



U.S. - JAPAN COORDINATED PROGRAM

FOR

PB90-121260

MASONRY BUILDING RESEARCH

REPORT NO. 3.2(b1)

OUT-OF-PLANE DYNAMIC TESTING OF CONCRETE MASONRY WALLS

VOLUME II: TEST RESULTS

by

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JULY 1989

supported by:

**NATIONAL SCIENCE FOUNDATION
GRANT NO. ECE-8701512**



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REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

FOREWORD

This report is one of a two volume final report prepared for the National Science Foundation under Grant No. ECE 8701512. The two volumes provide results and discussions of the research effort. These results are discussed and evaluated.

Volume I provides an introduction, a description of experimental program, a summary, and discussion of test results.

Volume II provides more detailed selected test results processed during this program. The plots presented were filtered and presented as time histories. A video tape is also available for this research effort.

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INTRODUCTION

Fifteen instrumentation channels recorded the test results along the height of the test panel. Figure 1 shows a typical instrumentation layout for a wall specimen. For further information on instrumentation layout, test setup, and the loading sequence the reader is referred to Volume I.

The digitized test data are presented in this volume in four appendices. Appendices A, B, C, and D contain the response time histories for Panels 1, 2, 3, and 4, respectively. For each panel, the data consists of velocity, displacement, relative displacement, and rebar strain time histories. Panel 1 was not instrumented with strain gages.

Each page of the data has an identification tag given in the bottom left-hand corner of the page. A typical identification tag is

XNmn

where

X = V for velocity response
= D for displacement response
= R for relative displacement
= G for rebar strain
N = 1, 2, 3, 4 representing the test specimen number
mn = representing the test sequence

Therefore, tag V415 indicates the velocity response for Panel #4 for Sequence 15.

It should be noted that although all the analog data recorded during the testing is digitized, the response plots given in this volume do not include all the digitized data. The displacement and the relative displacement time histories are postprocessed data based on the recorded velocity signals. The presented data is not filtered.

Pseudo velocity response spectra for a selected set of digitized data for all the four panels are given in Appendix E. The sampling rate for the calculated spectra is 200 cps.

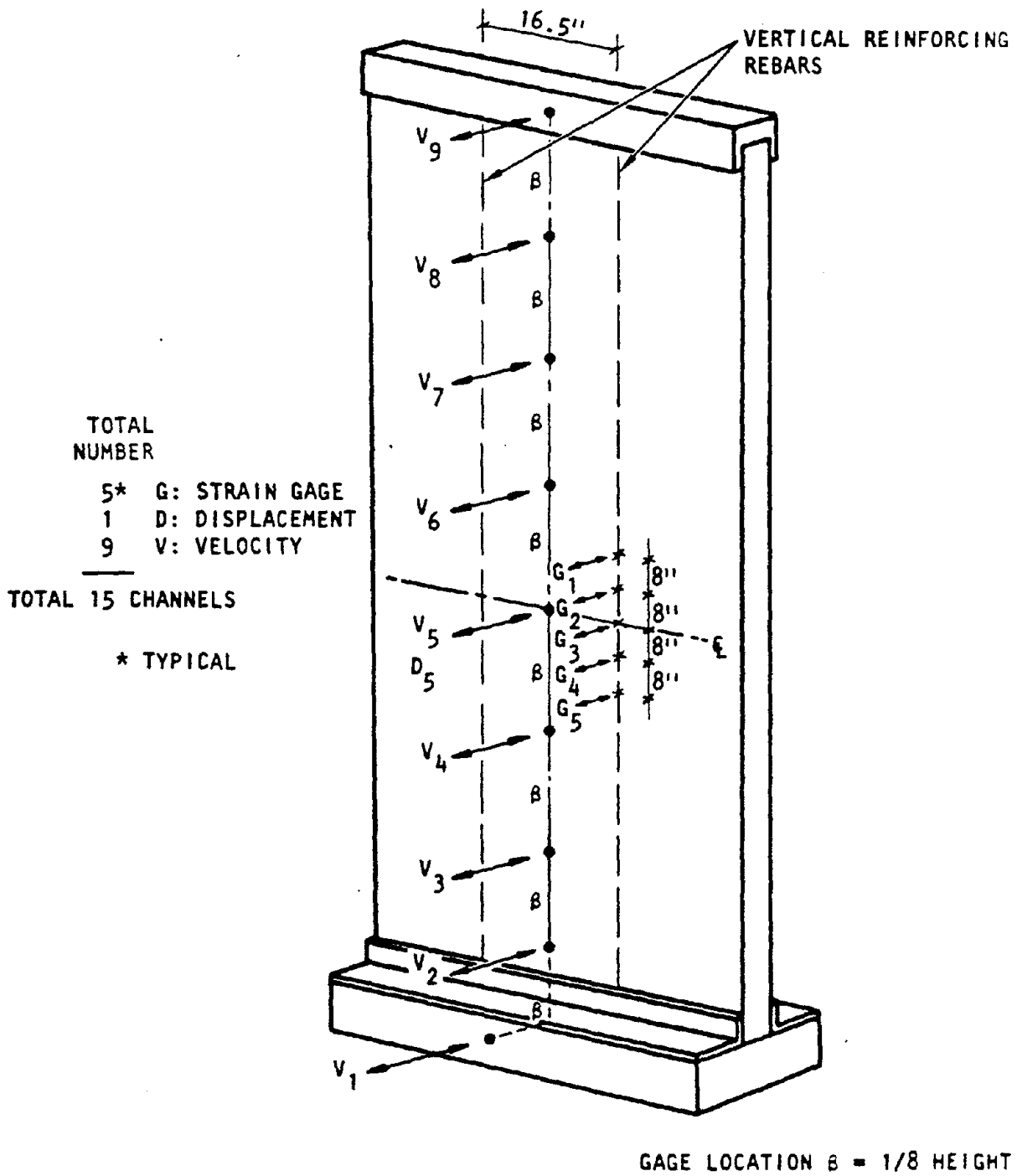
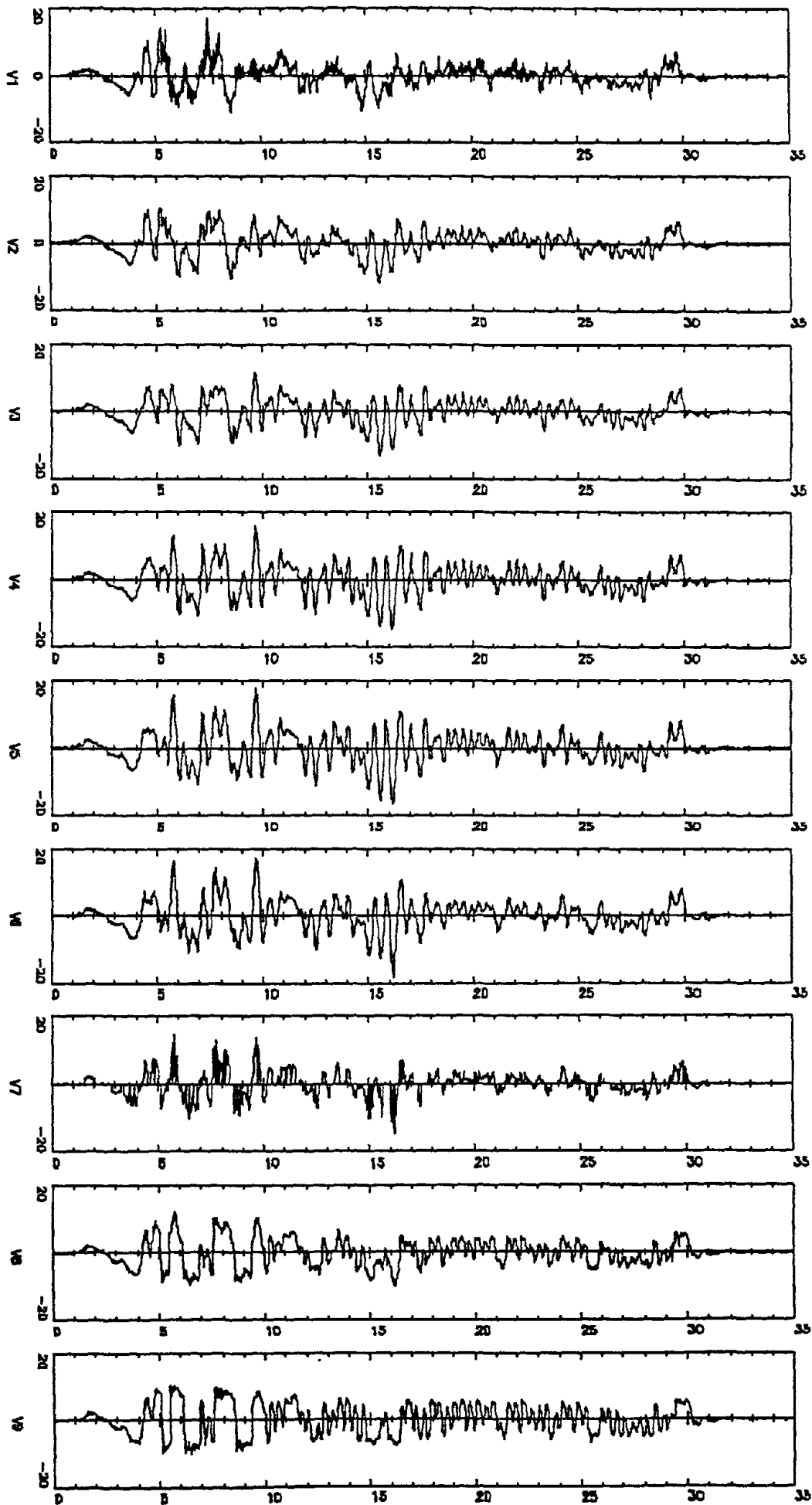


FIGURE 1. TYPICAL WALL INSTRUMENTATION FOR DYNAMIC TESTING

APPENDIX A
TIME HISTORY RESPONSE FOR PANEL #1

WALL # 1

VELOCITY TIME HISTORIES

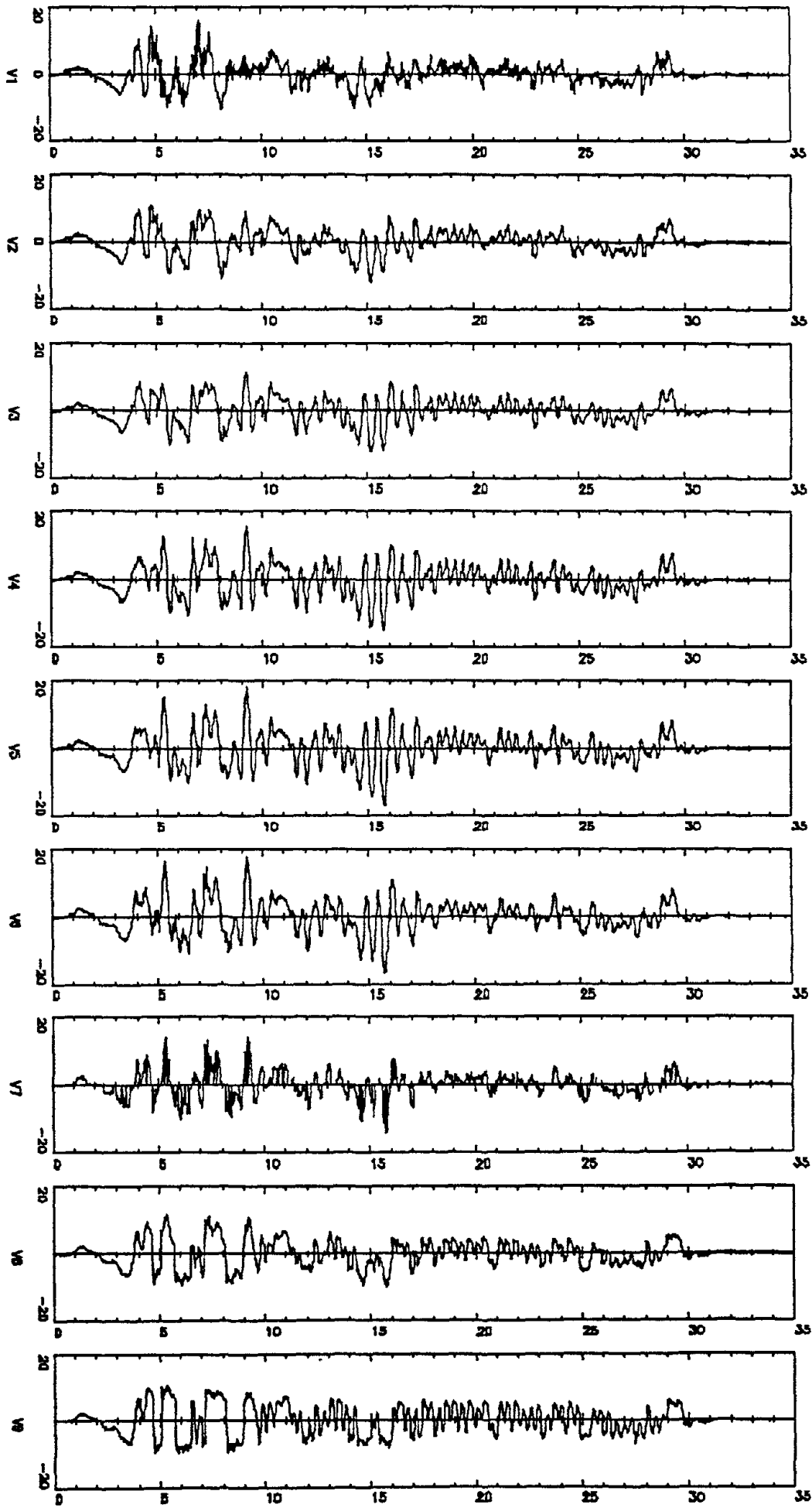


V10

V11

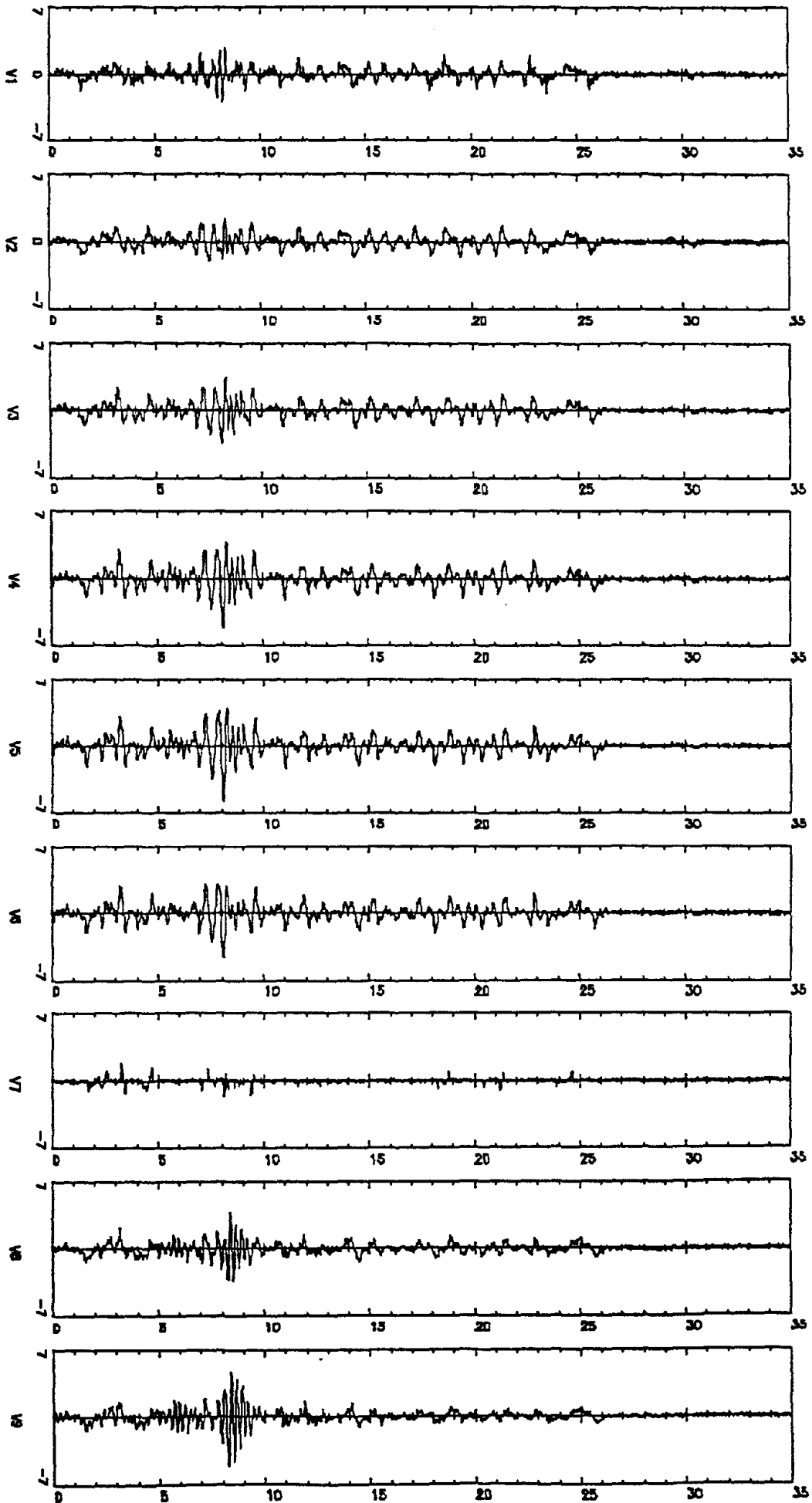
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A3



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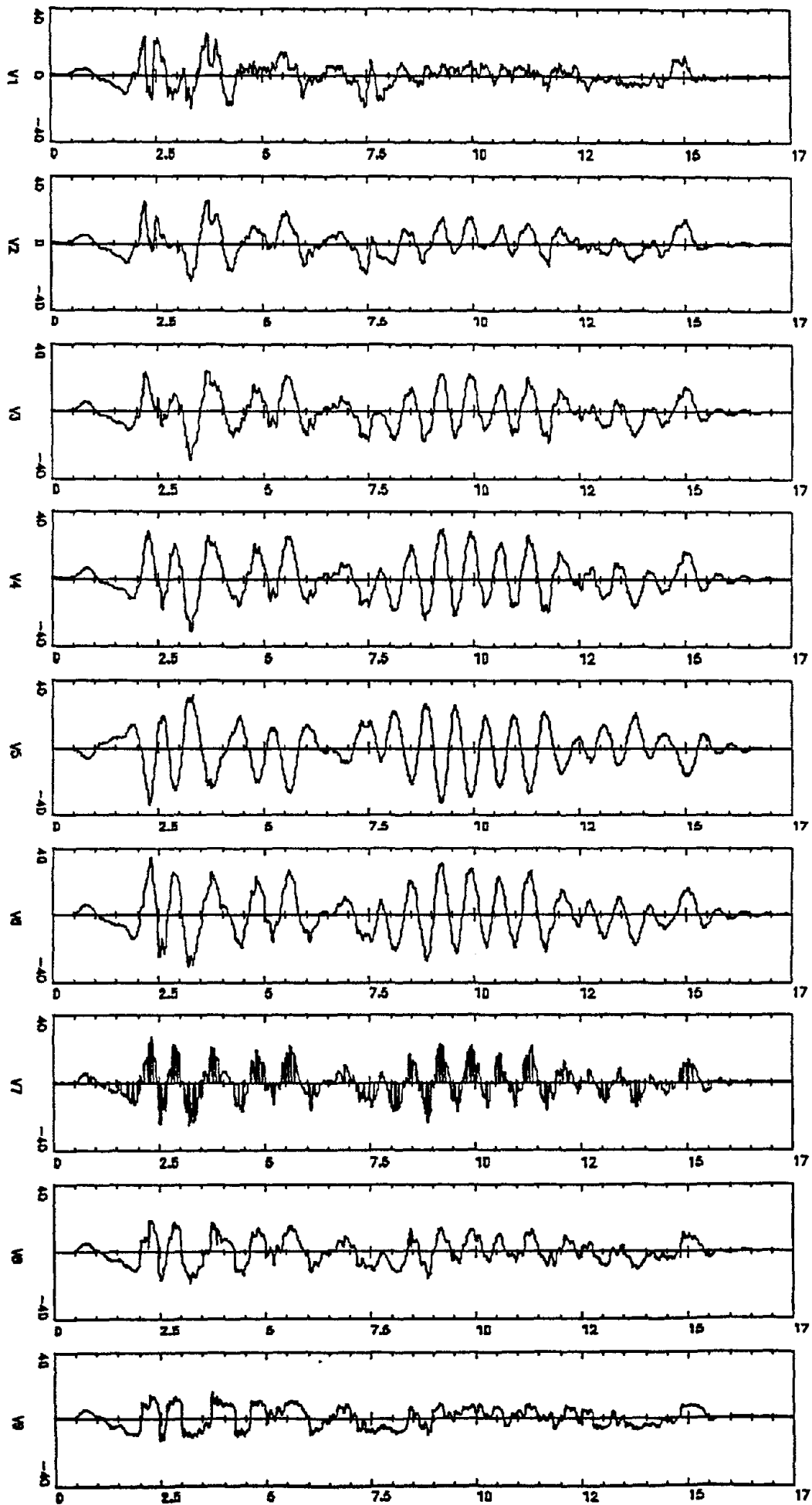


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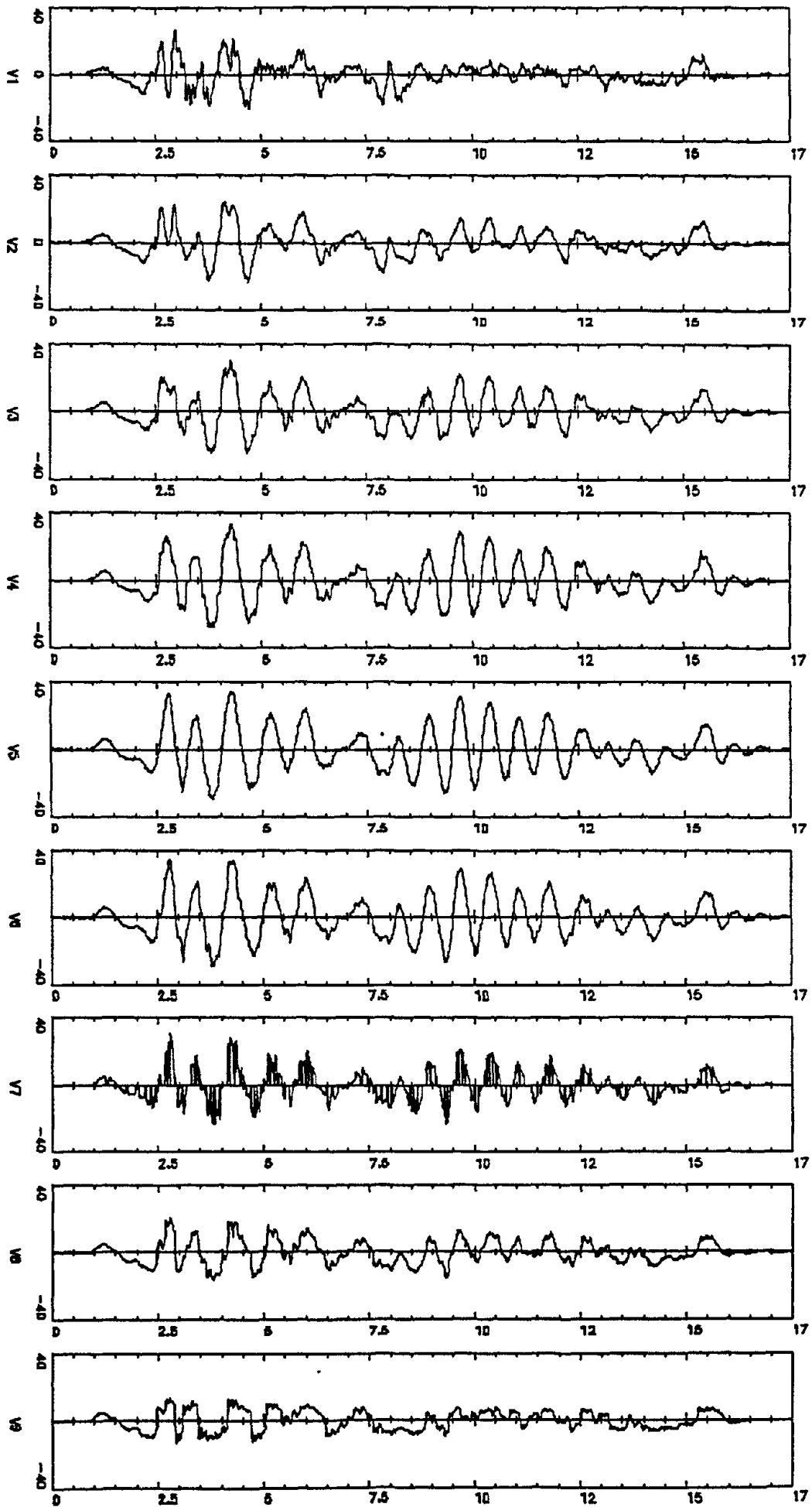


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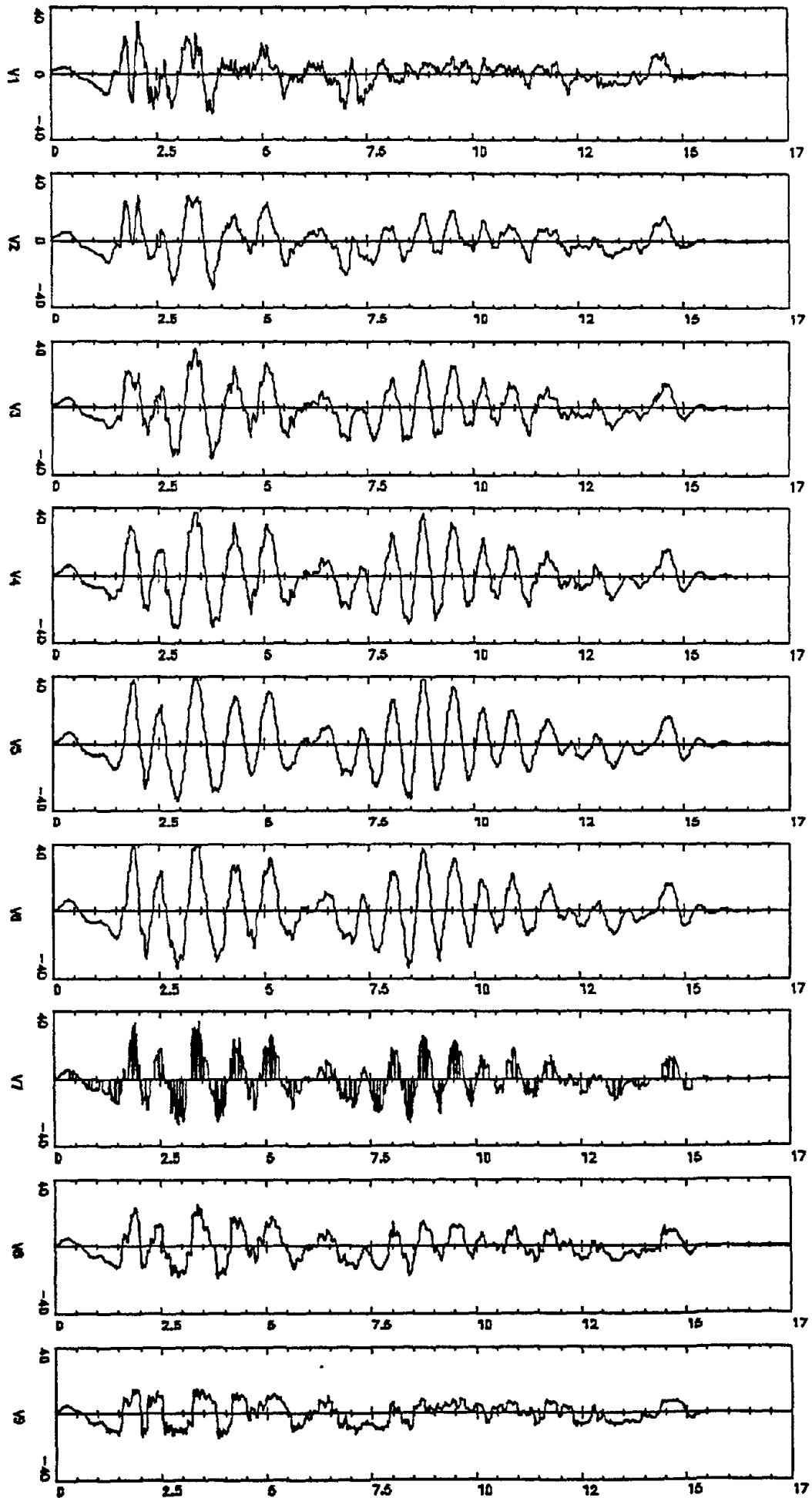
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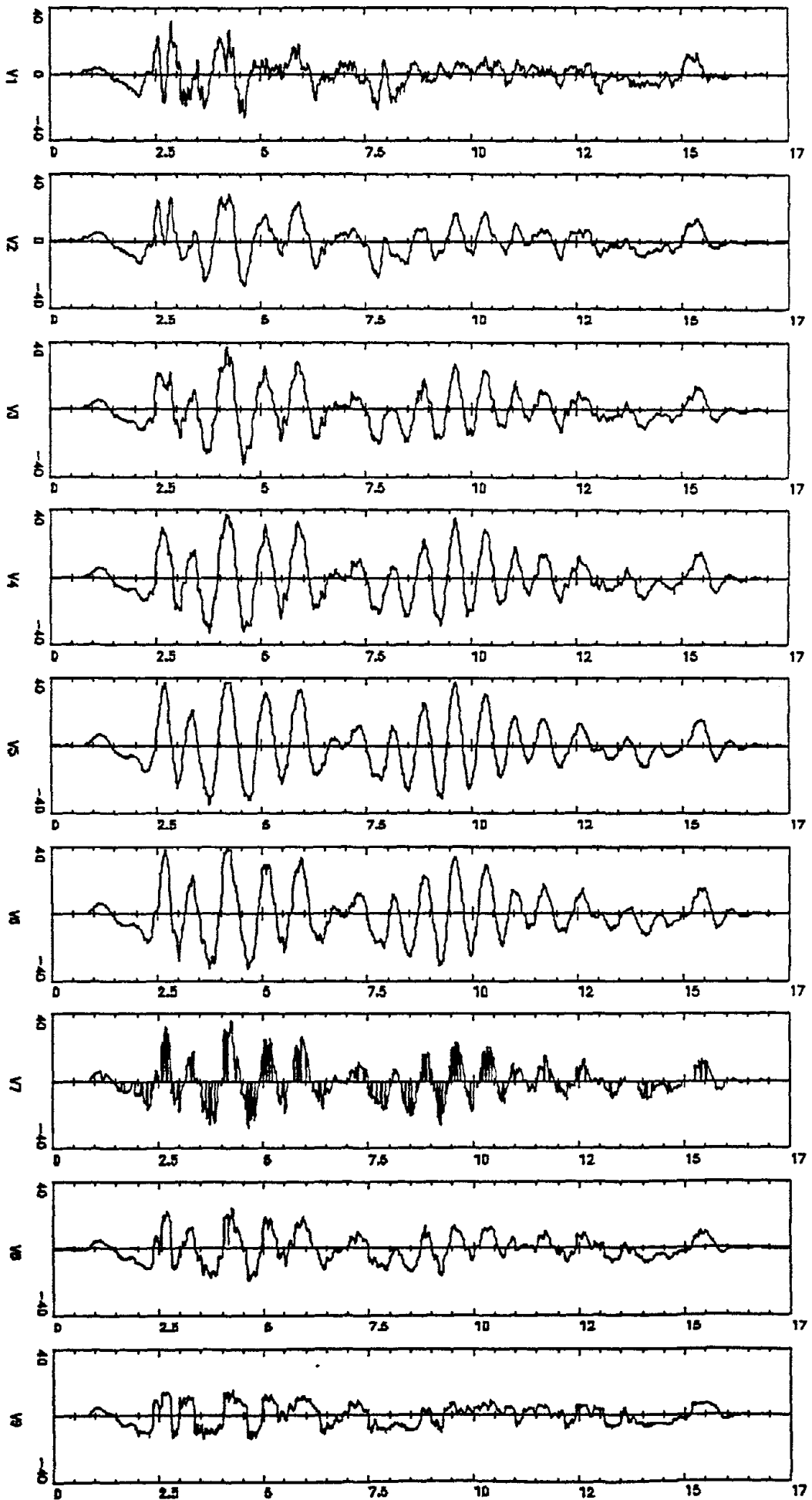


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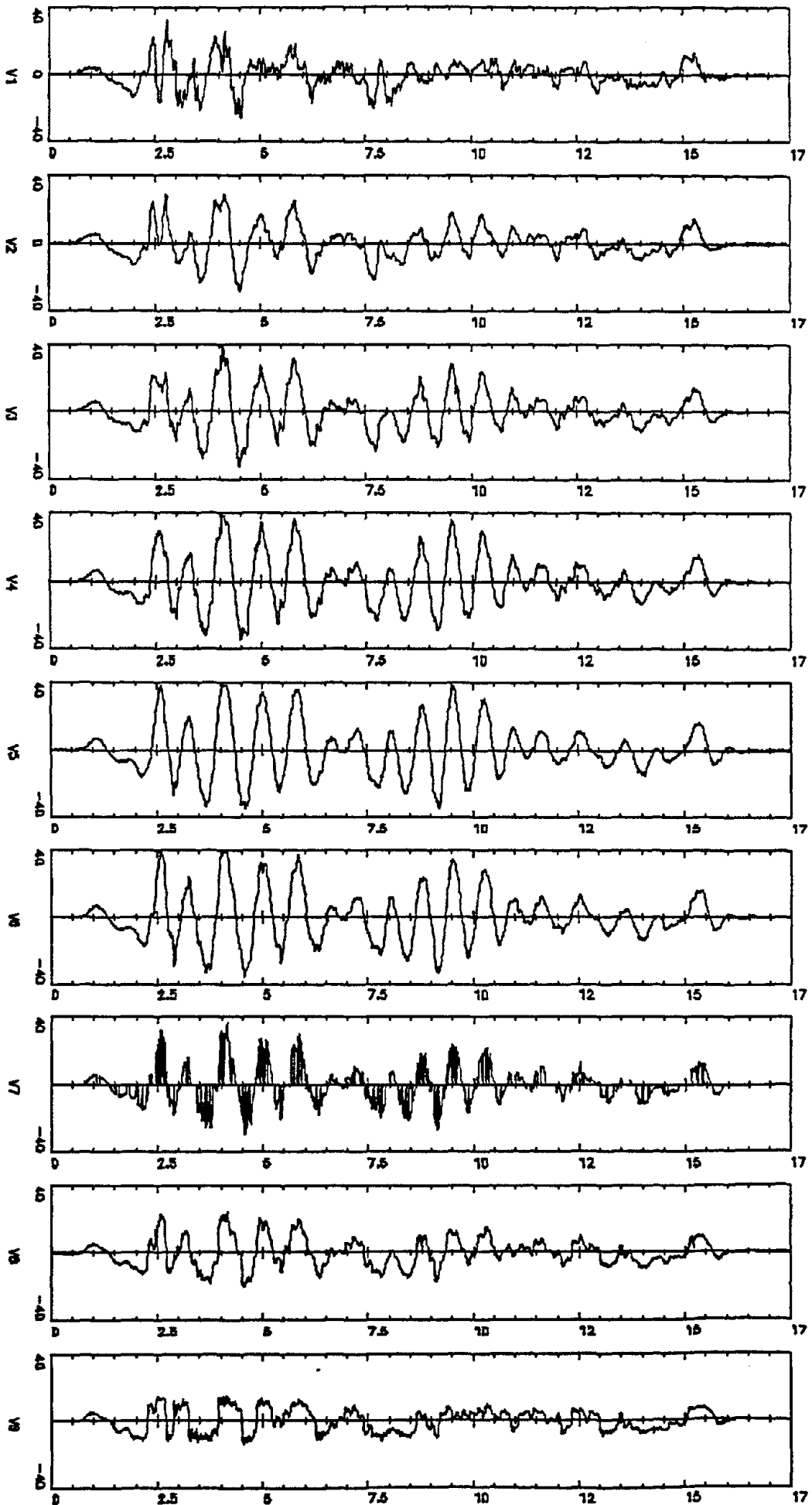


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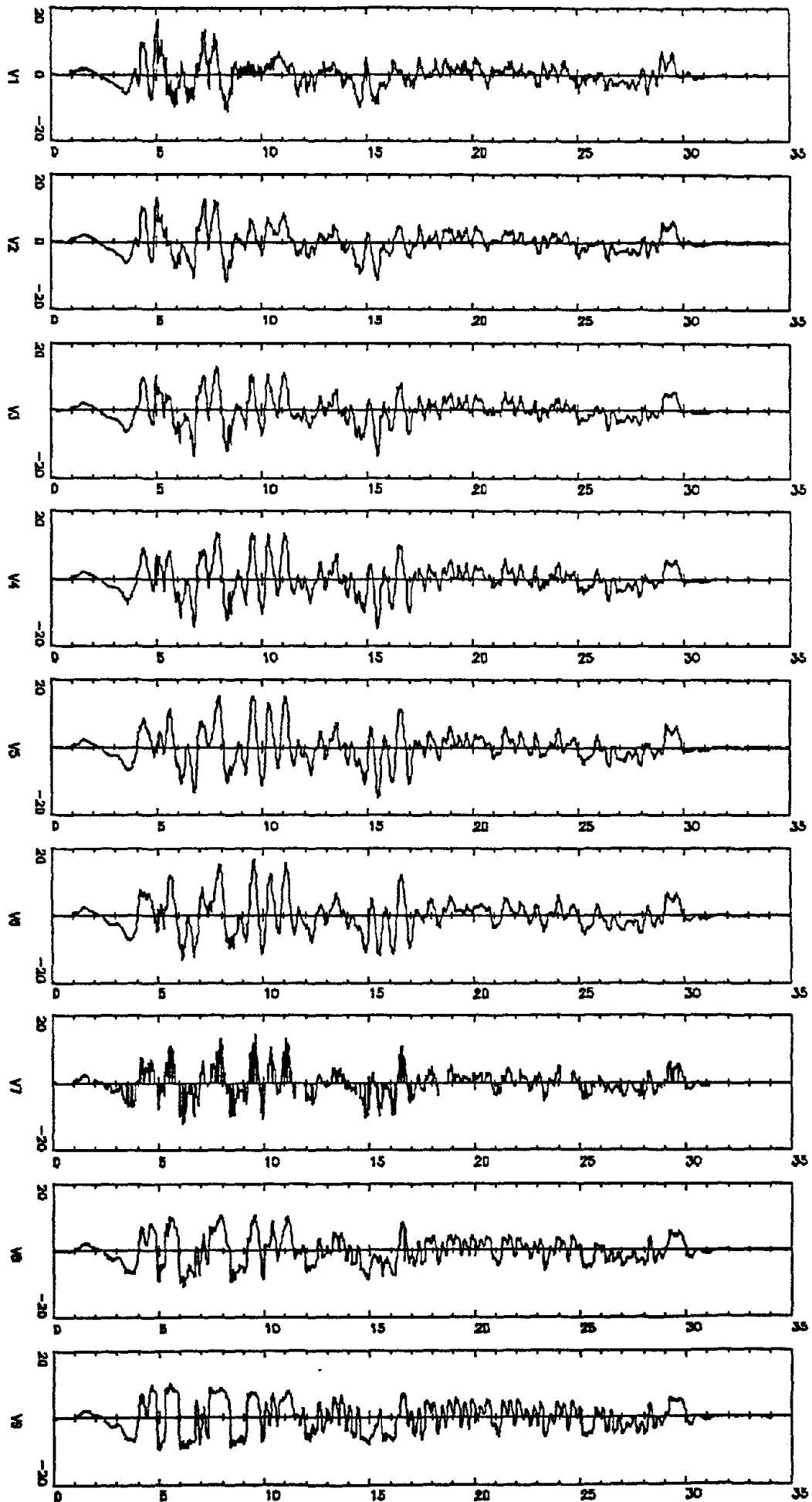
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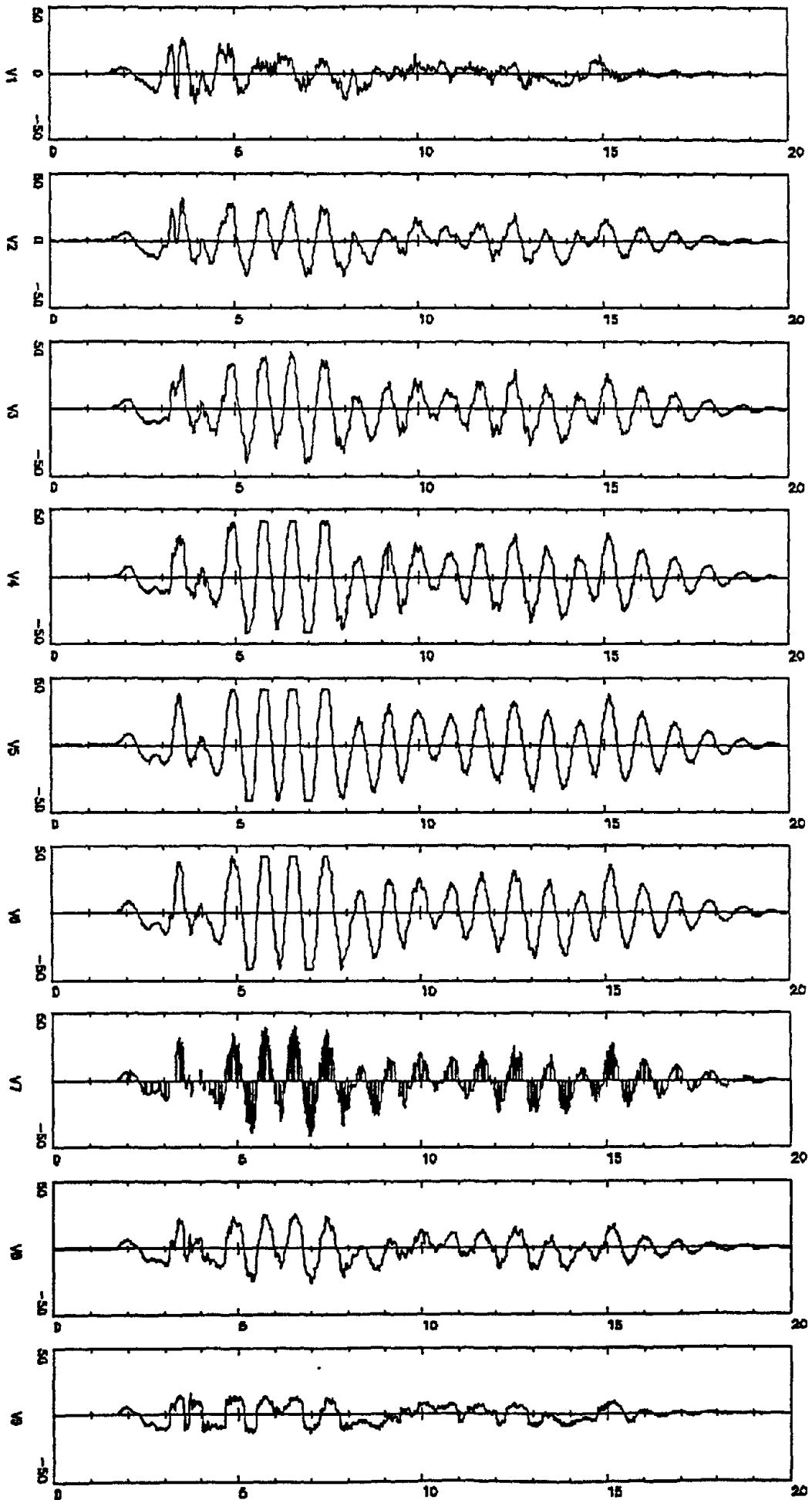


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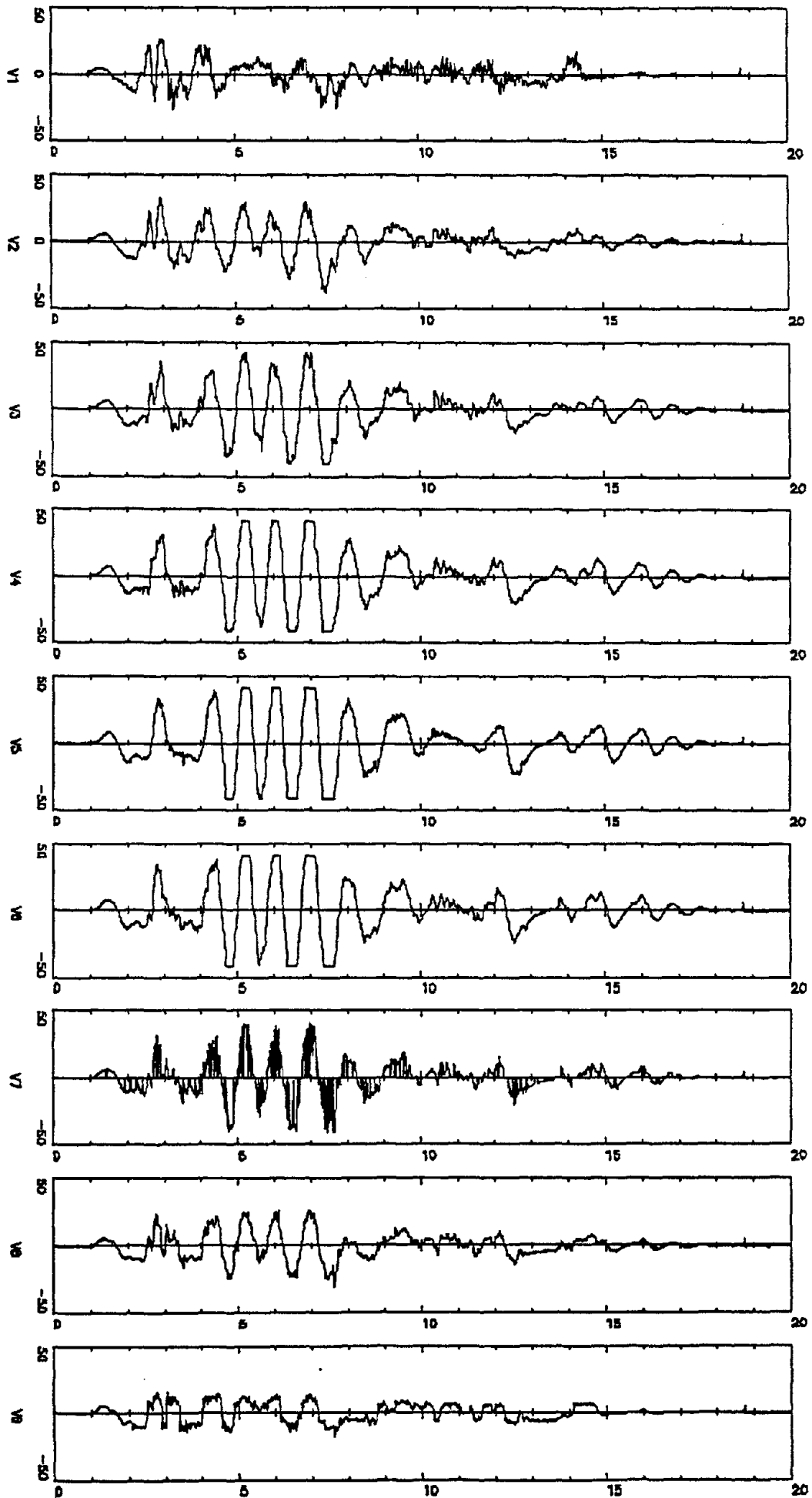


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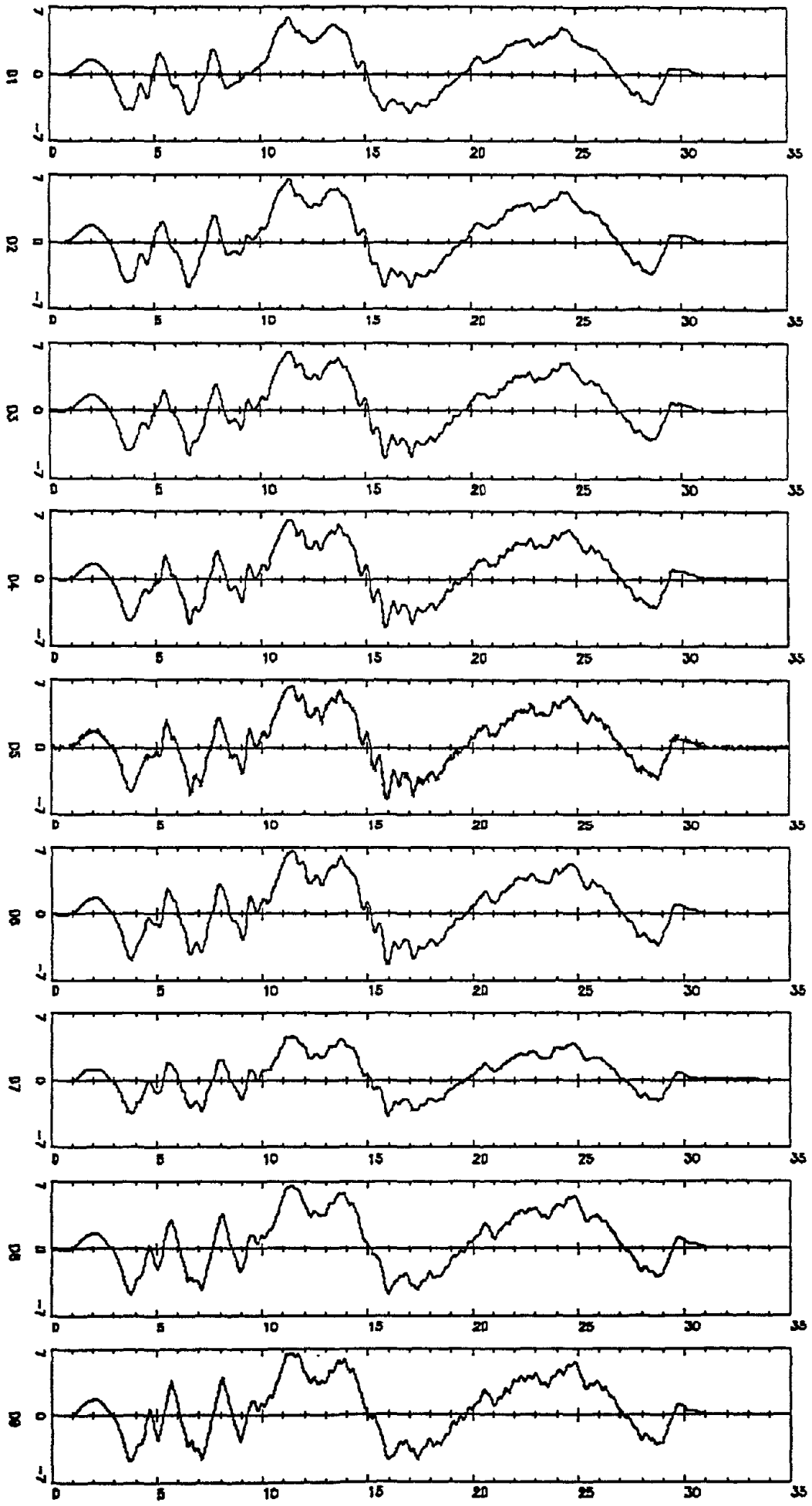
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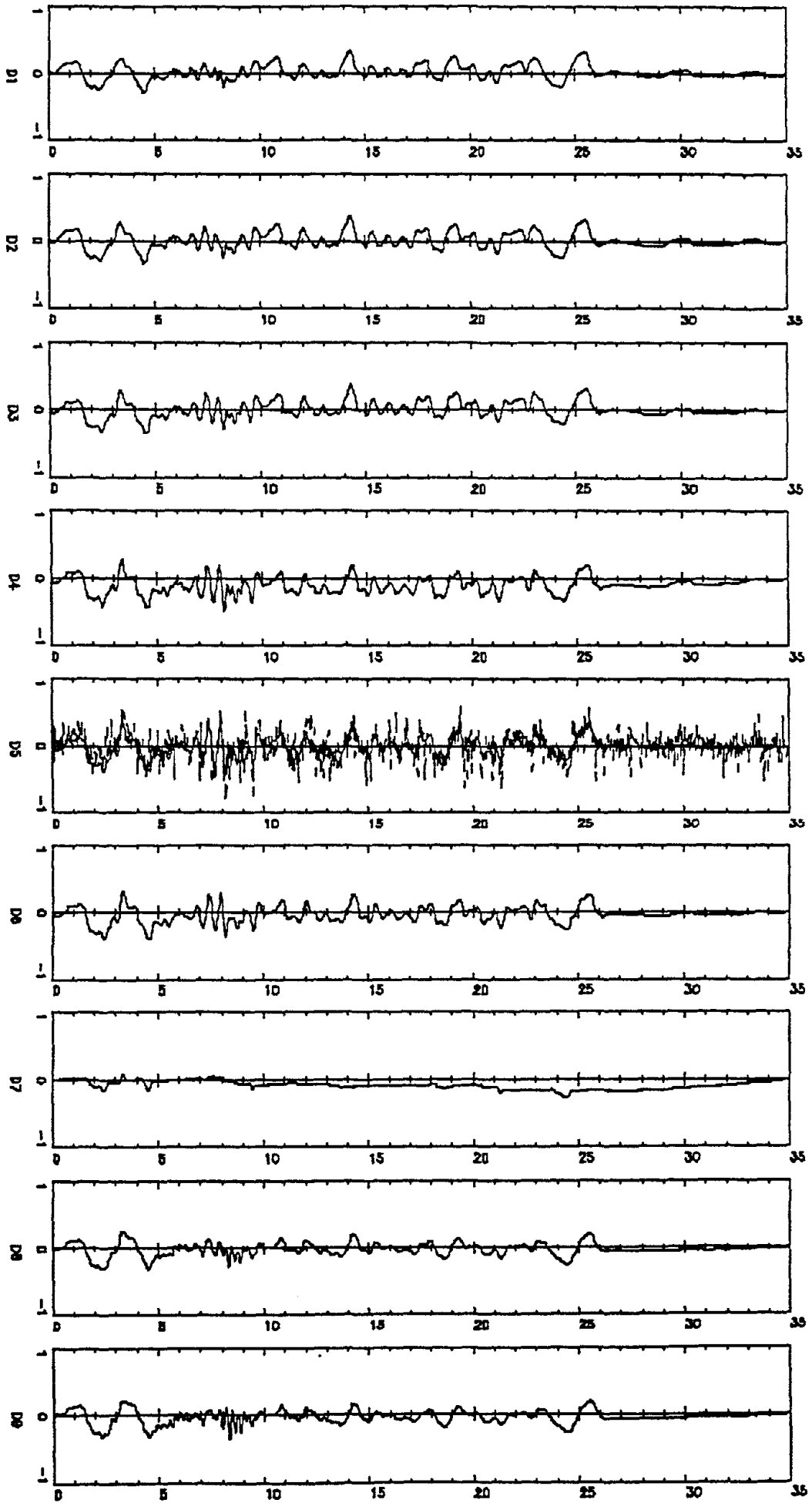
WALL # 1

DISPLACEMENT TIME HISTORIES



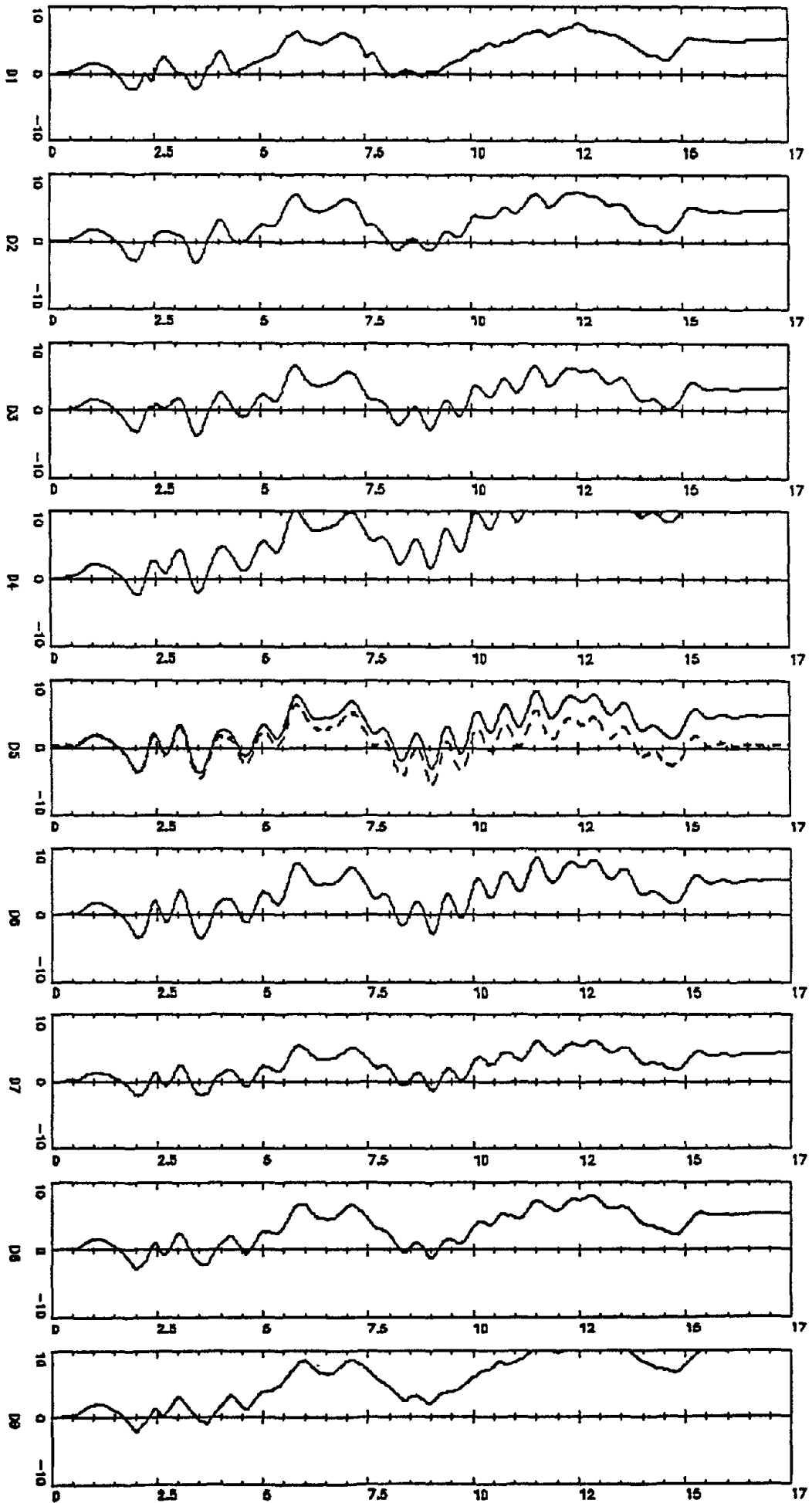
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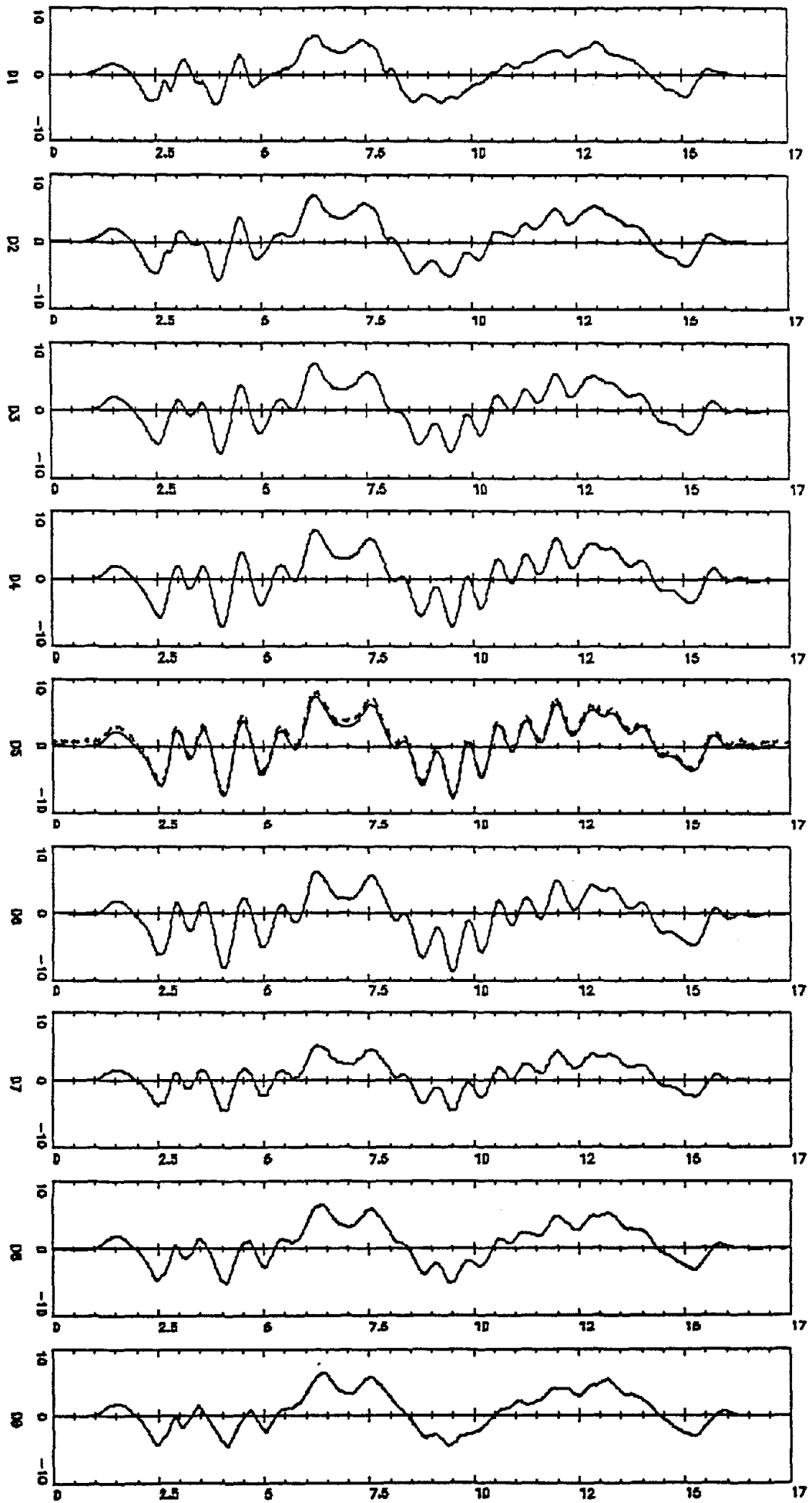


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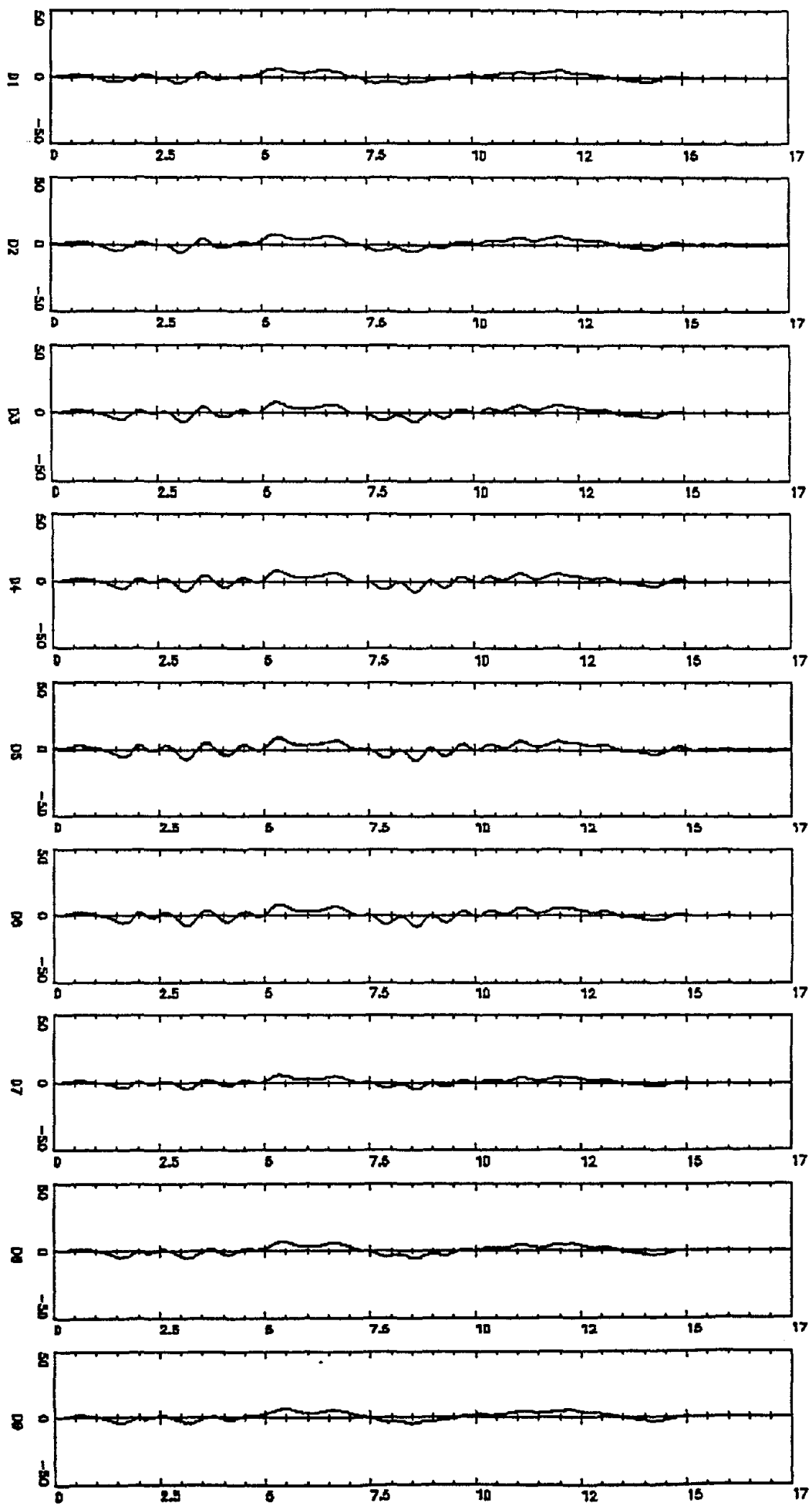
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D113

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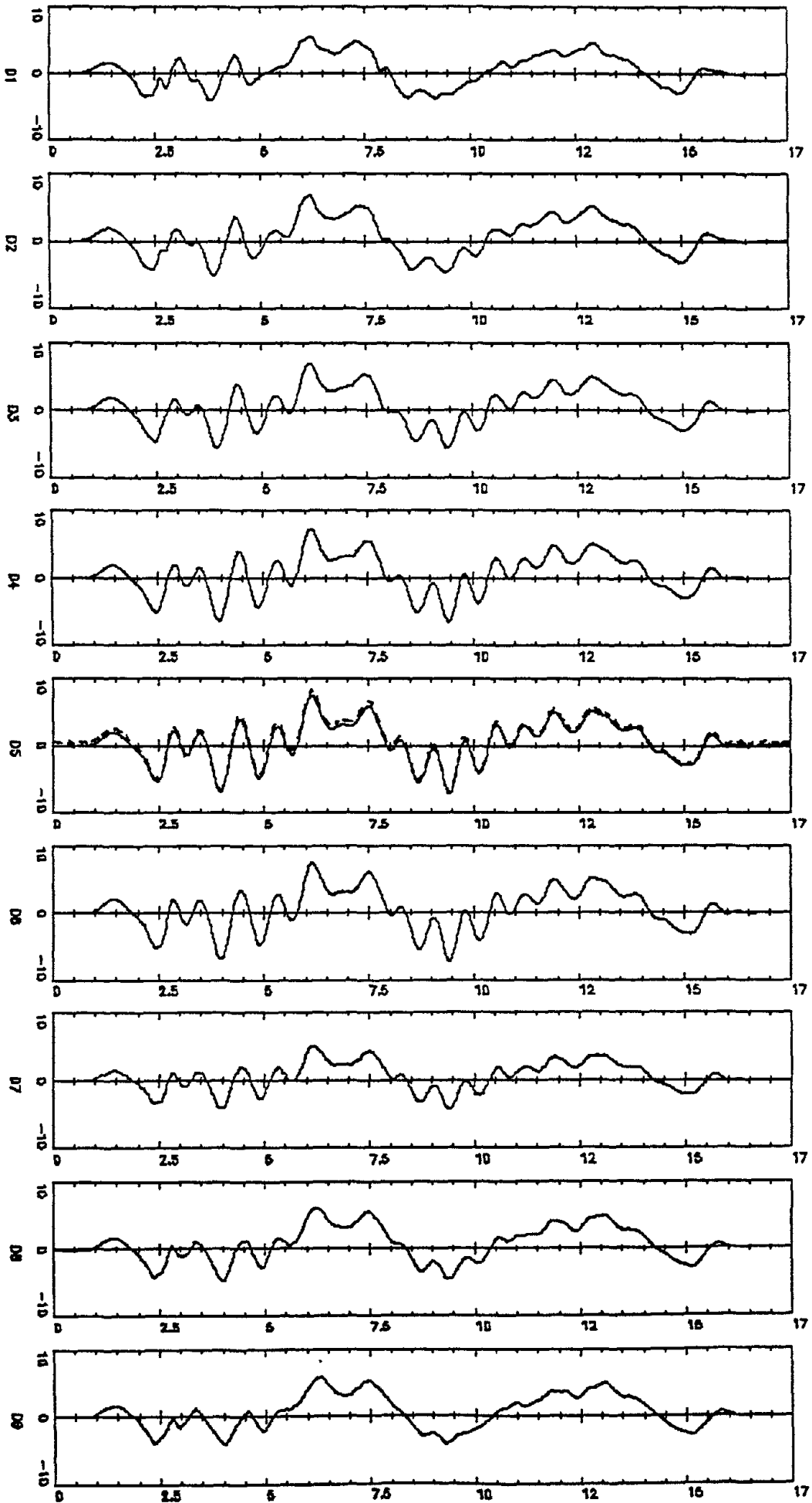
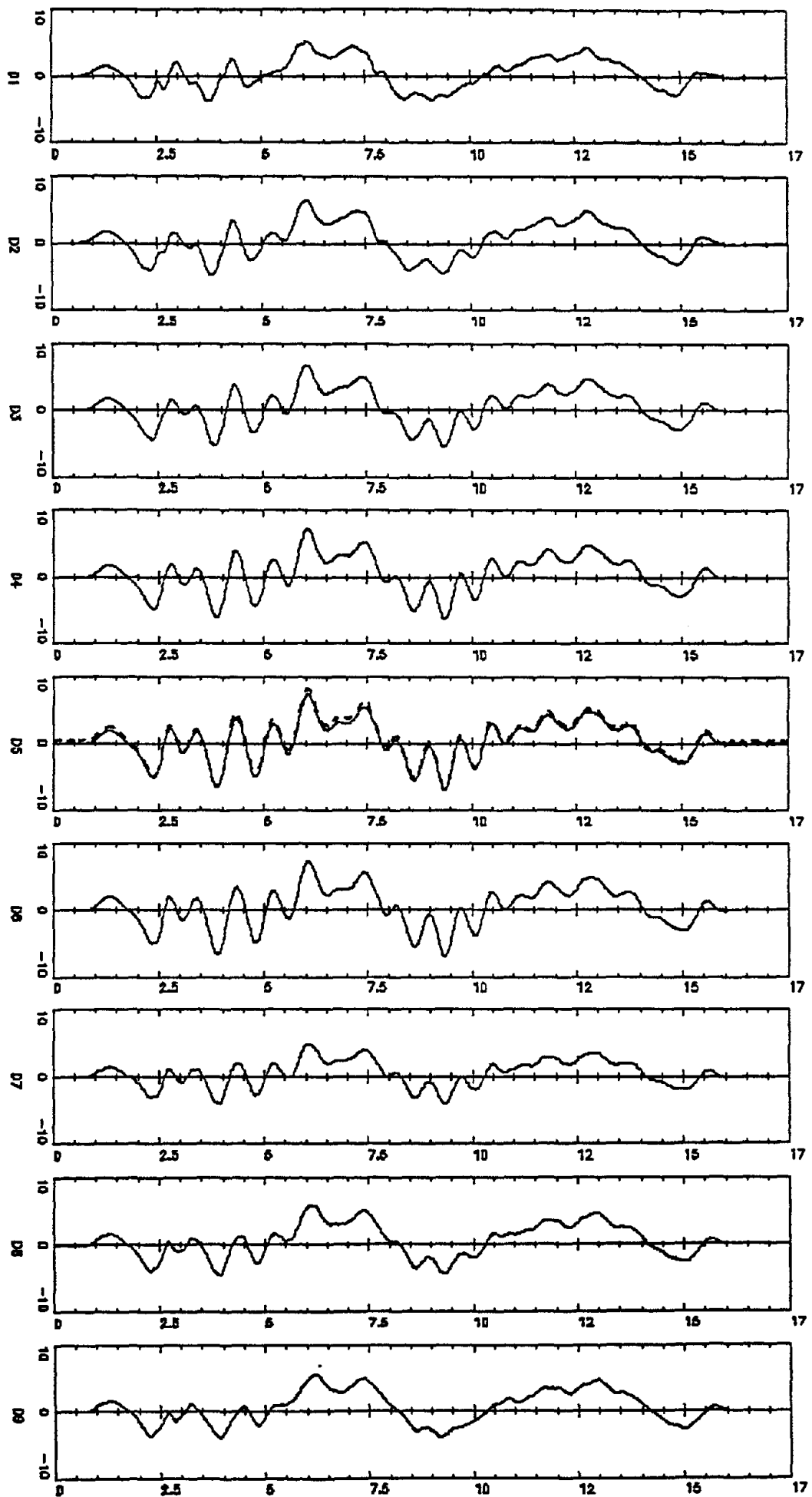


FIG. 4. PAPER 23-JUN-1988 10

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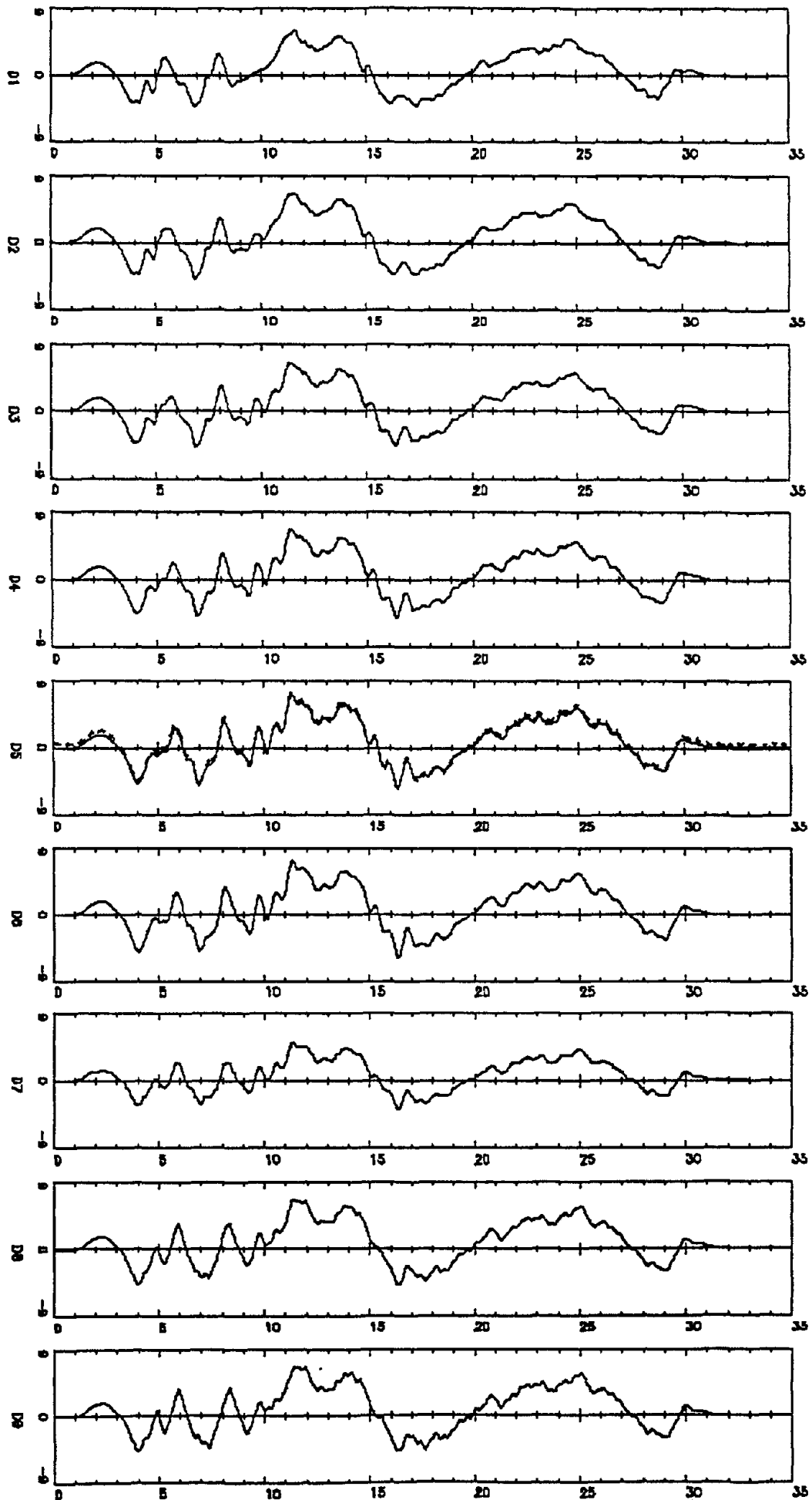


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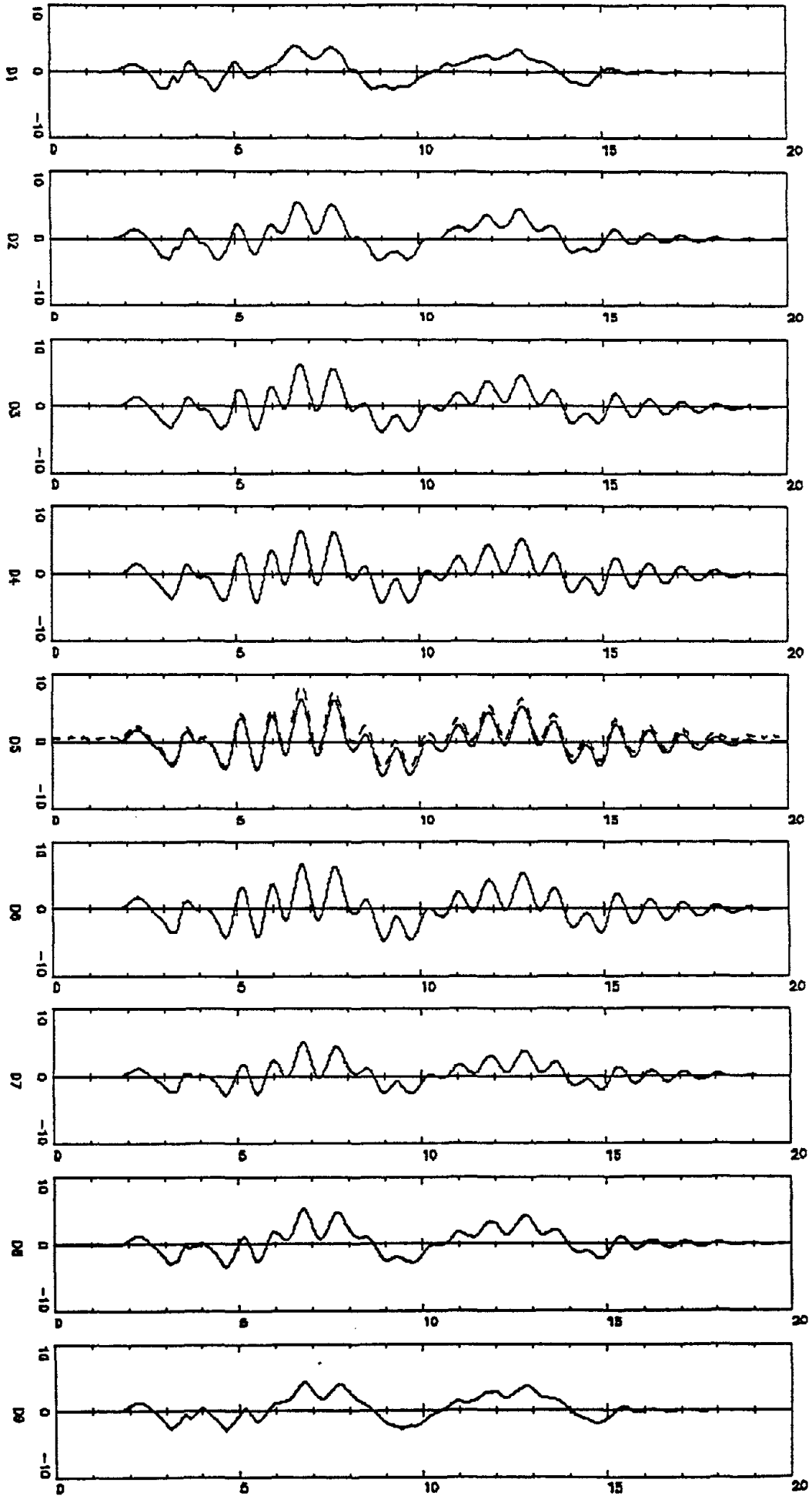


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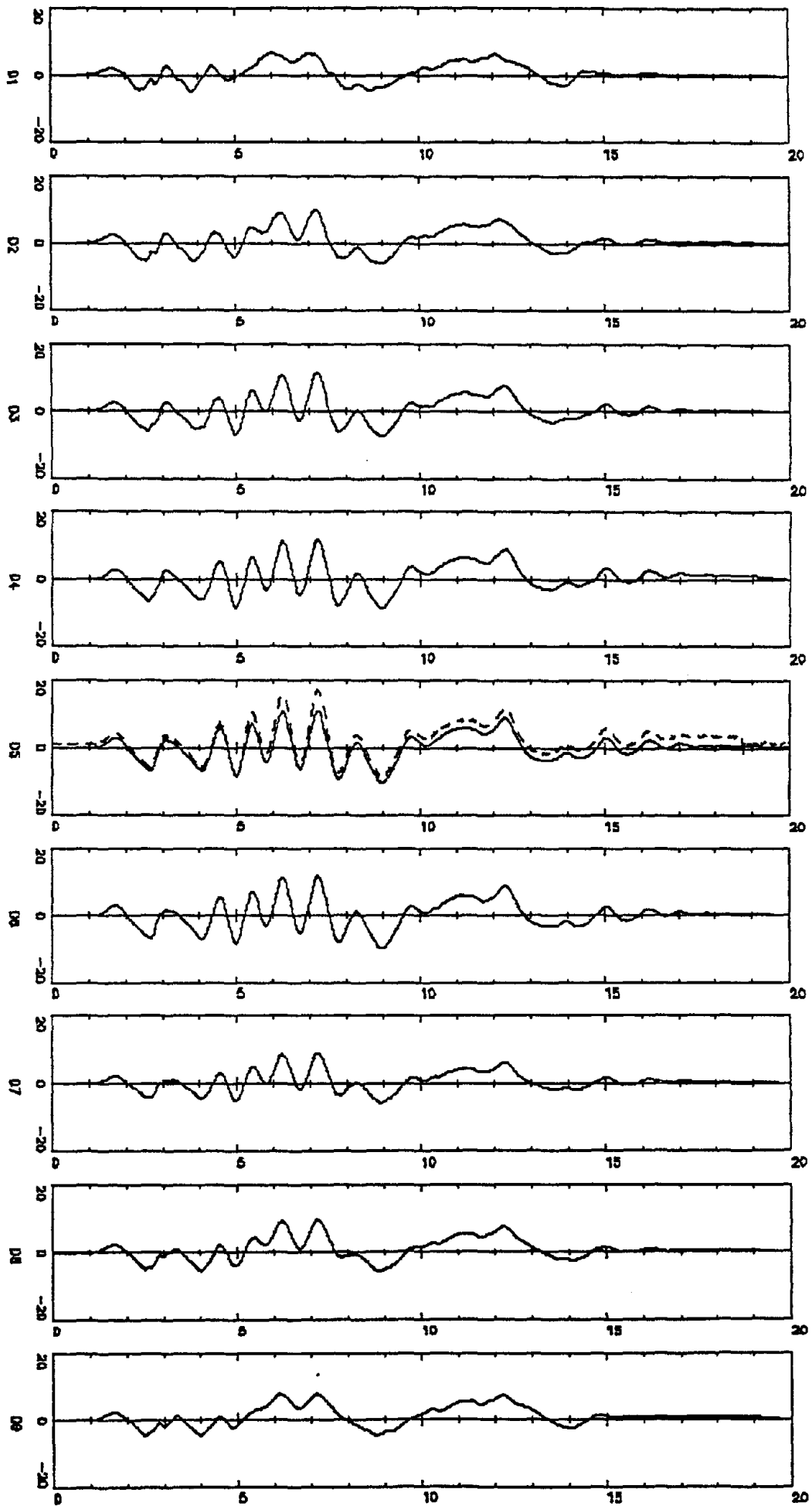


