

United State Department of the Interior  
Geological Survey

SEISMIC ENGINEERING DATA REPORT

THE IMPERIAL VALLEY EARTHQUAKE, OCTOBER 15, 1979.  
DIGITIZATION AND PROCESSING OF ACCELEROGRAPH RECORDS.

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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

Menlo Park, California

April 1980

## TABLE OF CONTENTS

	Page
SUMMARY . . . . .	1
DIGITIZATION AND PROCESSING . . . . .	3
REFERENCES . . . . .	6
APPENDIX 1. Tape Format . . . . .	7
APPENDIX 2. Plots of (a) uncorrected acceleration (b) corrected acceleration, velocity, and displacement (c) response spectra (d) Fourier spectra	
for the following stations:	
El Centro, Array 7, Imperial Valley College . . . . .	12
El Centro, Array 6, Huston Road . . . . .	26
El Centro, Bonds Corner, Hiways 98 and 115 . . . . .	40
El Centro, Array 8, Cruickshank Road . . . . .	54
El Centro, Array 5, James Road . . . . .	67
El Centro, Differential Array . . . . .	80
El Centro, Array 4, Anderson Road . . . . .	93
Brawley, Brawley Municipal Airport . . . . .	106
Holtville, California, Holtville Post Office . . . . .	119
El Centro, Array 10, Keystone Road . . . . .	132
Calexico, California, Calexico Fire Station . . . . .	145
El Centro, Array 11, McCabe School . . . . .	158
El Centro, Array 3, Pine Union School . . . . .	171
Parachute Test Facility . . . . .	184
El Centro, Array 2, Keystone Road . . . . .	197
El Centro, Array 12, Brockman Road . . . . .	210
Calipatria, California, Fire Station . . . . .	223
El Centro, Array 13, Strobel Residence . . . . .	236
El Centro, Array 1, Borchard Ranch . . . . .	249
Superstition Mountain, California . . . . .	262
Plaster City, California, Storehouse . . . . .	275
Coachella Canal Number 4, California . . . . .	288
APPENDIX 3. Documentation of tape of Mexico records from the following stations: Agrarias, Cerro Prieto, Chihuahua, Compuertas, Delta, Cucapah, and Victoria . . . . .	
	301

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## SUMMARY

This data report serves three purposes: the documentation of digital magnetic tapes containing the results of processing the USGS strong-motion data from the Imperial Valley earthquake of October 15, 1979, the reproduction of the more important graphical results, and the documentation of a tape containing digital recordings from the Northern Baja California strong-motion array.

The Imperial Valley earthquake of October 15, 1979 was instrumentally located on the Imperial fault approximately 25 km southeast of El Centro, California. This epicenter location is approximately 16 km further to the southeast than that of the 1940 Imperial Valley earthquake. The following parameters are for the mainshock (from CIT/USGS):

Origin time: 23:16:54.50, 15OCT79 (UTC)

Epicenter: 32.63N, 115.33W

Focal depth: 12 km

Magnitude:  $M_L = 6.6$

A U.S.G.S. Professional Paper on the Imperial Valley earthquake is in preparation. One contribution (Matthiesen and Porcella, 1980) contains a summary of the strong-motion data recorded during the main event and aftershocks. A preliminary version (Porcella and Matthiesen, 1979) of this contribution summarized the data from the near-in strong-motion accelerograph stations operated by the U.S. Geological Survey in the Imperial Valley of California. It contains tables of the operational stations within a radius of about 150 km of the epicenter and of the records from those accelerographs that triggered. It also contains reproductions of these records.

This data report is a follow-up of the Porcella and Matthiesen (1979) preliminary summary. Of the thirty mainshock accelerogram recordings from the U.S.G.S. network in the Imperial Valley, twenty-two of the 70-mm film records have been chosen for digitization, omitting the low amplitude records with epicentral distances greater than 60 km. Processing has been carried out on the sixty-six components for (a) uncorrected acceleration; (b) corrected acceleration, velocity and displacement; and (c) response spectra. These results are available on two magnetic tapes, briefly named IV, available from Environmental Data and Information Service, NOAA, Boulder, Colorado, 80302, phone (303) 499-1000, extension 6473. This report provides computer plots of the data contained on the tapes. We also include the log-log plots of the Fourier amplitude spectra, calculated by the FFT algorithm.

Additional details on the stations and records are easily accessible on the Strong-Motion Information Retrieval System, via interactive keyboard terminal, phone (415) 329-8600 (Converse, 1978).

Documentation of a tape provided by J. Brune, U.C. San Diego containing the seven digital recordings from the Northern Baja California strong-motion array is included in Appendix 3. A description of the tape contents and format, and reproductions of the computer plots of the records is taken directly from Brune and others (1980), where a preliminary description of these data can be found. Copies of the tape are available from EDIS (see address above). The data on this tape will be processed using the techniques that produce the plots in this report, and a tape containing this processed data will be made available from EDIS. We appreciate the opportunity to make this report more complete by including this information.

## DIGITIZATION AND PROCESSING

A record duration of approximately thirty-eight seconds was chosen for digitization with a laser-operated trace-following automatic scanner whose digitization rate lies between 600 and 800 samples per second. These raw data time series were then processed to produce magnetic tapes containing uncorrected accelerograms, filtered data corrected for instrument characteristics, and response spectra. The filter used had a gain of unity between the frequencies 0.17 and 23 Hz, and fell linearly to zero from 0.17 to 0.03 Hz at the low frequency and from 23 to 25 Hz at the high frequency end. In terms of period, the removal of the long period content was commenced at 6 sec and was complete at 33 sec. Details of these and other data processing procedures are discussed by Brady and others (1980).

Tape requirements dictated that the data be stored on two tapes, dividing the records into two sets as indicated in table 1. The first tape contains data from those stations within 11 km of the fault, the second from those additional stations within 60 km of the epicenter. The station locations are shown in figure 1, from Porcella and Matthiesen (1979). The 7-track 800 bpi tapes are generated in BCD format, blocked into 10 card-equivalents per record, and contain 99 files each. These 99 files are made up of 33 files for Phase 1: uncorrected data, 33 for Phase 2: corrected data, and 33 for Phase 3: response spectra, in that order. The card-image format is described in detail in Appendix 1.

Additional spectra were calculated during the processing stage, namely, the Fourier amplitude spectrum by FFT, the duration spectrum of response, and the spectrum of response amplitudes sustained for "n" cycles (Perez, 1980). The output from these programs is restricted to computer plots, and those of the log-log Fourier spectra are included here, in addition to plots of the data on the tapes, beginning in Appendix 2.

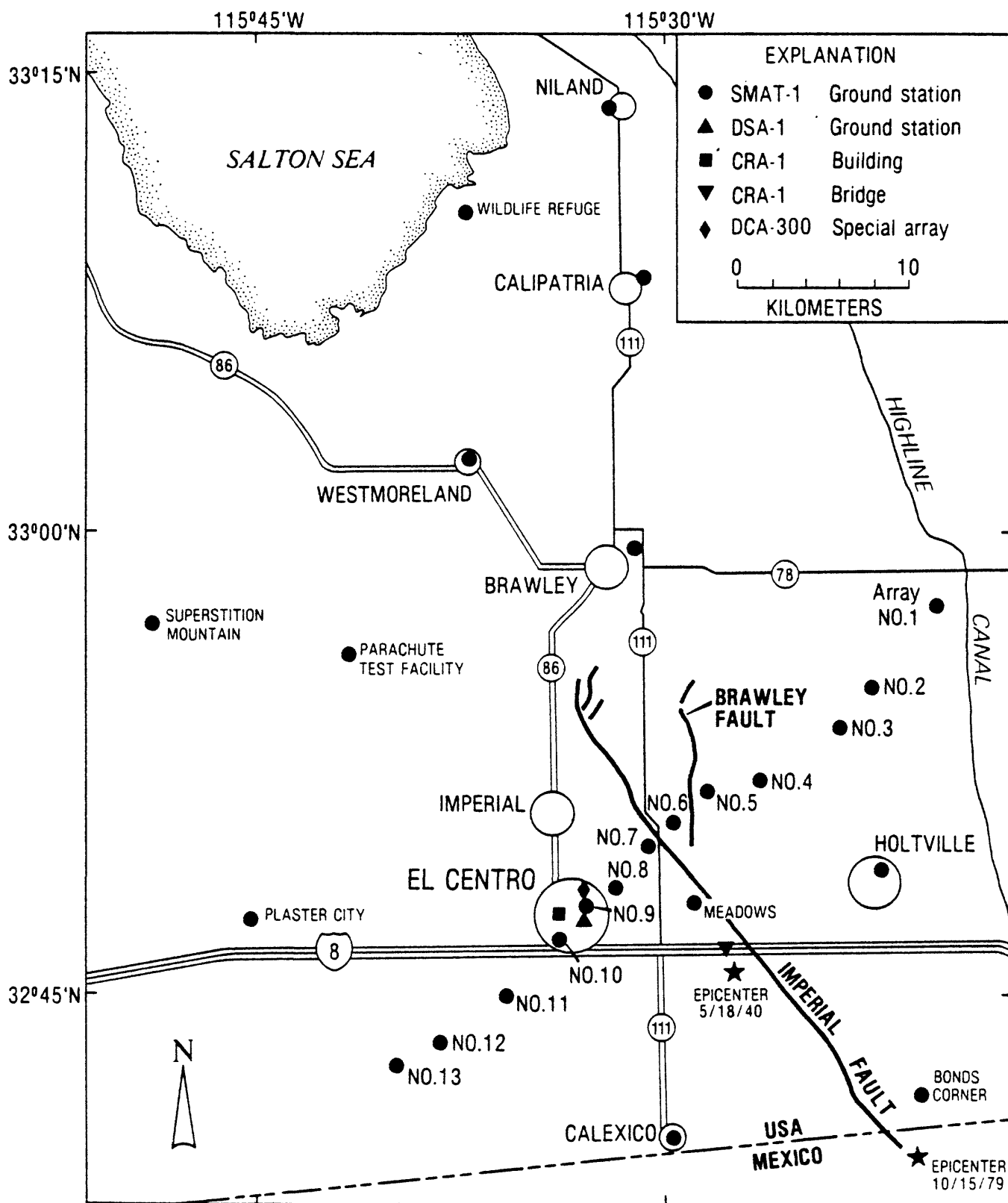
Table 1. Tape contents

First tape--close-in records

1. EL CENTFC,ARRAY 7,IMPERIAL VALLEY COLLEGE,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 7,IMPERIAL VALLEY COLLEGE,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 7,IMPERIAL VALLEY COLLEGE,10/15/79,2317UTC,140 DEGREES
2. EL CENTFC,ARRAY 6,HUSTON RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 6,HUSTON RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 6,HUSTON RD.,10/15/79,2317UTC,140 DEGREES
3. EL CENTFC,BCNDS CORNER,HIWAYS 98 AND 115,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,BCNDS CORNER,HIWAYS 98 AND 115,10/15/79,2317UTC,UP  
EL CENTFC,BCNDS CORNER,HIWAYS 98 AND 115,10/15/79,2317UTC,140 DEGREES
4. EL CENTFC,ARRAY 8,CRUICKSHANK RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 8,CRUICKSHANK RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 8,CRUICKSHANK RD.,10/15/79,2317UTC,140 DEGREES
5. EL CENTFC,ARRAY 5,JAMES RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 5,JAMES RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 5,JAMES RD.,10/15/79,2317UTC,140 DEGREES
6. EL CENTFC,DIFF. ARRAY,10/15/79,2317UTC,360 DEGREES  
EL CENTFC,DIFF. ARRAY,10/15/79,2317UTC,UP  
EL CENTFC,DIFF. ARRAY,10/15/79,2317UTC,270 DEGREES
7. EL CENTFC,ARRAY 4,ANDERSON RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 4,ANDERSON RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 4,ANDERSON RD.,10/15/79,2317UTC,140 DEGREES
8. BRAWLEY,BRAWLEY MUNICIPAL AIRPORT,10/15/79,2317UTC,315 DEGREES  
BRAWLEY,BRAWLEY MUNICIPAL AIRPORT,10/15/79,2317UTC,UP  
BRAWLEY,BRAWLEY MUNICIPAL AIRPORT,10/15/79,2317UTC,225 DEGREES
9. HOLTVILLE,CALIF,HOLTVILLE POST OFFICE,10/15/79,2317UTC,315 DEGREES  
HOLTVILLE,CALIF,HOLTVILLE POST OFFICE,10/15/79,2317UTC,UP  
HOLTVILLE,CALIF,HOLTVILLE POST OFFICE,10/15/79,2317UTC,225 DEGREES
10. EL CENTFC,ARRAY 10,KEYSTONE RD.,10/15/79,2317UTC,50 DEGREES  
EL CENTFC,ARRAY 10,KEYSTONE RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 10,KEYSTONE RD.,10/15/79,2317UTC,320 DEGREES
11. CALEXICO,CALIF,CALEXICO FIRE STATION,10/15/79,2317UTC,315 DEGREES  
CALEXICO,CALIF,CALEXICO FIRE STATION,10/15/79,2317UTC,UP  
CALEXICO,CALIF,CALEXICO FIRE STATION,10/15/79,2317UTC,225 DEGREES

Second tape--distant records

1. EL CENTFC,ARRAY 11,MCCABE SCHOOL,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 11,MCCABE SCHOOL,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 11,MCCABE SCHOOL,10/15/79,2317UTC,140 DEGREES
2. EL CENTFC,ARRAY 3,PINE UNION SCHOOL,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 3,PINE UNION SCHOOL,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 3,PINE UNION SCHOOL,10/15/79,2317UTC,140 DEGREES
3. PARACHUTE TEST FACILITY,10/15/79,2317UTC,315 DEGREES  
PARACHUTE TEST FACILITY,10/15/79,2317UTC,UP  
PARACHUTE TEST FACILITY,10/15/79,2317UTC,225 DEGREES
4. EL CENTFC,ARRAY 2,KEYSTONE RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 2,KEYSTONE RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 2,KEYSTONE RD.,10/15/79,2317UTC,140 DEGREES
5. EL CENTFC,ARRAY 12,BROCKMAN RD.,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 12,BROCKMAN RD.,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 12,BROCKMAN RD.,10/15/79,2317UTC,140 DEGREES
6. CALIPATRIA,CALIFORNIA,FIRE STATION,10/15/79,2317UTC,315 DEGREES  
CALIPATRIA,CALIFORNIA,FIRE STATION,10/15/79,2317UTC,UP  
CALIPATRIA,CALIFORNIA,FIRE STATION,10/15/79,2317UTC,225 DEGREES
7. EL CENTFC,ARRAY 13,STROBEL RESIDENCE,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 13,STROBEL RESIDENCE,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 13,STROBEL RESIDENCE,10/15/79,2317UTC,140 DEGREES
8. EL CENTFC,ARRAY 1,BORCHARD RANCH,10/15/79,2317UTC,230 DEGREES  
EL CENTFC,ARRAY 1,BORCHARD RANCH,10/15/79,2317UTC,UP  
EL CENTFC,ARRAY 1,BORCHARD RANCH,10/15/79,2317UTC,140 DEGREES
9. SUPERSTITION MOUNTAIN,CALIFORNIA,10/15/79,2317UTC,135 DEGREES  
SUPERSTITION MOUNTAIN,CALIFORNIA,10/15/79,2317UTC,UP  
SUPERSTITION MOUNTAIN,CALIFORNIA,10/15/79,2317UTC,45 DEGREES
10. PLASTER CITY,CALIFORNIA,STOREHOUSE,10/15/79,2317UTC,135 DEGREES  
PLASTER CITY,CALIFORNIA,STOREHOUSE,10/15/79,2317UTC,UP  
PLASTER CITY,CALIFORNIA,STOREHOUSE,10/15/79,2317UTC,45 DEGREES
11. COACHELLA CANAL NUMBER 4,CALIFORNIA,10/15/79,2317UTC,135 DEGREES  
COACHELLA CANAL NUMBER 4,CALIFORNIA,10/15/79,2317UTC,UP  
COACHELLA CANAL NUMBER 4,CALIFORNIA,10/15/79,2317UTC,45 DEGREES



## REFERENCES

- Converse, April, 1978, Strong-Motion Information Retrieval System User's Manual, USGS Open-File Report 79-289.
- Porcella, R. L., and Matthiesen, R. B., 1979, Preliminary Summary of the U.S. Geological Survey Strong-Motion Records from the October 15, 1979 Imperial Valley Earthquake, USGS Open-File Report 79-1654.
- Brady, A. G., Perez, V., and Mork, P. N., 1980, Digitization and Processing of Mainshock Ground Motion Data of USGS Network, Imperial Valley Earthquake, October 15, 1979, a contribution in USGS Professional Paper: The Imperial Valley Earthquake, October 15, 1979, in preparation.
- Matthiesen, R. B., and Porcella, R. L., 1980, Strong-motion data recorded in the U.S. during the 1979 Imperial Valley earthquakes, a contribution in USGS Professional Paper: The Imperial Valley Earthquake, October 15, 1979, in preparation.
- Perez, V., 1980, "Spectra of amplitudes sustained for a given number of cycles: an interpretation of response duration for strong-motion earthquake records", in press.
- Brune, J., Prince, J., Vernon, F., Mena, E., and Simons, R., 1980, Strong-motion data recorded in Mexico during the October 15, 1979 Imperial Valley earthquake mainshock, a contribution in U.S.G.S. Professional Paper: The Imperial Valley Earthquake, October 15, 1979, in preparation.



## Appendix 1

Card-image format for tapes delivered to EDIS, NOAA, Boulder Colorado.

PHASE I - Uncorrected ground acceleration (the first 33 files on each tape)

The time is given in seconds, the acceleration in G/10.

1. 11 title cards                      FORMAT (20A4)  
The first card contains the full name of the component.
2. 1 card with 5 integers, and 8 floating point numbers.  
The number of data points is given by the 5th  
integer                              FORMAT (2I2,2I4,I5,F7.4,7F8.3)
3. Data cards                          FORMAT (10F7.3)
4.              END-OF-FILE mark.

PHASE II - Corrected ground acceleration, velocity and displacement (33 files)

Data is given at equal time increments of 0.01 seconds.

1. Acceleration
  - a. 3 title cards                      FORMAT (20A4)  
First card contains the full name of the component.
  - b. 1 card                              FORMAT (I5,30X,F4.0,3X,F5.3,22X,I4)  
The 1st integer is the number of data points. The 2nd number is a  
scaling factor by which the amplitude must be divided, to give data  
in cm/sec/sec. The 3rd number is the time increment in seconds. The  
4th number, if it appears signifies the exact number of points per  
second (in case the 3rd number cannot be expressed as an exact  
decimal).

- c. Data cards                      FORMAT (6X,10F7.0)

## 2. Velocity

- a. 1 card                      FORMAT (20A4)

This card contains the full name of the component.

- b. 1 card                      FORMAT (I5,26X,F4.0,3X,F5.3,22X,I4)

The 1st integer is the number of data points. The 2nd number is a scaling factor by which the amplitude must be divided, to give data in cm/sec. The 3rd number is the time increment in seconds. The 4th number, if it appears, signifies the exact number of points per second (in case the 3rd number cannot be expressed as an exact decimal).

- c. Data cards                      FORMAT (6X,10F7.0)

### 3. Displacement

- a.    1 card                      FORMAT (20A4)

This card contains the full name of the component.

- b.    1 card                      FORMAT (I5,21X,F5.0,3X,F5.3,22X,I4)

The first integer is the number of data points. The second number is a scaling factor by which the amplitude must be divided, giving data in cm. The 3rd number is the time increment in seconds. The 4th number, if it appears, signifies the exact number of points per second (in case the 3rd number cannot be expressed as an exact decimal).

- c. Data cards                      FORMAT (6X,10F7.0)

#### 4. END-OF-FILE mark

PHASE III - Fourier and Response Spectra (33 files)

1. 4 title cards                      FORMAT (20A4)

The 1st card contains the full name of the component.

2. 7 cards                              FORMAT (13F6.3)

These cards contain 91 periods (sec)

3. Fourier amplitude spectra (cm/sec)

- a. 1 card                              FORMAT (20A4)

- b. 13 data cards                      FORMAT (7E11.4)

These cards contain Fourier amplitude spectra points.

4. Relative displacement response spectra (cm)

- a. 1 card                              FORMAT (20A4)

- b. 13 data cards                      FORMAT (7E11.4)

These cards contain 91 displacement response points, 0% damping.

5. Relative velocity response spectra (cm/sec)

- a. 1 card                              FORMAT (20A4)

- b. 13 cards                              FORMAT (7E11.4)

These cards contain 91 velocity response points, 0% damping.

6. Pseudo-velocity response spectra (cm/sec)

- a. 1 card                              FORMAT (20A4)

- b. 13 data cards                      FORMAT (7E11.4)

These cards contain 91 pseudo-velocity response points, 0% damping.

7. Absolute acceleration response spectra (cm/sec/sec)

- a. 1 card                              FORMAT (20A4)

- b. 16 data cards                      FORMAT (6E13.5)

These cards contain 91 absolute acceleration response points, 0% damping.

8. The sequence 4 through 7 is repeated for 2%, 5%, 10%, and 20% damping.

9 END-OF-FILE mark.

A five page micro-fiche delivered to EDIS has been generated for each of the two tapes, and contains the full content of the tape except for the END-OF-FILE marks.

## Appendix 2

Plots:

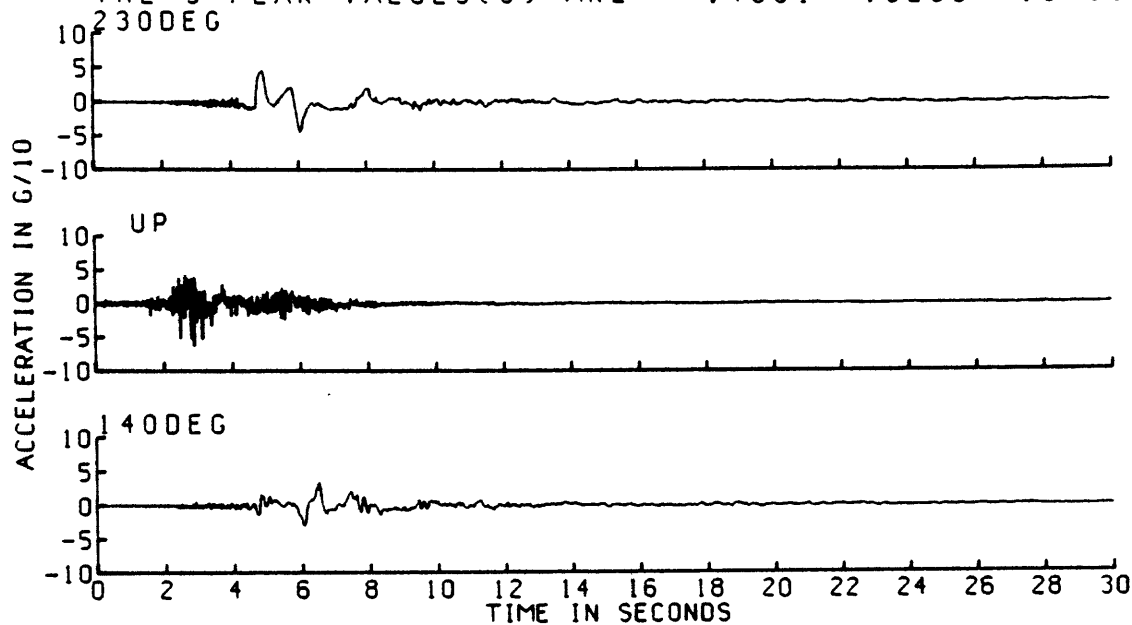
Uncorrected Acceleration

Corrected Acceleration, Velocity and Displacement

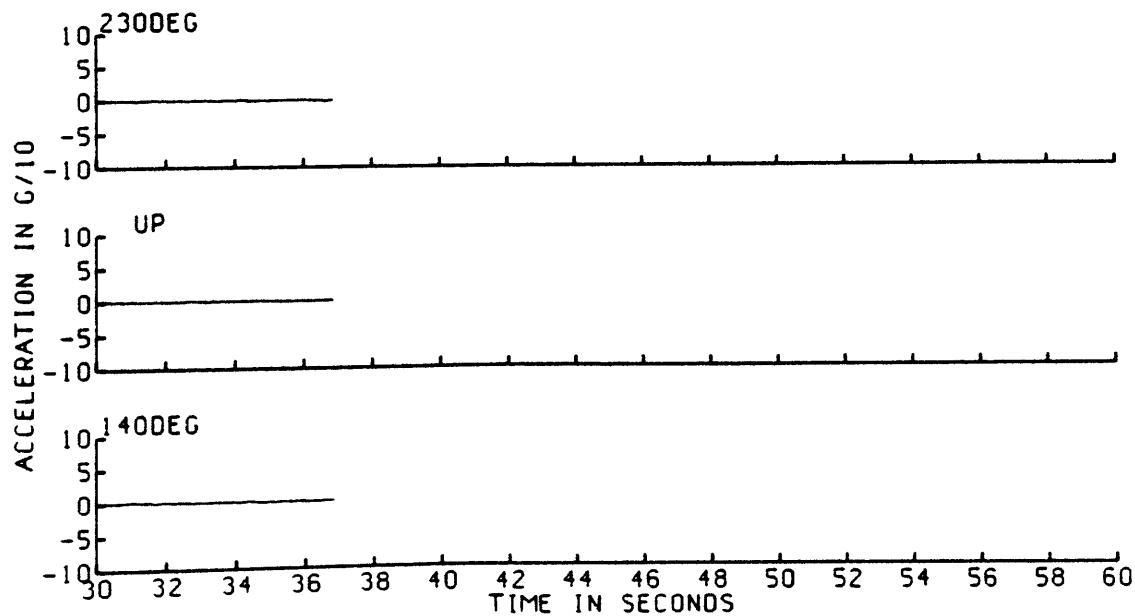
Response Spectra

Fourier Spectra

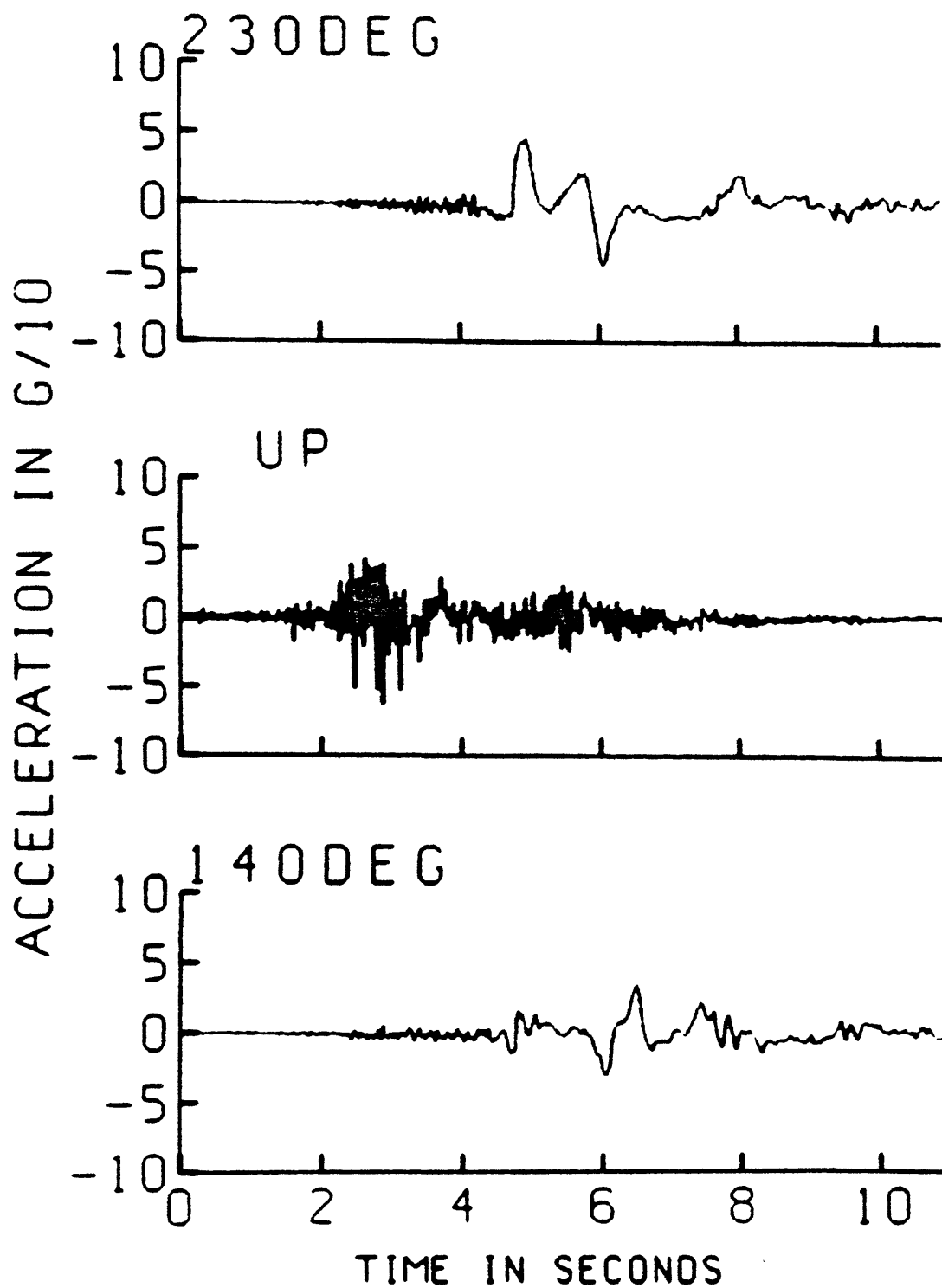
UNCORRECTED ACCELEROGRAM  
 EL CENTRO.ARRAY 7.IMP VAL COLLEGE.10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .4681 .6265 .3416



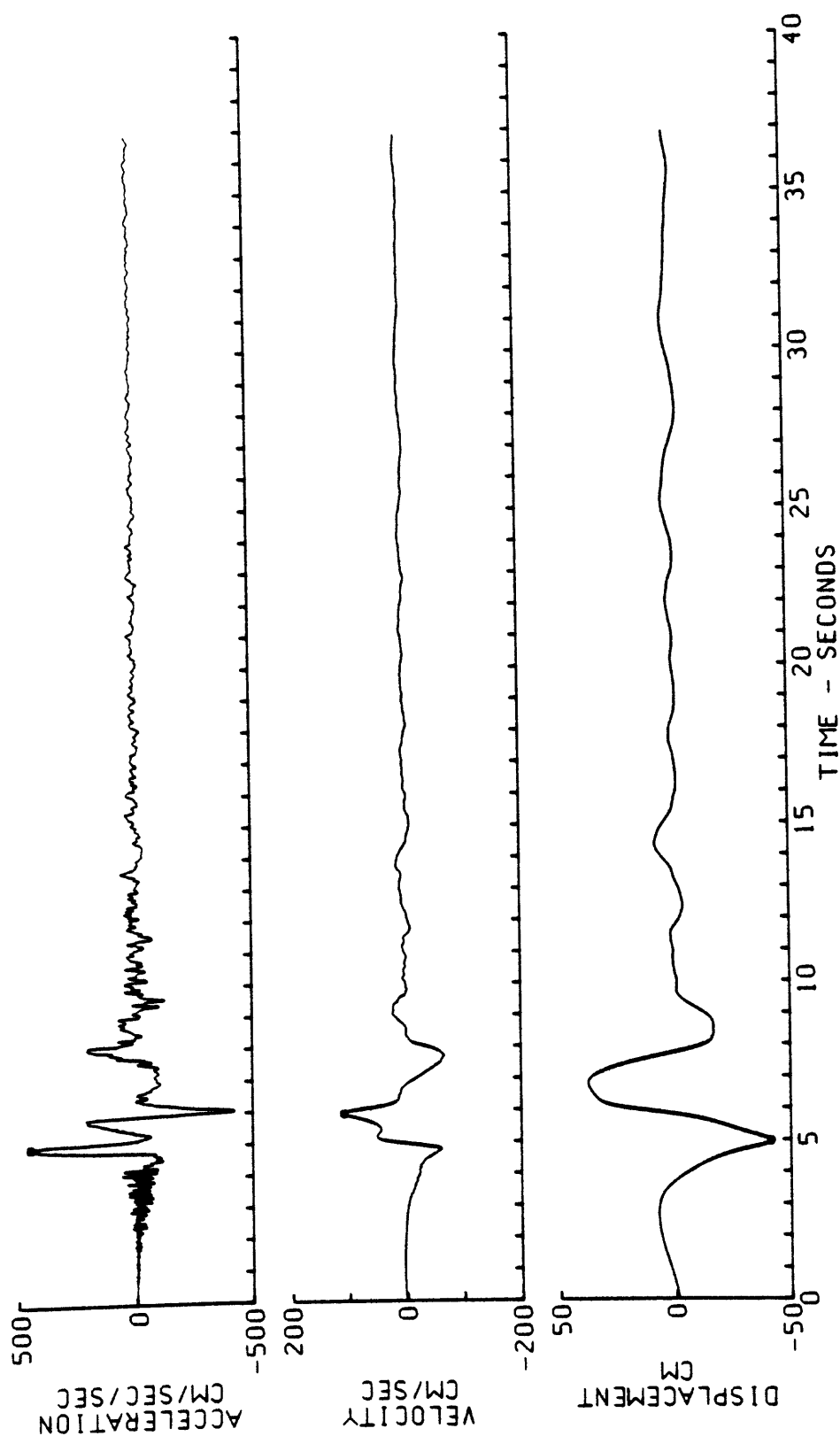
EL CENTRO.ARRAY 7.IMP VAL COLLEGE.10/15/79.2317UTC



EL CENTRO, ARRAY 7, IMP VAL COLLEGE  
10/15/79.2317UTC

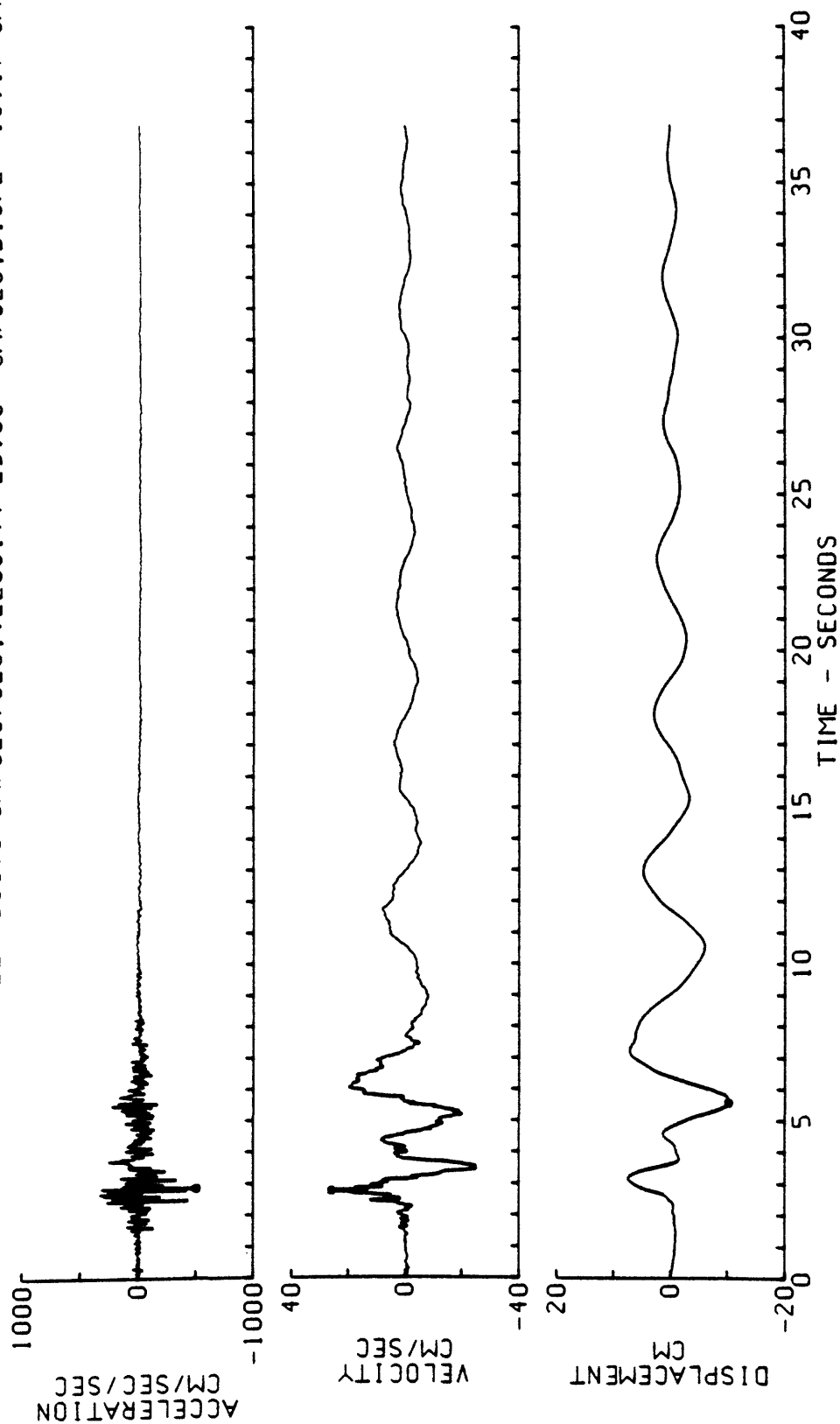


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 PEAK VALUES ACCEL=453.6 CM/SEC/SEC, VELOCITY=107.8 CM/SEC, DISPL=-41.36 CM

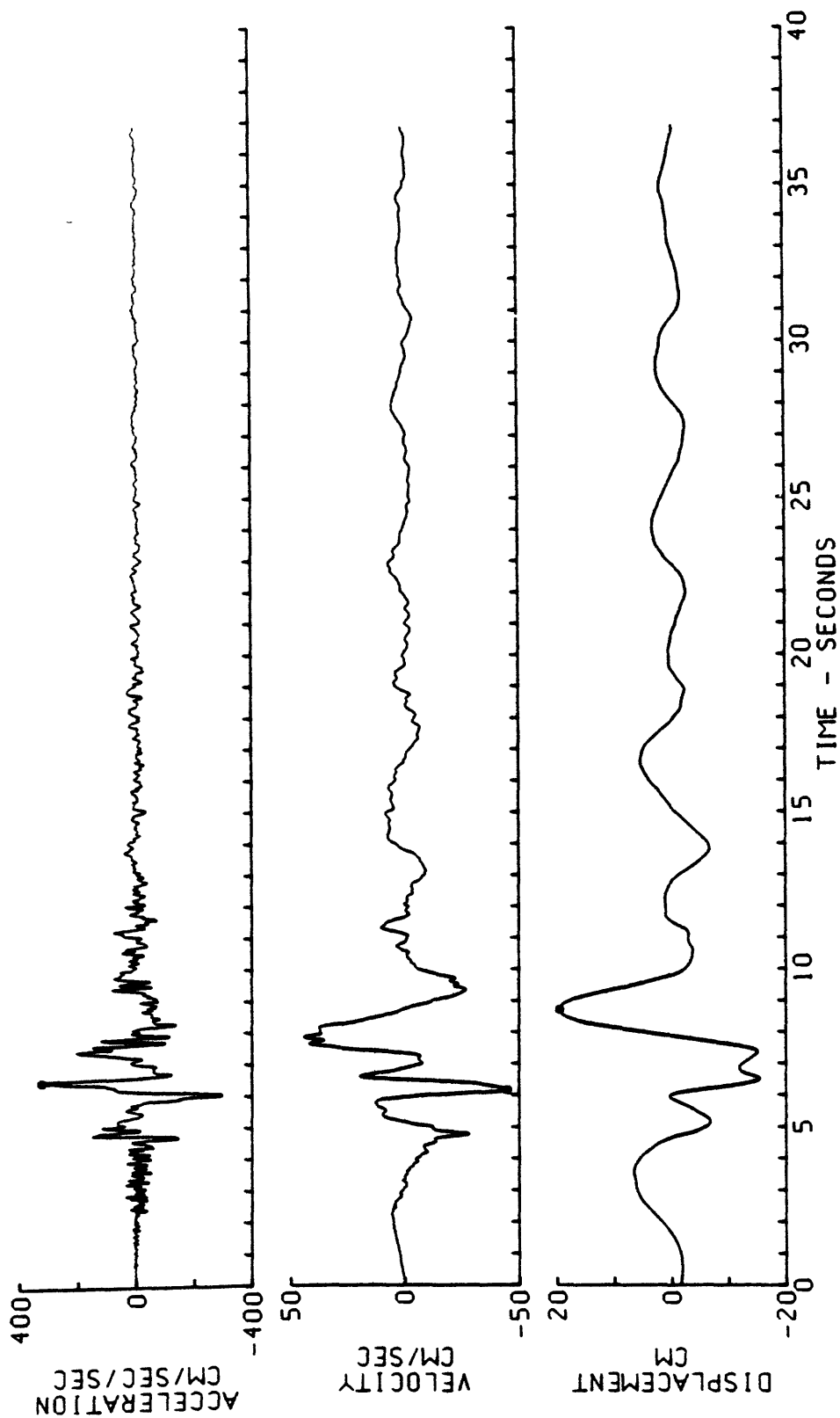




CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-503.6 CM/SEC/SEC, VELOCITY=25.86 CM/SEC, DISPL=-10.17 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=326.8 CM/SEC/SEC, VELOCITY=-44.96 CM/SEC, DISPL=19.52 CM



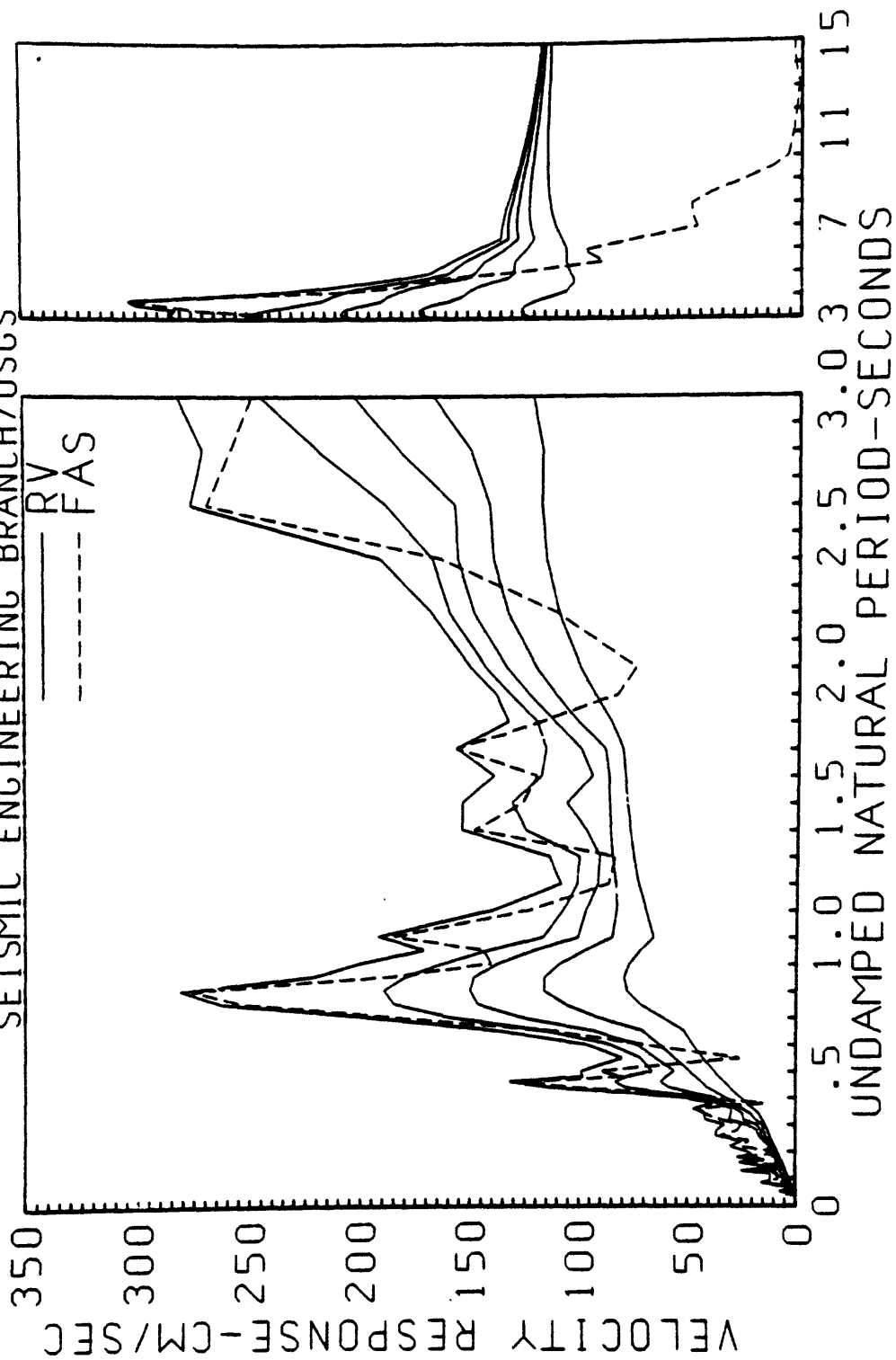
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 7.10/15/79.2317.230DEG

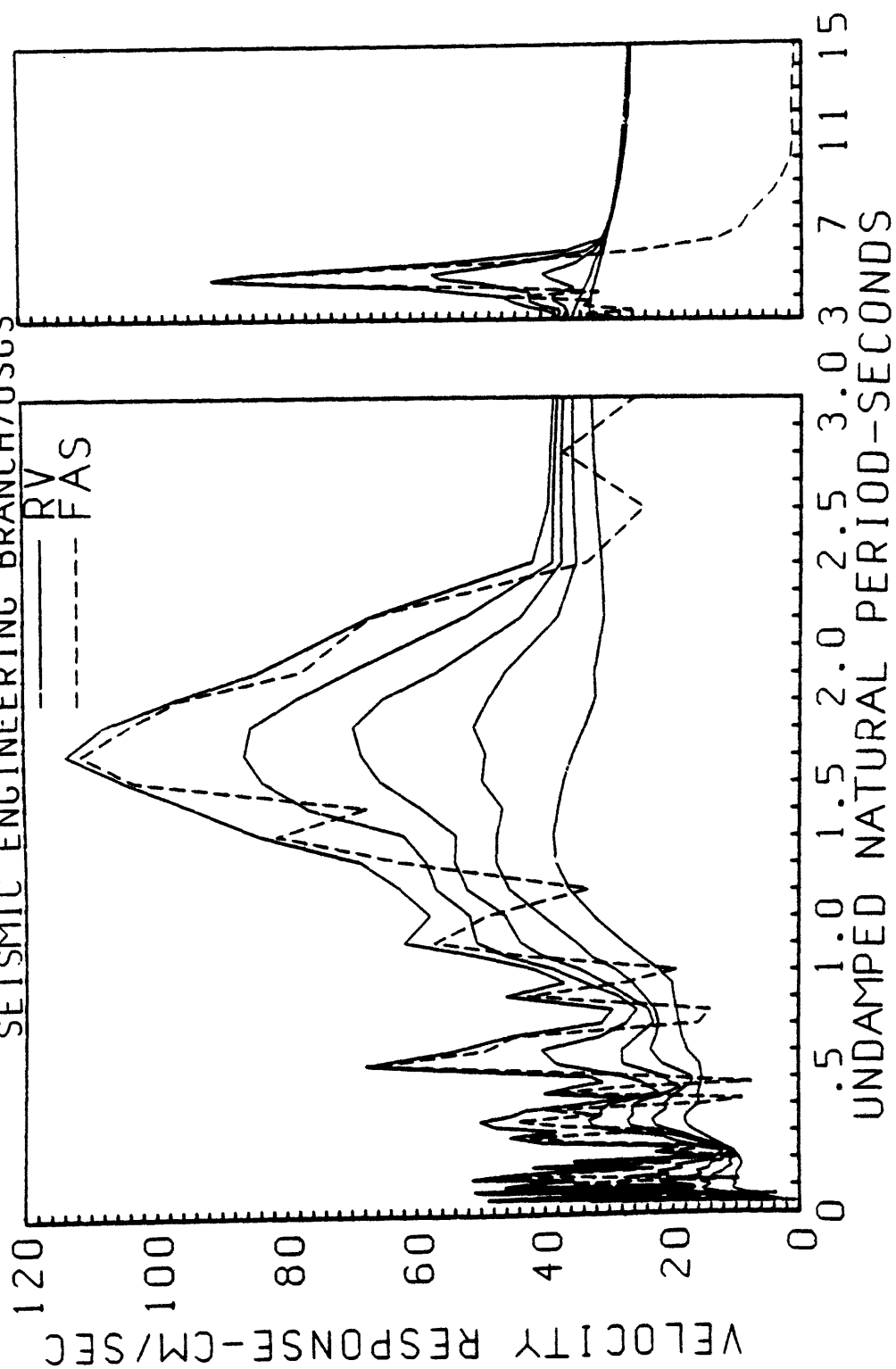
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

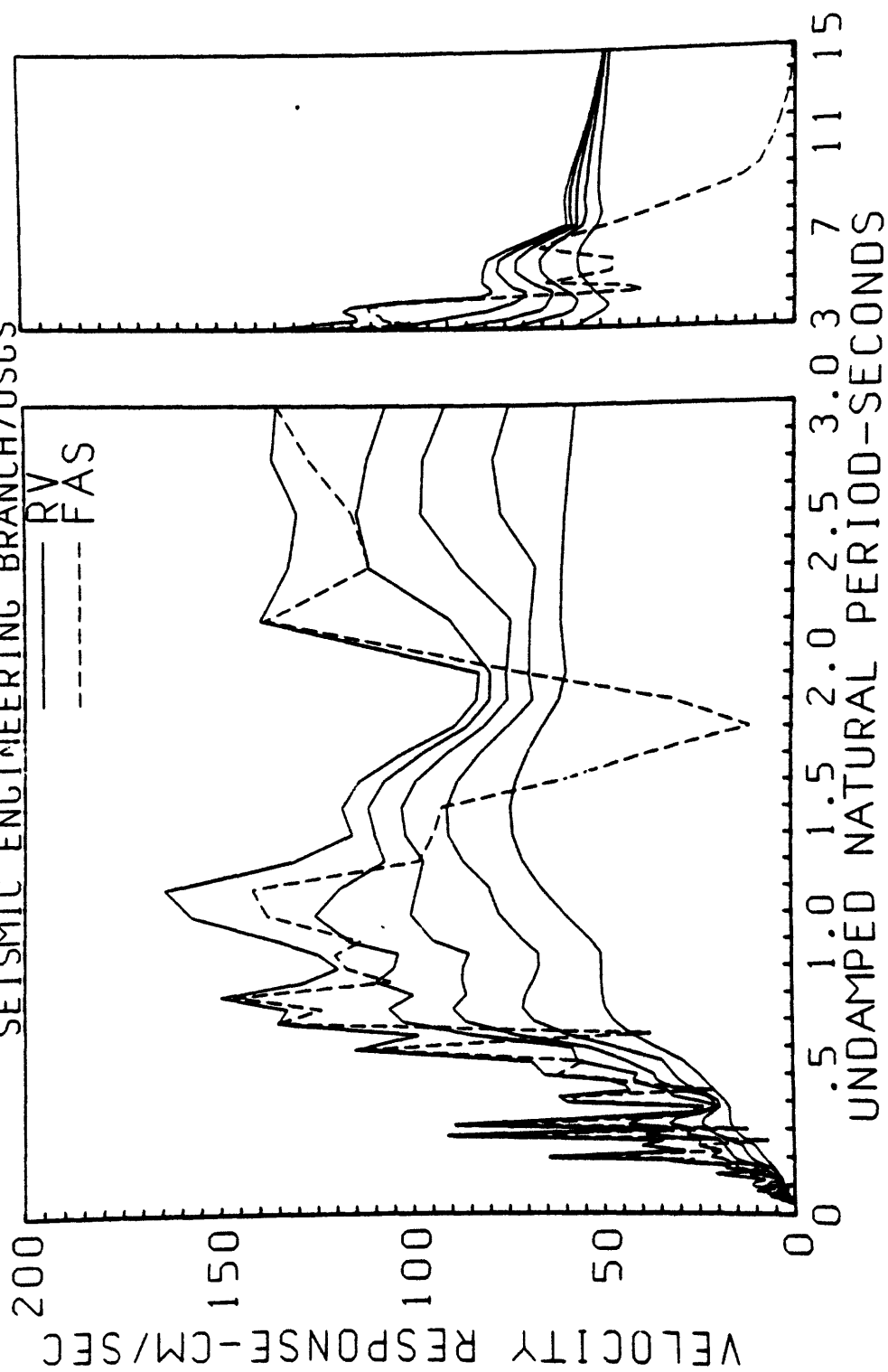
SEISMIC ENGINEERING BRANCH/USGS



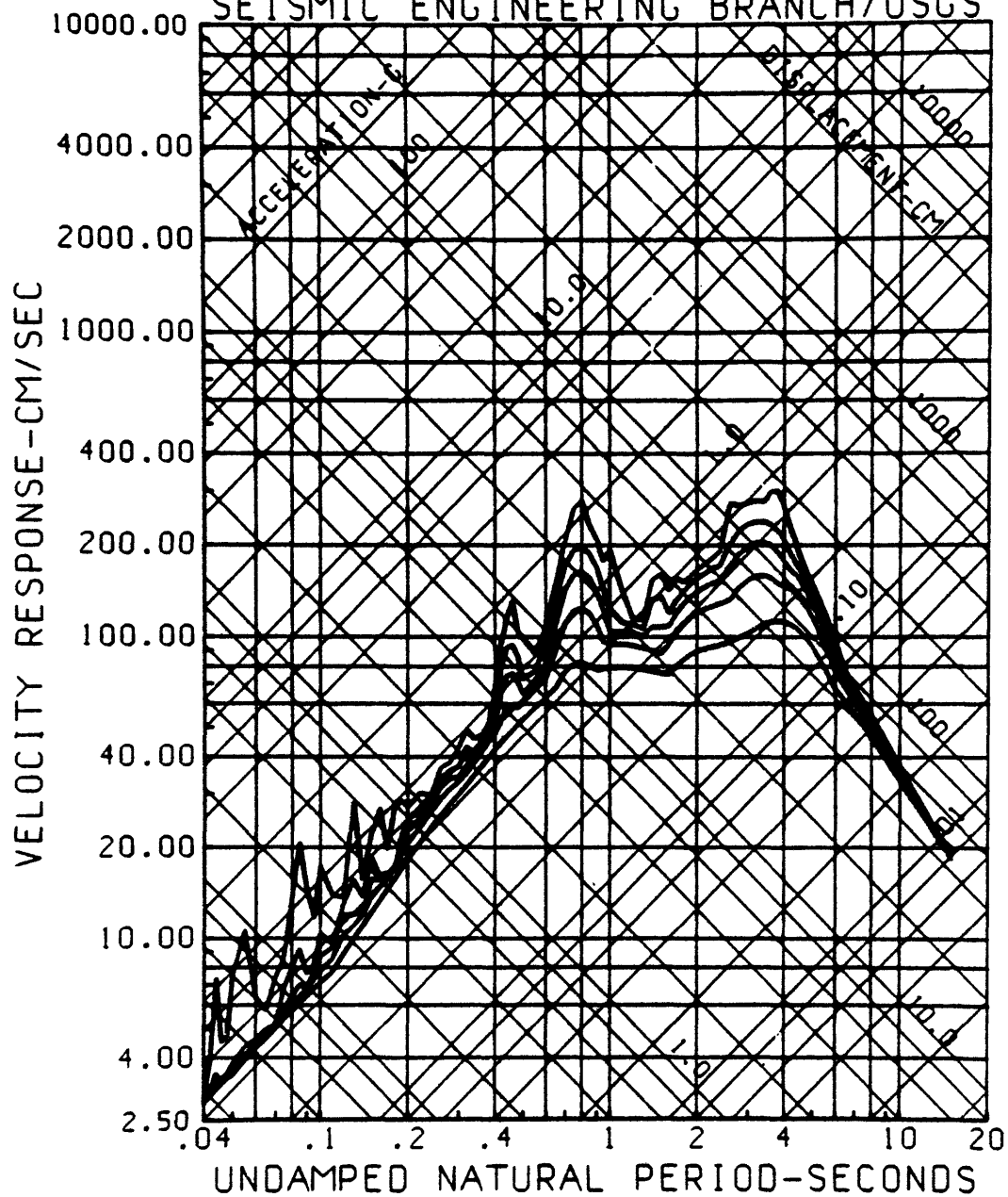
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 7, 10/15/79, 2317UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



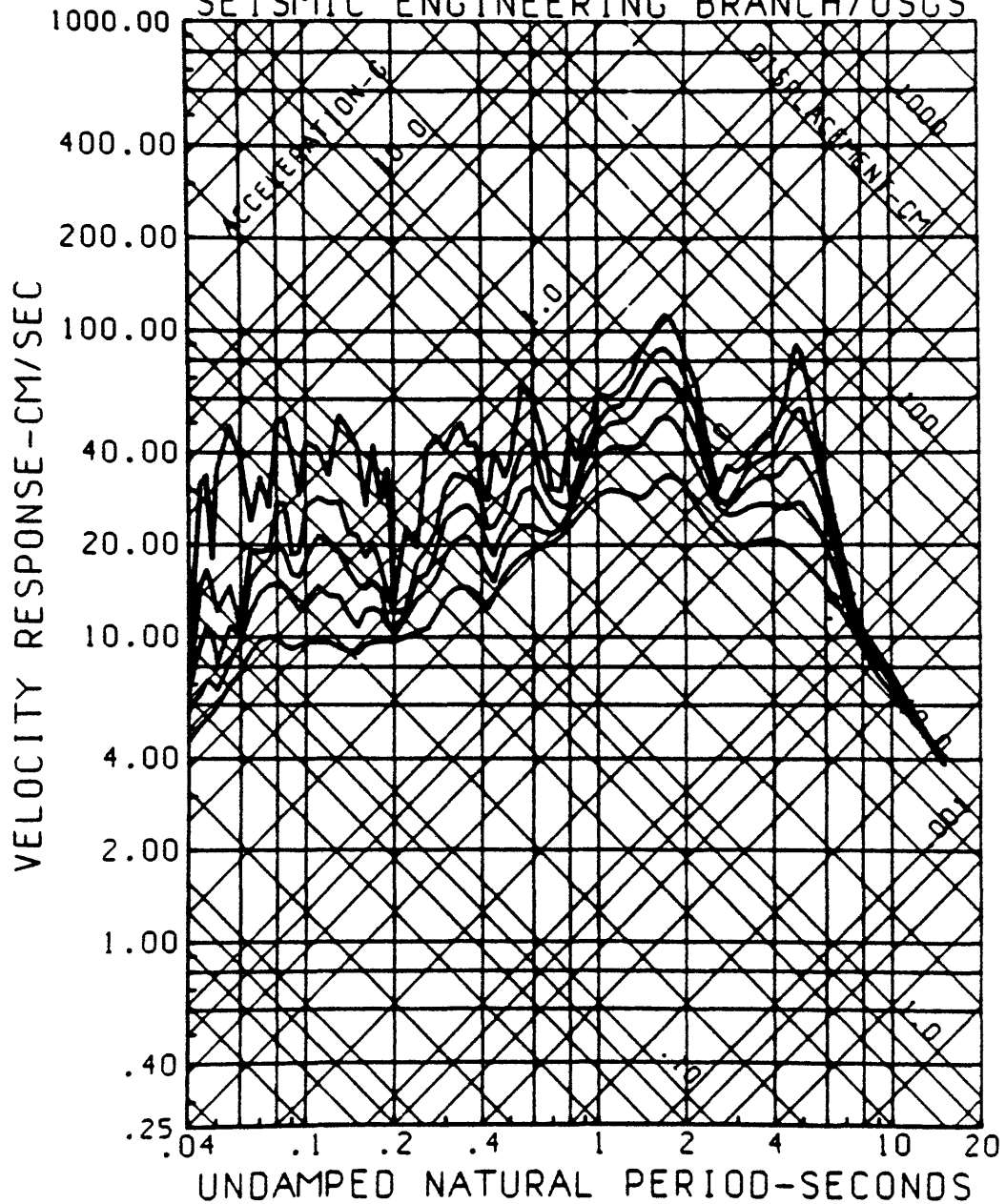
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 7, 10/15/79, 2317.140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



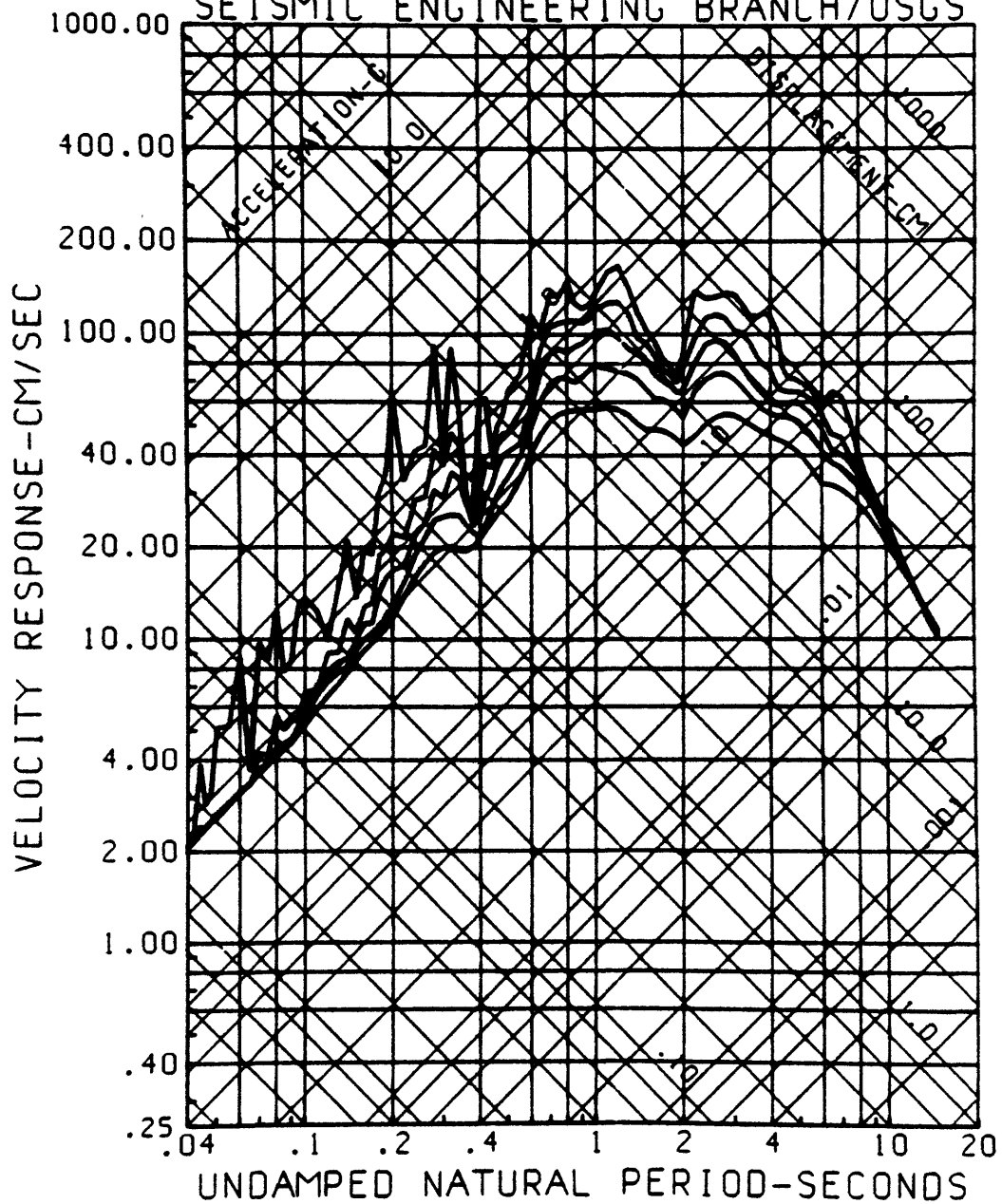
RESPONSE SPECTRA  
 EL CENTRO, ARRAY 7.10/15/79.2317.230 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



RESPONSE SPECTRA  
 EL CENTRO ARRAY 7.10/15/79.2317UTC.UP  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

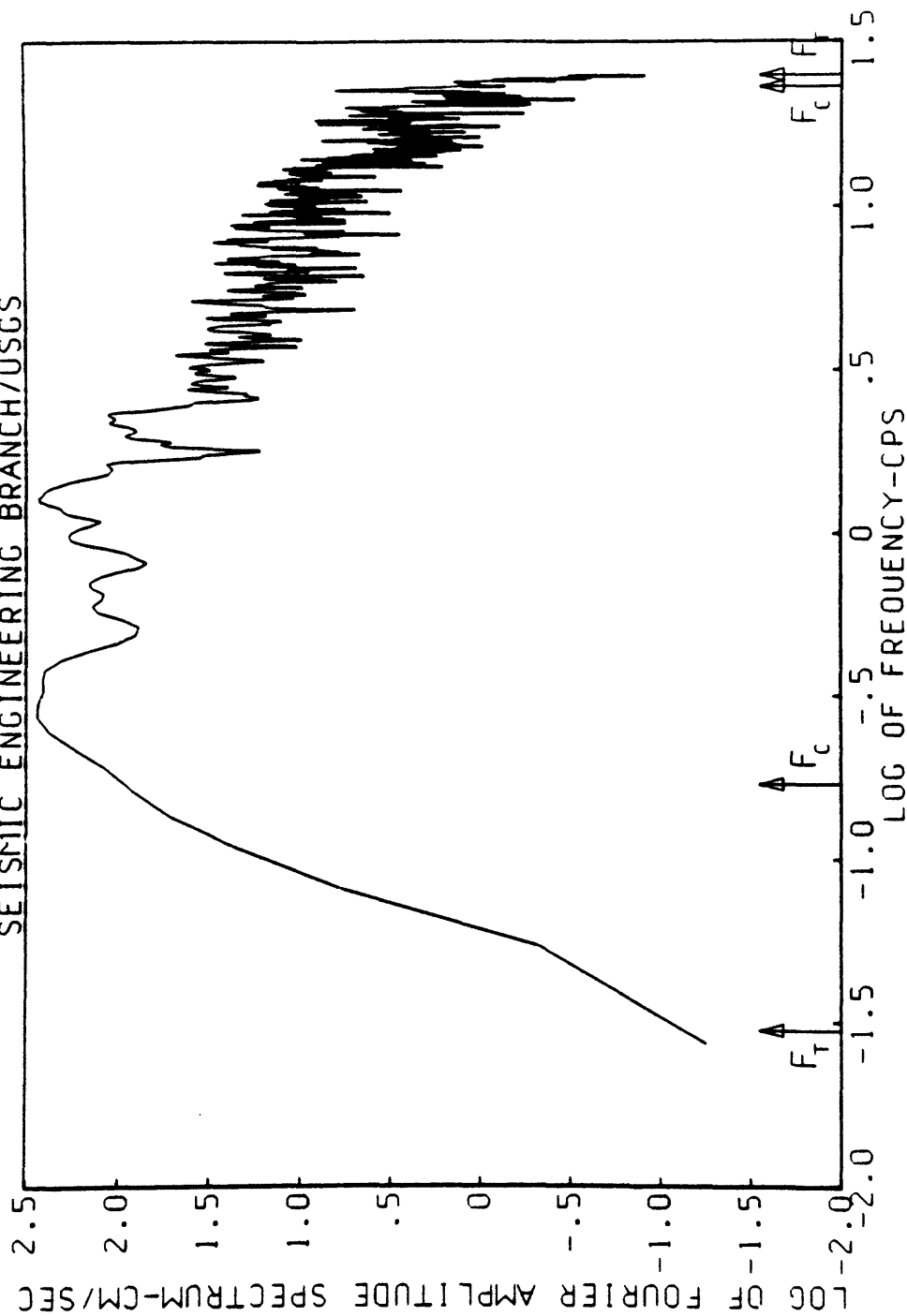


RESPONSE SPECTRA  
 EL CENTRO, ARRAY 7, 10/15/79, 2317.140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

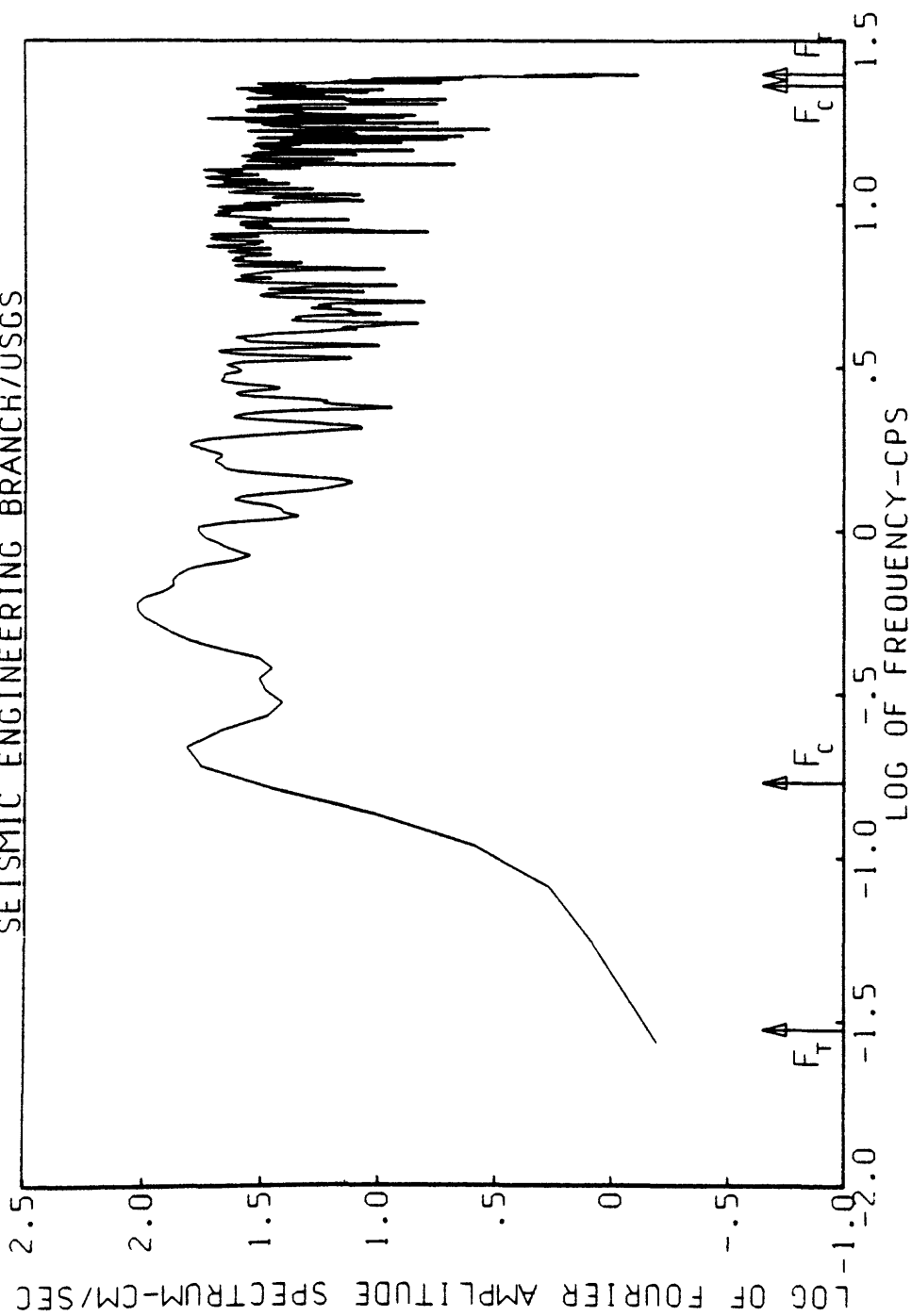




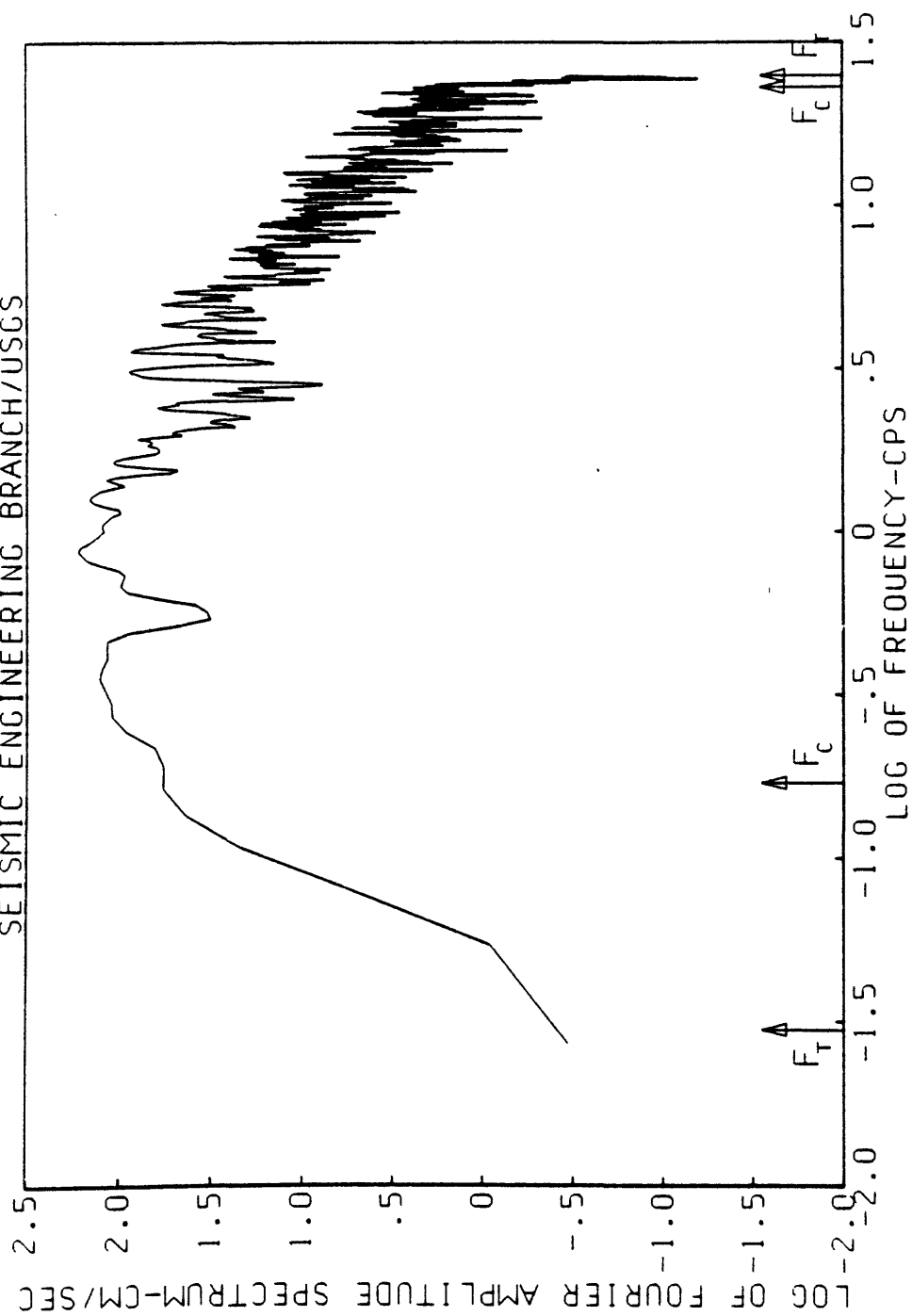
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



