

港湾技研資料

TECHNICAL NOTE OF
THE PORT AND HARBOUR RESEARCH INSTITUTE
MINISTRY OF TRANSPORT, JAPAN

No.907 June 1998

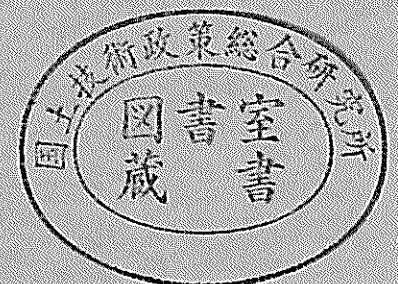
STRONG-MOTION EARTHQUAKE RECORDS
ON THE 1995 HYOGO-KEN NANBU EARTHQUAKE IN PORT AREAS

by Yukihiro SATO, Koji ICHII, Yuko HOSHINO, Yoko SATO, Masafumi MIYATA,
Toshikazu MORITA, Susumu IAI

1995年兵庫県南部地震の港湾地域における強震記録

佐	藤	幸	博
一	井	康	二
星	野	裕	子
佐	藤	陽	子
宮	田	正	史
森	田	年	一
井	合		進

運輸省港湾技術研究所



STRONG-MOTION EARTHQUAKE RECORDS ON THE 1995 HYOGO-KEN NANBU EARTHQUAKE IN PORT AREAS

Contents

Synopsis (in Japanese)	3
Synopsis	4
1. Introduction	5
2. Earthquakes and Triggered Stations	6
3. Digitization and Preliminary Analyses	24
4. Attenuation Relations of Acceleration, Velocity and Displacement	32
5. Amplification of Acceleration	34
6. Remarks for Records	35
6.1 Remarks for Records with long period components	35
6.2 Remarks for Records at Amagasaki station	35
6.3 Remarks for Records with abnormal recording condition	36
7. Summary	36
References	37
Strong-Motion Earthquake Observation Results of the Main Shock at 05:46:52, January 17, 1995.....	41
Results of Preliminary Analyses of the Main Shock at 05:46:52, January 17, 1995	43
1) S - 2615 Kobe-ji-S	44
2) S - 2616 Nagoya-Inae-S	52
3) S - 2618 Osaka-ji-S	59
4) S - 2619 Yokka.-Chitose-S	66
5) S - 2621 Kinuura-ji-S	73
6) M - 1553 Inae-Yaita-M	80
7) M - 1555 Yokka.-Sekitan-M	88
8) F - 764 Kobe-Dai8-G	96
9) F - 765 Amagasaki-G	104
10) F - 787 Toyama-GB	112
11) F - 788 Toyama-G	120
12) F - 789 Tsuruga-G	128
13) F - 790 Hiroshima-G	136
14) F - 791 Kochi-G	144
15) F - 792 Matsuyama-G	152
16) F - 793 Sakaiminato-G	160
17) F - 794 Komatsujima-G	168
18) F - 795 Wakayama-G	176
19) F - 800 Kanazawa-G	184
20) F - 869 Oita-G	192
21) F - 991 Kawasaki-F	200

Strong-Motion Earthquake Observation Results of the after Shocks	209
Results of Preliminary Analyses of the after Shocks	231
1) S - 2623 Kobe-ji-S at Jan. 17, 1995 5:52:07	232
2) F - 803 Amagasaki-G at Jan. 17, 1995 6:40:39	239
3) F - 804 Amagasaki-G at Jan. 17, 1995 6:42:48	247
4) F - 805 Amagasaki-G at Jan. 17, 1995 7:38:36	255
5) F - 808 Amagasaki-G at Jan. 17, 1995 12:34:20	263
6) F - 809 Amagasaki-G at Jan. 17, 1995 13:05:23	271
7) F - 810 Amagasaki-G at Jan. 18, 1995 0:51:29	279
8) F - 811 Amagasaki-G at Jan. 18, 1995 5:25:40	287
9) F - 812 Amagasaki-G at Jan. 18, 1995 6:50:18	295
10) F - 813 Amagasaki-G at Jan. 19, 1995 1:00:36	303
11) F - 817 Amagasaki-G at Jan. 23, 1995 21:44:15	311
12) F - 818 Amagasaki-G at Jan. 25, 1995 23:15:57	319
13) F - 856 Osaka-ji-G at Jan. 25, 1995 23:15:57	327
14) F - 819 Amagasaki-G at Feb. 2, 1995 16:19:27	335
15) F - 851 Osaka-Minami-G at Feb. 2, 1995 16:19:27	343
16) F - 854 Osaka-ji-G at Feb. 2, 1995 16:19:27	351
17) F - 820 Amagasaki-G at Feb. 6, 1995 13:00:12	359
18) F - 937 Wakayama-G at Feb. 18, 1995 21:37:33	367
19) F - 821 Amagasaki-G at Feb. 18, 1995 21:37:33	375
20) F - 852 Osaka-Minami-G at Feb. 18, 1995 21:37:33	383
21) F - 849 Amagasaki-G at Mar. 30, 1995 14:24:48	391
22) F - 850 Amagasaki-G at Apr. 6, 1995 10:50:48	399
23) F - 853 Osaka-Minami-G at Apr. 6, 1995 10:50:48	407
24) F - 855 Osaka-ji-G at Apr. 6, 1995 10:50:48	415
25) F - 932 Amagasaki-G at Jun. 16, 1995 7:55:50	423
26) F - 933 Amagasaki-G at Jun. 23, 1995 22:19:22	431
27) F - 934 Amagasaki-G at Oct. 14, 1995 2:04:05	439
28) F - 1040 Osaka-Minami-G at Oct. 14, 1995 2:04:05	447
29) F - 1041 Osaka-ji-G at Oct. 14, 1995 2:04:05	455

1995年兵庫県南部地震の港湾地域における強震記録

佐藤 幸博*
一井 康二*
星野 裕子**
佐藤 陽子**
宮田 正史***
森田 年一***
井合 進****

要旨

1995年1月17日05時46分、兵庫県の明石海峡付近を震源とする気象庁マグニチュード7.2の地震が発生した。気象庁によって、この地震は「平成7年(1995年)兵庫県南部地震」と命名された。本地震の震源位置は、北緯34度35.7分、東経135度2.2分、深さ17.9kmであった。本地震によって、兵庫県の神戸で震度Ⅶの激震、京都などで震度Ⅴの強震が記録されたのをはじめ、近畿・中国・四国の各地に激しい地震動がもたらされ、港湾施設においても神戸港を中心に甚大な被害が発生した。

1962年より観測が開始され、1963年から記録が得られている港湾地域強震観測網においては、本地震によって18港25地点で強震計が作動し、17港21地点でデジタルデータとしての加速度記録を得ることができた。デジタル記録が得られた港湾は、神戸港(地表・構造物)、名古屋港(2地点)、大阪港、四日市港(2地点)、衣浦港、尼崎港、富山港(地表・地中基盤)、敦賀港、広島港、高知港、松山港、境港港、小松島港、和歌山港、金沢港、大分港、川崎港であった。御前崎港、川崎港(地中基盤・構造物)については計器が異常値を示していたため、記録をデジタル化せず加速度の最大値のみの読み取りにとどまった。また、名古屋港のINAE-YAITA-Mでは元々2成分の観測の内、1成分に異常が発生し残る1成分のみのデジタルデータが得られた。

本資料で報告する記録は、兵庫県南部地震本震の際に港湾地域強震観測網で観測された21個の地表・地中の強震記録、ならびに余震の観測記録(29記録)である。報告する内容は、それぞれの記録について、1)未補正加速度記録、2)計器特性による補正加速度記録、3)SMAC-B2型強震計の計器特性と等価なものに換算した補正加速度記録、4)積分により求めた速度・変位、5)応答スペクトル、6)フーリエスペクトル、7)加速度・速度・変位の軌跡、を示している。また、地中基盤と地表の2層同時観測を行っている地点については、更に加速度の増幅率を示している。また本震の全記録を対象として、加速度・速度・変位の距離減衰関係を併せて示している。

キーワード：地震、港湾、強震観測、デジタル化加速度記録、応答スペクトル

* 構造部地盤震動研究室 ** 科学技術振興事業団重点研究支援協力員
*** 構造部構造振動研究室 **** 構造部地盤震動研究室長
〒239-0826 横須賀市長瀬3-1-1
Phone:0468-44-5028 Fax:0468-44-0839 E-mail: satoh_yuk@cc.phri.go.jp

STRONG-MOTION EARTHQUAKE RECORDS ON THE 1995 HYOGO-KEN NANBU EARTHQUAKE IN PORT AREAS

Yukihiro SATO*
Koji ICHII*
Yuko HOSHINO**
Yoko SATO**
Masafumi MIYATA***
Toshikazu MORITA***
Susumu IAI****

Synopsis

The 1995 Hyogo-ken Nanbu Earthquake of JMA (Japan Meteorological Agency) Magnitude 7.2 occurred in Akashi channel region (Western Hanshin area) in Japan at 05:46:52, January 17, 1995. This earthquake triggered 25 accelerographs installed at 17 ports in the strong-motion earthquake observation network of the Port and Harbour Research Institute. 21 accelerograms out of 25 were obtained as digital acceleration data.

This report presents the strong-motion earthquake observation results of this earthquake and the results of preliminary analyses of the 21 digitized acceleration records obtained on and in ground by the main shock. The records of after shocks are also presented. Original acceleration without instrument correction, corrected acceleration, SMAC-B2 equivalent acceleration, integrated velocity and displacement, response spectra, Fourier spectra and loci of accelerations, velocities and displacements are presented as results of preliminary analyses. Amplification of accelerations of the main shock and after shocks are also presented because surface ground motion and base motion were observed simultaneously in Toyama port. Attenuation relations of acceleration, velocity and displacement of main shock are also presented in this report.

Key Words : Earthquake, Port, Strong-Motion Earthquake Observation, Digitized Acceleration Record, Response Spectra

* Member of Geotechnical Earthquake Engineering Laboratory, Structural Engineering Division

** STA Core Research Project Assistance Fellow

*** Member of Structural Dynamics Laboratory, Structural Engineering Division

**** Chief of Geotechnical Earthquake Engineering Laboratory, Structural Engineering Division

3-1-1 Nagase Yokosuka 239-0826, Japan

Phone:+81-468-44-5028 Fax:+81-468-44-0839 E-mail: satoh_yuk@cc.phri.go.jp

1. Introduction

At 05:46:52, January 17, 1995, an earthquake of JMA Magnitude 7.2 hit Hanshin area of Japan. The epicenter of the earthquake was located in near Akashi channel area (between Kobe city - Awaji Island) in Japan. The earthquake was named as '1995 HYOGO-KEN NANBU EARTHQUAKE' by the Japan Meteorological Agency (JMA). This earthquake caused strong ground motion in Hanshin area of Japan. Structures were damaged by the earthquake.

This earthquake triggered 25 accelerographs installed at 17 ports in the strong-motion earthquake observation network of the Port and Harbour Research Institute (PHRI). 21 accelerograms at 17 ports out of 25 accelerograms at 18 ports were obtained as digital acceleration data. Ports where digitized accelerograms were obtained were Kobe port (on ground surface and on structure), Nagoya port (2 points on ground surface), Osaka port, Yokkaichi port (2 points on ground surface), Kinuura port, Amagasaki port, Toyama port (in ground and on surface), Tsuruga port, Hiroshima port, Kochi port, Matsuyama port, Sakaiminato port, Komatsujima port, Wakayama port, Kanazawa port, Oita port, and Kawasaki port. The three of triggered accelerograms, which were Omaezaki port and Kawasaki port (in ground and on structure) were not able to be digitized because of abnormal response of accelerographs. Since Inae-Yaita-M at Nagoya port originally observing two horizontal components and one respond abnormal at the earthquake, only the other one component were successfully recorded.

The strong-motion earthquake observation in port areas in Japan was started by PHRI in 1962 and the strong-motion records observed in the network of PHRI have been published as annual reports on strong-motion earthquake records in Japanese port since 1963^{1) - 28)}. When great earthquakes occurred, such as the 1968 Tokachi-Oki Earthquake, the 1978 Miyagi-Ken-Oki Earthquake, the etc., special volumes on records obtained by these great earthquakes have been compiled besides annual reports because there exist many accelerograms with large maximum acceleration observed at the same time and it is convenient to use records for investigating damage of structures by compilation^{29) - 39)}.

This report presents the strong-motion earthquake observation results of this earthquake and the following results of preliminary analyses of the 21 digitized acceleration records obtained on and in ground by the main shock. The records of after shocks are also presented. Original acceleration without instrument correction, corrected acceleration, SMAC-B2 equivalent acceleration, integrated velocity and displacement, response spectra, Fourier spectra and loci of accelerations, velocities and displacements are presented as results of preliminary analyses.

- Original Acceleration
- Corrected Acceleration
- SMAC-B2 Equivalent Acceleration
- Integrated Velocity and Displacement
- Response Spectra and Fourier Spectra of Corrected Acceleration
- Loci of Corrected Accelerations, Integrated Velocities and Displacements

Amplification of accelerations at Toyama port is presented as square root of the ratio of power spectrum of surface ground motion to that of base motion because surface ground motion and base motion by the main shock were observed simultaneously there. Attenuation relations of acceleration, velocity and displacement of the main shock are also presented in this report.

Following organizations cooperated with PHRI in the strong-motion earthquake observation in port areas in Japan.

- The Bureau for Ports and Harbours of the Ministry of Transport
- The Regional Bureaus for Port Construction of the Ministry of Transport
- The Port and Harbour Division, The Hokkaido Development Bureau of the Hokkaido Development Agency
- The Okinawa General Office of the Okinawa Development Agency
- The Harbour Bureau of the Tokyo Metropolitan Government
- The Harbour Bureau of the Osaka Municipal Government
- The Harbour Section of the Shizuoka Prefectural Government
- The Harbour Section of the Miyazaki Prefectural Government

2. Earthquakes and Triggered Stations

The 1995 Hyogo-ken Nanbu Earthquake at 05:46:52, January 17, 1995 triggered 25 accelerographs installed at 18 ports in the network of PHRI. 29 accelerographs are also recorded during after shocks. Details of these earthquakes are listed in Table 1 and Table 4 to 10⁴⁴⁾. Locations of epicenter of the main shock and the after shocks, which are slightly different from those by the Jishin-Kazan-Gaikyo published by JMA as a prompt report, are shown in Figure 1 and Figure 3 to 9^{44), 45)}.

The triggered stations in the network of PHRI, the maximum of original accelerations without instrument correction and JMA seismic intensity scale of main shock are shown in Figure 2. Dots in Figure 2 indicate ports where triggered accelerographs were installed and Roman numerals attached to ports represent JMA seismic intensity scale in its area.

All the triggered stations by the main shock are listed in Table 2 with name of locations, name of stations, type of accelerographs and installation conditions. The name of stations are composed of name of ports, type of accelerographs and installation conditions. As for the type of accelerographs, two kinds of accelerographs have been used in the strong-motion earthquake observation network of PHRI. One is the SMAC-B2 accelerograph of mechanical type and the other is the ERS accelerograph of electrical type equipped with either analog or digital recorder. There are several kinds of the ERS accelerograph and the ERS-G type is the newest type at present. Detailed descriptions of name of stations and accelerographs are reported in preceding annual reports. Site conditions of the stations, which are listed in the right column of Table 2 as the number of the Technical Note of the Port and Harbour Research Institute, are also available in the reports on site characteristics^{40) - 44)}

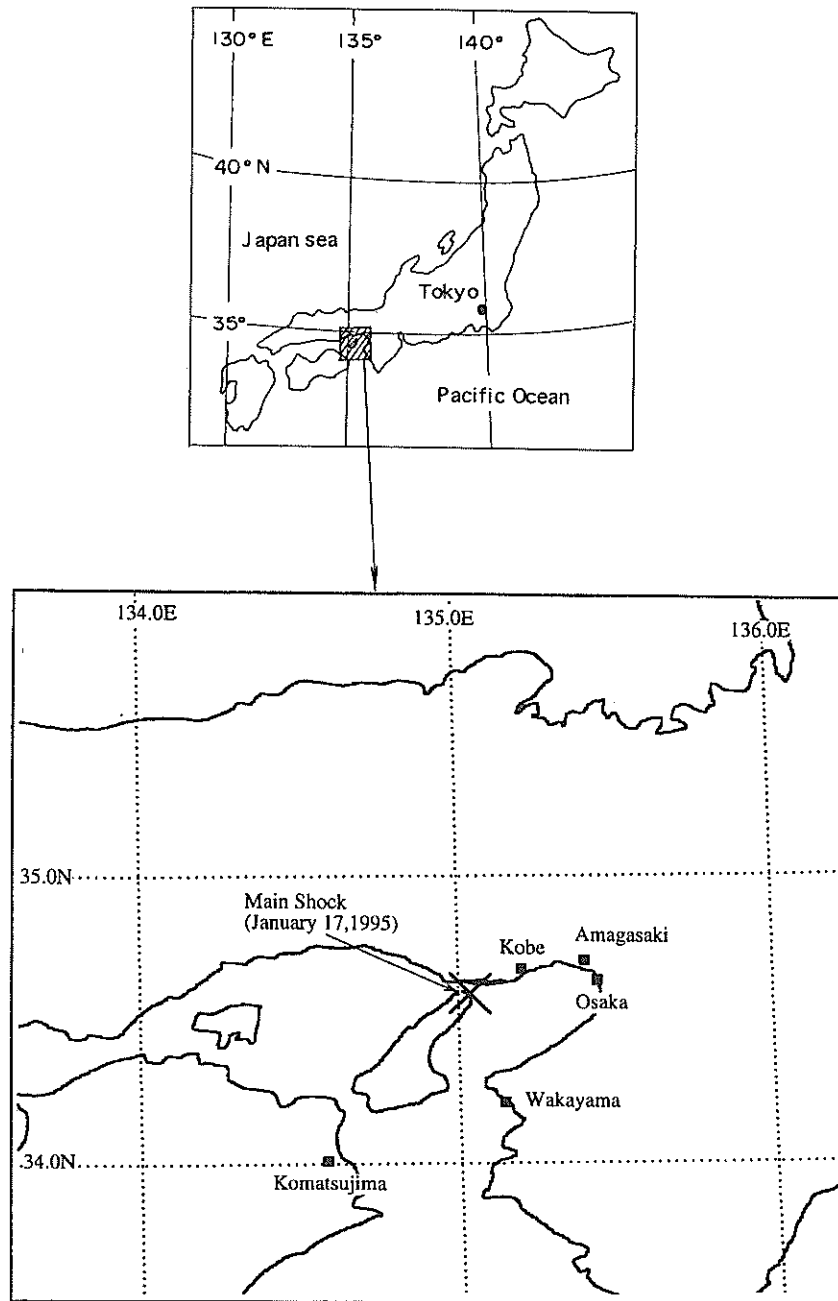
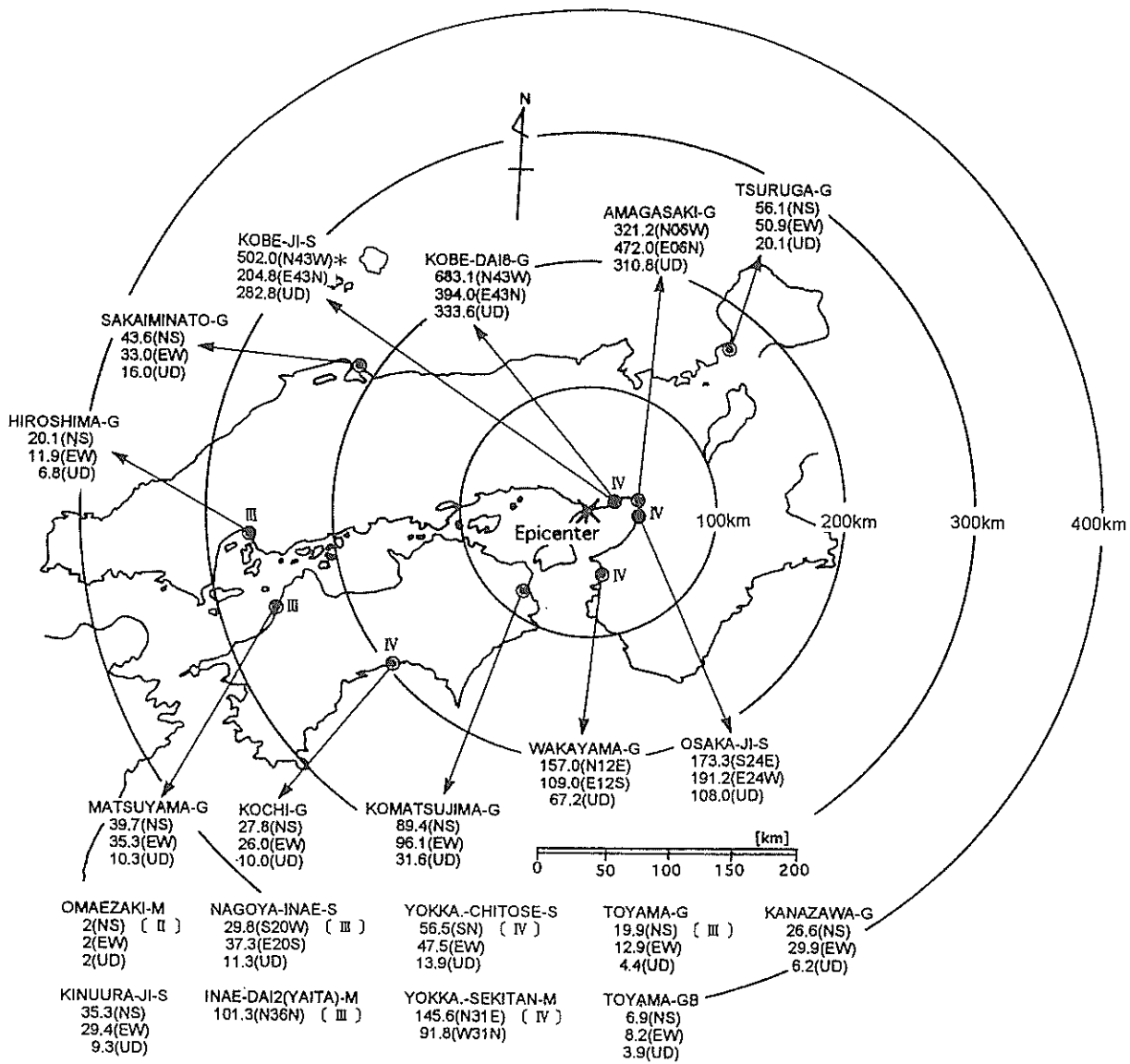


Figure 1 Locations of Epicenter of the Main shock

Table 1 Detail of Earthquake

Earthquake	Detail	
Main shock 1995 Hyogoken-Nanbu Earthquake	Date	January 17, 1995
	Time	05:46:51.8
	Hypocenter	
	Epicenter Region	AWAJISHIMA ISLAND REGION
	Latitude	34° 35.7'N
	Longitude	135° 2.2'E
	Depth	17.9km
JMA Magnitude	7.2	



Acceleration : Maximum of Original Acceleration(GAL)=(cm / s²)
 Roman Numerals : JMA Seismic Intensity Scale

- Name of Port-S : SMAC-B2 Type
 - Name of Port-M : ERS-M Type
 - Name of Port-F : ERS-F Type
 - Name of Port-G : ERS-G Type
- SMAC-B2 : Mechanical type(analog recorder)
 ERS type : Mechanical type(analog recorder or digital recorder)
 Suffix B : Accelerograph is installed in ground.
 * Out of range

Figure 2 Triggered Stations of PHRI, Maximum Original Acceleration and JMA Seismic Intensity Scale of the Main Shock

Table 2 List of Strong-Motion Earthquake Observation Stations of PHRI triggered by the Main shock

Name of port	Name of station	Type of Accelerograph	Installation condition	Ref. No.*
1 Kawasaki	1 Kawasaki-FR	ERS-F	on structure	
	2 Kawasaki-F	ERS-F	ground surface	
	3 Kawasaki-FB	ERS-F	in ground	
2 Omaezaki	4 Omaezaki-M	ERS-C	ground surface	351
3 Toyama	5 Toyama-G	ERS-G	ground surface	
	6 Toyama-GB	ERS-G	in ground	
4 Kinuura	7 Kinuura-ji-S	SMAC-B2	ground surface	298
5 Nagoya	8 Nagoya-Inae-S	SMAC-B2	on structure	34
	9 Inae-Yaita-M	ERS-B	on structure	34
6 Yokkaichi	10 Yokka.-Chitose-S	SMAC-B2	ground surface	34,107
	11 Yokka.-Sekitan-M	ERS-B	on structure	34
7 Kanazawa	12 Kanazawa-G	ERS-G	ground surface	
8 Tsuruga	13 Tsuruga-G	ERS-G	ground surface	
9 Osaka	14 Osaka-ji-S	SMAC-B2	ground surface	34
10 Amagasaki	15 Amagasaki-G	ERS-G	ground surface	
11 Kobe	16 Kobe-Maya-Dai2-M	ERS-B	on structure	34
	17 Kobe-Dai8-G	ERS-G	on structure	
	18 Kobe-ji-S	SMAC-B2	ground surface	34
12 Wakayama	19 Wakayama-G	ERS-G	ground surface	
13 Komatsujima	20 Komatsujima-G	ERS-G	ground surface	
14 Kochi	21 Kochi-G	ERS-G	ground surface	
15 Sakaiminato	22 Sakaiminato-G	ERS-G	ground surface	
16 Matsuyama	23 Matsuyama-G	ERS-G	ground surface	
17 Hiroshima	24 Hiroshima-G	ERS-G	ground surface	
18 Oita	25 Oita-G	ERS-G	ground surface	

*The numbers correspond to those of the Technical Note of the Port and Harbour Research Institute, in which site characteristics of stations are given.

Table 3 Results of Preliminary Analyses of the Main shock at 5:46:51, January 17, 1995

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
KOBE-JI-S *1 S-2615	SMAC-B2	Epicentral Dist. = 19 Hypocentral Dist. = 26	Original Acceleration(cm/s ²)	502.00 (N43W)	204.80 (E43N)	282.80
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	524.80	229.70	445.90
			Integrated Velocity - fixed(cm/s)	118.61	37.64	33.83
			Integrated Velocity - variable(cm/s)	105.57	39.53	36.97
Integrated Displacement - fixed(cm)	41.94	13.05	10.92			
Integrated Displacement - variable(cm)	37.89	60.03	11.17			
NAGOYA-INAE-S S-2616	SMAC-B2 (on structure)	Epicentral Dist. = 176 Hypocentral Dist. = 177	Original Acceleration(cm/s ²)	29.80 (S20W)	37.30 (E20S)	11.30
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	32.90	39.10	14.20
			Integrated Velocity - fixed(cm/s)	5.05	6.64	1.82
			Integrated Velocity - variable(cm/s)	4.31	5.85	1.37
Integrated Displacement - fixed(cm)	2.55	2.15	1.03			
Integrated Displacement - variable(cm)	1.79	1.53	0.33			
OSAKA-JI-S *2 S-2618	SMAC-B2	Epicentral Dist. = 38 Hypocentral Dist. = 42	Original Acceleration(cm/s ²)	173.30 (S24E)	191.20 (E24N)	108.00
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	217.40	213.50	208.70
			Integrated Velocity - fixed(cm/s)	32.13	35.87	11.85
			Integrated Velocity - variable(cm/s)	42.41	29.94	11.60
Integrated Displacement - fixed(cm)	14.52	13.19	5.20			
Integrated Displacement - variable(cm)	55.23	14.23	8.53			
YOKKA. -CHITOSE-S S-2619	SMAC-B2	Epicentral Dist. = 152 Hypocentral Dist. = 153	Original Acceleration(cm/s ²)	56.50	47.50	13.90
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	58.50	48.60	16.90
			Integrated Velocity - fixed(cm/s)	15.02	9.33	2.40
			Integrated Velocity - variable(cm/s)	14.35	9.31	2.04
Integrated Displacement - fixed(cm)	5.58	2.66	1.16			
Integrated Displacement - variable(cm)	5.52	1.89	0.71			
KINUURA-JI-S S-2621	SMAC-B2	Epicentral Dist. = 177 Hypocentral Dist. = 178	Original Acceleration(cm/s ²)	35.30	29.40	9.30
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	38.40	29.90	11.40
			Integrated Velocity - fixed(cm/s)	3.95	4.64	1.17
			Integrated Velocity - variable(cm/s)	3.91	3.53	1.00
Integrated Displacement - fixed(cm)	1.30	1.43	0.63			
Integrated Displacement - variable(cm)	0.83	0.88	0.23			

(to be continued)

(Table 3 Continued)

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
OMAEZAKI-M M-1552 (Not digitized)	ERS-C	Epicentral Dist. = 292 Hypocentral Dist. = 292	Original Acceleration(cm/s ²)	2.00	2.00	2.00
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	---	---	---
			Integrated Velocity - fixed(cm/s)	---	---	---
			Integrated Velocity - variable(cm/s)	---	---	---
Integrated Displacement - fixed(cm)	---	---	---			
Integrated Displacement - variable(cm)	---	---	---			
INAE-YAITA-M M-1553 (Abnormal)	ERS-B (on structure)	Epicentral Dist. = 176 Hypocentral Dist. = 177	Original Acceleration(cm/s ²)	101.30 (E36N)	101.30 (E36N)	---
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	82.20	---
			Corrected Acceleration(cm/s ²)	---	105.00	---
			Integrated Velocity - fixed(cm/s)	---	12.43	---
			Integrated Velocity - variable(cm/s)	---	13.39	---
Integrated Displacement - fixed(cm)	---	7.82	---			
Integrated Displacement - variable(cm)	---	5.92	---			
KOBÉ-MAYA-DAI2-M M-1554 (Abnormal)	ERS-B (on structure)	Epicentral Dist. = 21 Hypocentral Dist. = 27	Original Acceleration(cm/s ²)	---	---	---
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	---	---	---
			Integrated Velocity - fixed(cm/s)	---	---	---
			Integrated Velocity - variable(cm/s)	---	---	---
Integrated Displacement - fixed(cm)	---	---	---			
Integrated Displacement - variable(cm)	---	---	---			
YOKKA. -SEKITAN-M M-1555	ERS-B (on structure)	Epicentral Dist. = 152 Hypocentral Dist. = 153	Original Acceleration(cm/s ²)	145.60 (N31E)	91.80 (W31N)	---
			SMAC-B2 Equivalent Acceleration(cm/s ²)	148.70	91.90	---
			Corrected Acceleration(cm/s ²)	152.60	93.60	---
			Integrated Velocity - fixed(cm/s)	27.36	21.93	---
			Integrated Velocity - variable(cm/s)	26.00	22.29	---
Integrated Displacement - fixed(cm)	8.19	8.84	---			
Integrated Displacement - variable(cm)	10.64	8.48	---			
KOBÉ-DAI8-G F-764	ERS-G (on structure)	Epicentral Dist. = 19 Hypocentral Dist. = 26	Original Acceleration(cm/s ²)	683.10 (N43W)	394.00 (E43N)	333.60
			SMAC-B2 Equivalent Acceleration(cm/s ²)	629.20	355.80	215.00
			Corrected Acceleration(cm/s ²)	686.10	389.60	341.30
			Integrated Velocity - fixed(cm/s)	172.21	60.84	30.34
			Integrated Velocity - variable(cm/s)	186.13	60.95	35.13
Integrated Displacement - fixed(cm)	70.56	19.01	11.82			
Integrated Displacement - variable(cm)	74.27	18.05	14.59			

(to be continued)

(Table 3 Continued)

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
AMAGASAKI-G *3 F-765	ERS-G	Epicentral Dist. = 36 Hypocentral Dist. = 40	Original Acceleration(cm/s ²)	321.20 (N06W)	472.00 (E06N)	310.80
			SMAC-B2 Equivalent Acceleration(cm/s ²)	267.50	383.90	222.60
			Corrected Acceleration(cm/s ²)	325.70	497.00	310.30
			Integrated Velocity - fixed(cm/s)	66.15	56.78	24.44
			Integrated Velocity - variable(cm/s)	101.15	80.96	28.33
			Integrated Displacement - fixed(cm)	29.04	24.51	6.93
Integrated Displacement - variable(cm)	997.63	808.47	6.95			
TOYAMA-GB F-787	ERS-G (in ground)	Epicentral Dist. = 306 Hypocentral Dist. = 306	Original Acceleration(cm/s ²)	6.90	8.20	3.90
			SMAC-B2 Equivalent Acceleration(cm/s ²)	6.70	8.10	3.70
			Corrected Acceleration(cm/s ²)	6.80	8.20	3.80
			Integrated Velocity - fixed(cm/s)	2.19	3.68	1.25
			Integrated Velocity - variable(cm/s)	2.91	3.24	1.12
			Integrated Displacement - fixed(cm)	1.37	1.63	0.53
Integrated Displacement - variable(cm)	2.46	1.78	0.51			
TOYAMA-G F-788	ERS-G	Epicentral Dist. = 306 Hypocentral Dist. = 306	Original Acceleration(cm/s ²)	19.90	12.90	4.40
			SMAC-B2 Equivalent Acceleration(cm/s ²)	19.50	12.10	4.30
			Corrected Acceleration(cm/s ²)	19.80	12.90	4.40
			Integrated Velocity - fixed(cm/s)	4.51	3.97	1.26
			Integrated Velocity - variable(cm/s)	4.16	3.90	1.21
			Integrated Displacement - fixed(cm)	2.06	1.68	0.45
Integrated Displacement - variable(cm)	2.47	1.63	0.44			
TSURUGA-G F-789	ERS-G	Epicentral Dist. = 150 Hypocentral Dist. = 151	Original Acceleration(cm/s ²)	56.10	50.90	20.10
			SMAC-B2 Equivalent Acceleration(cm/s ²)	44.80	39.20	14.40
			Corrected Acceleration(cm/s ²)	56.60	50.80	19.70
			Integrated Velocity - fixed(cm/s)	4.77	3.16	1.24
			Integrated Velocity - variable(cm/s)	4.64	3.58	1.47
			Integrated Displacement - fixed(cm)	1.21	1.10	0.63
Integrated Displacement - variable(cm)	1.15	1.07	0.40			
HIROSHIMA-G F-790	ERS-G	Epicentral Dist. = 238 Hypocentral Dist. = 238	Original Acceleration(cm/s ²)	20.10	11.90	6.80
			SMAC-B2 Equivalent Acceleration(cm/s ²)	18.60	9.90	6.20
			Corrected Acceleration(cm/s ²)	20.30	11.90	6.90
			Integrated Velocity - fixed(cm/s)	2.87	1.84	0.84
			Integrated Velocity - variable(cm/s)	2.92	1.85	0.71
			Integrated Displacement - fixed(cm)	0.71	0.79	0.51
Integrated Displacement - variable(cm)	0.62	0.73	0.53			

(to be continued)

(Table 3 Continued)

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
KOCHI-G F-791	ERS-G	Epicentral Dist. = 182 Hypocentral Dist. = 182	Original Acceleration(cm/s ²)	27.80	26.00	10.00
			SMAC-B2 Equivalent Acceleration(cm/s ²)	26.30	24.10	8.80
			Corrected Acceleration(cm/s ²)	27.50	26.00	9.80
			Integrated Velocity - fixed(cm/s)	3.57	3.73	1.20
			Integrated Velocity - variable(cm/s)	3.39	3.83	1.12
Integrated Displacement - fixed(cm)	0.86	1.13	0.57			
Integrated Displacement - variable(cm)	1.46	2.47	0.46			
MATSUYAMA-G F-792	ERS-G	Epicentral Dist. = 229 Hypocentral Dist. = 230	Original Acceleration(cm/s ²)	39.70	35.30	10.30
			SMAC-B2 Equivalent Acceleration(cm/s ²)	38.00	32.60	9.00
			Corrected Acceleration(cm/s ²)	39.80	35.20	10.20
			Integrated Velocity - fixed(cm/s)	6.09	4.37	1.07
			Integrated Velocity - variable(cm/s)	5.95	4.56	0.96
Integrated Displacement - fixed(cm)	1.17	0.58	0.33			
Integrated Displacement - variable(cm)	1.39	0.76	0.20			
SAKAIMINATO-G F-793	ERS-G	Epicentral Dist. = 194 Hypocentral Dist. = 195	Original Acceleration(cm/s ²)	43.60	33.00	16.00
			SMAC-B2 Equivalent Acceleration(cm/s ²)	40.90	31.00	14.30
			Corrected Acceleration(cm/s ²)	43.40	33.20	15.80
			Integrated Velocity - fixed(cm/s)	7.05	6.76	1.81
			Integrated Velocity - variable(cm/s)	7.03	8.23	1.92
Integrated Displacement - fixed(cm)	2.43	3.22	0.65			
Integrated Displacement - variable(cm)	3.43	4.40	0.60			
KOMATSUJIMA-G F-794	ERS-G	Epicentral Dist. = 77 Hypocentral Dist. = 79	Original Acceleration(cm/s ²)	89.40	96.10	31.60
			SMAC-B2 Equivalent Acceleration(cm/s ²)	83.30	90.60	25.90
			Corrected Acceleration(cm/s ²)	88.90	96.70	31.20
			Integrated Velocity - fixed(cm/s)	12.87	17.28	2.99
			Integrated Velocity - variable(cm/s)	11.40	18.78	2.97
Integrated Displacement - fixed(cm)	2.63	3.92	0.72			
Integrated Displacement - variable(cm)	2.60	6.41	0.71			
WAKAYAMA-G F-795	ERS-G	Epicentral Dist. = 43 Hypocentral Dist. = 47	Original Acceleration(cm/s ²)	157.00 (N12S)	109.00 (E12S)	67.20
			SMAC-B2 Equivalent Acceleration(cm/s ²)	95.90	86.50	34.20
			Corrected Acceleration(cm/s ²)	157.20	110.20	68.70
			Integrated Velocity - fixed(cm/s)	11.89	15.07	5.25
			Integrated Velocity - variable(cm/s)	12.00	12.15	4.63
Integrated Displacement - fixed(cm)	2.93	4.22	1.23			
Integrated Displacement - variable(cm)	3.69	4.36	1.62			

(to be continued)

(Table 3 Continued)

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
KANAZAWA-G F-800	ERS-G	Epicentral Dist. = 265 Hypocentral Dist. = 266	Original Acceleration(cm/s ²)	26.60	29.90	6.20
			SMAC-B2 Equivalent Acceleration(cm/s ²)	24.70	28.50	6.10
			Corrected Acceleration(cm/s ²)	26.60	29.80	6.10
			Integrated Velocity - fixed(cm/s)	5.42	7.24	2.12
			Integrated Velocity - variable(cm/s)	5.78	7.36	2.22
			Integrated Displacement - fixed(cm)	2.42	2.99	1.16
Integrated Displacement - variable(cm)	3.58	3.83	1.08			
OITA-G F-869	ERS-G	Epicentral Dist. = 341 Hypocentral Dist. = 342	Original Acceleration(cm/s ²)	9.50	7.50	3.50
			SMAC-B2 Equivalent Acceleration(cm/s ²)	8.90	6.80	3.20
			Corrected Acceleration(cm/s ²)	9.40	7.60	3.40
			Integrated Velocity - fixed(cm/s)	1.85	1.35	0.58
			Integrated Velocity - variable(cm/s)	1.74	1.37	0.47
			Integrated Displacement - fixed(cm)	0.74	0.49	0.28
Integrated Displacement - variable(cm)	0.94	0.50	0.18			
KAWASAKI-FB F-990 (Abnormal)	ERS-F (in ground)	Epicentral Dist. = 442 Hypocentral Dist. = 443	Original Acceleration(cm/s ²)	2.60 (N16W)	0.30 (E16N)	1.20
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	---	---	---
			Integrated Velocity - fixed(cm/s)	---	---	---
			Integrated Velocity - variable(cm/s)	---	---	---
			Integrated Displacement - fixed(cm)	---	---	---
Integrated Displacement - variable(cm)	---	---	---			
KAWASAKI-F F-991	ERS-F	Epicentral Dist. = 442 Hypocentral Dist. = 443	Original Acceleration(cm/s ²)	5.40 (N16W)	9.30 (E16N)	1.50
			SMAC-B2 Equivalent Acceleration(cm/s ²)	5.10	9.20	1.30
			Corrected Acceleration(cm/s ²)	5.20	9.40	1.60
			Integrated Velocity - fixed(cm/s)	1.80	2.19	0.49
			Integrated Velocity - variable(cm/s)	1.57	2.32	0.40
			Integrated Displacement - fixed(cm)	0.98	0.69	0.35
Integrated Displacement - variable(cm)	1.39	0.93	0.22			

(to be continued)

(Table 3 Continued)

Name of Station & Number of Record	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
KAWASAKI-FR F-992 (Abnormal)	ERS-F (on structure)	Epical Dist. = 442 Hypocentral Dist. = 443	Original Acceleration(cm/s ²)	4.70 (N16W)	0.40 (E16N)	1.40
			SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
			Corrected Acceleration(cm/s ²)	---	---	---
			Integrated Velocity - fixed(cm/s)	---	---	---
			Integrated Velocity - variable(cm/s)	---	---	---
Integrated Displacement - fixed(cm)	---	---	---			
Integrated Displacement - variable(cm)	---	---	---			

- *1 : Slightly over ranged and the peak are estimated by eye.
*2 : Recorded traces are not clear and estimated with free hand by eye.
*3 : Liquefaction at the basement are observed as described in 6.2

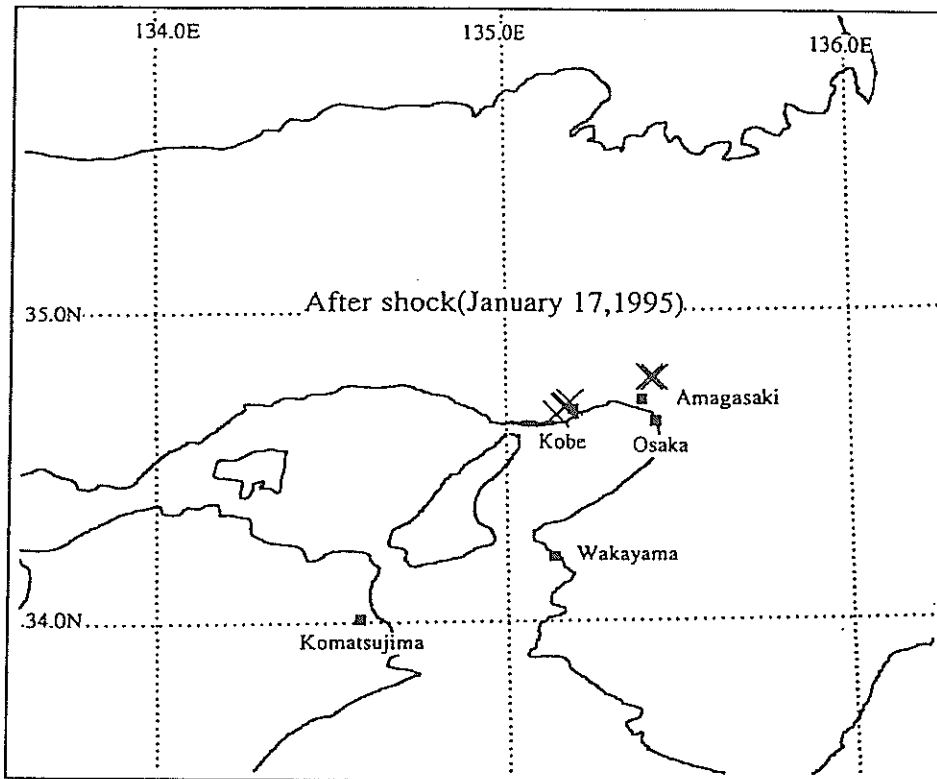


Figure 3 Locations of Epicenter of the After shocks (January 17,1995)

Table 4 Details of Earthquakes (January 17, 1995)

Earthquakes	Details	
After Shock	Date	January 17, 1995
	Time	05:52:07.3
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 39.9'N
	Longitude	135° 8.9'E
	Depth	15.1km
JMA Magnitude	4.4	
After Shock	Date	January 17, 1995
	Time	06:40:39.7
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 41.6'N
	Longitude	135° 10.8'E
	Depth	13.8km
JMA Magnitude	3.9	
After Shock	Date	January 17, 1995
	Time	06:42:48.0
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 46.9'N
	Longitude	135° 25.4'E
	Depth	14.8km
JMA Magnitude	4.3	

(Table 4 Continued)

Earthquakes	Details	
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 17, 1995 07:38:36.3 SE HYOGO PREF 34° 46.9'N 135° 26.3'E 11.7km 5.4
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 17, 1995 12:34:20.9 SE HYOGO PREF 34° 42.1'N 135° 11.5'E 13.6km 3.3
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 17, 1995 13:05:23.2 SE HYOGO PREF 34° 41.3'N 135° 10.4'E 14.5km 4.7

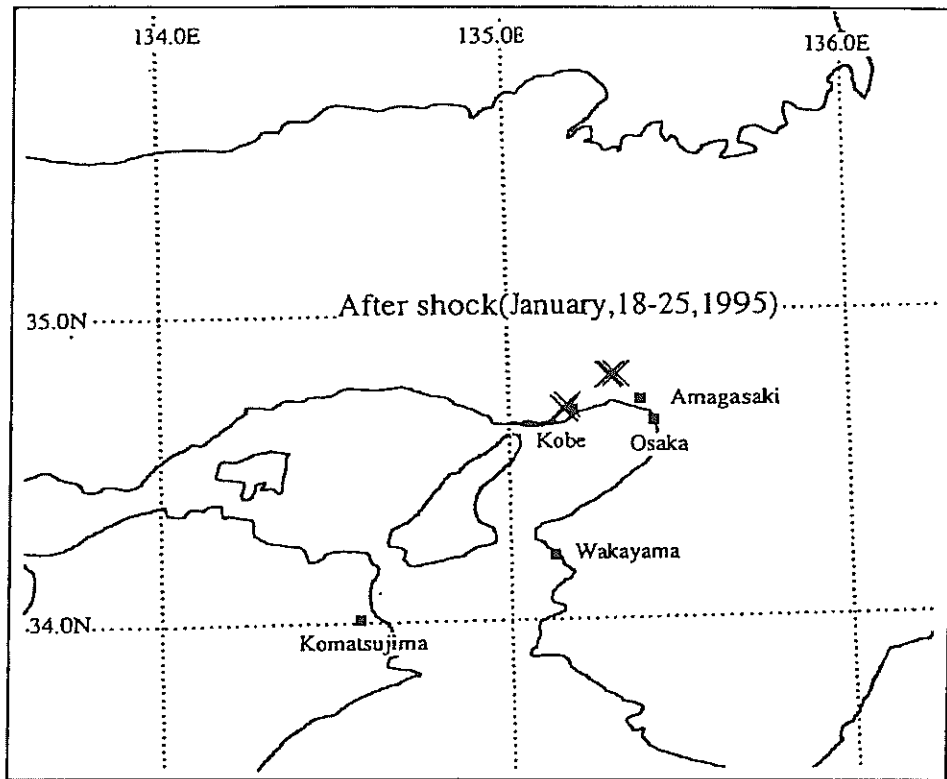


Figure 4 Locations of Epicenter of the After shocks (January 18-25,1995)

Table 5 Details of Earthquakes (January 18-25, 1995)

Earthquakes	Details	
After Shock	Date	January 18, 1995
	Time	00:51:29.6
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 40.8'N
	Longitude	135° 10.7'E
	Depth	15.7km
JMA Magnitude	4.3	
After Shock	Date	January 18, 1995
	Time	05:25:40.3
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 41.6'N
	Longitude	135° 11.1'E
	Depth	15.3km
JMA Magnitude	4.3	
After Shock	Date	January 18, 1995
	Time	06:50:18.6
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 41.0'N
	Longitude	135° 10.2'E
	Depth	12.9km
JMA Magnitude	4.3	

(Table 5 Continued)

Earthquakes	Details	
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 19, 1995 01:00:36.5 SE HYOGO PREF 34° 47.6'N 135° 19.8'E 13.1km 4.0
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 23, 1995 21:44:15.4 SE HYOGO PREF 34° 47.6'N 135° 18.9'E 15.6km 4.2
After Shock	Date Time Hypocenter Epicenter Region Latitude Longitude Depth JMA Magnitude	January 25, 1995 23:15:57.2 SE HYOGO PREF 34° 47.4'N 135° 18.4'E 14.8km 5.1

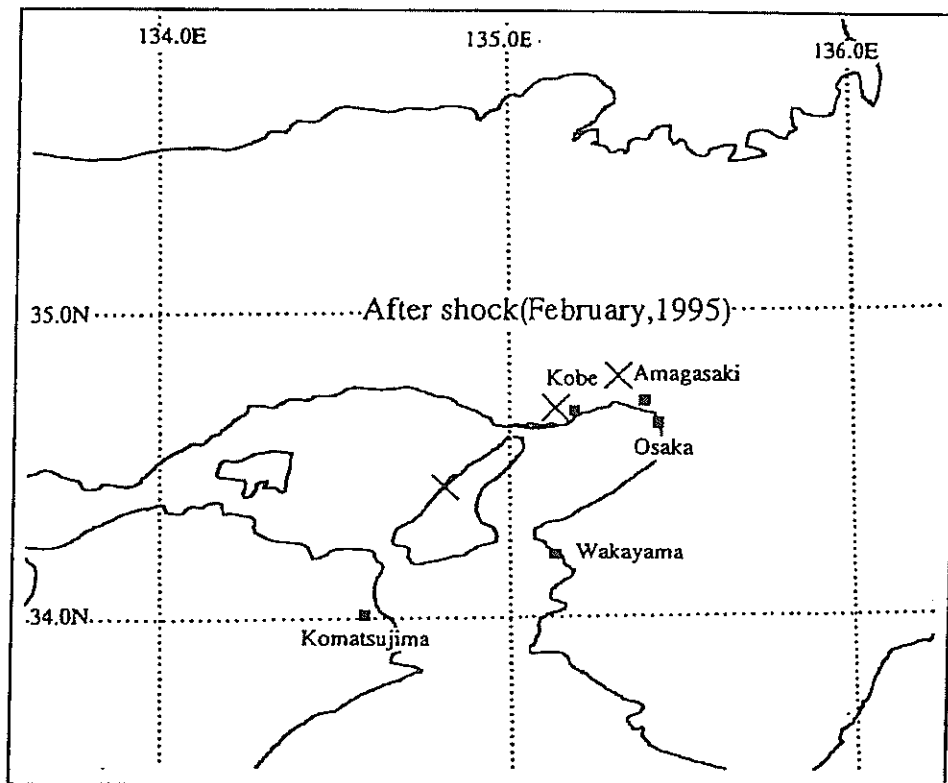


Figure 5 Locations of Epicenter of the After shocks (February, 1995)

Table 6 Details of Earthquakes (February, 1995)

Earthquakes	Details	
After Shock	Date	February 02, 1995
	Time	16:19:27.9
	Hypocenter	
	Epicenter Region	SE HYOGO PREF.
	Latitude	34° 41.4'N
	Longitude	135° 8.6'E
	Depth	18.1km
JMA Magnitude	4.1	
After Shock	Date	February 06, 1995
	Time	13:00:12.6
	Hypocenter	
	Epicenter Region	SE HYOGO PREF.
	Latitude	34° 47.5'N
	Longitude	135° 19.5'E
	Depth	13.2km
JMA Magnitude	3.6	
After Shock	Date	February 18, 1995
	Time	21:37:33.9
	Hypocenter	
	Epicenter Region	AWAJISHIMA ISLAND REGION
	Latitude	34° 26.2'N
	Longitude	134° 49.0'E
	Depth	15.9km
JMA Magnitude	4.8	

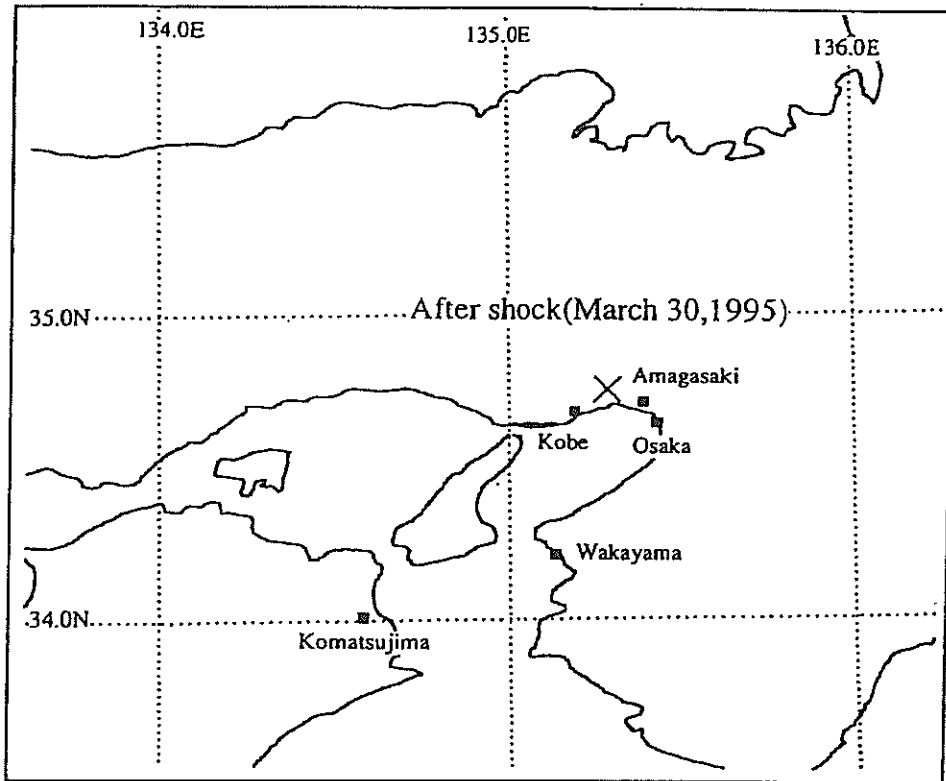


Figure 6 Locations of Epicenter of the After shock (March 30,1995)

Table 7 Detail of Earthquake (March 30, 1995)

Earthquake.	Detail.	
After Shock	Date	March 30, 1995
	Time	14:24:48.3
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 45.2'N
	Longitude	135° 17.8'E
	Depth	12.6km
	JMA Magnitude	3.6

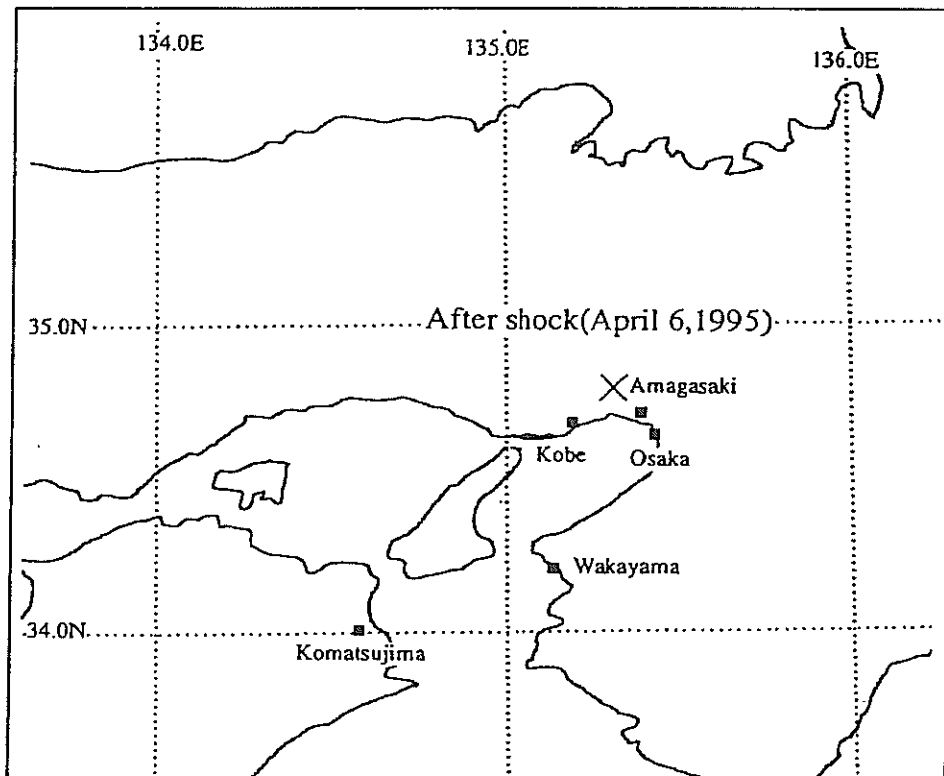


Figure 7 Locations of Epicenter of the After shock (April 6,1995)

Table 8 Detail of Earthquake (April 6, 1995)

Earthquake	Detail	
After Shock	Date	April 06, 1995
	Time	10:50:48.5
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 47.5'N
	Longitude	135° 19.3'E
	Depth	11.8km
JMA Magnitude	4.0	

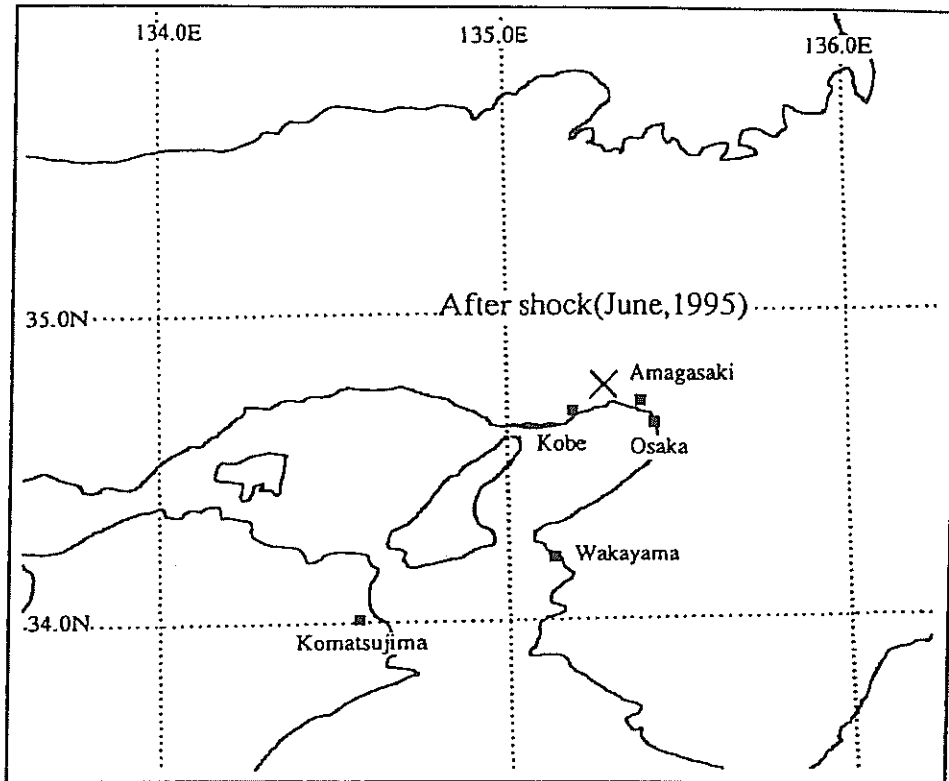


Figure 8 Locations of Epicenter of the After shocks (June,1995)

Table 9 Details of Earthquakes (June, 1995)

Earthquakes	Details	
After Shock	Date	June 16, 1995
	Time	07:55:50.6
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 45.8'N
	Longitude	135° 17.6'E
	Depth	12.5km
JMA Magnitude	3.8	
After Shock	Date	June 23, 1995
	Time	22:19:22.7
	Hypocenter	
	Epicenter Region	SE HYOGO PREF
	Latitude	34° 45.5'N
	Longitude	135° 17.4'E
	Depth	13.2km
JMA Magnitude	3.7	

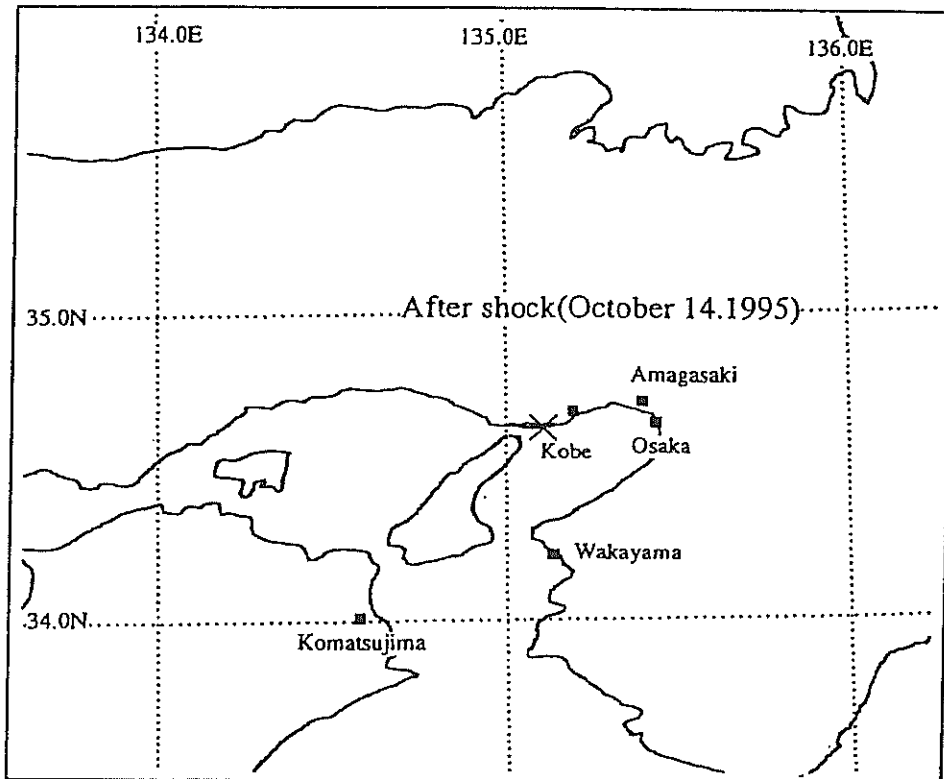


Figure 9 Locations of Epicenter of the After shock (October 14,1995)

Table 10 Detail of Earthquake (October 14, 1995)

Earthquake:	Detail	
After Shock	Date	October 14, 1995
	Time	02:04:05.9
	Hypocenter	
	Epicenter Region	OSAKA BAY REGION
	Latitude	34° 37.6'N
	Longitude	135° 6.9'E
	Depth	15.3km
	JMA Magnitude	4.5

3. Digitization and Preliminary Analyses

Procedures of digitization and preliminary analyses are identical with those described in the preceding annual reports and are not described here.

The results of preliminary analyses of the main shock and the after shocks are summarized in Table 3 and Table 11. Name of stations, record numbers, type of accelerographs, installation conditions, epicentral and hypocentral distance are shown these tables with the results of preliminary analyses. As results of preliminary analyses, the maximum of each component of original acceleration without instrument correction, SMAC-B2 equivalent acceleration, corrected acceleration, integrated velocity and integrated displacement are presented in these tables. Computed plots of these records are also presented in later part of this report with response spectra, Fourier spectra and loci of accelerations, velocities and displacements.

Table 11 Results of Preliminary Analyses of the After Shocks

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
KOBE-JI-S S-2623	Jan.17,1995 5:52:07	SMAC-B2	Epicentral Dist. = 6 Hypocentral Dist. = 16	Original Acceleration(cm/s ²)	20.10 (S43E)	31.50 (E43N)	35.90
				SMAC-B2 Equivalent Acceleration(cm/s ²)	---	---	---
				Corrected Acceleration(cm/s ²)	29.50	51.00	85.00
				Integrated Velocity - fixed(cm/s)	2.19	6.10	1.83
				Integrated Velocity - variable(cm/s)	1.68	4.81	1.79
Integrated Displacement - fixed(cm)	0.57	1.45	0.42				
Integrated Displacement - variable(cm)	0.24	0.89	0.13				
AMAGASAKI-G * F-803	Jan.17,1995 6:40:39	ERS-G	Epicentral Dist. = 21 Hypocentral Dist. = 25	Original Acceleration(cm/s ²)	13.30 (N06W)	9.80 (E06N)	13.40
				SMAC-B2 Equivalent Acceleration(cm/s ²)	6.60	4.70	5.00
				Corrected Acceleration(cm/s ²)	12.30	9.70	13.20
				Integrated Velocity - fixed(cm/s)	0.31	0.24	0.29
				Integrated Velocity - variable(cm/s)	0.30	0.23	0.27
Integrated Displacement - fixed(cm)	0.04	0.02	0.04				
Integrated Displacement - variable(cm)	0.01	0.01	0.01				
AMAGASAKI-G * F-804	Jan.17,1995 6:42:48	ERS-G	Epicentral Dist. = 8 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	17.50 (N06W)	13.30 (E06N)	22.50
				SMAC-B2 Equivalent Acceleration(cm/s ²)	8.90	8.00	4.00
				Corrected Acceleration(cm/s ²)	16.50	13.90	17.20
				Integrated Velocity - fixed(cm/s)	0.56	0.53	0.23
				Integrated Velocity - variable(cm/s)	0.53	0.53	0.21
Integrated Displacement - fixed(cm)	0.05	0.04	0.02				
Integrated Displacement - variable(cm)	0.03	0.03	0.01				
AMAGASAKI-G * F-805	Jan.17,1995 7:38:36	ERS-G	Epicentral Dist. = 8 Hypocentral Dist. = 14	Original Acceleration(cm/s ²)	40.50 (N06W)	25.40 (E06N)	41.80
				SMAC-B2 Equivalent Acceleration(cm/s ²)	28.40	18.80	13.20
				Corrected Acceleration(cm/s ²)	39.20	25.10	34.90
				Integrated Velocity - fixed(cm/s)	2.09	1.39	0.67
				Integrated Velocity - variable(cm/s)	2.24	1.36	0.75
Integrated Displacement - fixed(cm)	0.32	0.19	0.12				
Integrated Displacement - variable(cm)	0.24	0.13	0.06				
AMAGASAKI-G * F-808	Jan.17,1995 12:34:20	ERS-G	Epicentral Dist. = 20 Hypocentral Dist. = 24	Original Acceleration(cm/s ²)	9.70 (N06W)	14.30 (E06N)	14.20
				SMAC-B2 Equivalent Acceleration(cm/s ²)	6.30	8.80	4.00
				Corrected Acceleration(cm/s ²)	10.50	15.00	10.90
				Integrated Velocity - fixed(cm/s)	0.48	0.55	0.21
				Integrated Velocity - variable(cm/s)	0.46	0.52	0.20
Integrated Displacement - fixed(cm)	0.04	0.03	0.01				
Integrated Displacement - variable(cm)	0.03	0.02	0.01				

(to be continued)

(Table 11 Continued)

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
AMAGASAKI-G * F-809	Jan. 17, 1995 13:05:23	ERS-G	Epical Dist. = 21 Hypocentral Dist. = 26	Original Acceleration(cm/s ²)	33.80 (N06W)	19.70 (E06N)	37.80
				SMAC-B2 Equivalent Acceleration(cm/s ²)	18.80	9.90	14.10
				Corrected Acceleration(cm/s ²)	32.00	20.10	36.30
				Integrated Velocity - fixed(cm/s)	1.32	0.94	0.60
				Integrated Velocity - variable(cm/s)	1.41	0.85	0.58
Integrated Displacement - fixed(cm)	0.13	0.14	0.04				
Integrated Displacement - variable(cm)	0.10	0.11	0.02				
AMAGASAKI-G * F-810	Jan. 18, 1995 0:51:29	ERS-G	Epical Dist. = 21 Hypocentral Dist. = 26	Original Acceleration(cm/s ²)	28.10 (N06W)	10.90 (E06N)	21.80
				SMAC-B2 Equivalent Acceleration(cm/s ²)	14.50	5.30	8.00
				Corrected Acceleration(cm/s ²)	27.90	10.70	23.30
				Integrated Velocity - fixed(cm/s)	0.60	0.34	0.34
				Integrated Velocity - variable(cm/s)	0.59	0.32	0.35
Integrated Displacement - fixed(cm)	0.06	0.05	0.02				
Integrated Displacement - variable(cm)	0.05	0.03	0.01				
AMAGASAKI-G * F-811	Jan. 18, 1995 5:25:40	ERS-G	Epical Dist. = 20 Hypocentral Dist. = 25	Original Acceleration(cm/s ²)	14.30 (N06W)	5.90 (E06N)	10.90
				SMAC-B2 Equivalent Acceleration(cm/s ²)	6.90	3.20	4.20
				Corrected Acceleration(cm/s ²)	14.00	5.70	10.20
				Integrated Velocity - fixed(cm/s)	0.51	0.31	0.21
				Integrated Velocity - variable(cm/s)	0.52	0.28	0.21
Integrated Displacement - fixed(cm)	0.04	0.06	0.01				
Integrated Displacement - variable(cm)	0.03	0.03	0.01				
AMAGASAKI-G * F-812	Jan. 18, 1995 6:50:18	ERS-G	Epical Dist. = 22 Hypocentral Dist. = 25	Original Acceleration(cm/s ²)	10.80 (N06W)	16.90 (E06N)	11.90
				SMAC-B2 Equivalent Acceleration(cm/s ²)	5.70	7.50	3.80
				Corrected Acceleration(cm/s ²)	10.60	17.50	10.50
				Integrated Velocity - fixed(cm/s)	0.58	0.43	0.22
				Integrated Velocity - variable(cm/s)	0.58	0.42	0.22
Integrated Displacement - fixed(cm)	0.07	0.06	0.01				
Integrated Displacement - variable(cm)	0.04	0.04	0.01				
AMAGASAKI-G * F-813	Jan. 19, 1995 1:00:36	ERS-G	Epical Dist. = 11 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	17.60 (N06W)	25.70 (E06N)	34.60
				SMAC-B2 Equivalent Acceleration(cm/s ²)	11.20	16.10	7.80
				Corrected Acceleration(cm/s ²)	18.60	25.20	32.30
				Integrated Velocity - fixed(cm/s)	0.79	1.10	0.42
				Integrated Velocity - variable(cm/s)	0.79	1.14	0.41
Integrated Displacement - fixed(cm)	0.05	0.10	0.02				
Integrated Displacement - variable(cm)	0.04	0.08	0.01				

(to be continued)

(Table11 Continued)

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
AMAGASAKI-G * F-817	Jan.23,1995 21:44:15	ERS-G	Epicentral Dist. = 12 Hypocentral Dist. = 20	Original Acceleration(cm/s ²)	16.00 (N06W)	35.10 (E06N)	14.10
				SMA C-B2 Equivalent Acceleration(cm/s ²)	8.20	20.60	5.10
				Corrected Acceleration(cm/s ²)	15.70	34.70	13.50
				Integrated Velocity - fixed(cm/s)	0.51	1.64	0.24
AMAGASAKI-G * F-818	Jan.25,1995 23:15:57	ERS-G	Epicentral Dist. = 12 Hypocentral Dist. = 19	Integrated Velocity - variable(cm/s)	0.50	1.69	0.23
				Integrated Displacement - fixed(cm)	0.04	0.14	0.02
				Integrated Displacement - variable(cm)	0.03	0.11	0.01
				Original Acceleration(cm/s ²)	27.00 (N06W)	72.80 (E06N)	28.50
OSAKA-JI-G F-856	Jan.25,1995 23:15:57	ERS-G	Epicentral Dist. = 20 Hypocentral Dist. = 25	SMA C-B2 Equivalent Acceleration(cm/s ²)	19.80	65.50	10.60
				Corrected Acceleration(cm/s ²)	26.80	72.20	21.40
				Integrated Velocity - fixed(cm/s)	1.68	5.66	0.61
				Integrated Velocity - variable(cm/s)	1.81	5.84	0.60
AMAGASAKI-G * F-819	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 24 Hypocentral Dist. = 30	Integrated Displacement - fixed(cm)	0.22	0.70	0.05
				Integrated Displacement - variable(cm)	0.19	0.68	0.04
				Original Acceleration(cm/s ²)	16.00	52.30	17.80
				SMA C-B2 Equivalent Acceleration(cm/s ²)	9.00	46.10	7.90
OSAKA-MINAMI-G F-851	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 33	Corrected Acceleration(cm/s ²)	15.90	52.30	18.30
				Integrated Velocity - fixed(cm/s)	0.72	3.57	0.59
				Integrated Velocity - variable(cm/s)	0.71	3.84	0.56
				Integrated Displacement - fixed(cm)	0.09	0.48	0.10
AMAGASAKI-G * F-819	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 24 Hypocentral Dist. = 30	Integrated Displacement - variable(cm)	0.08	0.44	0.06
				Original Acceleration(cm/s ²)	20.00 (N06W)	16.00 (E06N)	24.30
				SMA C-B2 Equivalent Acceleration(cm/s ²)	11.10	7.80	9.60
				Corrected Acceleration(cm/s ²)	19.10	15.30	24.70
OSAKA-MINAMI-G F-851	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 33	Integrated Velocity - fixed(cm/s)	0.65	0.61	0.44
				Integrated Velocity - variable(cm/s)	0.70	0.61	0.44
				Integrated Displacement - fixed(cm)	0.06	0.05	0.04
				Integrated Displacement - variable(cm)	0.05	0.03	0.02
OSAKA-MINAMI-G F-851	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 33	Original Acceleration(cm/s ²)	21.90	35.70	13.80
				SMA C-B2 Equivalent Acceleration(cm/s ²)	8.30	24.30	8.70
				Corrected Acceleration(cm/s ²)	21.50	35.50	14.60
				Integrated Velocity - fixed(cm/s)	0.39	1.16	0.45
OSAKA-MINAMI-G F-851	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 33	Integrated Velocity - variable(cm/s)	0.36	1.10	0.45
				Integrated Displacement - fixed(cm)	0.01	0.08	0.02
				Integrated Displacement - variable(cm)	0.01	0.06	0.01

(to be continued)

(Table I) Continued)

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
OSAKA-JI-G F-854	Feb.2,1995 16:19:27	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 33	Original Acceleration(cm/s ²)	22.40	21.30	22.50
				SMAC-B2 Equivalent Acceleration(cm/s ²)	11.00	13.10	11.10
				Corrected Acceleration(cm/s ²)	21.30	21.90	21.70
				Integrated Velocity - fixed(cm/s)	0.66	0.89	0.59
				Integrated Velocity - variable(cm/s)	0.63	0.85	0.57
Integrated Displacement - fixed(cm)	0.03	0.05	0.03				
Integrated Displacement - variable(cm)	0.03	0.04	0.02				
AMAGASAKI-G * F-820	Feb.6,1995 13:00:12	ERS-G	Epicentral Dist. = 11 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	4.70 (N06W)	10.70 (E06N)	5.80
				SMAC-B2 Equivalent Acceleration(cm/s ²)	2.50	5.20	1.50
				Corrected Acceleration(cm/s ²)	4.60	10.00	6.30
				Integrated Velocity - fixed(cm/s)	0.14	0.35	0.09
				Integrated Velocity - variable(cm/s)	0.13	0.33	0.08
Integrated Displacement - fixed(cm)	0.01	0.03	0.01				
Integrated Displacement - variable(cm)	0.00	0.01	0.00				
WAKAYAMA-G F-937	Feb.18,1995 21:37:33	ERS-G	Epicentral Dist. = 39 Hypocentral Dist. = 42	Original Acceleration(cm/s ²)	44.90 (N12E)	23.40 (E12S)	9.60
				SMAC-B2 Equivalent Acceleration(cm/s ²)	23.10	11.20	6.20
				Corrected Acceleration(cm/s ²)	43.80	22.70	9.60
				Integrated Velocity - fixed(cm/s)	1.39	0.72	0.39
				Integrated Velocity - variable(cm/s)	1.34	0.72	0.36
Integrated Displacement - fixed(cm)	0.13	0.07	0.03				
Integrated Displacement - variable(cm)	0.12	0.06	0.03				
AMAGASAKI-G * F-821	Feb.18,1995 21:37:33	ERS-G	Epicentral Dist. = 62 Hypocentral Dist. = 64	Original Acceleration(cm/s ²)	8.30 (N06W)	4.30 (E06N)	4.80
				SMAC-B2 Equivalent Acceleration(cm/s ²)	6.30	2.30	2.50
				Corrected Acceleration(cm/s ²)	8.20	4.30	4.90
				Integrated Velocity - fixed(cm/s)	0.62	0.25	0.13
				Integrated Velocity - variable(cm/s)	0.56	0.24	0.12
Integrated Displacement - fixed(cm)	0.08	0.05	0.02				
Integrated Displacement - variable(cm)	0.06	0.03	0.00				
OSAKA-MINAMI-G F-852	Feb.18,1995 21:37:33	ERS-G	Epicentral Dist. = 62 Hypocentral Dist. = 64	Original Acceleration(cm/s ²)	13.20	8.00	9.30
				SMAC-B2 Equivalent Acceleration(cm/s ²)	10.60	6.00	4.90
				Corrected Acceleration(cm/s ²)	13.60	8.00	9.30
				Integrated Velocity - fixed(cm/s)	0.97	0.38	0.30
				Integrated Velocity - variable(cm/s)	1.03	0.37	0.28
Integrated Displacement - fixed(cm)	0.12	0.06	0.02				
Integrated Displacement - variable(cm)	0.09	0.03	0.01				

(to be continued)

(Table 11 Continued)

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
AMAGASAKI-G * F-849	Mar.30,1995 14:24:48	ERS-G	Epical Dist. = 11 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	9.60 (N06W)	16.80 (E06N)	7.90
				SMA-C-B2 Equivalent Acceleration(cm/s ²)	4.50	7.80	4.30
				Corrected Acceleration(cm/s ²)	9.90	16.90	7.50
				Integrated Velocity - fixed(cm/s)	0.25	0.36	0.20
				Integrated Velocity - variable(cm/s)	0.23	0.35	0.18
Integrated Displacement - fixed(cm)	0.01	0.01	0.01				
Integrated Displacement - variable(cm)	0.01	0.01	0.00				
AMAGASAKI-G * F-850	Apr.6,1995 10:50:48	ERS-G	Epical Dist. = 12 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	10.60 (N06W)	27.80 (E06N)	16.80
				SMA-C-B2 Equivalent Acceleration(cm/s ²)	4.30	15.50	3.50
				Corrected Acceleration(cm/s ²)	7.10	27.00	13.70
				Integrated Velocity - fixed(cm/s)	0.38	0.83	0.20
				Integrated Velocity - variable(cm/s)	0.36	0.90	0.19
Integrated Displacement - fixed(cm)	0.05	0.10	0.01				
Integrated Displacement - variable(cm)	0.03	0.08	0.01				
OSAKA-MINAMI-G F-853	Apr.6,1995 10:50:48	ERS-G	Epical Dist. = 20 Hypocentral Dist. = 23	Original Acceleration(cm/s ²)	7.50	16.80	6.10
				SMA-C-B2 Equivalent Acceleration(cm/s ²)	5.50	11.40	3.40
				Corrected Acceleration(cm/s ²)	7.00	16.10	6.00
				Integrated Velocity - fixed(cm/s)	0.38	0.73	0.17
				Integrated Velocity - variable(cm/s)	0.32	0.65	0.15
Integrated Displacement - fixed(cm)	0.04	0.05	0.02				
Integrated Displacement - variable(cm)	0.02	0.04	0.01				
OSAKA-G F-855	Apr.6,1995 10:50:48	ERS-G	Epical Dist. = 20 Hypocentral Dist. = 23	Original Acceleration(cm/s ²)	5.30	10.60	4.80
				SMA-C-B2 Equivalent Acceleration(cm/s ²)	2.70	7.30	1.80
				Corrected Acceleration(cm/s ²)	5.20	10.50	4.60
				Integrated Velocity - fixed(cm/s)	0.16	0.42	0.11
				Integrated Velocity - variable(cm/s)	0.15	0.36	0.09
Integrated Displacement - fixed(cm)	0.03	0.05	0.02				
Integrated Displacement - variable(cm)	0.01	0.04	0.00				
AMAGASAKI-G * F-932	Jun.16,1995 7:55:50	ERS-G	Epical Dist. = 12 Hypocentral Dist. = 17	Original Acceleration(cm/s ²)	13.20 (N06W)	29.70 (E06N)	17.90
				SMA-C-B2 Equivalent Acceleration(cm/s ²)	6.60	13.70	8.80
				Corrected Acceleration(cm/s ²)	12.60	29.50	20.30
				Integrated Velocity - fixed(cm/s)	0.33	0.57	0.39
				Integrated Velocity - variable(cm/s)	0.35	0.58	0.36
Integrated Displacement - fixed(cm)	0.03	0.03	0.02				
Integrated Displacement - variable(cm)	0.02	0.03	0.01				

(to be continued)

(Table 11 Continued)

Name of Station & Number of Record	Date & Time	Type of Accelerograph	Distance(km)	Type of Data	Maximum of N-S Component	Maximum of E-W Component	Maximum of U-D Component
AMAGASAKI-G * F-933	Jun.23,1995 22:19:22	ERS-G	Epicentral Dist. = 12 Hypocentral Dist. = 18	Original Acceleration(cm/s ²)	8.30 (N06W)	12.40 (E06N)	12.00
				SMAC-B2 Equivalent Acceleration(cm/s ²)	5.70	7.30	6.80
				Corrected Acceleration(cm/s ²)	8.10	11.80	11.30
				Integrated Velocity - fixed(cm/s)	0.30	0.47	0.30
				Integrated Velocity - variable(cm/s)	0.30	0.45	0.28
Integrated Displacement - fixed(cm)	0.03	0.02	0.02				
Integrated Displacement - variable(cm)	0.02	0.02	0.01				
AMAGASAKI-G * F-934	Oct.14,1995 2:04:05	ERS-G	Epicentral Dist. = 28 Hypocentral Dist. = 32	Original Acceleration(cm/s ²)	13.60 (N06W)	11.20 (E06N)	11.30
				SMAC-B2 Equivalent Acceleration(cm/s ²)	8.70	4.40	3.90
				Corrected Acceleration(cm/s ²)	13.40	10.90	10.30
				Integrated Velocity - fixed(cm/s)	0.90	0.43	0.23
				Integrated Velocity - variable(cm/s)	0.75	0.39	0.21
Integrated Displacement - fixed(cm)	0.11	0.05	0.02				
Integrated Displacement - variable(cm)	0.09	0.04	0.01				
OSAKA-MINAMI-G F-1040	Oct.14,1995 2:04:05	ERS-G	Epicentral Dist. = 30 Hypocentral Dist. = 34	Original Acceleration(cm/s ²)	36.70	22.70	19.70
				SMAC-B2 Equivalent Acceleration(cm/s ²)	23.40	11.80	9.40
				Corrected Acceleration(cm/s ²)	36.30	21.90	20.70
				Integrated Velocity - fixed(cm/s)	2.05	0.98	0.43
				Integrated Velocity - variable(cm/s)	1.84	1.00	0.39
Integrated Displacement - fixed(cm)	0.20	0.08	0.03				
Integrated Displacement - variable(cm)	0.18	0.08	0.03				
OSAKA-JI-G F-1041	Oct.14,1995 2:04:05	ERS-G	Epicentral Dist. = 30 Hypocentral Dist. = 34	Original Acceleration(cm/s ²)	28.20	11.90	18.60
				SMAC-B2 Equivalent Acceleration(cm/s ²)	19.90	5.80	5.20
				Corrected Acceleration(cm/s ²)	26.90	11.60	17.50
				Integrated Velocity - fixed(cm/s)	1.19	0.39	0.43
				Integrated Velocity - variable(cm/s)	1.29	0.37	0.38
Integrated Displacement - fixed(cm)	0.18	0.05	0.04				
Integrated Displacement - variable(cm)	0.15	0.04	0.03				

* : Liquefaction at the basement are observed as described in 6.2

Original acceleration used in this report denotes the digitized acceleration data with base line correction and without instrument correction.

SMAC-B2 equivalent acceleration denotes the acceleration data corrected by the frequency characteristics of the SMAC-B2 accelerograph of mechanical type. The SMAC-B2 accelerograph has been a main accelerograph in the network of PHRI and many accelerograms have been recorded by this accelerograph. Because frequency characteristics of the SMAC-B2 accelerograph, however, are not very sensitive in high frequency range in comparison with those of the ERS accelerograph of electrical type, the maximum accelerations of records by the SMAC-B2 accelerograph are tend to be smaller than by the ERS accelerograph. By this procedure of computing SMAC-B2 equivalent acceleration, the maximum acceleration of all the records, which were recorded by the ERS accelerographs, can be directly compared with those by the SMAC-B2 accelerograph so far.

Corrected acceleration denotes the acceleration data with instrument correction processed through the variable filter which is briefly described in the preceding annual reports. For the records by the SMAC-B2 accelerograph, acceleration components around 10 Hz in frequency domain are amplified by this procedure. For the records by ERS accelerograph of earlier type (ERS-B, C and D- type), acceleration is slightly amplified in accordance with frequency. For the records by the recent type of the ERS accelerograph (ERS-F and-G type), phase characteristics of records are only corrected.

Integrations for computing velocities and displacements are conducted by using two types of low cut filter. One is the fixed filter of which cut off frequency is fixed and the other is the variable filter which cut off frequency is varied according to the content of low frequency components of records. Detailed descriptions of these filtering procedures are reported in the preceding annual reports.

Response spectra, Fourier spectra and loci of corrected accelerations, velocities and displacements of each record are also presented with the computer plots of time history data of accelerations, velocities and displacements. As for response spectra, acceleration ratio of absolute acceleration response to the maximum acceleration of the input motion, absolute acceleration response, relative velocity response and relative displacement response are presented. As for loci, corrected accelerations and integrated velocities and displacements computed with the variable filter are used for plots.

4. Attenuation Relations

Attenuation relations of peak ground acceleration of corrected acceleration, peak ground velocity and displacement computed with the variable filter are shown in Figure 10 to Figure 12. Results of horizontal and vertical motions are shown together in these figures. As for horizontal motion, larger of two horizontal components is used. There exists attenuation relationship for both horizontal and vertical acceleration in Figure 10. Existence of attenuation for velocity and displacements are also clear in Figure 11 and 12. In these analysis, site characteristics of the stations, such as shear wave velocity profile, are not considered here.

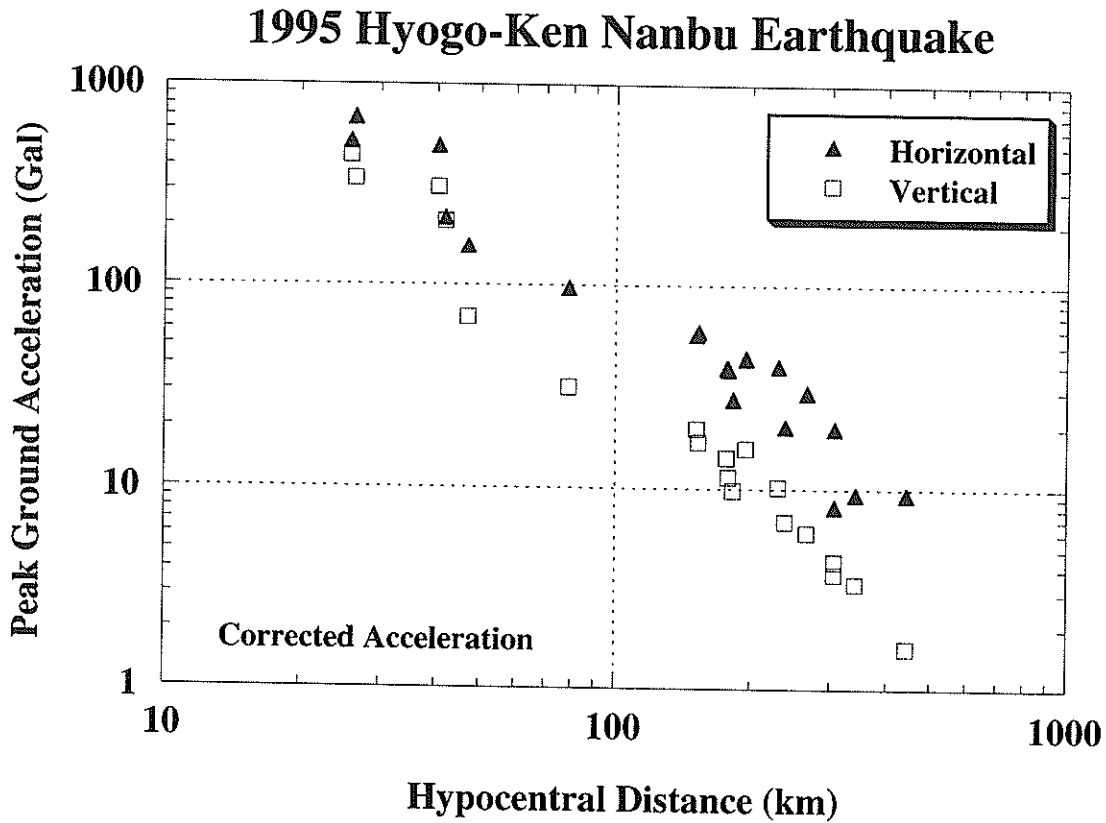


Figure 10 Attenuation Relation of Peak Ground Acceleration

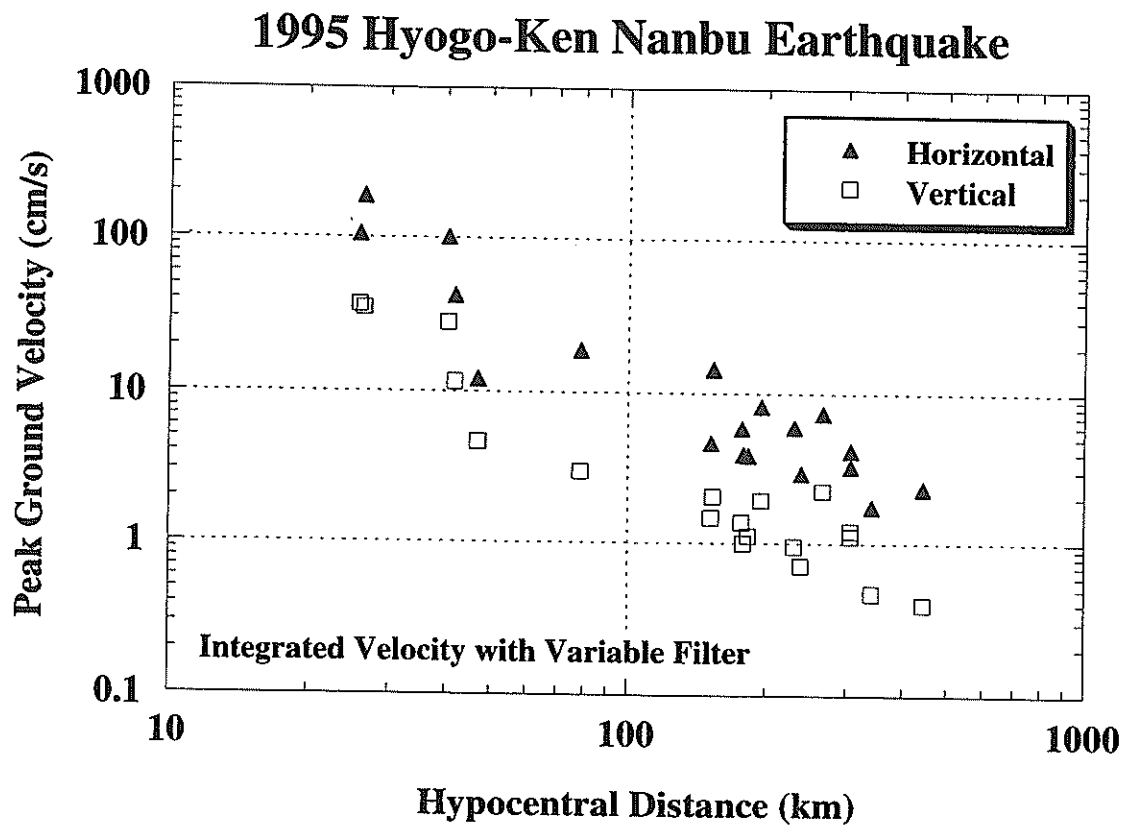


Figure 11 Attenuation Relation of Peak Ground Velocity

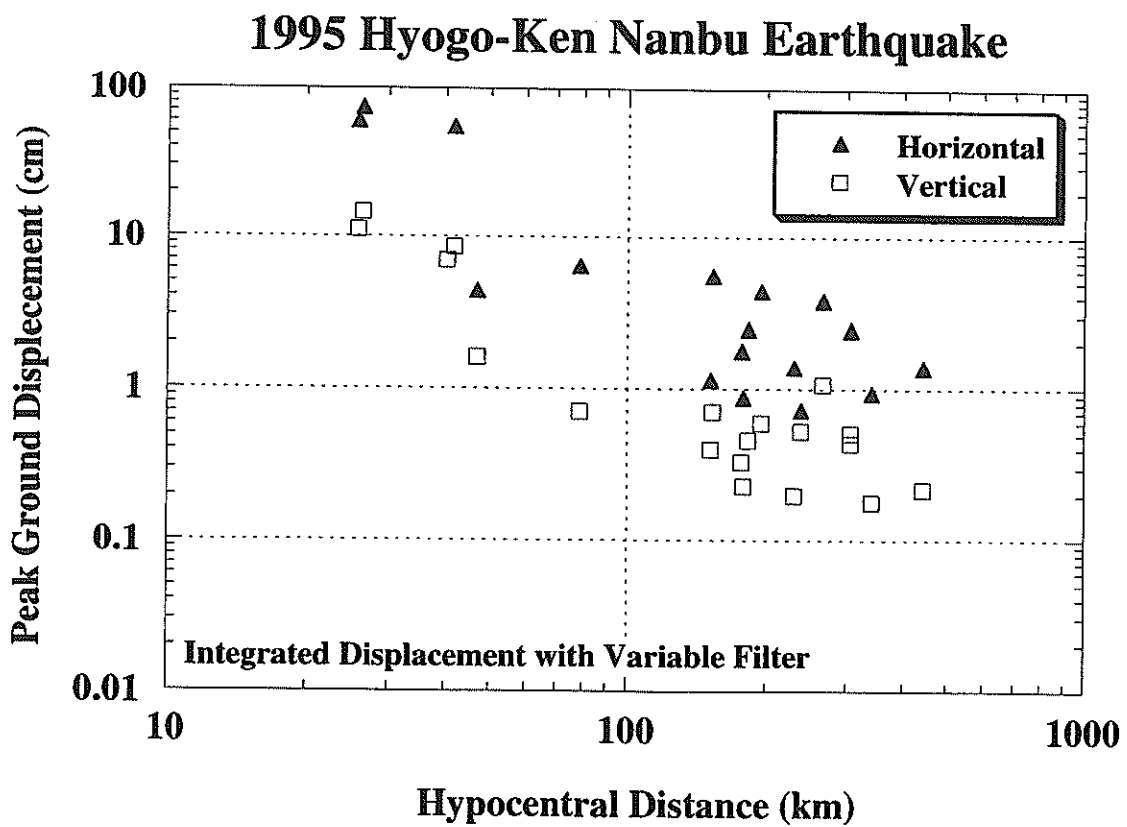


Figure 12 Attenuation Relation of Peak Ground Displacement

5. Amplification of Acceleration

Surface ground motion and base motion of the main shock were observed simultaneously at Toyama port. Amplification of accelerations, which are computed by square root of ratio of power spectrum of surface ground motion to that of base motion, are shown in Figure 13. Acceleration around 1.2 Hz and 3Hz are amplified in the horizontal components and acceleration around 6Hz are amplified in the vertical components. In these analyses, power spectra are smoothed using Parzen window with band width 1.0 Hz⁴⁷⁾.

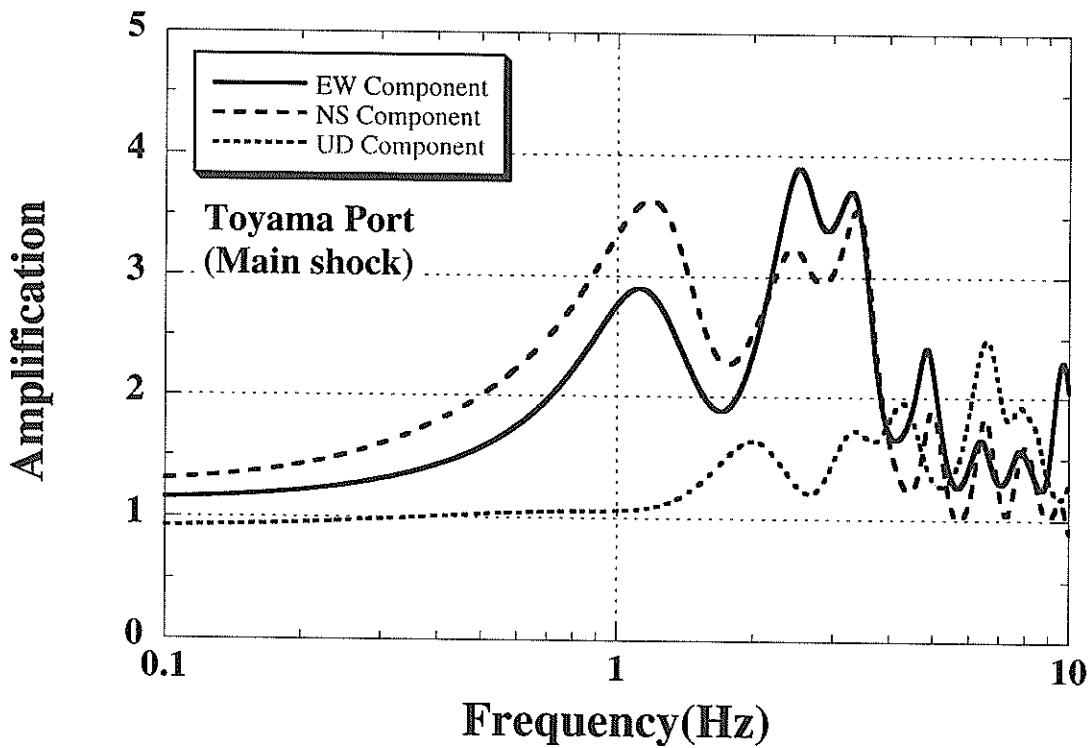


Figure 13 Amplification of Acceleration at Toyama Port (Main shock on January 17)

6. Remarks for Records

6.1 Remarks for Records with long period components

The cut-off frequency of a high pass filter for integration of digitized accelerogram should be varied in accordance with frequency characteristics of an accelerogram from a point of view that SN ratio should be higher than some constant level for every frequency component and at the same time the physically real signals should be preserved as much as possible. On the other hand, cut-off frequency of the high pass filter should be constant for any accelerograms from a point of view that the preserved real seismic signals should be filtered out by same filter for purpose of comparison between two or more velocities or displacements even if integrated errors are more or less included in them. In order to satisfy a wide range of applications of the strong-motion record from the various view points, the authors proposed two method of correction of an accelerogram to obtain integrated velocities and displacements. One is a method with a fixed filter and the other is a method with a variable filter²⁸⁾.

Cut-off frequency of the fixed filter is 0.154 Hz. Therefore wave components lower than 0.154 Hz is removed. On the other hand, cut-off frequency of the variable filter varies with each record. Therefore results of velocity and displacement are different for each record.

For example, cut-off frequency of the record obtained at Kobe-ji-S station by the main shock is about 0.047Hz (EW component). Therefore time history of the velocity and displacement with fixed filter are quite different from those with variable filter. Maximum velocity and displacement are also different for each other. Loci of velocity and displacement with variable filter and fixed filter are different each other. We can find that EW component of ground motion at Kobe-ji-S station (S - 2615) contains long period components.

6.2 Remarks for Records at Amagasaki station

The basement of accelerograph are tilted after the earthquake and it seems that liquefaction were occurred beneath the recording station. We observed the trace of liquefaction at the site as shown in Photo.1. These are the reason why the results of preliminary analysis of the records at Amagasaki-G stations at main shock indicated abnormal integrated displacements. It is necessary to take into account the effect of this liquefaction and the inclination of basement when we use the recorded motion at Amagasaki-G station including the motion recorded during after shocks.



Photo1 The evidence of liquefaction at the site (Amagasaki Port)

6.3 Remarks for Records with abnormal recording condition

Some recording station are under abnormal recording condition at the main shock and it is necessary to take into account these recording condition if we use these recorded motion in application. These abnormal recording condition are summarized as following notations.

Kobe-ji-S: S-2615: Slightly over ranged and the peak are estimated by eye.

Osaka-ji-S: S-2618: Recorded traces are not clear and estimated with free hand by eye.

Amagasaki-G: F-765 etc.: Liquefaction at the basement are observed as described in 6.2

7. Summary

The 1995 Hyogo-ken Nanbu Earthquake of JMA (Japan Meteorological Agency) Magnitude 7.2 occurred in near Akashi channel (between Kobe city and Awaji island) in Japan at 05:46:52, January 17,1995. This earthquake caused strong ground motion in Hanshin area of Japan. Structures were damaged by the earthquake.

The earthquake triggered 25 accelerographs installed at 17 ports in the strong-motion earthquake observation network of the Port and Harbour Research Institute. 21 accelerograms out of 25 were obtained as digital acceleration data observed in port areas in Japan.

This report presents the strong-motion earthquake observation results of this earthquake and the results of preliminary analyses of the 21 digitized acceleration records obtained on surface ground and in ground by the main shock. The 29 records of after shocks are also presented. Original acceleration without instrument correction, corrected acceleration, SMAC-B2 equivalent acceleration, integrated velocity and displacement, response spectra, Fourier spectra and loci of accelerations, velocities and displacements are presented as results of preliminary analyses. Amplification of accelerations of the main shock at Toyama port are also presented. Attenuation relations of acceleration, velocity and displacement of main shock are also presented in this report.

(Received on March 31, 1998)

Acknowledgements

The Network of Strong-Motion Earthquake Observation in port area have been supported with cooperation of related organizations and efforts of partners at each site. The authors greatly acknowledged their cooperation and the list of cooperative organizations and partners are summarized in 1995 annual report of Strong-Motion Earthquake Observation in port area. The authors also acknowledged the secretaries of Geotechnical Earthquake Engineering Laboratory, Ms.Chieko Tsuchitani for her great contribution in digitization of Strong-Motion records.

References

- 1) Hajime Tsuchida, Teiichiro Yamada, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1963 and 1964), Technical Note of the Port and Harbour Research Institute, No.55, September 1968.
- 2) Hajime Tsuchida, Teiichiro Yamada, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1965 and 1966), Technical Note of the Port and Harbour Research Institute, No.62, December 1968.
- 3) Hajime Tsuchida, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1967), Technical Note of the Port and Harbour Research Institute, No.64, March 1969.
- 4) Hajime Tsuchida, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1968), Technical Note of the Port and Harbour Research Institute, No.98, March 1970.
- 5) Hajime Tsuchida, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1969), Technical Note of the Port and Harbour Research Institute, No.100, June 1970.
- 6) Hajime Tsuchida, Eiichi Kurata and Katsuko Sudo: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1970), Technical Note of the Port and Harbour Research Institute, No.116, March 1971.
- 7) Eiichi Kurata, Tokuzo Ishizaka and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1971), Technical Note of the Port and Harbour Research Institute, No.136, March 1972.
- 8) Eiichi Kurata, Tokuzo Ishizaka and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1972), Technical Note of the Port and Harbour Research Institute, No.160, March 1973.
- 9) Eiichi Kurata, Tokuzo Ishizaka and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1973), Technical Note of the Port and Harbour Research Institute, No.181, March 1974.
- 10) Eiichi Kurata, Tokuzo Ishizaka and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1974), Technical Note of the Port and Harbour Research Institute, No.202, March 1975.
- 11) Eiichi Kurata, Susumu Iai and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1975), Technical Note of the Port and Harbour Research Institute, No.236, March 1976.
- 12) Eiichi Kurata, Susumu Iai and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports, Supplementary (1963 through 1975, Vertical component), Technical Note of the Port and Harbour Research Institute, No.250, December 1976.
- 13) Eiichi Kurata, Susumu Iai and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1976 and 1977), Technical Note of the Port and Harbour Research Institute, No.287, March 1978.
- 14) Eiichi Kurata, Susumu Iai, Yoshiko Yokoyama and Hajime Tsuchida: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1978 and 1979), Technical Note of the Port and Harbour Research Institute, No.338, June 1980.
- 15) Eiichi Kurata, Susumu Iai, Yoshiko Yokoyama and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1980), Technical Note of the Port and Harbour Research Institute, No.374, June 1981.
- 16) Eiichi Kurata and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1981), Technical Note of the Port and Harbour Research Institute, No.426, June 1982.
- 17) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1982), Technical Note of the Port and Harbour Research Institute, No.446, June 1983.
- 18) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1983), Technical Note of the Port and Harbour Research Institute, No.487, June 1984.
- 19) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1984), Technical Note of the Port and Harbour Research Institute, No.519, June 1985.

- 20) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1985), Technical Note of the Port and Harbour Research Institute, No.547, June 1986.
- 21) Eiichi Kurata, Susumu Iai and Setsuo Noda: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1986), Technical Note of the Port and Harbour Research Institute, No.588, June 1987.
- 22) Eiichi Kurata and Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1987), Technical Note of the Port and Harbour Research Institute, No.618, June 1988.
- 23) Eiichi Kurata and Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1988), Technical Note of the Port and Harbour Research Institute, No.649, June 1989.
- 24) Eiichi Kurata and Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1989), Technical Note of the Port and Harbour Research Institute, No.676, June 1990.
- 25) Eiichi Kurata and Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1990), Technical Note of the Port and Harbour Research Institute, No.705, June 1991.
- 26) Eiichi Kurata and Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1991), Technical Note of the Port and Harbour Research Institute, No.727, June 1992.
- 27) Yasuo Matsunaga, Hirotaka Sakurai, Toshikazu Morita, Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1992&1993), Technical Note of the Port and Harbour Research Institute, No.776, June 1994.
- 28) Masafumi Miyata, Yukihiro Sato, Koji Ichii, Toshikazu Morita, Susumu Iai: Annual Report on Strong-Motion Earthquake Records in Japanese Ports (1994), Technical Note of the Port and Harbour Research Institute, No.840, June 1996.
- 29) Hajime Tsuchida, Eiichi Kurata and Katsuko Sudo: Strong-Motion Earthquake Records on the 1968 Tokachi-Oki Earthquake and Its Aftershocks, Technical Note of the Port and Harbour Research Institute, No.80, June 1969.
- 30) Eiichi Kurata, Susumu Iai and Hajime Tsuchida: Strong-Motion Earthquake Records on the 1978 Izu-Oshima-Kinkai Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.317, March 1979.
- 31) Eiichi Kurata, Susumu Iai, Yoshiko Yokoyama and Hajime Tsuchida: Strong-Motion Earthquake Records on the 1978 Miyagi-Ken-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.319, June 1979.
- 32) Eiichi Kurata and Setsuo Noda: Strong-Motion Earthquake Records on the 1982 Urakawa-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.442, March 1983.
- 33) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Strong-Motion Earthquake Records on the 1983 Nipponkai-Chubu Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.458, September 1983.
- 34) Eiichi Kurata, Tetsuo Fukuhara and Setsuo Noda: Strong-Motion Earthquake Records on the 7 August 1984 Hyuga-nada Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.503, December 1984.
- 35) Eiichi Kurata, Setsuo Noda and Toyoshi Higuchi: Strong-Motion Earthquake Records on the 17 December 1987 Chiba-ken-Toho-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.619, June 1988.
- 36) Yasuo Matsunaga, Hirotaka Sakurai, Toshikazu Morita and Susumu Iai: Strong-Motion Earthquake Records on the 1993 Kushiro-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.777, June 1994.
- 37) Yasuo Matsunaga, Hirotaka Sakurai, Toshikazu Morita and Susumu Iai: Strong-Motion Earthquake Records on the 1993 Hokkaido-Nansei-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.778, June 1994.
- 38) Yukihiro Sato, Masafumi Miyata, Koji Ichii, Toshikazu Morita, Susumu Iai: Strong-Motion Earthquake Records on the 1994 Hokkaido-Toho-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.853, December 1996.

- 39) Yukihiko Sato, Koji Ichii, Masafumi Miyata, Toshikazu Morita, Susumu Iai: Strong-Motion Earthquake Records on the 1994 Sanriku-Haruka-Oki Earthquake in Port Areas, Technical Note of the Port and Harbour Research Institute, No.892, December 1997.
- 40) Hajime Tsuchida, Teiichiro Yamada and Eiichi Kurata: Site Characteristics of Strong-Motion Earthquake Stations in Ports and Harbour in Japan (Part 1), Technical Note of the Port and Harbour Research Institute, No.34, November 1967.
- 41) Eiichi Kurata, Hajime Tsuchida and Katsuko Sudo: Site Characteristics of Strong -Motion Earthquake Stations in Ports and Harbour in Japan (Part 2), Technical Note of the Port and Harbour Research Institute, No.107, December 1970.
- 42) Eiichi Kurata and Tokuzo Ishizaka: Site Characteristics of Strong -Motion Earthquake Stations in Ports and Harbours in Japan (Part 3), Technical Note of the Port and Harbour Research Institute, No.156, March 1973.
- 43) Yoshiko Yokoyama and Eiichi Kurata: Site Characteristics of Strong -Motion Earthquake Stations in Ports and Harbours in Japan (Part 4), Technical Note of the Port and Harbour Research Institute, No.298, June 1978.
- 44) Yoshiko Yokoyama and Eiichi Kurata: Site Characteristics of Strong -Motion Earthquake Stations in Ports and Harbours in Japan (Part 5), Technical Note of the Port and Harbour Research Institute, No.351, September 1980.
- 45) The Seismological Bulletin of the Japan Meteorological Agency for 1995, The Japan Meteorological Agency, 1996.
- 46) Jishin -Kazan -Gaikyo of the Japan Meteorological Agency for January 1995, The Japan Meteorological Agency, 1994.
- 47) Yorihiro Ohosaki: Entrance of Spectral Analysis of Earthquake Motion, New Edition, Kashima Printings, May 1994 (in Japanese).

Strong-Motion Earthquake Observation Results
of the Main Shock at 5:46:52, January 17, 1995

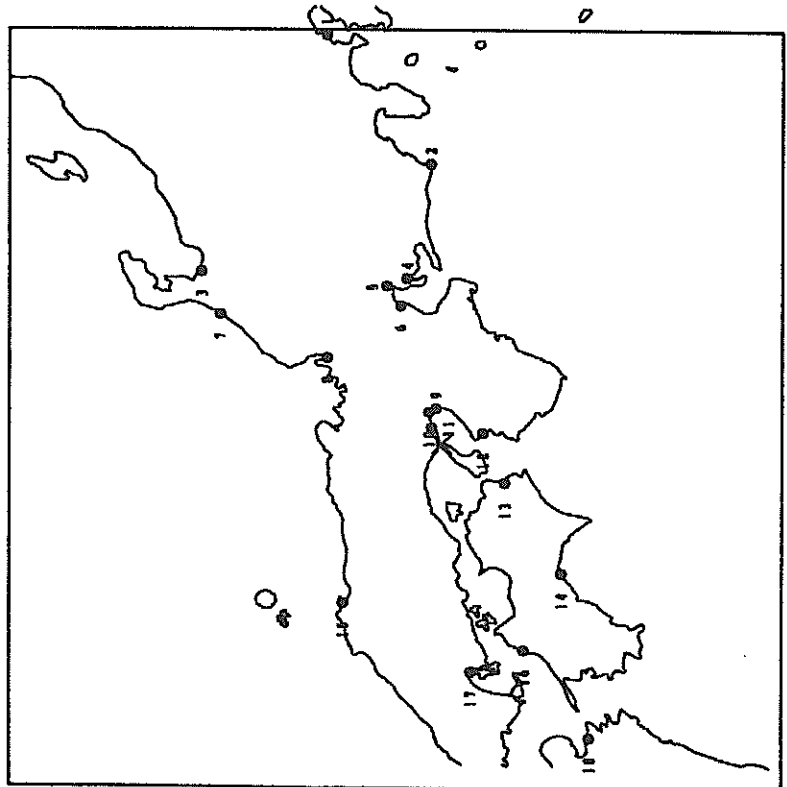
STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

05:46 JAN. 17, 1995
 AWAJISHIMA ISLAND REGION
 EPICENTER : 34 35.7'N 135 2.2 'E
 DEPTH : 17.9KM MAGNITUDE : 7.2

JHA INTENSITIES

VI : KOBE, SUMOTO
 V : TOYOOKA, HIKONE, KYOTO
 IV : NARA, TSU, TSURUGA, FUKUI,
 UENO, YOKKAICHI, GIFU,
 SAKAI, KOCHI, FUKUYAMA,
 TOTTORI, TADOTSU, TSUYAMA,
 TOKUSHIMA, OKAYAMA,
 TAKAMATSU, OSAKA, MAIZURU,
 HIMEJI, WAKAYAMA

STATION	CONDITION	RECORD NUMBER	MAX. ACC. (NS) (EW) (UD)	* (GAL)	DIST. (KM)	
1 KAWASAKI-FR	ON STRUC.	F-992	5	1	441	
1 KAWASAKI-F	ON GROUND	F-991	5	9	441	
1 KAWASAKI-FB	IN GROUND	F-990	3	1	441	
2 OMAEZAKI-M	ON GROUND	M-1552	2	2	291	
3 TOYAMA-G	ON GROUND	F-788	20	13	4	306
3 TOYAMA-GB	IN GROUND	F-787	7	8	4	306
4 KINUURA-JI-S	ON GROUND	S-2621	27	25	9	177
5 NAGOYA-INAB-S	ON STRUC.	S-2616	30	32	12	175
5 INAE-YAITA-M	ON STRUC.	M-1553	4	90	175	
6 YOKKA.-CHITOSE-S	ON GROUND	S-2619	54	41	11	151
6 YOKKA.-SEKITAN-M	ON STRUC.	M-1555	5	93	151	
7 KANAZAWA-O	ON GROUND	F-800	27	30	6	265
8 TSURUGA-G	ON GROUND	F-789	56	51	20	150
9 OSAKA-JI-S	ON GROUND	S-2618	178	125	103	37
10 AMAGASAKI-G	ON GROUND	F-765	321	472	311	36
11 KOBE-MAYA-DAI2-M	ON STRUC.	M-1554	4	480	20	
11 KOBE-DAI8-G	ON STRUC.	F-764	683	394	334	19
11 KOBE-JI-S	ON GROUND	S-2615	206	531	285	18
12 WAKAYAMA-G	ON GROUND	F-795	157	109	67	43
13 KOMATSUJIMA-G	ON GROUND	F-794	89	96	32	76
14 KOCHI-G	ON GROUND	F-791	28	26	10	181
15 SAKAIMINATO-G	ON GROUND	F-793	44	33	16	193
16 MATSUYAMA-G	ON GROUND	F-792	40	35	10	228
17 HIROSHIMA-G	ON GROUND	F-790	20	12	7	236
18 OITA-G	ON GROUND	F-869	10	8	4	340



* These maximum acceleration was roughly estimated and different from exact values written in following pages.

Results of Preliminary Analyses
of the Main Shock at 5:46:52, January 17, 1995

RECORD NUMBER : S-2615

STATION : KOBE-JI-S

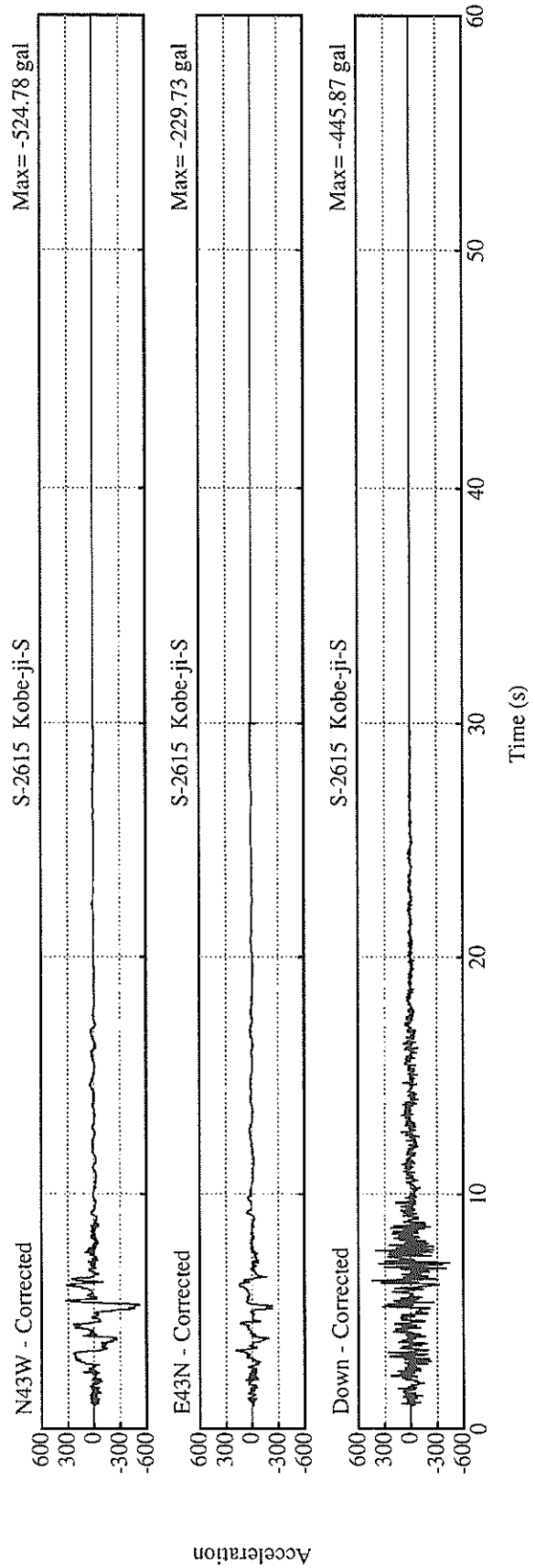
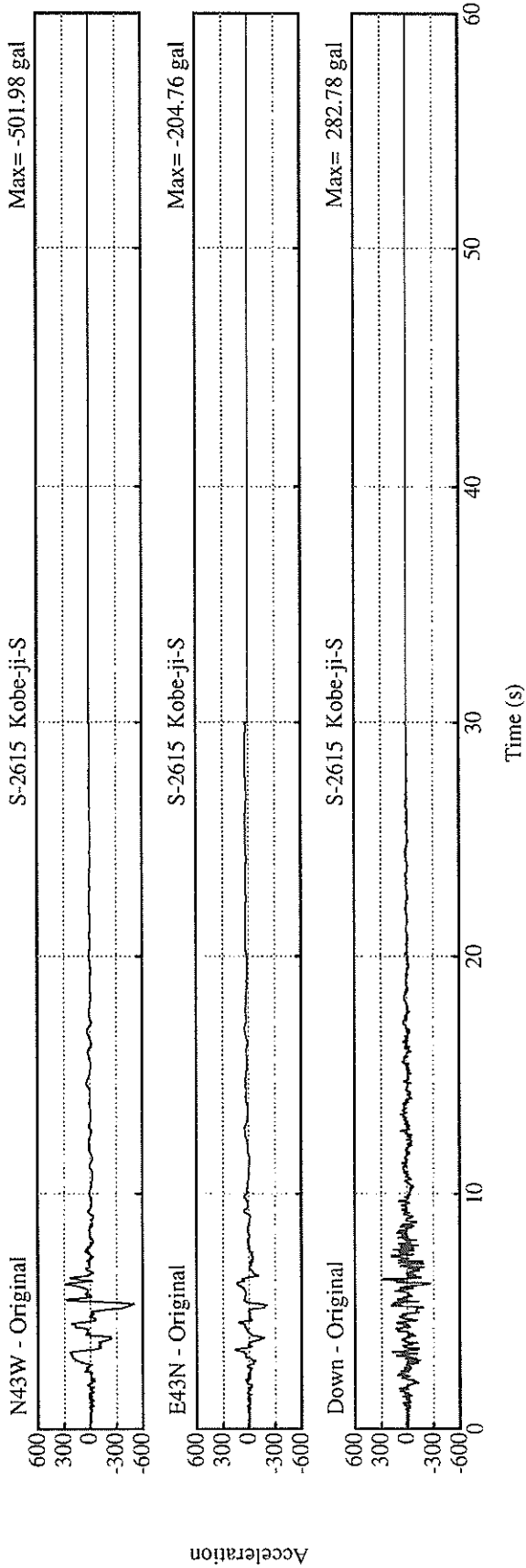
EARTHQUAKE DATA

DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

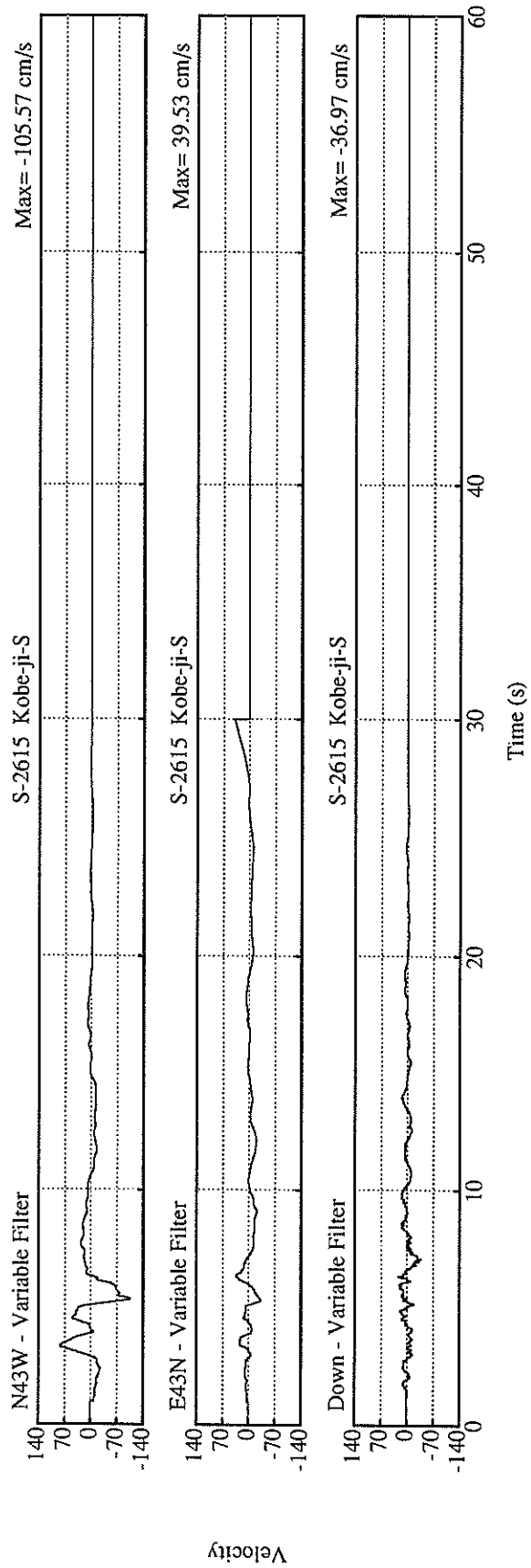
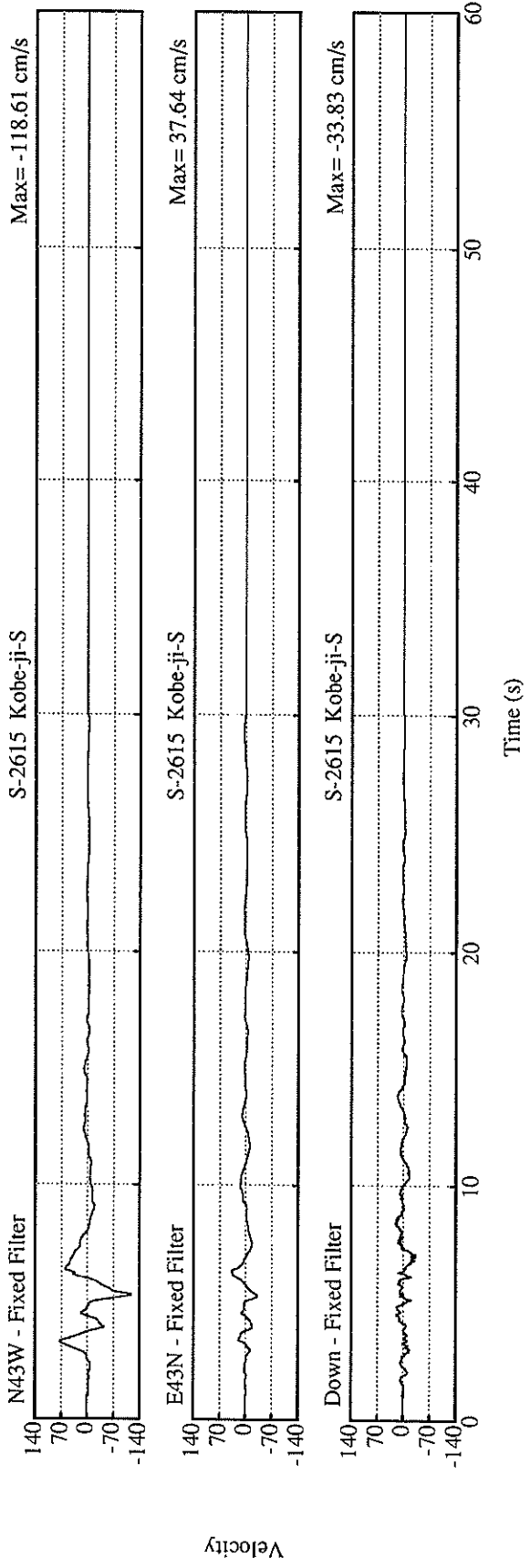
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.060	0.047	0.096	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	502.0	204.8	282.8	520.6
CORRECTED	524.8	229.7	445.9	538.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	118.61	37.64	33.83	122.37
VARIABLE FILTER	105.57	39.53	36.97	110.02
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	41.94	13.05	10.92	43.30
VARIABLE FILTER	37.89	60.03	11.17	60.03

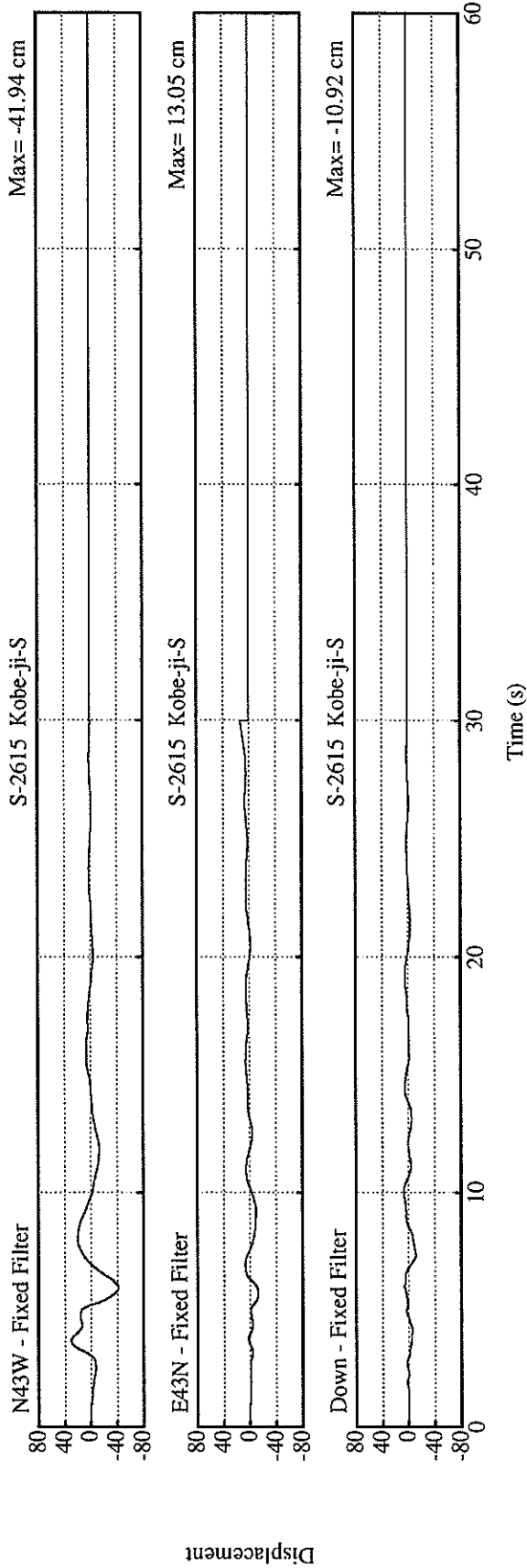
* RESULTANT OF HORIZONTAL COMPONENTS



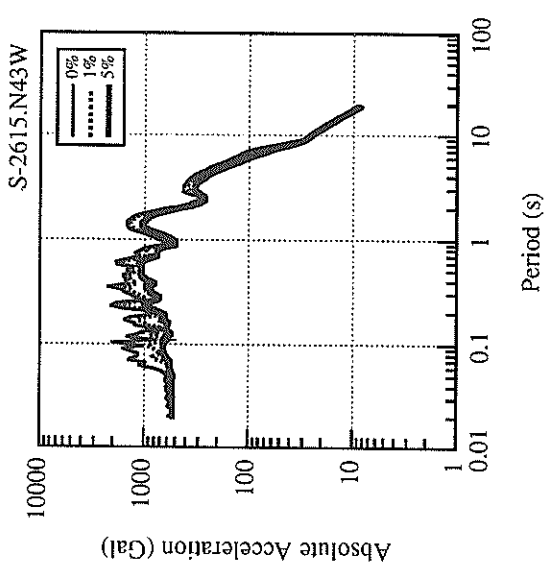
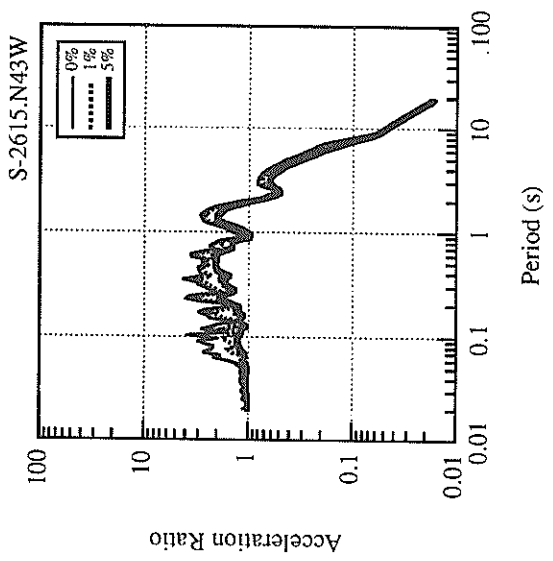
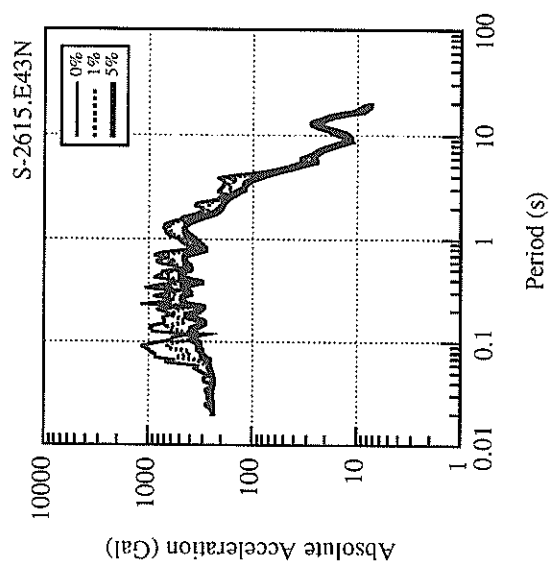
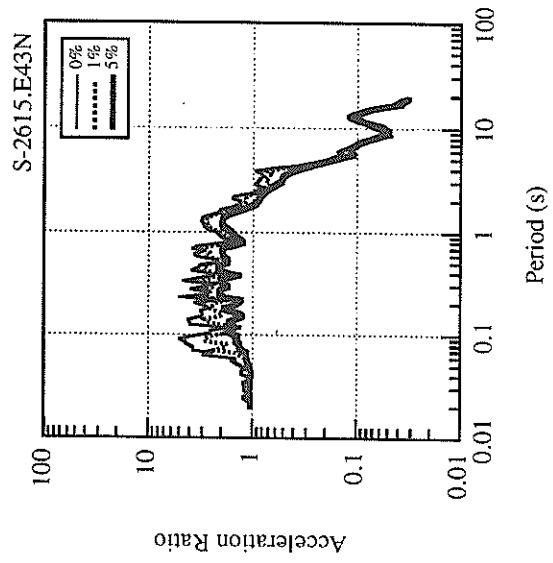
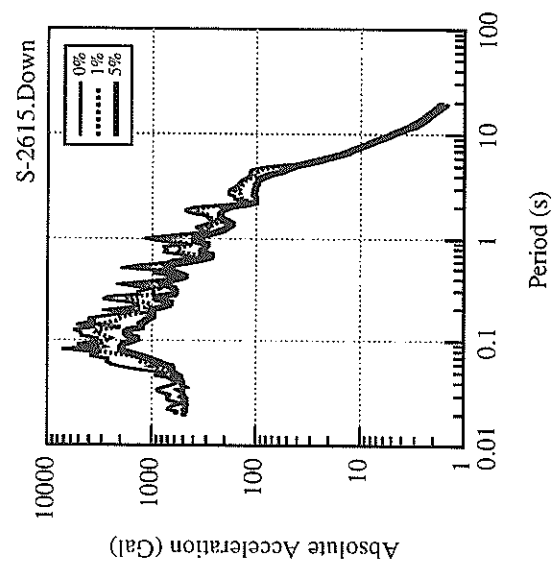
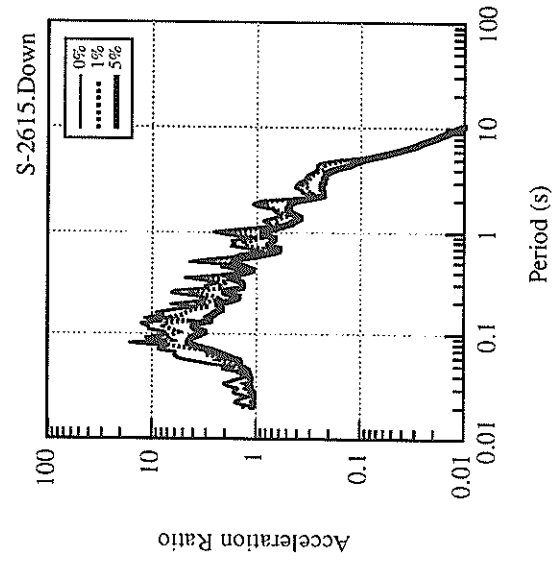
* The irregularity at 30 seconds in the figure is due to inexistence of recorded data after 30 seconds.

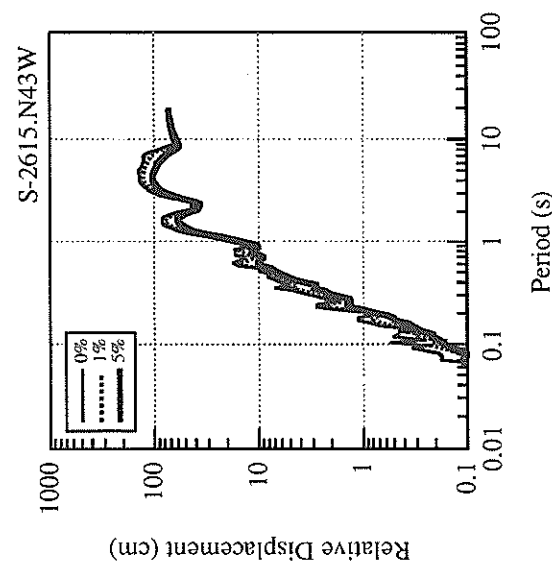
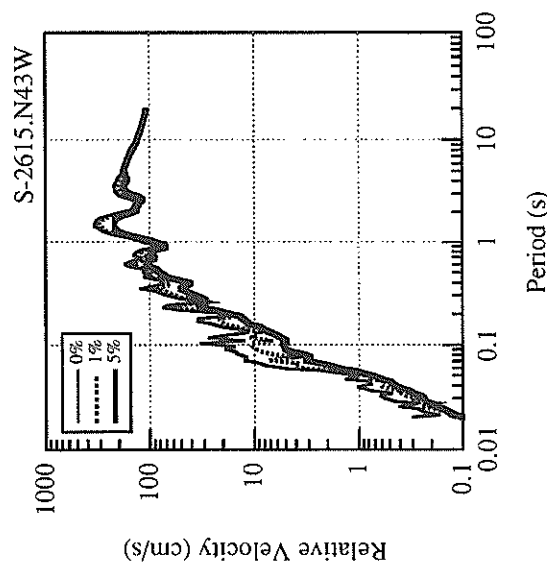
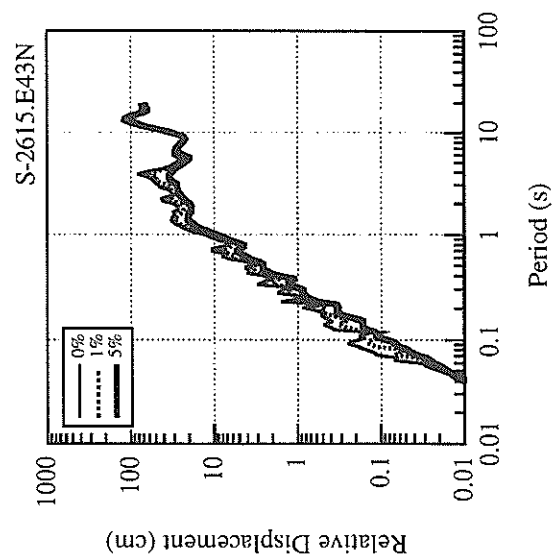
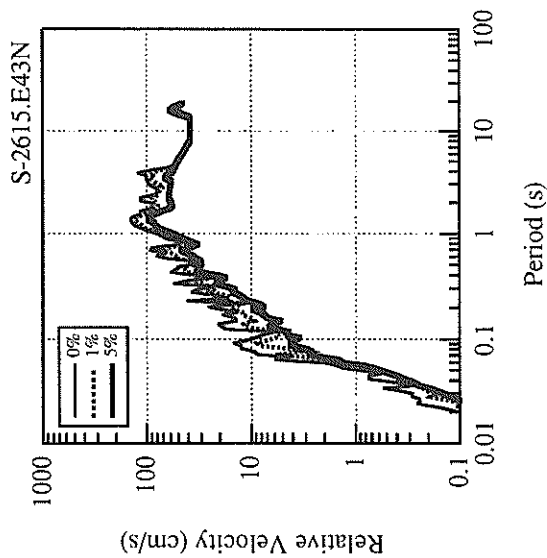
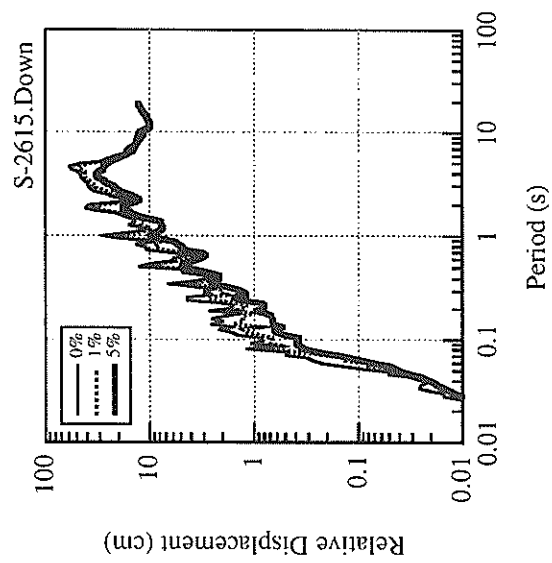
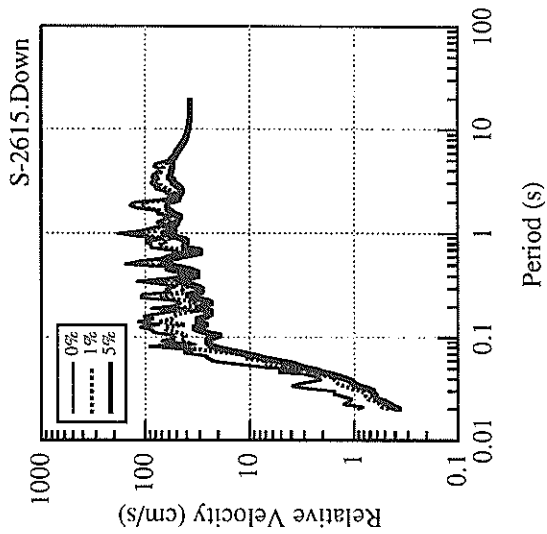


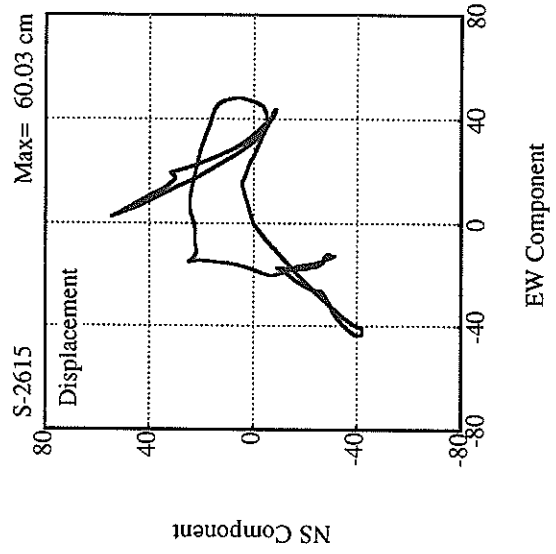
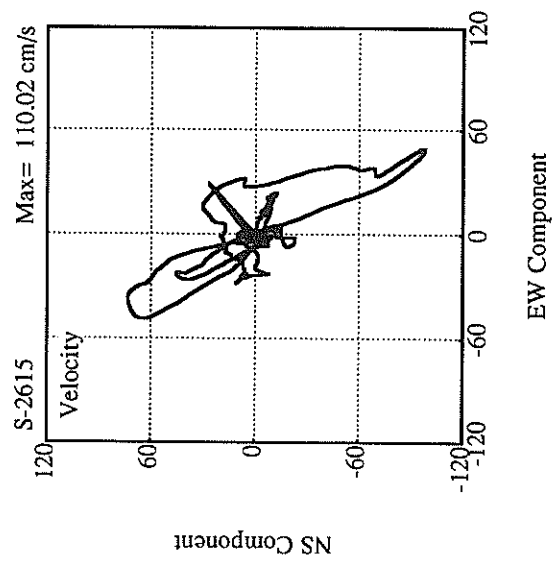
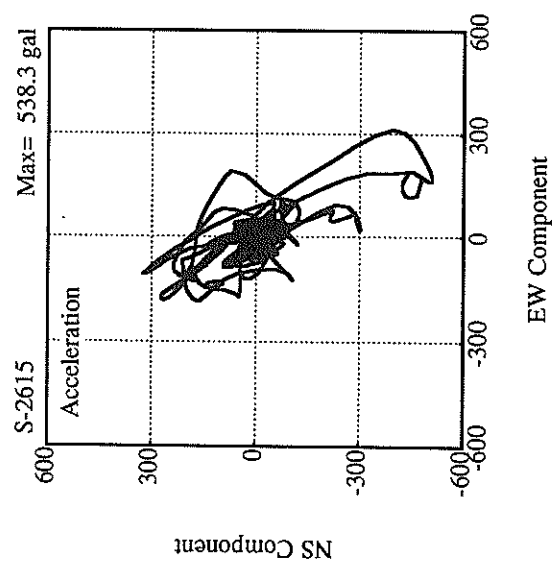
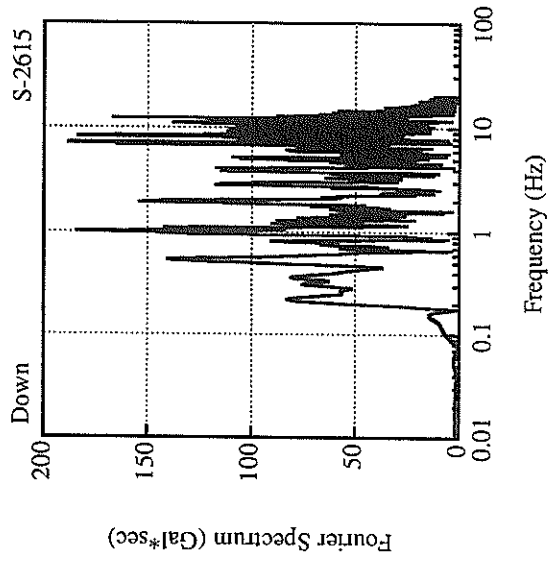
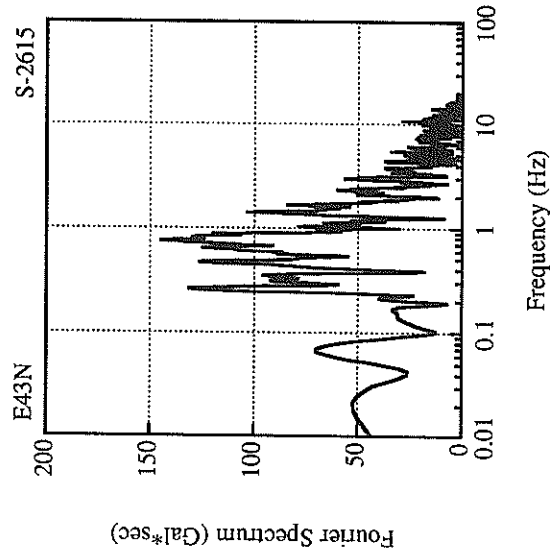
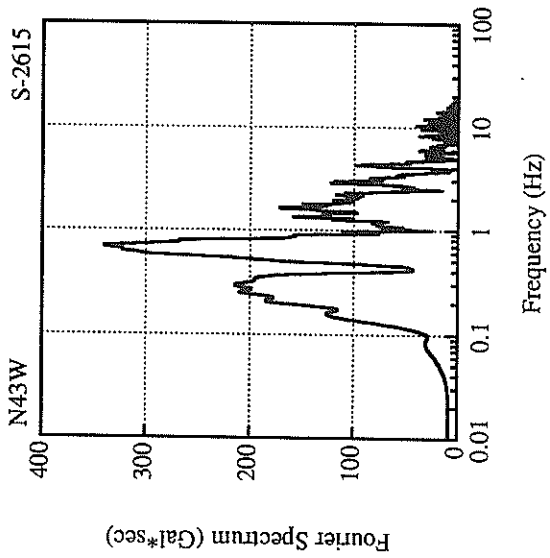
* The irregularity at 30 seconds in the figure is due to inexistence of recorded data after 30 seconds.



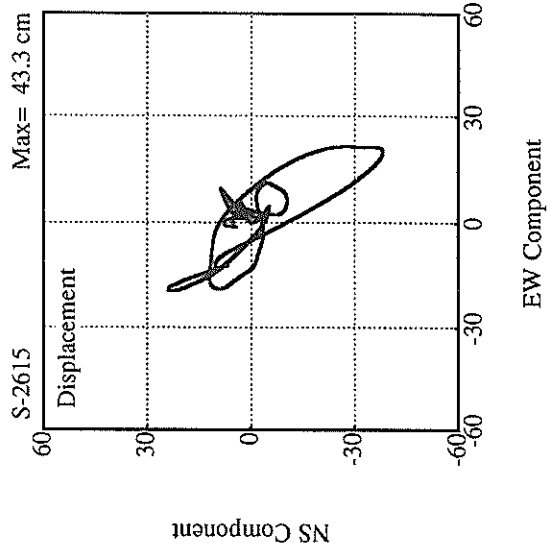
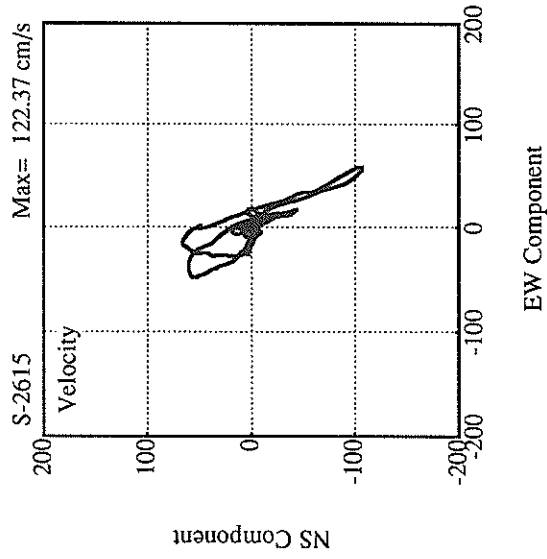
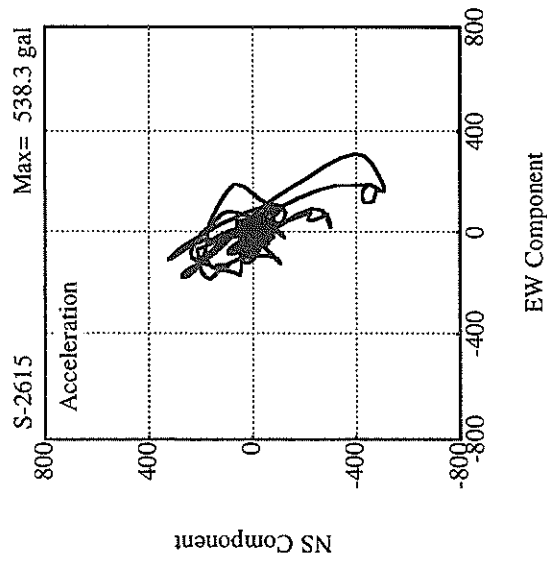
* The irregularity at 30 seconds in the figure is due to inexistence of recorded data after 30 seconds.







* Loci of acceleration, velocity, displacement with variable filter are different from these with fixed filter as shown in next page.



* Loci of acceleration, velocity, displacement calculated with fixed filter.

RECORD NUMBER : S-2616

STATION : NAGOYA-INA-E-S

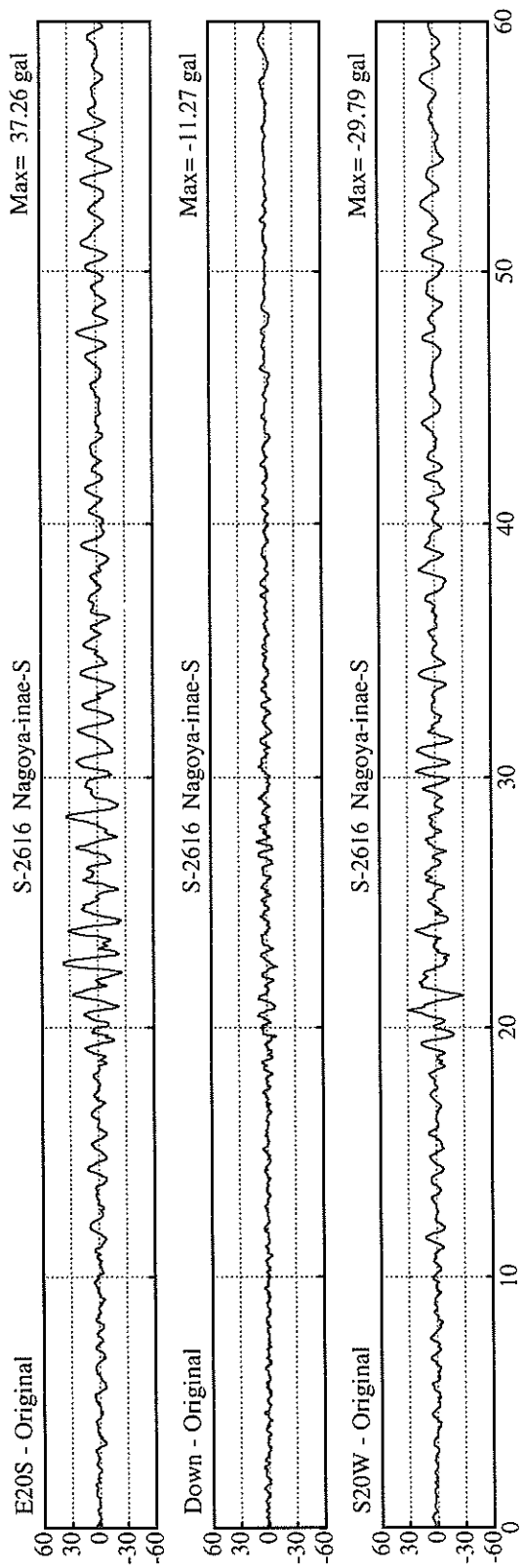
EARTHQUAKE DATA

DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

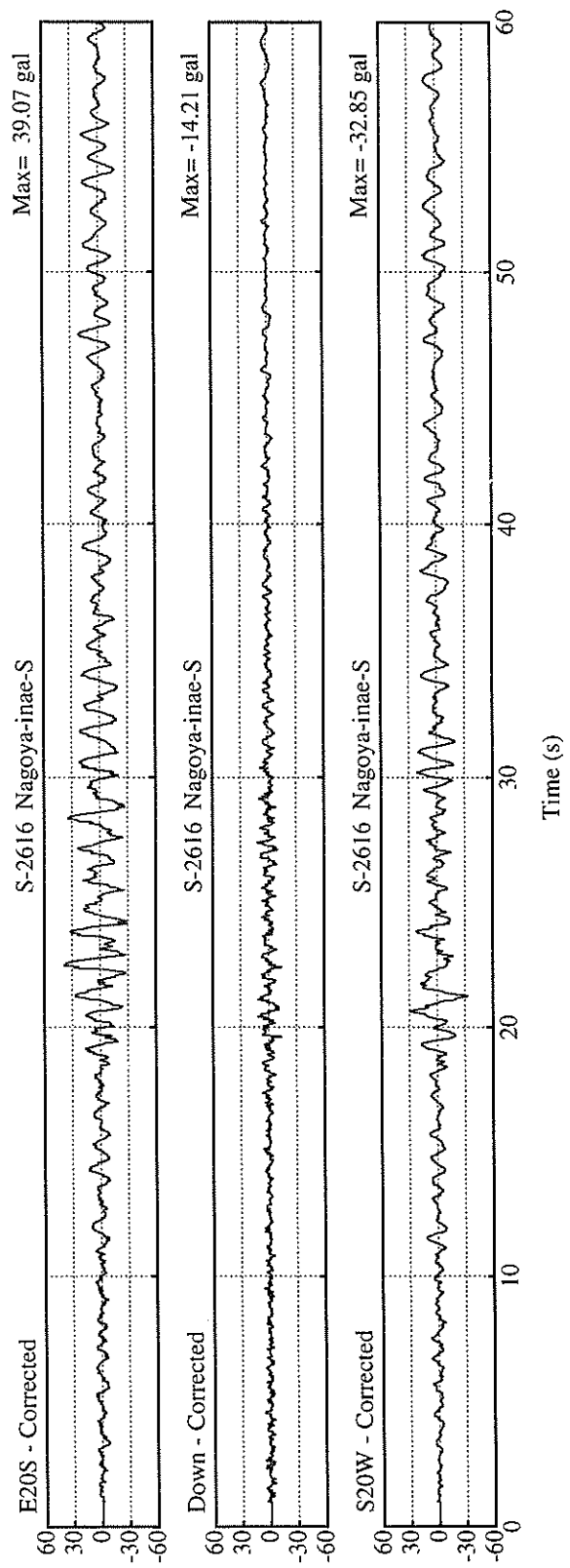
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.170	0.158	0.353	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	29.8	37.3	11.3	39.8
CORRECTED	32.9	39.1	14.2	42.5
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	5.05	6.64	1.82	6.68
VARIABLE FILTER	4.31	5.85	1.37	6.56
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.55	2.15	1.03	2.55
VARIABLE FILTER	1.79	1.53	0.33	1.84

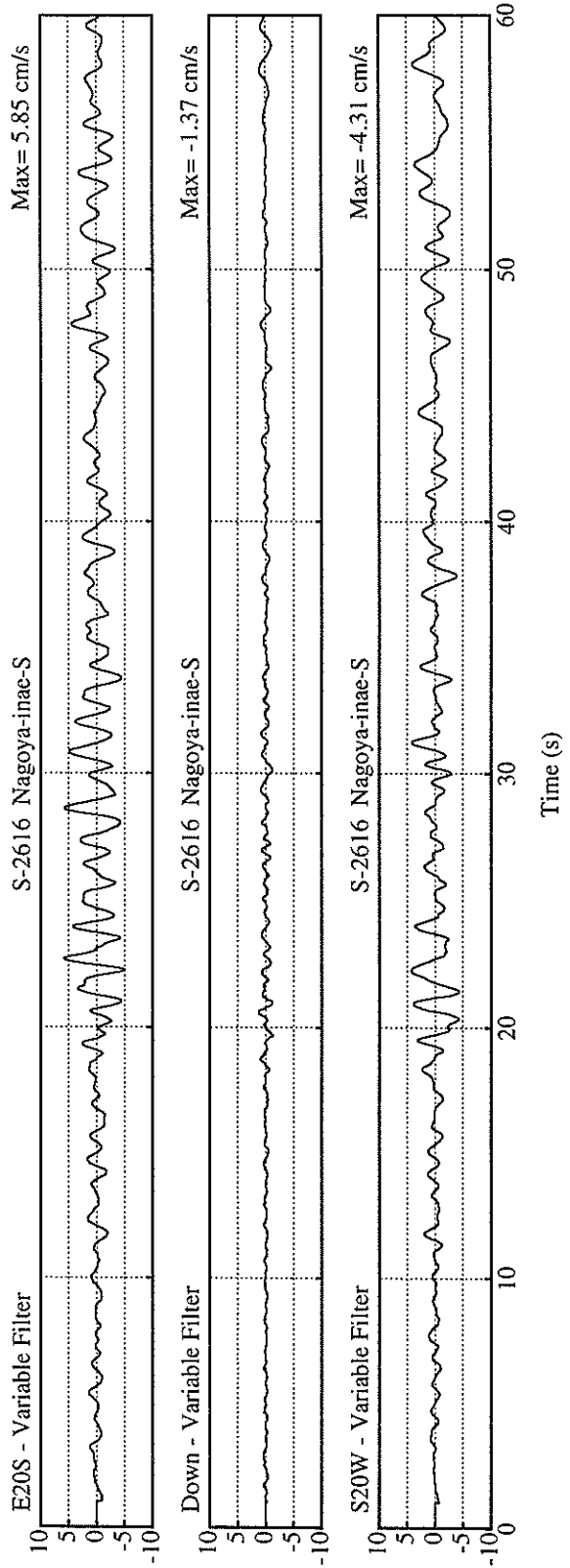
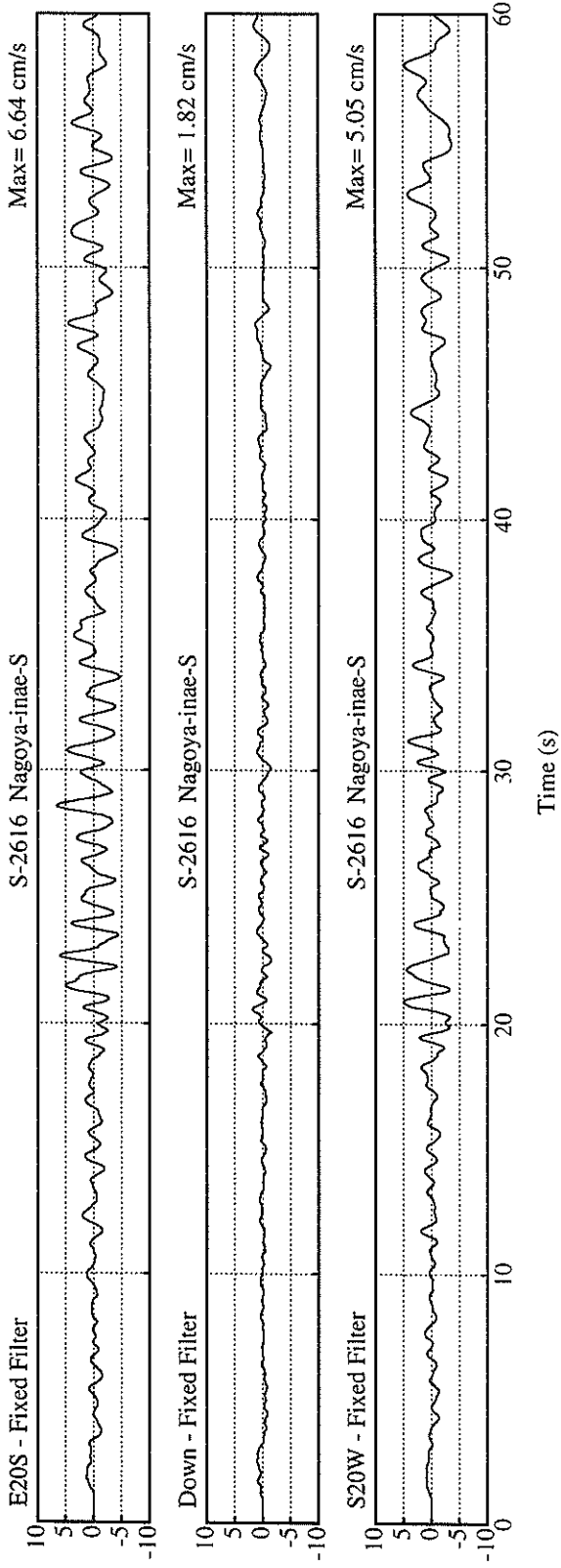
* RESULTANT OF HORIZONTAL COMPONENTS

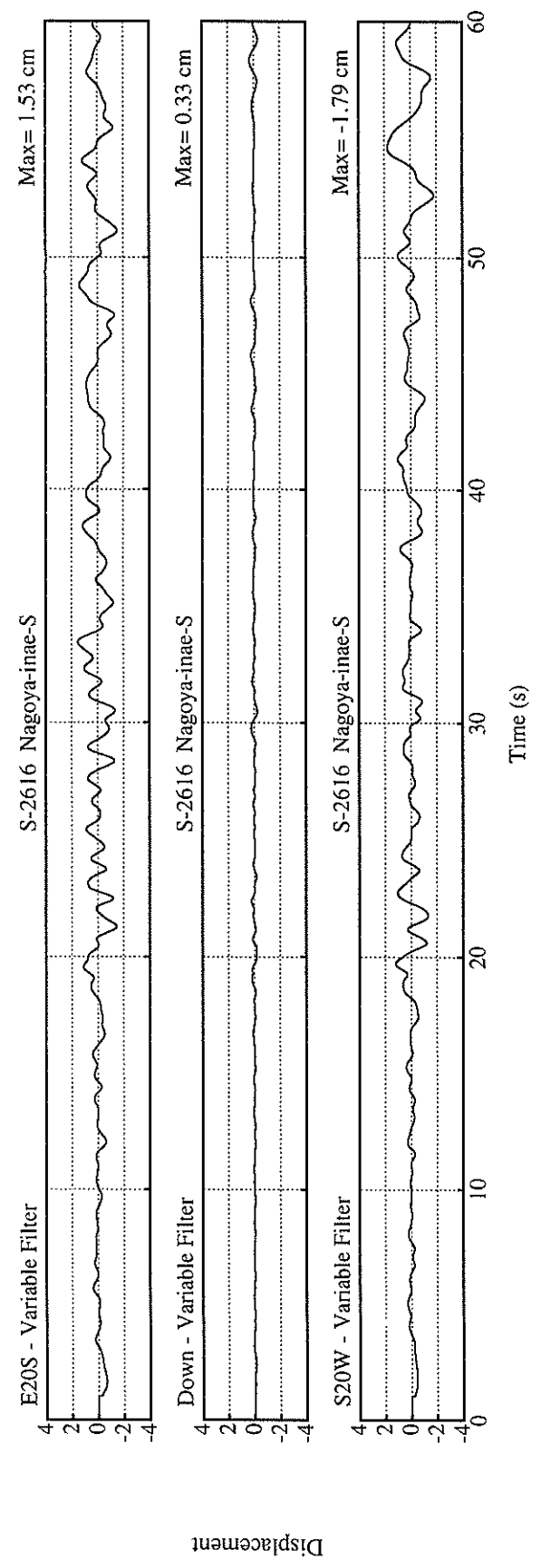
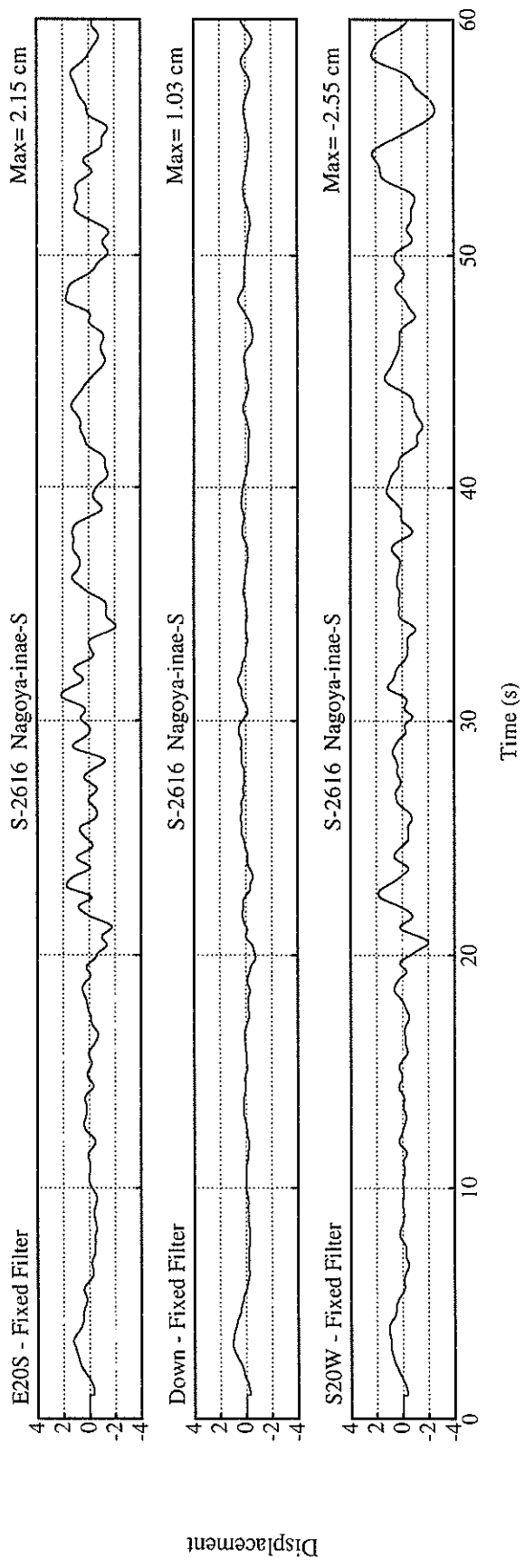


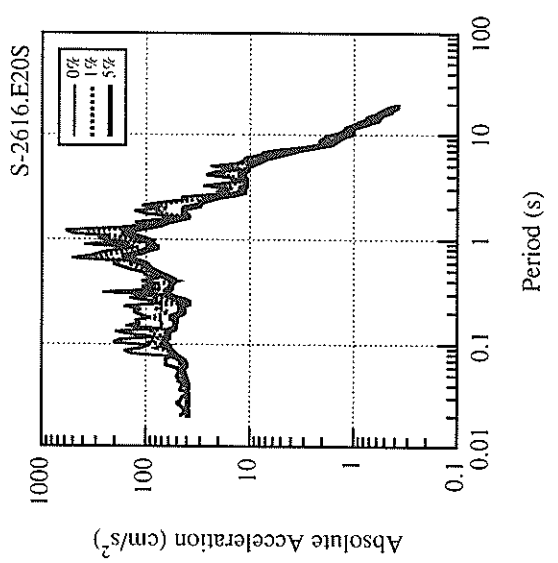
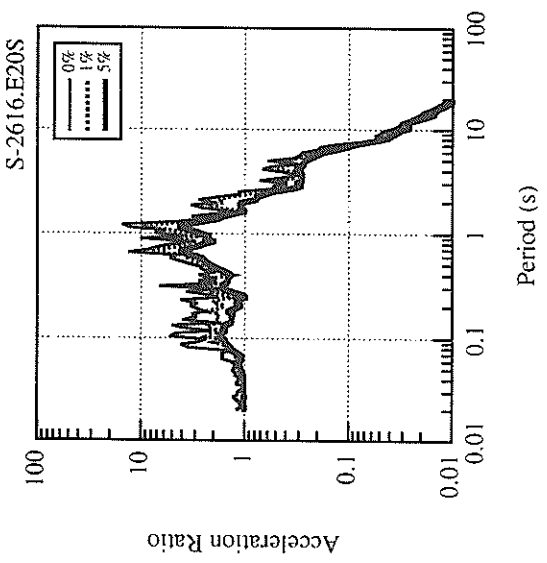
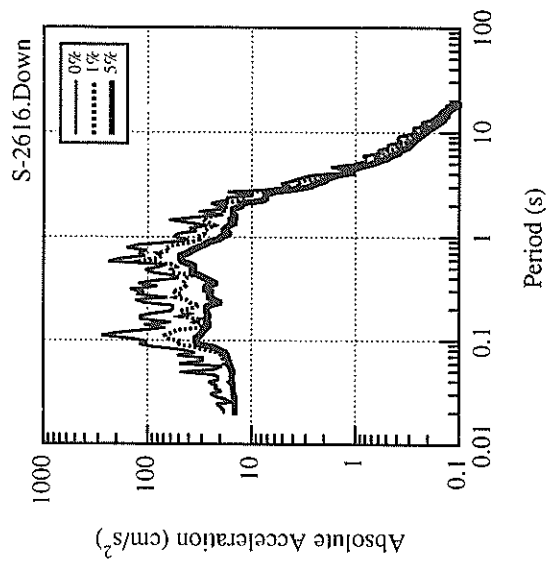
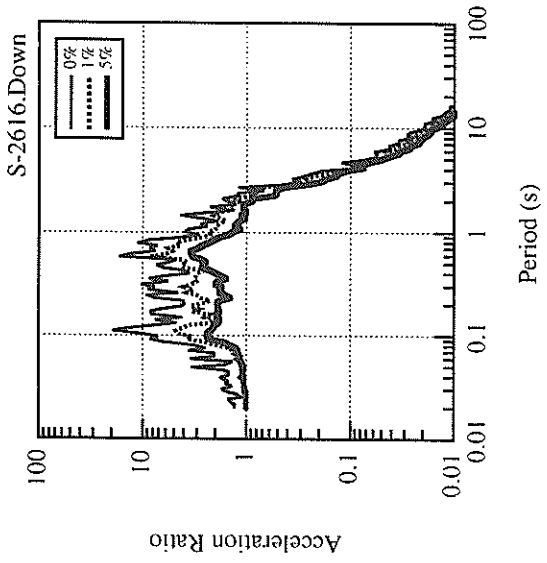
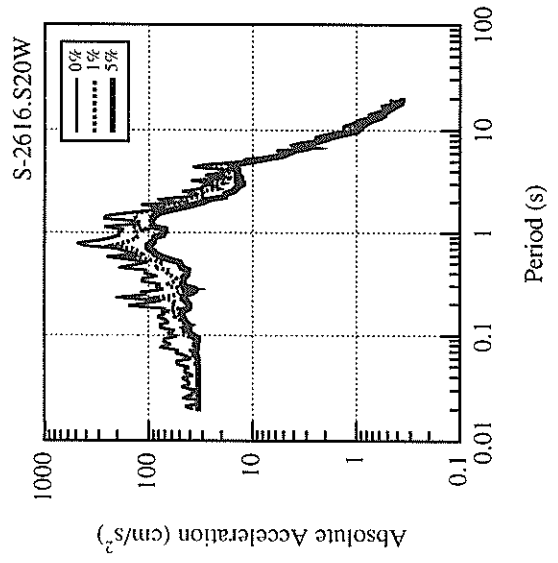
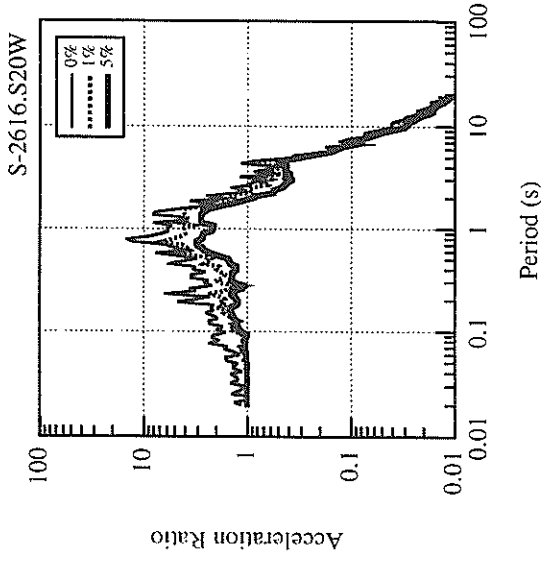
Acceleration

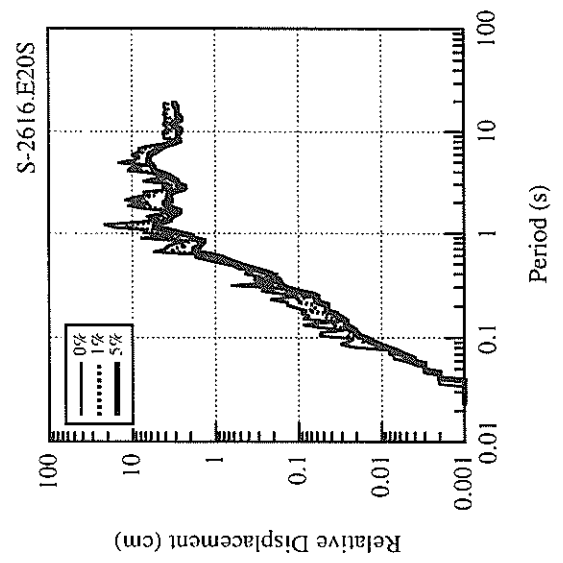
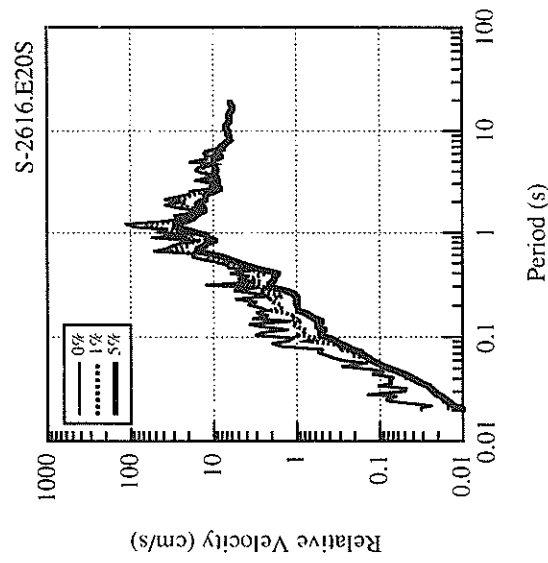
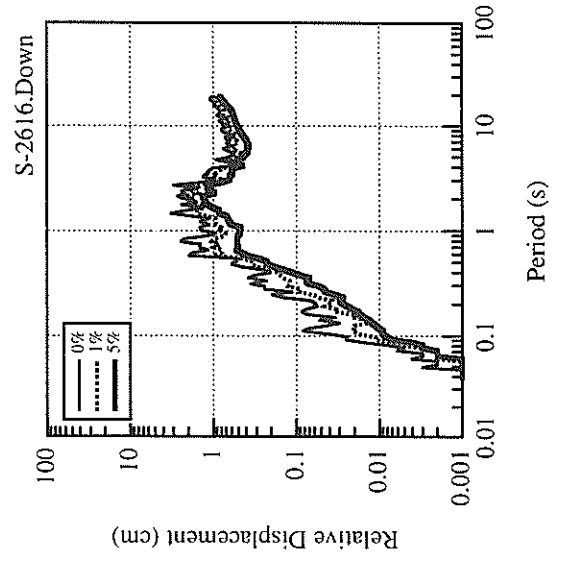
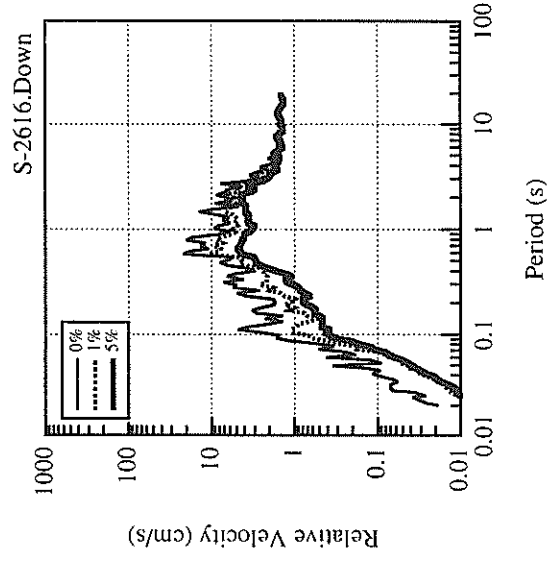
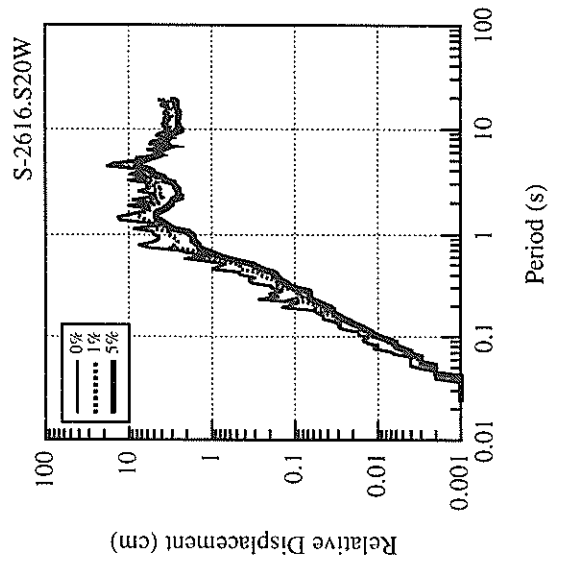
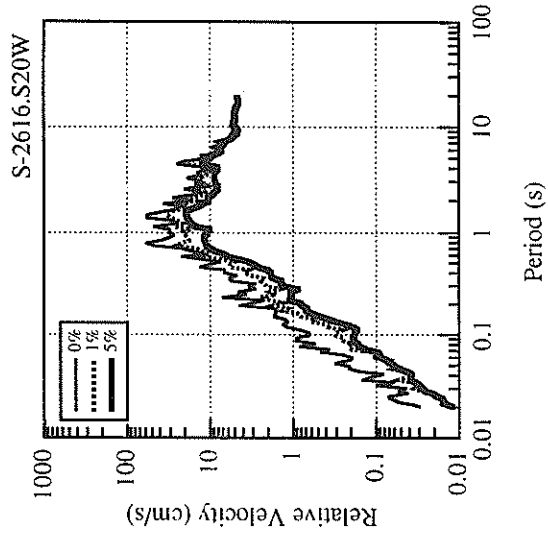


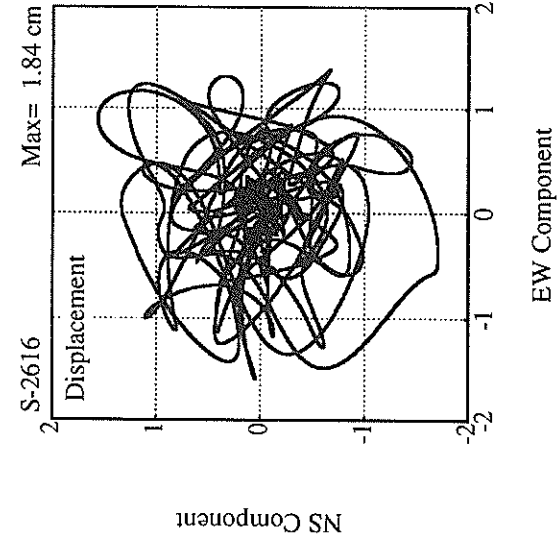
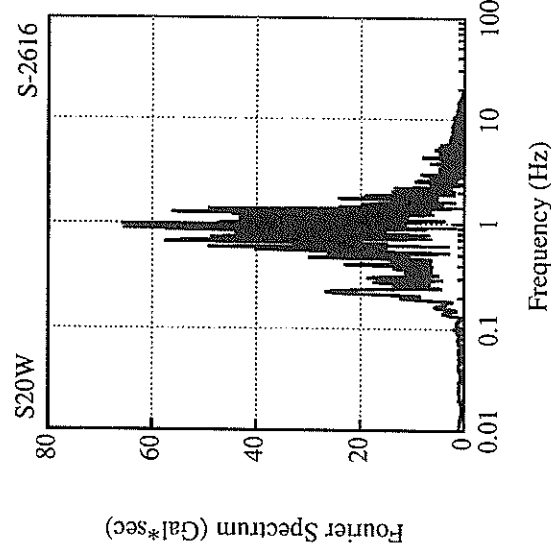
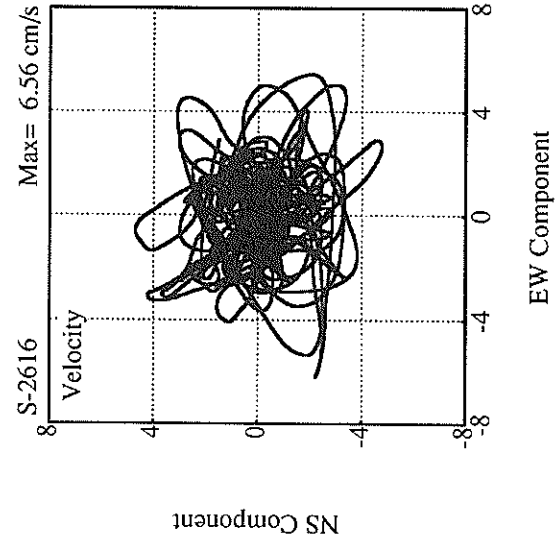
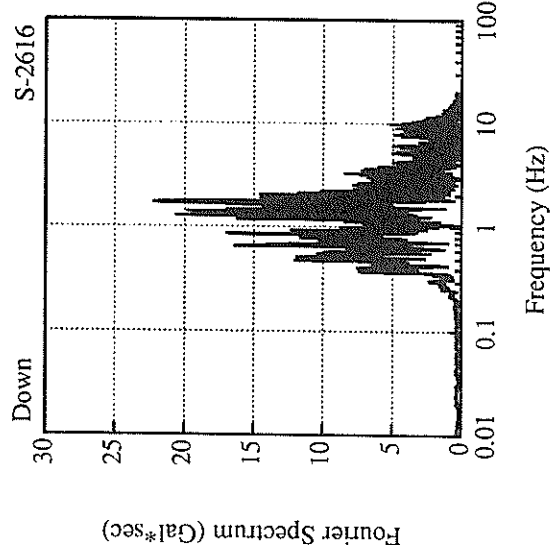
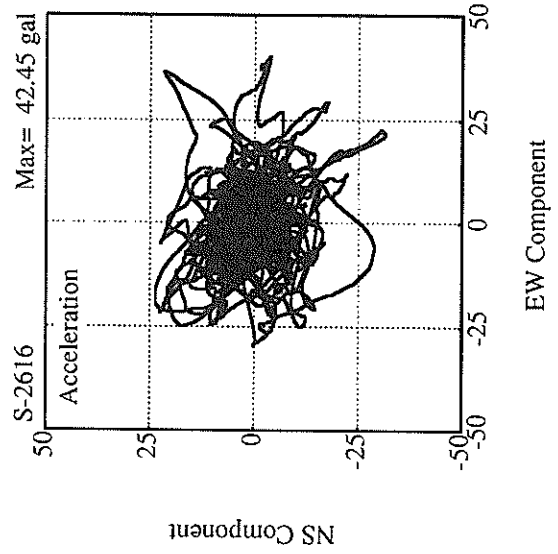
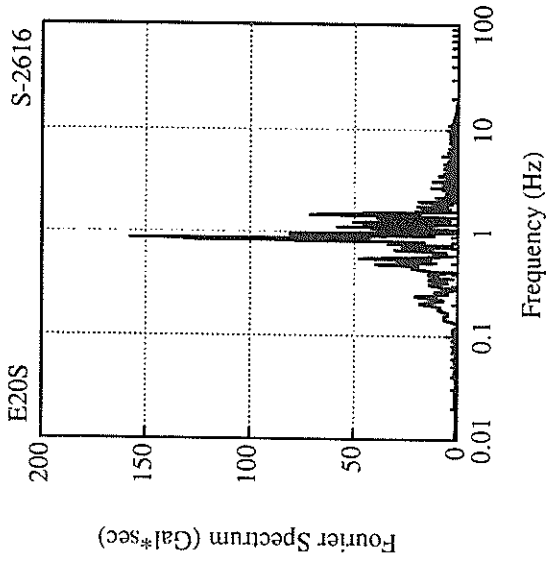
Acceleration











RECORD NUMBER : S-2618
 STATION : OSAKA-JI-S

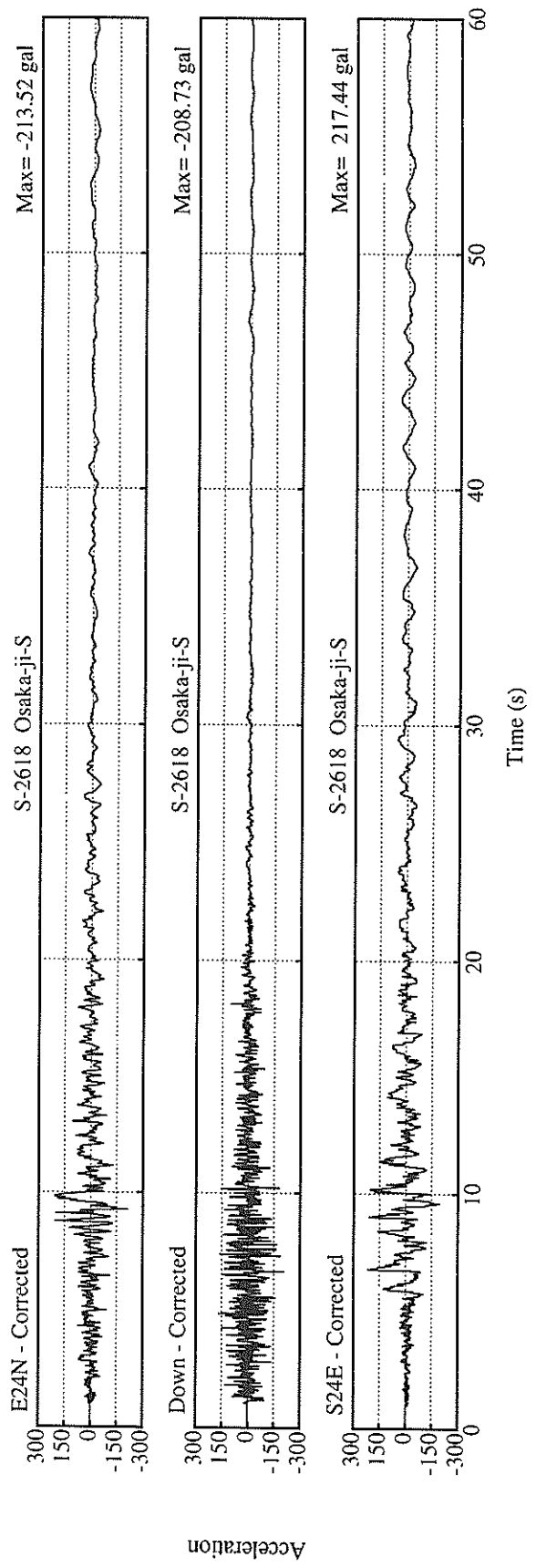
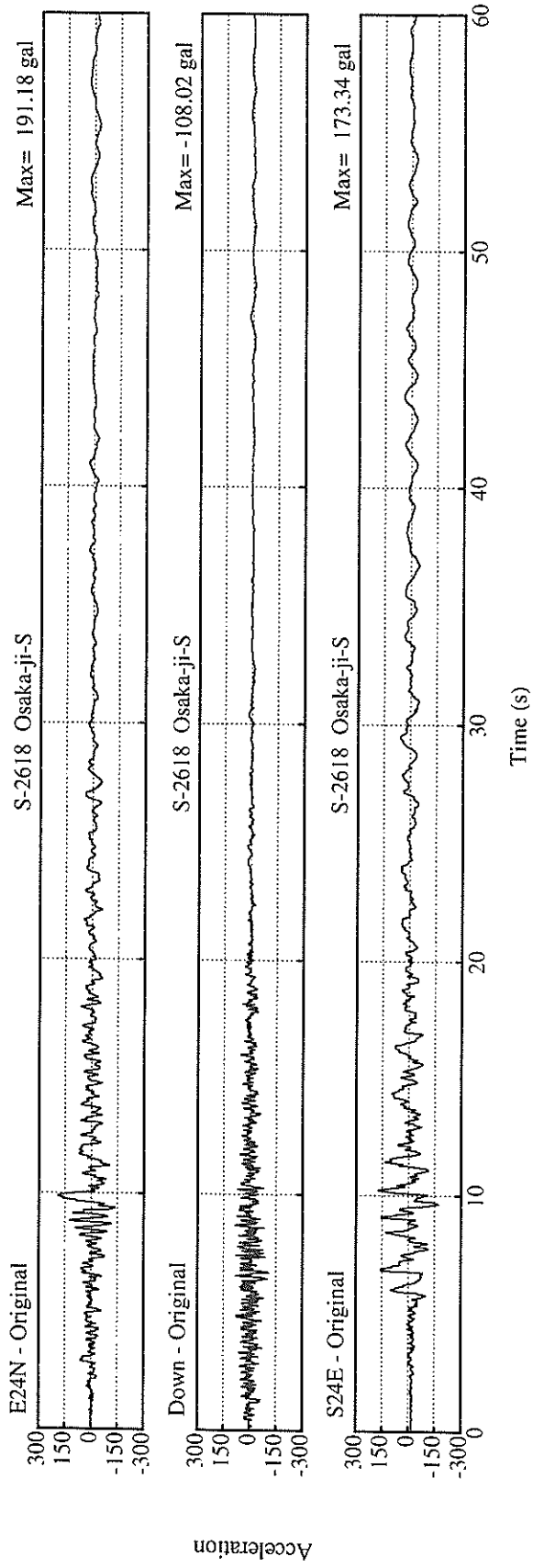
EARTHQUAKE DATA

 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34°35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

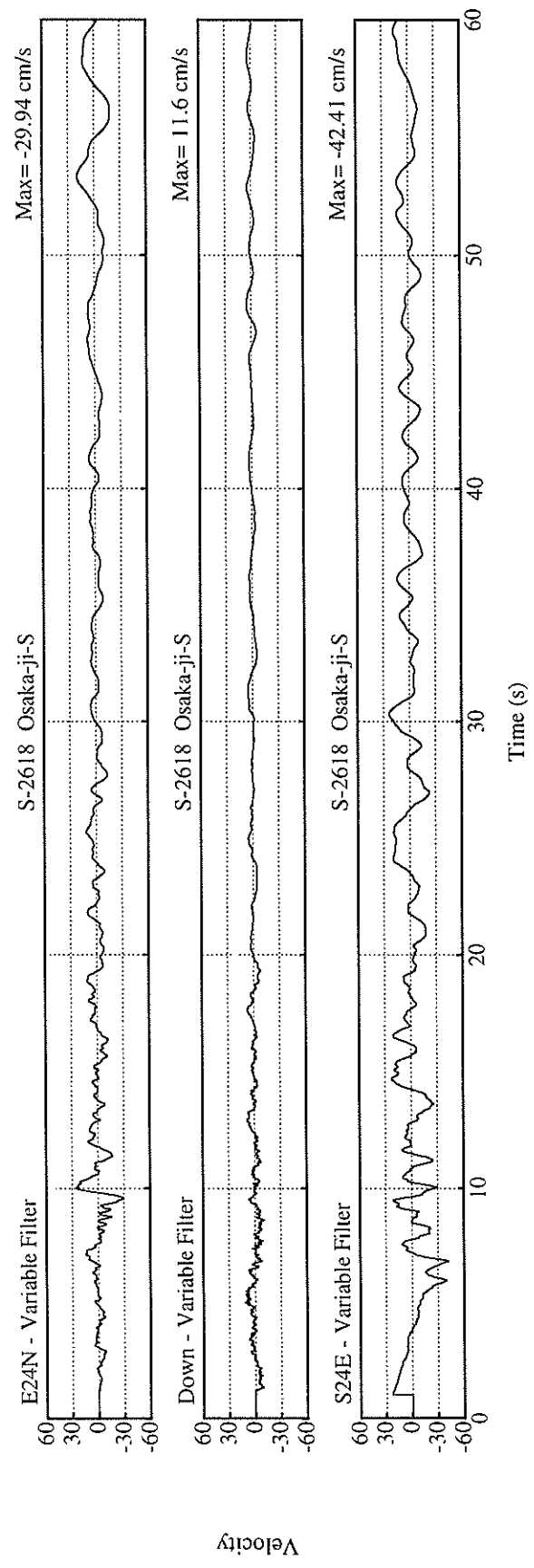
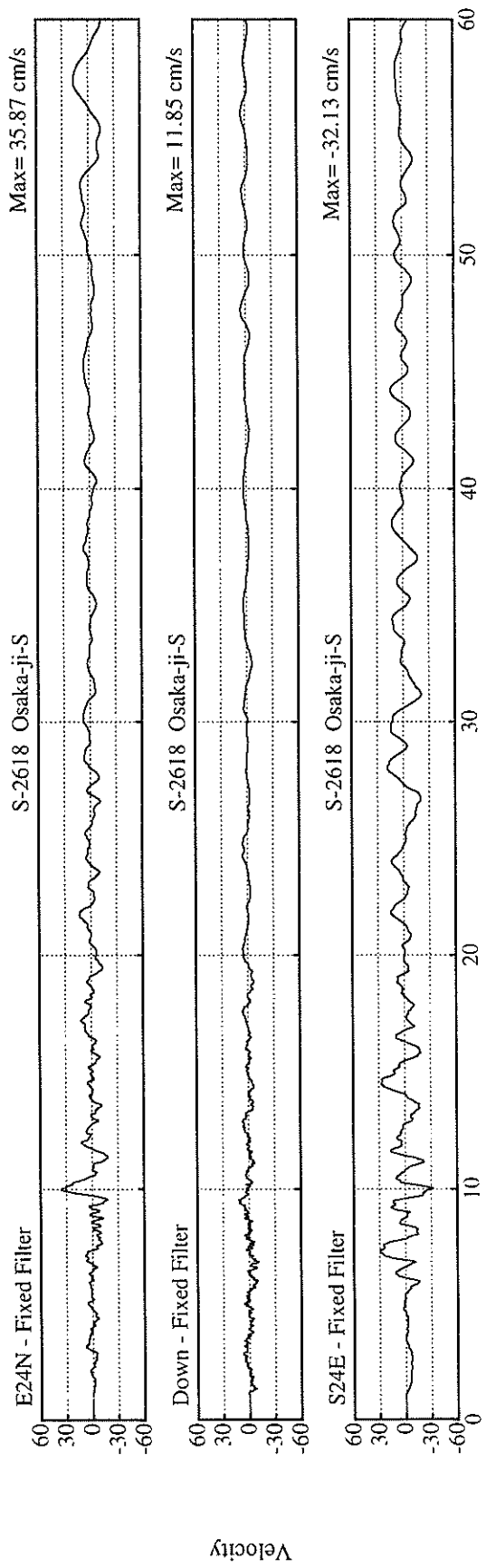
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.048	0.085	0.085	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	173.3	191.2	108.0	196.8
CORRECTED	217.4	213.5	208.7	222.0
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	32.13	35.87	11.85	46.90
VARIABLE FILTER	42.41	29.94	11.60	43.04
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	14.52	13.19	5.20	14.72
VARIABLE FILTER	55.23	14.23	8.53	55.24

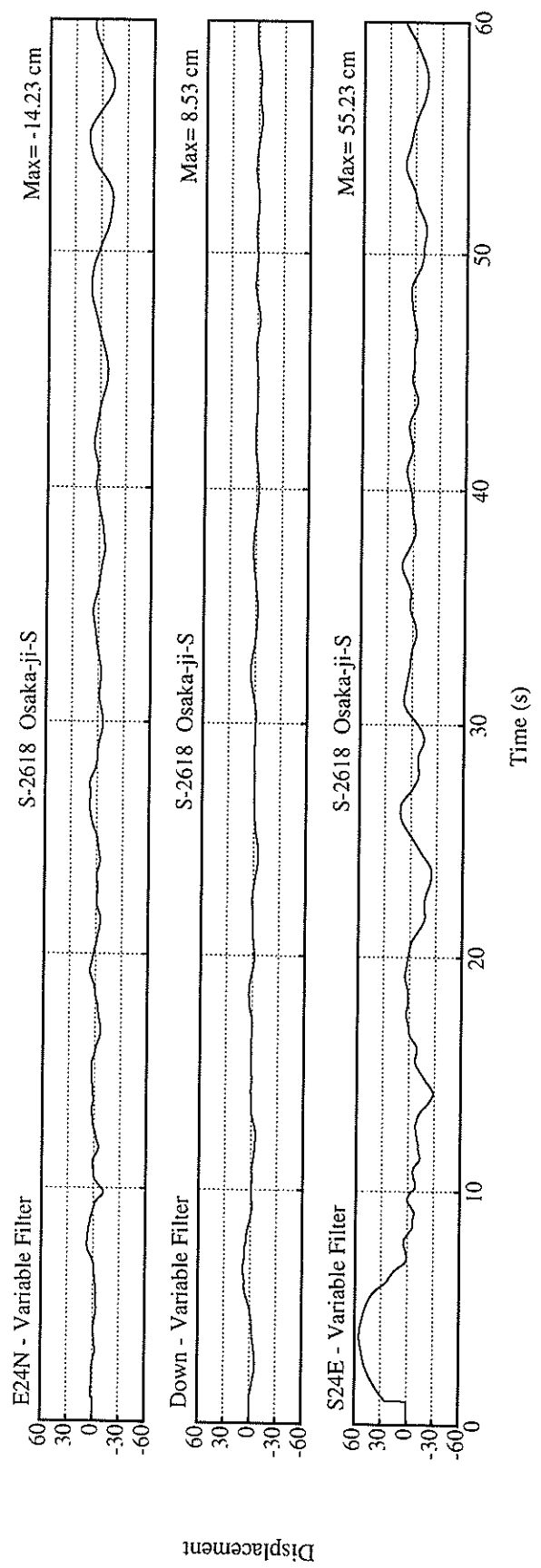
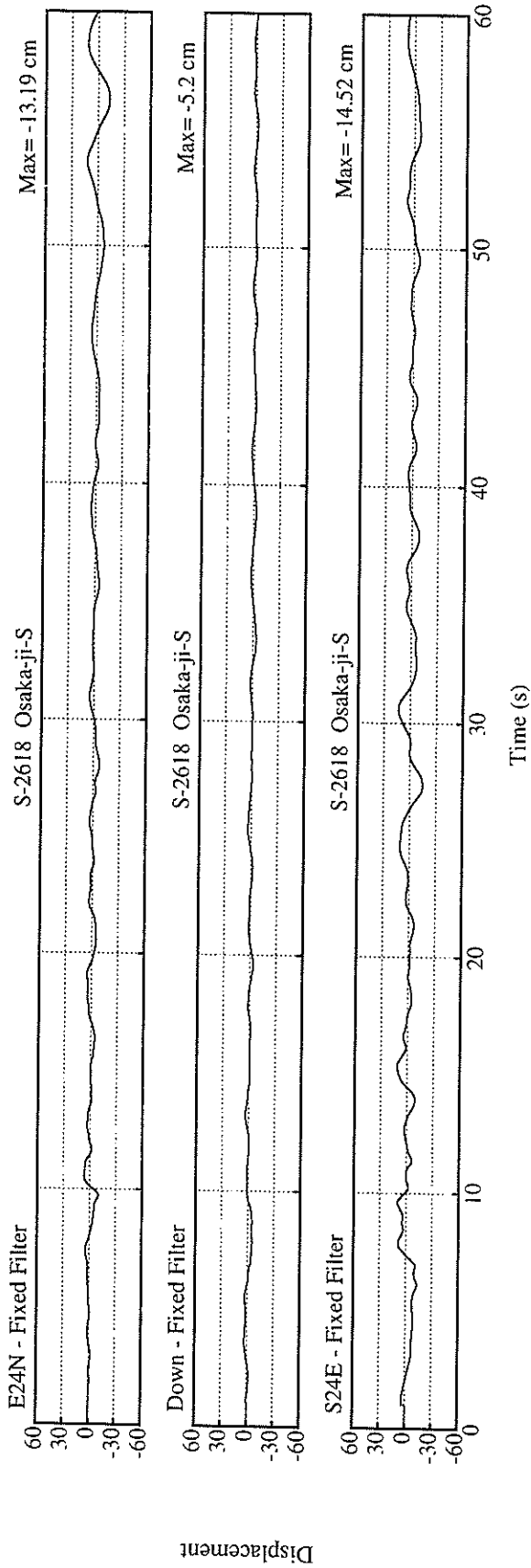
* RESULTANT OF HORIZONTAL COMPONENTS



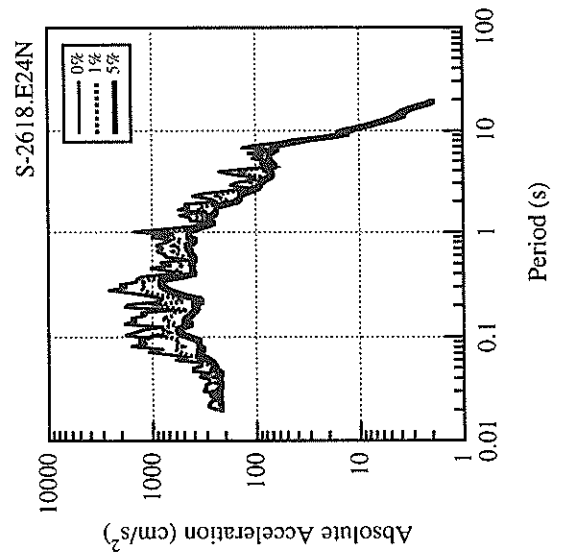
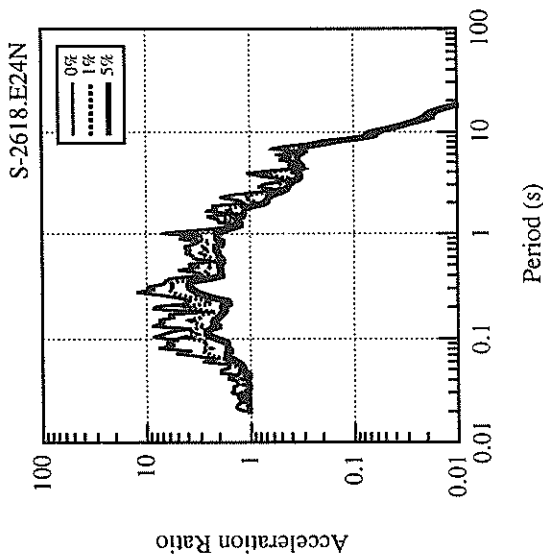
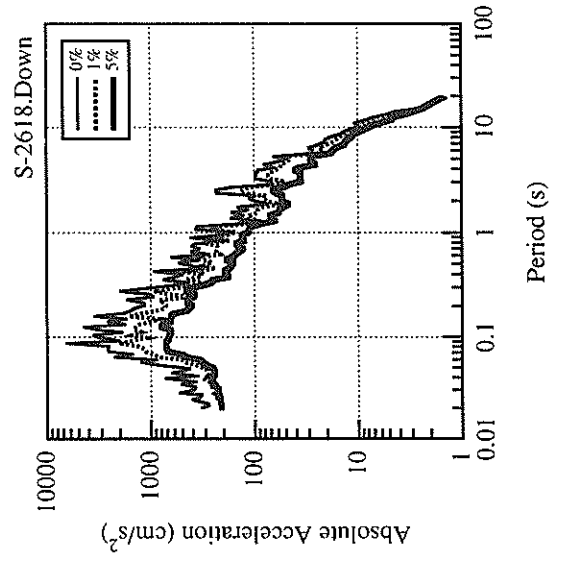
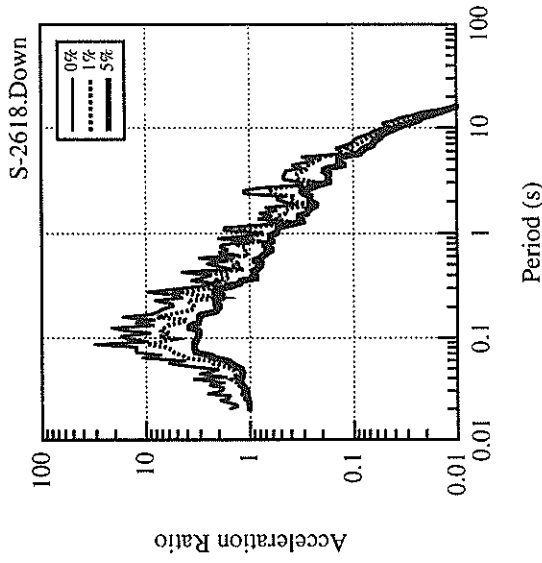
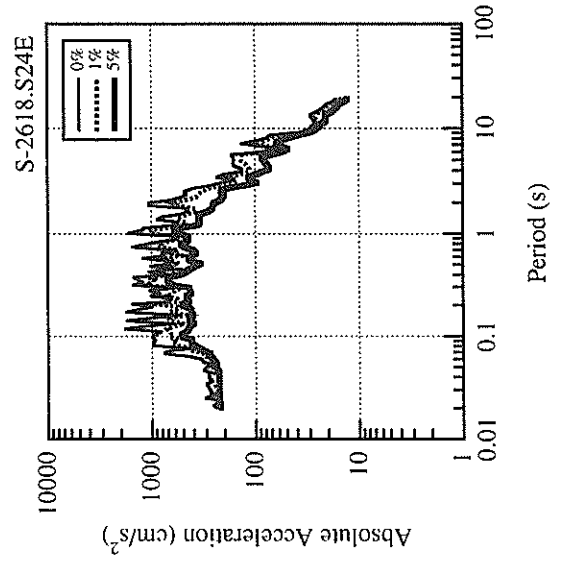
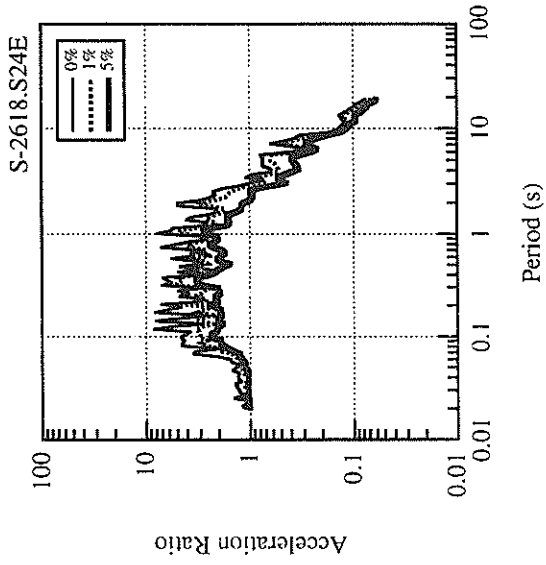
* Recorded traces at this site are not clear and estimated with free hand by eye.

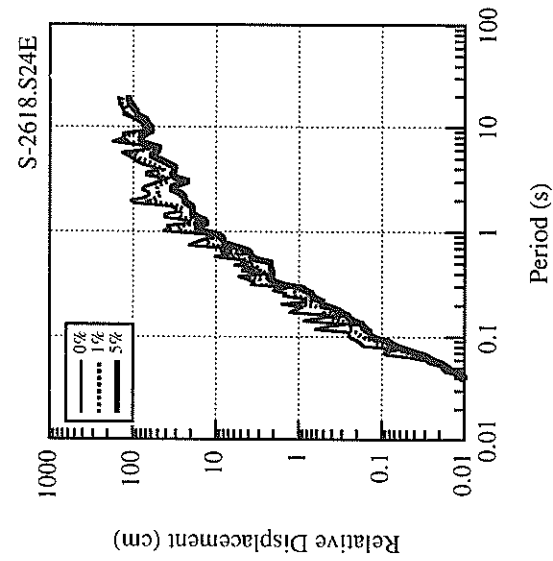
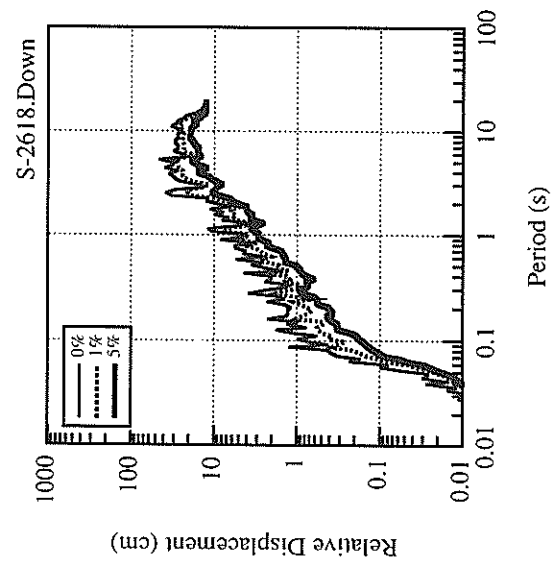
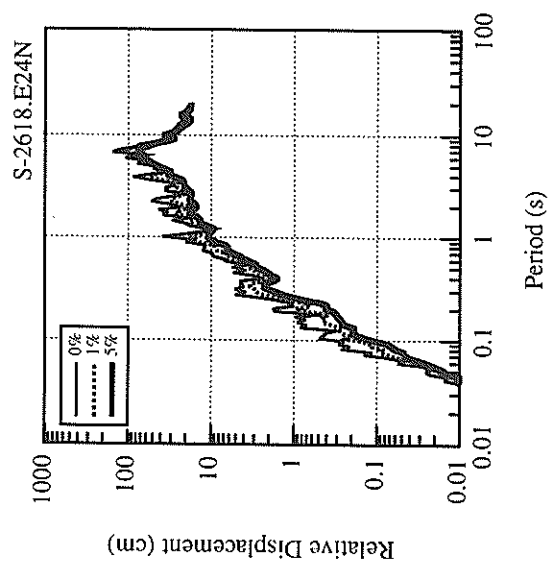
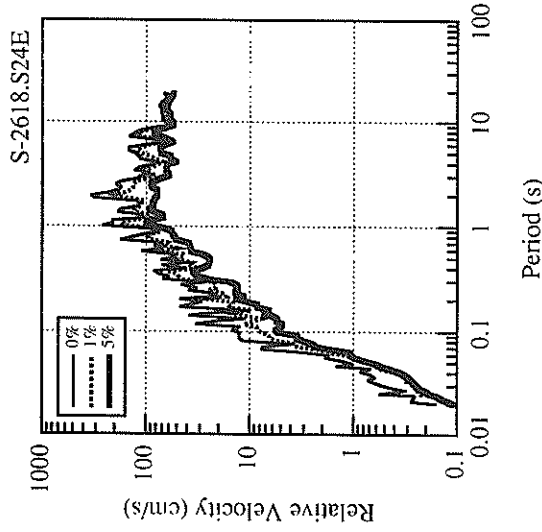
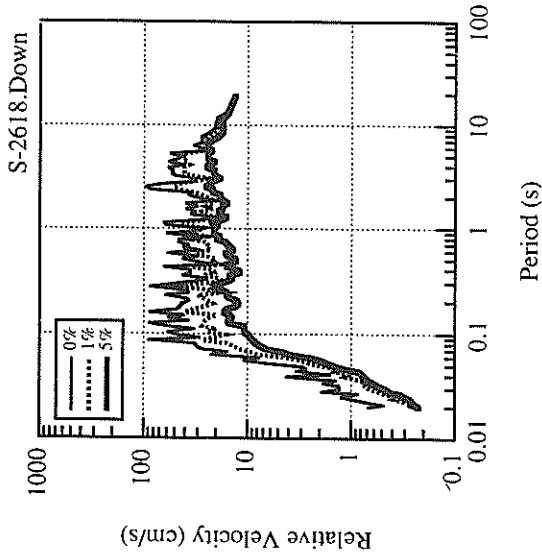
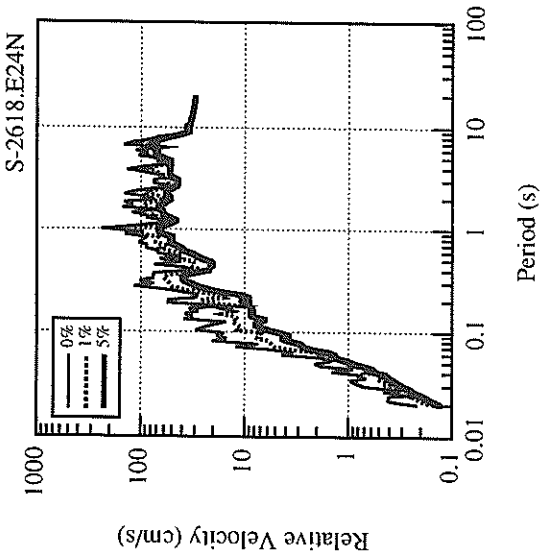


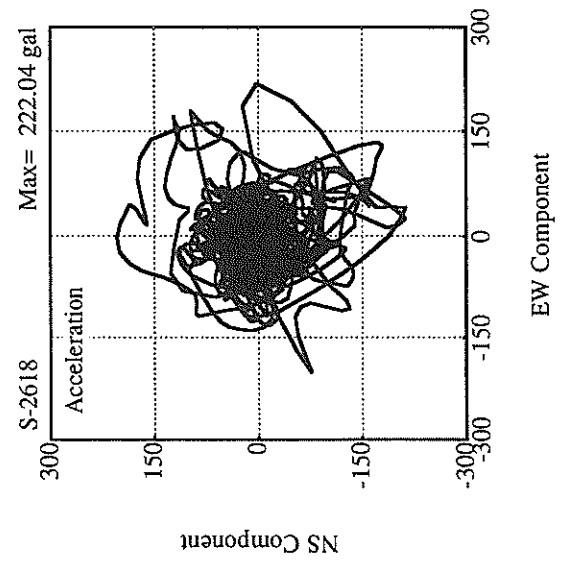
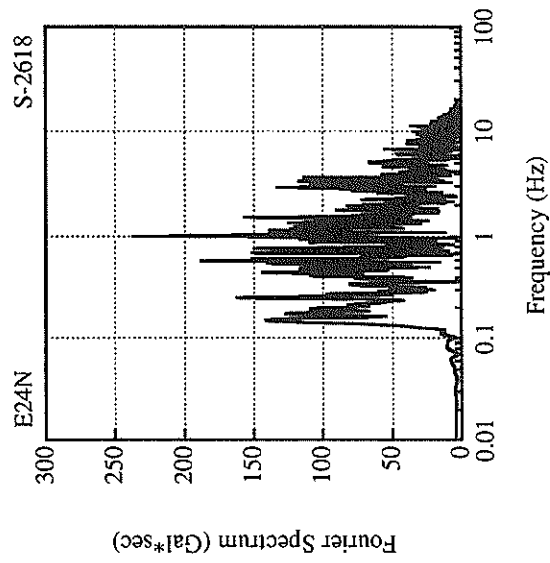
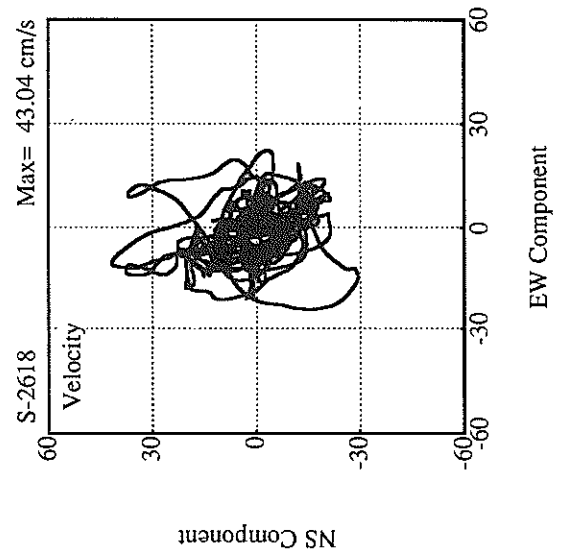
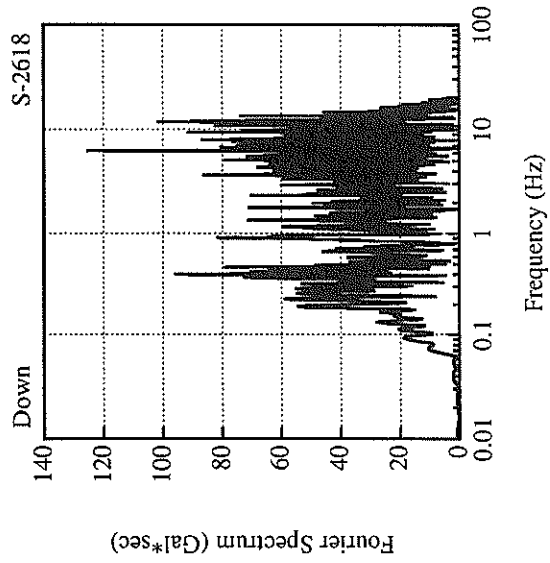
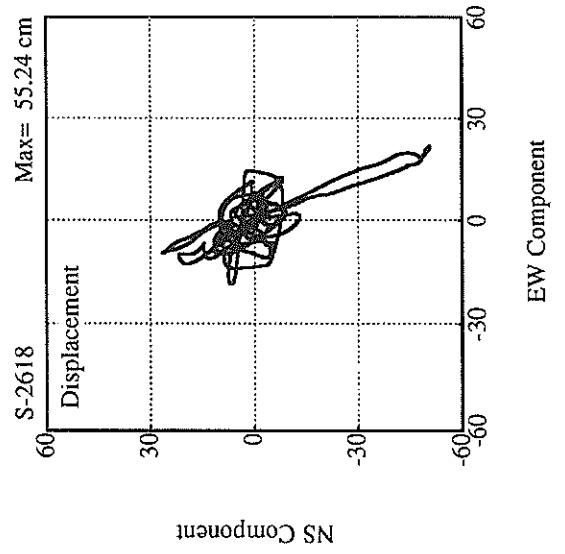
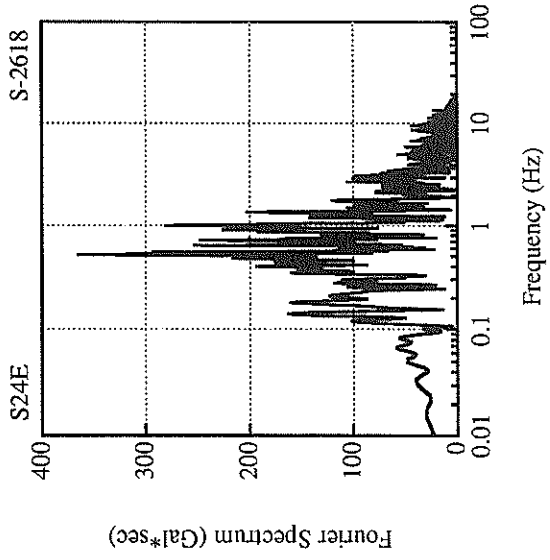
* Recorded traces at this site are not clear and estimated with free hand by eye.



* Recorded traces at this site are not clear and estimated with free hand by eye.







RECORD NUMBER : S-2619
 STATION : YOKKA.-CHITOSE-S

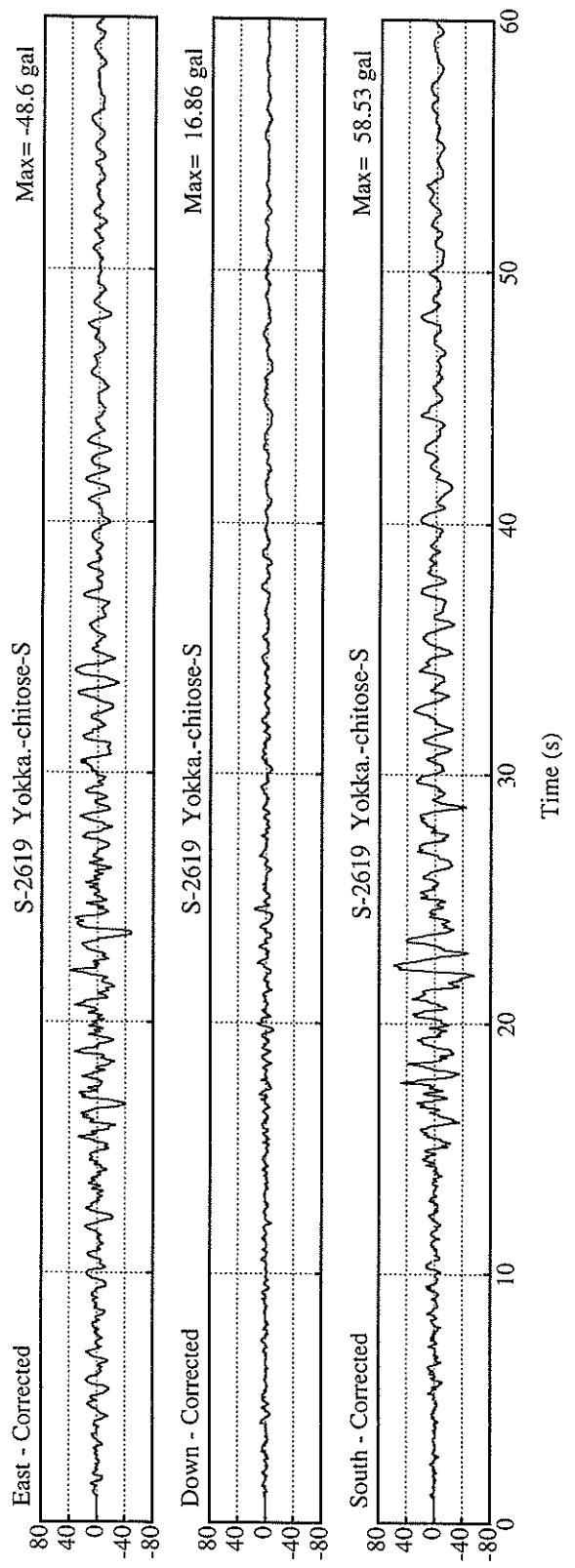
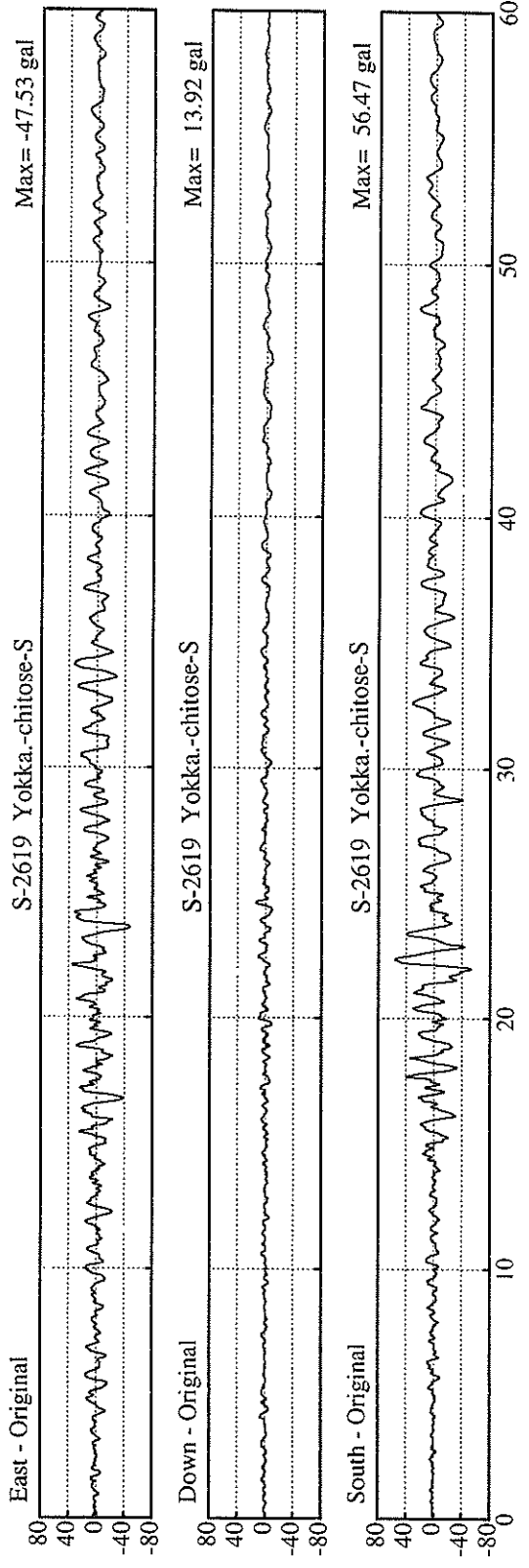
EARTHQUAKE DATA

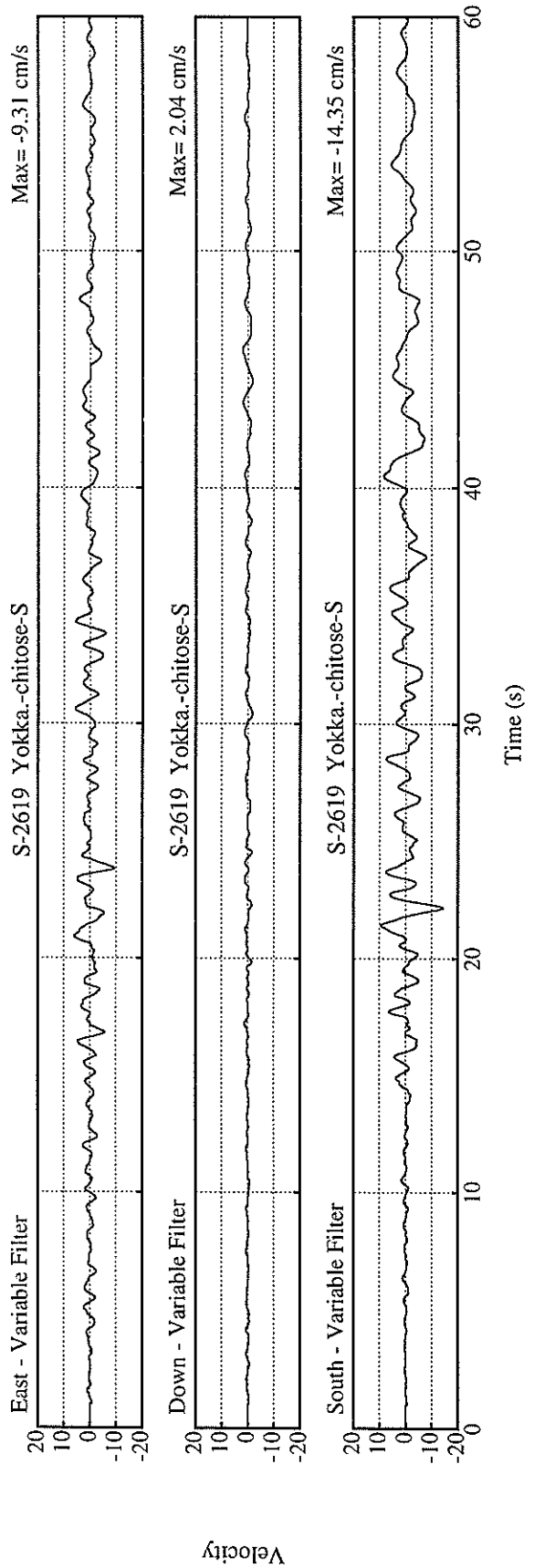
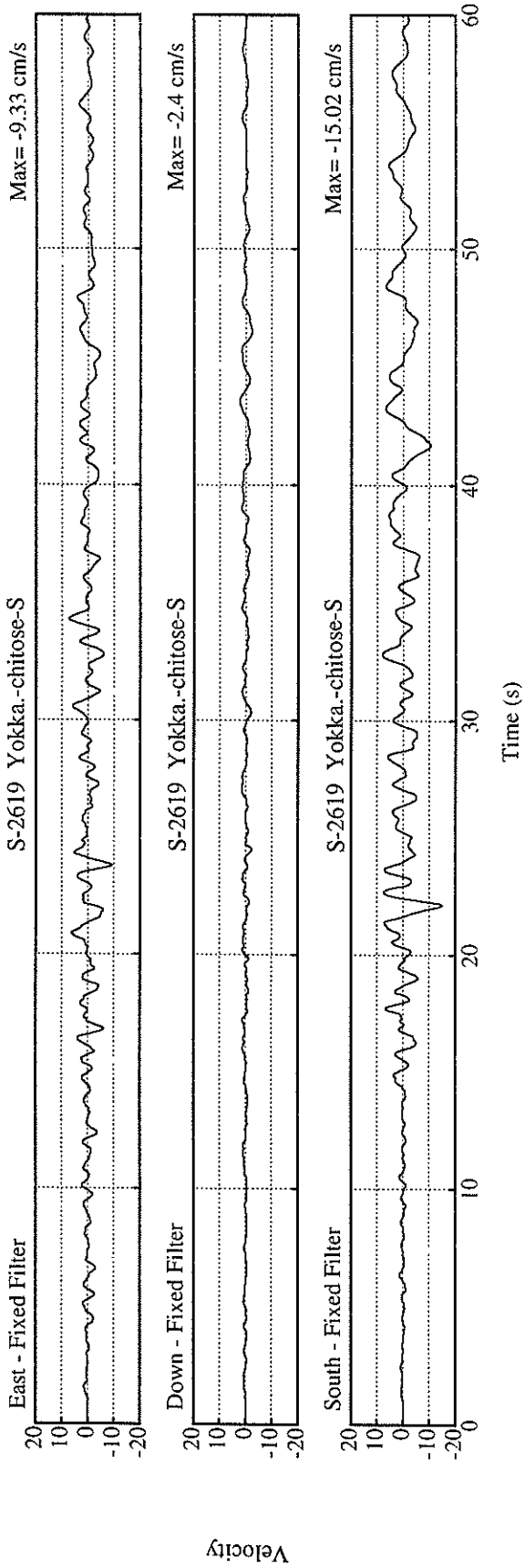
 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34° 35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

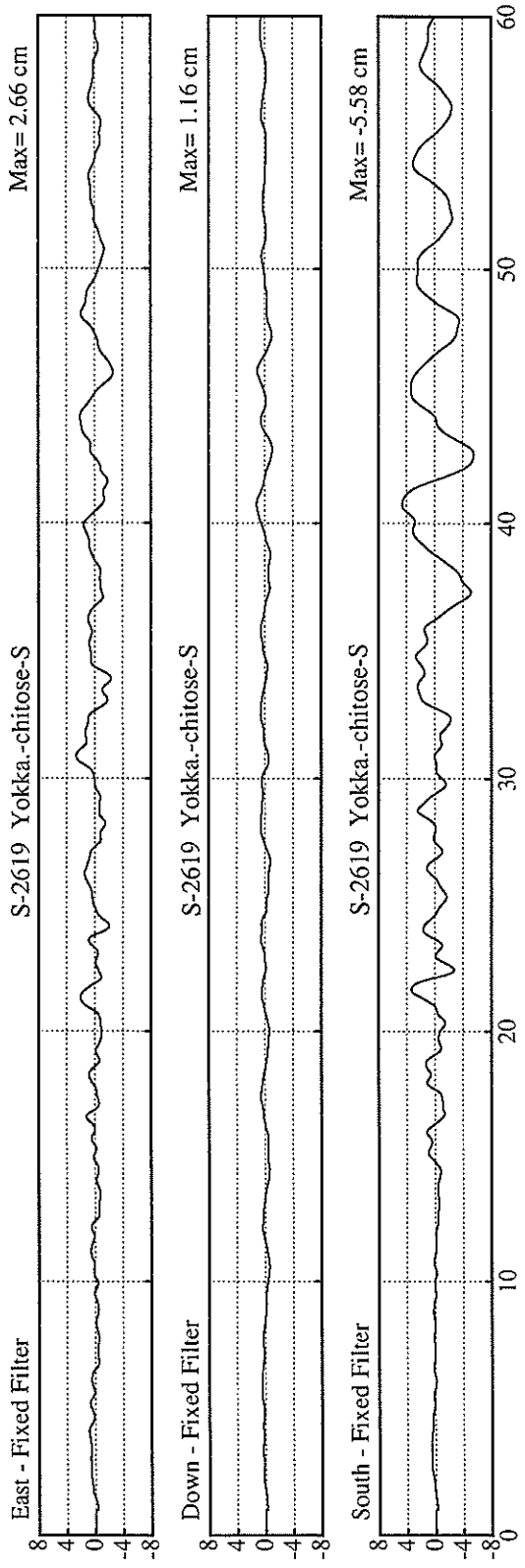
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.134	0.170	0.243	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	56.5	47.5	13.9	56.5
CORRECTED	58.5	48.6	16.9	58.5
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	15.02	9.33	2.40	15.02
VARIABLE FILTER	14.35	9.31	2.04	14.35
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	5.58	2.66	1.16	5.59
VARIABLE FILTER	5.52	1.89	0.71	5.52

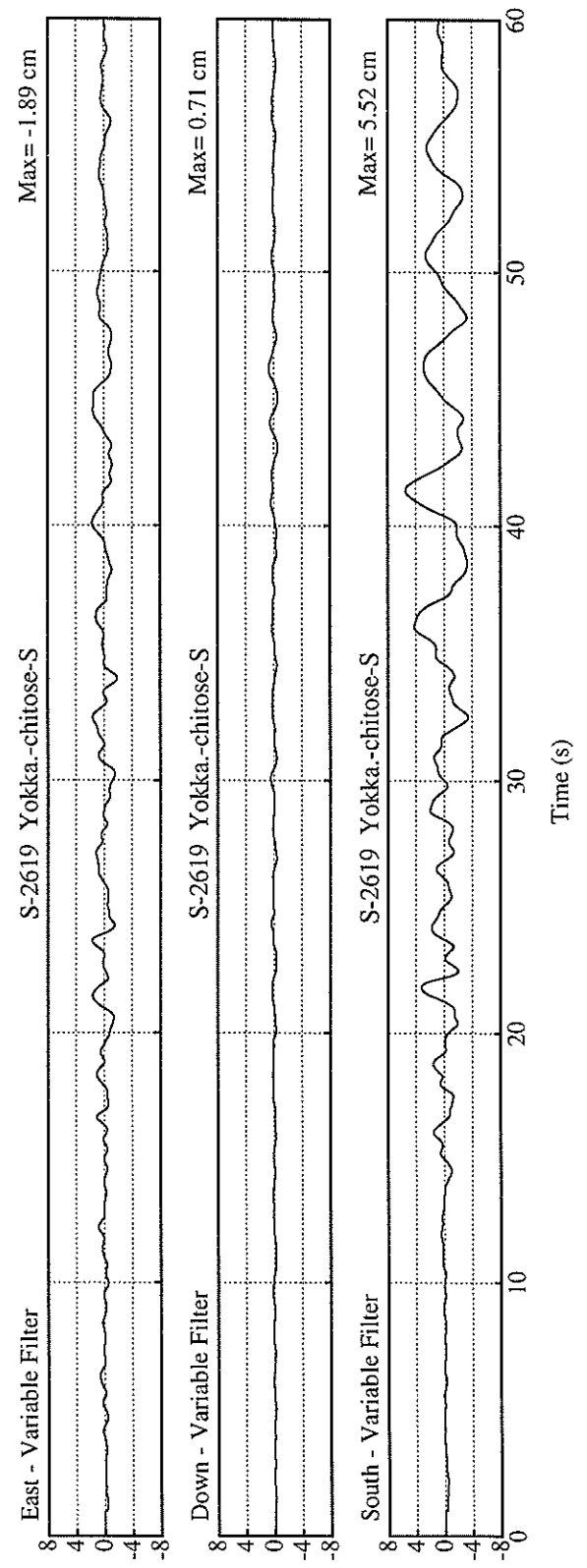
* RESULTANT OF HORIZONTAL COMPONENTS



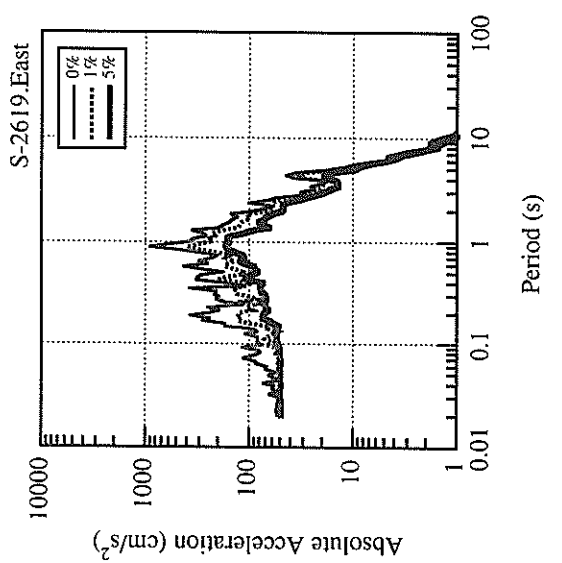
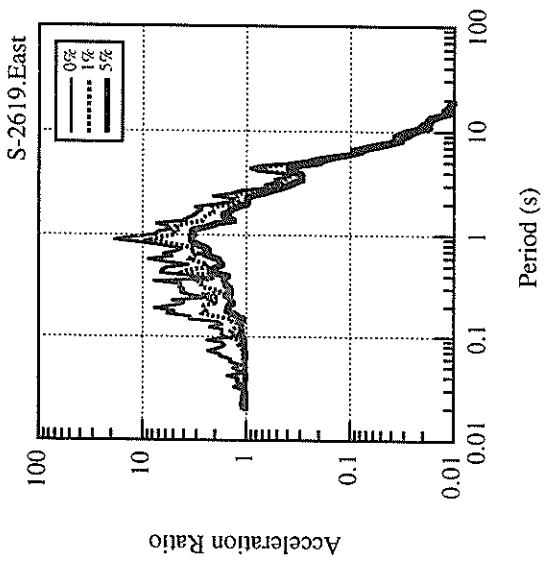
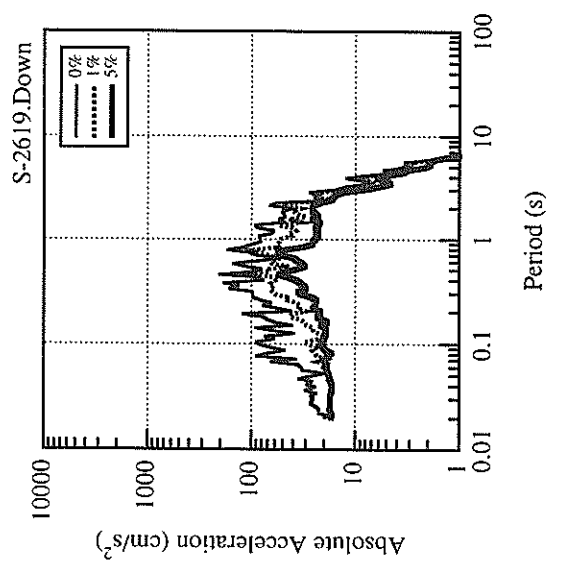
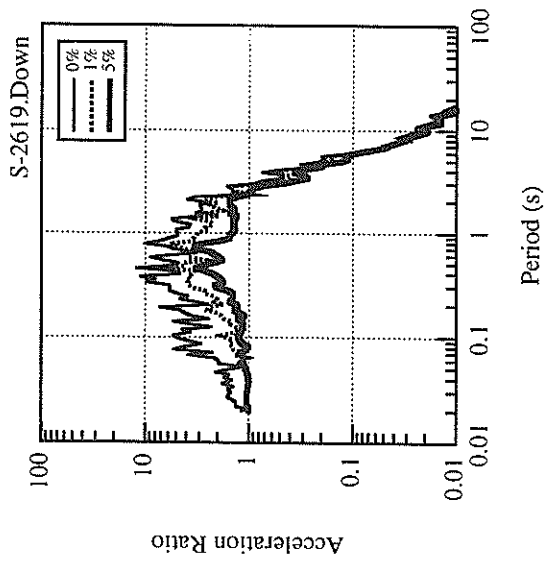
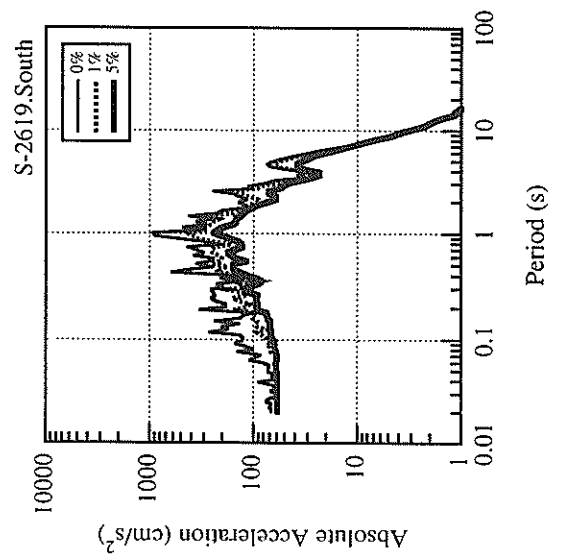
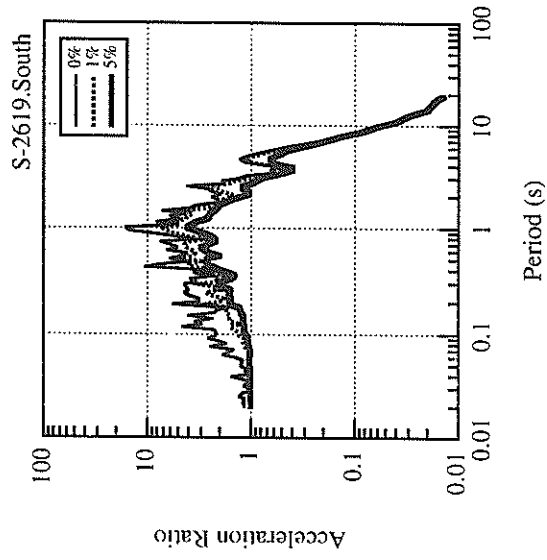


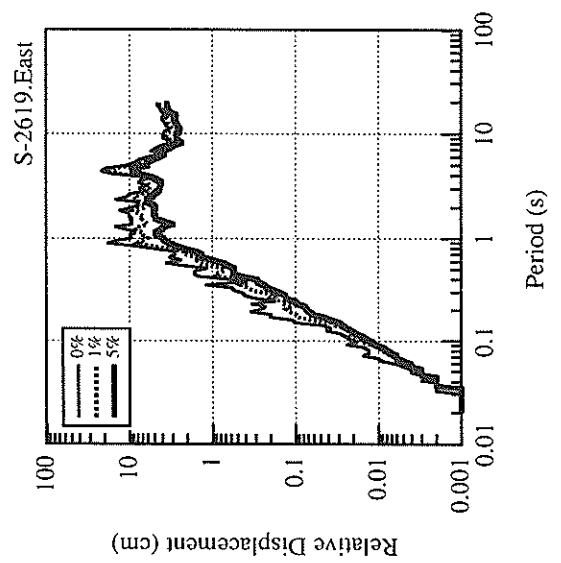
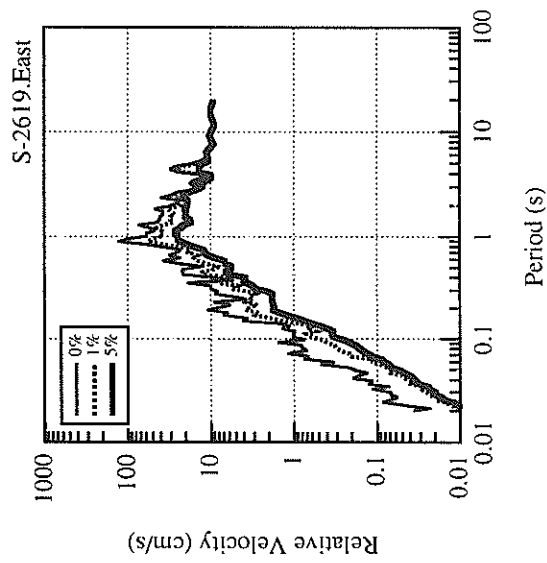
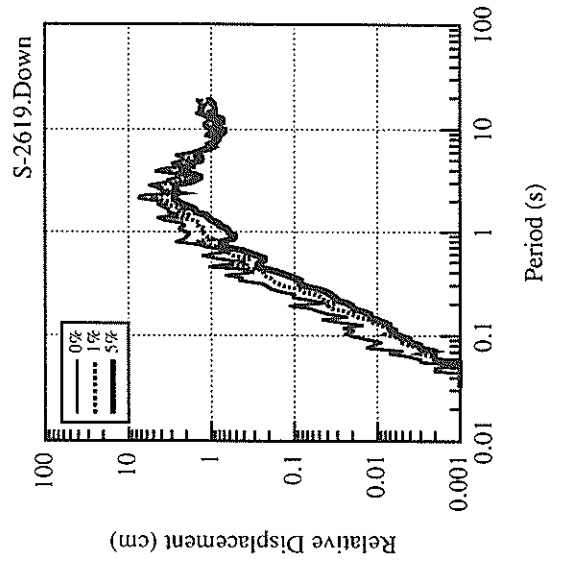
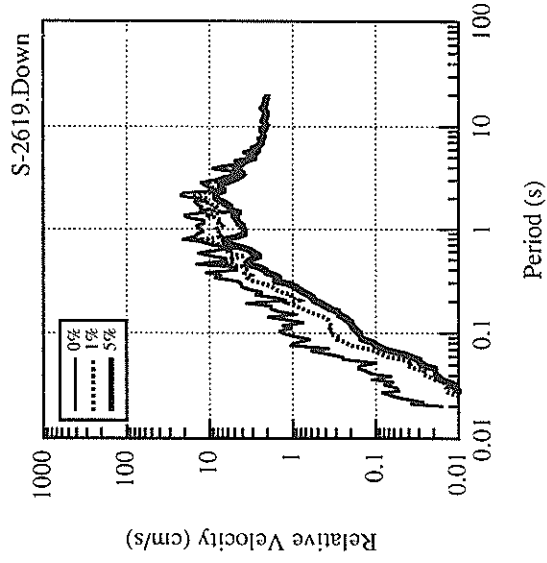
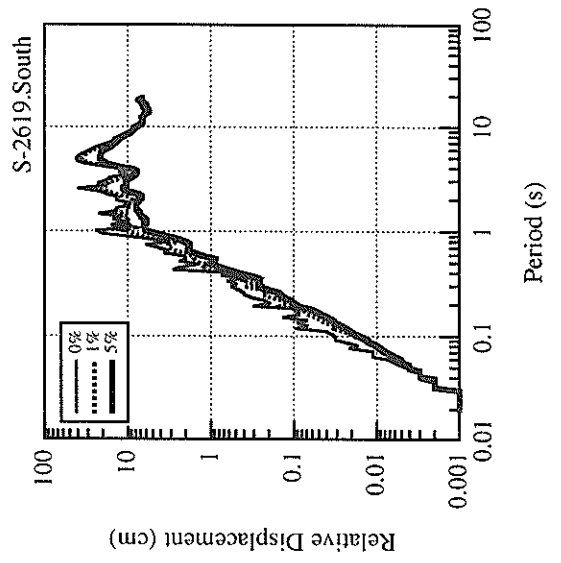
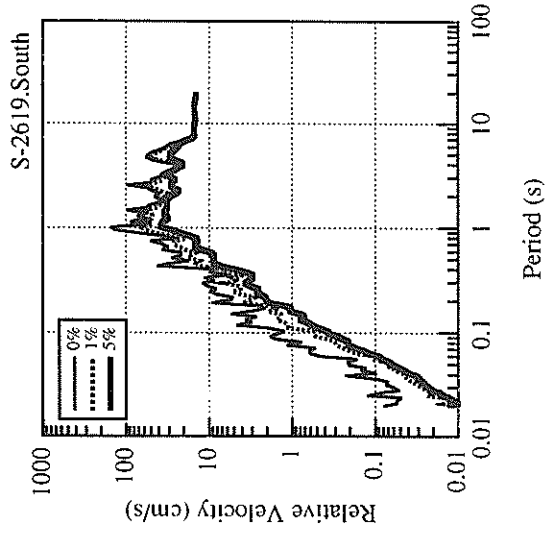


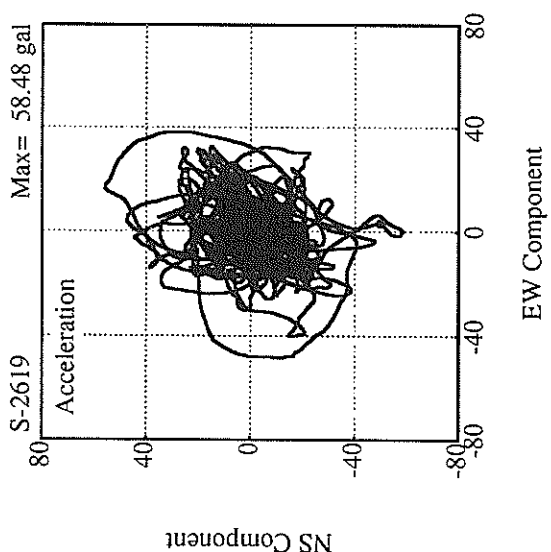
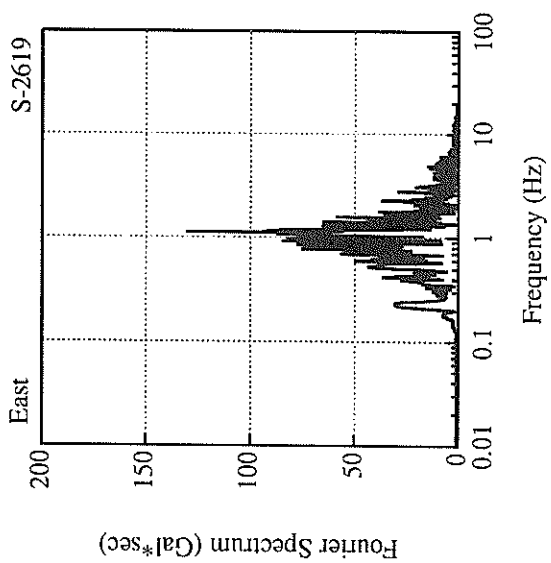
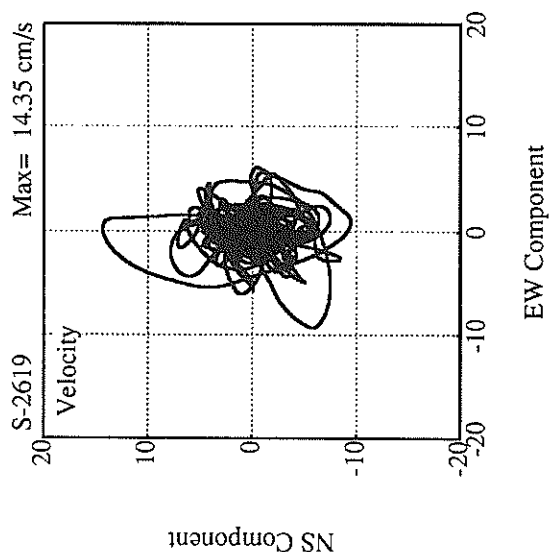
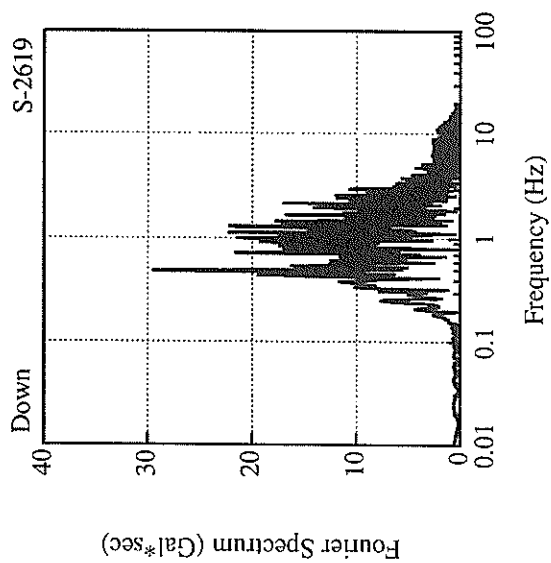
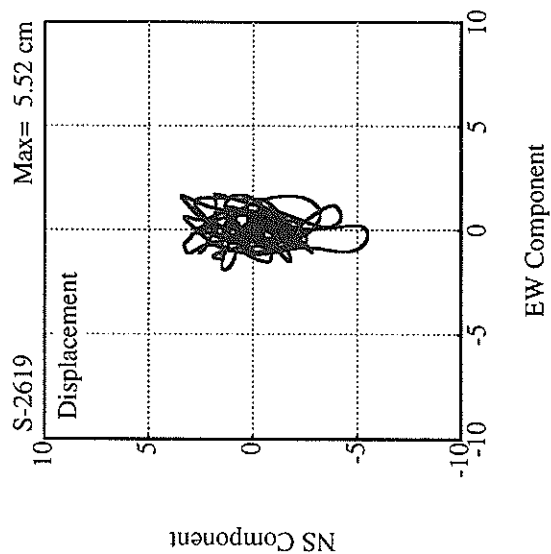
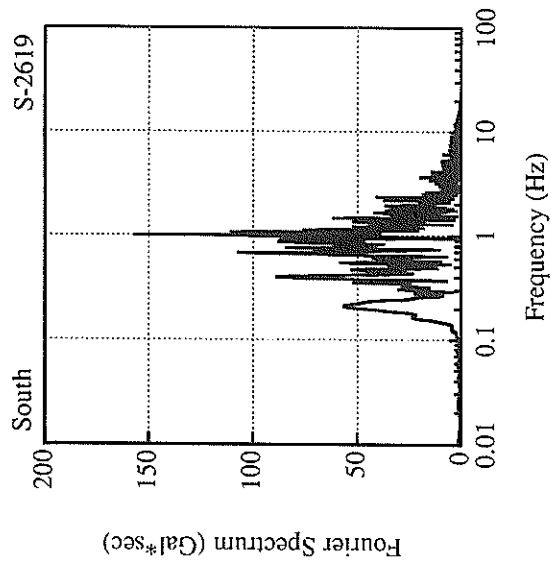
Displacement



Displacement







RECORD NUMBER : S-2621
 STATION : KINUURA-JI-S

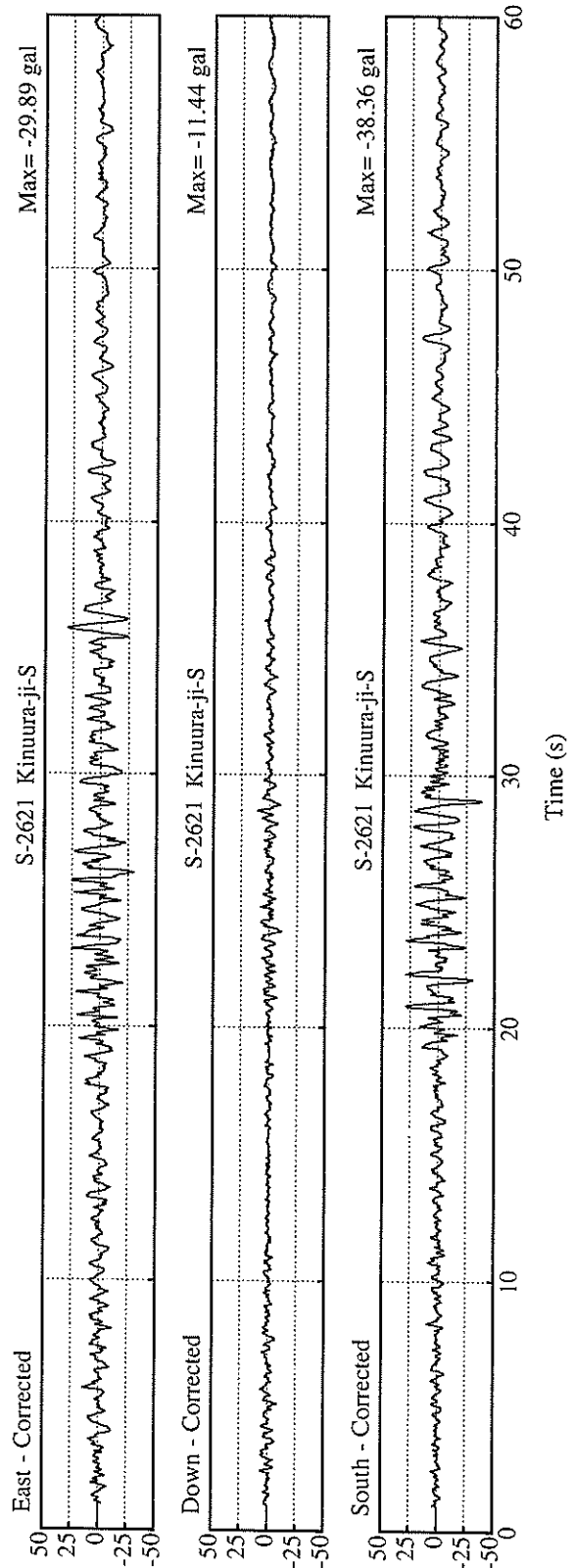
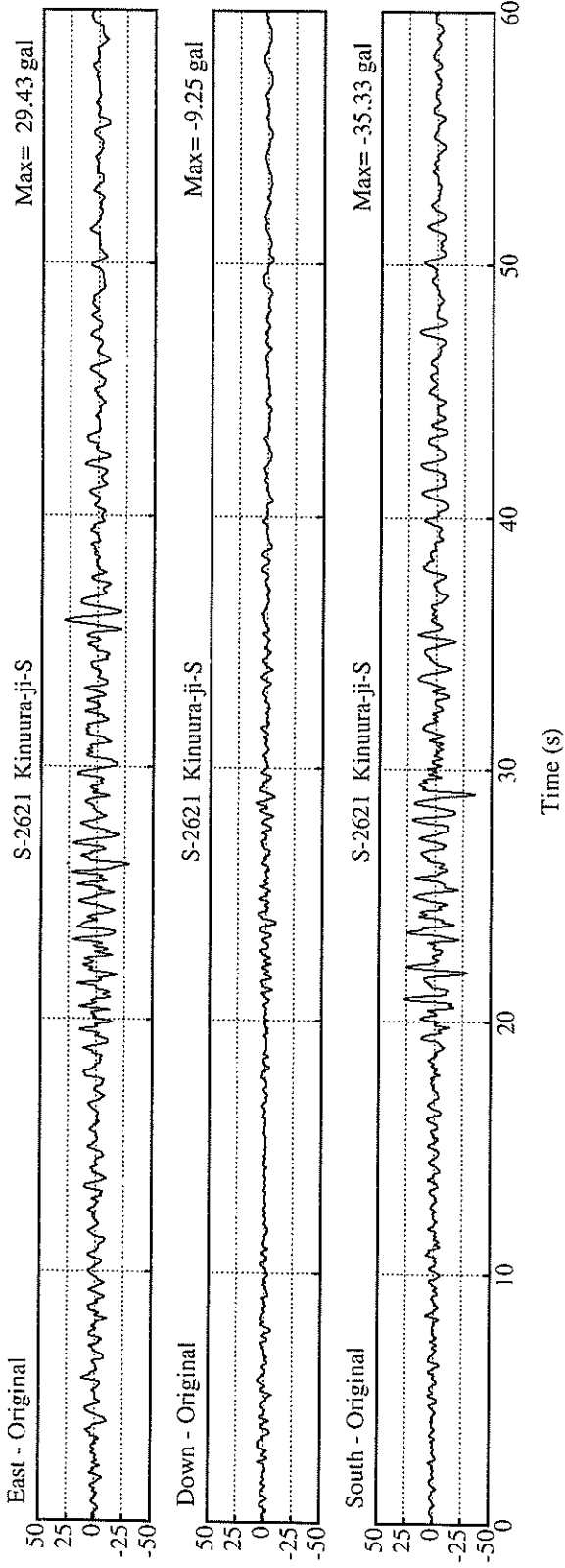
EARTHQUAKE DATA

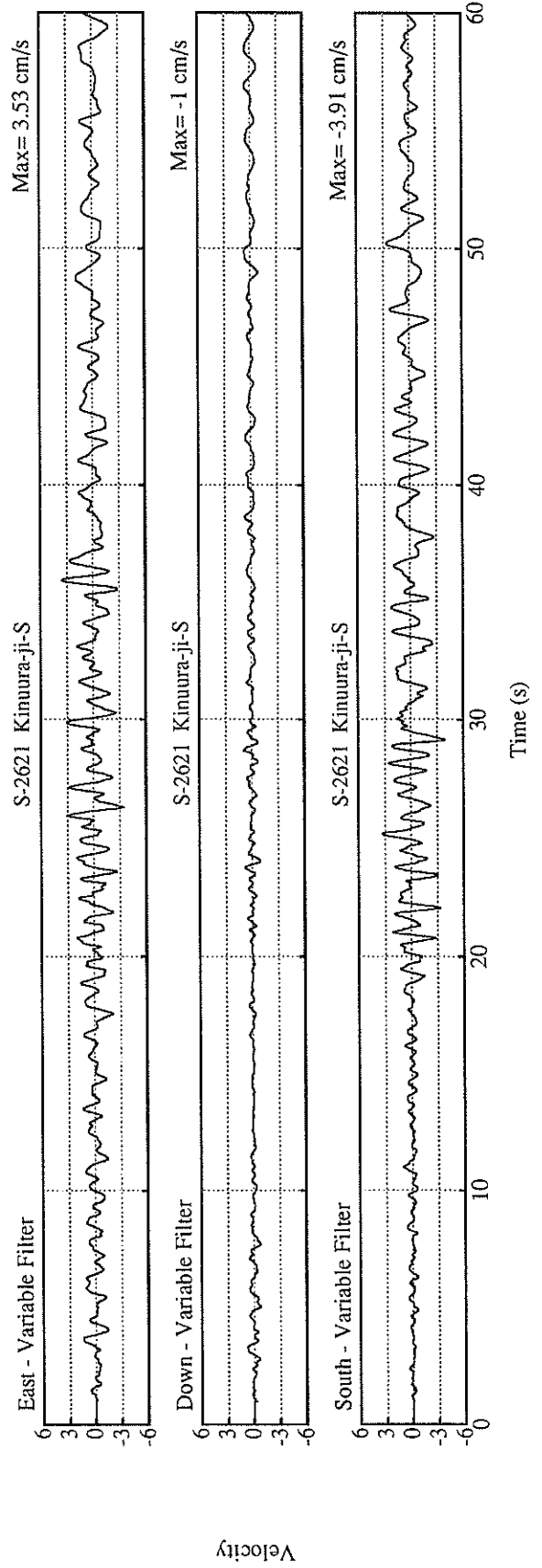
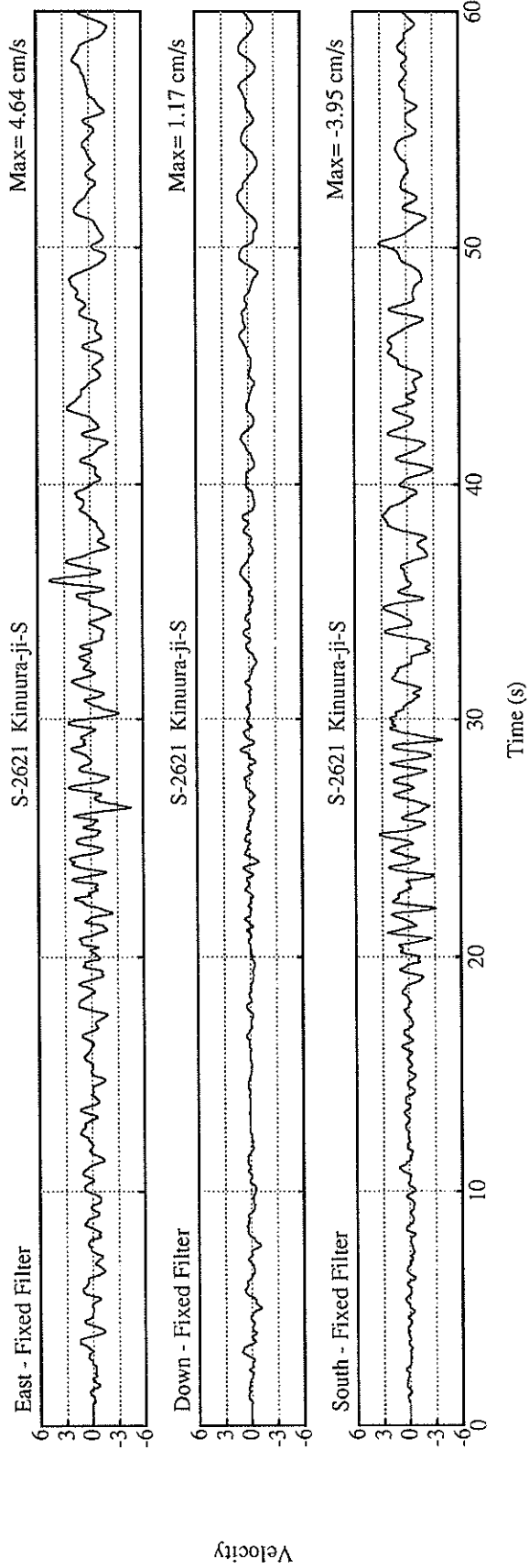
 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34°35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

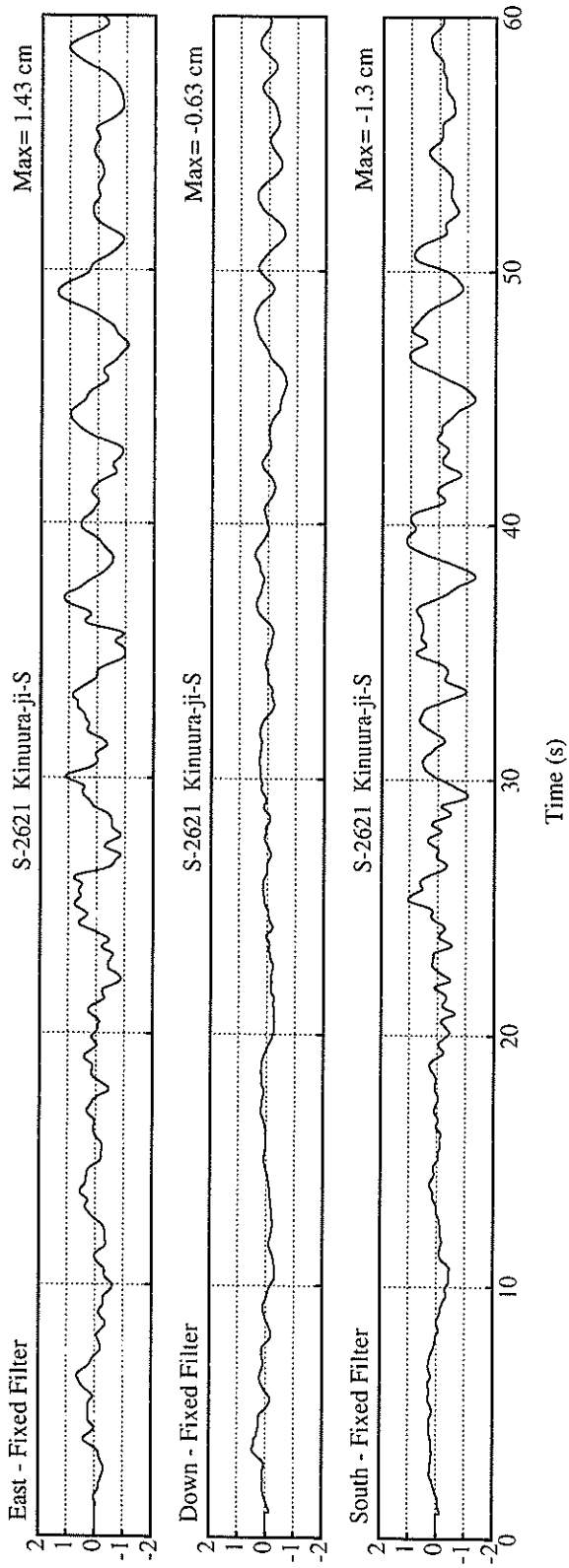
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.243	0.219	0.402	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	35.3	29.4	9.3	35.3
CORRECTED	38.4	29.9	11.4	38.4
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	3.95	4.64	1.17	5.06
VARIABLE FILTER	3.91	3.53	1.00	3.92
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	1.30	1.43	0.63	1.59
VARIABLE FILTER	0.83	0.88	0.23	0.89

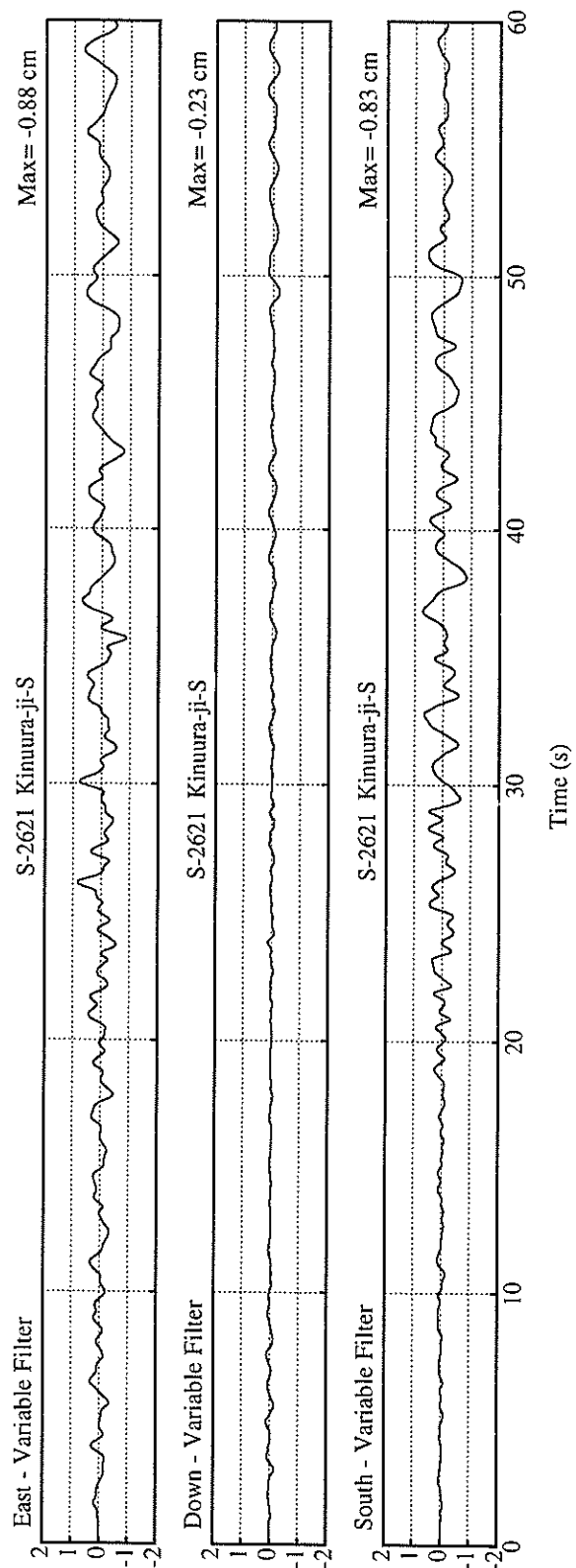
* RESULTANT OF HORIZONTAL COMPONENTS



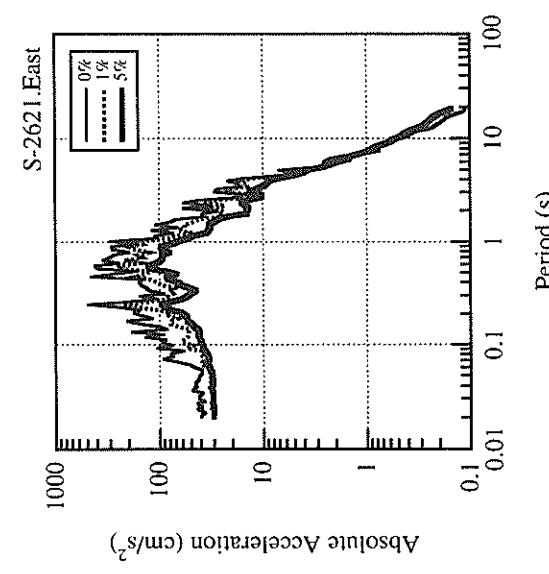
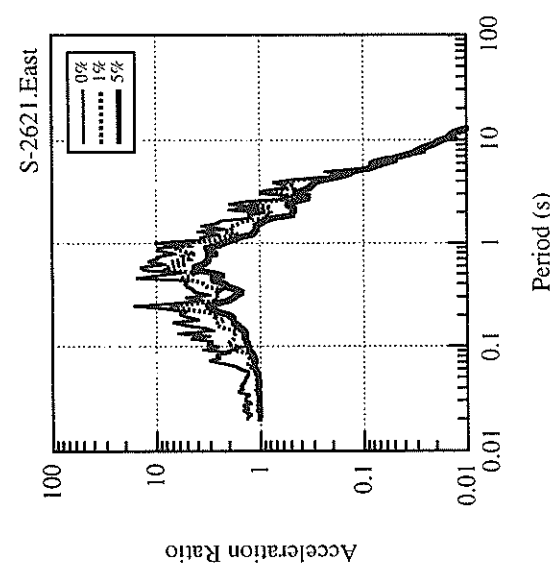
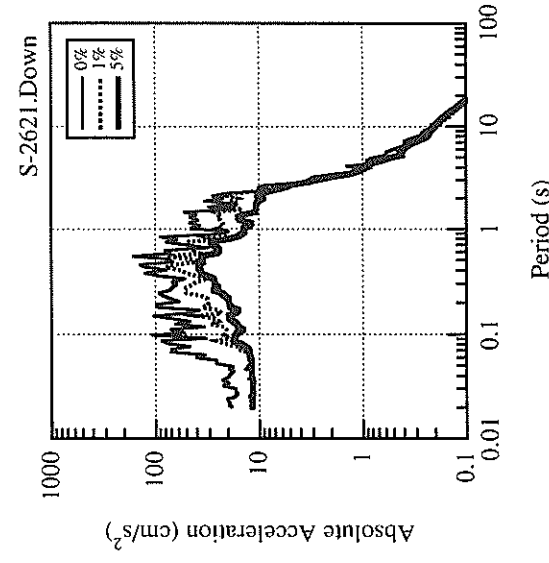
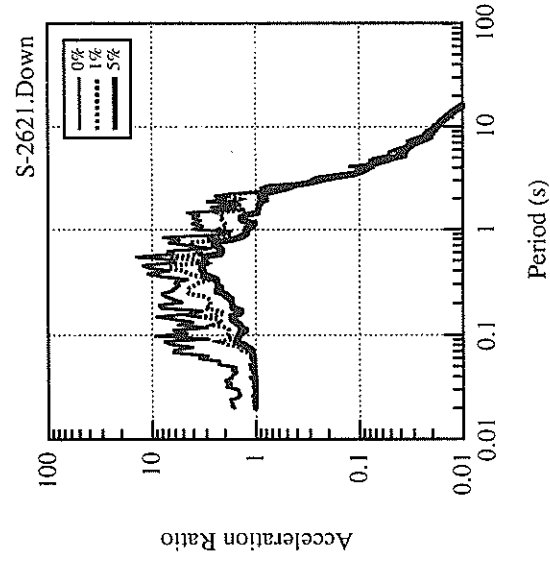
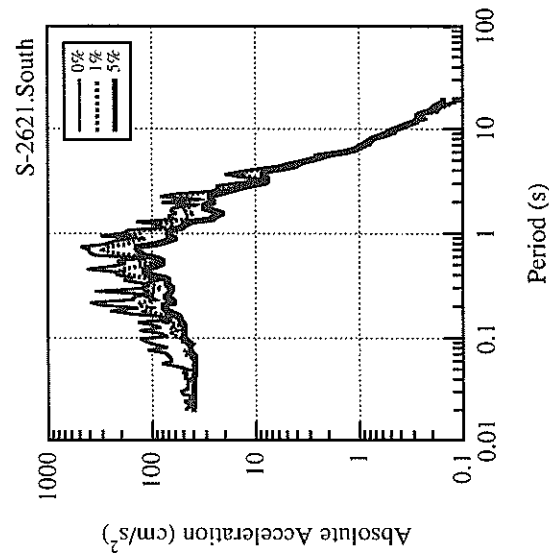
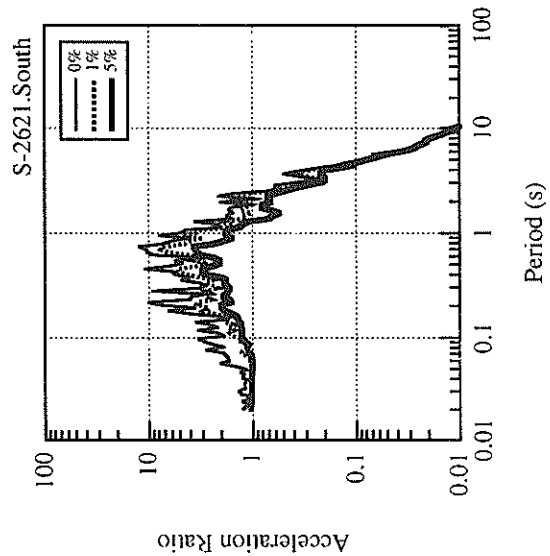


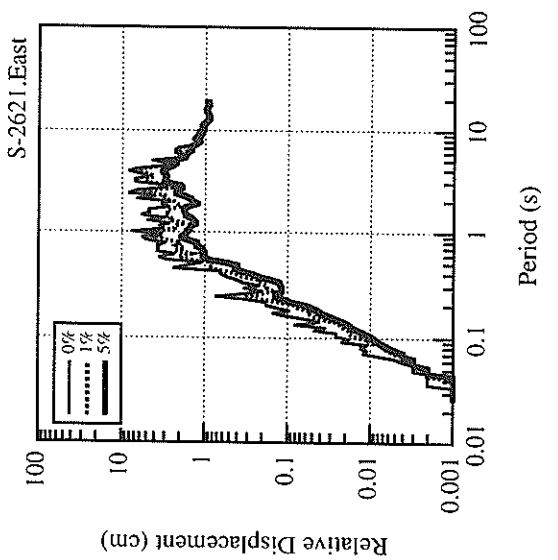
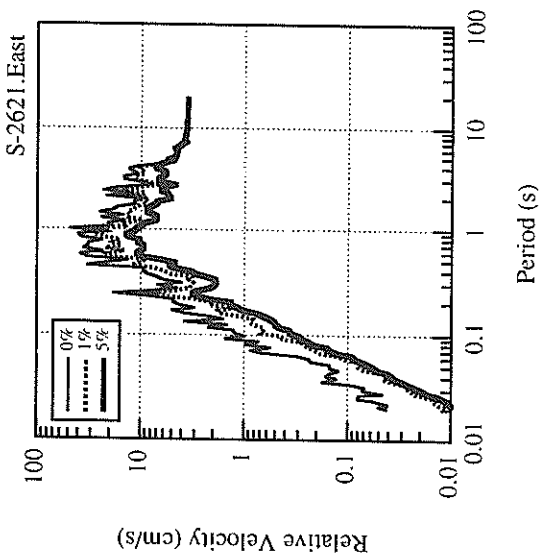
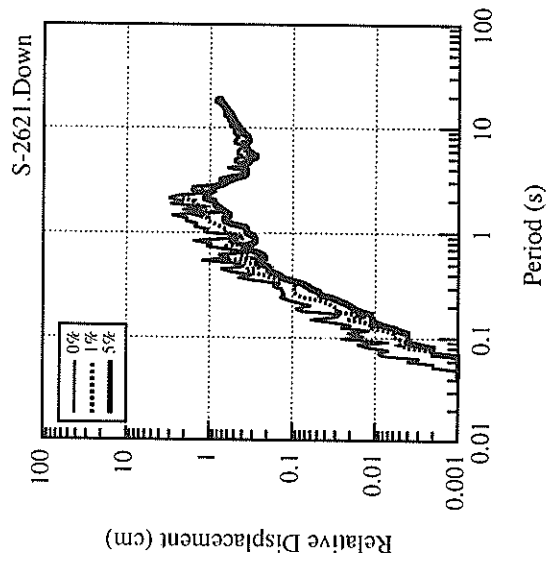
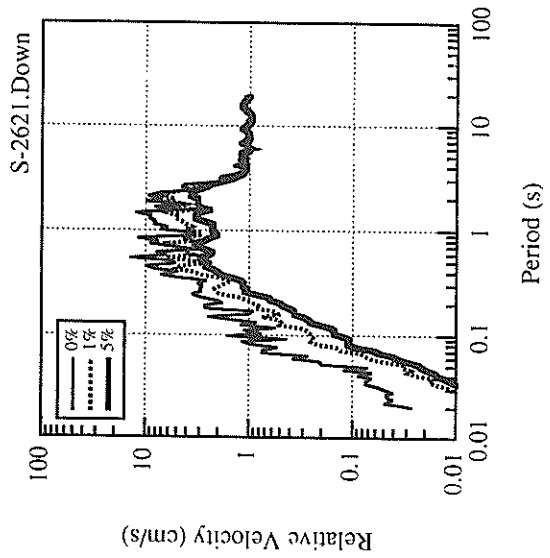
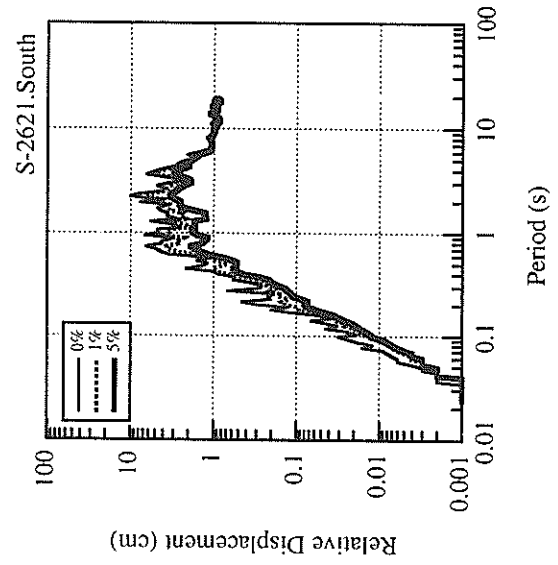
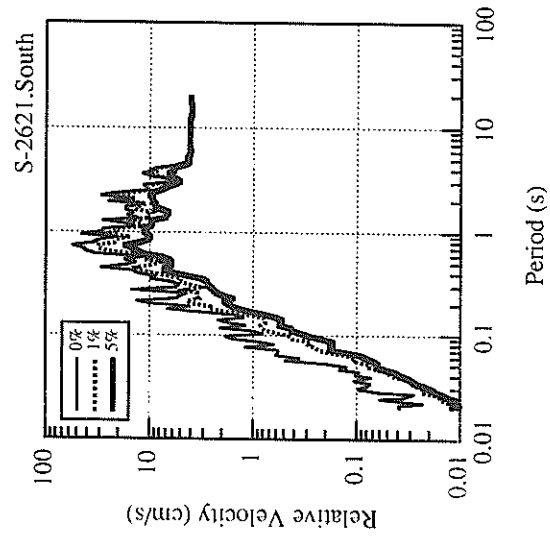


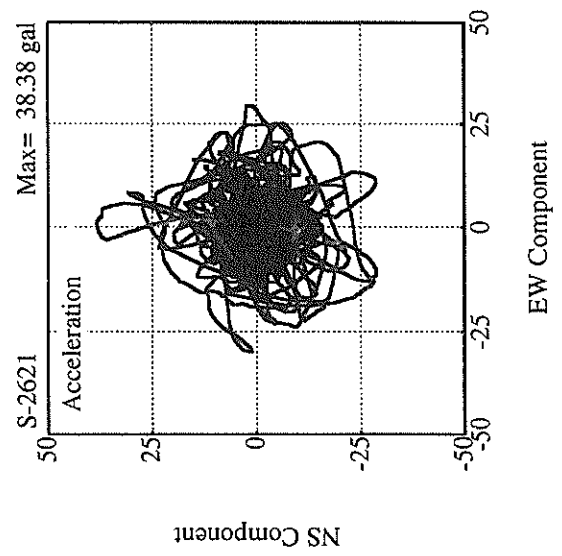
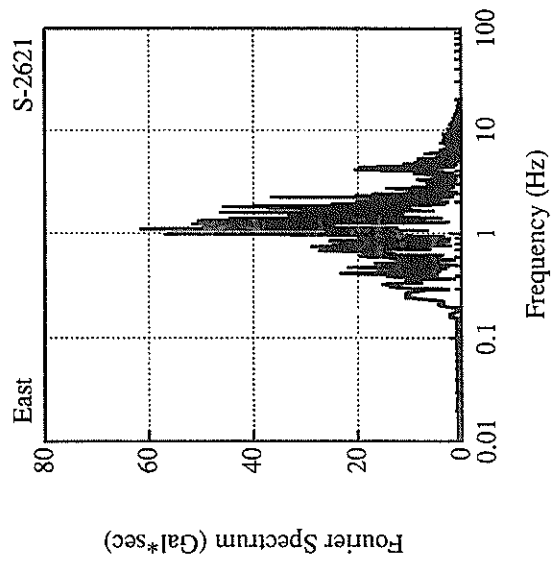
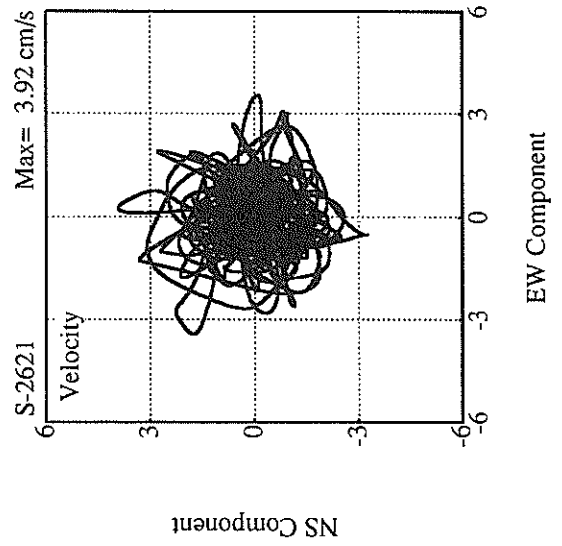
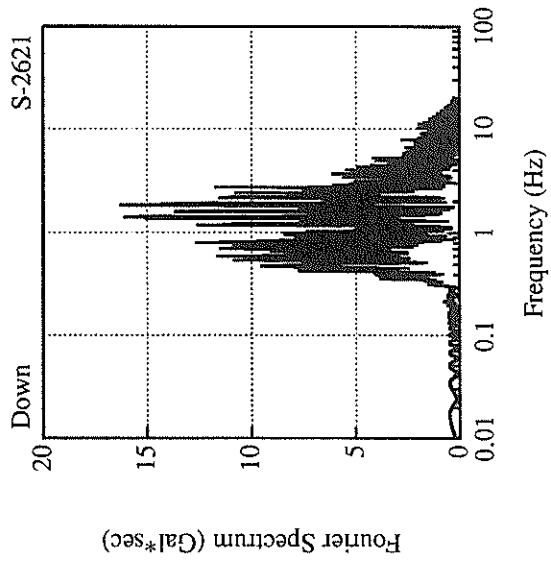
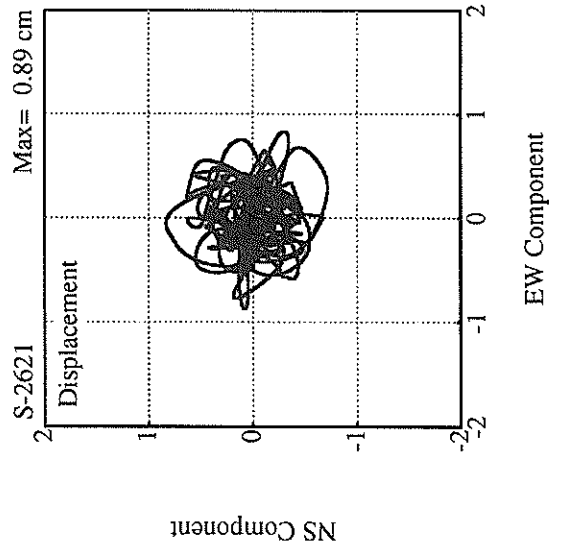
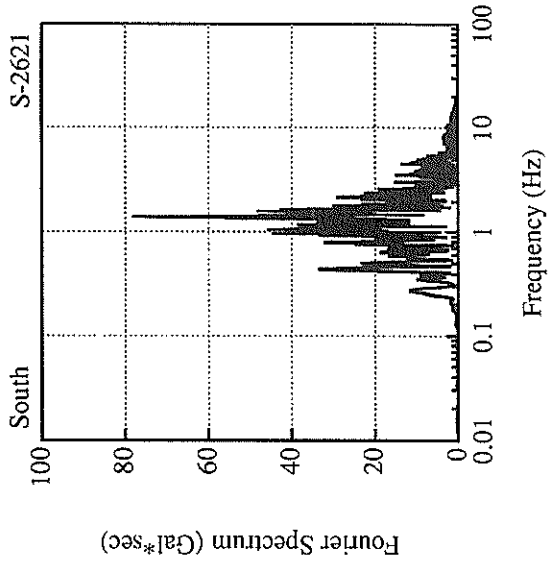
Displacement



Displacement







RECORD NUMBER : M-1553
 STATION : INAE-YAITA-M

EARTHQUAKE DATA

```
*****
DATE AND TIME                5:46 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34° 35.7' N
  LONGITUDE                   135° 2.2' E
  DEPTH                       17.9KM
  JMA MAGNITUDE              7.2
*****
```

PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
--	-----	-----	-----	-------------

PARAMETER OF THE VARIABLE FILTER

FC (HZ)				0.131
---------	--	--	--	-------

MAXIMUM ACCELERATION (GAL)

SMAC-B2 EQUIVALENT				82.2
ORIGINAL				101.3
CORRECTED				105.0

MAXIMUM VELOCITY (CM/SEC)

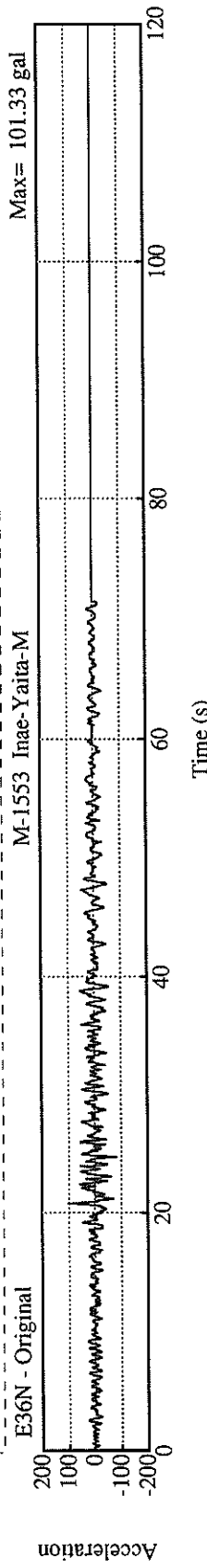
FIXED FILTER				12.43
VARIABLE FILTER				13.39

MAXIMUM DISPLACEMENT (CM)

FIXED FILTER				7.815
VARIABLE FILTER				5.920

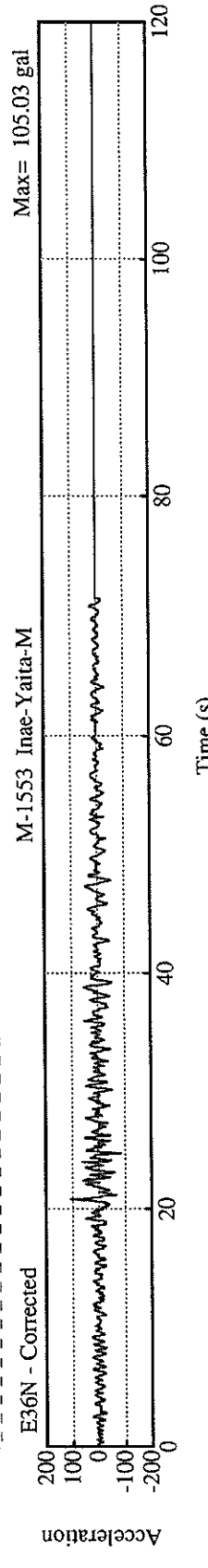
* RESULTANT OF HORIZONTAL COMPONENTS

N36W component shows abnormal response.