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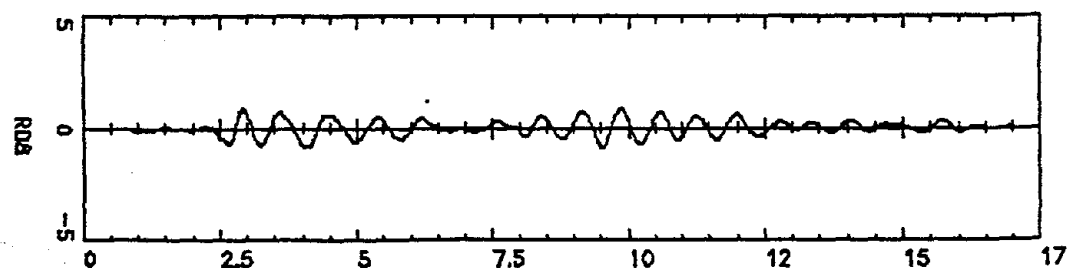
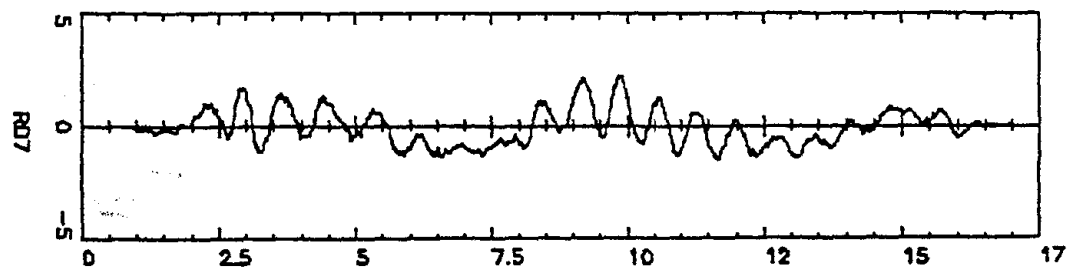
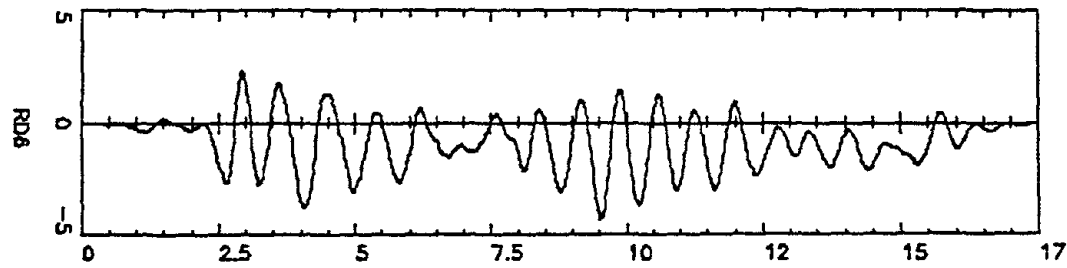
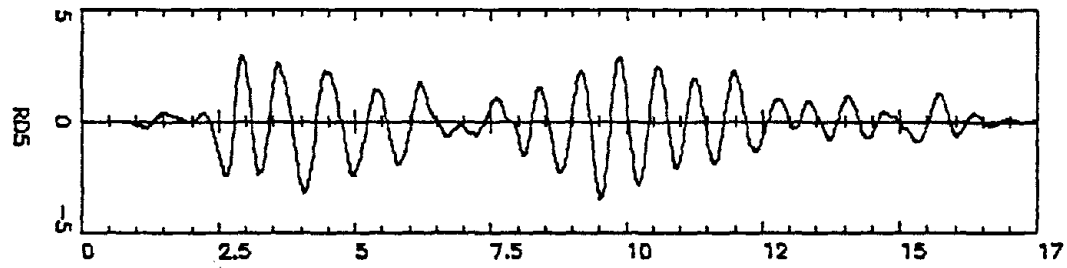
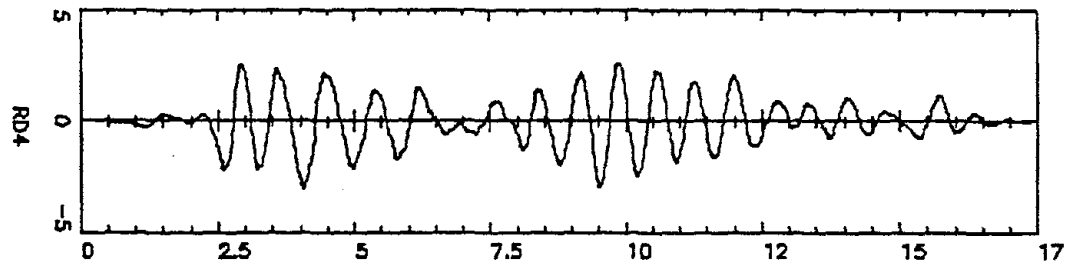
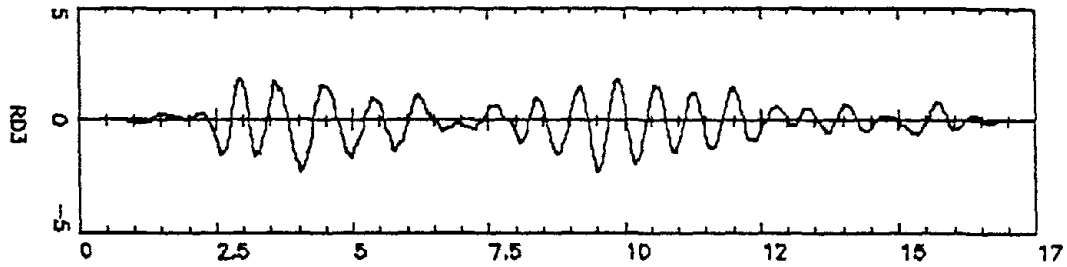
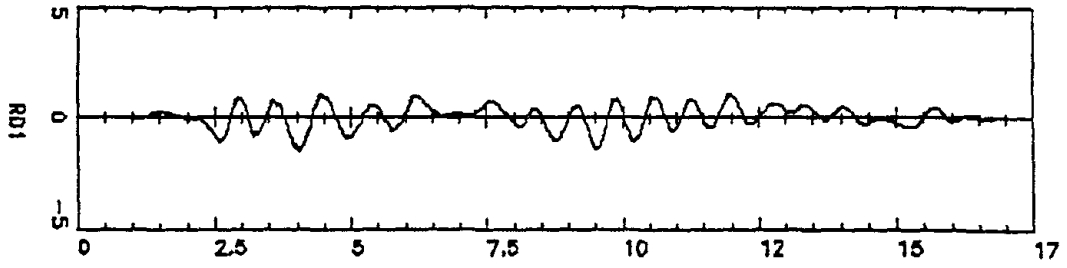
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WALL # 1

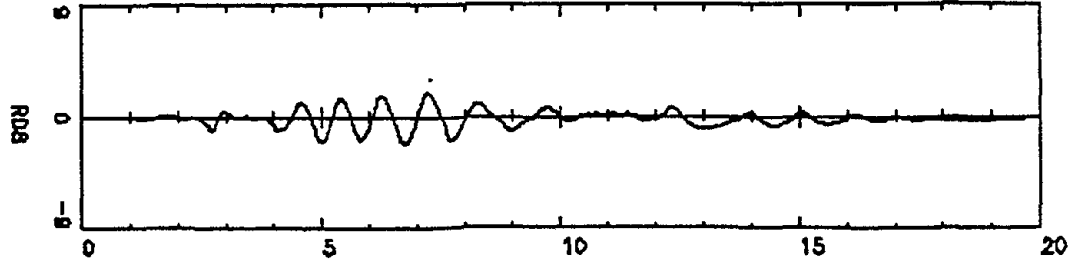
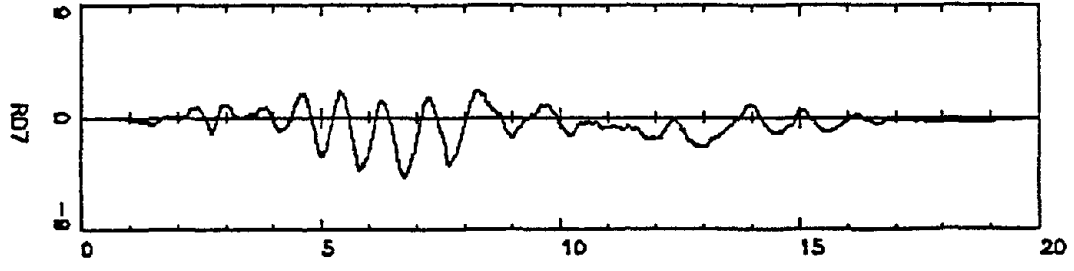
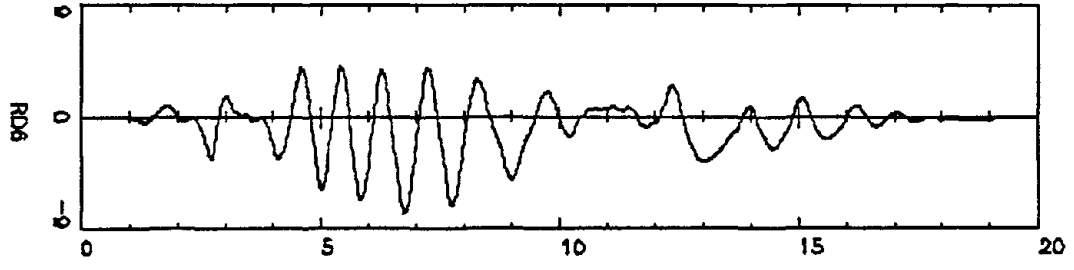
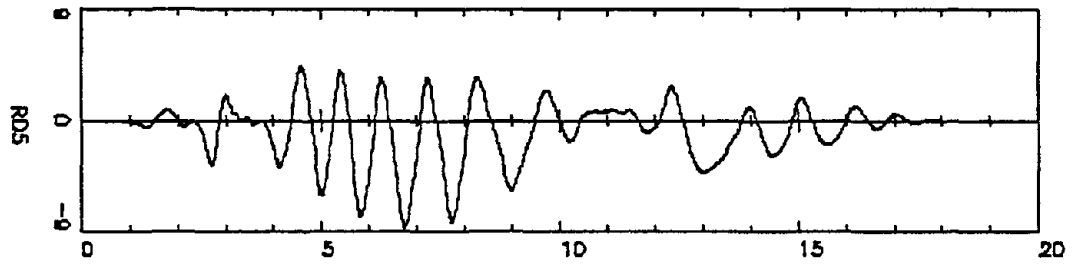
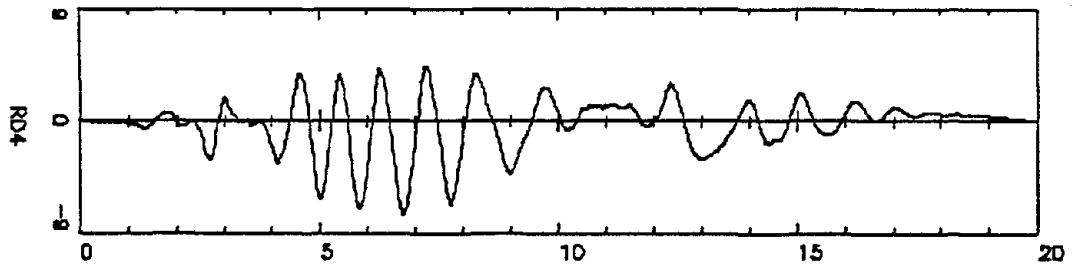
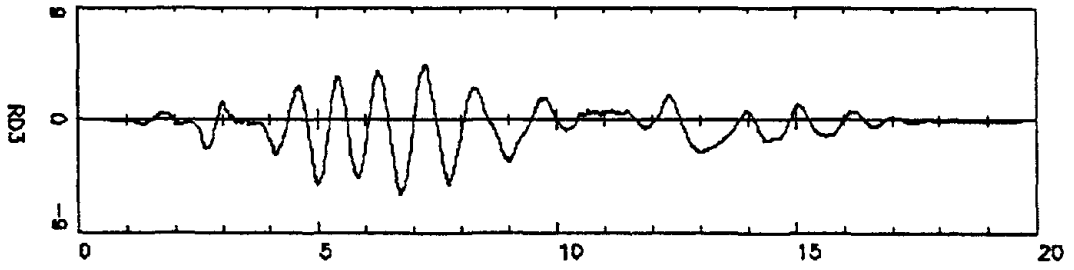
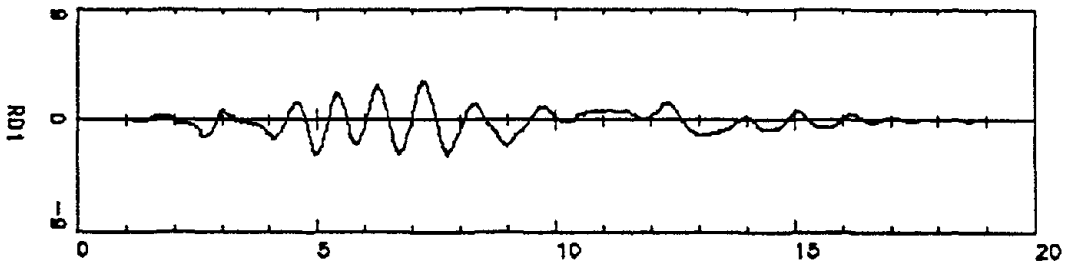
RELATIVE DISPLACEMENT TIME HISTORIES



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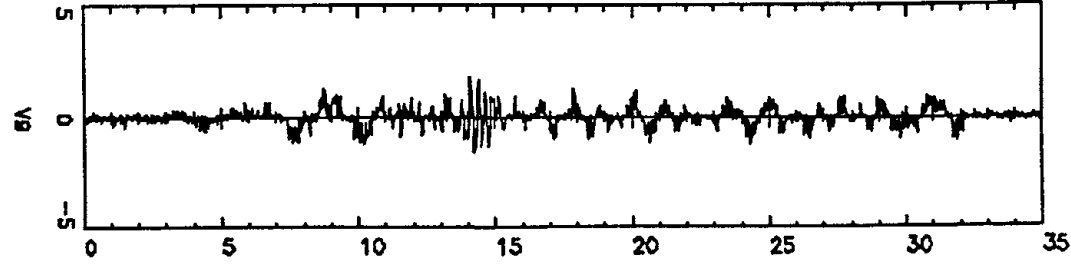
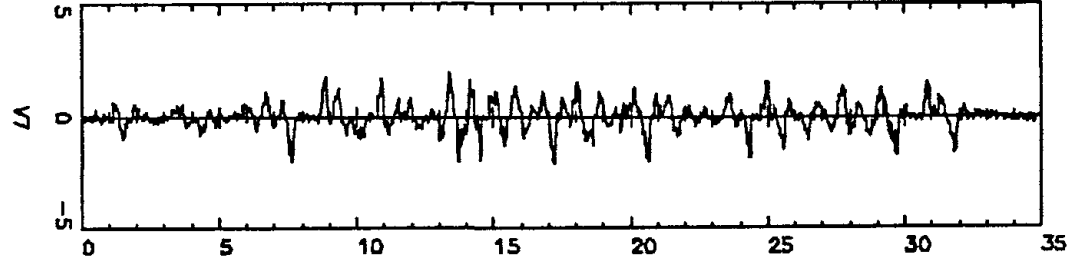
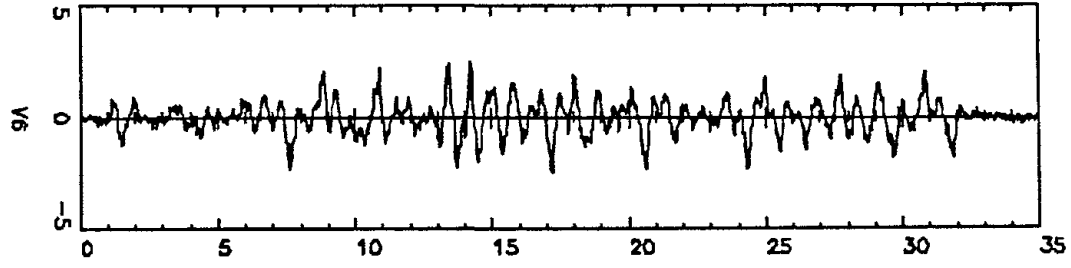
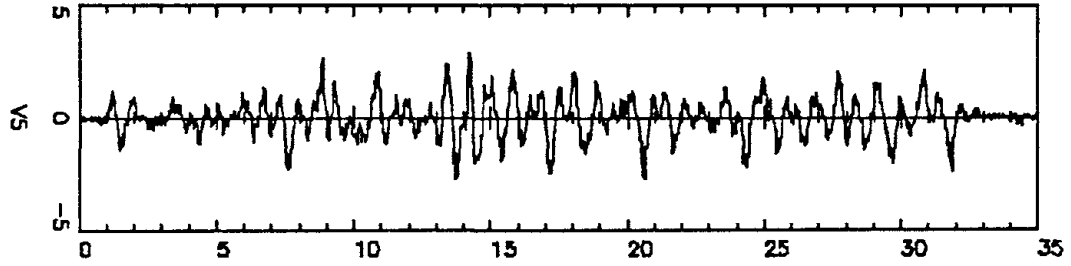
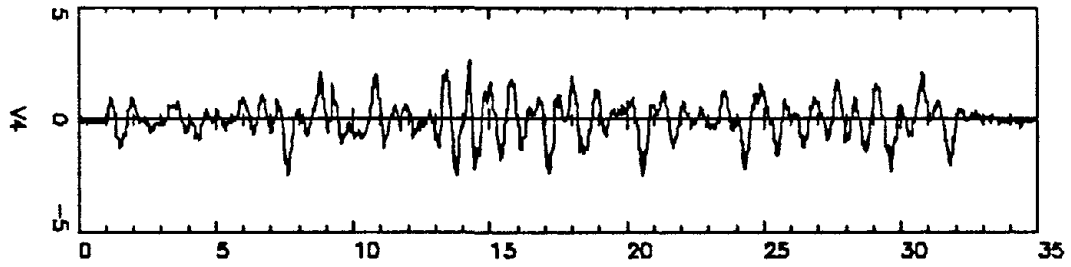
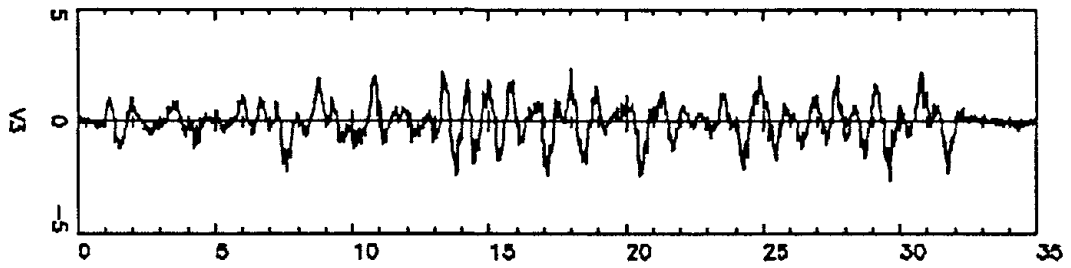
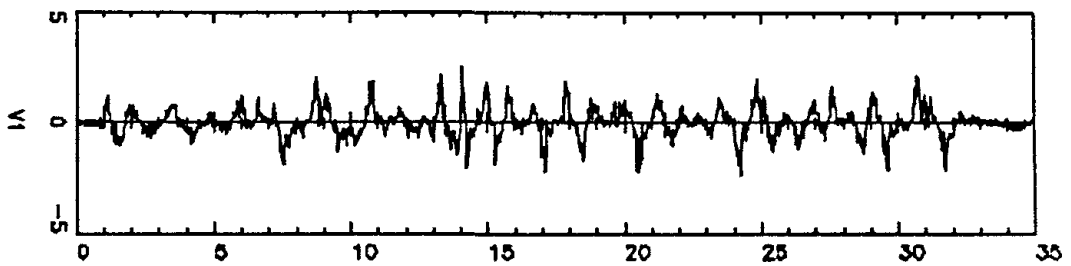
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APPENDIX B

TIME HISTORY RESPONSE FOR PANEL #2

WALL # 2

VELOCITY TIME HISTORIES

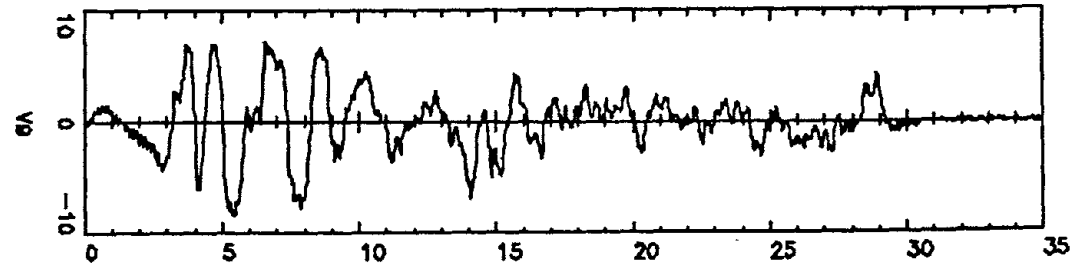
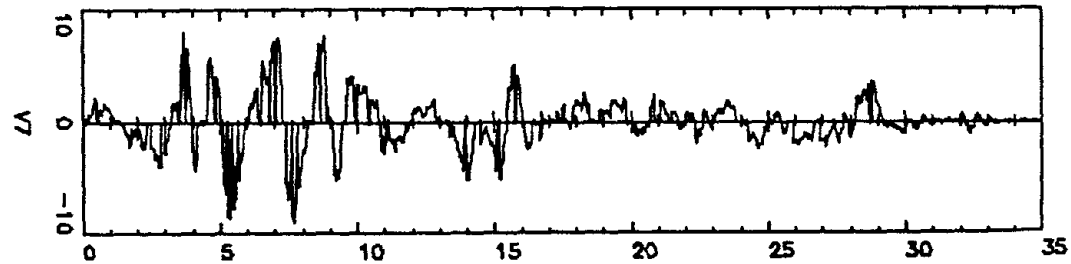
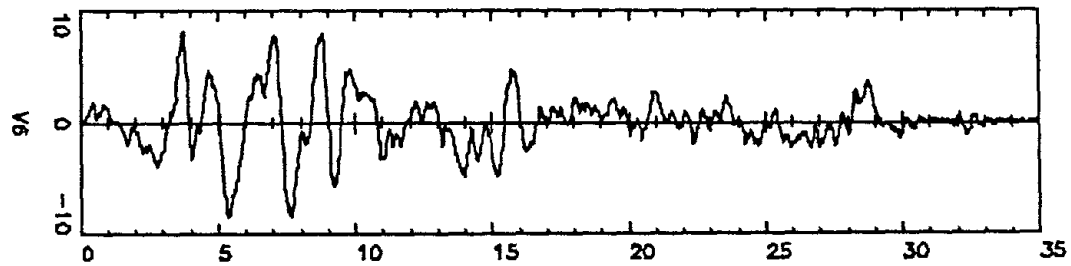
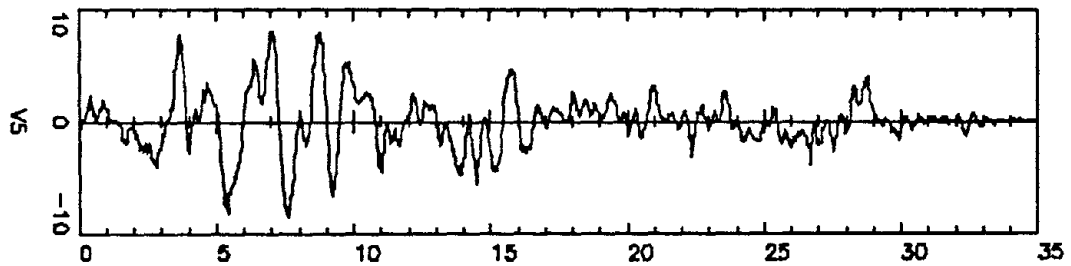
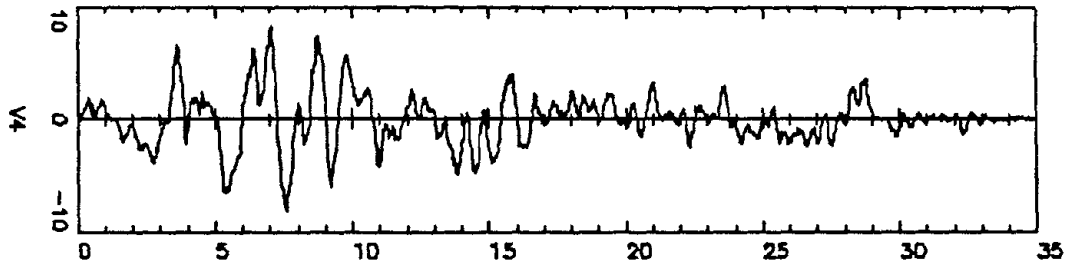
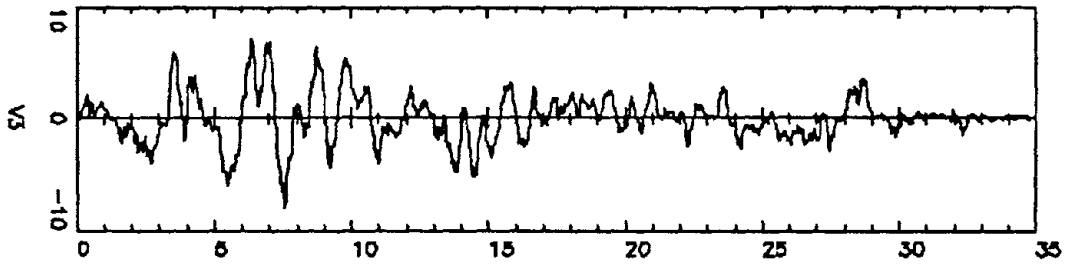
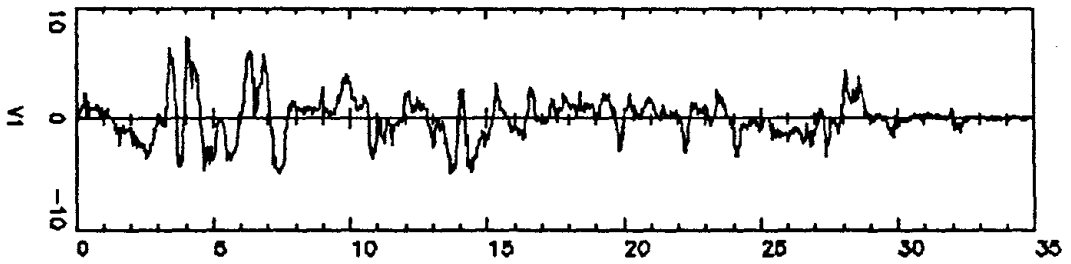


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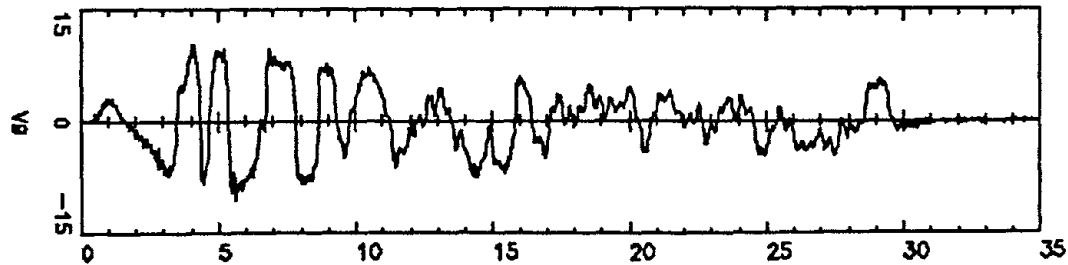
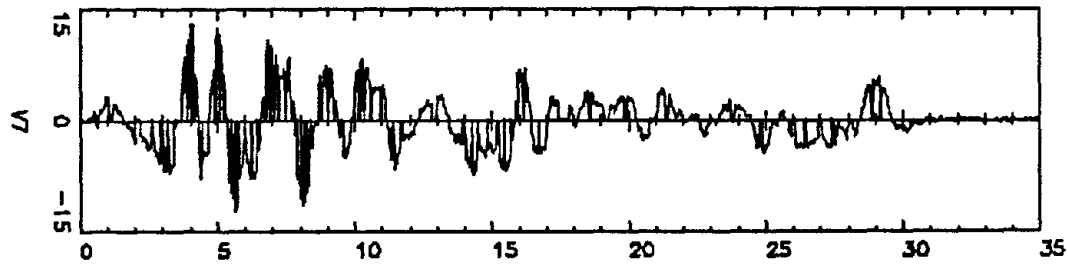
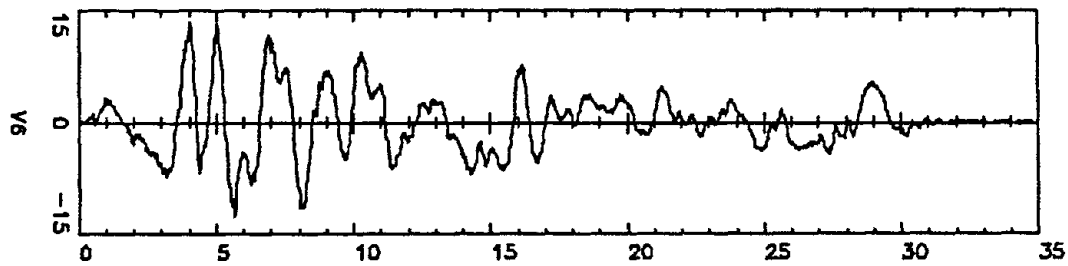
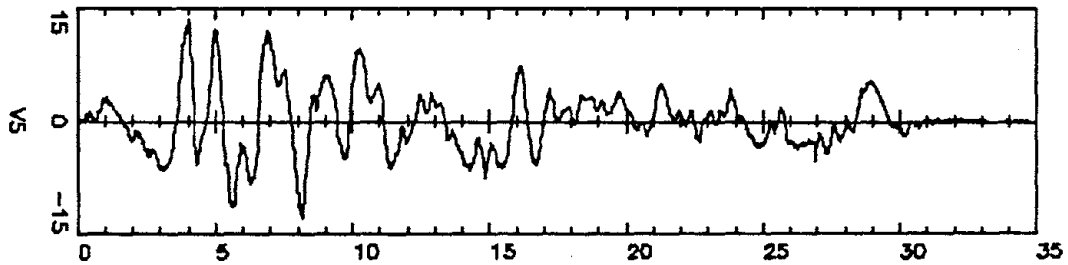
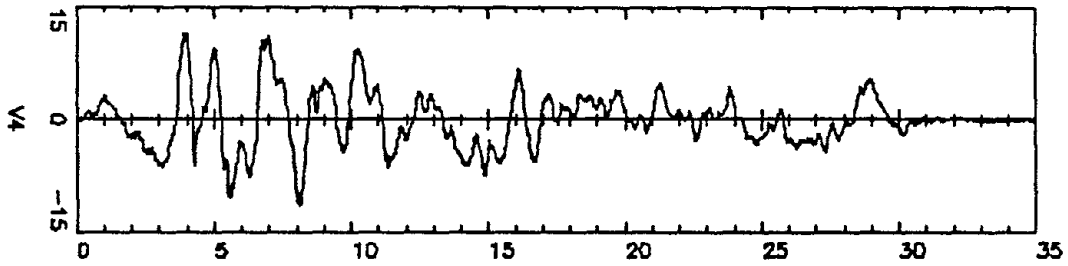
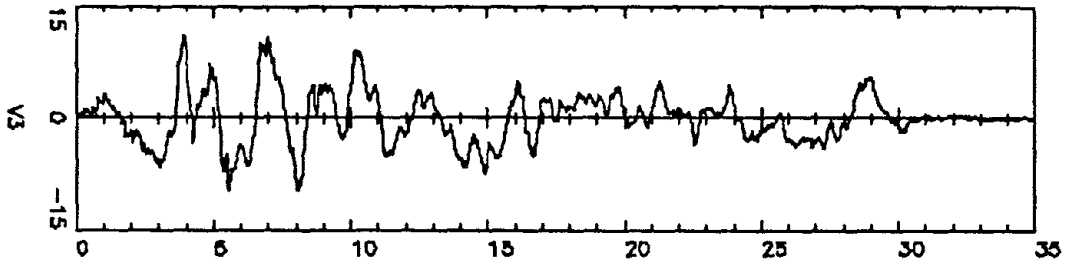
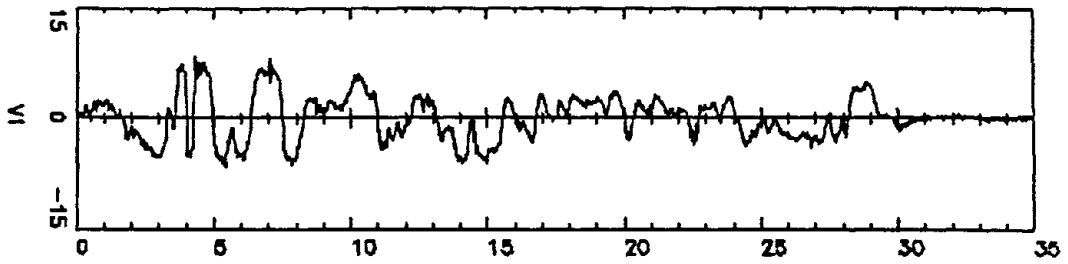


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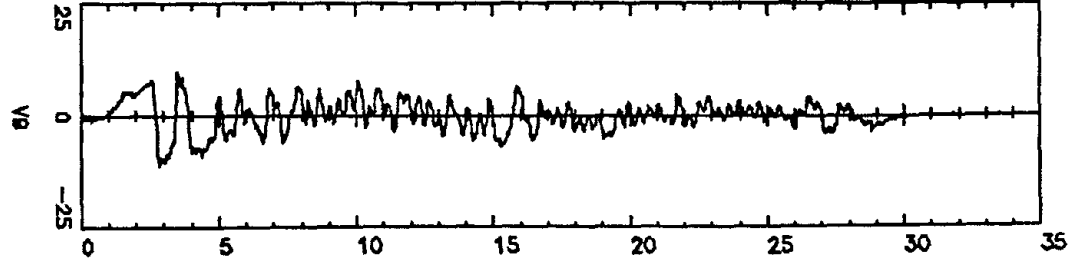
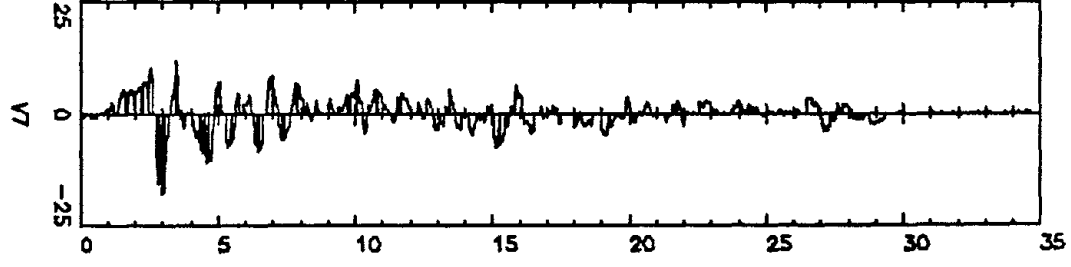
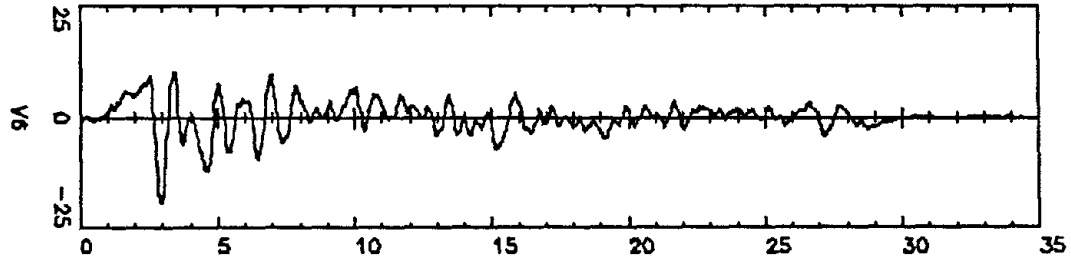
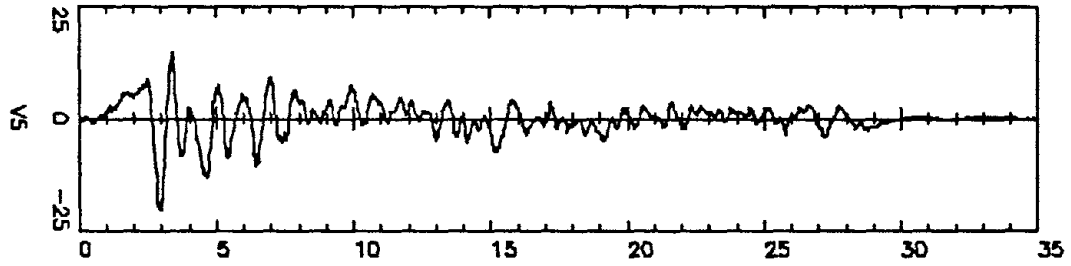
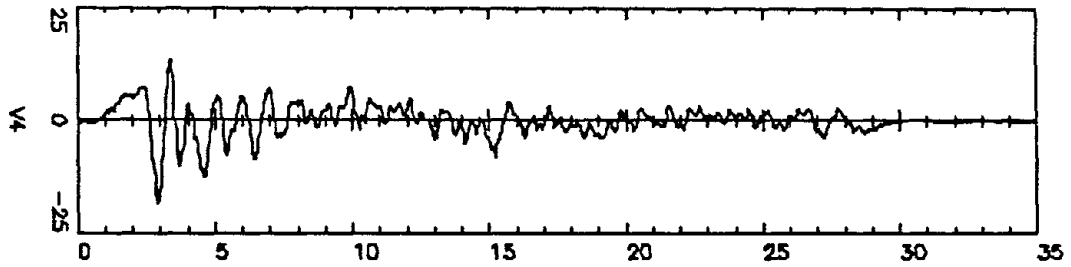
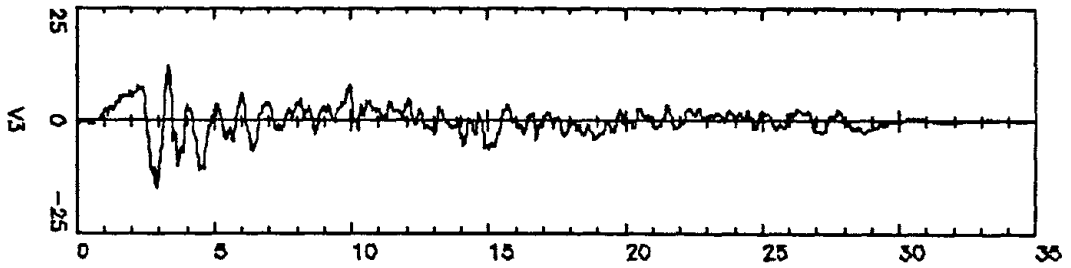
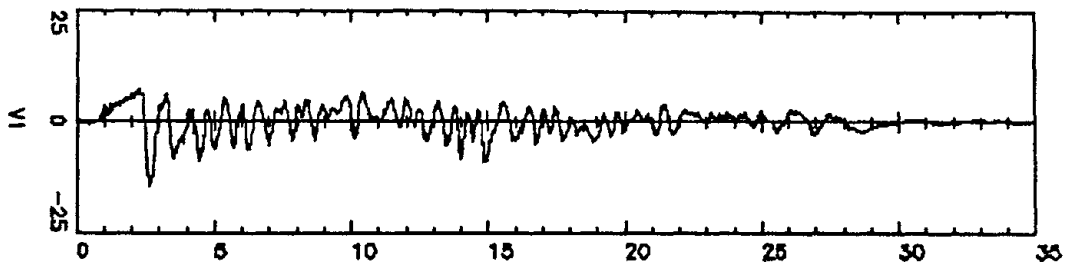


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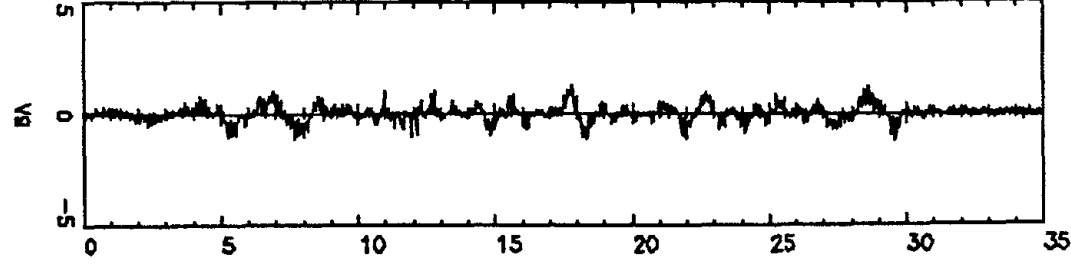
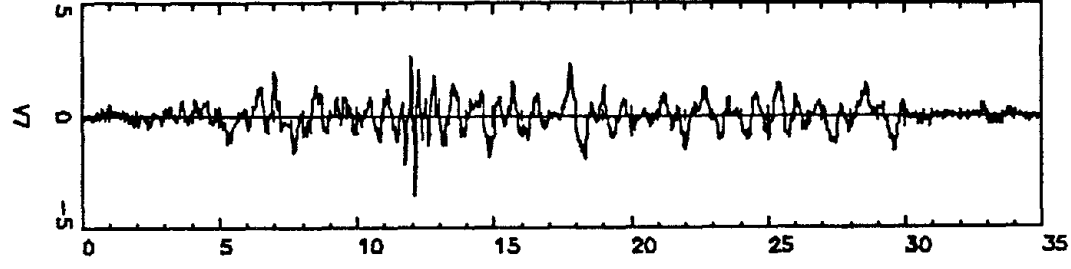
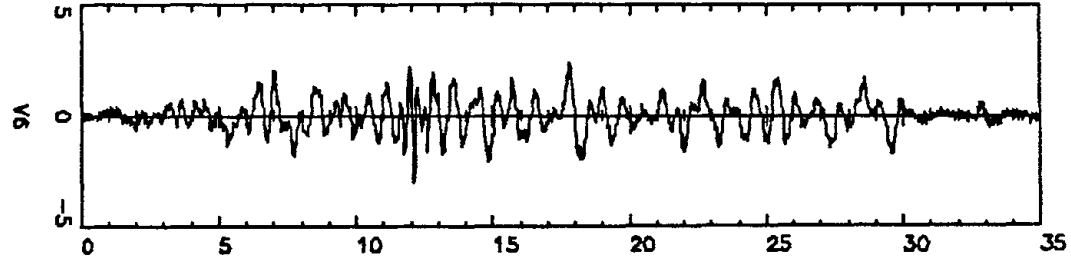
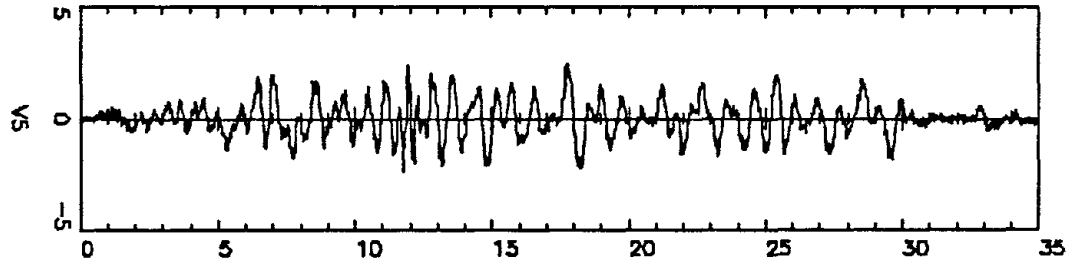
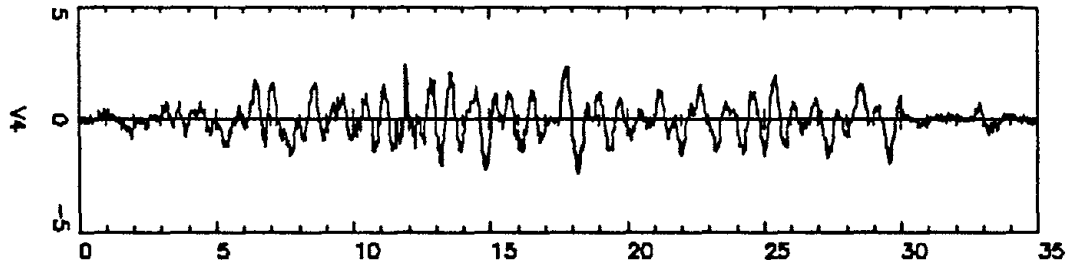
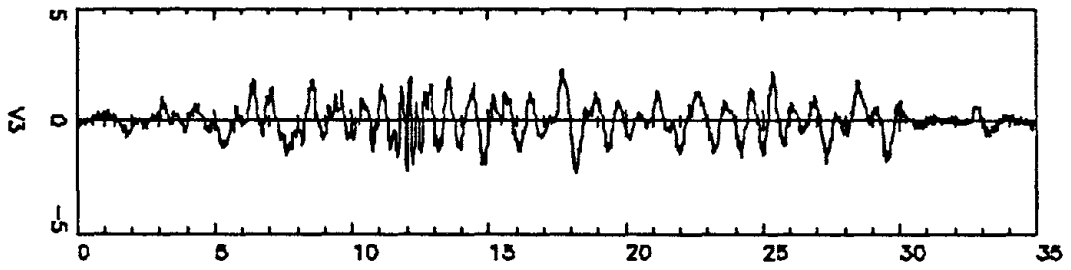
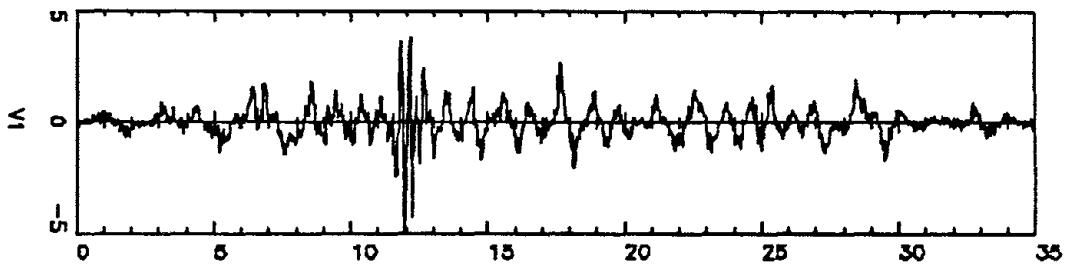
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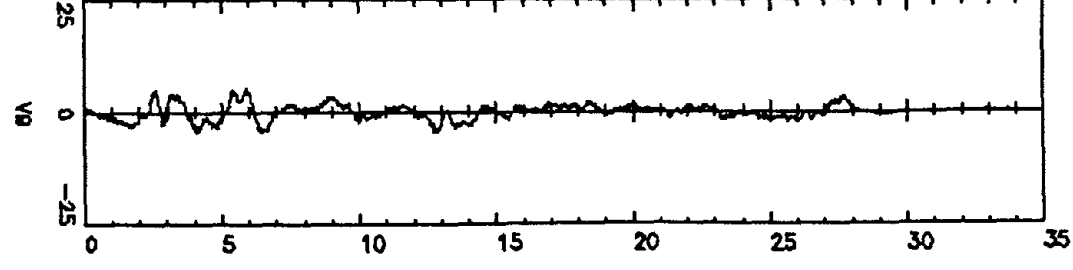
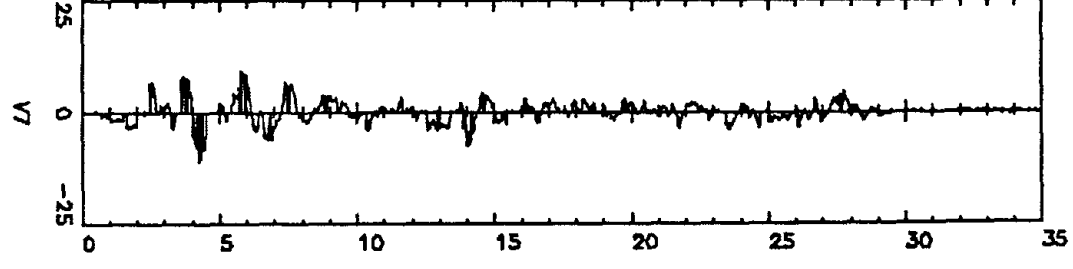
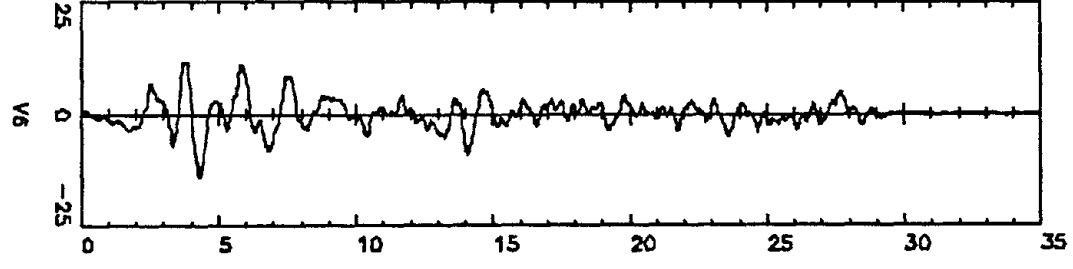
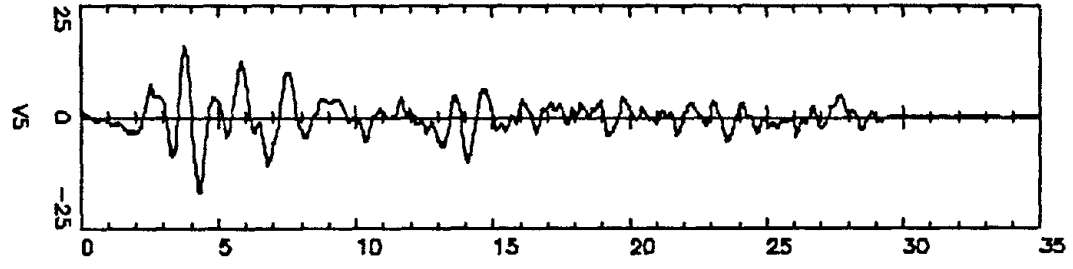
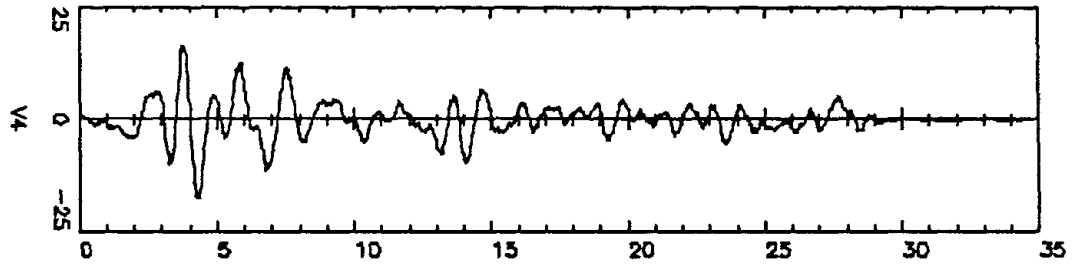
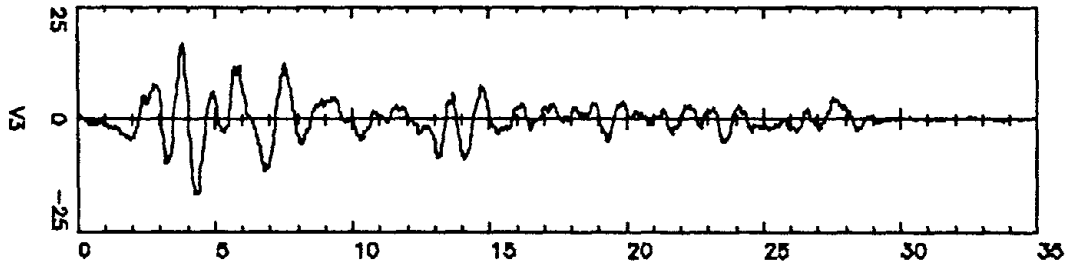
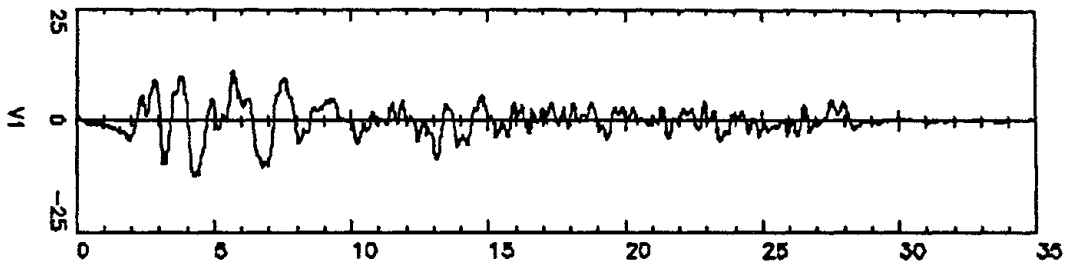
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VZ08

SAYED

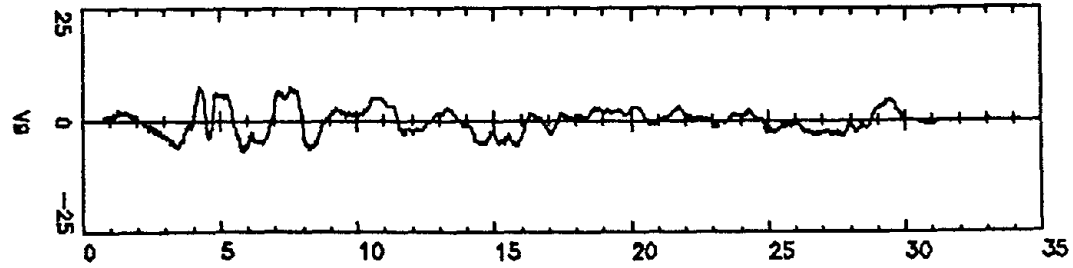
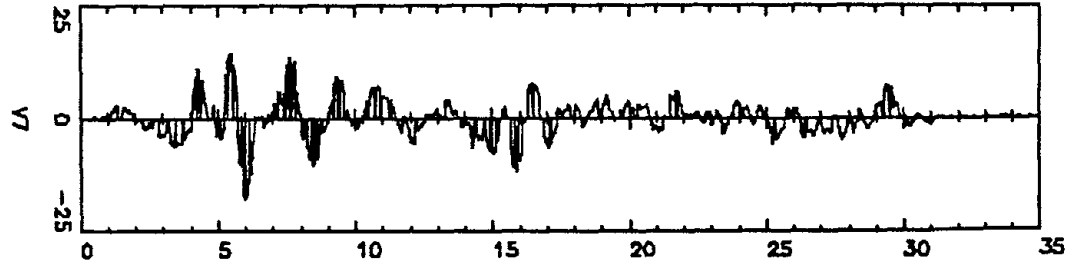
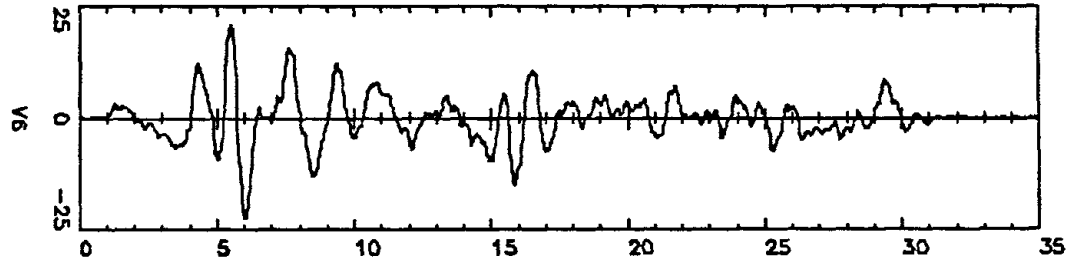
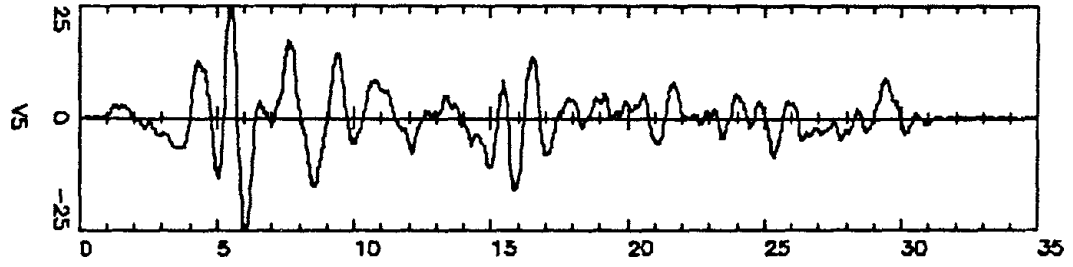
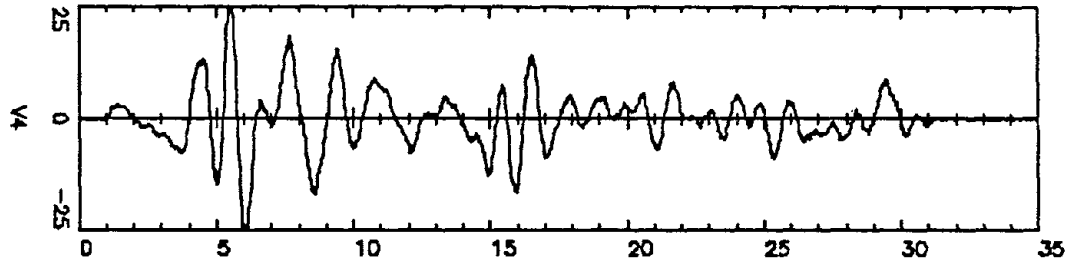
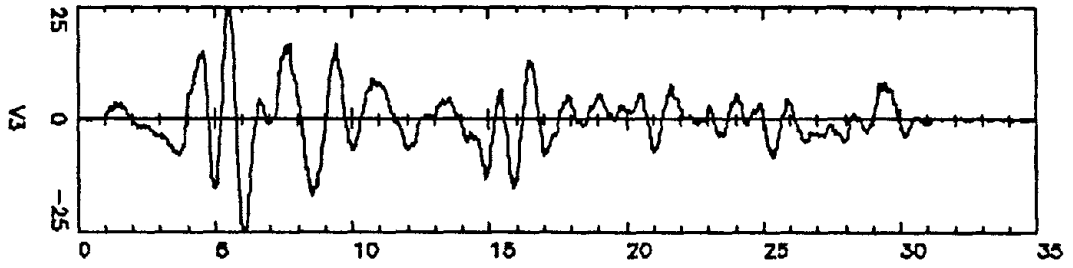
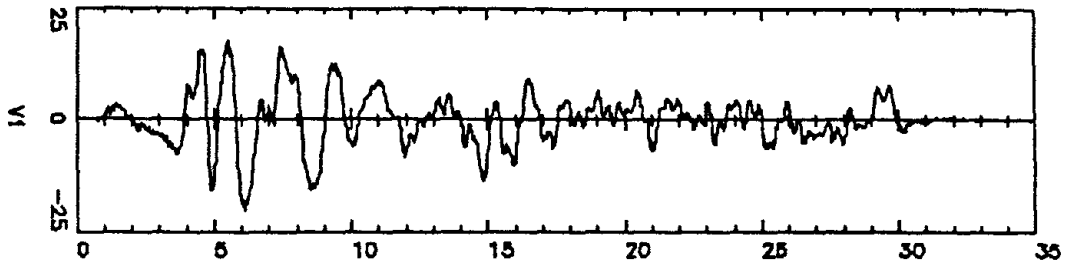
28-SEP-1988 12:29



V111

SAVED

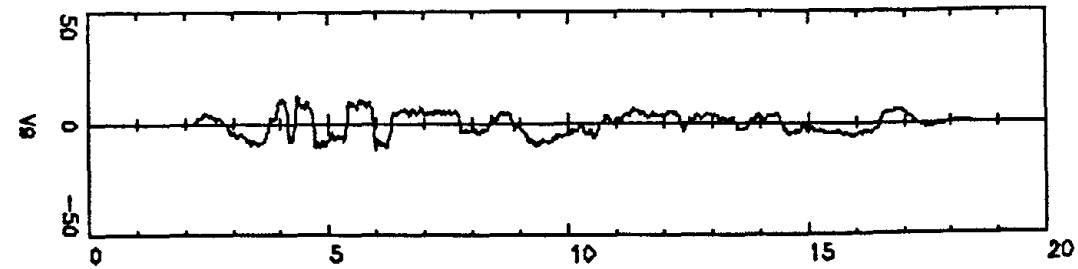
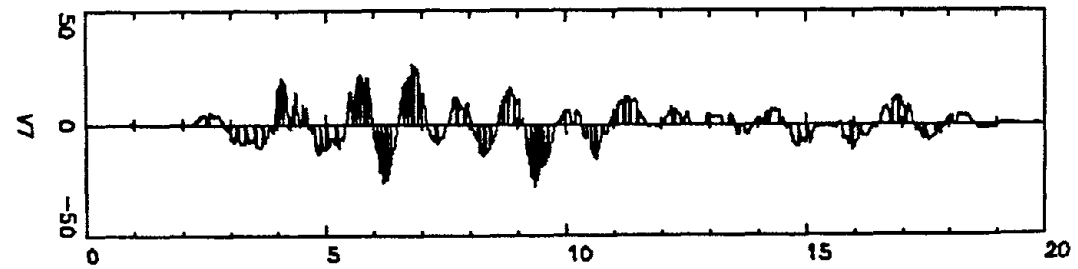
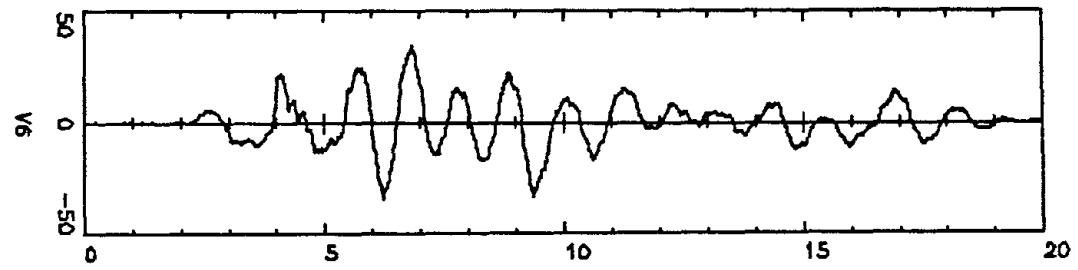
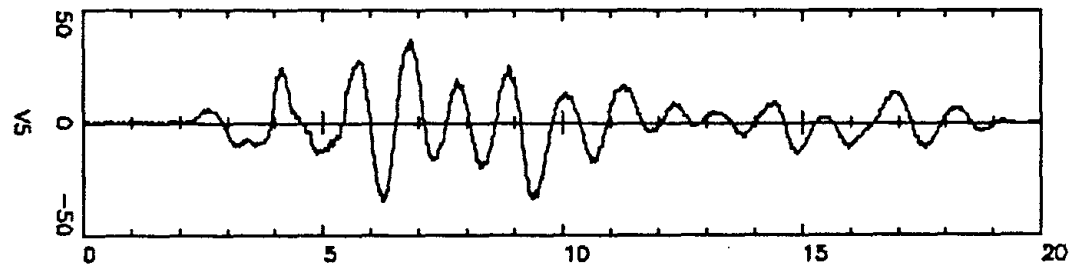
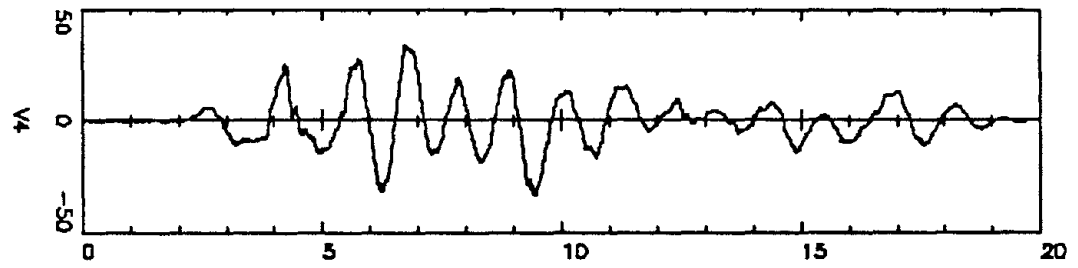
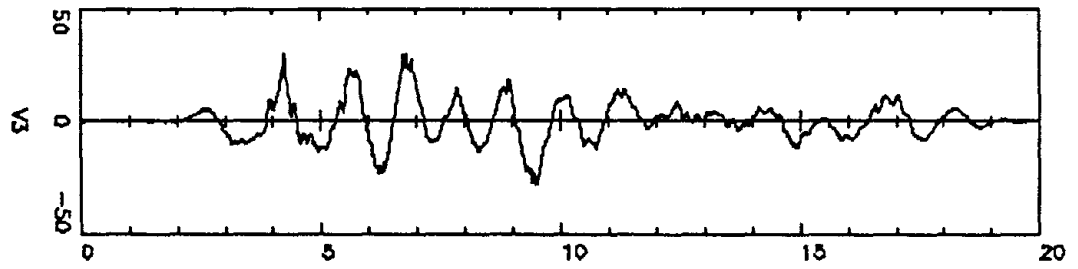
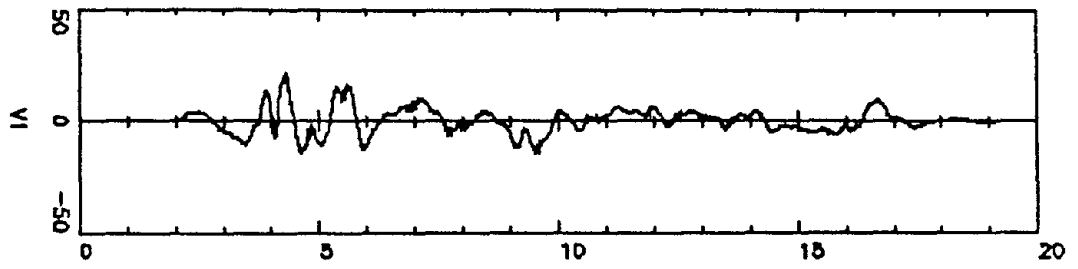
28-SEP-1988 12:24



V. 11 : AMED

26-SEP-1988 12:21

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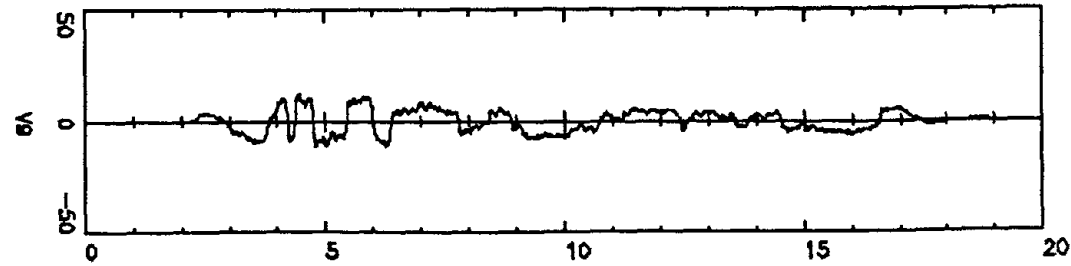
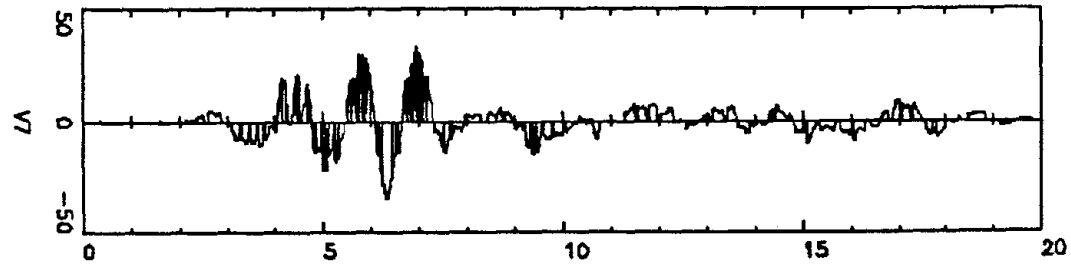
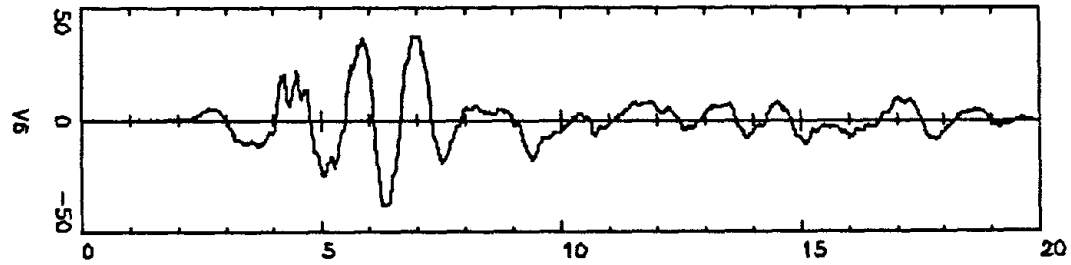
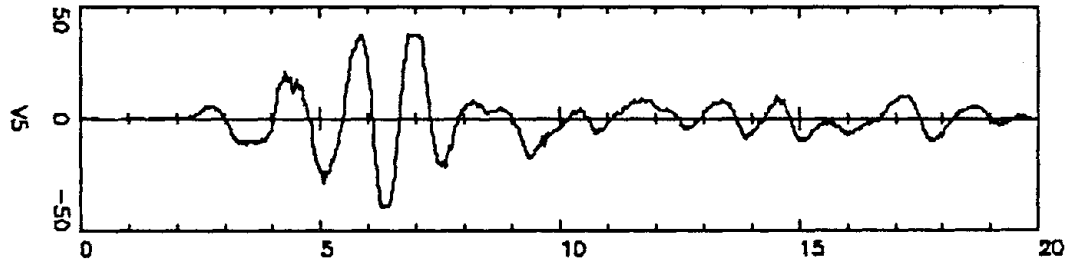
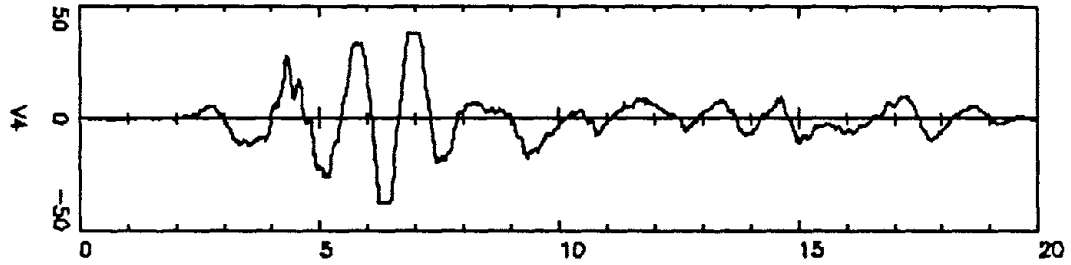
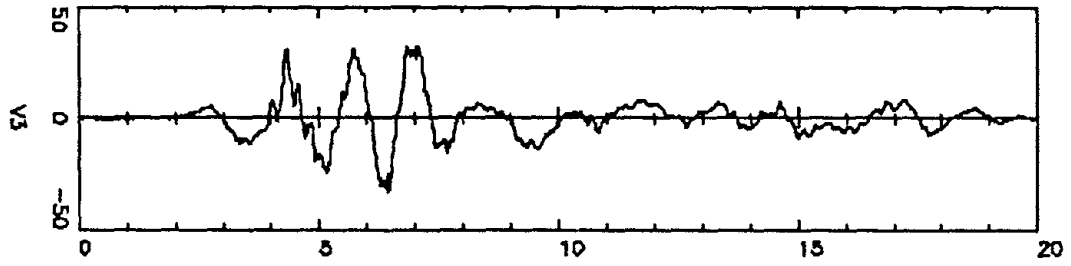
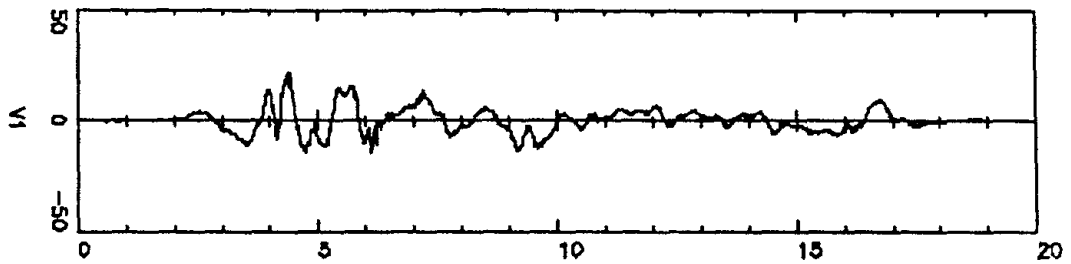


V1

SAYED

26-SEP-1988 12:11

B10

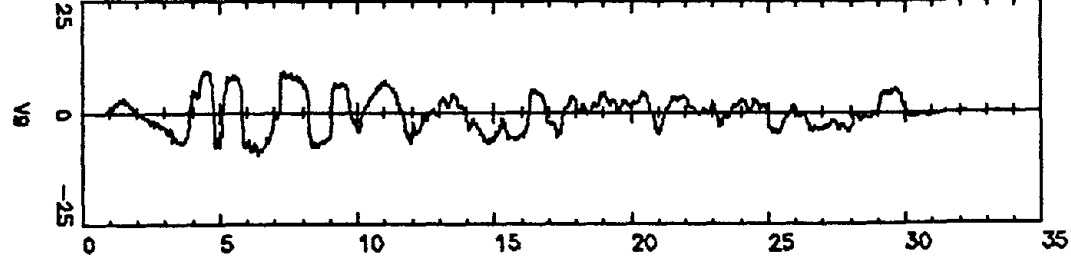
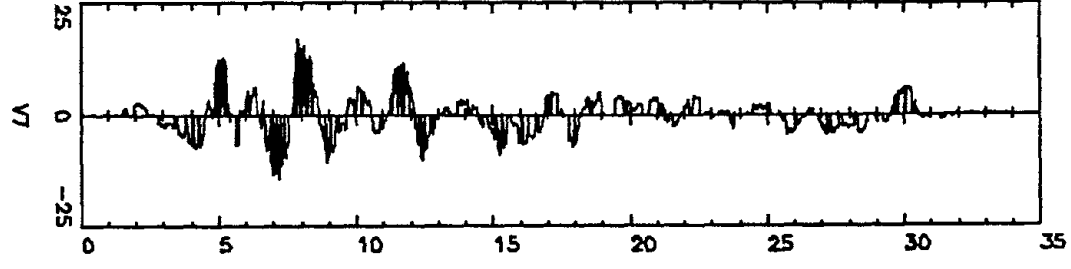
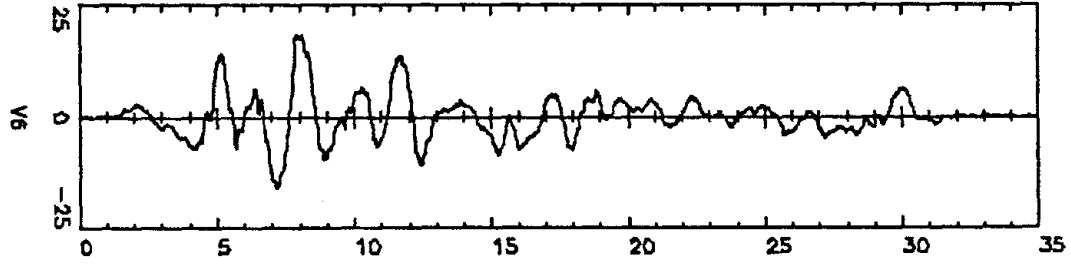
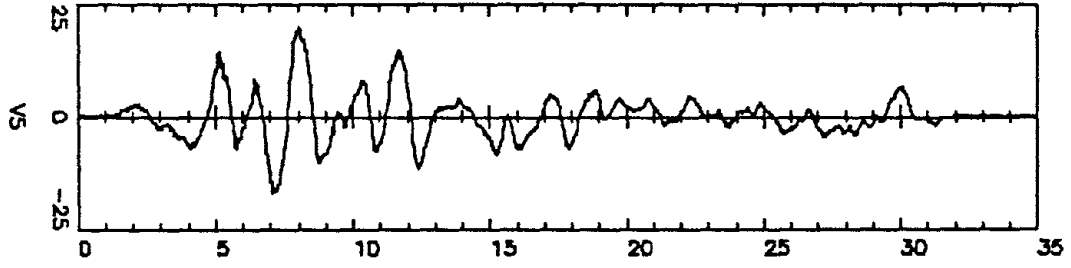
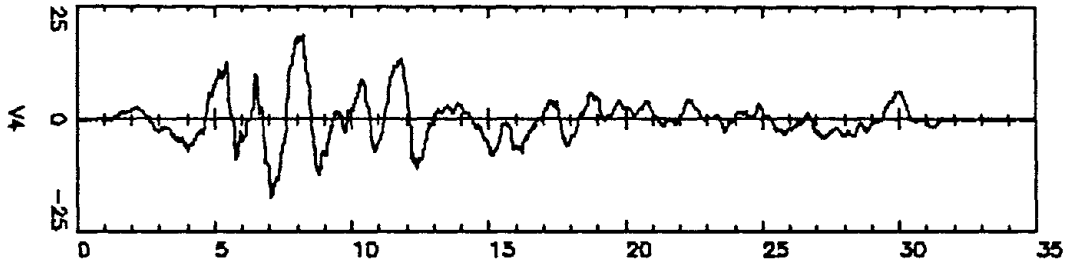
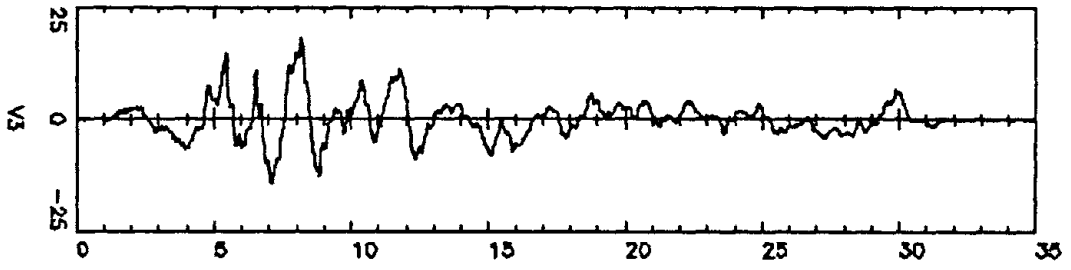
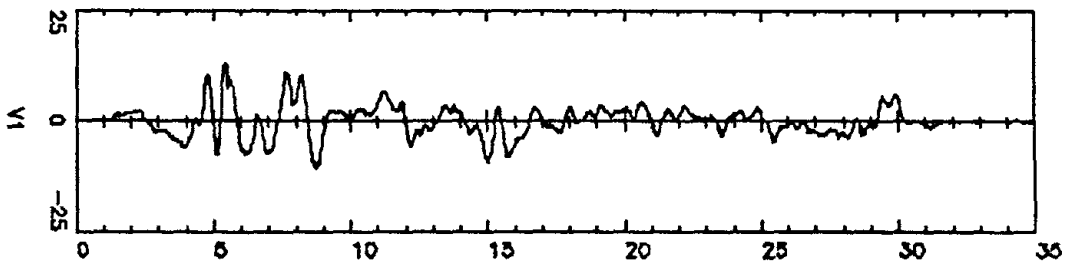


VZ12

SAYED

26-SEP-1988 12:06

B11

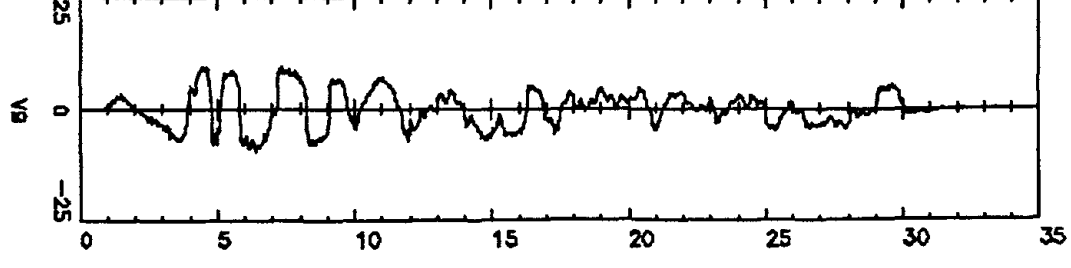
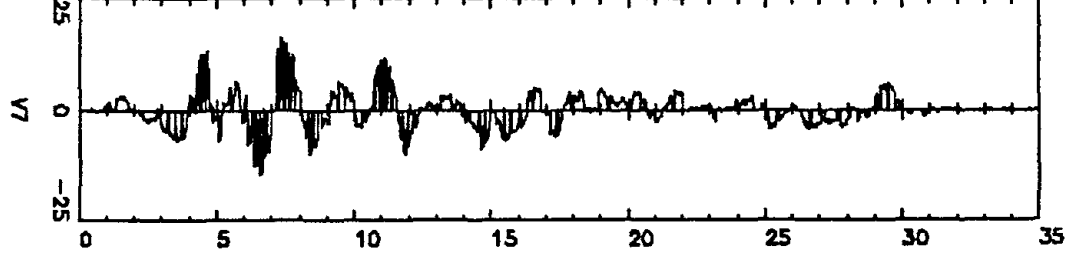
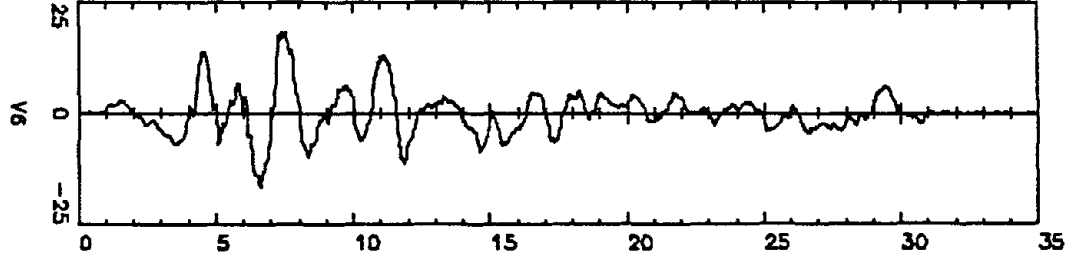
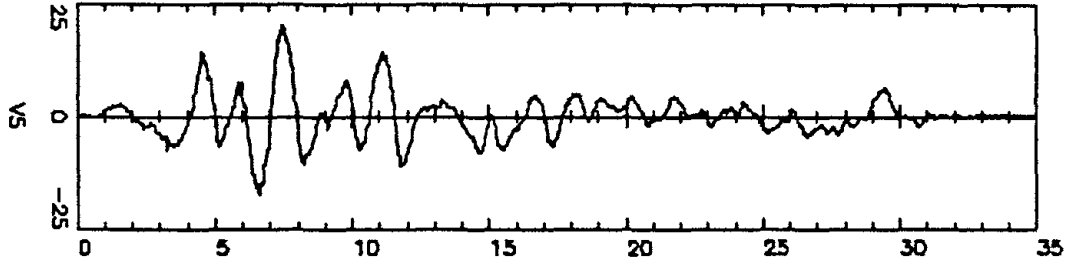
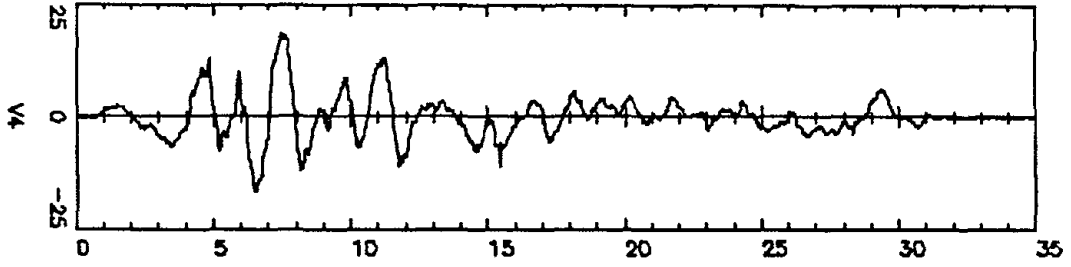
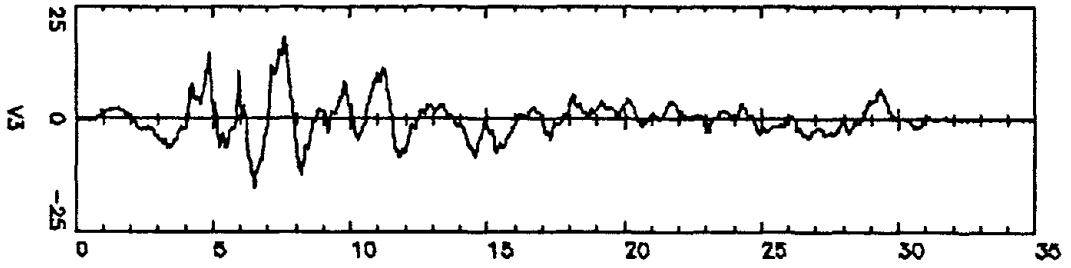
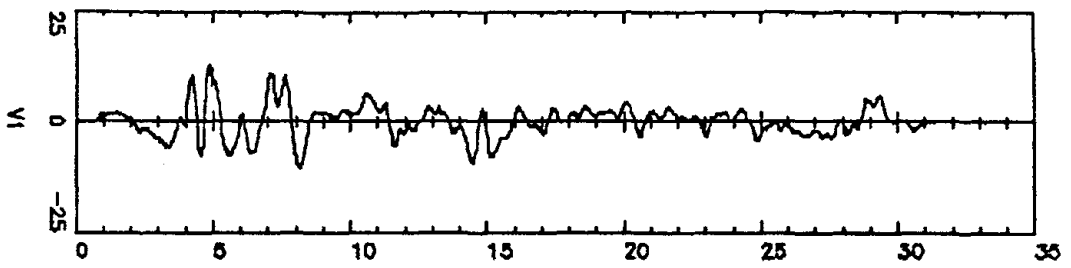