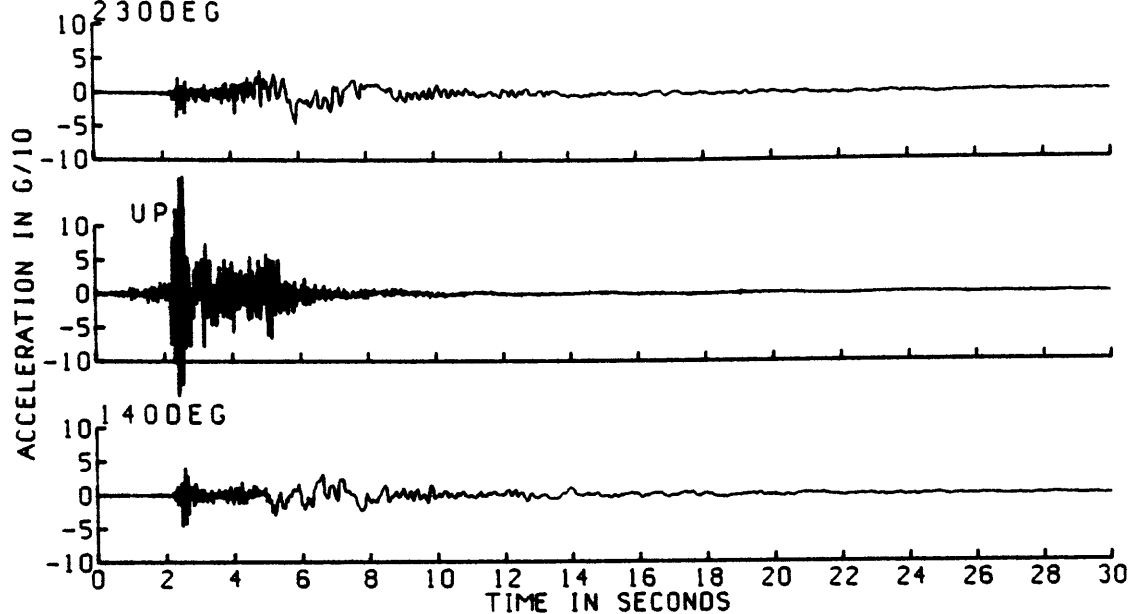
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



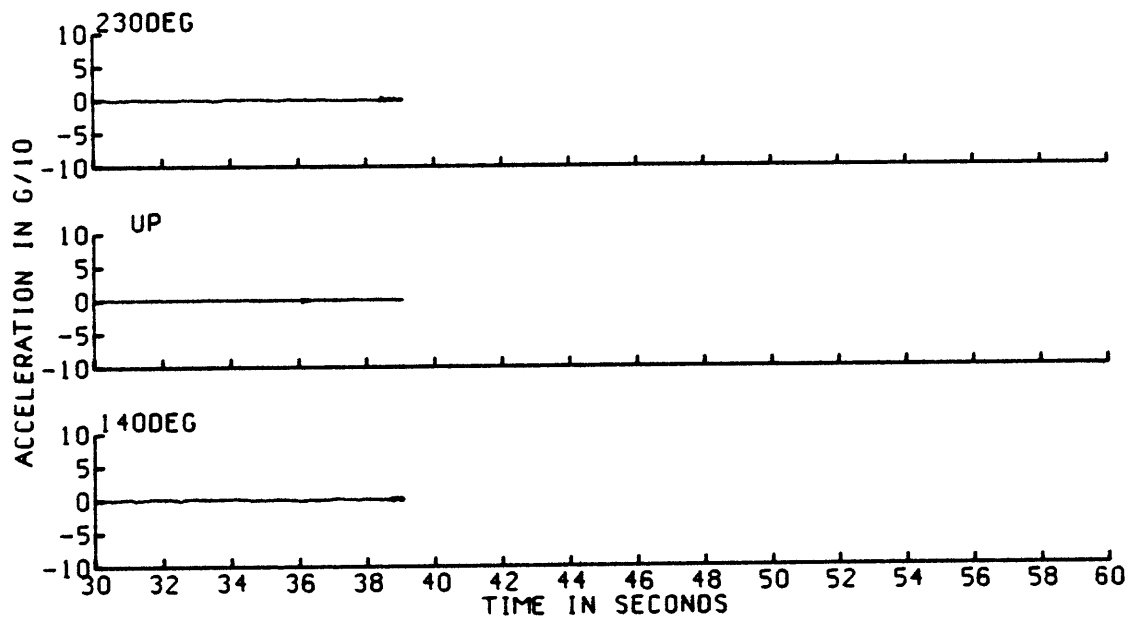
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 IMPERIAL VALLEY COLLEGE, EL CENTRO, CALIFORNIA, 140 DEGREES  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



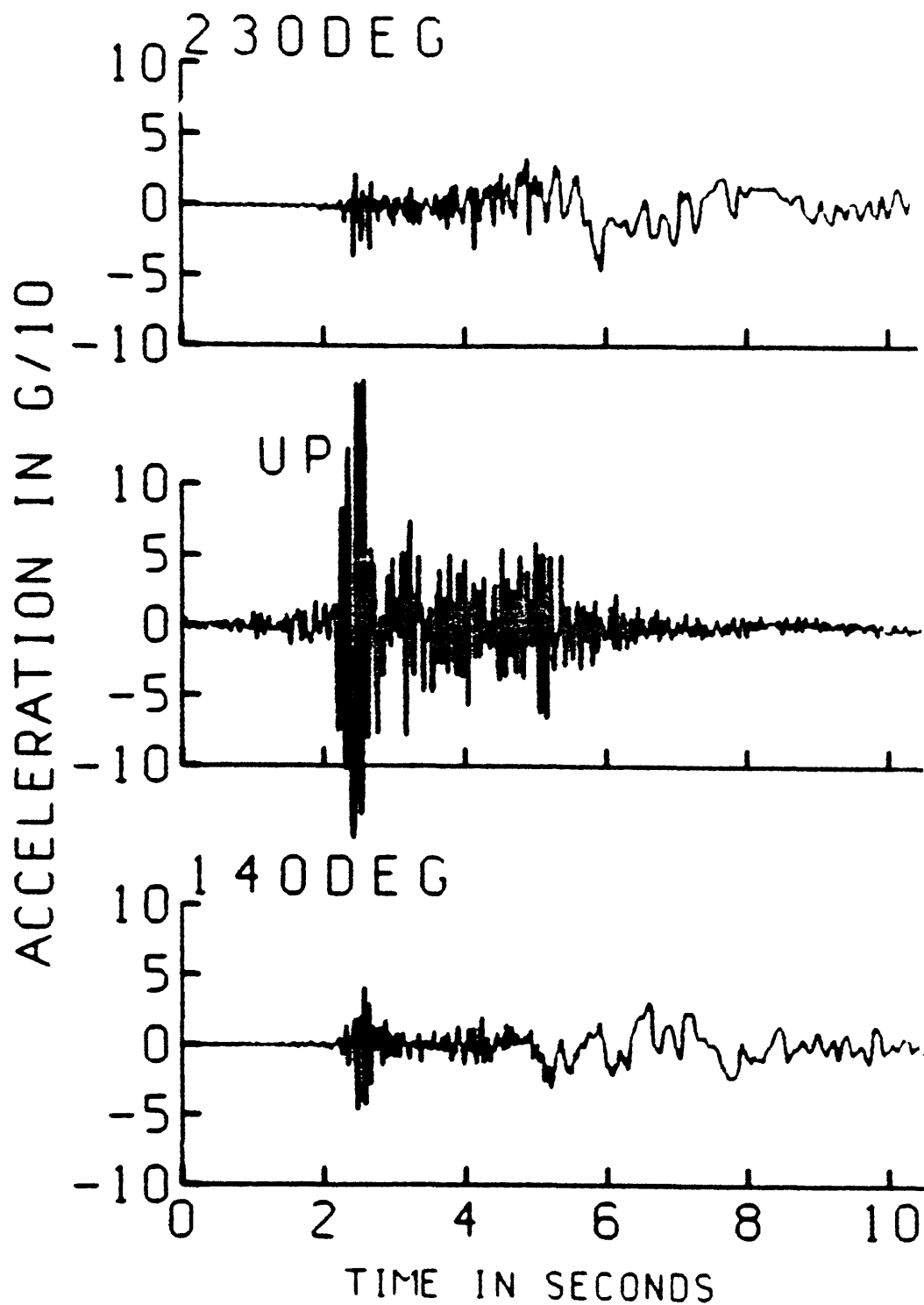
UNCORRECTED ACCELEROGRAM  
 EL CENTRO, ARRAY 6, HUSTON RD..10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .4556 1.752 .4592



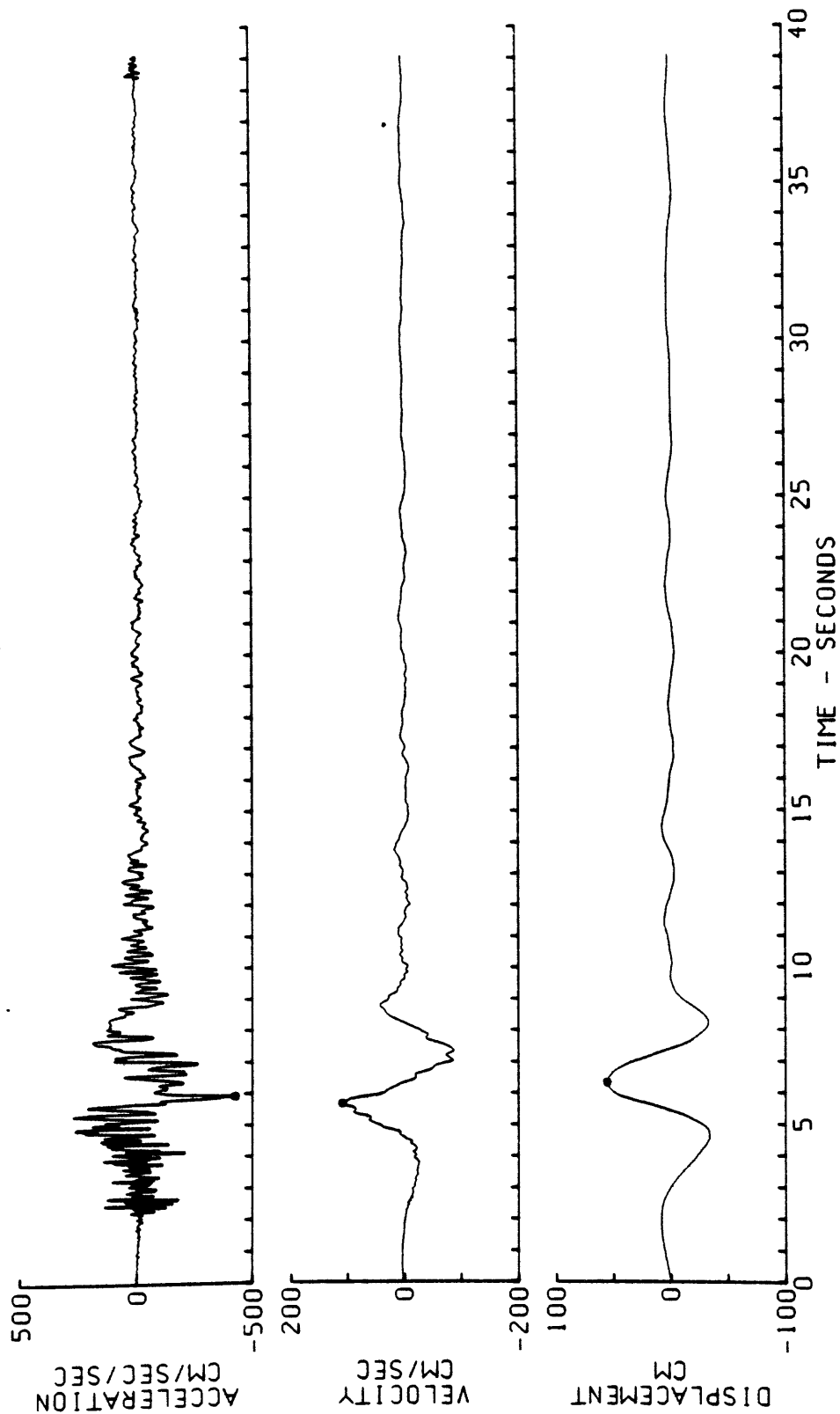
EL CENTRO, ARRAY 6, HUSTON RD..10/15/79.2317UTC



EL CENTRO.ARRAY 6.HUSTON RD.  
10/15/79.2317UTC

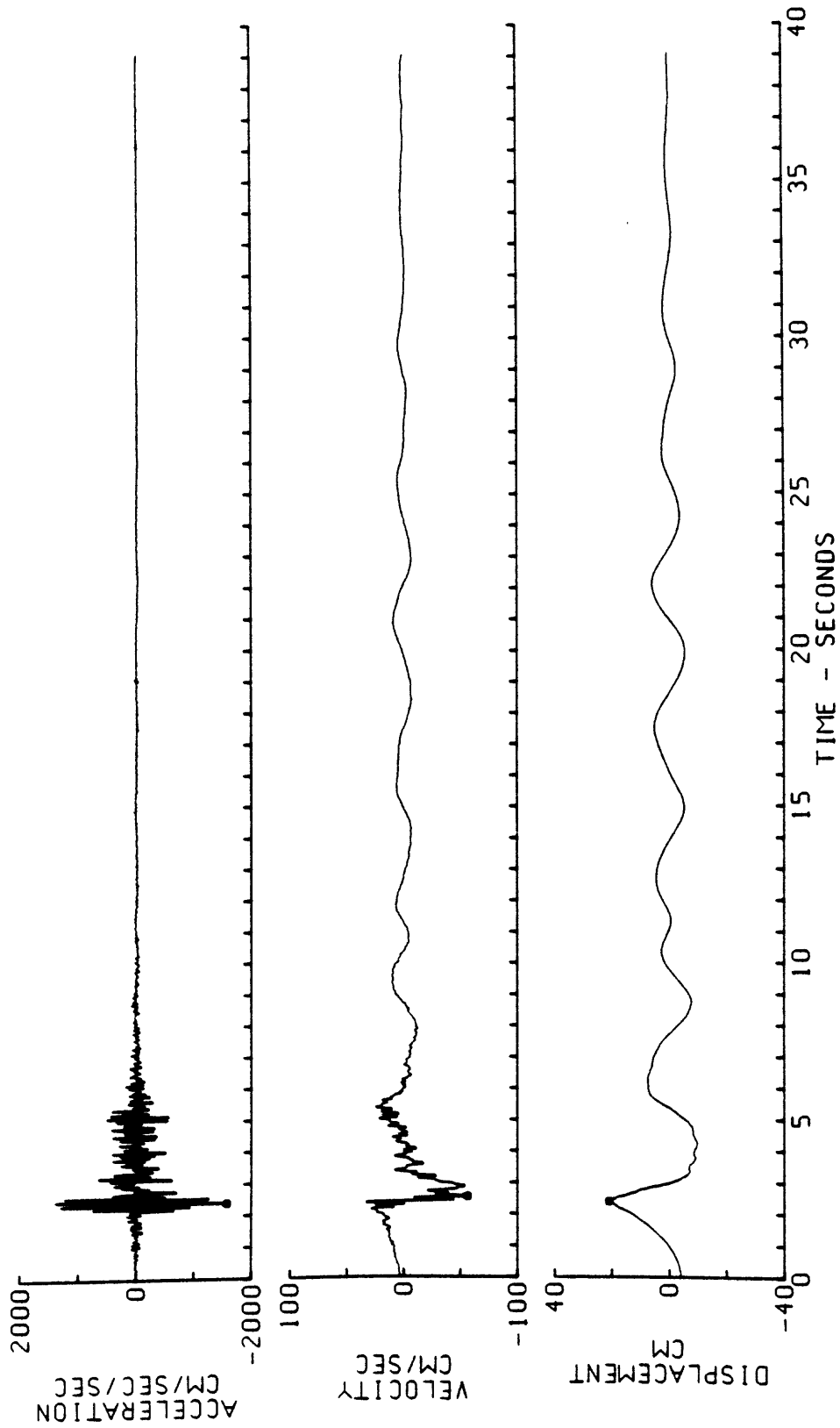


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-422.7 CM/SEC/SEC, VELOCITY=108.6 CM/SEC, DISPL=55.20 CM

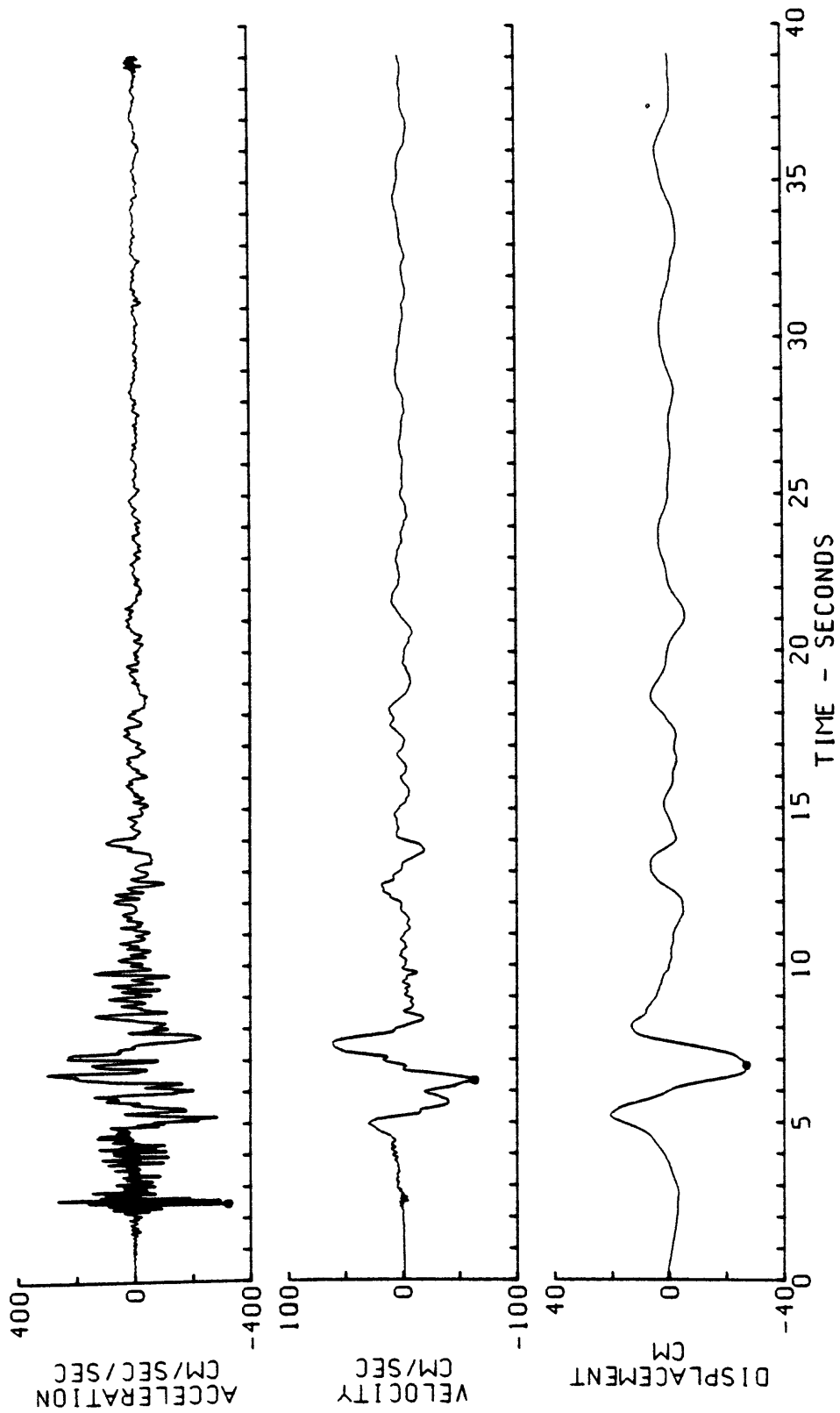


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA, COMP UP

DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-1566.5CM/SEC/SEC, VELOCITY=-56.15 CM/SEC, DISPL=-20.95 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-322.5 CM/SEC/SEC, VELOCITY=-62.95 CM/SEC, DISPL=-26.89 CM





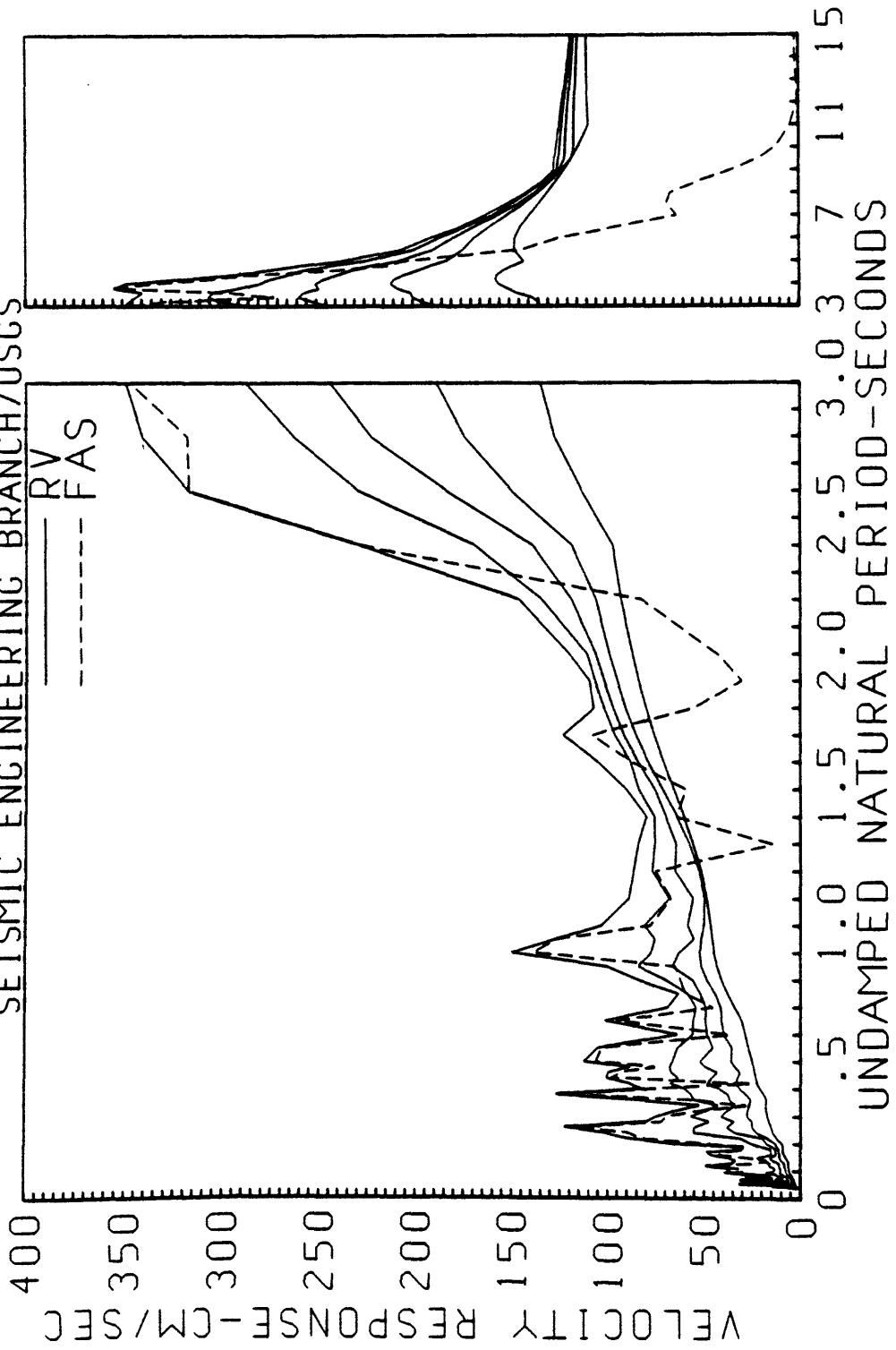
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 6.10/15/79.2317.230DEG

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



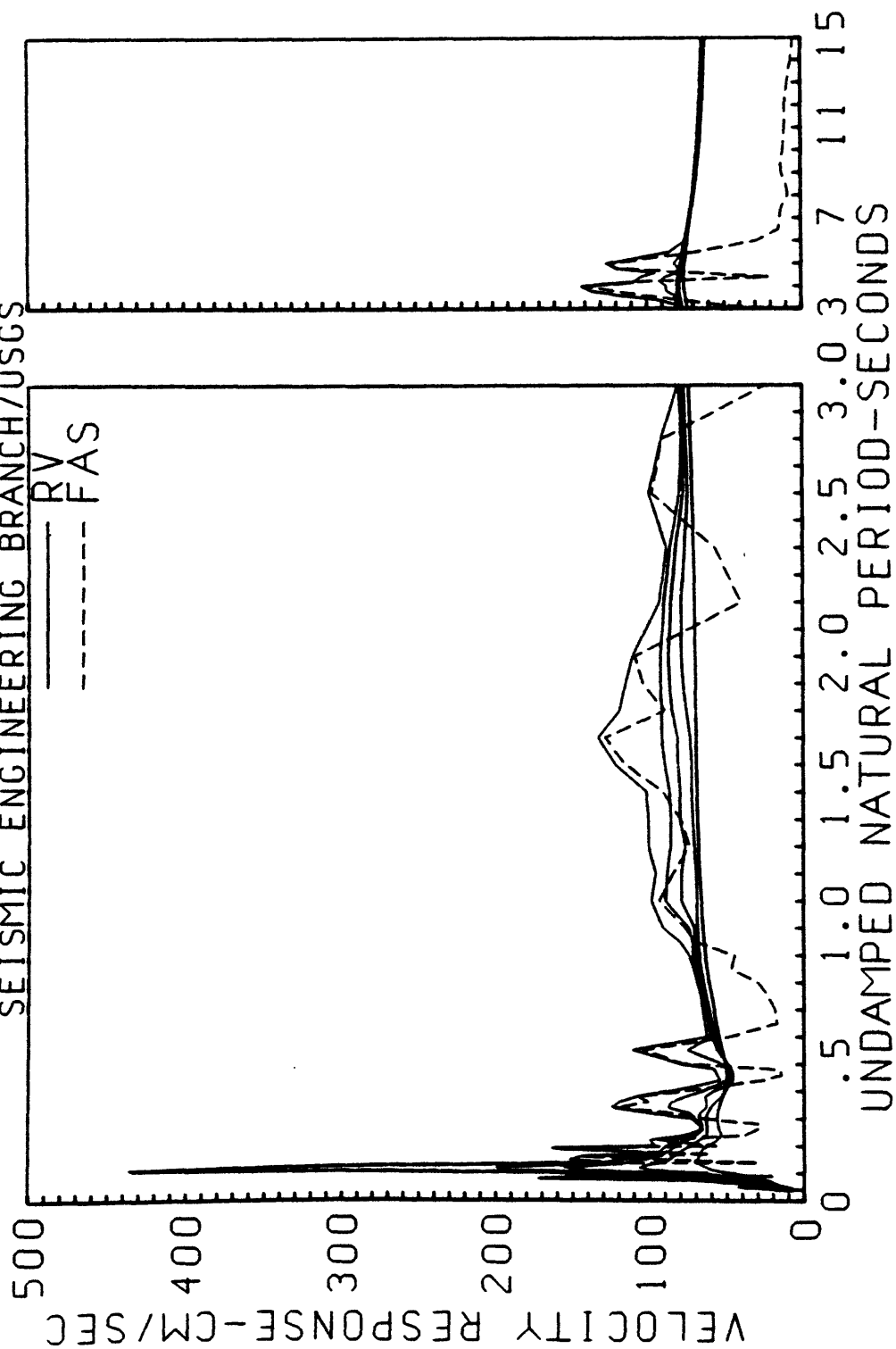
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 6, 10/15/79, 2317UTC, UP

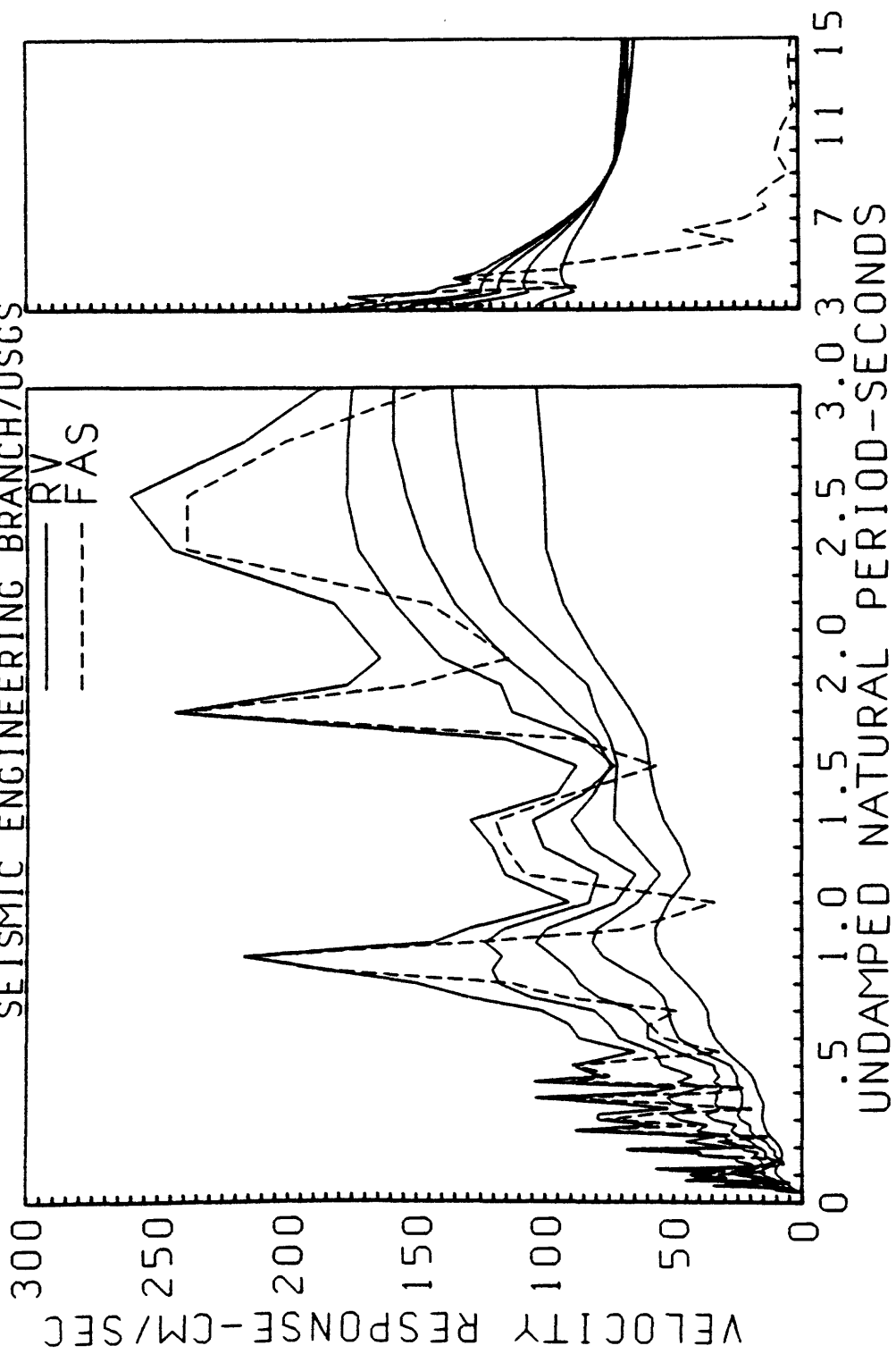
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

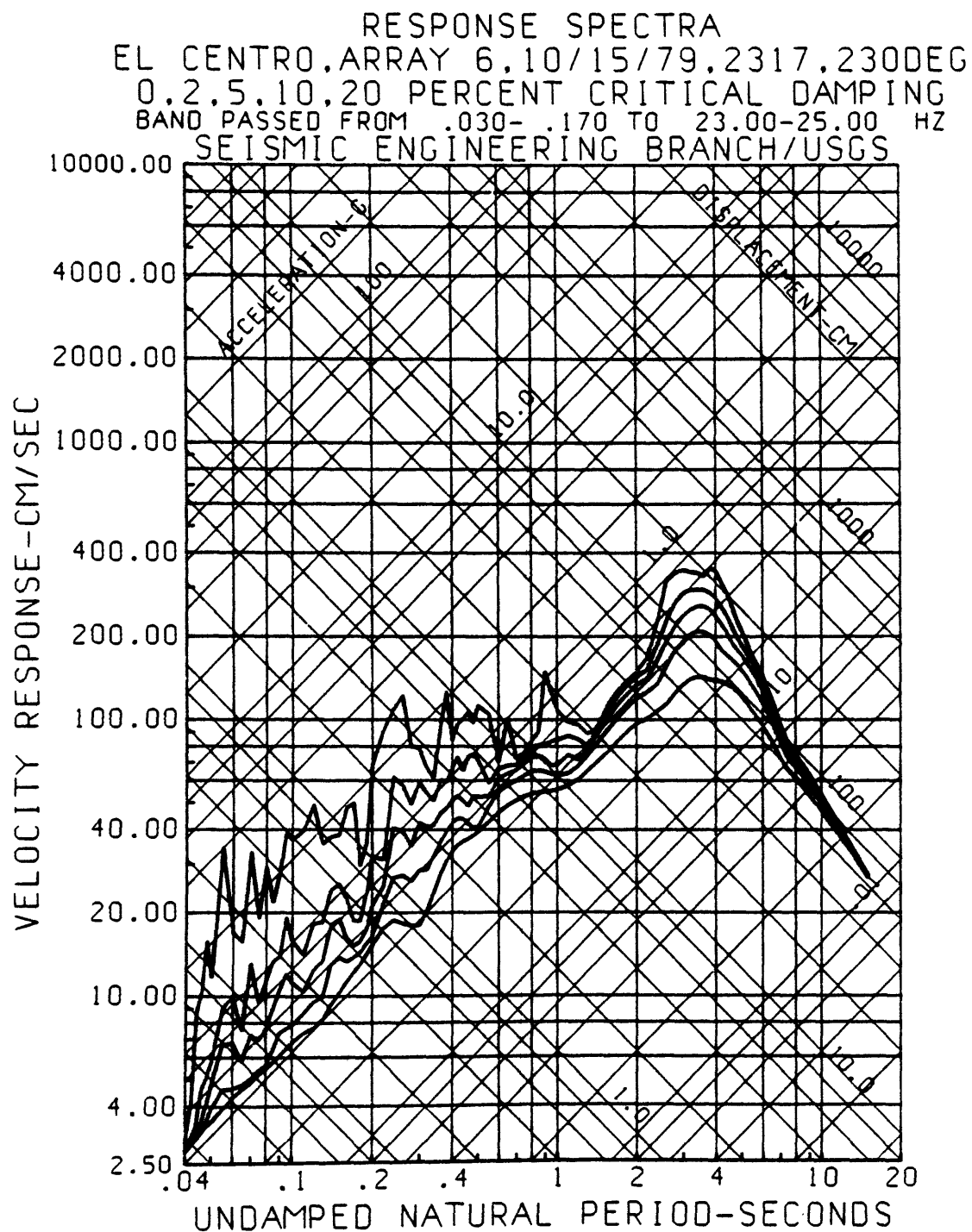
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

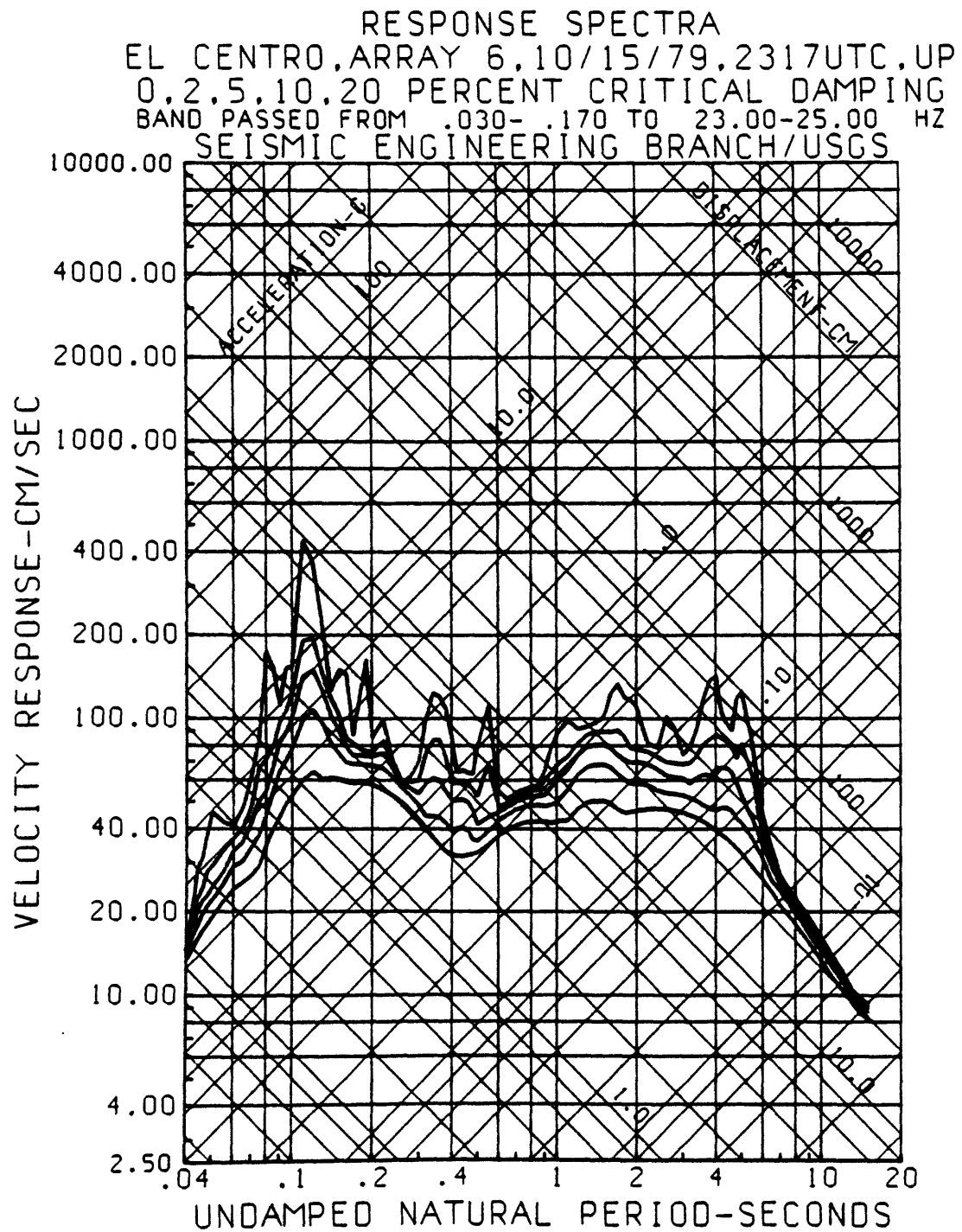
SEISMIC ENGINEERING BRANCH/USGS

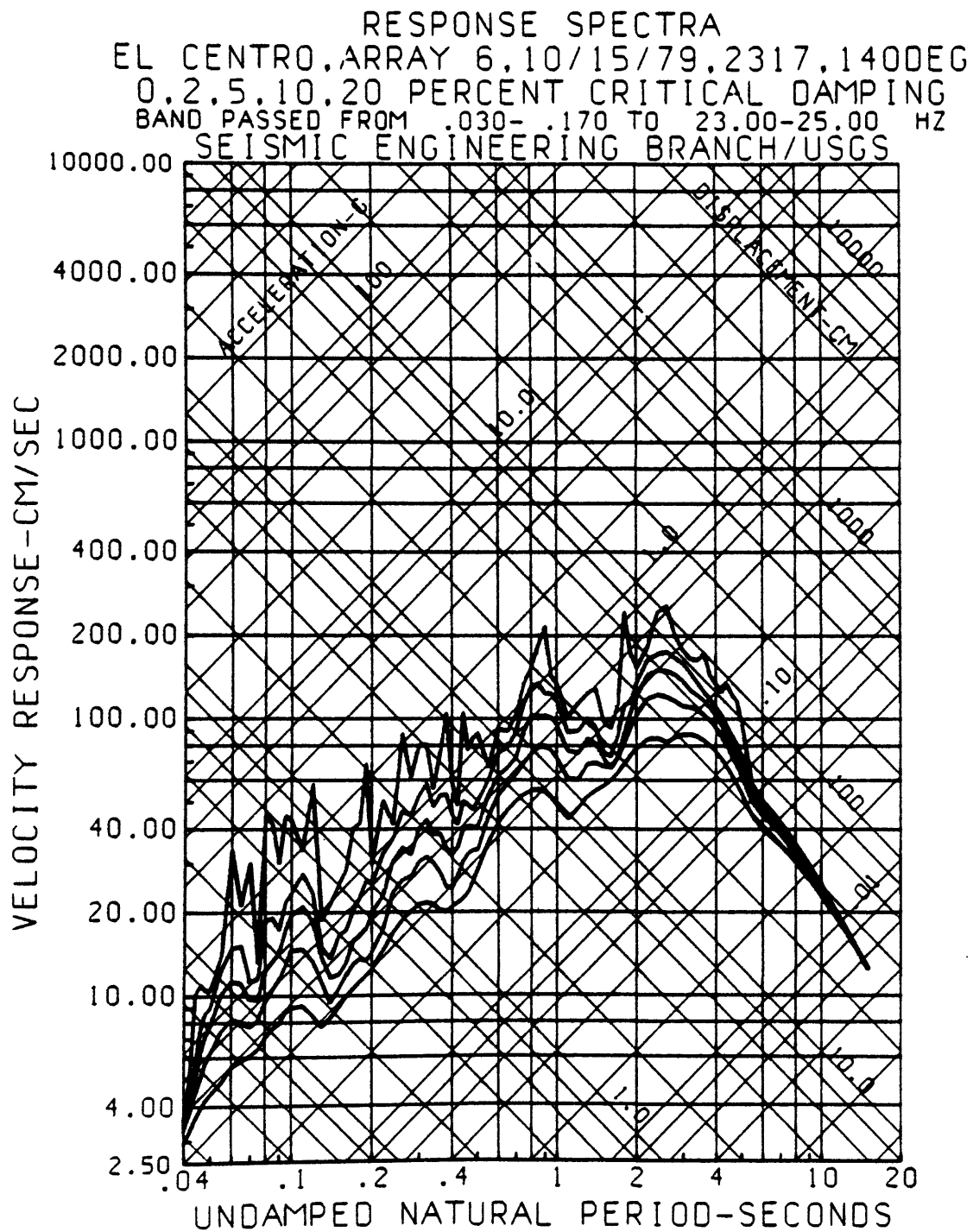


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 6, 10/15/79, 2317.140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

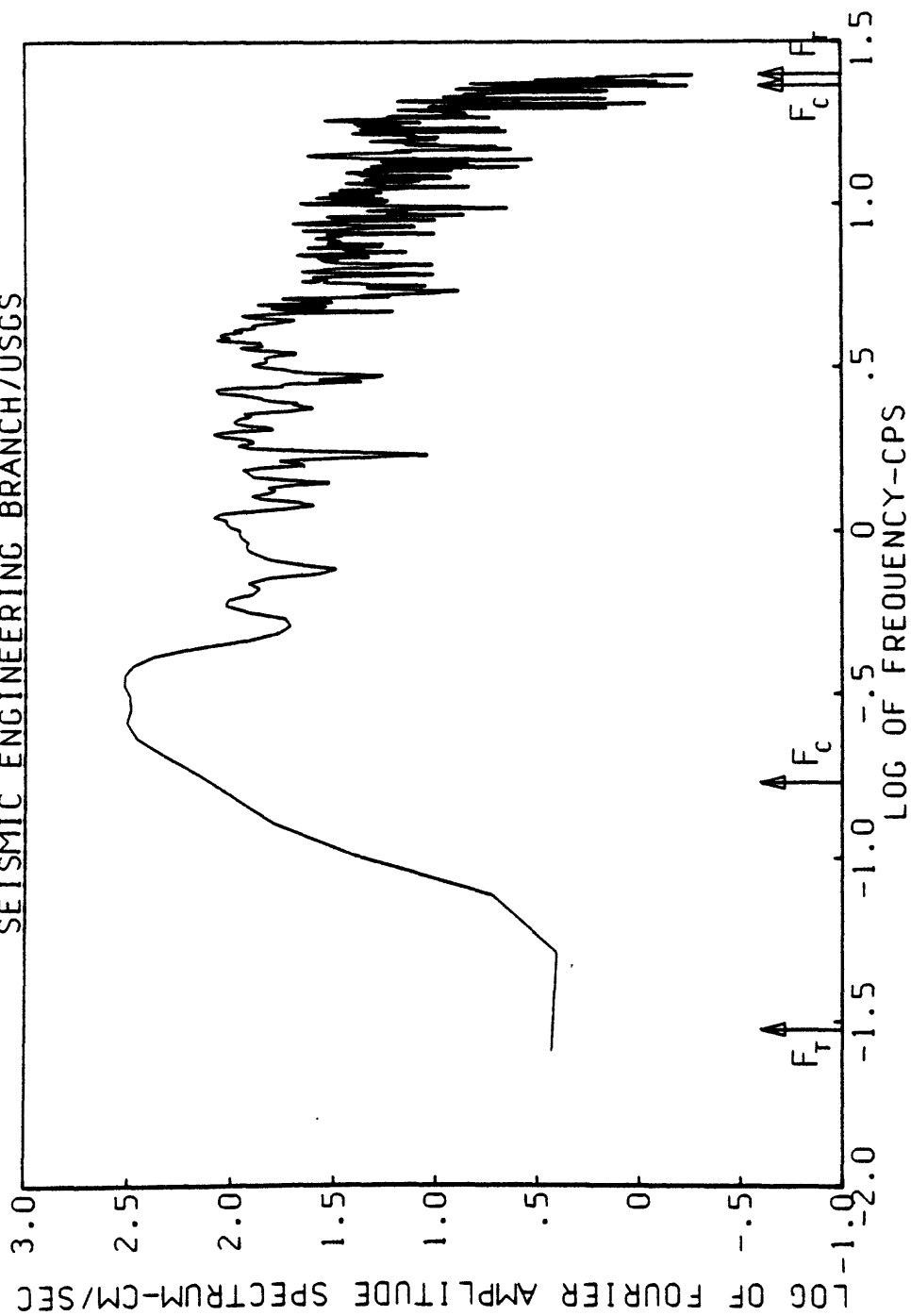




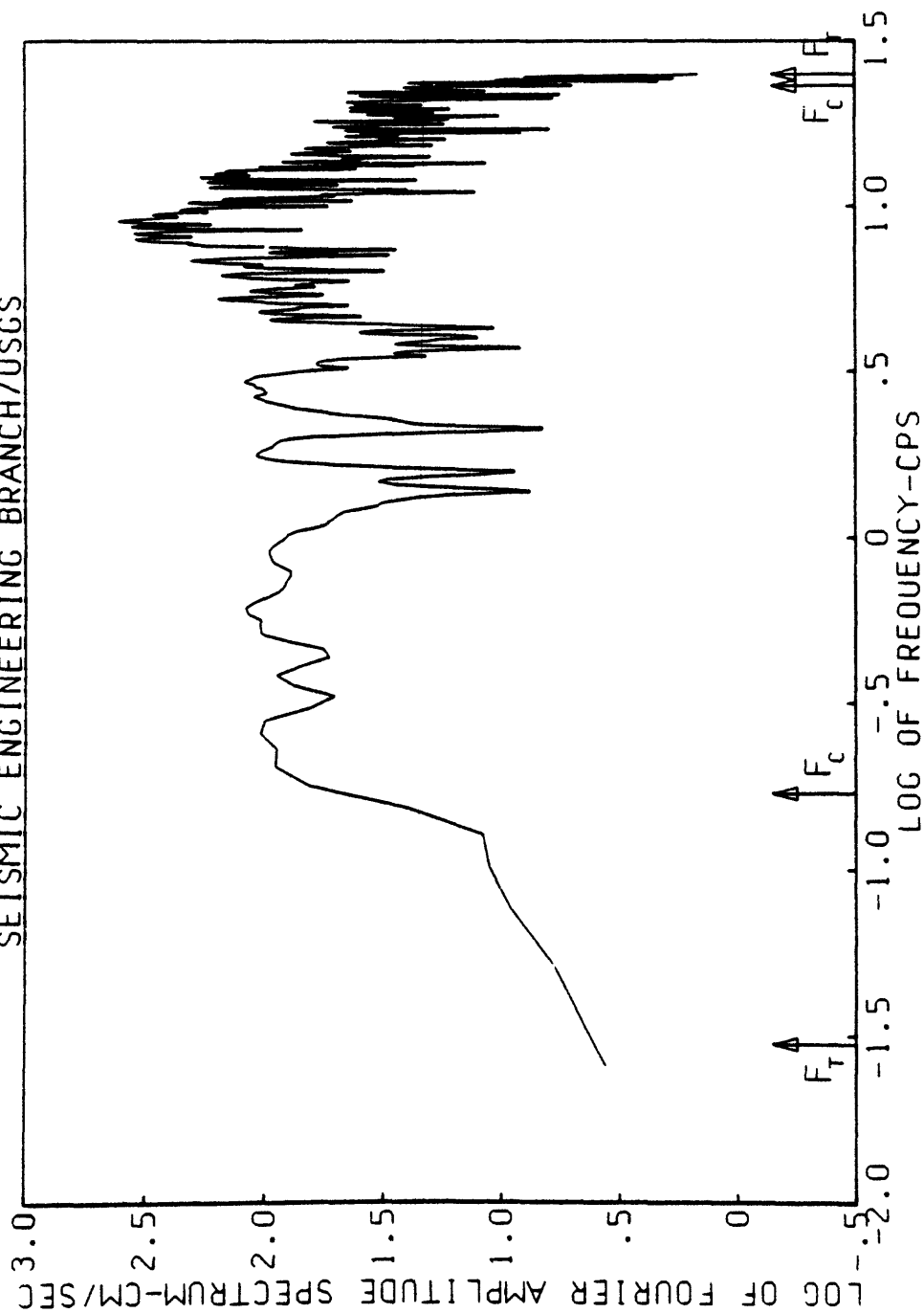




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA. COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

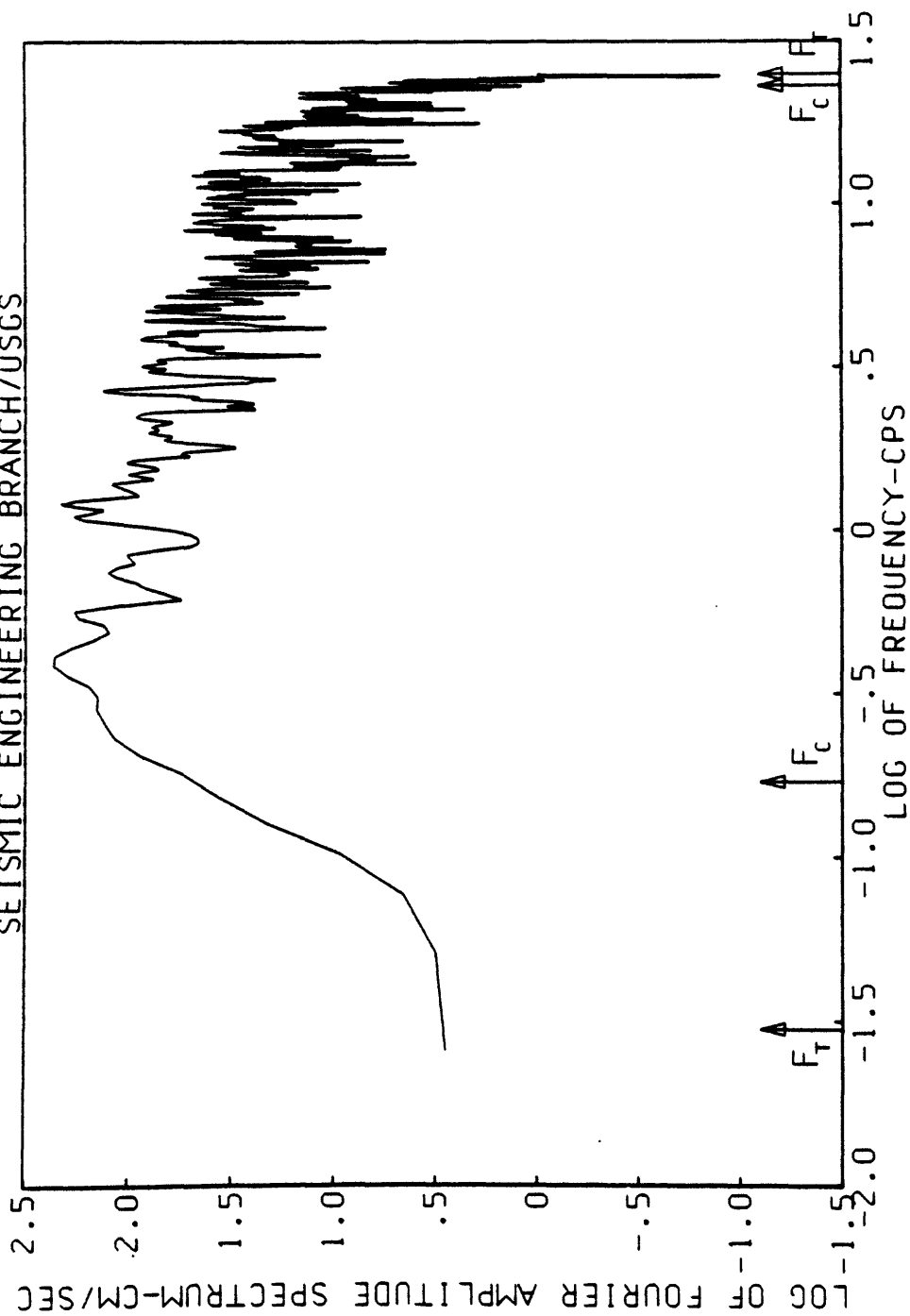


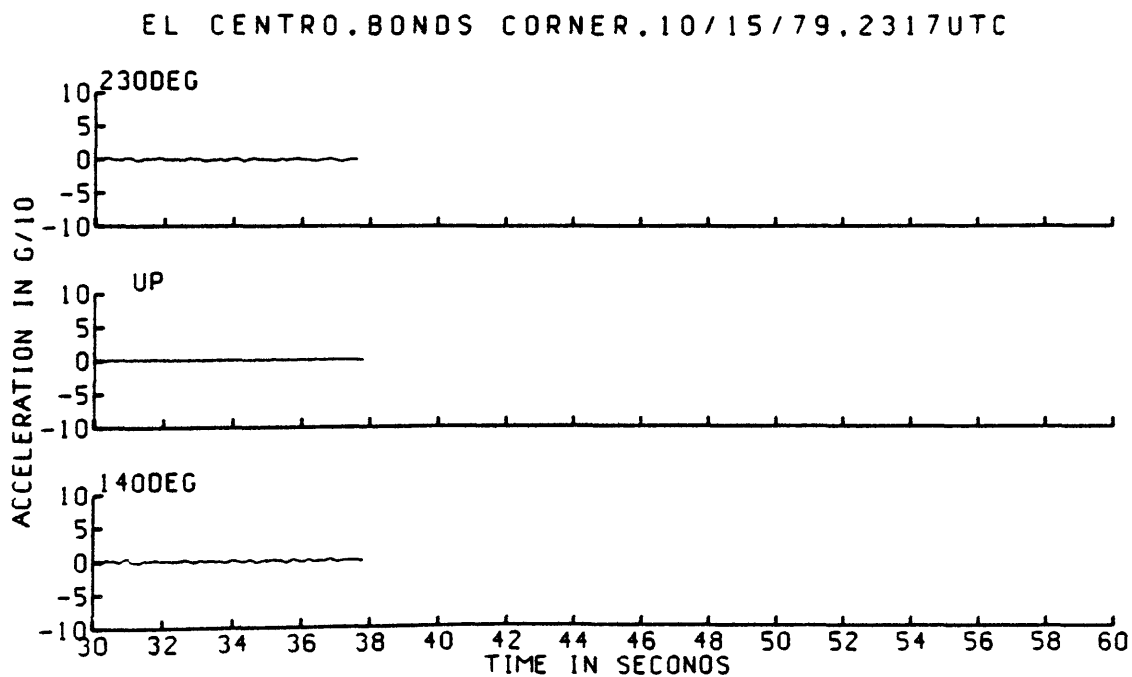
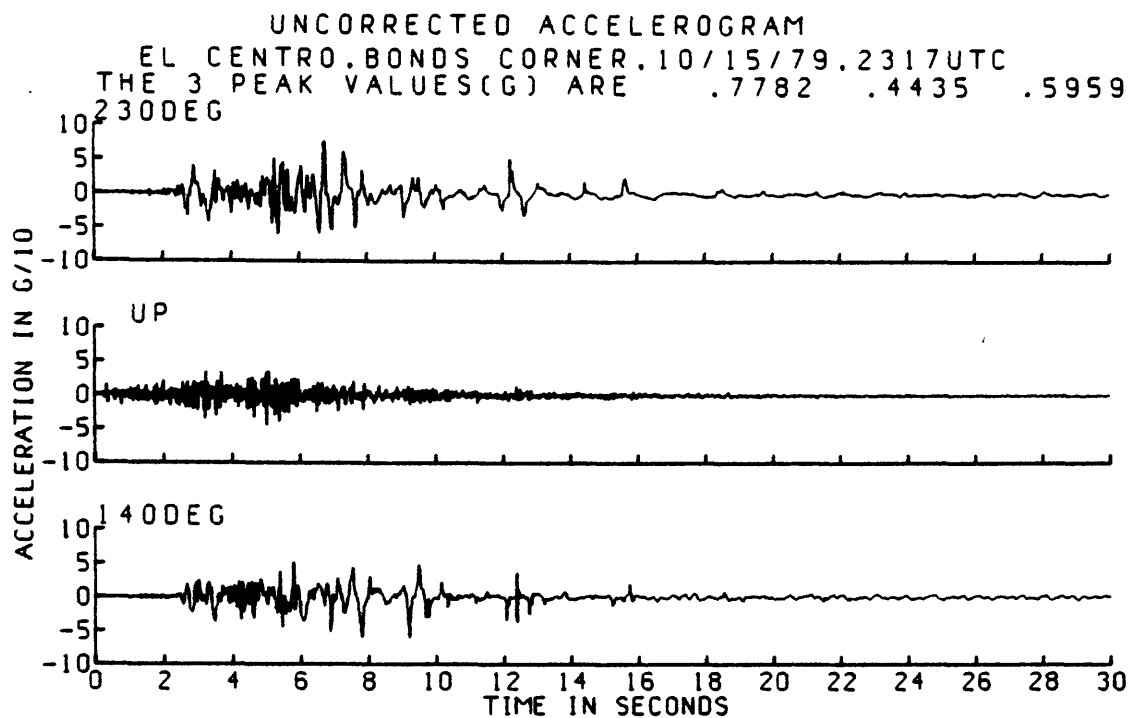
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



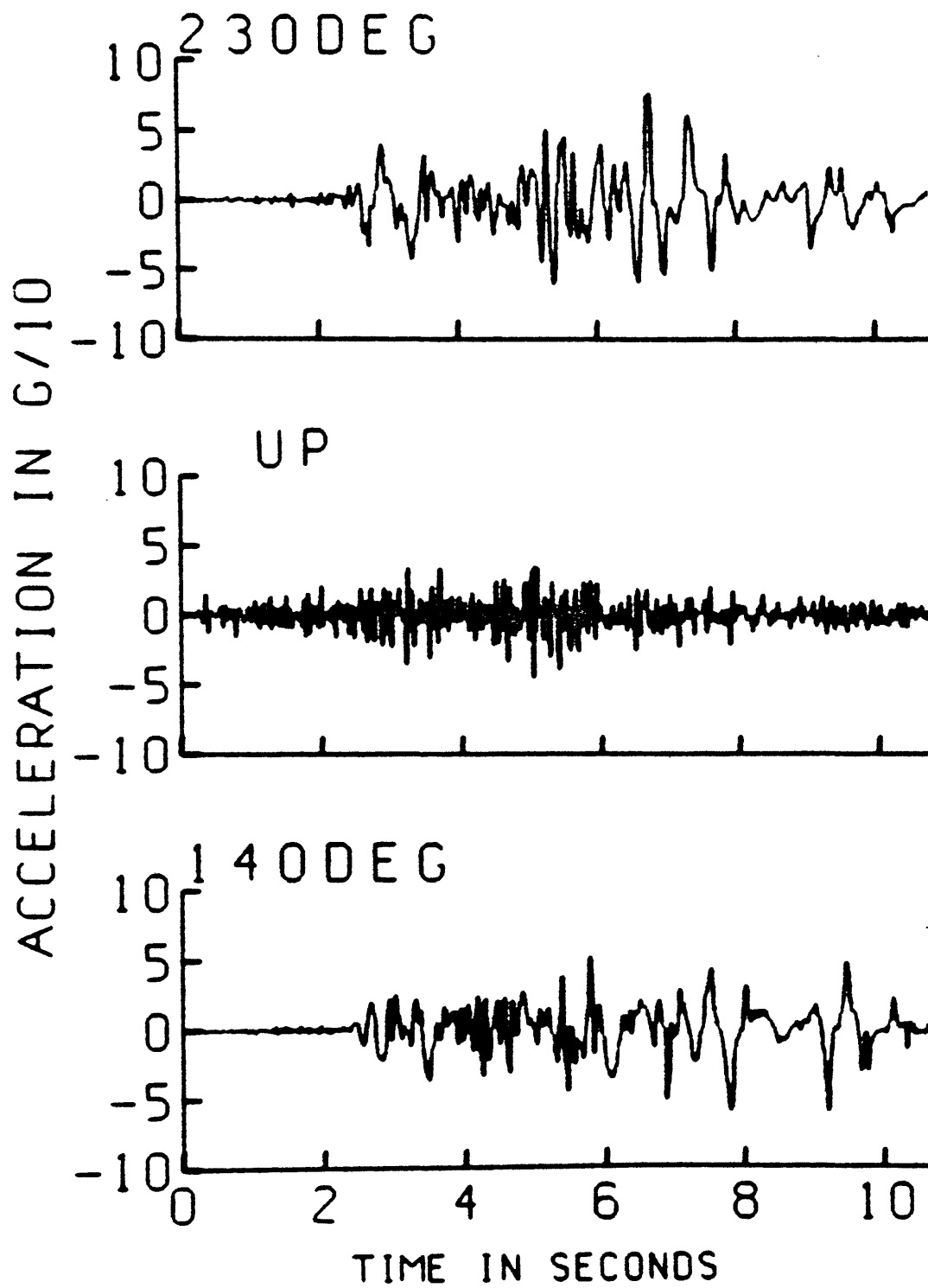


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HUSTON RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

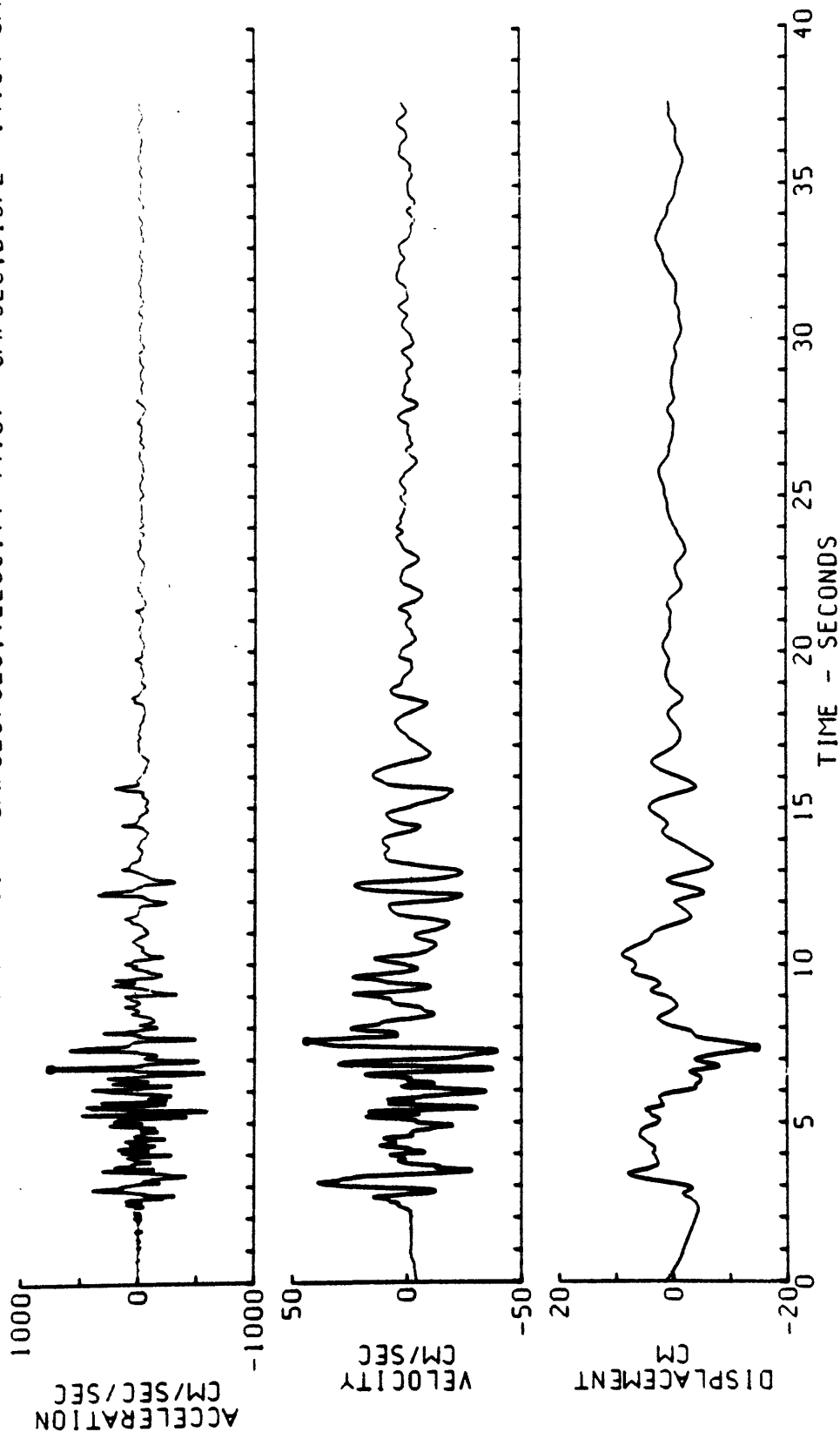




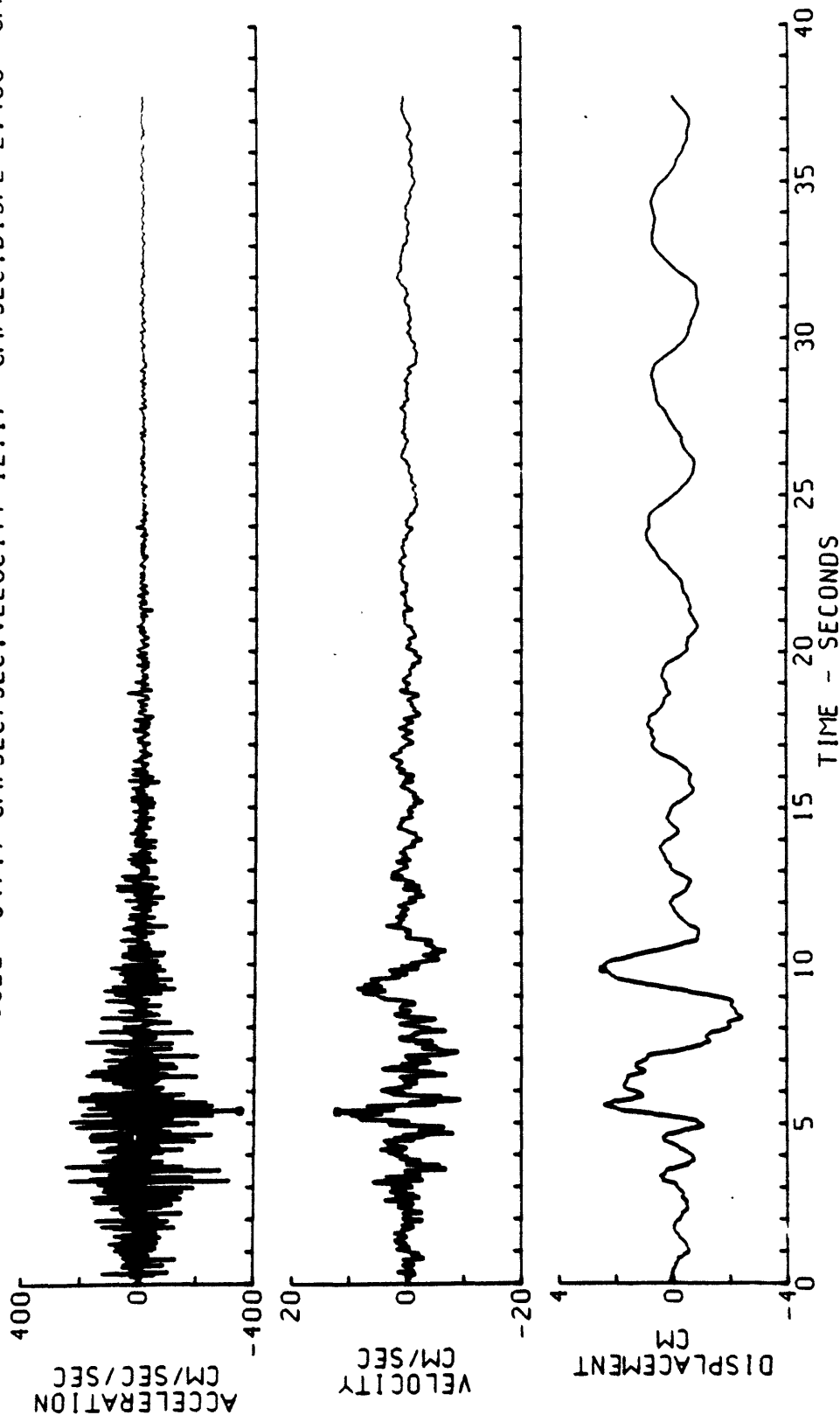
BONDS CORNER  
10/15/79.2317UTC



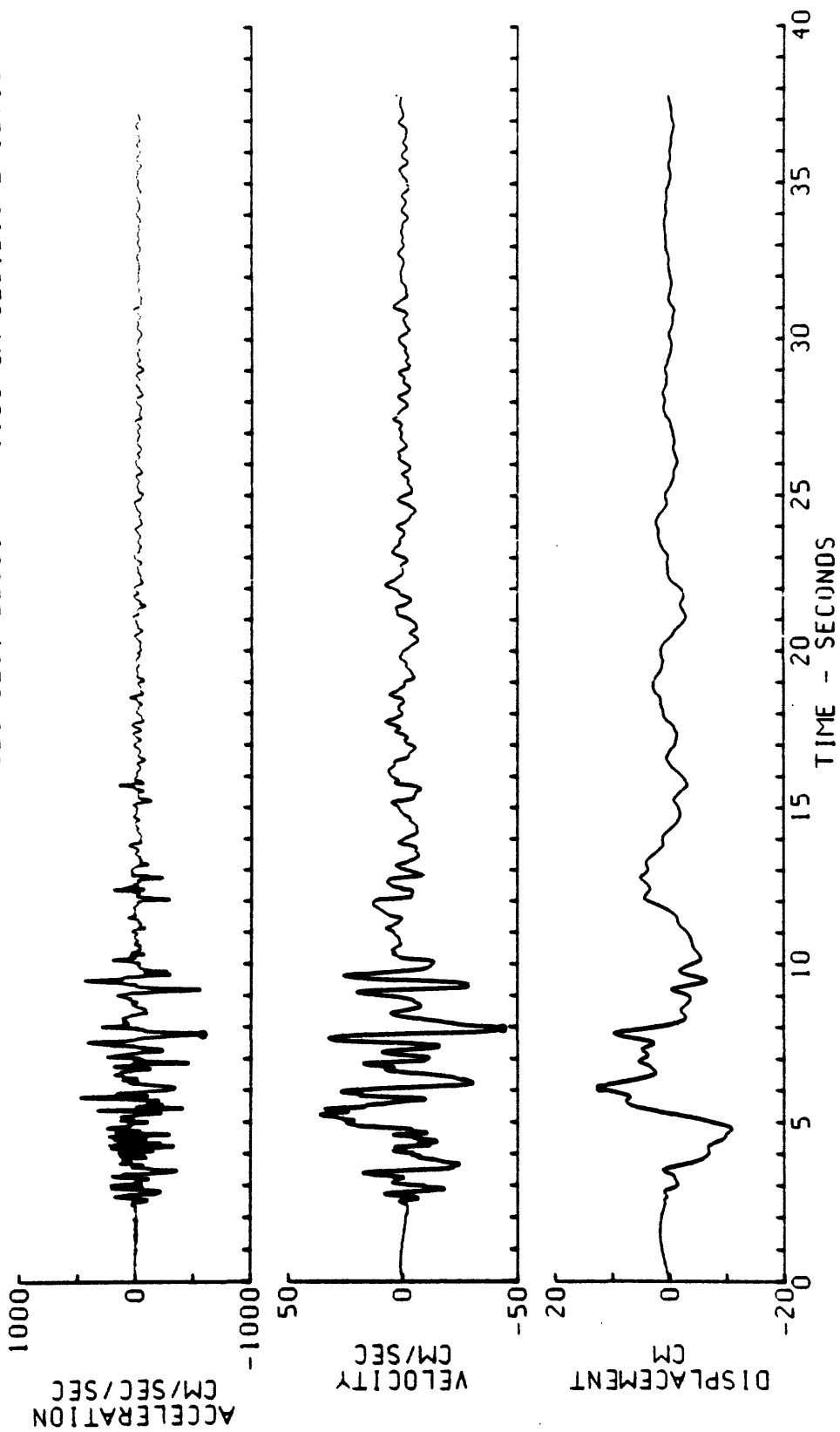
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF., COMP 230 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=770.4 CM/SEC/SEC, VELOCITY=44.07 CM/SEC, DISPL=-14.64 CM



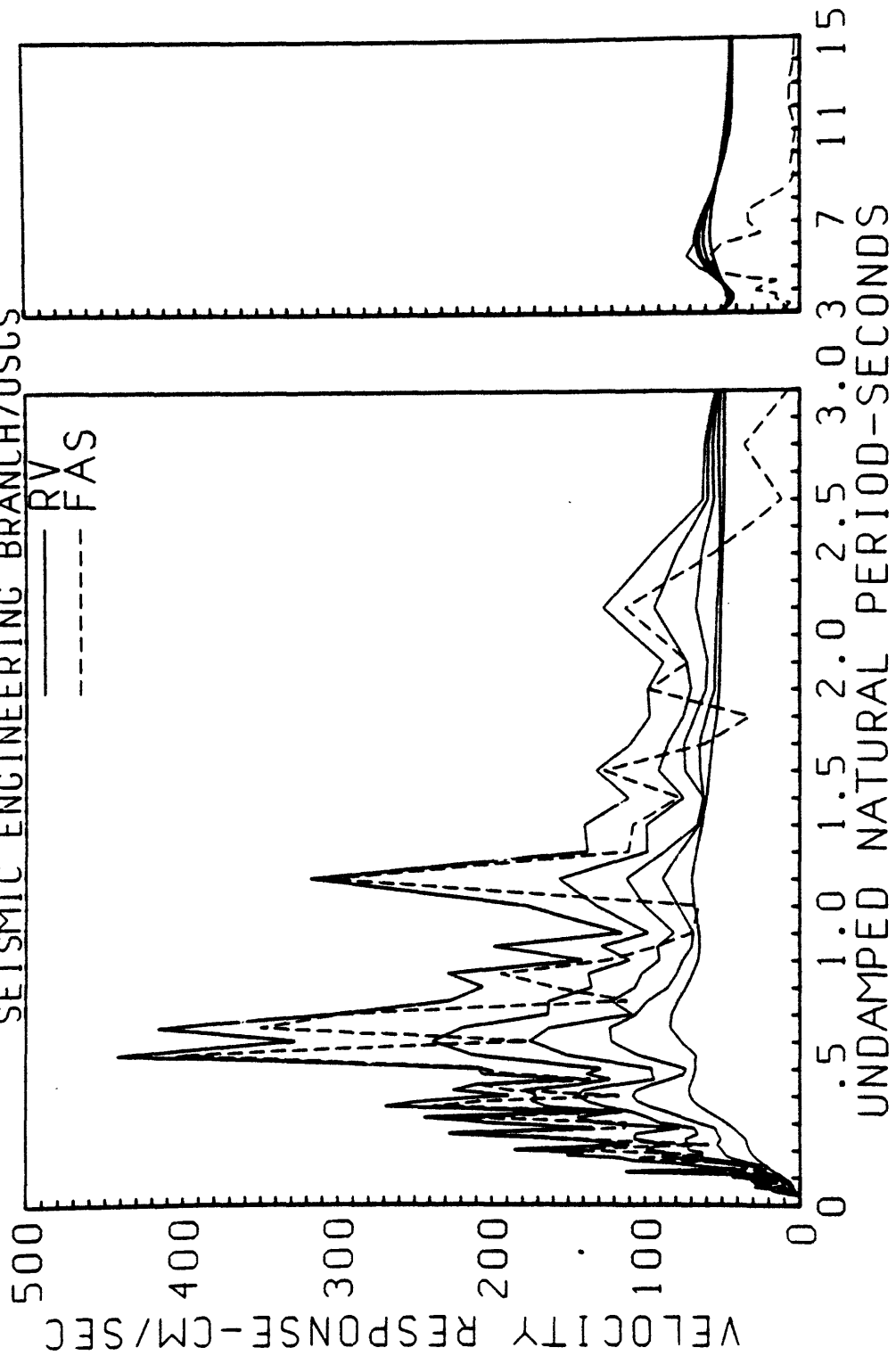
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF., COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-347.7 CM/SEC/SEC, VELOCITY=12.17 CM/SEC, DISPL=2.460 CM