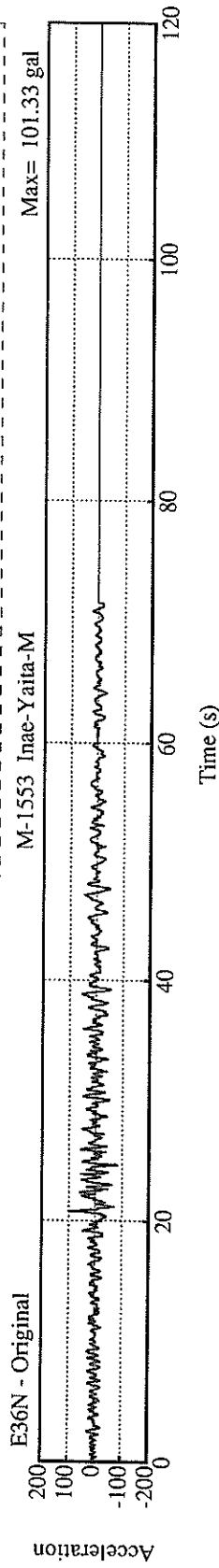
UP-DOWN component is not under observation.

N36W component shows abnormal response.



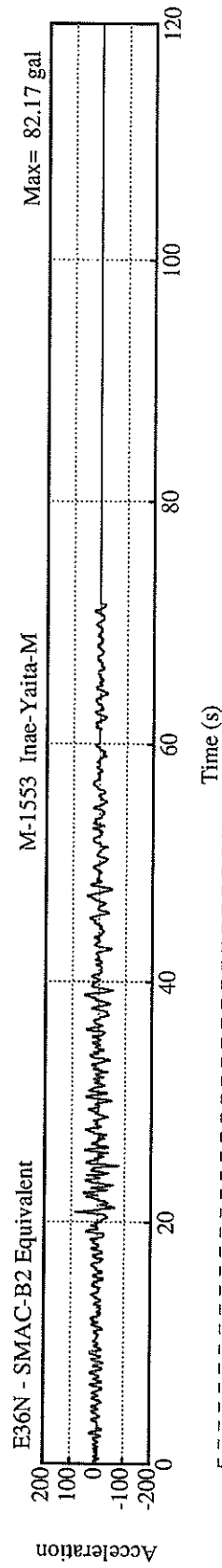
UP-DOWN component is not under observation.

N36W component shows abnormal response.



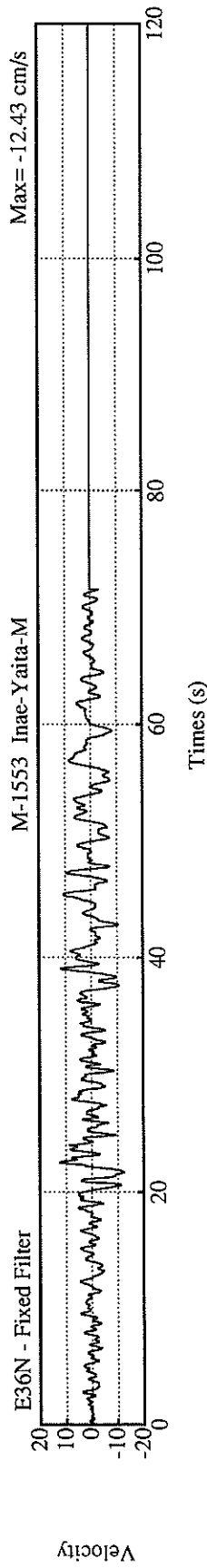
UP-DOWN component is not under observation.

N36W component shows abnormal response.



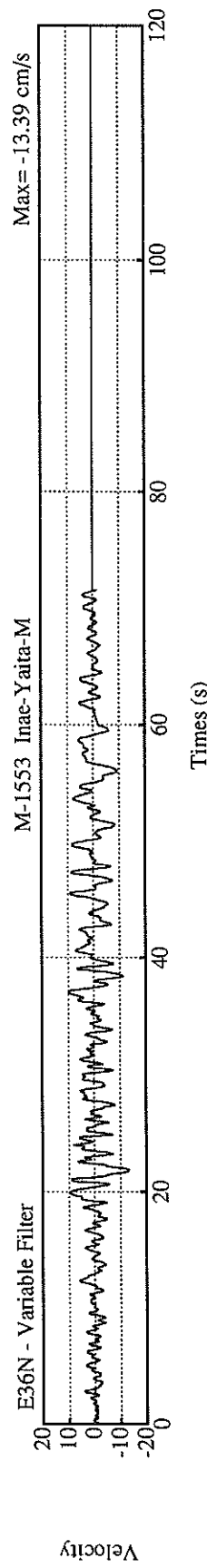
UP-DOWN component is not under observation.

N36W component shows abnormal response.



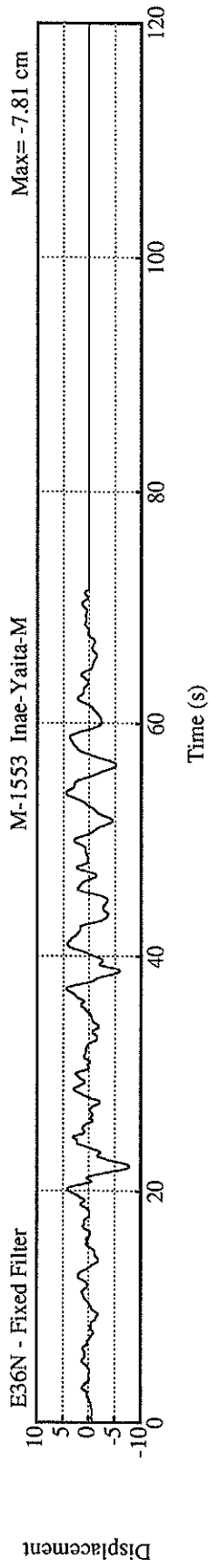
UP-DOWN component is not under observation.

N36W component shows abnormal response.



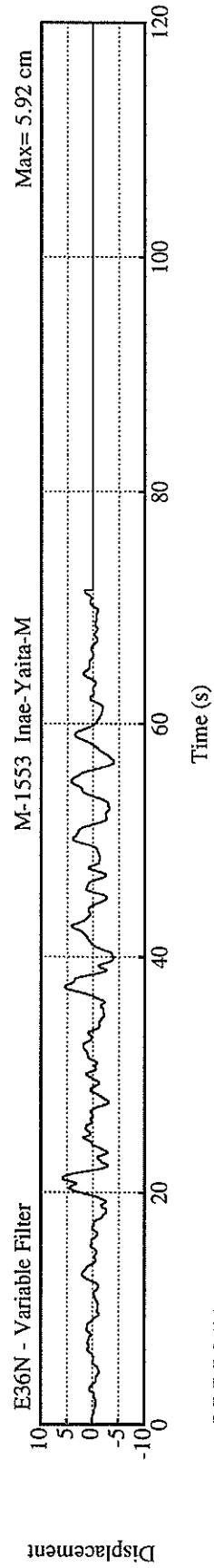
UP-DOWN component is not under observation.

N36W component shows abnormal response.

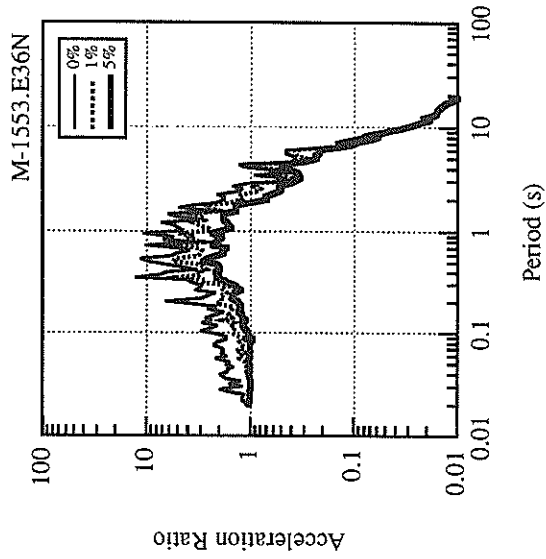


UP-DOWN component is not under observation.

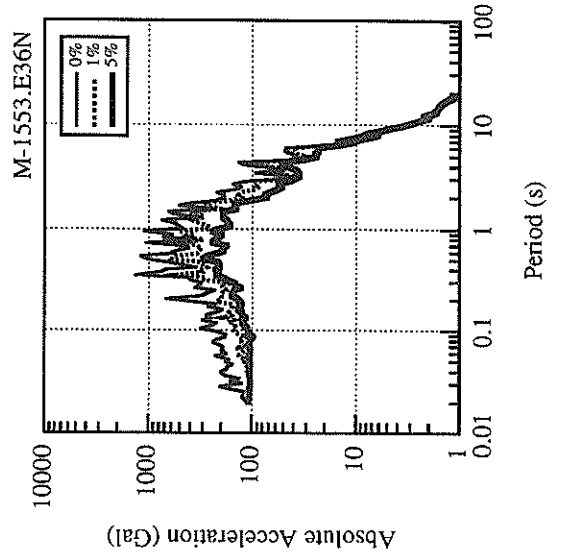
N36W component shows abnormal response.



UP-DOWN component is not under observation.



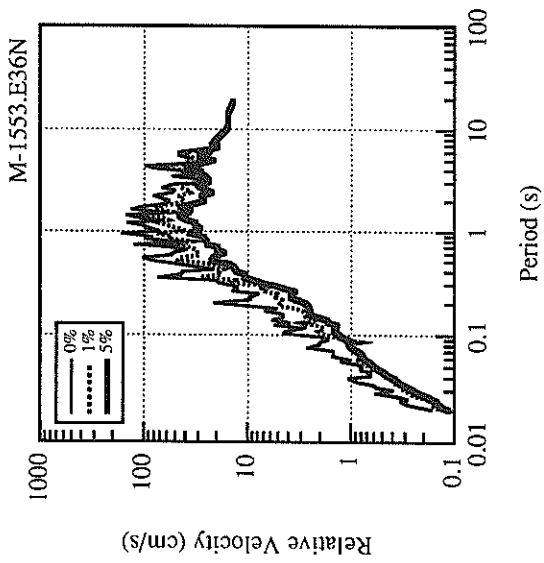
UP-DOWN component is not under observation.



UP-DOWN component is not under observation.

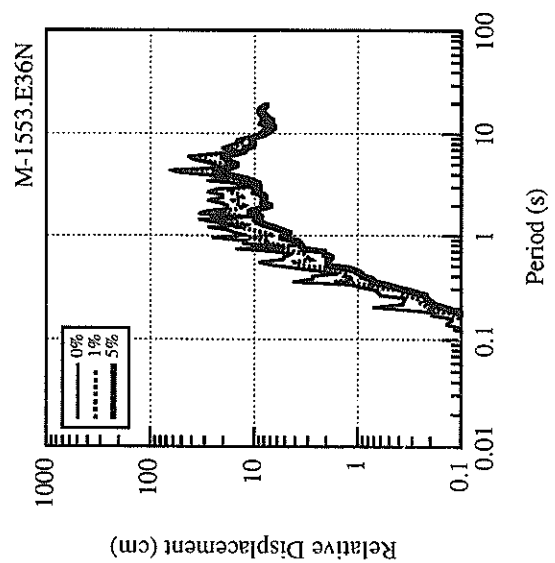
N36W component shows abnormal response.

N36W component shows abnormal response.



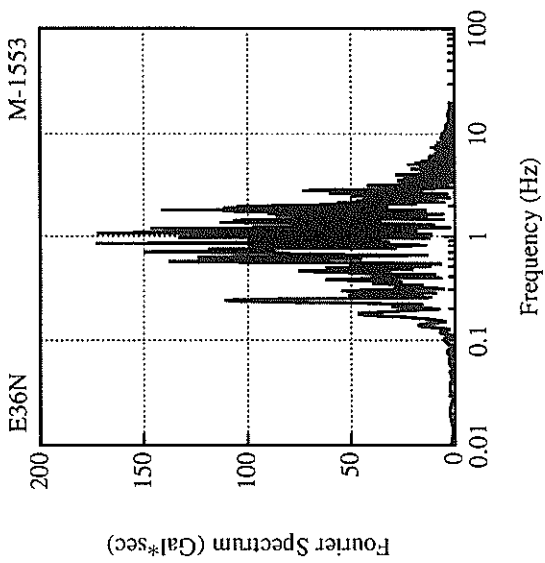
N36W component shows abnormal response.

UP-DOWN component is not under observation.



N36W component shows abnormal response.

UP-DOWN component is not under observation.



UP-DOWN component is
not under observation.

N36W component shows
abnormal response.

The loci of accelerations, velocities and displacements in horizontal plane cannot be shown since only one component was successfully recorded at this site.

RECORD NUMBER : M-1555
 STATION : YOKKA.-SEKITAN-M

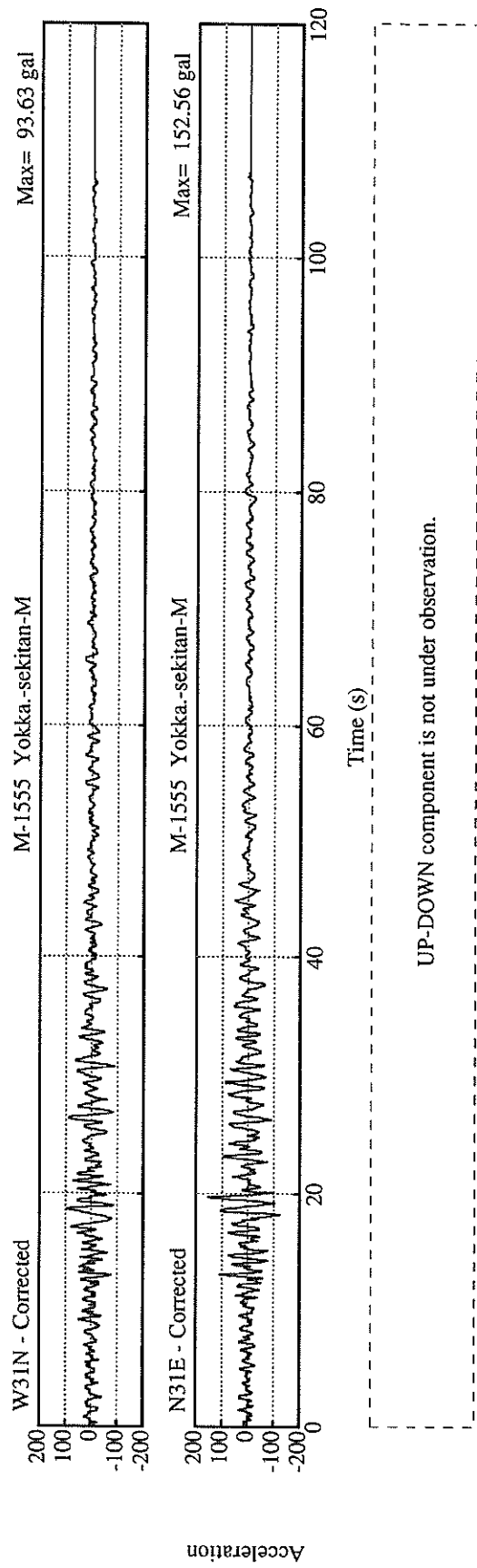
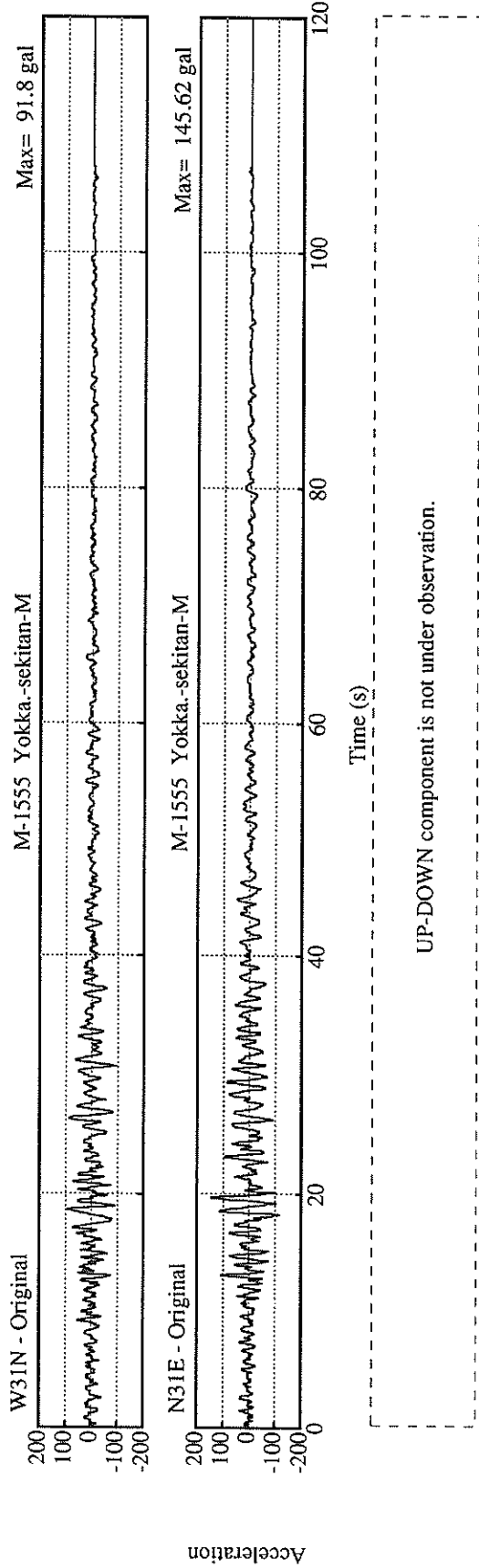
EARTHQUAKE DATA

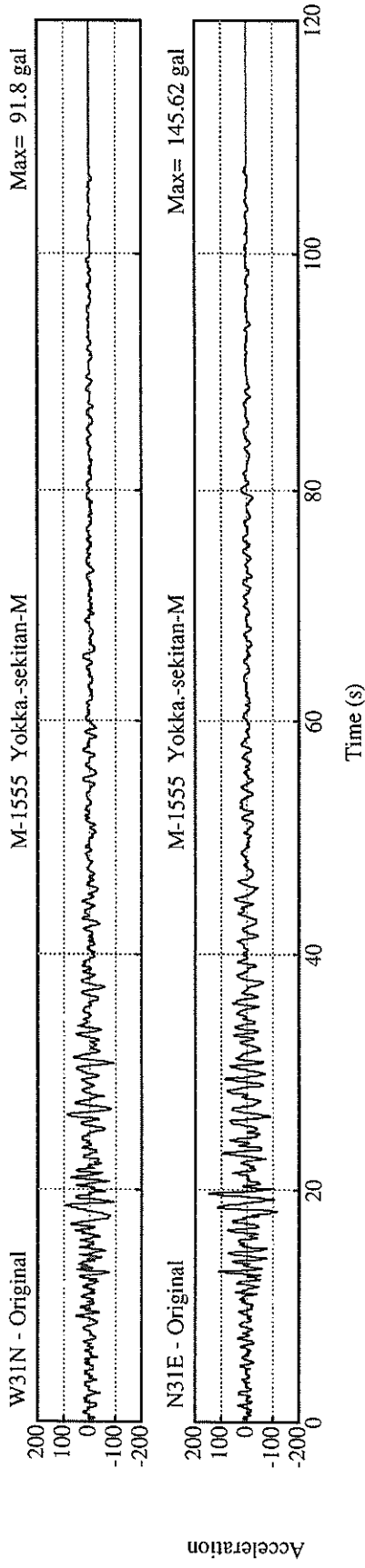
```
*****
DATE AND TIME                5:46 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34° 35.7' N
  LONGITUDE                  135° 2.2' E
  DEPTH                      17.9KM
  JMA MAGNITUDE              7.2
*****
```

PEAK VALUES OF COMPONENTS

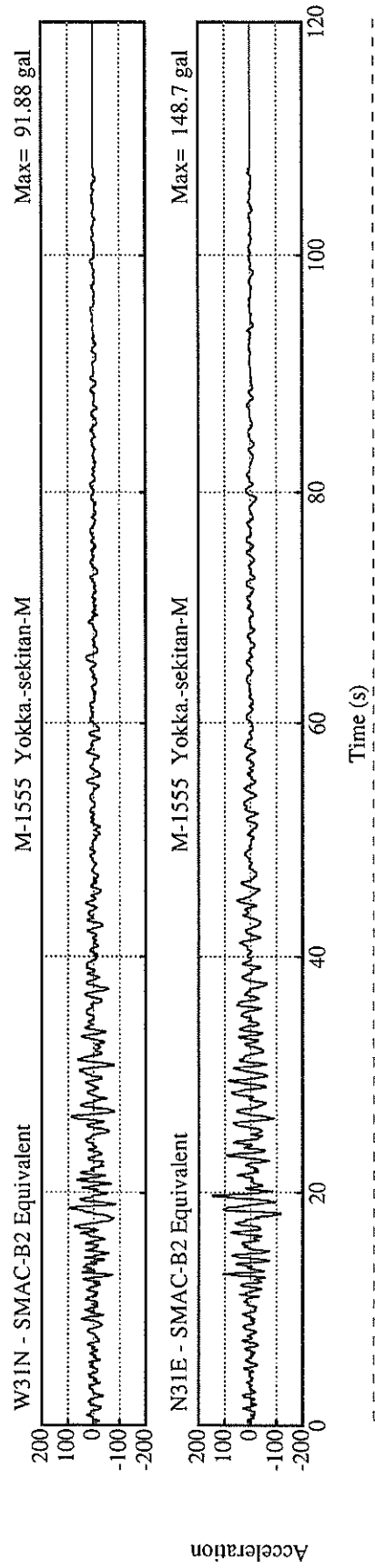
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.107	0.113		
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	148.7	91.9		148.7
ORIGINAL	145.6	91.8		145.6
CORRECTED	152.6	93.6		152.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	27.36	21.93		31.82
VARIABLE FILTER	26.00	22.29		30.23
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	8.191	8.840		10.618
VARIABLE FILTER	10.639	8.479		11.228

* RESULTANT OF HORIZONTAL COMPONENTS

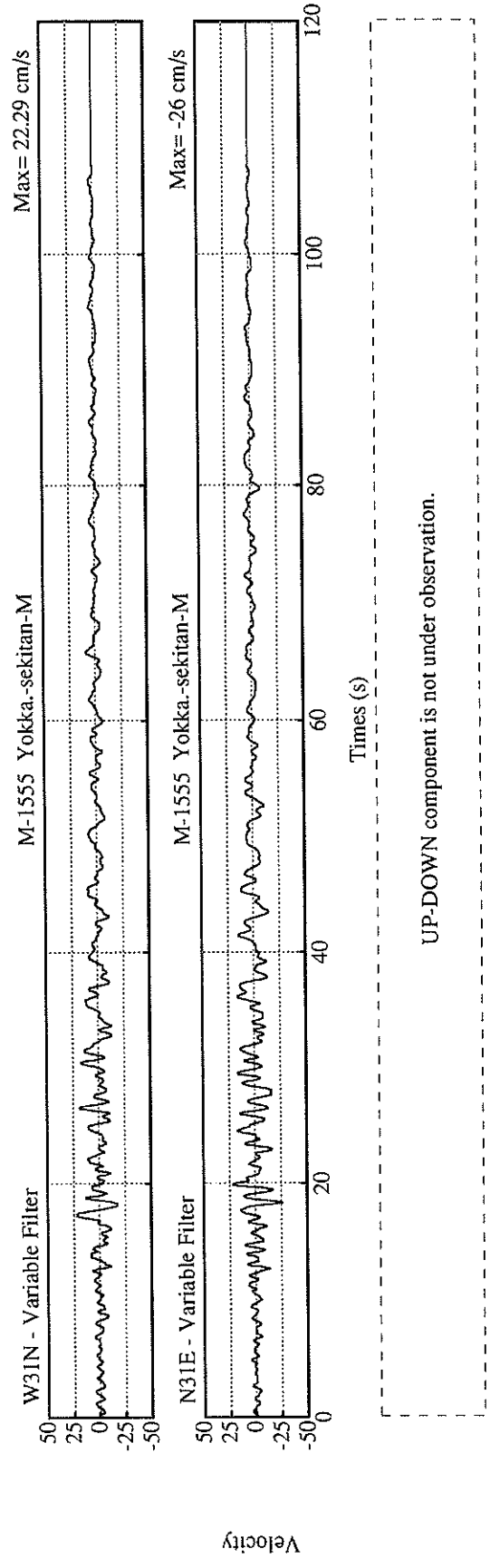
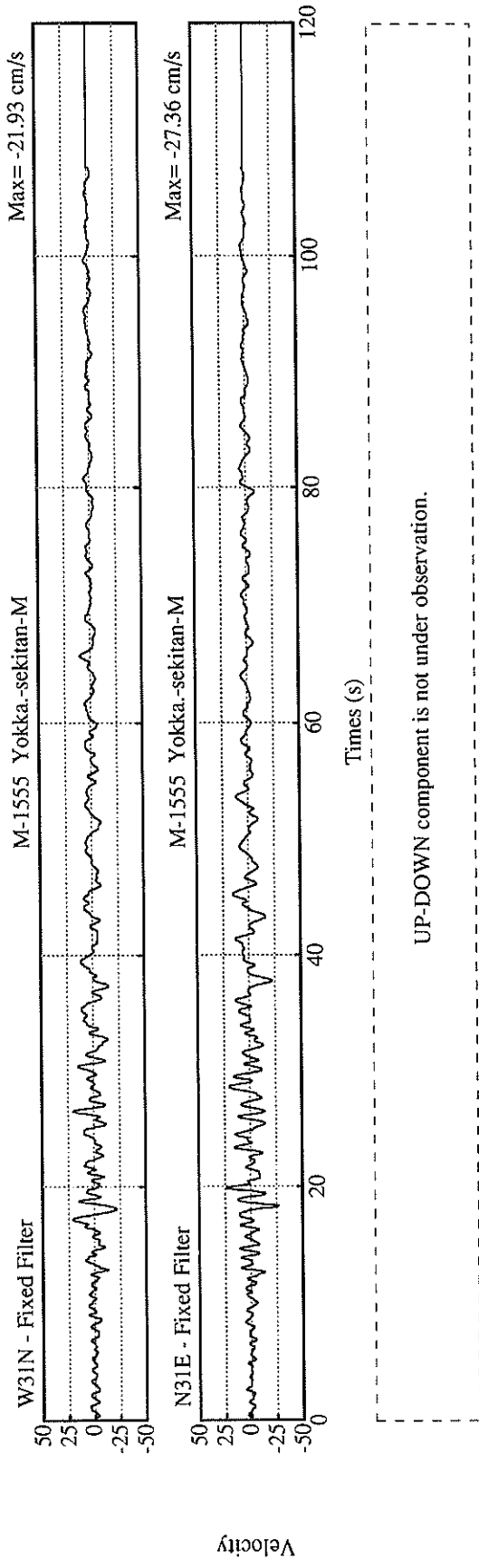


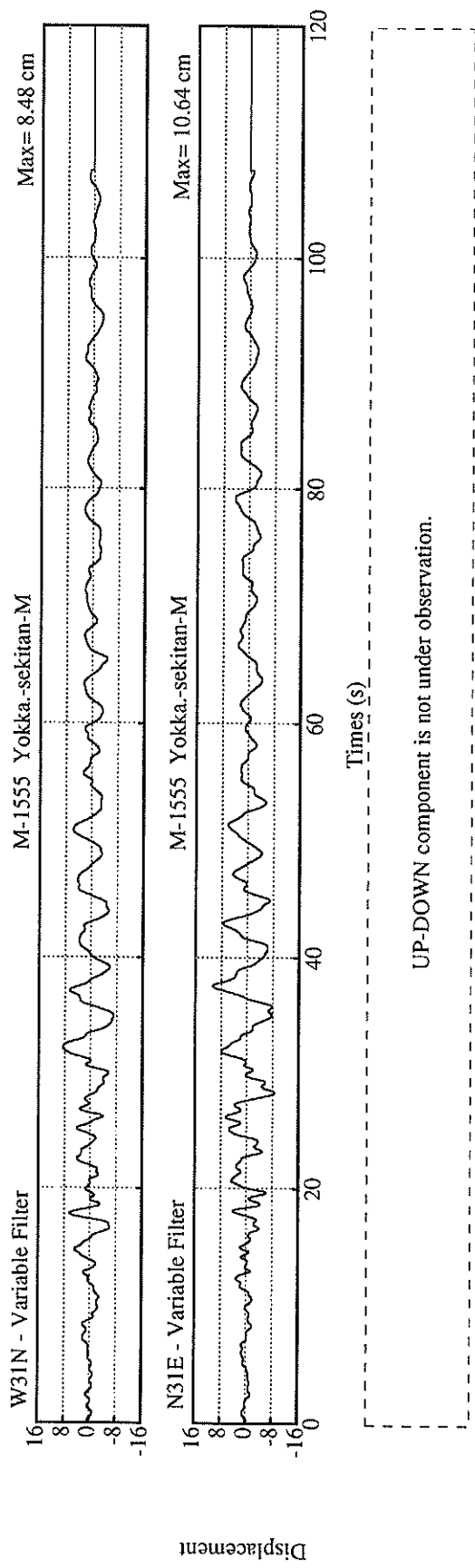
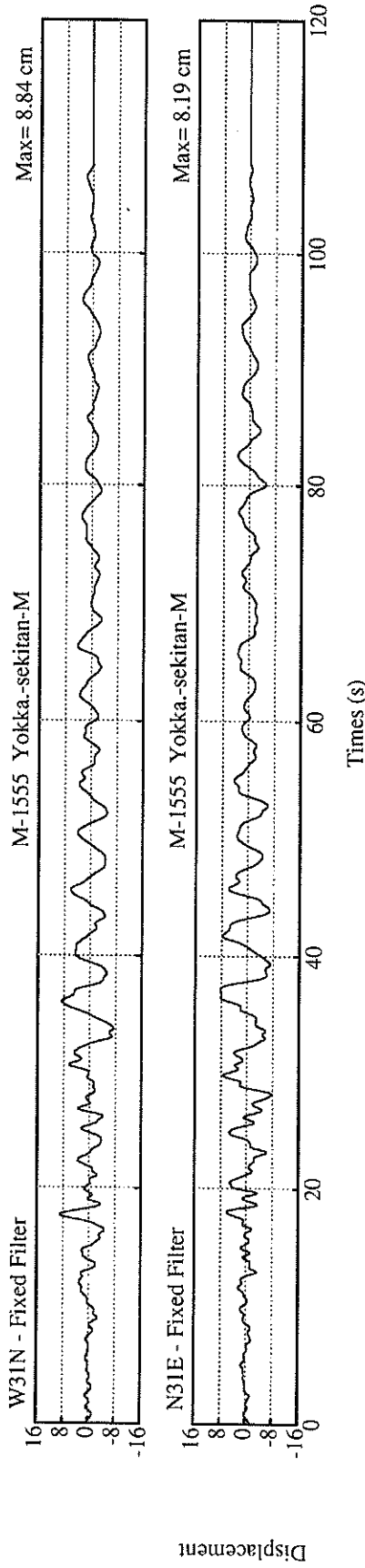


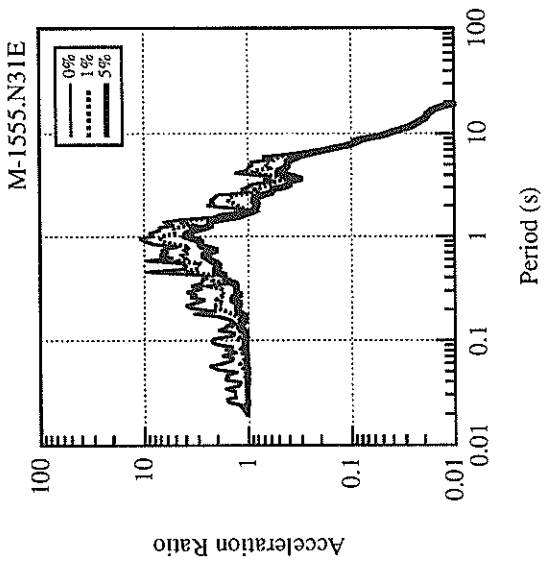
UP-DOWN component is not under observation.



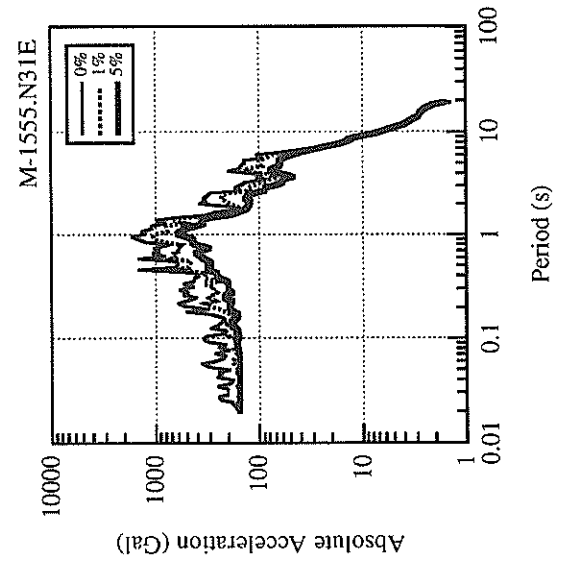
UP-DOWN component is not under observation.



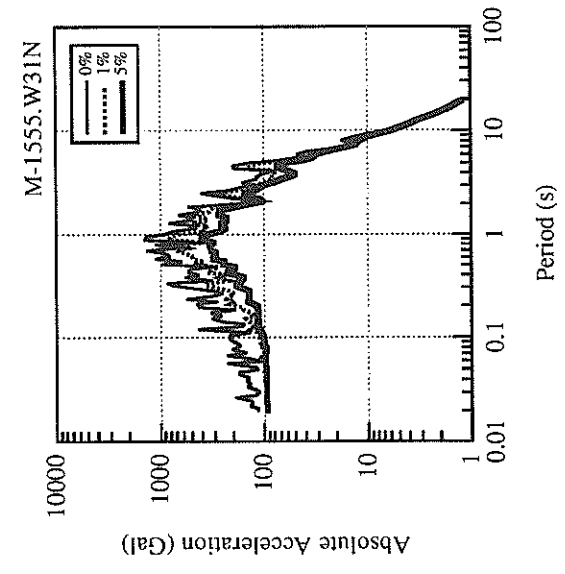
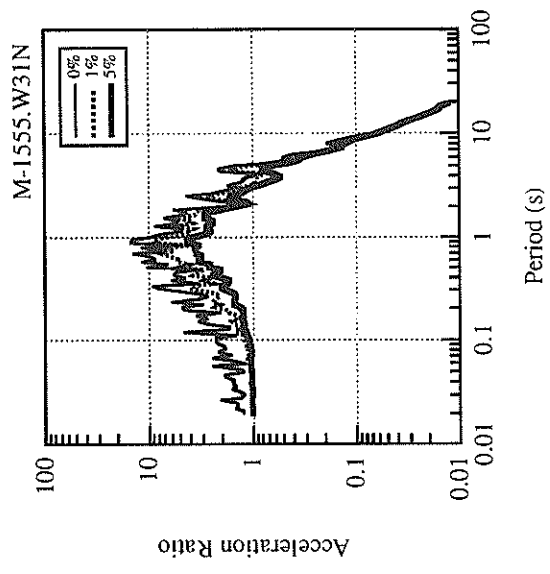


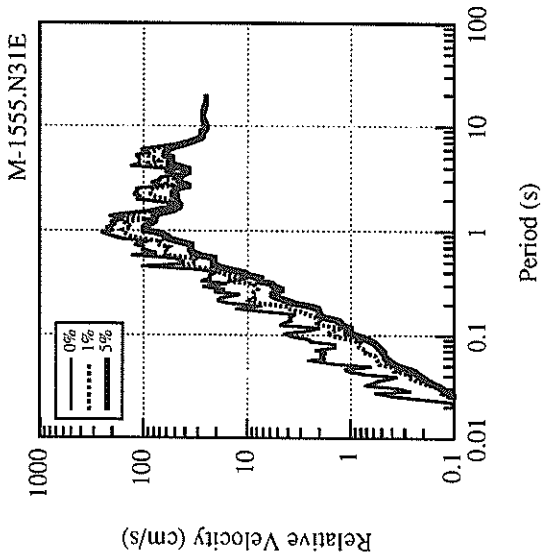


UP-DOWN component is not under observation.

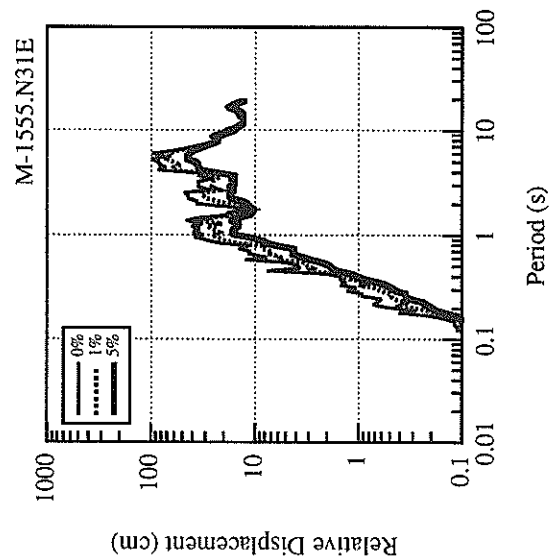
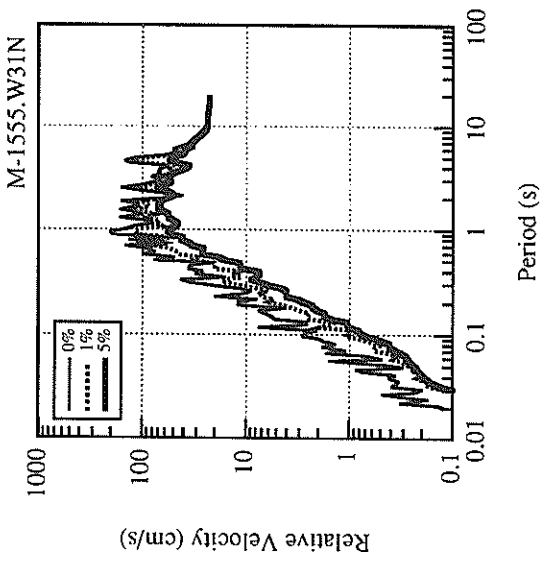


UP-DOWN component is not under observation.

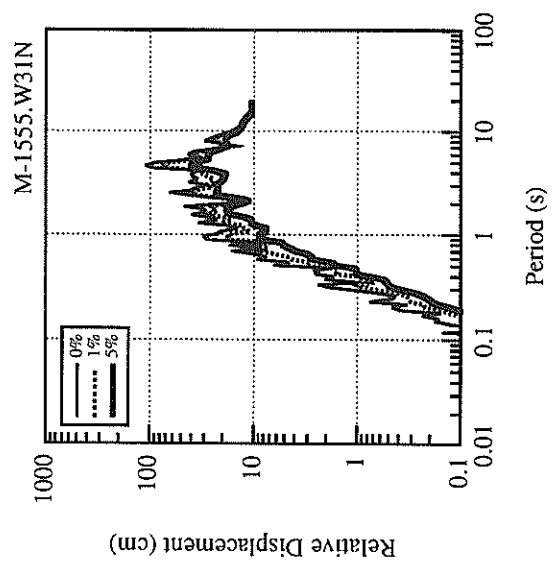


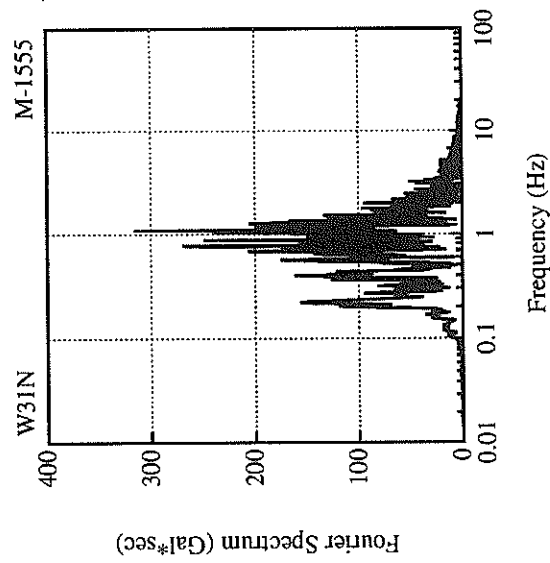
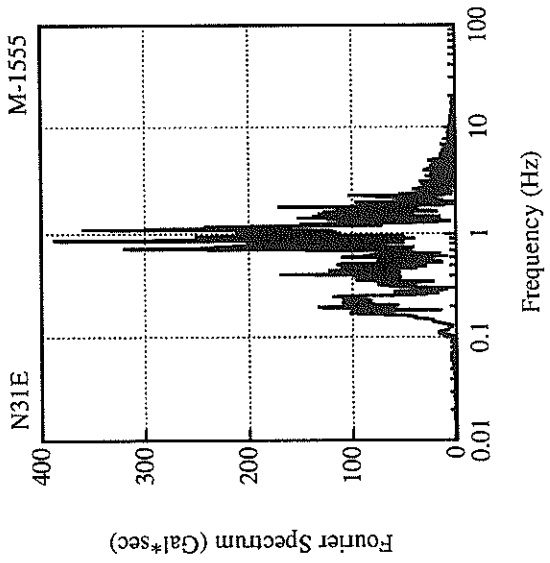


UP-DOWN component is
not under observation.

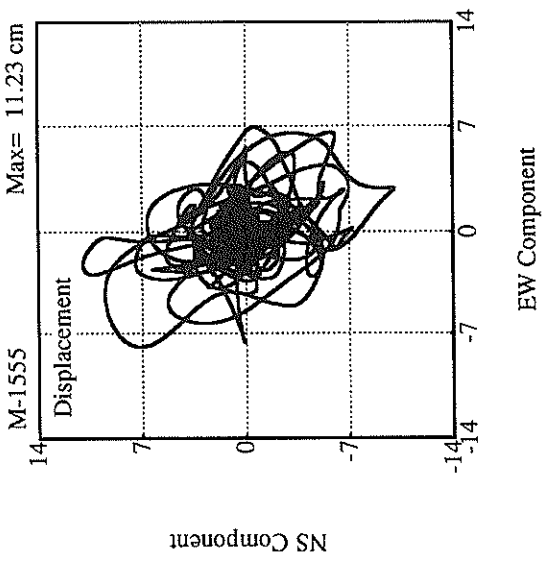
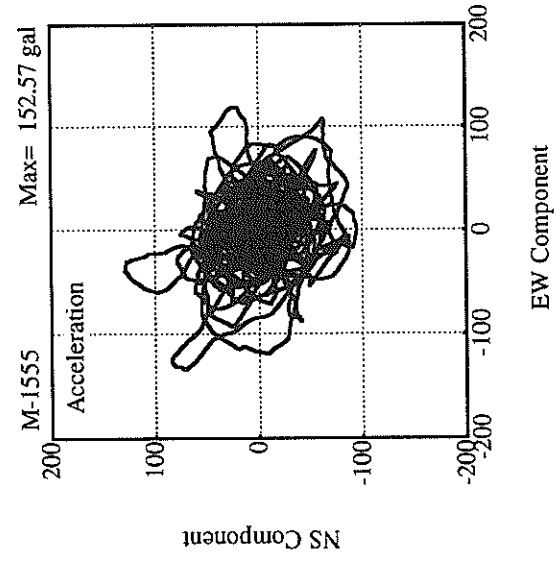
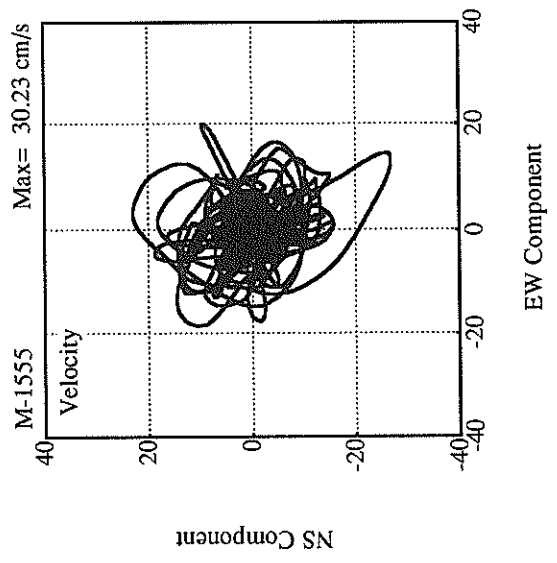


UP-DOWN component is
not under observation.





UP-DOWN component is
not under observation.



RECORD NUMBER : F-764

STATION : KOBE-DAI8-G

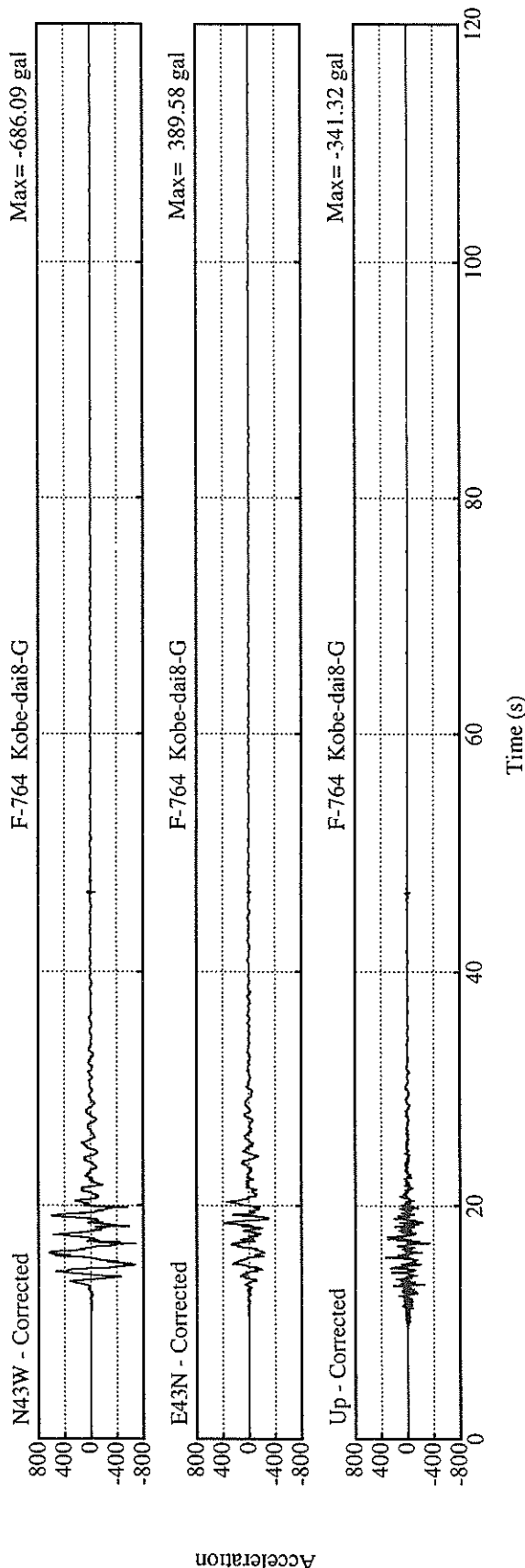
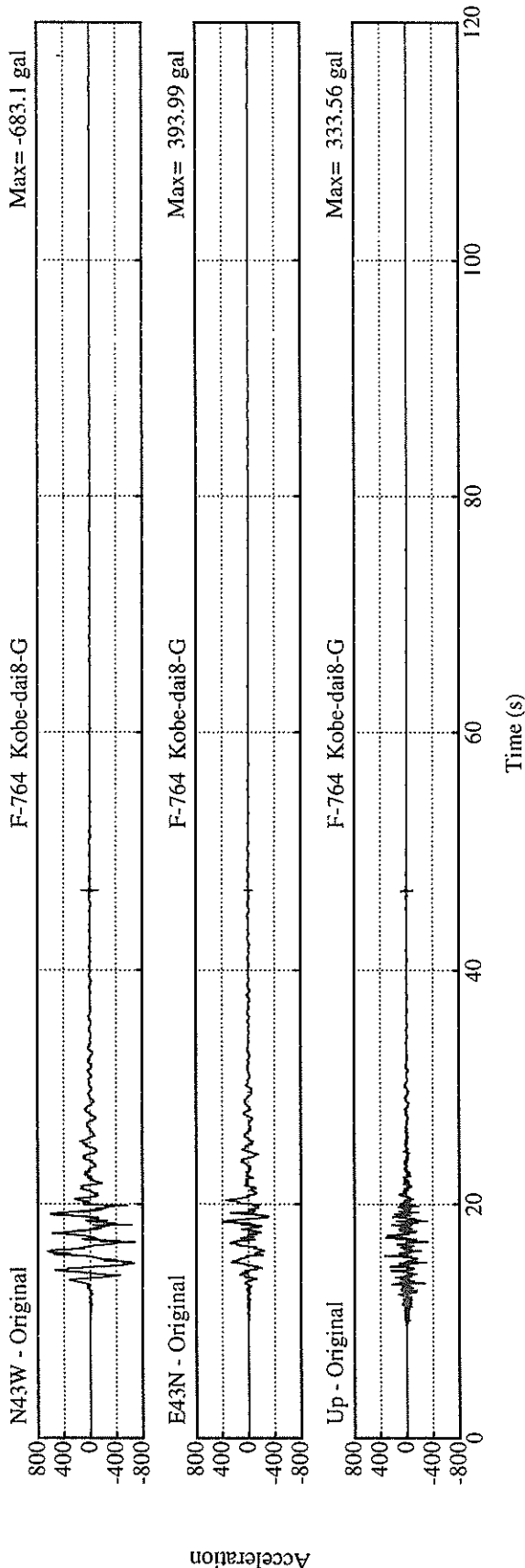
EARTHQUAKE DATA

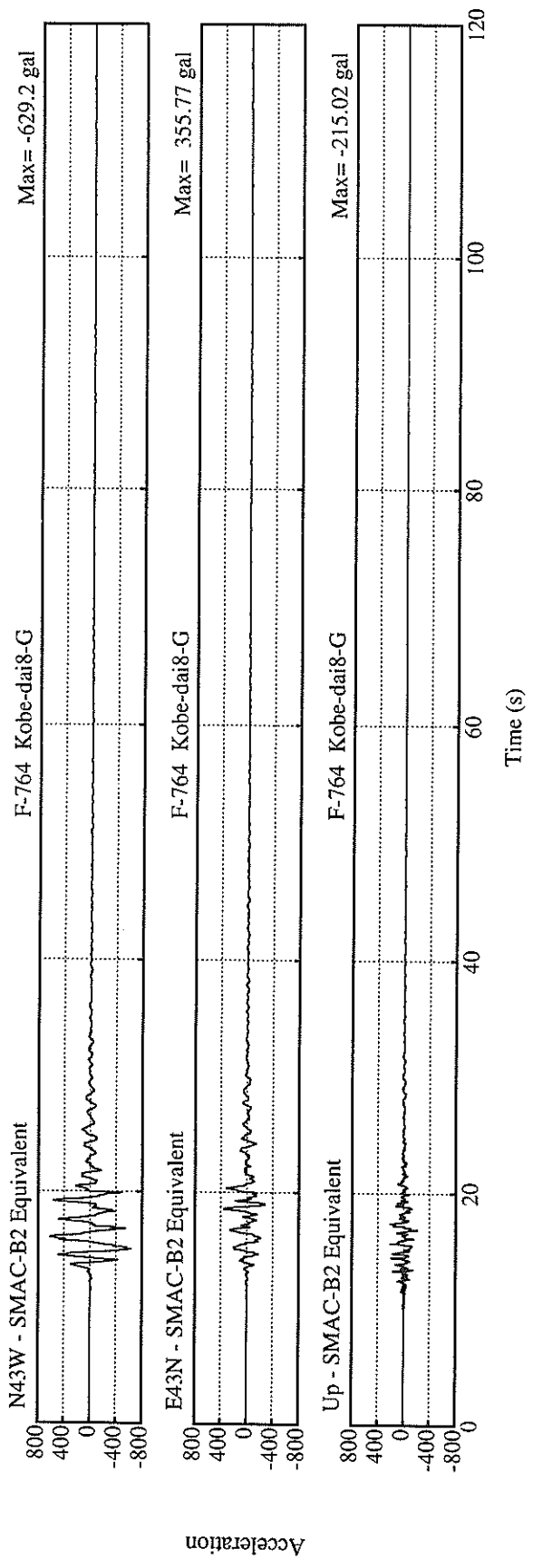
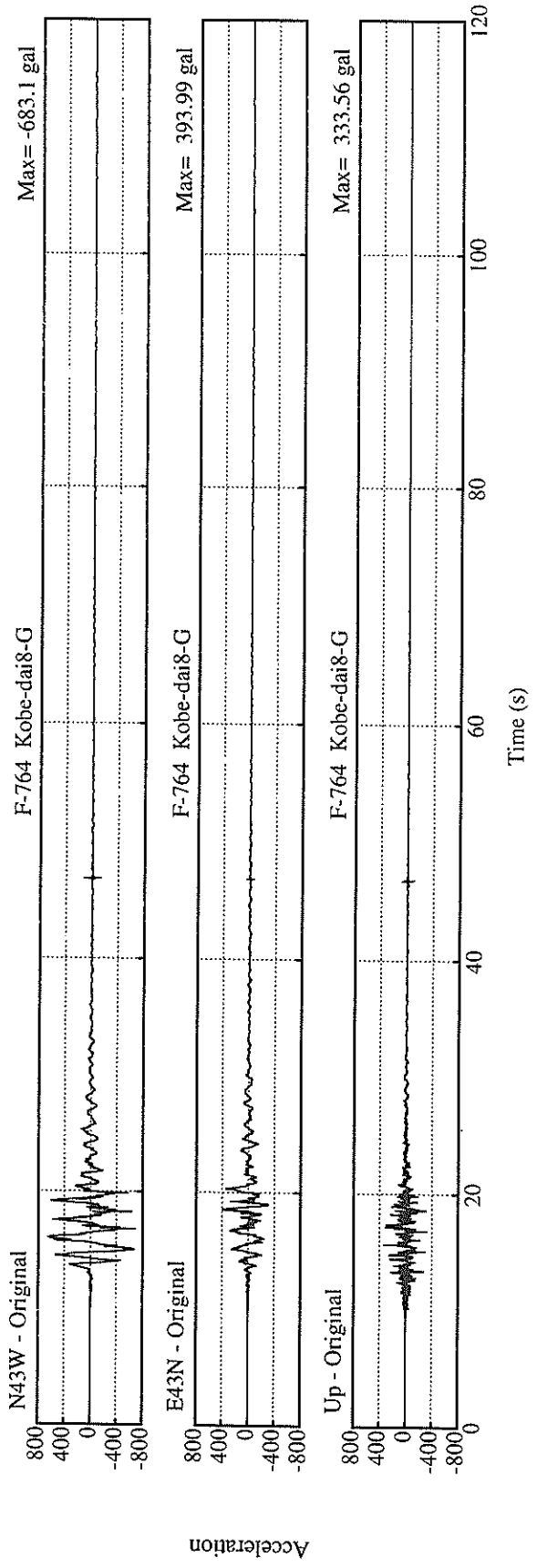
DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34°35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

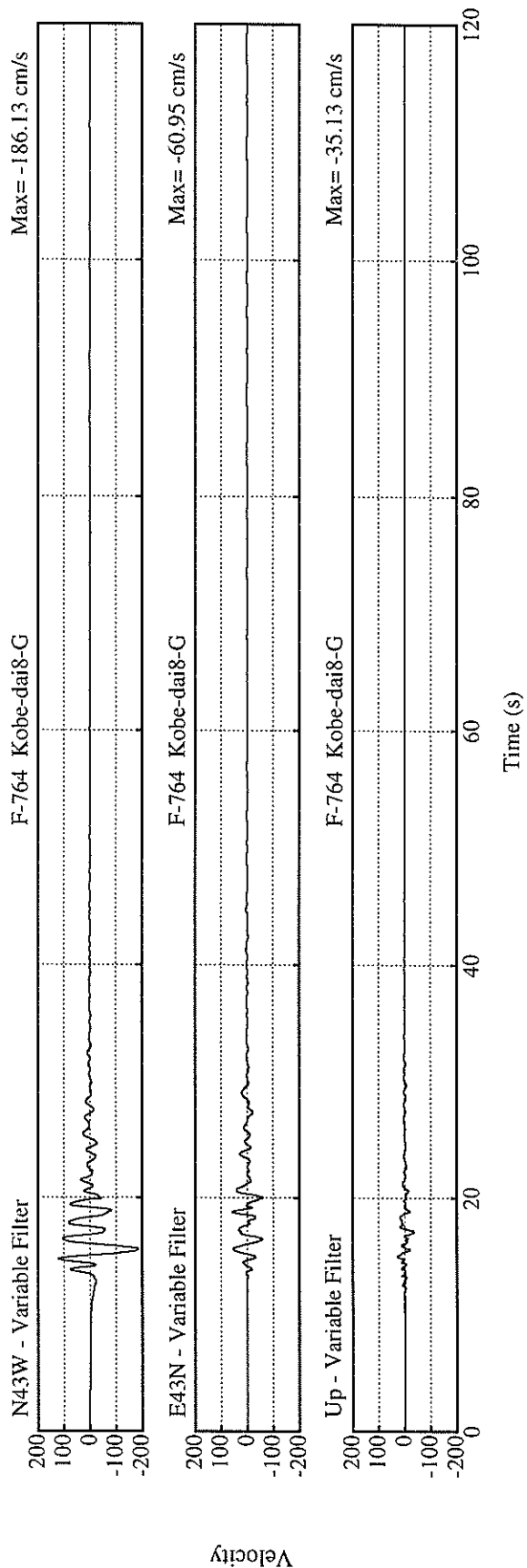
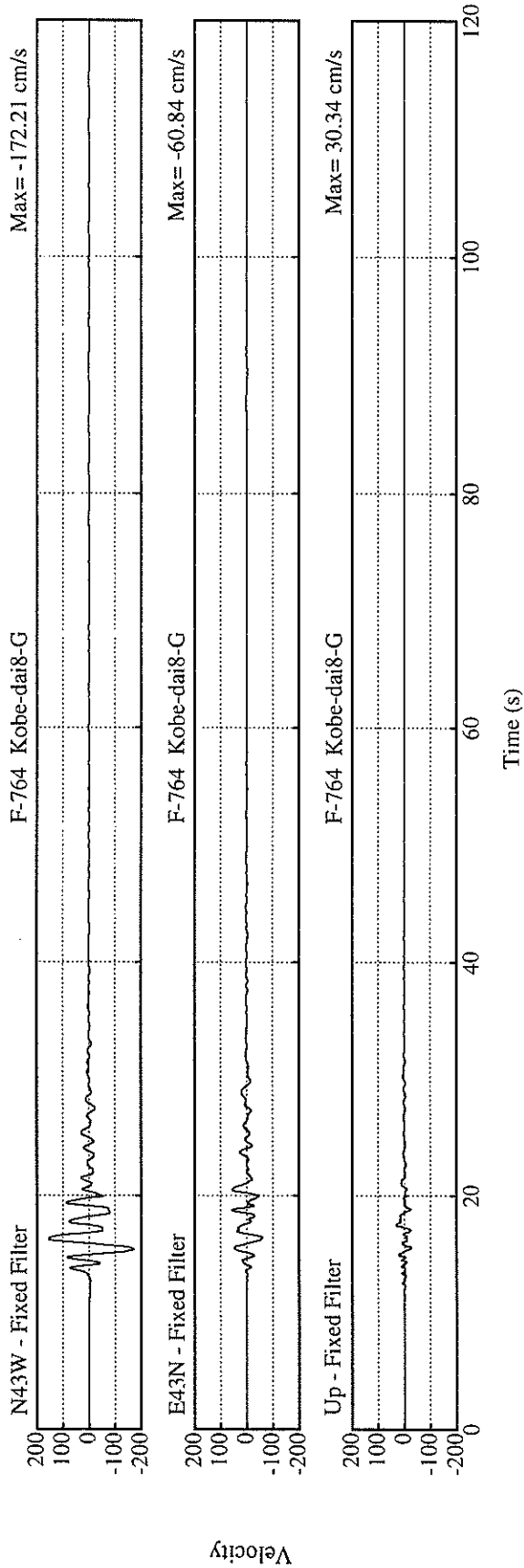
PEAK VALUES OF COMPONENTS

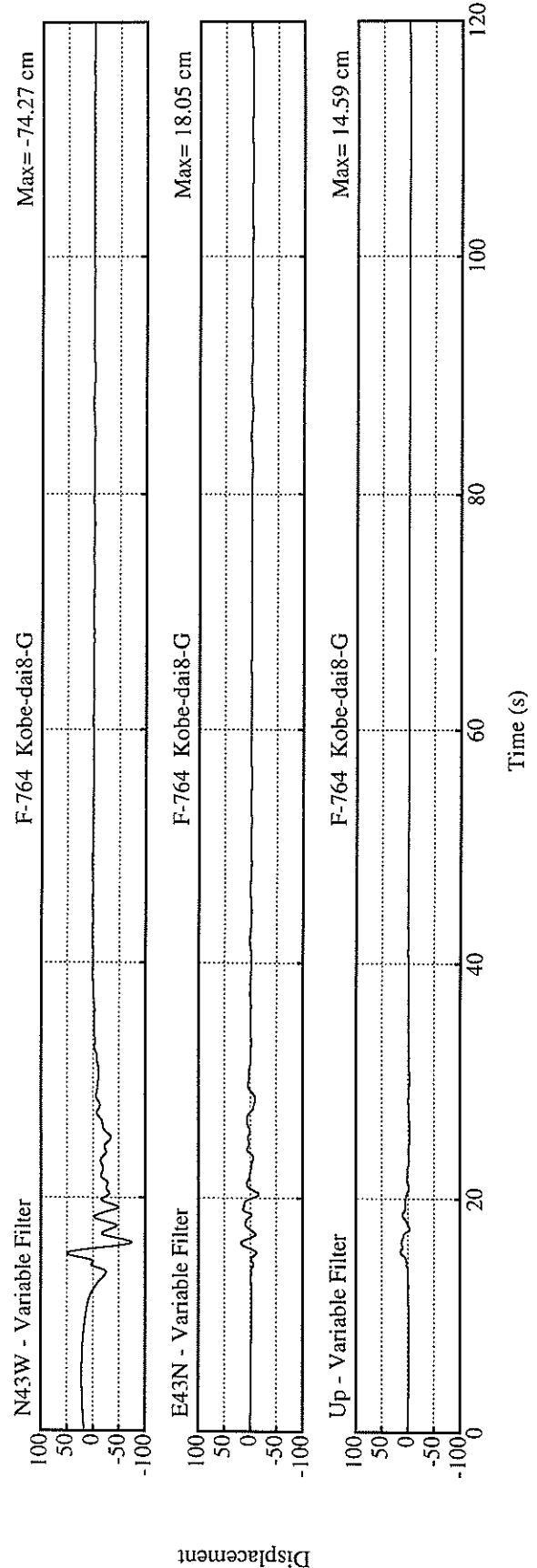
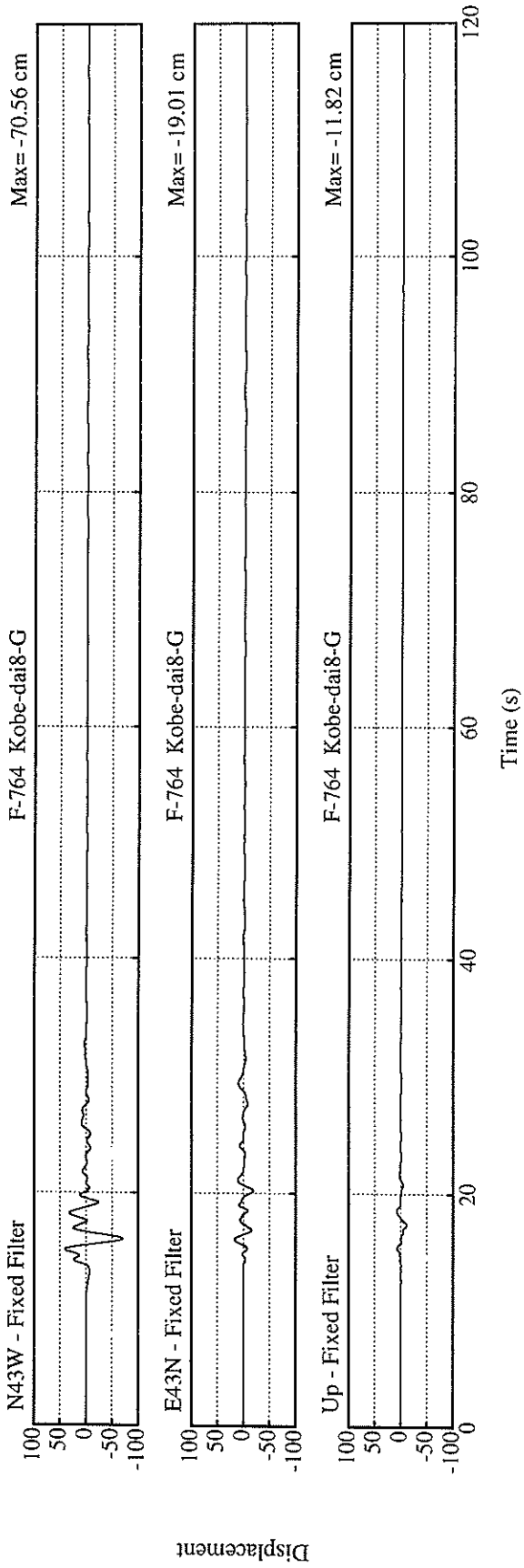
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.018	0.036	0.030	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	629.2	355.8	215.0	650.2
ORIGINAL	683.1	394.0	333.6	729.8
CORRECTED	686.1	389.6	341.3	726.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	172.21	60.84	30.34	177.23
VARIABLE FILTER	186.13	60.95	35.13	193.76
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	70.56	19.01	11.82	72.58
VARIABLE FILTER	74.27	18.05	14.59	76.42

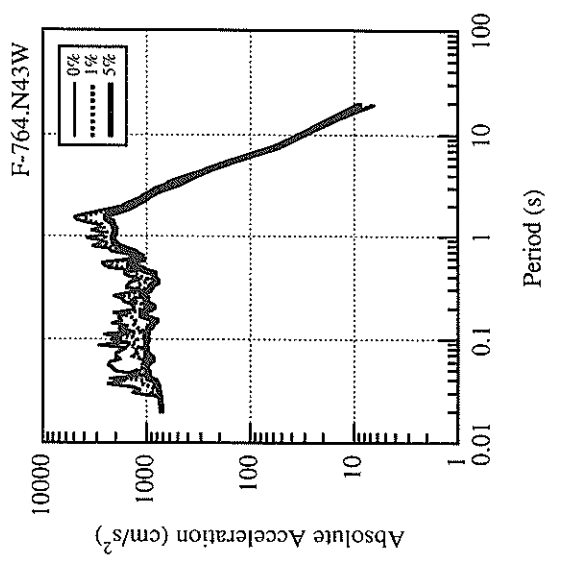
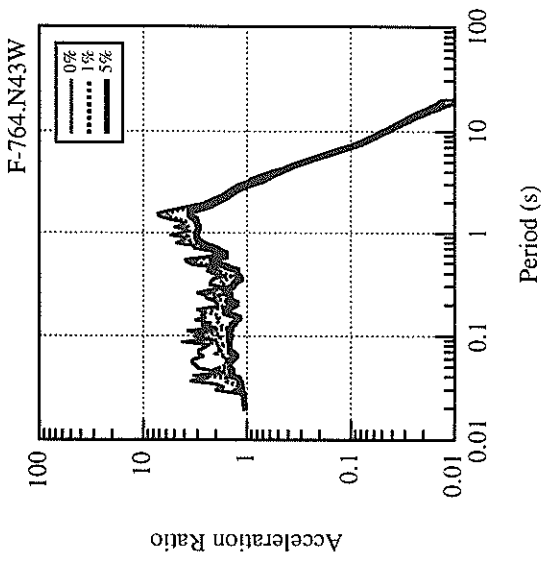
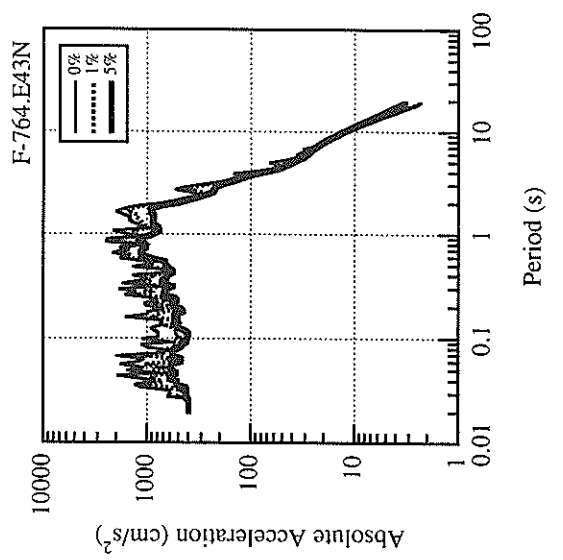
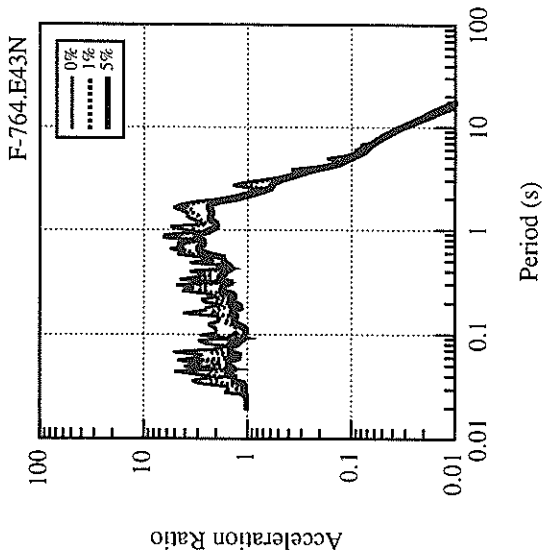
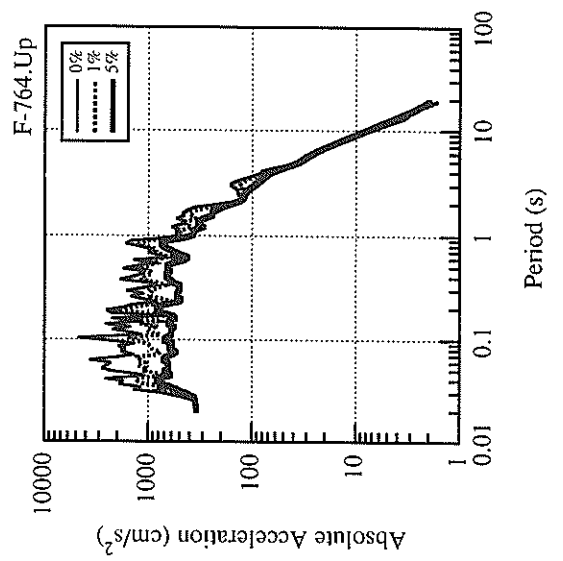
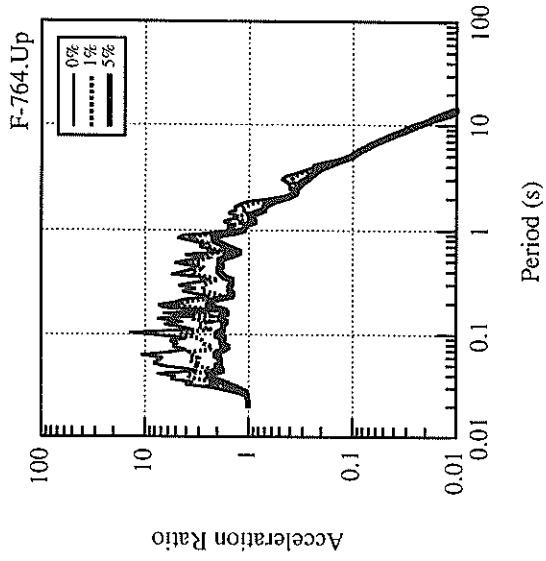
* RESULTANT OF HORIZONTAL COMPONENTS

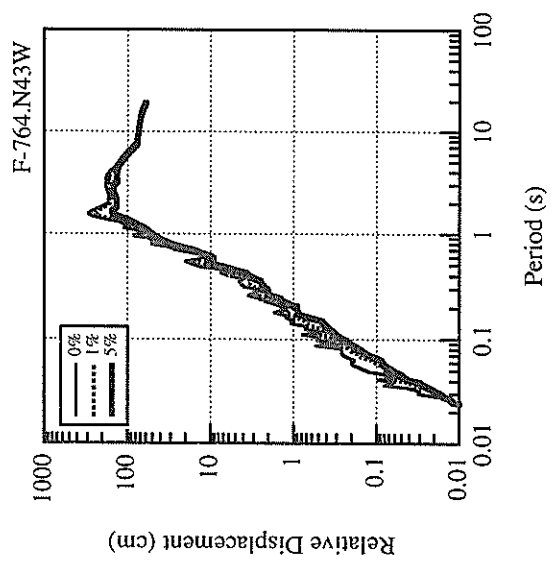
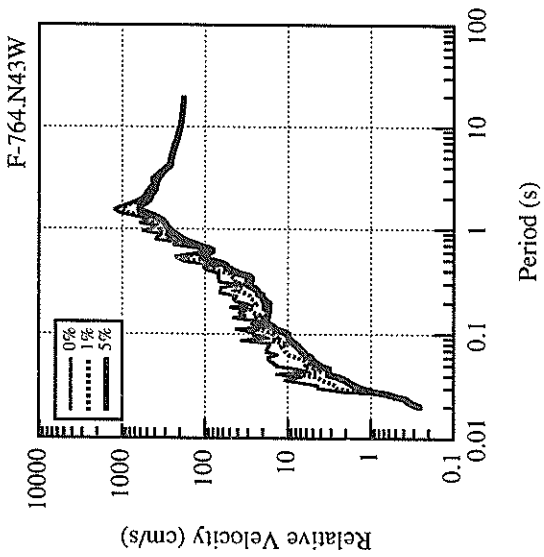
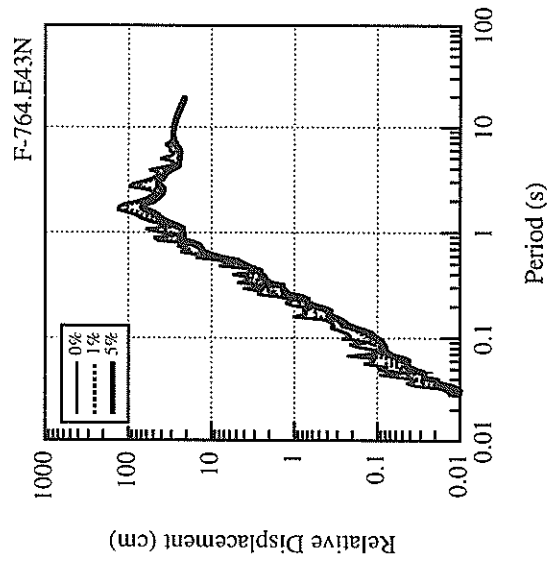
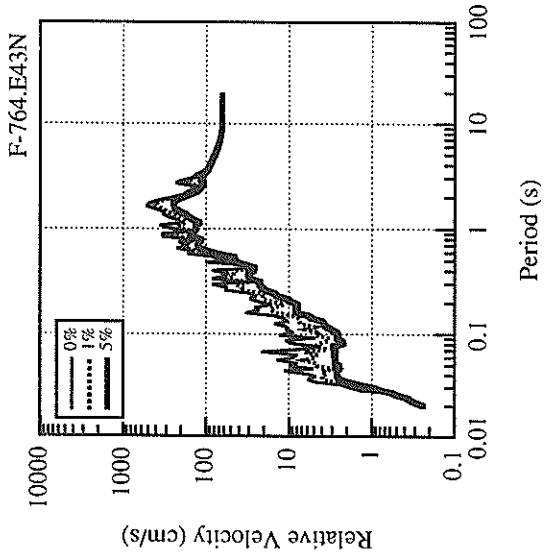
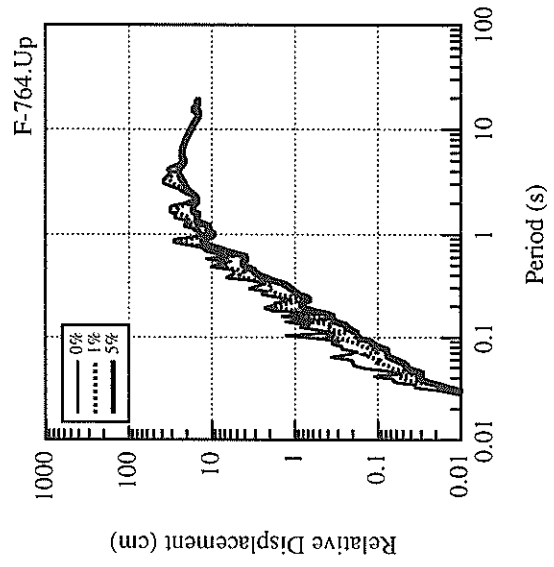
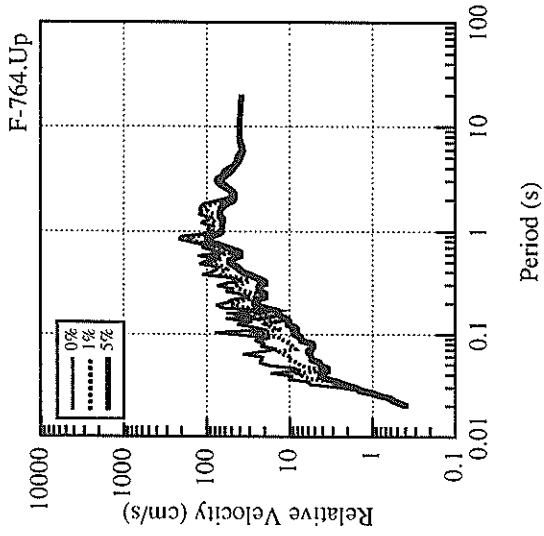


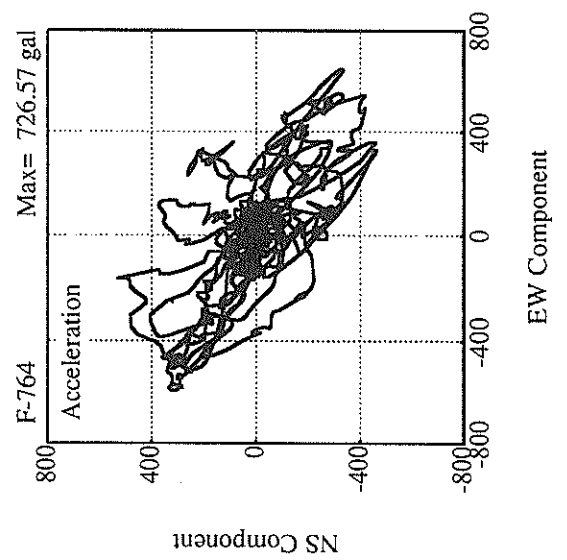
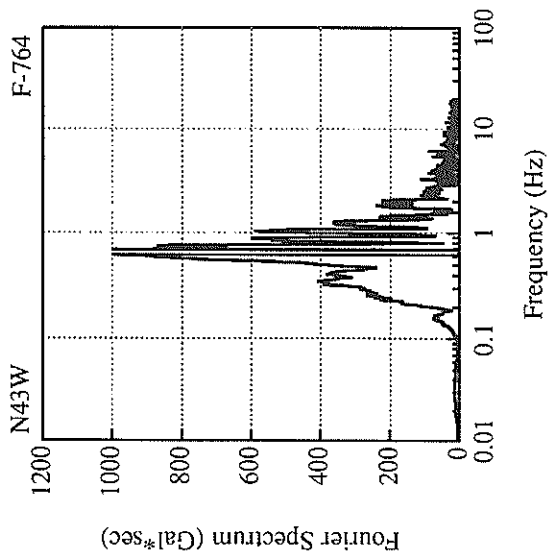
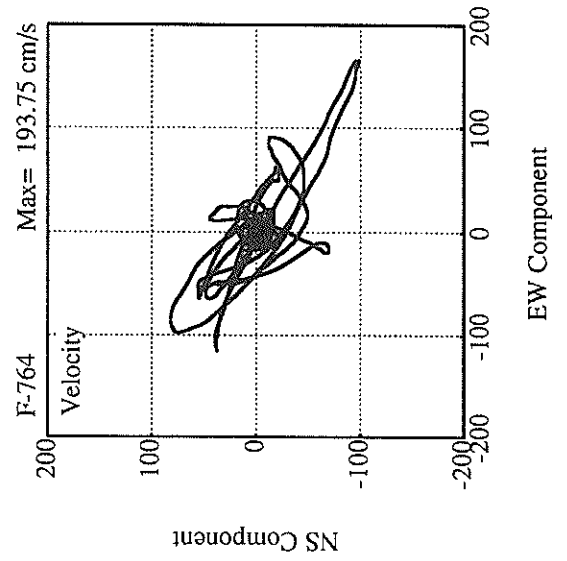
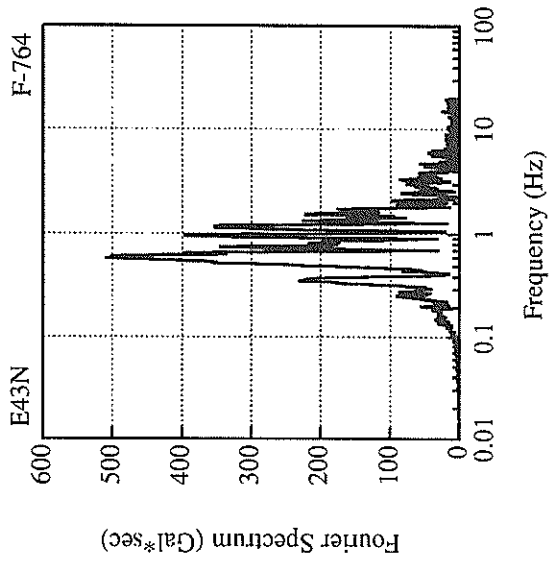
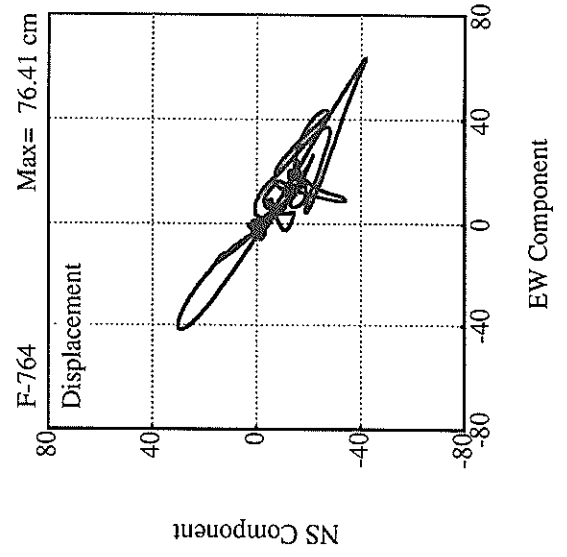
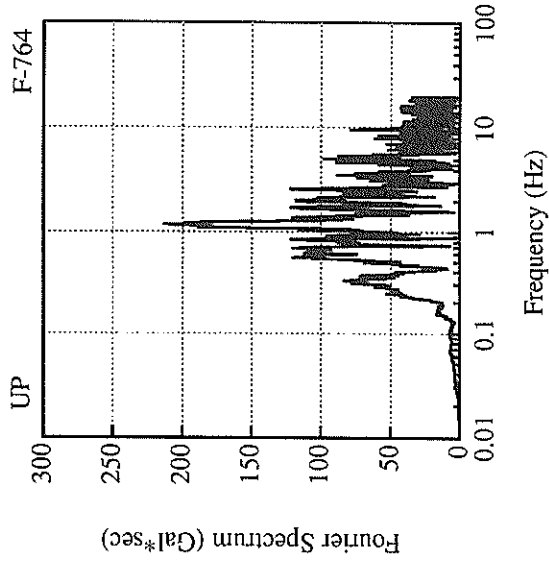












RECORD NUMBER : F-765
 STATION : AMAGASAKI-G

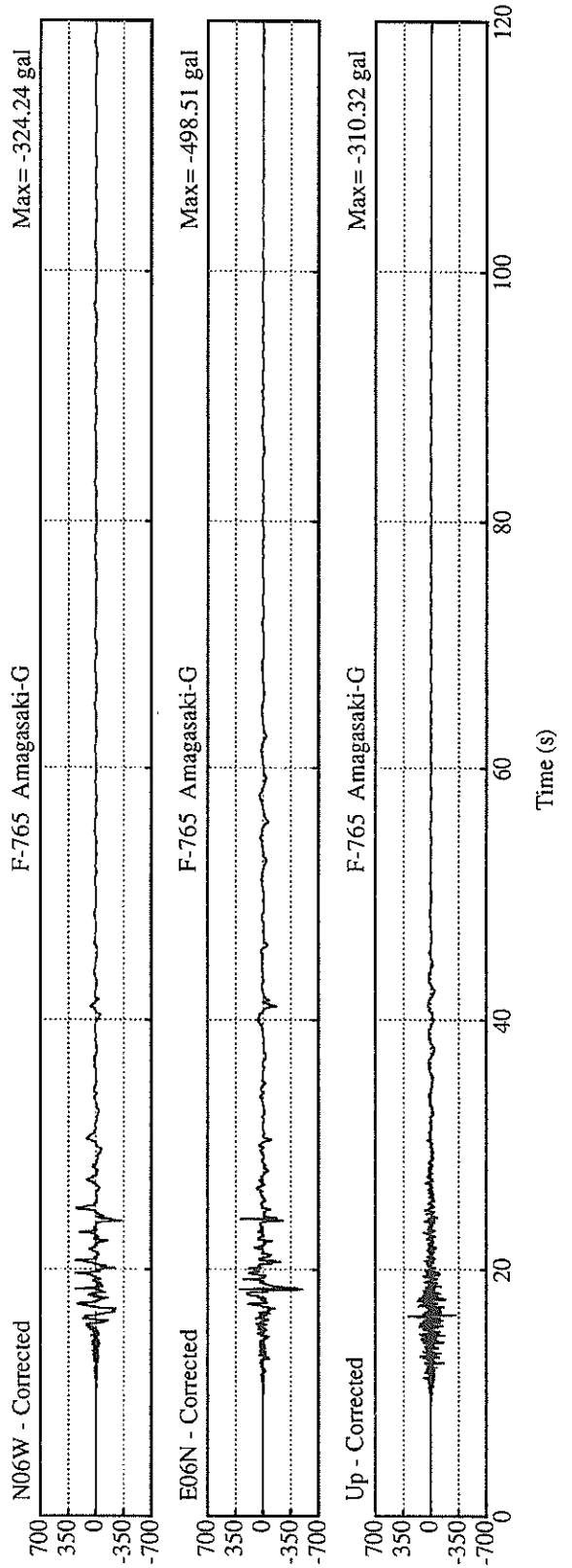
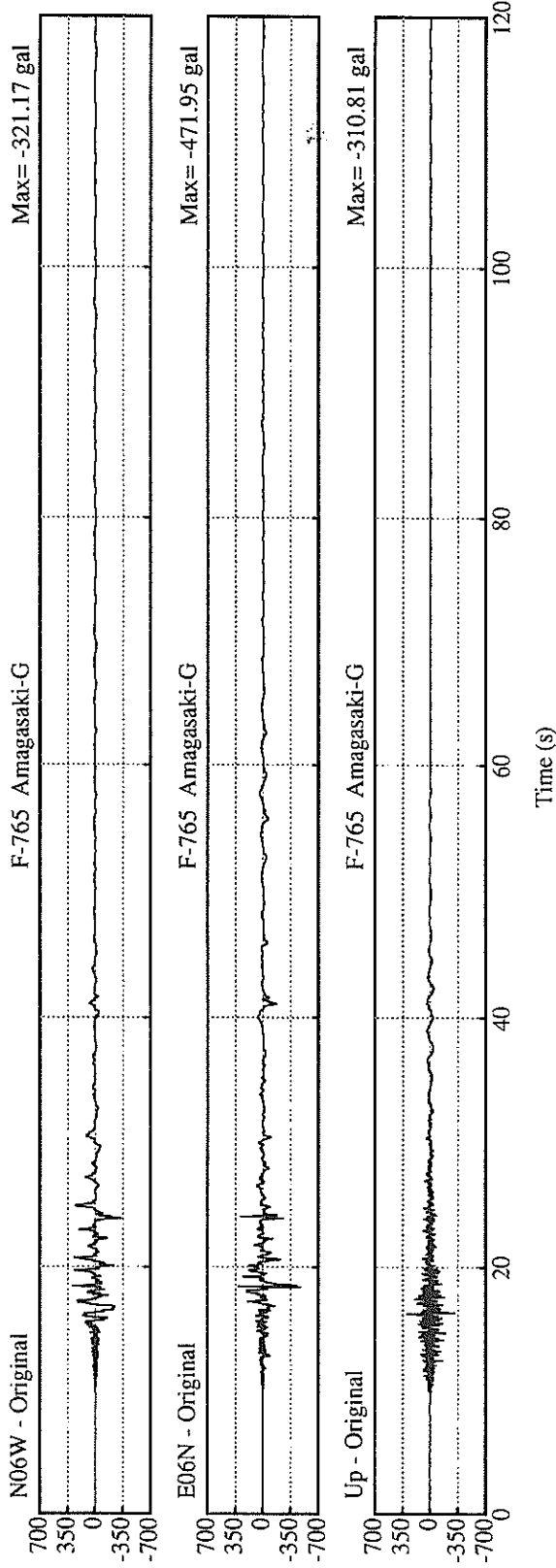
EARTHQUAKE DATA

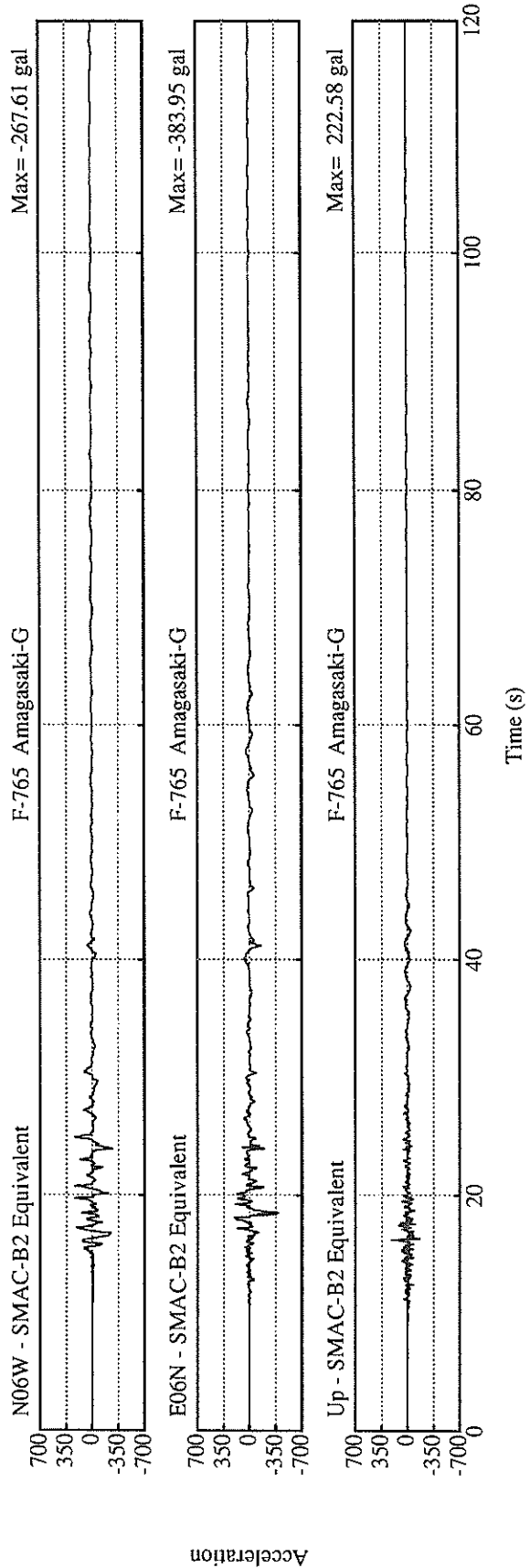
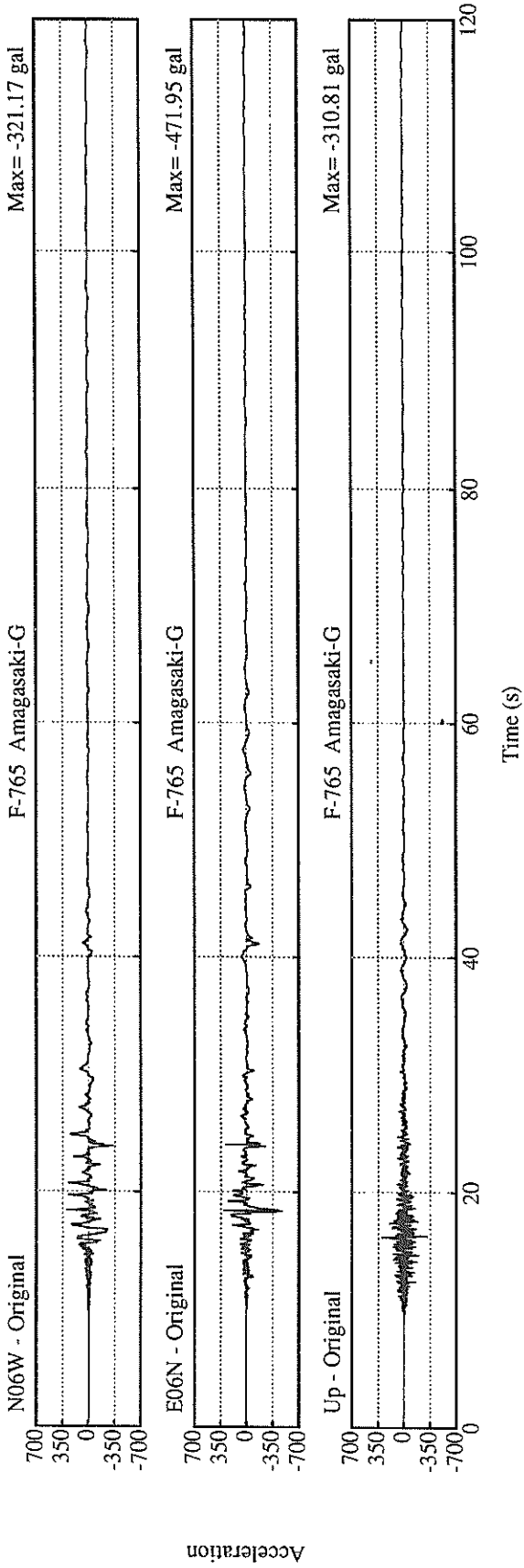
 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34°35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

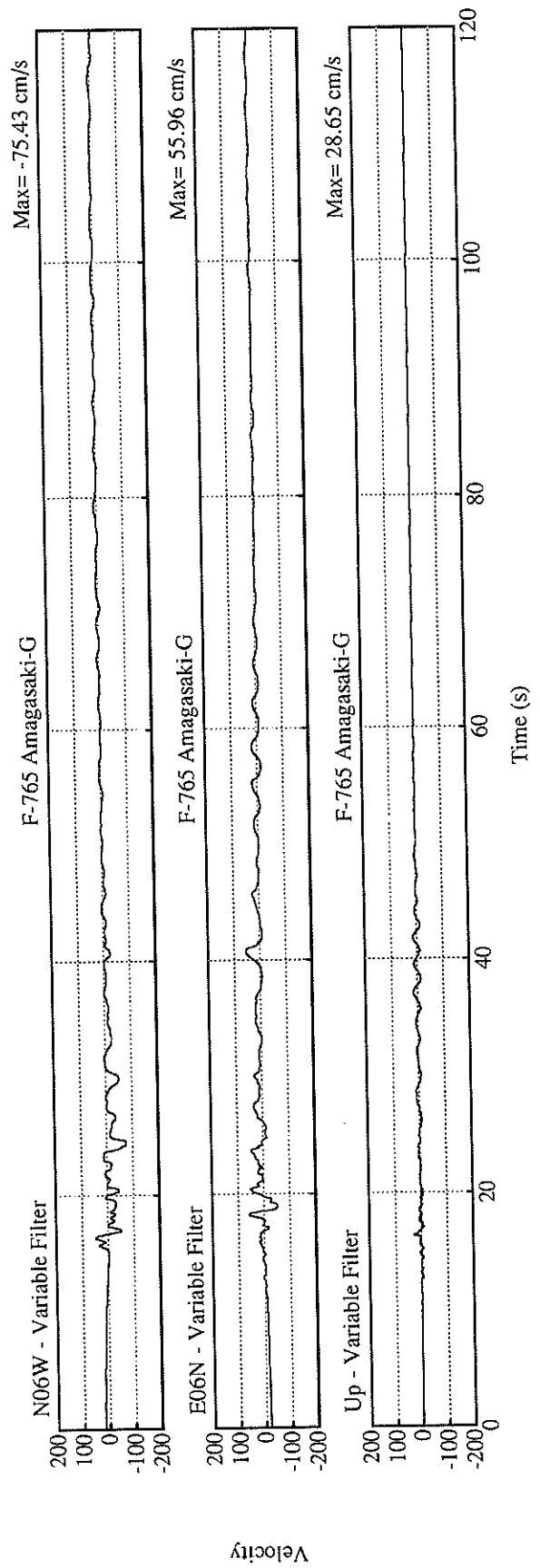
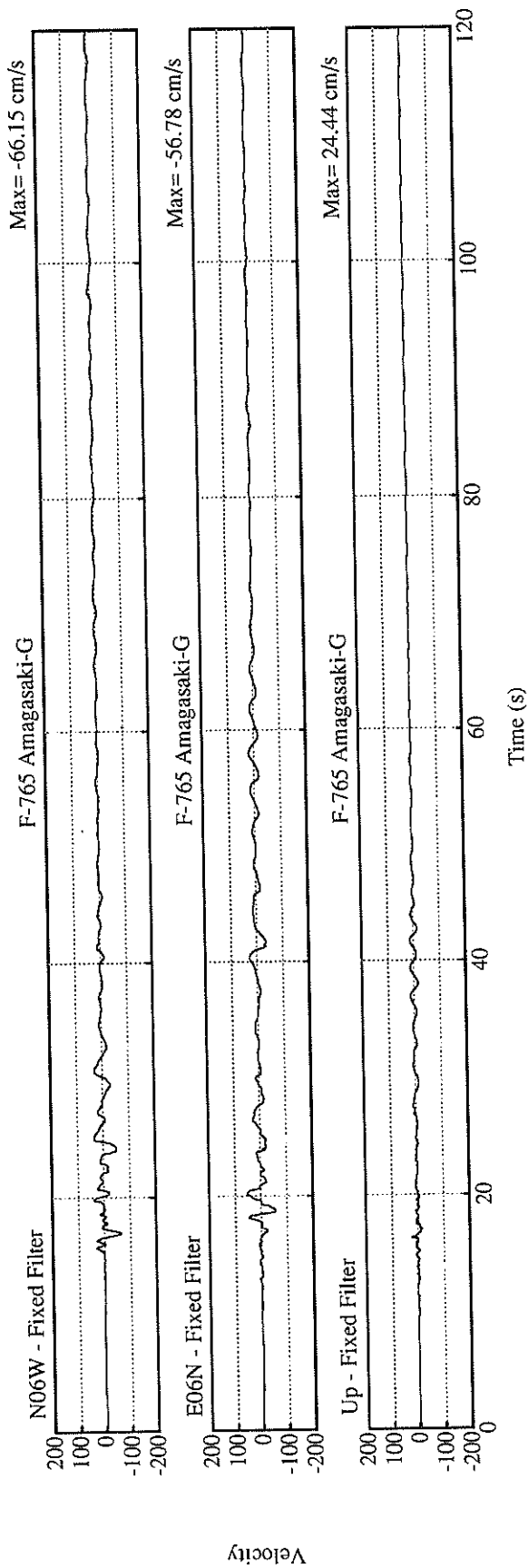
PEAK VALUES OF COMPONENTS

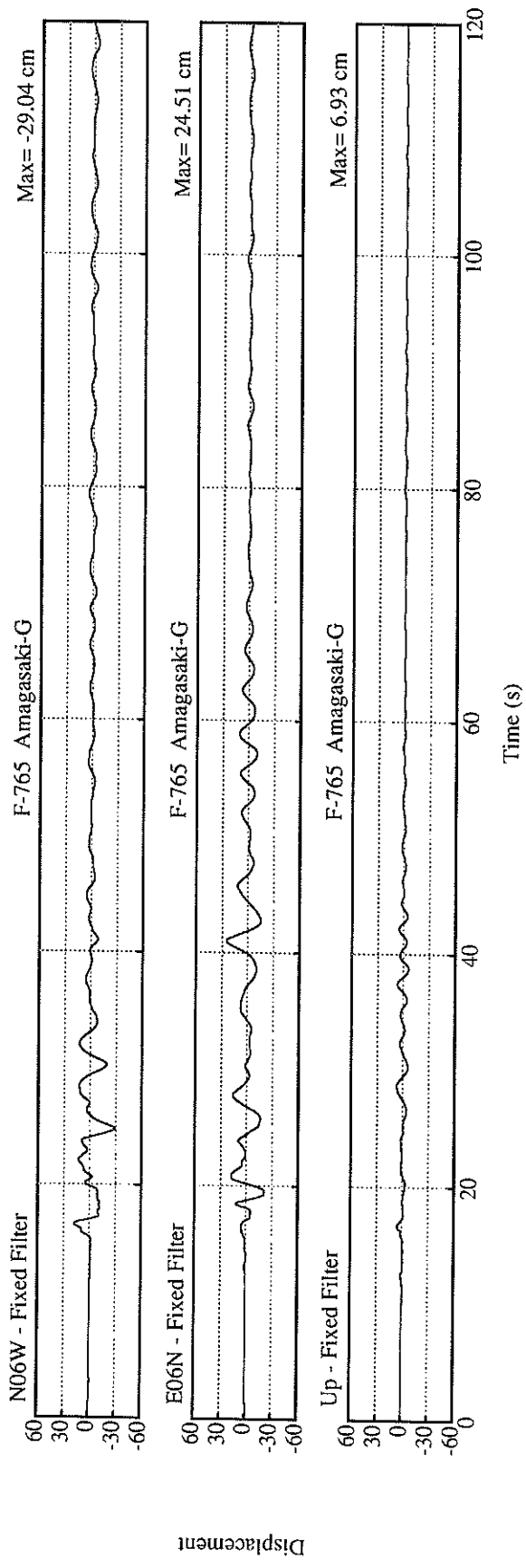
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.012	0.012	0.067	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	267.6	383.9	222.6	397.3
ORIGINAL	321.2	472.0	310.8	473.2
CORRECTED	324.2	498.5	310.3	499.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	66.15	56.78	24.44	69.76
VARIABLE FILTER	75.43	55.96	28.65	75.50
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	29.04	24.51	6.93	30.10
VARIABLE FILTER	****	****	****	****

* RESULTANT OF HORIZONTAL COMPONENTS

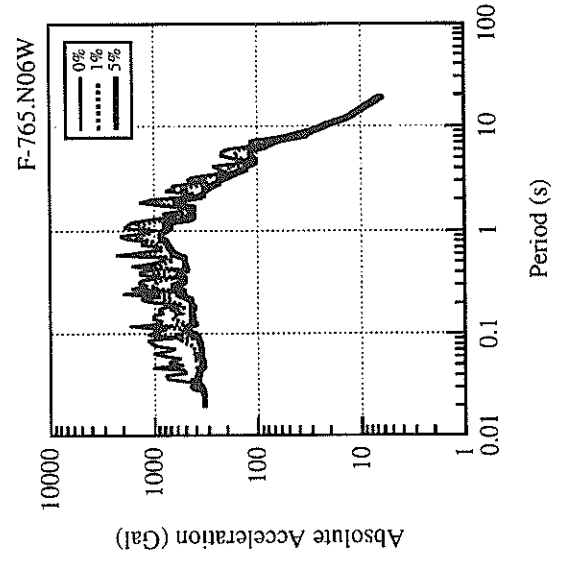
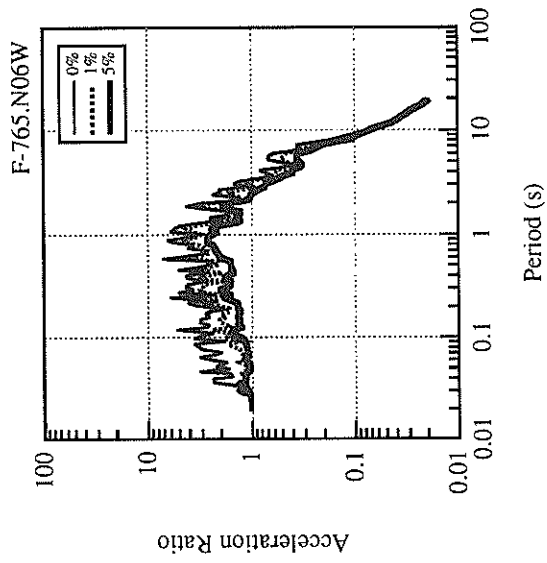
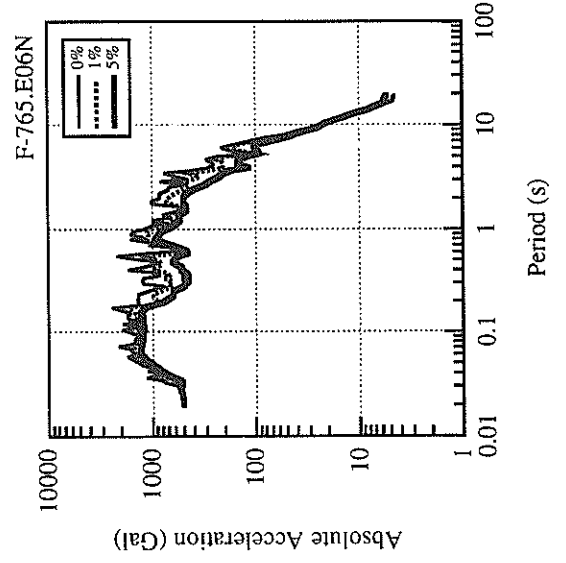
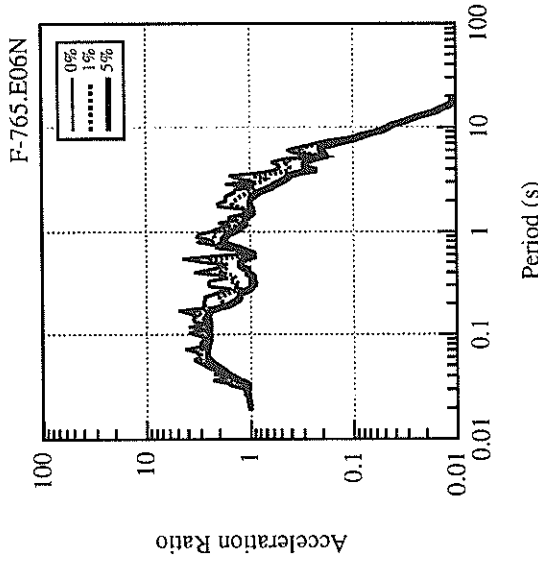
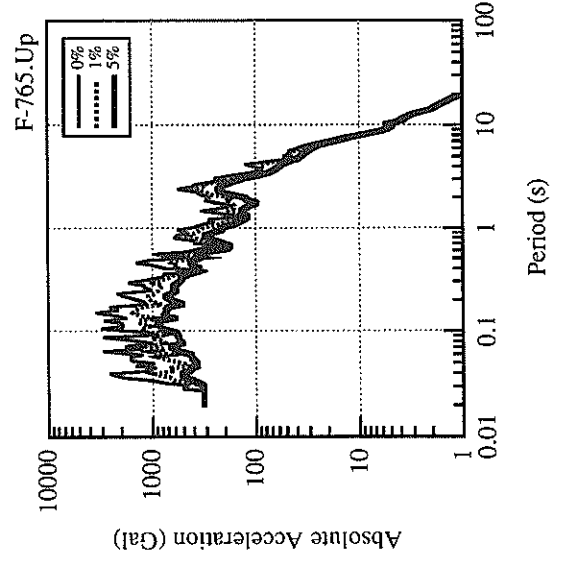
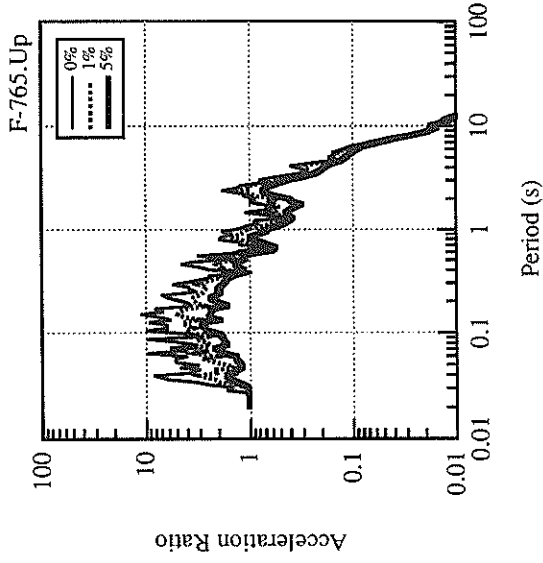


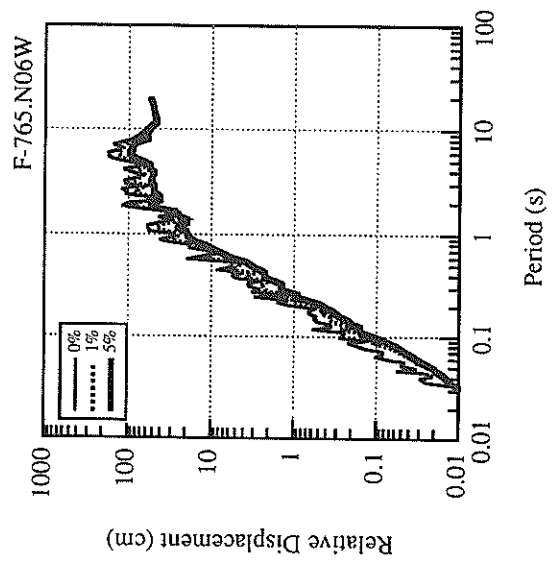
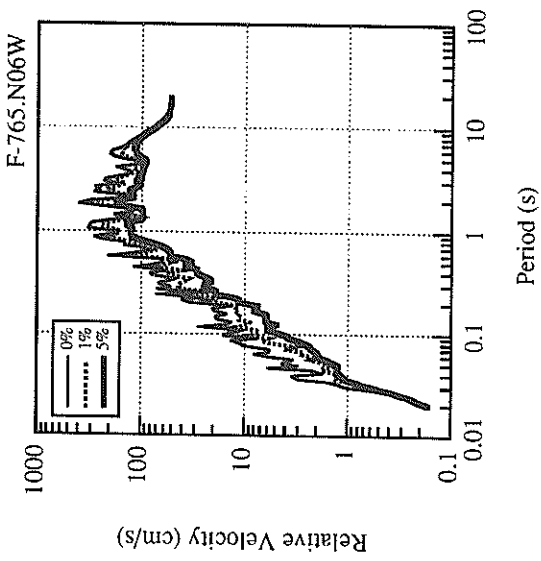
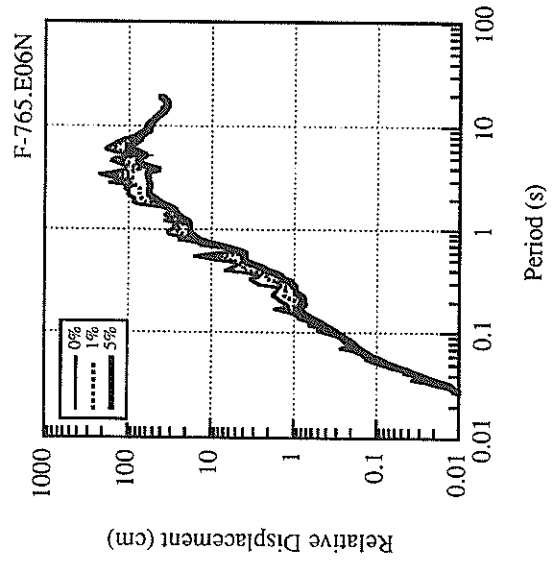
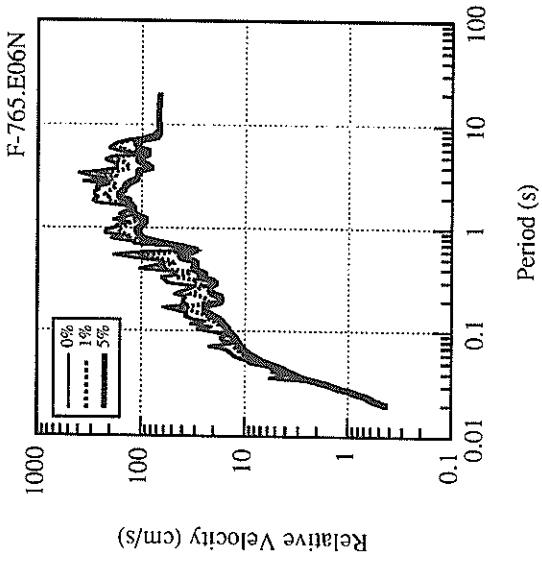
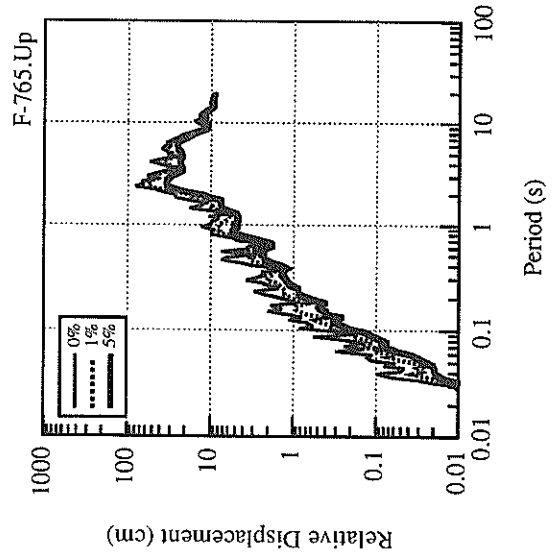
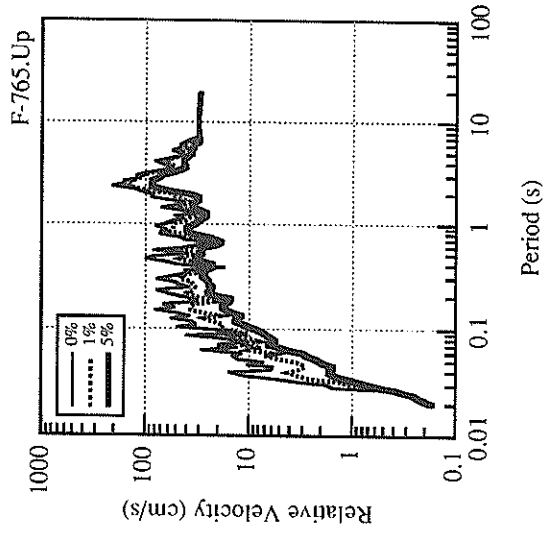


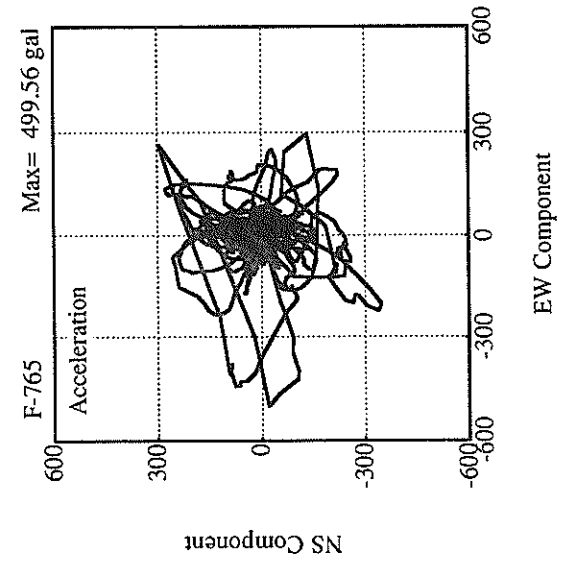
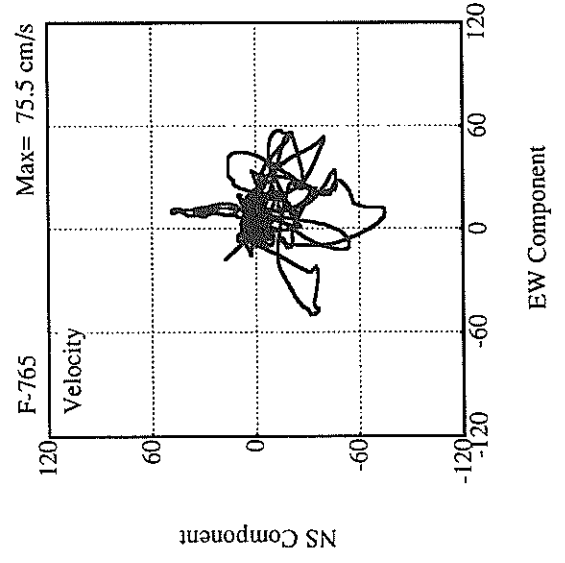
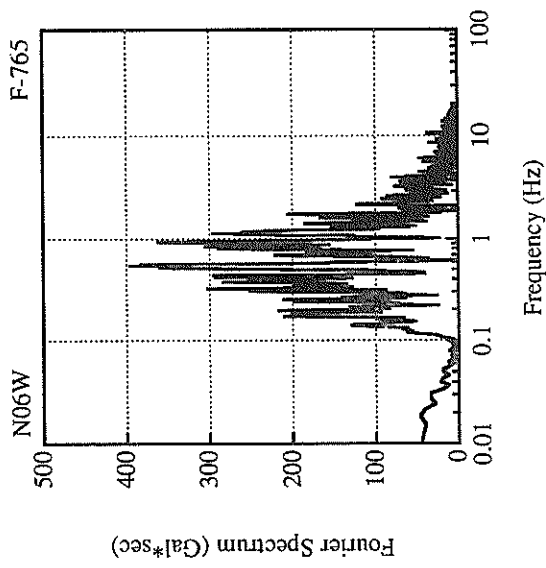
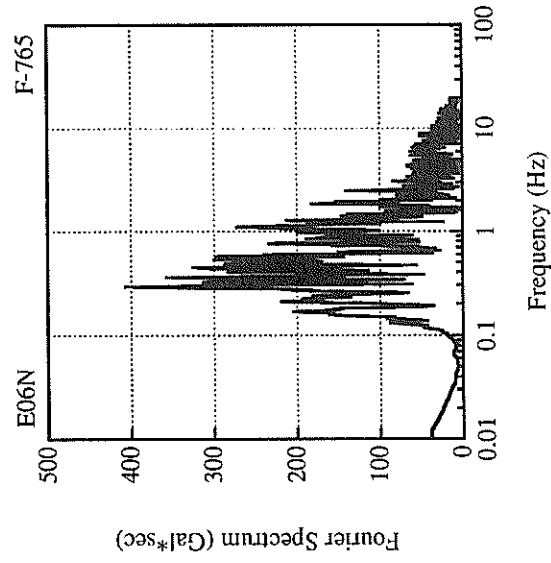
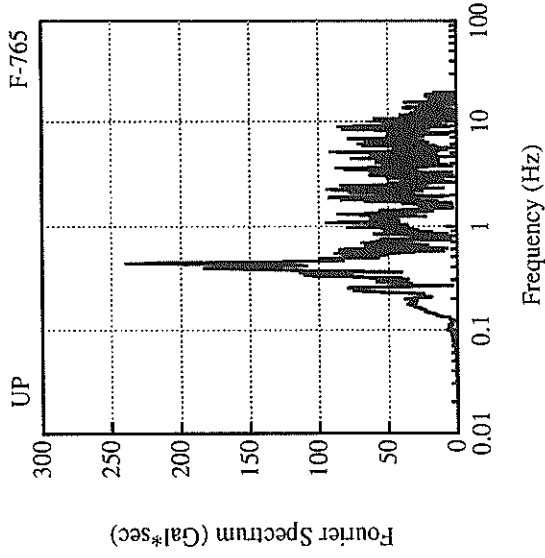




* Abnormal displacement are calculated with variable filter due to the inclination and movement of accelerometer.







* Abnormal displacement are calculated with variable filter due to the inclination and movement of accelerometer.

RECORD NUMBER : F-787
 STATION : TOYAMA-GB

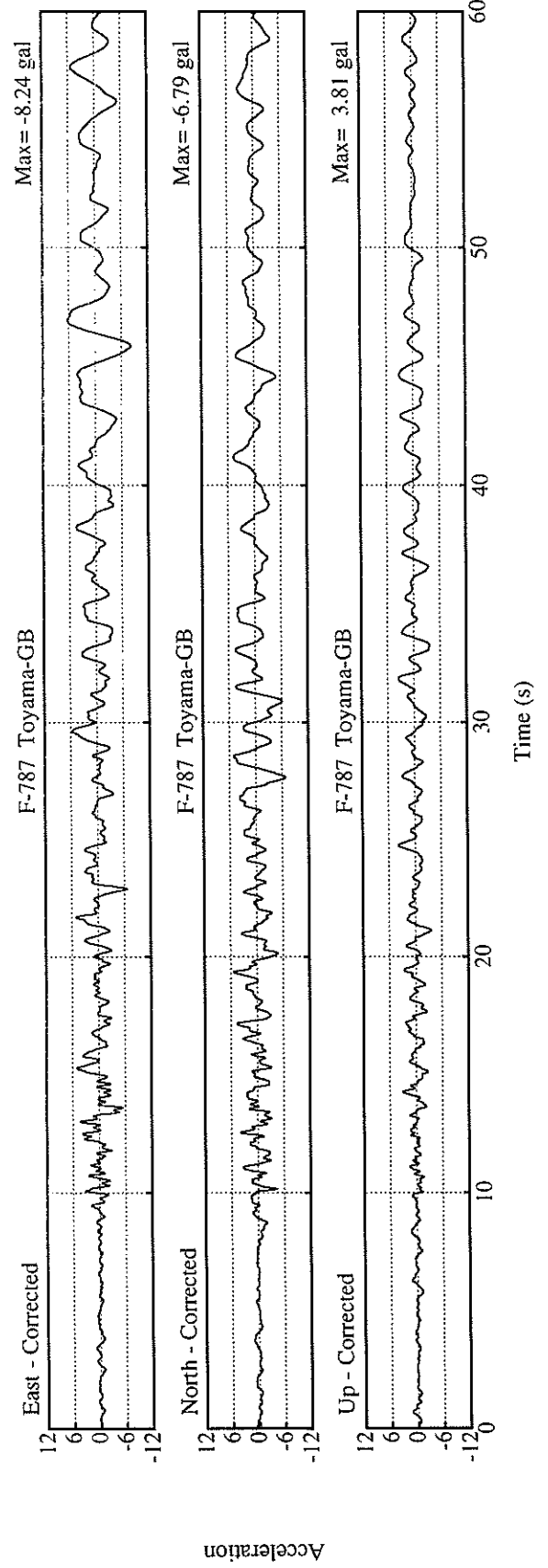
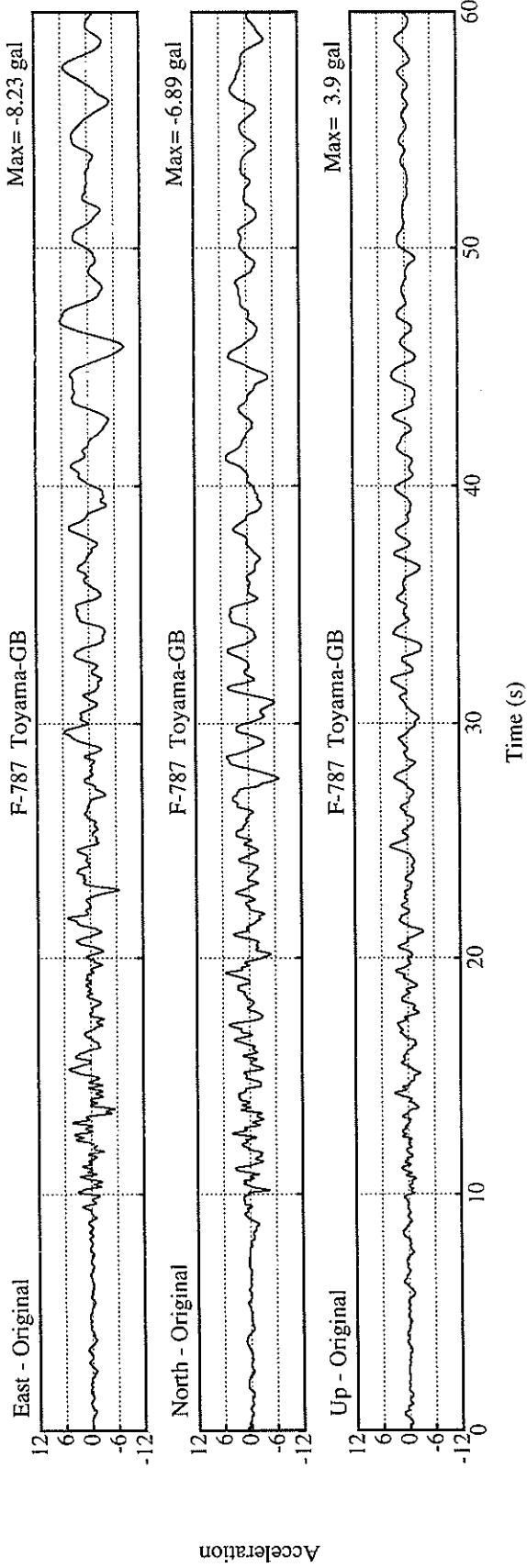
EARTHQUAKE DATA

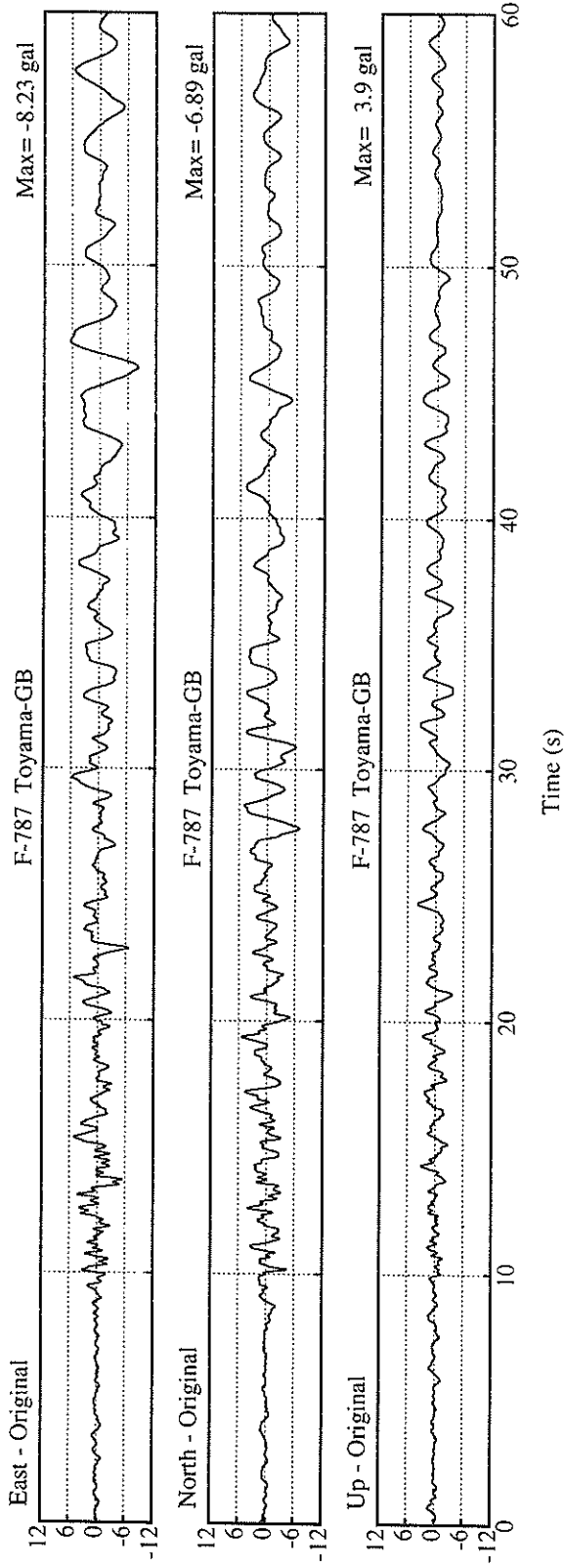
 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34° 35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

PEAK VALUES OF COMPONENTS

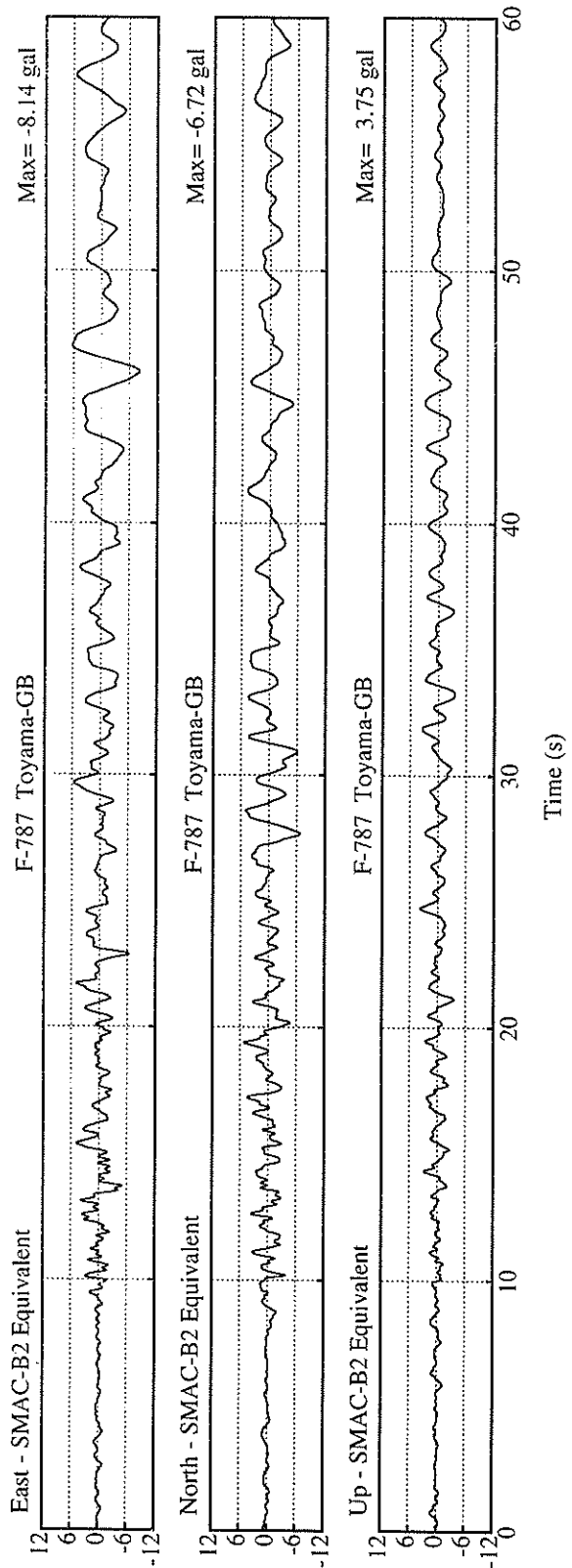
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.054	0.066	0.115	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.7	8.1	3.7	8.3
ORIGINAL	6.9	8.2	3.9	8.3
CORRECTED	6.8	8.2	3.8	8.4
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	2.19	3.68	1.25	3.85
VARIABLE FILTER	2.91	3.24	1.12	3.37
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	1.37	1.63	0.53	2.00
VARIABLE FILTER	2.46	1.78	0.51	2.62

* RESULTANT OF HORIZONTAL COMPONENTS

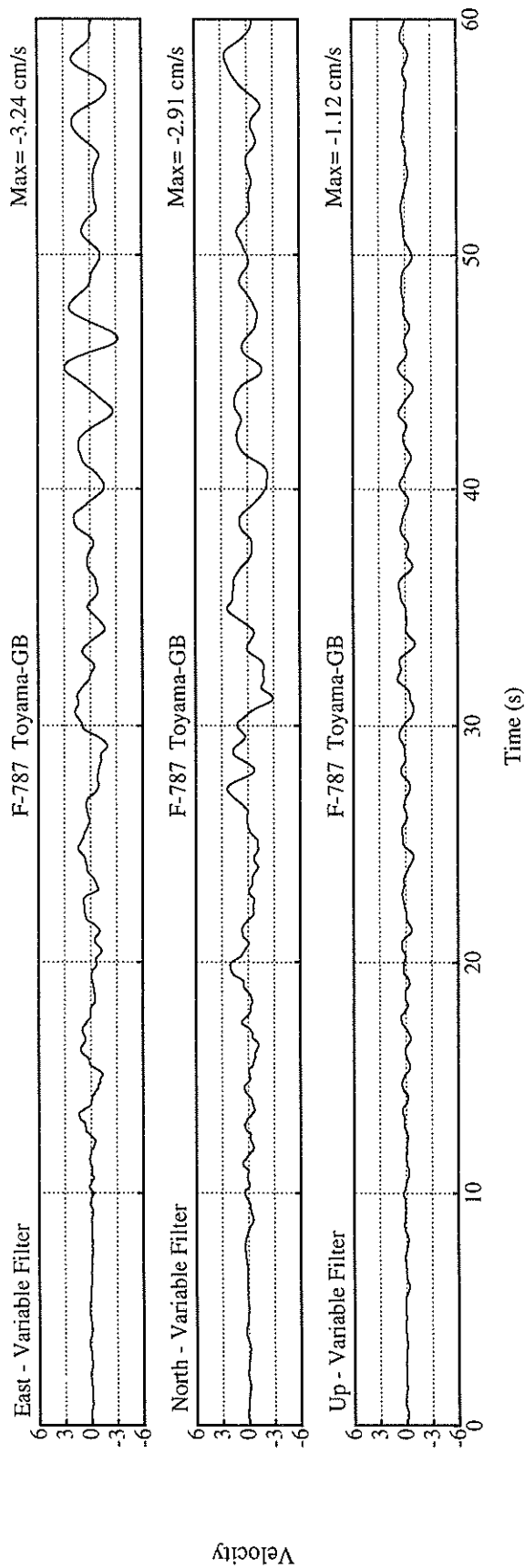
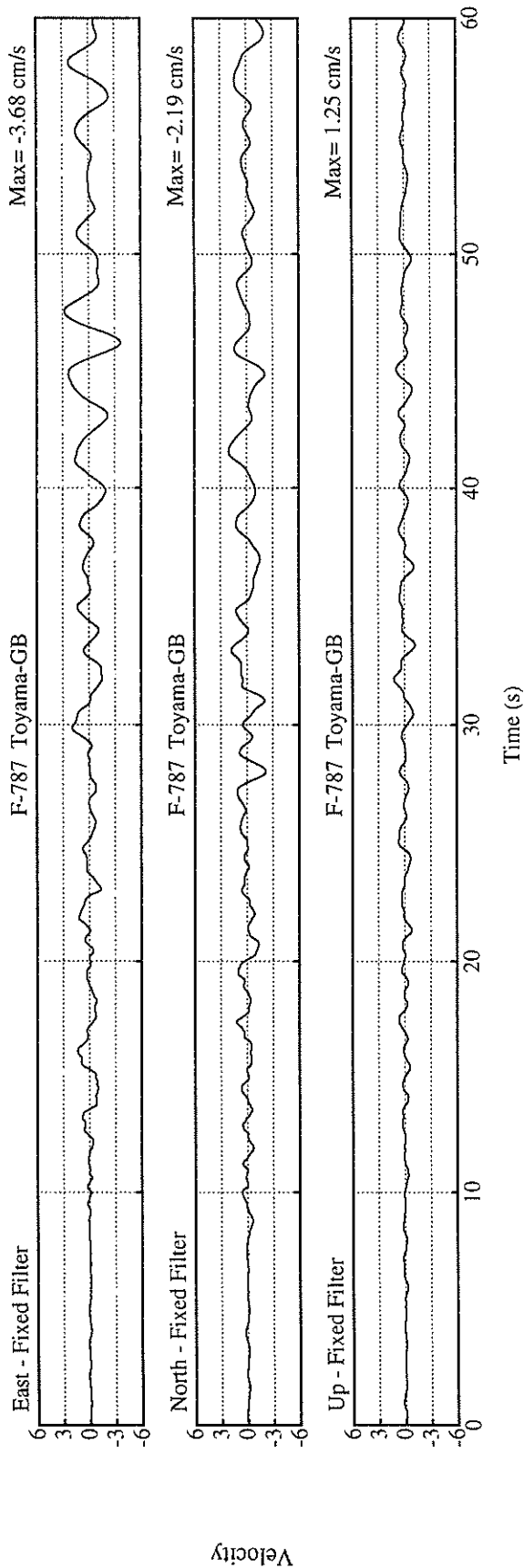


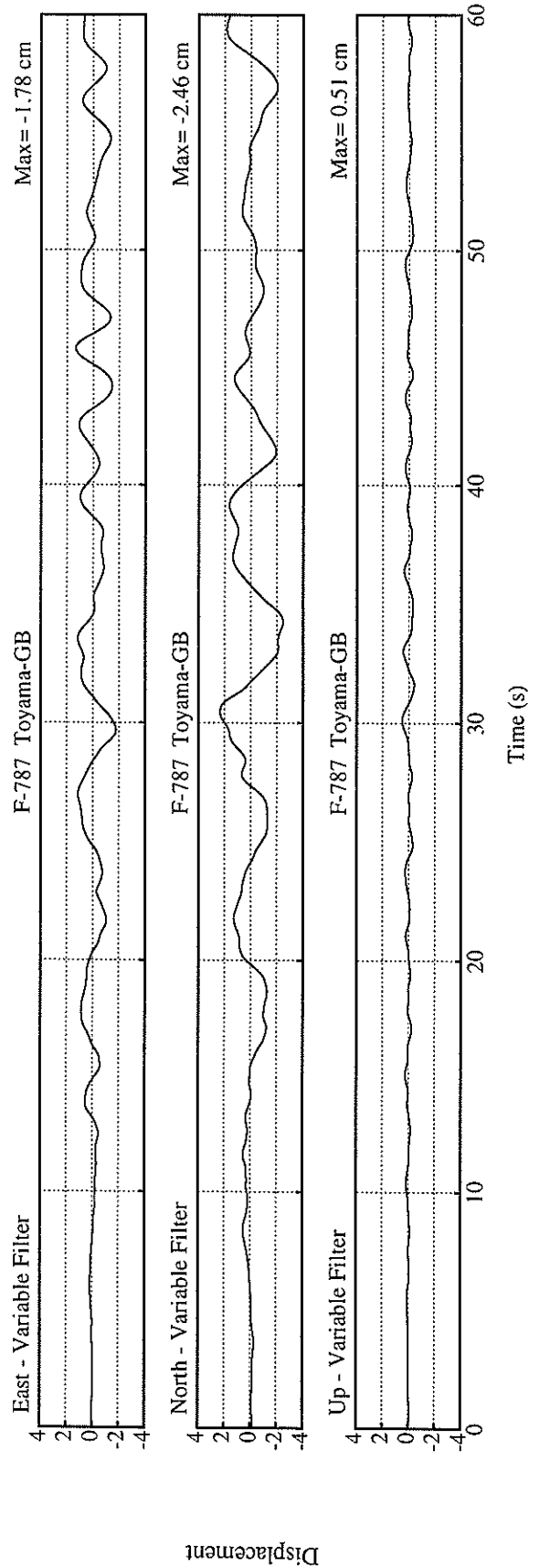
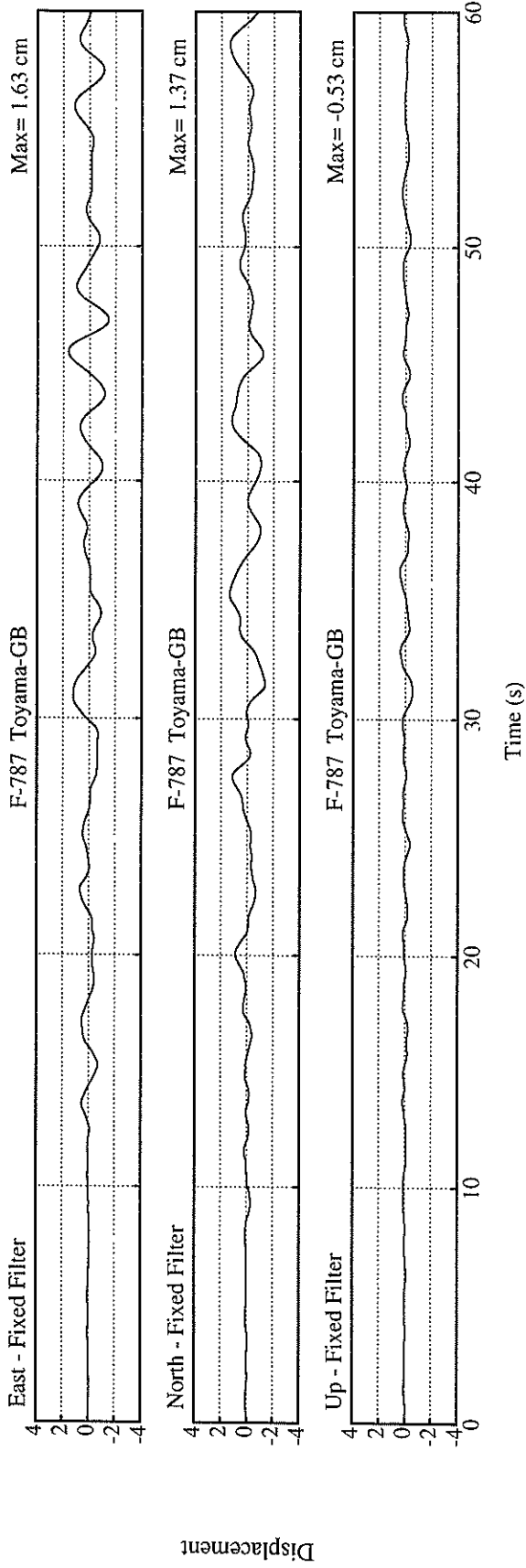


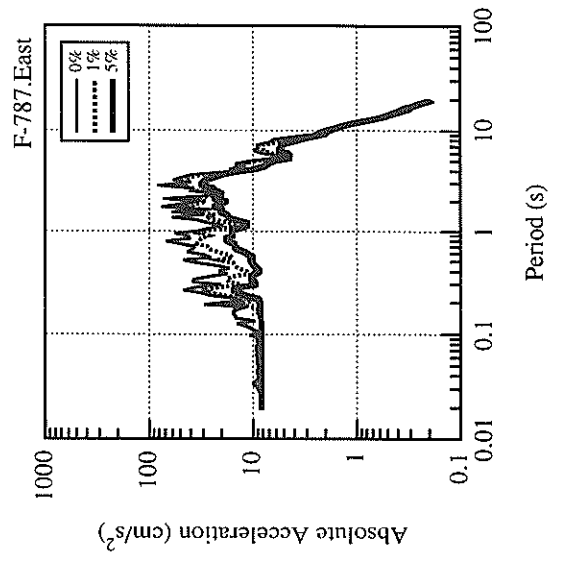
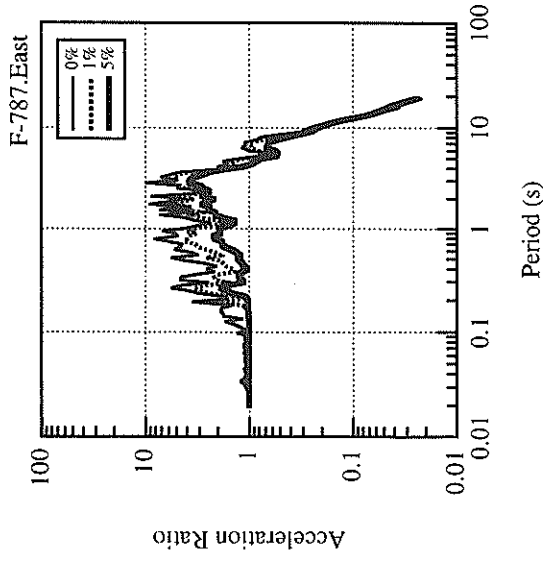
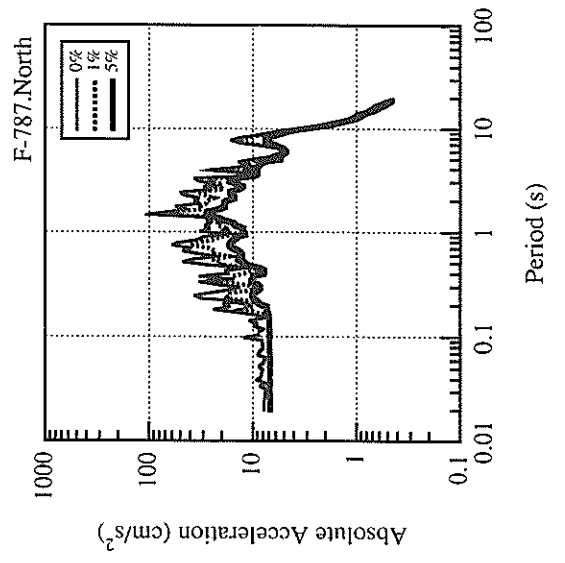
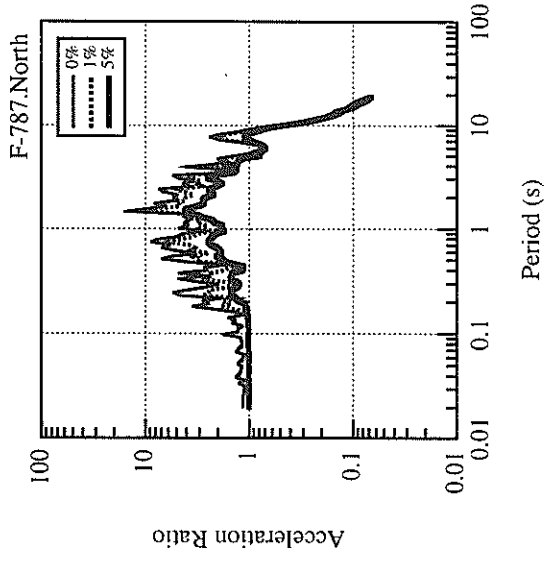
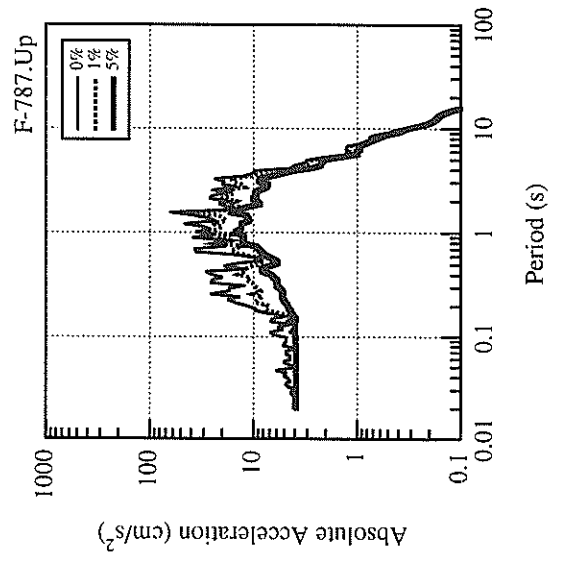
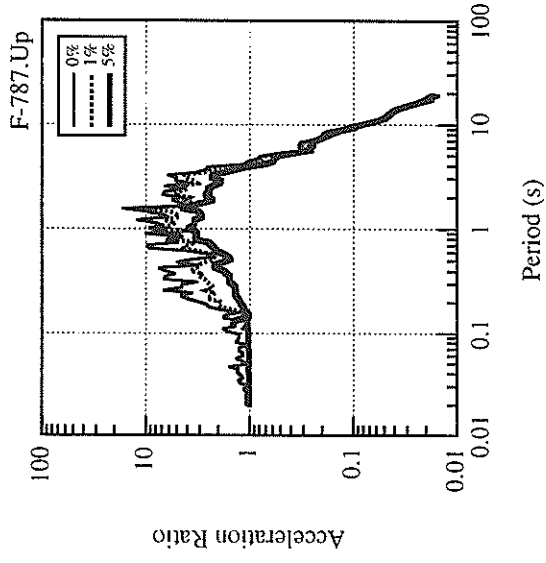
Acceleration

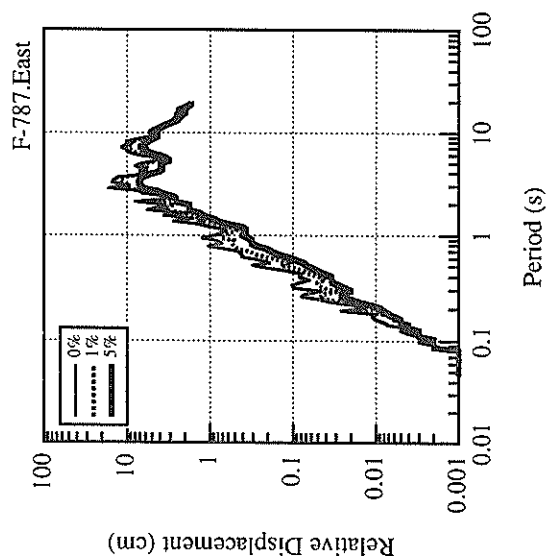
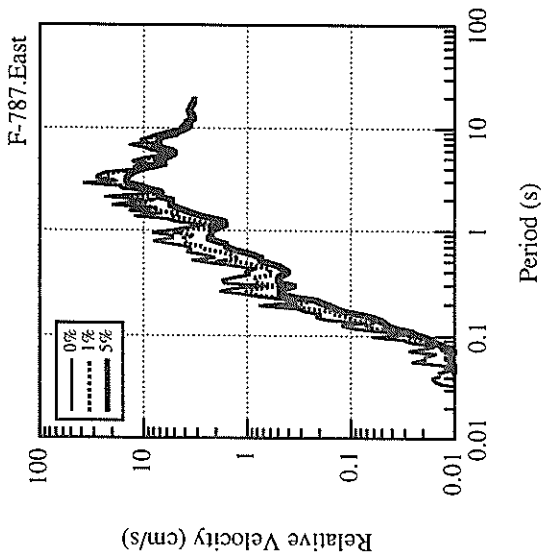
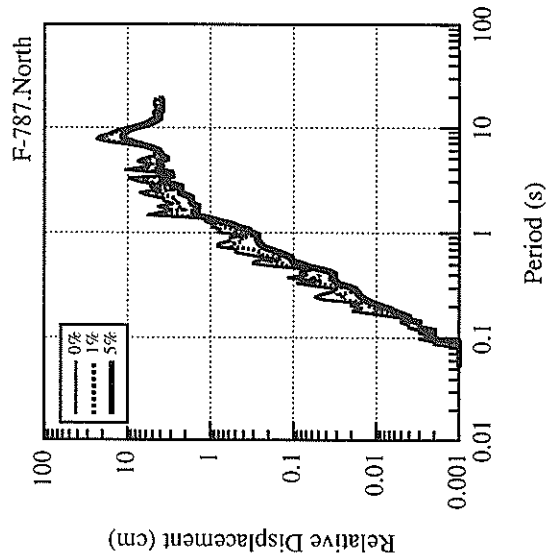
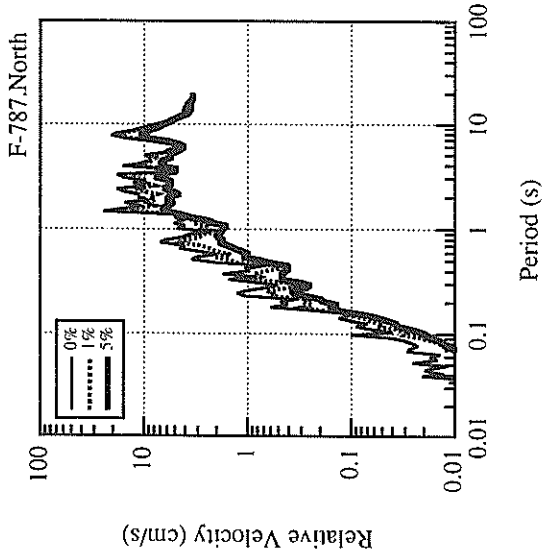
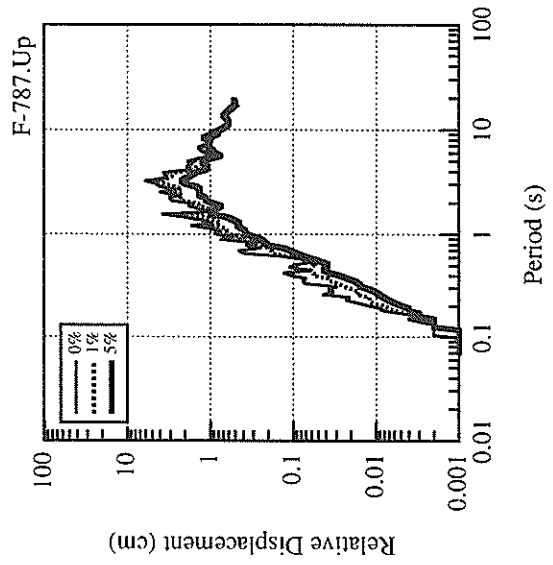
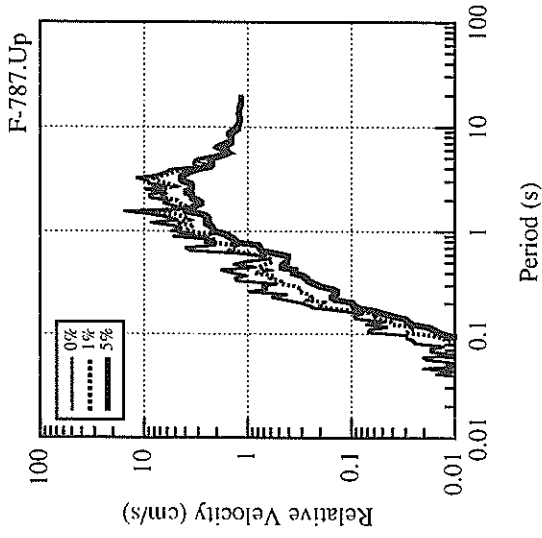


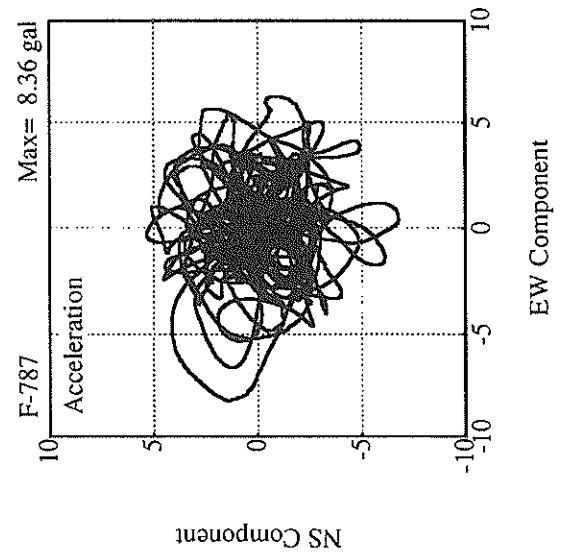
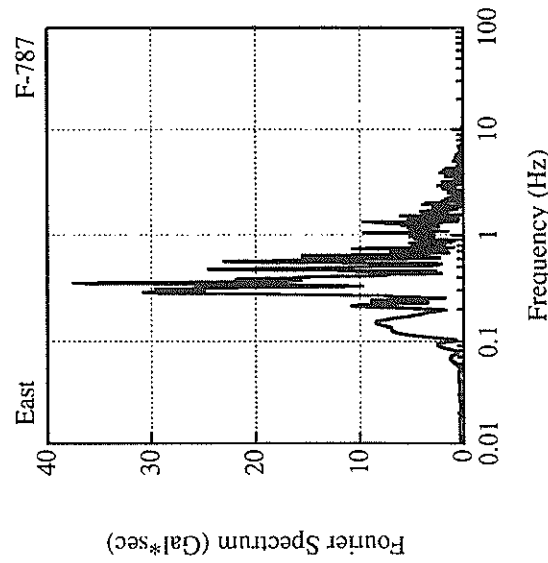
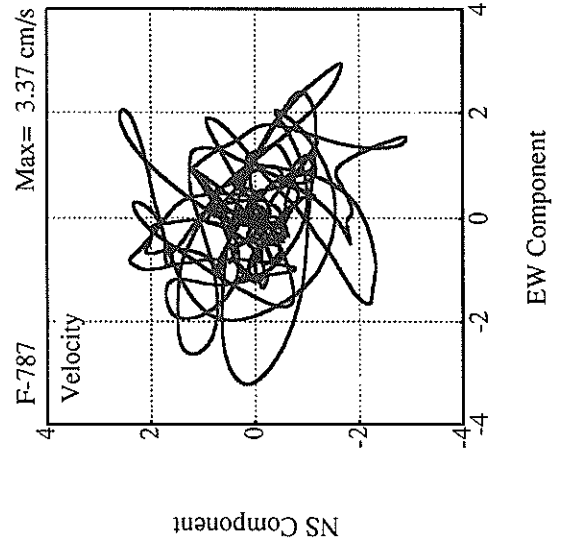
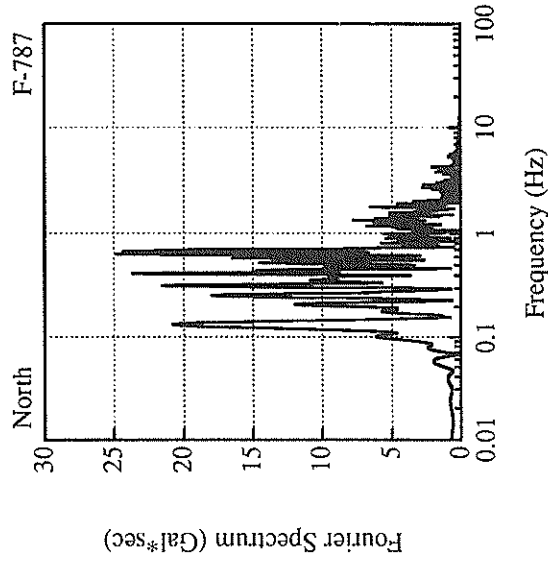
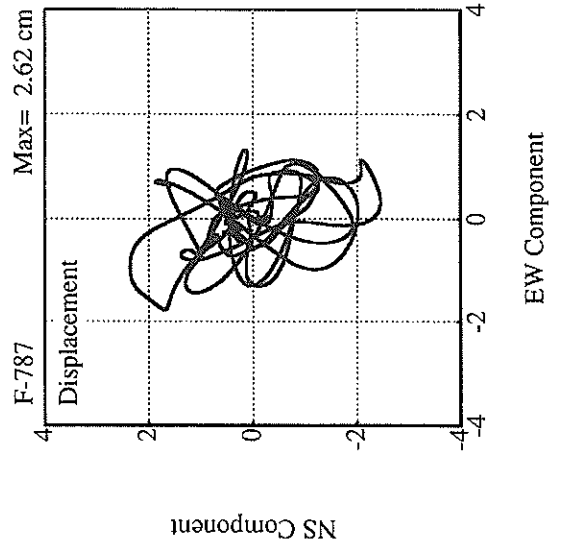
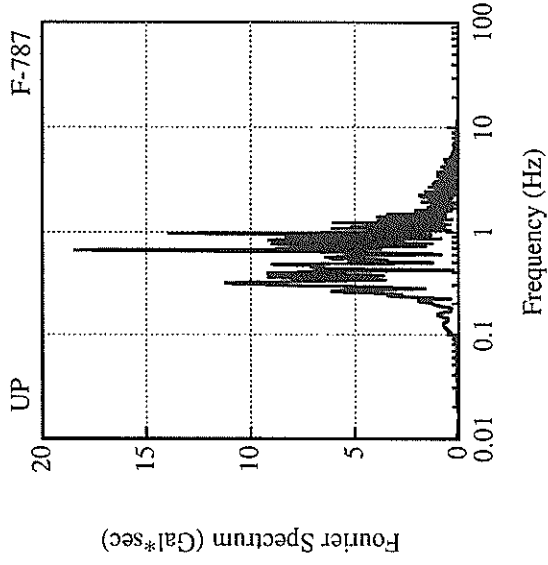
Acceleration











RECORD NUMBER : F-788
 STATION : TOYAMA-G

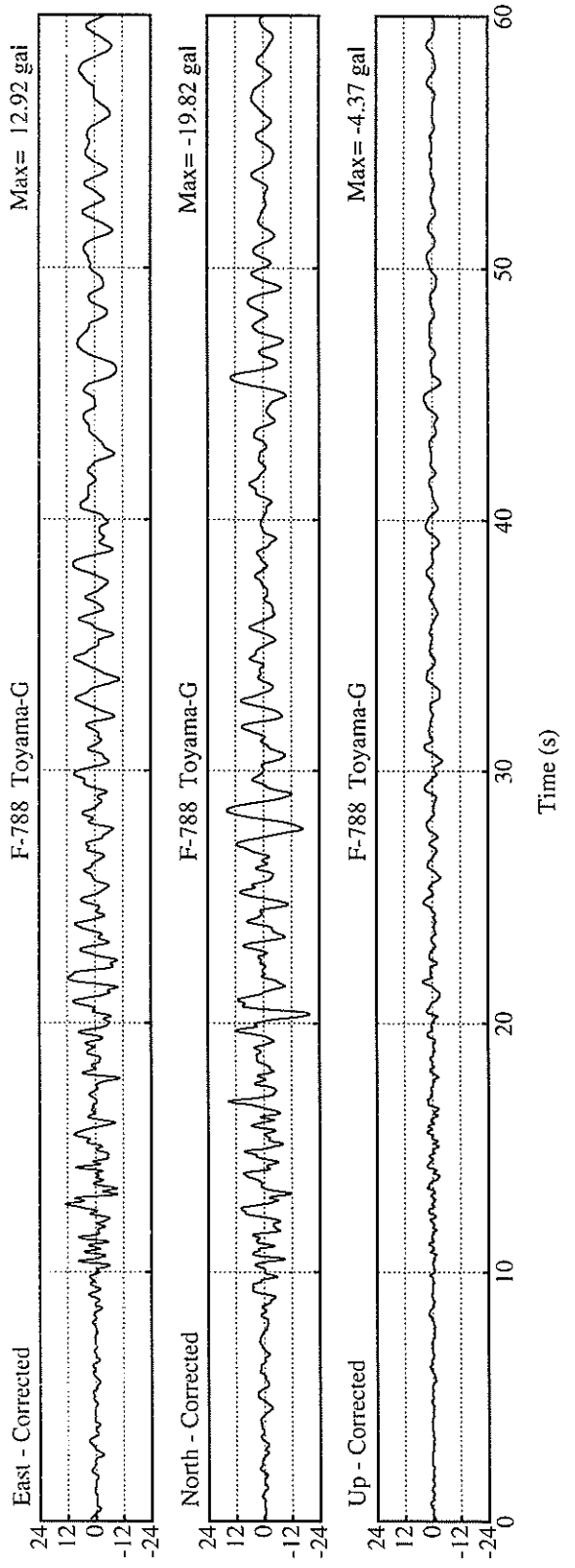
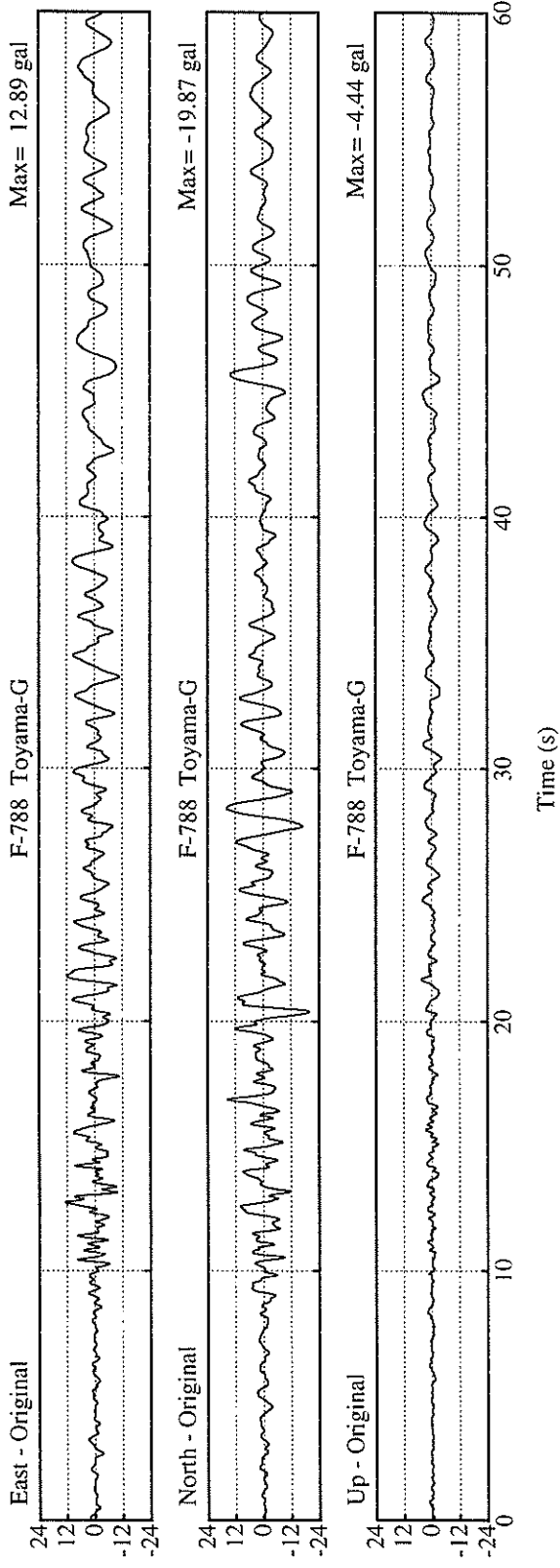
EARTHQUAKE DATA

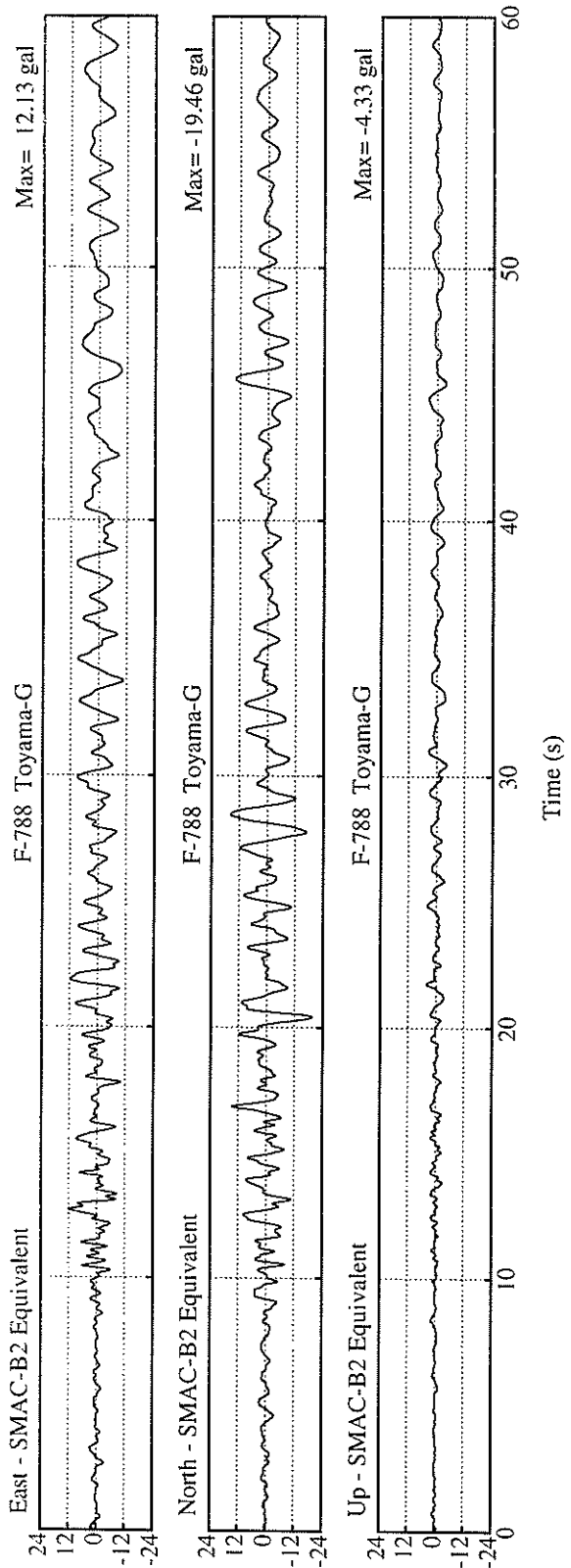
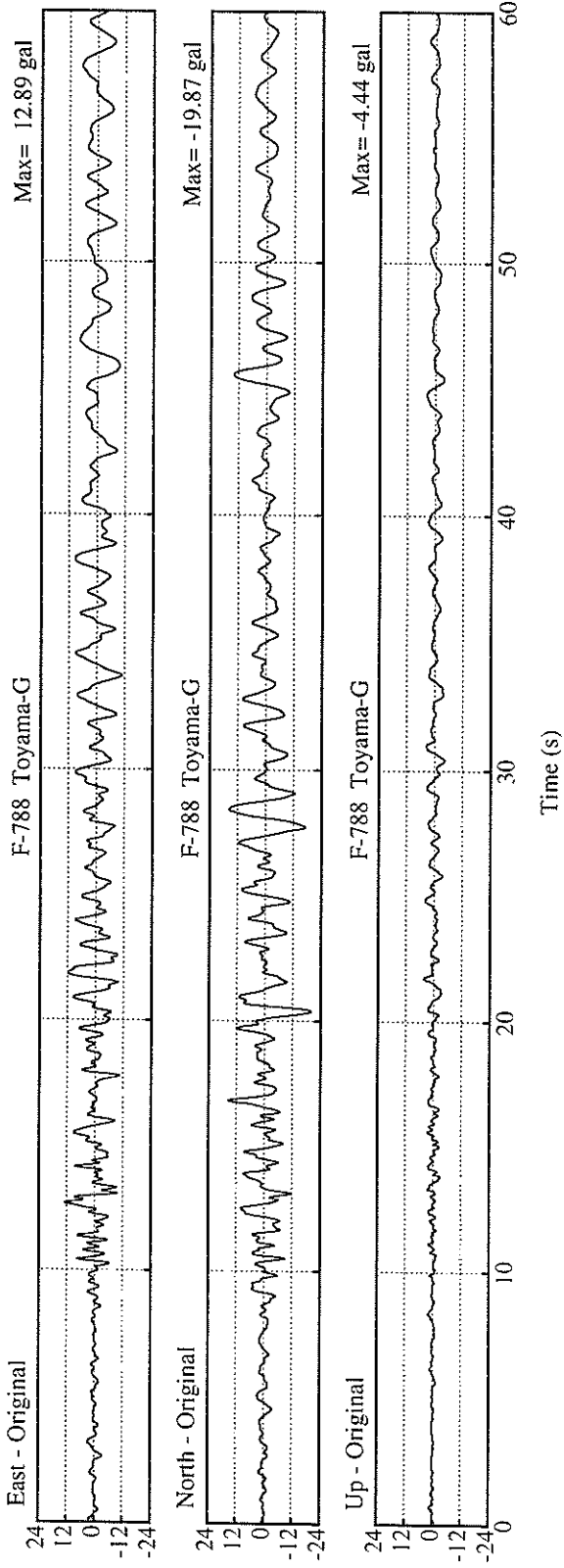
```
*****
DATE AND TIME                5:46 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34° 35.7' N
  LONGITUDE                  135° 2.2' E
  DEPTH                      17.9KM
  JMA MAGNITUDE              7.2
*****
```

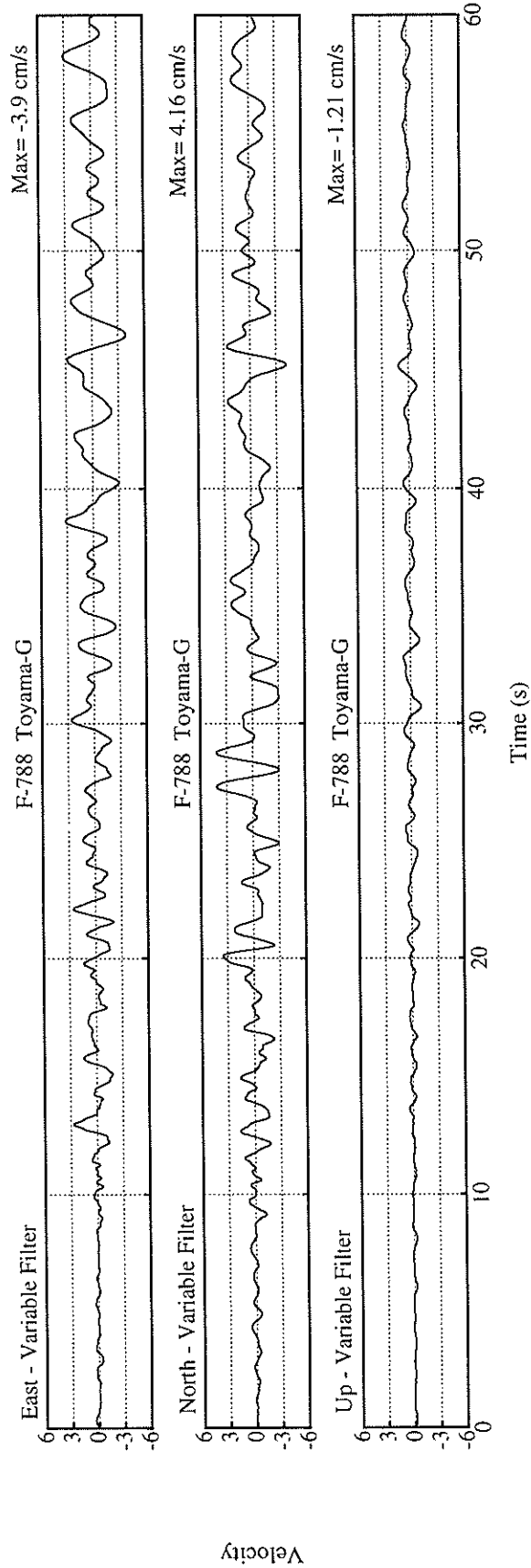
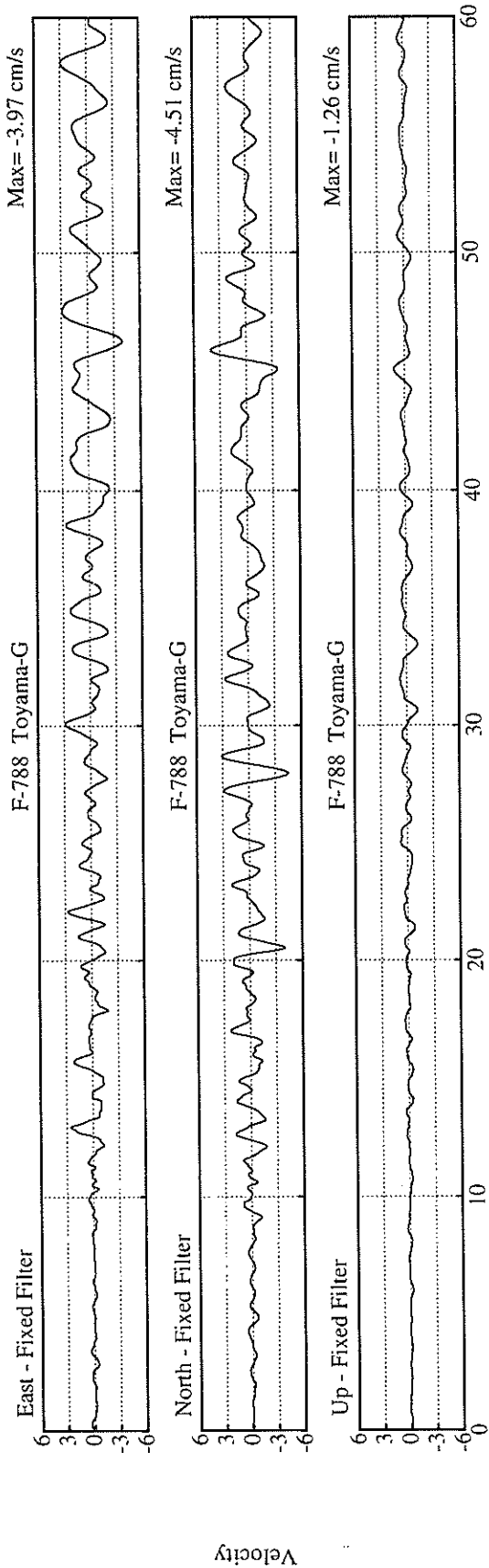
PEAK VALUES OF COMPONENTS

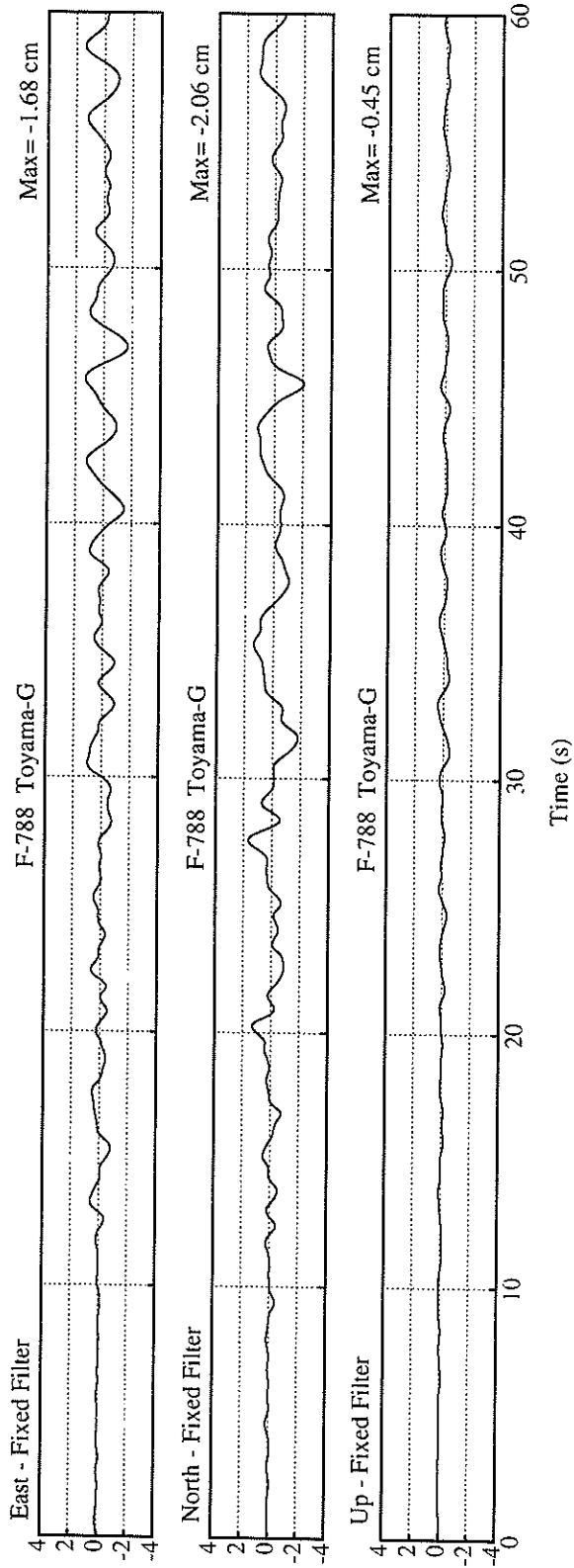
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.073	0.097	0.182	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	19.5	12.1	4.3	19.7
ORIGINAL	19.9	12.9	4.4	20.1
CORRECTED	19.8	12.9	4.4	20.0
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	4.51	3.97	1.26	4.71
VARIABLE FILTER	4.16	3.90	1.21	4.82
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.06	1.68	0.45	2.41
VARIABLE FILTER	2.47	1.63	0.44	2.47

* RESULTANT OF HORIZONTAL COMPONENTS

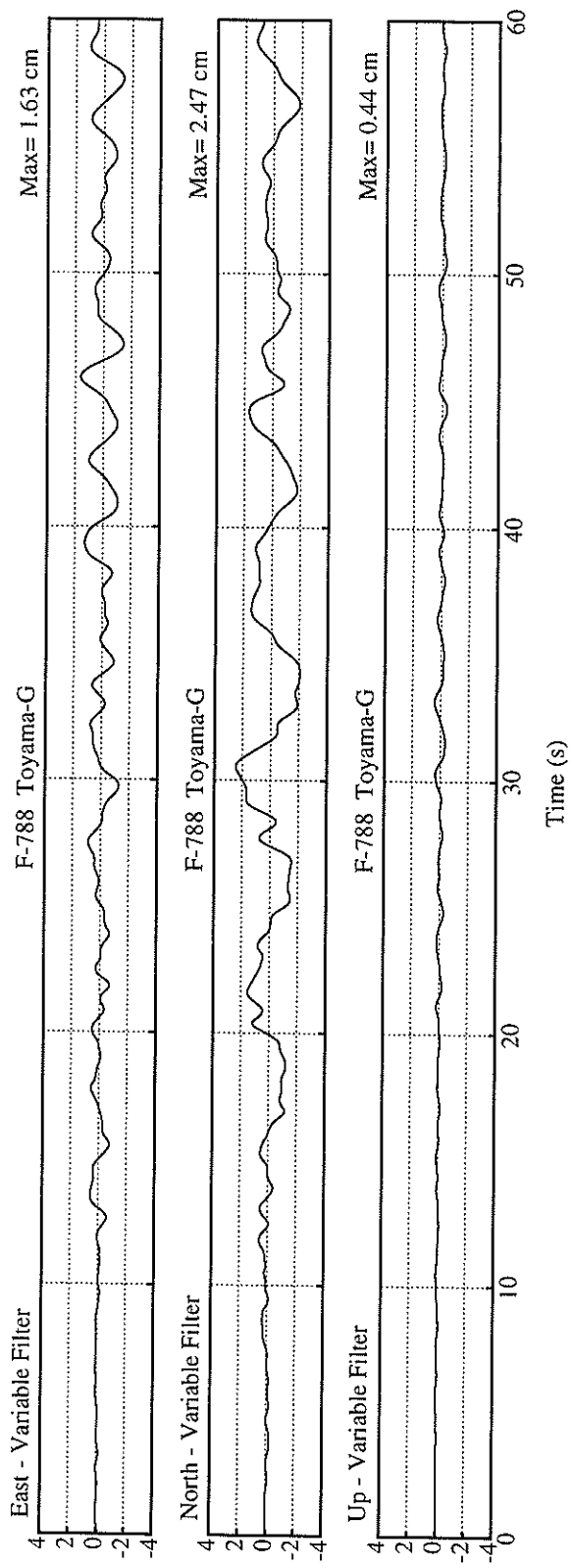




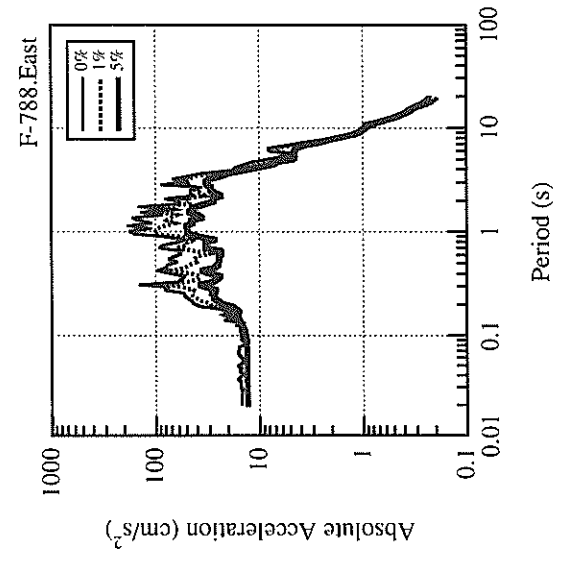
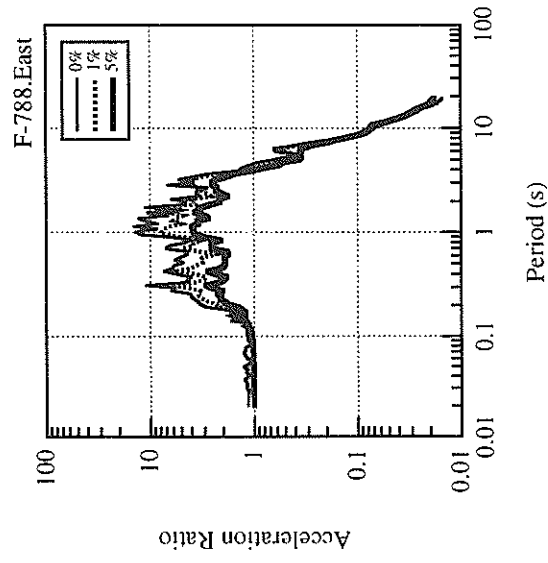
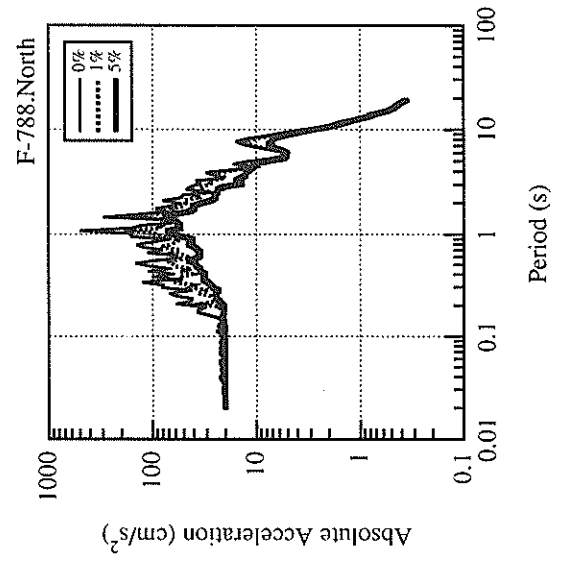
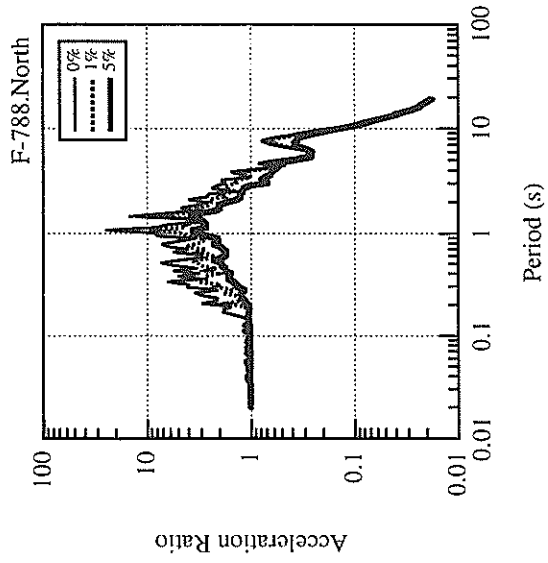
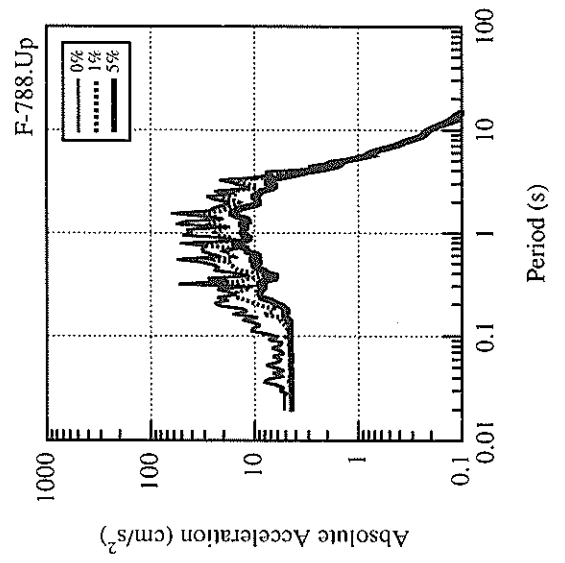
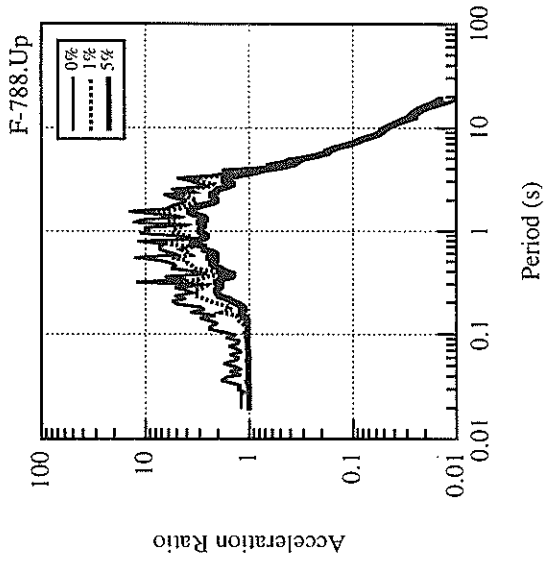


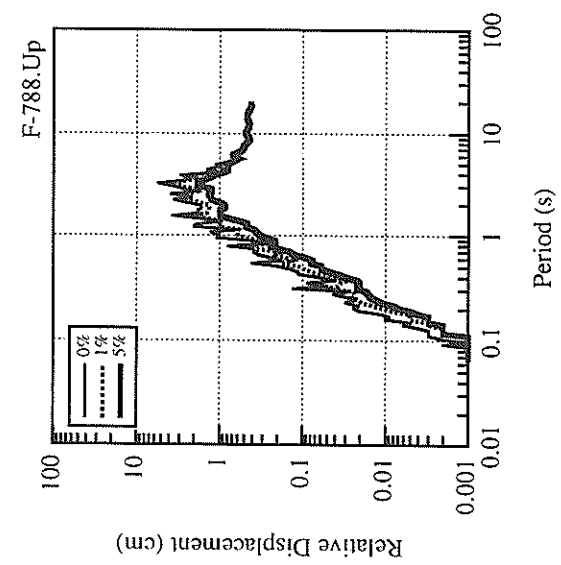
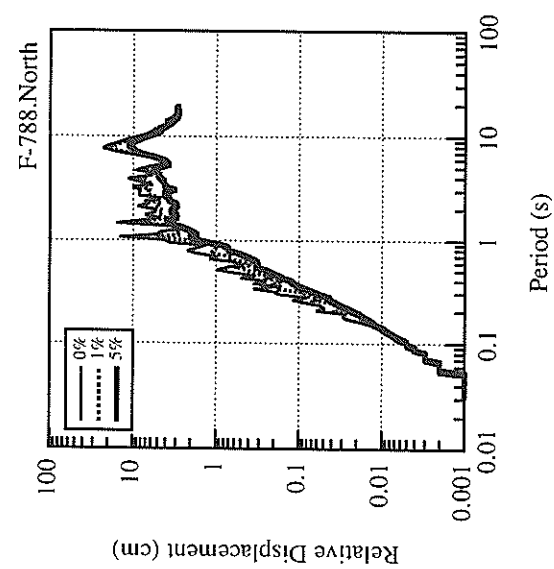
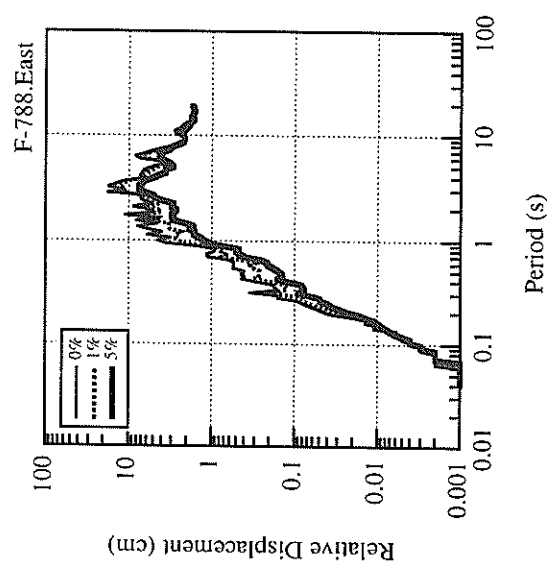
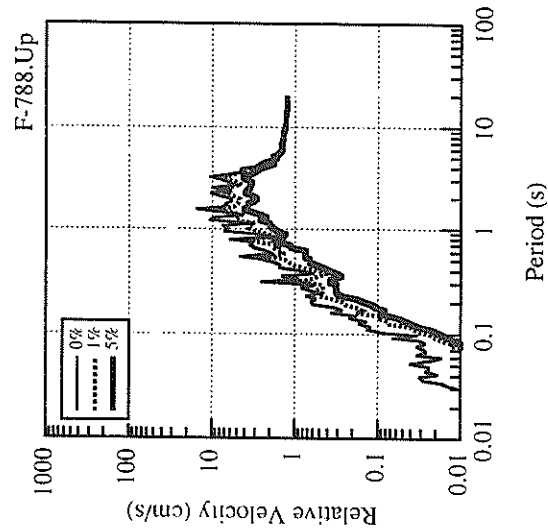
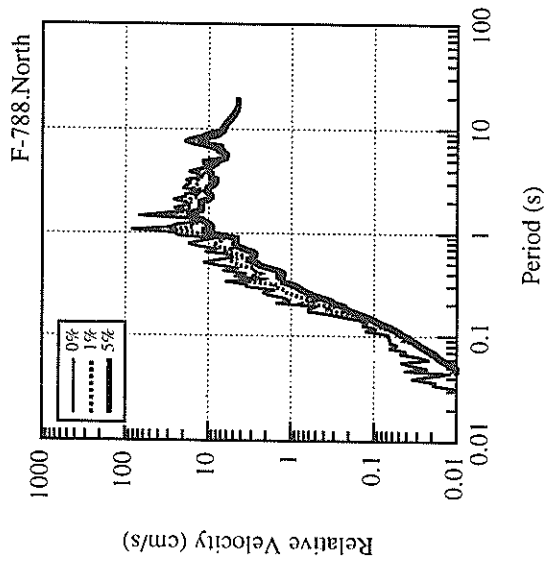
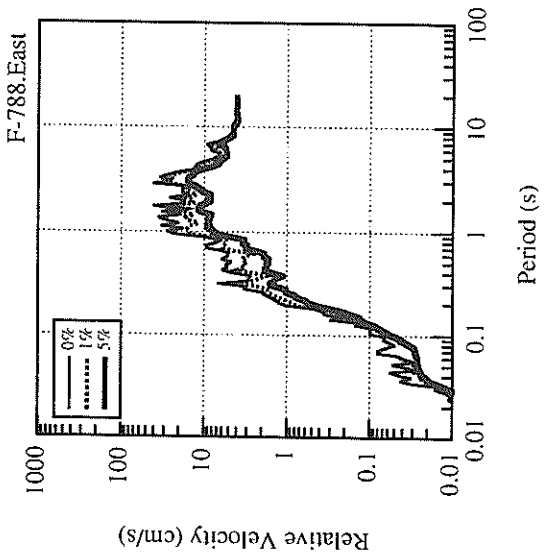


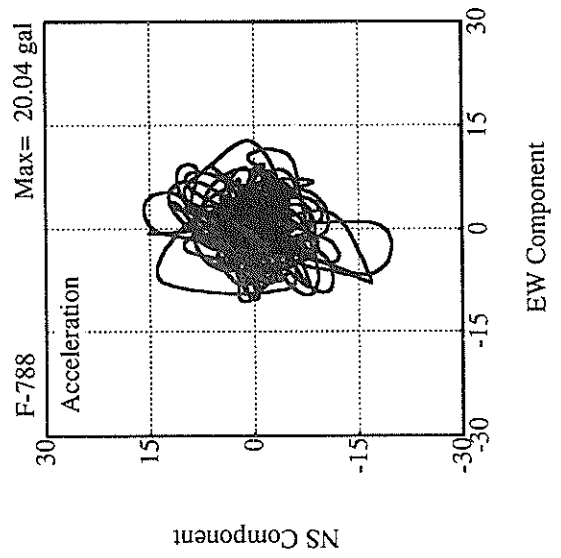
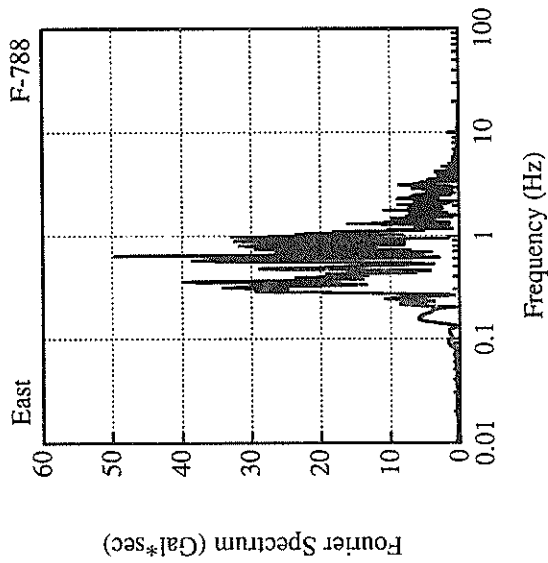
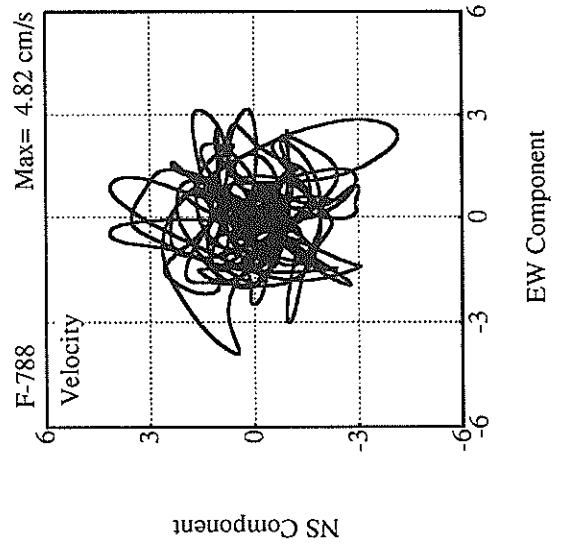
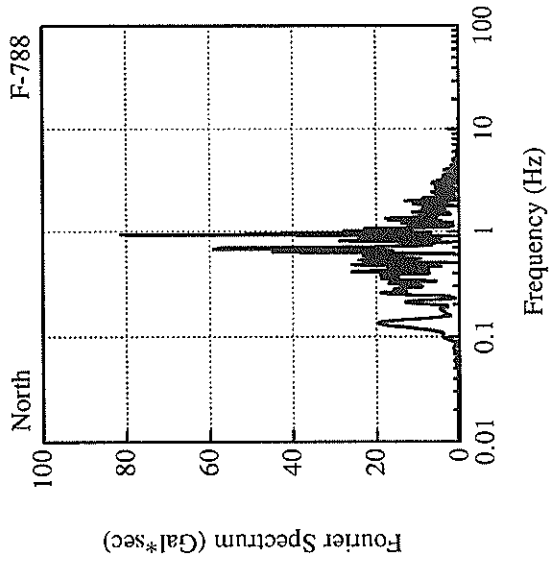
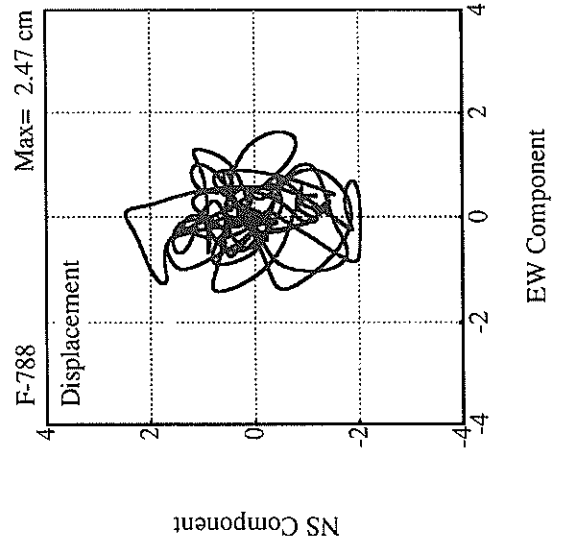
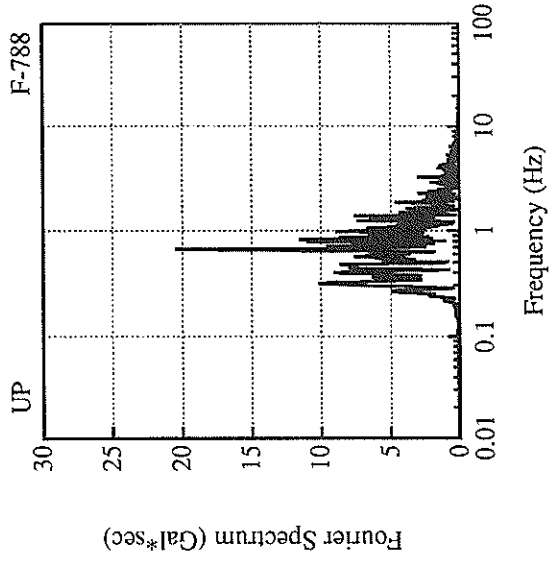
Displacement



Displacement







RECORD NUMBER : F-789

STATION : TSURUGA-G

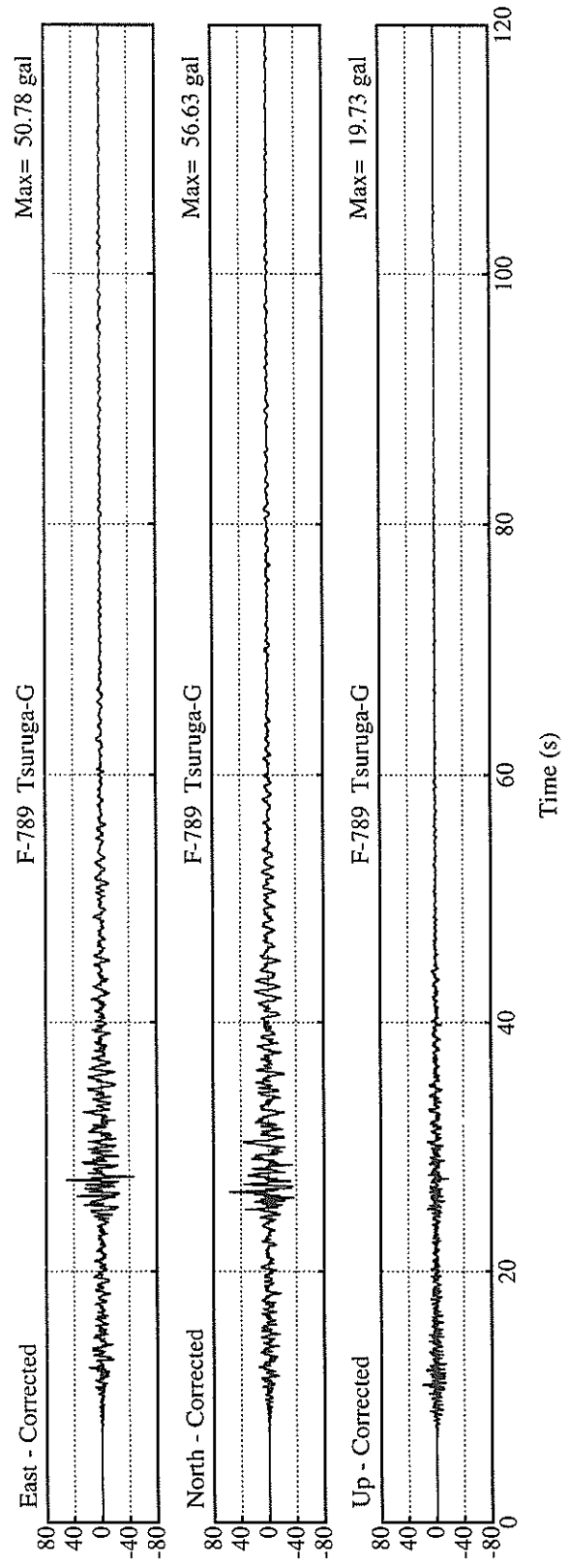
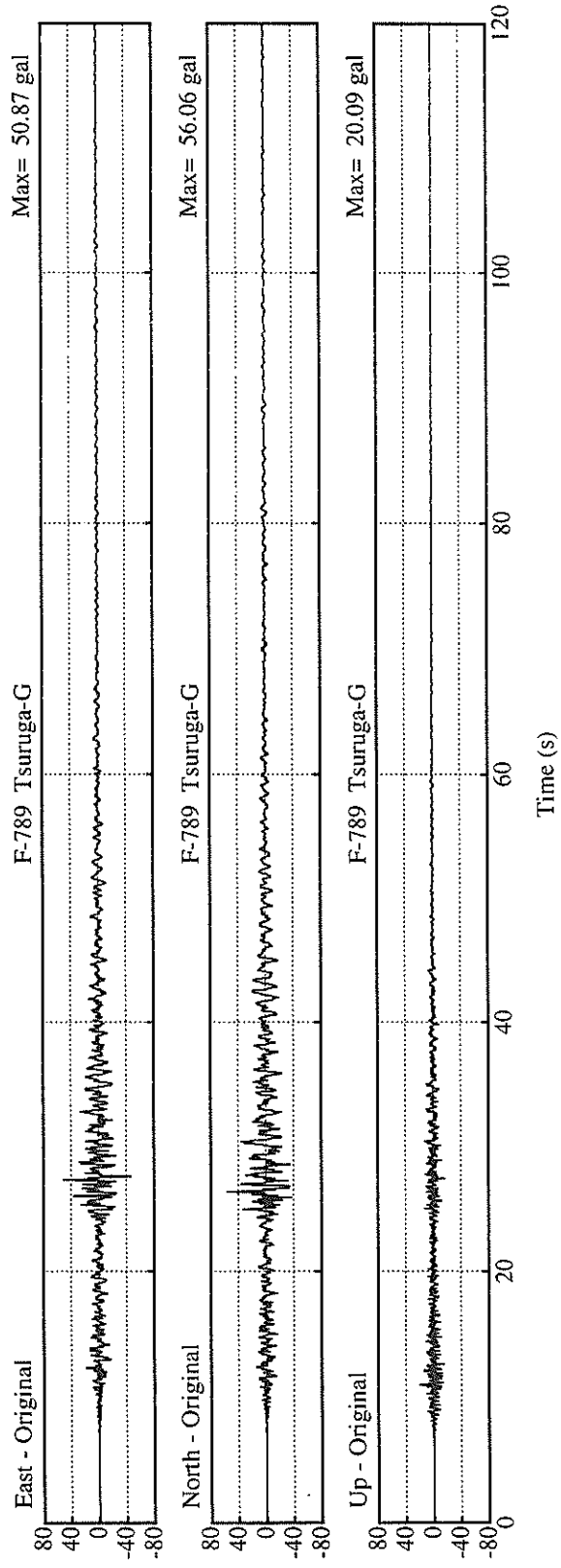
EARTHQUAKE DATA

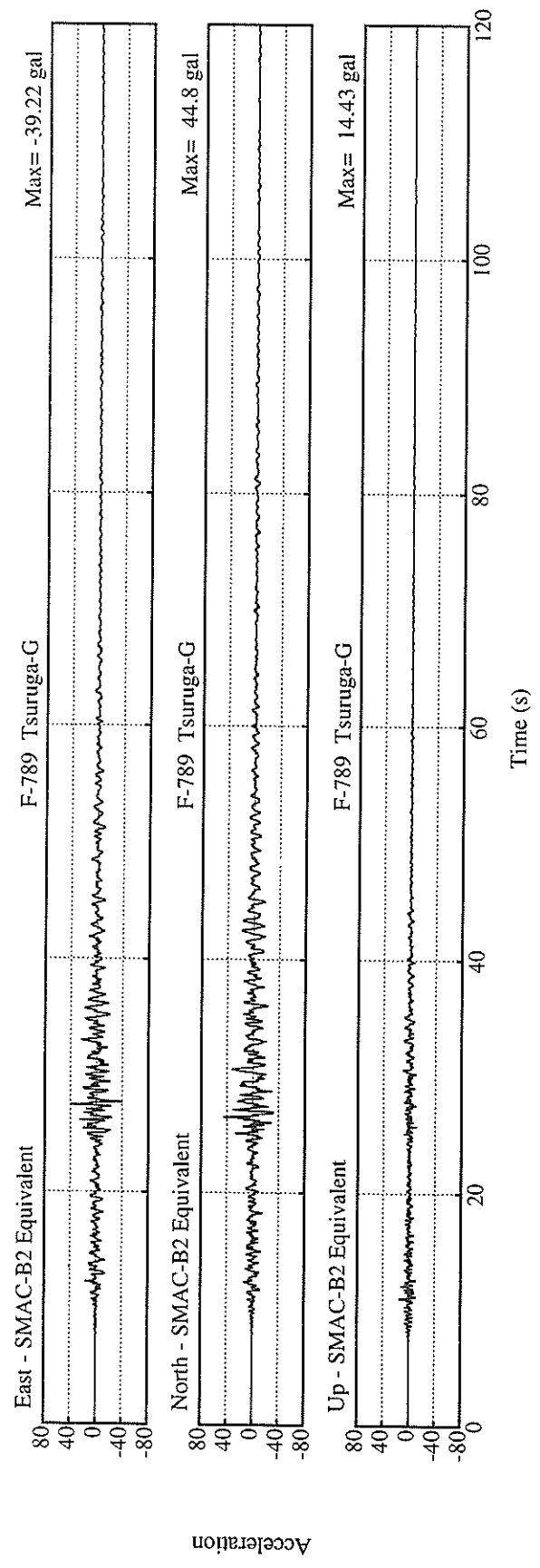
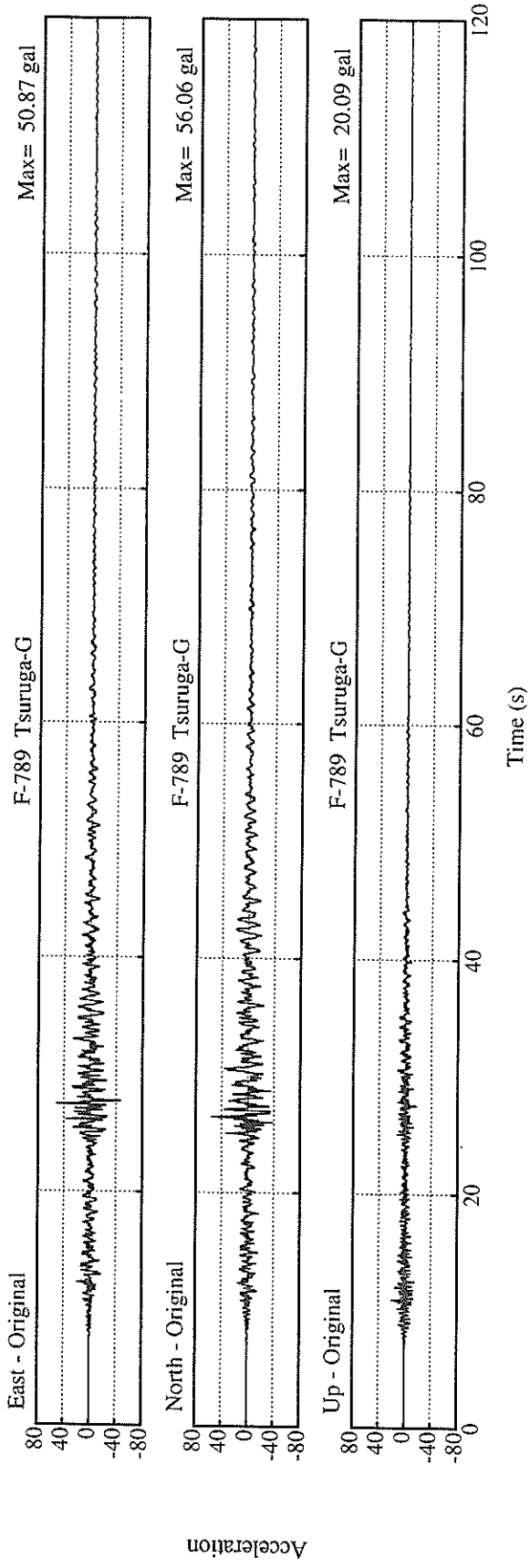
DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

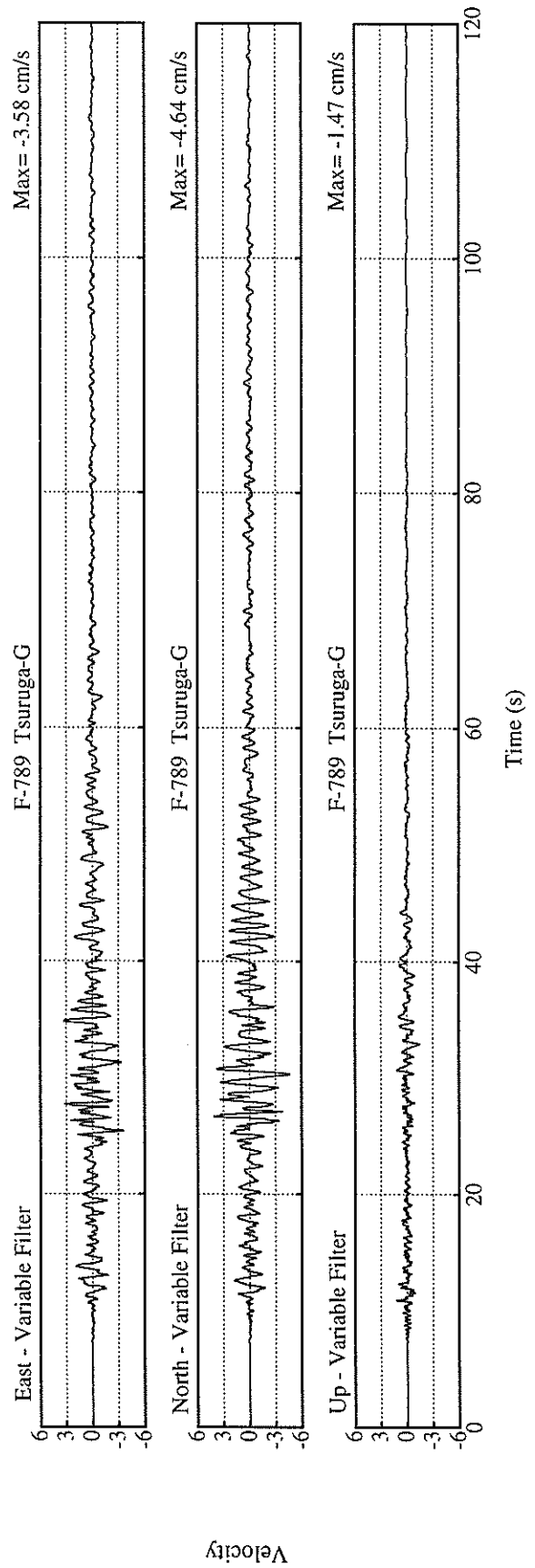
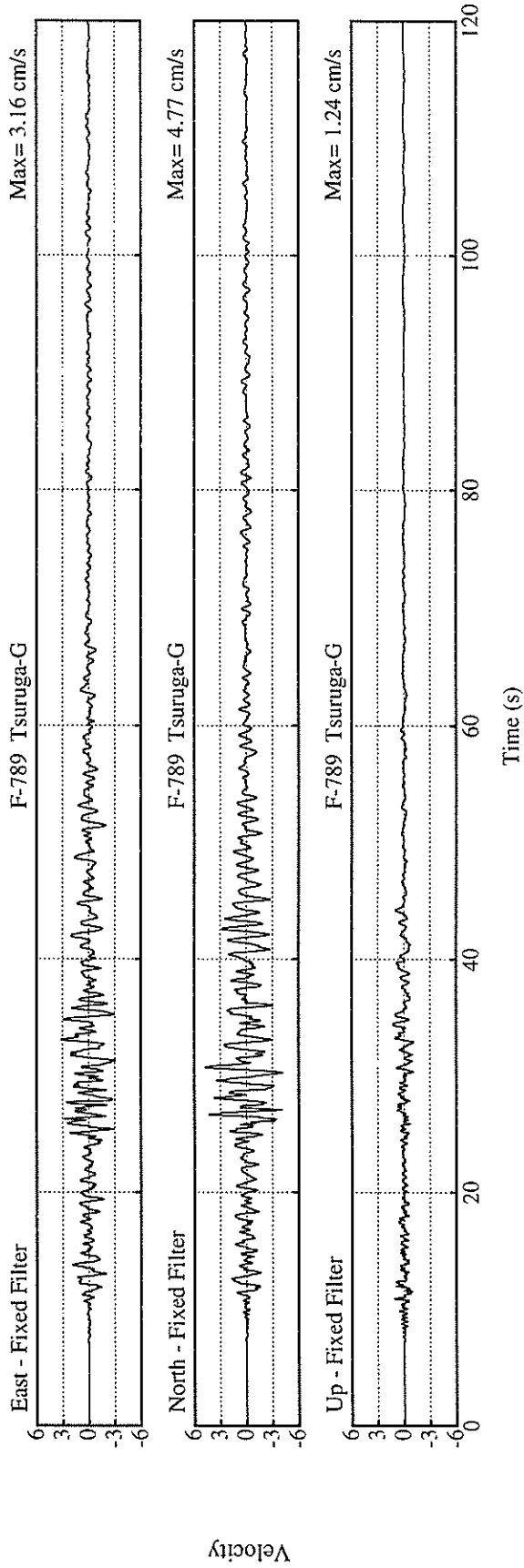
PEAK VALUES OF COMPONENTS

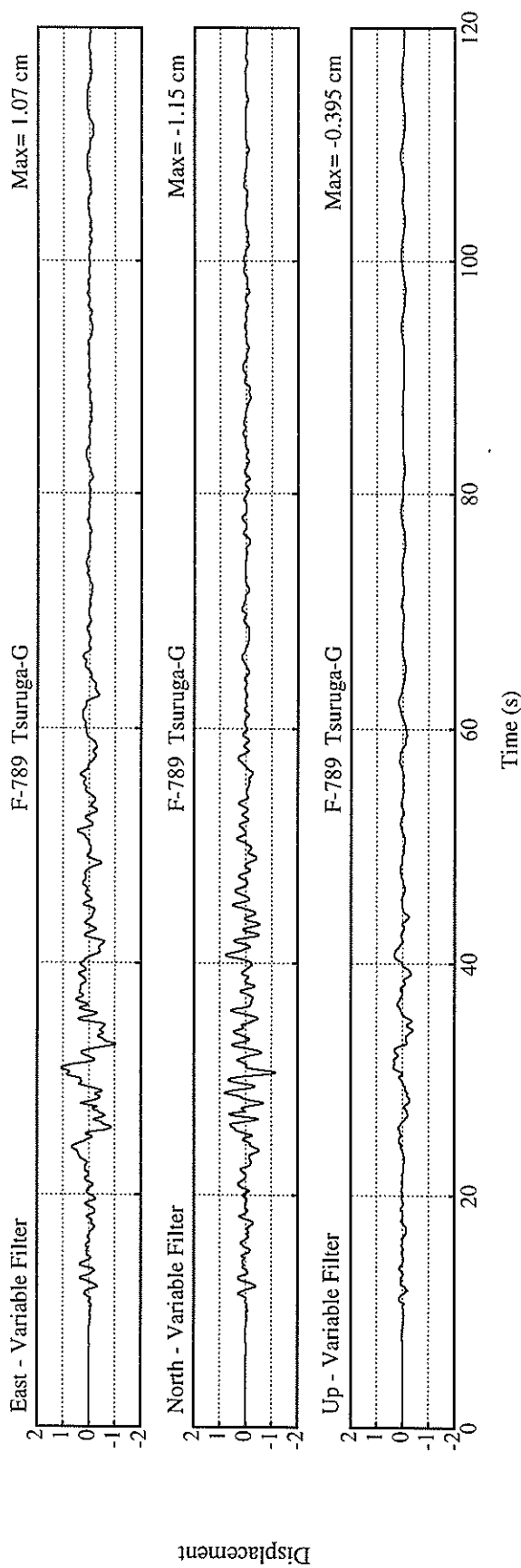
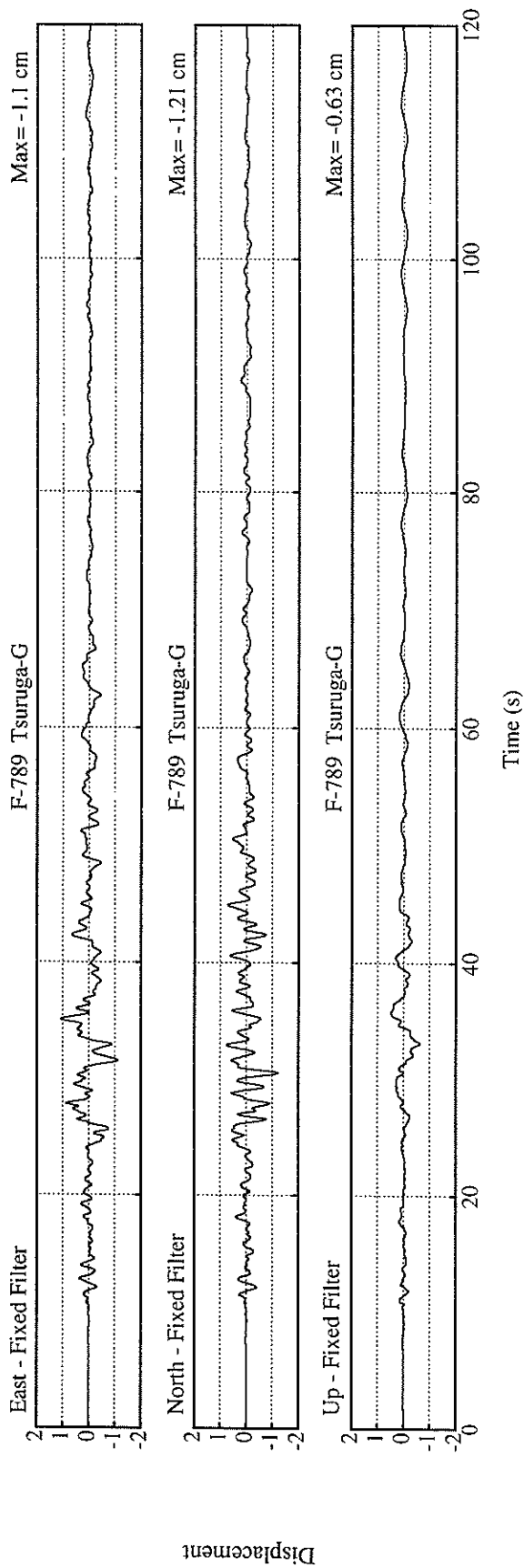
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.140	0.110	0.140	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	44.8	39.2	14.4	45.0
ORIGINAL	56.1	50.9	20.1	56.6
CORRECTED	56.6	50.8	19.7	56.7
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	4.77	3.16	1.24	4.83
VARIABLE FILTER	4.64	3.58	1.47	4.81
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	1.21	1.10	0.63	1.23
VARIABLE FILTER	1.15	1.07	0.40	1.38

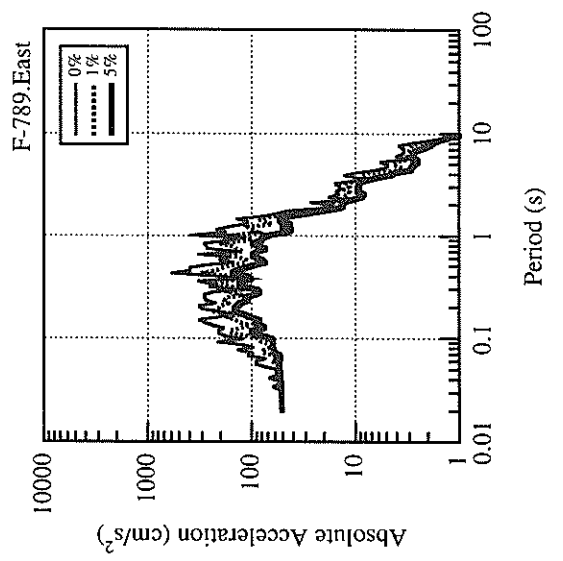
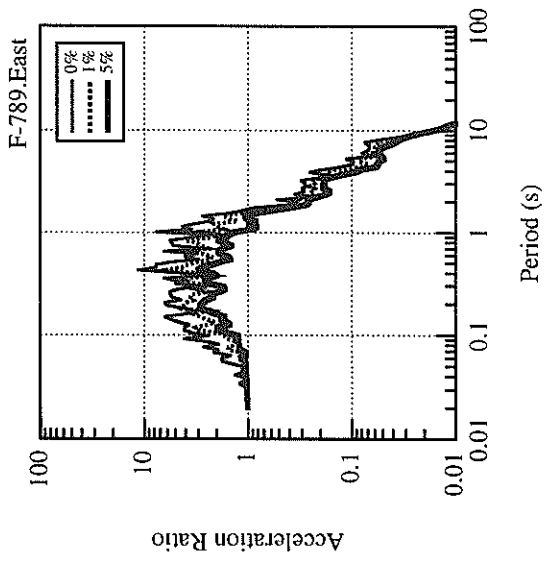
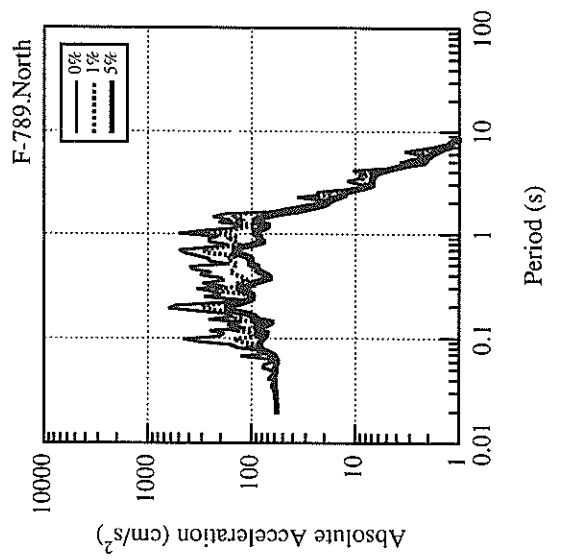
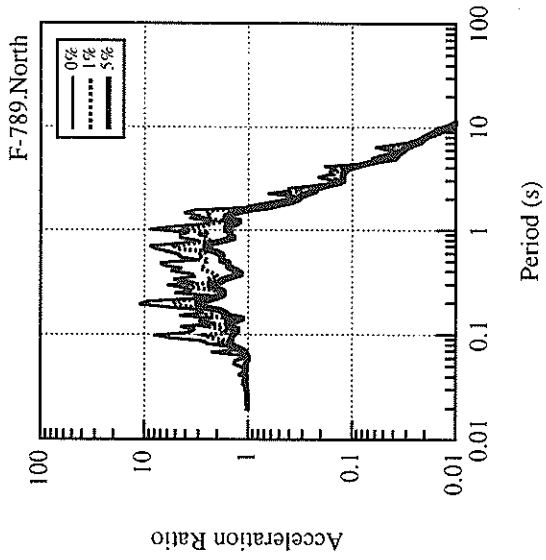
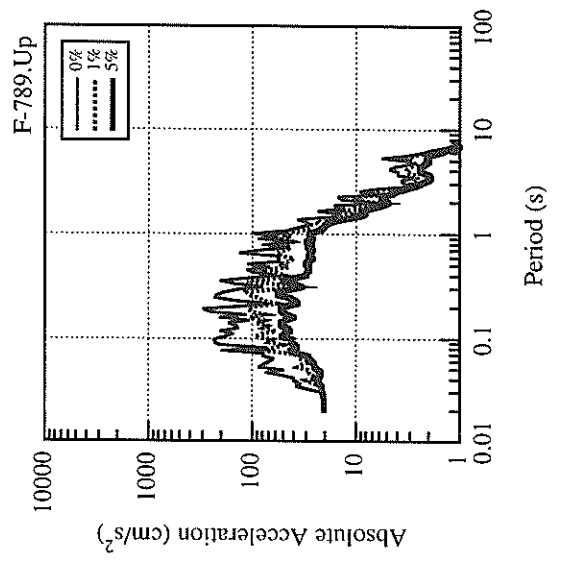
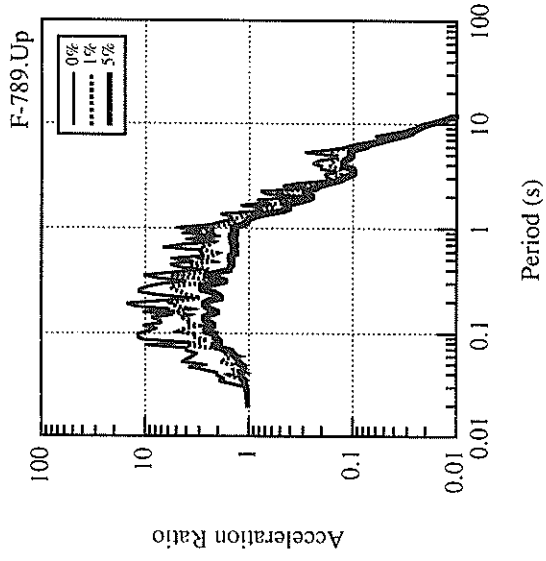
* RESULTANT OF HORIZONTAL COMPONENTS

