bearing lobsters

were particularaly abundant. During the 1973-74 disposal some gear was lost due to surface vessel activity. A few pots fished on the site caught no lobsters throughout the spring following cessation of dumping. In the year following, catches on the spoil were very low and pots could be stuck in the soft mud. Low catches and "mudding up" were correlated with strong spring tides.

Since 1974 there has been slow recovery of catches with possible drop-offs associated with the small dumping jobs. The present catches are estimated by one fisherman to be one-half of pre-1973 levels and smaller than in the area west of the site.

The lobsters caught at the dump site are reported to be of high quality with few culls. Relatively few "ground-keepers" with dark, heavy shells are found. One fisherman mentioned a relative absence of smaller lobsters while another mentioned the presence of small lobsters which reached legal size after shedding in the area.

Tentative arrangements have been made with a lobsterman to collect data from strings of pots close to and at a distance from the site for two months prior to dumping, during dumping, and through the following summer. Data on numbers, sizes, and sex of lobsters will be collected and the differences between sites analyzed by analysis of variance.

Finfish. Previous reports on the New Haven disposal site do not locate any trawl fisheries near the site. Lobstermen will make a tow for lobster bait in this area on rare occasions.

During late summer and fall large draggers from New York and New Jersey fish for scup (porgy) in this area. Draggers are reported to have avoided the spoil mound for several years until it had leveled off or became more compact. DAMOS divers observed a deep gouge made by trawl doors on the spoil surface in

1978. Scup are often associated with bottom mounds and may be attracted to the spoil pile. The spoil mound is a very small part of the range of the scup fishery. Closure of the area to trawling would have no effect on the fishery as a whole, but would increase the value of the area to the lobster fishery.

Oysters and other shallow water fisheries will not be considered in this study because of their distance from the disposal site (approximately 4 miles).