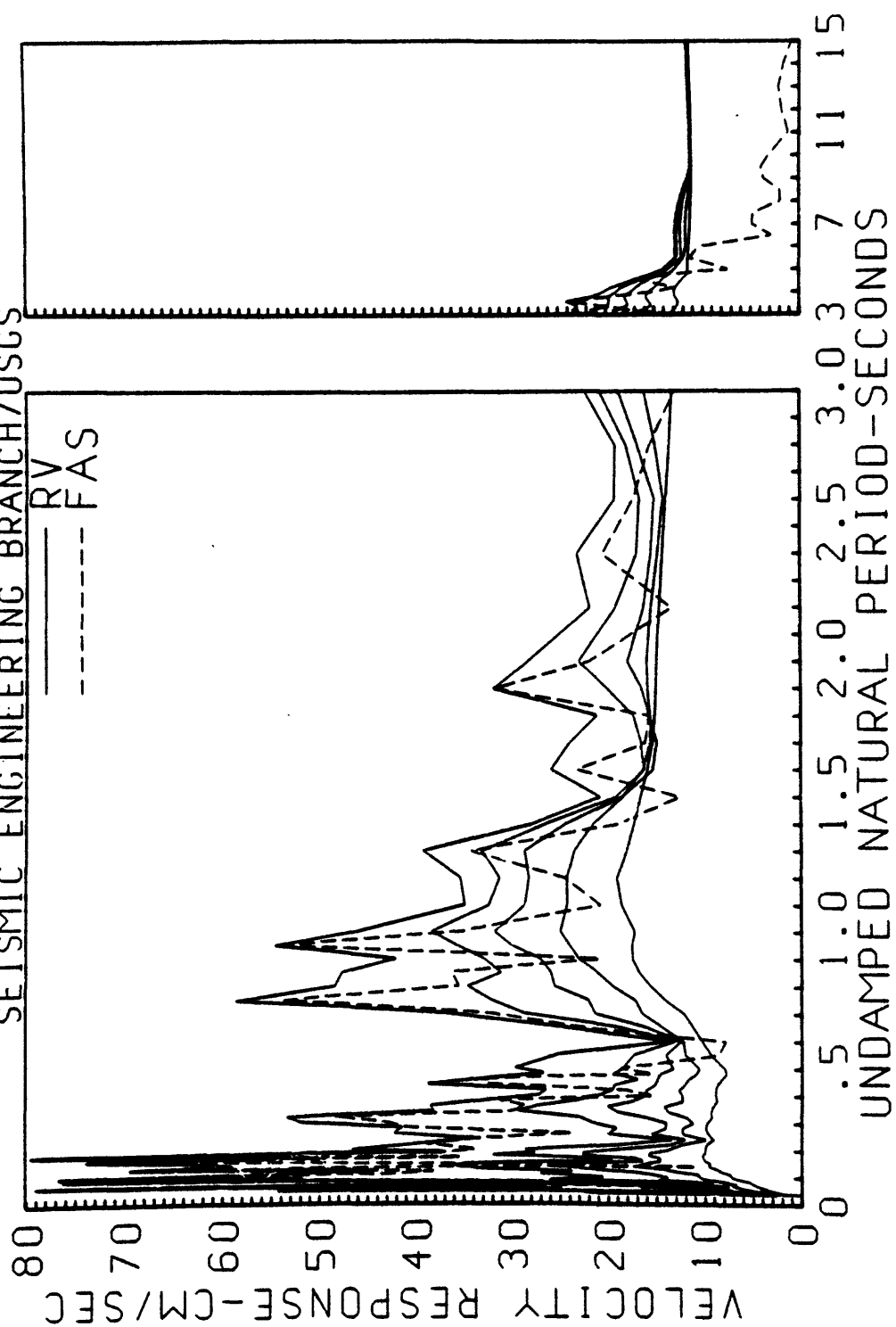
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF., COMP 140 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-575.7 CM/SEC/SEC, VELOCITY=-43.63 CM/SEC, DISPL=-12.19 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, BONDS CORNER, 10/15/79, 230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

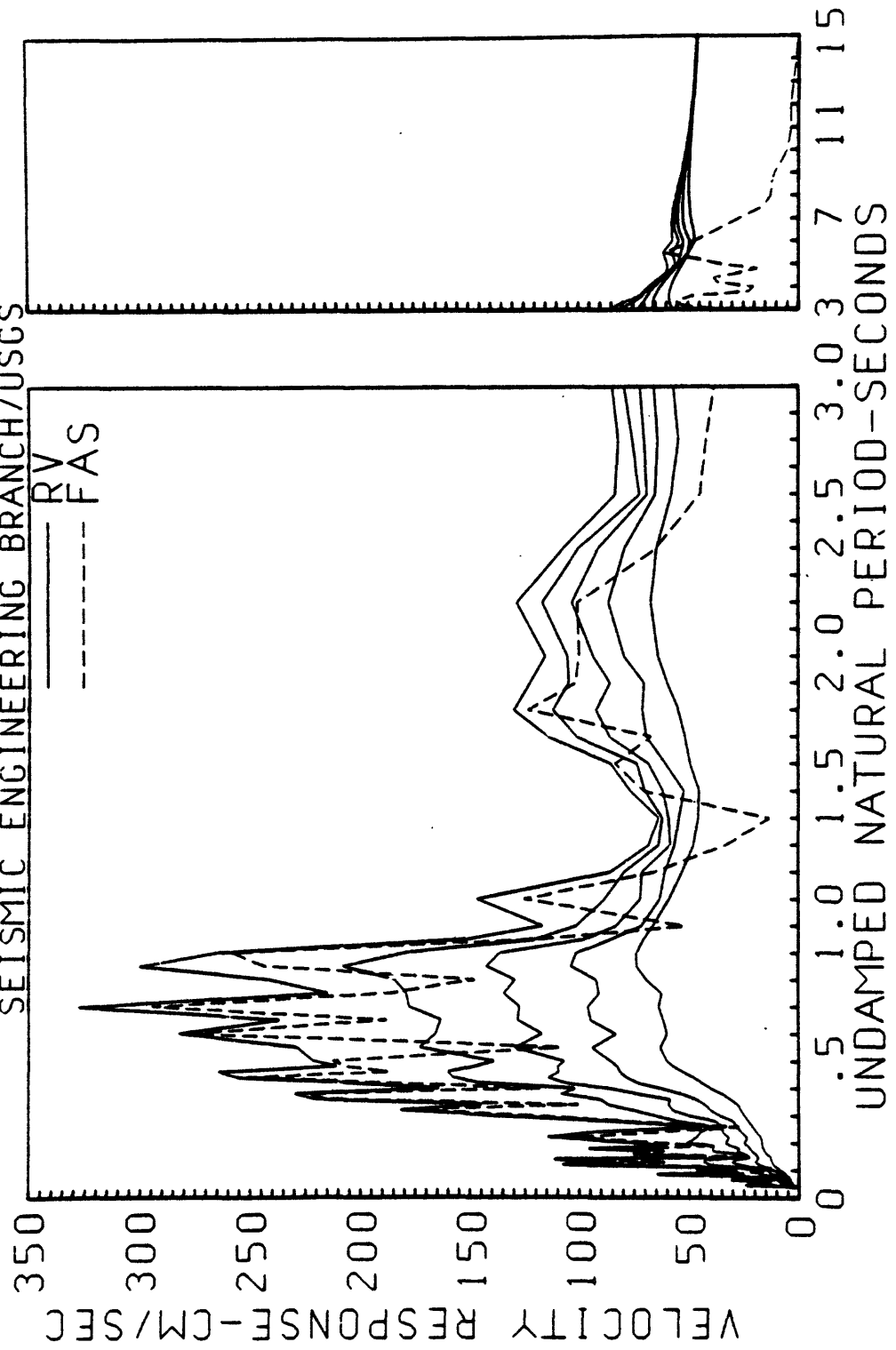


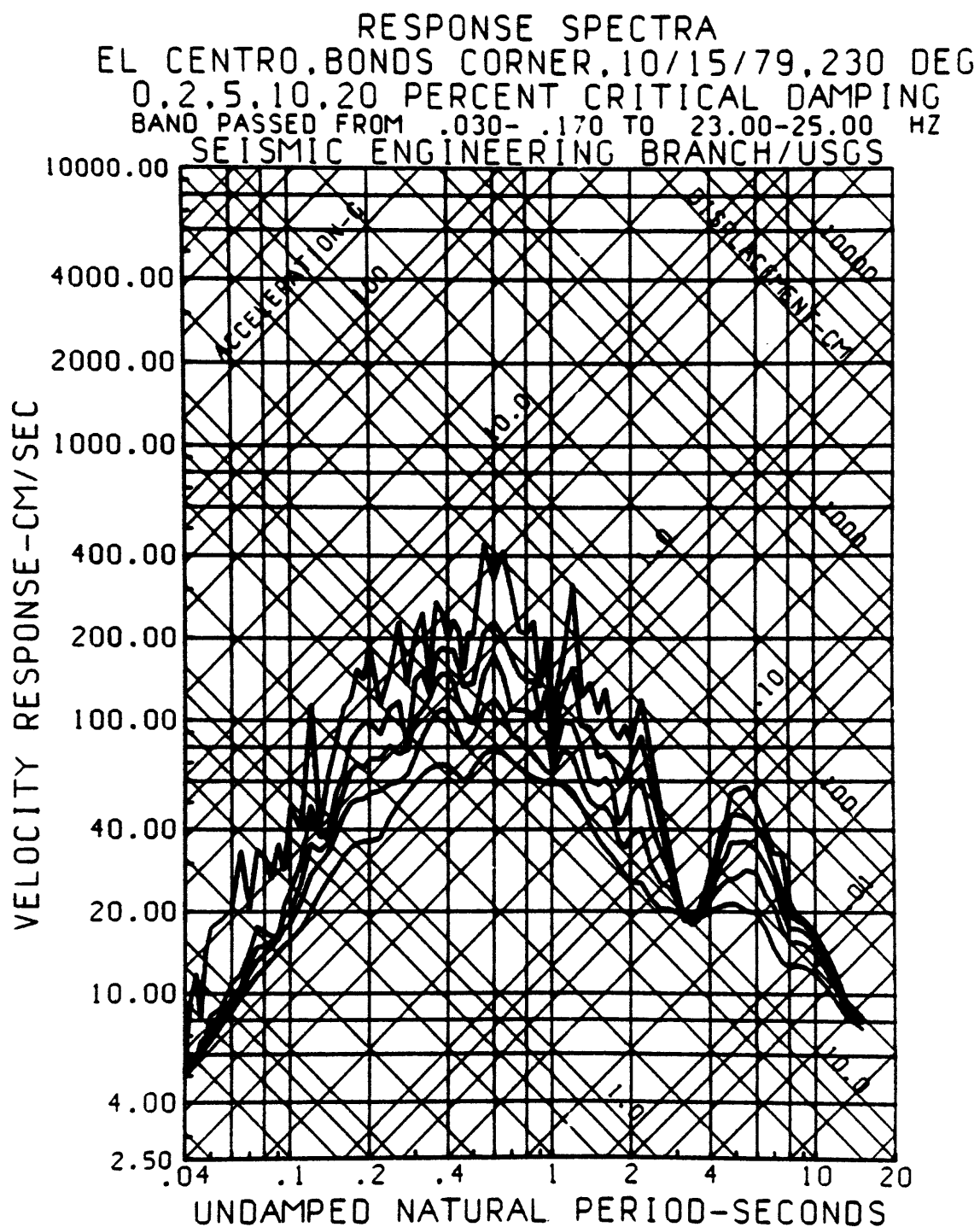
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, BONDS CORNER, 10/15/79, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



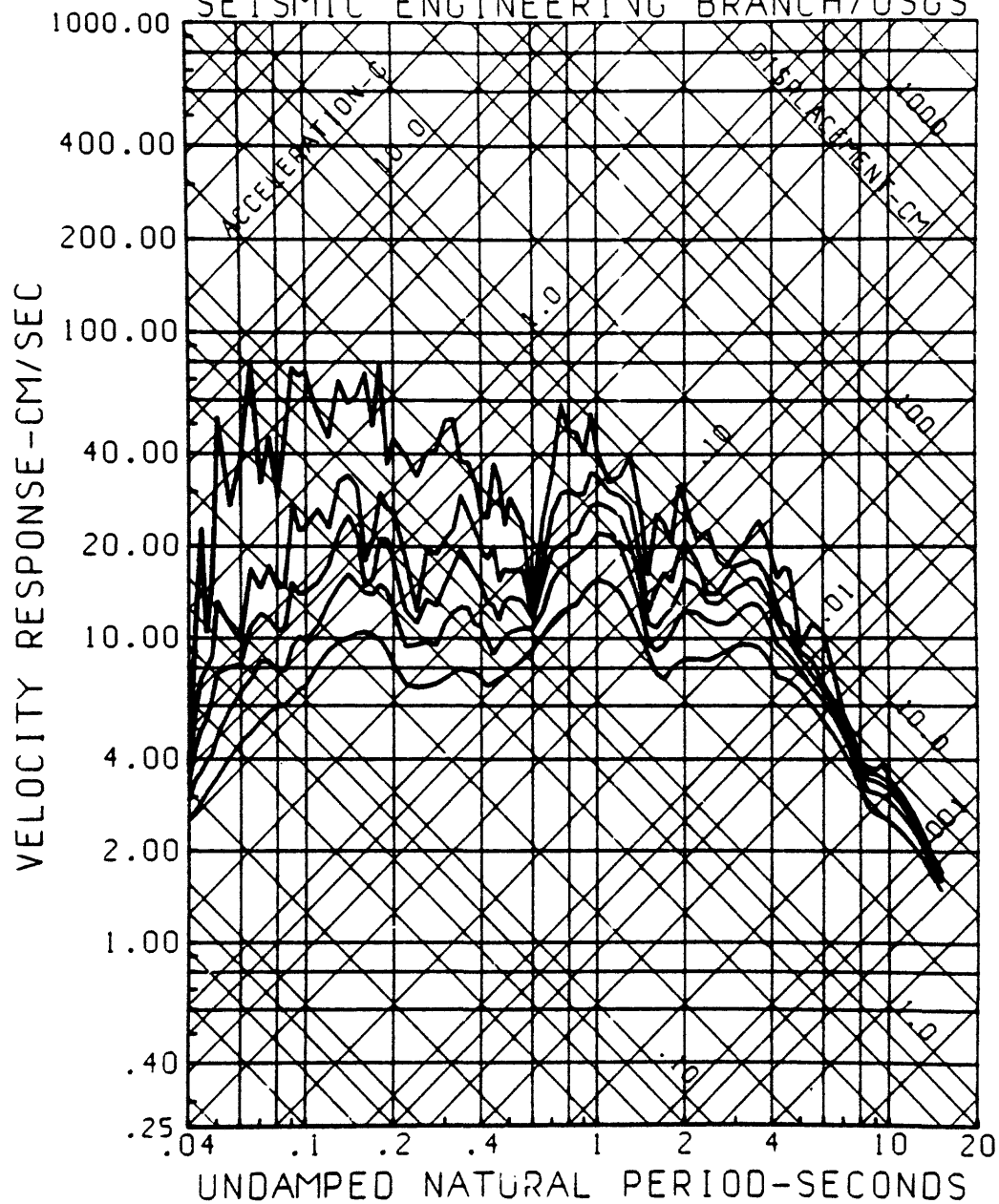


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, BONDS CORNER, 10/15/79, 140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

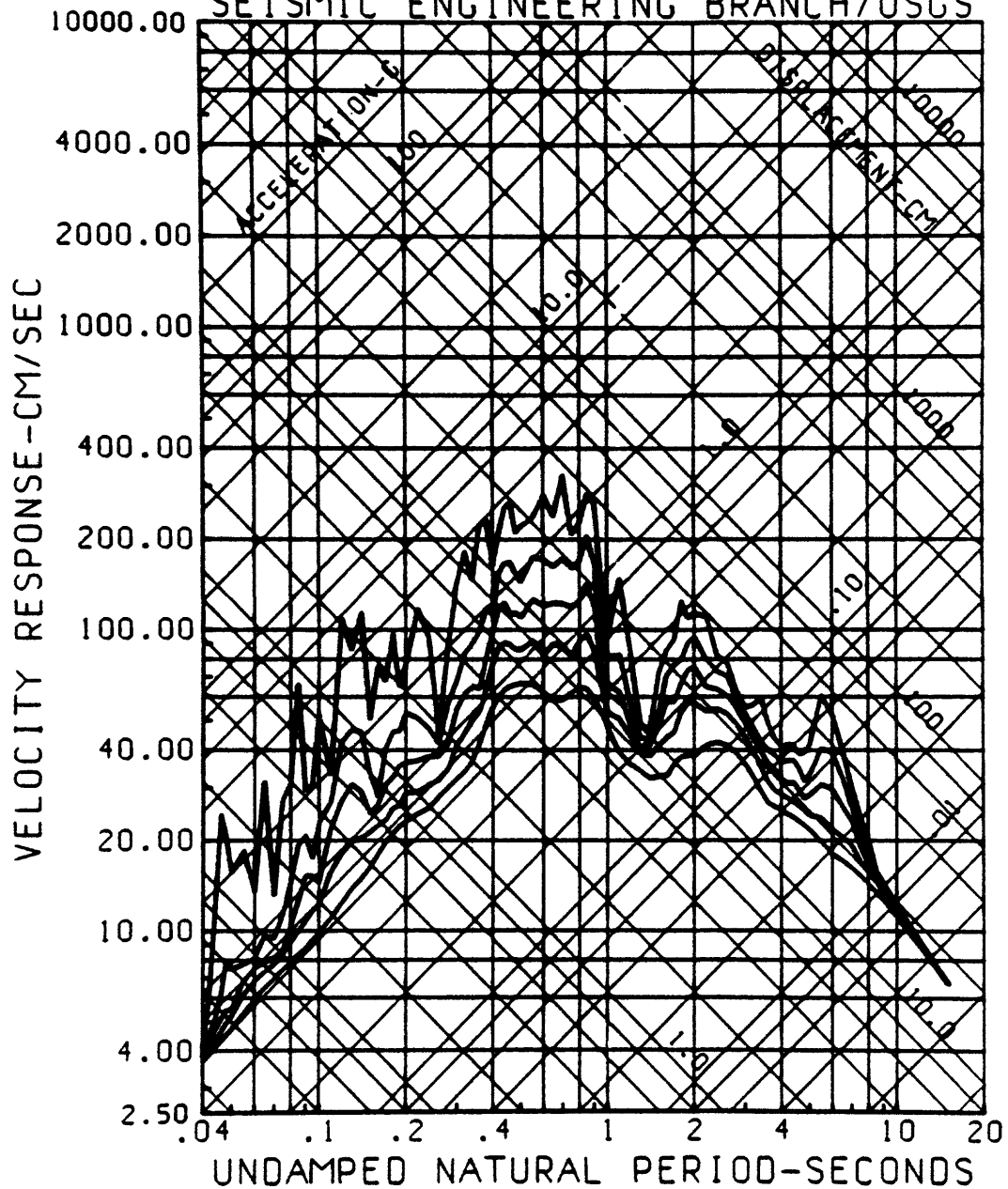




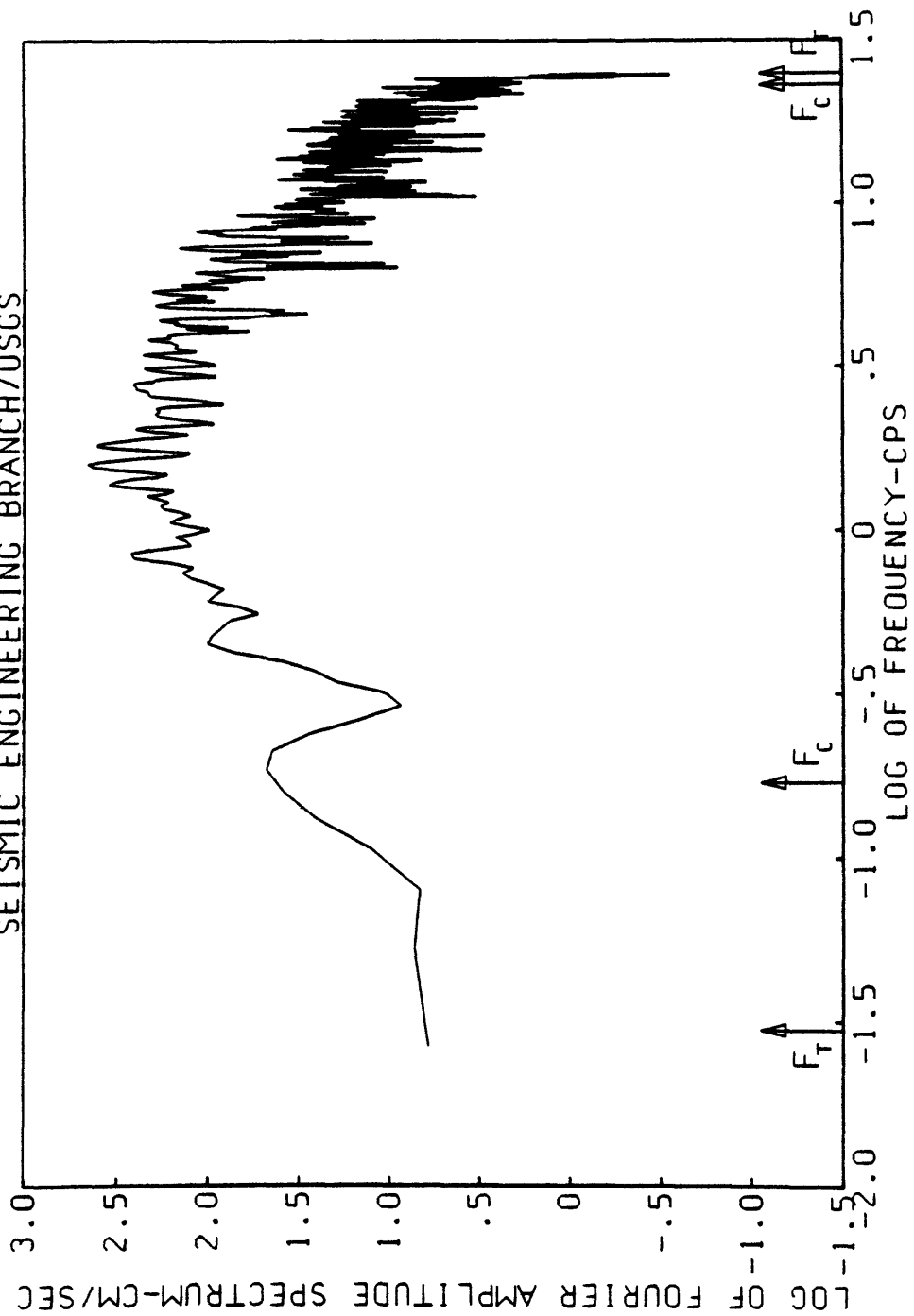
RESPONSE SPECTRA  
 EL CENTRO. BONDS CORNER. 10/15/79. UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



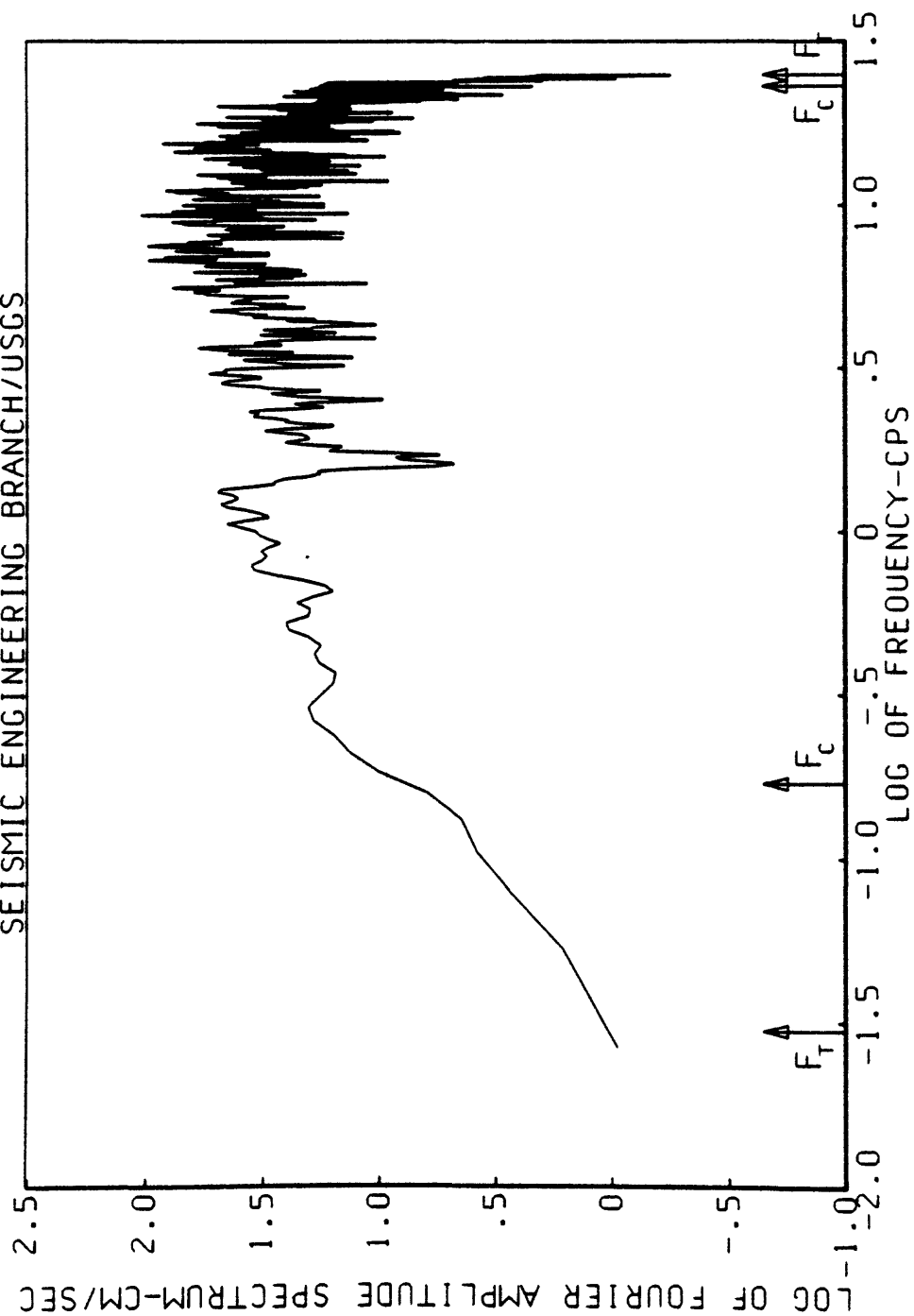
RESPONSE SPECTRA  
 EL CENTRO, BONDS CORNER, 10/15/79, 140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USCS



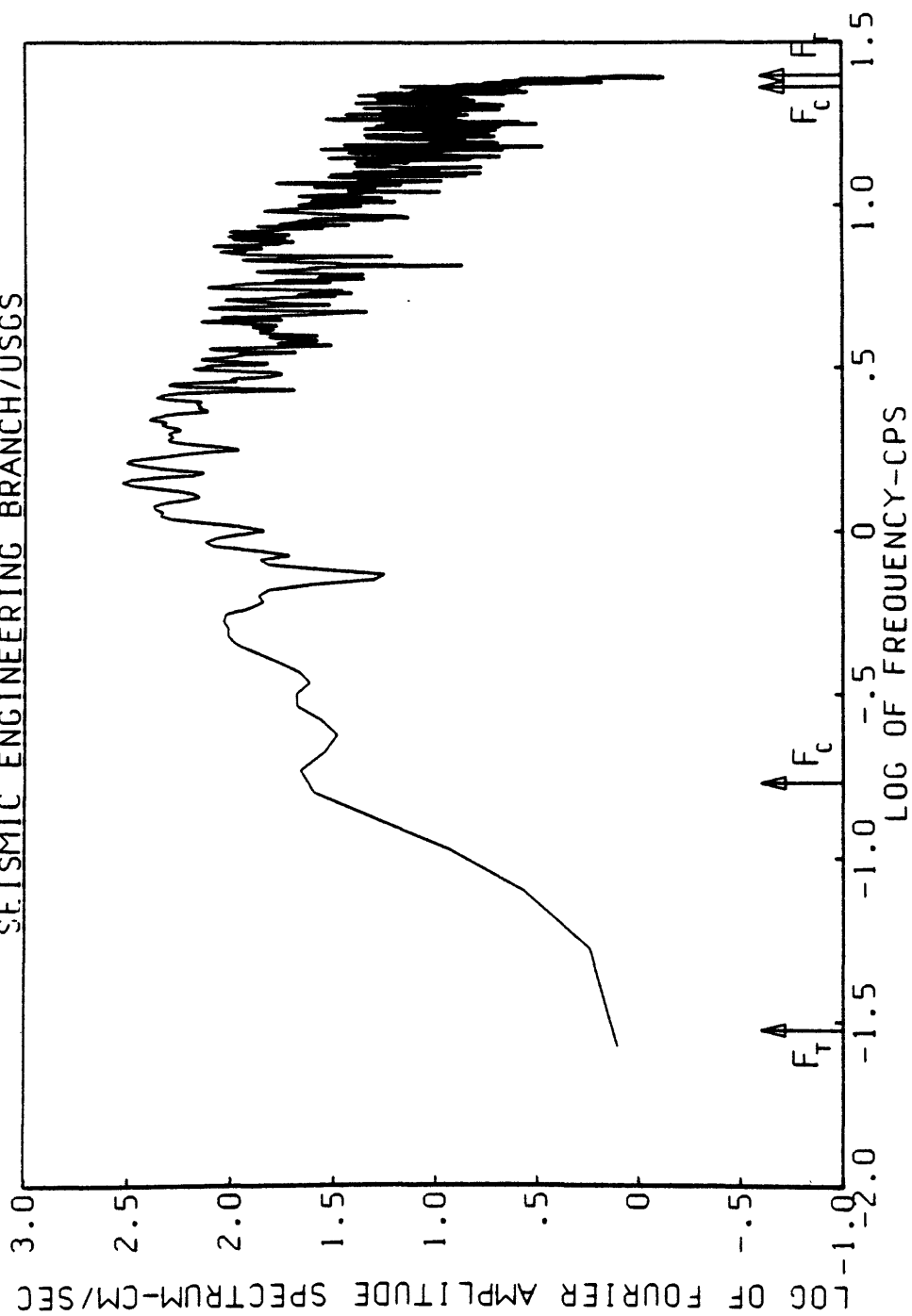
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF., COMP 230 DEG  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



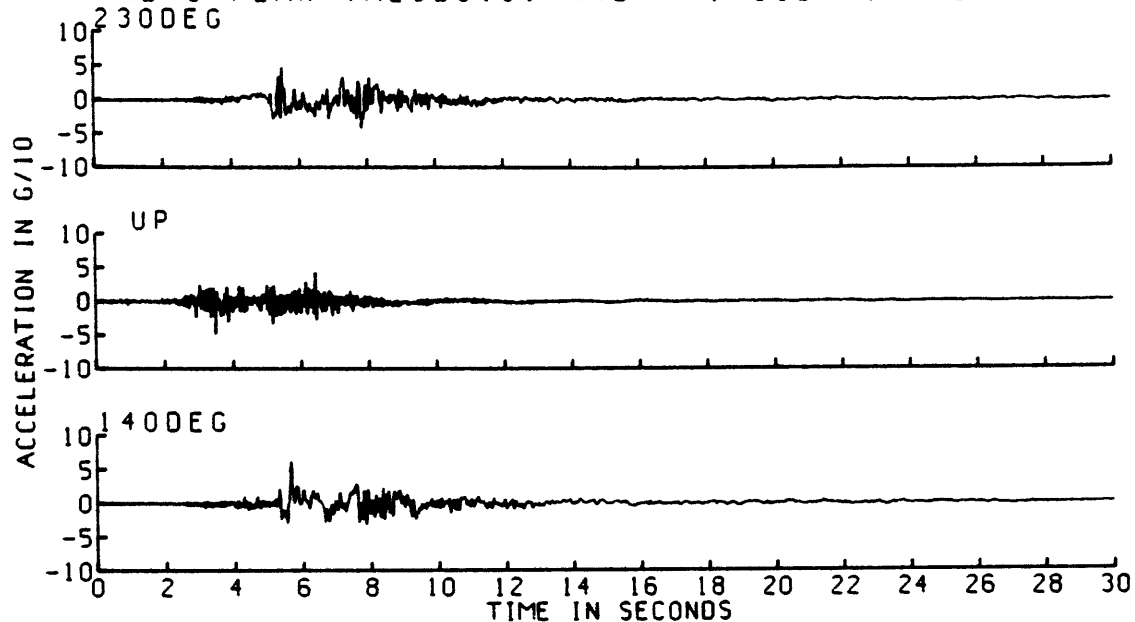
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF.. COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



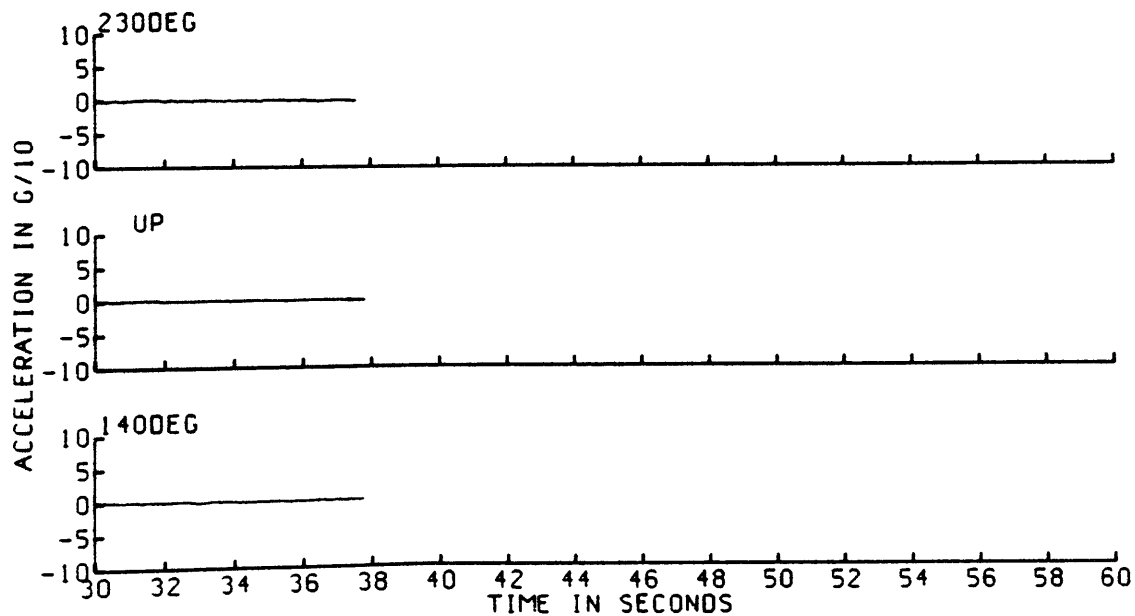
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BONDS CORNER, HIWAYS 98 AND 115, EL CENTRO, CALIF., COMP 140 DEG  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



UNCORRECTED ACCELEROGRAM  
 EL CENTRO, ARRAY 8, CRUICKSHANK RD., 10/15/79, 2317UTC  
 THE 3 PEAK VALUES (G) ARE .4805 .4775 .6191

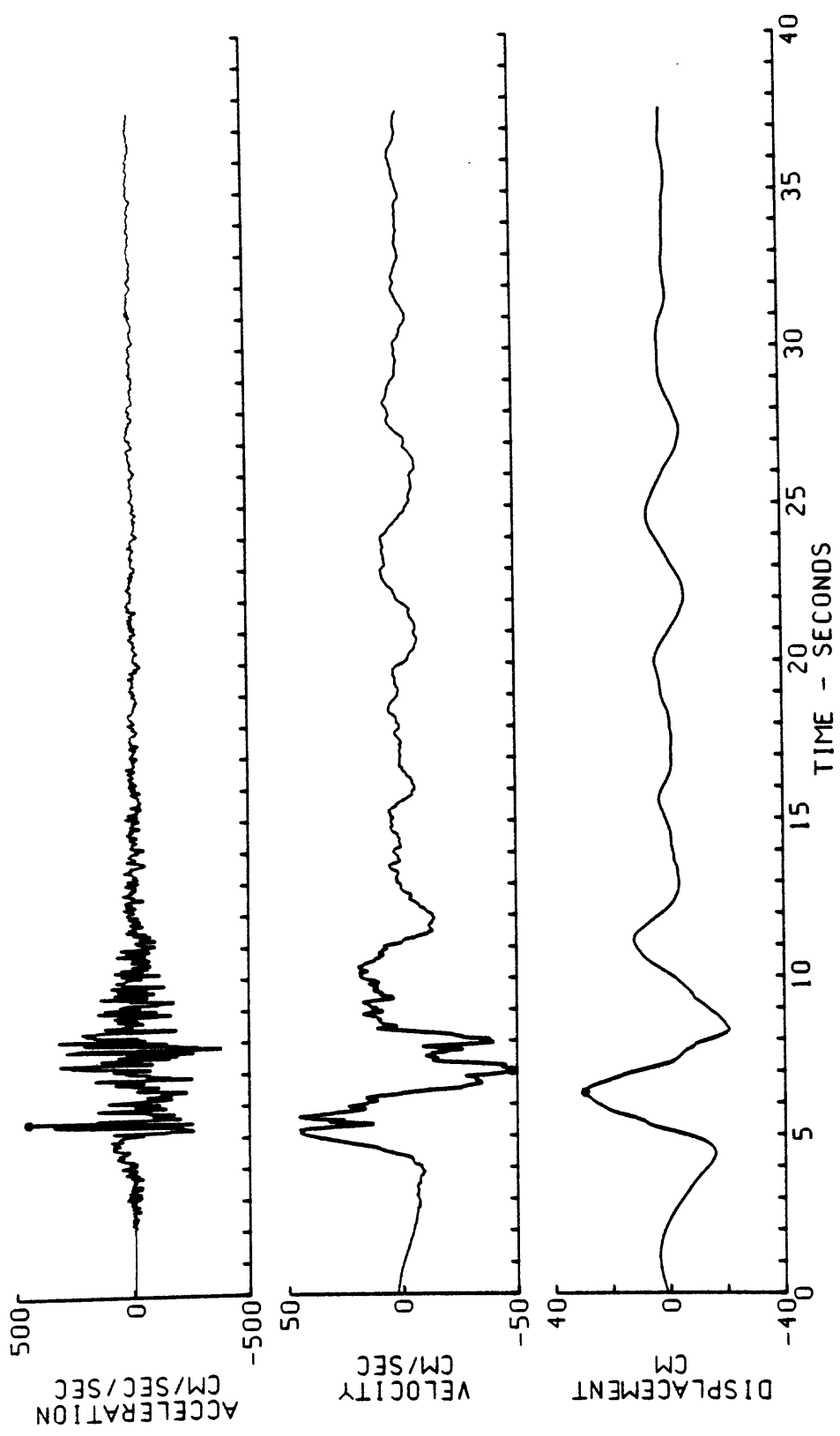


EL CENTRO, ARRAY 8, CRUICKSHANK RD., 10/15/79, 2317UTC

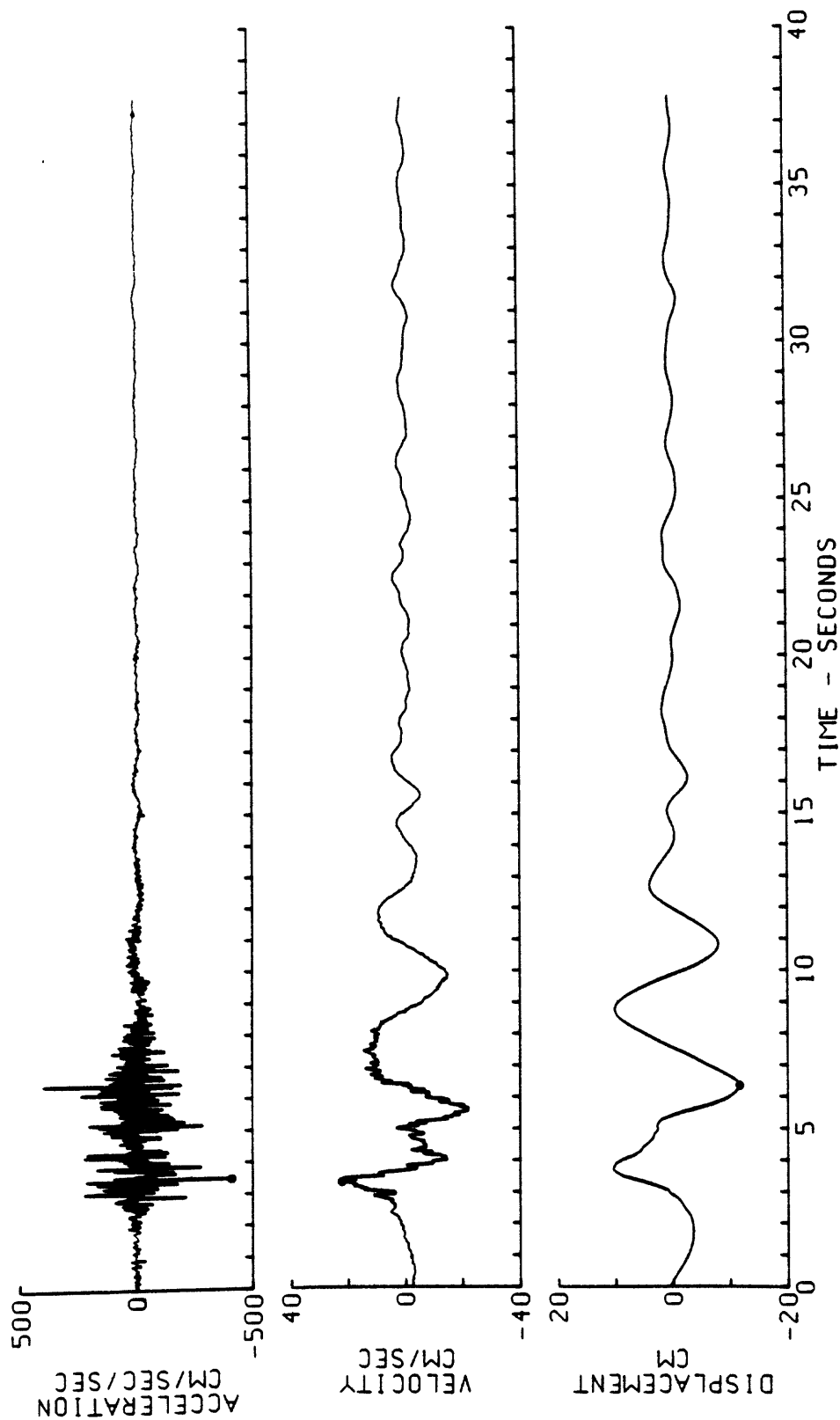




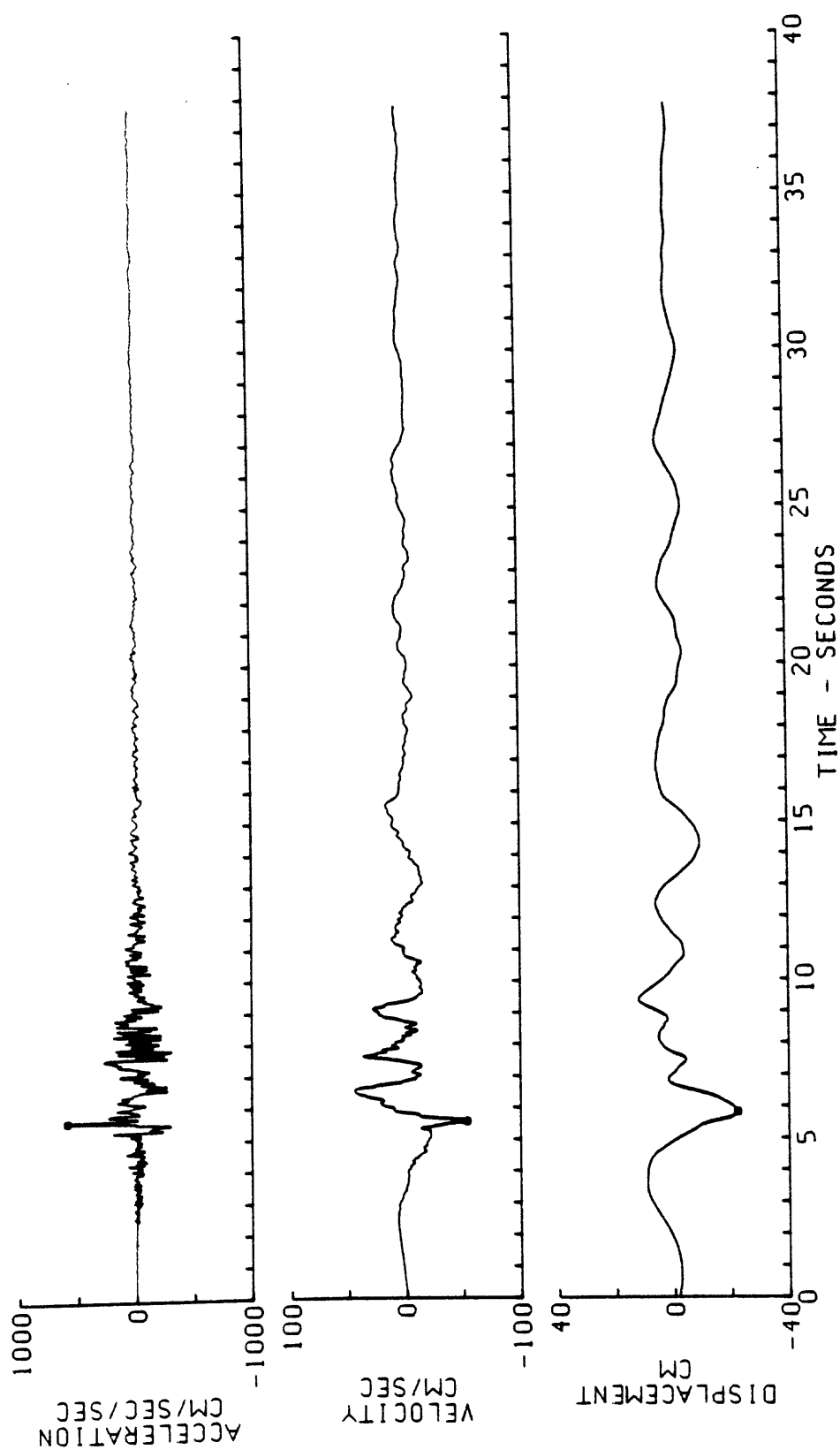
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=457.4 CM/SEC/SEC, VELOCITY=-47.71 CM/SEC, DISPL=29.34 CM



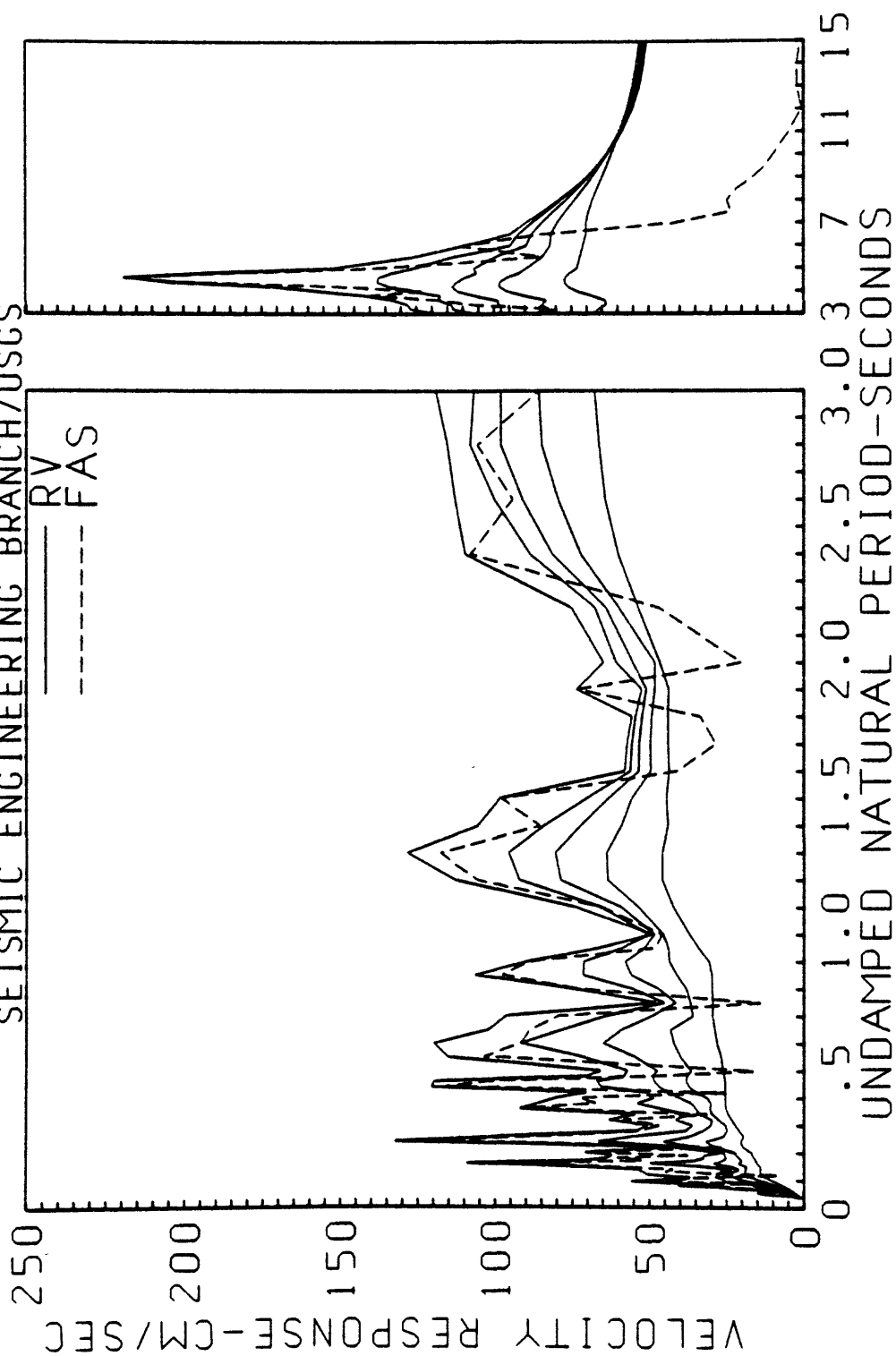
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-405.9 CM/SEC/SEC, VELOCITY=22.39 CM/SEC, DISPL=-11.63 CM



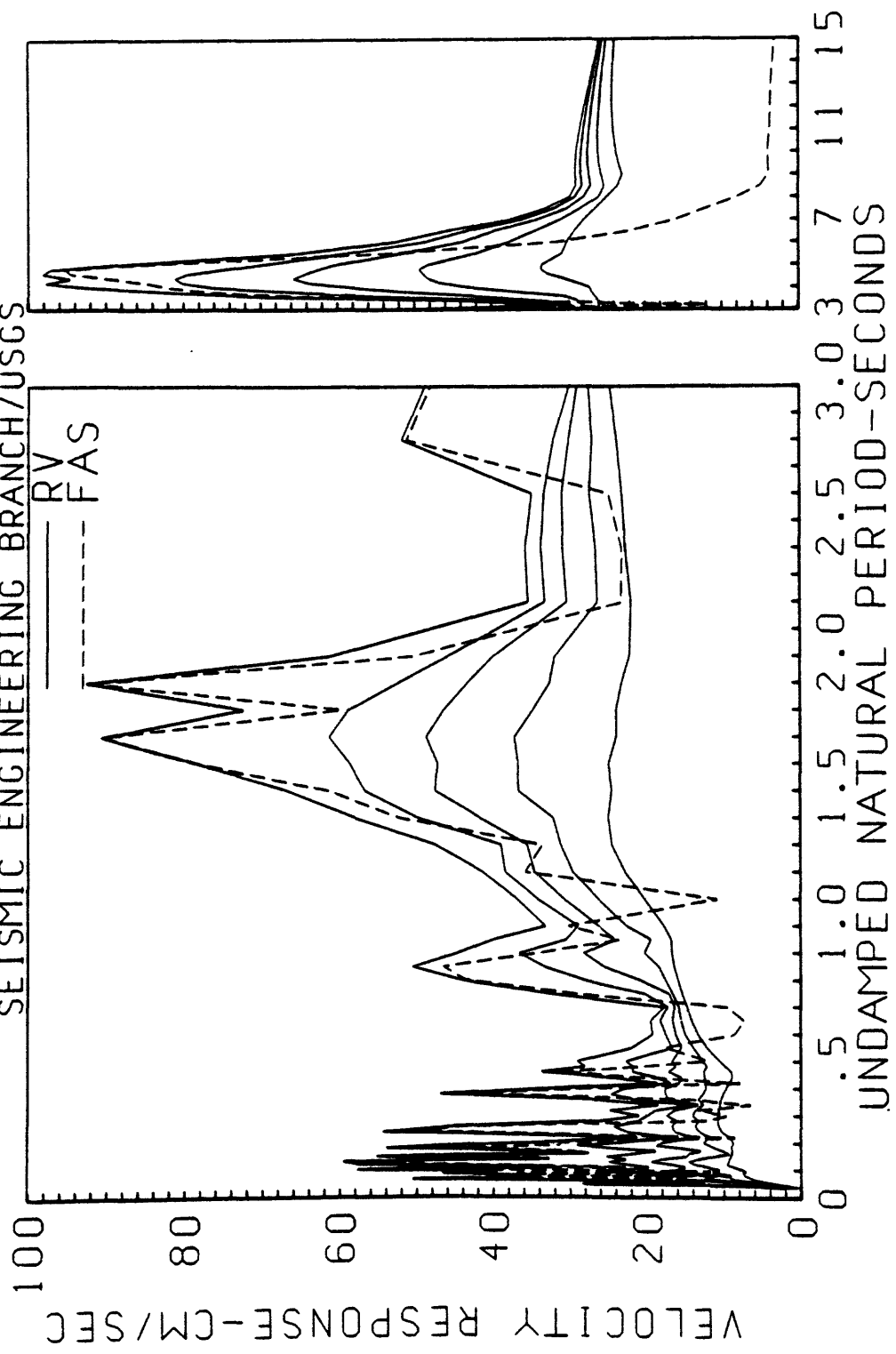
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=598.2 CM/SEC/SEC, VELOCITY=-53.43 CM/SEC, DISPL=-22.25 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO.ARRAY 8.10/15/79.2317.230DEC  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 8, 10/15/79, 2317UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



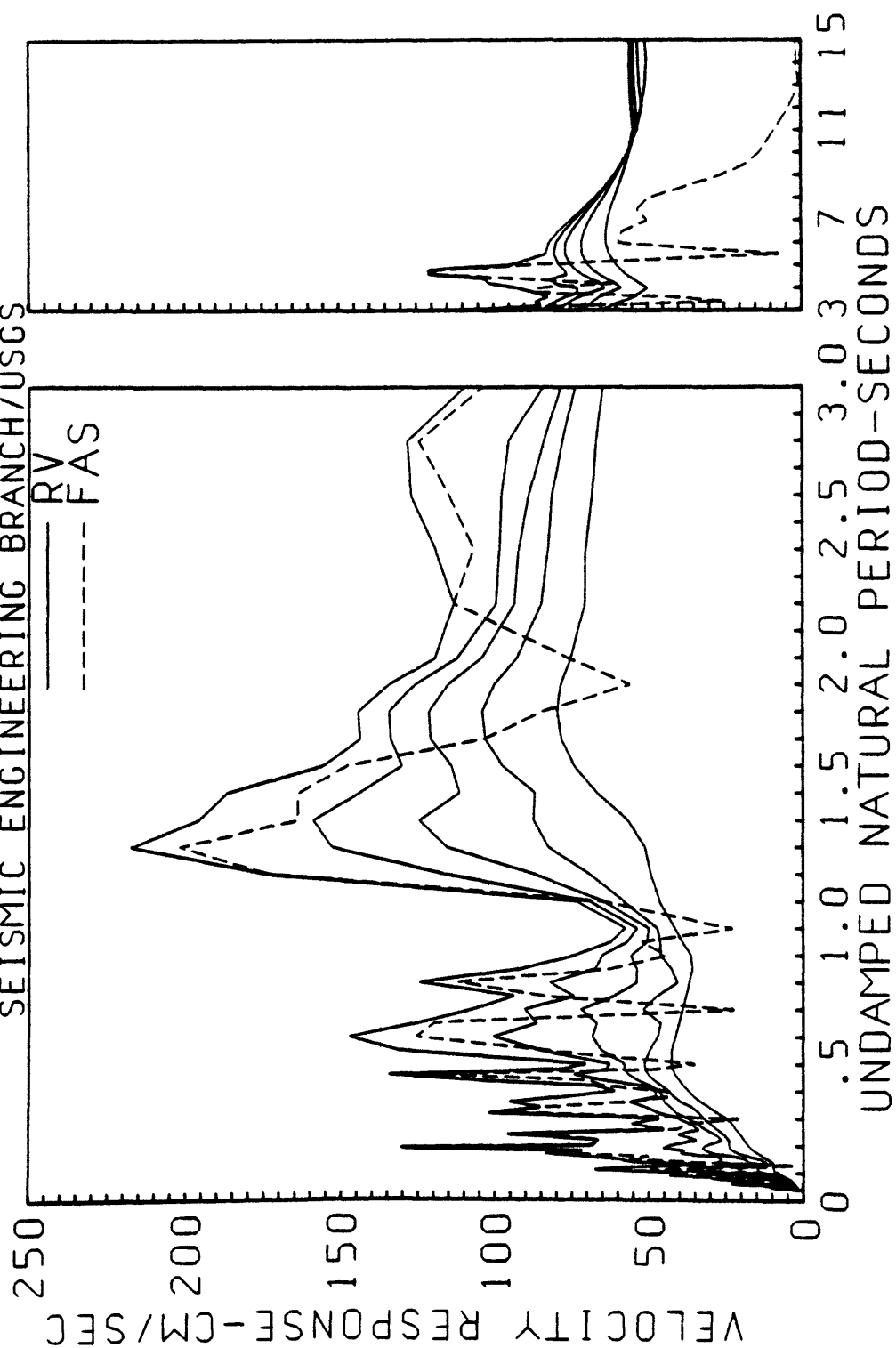
# RELATIVE VELOCITY RESPONSE SPECTRUM

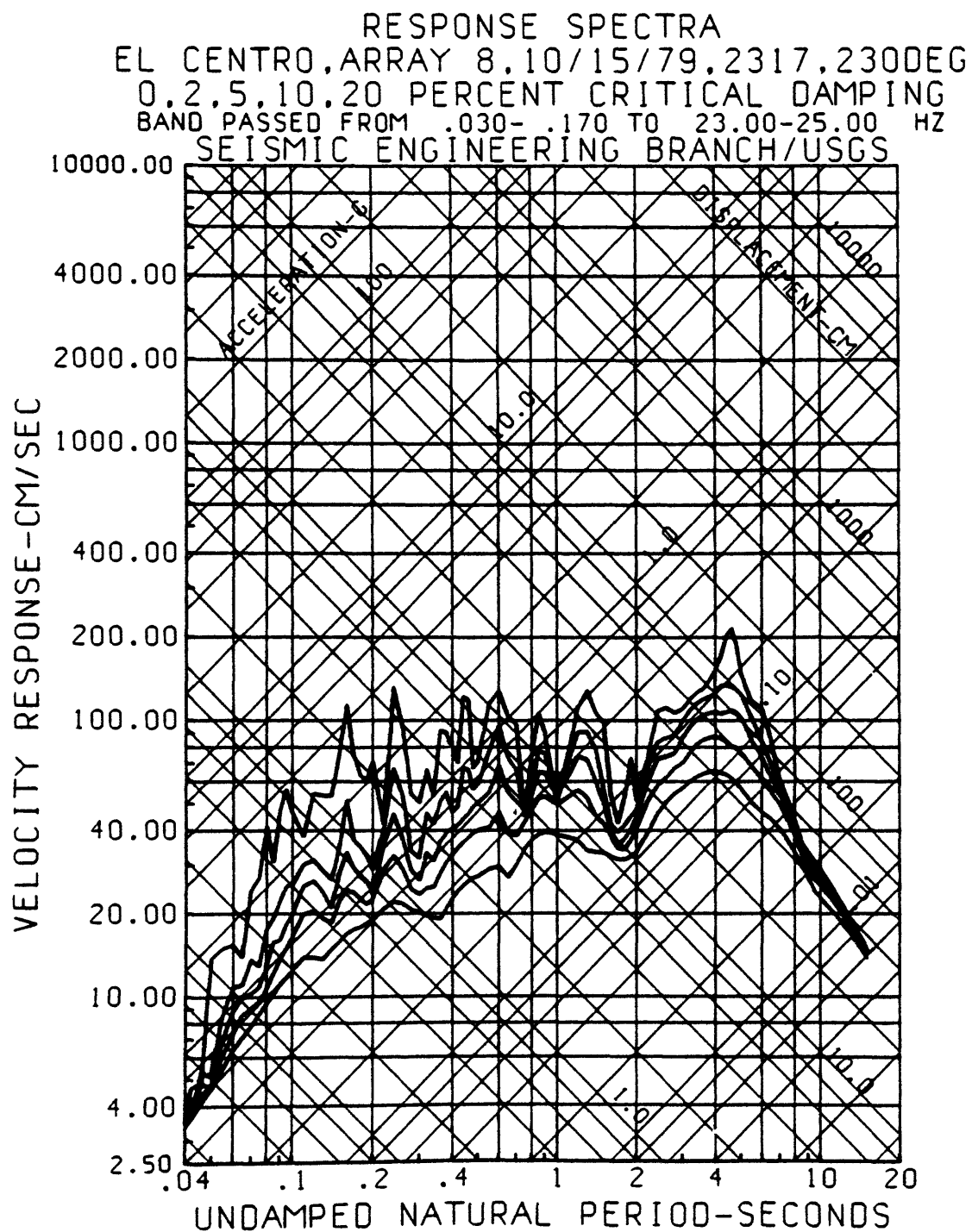
EL CENTRO, ARRAY 8, 10/15/79, 2317.140 DEG

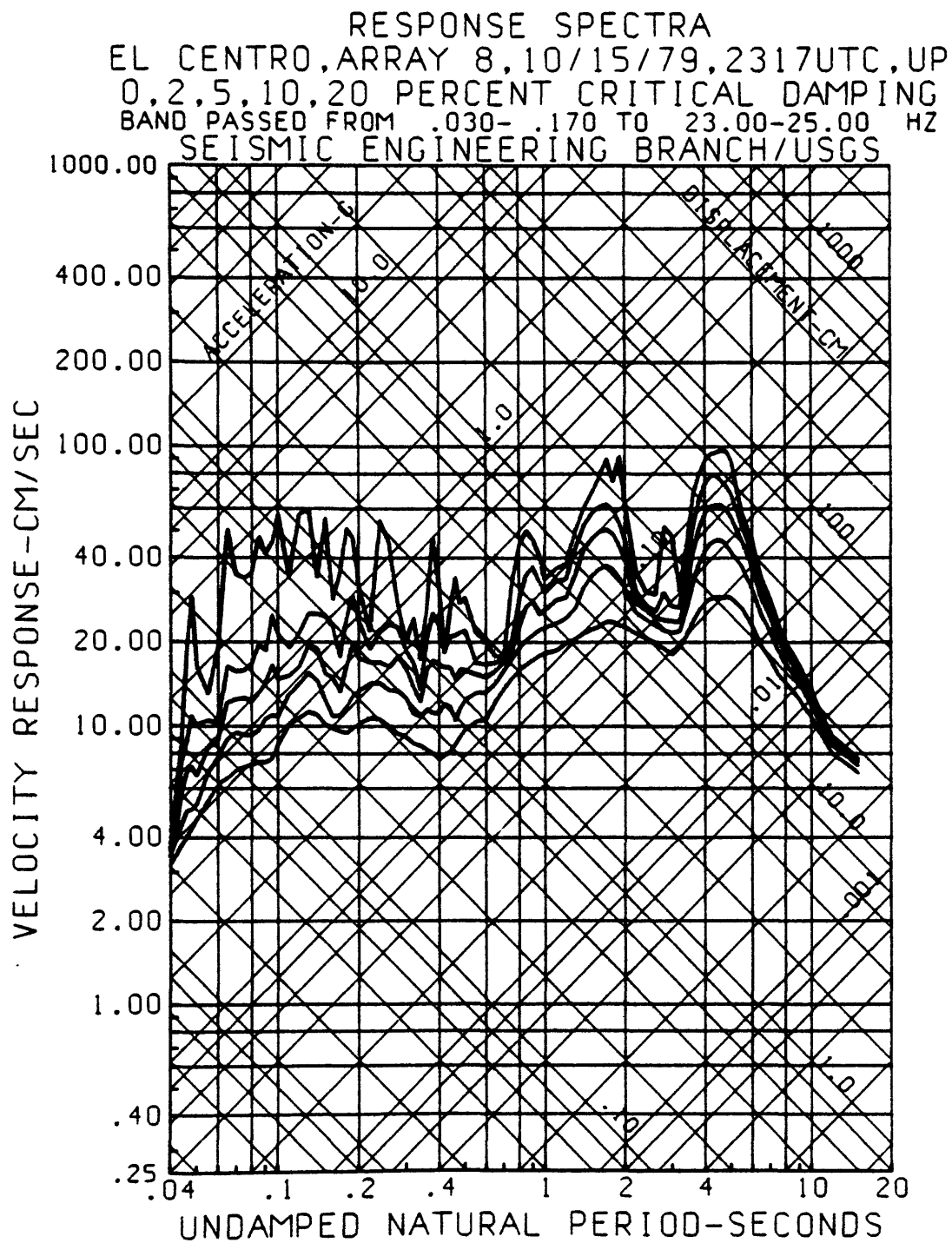
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

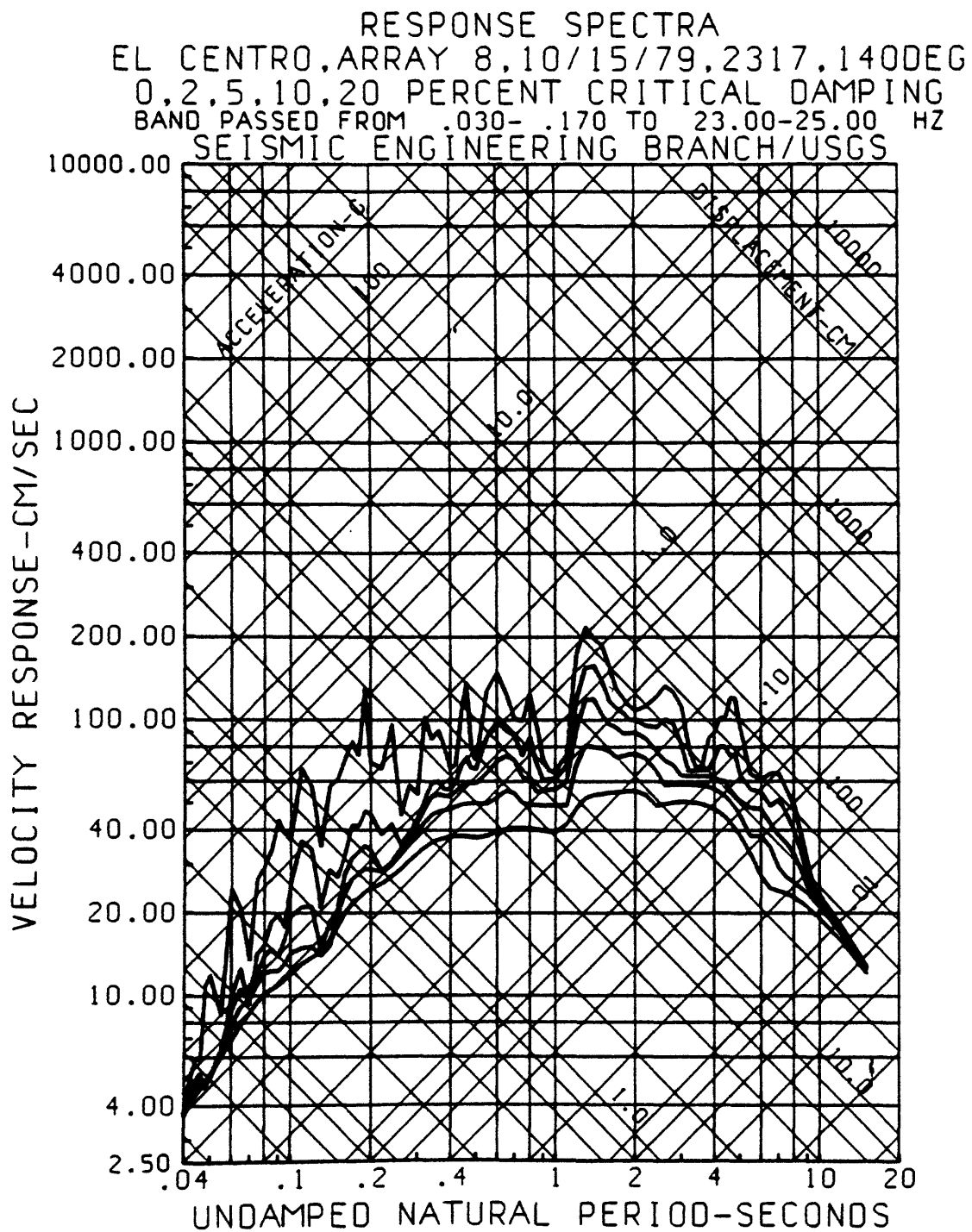
SEISMIC ENGINEERING BRANCH/USGS



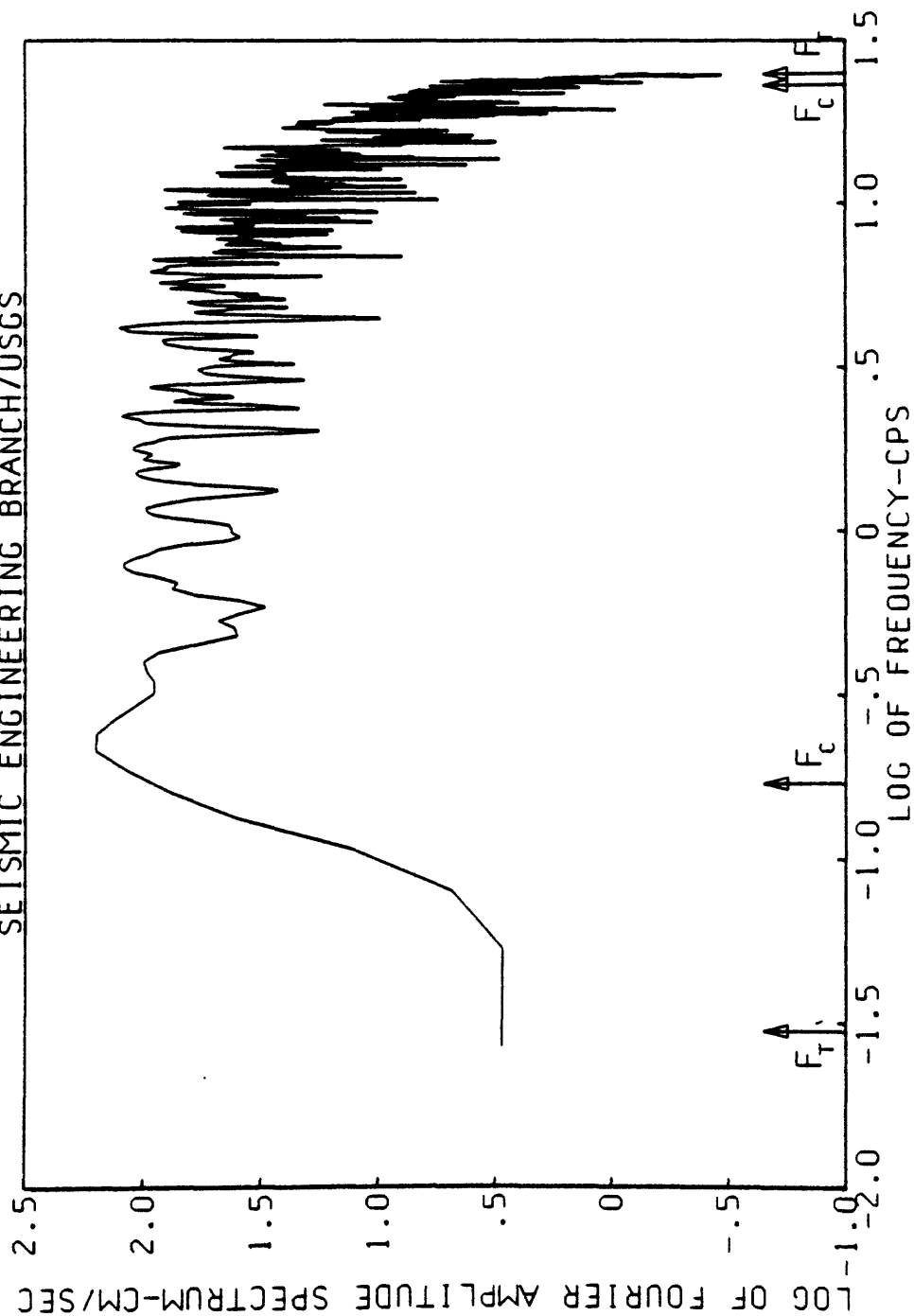




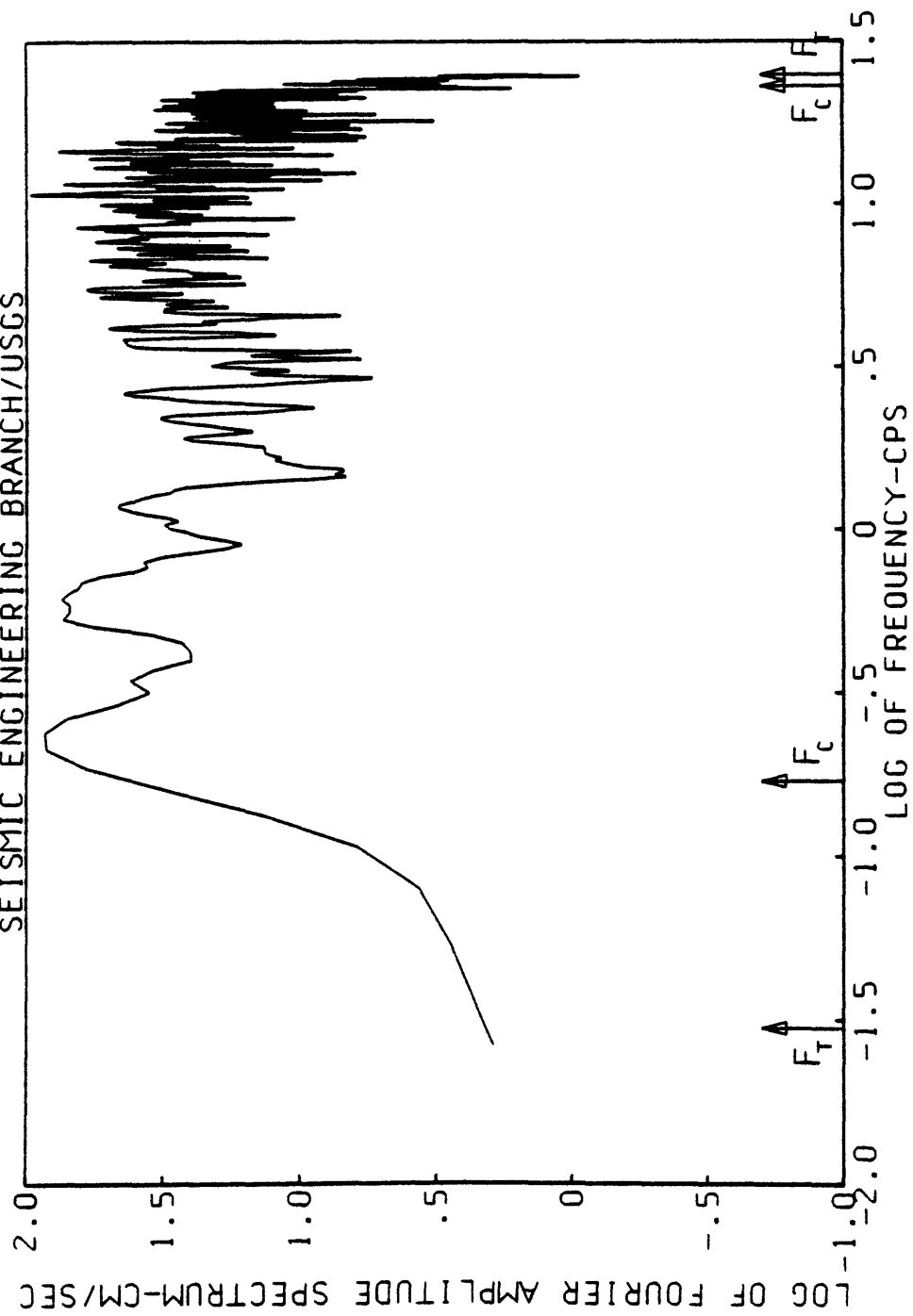




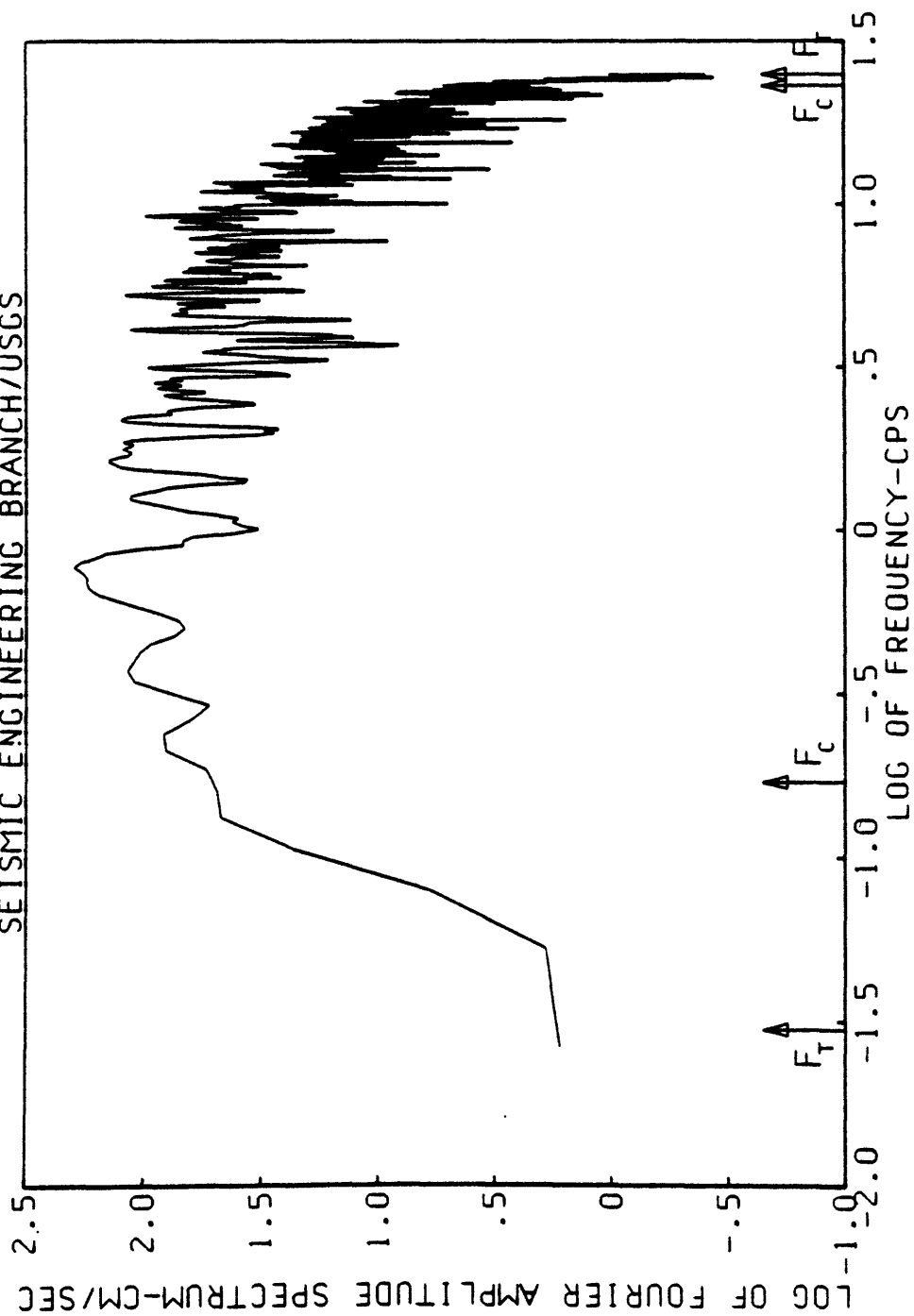
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