V213

SAVED

26-SEP-1985 12:02

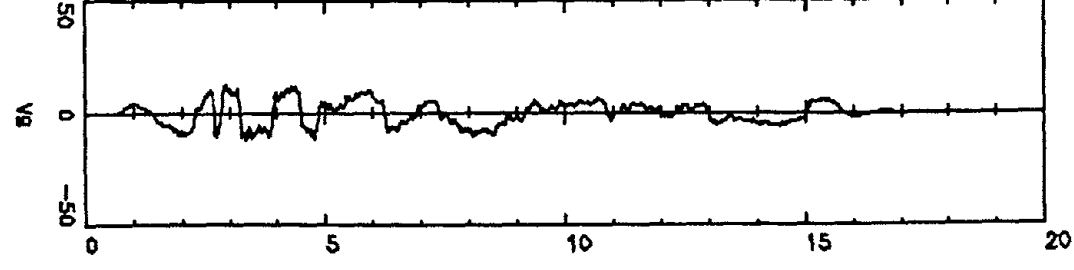
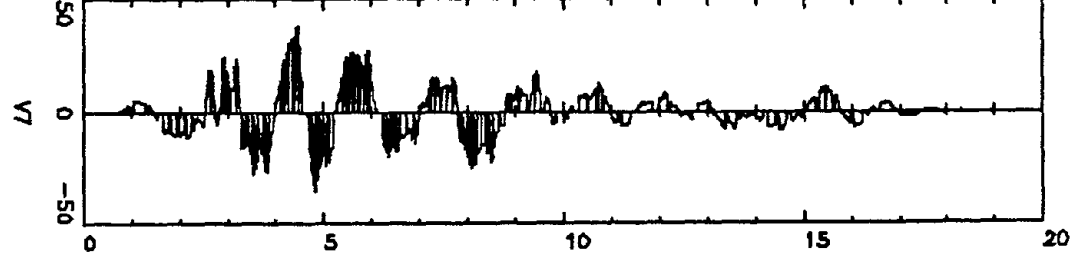
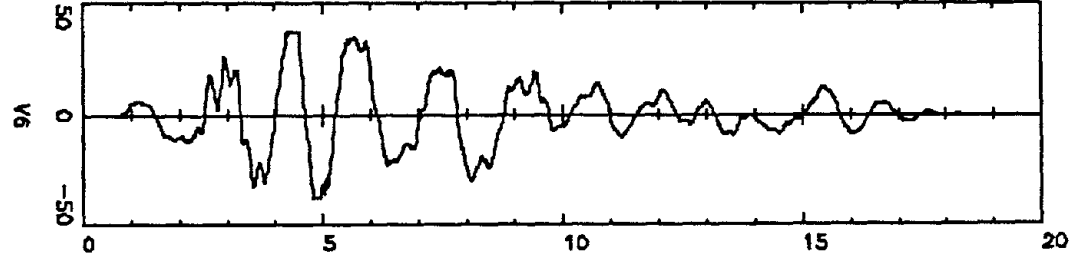
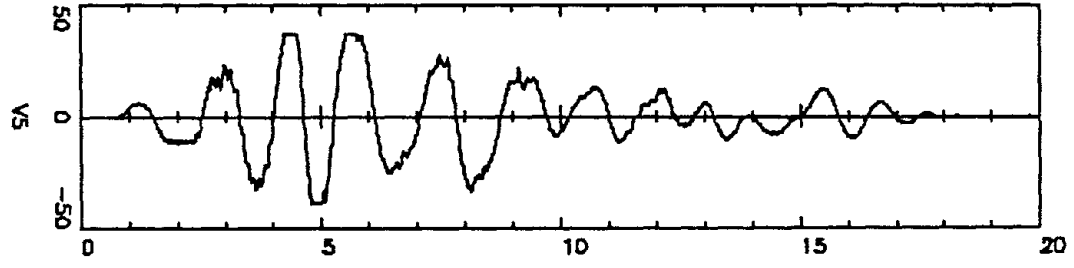
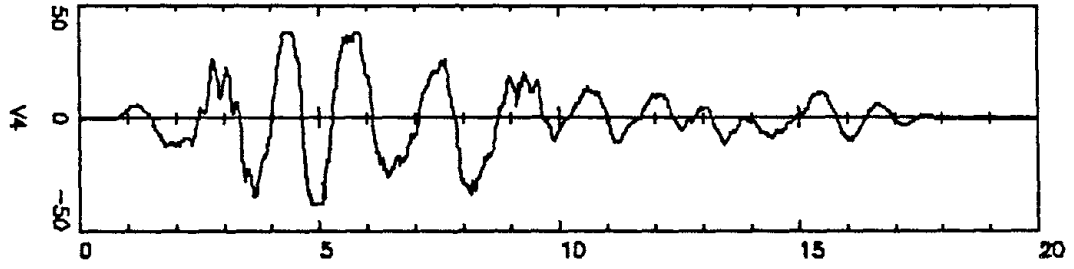
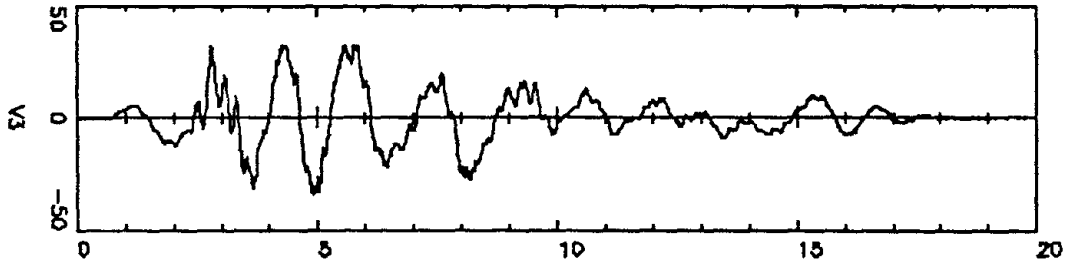
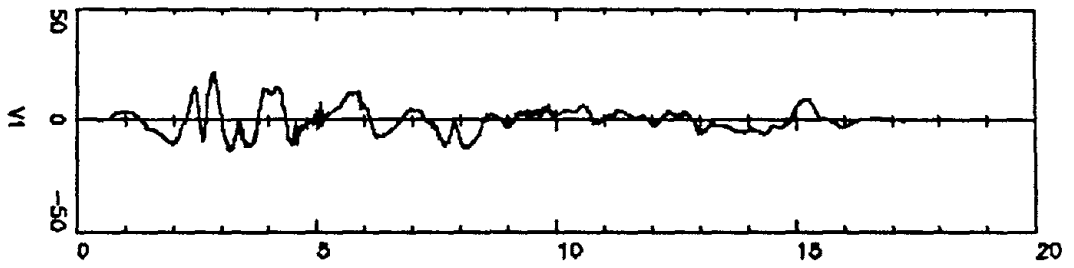
B12



VZ14

SAVED

28-SEP-1988 11:49



V215

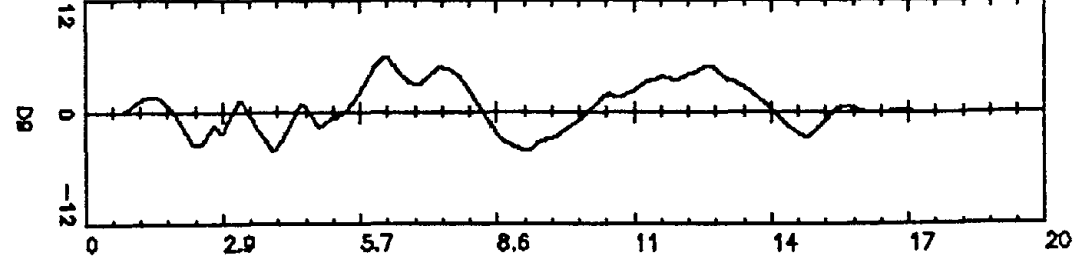
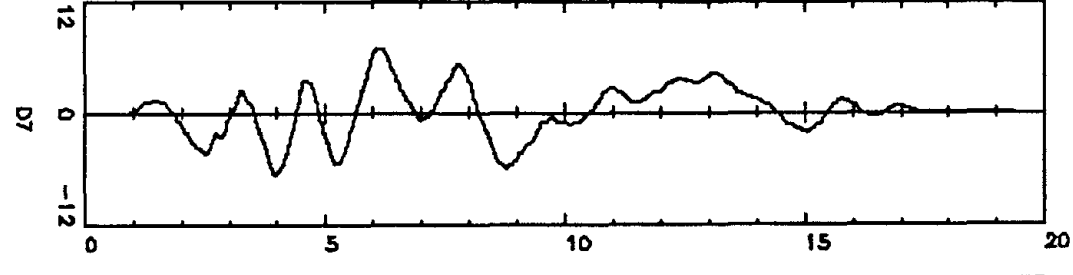
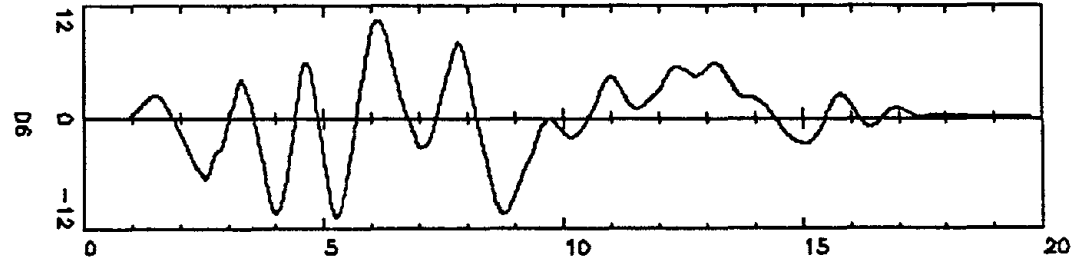
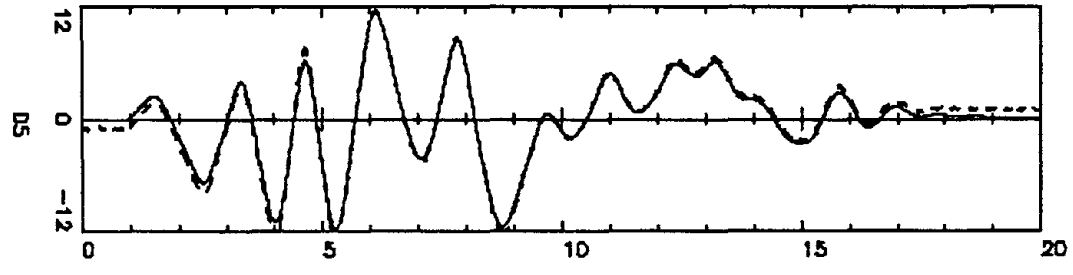
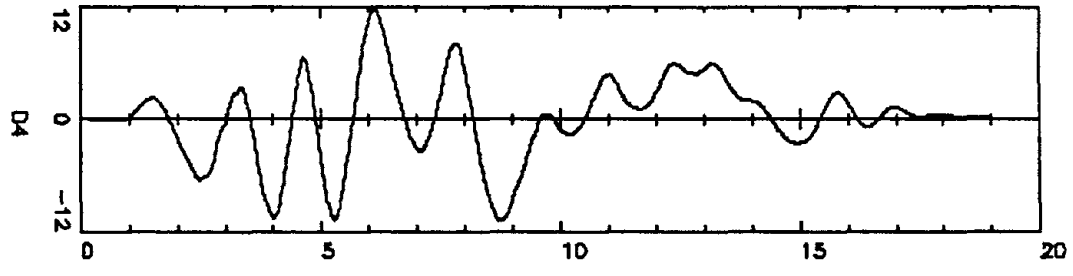
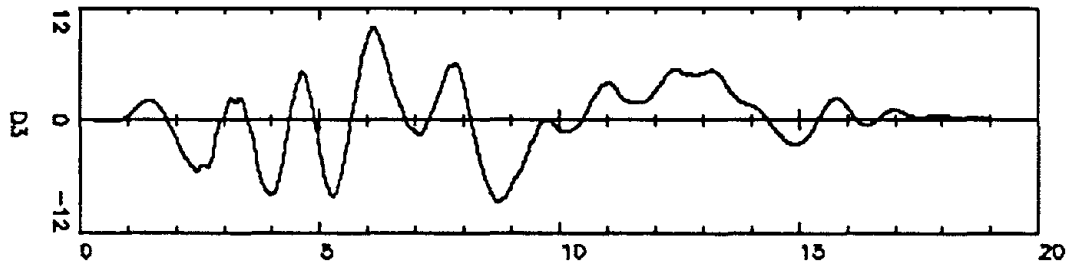
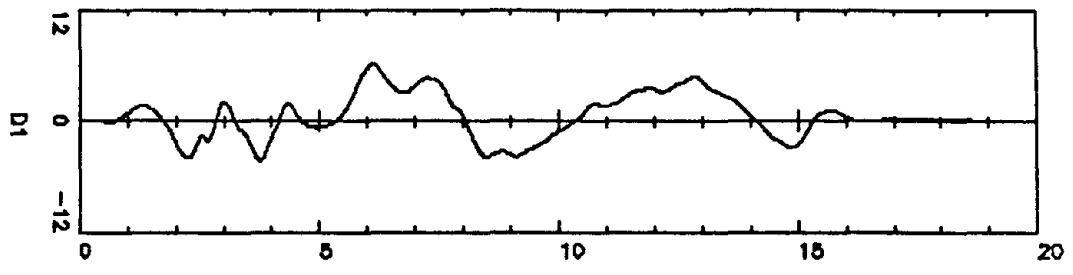
SAVED

23-SEP-1988 10:47

B19

WALL # 2

DISPLACEMENT TIME HISTORIES

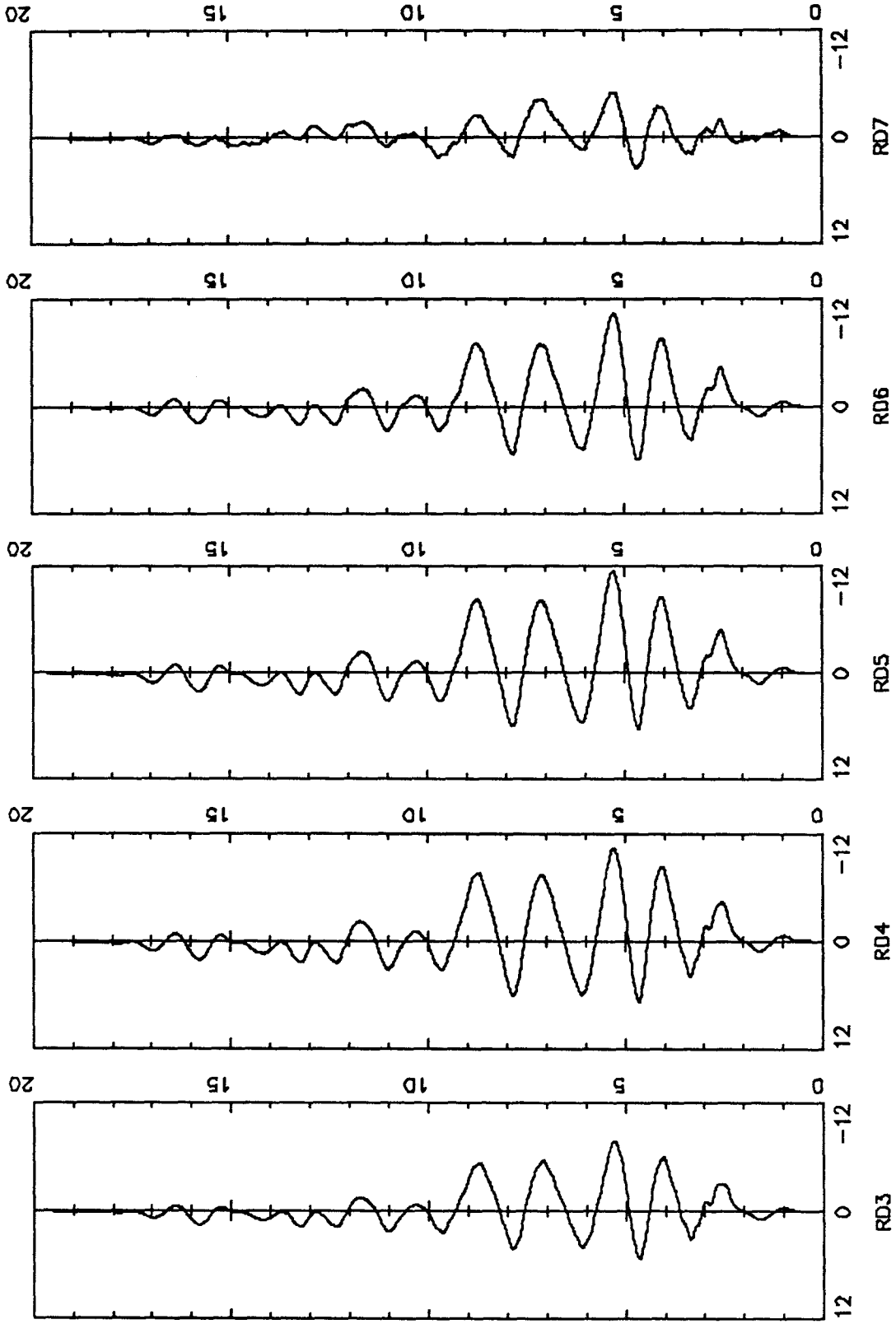


100 200 300 400 500 600 700 800 900 1000

WALL # 2

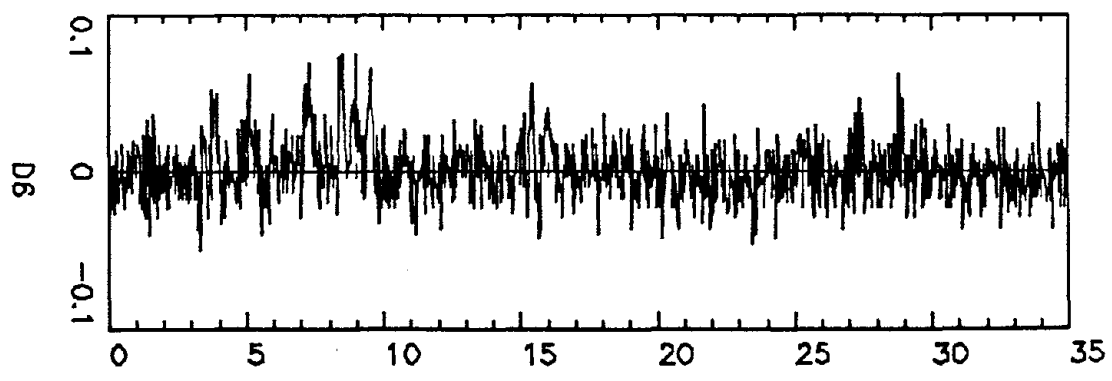
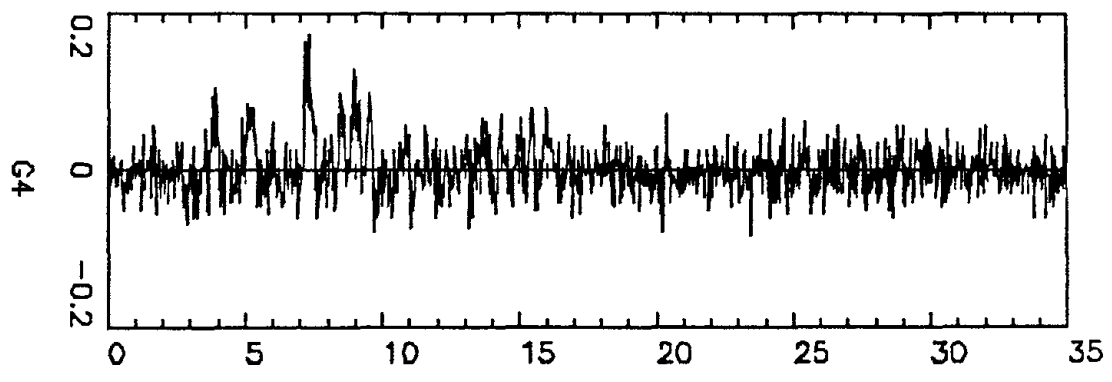
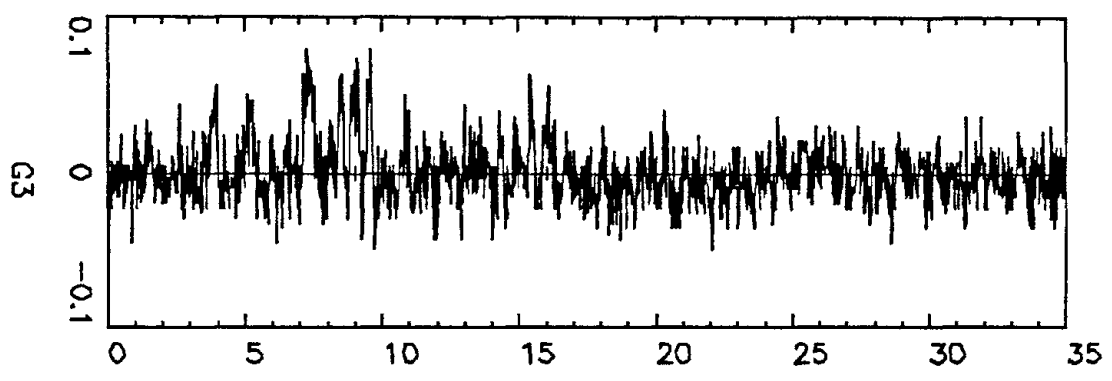
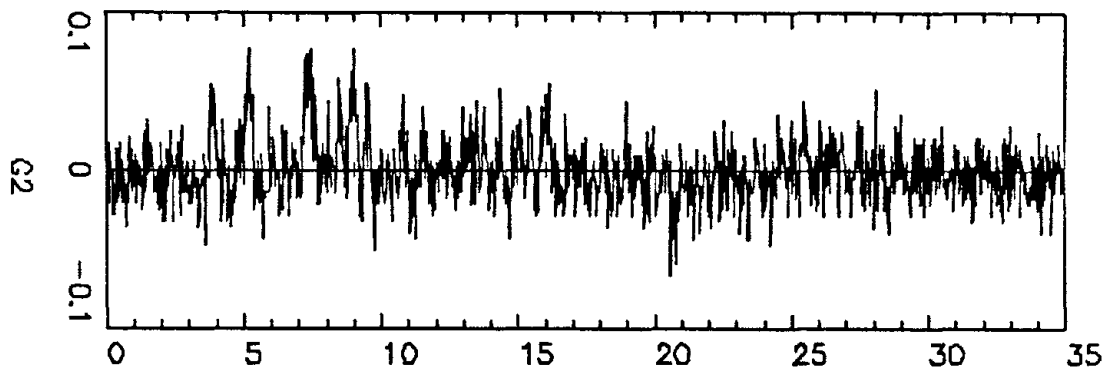
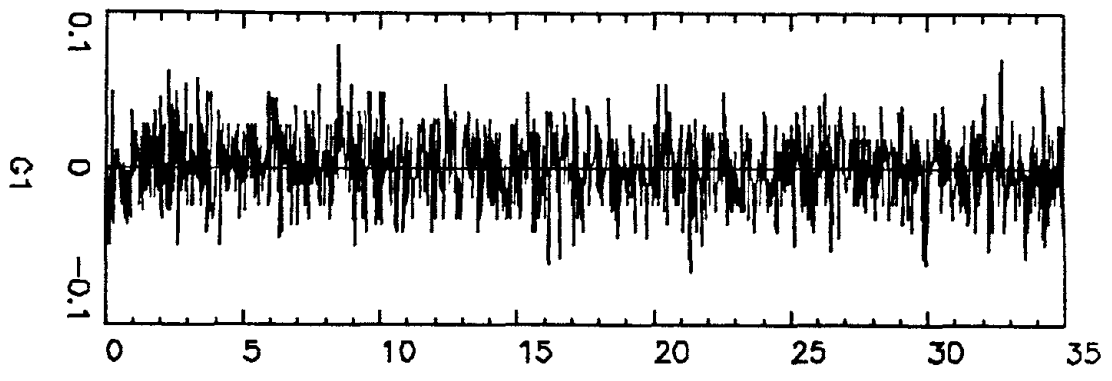
RELATIVE DISPLACEMENT TIME HISTORIES

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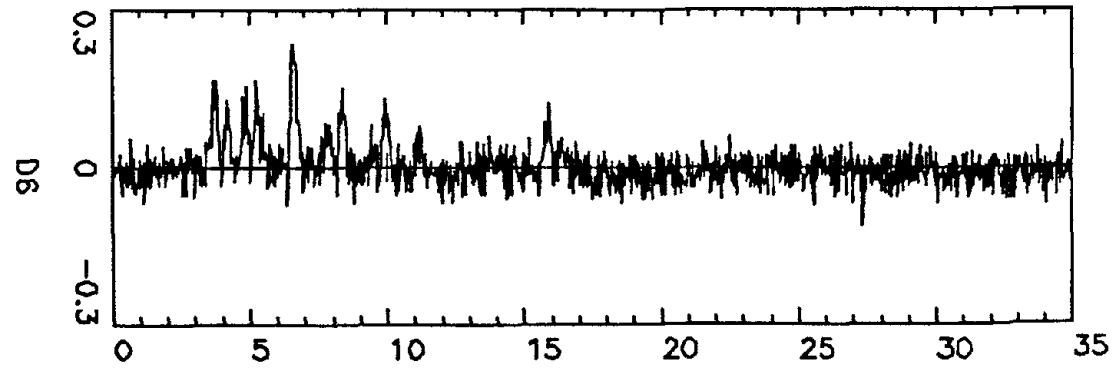
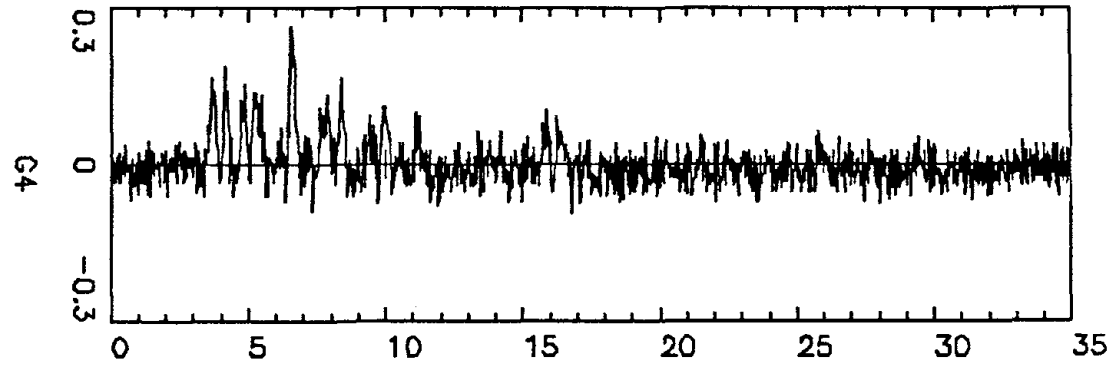
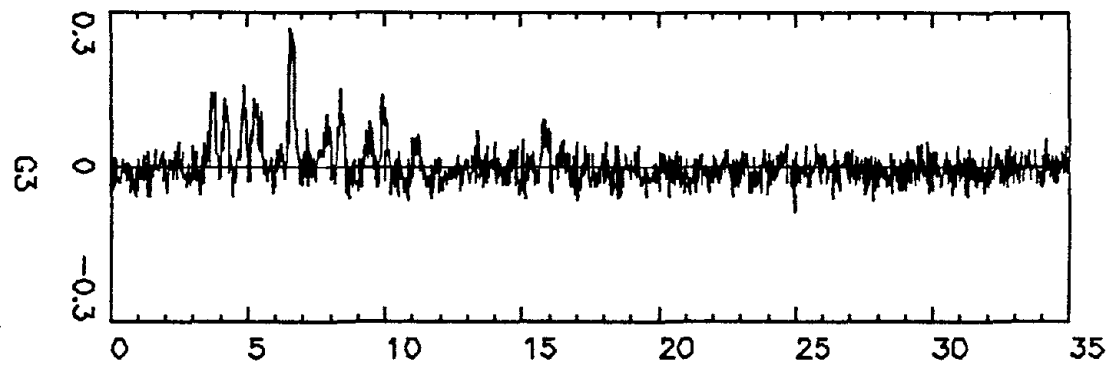
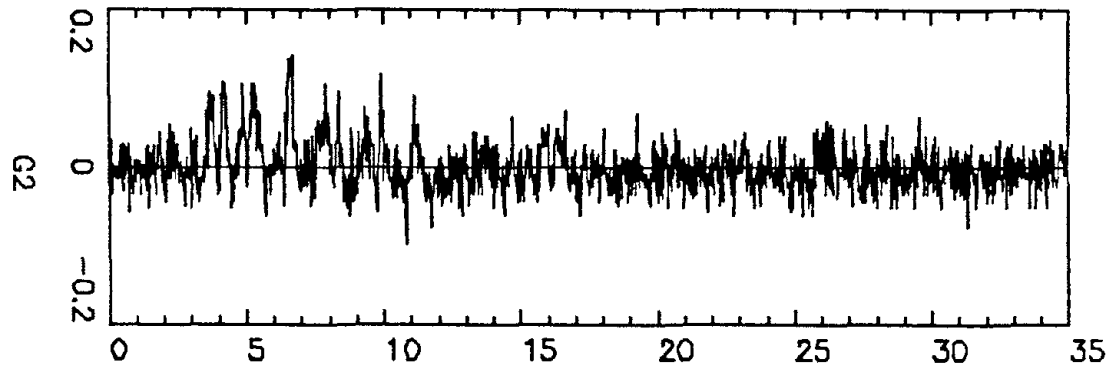
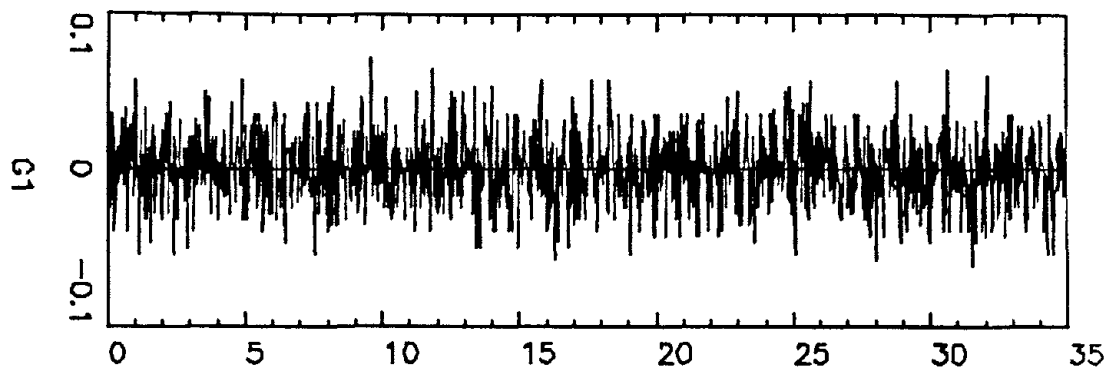
WALL # 2

REINFORCEMENT STRAIN TIME HISTORIES



GZ03
SAVED
26-SEP-1988 11:40

B21

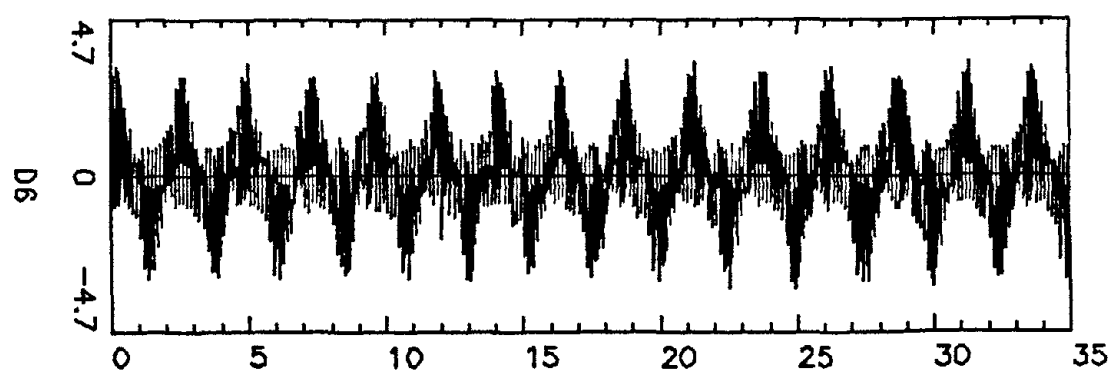
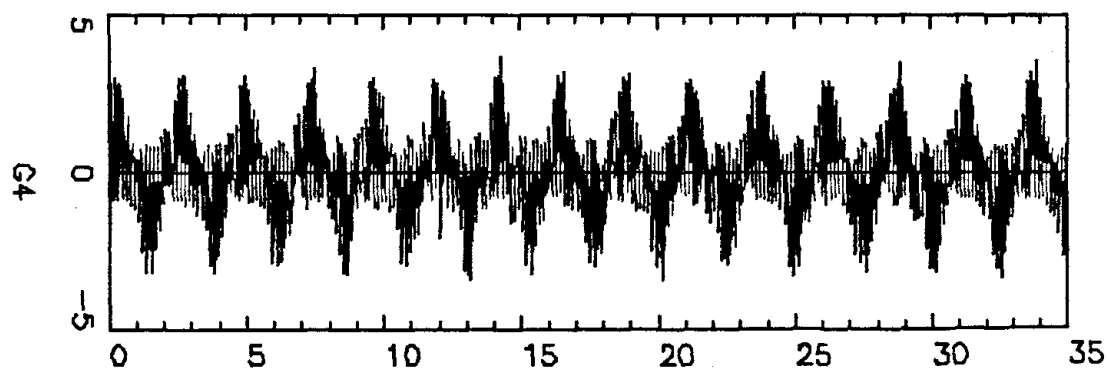
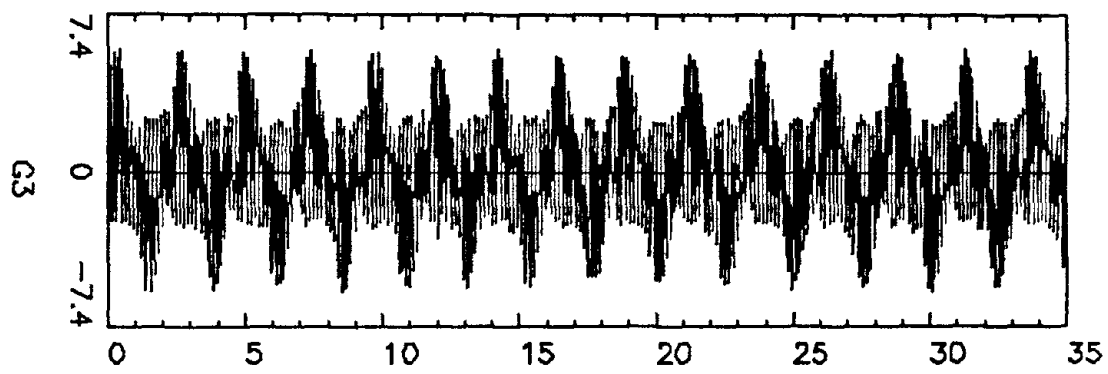
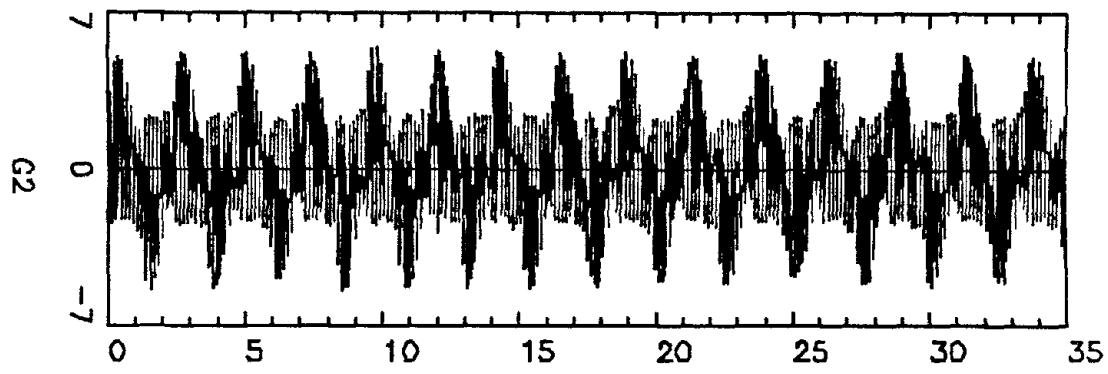
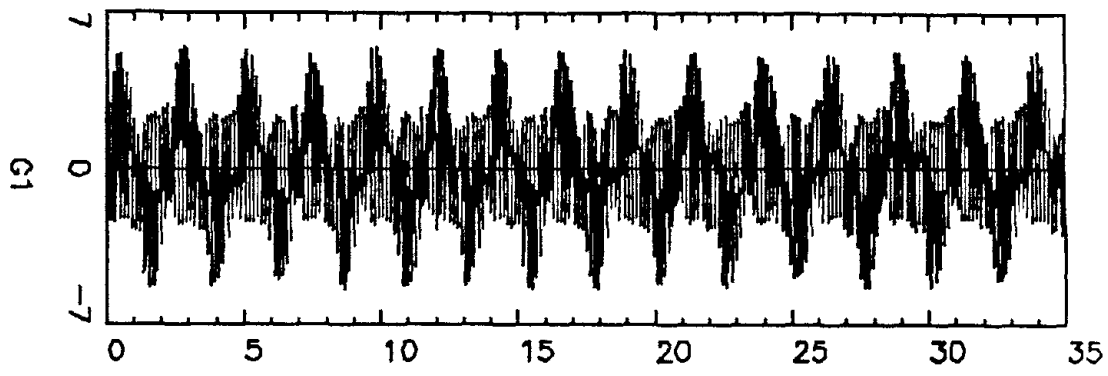


G205

SAYED

Z6-SEP-1988 11:5'

B22

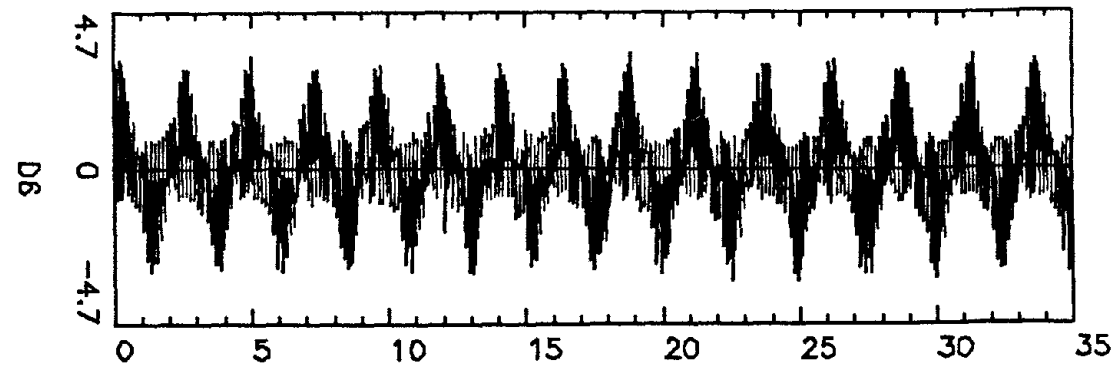
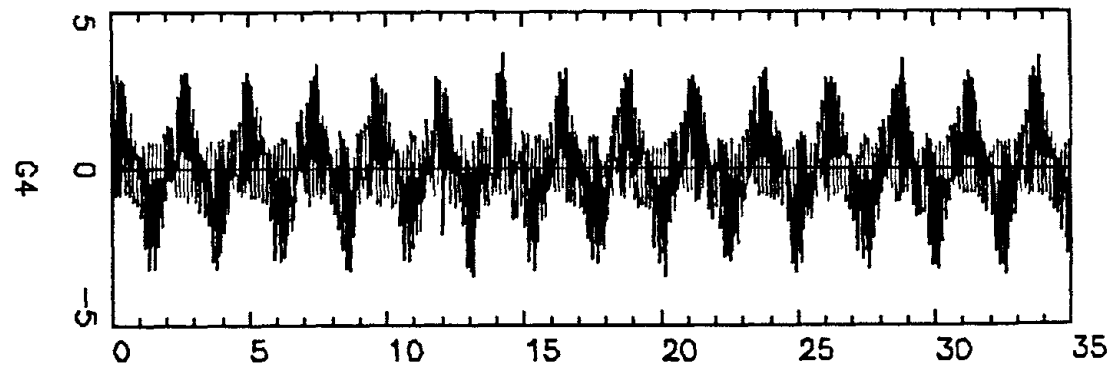
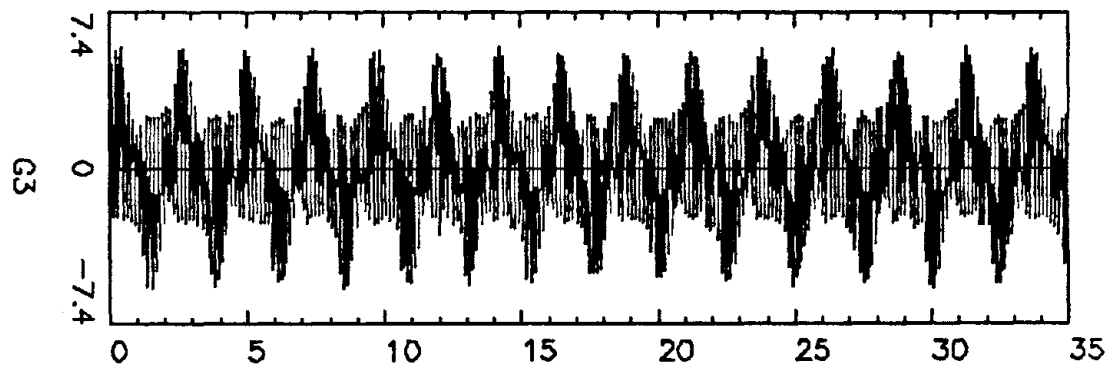
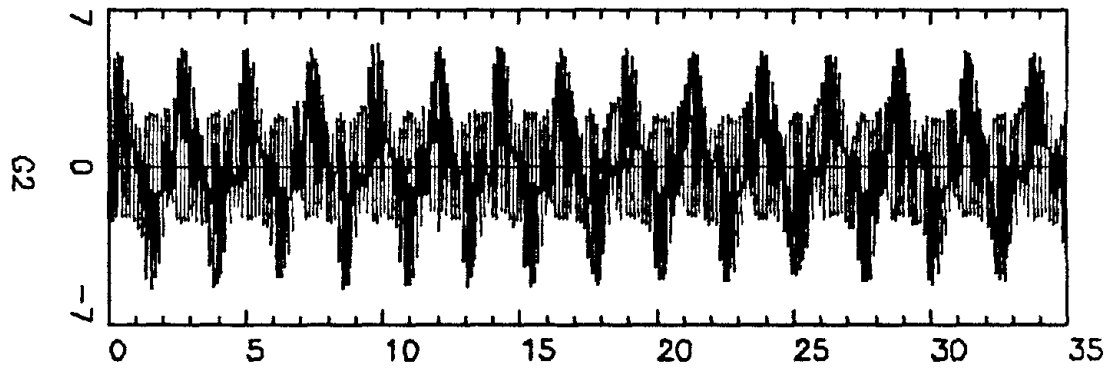
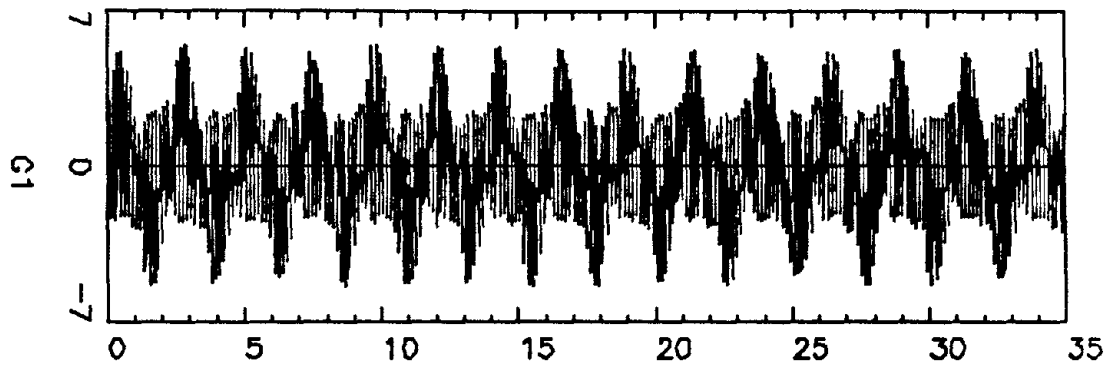


G208

SAVED

26-SEP-1988 11:51

B24

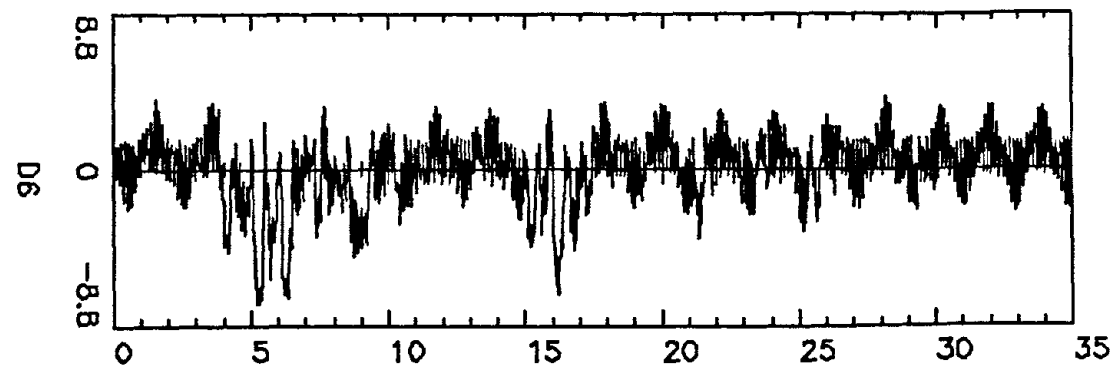
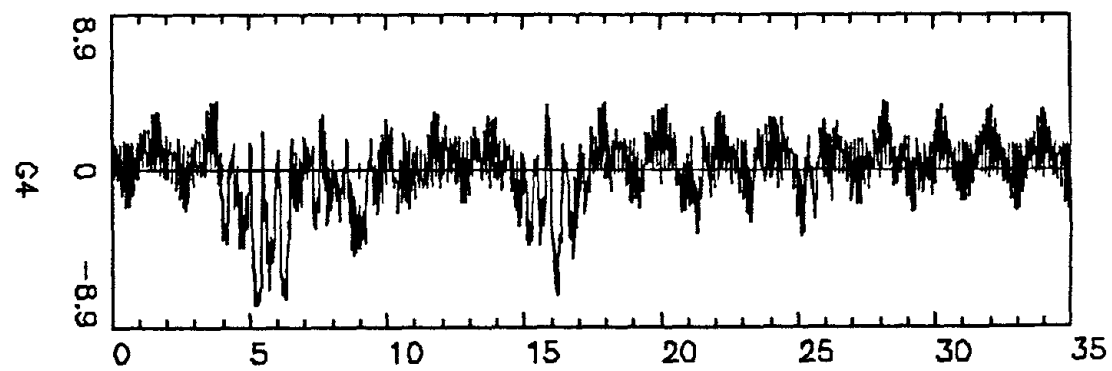
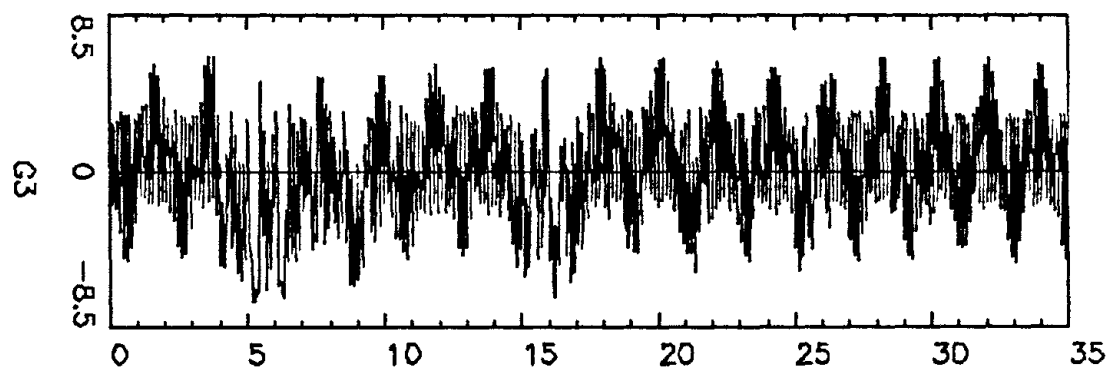
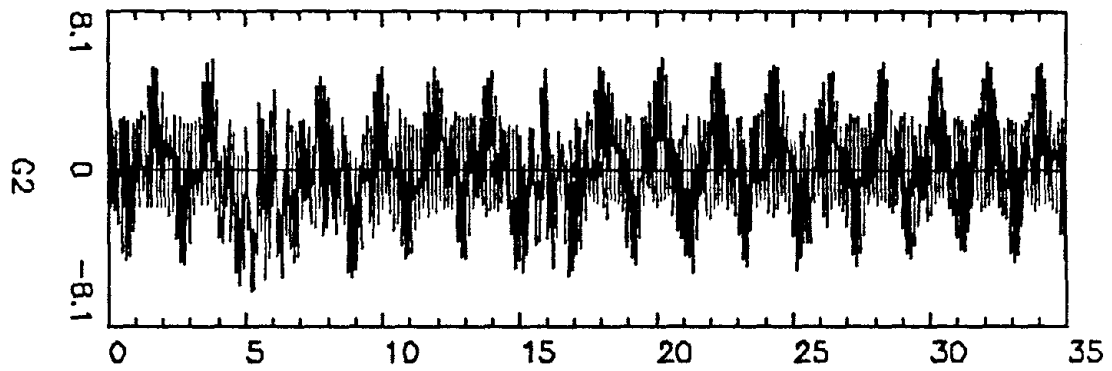
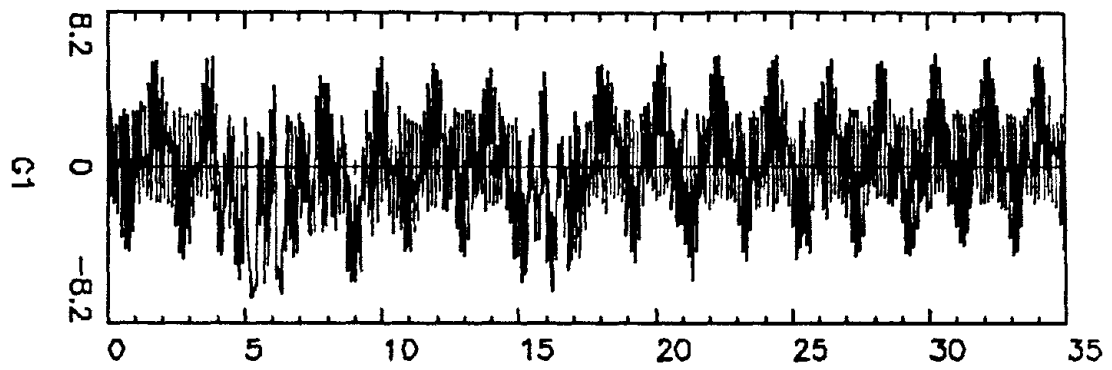


G209

SAYED

Z6-SEP-1988 11:28

B25

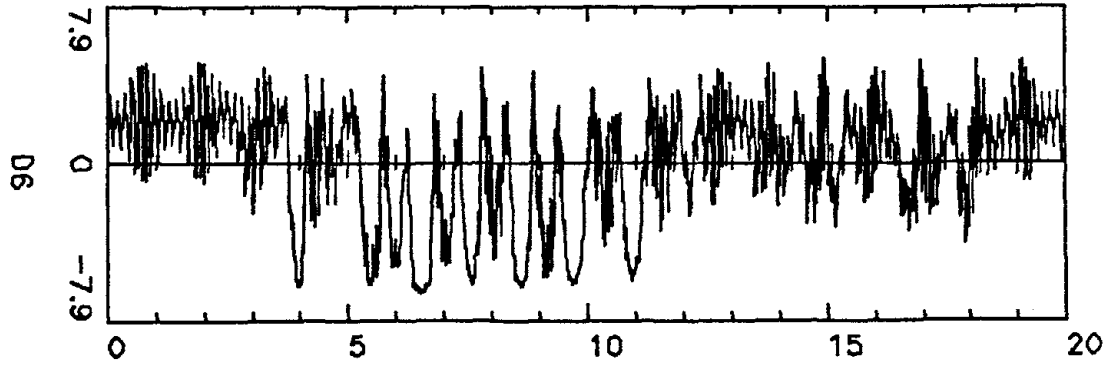
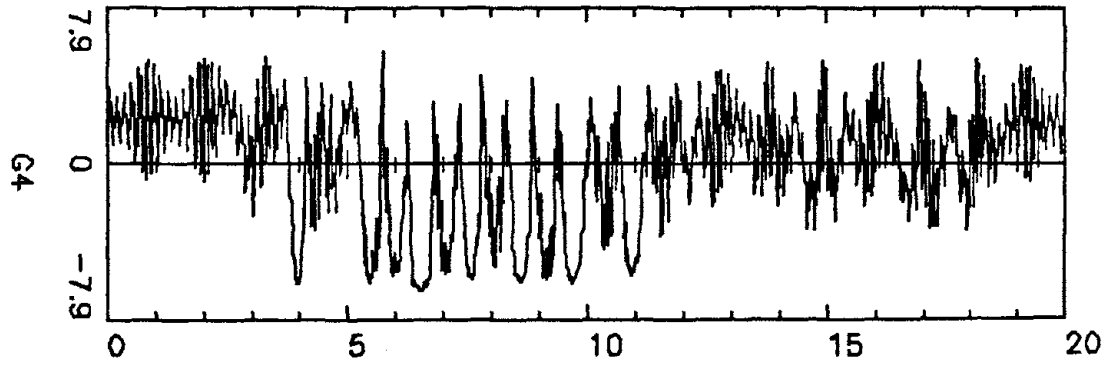
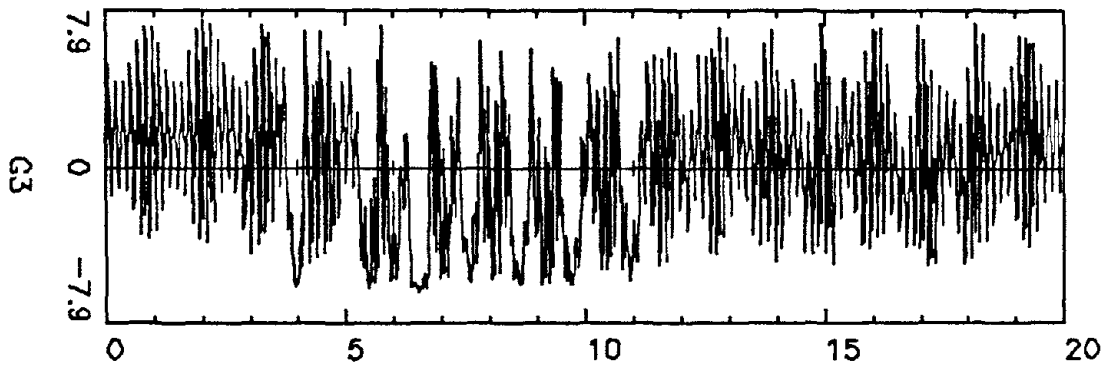
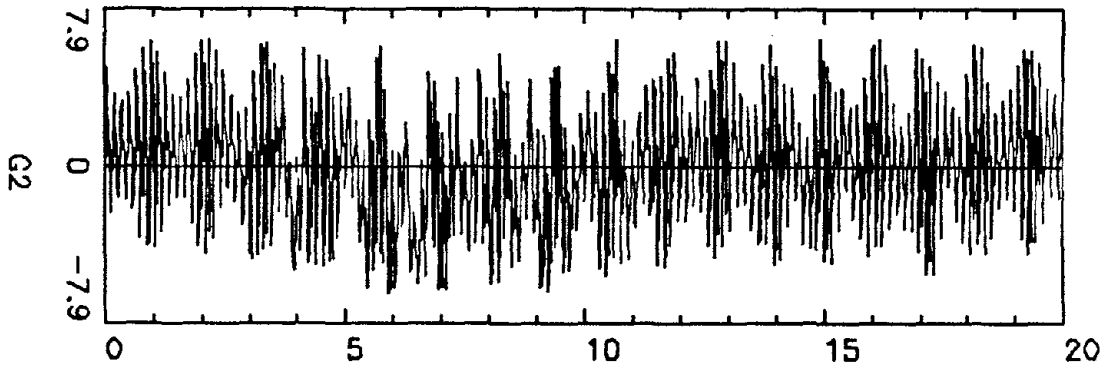
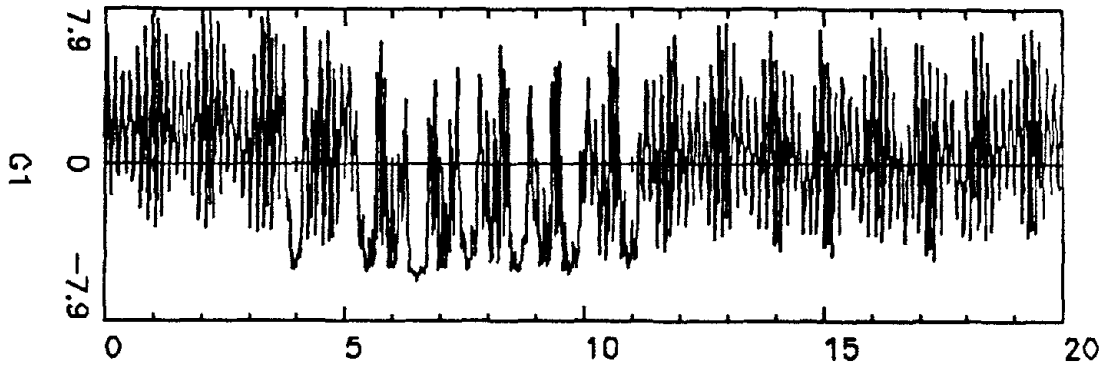


G210

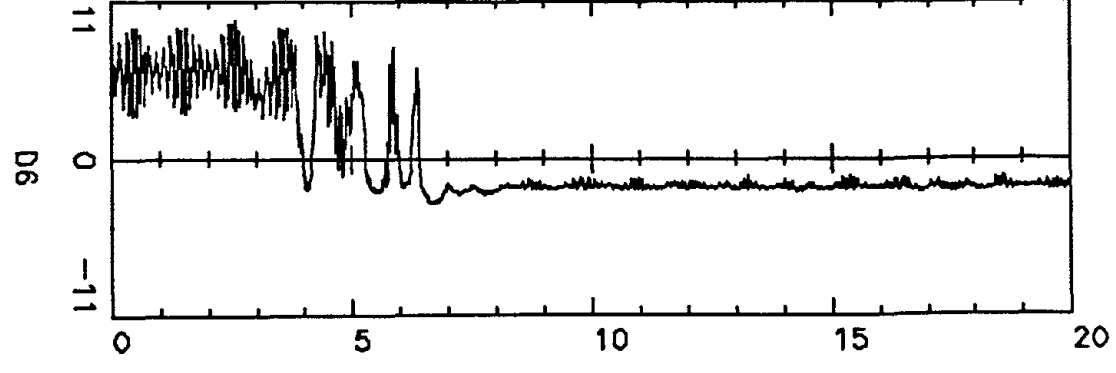
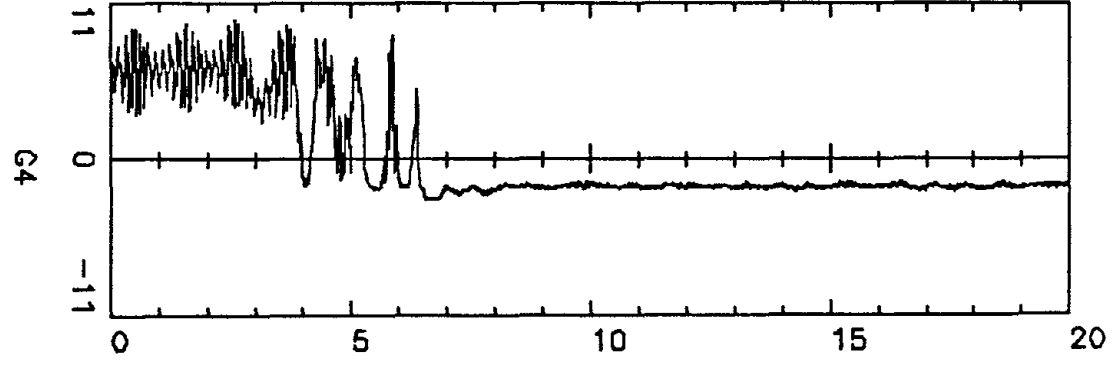
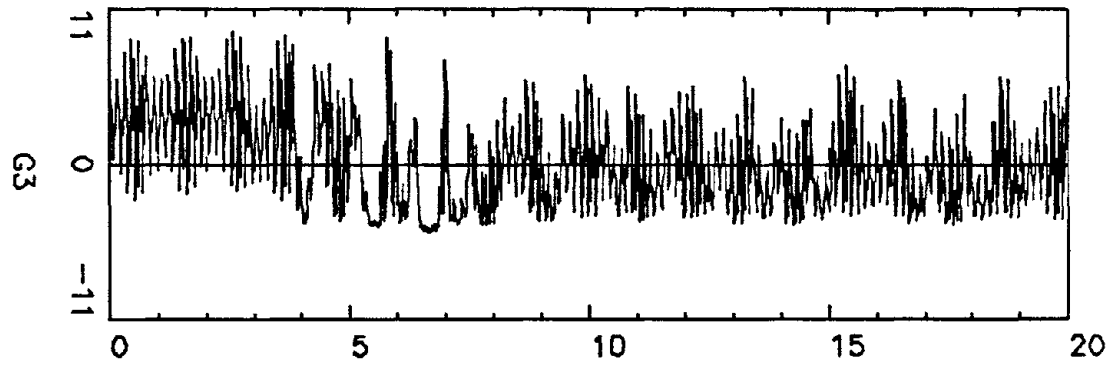
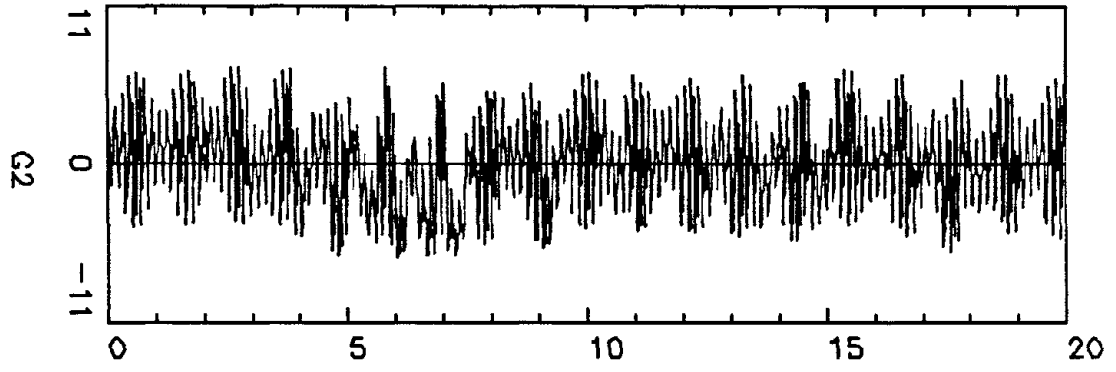
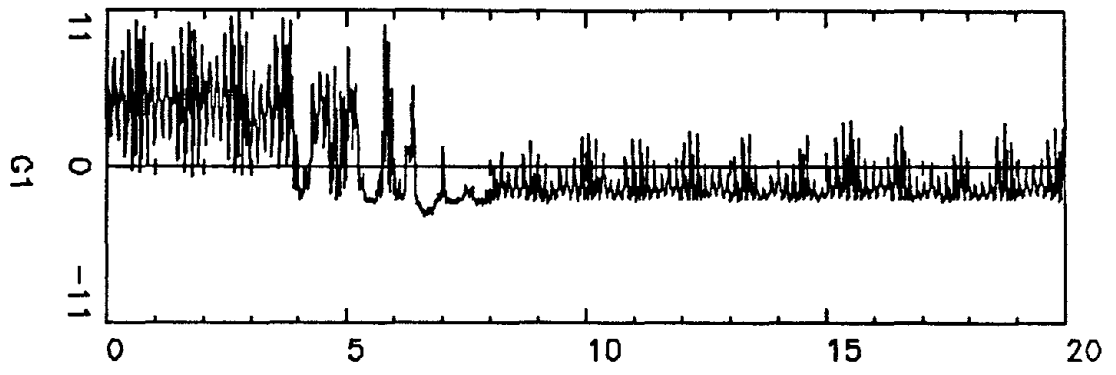
SAYED

Z6-SEP-1988 11:24

B26



G211 SAYED 28-SEP-1988 10:41

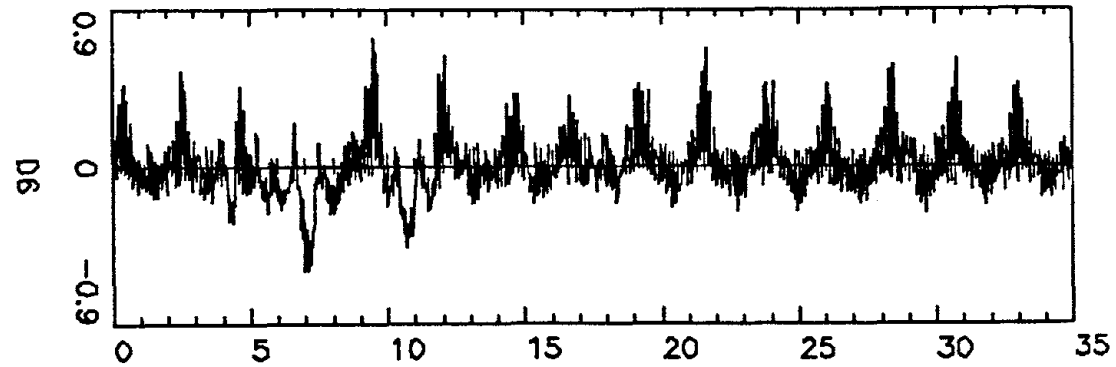
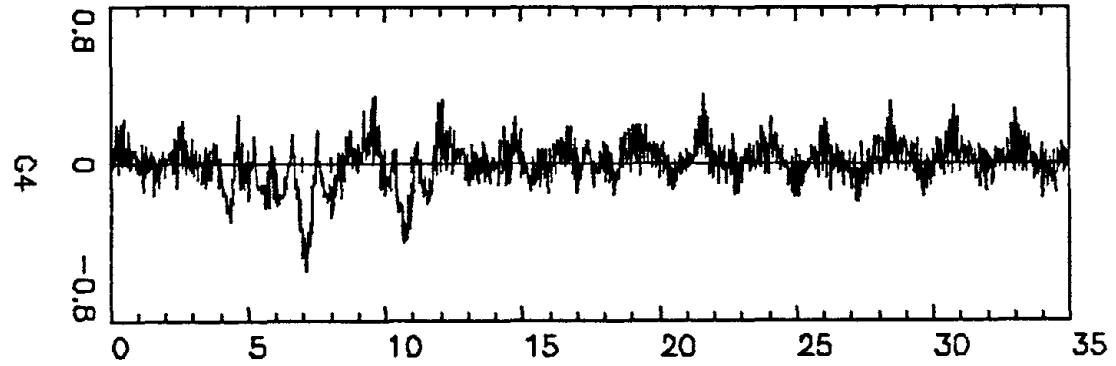
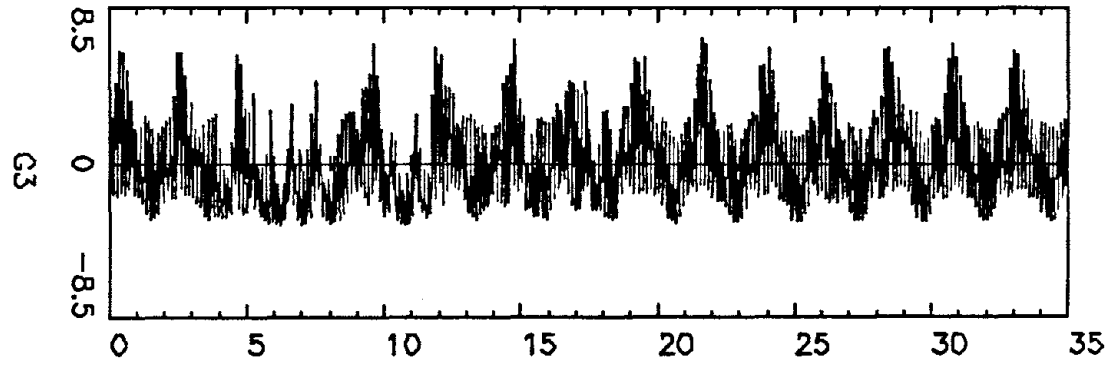
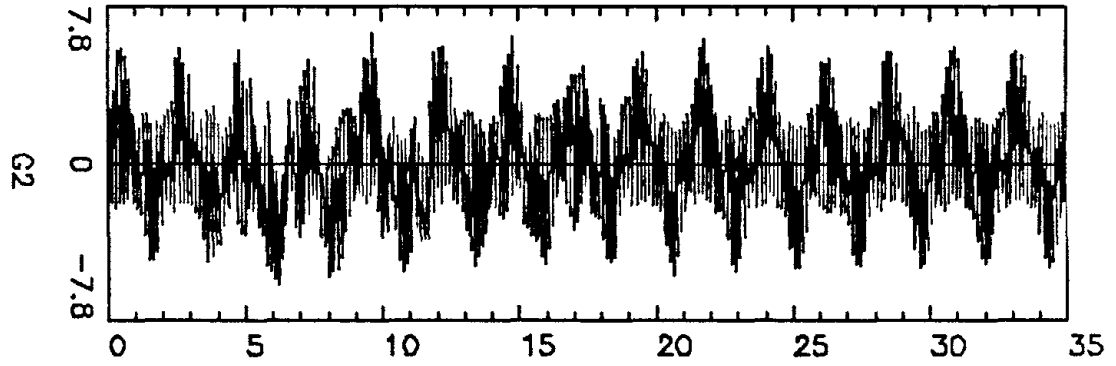
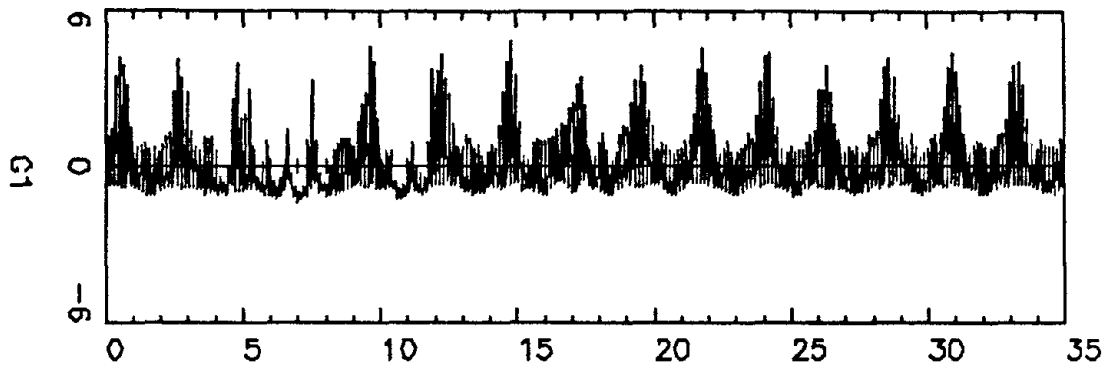


G212

SAVED

26-SEP-1988 10:39

828

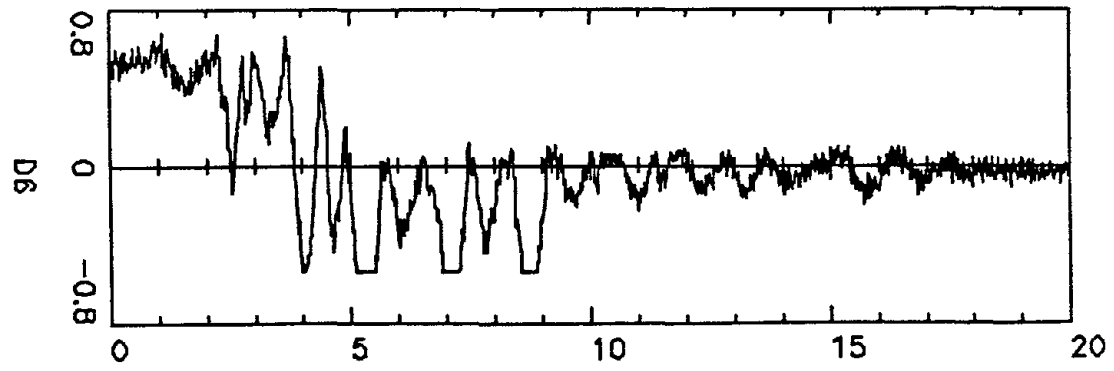
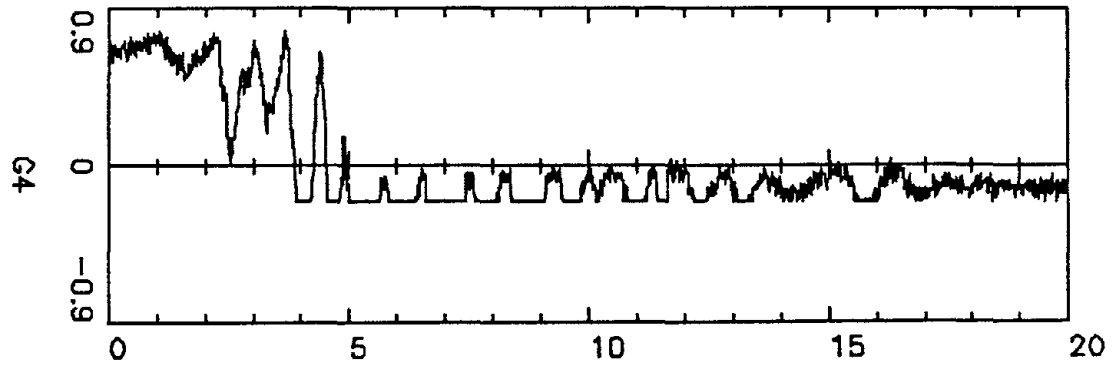
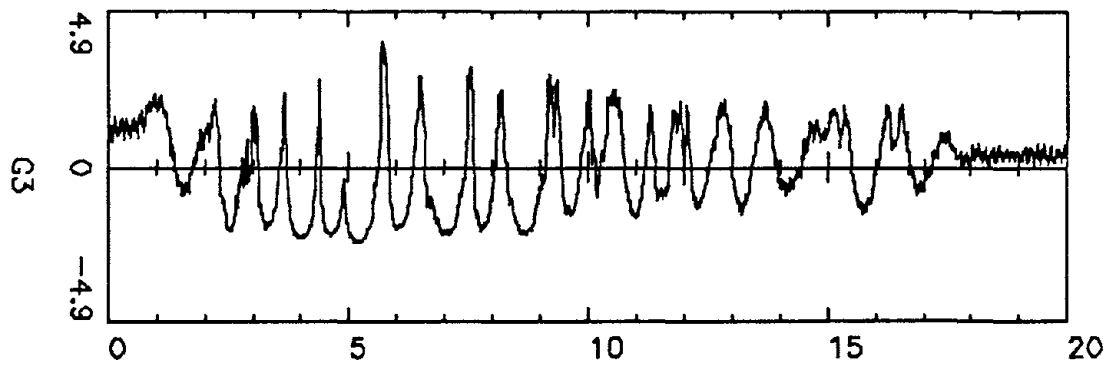
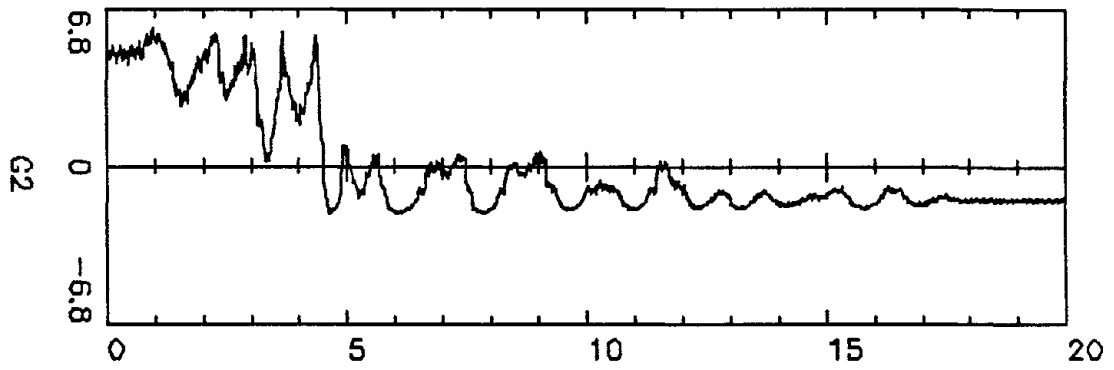
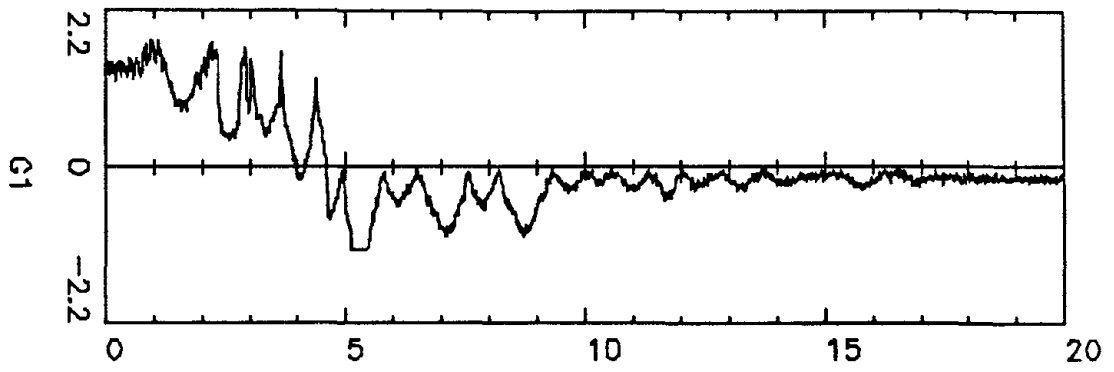