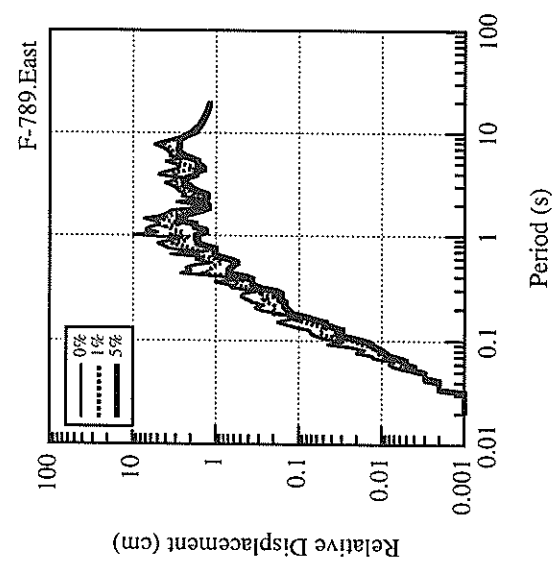
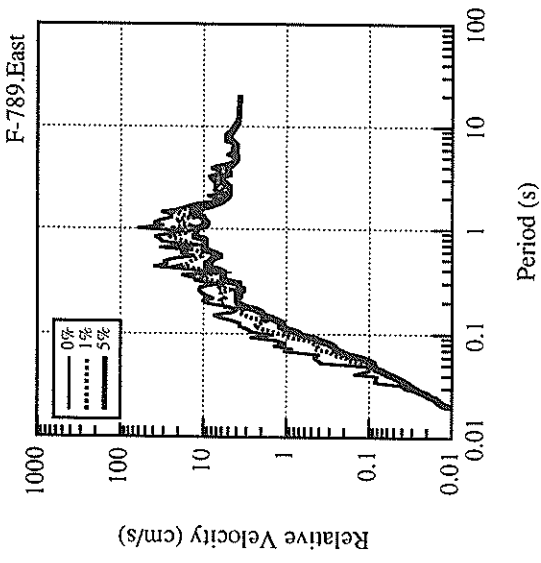
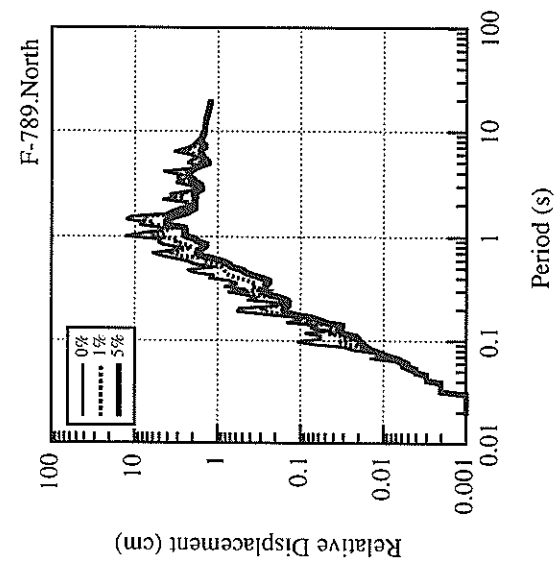
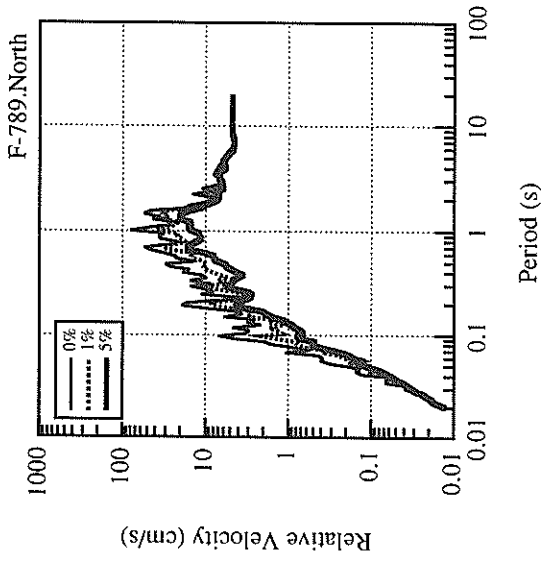
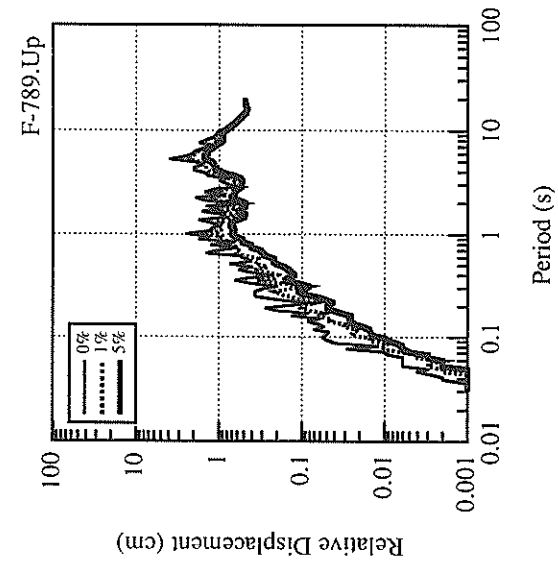
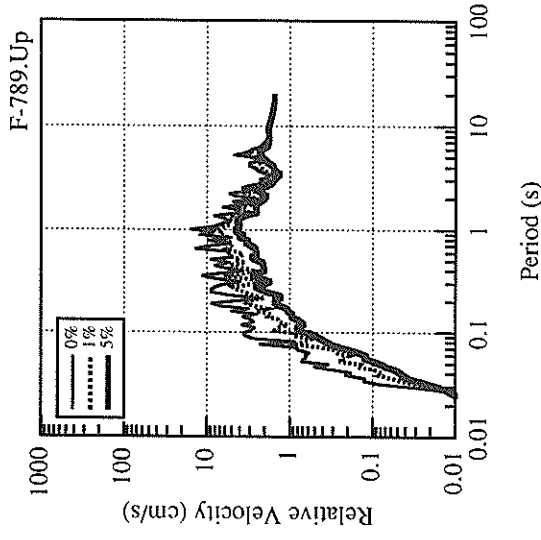


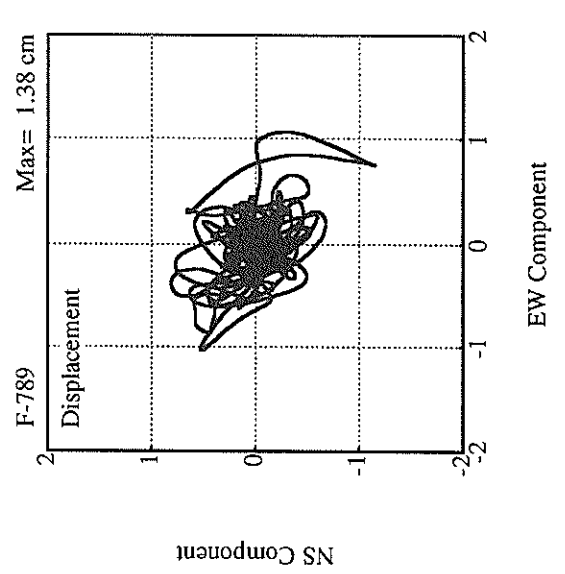
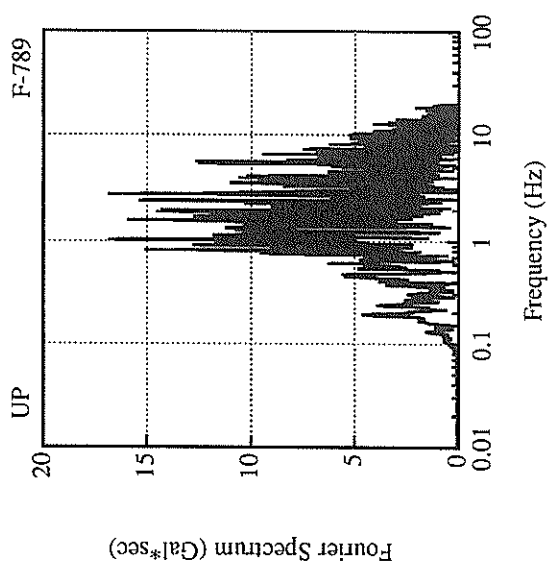
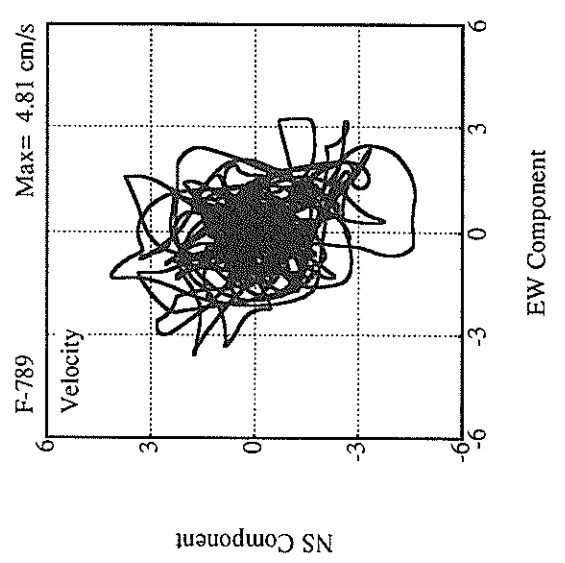
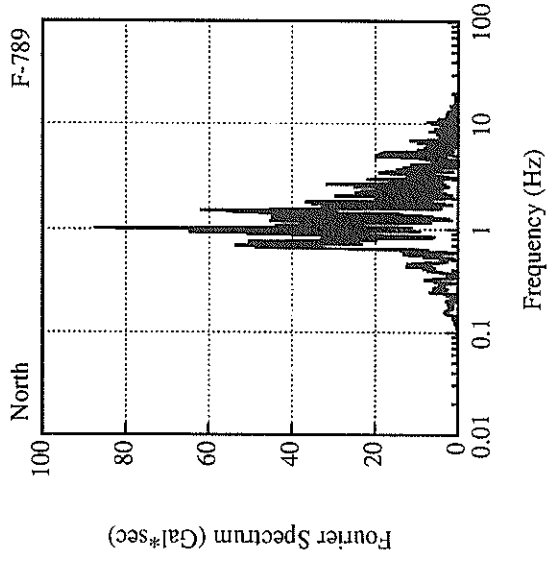
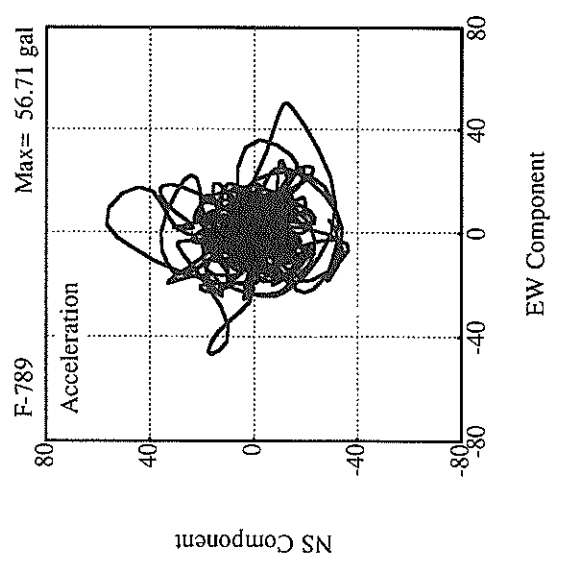
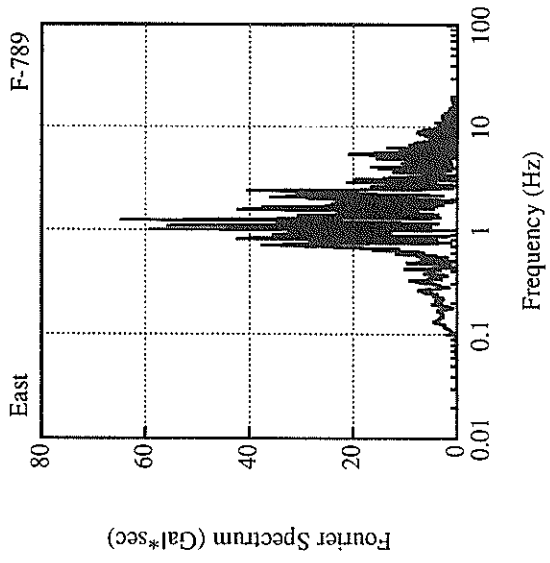












RECORD NUMBER : F-790

STATION : HIROSHIMA-G

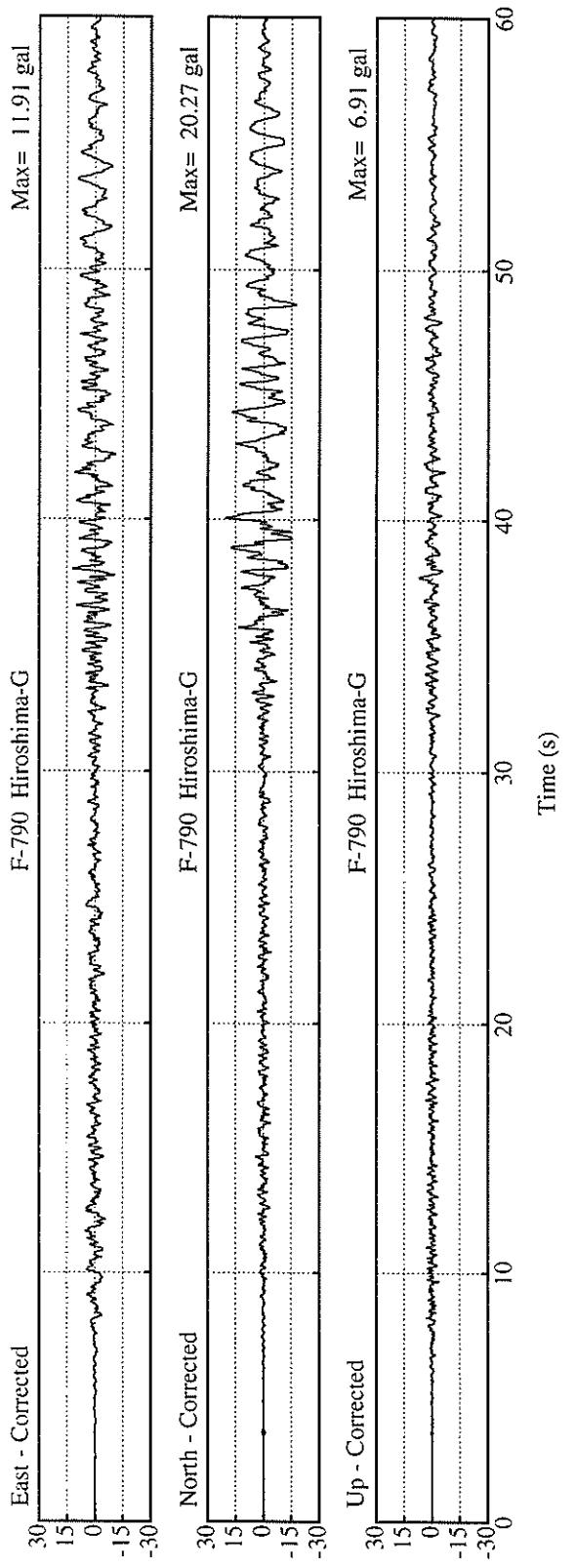
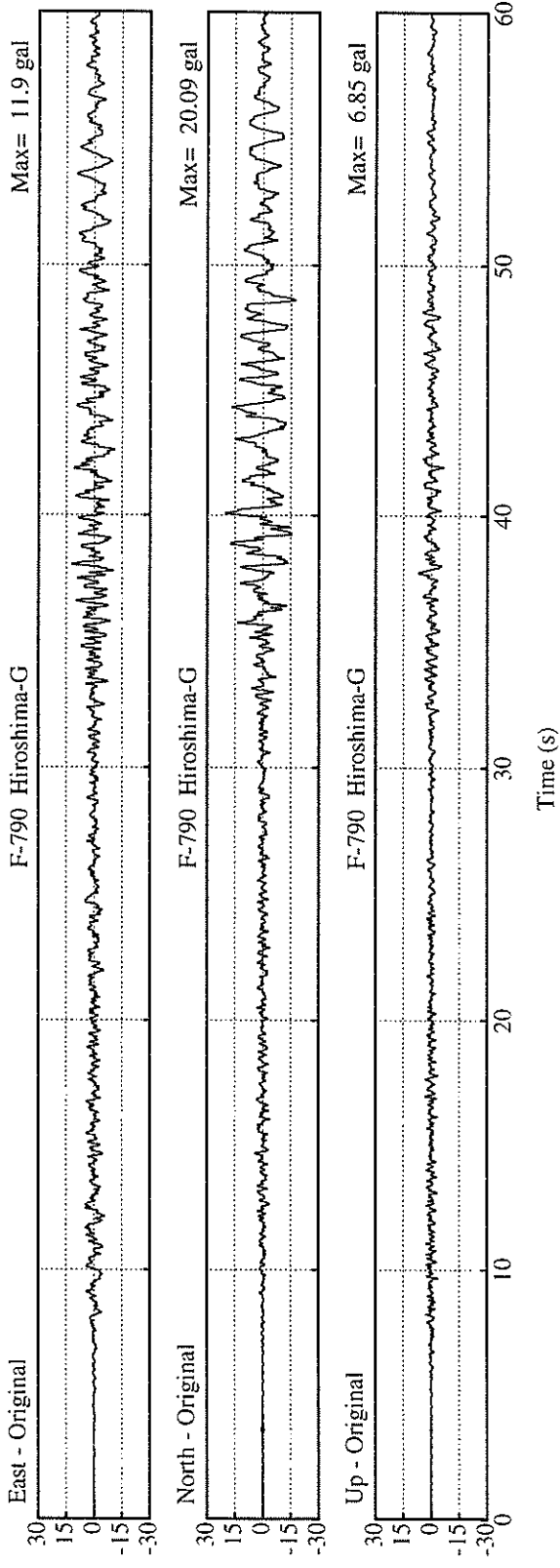
EARTHQUAKE DATA

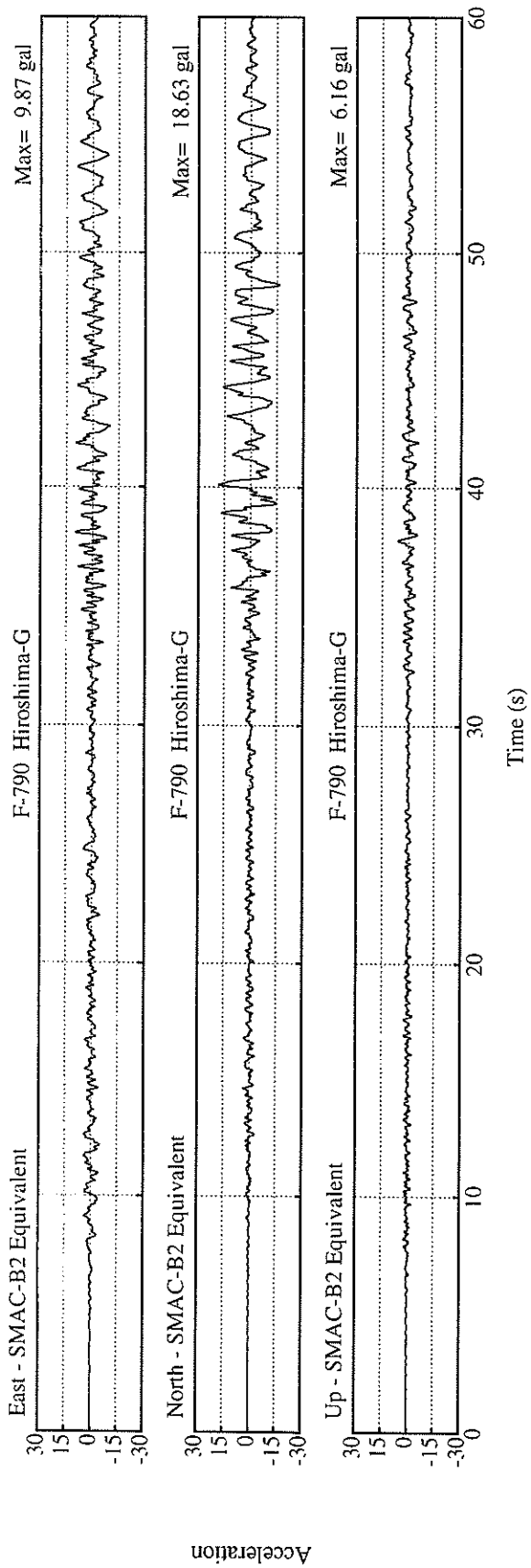
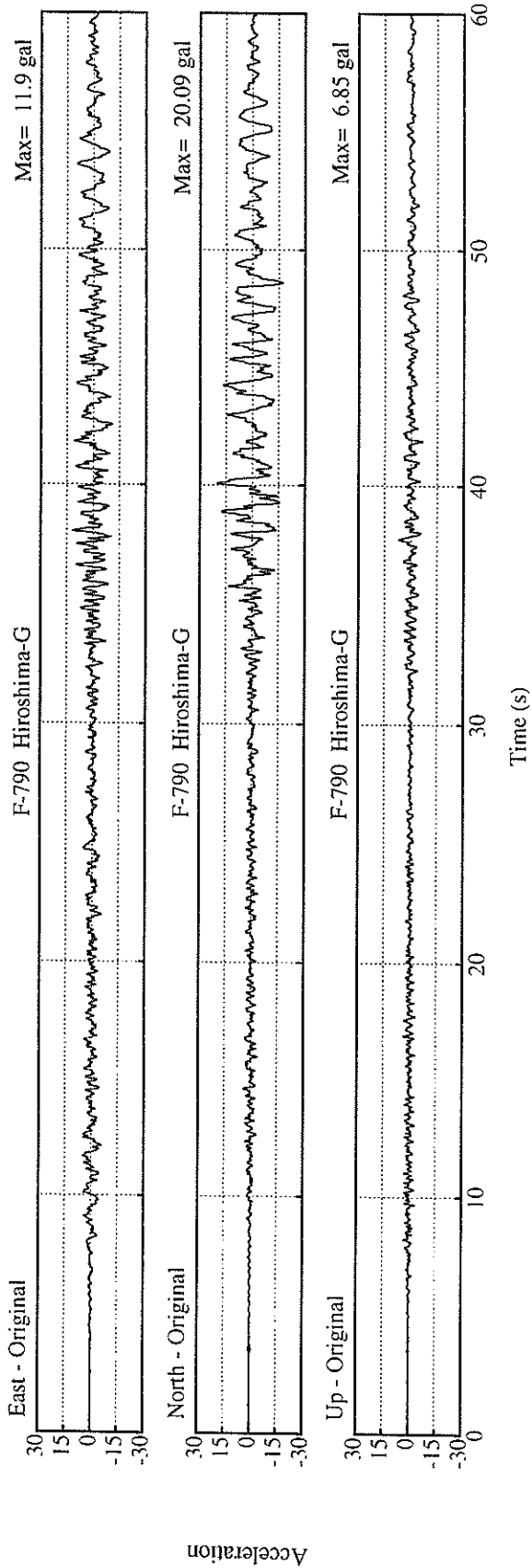
DATE AND TIME 5:26 JAN.17,1995 (DATE ERROR)
LOCATION OF HYPOCENTER
EPICENTRAL REGION
LATITUDE 0° 0.0' N
LONGITUDE 0° 0.0' E
DEPTH 0.0KM
JMA MAGNITUDE 0.0

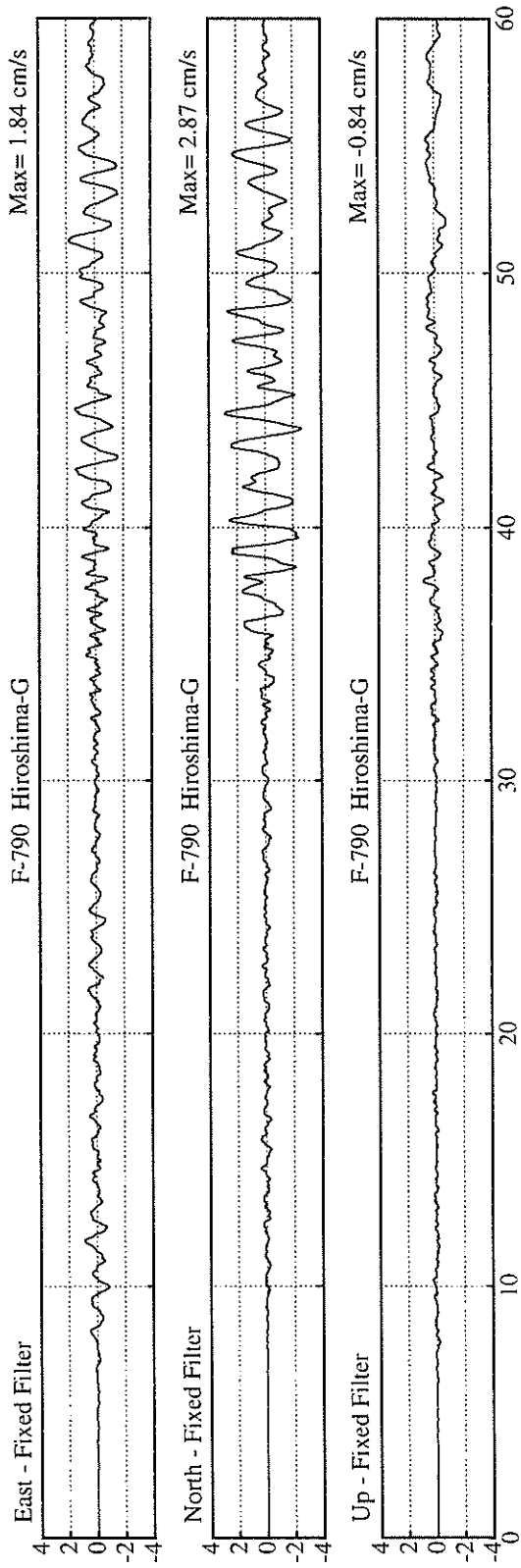
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.121	0.121	0.121	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	18.6	9.9	6.2	18.7
ORIGINAL	20.1	11.9	6.8	20.1
CORRECTED	20.3	11.9	6.9	20.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	2.87	1.84	0.84	3.10
VARIABLE FILTER	2.92	1.85	0.71	3.04
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.71	0.79	0.51	0.87
VARIABLE FILTER	0.62	0.73	0.53	0.74

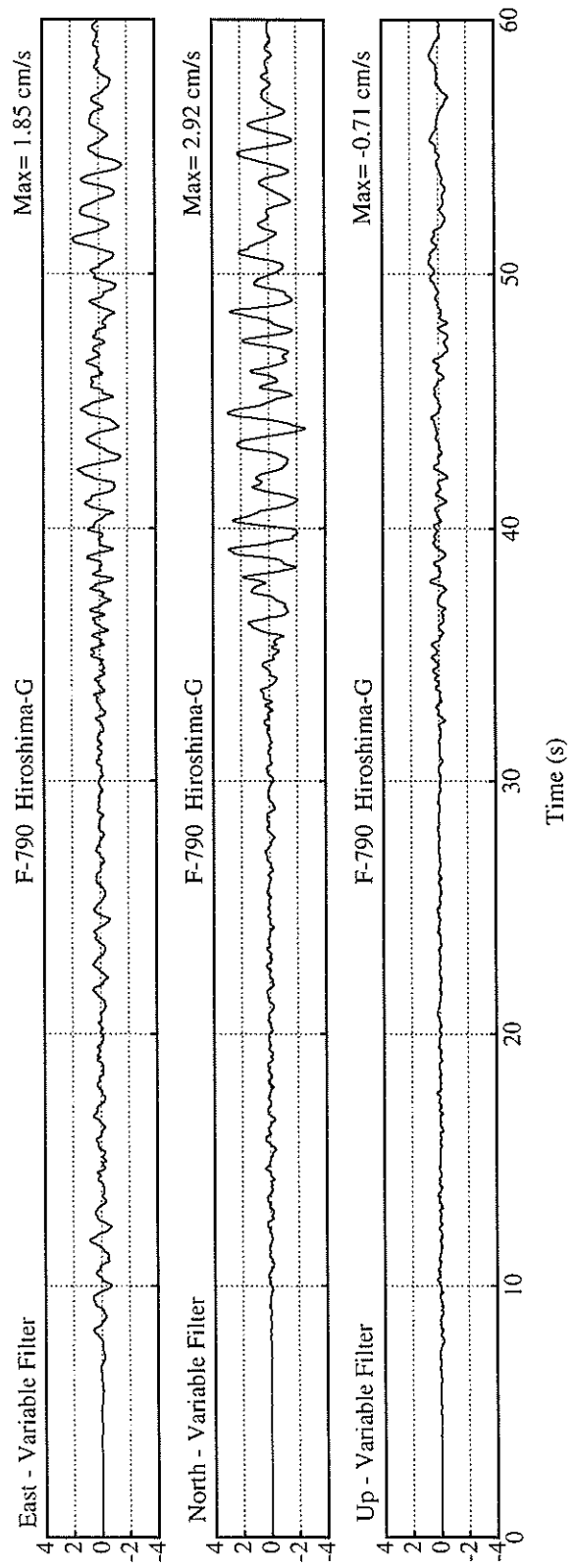
* RESULTANT OF HORIZONTAL COMPONENTS



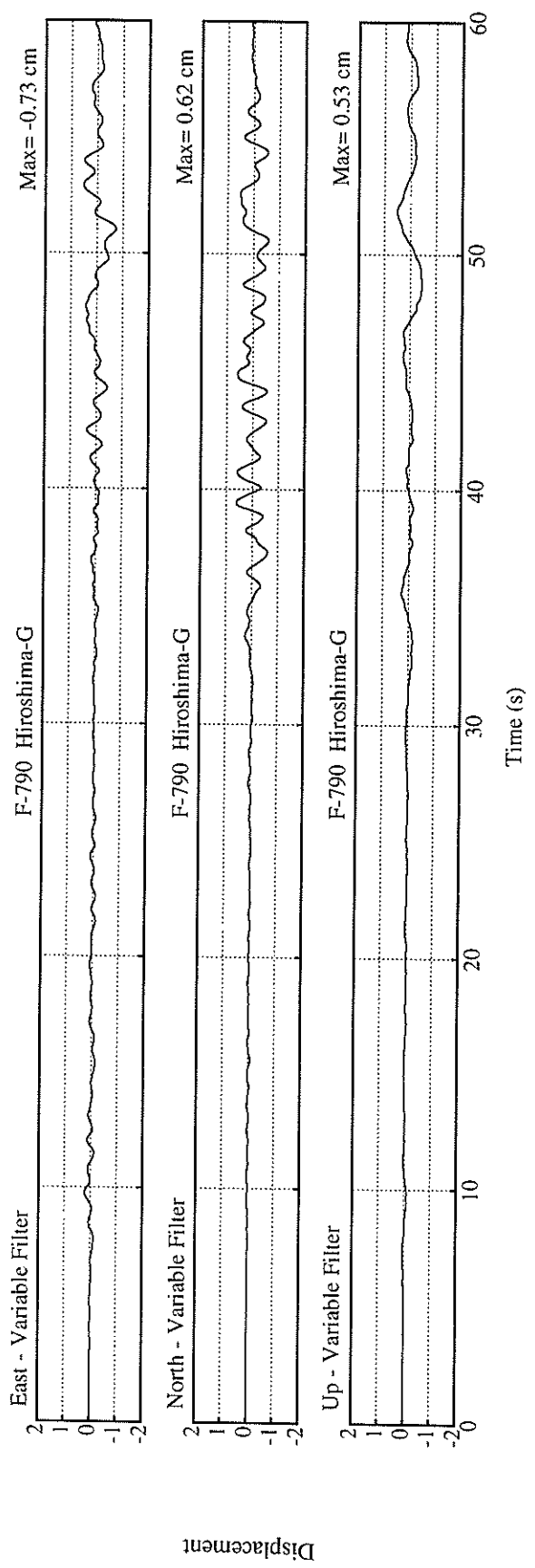
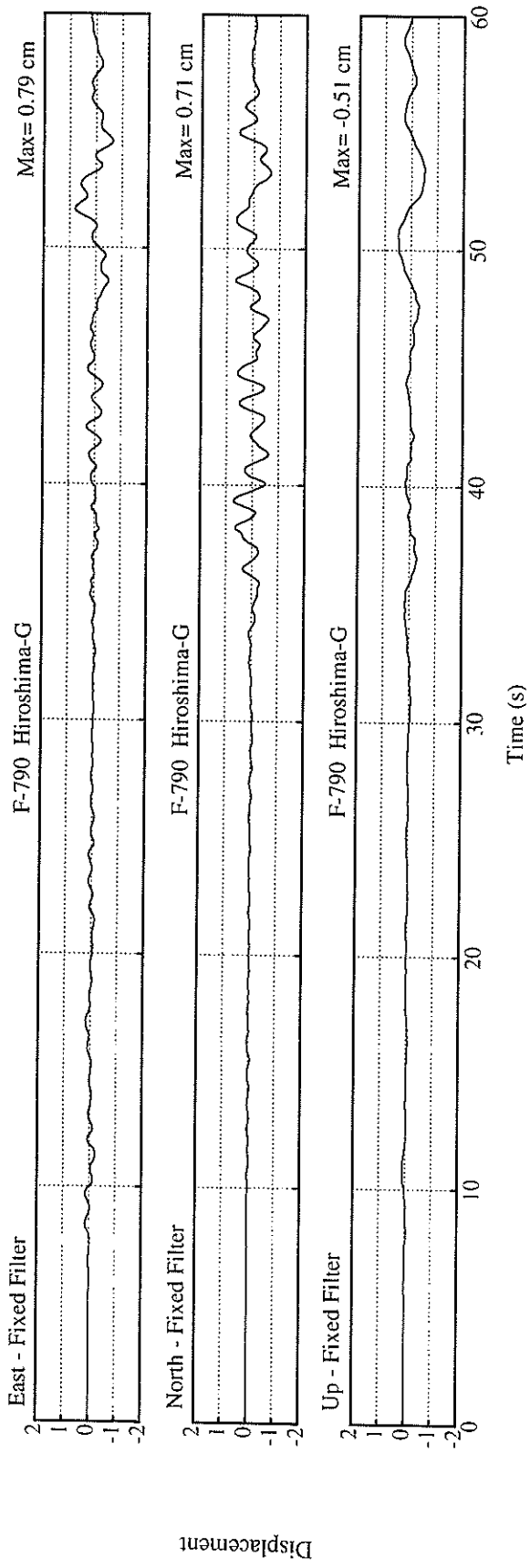


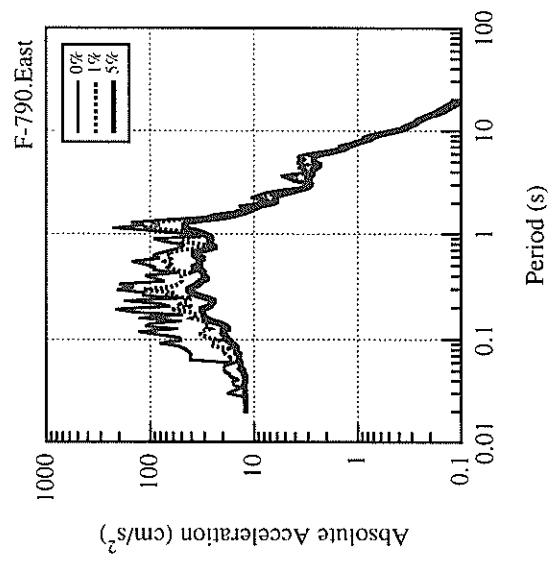
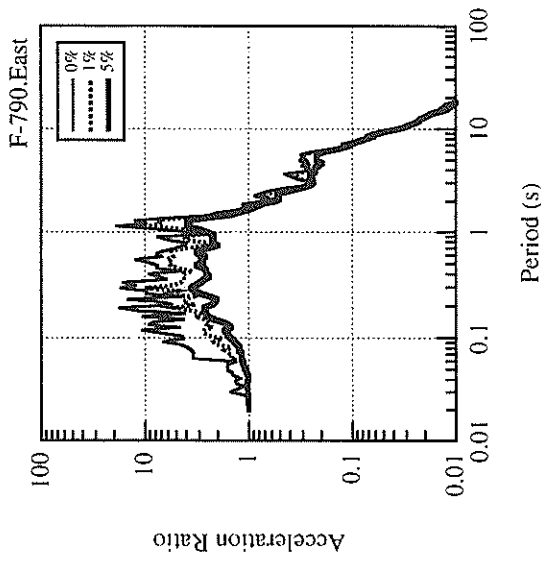
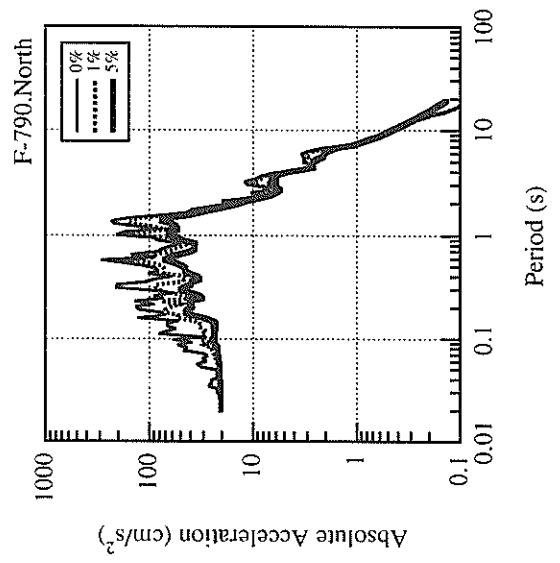
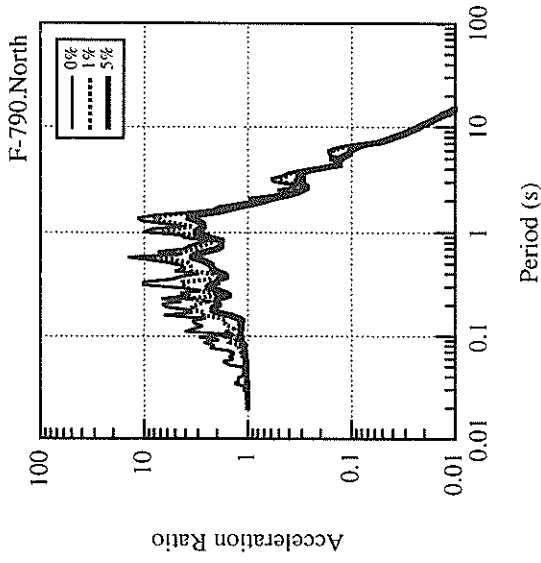
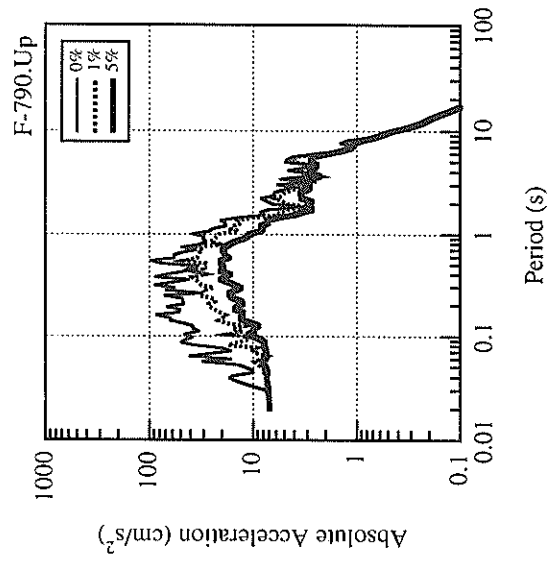
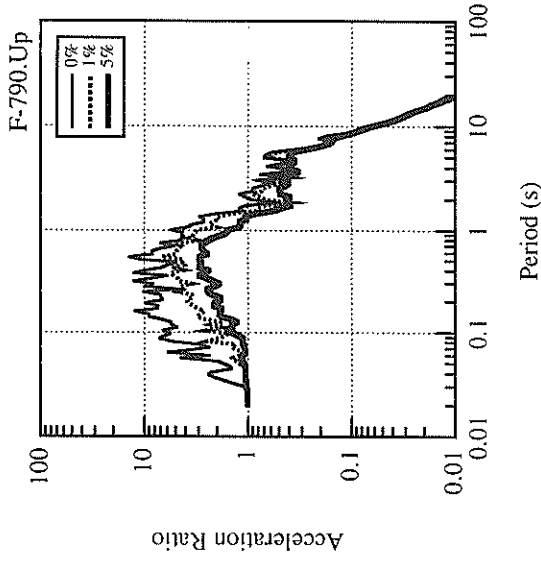


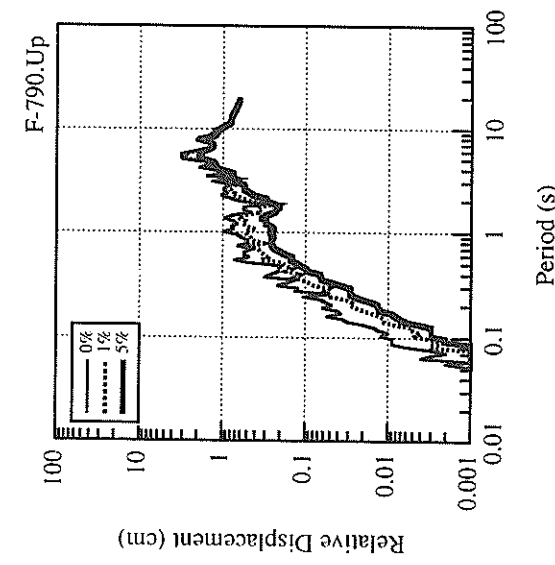
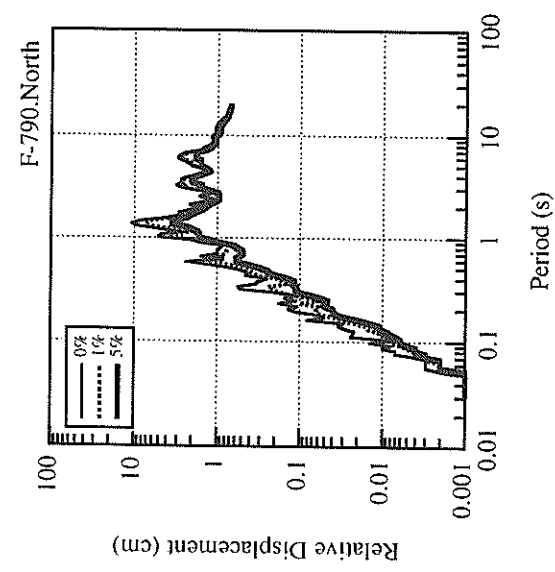
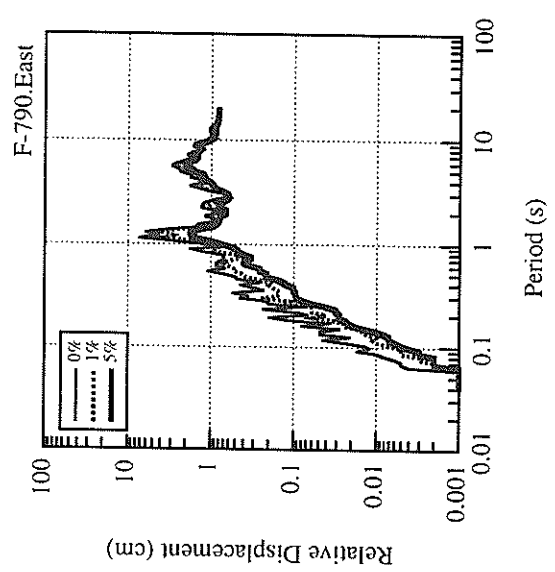
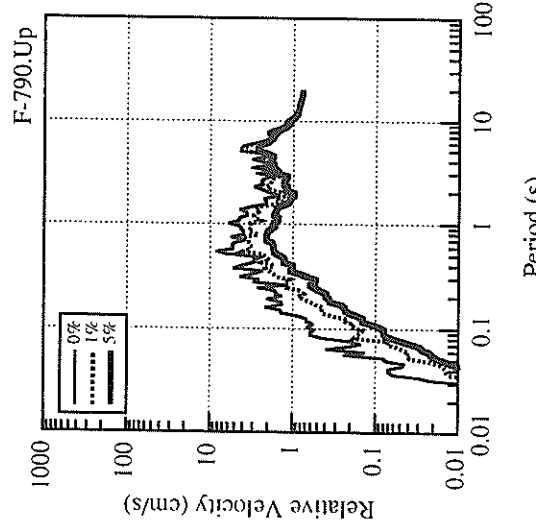
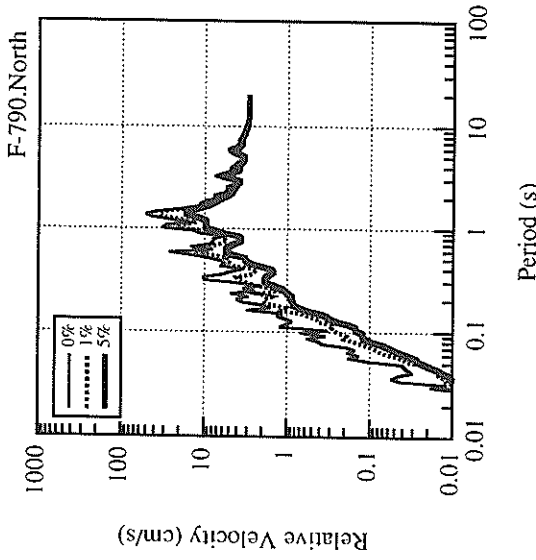
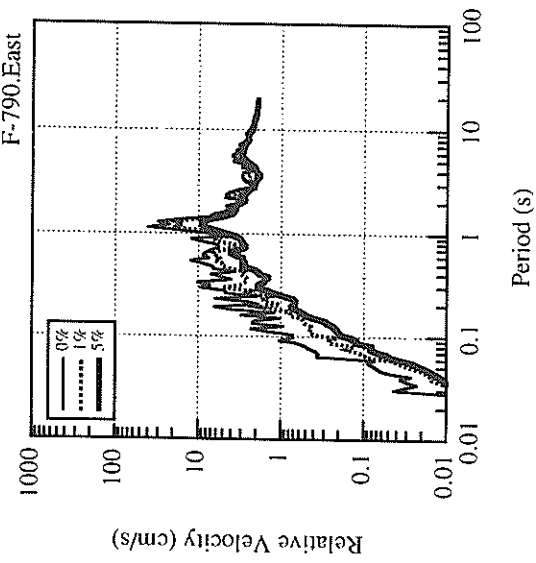
Velocity

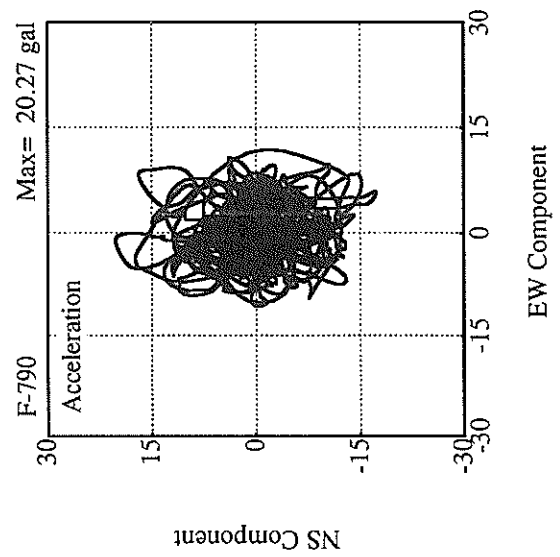
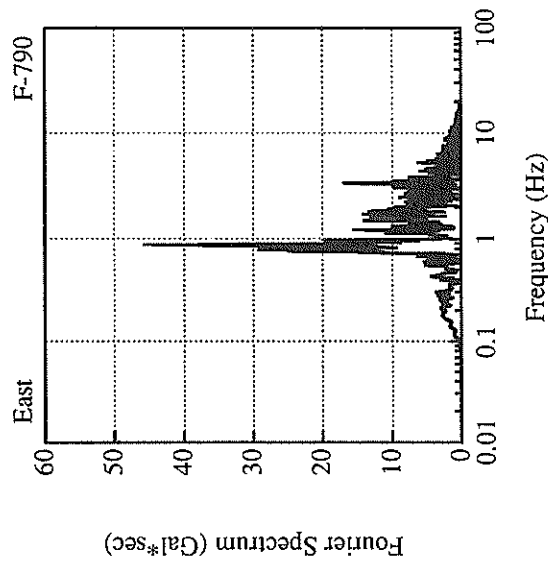
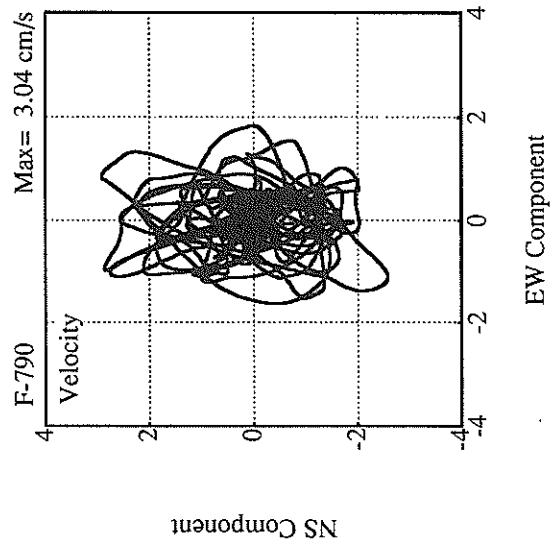
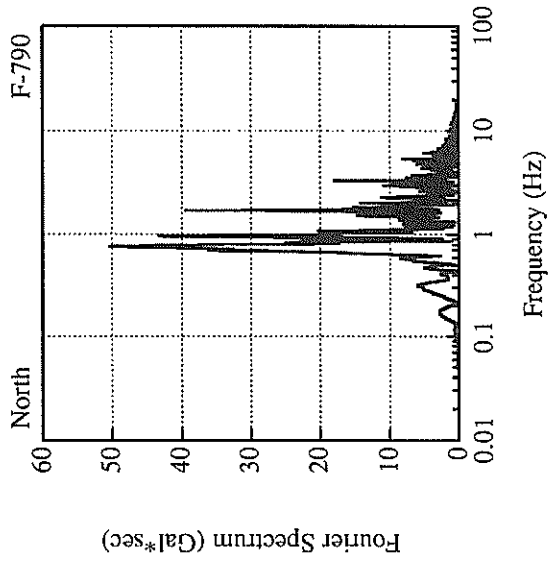
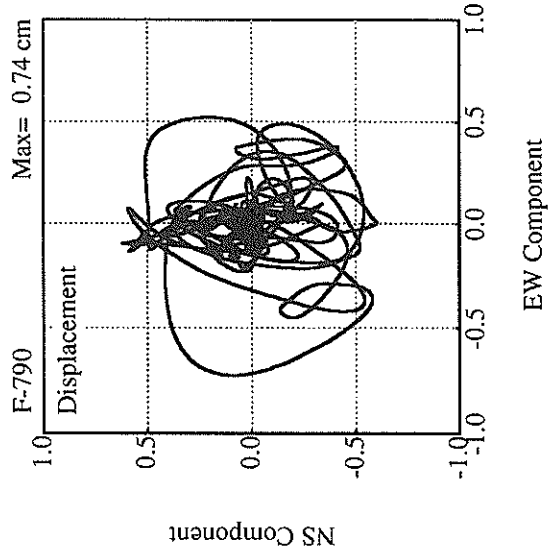
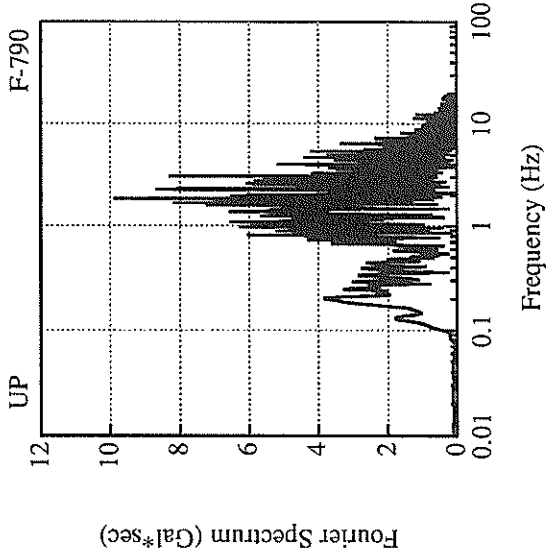


Velocity









RECORD NUMBER : F-791
 STATION : KOCHI-G

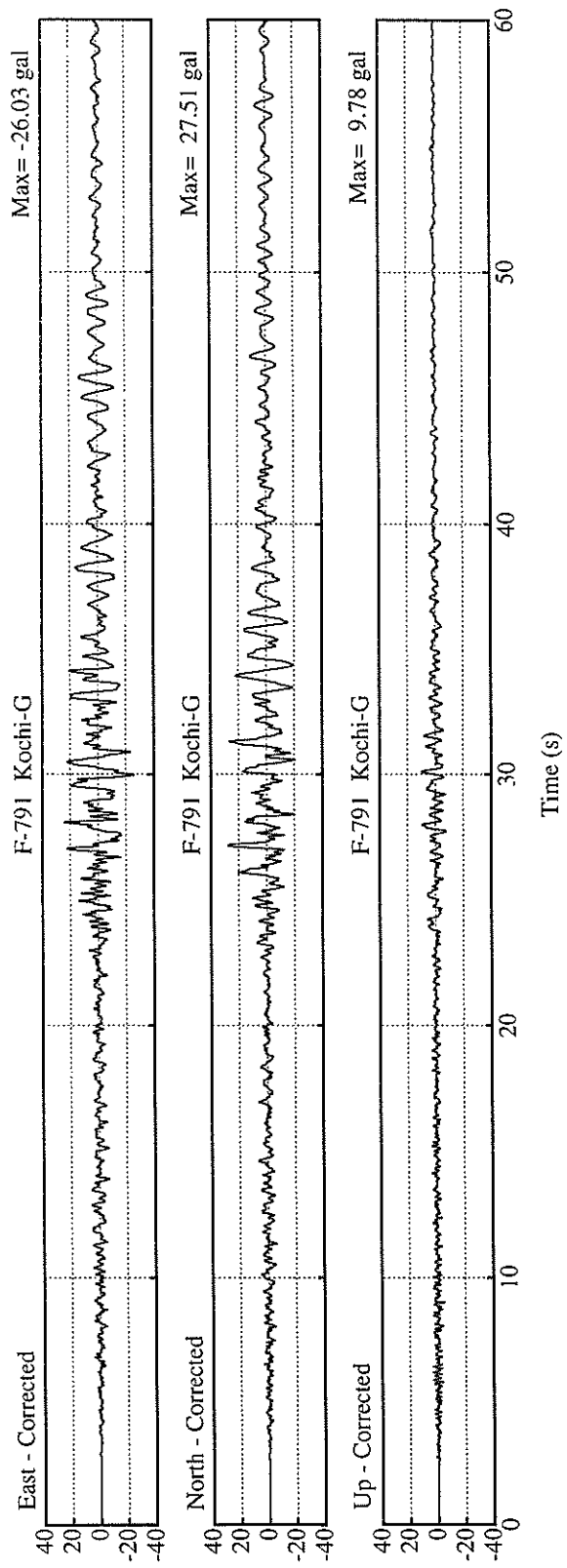
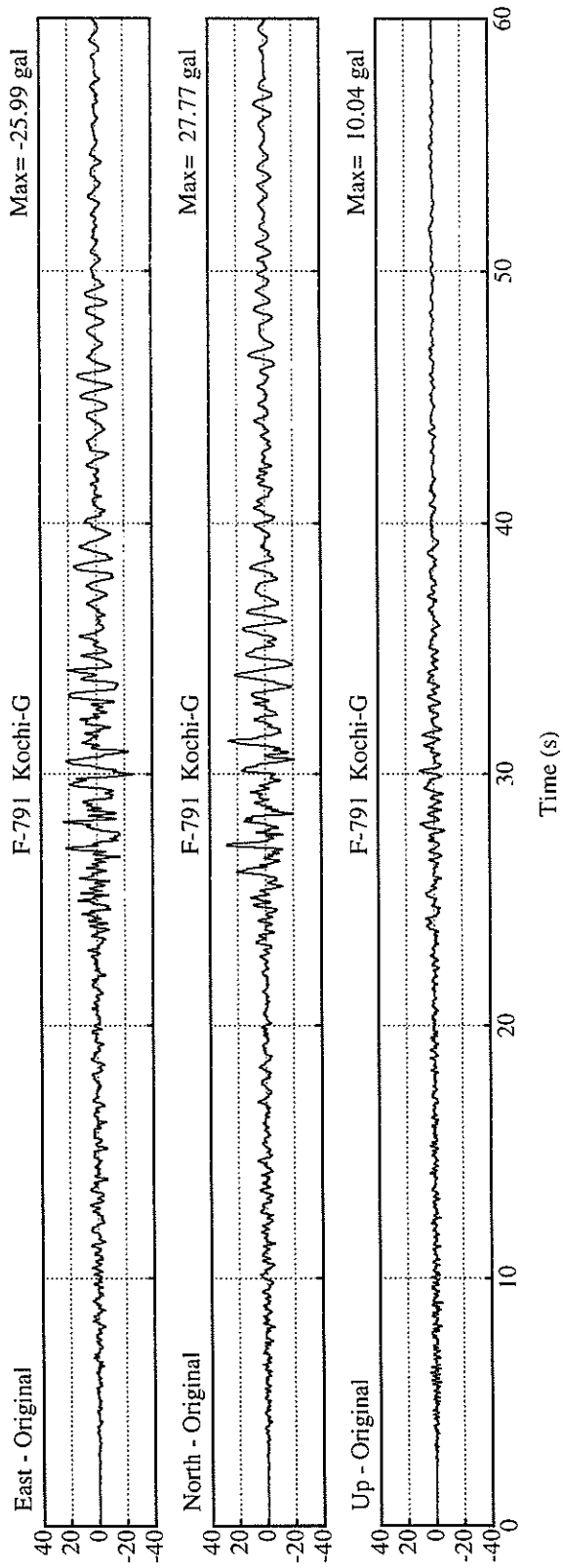
EARTHQUAKE DATA

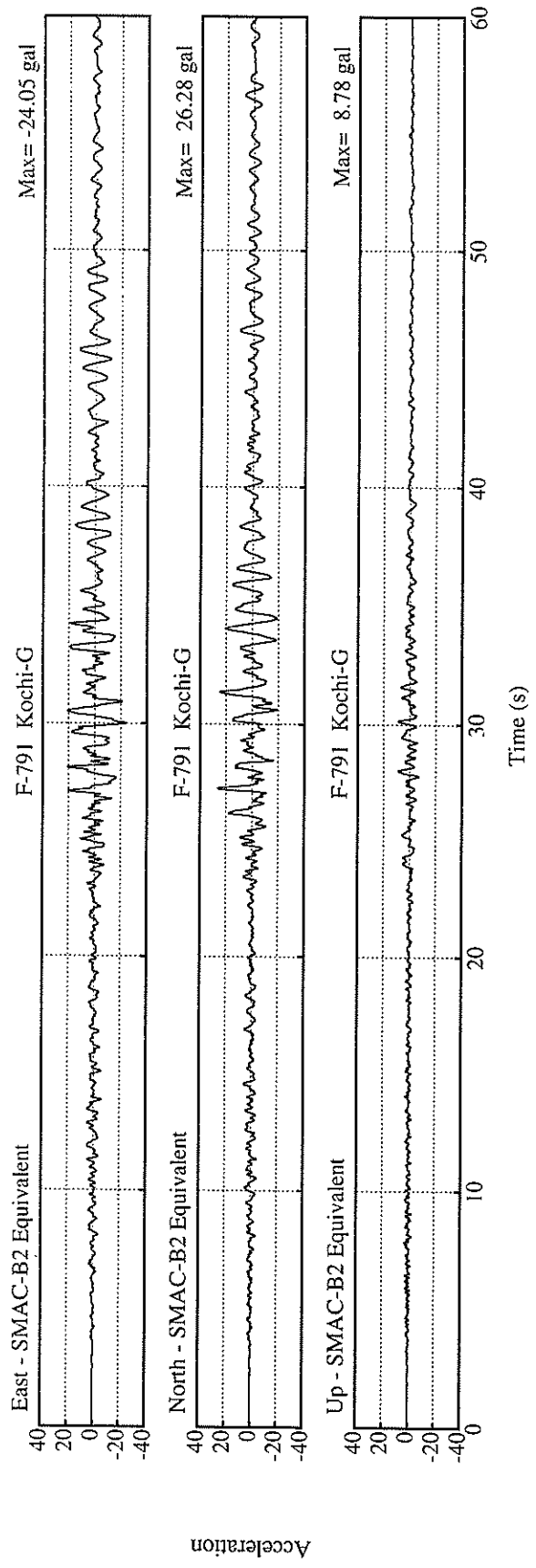
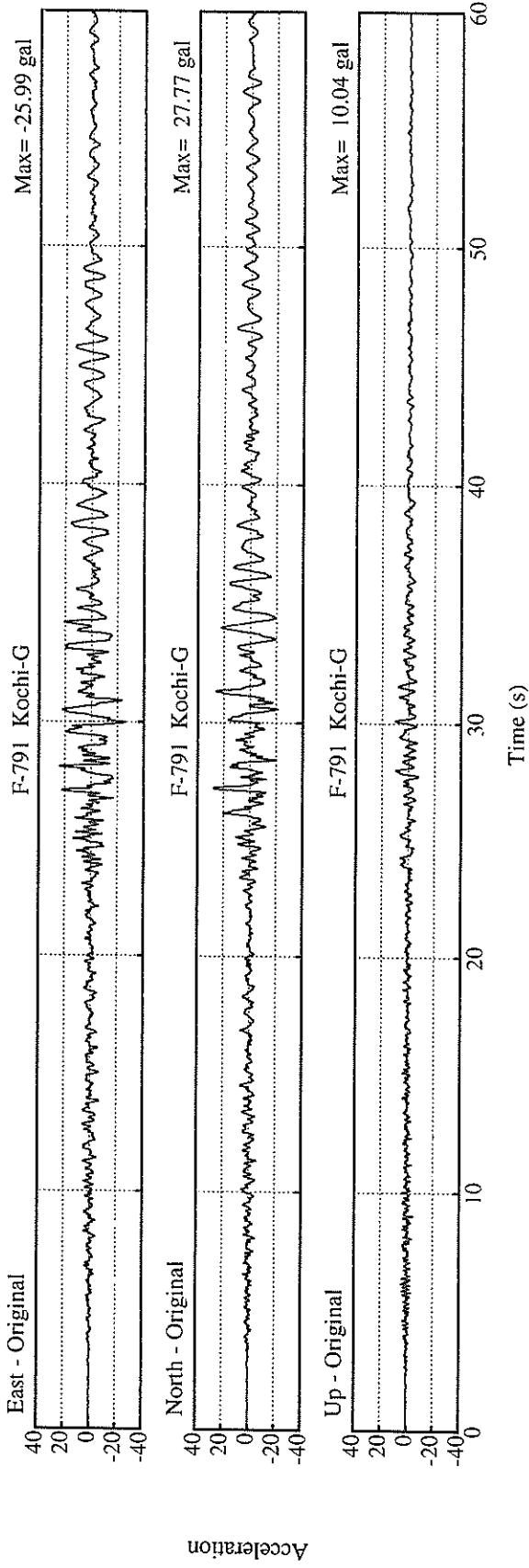
 DATE AND TIME 5:46 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34° 35.7' N
 LONGITUDE 135° 2.2' E
 DEPTH 17.9KM
 JMA MAGNITUDE 7.2

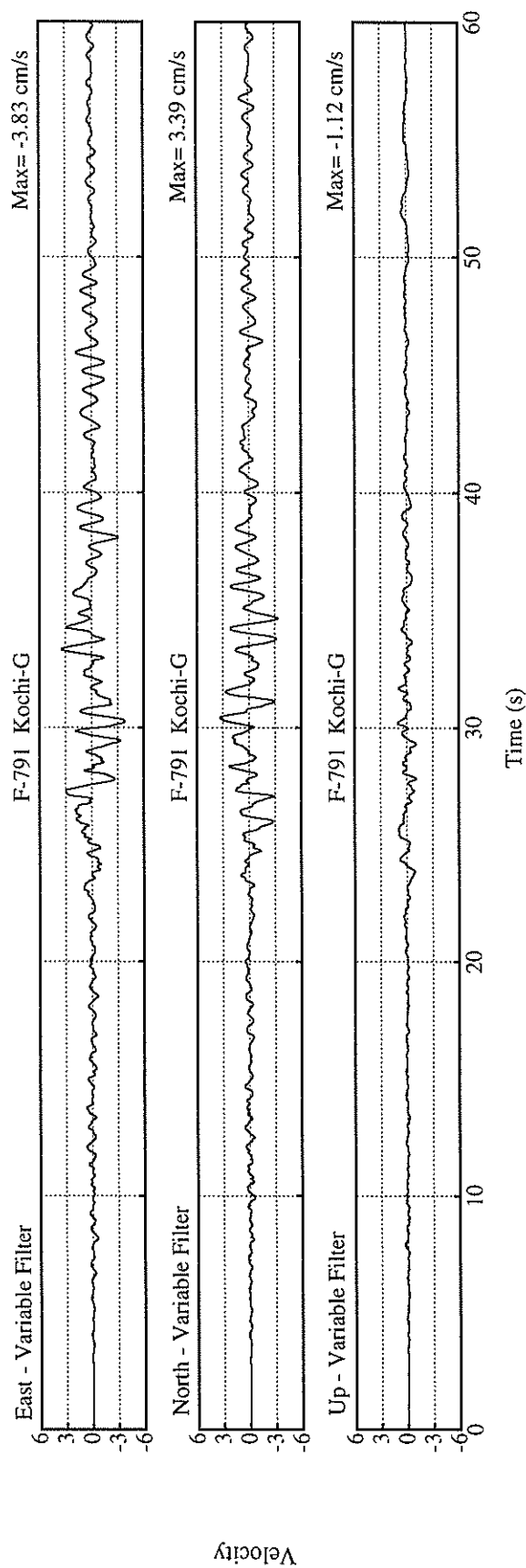
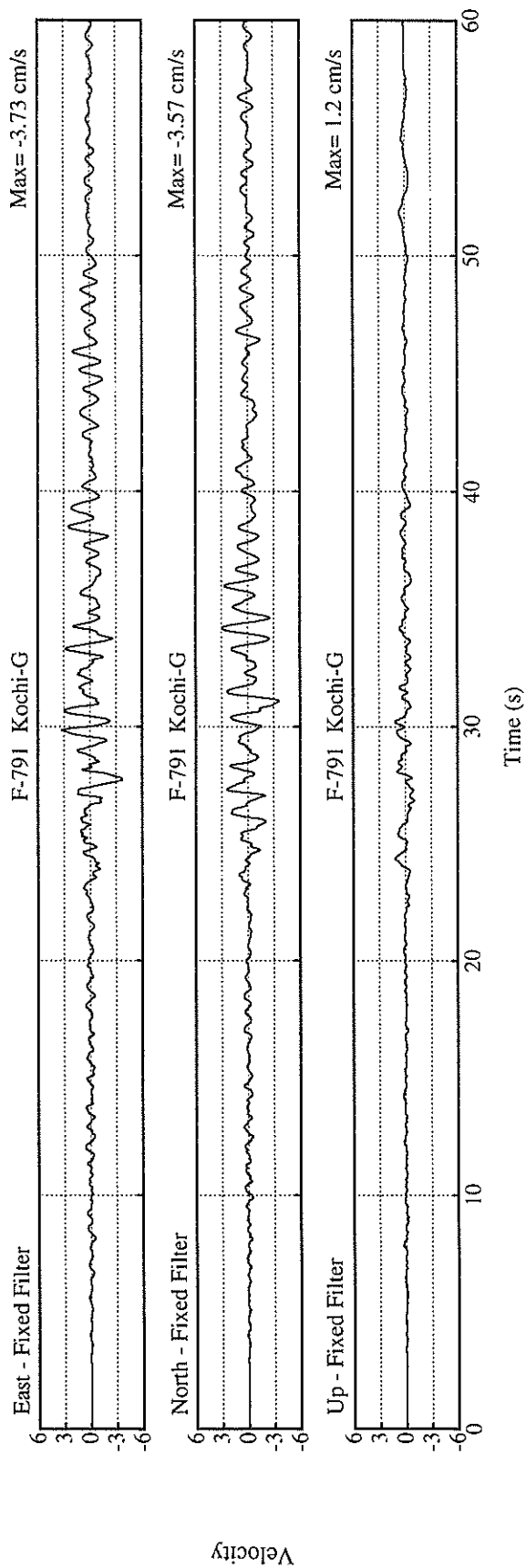
PEAK VALUES OF COMPONENTS

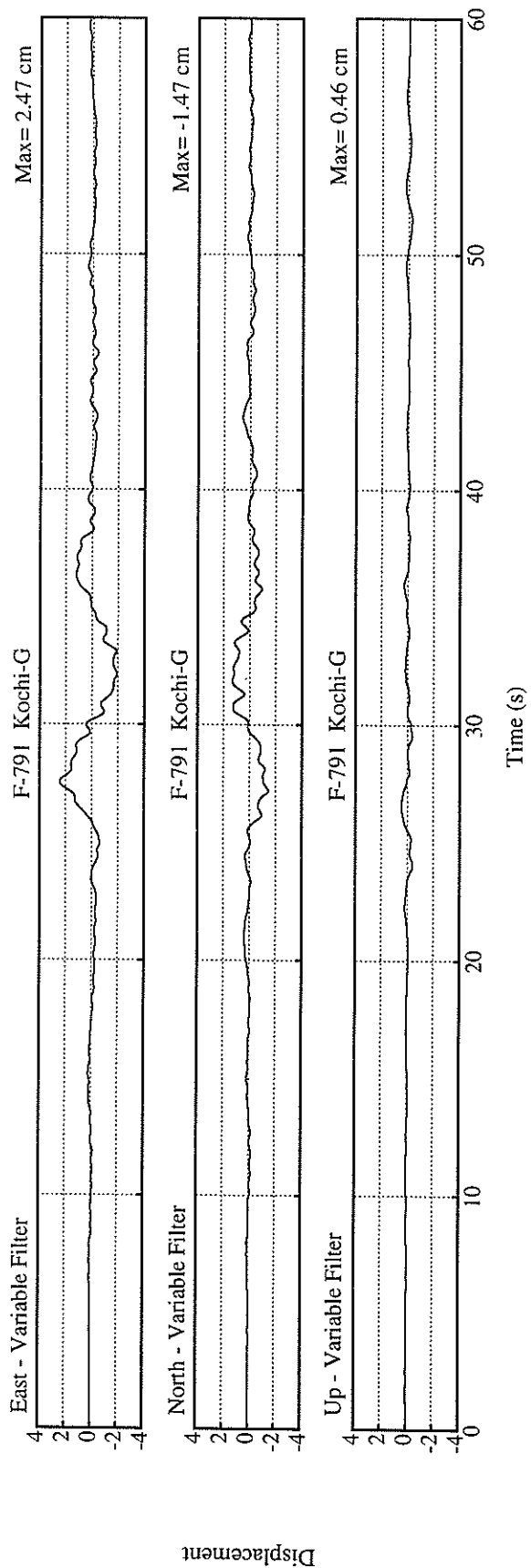
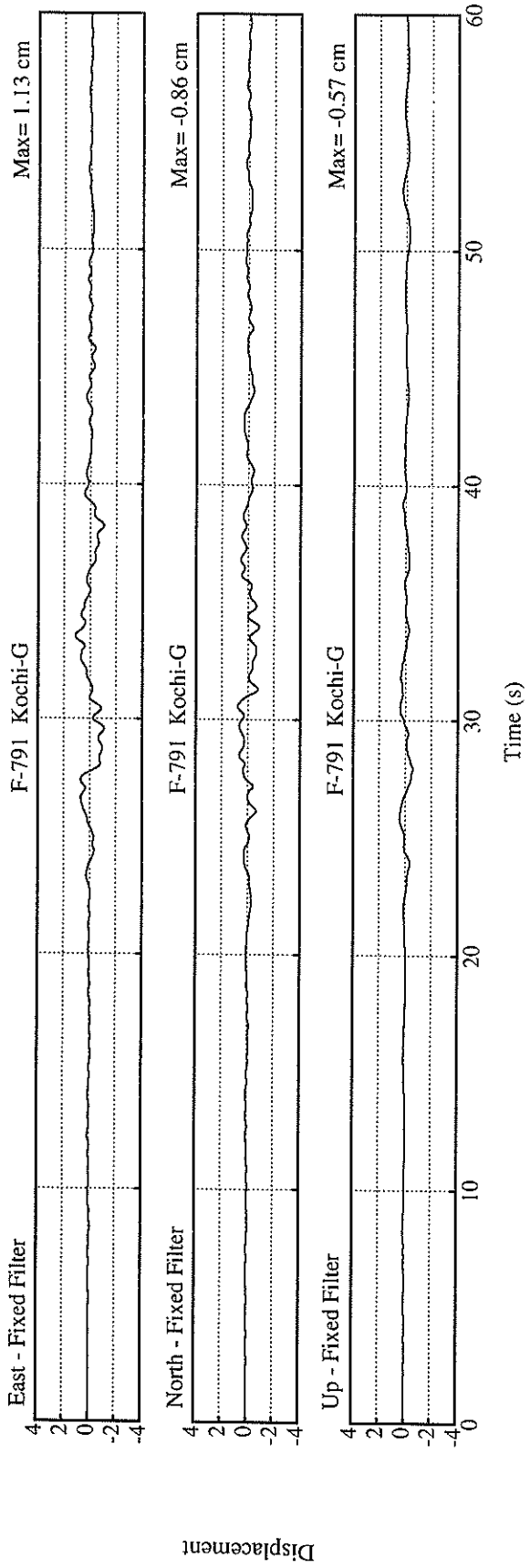
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.073	0.066	0.140	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	26.3	24.1	8.8	26.4
ORIGINAL	27.8	26.0	10.0	28.1
CORRECTED	27.5	26.0	9.8	28.0
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	3.57	3.73	1.20	3.77
VARIABLE FILTER	3.39	3.83	1.12	4.74
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.86	1.13	0.57	1.25
VARIABLE FILTER	1.46	2.47	0.46	2.69

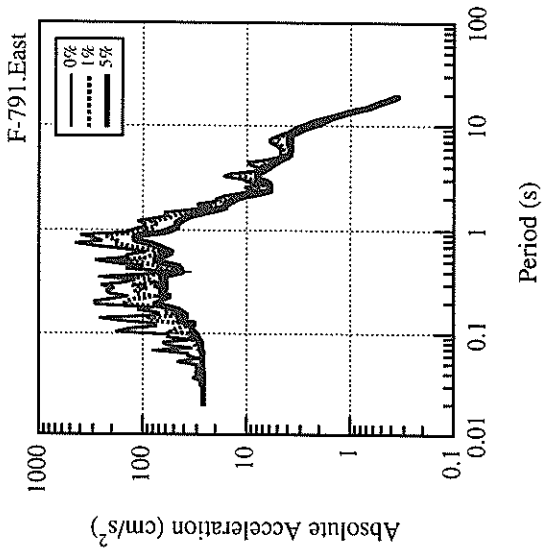
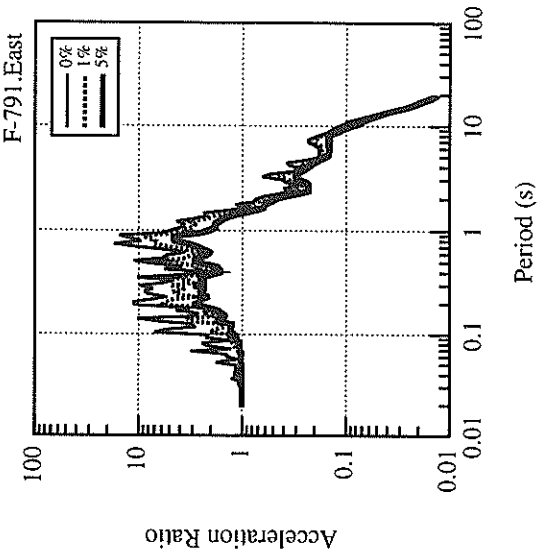
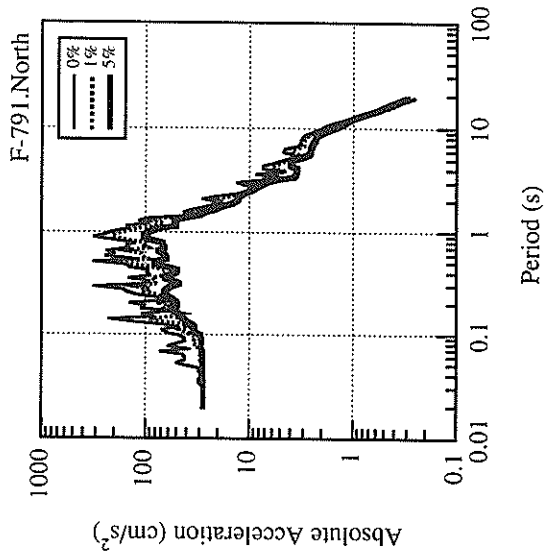
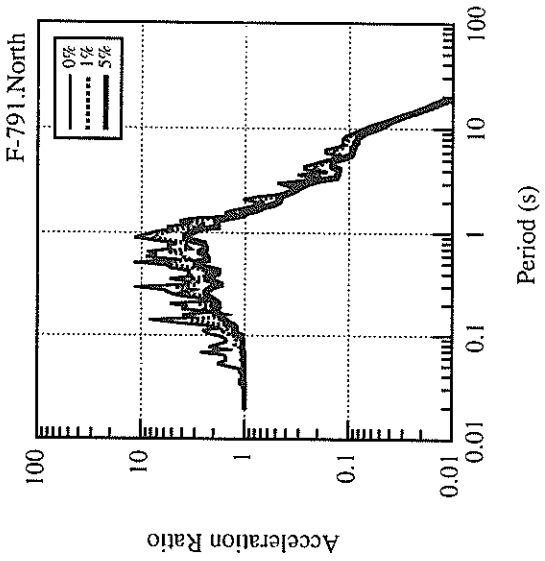
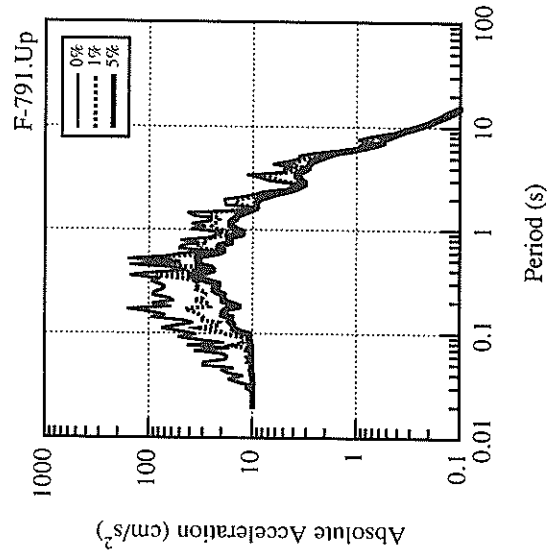
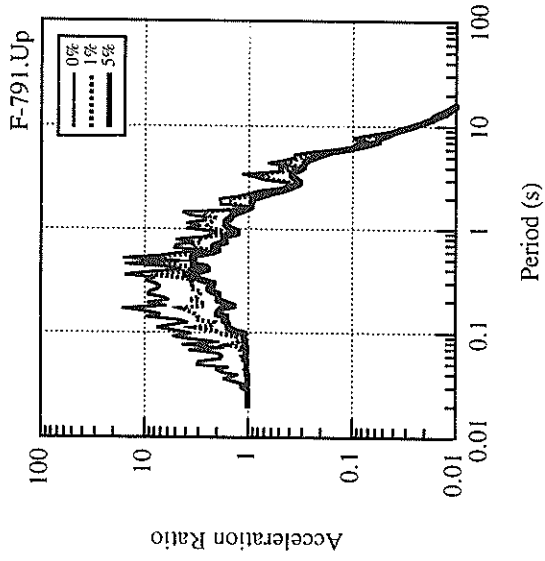
* RESULTANT OF HORIZONTAL COMPONENTS

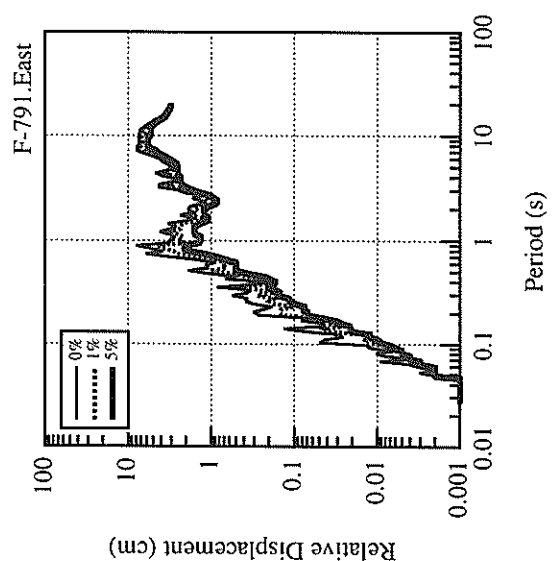
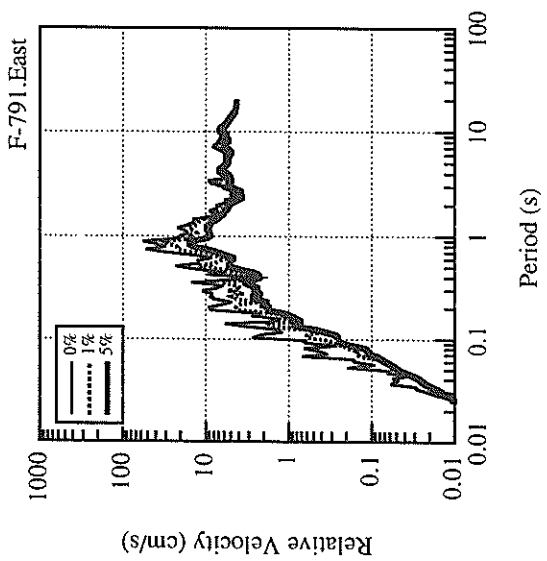
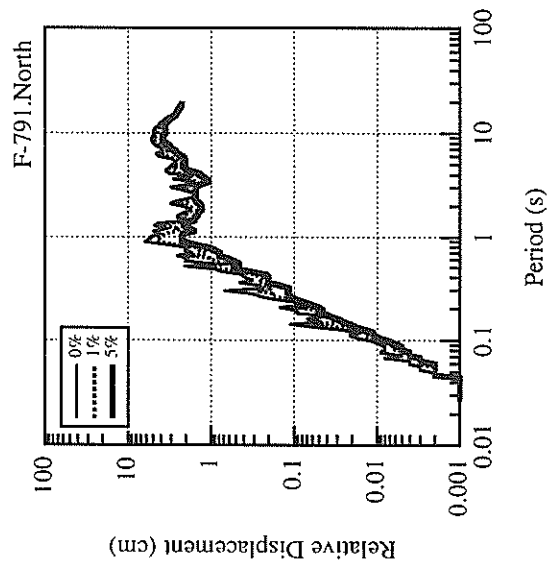
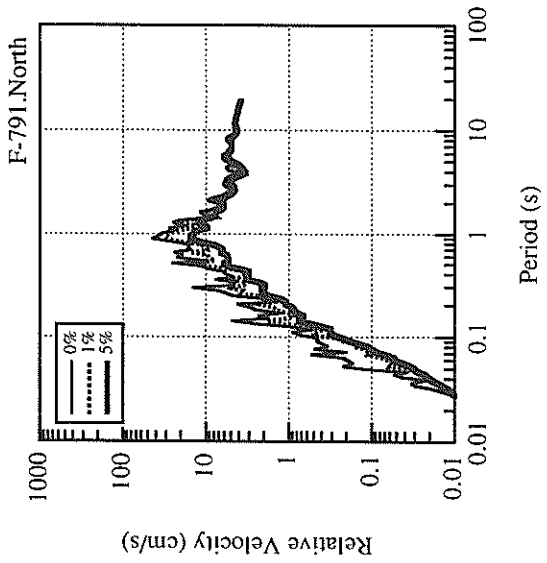
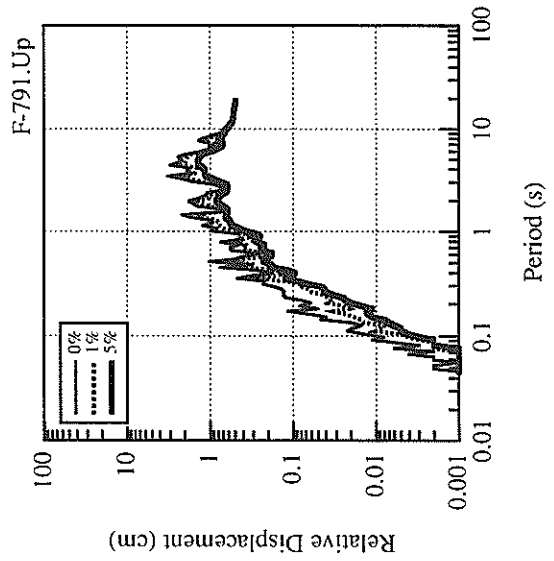
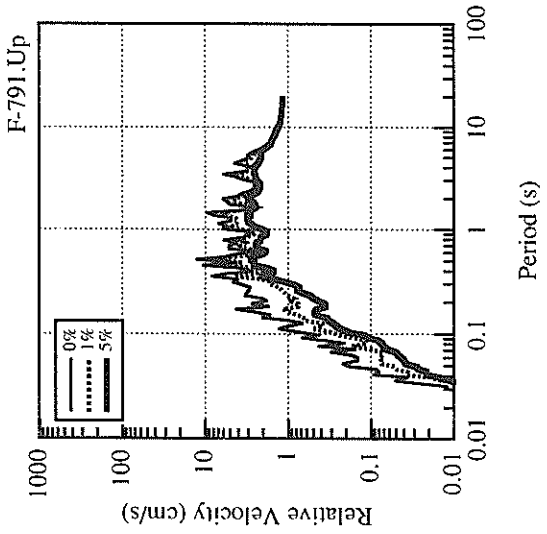


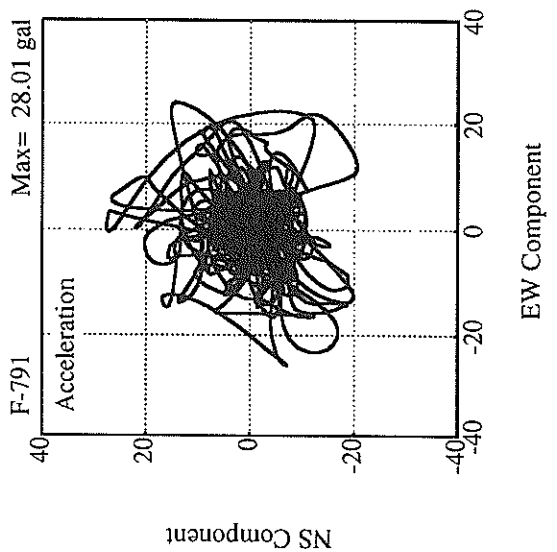
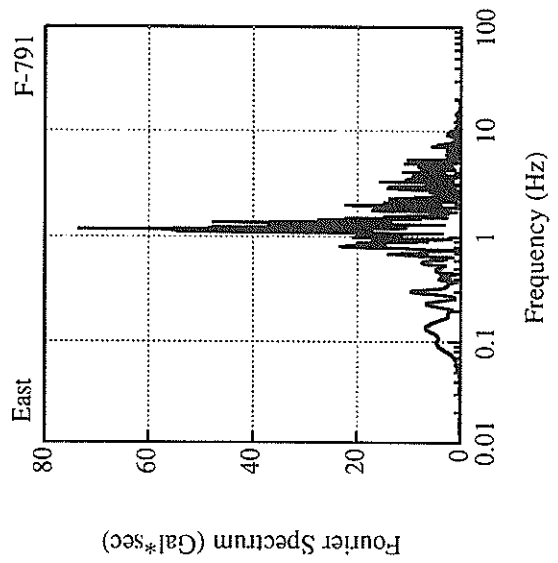
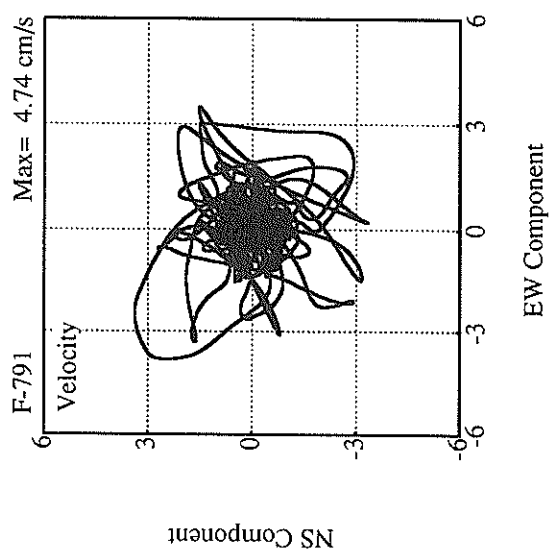
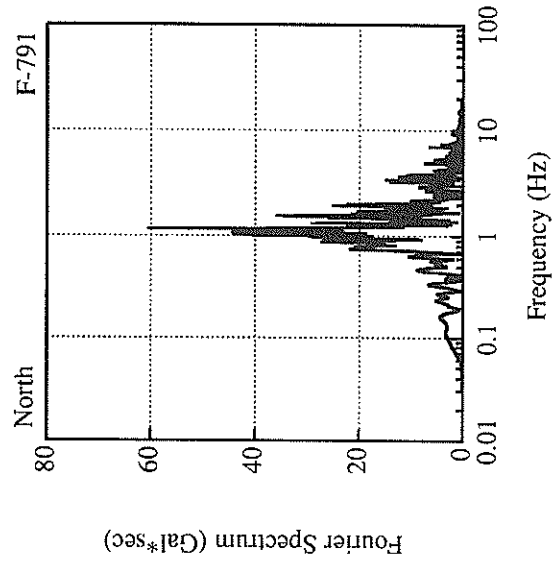
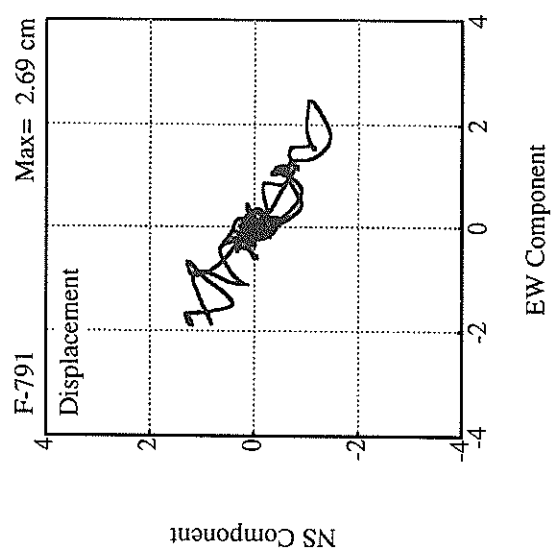
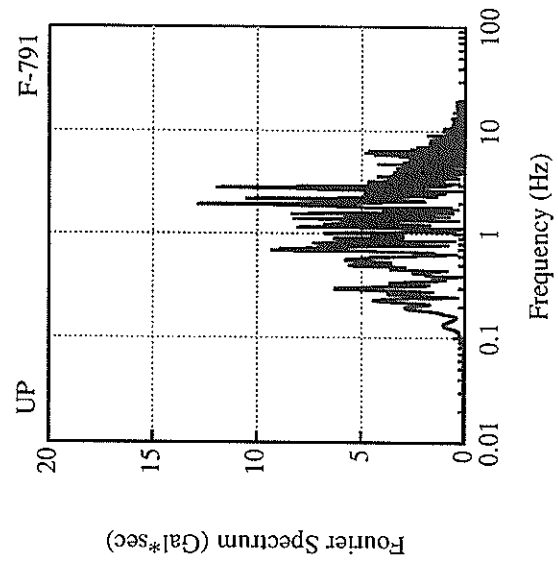












RECORD NUMBER : F-792
 STATION : MATSUYAMA-G

EARTHQUAKE DATA

 DATE AND TIME 5:40 JAN.17,1995 (DATE ERROR)
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION
 LATITUDE 0° 0.0' N
 LONGITUDE 0° 0.0' E
 DEPTH 0.0KM
 JMA MAGNITUDE 0.0

PEAK VALUES OF COMPONENTS

 N S E W U D HORIZONTAL*

PARAMETER OF THE VARIABLE FILTER

 FC (HZ) 0.091 0.134 0.158

MAXIMUM ACCELERATION (GAL)

 SMAC-B2 EQUIVALENT 38.0 32.6 9.0 38.2
 ORIGINAL 39.7 35.3 10.3 39.7
 CORRECTED 39.8 35.2 10.2 39.8

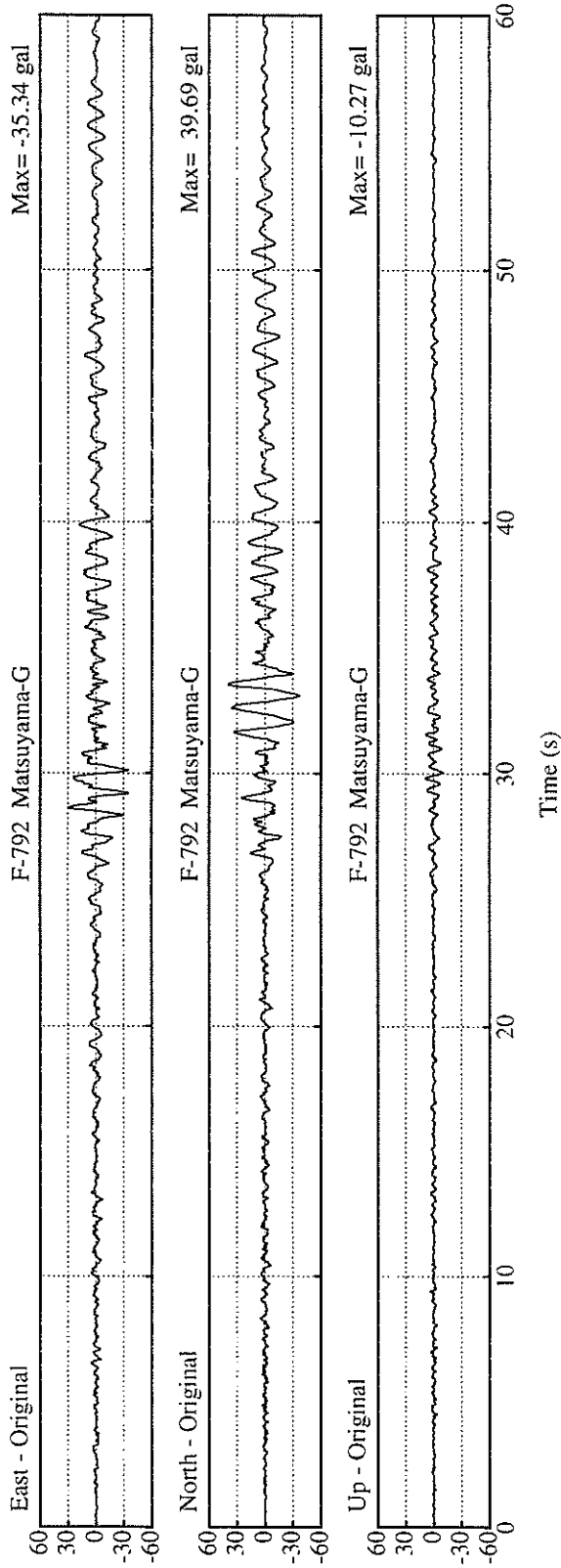
MAXIMUM VELOCITY (CM/SEC)

 FIXED FILTER 6.09 4.37 1.07 6.17
 VARIABLE FILTER 5.95 4.56 0.96 6.14

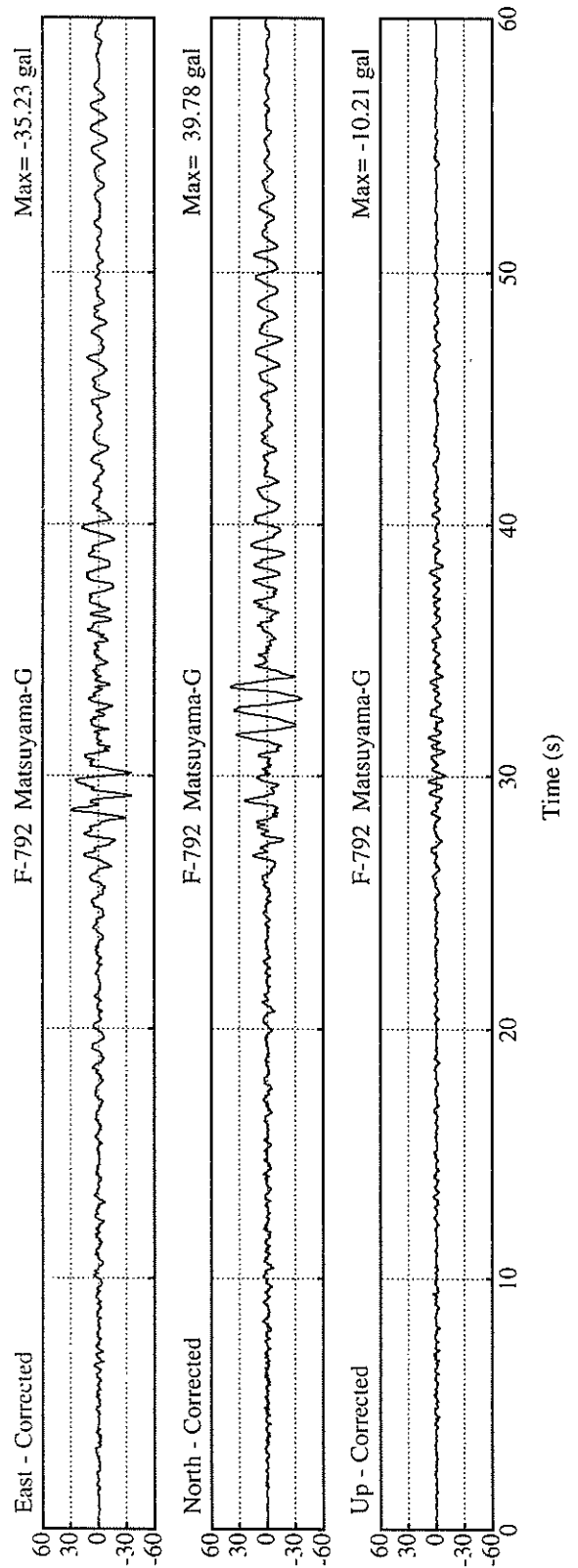
MAXIMUM DISPLACEMENT (CM)

 FIXED FILTER 1.17 0.58 0.33 1.21
 VARIABLE FILTER 1.39 0.76 0.20 1.40

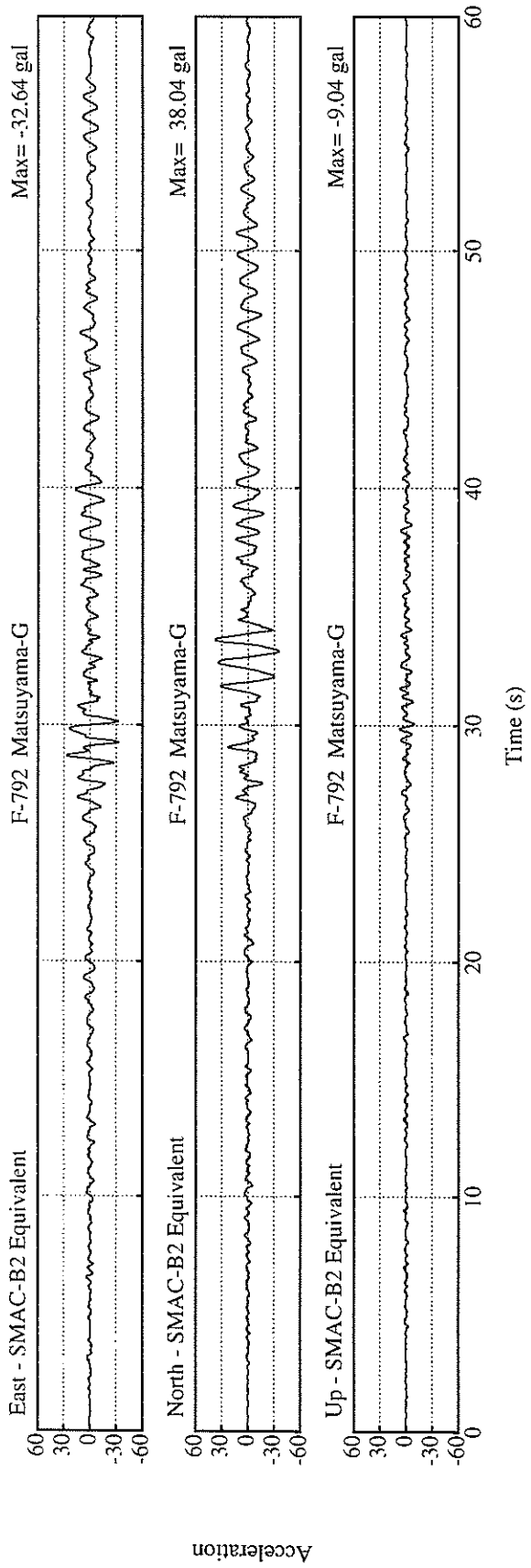
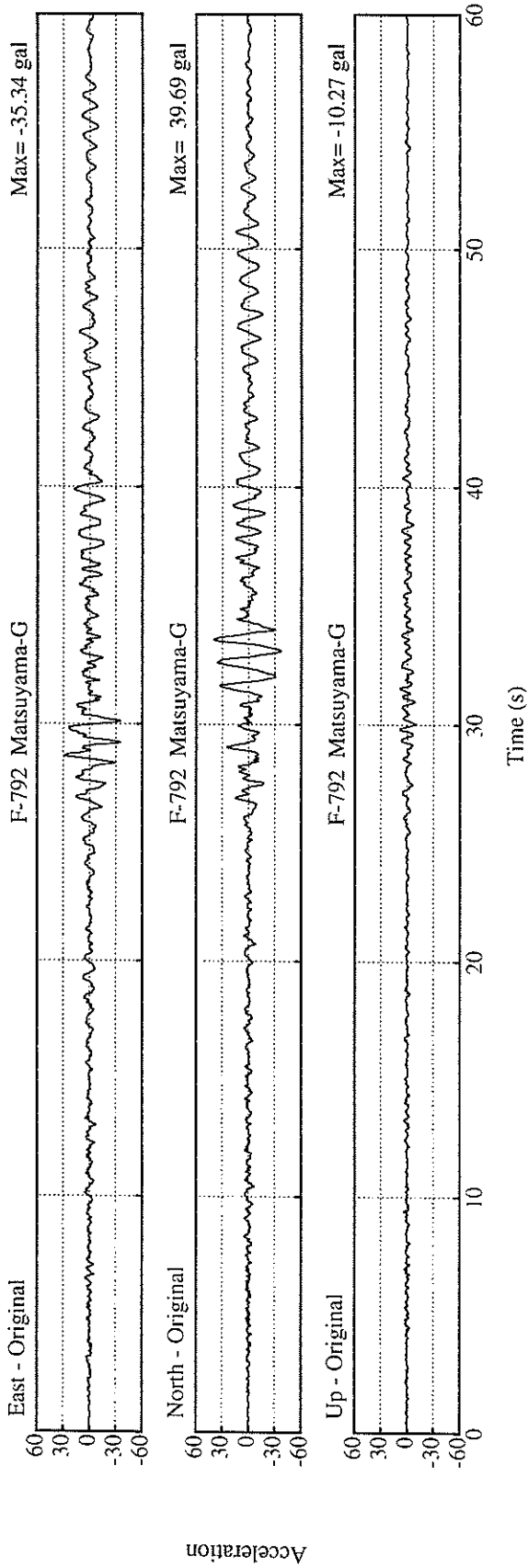
* RESULTANT OF HORIZONTAL COMPONENTS

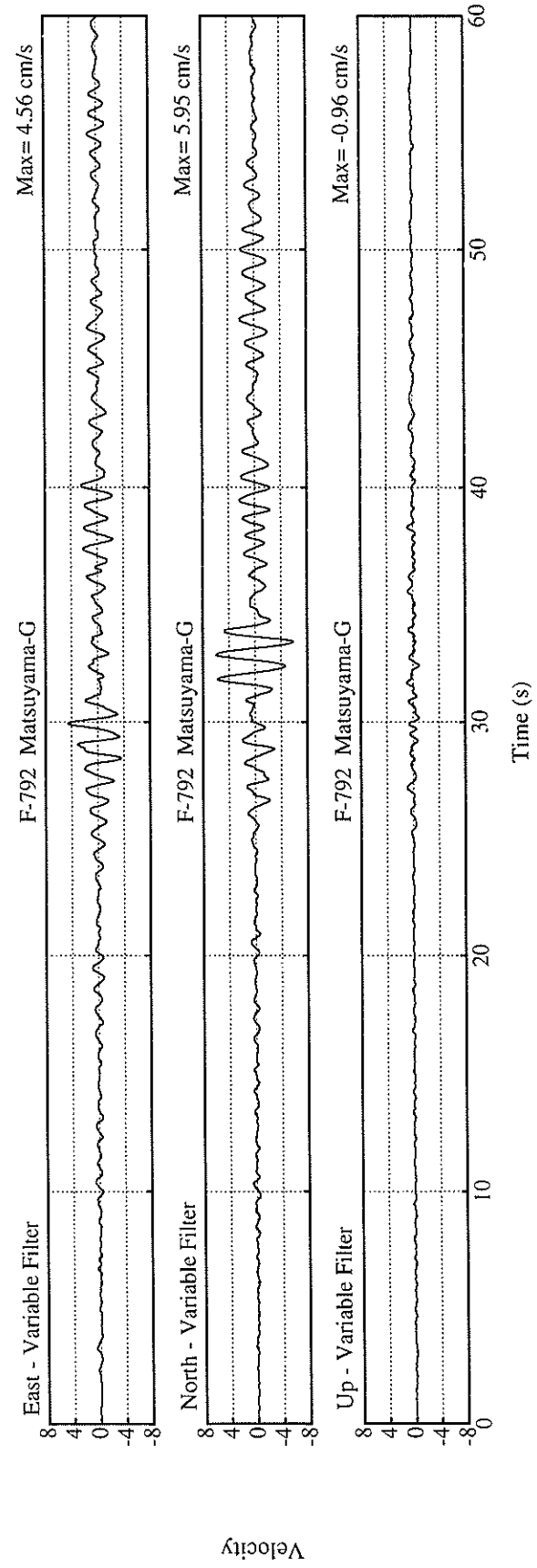
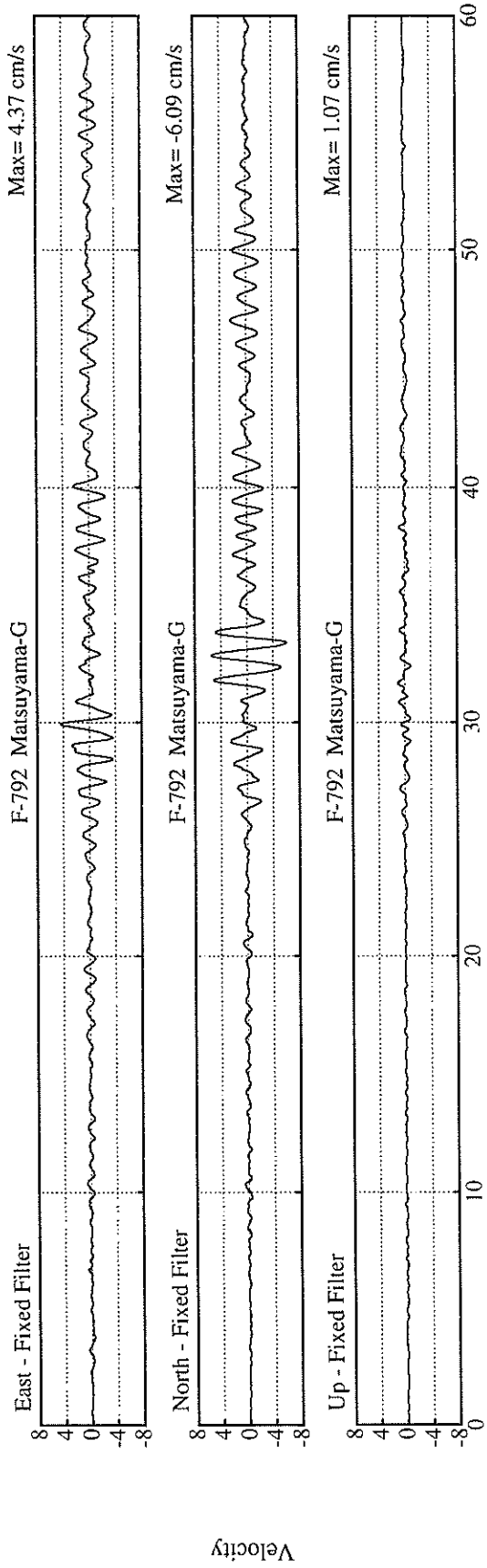


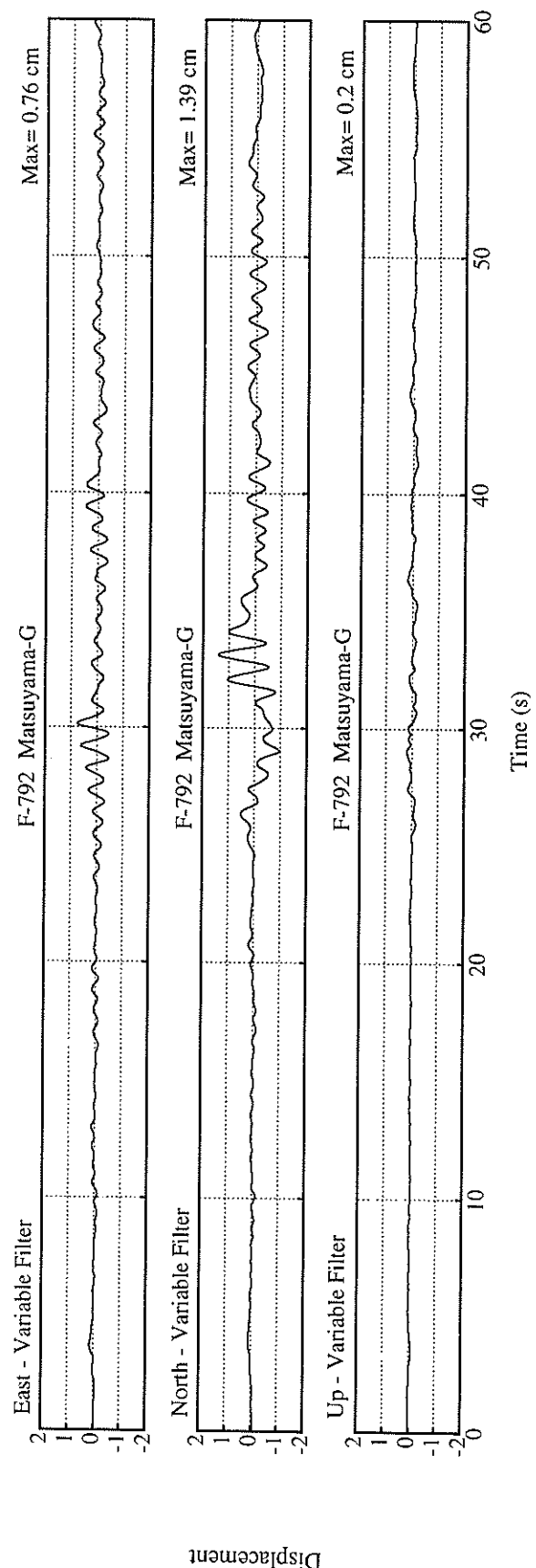
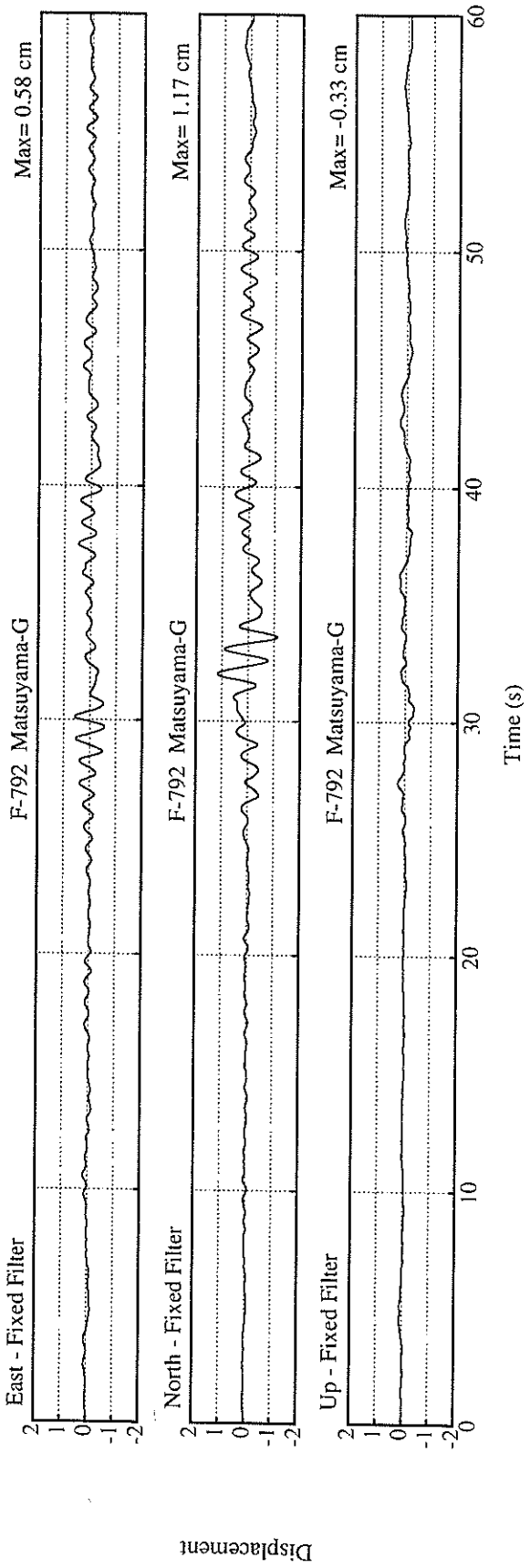
Acceleration

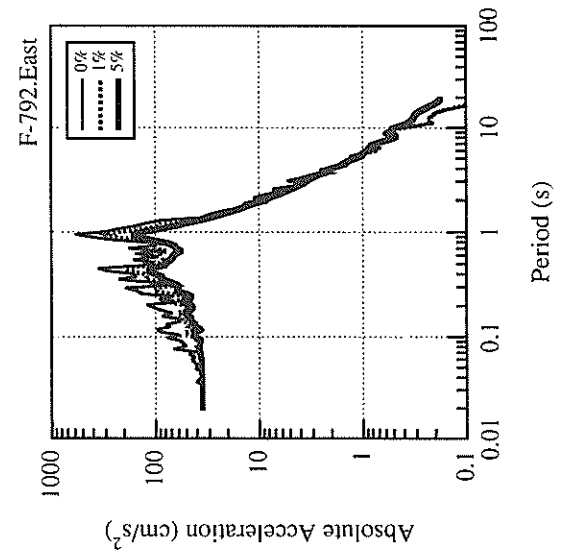
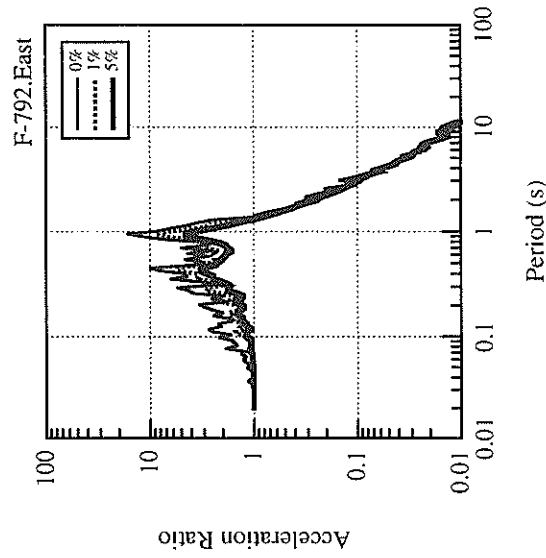
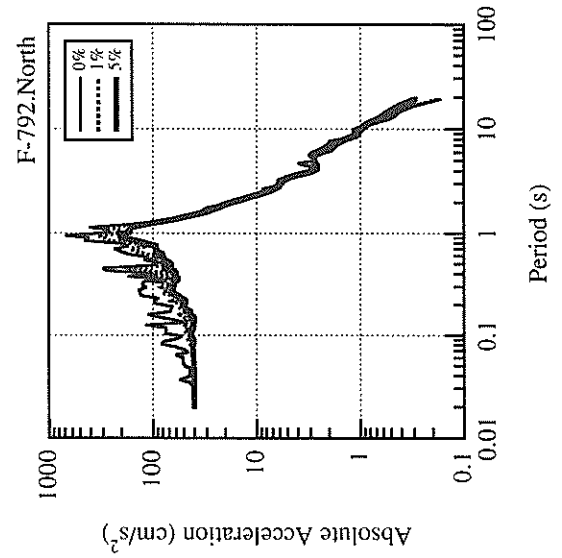
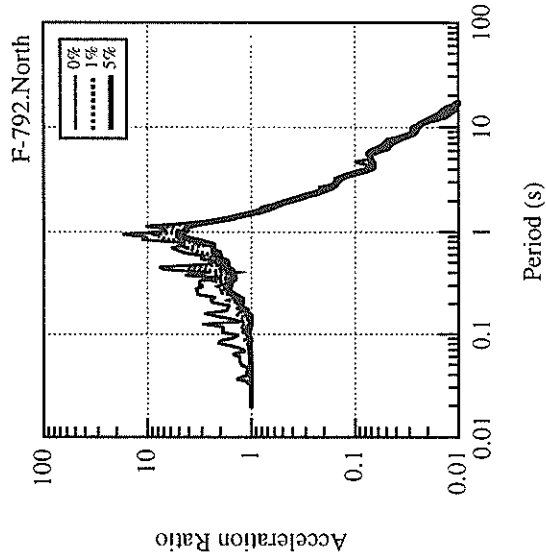
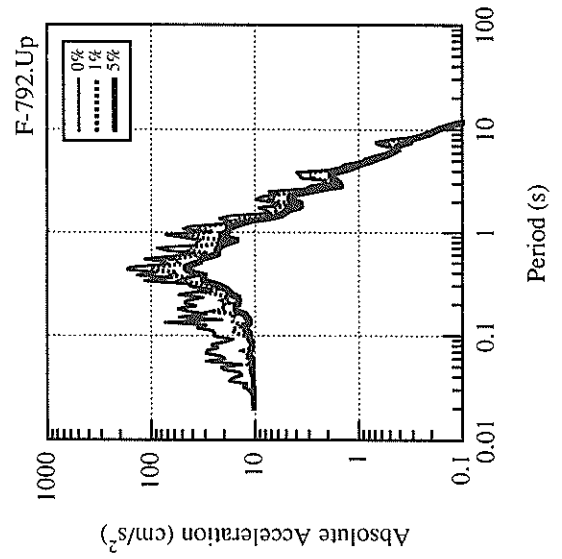
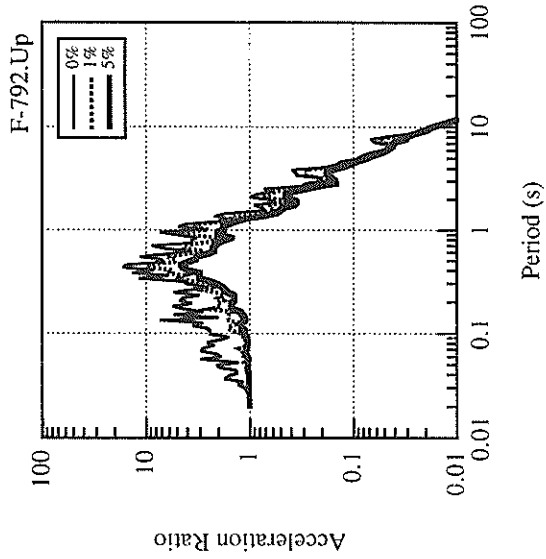


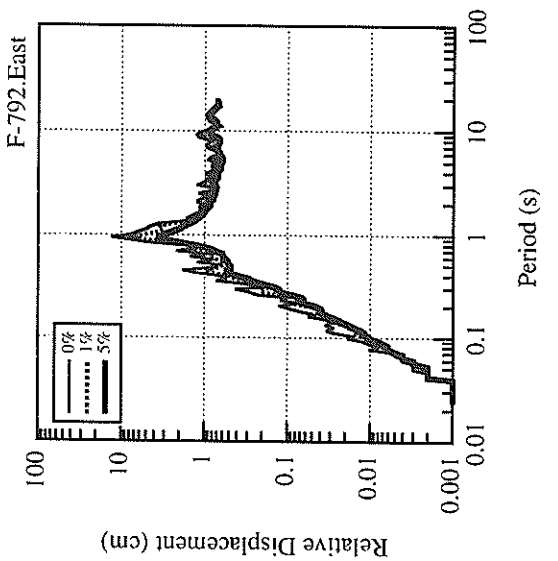
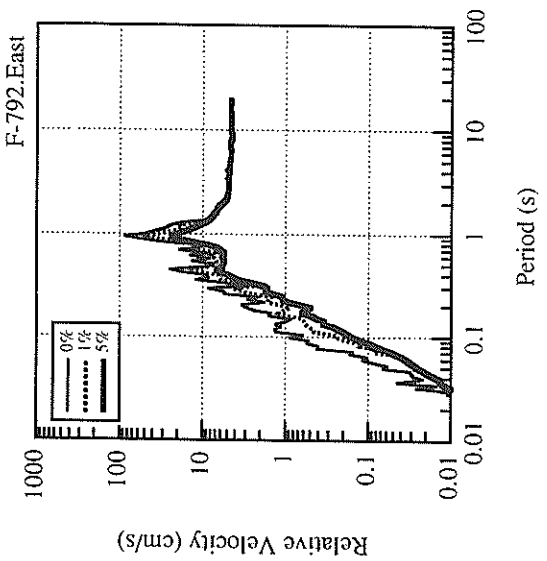
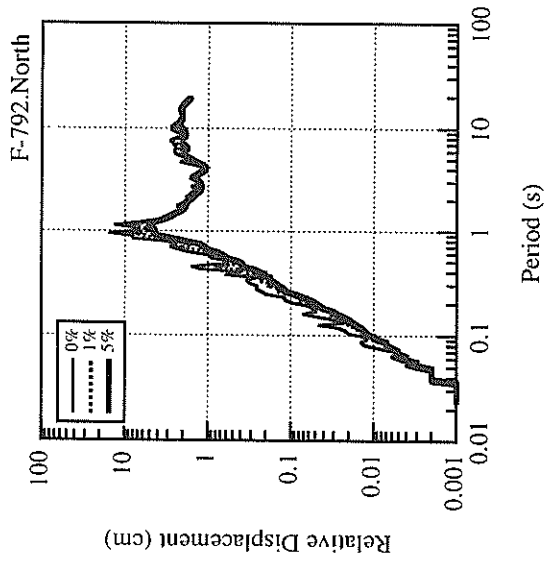
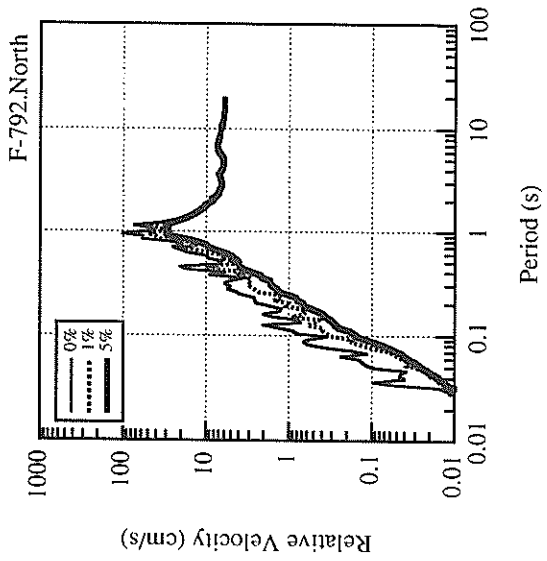
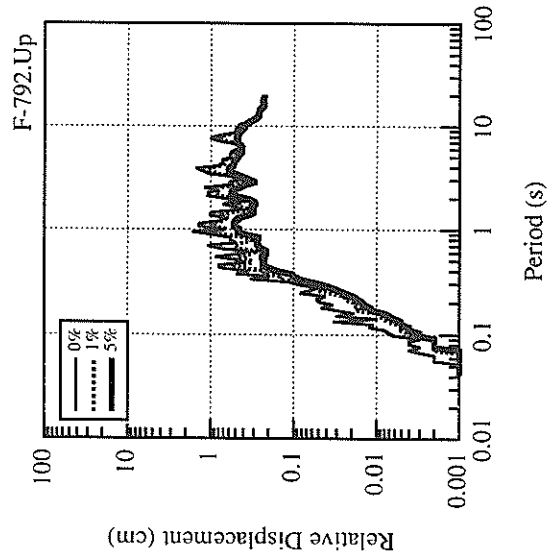
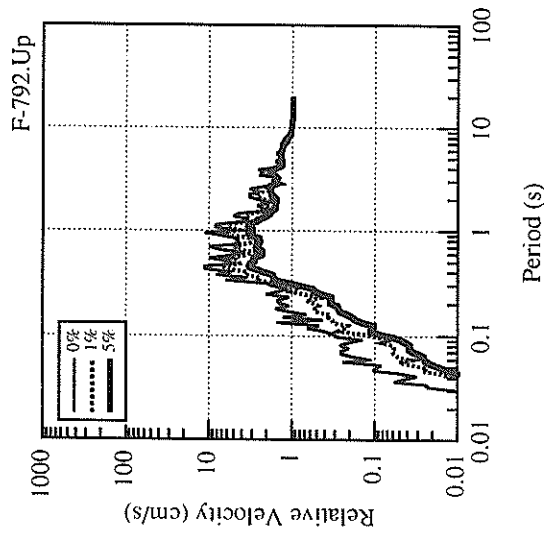
Acceleration

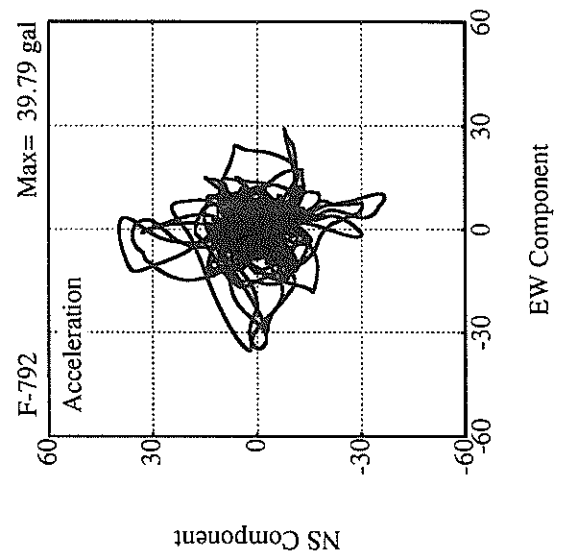
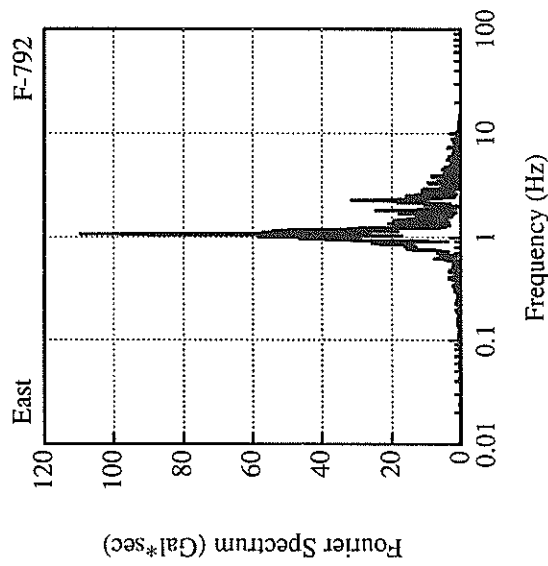
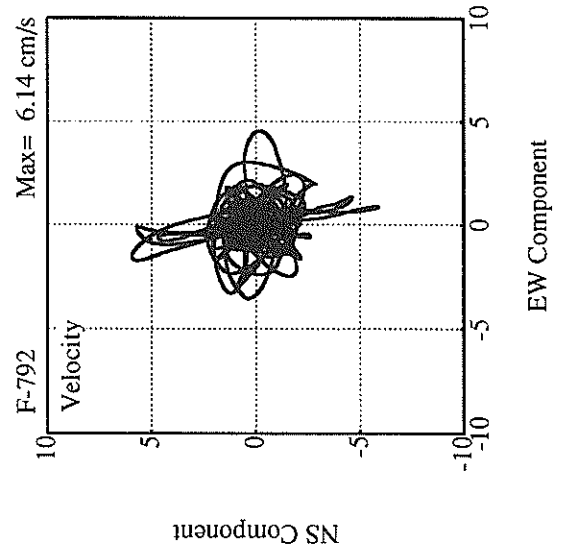
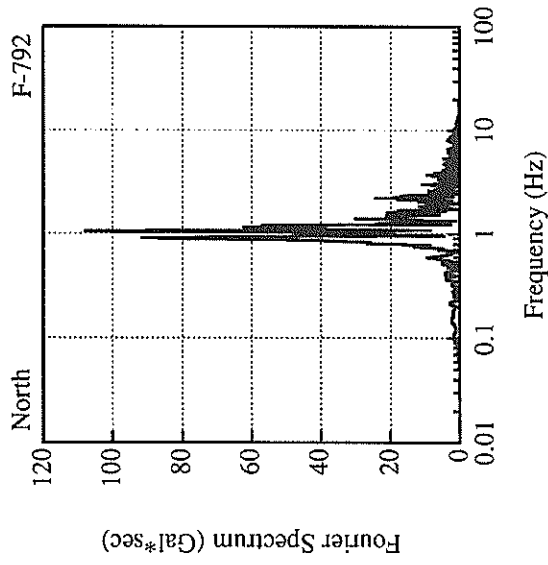
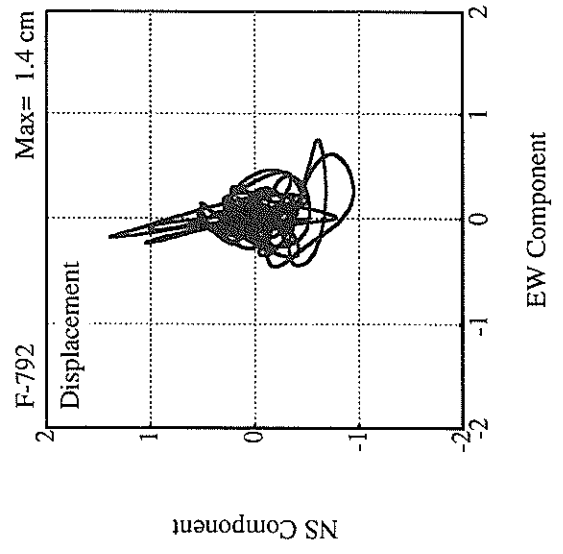
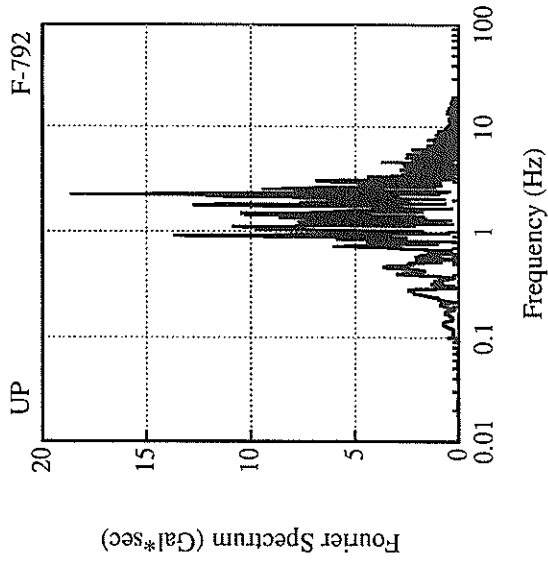












RECORD NUMBER : F-793

STATION : SAKAIMINATO-G

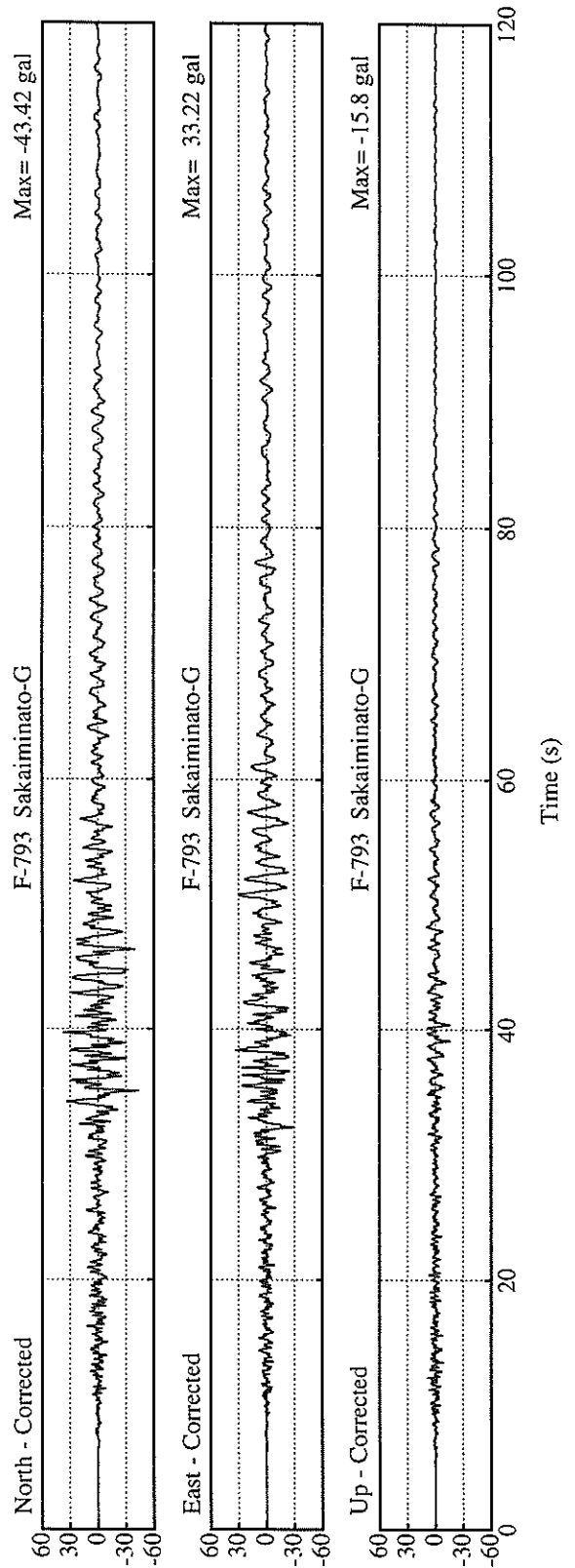
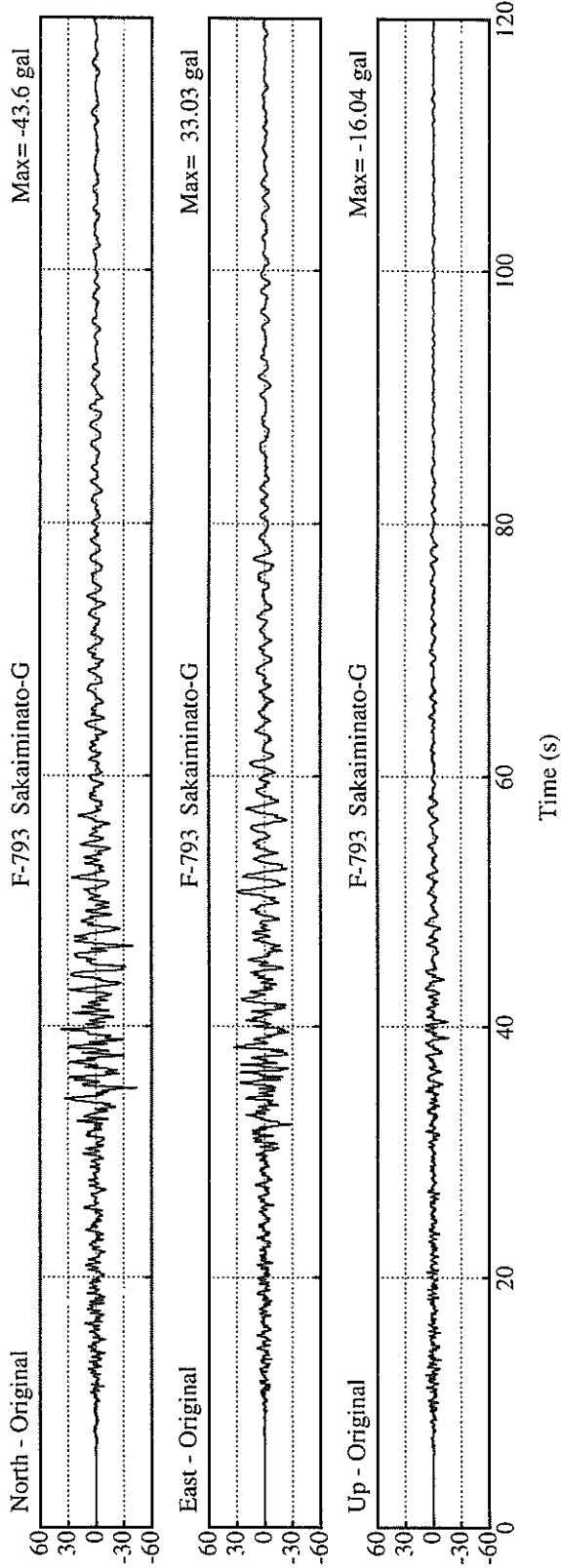
EARTHQUAKE DATA

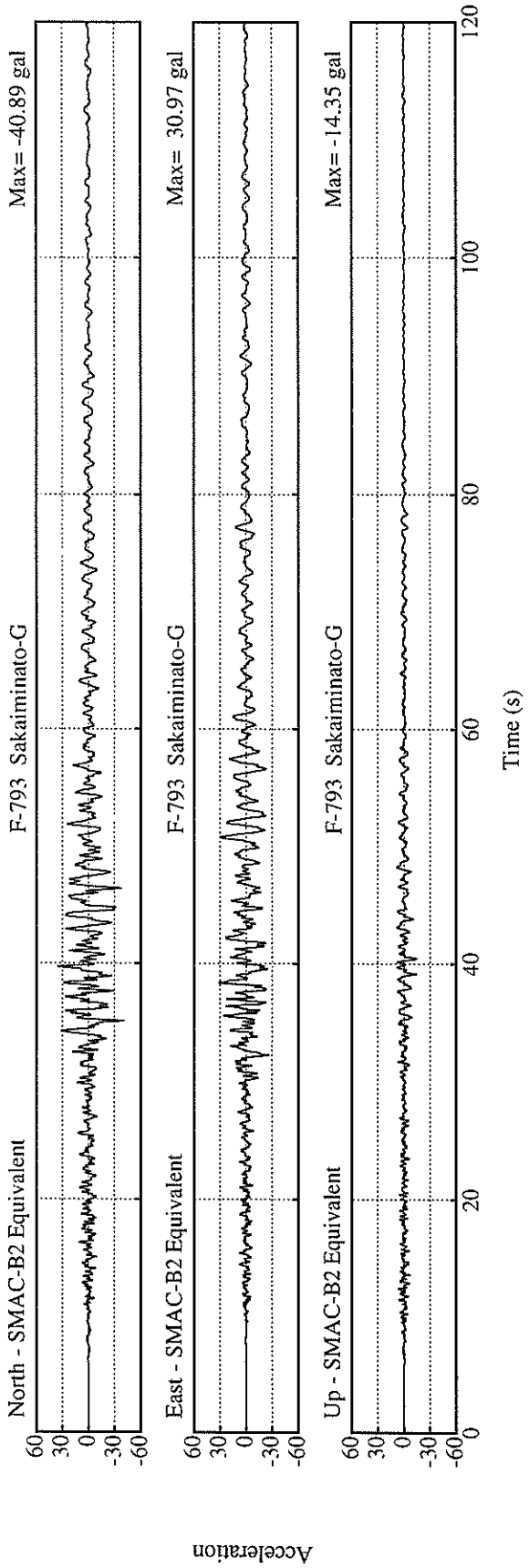
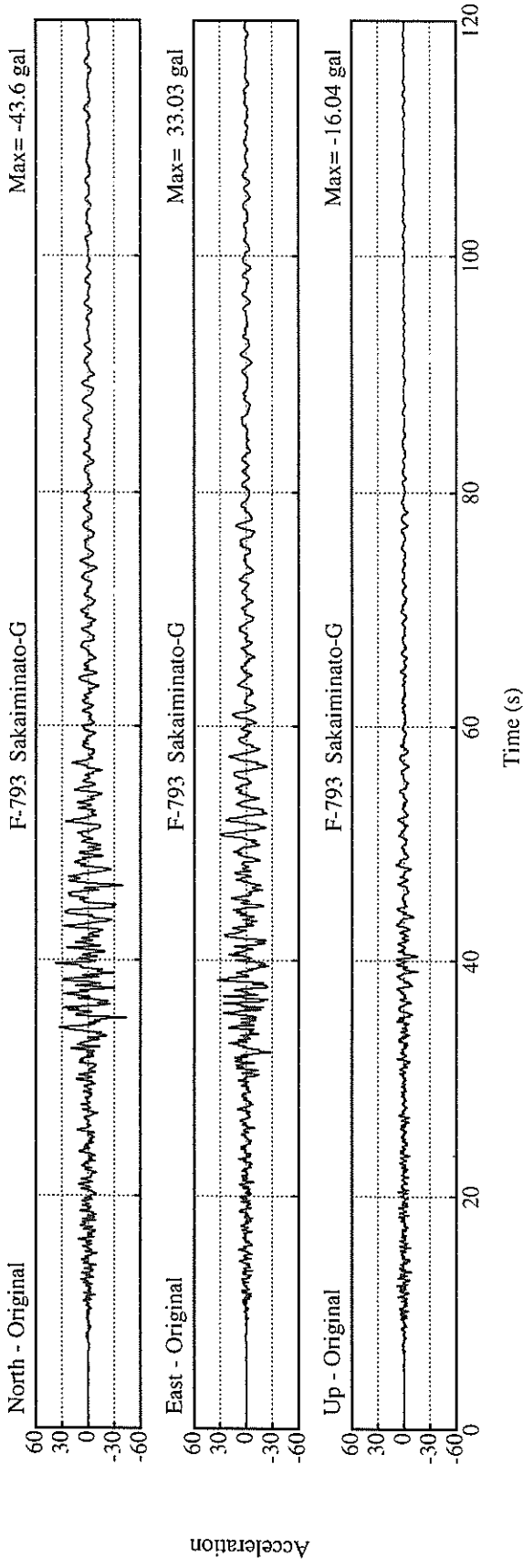
DATE AND TIME 5:36 JAN.17,1995 (DATE ERROR)
LOCATION OF HYPOCENTER
EPICENTRAL REGION
LATITUDE 0° 0.0' N
LONGITUDE 0° 0.0' E
DEPTH 0.0KM
JMA MAGNITUDE 0.0

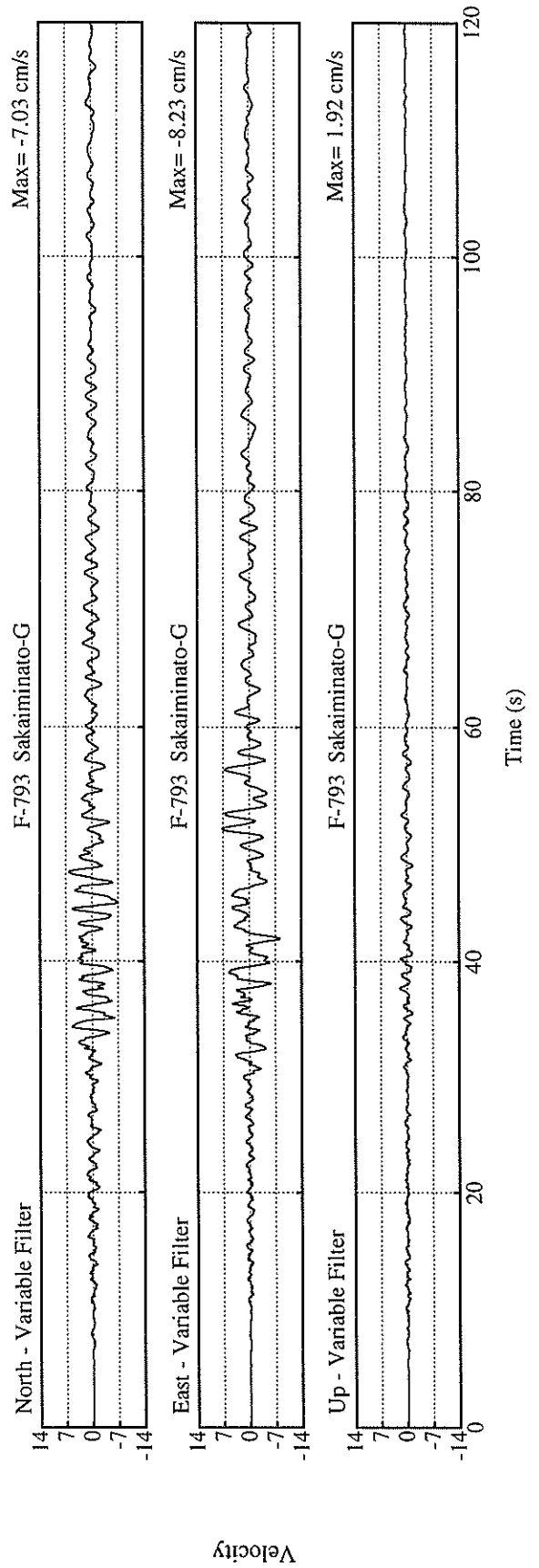
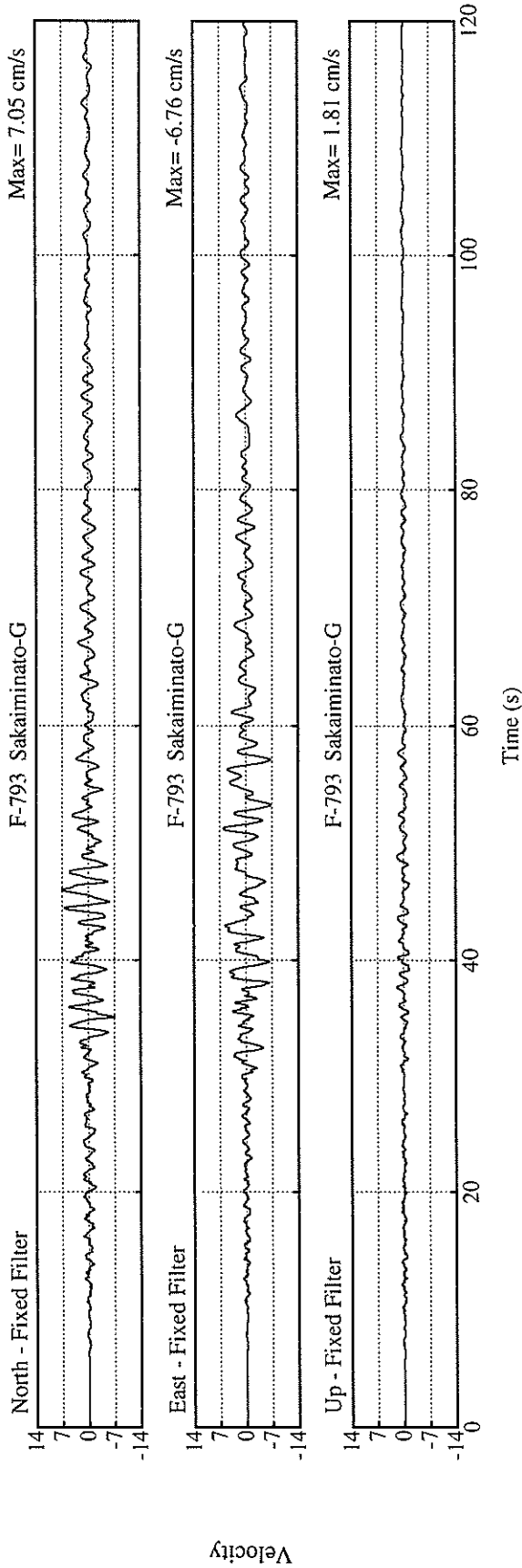
PEAK VALUES OF COMPONENTS

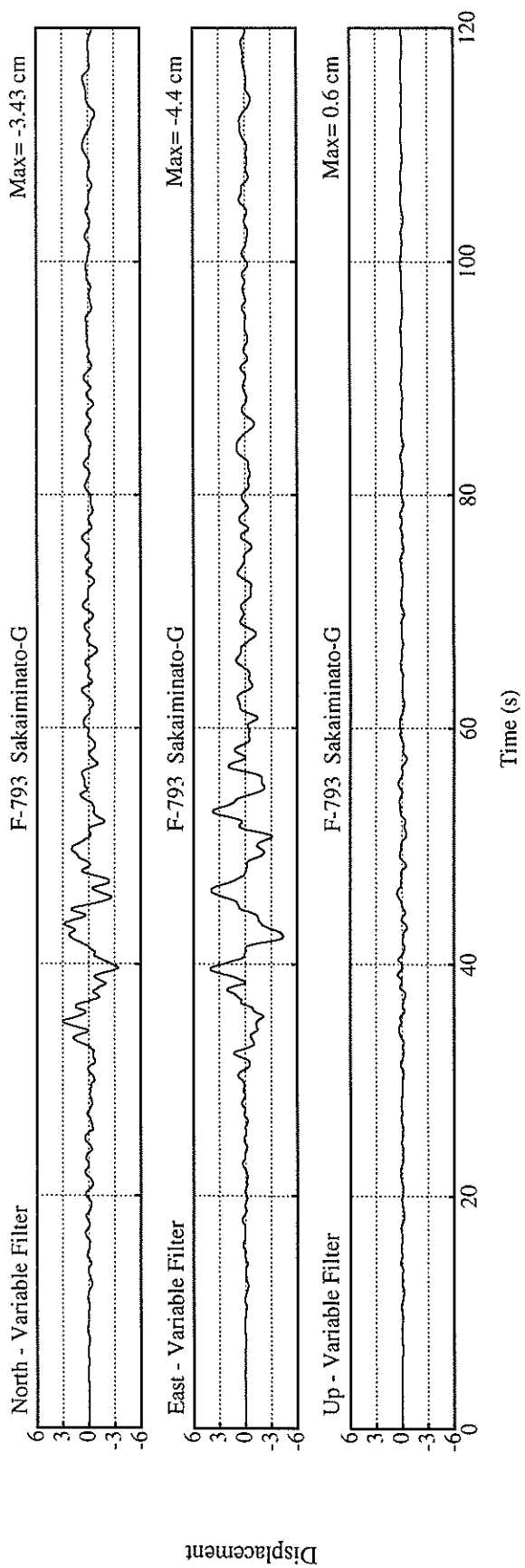
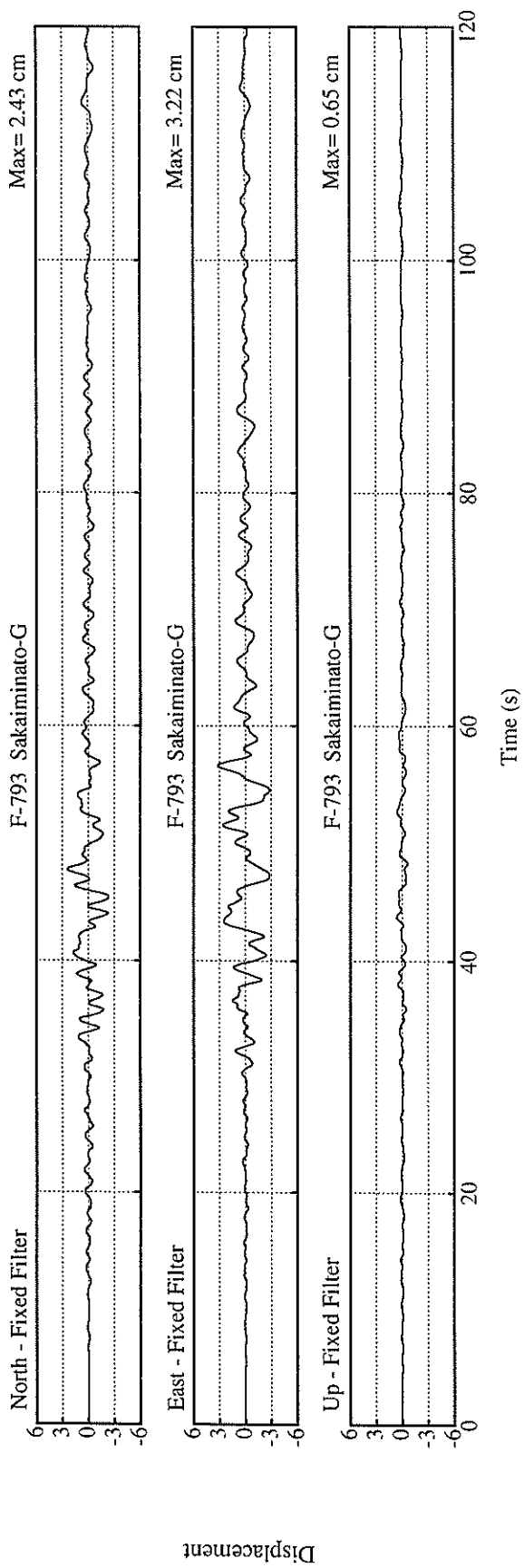
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.079	0.079	0.128	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	40.9	31.0	14.3	41.7
ORIGINAL	43.6	33.0	16.0	43.6
CORRECTED	43.4	33.2	15.8	43.4
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	7.05	6.76	1.81	7.64
VARIABLE FILTER	7.03	8.23	1.92	8.81
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.43	3.22	0.65	3.38
VARIABLE FILTER	3.43	4.40	0.60	5.27

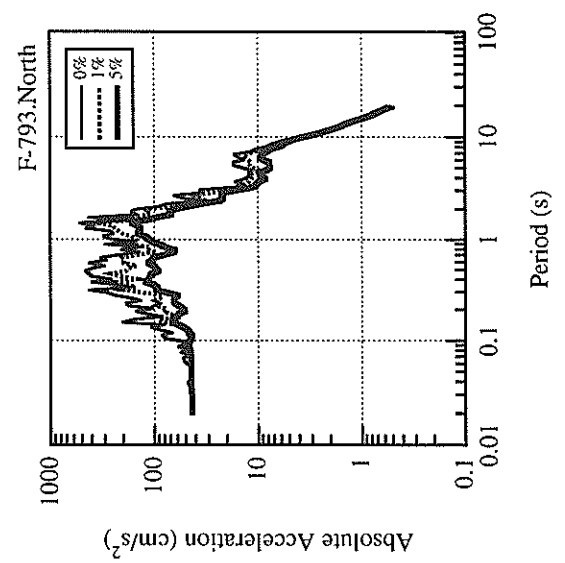
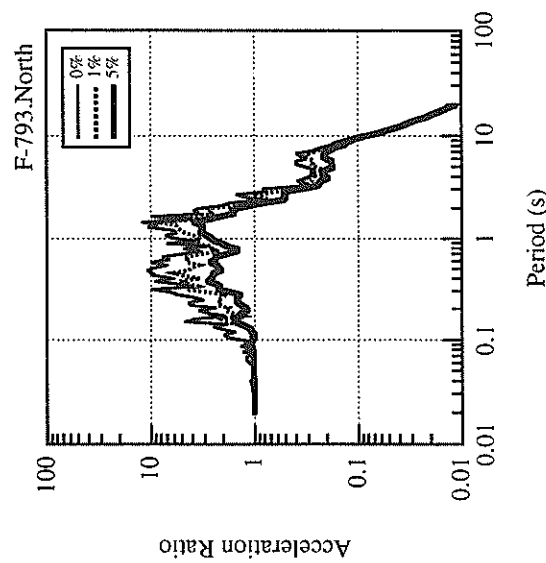
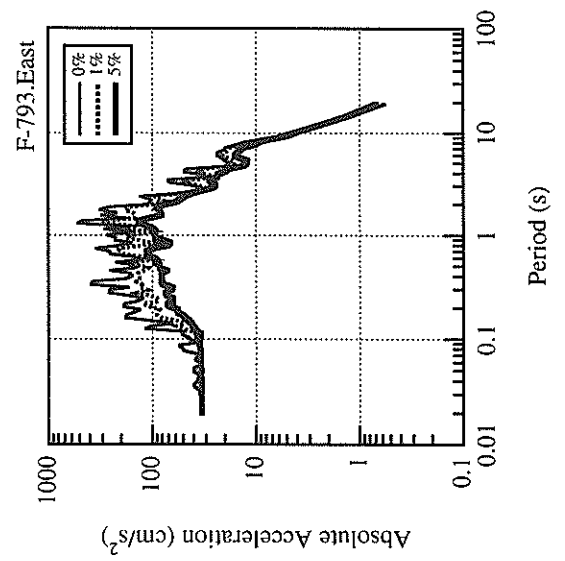
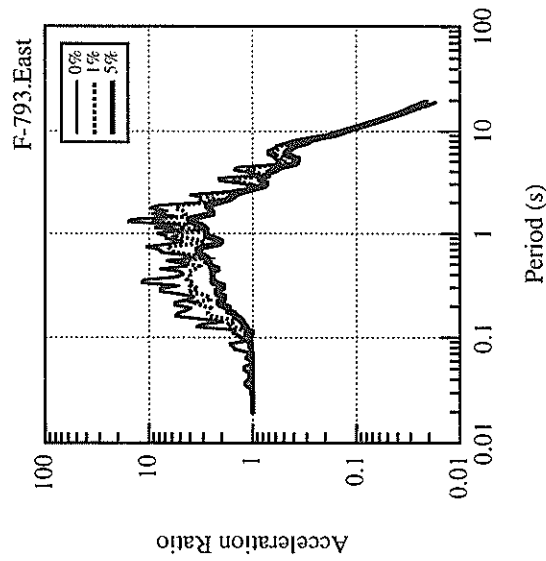
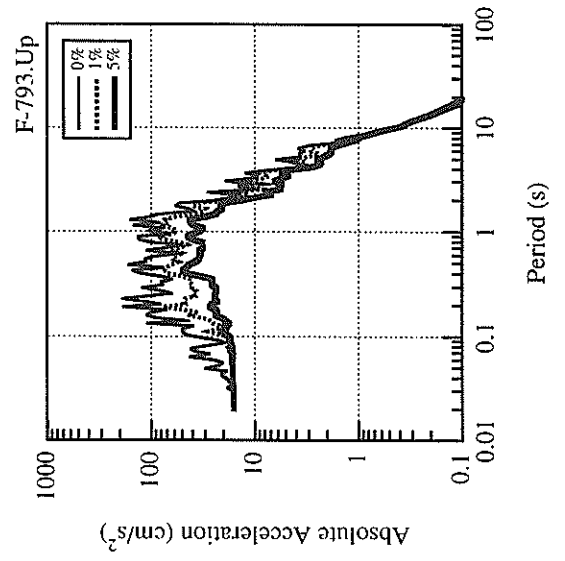
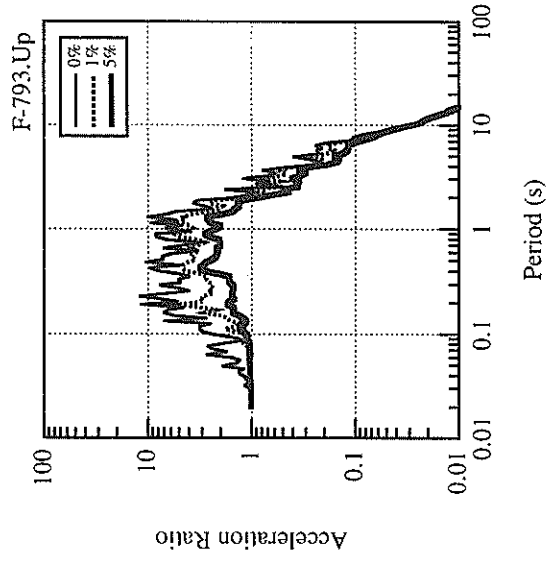
* RESULTANT OF HORIZONTAL COMPONENTS

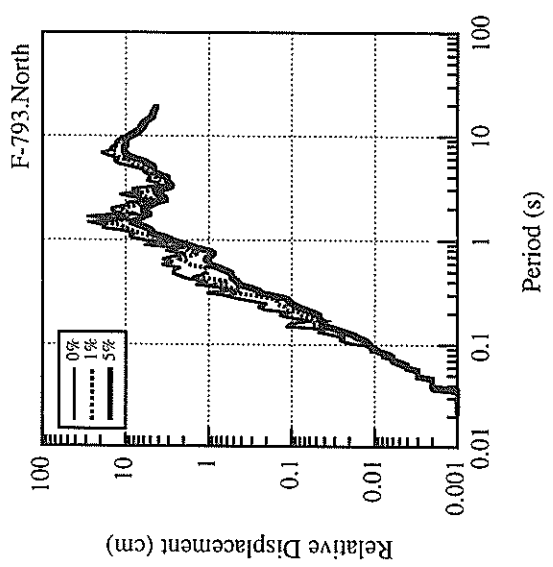
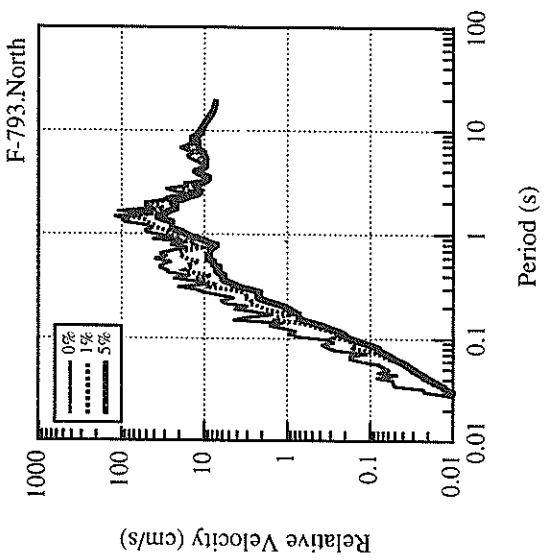
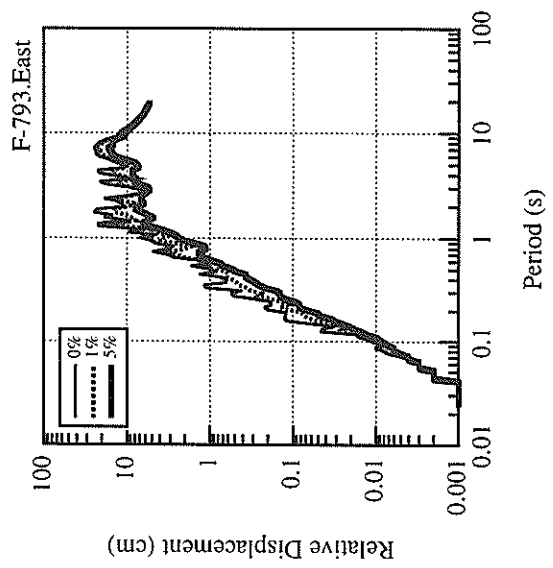
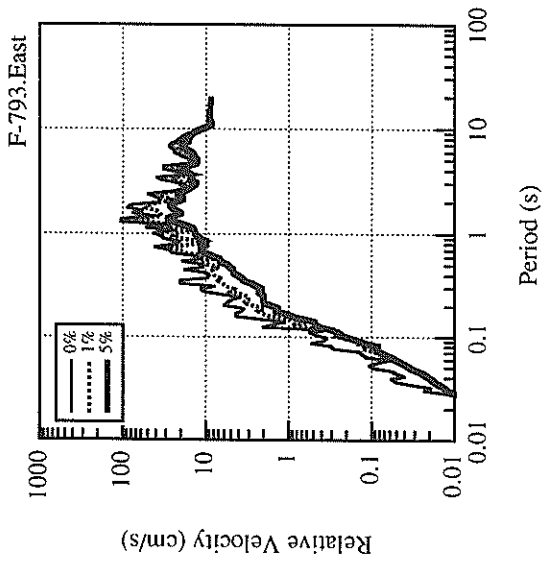
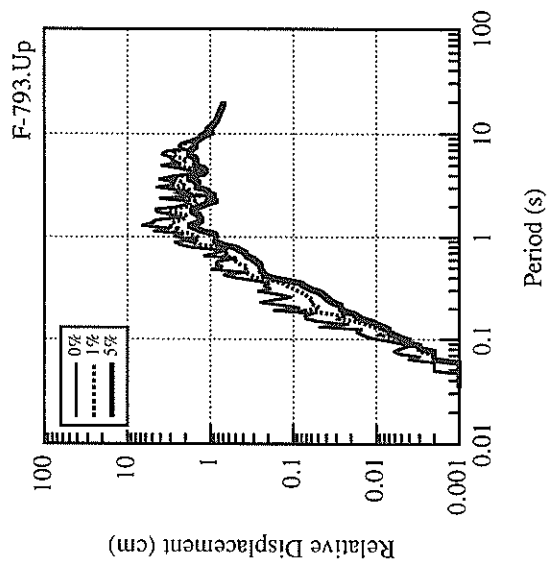
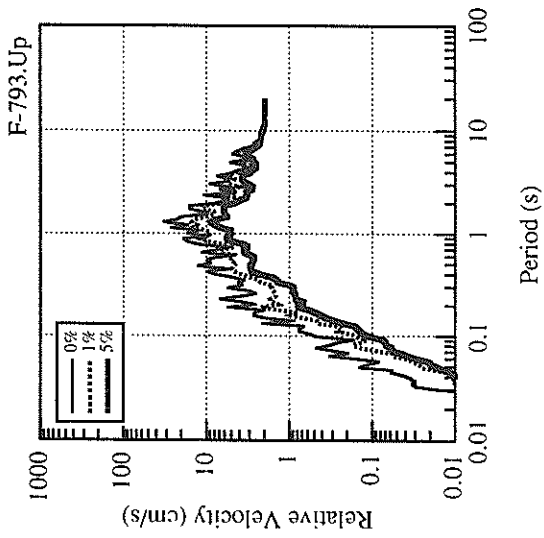


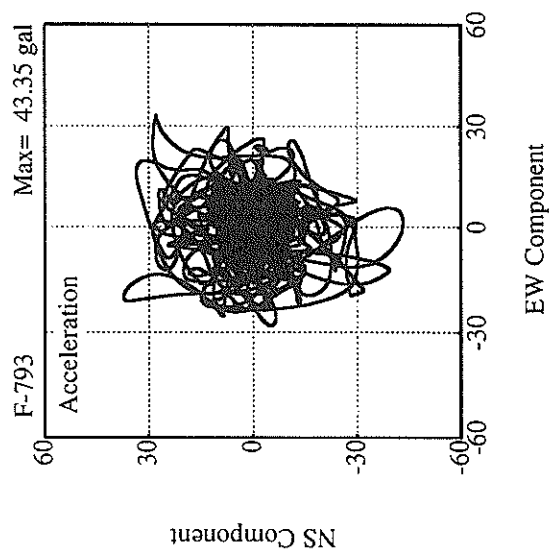
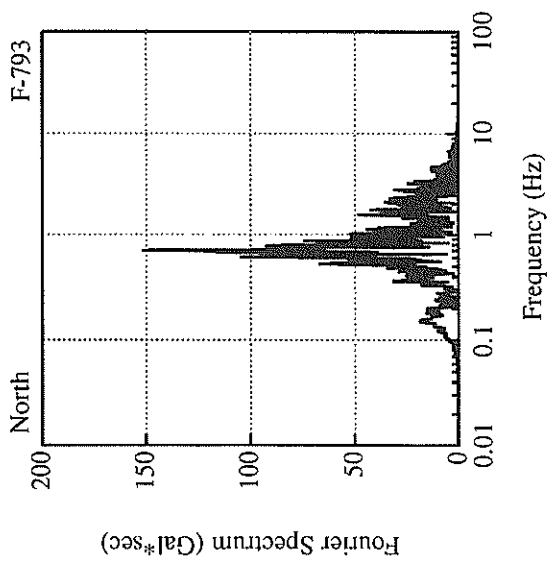
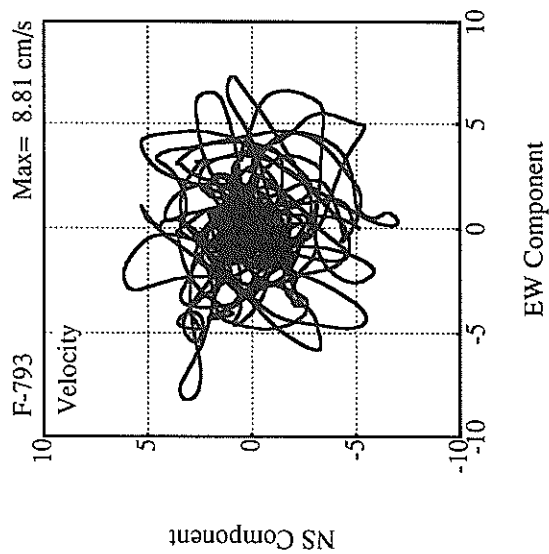
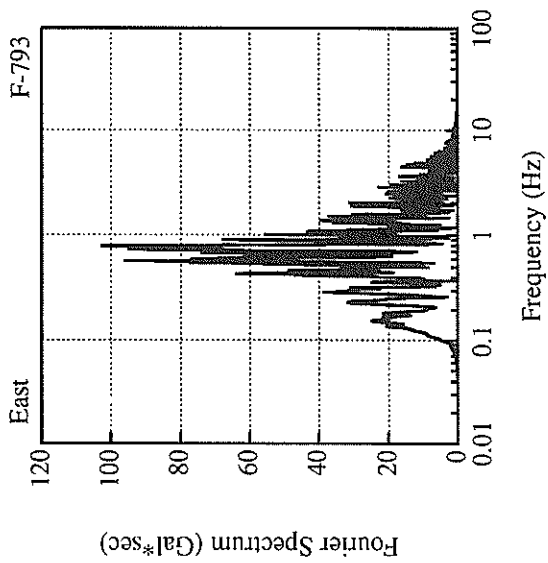
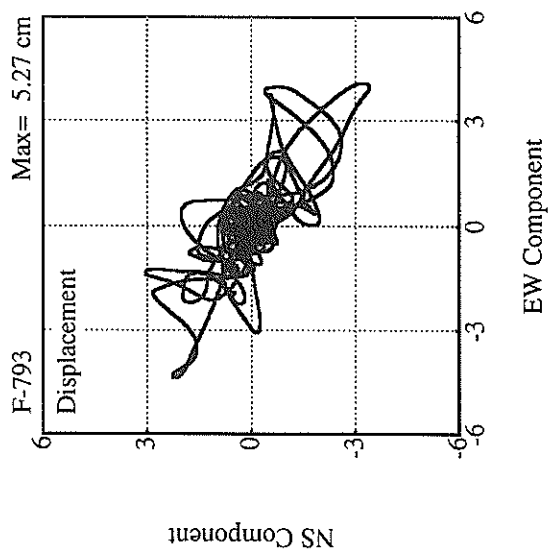
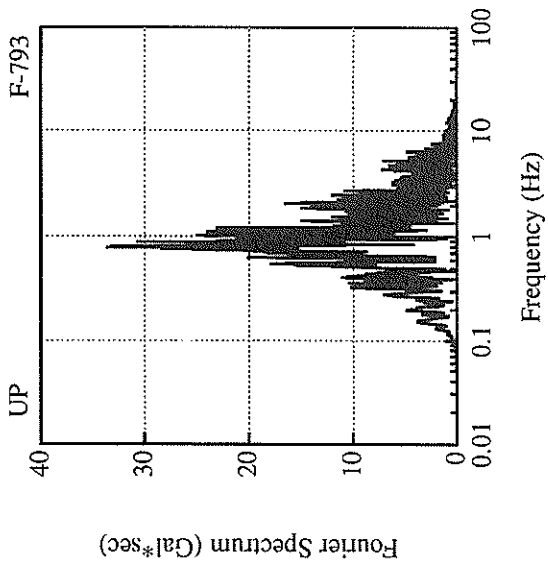












RECORD NUMBER : F-794

STATION : KOMATSUJIMA-G

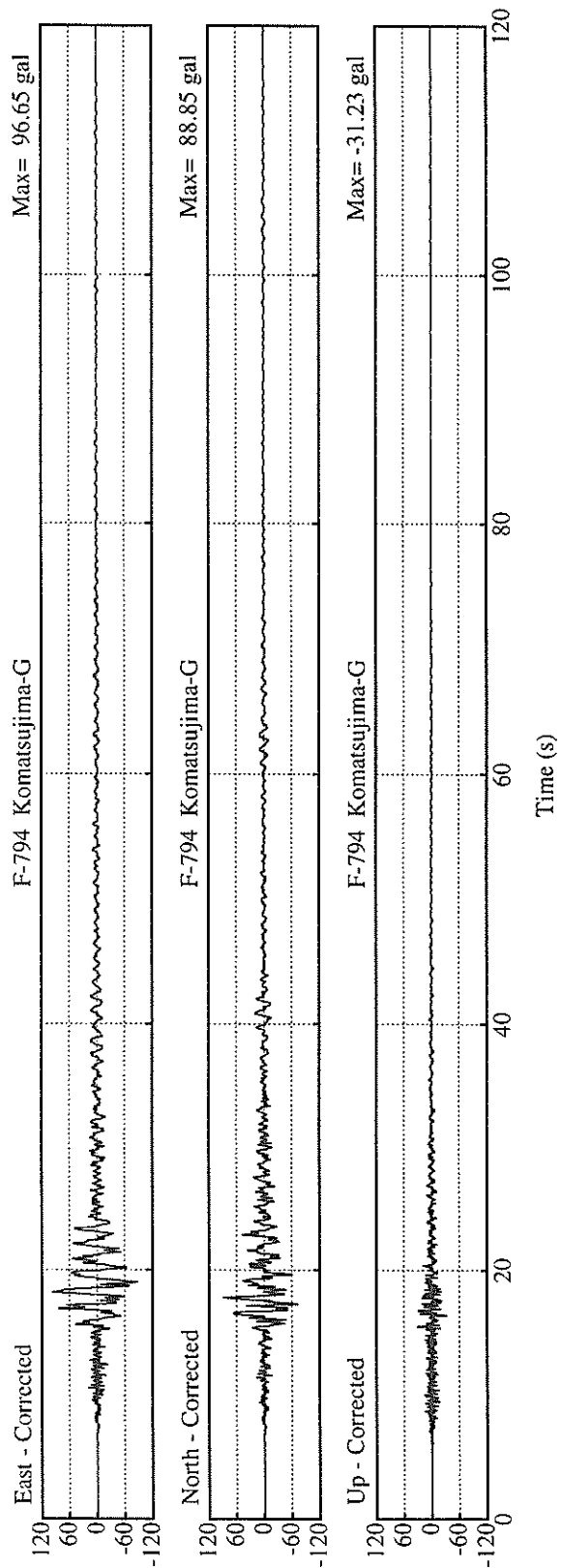
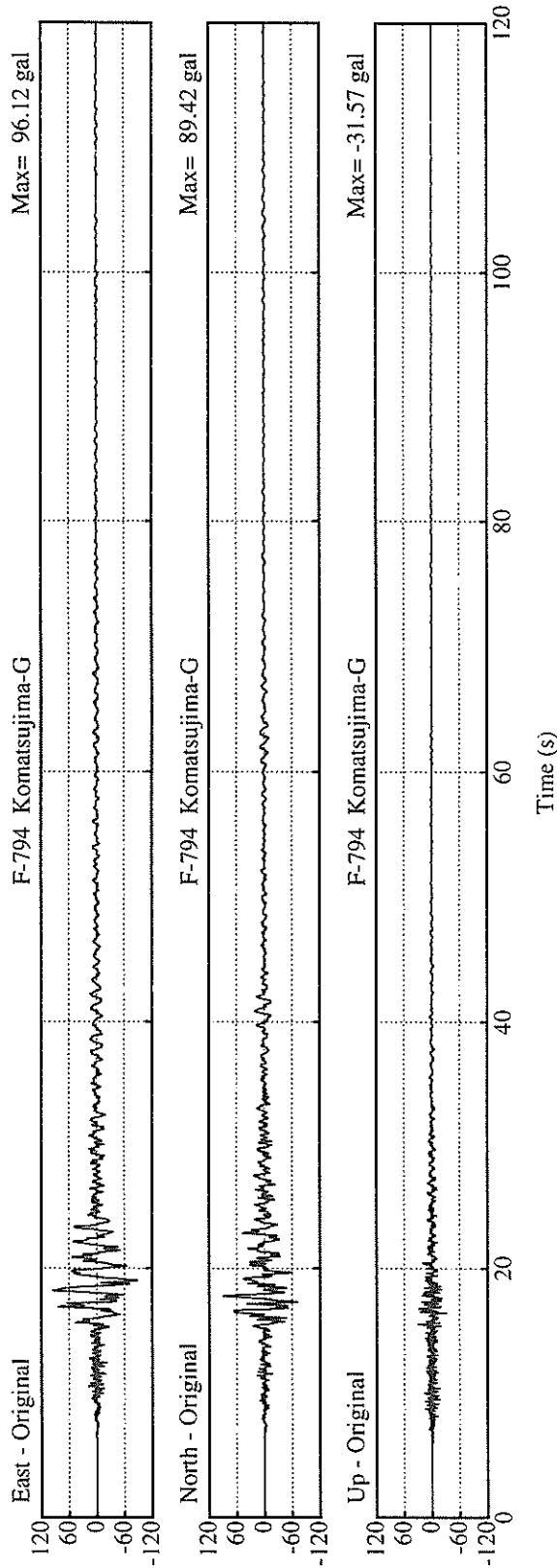
EARTHQUAKE DATA

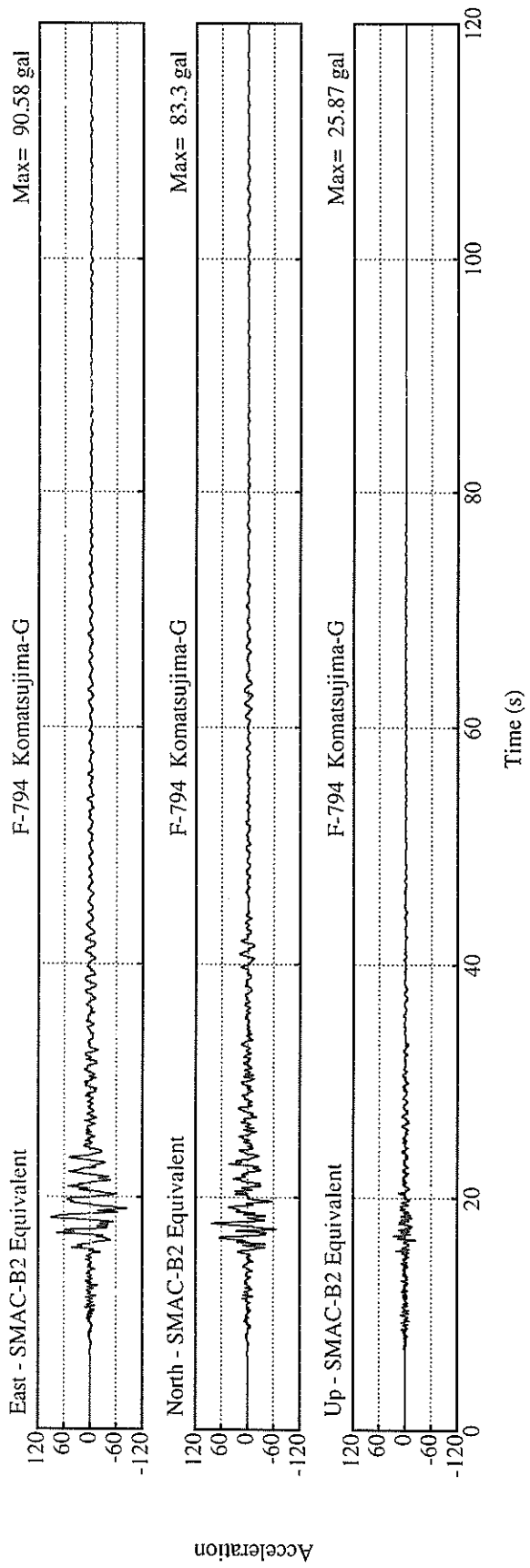
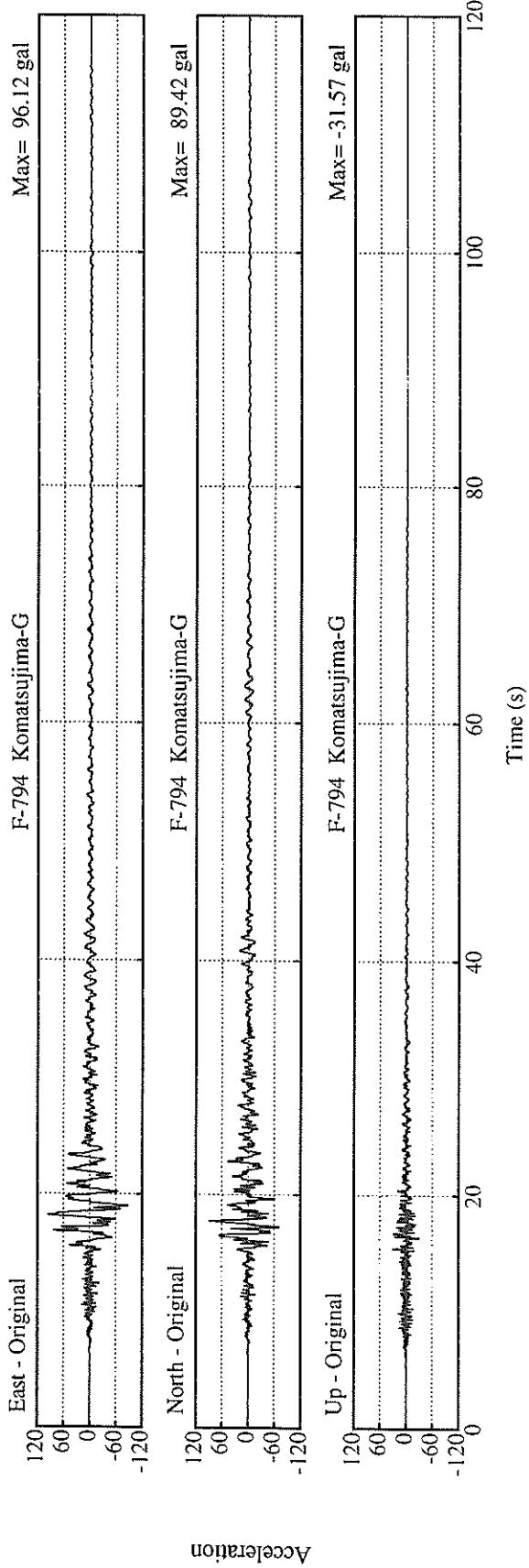
DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

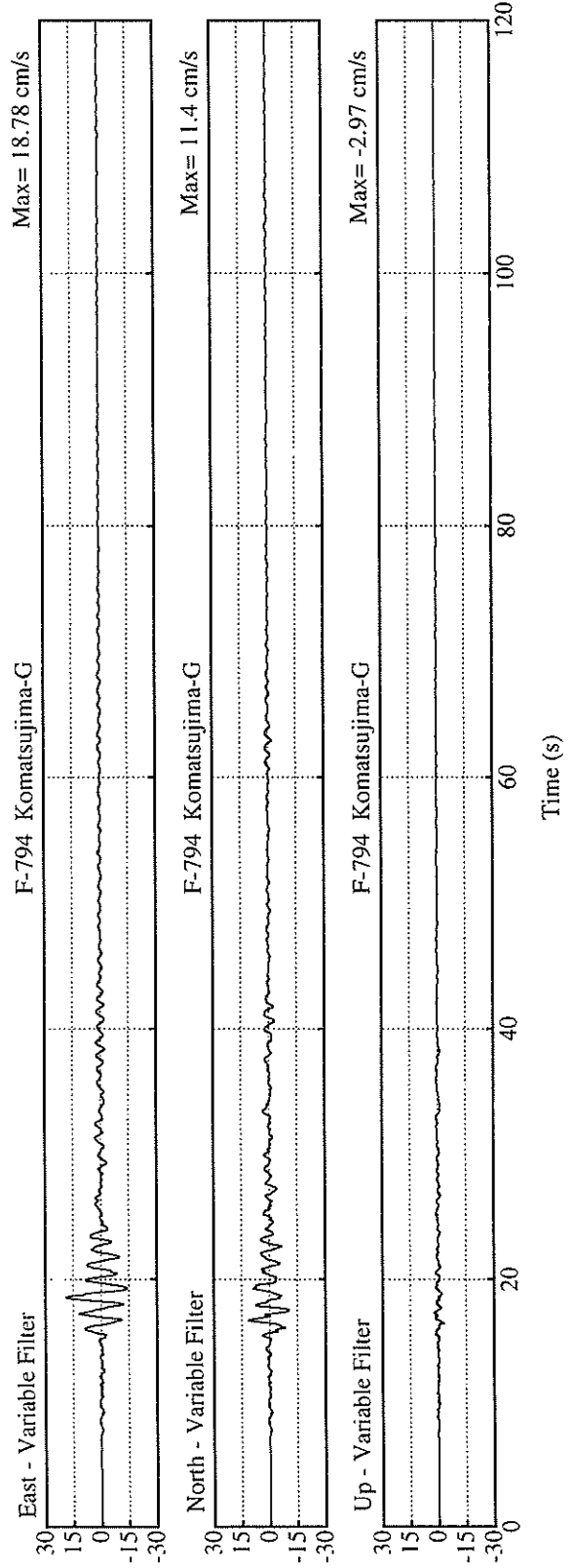
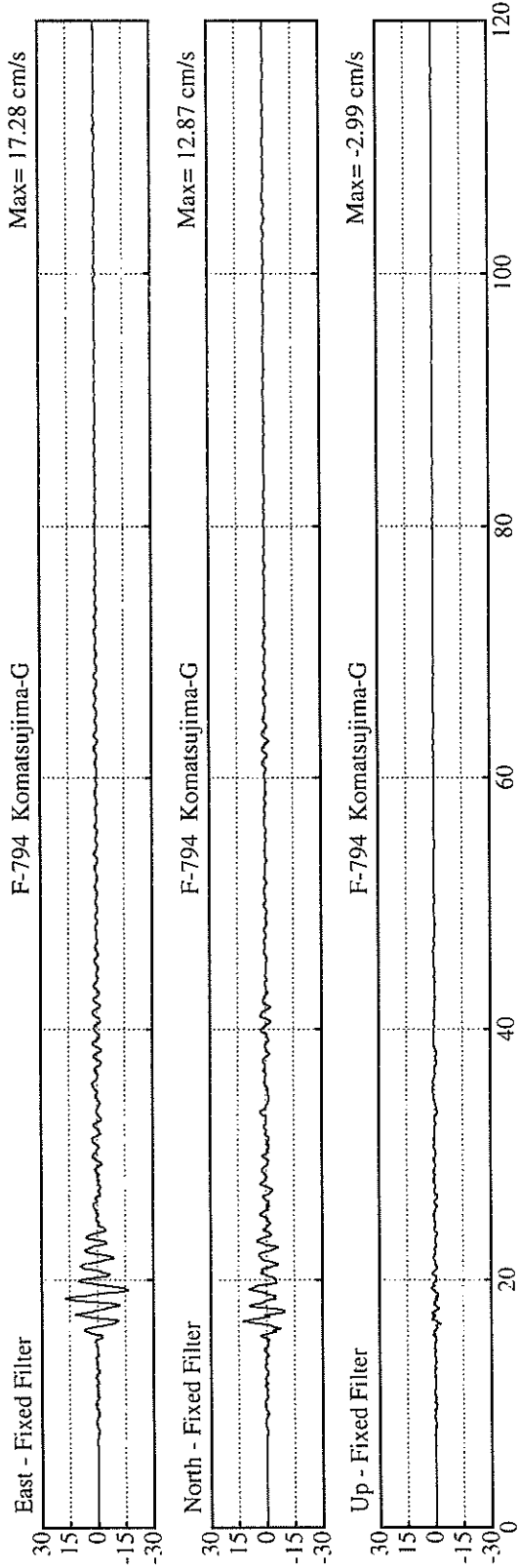
PEAK VALUES OF COMPONENTS

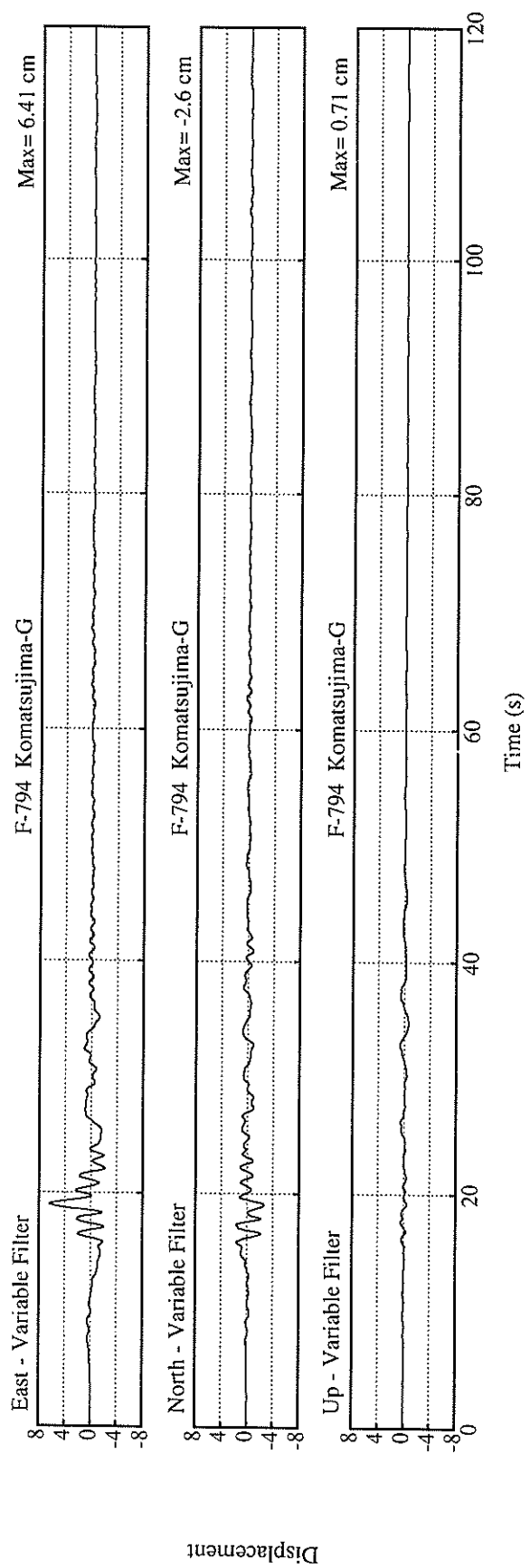
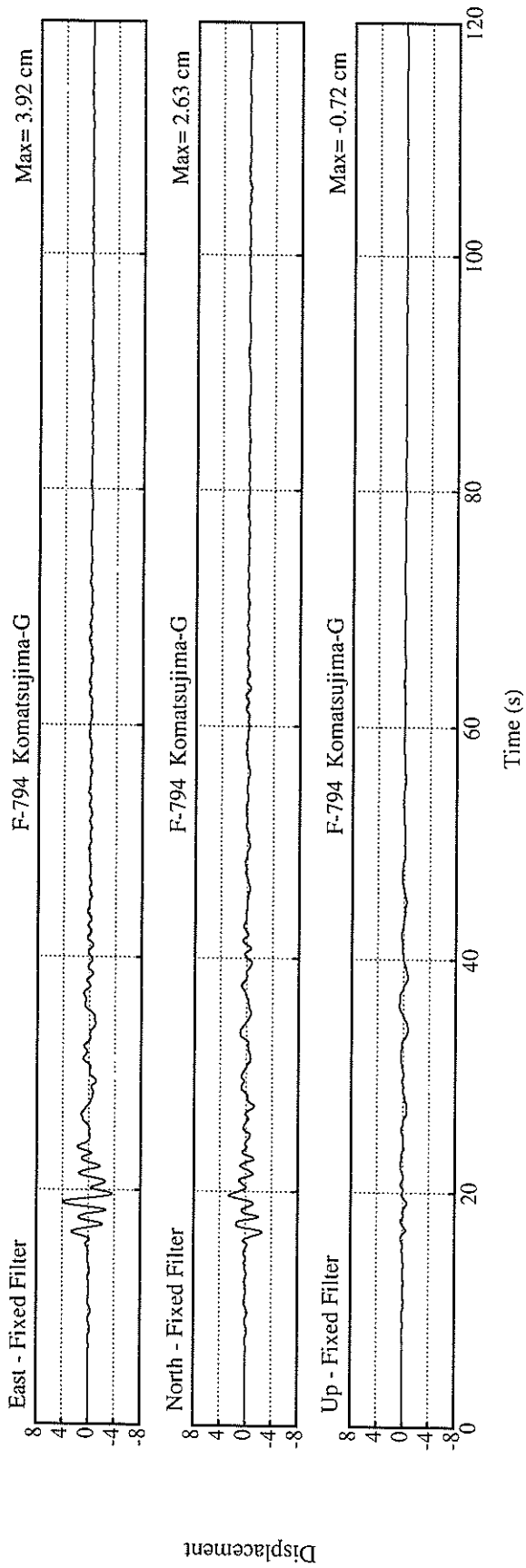
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.097	0.073	0.128	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	83.3	90.6	25.9	90.6
ORIGINAL	89.4	96.1	31.6	96.2
CORRECTED	88.9	96.7	31.2	96.7
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	12.87	17.28	2.99	18.49
VARIABLE FILTER	11.40	18.78	2.97	19.44
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.63	3.92	0.72	4.47
VARIABLE FILTER	2.60	6.41	0.71	6.91

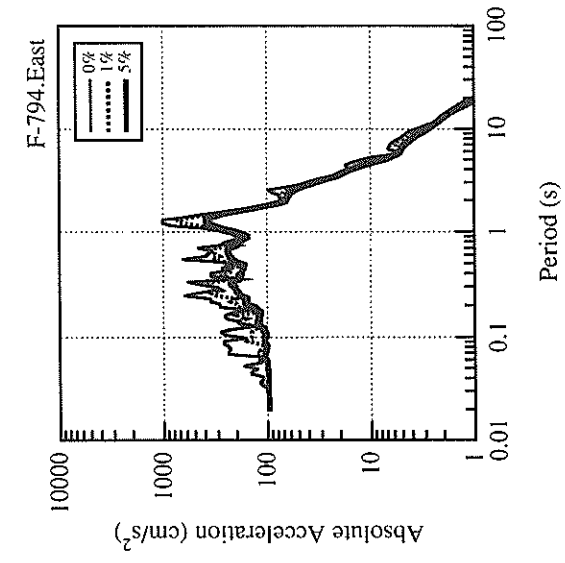
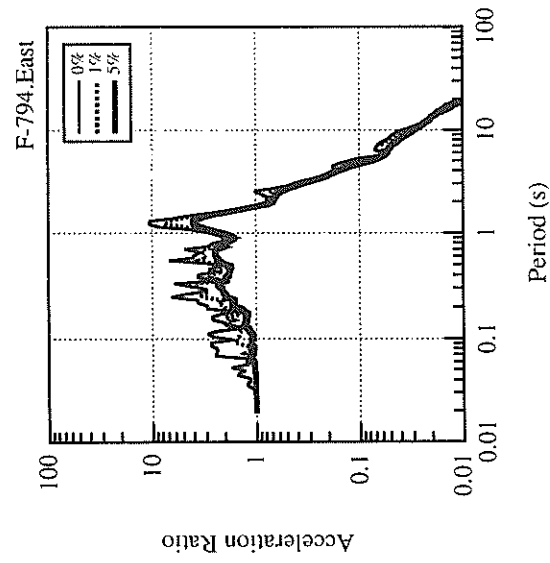
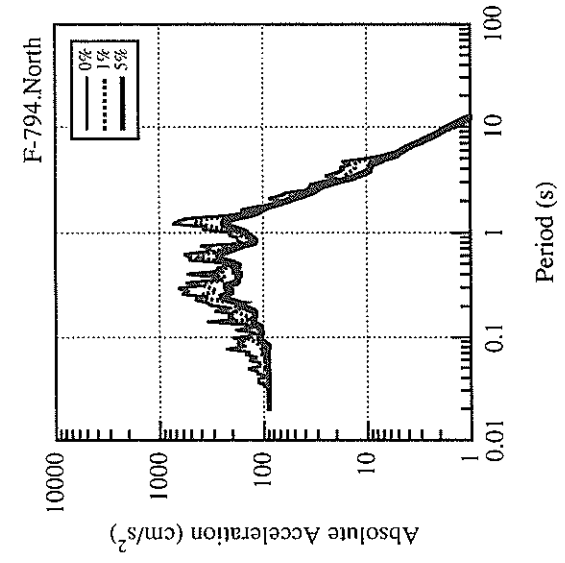
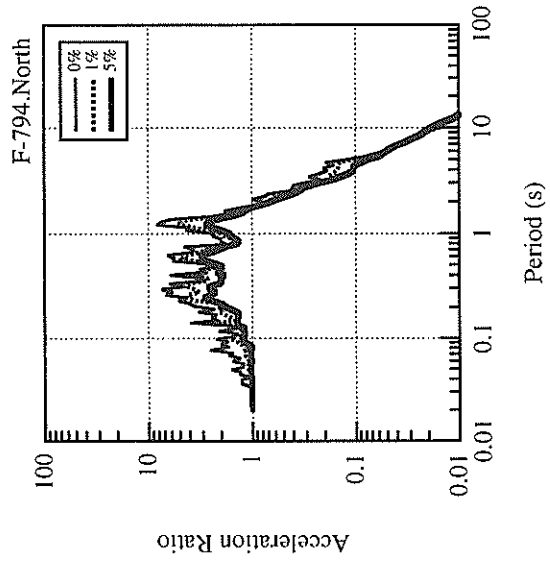
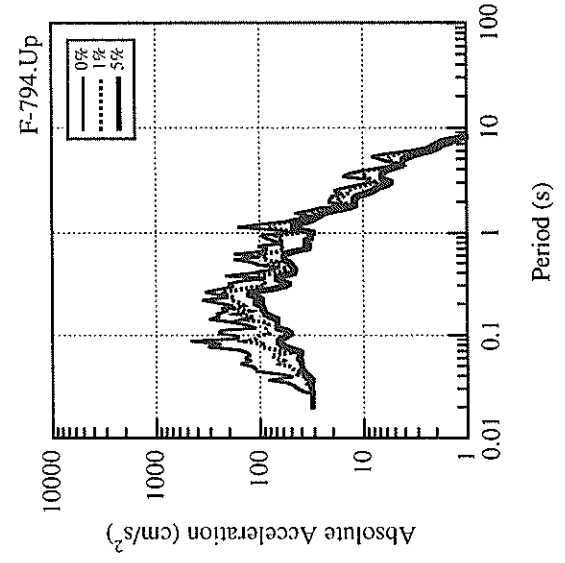
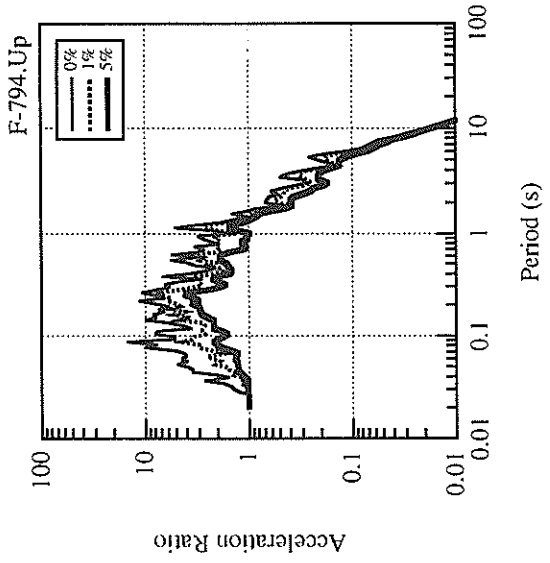
* RESULTANT OF HORIZONTAL COMPONENTS

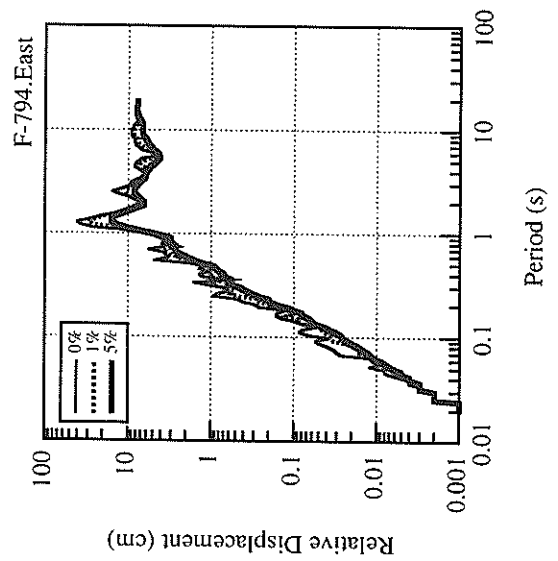
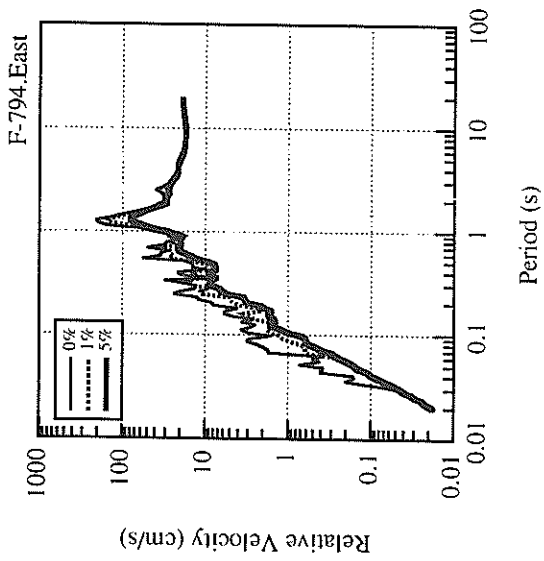
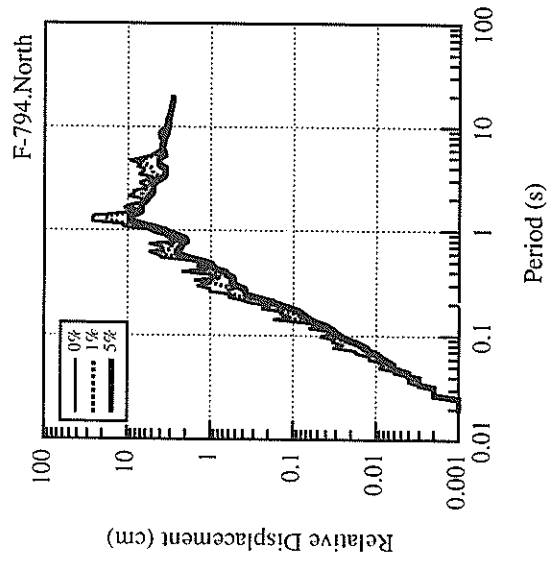
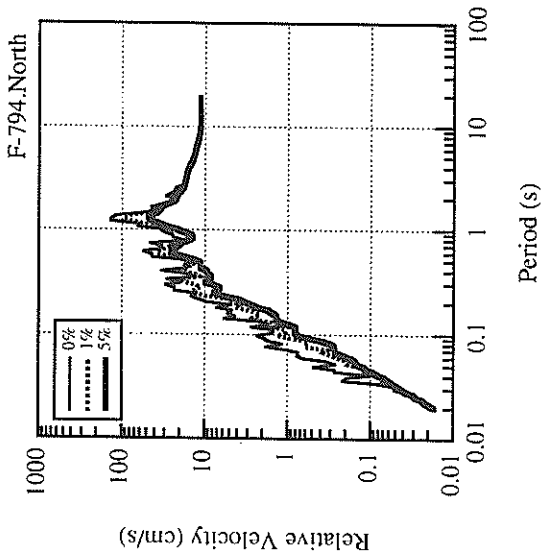
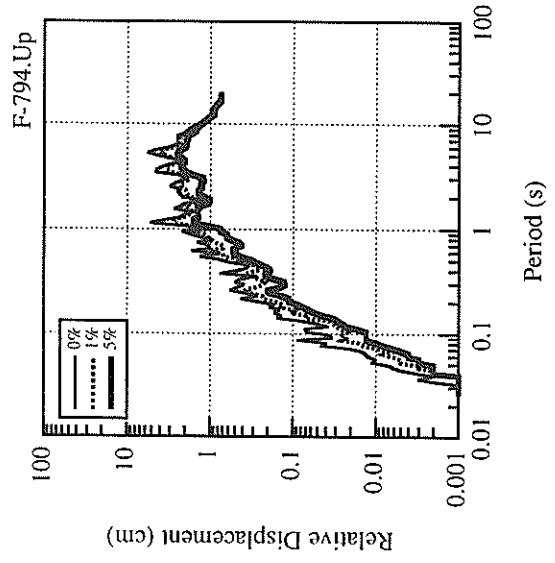
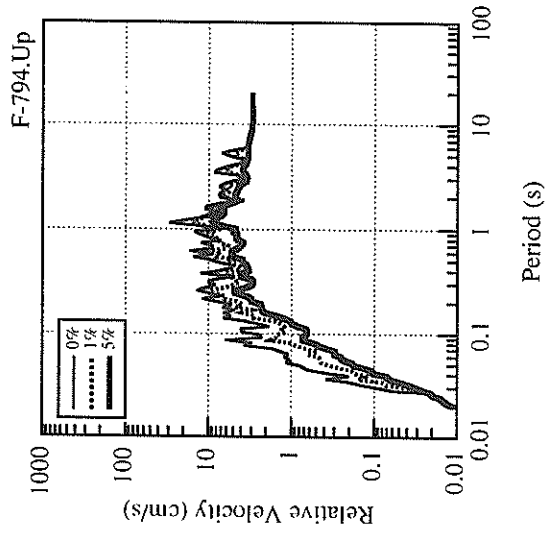


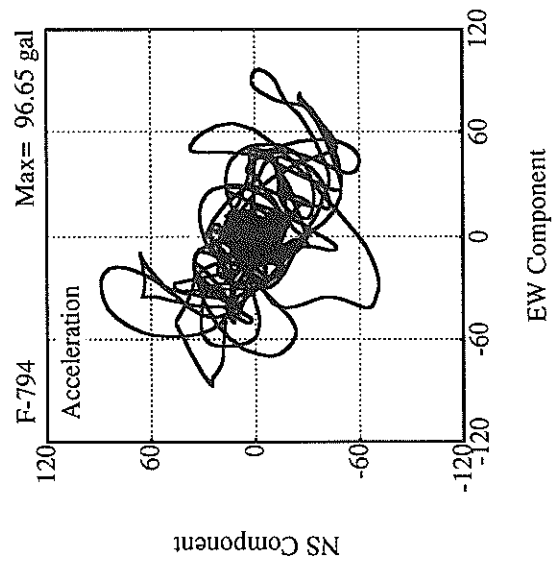
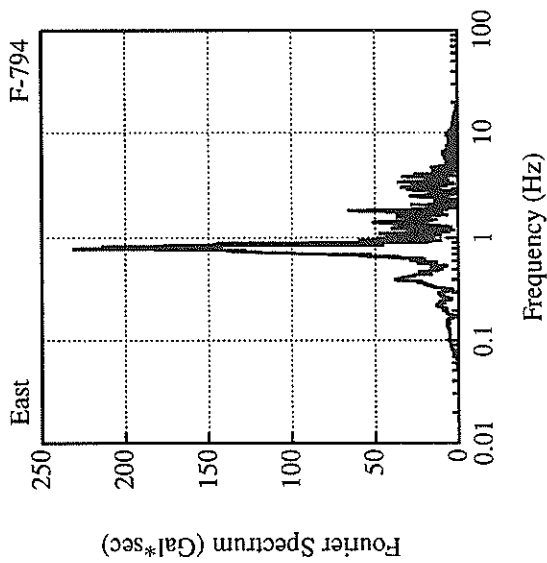
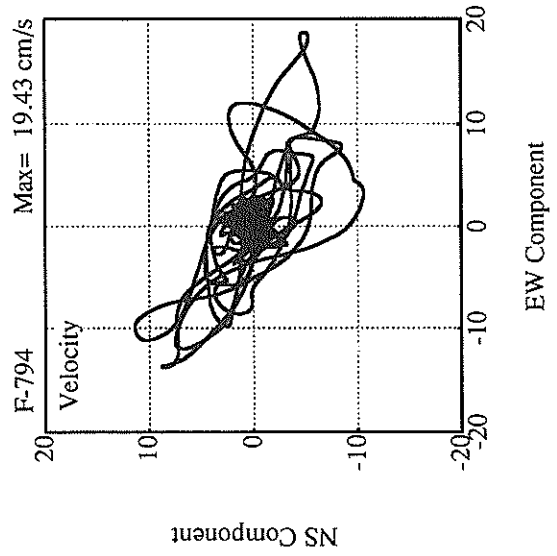
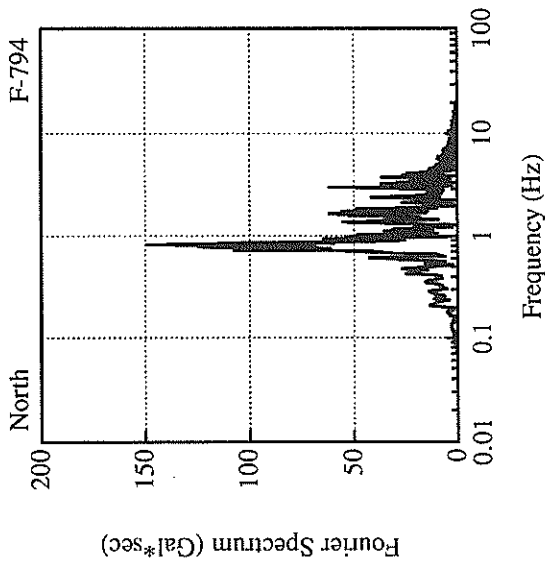
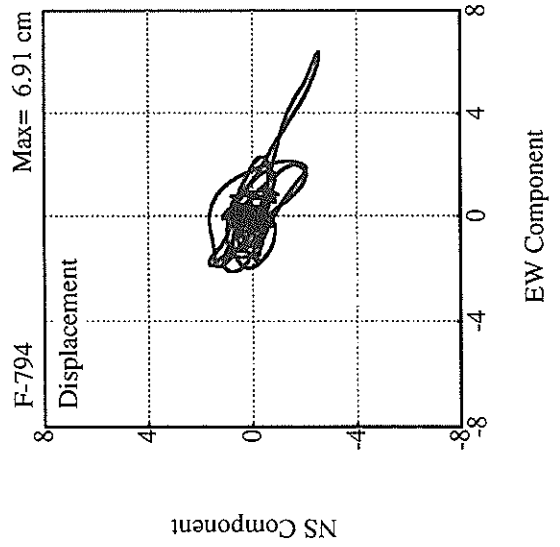
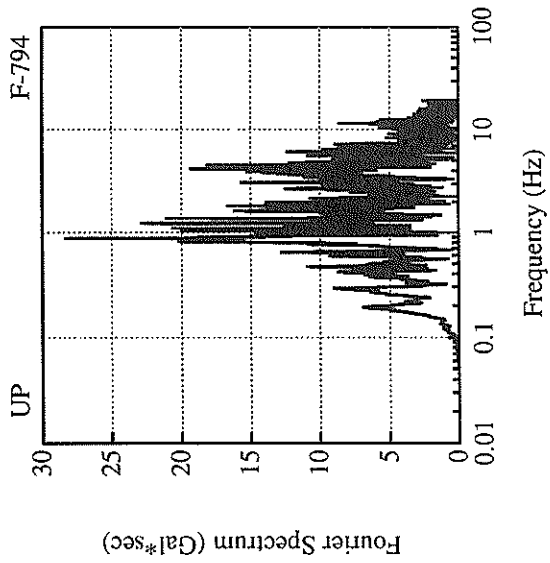












RECORD NUMBER : F-795
 STATION : WAKAYAMA-G

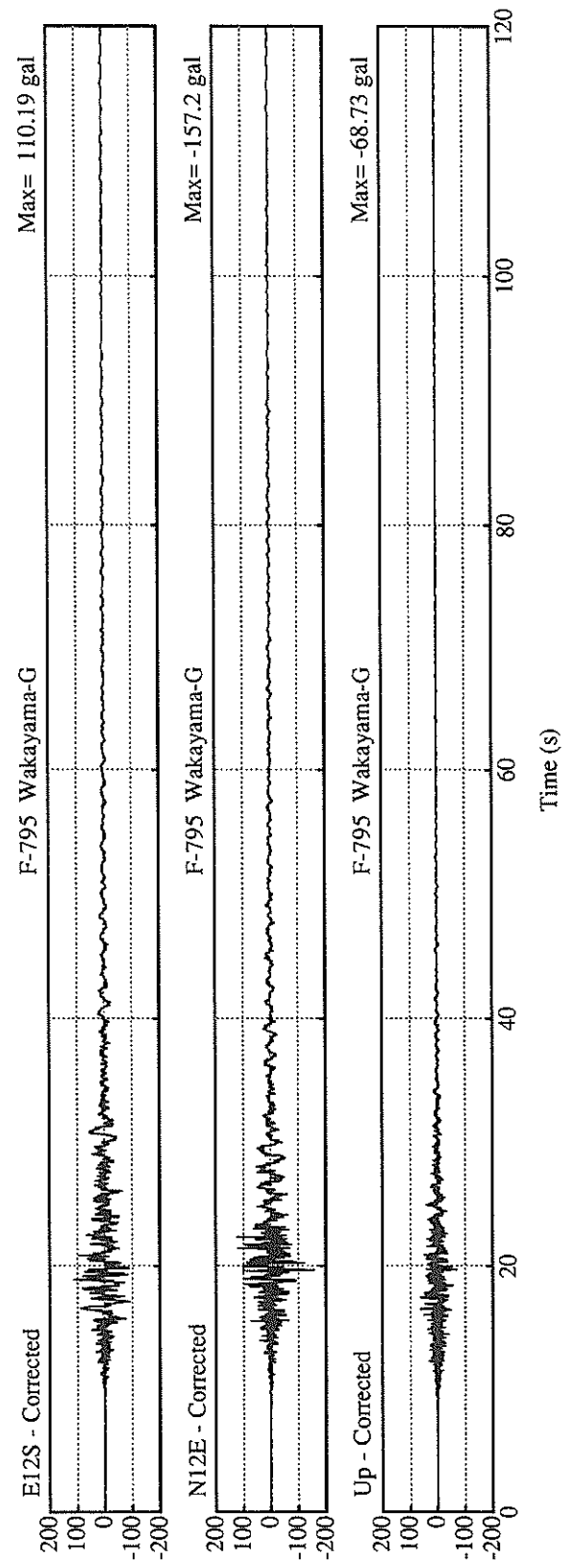
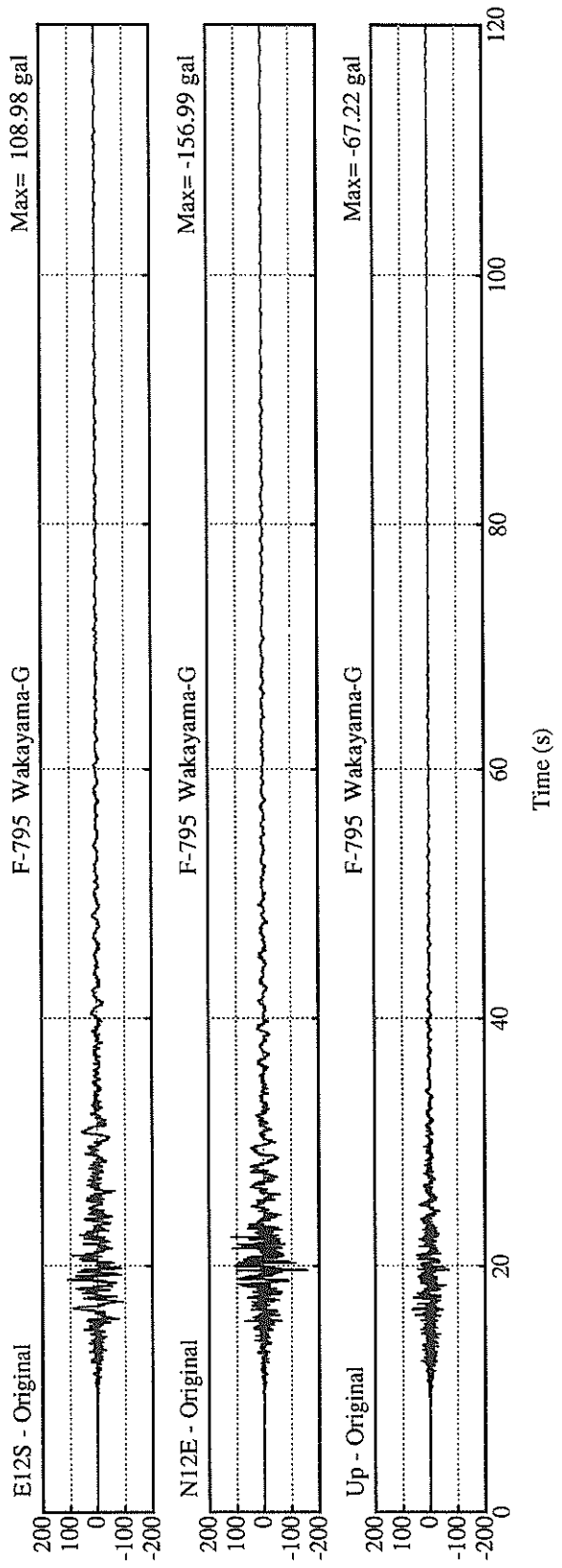
EARTHQUAKE DATA

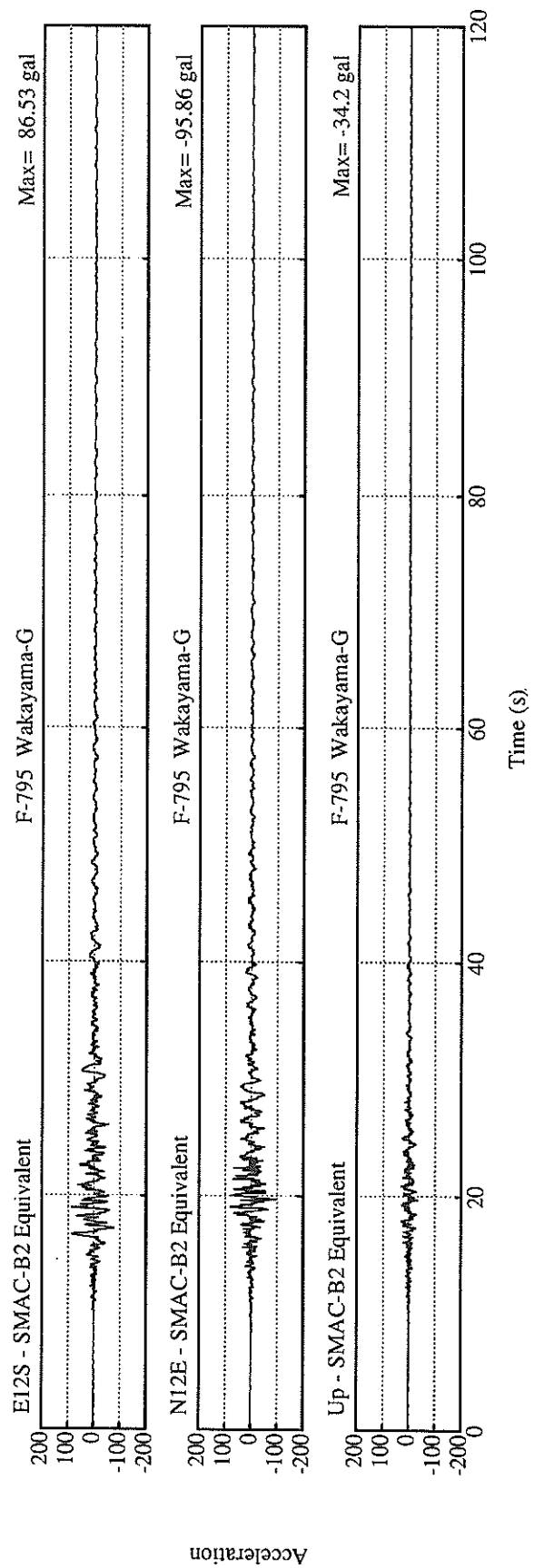
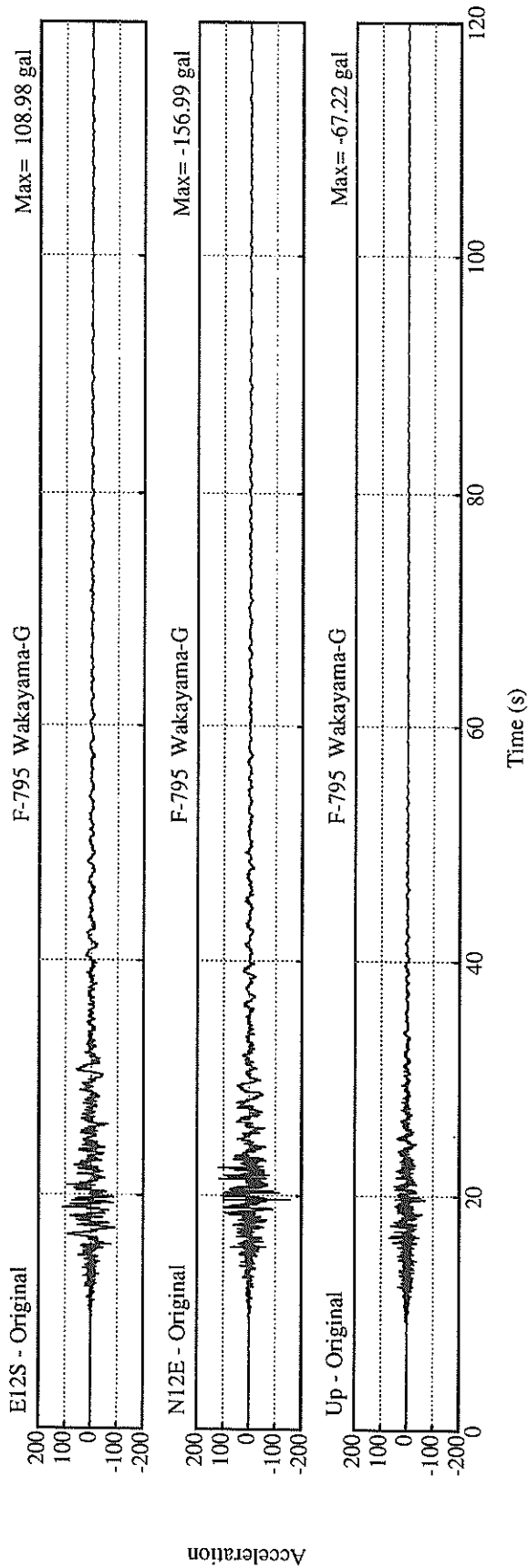
 DATE AND TIME 5:32 JAN.17,1995 (DATE ERROR)
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION
 LATITUDE 0° 0.0' N
 LONGITUDE 0° 0.0' E
 DEPTH 0.0KM
 JMA MAGNITUDE 0.0

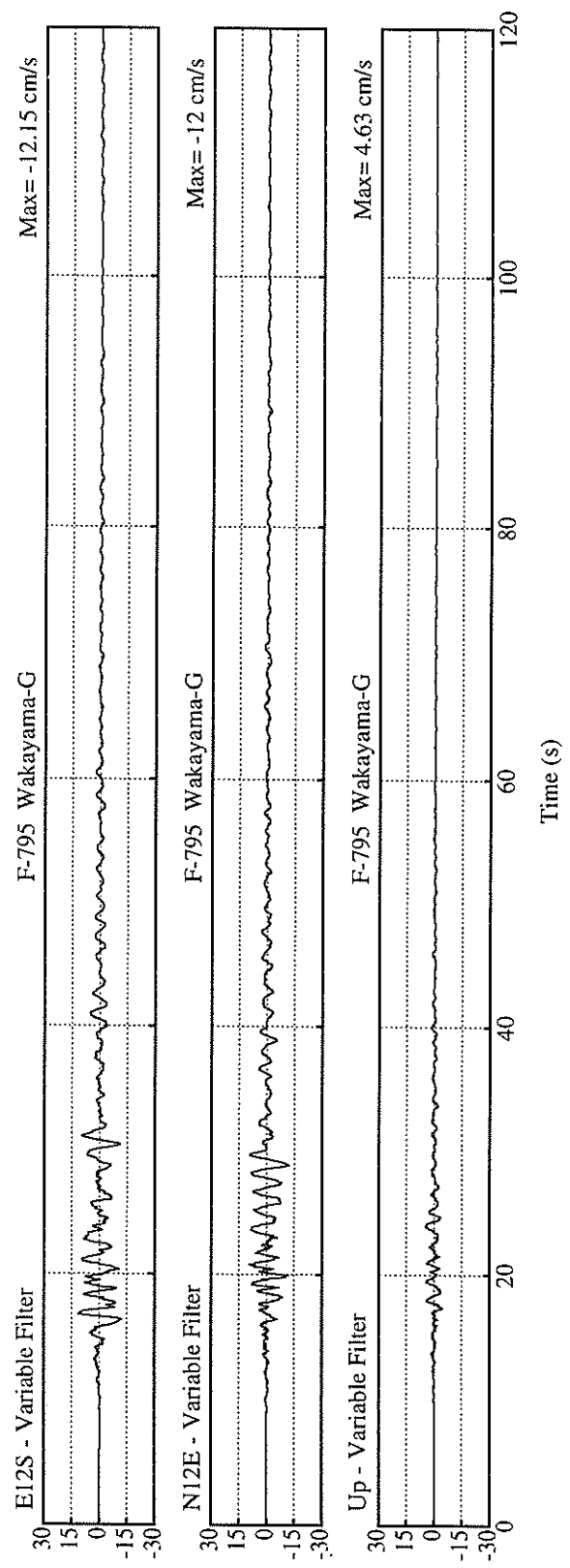
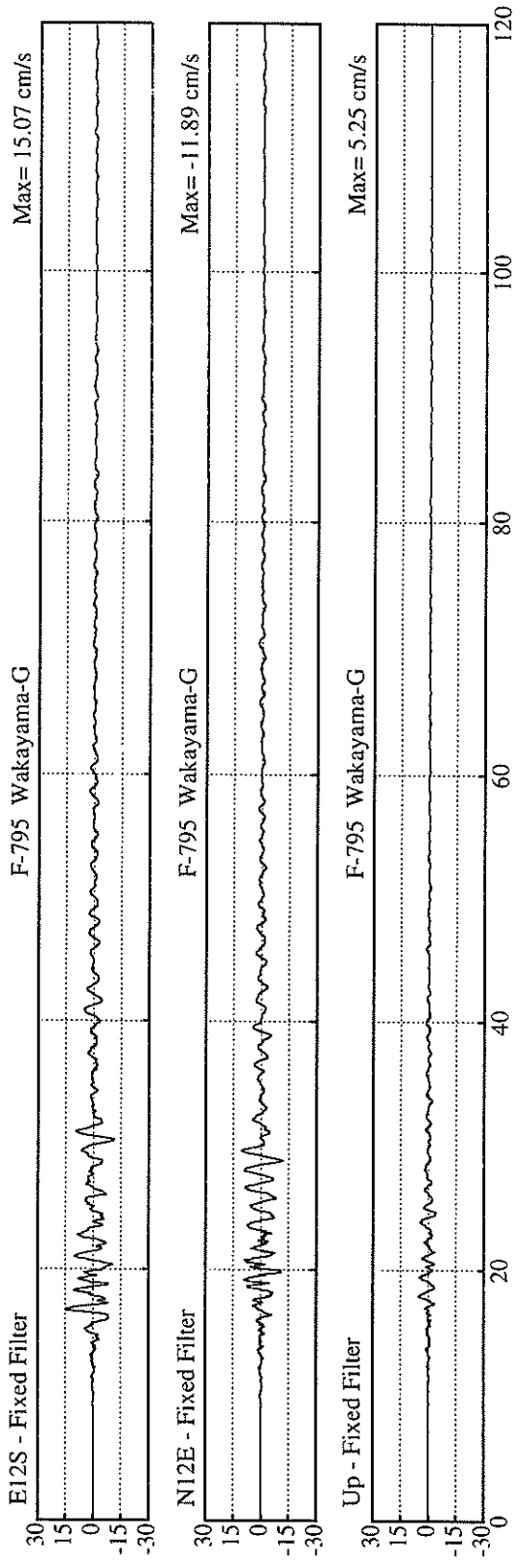
PEAK VALUES OF COMPONENTS

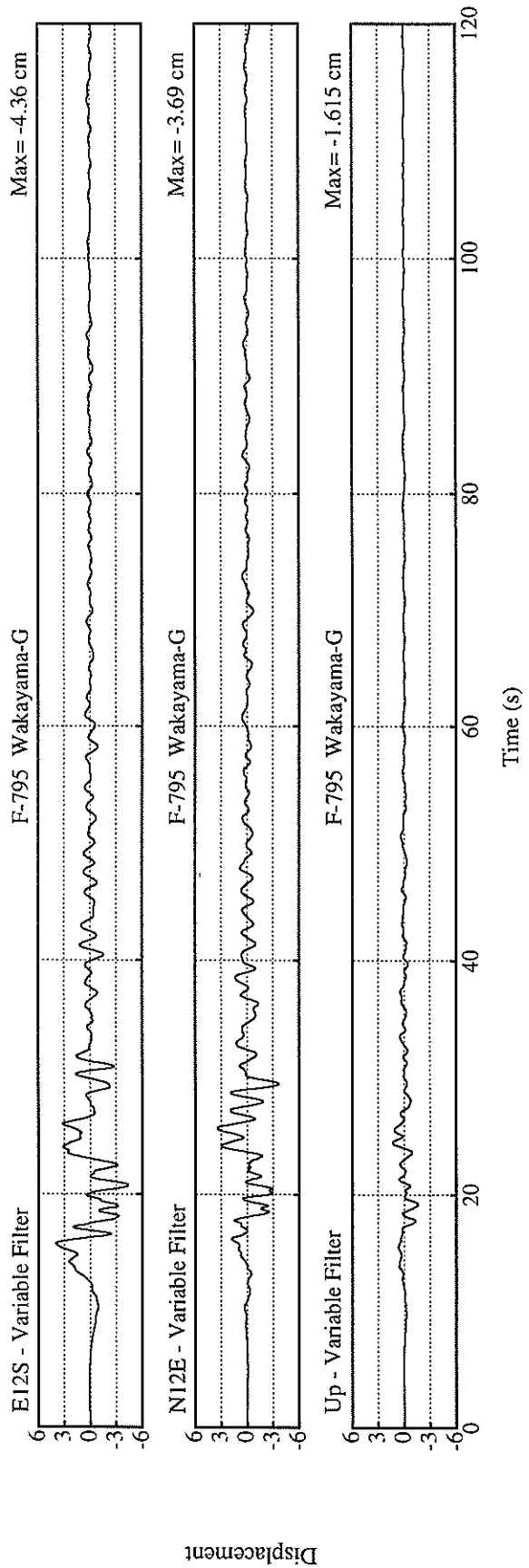
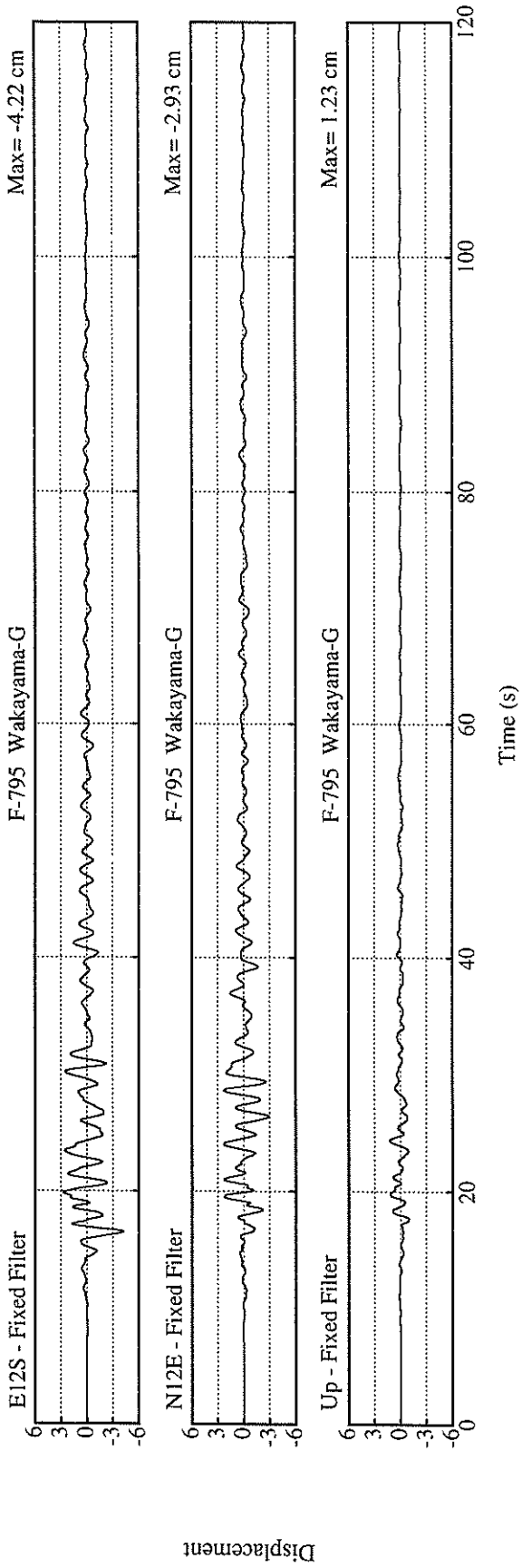
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.073	0.067	0.091	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	95.9	86.5	34.2	98.7
ORIGINAL	157.0	109.0	67.2	157.0
CORRECTED	157.2	110.2	68.7	157.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	11.89	15.07	5.25	15.08
VARIABLE FILTER	12.00	12.15	4.63	13.35
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.93	4.22	1.23	4.31
VARIABLE FILTER	3.69	4.36	1.62	4.74

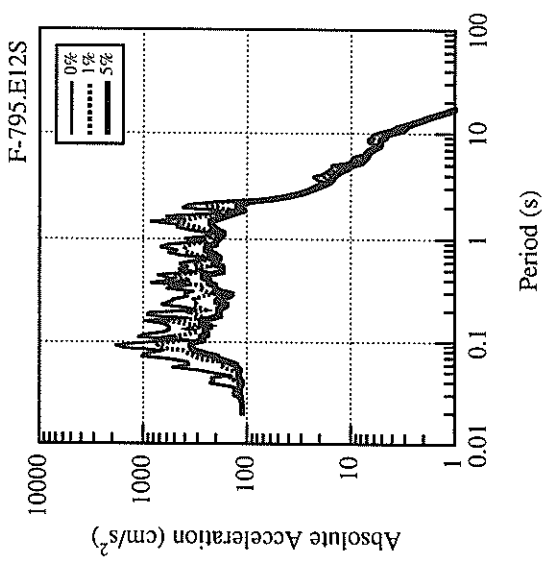
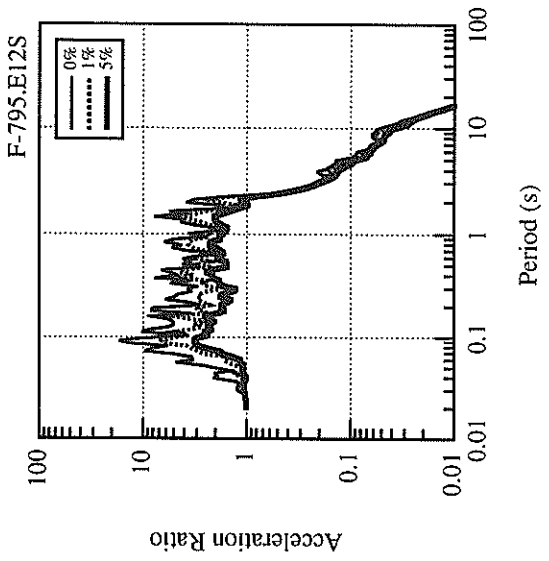
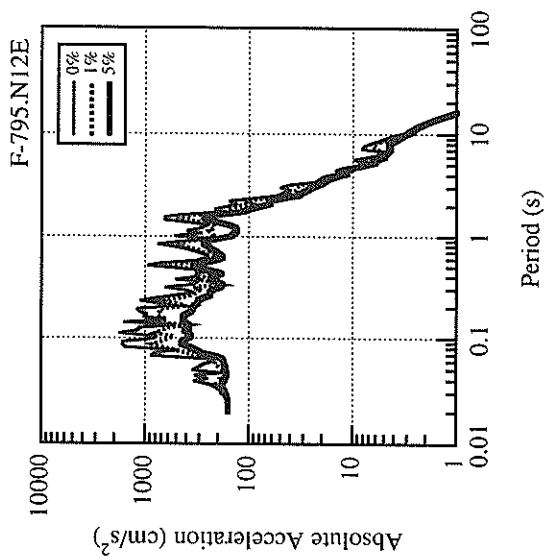
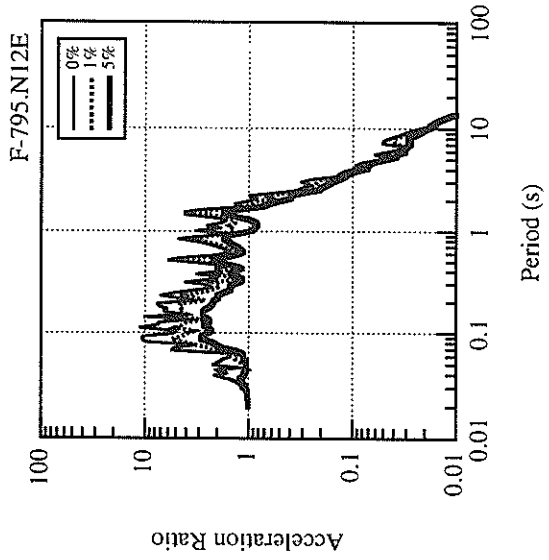
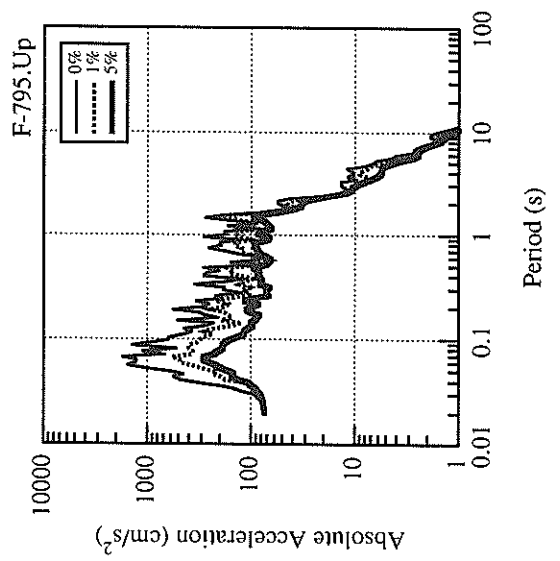
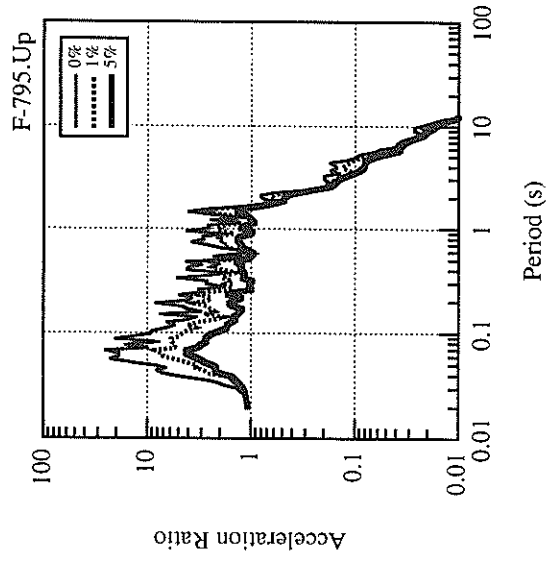
* RESULTANT OF HORIZONTAL COMPONENTS

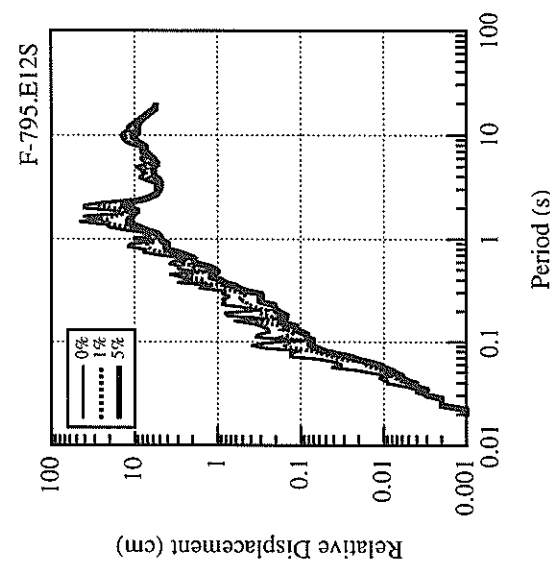
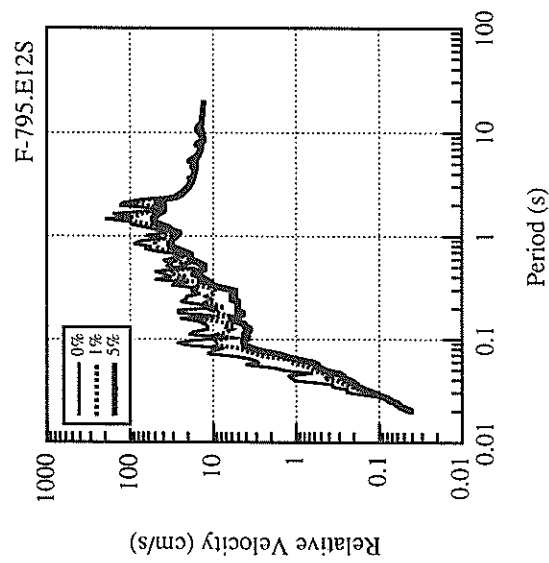
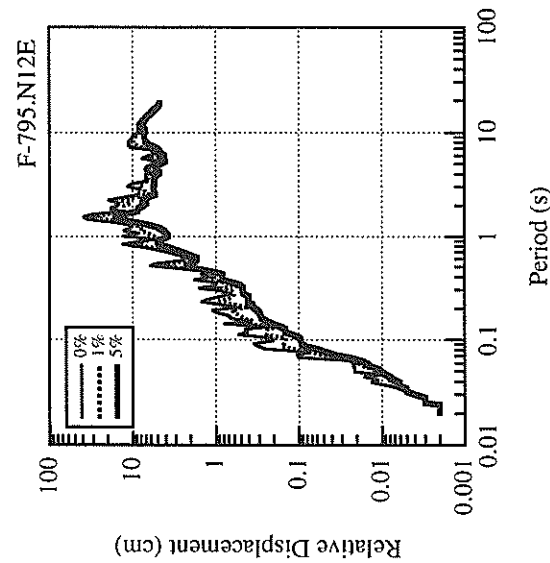
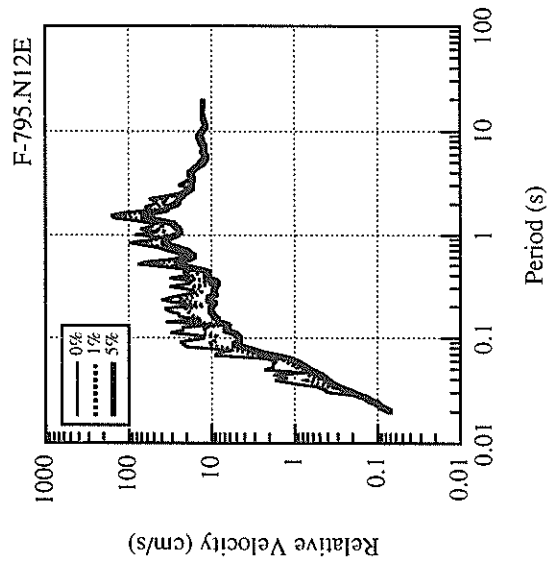
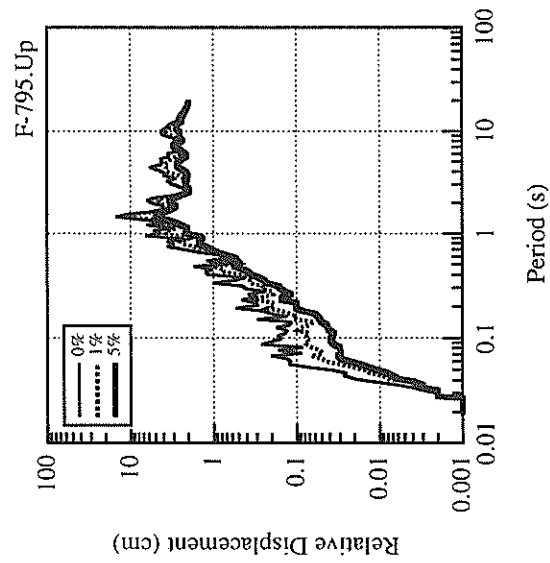
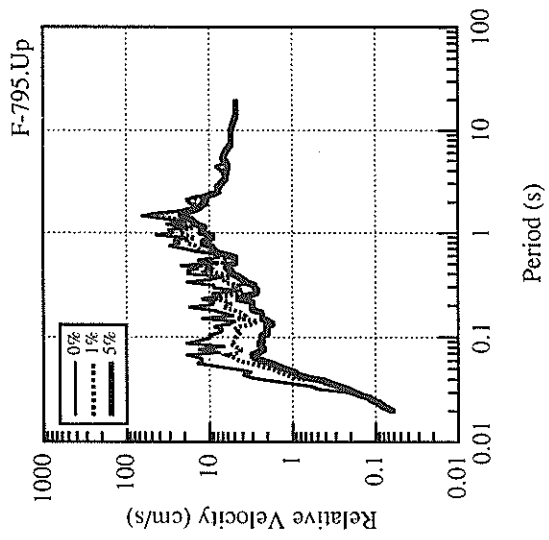


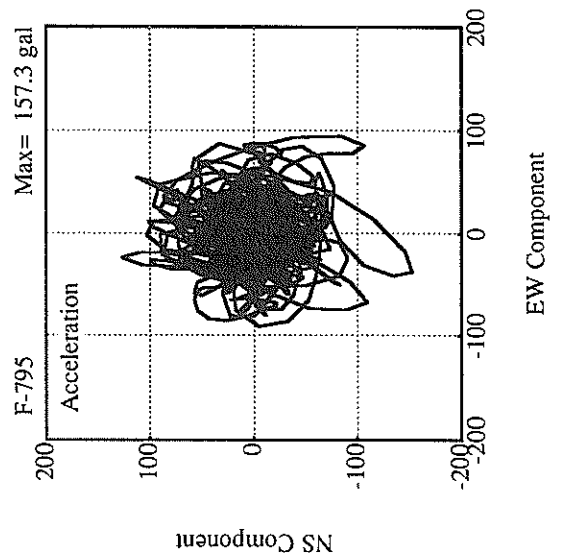
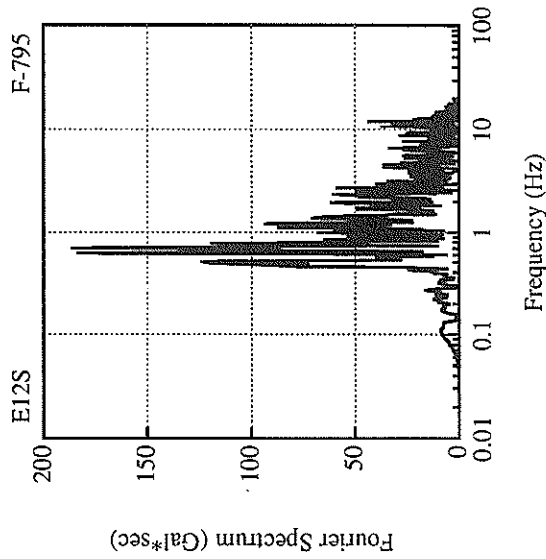
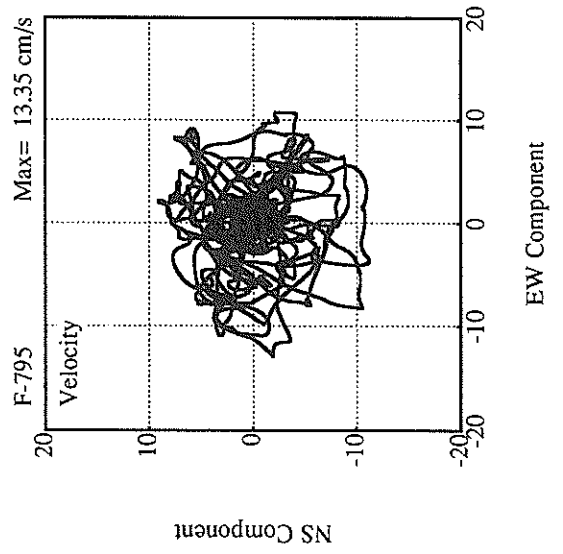
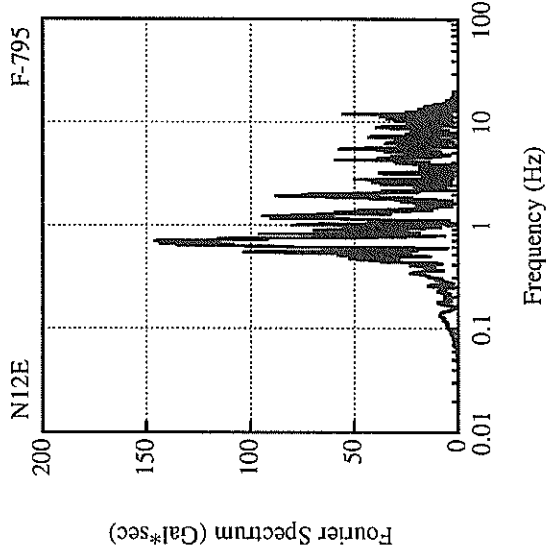
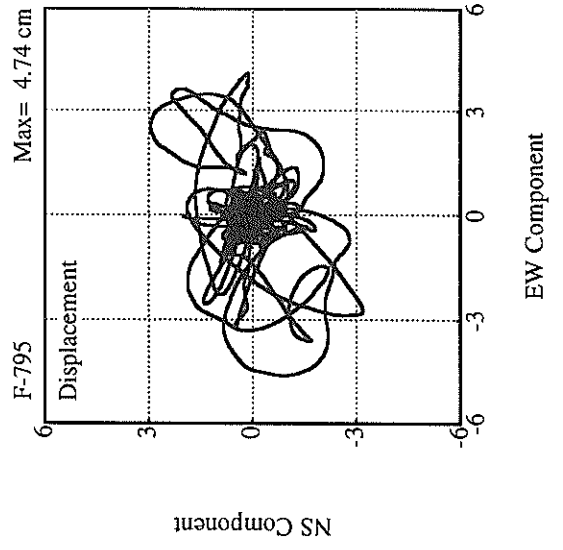
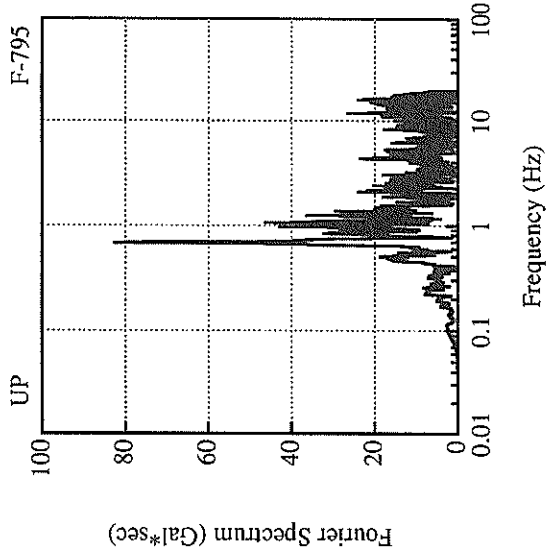












RECORD NUMBER : F-800

STATION : KANAZAWA-G

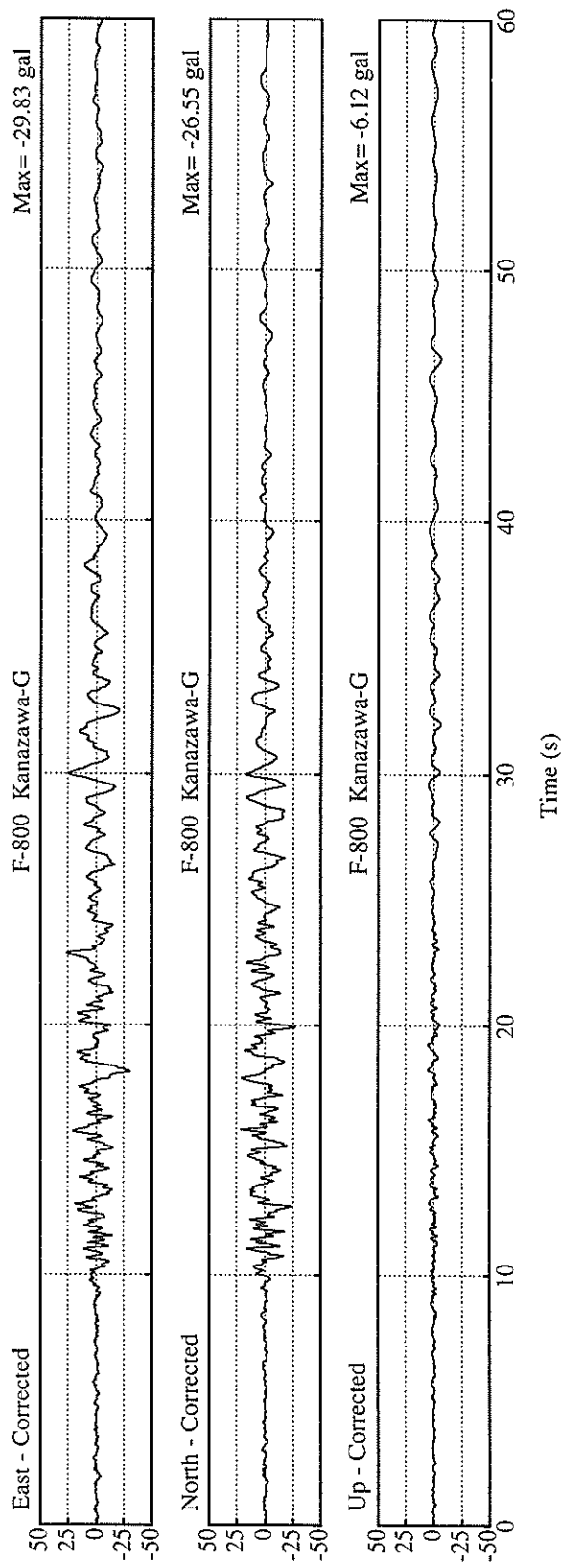
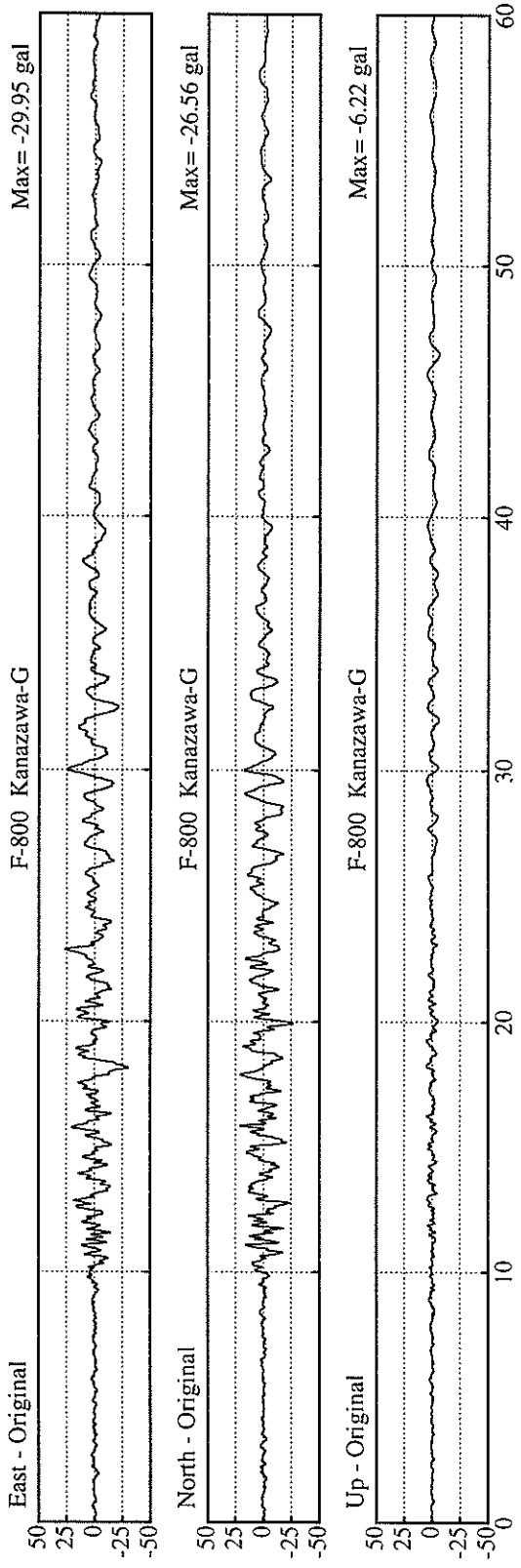
EARTHQUAKE DATA

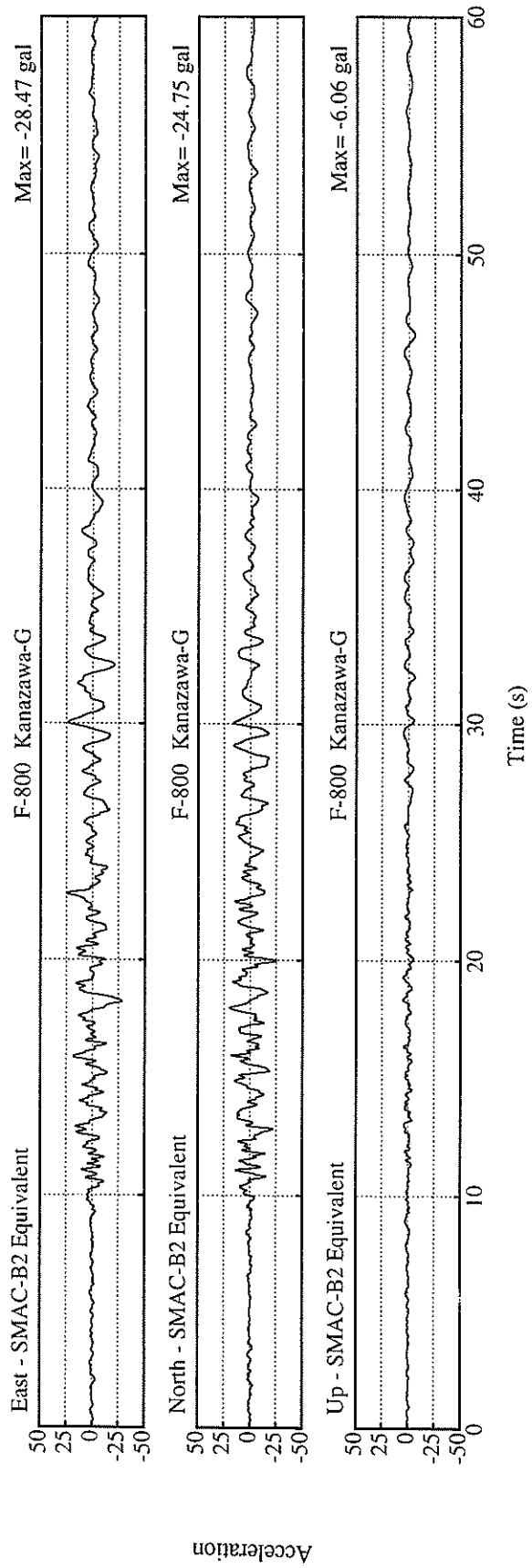
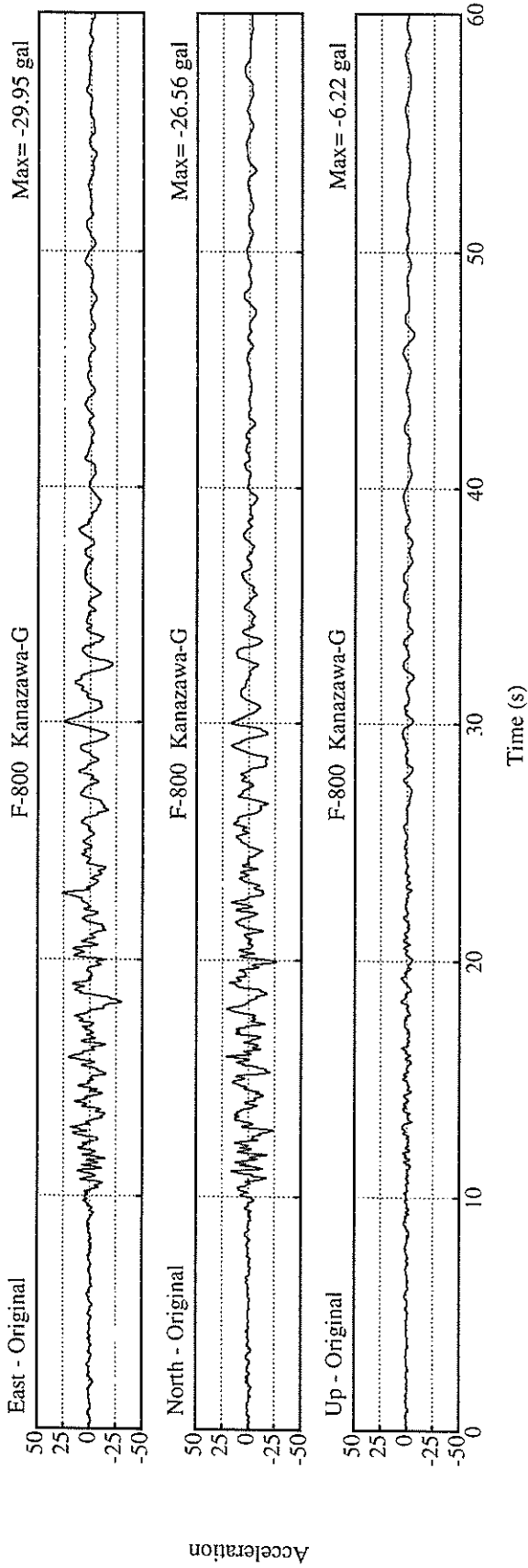
DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