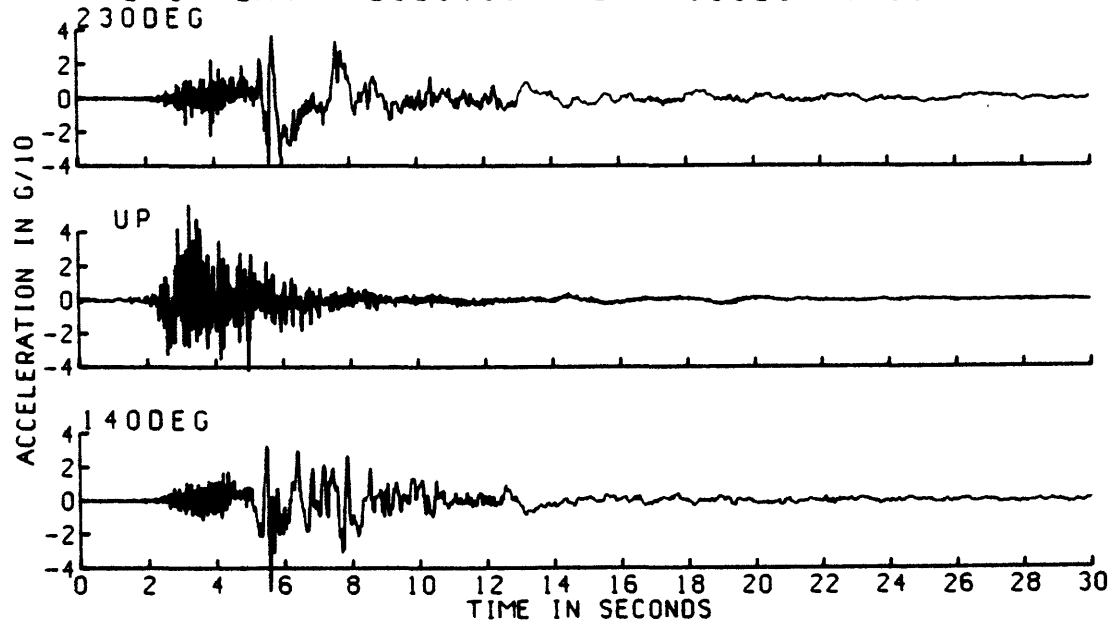
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



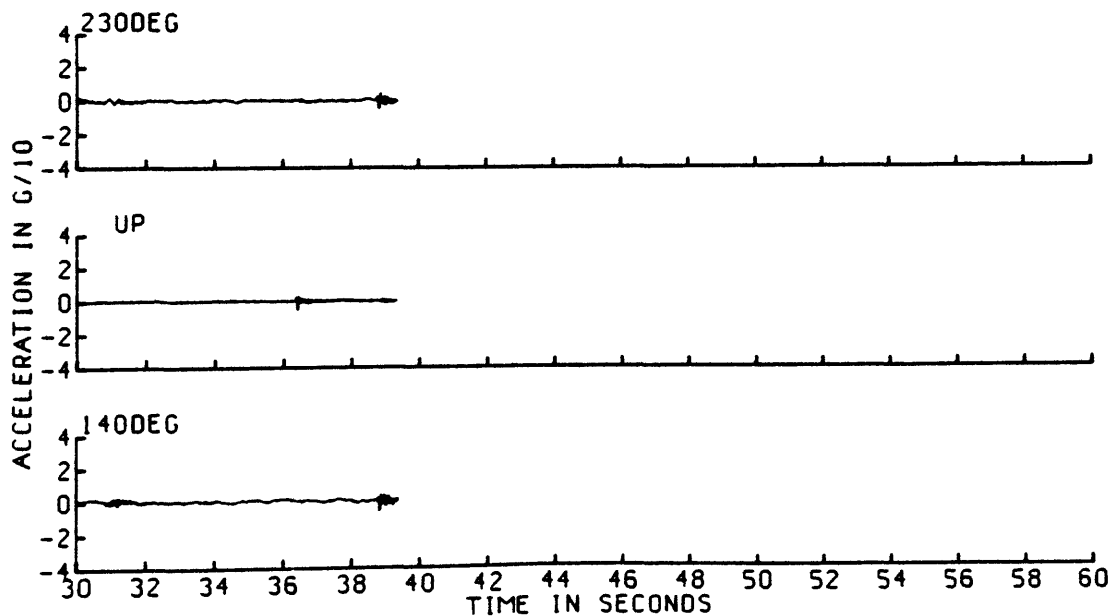
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 CRUICKSHANK RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



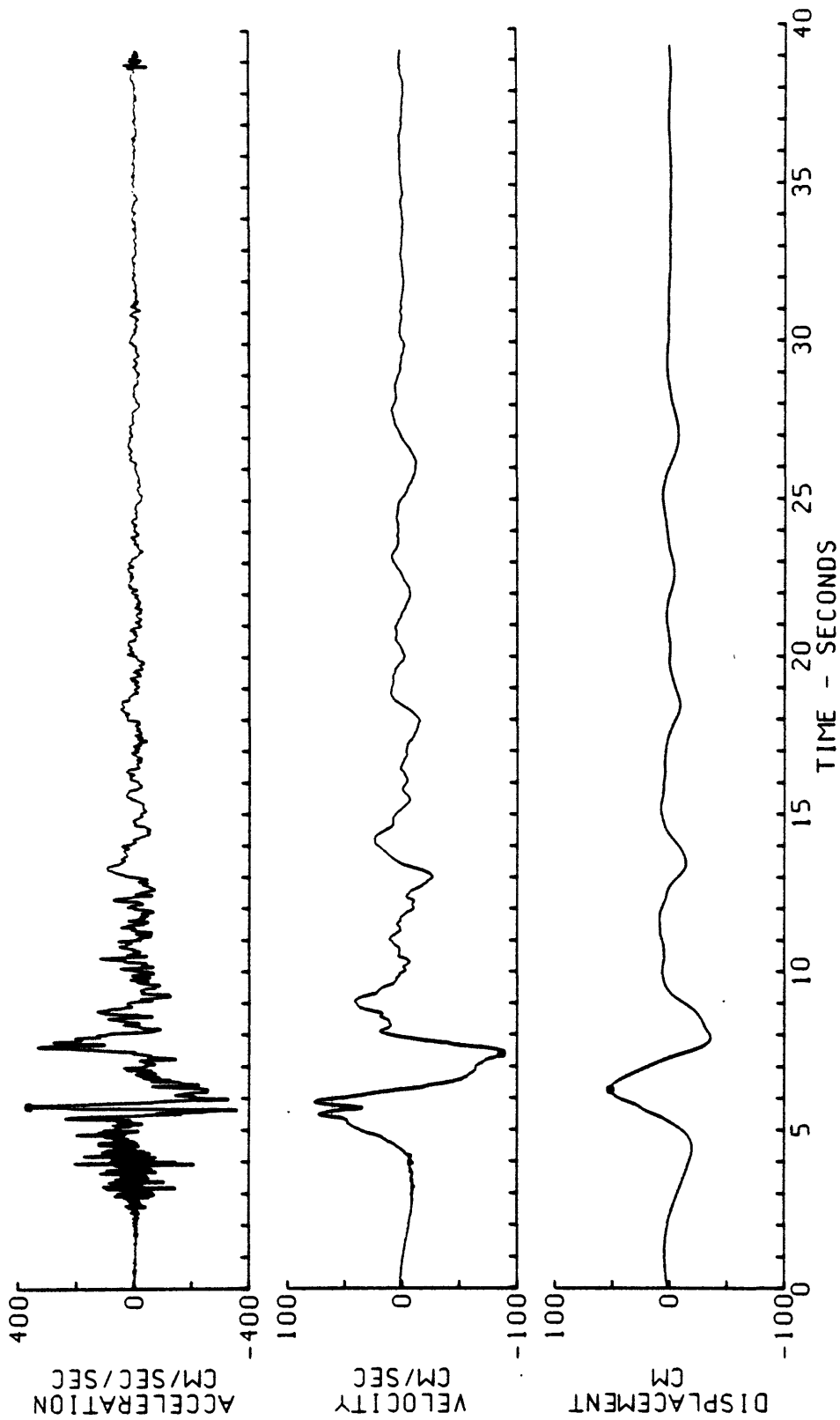
UNCORRECTED ACCELEROGRAM  
 EL CENTRO.ARRAY 5.JAMES RD..10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .3828 .5657 .5333



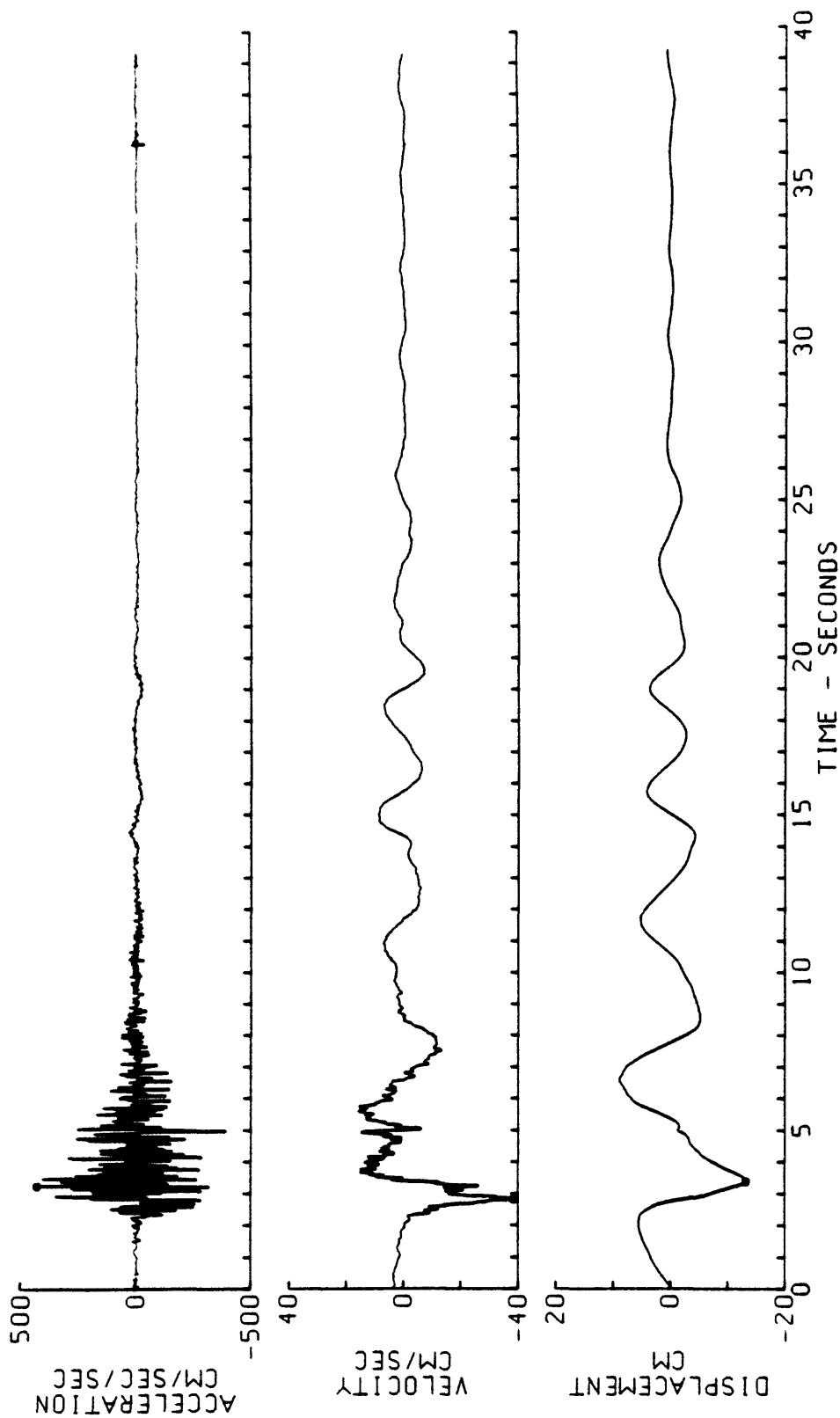
EL CENTRO.ARRAY 5.JAMES RD..10/15/79.2317UTC



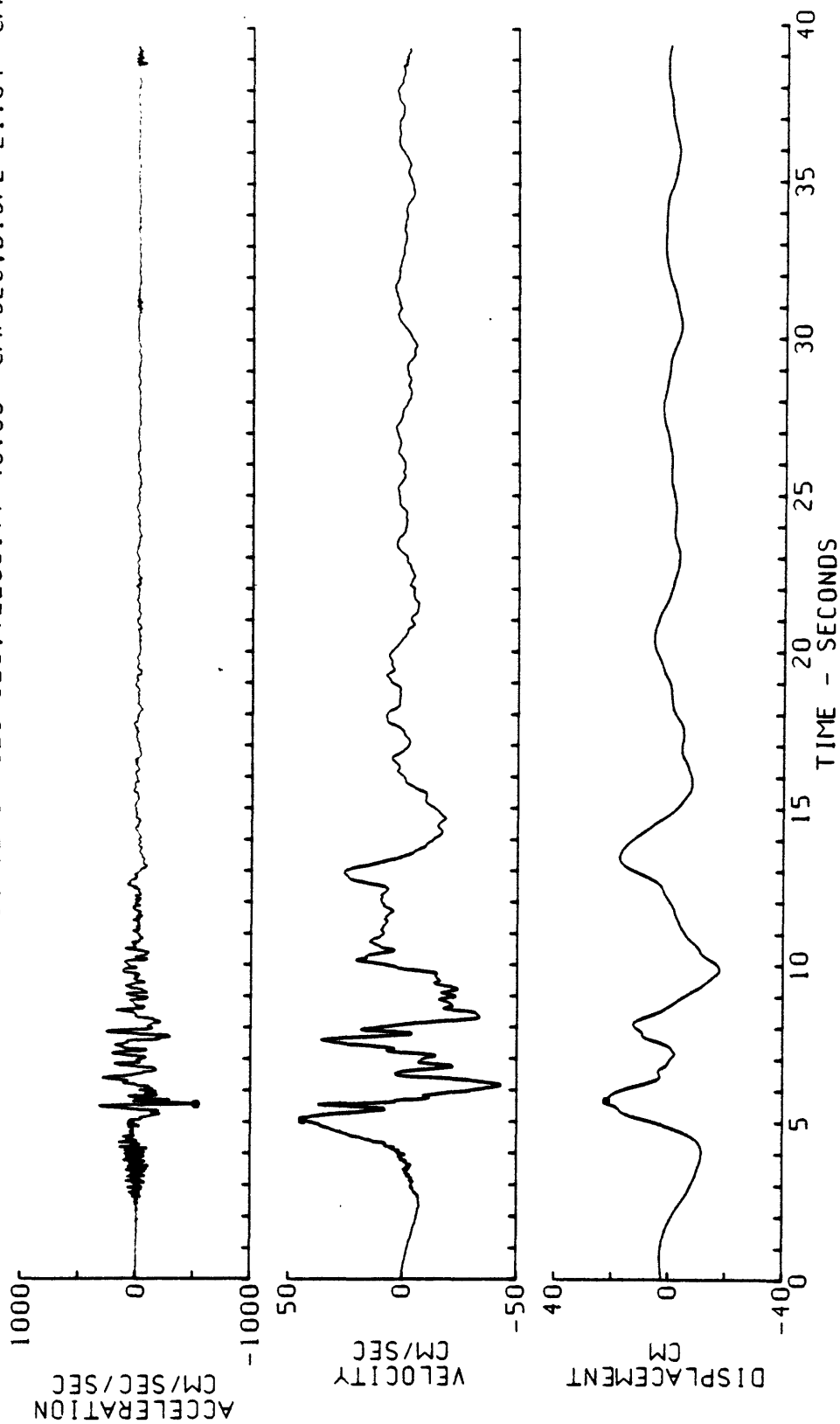
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=367.2 CM/SEC/SEC, VELOCITY=-86.56 CM/SEC, DISPL=51.85 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=432.3 CM/SEC/SEC, VELOCITY=-38.42 CM/SEC, DISPL=-13.27 CM



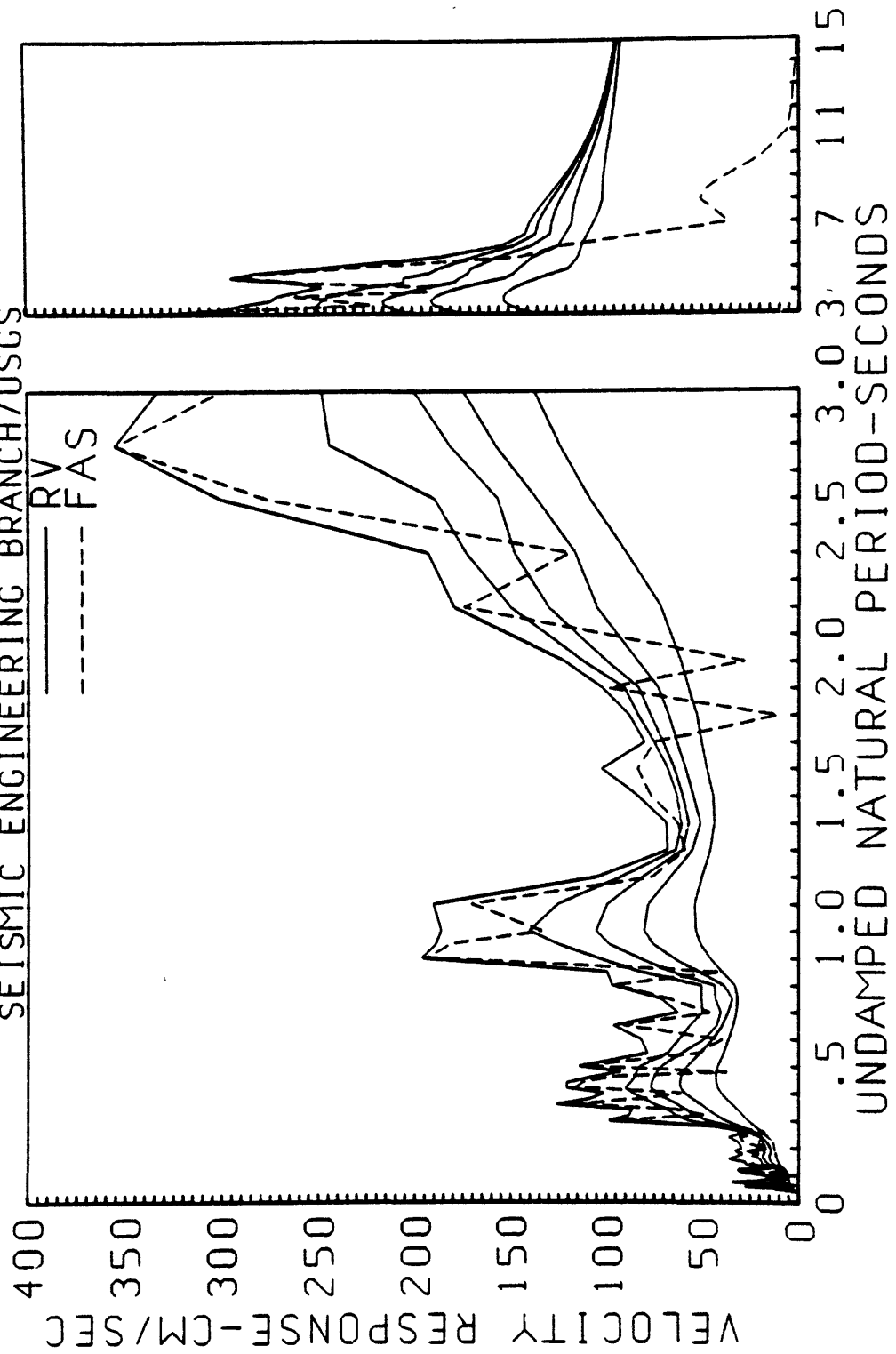
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-517.2 CM/SEC/SEC, VELOCITY=43.99 CM/SEC, DISPL=21.84 CM



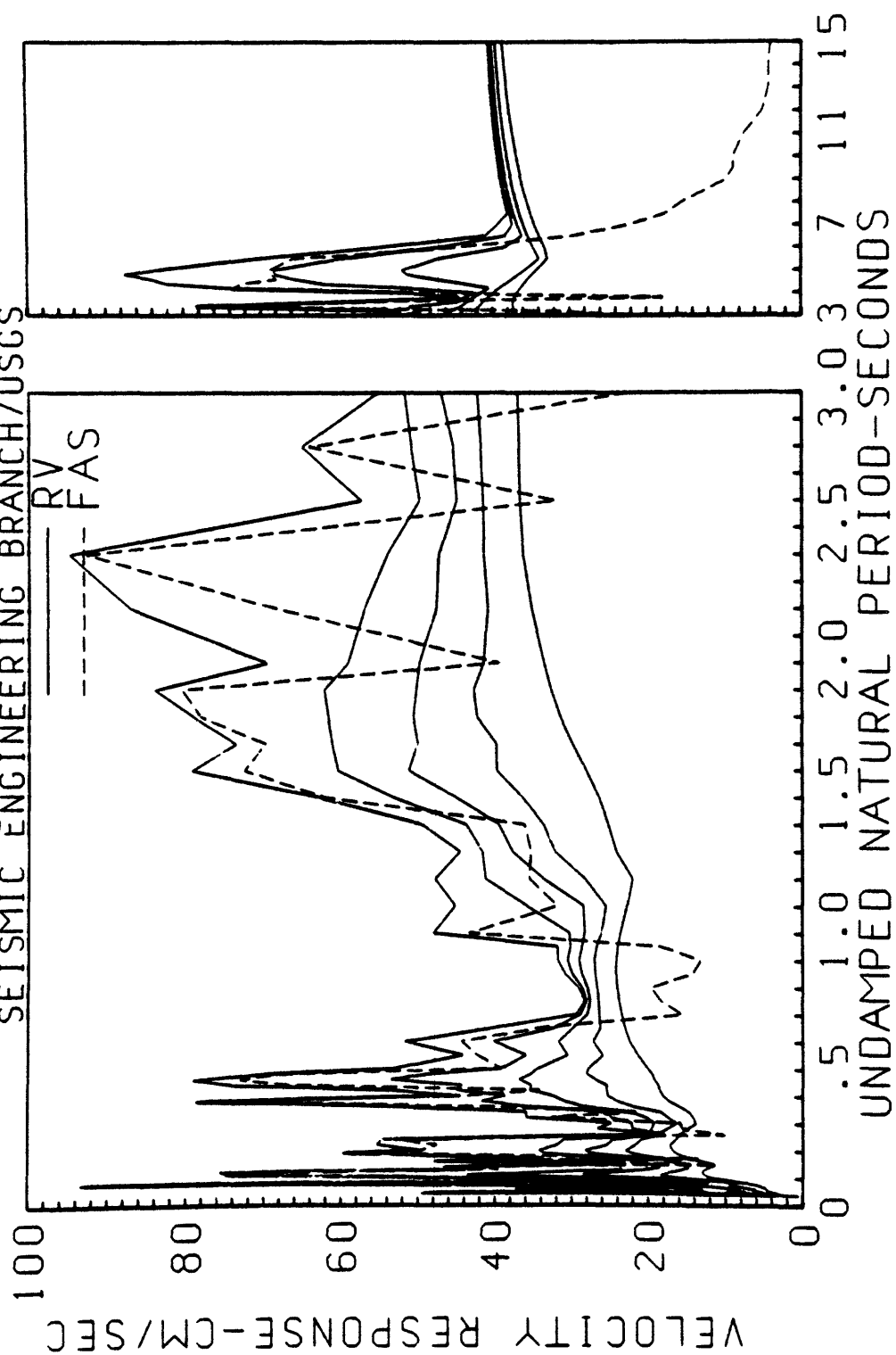


# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 5, 10/15/79, 2317.230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

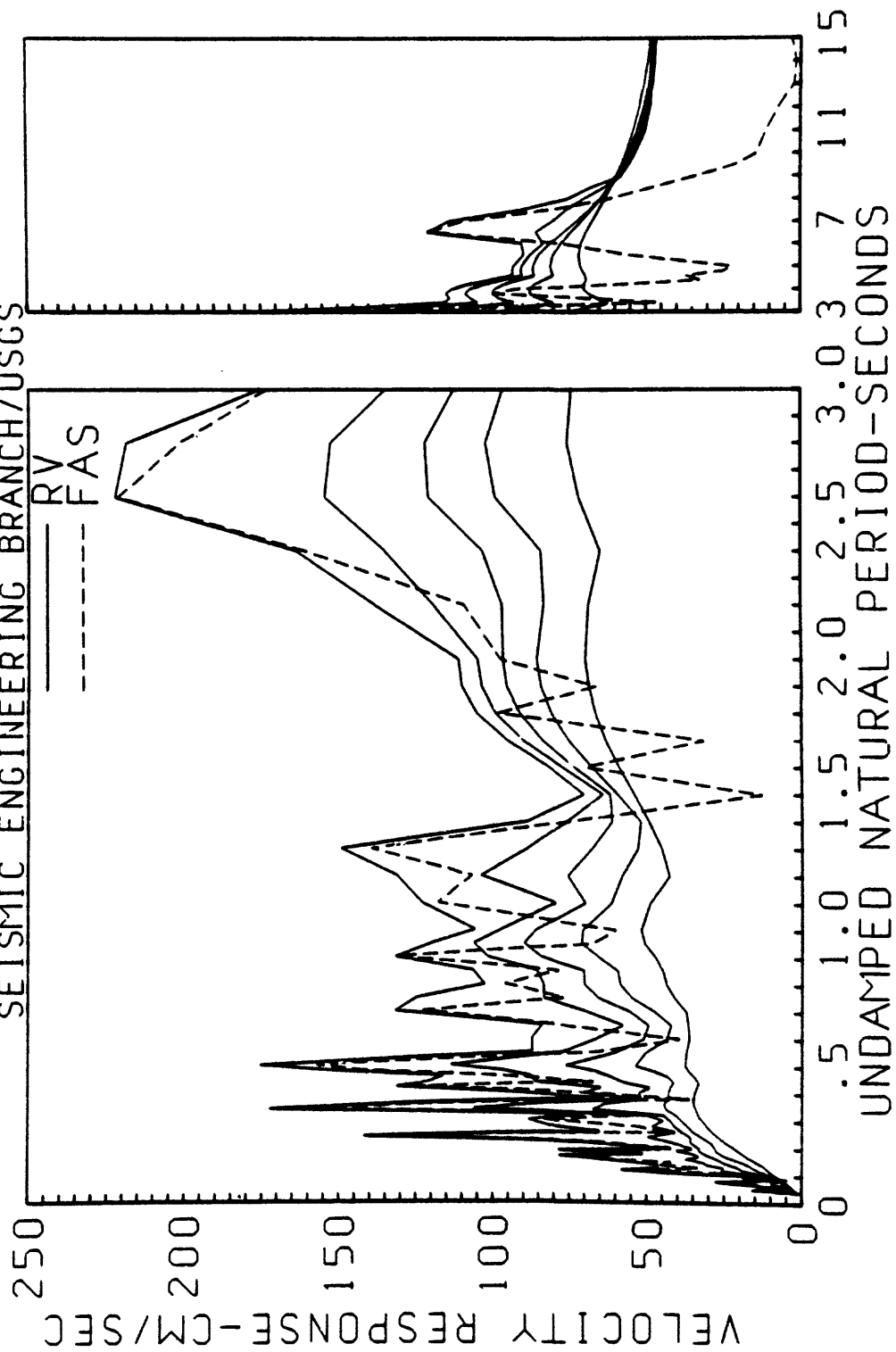


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 5, 10/15/79, 2317UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

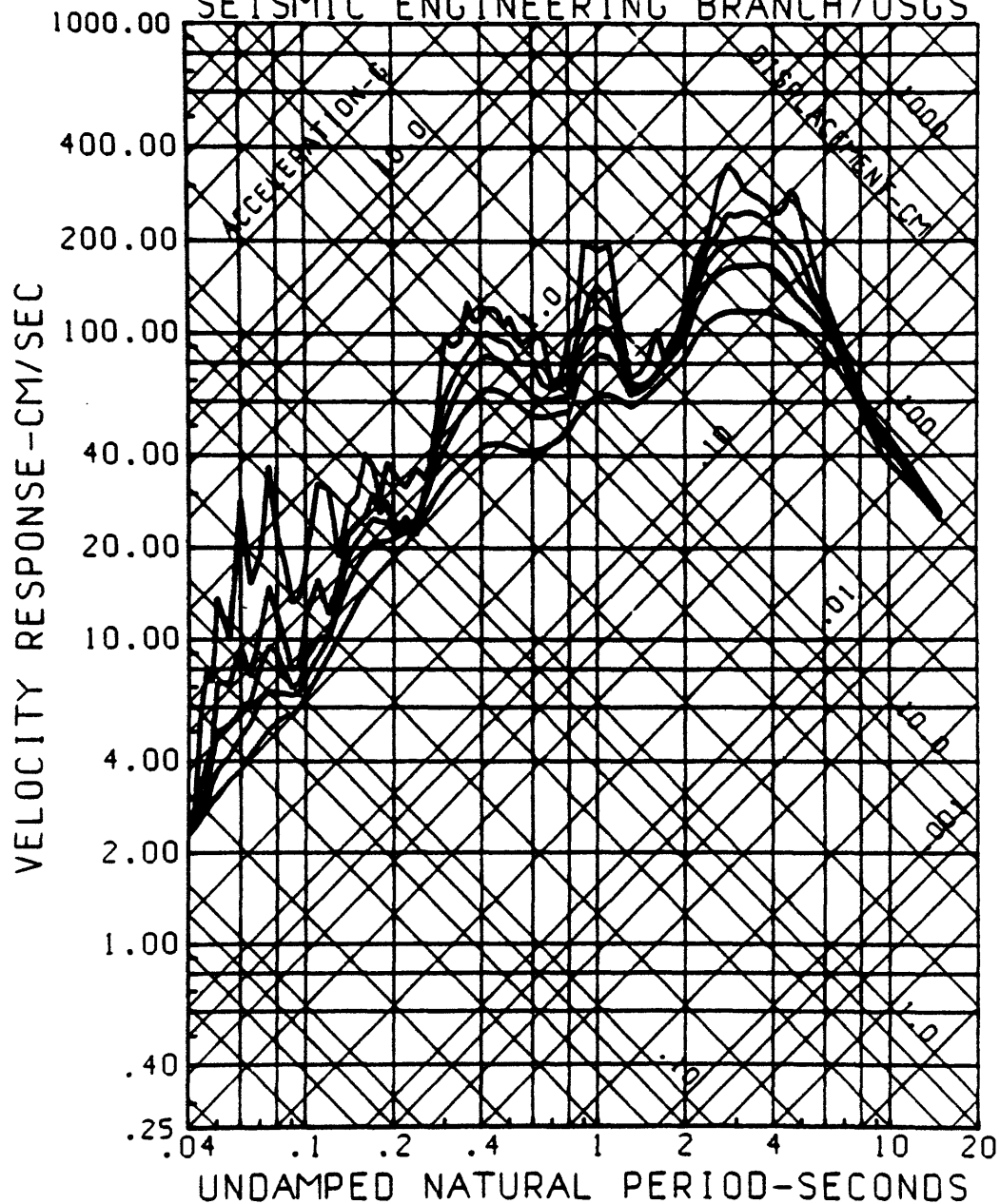


# RELATIVE VELOCITY RESPONSE SPECTRUM

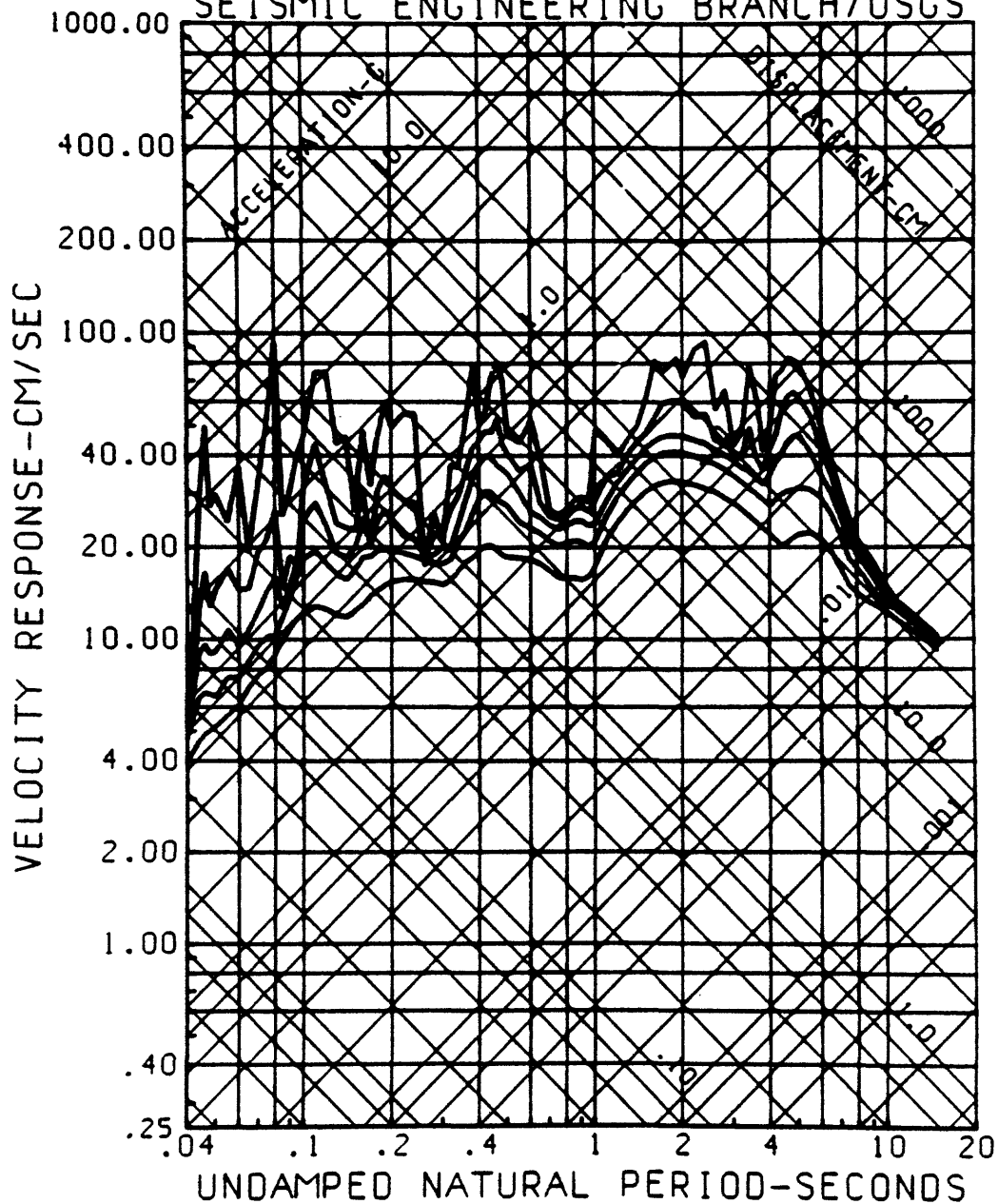
EL CENTRO, ARRAY 5.10/15/79.2317.140DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

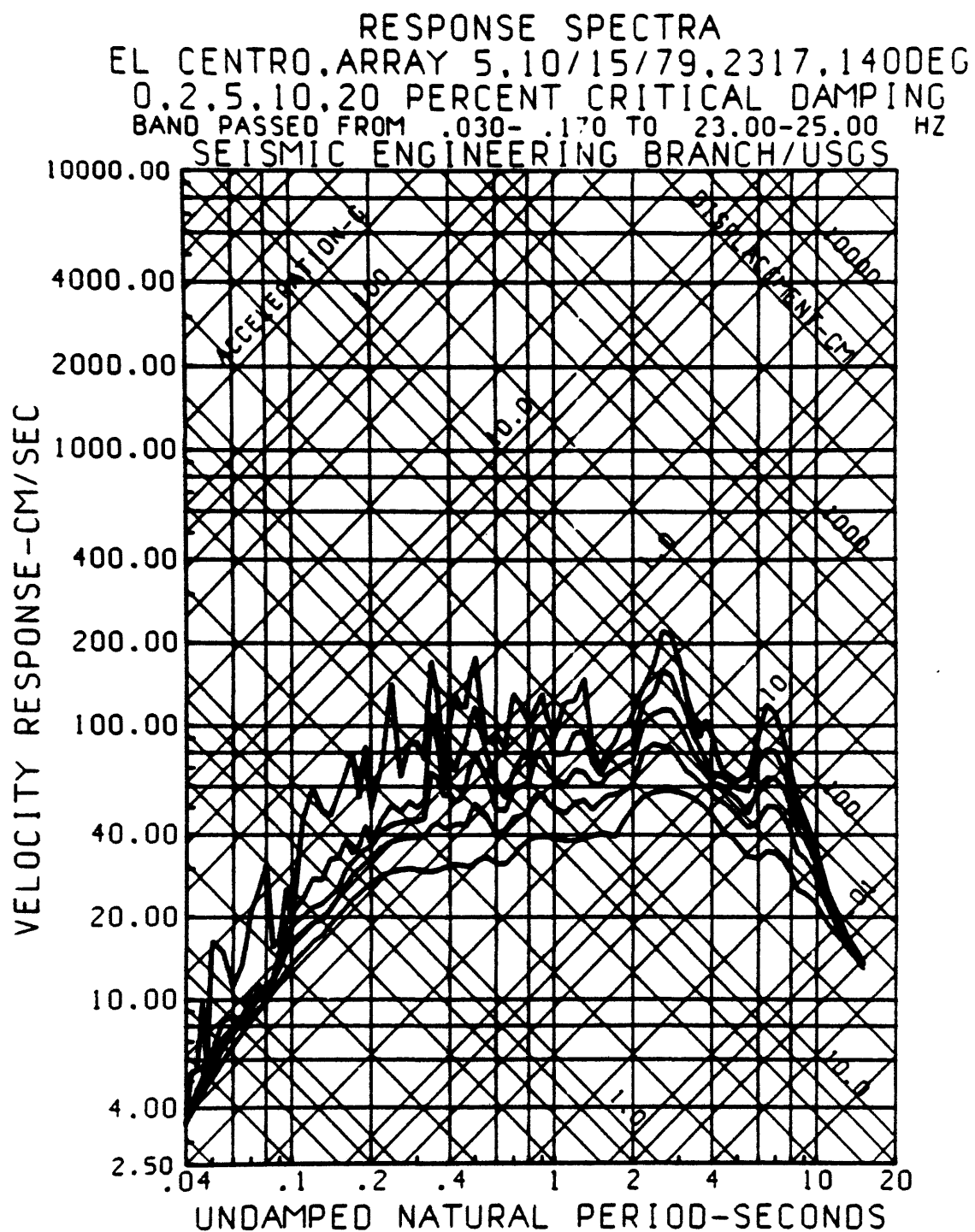


RESPONSE SPECTRA  
 EL CENTRO ARRAY 5.10/15/79.2317.2300EG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

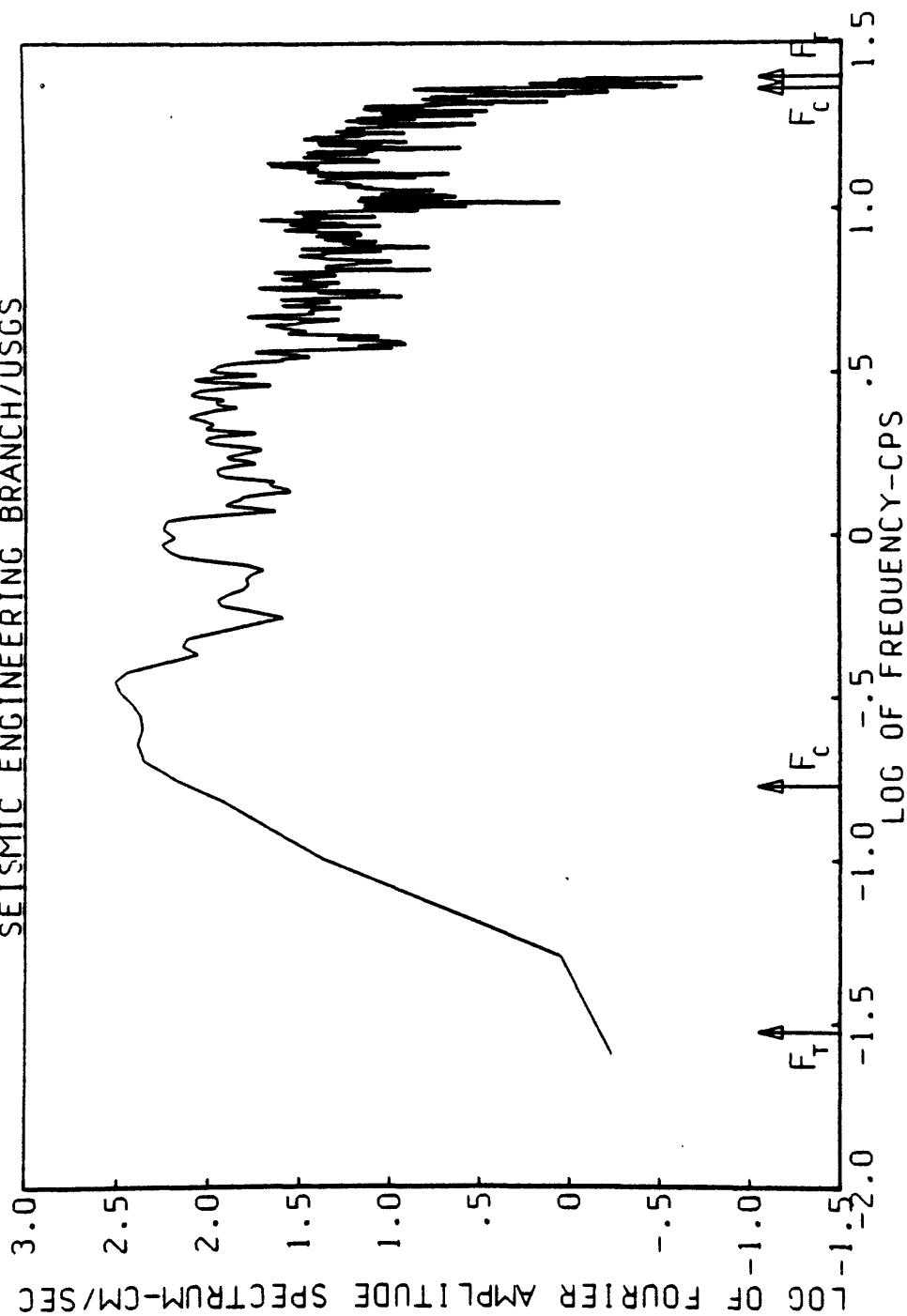


RESPONSE SPECTRA  
 EL CENTRO, ARRAY 5.10/15/79.2317UTC.UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

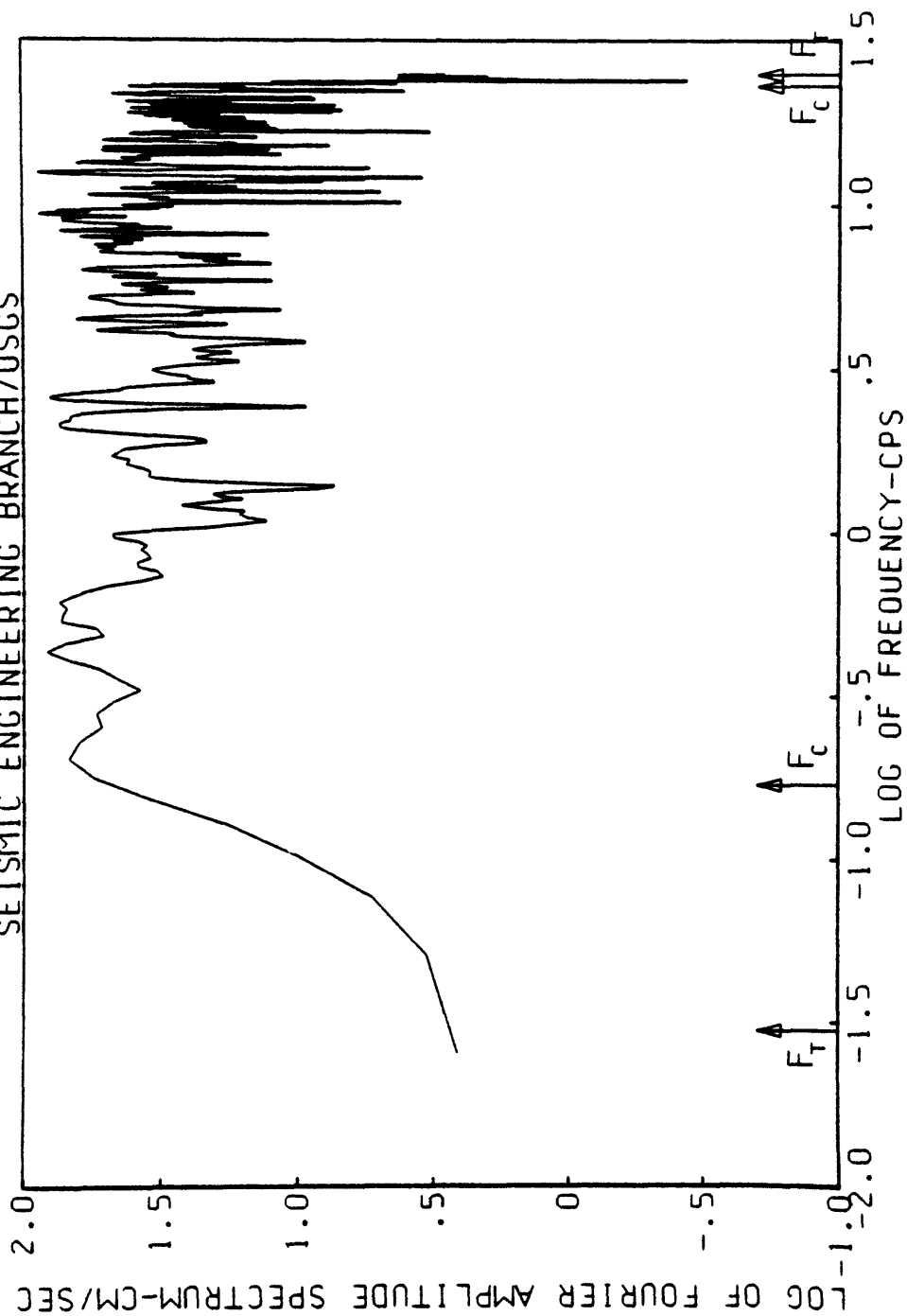




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030-- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

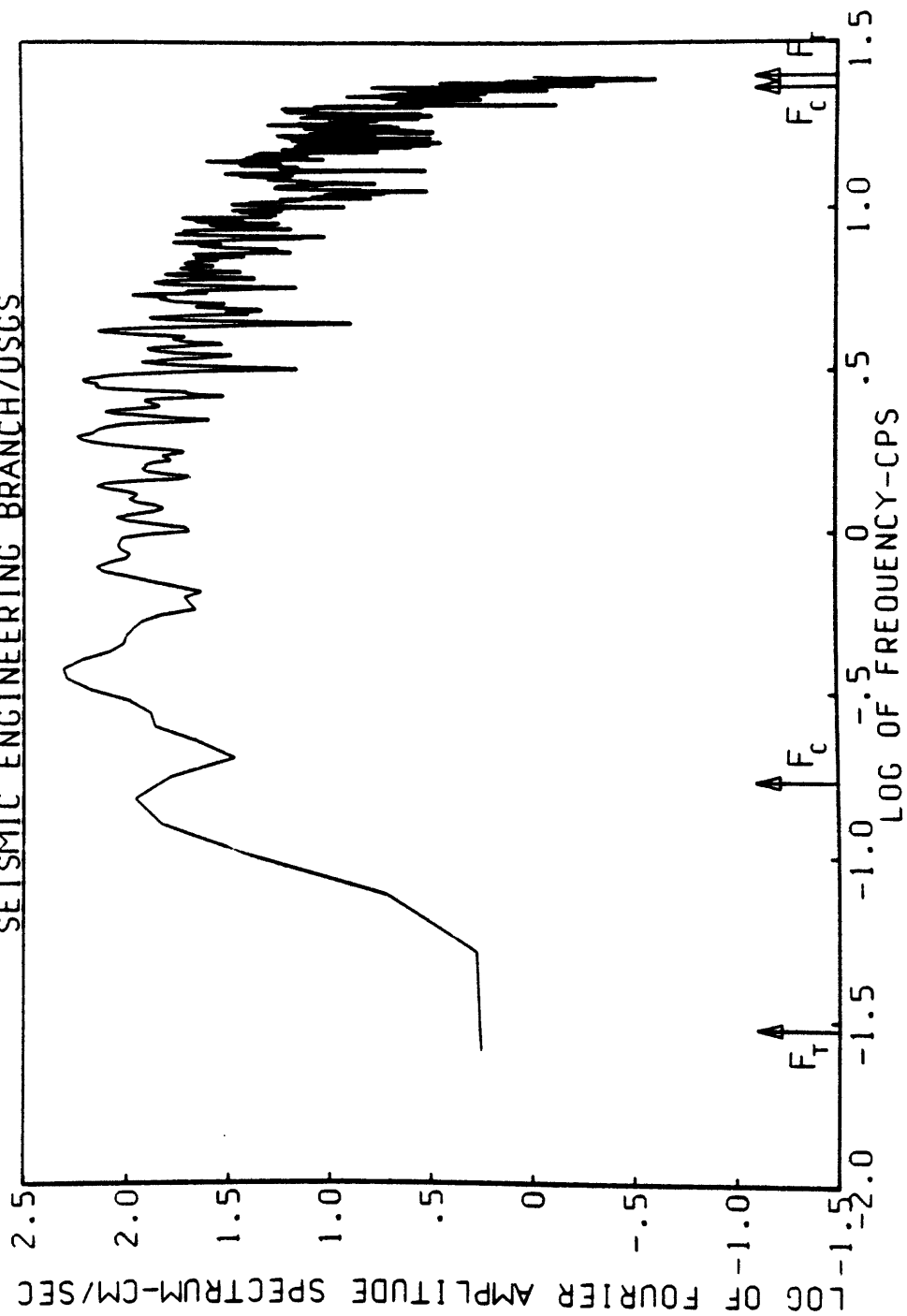


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



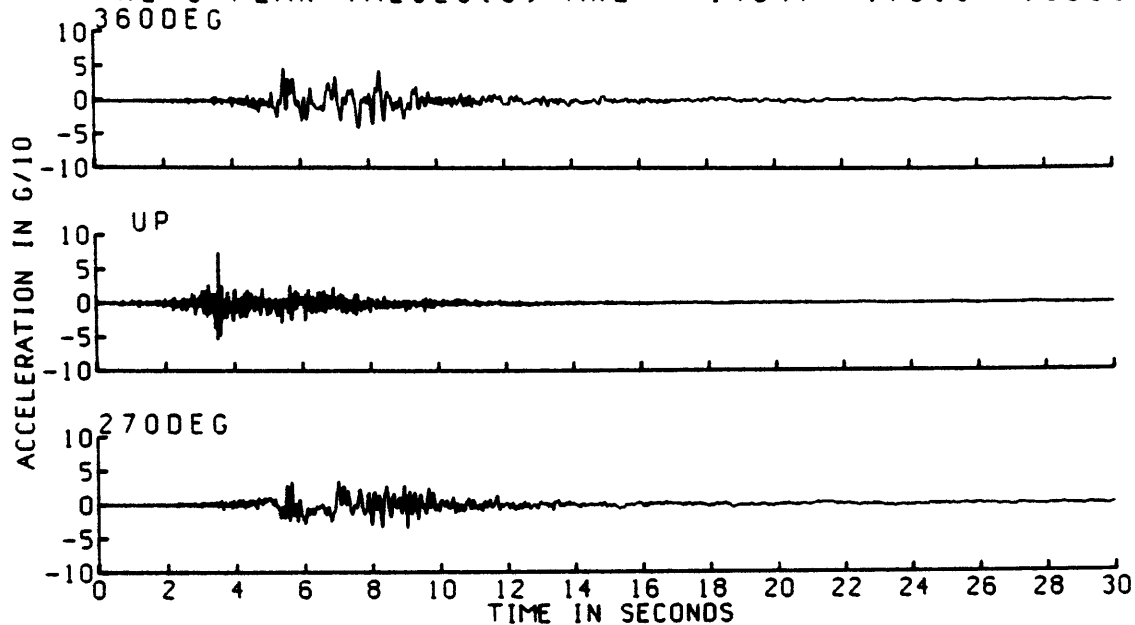


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 JAMES RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

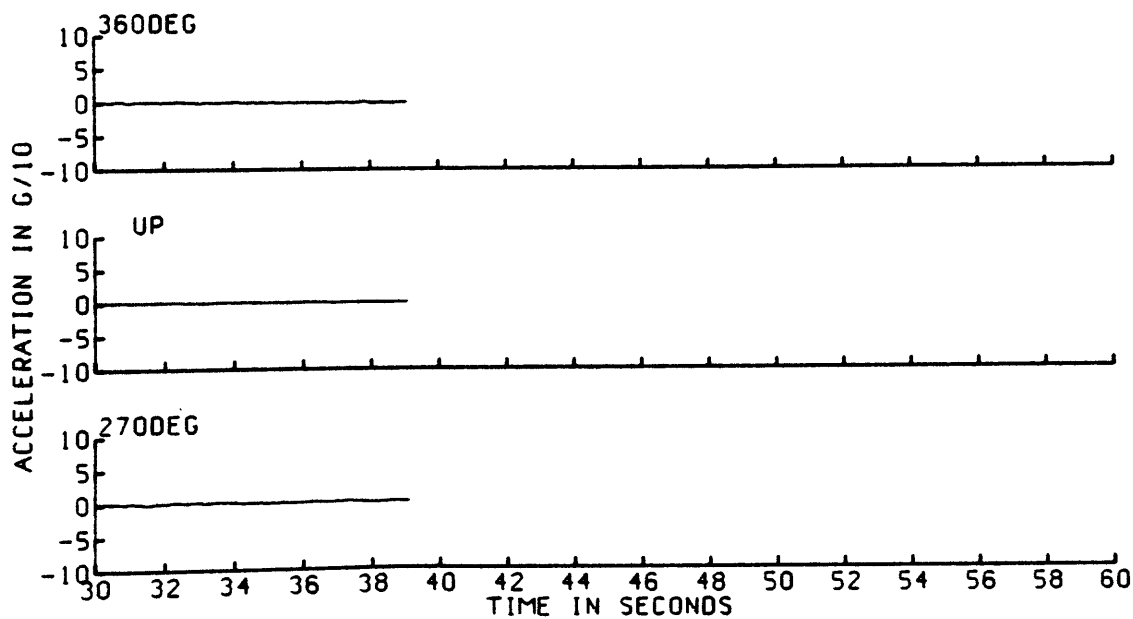


# UNCORRECTED ACCELEROGRAM

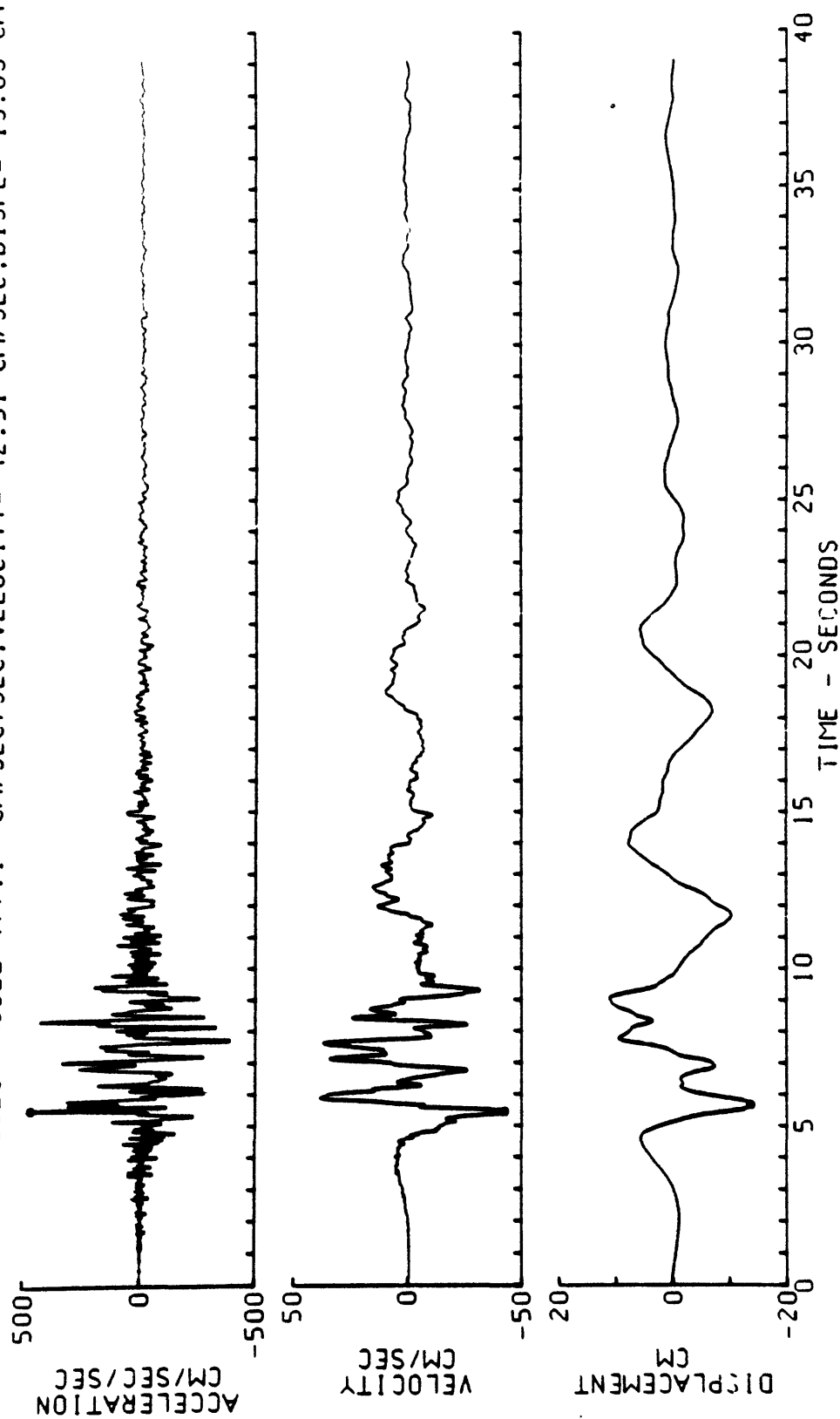
EL CENTRO.DIFF. ARRAY.10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .4867 .7518 .3536



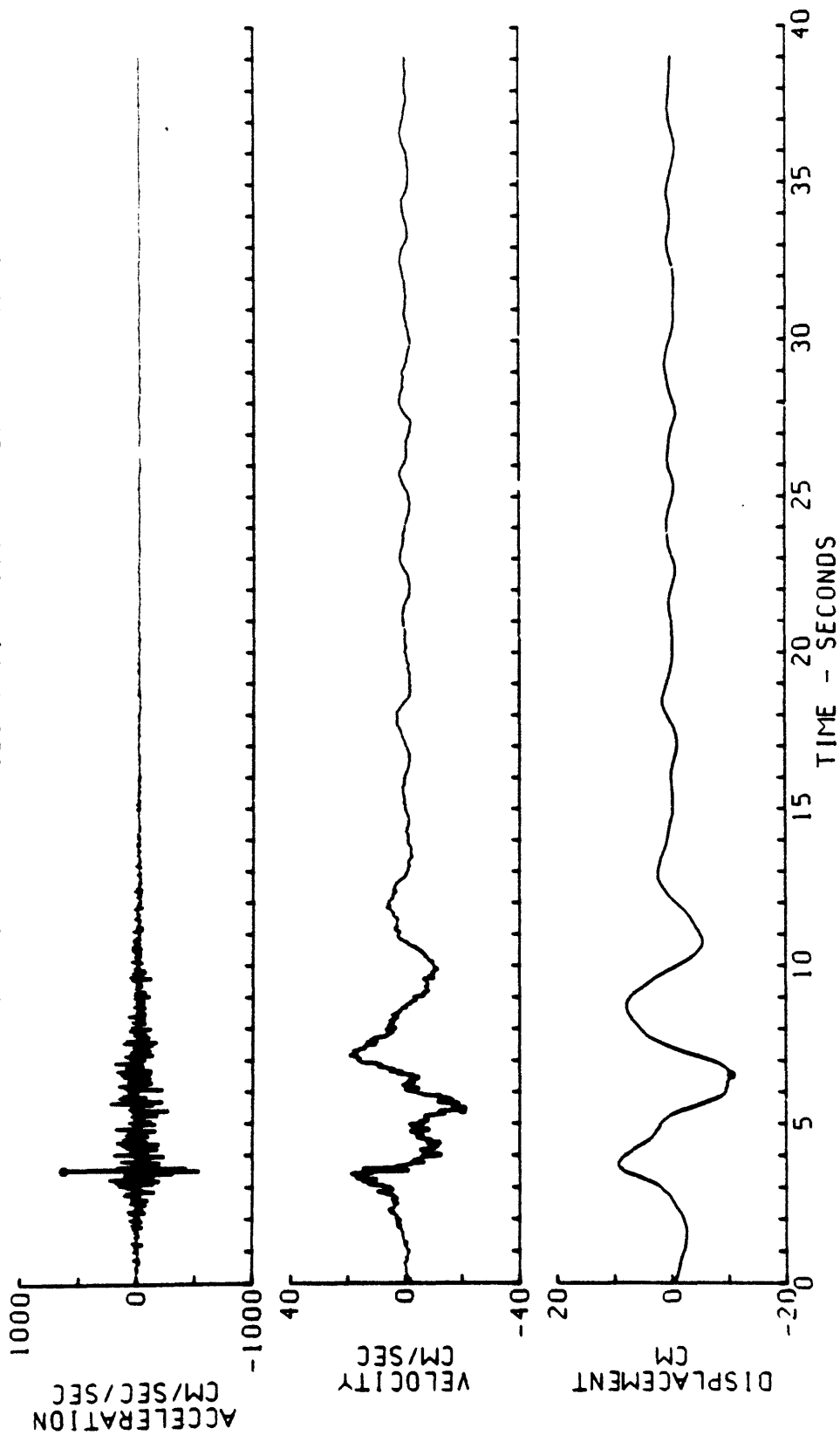
EL CENTRO.DIFF. ARRAY.10/15/79.2317UTC



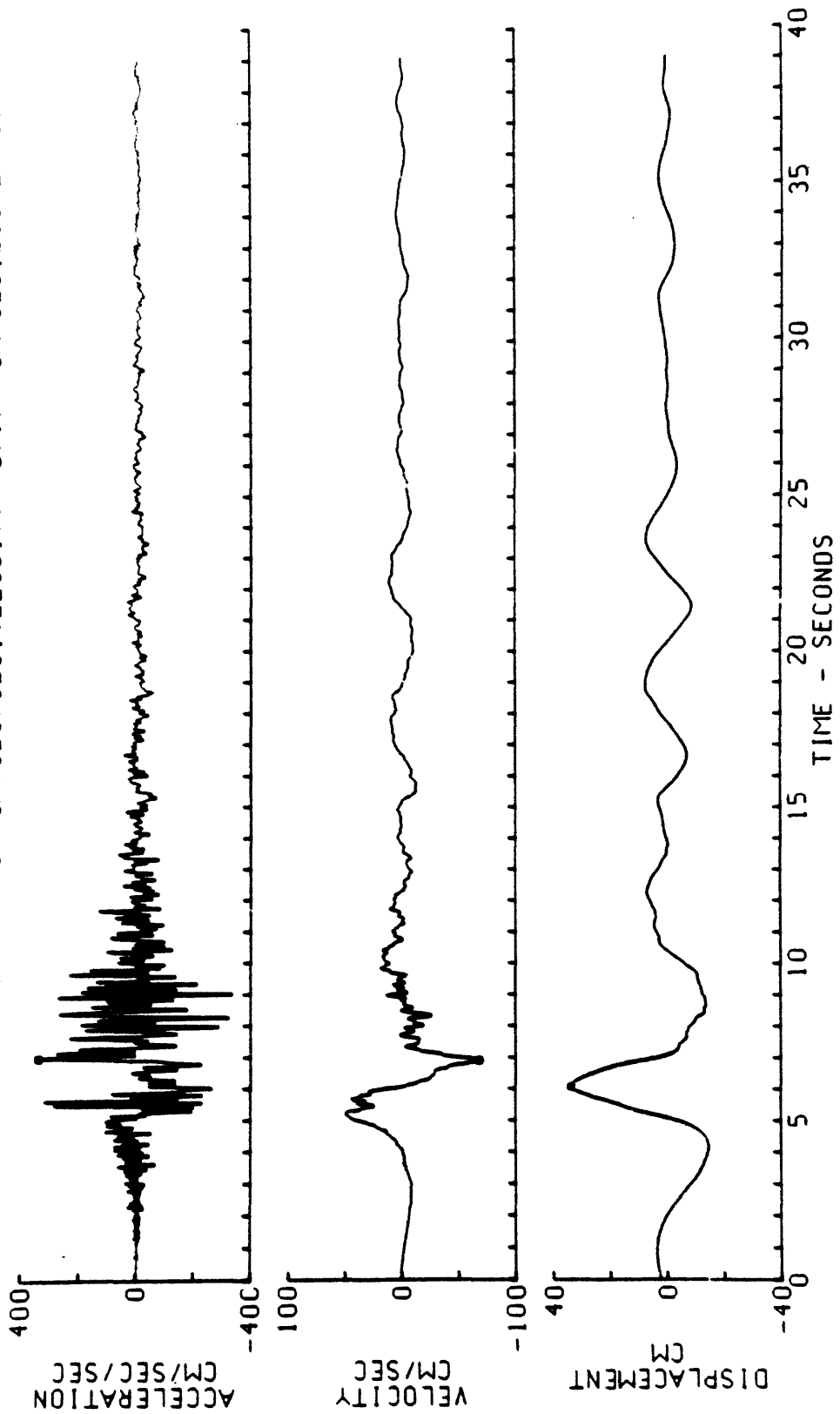
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP 360 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=477.1 CM/SEC/SEC, VELOCITY=-42.51 CM/SEC, DISPL=-13.69 CM



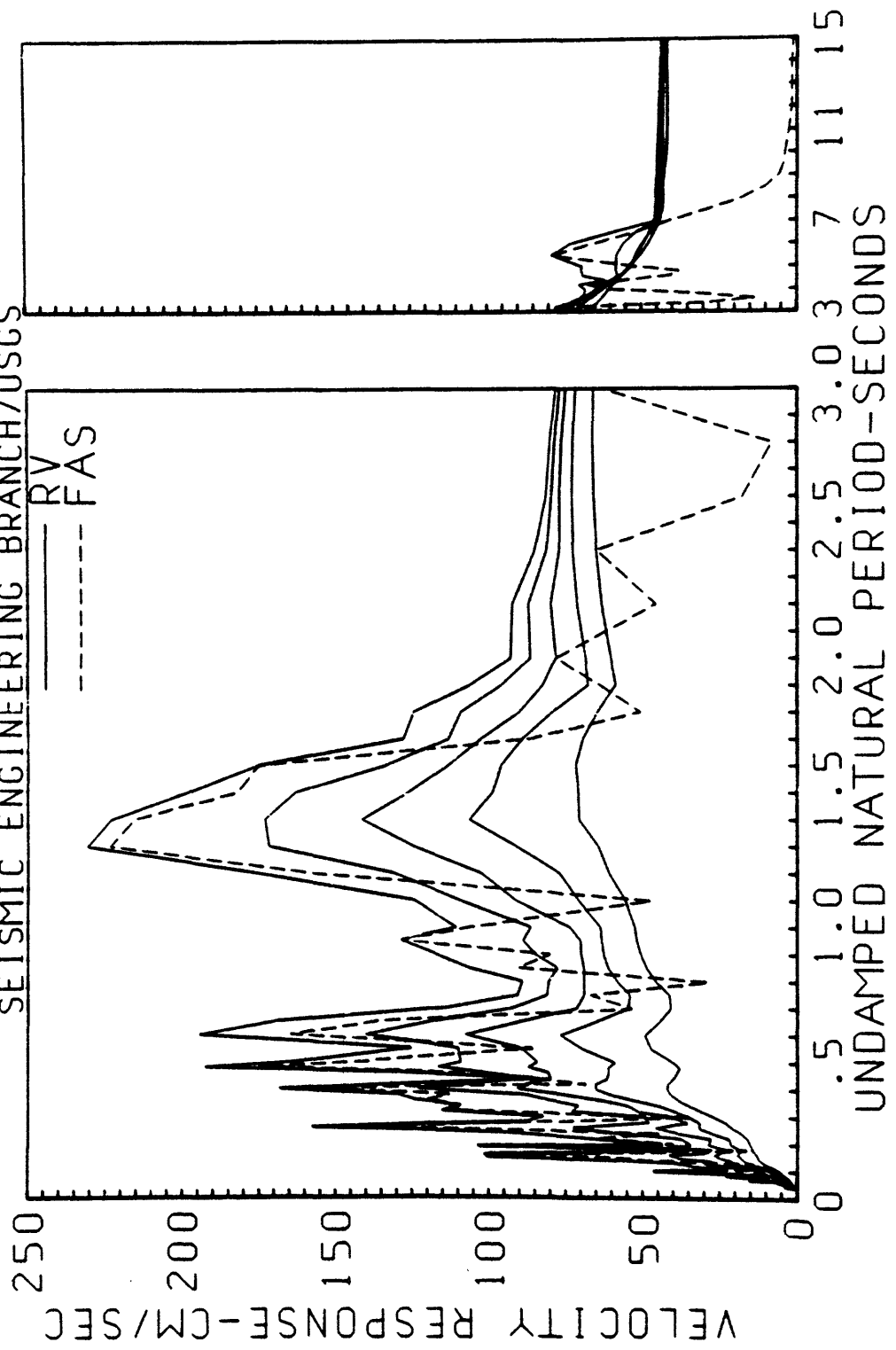
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=645.8 CM/SEC/SEC, VELOCITY=-20.00 CM/SEC, DISPL=-10.37 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP 270 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=344.9 CM/SEC/SEC, VELOCITY=-67.77 CM/SEC, DISPL=33.75 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, DIFF ARR., 10/15/79, 2317.360 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