G214

SAYED

28-SEP-1988 10:58

B30



G215 SAYED 28-SEP-1988 15:25

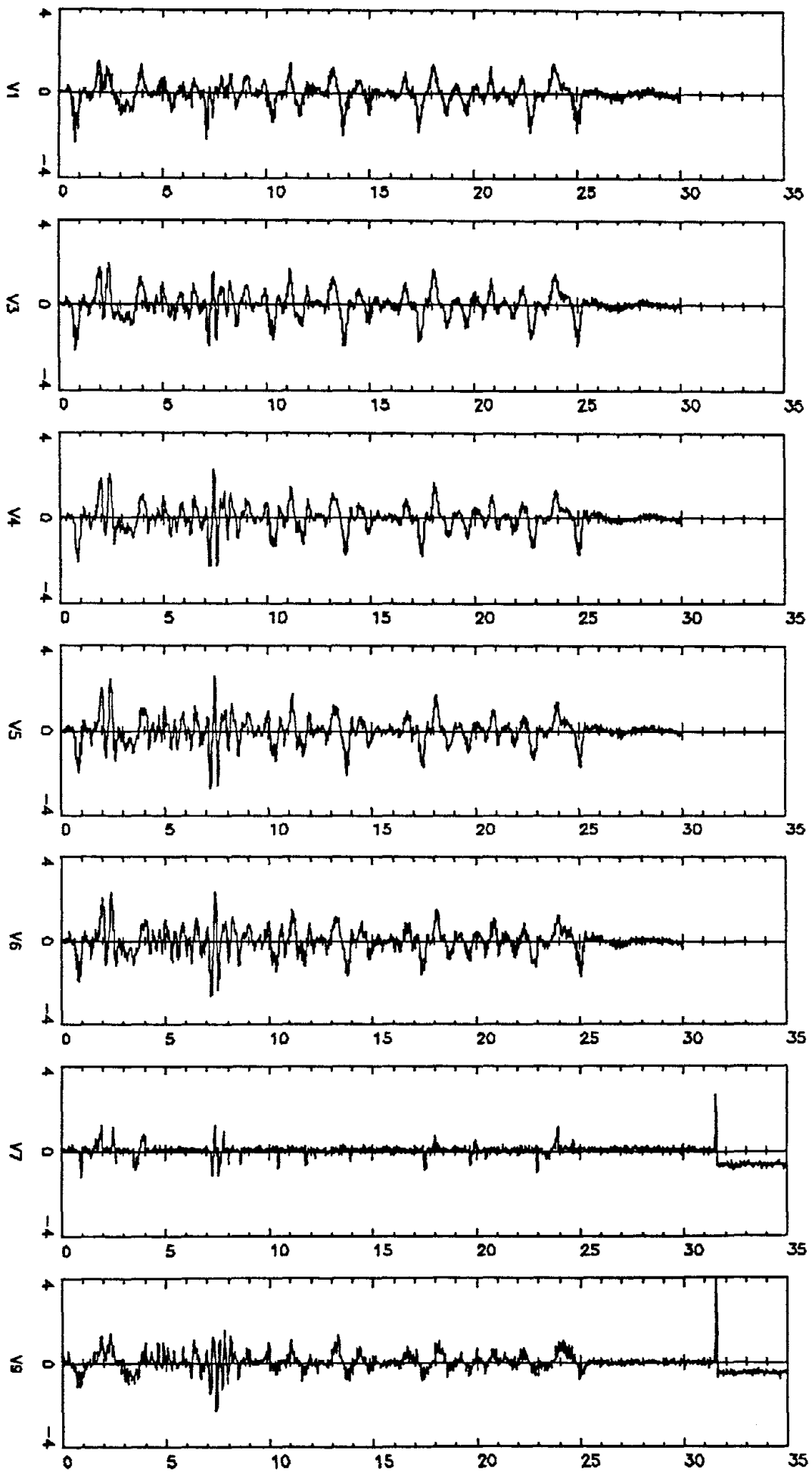
831

APPENDIX C

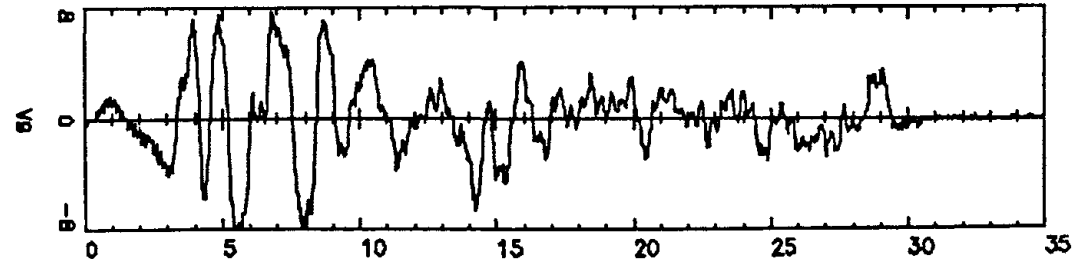
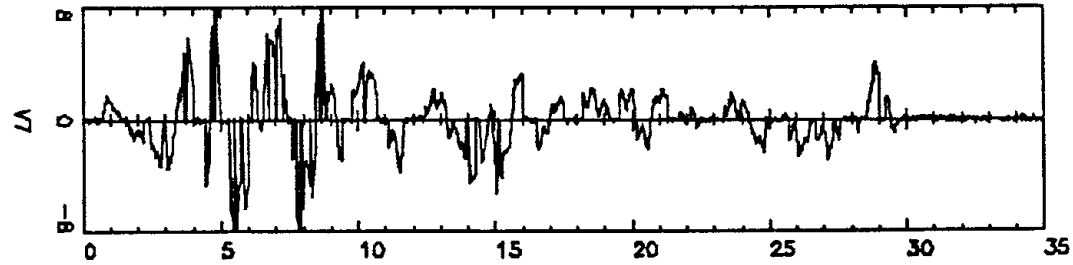
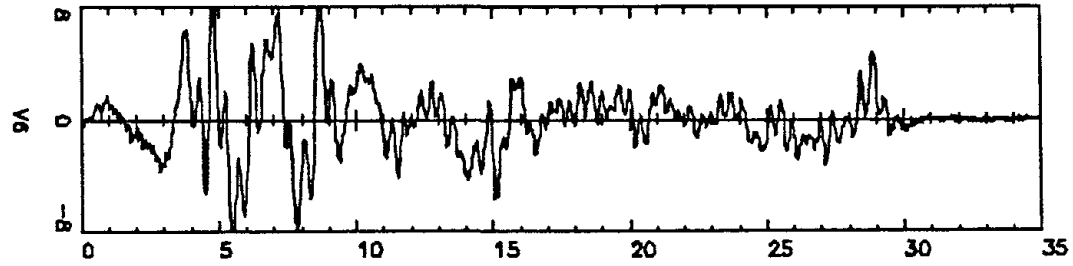
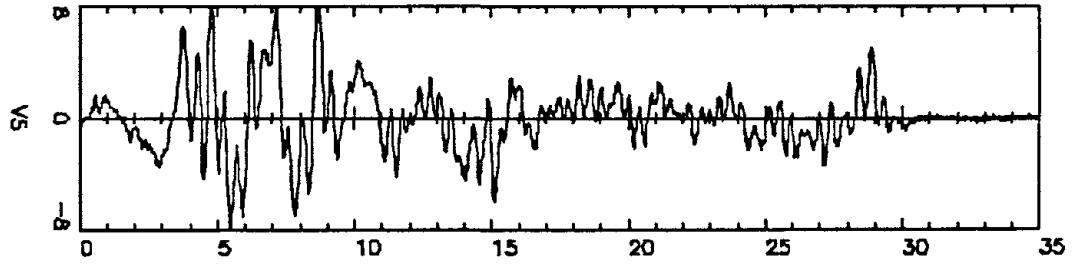
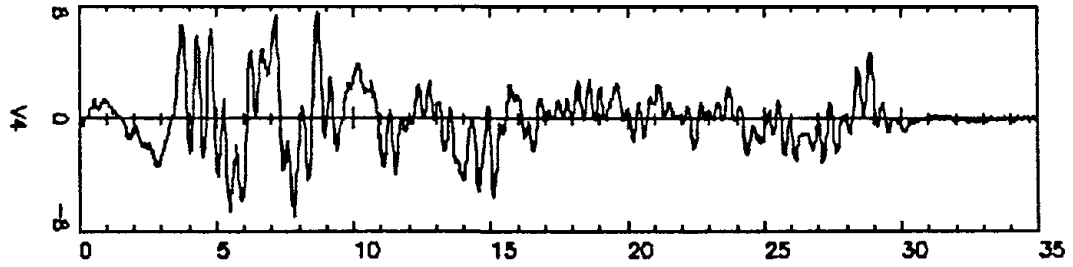
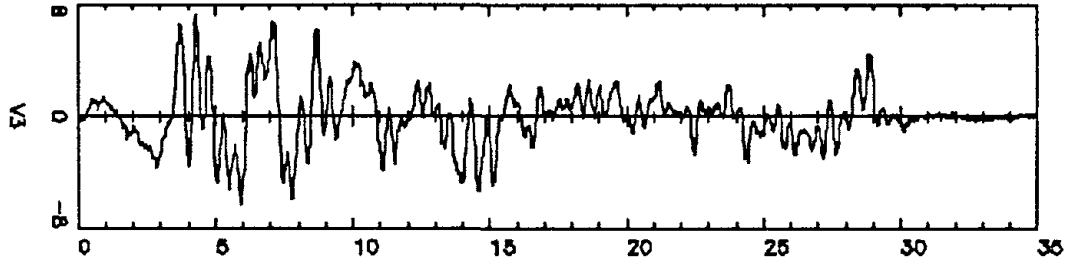
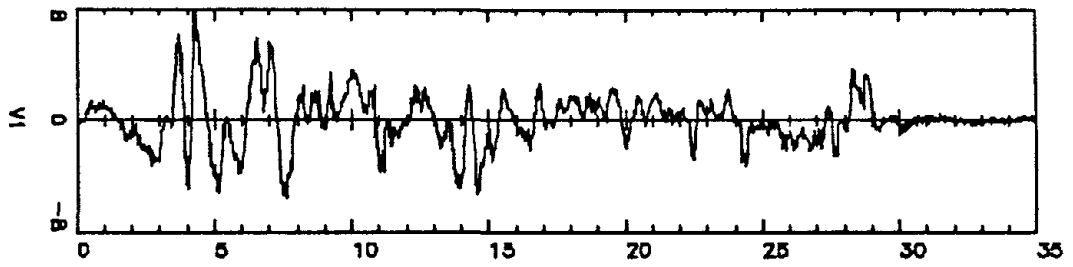
TIME HISTORY RESPONSE FOR PANEL #3

WALL # 3

VELOCITY TIME HISTORIES



C5

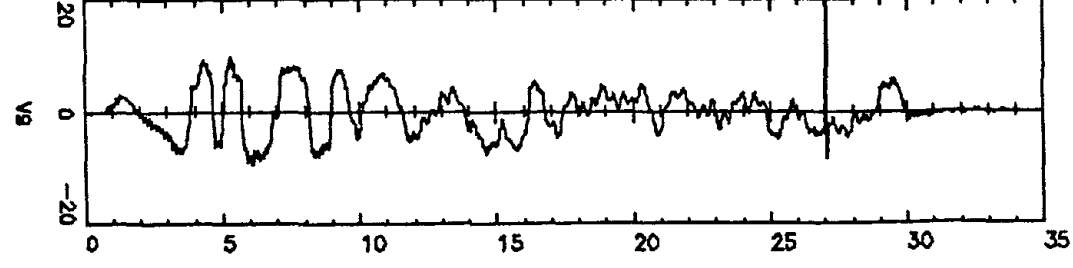
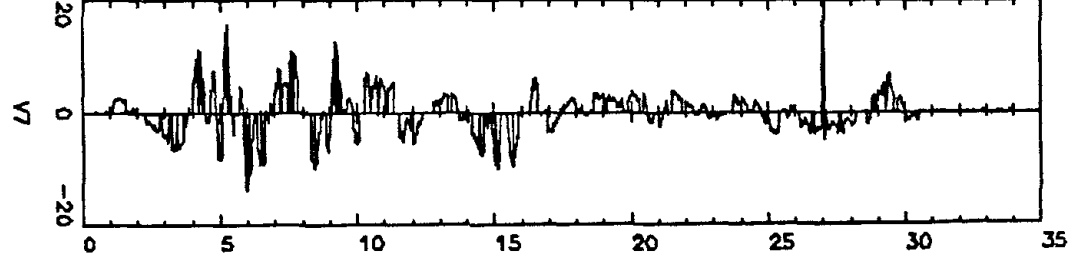
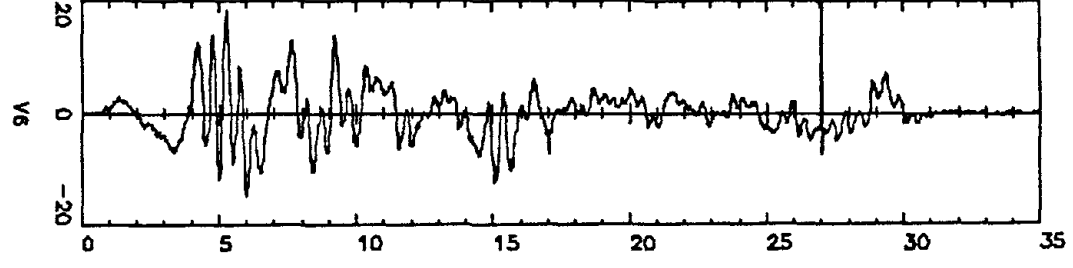
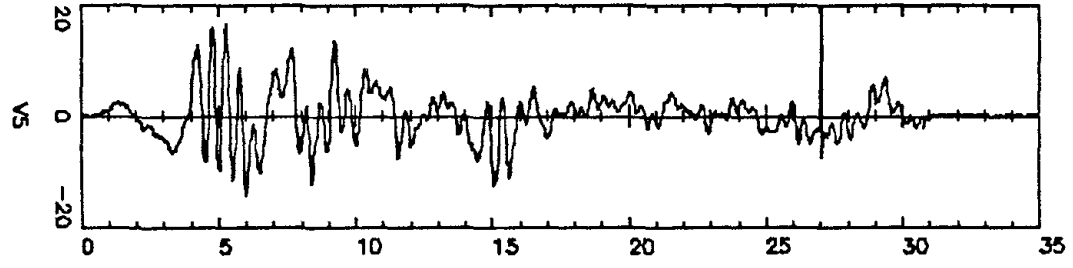
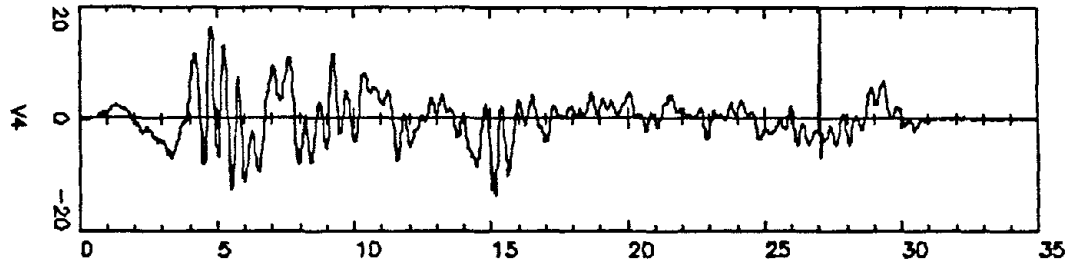
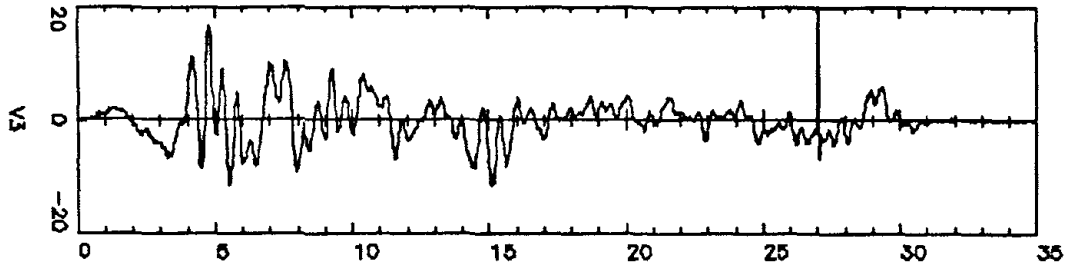
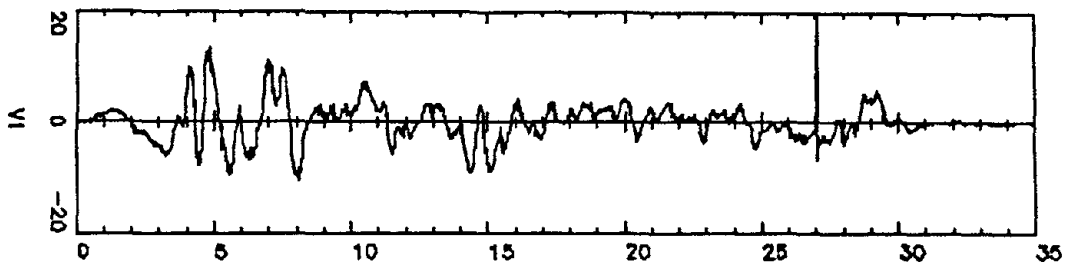


V303

SAVED

22-SEP-1988 12:21

04

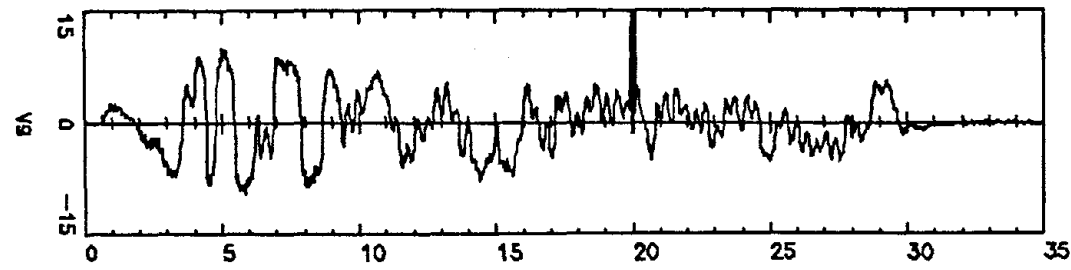
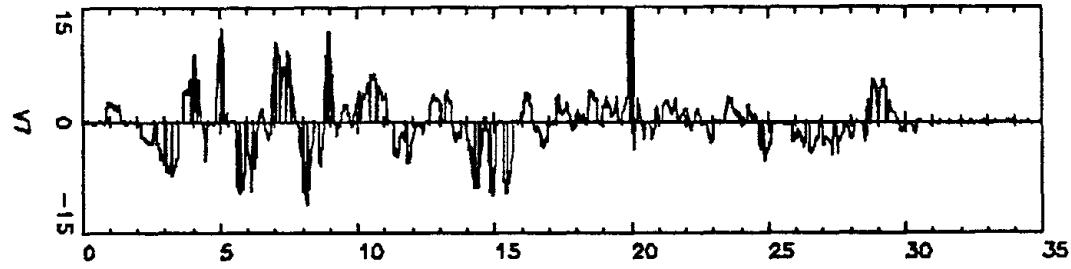
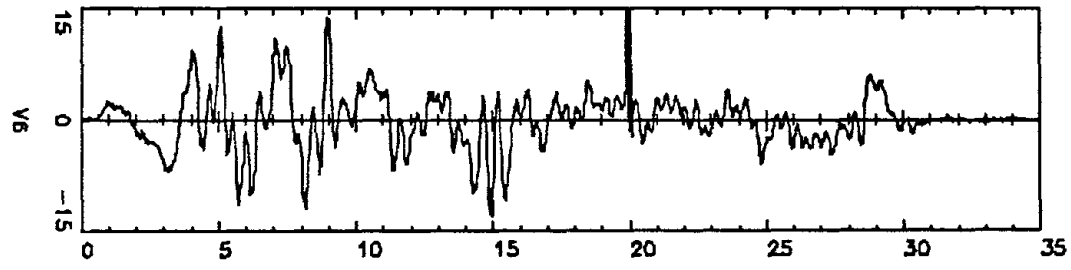
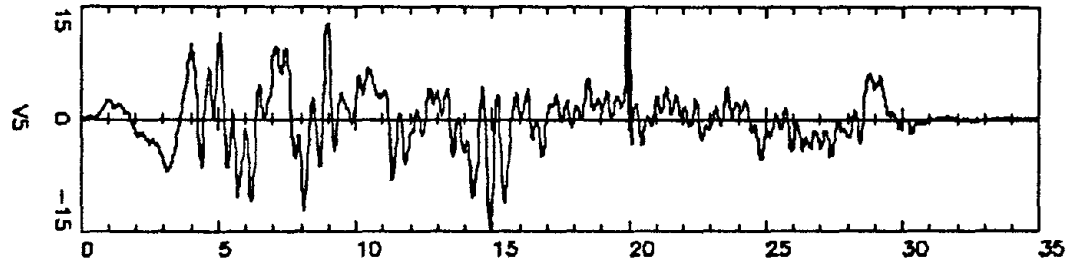
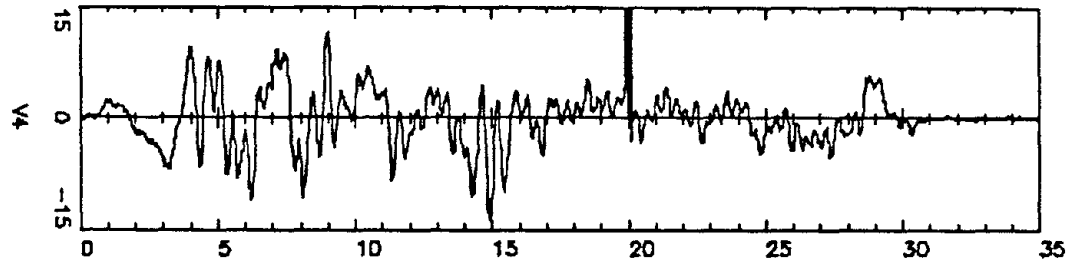
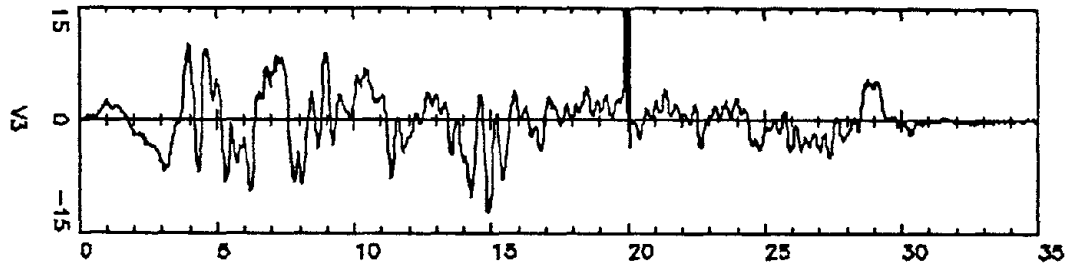
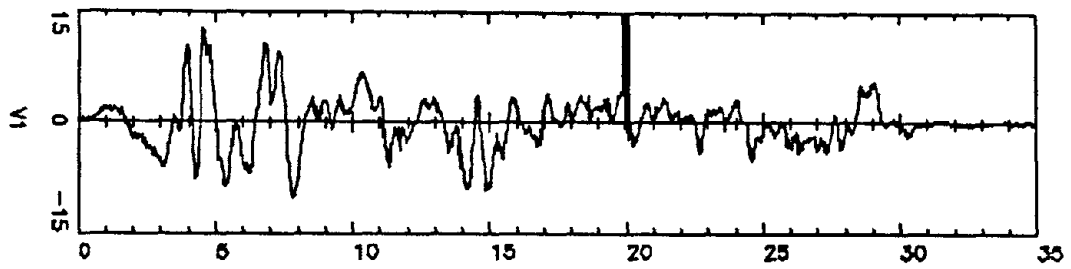


V305

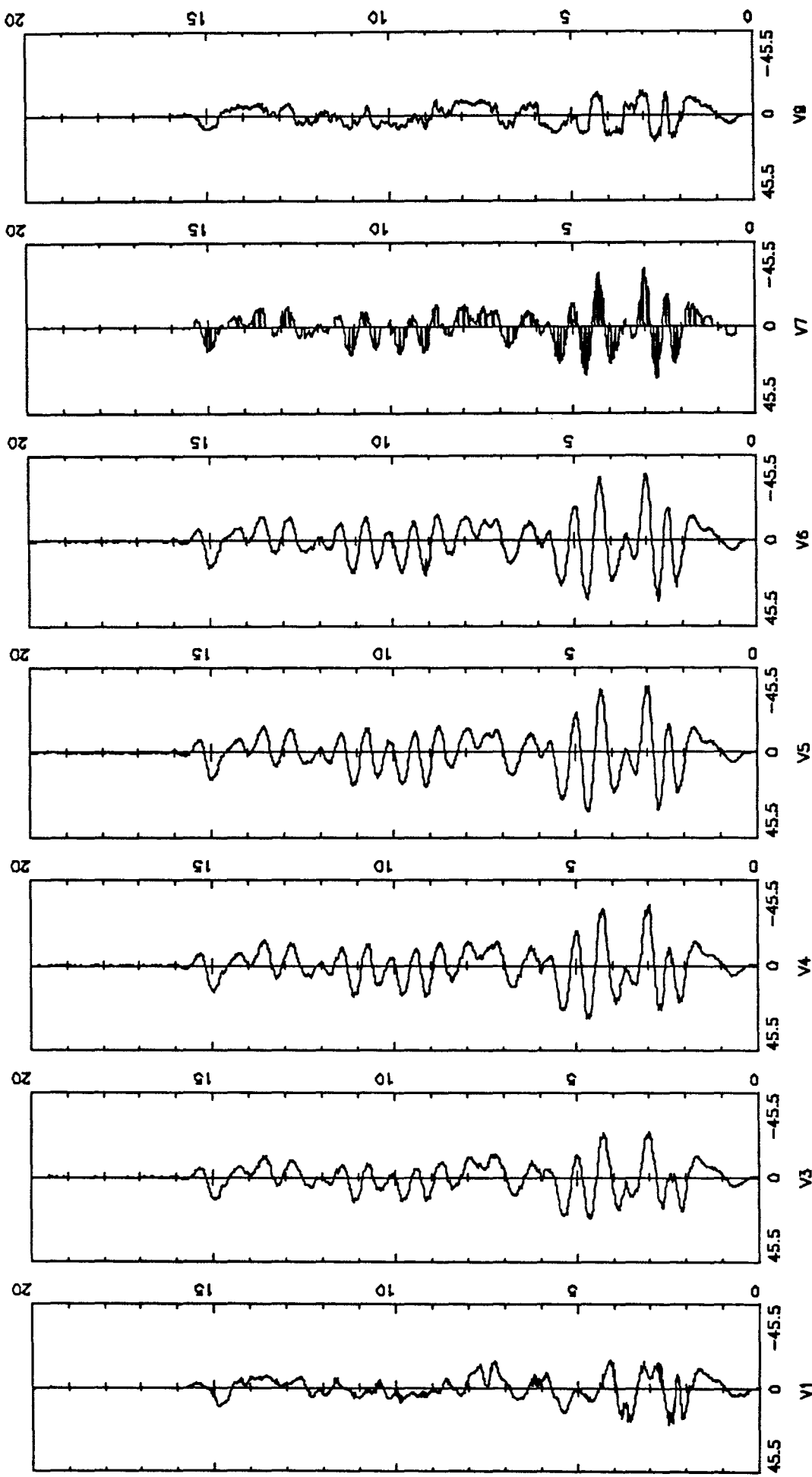
SAYED

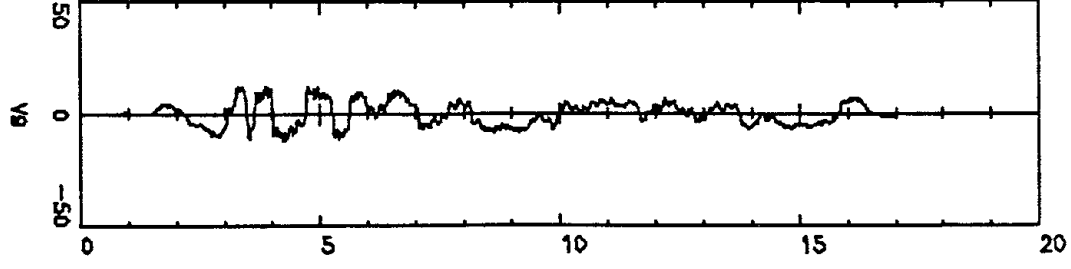
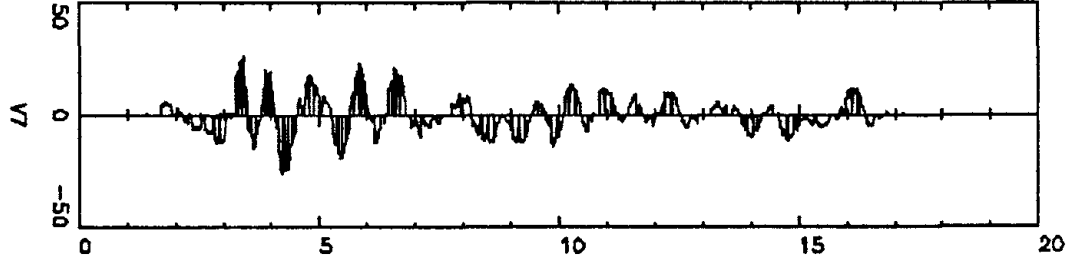
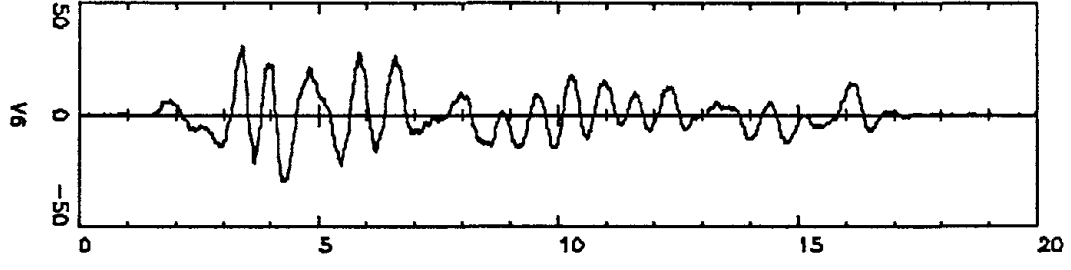
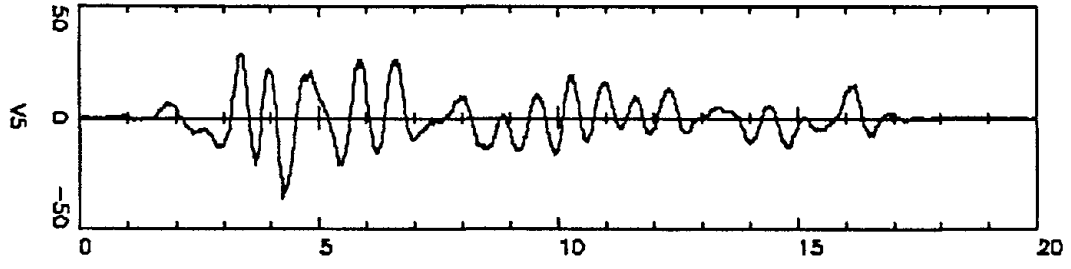
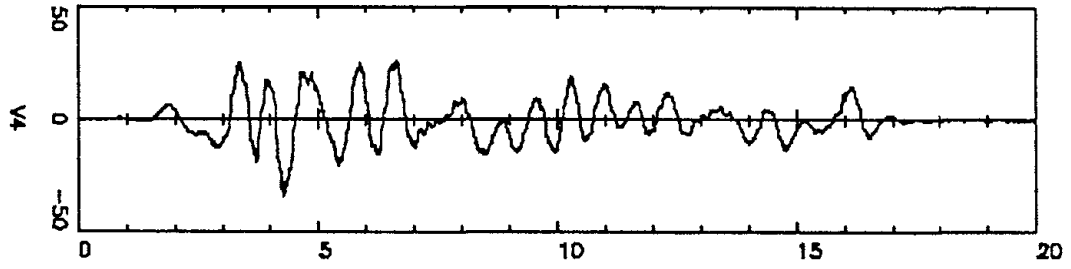
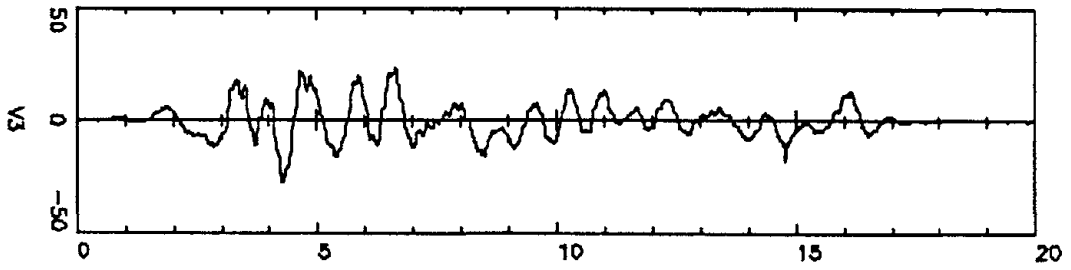
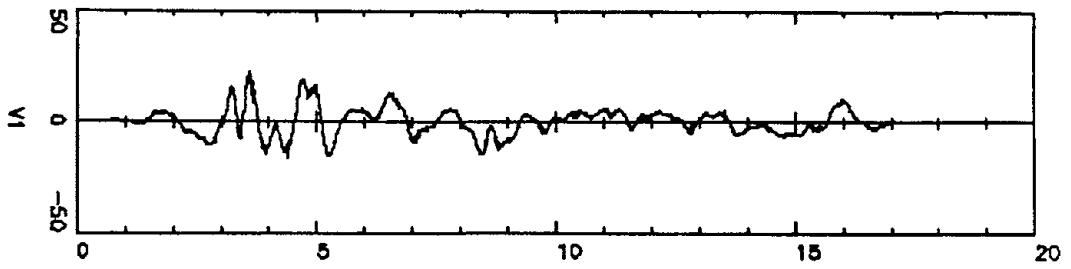
20-SEP-1988 15:35

05



27



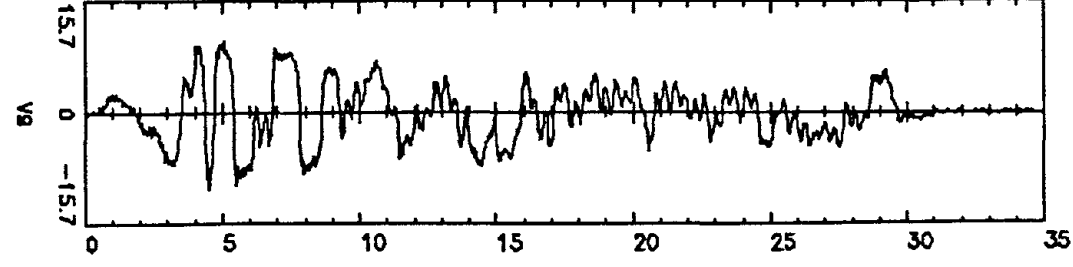
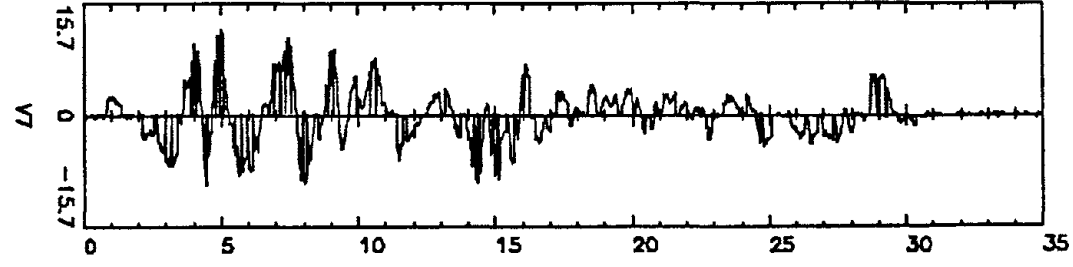
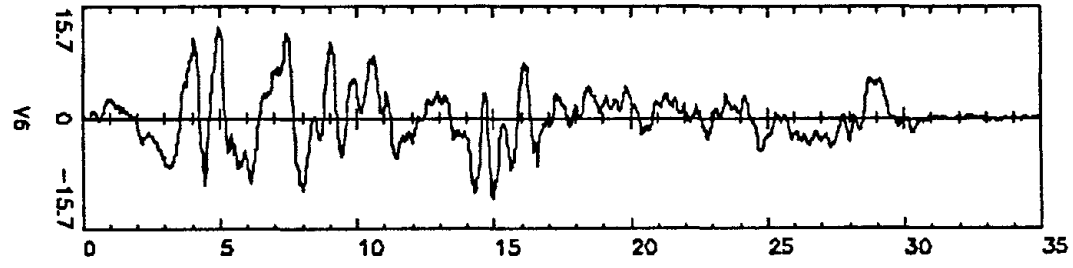
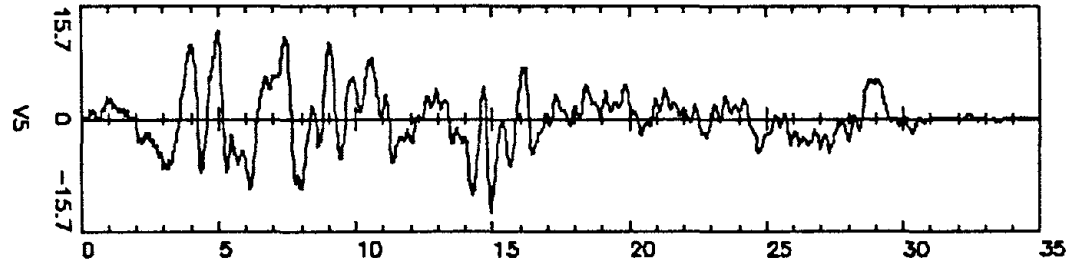
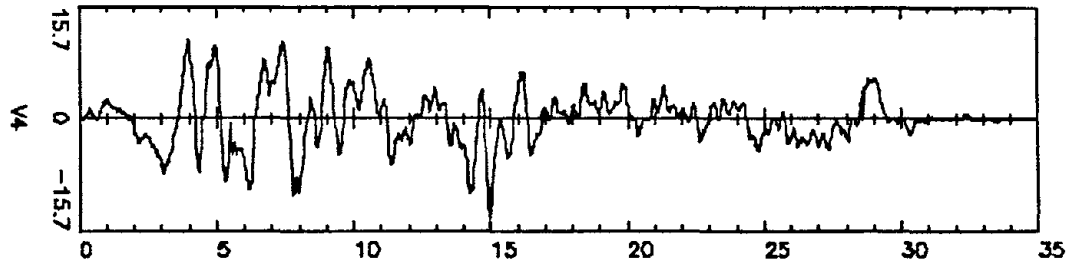
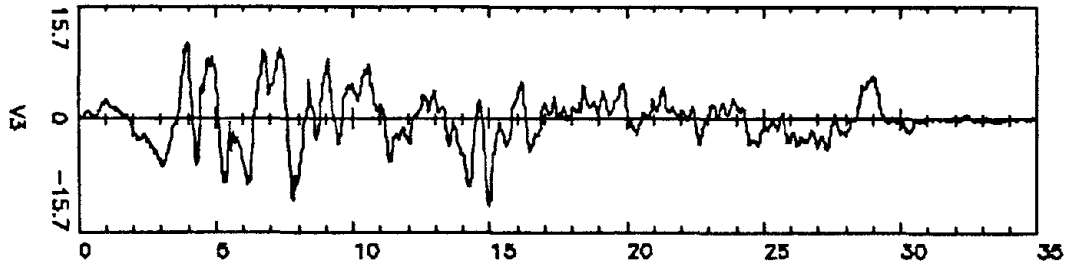
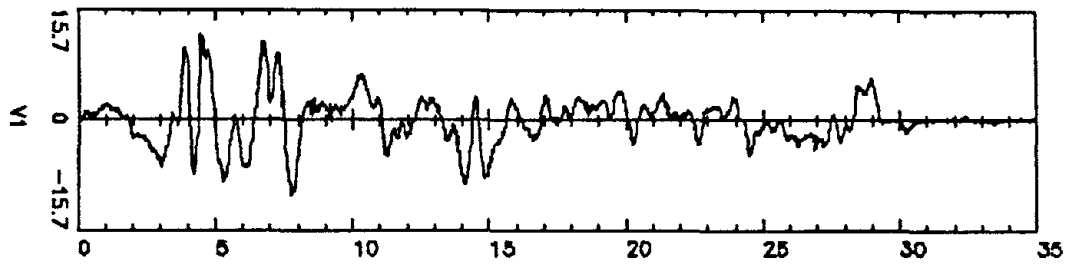


V110

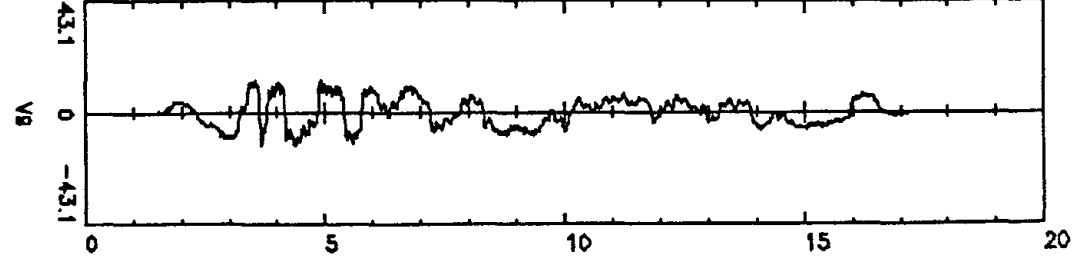
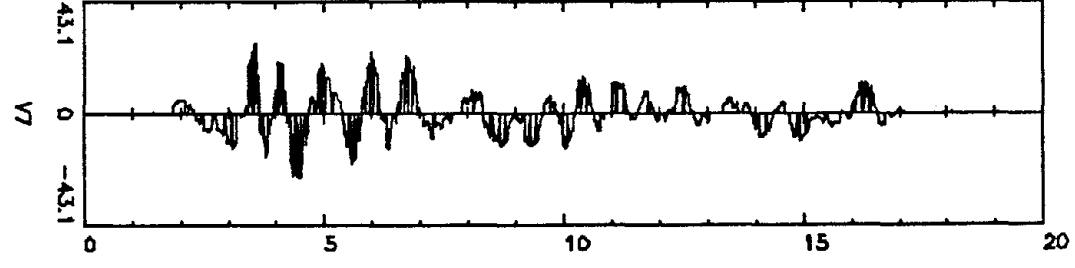
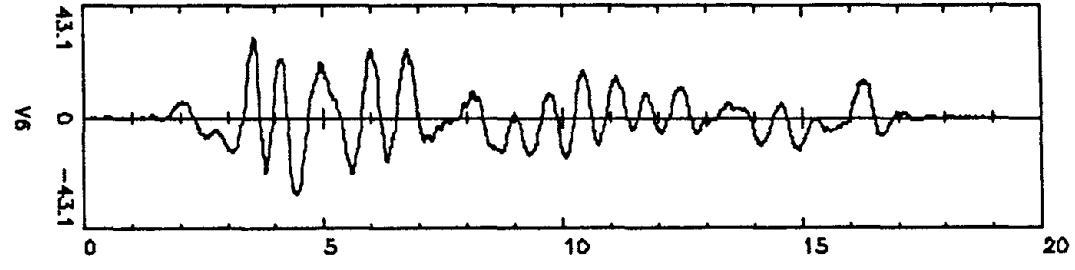
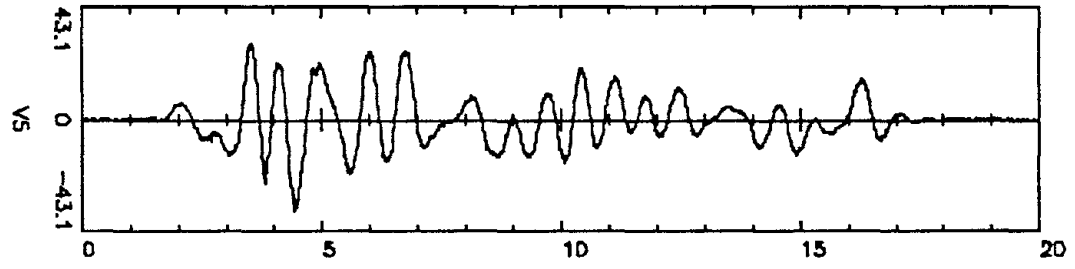
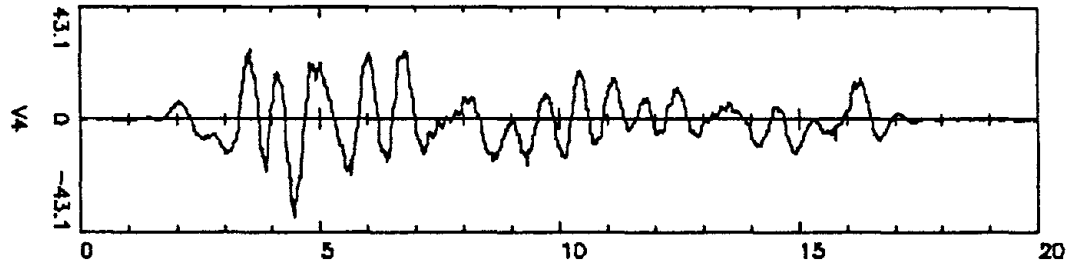
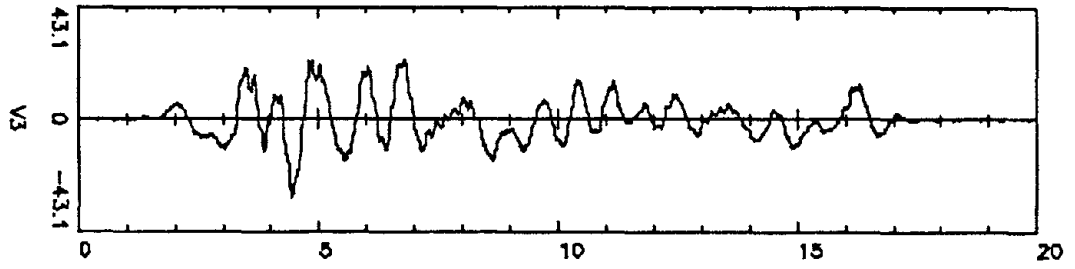
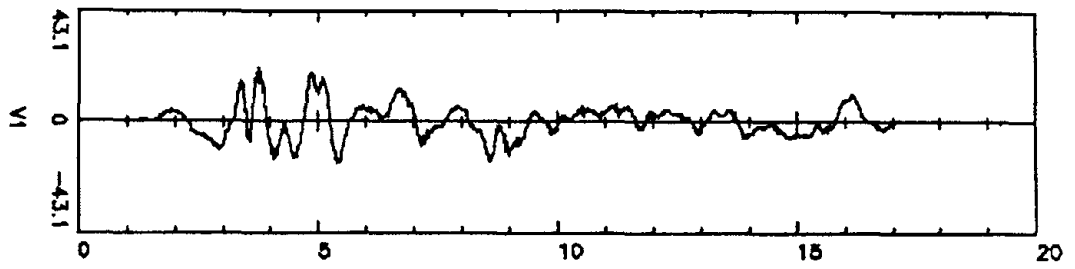
SAVED

Z8-SEP-1988 16:23

08



V1
V3
V4
V5
V6
V7
V9

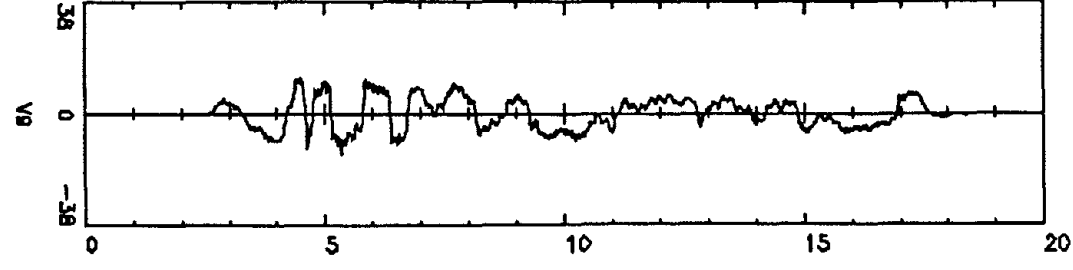
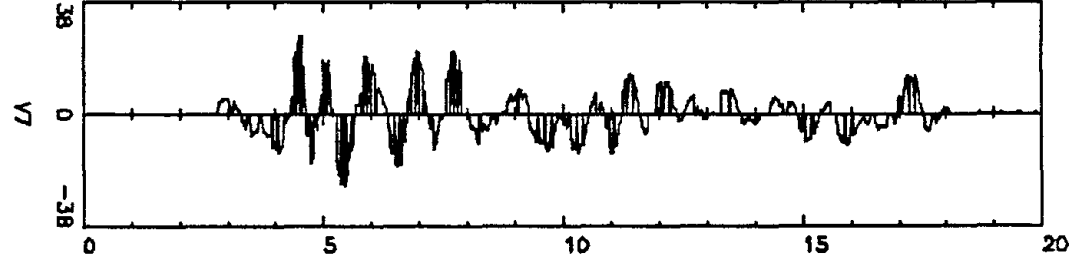
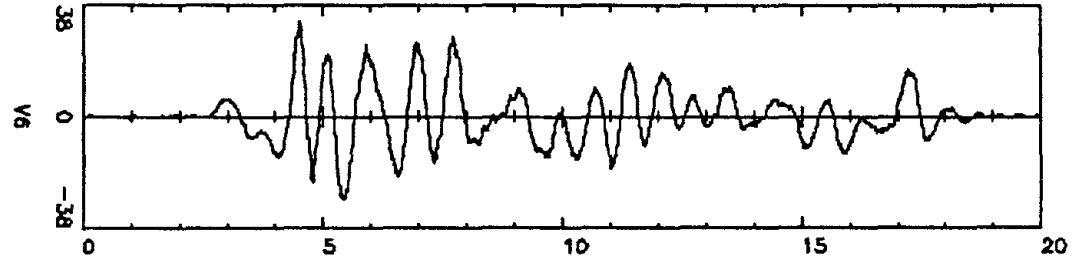
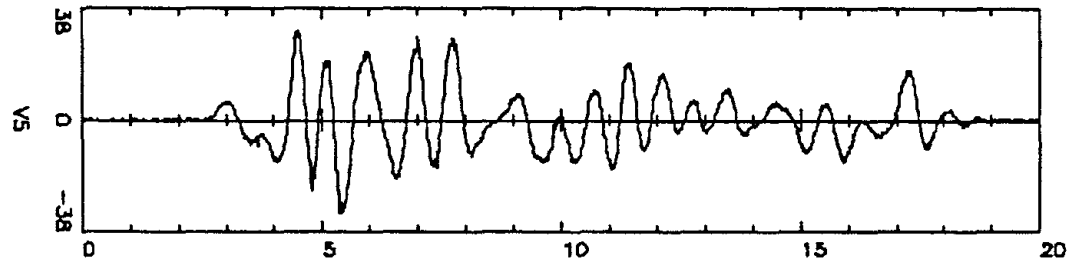
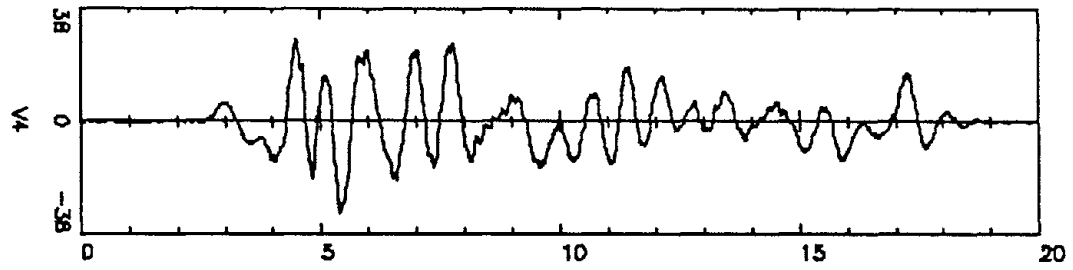
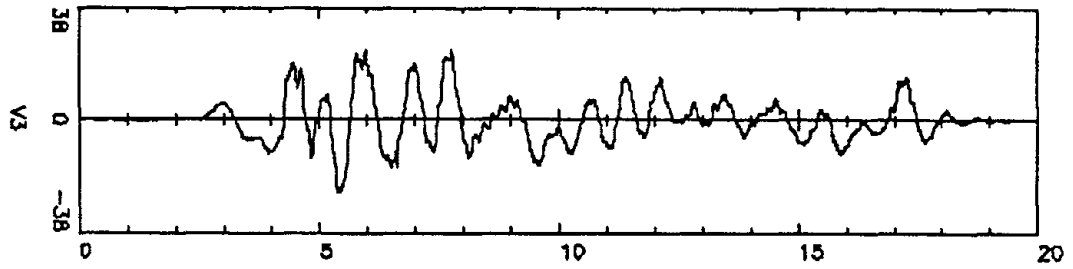
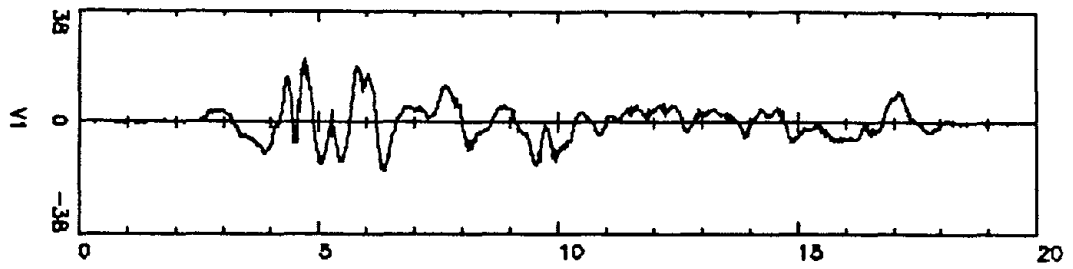


V:117

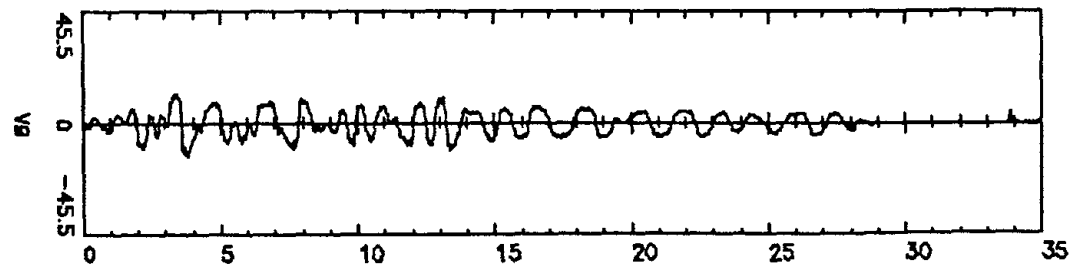
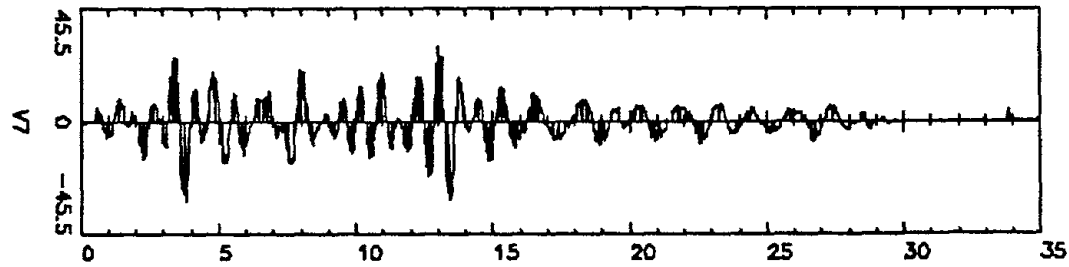
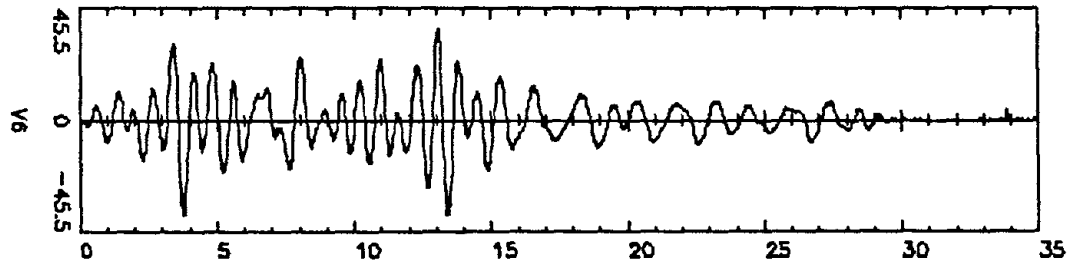
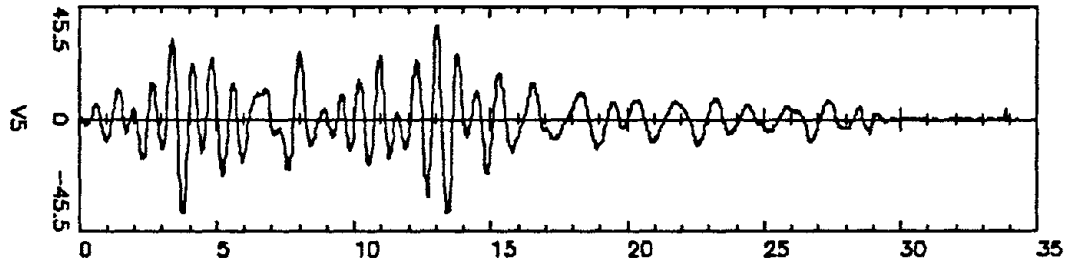
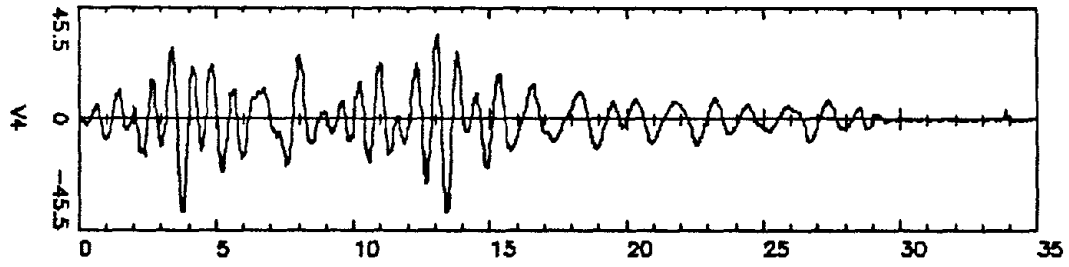
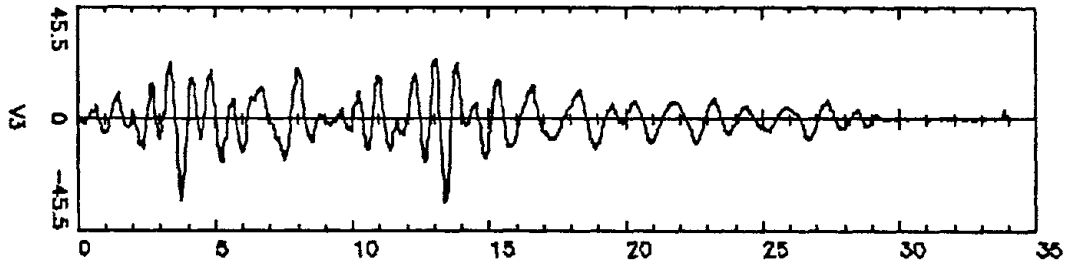
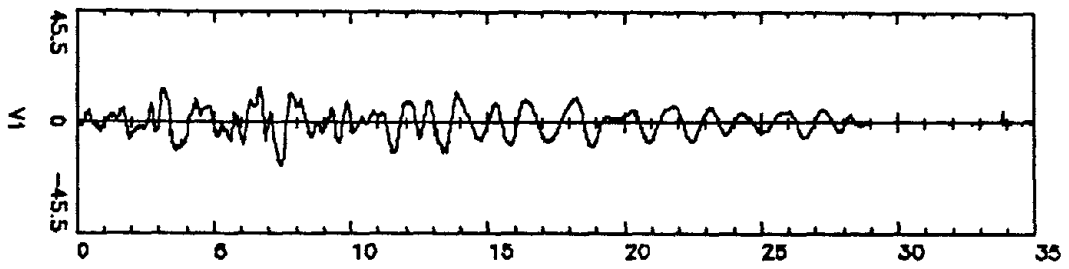
SAVED

5-SEP-1988 21:34

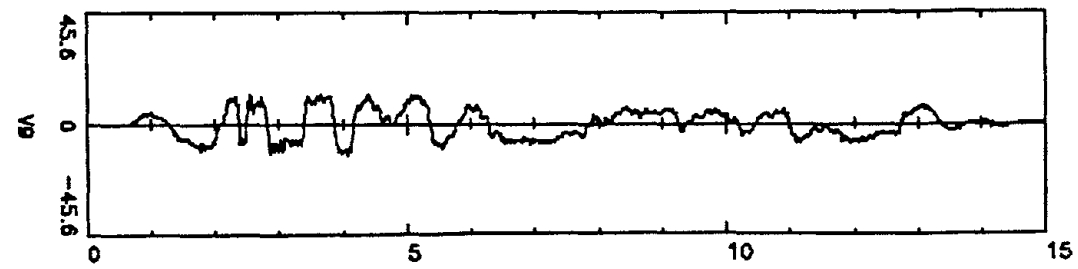
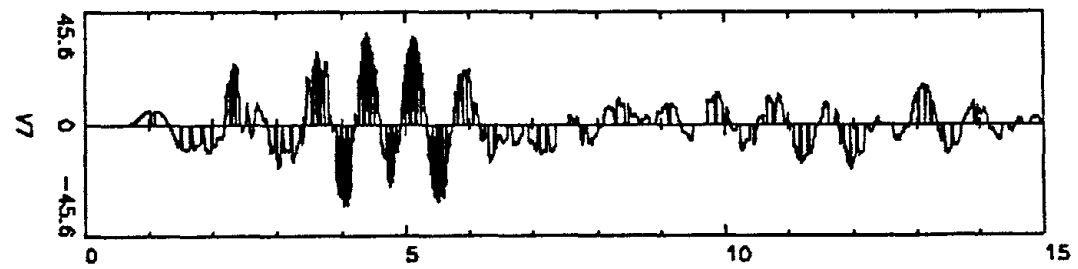
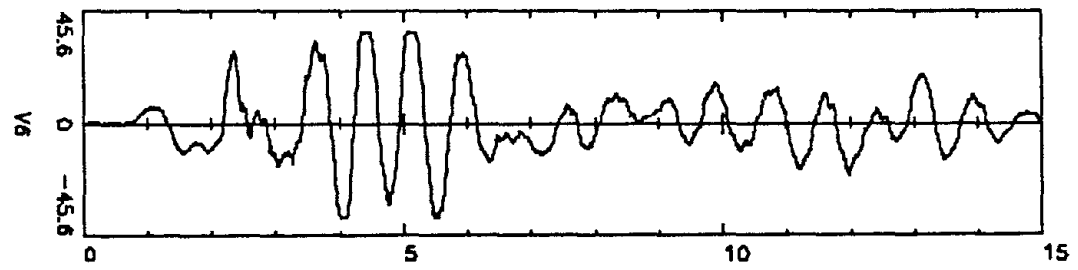
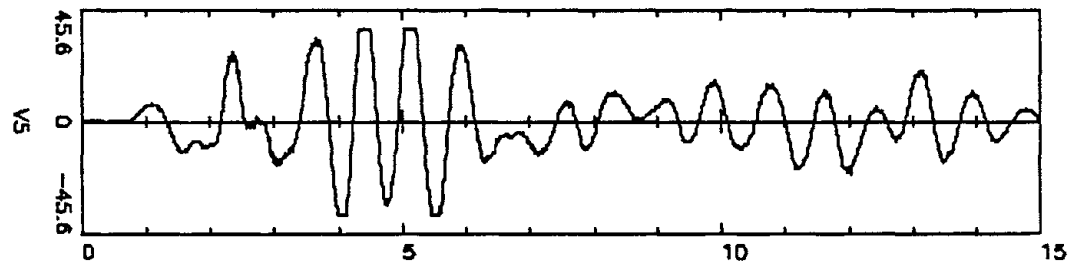
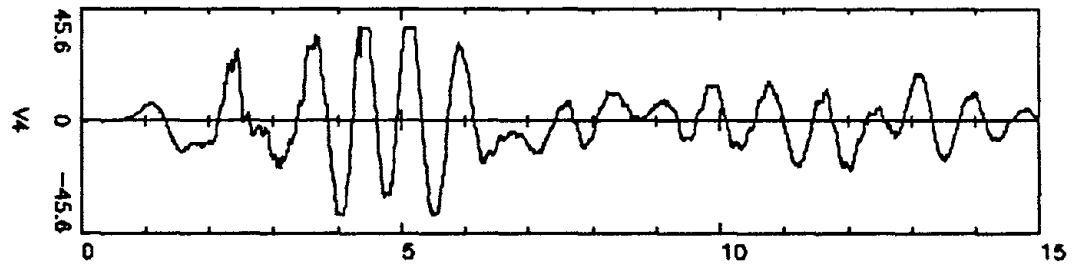
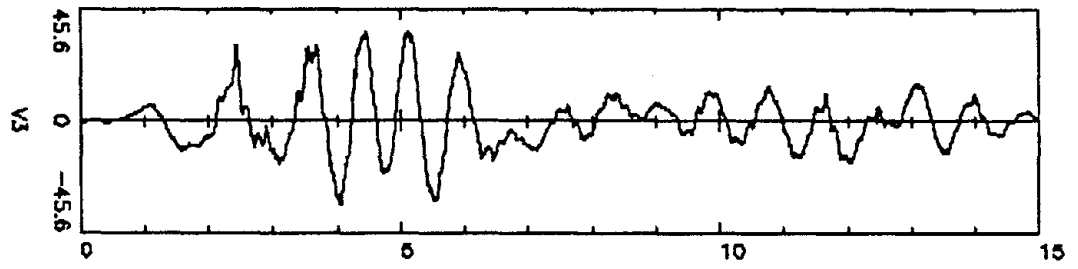
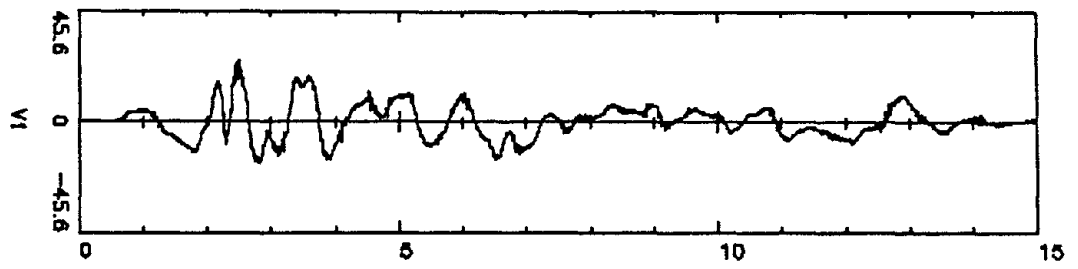
C10

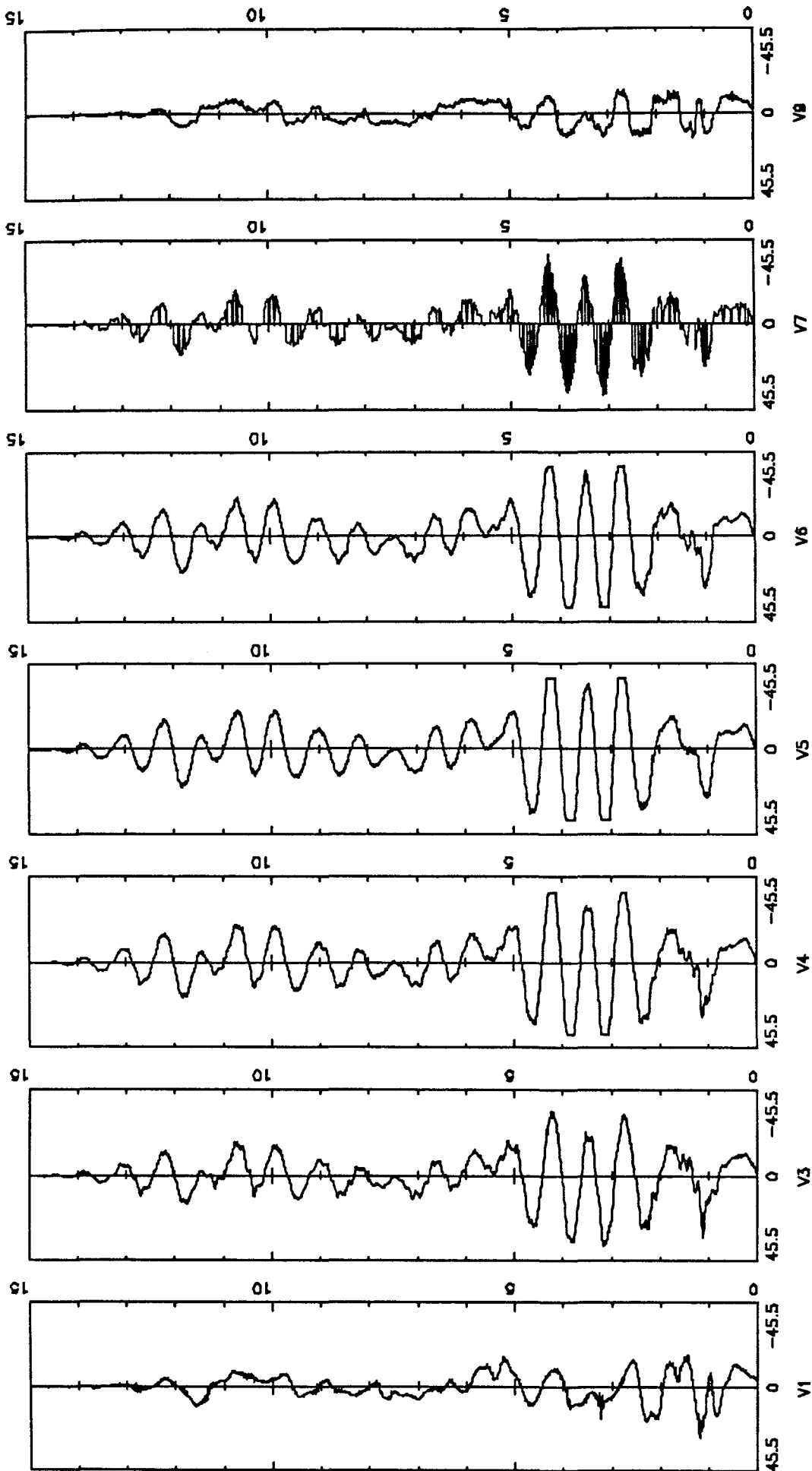


VI
AV
17



C14

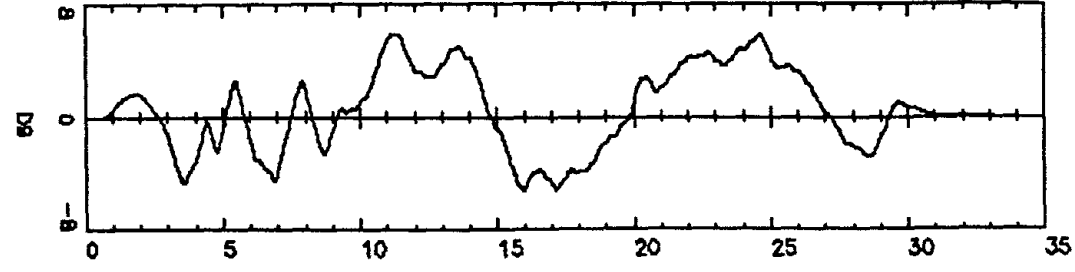
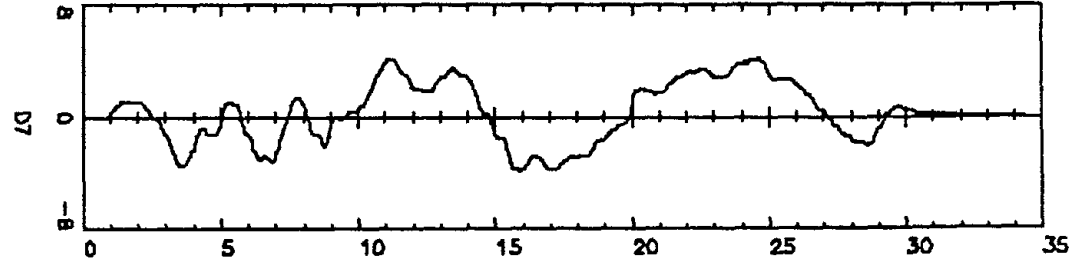
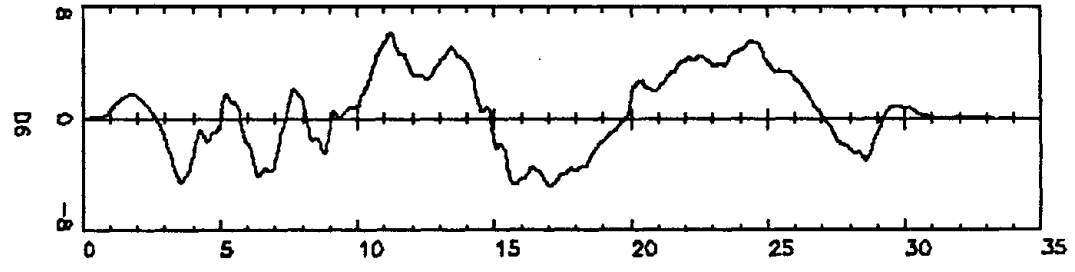
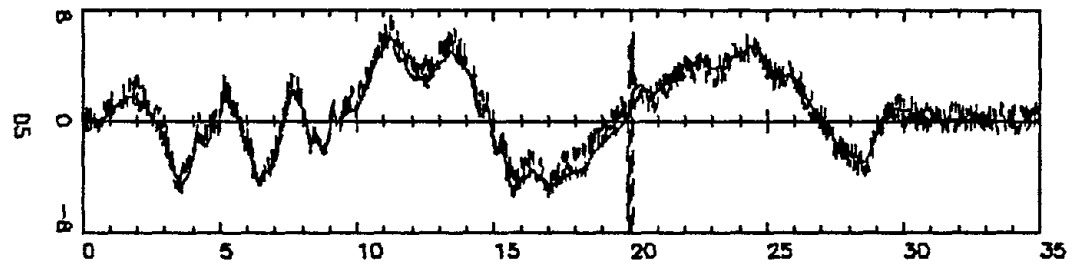
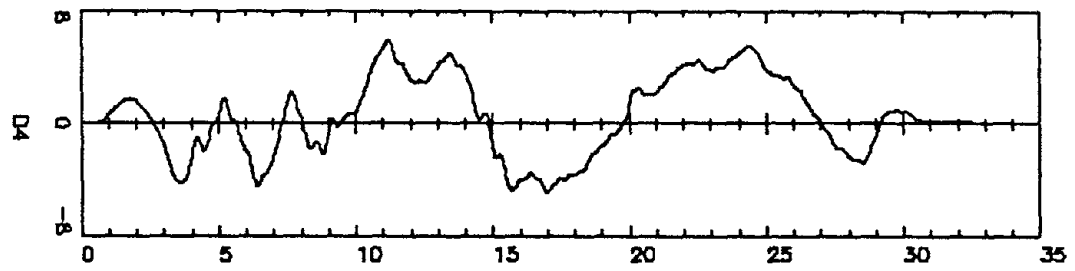
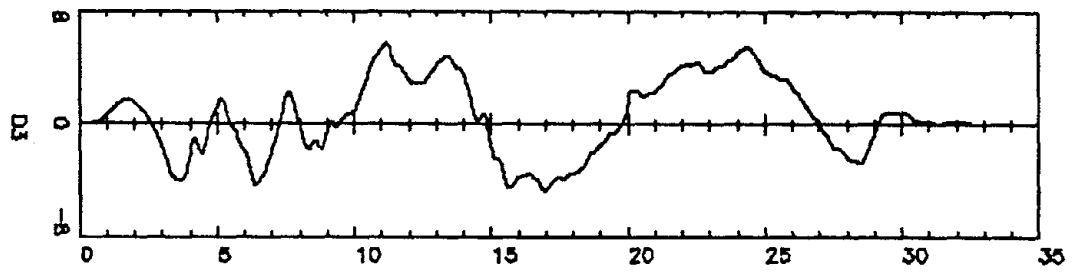
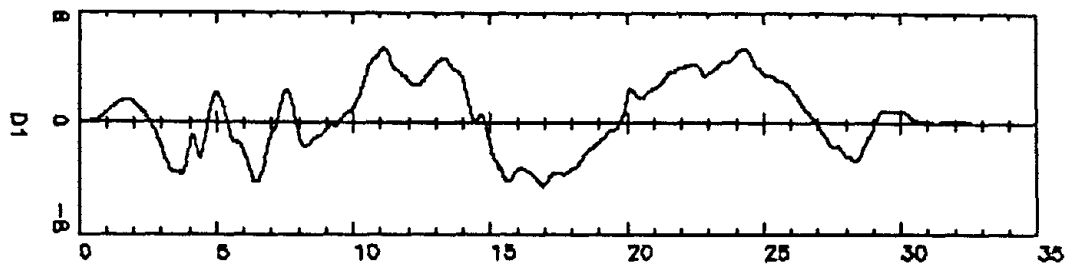


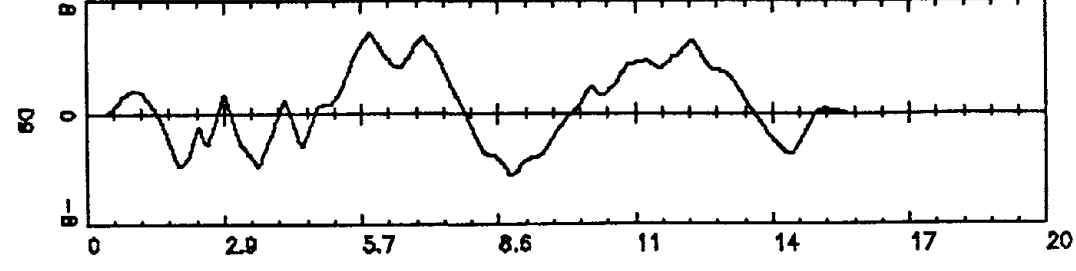
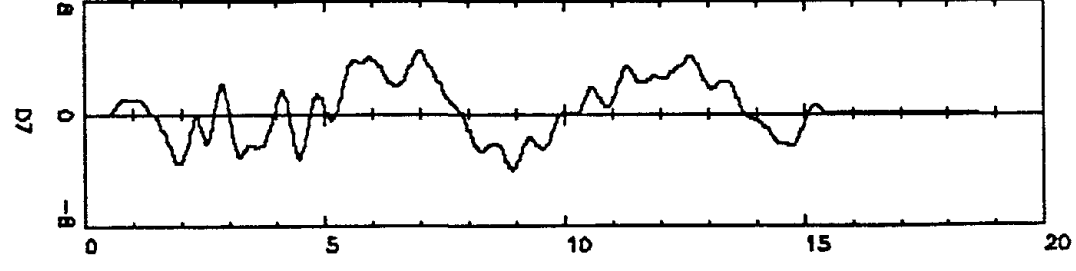
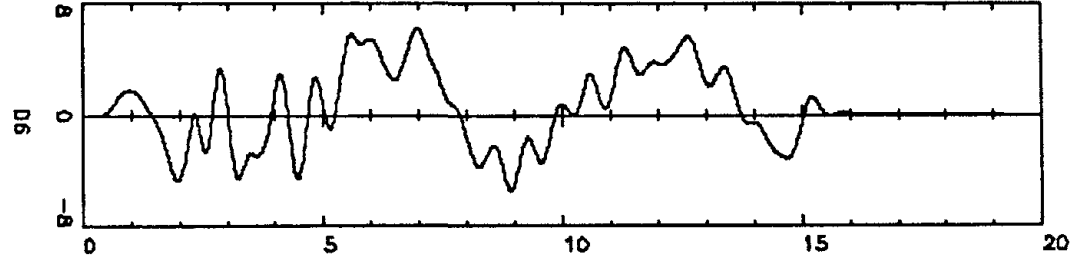
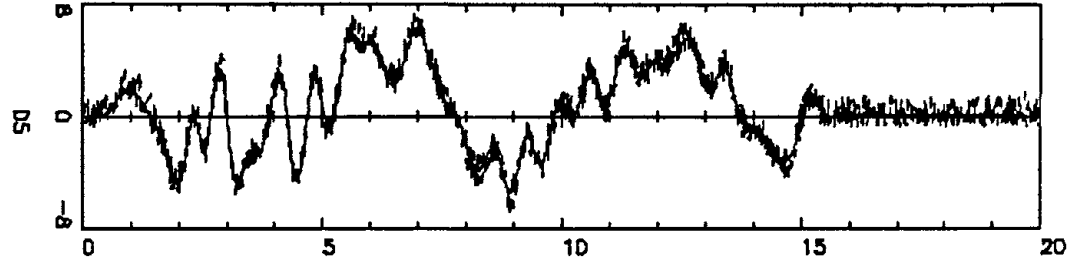
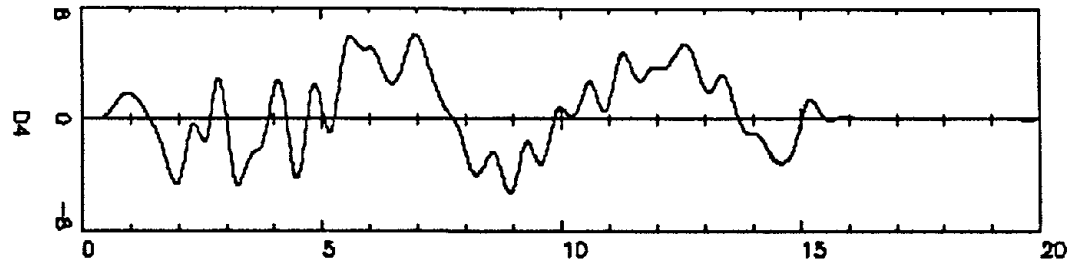
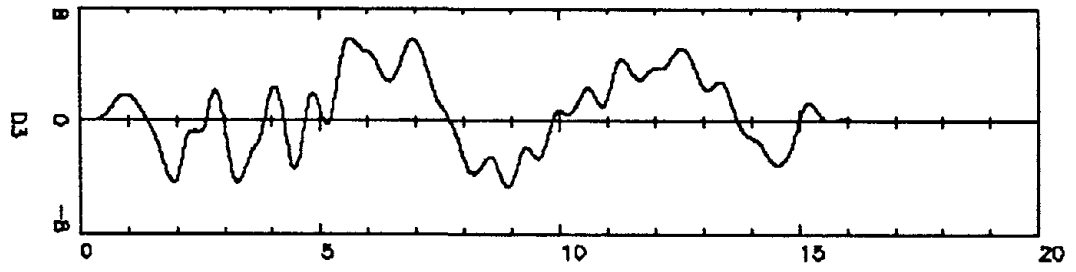
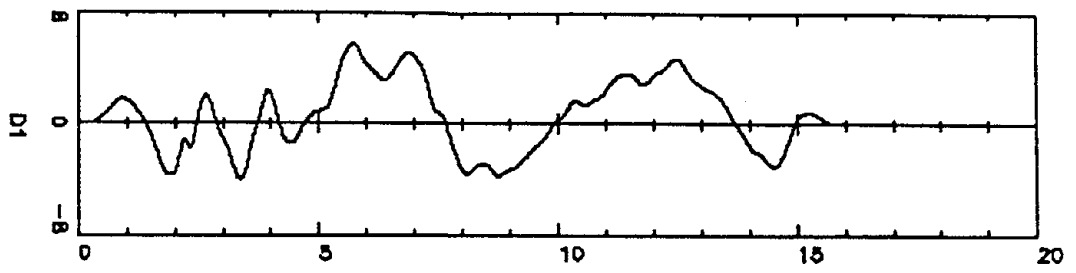


11-11-55 11:00 AM

WALL # 3

DISPLACEMENT TIME HISTORIES



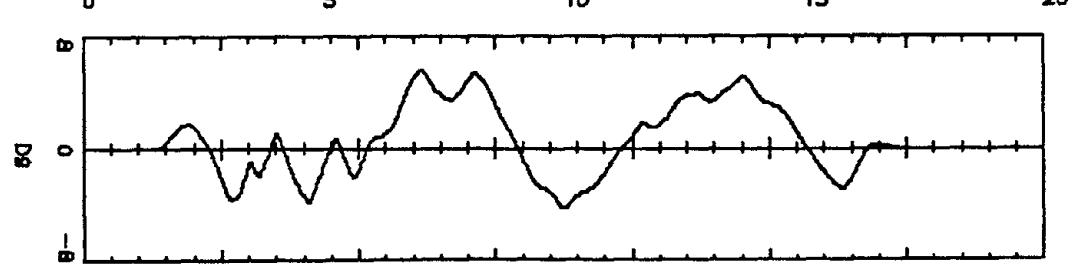
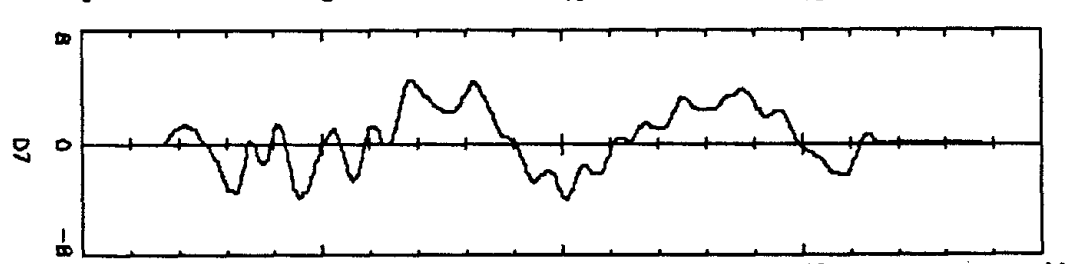
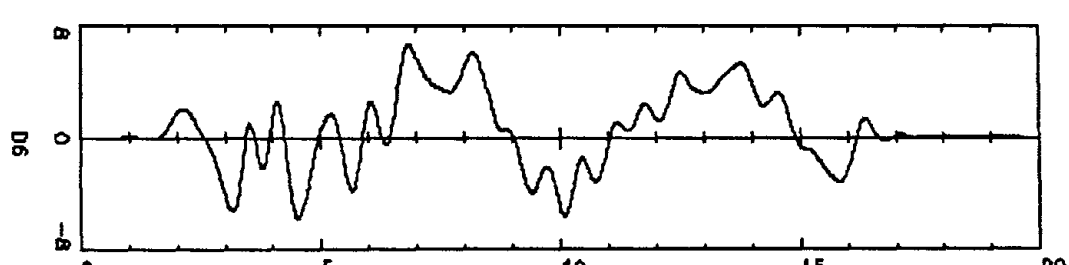
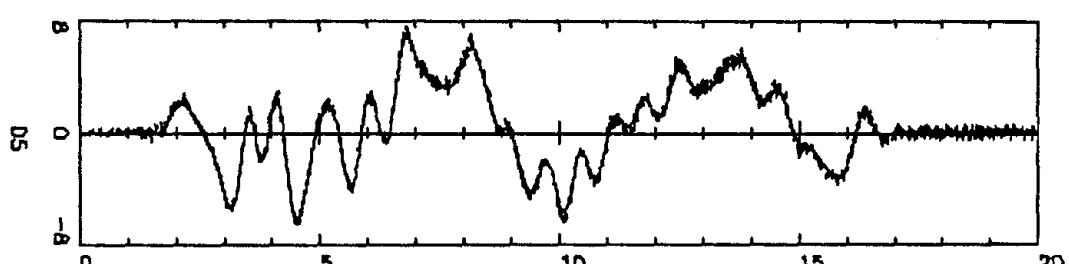
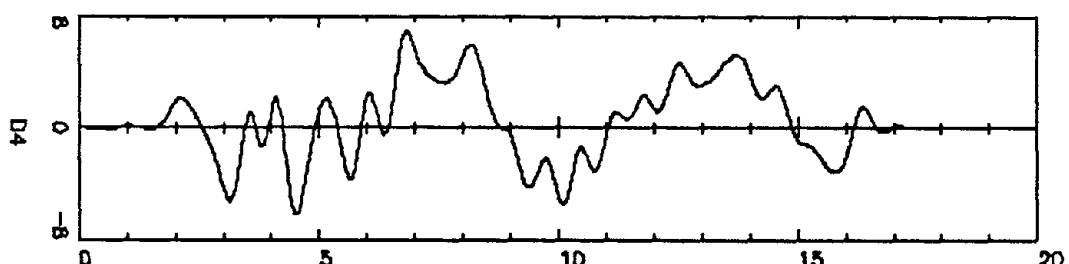
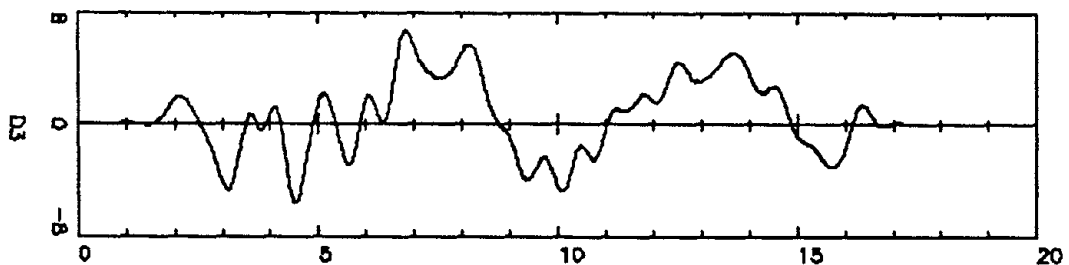
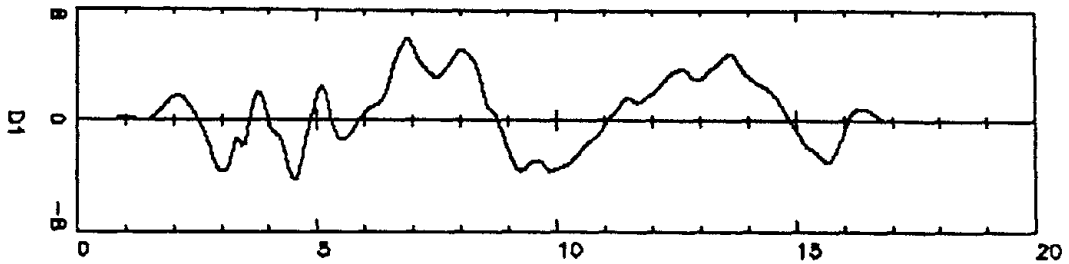