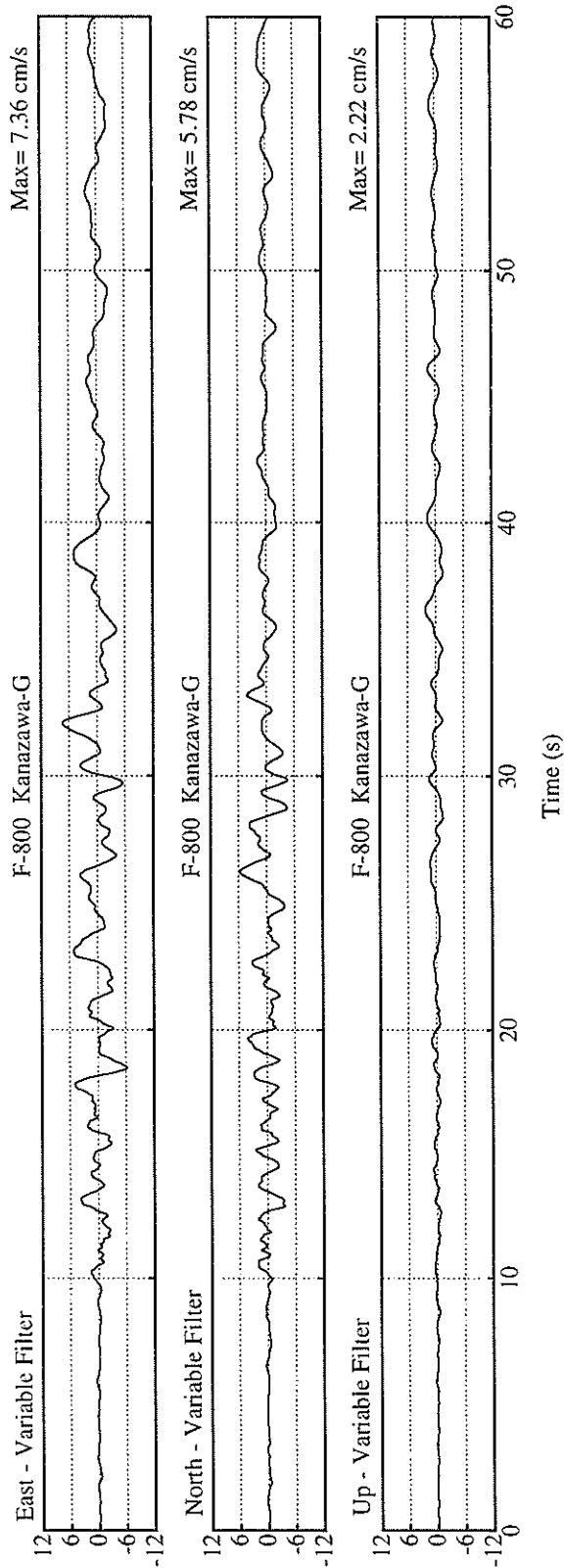
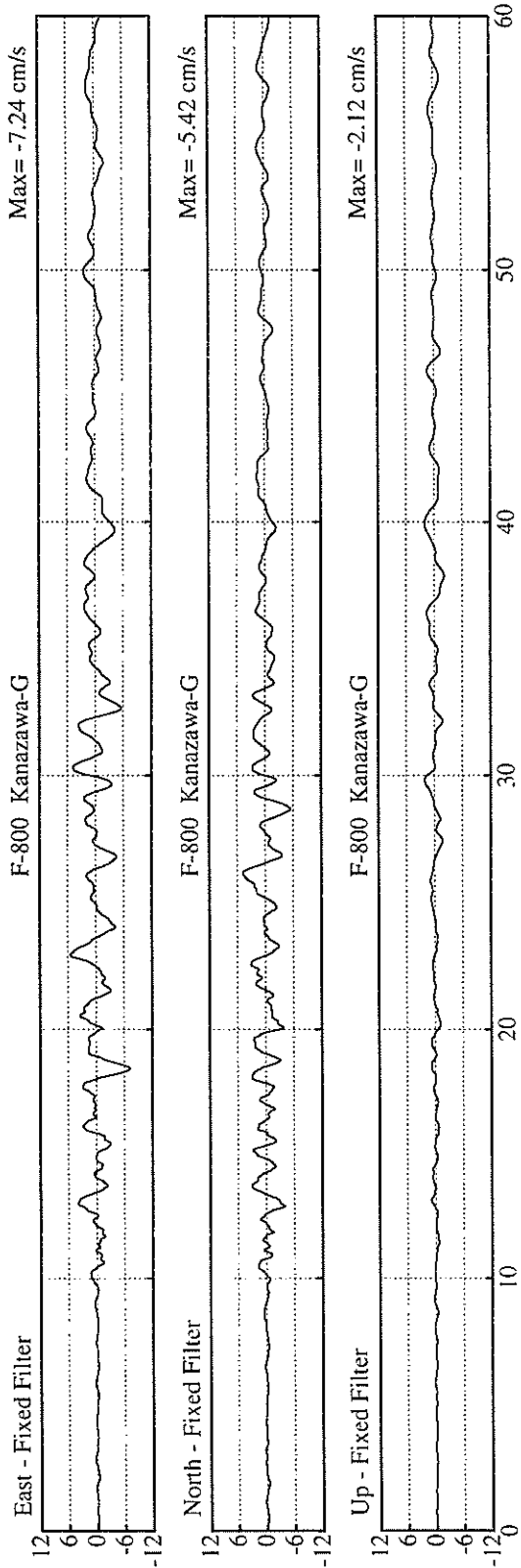
PEAK VALUES OF COMPONENTS

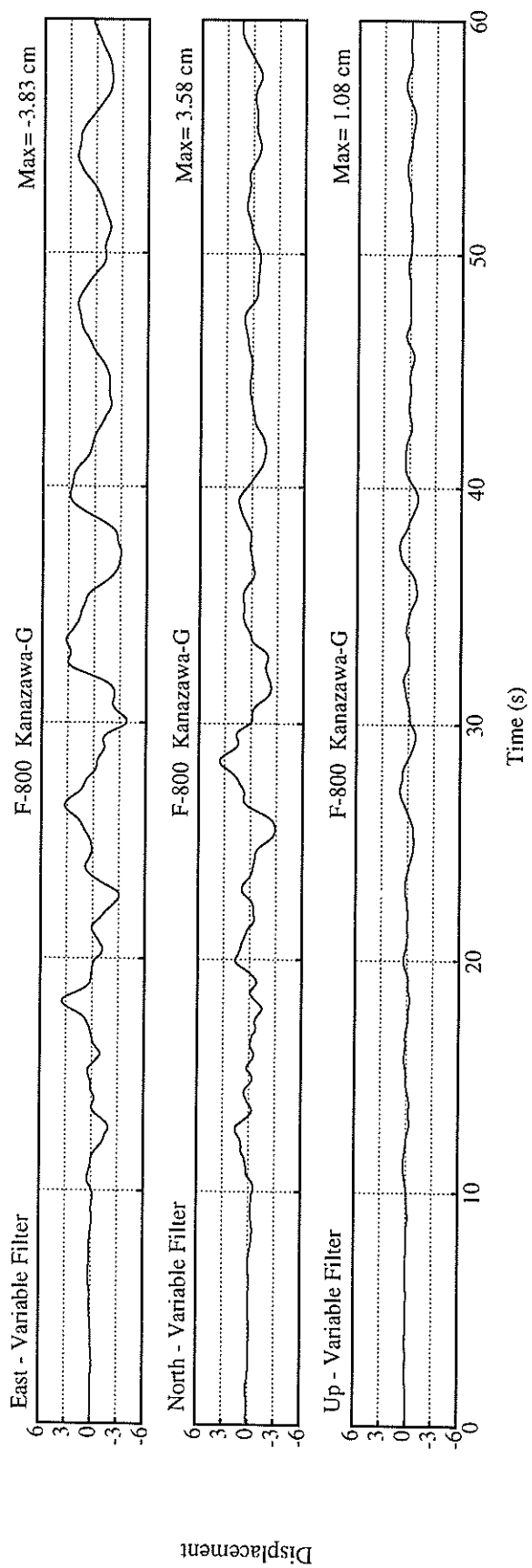
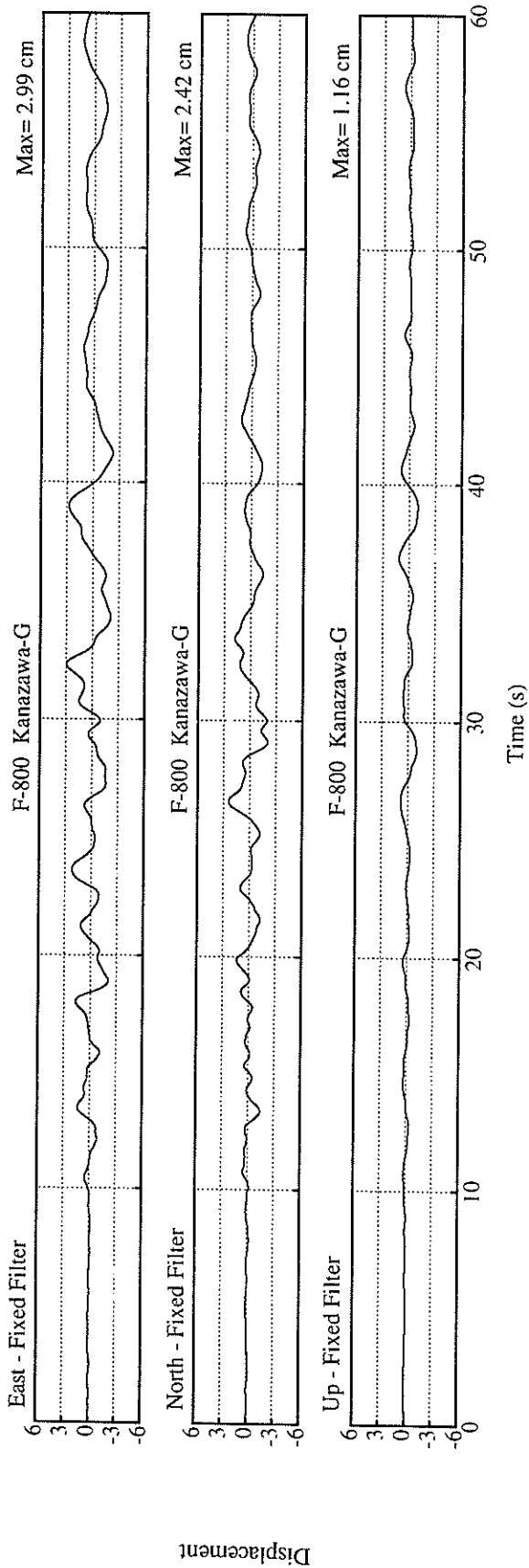
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.073	0.073	0.121	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	24.7	28.5	6.1	28.8
ORIGINAL	26.6	29.9	6.2	30.1
CORRECTED	26.6	29.8	6.1	29.8
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	5.42	7.24	2.12	7.33
VARIABLE FILTER	5.78	7.36	2.22	7.41
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	2.42	2.99	1.16	3.22
VARIABLE FILTER	3.58	3.83	1.08	3.83

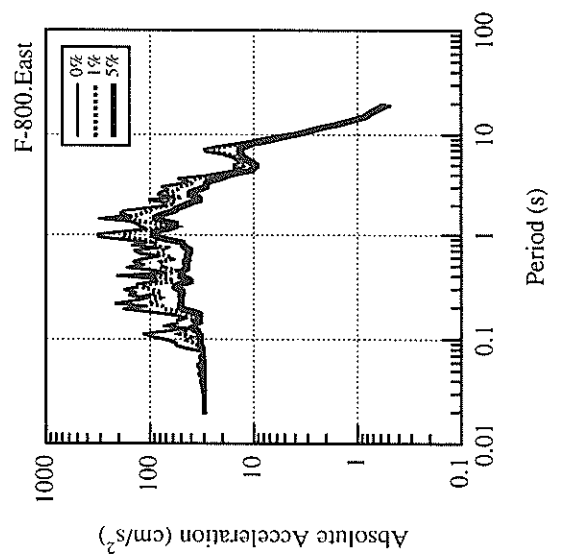
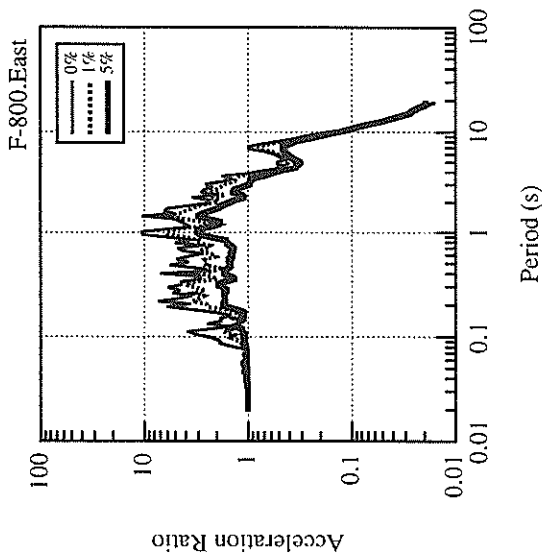
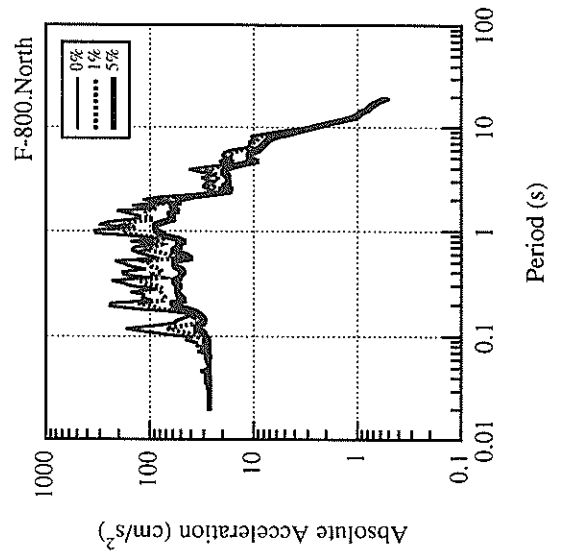
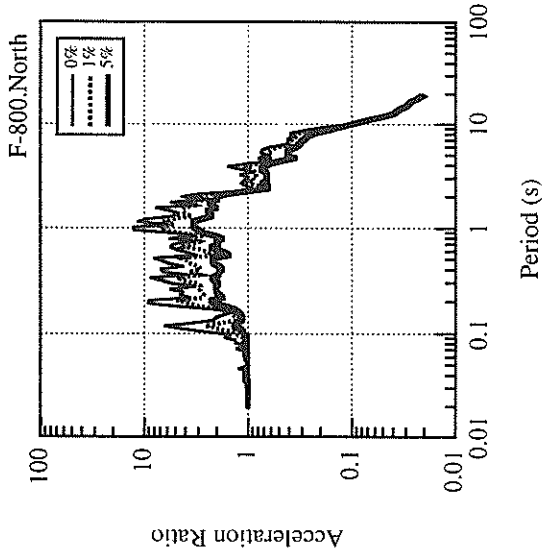
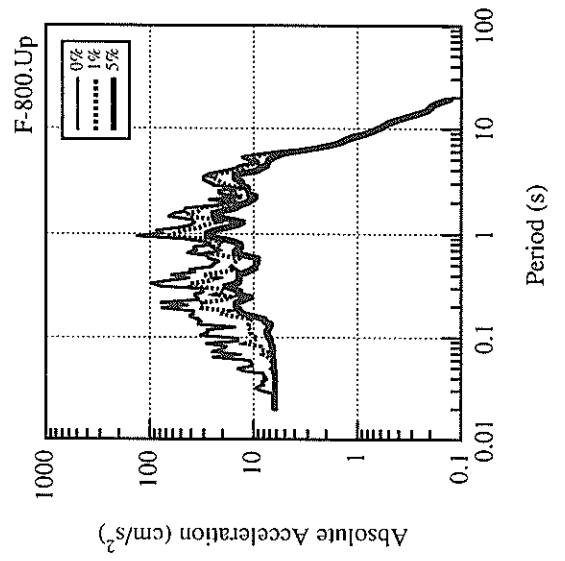
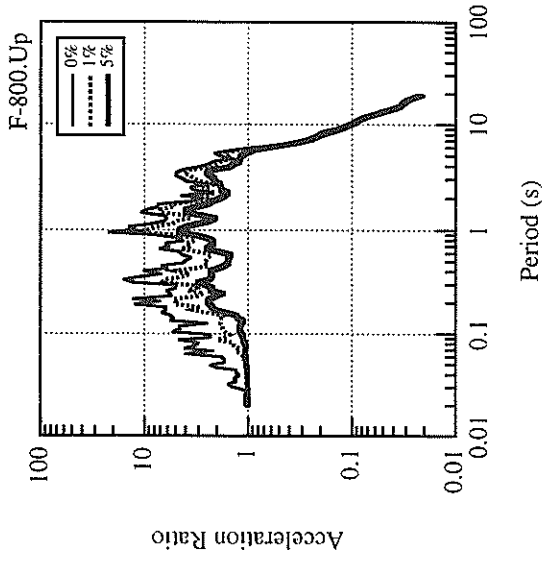
* RESULTANT OF HORIZONTAL COMPONENTS

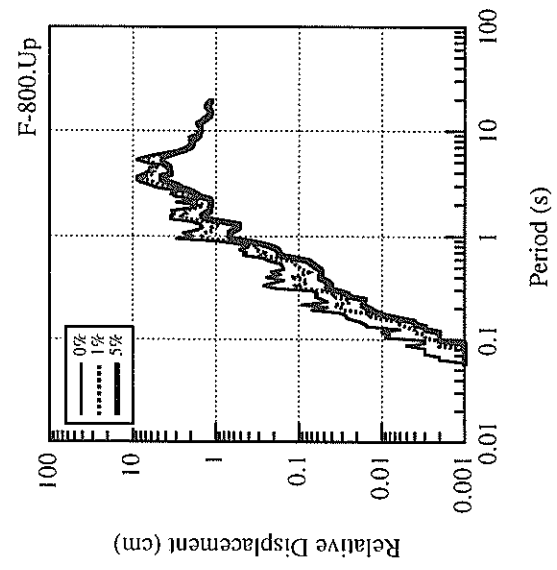
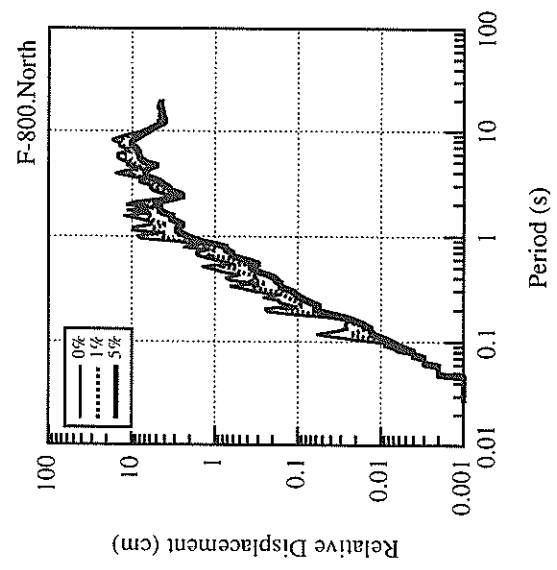
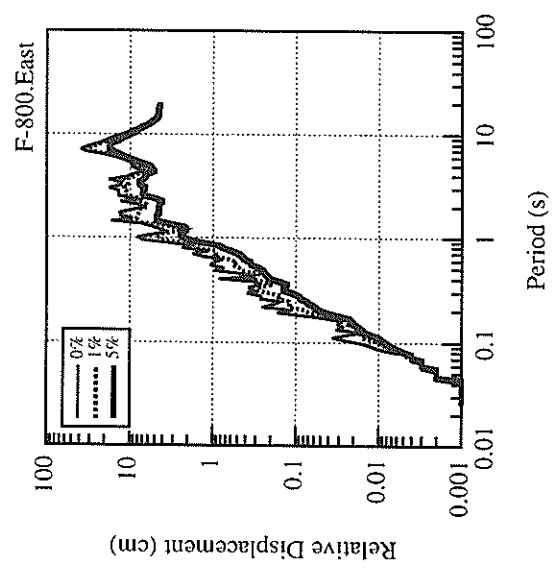
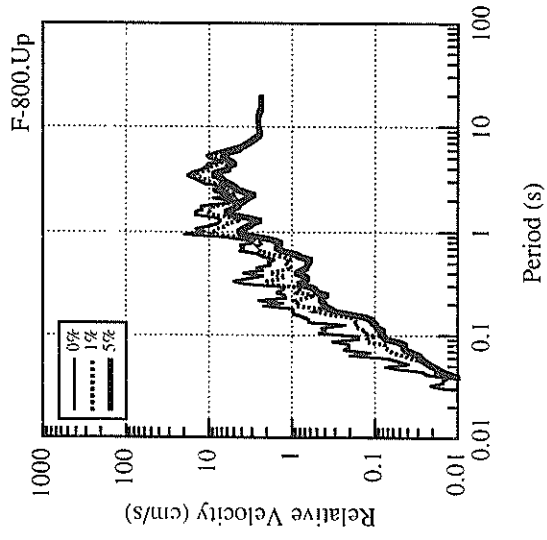
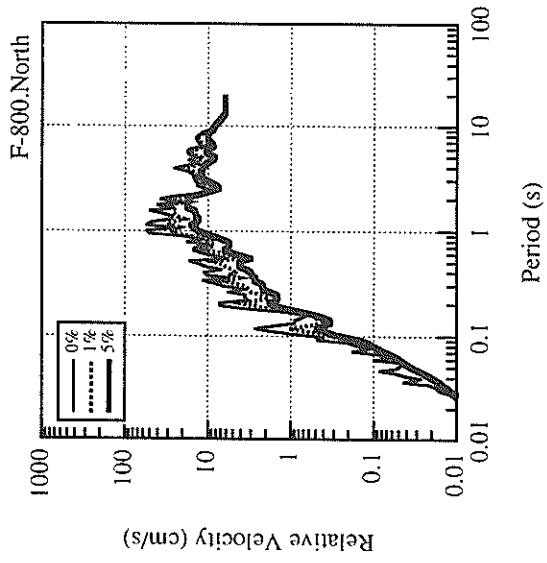
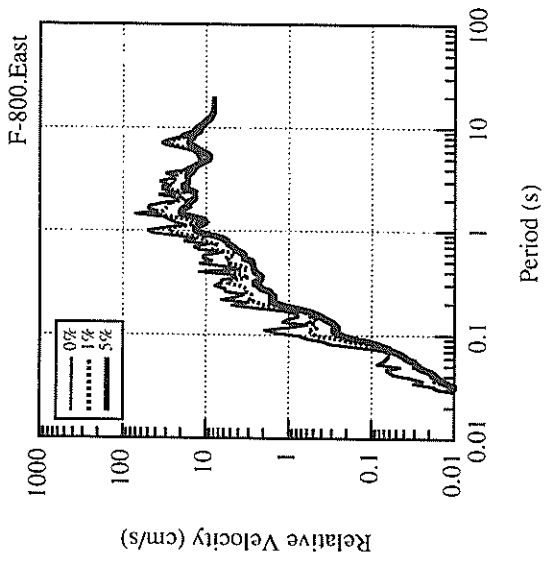


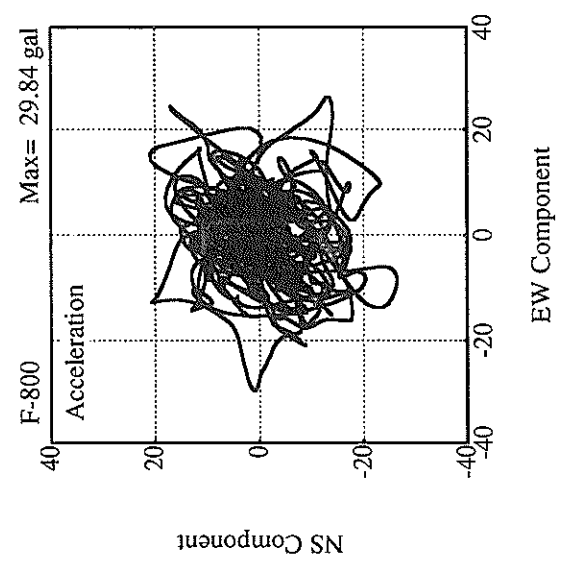
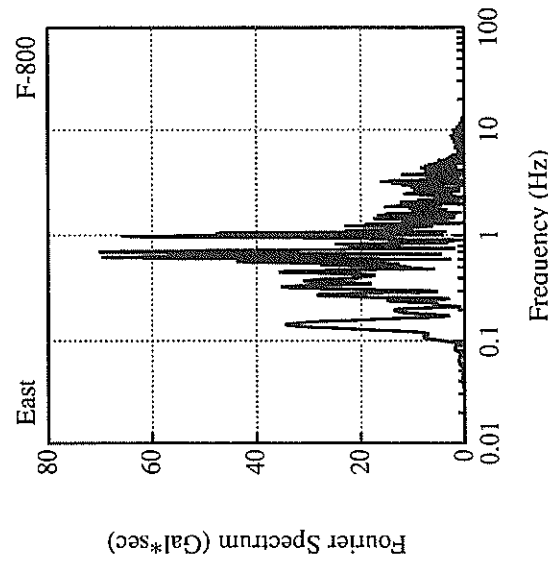
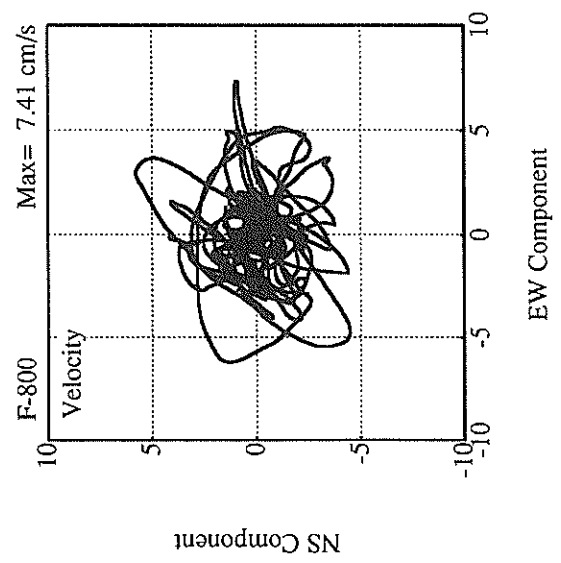
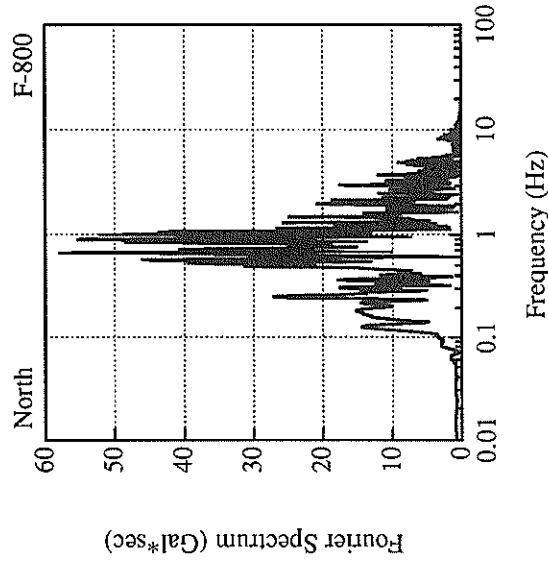
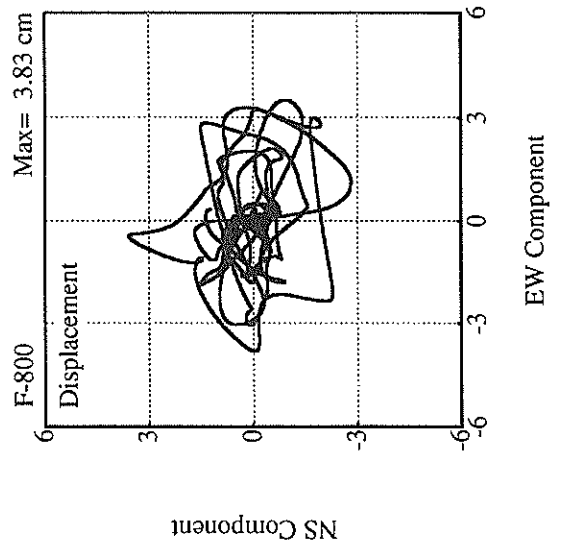
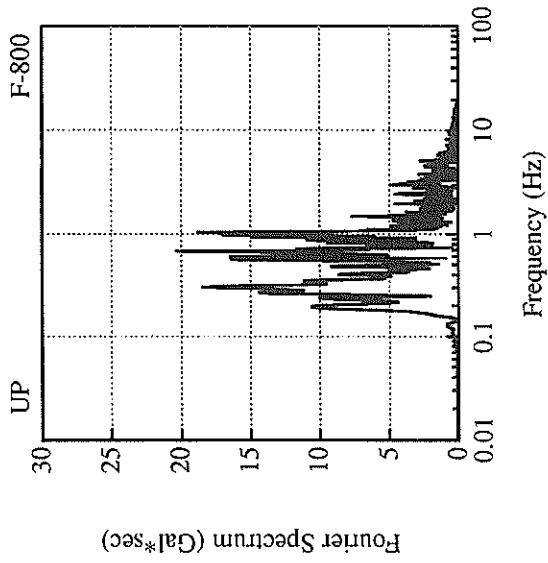












RECORD NUMBER : F-869

STATION : OITA-G

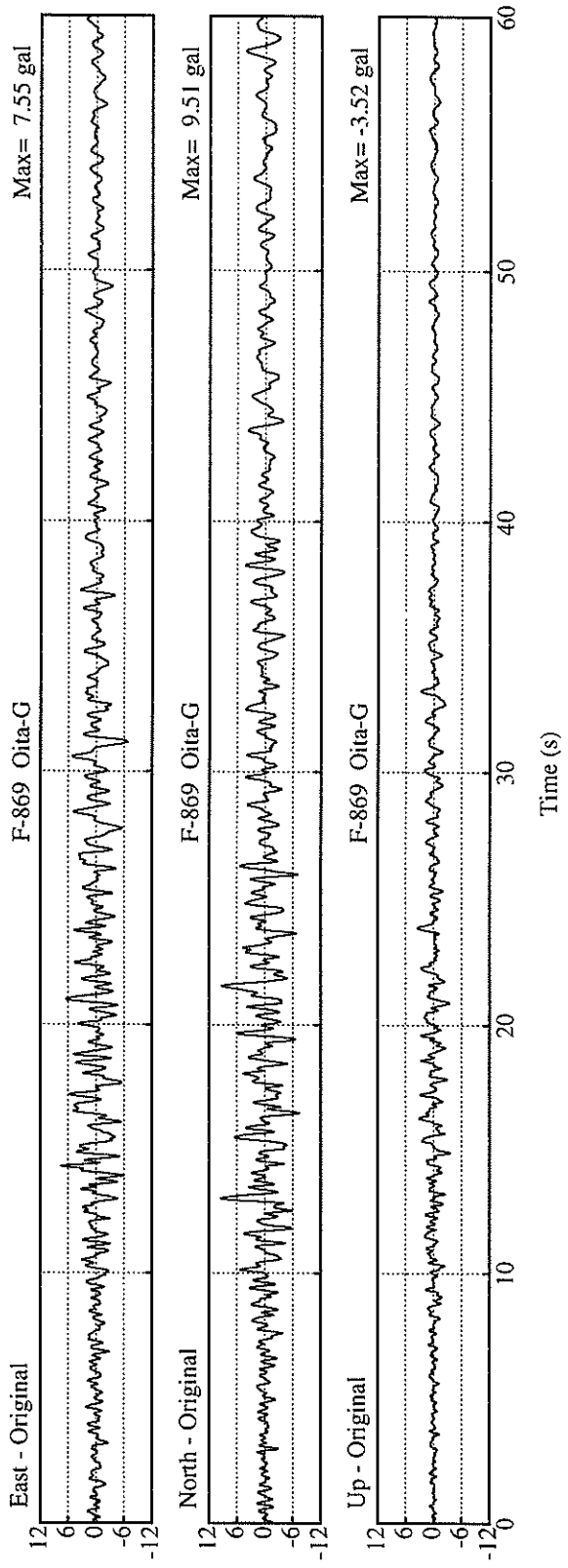
EARTHQUAKE DATA

DATE AND TIME 5:46 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION AWAJISHIMA ISLAND REGION
LATITUDE 34° 35.7' N
LONGITUDE 135° 2.2' E
DEPTH 17.9KM
JMA MAGNITUDE 7.2

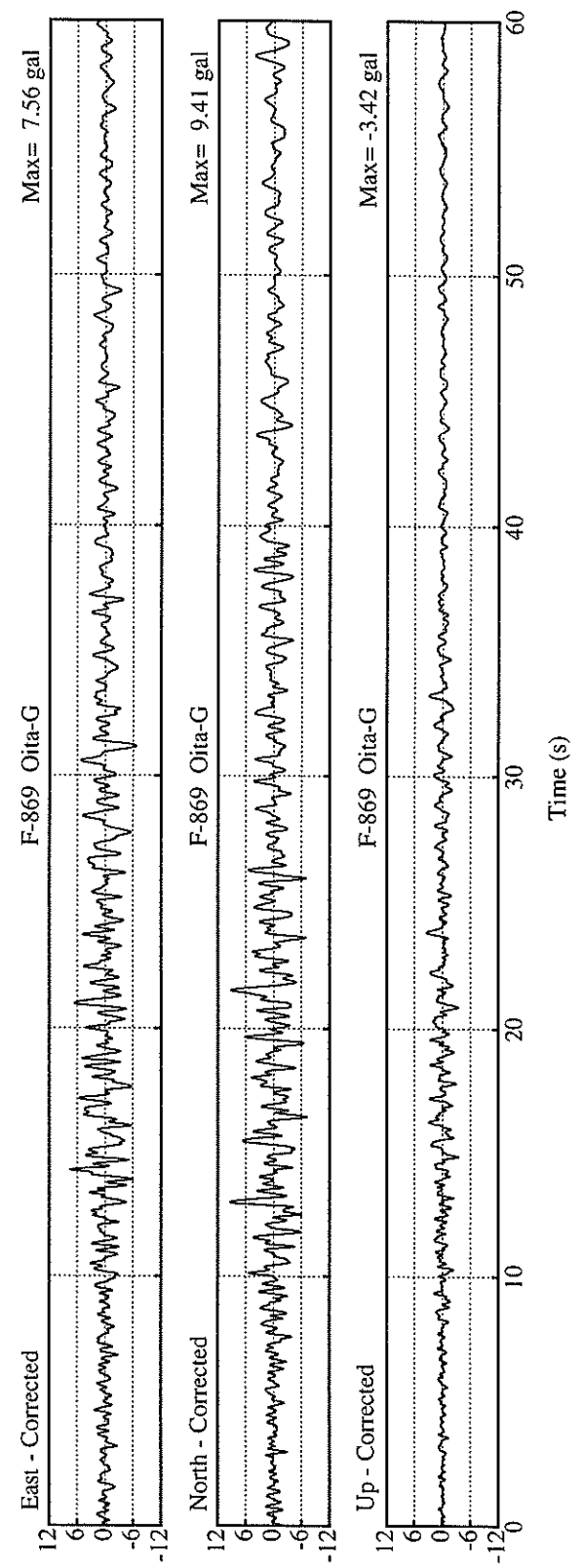
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.085	0.140	0.182	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	8.9	6.8	3.2	9.8
ORIGINAL	9.5	7.5	3.5	10.5
CORRECTED	9.4	7.6	3.4	10.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	1.85	1.35	0.58	1.86
VARIABLE FILTER	1.74	1.37	0.47	1.86
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.74	0.49	0.28	0.85
VARIABLE FILTER	0.94	0.50	0.18	1.06

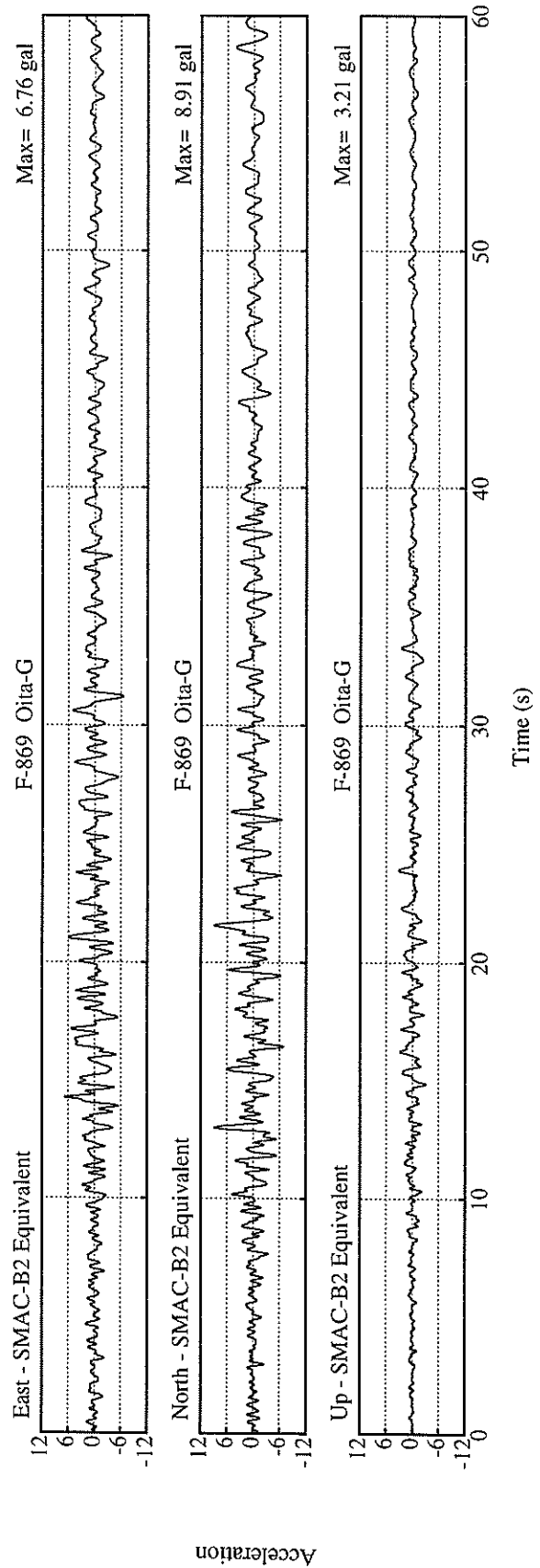
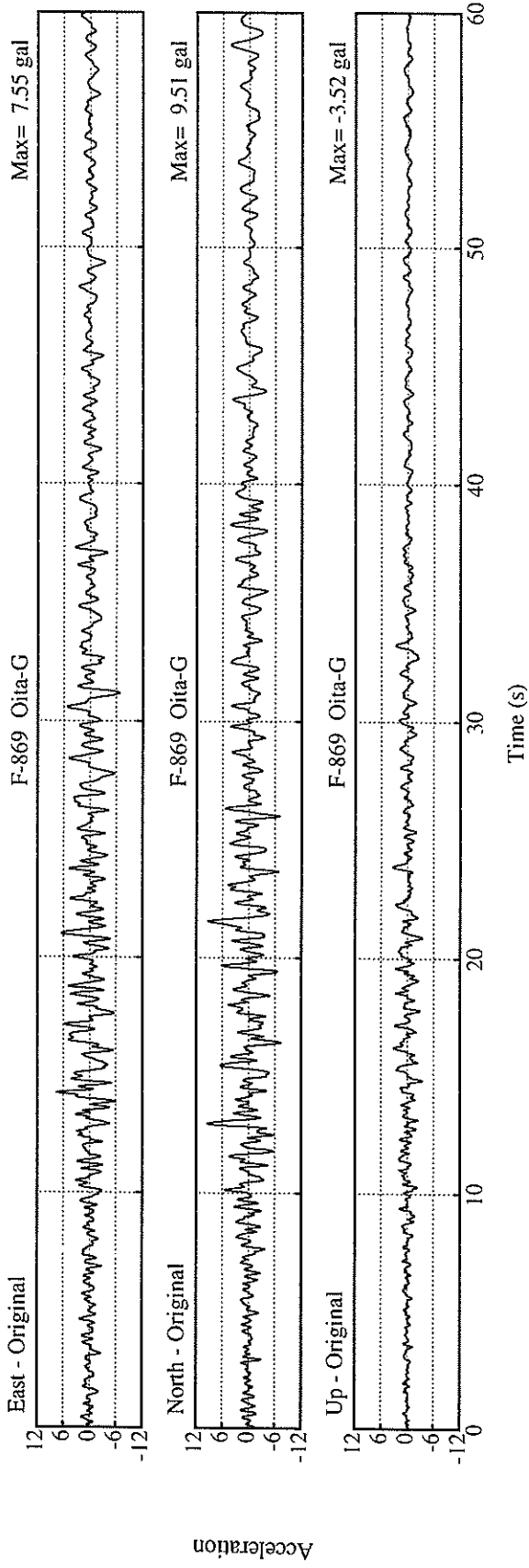
* RESULTANT OF HORIZONTAL COMPONENTS

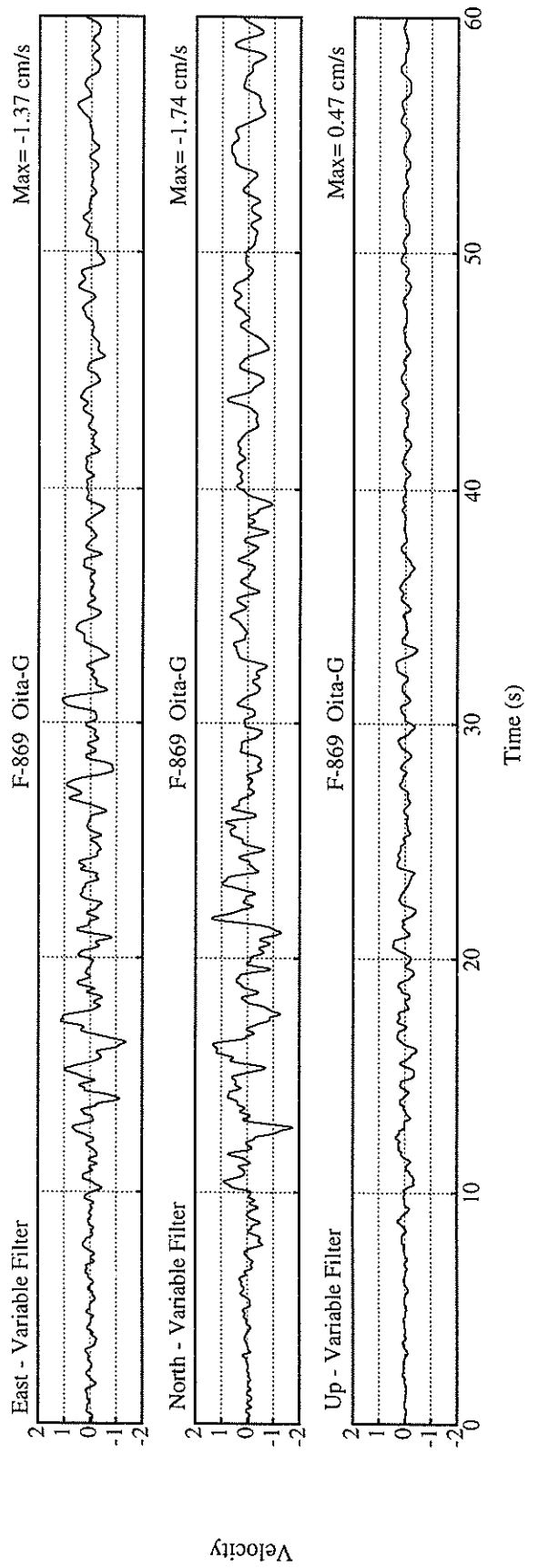
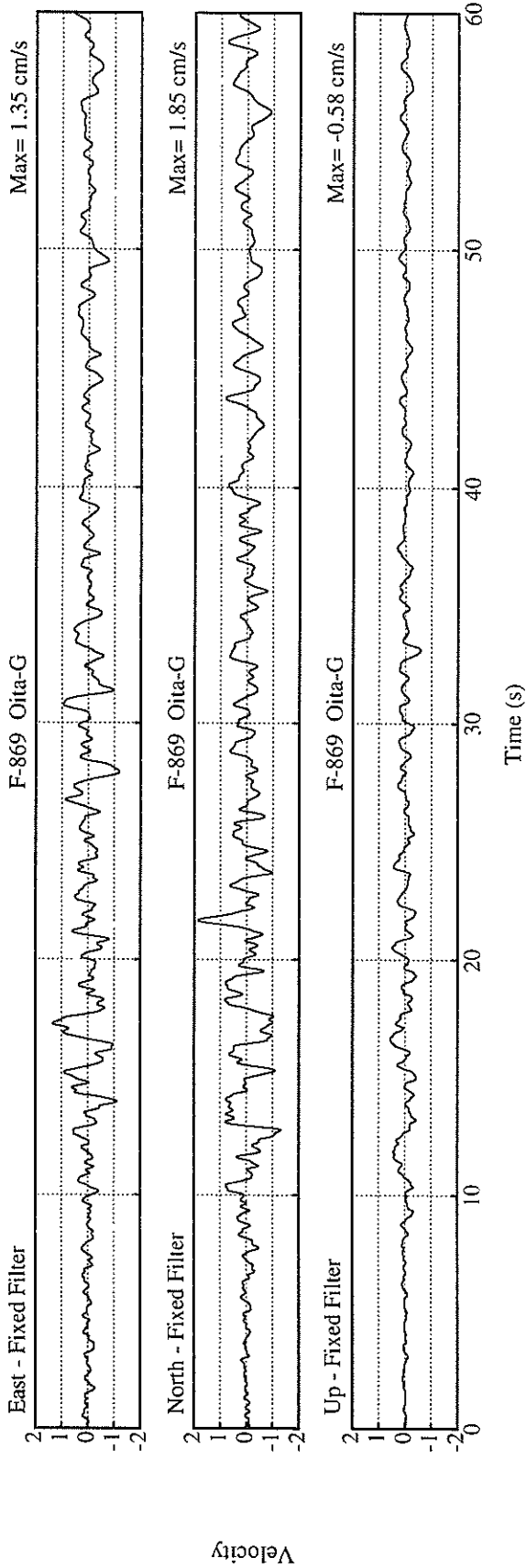


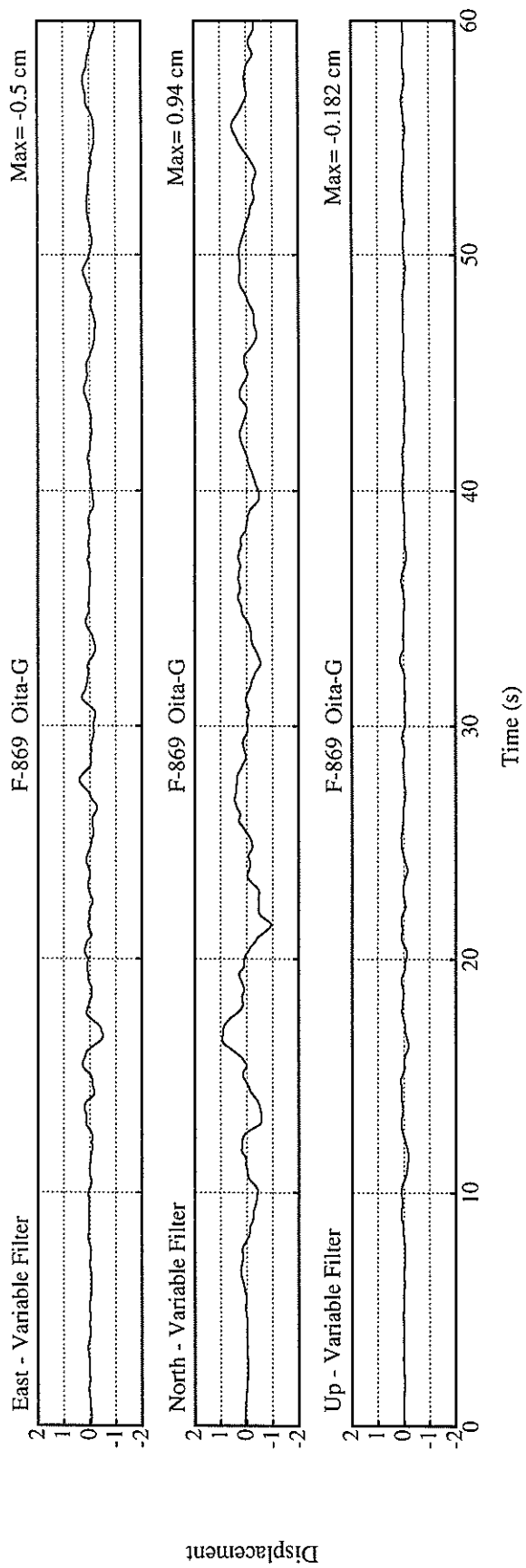
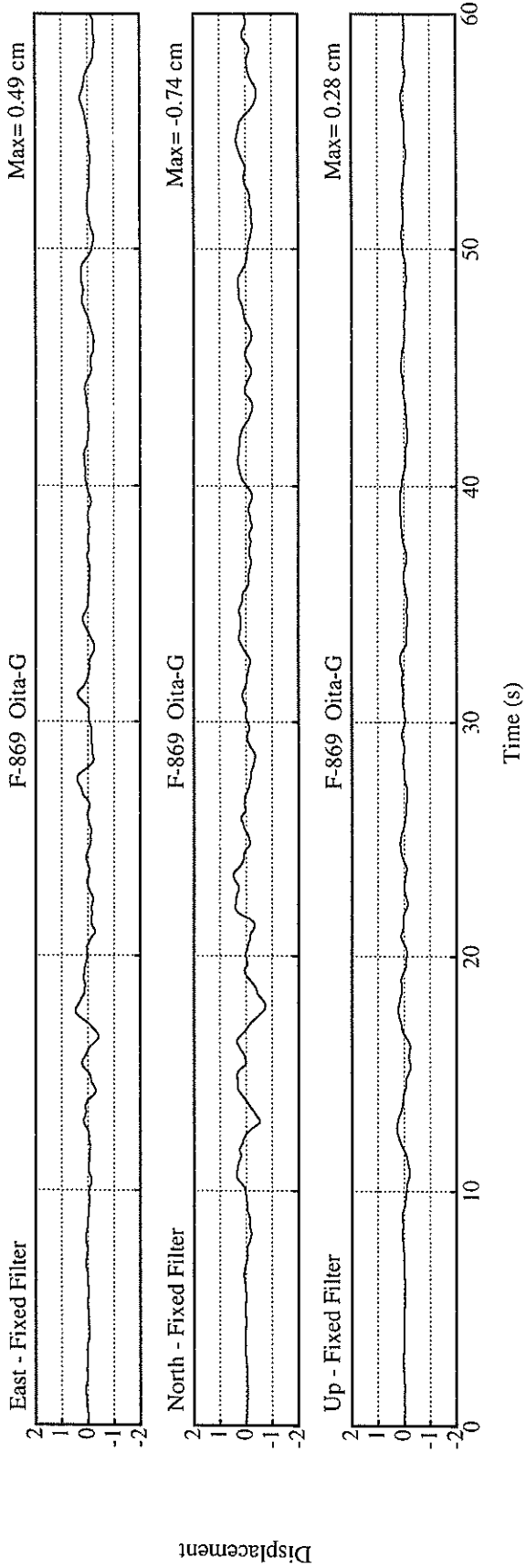
Acceleration

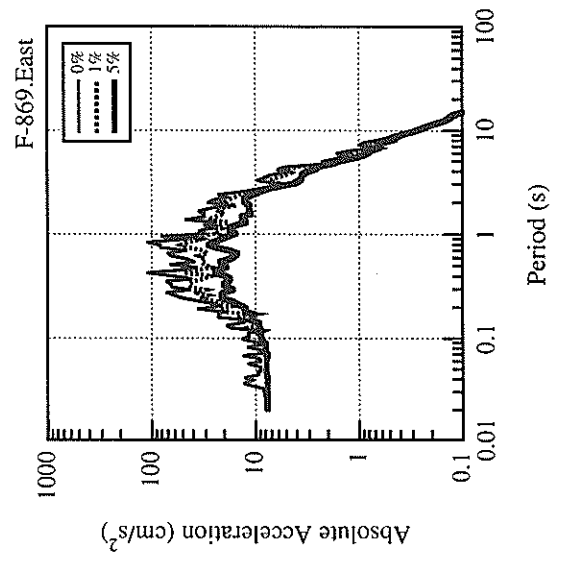
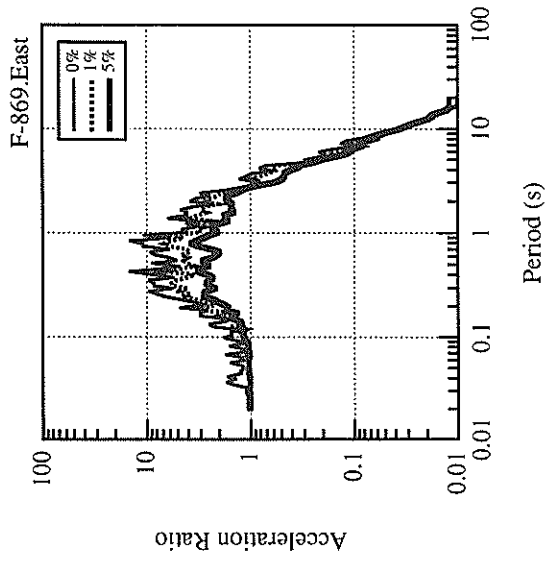
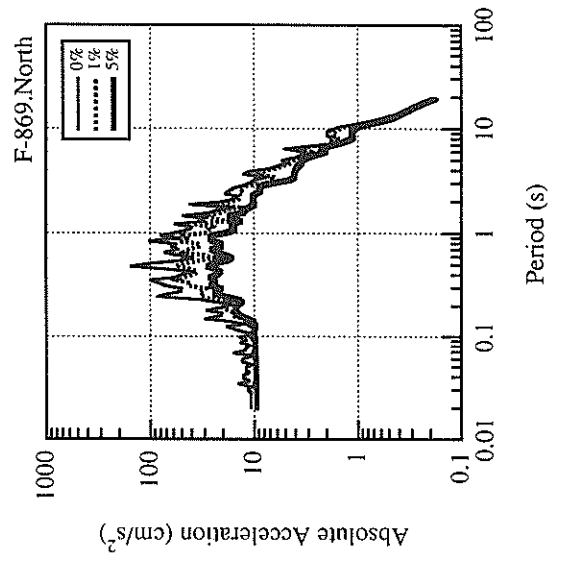
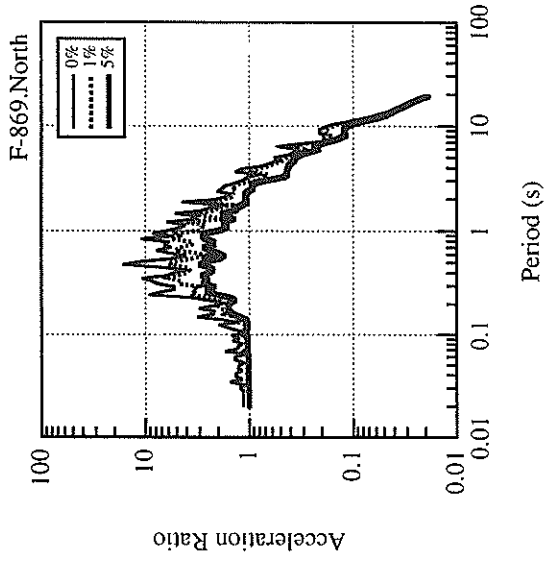
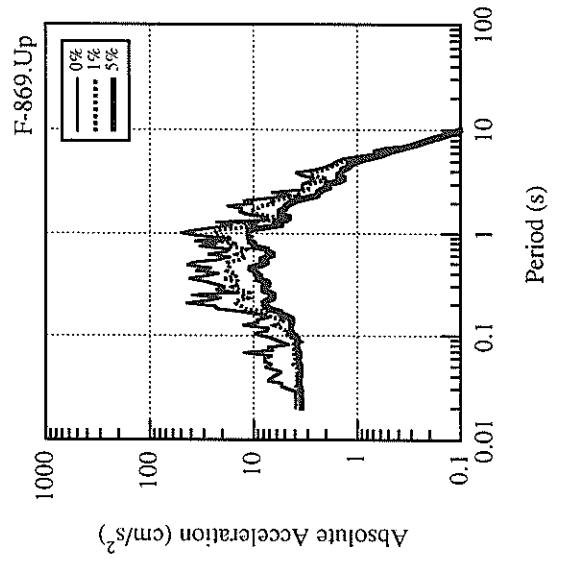
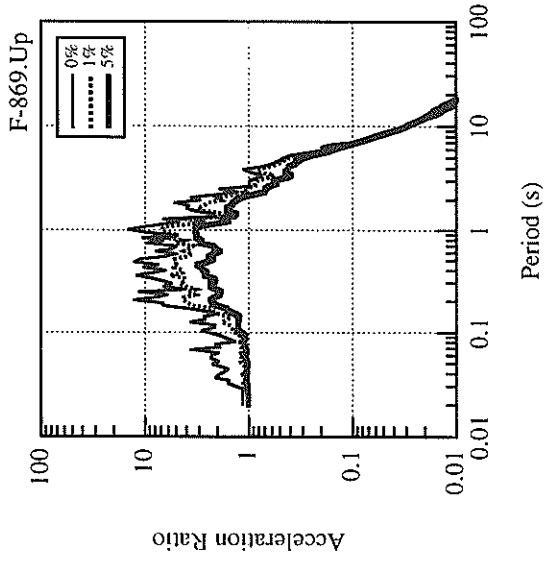


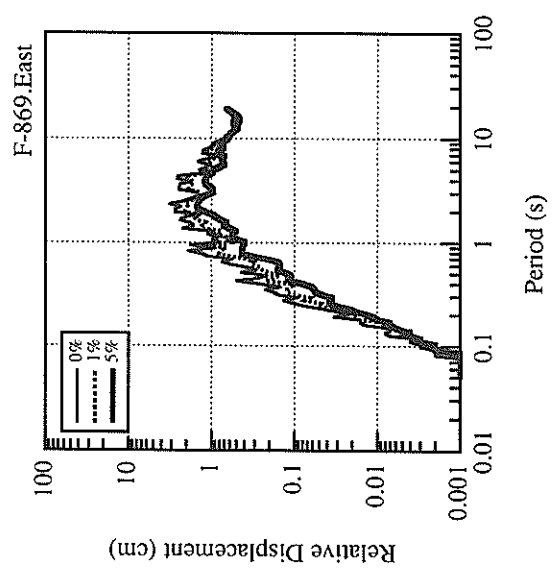
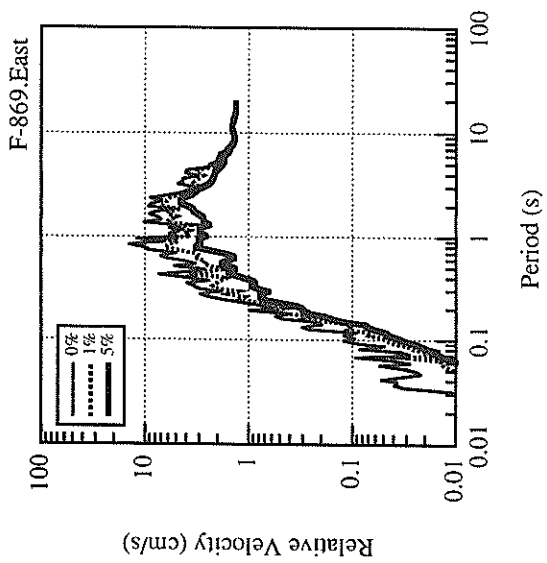
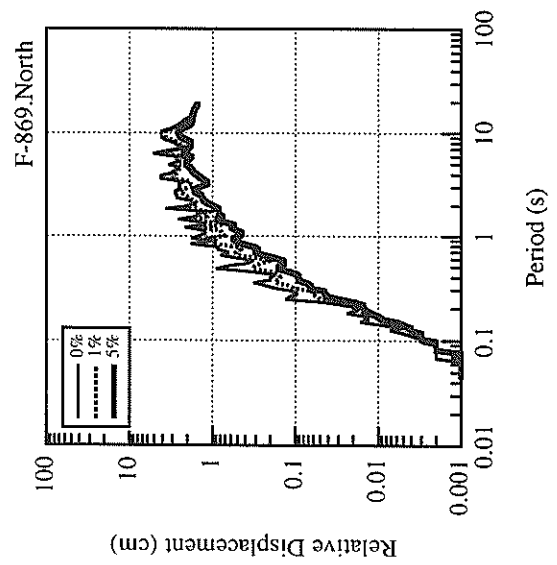
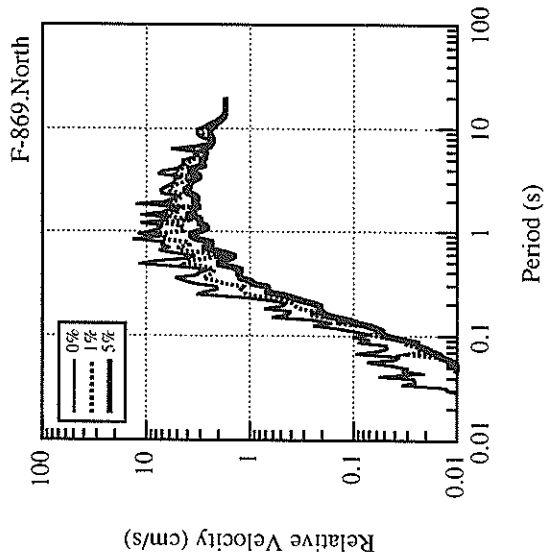
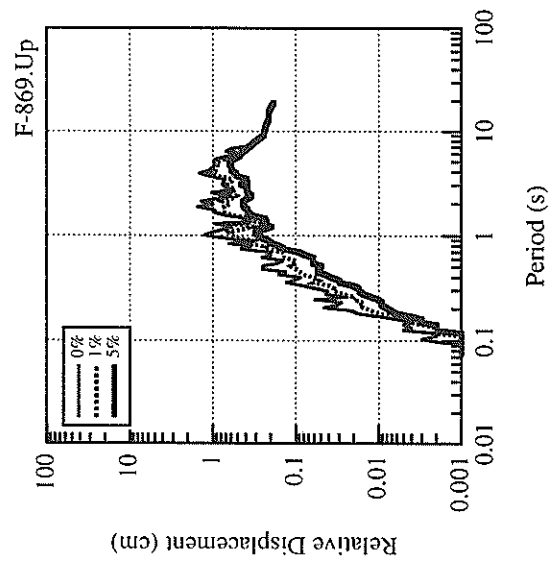
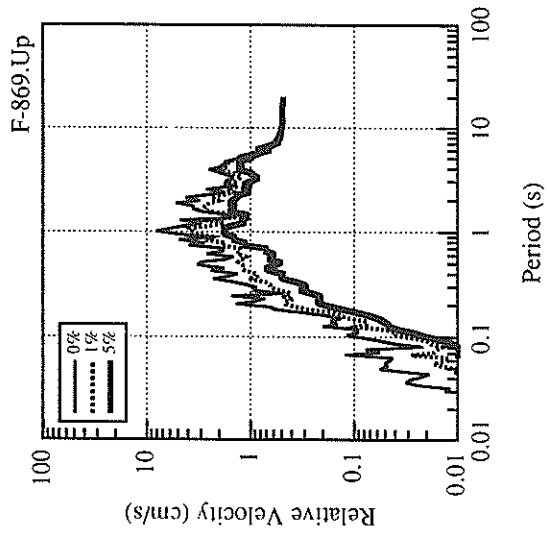
Acceleration

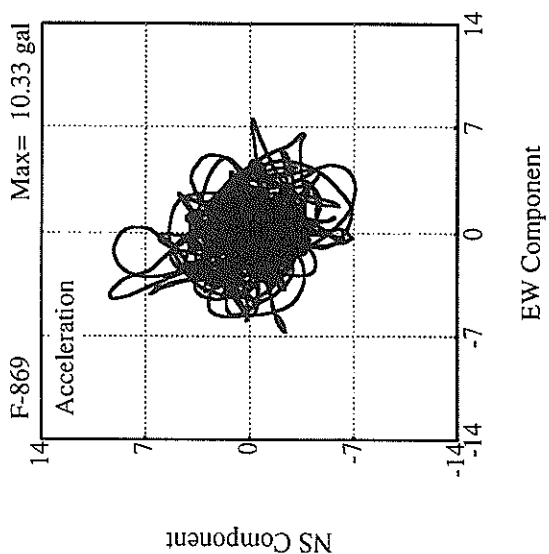
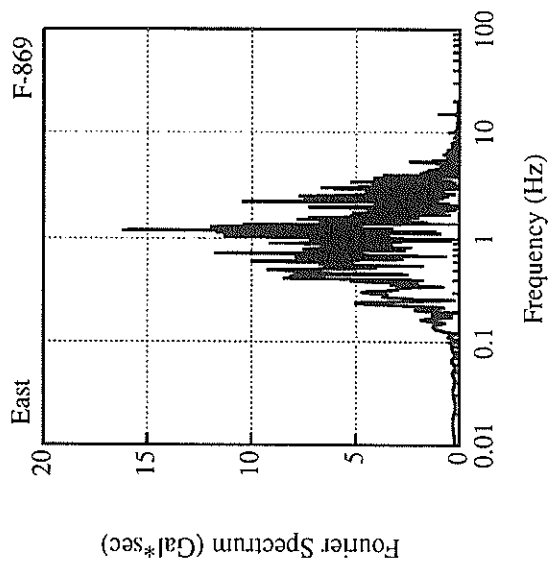
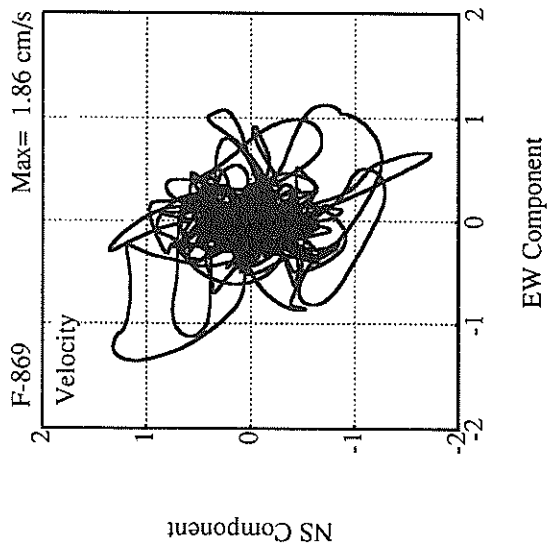
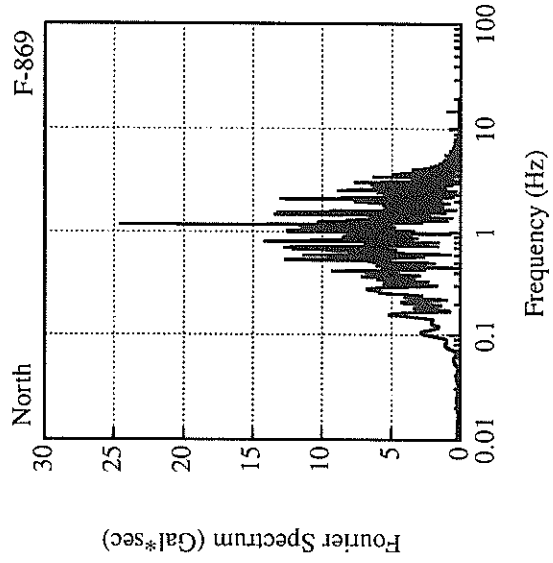
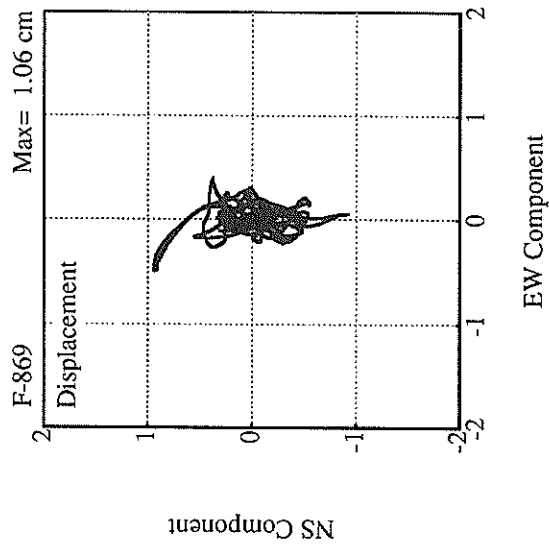
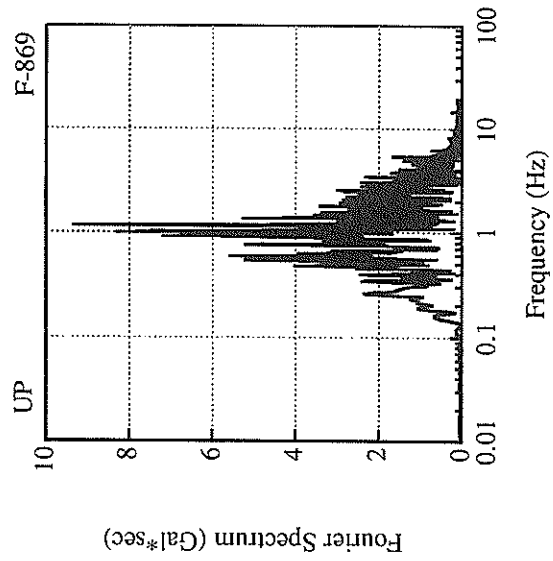












RECORD NUMBER : F-991
 STATION : KAWASAKI-F

EARTHQUAKE DATA

```
*****
DATE AND TIME                5:46 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34° 35.7' N
  LONGITUDE                  135° 2.2' E
  DEPTH                      17.9KM
  JMA MAGNITUDE              7.2
*****
```

PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
--	-----	-----	-----	-------------

PARAMETER OF THE VARIABLE FILTER

FC (HZ)	0.073	0.091	0.152	
---------	-------	-------	-------	--

MAXIMUM ACCELERATION (GAL)

SMAC-B2 EQUIVALENT	5.1	9.2	1.3	9.2
ORIGINAL	5.4	9.3	1.5	9.3
CORRECTED	5.2	9.4	1.6	9.4

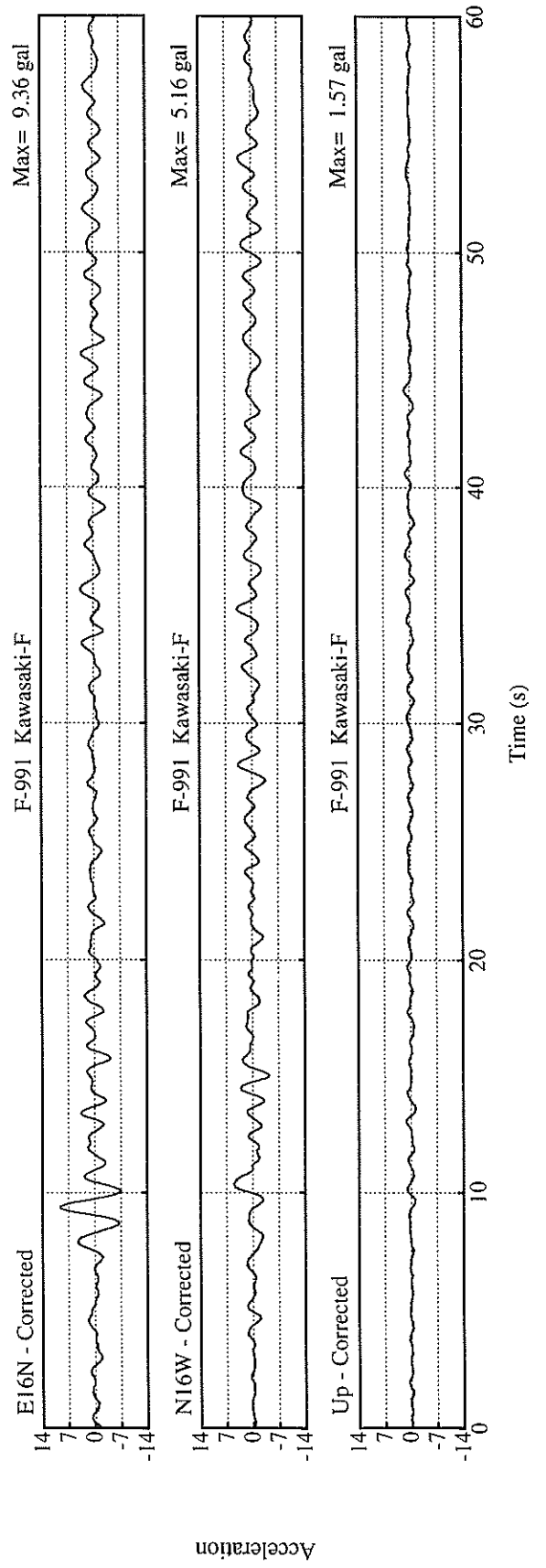
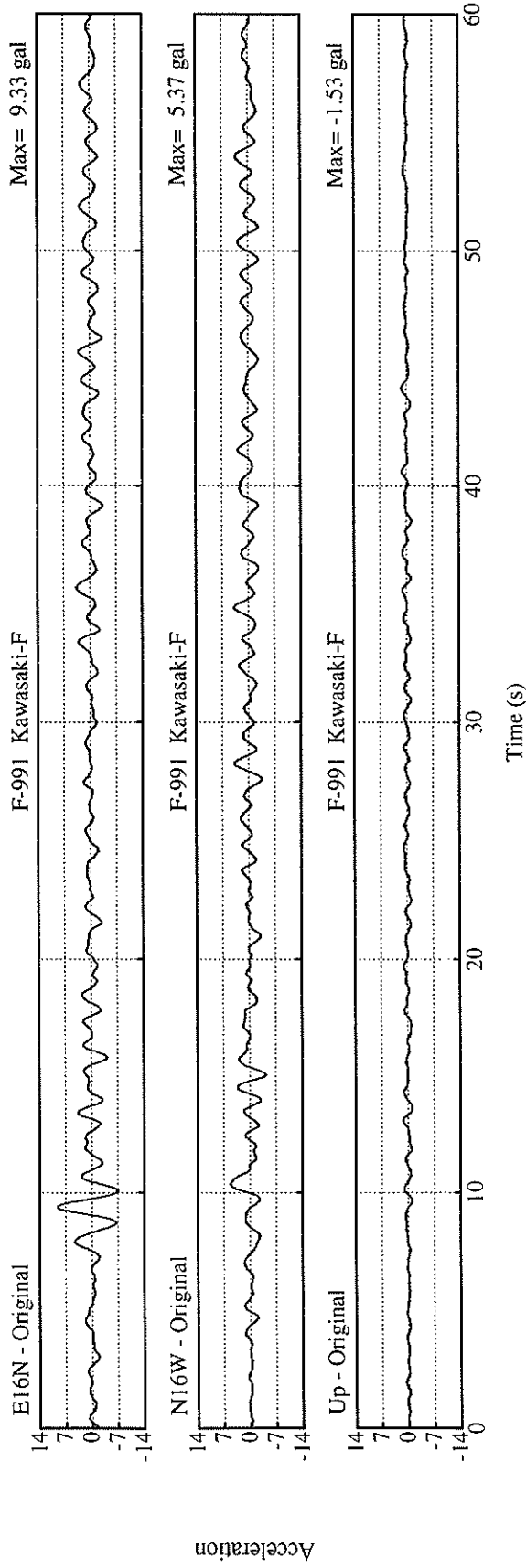
MAXIMUM VELOCITY (CM/SEC)

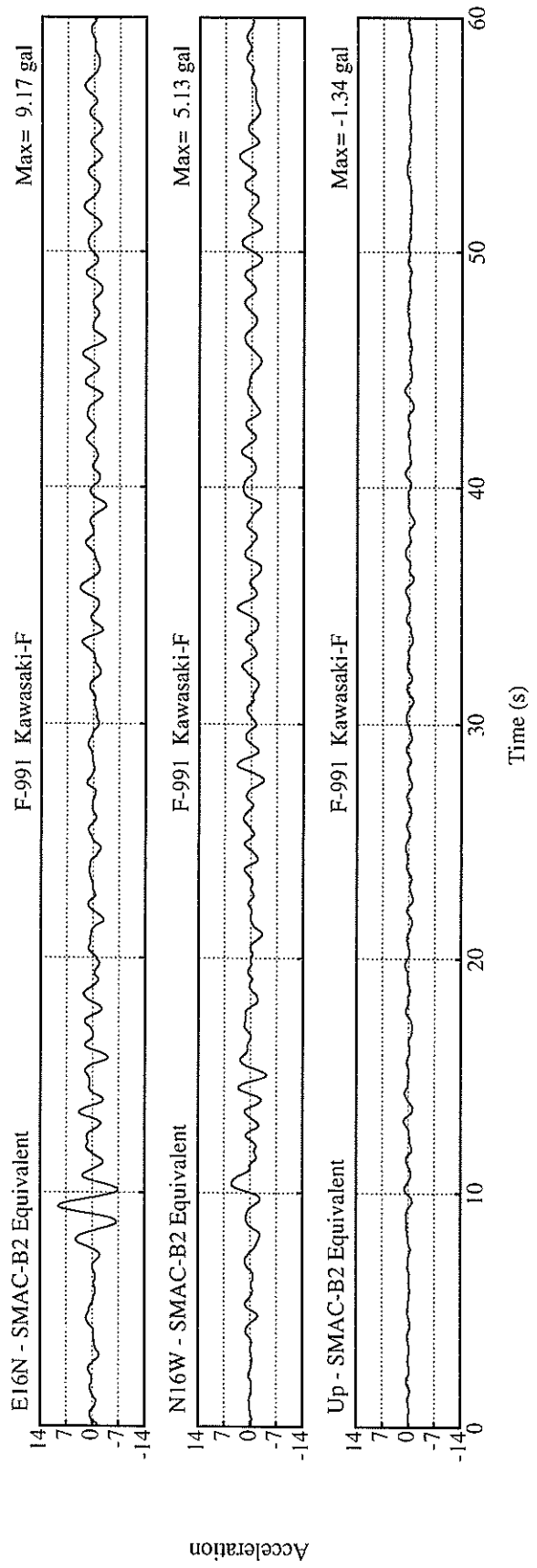
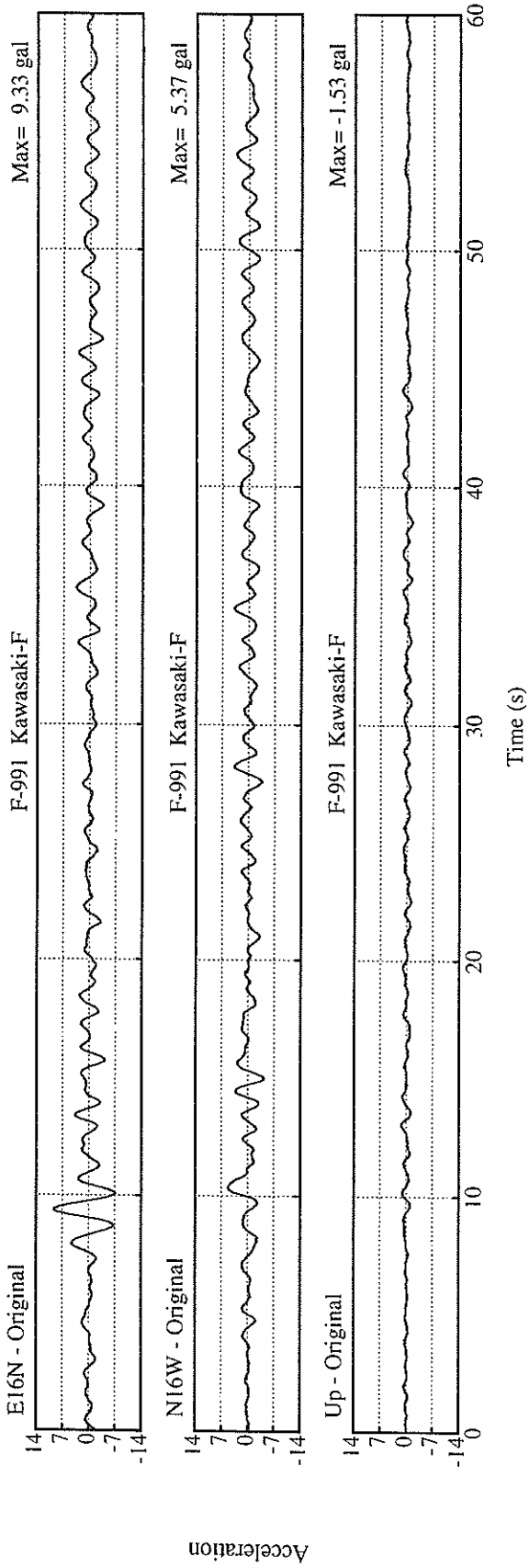
FIXED FILTER	1.80	2.19	0.49	2.19
VARIABLE FILTER	1.57	2.32	0.40	2.62

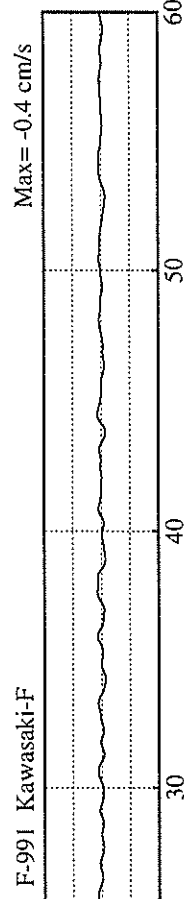
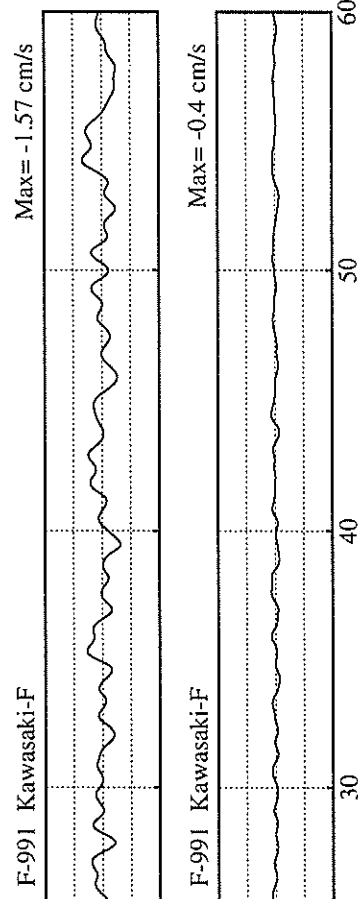
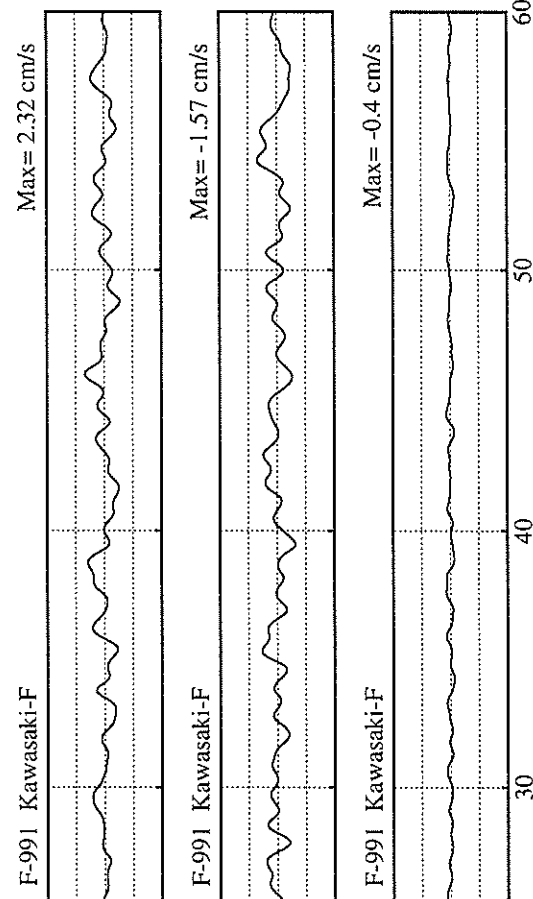
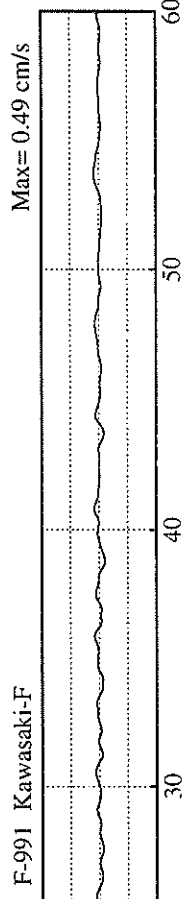
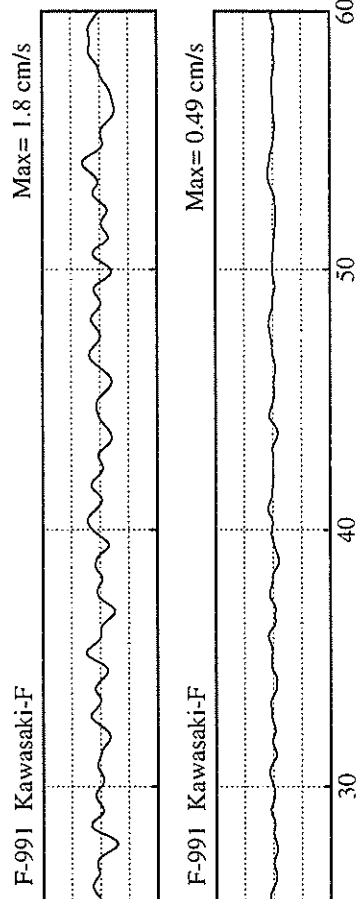
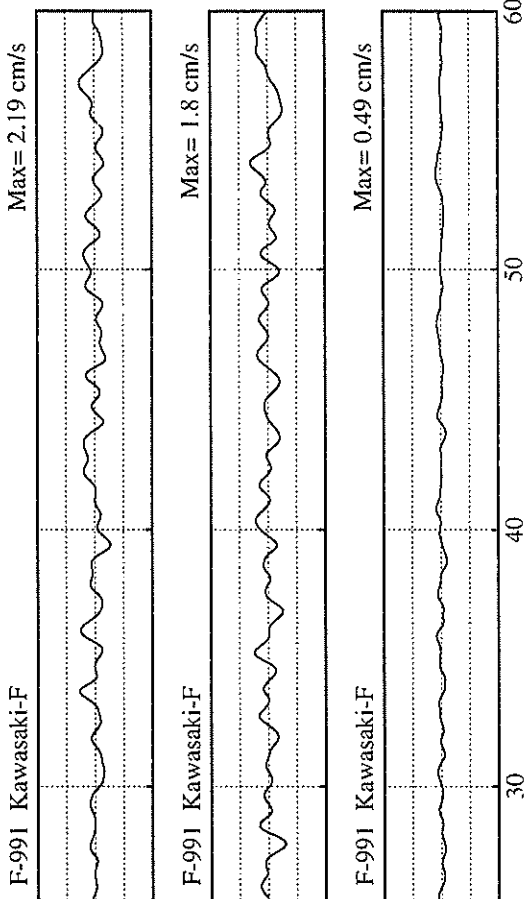
MAXIMUM DISPLACEMENT (CM)

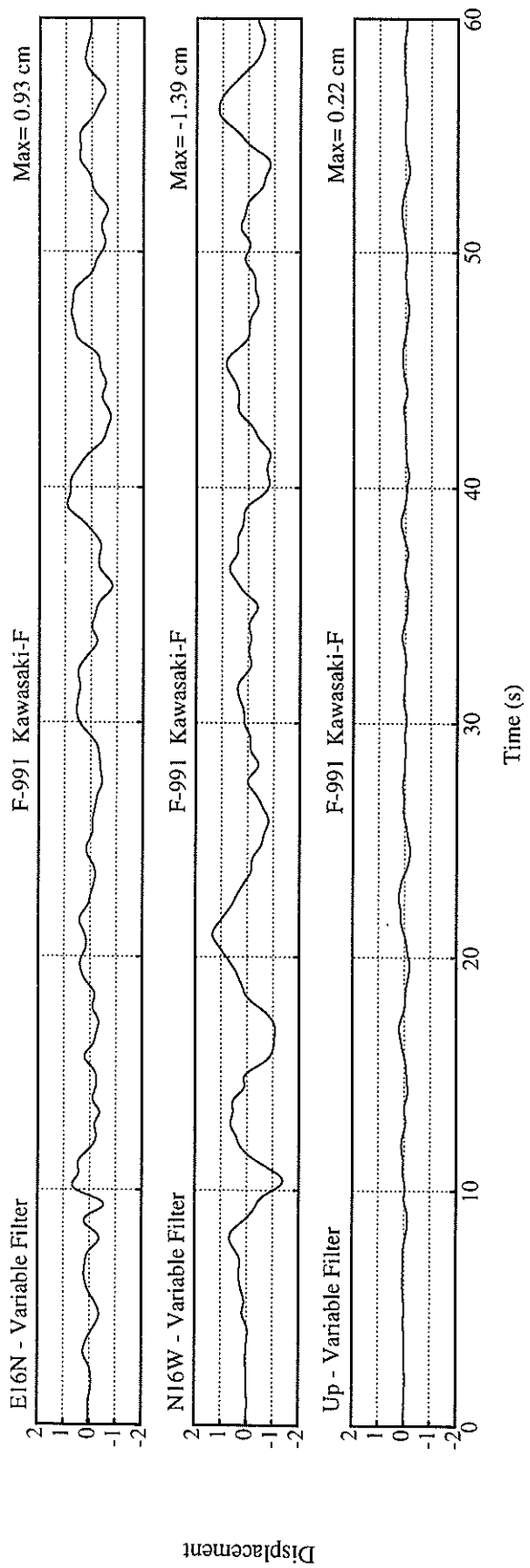
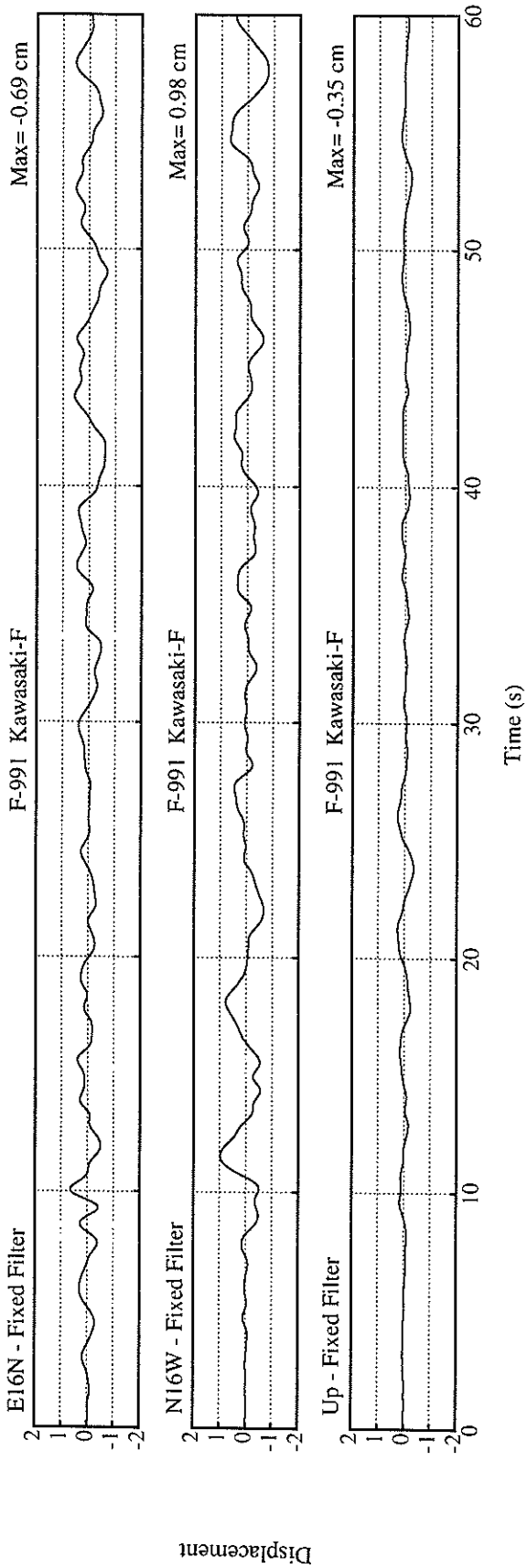
FIXED FILTER	0.98	0.69	0.35	1.05
VARIABLE FILTER	1.39	0.93	0.22	1.51

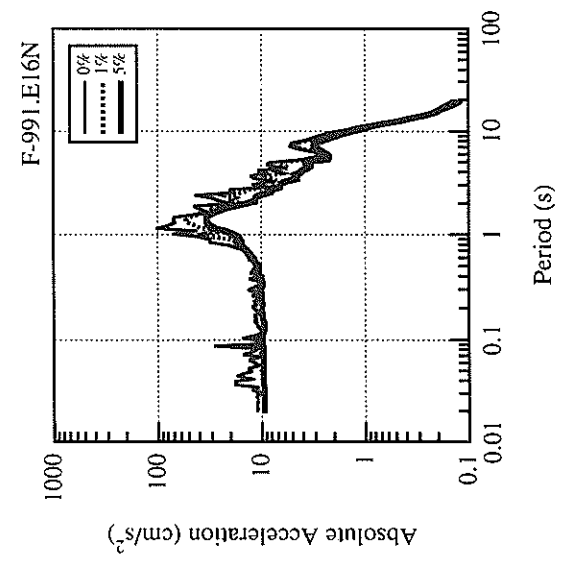
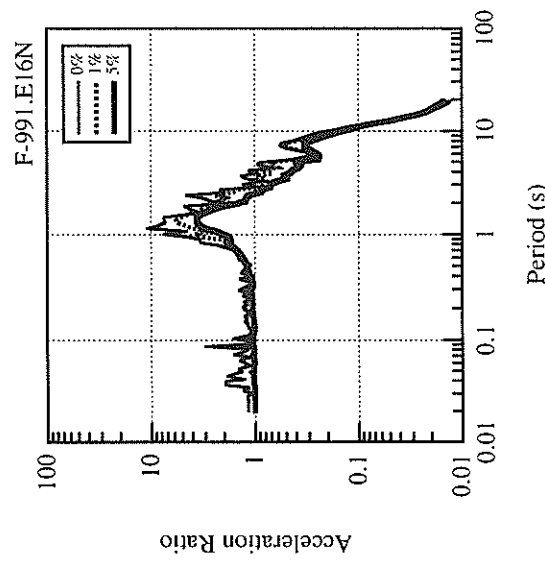
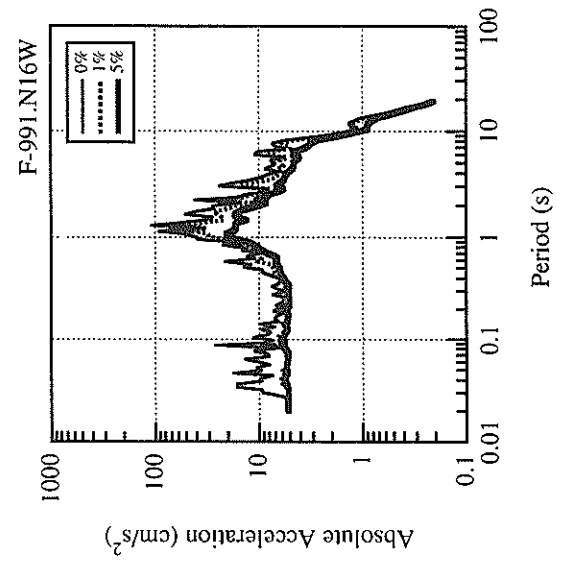
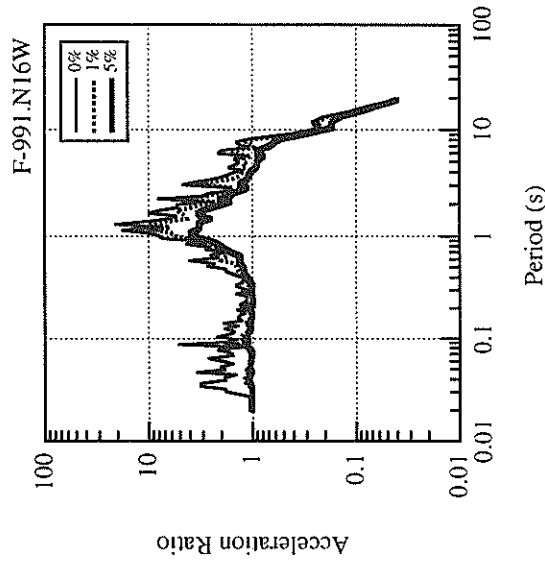
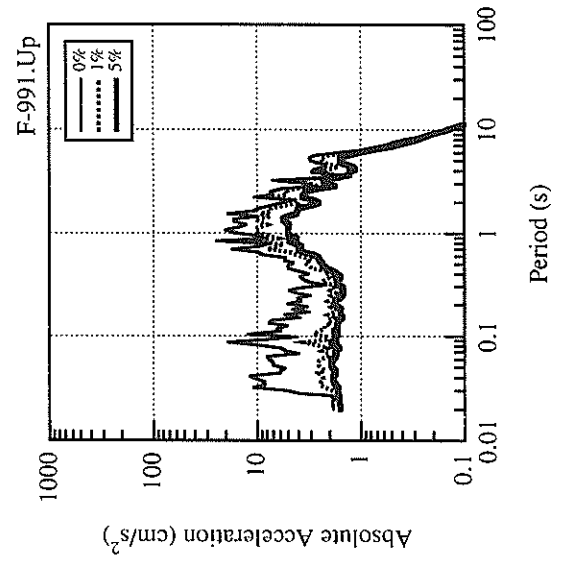
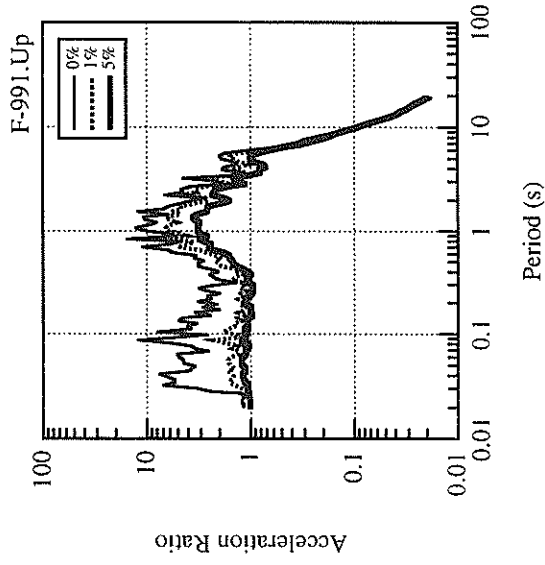
* RESULTANT OF HORIZONTAL COMPONENTS

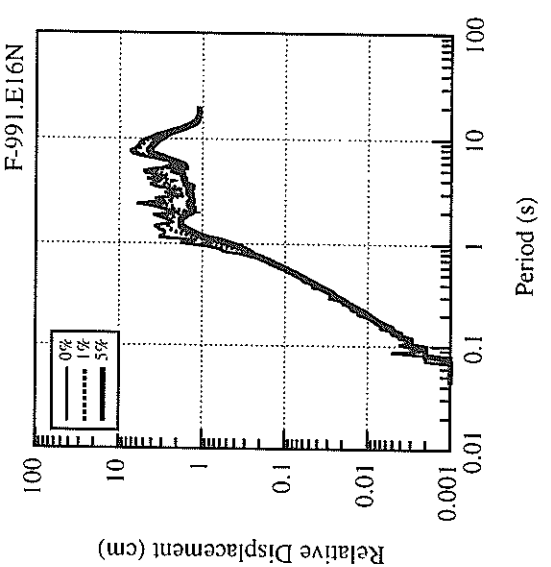
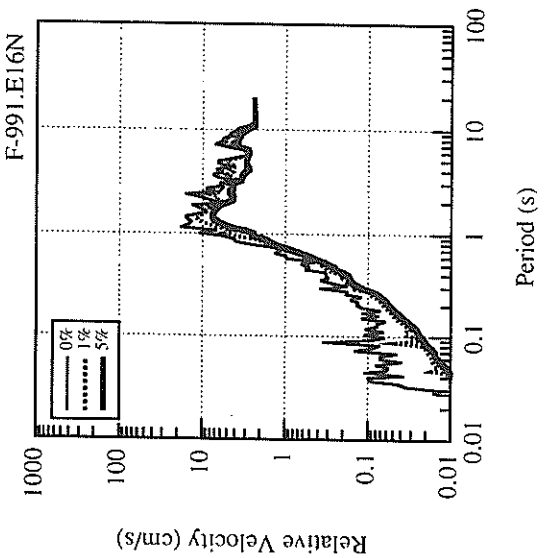
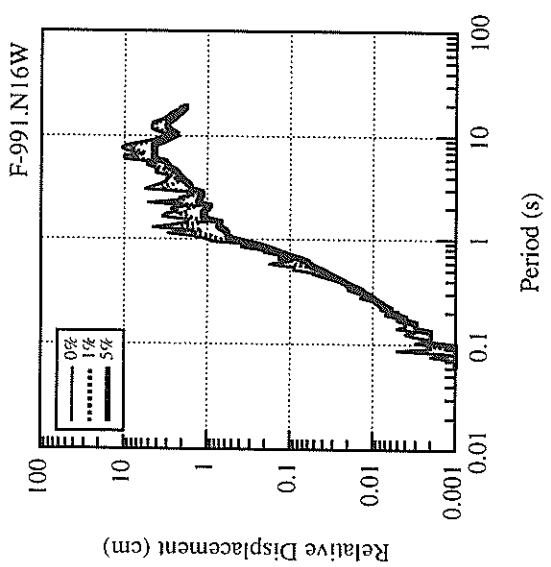
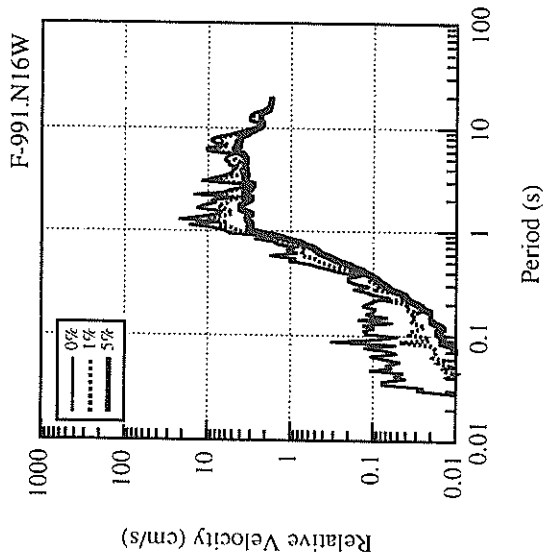
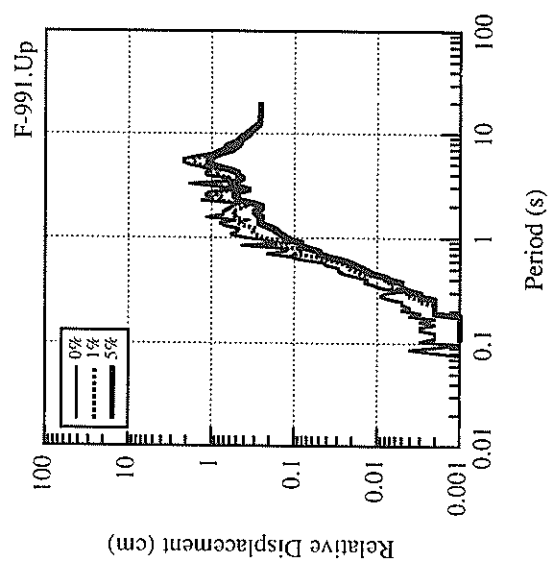
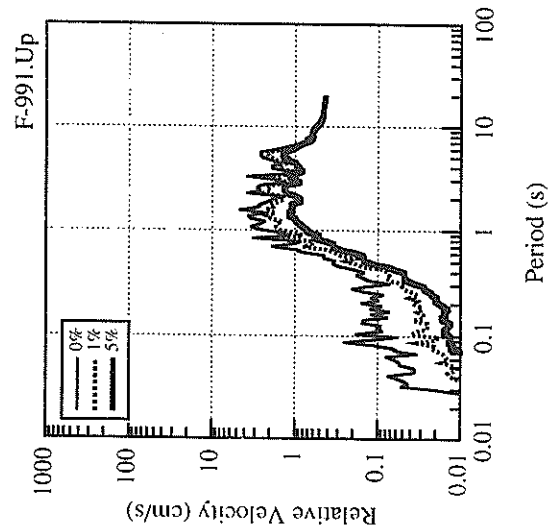


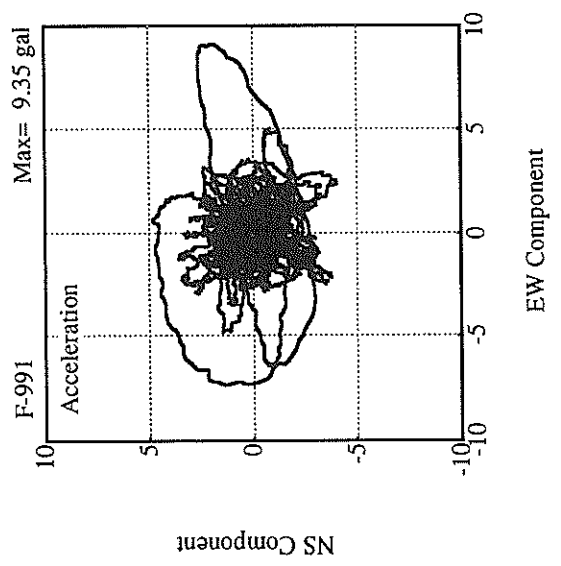
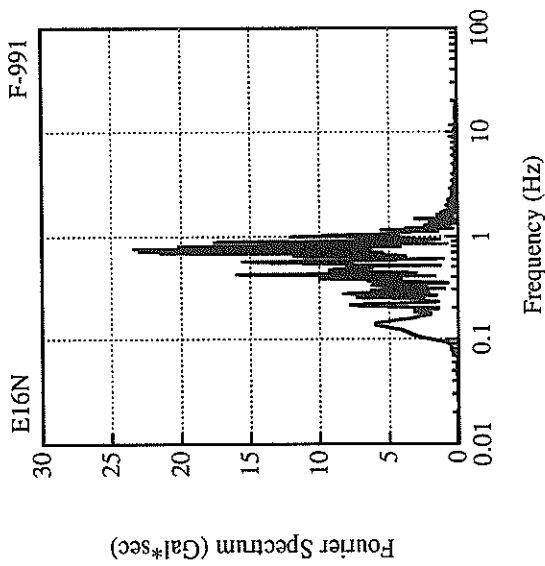
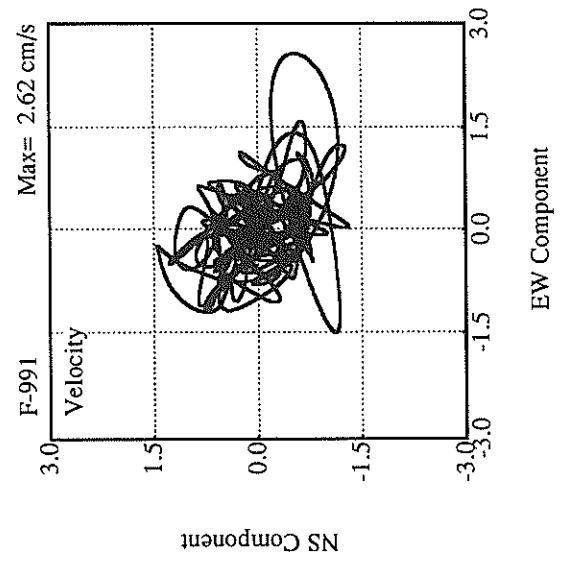
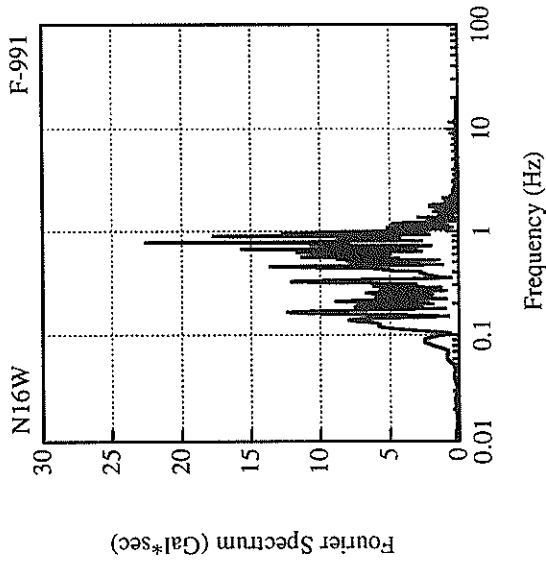
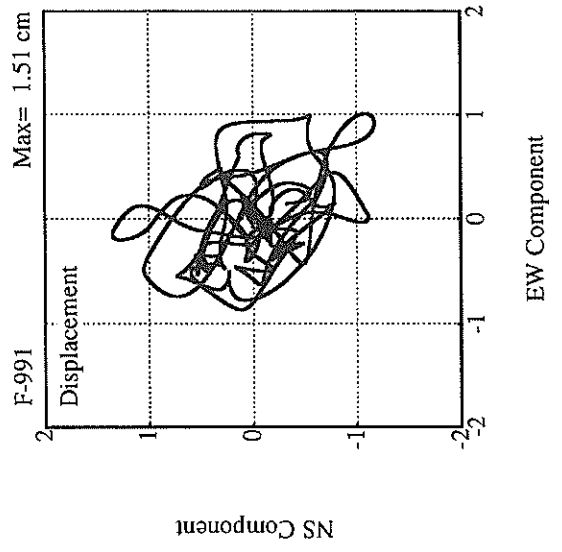
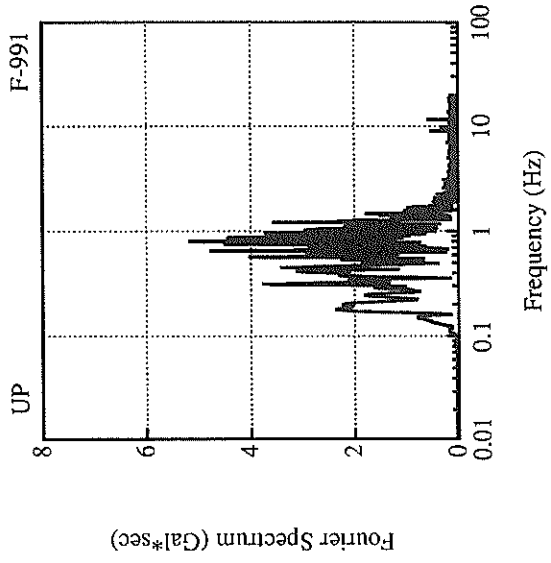












Strong-Motion Earthquake Observation Results
of the after Shocks

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

05:52 JAN. 17, 1995

SE HYOGO PREF

EPICENTER : 34 39.9'N 135 8.9 'E

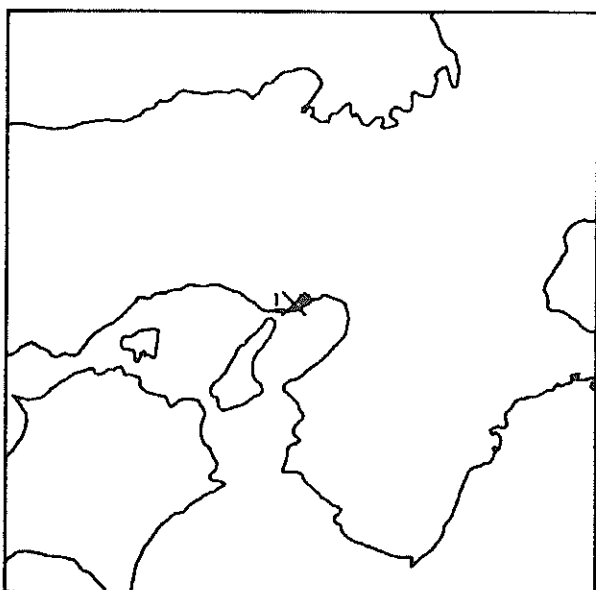
DEPTH : 15.1KM MAGNITUDE : 4.4

JMA INTENSITIES

III : KOBE

II : HIMEJI

I : OSAKA, TOYOOKA, OKAYAMA,
KYOTO, WAKAYAMA



STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
I KOBE-JI-S	ON GROUND	S-2623	19	31	36	5

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

06:40 JAN. 17, 1995

SE HYOGO PREF

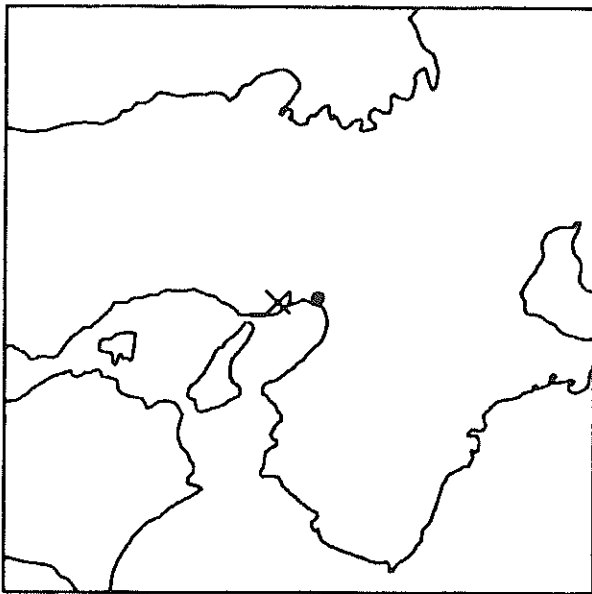
EPICENTER : 34 41.6'N 135 10.8'E

DEPTH : 13.8KM MAGNITUDE : 3.9

JMA INTENSITIES

II : KOBE

I : NARA, KYOTO



STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 803	13	10	13	20

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

06:42 JAN. 17, 1995

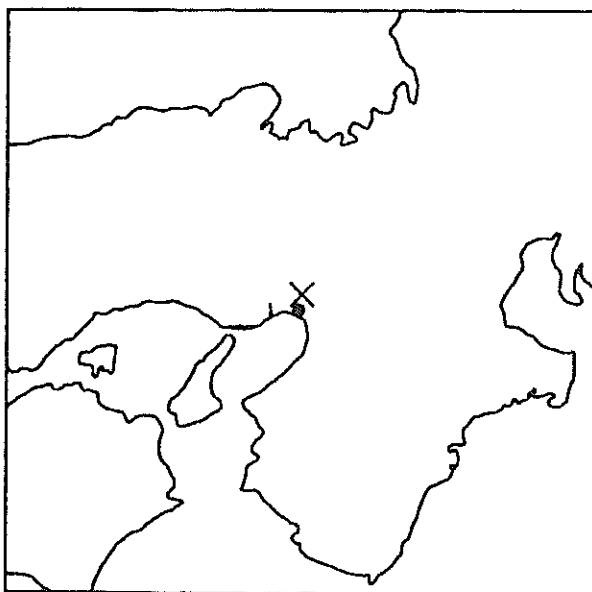
SE HYOGO PREF

EPICENTER : 34 46.9'N 135 25.4'E

DEPTH : 14.8KM MAGNITUDE : 4.3

JMA INTENSITIES

II : KOBE, OSAKA, NARA, HIMEJI,
TOTTORI



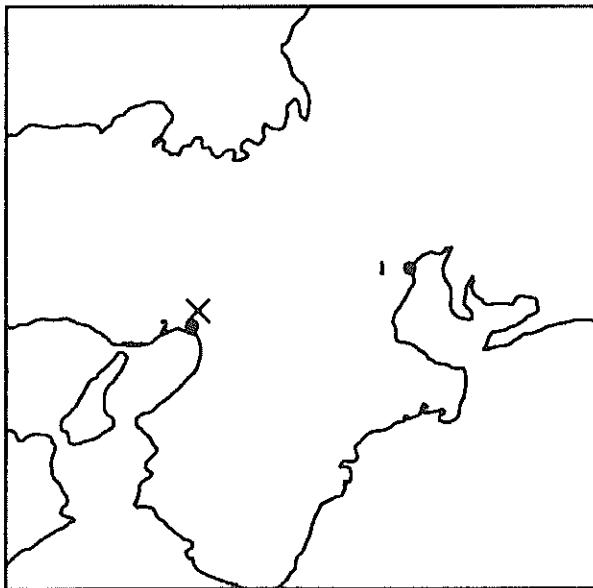
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 804	18	13	23	7

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

07:38 JAN. 17, 1995
 SE HYOGO PREF
 EPICENTER : 34 46.9'N 135 26.3'E
 DEPTH : 11.7KM MAGNITUDE : 5.4

JMA INTENSITIES

IV : NARA
 III : KOBE, OSAKA, KYOTO, HIKONE,
 MAIZURU, TOYOOKA, TSU,
 UENO



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	YOKKA.-CHITOSE-S	ON GROUND	S-2620	5	4	1	111
2	AMAGASAKI-G	ON GROUND	F- 805	41	25	42	8

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

12:34 JAN. 17, 1995

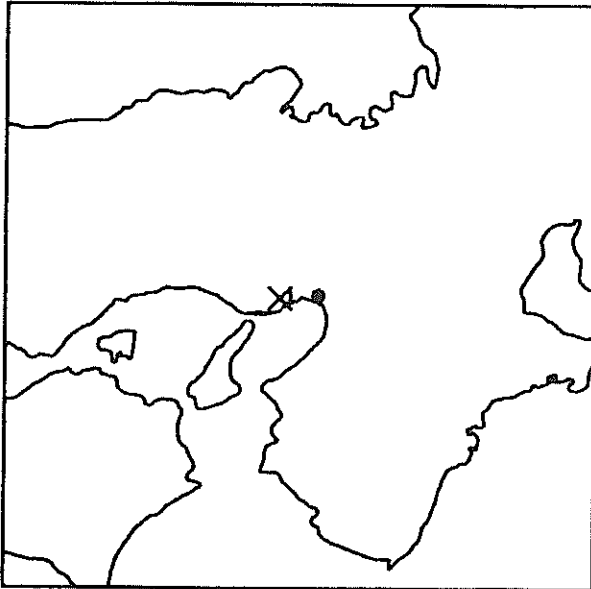
JMA INTENSITIES

SE HYOGO PREF

I : KOBE

EPICENTER : 34 42.1'N 135 11.5' E

DEPTH : 13.6KM MAGNITUDE : 3.3



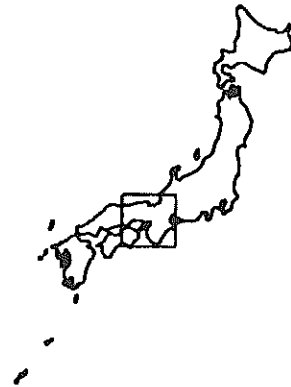
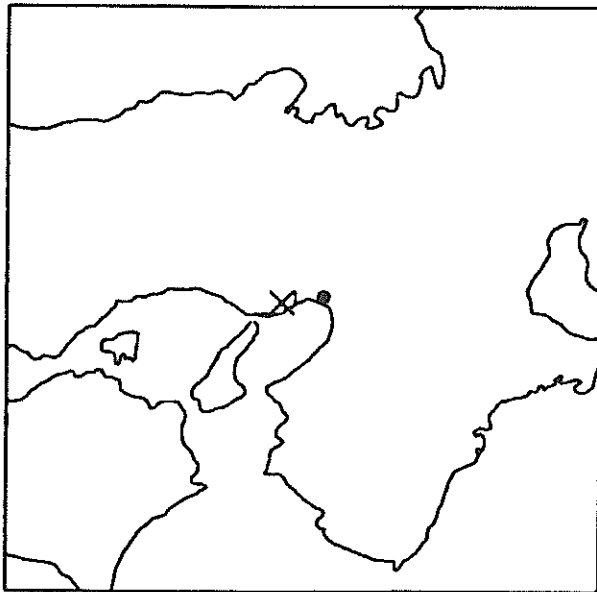
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 808	10	14	14	19

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

13:05 JAN. 17, 1995
 SE HYOGO PREF
 EPICENTER : 34 41.3'N 135 10.4'E
 DEPTH : 14.5KM MAGNITUDE : 4.7

JMA INTENSITIES

Ⅲ : KOBE
 Ⅱ : KYOTO, NARA, TOYOOKA,
 HIKONE, OKAYAMA, SUMOTO



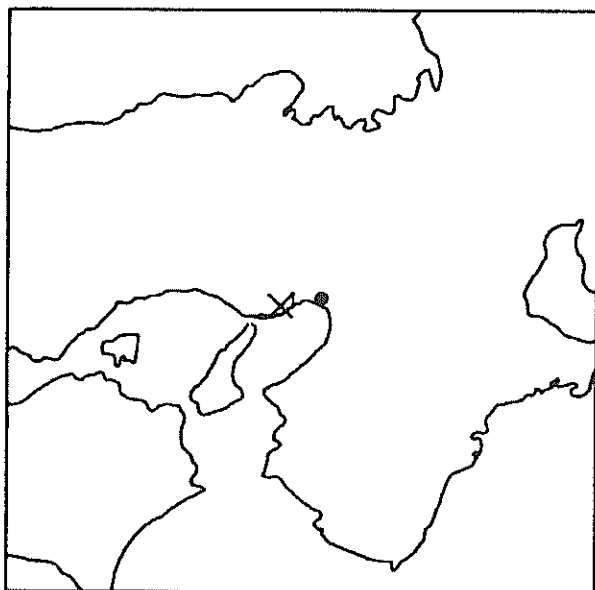
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 809	34	20	38	21

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

00:51 JAN. 18, 1995
 SE HYOGO PREF
 EPICENTER : 34 40.8'N 135 10.7'E
 DEPTH : 15.7KM MAGNITUDE : 4.3

JMA INTENSITIES

III : KOBE
 II : SUMOTO
 I : TADOTSU, TAKAMATSU,
 TAKAMATSU, OKAYAMA,
 TOTTORI, HIKONE, TOYOOKA,
 MAIZURU, HIMEJI, NARA,
 KYOTO, WAKAYAMA, OSAKA,
 UENO



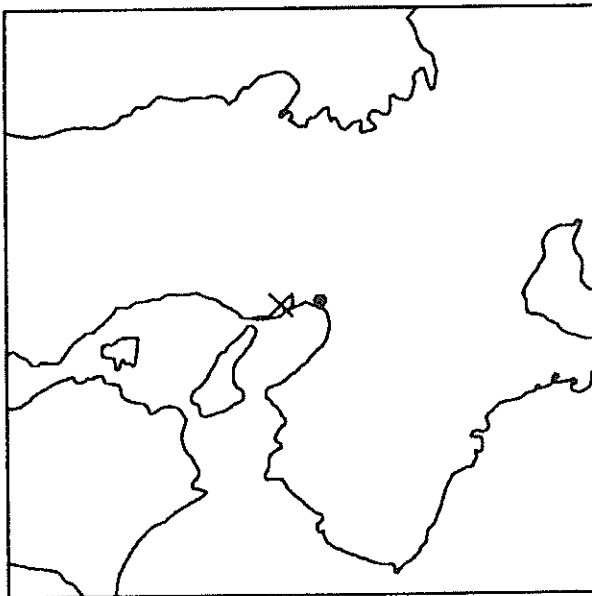
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 810	28	11	22	20

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

05:25 JAN. 18, 1995
 SE HYOGO PREF
 EPICENTER : 34 41.6'N 135 11.1'E
 DEPTH : 15.3KM MAGNITUDE : 4.3

JMA INTENSITIES

III : KOBE
 II : KYOTO
 I : SUMOTO, NARA, OSAKA,
 WAKAYAMA, TOYOOKA, HIKONE,
 TOKUSHIMA, OKAYAMA,
 TOTTORI, UENO, TSURUGA



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	AMAGASAKI-G	ON GROUND	F- 811	14	6	11	20

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

06:50 JAN. 18, 1995

SE HYOGO PREF

EPICENTER : 34 41.0'N 135 10.2'E

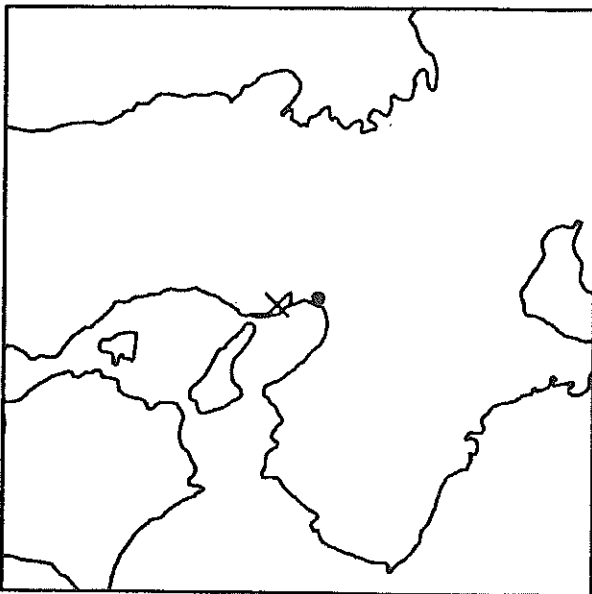
DEPTH : 12.9KM MAGNITUDE : 4.3

JMA INTENSITIES

III : KOBE

II : OKAYAMA, TOYOOKA

I : SUMOTO, NARA, OSAKA,
WAKAYAMA, HIMEJI, KYOTO,
MAIZURU, TOTTORI,
TAKAMATSU, TADOTSU



STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
I AMAGASAKI-G	ON GROUND	F- 812	11	17	12	21

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

01:00 JAN. 19, 1995

SE HYOGO PREF

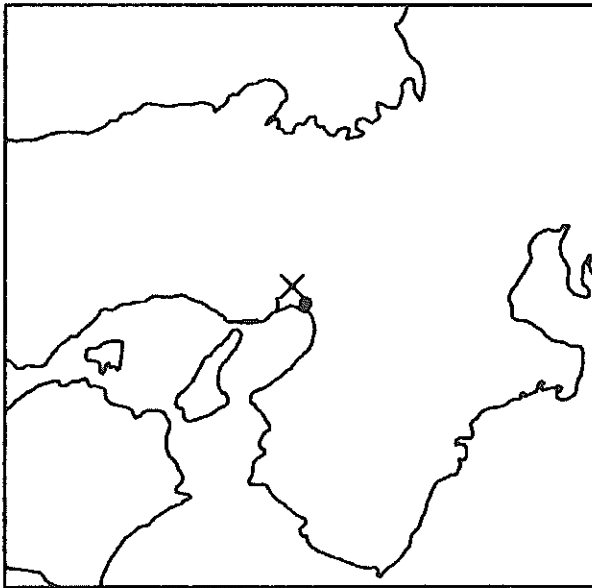
EPICENTER : 34 47.6'N 135 19.8'E

DEPTH : 13.1KM MAGNITUDE : 4.0

JMA INTENSITIES

II : KOBE

I : OSAKA, KYOTO, NARA, HIKONE,
TOYOOKA



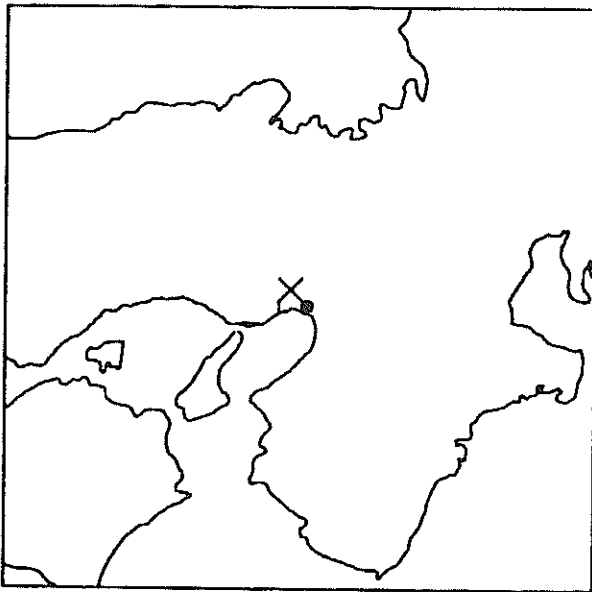
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 813	18	26	35	11

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

21:44 JAN. 23, 1995
 SE HYOGO PREF
 EPICENTER : 34 47.6'N 135 18.9'E
 DEPTH : 15.6KM MAGNITUDE : 4.2

JMA INTENSITIES

III : KOBE
 I : OSAKA, TAKAWATSU, TOTTORI,
 TOYOOKA, NARA, KYOTO,
 OKAYAMA, SUMOTO



STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 817	16	35	14	12

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

23:15 JAN. 25, 1995

SE HYOGO PREF

EPICENTER : 34 47.4'N 135 18.4'E

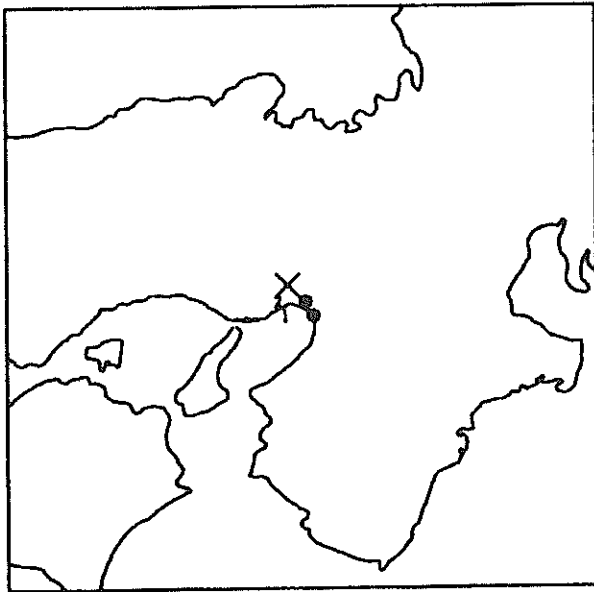
DEPTH : 14.8KM MAGNITUDE : 5.1

JMA INTENSITIES

IV : KOBE

III : OSAKA, KYOTO

II : SUMOTO, NARA, HIKONE,
MAIZURU, TOTTORI, TOYOOKA,
UENO, TSURUGA, TSU



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	OSAKA-JI-G	ON GROUND	F- 856	16	52	18	20
2	AMAGASAKI-G	ON GROUND	F- 818	27	73	29	12

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

16:19 FEB. 2, 1995

SE HYOGO PREF

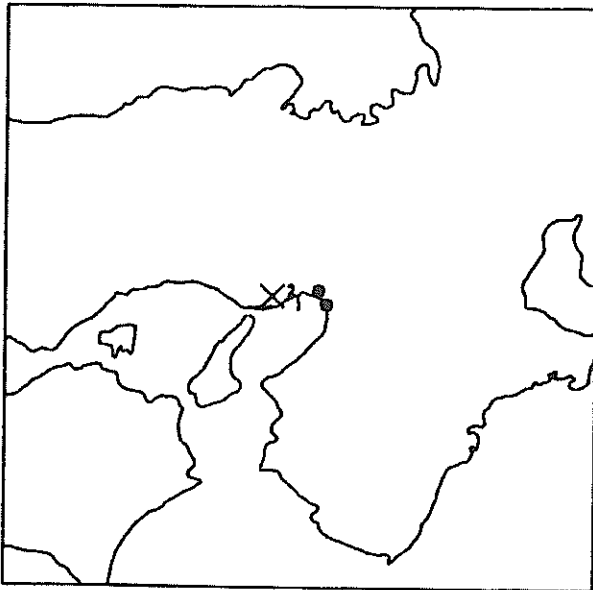
EPICENTER : 34 41.4'N 135 8.6 'E

DEPTH : 18.1KM MAGNITUDE : 4.1

JMA INTENSITIES

III : KOBE

I : OSAKA, HIKONE, TOYOOKA,
MAIZURU, KYOTO, WAKAYAMA,
NARA



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	OSAKA-JI-G	ON GROUND	F- 854	22	21	23	27
1	OSAKA-MINAMI-G	ON GROUND	F- 851	22	36	14	27
2	AMAGASAKI-G	ON GROUND	F- 819	20	16	24	23

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

13:00 FEB. 6 ,1995

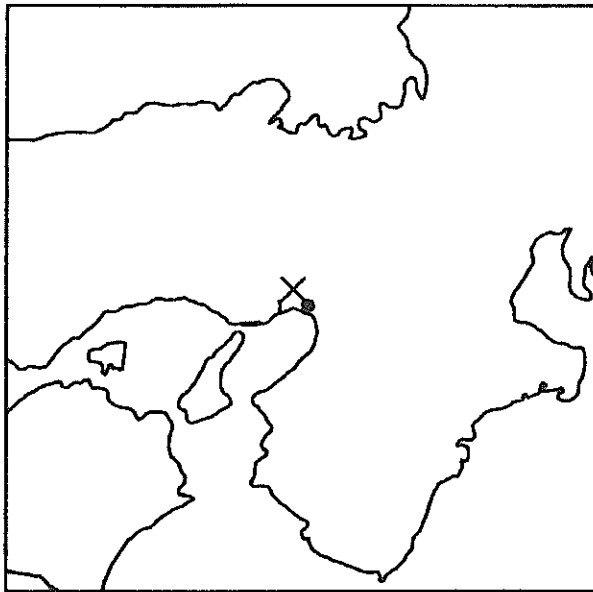
SE HYOGO PREF

EPICENTER : 34 47.5'N 135 19.5'E

DEPTH : 13.2KM MAGNITUDE : 3.6

JMA INTENSITIES

I : KOBE



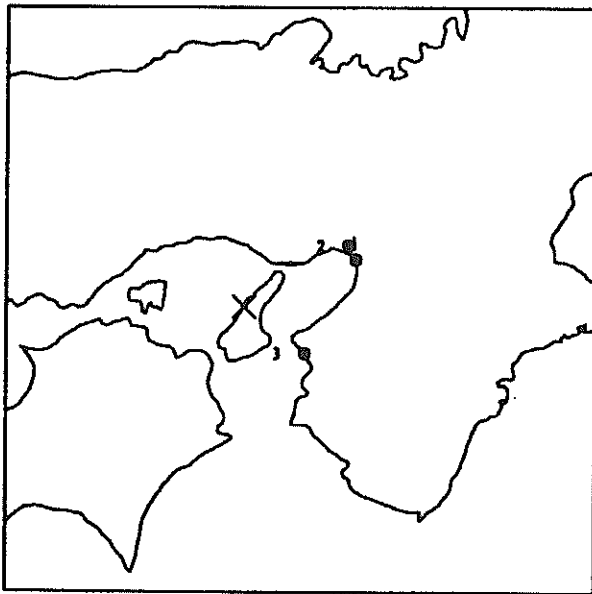
	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	AMAGASAKI-G	ON GROUND	F- 820	5	11	6	11

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

21:37 FEB. 18, 1995
 AWAJISHIMA ISLAND REGION
 EPICENTER : 34 26.2'N 134 49.0'E
 DEPTH : 15.9KM MAGNITUDE : 4.8

JMA INTENSITIES

IV : SUMOTO
 III : WAKAYAMA, KOBE
 II : SAKAI, TOTTORI, NARA,
 TOYOOKA, KYOTO, TADOTSU,
 TSUYAMA, TAKAMATSU,
 OKAYAMA, TOKUSHIMA,
 HIMEJI



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	OSAKA-MINAMI-G	ON GROUND	F- 852	13	8	9	62
2	AMAGASAKI-G	ON GROUND	F- 821	8	4	5	61
3	WAKAYAMA-G	ON GROUND	F- 937	45	23	10	39

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

14:24 MAR. 30, 1995

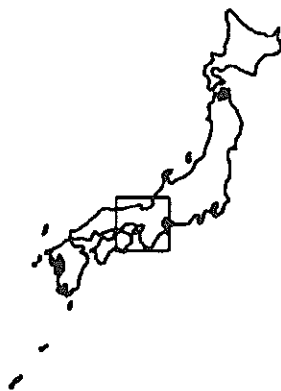
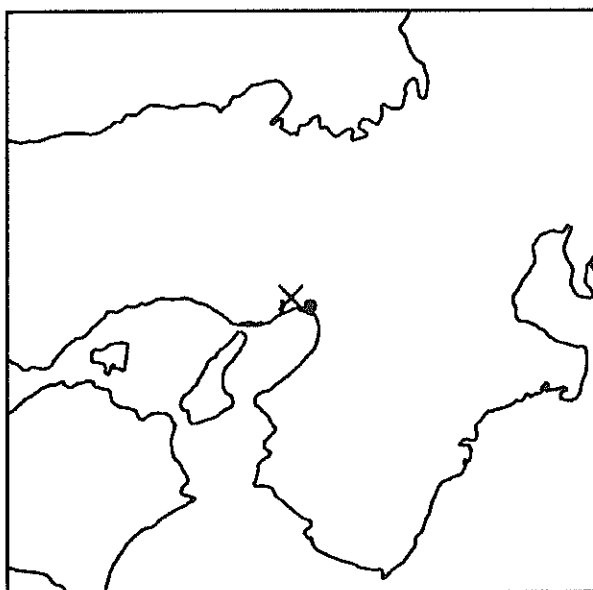
SE HYOGO PREF

EPICENTER : 34 45.2'N 135 17.8'E

DEPTH : 12.6KM MAGNITUDE : 3.6

JMA INTENSITIES

I : KOBE



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	AMAGASAKI-G	ON GROUND	F- 849	10	17	8	10

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

10:50 APR. 6, 1995

SE HYOGO PREF

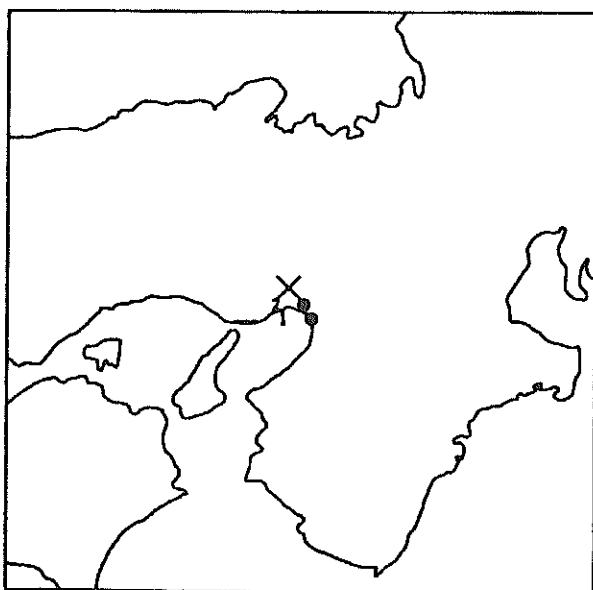
EPICENTER : 34 47.5'N 135 19.3'E

DEPTH : 11.8KM MAGNITUDE : 4.0

JMA INTENSITIES

II : KOBE

I : KYOTO, NARA, OSAKA



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	OSAKA-JI-G	ON GROUND	F- 855	5	11	5	19
1	OSAKA-MINAMI-G	ON GROUND	F- 853	8	17	6	19
2	AMAGASAKI-G	ON GROUND	F- 850	11	28	17	11

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

07:55 JUNE 16,1995

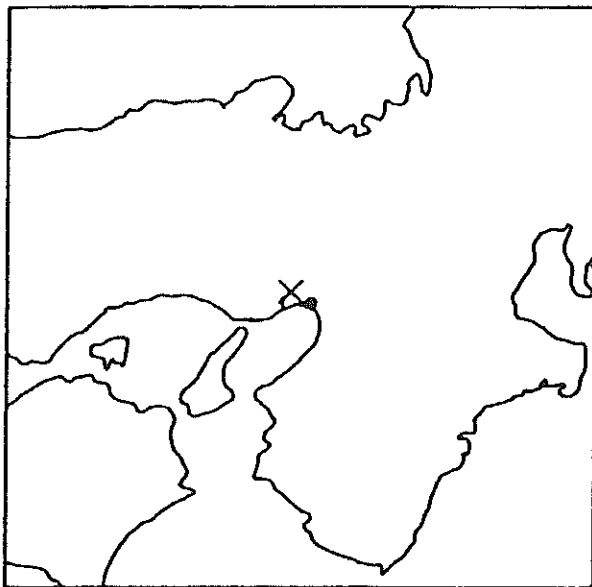
JMA INTENSITIES

SE HYOGO PREF

I : KOBE

EPICENTER : 34 45.8'N 135 17.6'E

DEPTH : 12.5KM MAGNITUDE : 3.8



STATION	CONDITION	RECORD NUMBER	MAX.ACC.(GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 932	30	13	18	11

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

22:19 JUNE 23, 1995

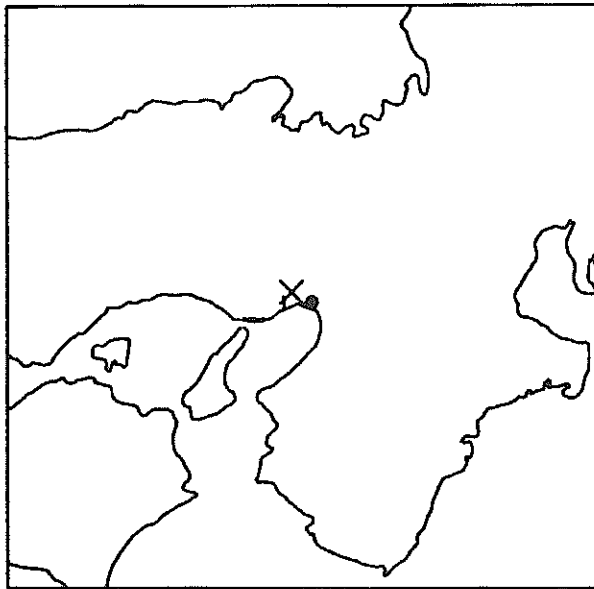
SE HYOGO PREF

EPICENTER : 34 45.5'N 135 17.4'E

DEPTH : 13.2KM MAGNITUDE : 3.7

JMA INTENSITIES

I : KOBE



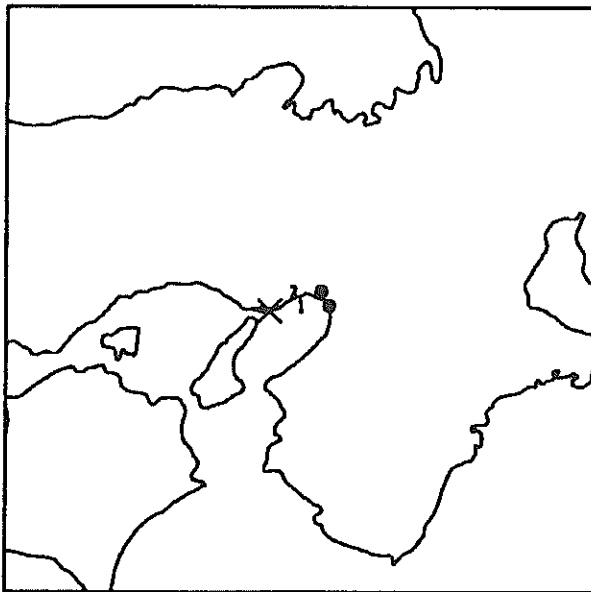
STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
			(NS)	(EW)	(UD)	
1 AMAGASAKI-G	ON GROUND	F- 933	12	8	12	11

STRONG-MOTION EARTHQUAKE OBSERVATION RESULTS

02:04 OCT. 14, 1995
 OSAKA BAY REGION
 EPICENTER : 34 37.6'N 135 6.9 'E
 DEPTH : 15.3KM MAGNITUDE : 4.5

JMA INTENSITIES

IV : KOBE
 II : TSU, HIKONE, OSAKA,
 TOYOOKA, SUMOTO, NARA,
 WAKAYAMA, HIMEJI, TOTTORI,
 OKAYAMA, TOKUSHIMA



	STATION	CONDITION	RECORD NUMBER	MAX. ACC. (GAL)			DIST. (KM)
				(NS)	(EW)	(UD)	
1	OSAKA-JI-G	ON GROUND	F-1041	28	12	19	30
1	OSAKA-MINAMI-G	ON GROUND	F-1040	37	23	20	30
2	AMAGASAKI-G	ON GROUND	F- 934	11	14	11	28

Results of Preliminary Analyses
of the after Shocks

RECORD NUMBER : S-2623
 STATION : KOBE-JI-S

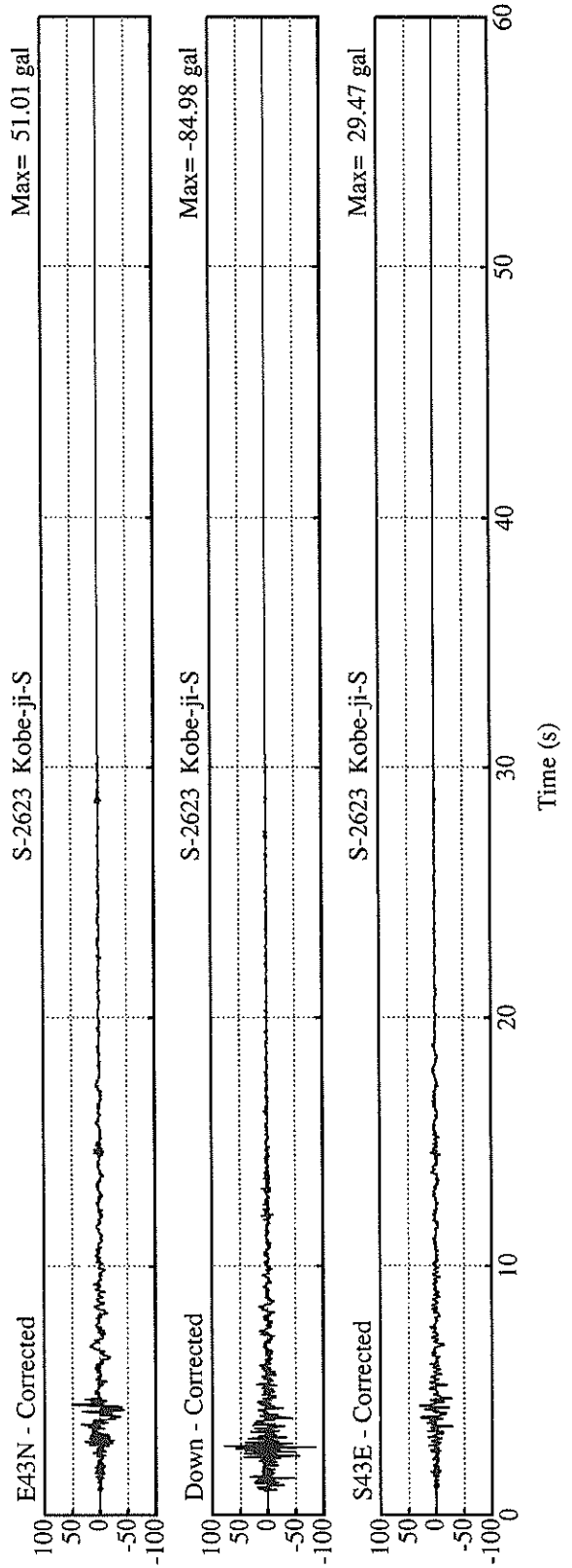
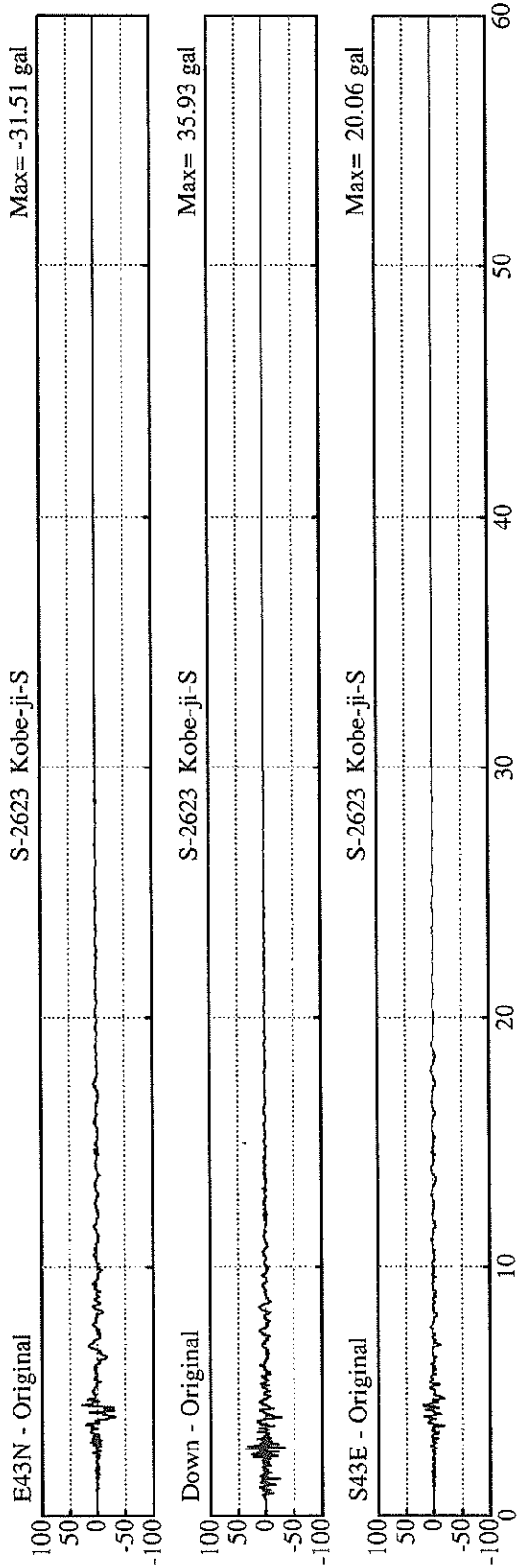
EARTHQUAKE DATA

```
*****
DATE AND TIME                5:52 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          SE HYOGO PREF
  LATITUDE                   34°39.9' N
  LONGITUDE                  135° 8.9' E
  DEPTH                      15.1KM
  JMA MAGNITUDE              4.4
*****
```

PEAK VALUES OF COMPONENTS

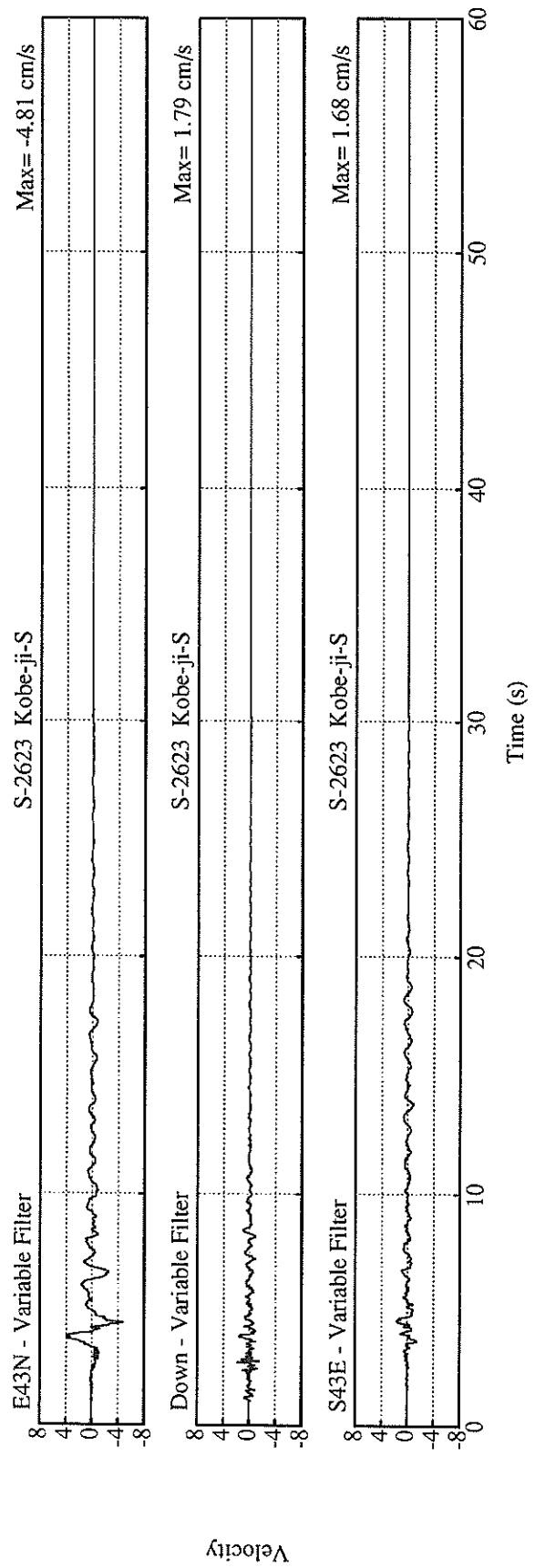
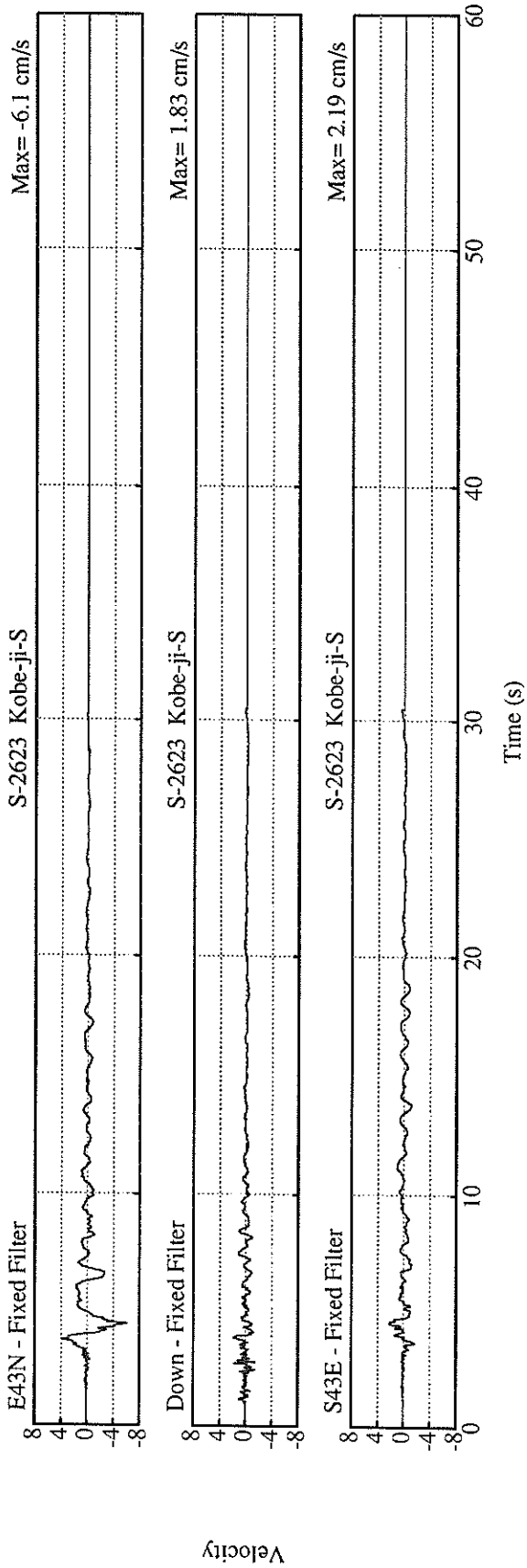
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.523	0.340	0.804	
MAXIMUM ACCELERATION (GAL)				
ORIGINAL	20.1	31.5	35.9	35.0
CORRECTED	29.5	51.0	85.0	53.8
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	2.19	6.10	1.83	6.18
VARIABLE FILTER	1.68	4.81	1.79	4.81
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.57	1.45	0.42	1.47
VARIABLE FILTER	0.24	0.89	0.13	0.90

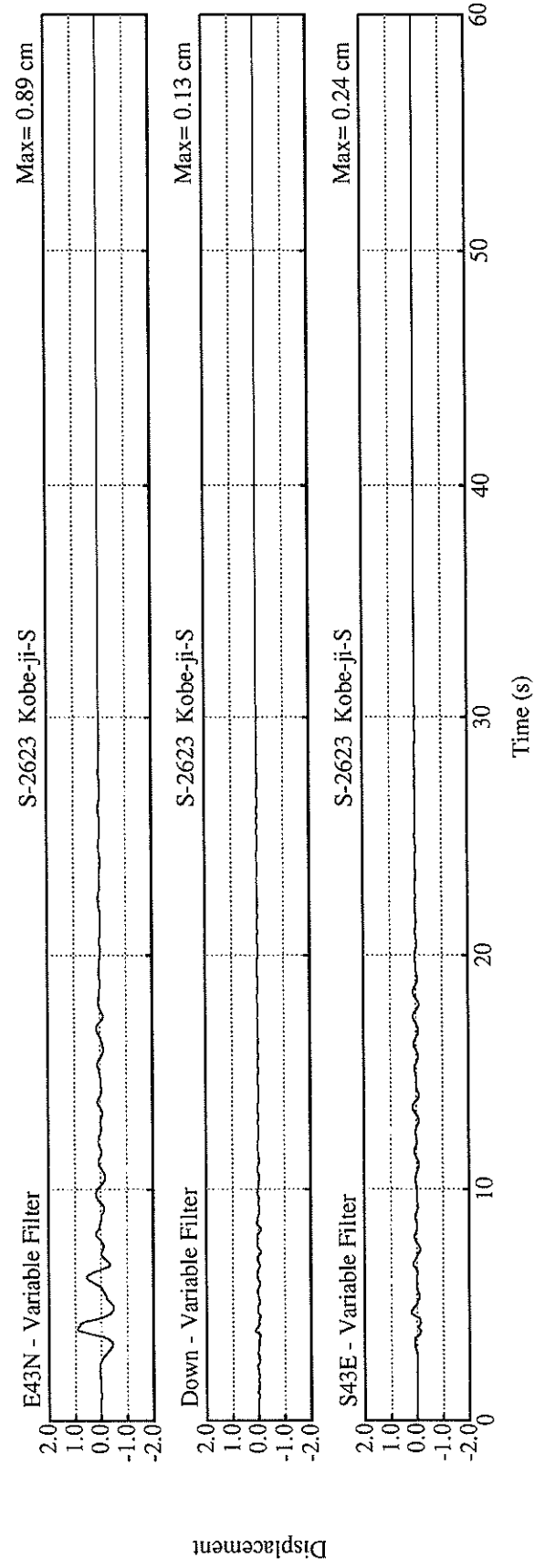
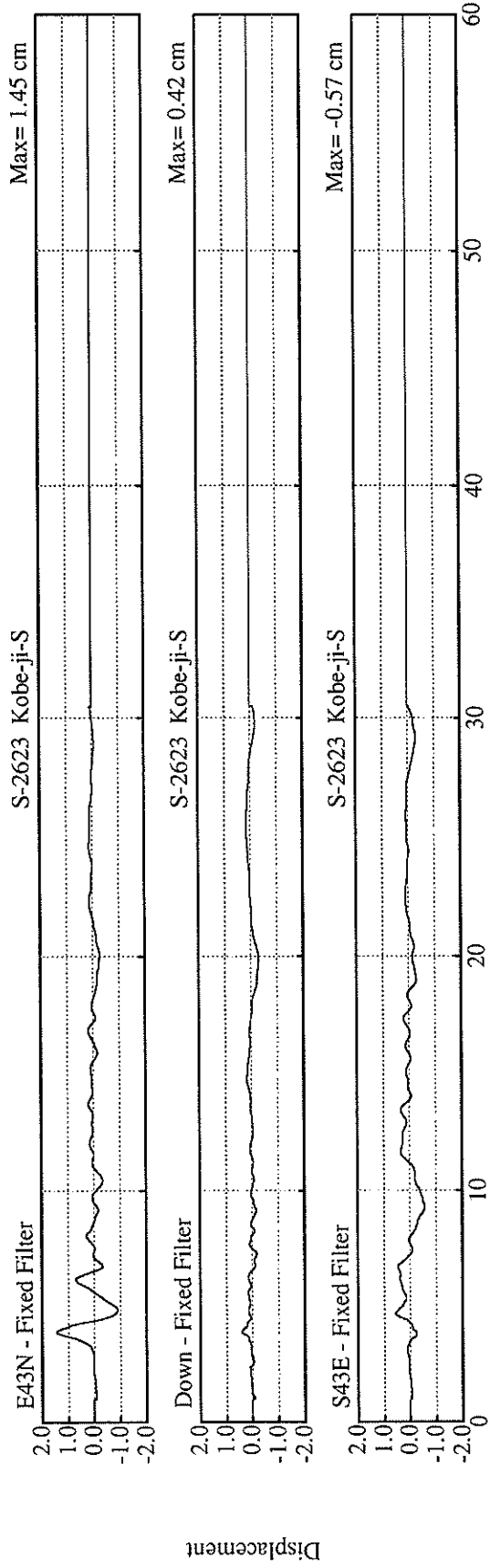
* RESULTANT OF HORIZONTAL COMPONENTS



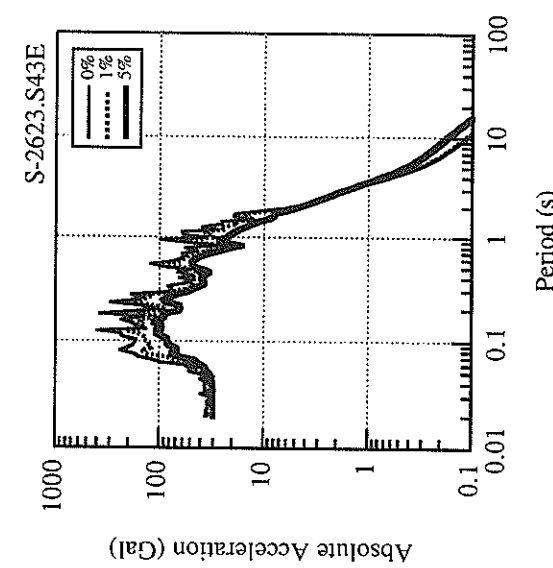
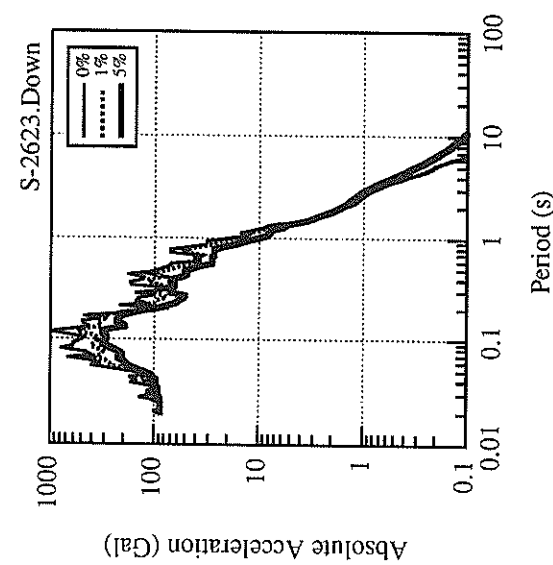
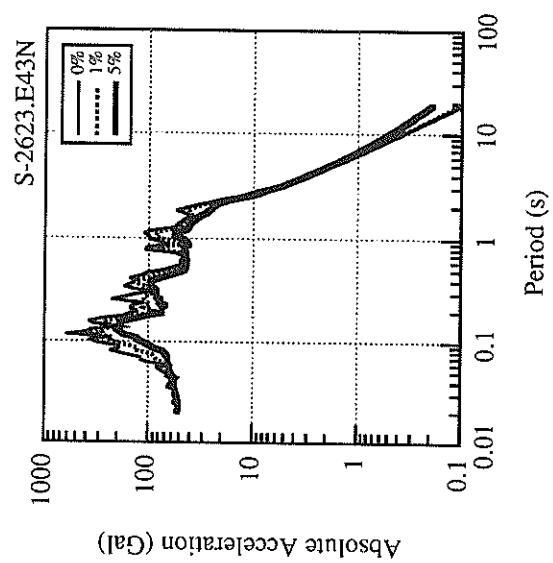
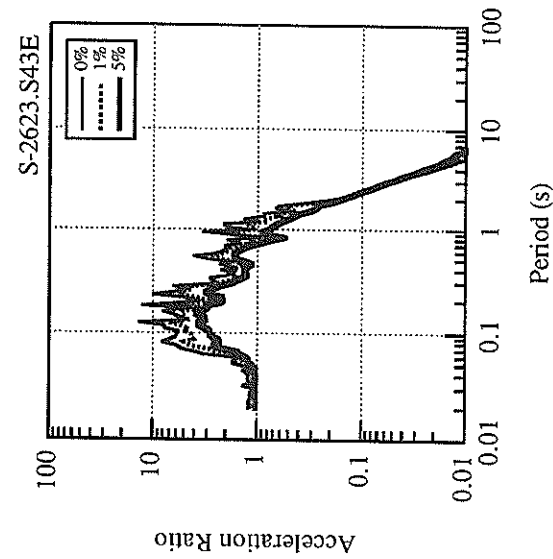
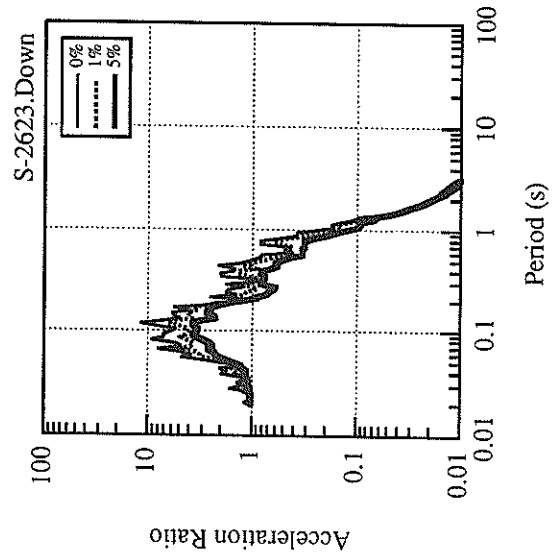
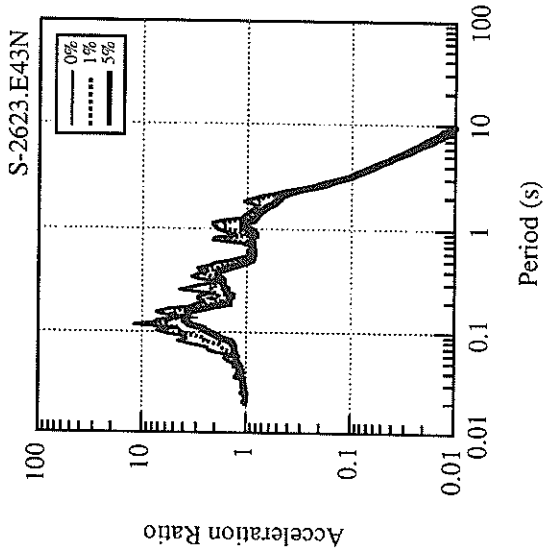
Acceleration

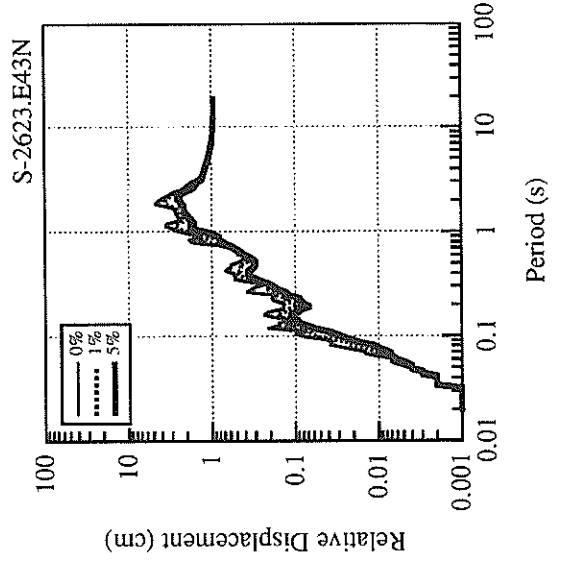
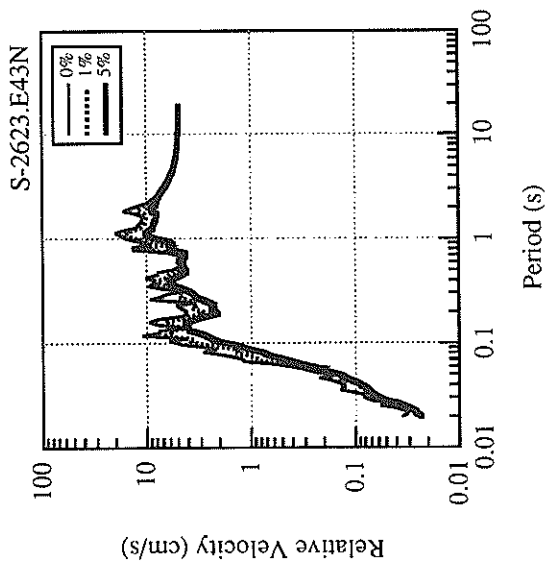
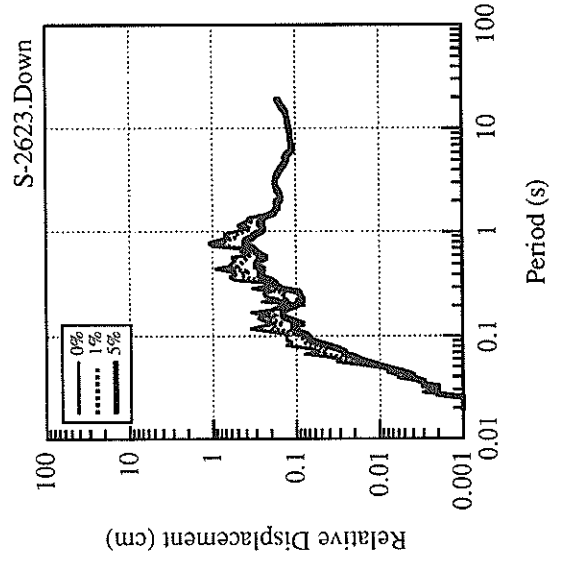
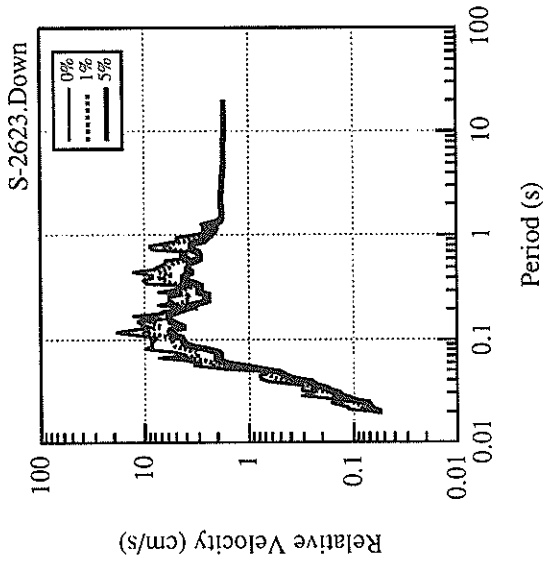
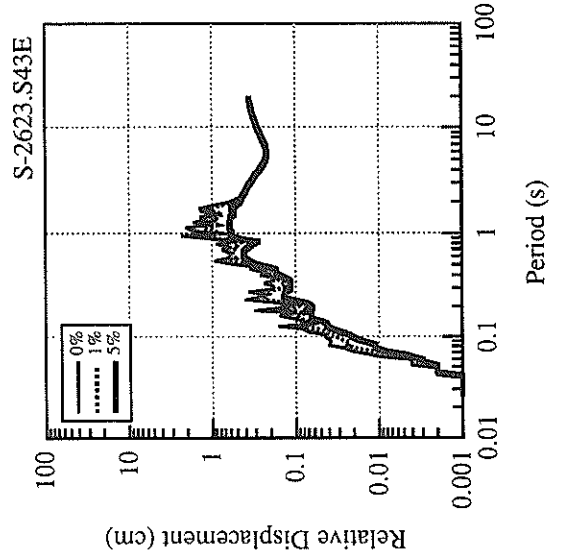
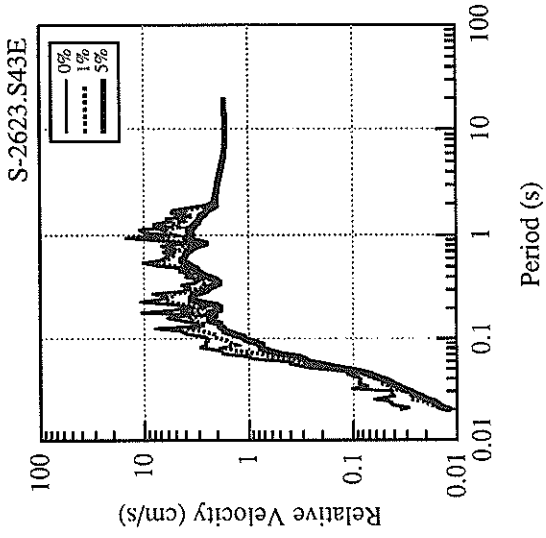
Acceleration

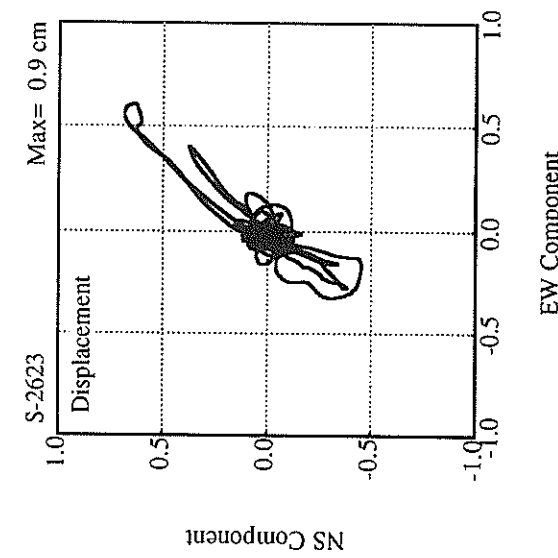
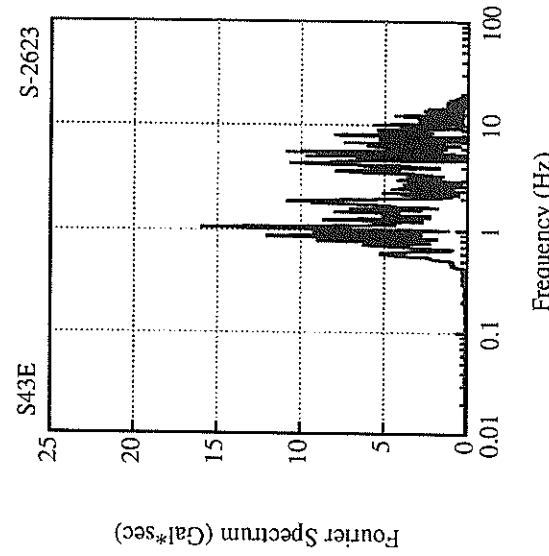
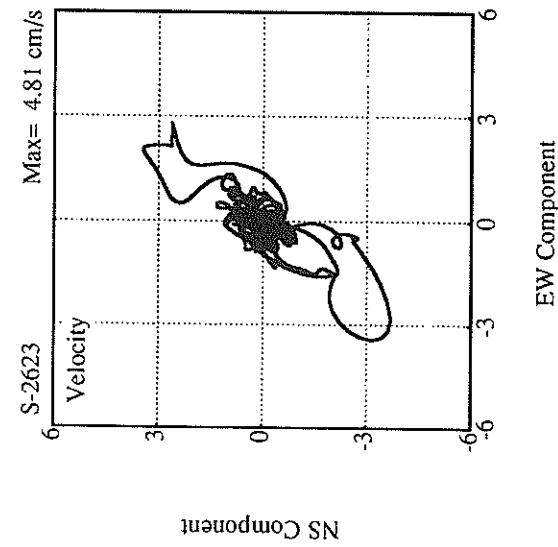
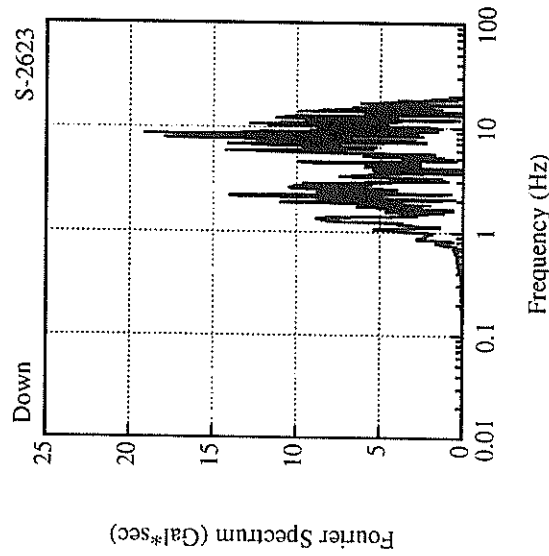
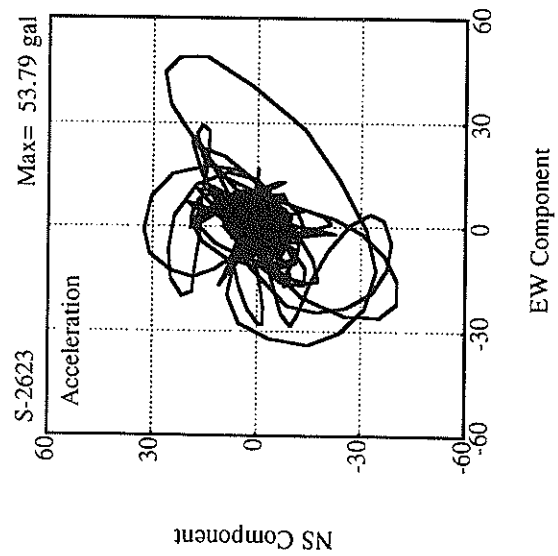
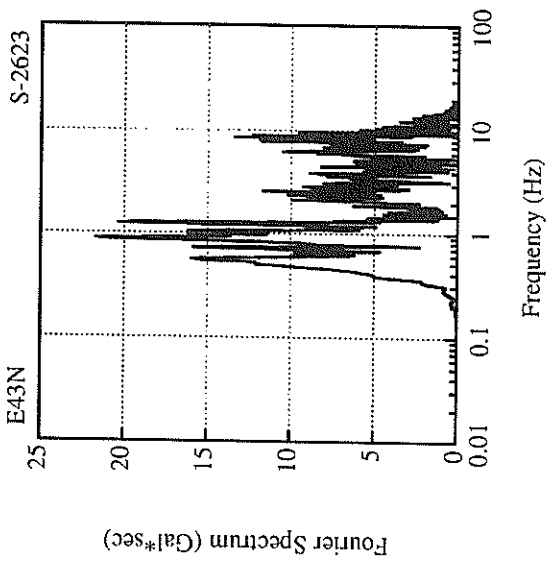




Displacement







RECORD NUMBER : F-803
 STATION : AMAGASAKI-G

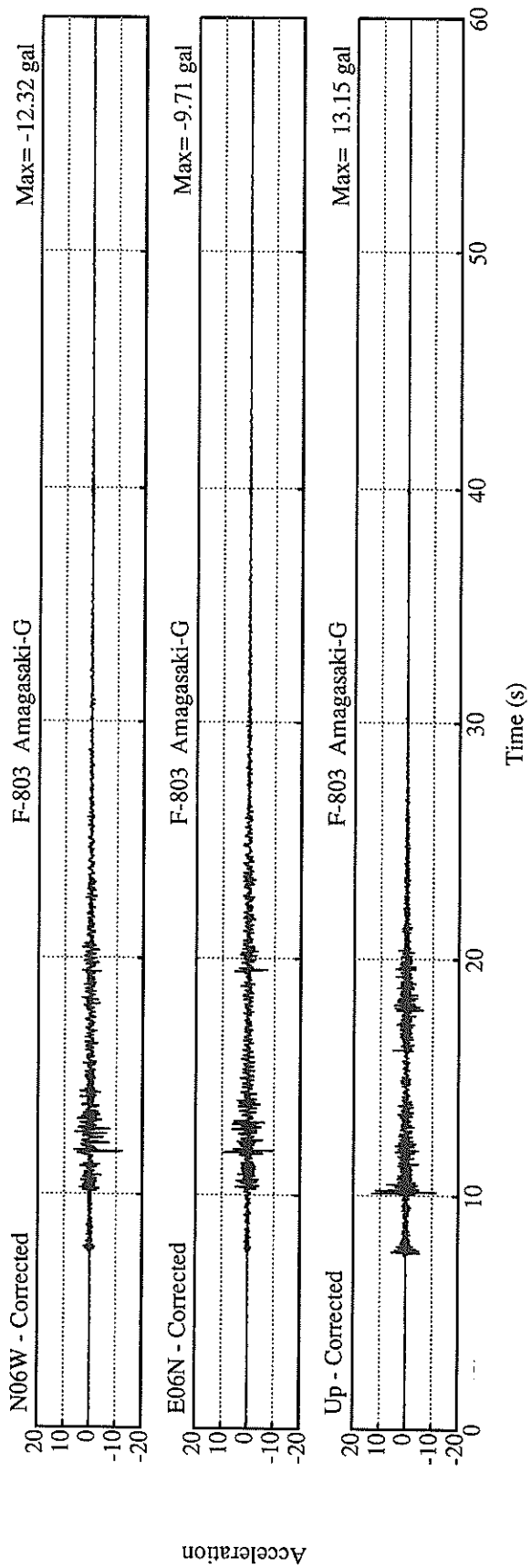
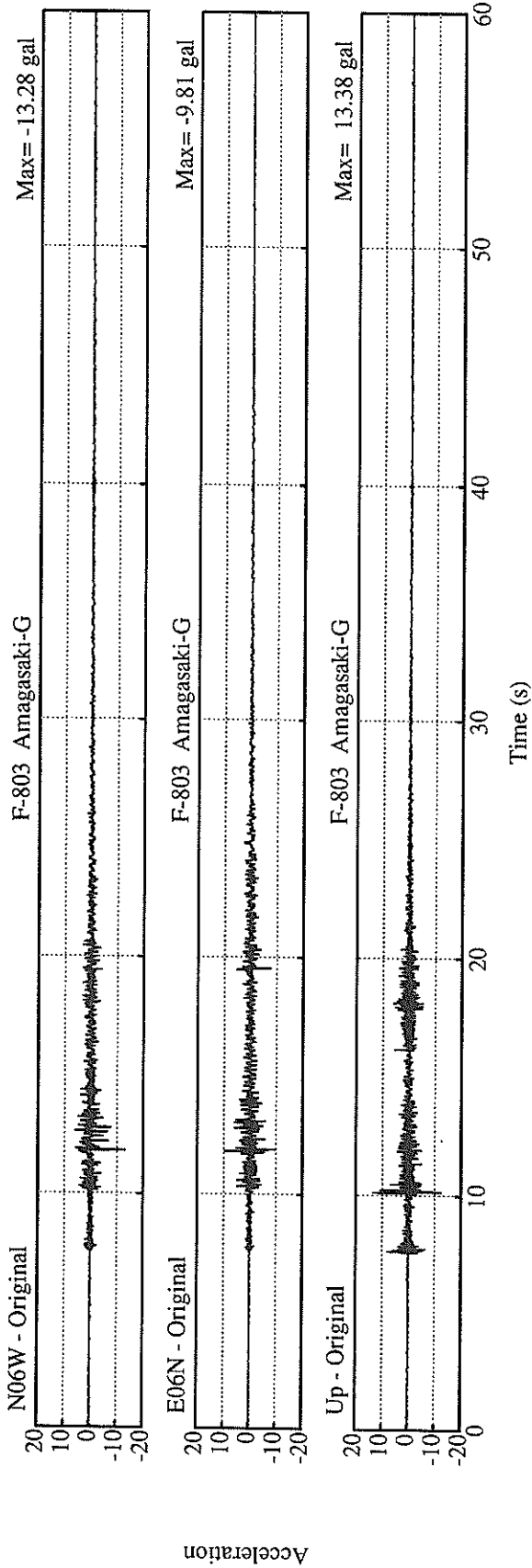
EARTHQUAKE DATA

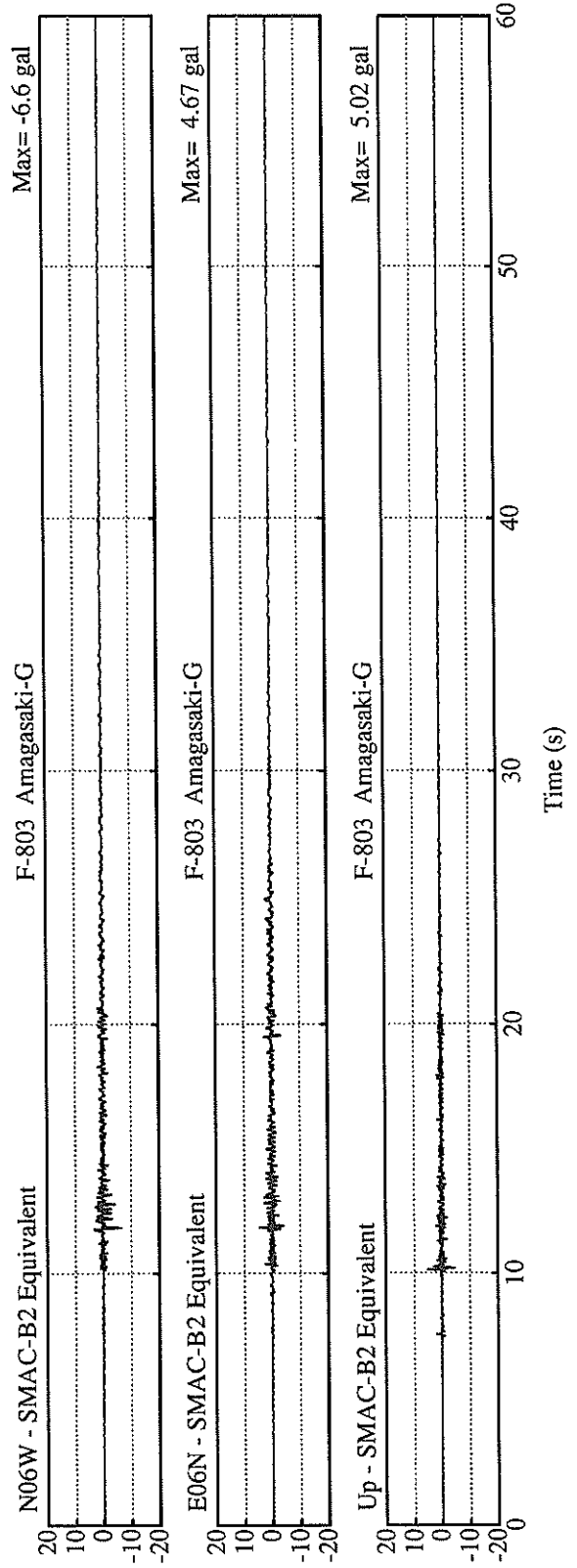
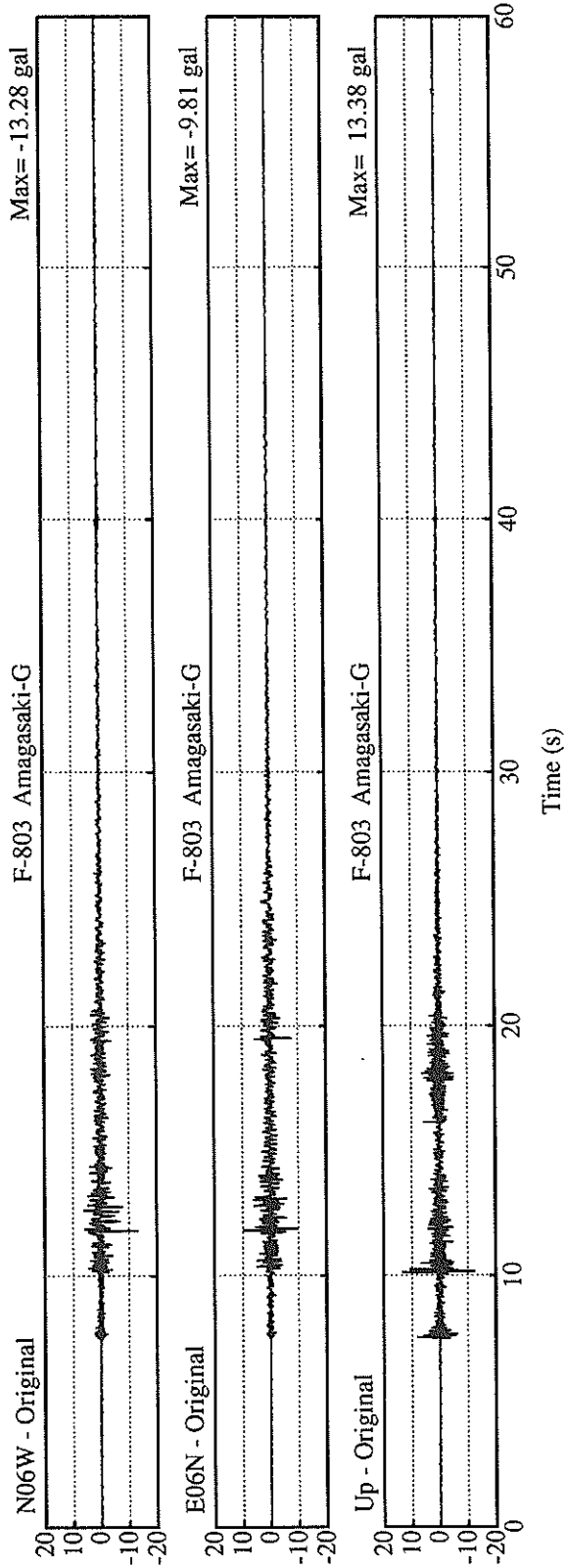
 DATE AND TIME 6:40 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°41.6' N
 LONGITUDE 135°10.8' E
 DEPTH 13.8KM
 JMA MAGNITUDE 3.9

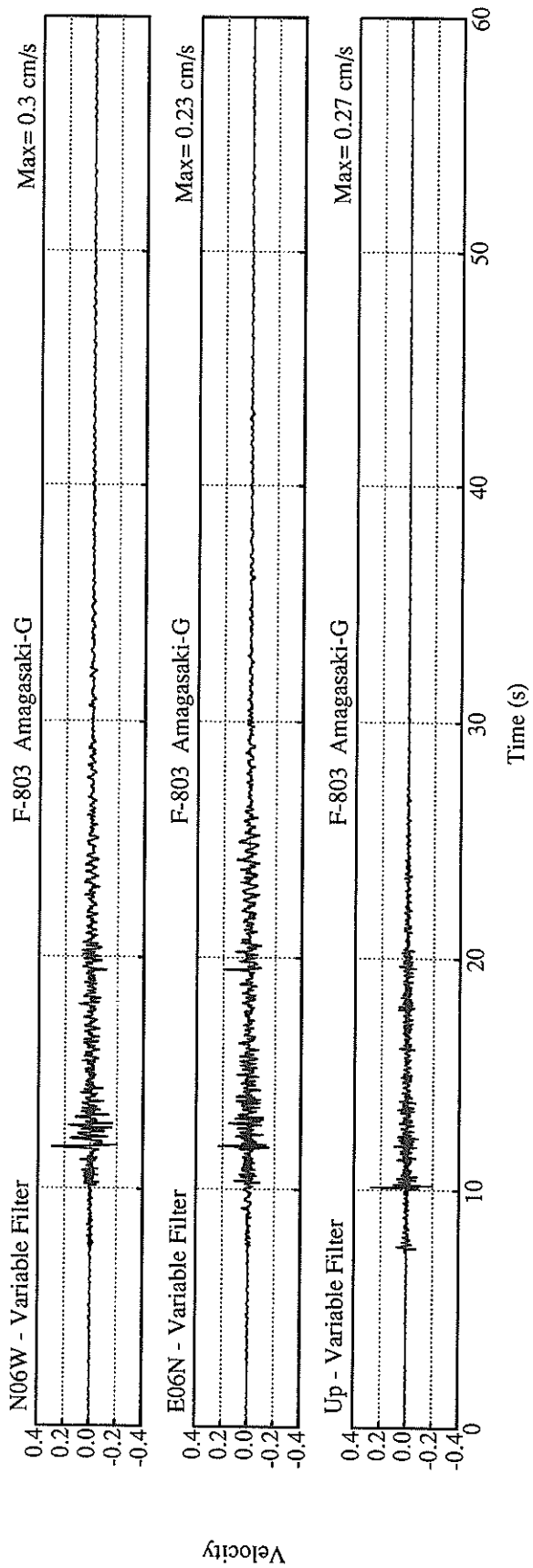
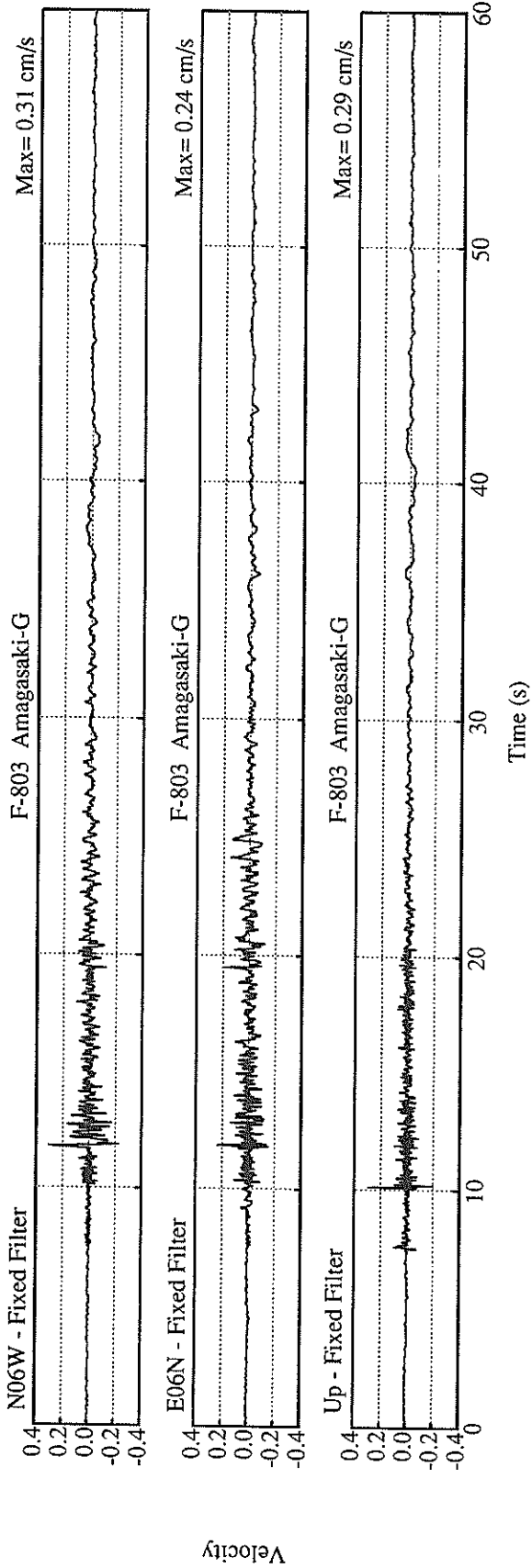
PEAK VALUES OF COMPONENTS

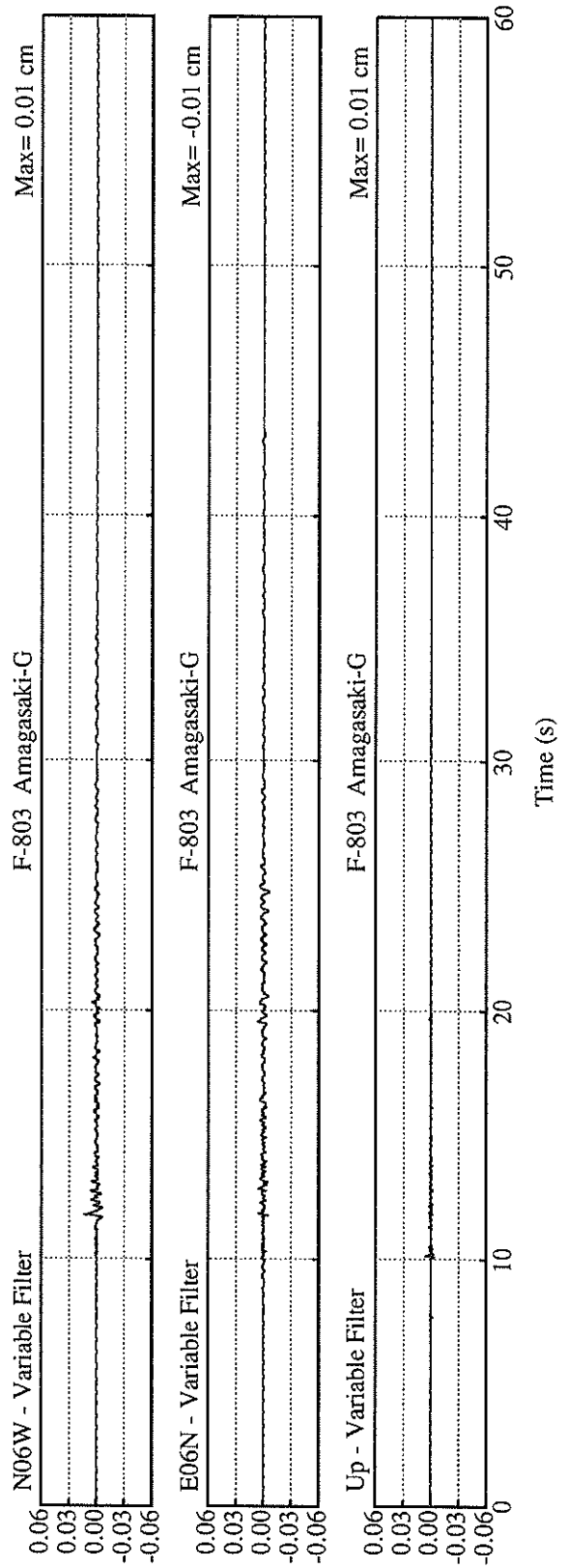
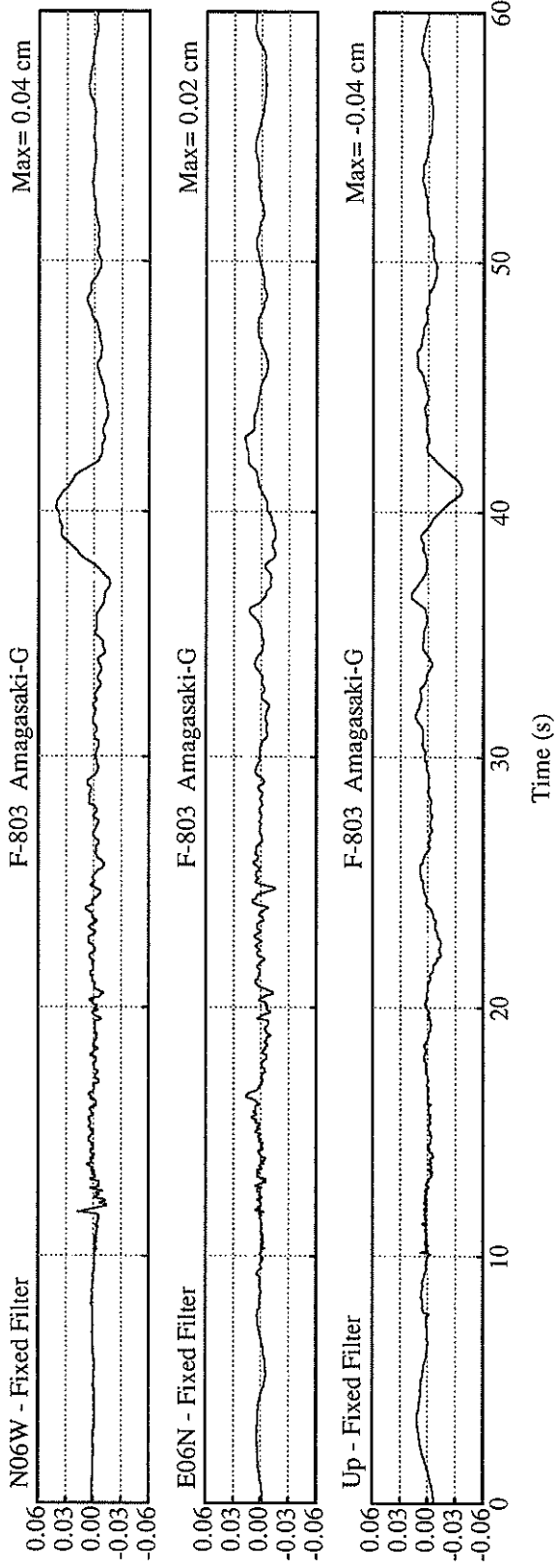
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.495	1.428	2.660	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.6	4.7	5.0	8.0
ORIGINAL	13.3	9.8	13.4	16.4
CORRECTED	12.3	9.7	13.2	15.4
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.31	0.24	0.29	0.34
VARIABLE FILTER	0.30	0.23	0.27	0.34
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.04	0.02	0.04	0.04
VARIABLE FILTER	0.01	0.01	0.01	0.01

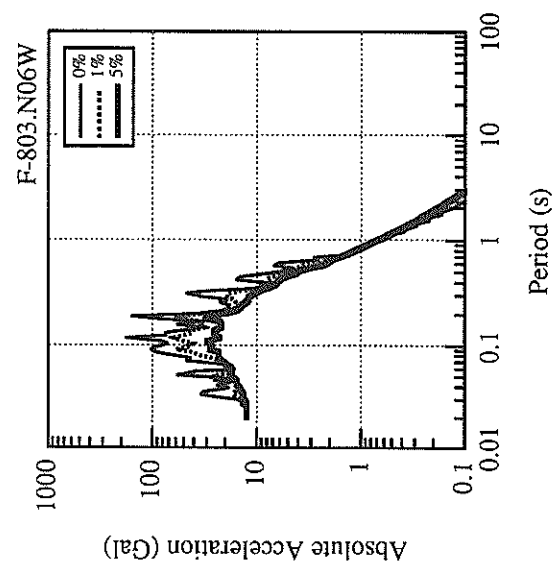
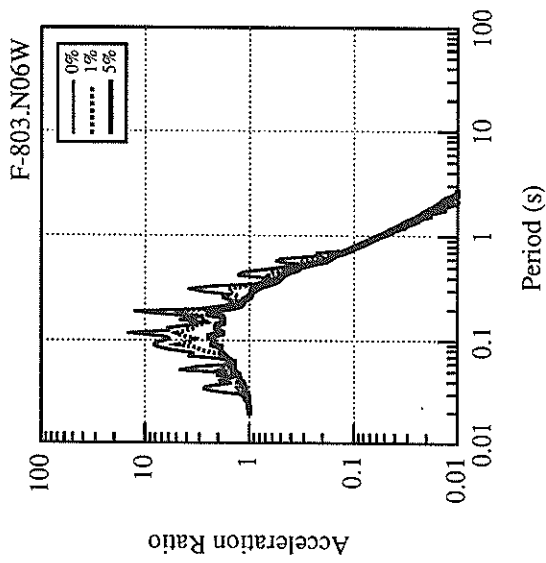
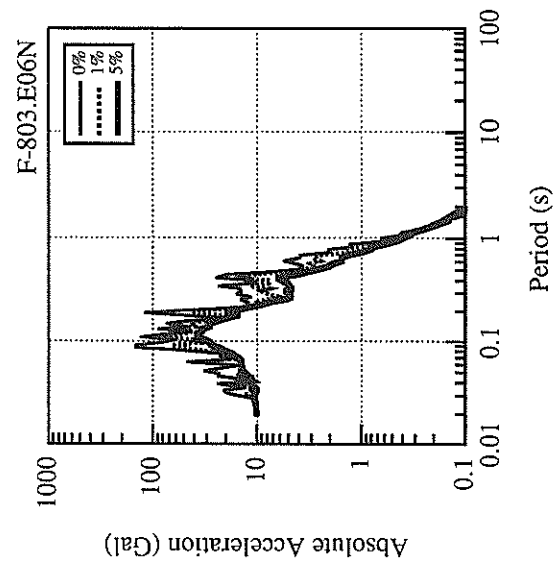
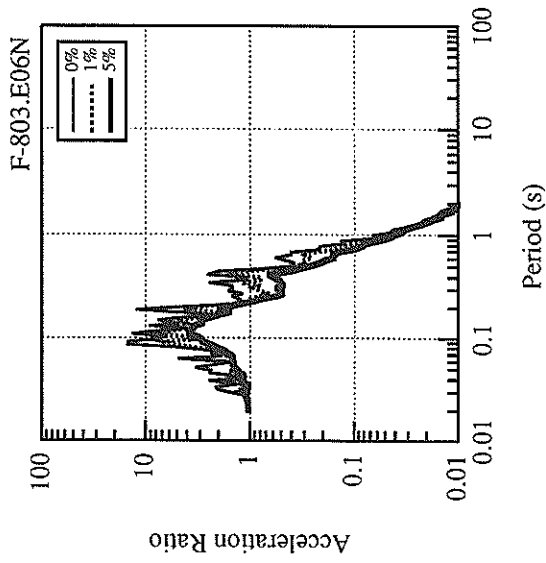
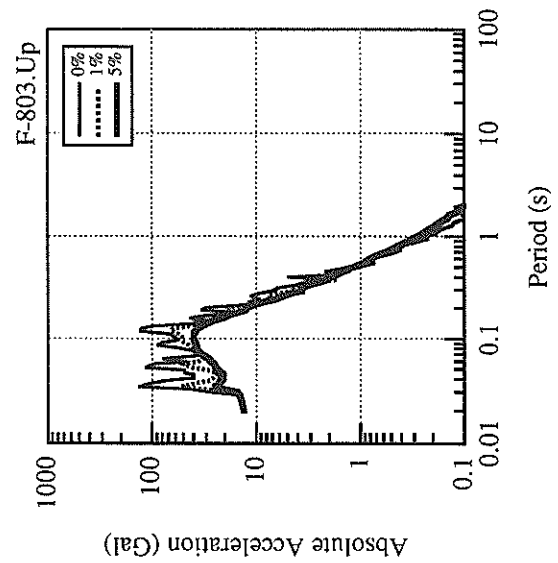
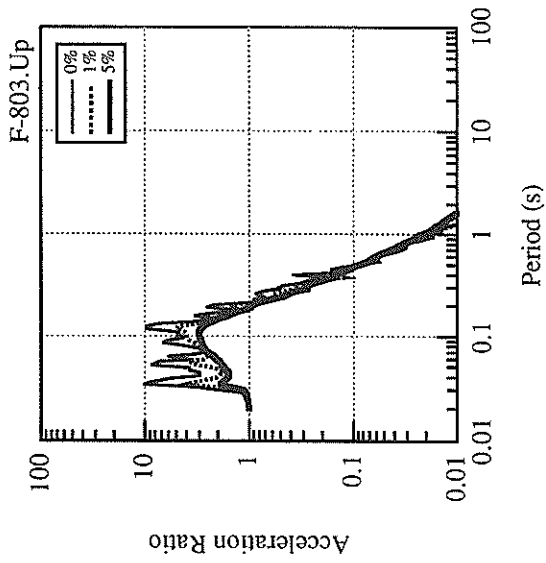
* RESULTANT OF HORIZONTAL COMPONENTS

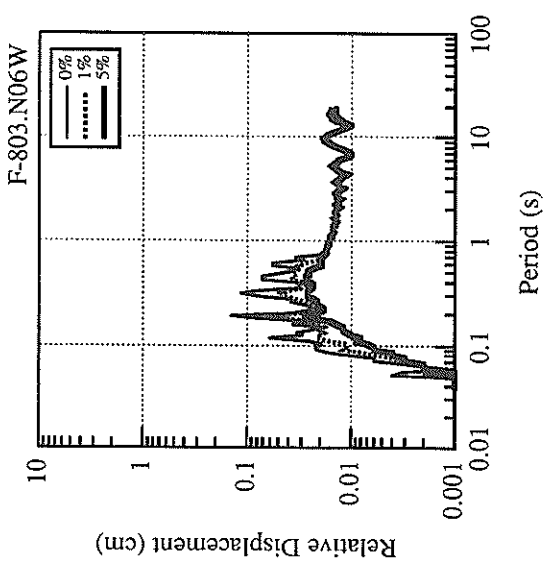
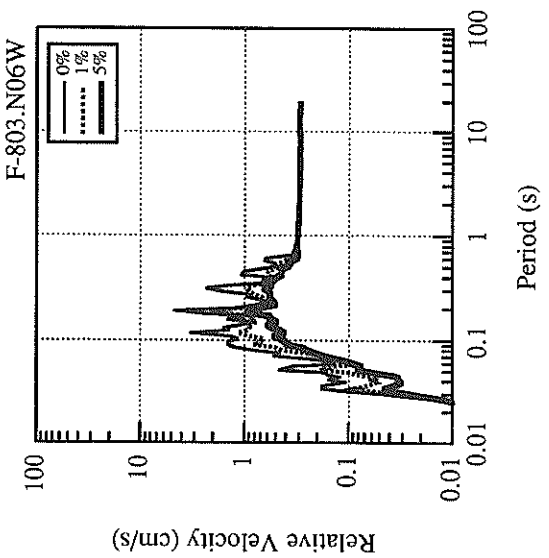
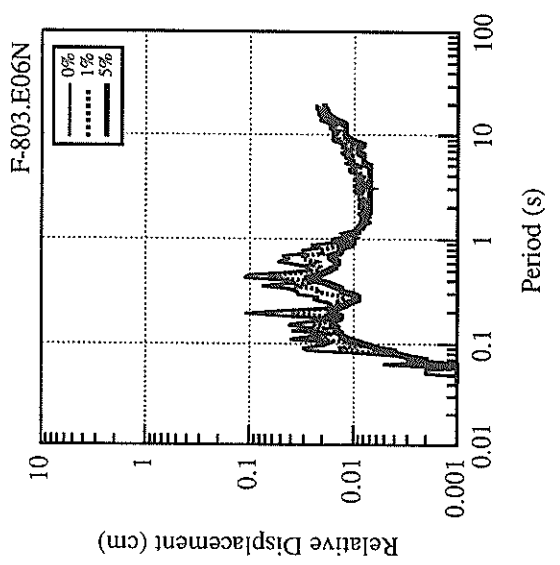
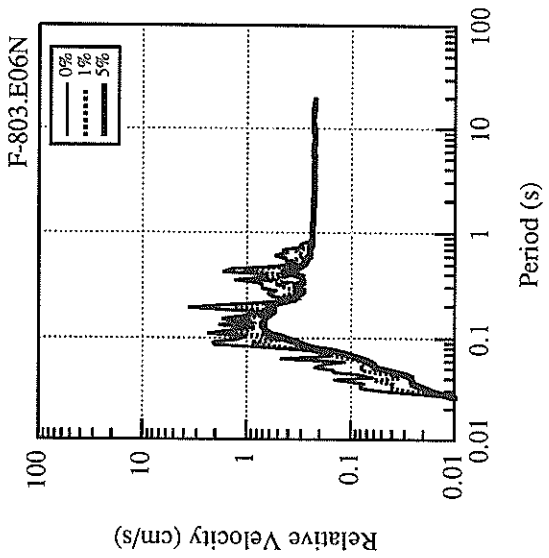
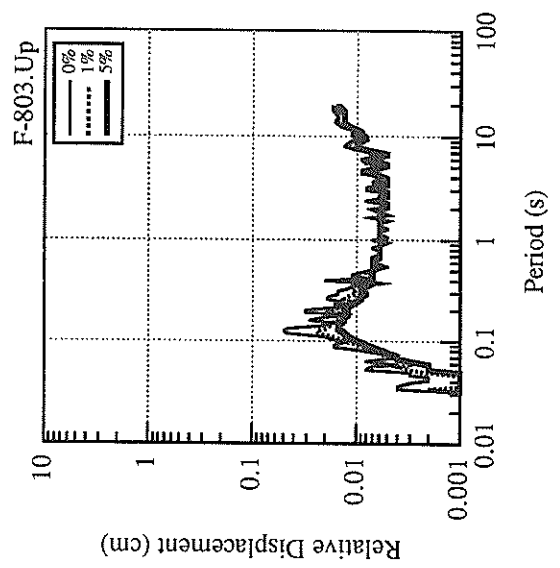
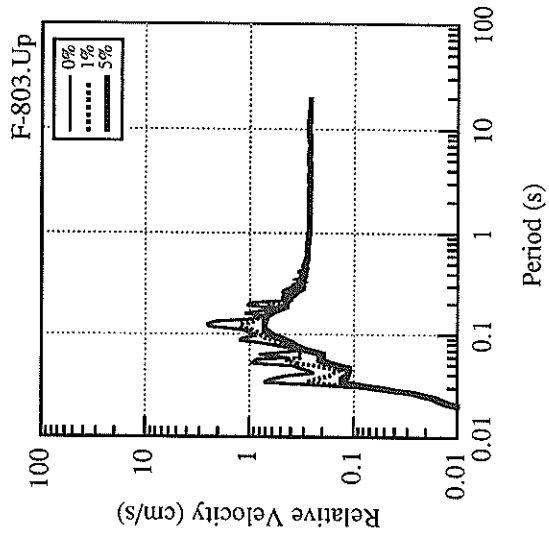


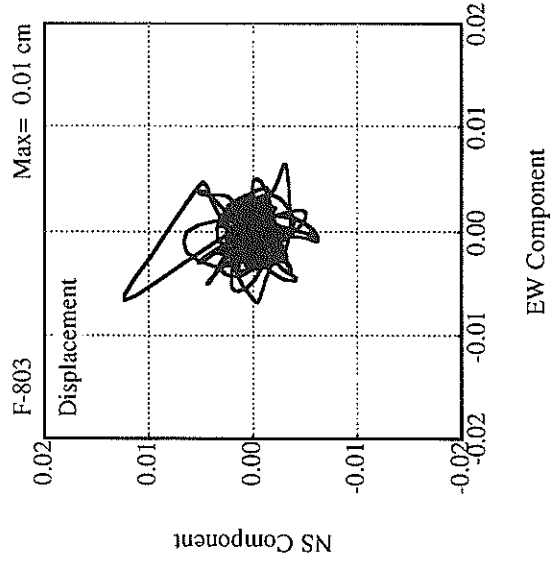
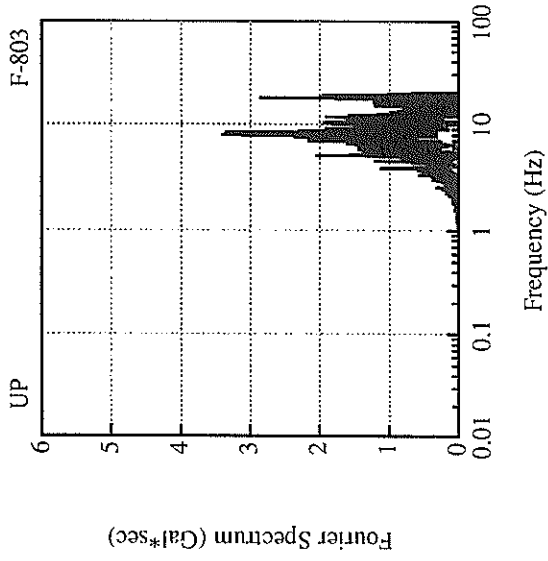
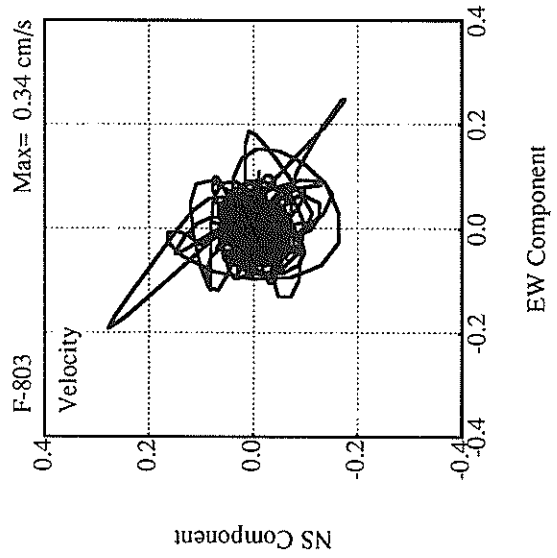
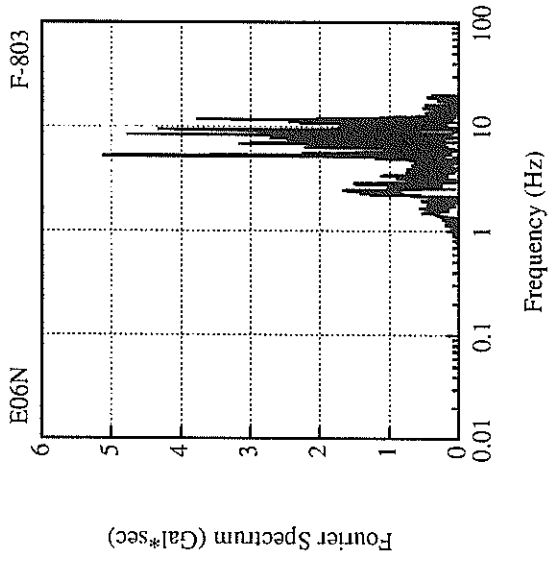
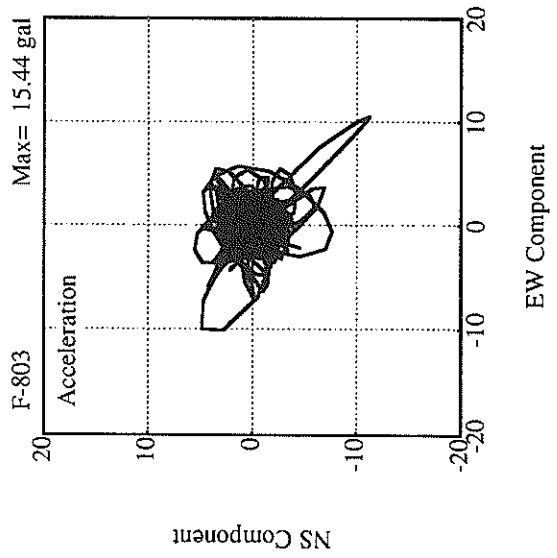
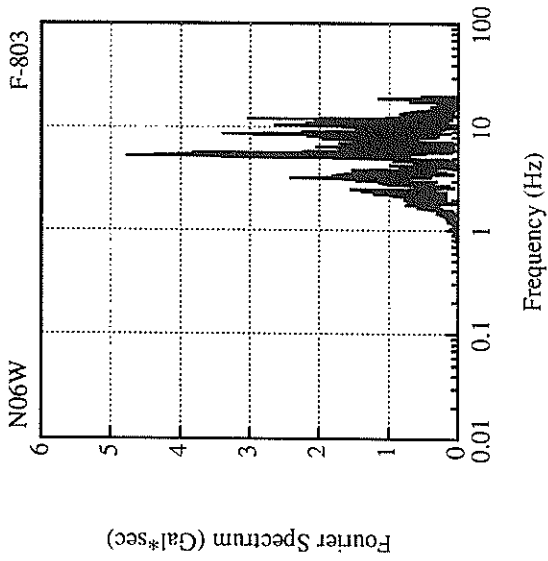












RECORD NUMBER : F-804
 STATION : AMAGASAKI-G

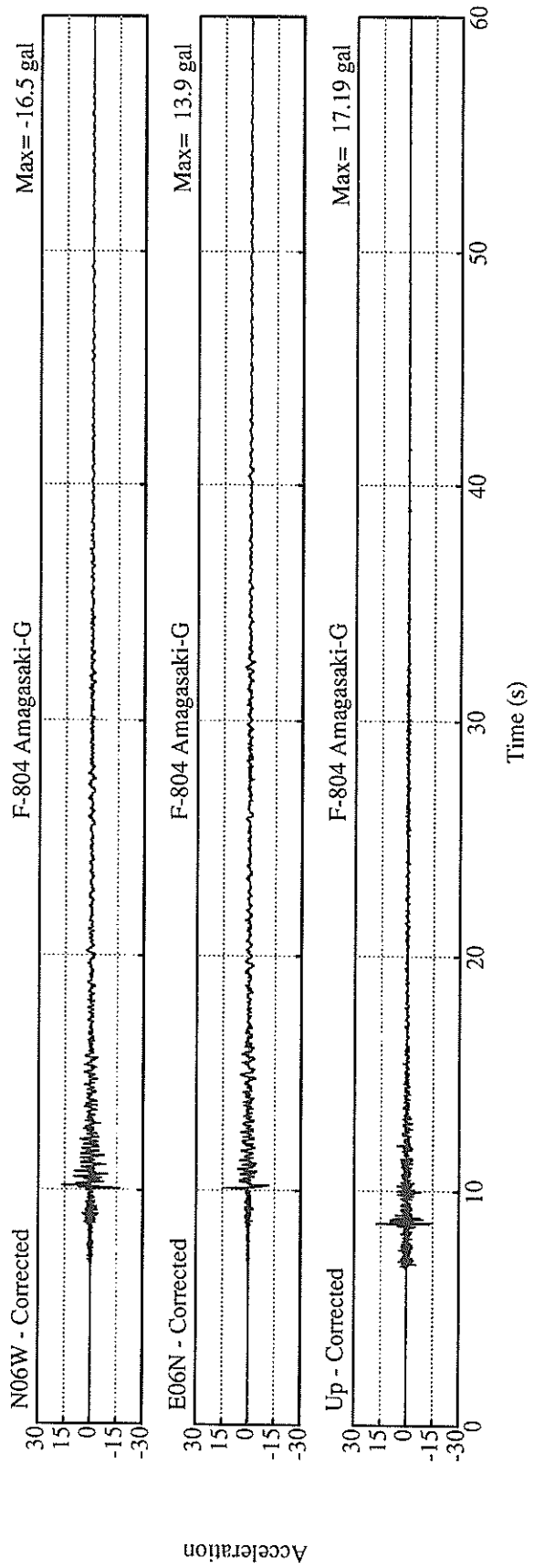
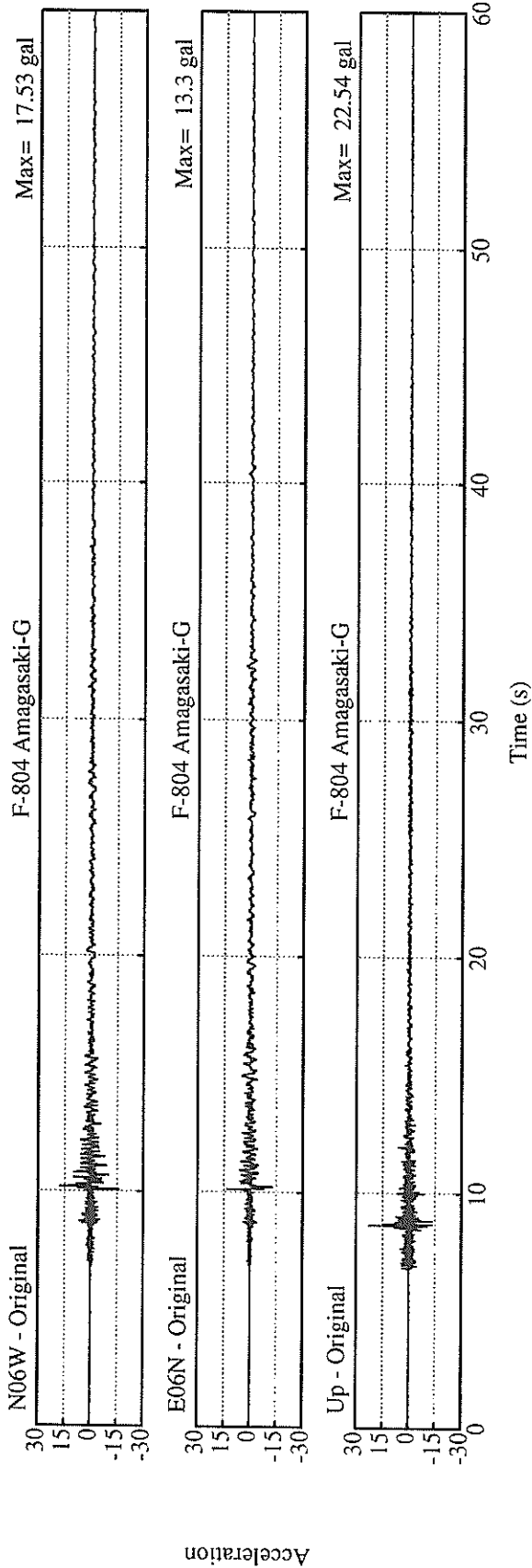
EARTHQUAKE DATA

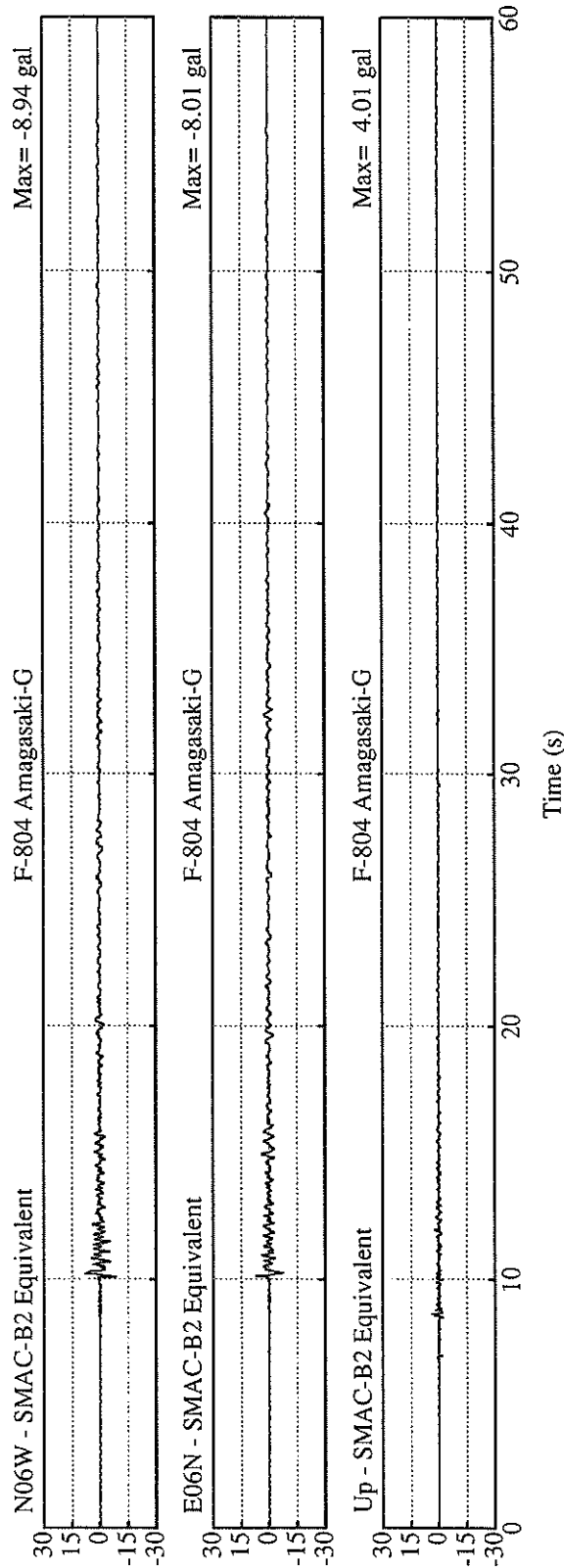
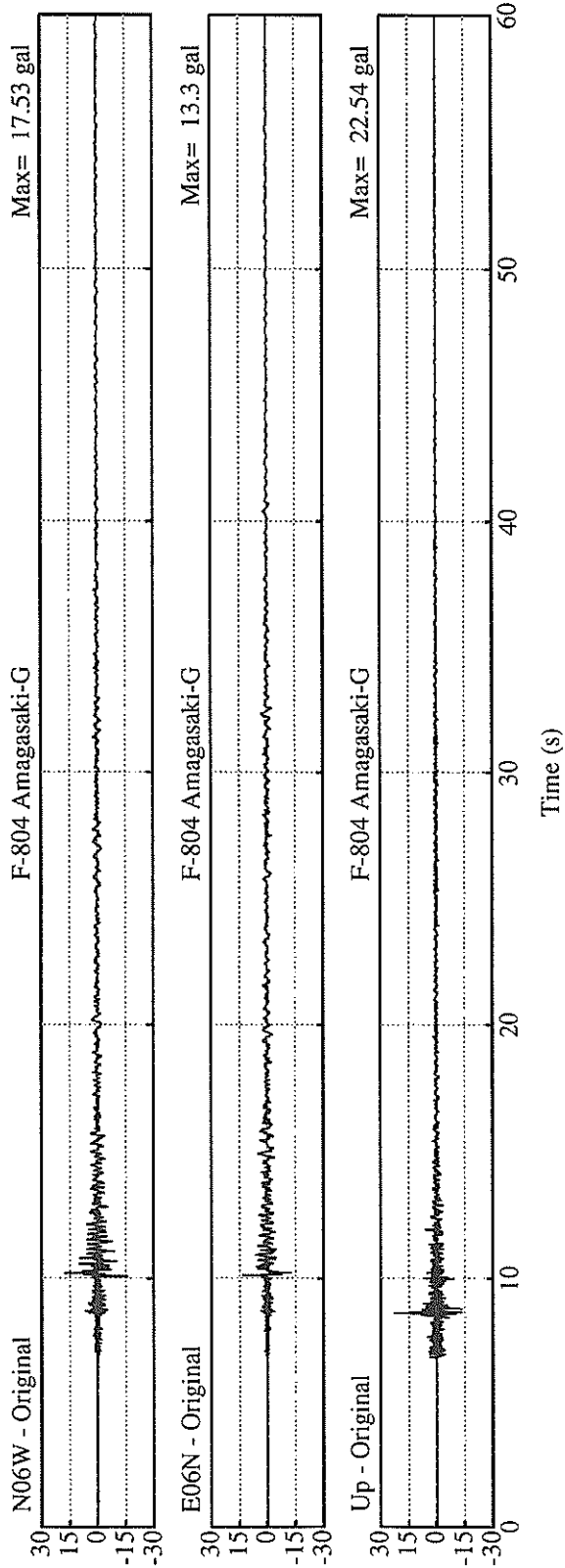
```
*****
DATE AND TIME                6:42 JAN.17,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          SE HYOGO PREF
  LATITUDE                   34°46.9' N
  LONGITUDE                  135°25.4' E
  DEPTH                      14.8KM
JMA MAGNITUDE                4.3
*****
```

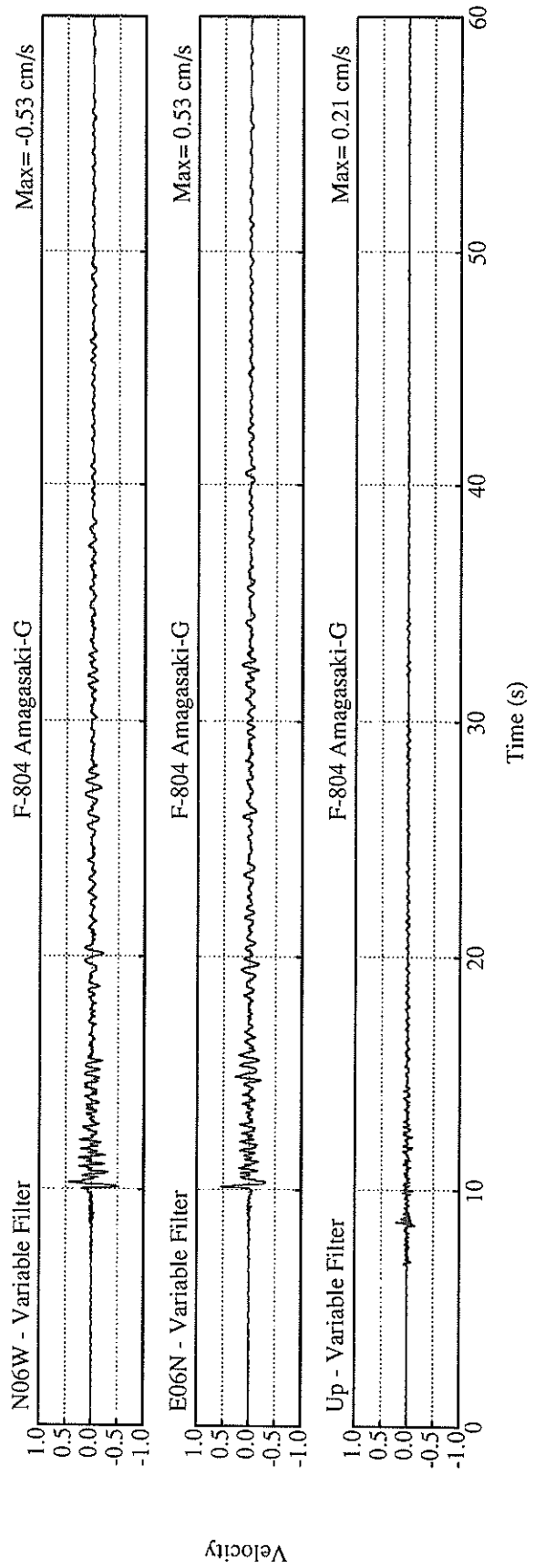
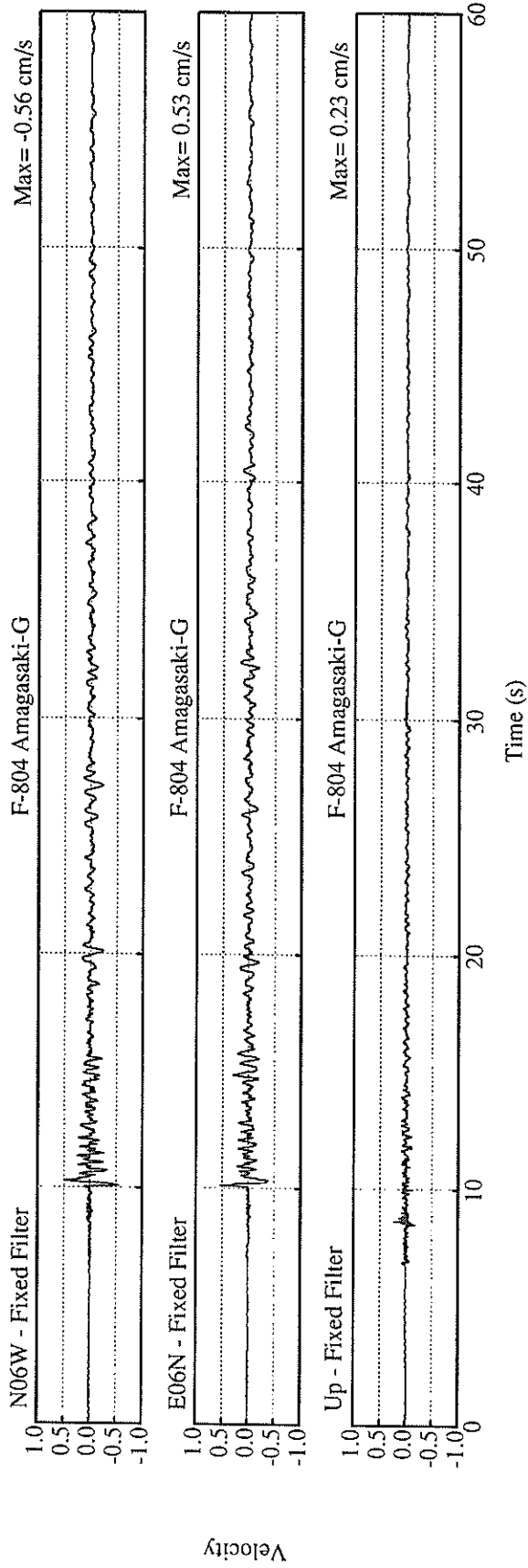
PEAK VALUES OF COMPONENTS

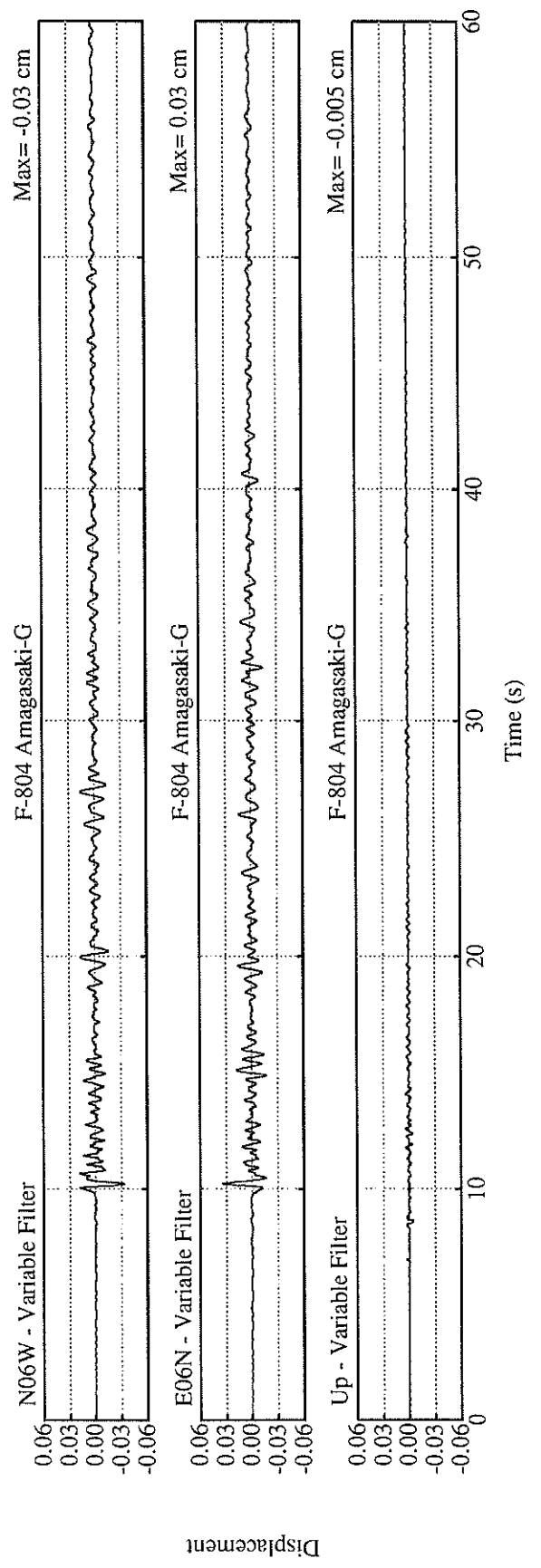
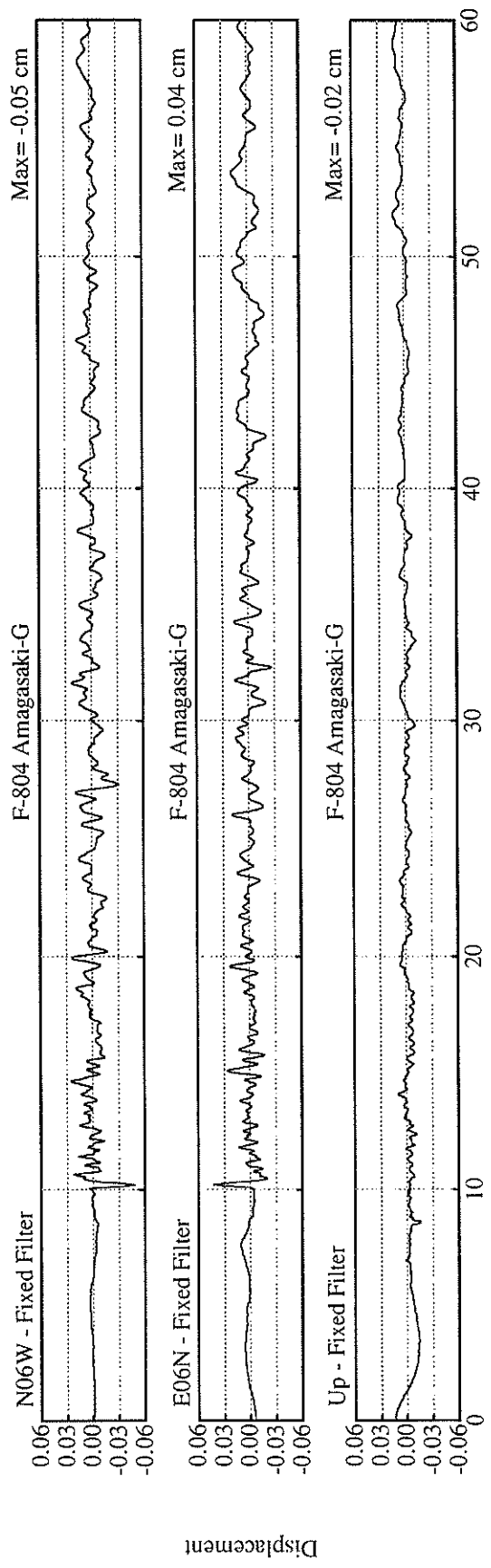
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.921	0.903	1.678	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	8.9	8.0	4.0	9.9
ORIGINAL	17.5	13.3	22.5	17.7
CORRECTED	16.5	13.9	17.2	16.7
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.56	0.53	0.23	0.68
VARIABLE FILTER	0.53	0.53	0.21	0.66
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.05	0.04	0.02	0.06
VARIABLE FILTER	0.03	0.03	0.01	0.05

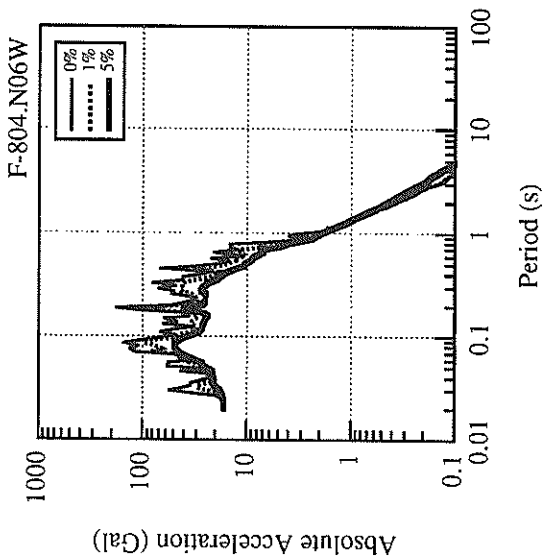
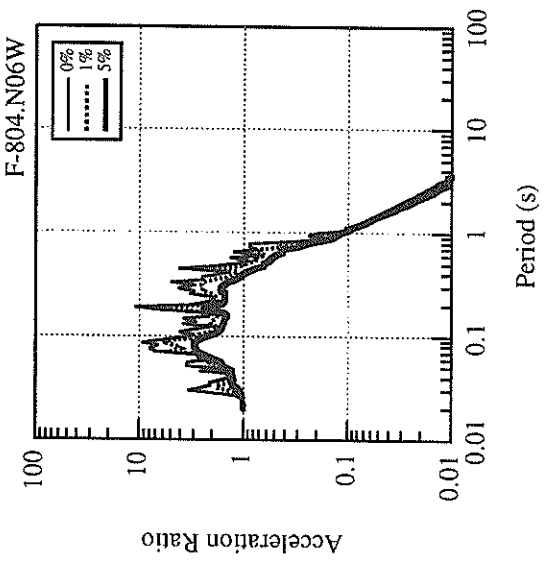
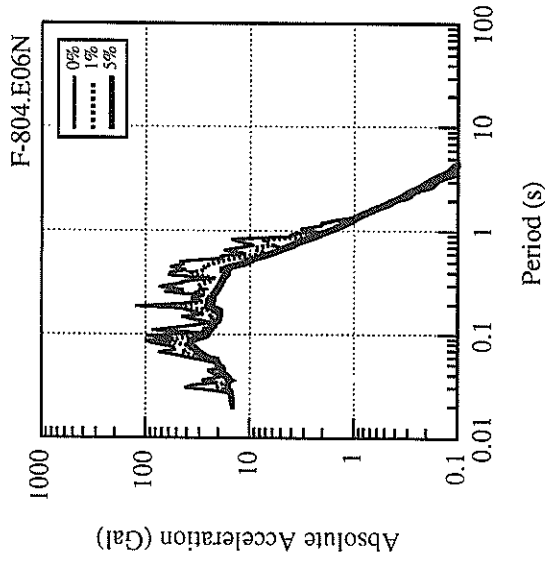
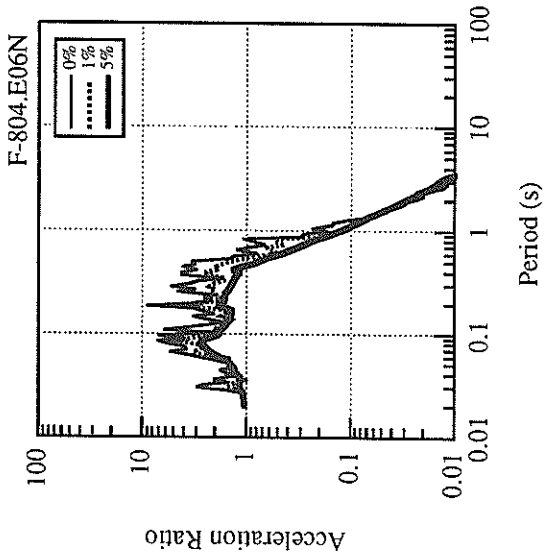
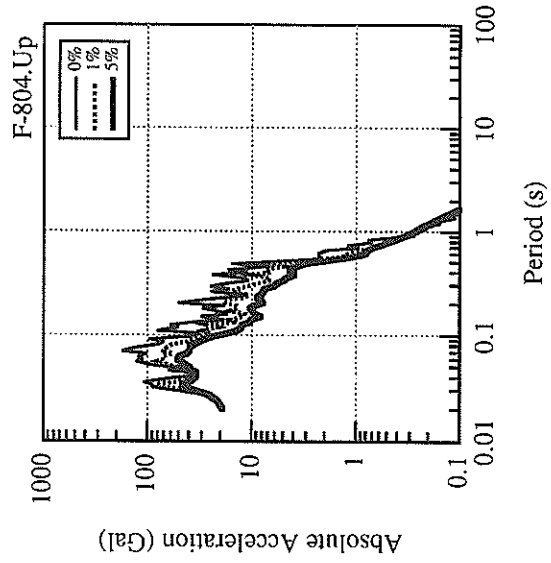
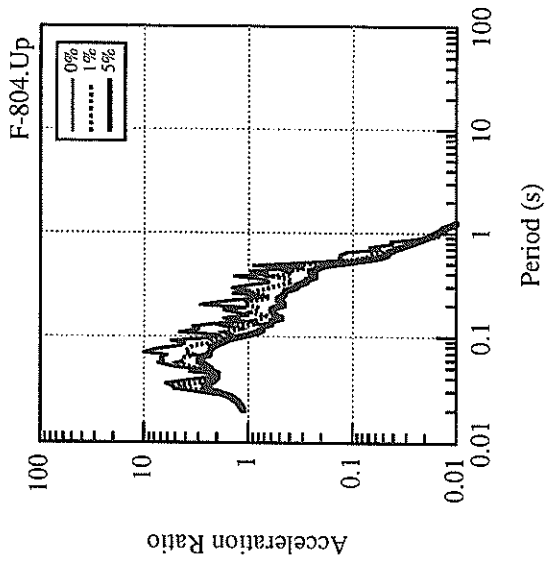
* RESULTANT OF HORIZONTAL COMPONENTS

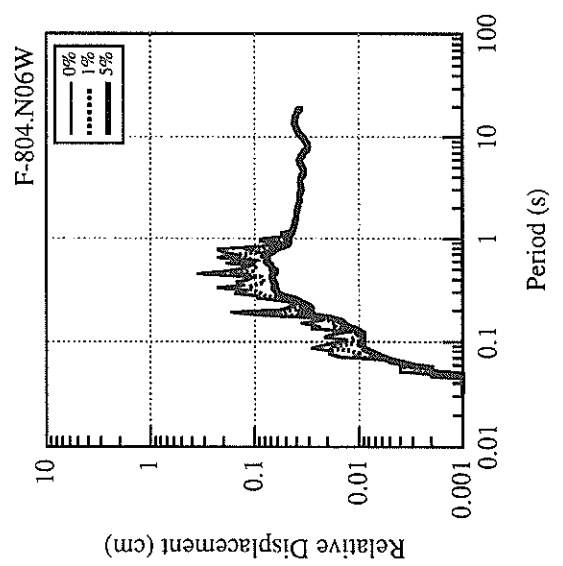
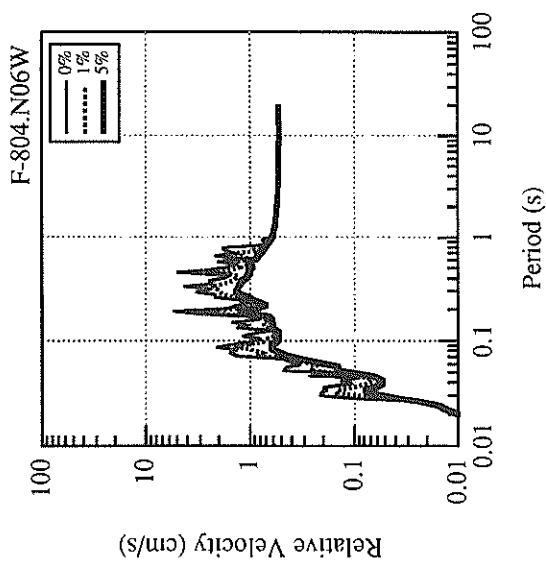
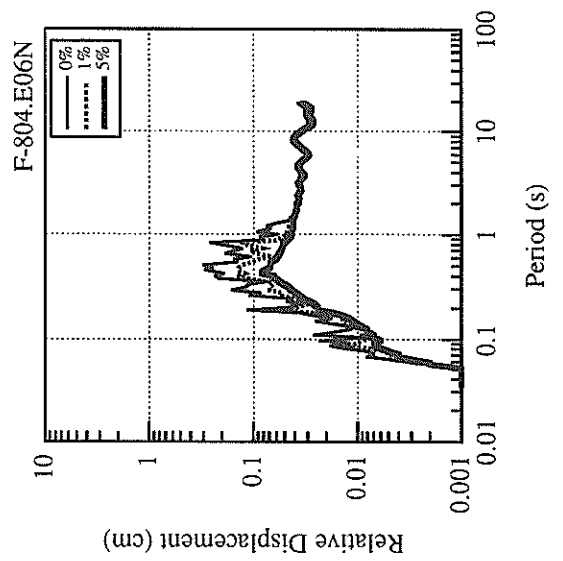
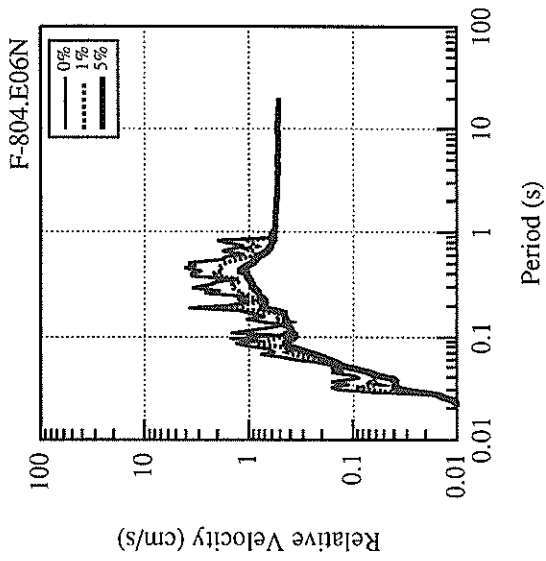
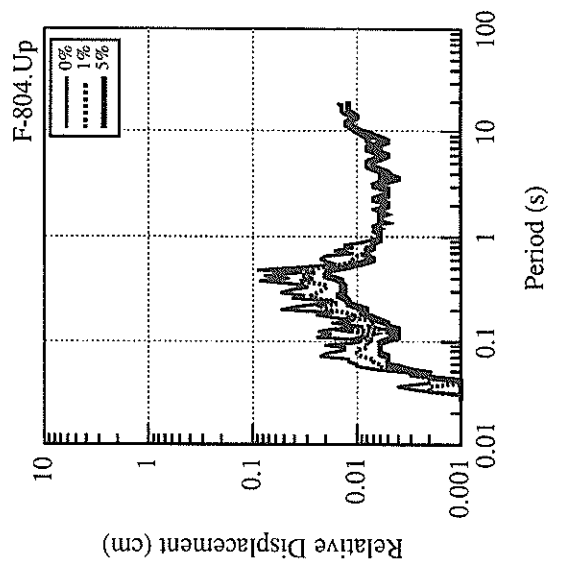
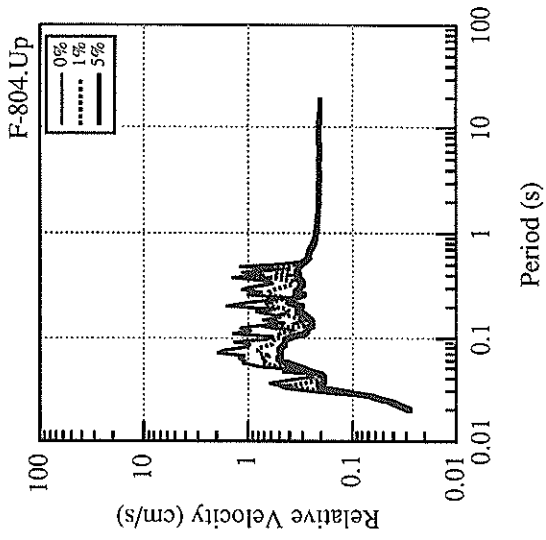


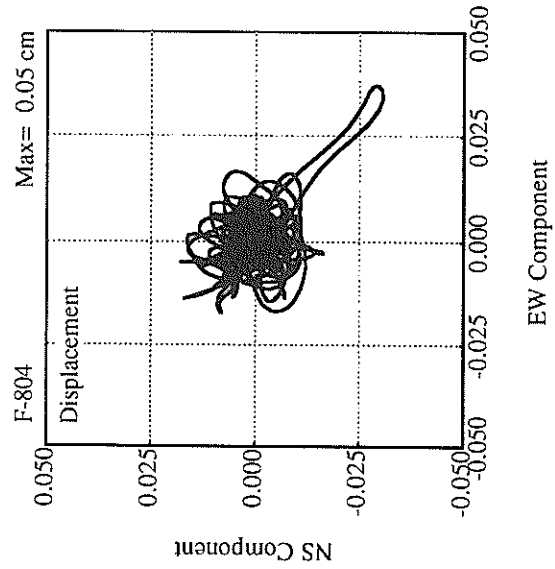
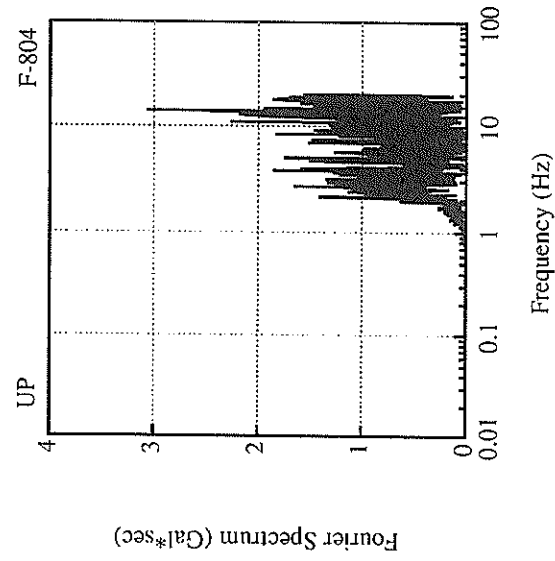
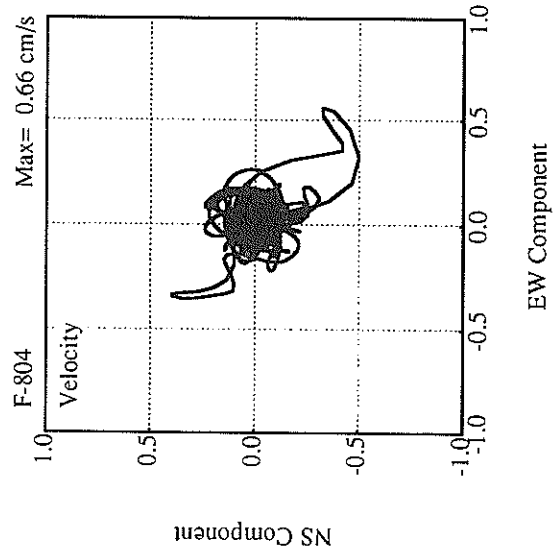
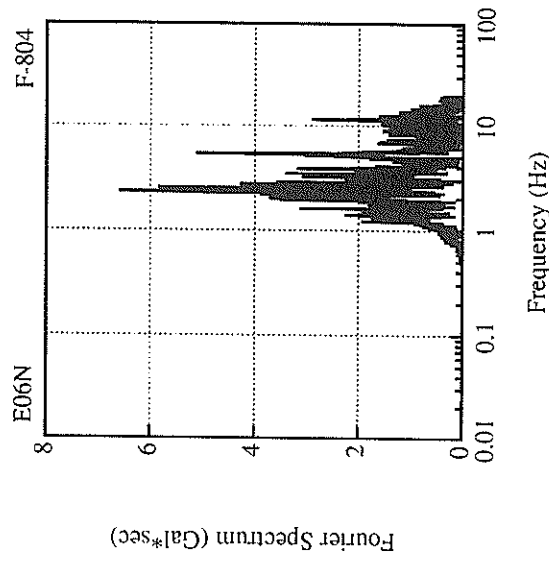
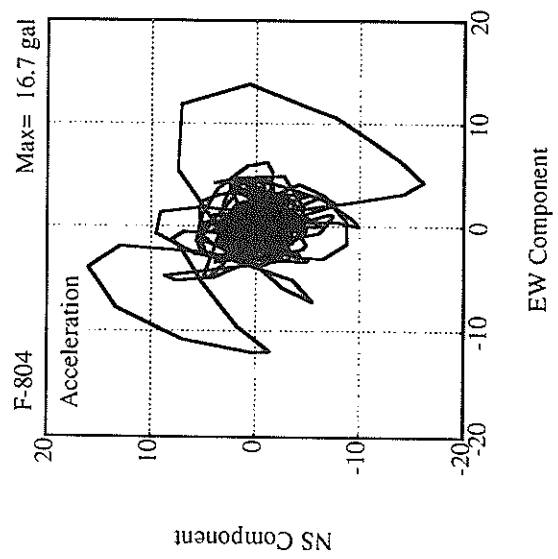
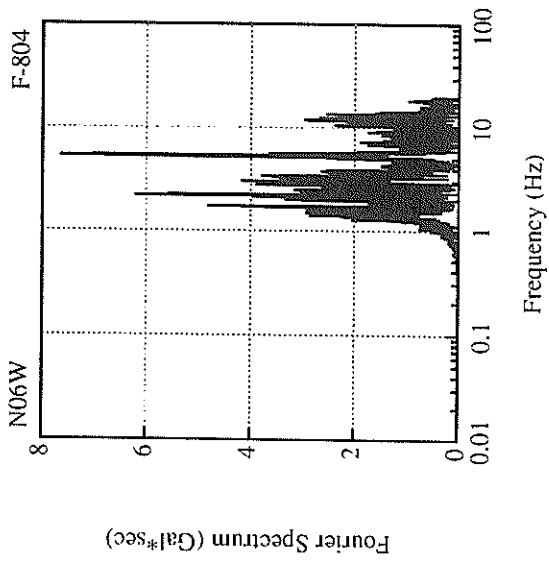