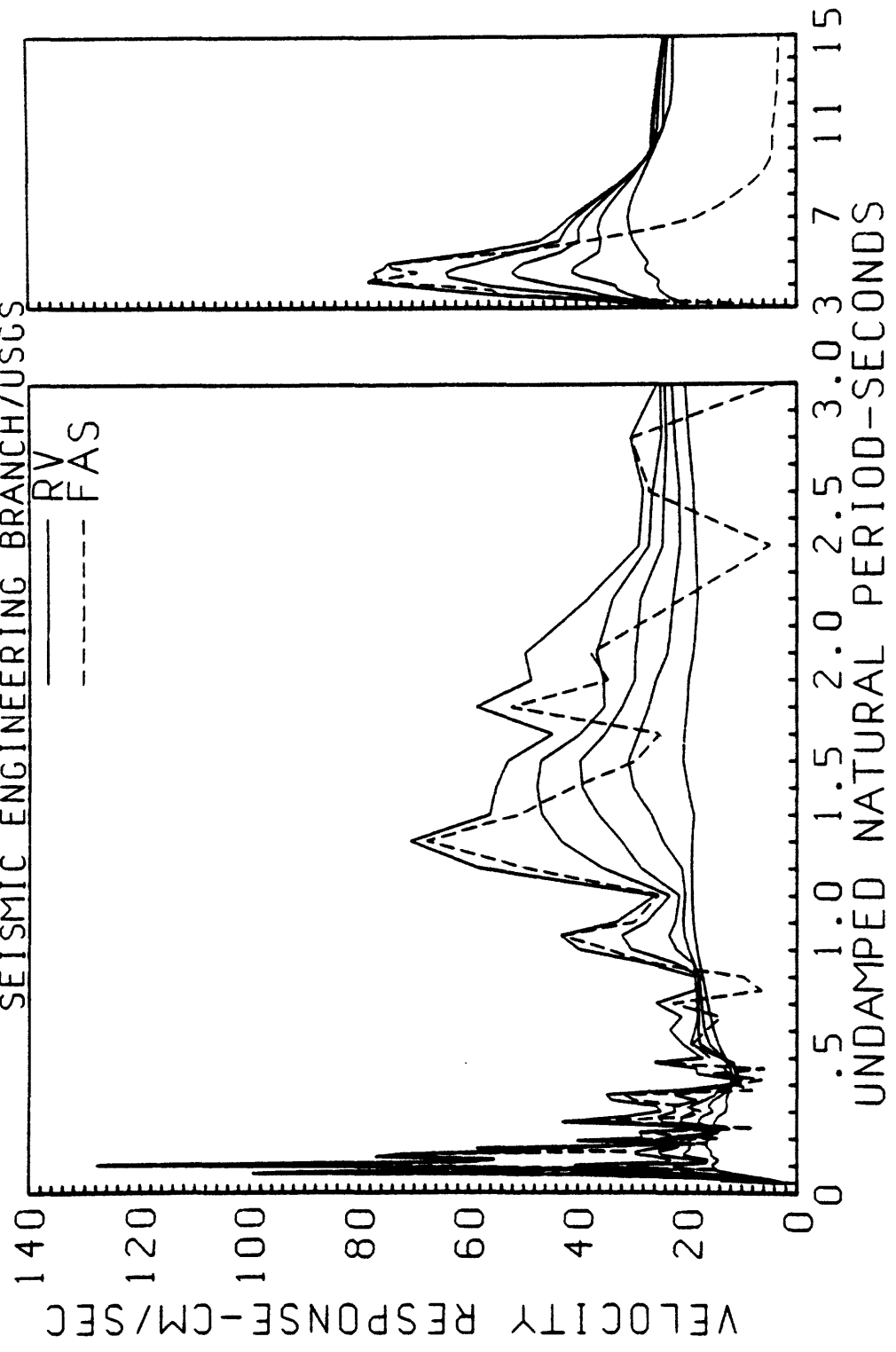
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO,DIFF ARRAY,10/15/79,2317UTC,UP

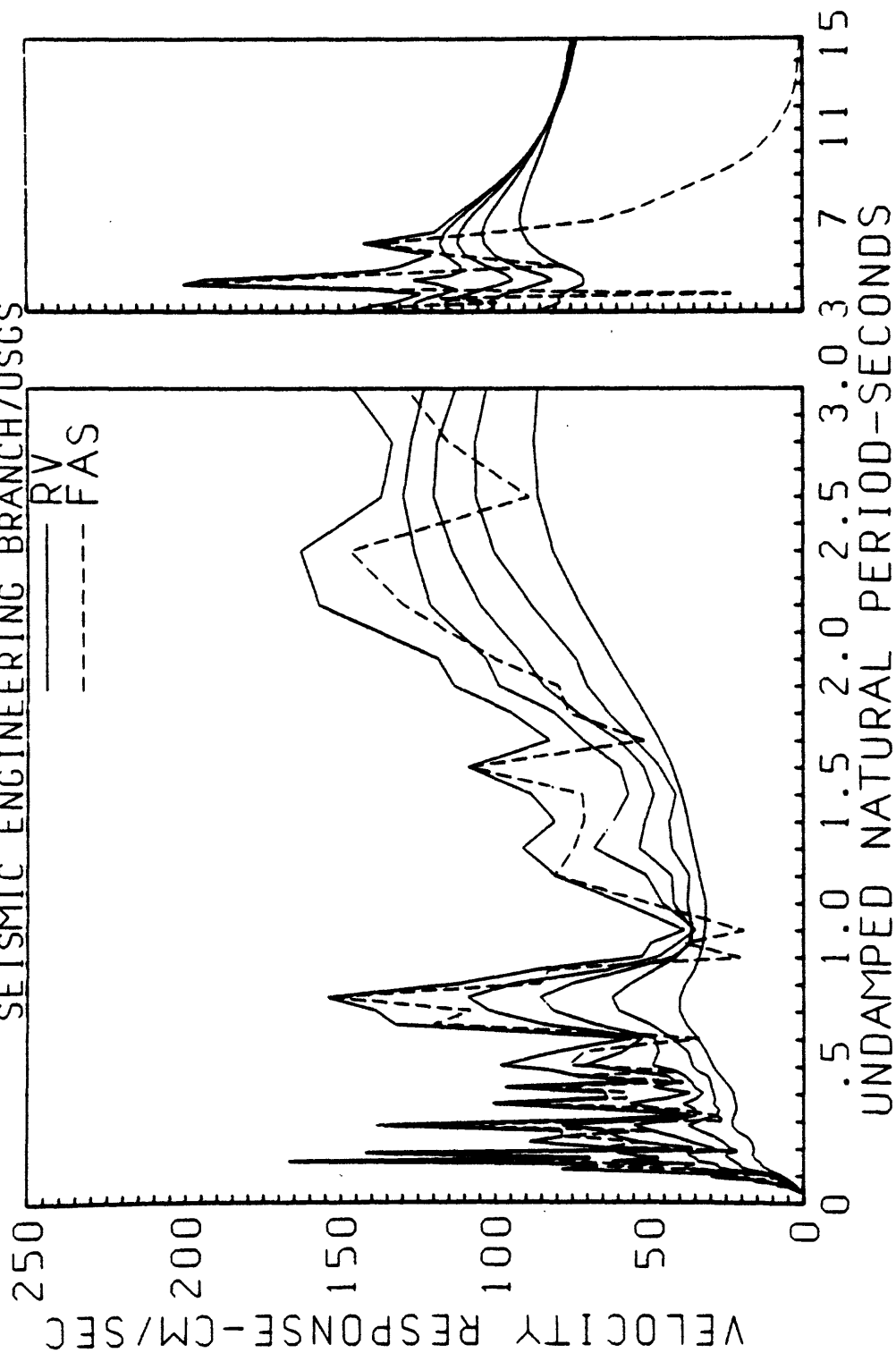
0.2,5,10,20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

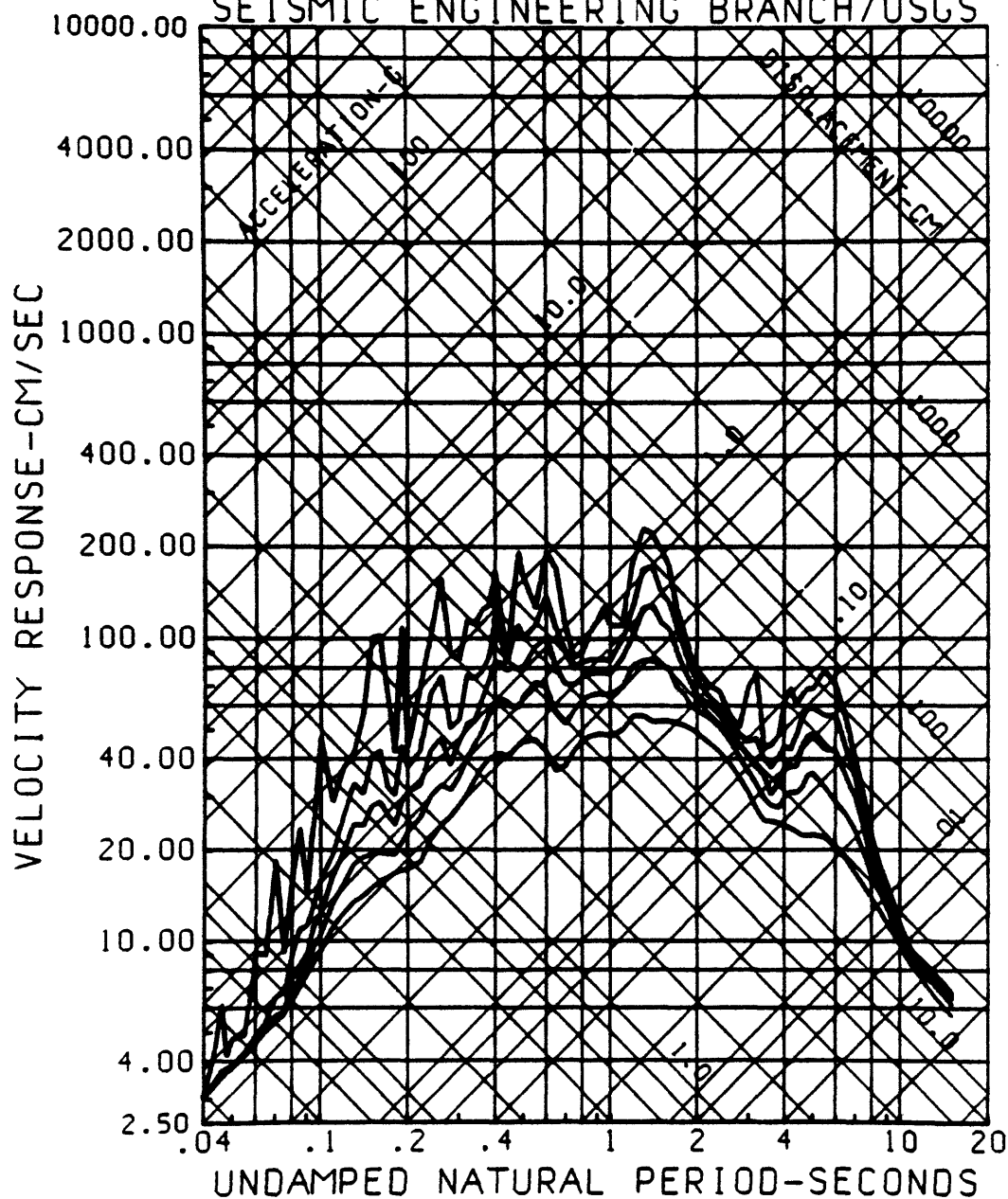


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, DIFF ARR., 10/15/79, 2317.270 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

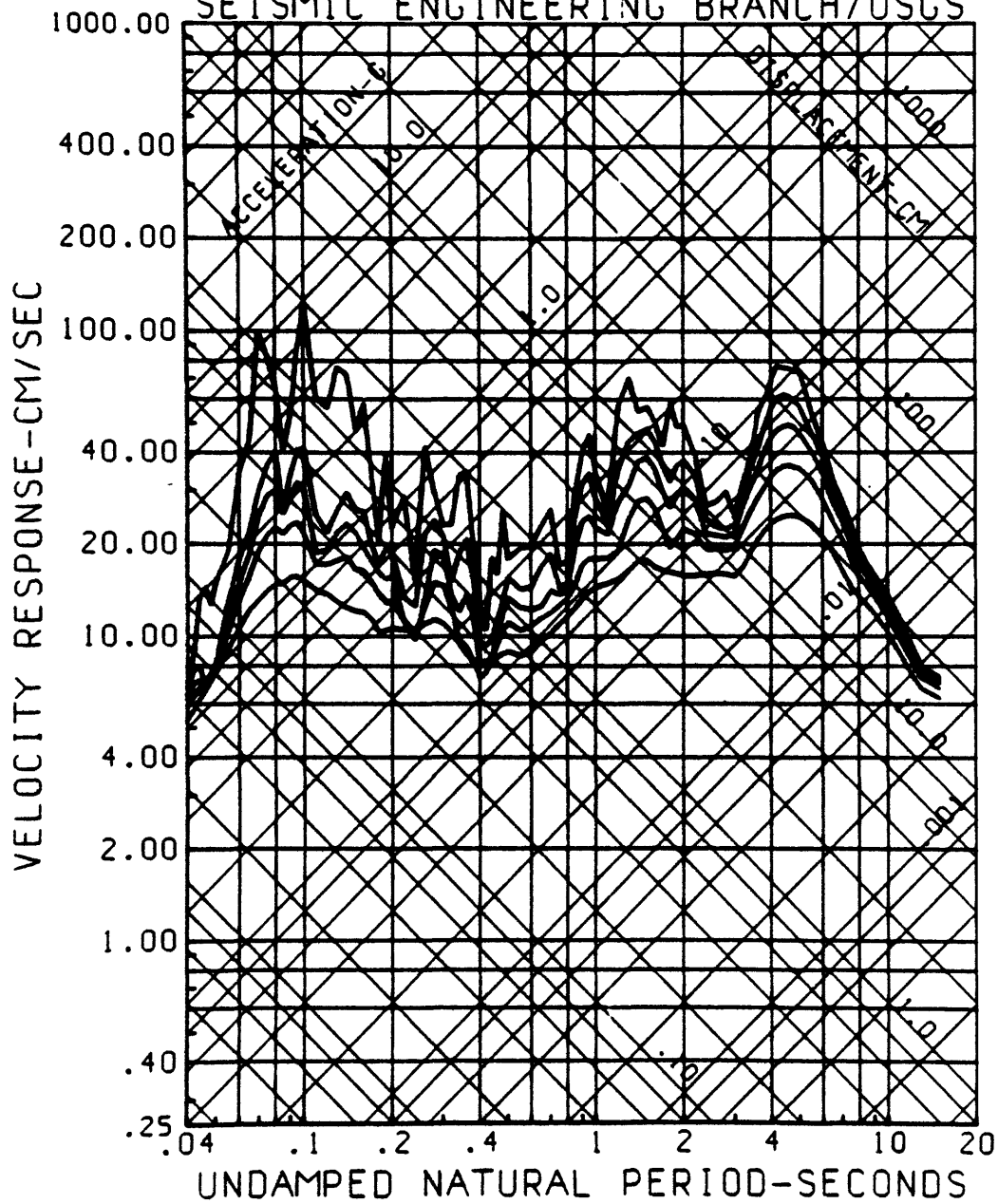




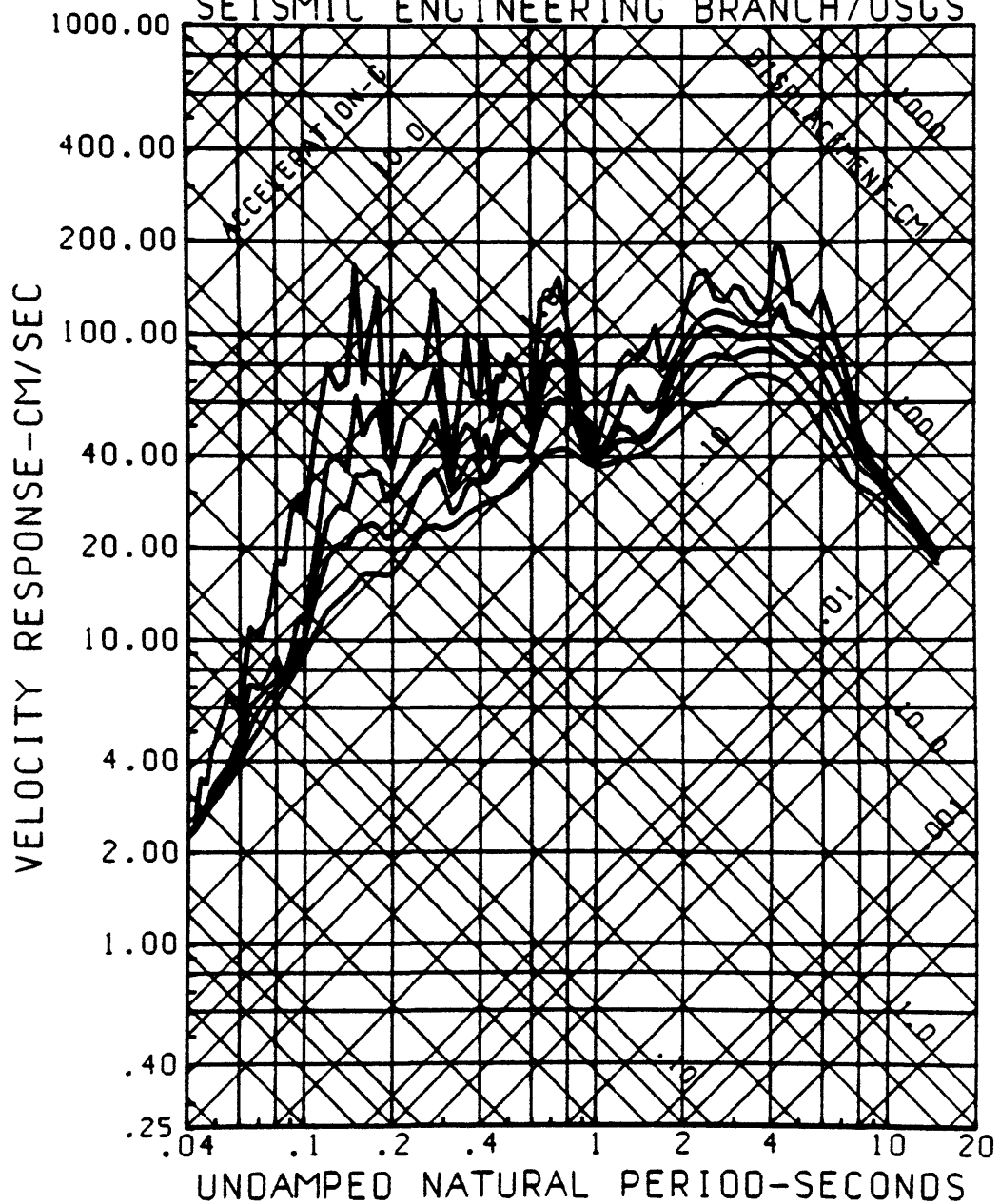
RESPONSE SPECTRA  
 EL CENTRO.DIFF ARR..10/15/79.2317.360DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



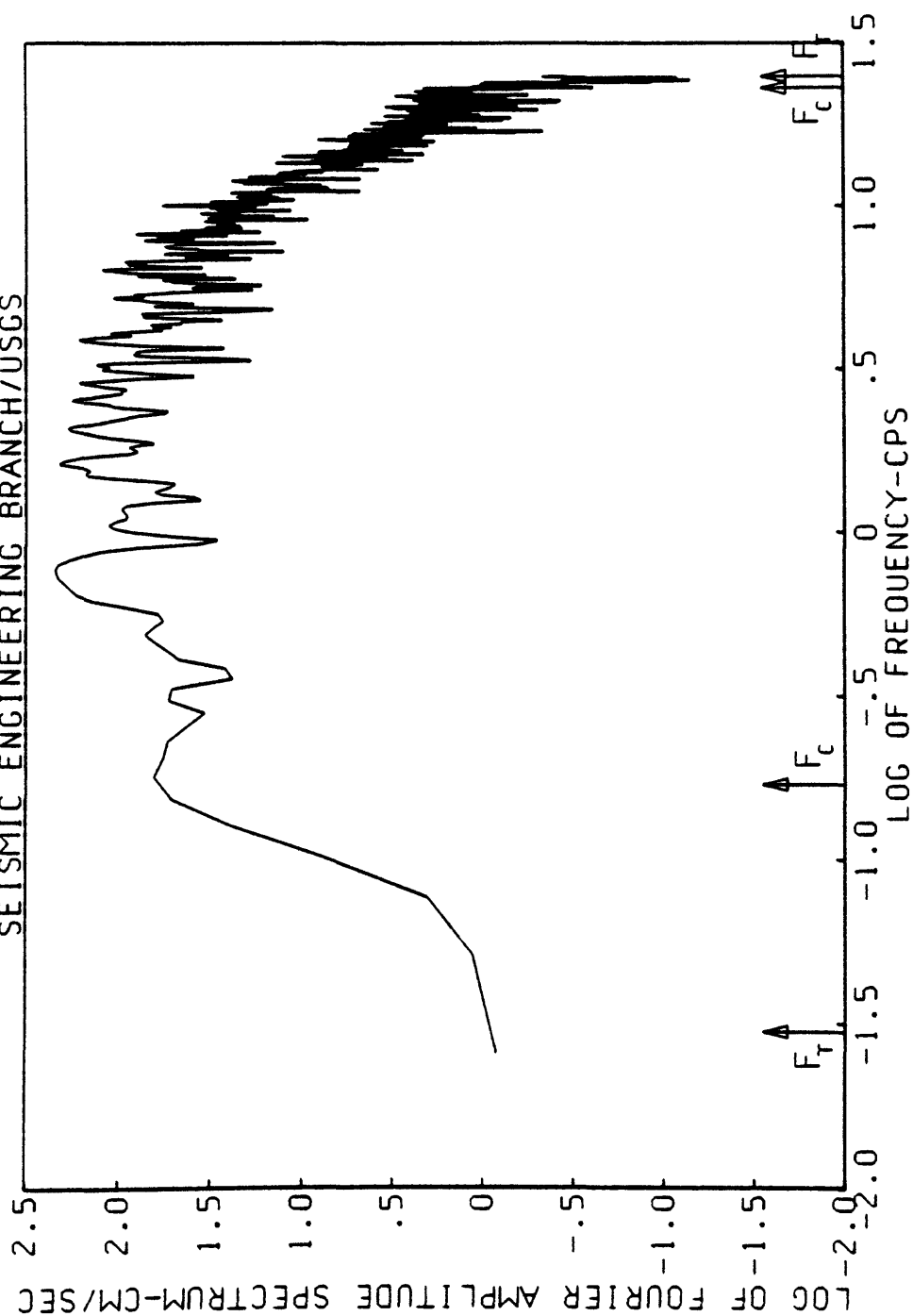
RESPONSE SPECTRA  
 EL CENTRO.DIFF ARRAY.10/15/79.2317UTC.UP  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



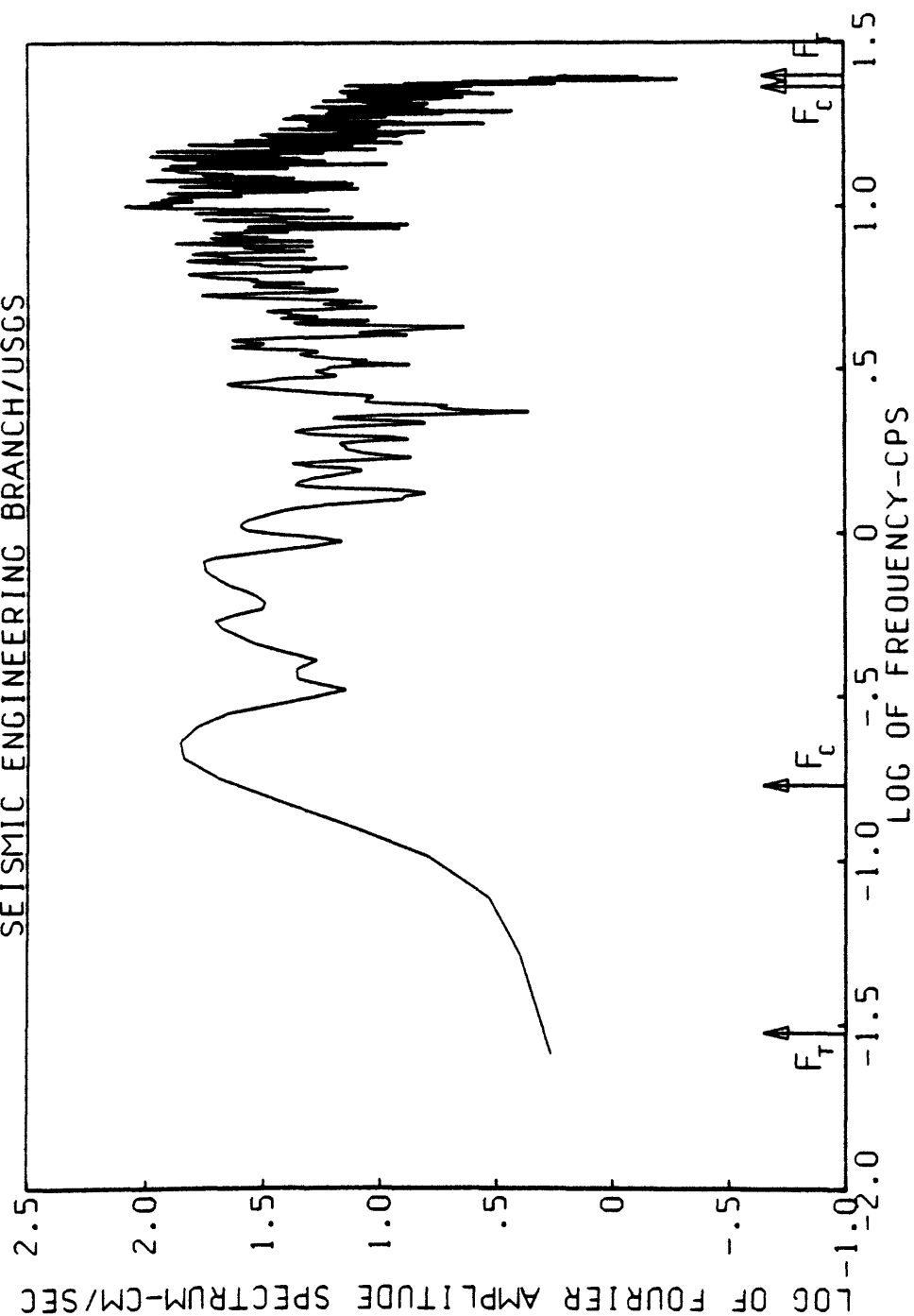
RESPONSE SPECTRA  
 EL CENTRO.DIFF ARR..10/15/79.2317.270DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



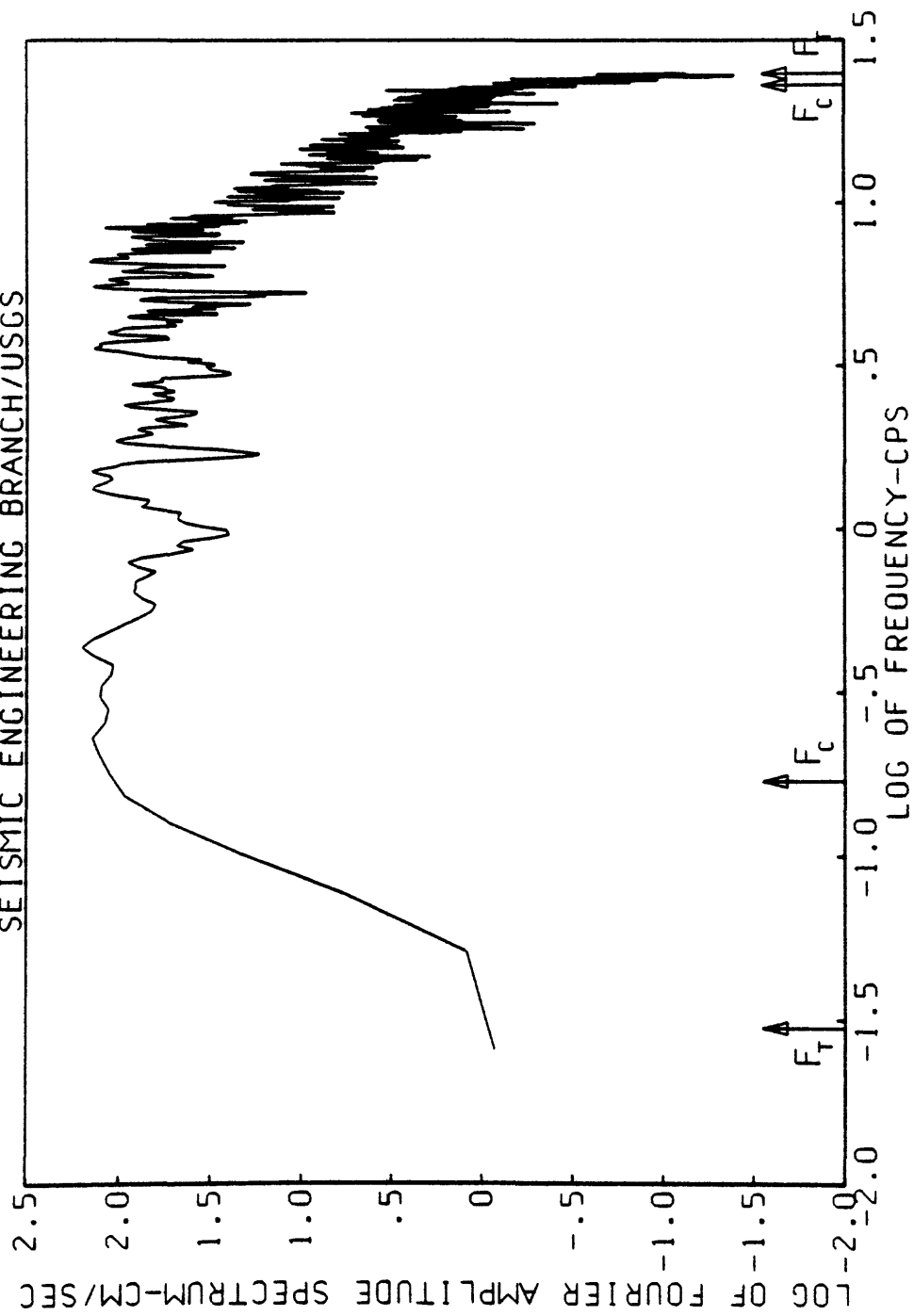
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP 360 DEGREES  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



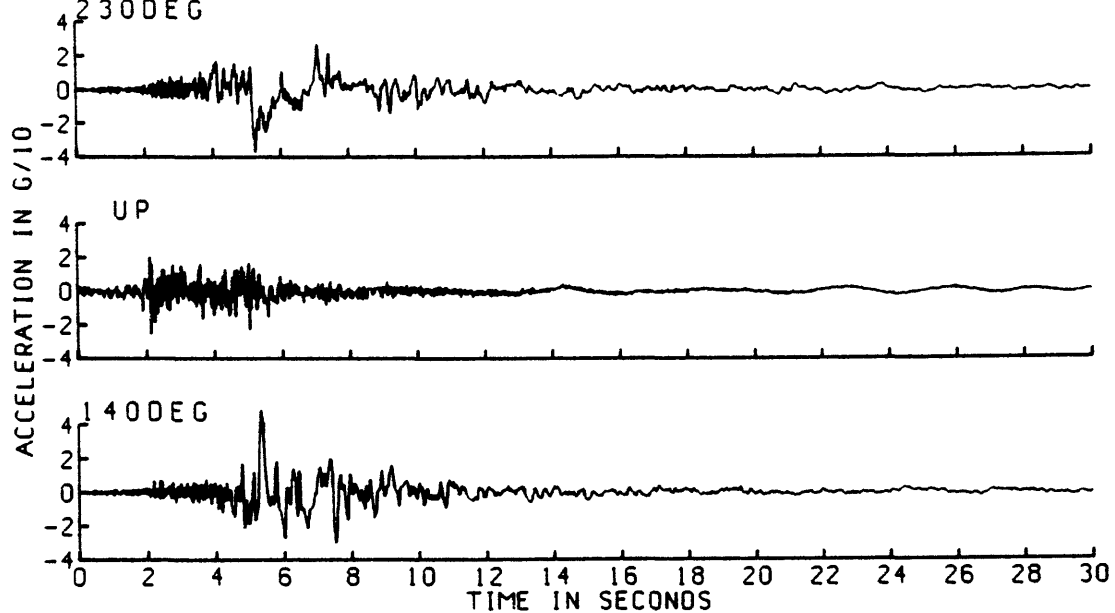
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



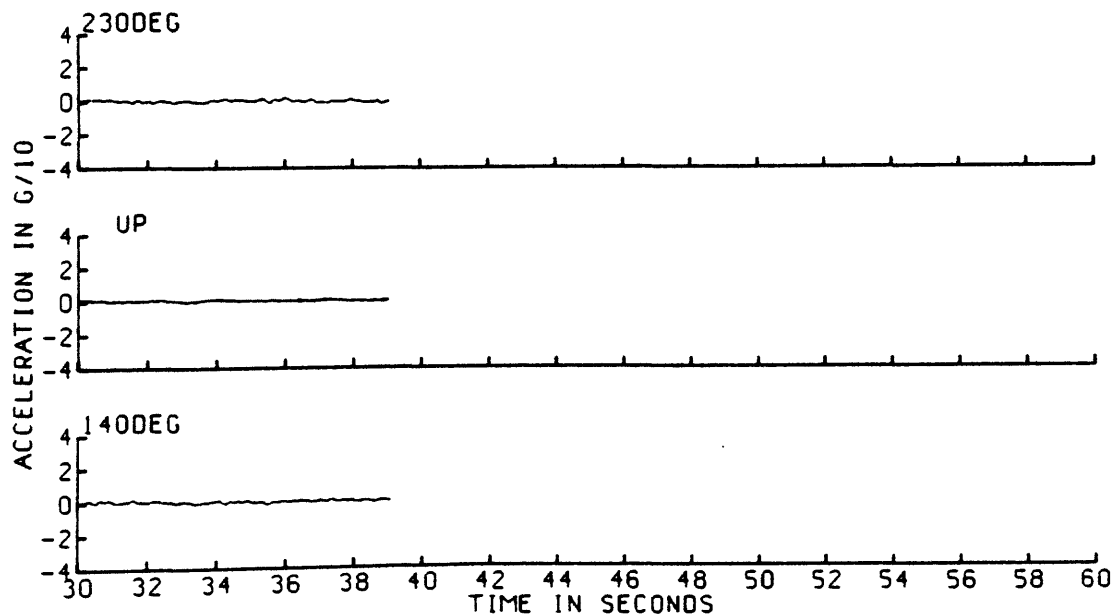
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 DIFF ARRAY, DOGWOOD RD., EL CENTRO, CALIFORNIA, COMP 270 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



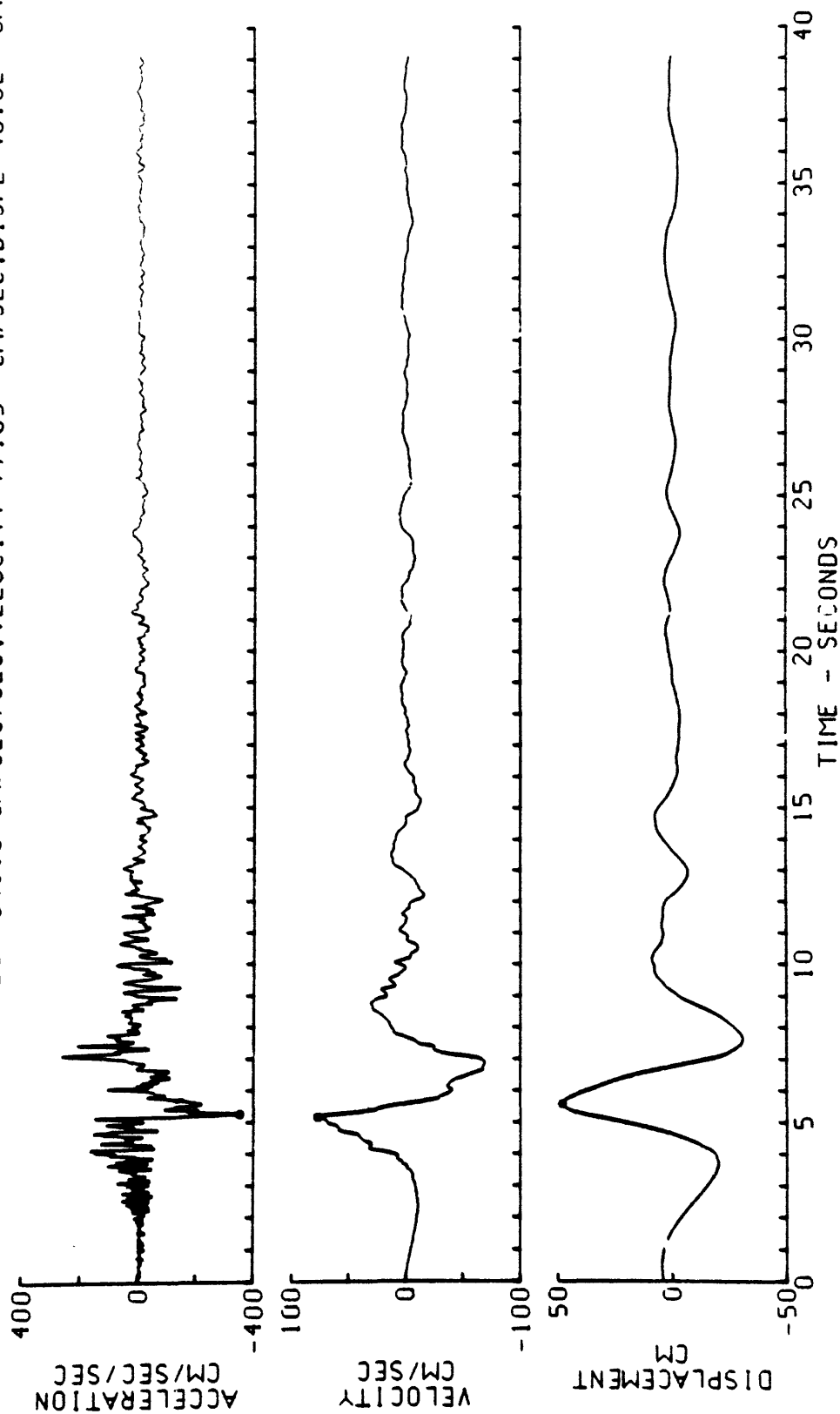
UNCORRECTED ACCELEROGRAM  
 EL CENTRO.ARRAY 4.ANDERSON RD..10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .3700 .2504 .4886  
 230DEG



EL CENTRO.ARRAY 4.ANDERSON RD..10/15/79.2317UTC

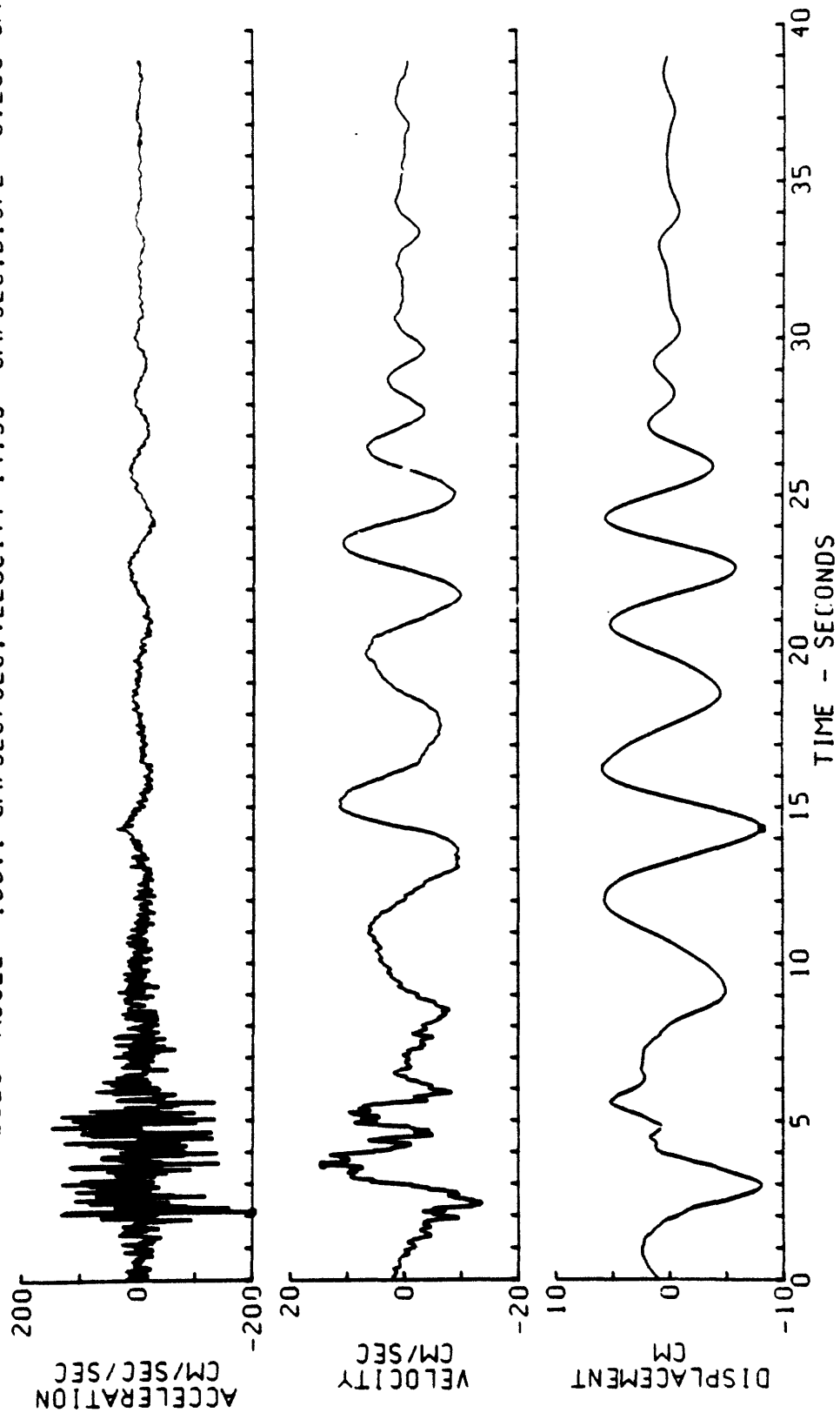


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-349.6 CM/SEC/SEC, VELOCITY=77.65 CM/SEC, DISPL=48.02 CM

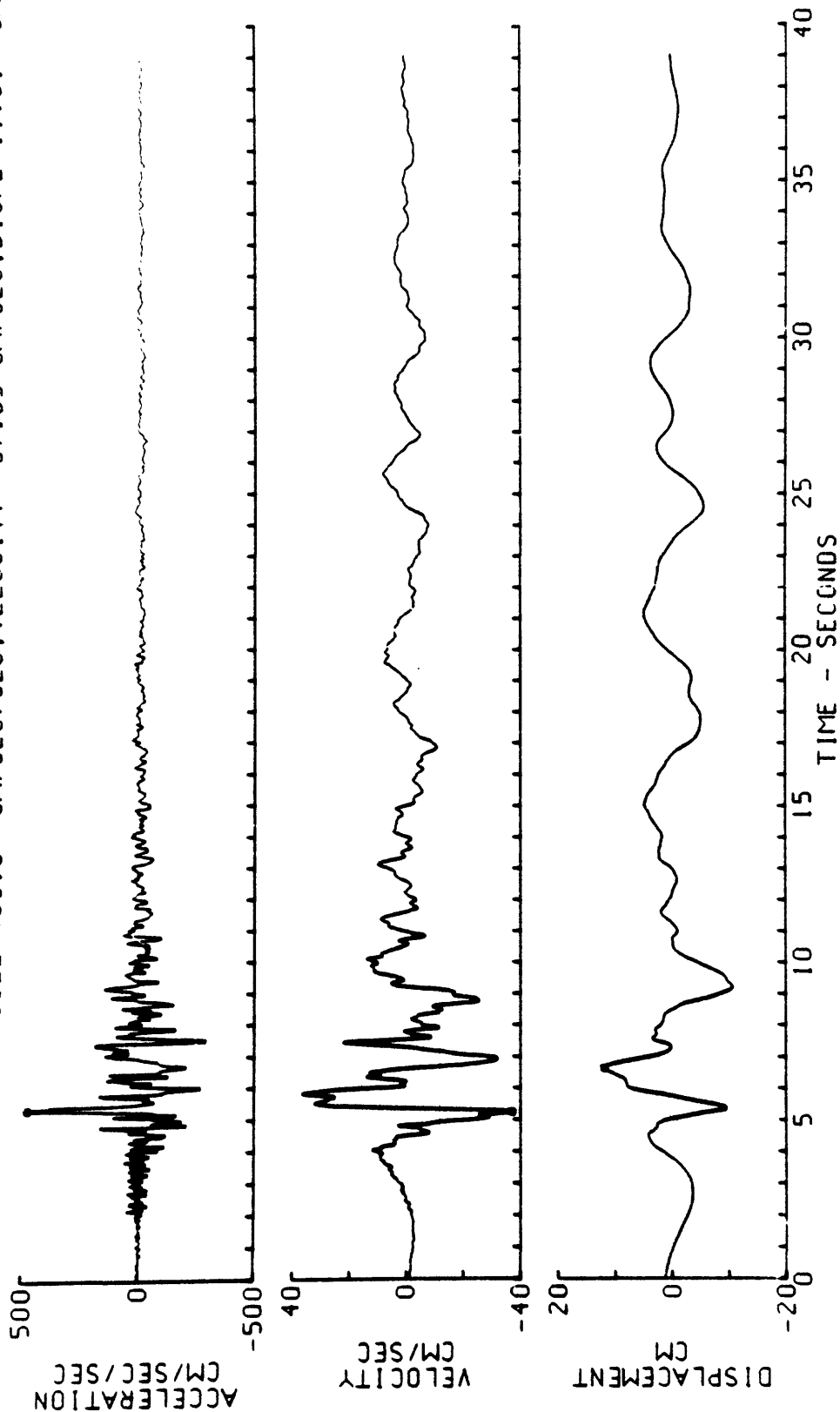




CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-199.1 CM/SEC/SEC, VELOCITY=14.39 CM/SEC, DISPL=-8.200 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=483.6 CM/SEC/SEC, VELOCITY=-37.05 CM/SEC, DISPL=11.91 CM



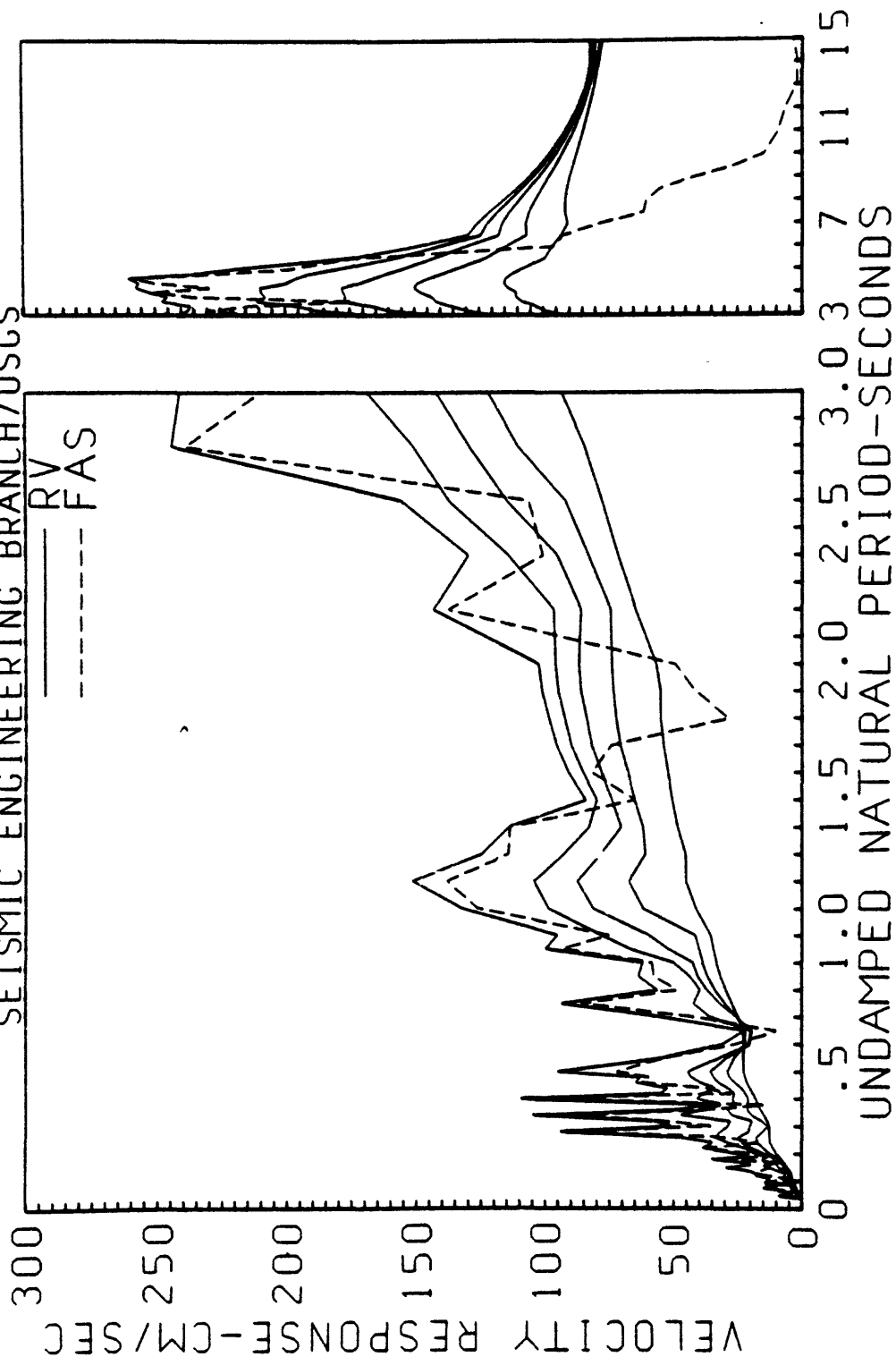
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 4.10/15/79.2317.230DEG

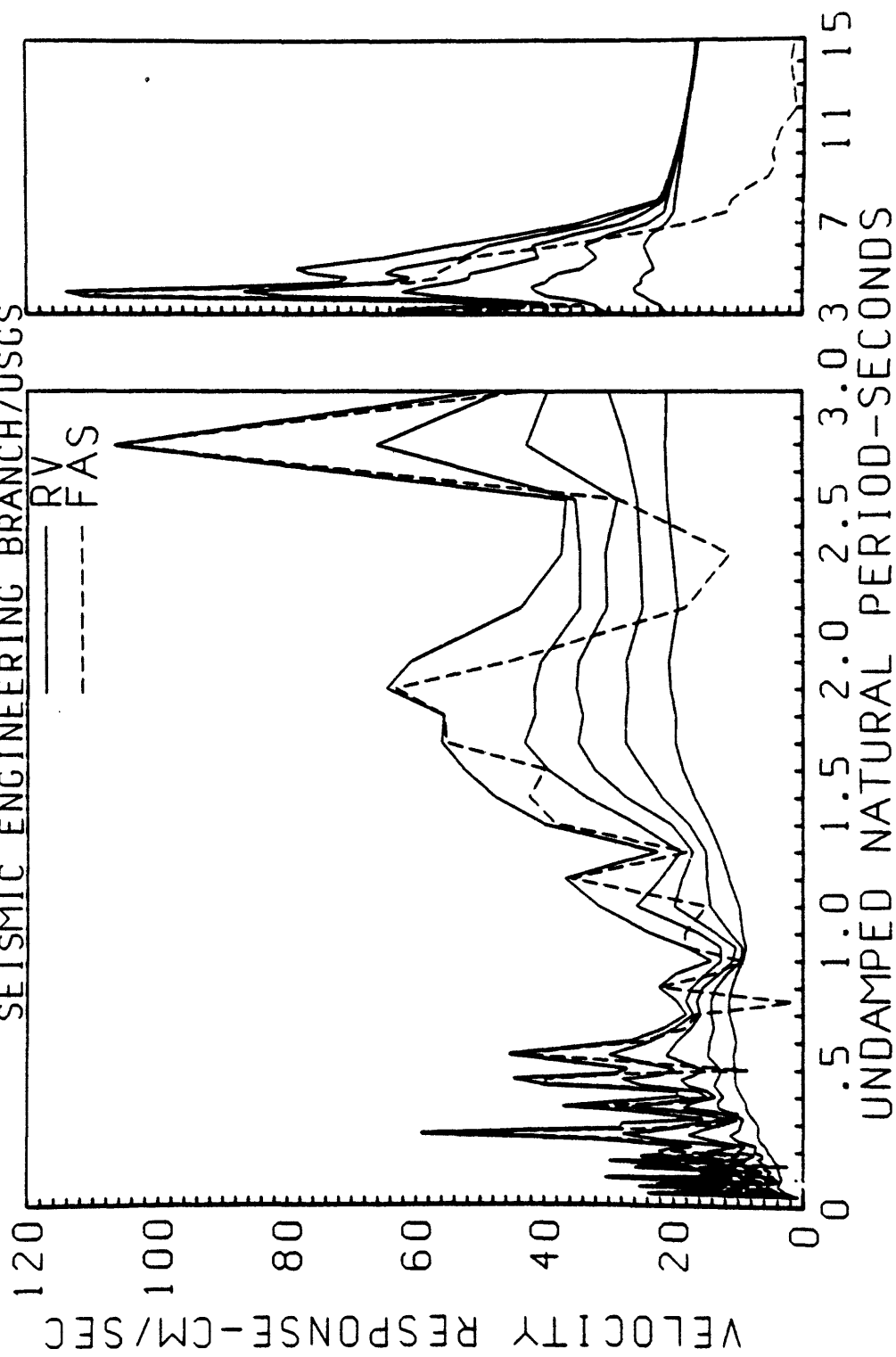
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 4, 10/15/79, 2317UTC, UP  
 0, 2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



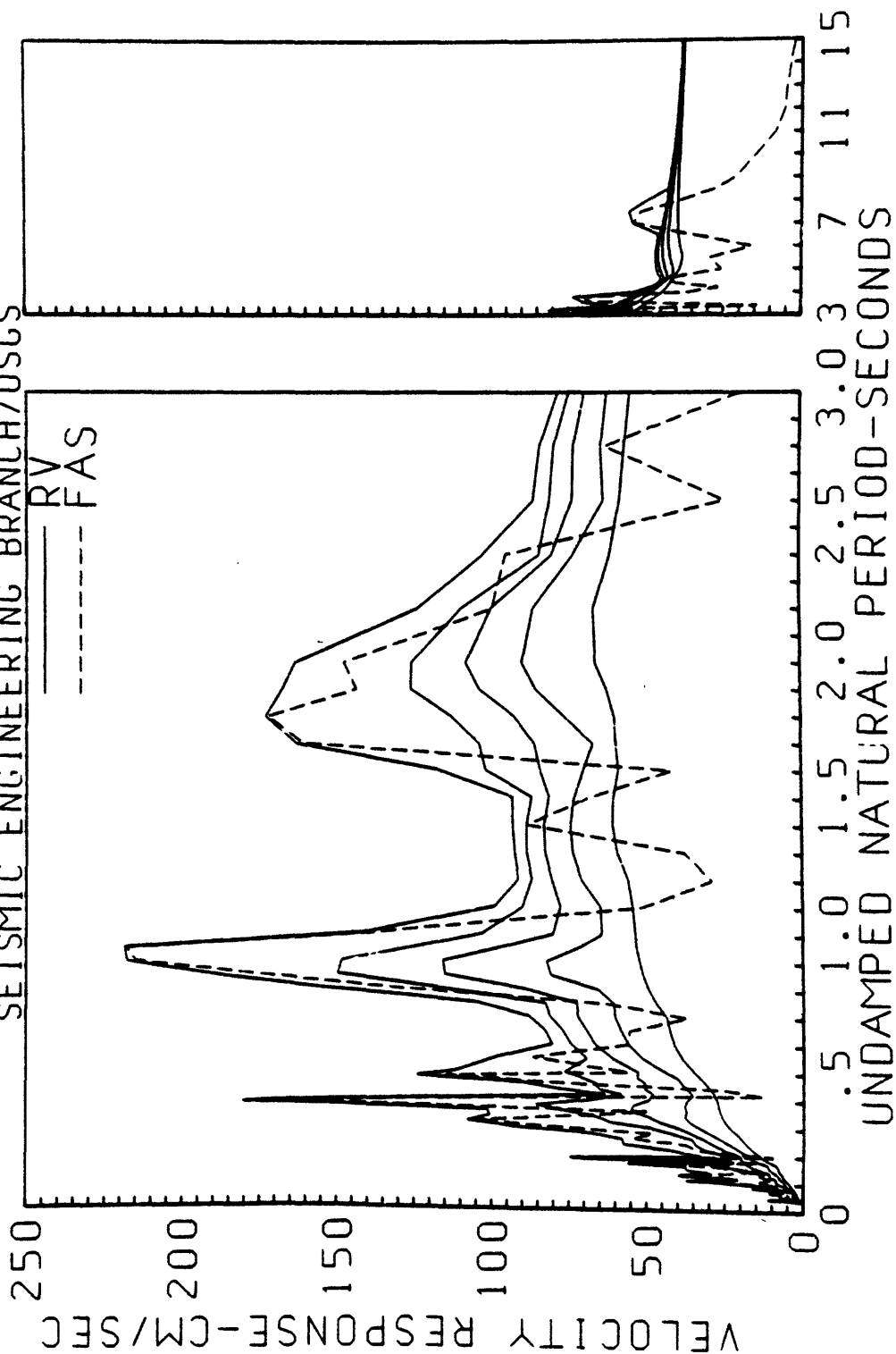
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO ARRAY 4.10/15/79.2317.140DEG

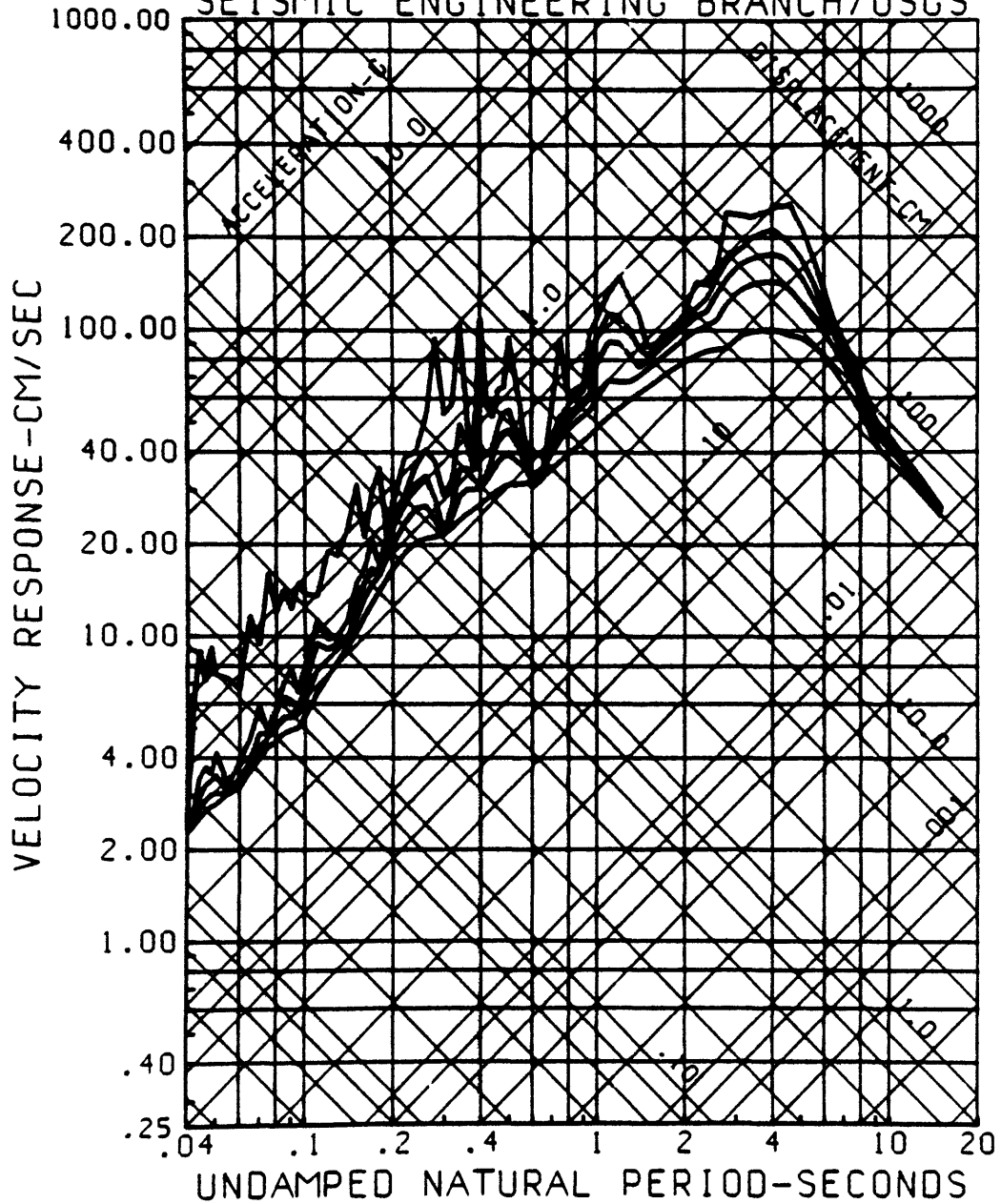
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

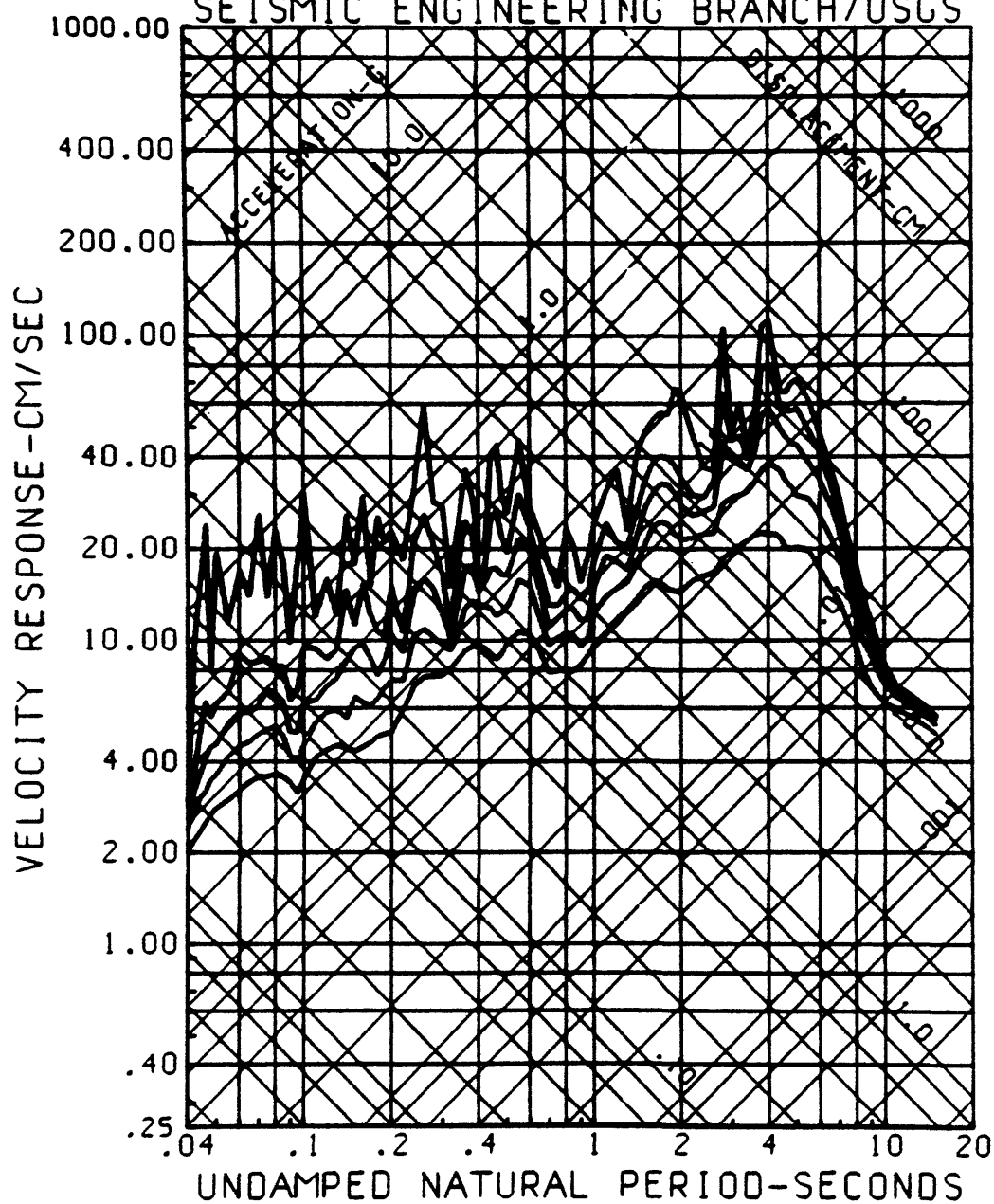
SEISMIC ENGINEERING BRANCH/USGS

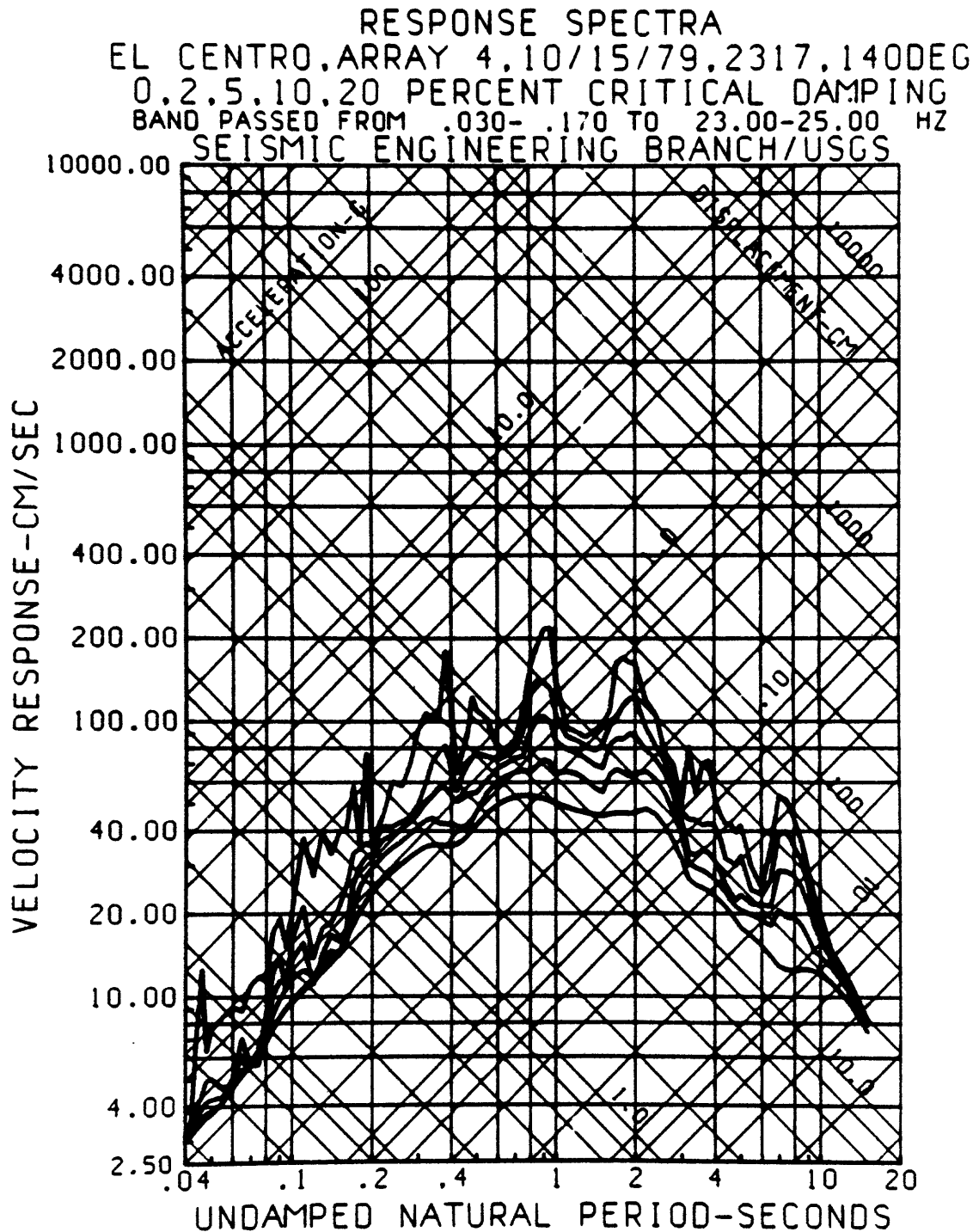


RESPONSE SPECTRA  
 EL CENTRO, ARRAY 4, 10/15/79, 2317, 230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



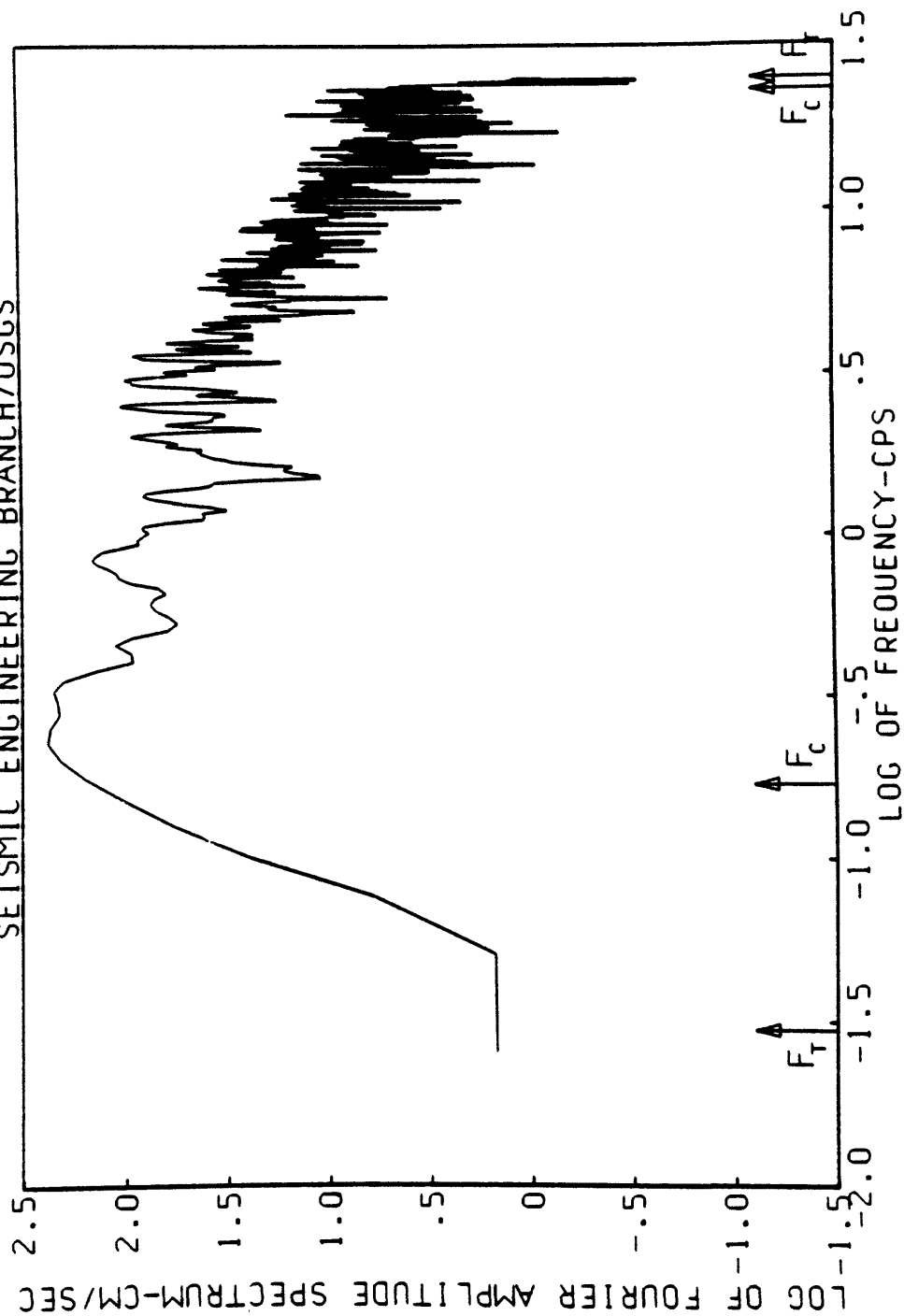
RESPONSE SPECTRA  
EL CENTRO, ARRAY 4, 10/15/79, 2317UTC, UP  
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
SEISMIC ENGINEERING BRANCH/USGS



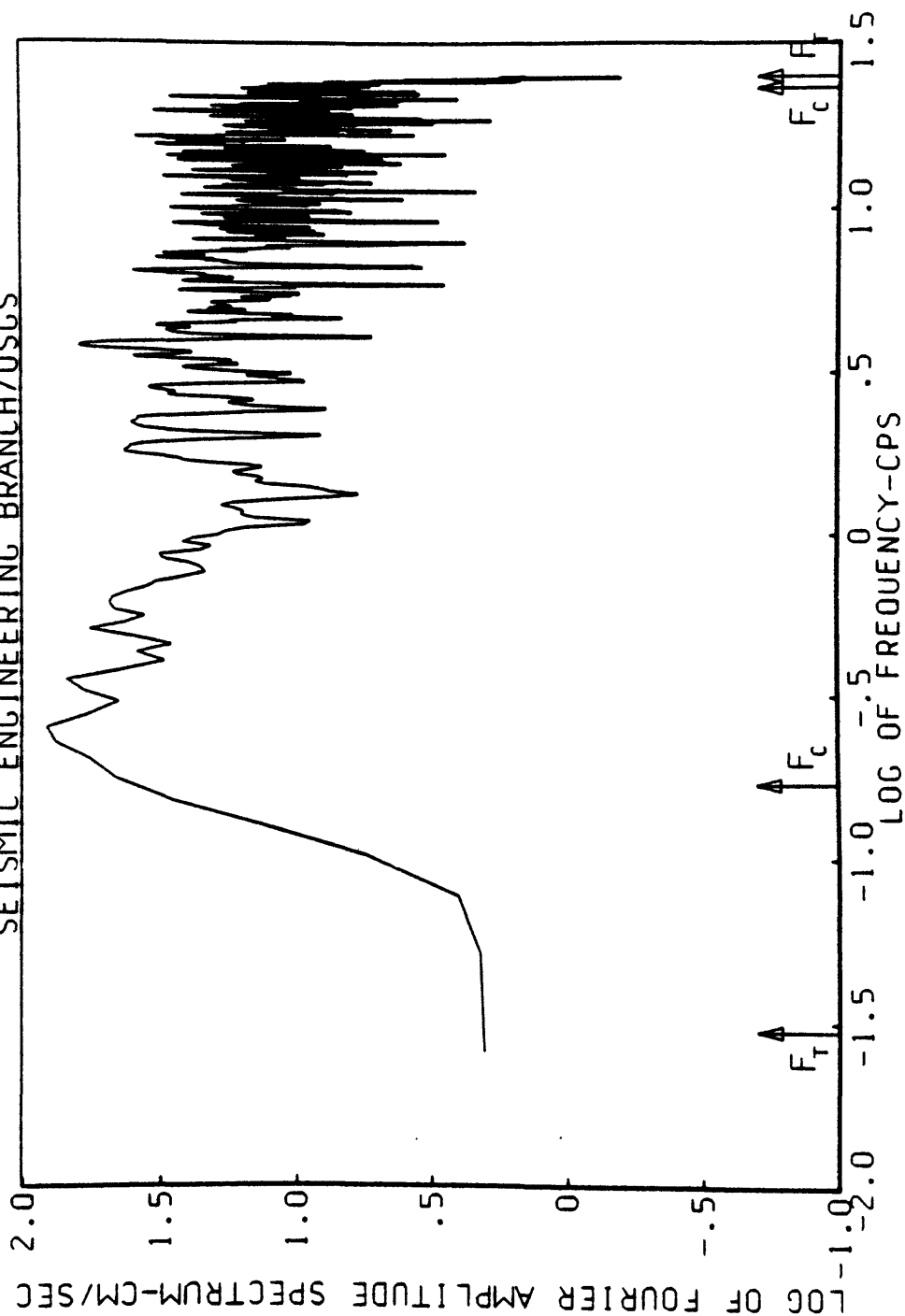




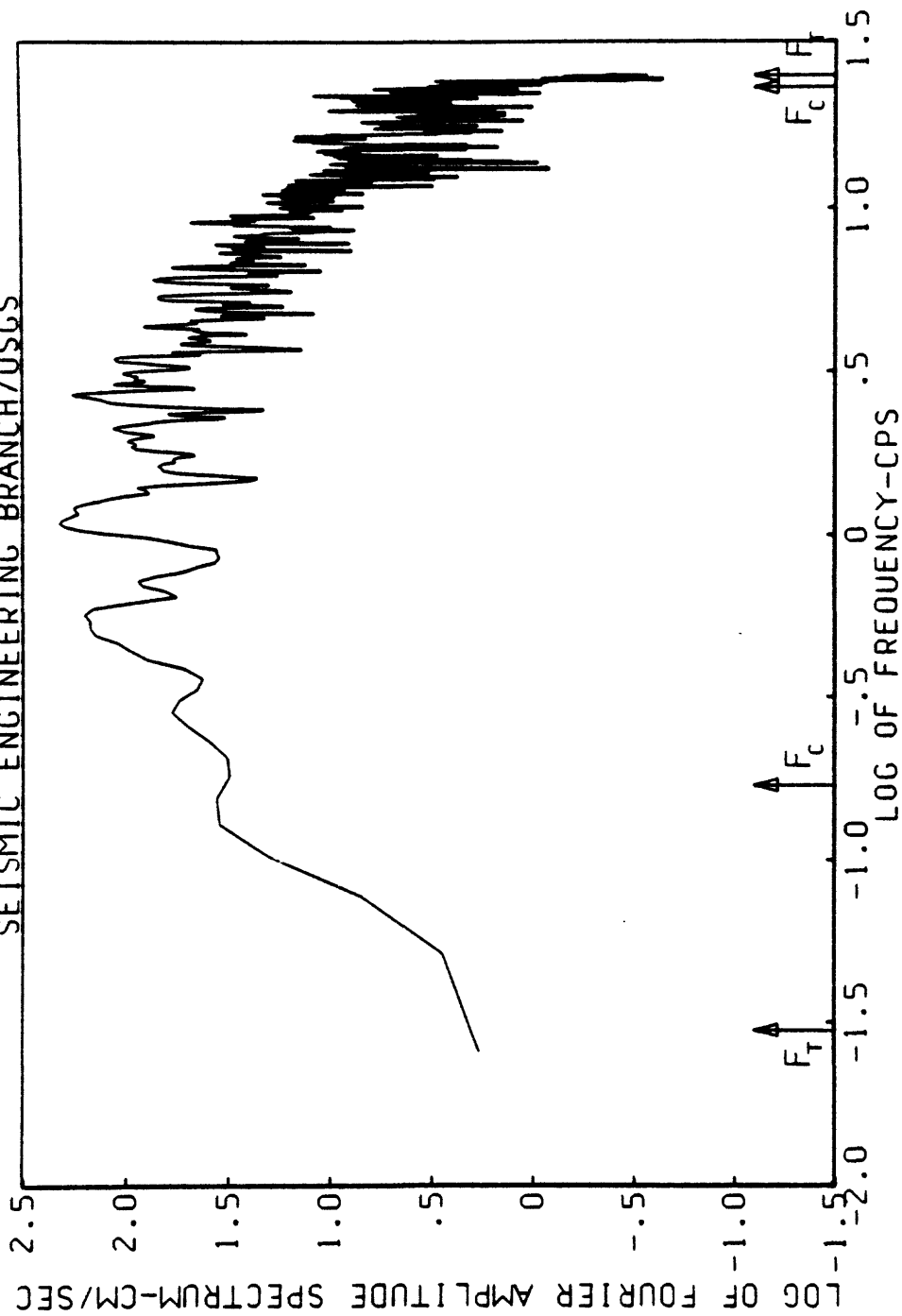
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