1111

SAYED

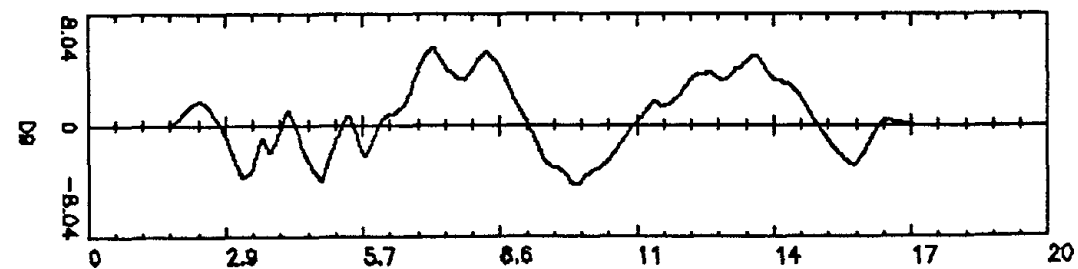
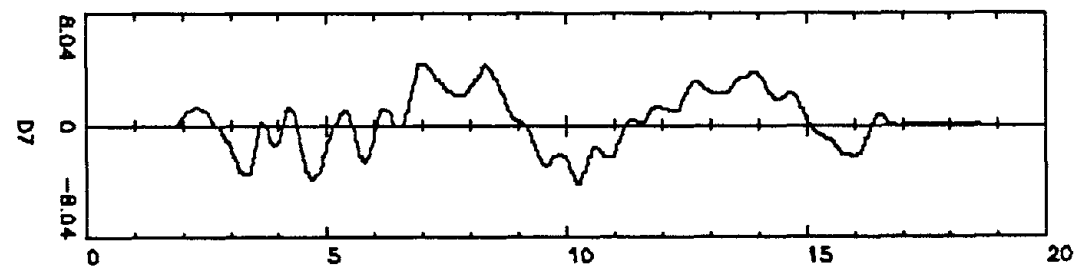
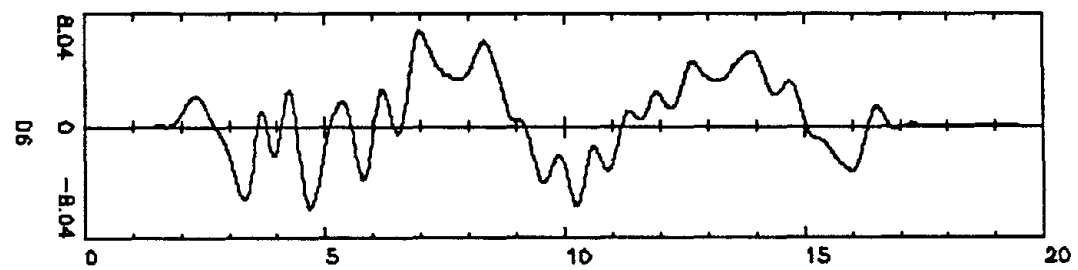
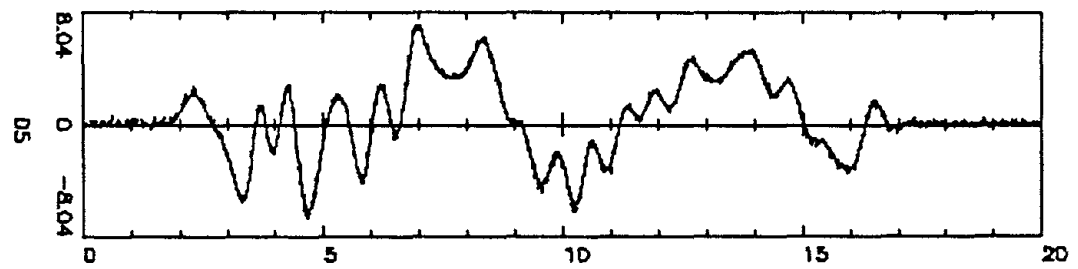
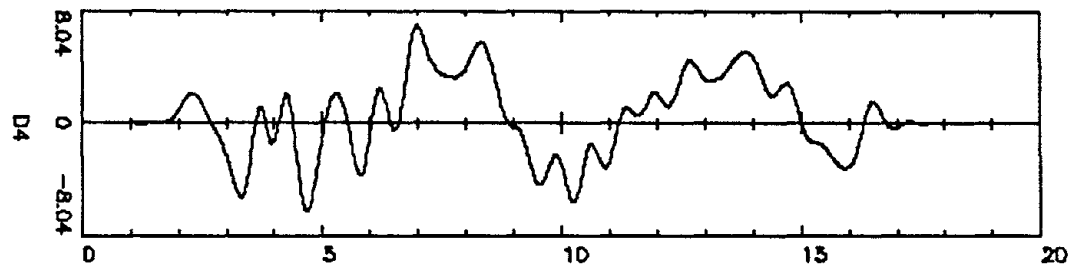
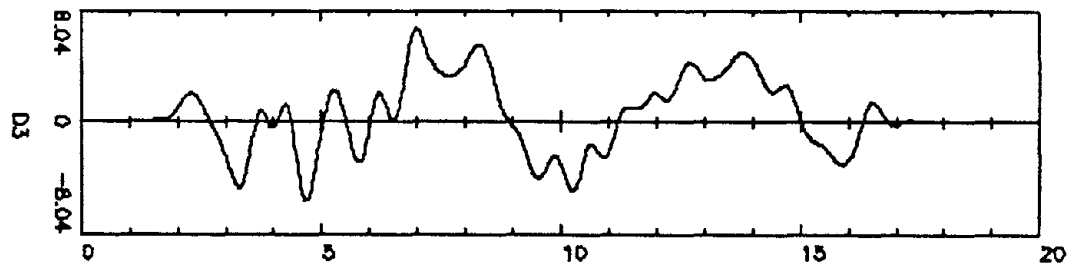
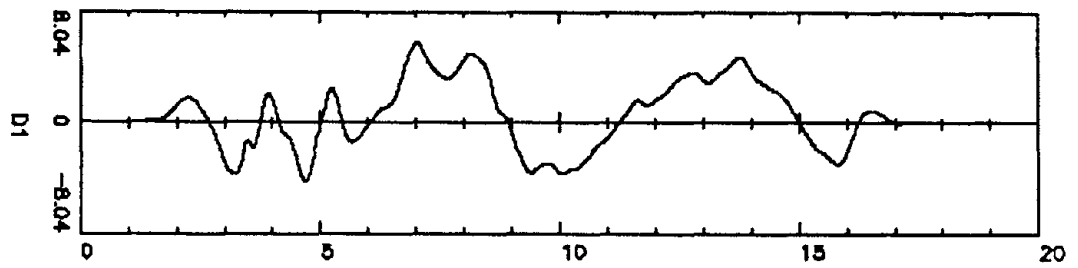
17-SEP-1988 17:21

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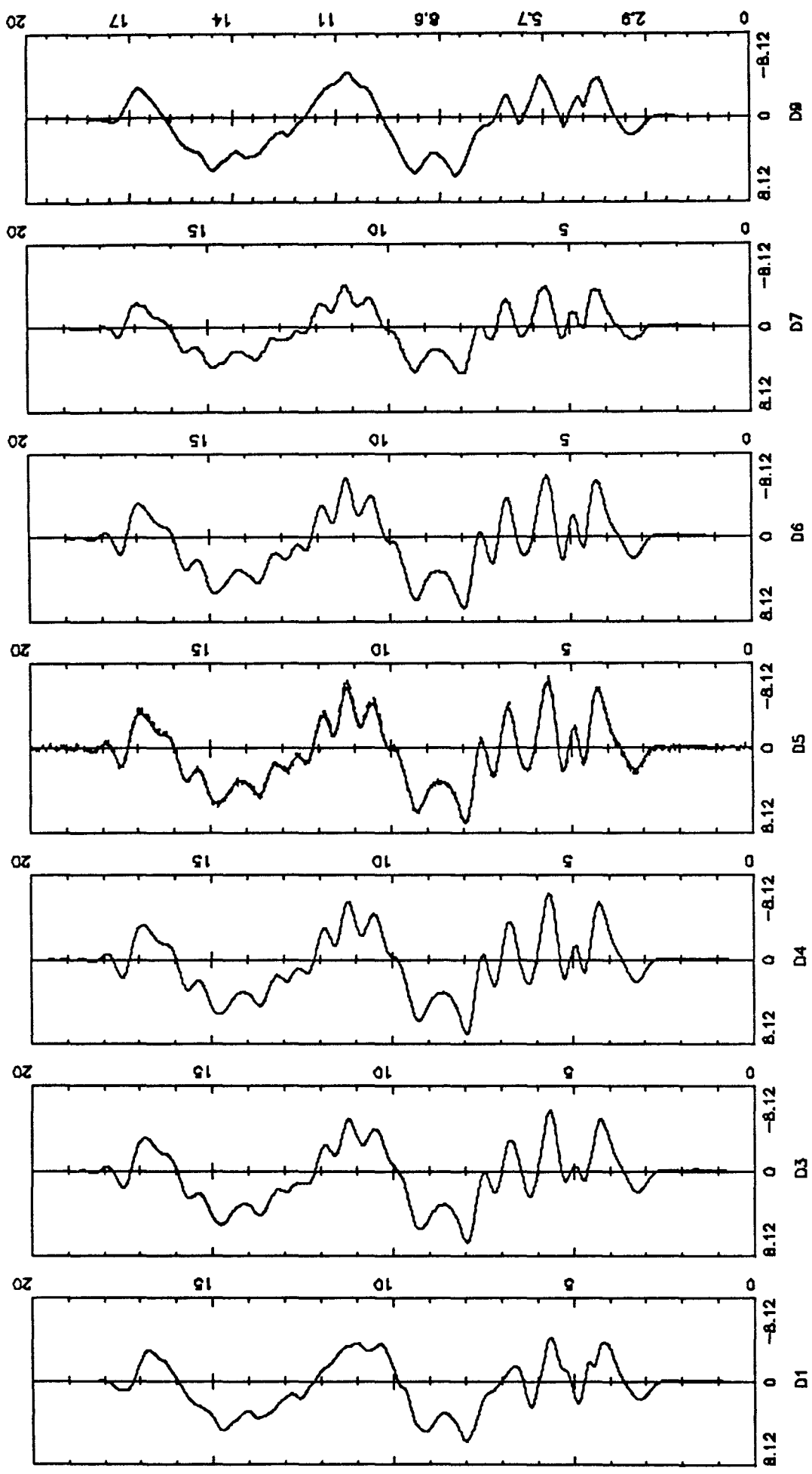


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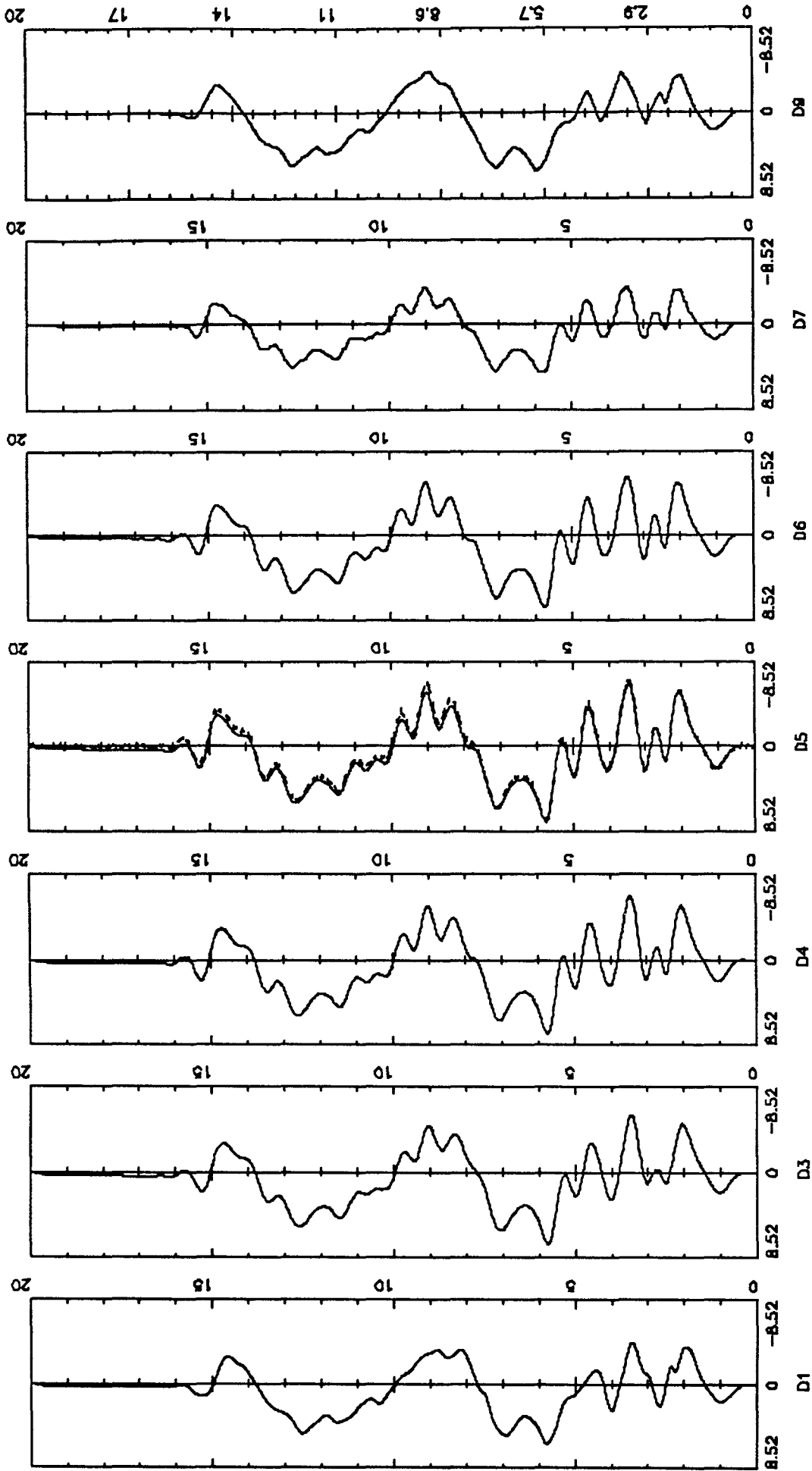
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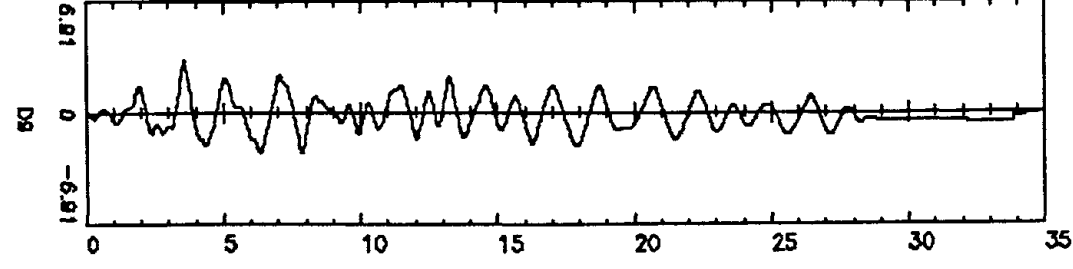
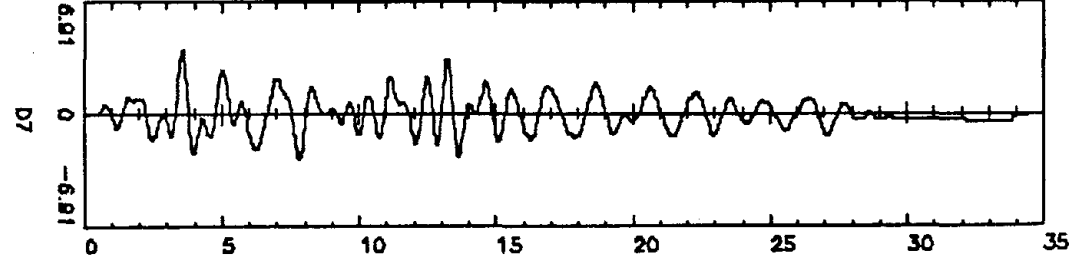
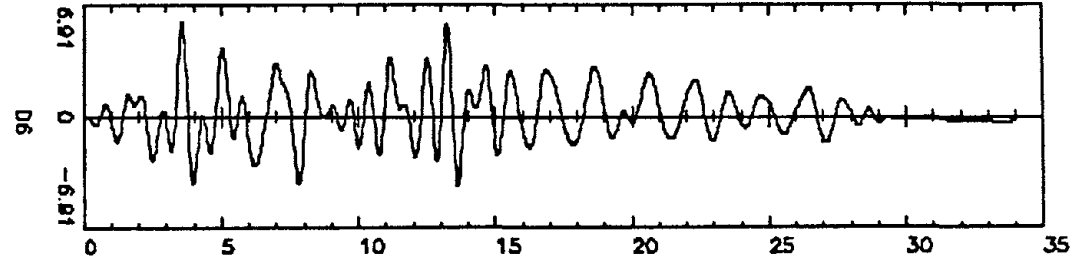
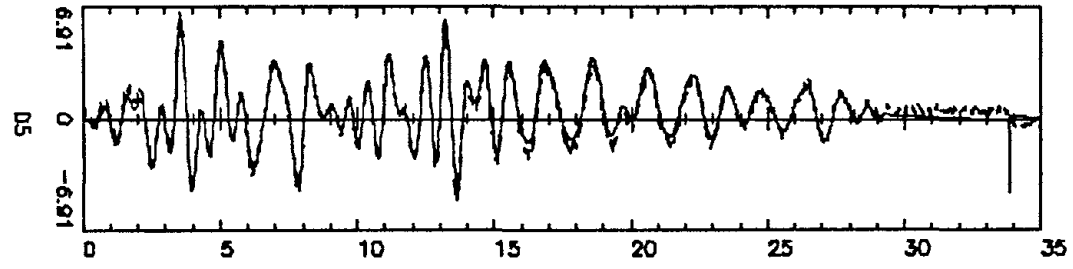
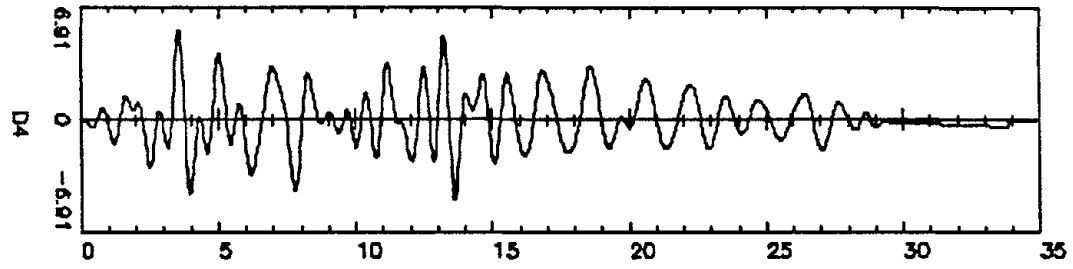
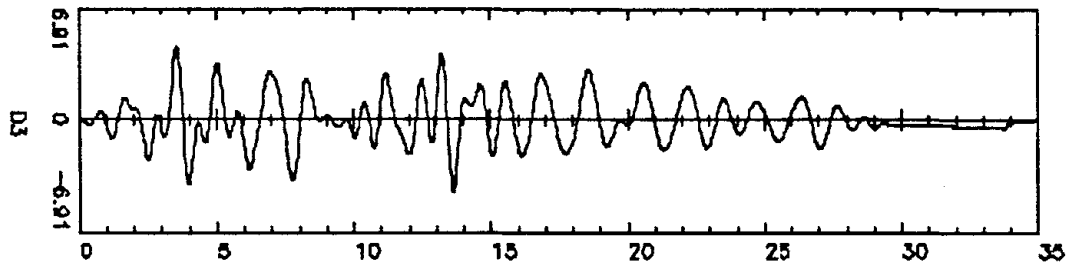
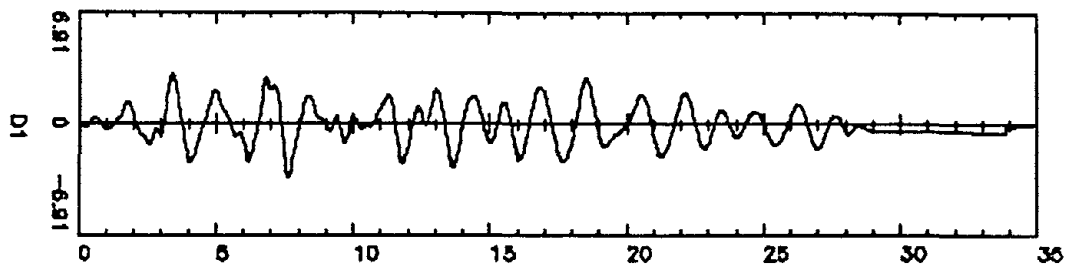


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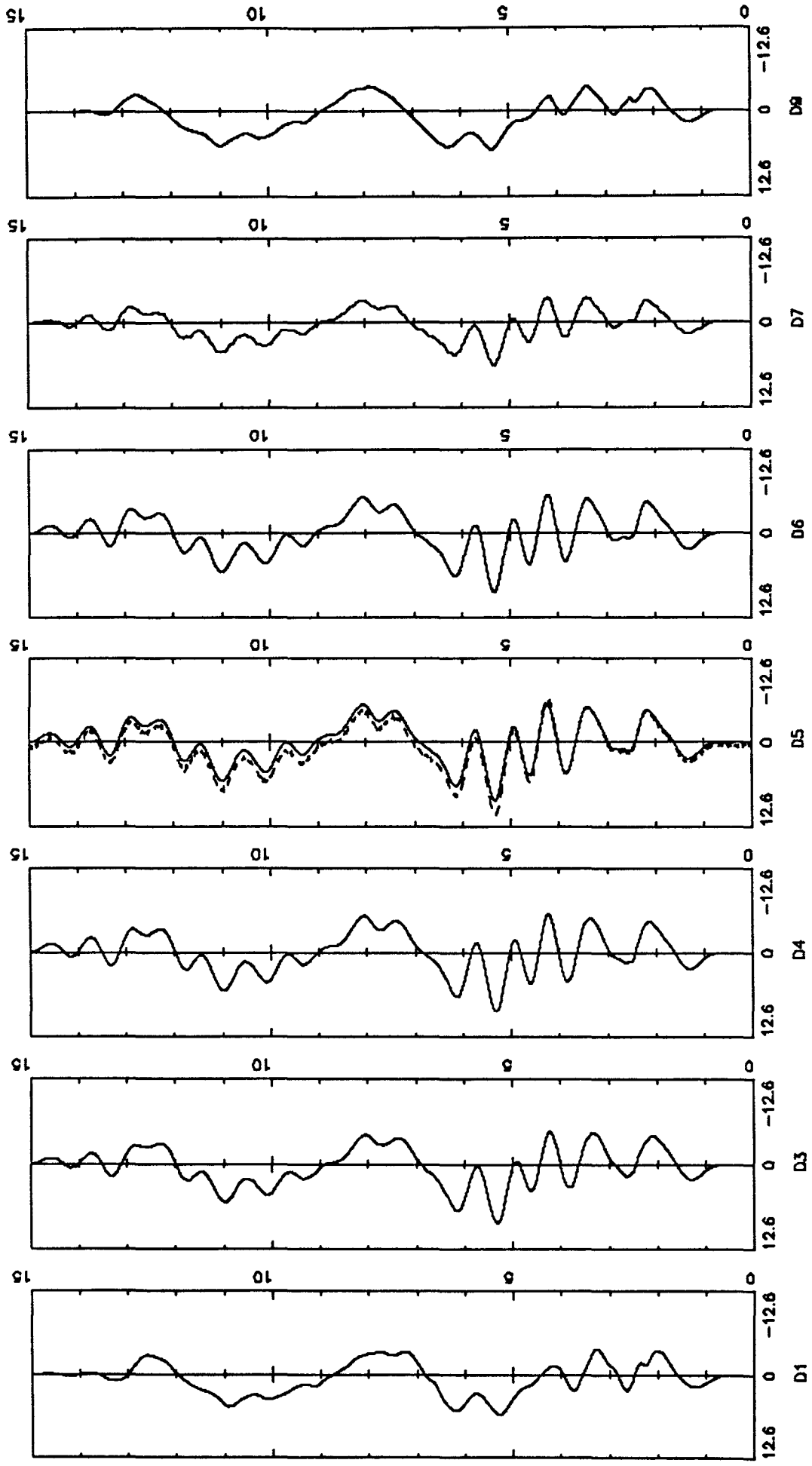


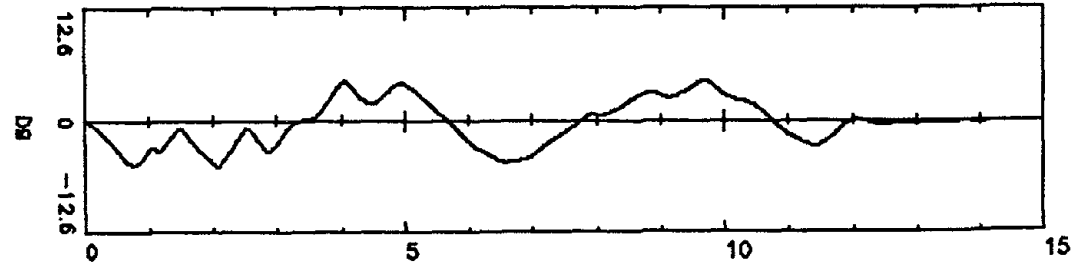
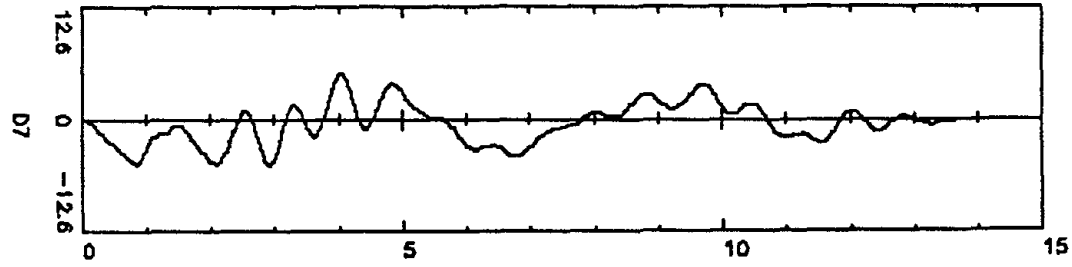
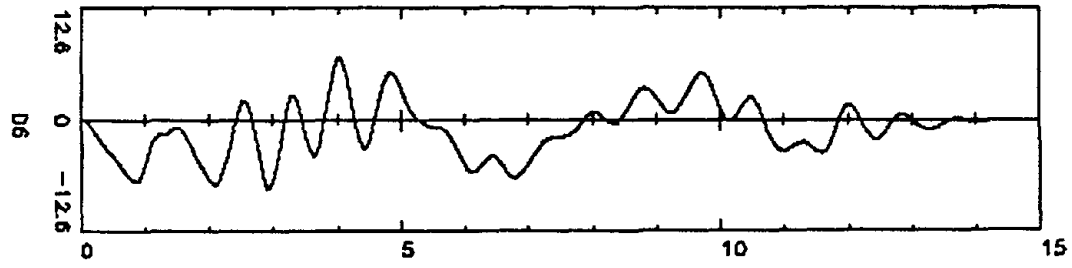
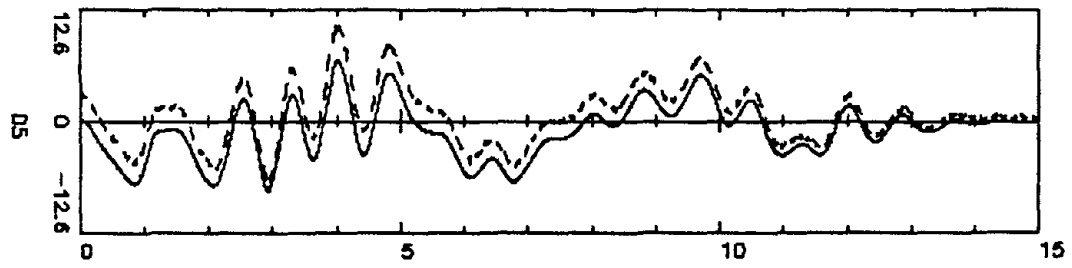
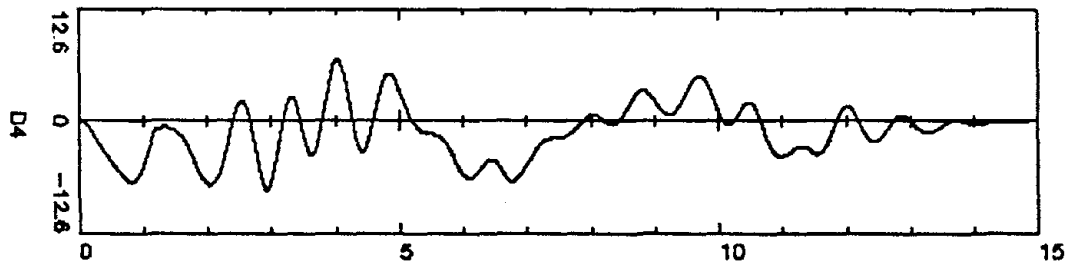
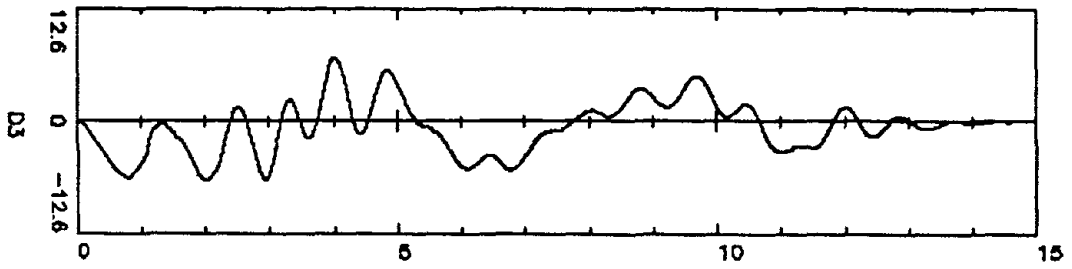
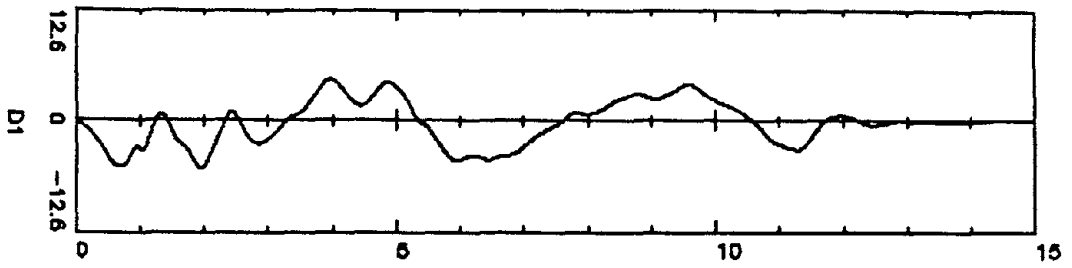


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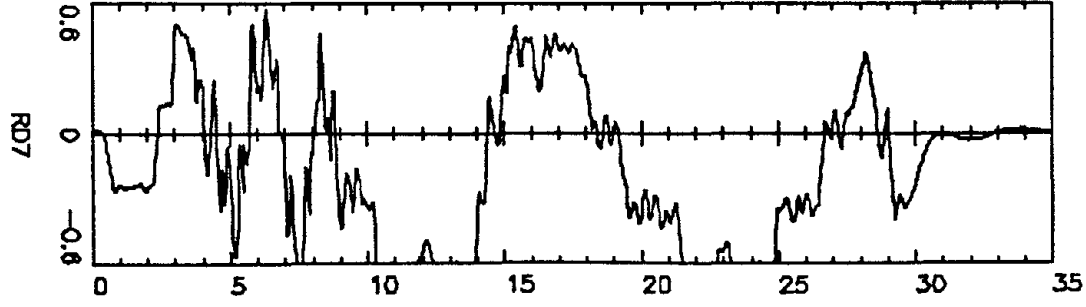
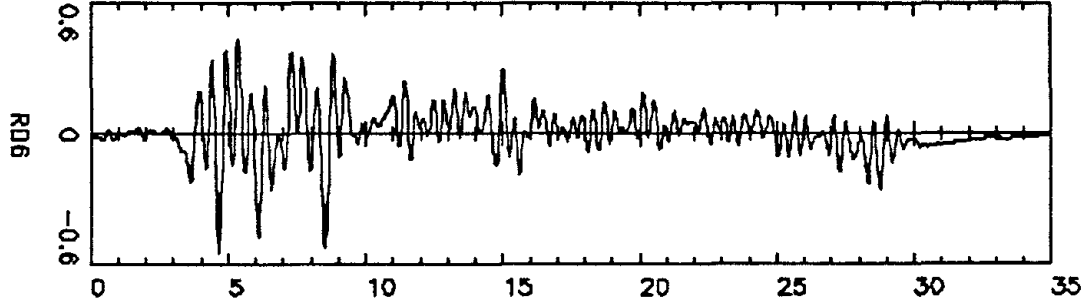
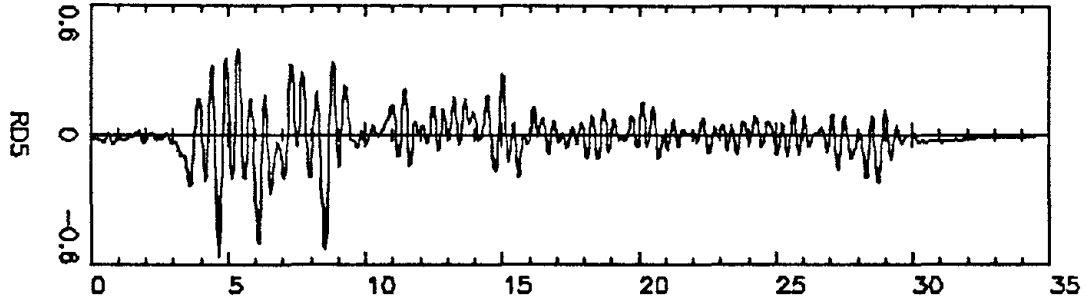
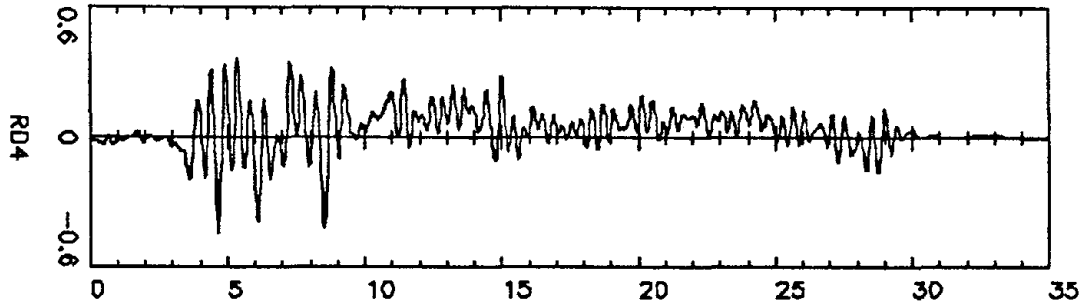
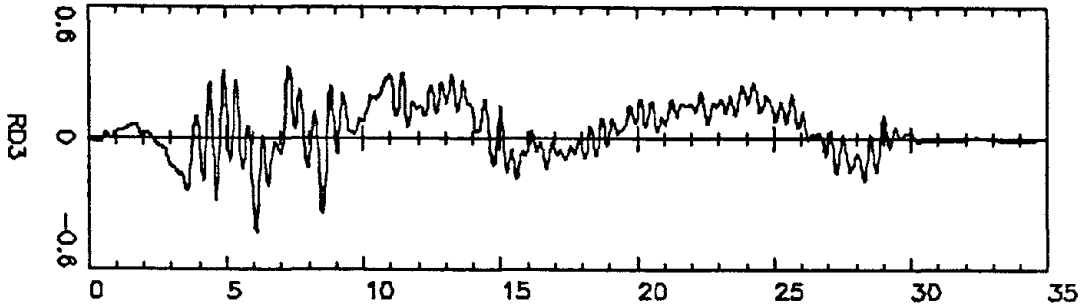
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WALL # 3

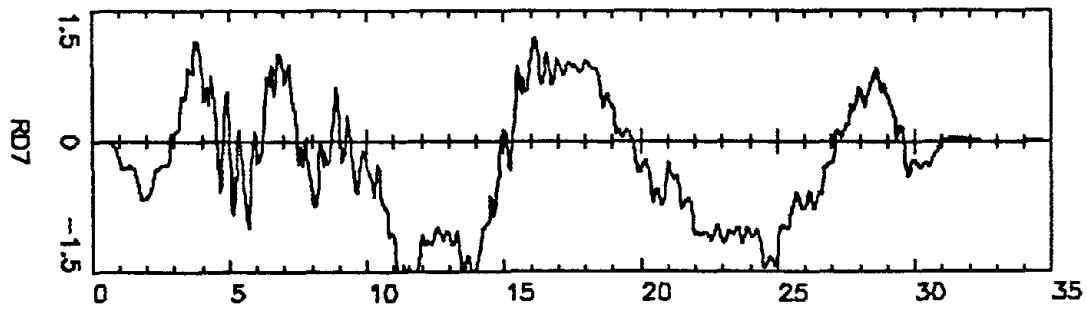
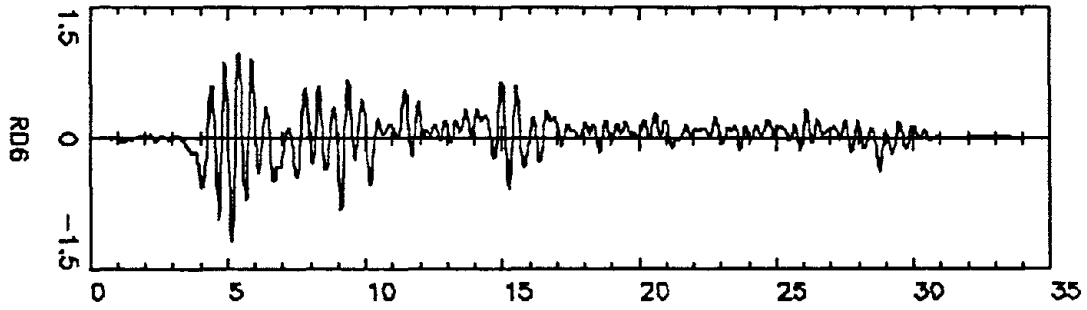
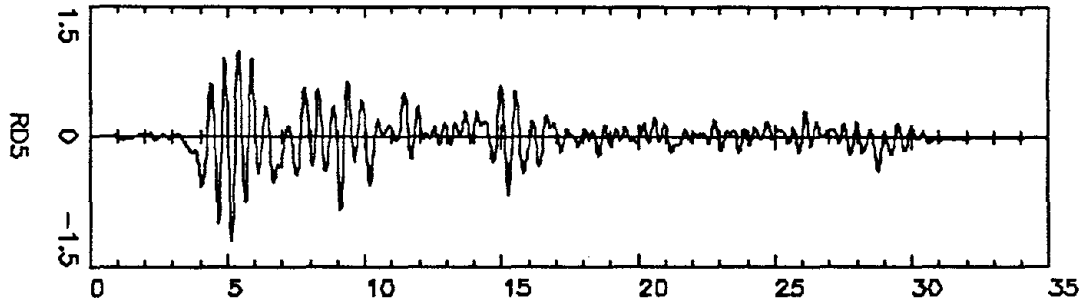
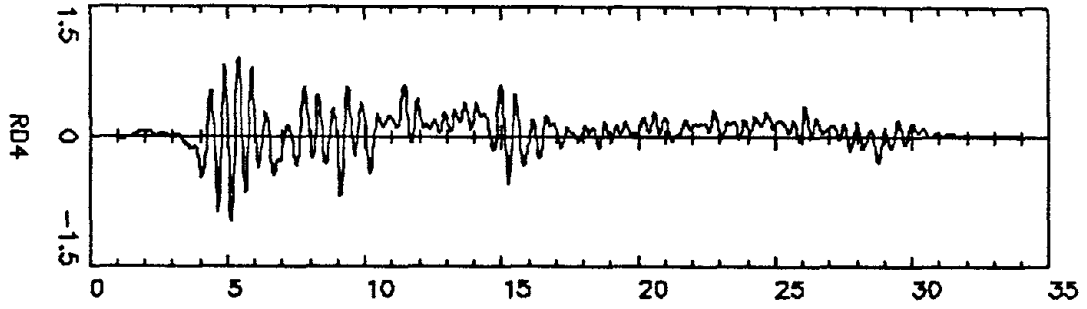
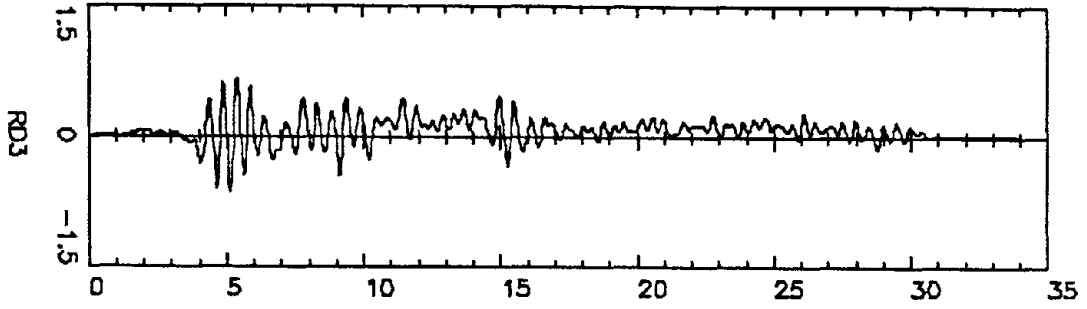
RELATIVE DISPLACEMENT TIME HISTORIES



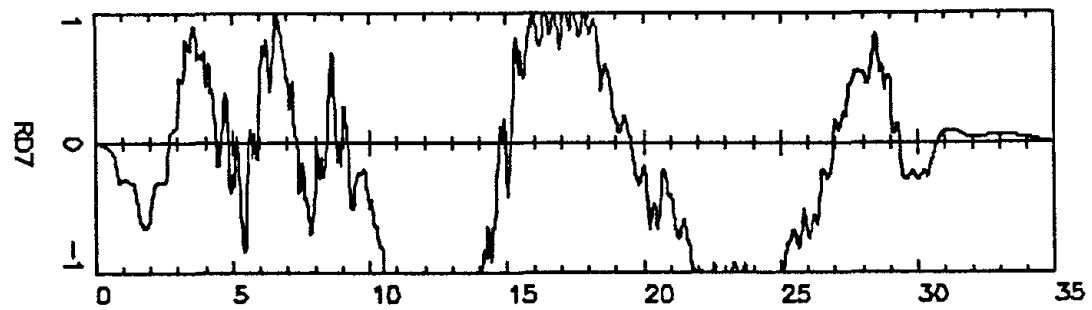
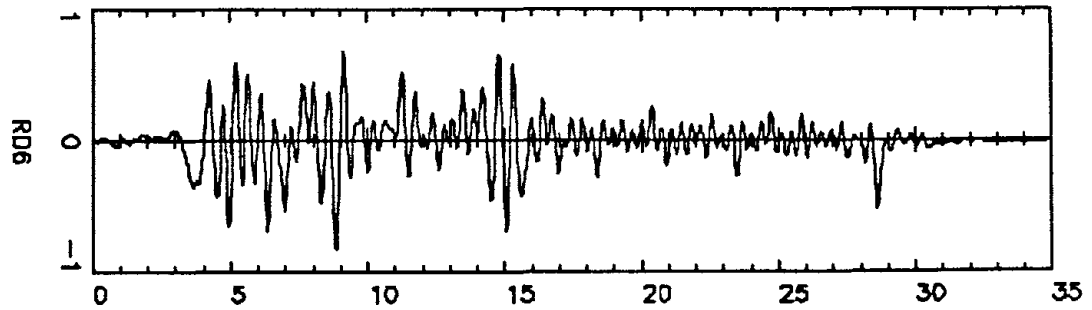
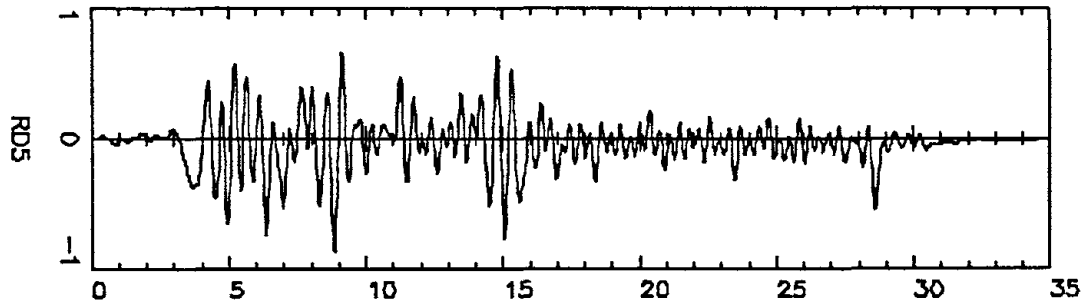
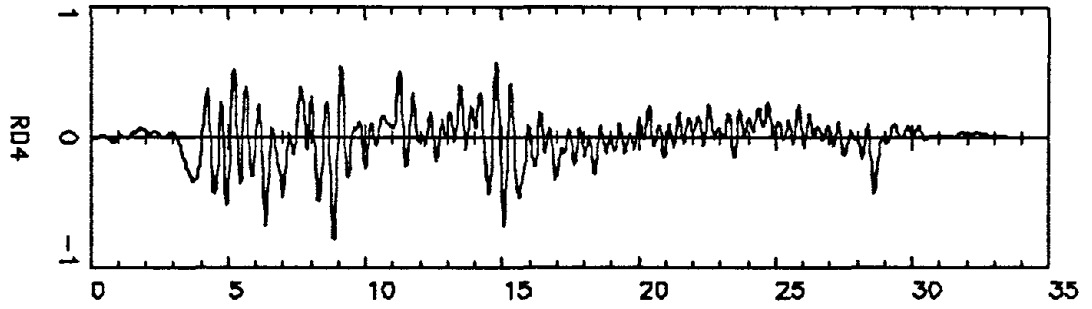
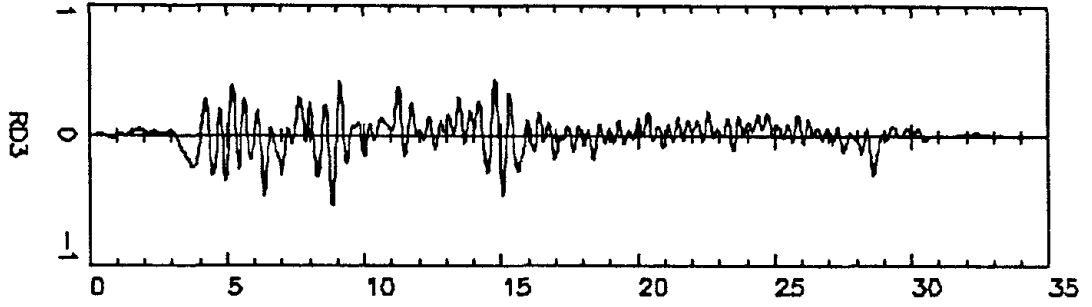
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errors from Devor no 7

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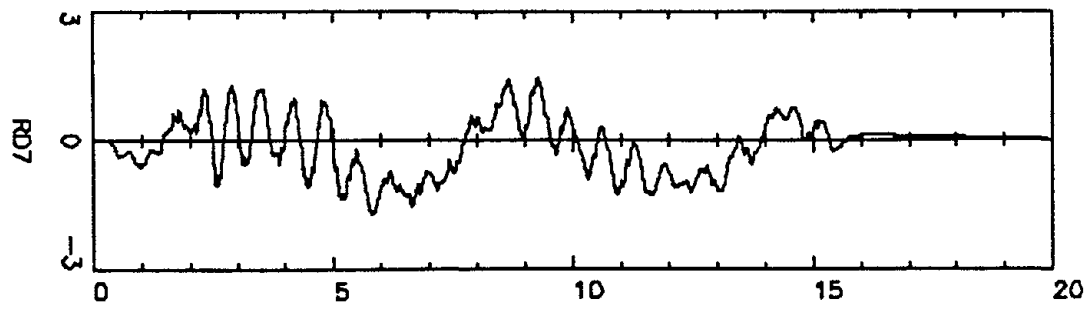
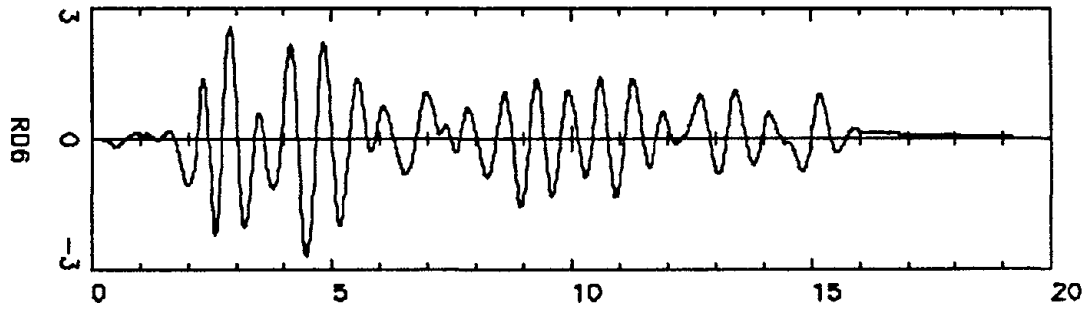
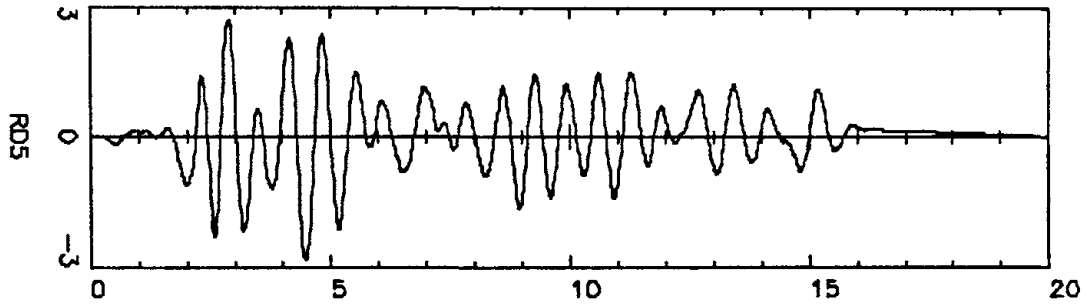
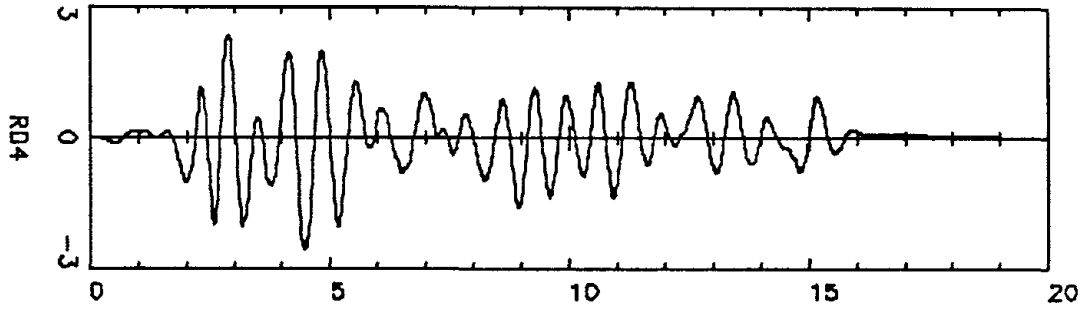
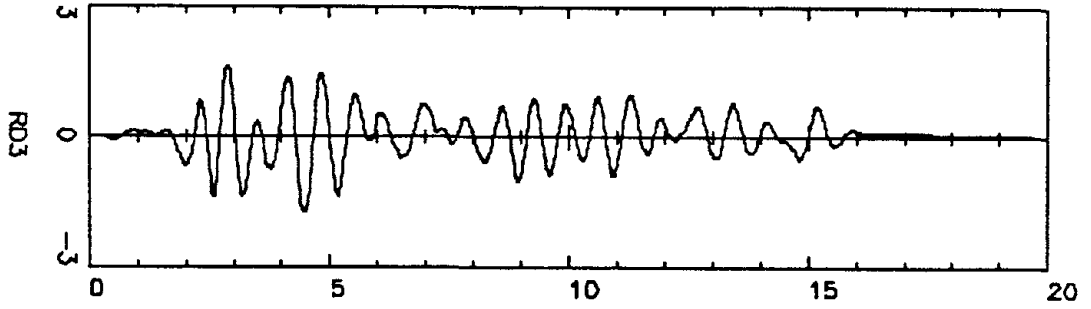


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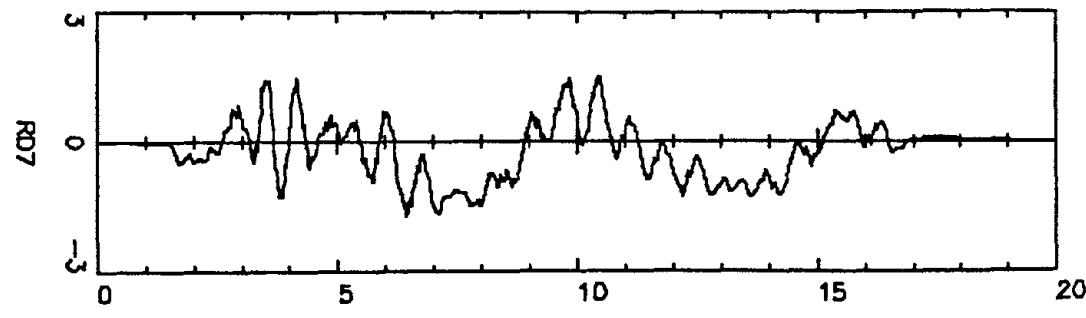
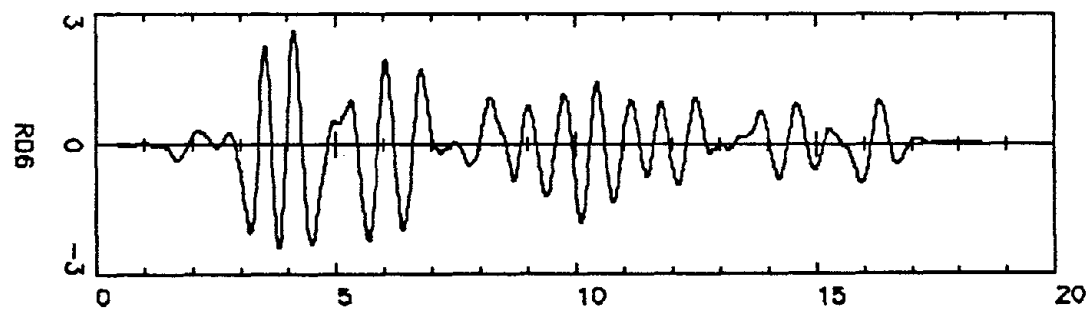
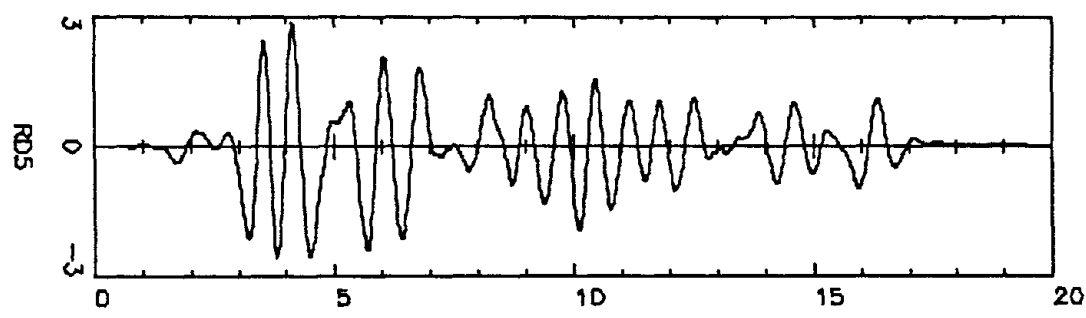
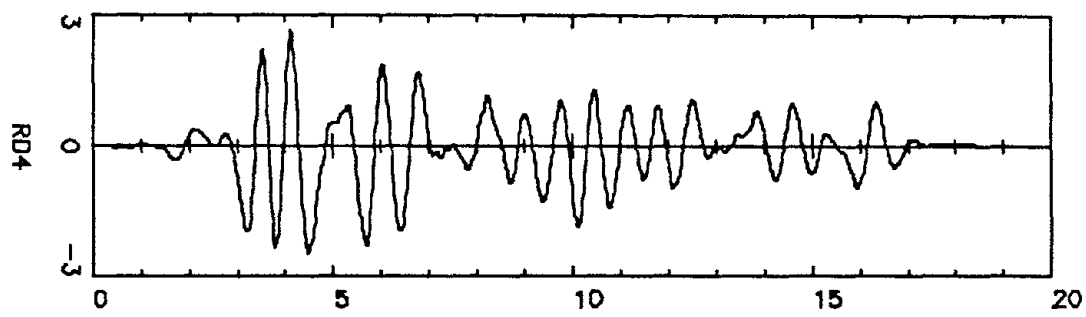
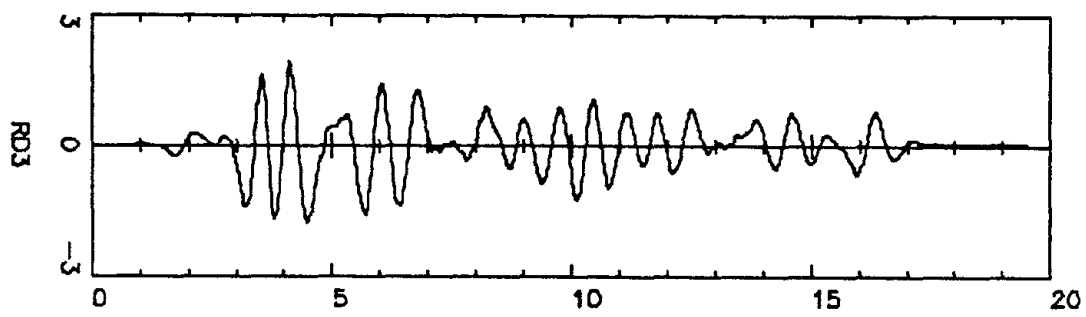
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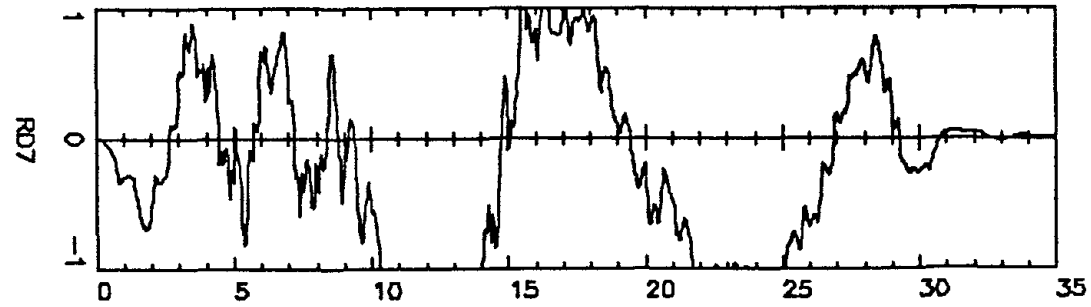
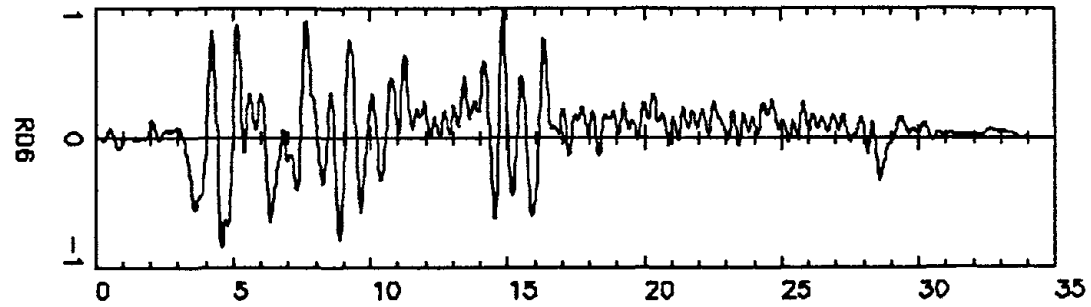
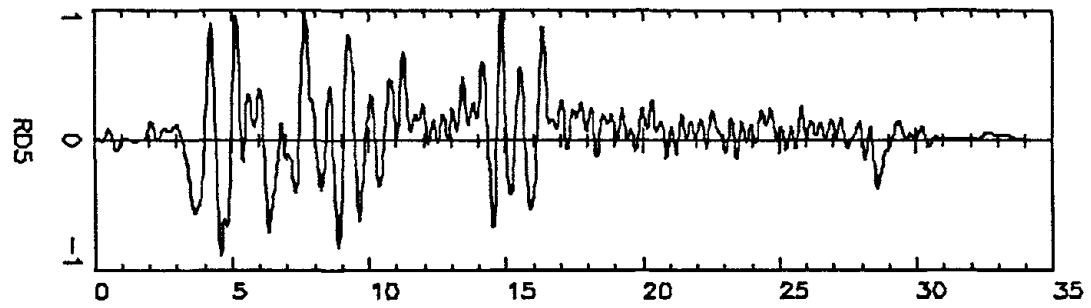
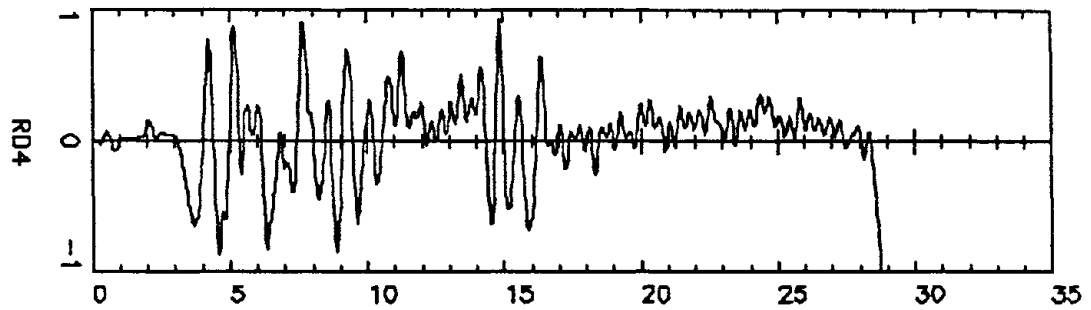
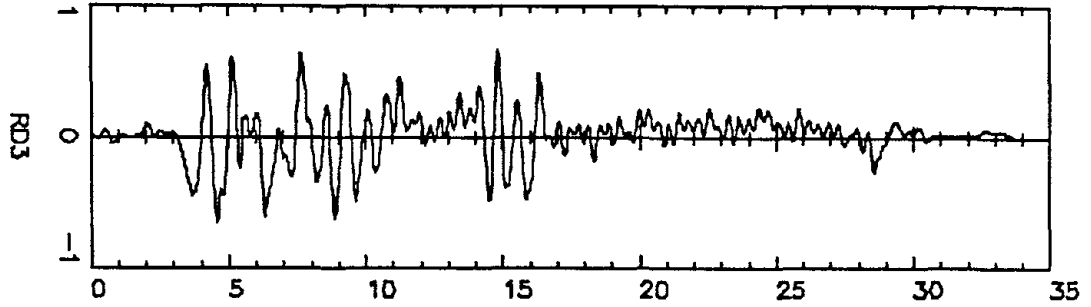
032



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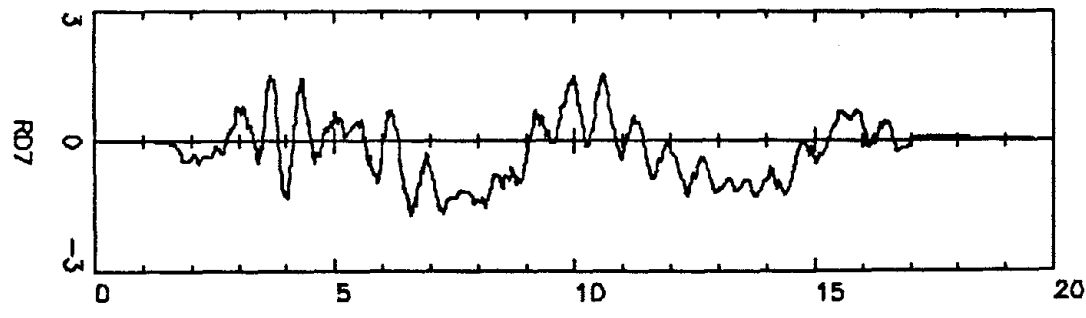
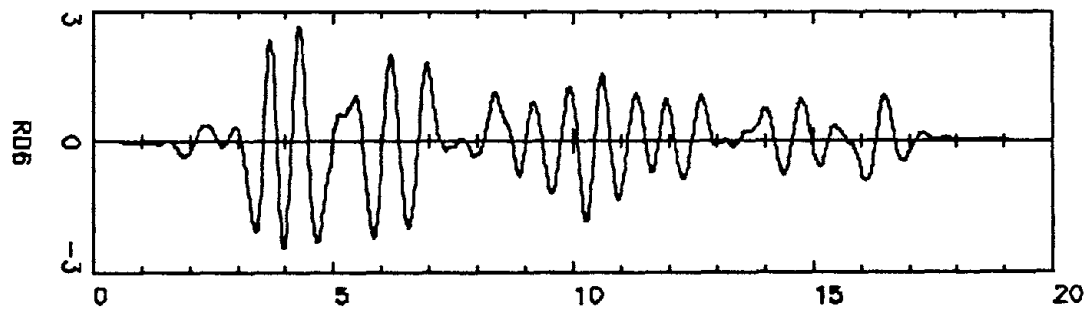
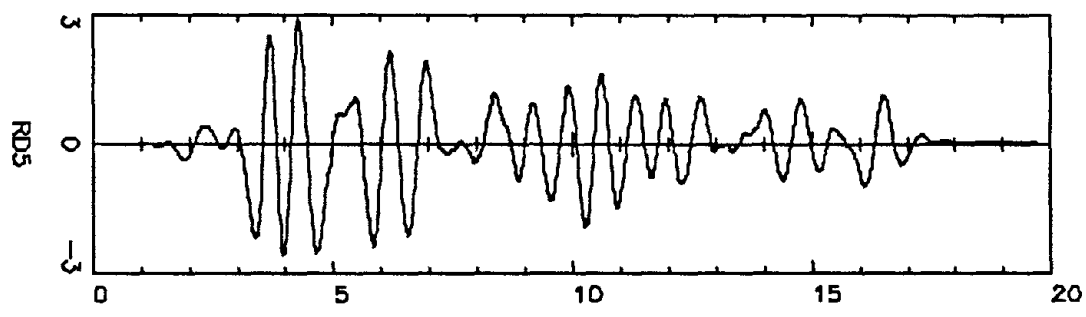
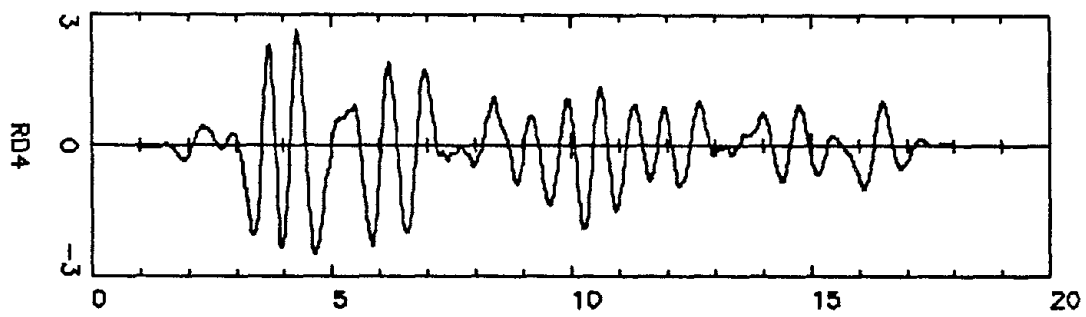
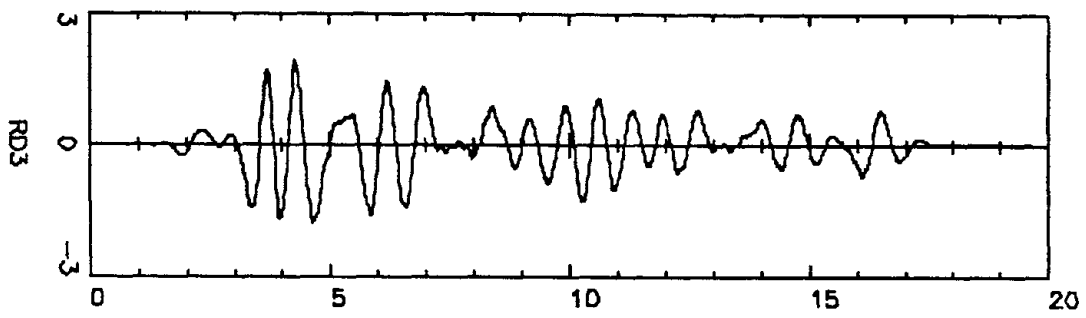


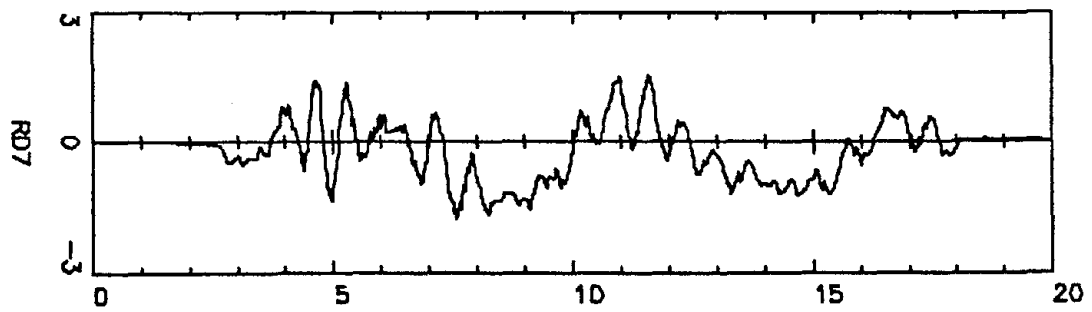
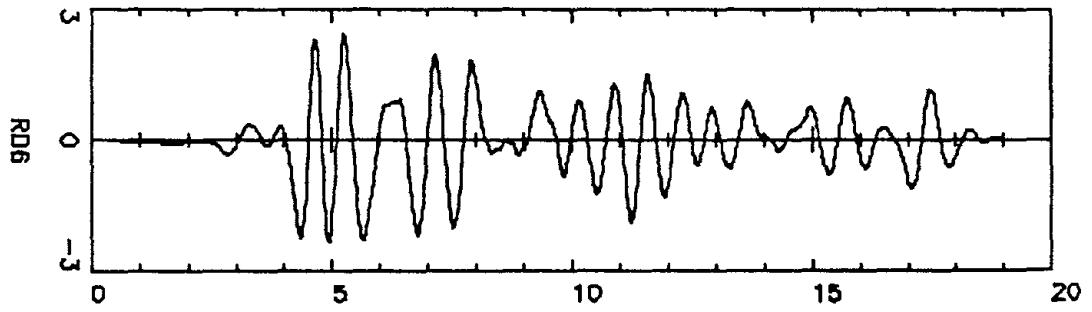
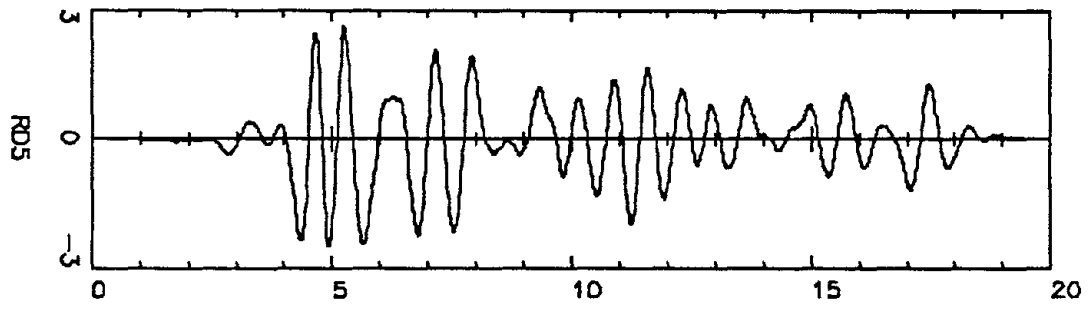
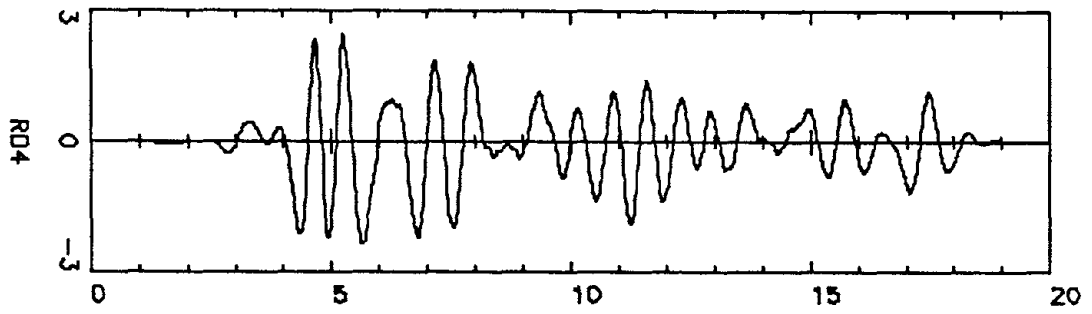
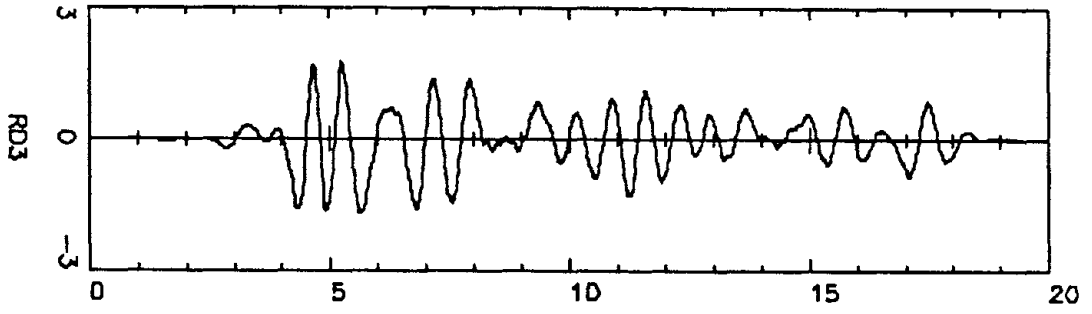
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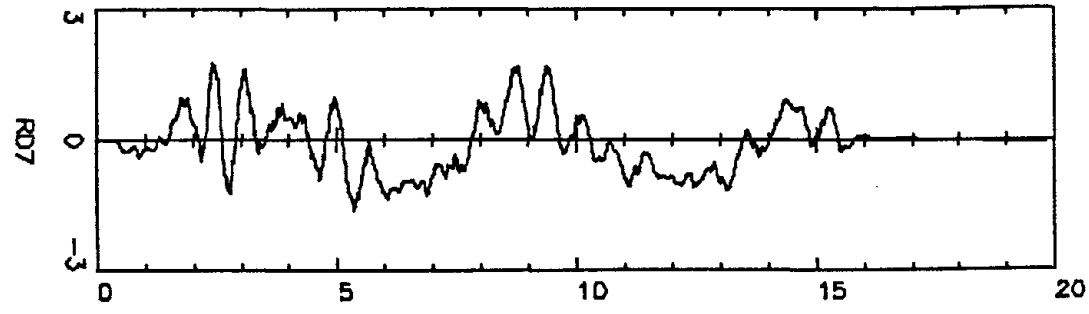
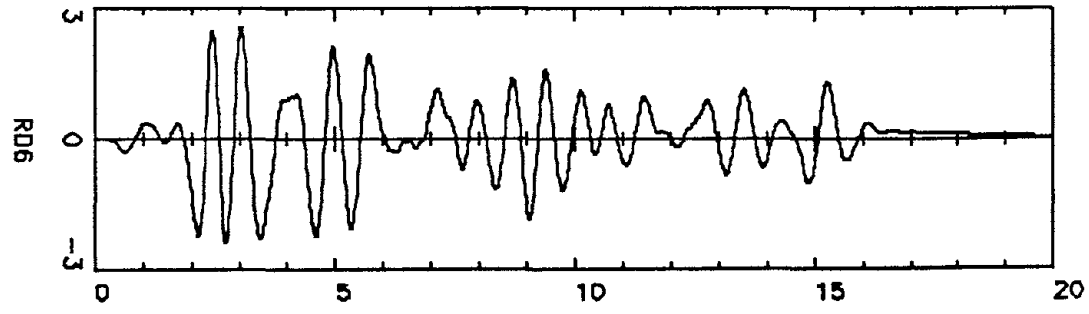
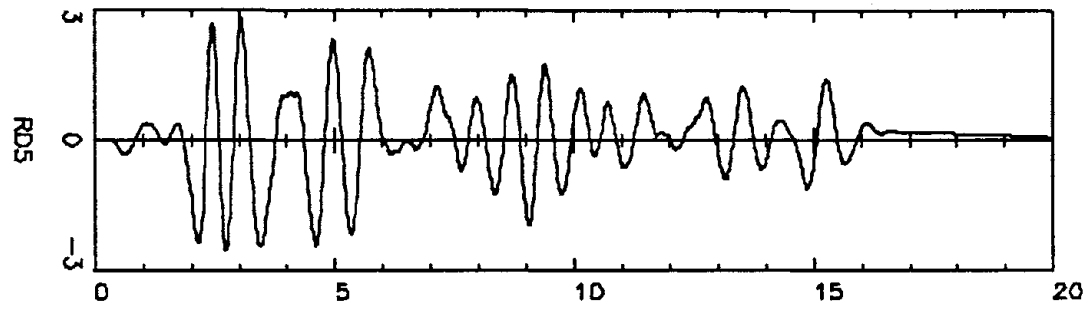
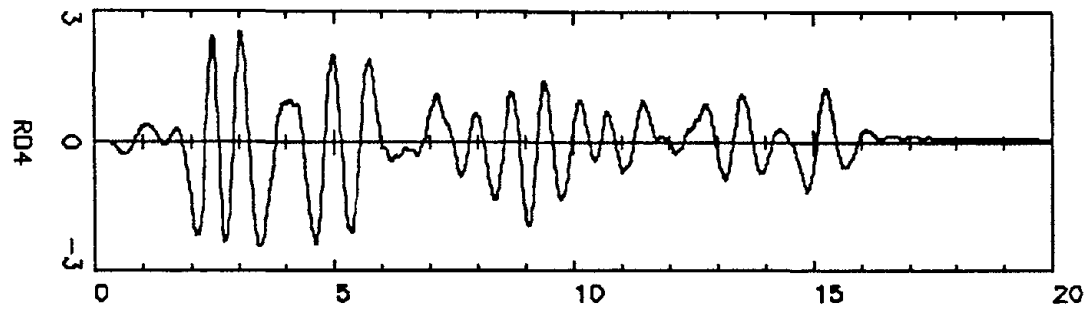
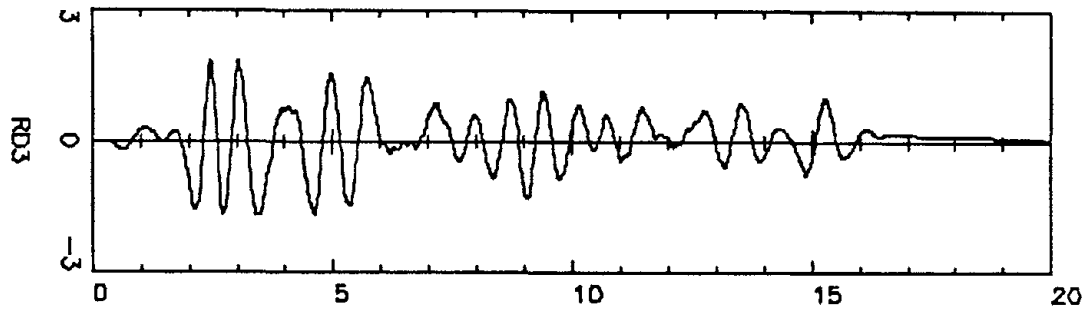
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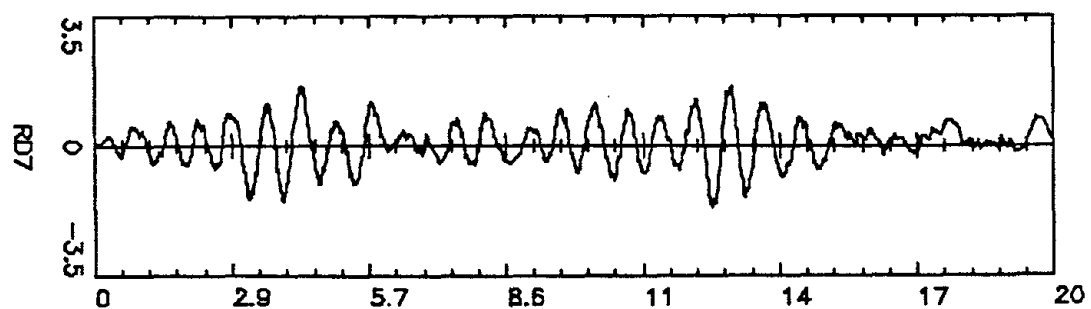
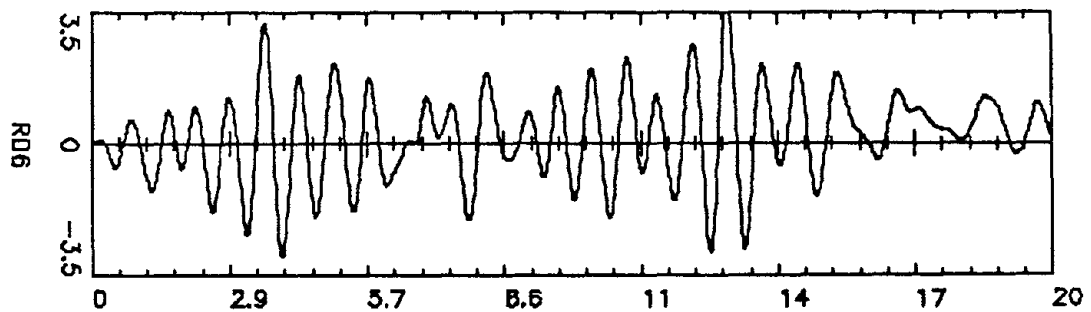
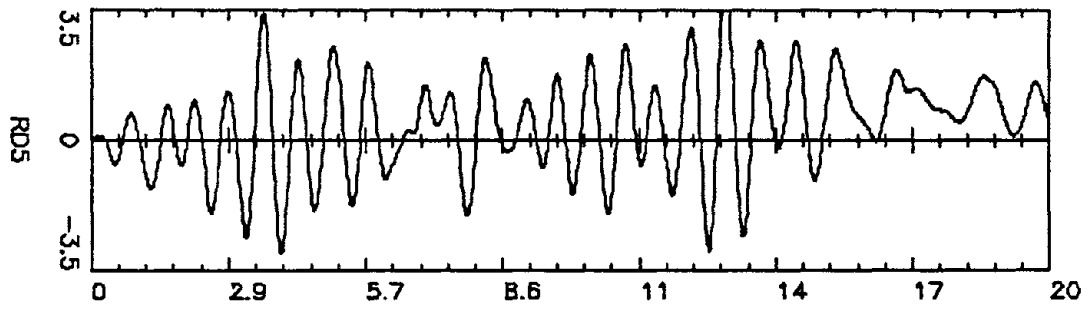
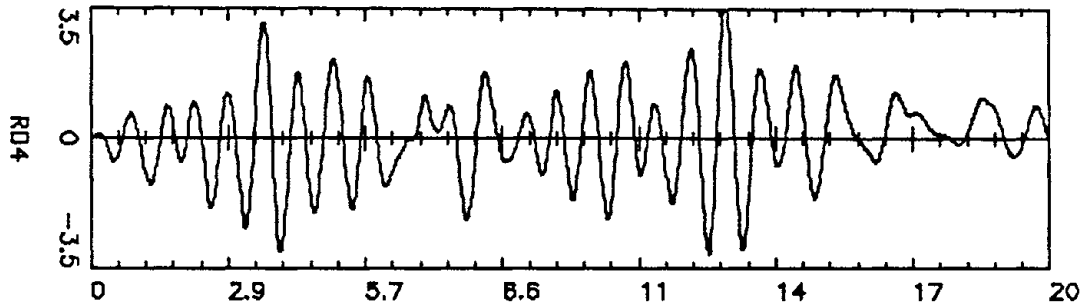
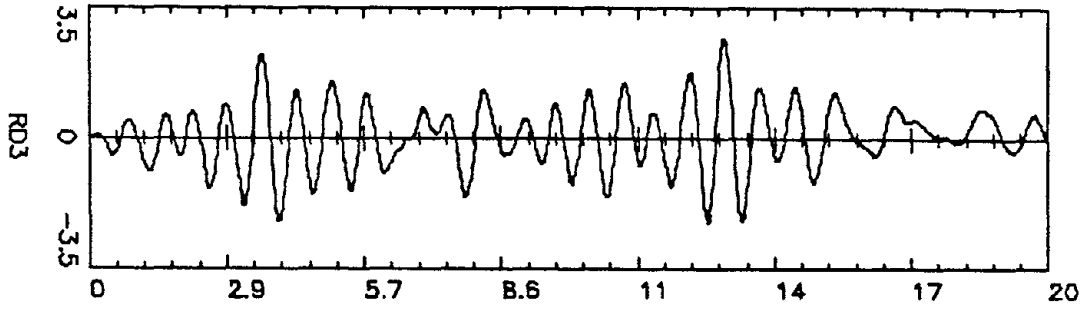
19-SEP-1988 12:01