RECORD NUMBER : F-805
 STATION : AMAGASAKI-G

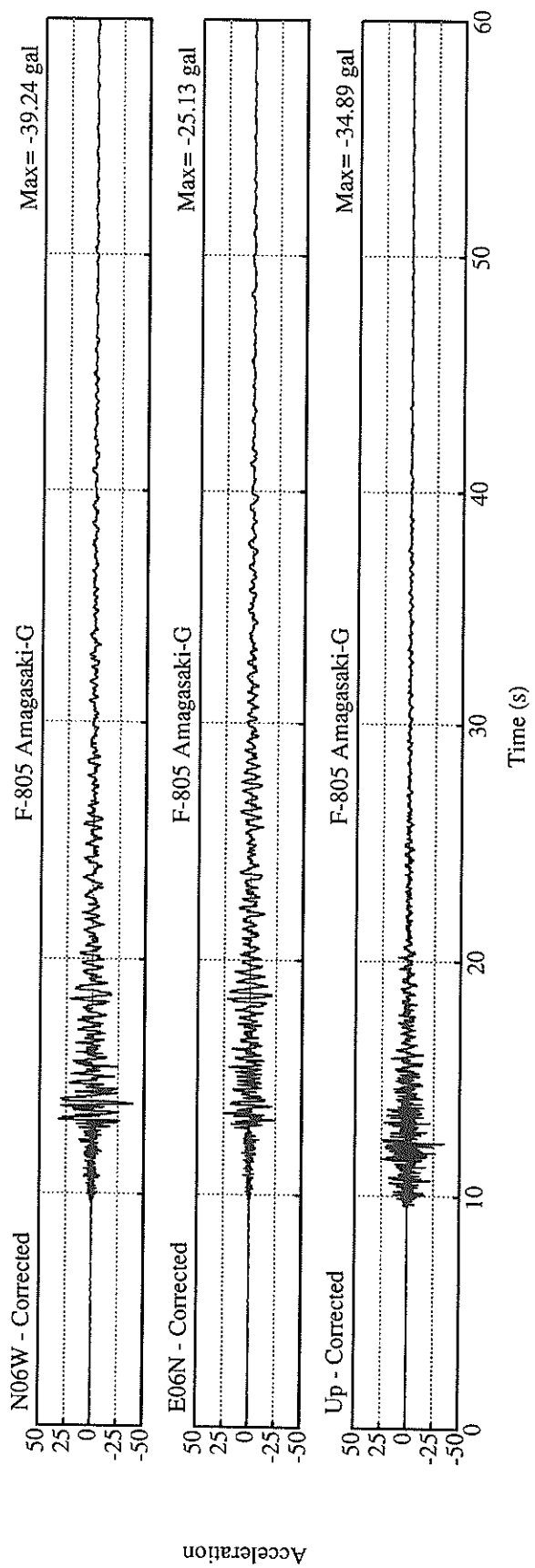
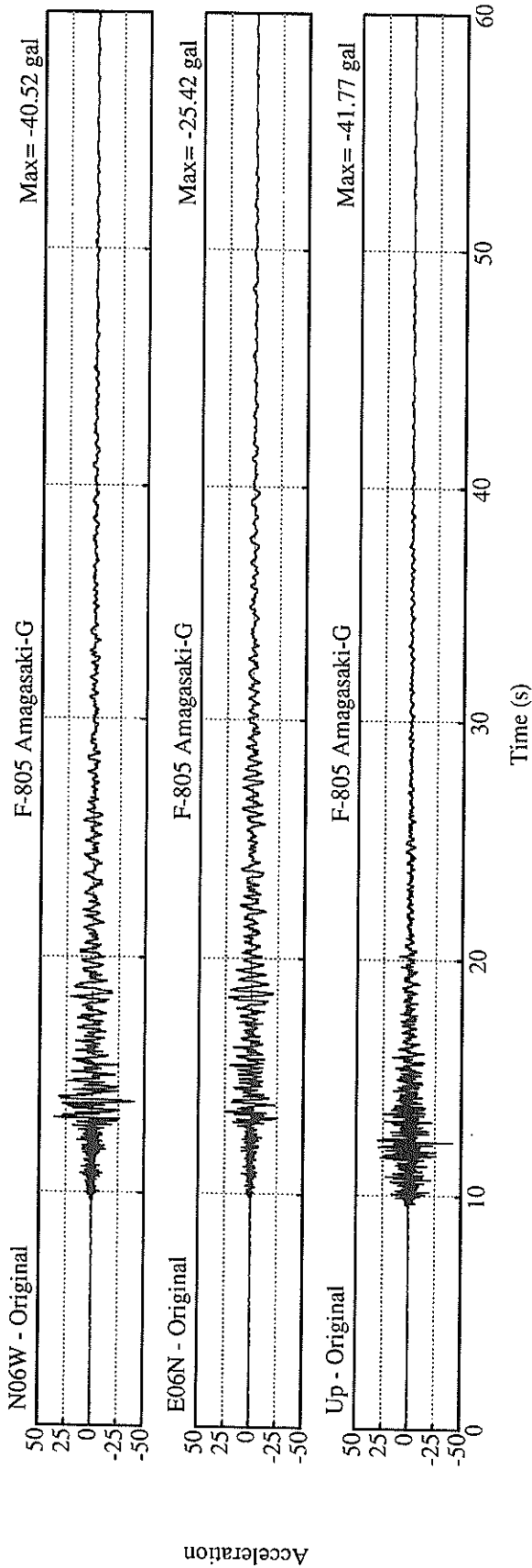
EARTHQUAKE DATA

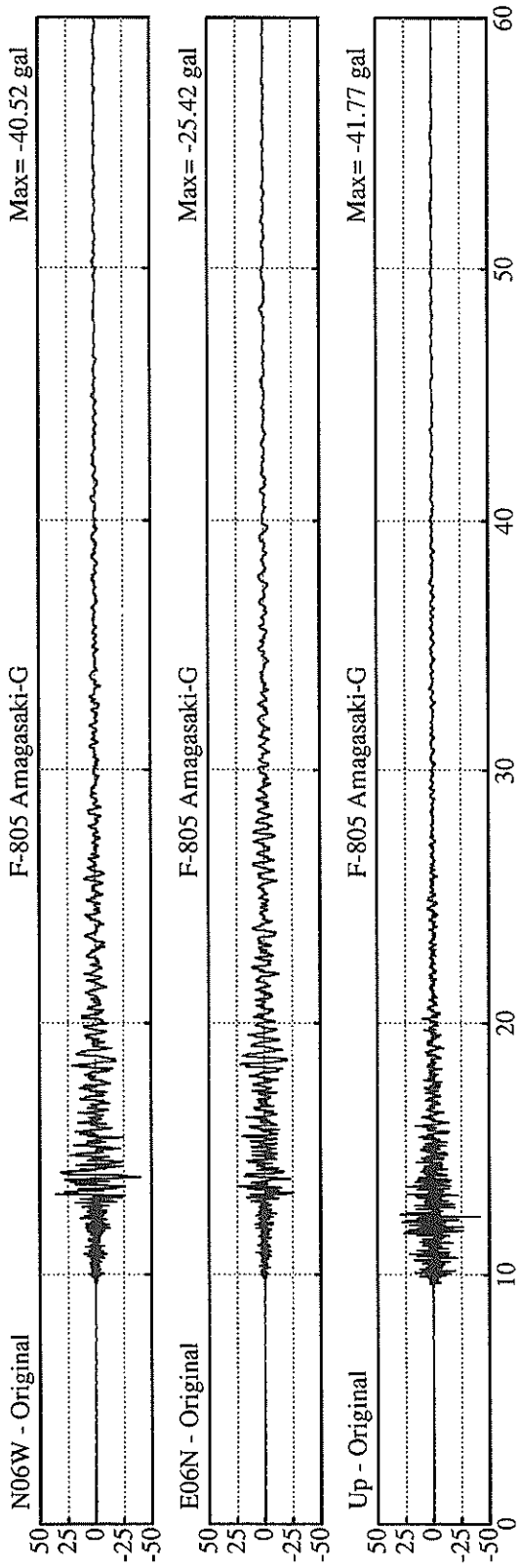
 DATE AND TIME 7:38 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°46.9' N
 LONGITUDE 135°26.3' E
 DEPTH 11.7KM
 JMA MAGNITUDE 5.4

PEAK VALUES OF COMPONENTS

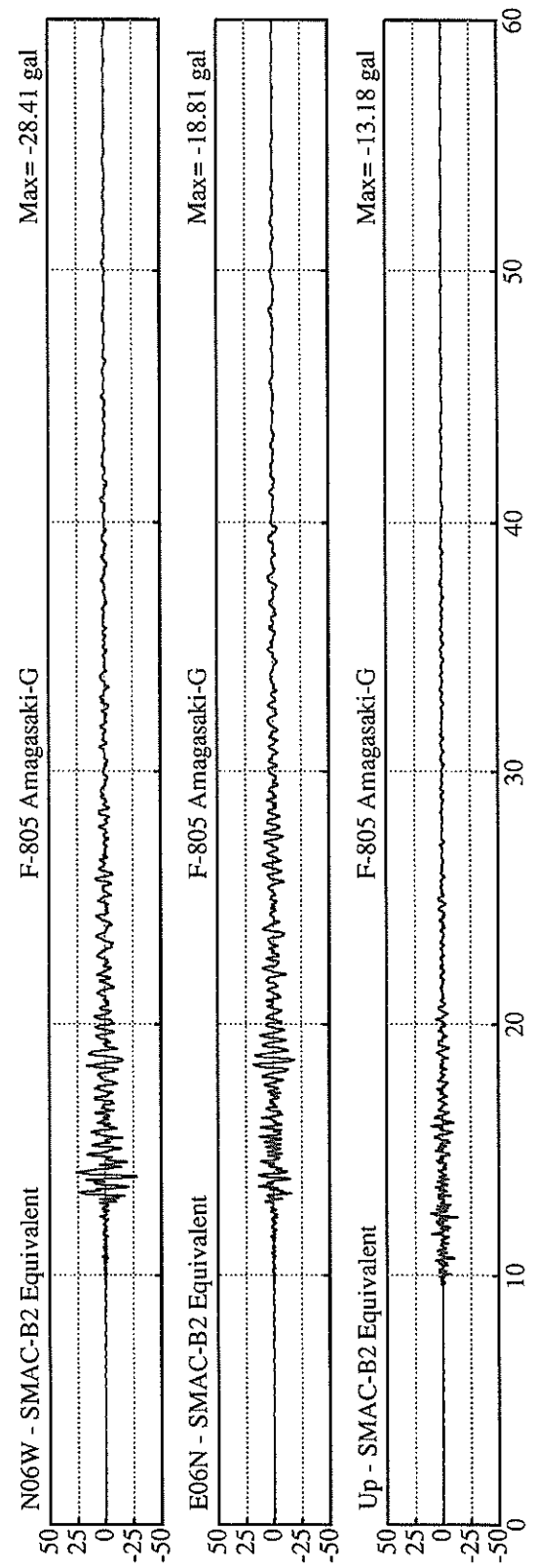
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.262	0.304	0.372	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	28.4	18.8	13.2	28.9
ORIGINAL	40.5	25.4	41.8	40.5
CORRECTED	39.2	25.1	34.9	39.2
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	2.09	1.39	0.67	2.16
VARIABLE FILTER	2.24	1.36	0.75	2.33
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.32	0.19	0.12	0.35
VARIABLE FILTER	0.24	0.13	0.06	0.25

* RESULTANT OF HORIZONTAL COMPONENTS

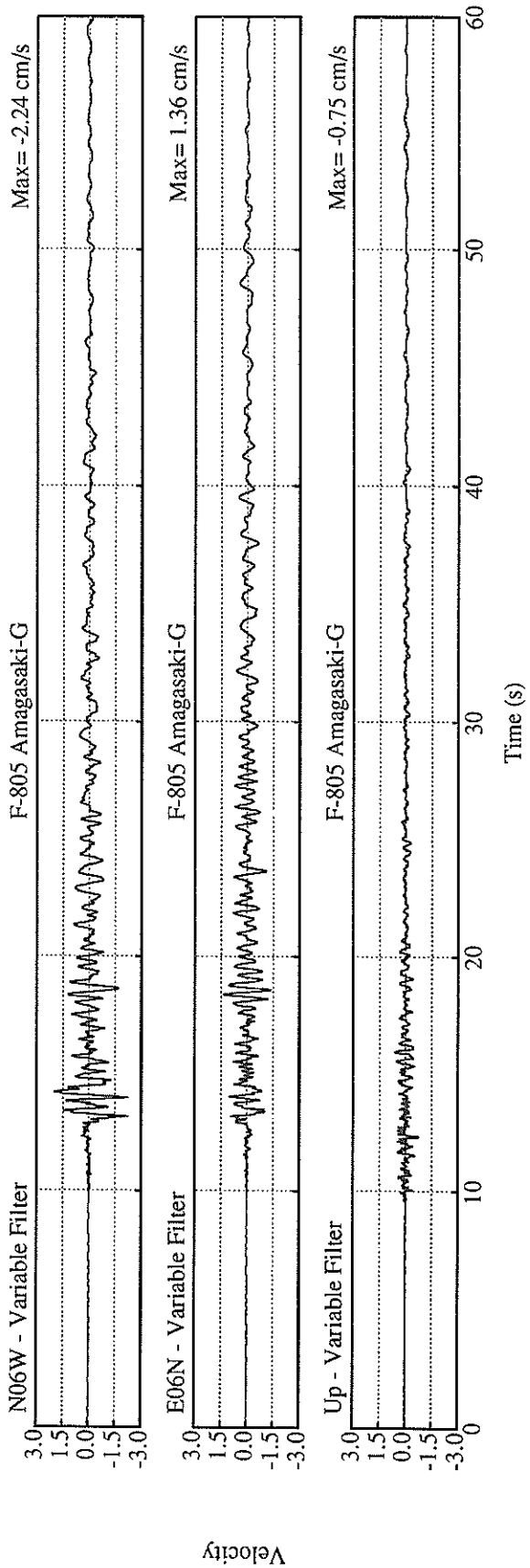
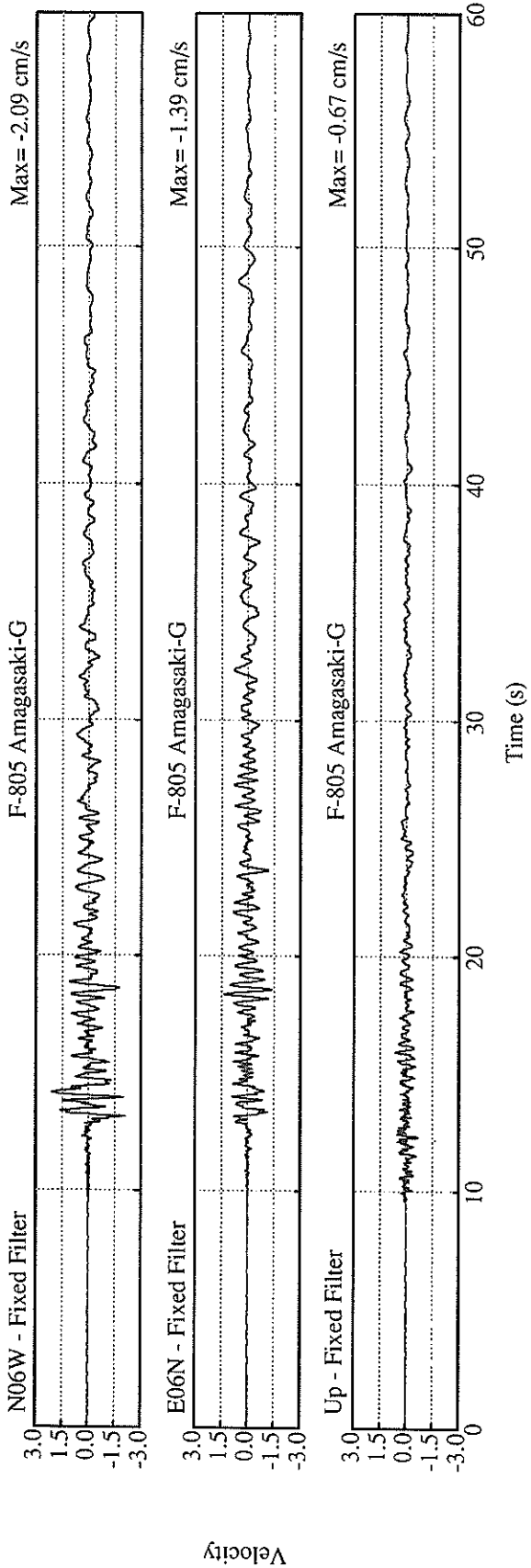


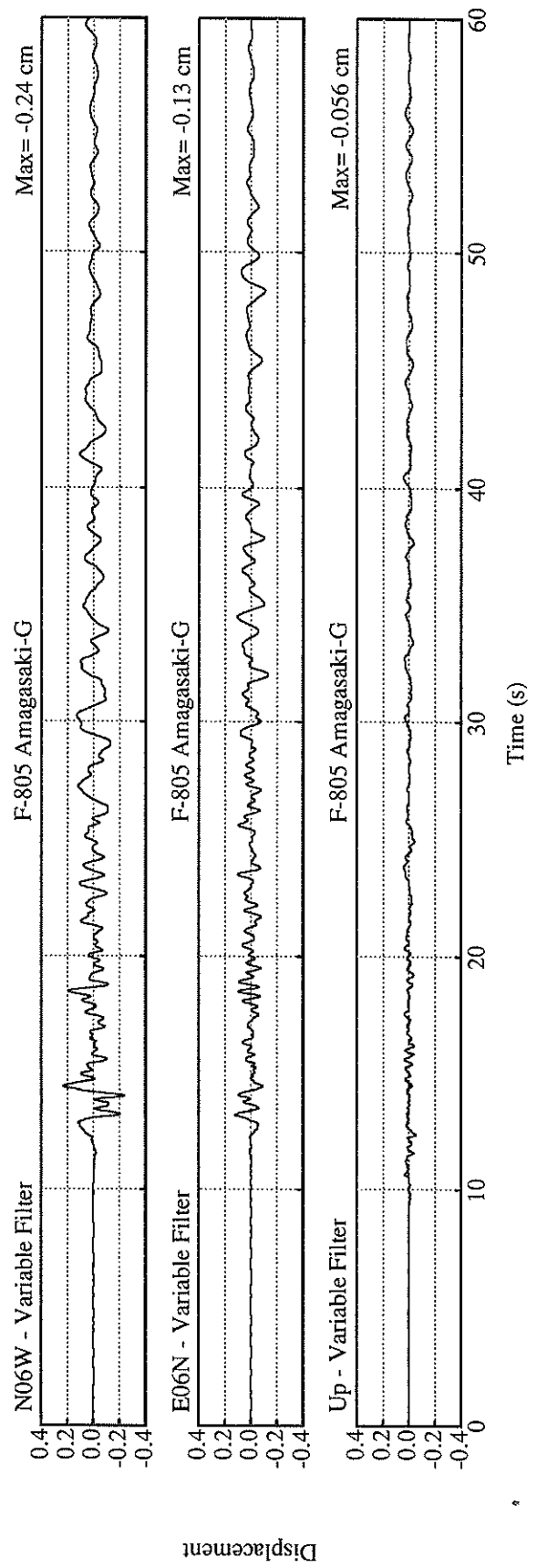
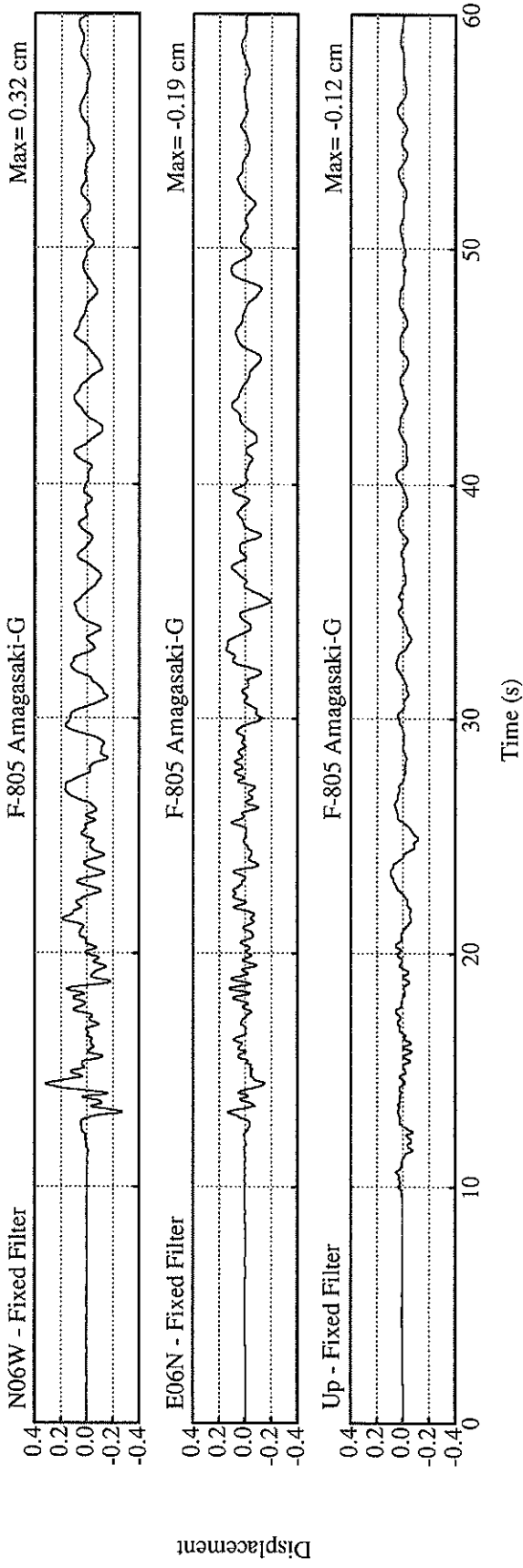


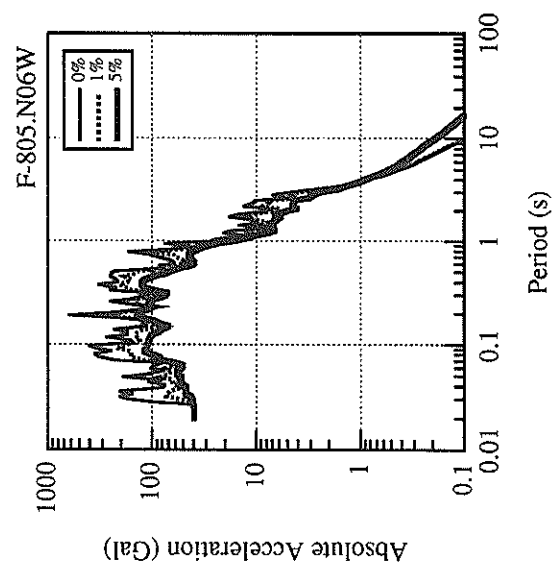
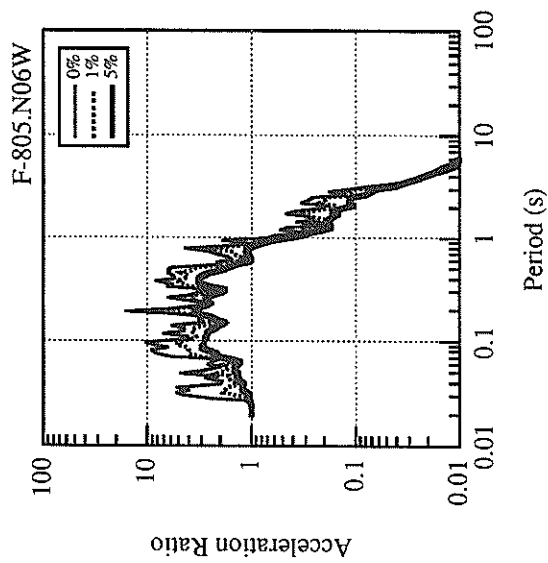
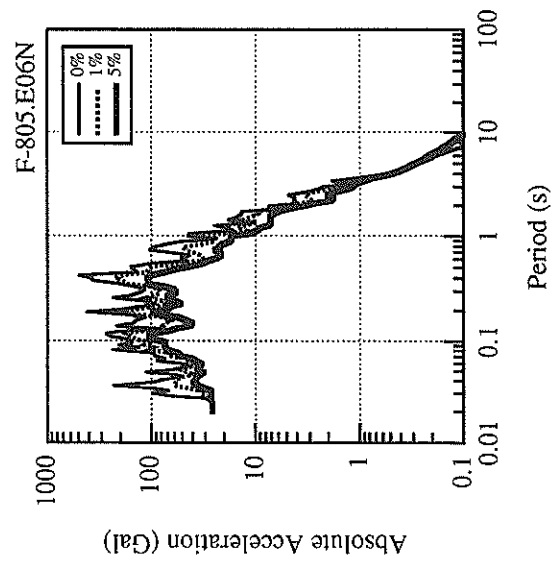
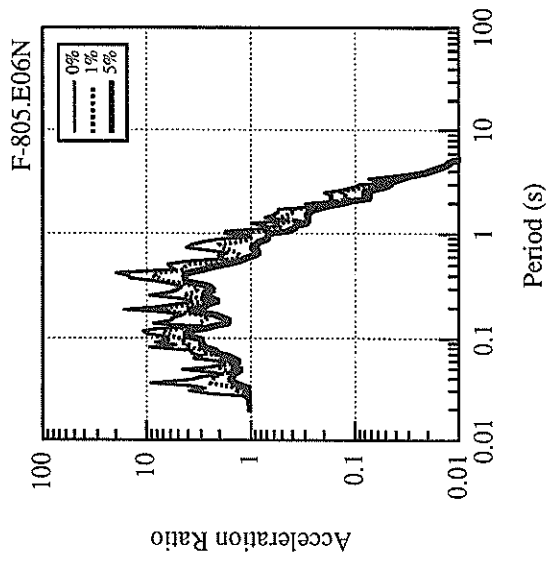
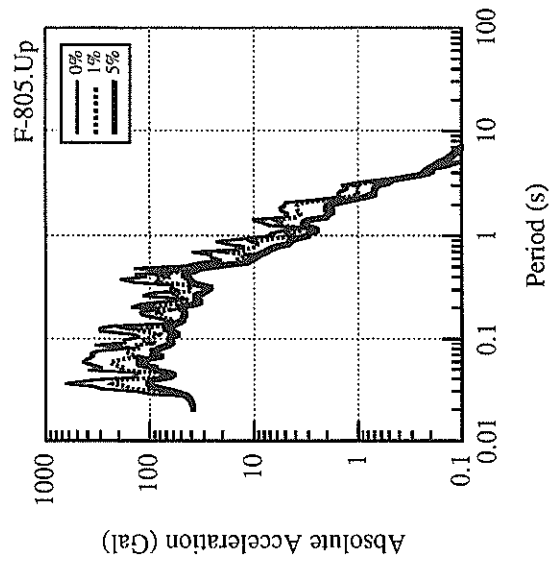
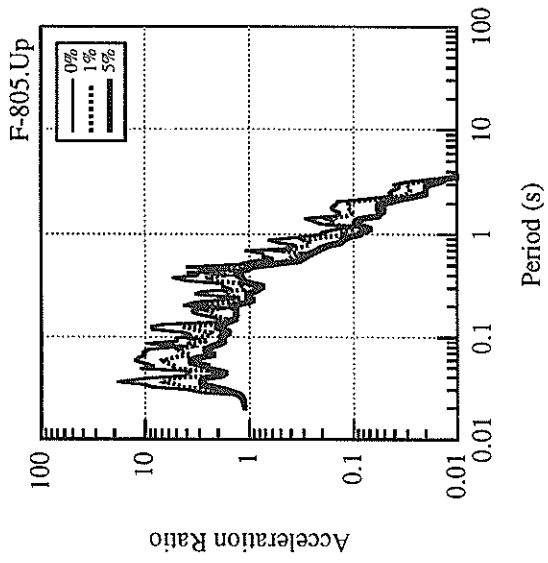
Acceleration

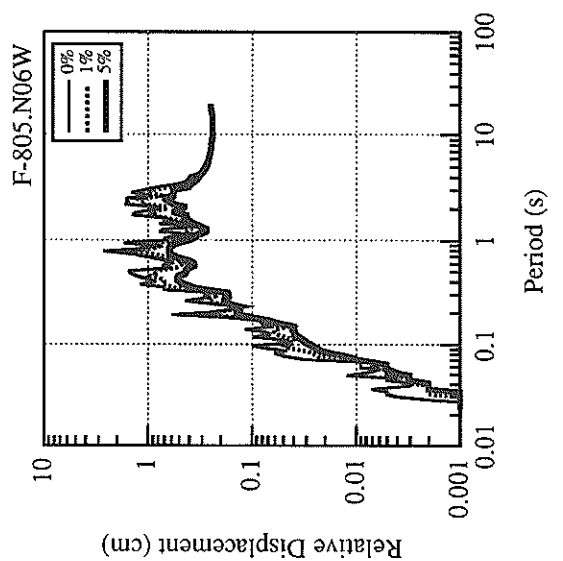
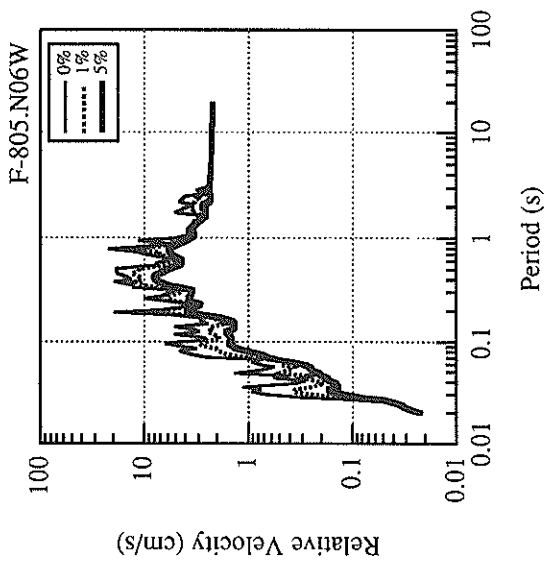
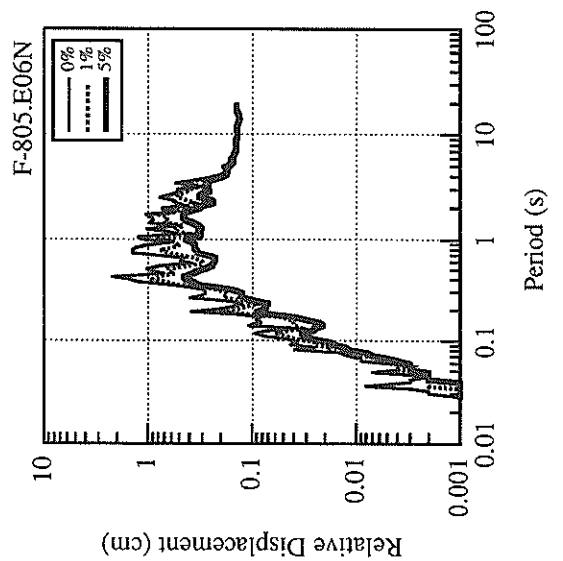
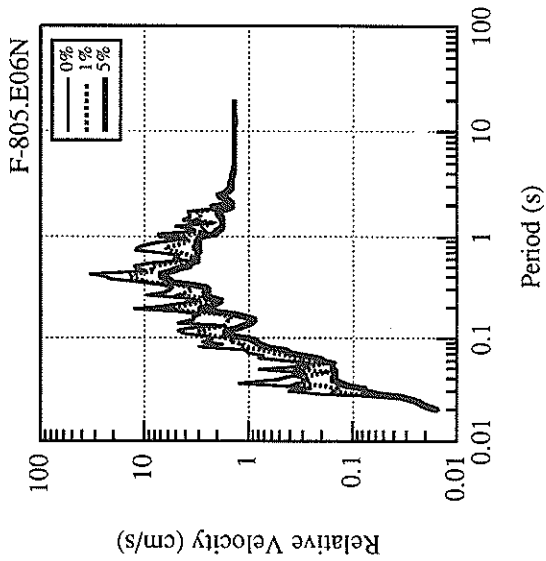
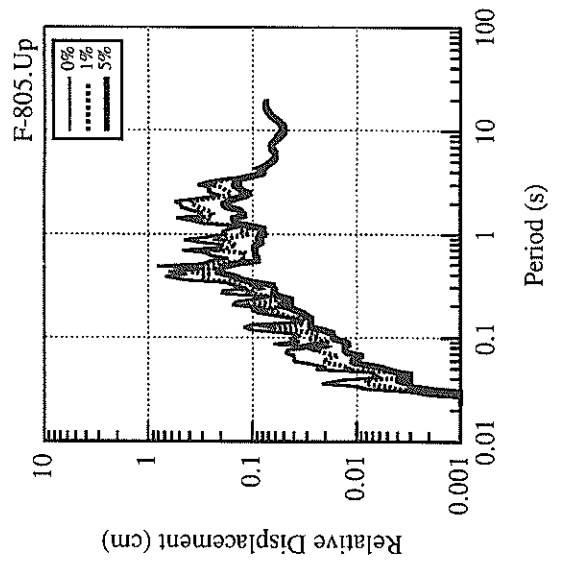
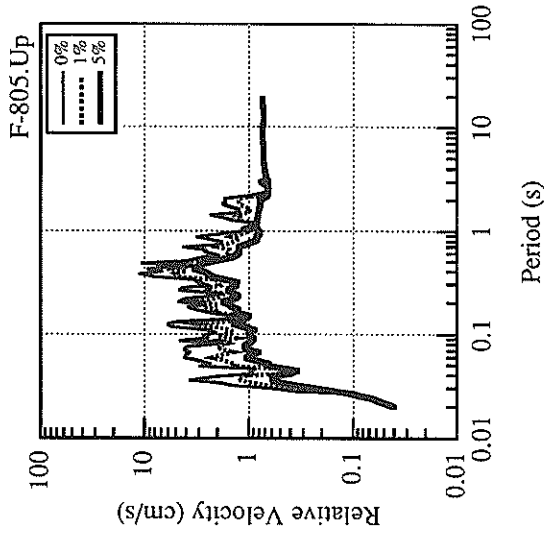


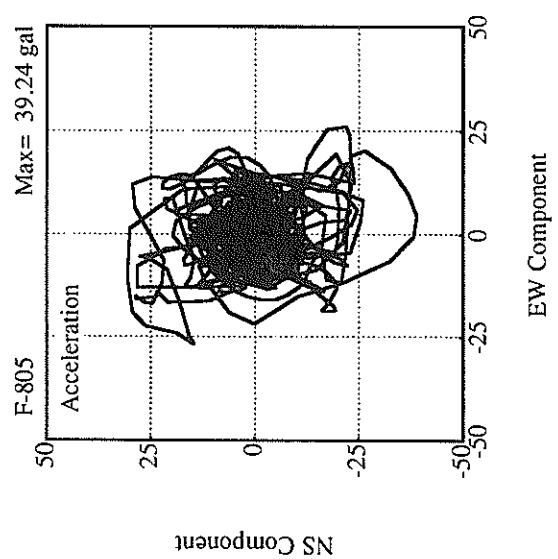
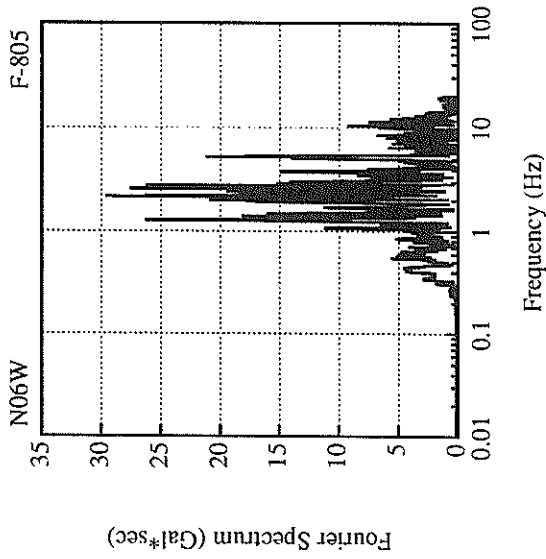
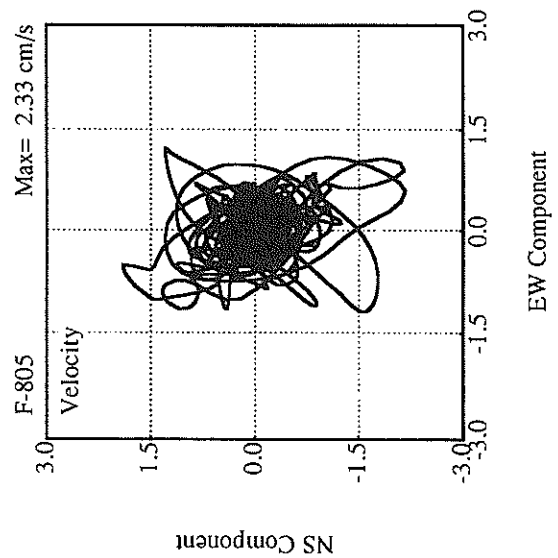
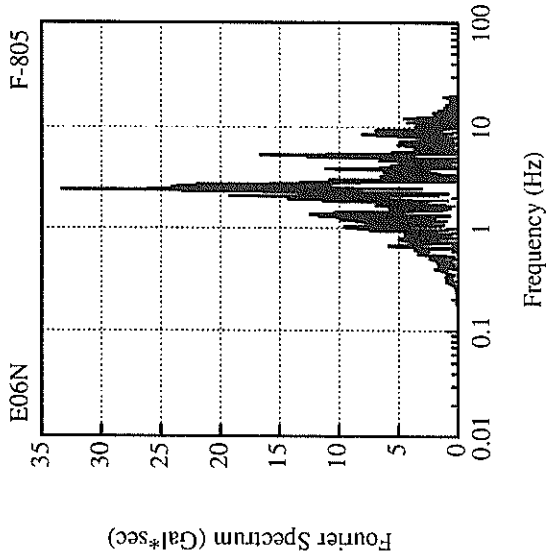
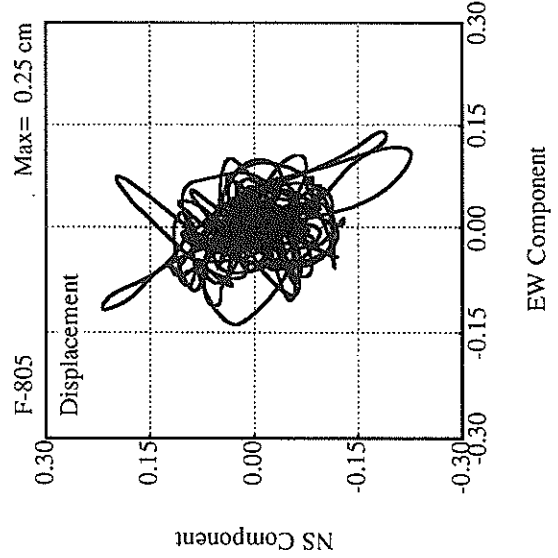
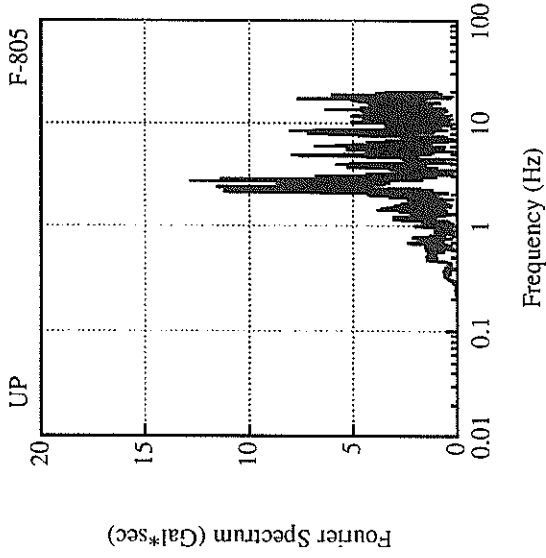
Acceleration











RECORD NUMBER : F-808
 STATION : AMAGASAKI-G

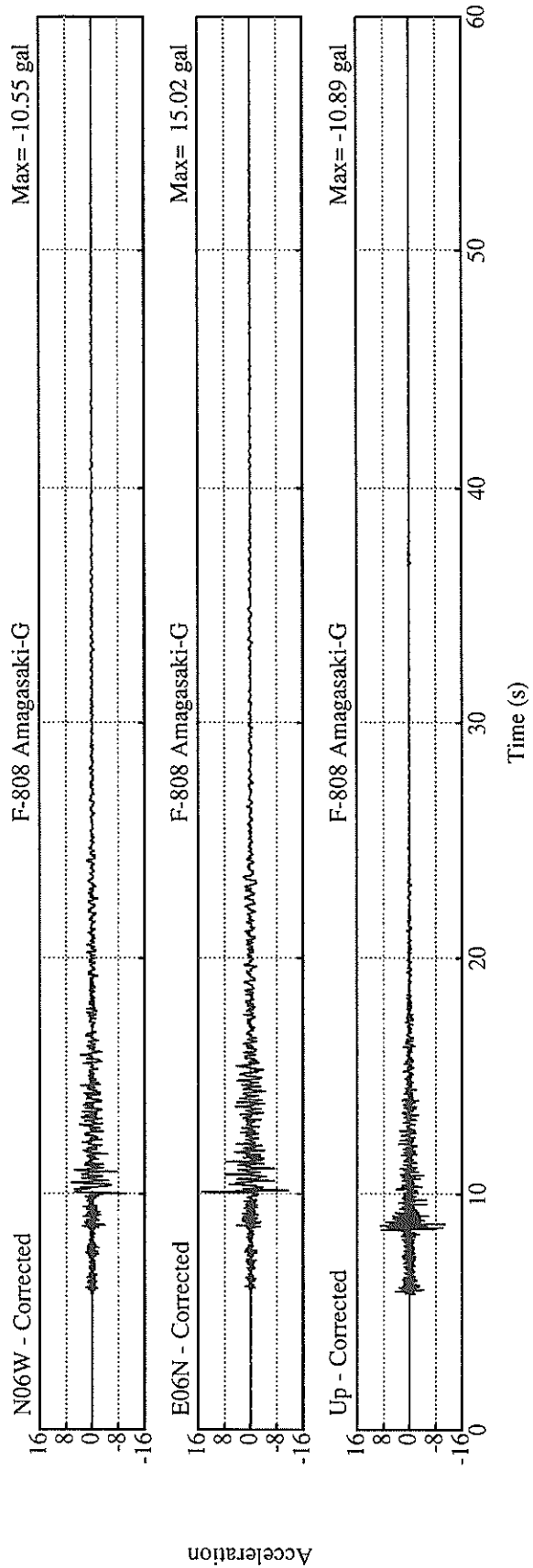
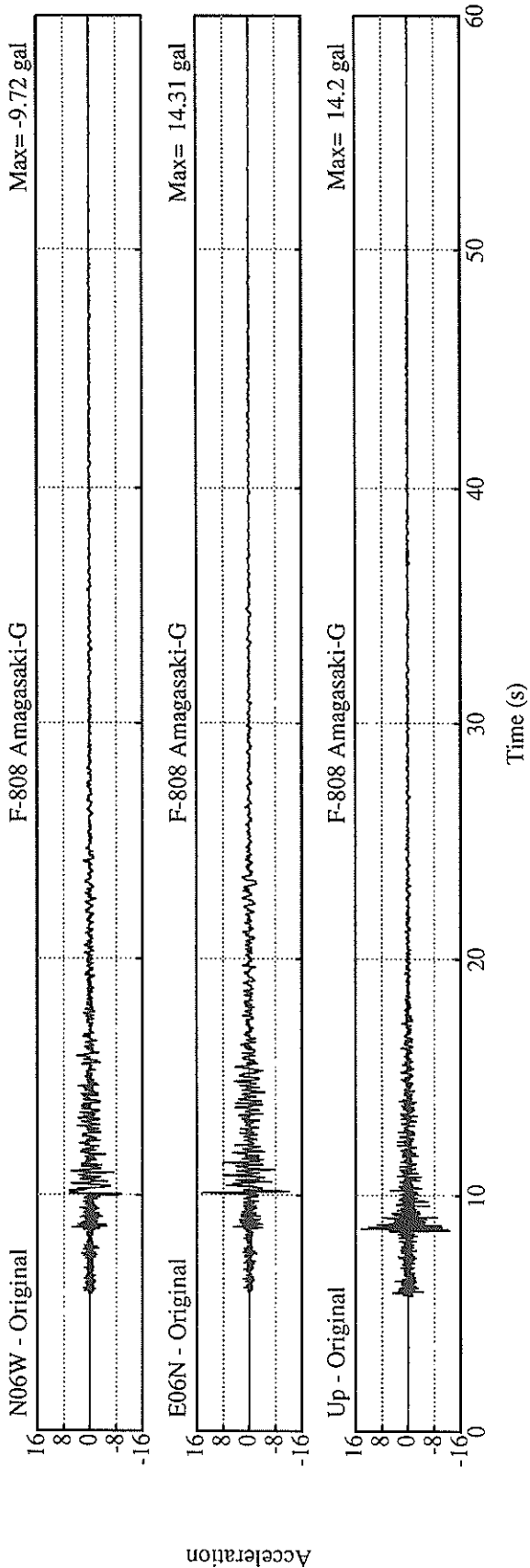
EARTHQUAKE DATA

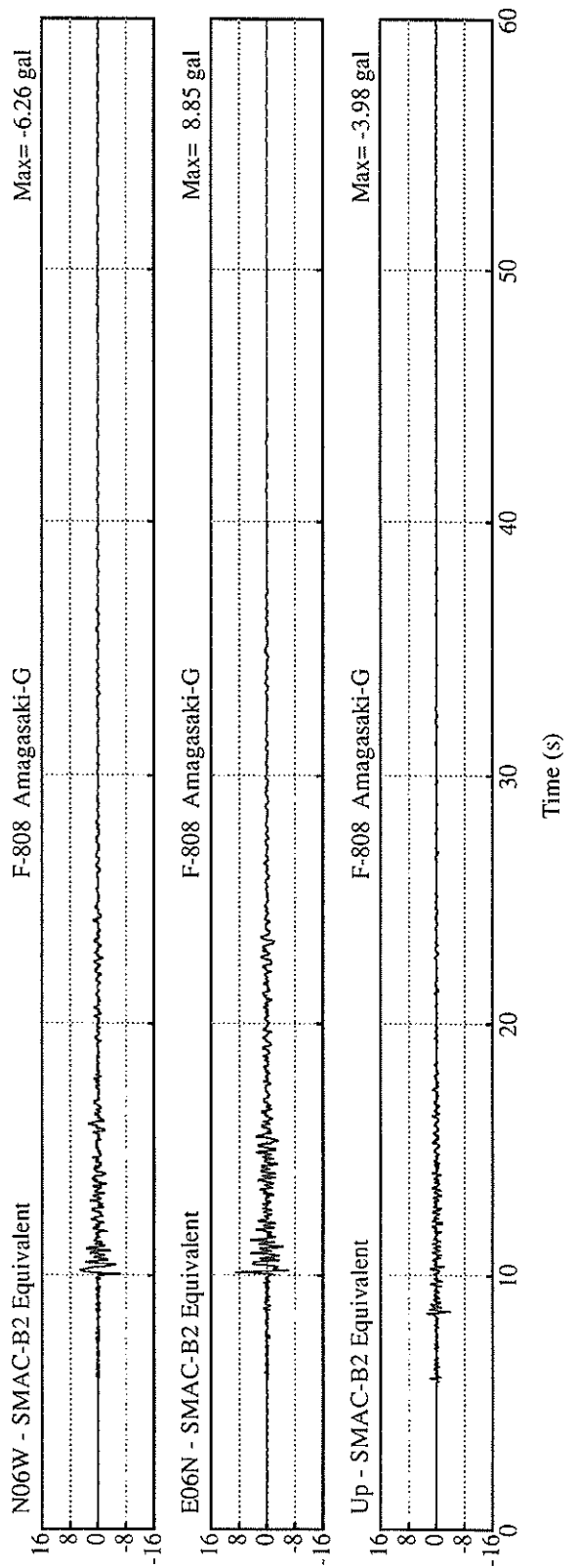
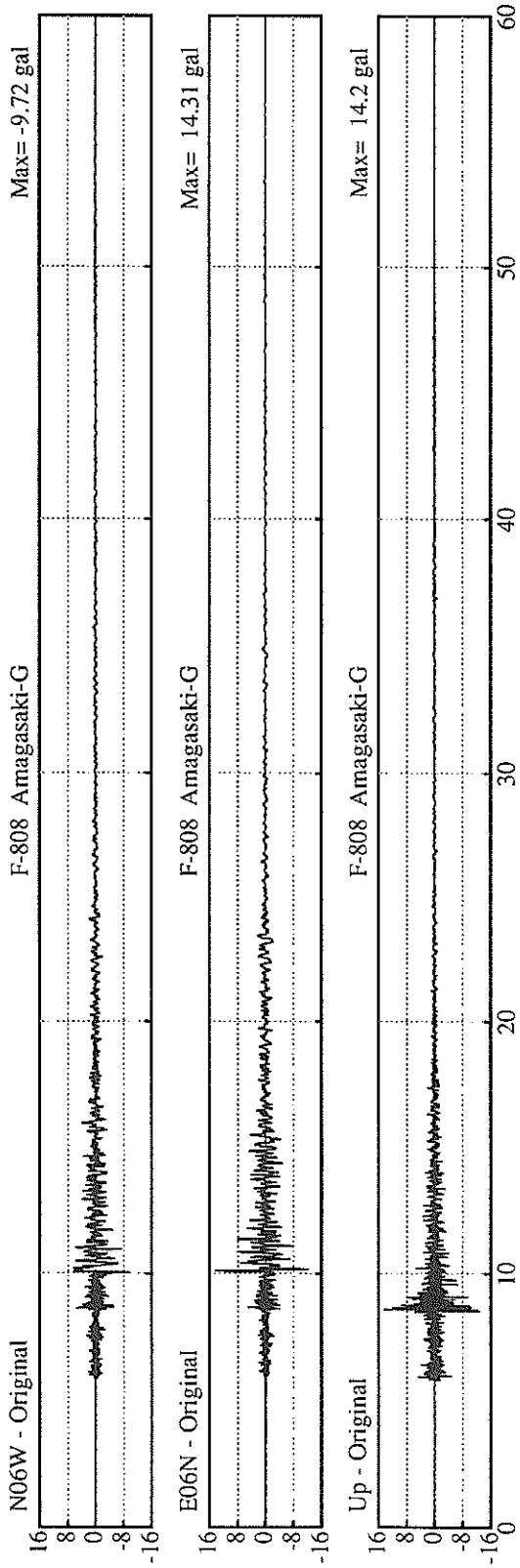
 DATE AND TIME 12:34 JAN.17,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°42.1' N
 LONGITUDE 135°11.5' E
 DEPTH 13.6KM
 JMA MAGNITUDE 3.3

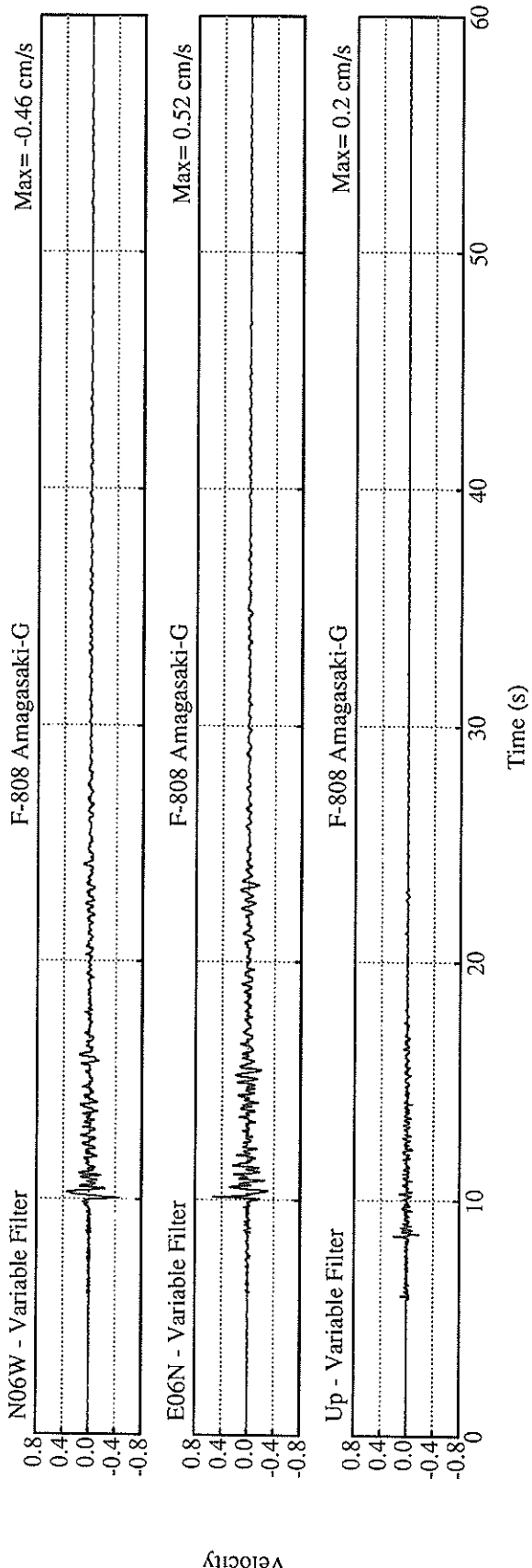
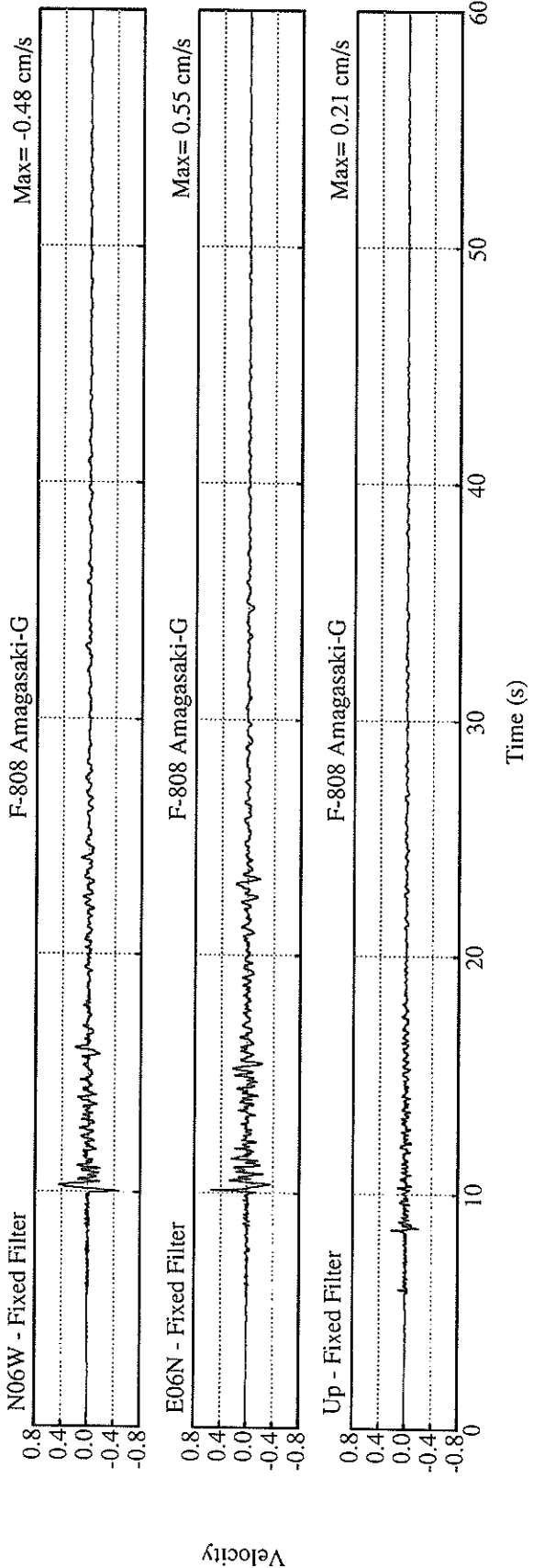
PEAK VALUES OF COMPONENTS

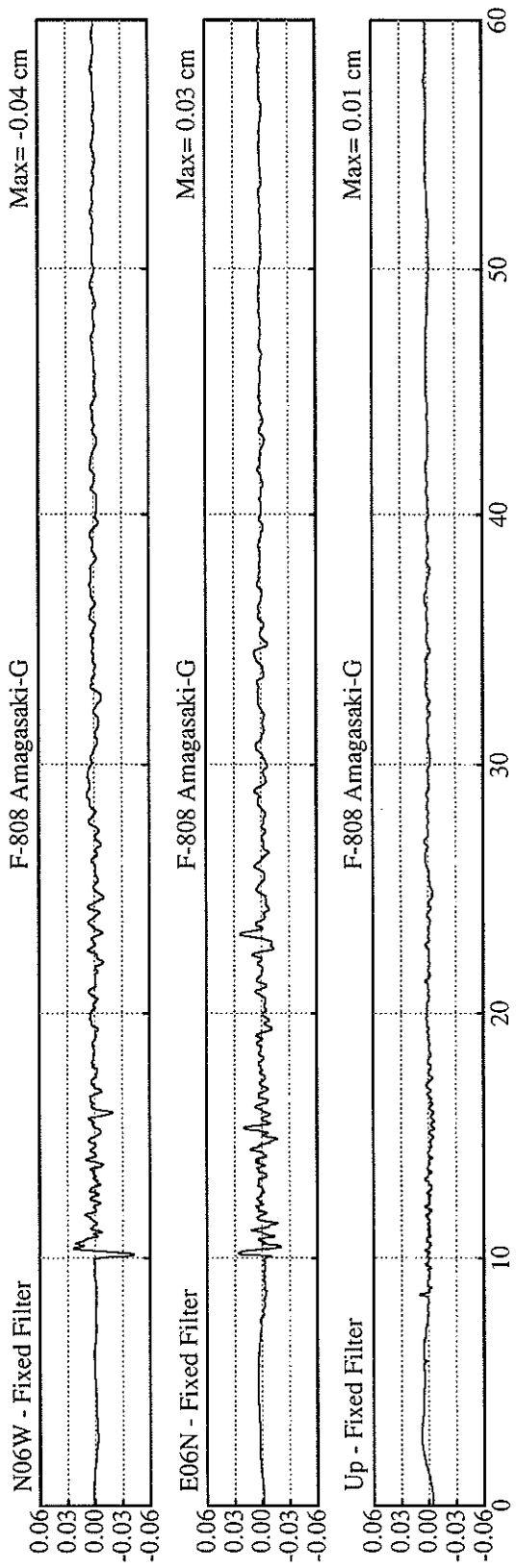
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.092	1.153	2.117	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.3	8.8	4.0	9.4
ORIGINAL	9.7	14.3	14.2	15.2
CORRECTED	10.5	15.0	10.9	15.7
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.48	0.55	0.21	0.56
VARIABLE FILTER	0.46	0.52	0.20	0.54
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.04	0.03	0.01	0.05
VARIABLE FILTER	0.03	0.02	0.01	0.03

* RESULTANT OF HORIZONTAL COMPONENTS

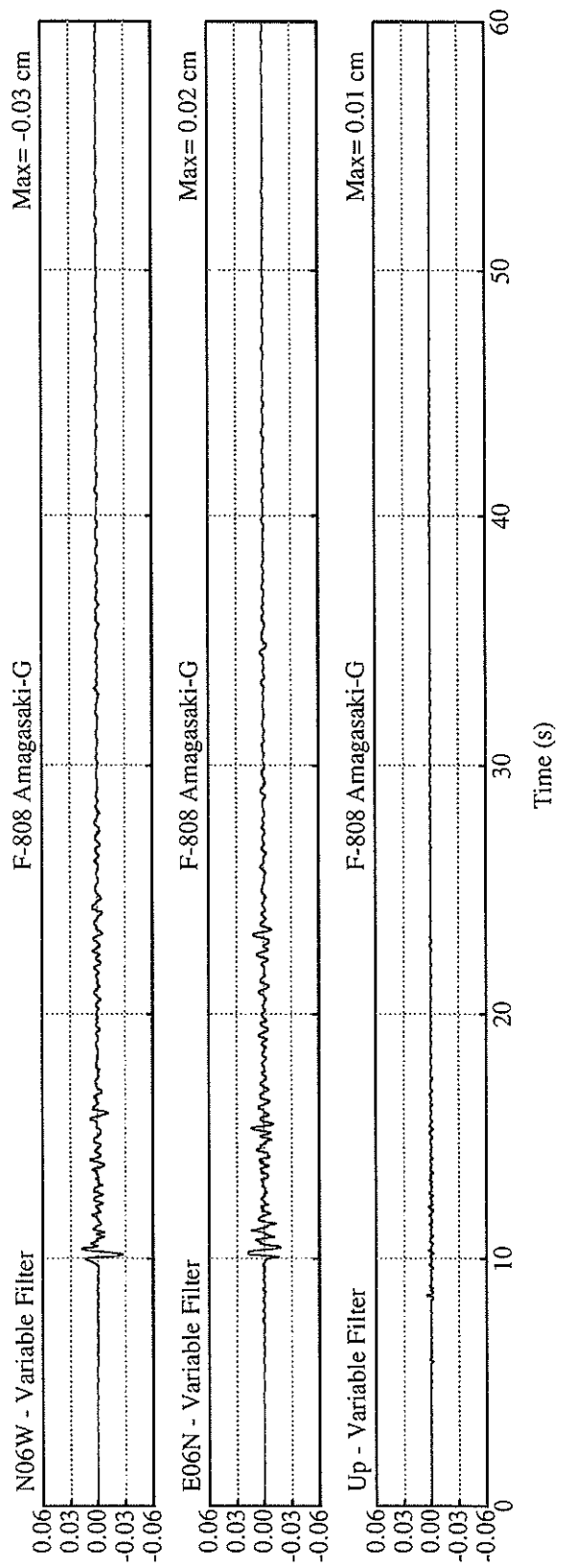




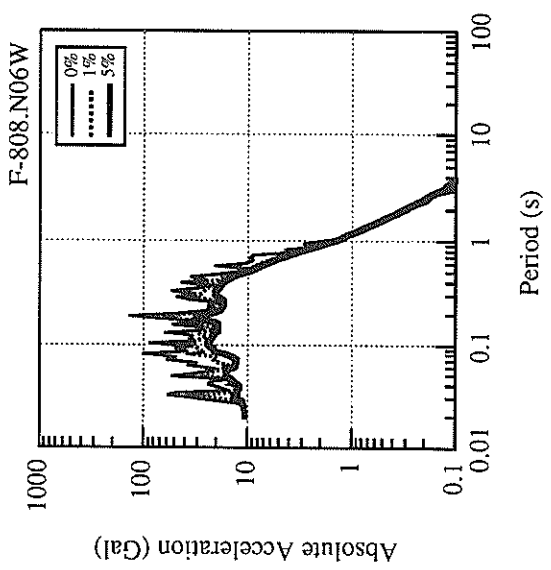
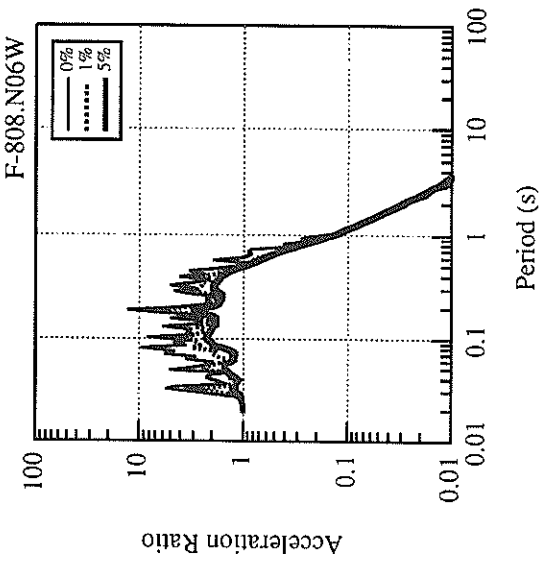
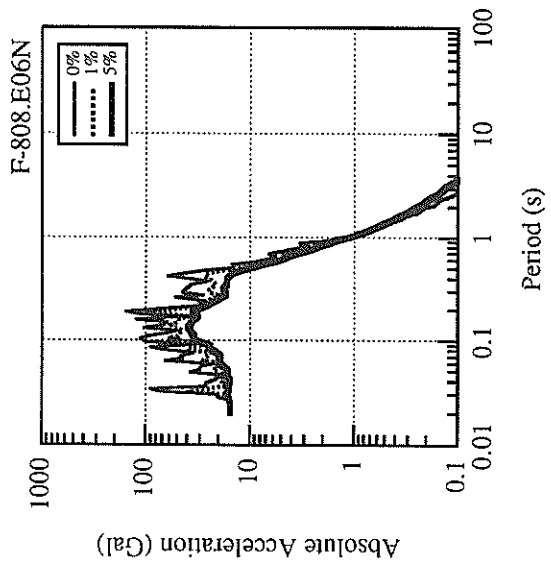
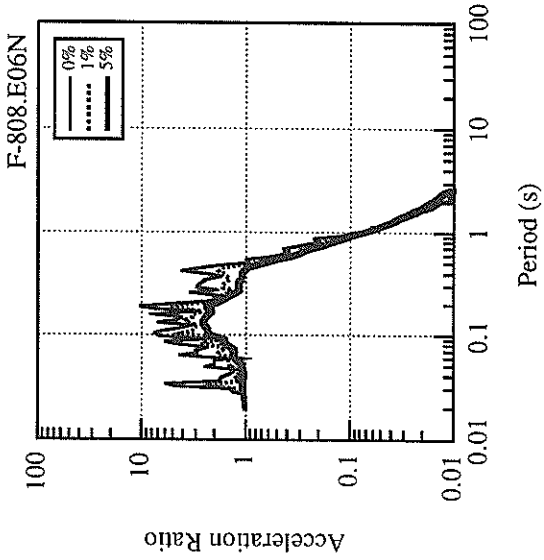
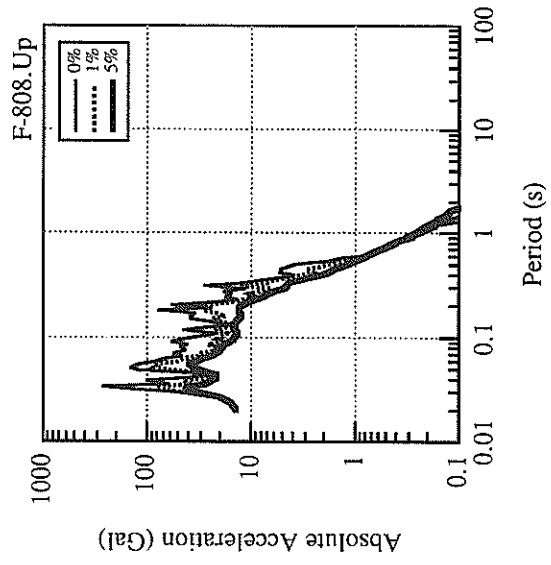
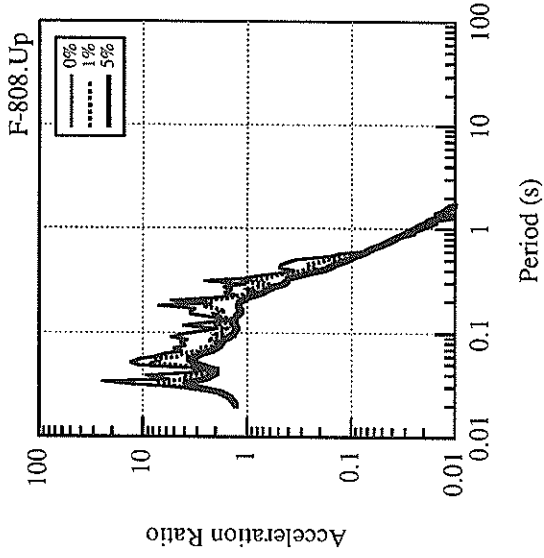


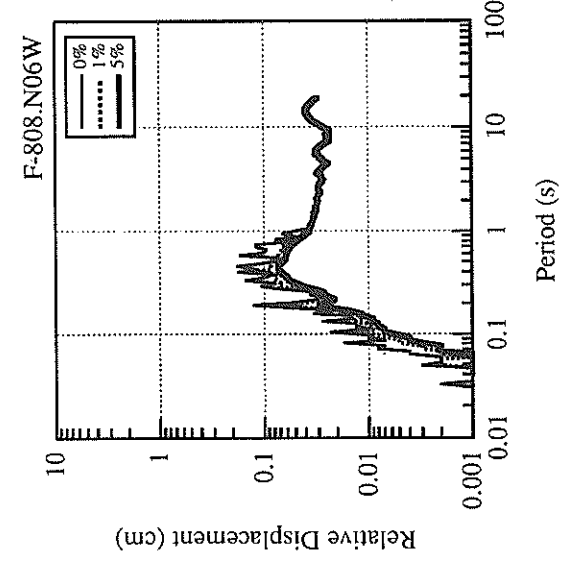
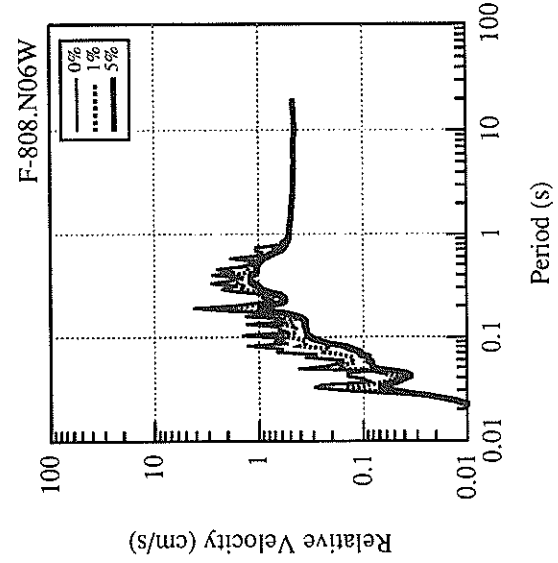
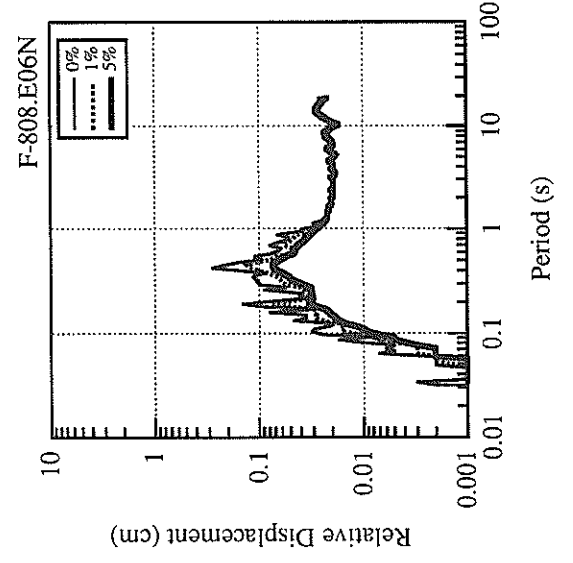
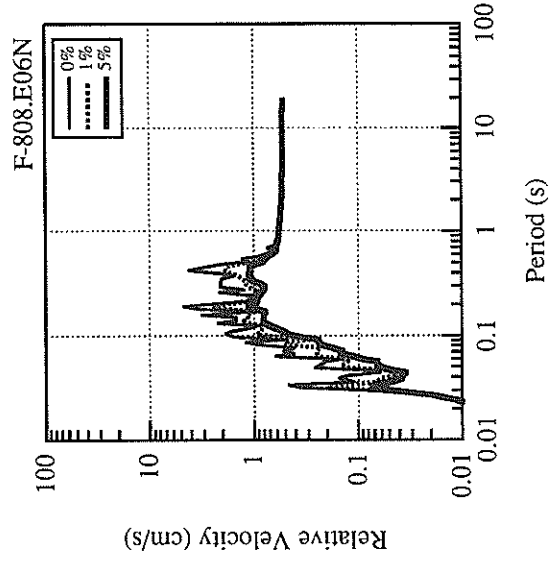
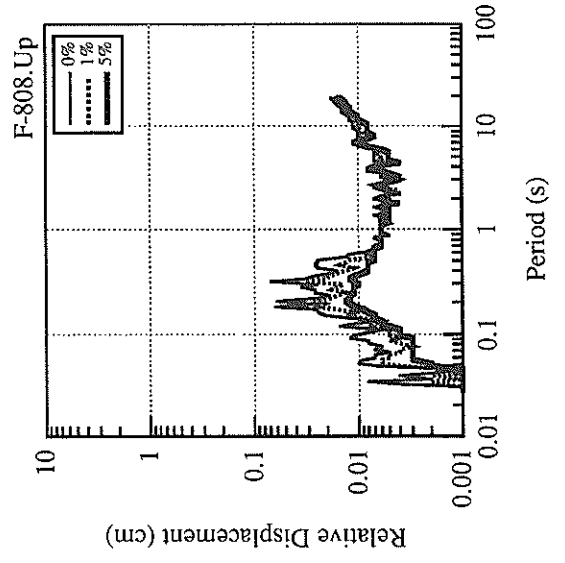
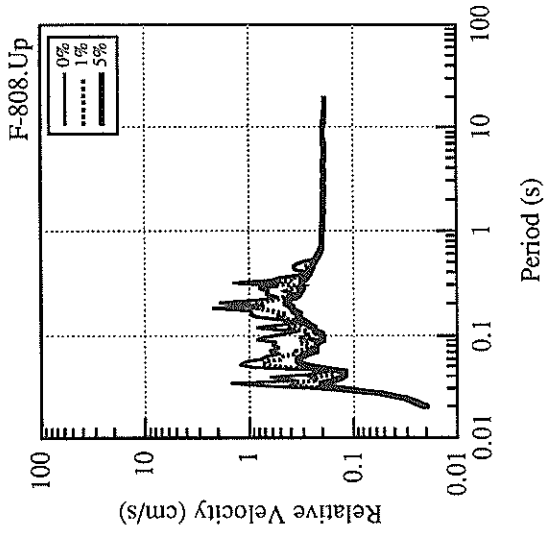


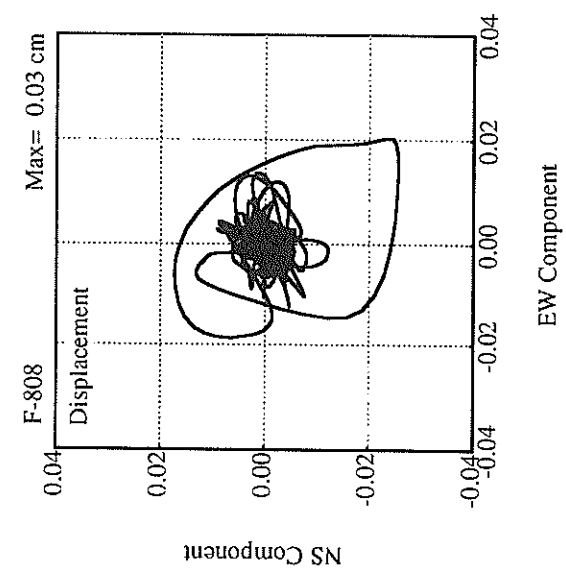
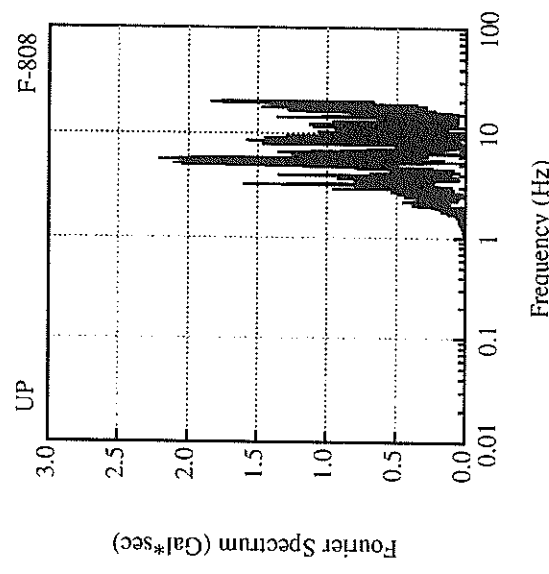
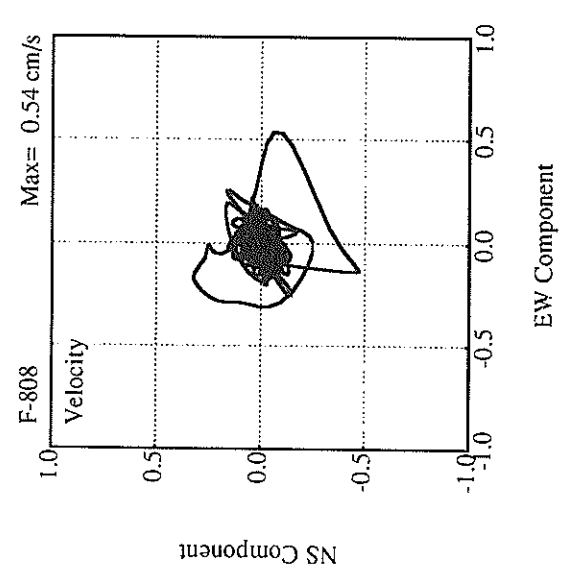
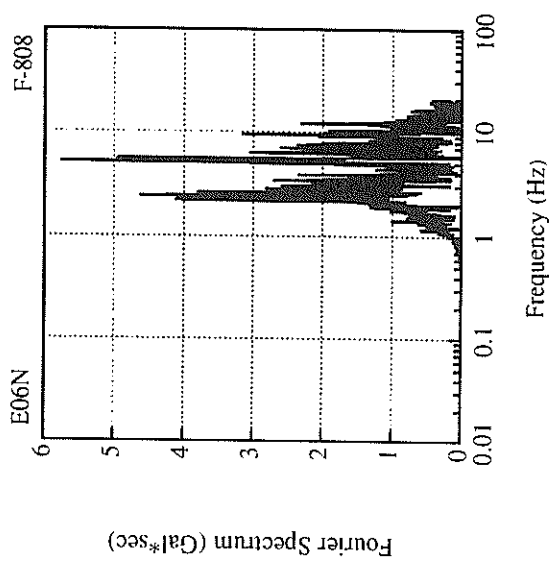
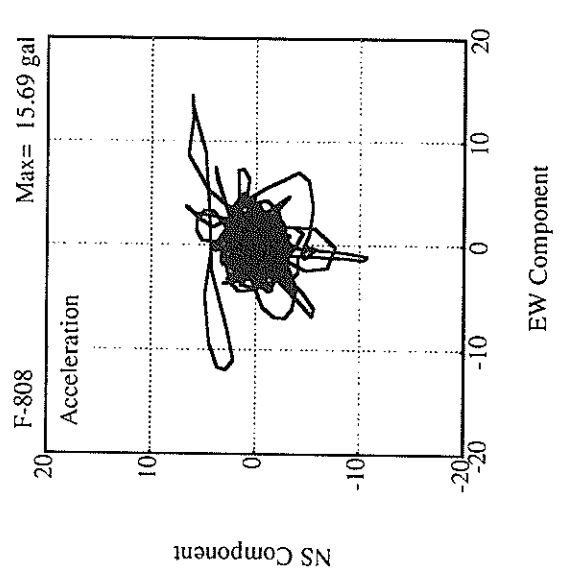
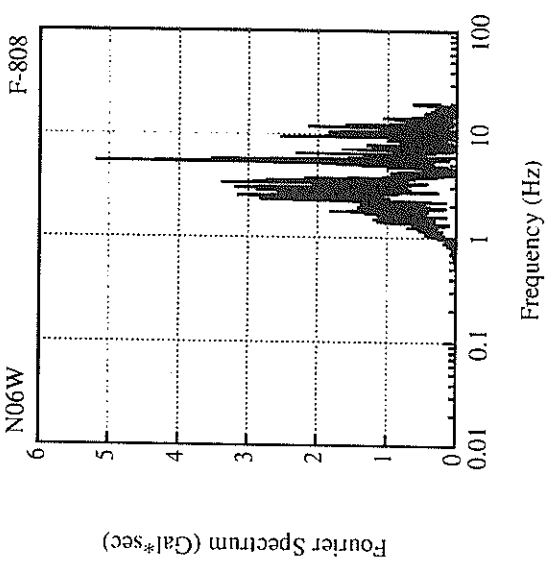
Displacement



Displacement







RECORD NUMBER : F-809

STATION : AMAGASAKI-G

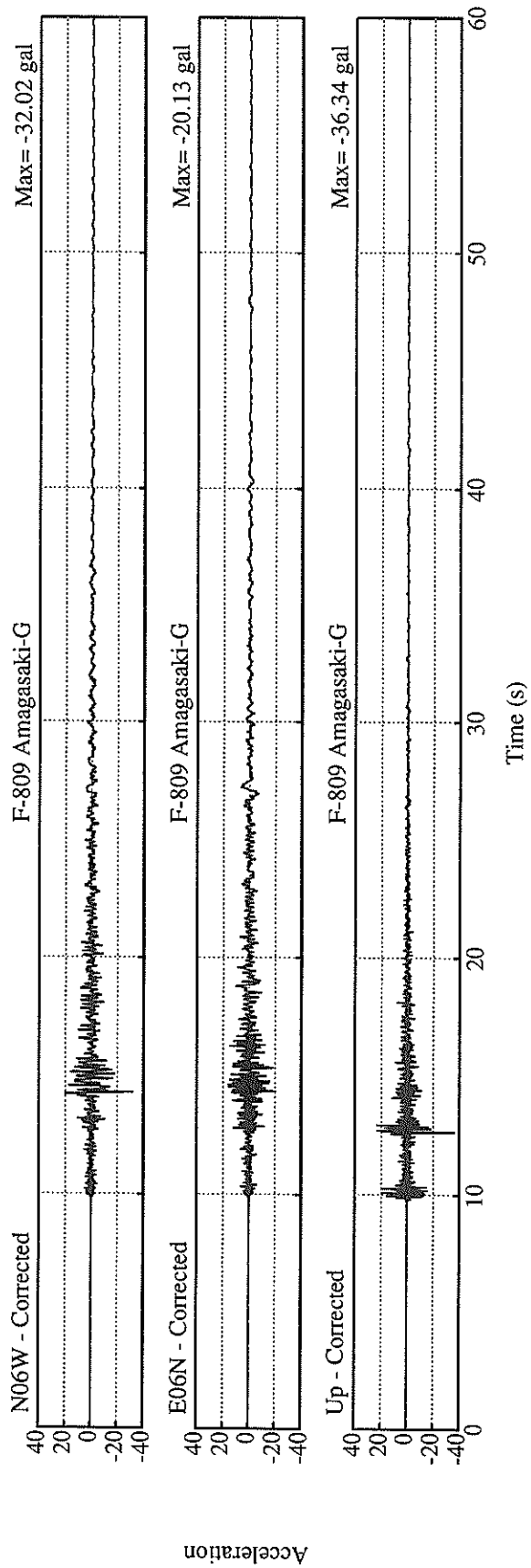
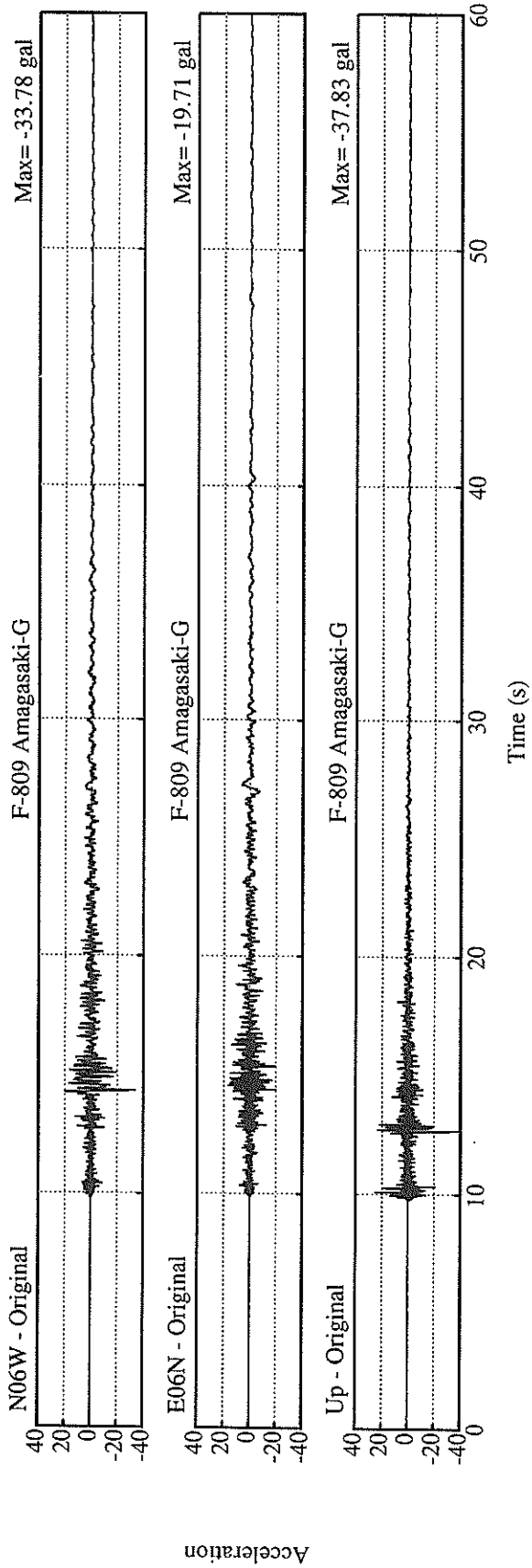
EARTHQUAKE DATA

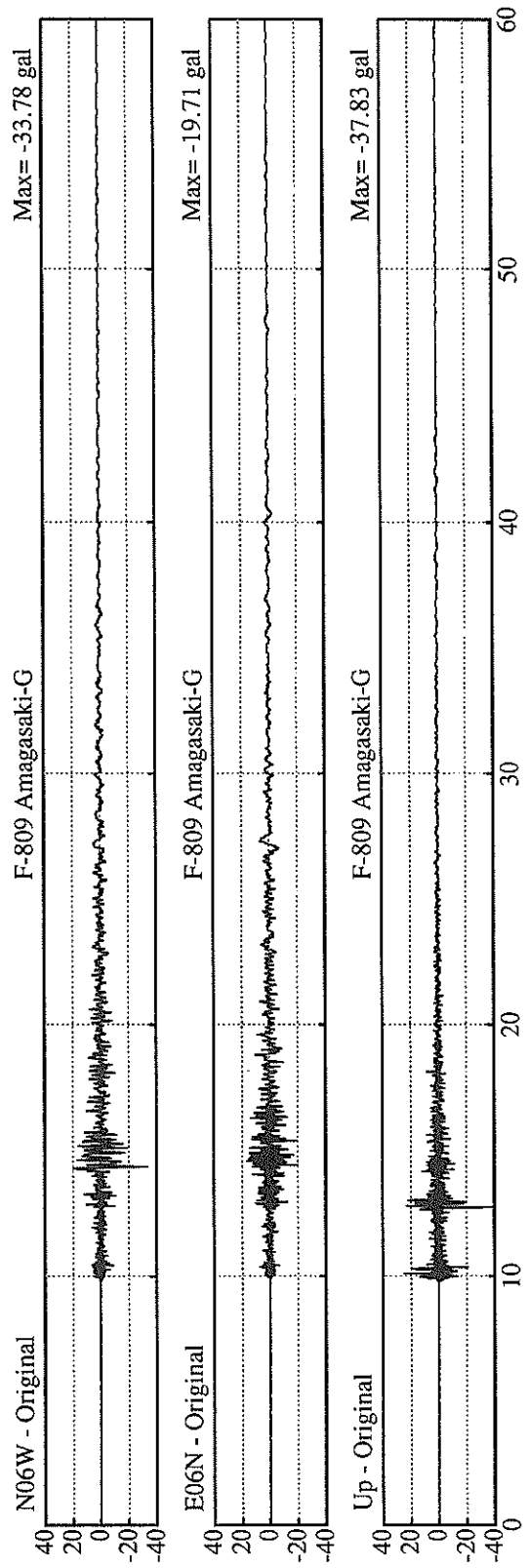
DATE AND TIME 13: 5 JAN.17,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION SE HYOGO PREF
LATITUDE 34°41.3' N
LONGITUDE 135°10.4' E
DEPTH 14.5KM
JMA MAGNITUDE 4.7

PEAK VALUES OF COMPONENTS

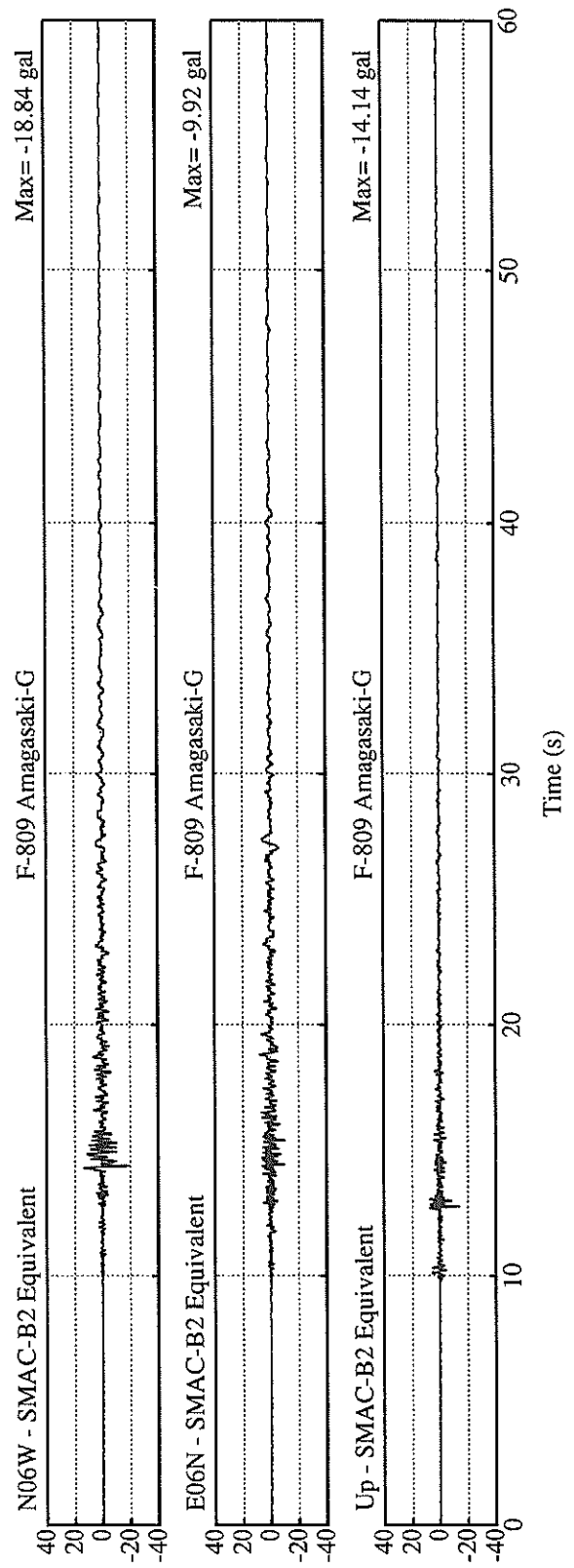
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.494	0.463	0.738	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	18.8	9.9	14.1	19.8
ORIGINAL	33.8	19.7	37.8	36.0
CORRECTED	32.0	20.1	36.3	34.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	1.32	0.94	0.60	1.32
VARIABLE FILTER	1.41	0.85	0.58	1.41
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.13	0.14	0.04	0.14
VARIABLE FILTER	0.10	0.11	0.02	0.11

* RESULTANT OF HORIZONTAL COMPONENTS

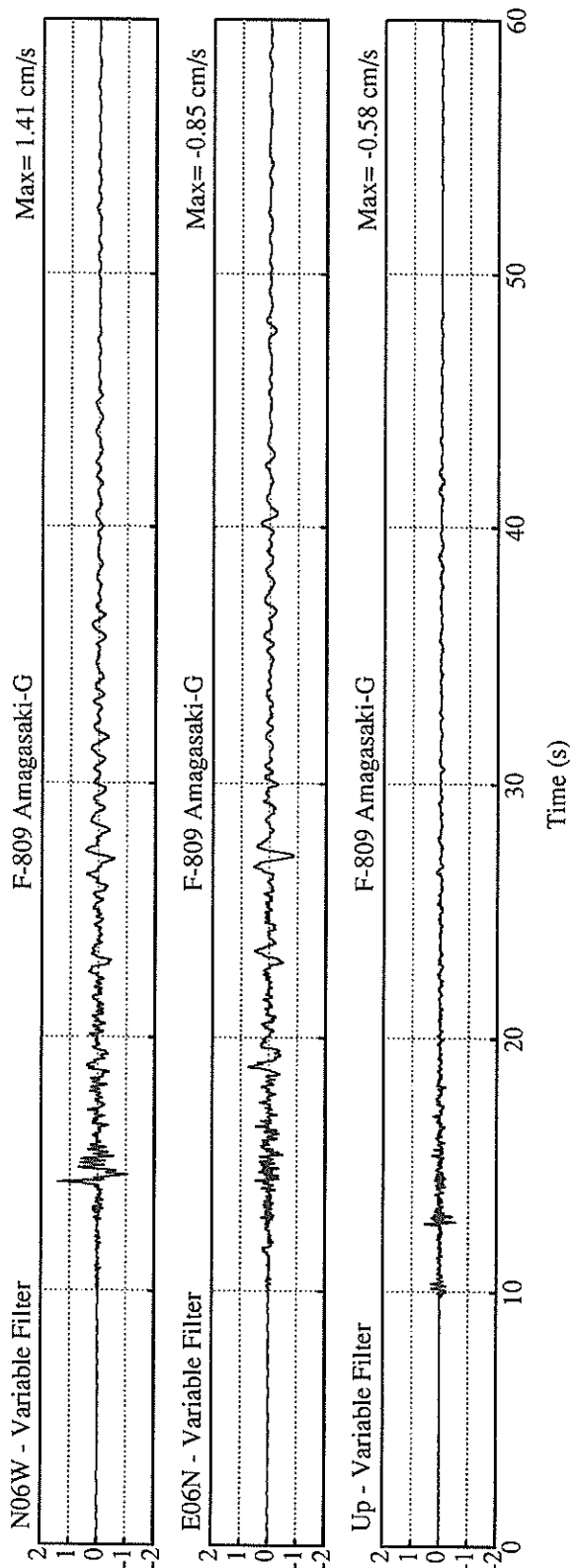
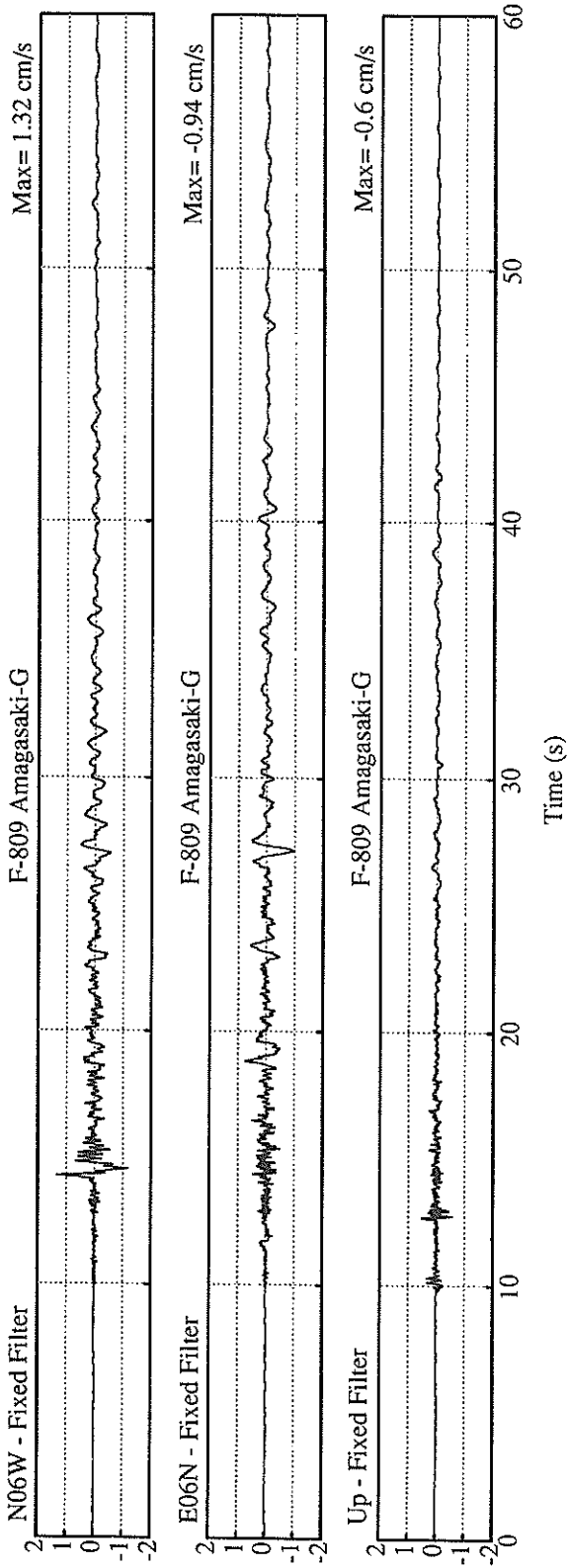


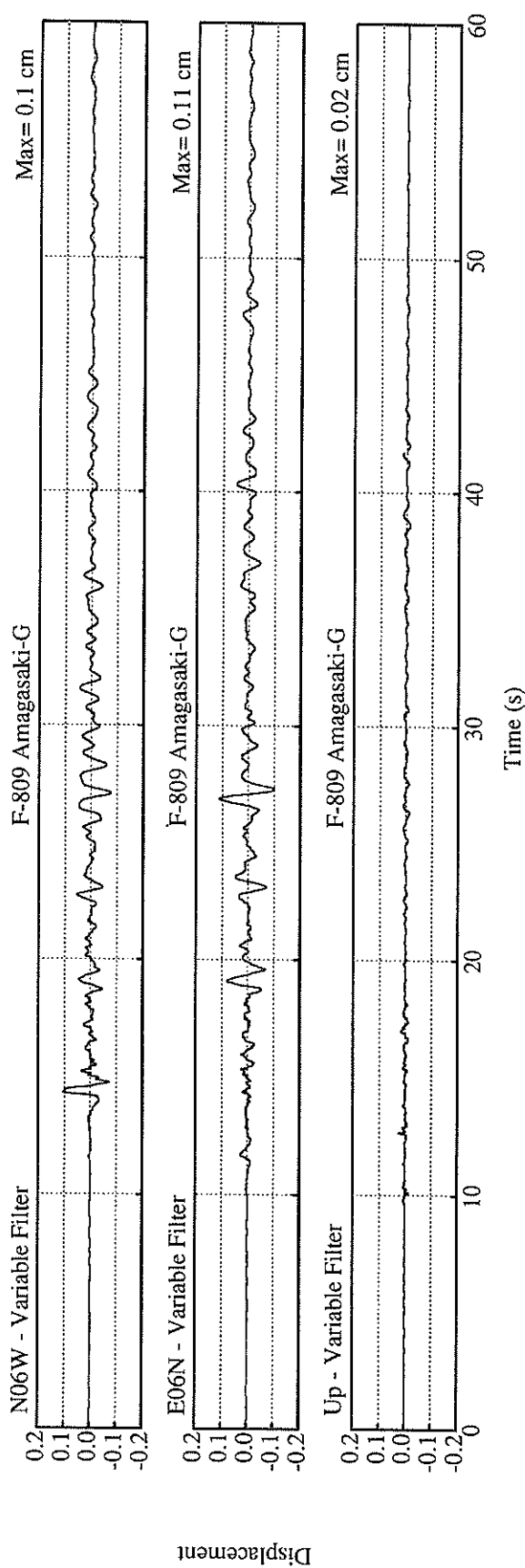
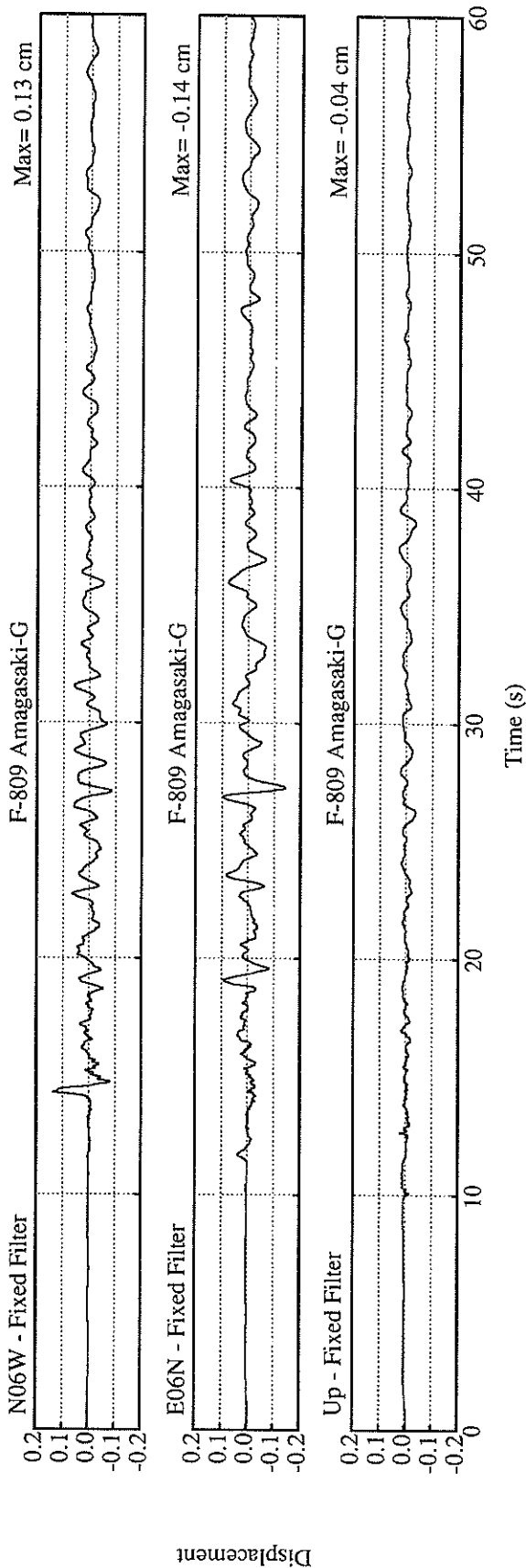


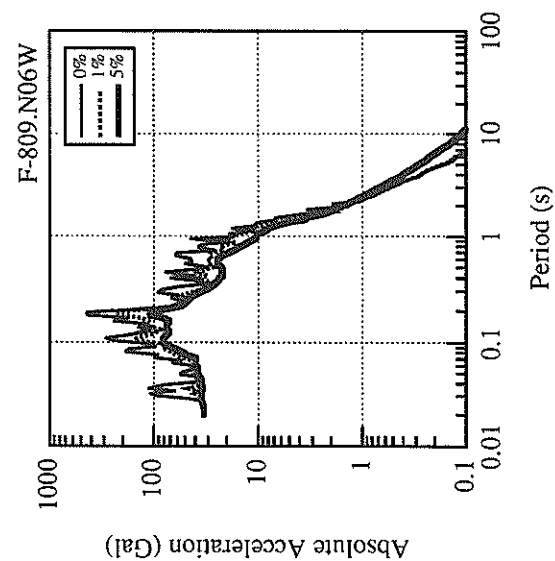
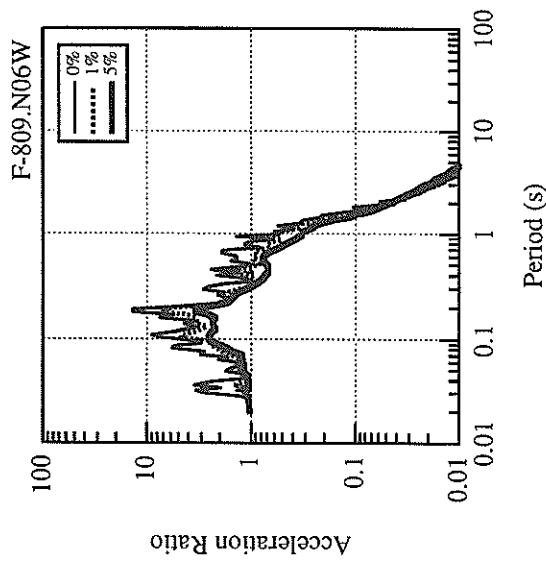
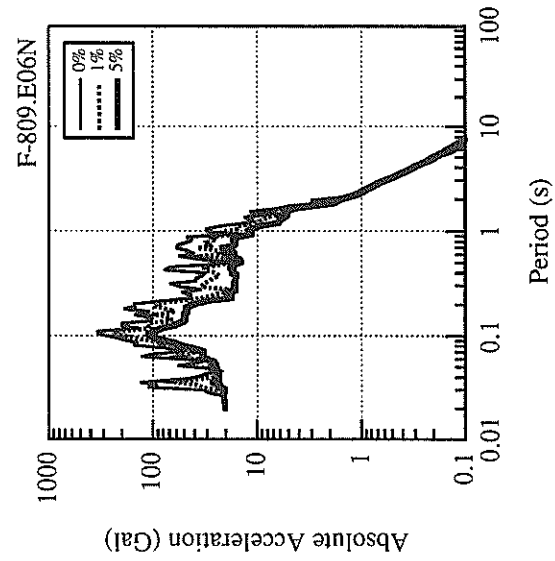
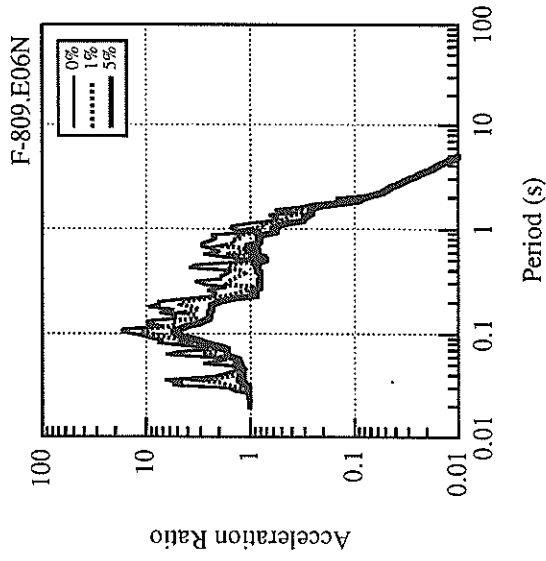
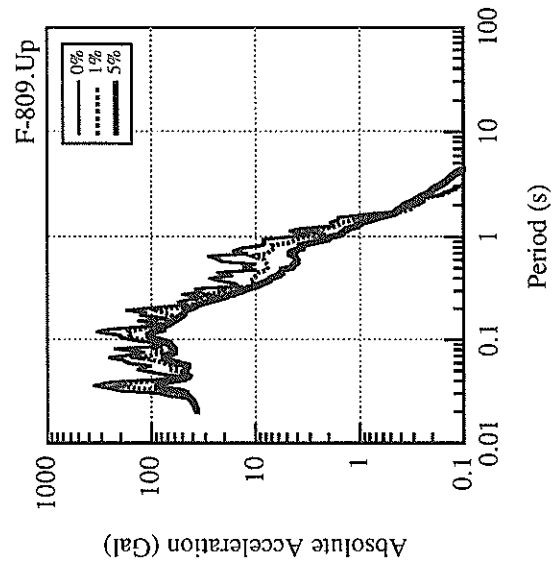
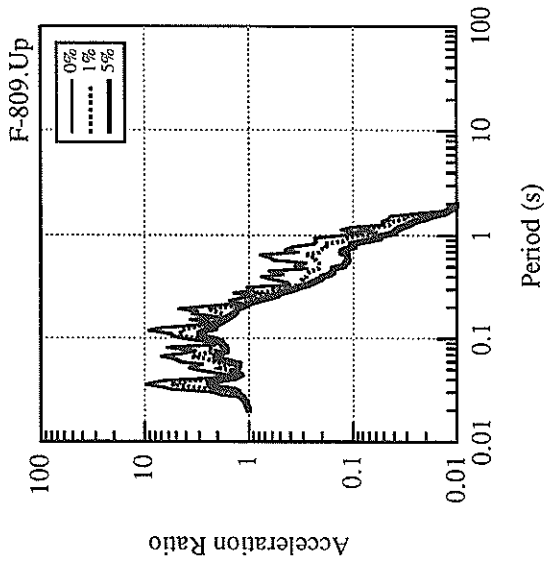
Acceleration

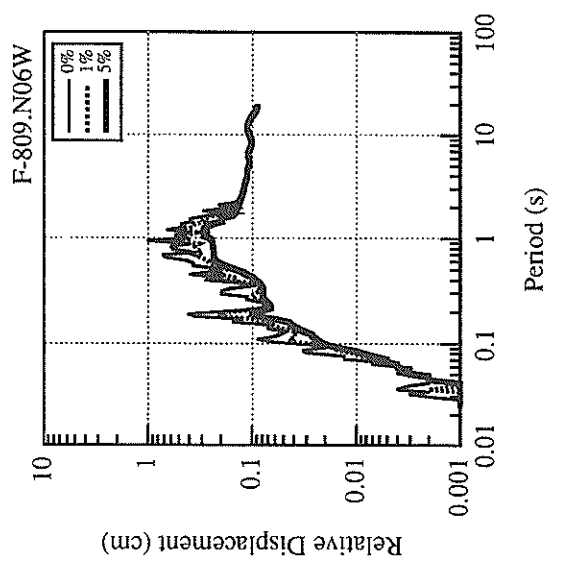
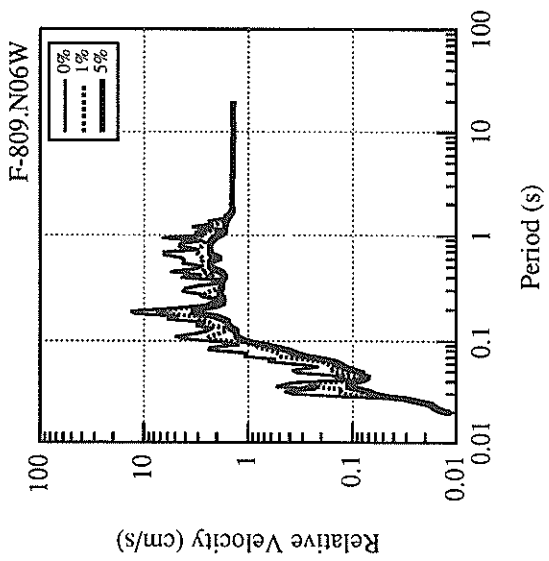
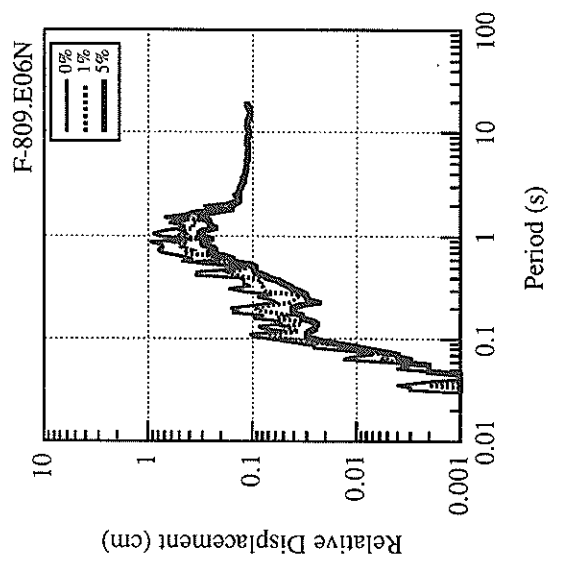
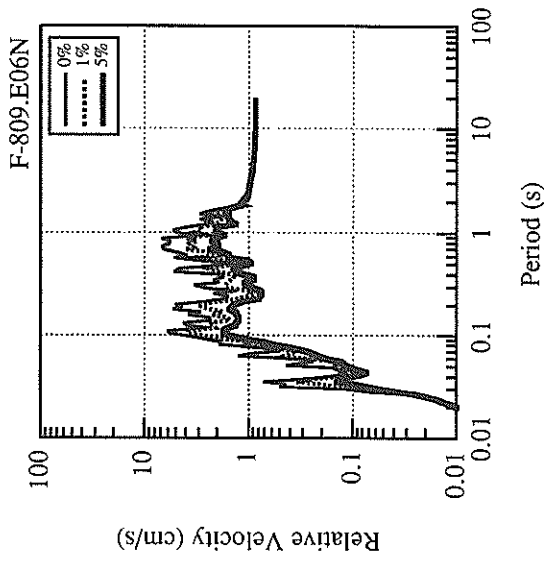
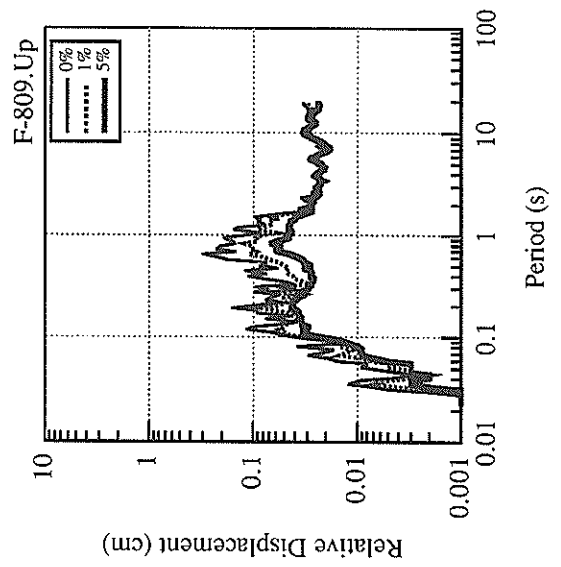
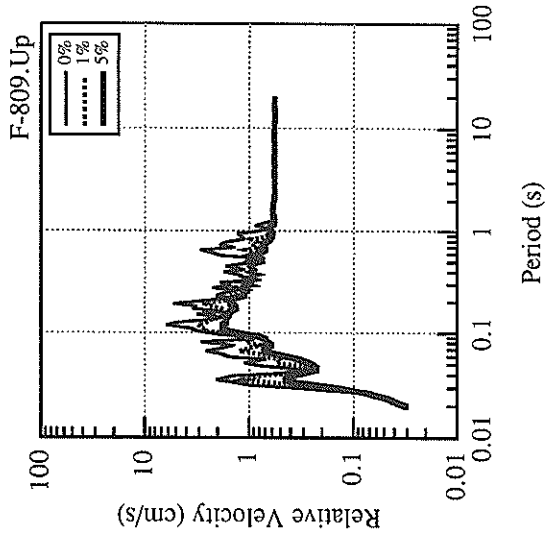


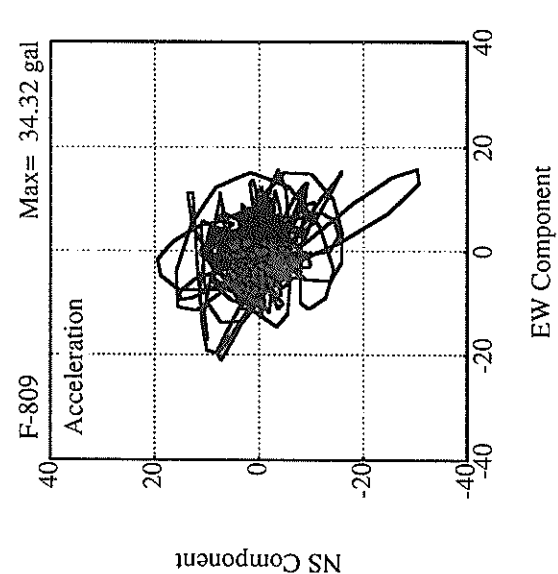
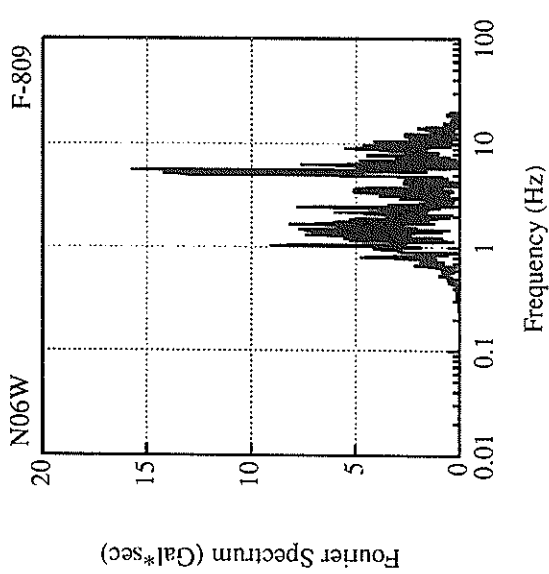
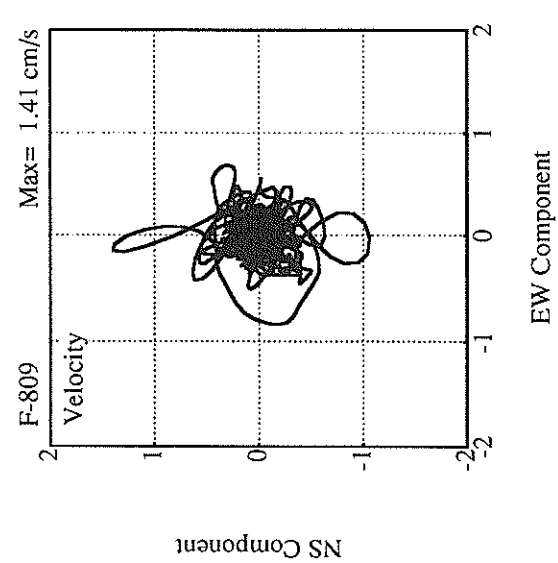
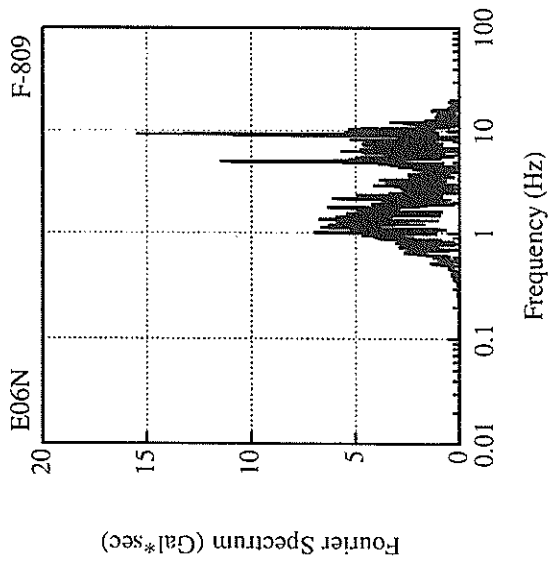
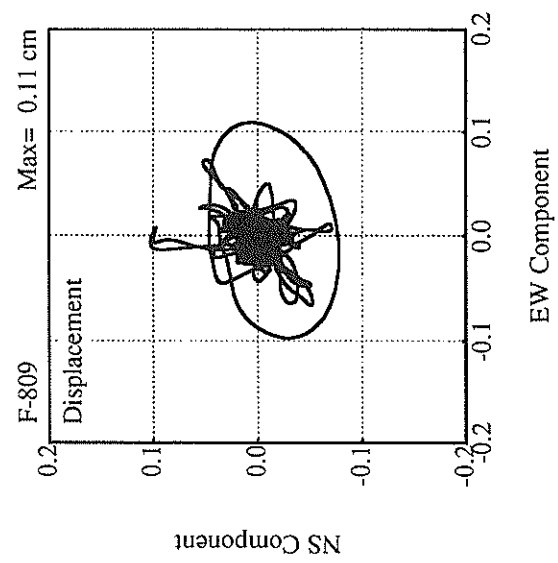
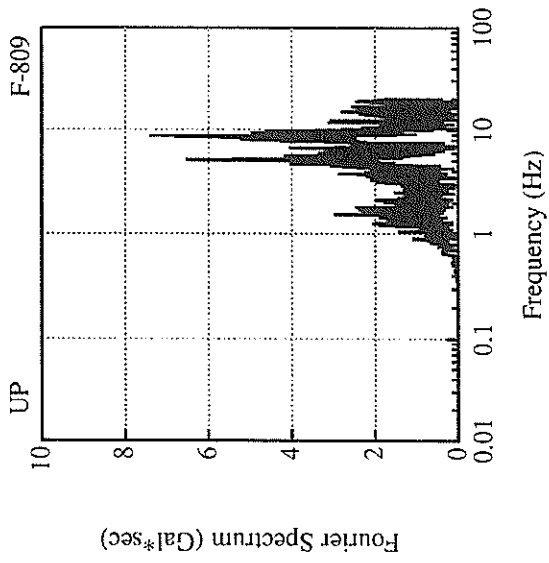
Acceleration











RECORD NUMBER : F-810
 STATION : AMAGASAKI-G

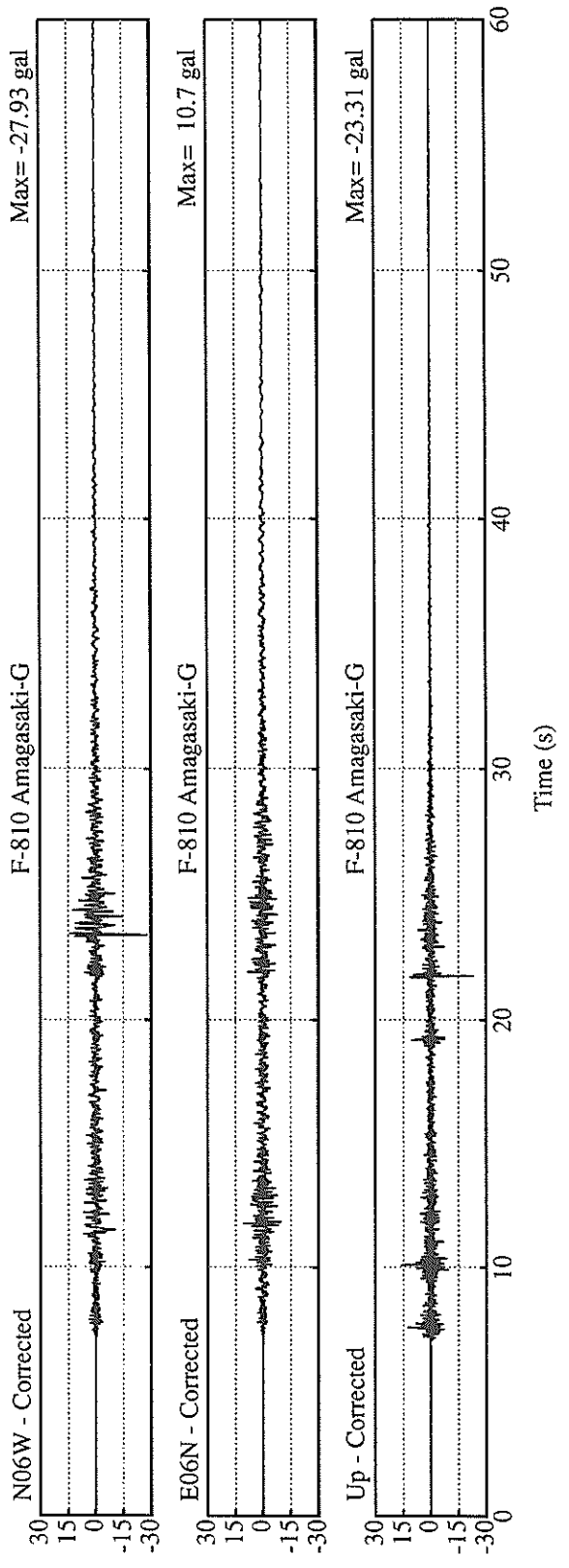
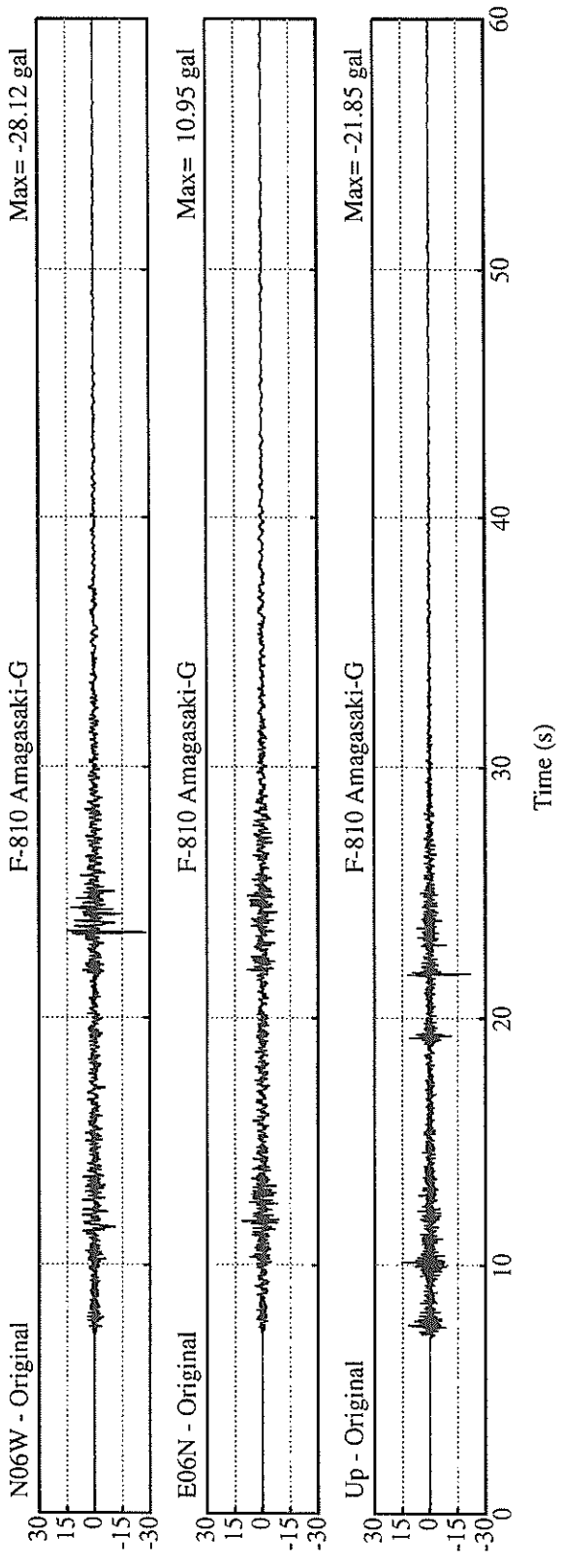
EARTHQUAKE DATA

 DATE AND TIME 0:51 JAN.18,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°40.8' N
 LONGITUDE 135°10.7' E
 DEPTH 15.7KM
 JMA MAGNITUDE 4.3

PEAK VALUES OF COMPONENTS

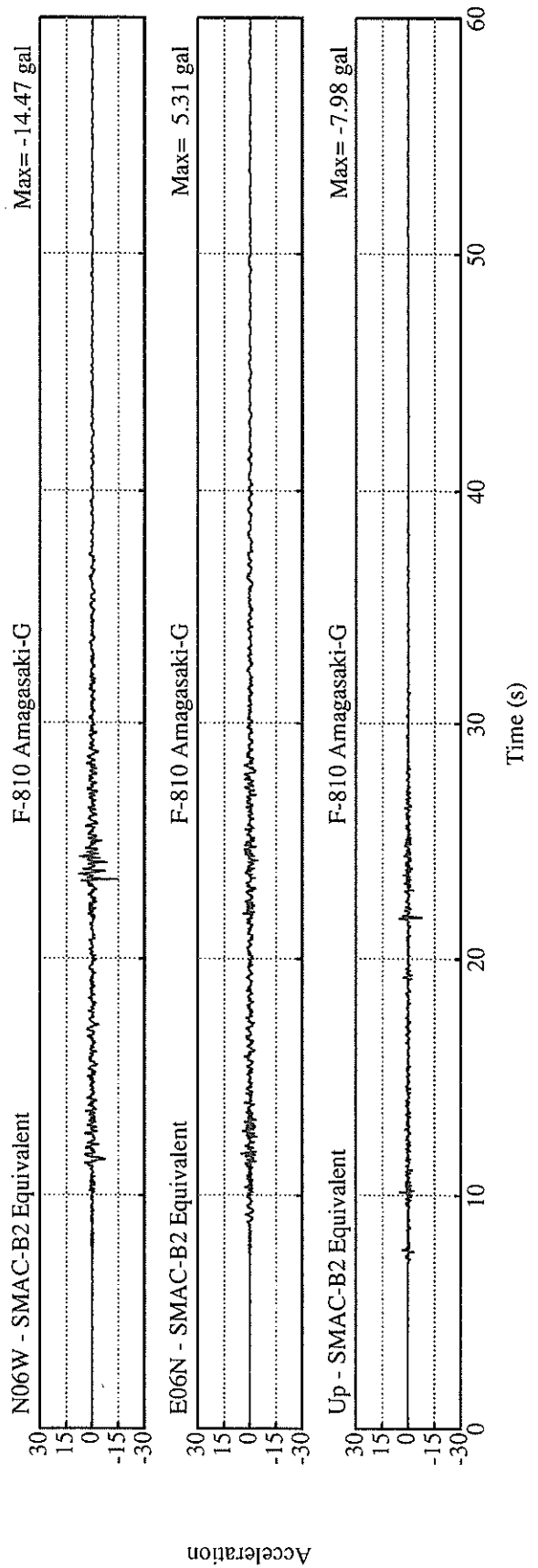
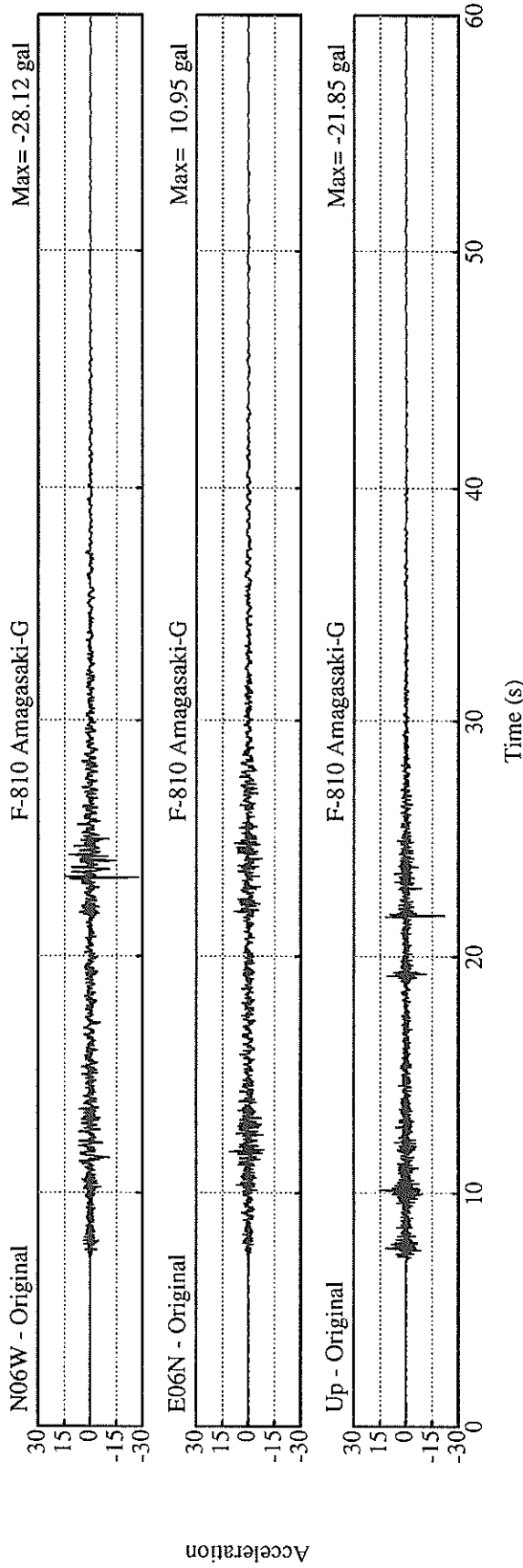
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.665	0.646	1.379	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	14.5	5.3	8.0	14.5
ORIGINAL	28.1	10.9	21.8	28.1
CORRECTED	27.9	10.7	23.3	27.9
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.60	0.34	0.34	0.60
VARIABLE FILTER	0.59	0.32	0.35	0.59
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.06	0.05	0.02	0.06
VARIABLE FILTER	0.05	0.03	0.01	0.05

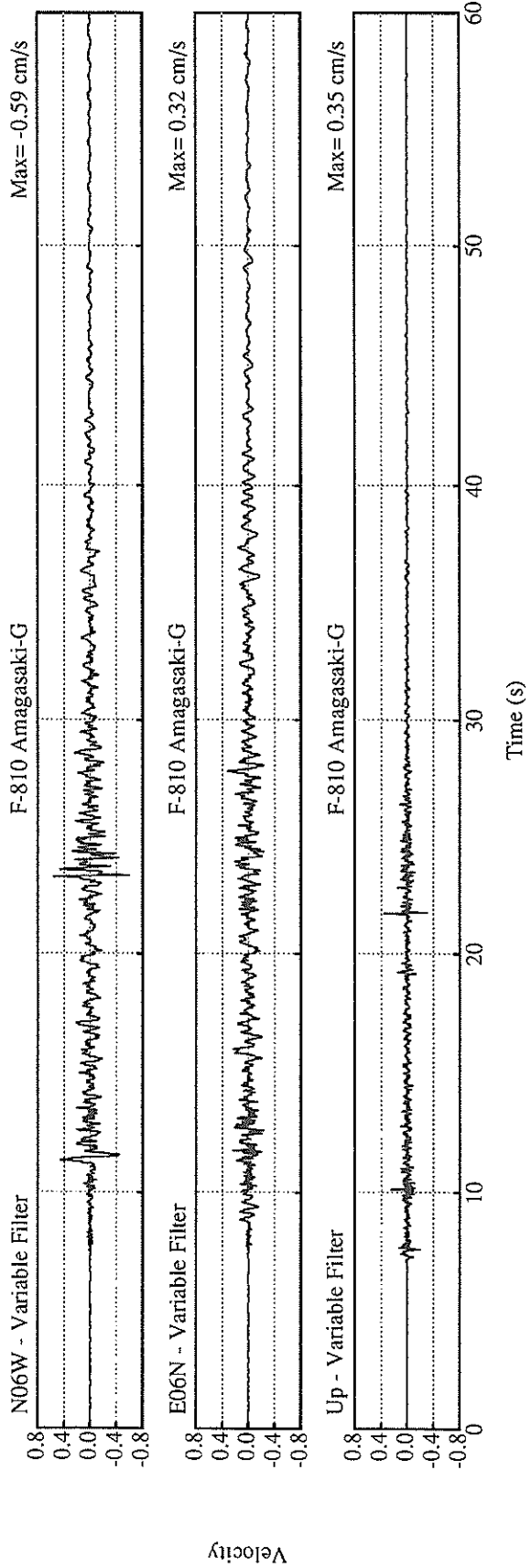
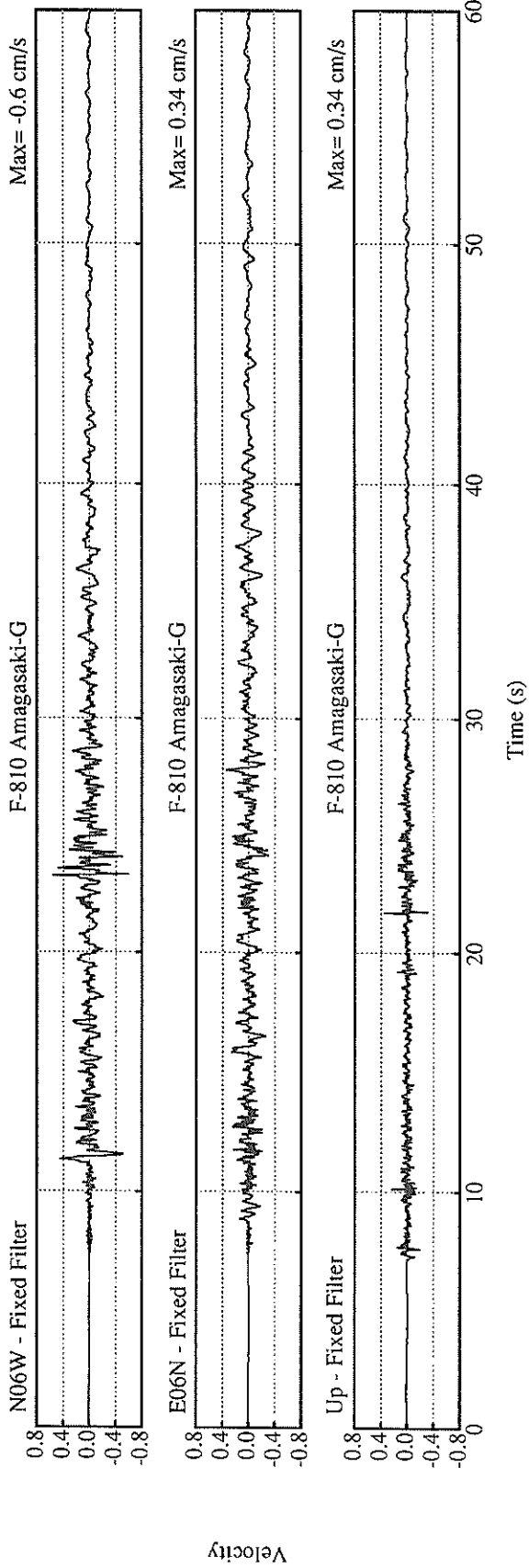
* RESULTANT OF HORIZONTAL COMPONENTS

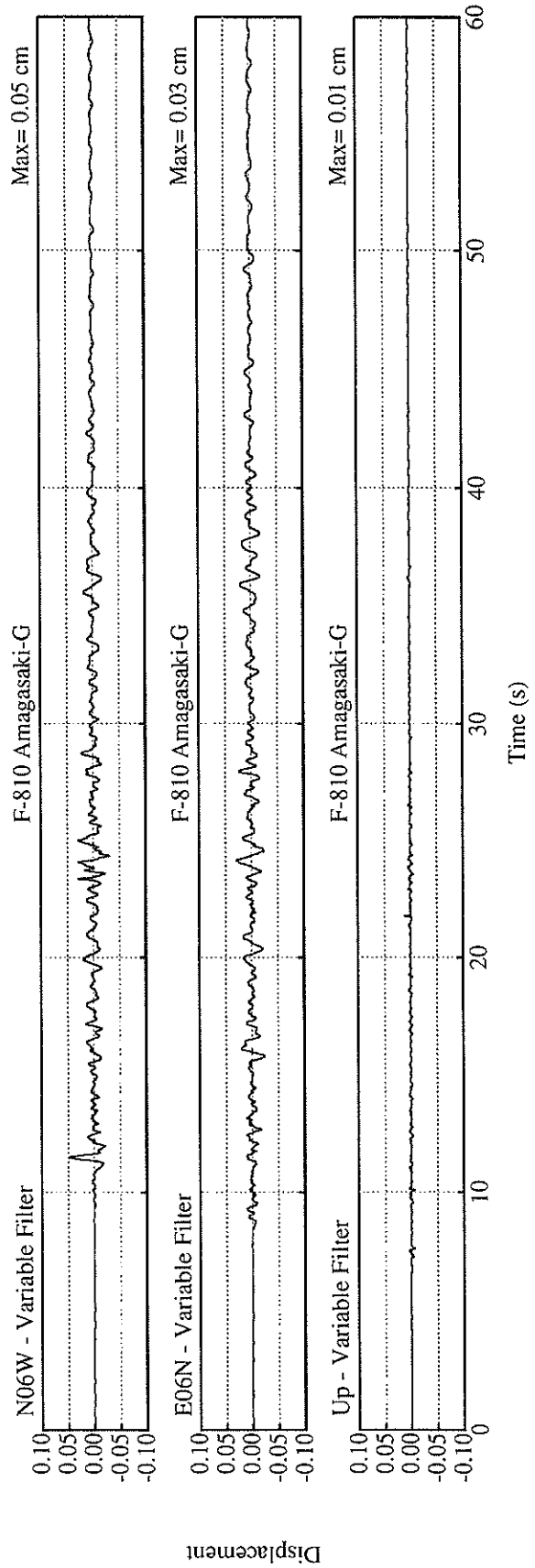
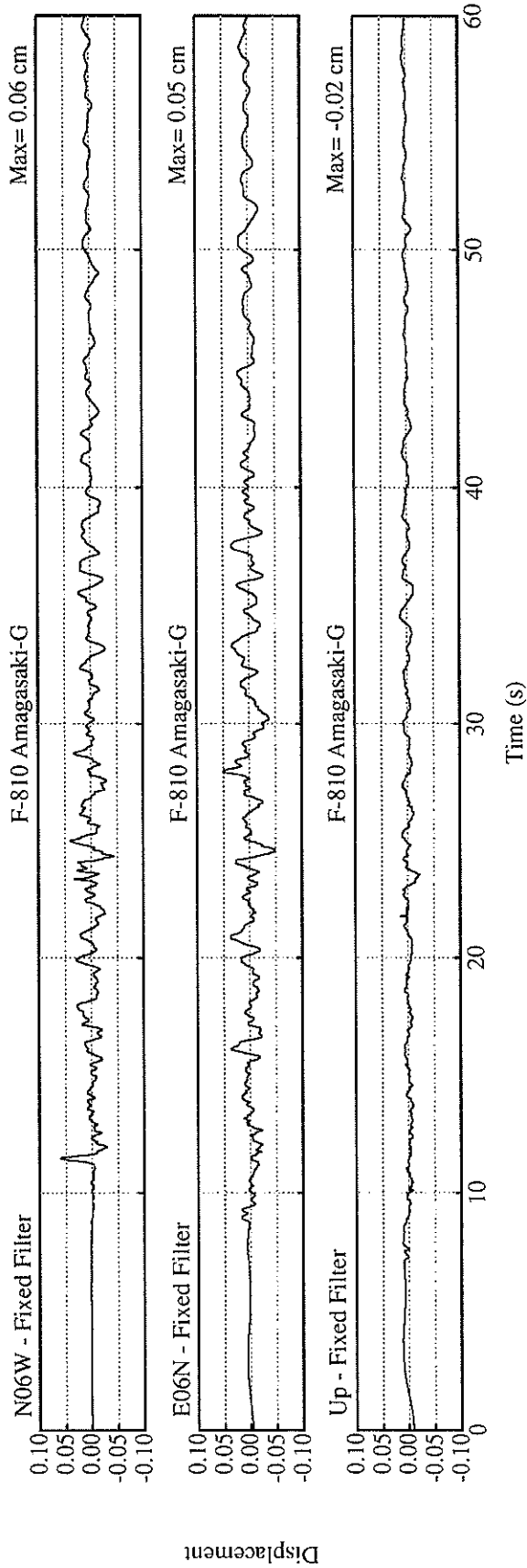


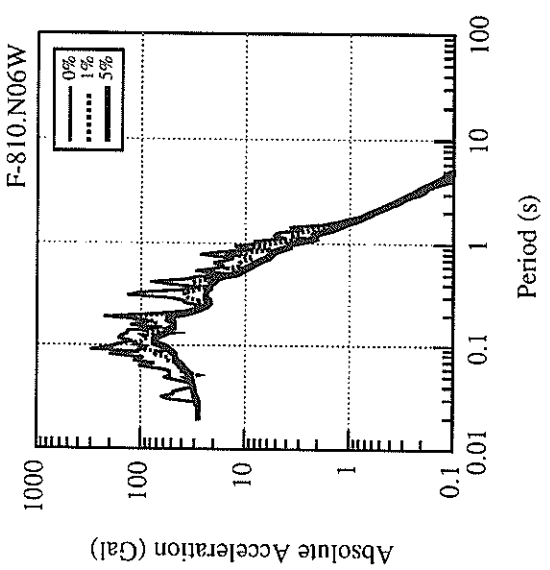
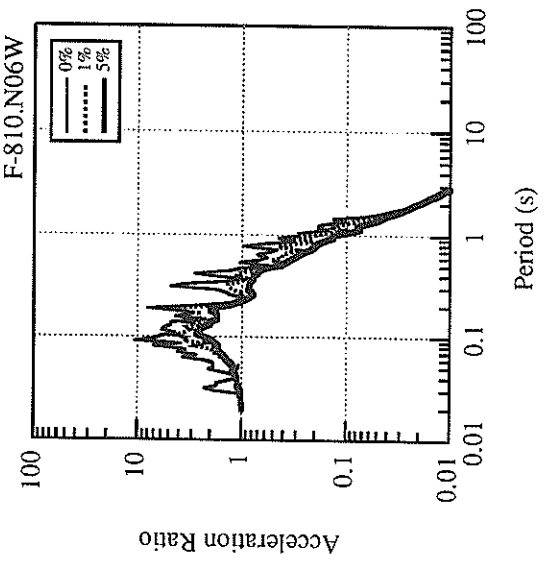
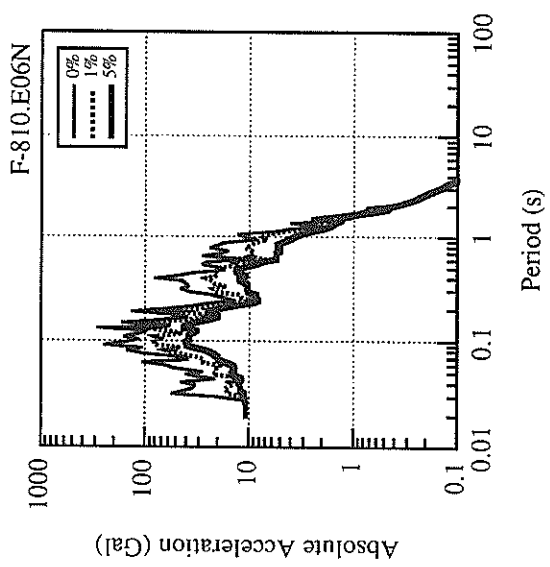
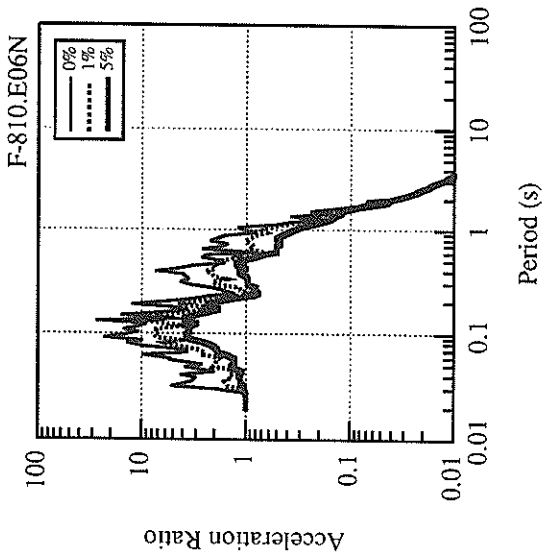
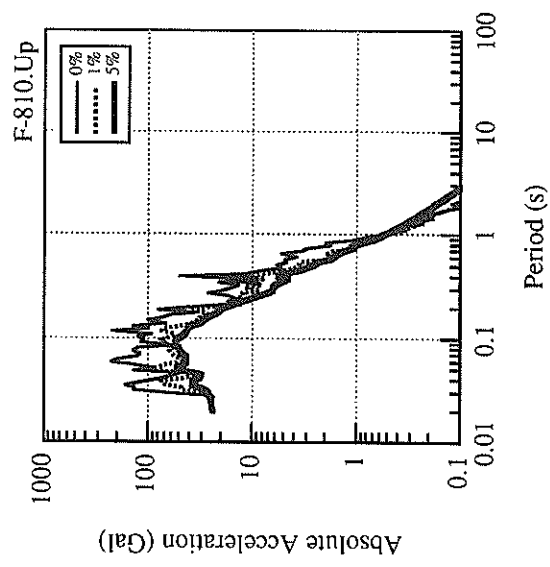
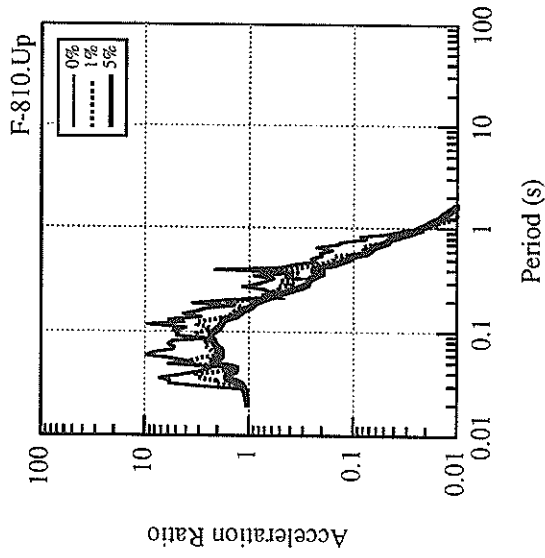
Acceleration

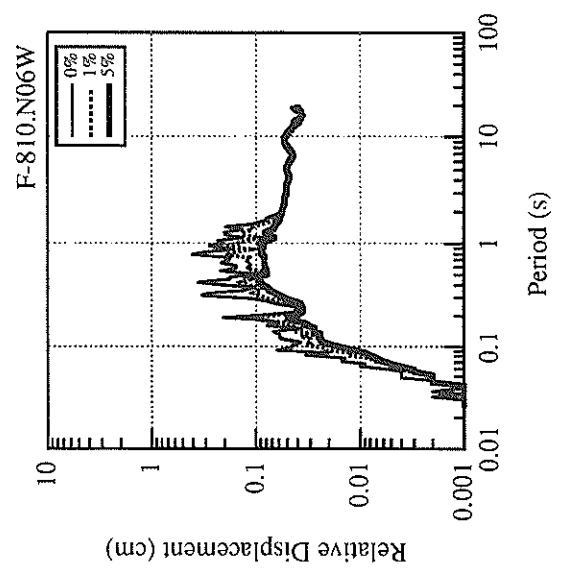
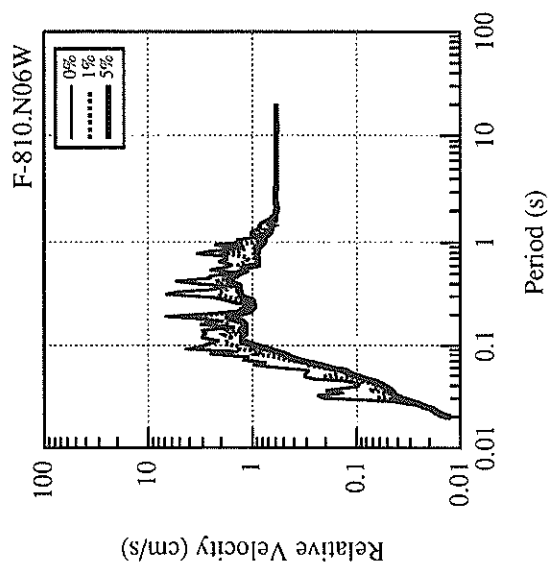
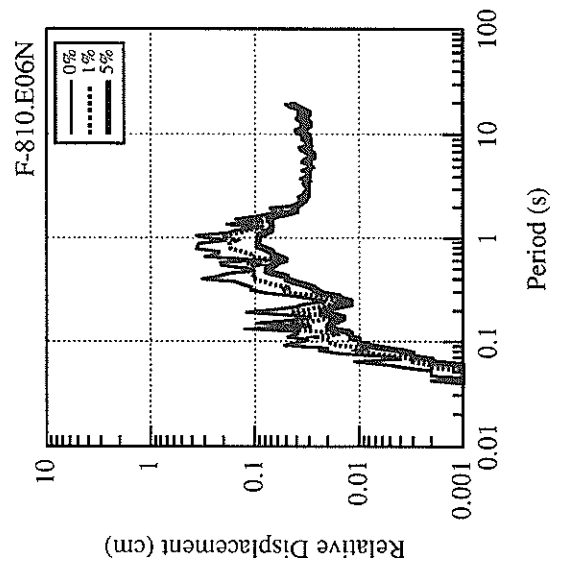
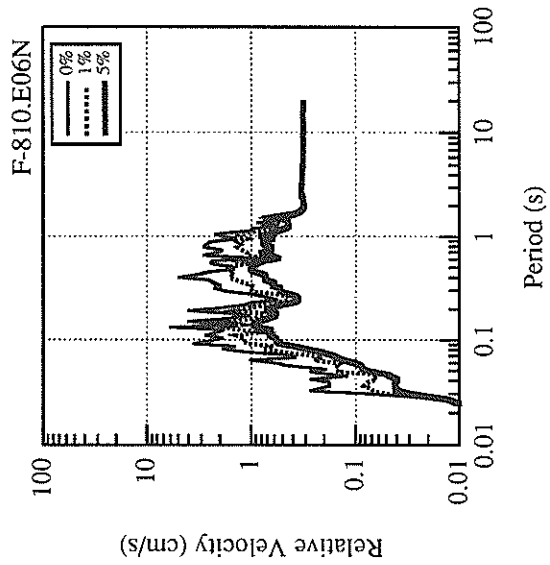
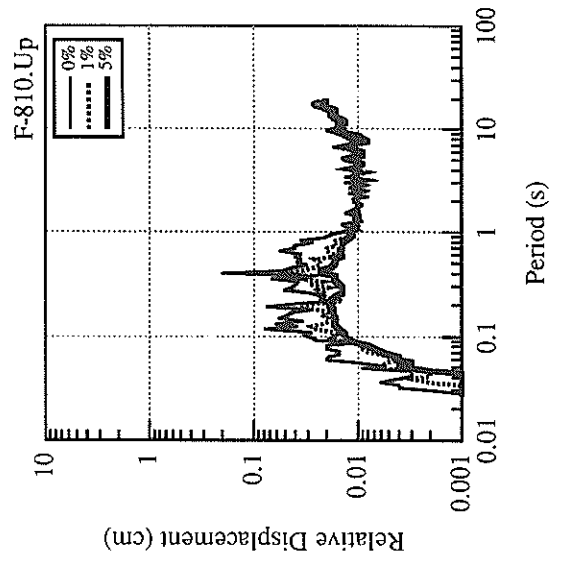
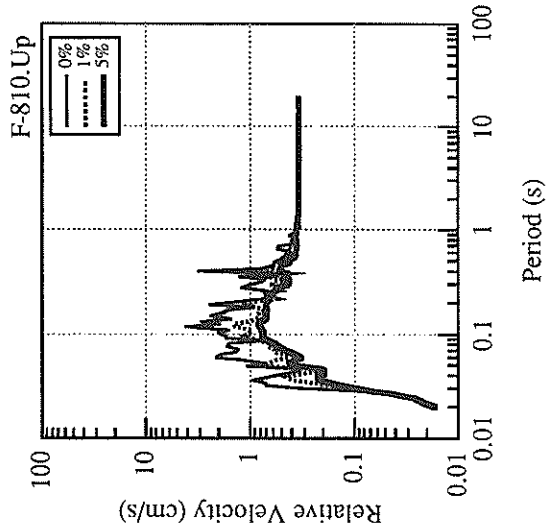
Acceleration

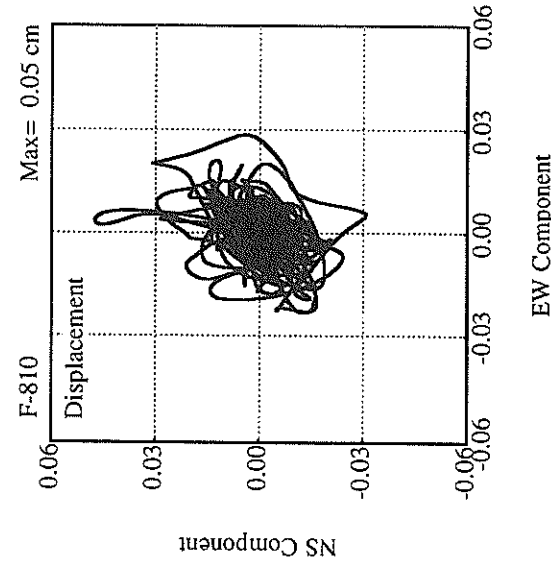
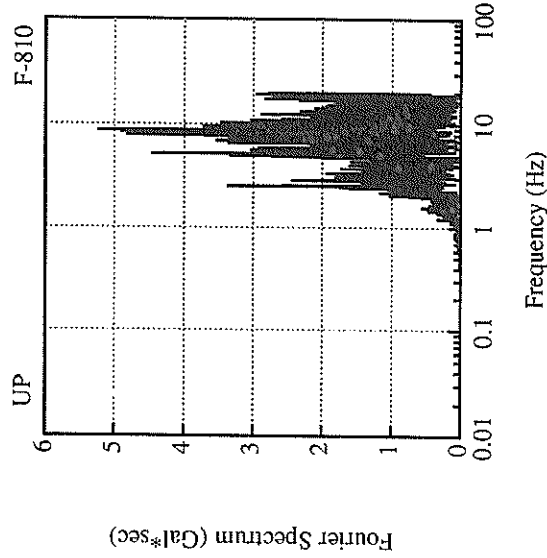
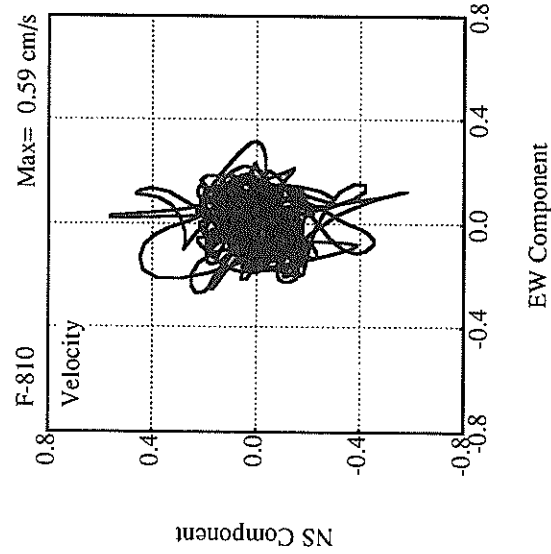
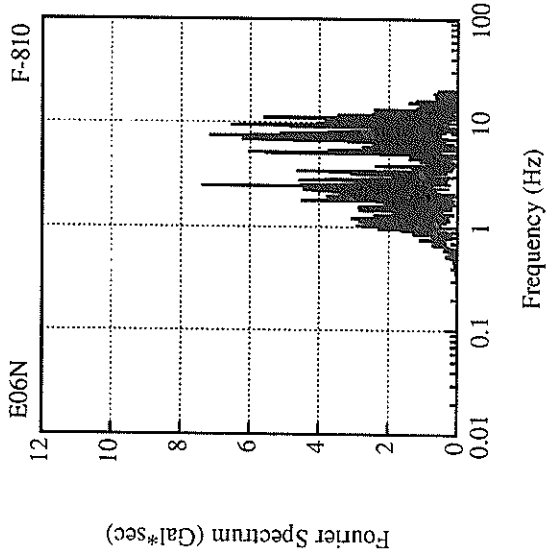
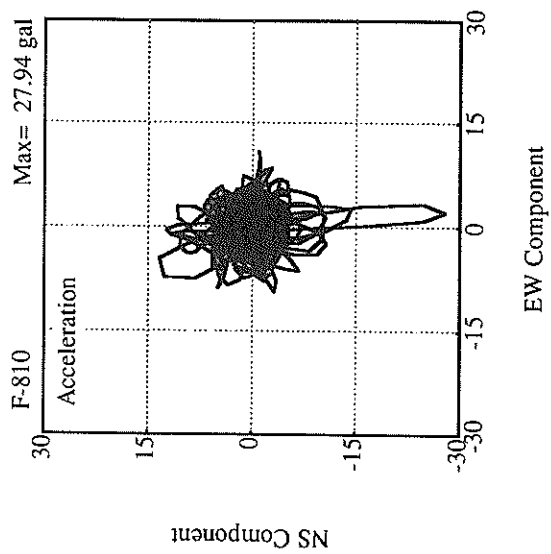
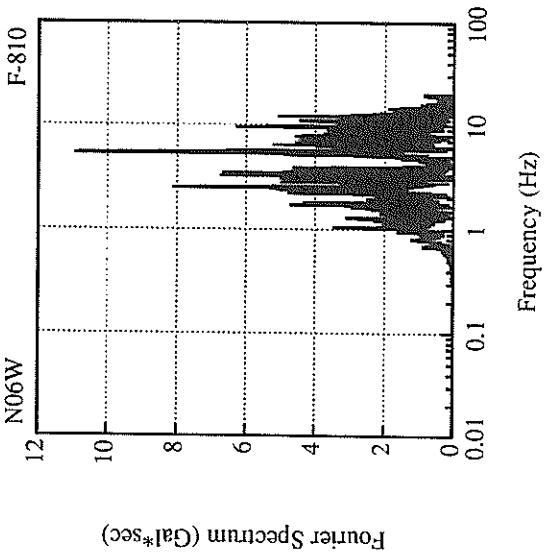












RECORD NUMBER : F-811
 STATION : AMAGASAKI-G

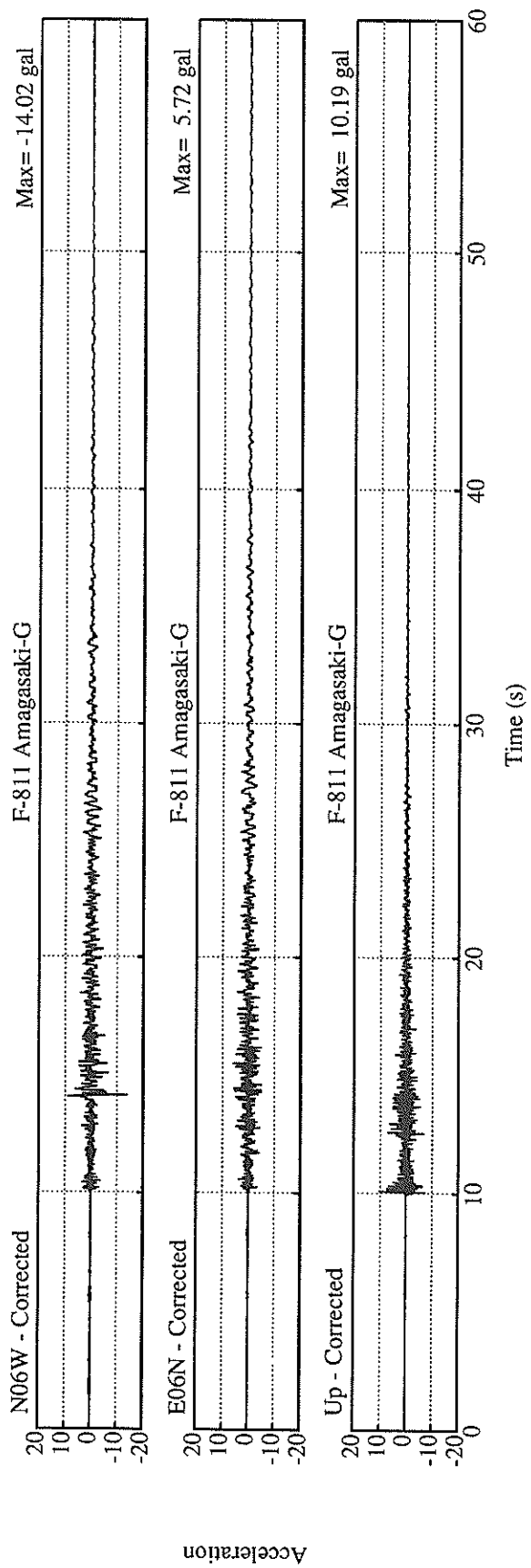
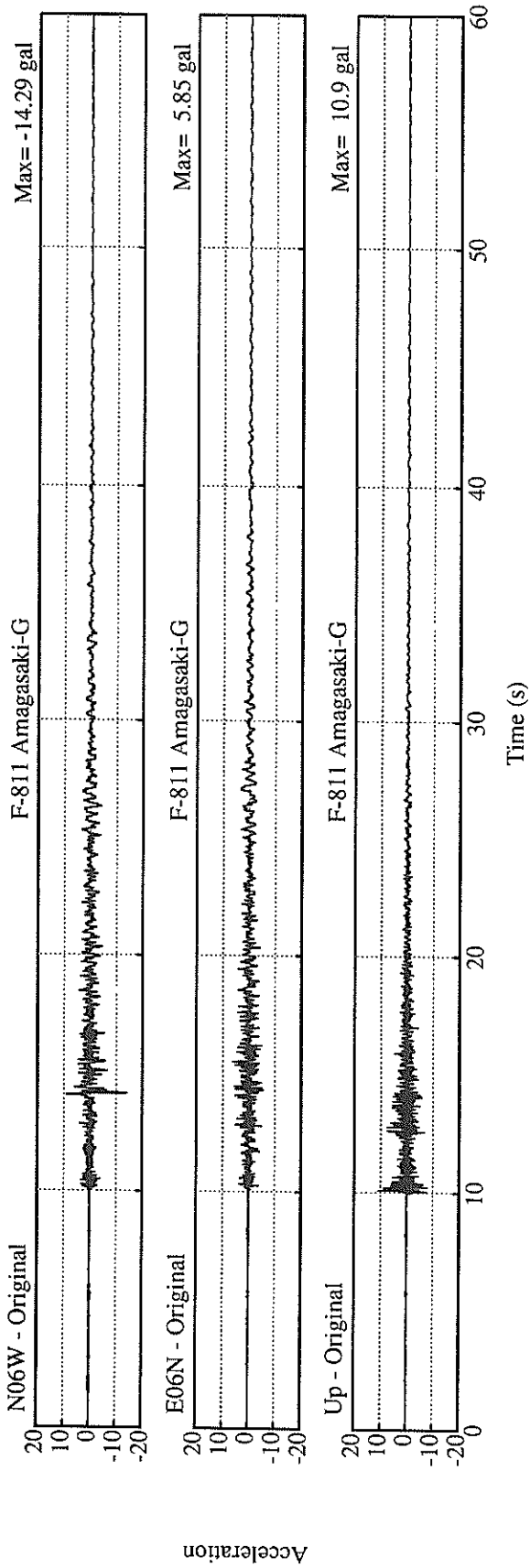
EARTHQUAKE DATA

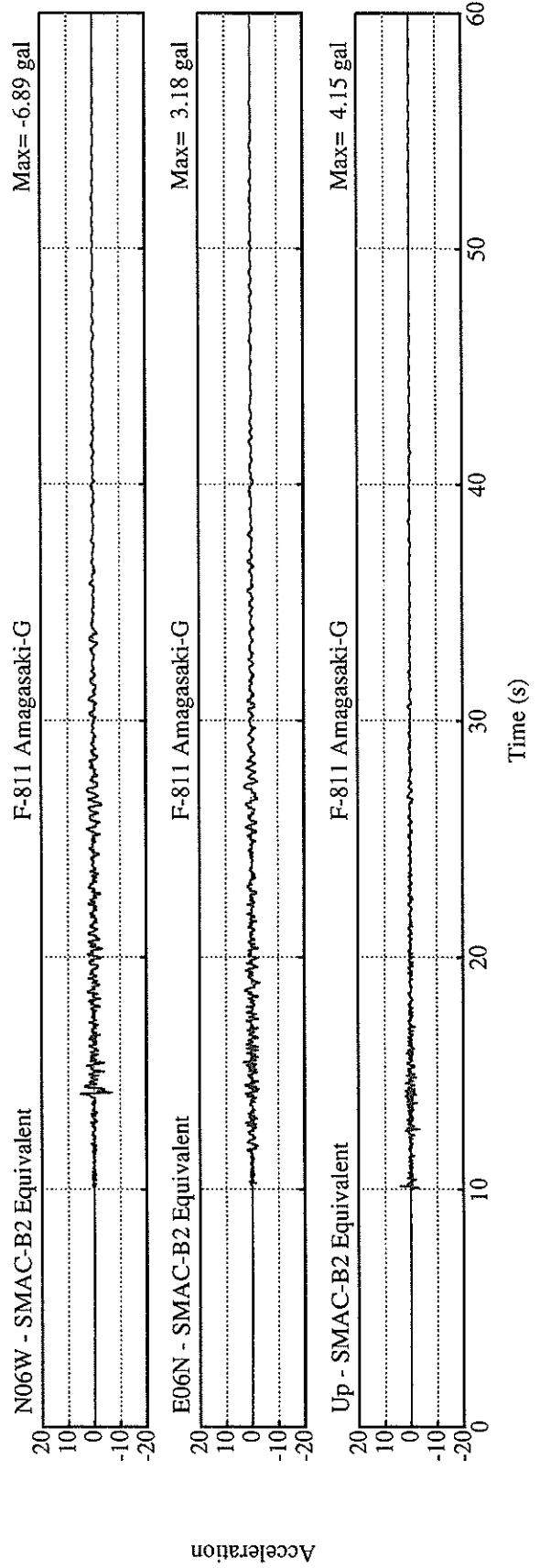
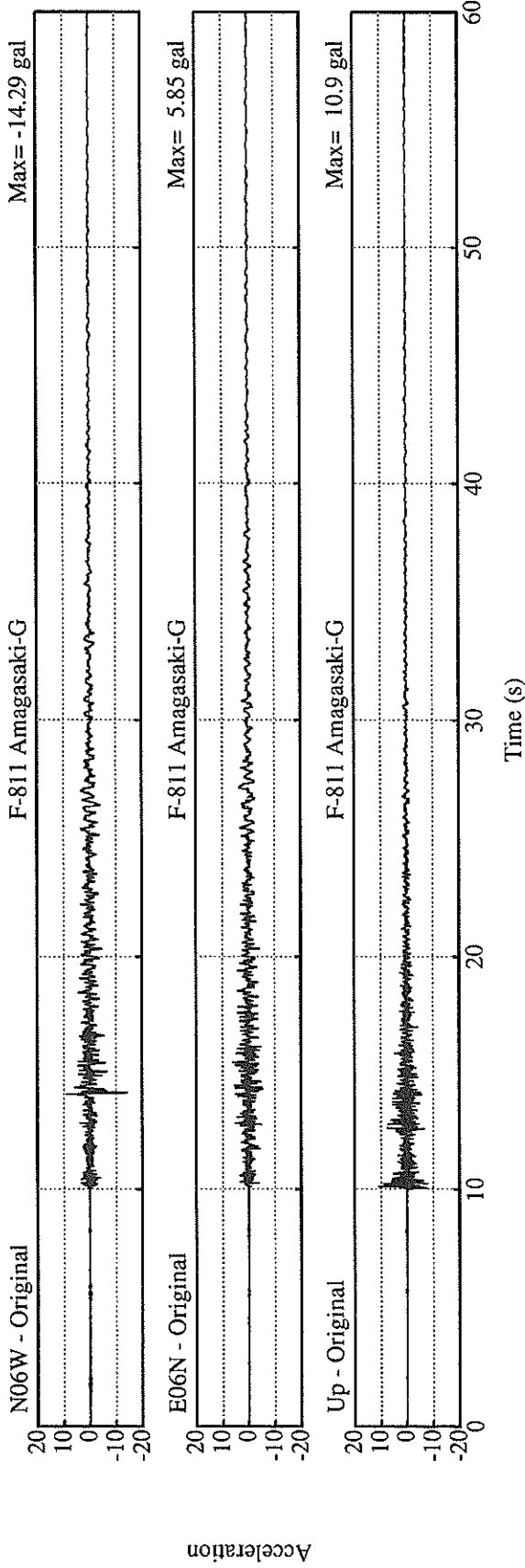
 DATE AND TIME 5:25 JAN.18,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°41.6' N
 LONGITUDE 135°11.1' E
 DEPTH 15.3KM
 JMA MAGNITUDE 4.3

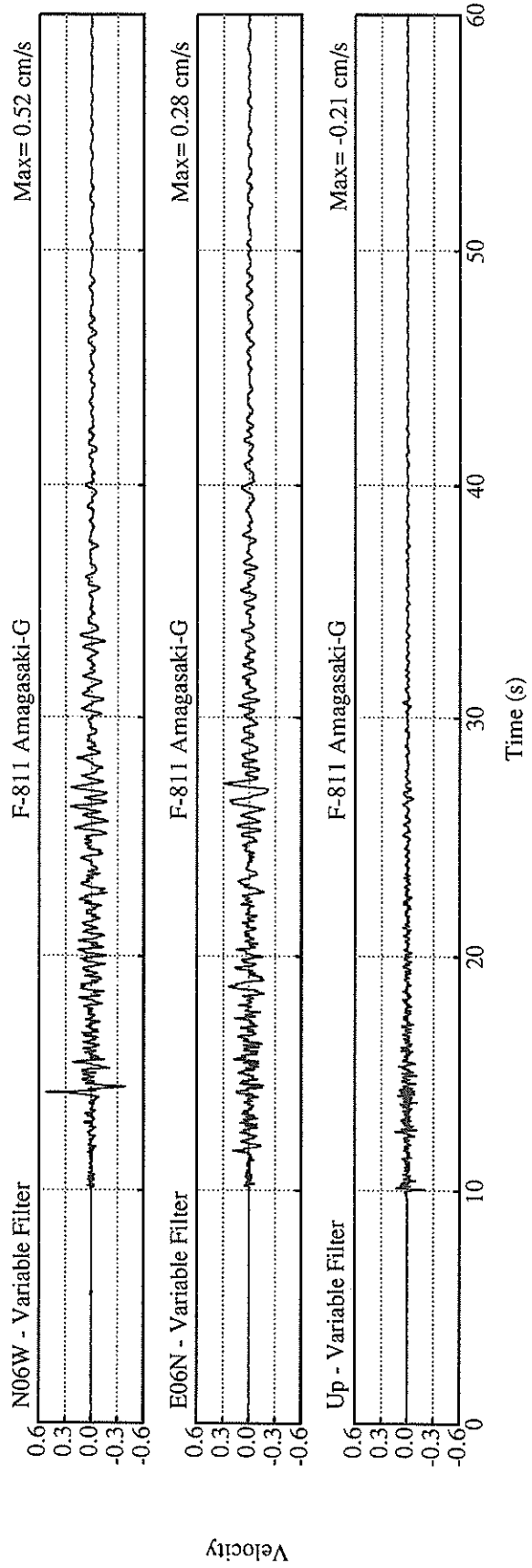
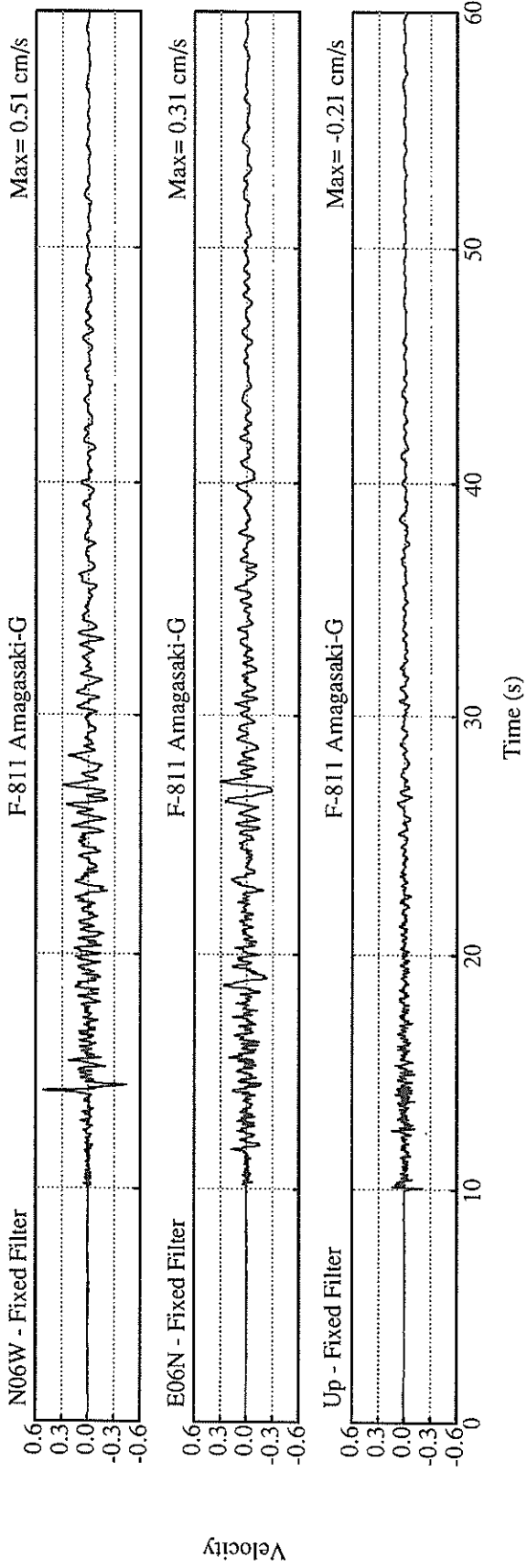
PEAK VALUES OF COMPONENTS

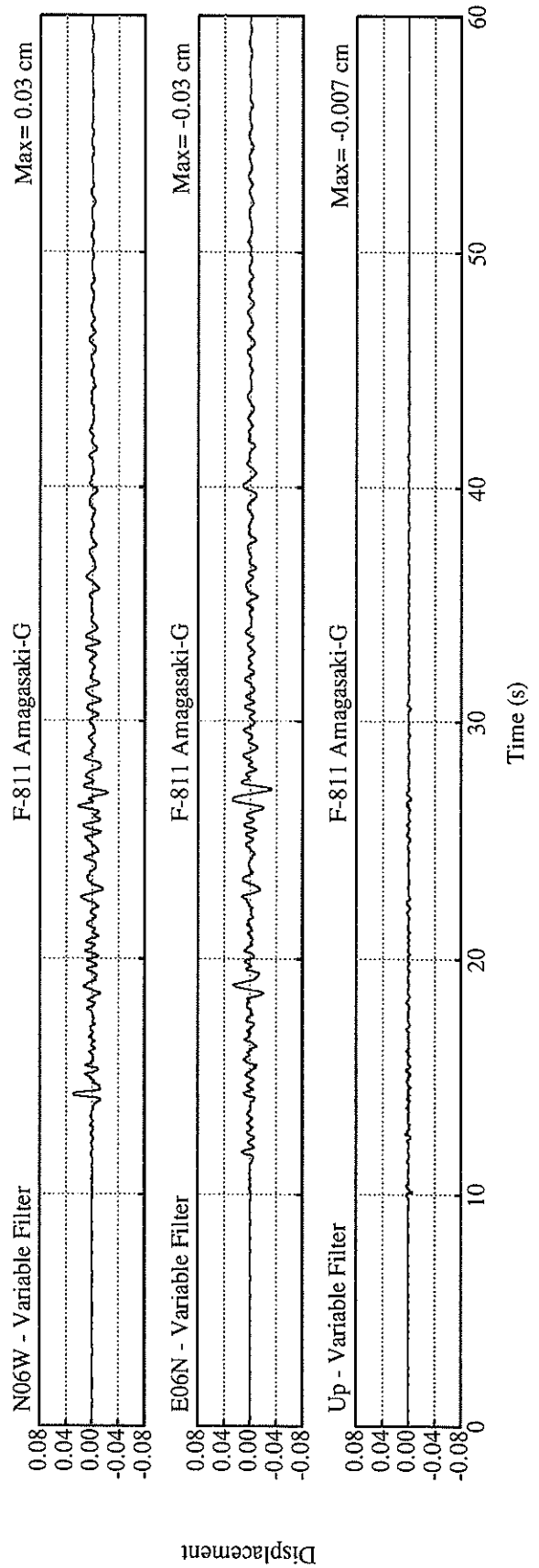
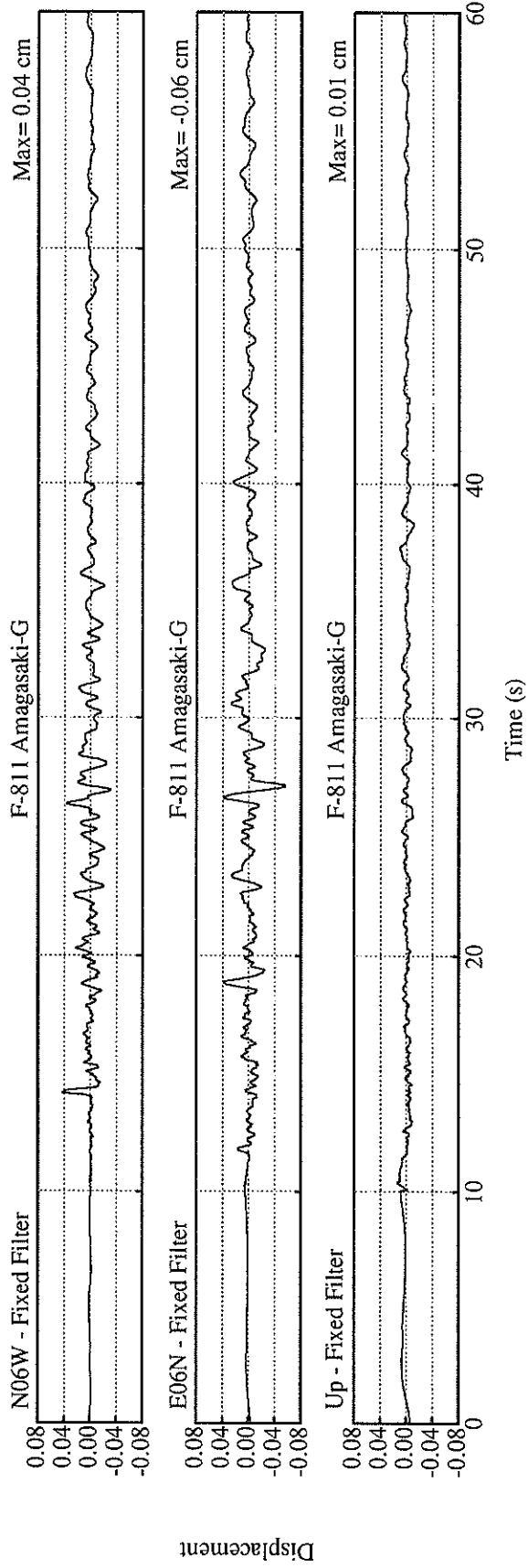
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.787	0.744	1.476	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.9	3.2	4.2	6.9
ORIGINAL	14.3	5.9	10.9	14.3
CORRECTED	14.0	5.7	10.2	14.0
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.51	0.31	0.21	0.53
VARIABLE FILTER	0.52	0.28	0.21	0.54
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.04	0.06	0.01	0.06
VARIABLE FILTER	0.03	0.03	0.01	0.03

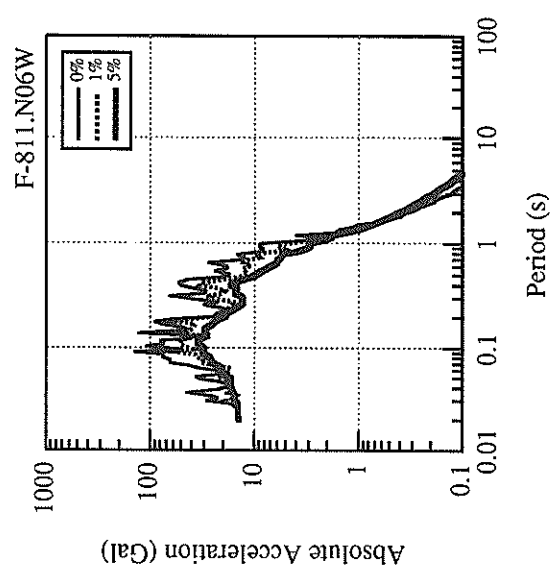
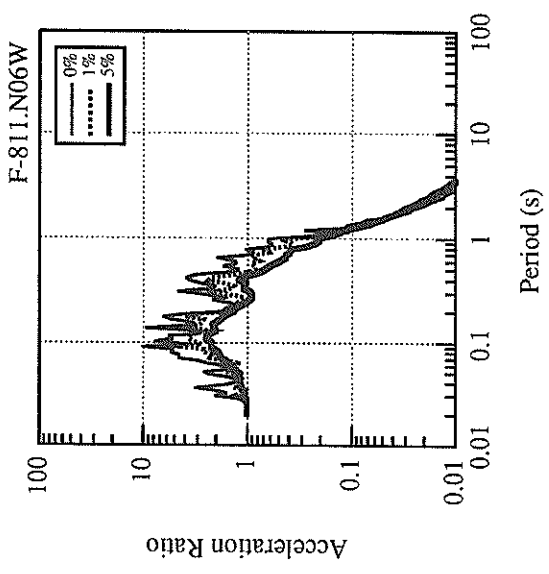
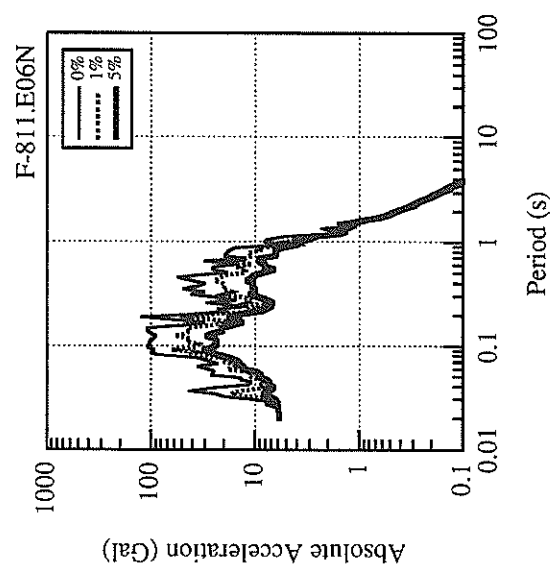
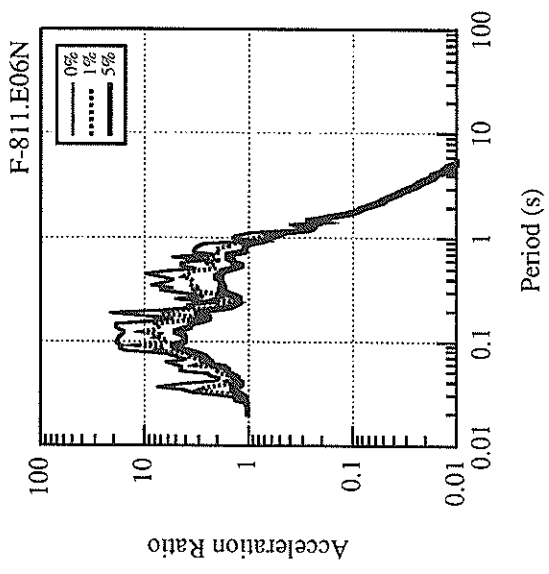
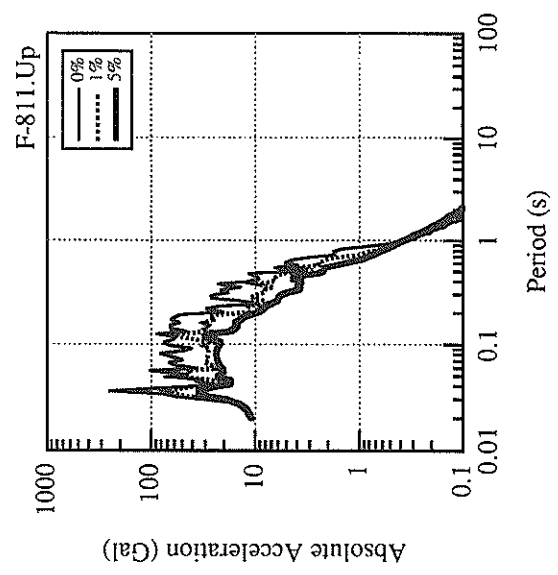
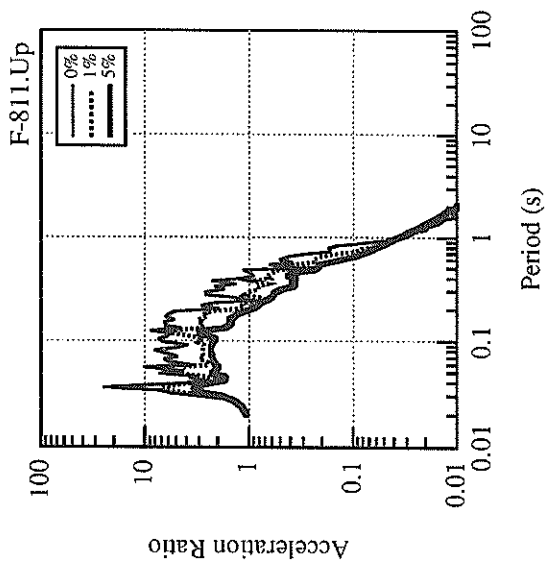
* RESULTANT OF HORIZONTAL COMPONENTS

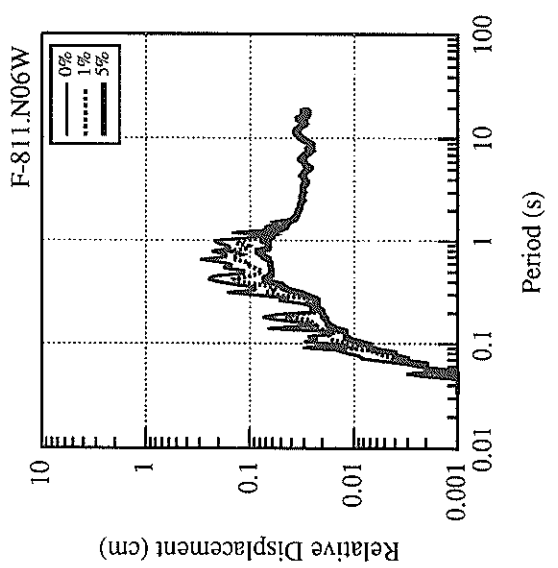
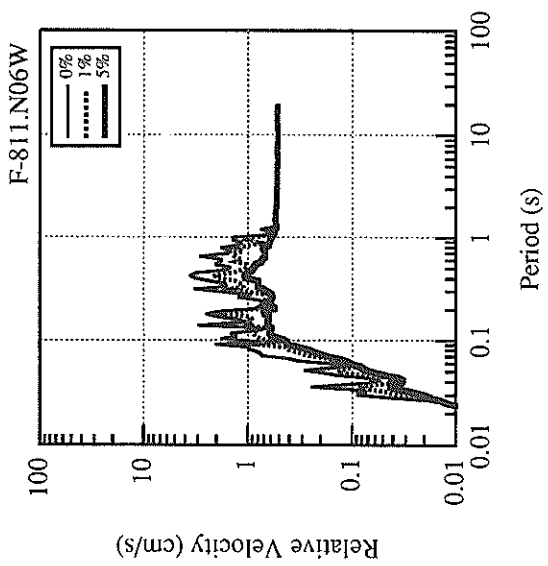
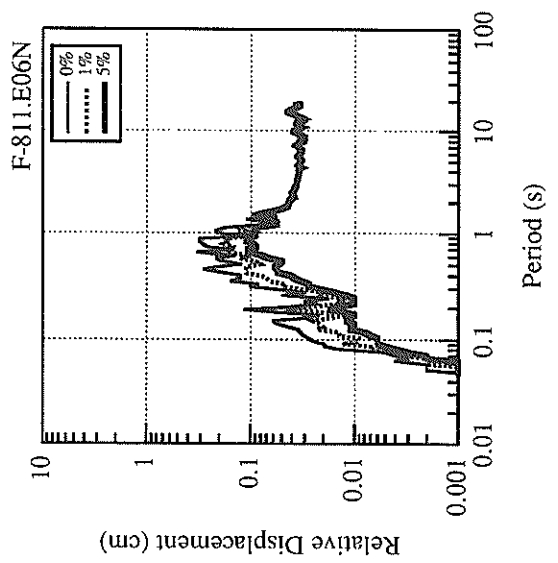
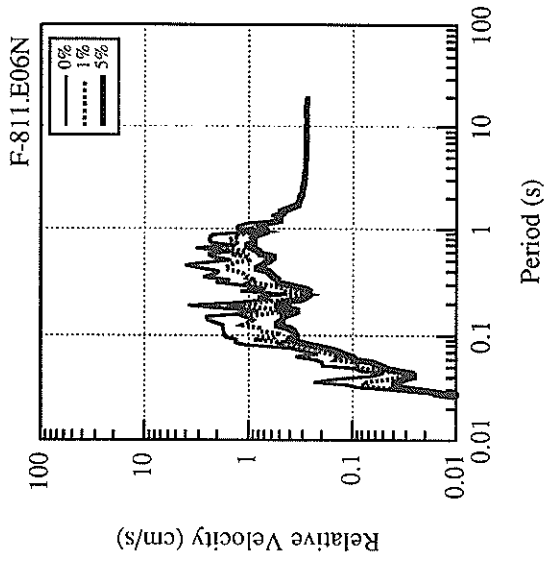
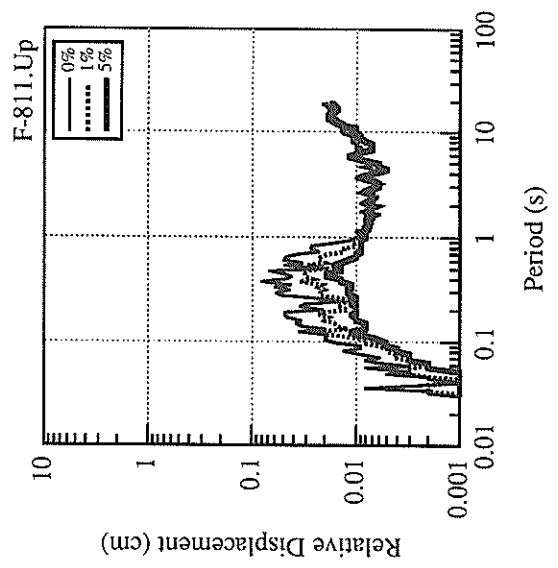
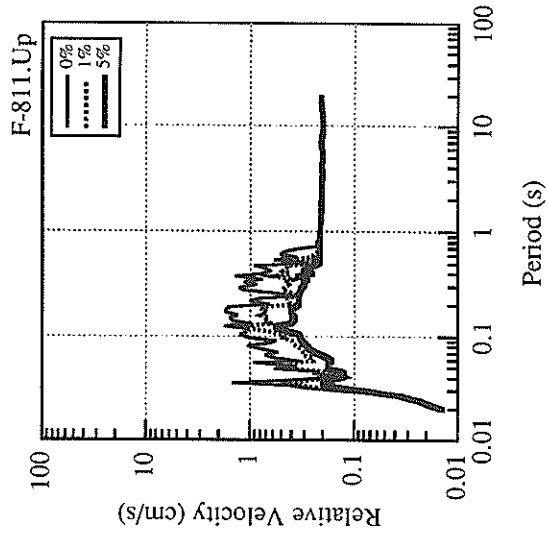


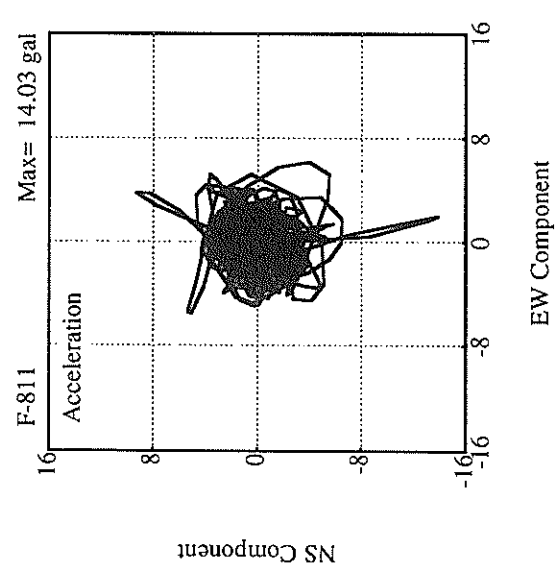
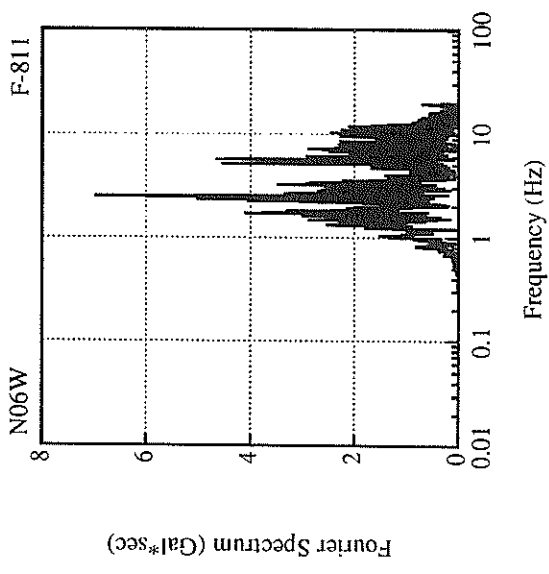
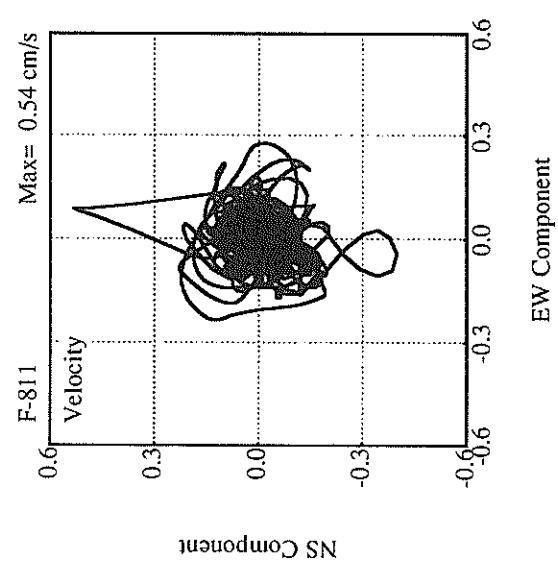
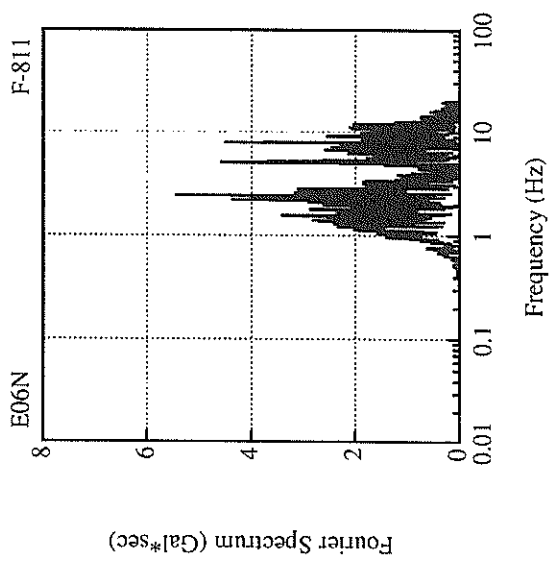
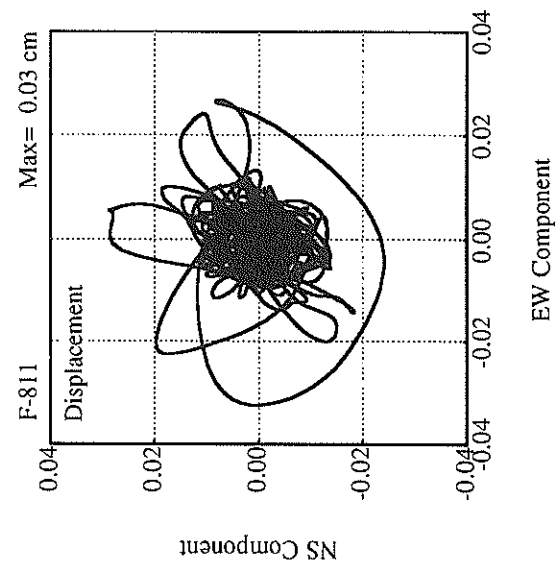
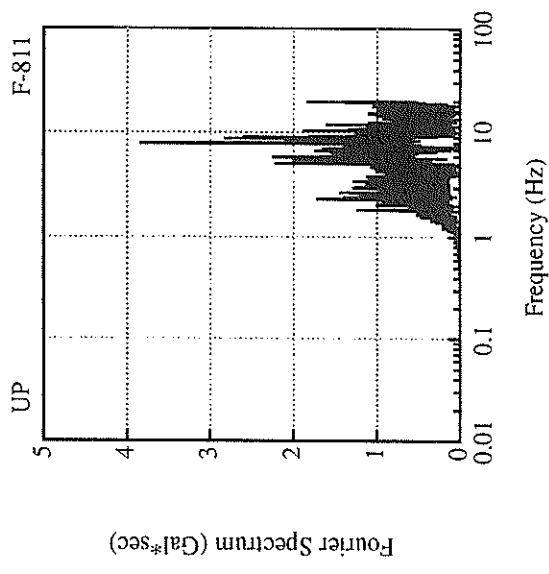












RECORD NUMBER : F-812
 STATION : AMAGASAKI-G

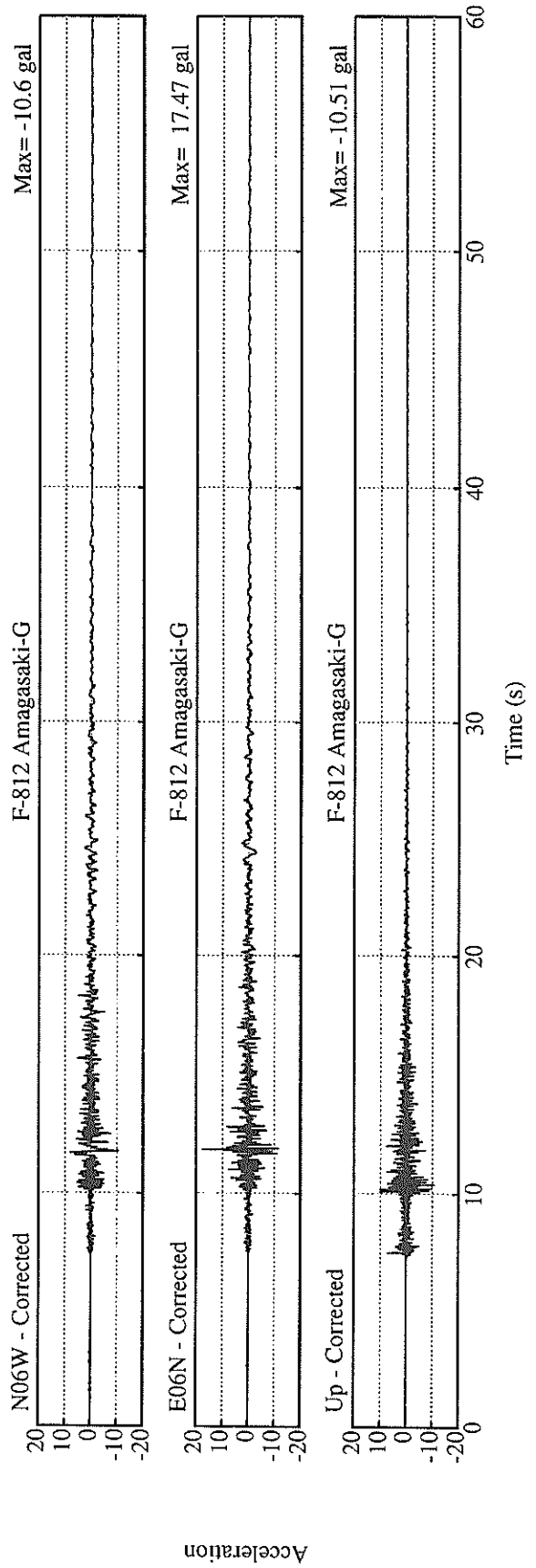
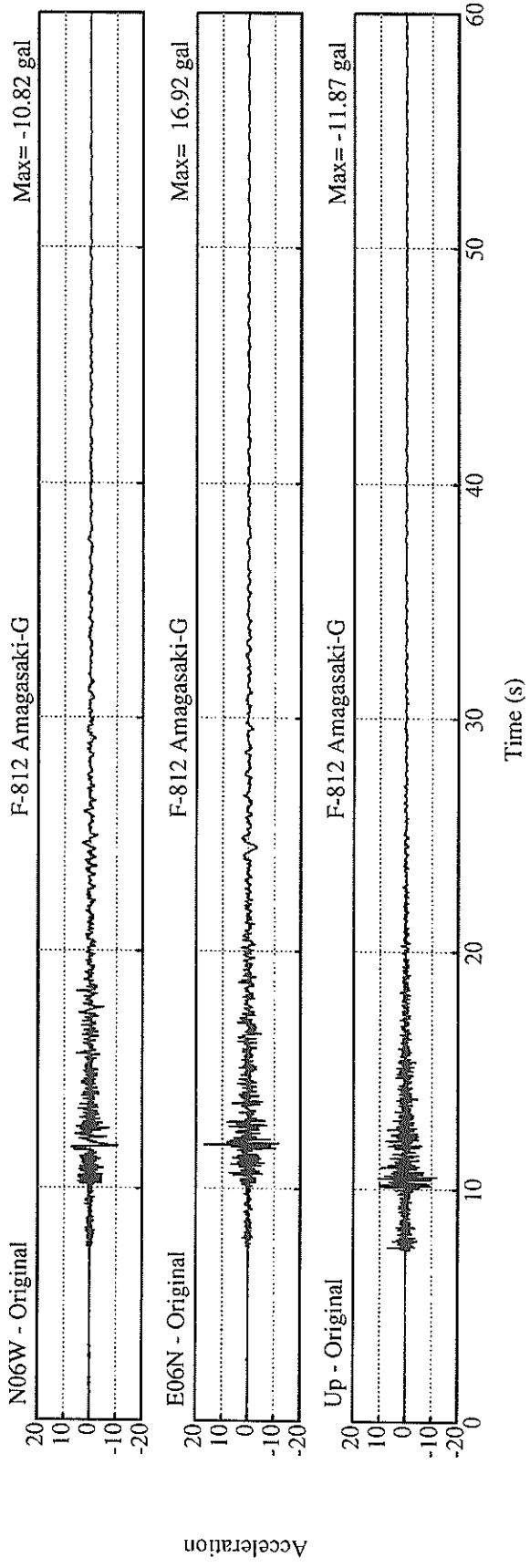
EARTHQUAKE DATA

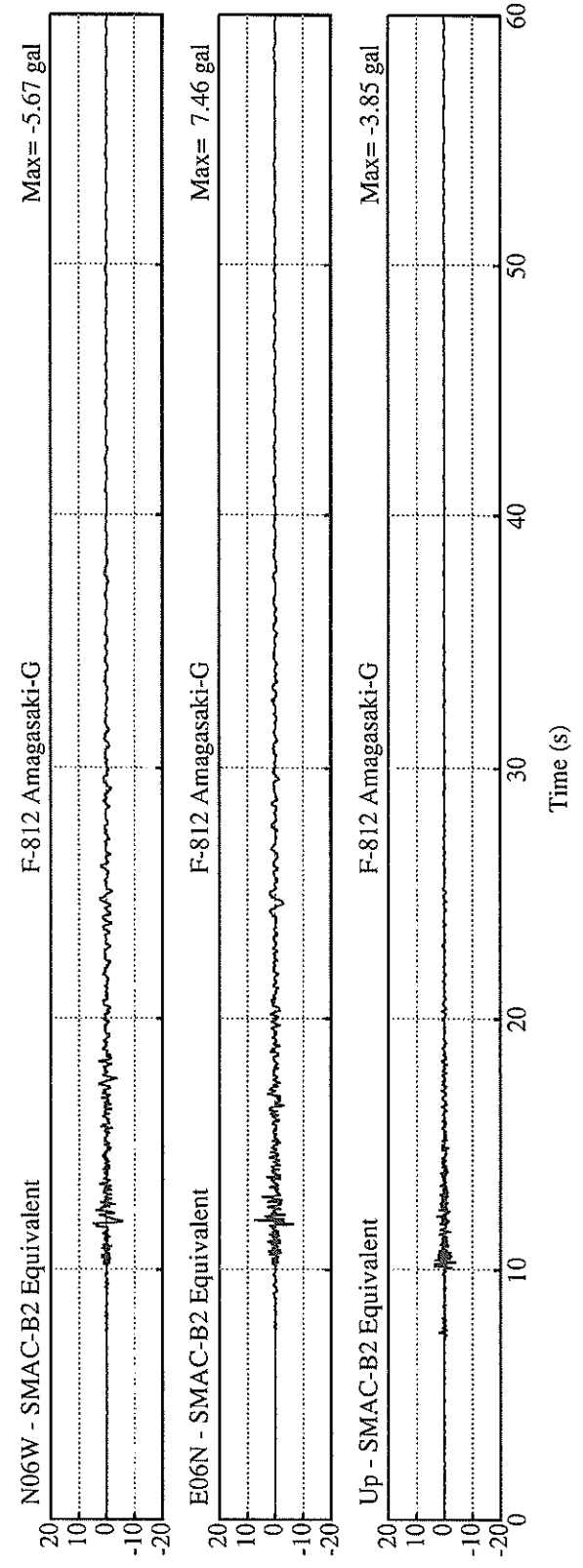
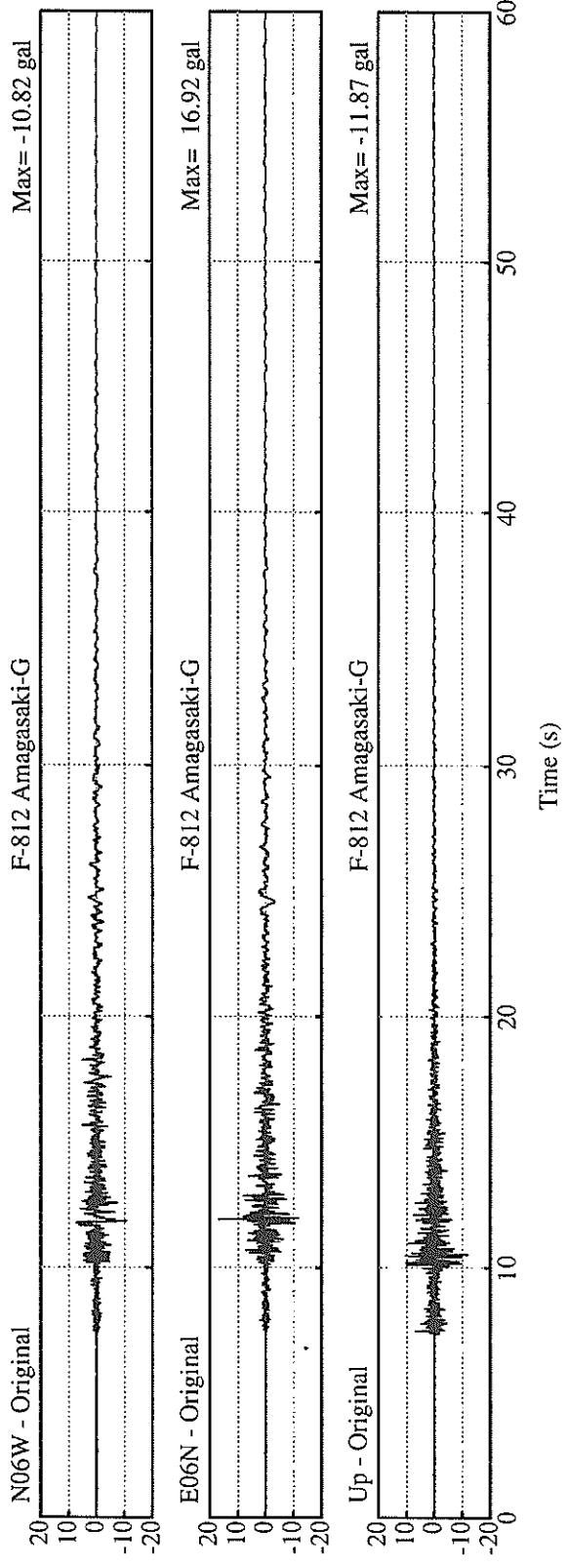
```
*****
DATE AND TIME                6:50 JAN.18,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          SE HYOGO PREF
  LATITUDE                   34°41.0' N
  LONGITUDE                  135°10.2' E
  DEPTH                      12.9KM
  JMA MAGNITUDE              4.3
*****
```

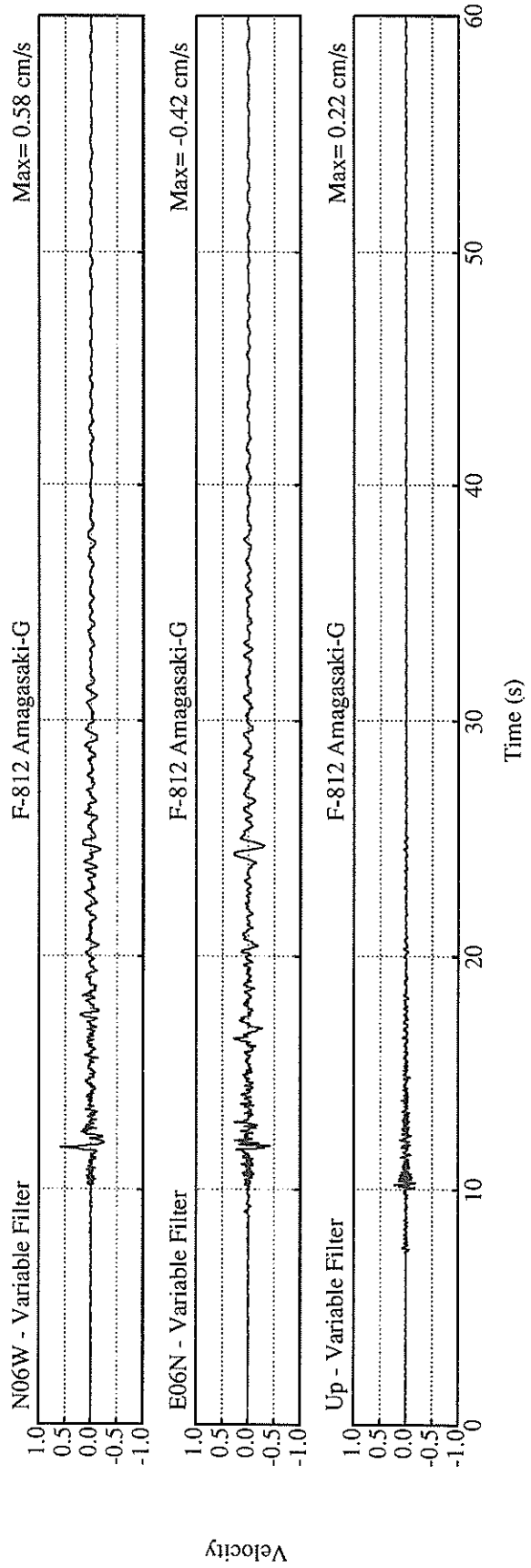
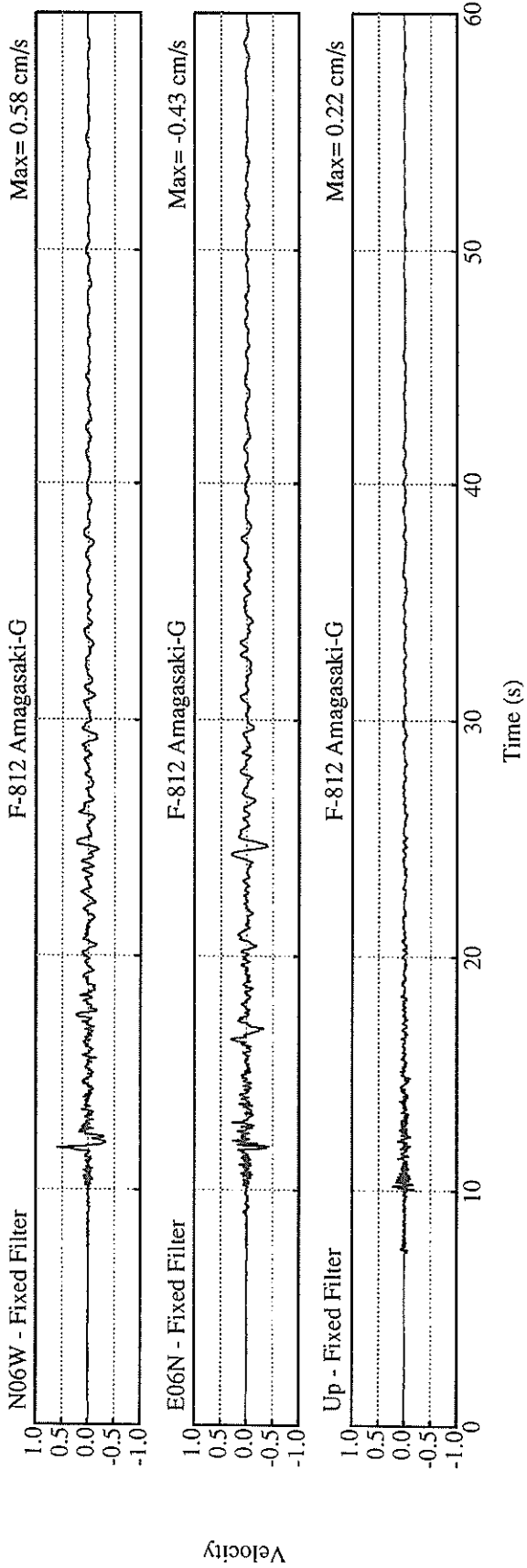
PEAK VALUES OF COMPONENTS

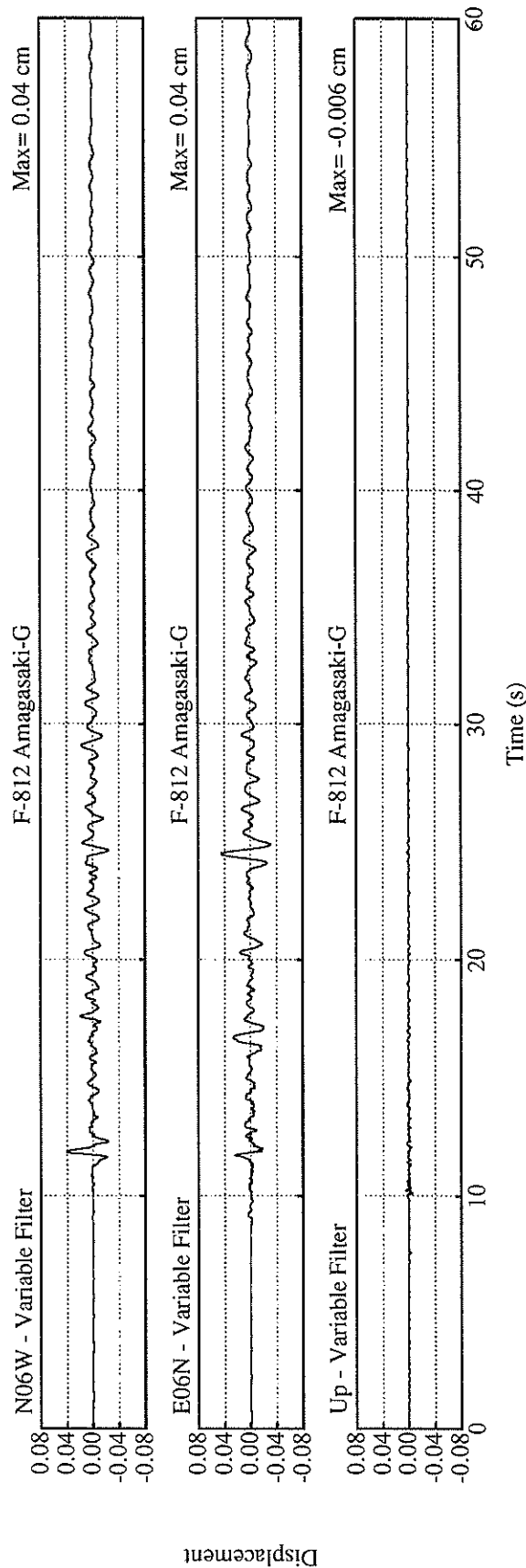
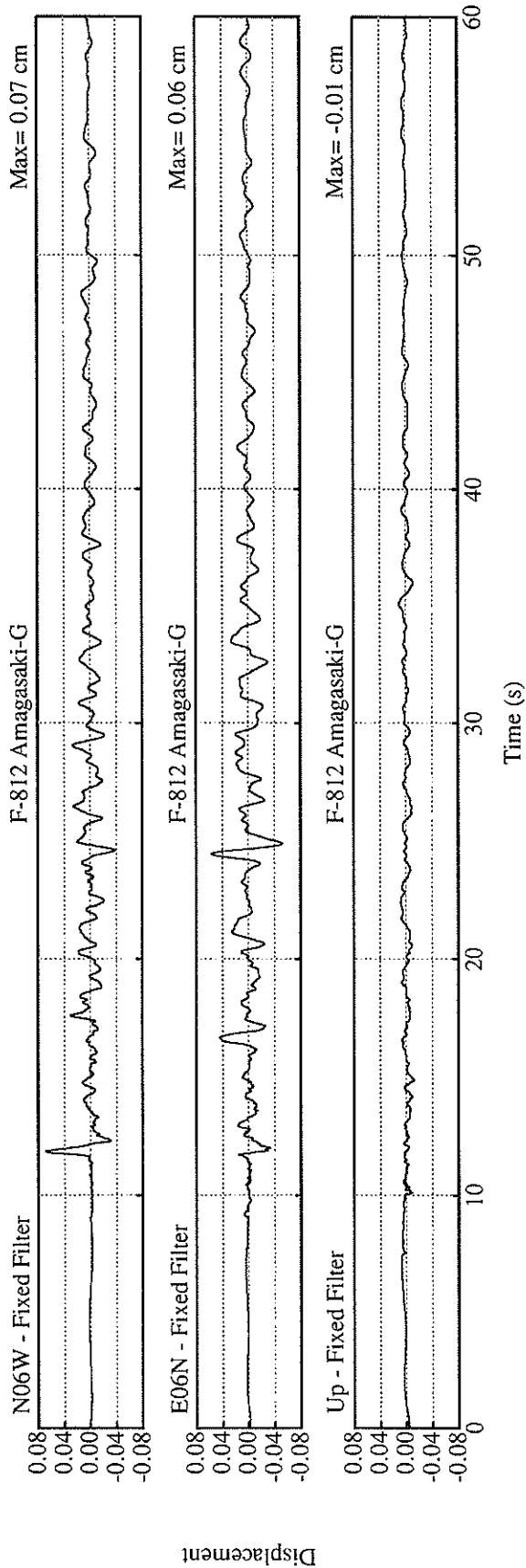
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.738	0.665	1.659	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	5.7	7.5	3.8	8.8
ORIGINAL	10.8	16.9	11.9	18.0
CORRECTED	10.6	17.5	10.5	18.1
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.58	0.43	0.22	0.69
VARIABLE FILTER	0.58	0.42	0.22	0.67
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.07	0.06	0.01	0.07
VARIABLE FILTER	0.04	0.04	0.01	0.05

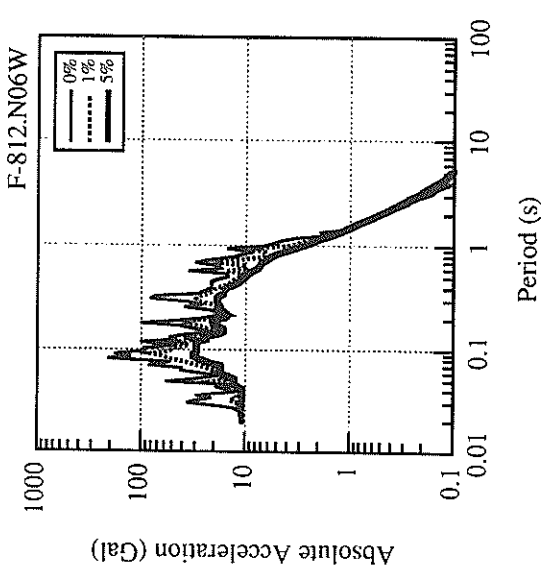
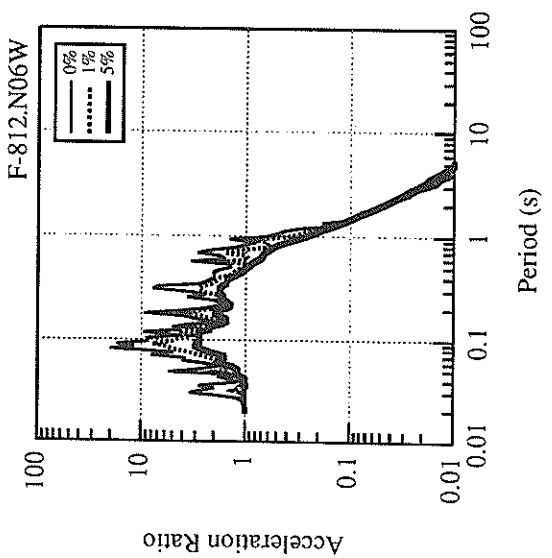
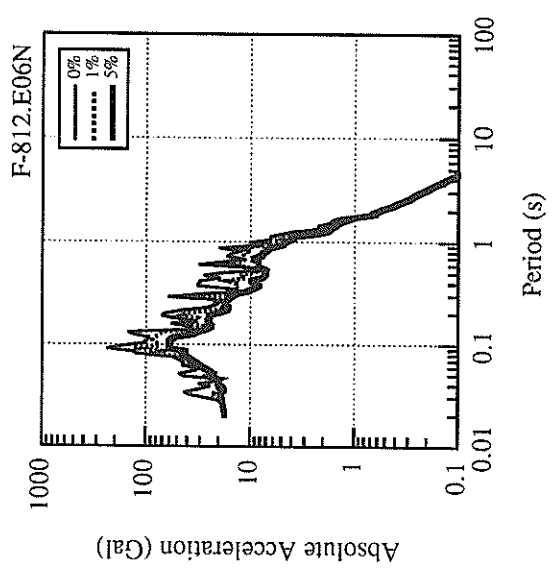
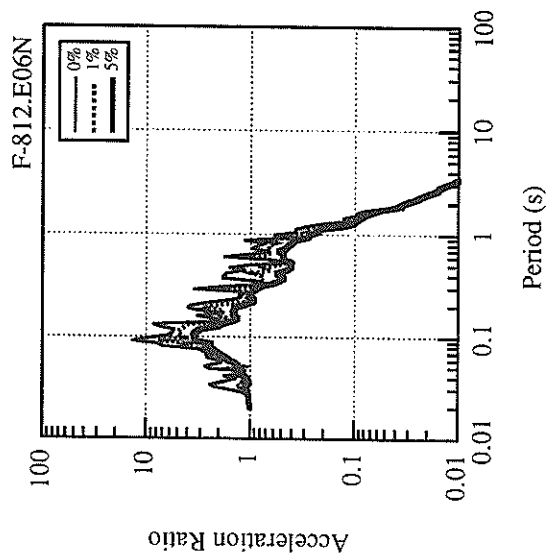
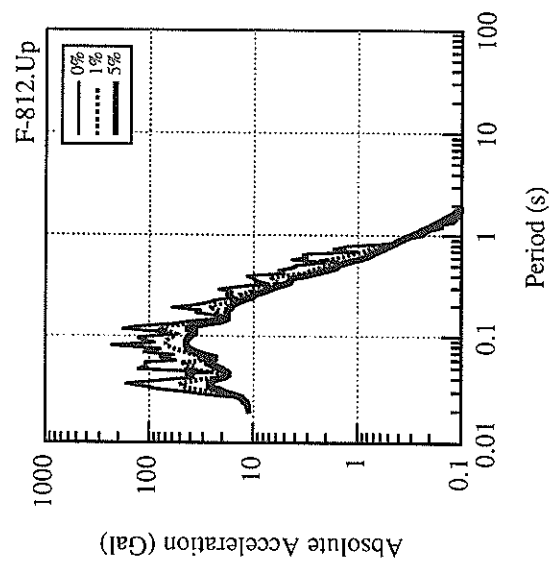
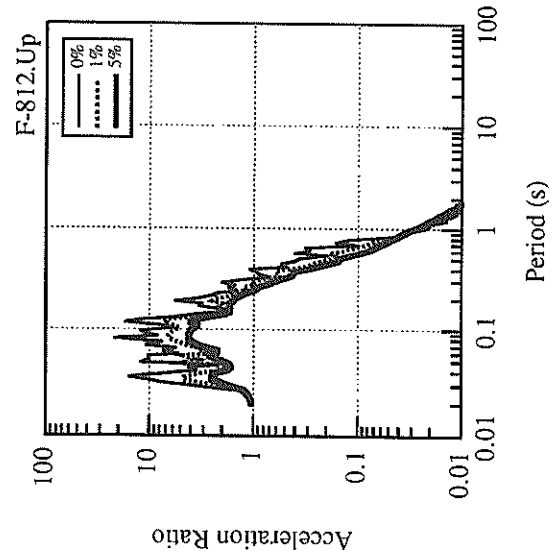
* RESULTANT OF HORIZONTAL COMPONENTS

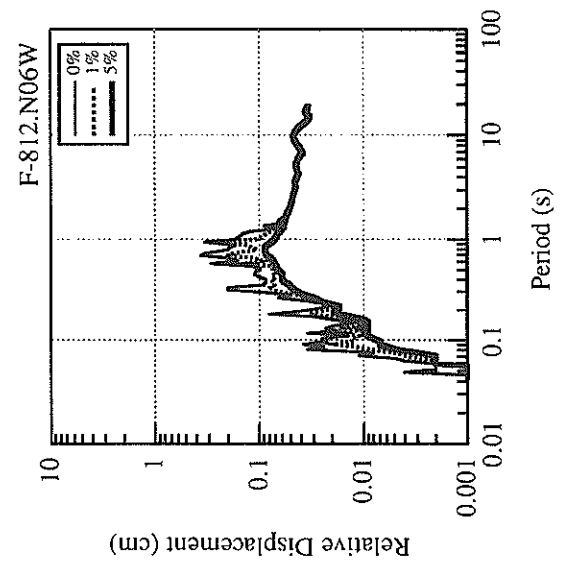
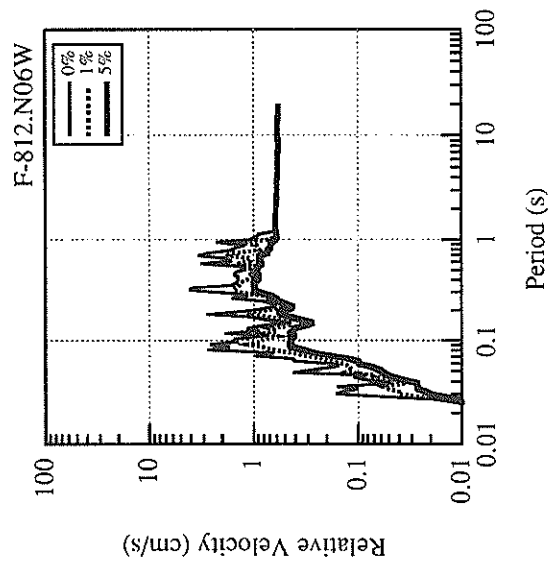
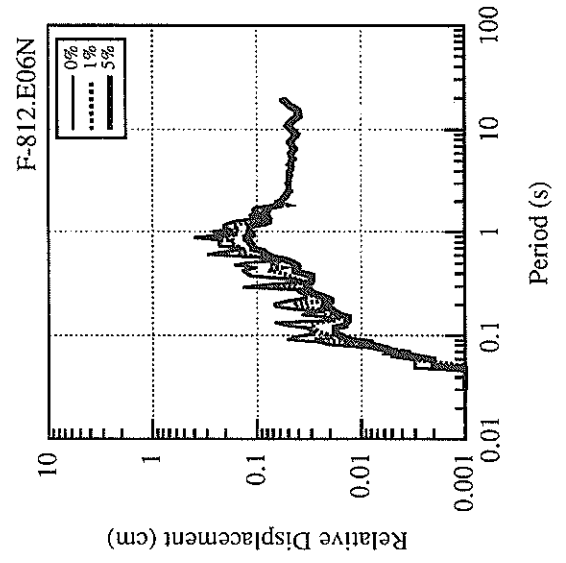
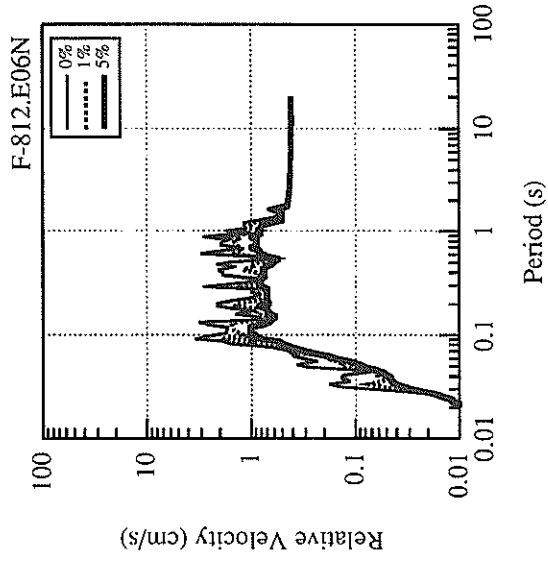
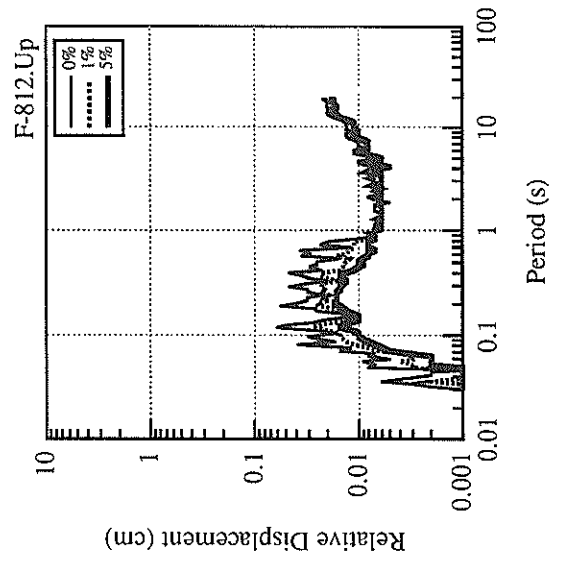
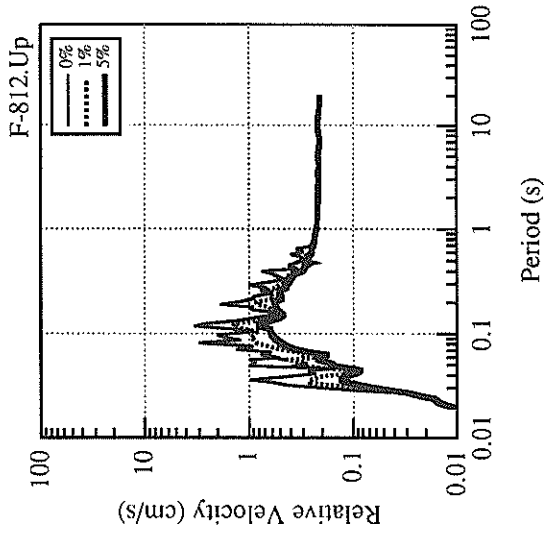


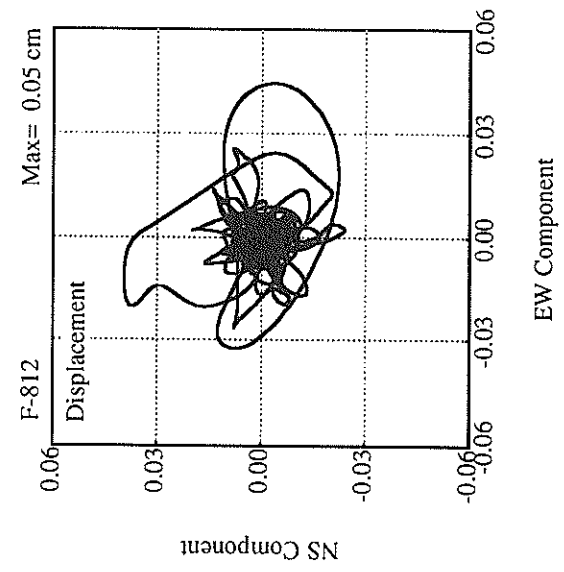
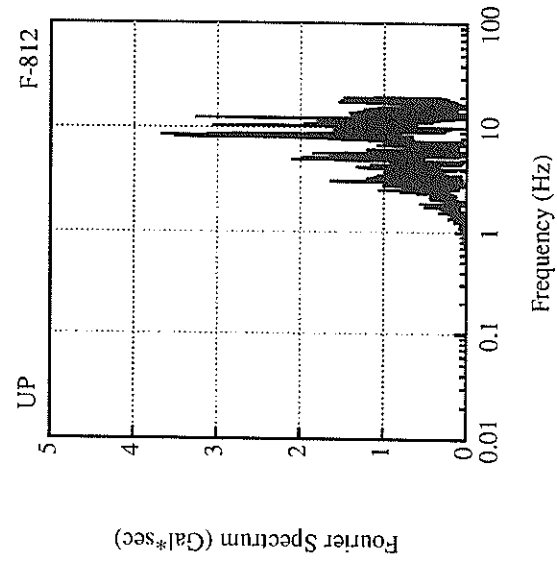
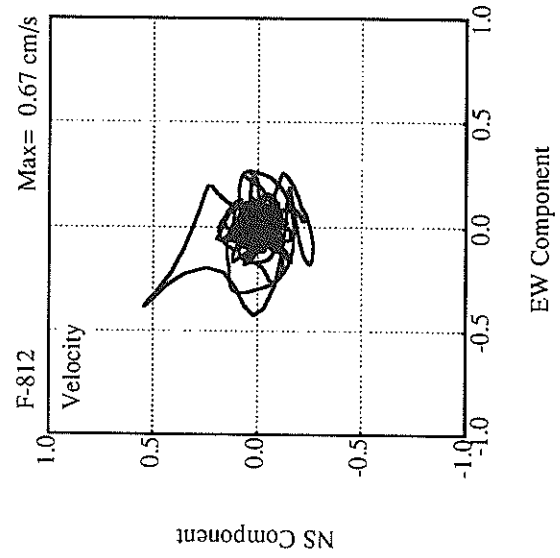
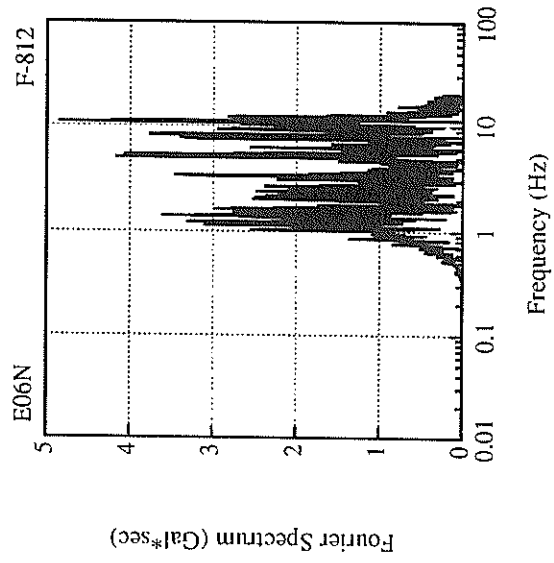
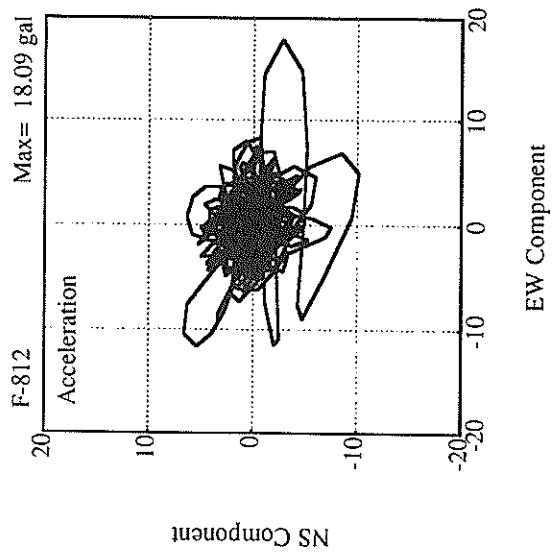
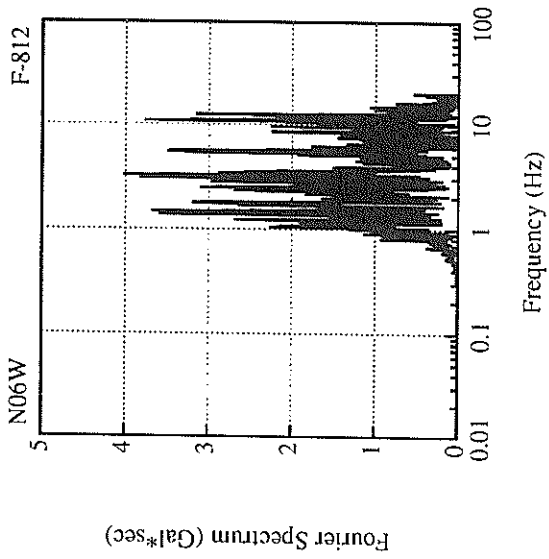












RECORD NUMBER : F-813
 STATION : AMAGASAKI-G

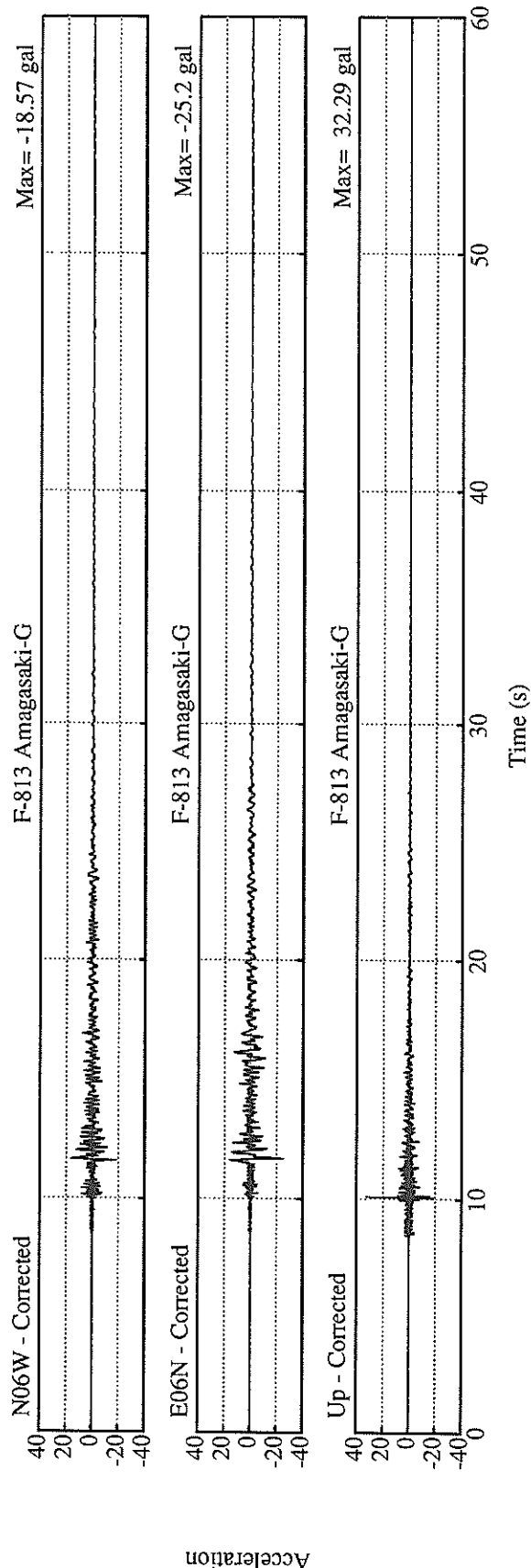
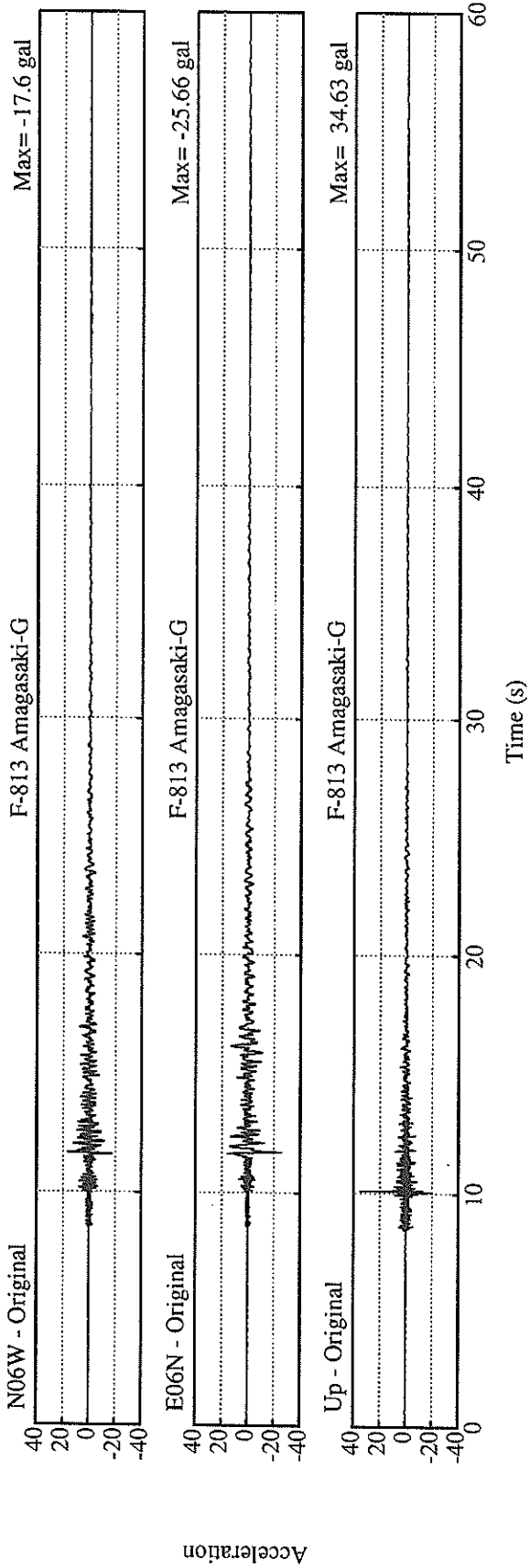
EARTHQUAKE DATA

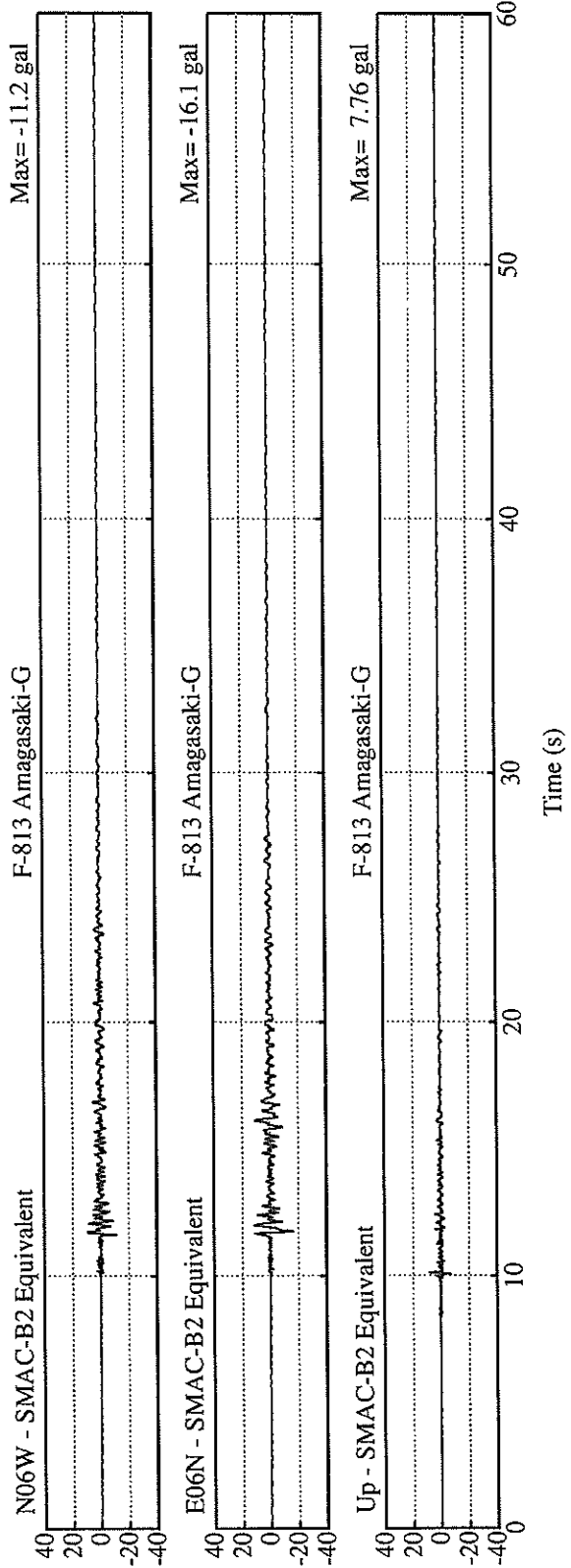
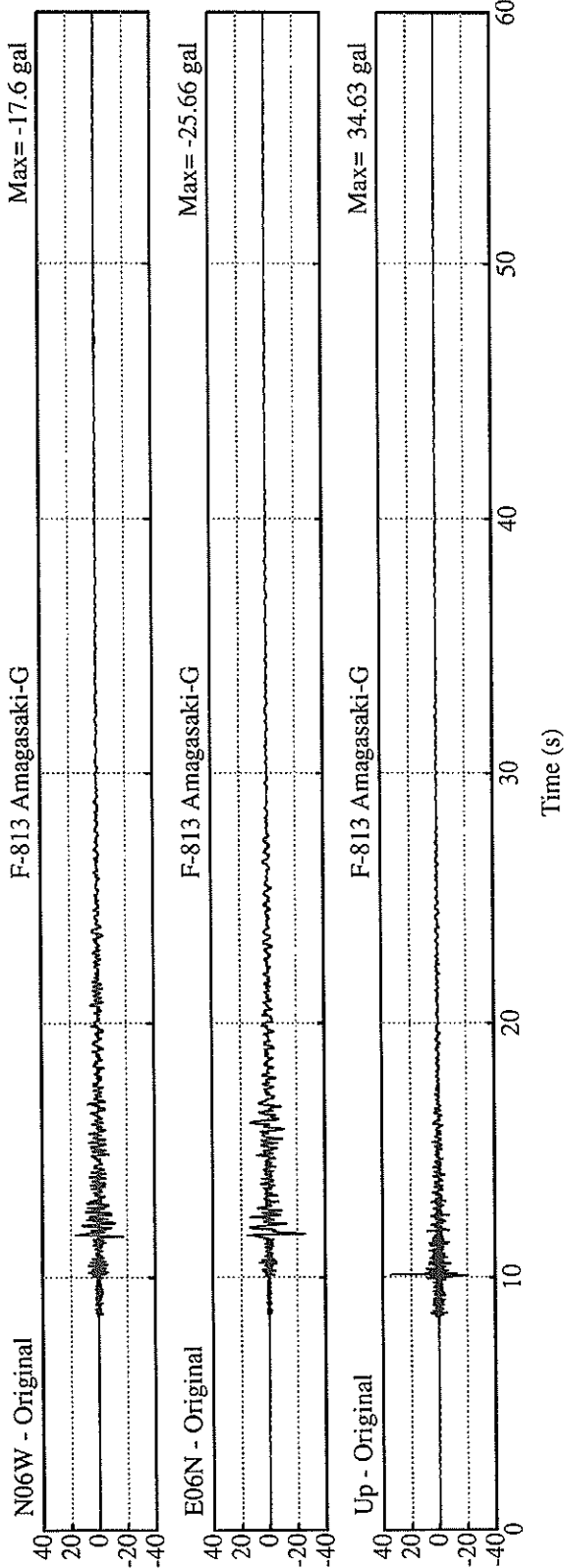
```
*****
DATE AND TIME                1: 0 JAN.19,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          SE HYOGO PREF
  LATITUDE                   34°47.6' N
  LONGITUDE                  135°19.8' E
  DEPTH                      13.1KM
  JMA MAGNITUDE              4.0
*****
```

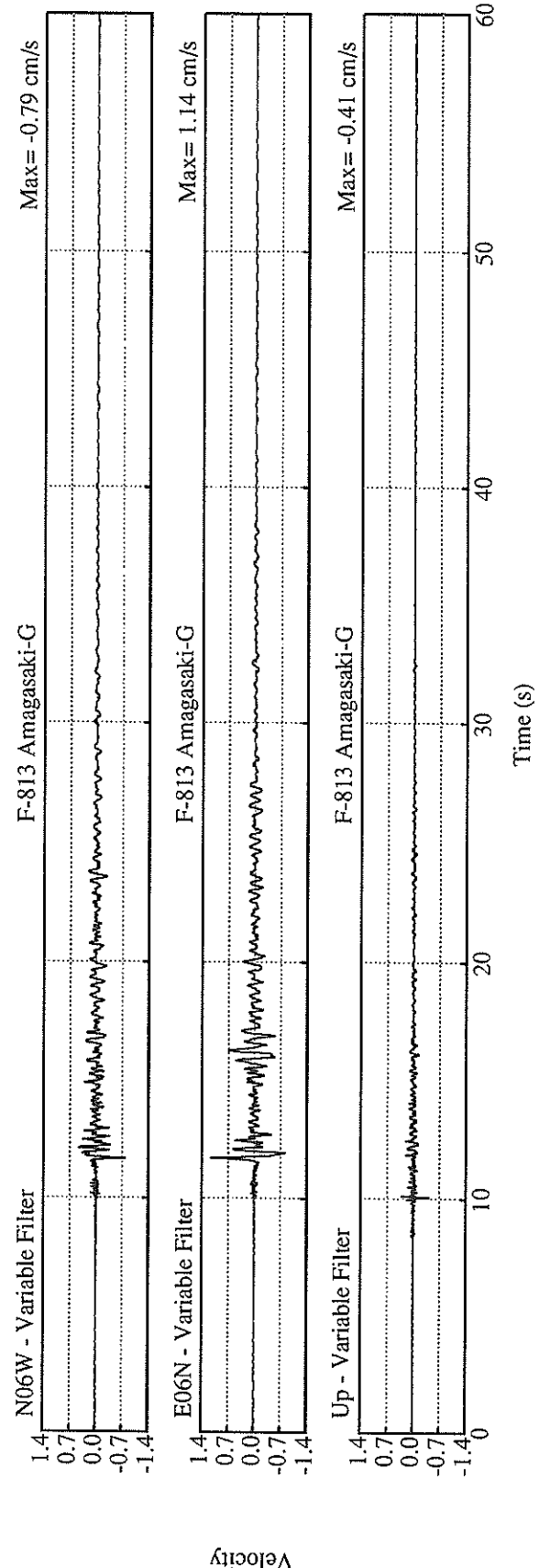
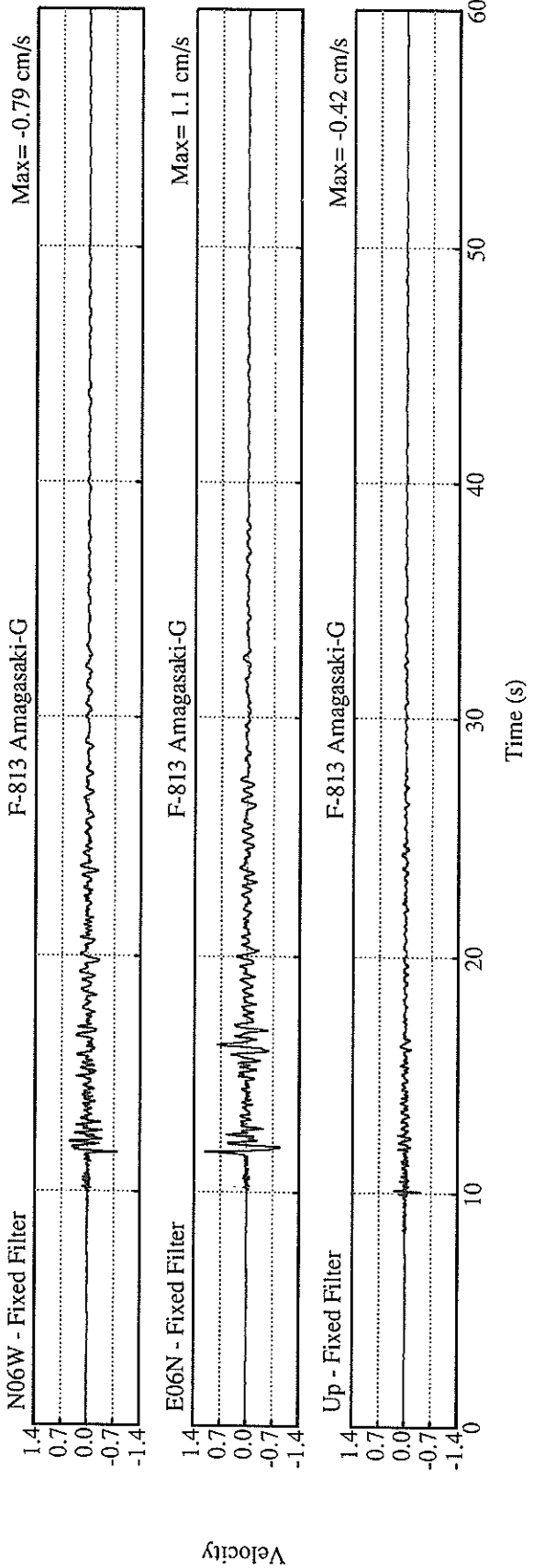
PEAK VALUES OF COMPONENTS

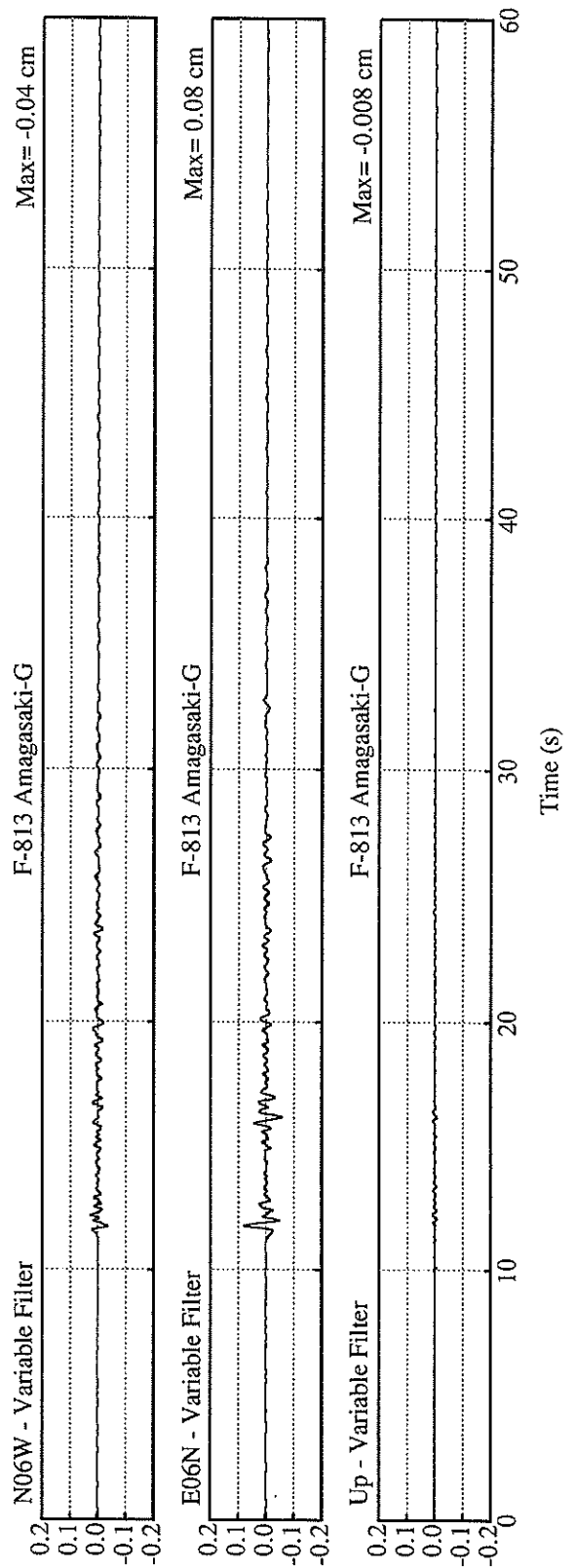
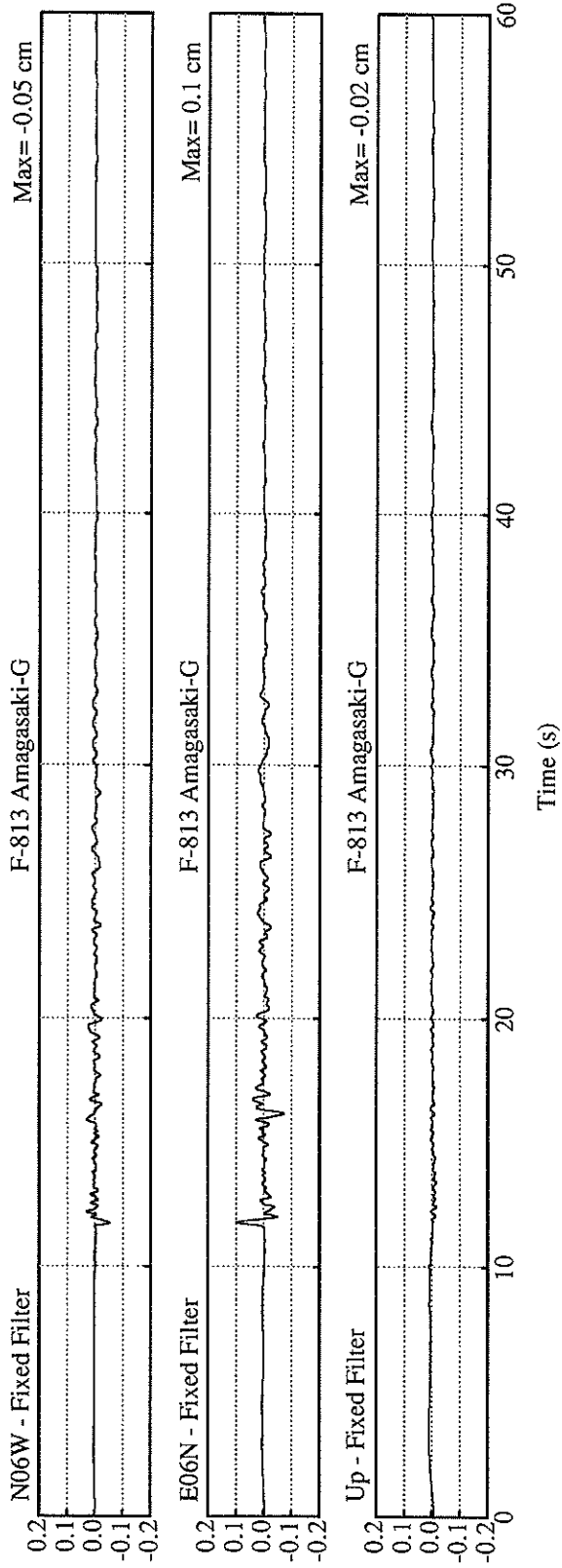
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.909	0.787	1.550	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	11.2	16.1	7.8	17.9
ORIGINAL	17.6	25.7	34.6	27.2
CORRECTED	18.6	25.2	32.3	26.5
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.79	1.10	0.42	1.17
VARIABLE FILTER	0.79	1.14	0.41	1.21
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.05	0.10	0.02	0.11
VARIABLE FILTER	0.04	0.08	0.01	0.08