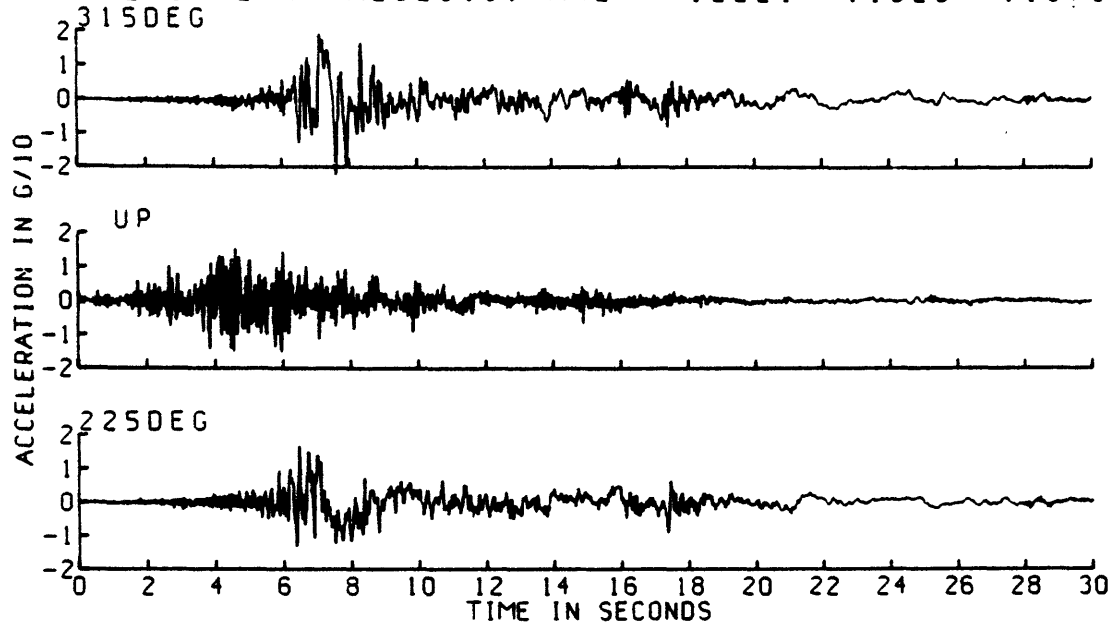
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD..EL CENTRO,CALIFORNIA,COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



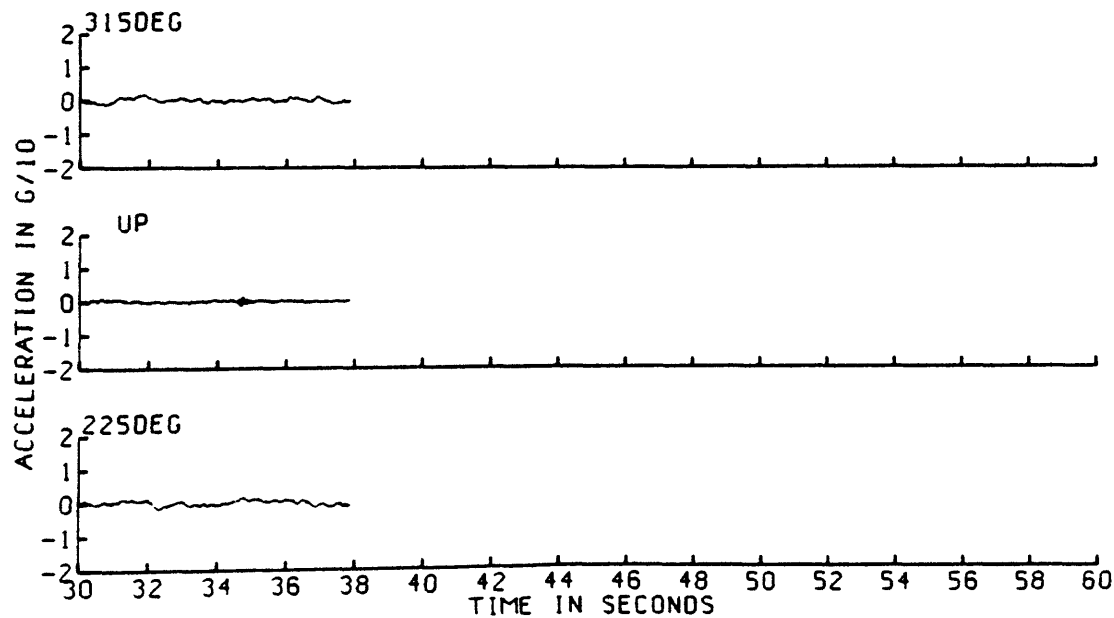
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 ANDERSON RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



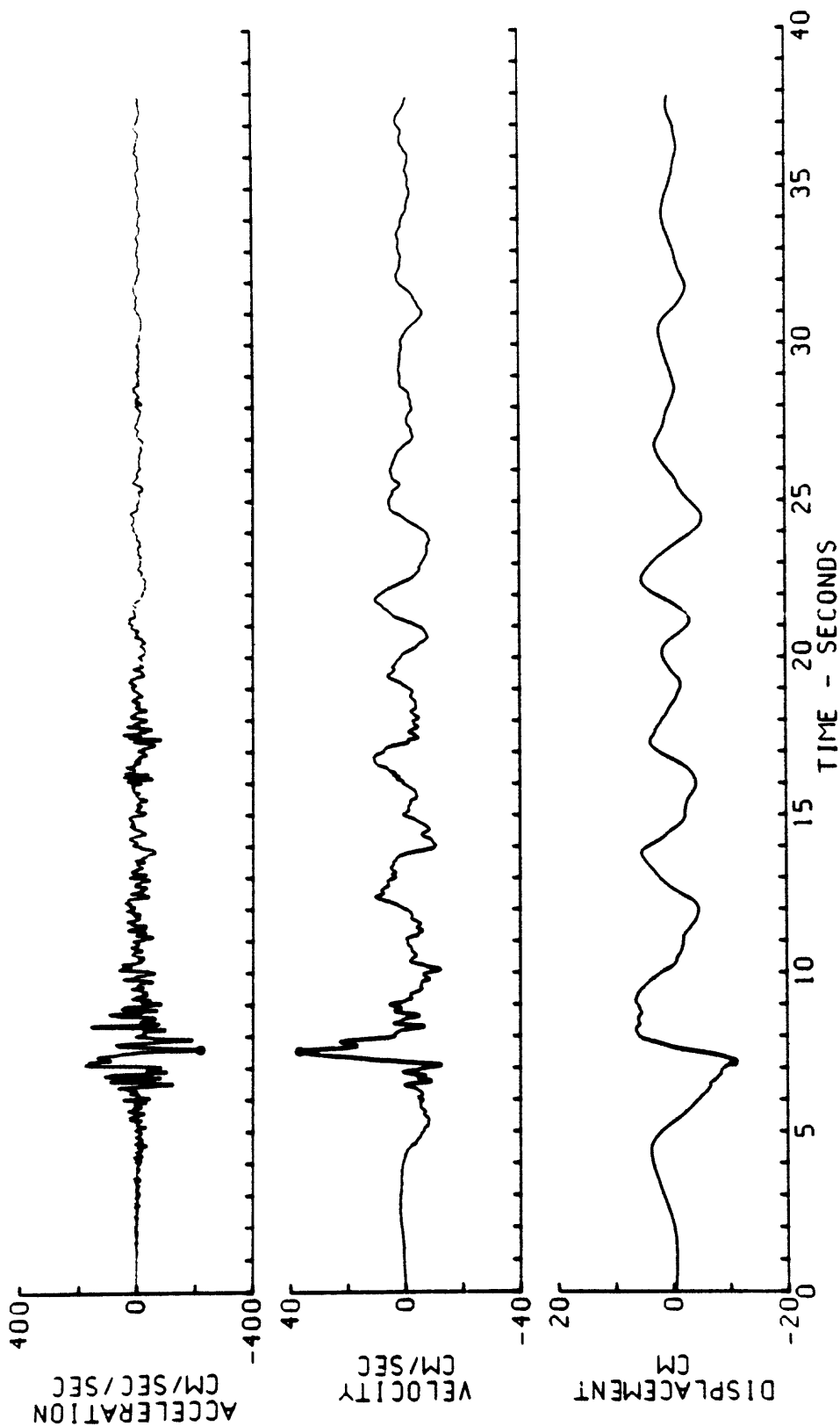
UNCORRECTED ACCELEROGRAM  
 BRAWLEY, BRAWLEY AIRPORT, 10/15/79, 2317UTC  
 THE 3 PEAK VALUES(G) ARE .2221 .1525 .1673



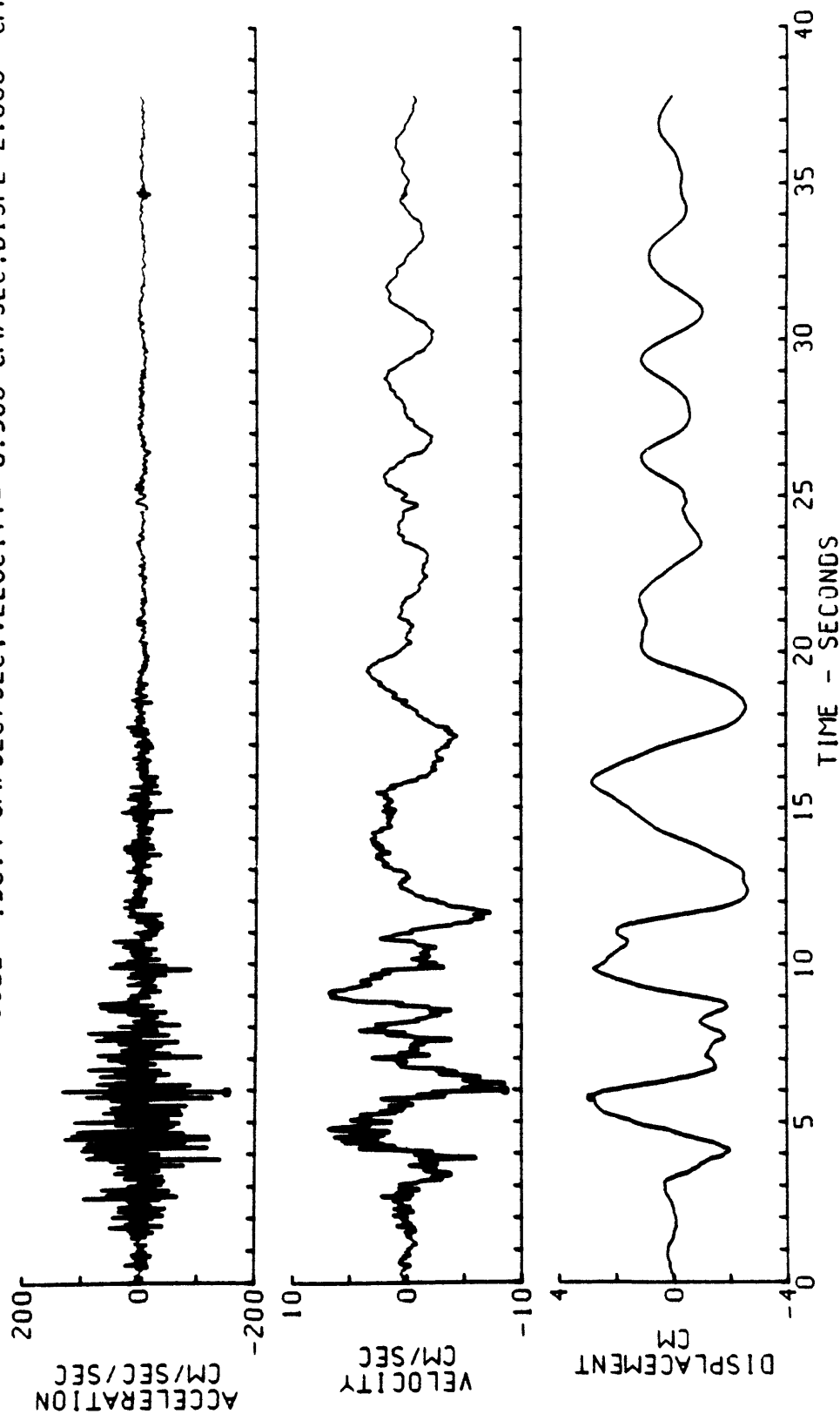
BRAWLEY, BRAWLEY AIRPORT, 10/15/79, 2317UTC



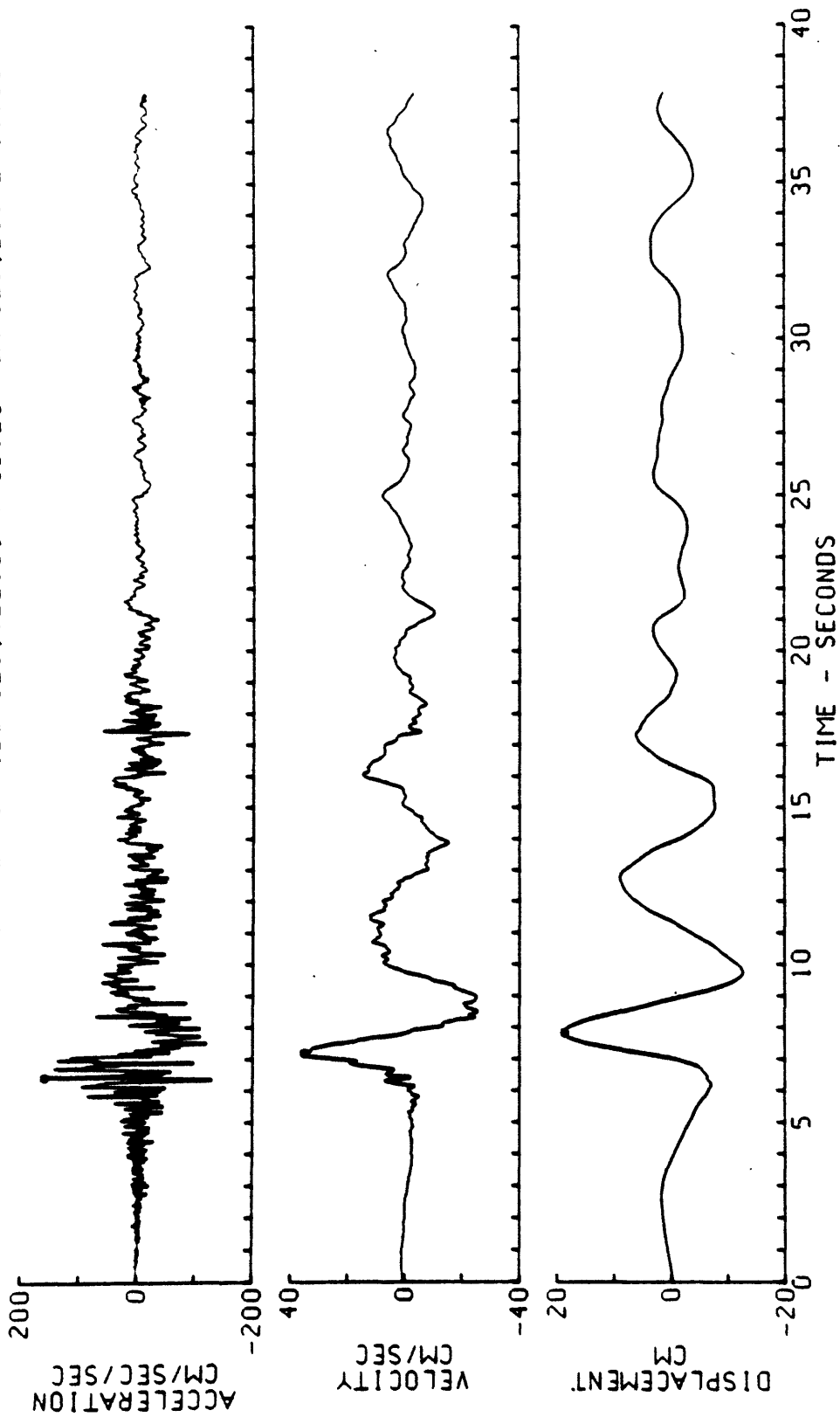
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BRAWLEY MUNICIPAL AIRPORT, BRAWLEY, CALIFORNIA, COMP 315 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-216.5 CM/SEC/SEC, VELOCITY=37.12 CM/SEC, DISPL=-10.64 CM



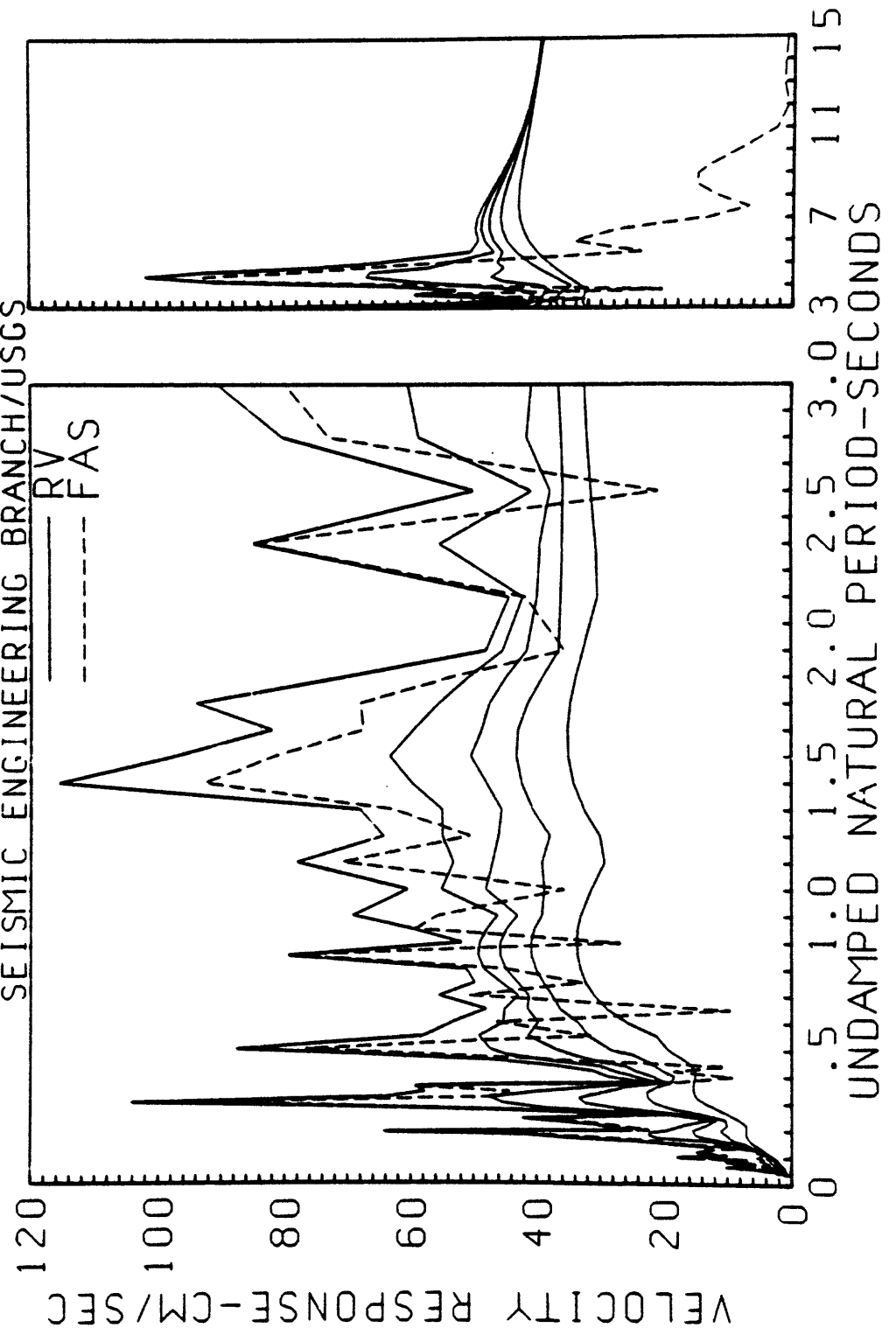
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BRAWLEY MUNICIPAL AIRPORT, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-150.4 CM/SEC/SEC, VELOCITY=-8.560 CM/SEC, DISPL=-2.880 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BRAWLEY MUNICIPAL AIRPORT, EL CENTRO, CALIFORNIA, COMP 225 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=162.2 CM/SEC/SEC, VELOCITY=35.29 CM/SEC, DISPL=18.66 CM



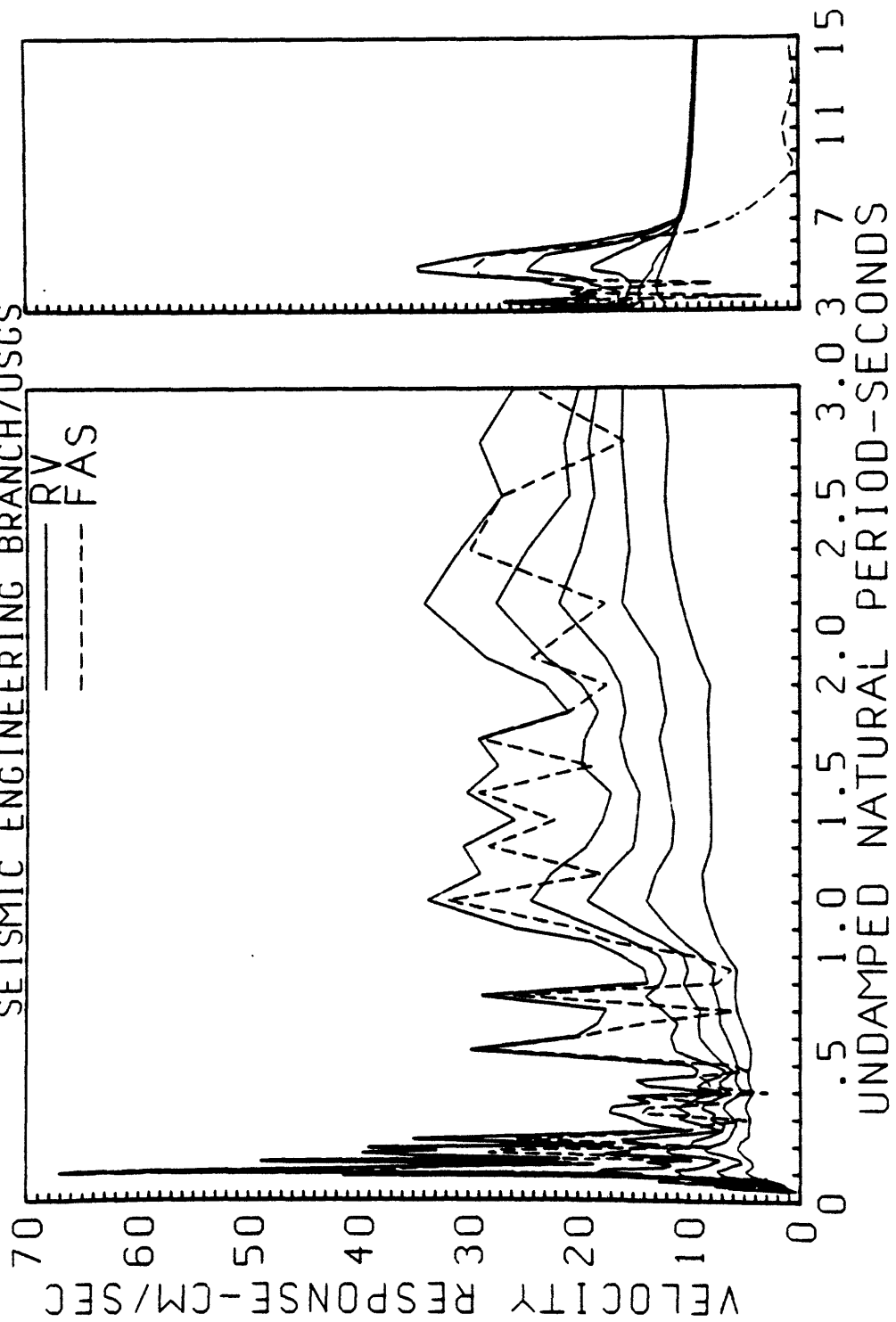
RELATIVE VELOCITY RESPONSE SPECTRUM  
 BRAWLEY AIRPORT, 10/15/79, 315 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



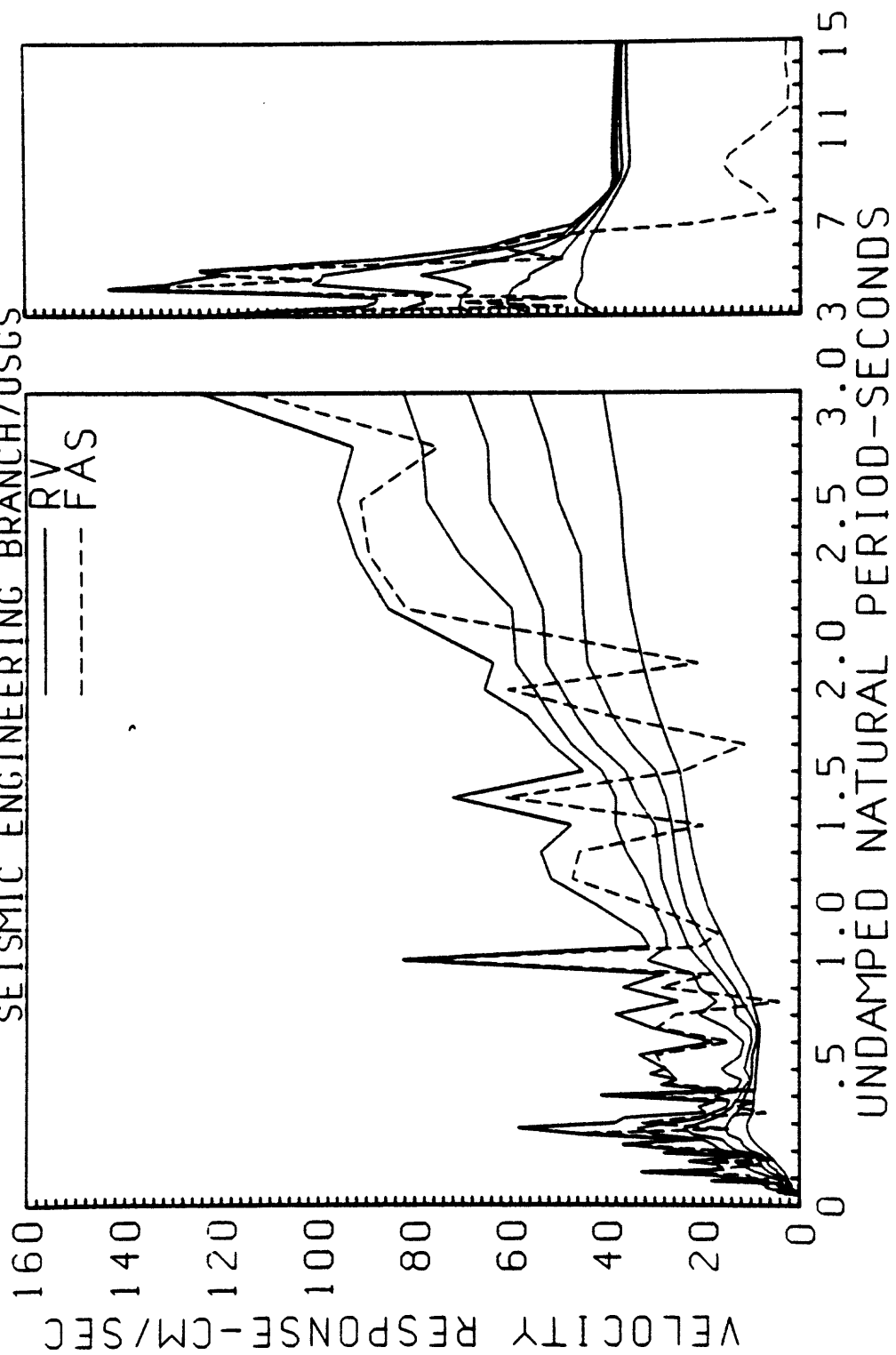


# RELATIVE VELOCITY RESPONSE SPECTRUM

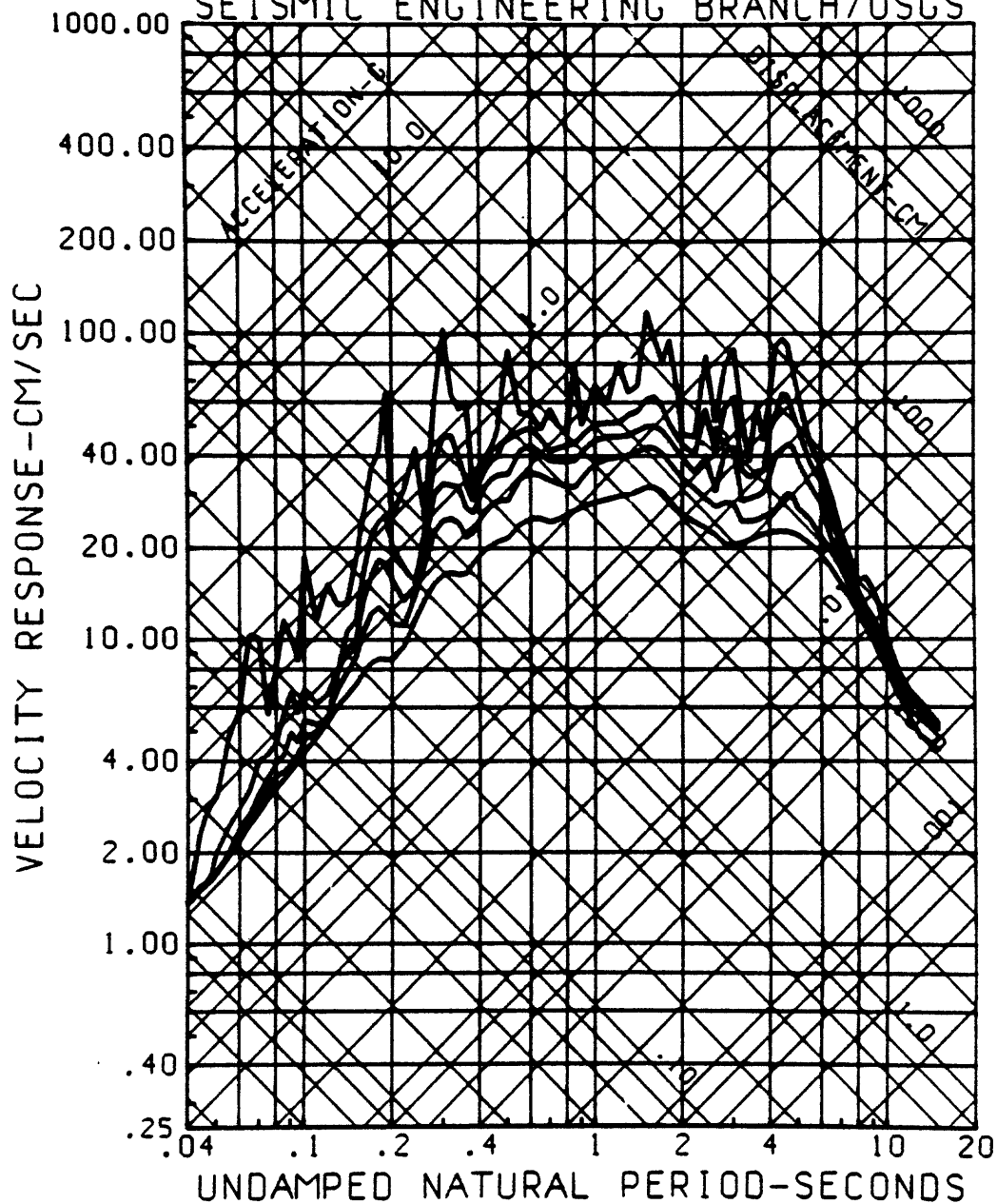
BRAWLEY, BRAWLEY AIRPORT, 10/15/79, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



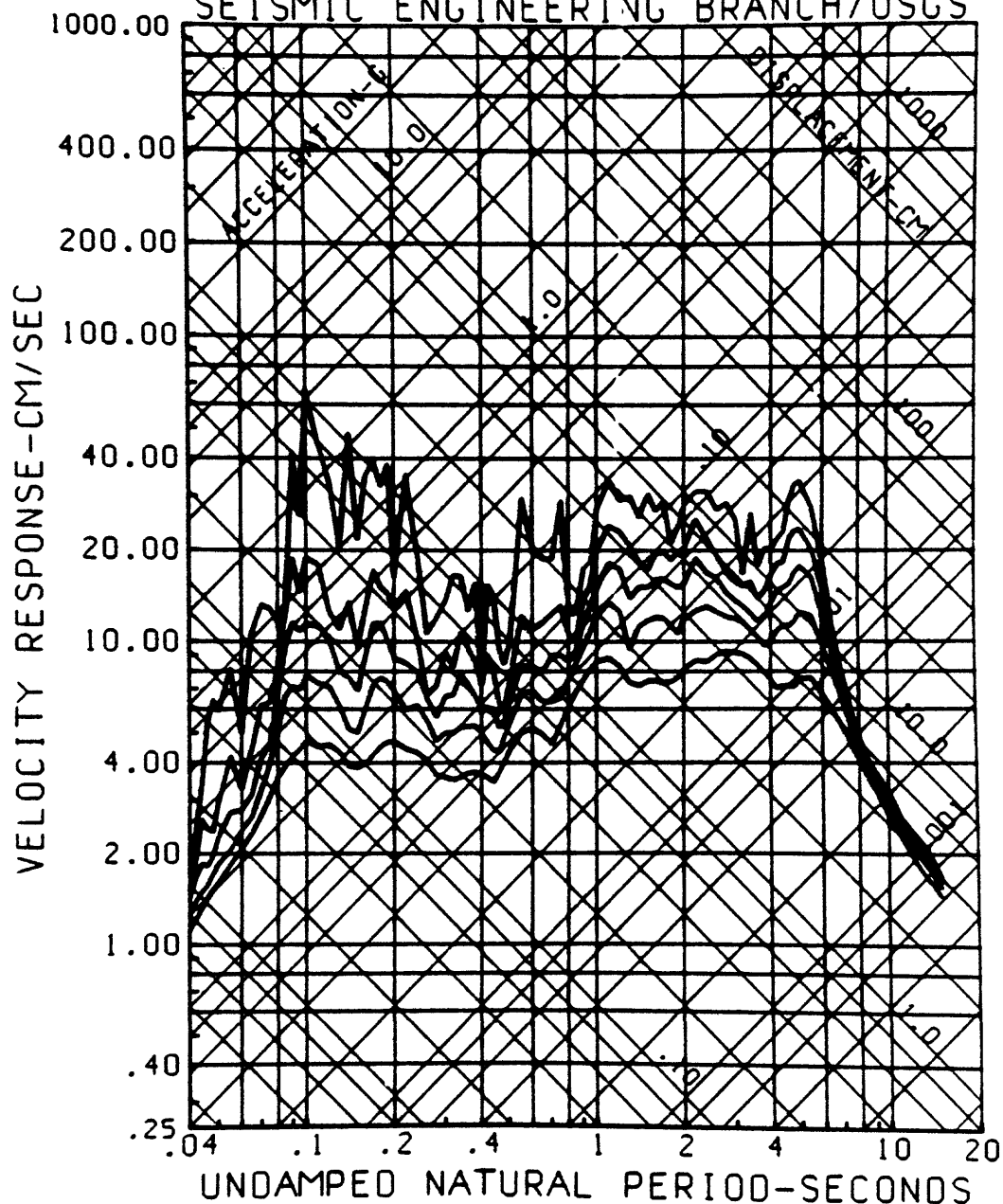
RELATIVE VELOCITY RESPONSE SPECTRUM  
 BRAWLEY AIRPORT, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030-- .170 TO 23.00--25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



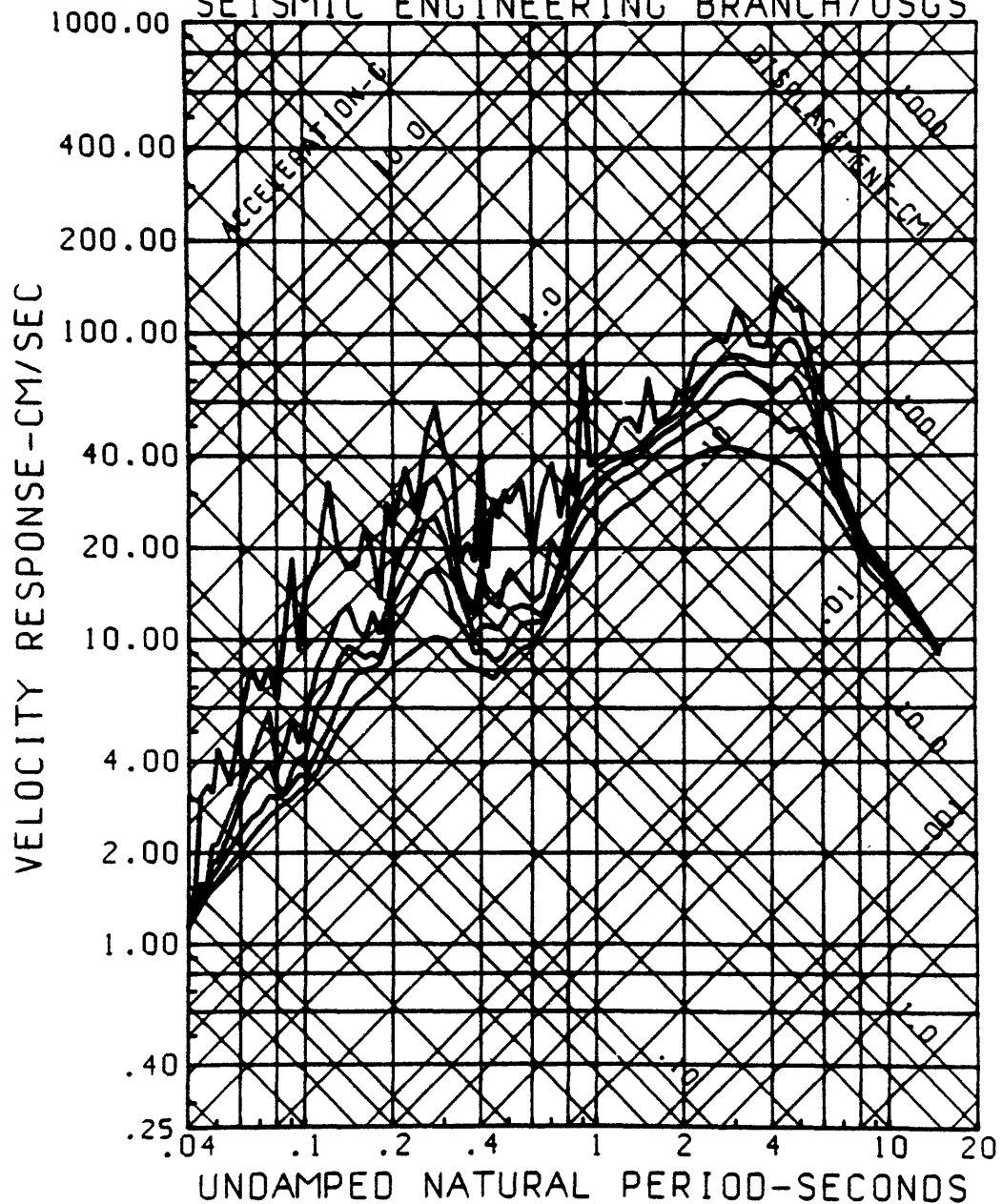
RESPONSE SPECTRA  
 BRAWLEY, BRAWLEY AIRPORT, 10/15/79, 315 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USCS



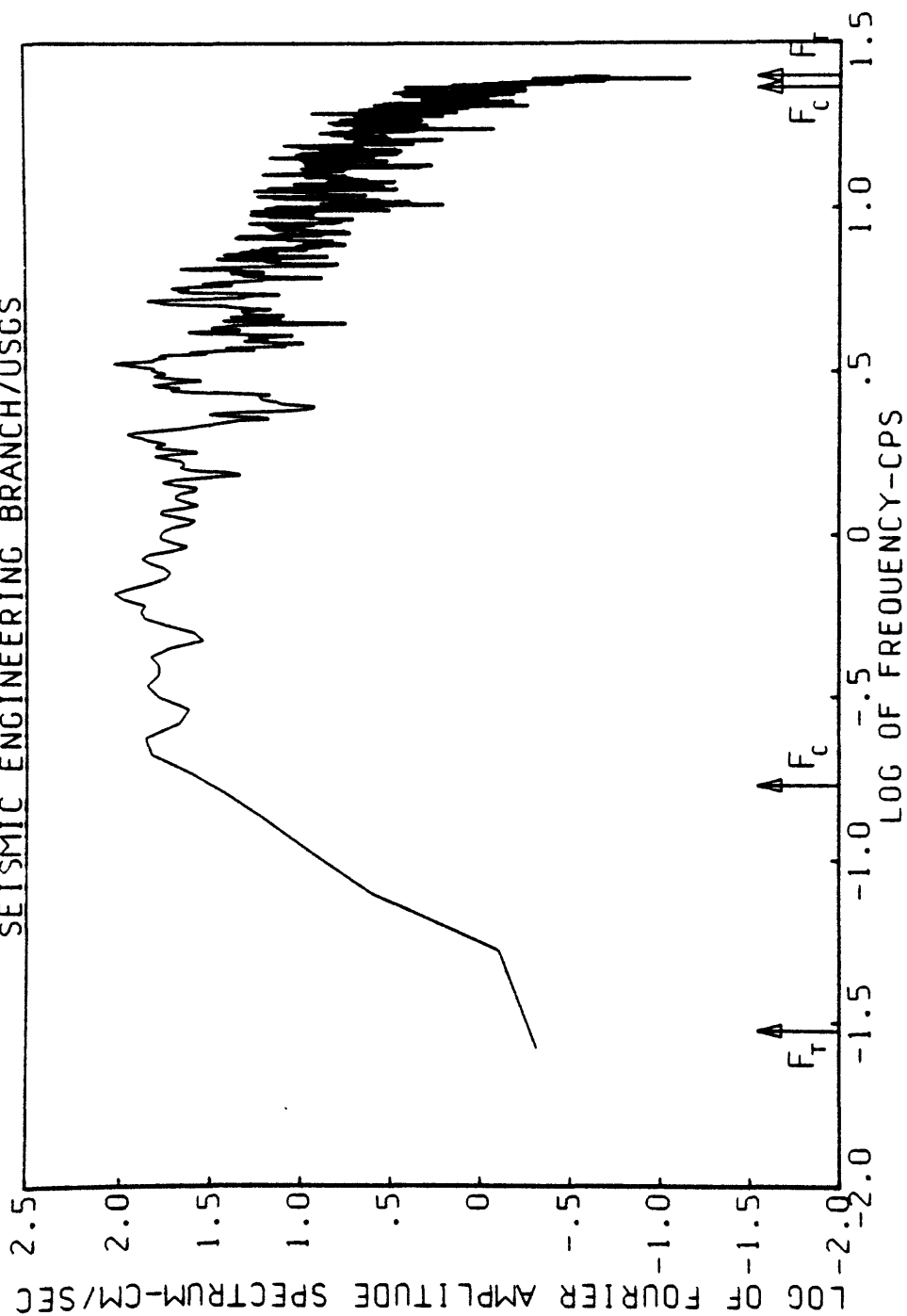
RESPONSE SPECTRA  
 BRAWLEY, BRAWLEY AIRPORT, 10/15/79, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



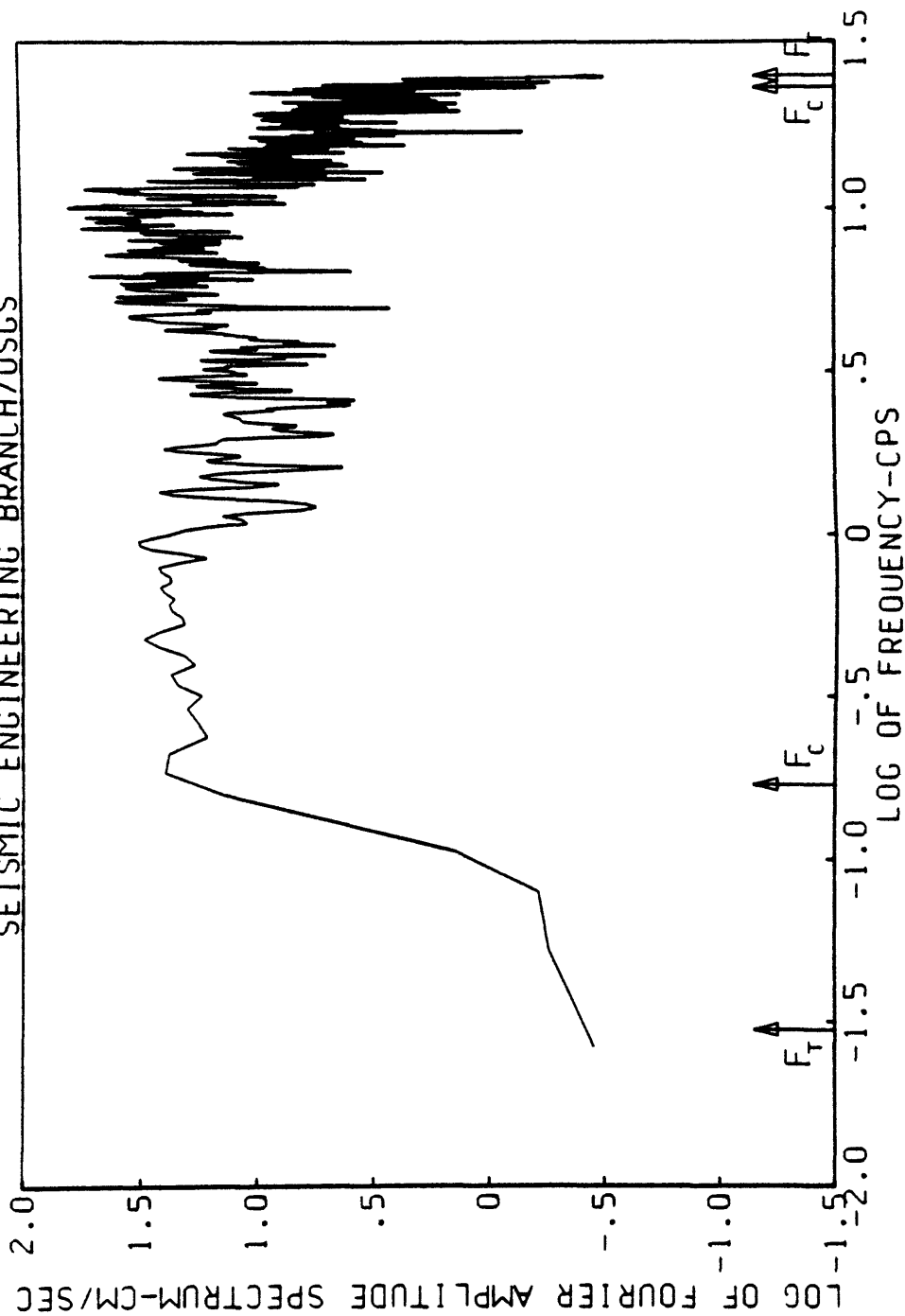
RESPONSE SPECTRA  
 BRAWLEY, BRAWLEY AIRPORT, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



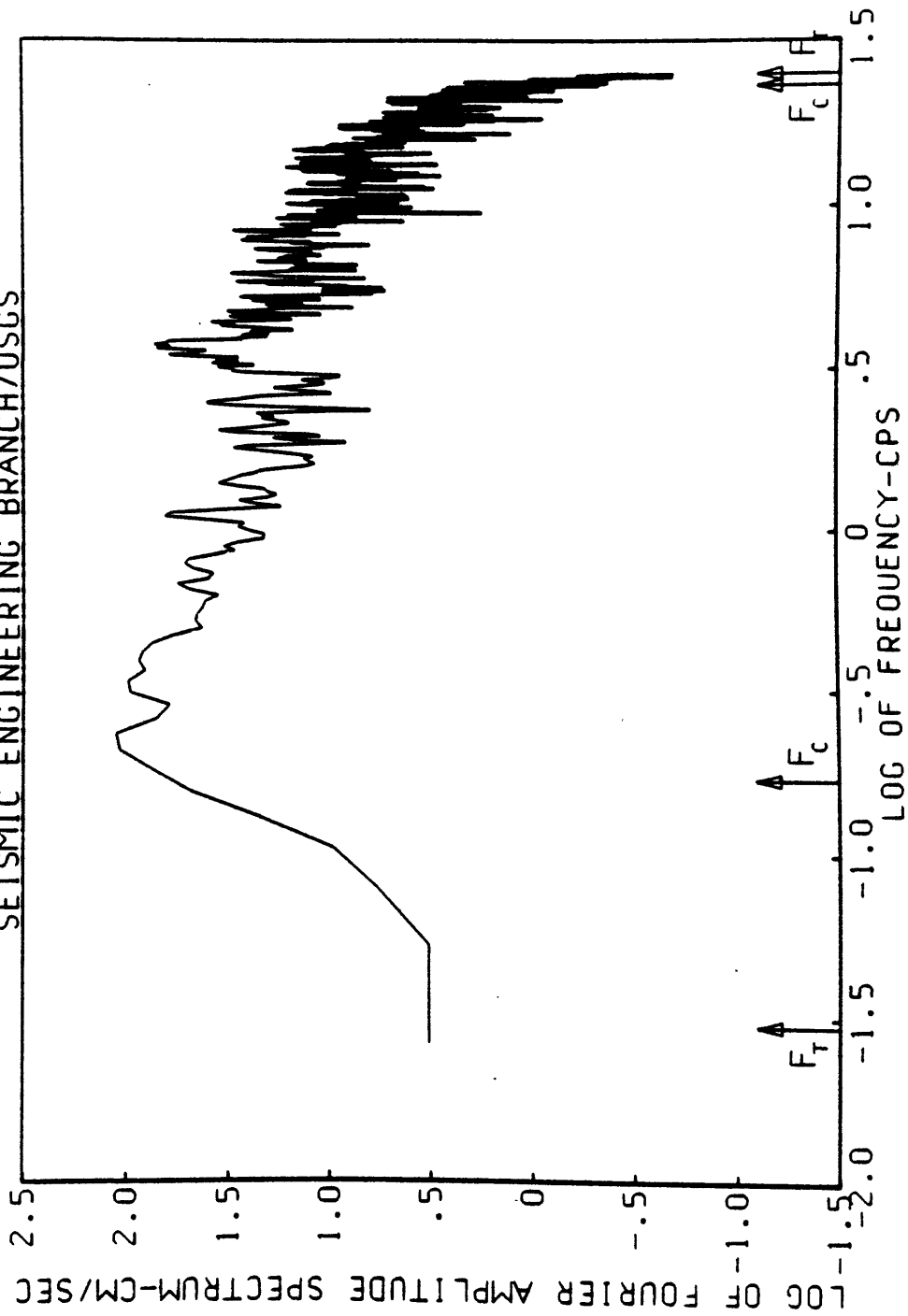
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BRAWLEY MUNICIPAL AIRPORT, BRAWLEY, CALIFORNIA, COMP 315 DEG  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317 UTC  
 BRAWLEY MUNICIPAL AIRPORT, EL CENTRO, CALIFORNIA. COMP UP  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

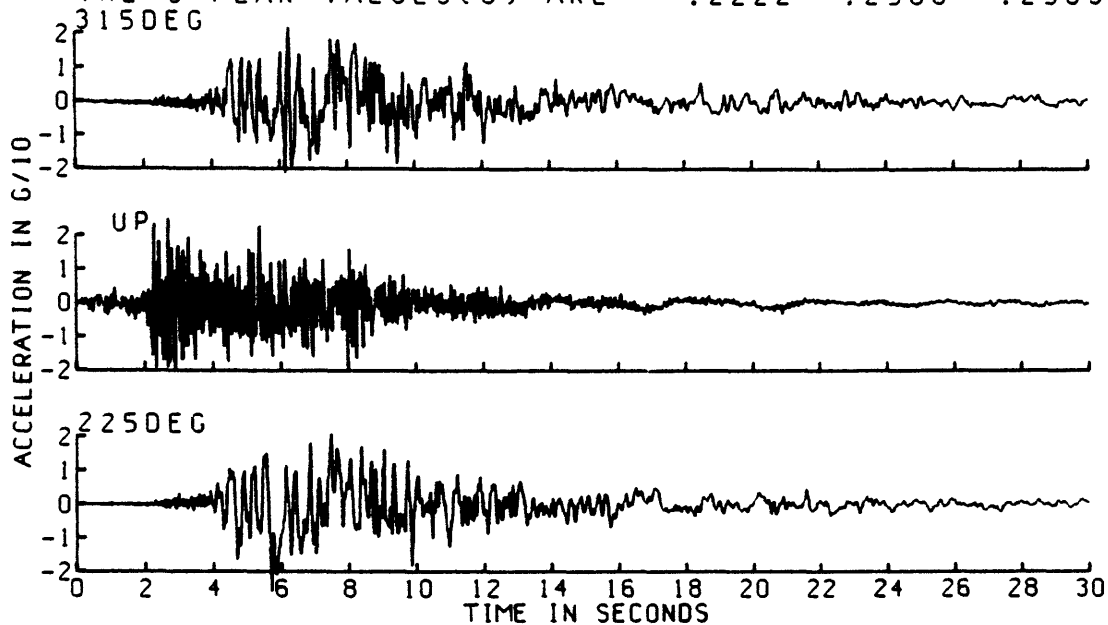


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BRAWLEY MUNICIPAL AIRPORT, EL CENTRO, CALIFORNIA, COMP 225 DEG  
 BAND PASSED FROM .030-- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

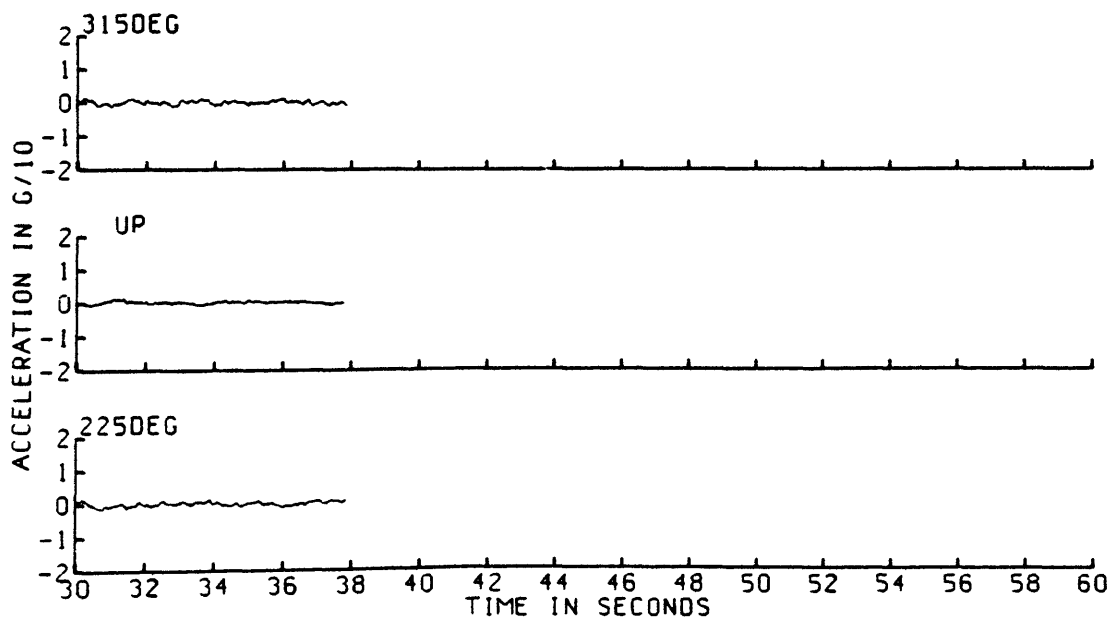




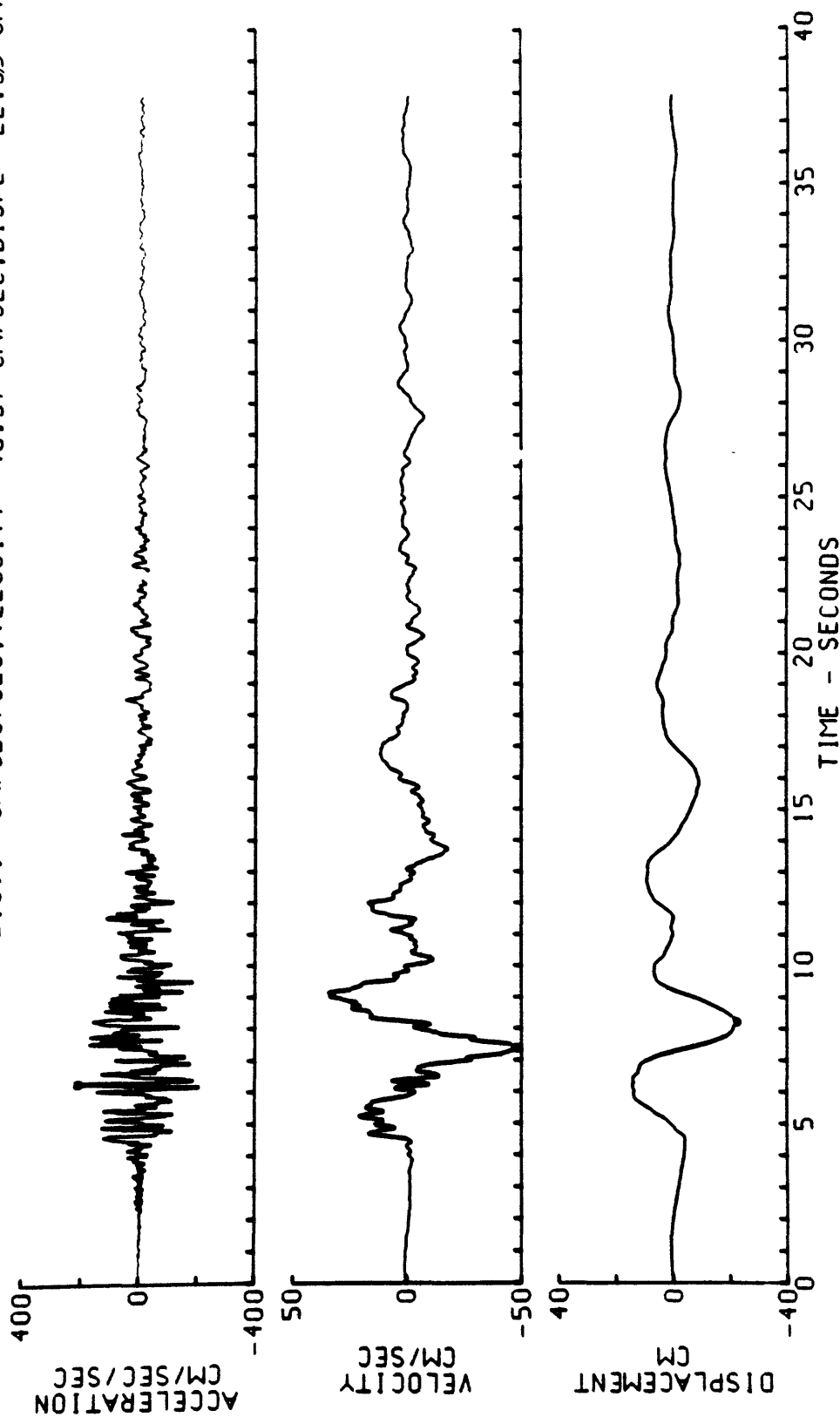
UNCORRECTED ACCELEROGRAM  
 HOLTVILLE.HOLTVILLE POST OFFICE.10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .2222 .2500 .2589



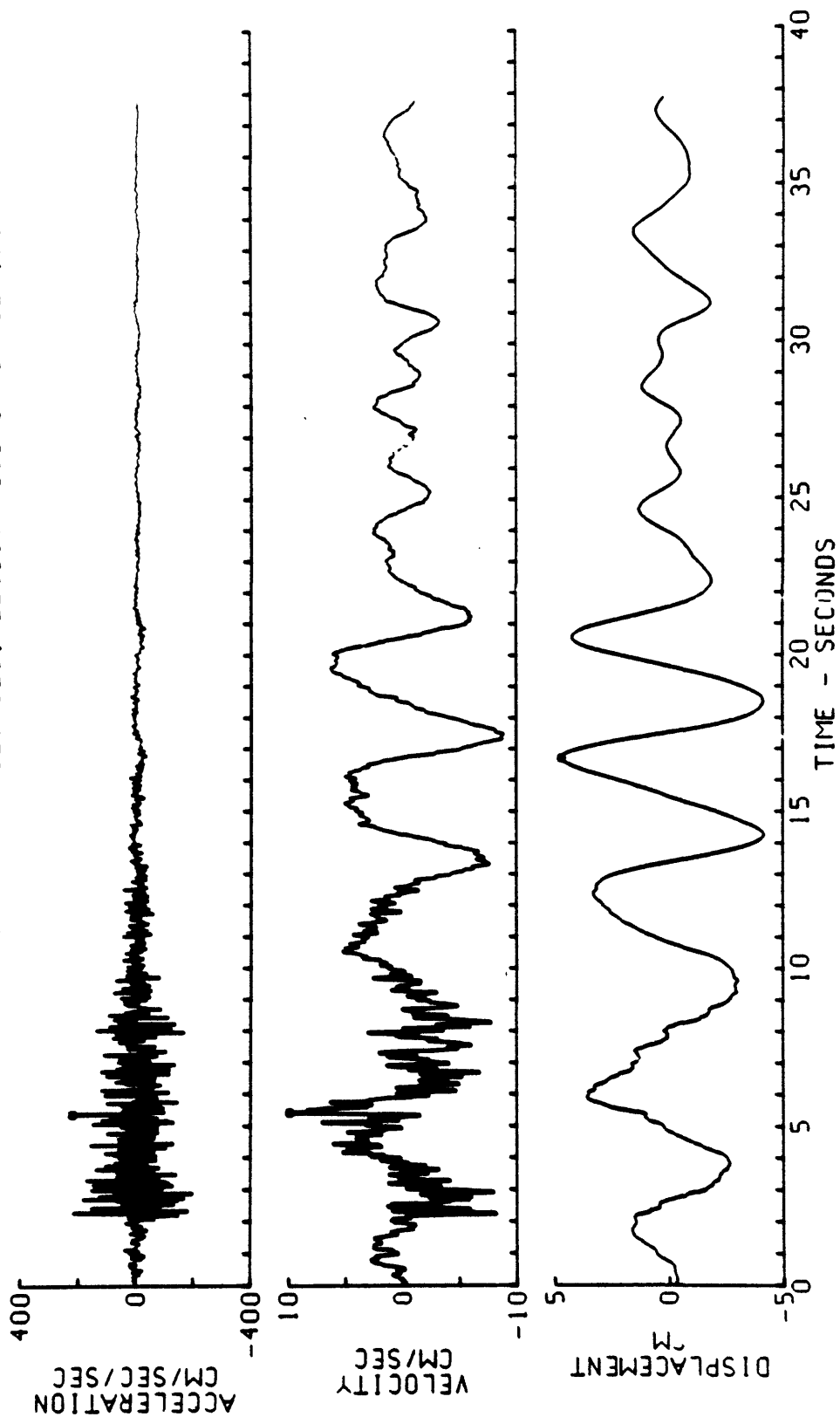
HOLTVILLE.HOLTVILLE POST OFFICE.10/15/79.2317UTC



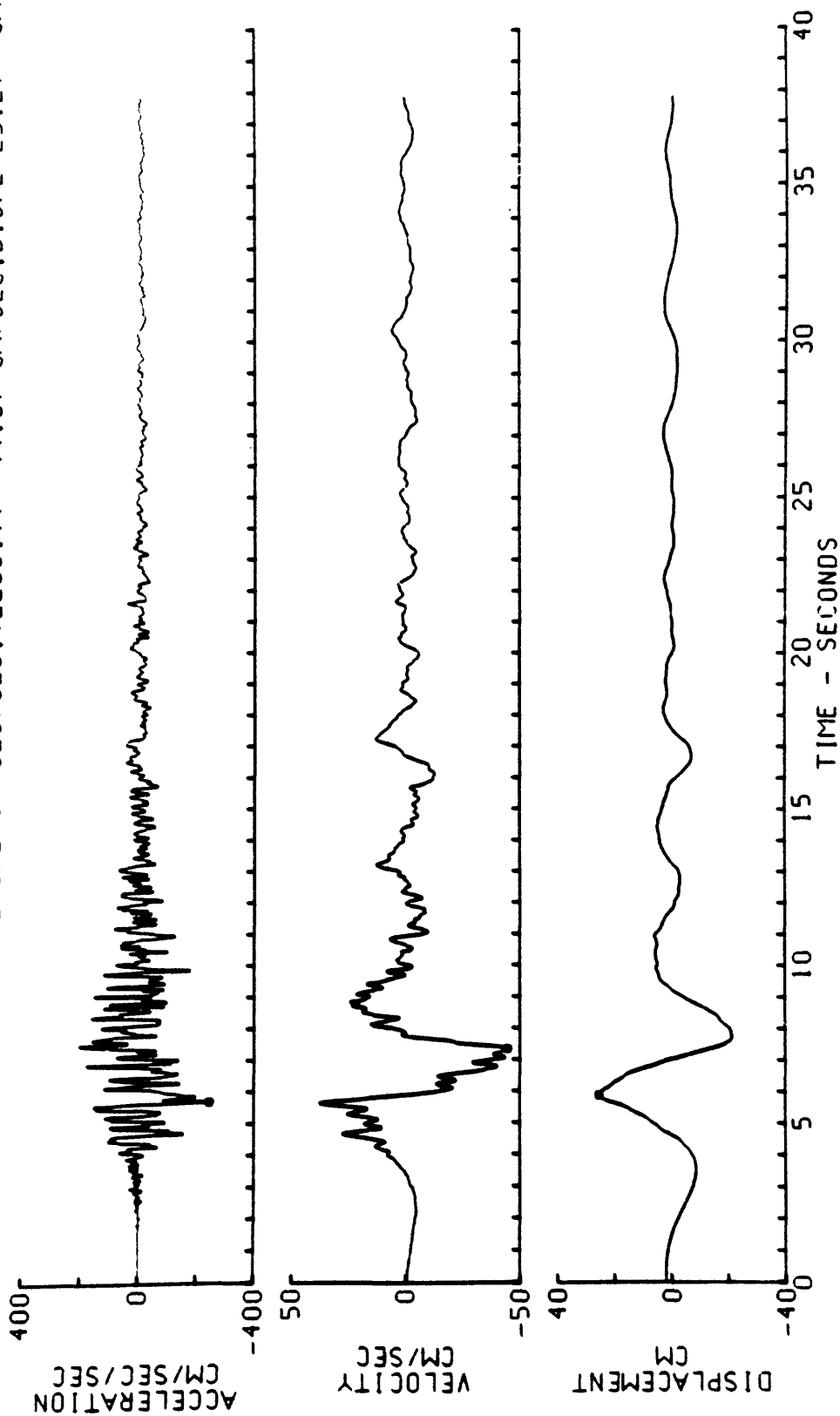
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP 315 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=213.1 CM/SEC/SEC, VELOCITY=-48.37 CM/SEC, DISPL=-22.35 CM



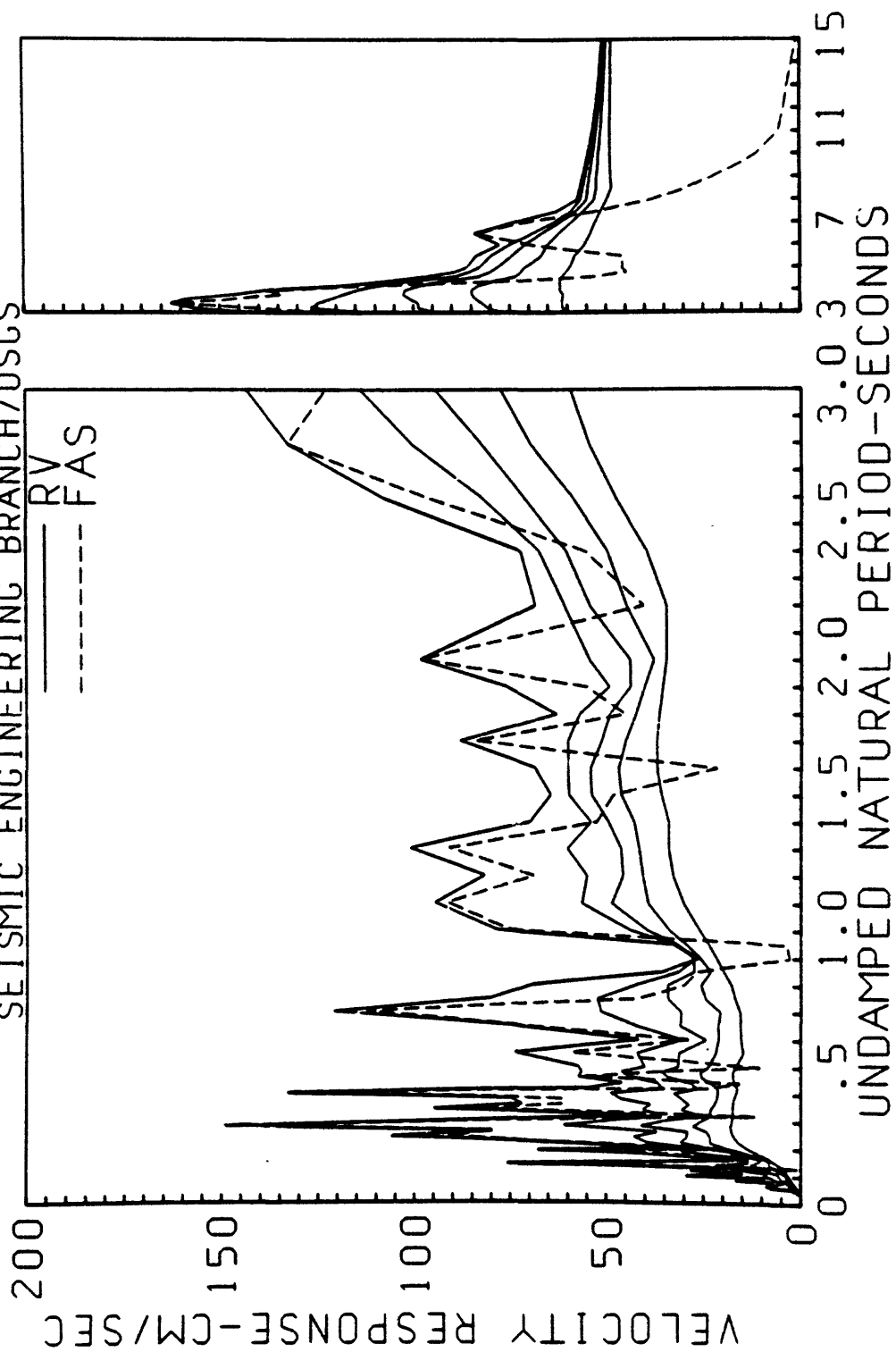
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=223.7 CM/SEC/SEC, VELOCITY=9.920 CM/SEC, DISPL=4.670 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP 225 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-246.2 CM/SEC/SEC, VELOCITY=-44.67 CM/SEC, DISPL=25.27 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 HOLTVILLE POST OFFICE, 10/15/79, 315 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