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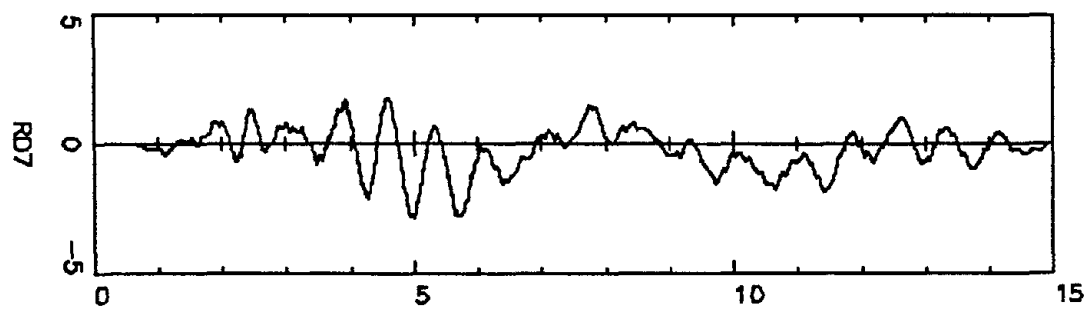
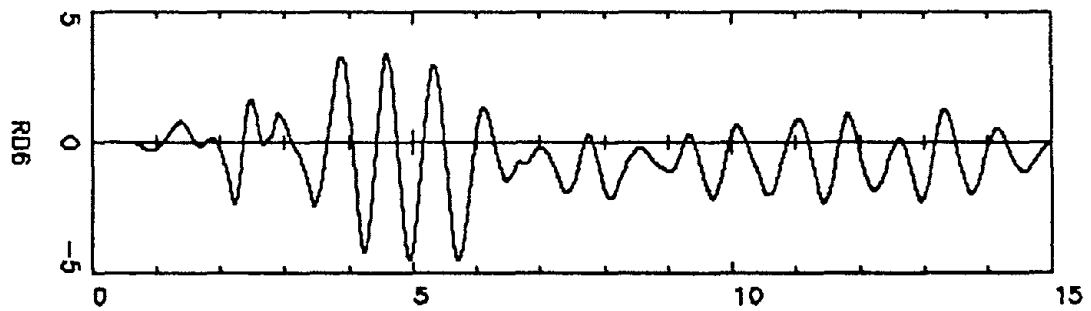
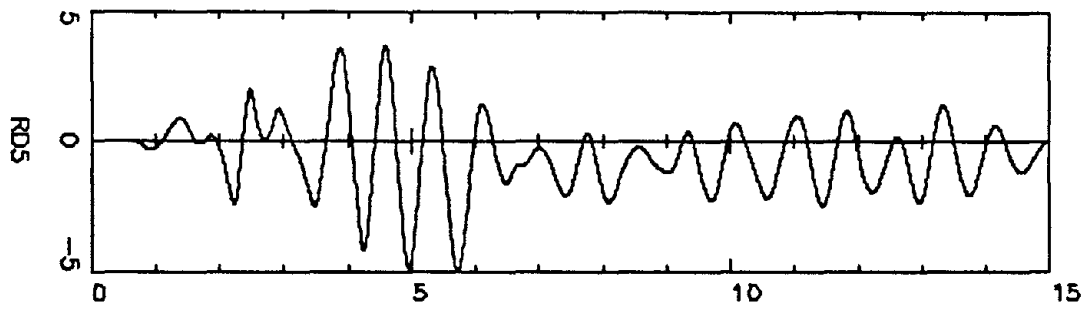
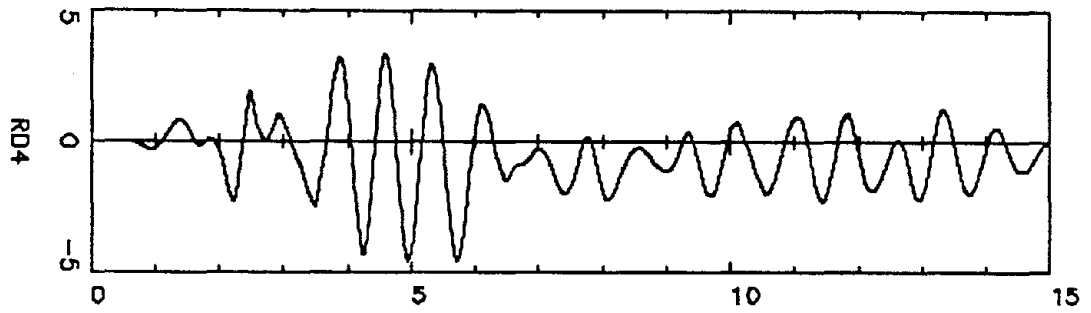
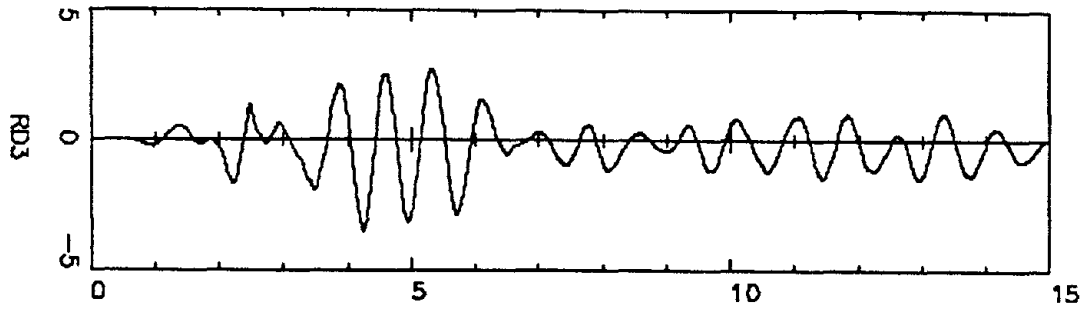


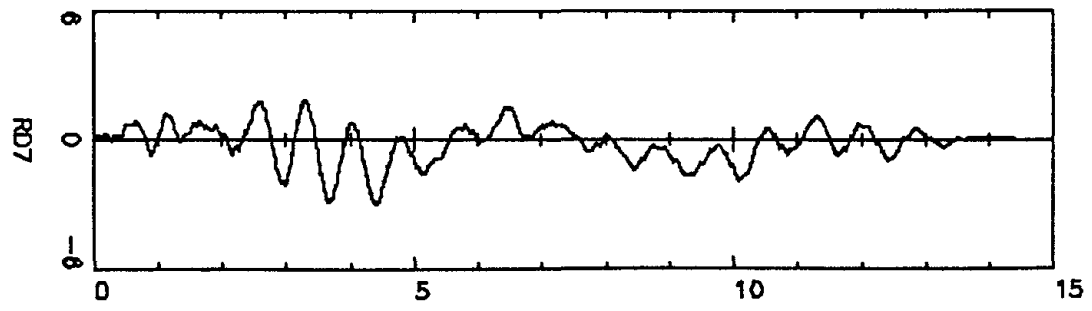
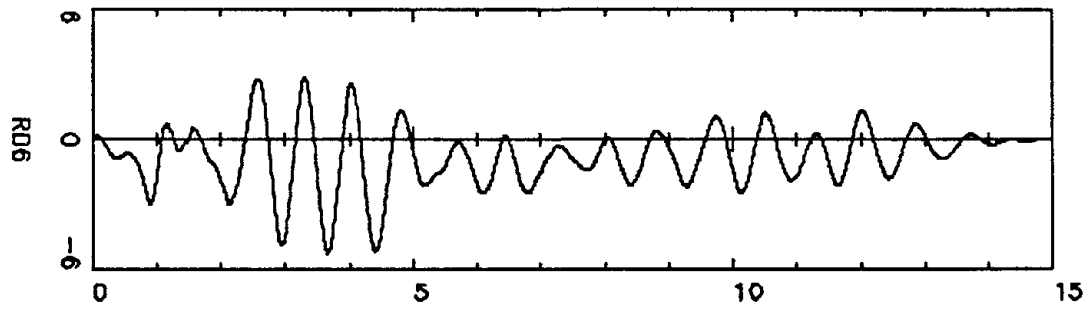
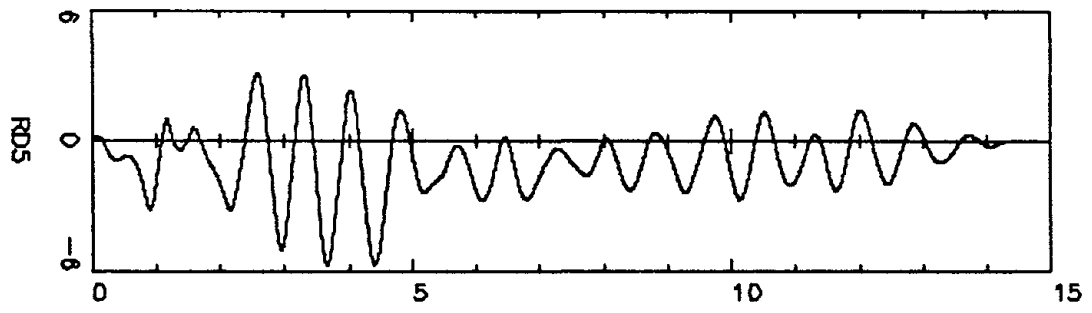
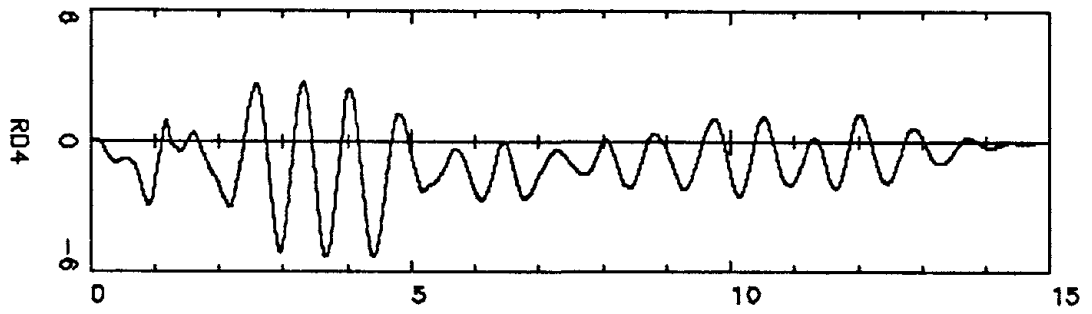
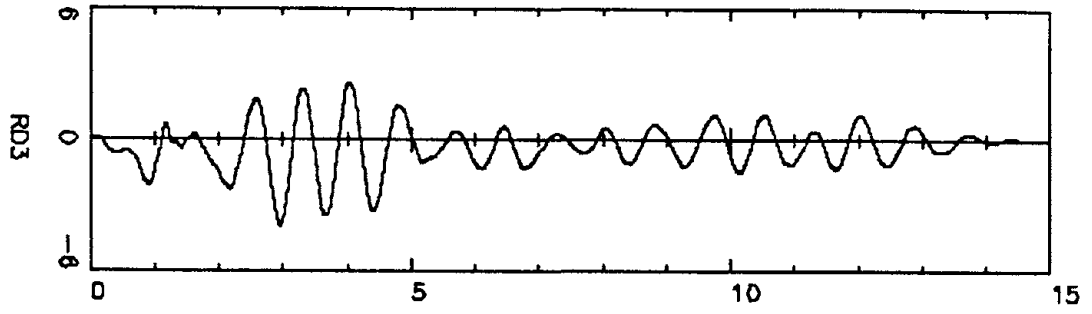


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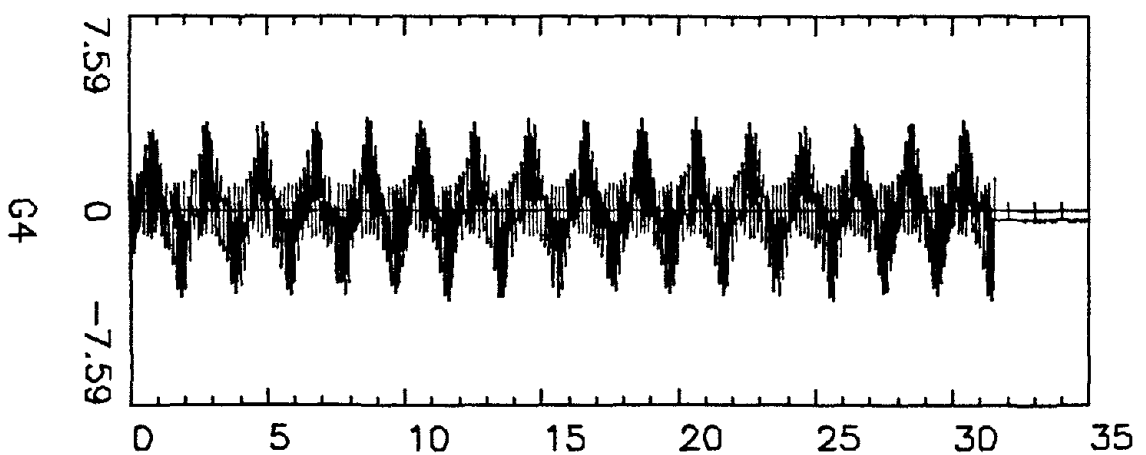
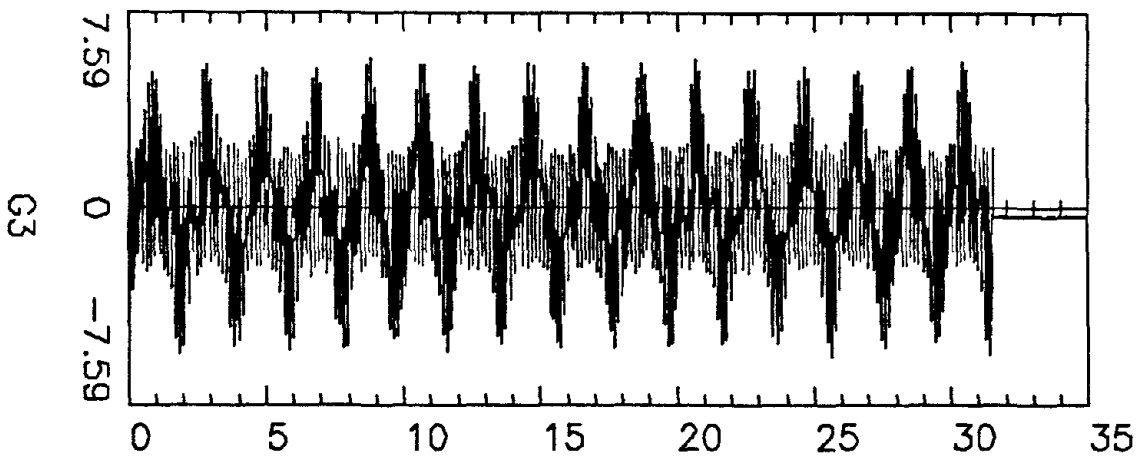
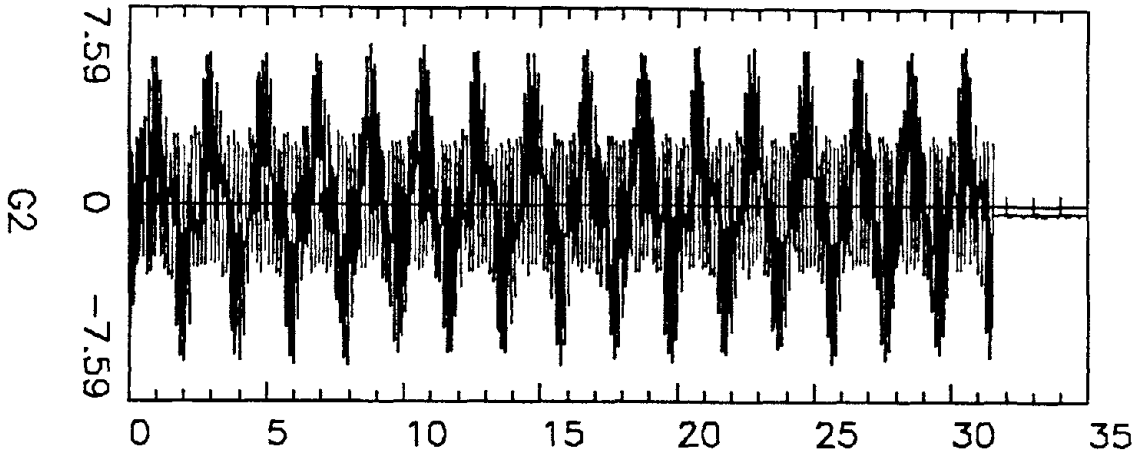
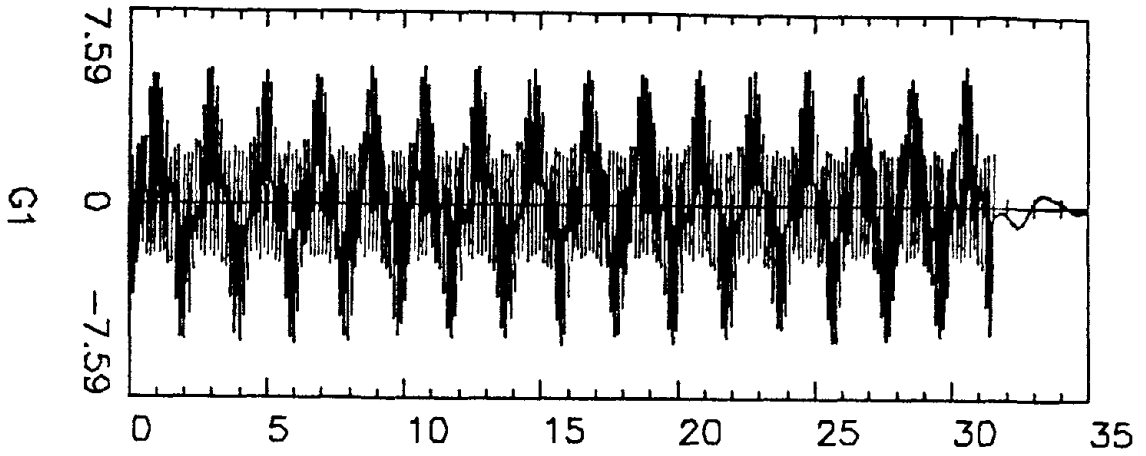
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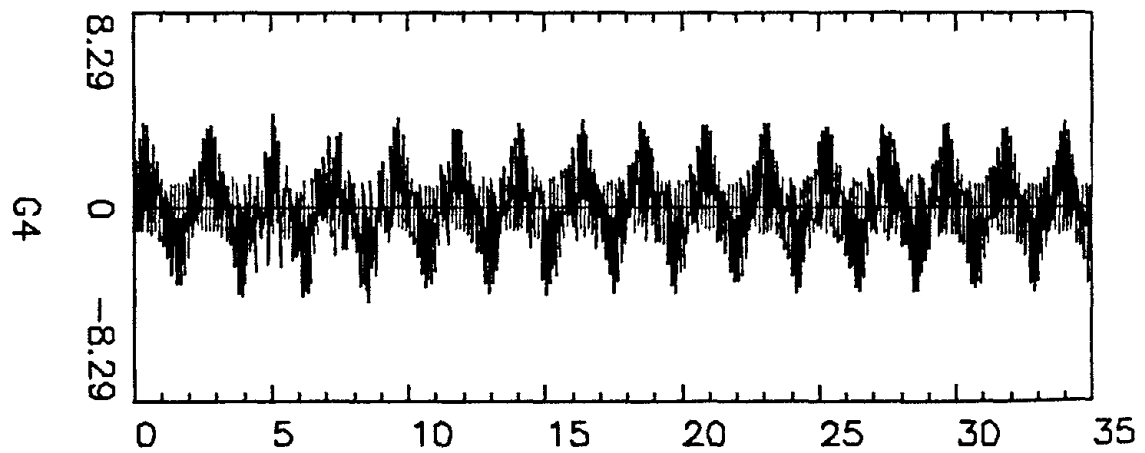
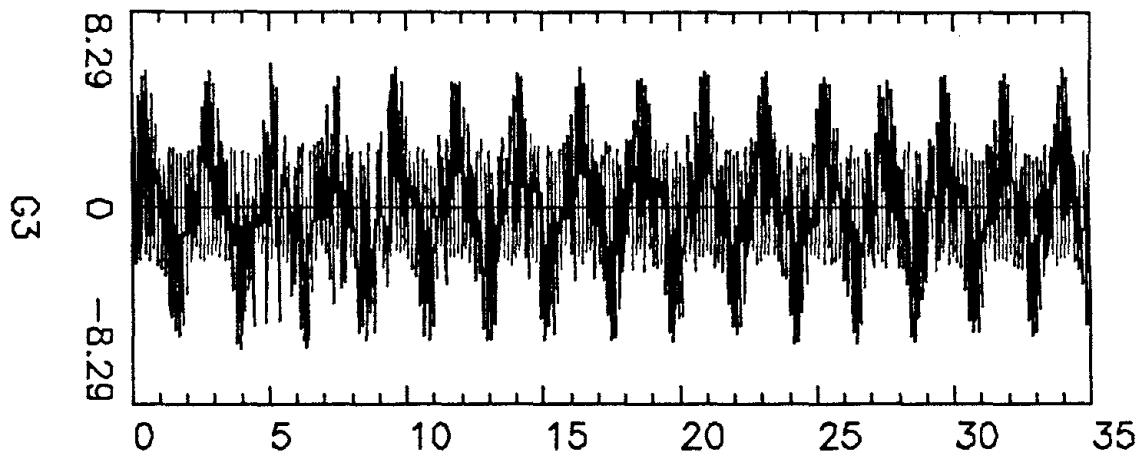
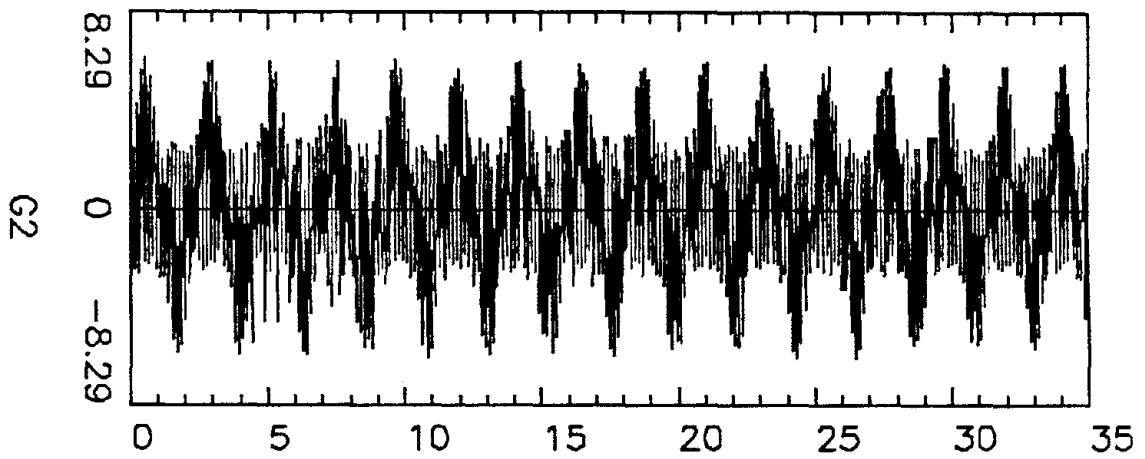
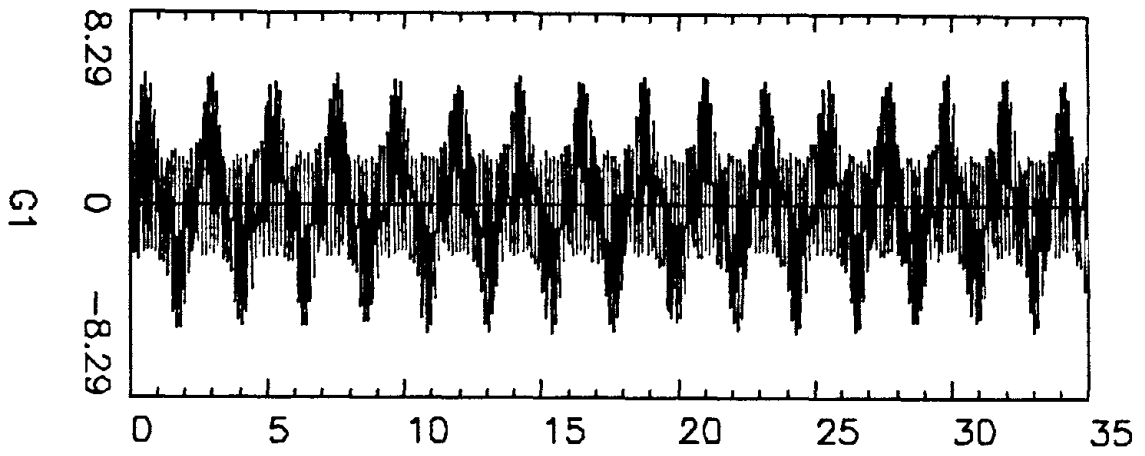


WALL # 3

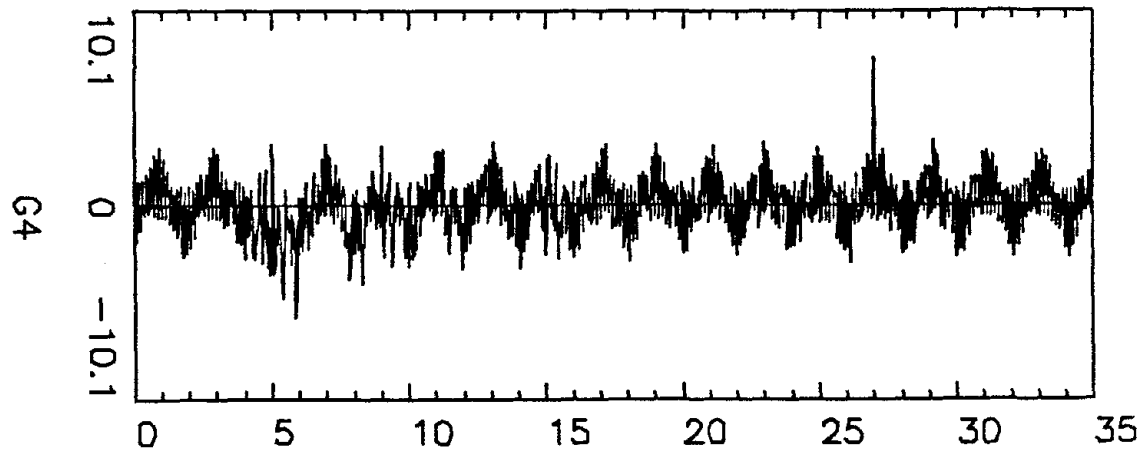
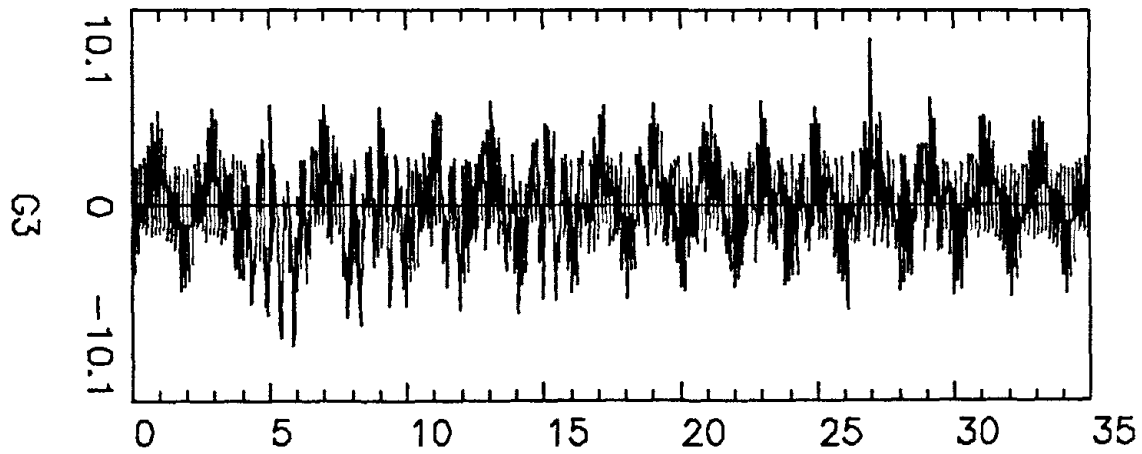
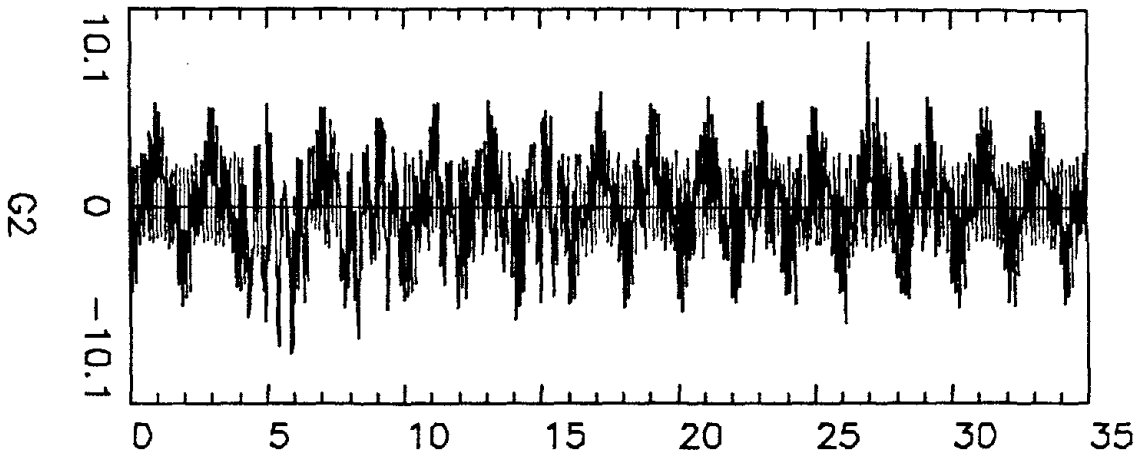
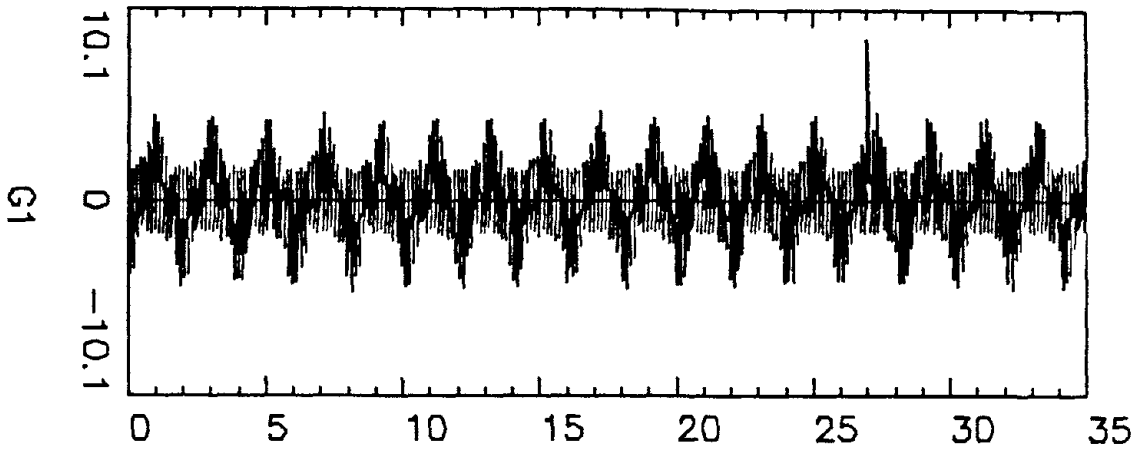
REINFORCEMENT STRAIN TIME HISTORIES



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C44

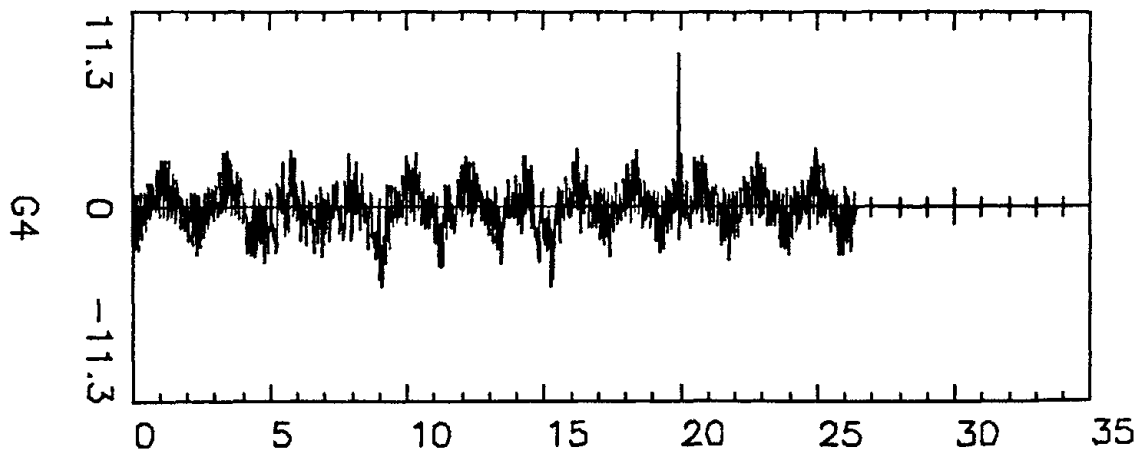
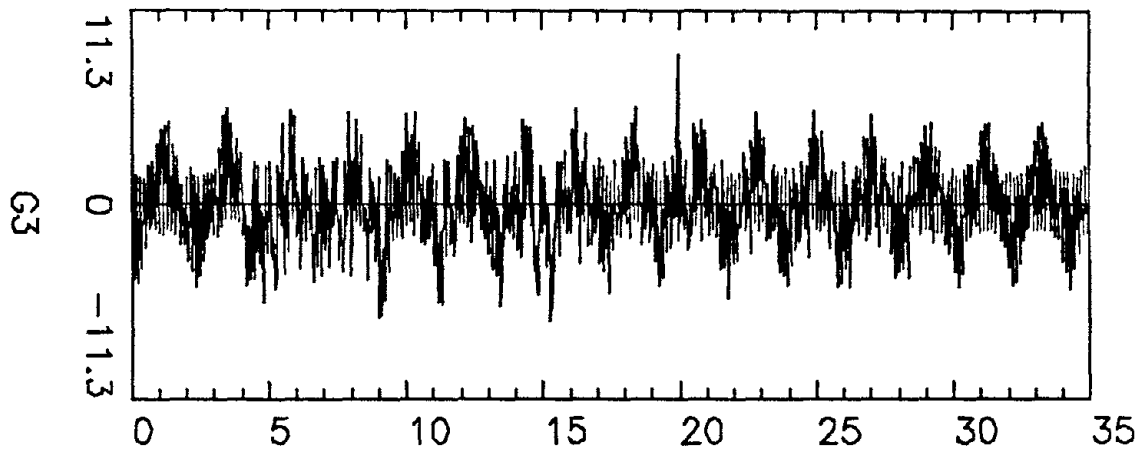
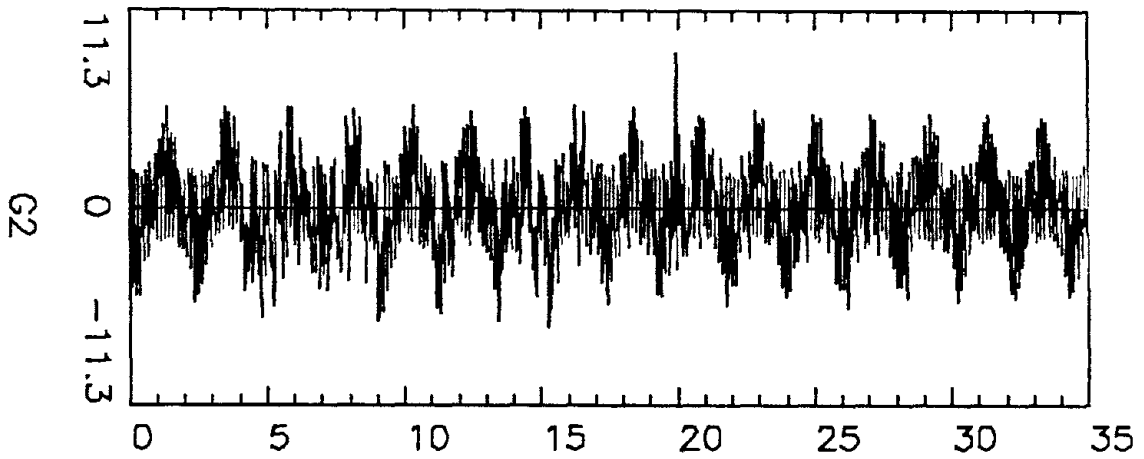
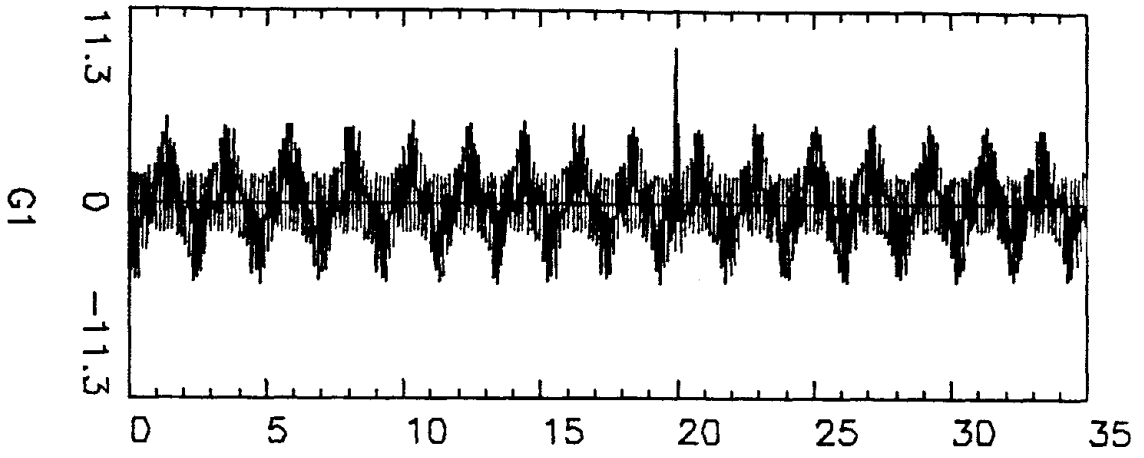


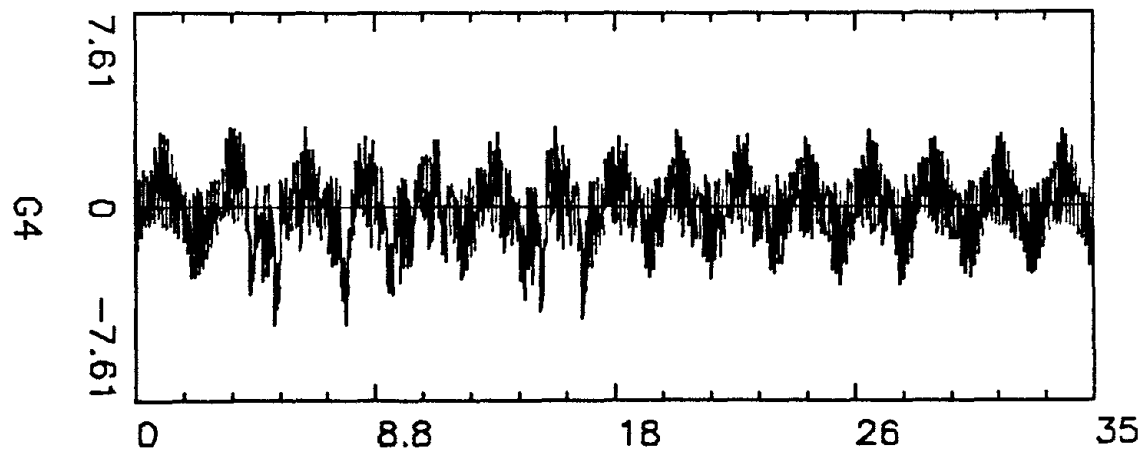
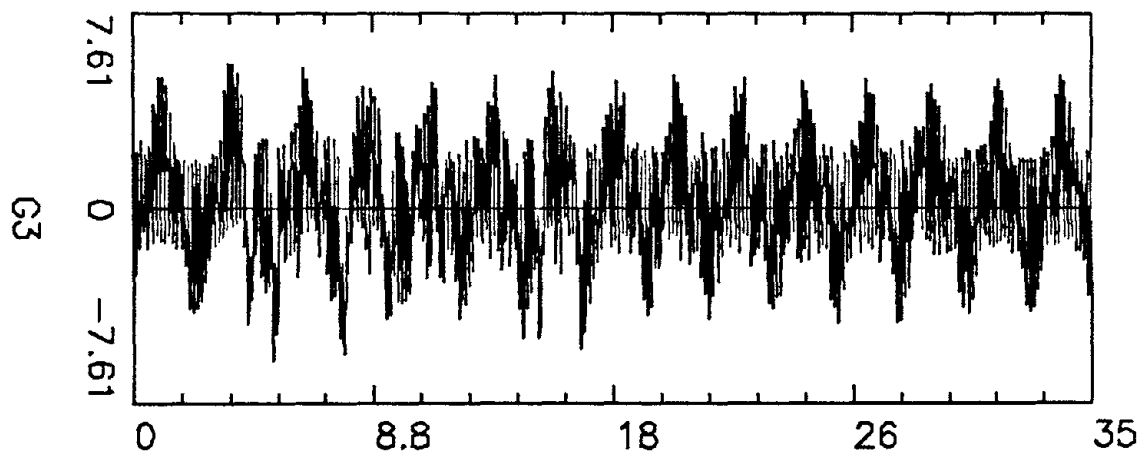
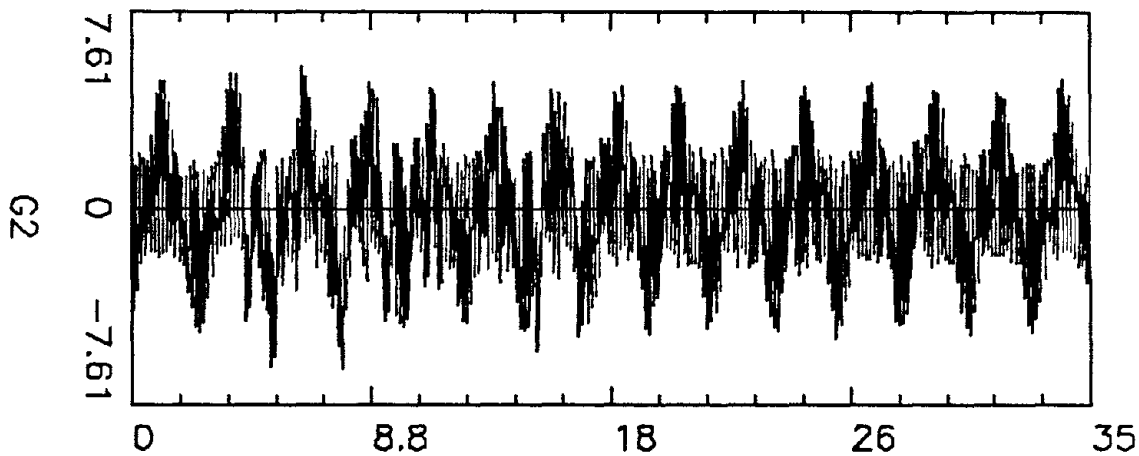
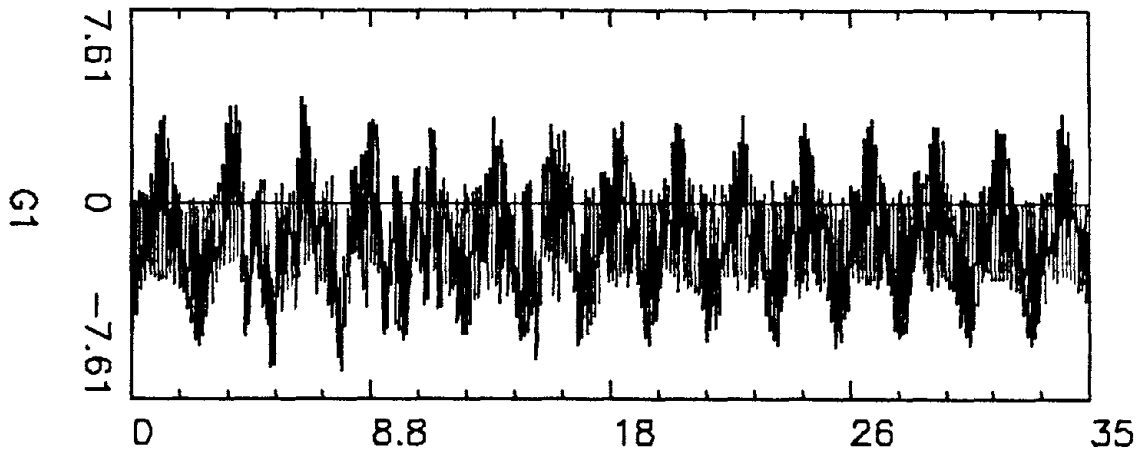
G305

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C45



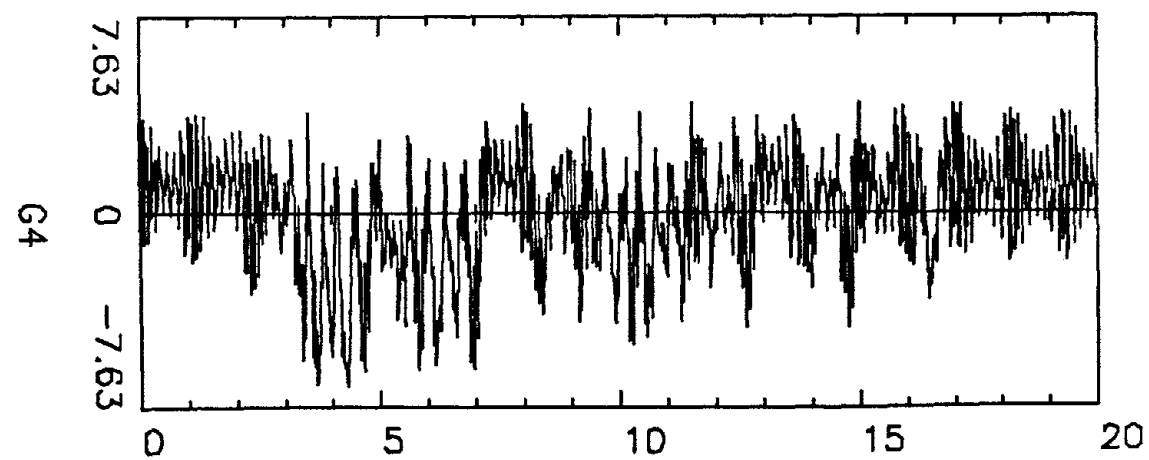
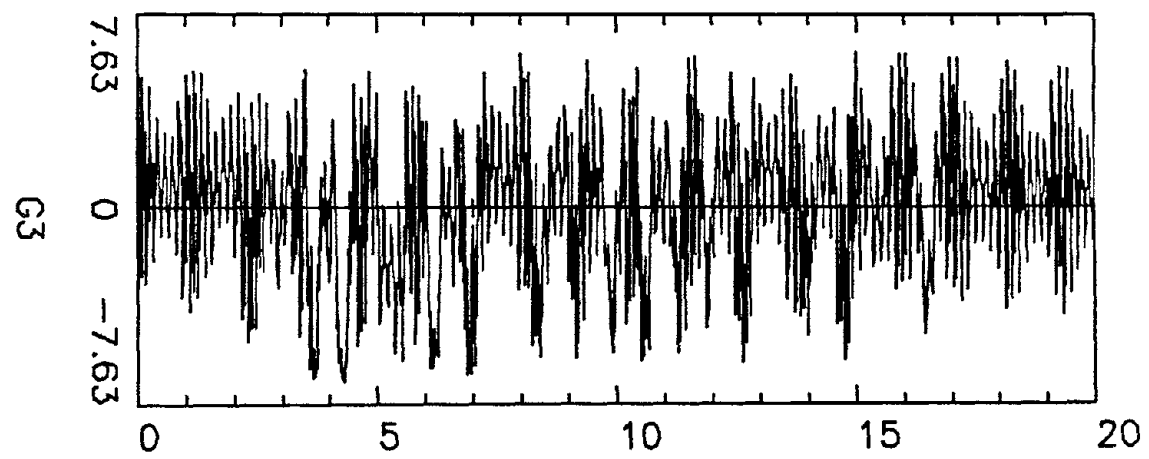
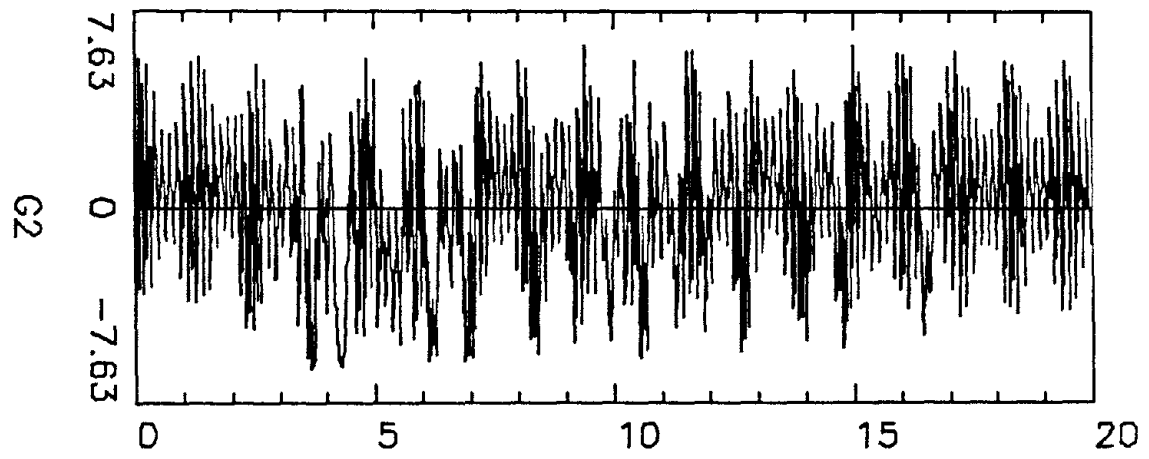
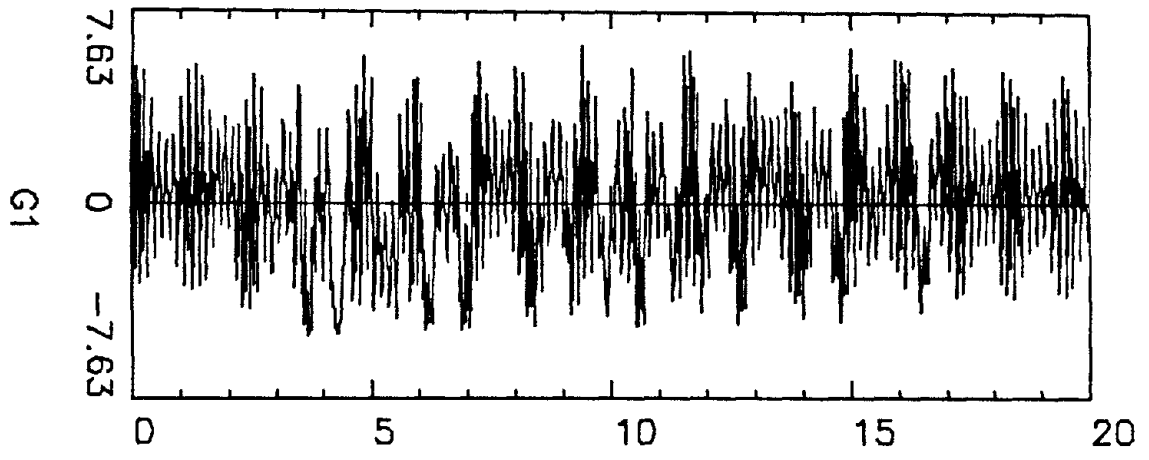


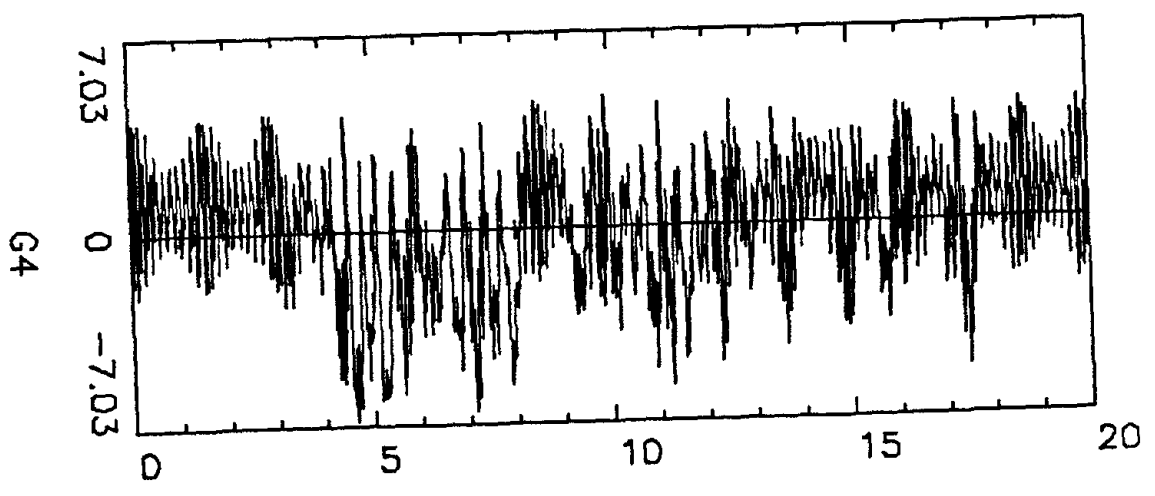
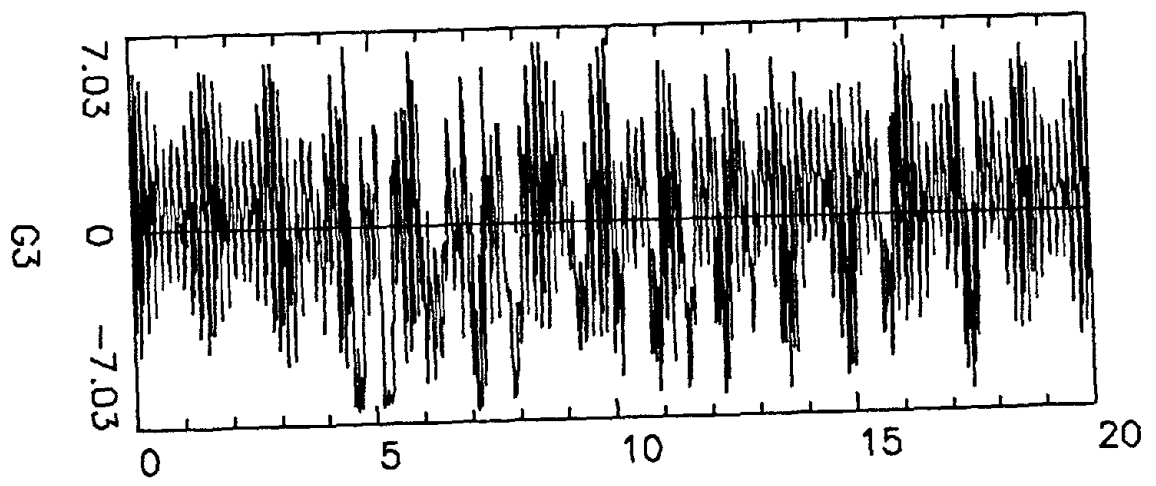
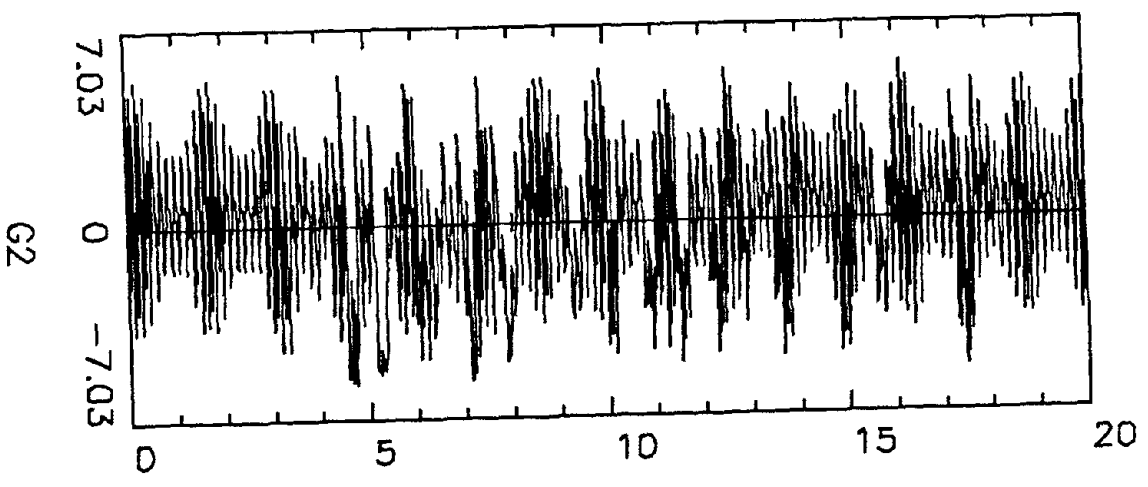
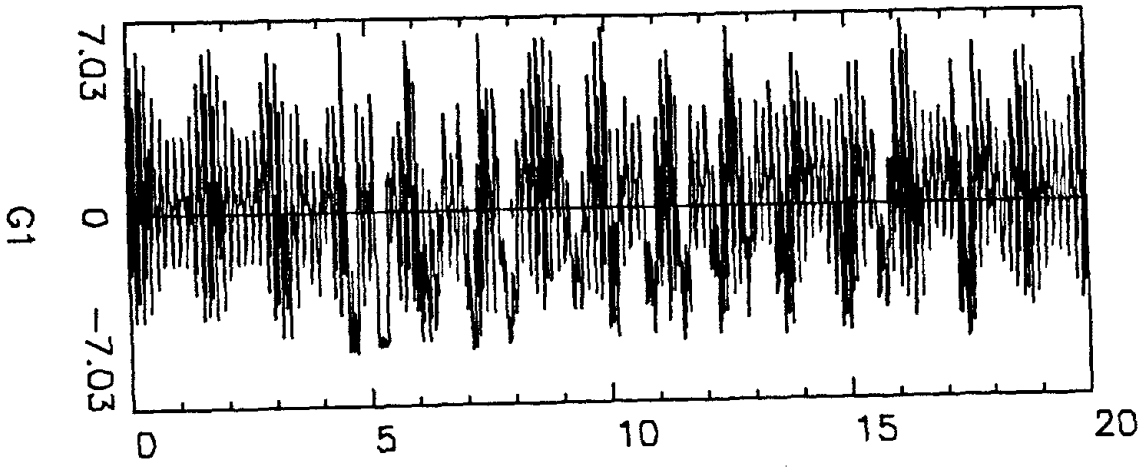
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22-SEP-1988 12:

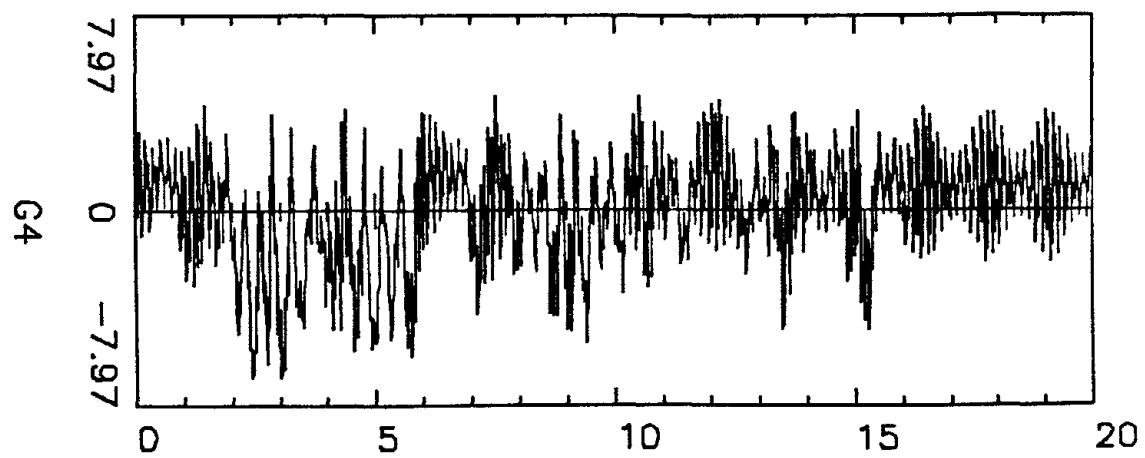
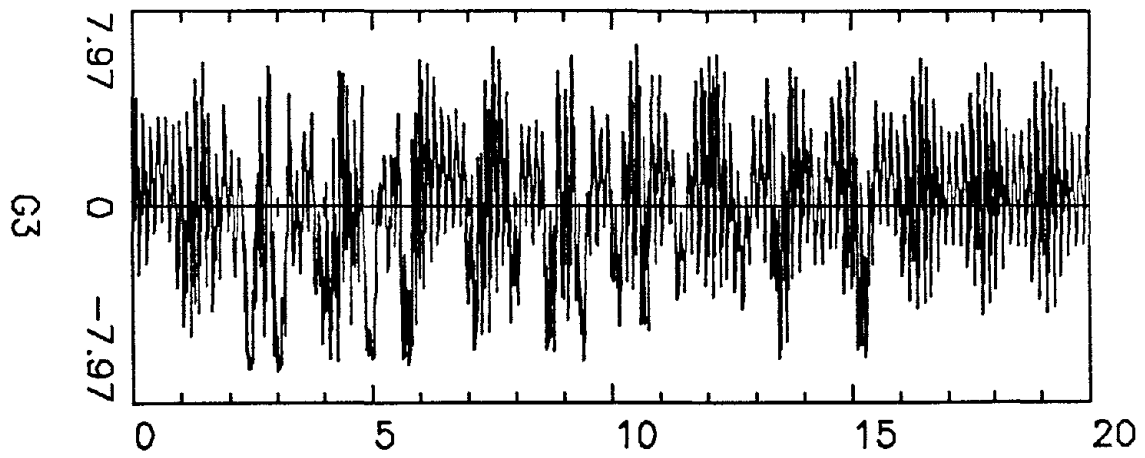
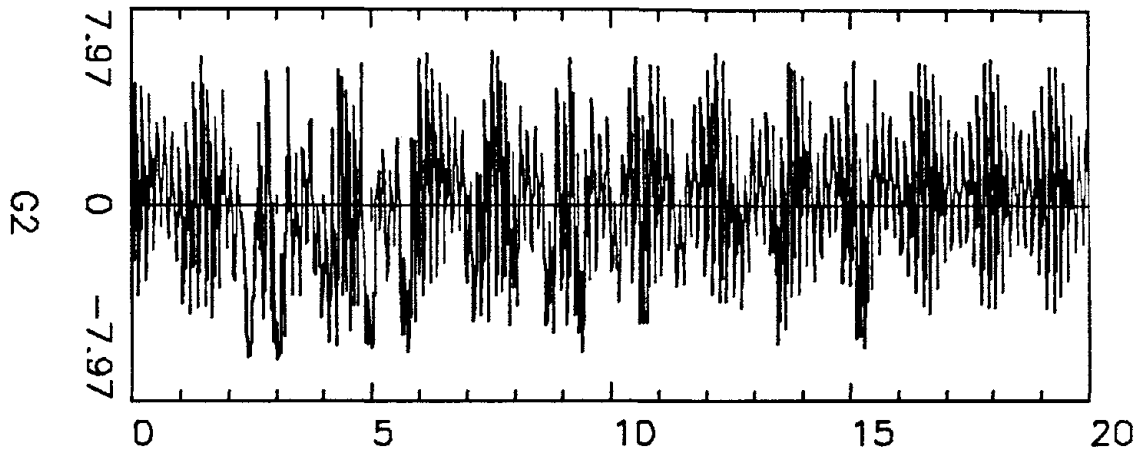
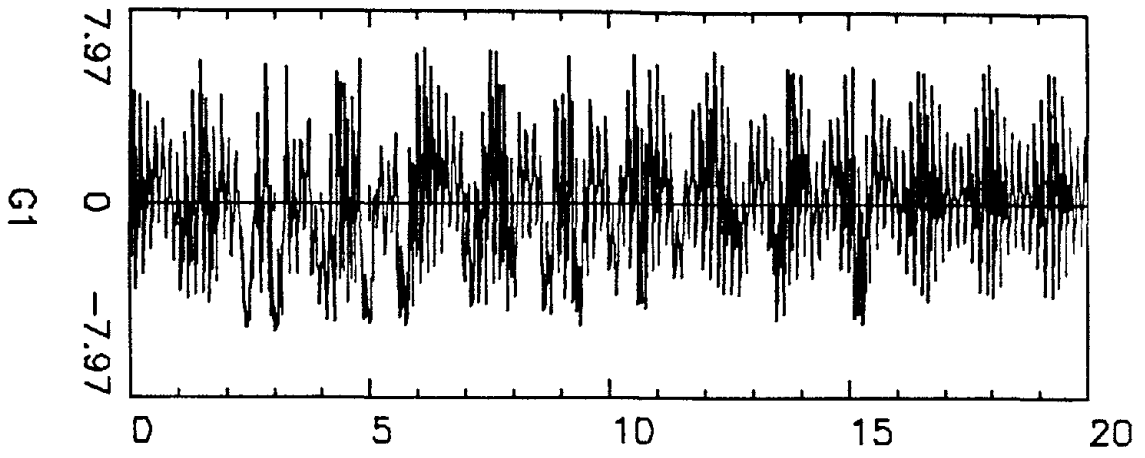
049



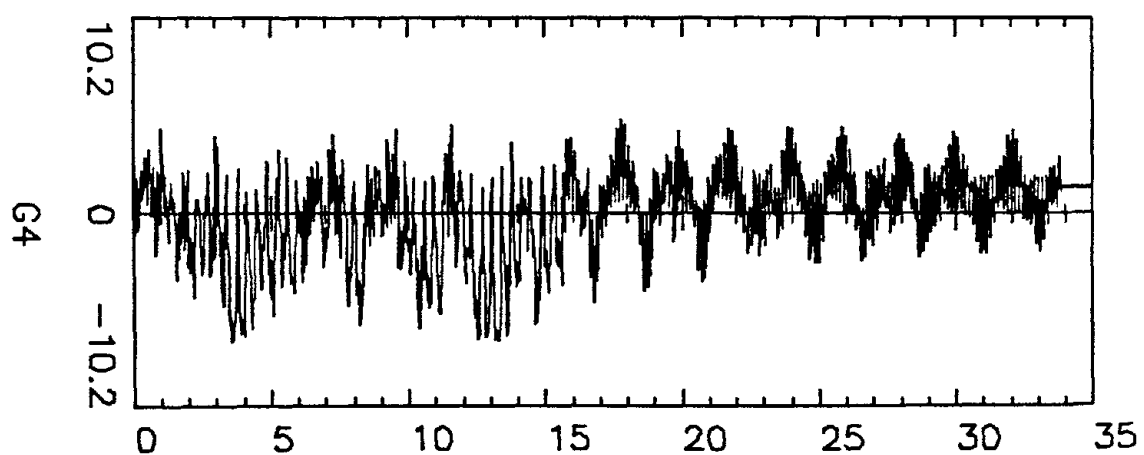
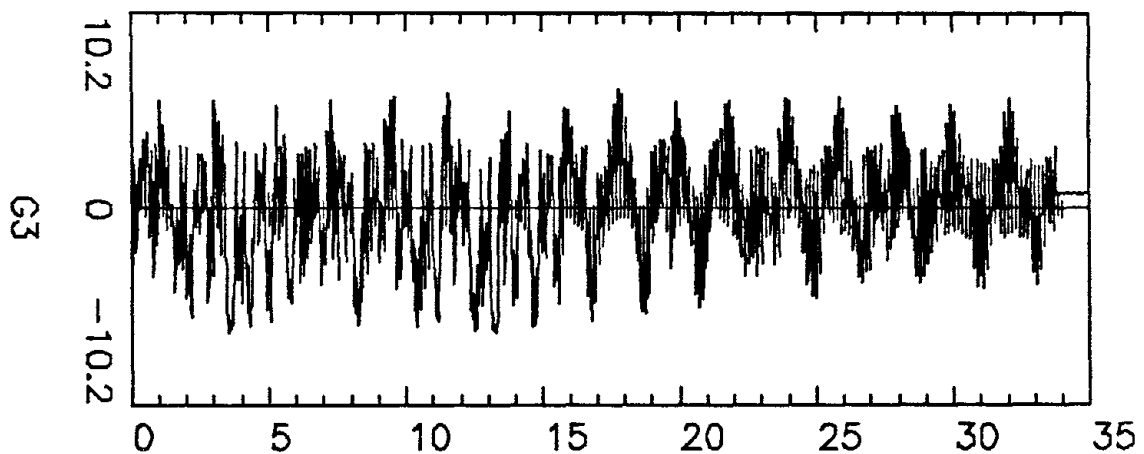
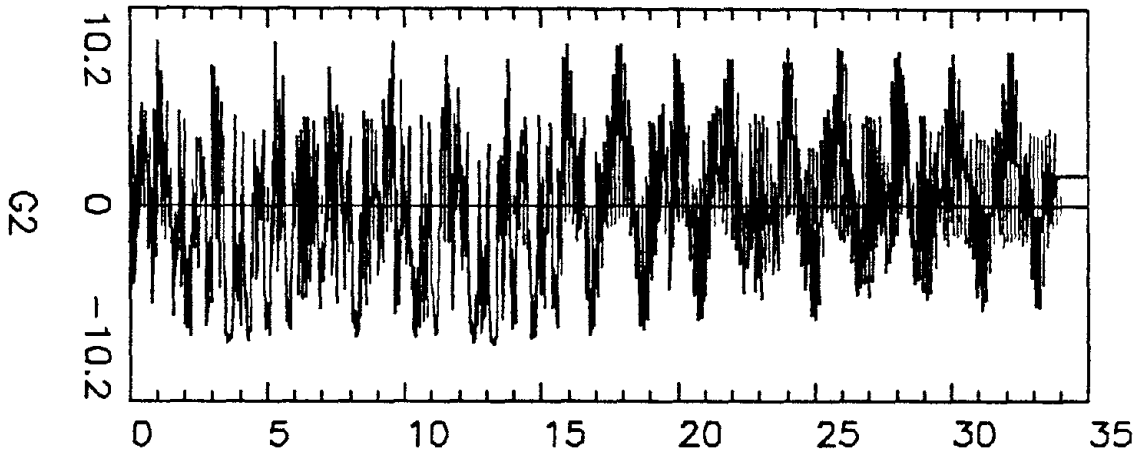
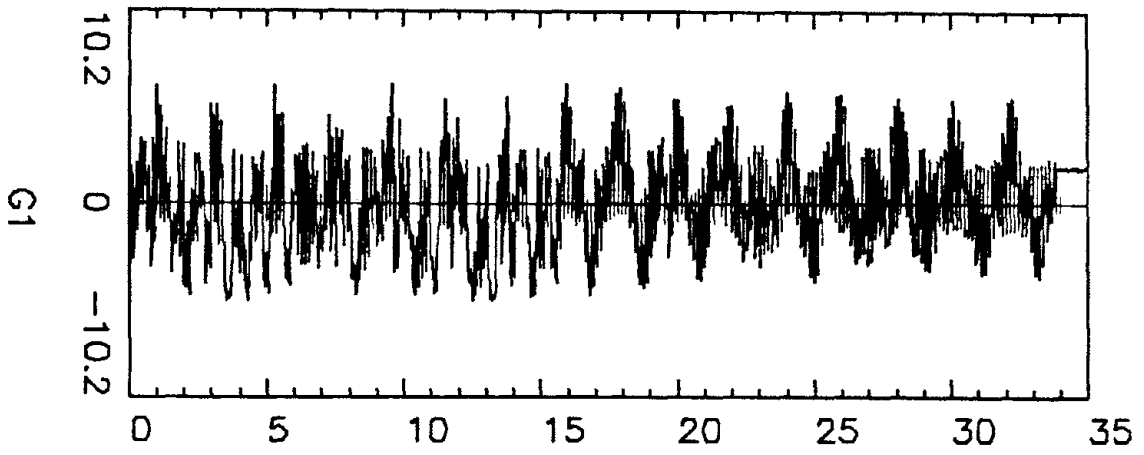


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051



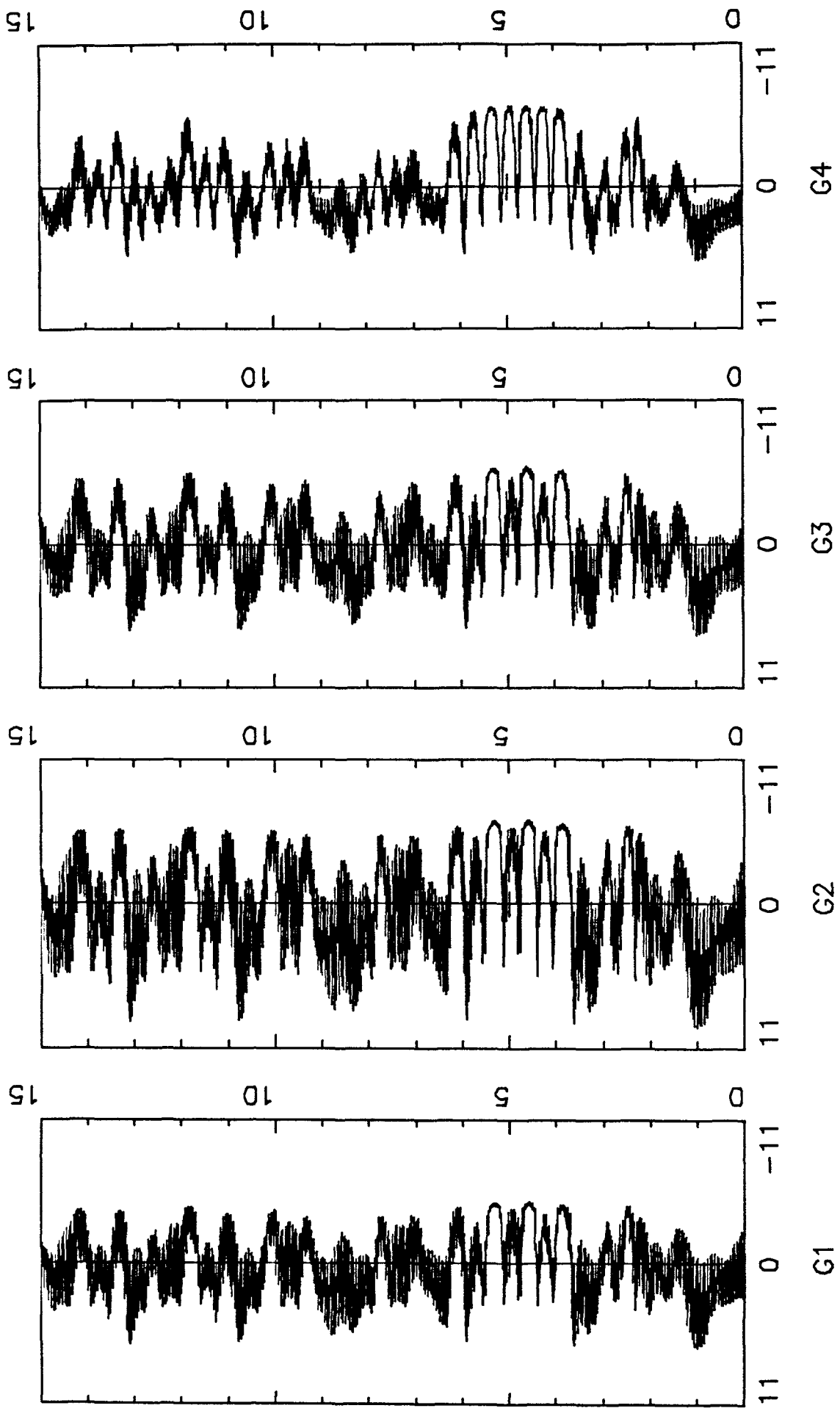
11.0
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5-SEP-1988 22:0

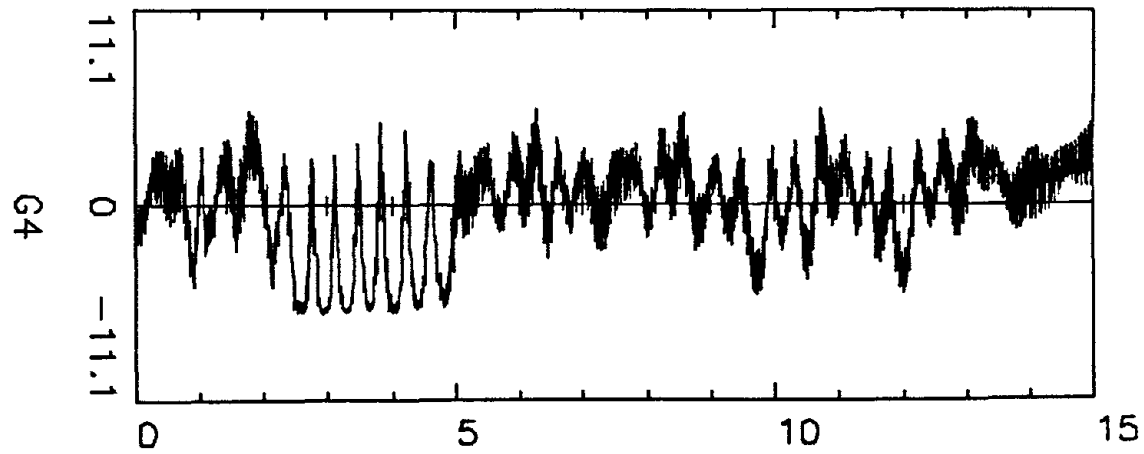
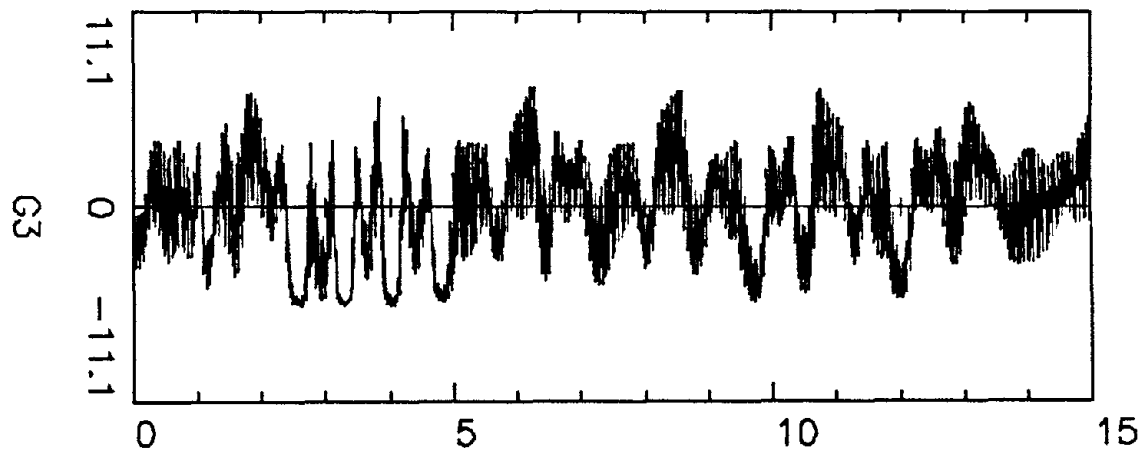
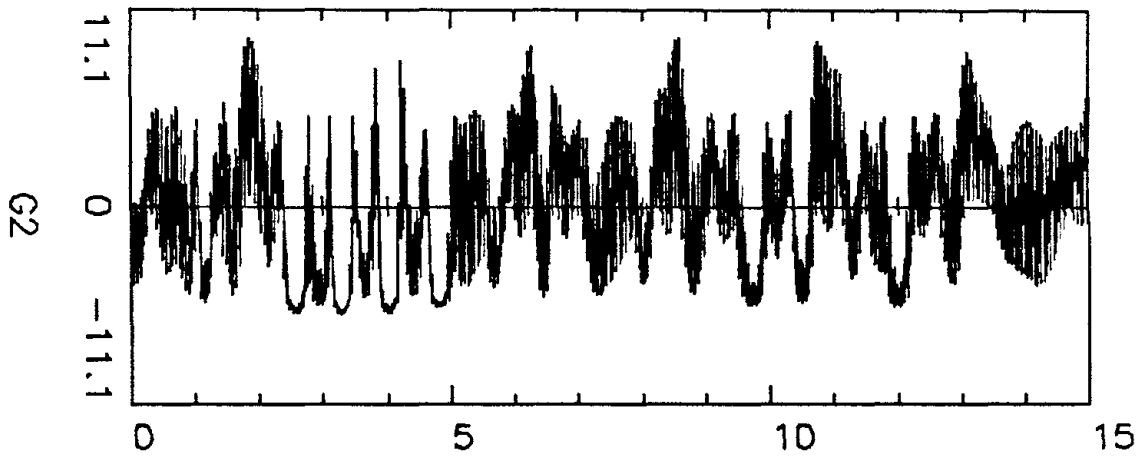
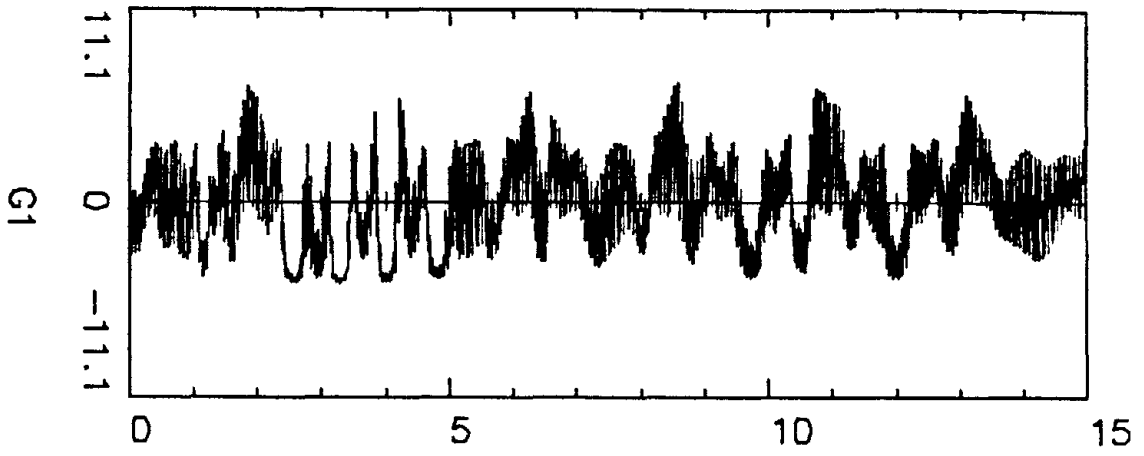