* RESULTANT OF HORIZONTAL COMPONENTS



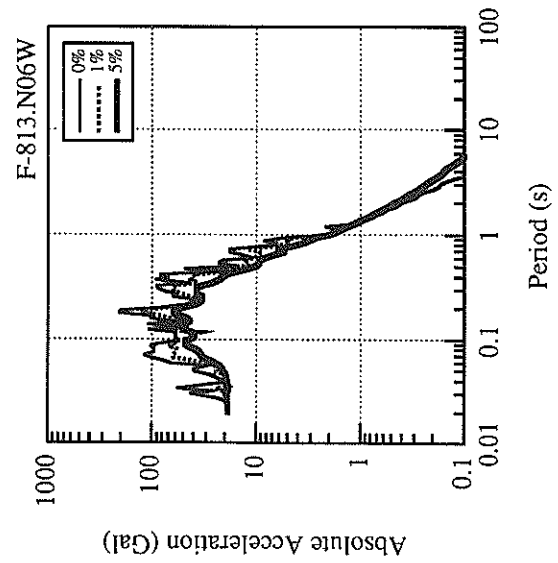
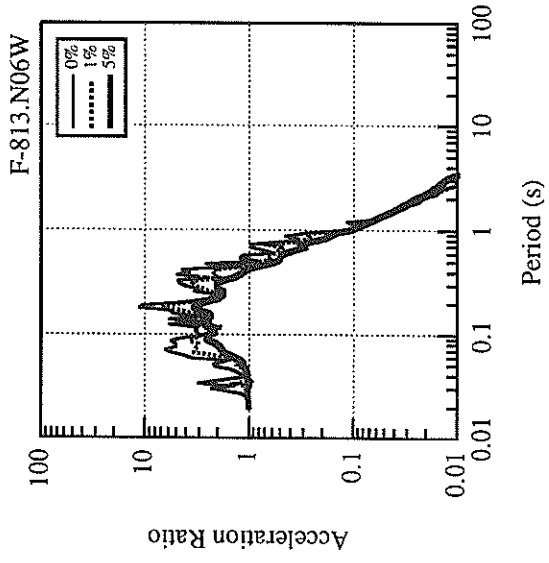
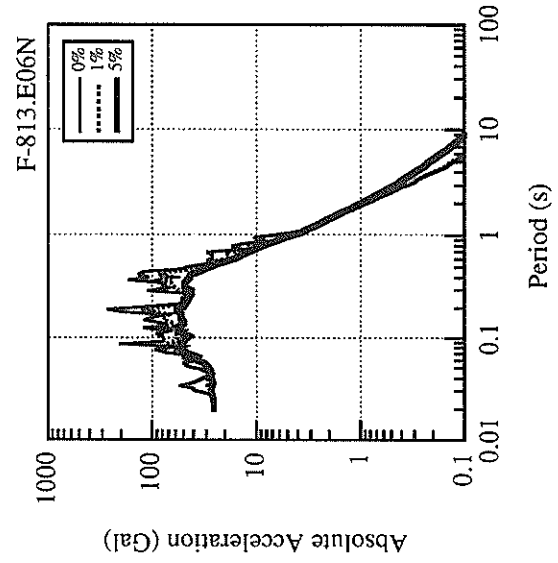
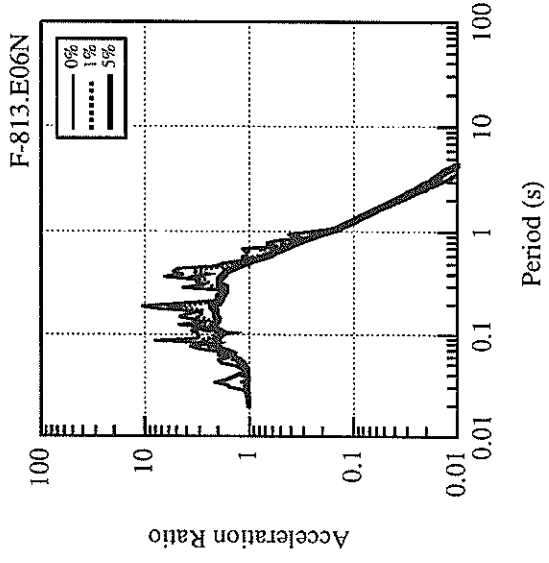
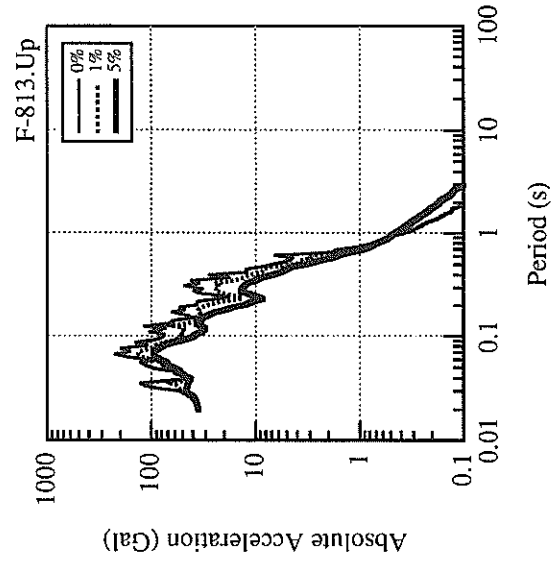
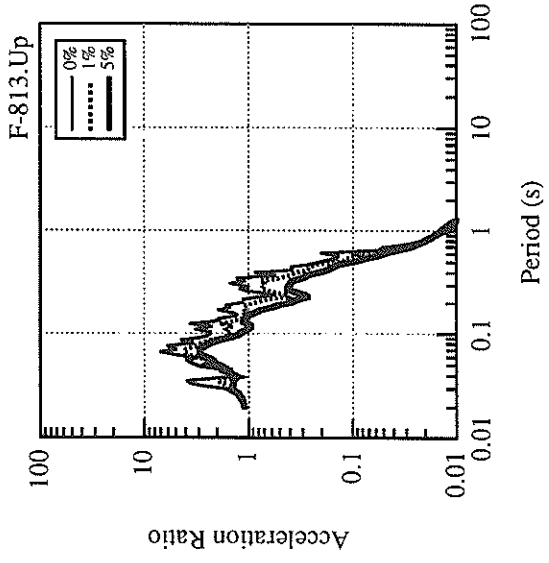


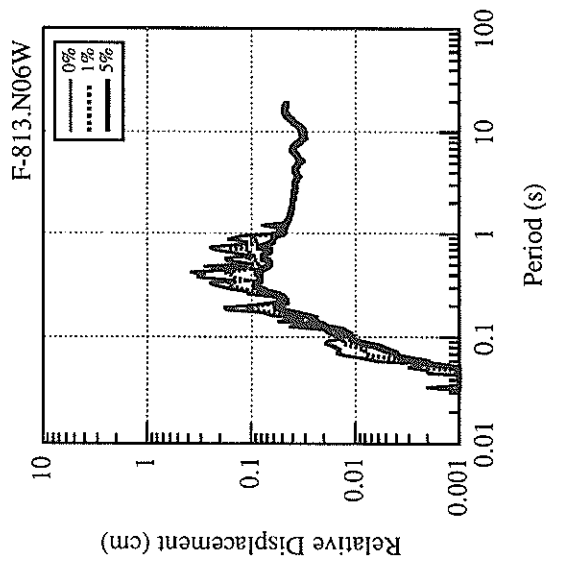
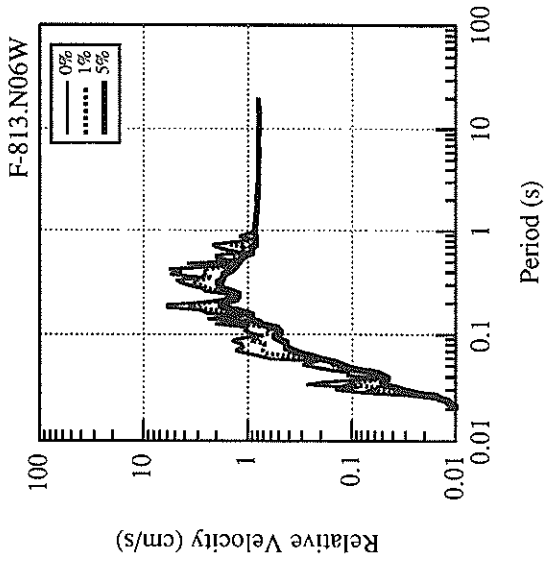
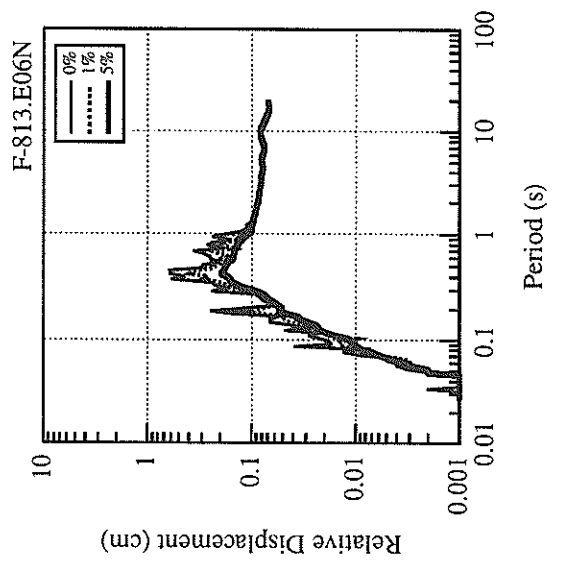
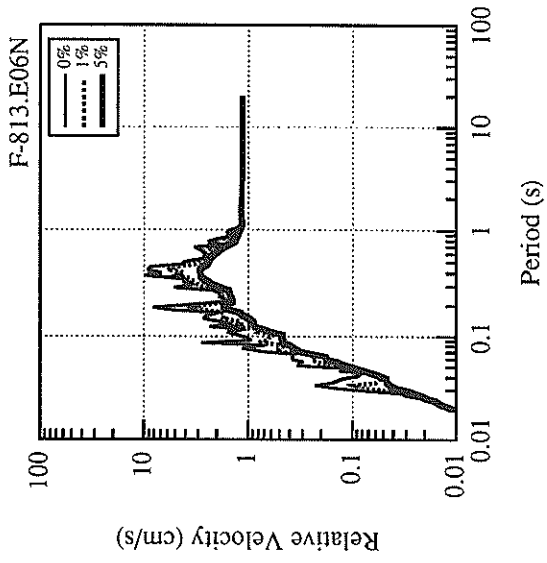
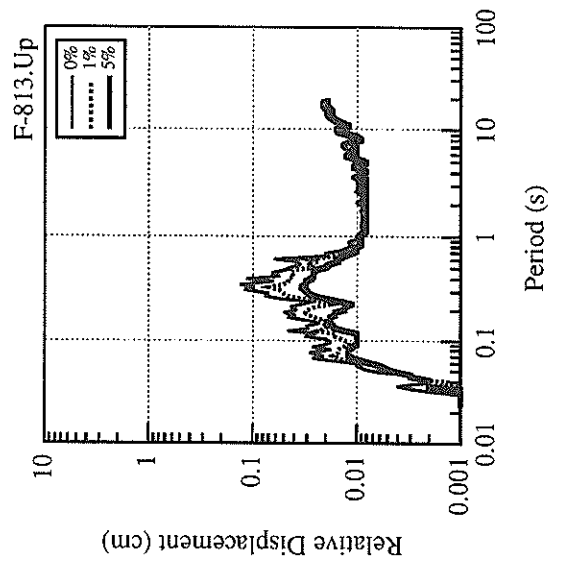
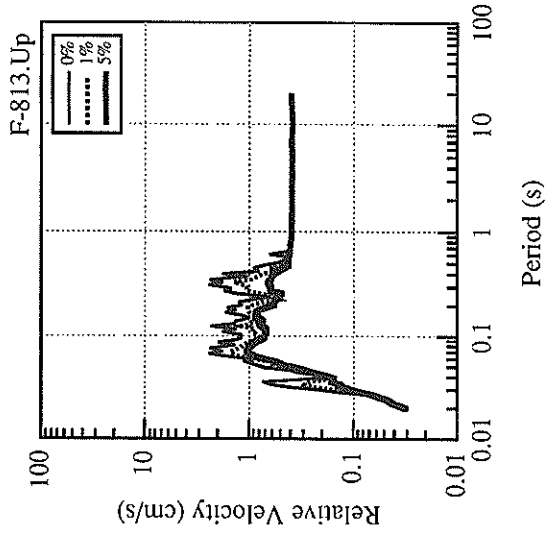


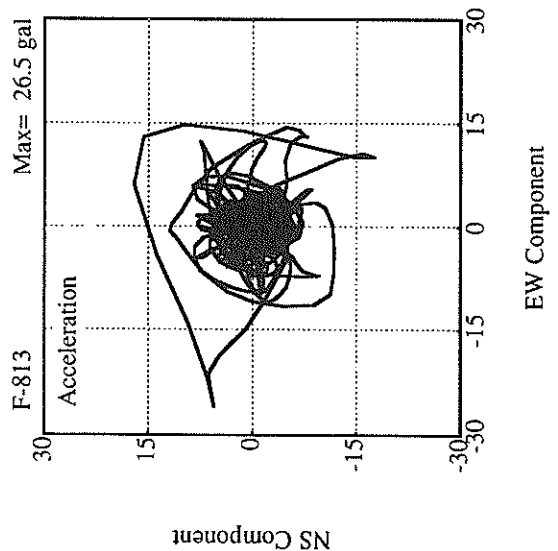
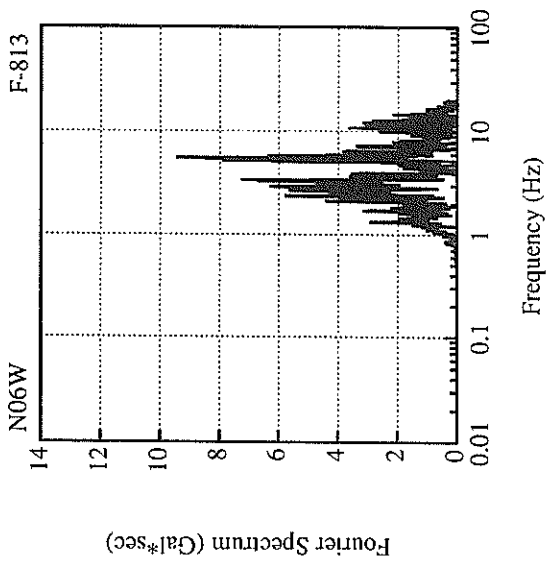
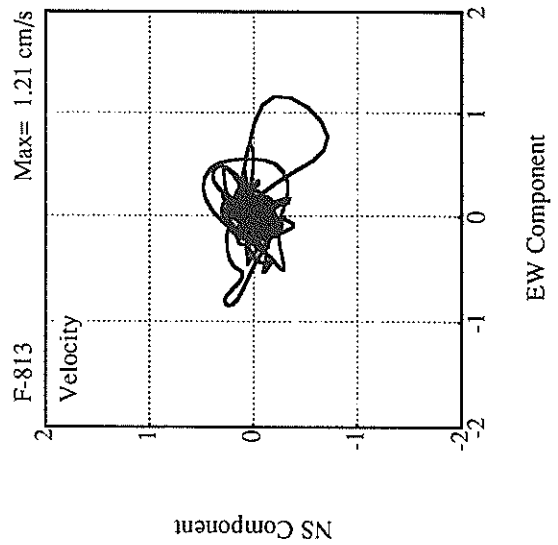
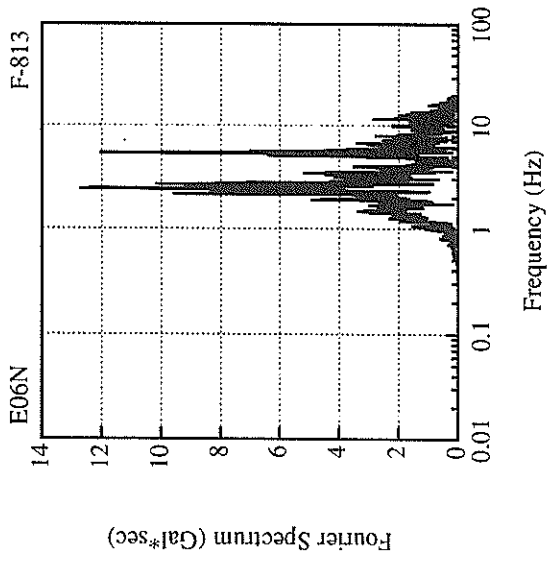
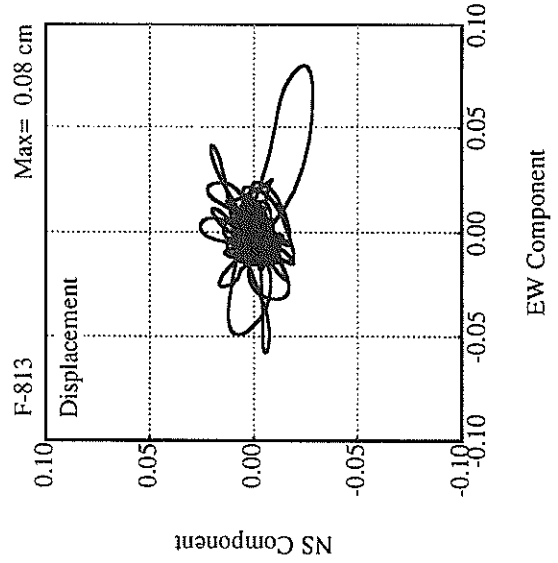
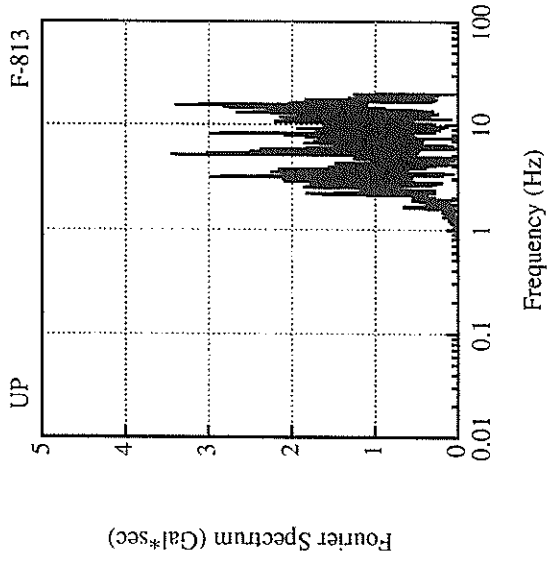


Displacement

Displacement







RECORD NUMBER : F-817
 STATION : AMAGASAKI-G

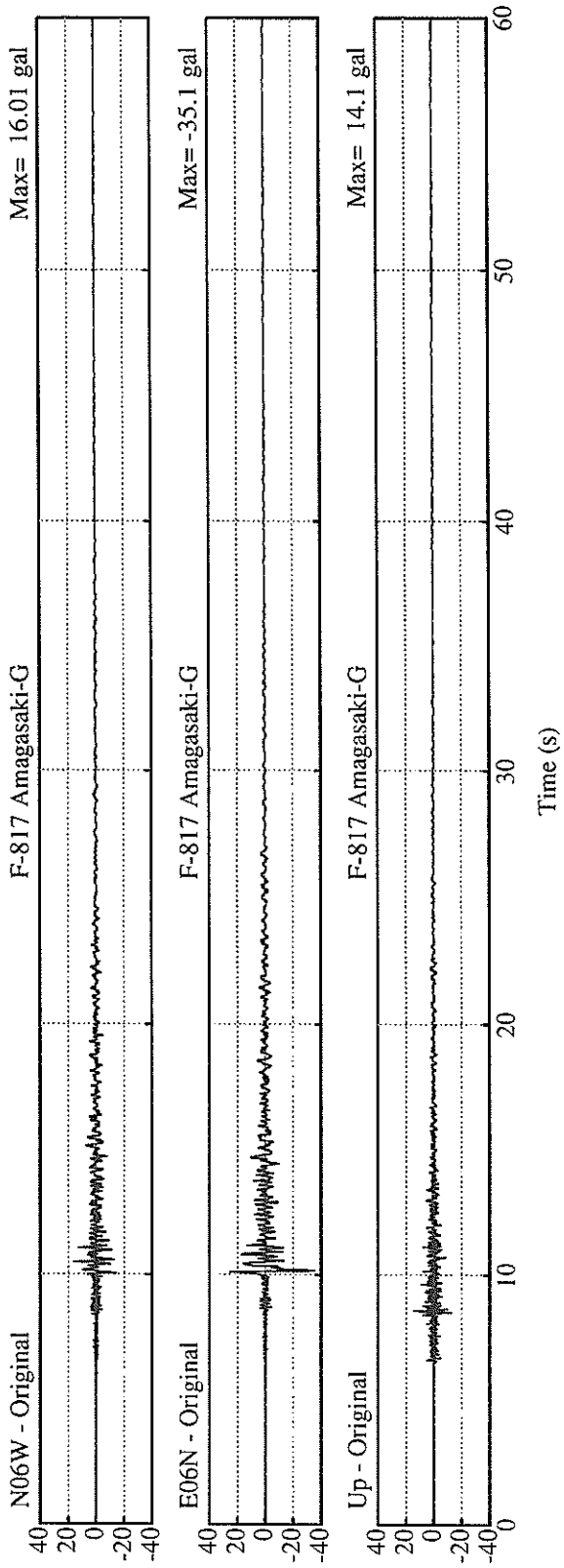
EARTHQUAKE DATA

 DATE AND TIME 21:44 JAN.23,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°47.6' N
 LONGITUDE 135°18.9' E
 DEPTH 15.6KM
 JMA MAGNITUDE 4.2

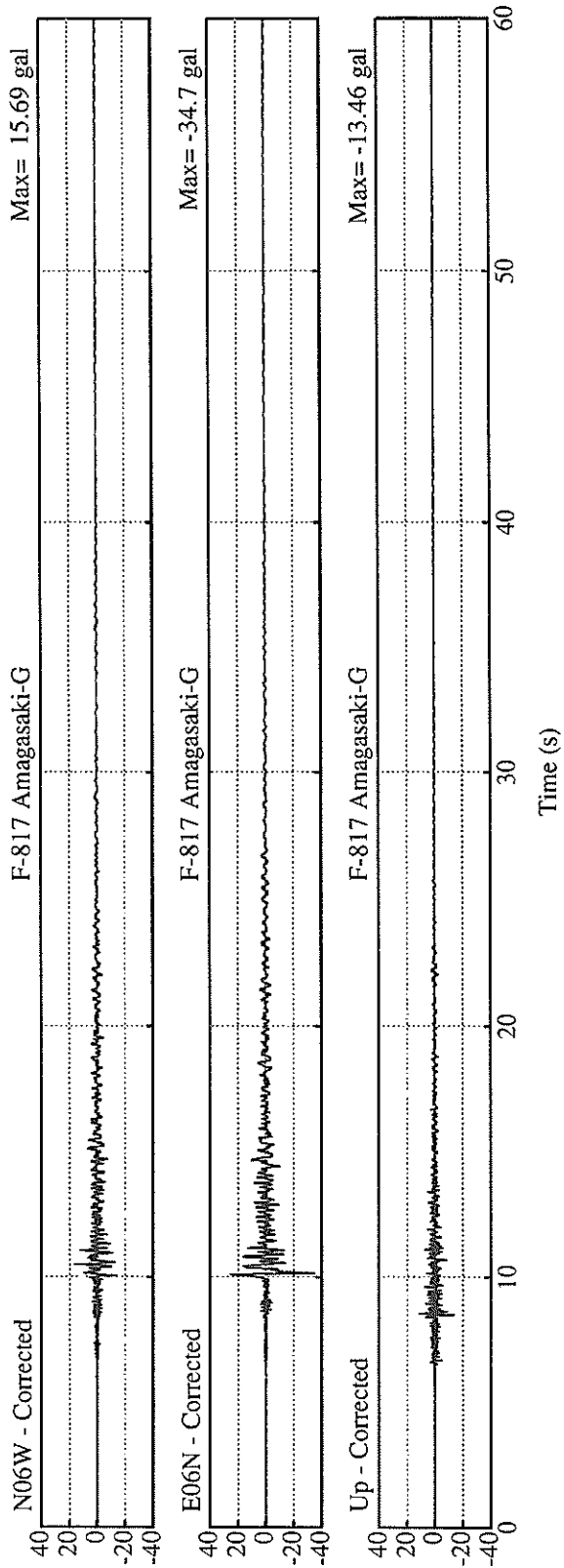
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.823	0.695	1.360	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	8.2	20.6	5.1	21.4
ORIGINAL	16.0	35.1	14.1	36.3
CORRECTED	15.7	34.7	13.5	35.9
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.51	1.64	0.24	1.71
VARIABLE FILTER	0.50	1.69	0.23	1.76
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.04	0.14	0.02	0.15
VARIABLE FILTER	0.03	0.11	0.01	0.12

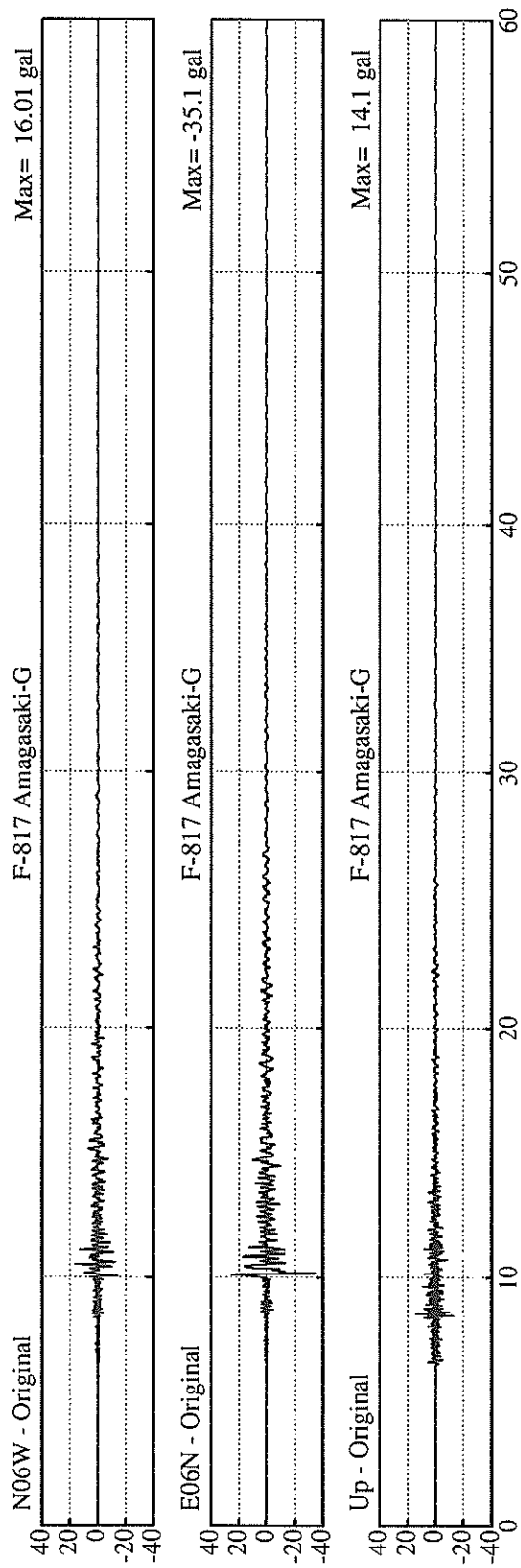
* RESULTANT OF HORIZONTAL COMPONENTS



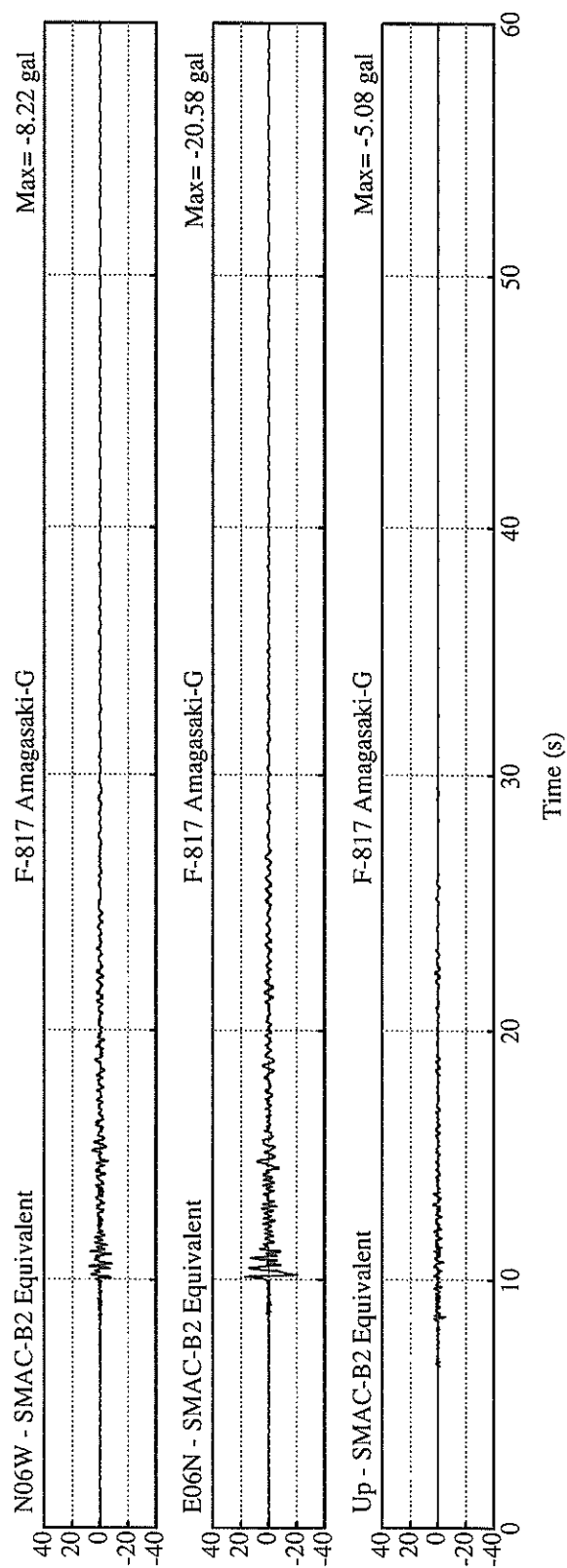
Acceleration



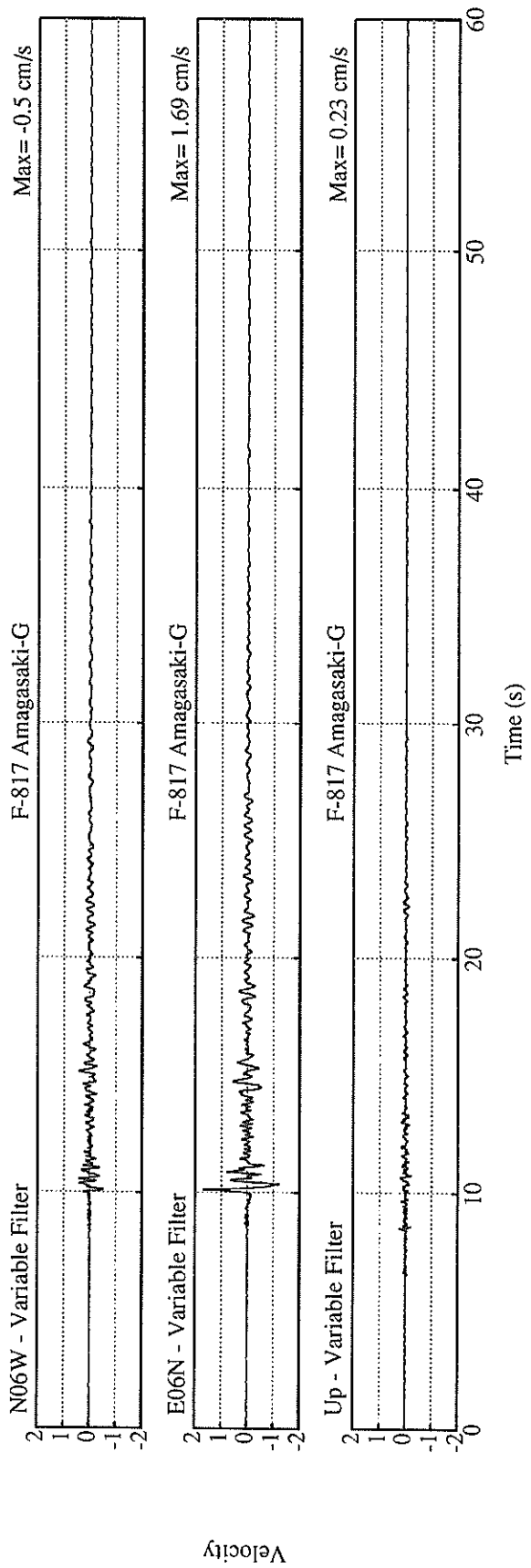
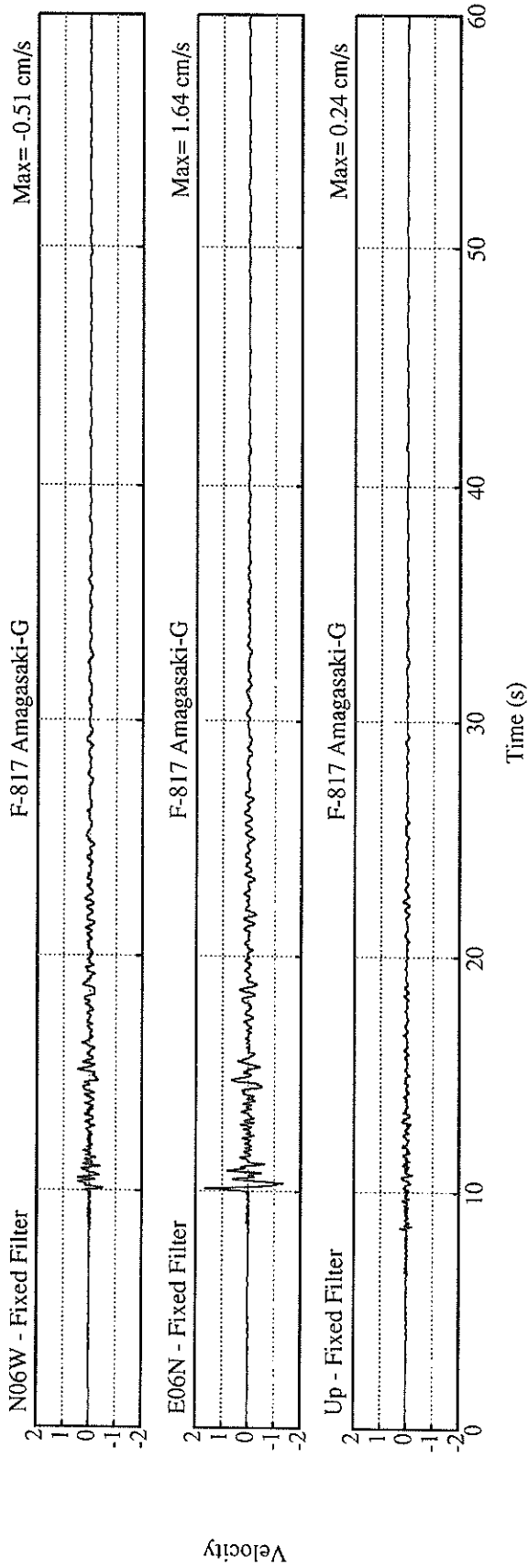
Acceleration

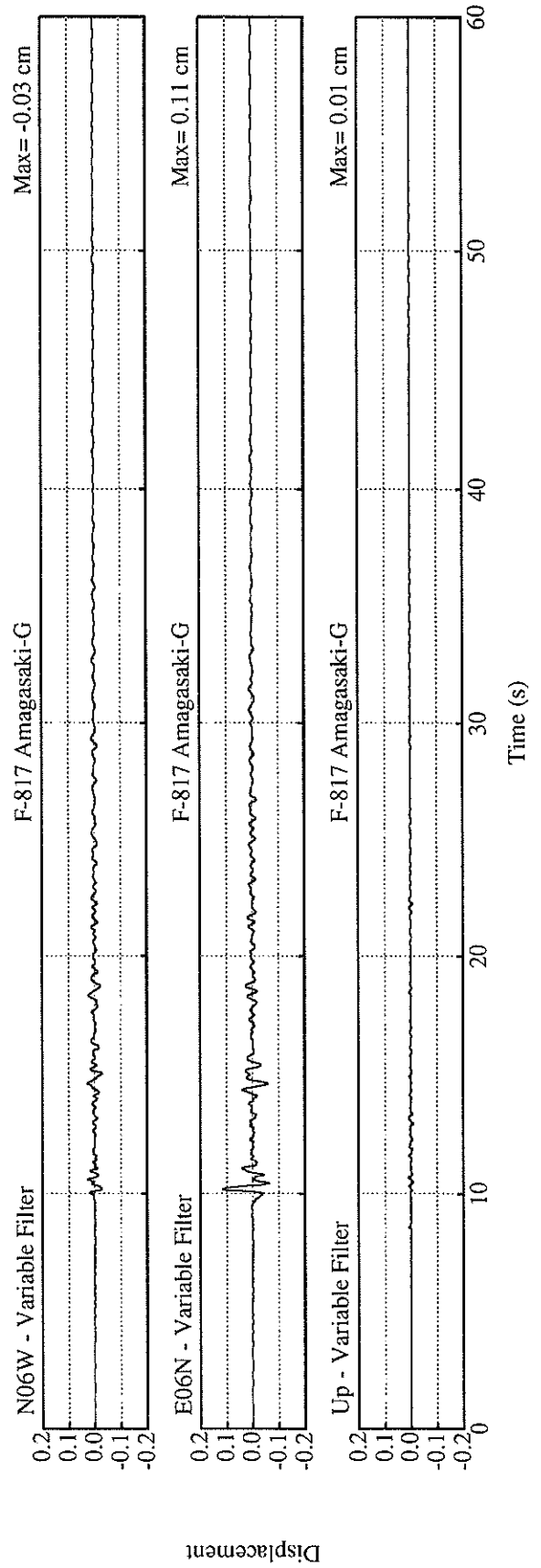
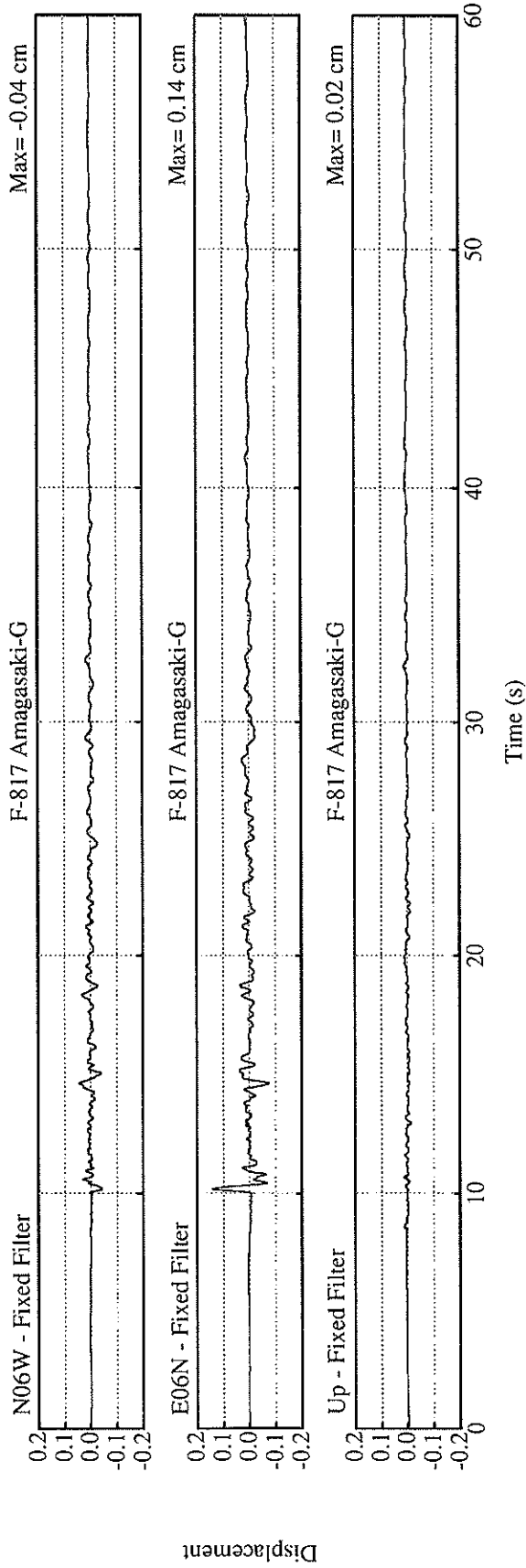


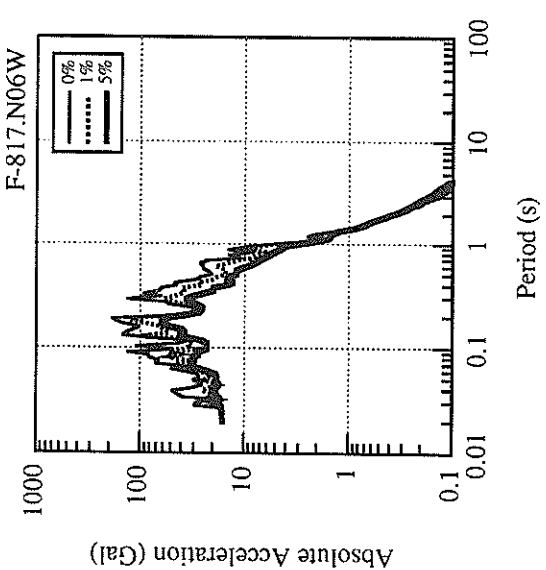
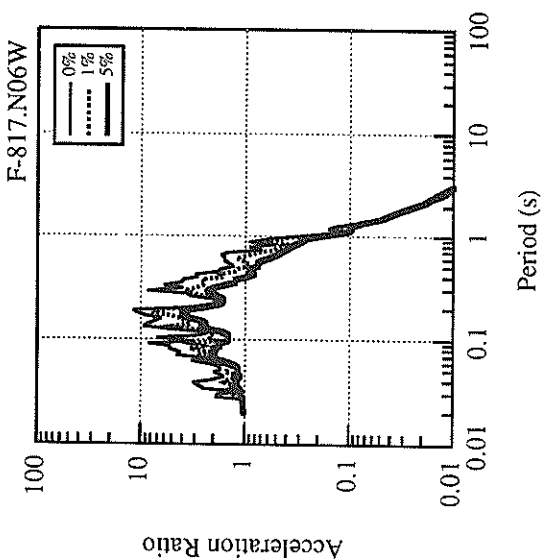
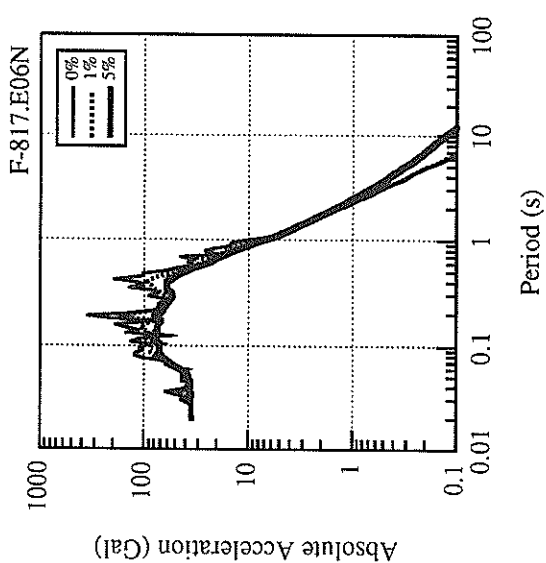
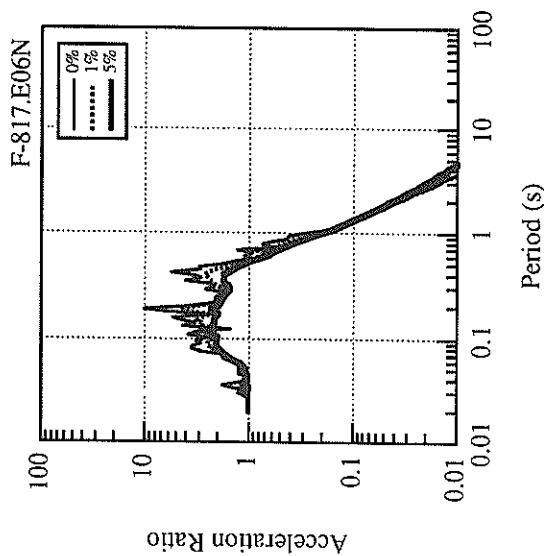
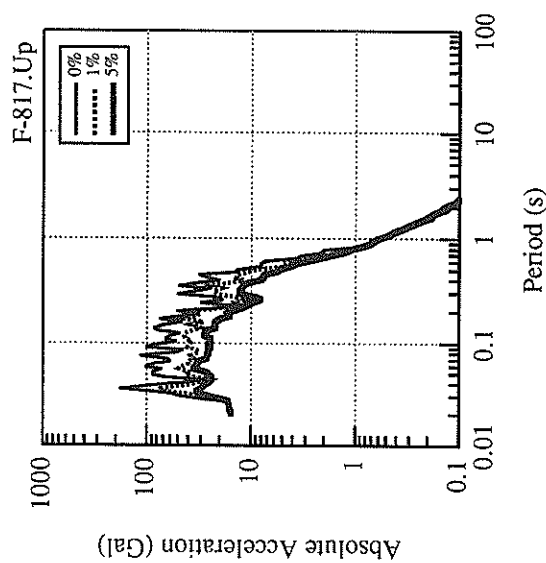
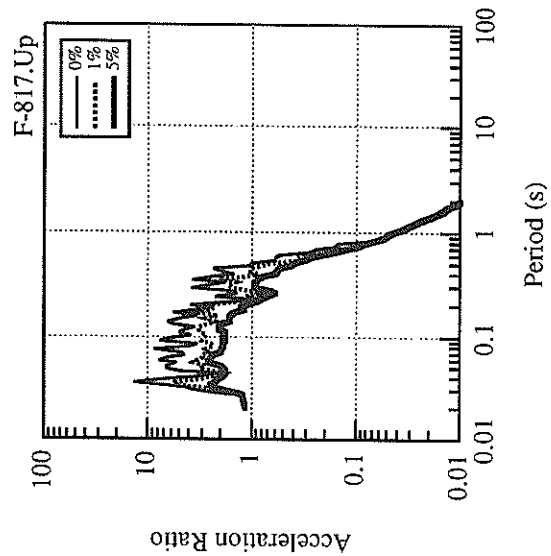
Acceleration

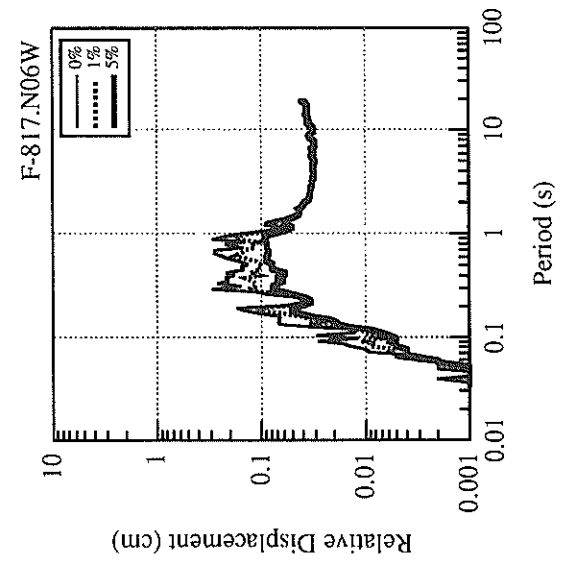
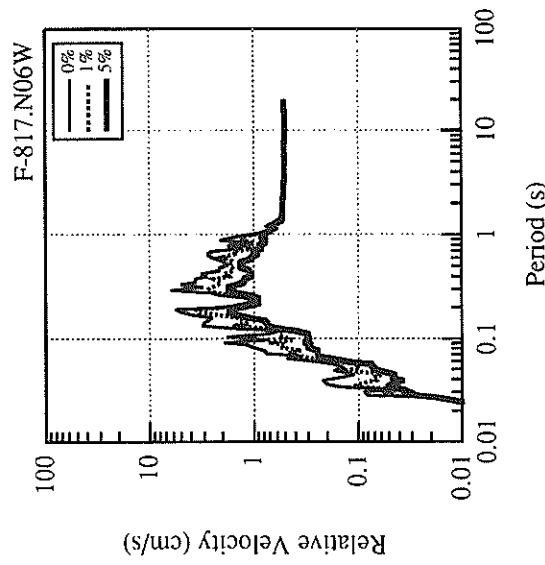
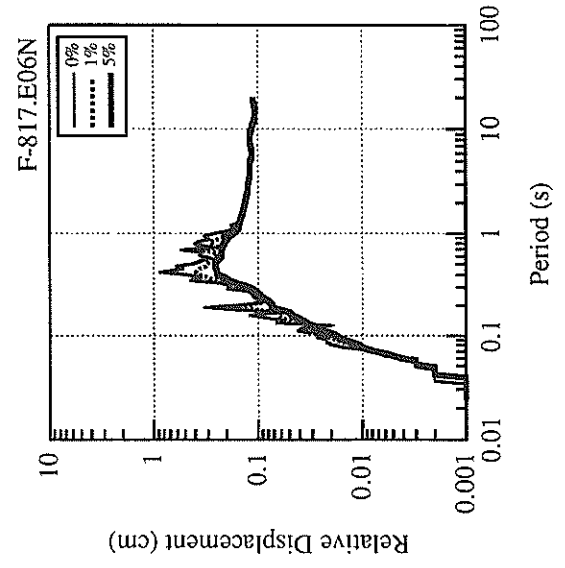
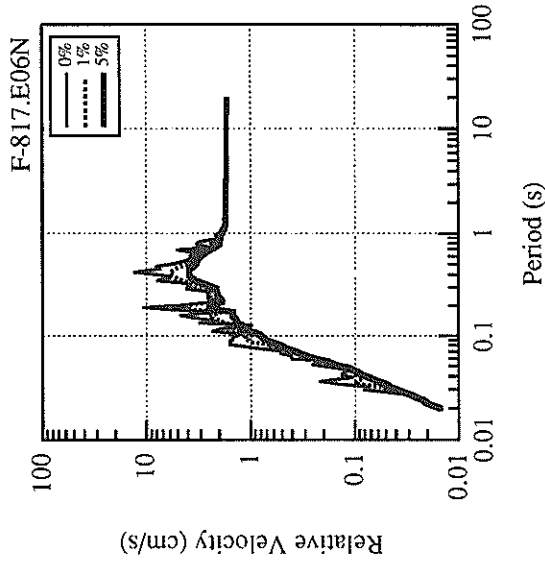
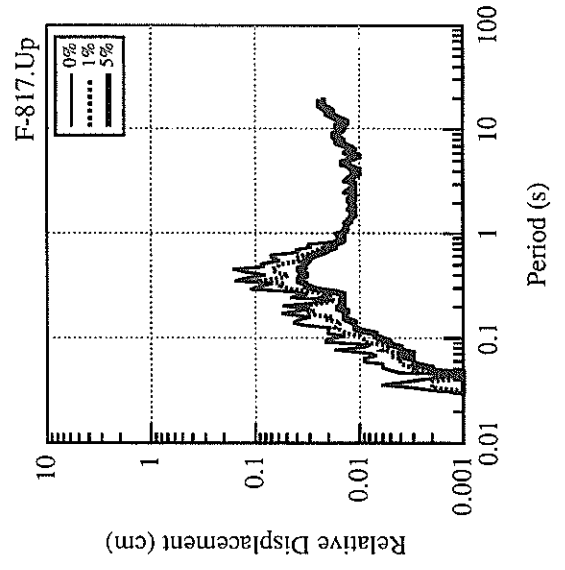
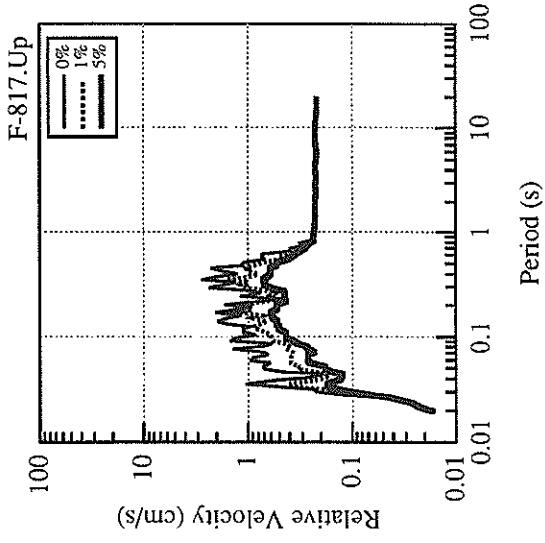


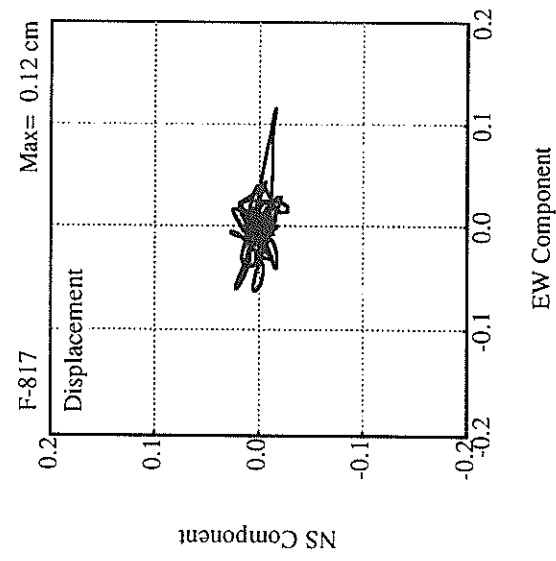
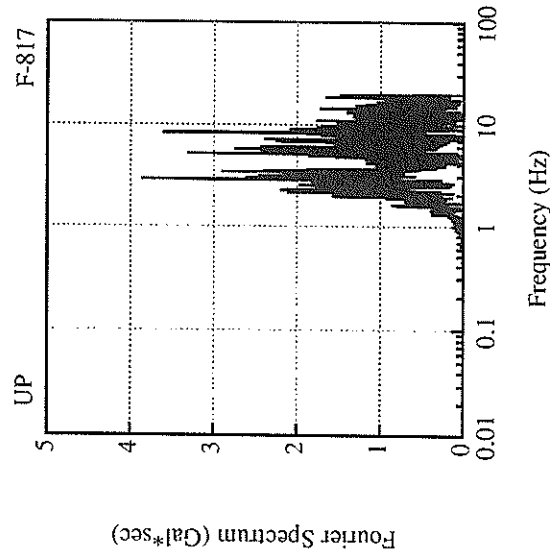
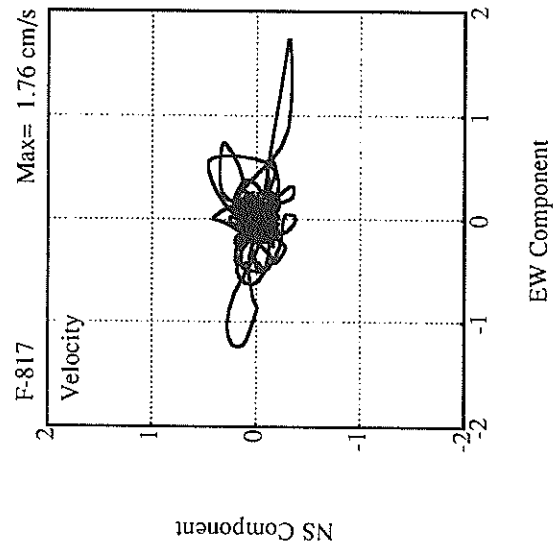
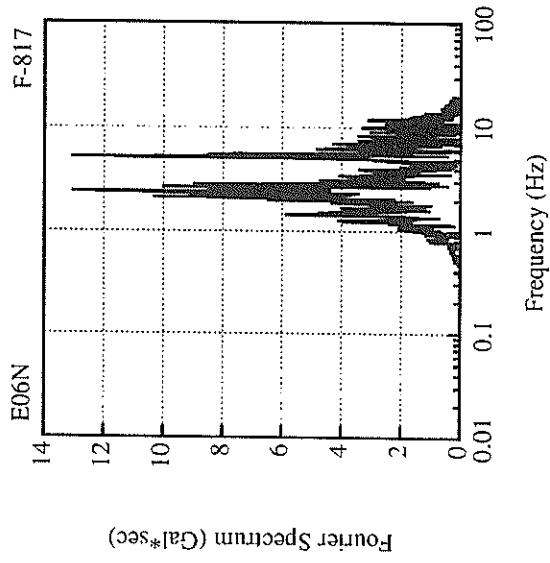
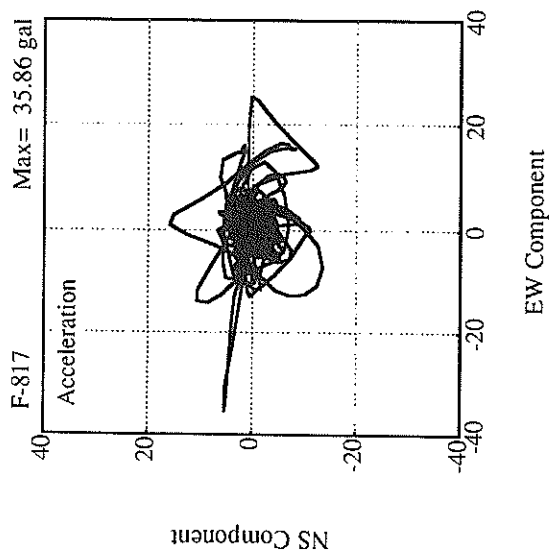
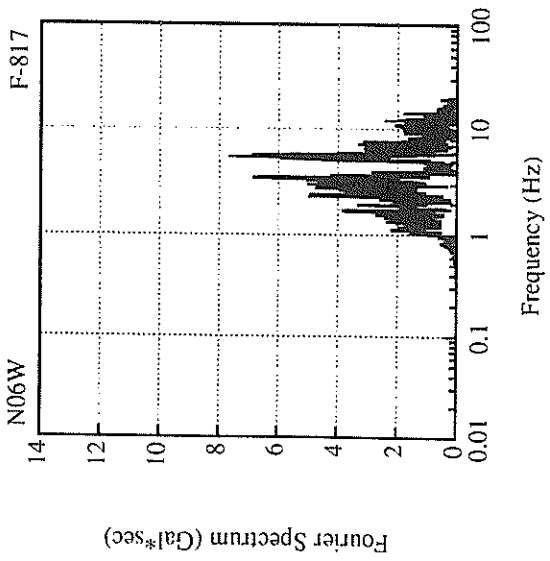
Acceleration











RECORD NUMBER : F-818
 STATION : AMAGASAKI-G

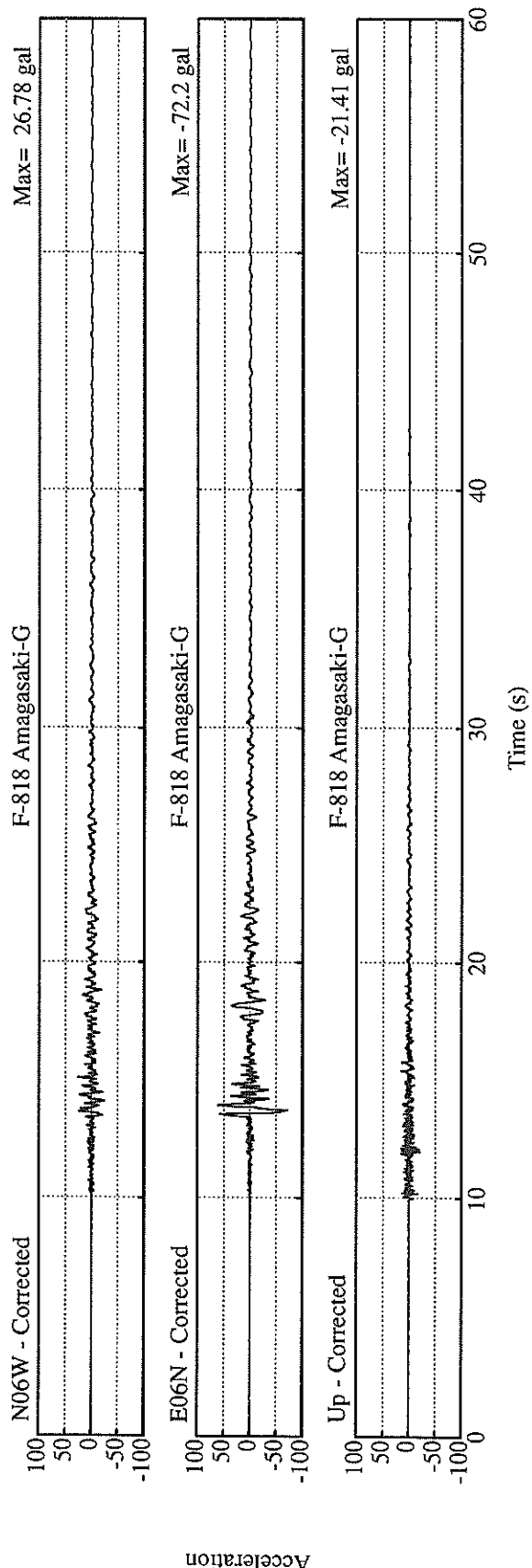
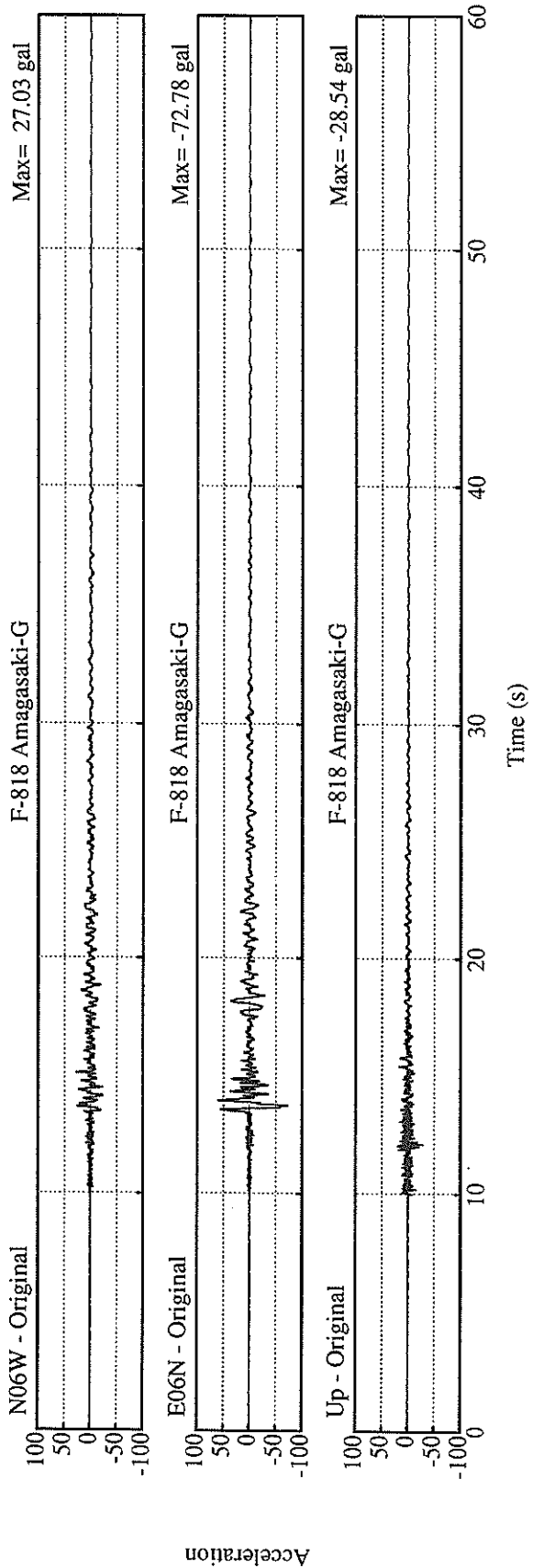
EARTHQUAKE DATA

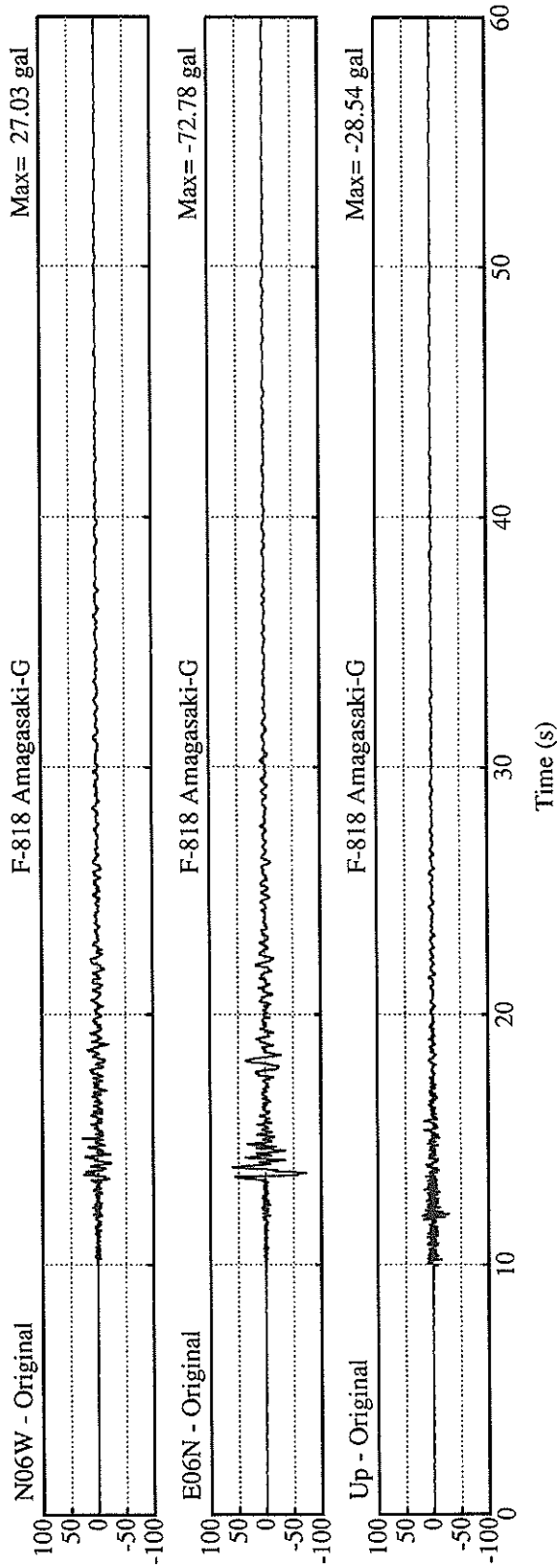
 DATE AND TIME 23:15 JAN.25,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34° 47.4' N
 LONGITUDE 135° 18.4' E
 DEPTH 14.8KM
 JMA MAGNITUDE 5.1

PEAK VALUES OF COMPONENTS

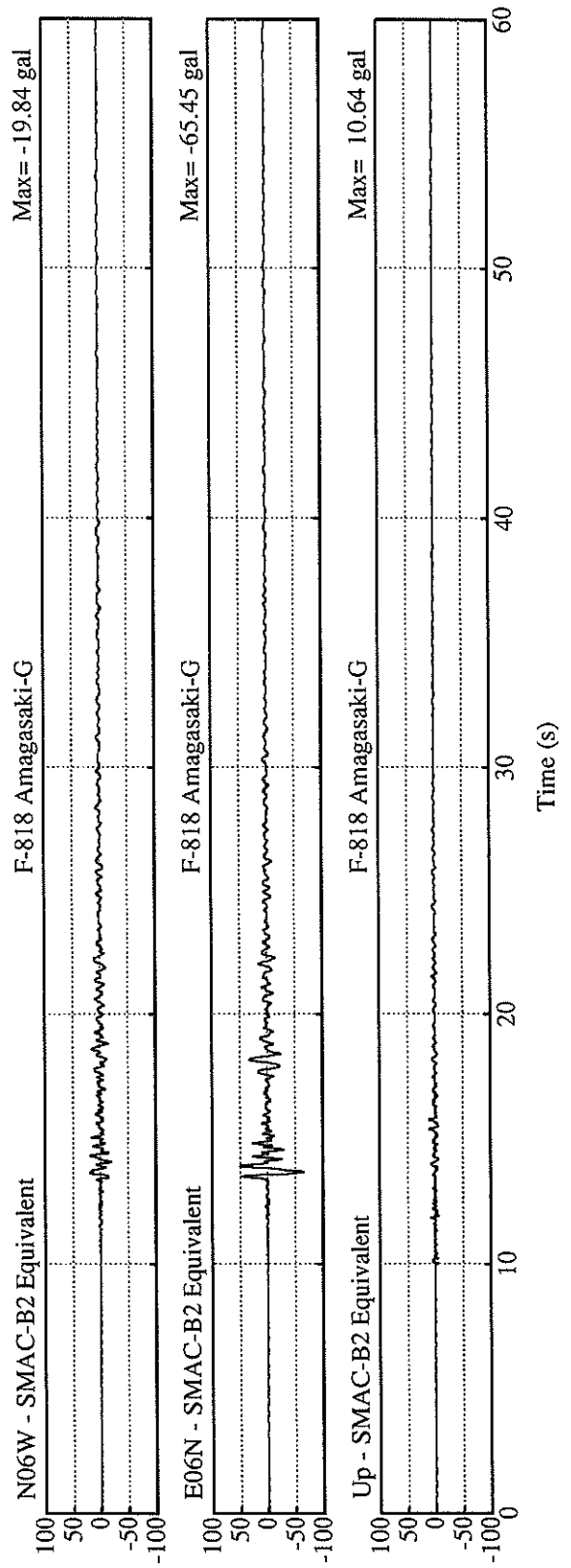
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.439	0.329	0.610	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	19.8	65.5	10.6	66.5
ORIGINAL	27.0	72.8	28.5	73.1
CORRECTED	26.8	72.2	21.4	72.4
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	1.68	5.66	0.61	5.81
VARIABLE FILTER	1.81	5.84	0.60	6.10
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.22	0.70	0.05	0.73
VARIABLE FILTER	0.19	0.68	0.04	0.70

* RESULTANT OF HORIZONTAL COMPONENTS

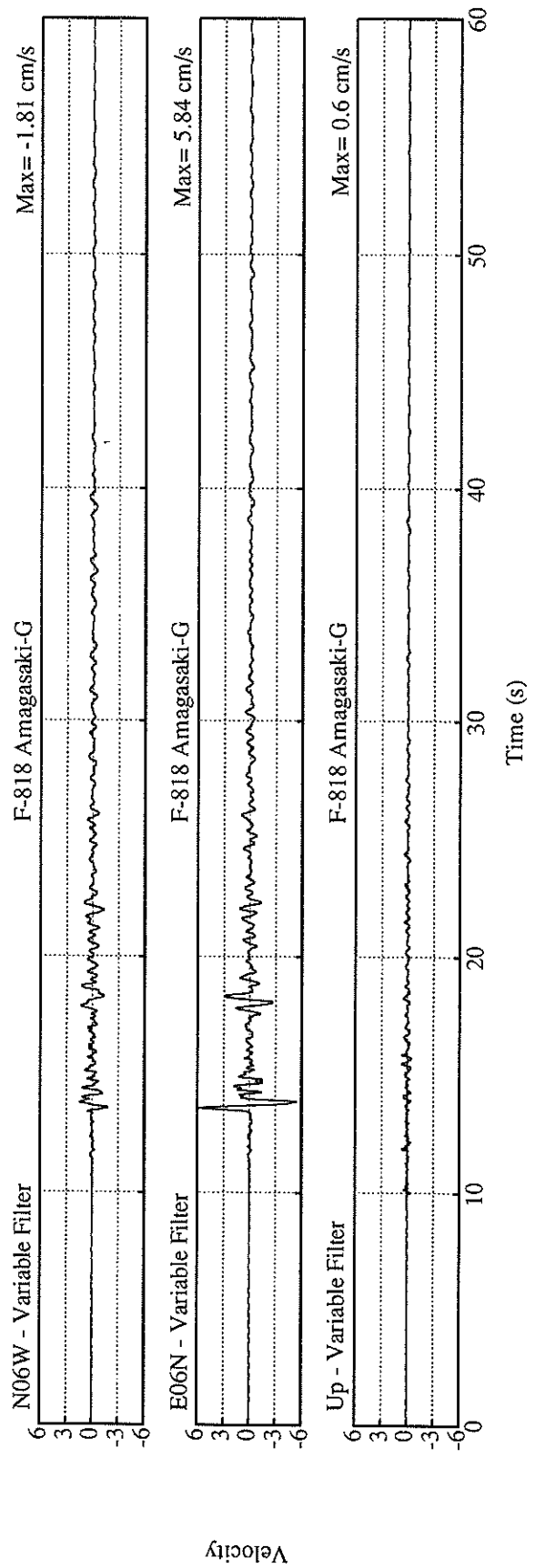
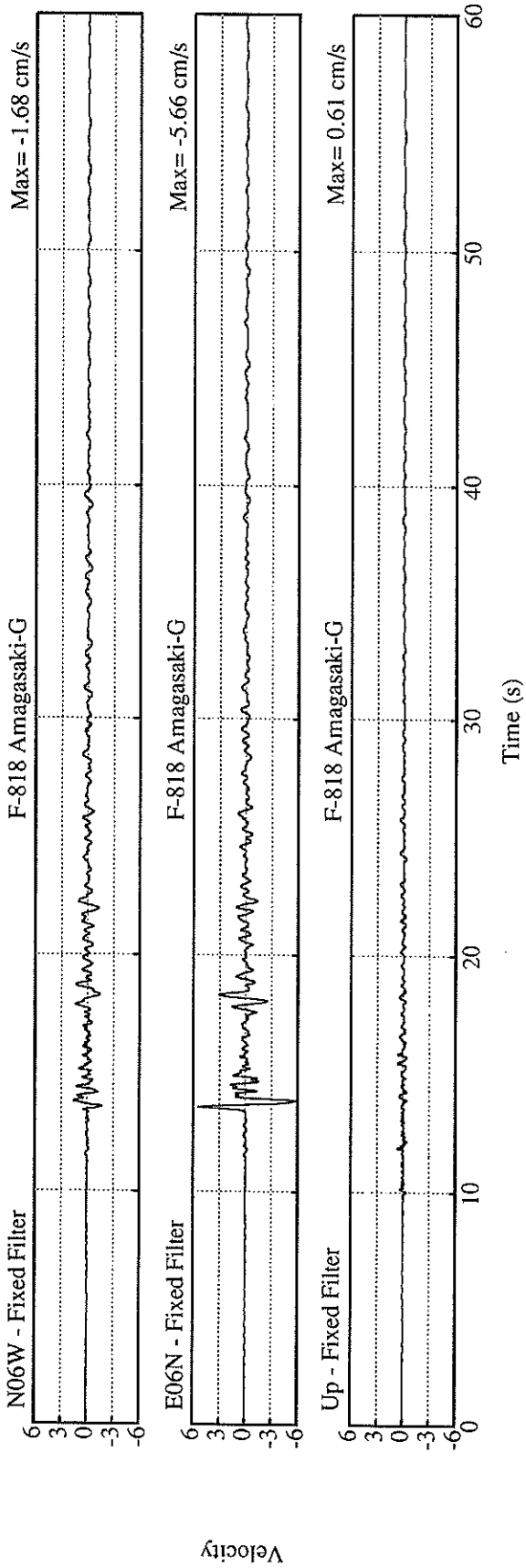


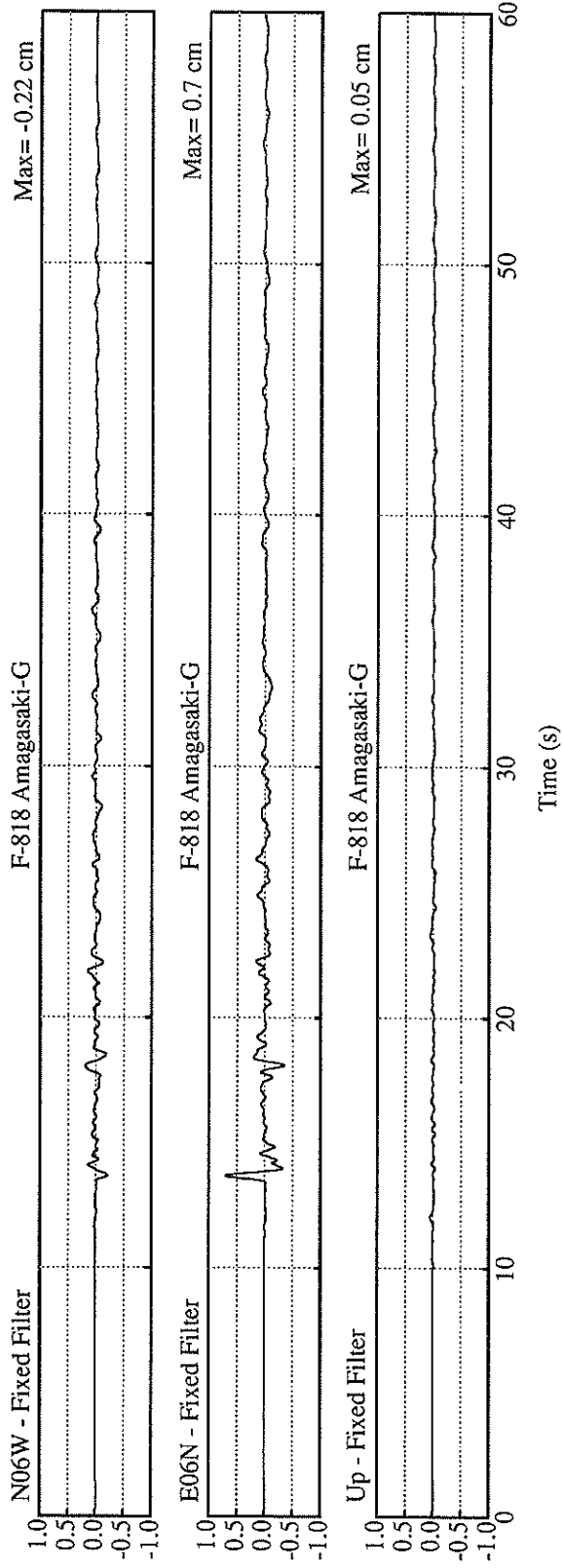


Acceleration

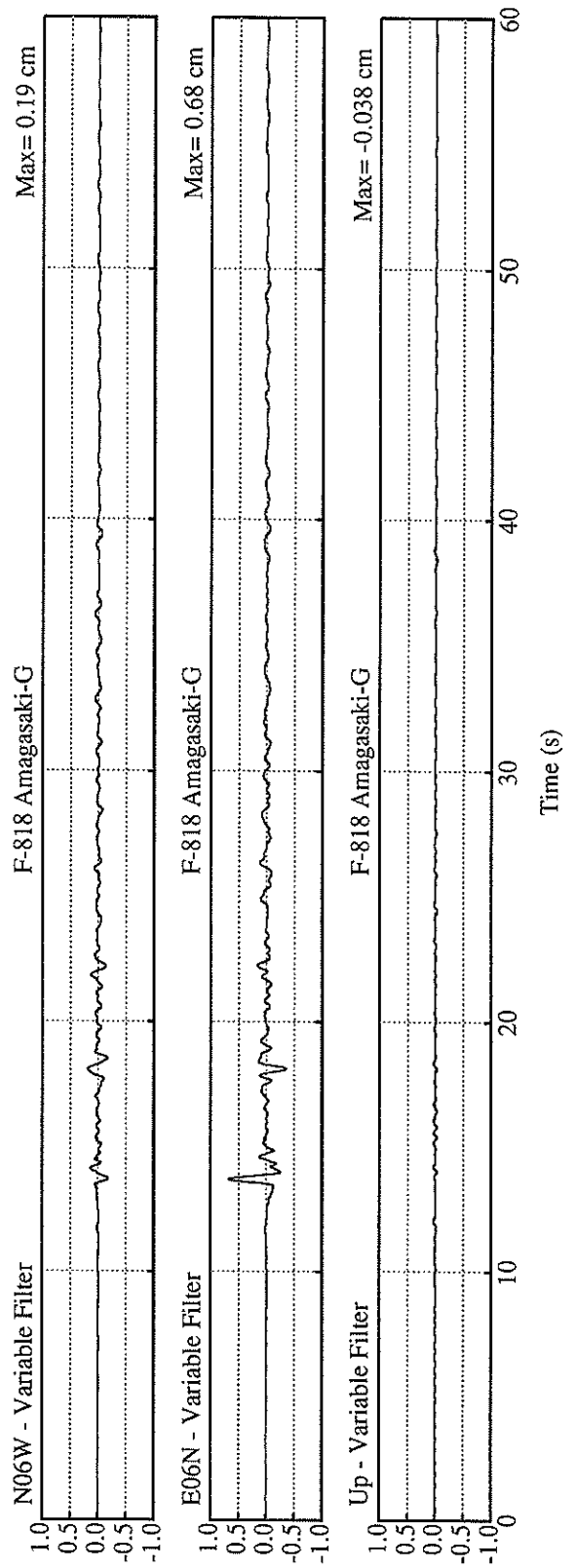


Acceleration

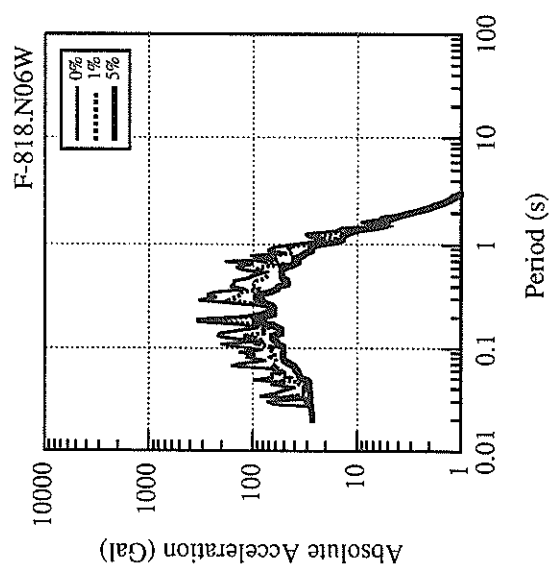
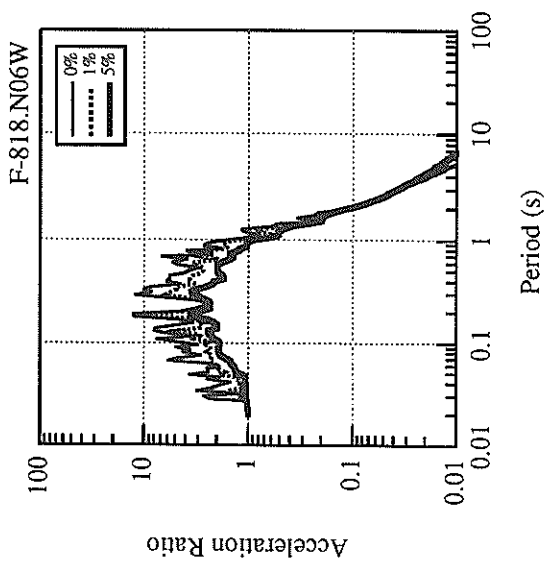
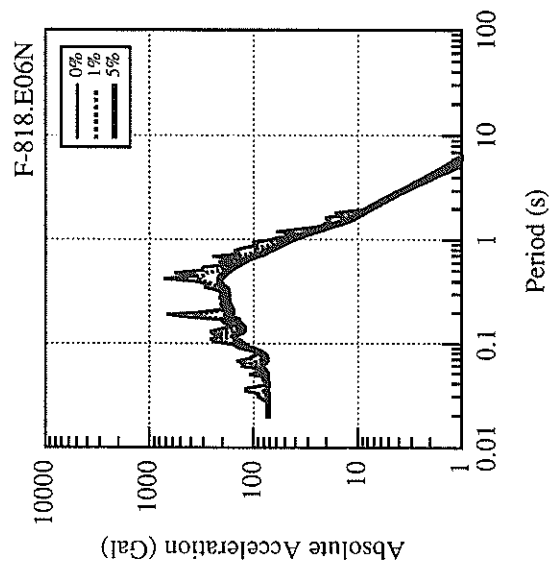
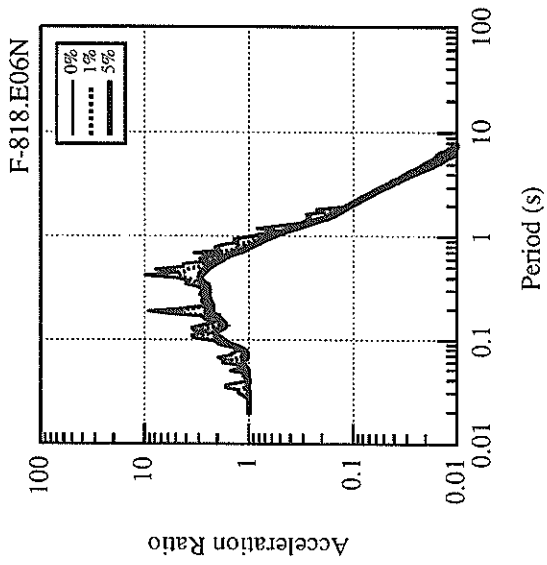
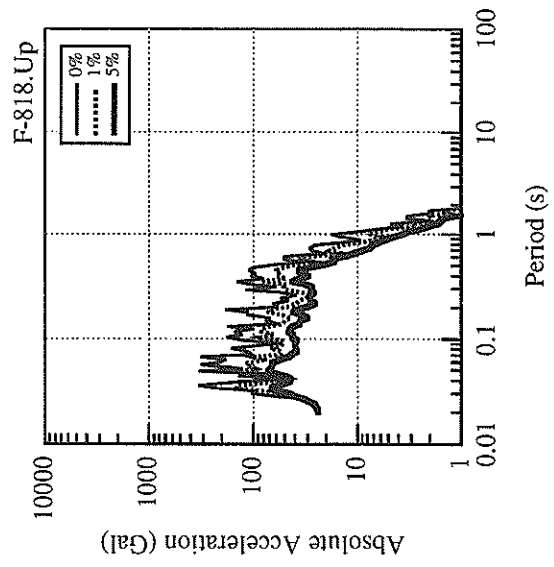
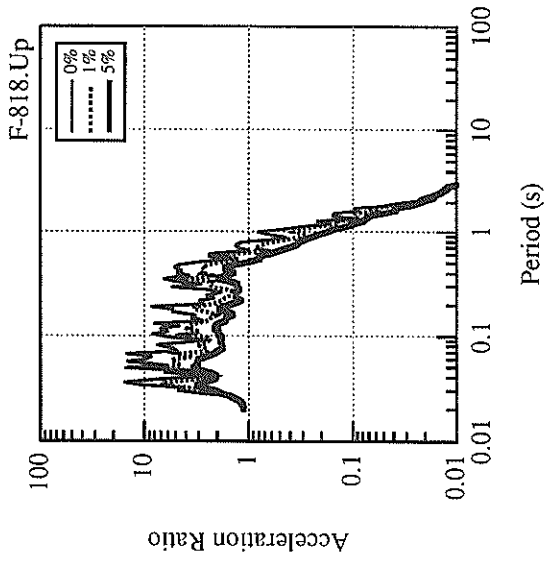


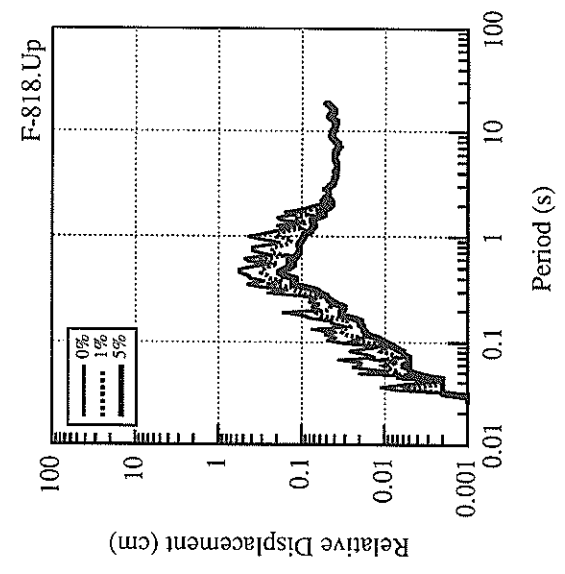
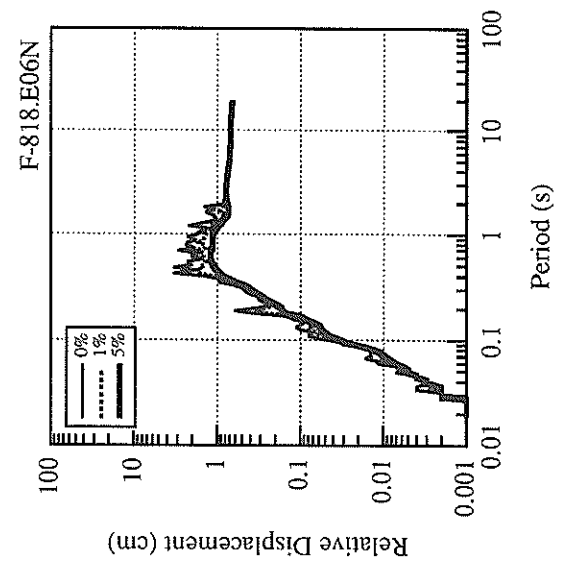
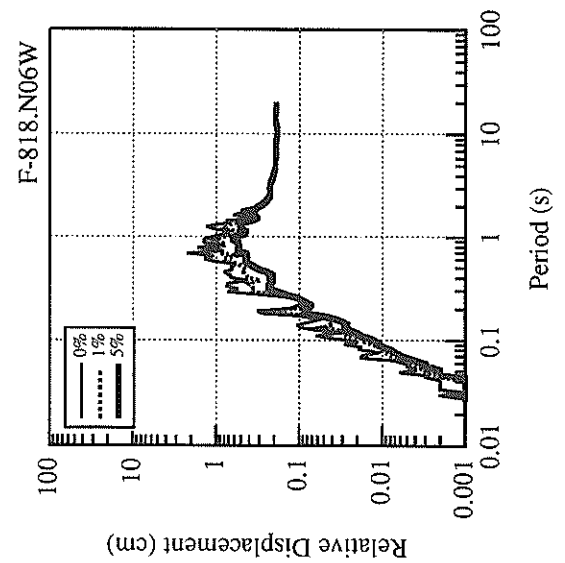
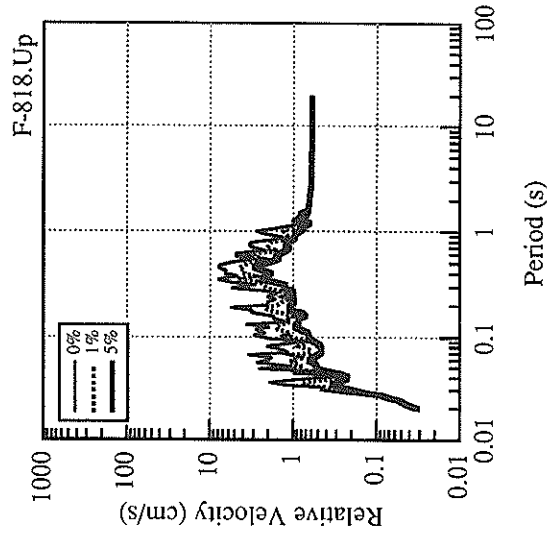
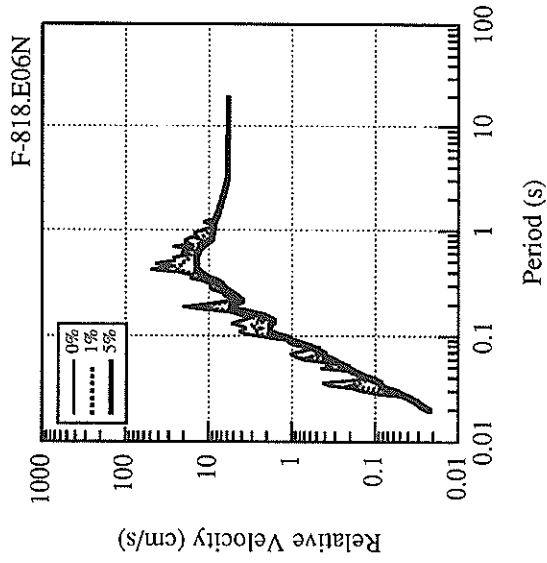
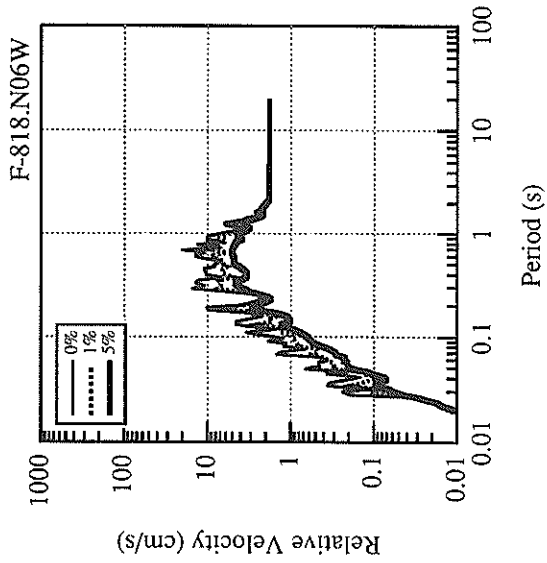


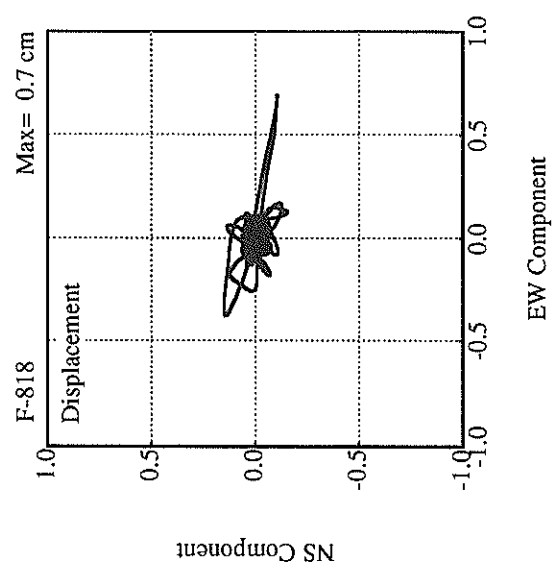
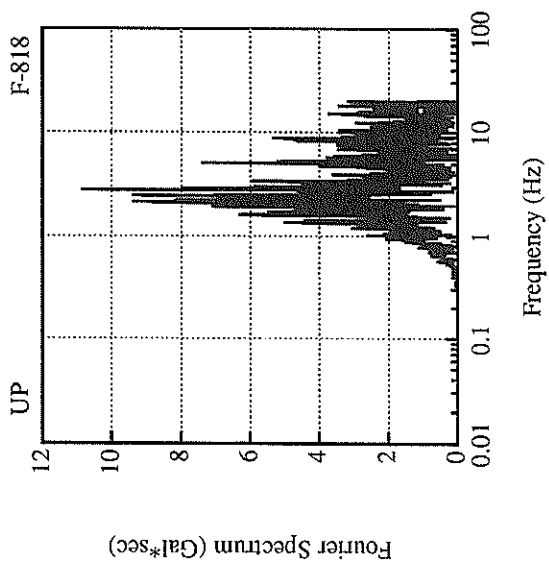
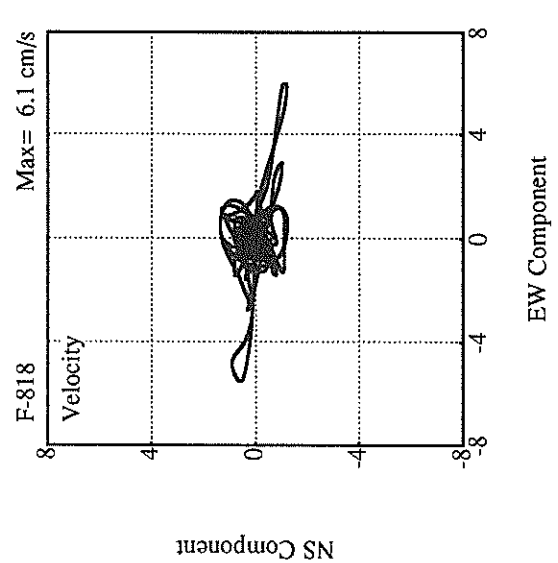
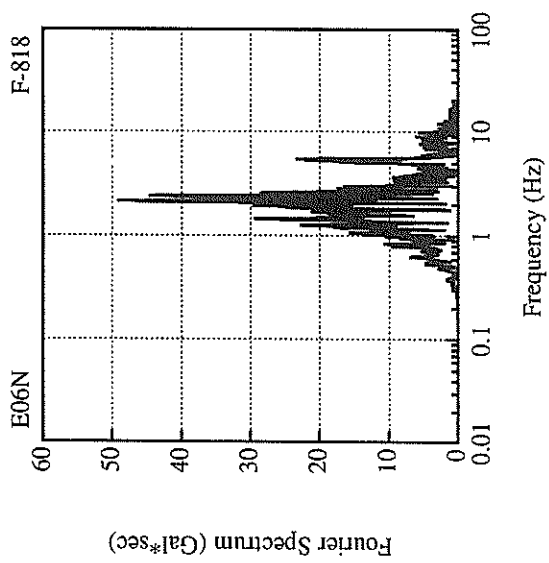
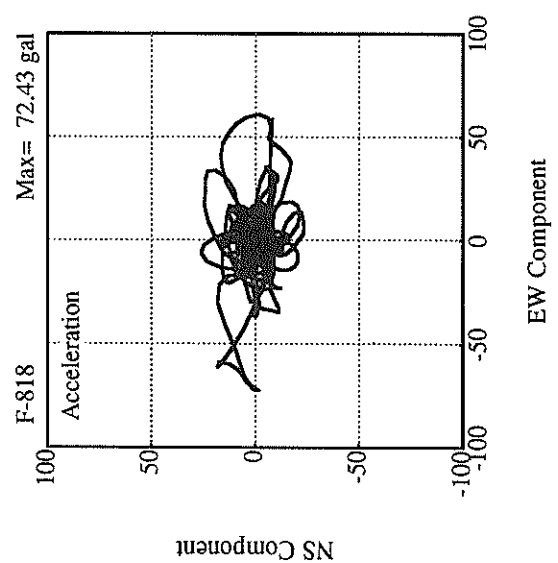
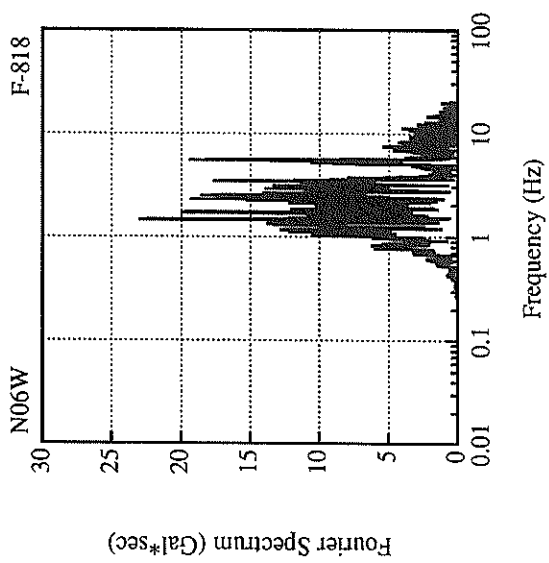
Displacement



Displacement







RECORD NUMBER : F-856
 STATION : OSAKA-JI-G

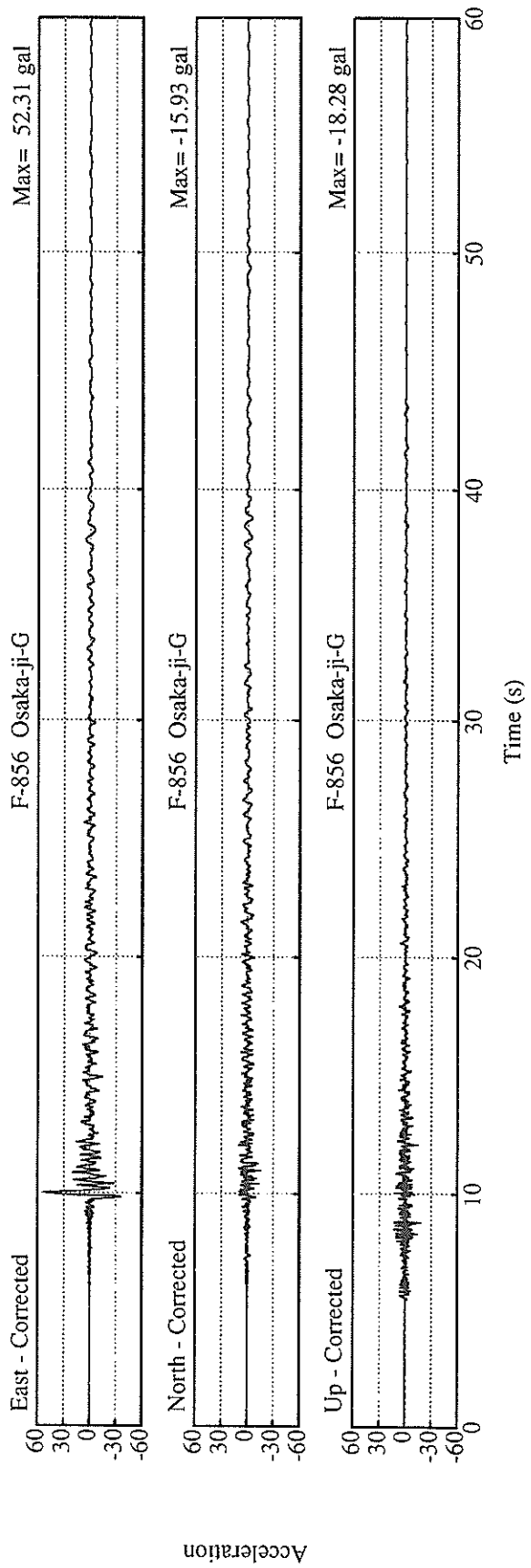
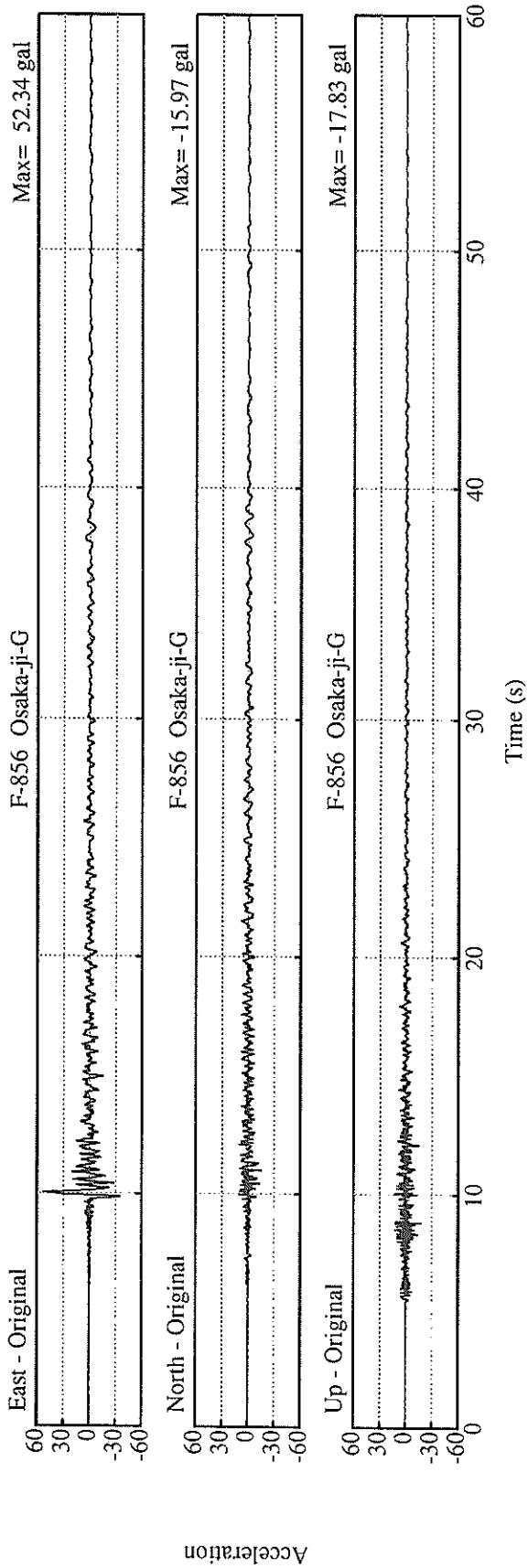
EARTHQUAKE DATA

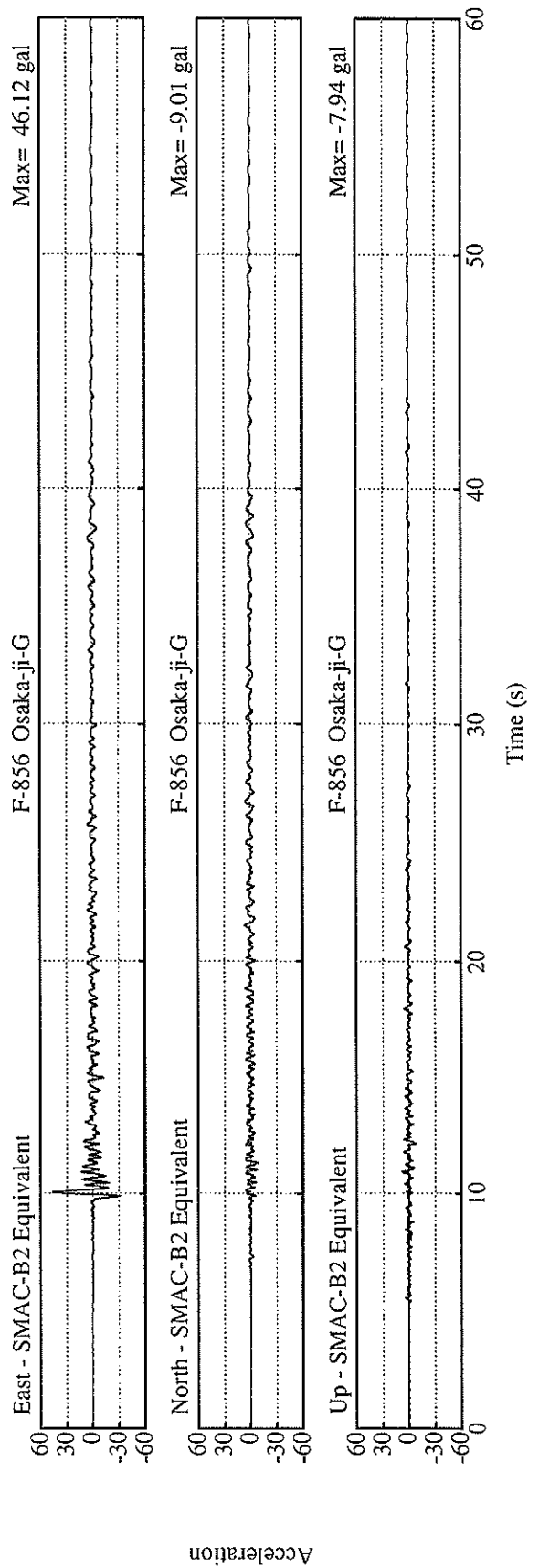
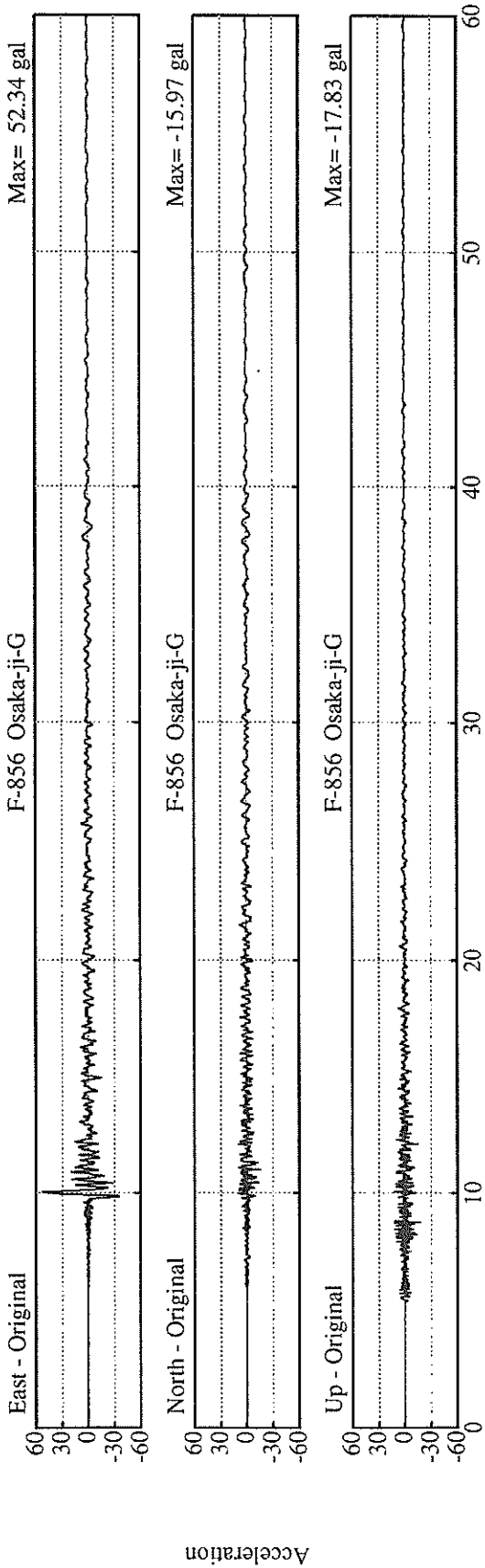
 DATE AND TIME 23:15 JAN.25,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34° 47.4' N
 LONGITUDE 135° 18.4' E
 DEPTH 14.8KM
 JMA MAGNITUDE 5.1

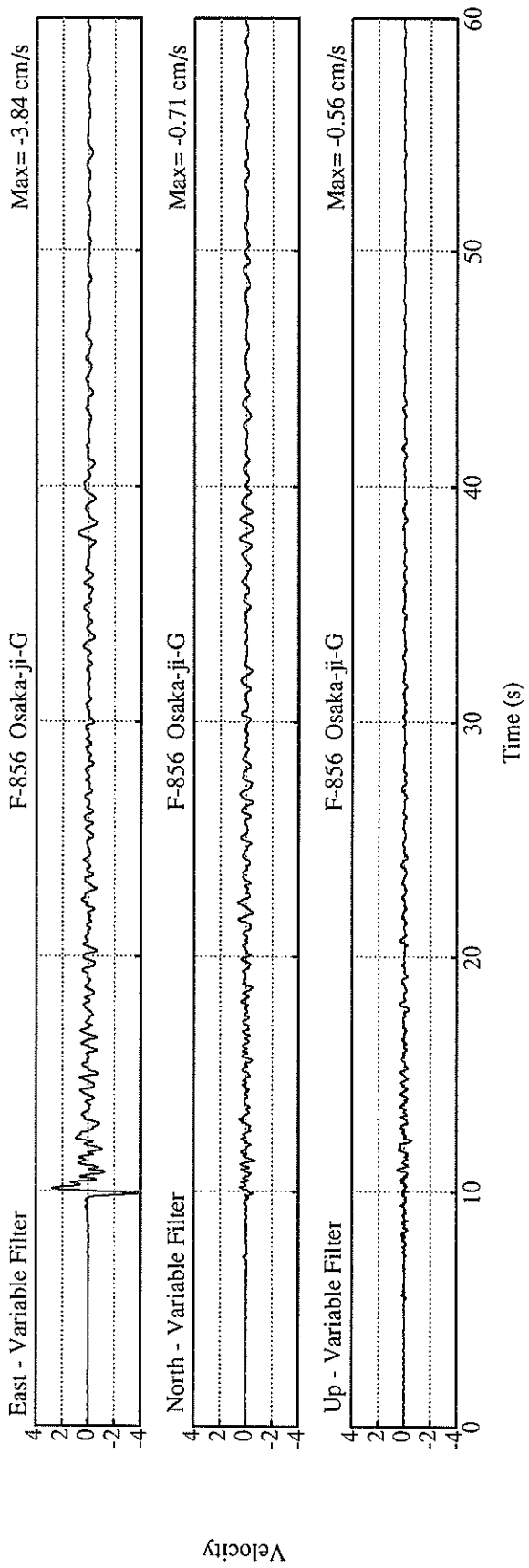
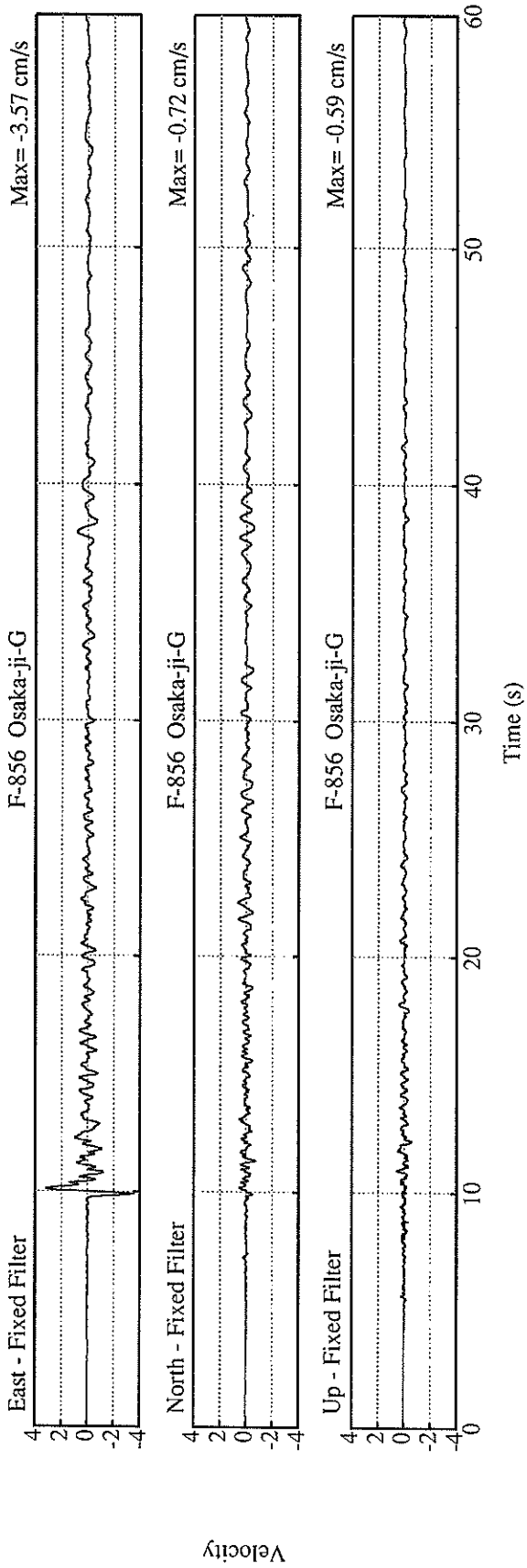
PEAK VALUES OF COMPONENTS

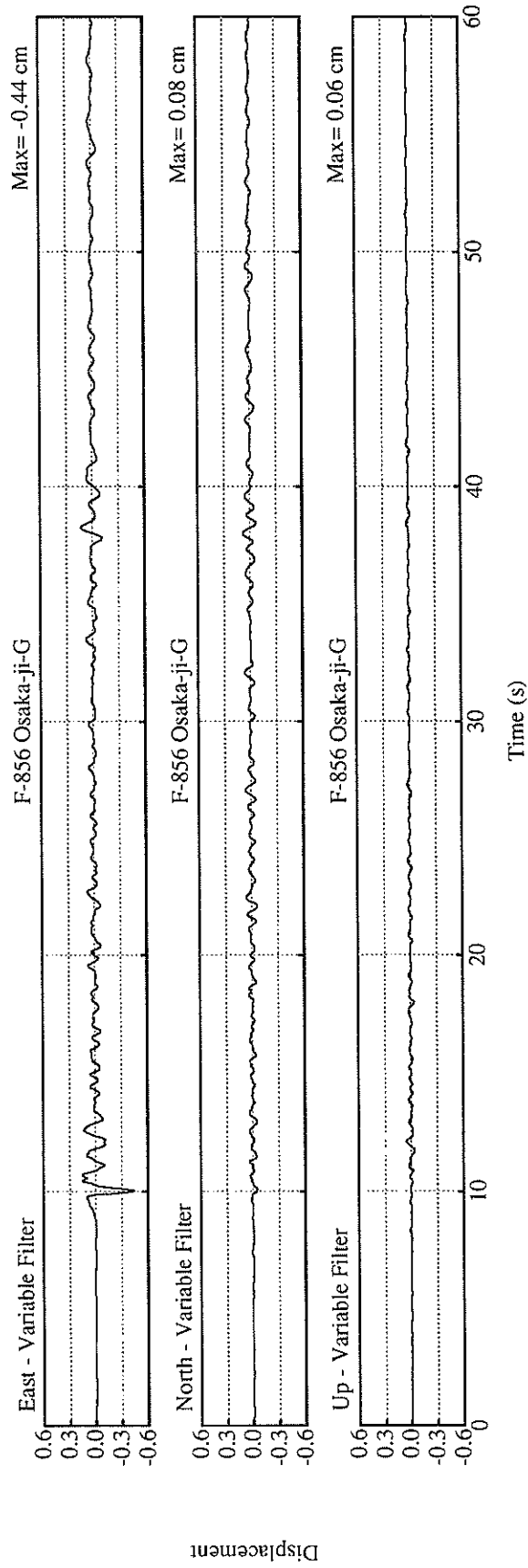
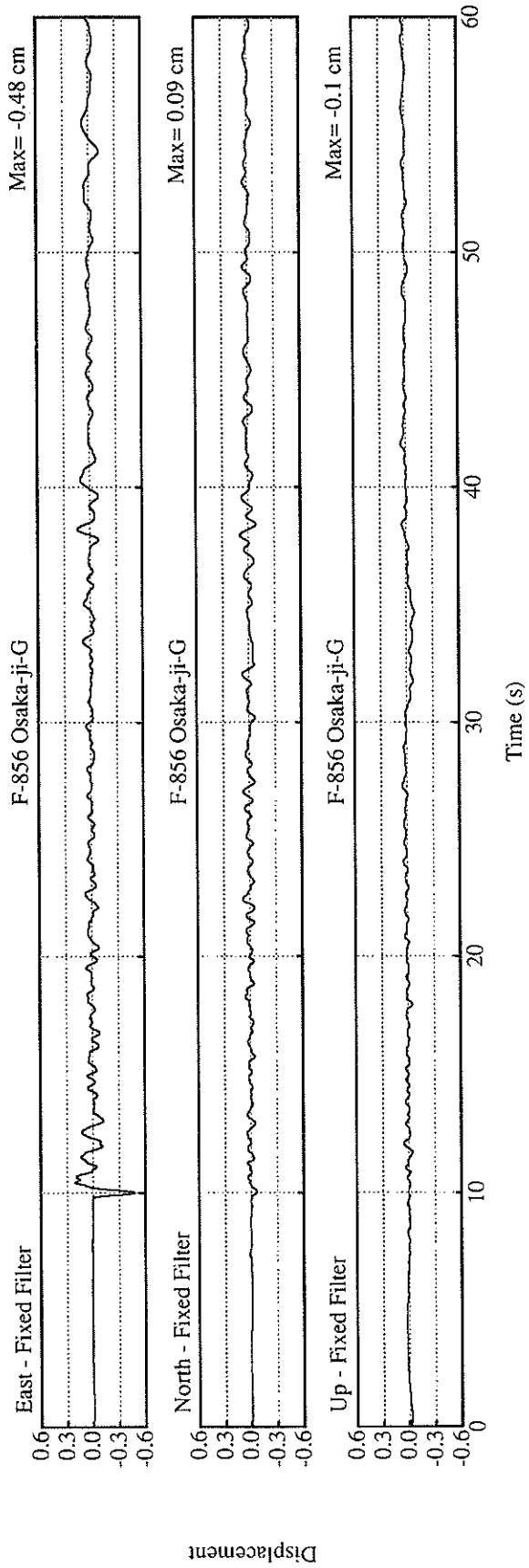
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.451	0.353	0.579	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	9.0	46.1	7.9	46.1
ORIGINAL	16.0	52.3	17.8	52.3
CORRECTED	15.9	52.3	18.3	52.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.72	3.57	0.59	3.60
VARIABLE FILTER	0.71	3.84	0.56	3.87
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.09	0.48	0.10	0.48
VARIABLE FILTER	0.08	0.44	0.06	0.45

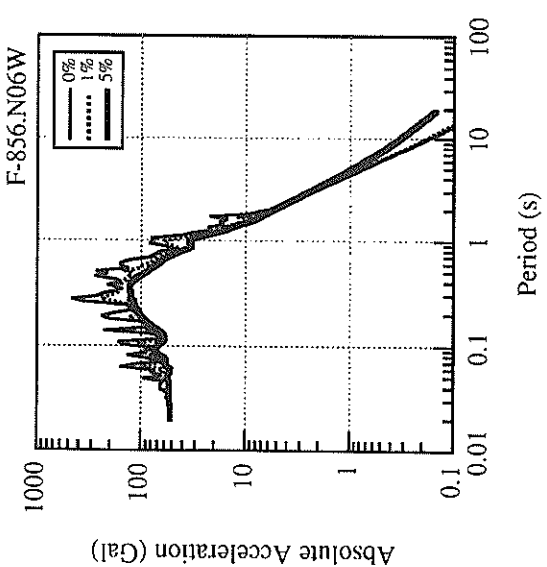
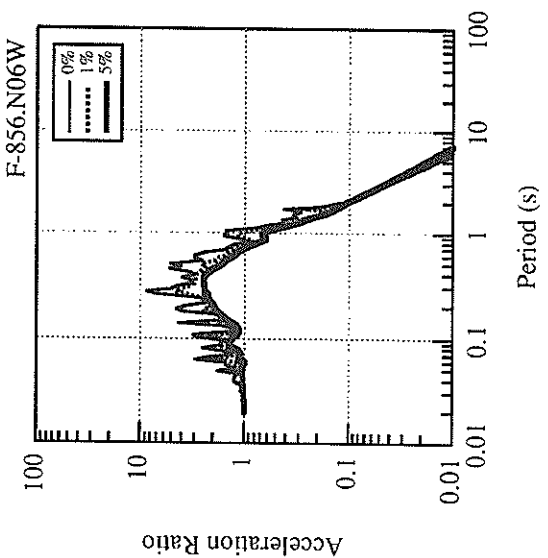
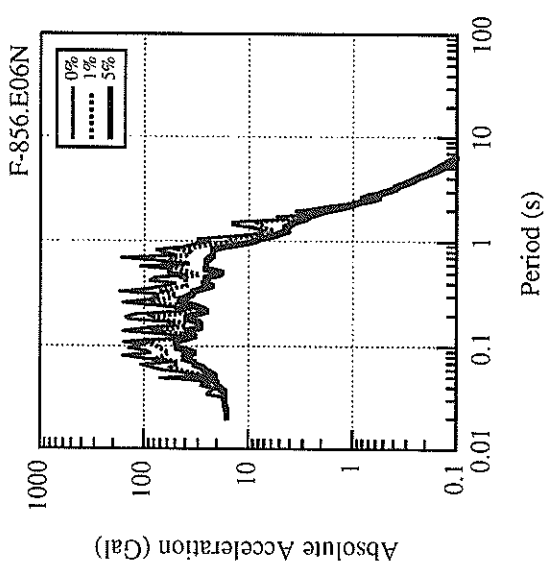
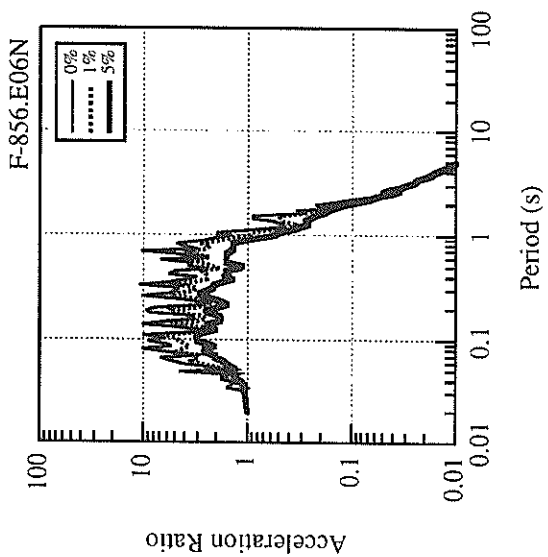
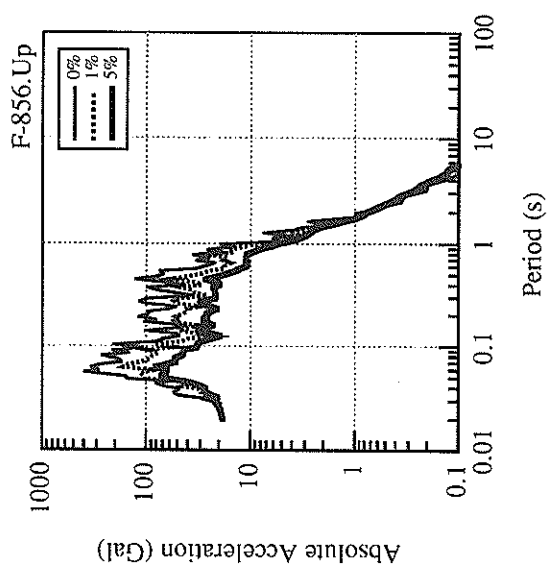
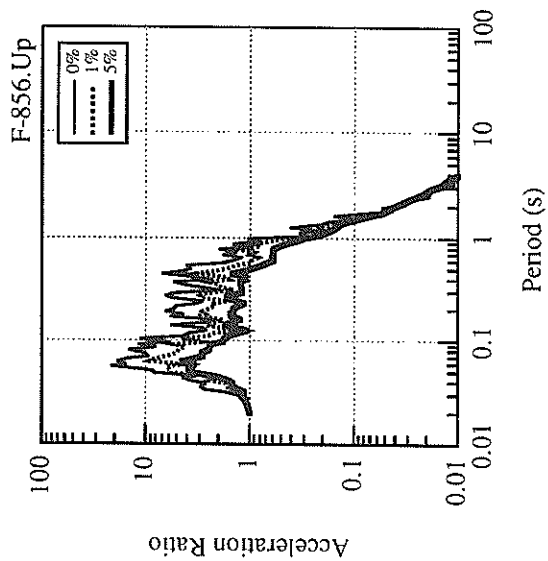
* RESULTANT OF HORIZONTAL COMPONENTS

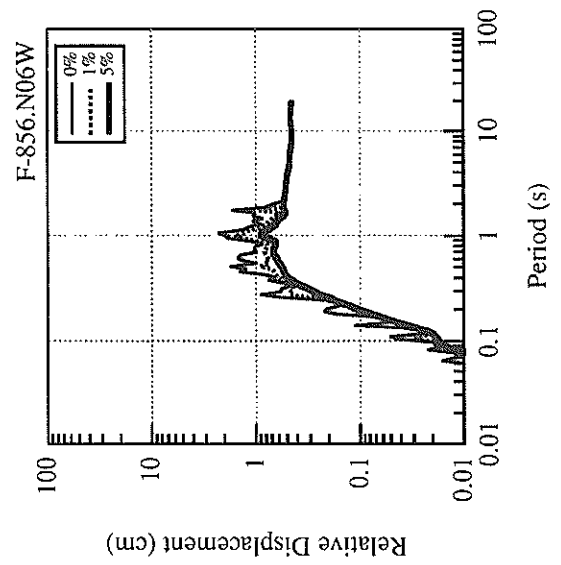
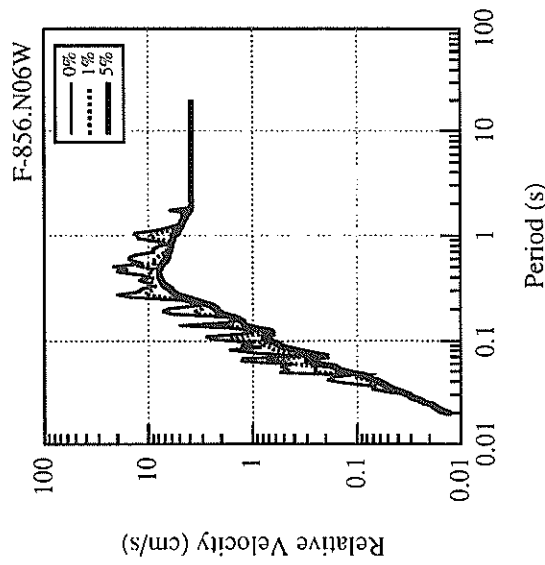
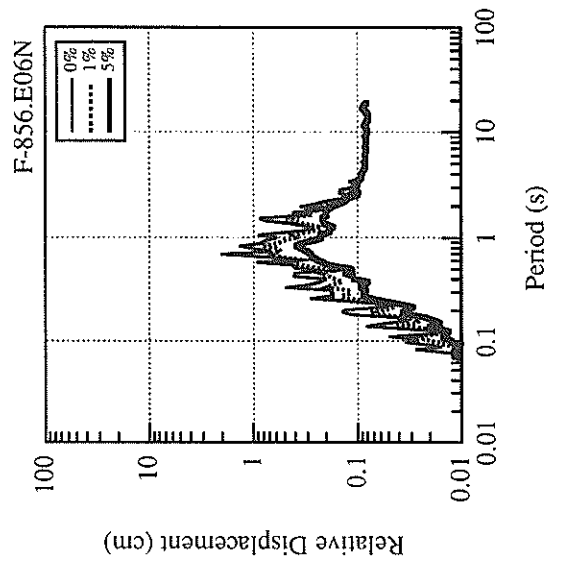
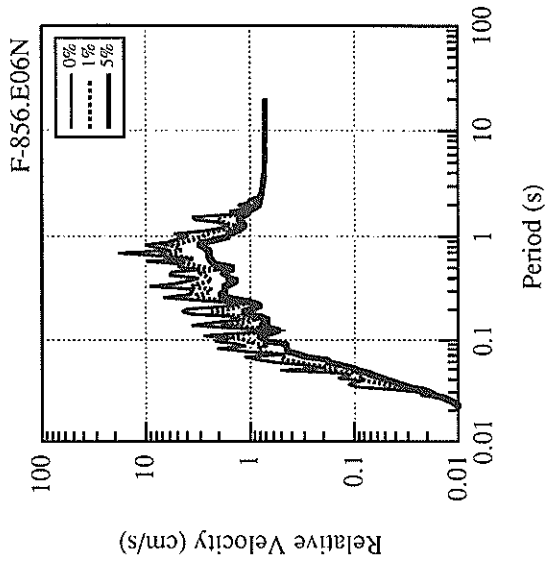
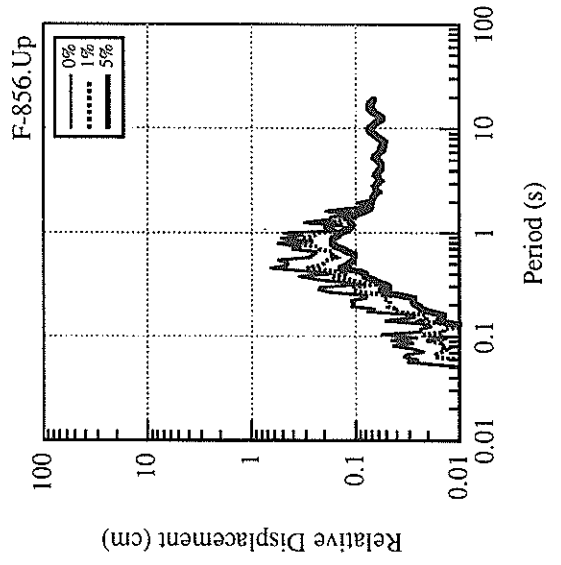
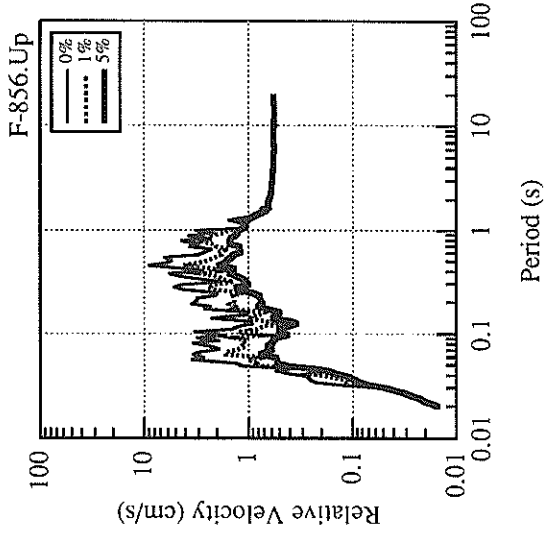


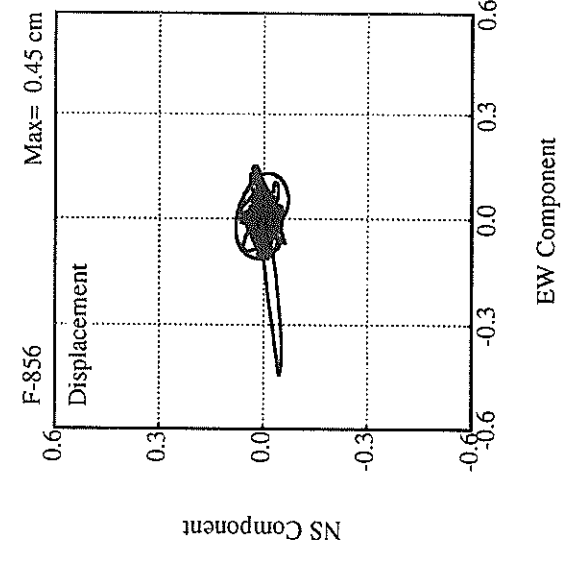
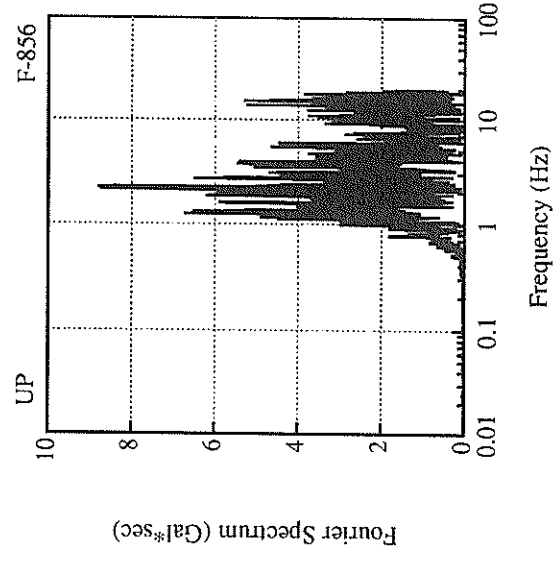
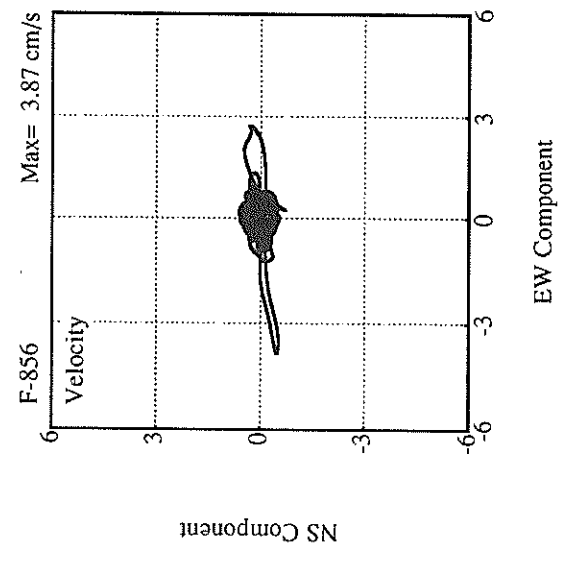
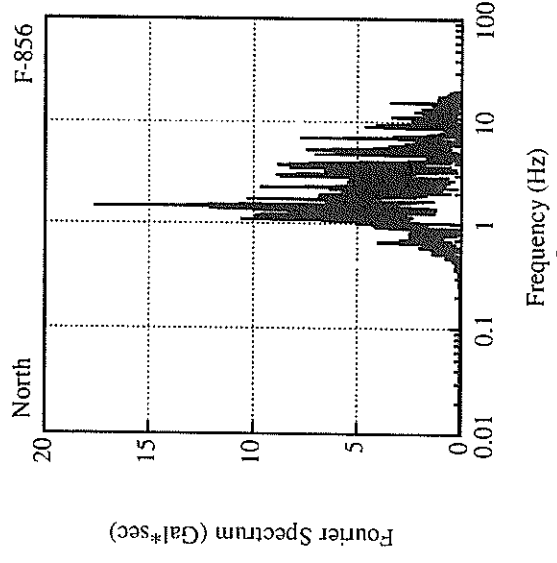
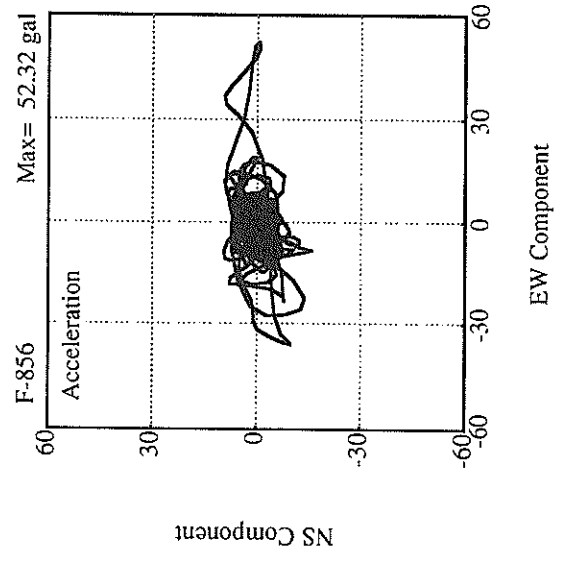
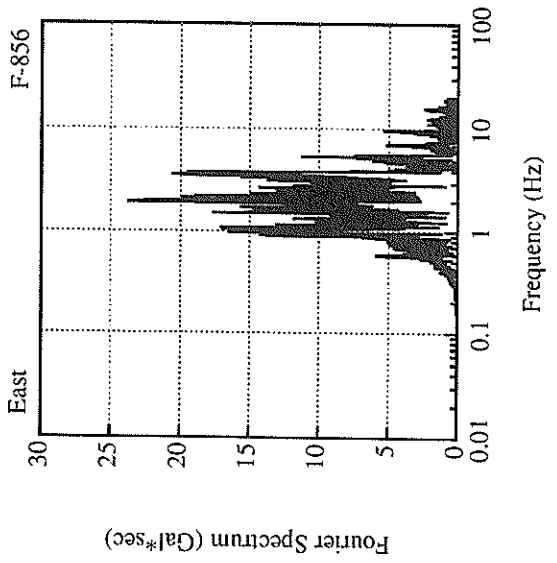












RECORD NUMBER : F-819
 STATION : AMAGASAKI-G

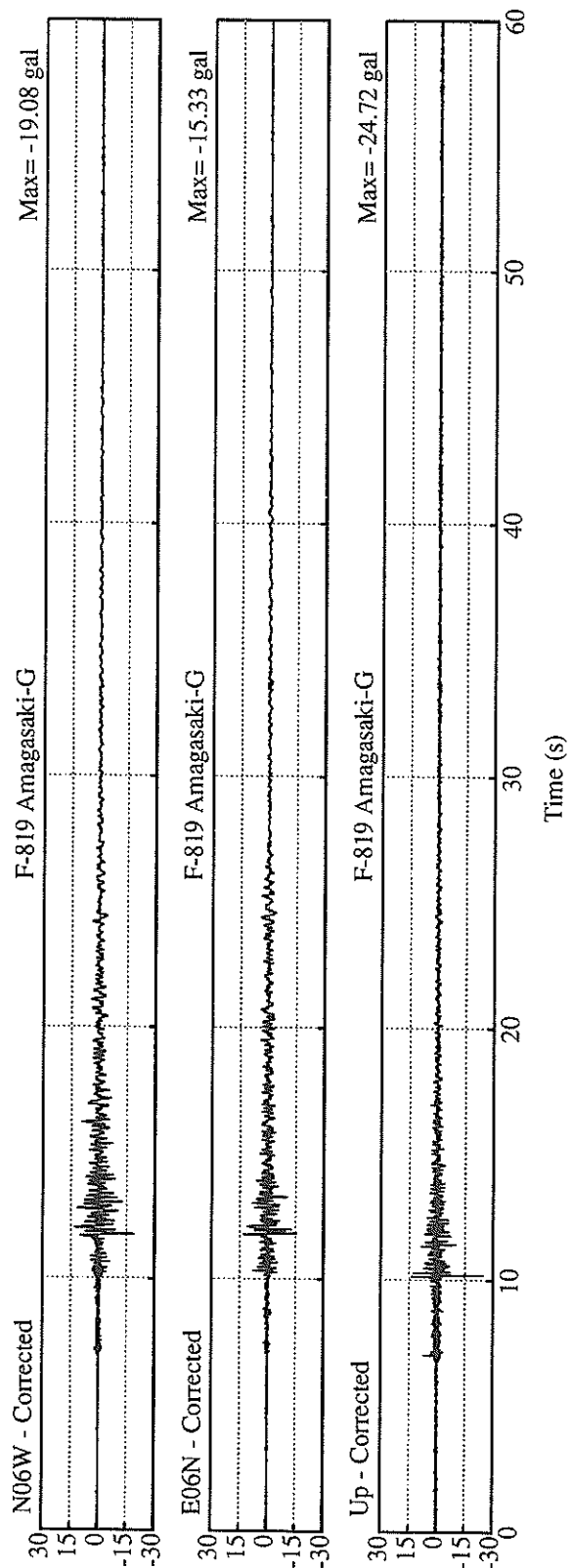
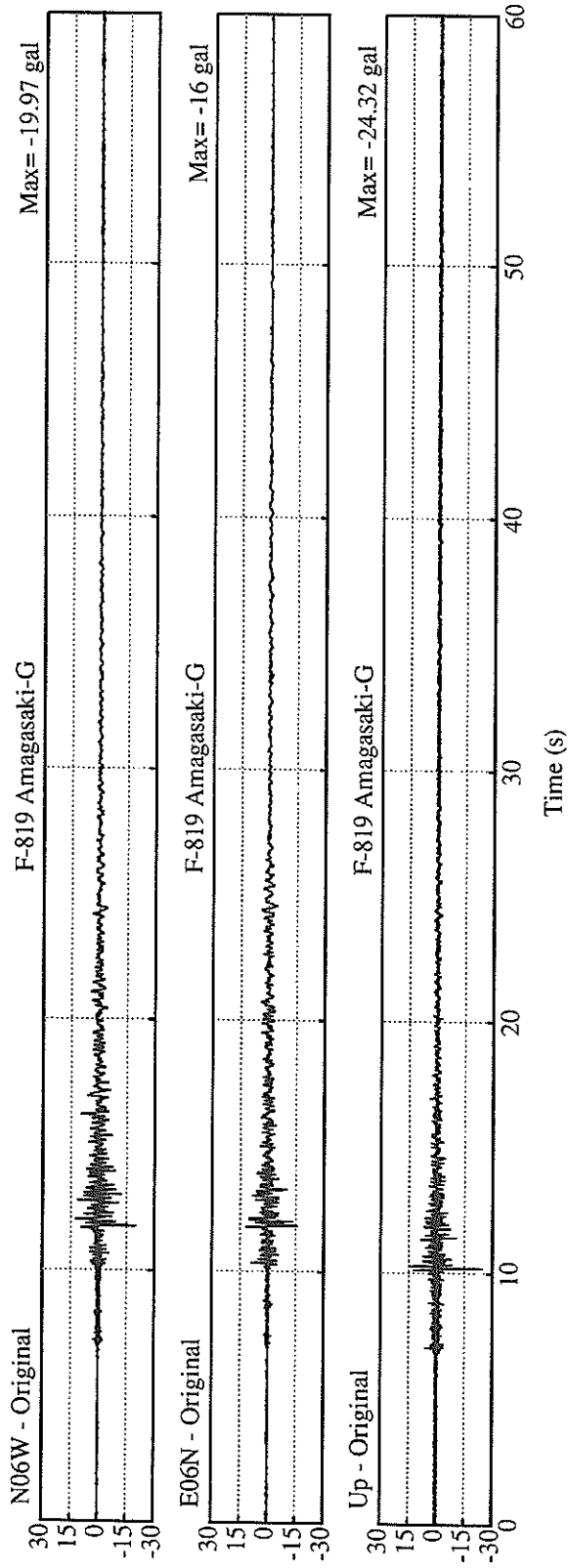
EARTHQUAKE DATA

 DATE AND TIME 16:19 FEB. 2,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°41.4' N
 LONGITUDE 135° 8.6' E
 DEPTH 18.1KM
 JMA MAGNITUDE 4.1

PEAK VALUES OF COMPONENTS

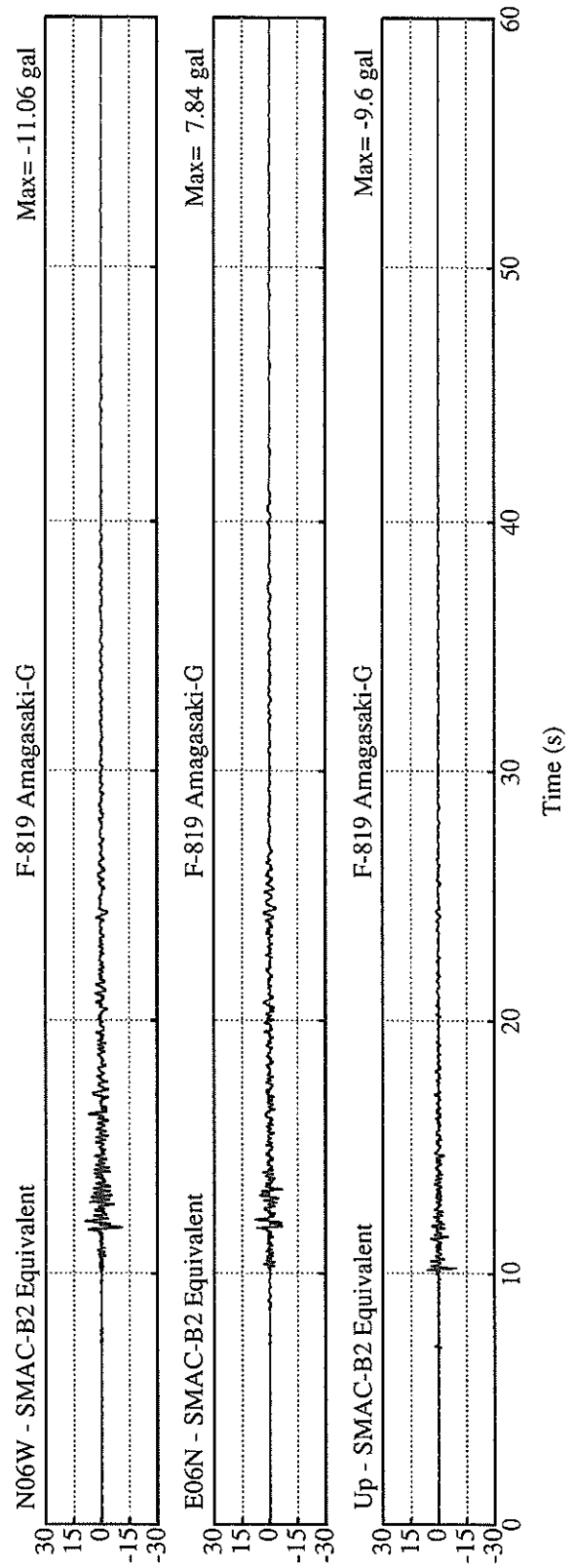
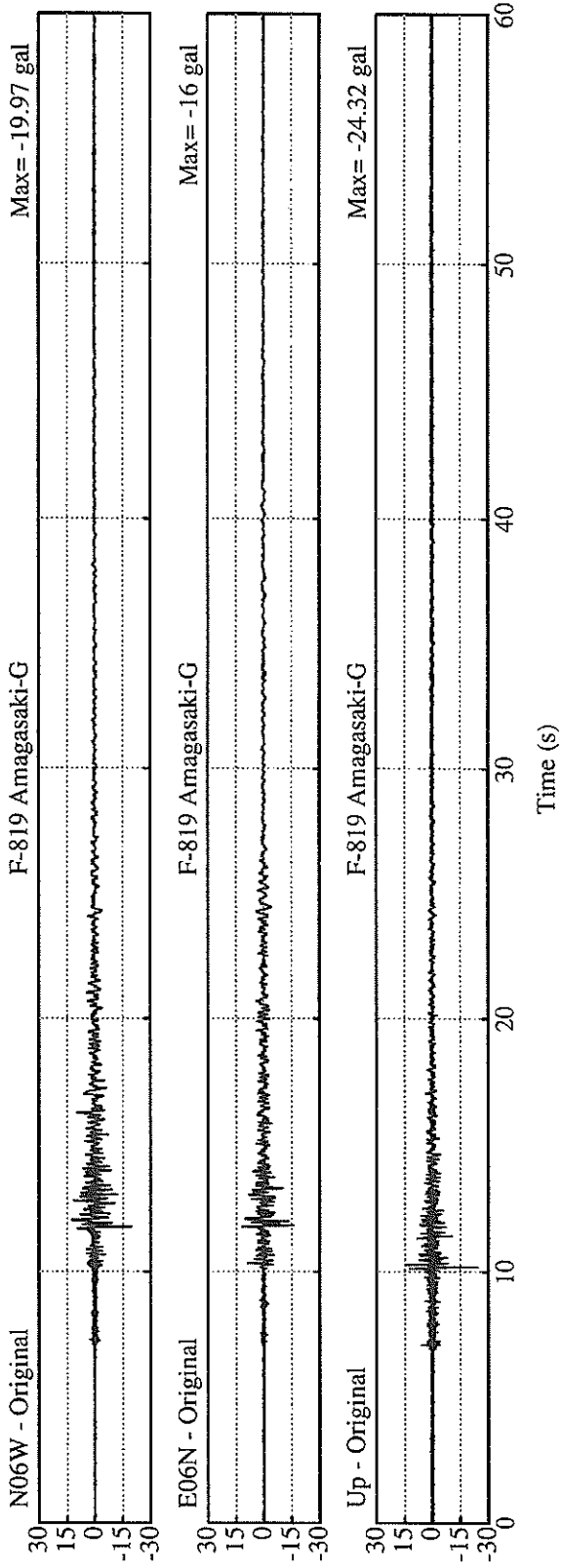
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.787	0.835	1.305	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	11.1	7.8	9.6	12.8
ORIGINAL	20.0	16.0	24.3	22.4
CORRECTED	19.1	15.3	24.7	21.7
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.65	0.61	0.44	0.67
VARIABLE FILTER	0.70	0.61	0.44	0.71
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.06	0.05	0.04	0.06
VARIABLE FILTER	0.05	0.03	0.02	0.05

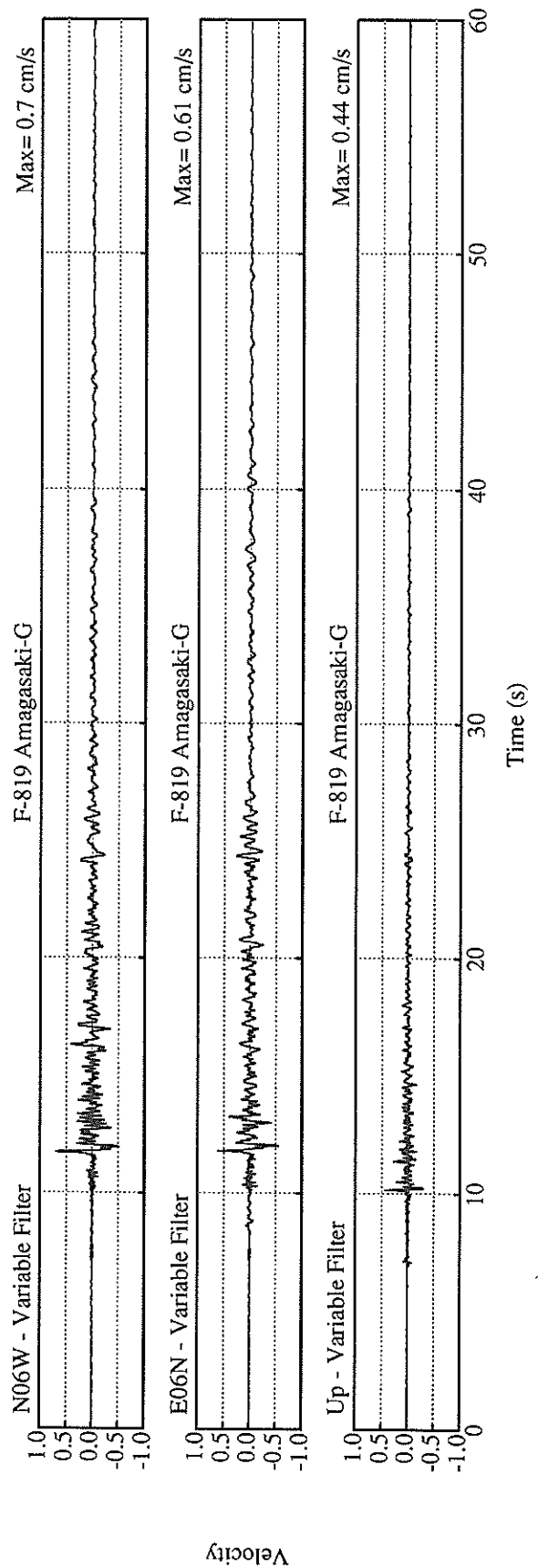
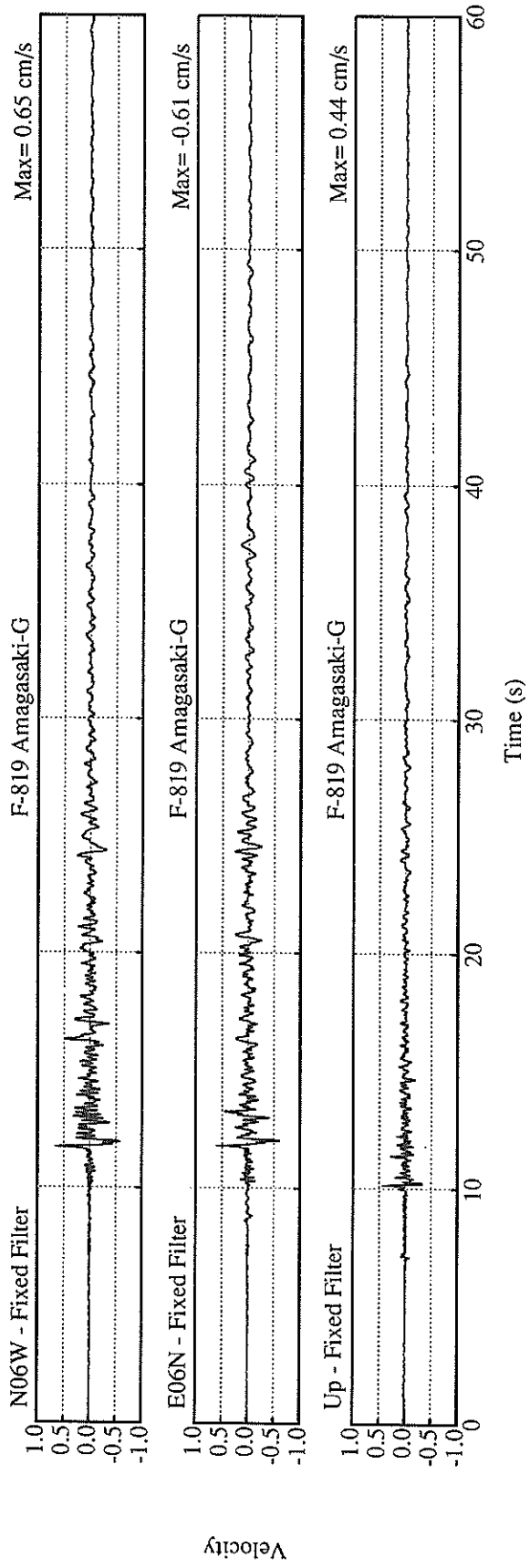
* RESULTANT OF HORIZONTAL COMPONENTS

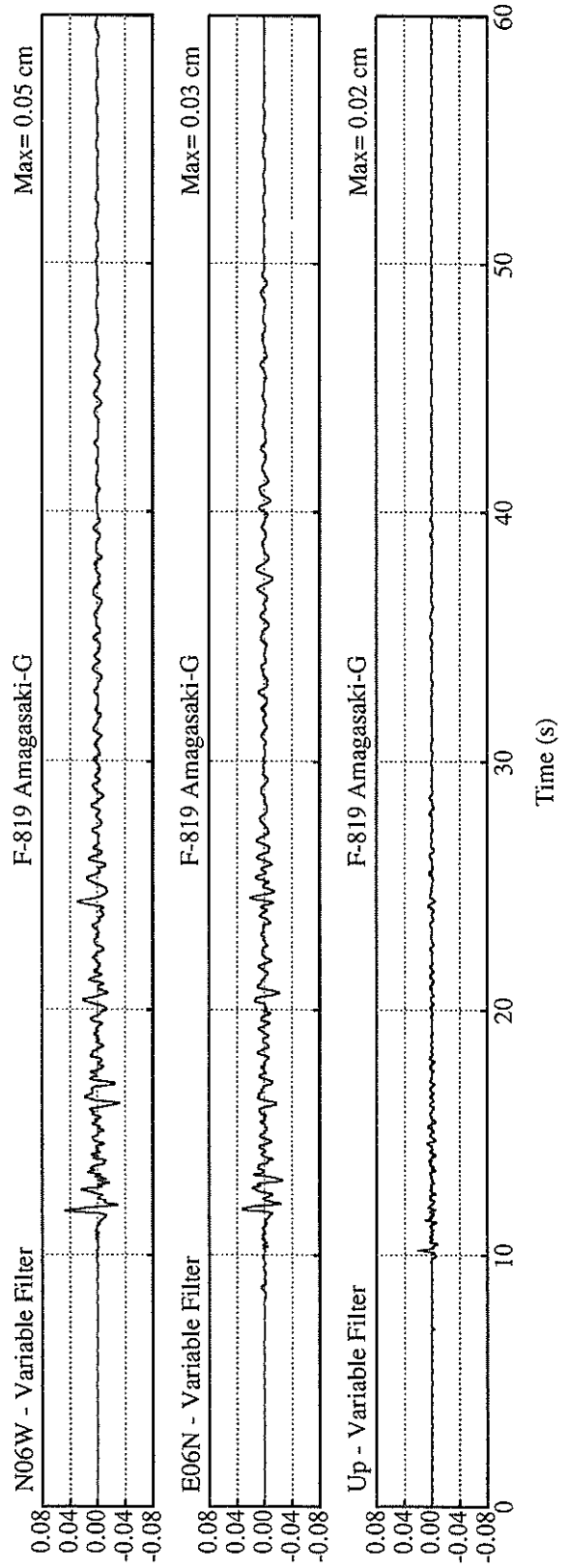
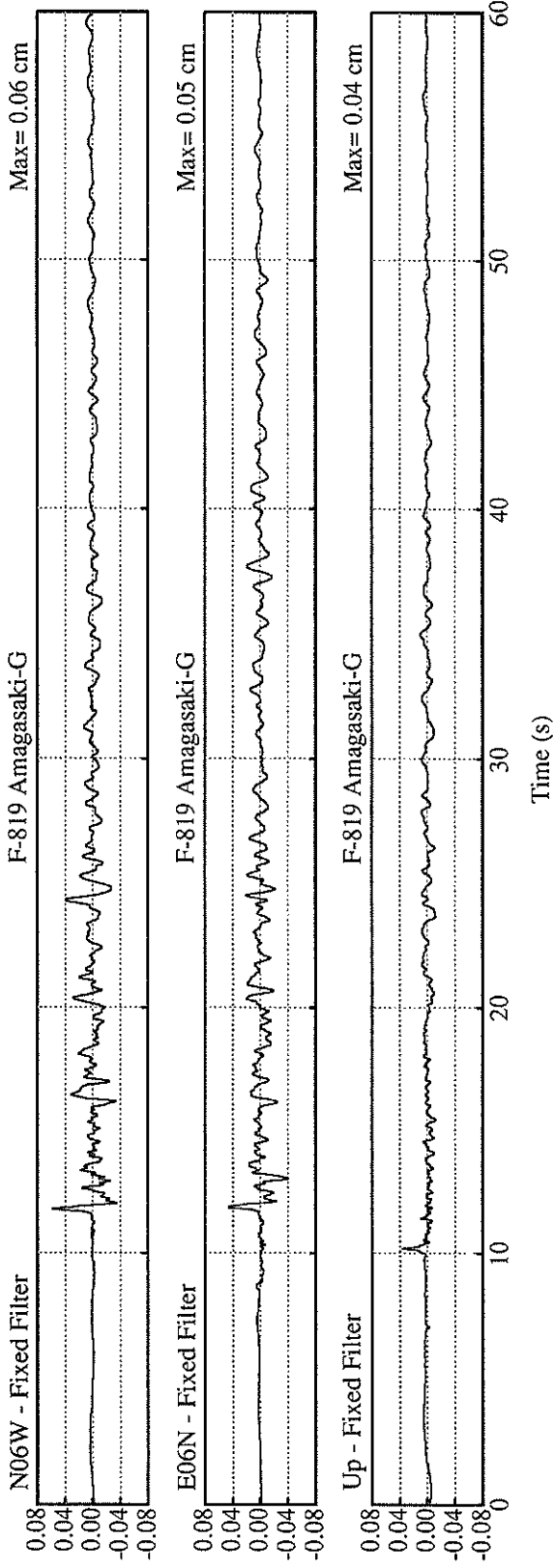


Acceleration

Acceleration

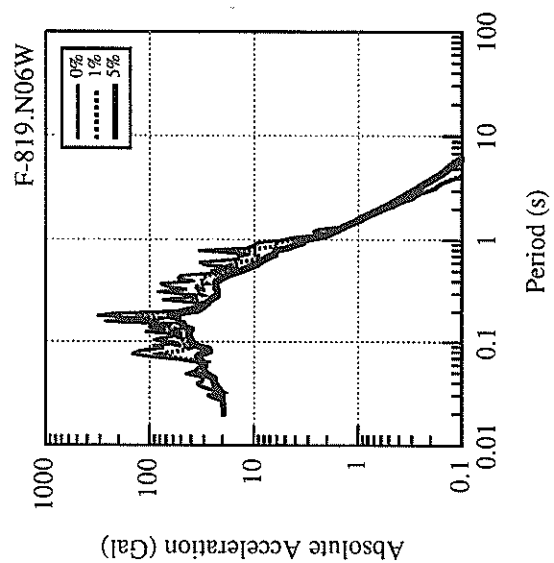
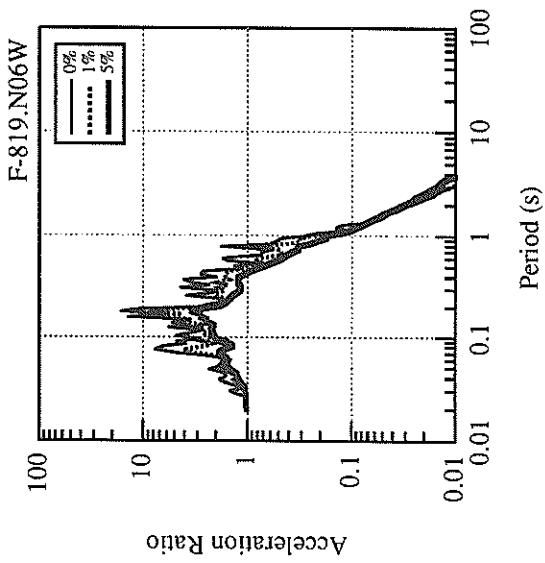
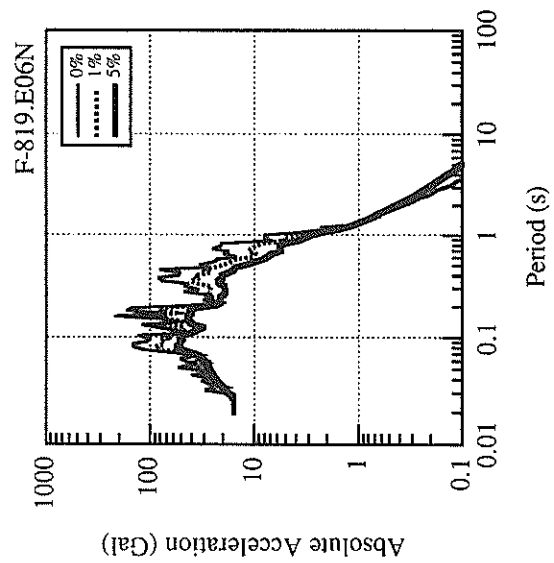
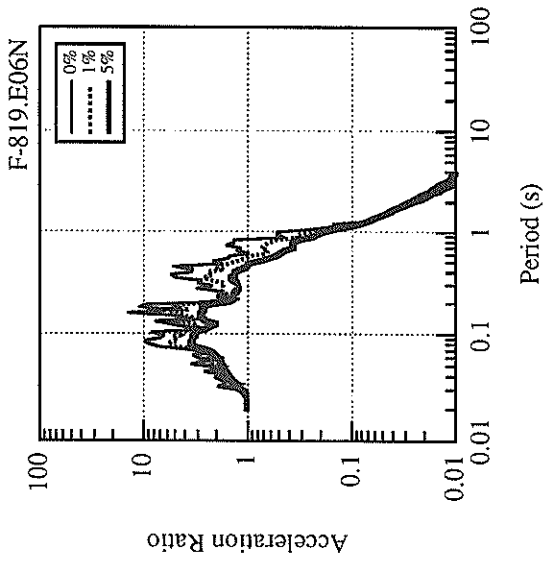
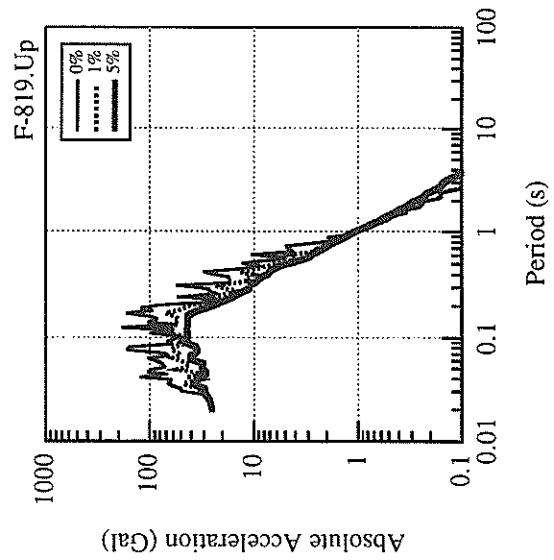
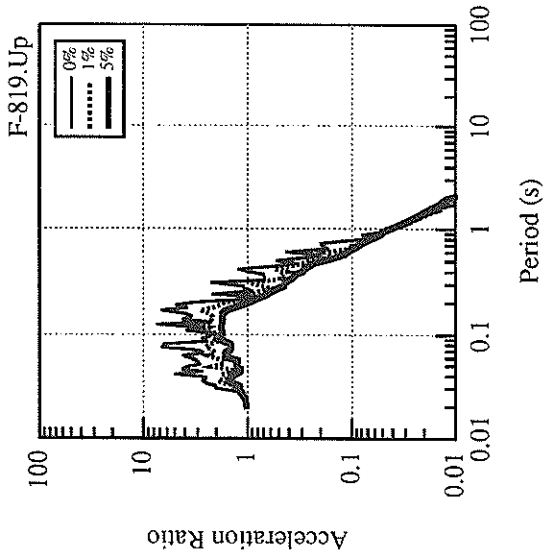


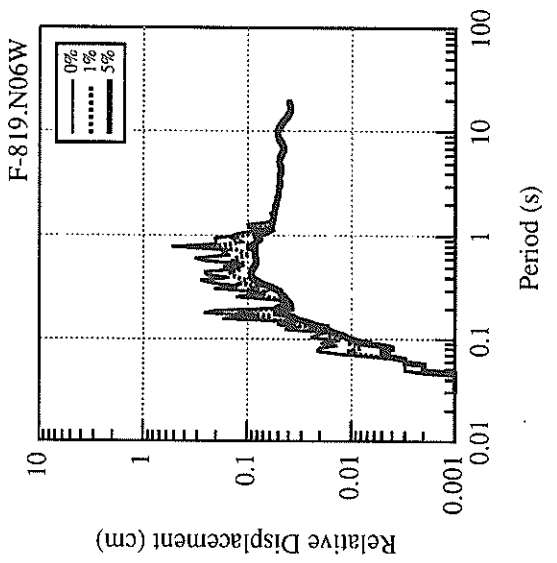
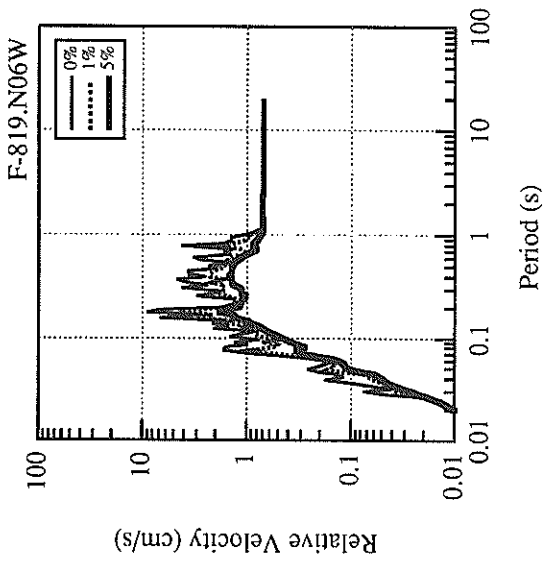
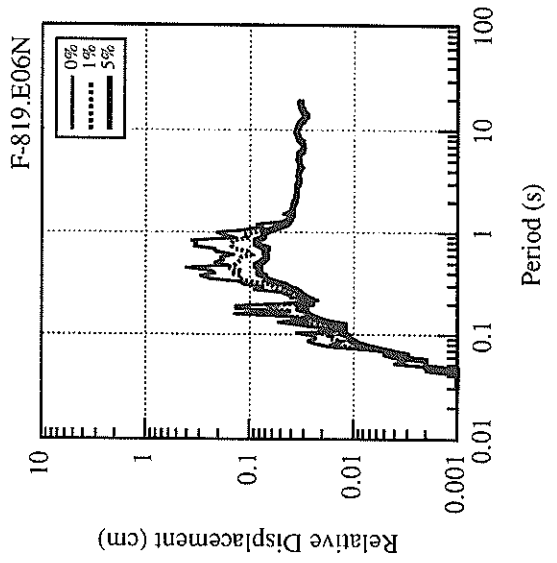
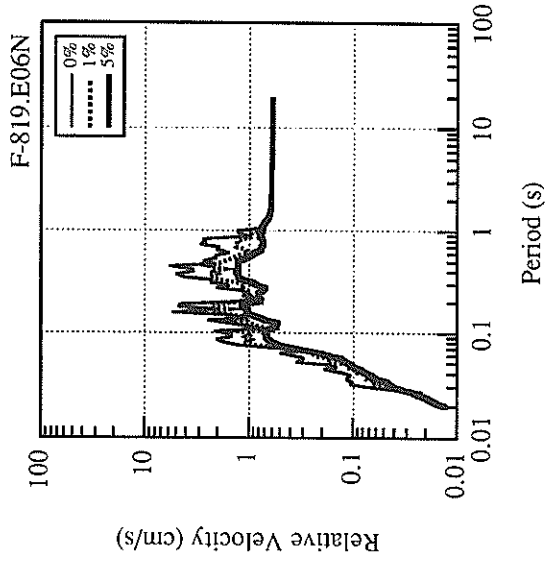
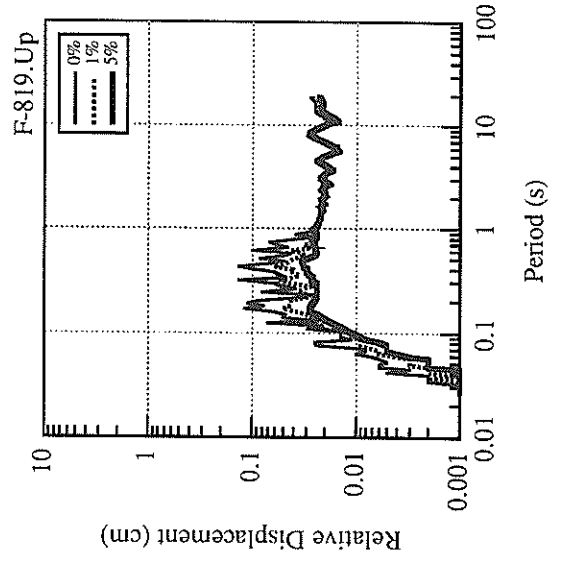
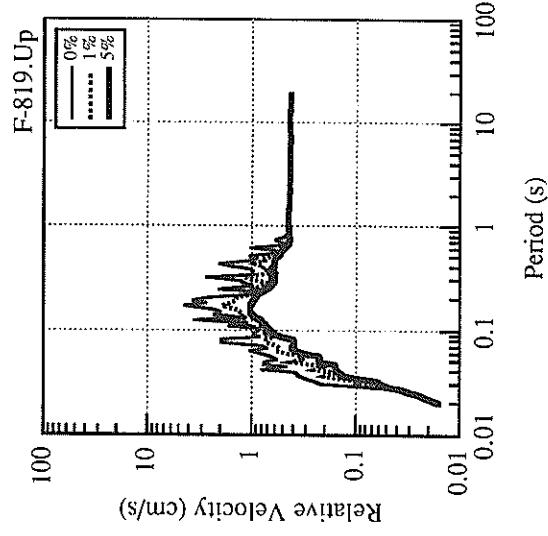


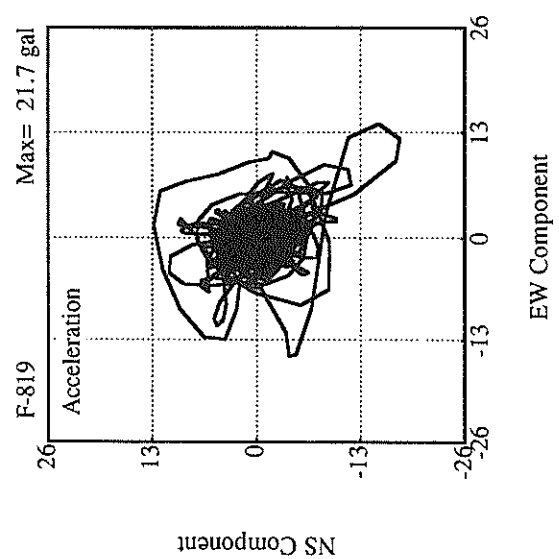
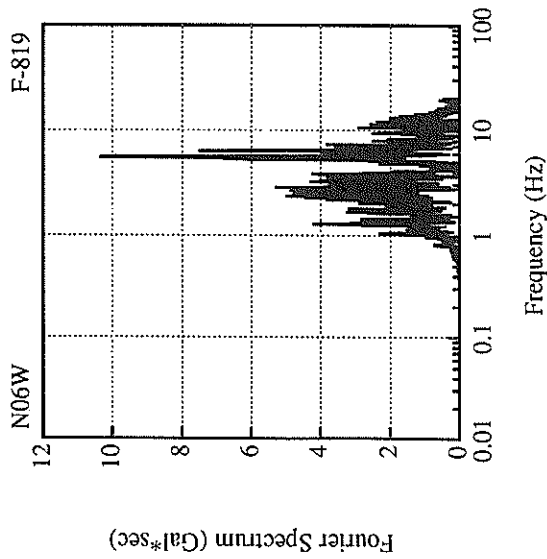
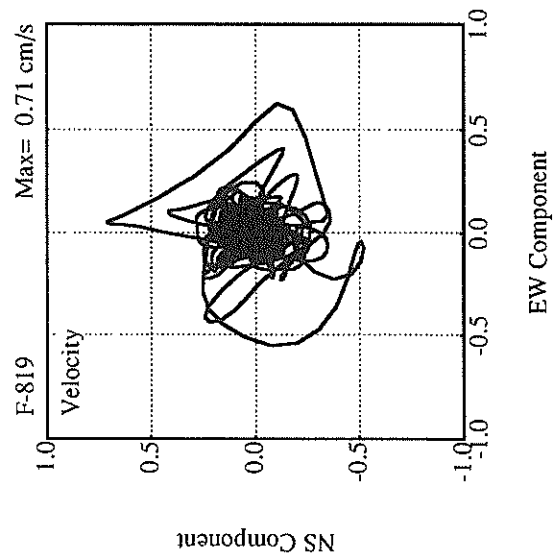
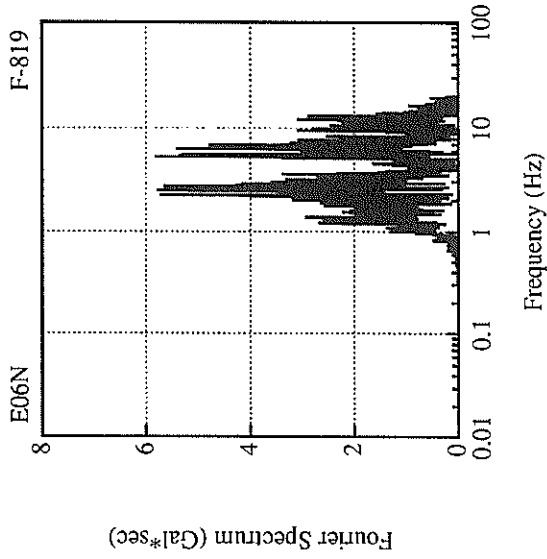
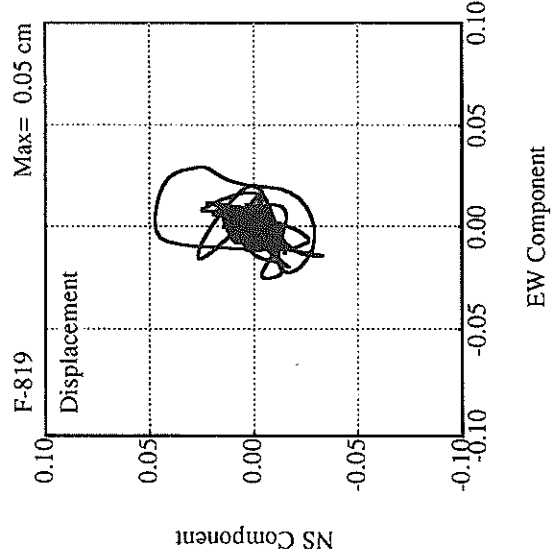
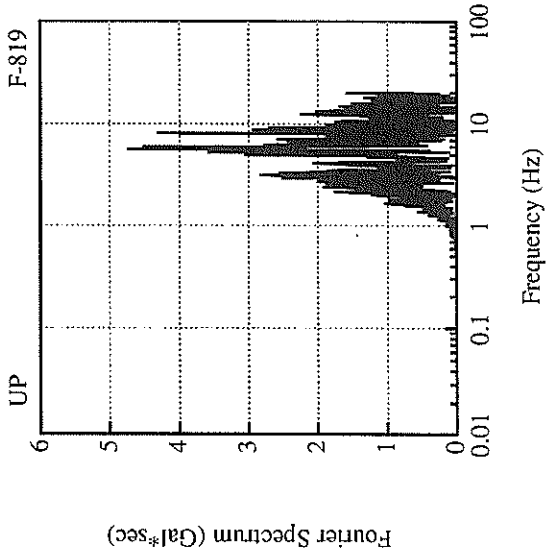


Displacement

Displacement







RECORD NUMBER : F-851
 STATION : OSAKA-MINAMI-G

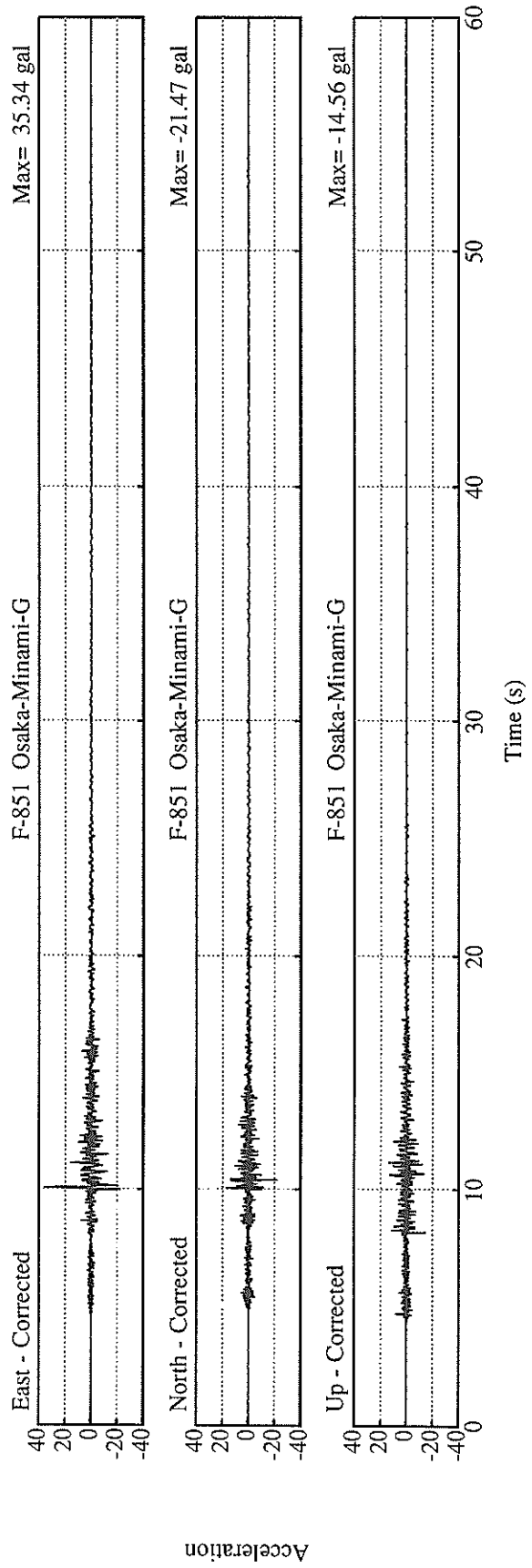
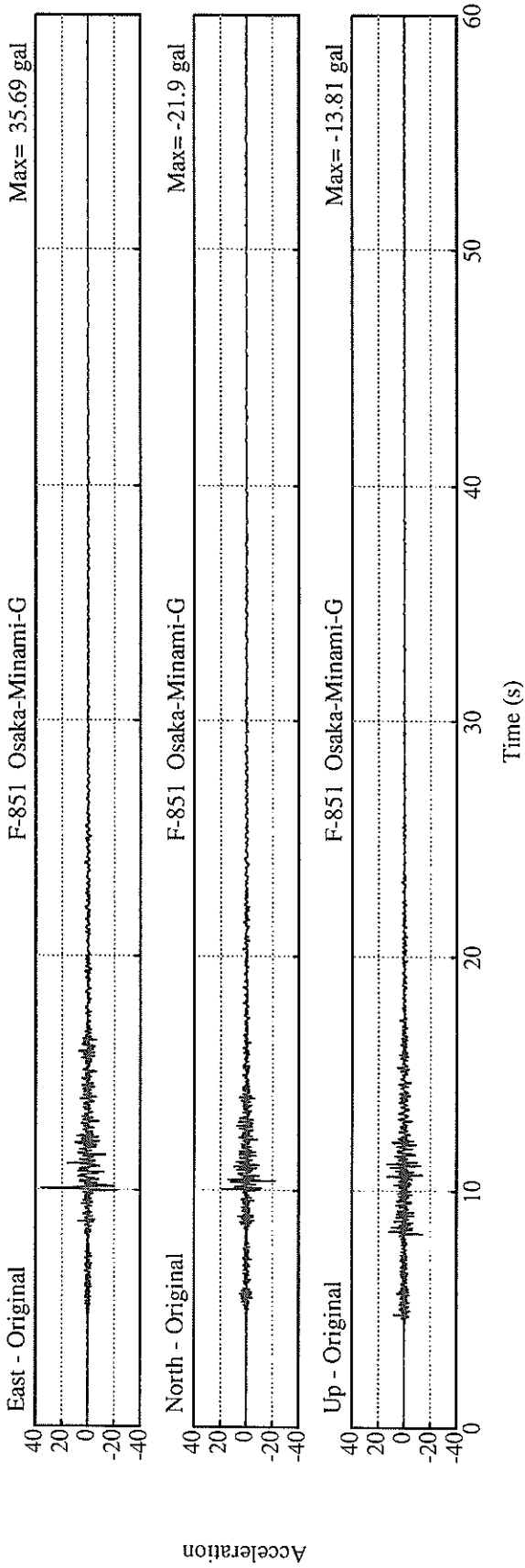
EARTHQUAKE DATA

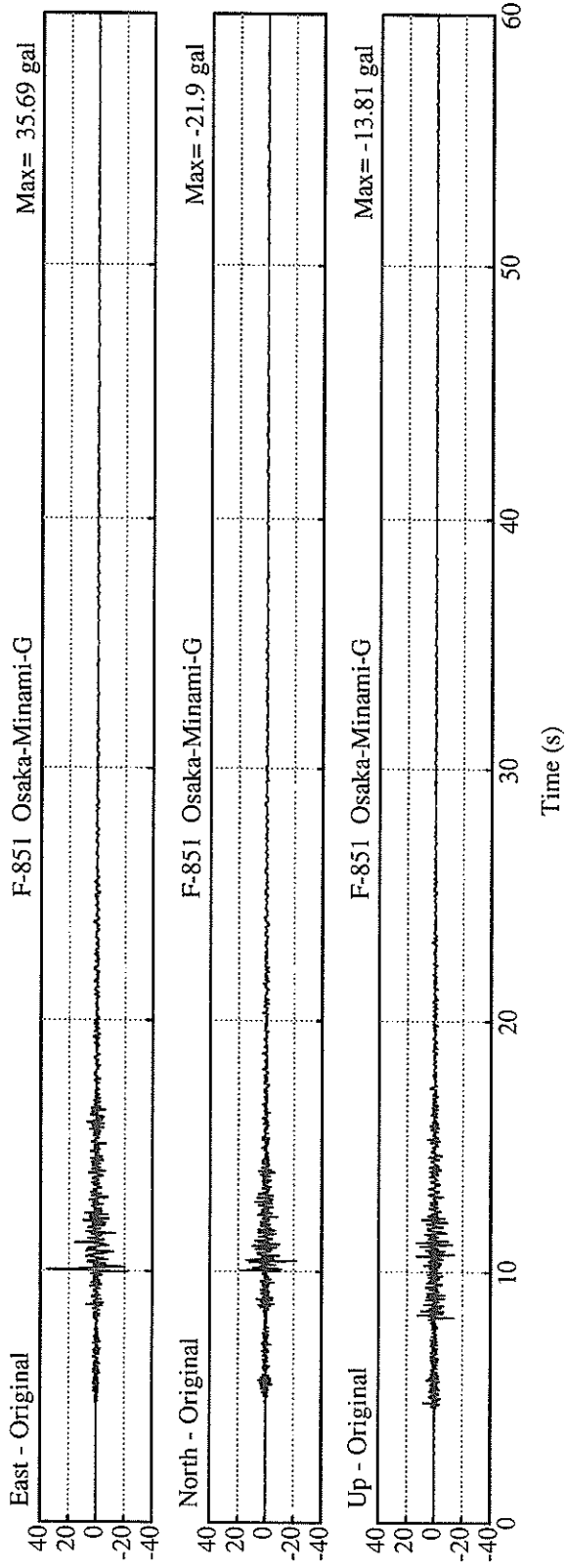
 DATE AND TIME 16:19 FEB. 2,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34° 41.4' N
 LONGITUDE 135° 8.6' E
 DEPTH 18.1KM
 JMA MAGNITUDE 4.1

PEAK VALUES OF COMPONENTS

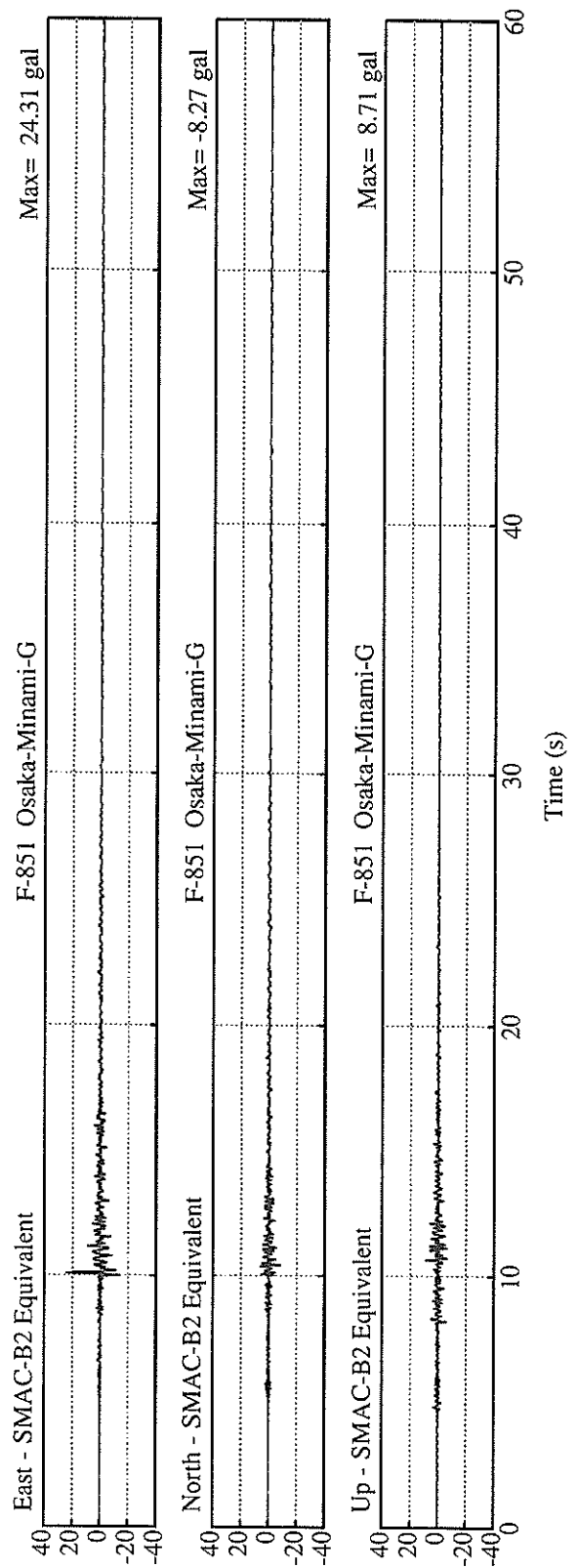
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.189	0.988	1.513	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	8.3	24.3	8.7	24.3
ORIGINAL	21.9	35.7	13.8	35.7
CORRECTED	21.5	35.3	14.6	35.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.39	1.16	0.45	1.17
VARIABLE FILTER	0.36	1.10	0.45	1.11
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.01	0.08	0.02	0.08
VARIABLE FILTER	0.01	0.06	0.01	0.06

* RESULTANT OF HORIZONTAL COMPONENTS

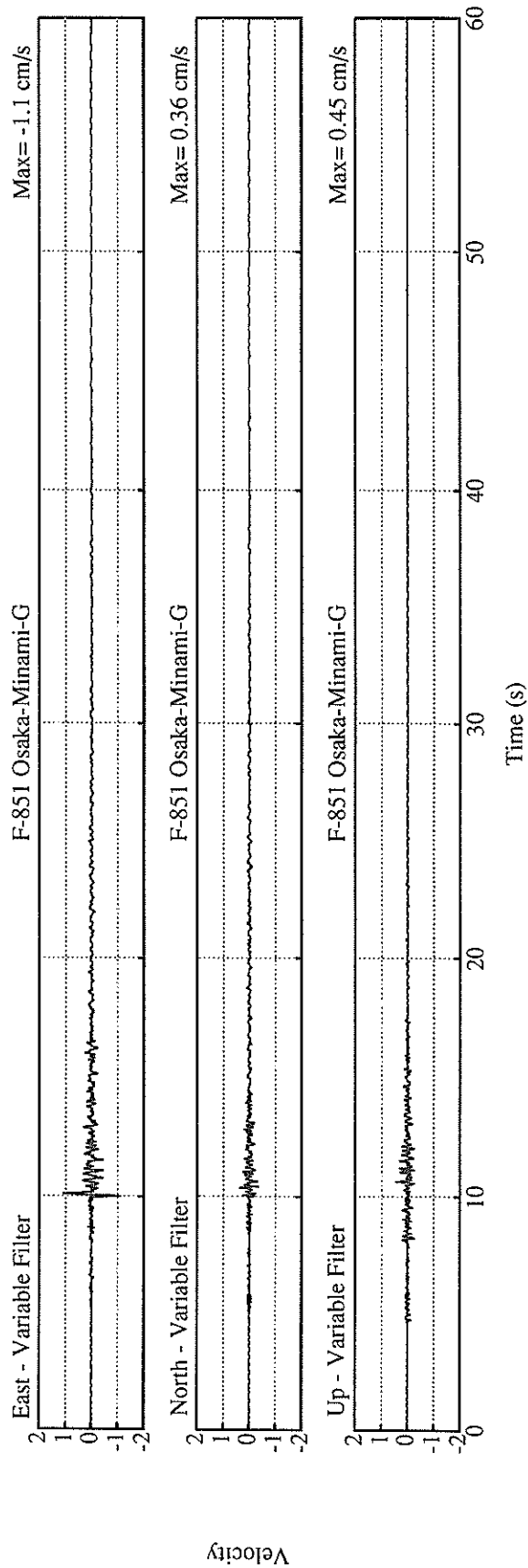
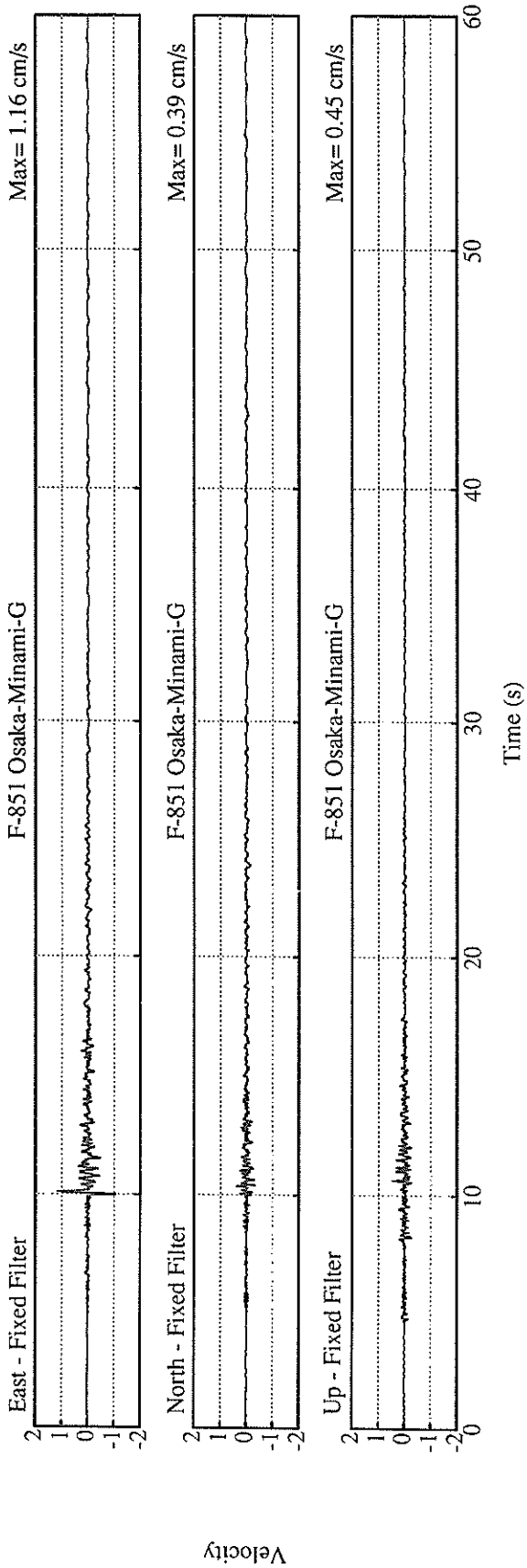


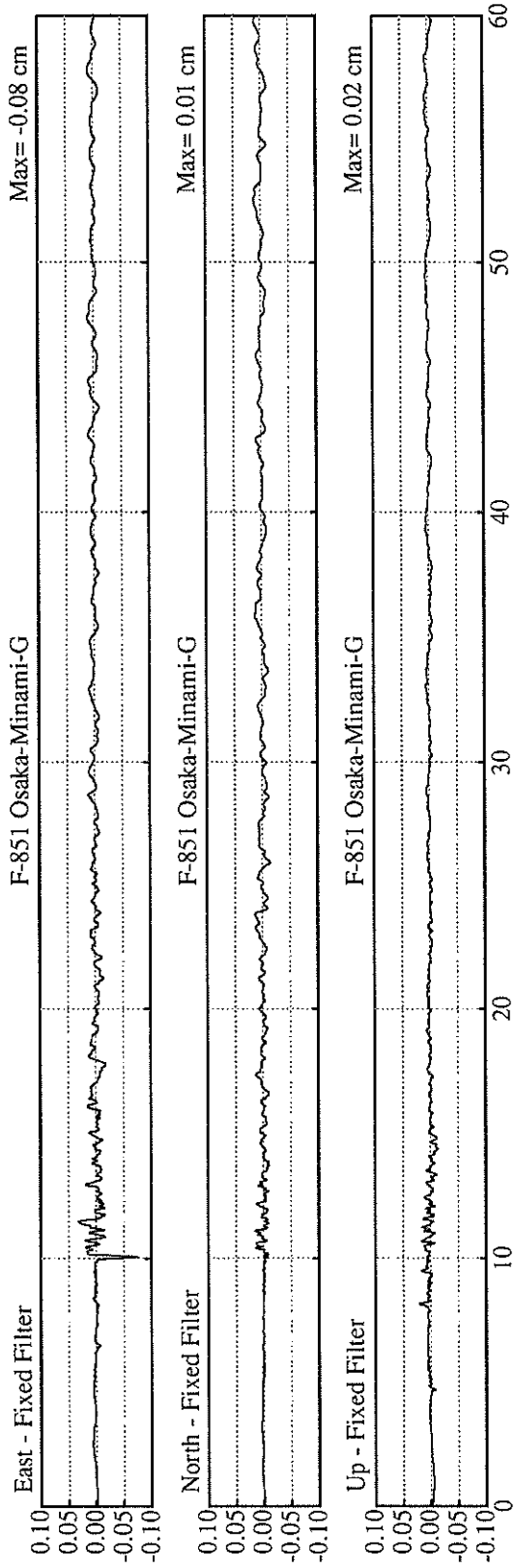


Acceleration

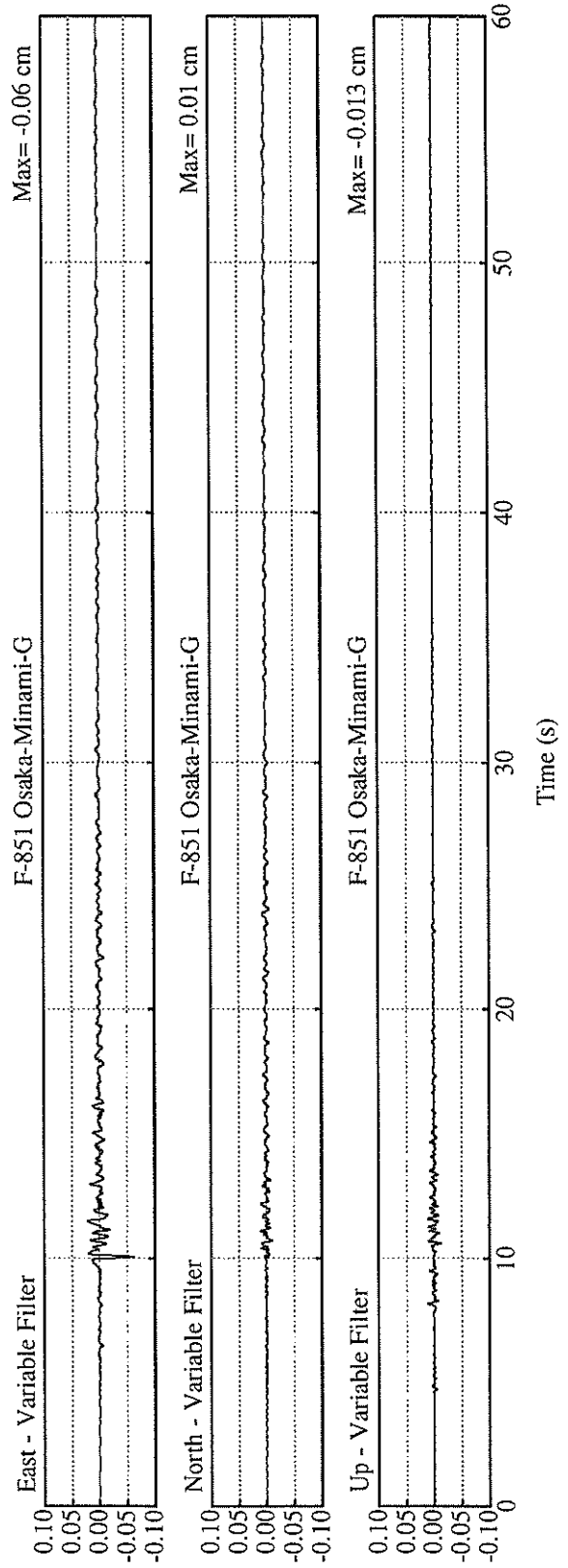


Acceleration

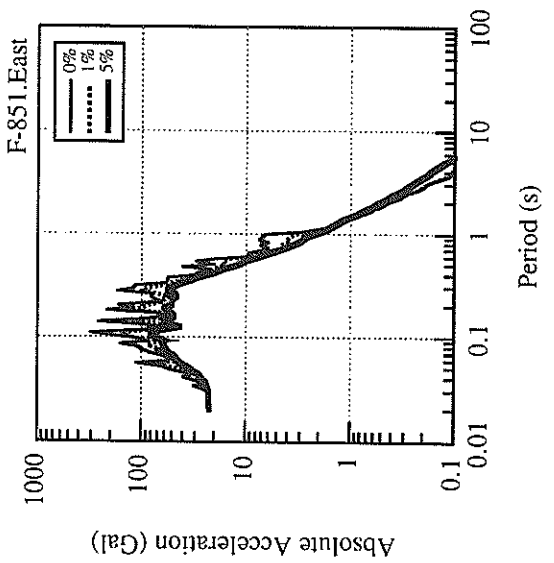
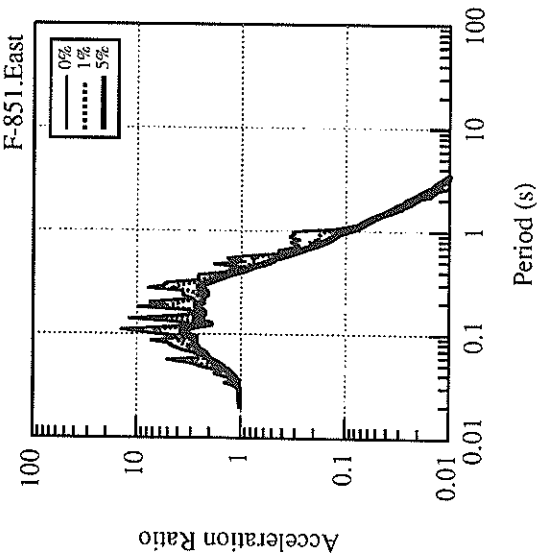
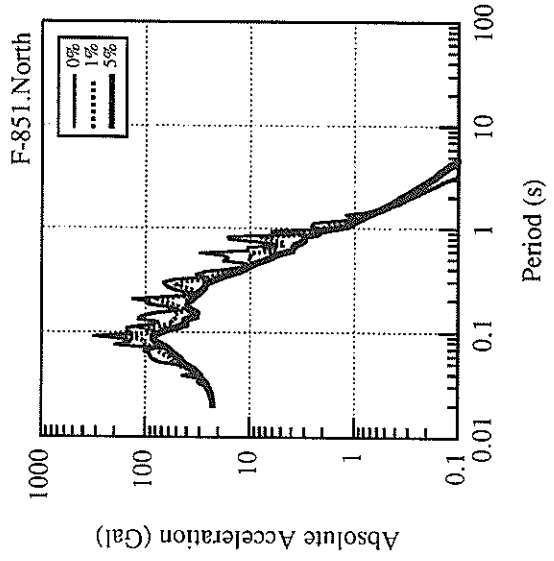
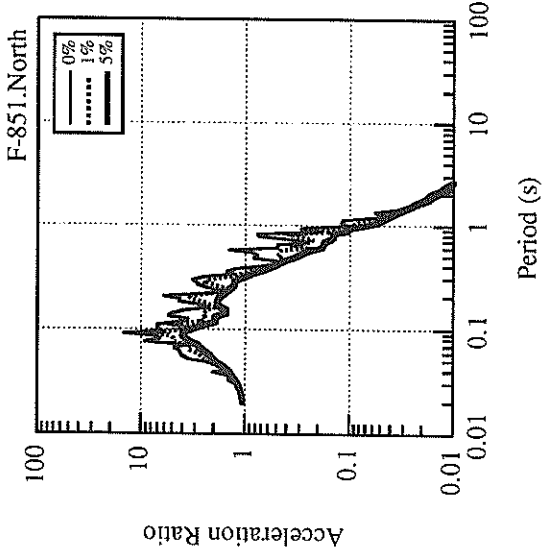
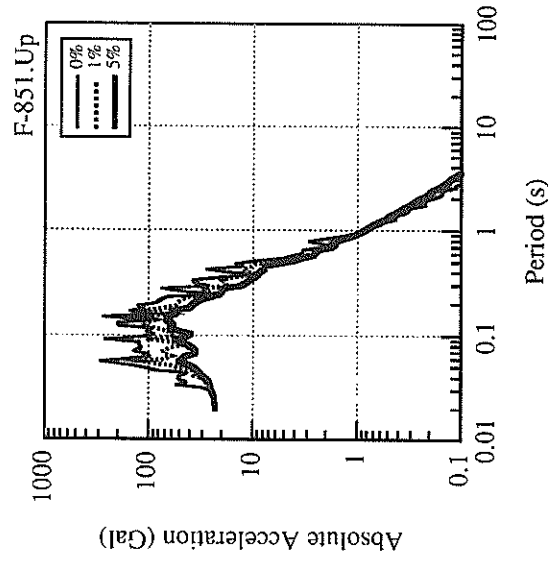
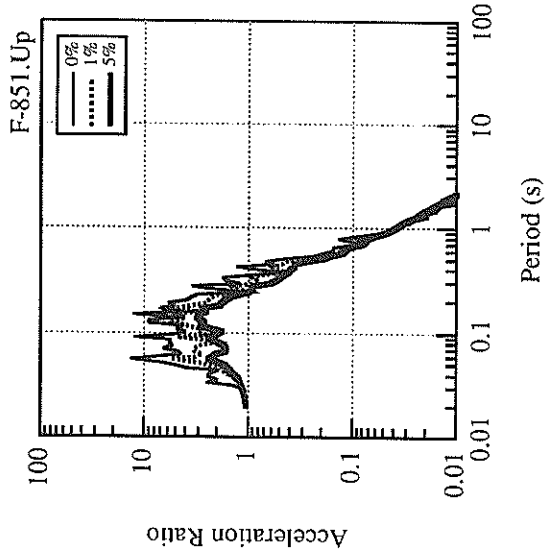


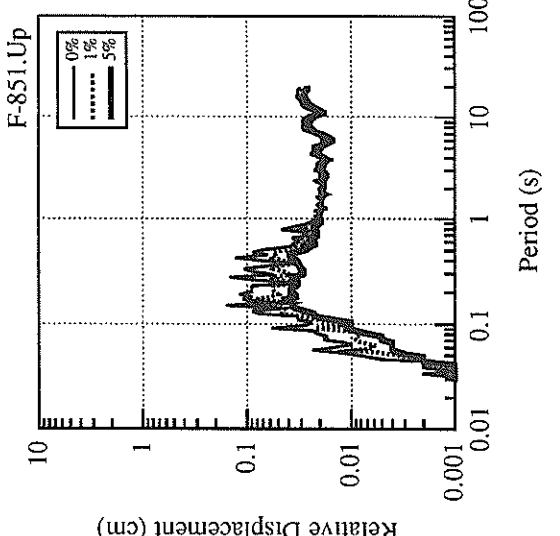
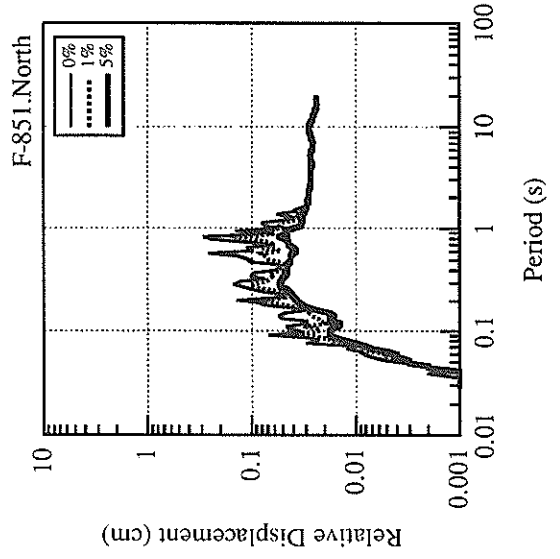
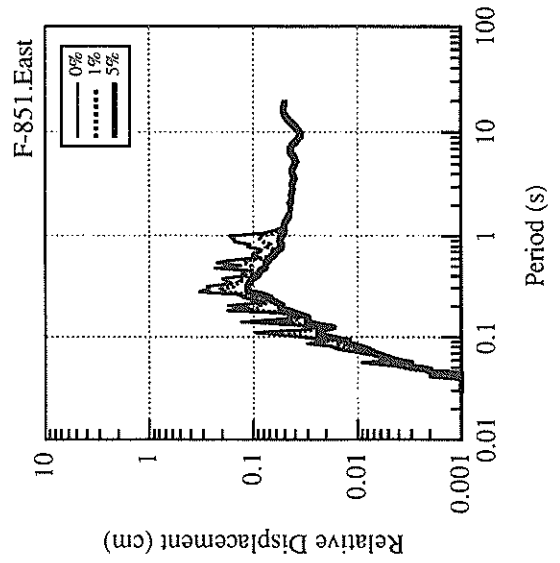
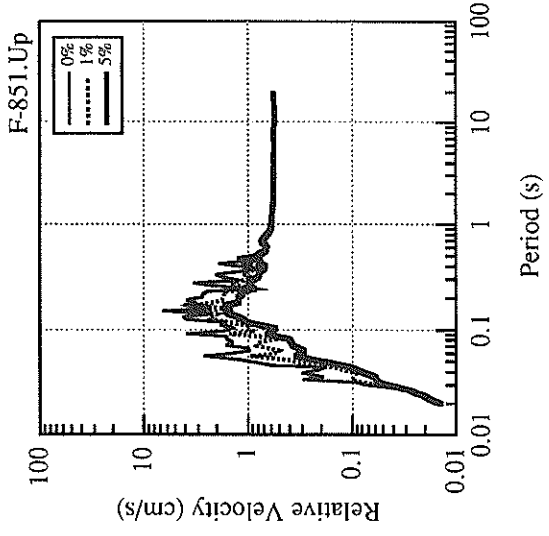
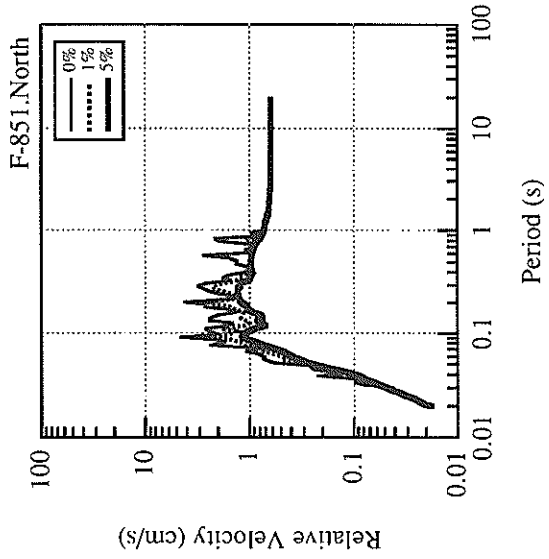
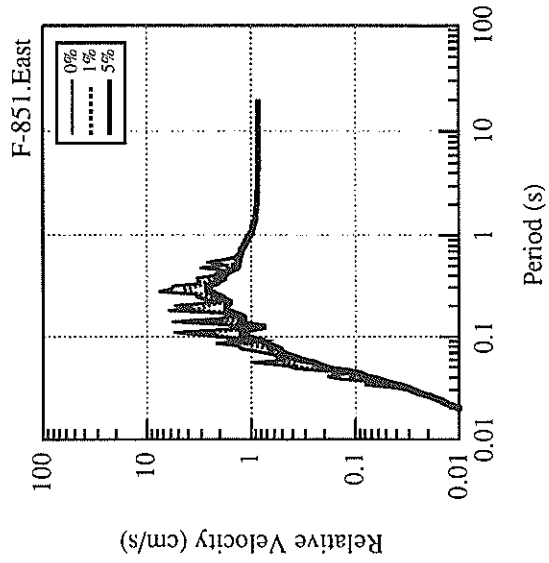


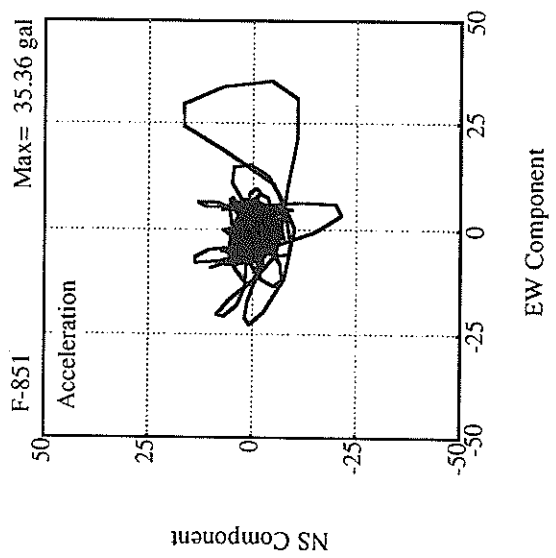
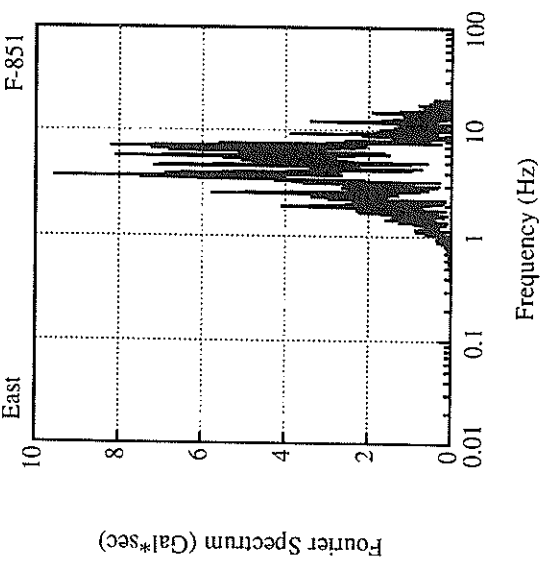
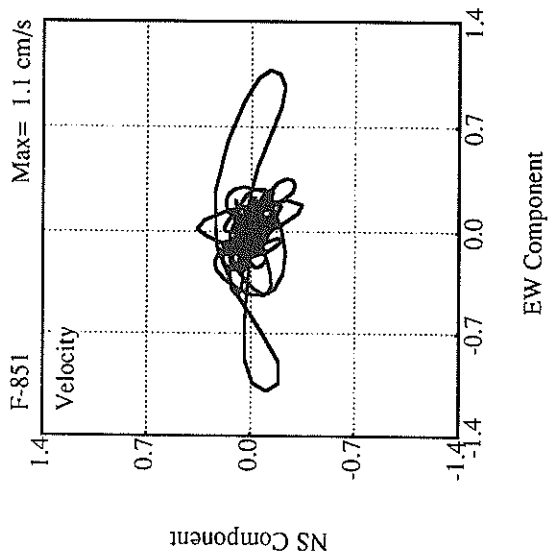
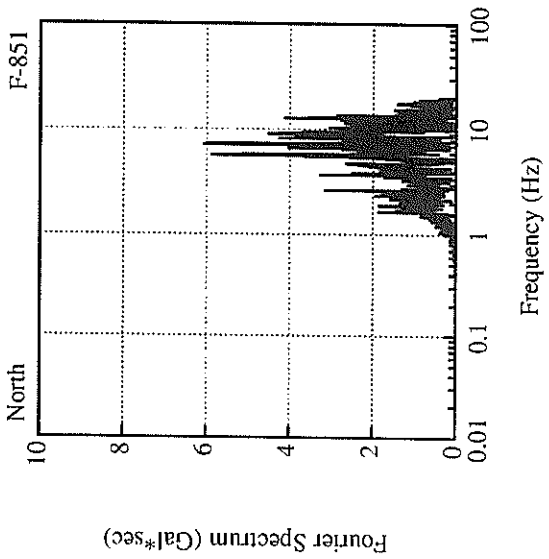
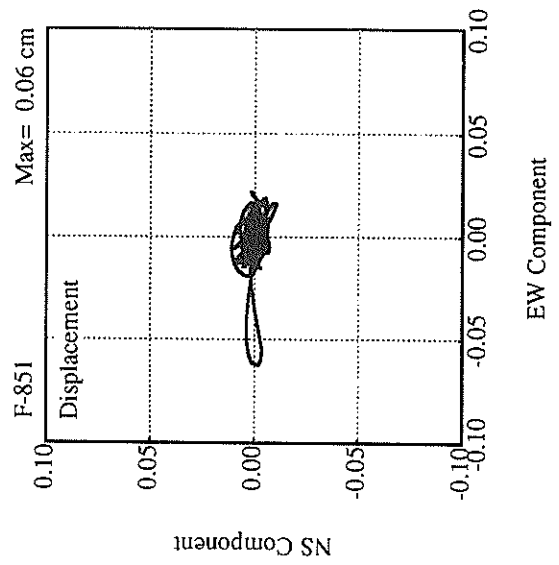
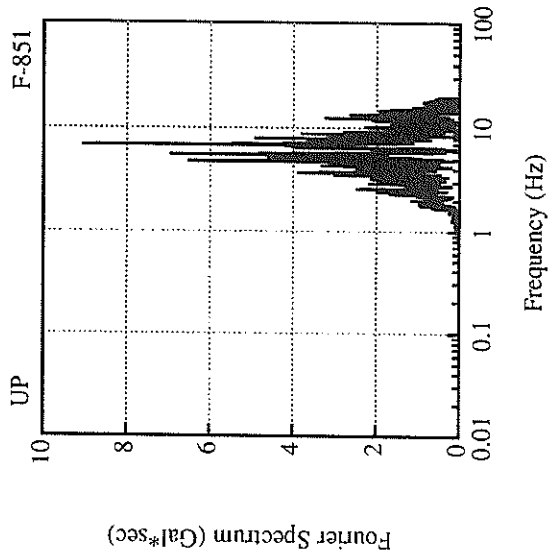
Displacement



Displacement







RECORD NUMBER : F-854
 STATION : OSAKA-JI-G

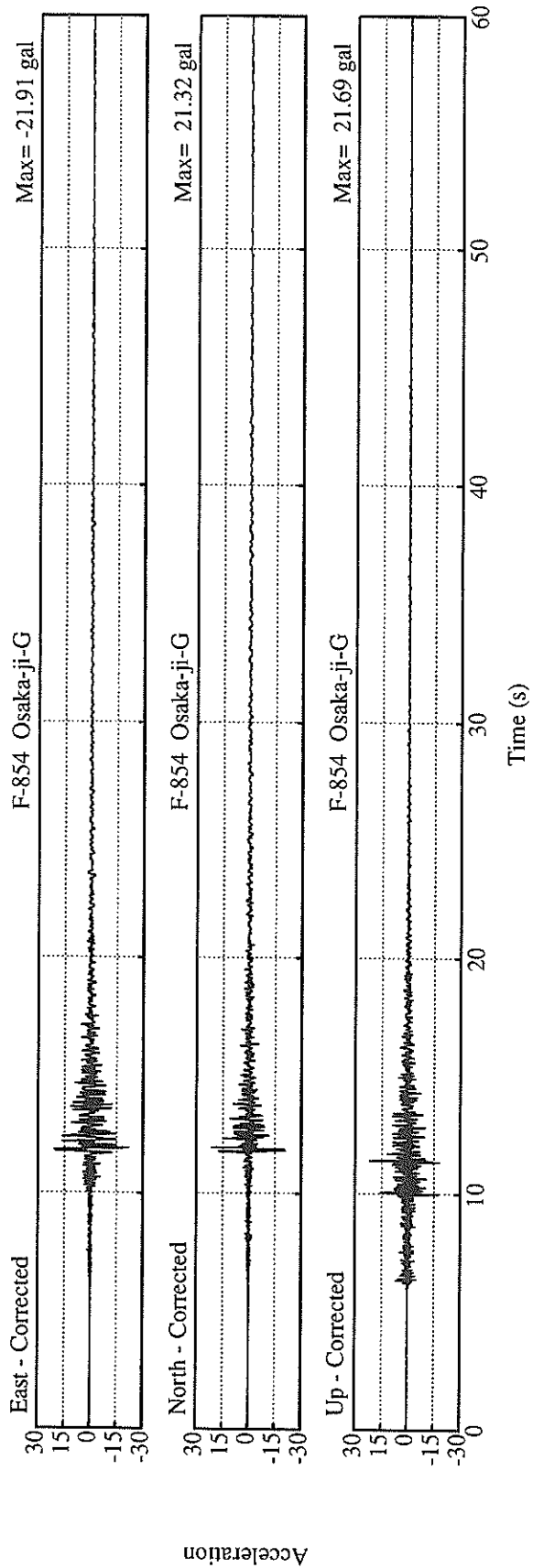
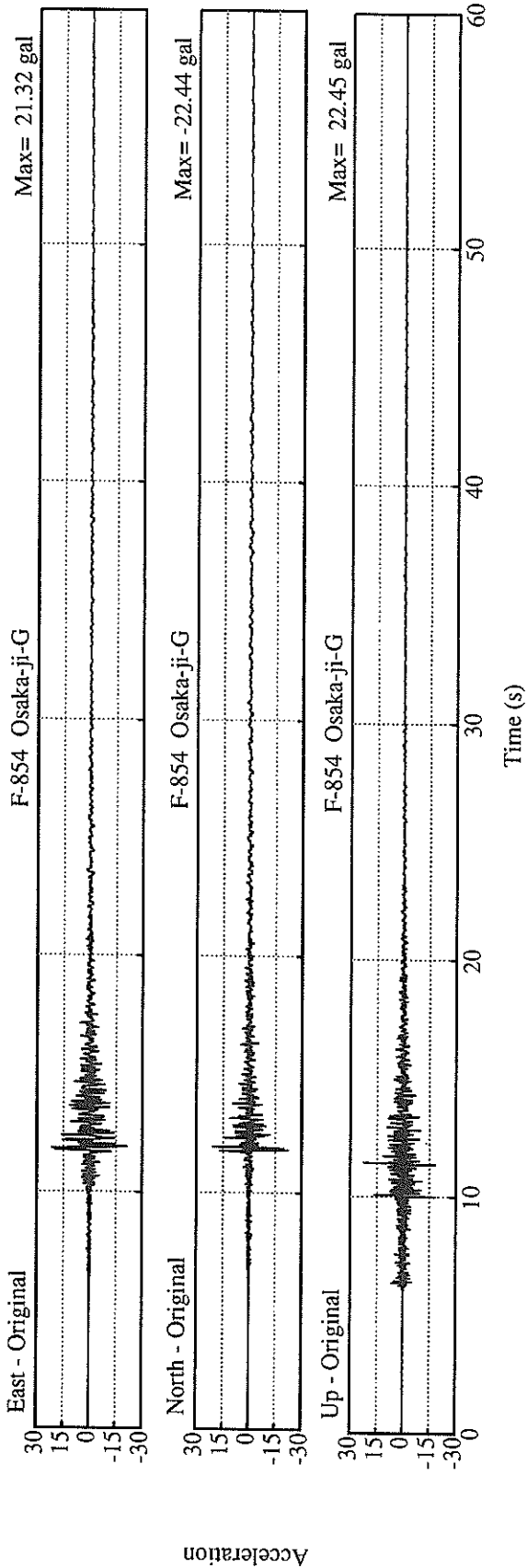
EARTHQUAKE DATA

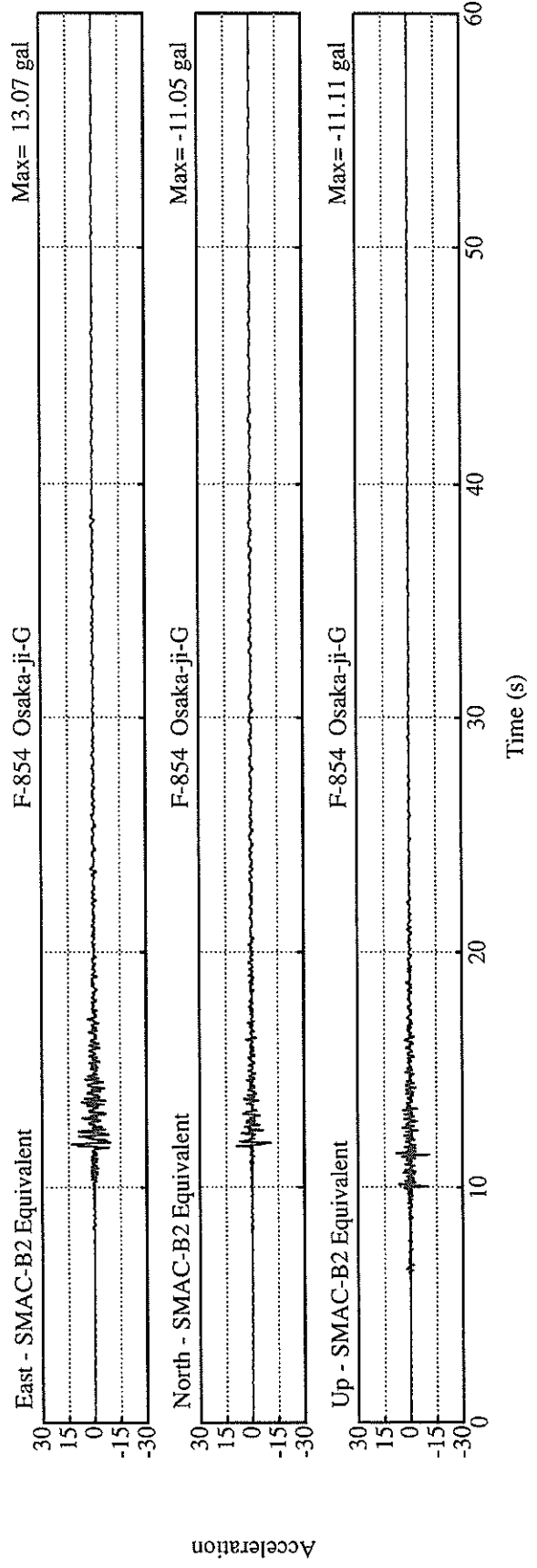
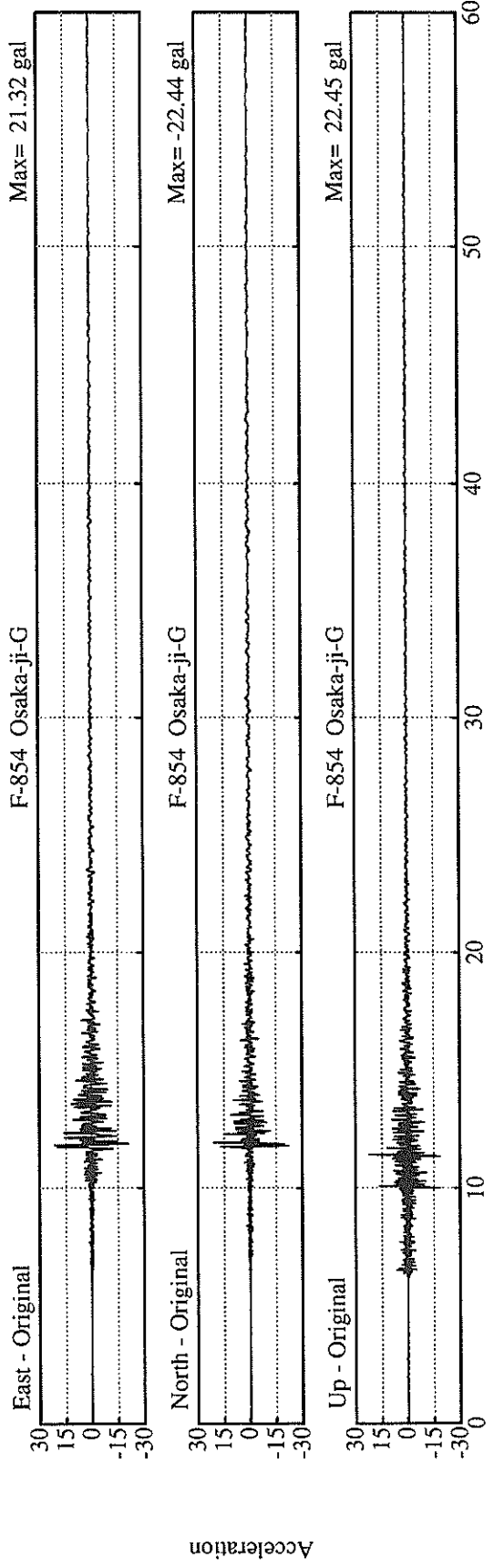
 DATE AND TIME 16:19 FEB. 2,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°41.4' N
 LONGITUDE 135° 8.6' E
 DEPTH 18.1KM
 JMA MAGNITUDE 4.1

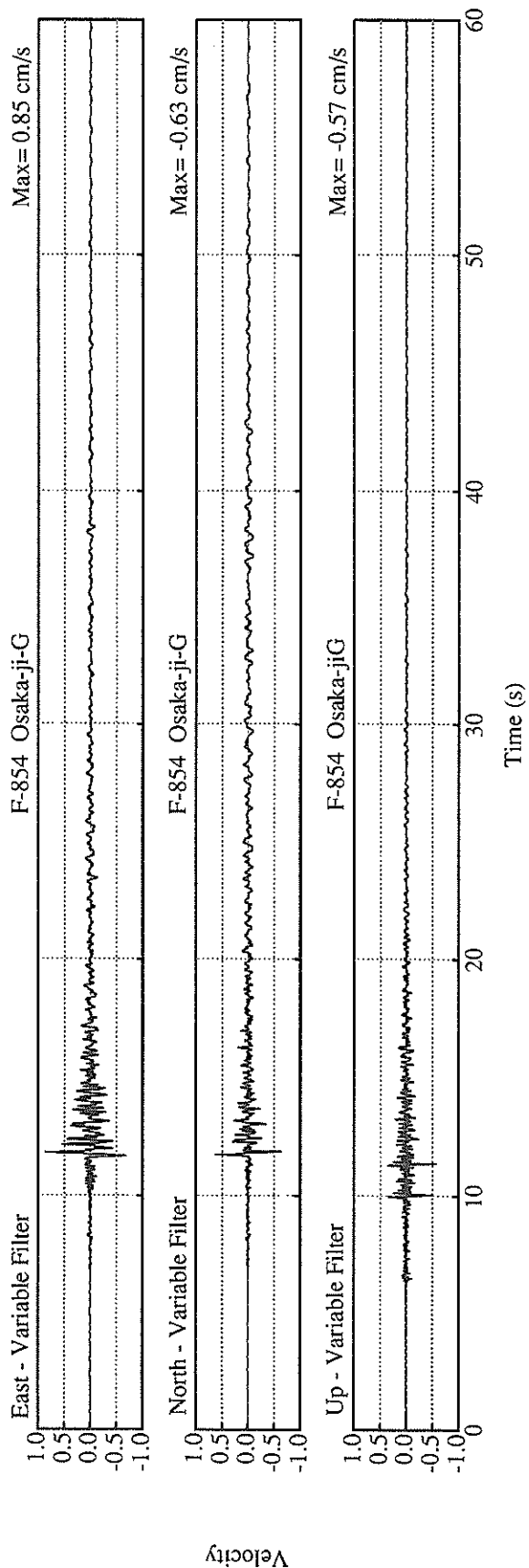
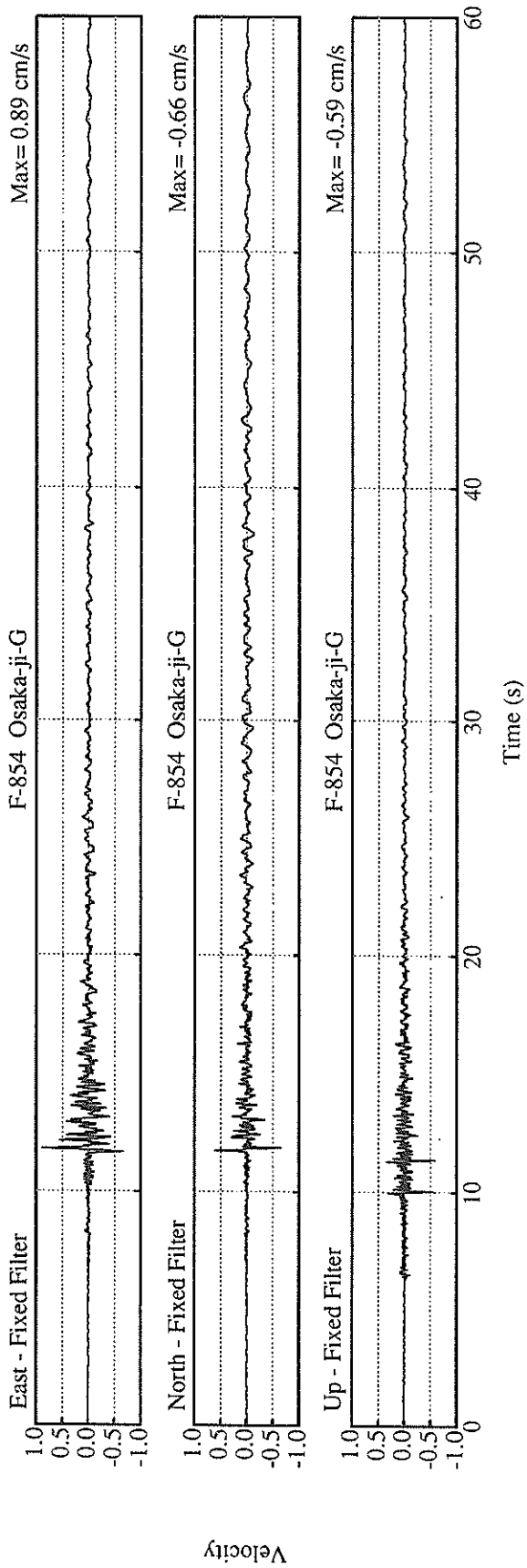
PEAK VALUES OF COMPONENTS

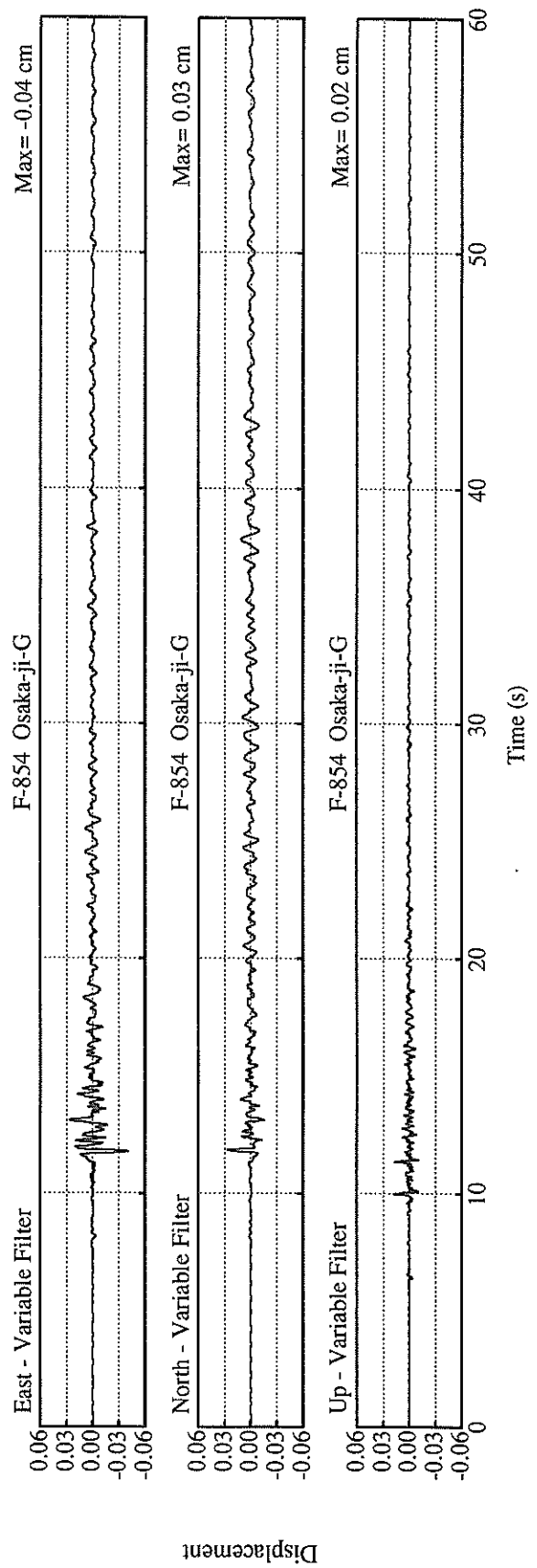
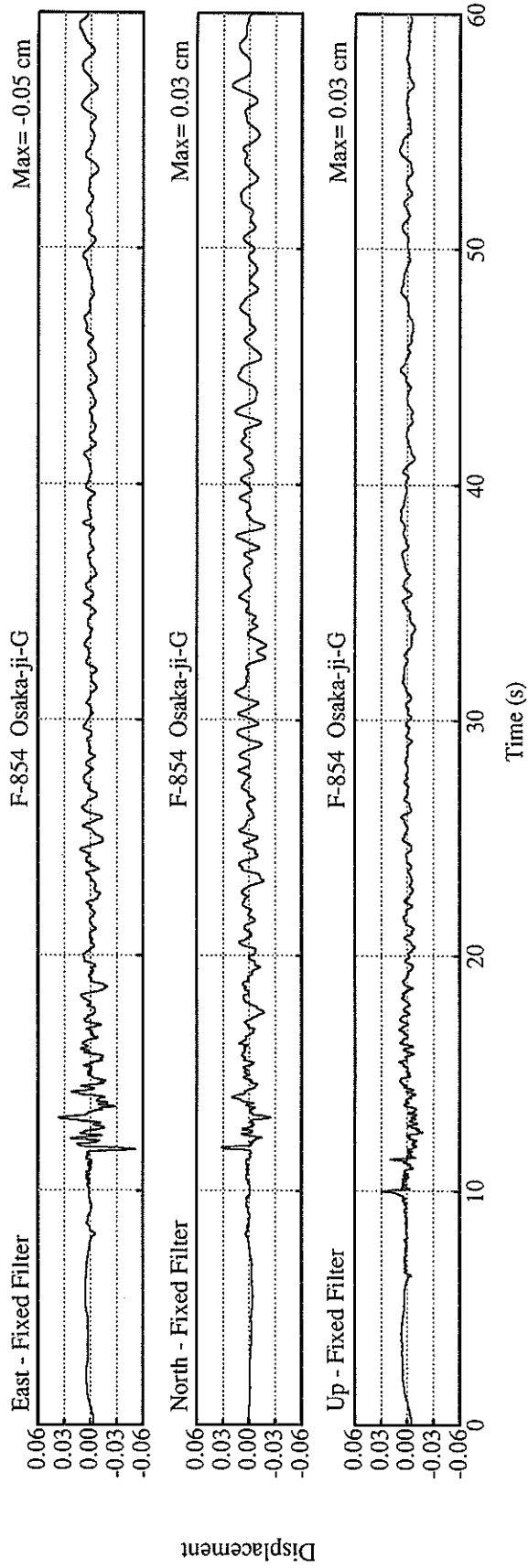
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.848	0.909	1.348	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	11.0	13.1	11.1	13.6
ORIGINAL	22.4	21.3	22.5	27.8
CORRECTED	21.3	21.9	21.7	27.3
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.66	0.89	0.59	0.89
VARIABLE FILTER	0.63	0.85	0.57	0.85
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.03	0.05	0.03	0.06
VARIABLE FILTER	0.03	0.04	0.02	0.04

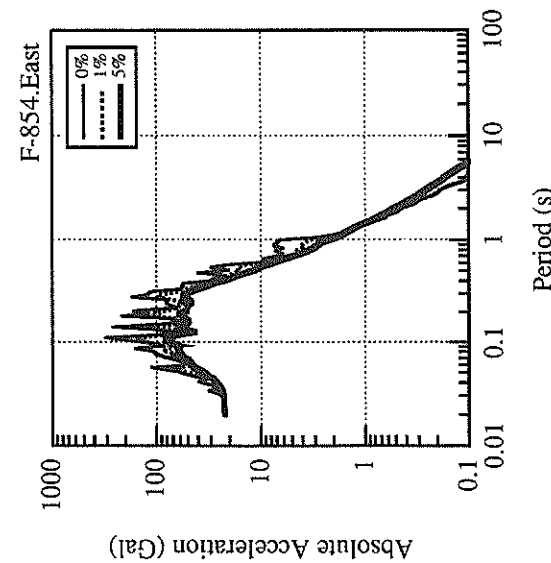
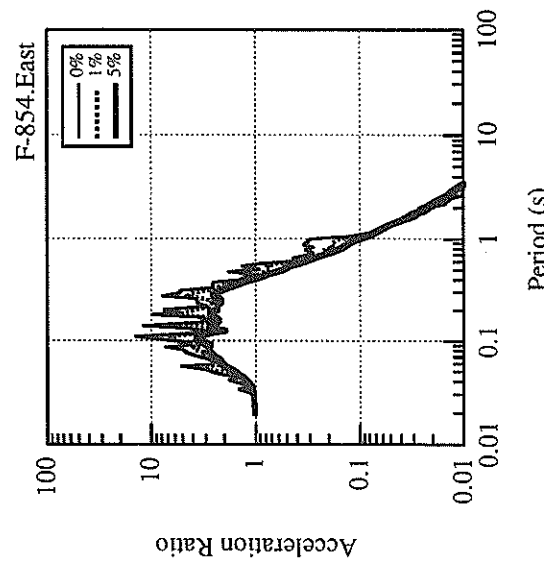
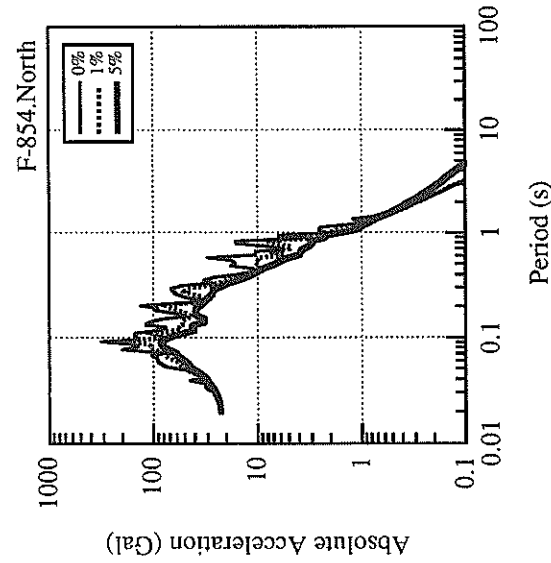
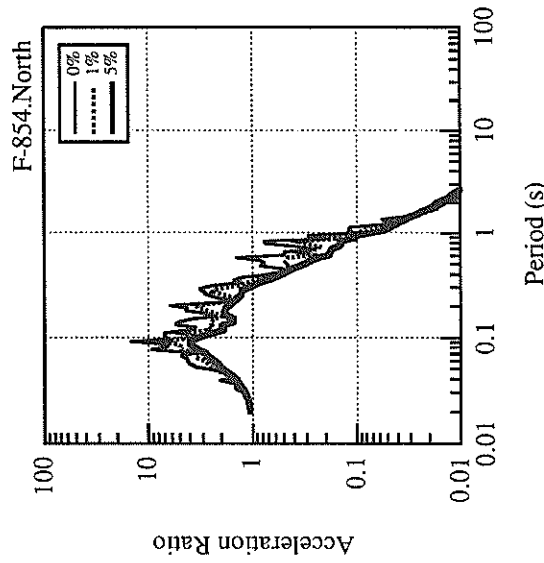
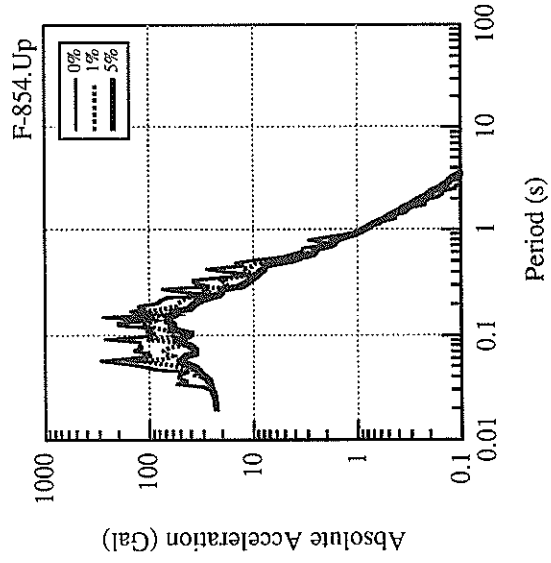
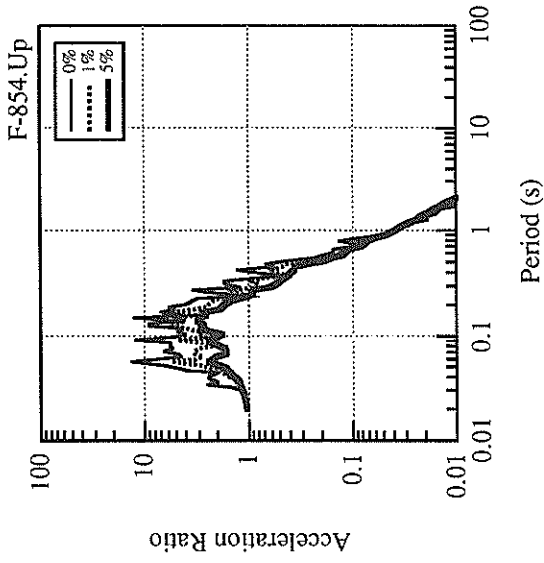
* RESULTANT OF HORIZONTAL COMPONENTS

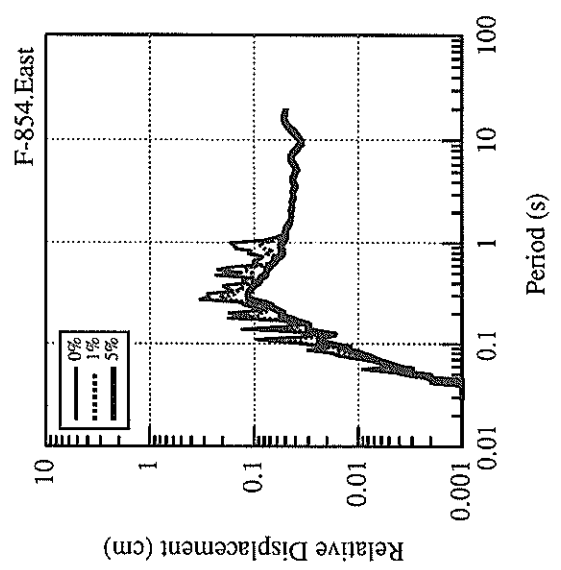
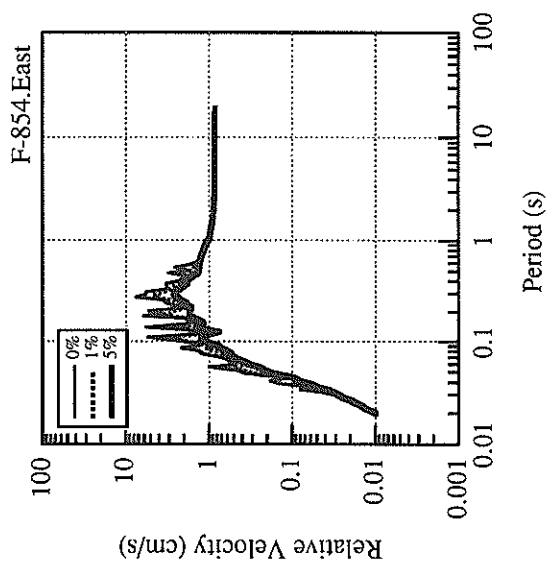
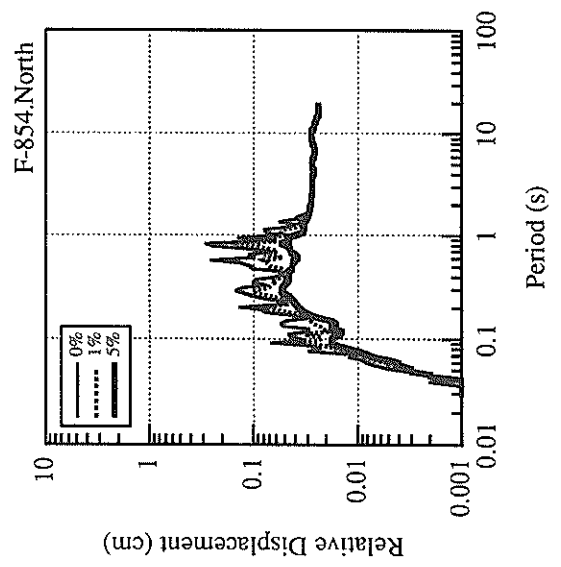
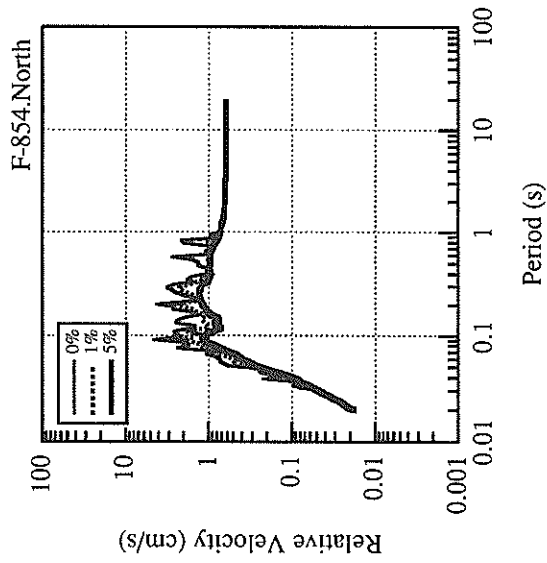
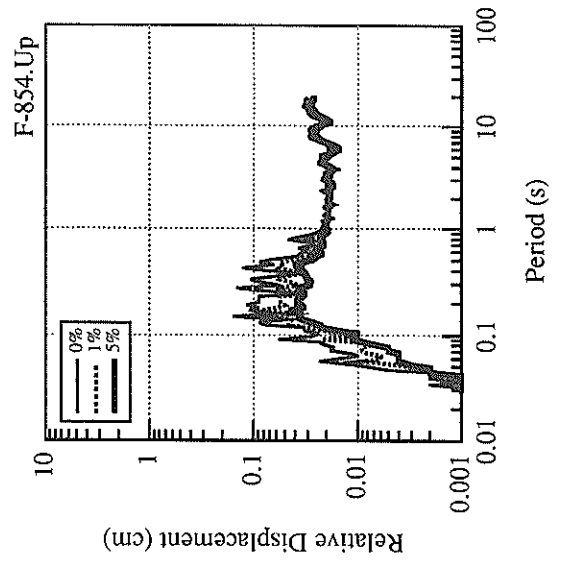
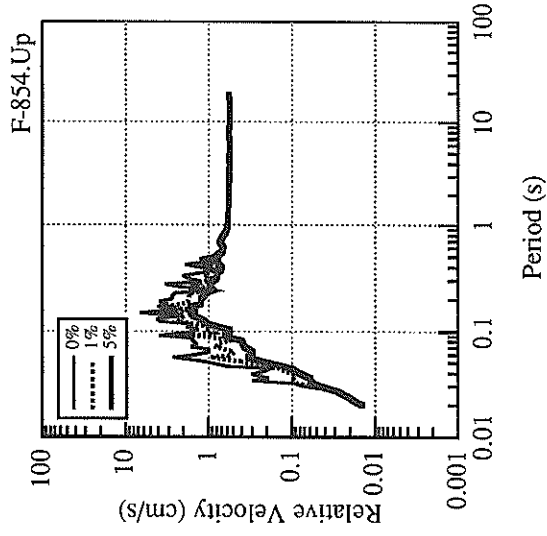


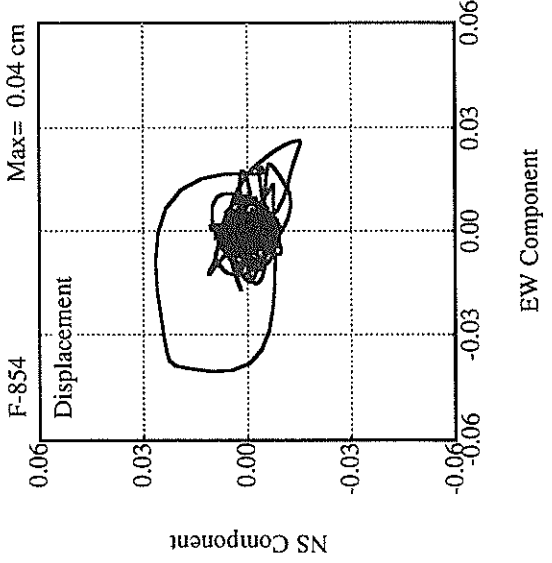
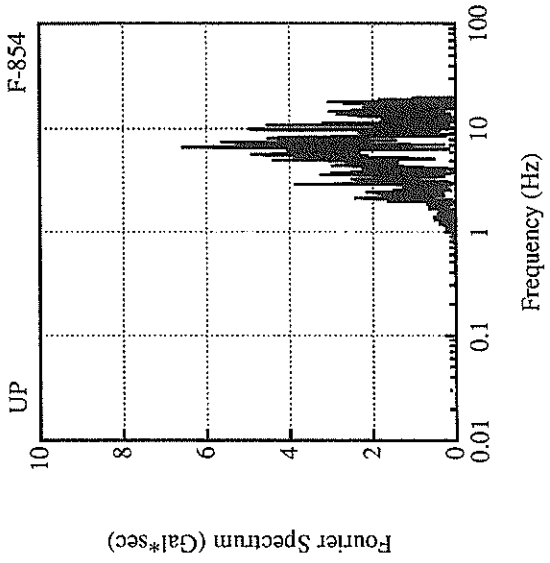
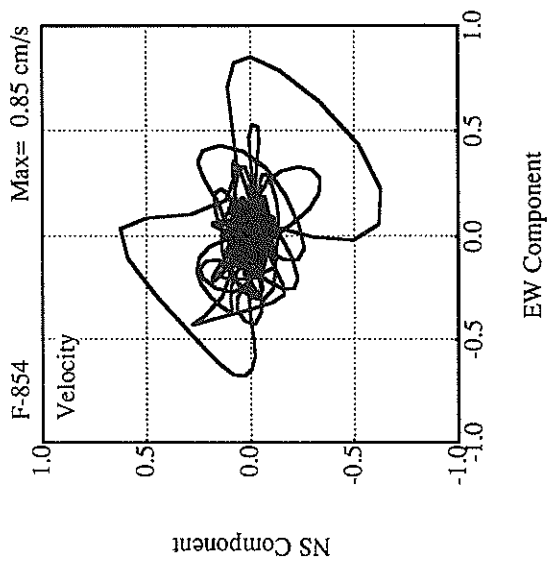
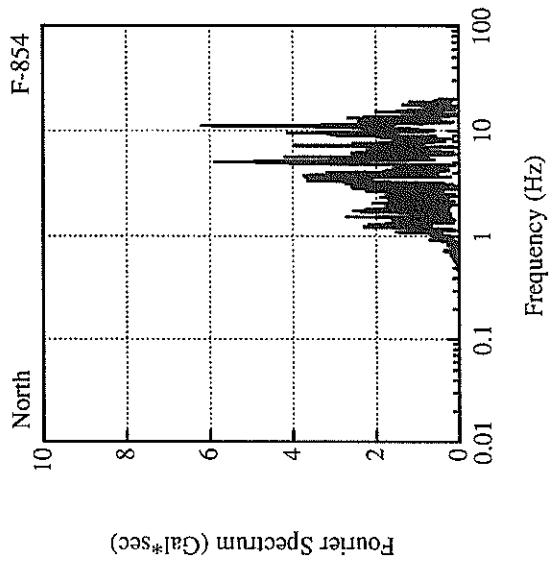
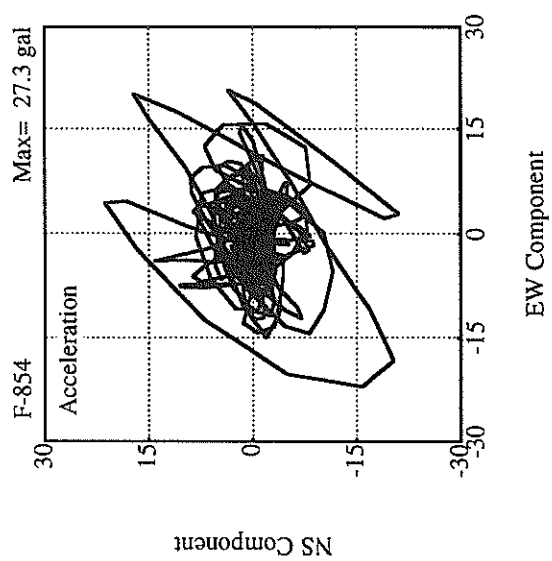
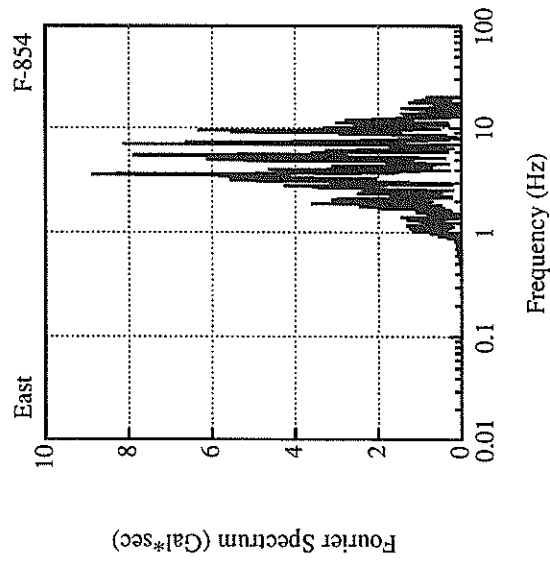