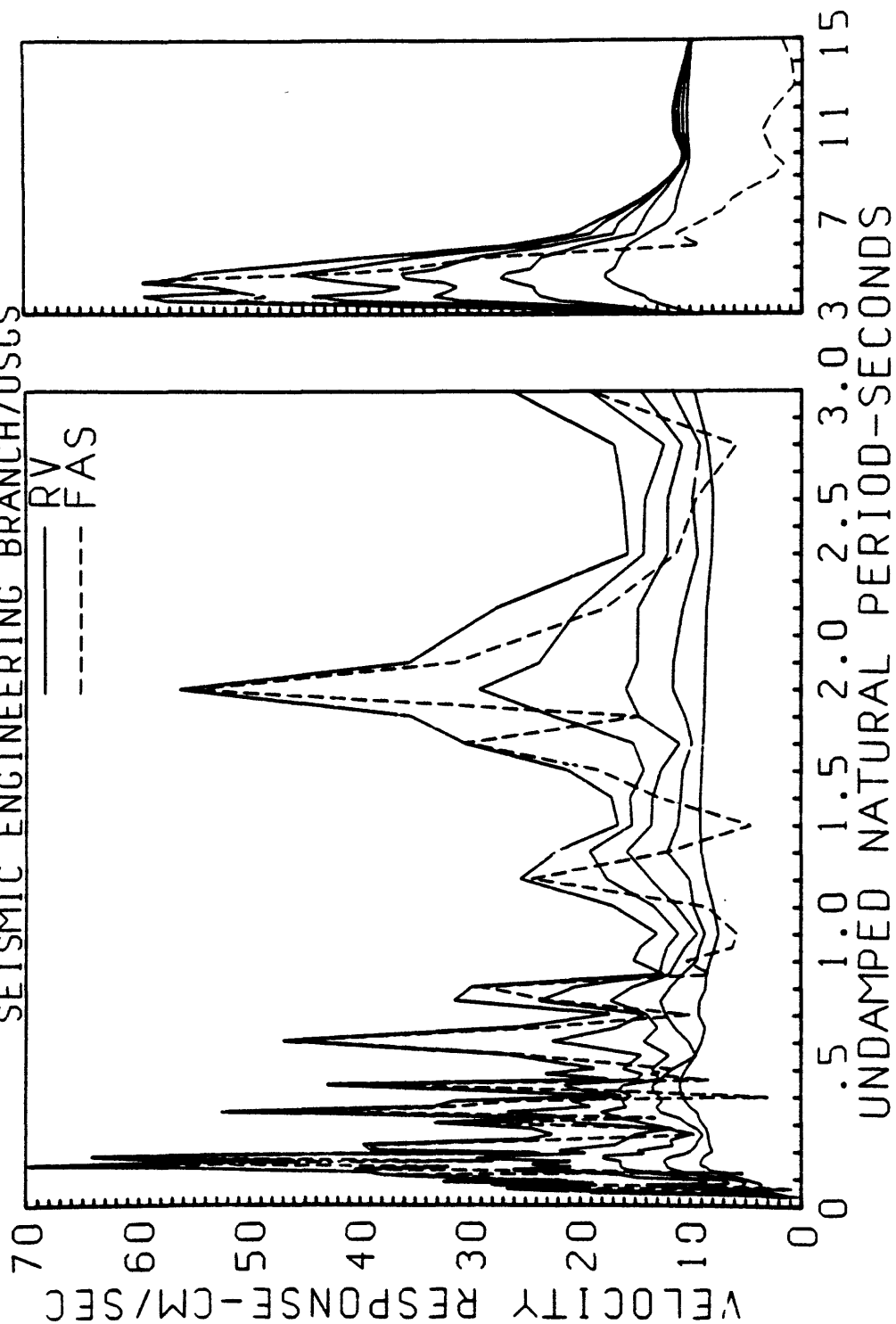
# RELATIVE VELOCITY RESPONSE SPECTRUM

HOLTVILLE POST OFFICE, 10/15/79, UP

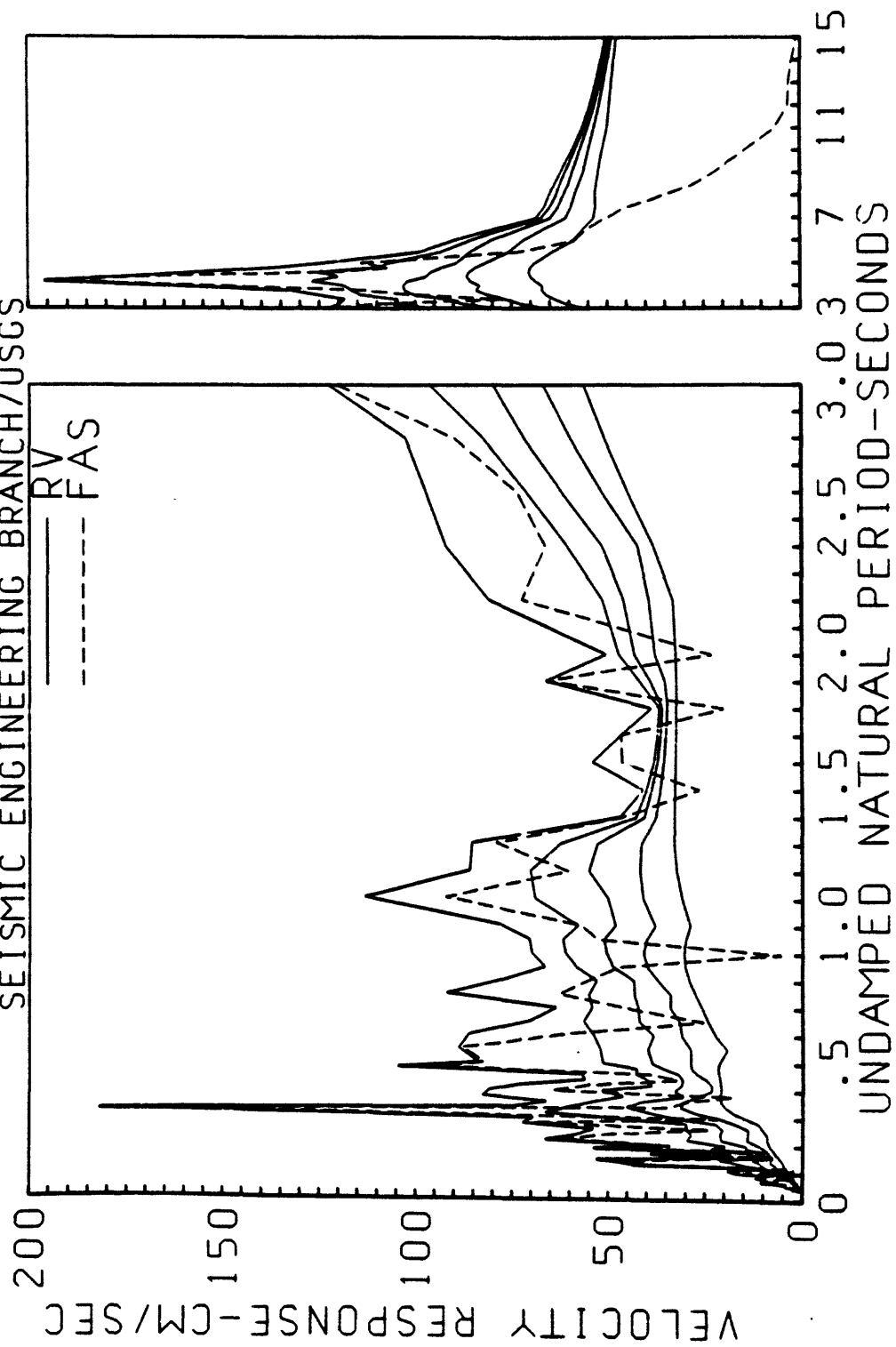
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

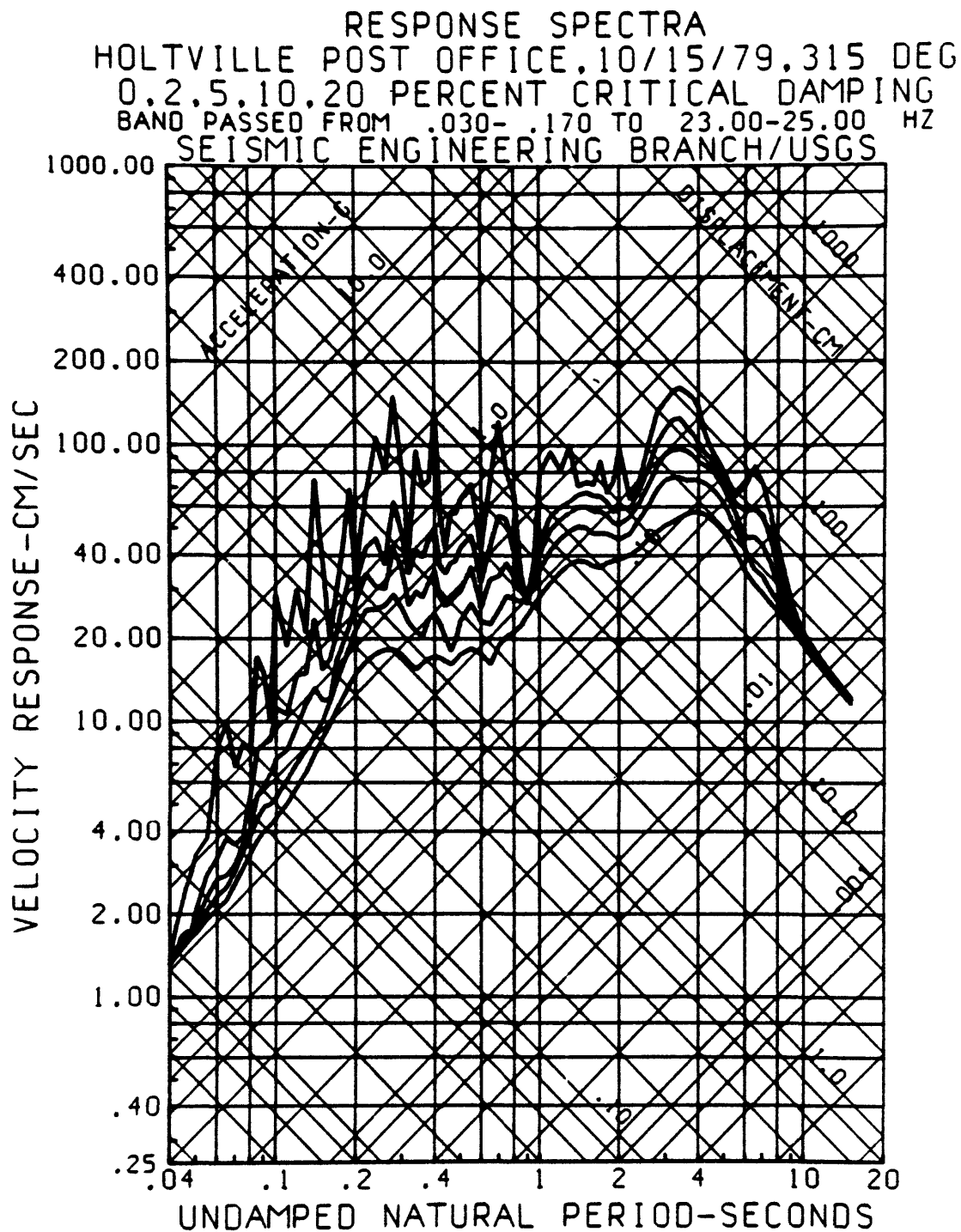
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



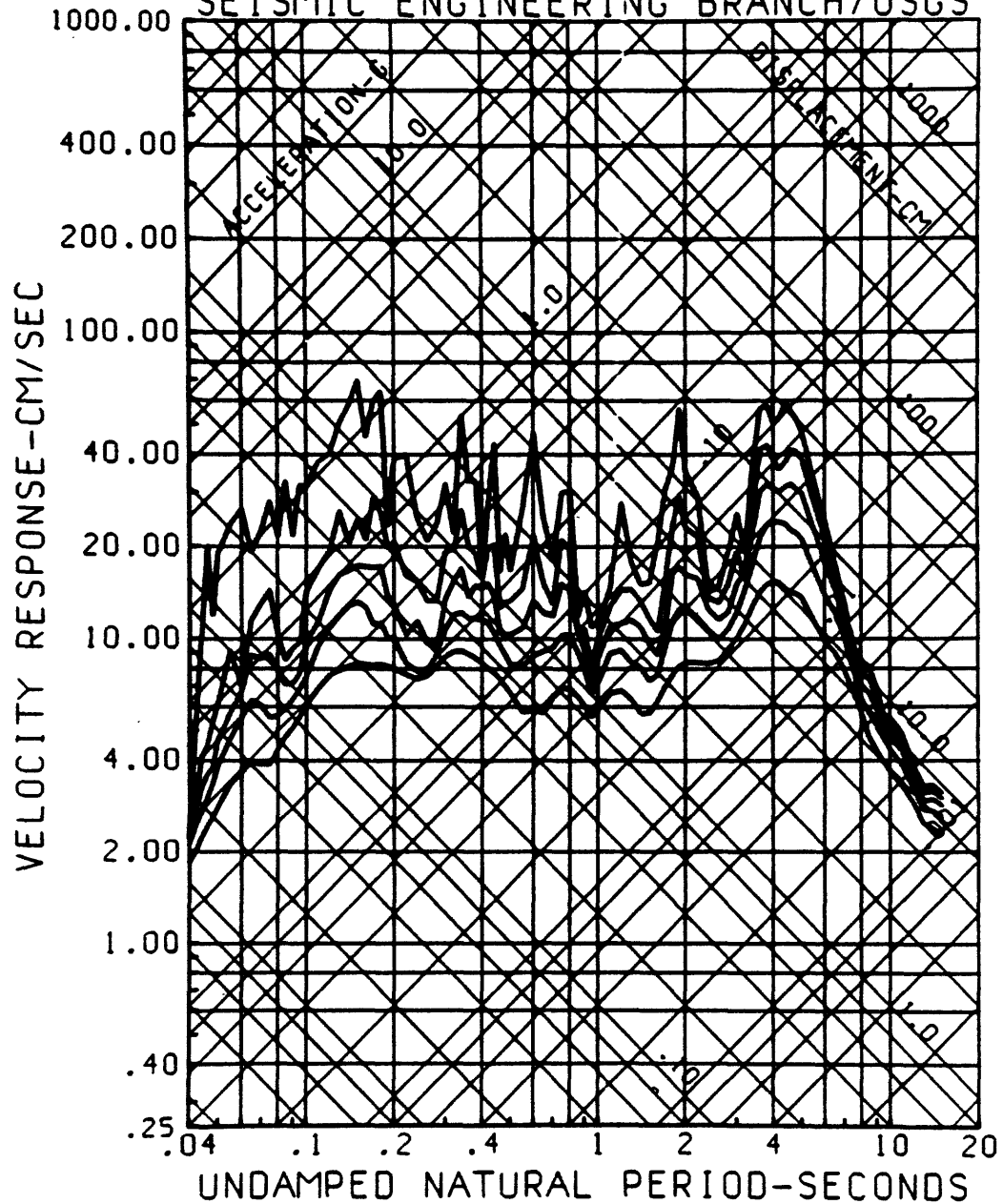
RELATIVE VELOCITY RESPONSE SPECTRUM  
 HOLTVILLE POST OFFICE, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



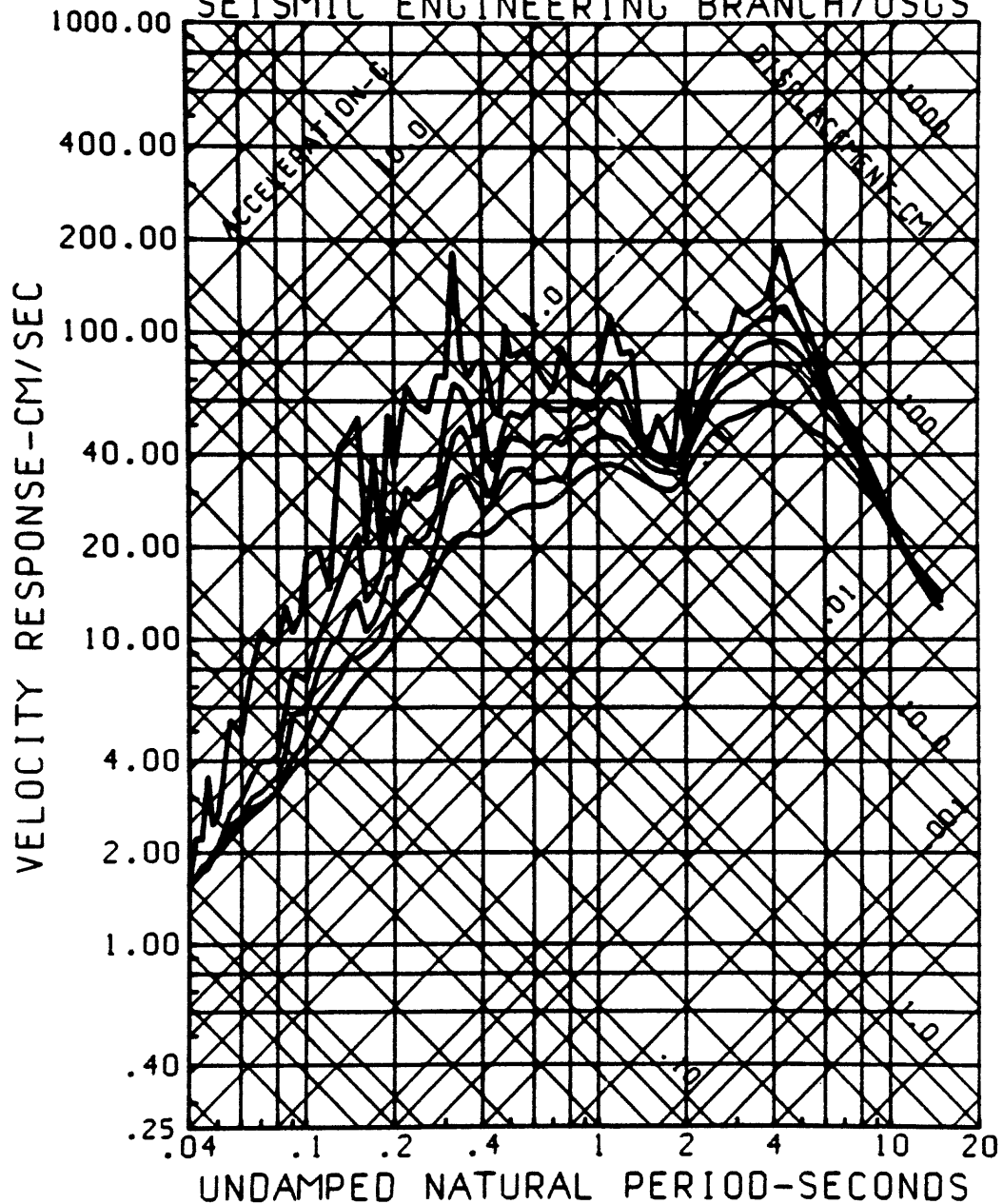




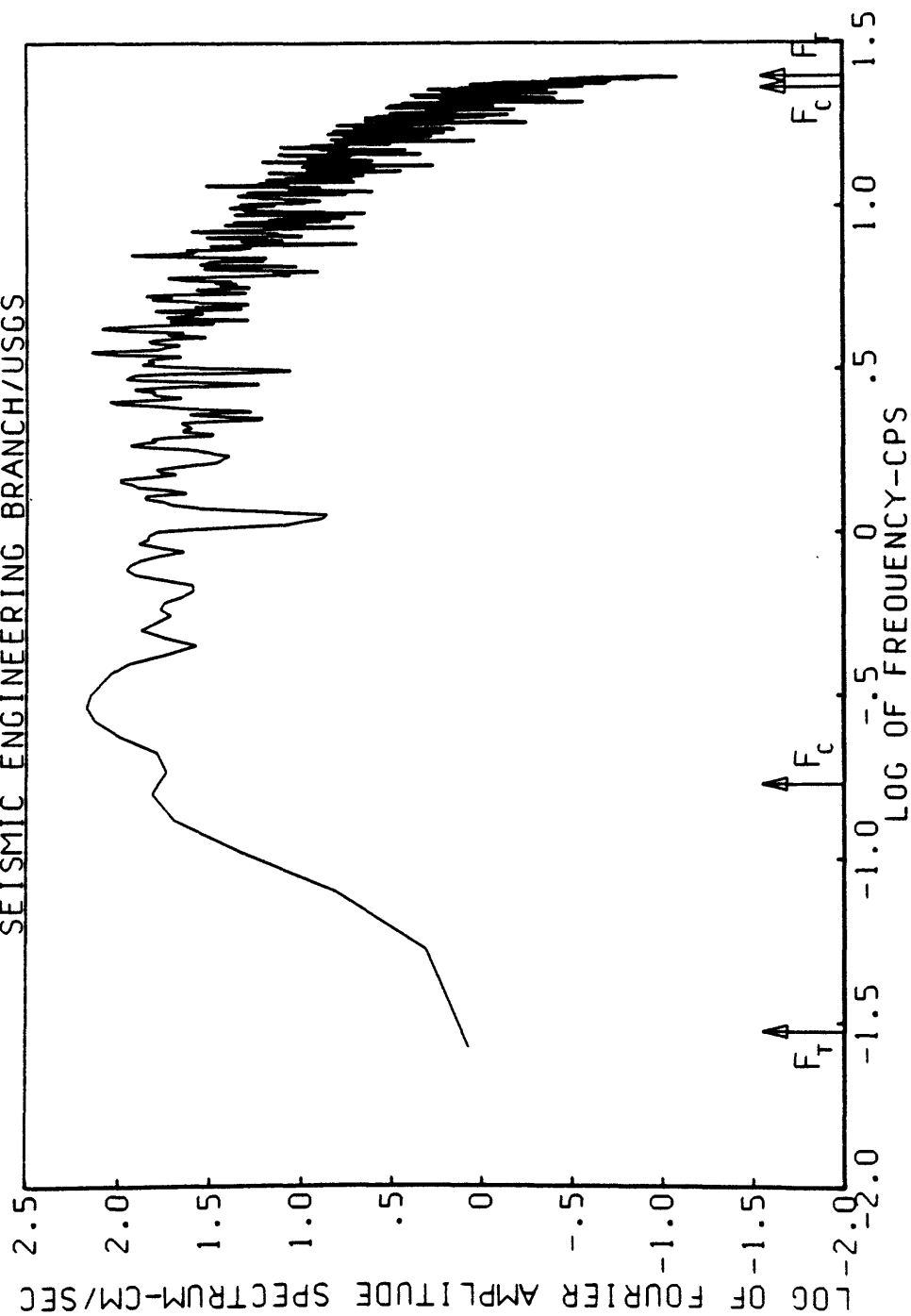
RESPONSE SPECTRA  
 HOLTVILLE POST OFFICE, 10/15/79, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



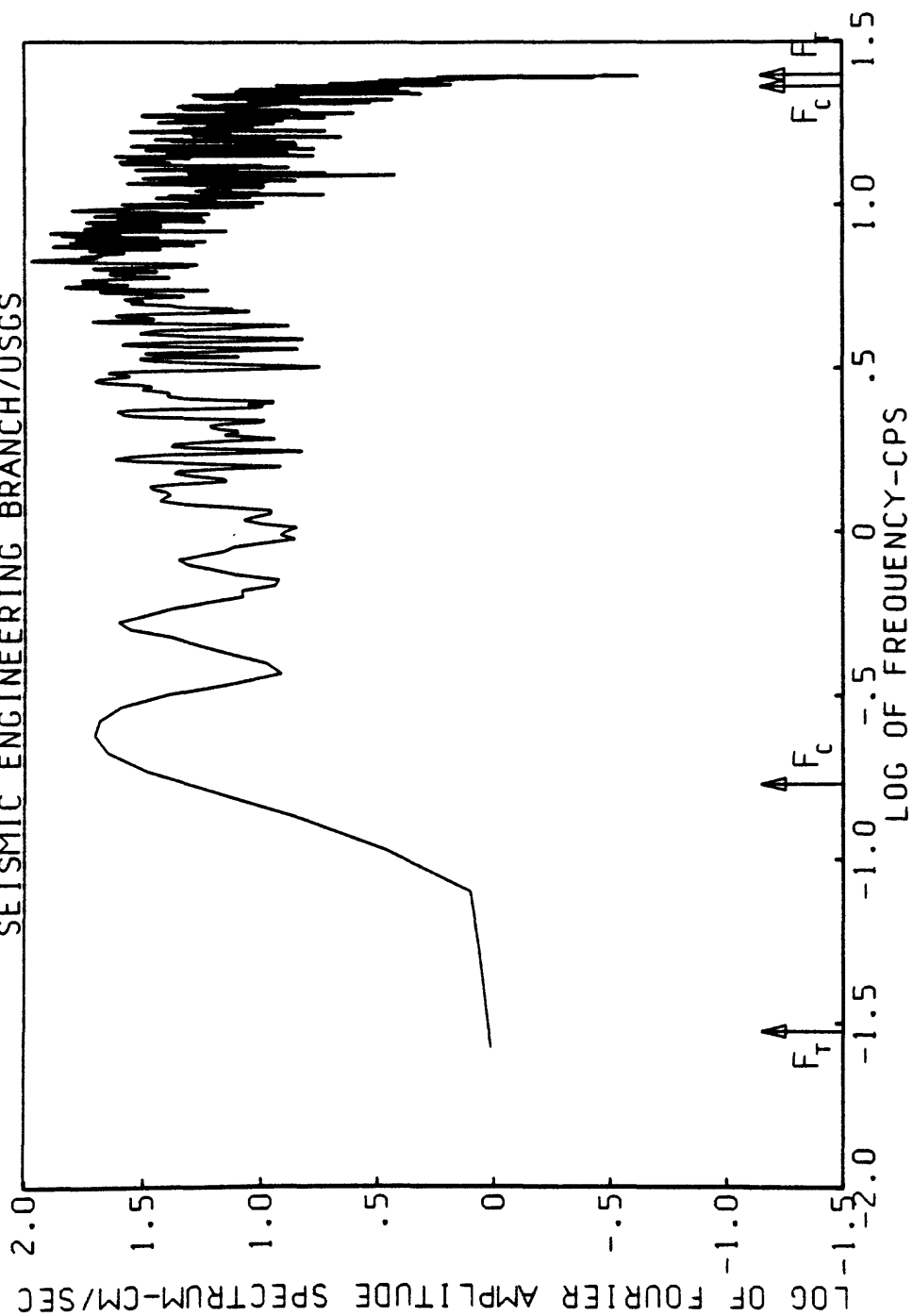
RESPONSE SPECTRA  
 HOLTVILLE POST OFFICE, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



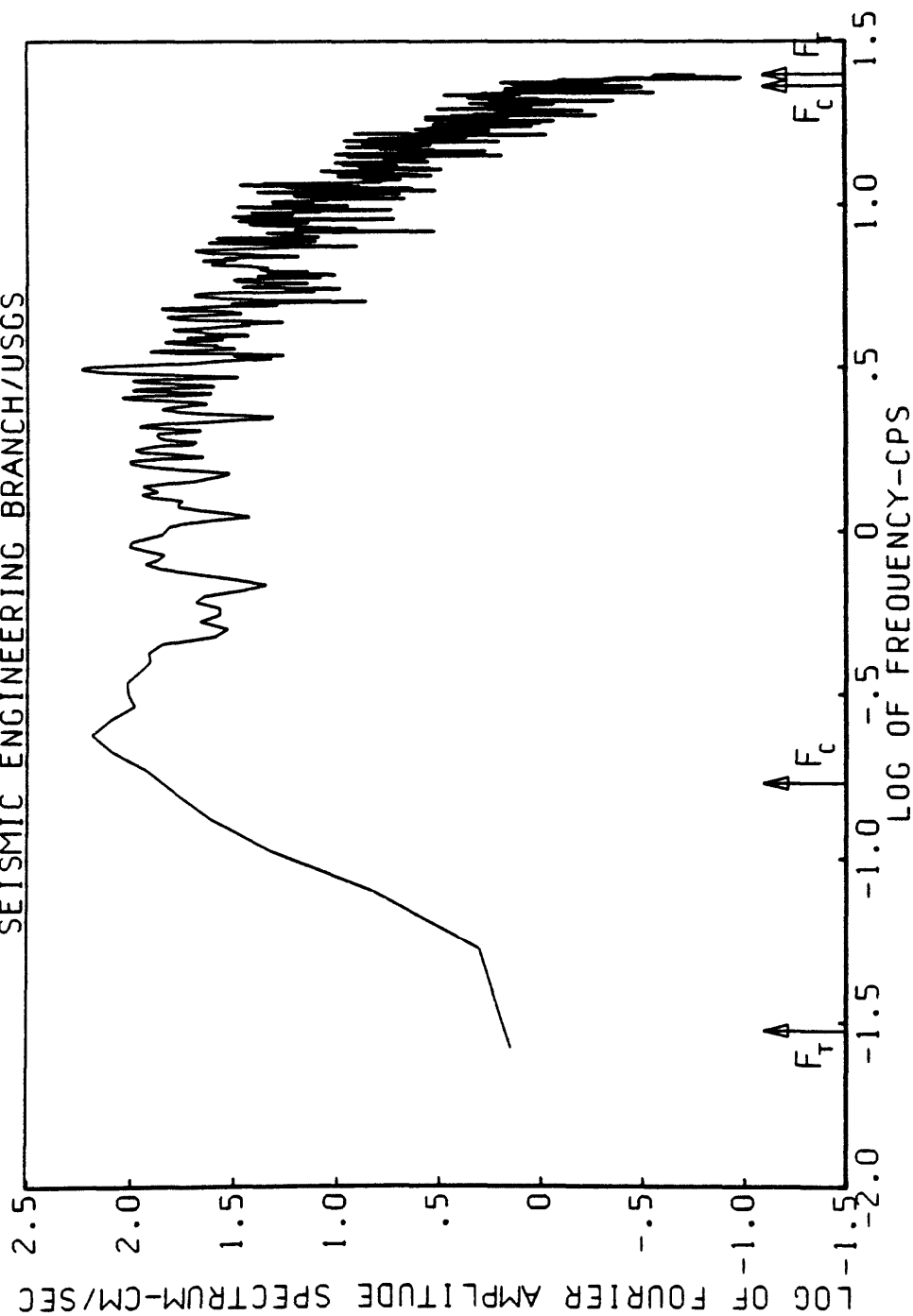
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP 315 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



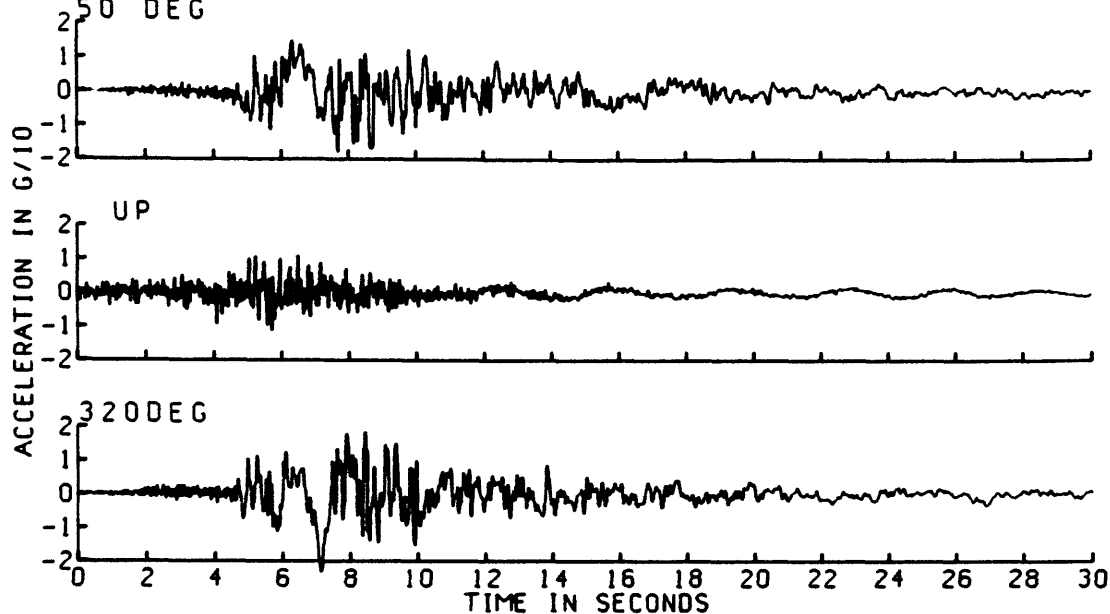
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



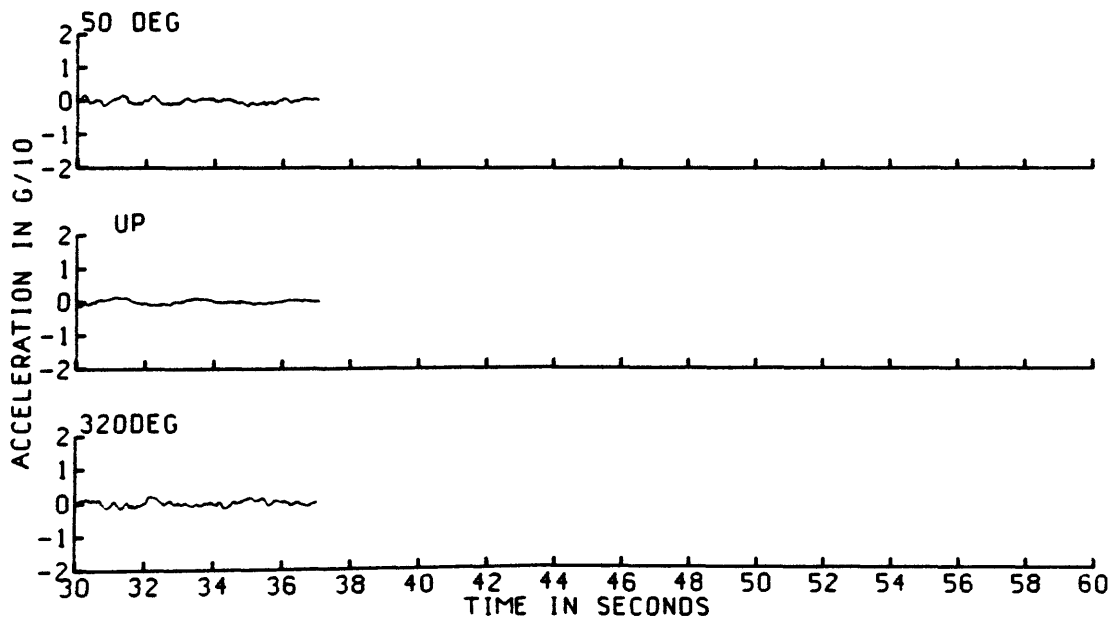
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 HOLTVILLE POST OFFICE, HOLTVILLE, CALIFORNIA, COMP 225 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



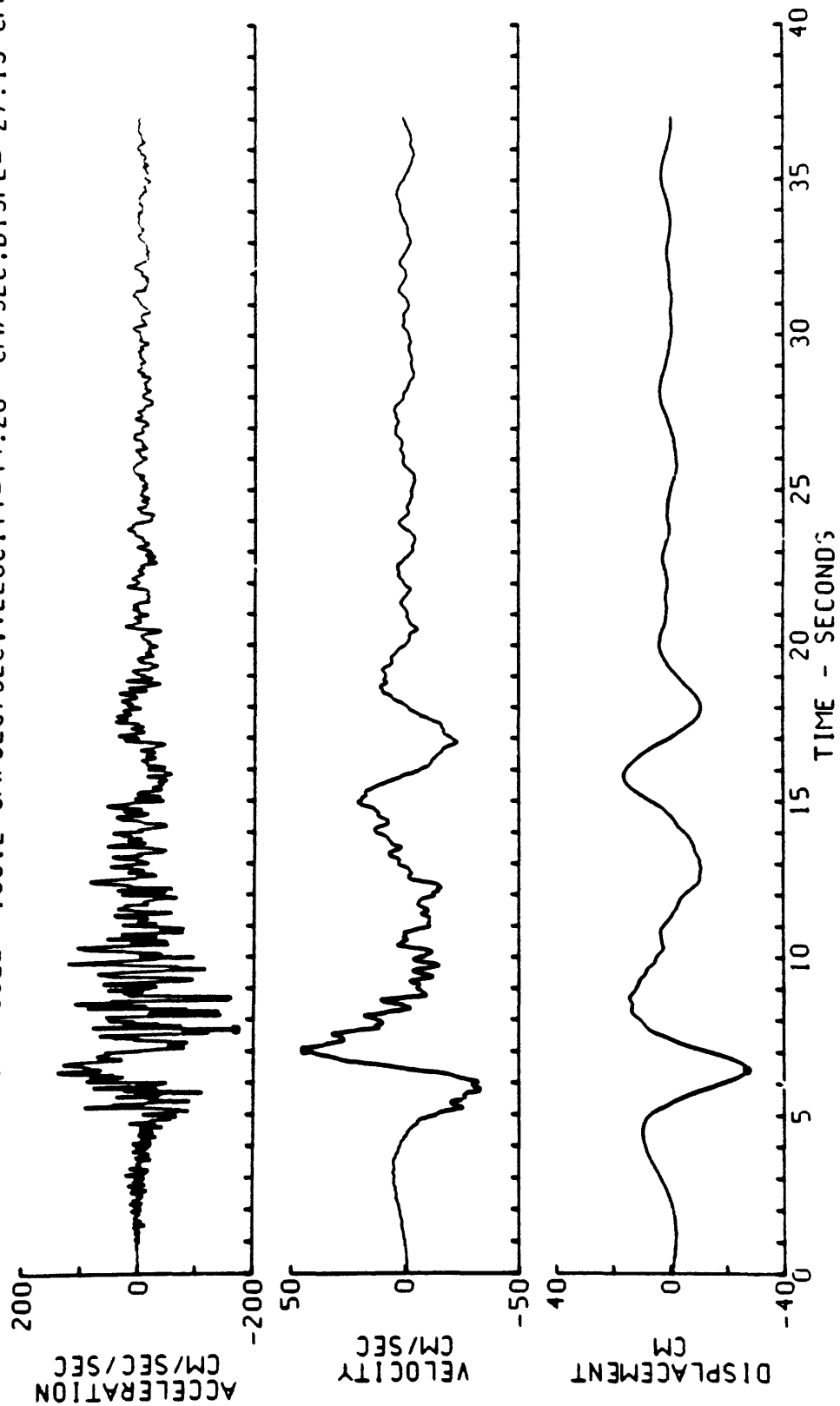
UNCORRECTED ACCELEROGRAM  
 EL CENTRO, ARRAY 10, COMMUNITY HOSP., 10/15/79, 2317UTC  
 THE 3 PEAK VALUES(G) ARE .1776 .1113 .2314  
 50 DEG



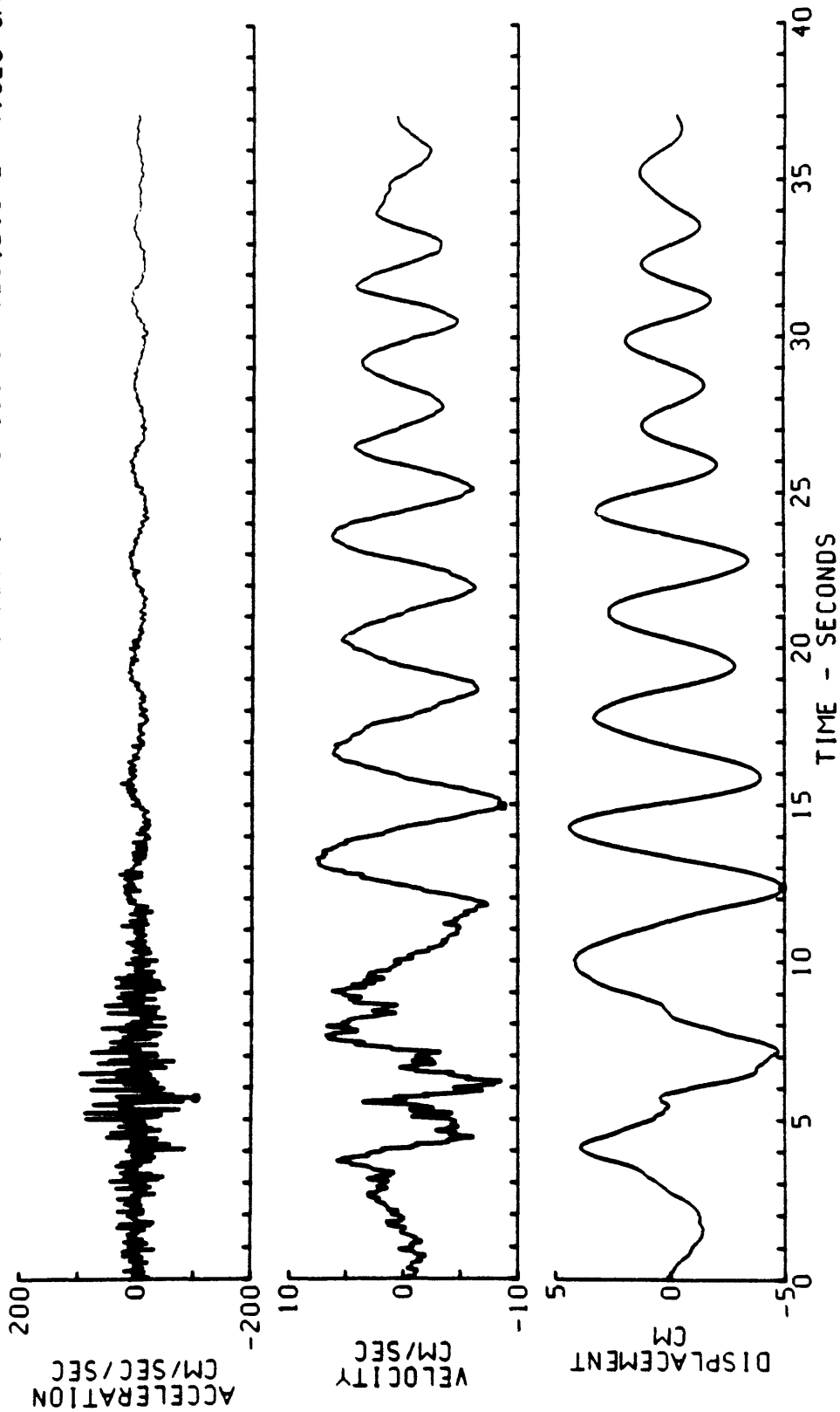
EL CENTRO, ARRAY 10, COMMUNITY HOSP., 10/15/79, 2317UTC



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL, ARRAY 10.EL CENTRO CALIFORNIA, COMP 50 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-168.2 CM/SEC/SEC, VELOCITY=44.28 CM/SEC, DISPL=-27.13 CM

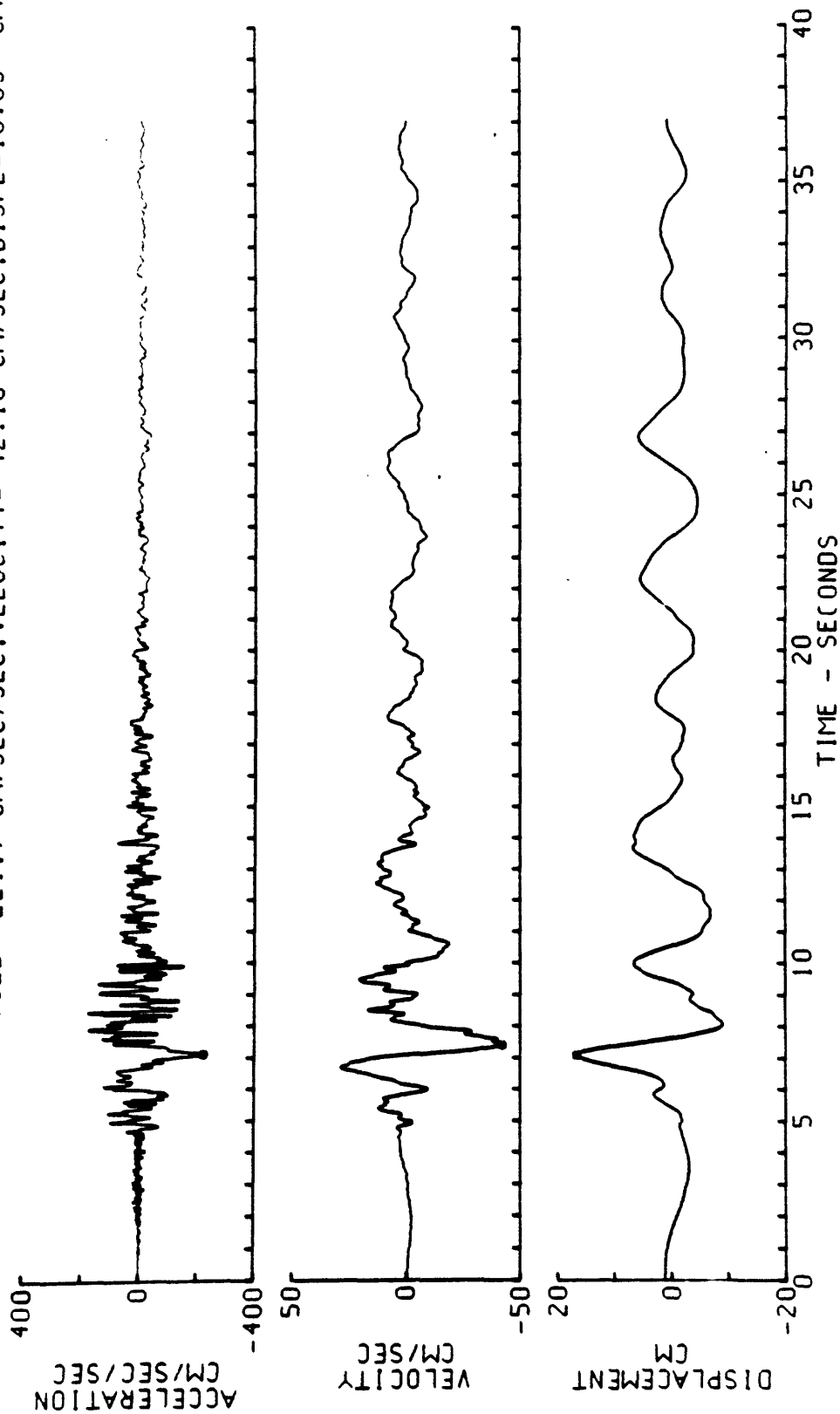


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL ARRAY 10, EL CENTRO CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-102.8 CM/SEC/SEC, VELOCITY=-8.680 CM/SEC, DISPL=-4.920 CM

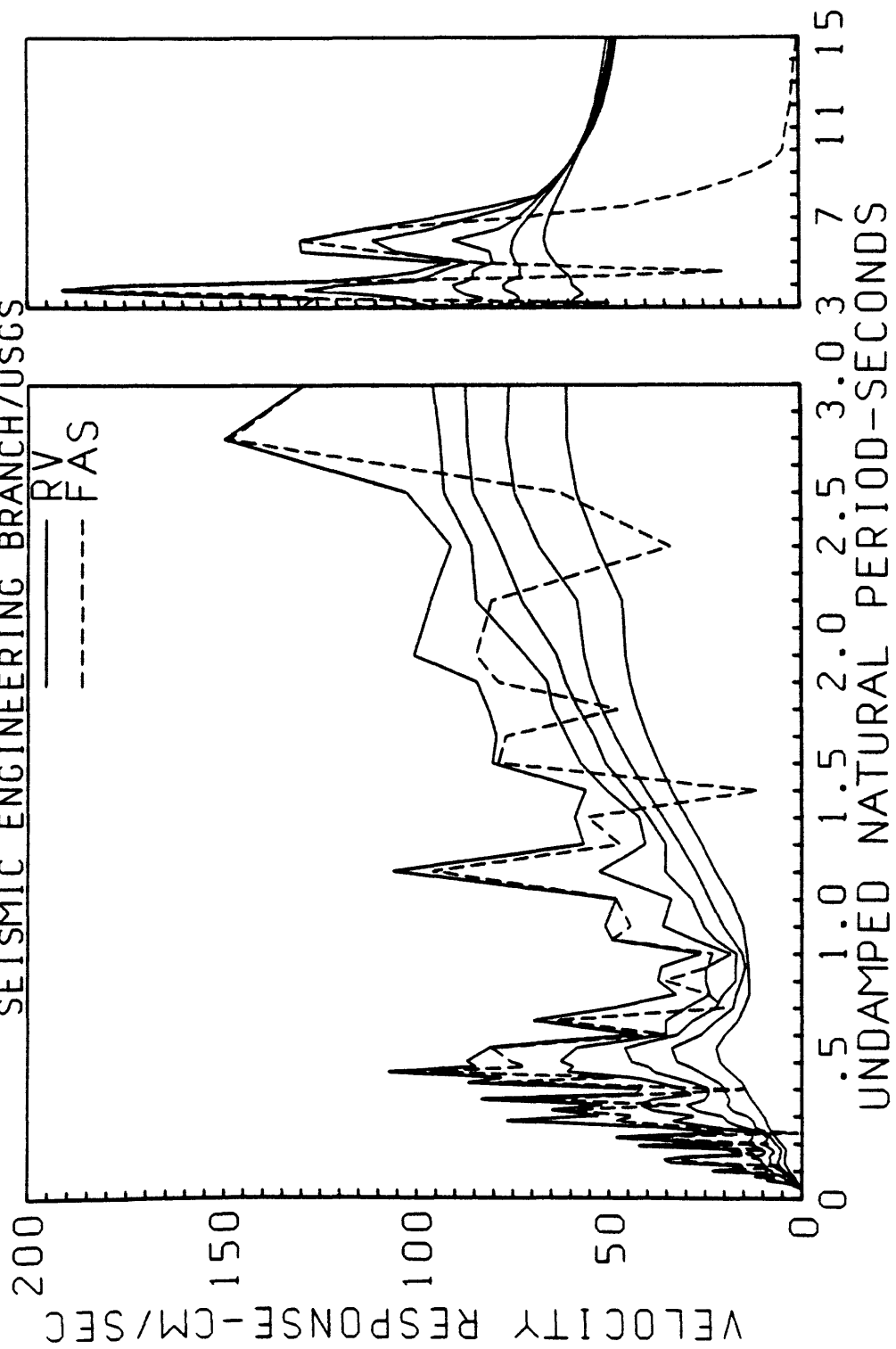


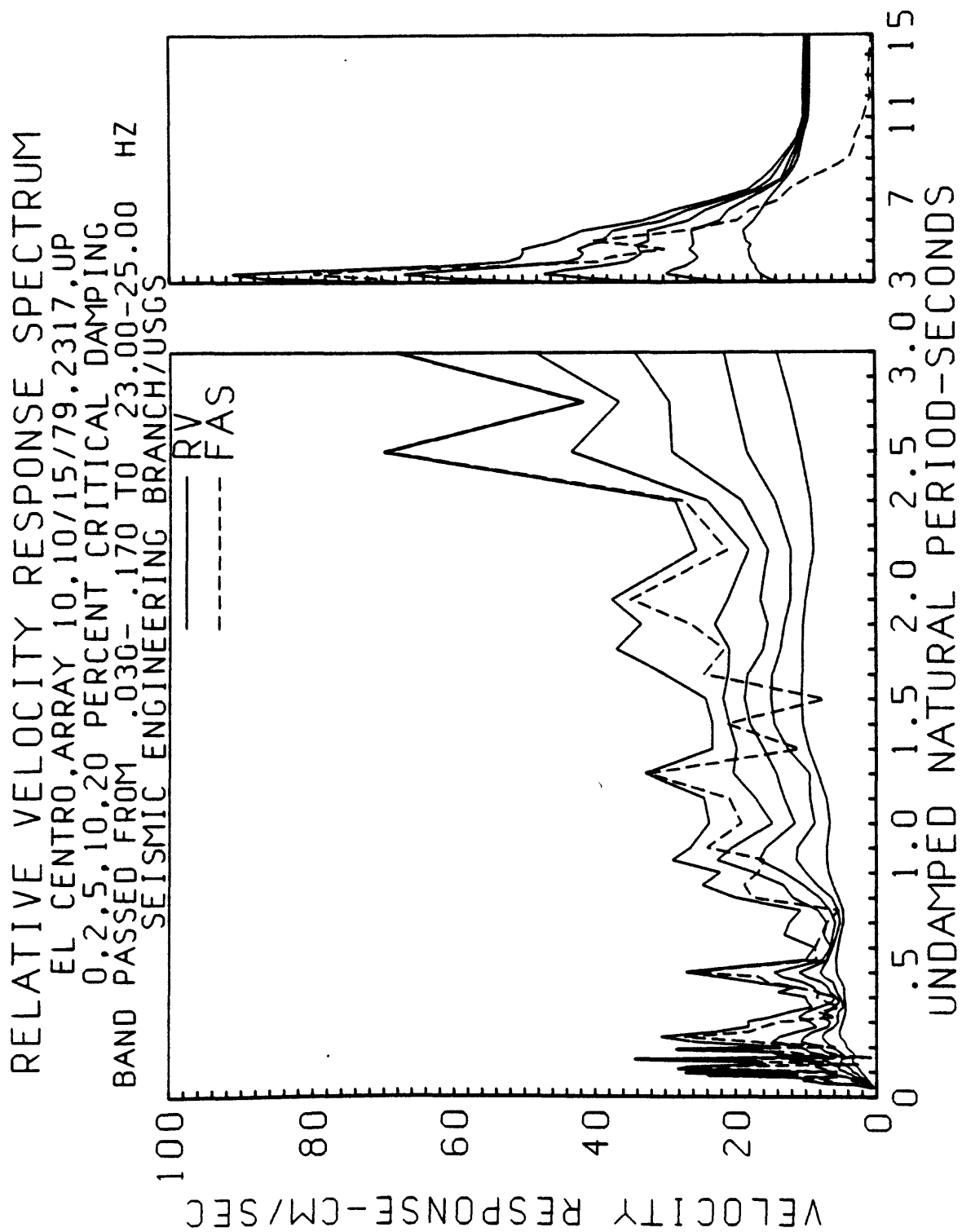


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL ARRAY 10.EL CENTRO CALIFORNIA, COMP 320 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMP'S OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-221.7 CM/SEC/SEC, VELOCITY=-42.18 CM/SEC, DISPL=16.69 CM

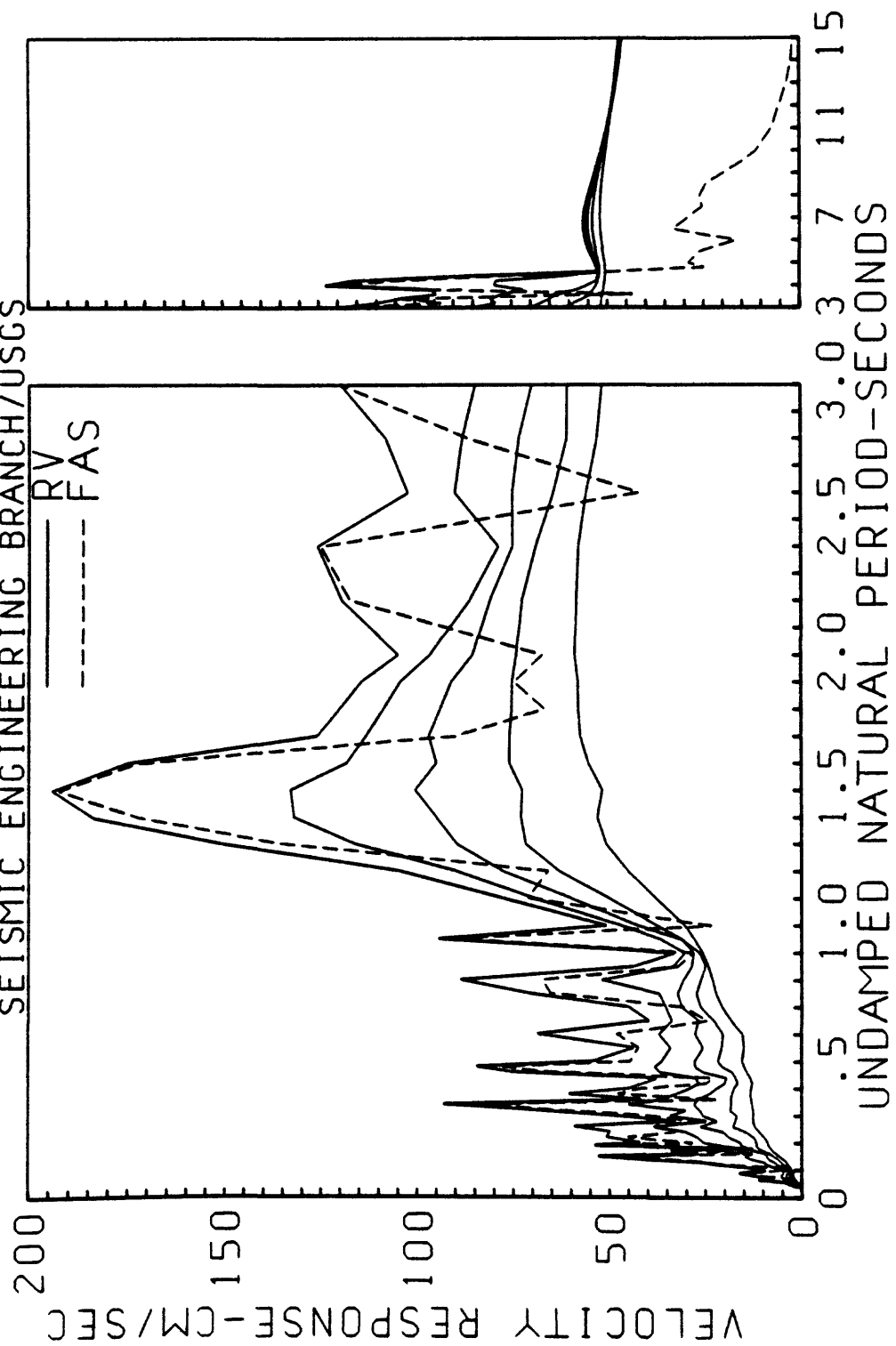


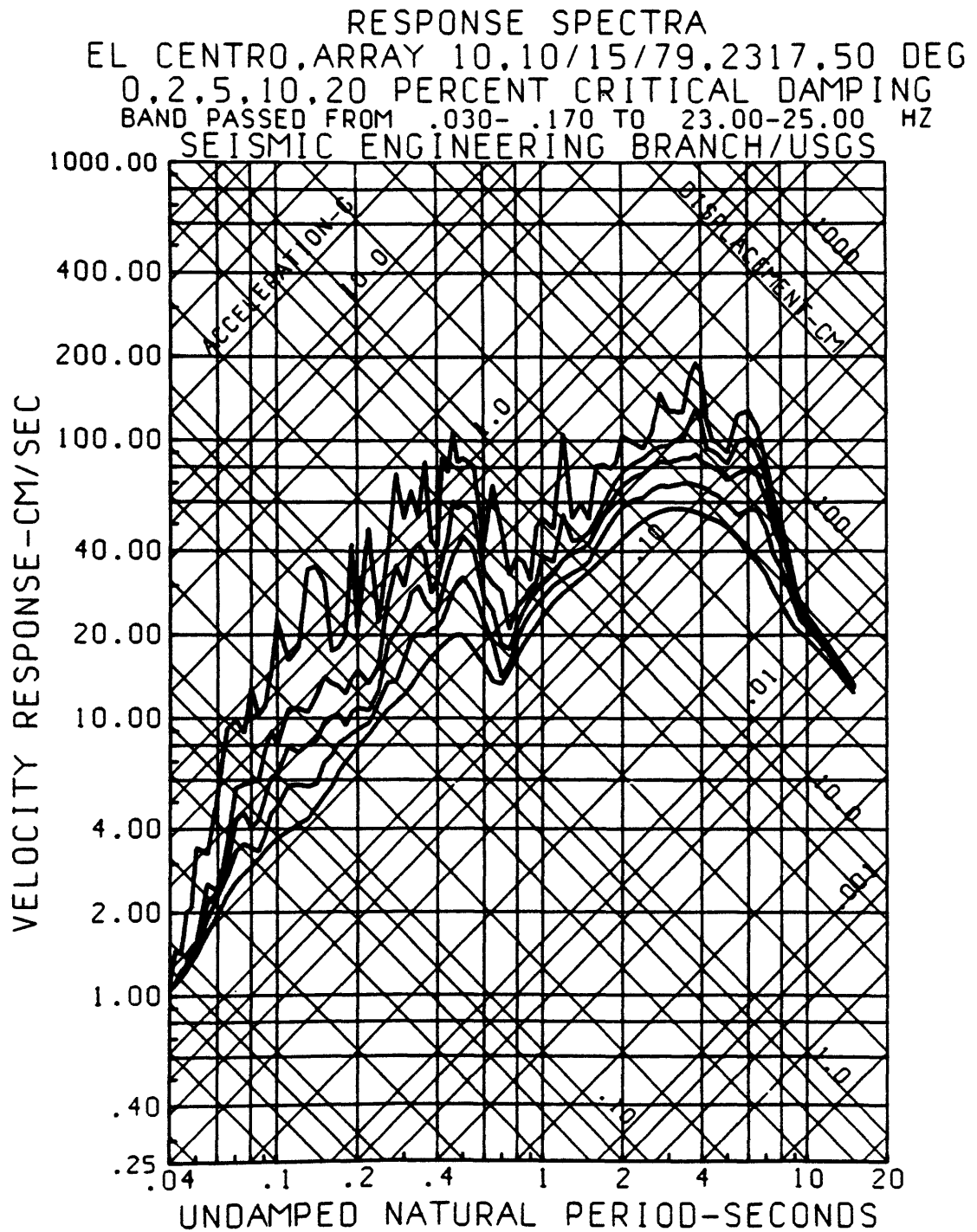
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 10, 10/15/79, 2317.50 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

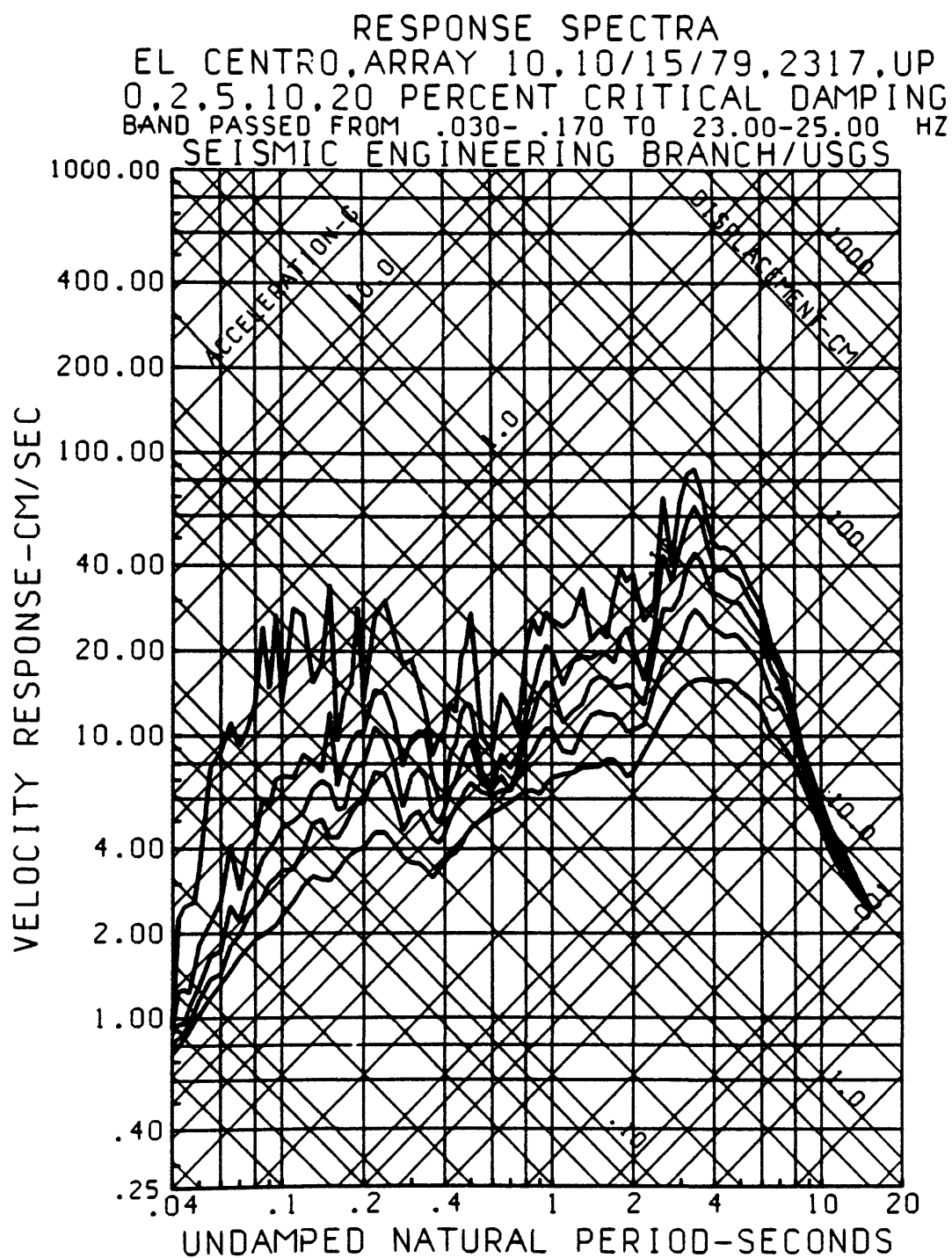


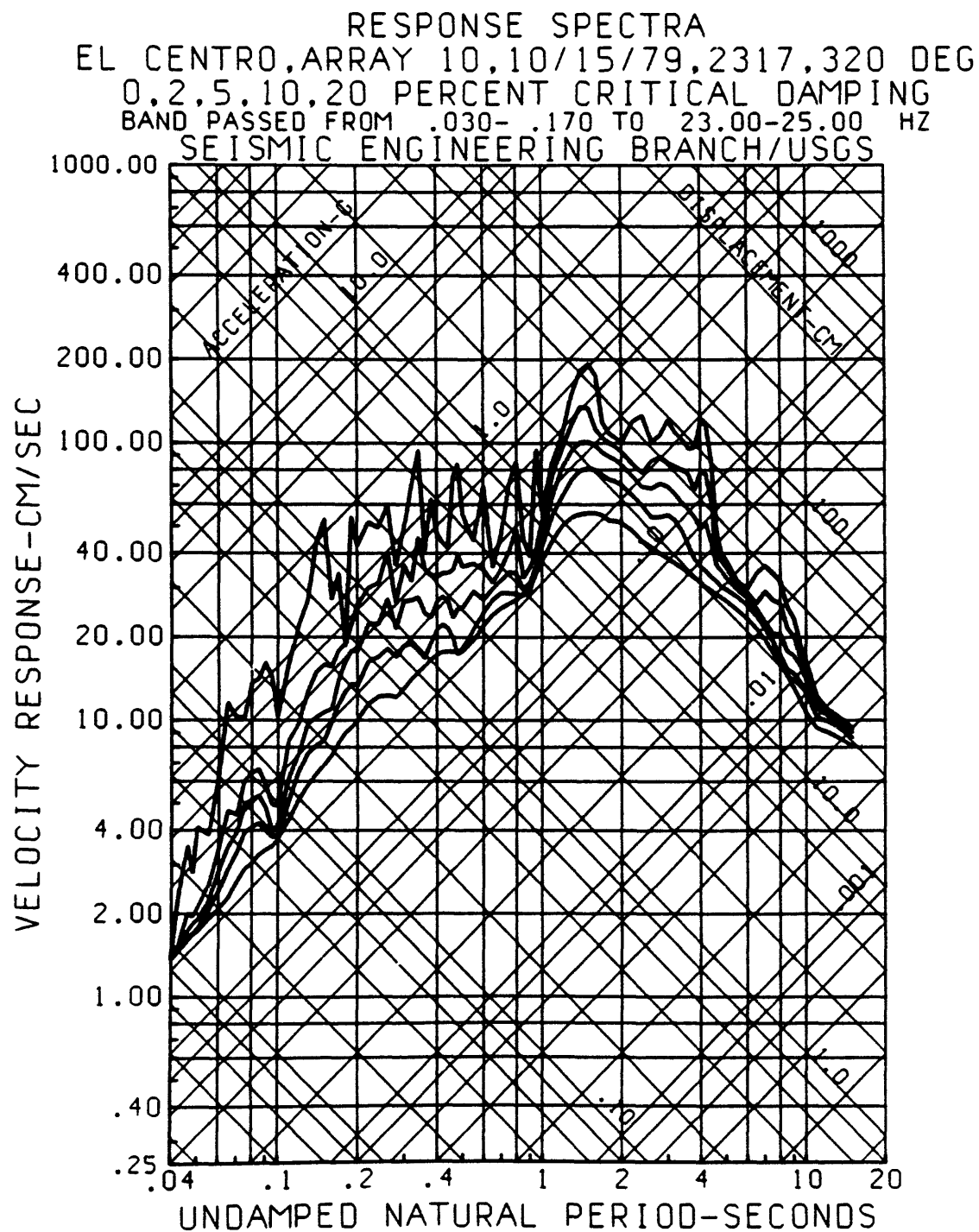


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 10, 10/15/79, 2317, 320 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

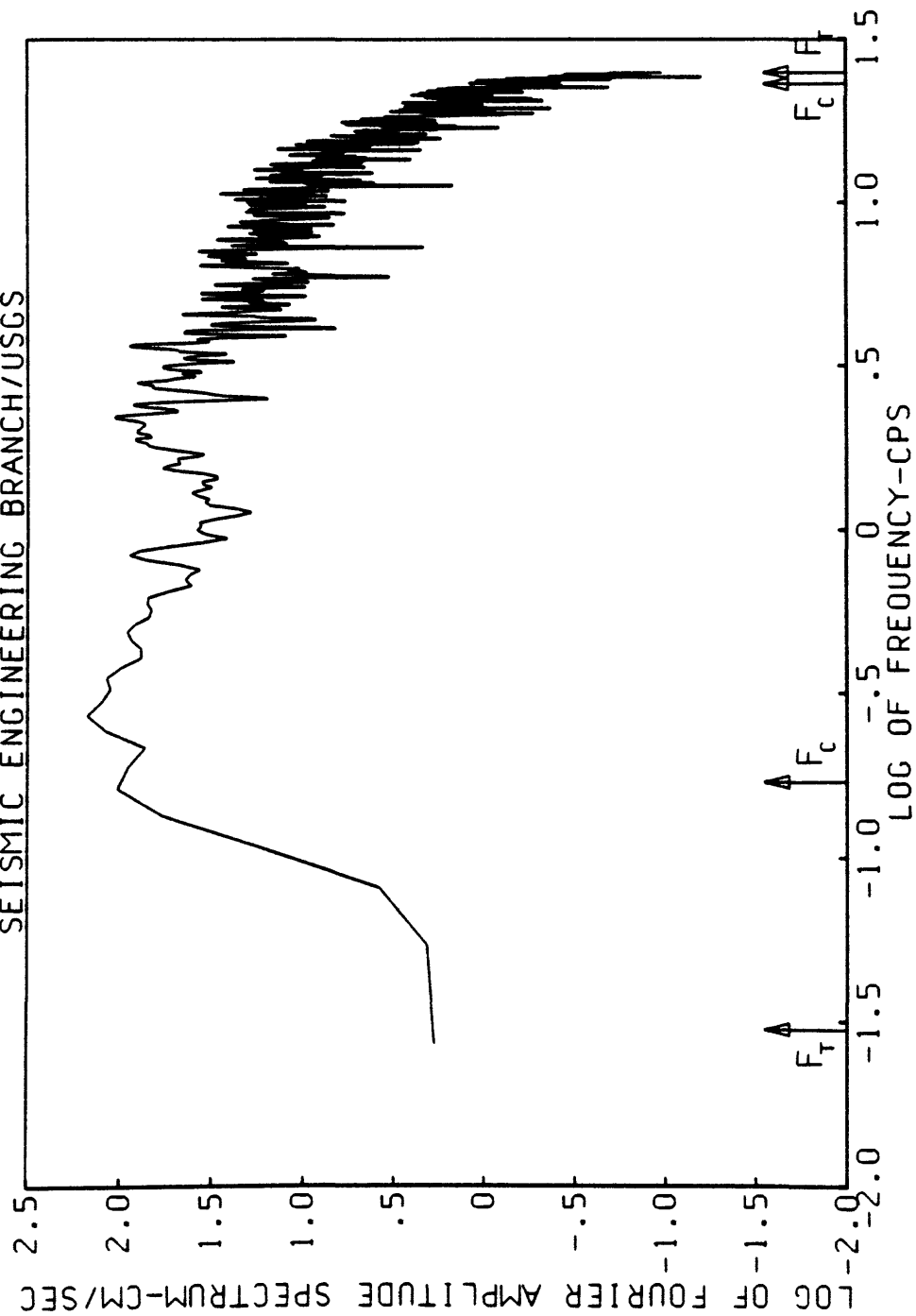






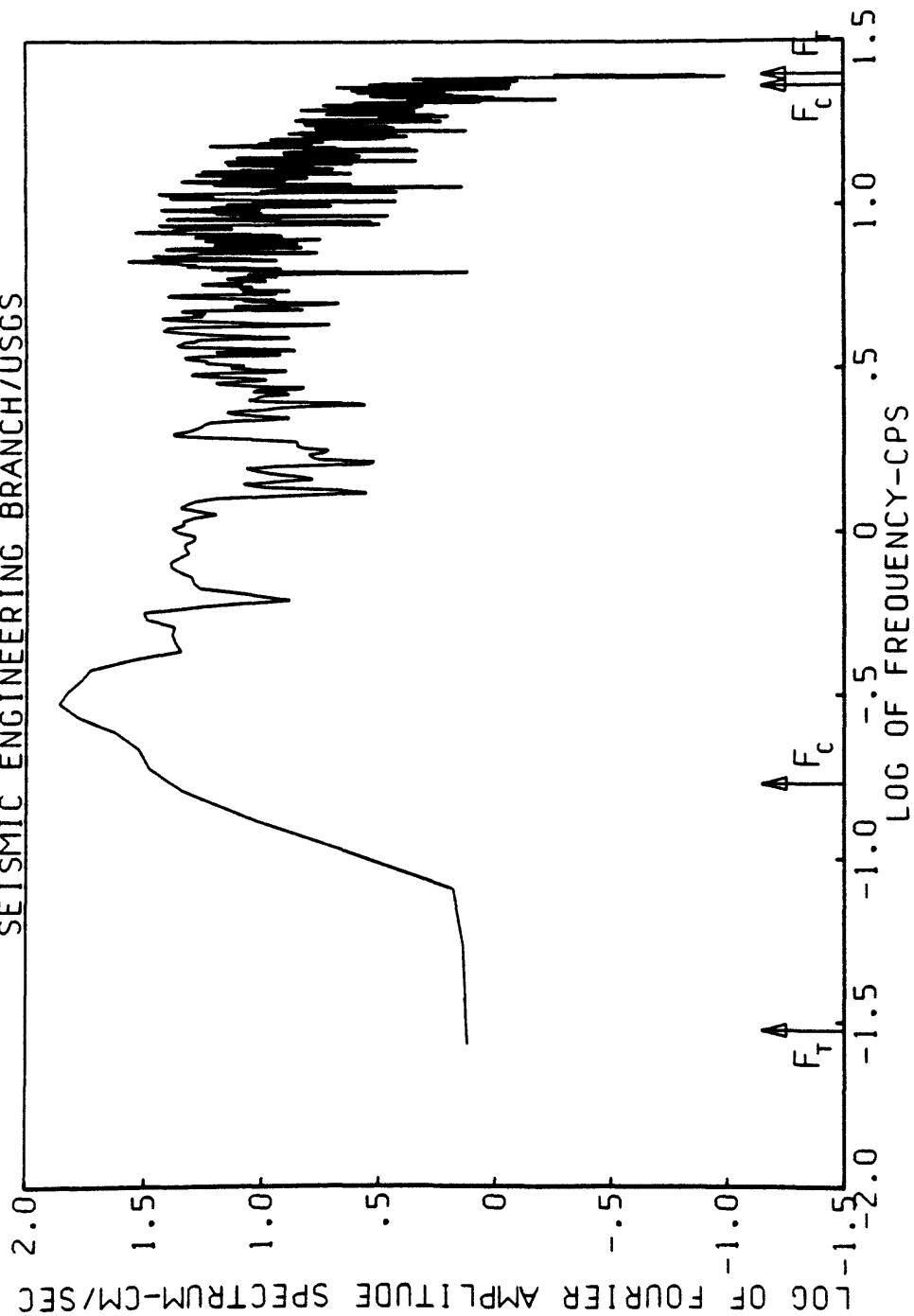


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL ARRAY 10, EL CENTRO CALIFORNIA, COMP 50 DEG  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