G3ZB SAYED 26-AUG-1988 16:20

053

452





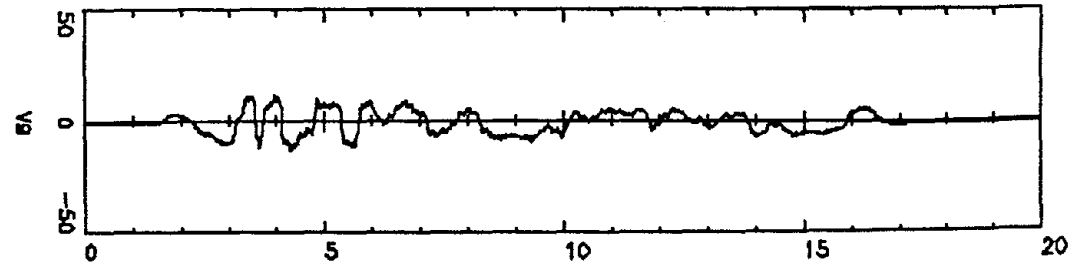
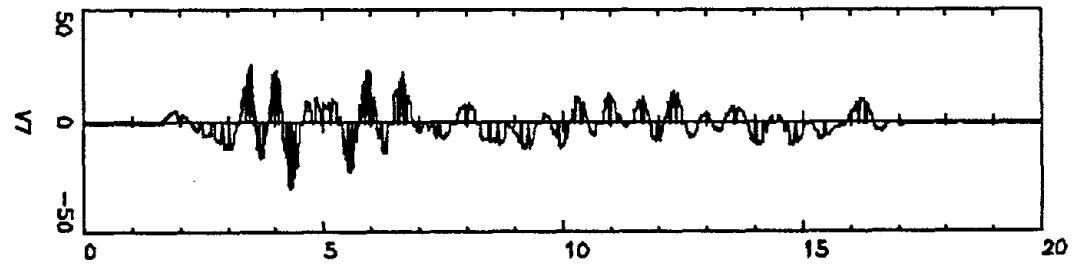
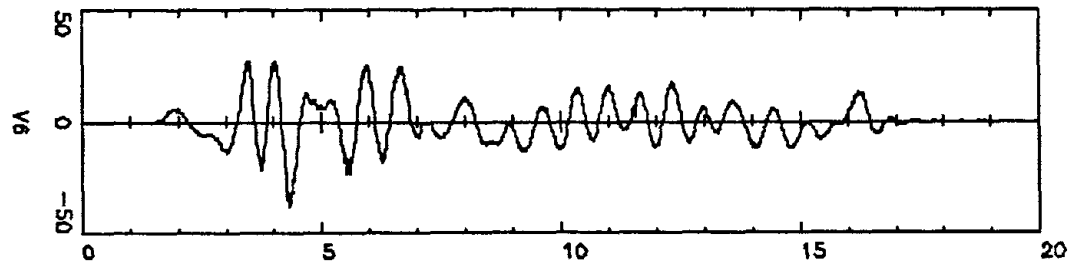
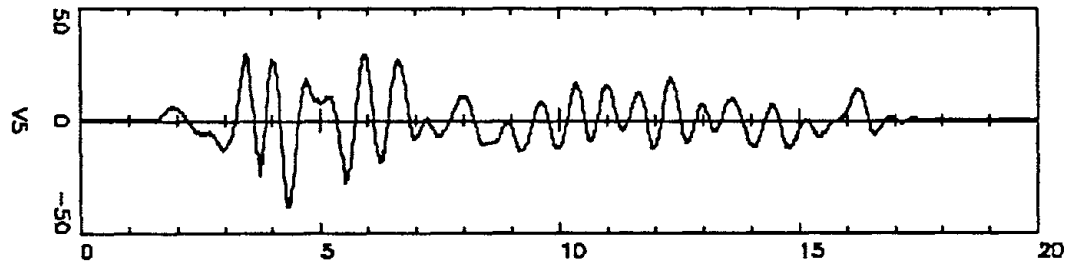
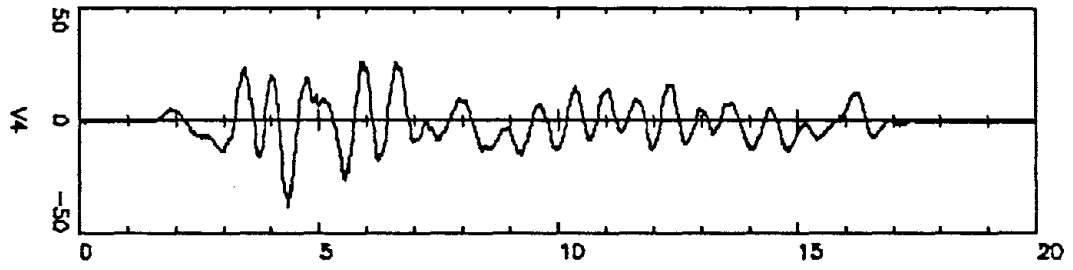
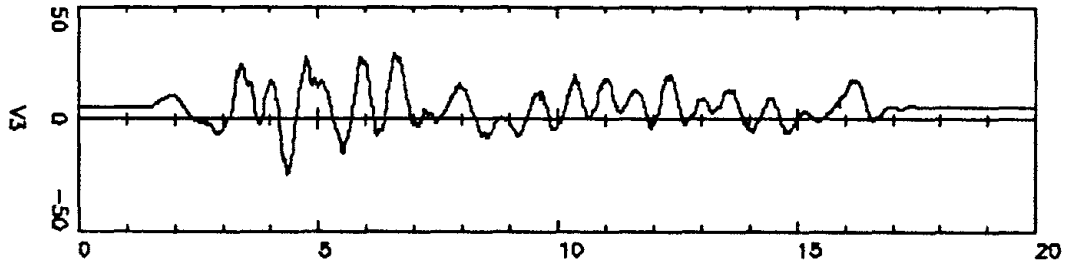
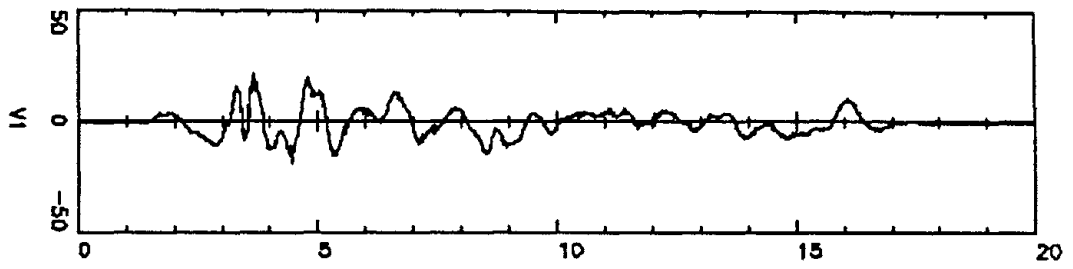
055

APPENDIX D

TIME HISTORY RESPONSE FOR PANEL #4

WALL # 4

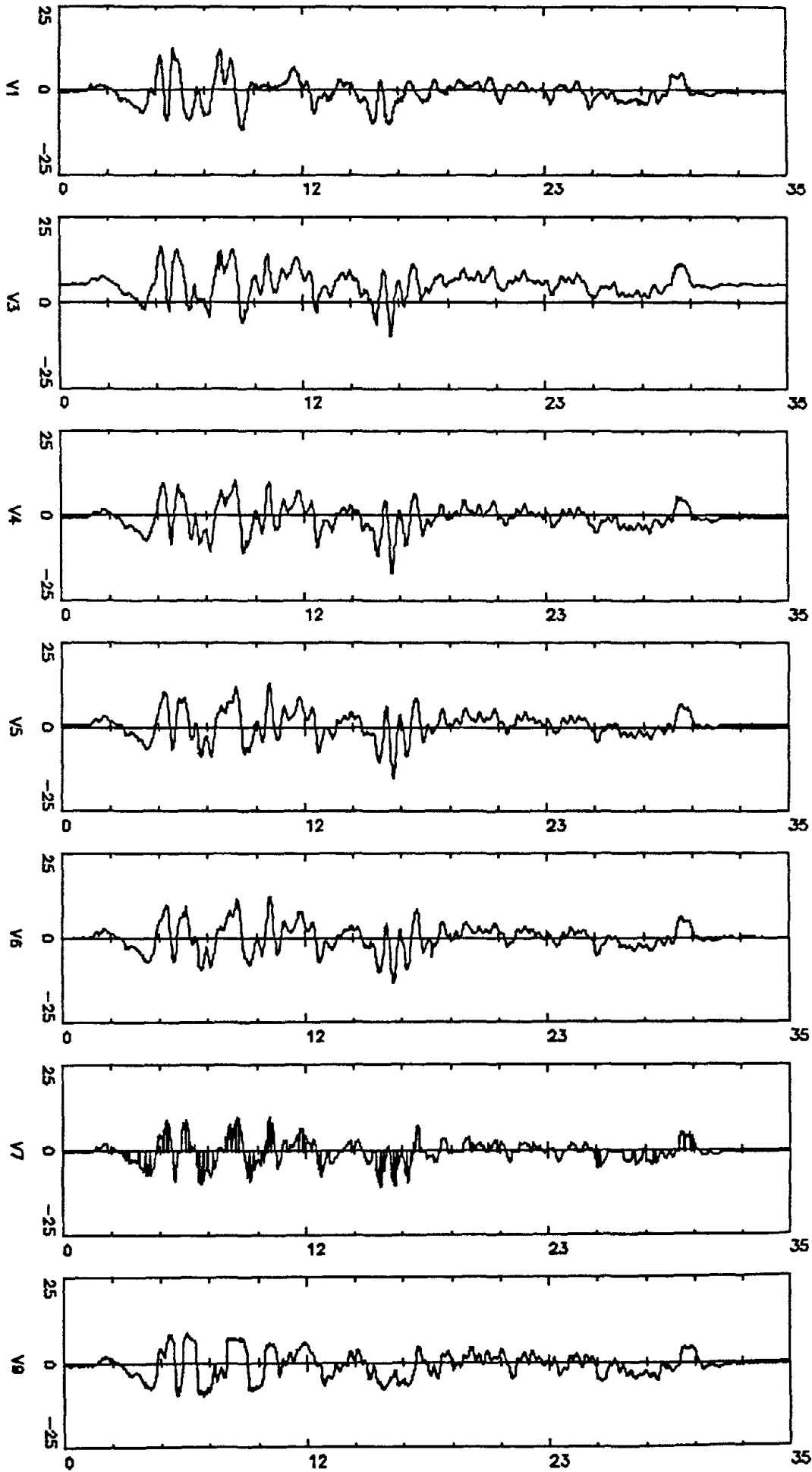
VELOCITY TIME HISTORIES



V415

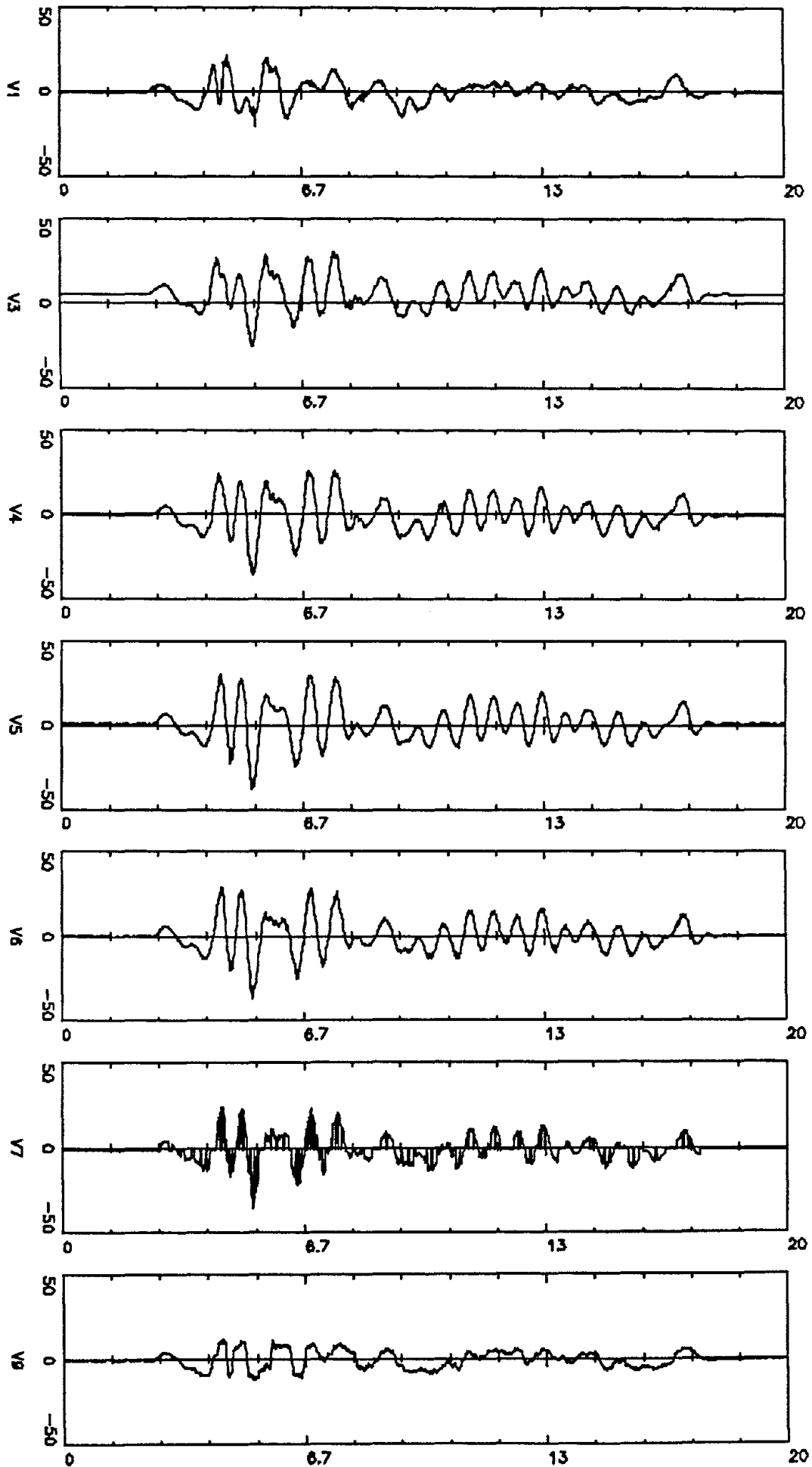
SAVED

Z8-SEP-1988 16:47

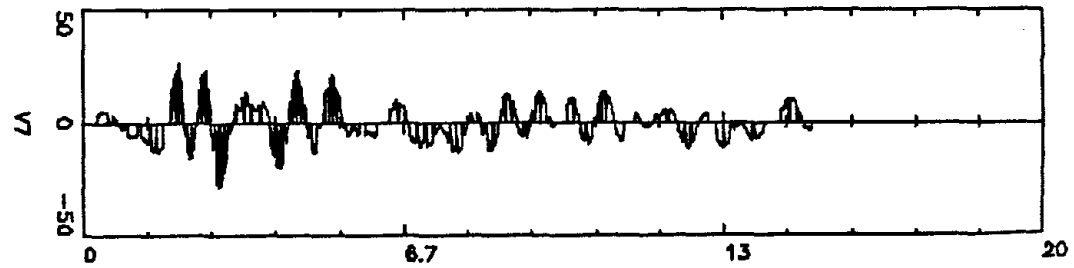
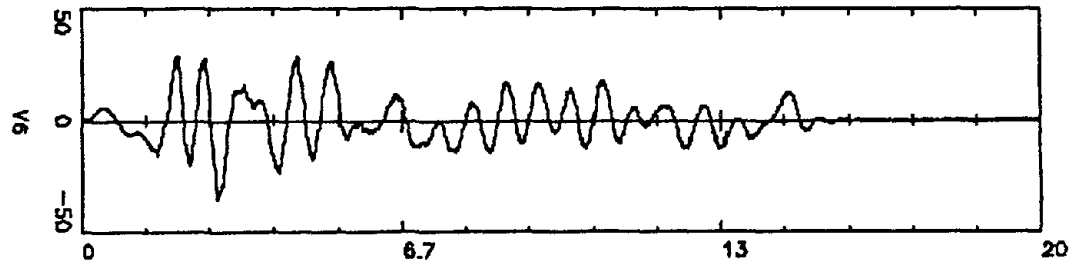
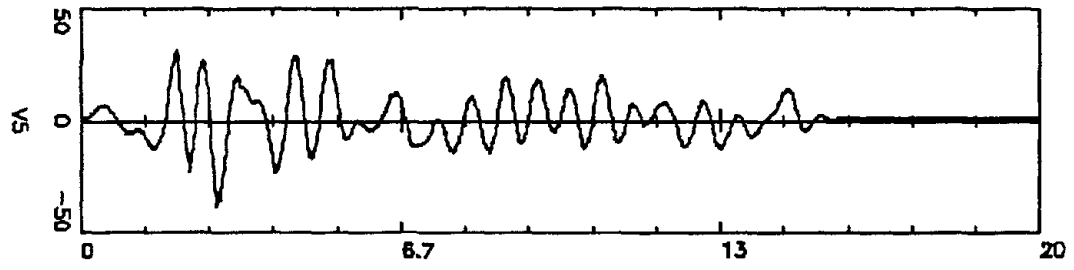
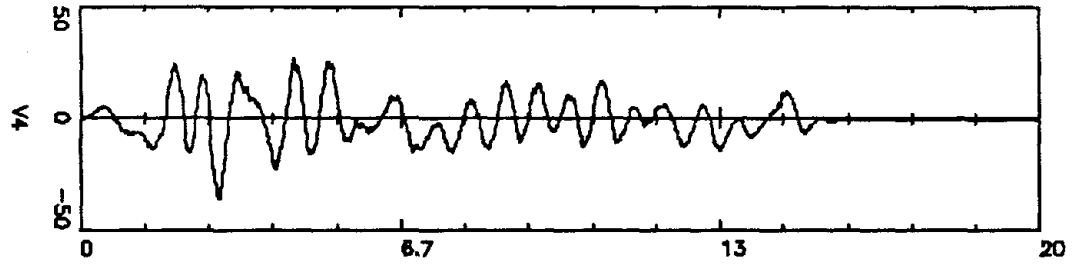
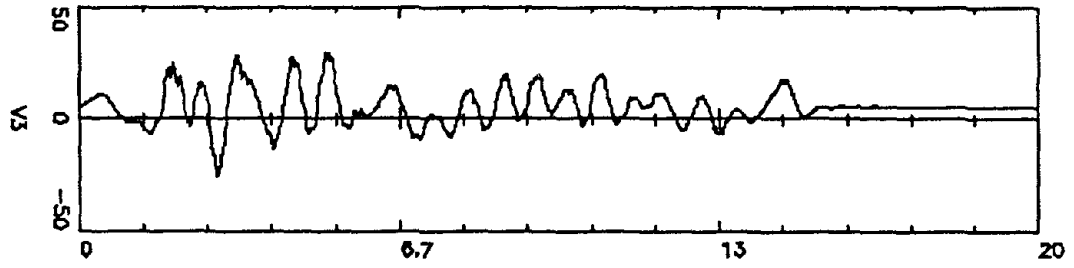
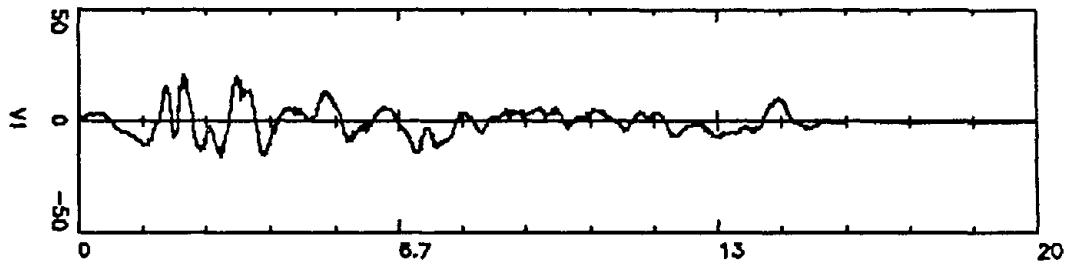


V4(1) SAYE(1)

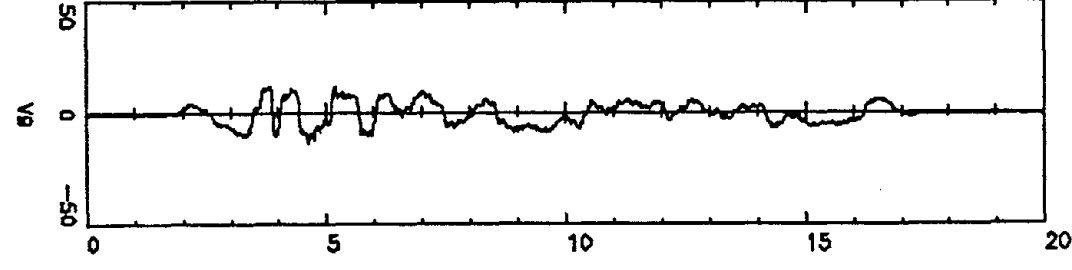
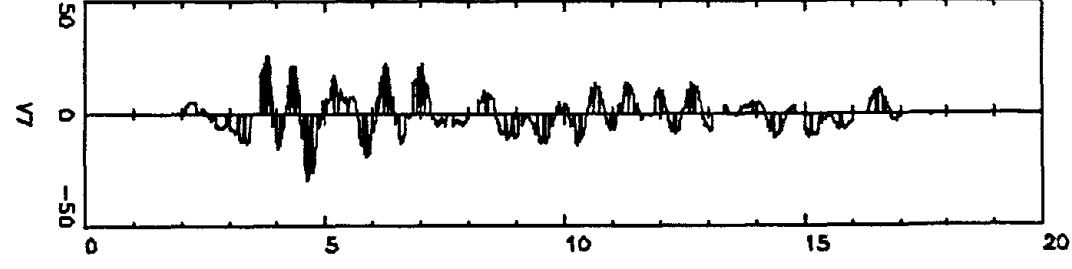
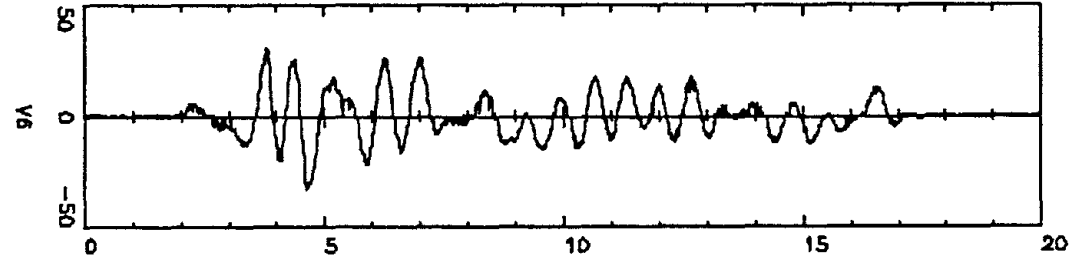
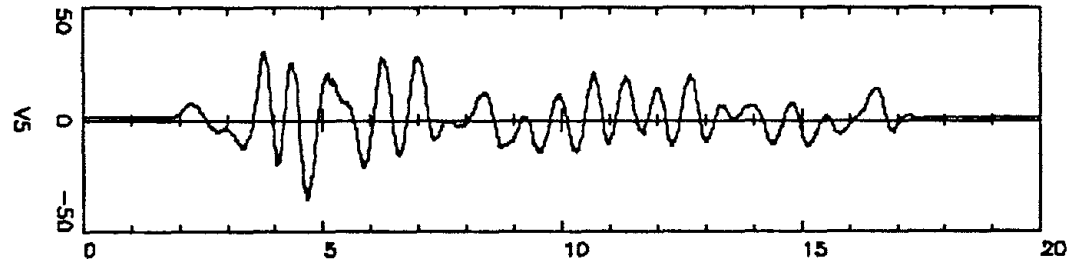
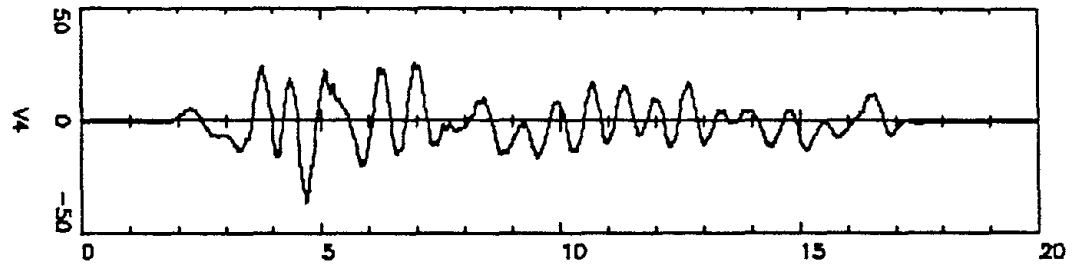
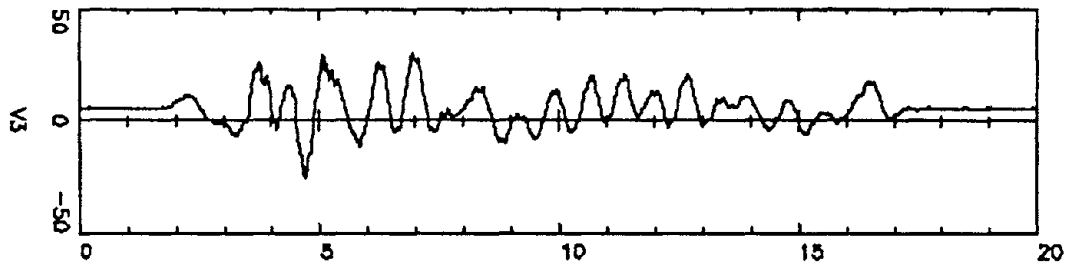
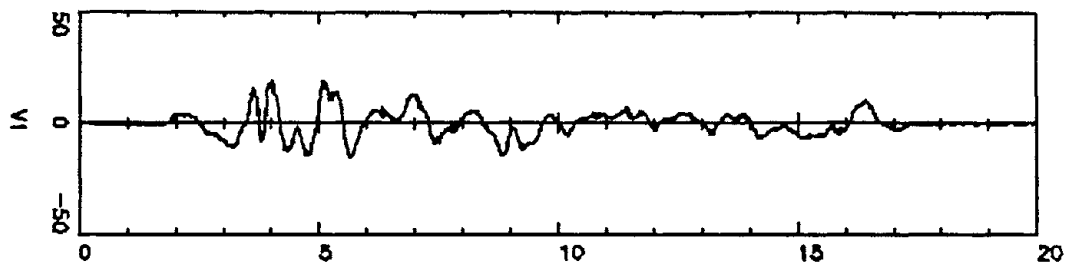
28-SEP-1988 18



V417 SAYED 26-SEP-1988 16:17



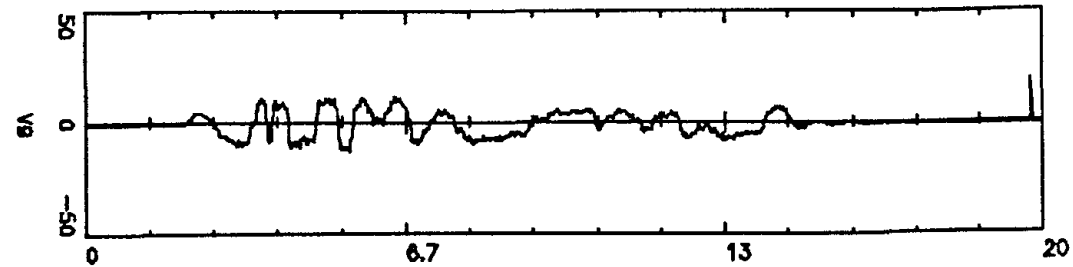
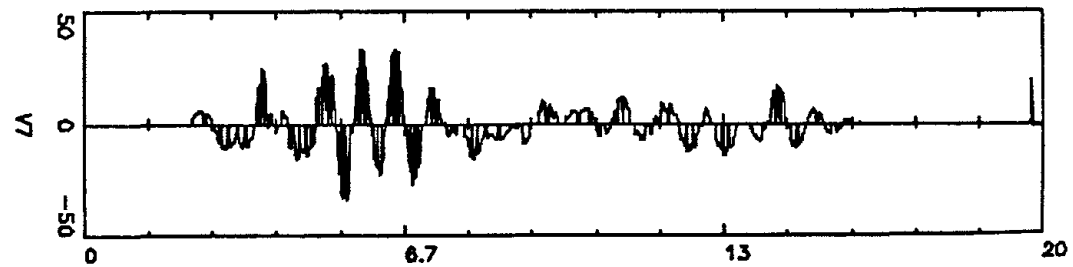
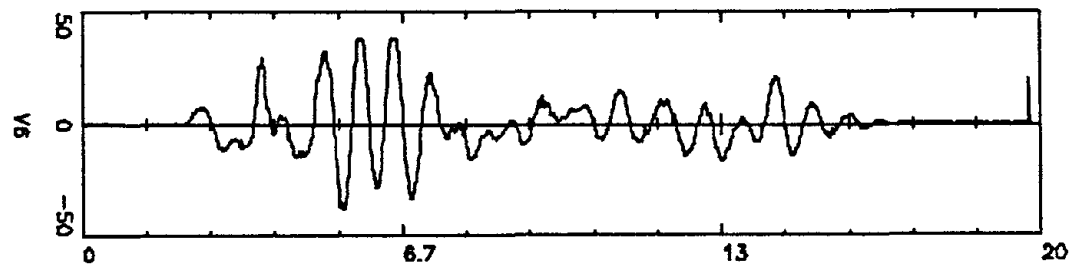
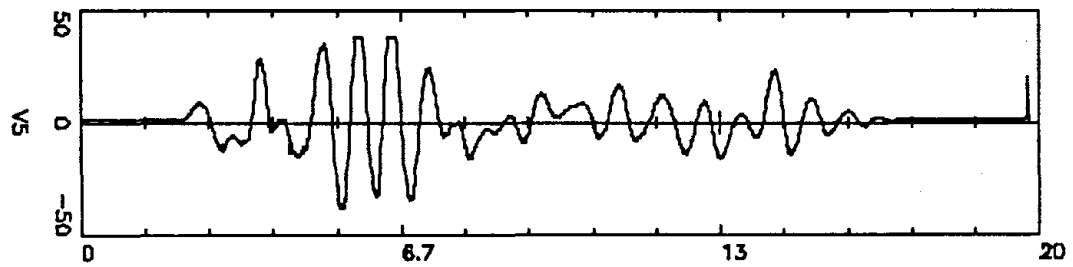
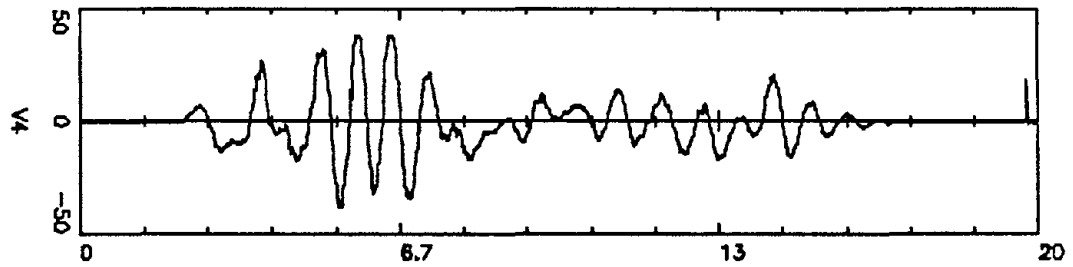
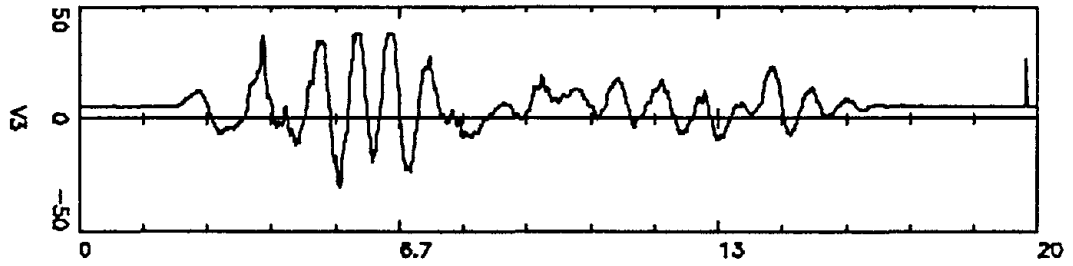
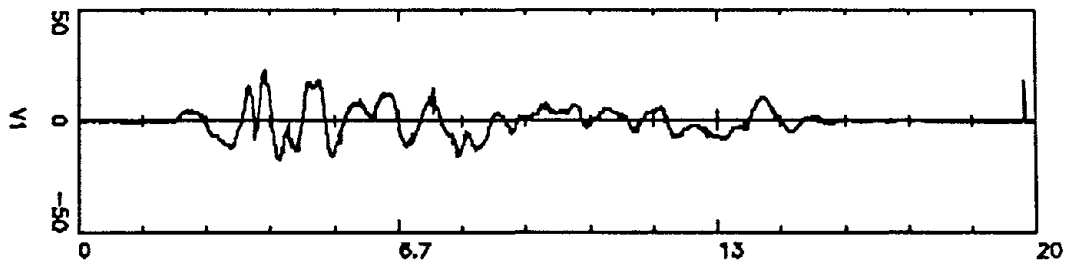
VIA: 11
SAYED
28--SEP--1988 16:1



V1 (1)

V7 (1)

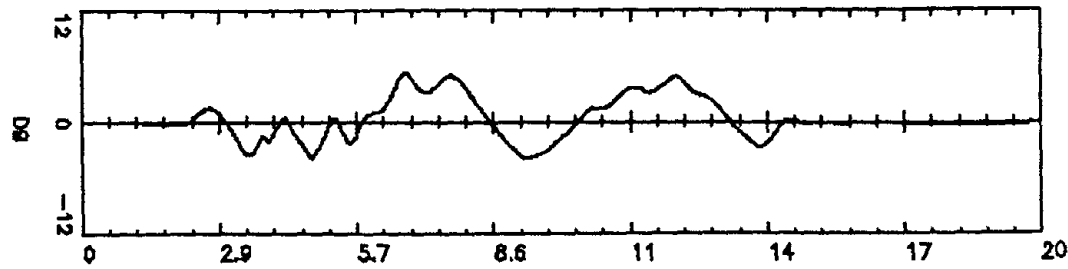
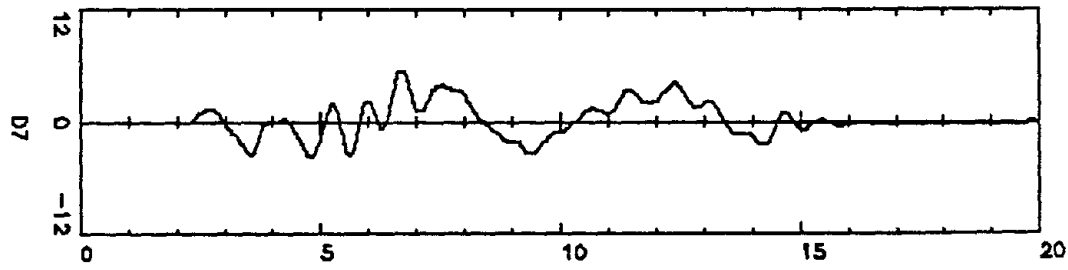
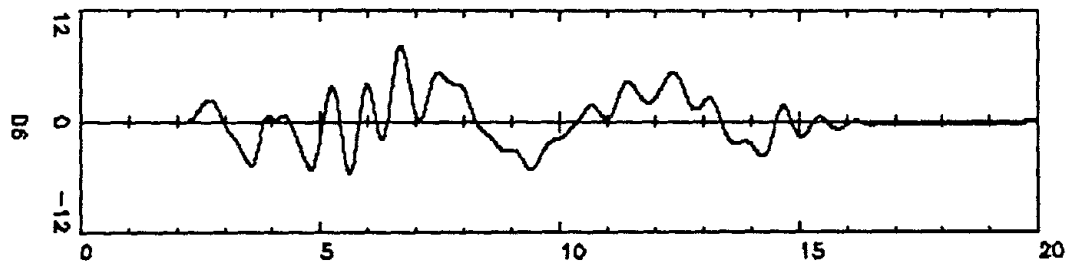
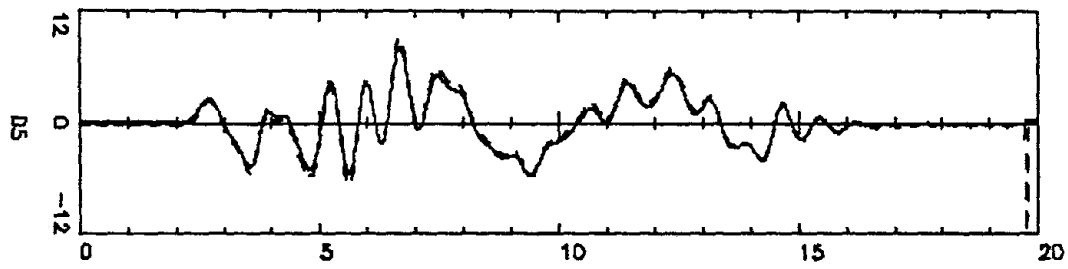
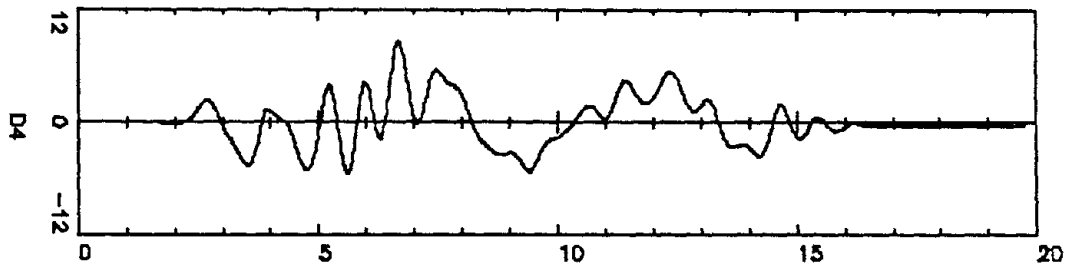
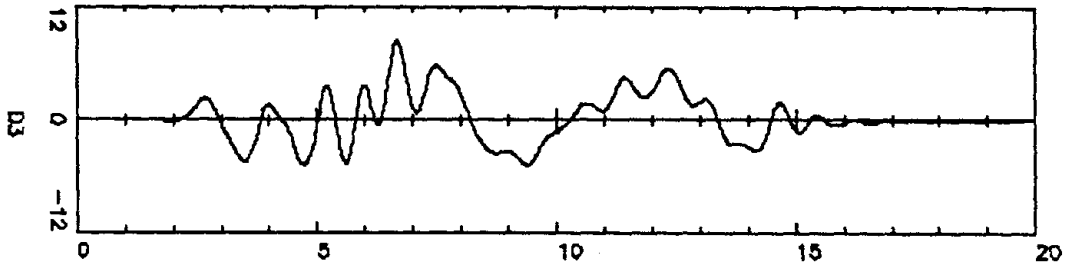
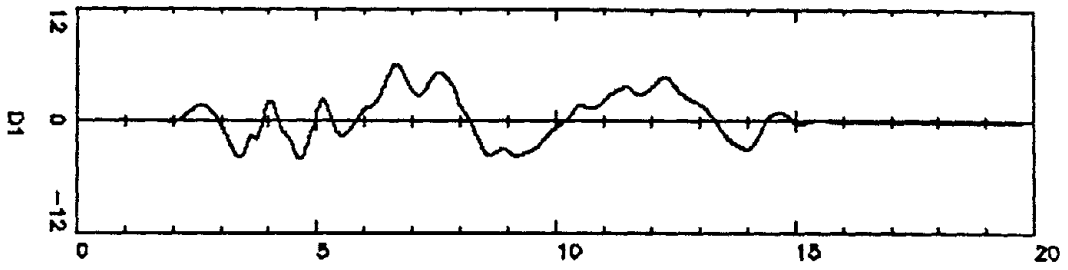
21-SEP-1988 16:50



V1 V3 V4 V5 V6 V7 V8

WALL # 4

DISPLACEMENT TIME HISTORIES



D430

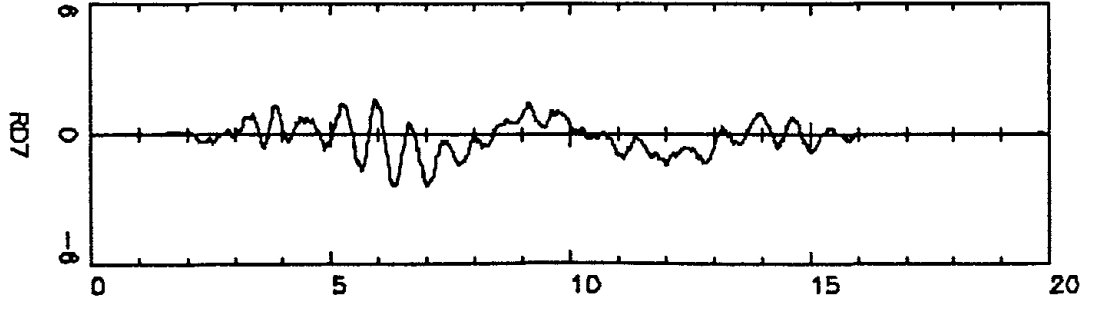
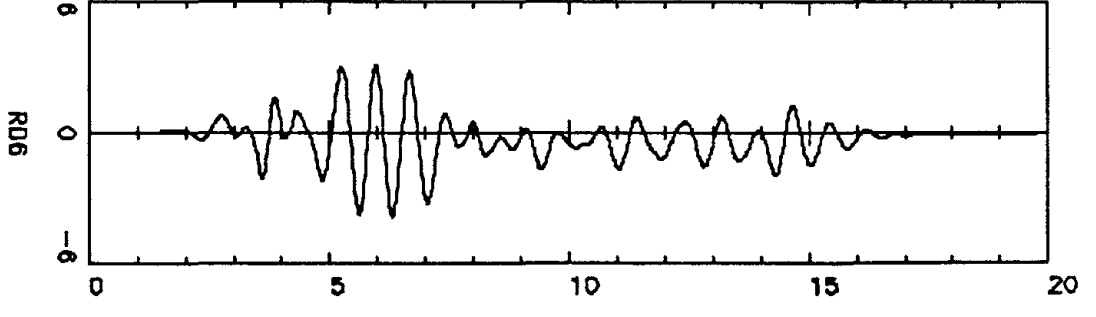
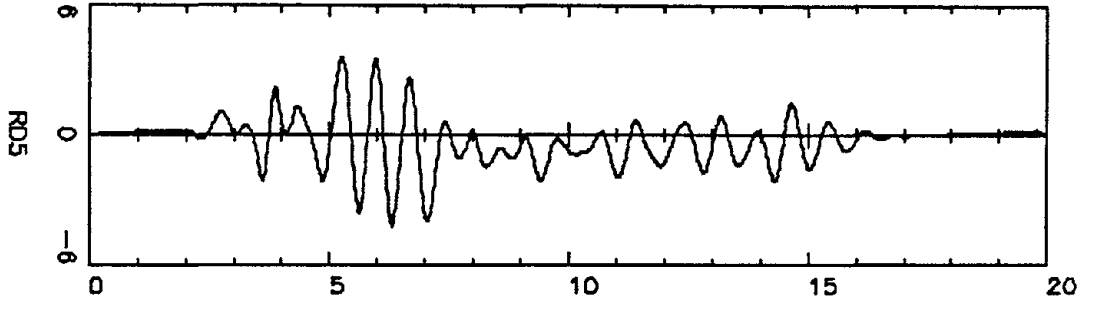
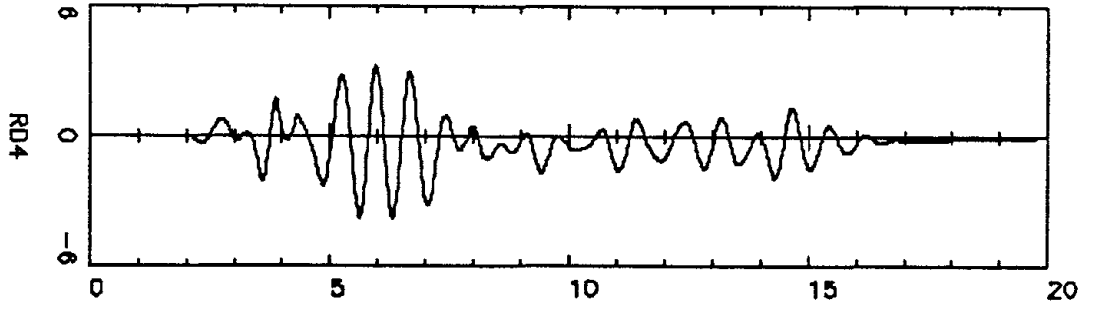
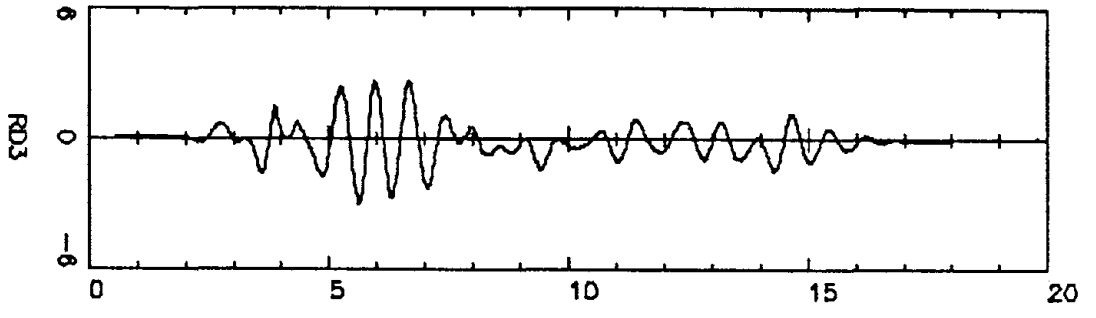
SAVED

Z7-SEP-1988 16:11

D10

WALL # 4

RELATIVE DISPLACEMENT TIME HISTORIES

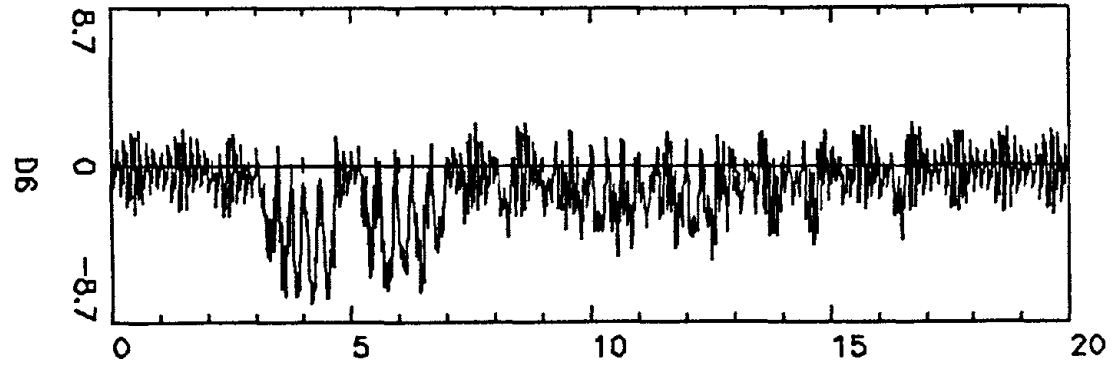
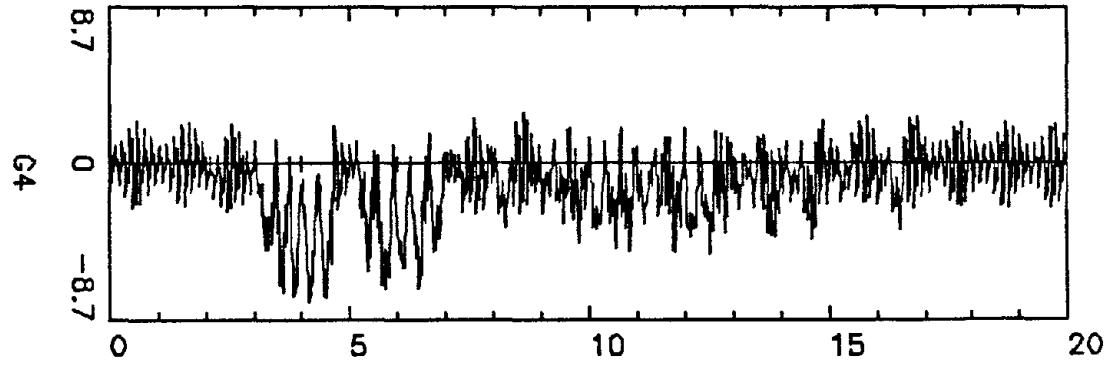
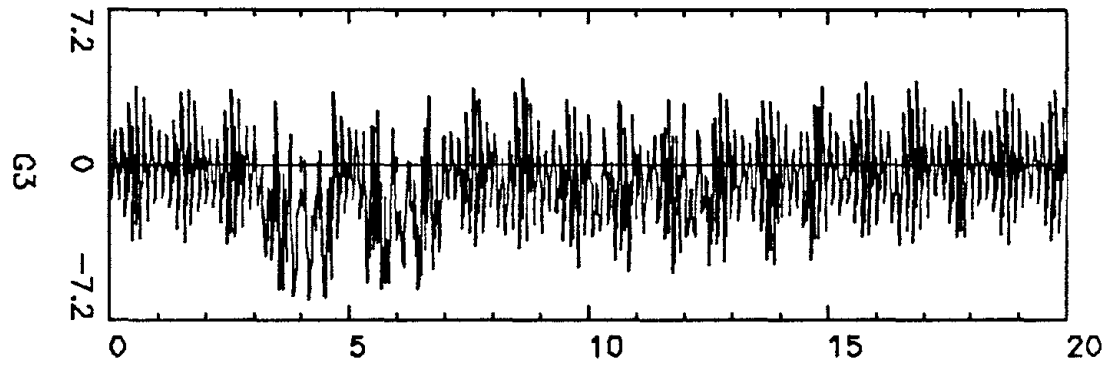
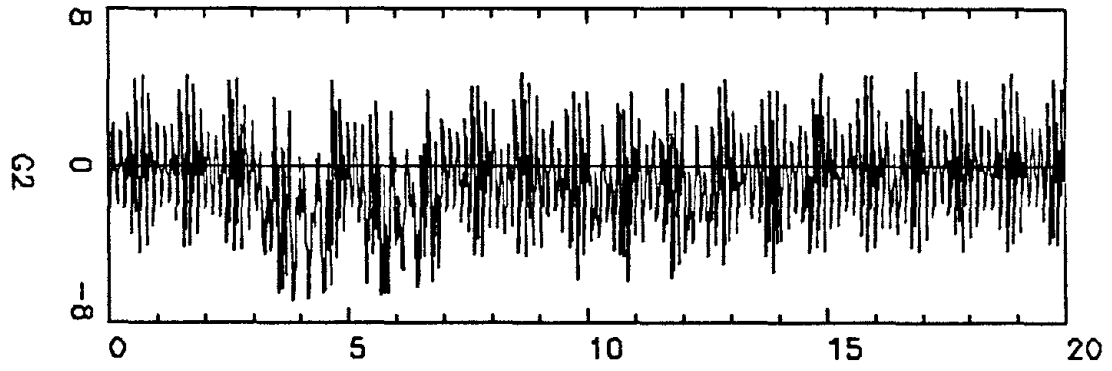
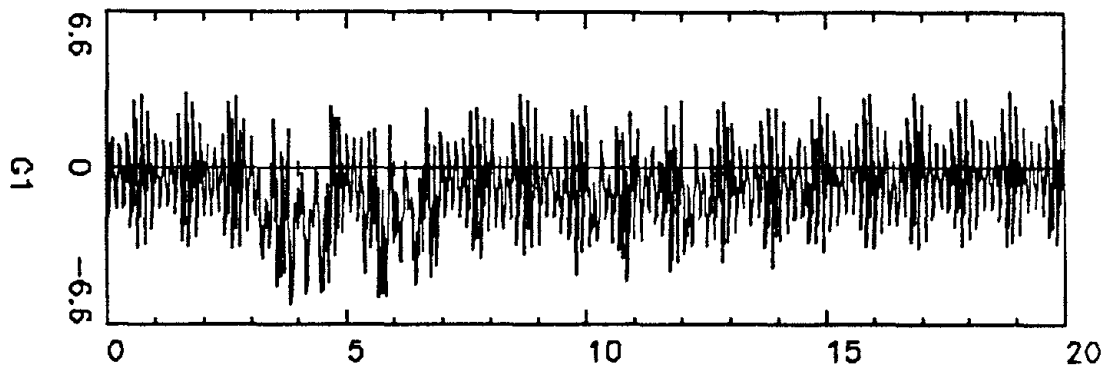


7-12-10 10:07

012

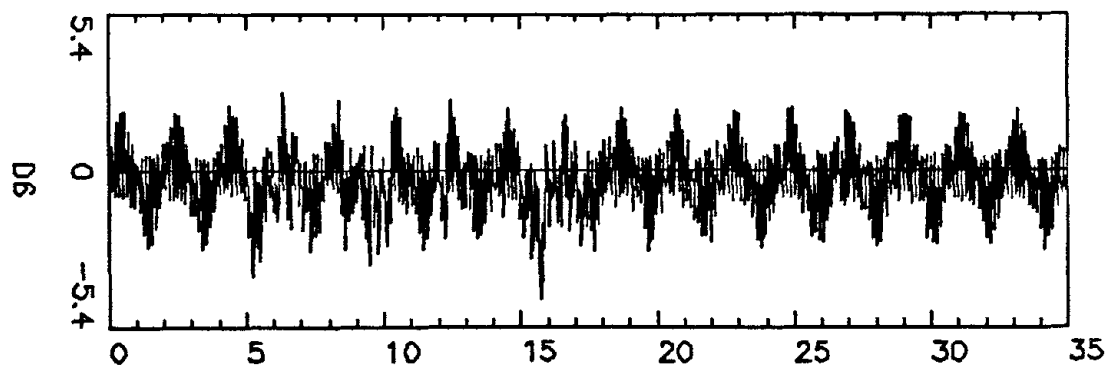
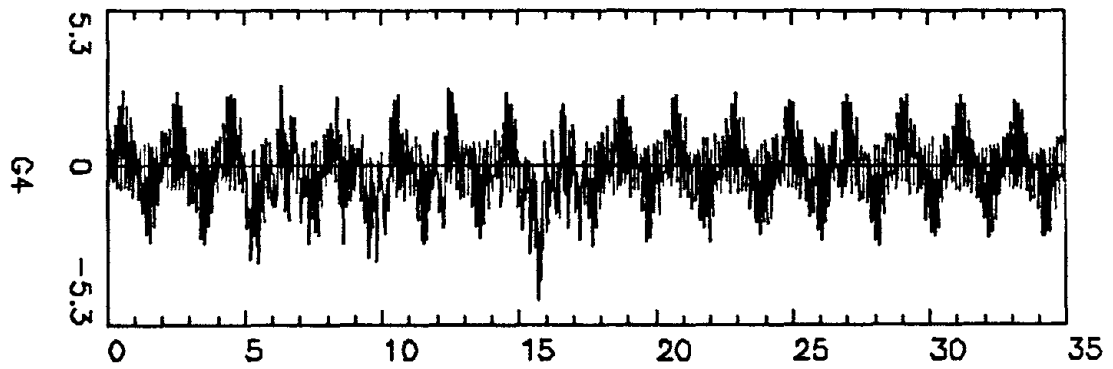
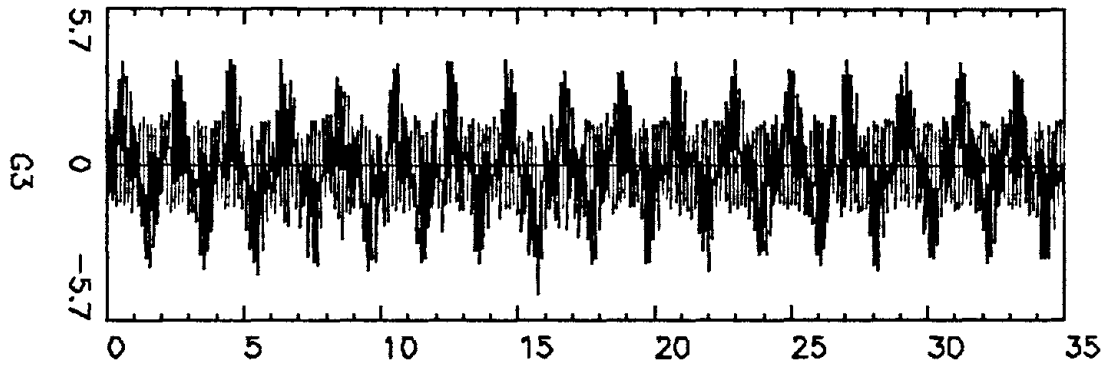
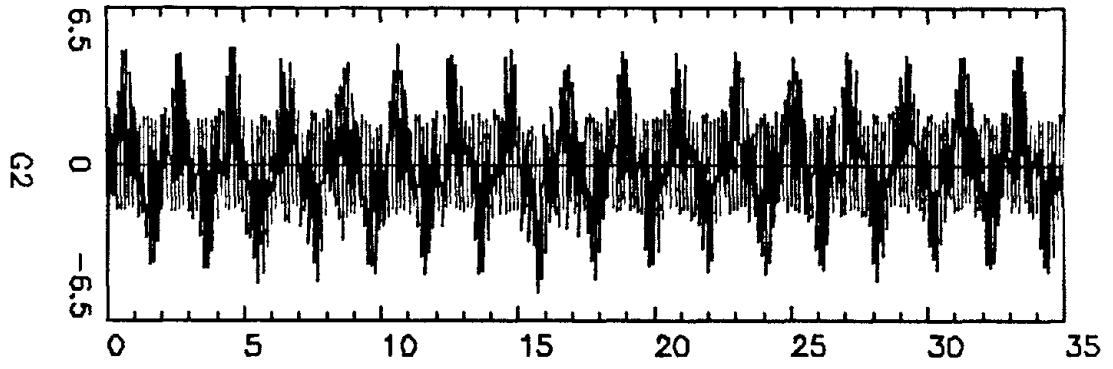
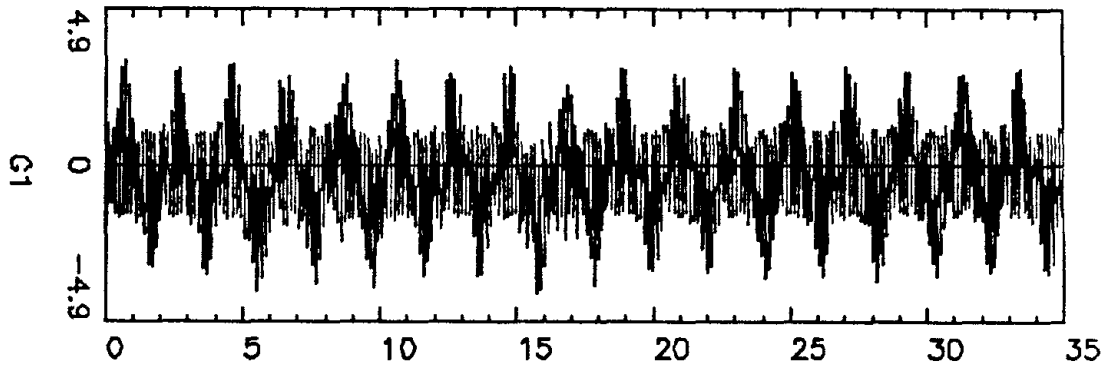
WALL # 4

REINFORCEMENT STRAIN TIME HISTORIES



G415 SAYED 26-SEP-1988 18:51

214

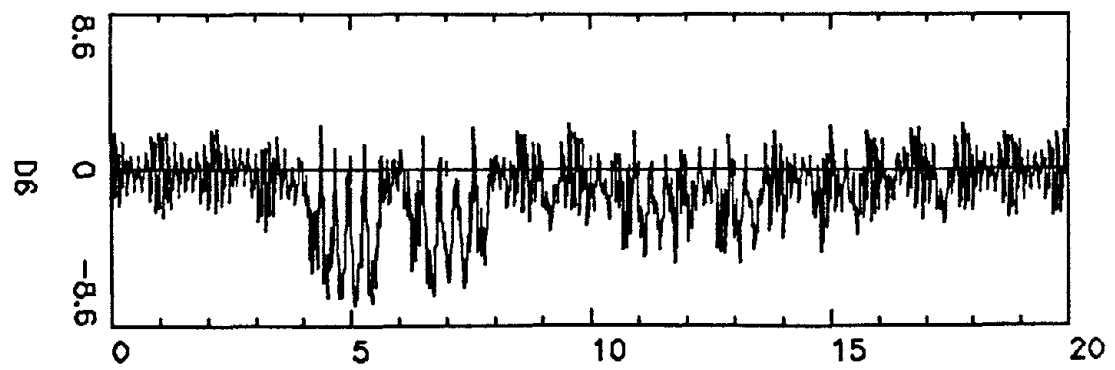
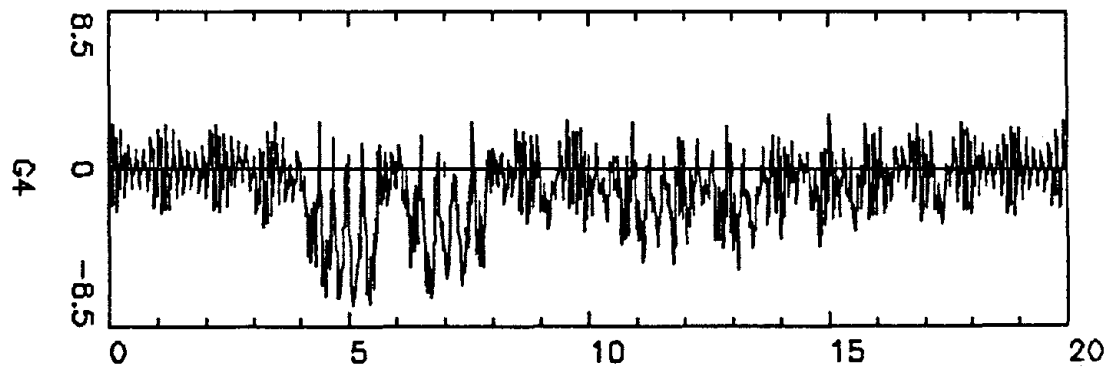
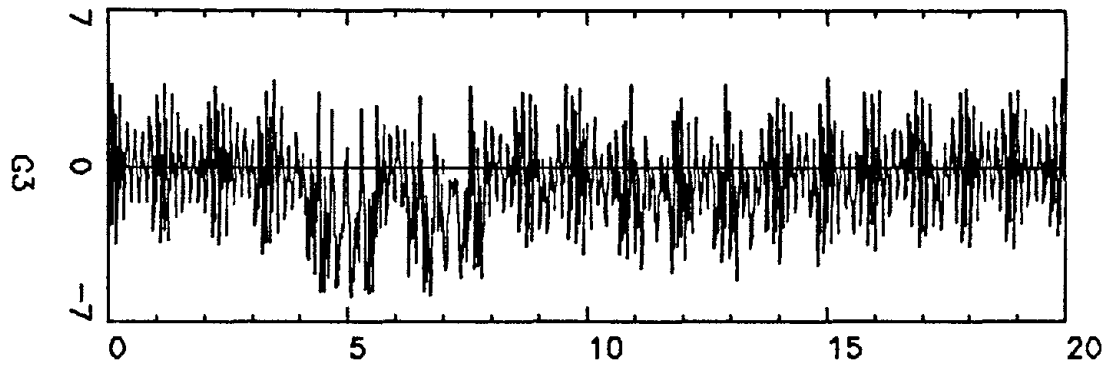
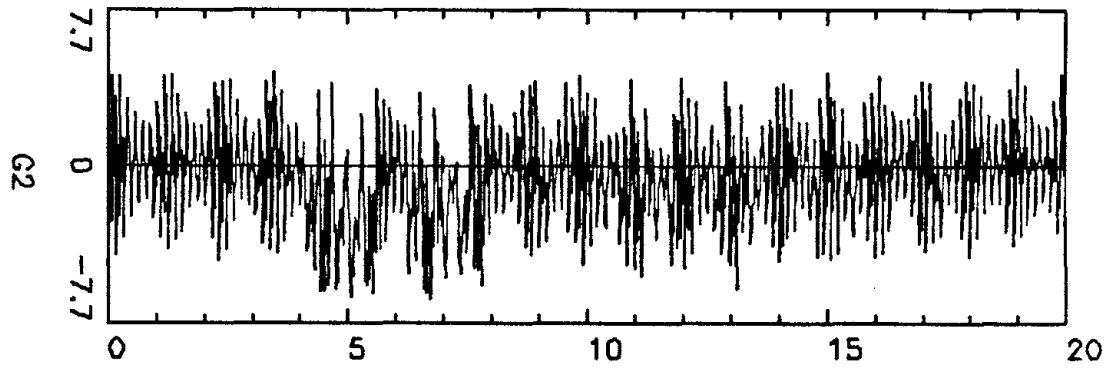
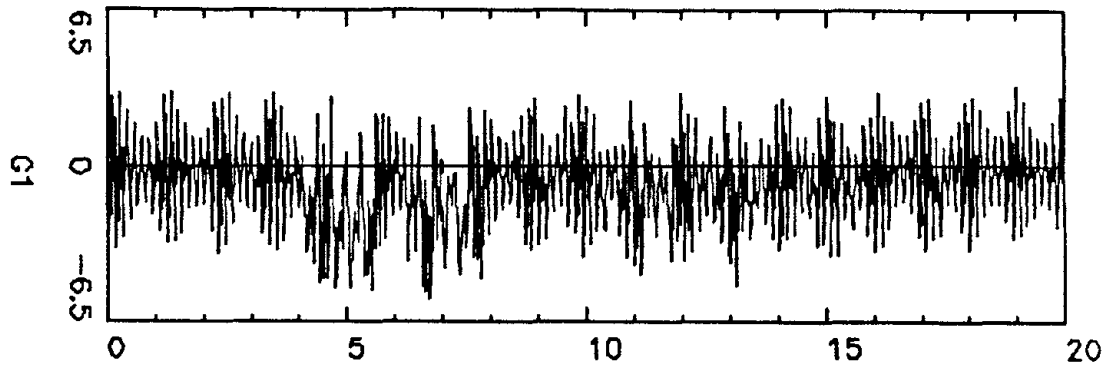


G416

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26-SEP-1988 17:1

D15

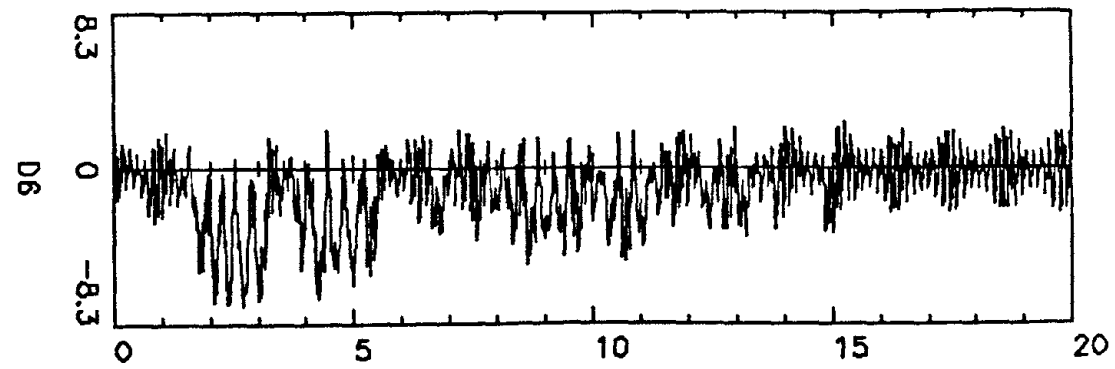
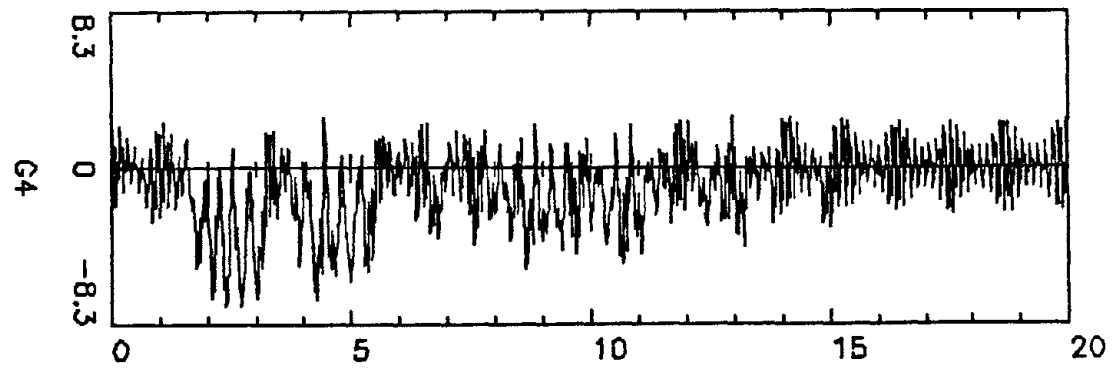
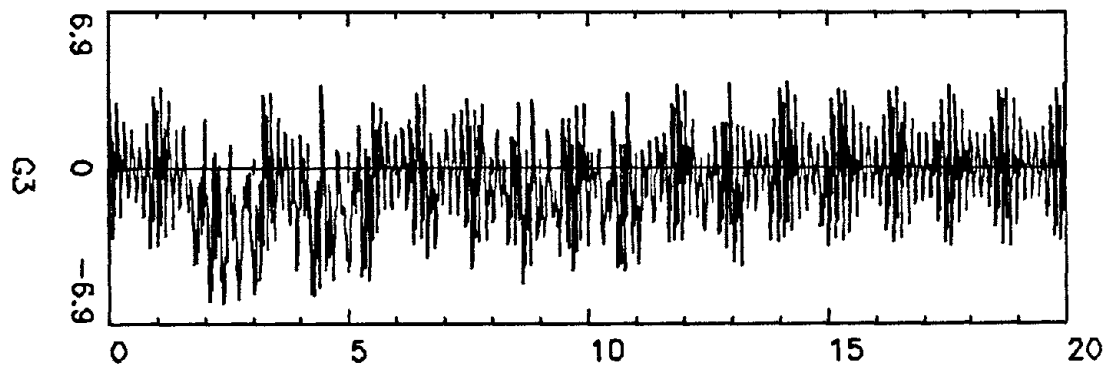
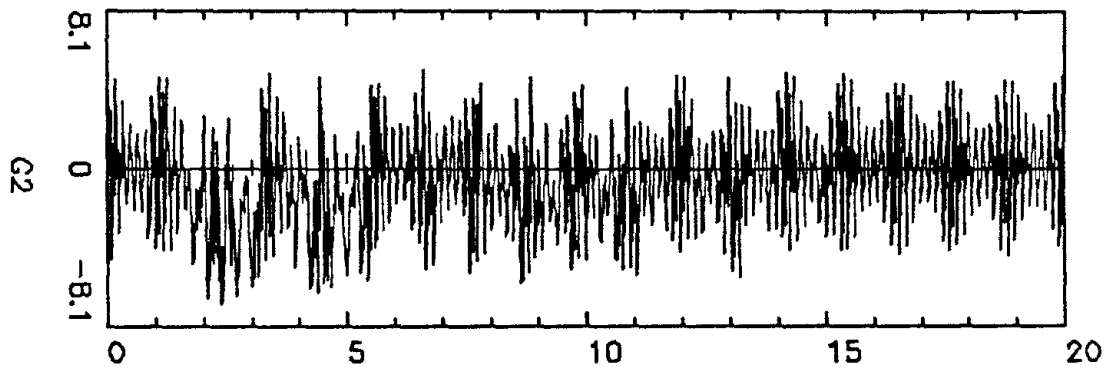
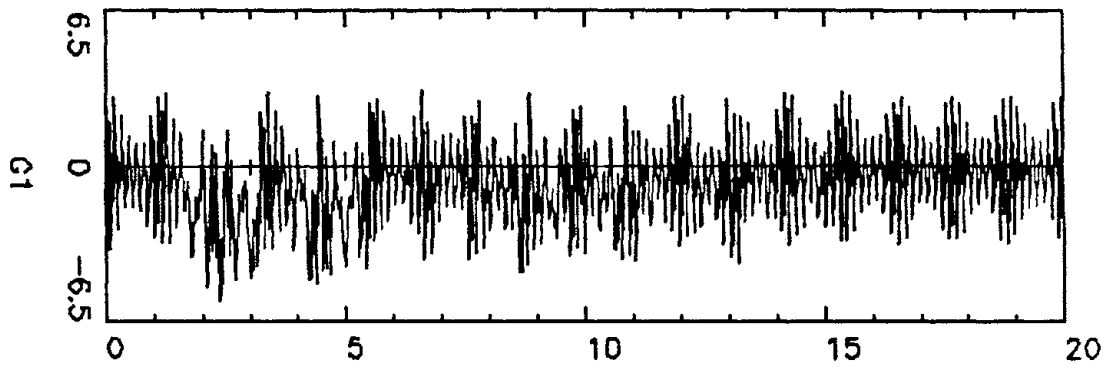


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26-SEP-1988 16:

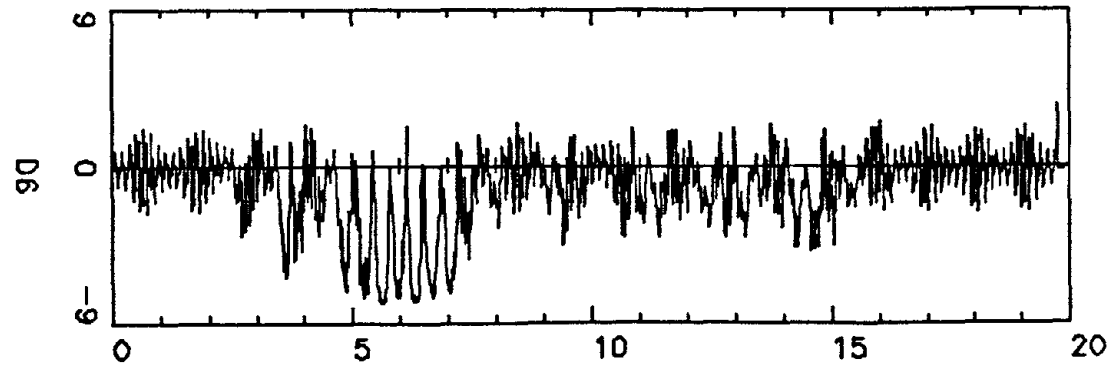
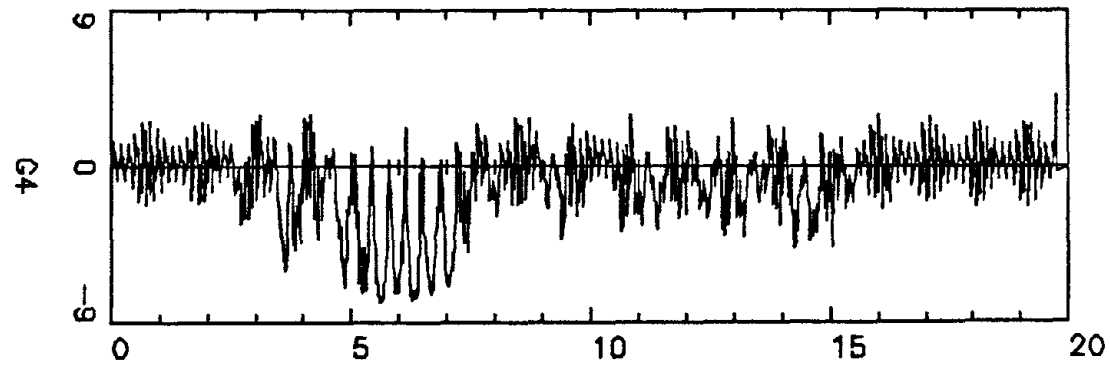
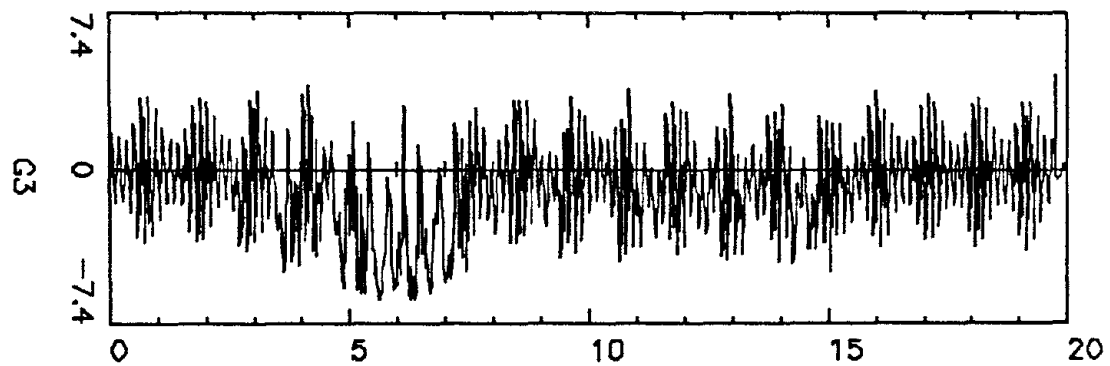
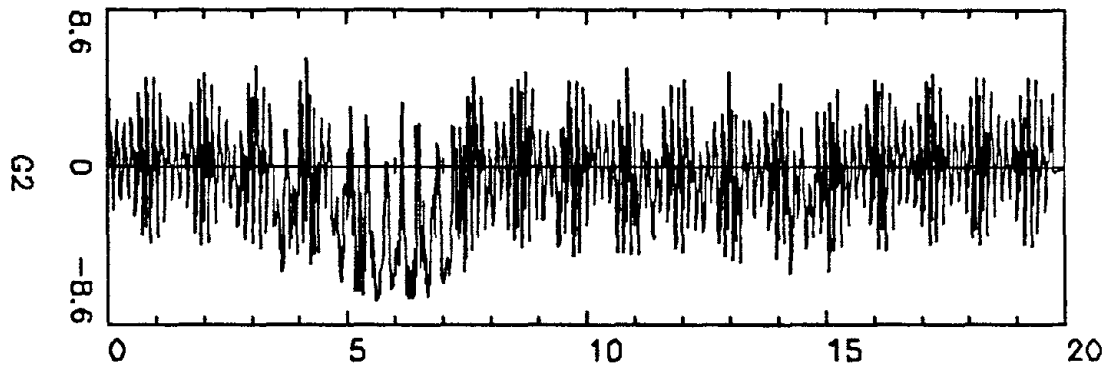
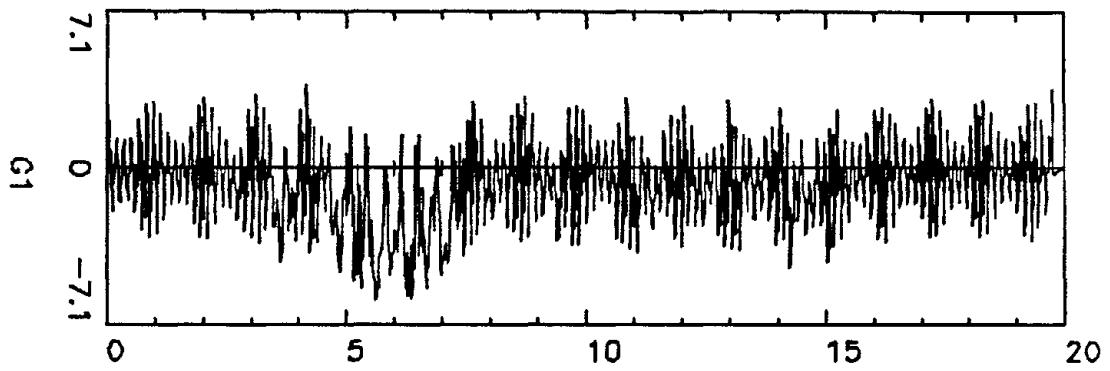
D16



G420

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26-SEP-1988 16:14



G430

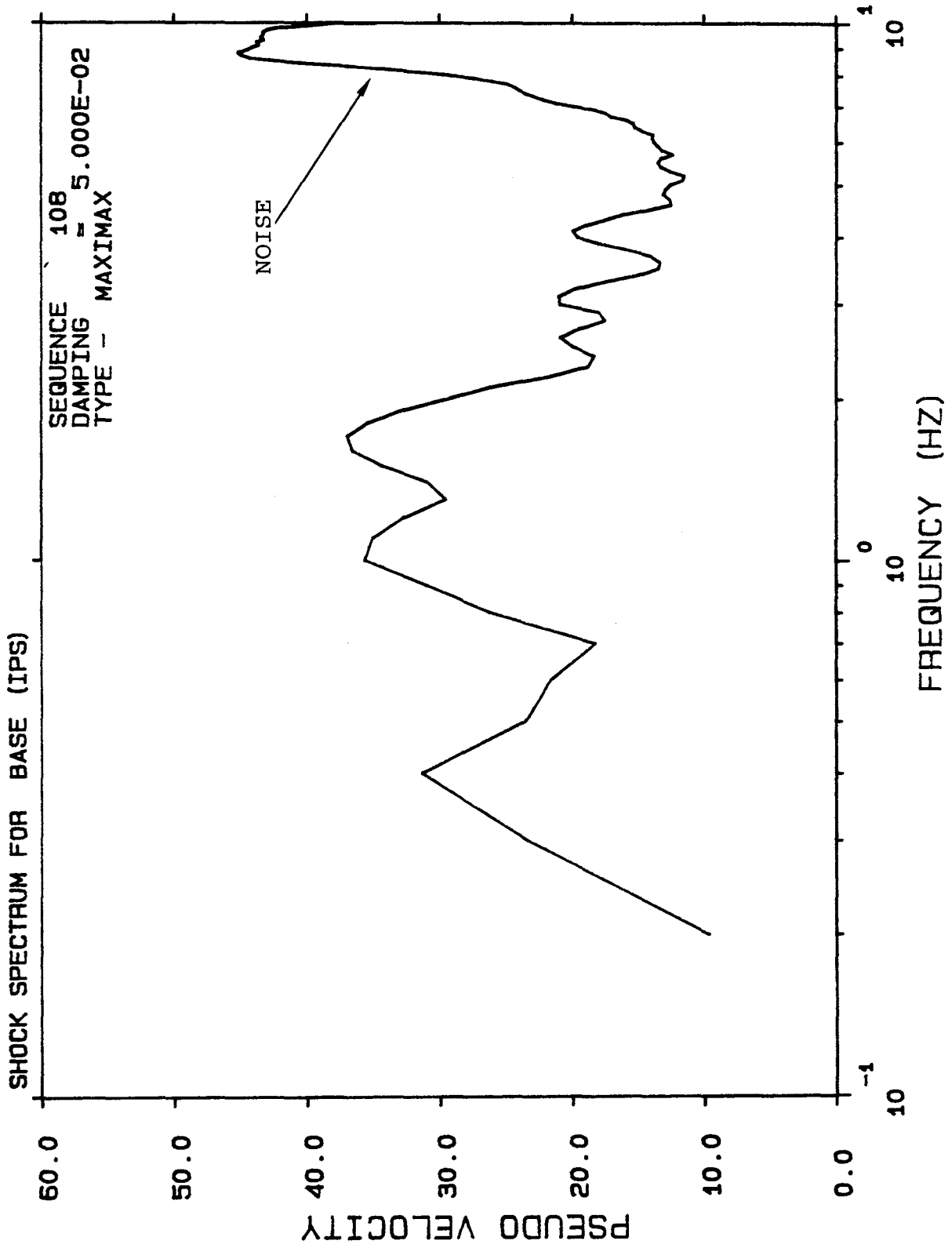
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28-SEP-1988 16:38