RECORD NUMBER : F-820
 STATION : AMAGASAKI-G

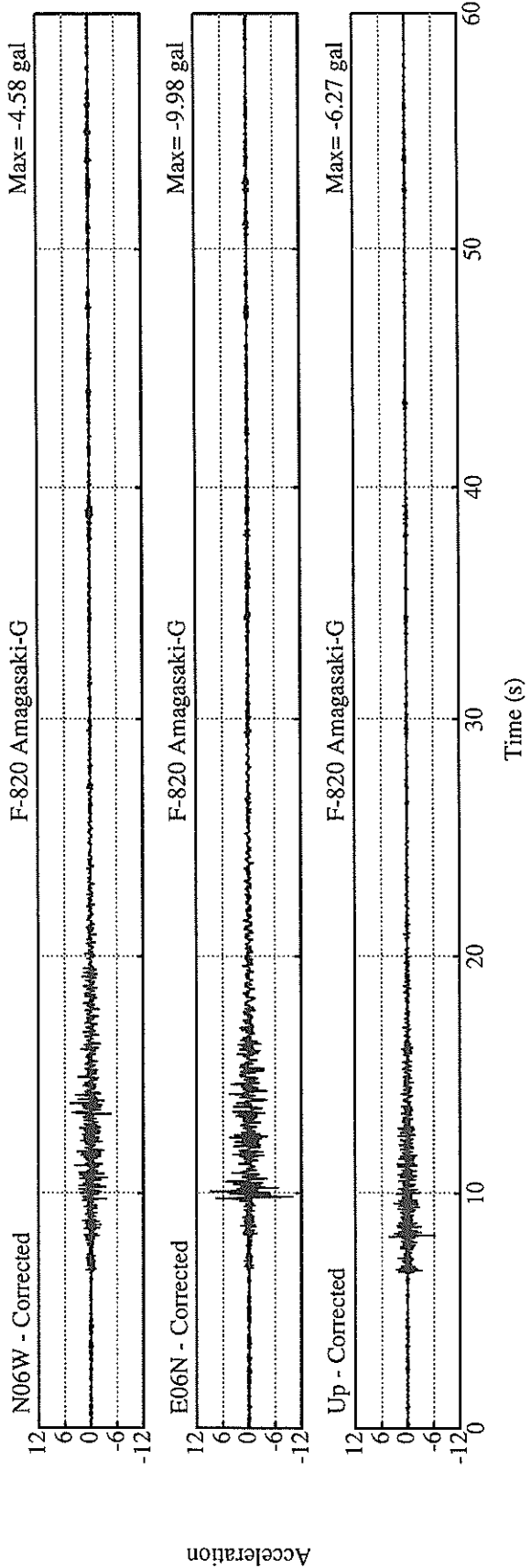
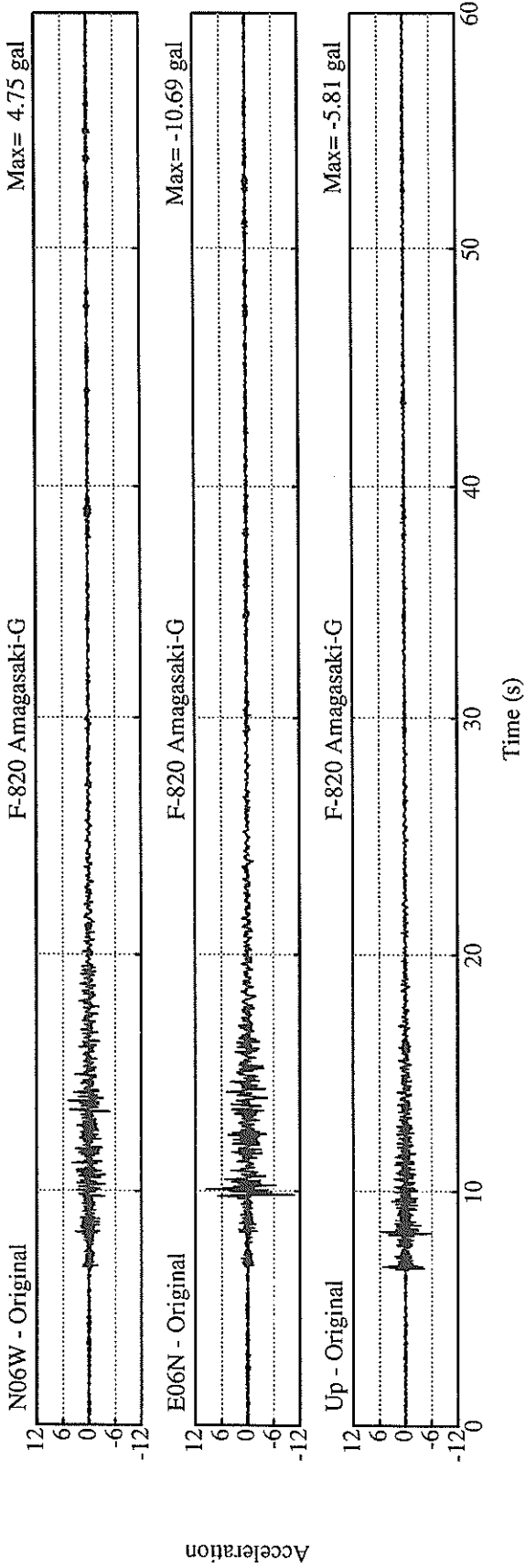
EARTHQUAKE DATA

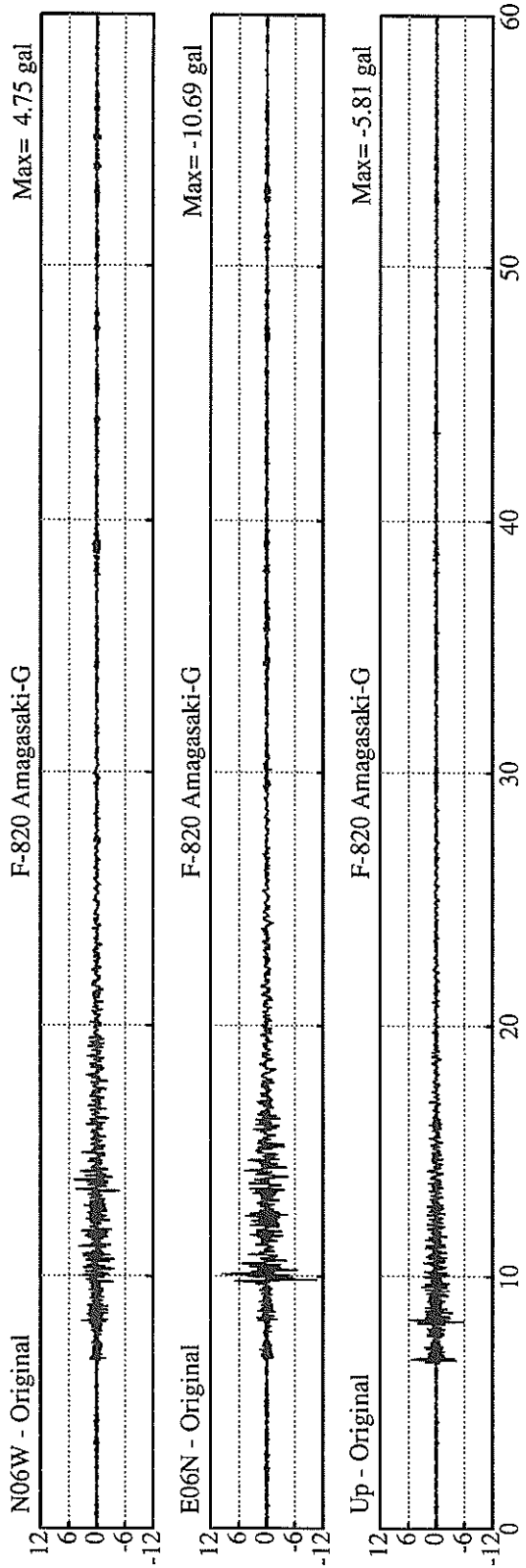
 DATE AND TIME 13: 0 FEB. 6, 1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34° 47.5' N
 LONGITUDE 135° 19.5' E
 DEPTH 13.2KM
 JMA MAGNITUDE 3.6

PEAK VALUES OF COMPONENTS

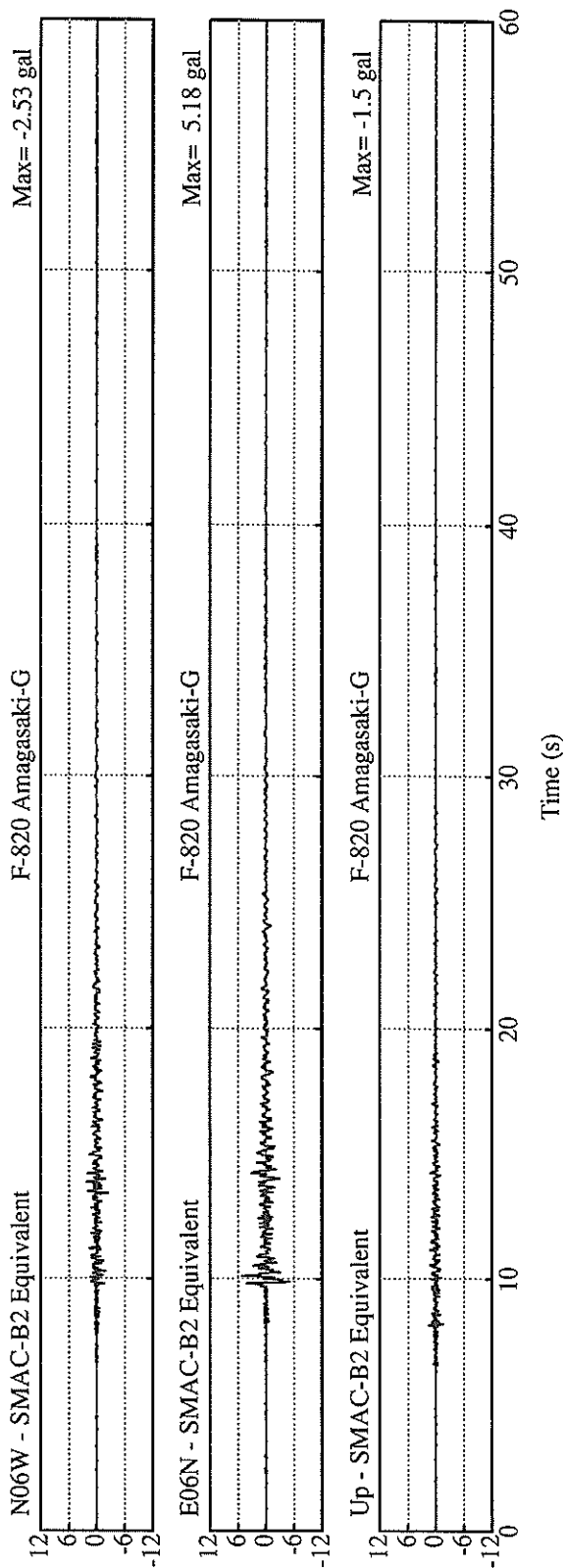
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.946	1.458	2.691	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	2.5	5.2	1.5	5.3
ORIGINAL	4.7	10.7	5.8	10.8
CORRECTED	4.6	10.0	6.3	10.1
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.14	0.35	0.09	0.36
VARIABLE FILTER	0.13	0.33	0.08	0.34
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.01	0.03	0.01	0.03
VARIABLE FILTER	0.00	0.01	0.00	0.01

* RESULTANT OF HORIZONTAL COMPONENTS

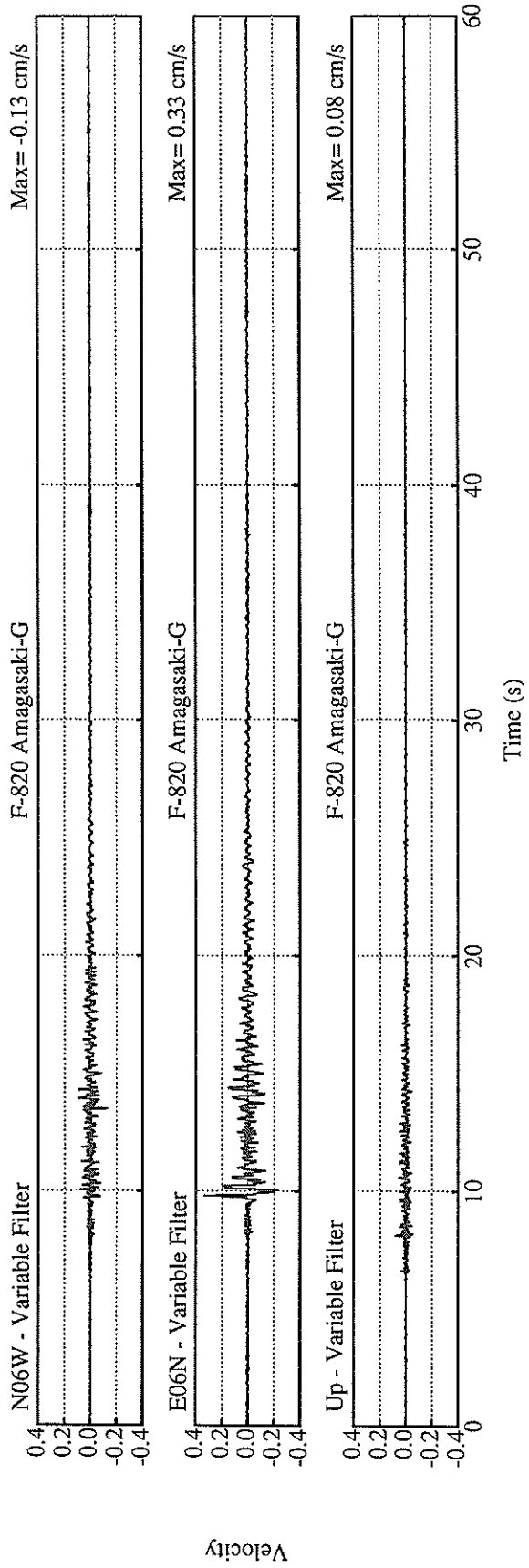
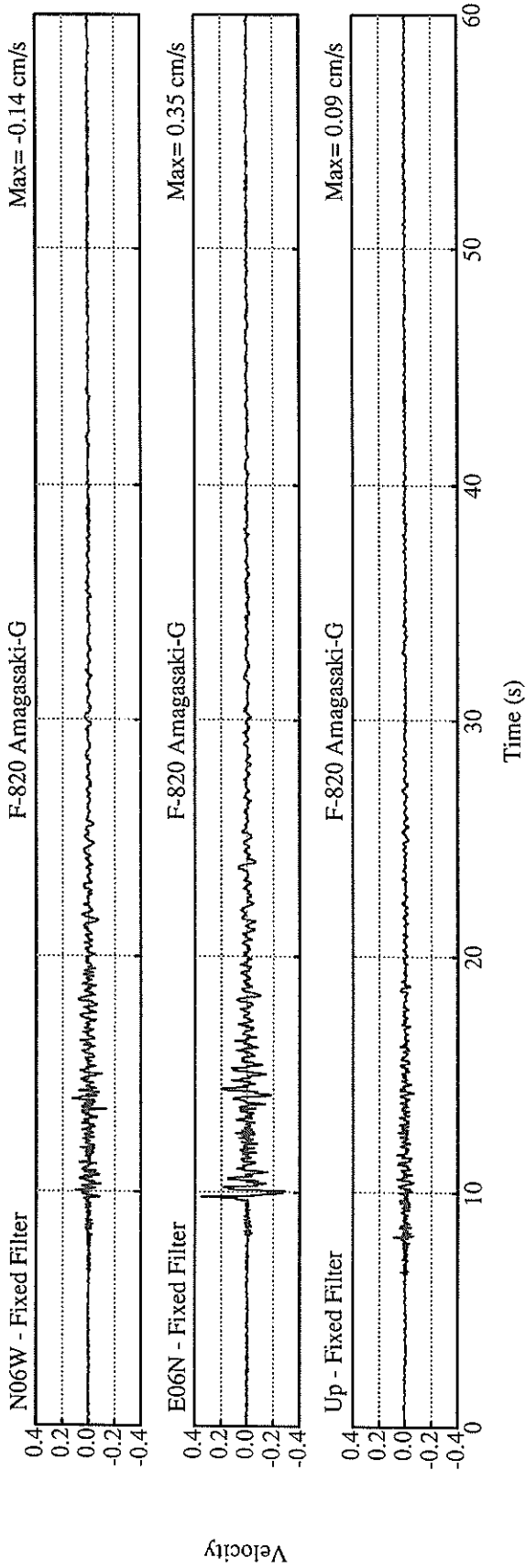


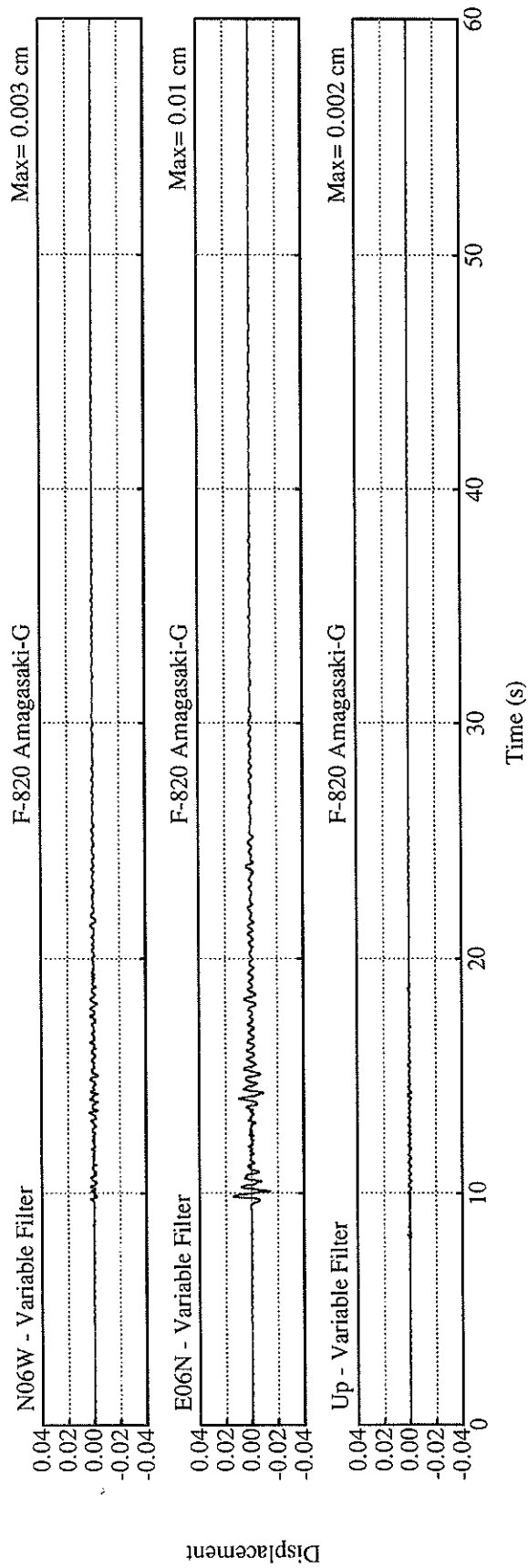
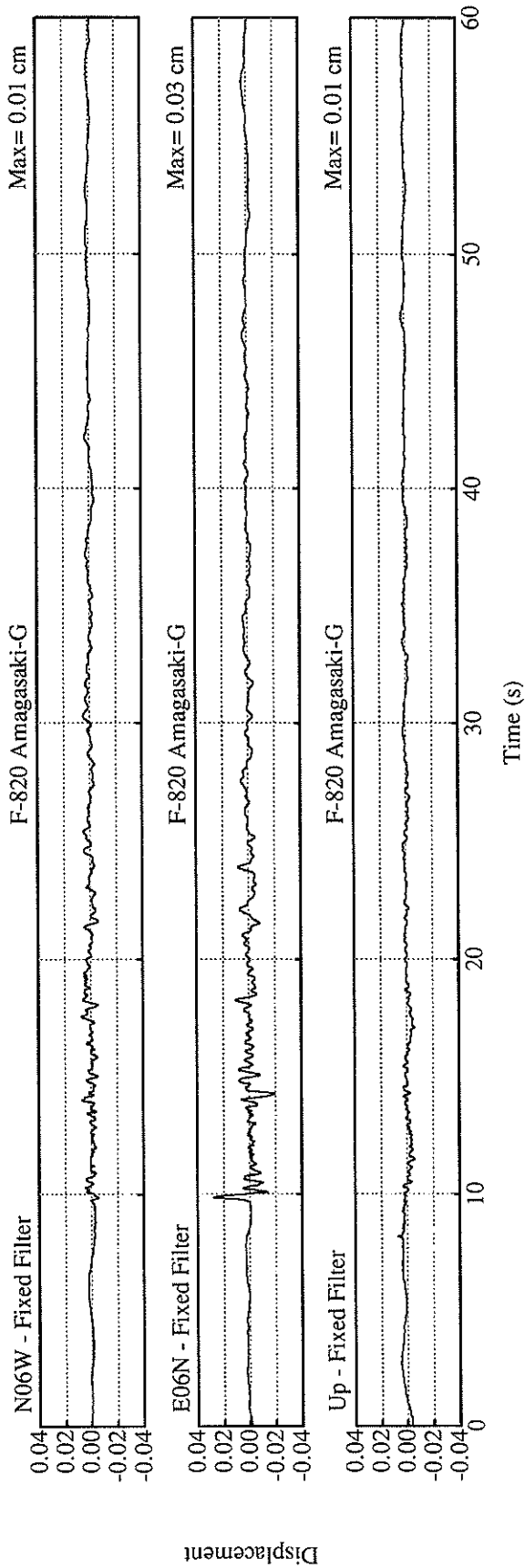


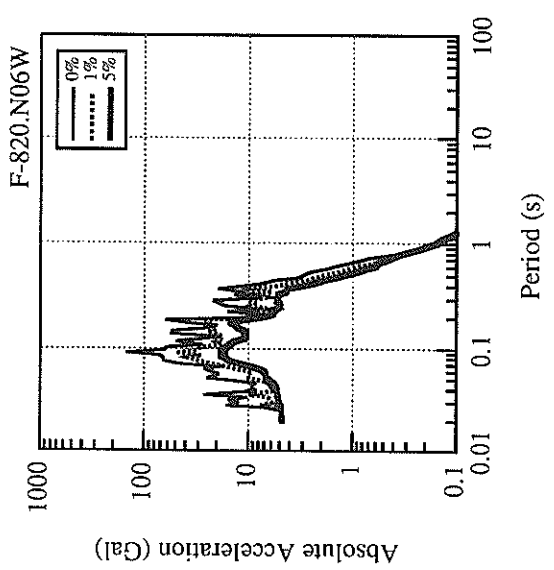
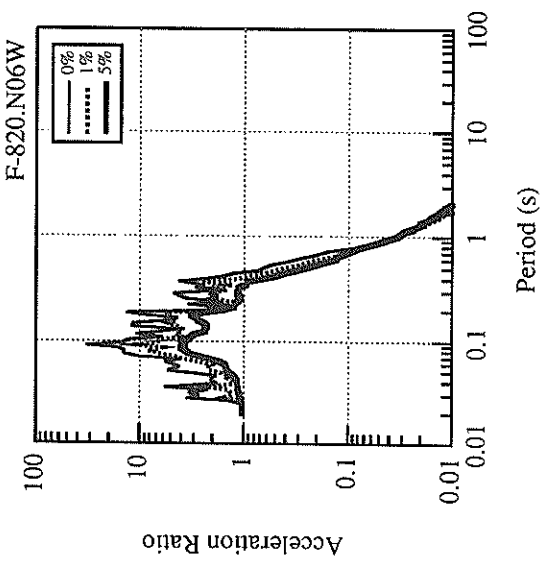
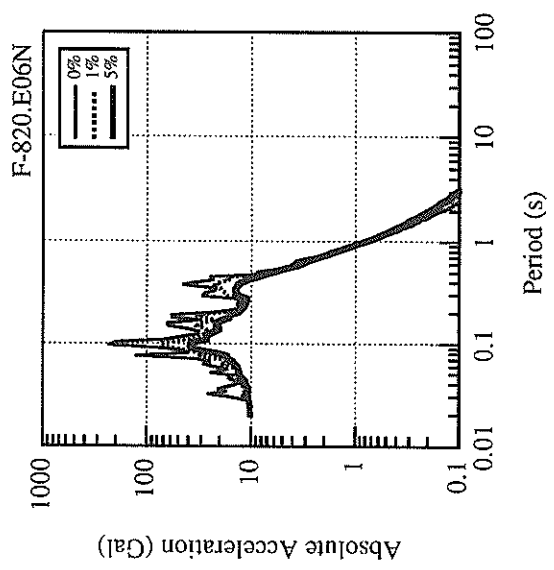
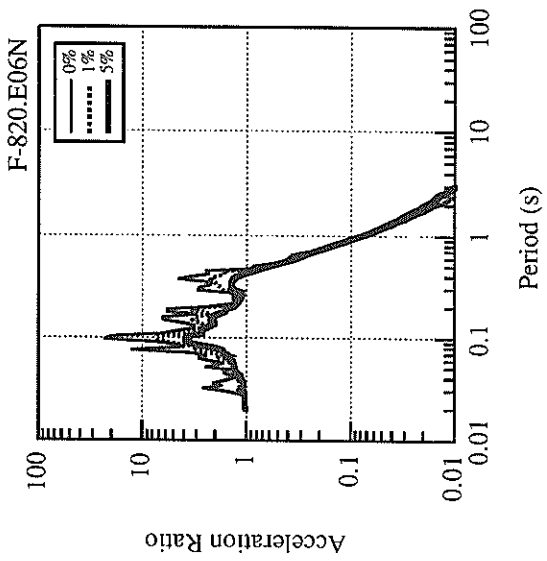
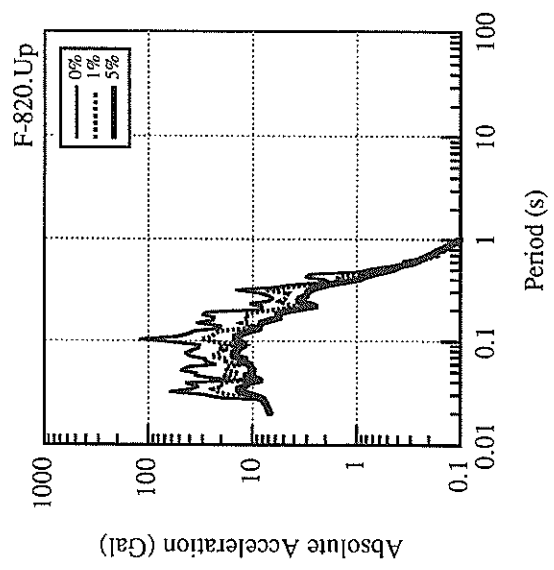
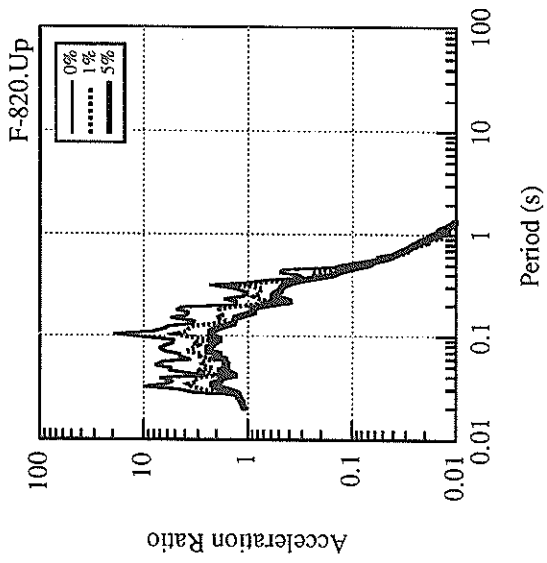
Acceleration

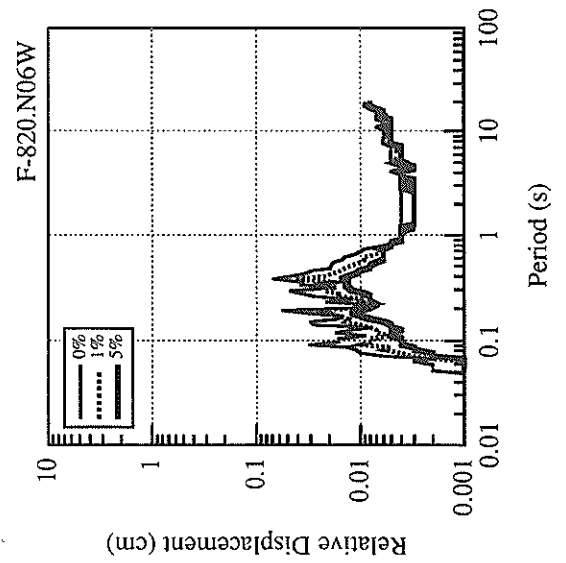
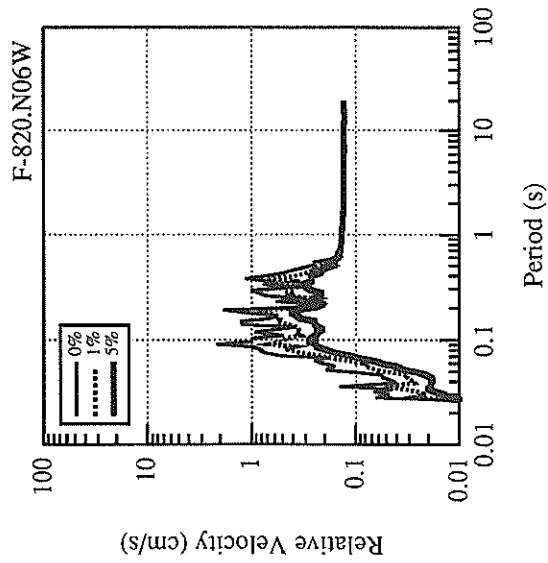
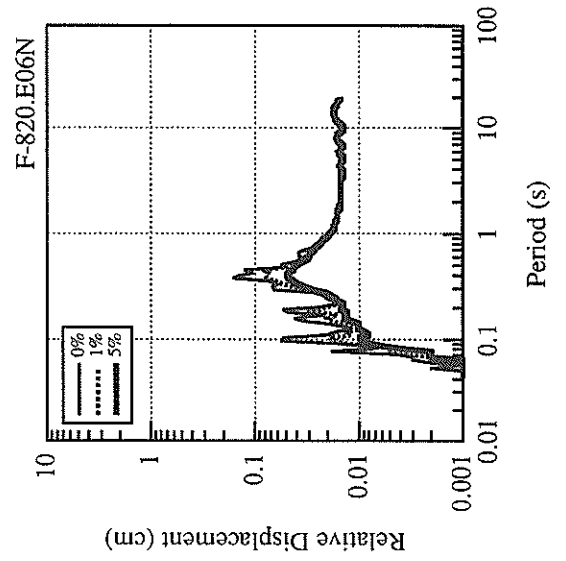
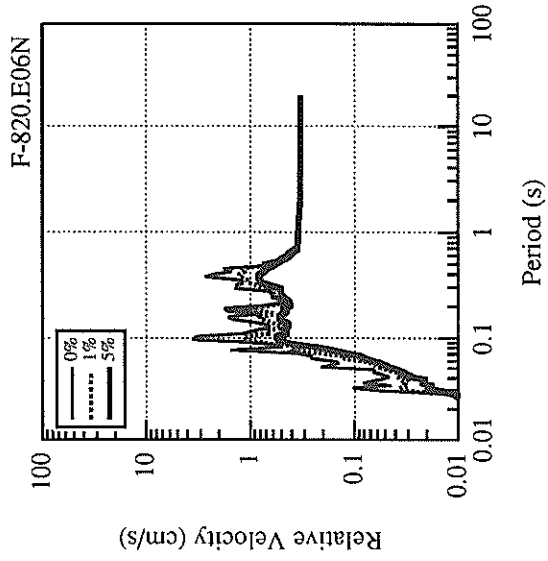
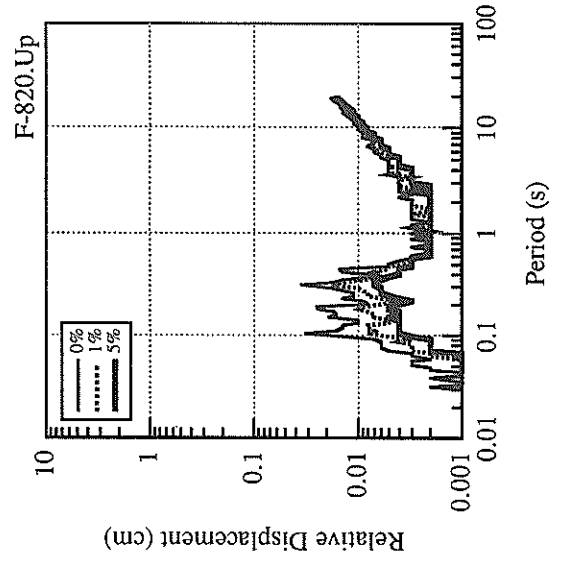
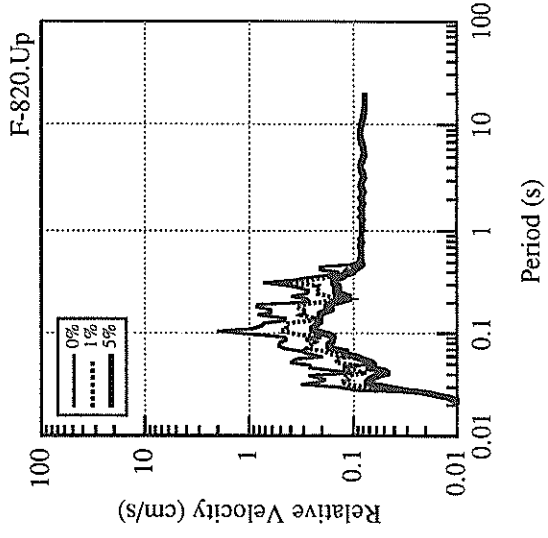


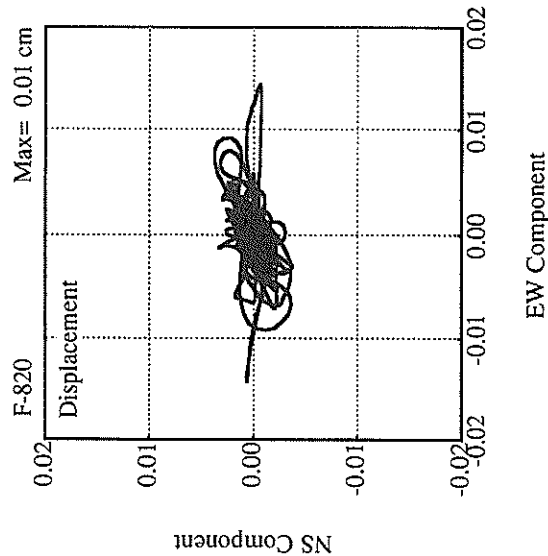
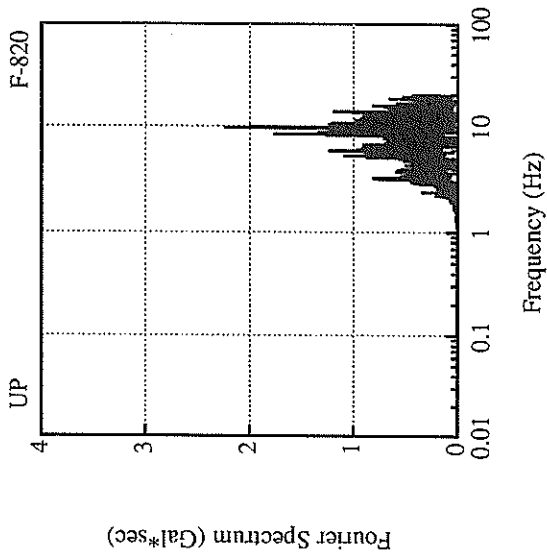
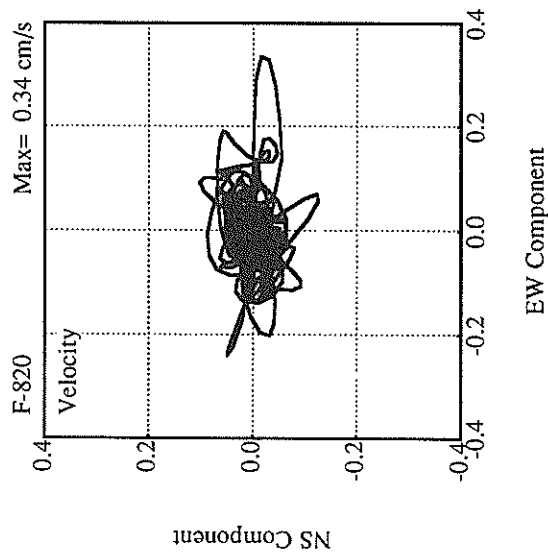
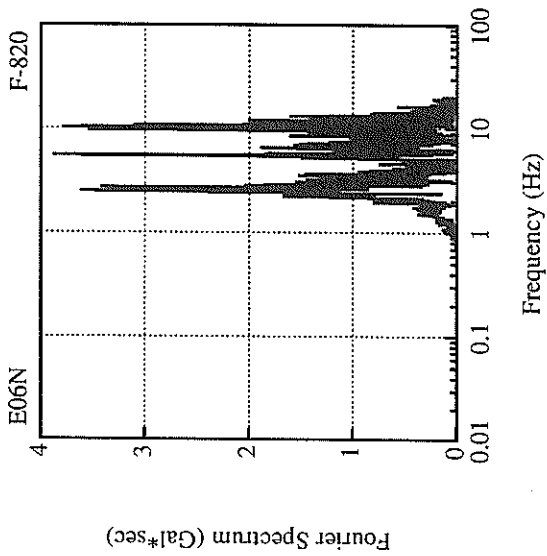
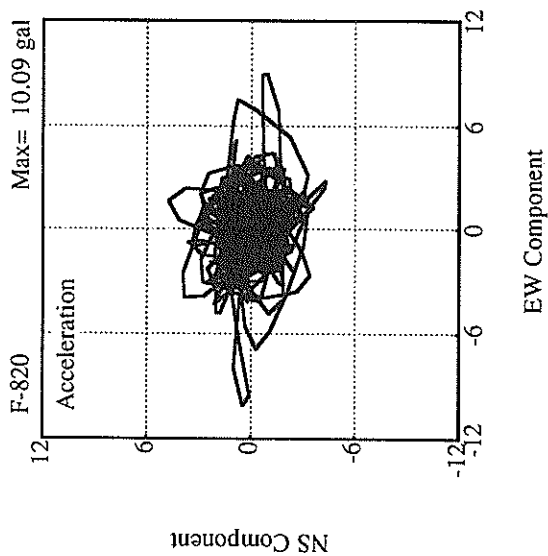
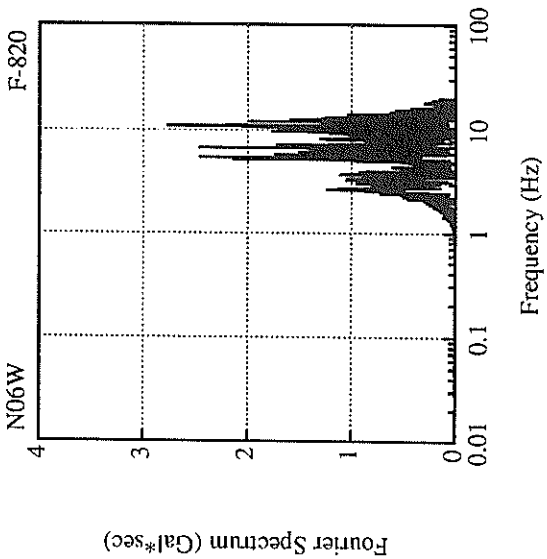
Acceleration











RECORD NUMBER : F-937
 STATION : WAKAYAMA-G

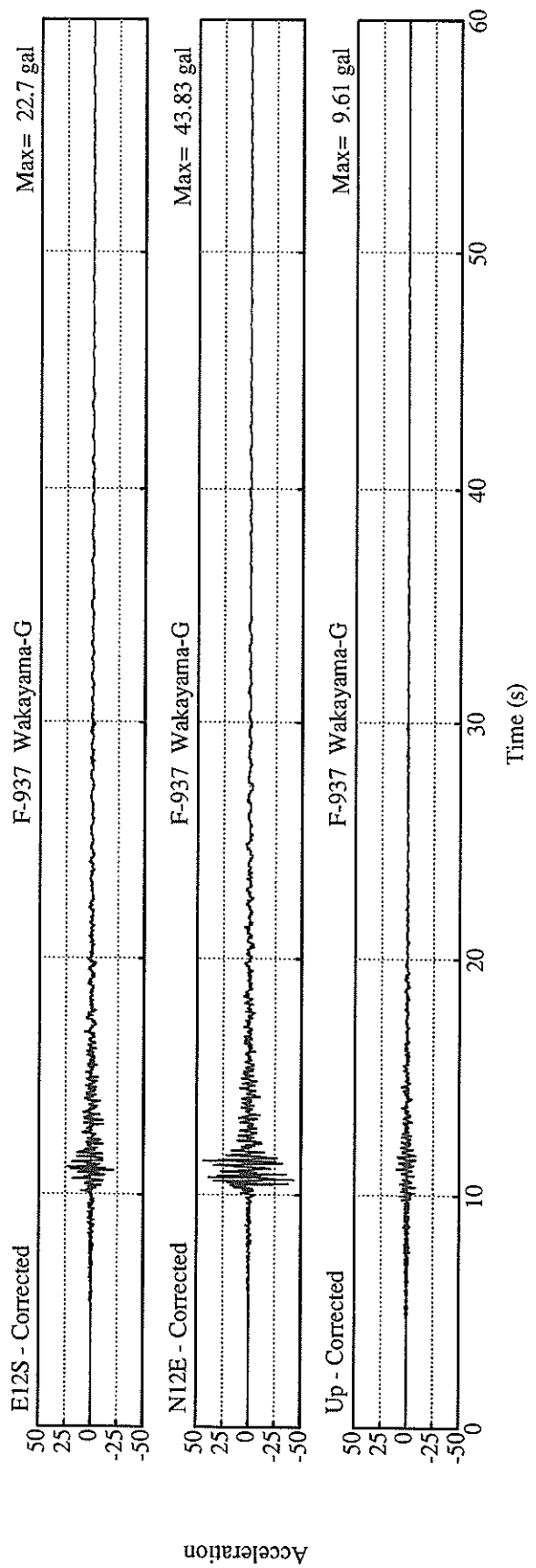
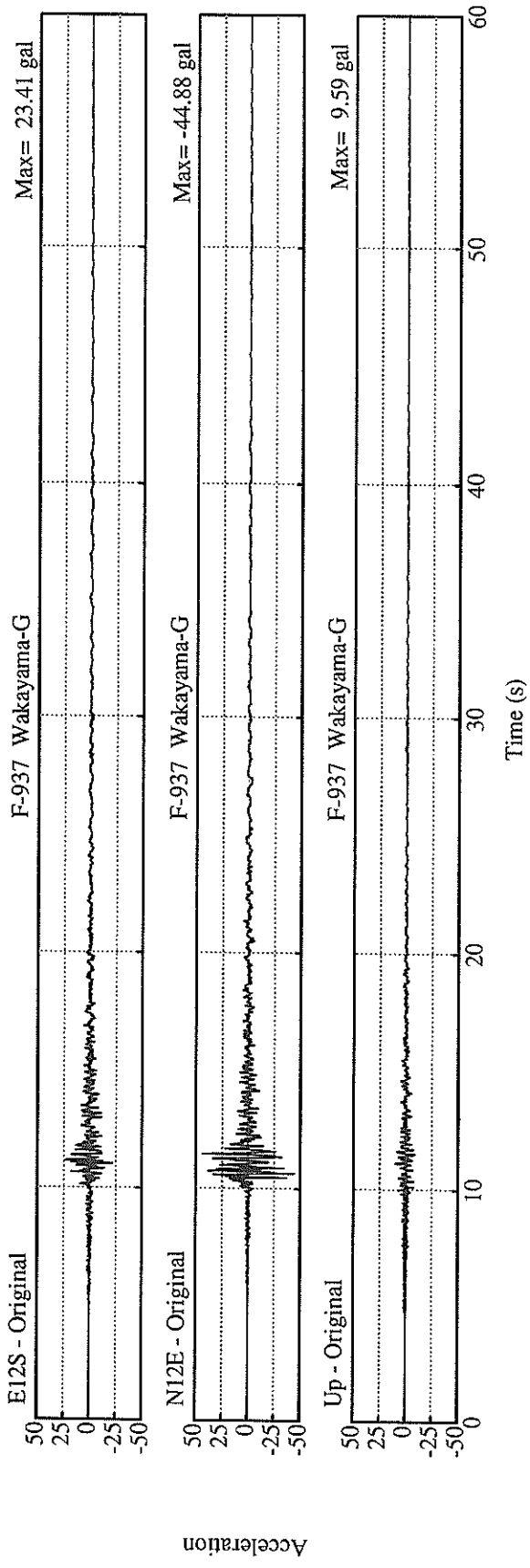
EARTHQUAKE DATA

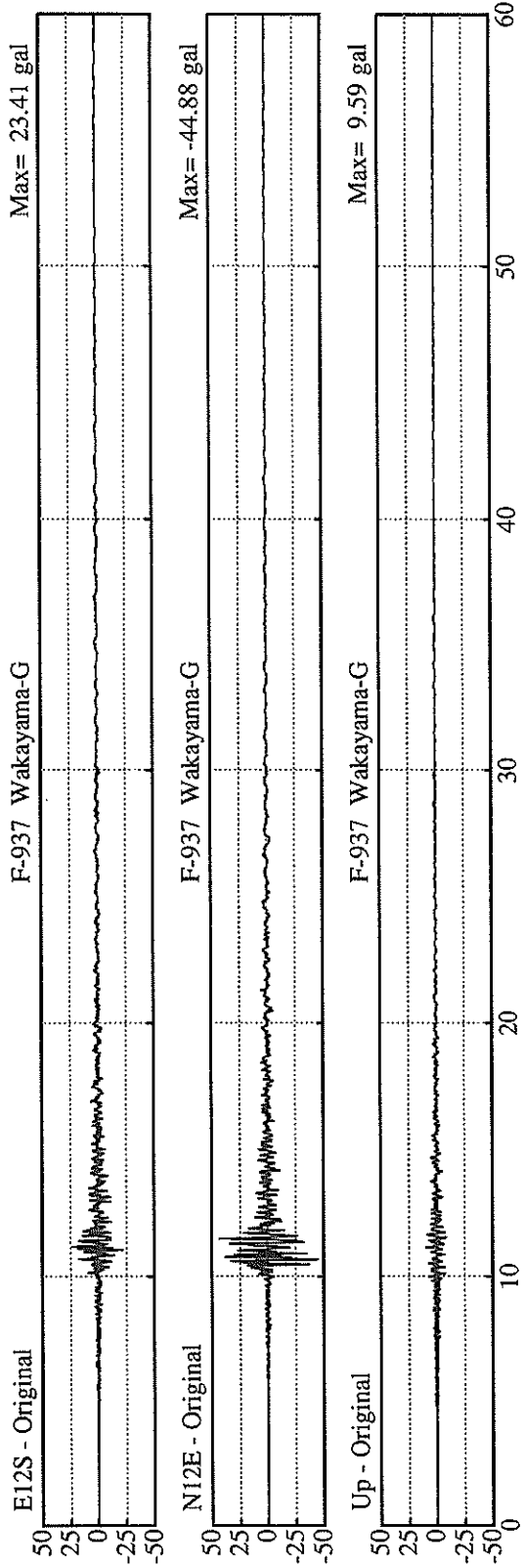
 DATE AND TIME 21:37 FEB.18,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION AWAJISHIMA ISLAND REGION
 LATITUDE 34°26.2' N
 LONGITUDE 134°49.0' E
 DEPTH 15.9KM
 JMA MAGNITUDE 4.8

PEAK VALUES OF COMPONENTS

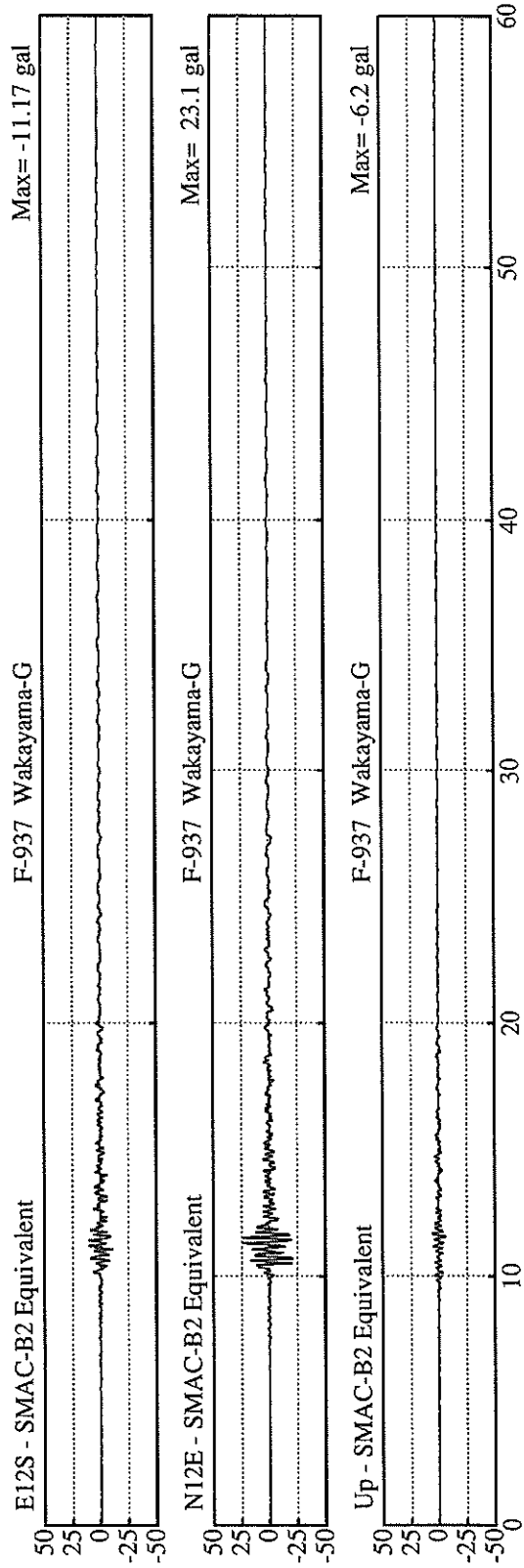
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.420	0.488	0.768	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	23.1	11.2	6.2	23.6
ORIGINAL	44.9	23.4	9.6	45.5
CORRECTED	43.8	22.7	9.6	44.5
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	1.39	0.72	0.39	1.42
VARIABLE FILTER	1.34	0.72	0.36	1.41
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.13	0.07	0.03	0.13
VARIABLE FILTER	0.12	0.06	0.03	0.12

* RESULTANT OF HORIZONTAL COMPONENTS

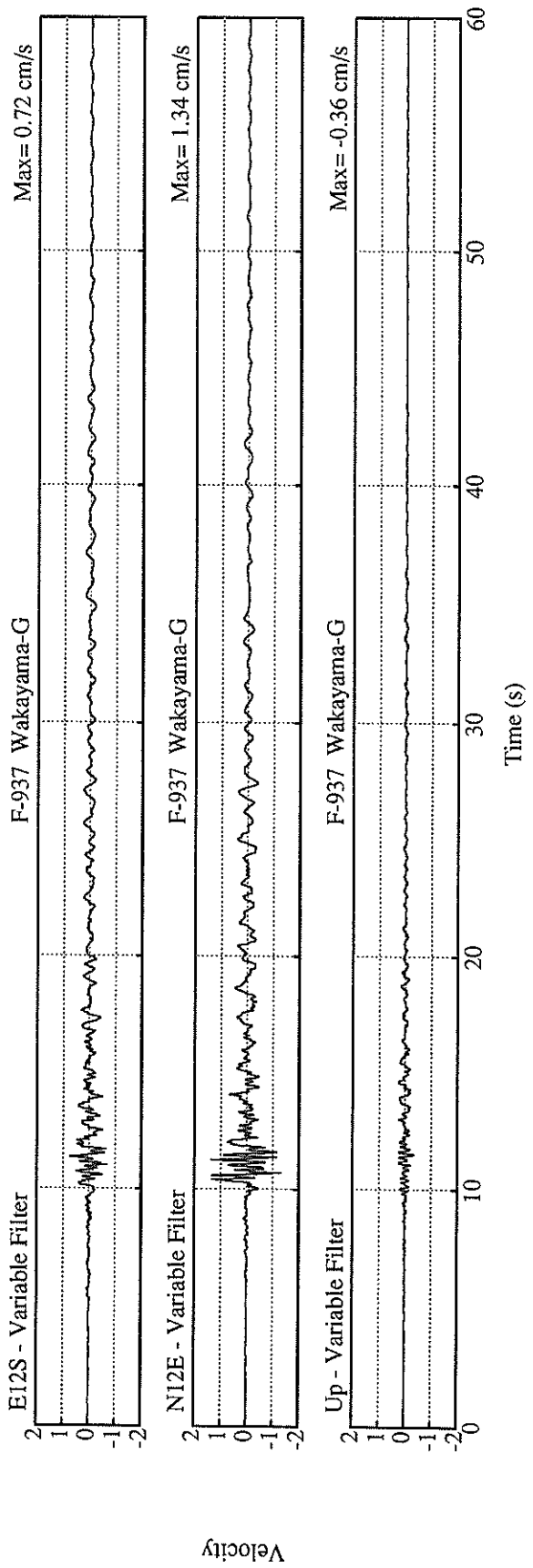
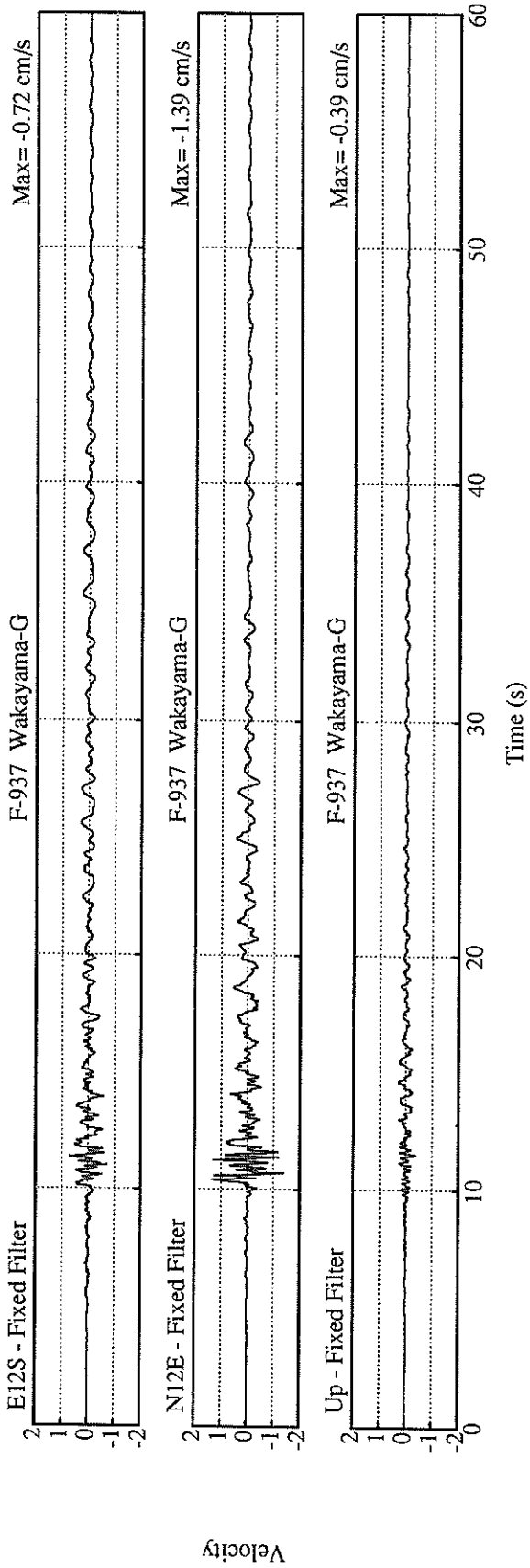


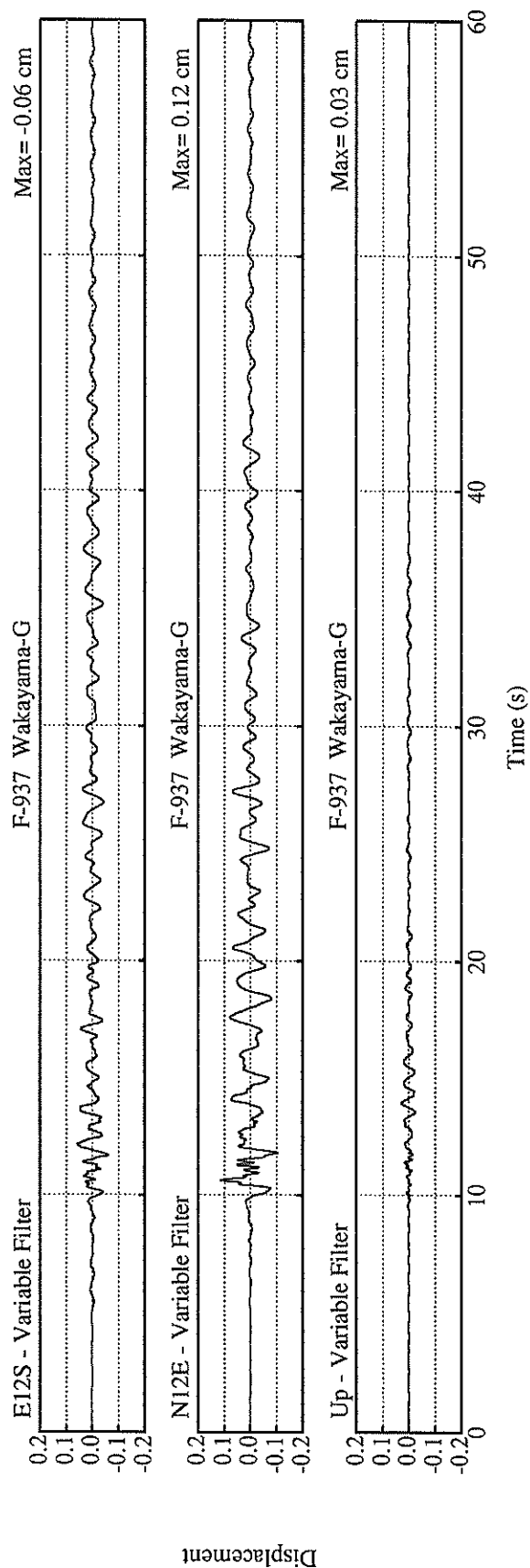
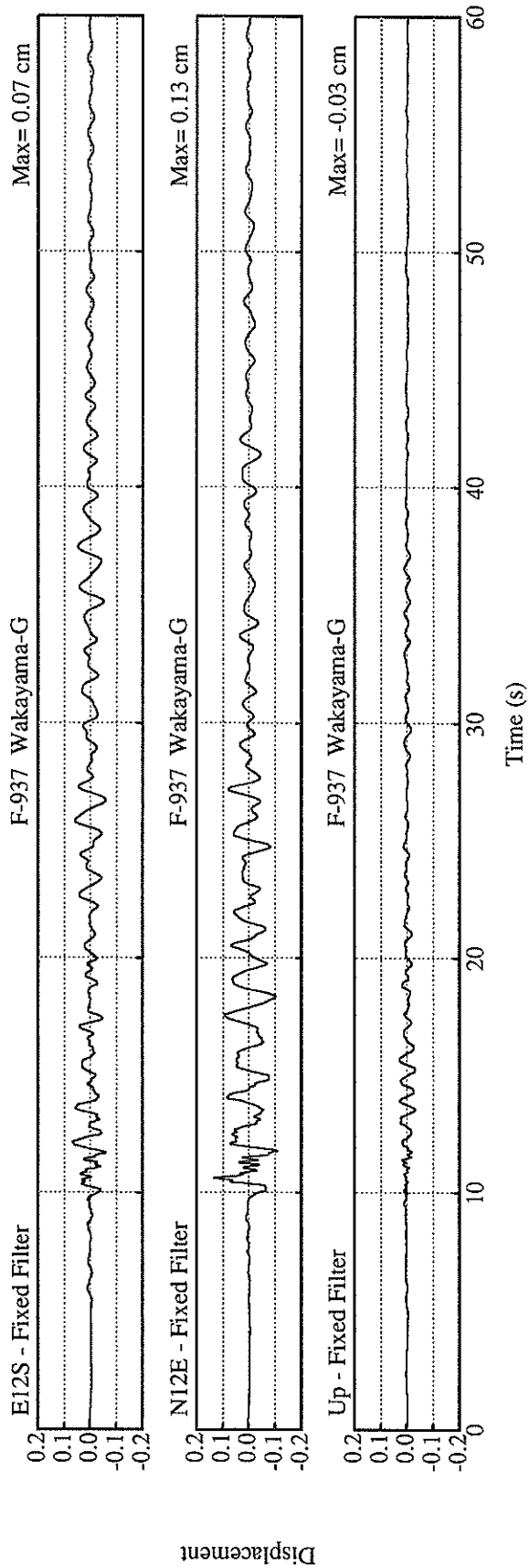


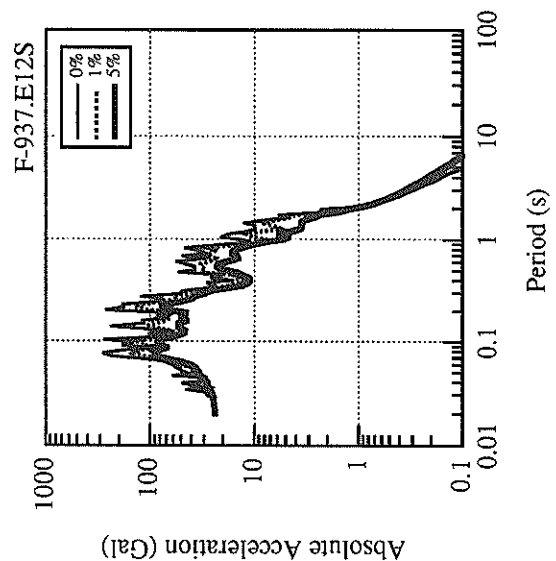
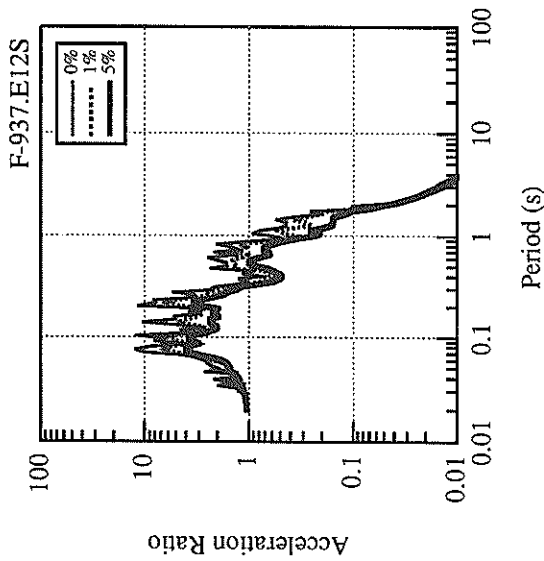
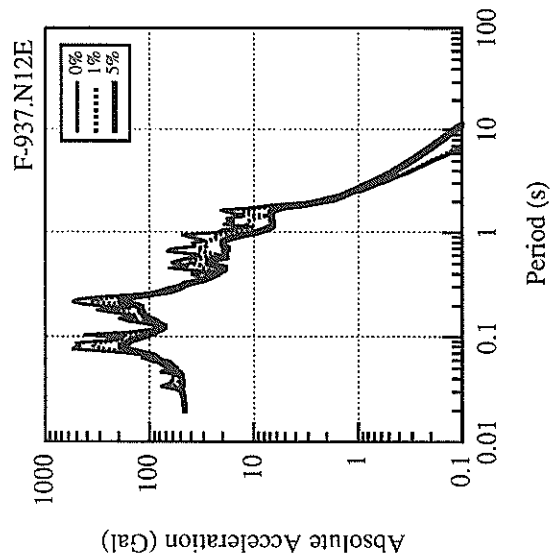
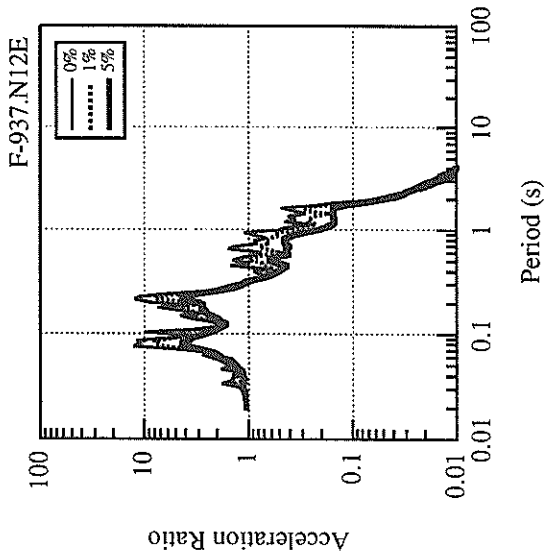
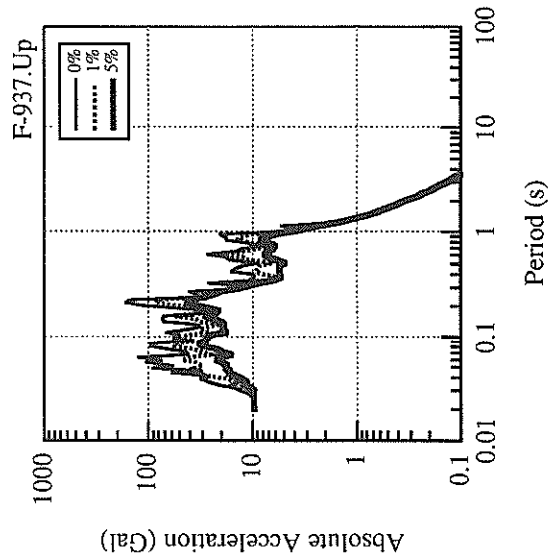
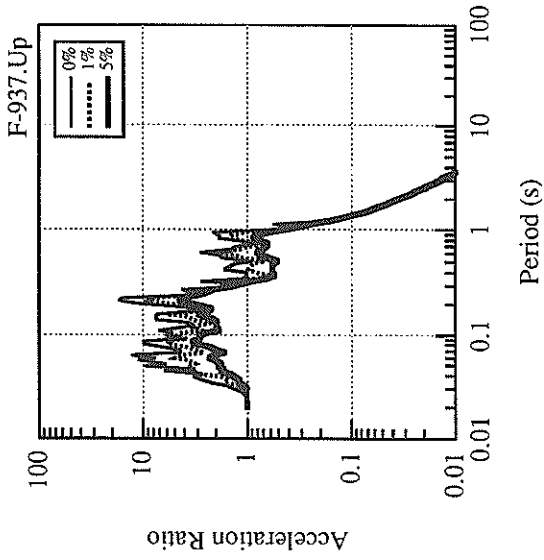
Acceleration

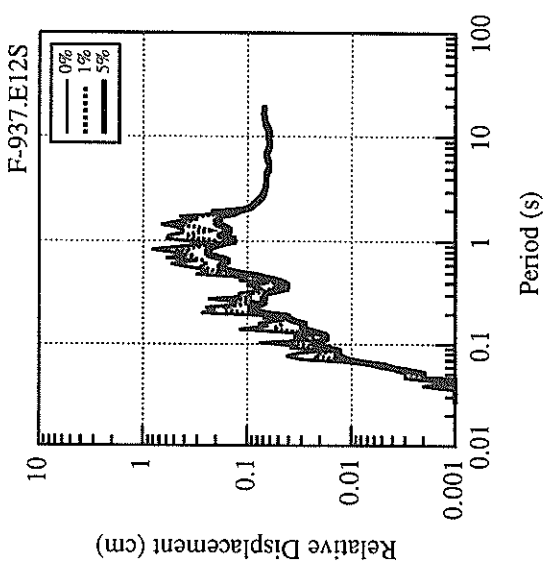
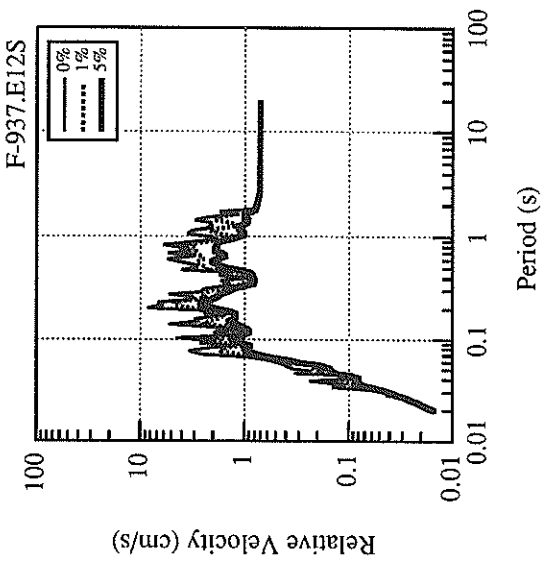
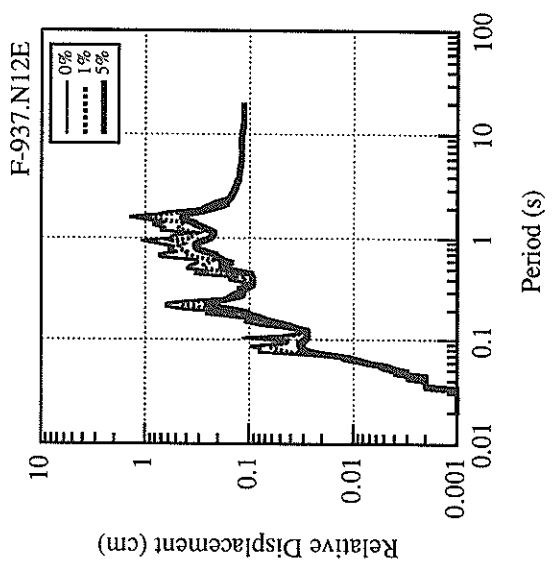
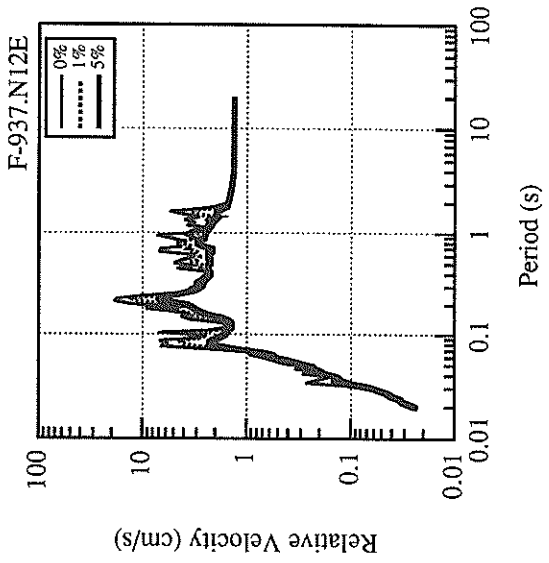
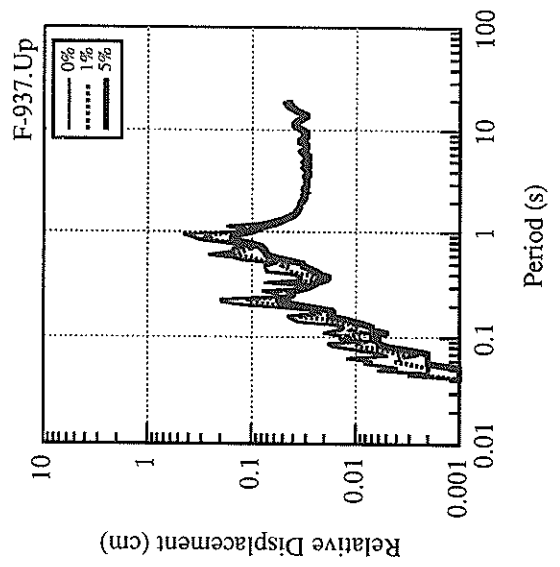
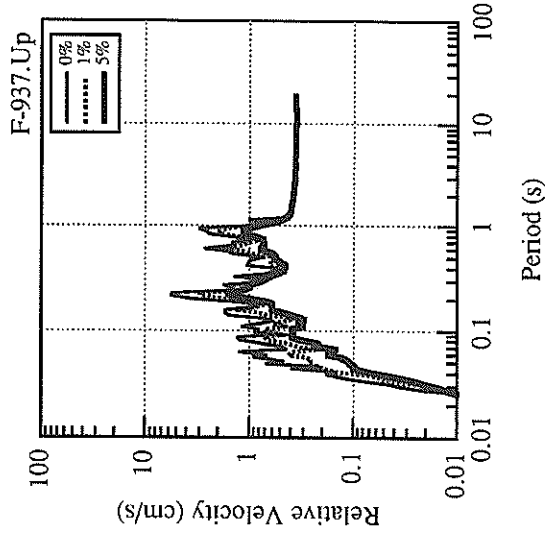


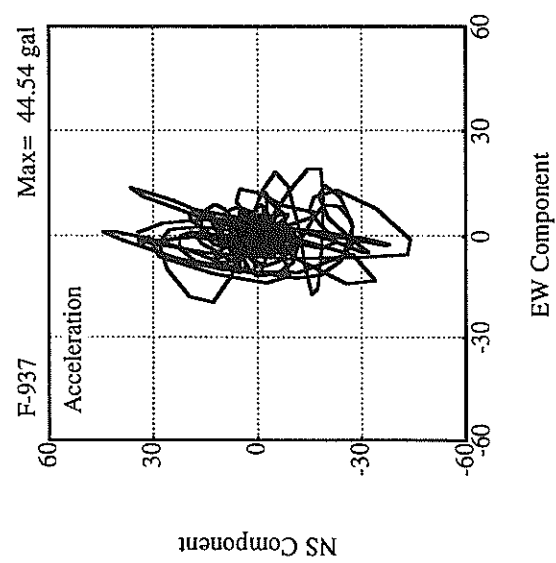
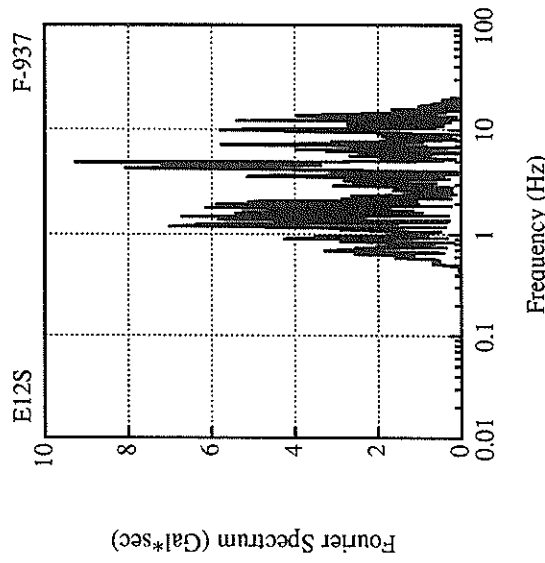
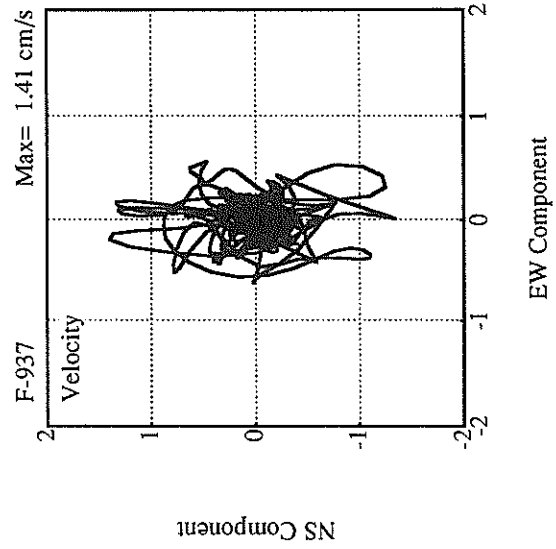
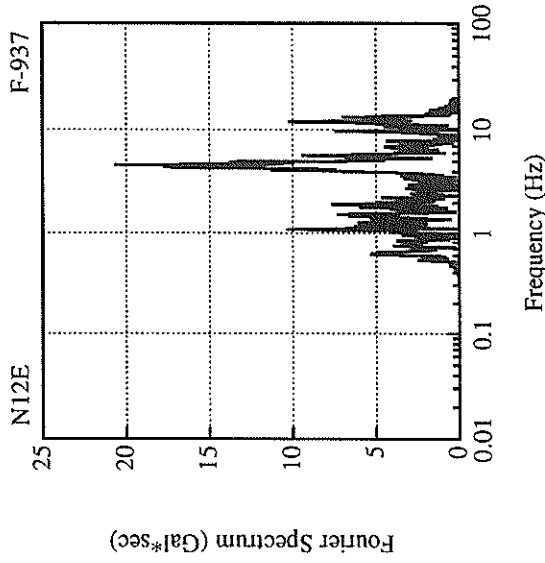
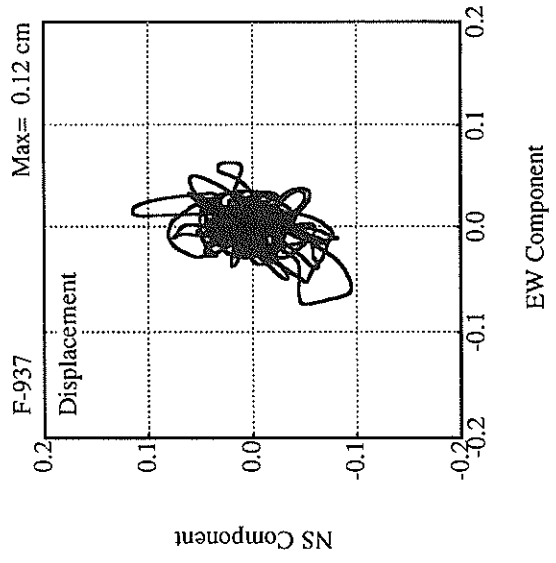
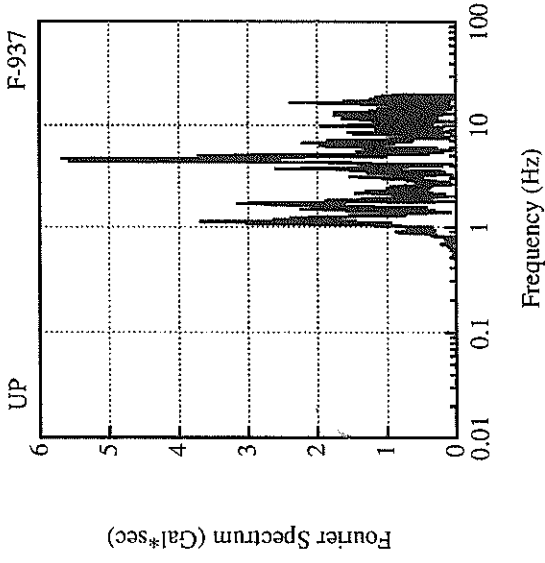
Acceleration











RECORD NUMBER : F-821
 STATION : AMAGASAKI-G

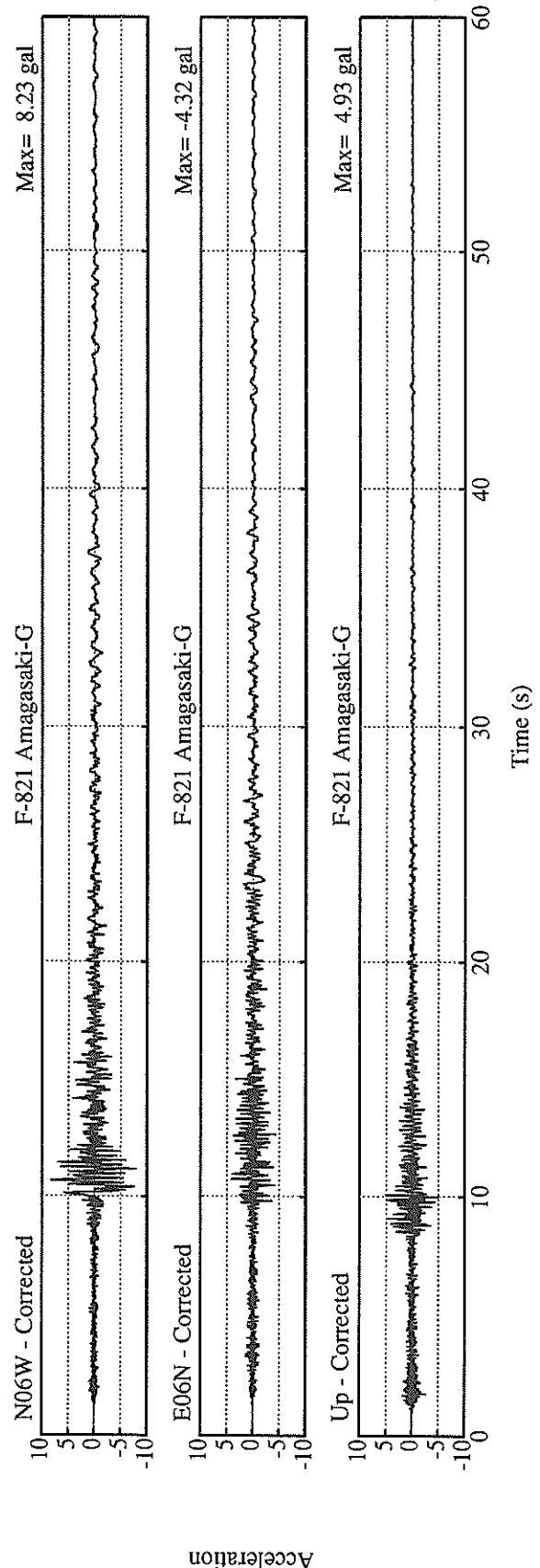
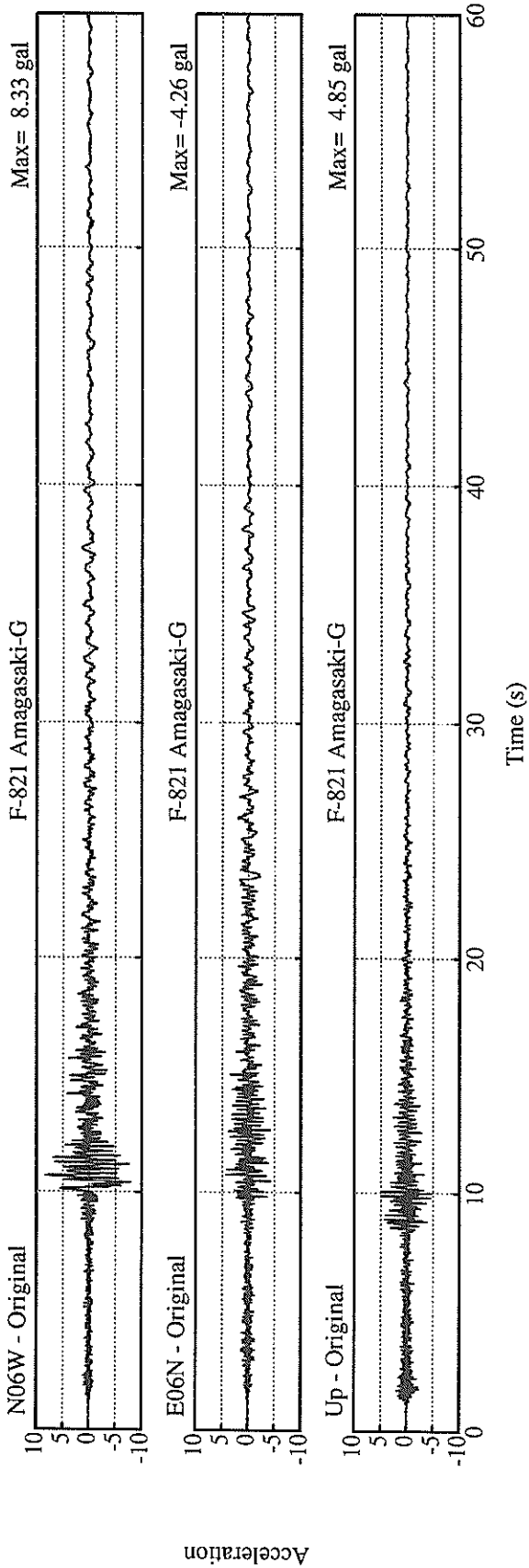
EARTHQUAKE DATA

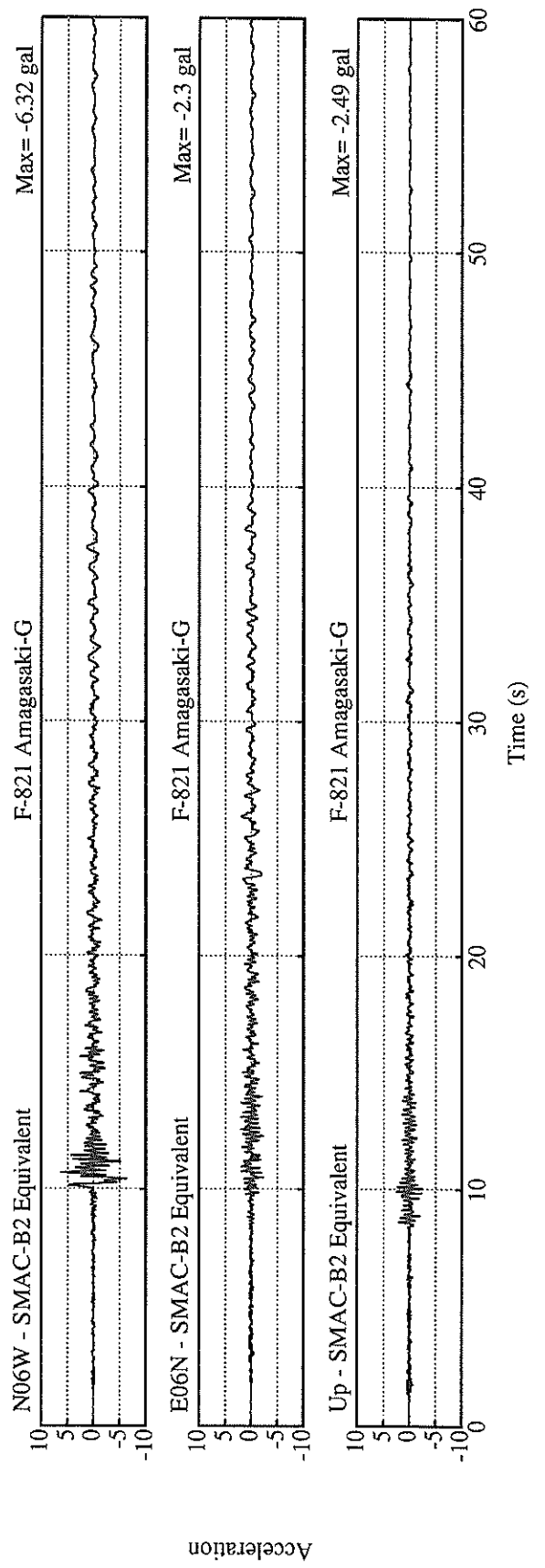
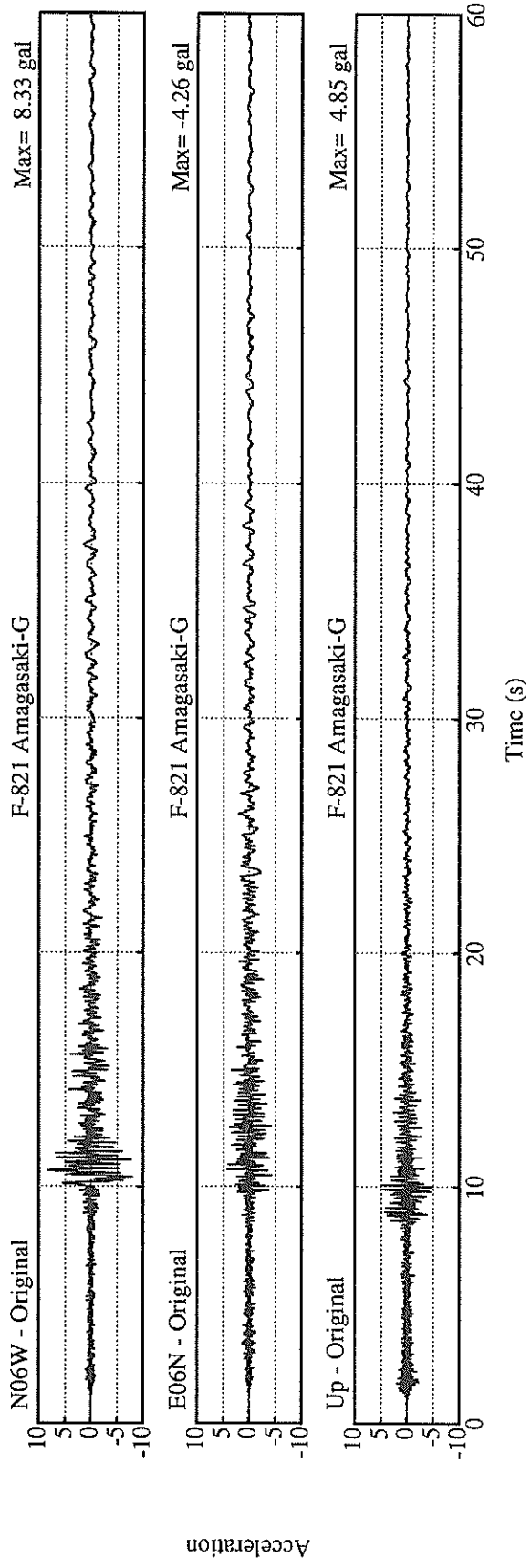
```
*****
DATE AND TIME                21:37 FEB.18,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34° 26.2' N
  LONGITUDE                  134° 49.0' E
  DEPTH                      15.9KM
  JMA MAGNITUDE              4.8
*****
```

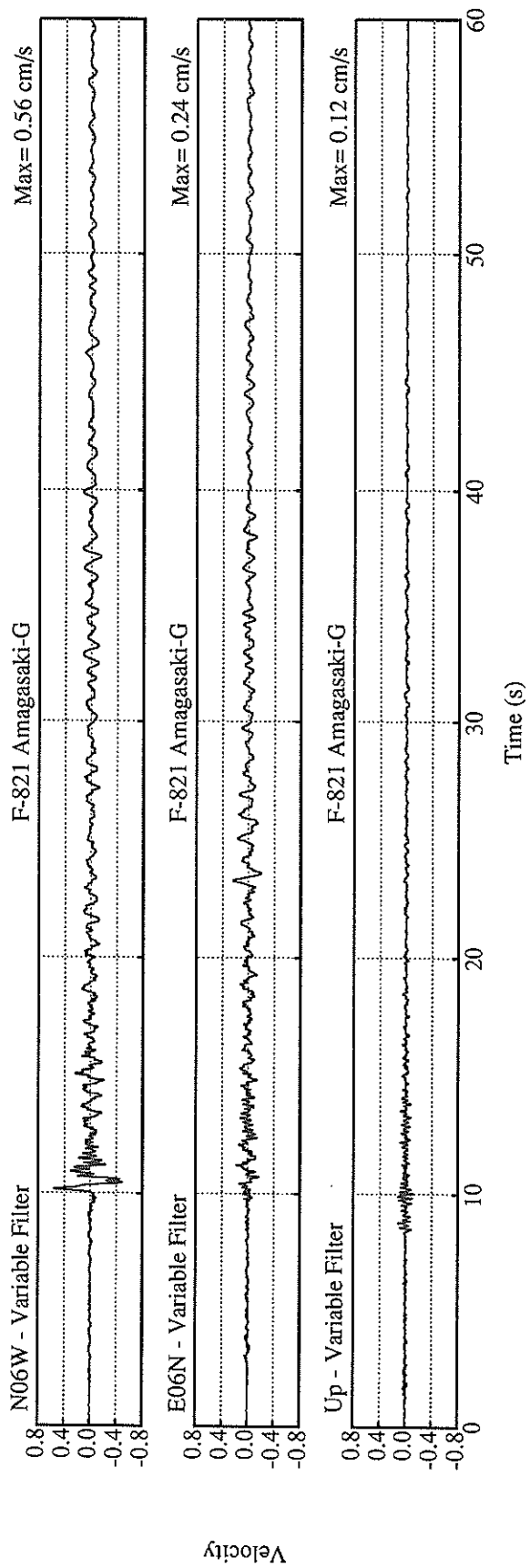
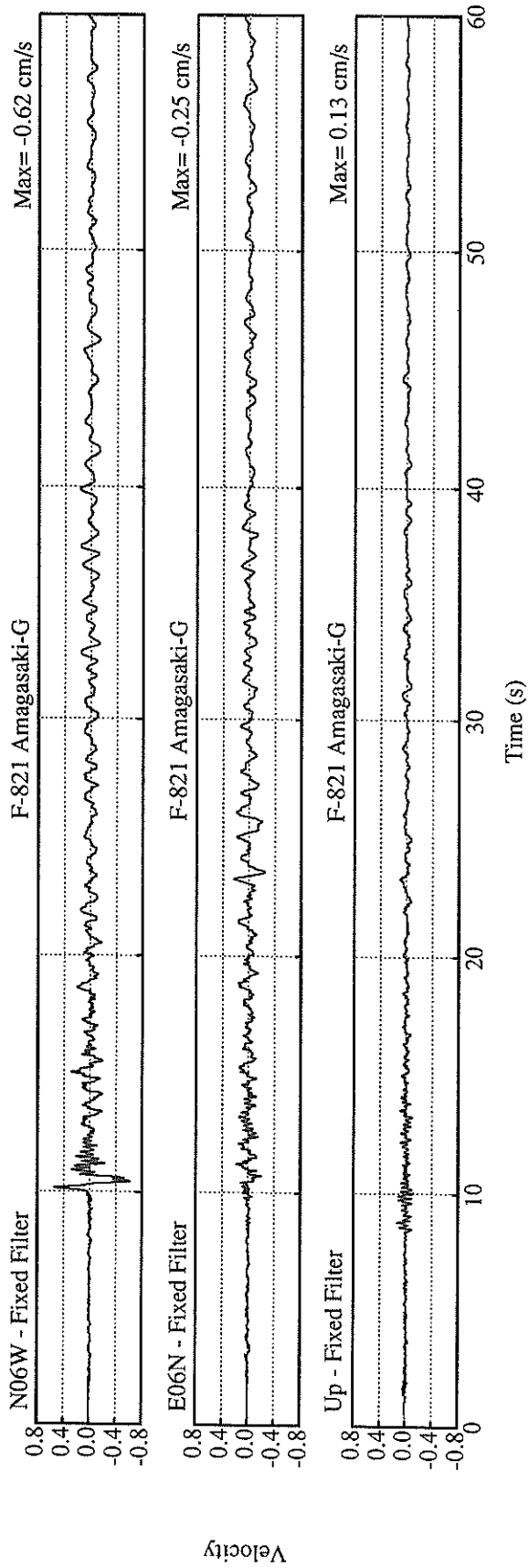
PEAK VALUES OF COMPONENTS

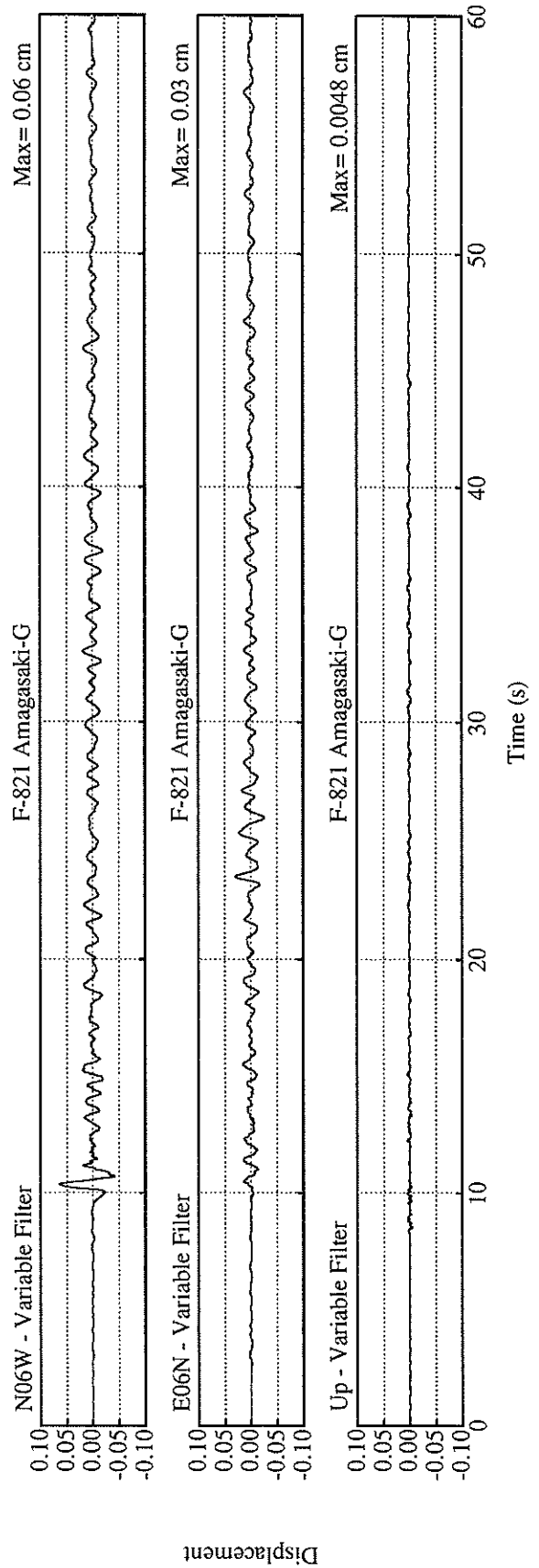
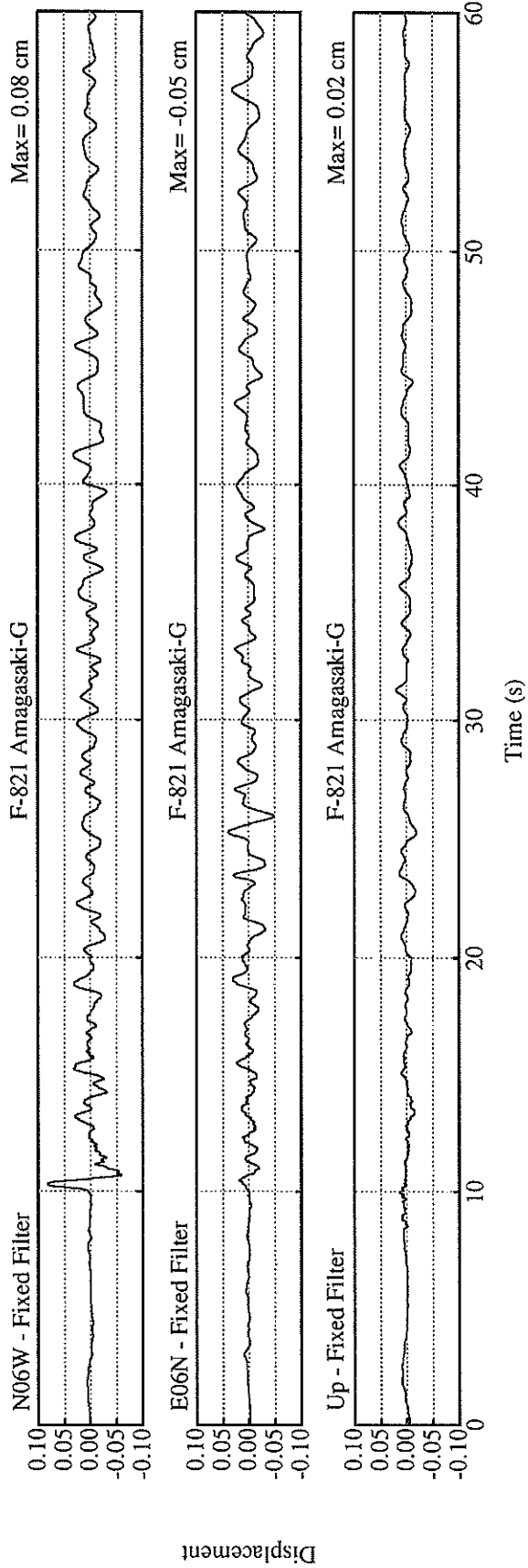
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.591	0.622	1.116	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.3	2.3	2.5	6.5
ORIGINAL	8.3	4.3	4.8	8.9
CORRECTED	8.2	4.3	4.9	8.8
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.62	0.25	0.13	0.63
VARIABLE FILTER	0.56	0.24	0.12	0.56
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.08	0.05	0.02	0.08
VARIABLE FILTER	0.06	0.03	0.00	0.06

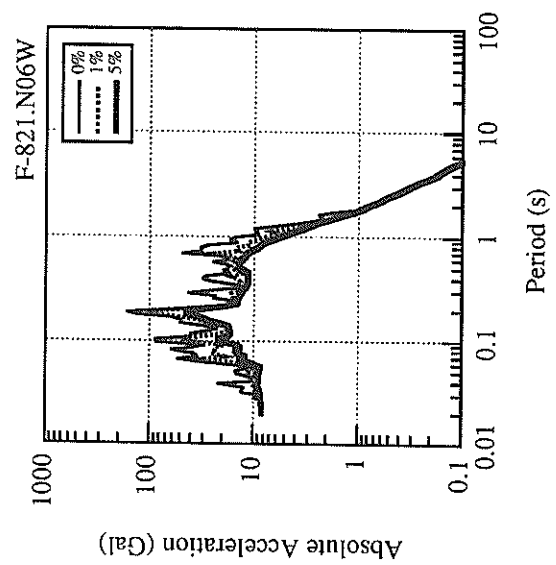
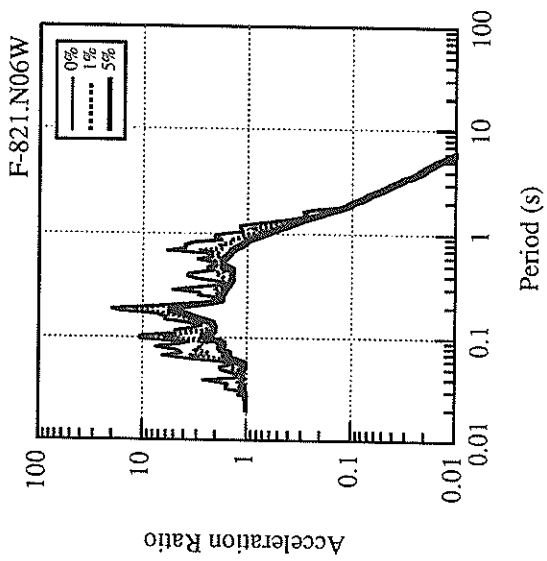
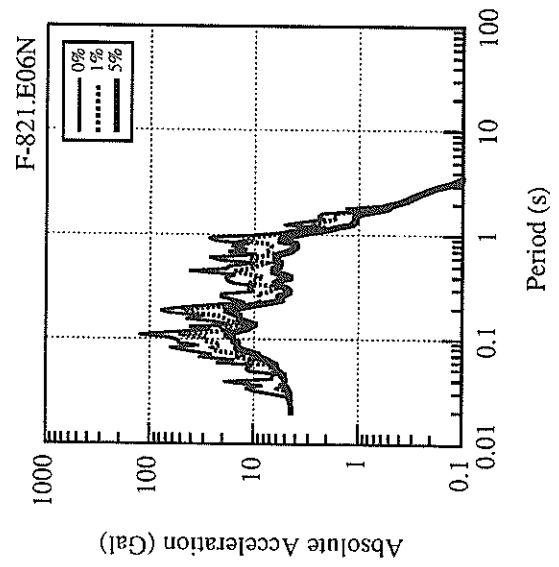
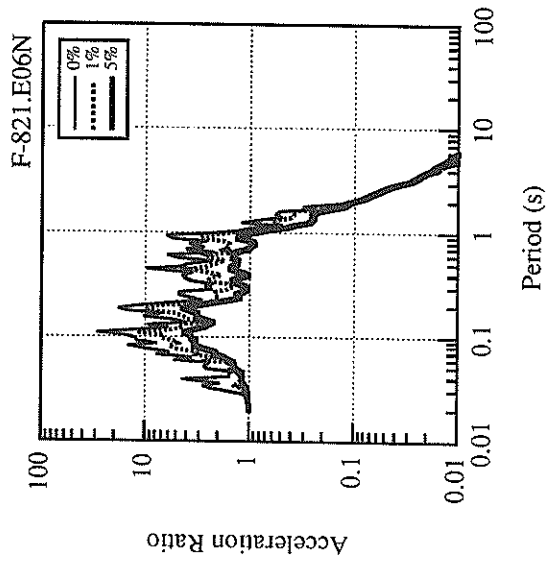
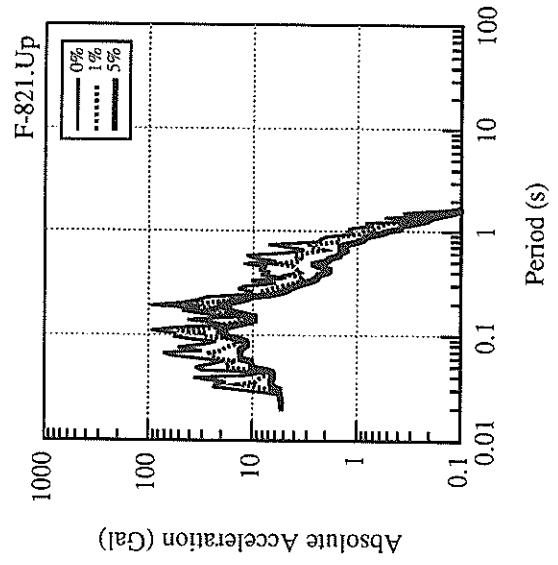
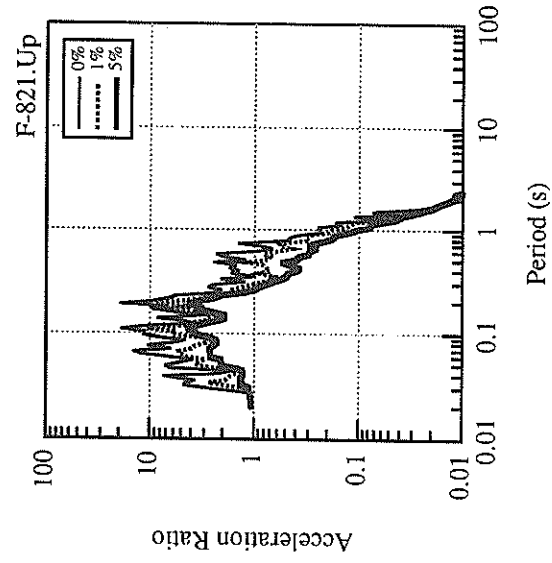
* RESULTANT OF HORIZONTAL COMPONENTS

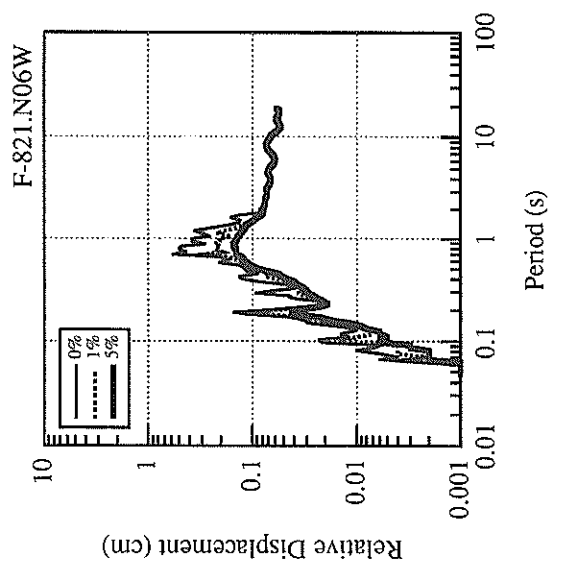
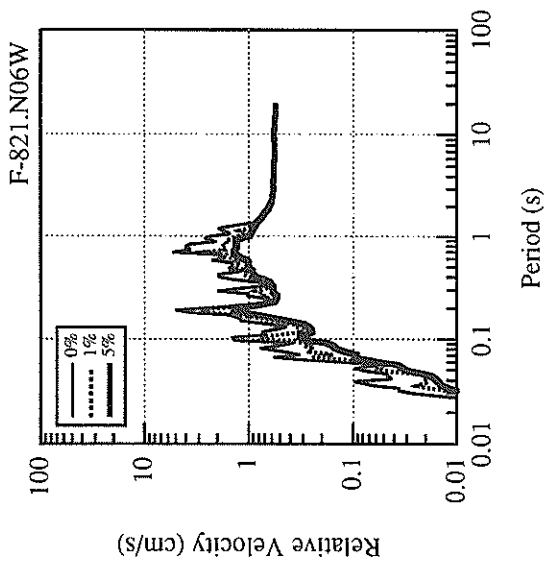
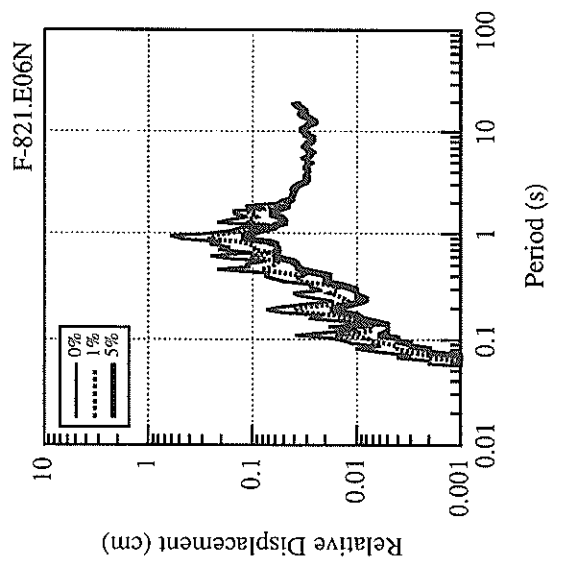
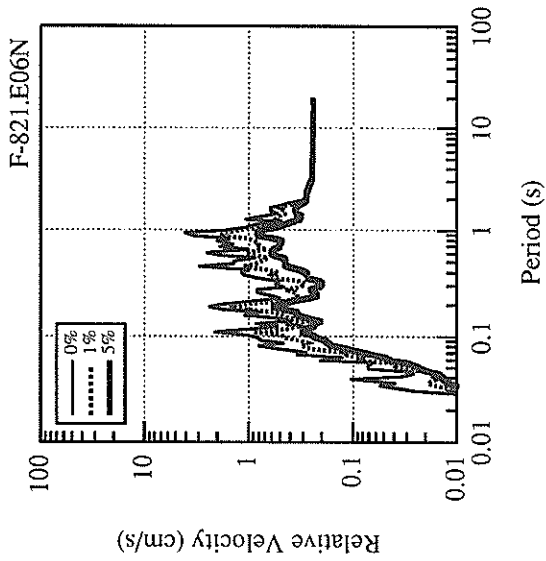
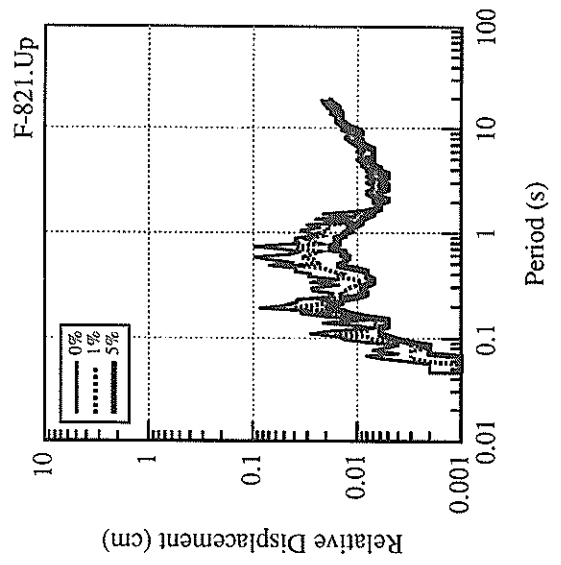
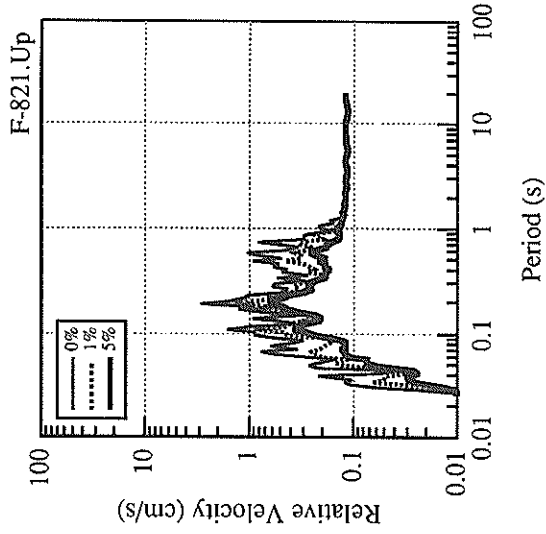


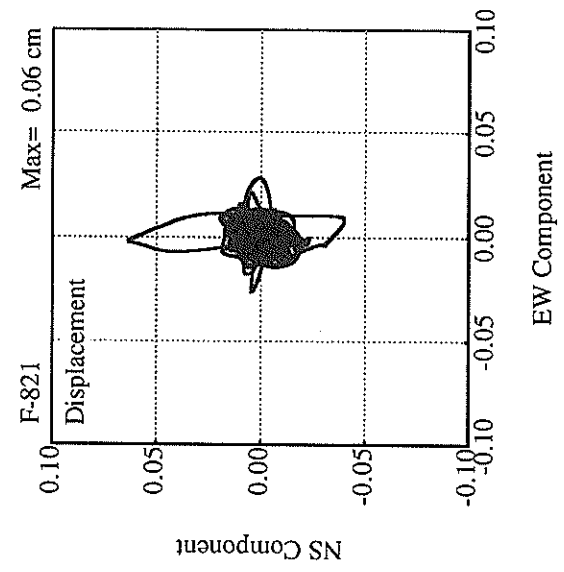
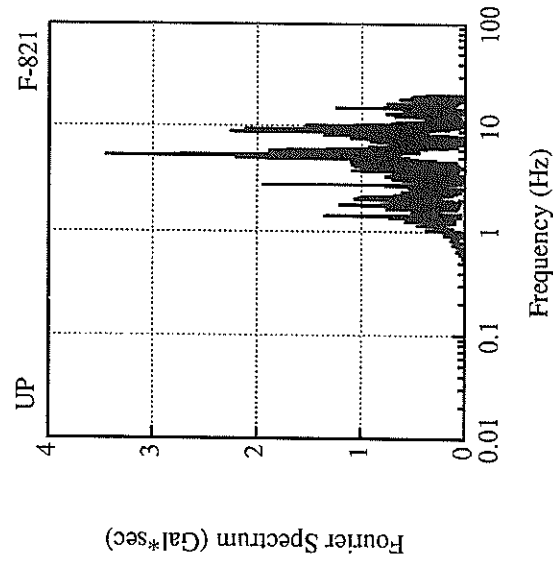
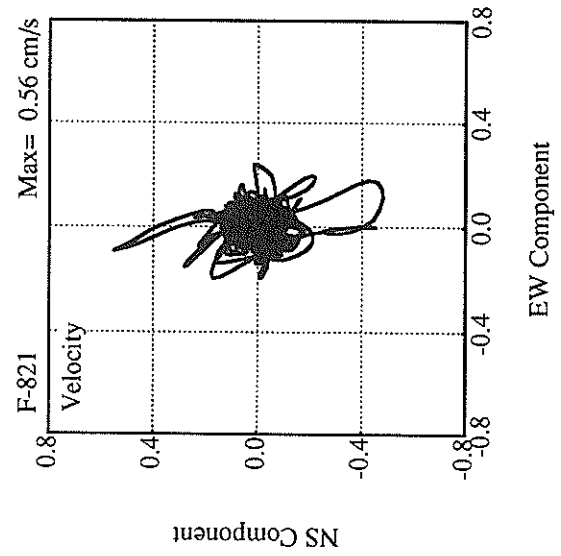
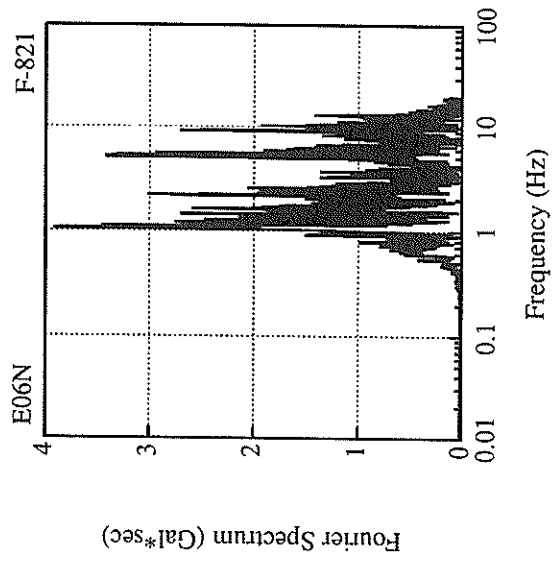
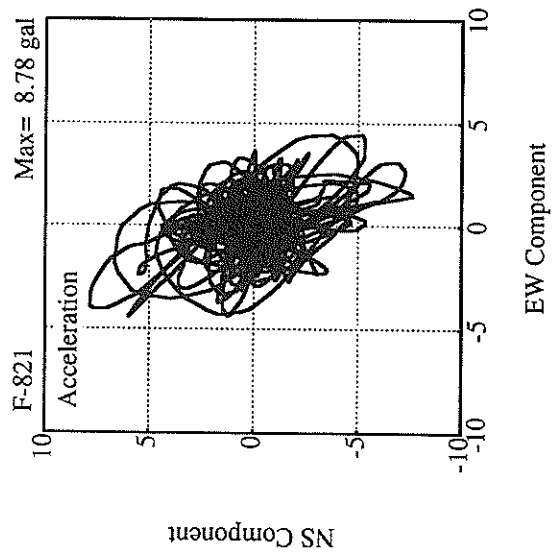
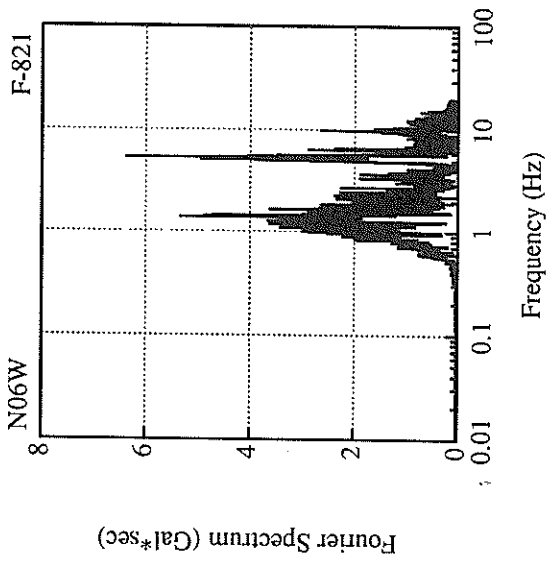












RECORD NUMBER : F-852
 STATION : OSAKA-MINAMI-G

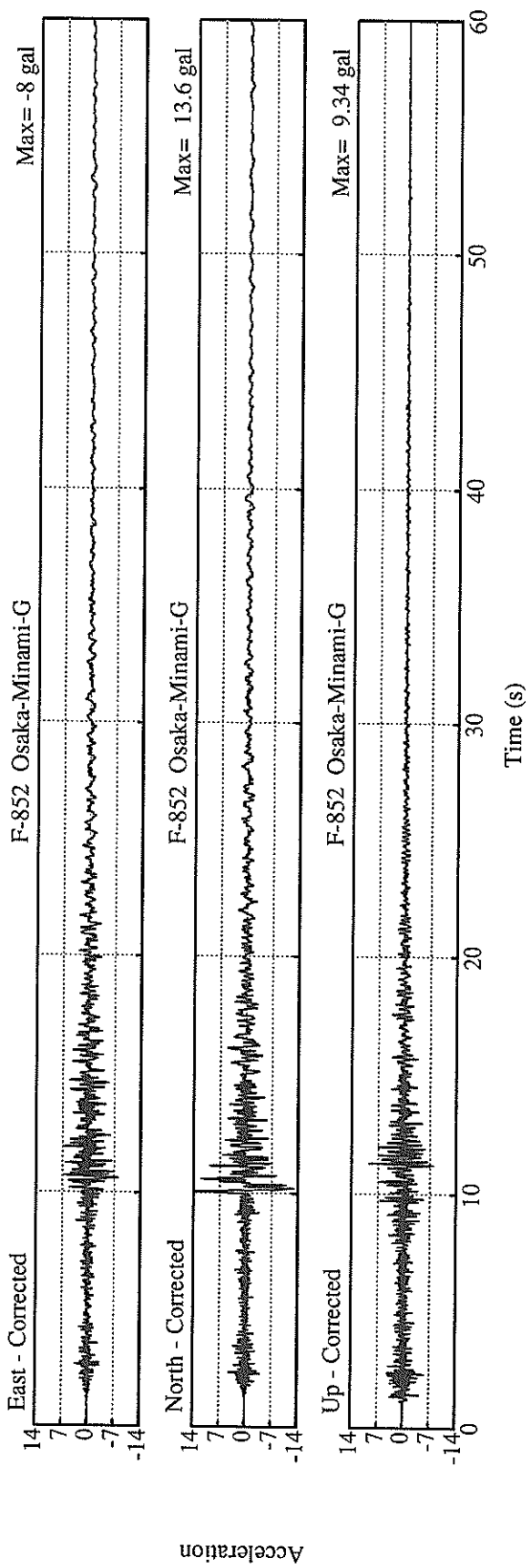
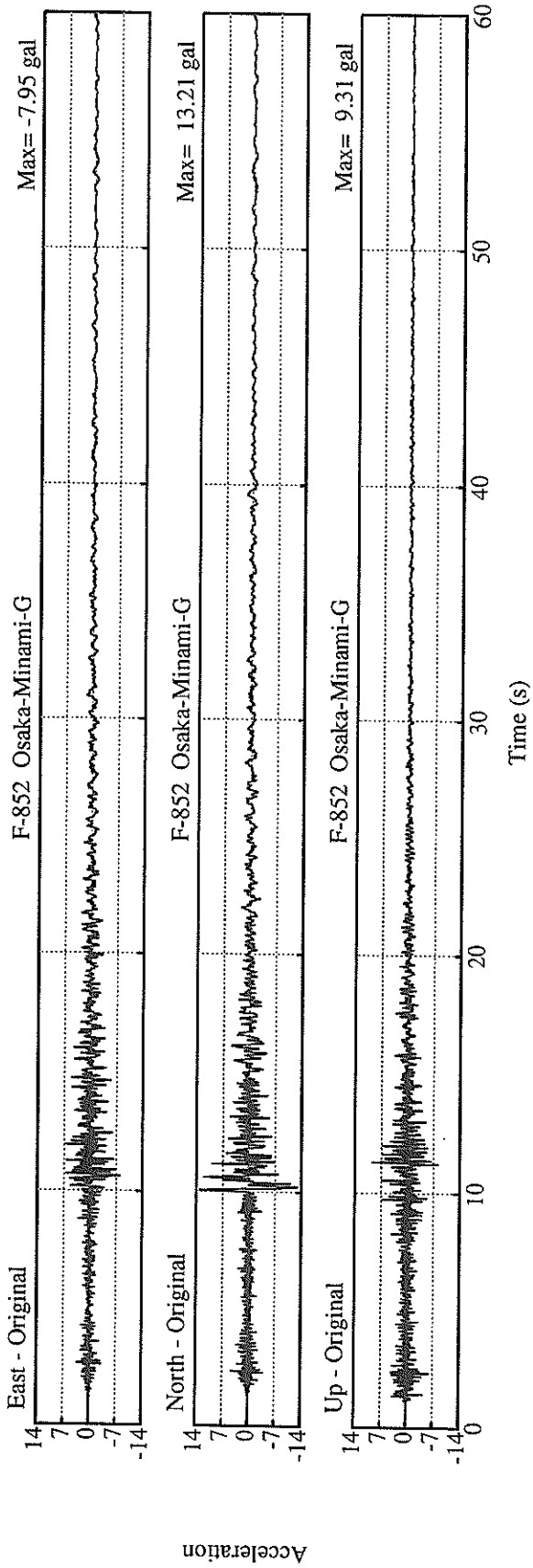
EARTHQUAKE DATA

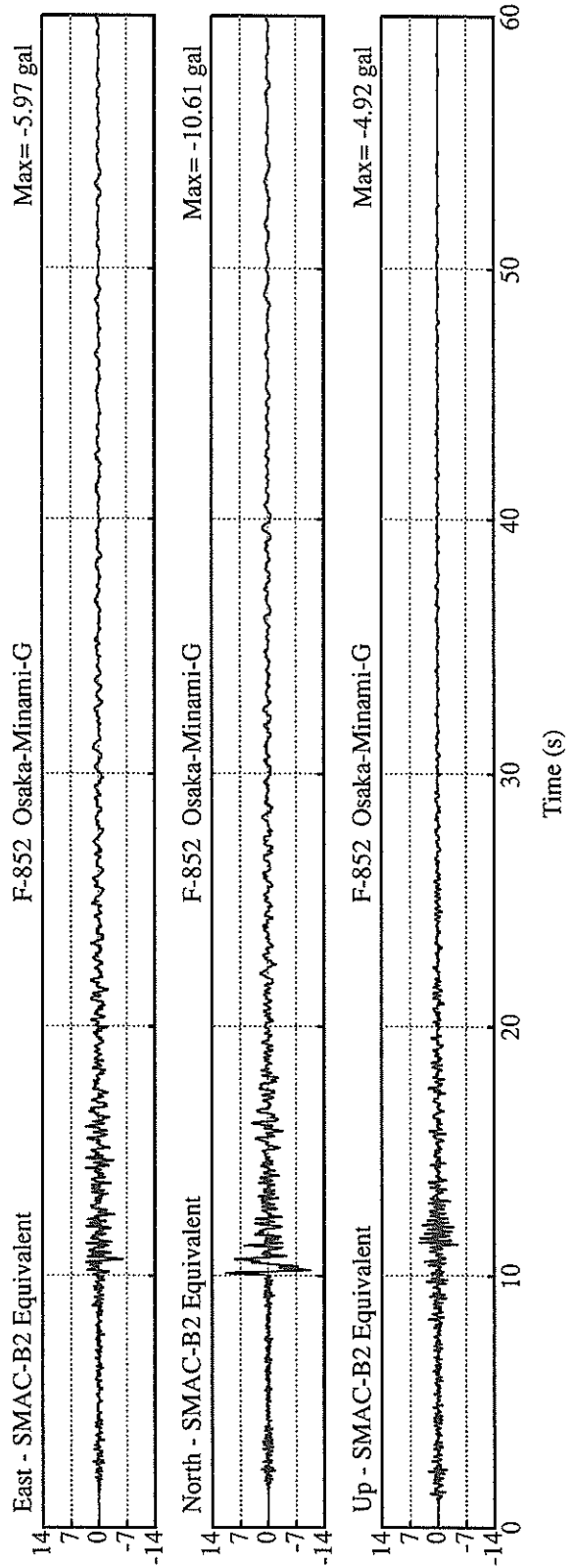
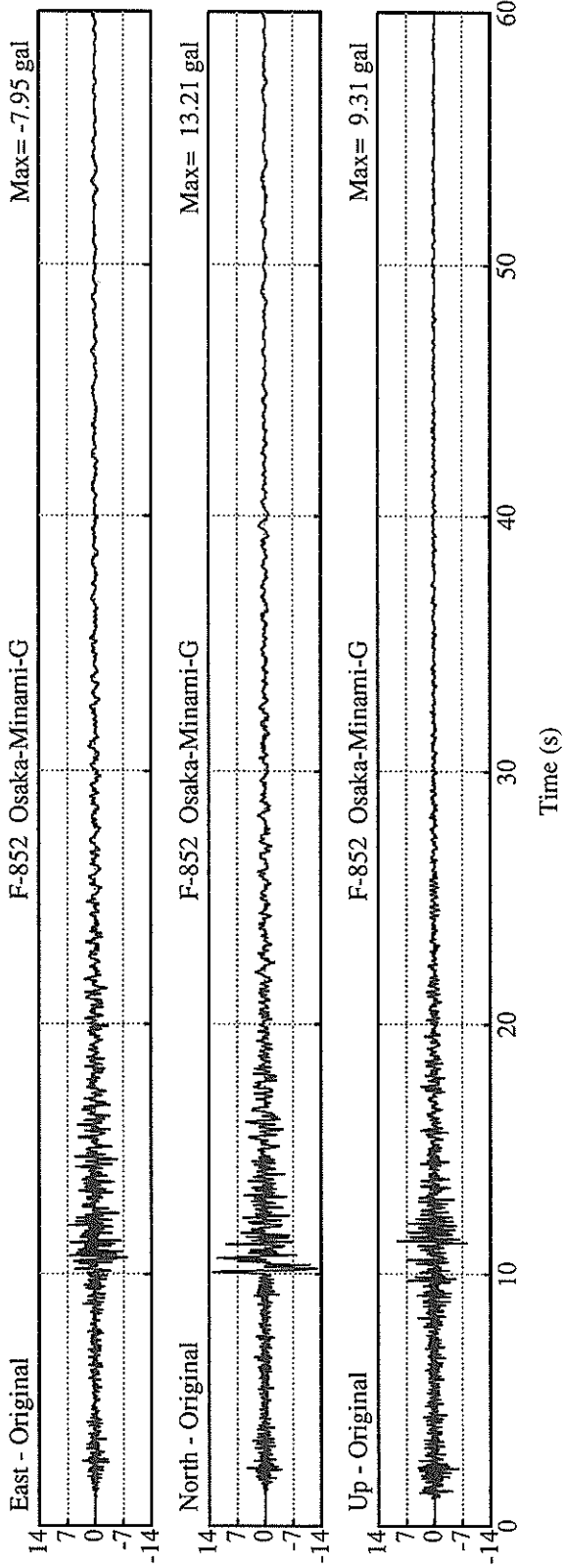
```
*****
DATE AND TIME                21:37 FEB.18,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION          AWAJISHIMA ISLAND REGION
  LATITUDE                   34°26.2' N
  LONGITUDE                  134°49.0' E
  DEPTH                      15.9KM
  JMA MAGNITUDE              4.8
*****
```

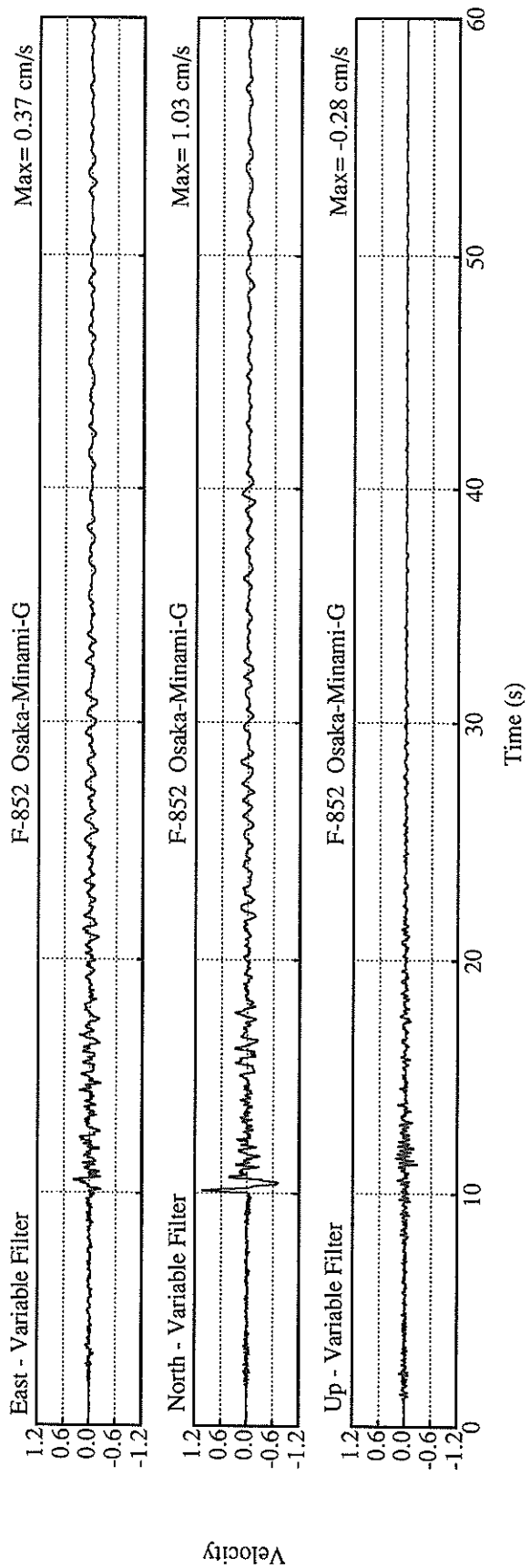
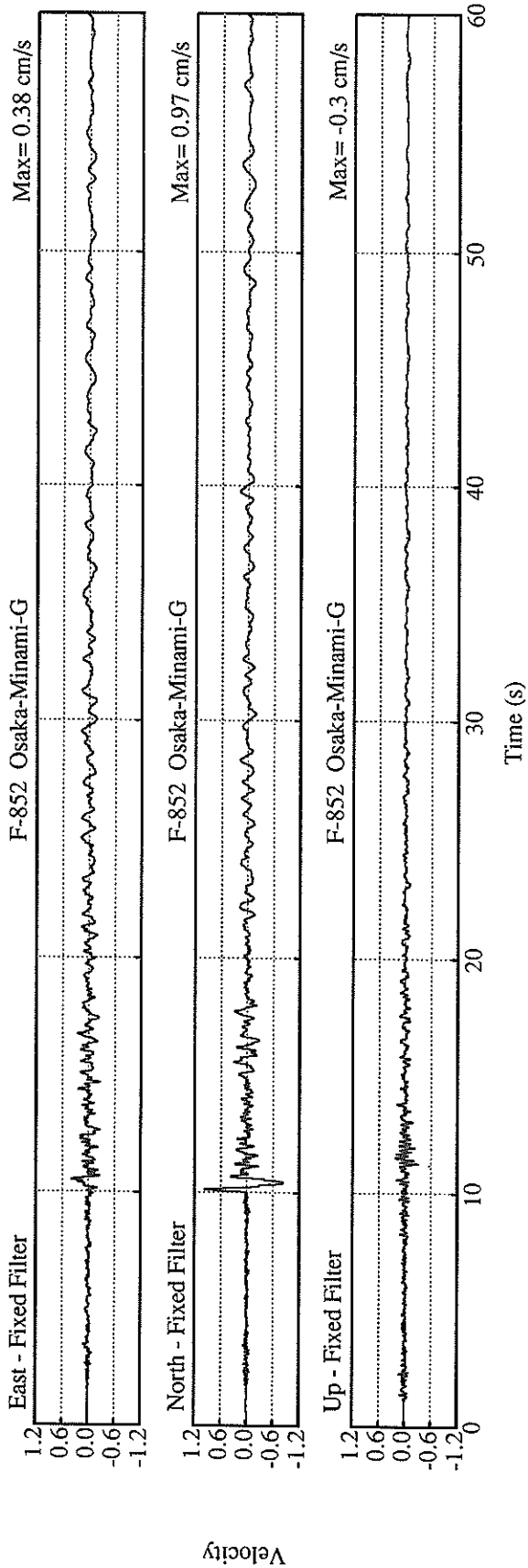
PEAK VALUES OF COMPONENTS

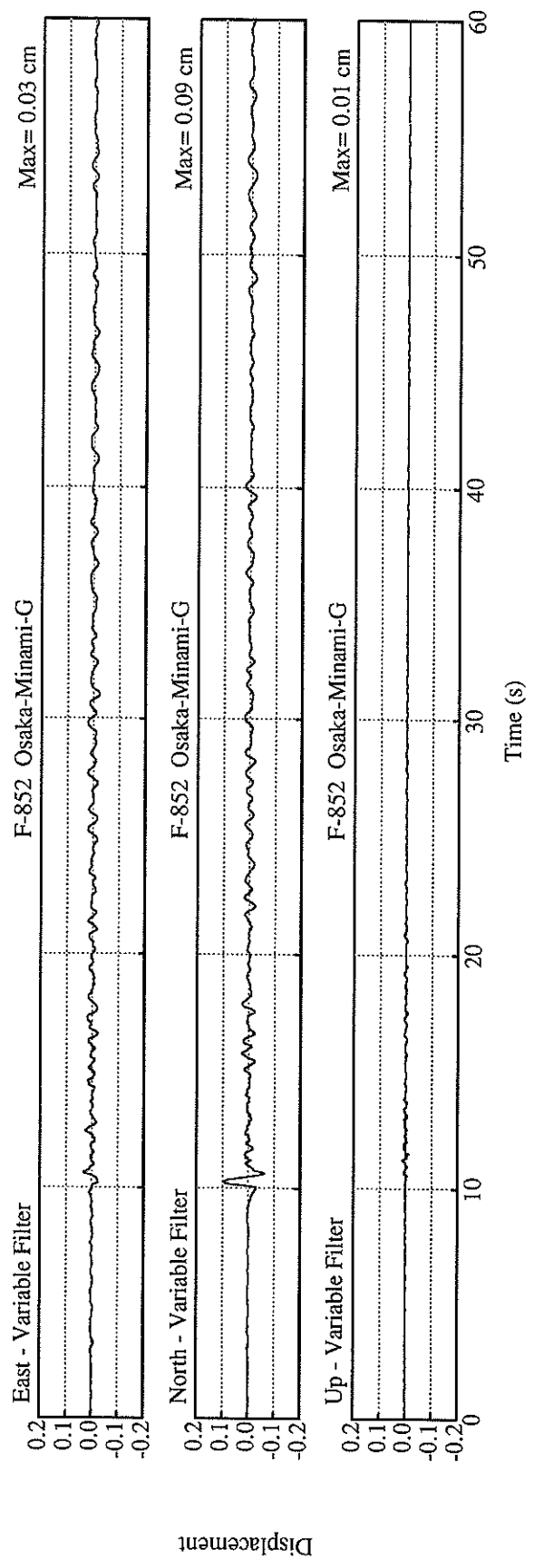
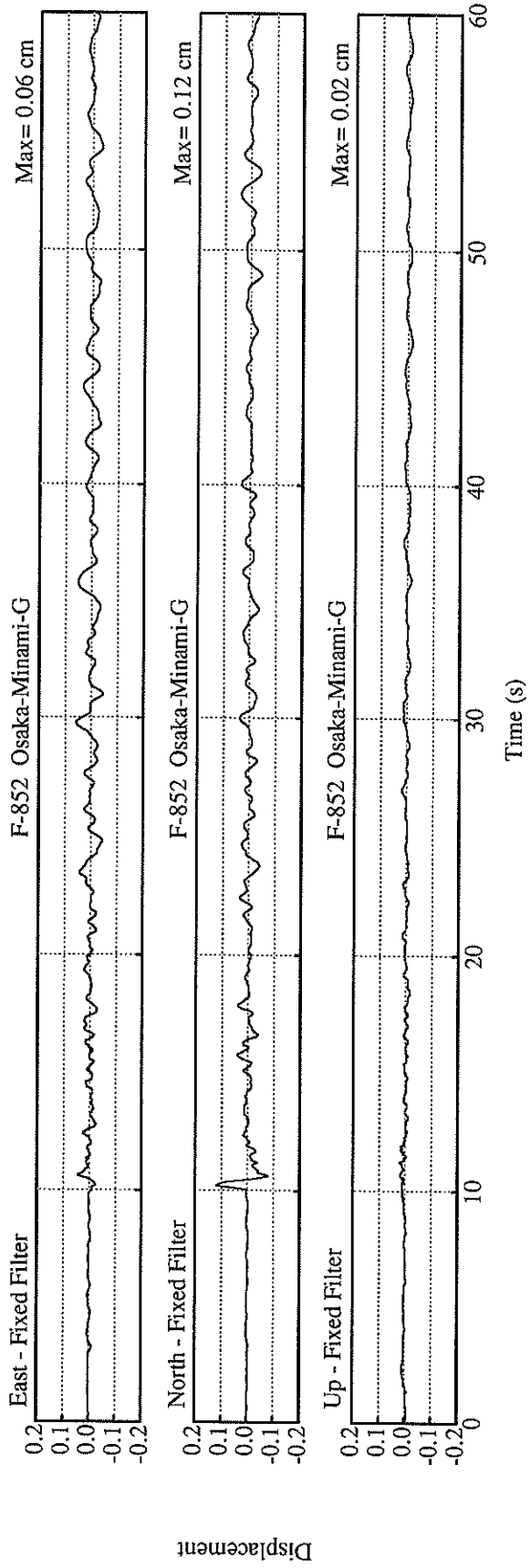
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.536	0.530	1.135	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	10.6	6.0	4.9	11.0
ORIGINAL	13.2	8.0	9.3	14.1
CORRECTED	13.6	8.0	9.3	14.0
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.97	0.38	0.30	0.99
VARIABLE FILTER	1.03	0.37	0.28	1.04
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.12	0.06	0.02	0.12
VARIABLE FILTER	0.09	0.03	0.01	0.10

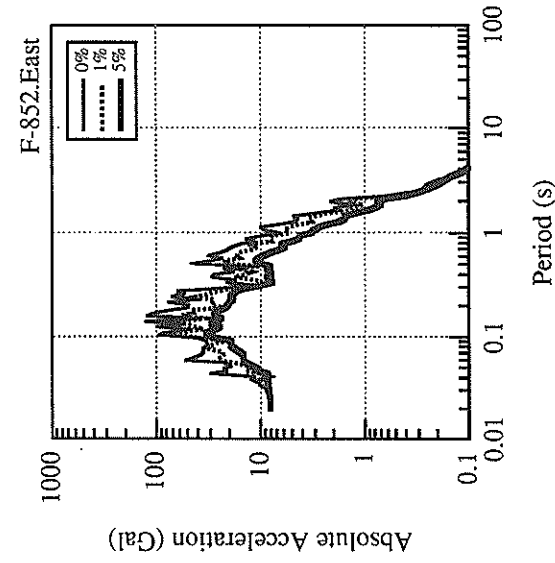
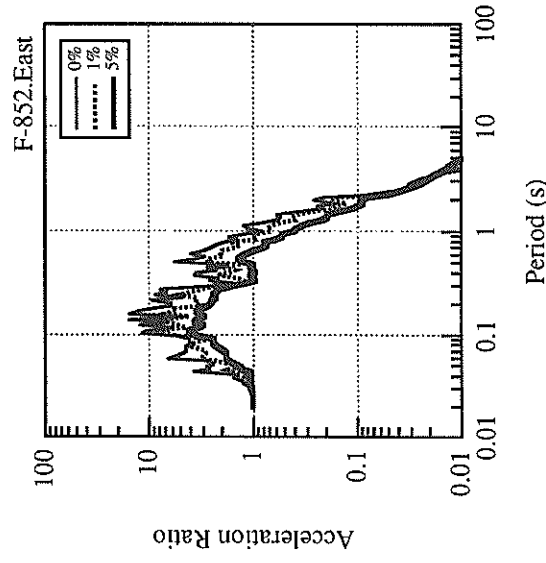
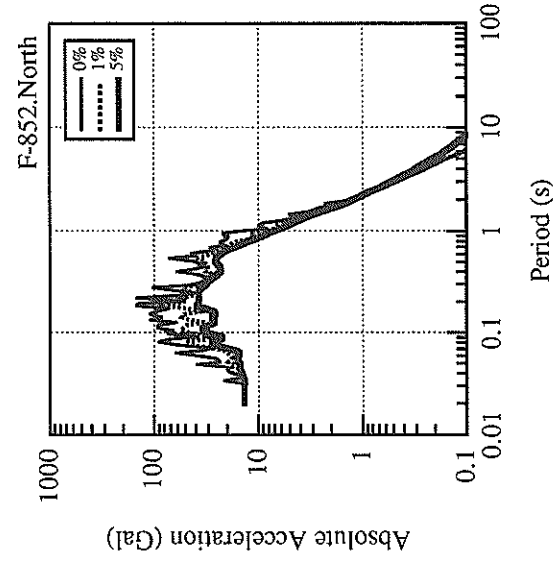
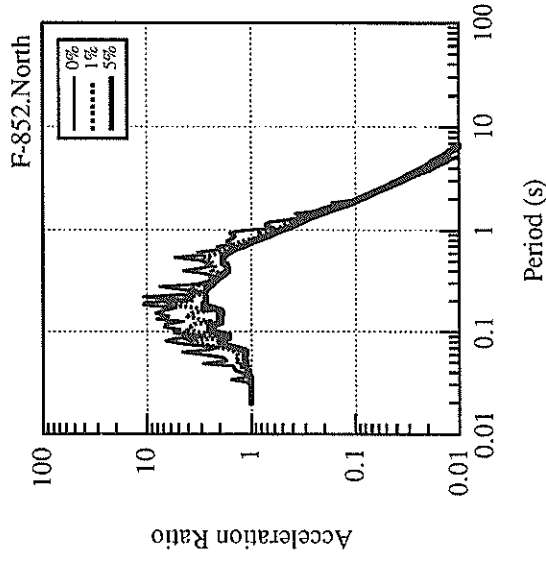
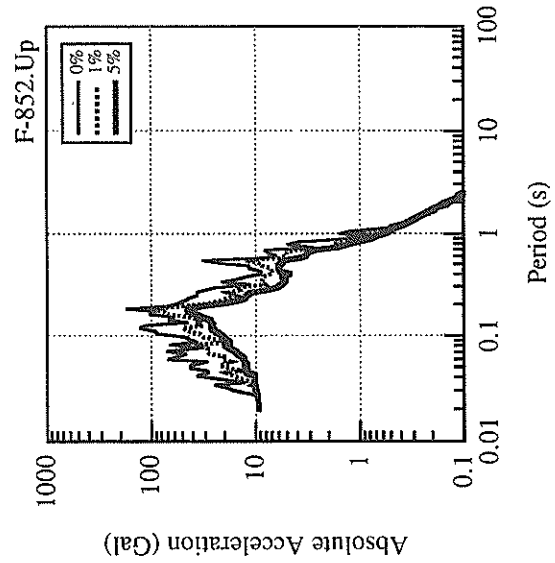
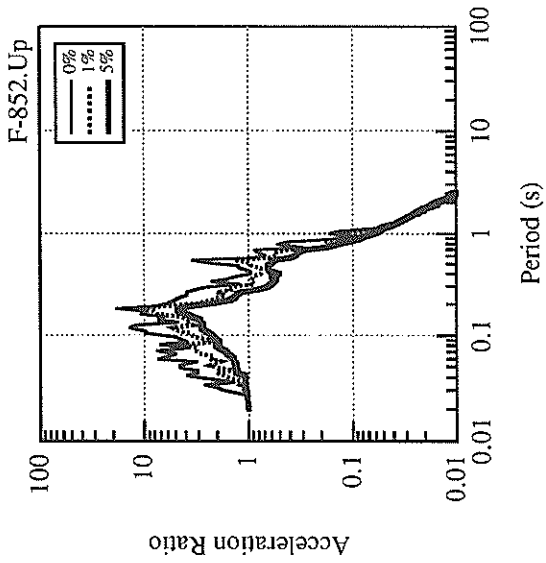
* RESULTANT OF HORIZONTAL COMPONENTS

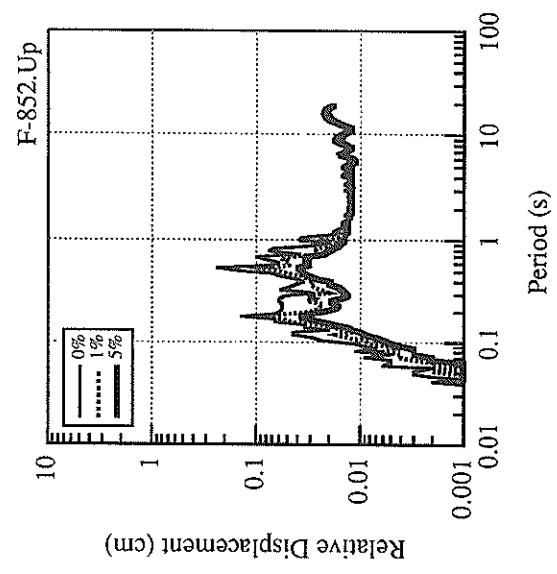
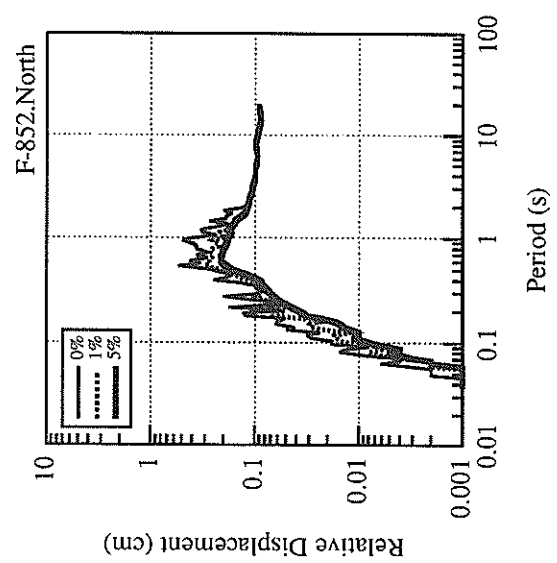
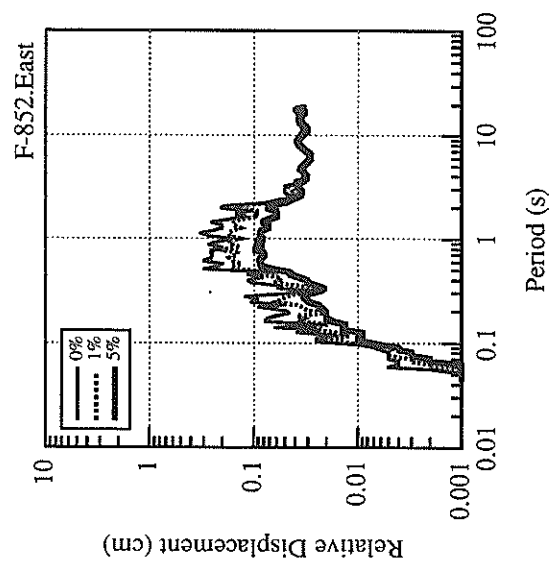
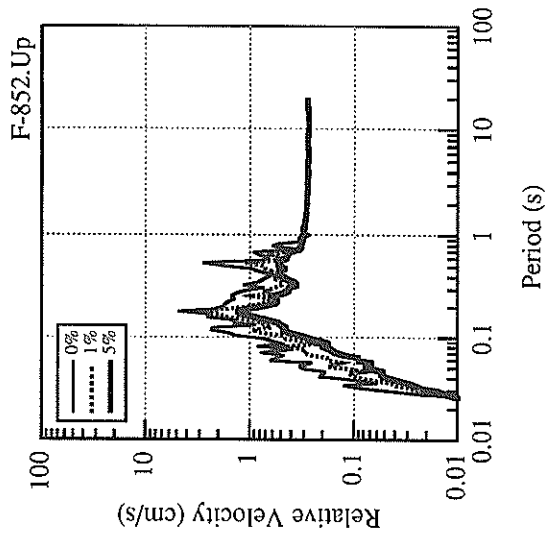
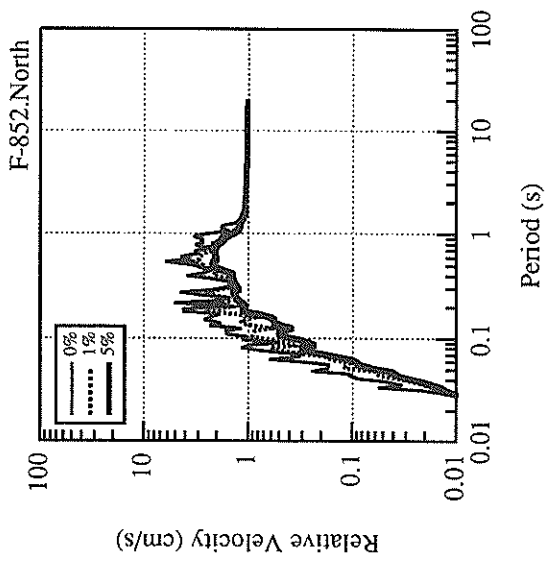
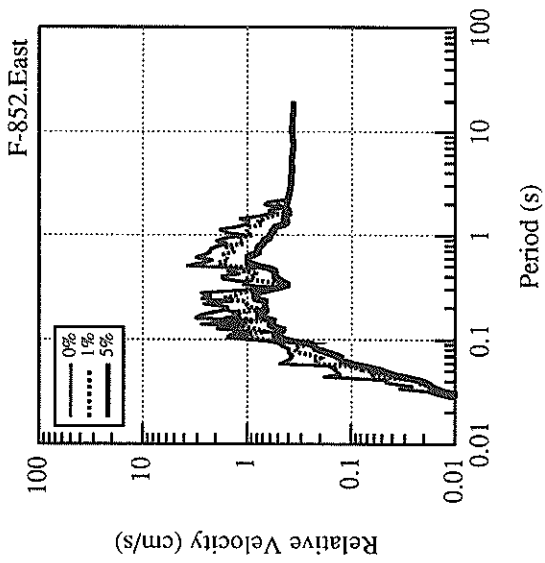


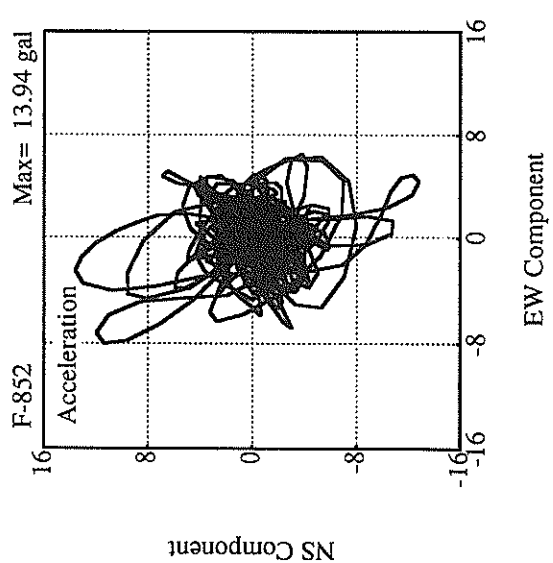
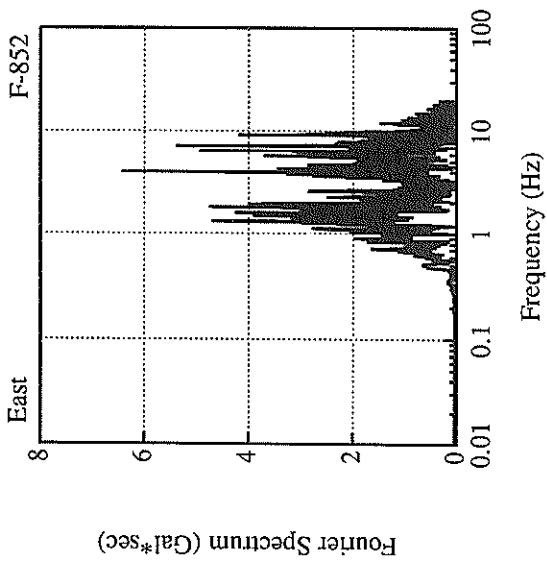
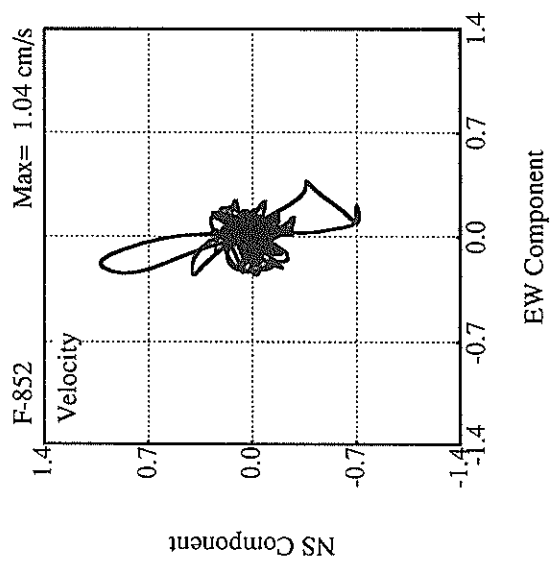
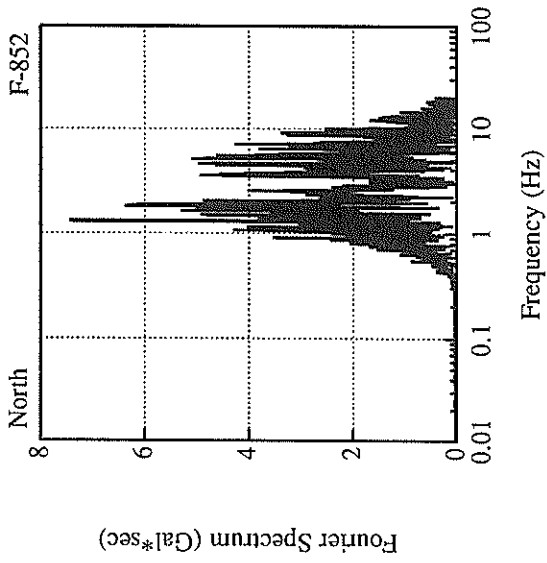
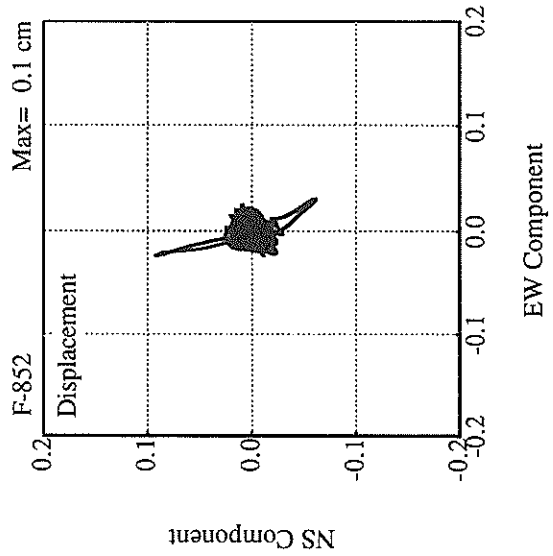
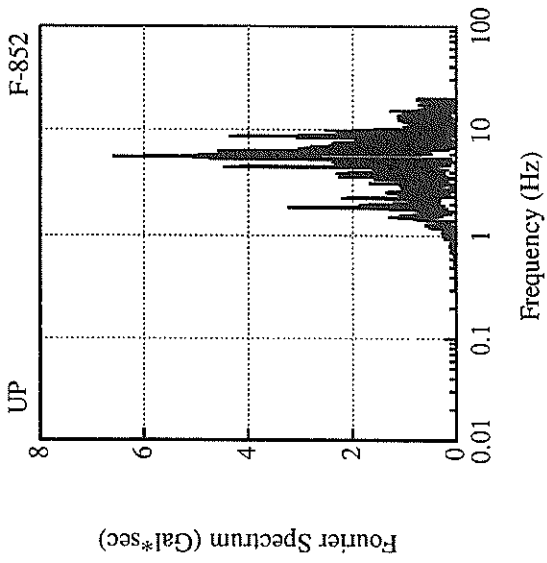












RECORD NUMBER : F-849
 STATION : AMAGASAKI-G

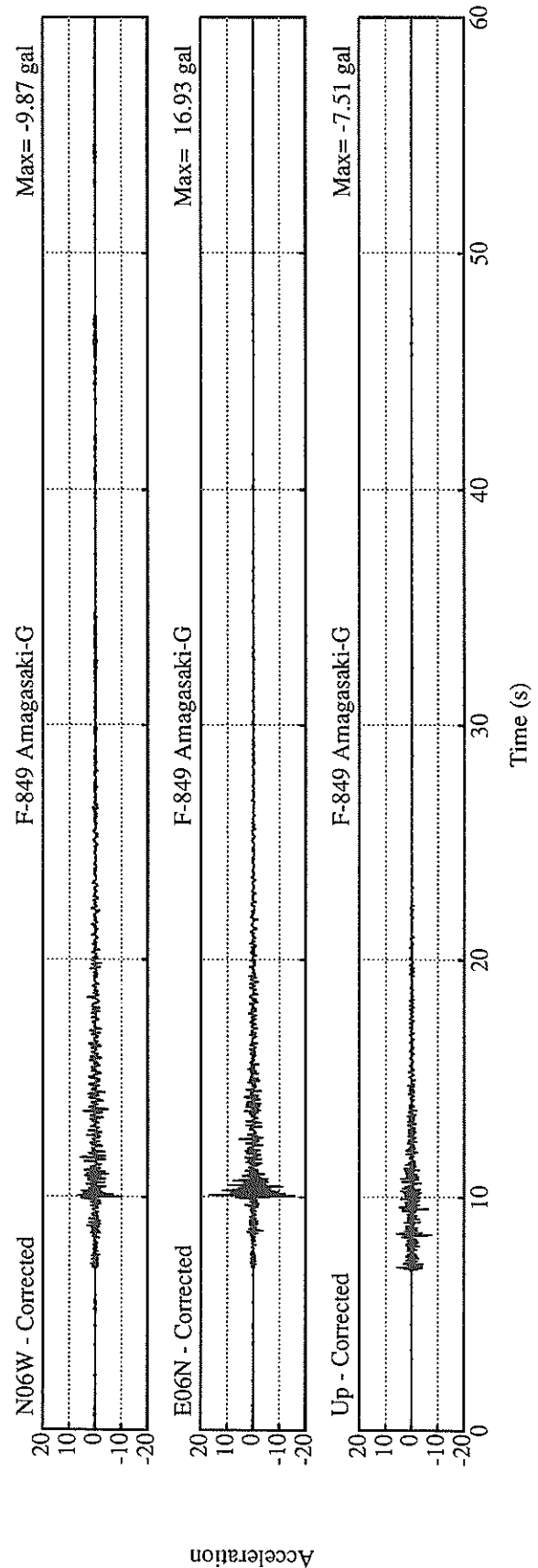
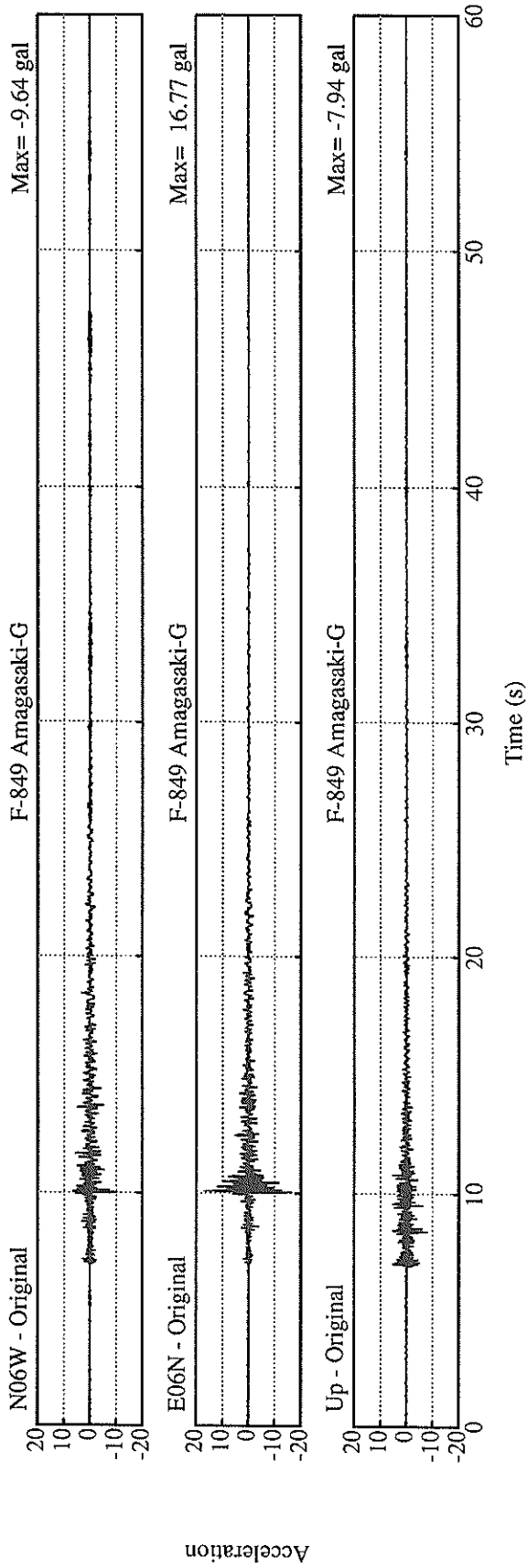
EARTHQUAKE DATA

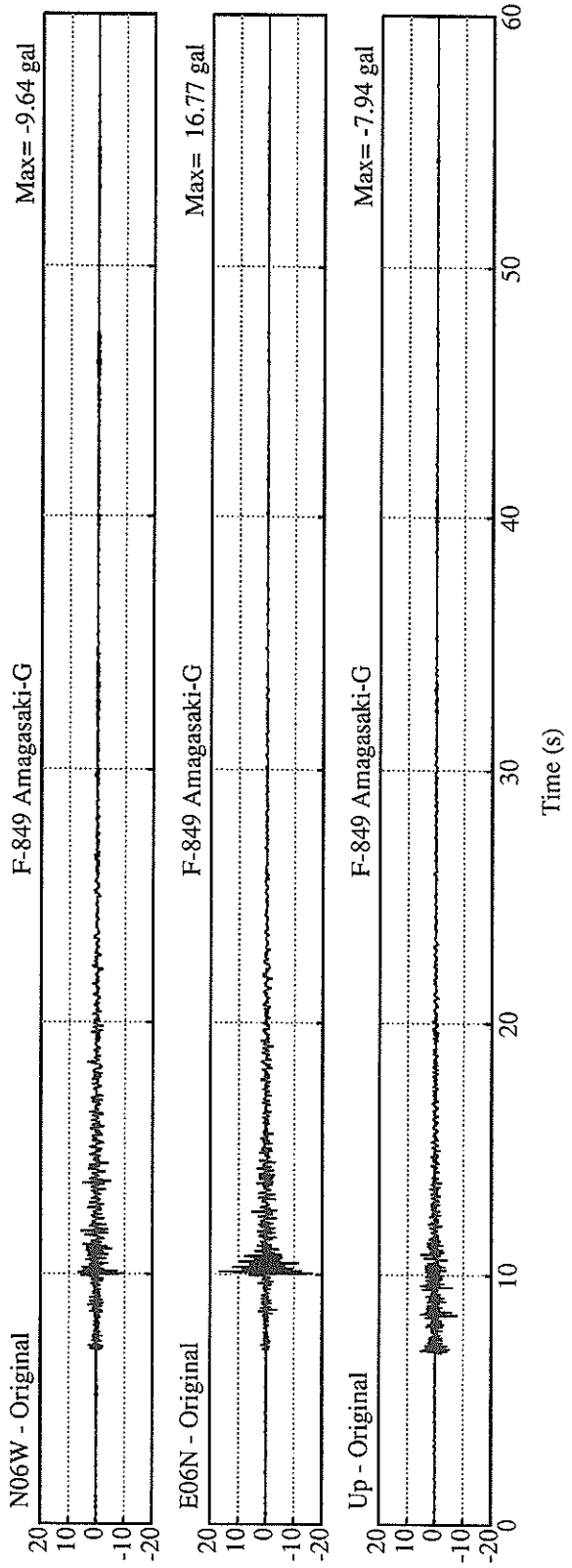
 DATE AND TIME 14:24 MAR.30,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°45.2' N
 LONGITUDE 135°17.8' E
 DEPTH 12.6KM
 JMA MAGNITUDE 3.6

PEAK VALUES OF COMPONENTS

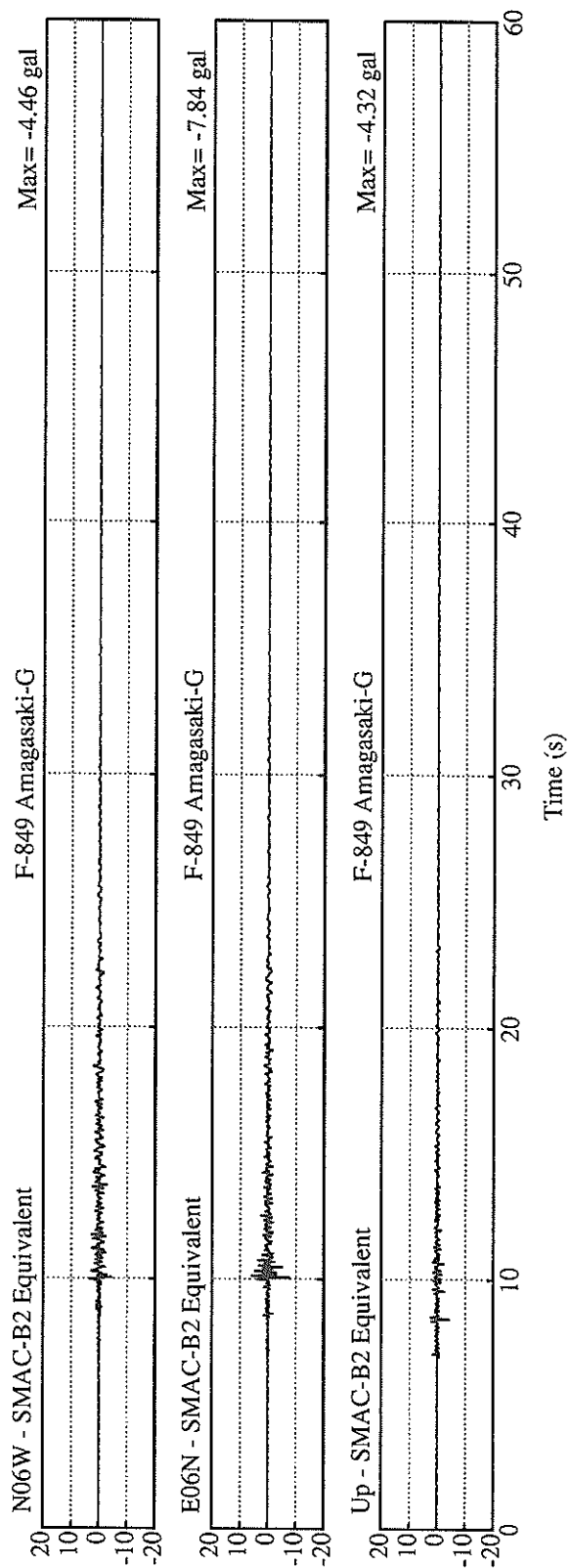
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.586	1.721	2.490	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	4.5	7.8	4.3	8.2
ORIGINAL	9.6	16.8	7.9	17.2
CORRECTED	9.9	16.9	7.5	17.5
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.25	0.36	0.20	0.36
VARIABLE FILTER	0.23	0.35	0.18	0.35
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.01	0.01	0.01	0.02
VARIABLE FILTER	0.01	0.01	0.00	0.01

* RESULTANT OF HORIZONTAL COMPONENTS

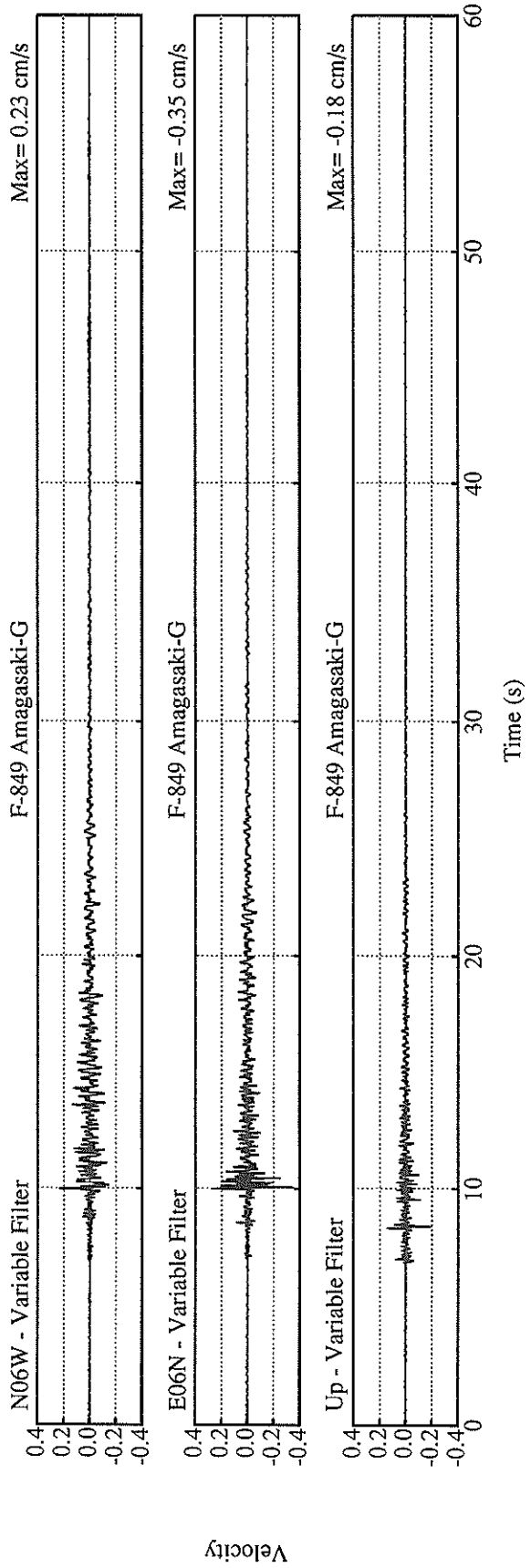
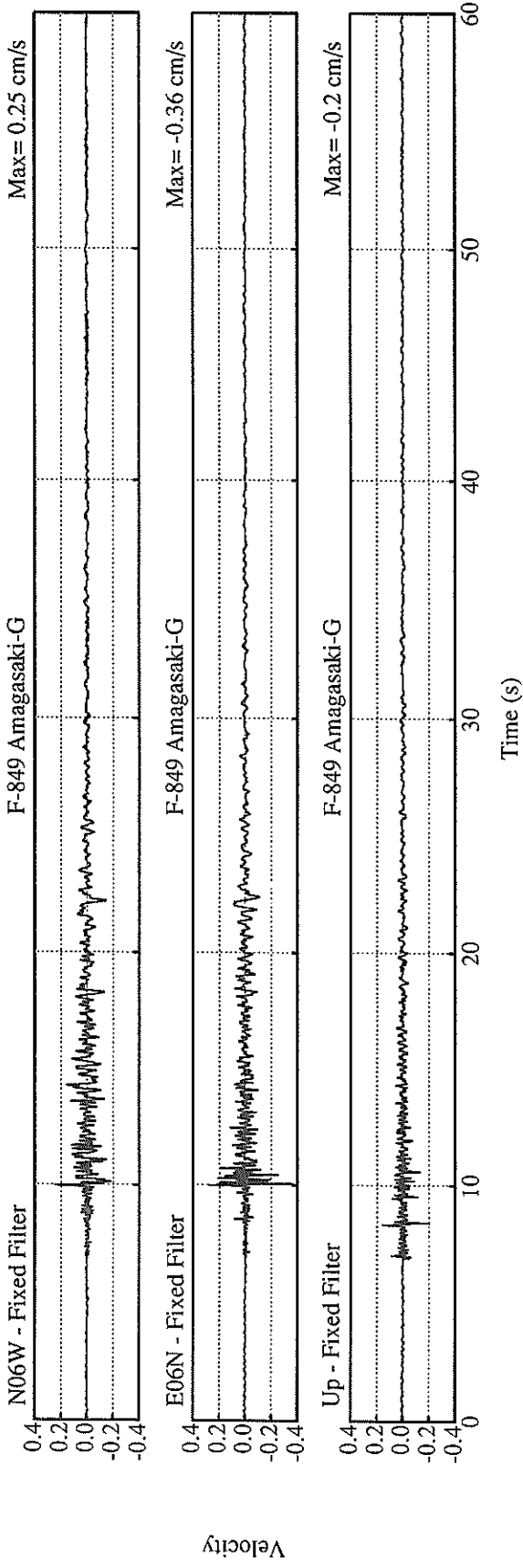


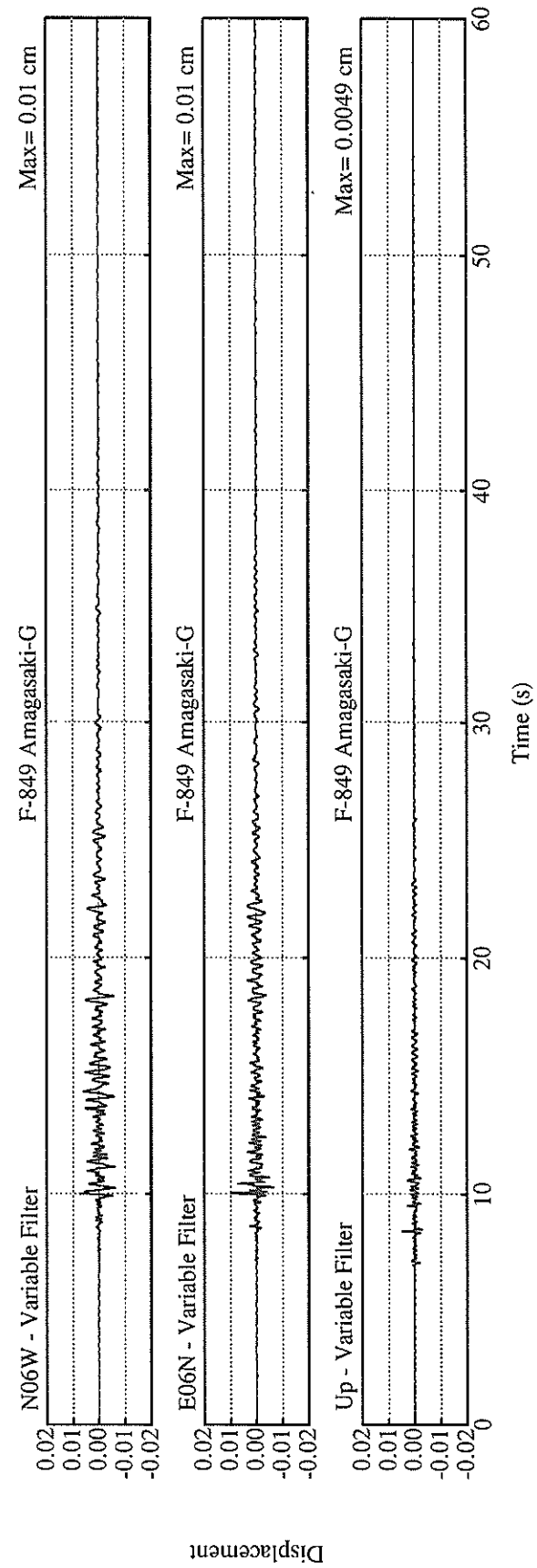
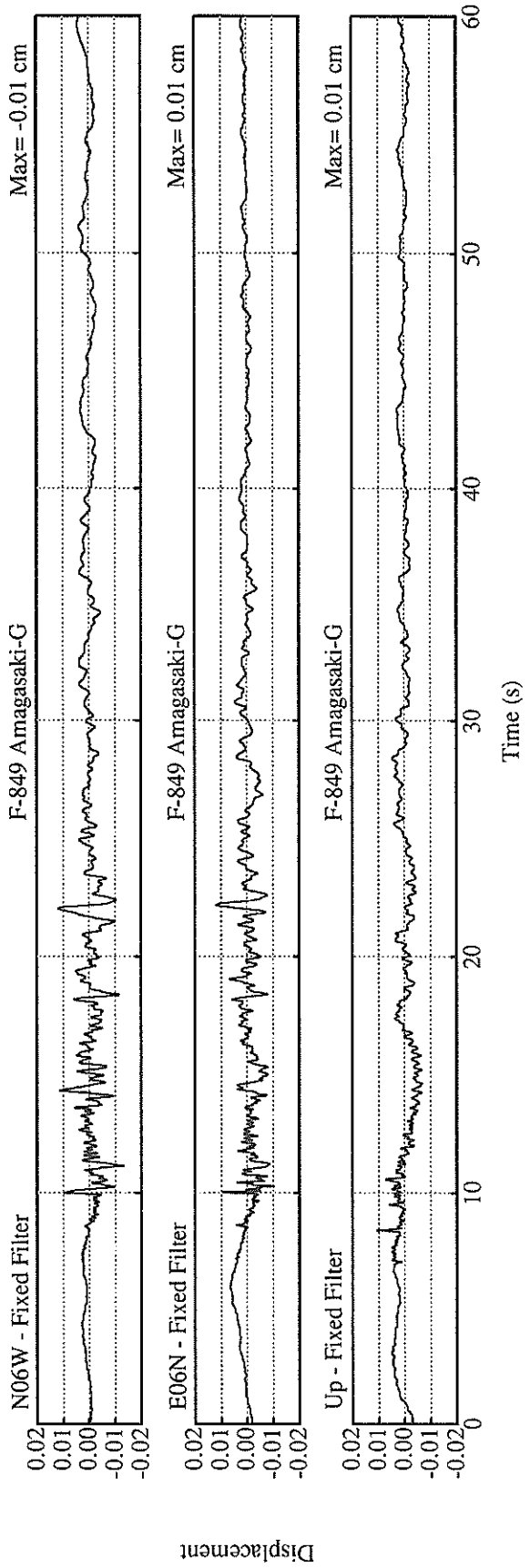


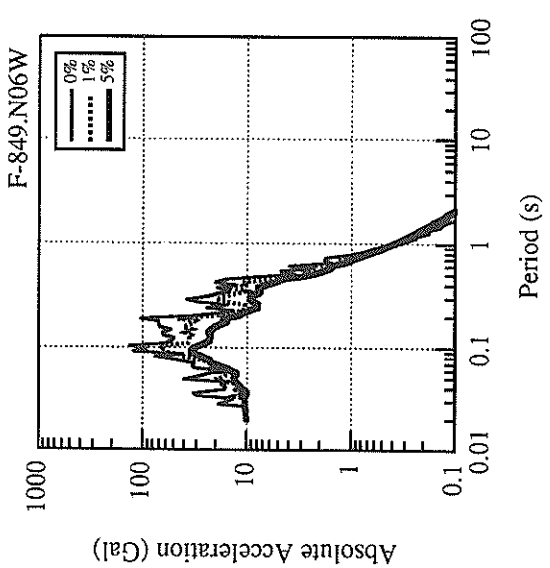
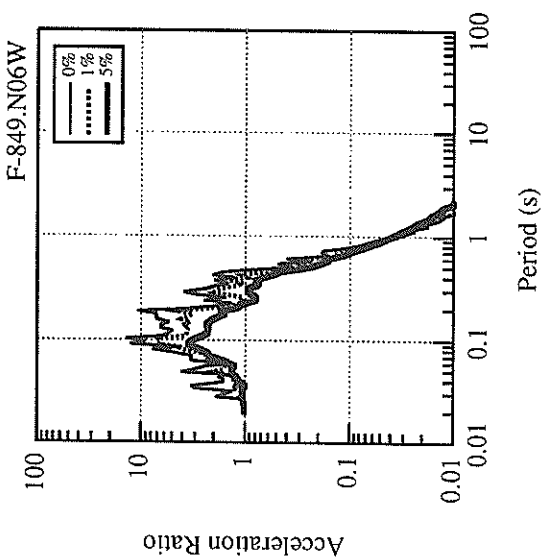
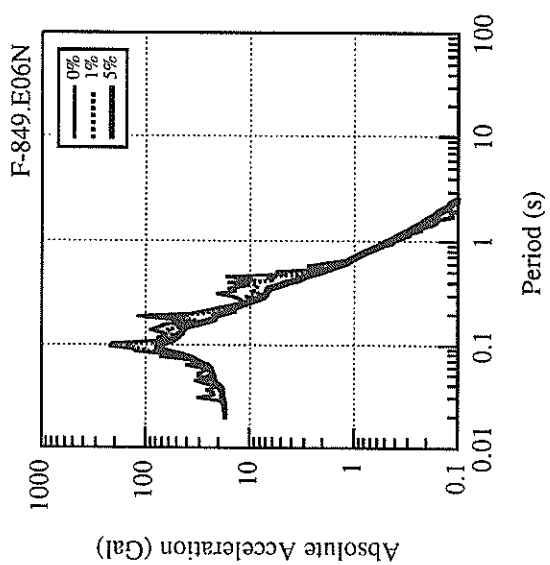
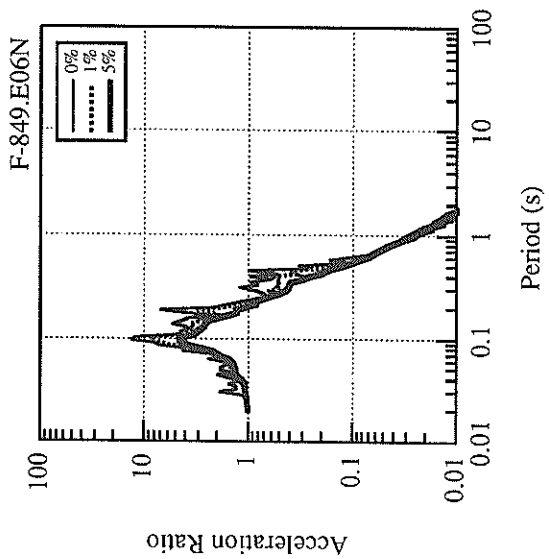
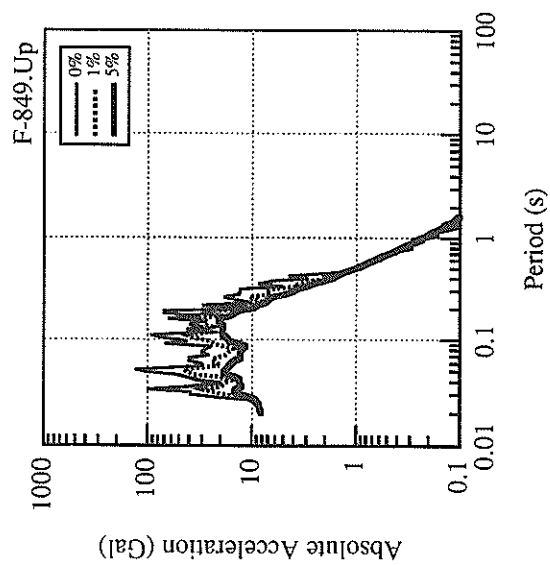
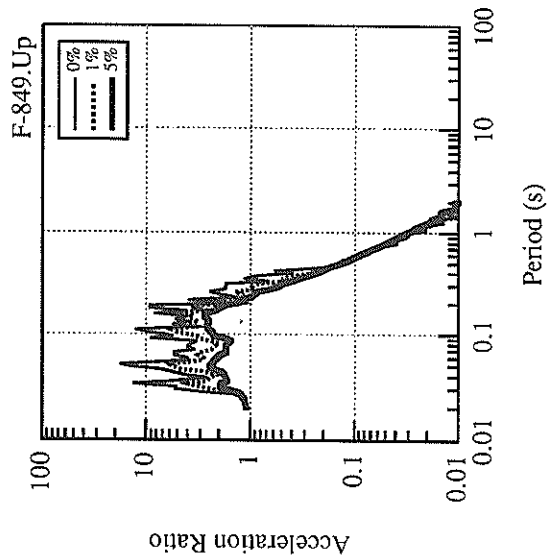
Acceleration

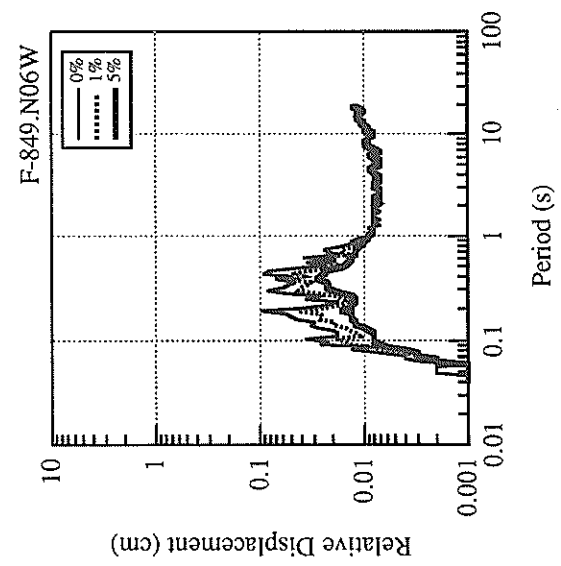
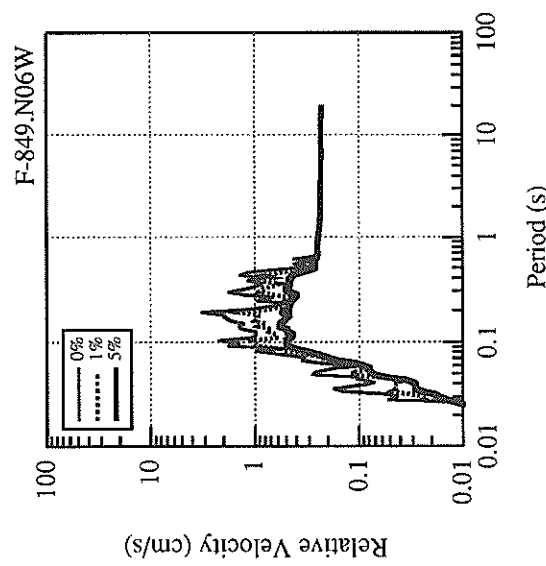
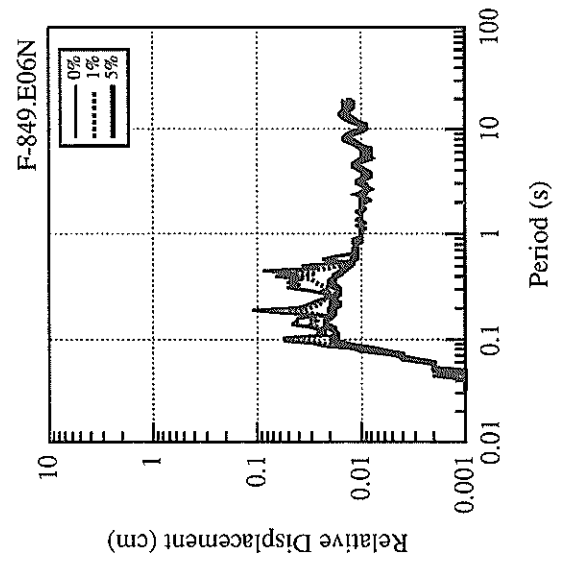
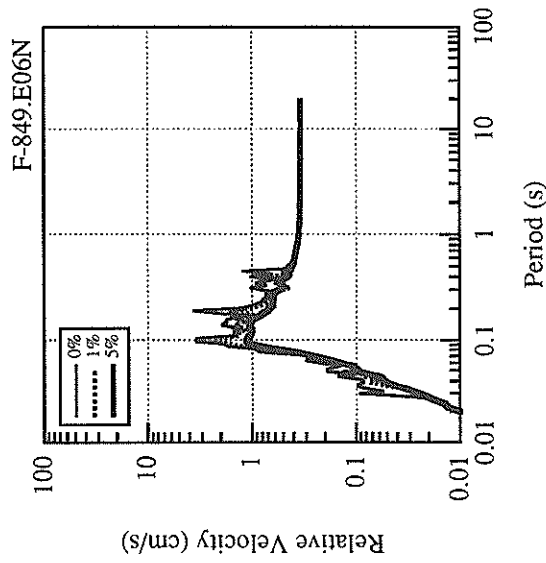
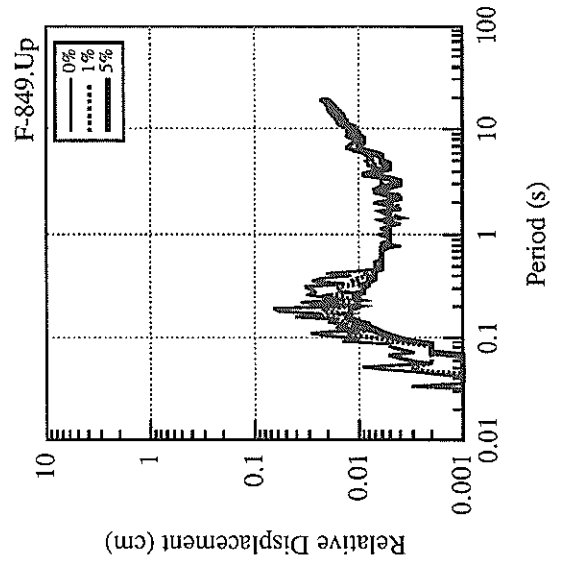
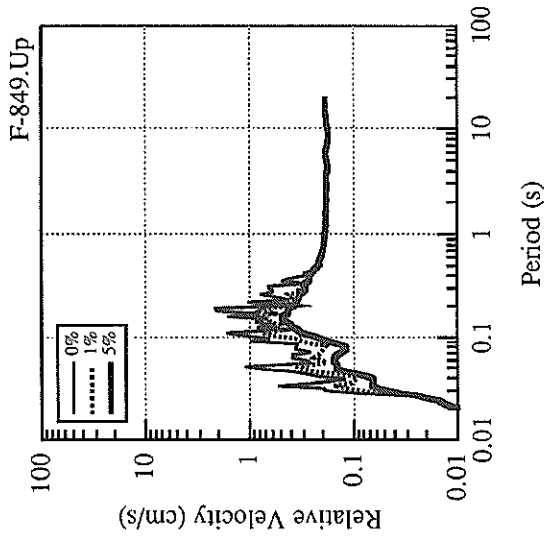


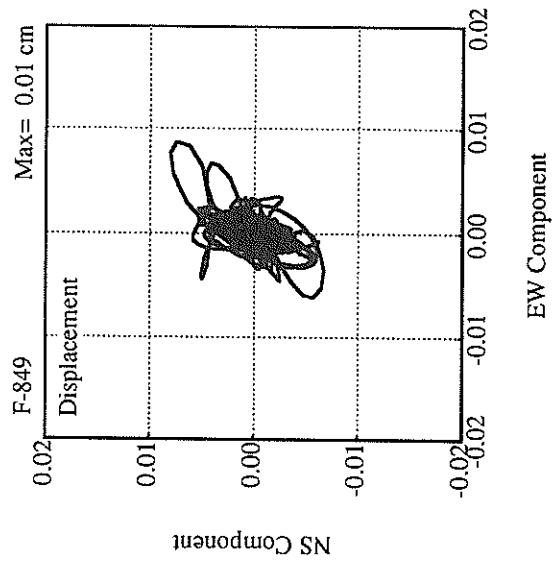
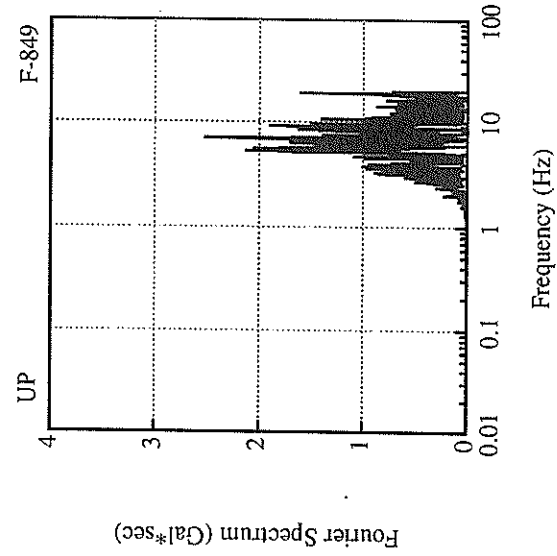
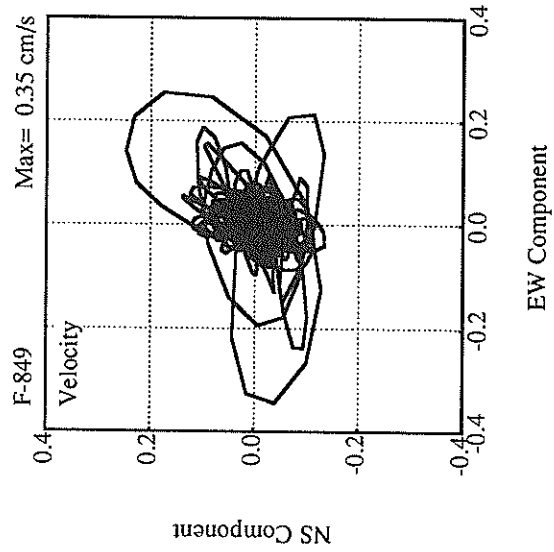
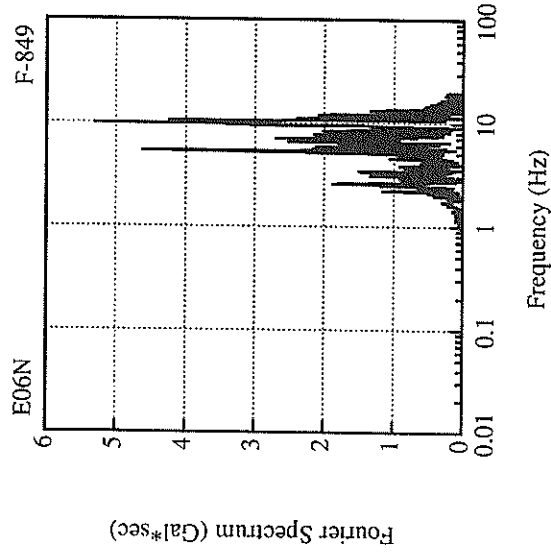
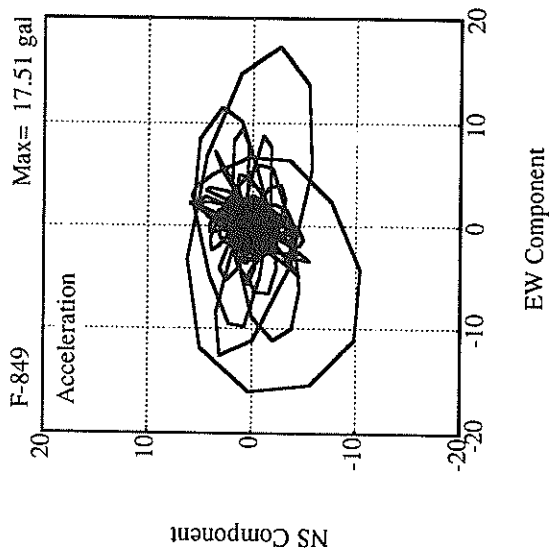
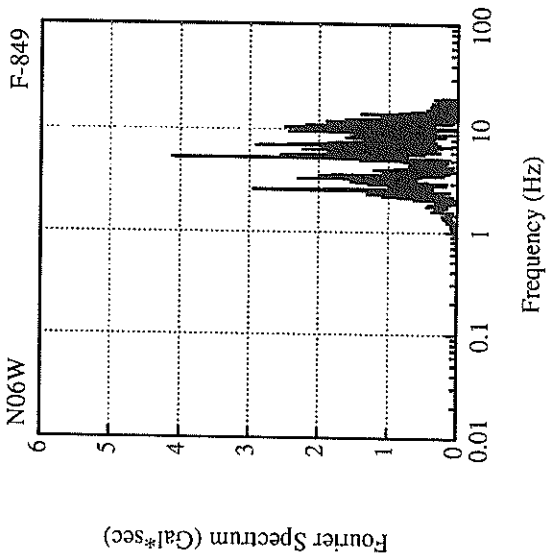
Acceleration











RECORD NUMBER : F-850
 STATION : AMAGASAKI-G

EARTHQUAKE DATA

```
*****
DATE AND TIME           10:50 APR  6,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION     SE HYOGO PREF
  LATITUDE              34°47.5' N
  LONGITUDE             135°19.3' E
  DEPTH                 11.8KM
  JMA MAGNITUDE         4.0
*****
```

PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
--	-----	-----	-----	-------------

PARAMETER OF THE VARIABLE FILTER

FC (HZ)	0.842	0.707	1.391	
---------	-------	-------	-------	--

MAXIMUM ACCELERATION (GAL)

SMAC-B2 EQUIVALENT	4.3	15.5	3.5	15.8
ORIGINAL	10.6	27.8	16.8	27.9
CORRECTED	7.1	27.0	13.7	27.1

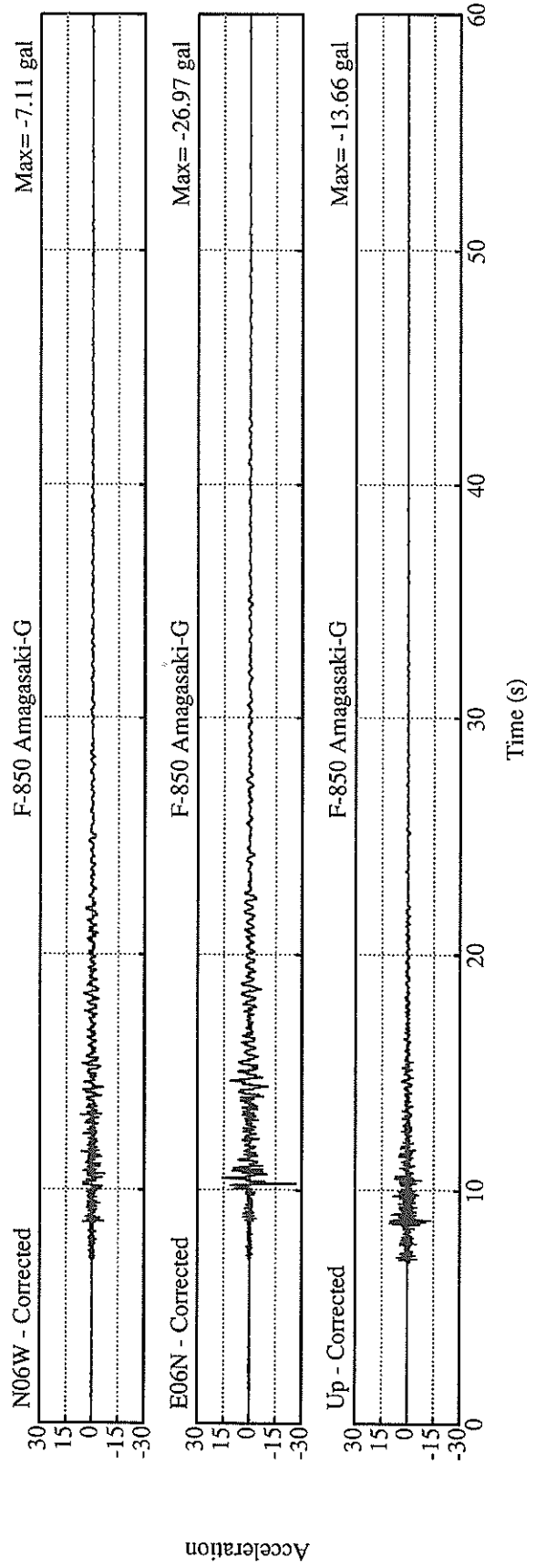
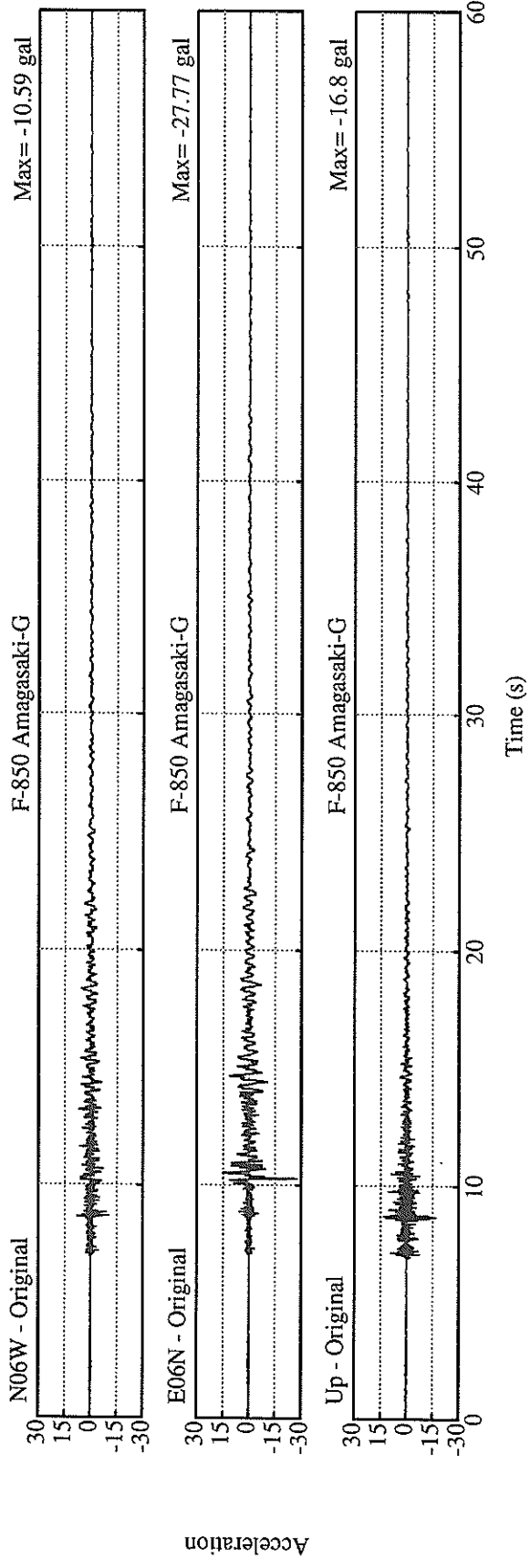
MAXIMUM VELOCITY (CM/SEC)

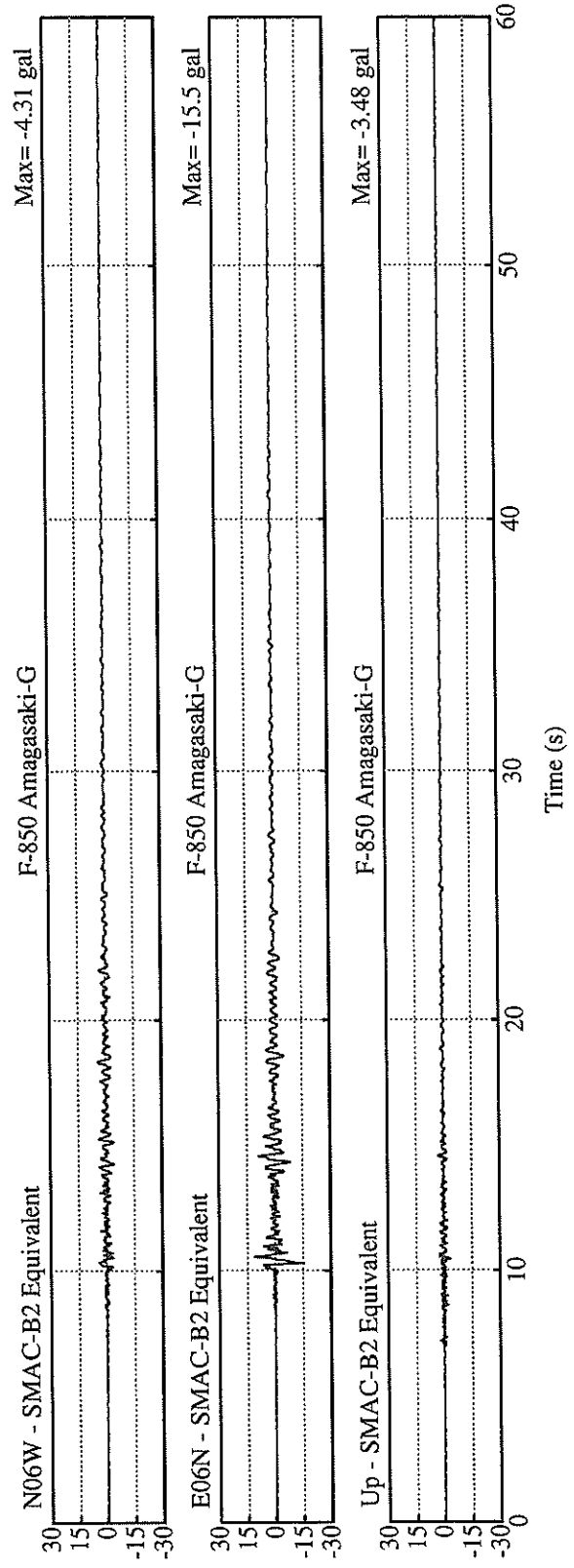
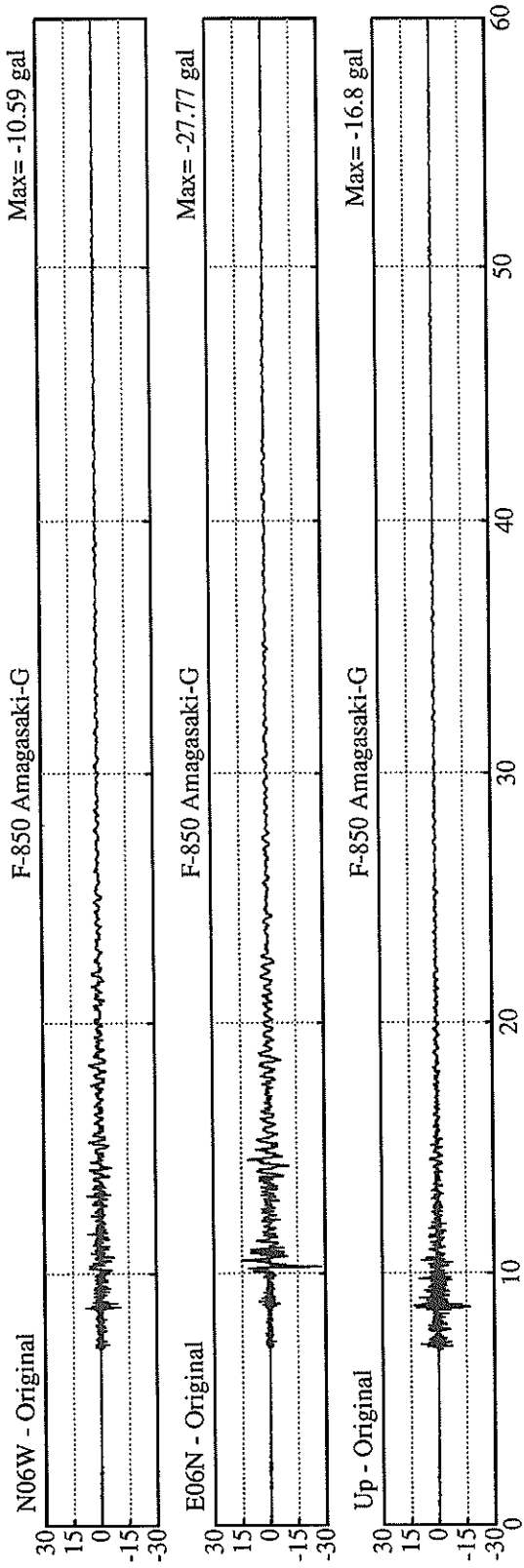
FIXED FILTER	0.38	0.83	0.20	0.84
VARIABLE FILTER	0.36	0.90	0.19	0.92

MAXIMUM DISPLACEMENT (CM)

FIXED FILTER	0.05	0.10	0.01	0.11
VARIABLE FILTER	0.03	0.08	0.01	0.08

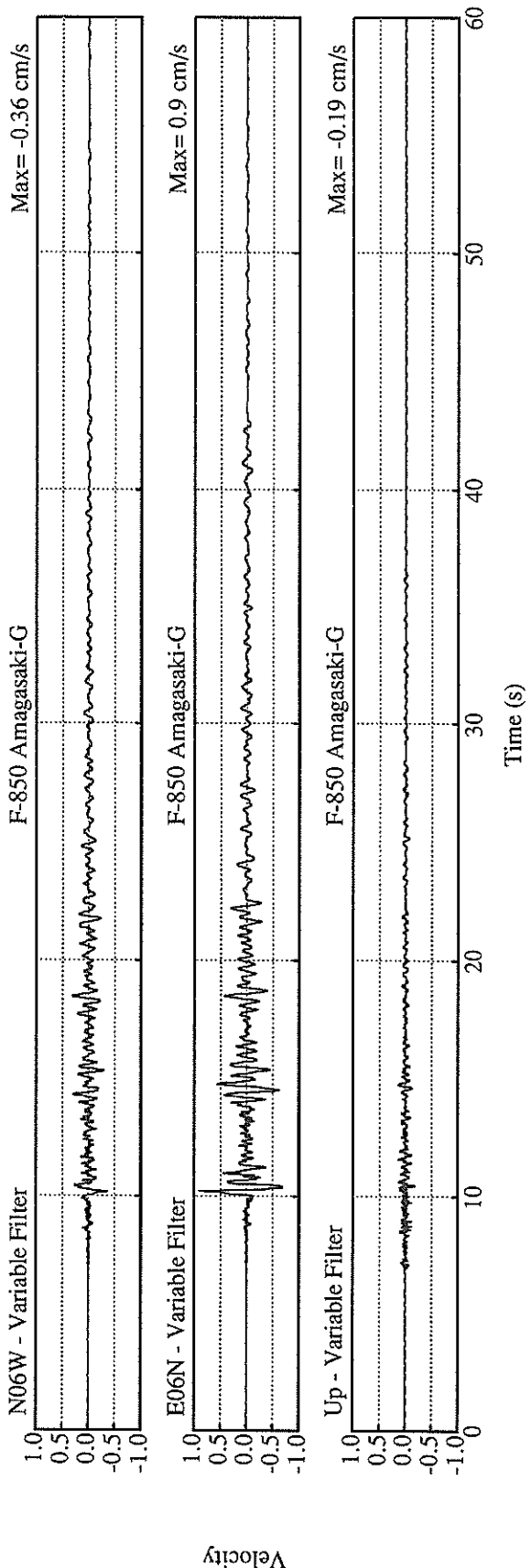
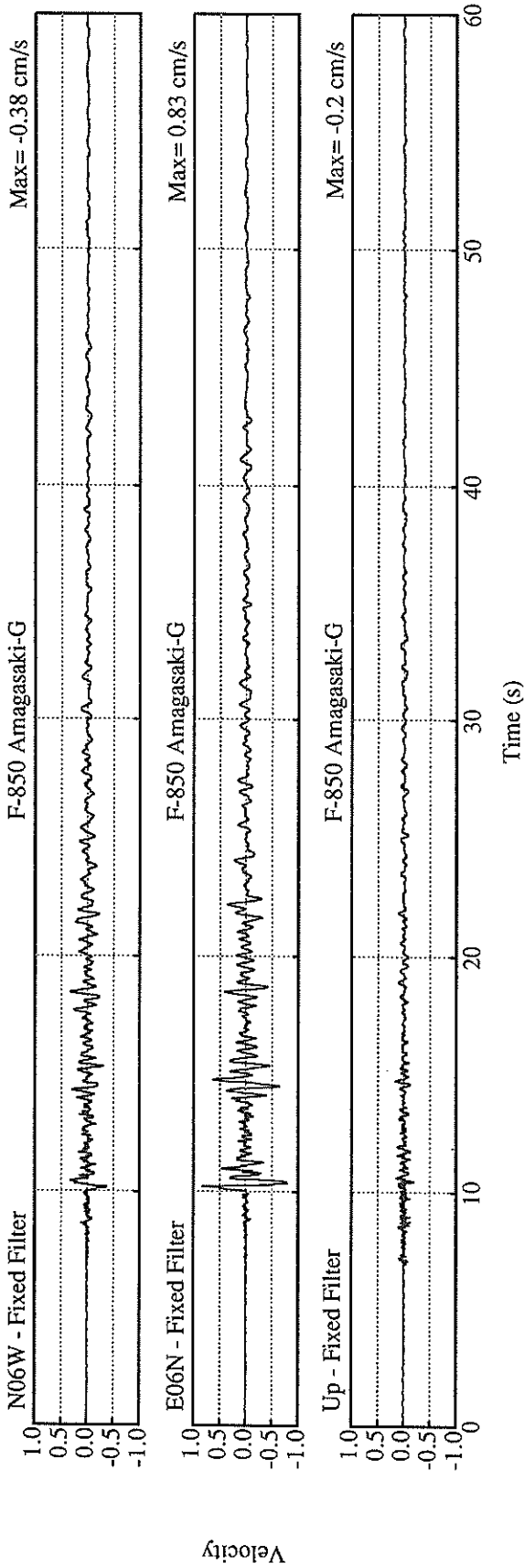
* RESULTANT OF HORIZONTAL COMPONENTS

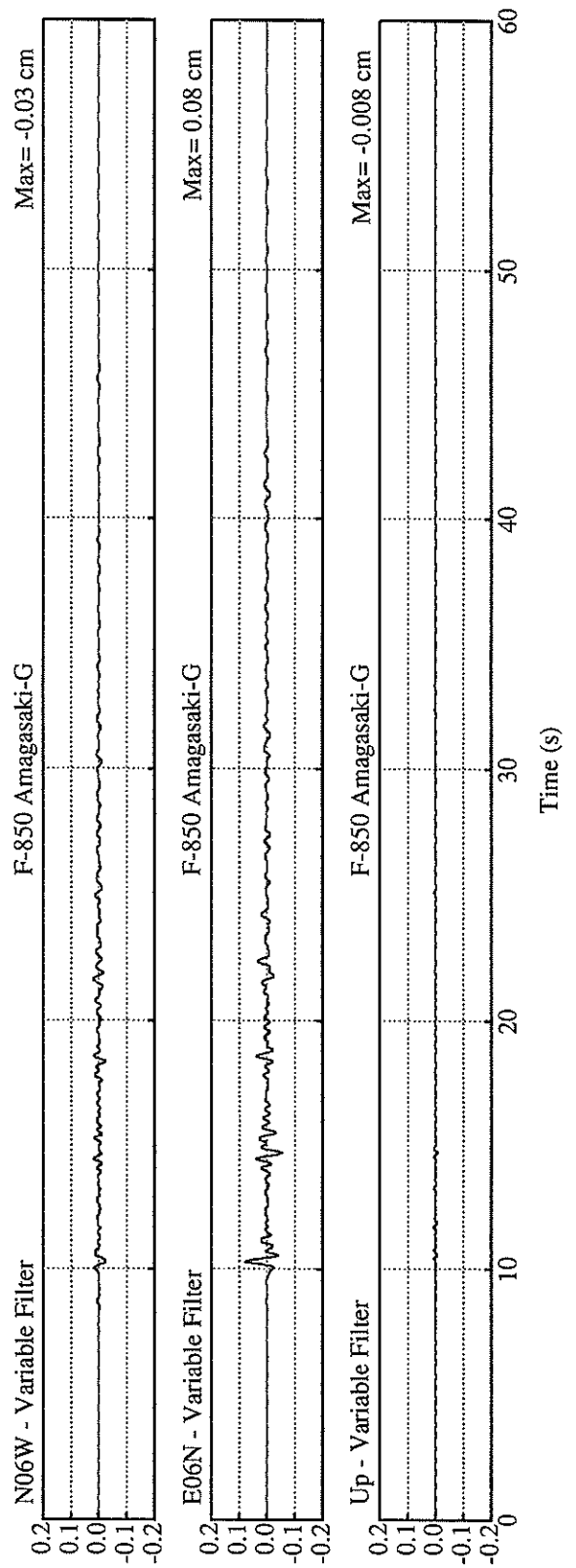
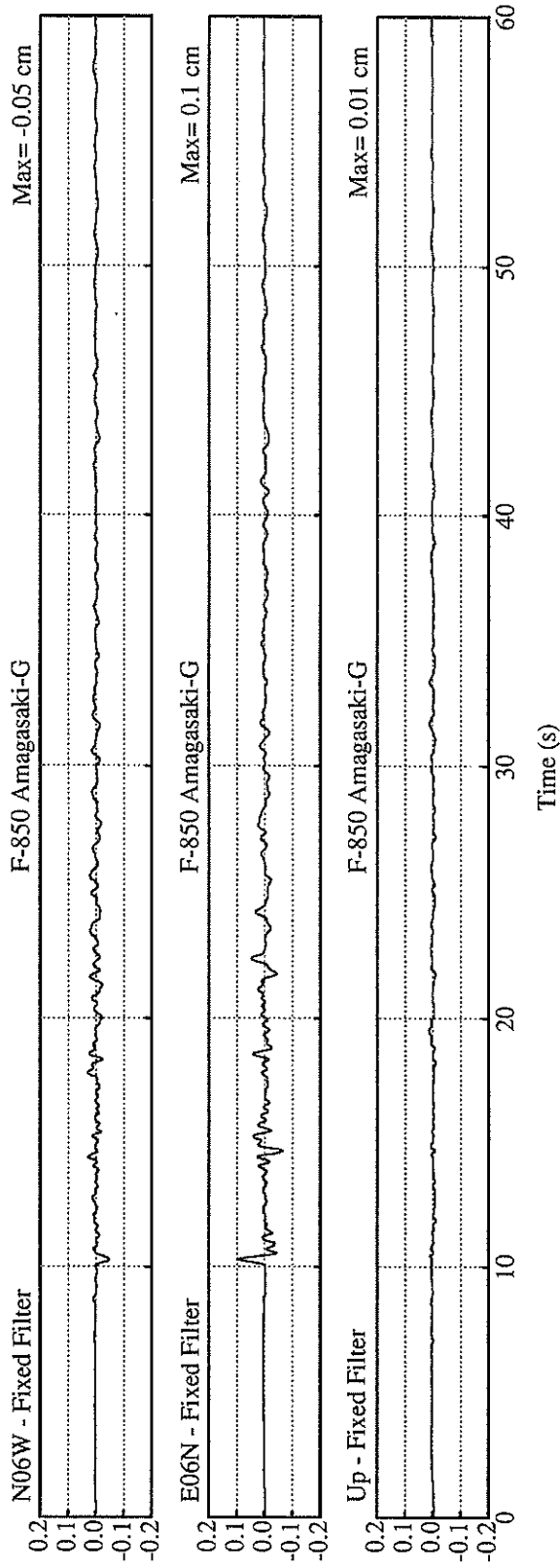


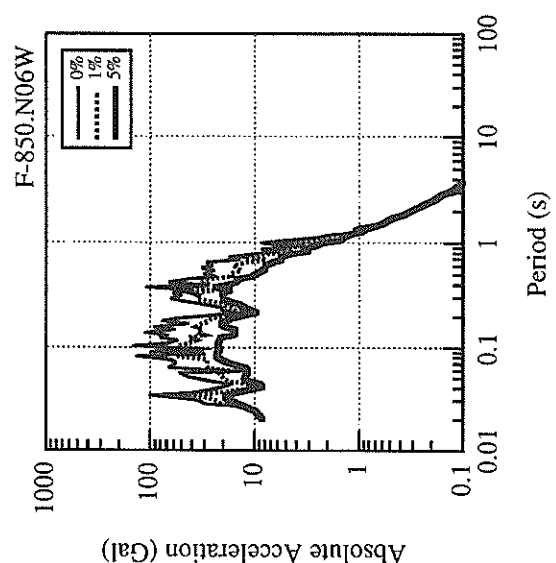
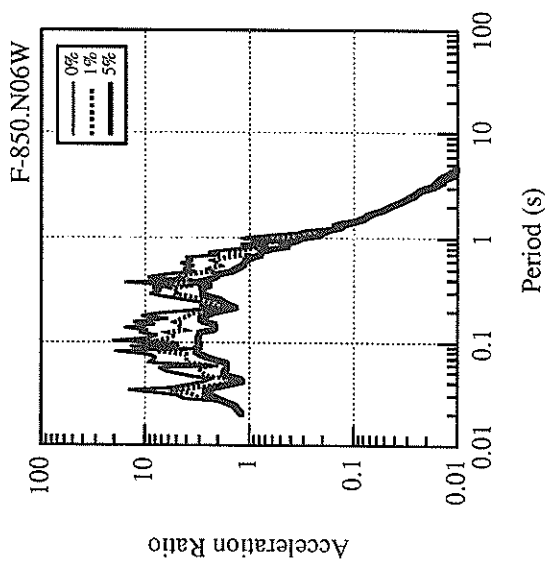
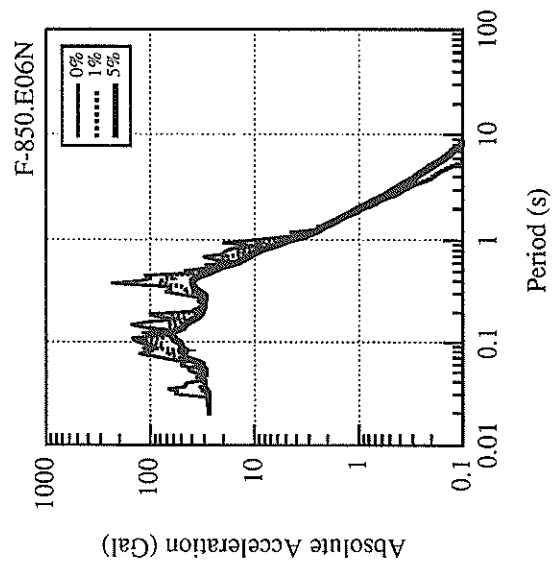
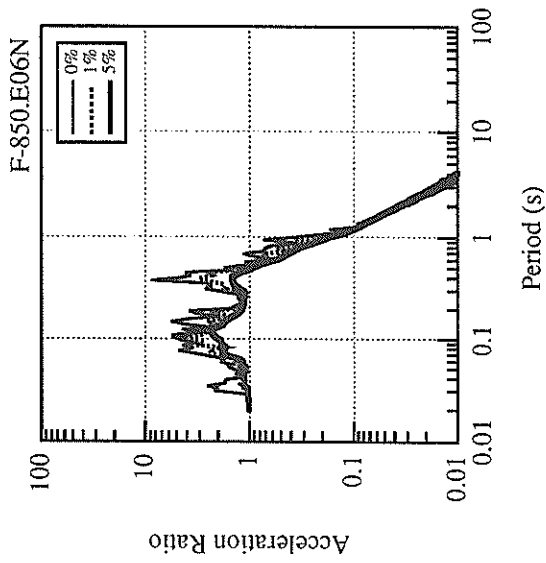
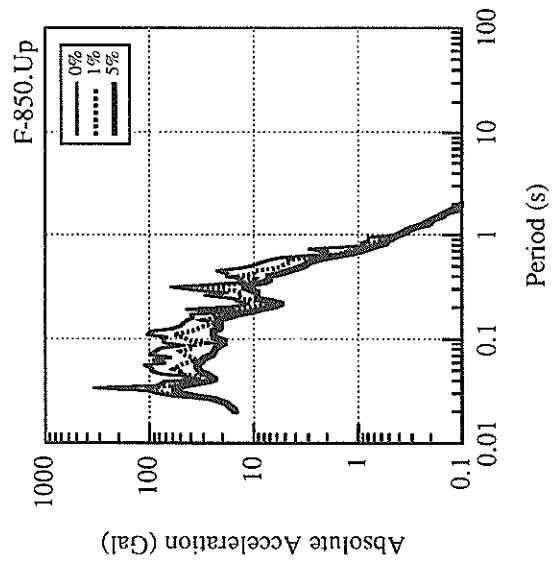
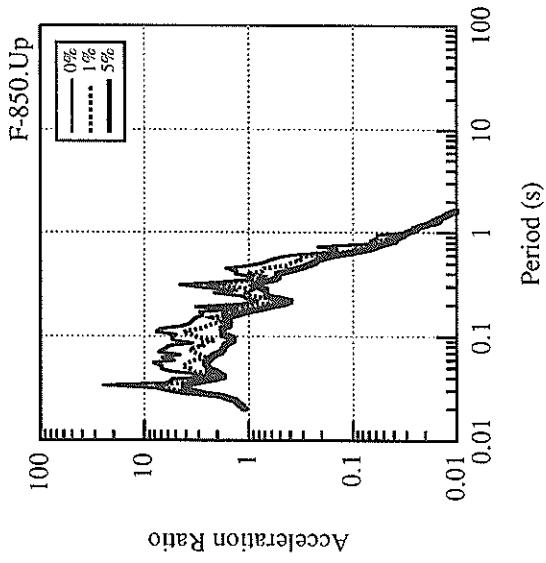


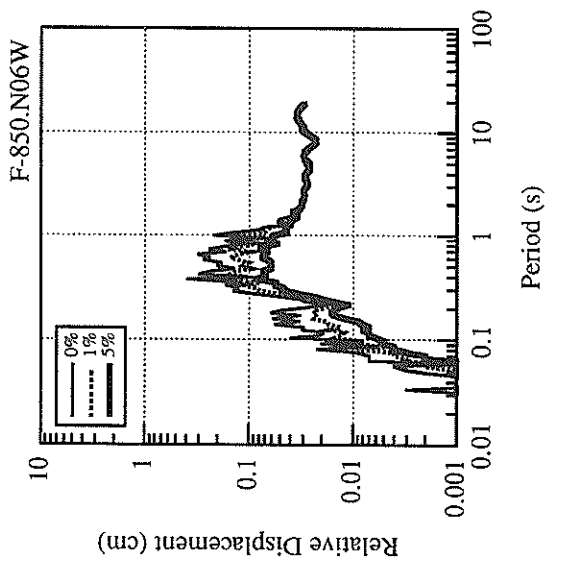
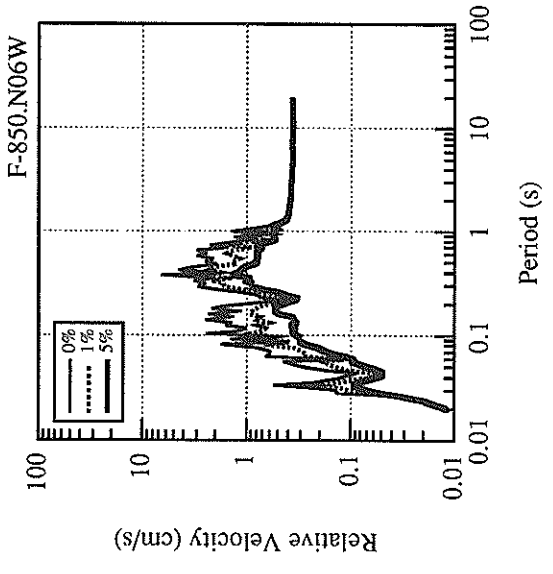
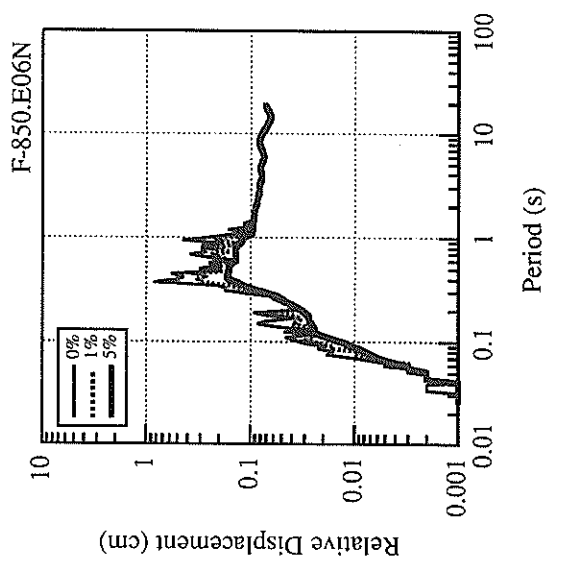
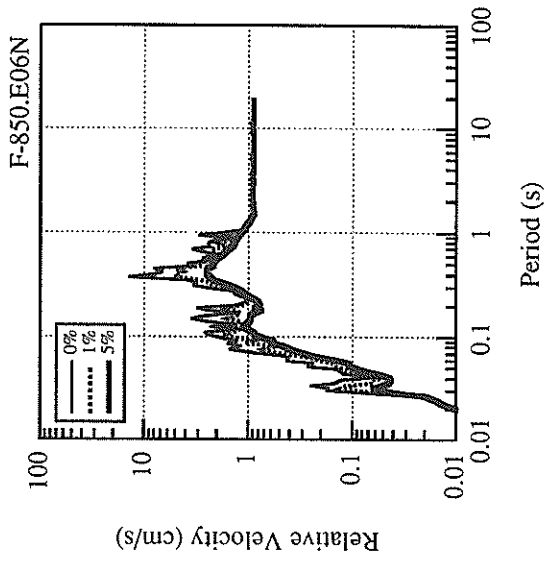
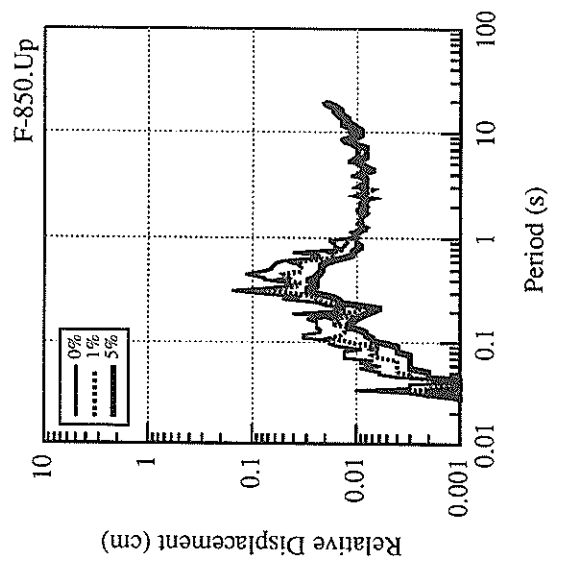
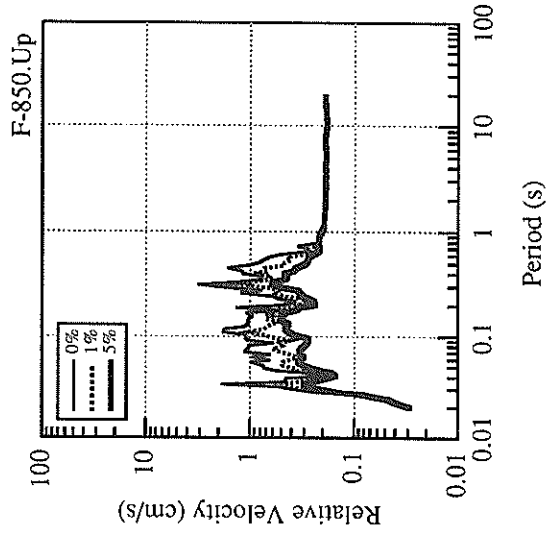
Acceleration

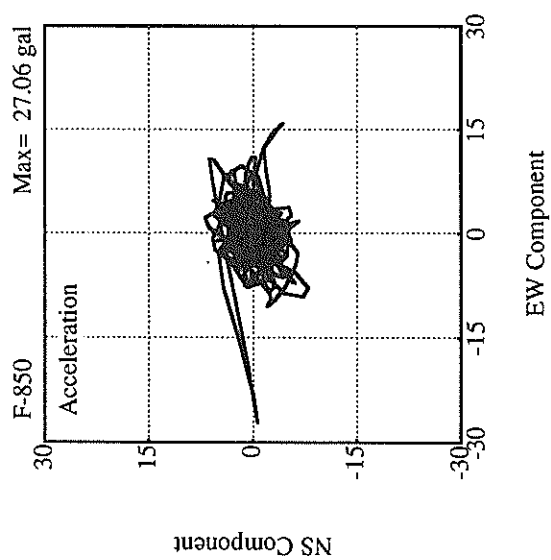
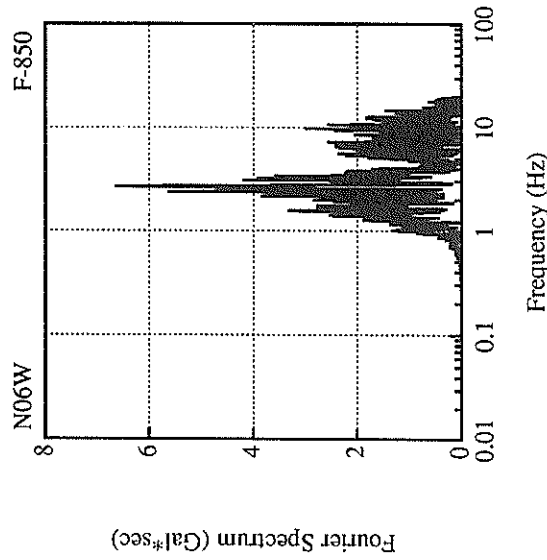
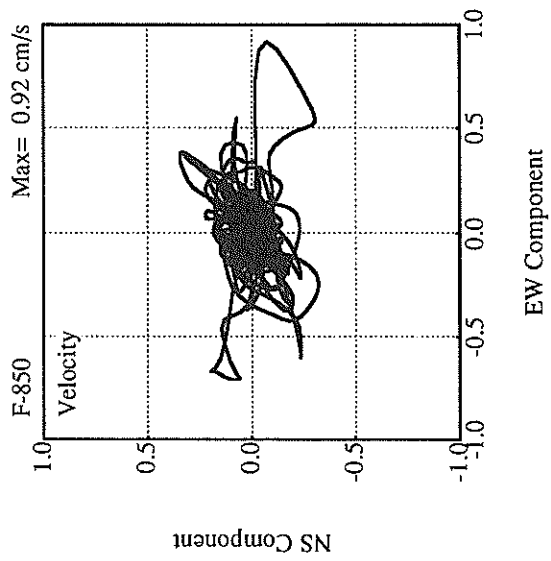
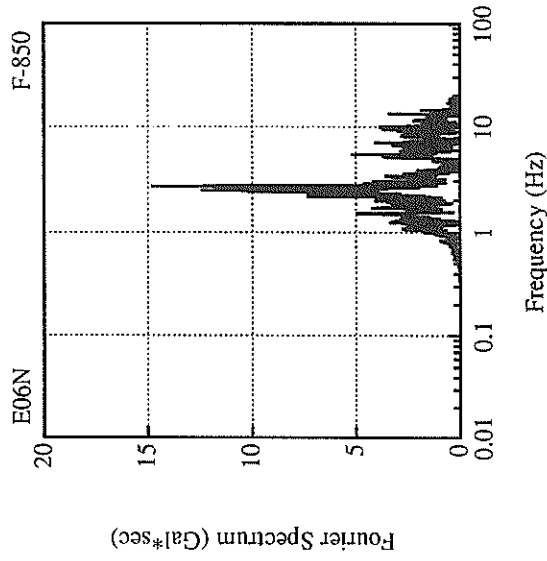
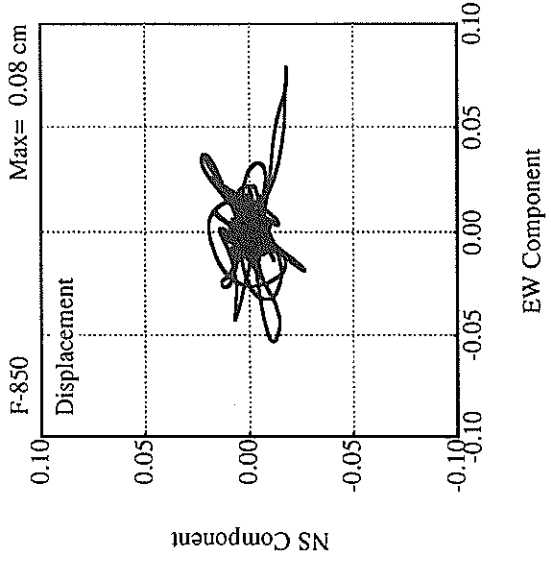
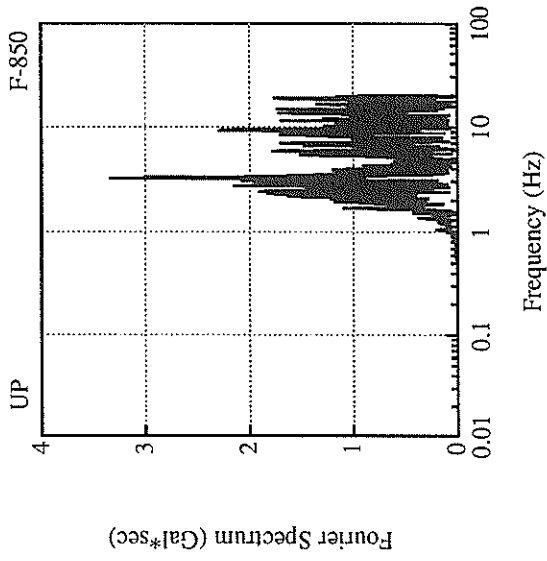
Acceleration











RECORD NUMBER : F-853

STATION : OSAKA-MINAMI-G

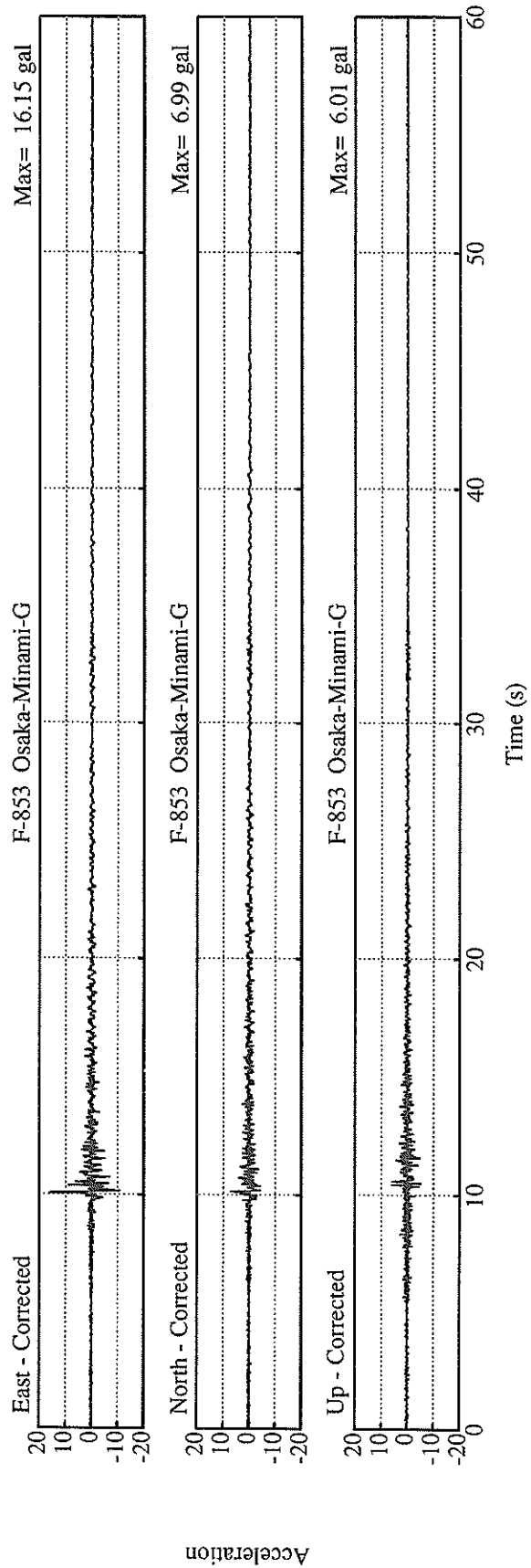
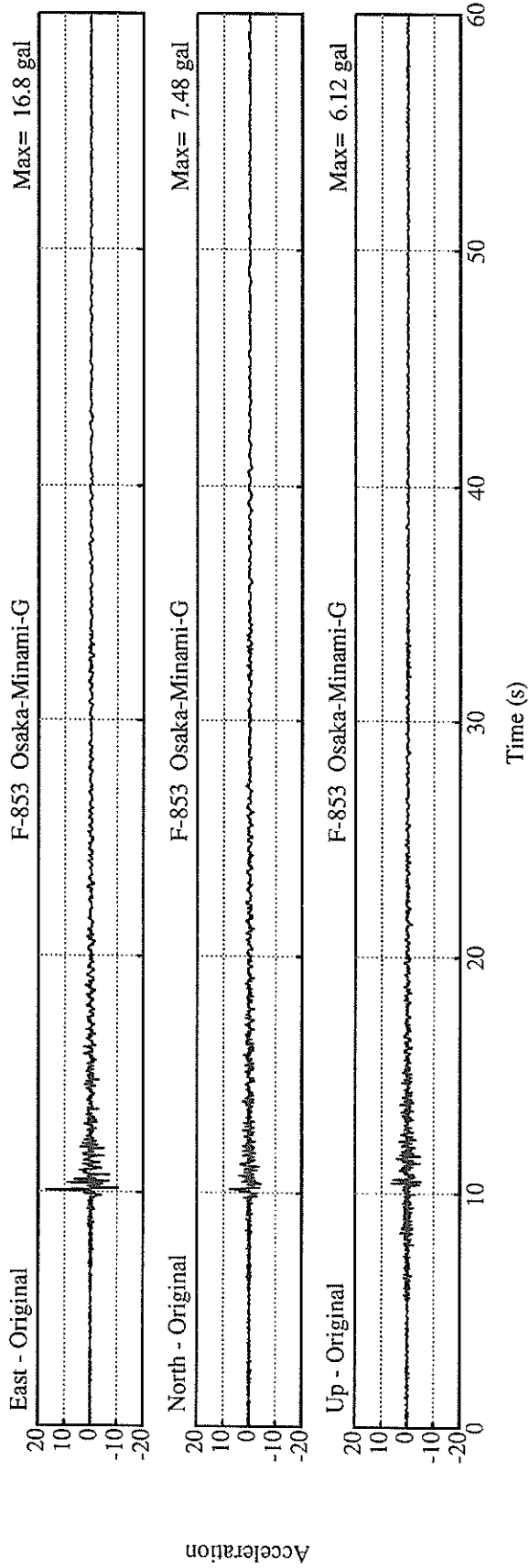
EARTHQUAKE DATA

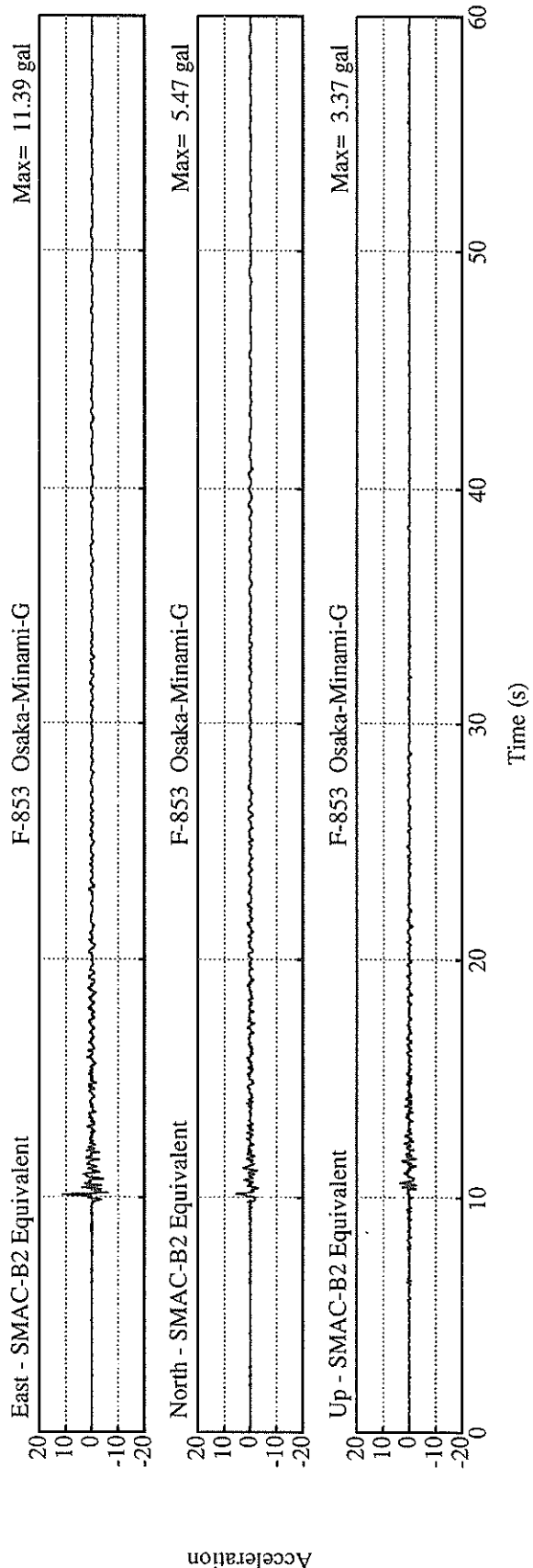
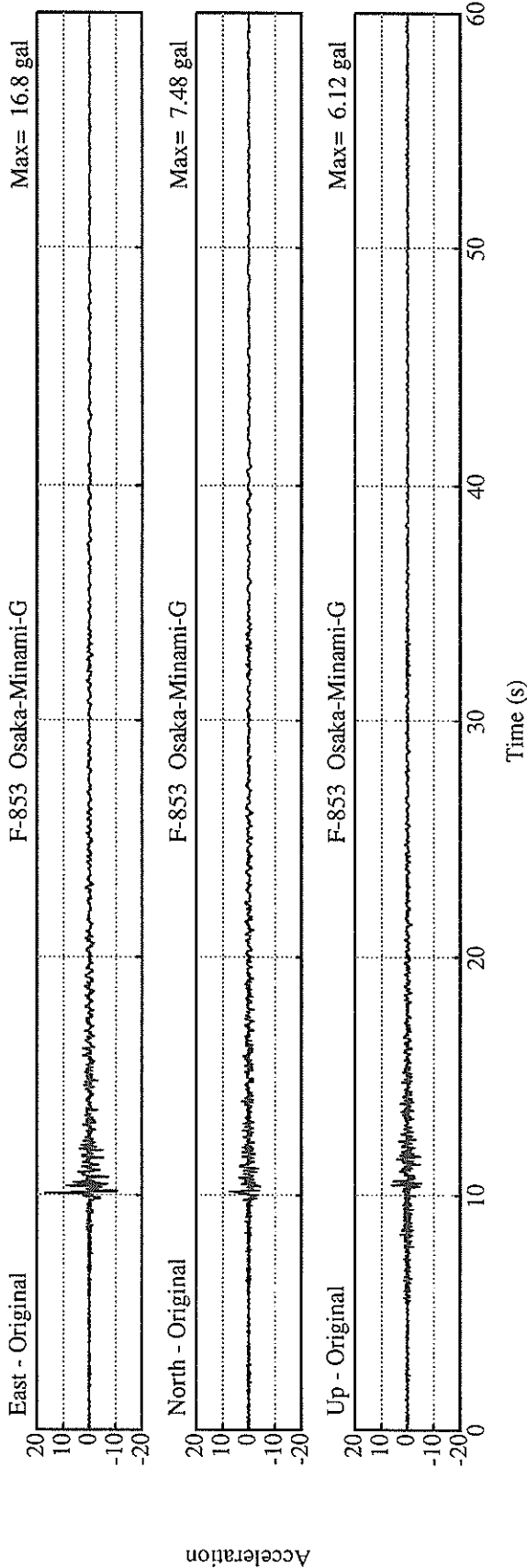
DATE AND TIME 10:50 APR 6,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION SE HYOGO PREF
LATITUDE 34°47.5' N
LONGITUDE 135°19.3' E
DEPTH 11.8KM
JMA MAGNITUDE 4.0

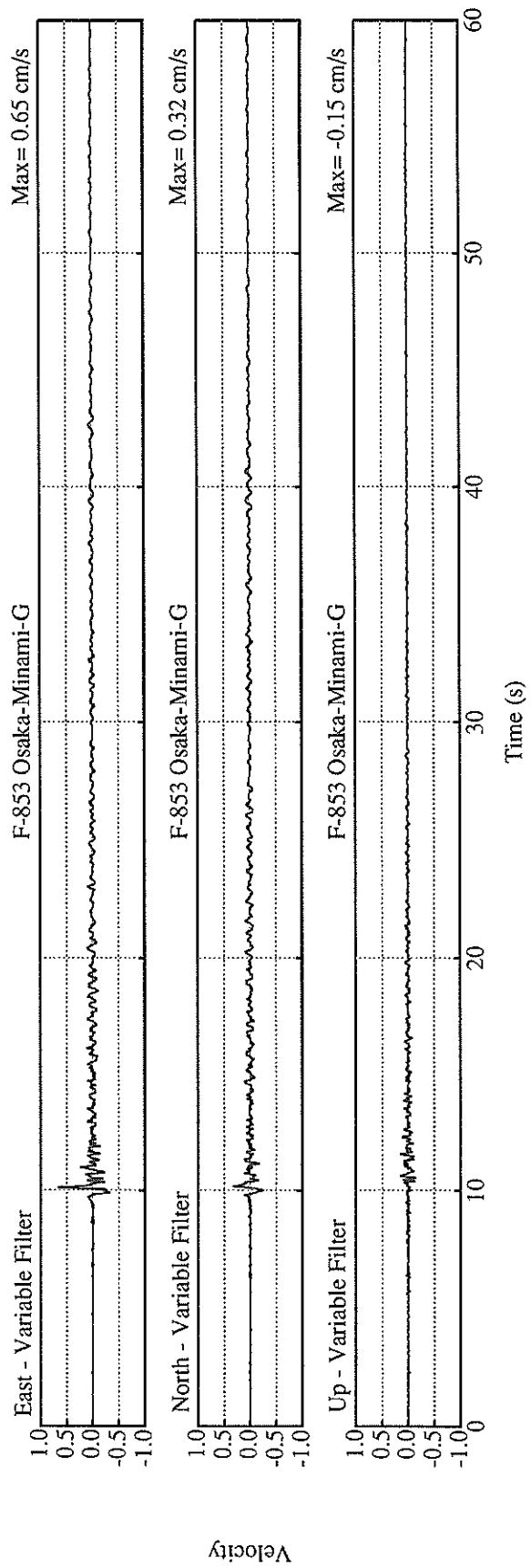
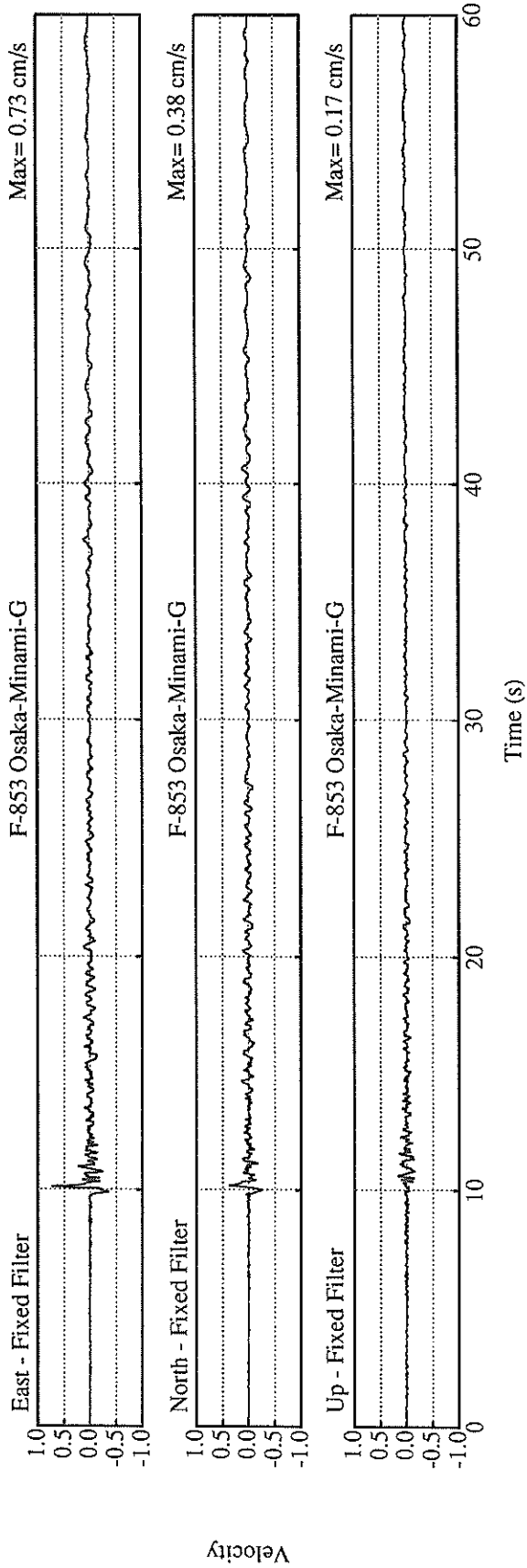
PEAK VALUES OF COMPONENTS

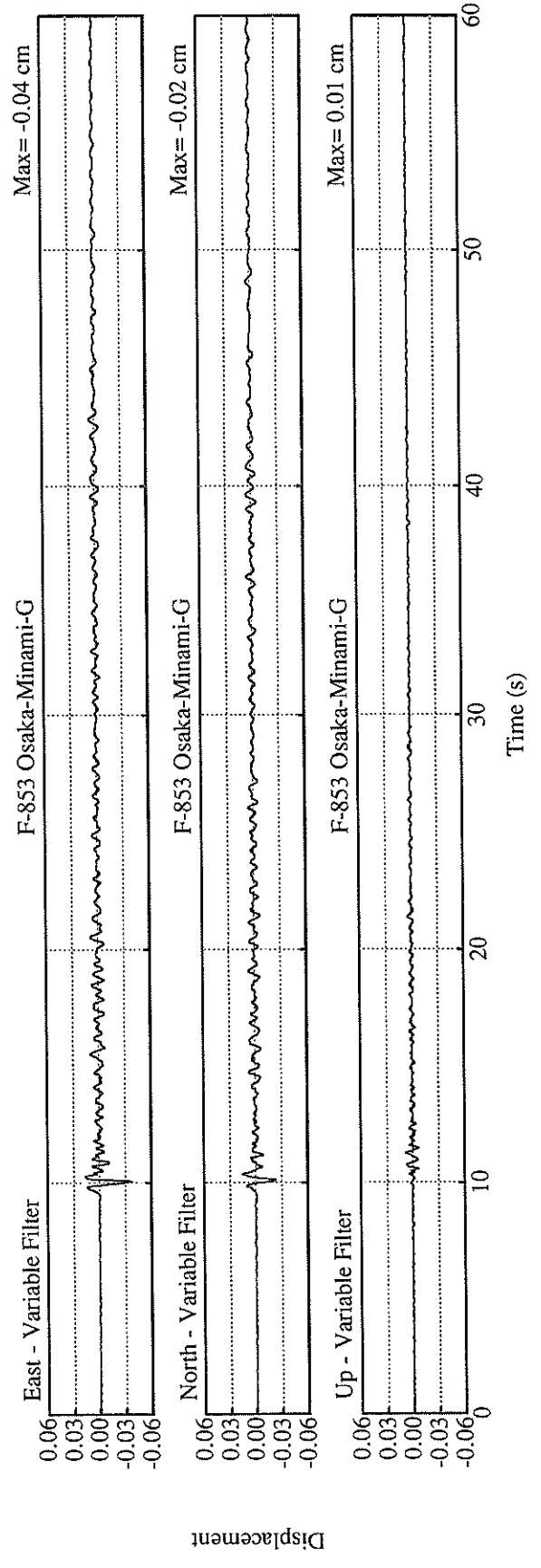
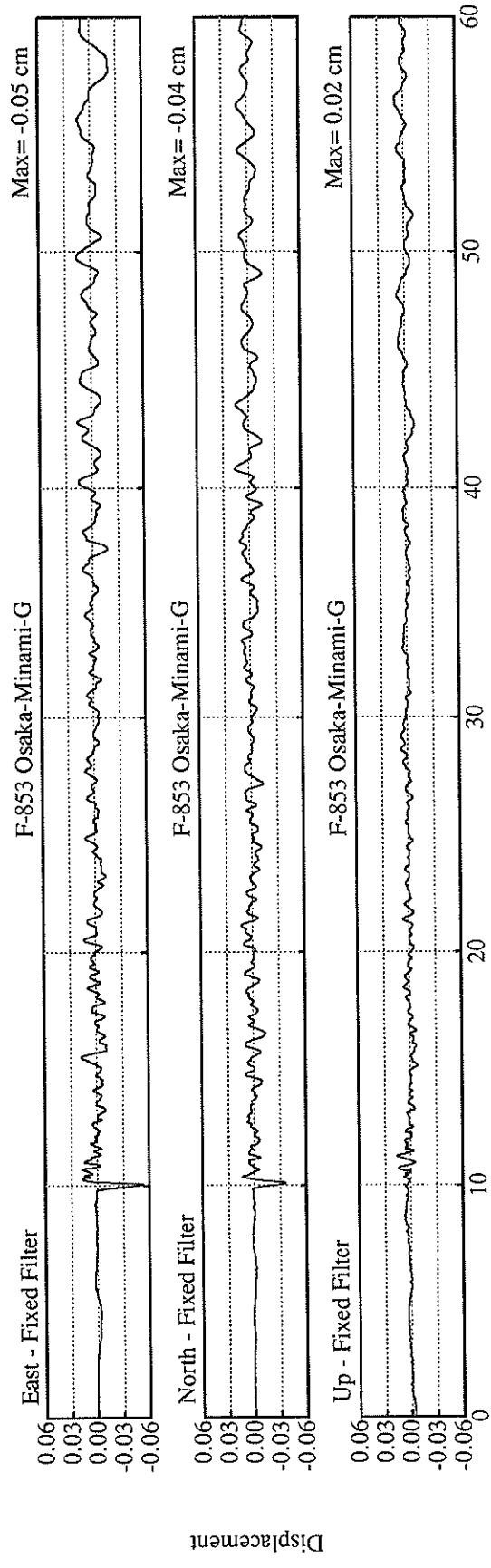
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.982	0.939	1.482	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	5.5	11.4	3.4	11.6
ORIGINAL	7.5	16.8	6.1	16.8
CORRECTED	7.0	16.1	6.0	16.2
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.38	0.73	0.17	0.73
VARIABLE FILTER	0.32	0.65	0.15	0.65
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.04	0.05	0.02	0.06
VARIABLE FILTER	0.02	0.04	0.01	0.04