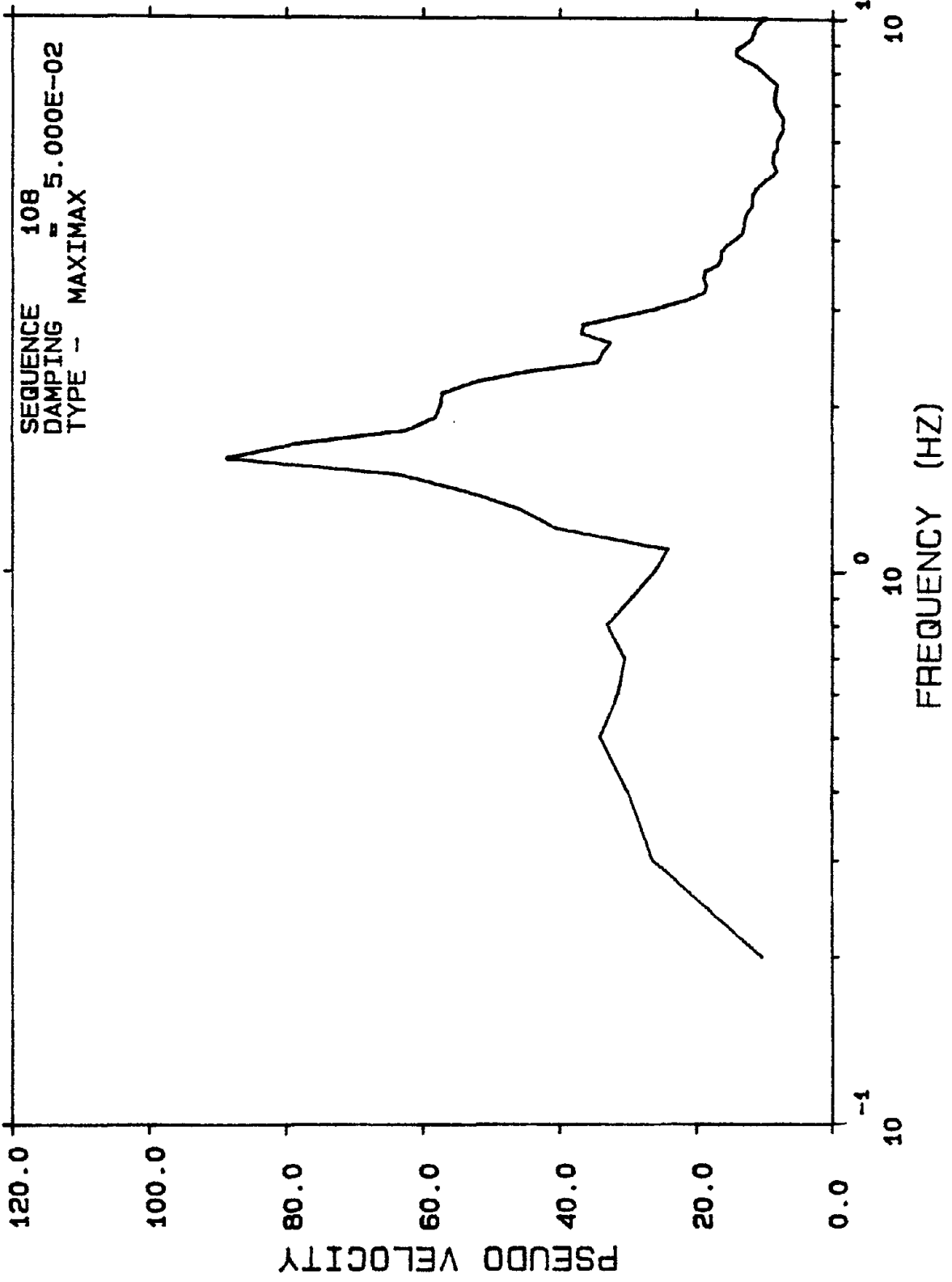
D19

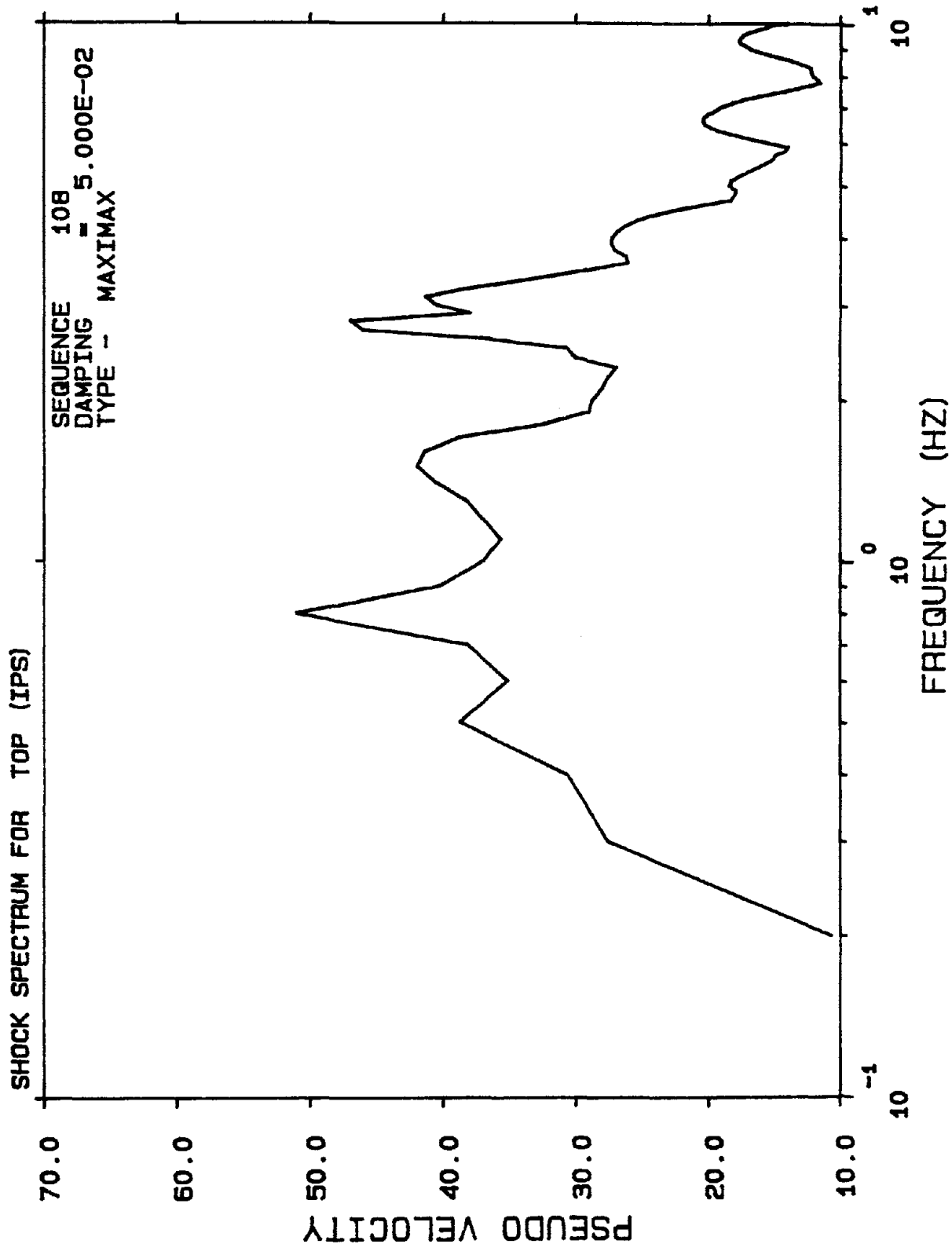
APPENDIX E

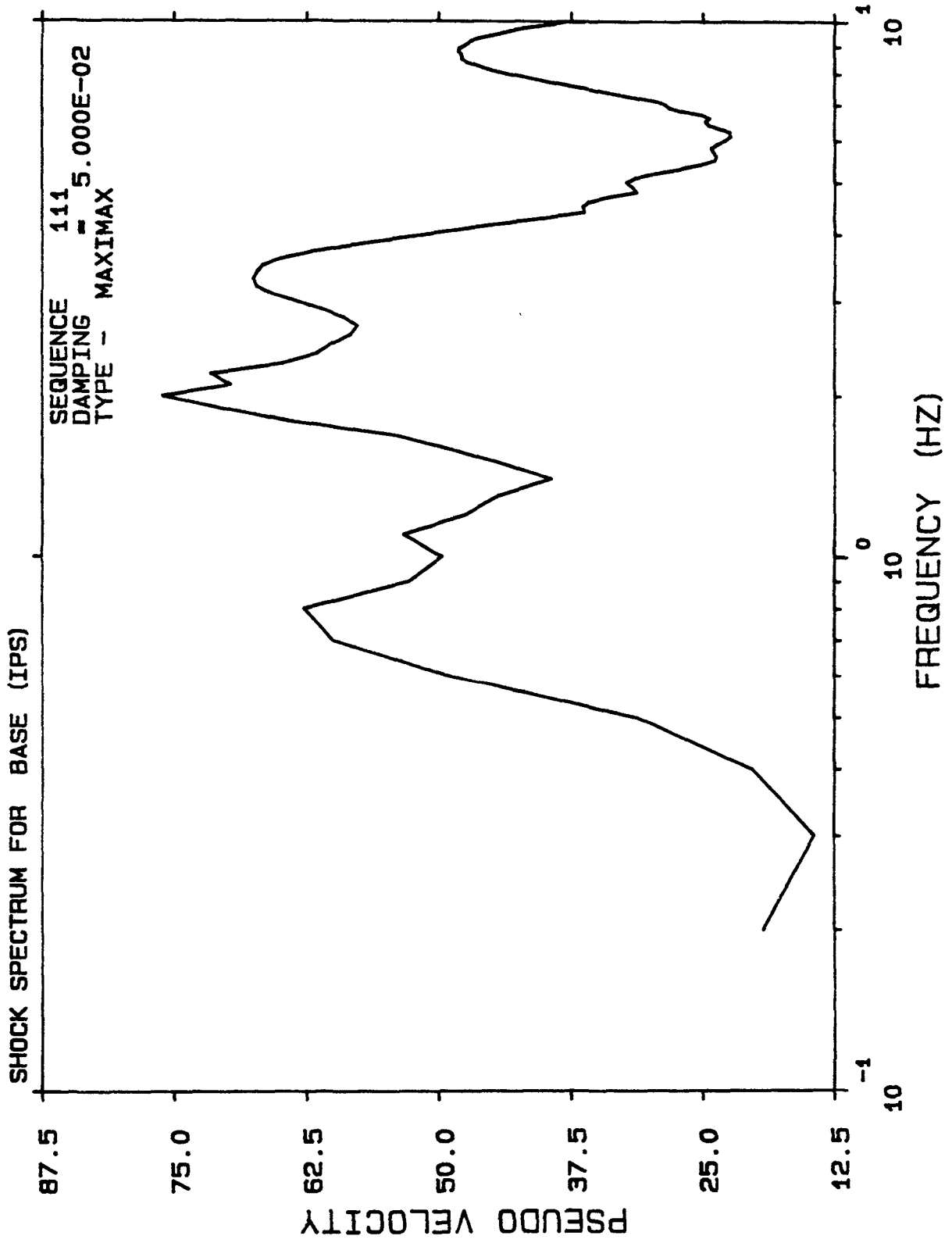
WALL PANEL RESPONSE SPECTRA



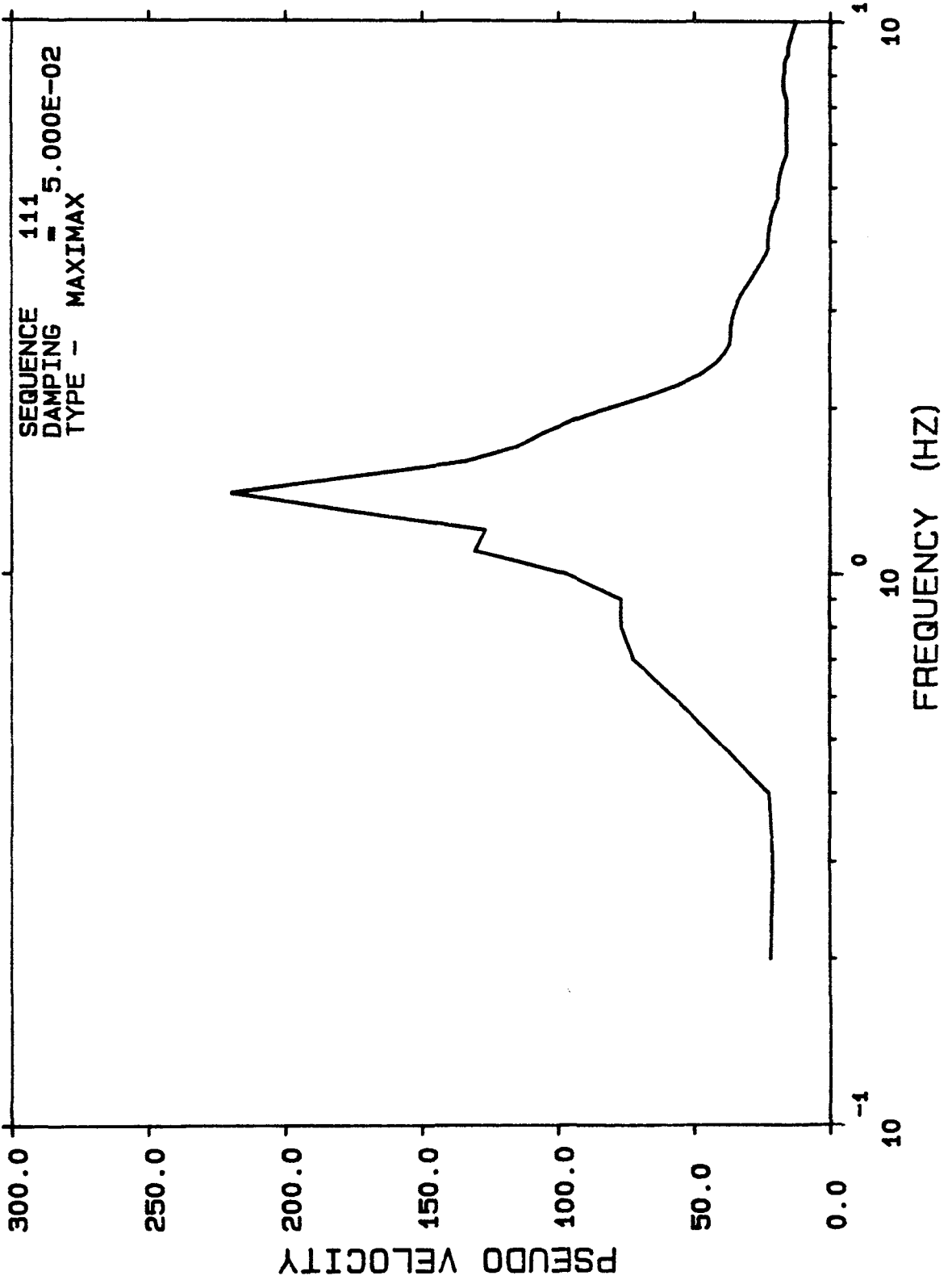
SHOCK SPECTRUM FOR MIDHGT (IPS)



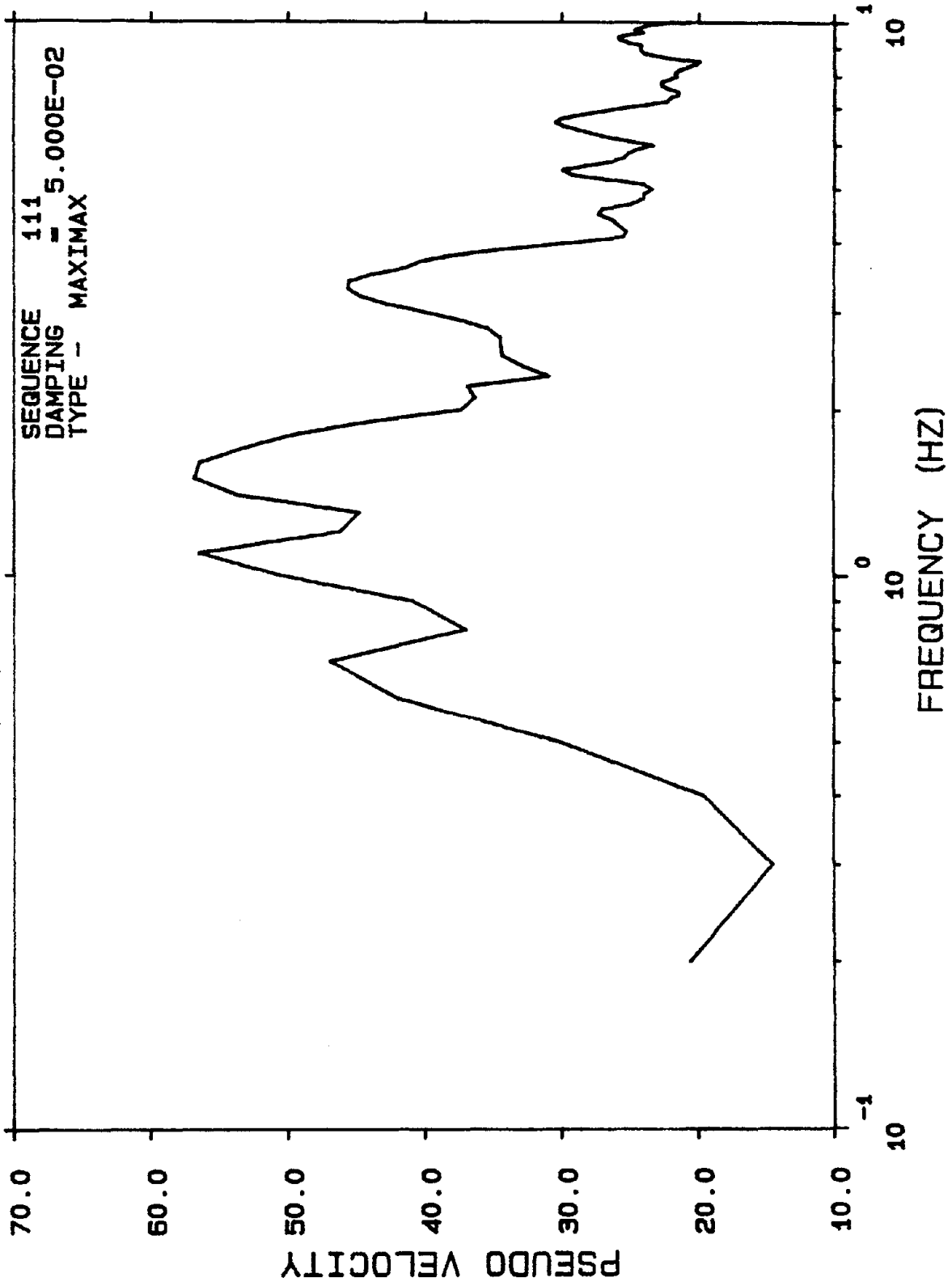


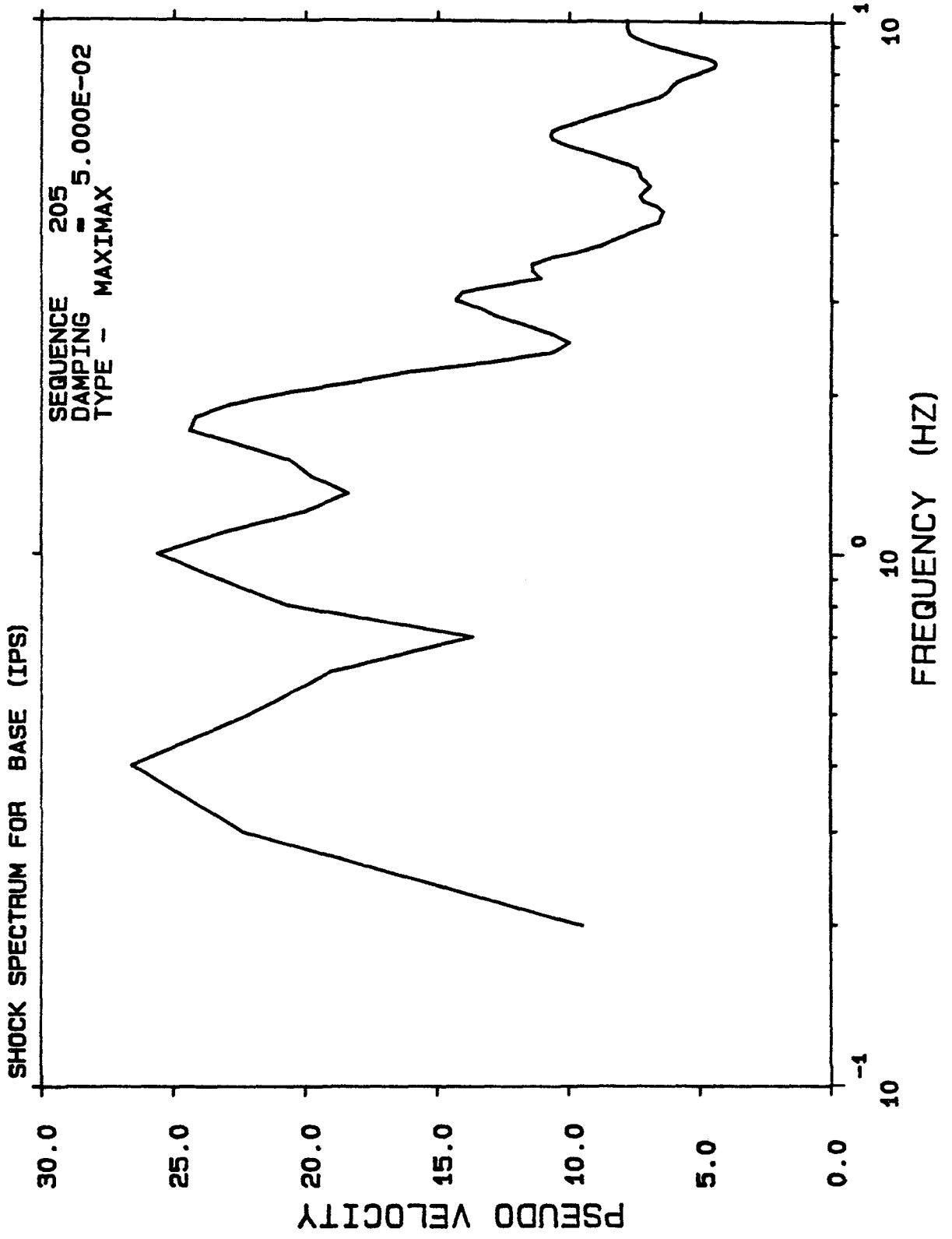


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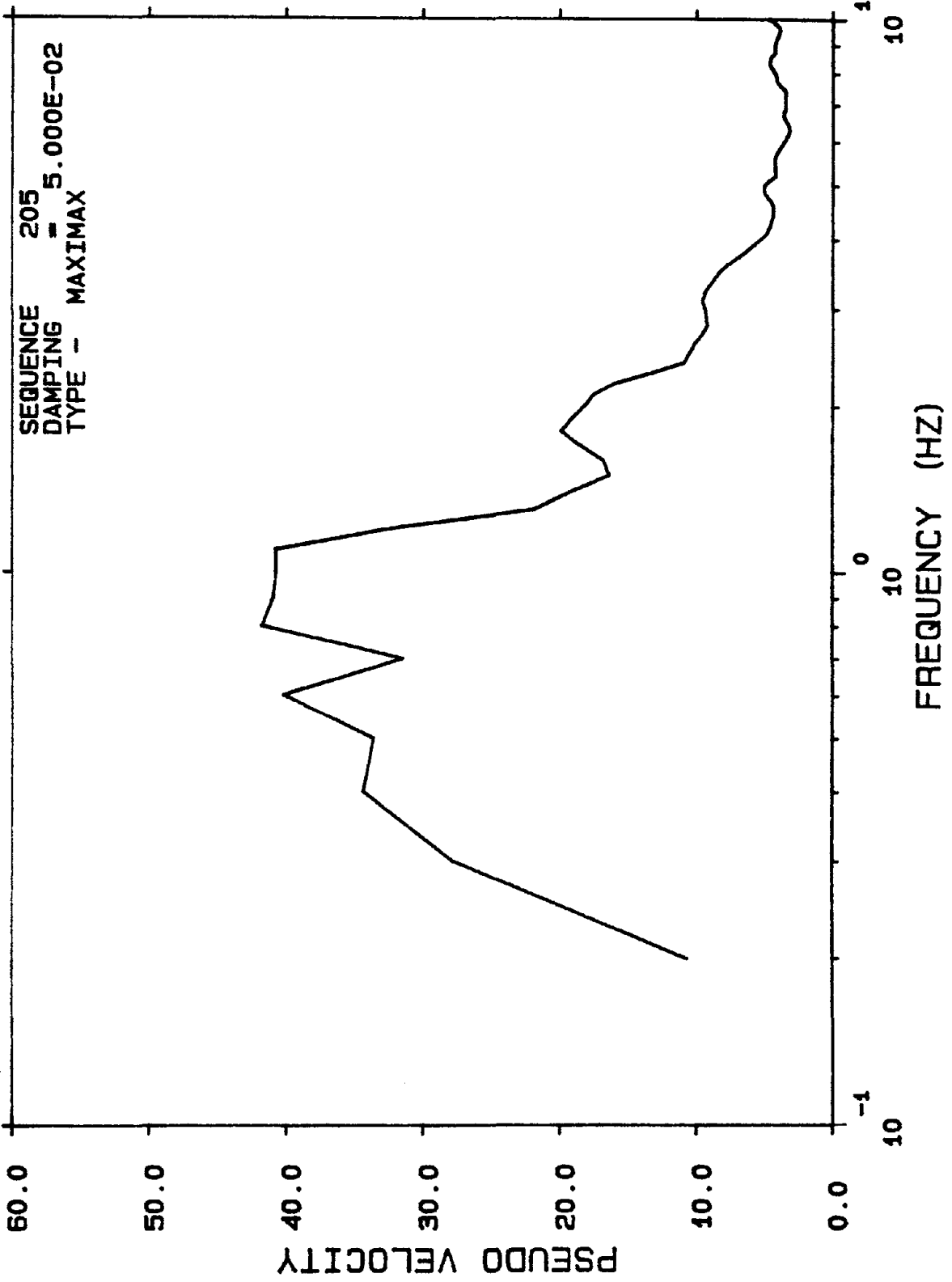


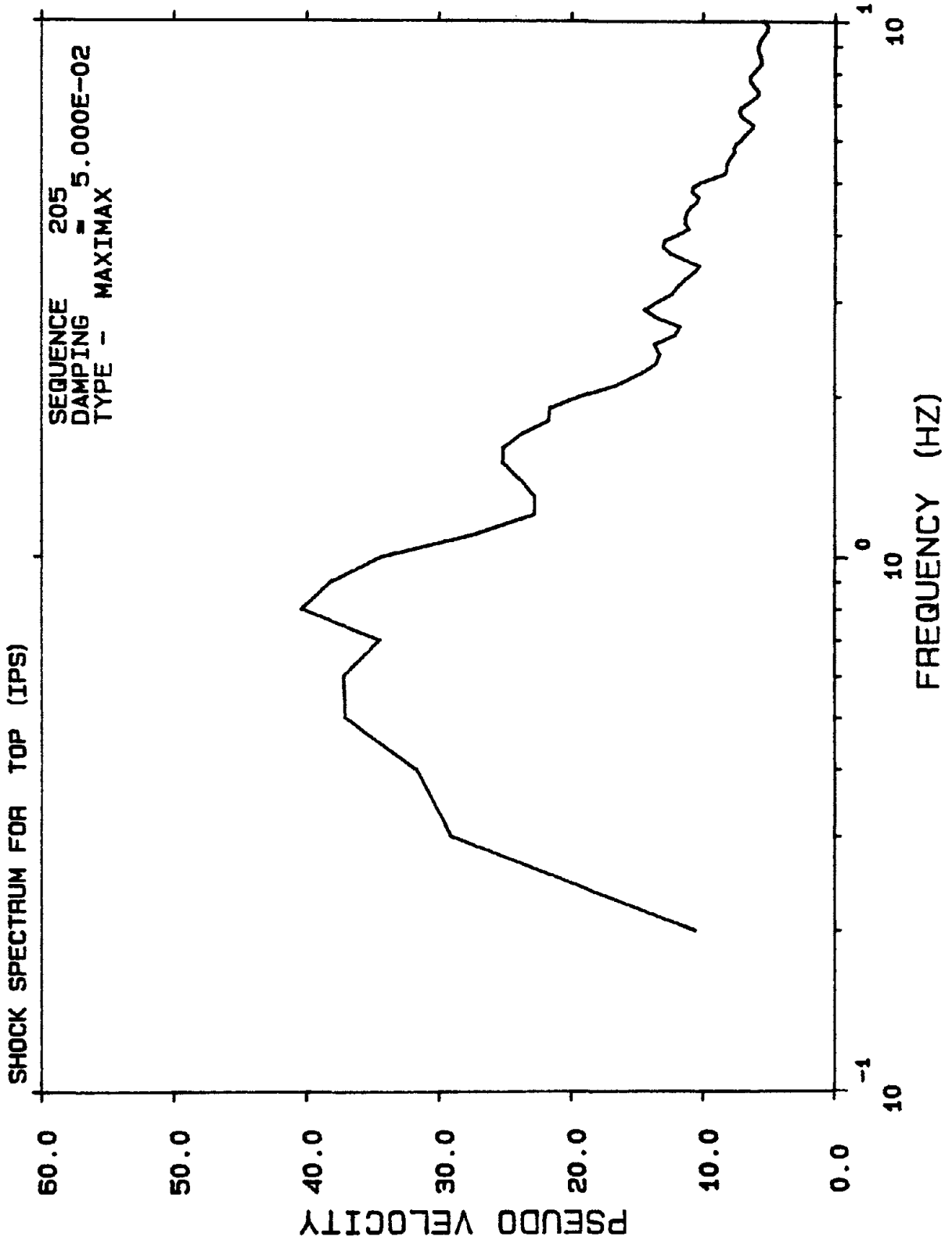
SHOCK SPECTRUM FOR TOP (IPS)

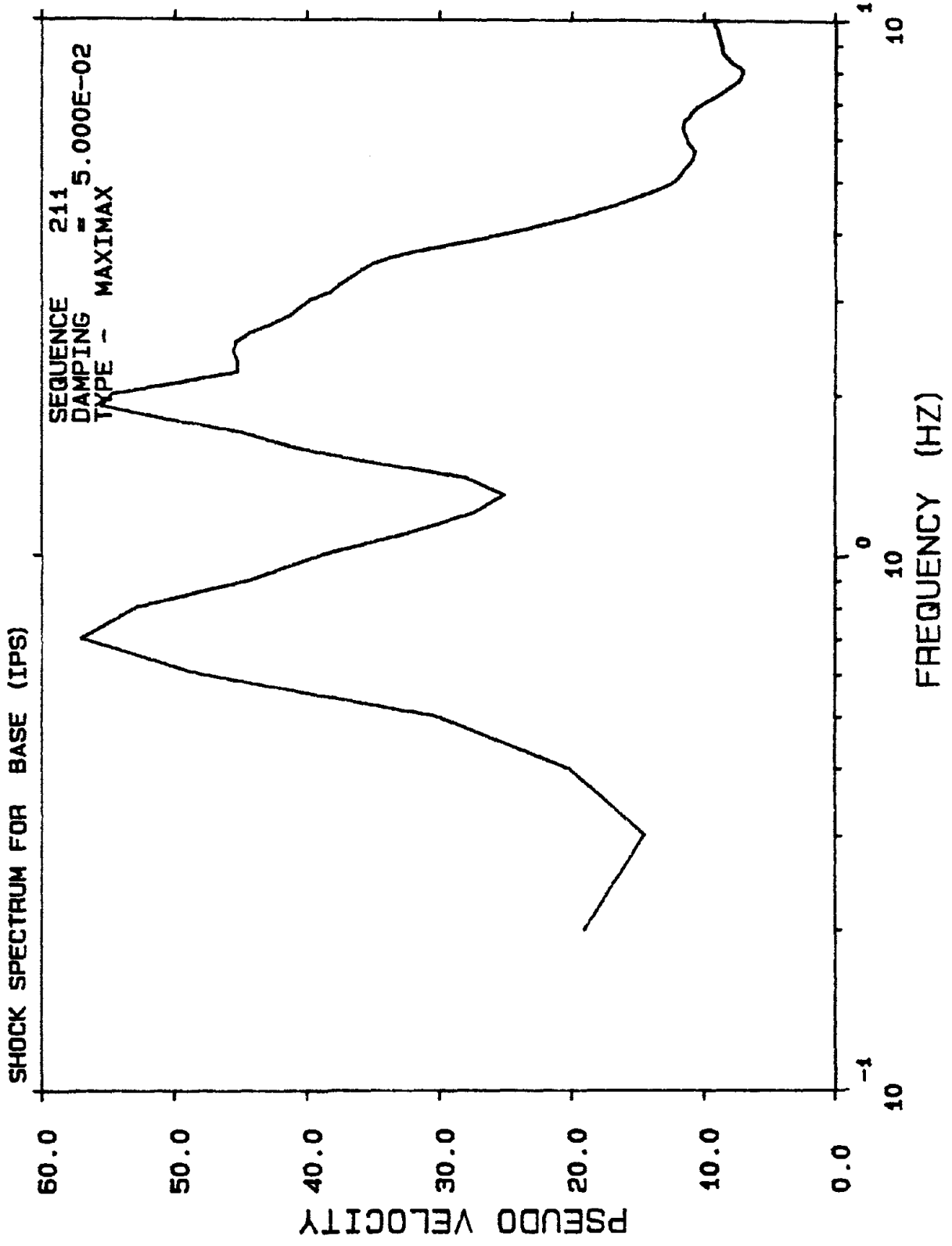




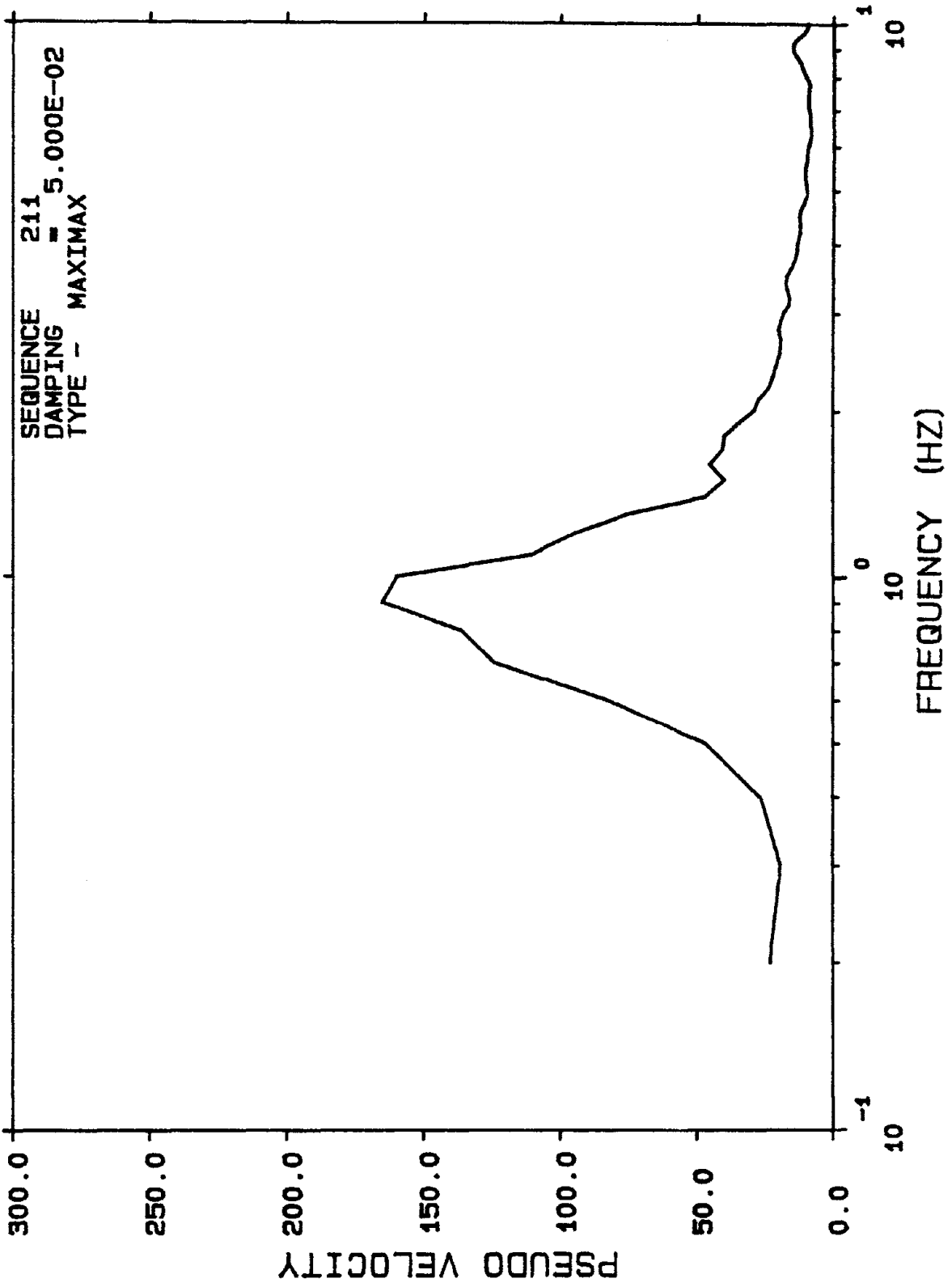
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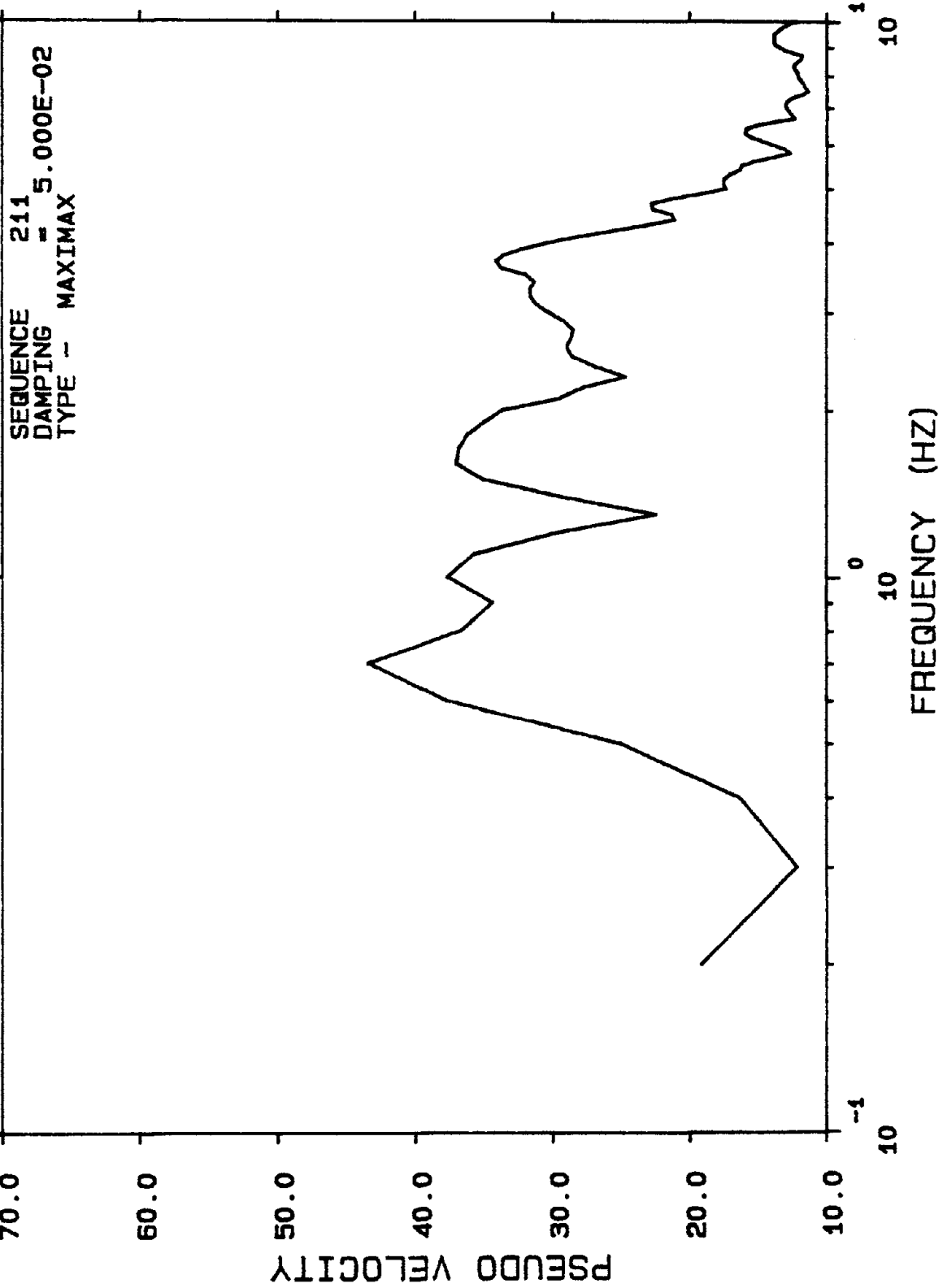




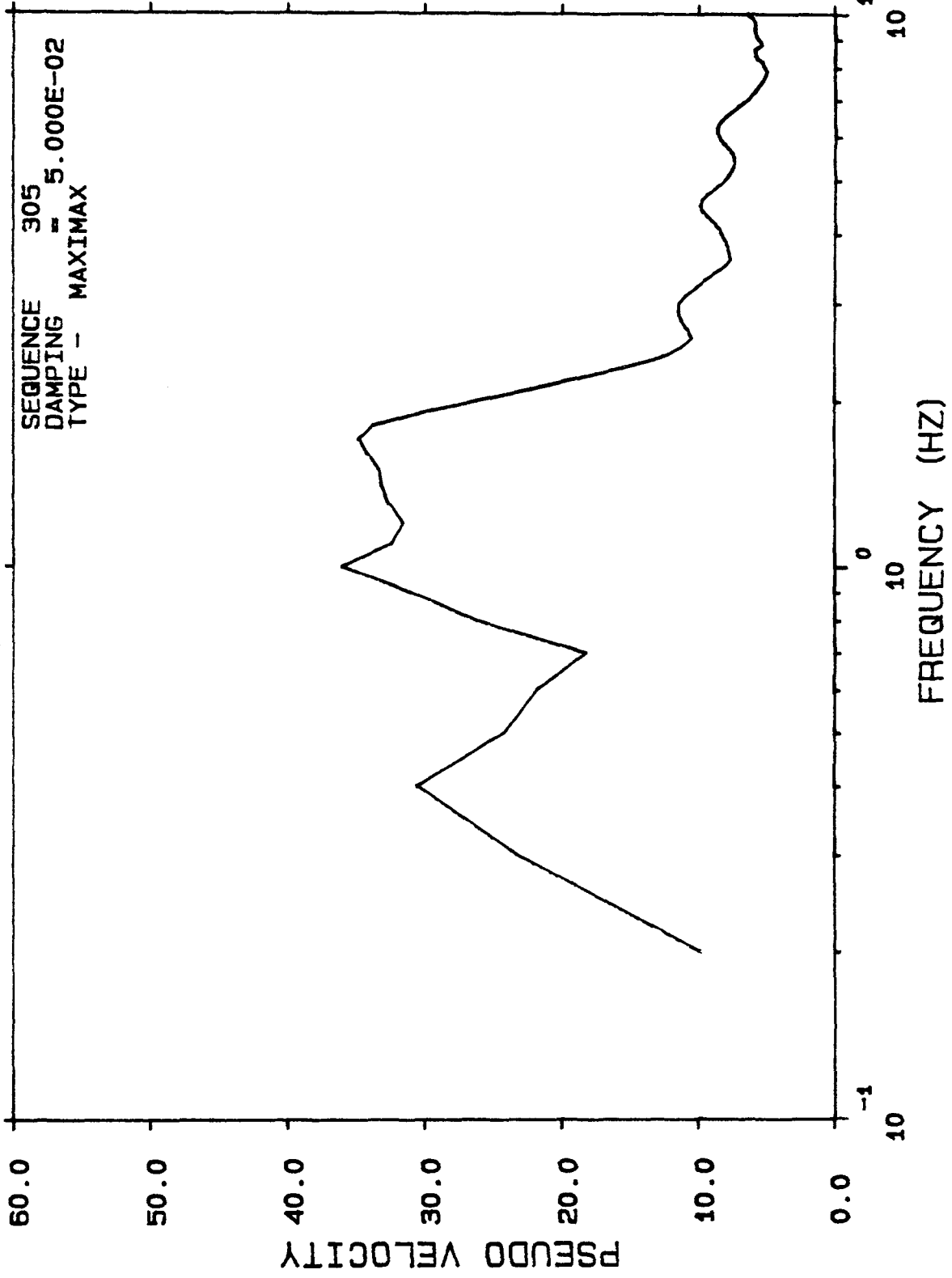
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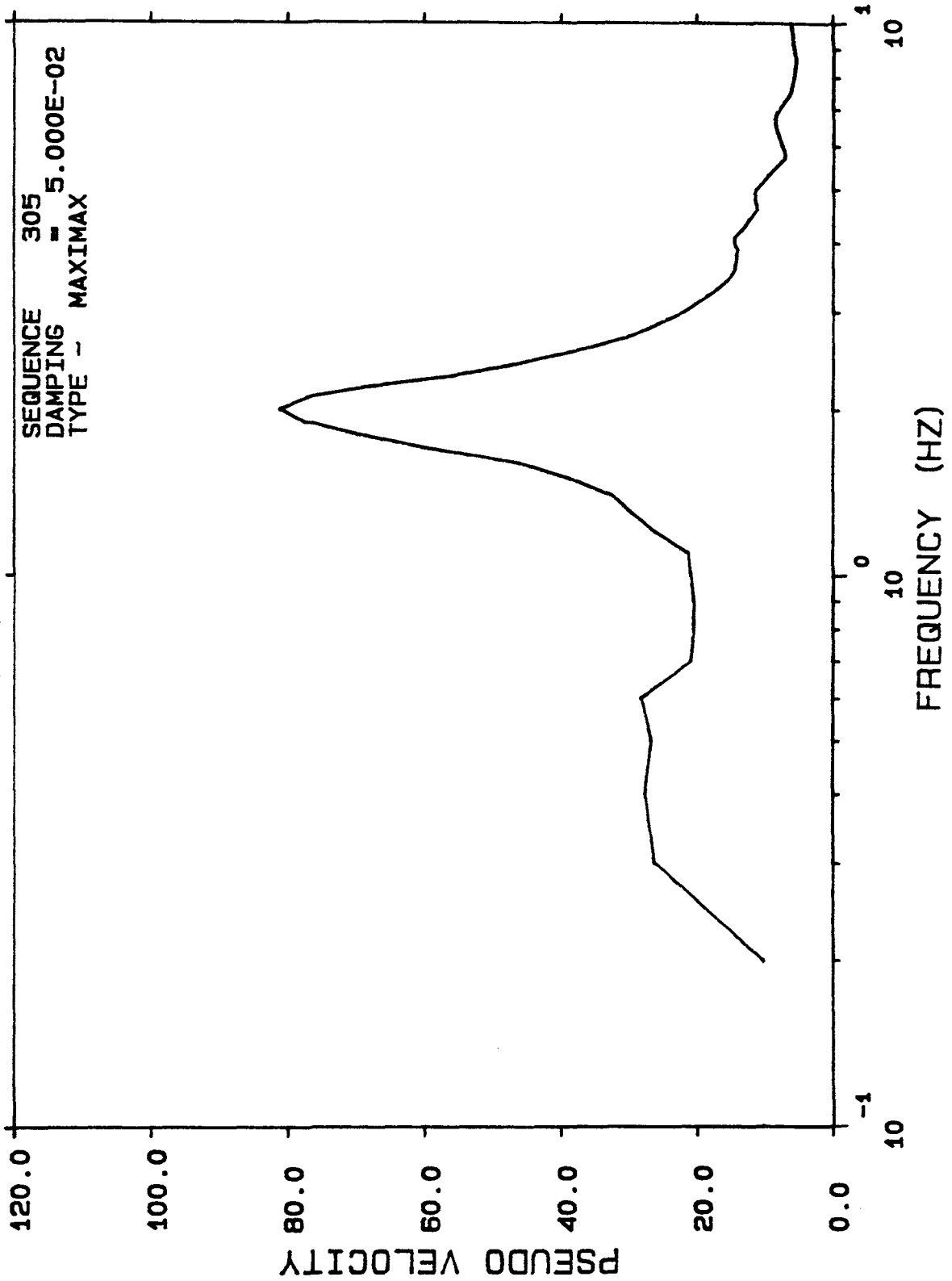
SHOCK SPECTRUM FOR TOP (IPS)



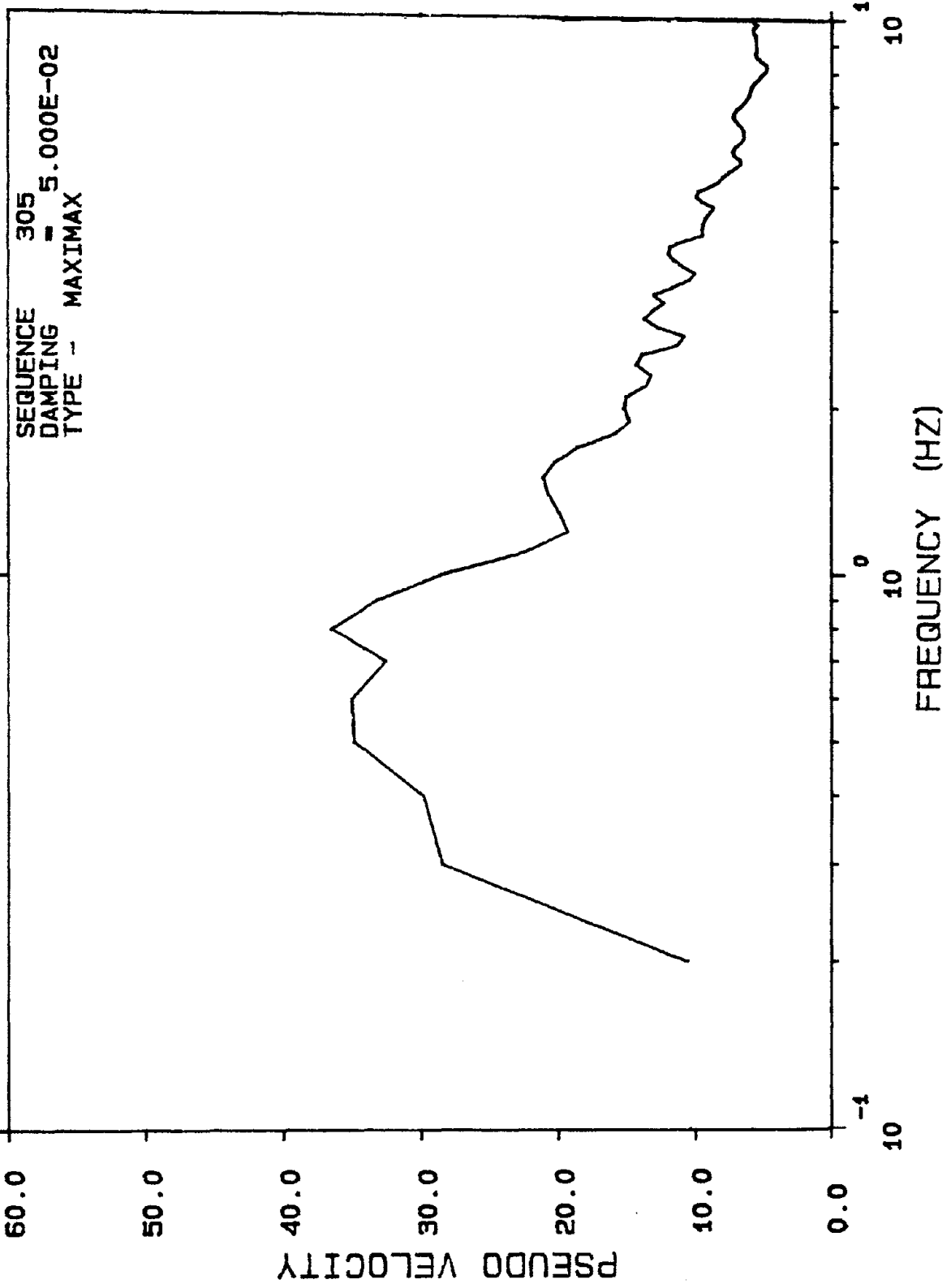
SHOCK SPECTRUM FOR BASE (IPS)

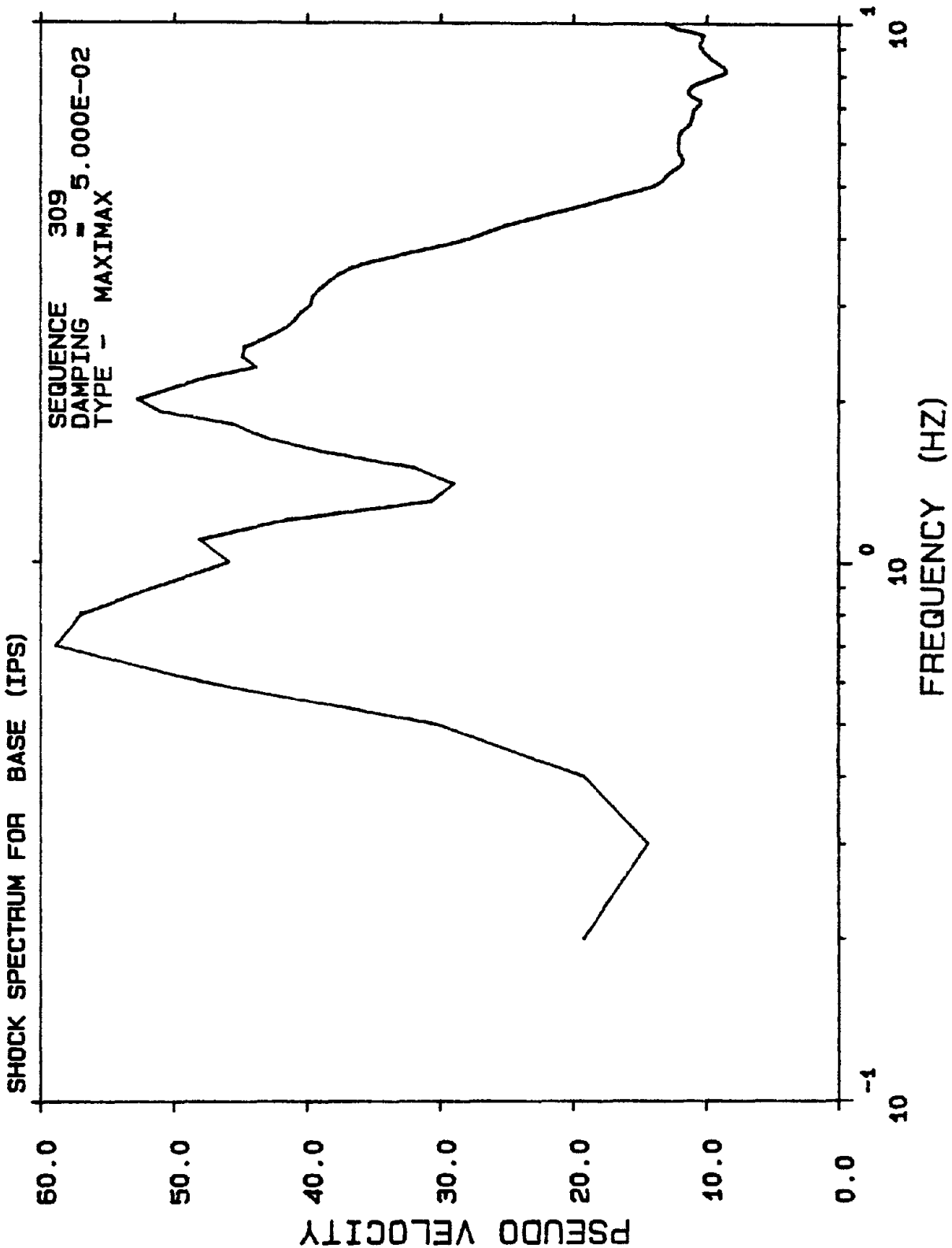


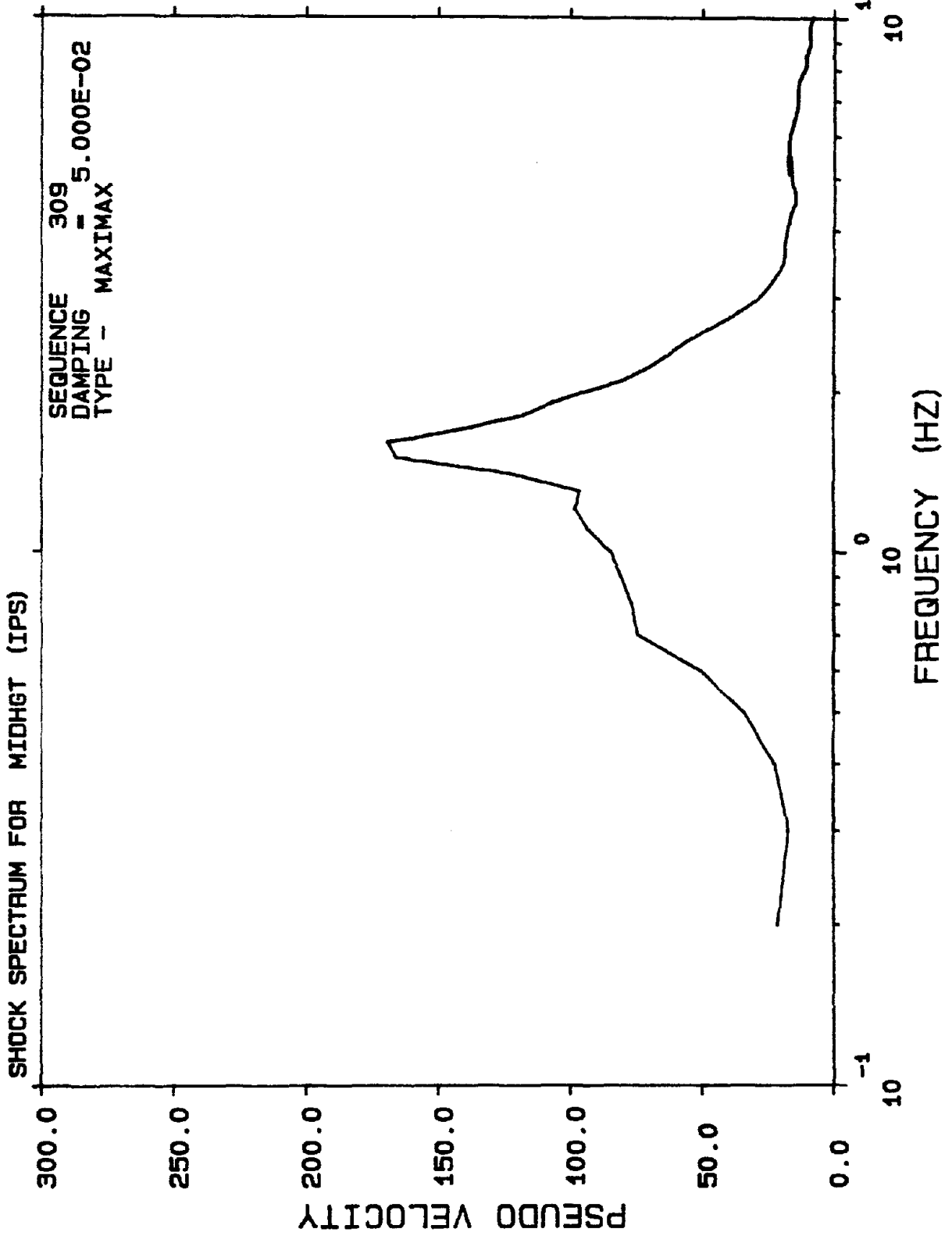
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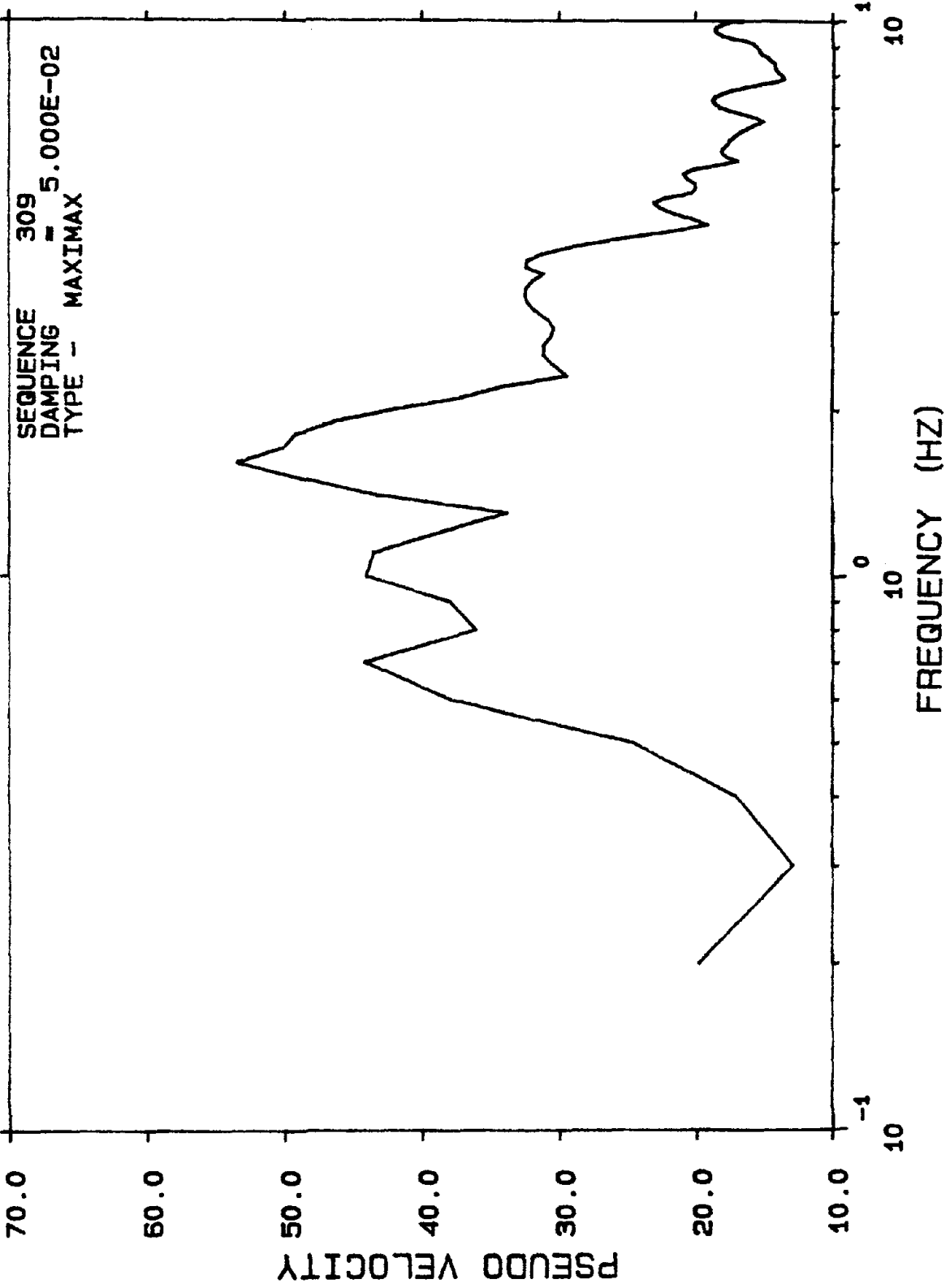
SHOCK SPECTRUM FOR TOP (IPS)

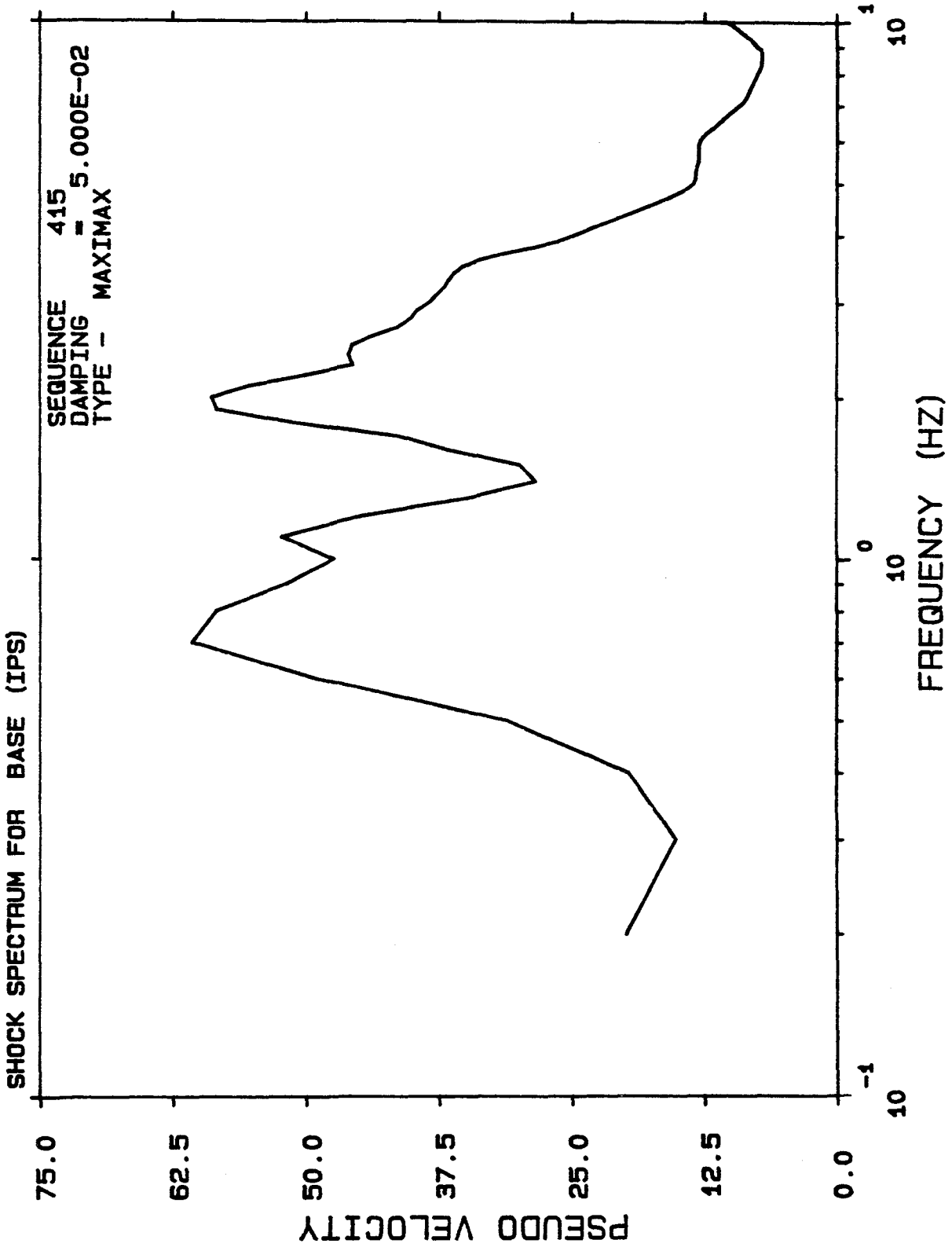




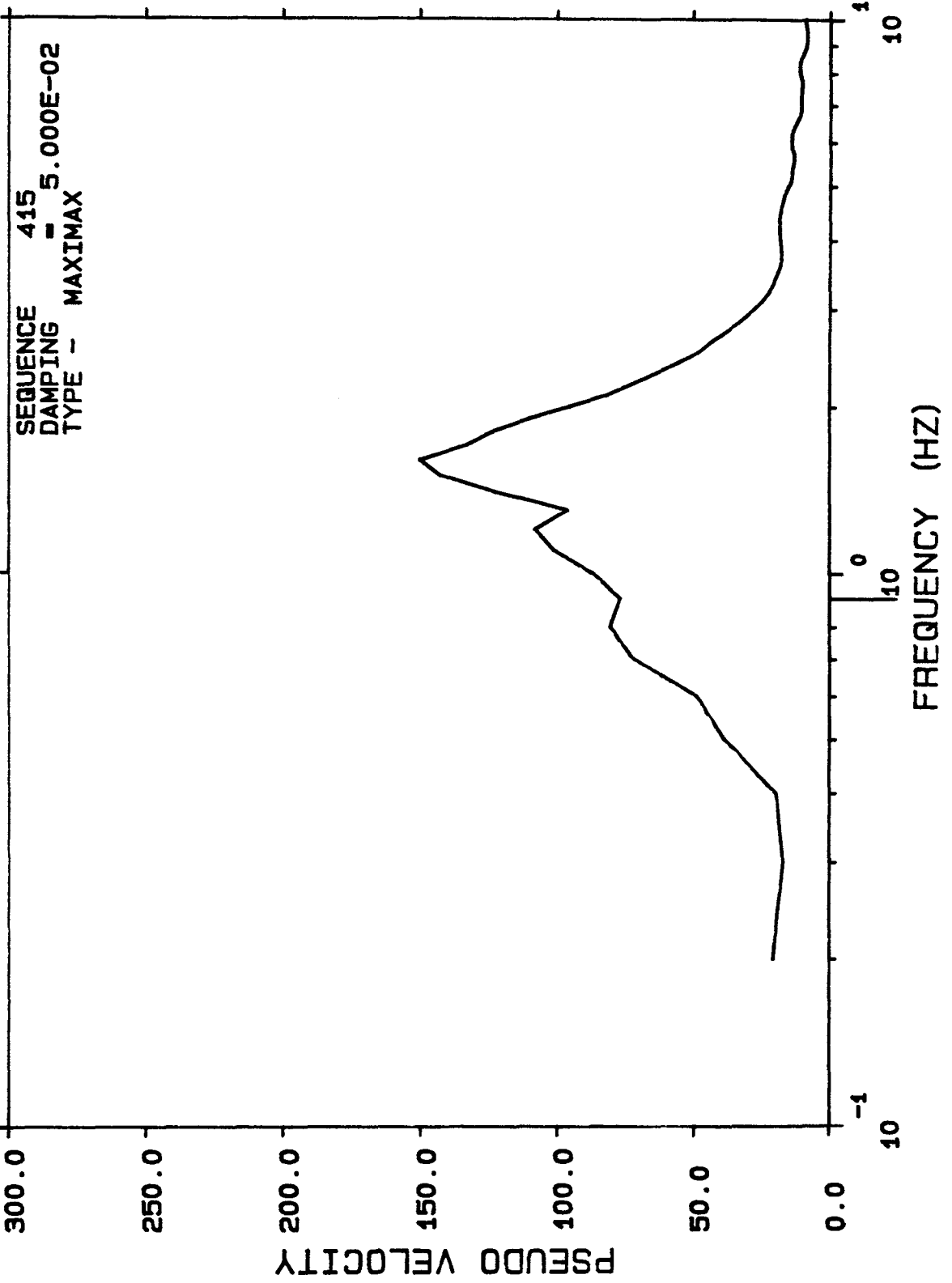


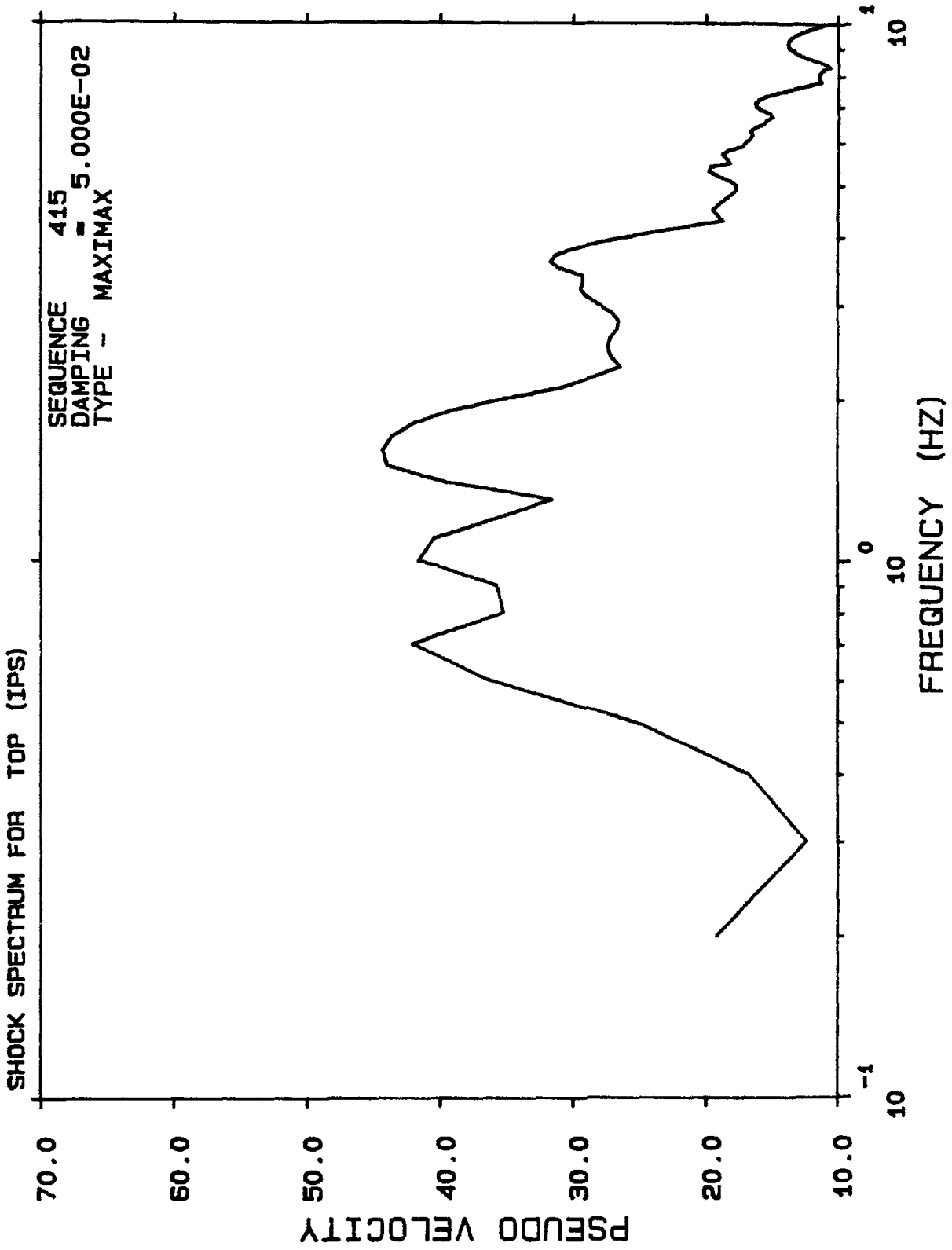
SHOCK SPECTRUM FOR TOP (IPS)



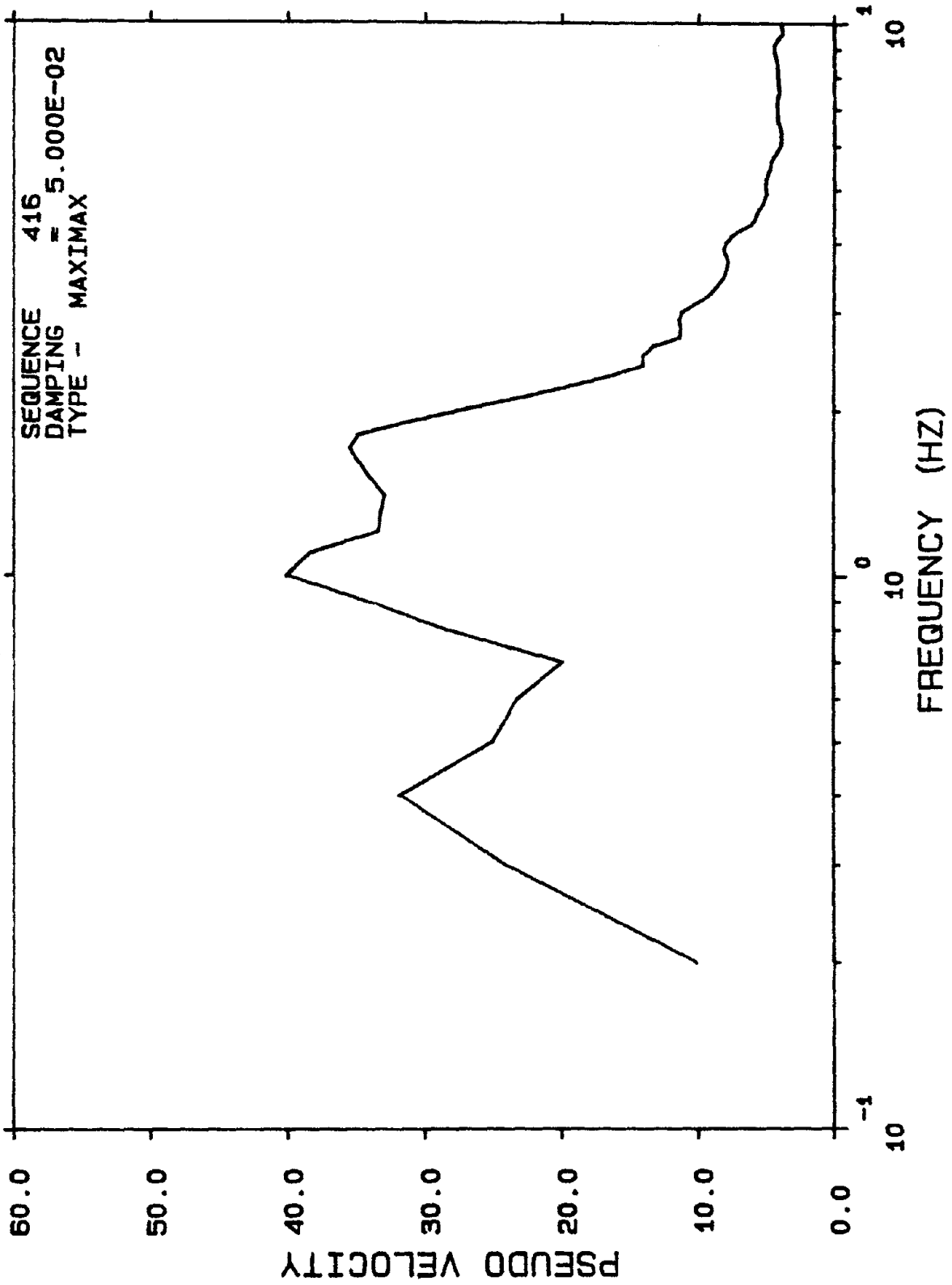


SHOCK SPECTRUM FOR MIDHGT (IPS)

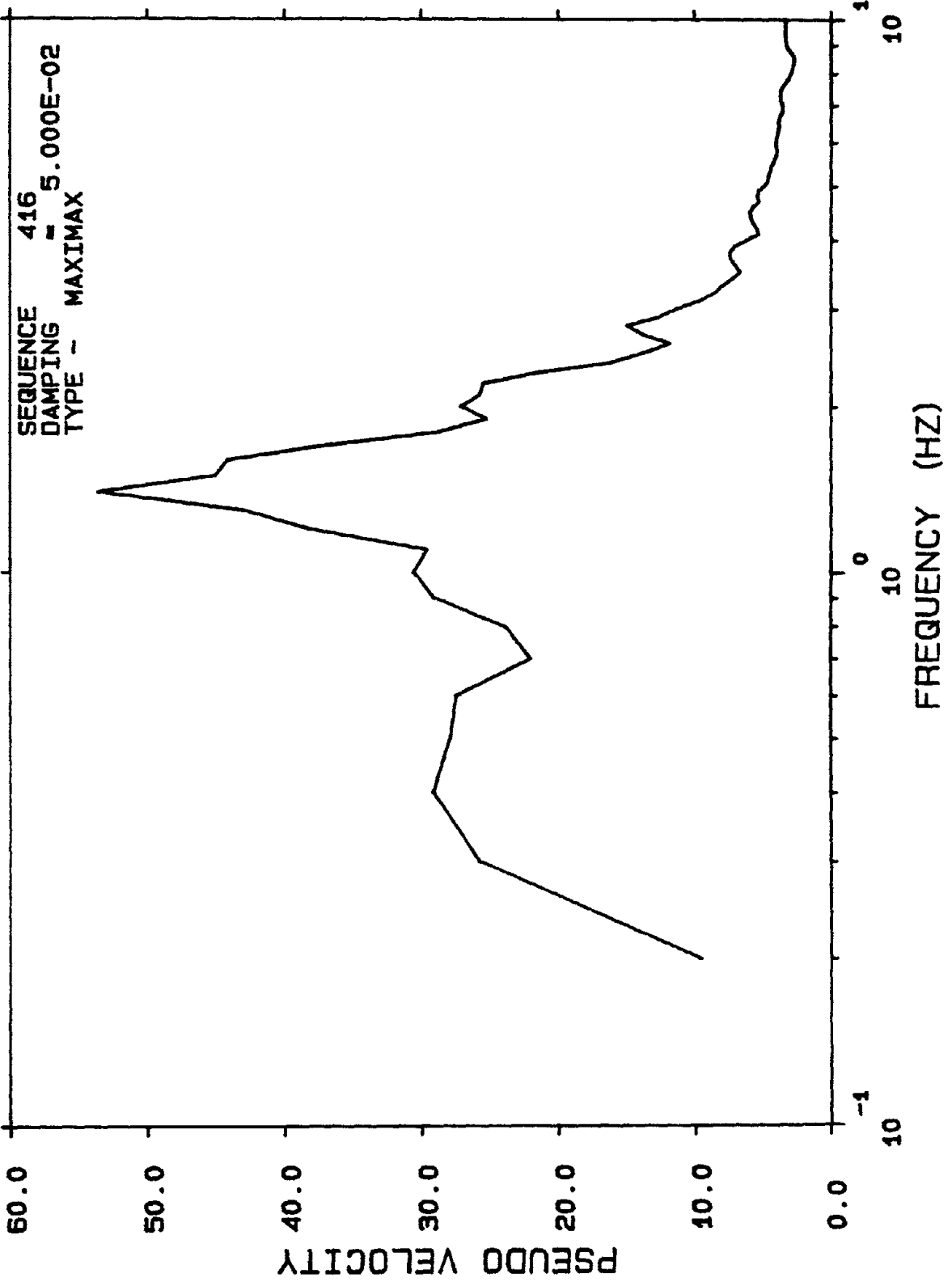




SHOCK SPECTRUM FOR BASE (IPS)



SHOCK SPECTRUM FOR MIDHGT (IPS)



SHOCK SPECTRUM FOR TOP (IPS)