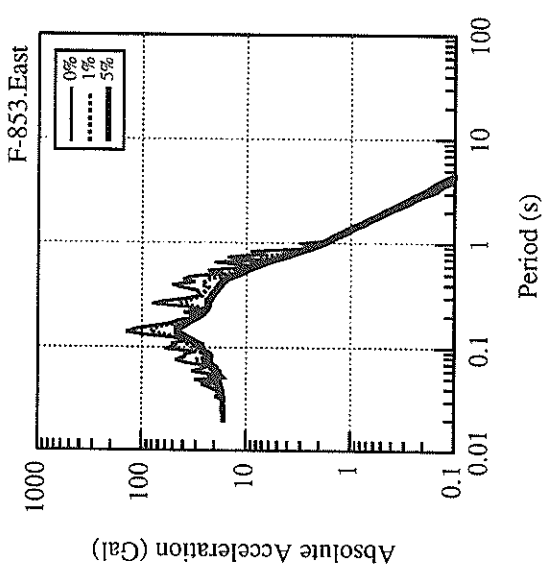
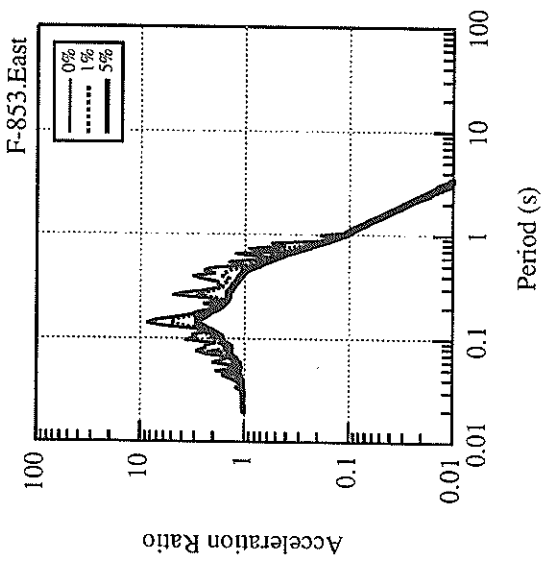
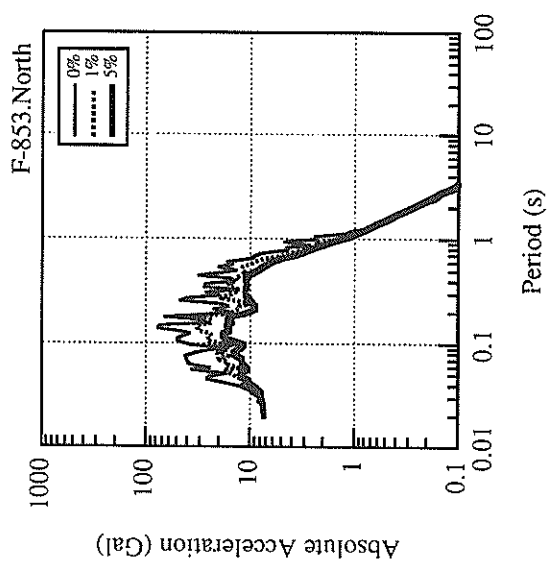
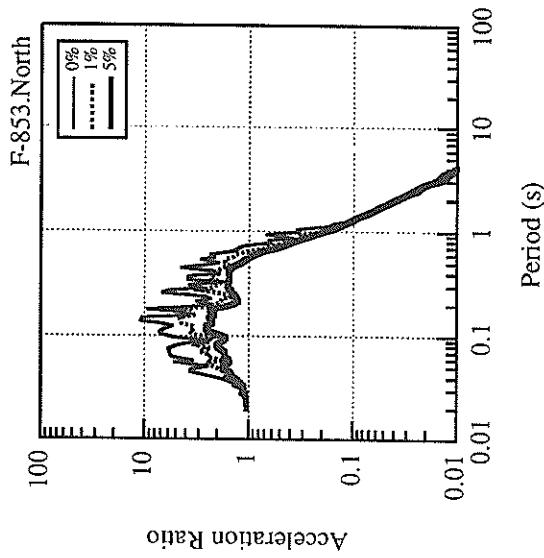
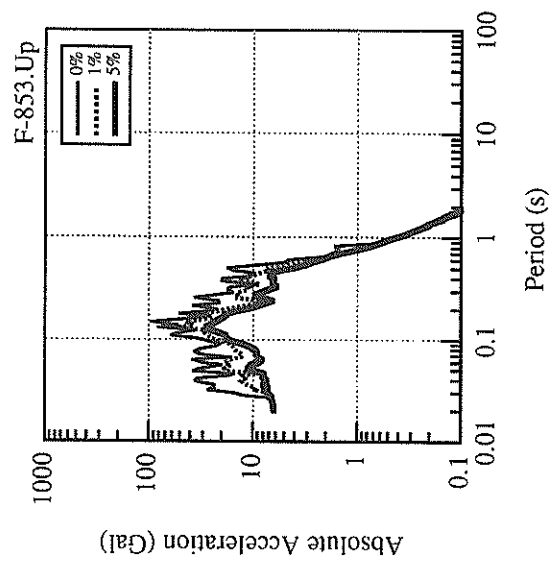
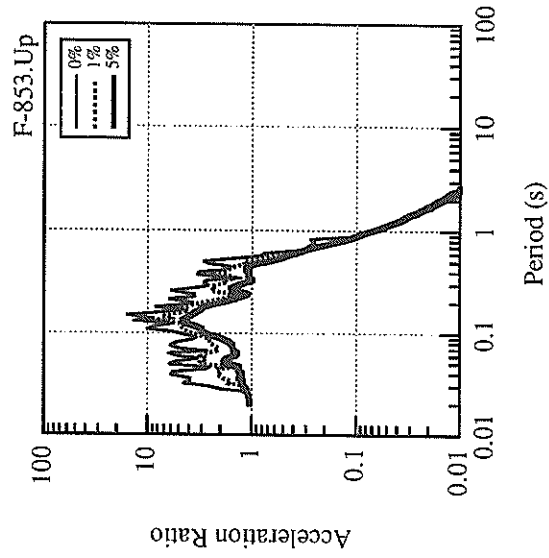
* RESULTANT OF HORIZONTAL COMPONENTS

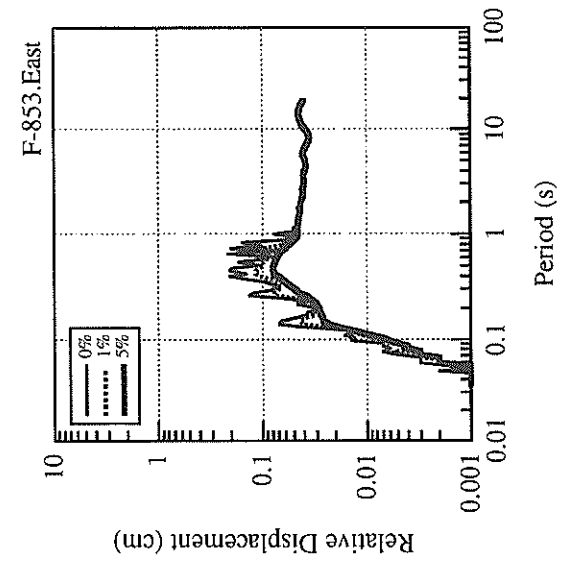
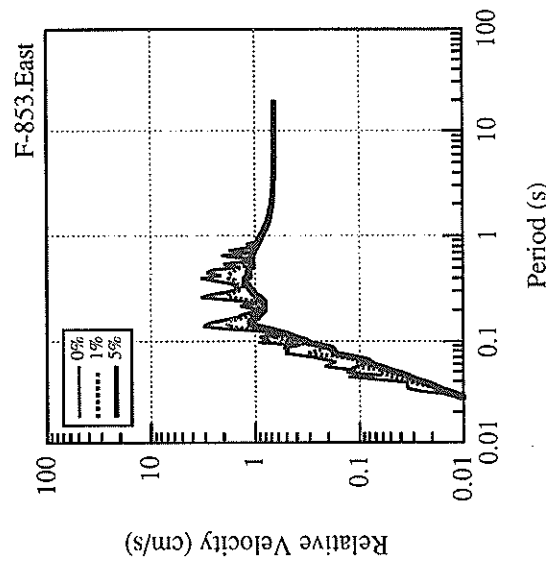
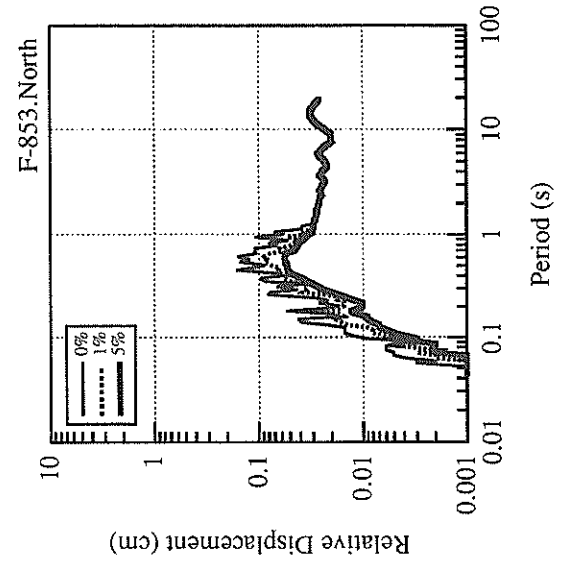
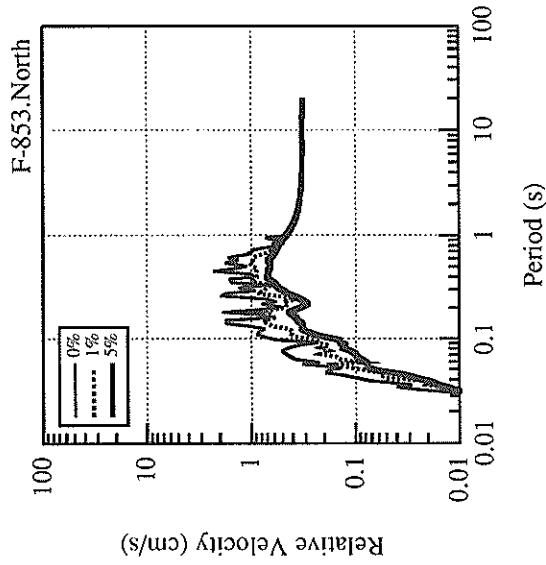
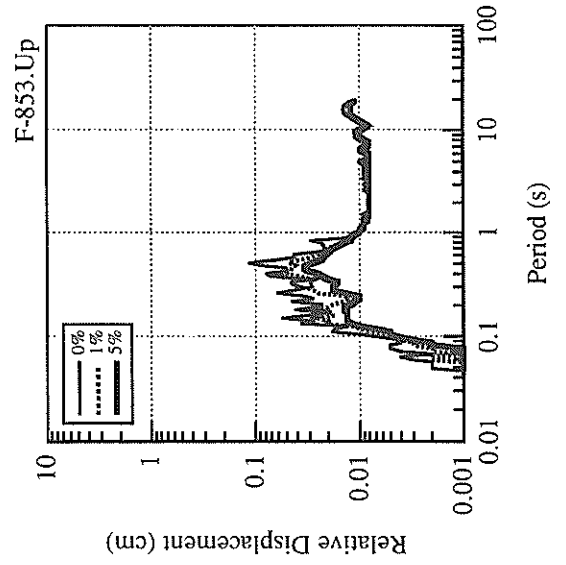
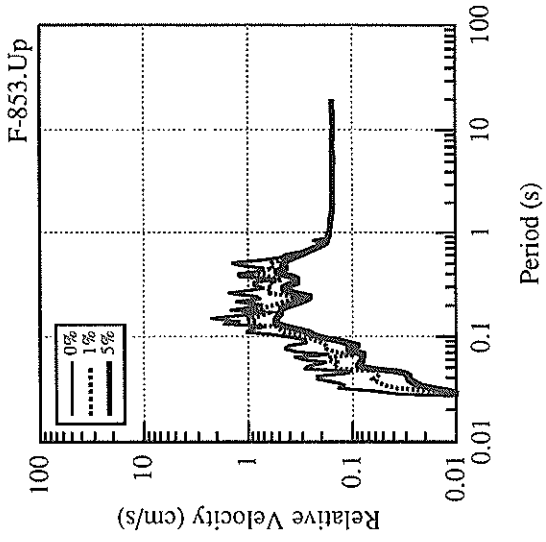


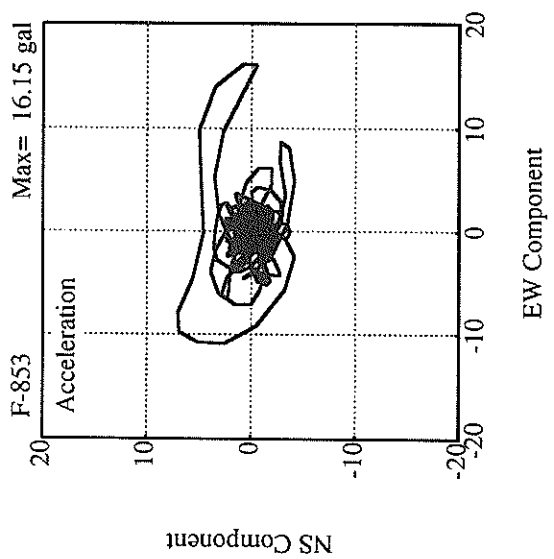
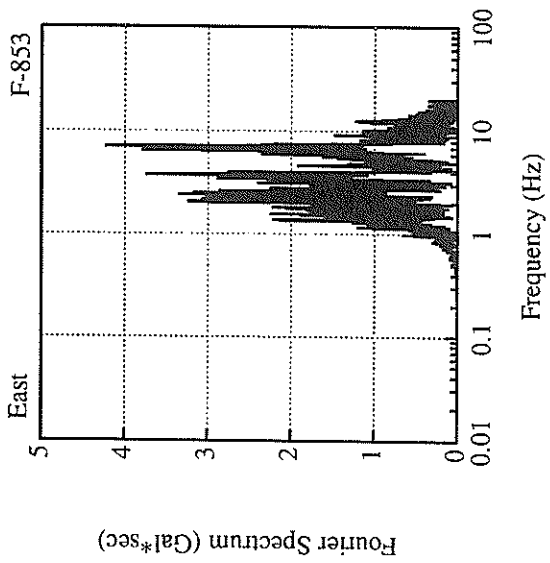
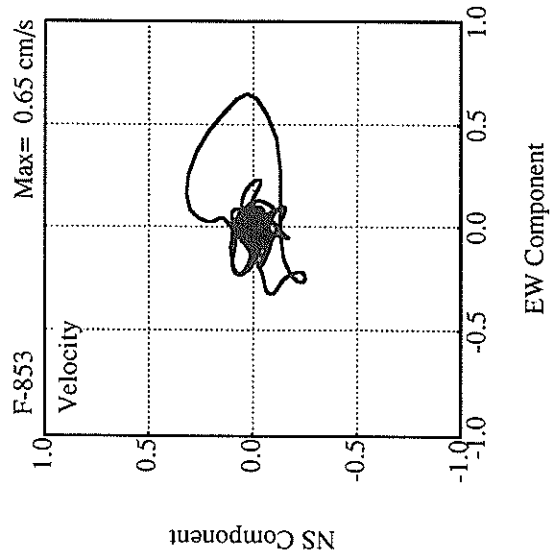
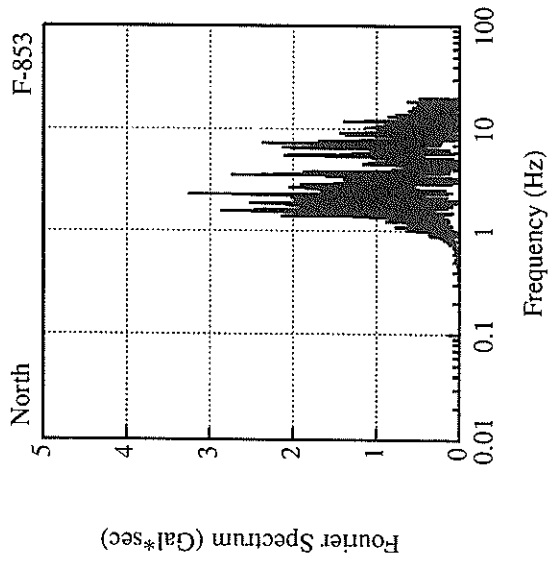
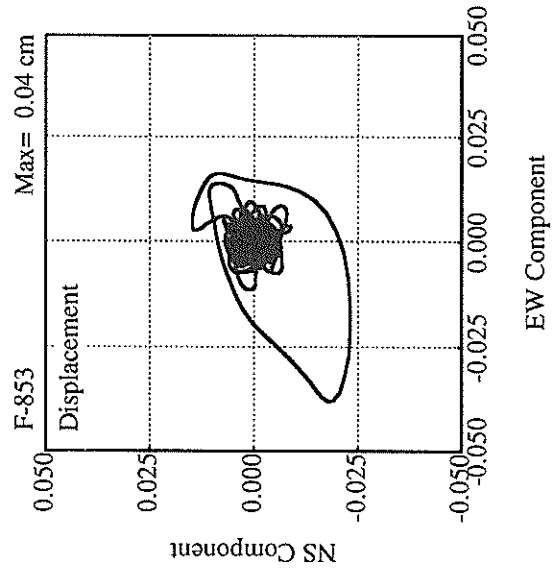
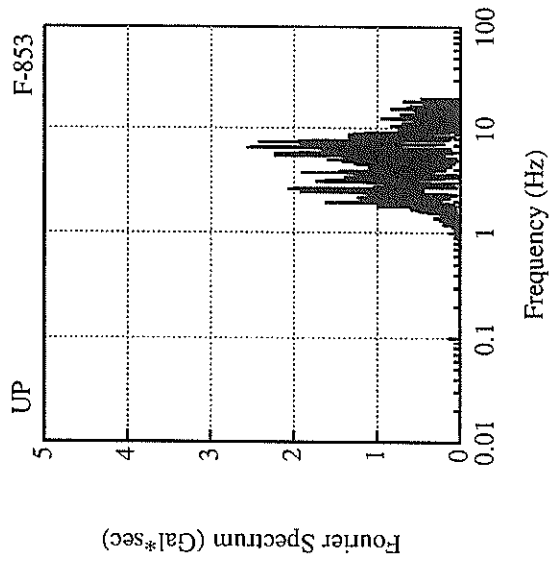












RECORD NUMBER : F-855
 STATION : OSAKA-JI-G

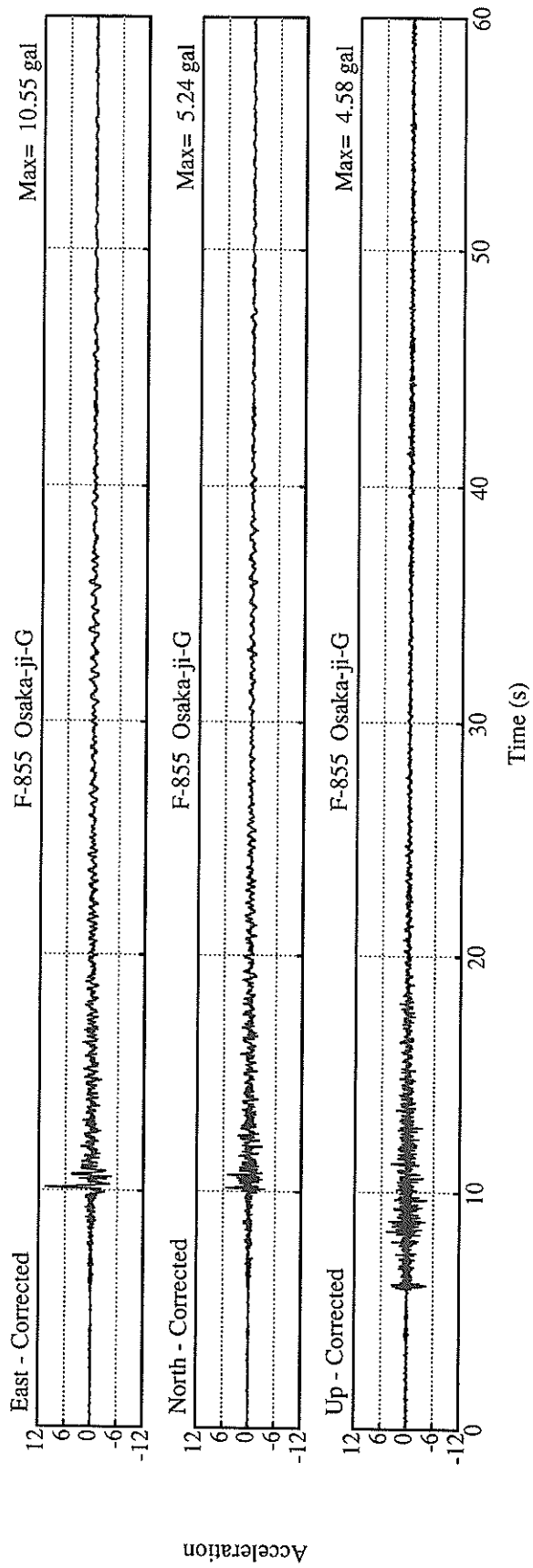
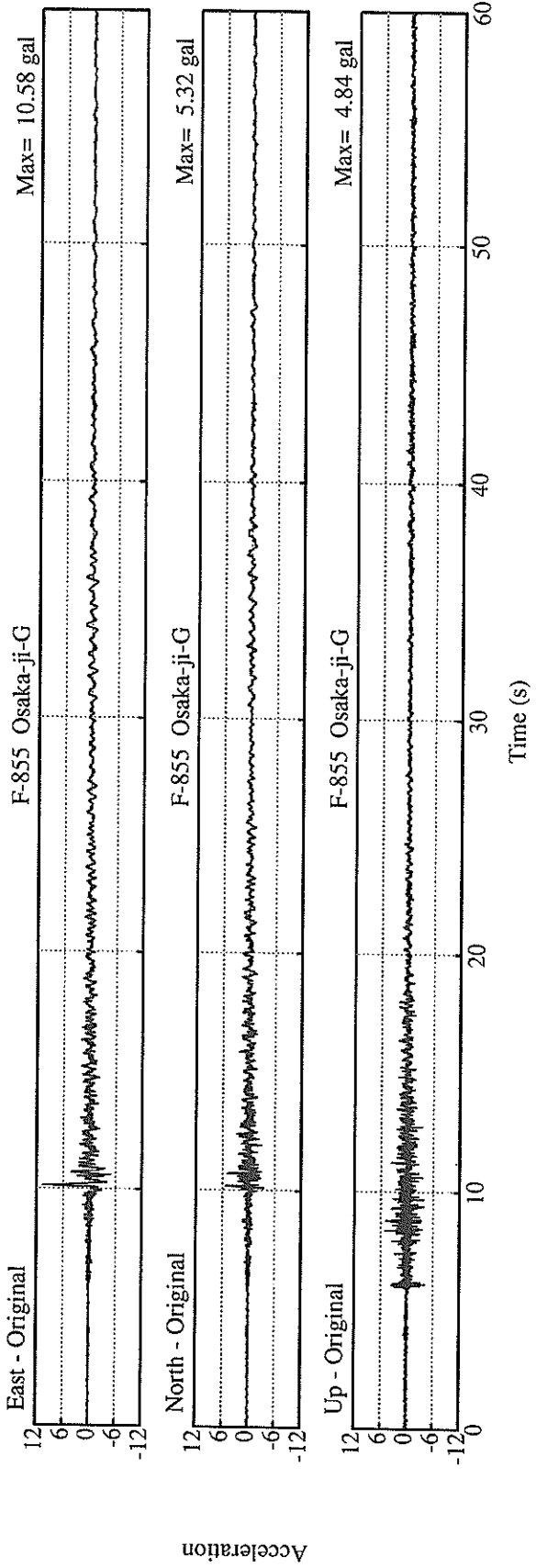
EARTHQUAKE DATA

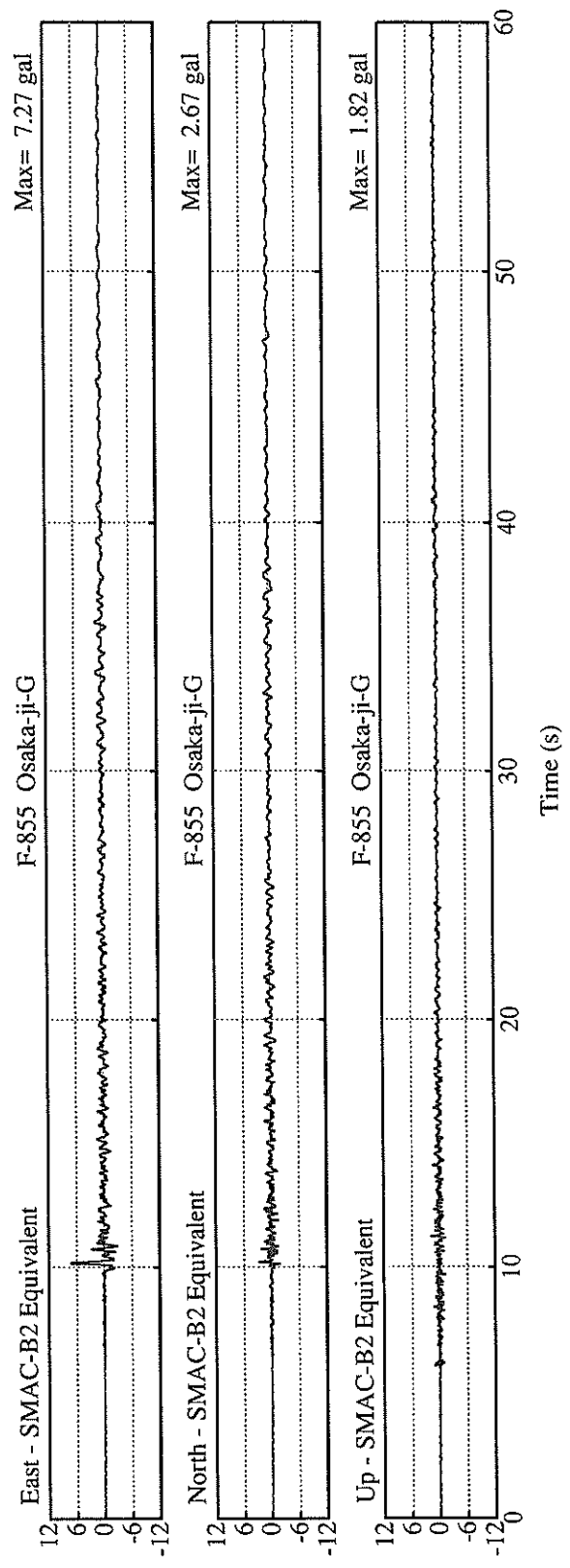
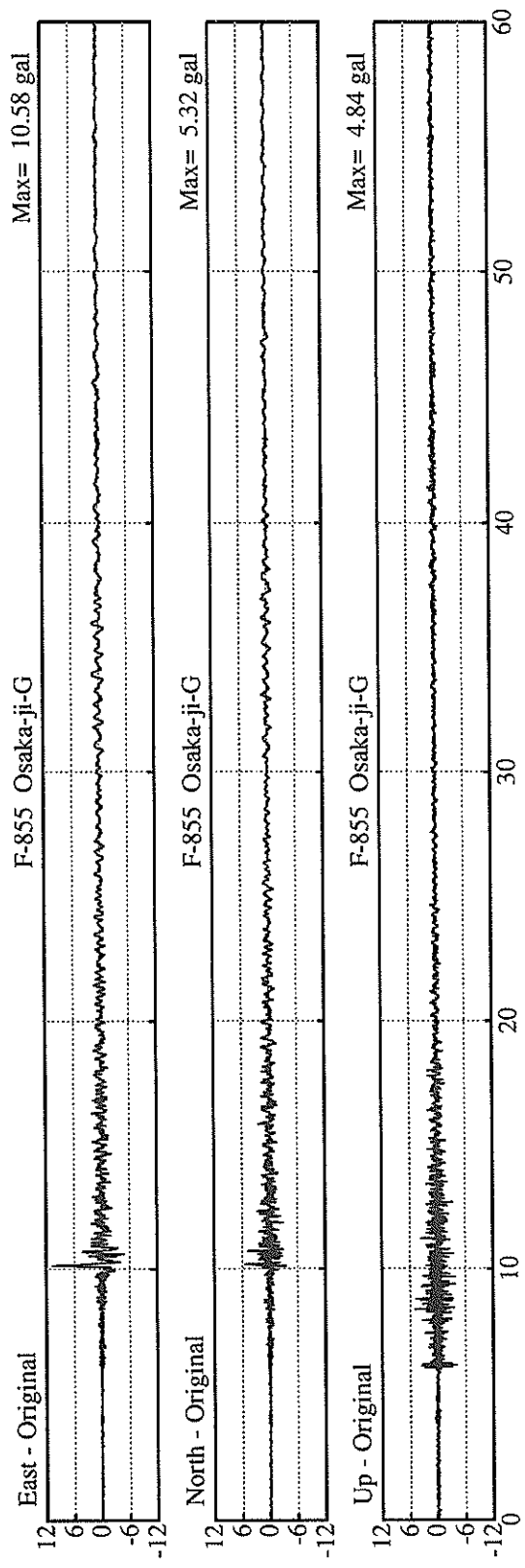
```
*****
DATE AND TIME           10:50 APR 6,1995
LOCATION OF HYPOCENTER
  EPICENTRAL REGION     SE HYOGO PREF
  LATITUDE              34°47.5' N
  LONGITUDE             135°19.3' E
  DEPTH                 11.8KM
  JMA MAGNITUDE         4.0
*****
```

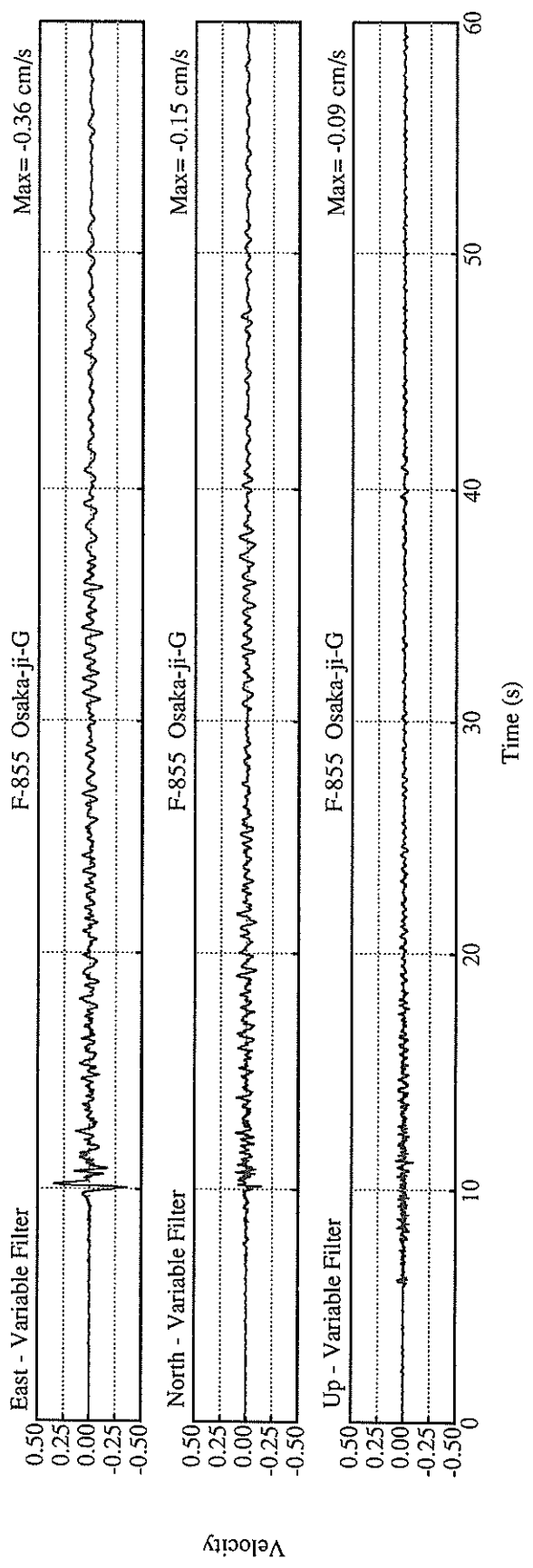
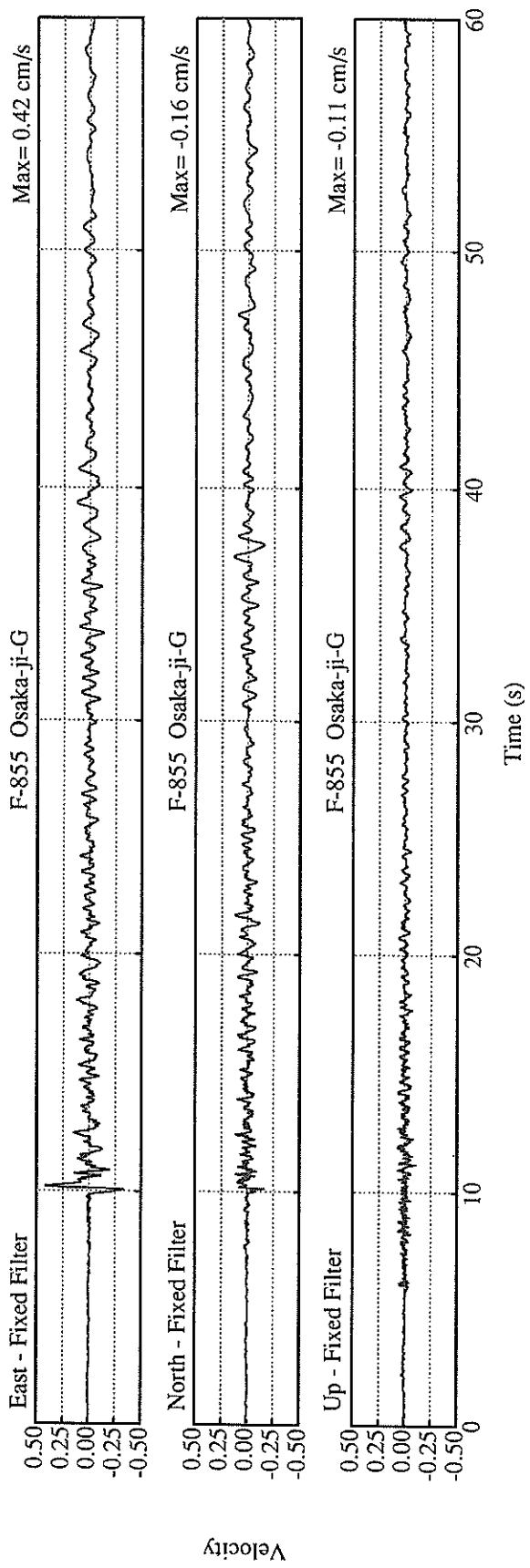
PEAK VALUES OF COMPONENTS

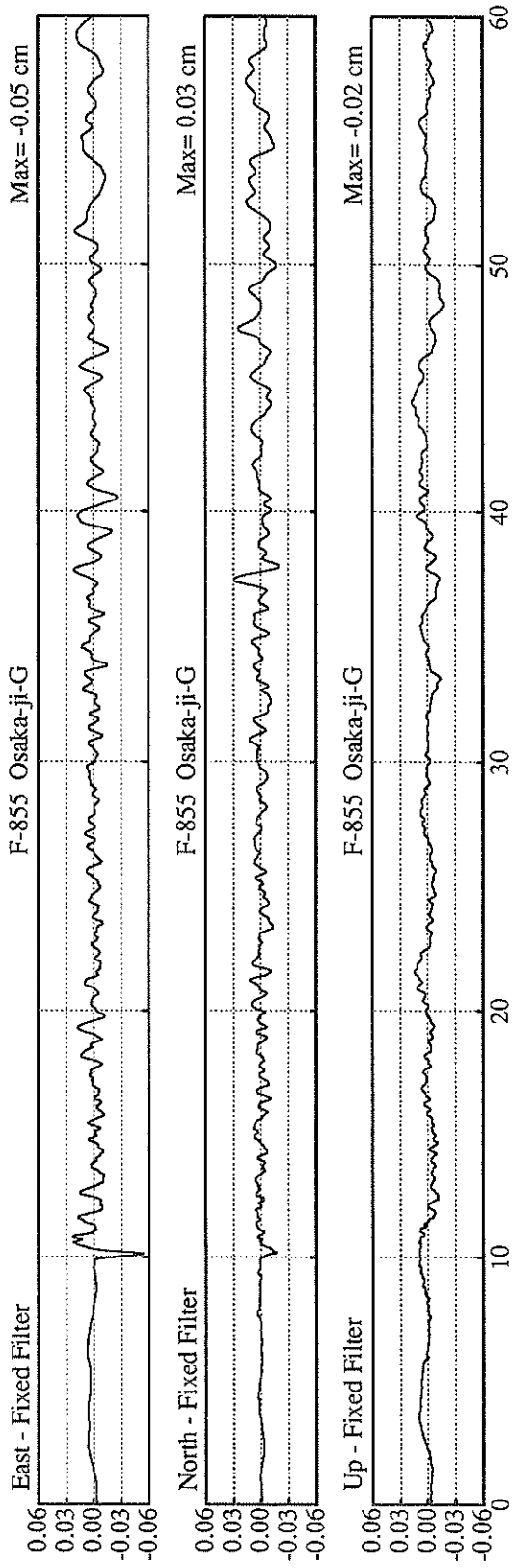
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.933	0.781	1.476	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	2.7	7.3	1.8	7.4
ORIGINAL	5.3	10.6	4.8	10.8
CORRECTED	5.2	10.5	4.6	10.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.16	0.42	0.11	0.42
VARIABLE FILTER	0.15	0.36	0.09	0.36
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.03	0.05	0.02	0.06
VARIABLE FILTER	0.01	0.04	0.00	0.04

* RESULTANT OF HORIZONTAL COMPONENTS

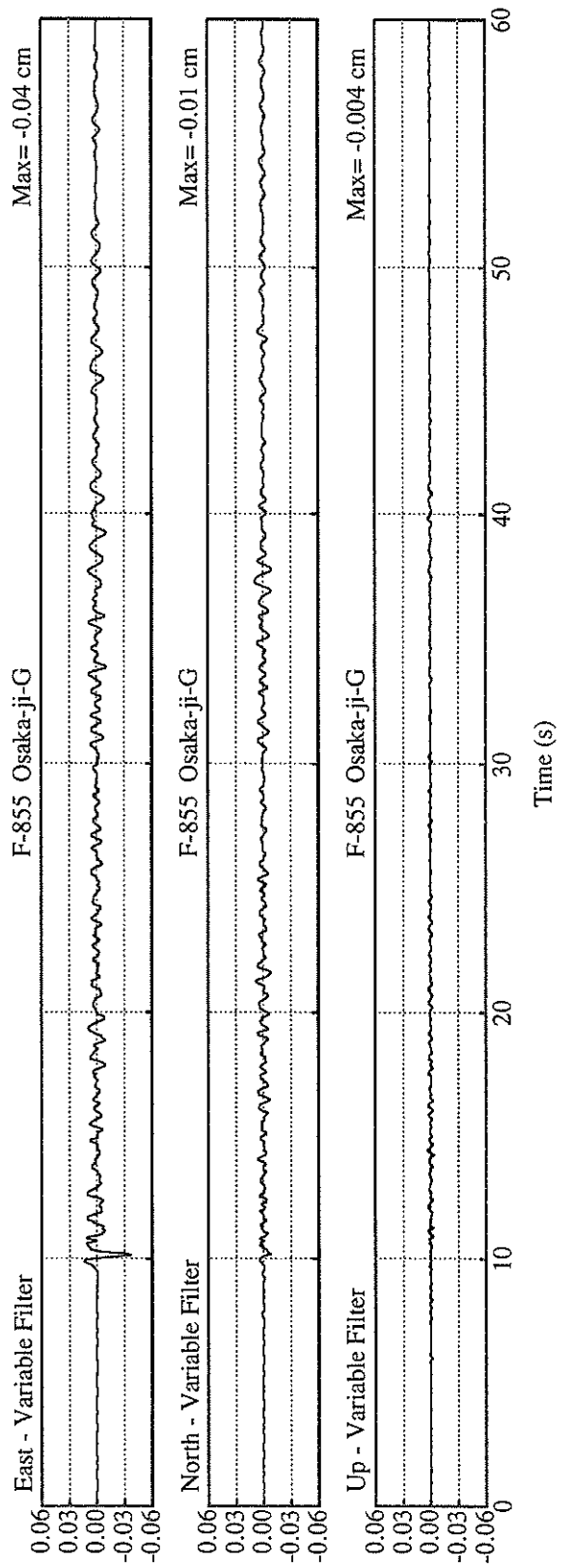




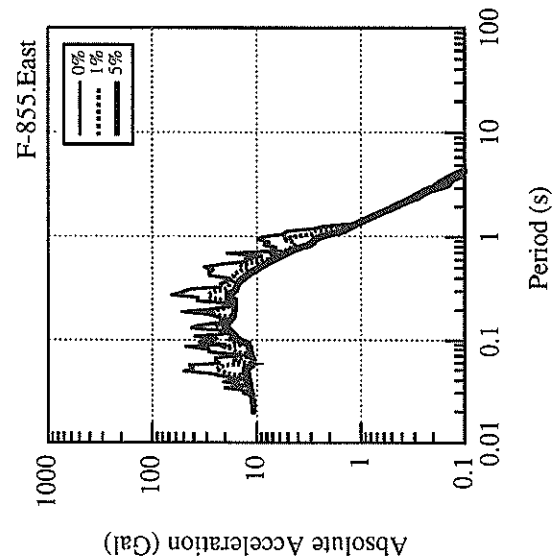
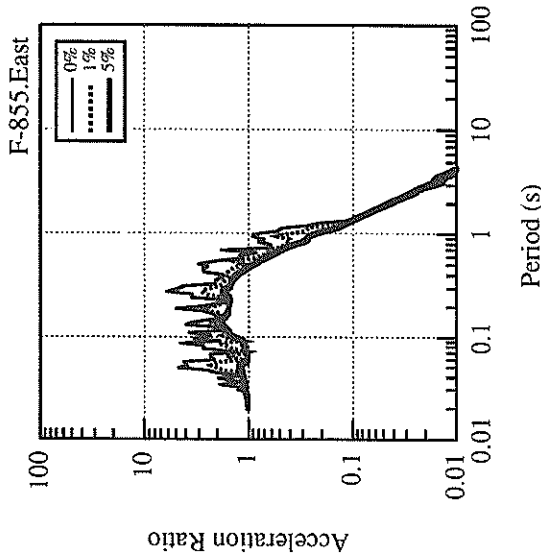
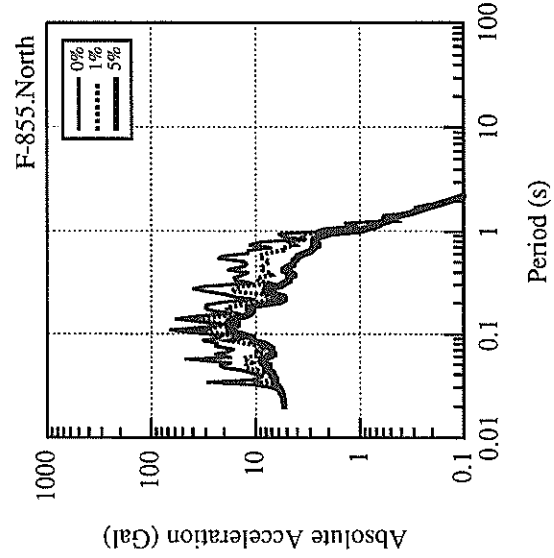
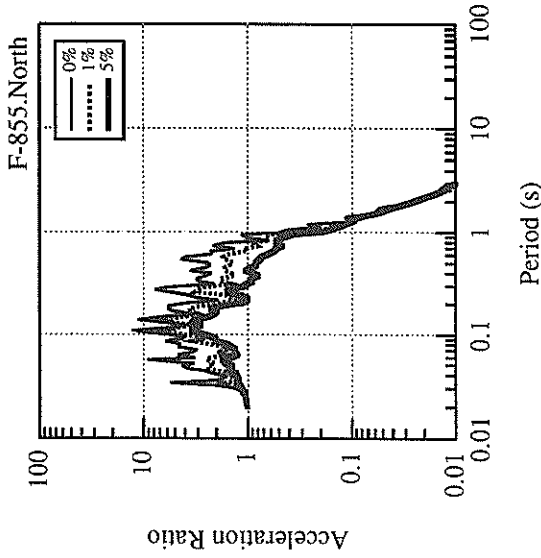
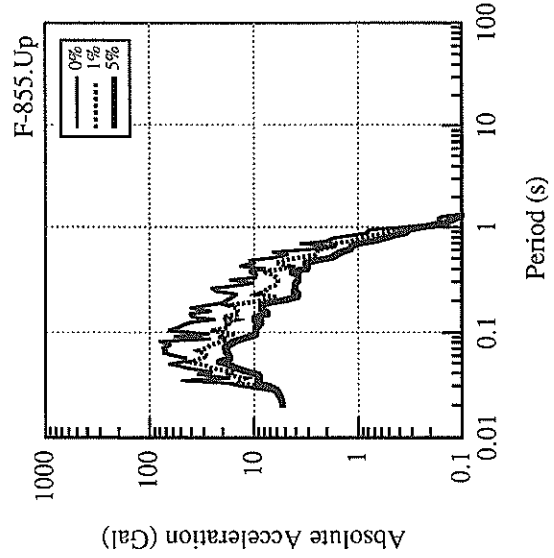
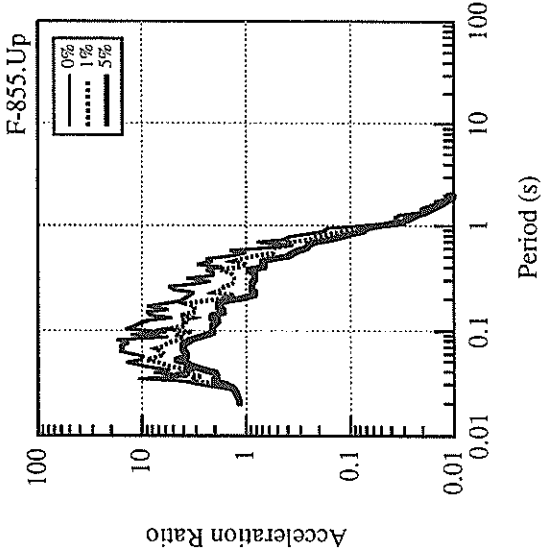


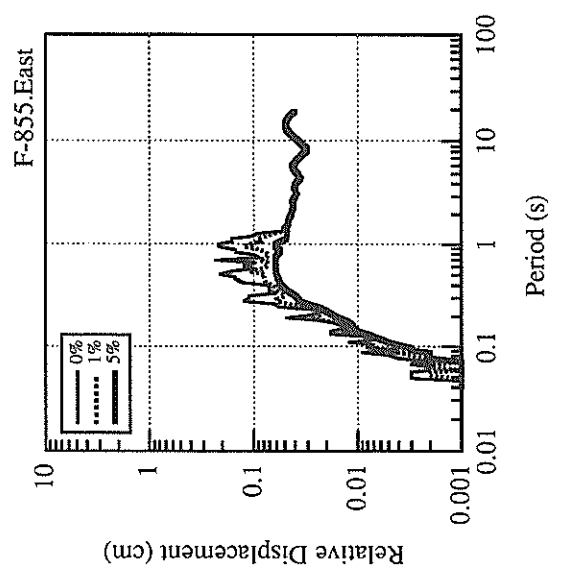
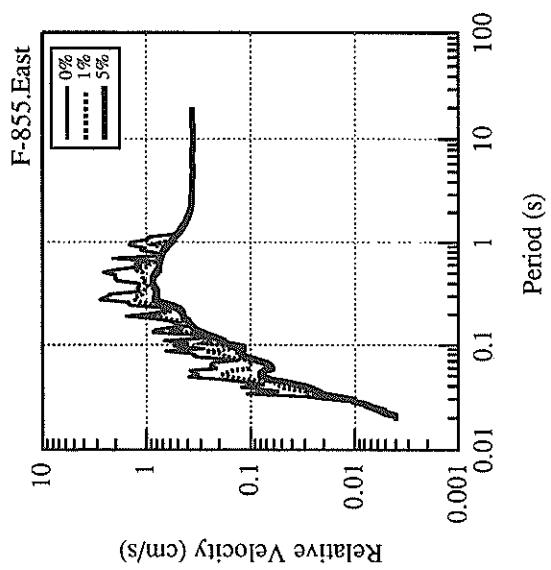
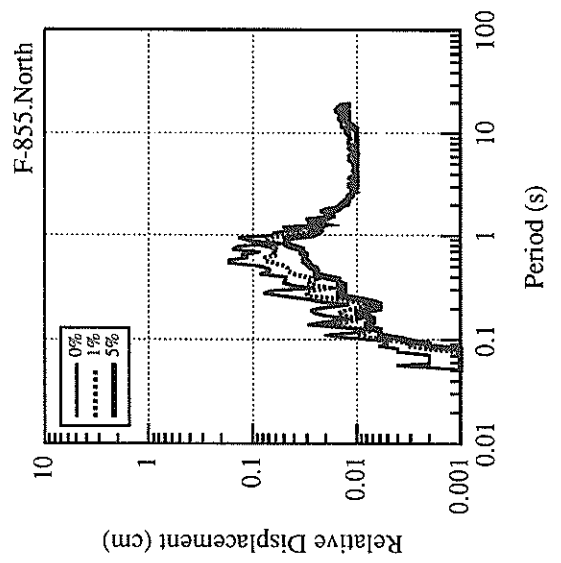
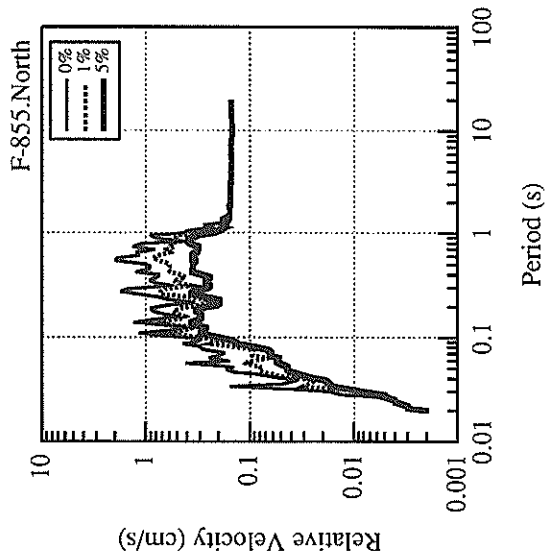
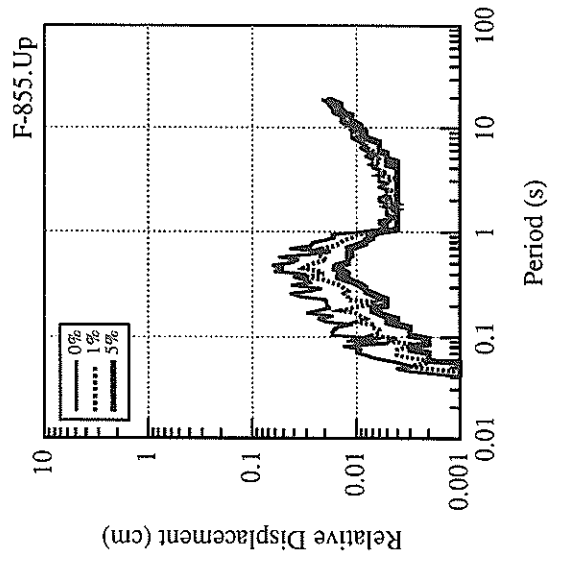
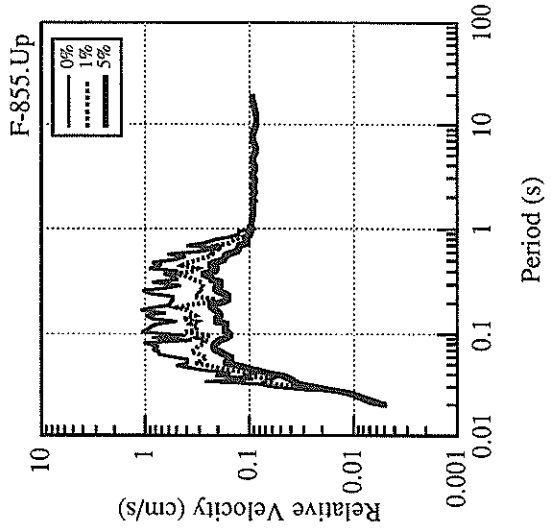


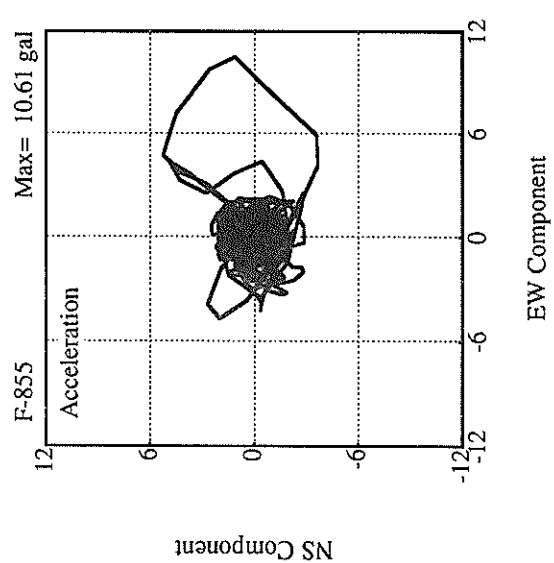
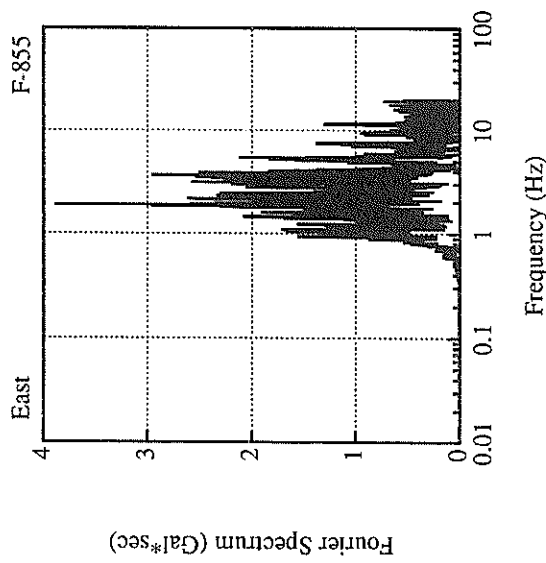
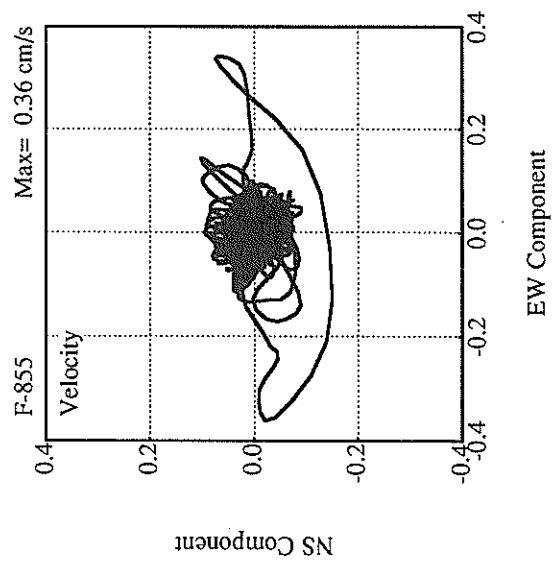
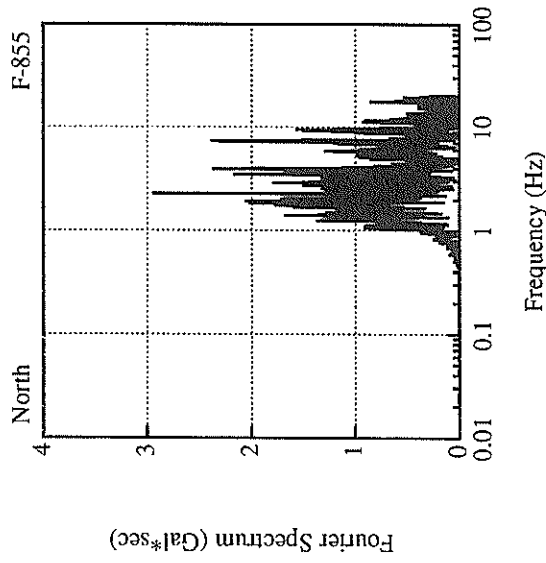
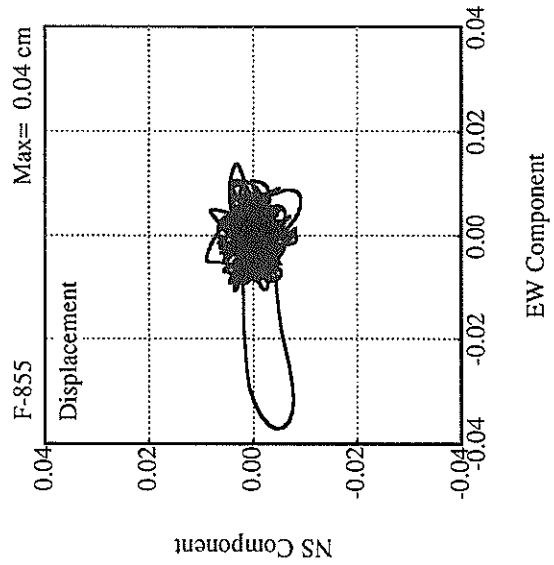
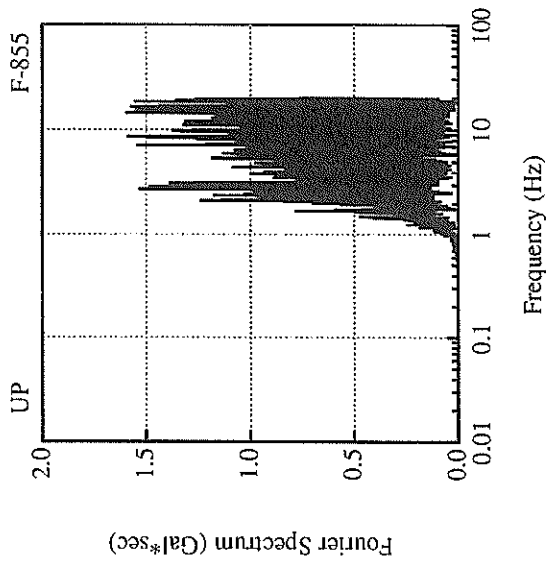
Displacement



Displacement







RECORD NUMBER : F-932
 STATION : AMAGASAKI-G

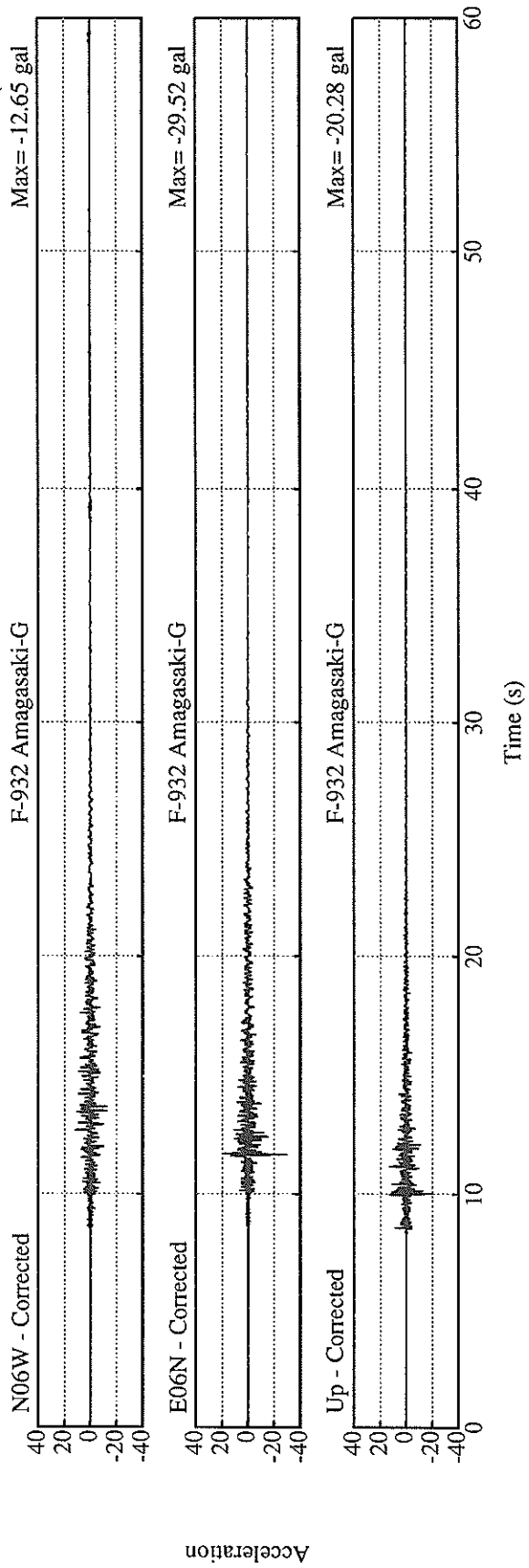
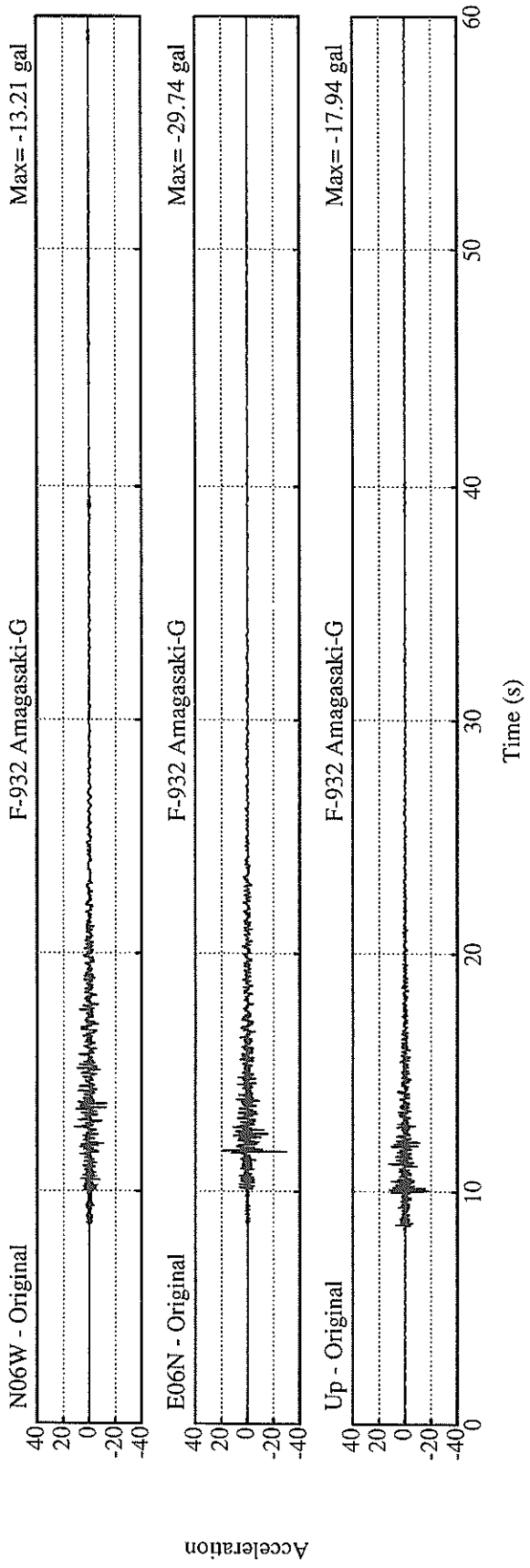
EARTHQUAKE DATA

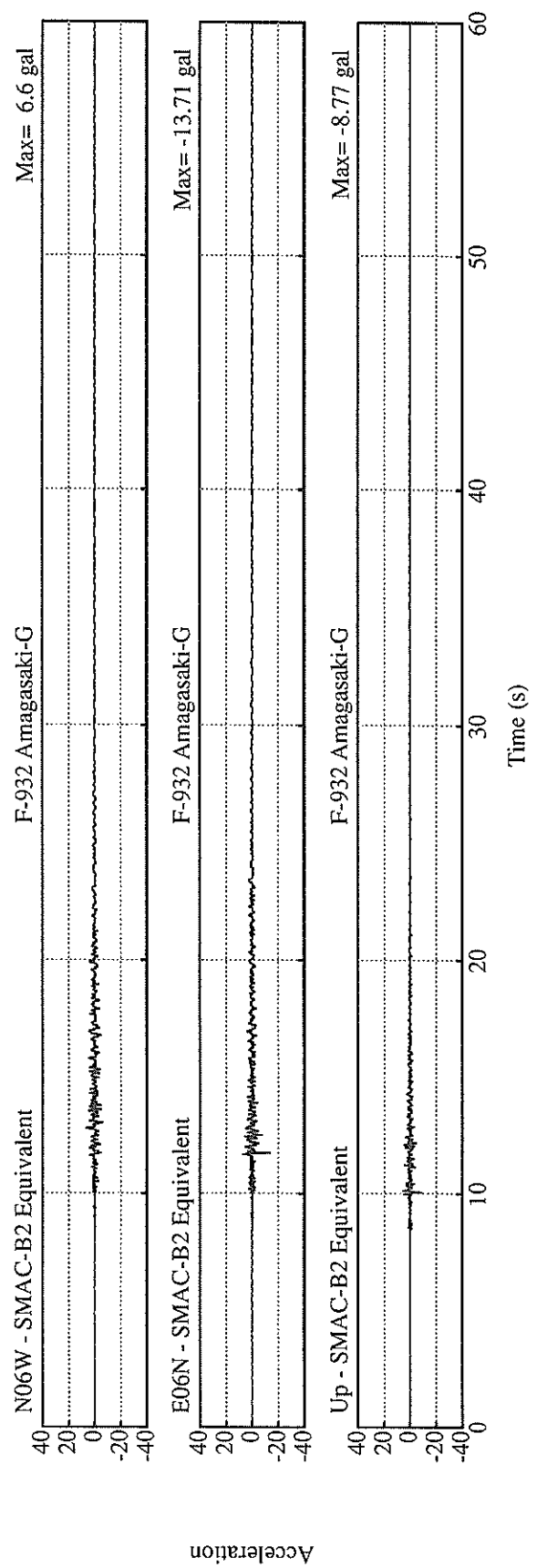
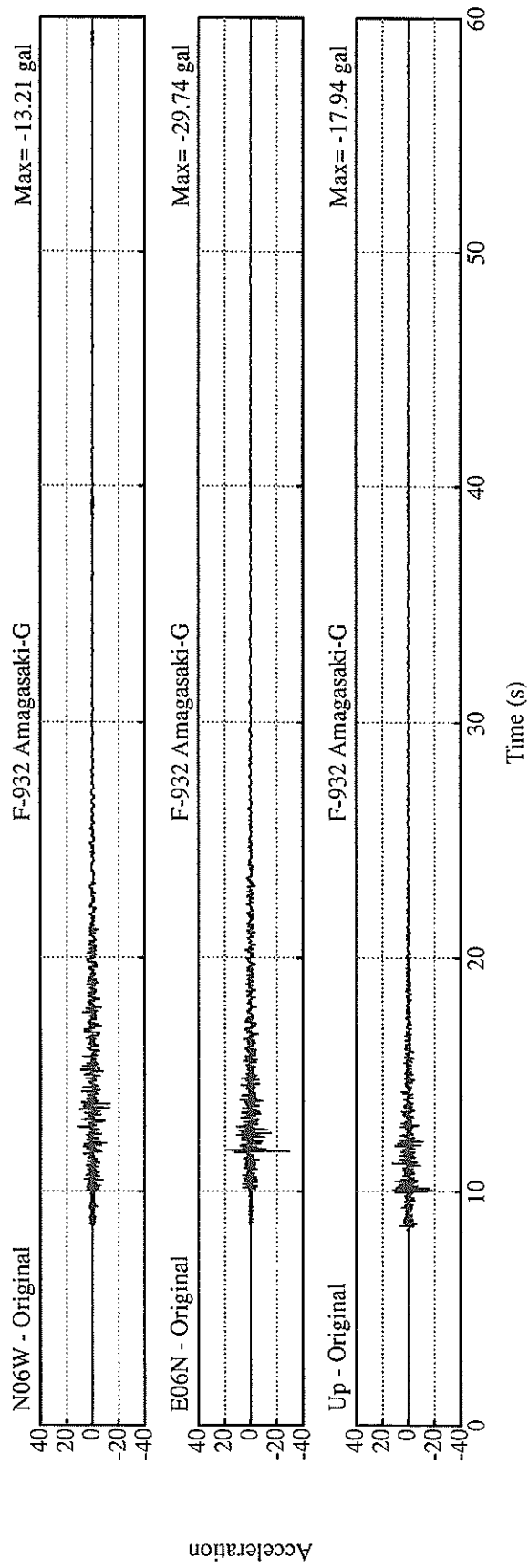
 DATE AND TIME 7:55 JUNE16,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°45.8' N
 LONGITUDE 135°17.6' E
 DEPTH 12.5KM
 JMA MAGNITUDE 3.8

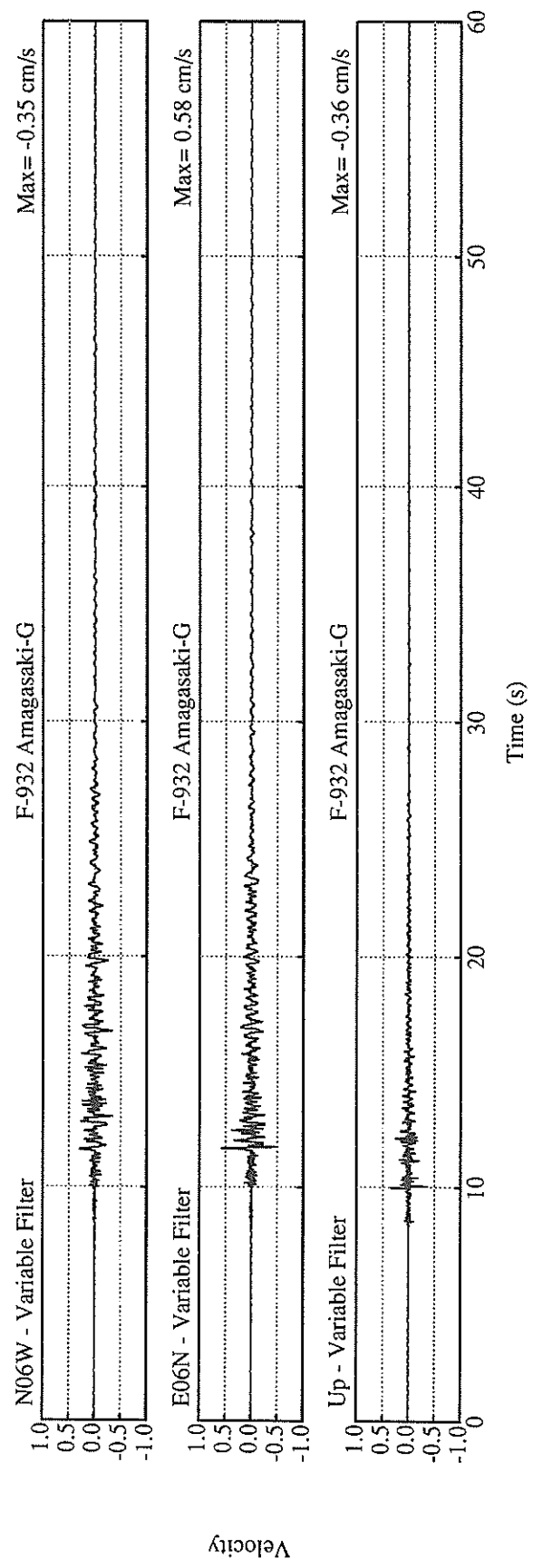
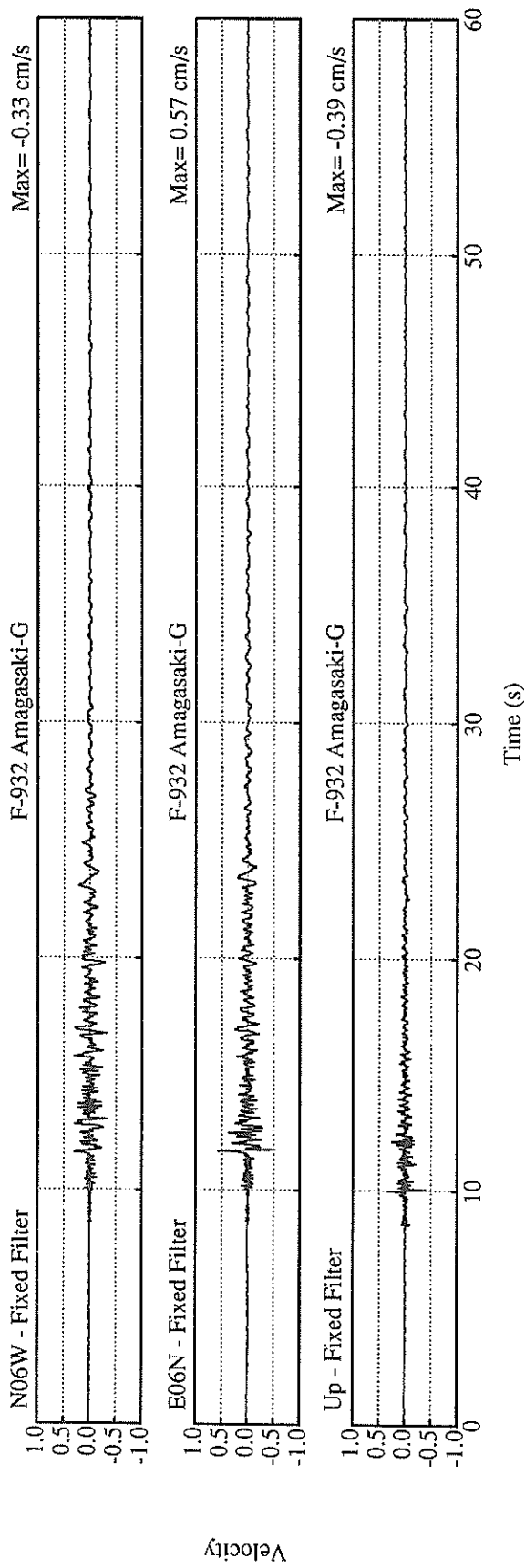
PEAK VALUES OF COMPONENTS

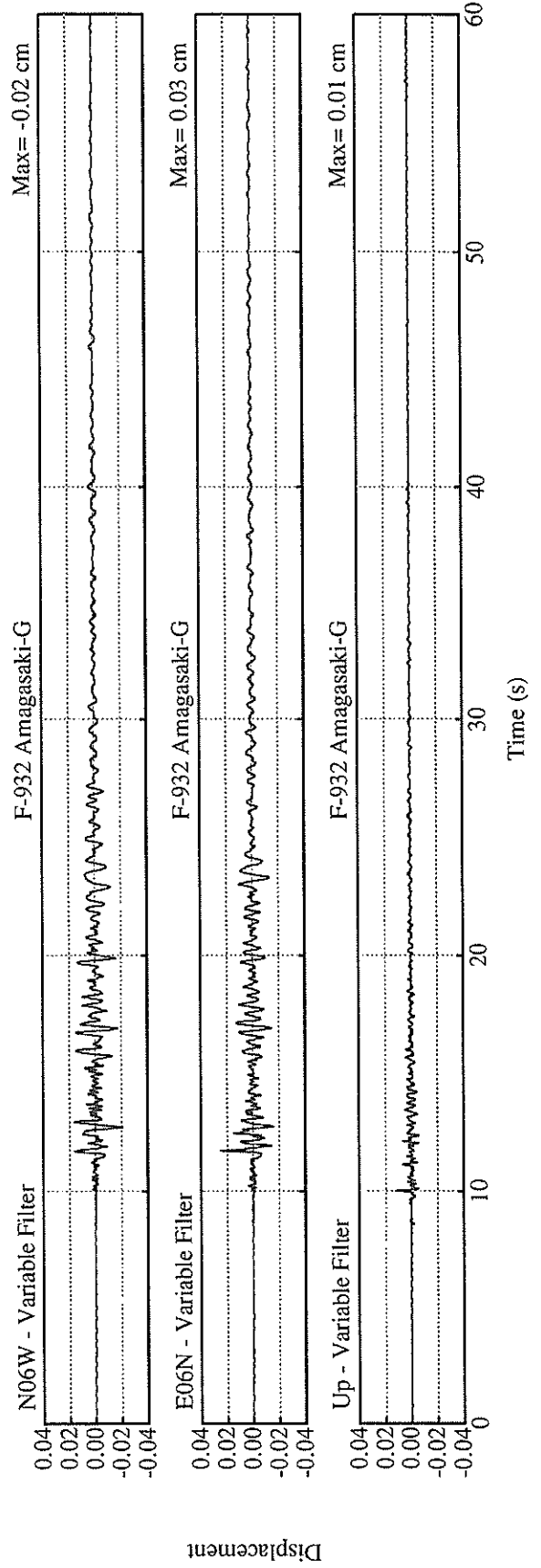
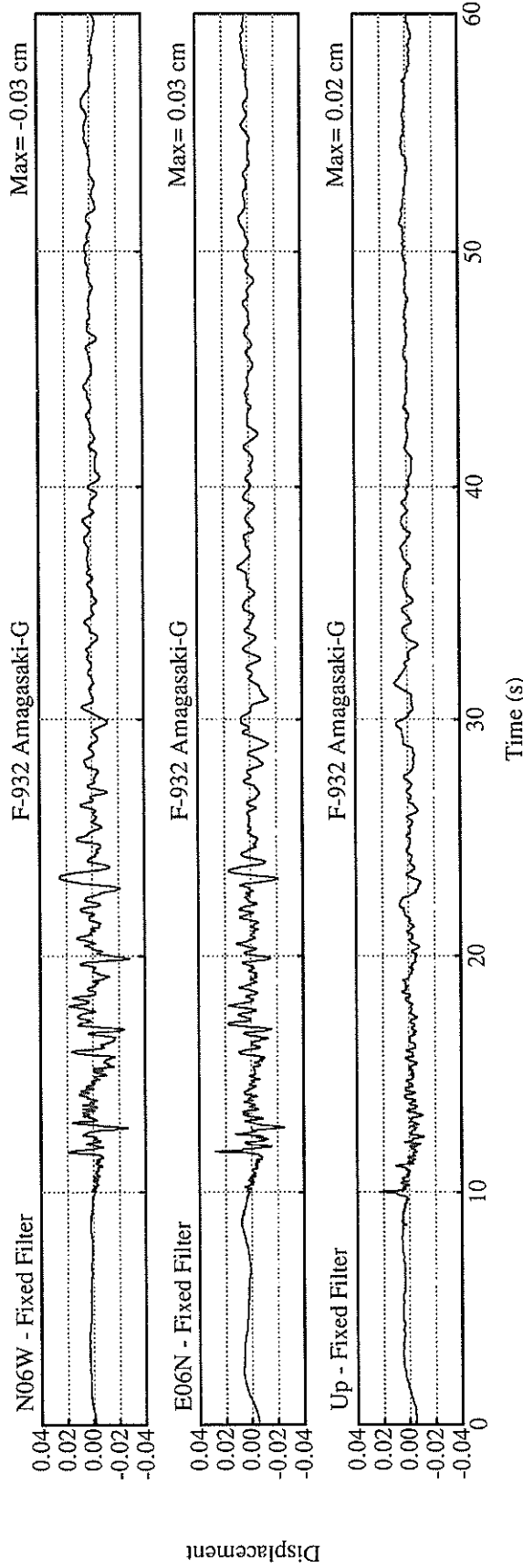
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.000	1.104	1.714	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	6.6	13.7	8.8	14.0
ORIGINAL	13.2	29.7	17.9	30.0
CORRECTED	12.6	29.5	20.3	29.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.33	0.57	0.39	0.57
VARIABLE FILTER	0.35	0.58	0.36	0.58
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.03	0.03	0.02	0.04
VARIABLE FILTER	0.02	0.03	0.01	0.03

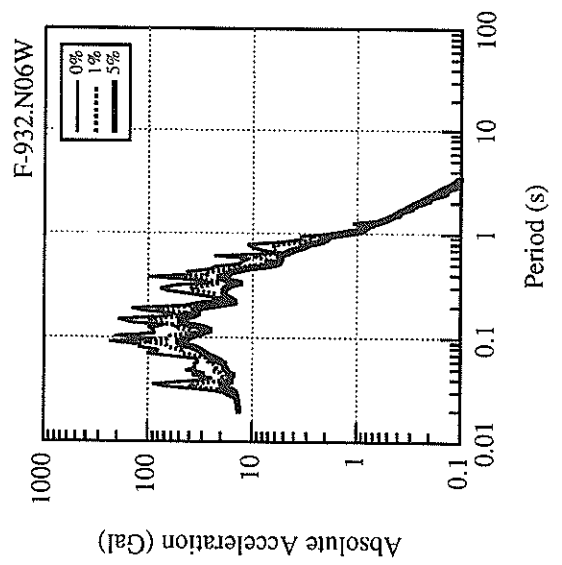
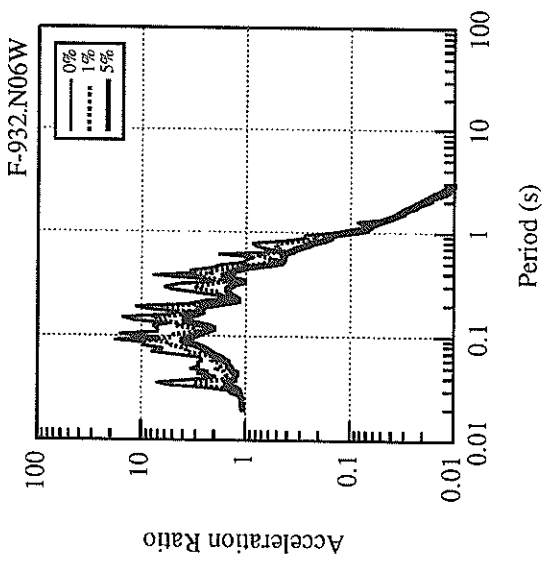
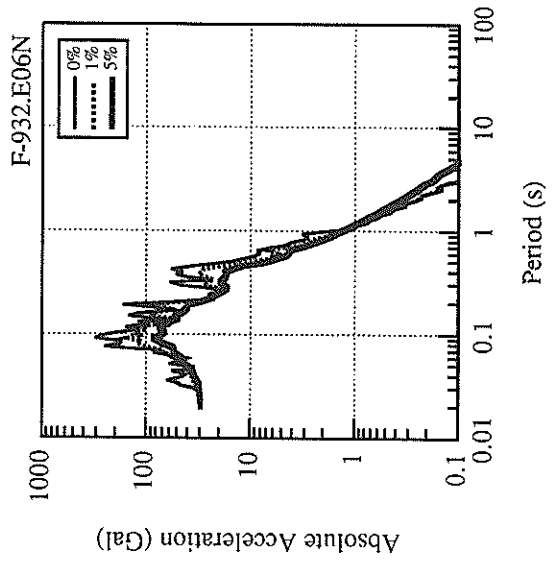
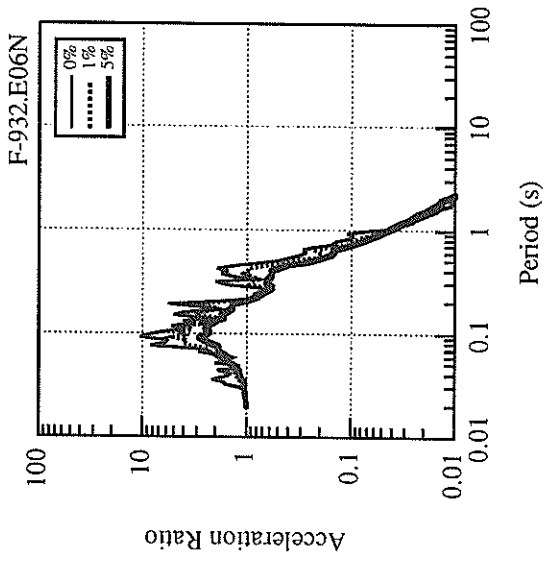
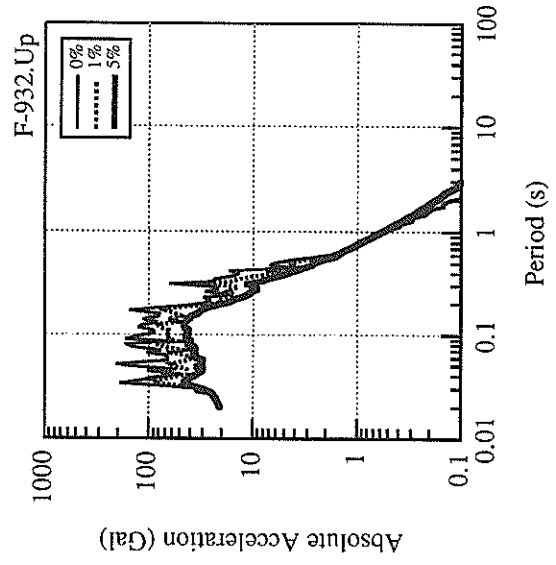
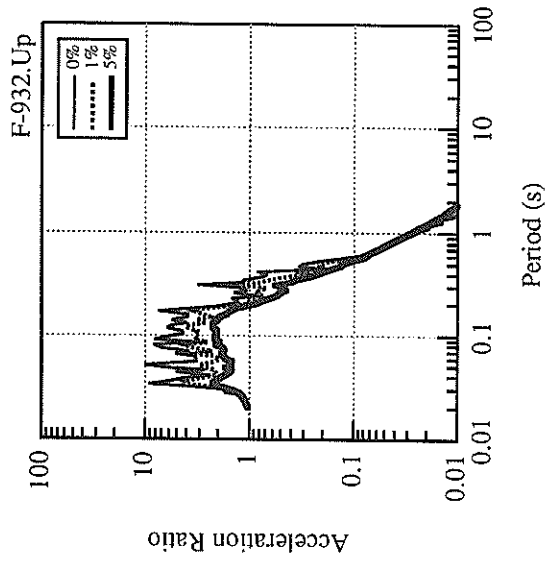
* RESULTANT OF HORIZONTAL COMPONENTS

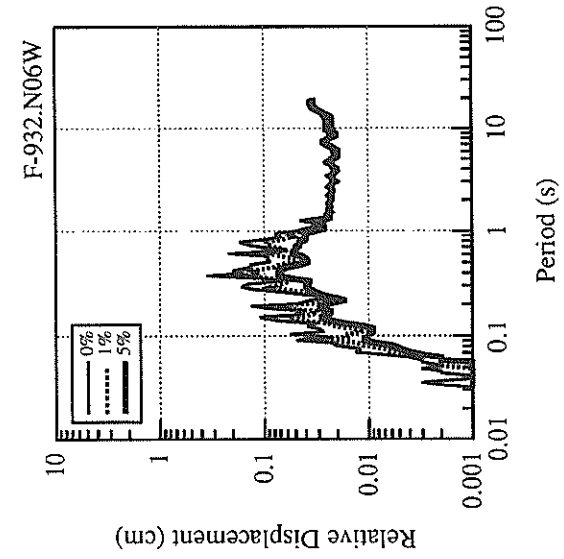
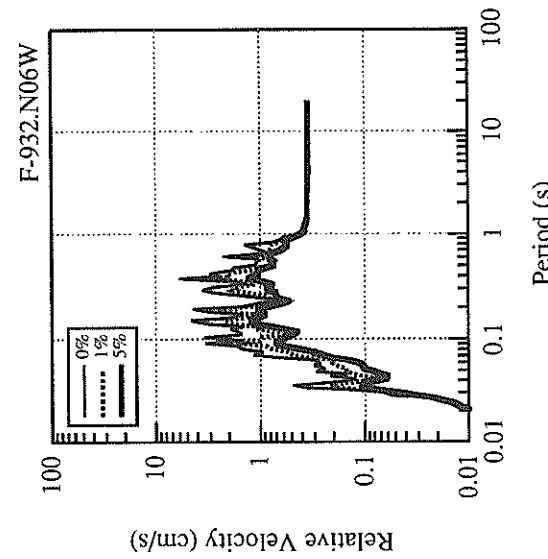
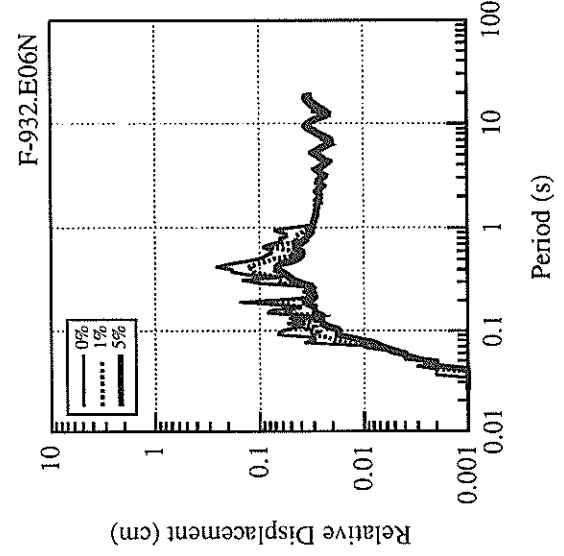
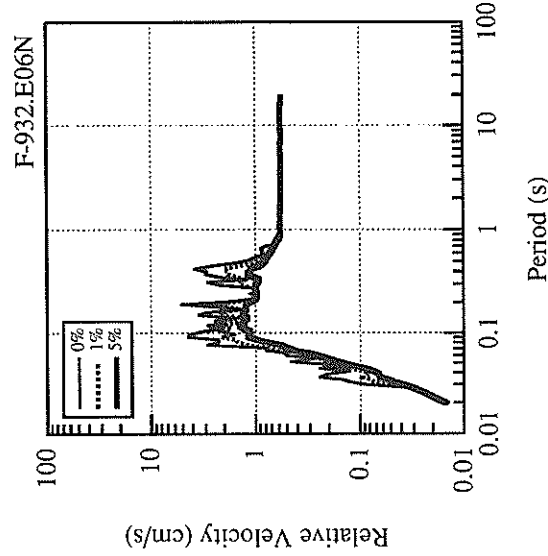
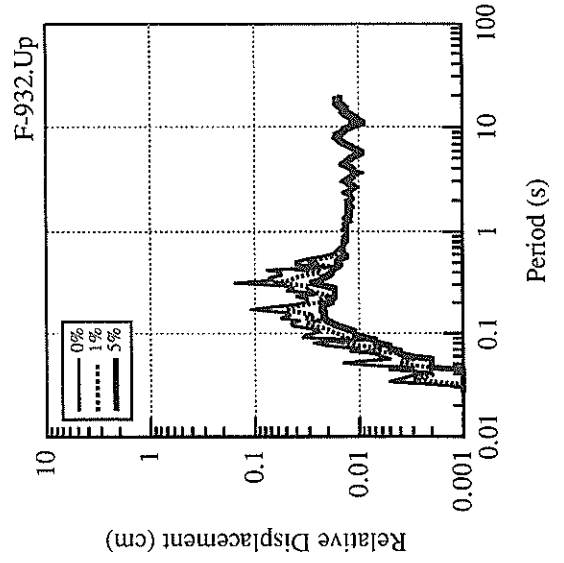
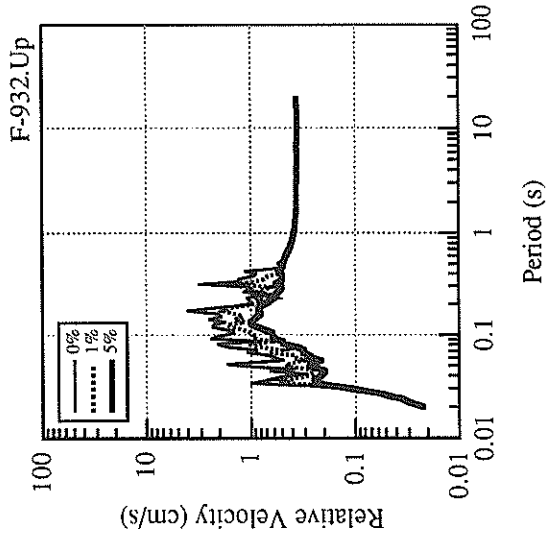


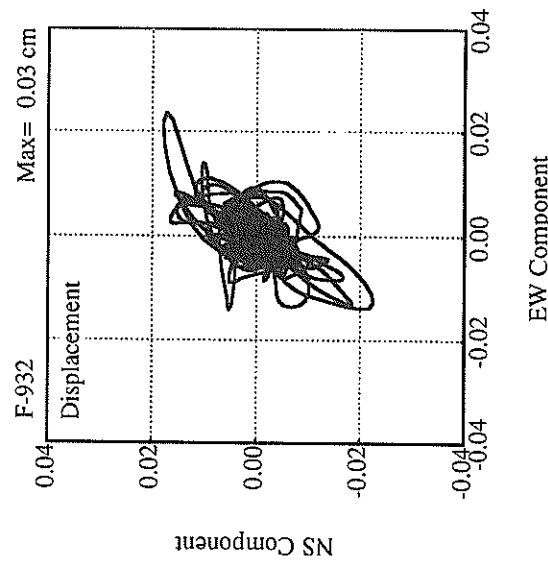
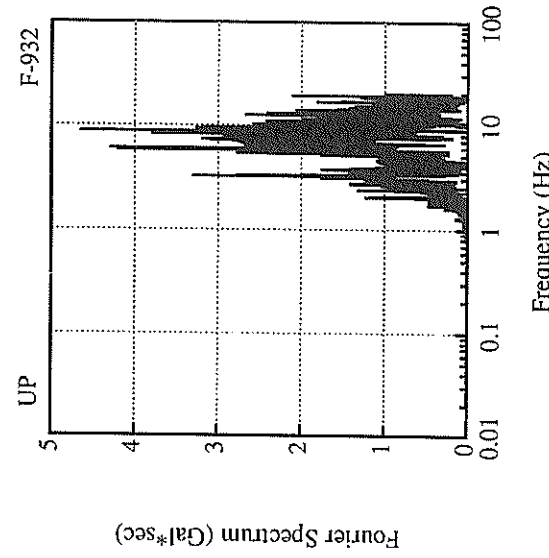
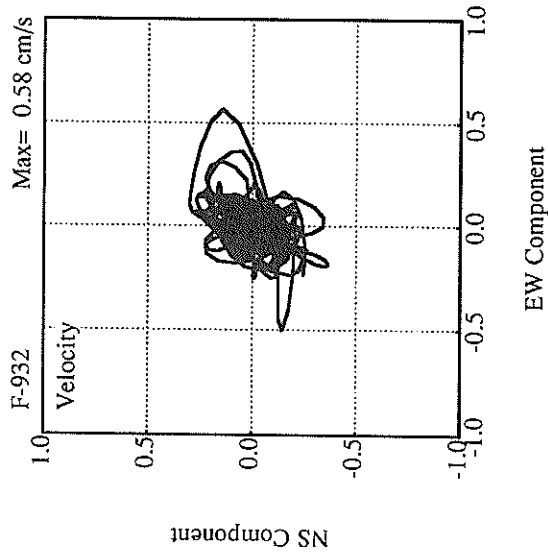
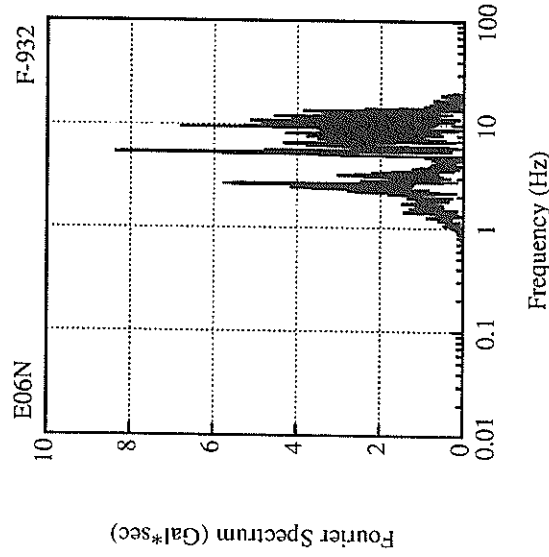
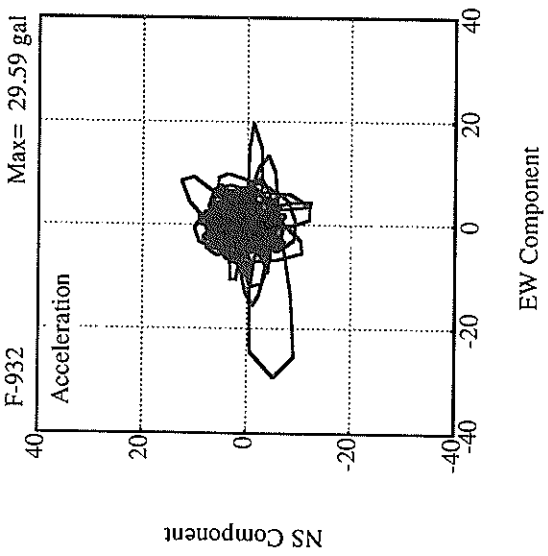
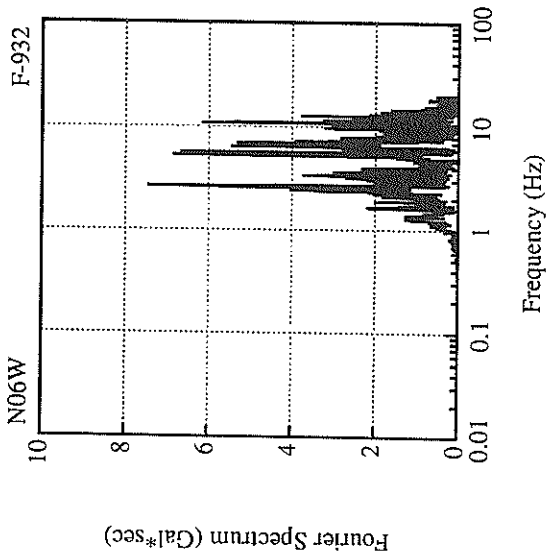












RECORD NUMBER : F-933
 STATION : AMAGASAKI-G

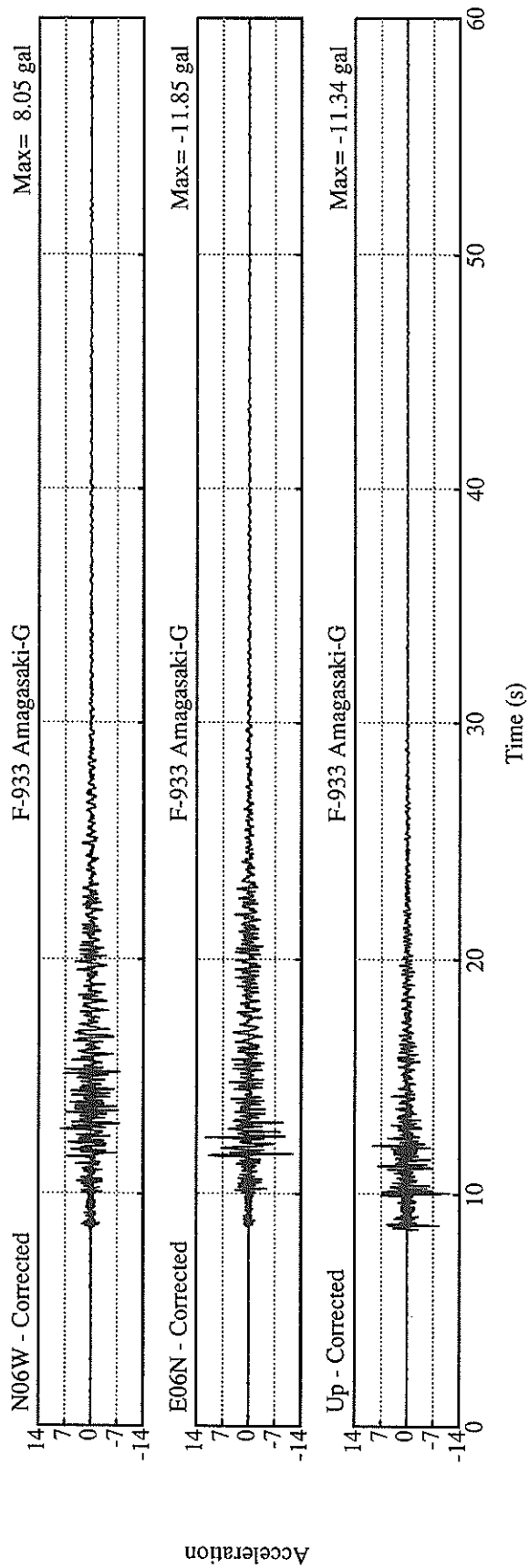
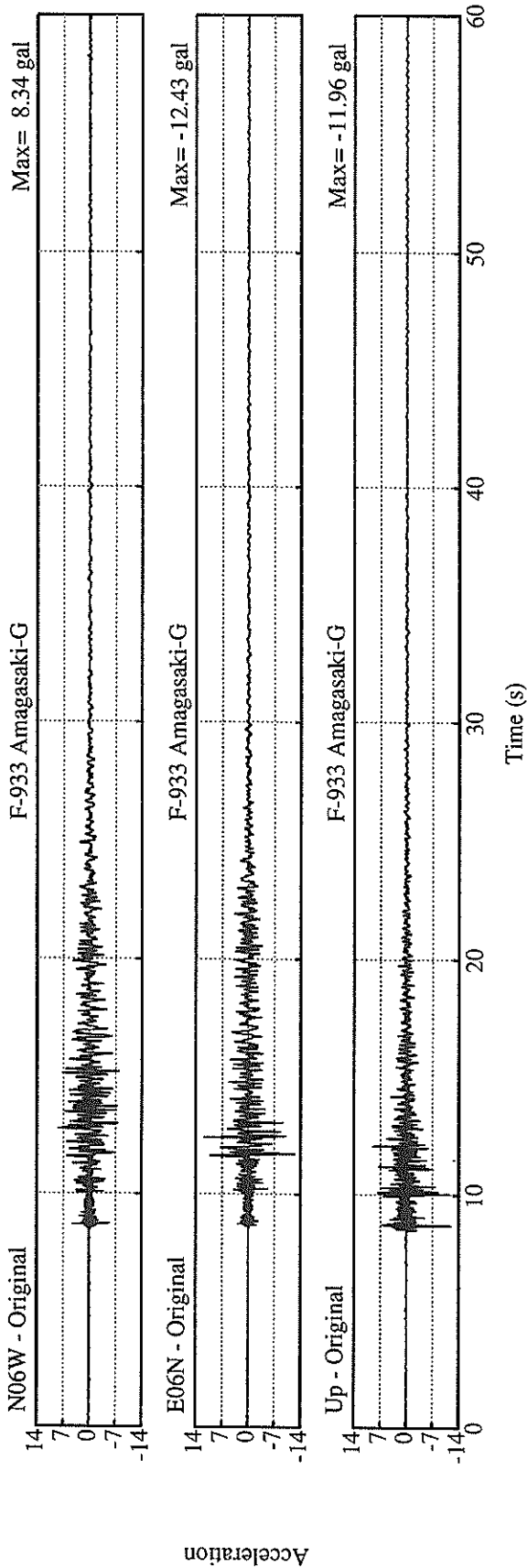
EARTHQUAKE DATA

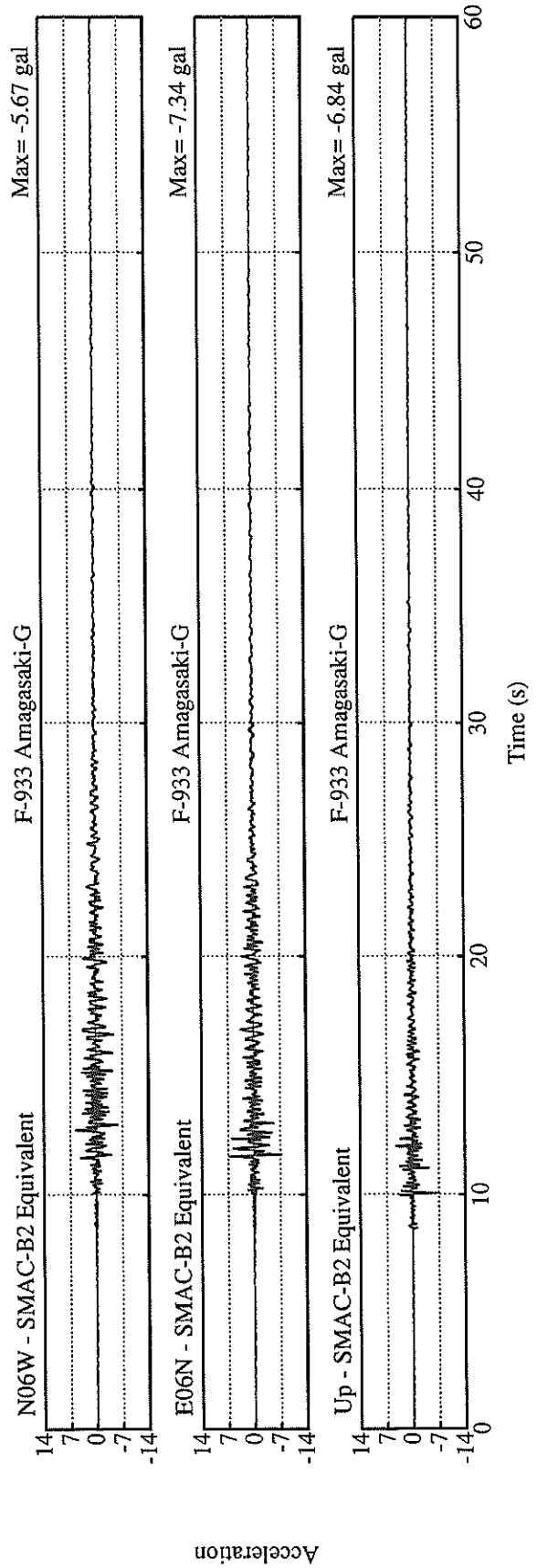
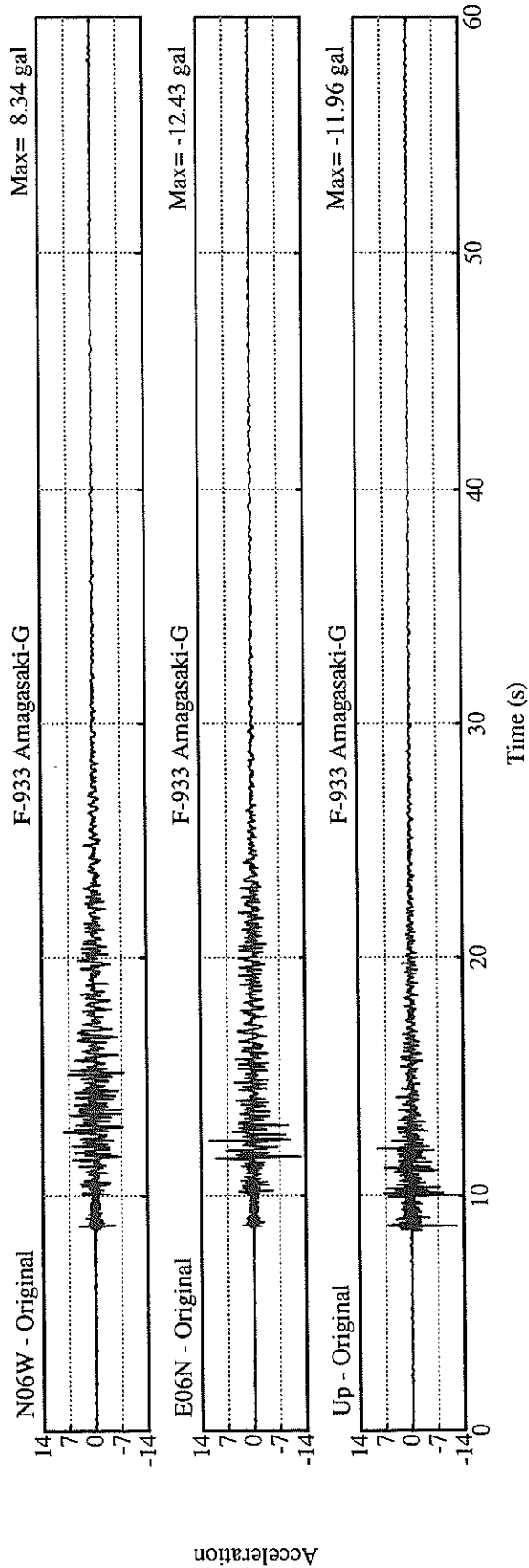
 DATE AND TIME 22:19 JUNE23,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION SE HYOGO PREF
 LATITUDE 34°45.5' N
 LONGITUDE 135°17.4' E
 DEPTH 13.2KM
 JMA MAGNITUDE 3.7

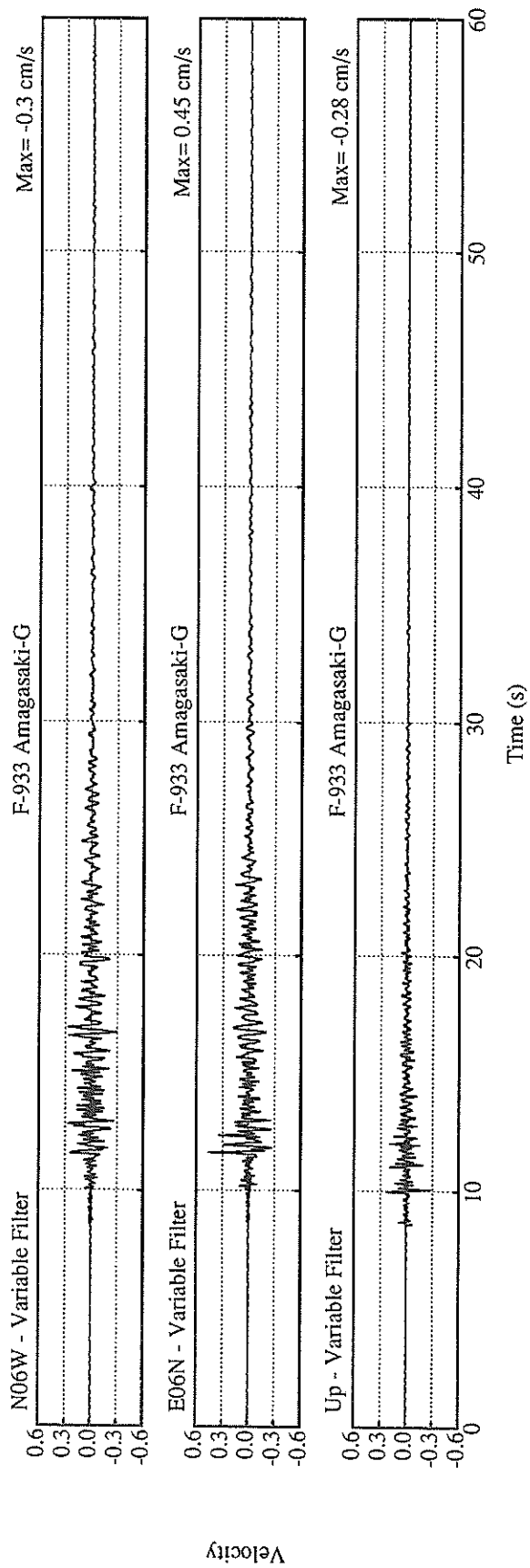
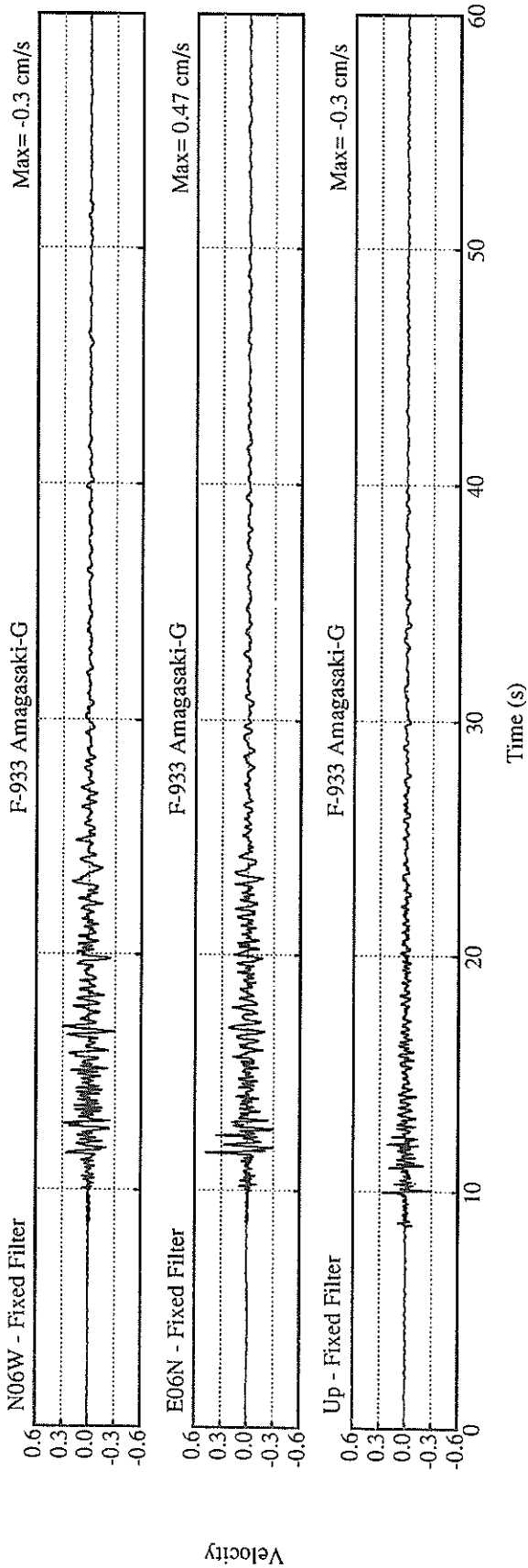
PEAK VALUES OF COMPONENTS

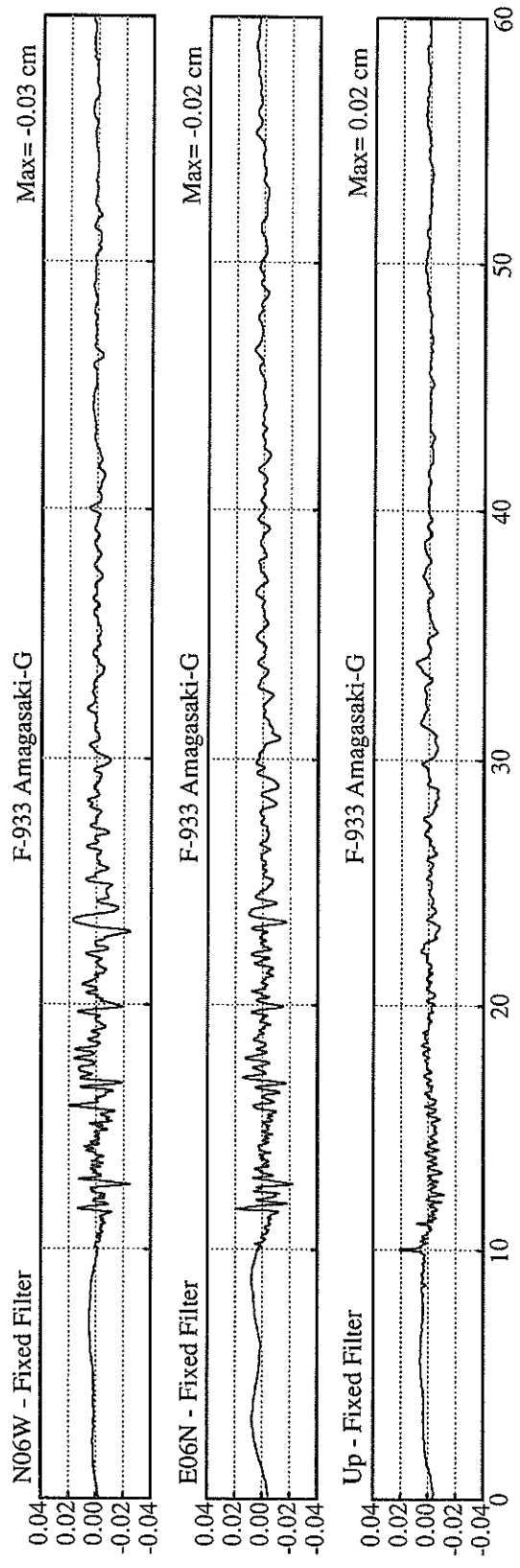
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	1.092	1.220	1.794	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	5.7	7.3	6.8	8.5
ORIGINAL	8.3	12.4	12.0	13.4
CORRECTED	8.1	11.8	11.3	13.1
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.30	0.47	0.30	0.51
VARIABLE FILTER	0.30	0.45	0.28	0.49
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.03	0.02	0.02	0.03
VARIABLE FILTER	0.02	0.02	0.01	0.02

* RESULTANT OF HORIZONTAL COMPONENTS

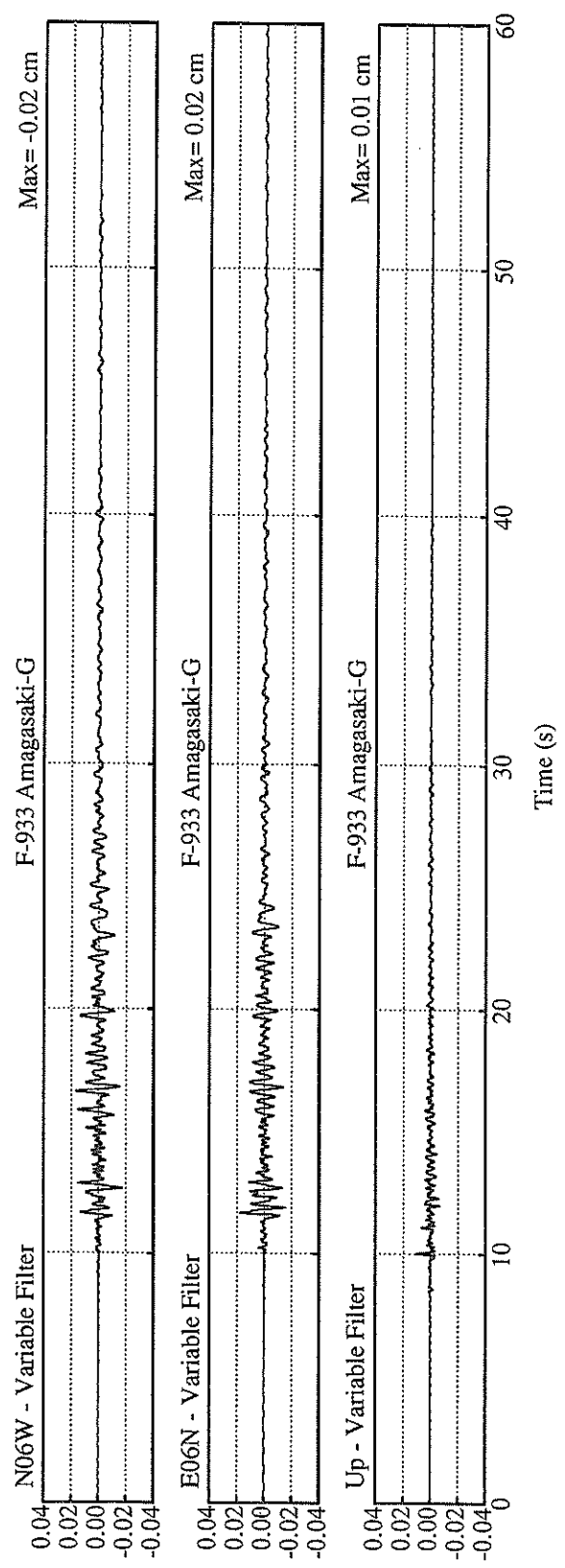




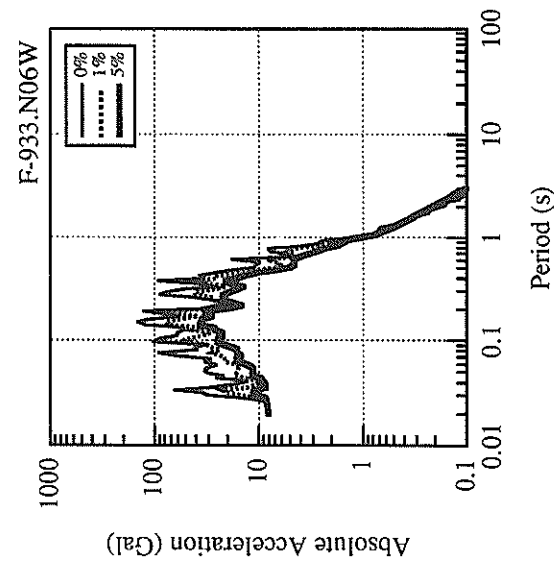
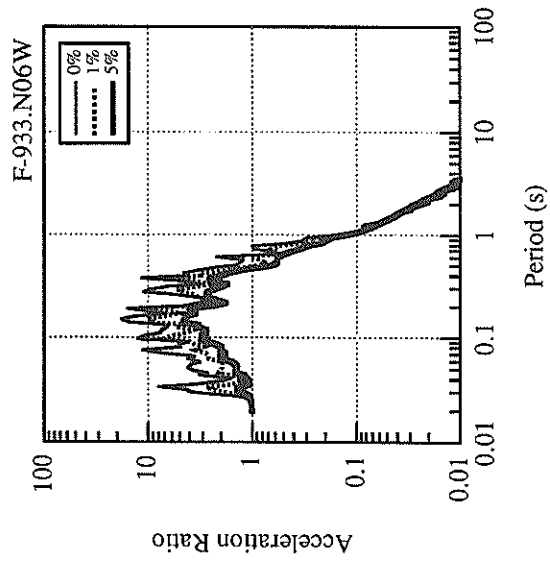
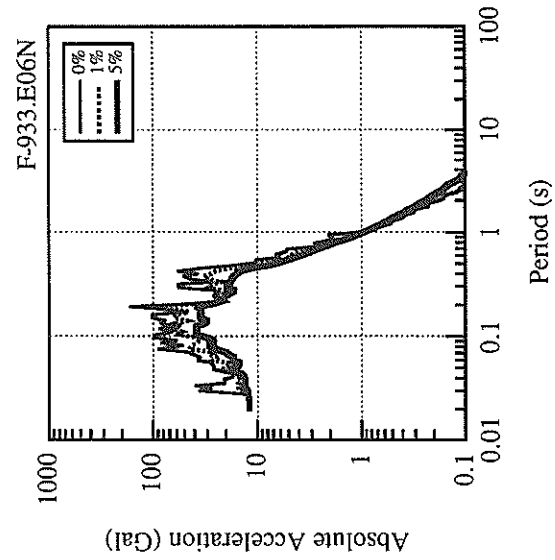
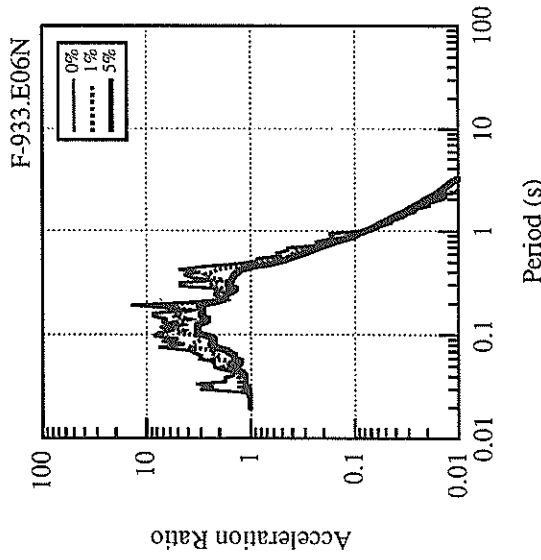
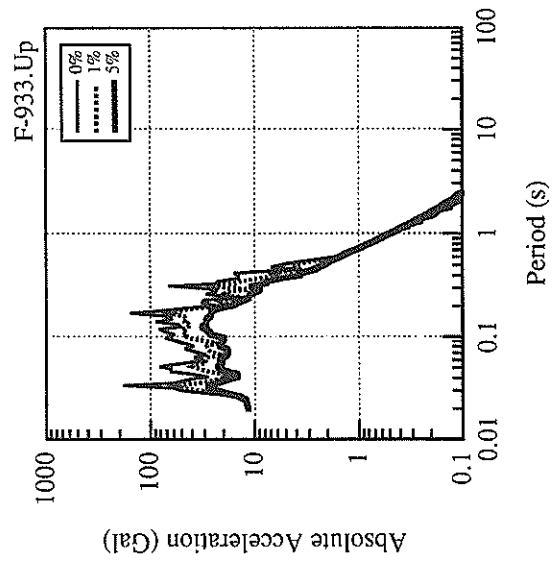
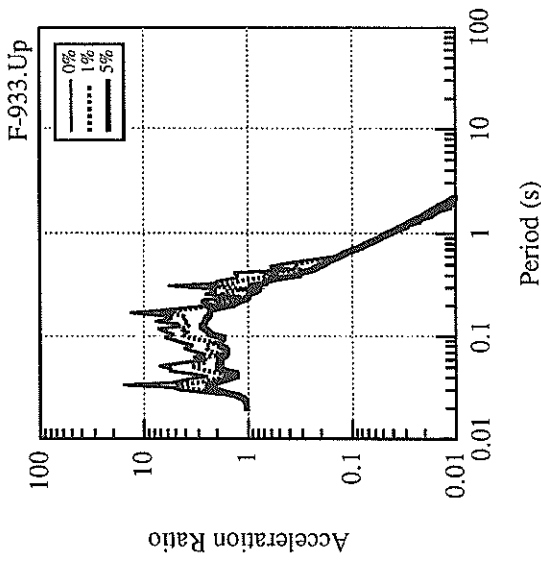


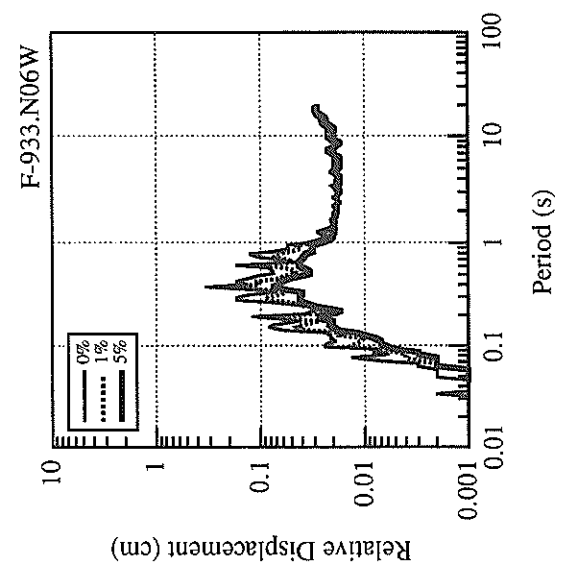
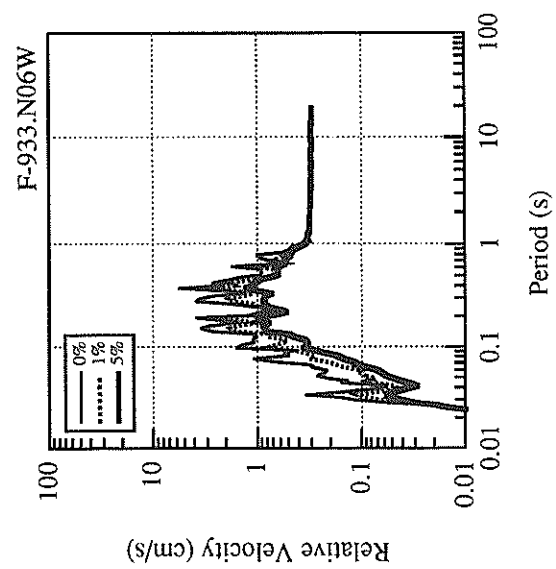
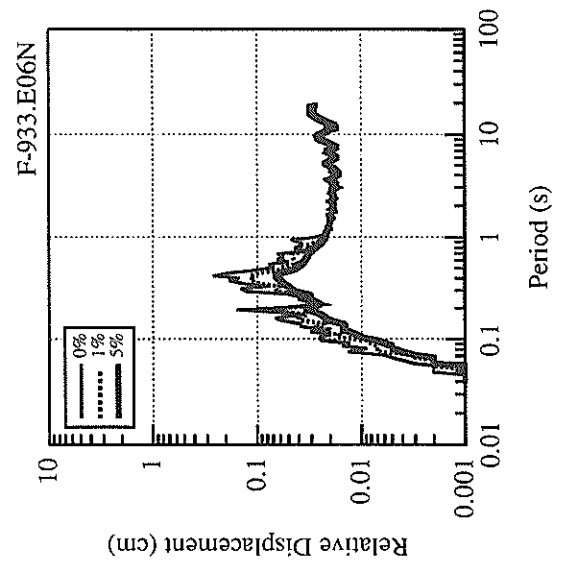
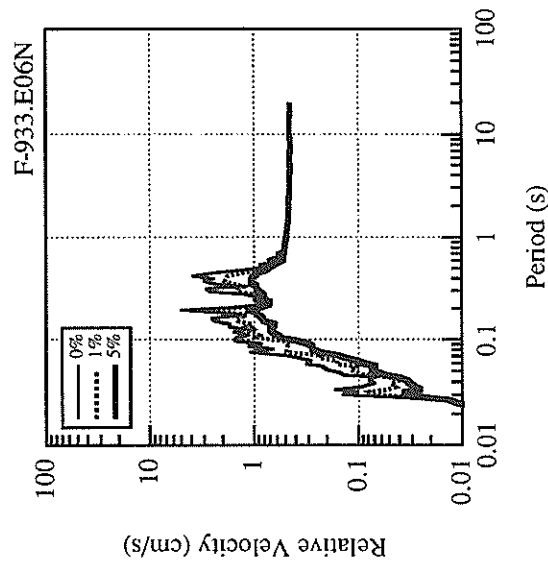
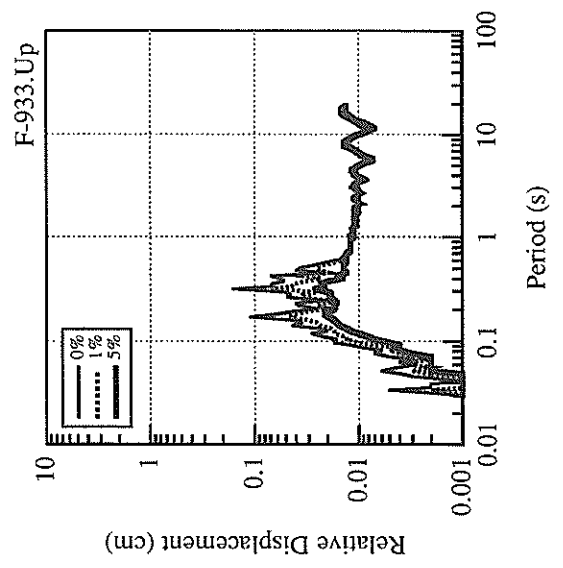
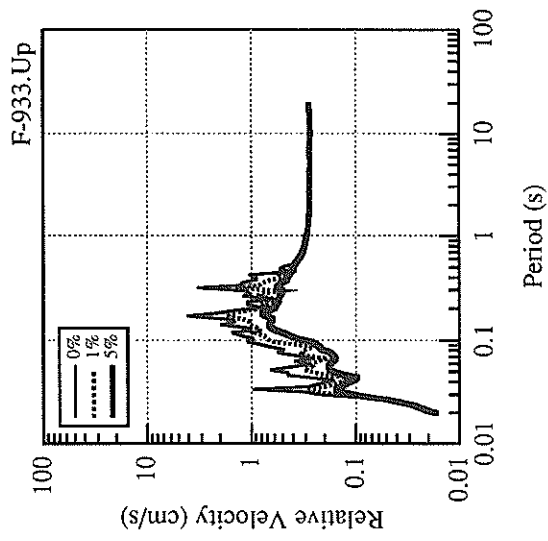


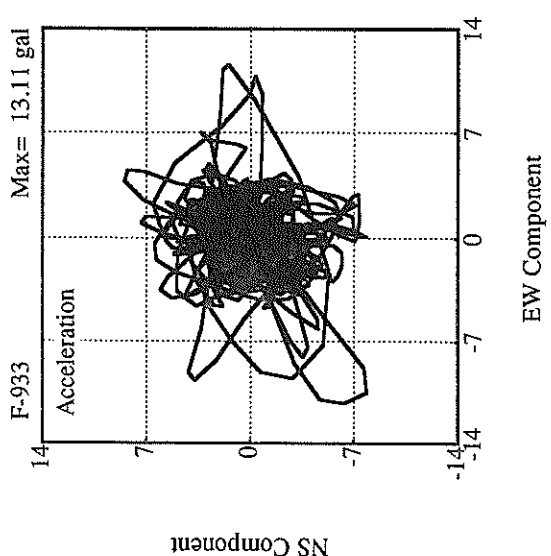
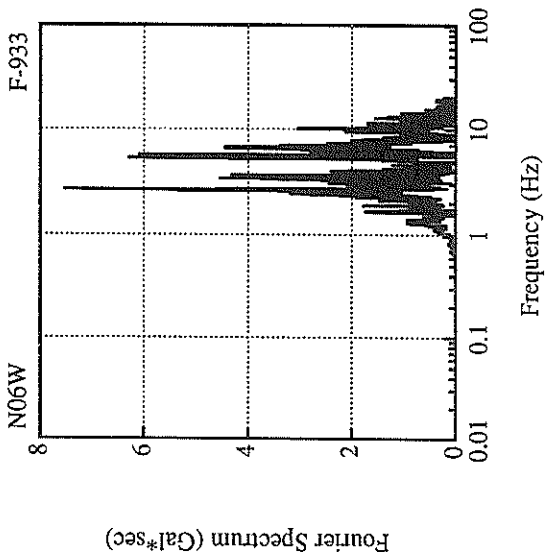
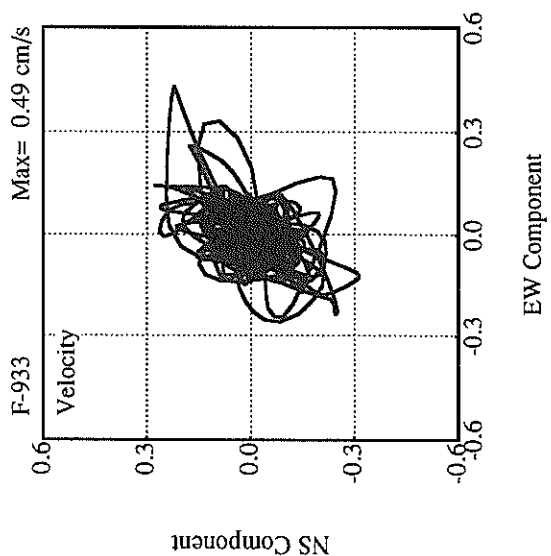
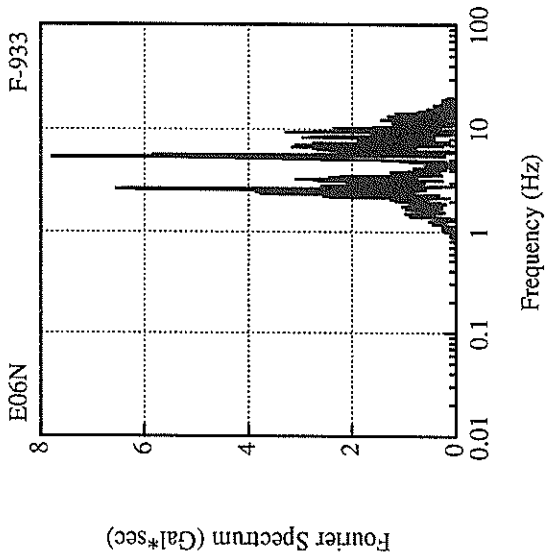
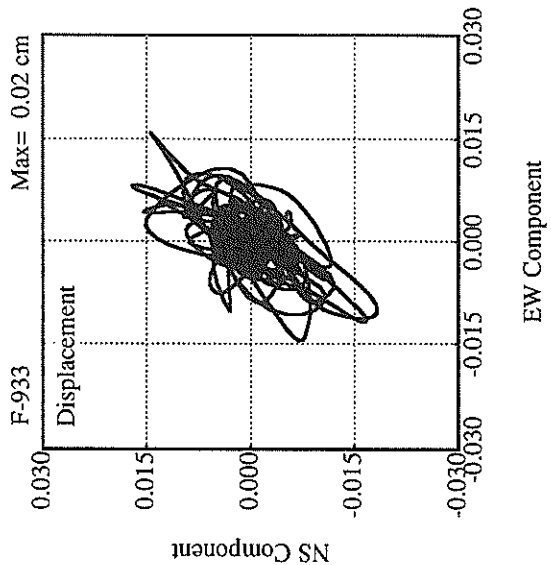
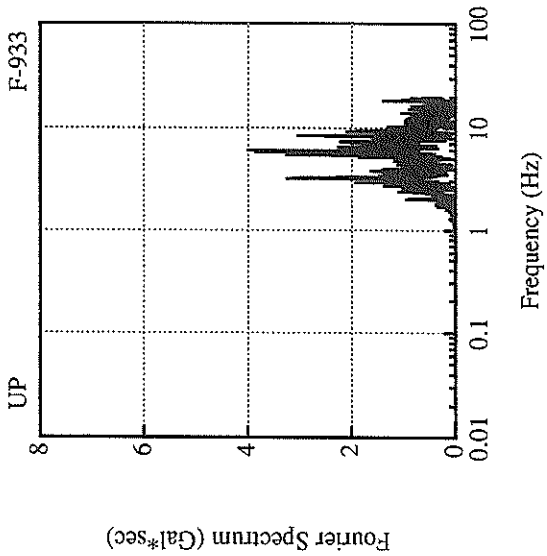
Displacement



Displacement







RECORD NUMBER : F-934

STATION : AMAGASAKI-G

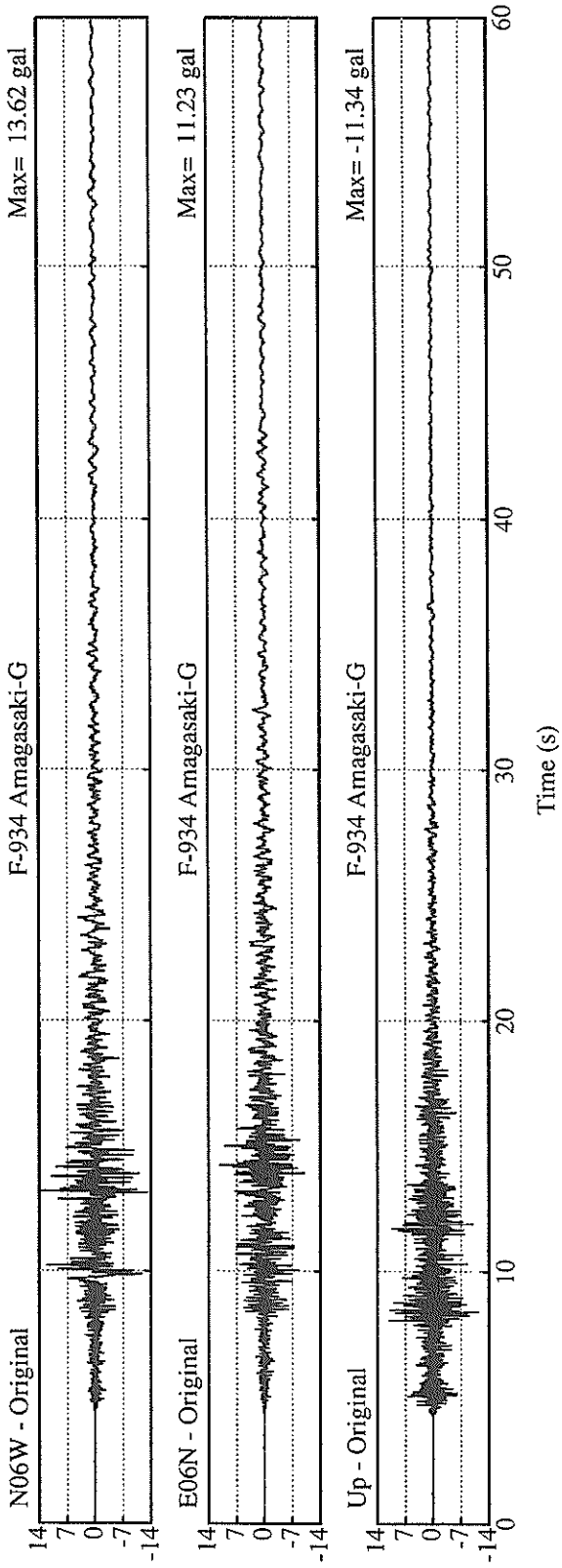
EARTHQUAKE DATA

DATE AND TIME 2: 4 OCT.14,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION OSAKA BAY REGION
LATITUDE 34° 37.6' N
LONGITUDE 135° 6.9' E
DEPTH 15.3KM
JMA MAGNITUDE 4.5

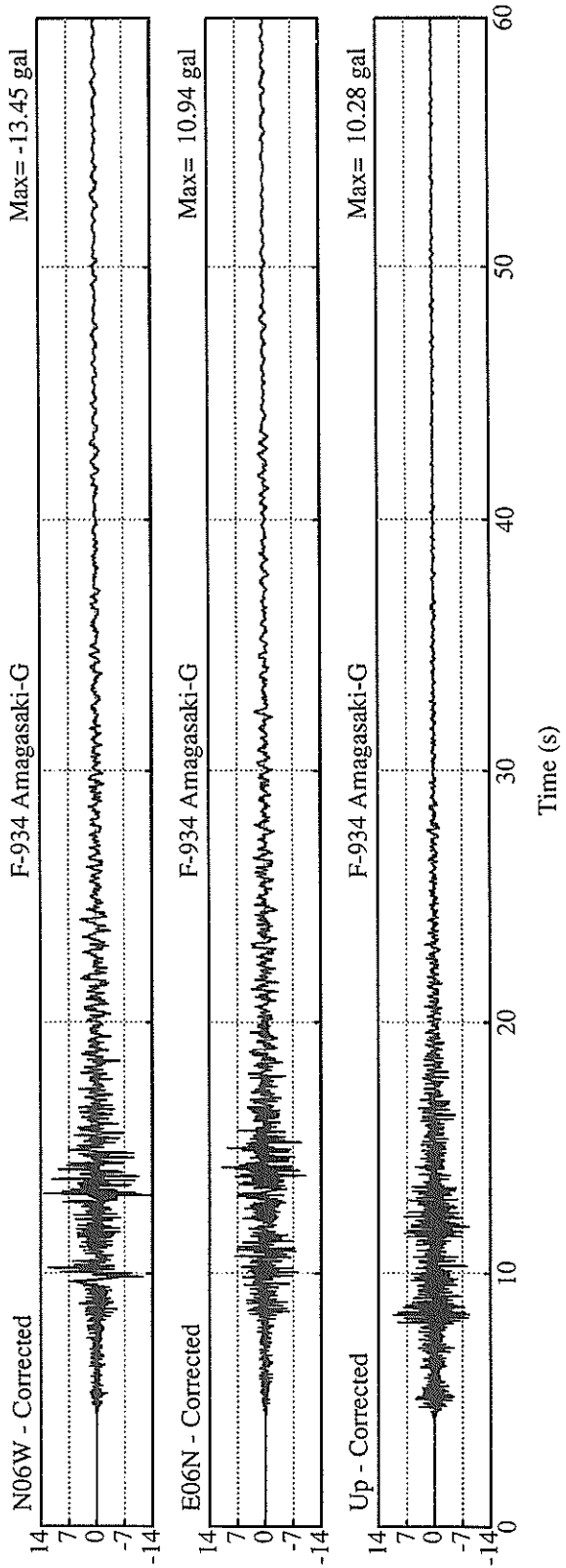
PEAK VALUES OF COMPONENTS

	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.585	0.622	1.049	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	8.7	4.4	3.9	8.7
ORIGINAL	13.6	11.2	11.3	15.4
CORRECTED	13.4	10.9	10.3	14.9
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	0.90	0.43	0.23	0.90
VARIABLE FILTER	0.75	0.39	0.21	0.75
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.11	0.05	0.02	0.12
VARIABLE FILTER	0.09	0.04	0.01	0.09

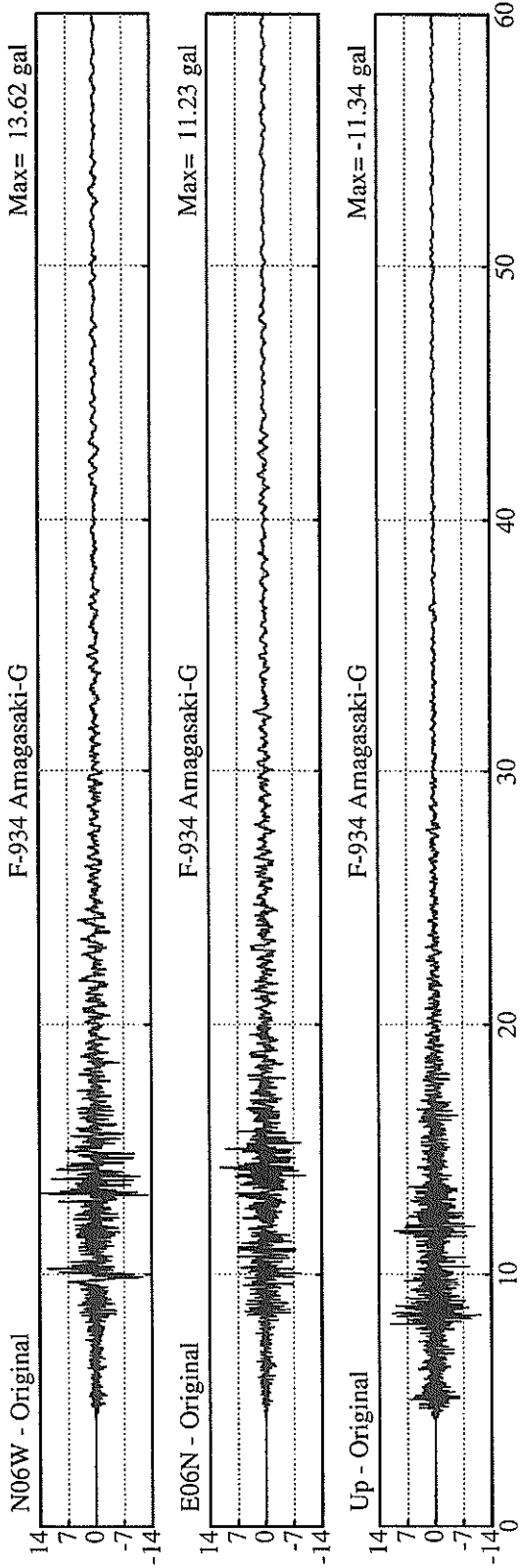
* RESULTANT OF HORIZONTAL COMPONENTS



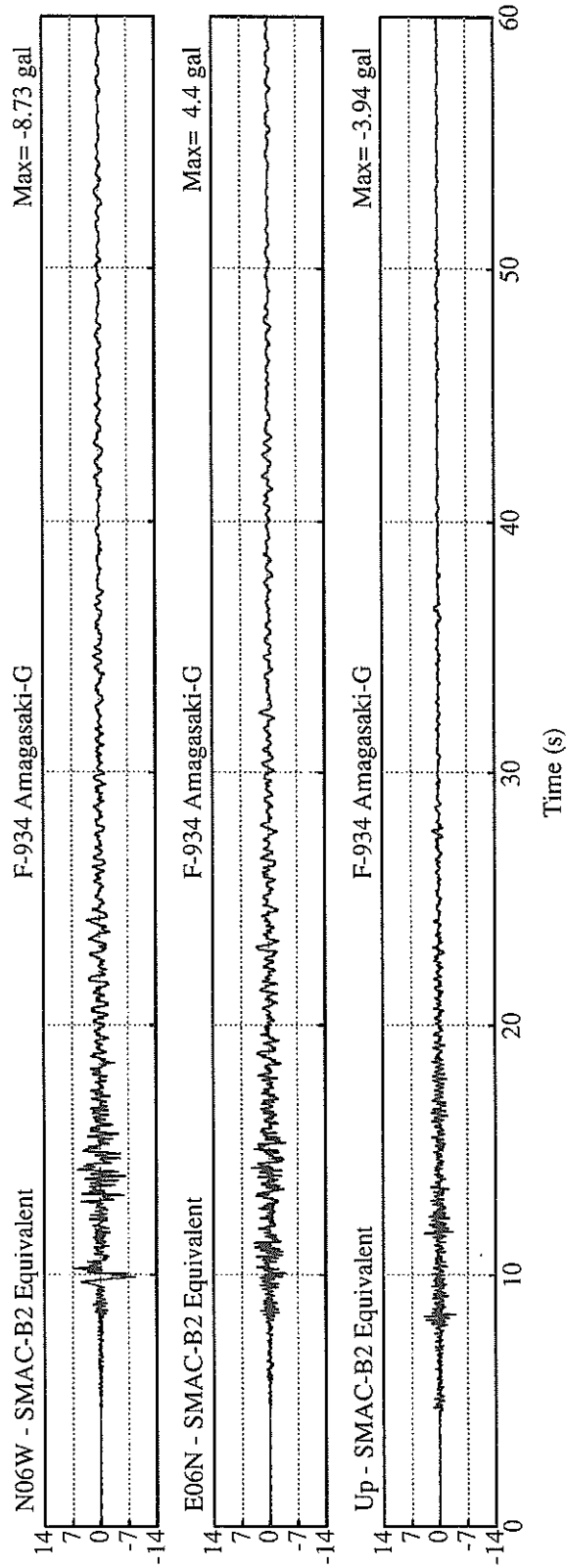
Acceleration



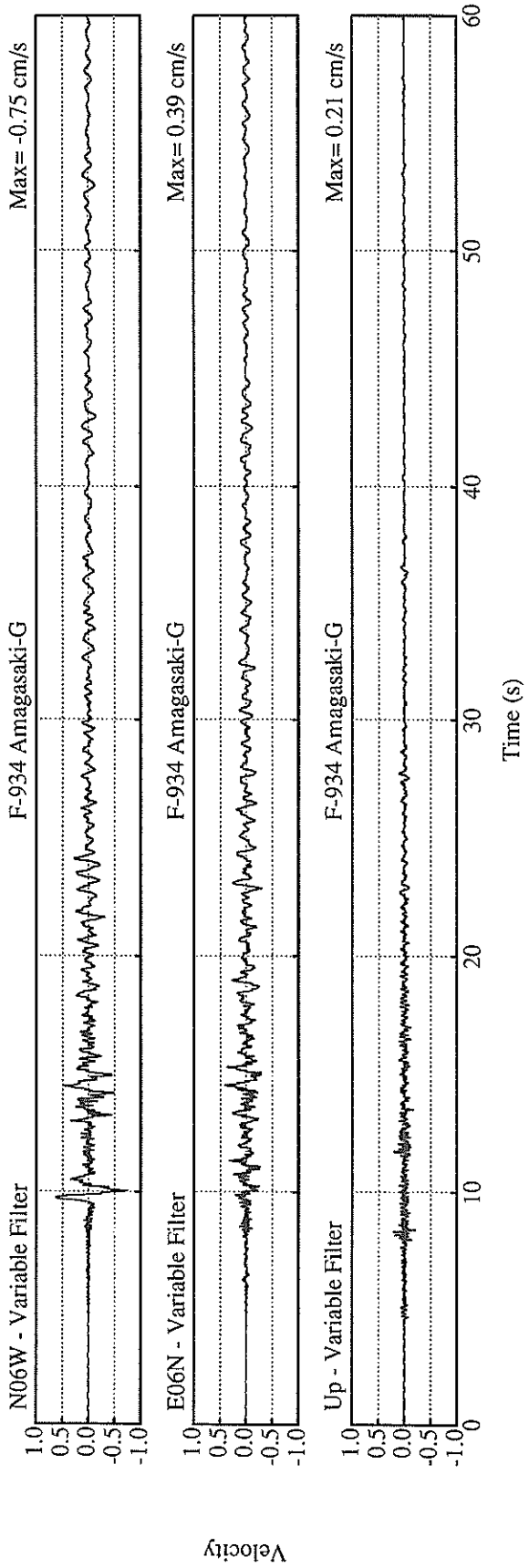
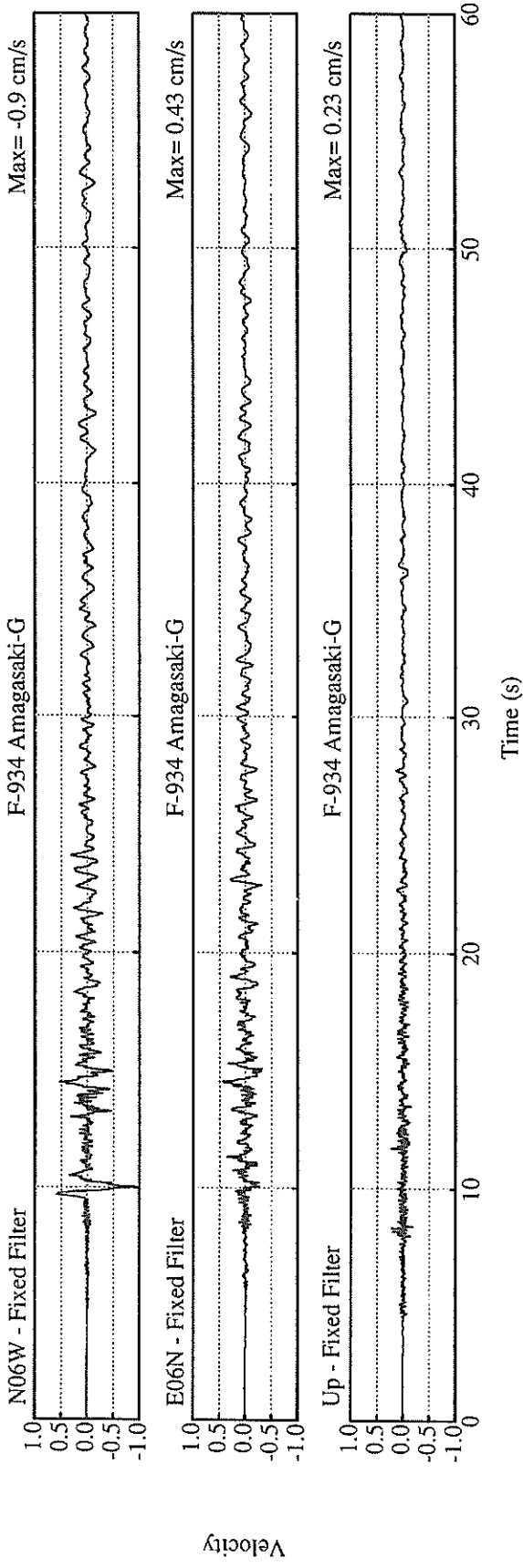
Acceleration

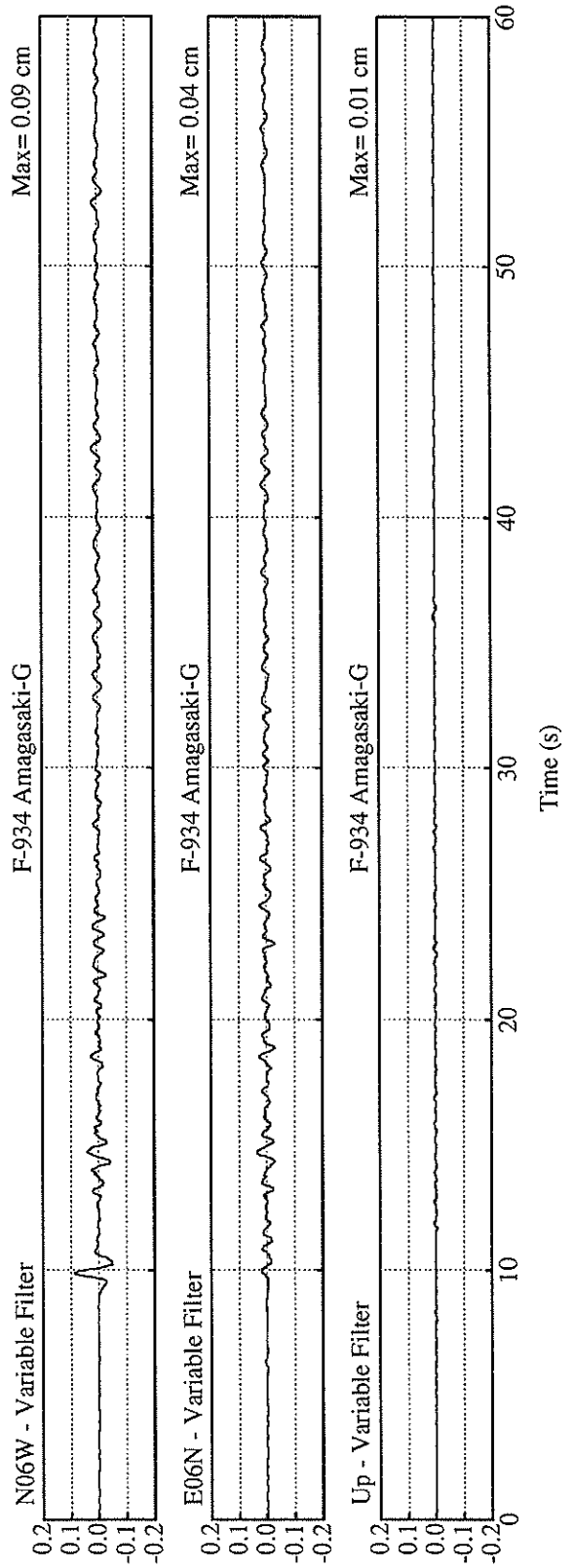
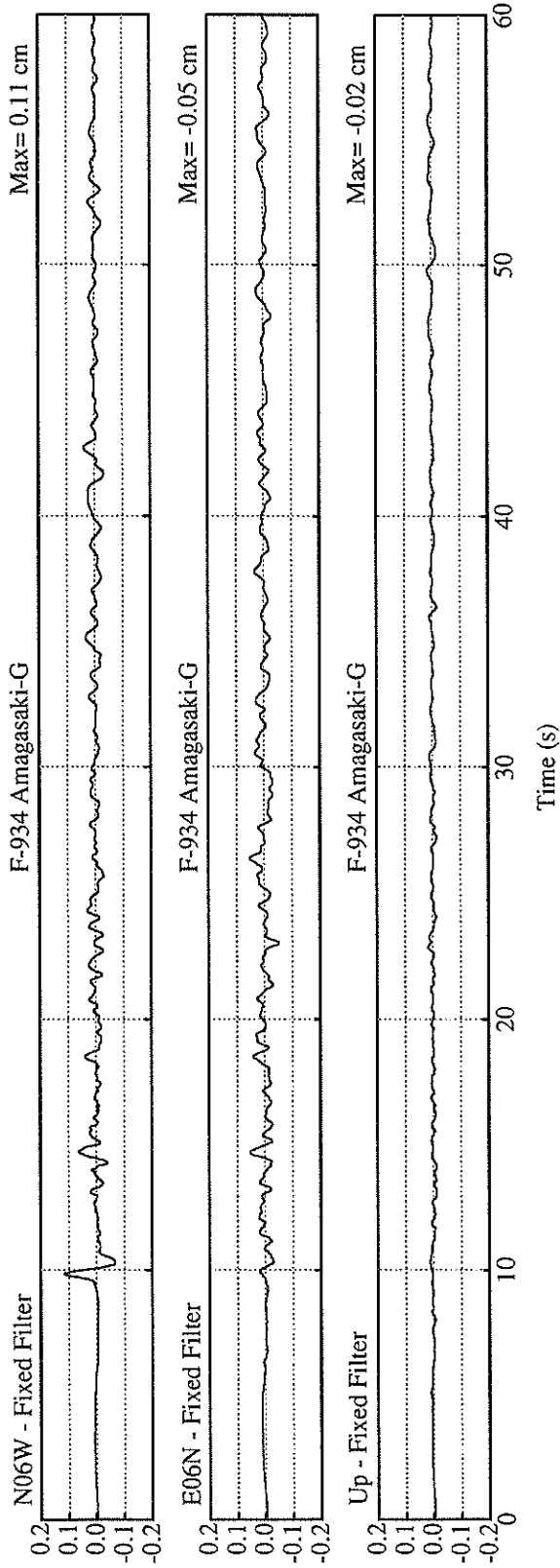


Acceleration



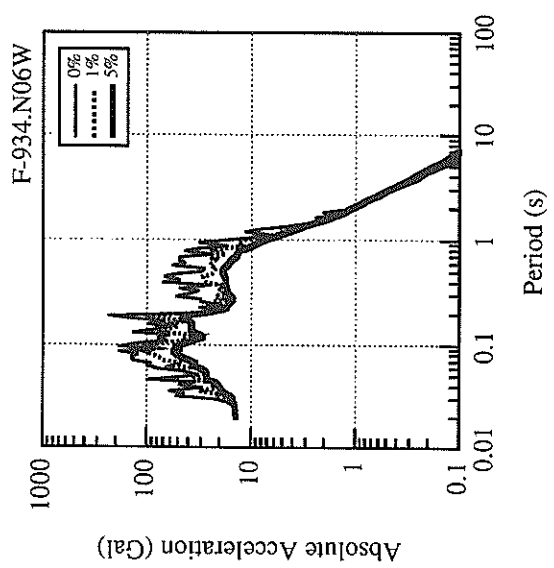
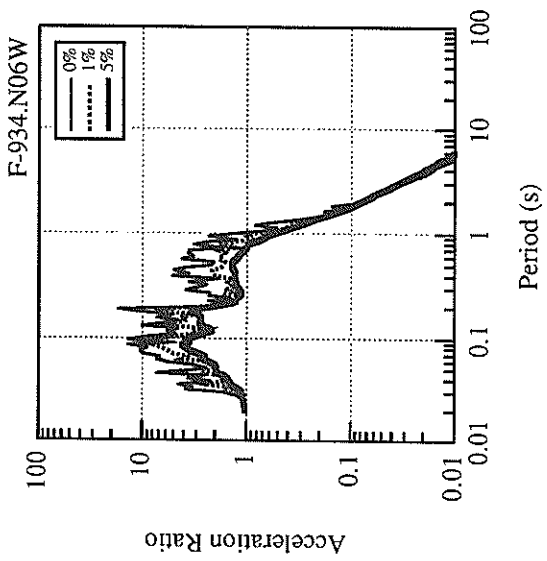
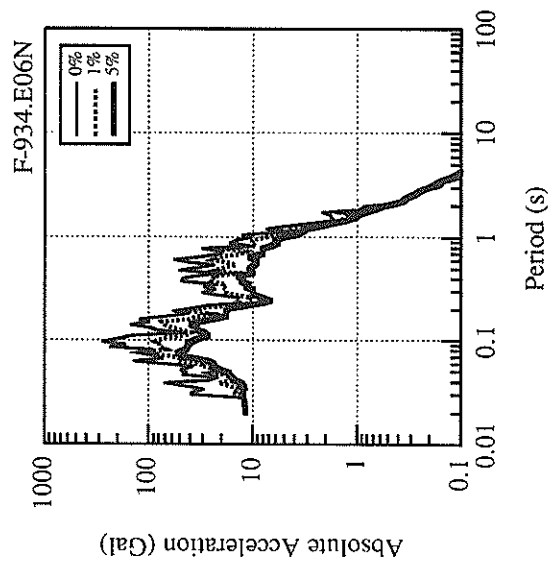
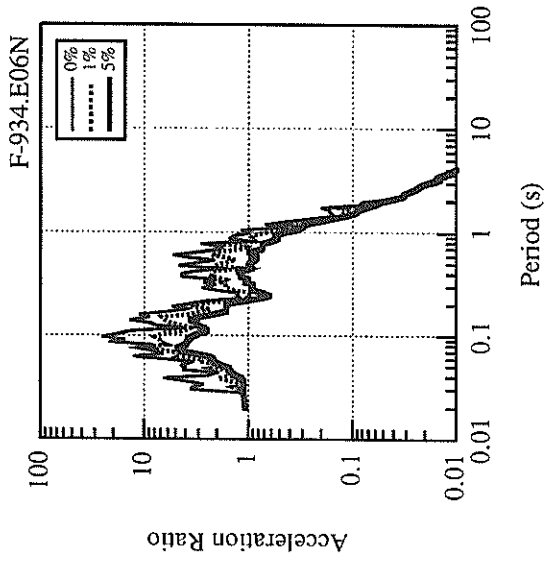
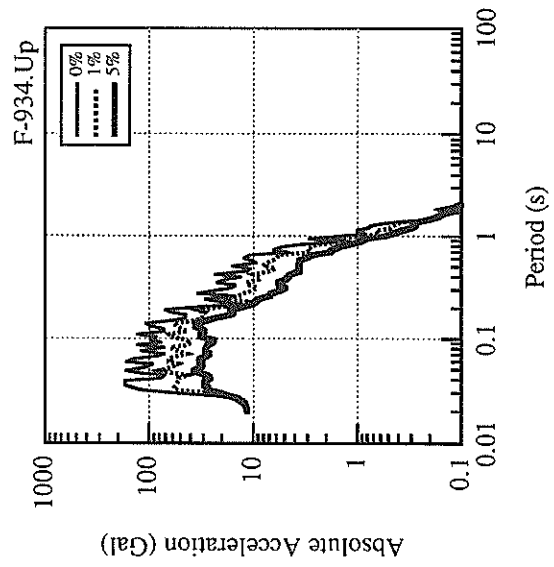
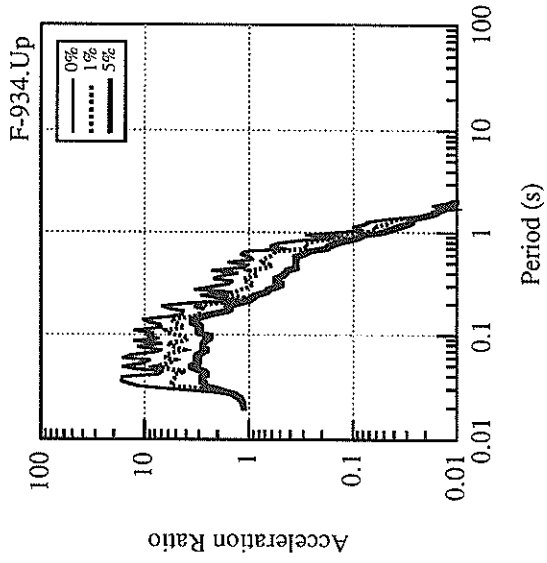
Acceleration

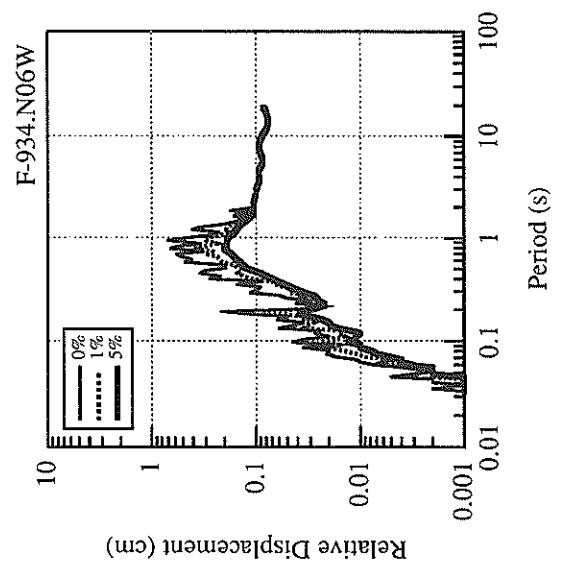
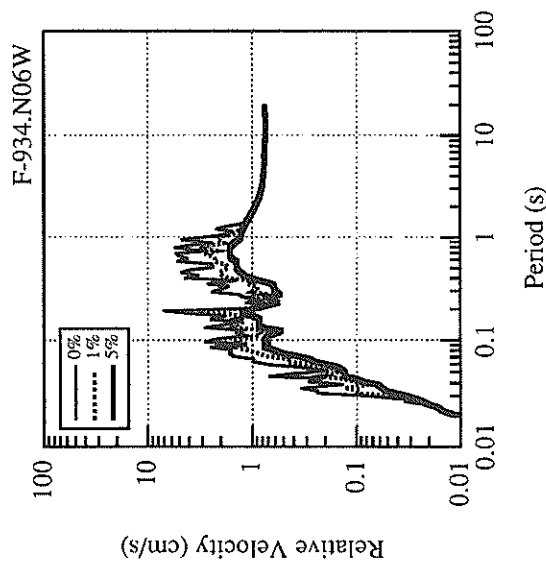
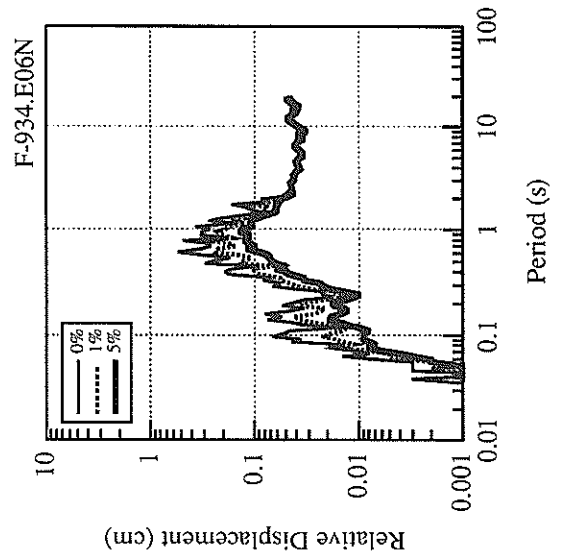
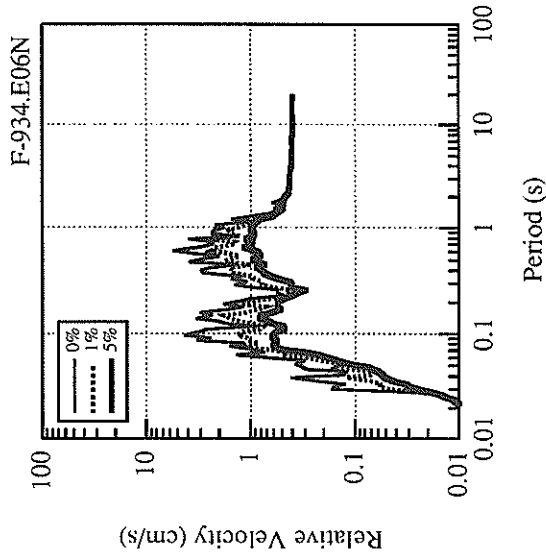
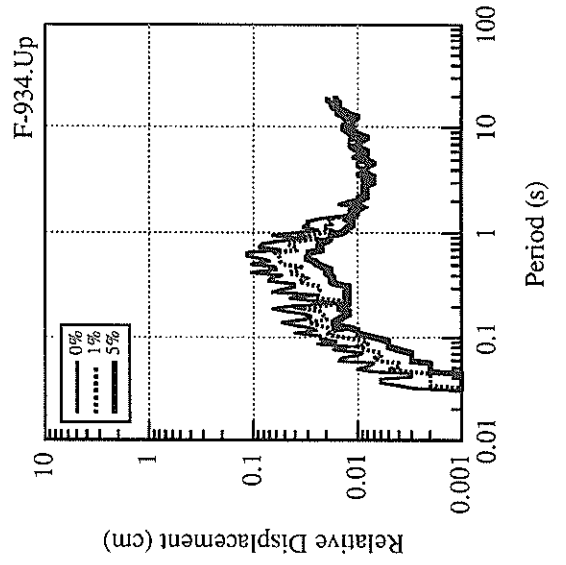
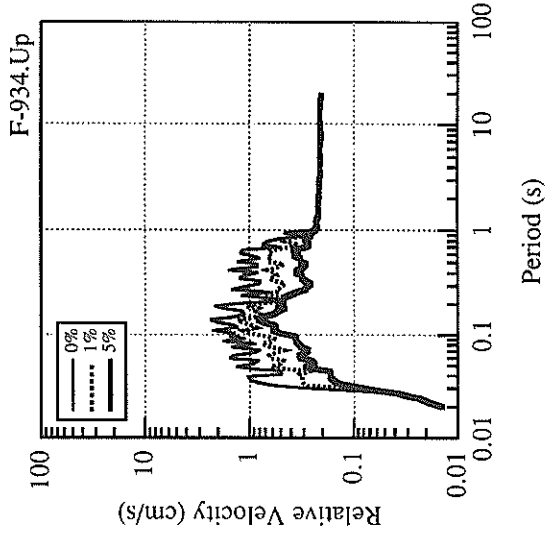


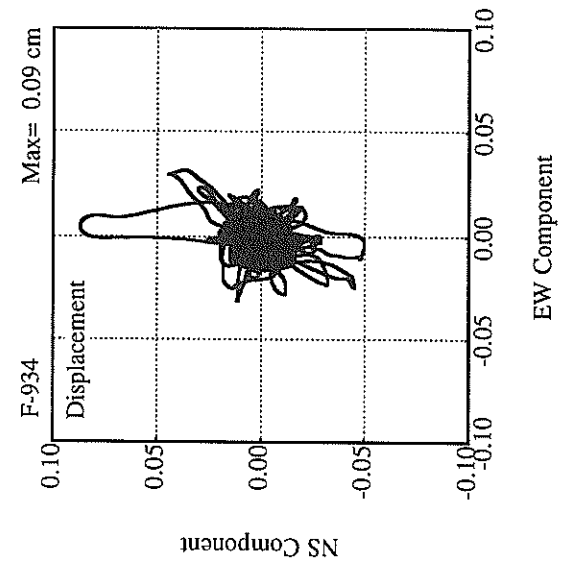
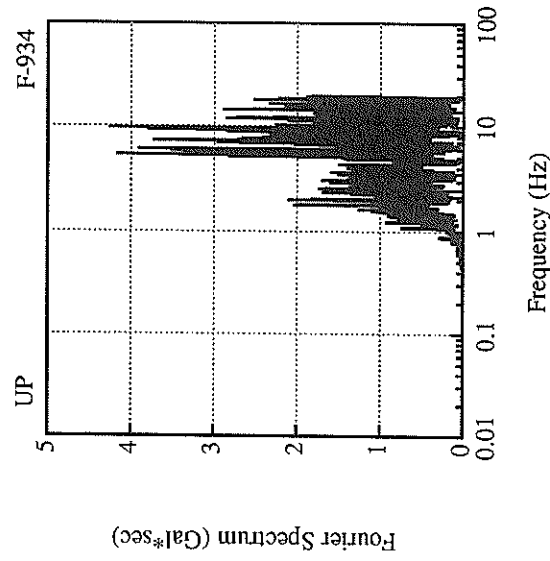
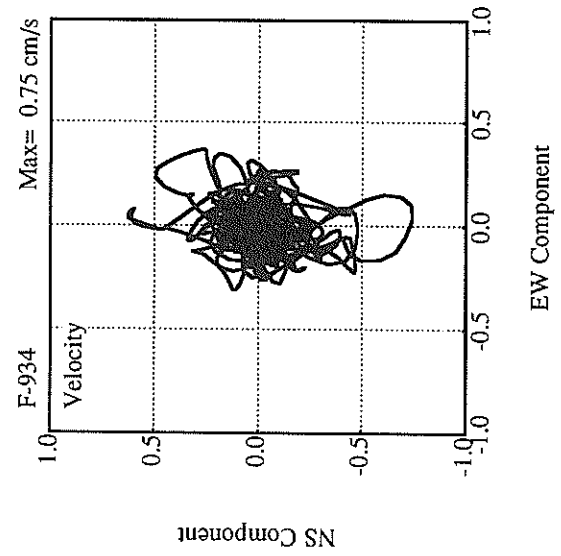
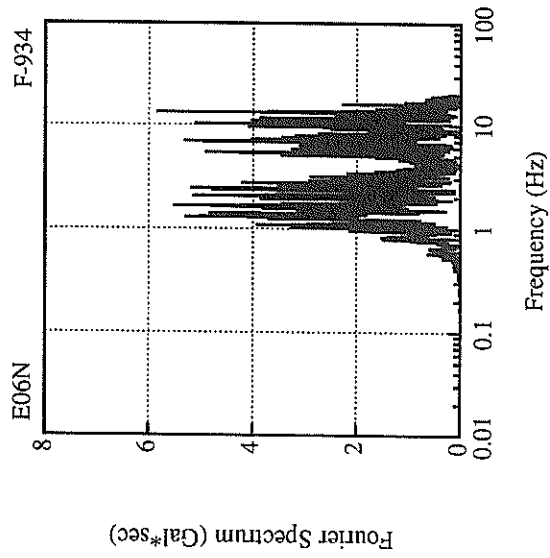
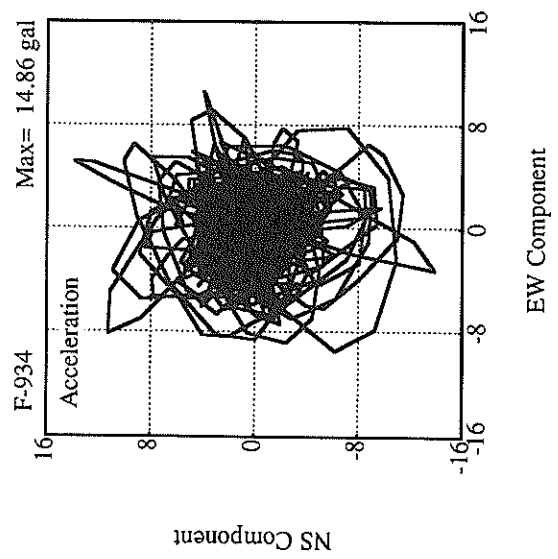
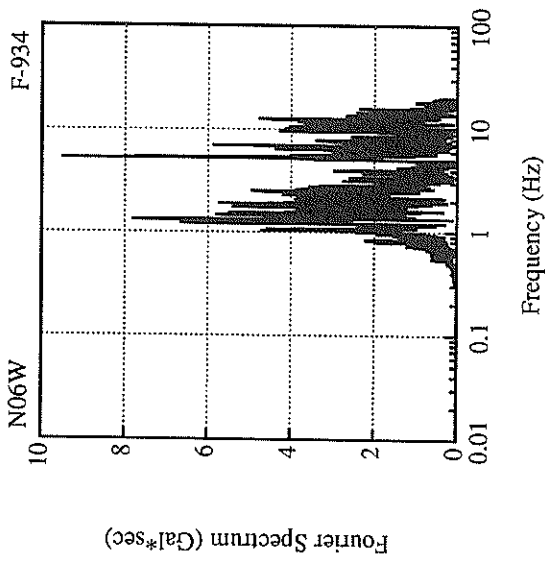


Displacement

Displacement







RECORD NUMBER : F-1040

STATION : OSAKA-MINAMI-G

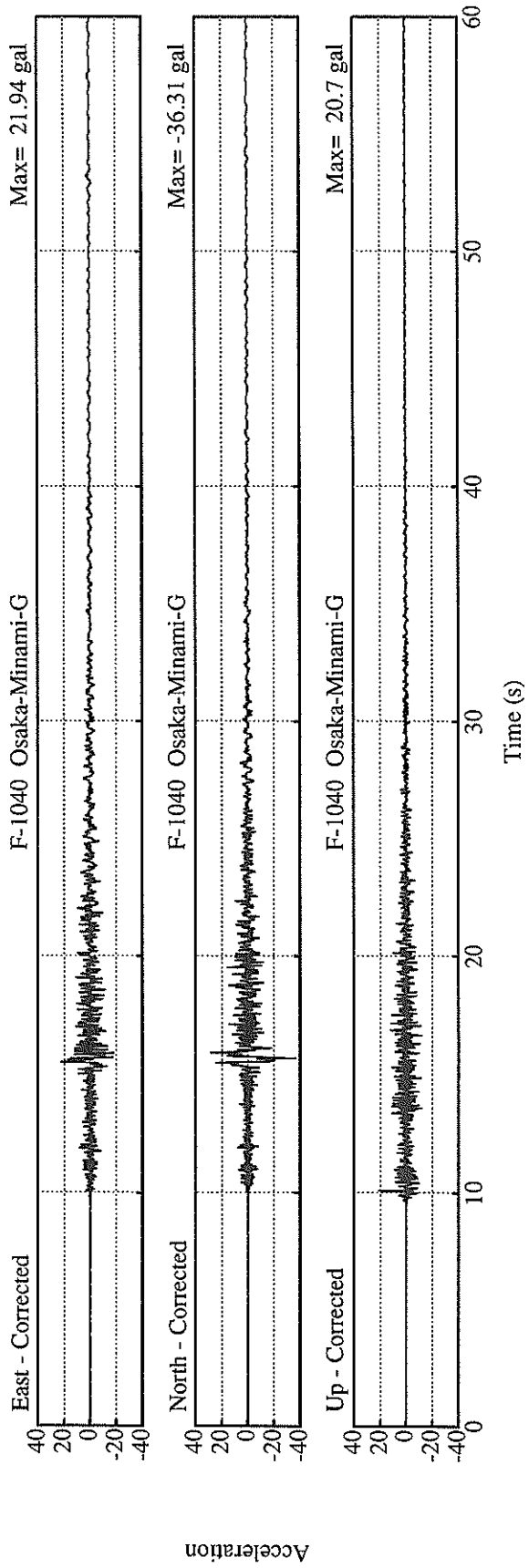
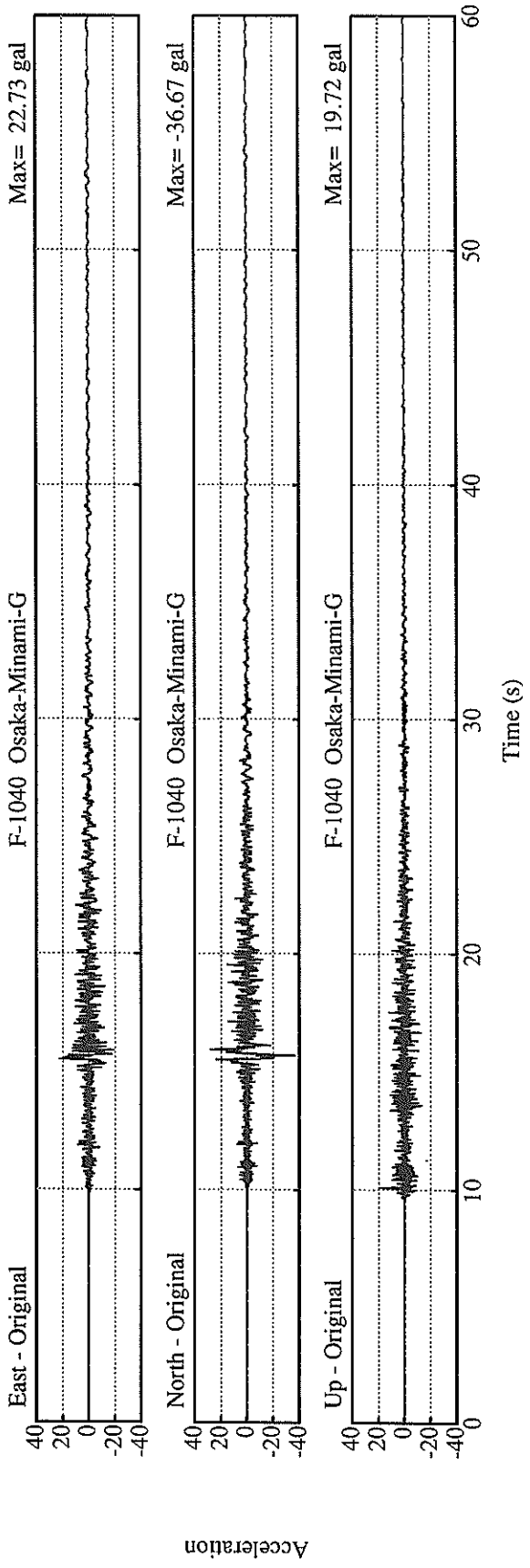
EARTHQUAKE DATA

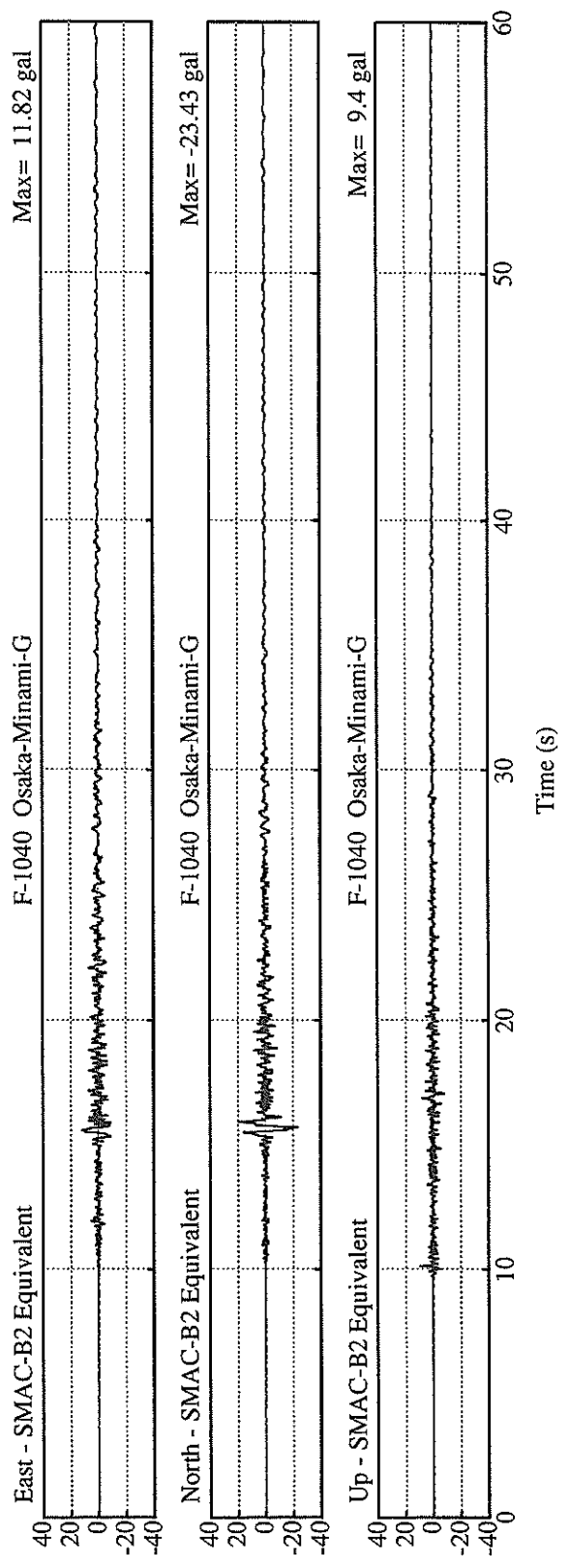
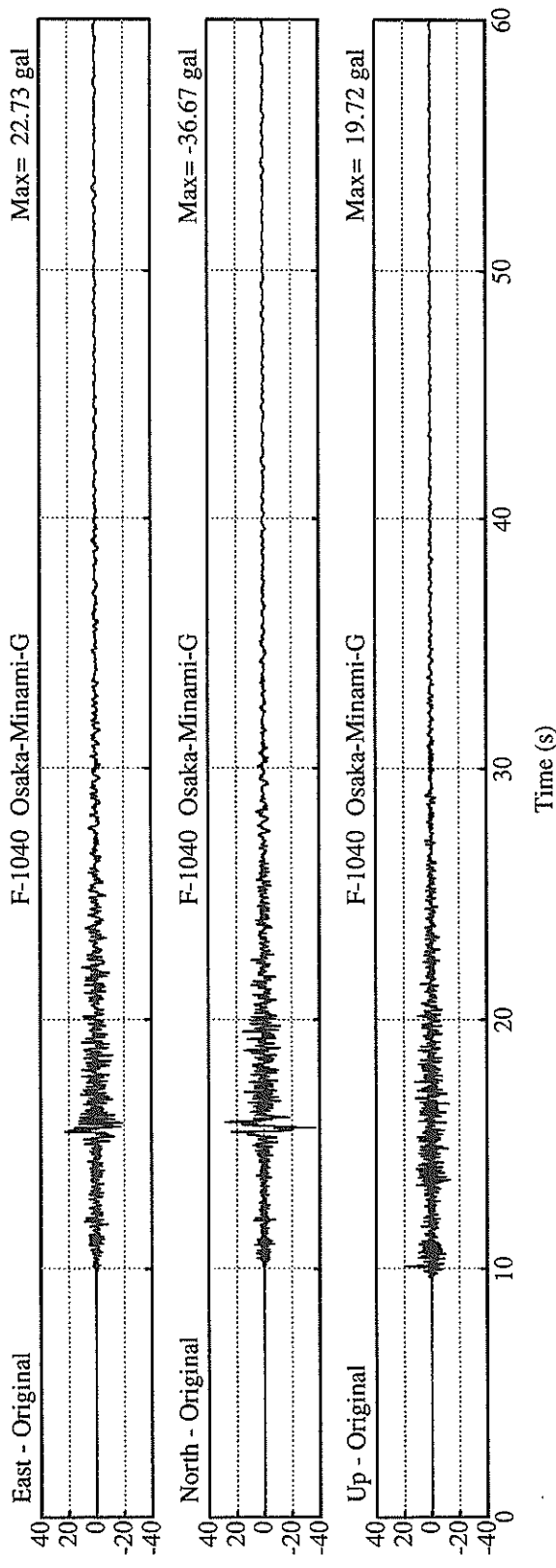
DATE AND TIME 2: 4 OCT.14,1995
LOCATION OF HYPOCENTER
EPICENTRAL REGION OSAKA BAY REGION
LATITUDE 34° 37.6' N
LONGITUDE 135° 6.9' E
DEPTH 15.3KM
JMA MAGNITUDE 4.5

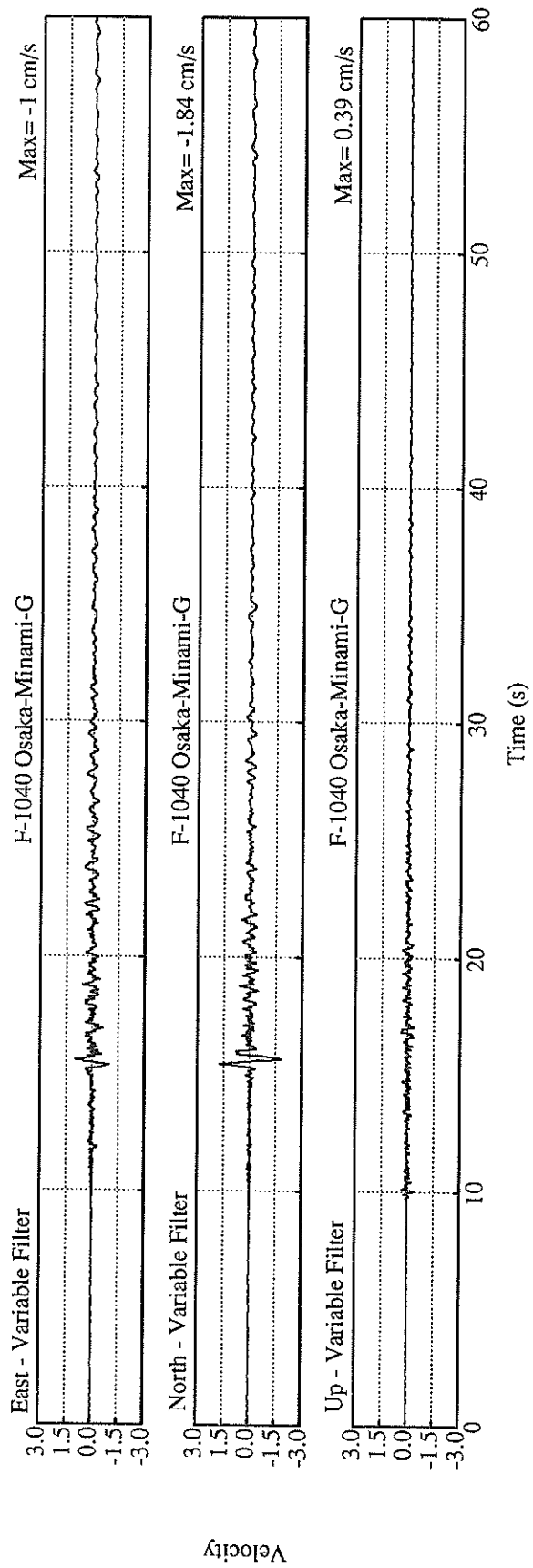
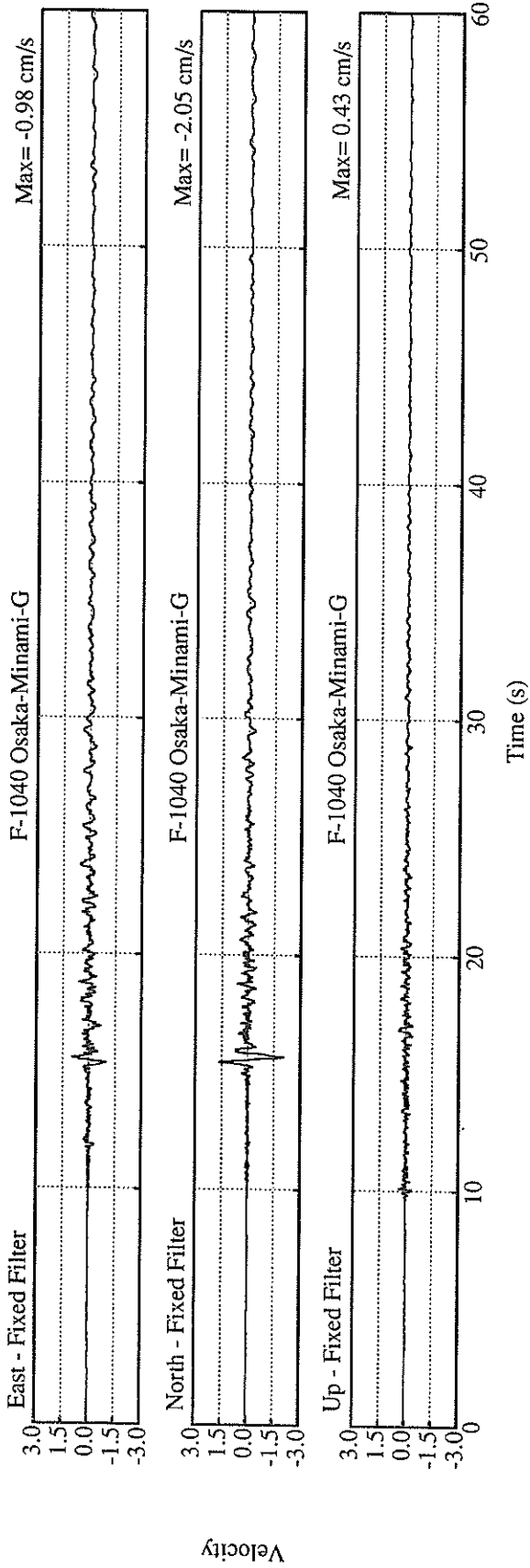
PEAK VALUES OF COMPONENTS

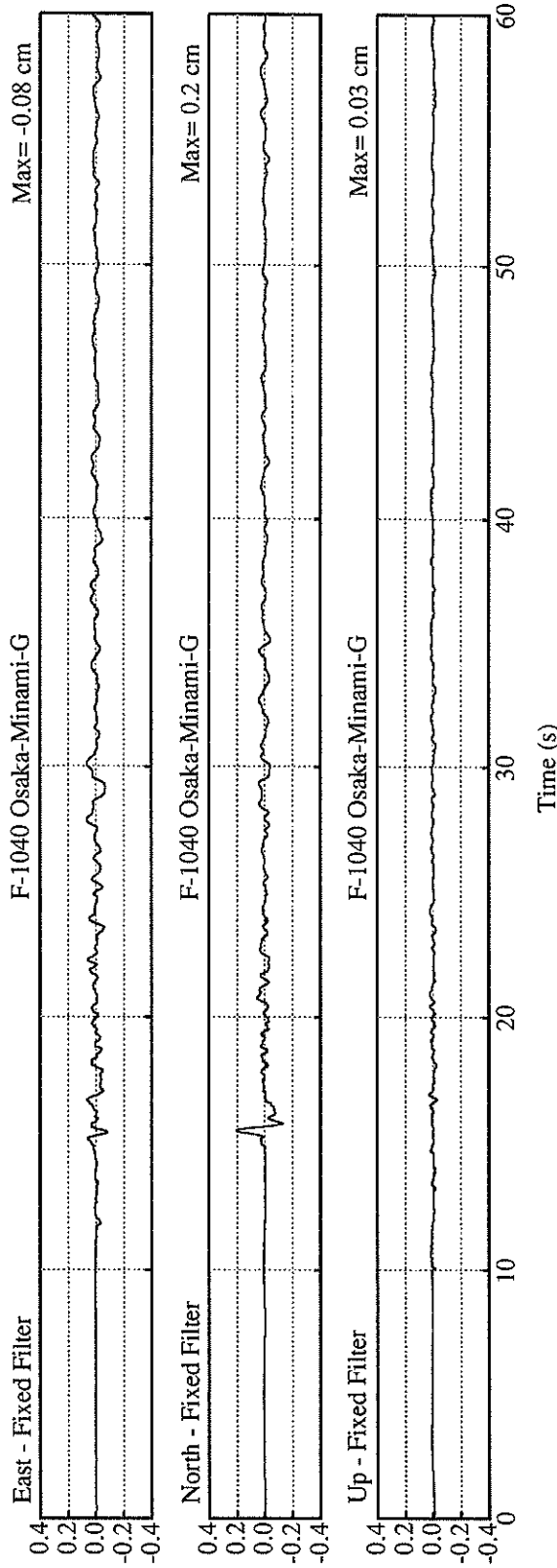
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.494	0.494	0.958	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	23.4	11.8	9.4	23.4
ORIGINAL	36.7	22.7	19.7	36.7
CORRECTED	36.3	21.9	20.7	36.6
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	2.05	0.98	0.43	2.08
VARIABLE FILTER	1.84	1.00	0.39	1.86
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.20	0.08	0.03	0.21
VARIABLE FILTER	0.18	0.08	0.03	0.19

* RESULTANT OF HORIZONTAL COMPONENTS

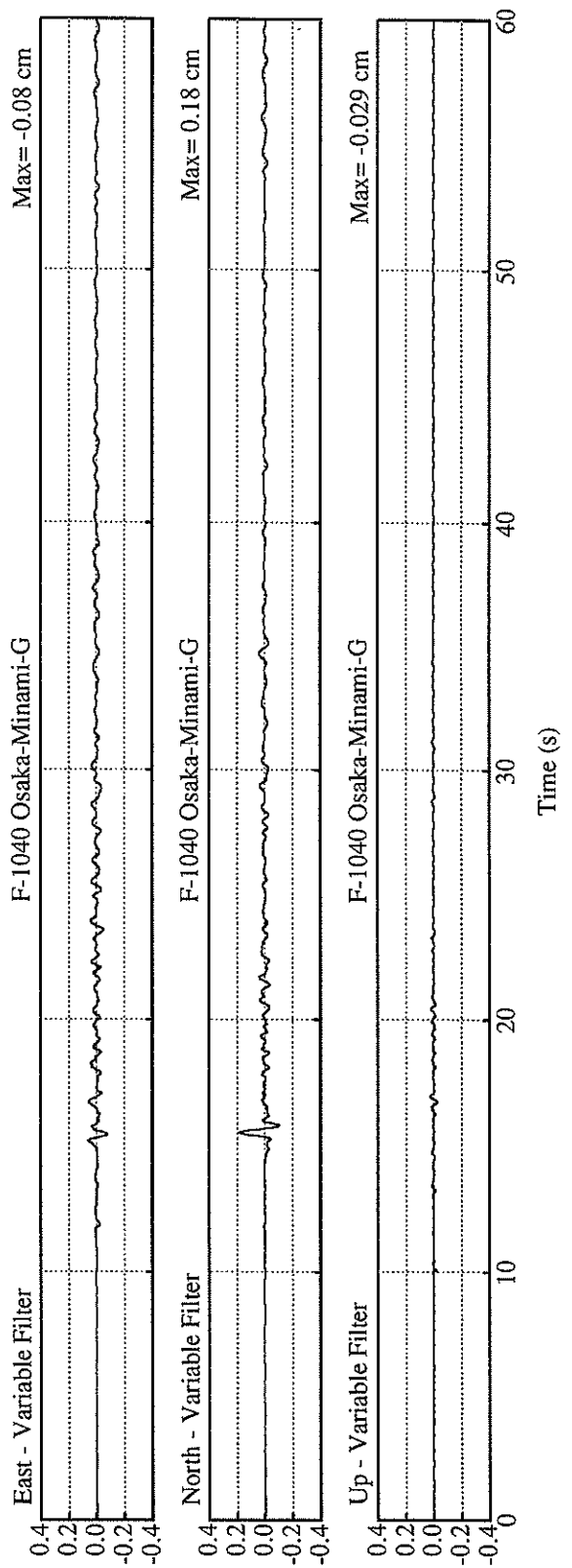




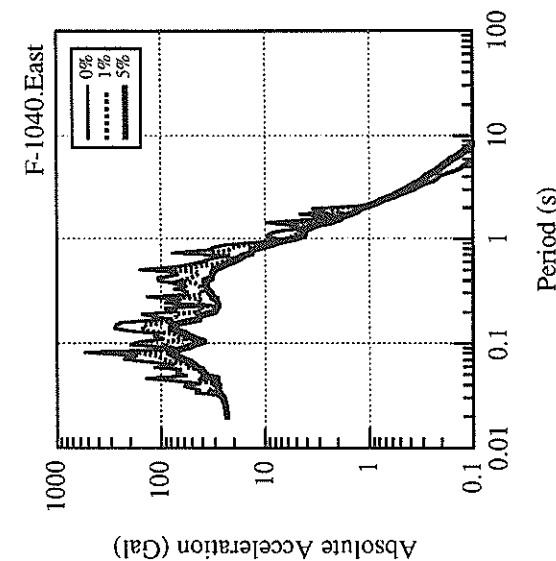
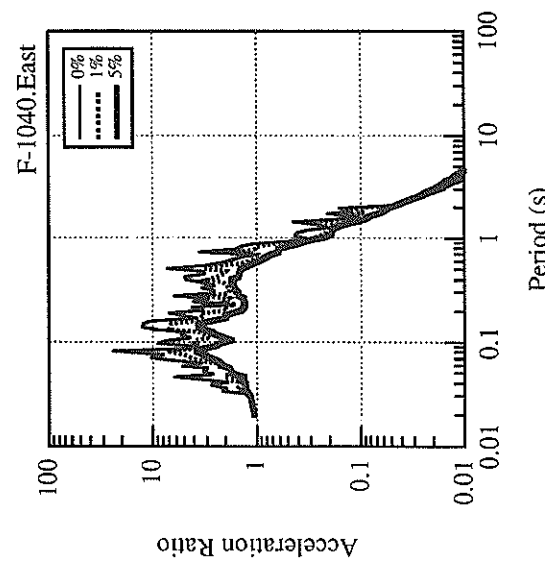
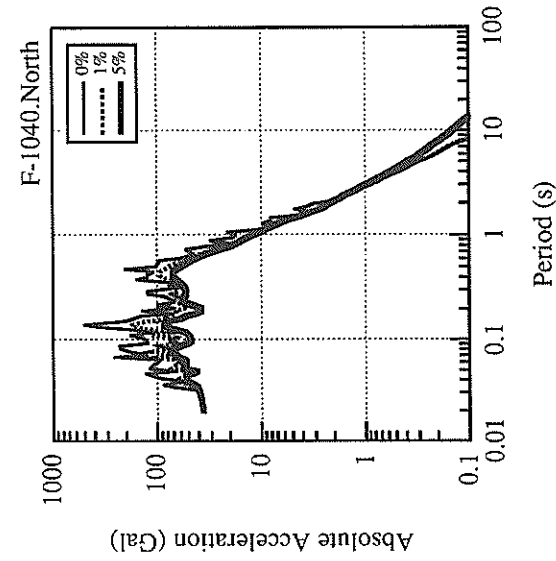
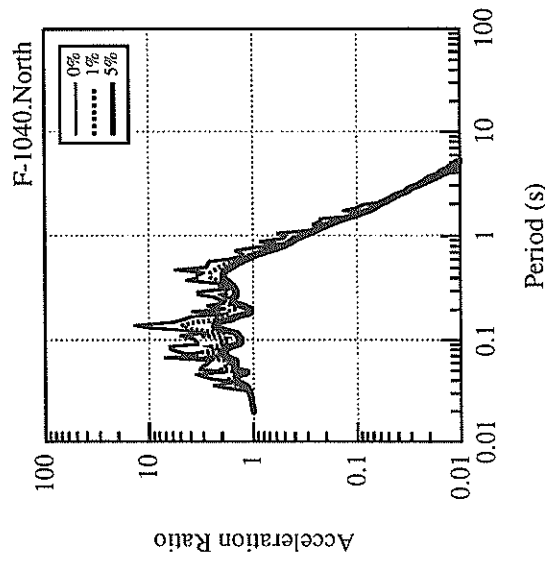
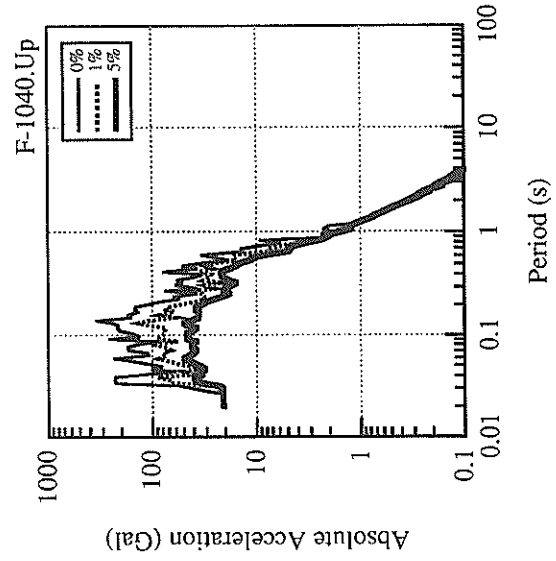
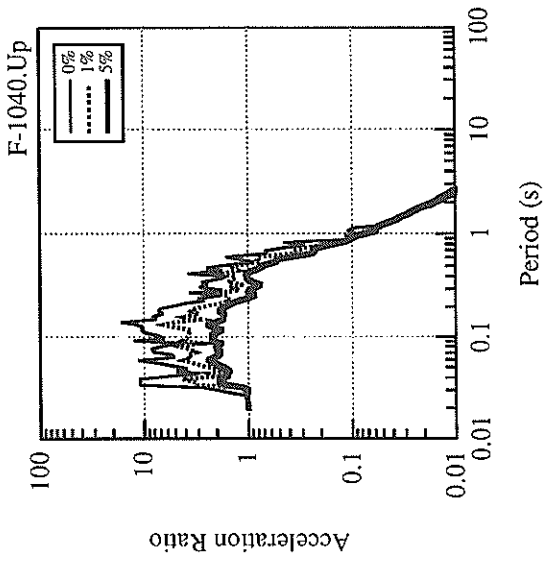


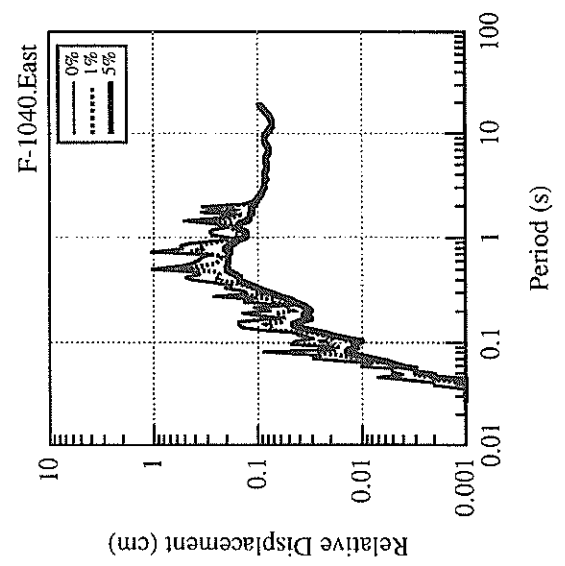
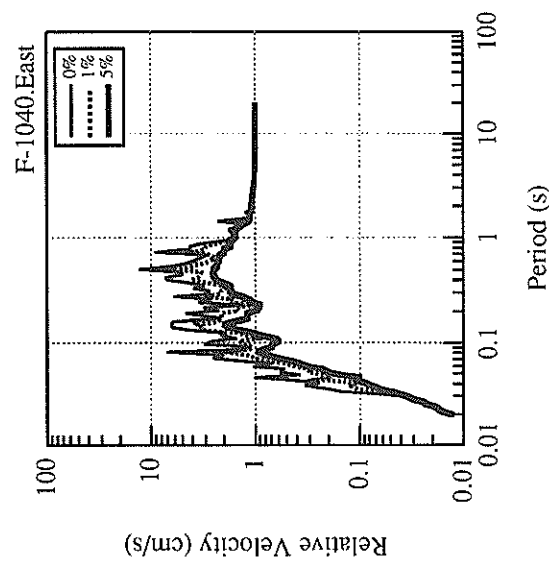
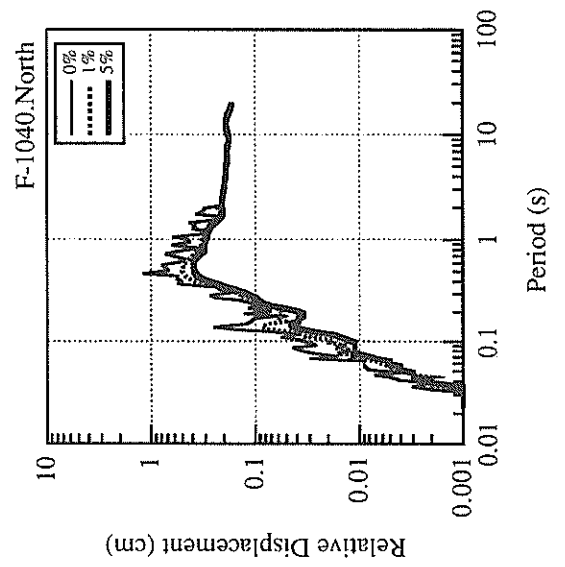
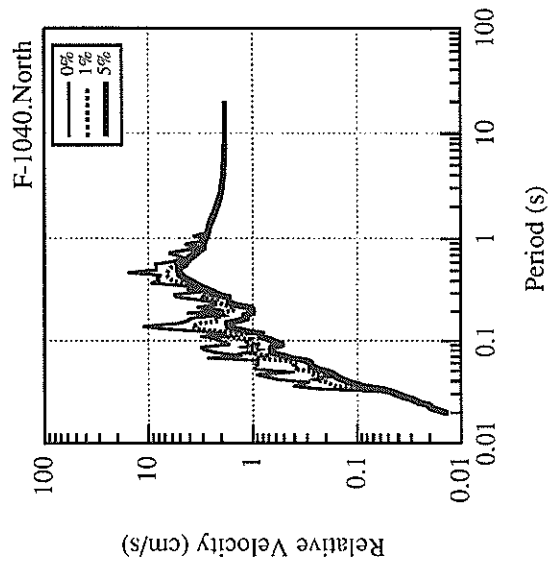
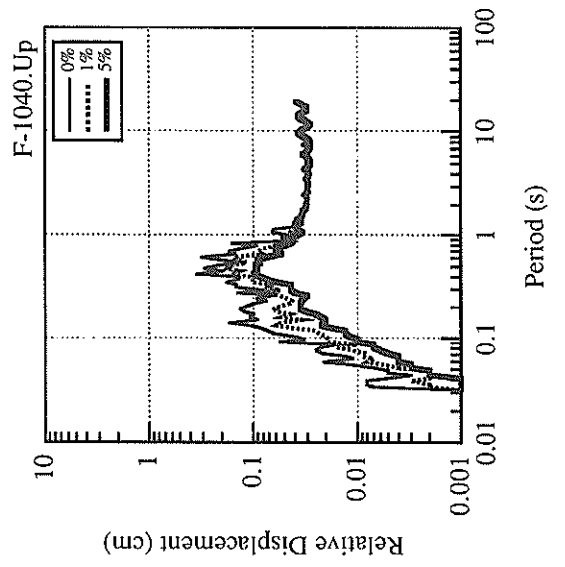
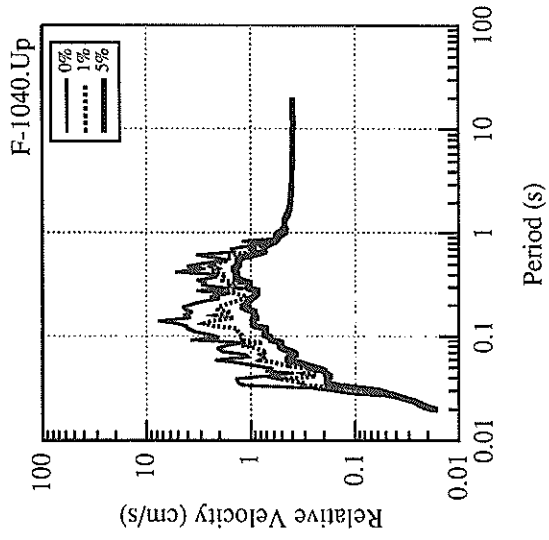


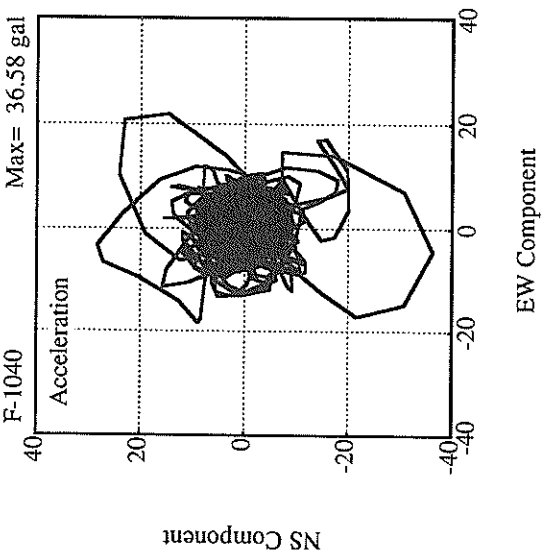
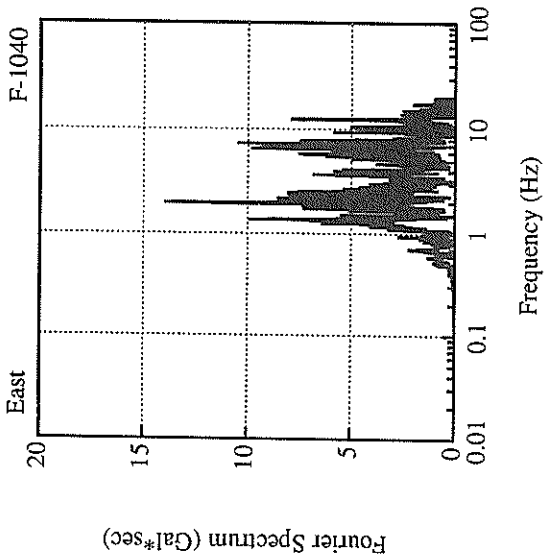
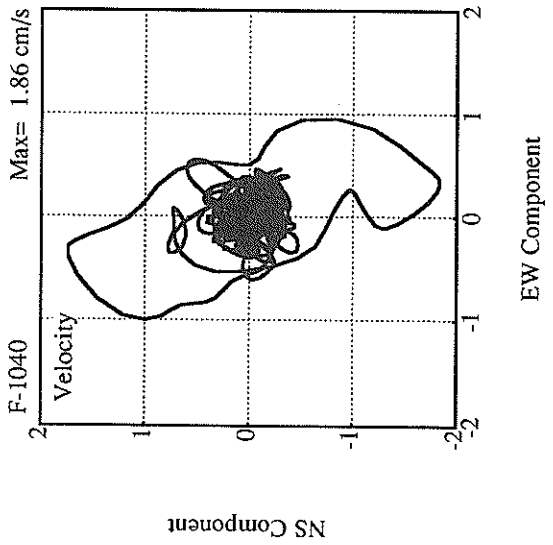
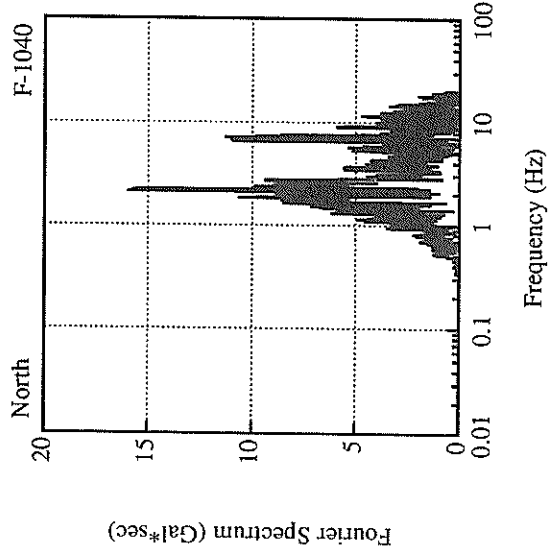
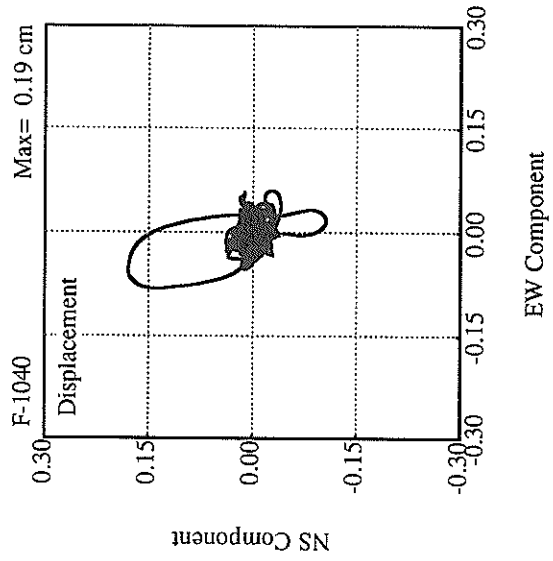
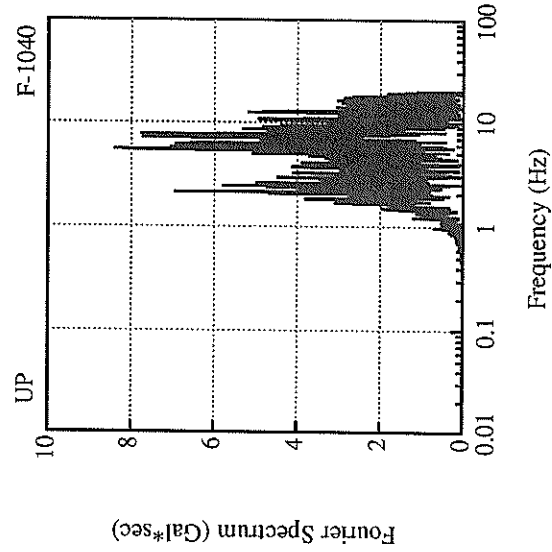
Displacement



Displacement







RECORD NUMBER : F-1041
 STATION : OSAKA-JI-G

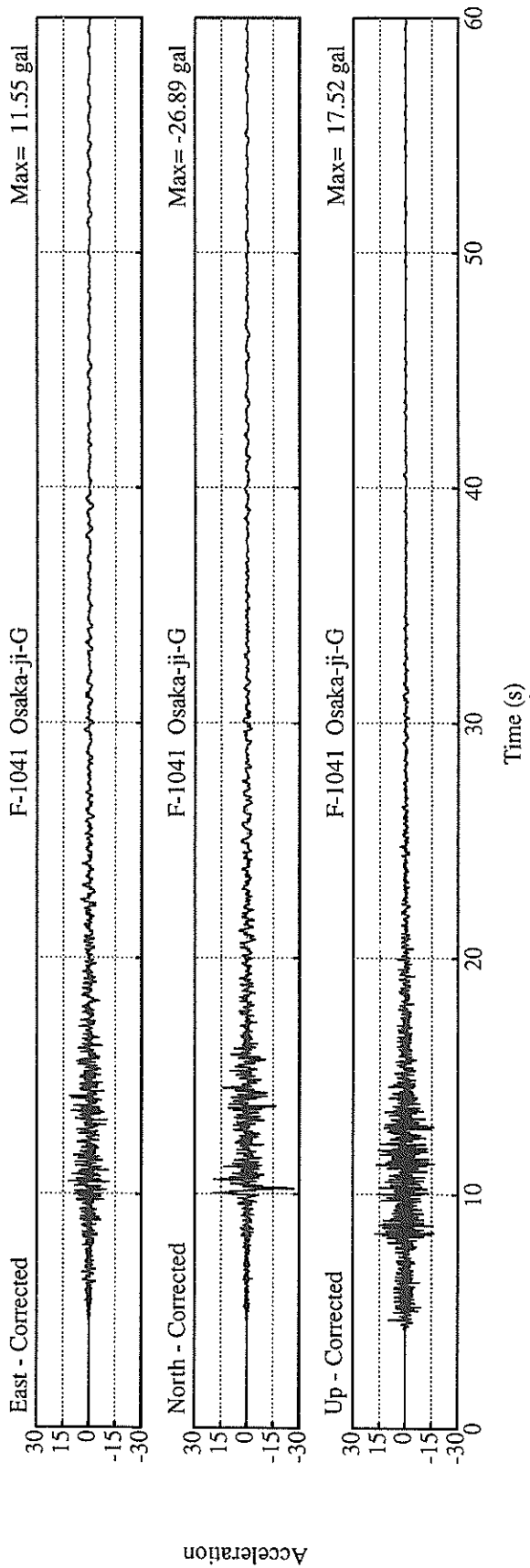
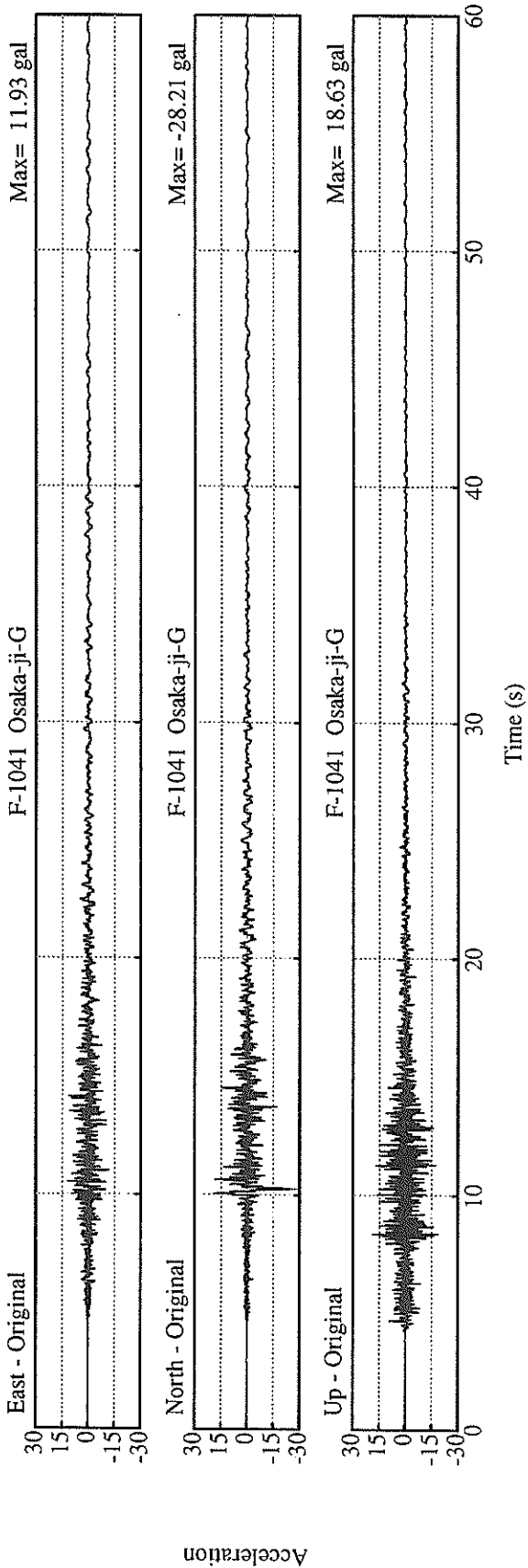
EARTHQUAKE DATA

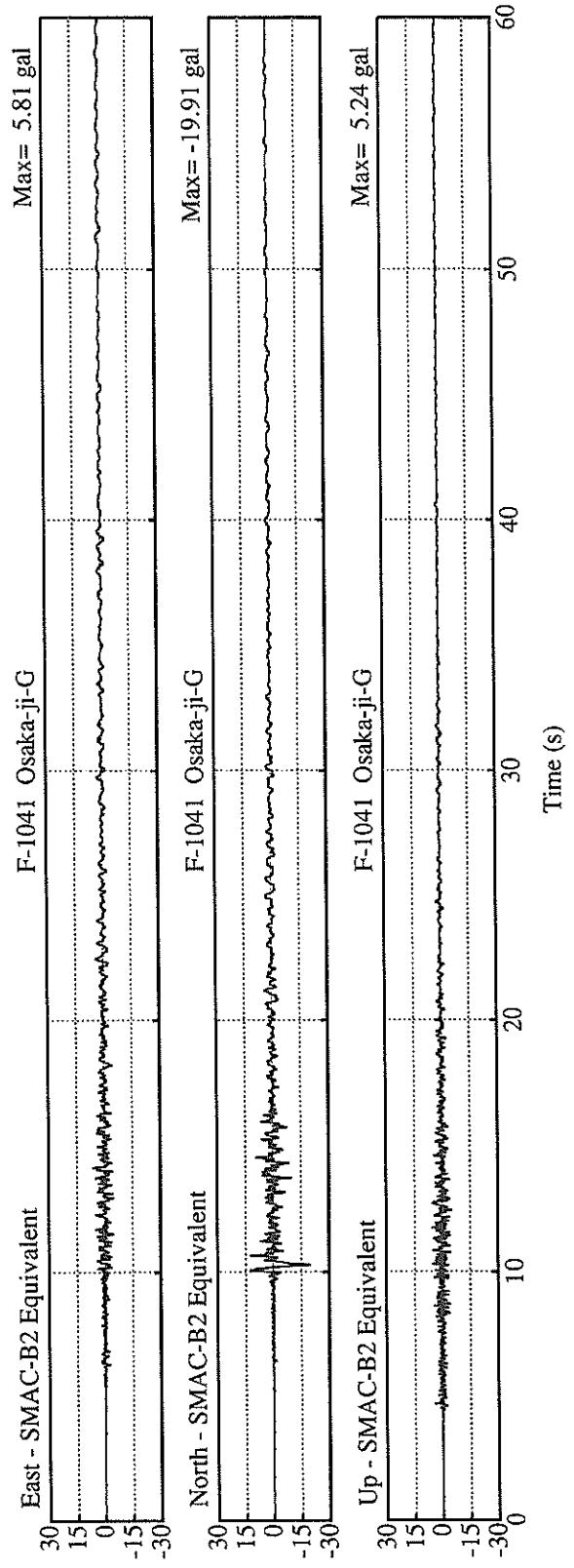
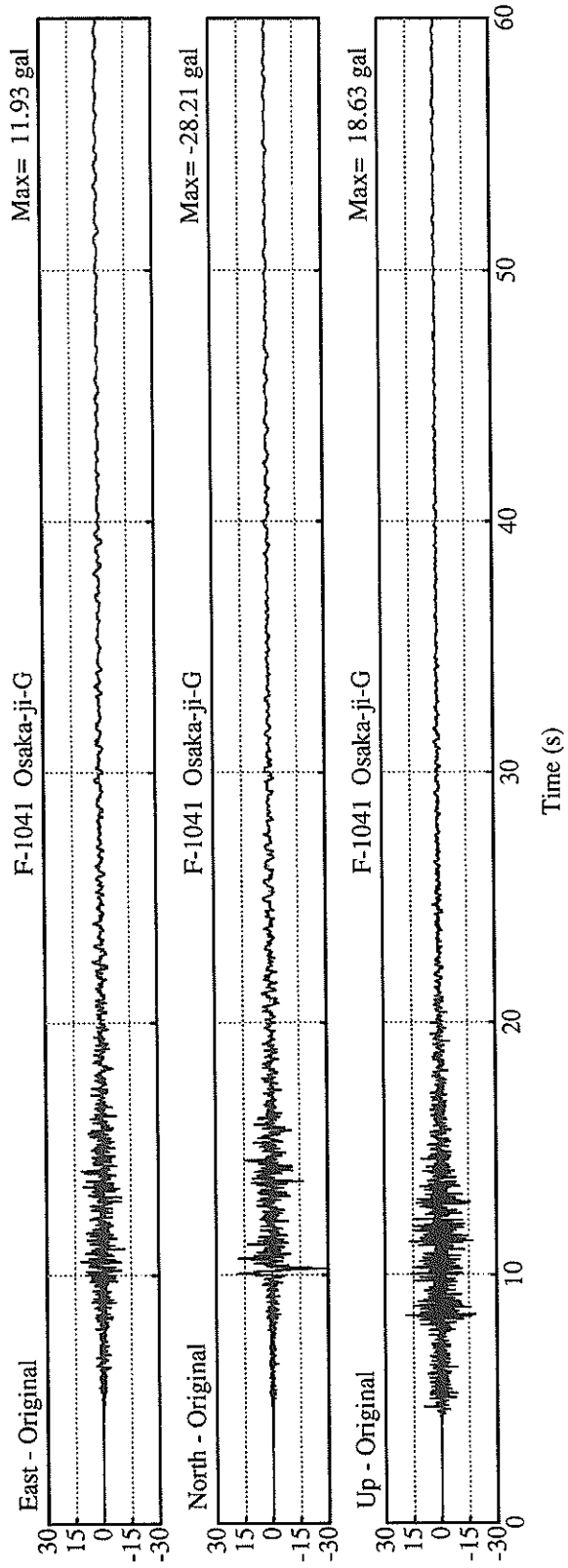
 DATE AND TIME 2: 4 OCT.14,1995
 LOCATION OF HYPOCENTER
 EPICENTRAL REGION OSAKA BAY REGION
 LATITUDE 34° 37.6' N
 LONGITUDE 135° 6.9' E
 DEPTH 15.3KM
 JMA MAGNITUDE 4.5

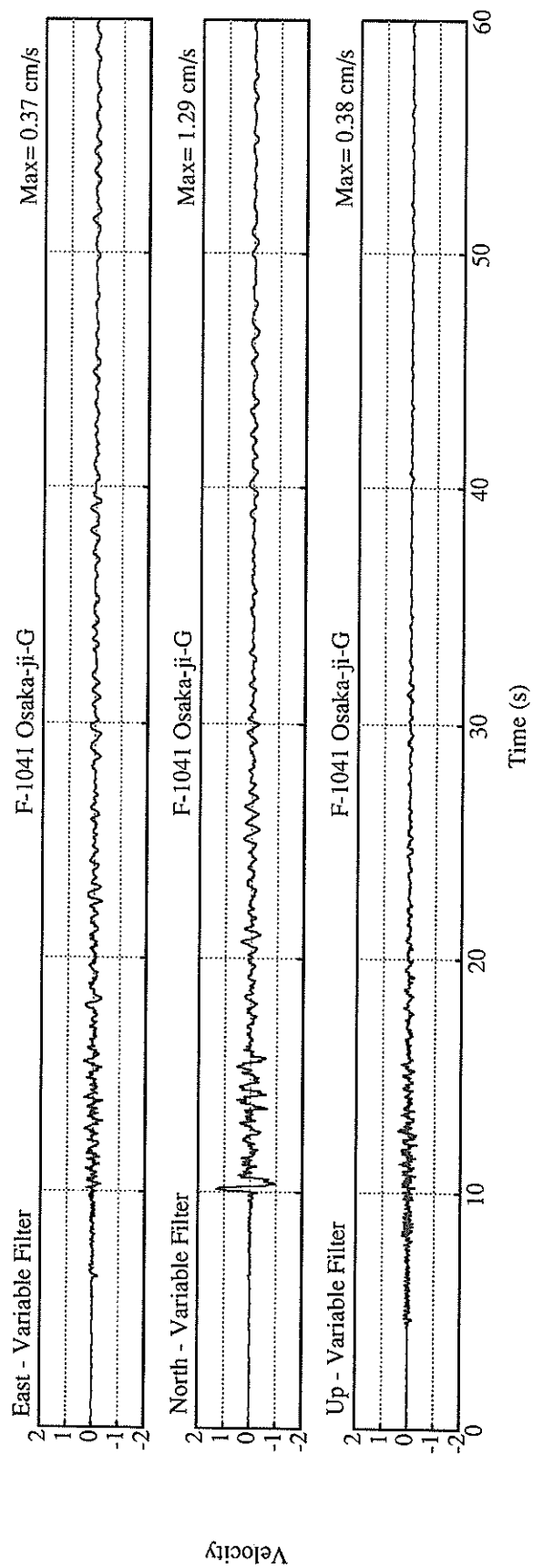
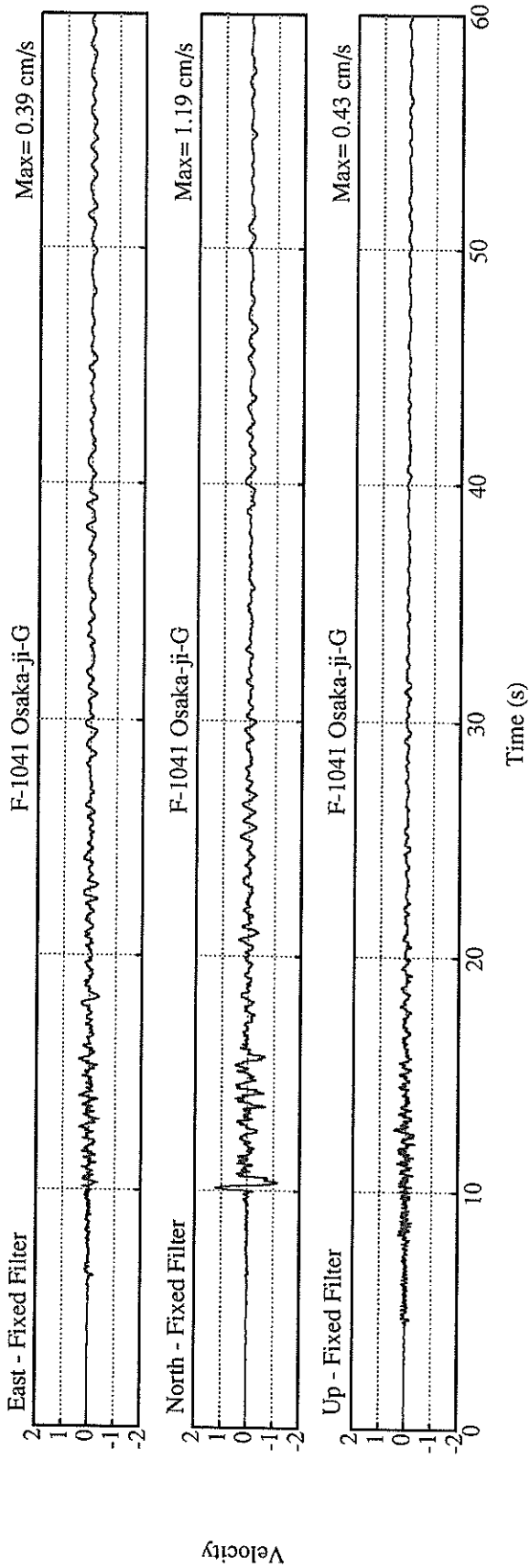
PEAK VALUES OF COMPONENTS

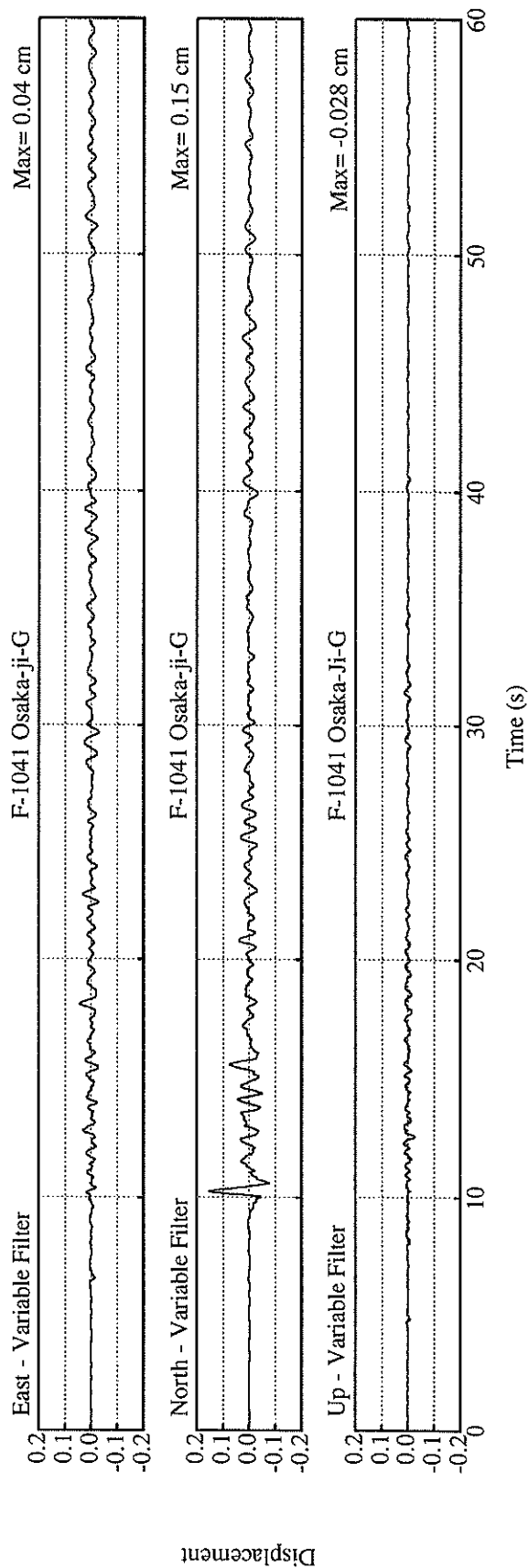
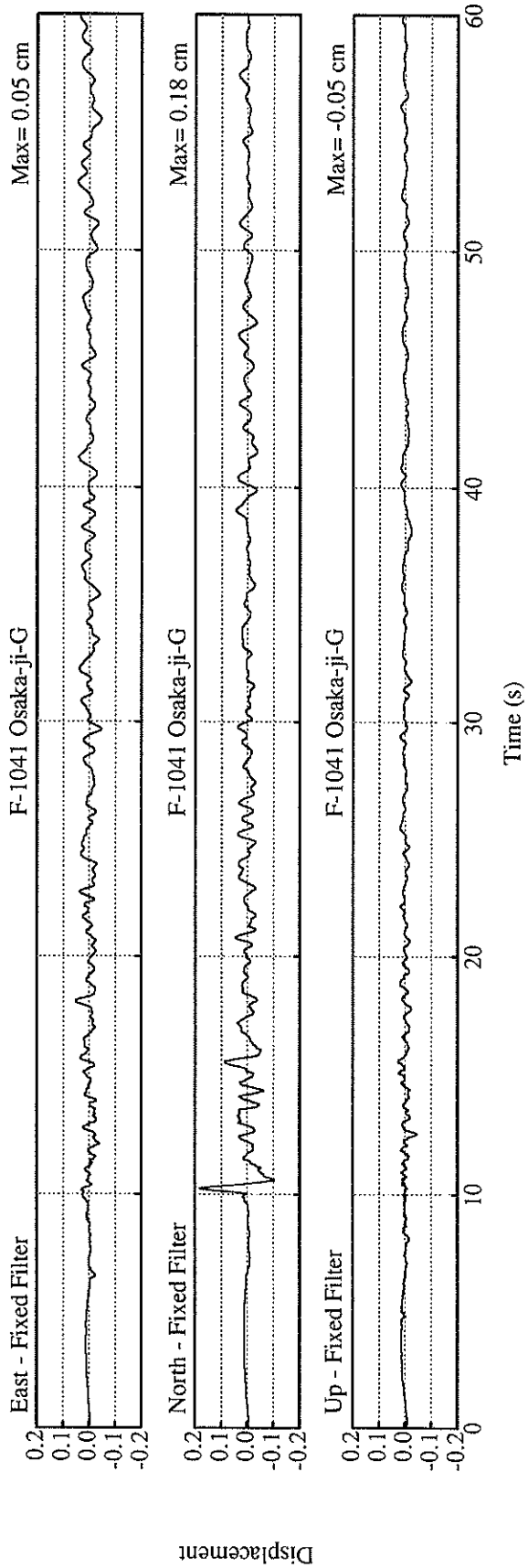
	N S	E W	U D	HORIZONTAL*
PARAMETER OF THE VARIABLE FILTER				
FC (HZ)	0.506	0.585	0.854	
MAXIMUM ACCELERATION (GAL)				
SMAC-B2 EQUIVALENT	19.9	5.8	5.2	20.0
ORIGINAL	28.2	11.9	18.6	28.4
CORRECTED	26.9	11.6	17.5	27.1
MAXIMUM VELOCITY (CM/SEC)				
FIXED FILTER	1.19	0.39	0.43	1.20
VARIABLE FILTER	1.29	0.37	0.38	1.31
MAXIMUM DISPLACEMENT (CM)				
FIXED FILTER	0.18	0.05	0.04	0.18
VARIABLE FILTER	0.15	0.04	0.03	0.15

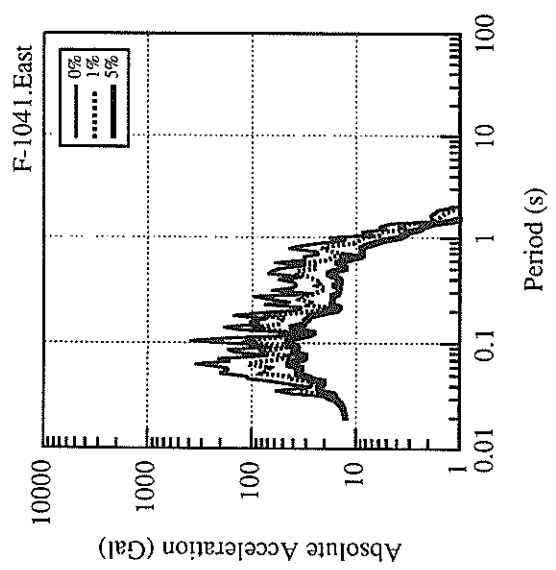
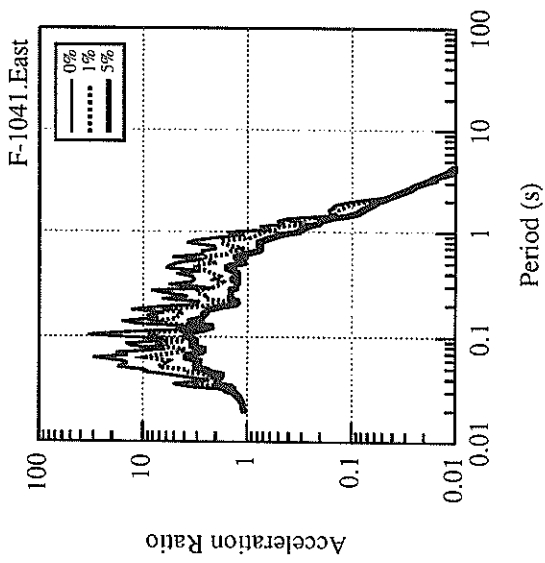
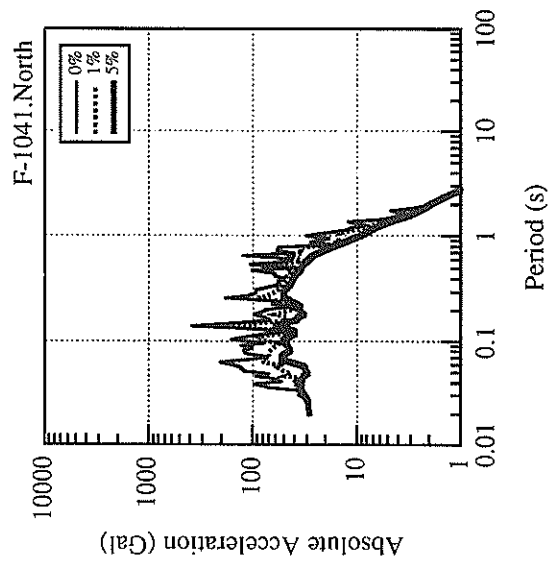
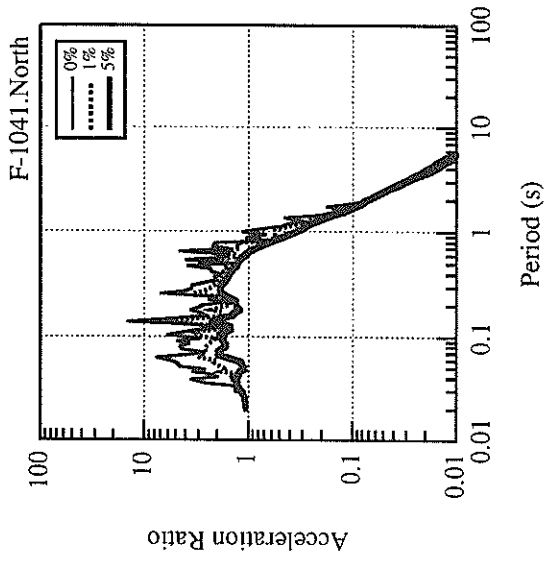
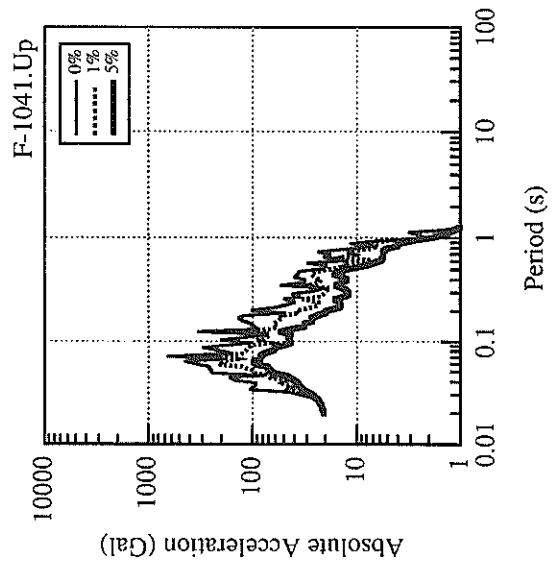
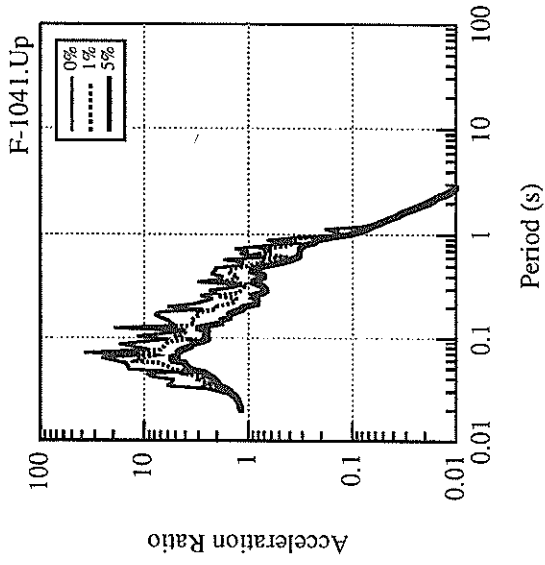
* RESULTANT OF HORIZONTAL COMPONENTS

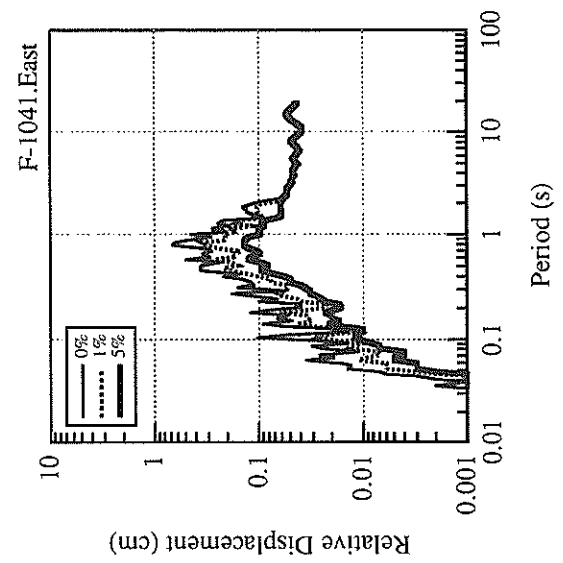
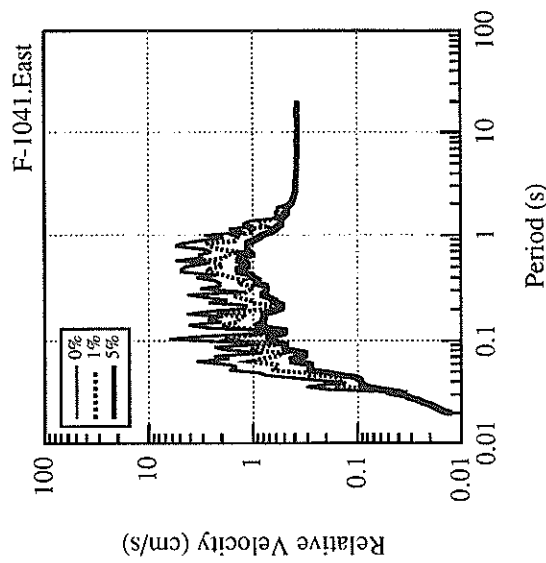
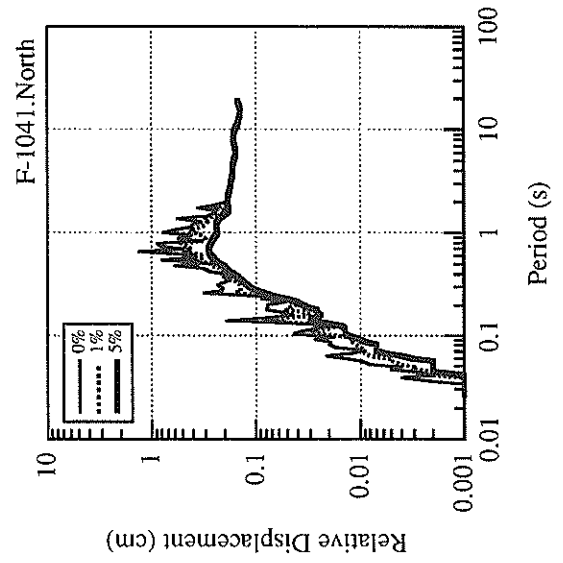
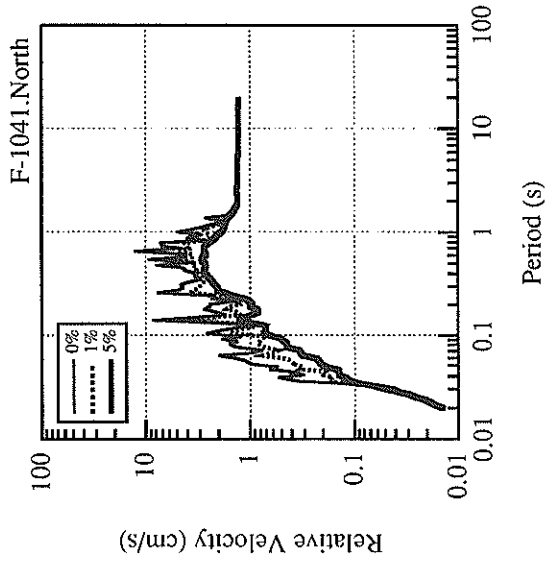
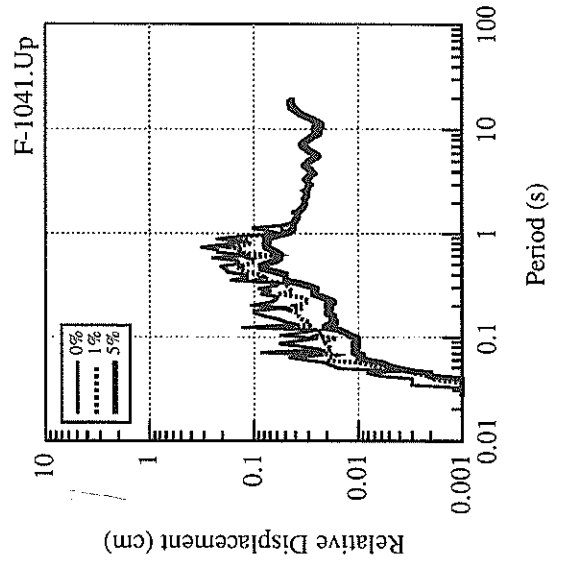
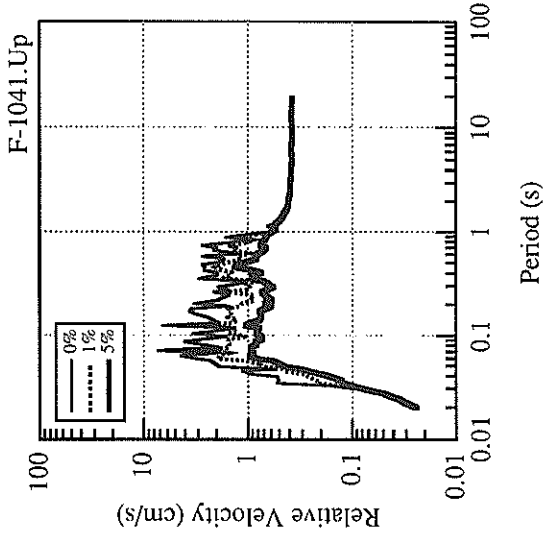


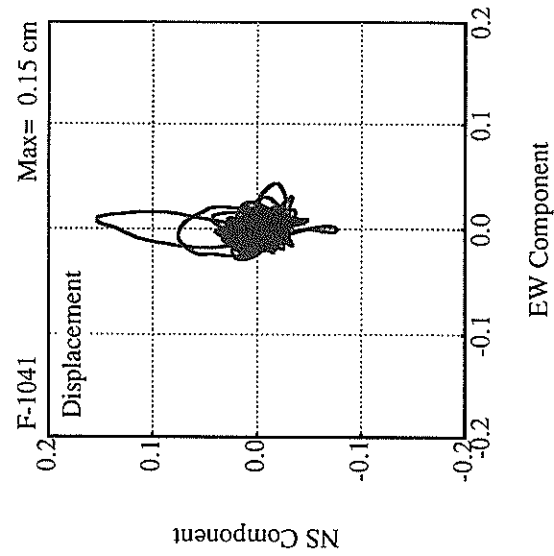
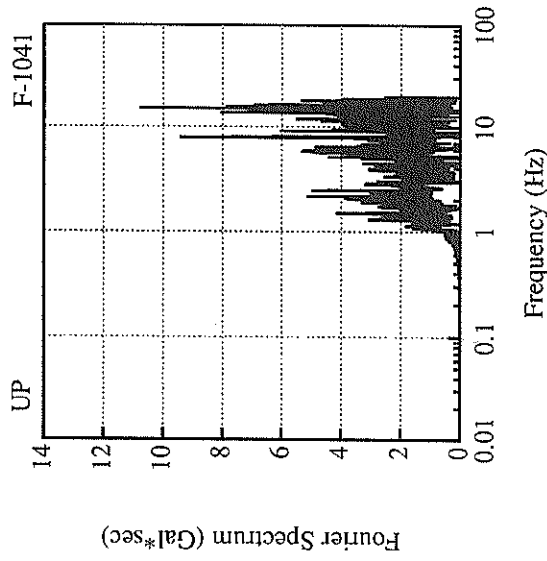
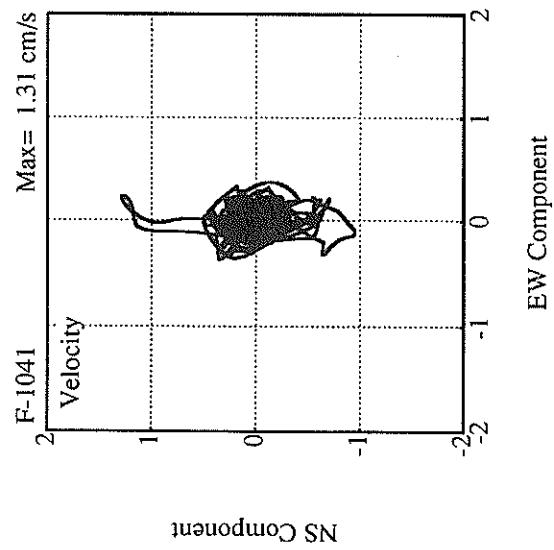
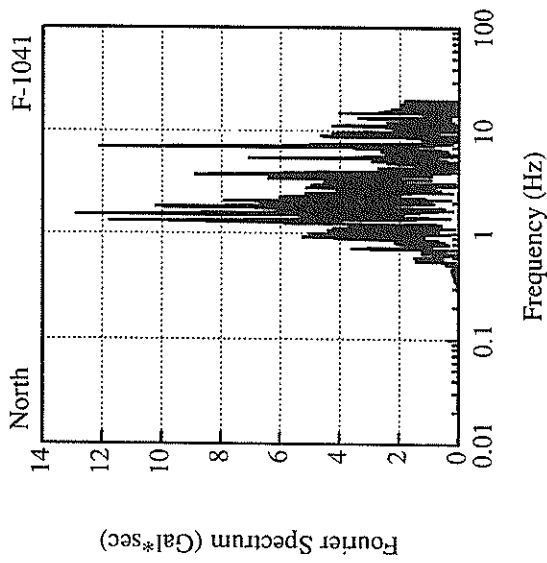
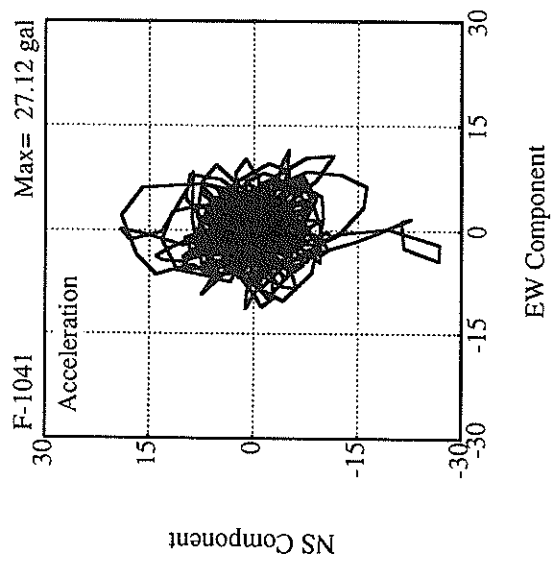
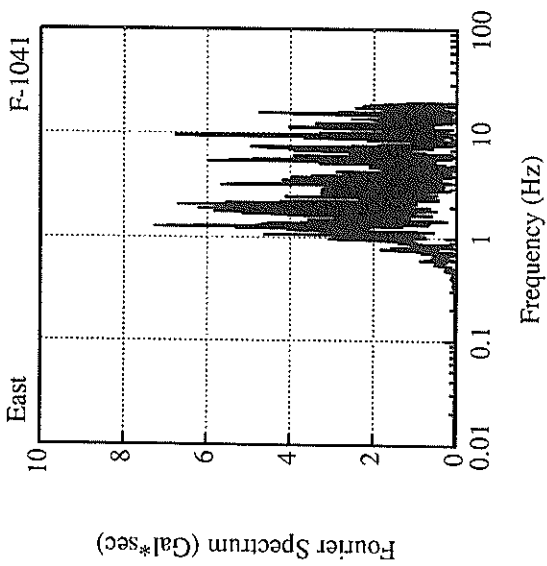












港湾技研資料 No.907

1998.6

編集兼発行人 運輸省港湾技術研究所

発行所 運輸省港湾技術研究所
横須賀市長瀬3丁目1番1号

印刷所 株式会社 東京プリント

Published by the Port and Harbour Research Institute
Nagase, Yokosuka, Japan.

Copyright © (1998) by P.H.R.I

All right reserved. No part of this book may be reproduced by any means, nor transmitted, nor translated into a machine language without the written permission of the Director General of P.H.R.I

この資料は、港湾技術研究所長の承認を得て刊行したものである。したがって、本資料の全部又は一部の転載、複写は、港湾技術研究所長の文書による承認を得ずしてこれを行ってはならない。