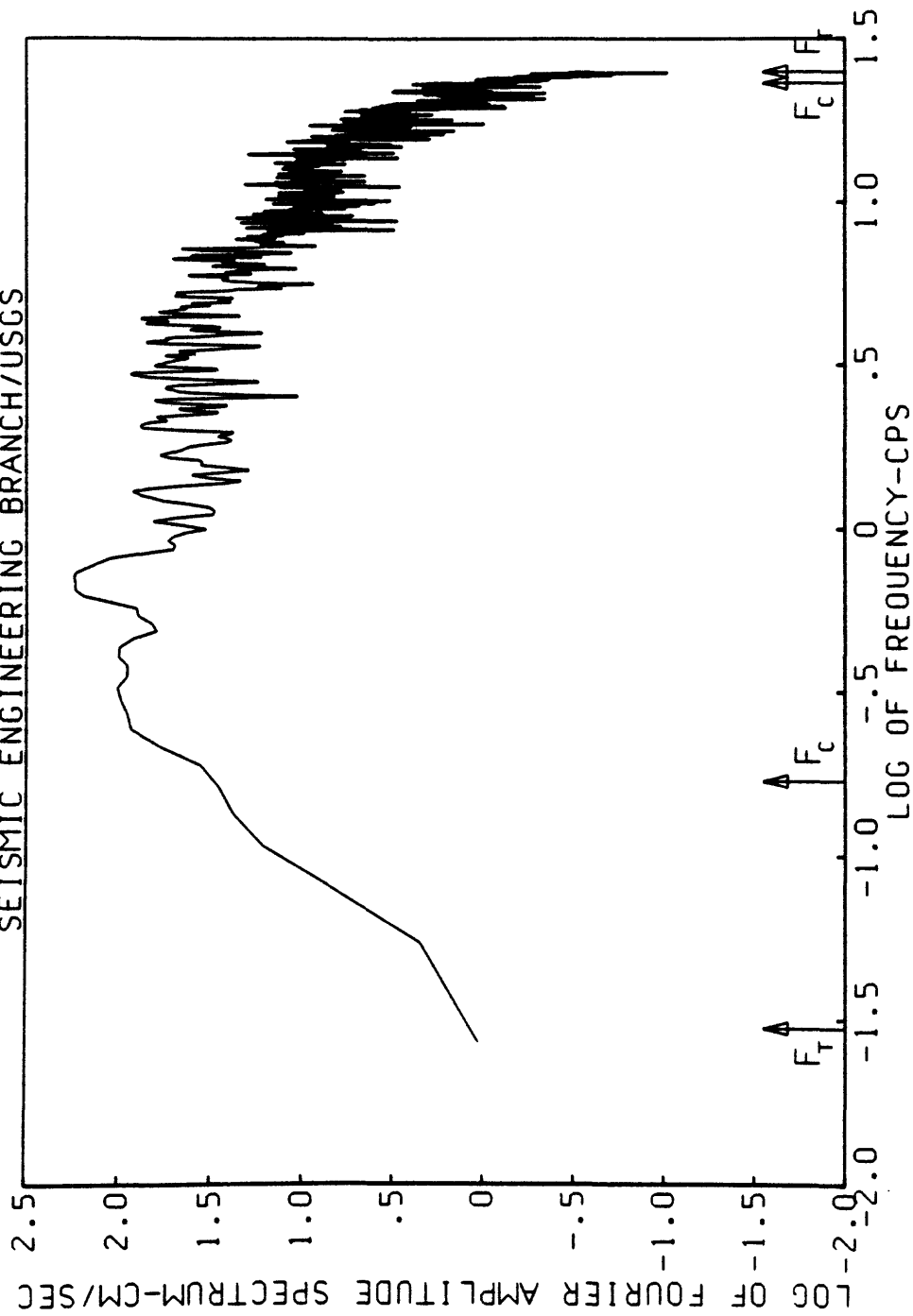




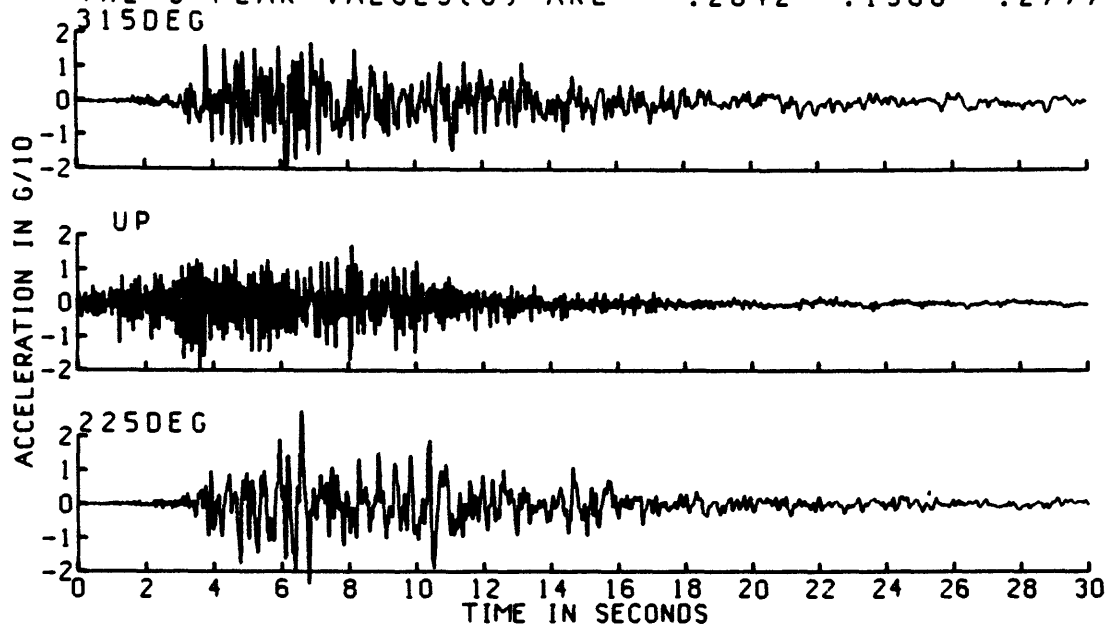
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL, ARRAY 10, EL CENTRO CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



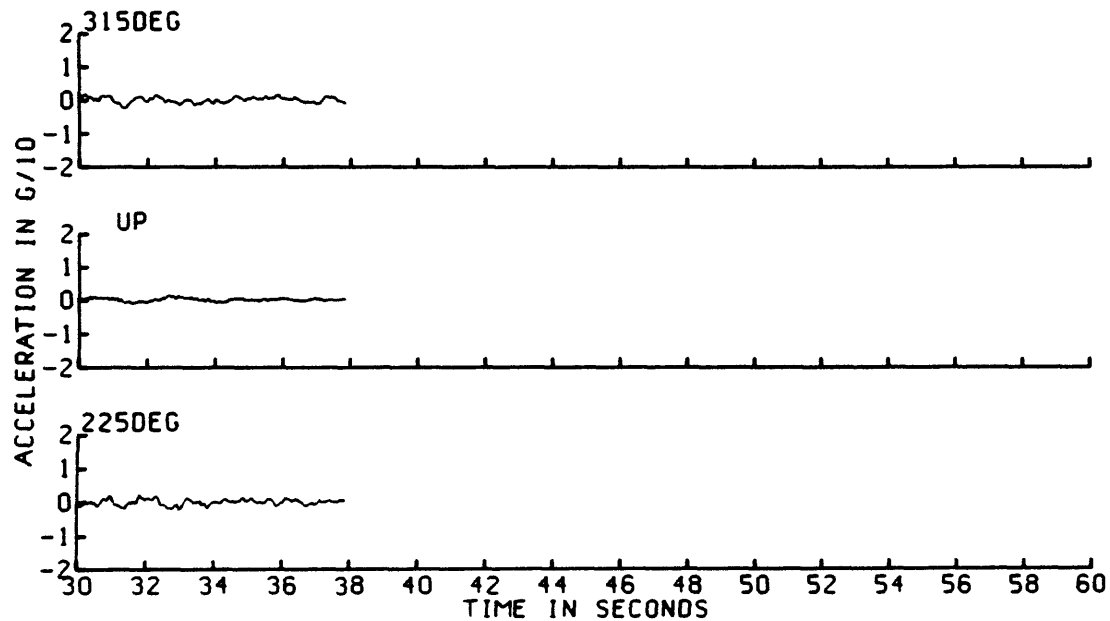
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COMMUN. HOSPITAL ARRAY 10, EL CENTRO CALIFORNIA, COMP 320 DEG  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



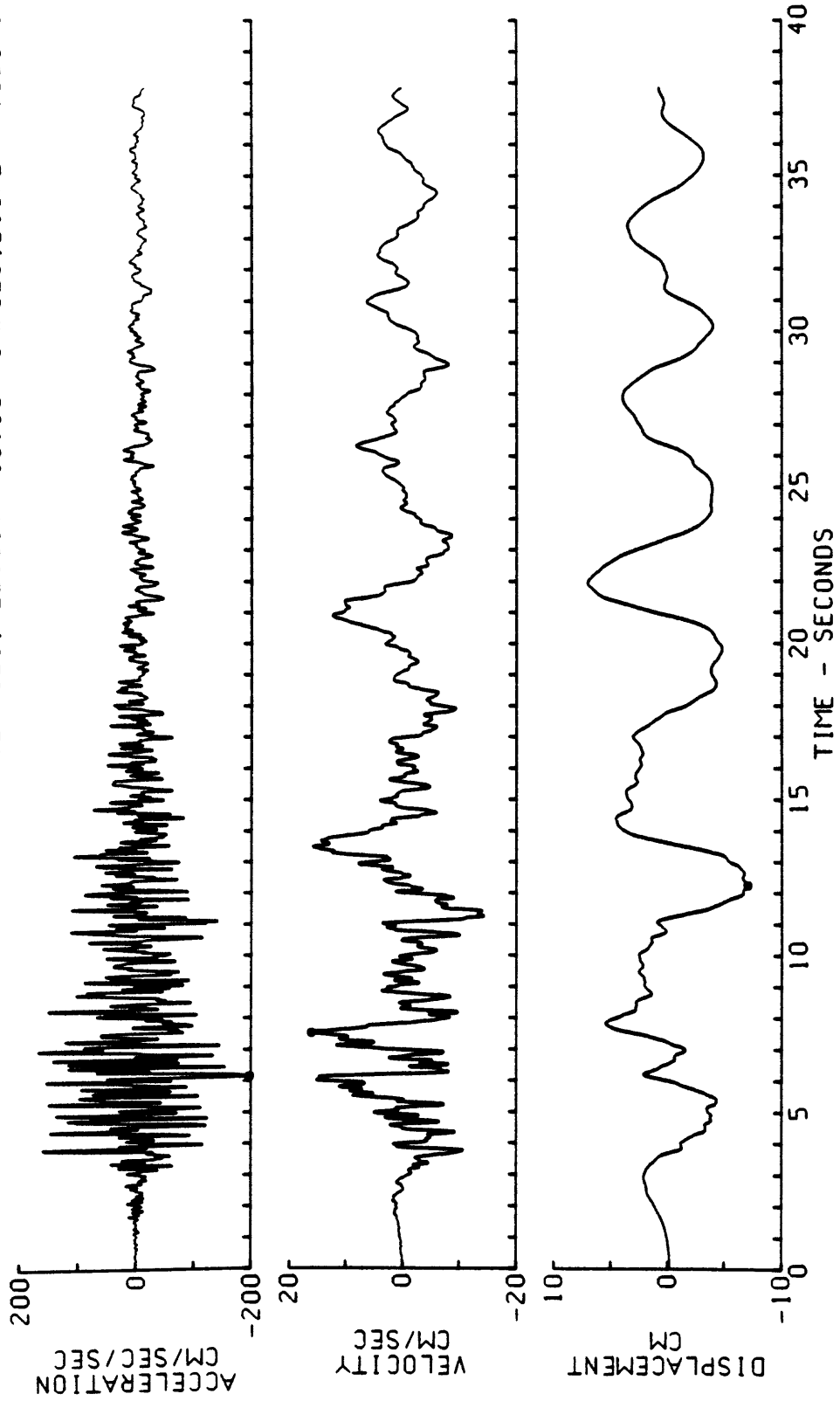
UNCORRECTED ACCELEROGRAM  
 CALEXICO.CALEXICO FIRE STATION.10/15/79.2317UTS  
 THE 3 PEAK VALUES(G) ARE .2042 .1988 .2777



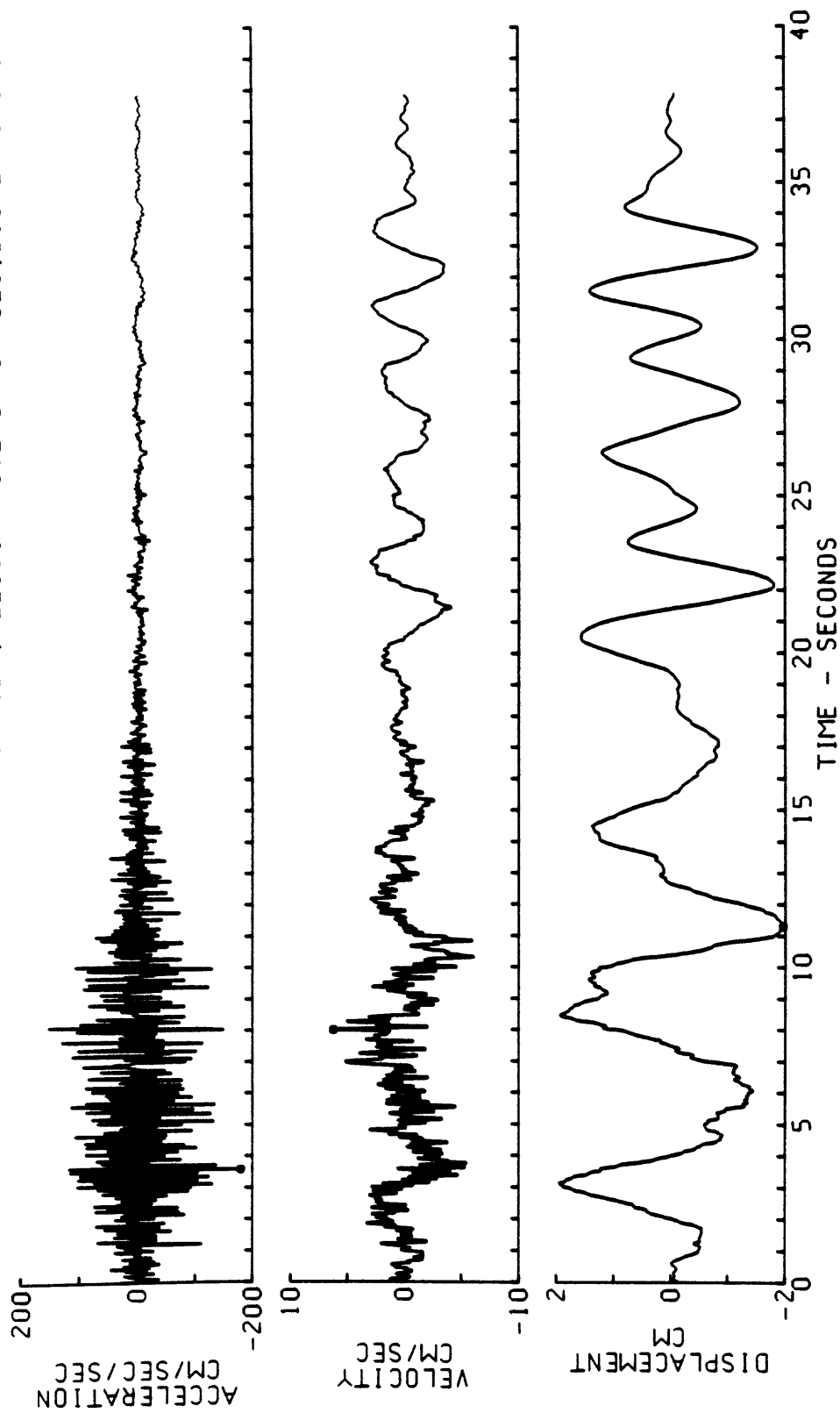
CALEXICO.CALEXICO FIRE STATION.10/15/79.2317UTS



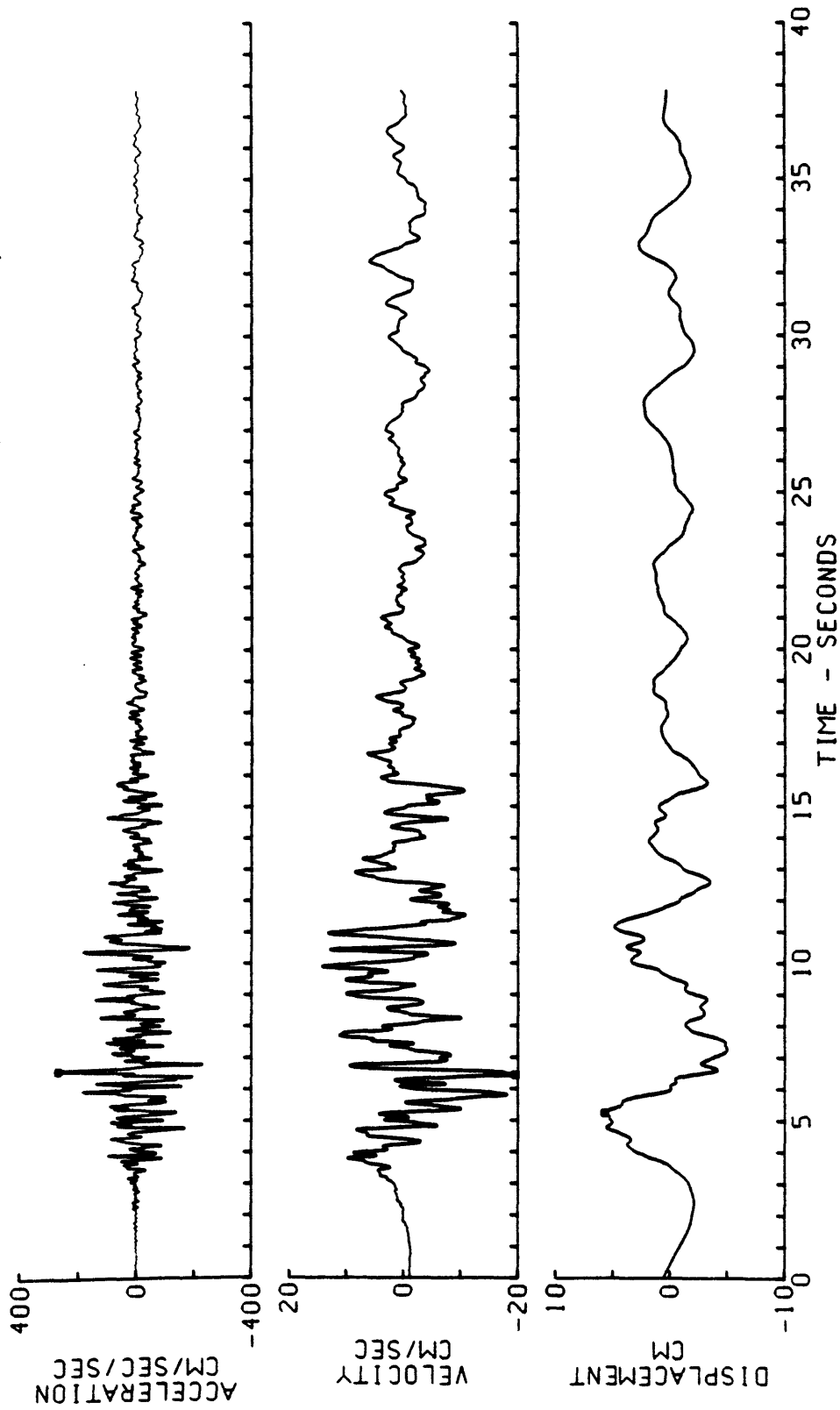
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF. COMP 315 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-196.9 CM/SEC/SEC, VELOCITY=16.08 CM/SEC, DISPL=-7.050 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF., COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-179.1 CM/SEC/SEC, VELOCITY=6.240 CM/SEC, DISPL=-1.970 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF. COMP 225 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=269.6 CM/SEC/SEC, VELOCITY=-19.43 CM/SEC, DISPL=5.710 CM



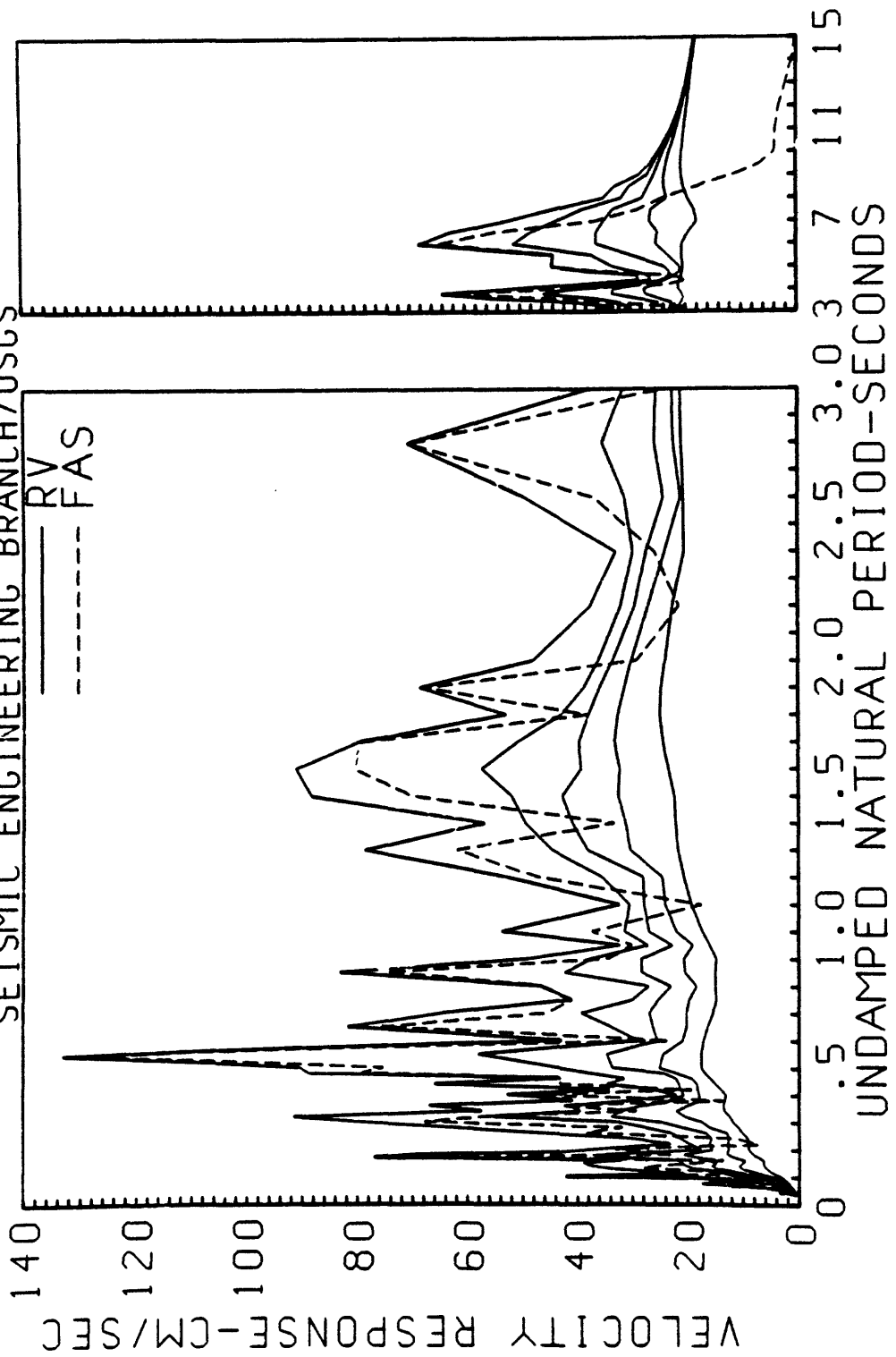
# RELATIVE VELOCITY RESPONSE SPECTRUM

CALEXICO FIRE STATION, 10/15/79, 315 DEG

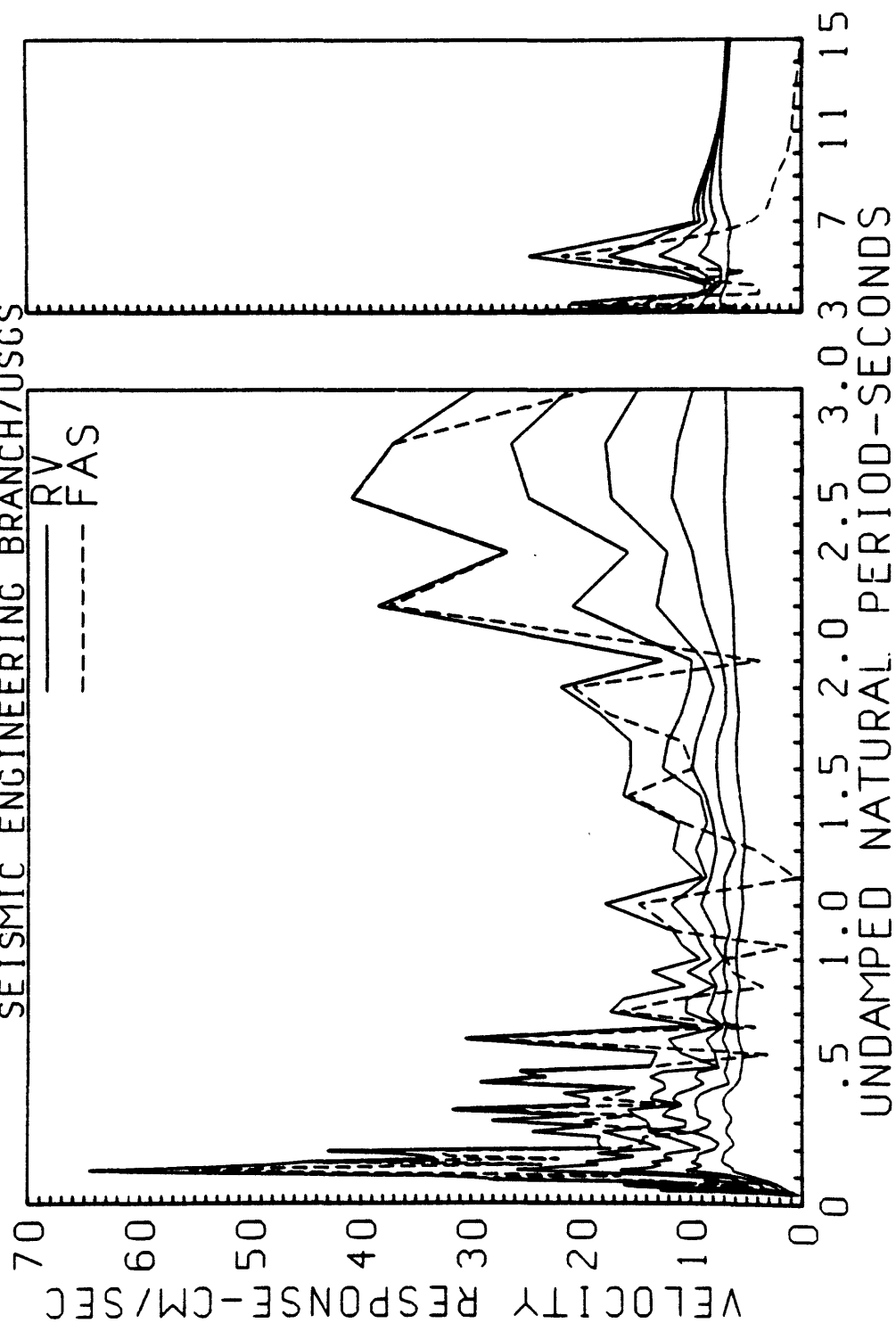
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

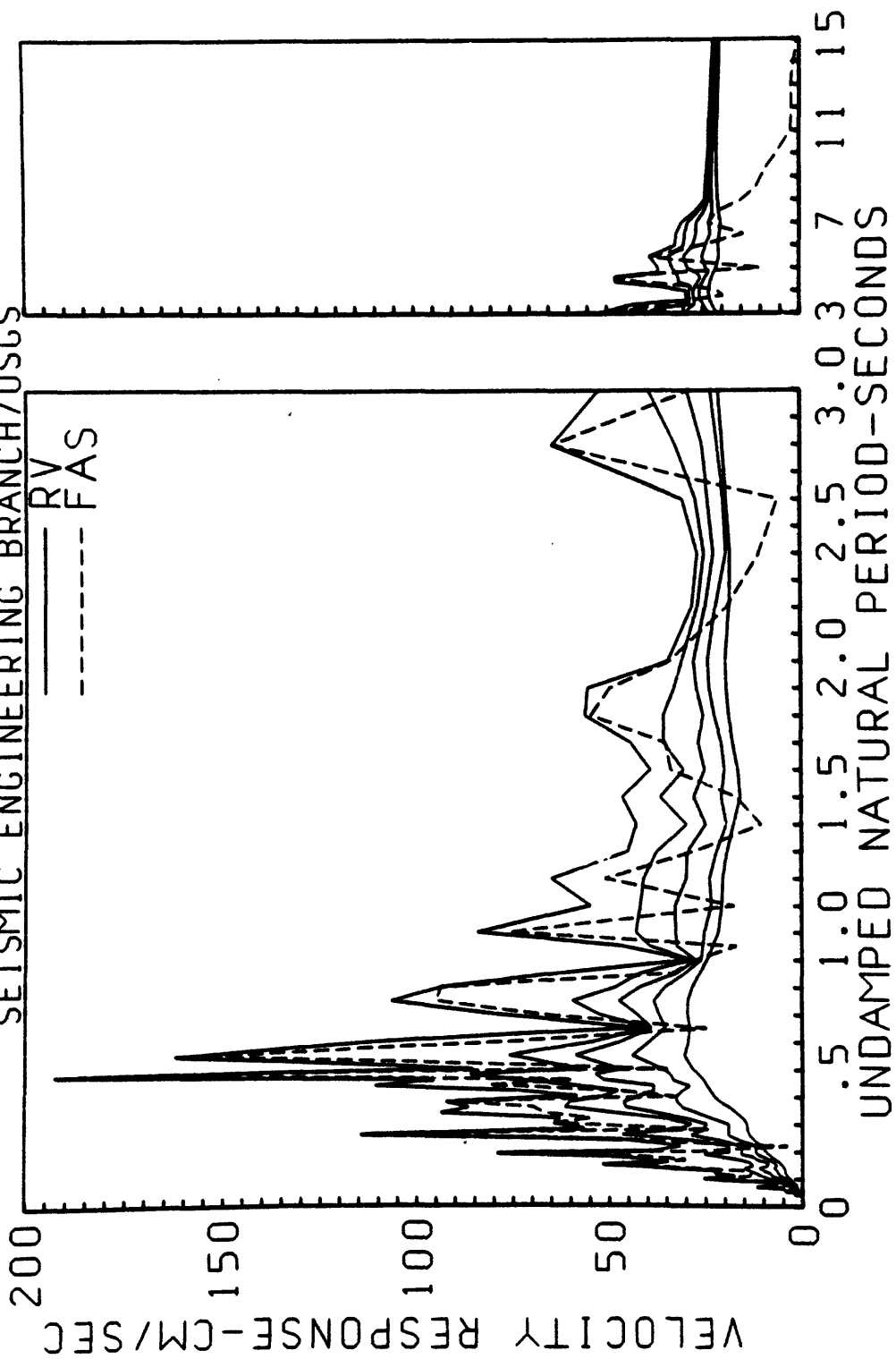


RELATIVE VELOCITY RESPONSE SPECTRUM  
 CALEXICO FIRE STATION.10/15/79.UP  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

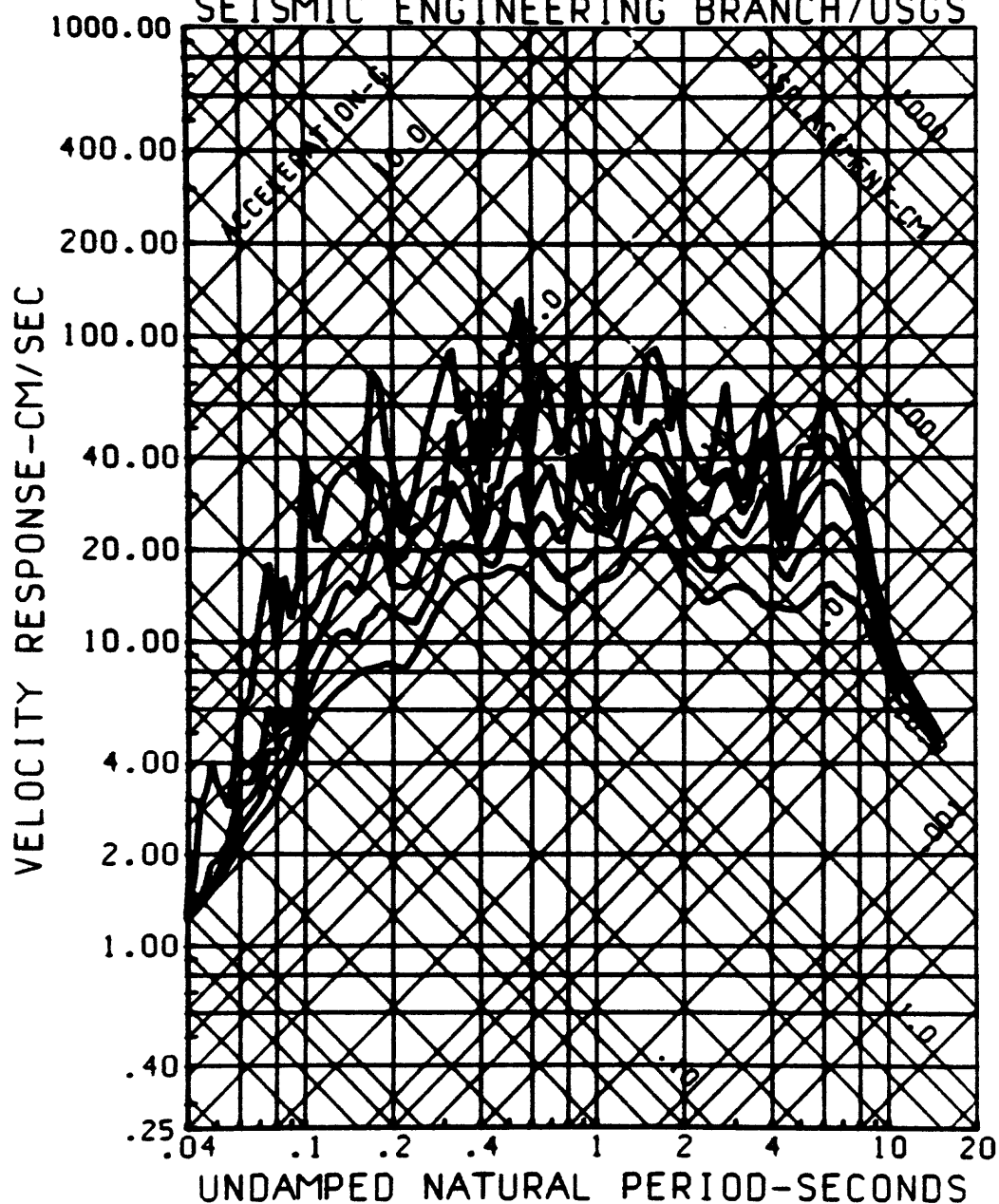




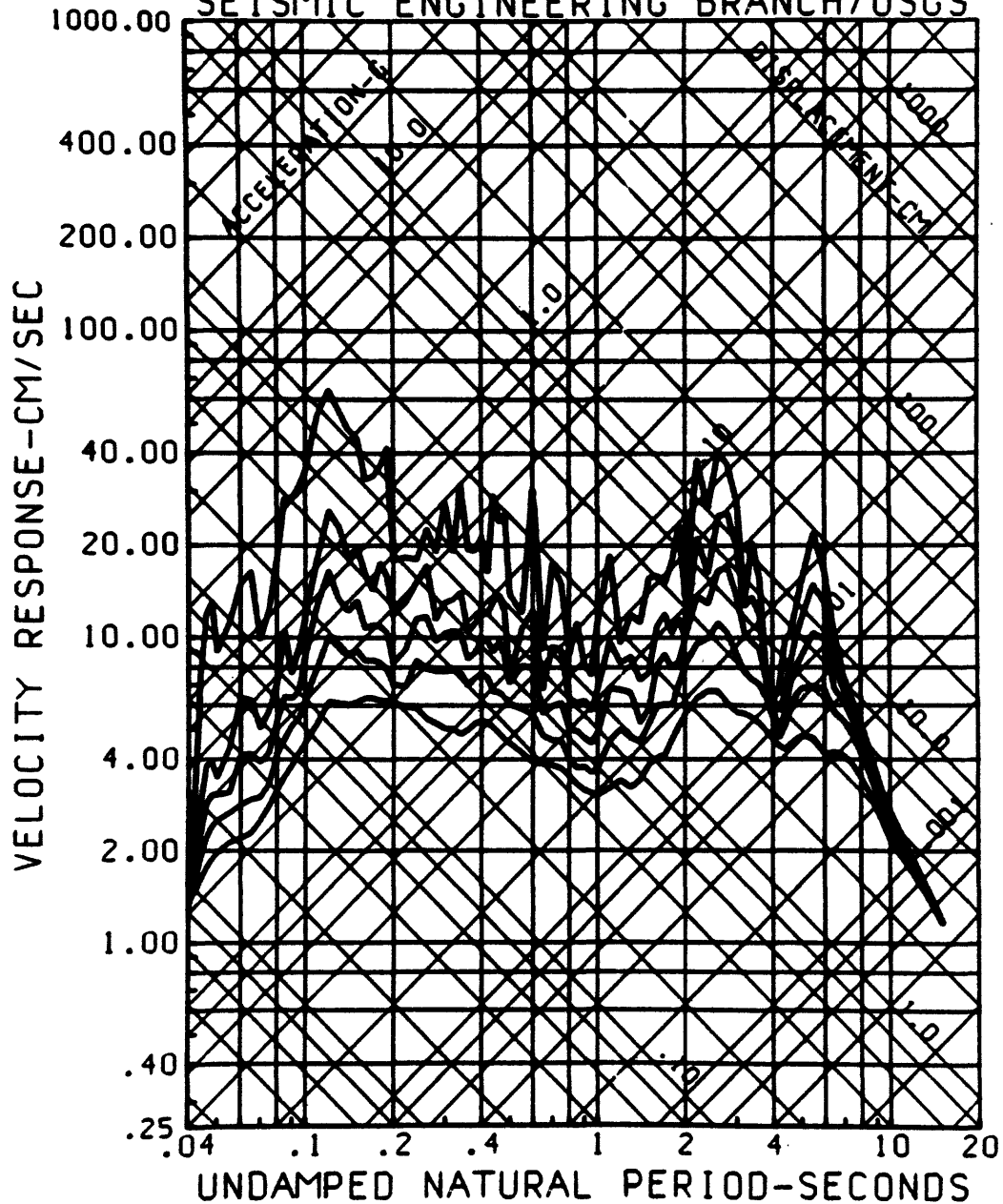
RELATIVE VELOCITY RESPONSE SPECTRUM  
 CALEXICO FIRE STATION, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



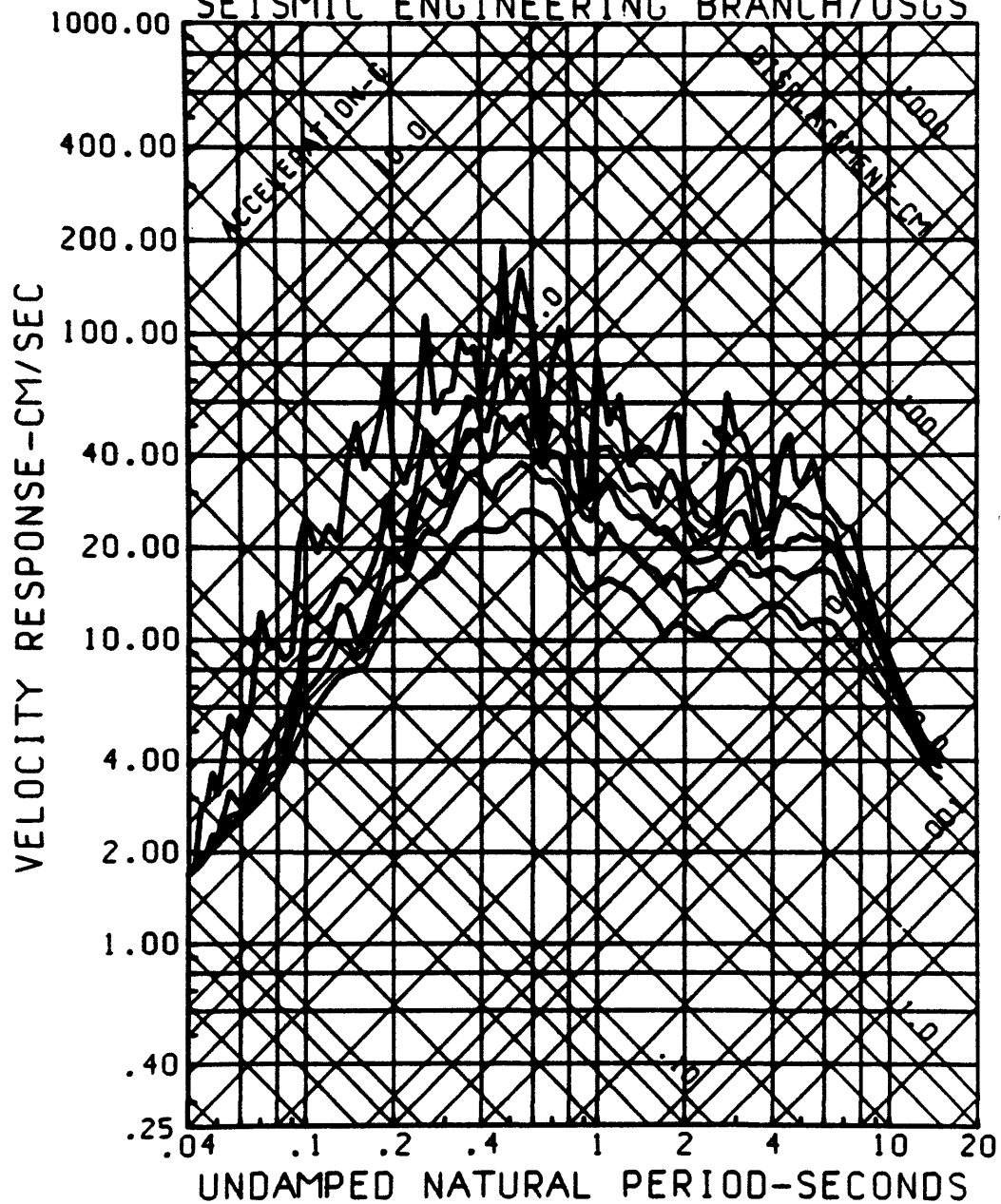
RESPONSE SPECTRA  
 CALEXICO FIRE STATION.10/15/79.315 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



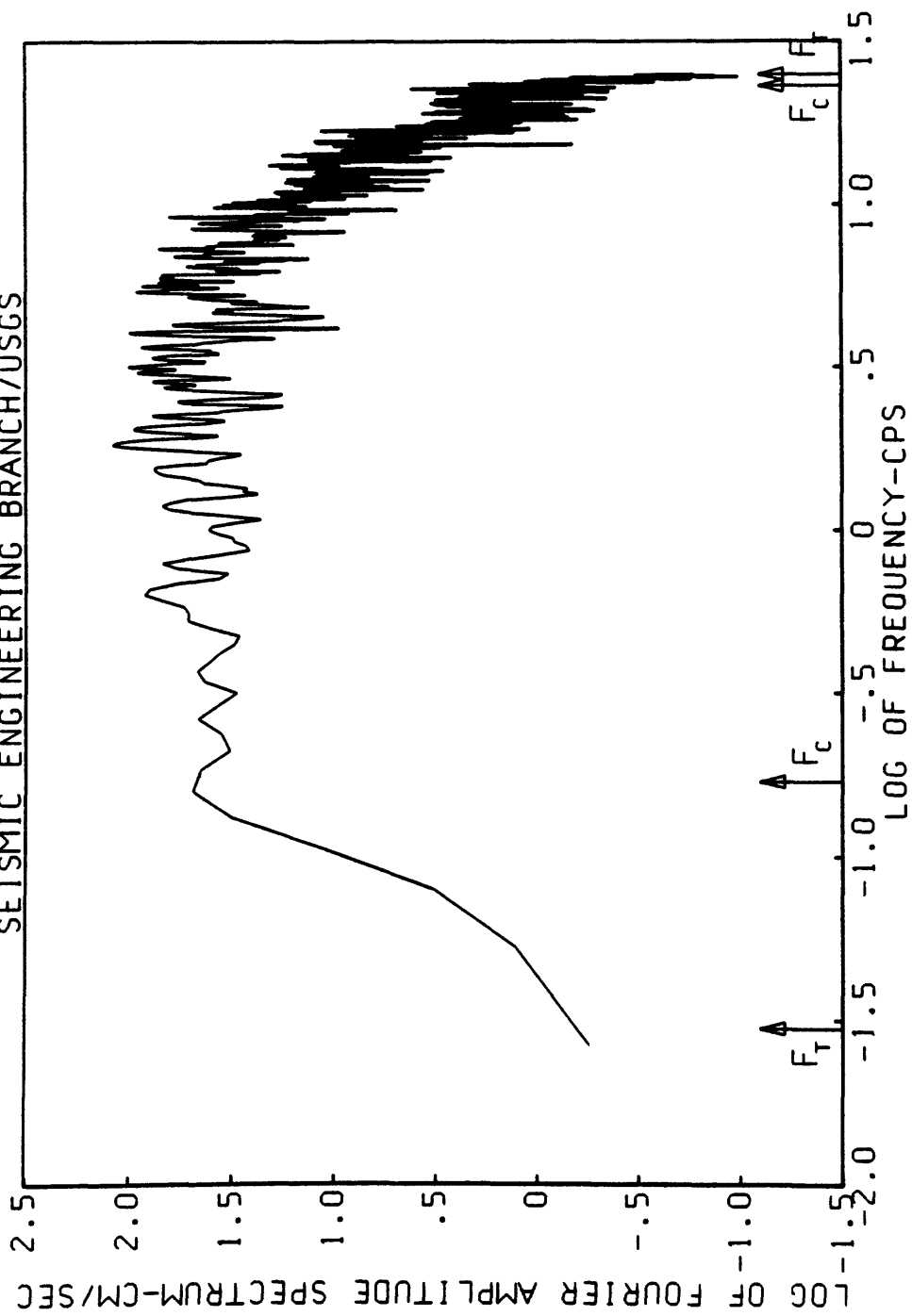
RESPONSE SPECTRA  
 CALEXICO FIRE STATION, 10/15/79, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



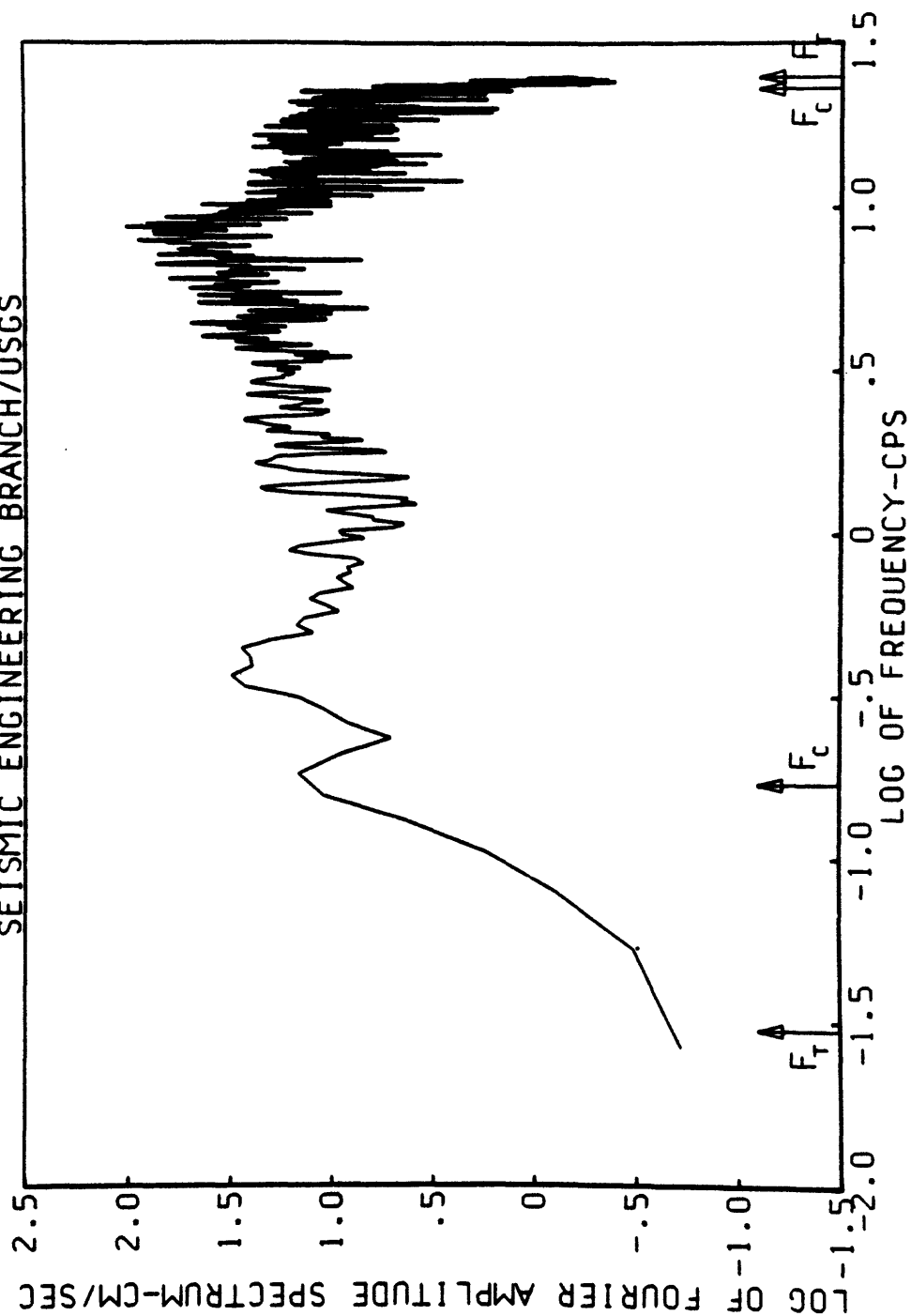
RESPONSE SPECTRA  
 CALEXICO FIRE STATION, 10/15/79, 225 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



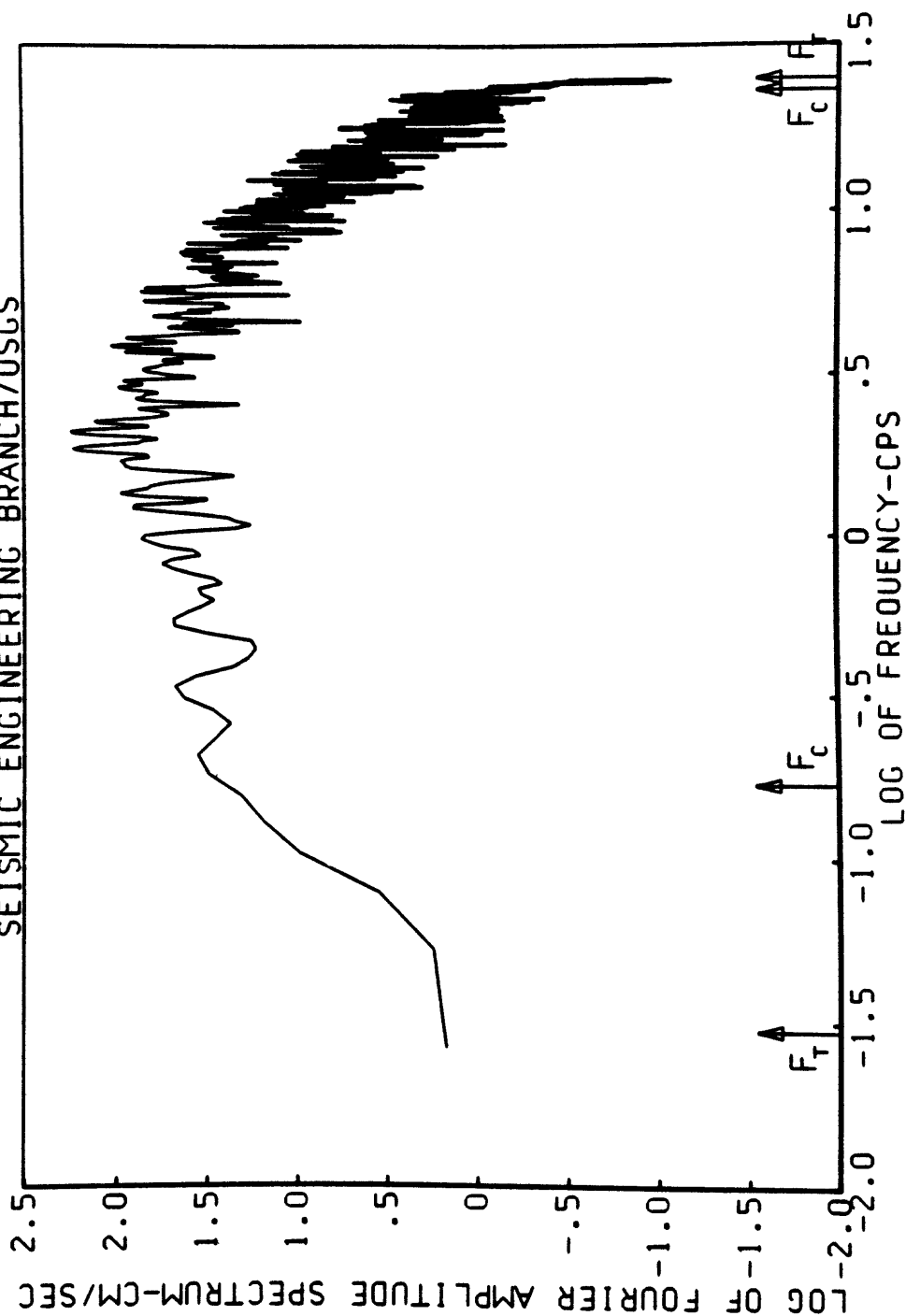
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF. COMP 315 DEG  
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
SEISMIC ENGINEERING BRANCH/USGS



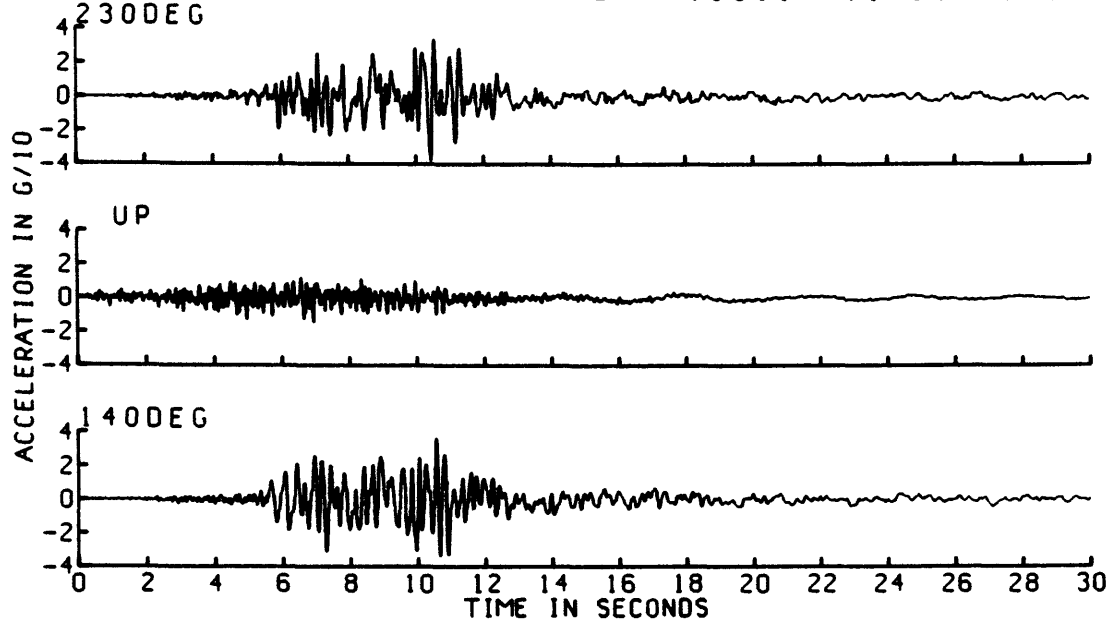
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF. COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



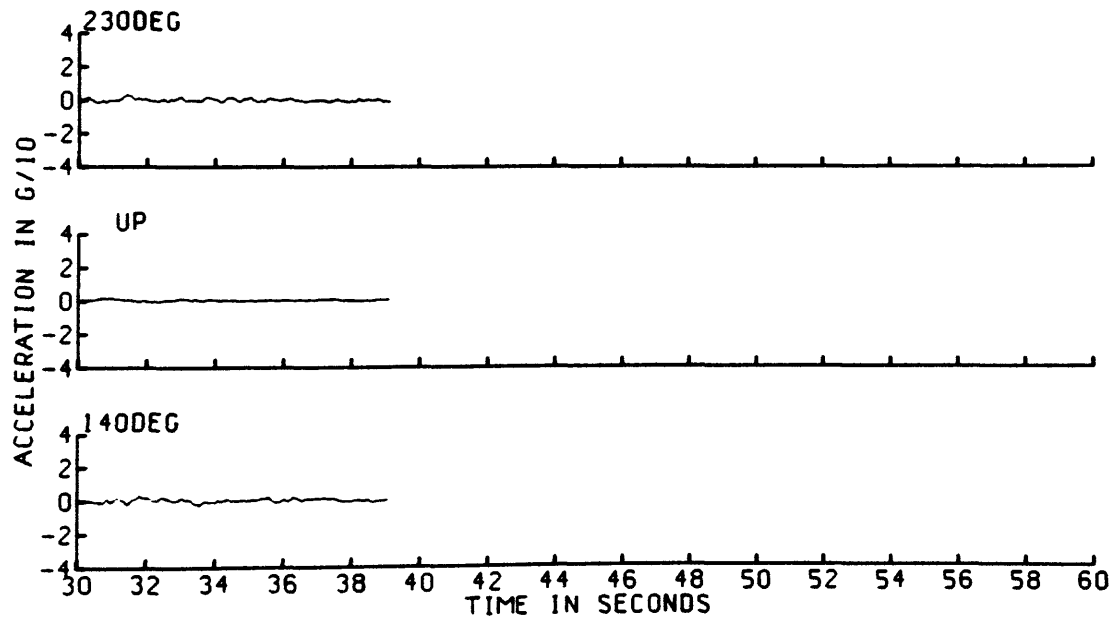
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 5TH STREET, CALEXICO FIRE STATION, CALEXICO, CALIF. COMP 225 DEG  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



UNCORRECTED ACCELEROGRAM  
 EL CENTRO.ARRAY 11.MCCABE SCHOOL.10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .3811 .1451 .3683

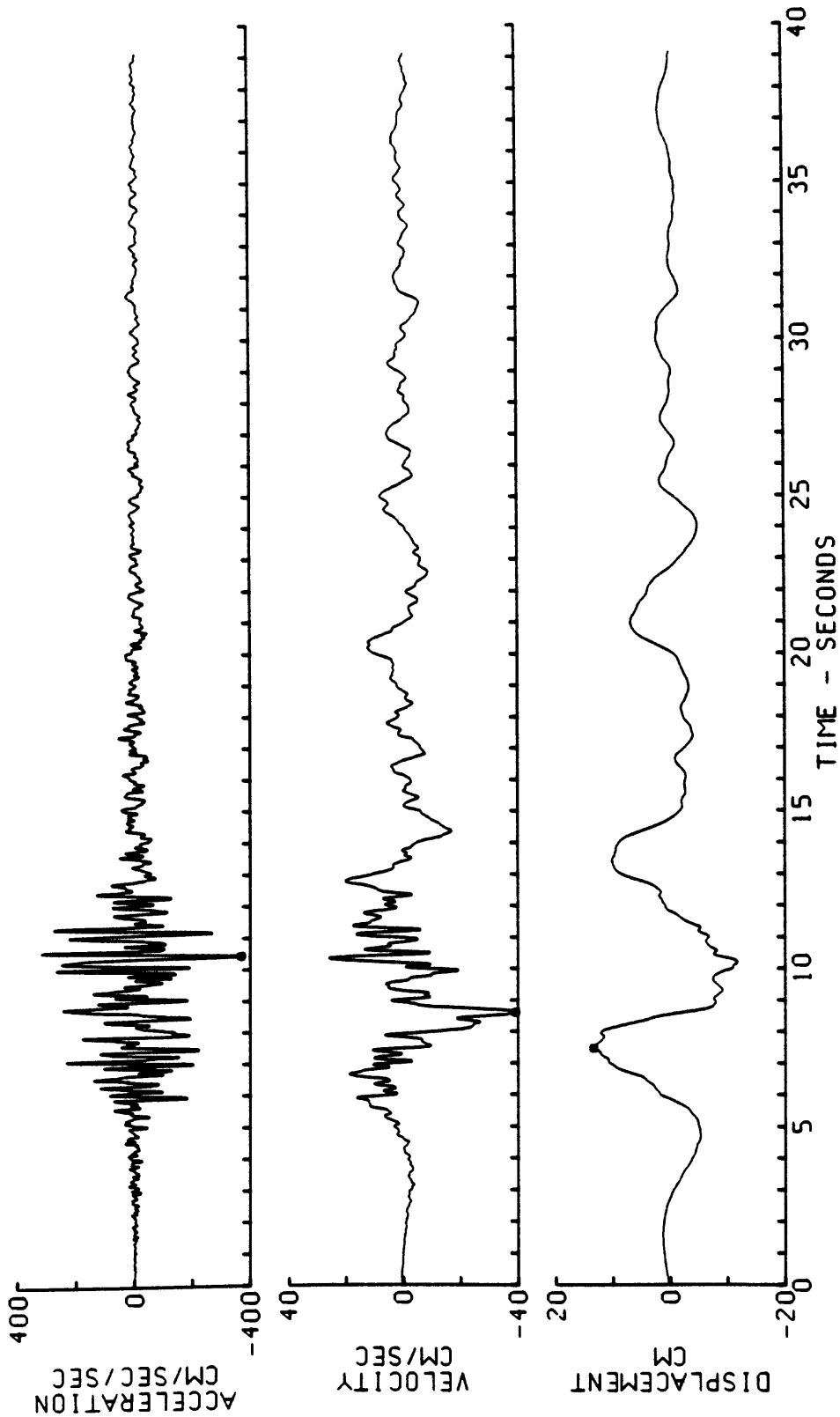


EL CENTRO.ARRAY 11.MCCABE SCHOOL.10/15/79.2317UTC

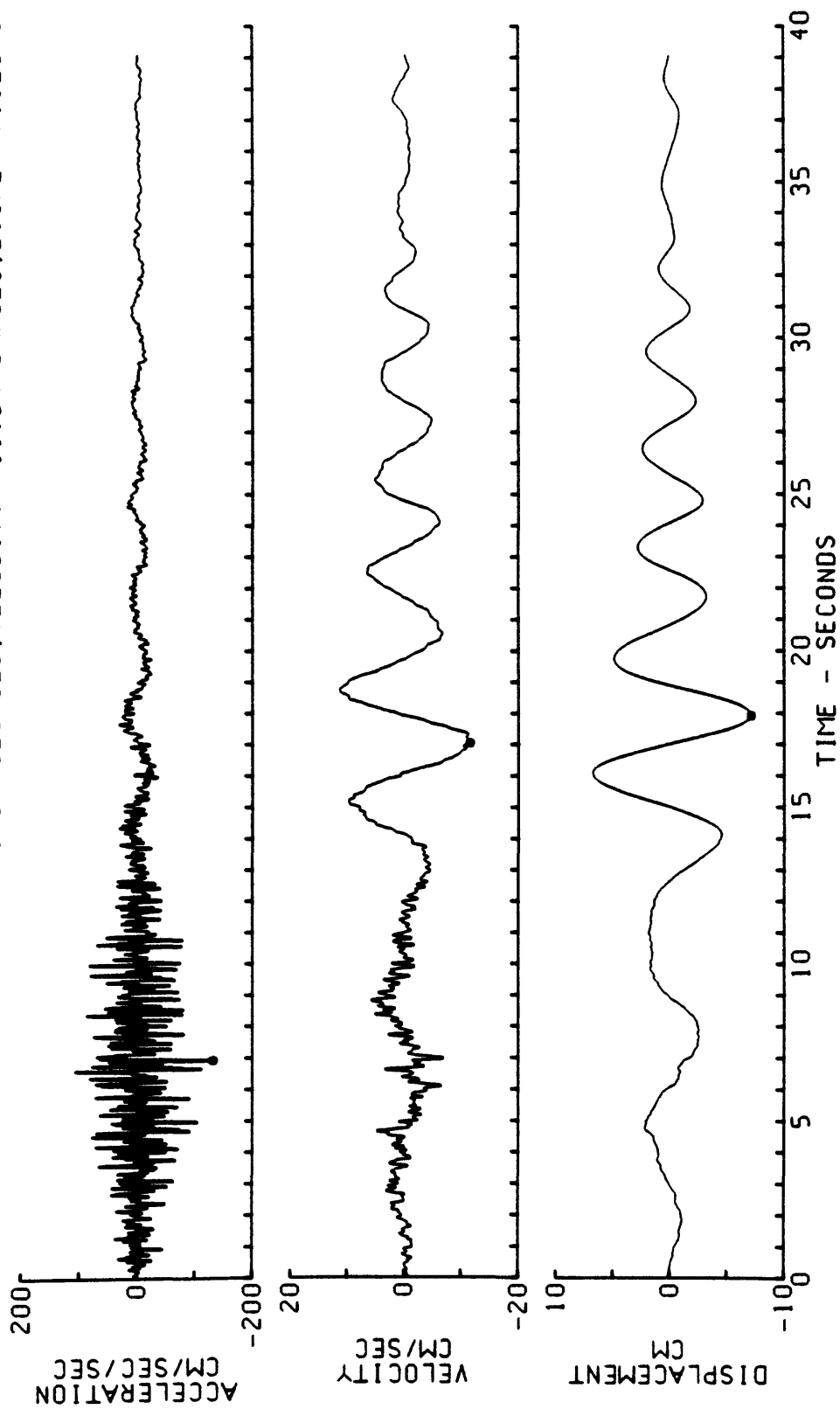




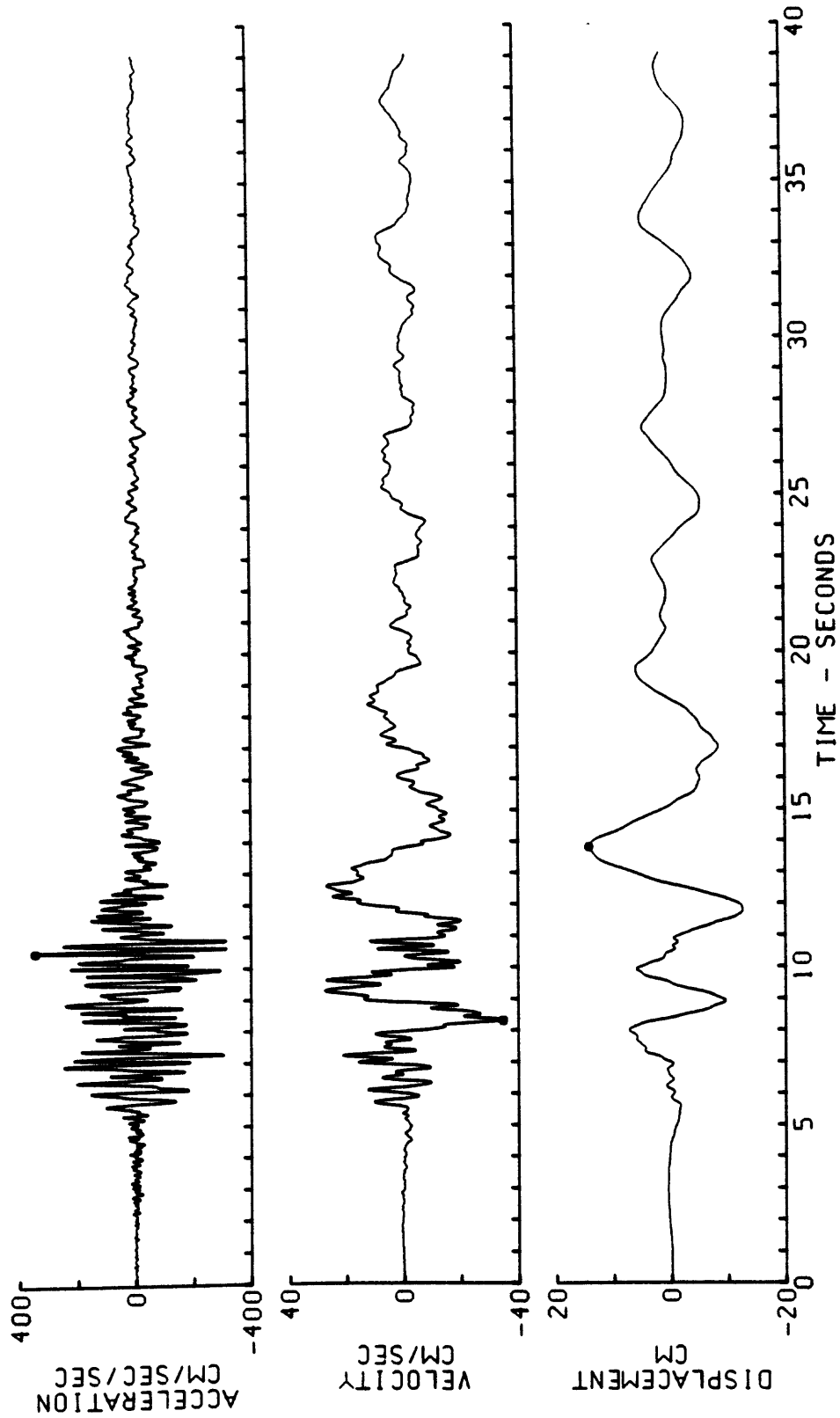
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-367.5 CM/SEC/SEC, VELOCITY=-39.07 CM/SEC, DISPL=13.36 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-131.1 CM/SEC/SEC, VELOCITY=-11.54 CM/SEC, DISPL=-7.120 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=350.0 CM/SEC/SEC, VELOCITY=-34.70 CM/SEC, DISPL=14.17 CM



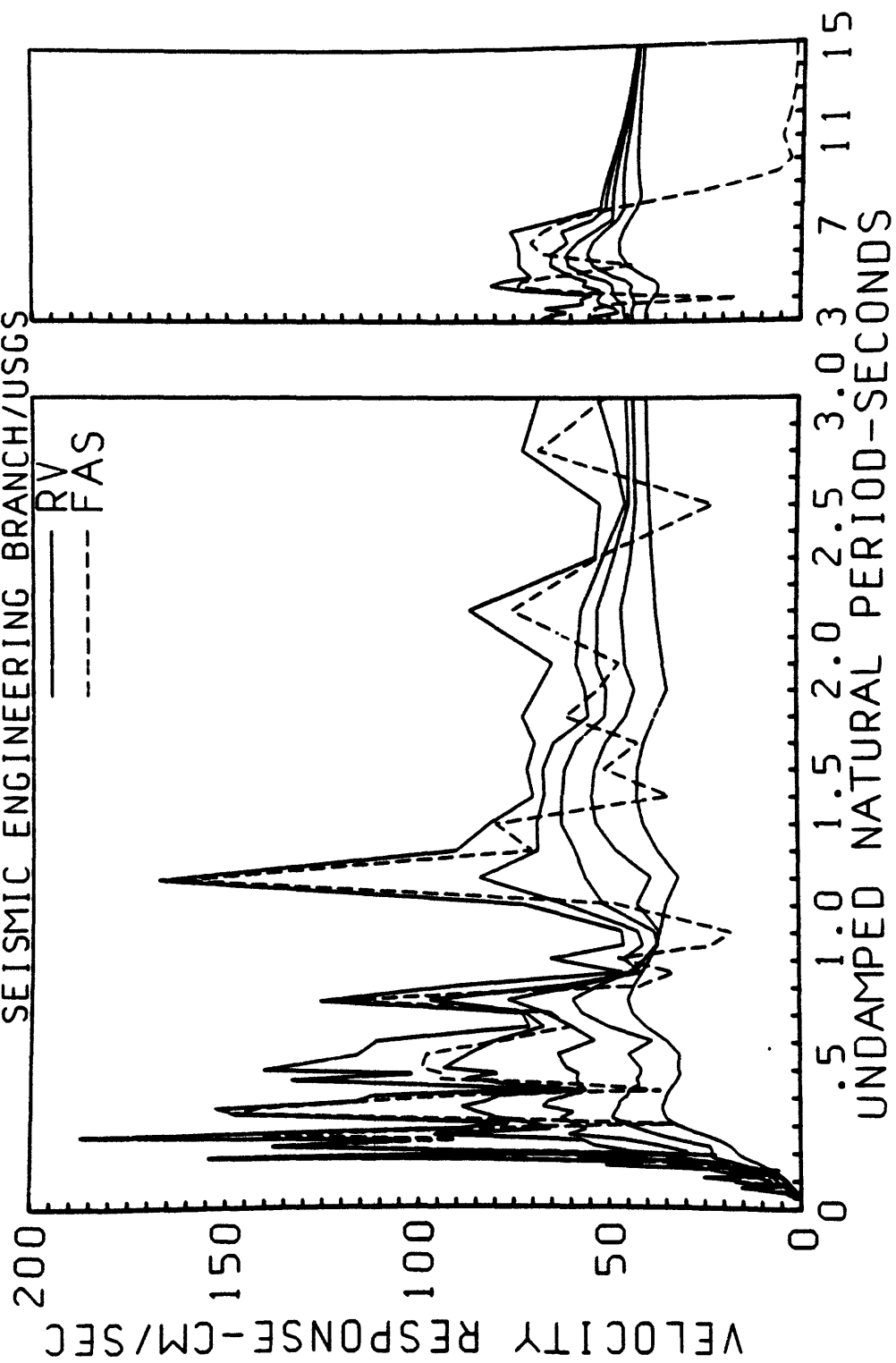
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 11.10/15/79.2317.230DEG

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



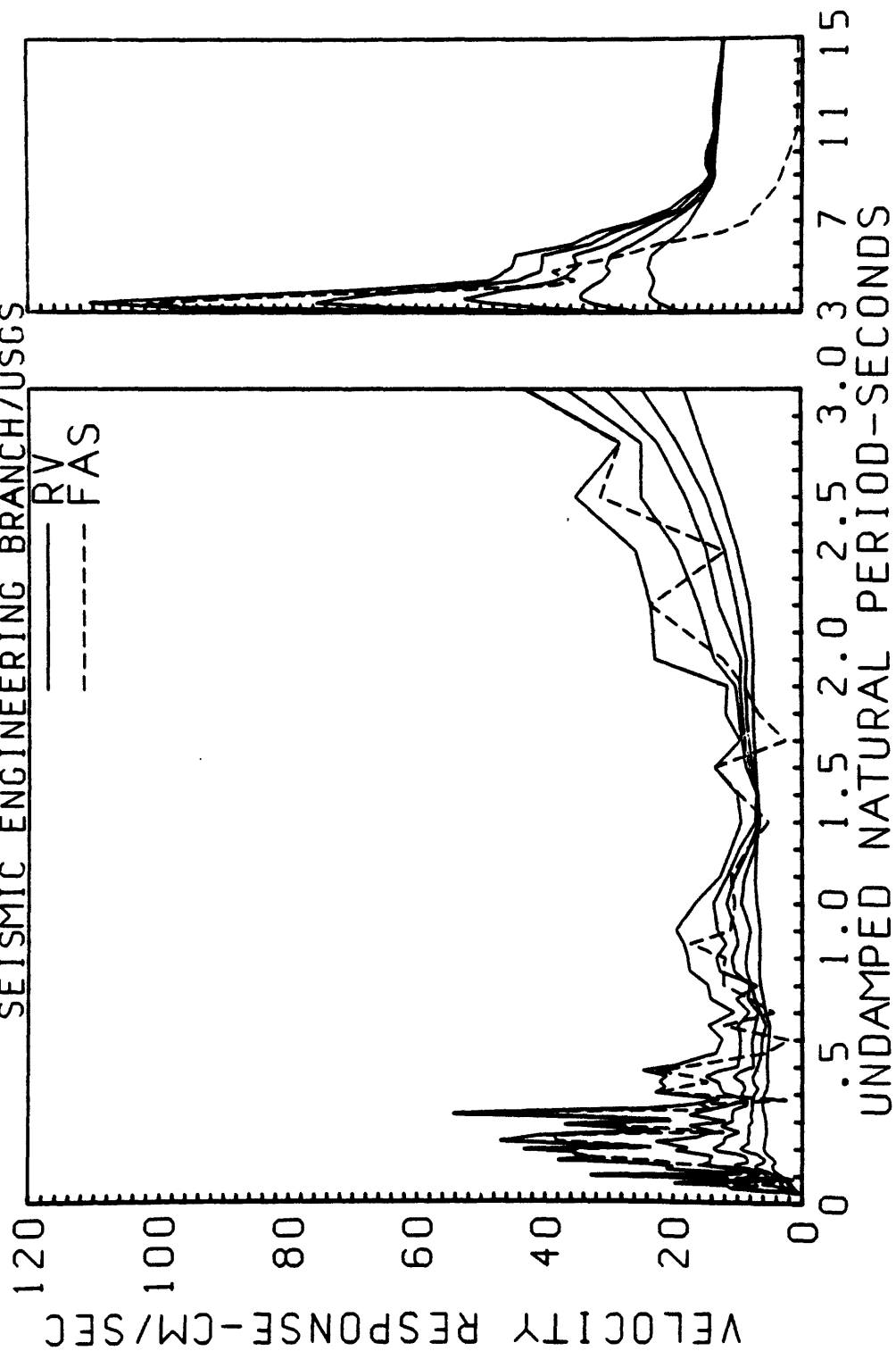
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 11, 10/15/79, 2317UTC, UP

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



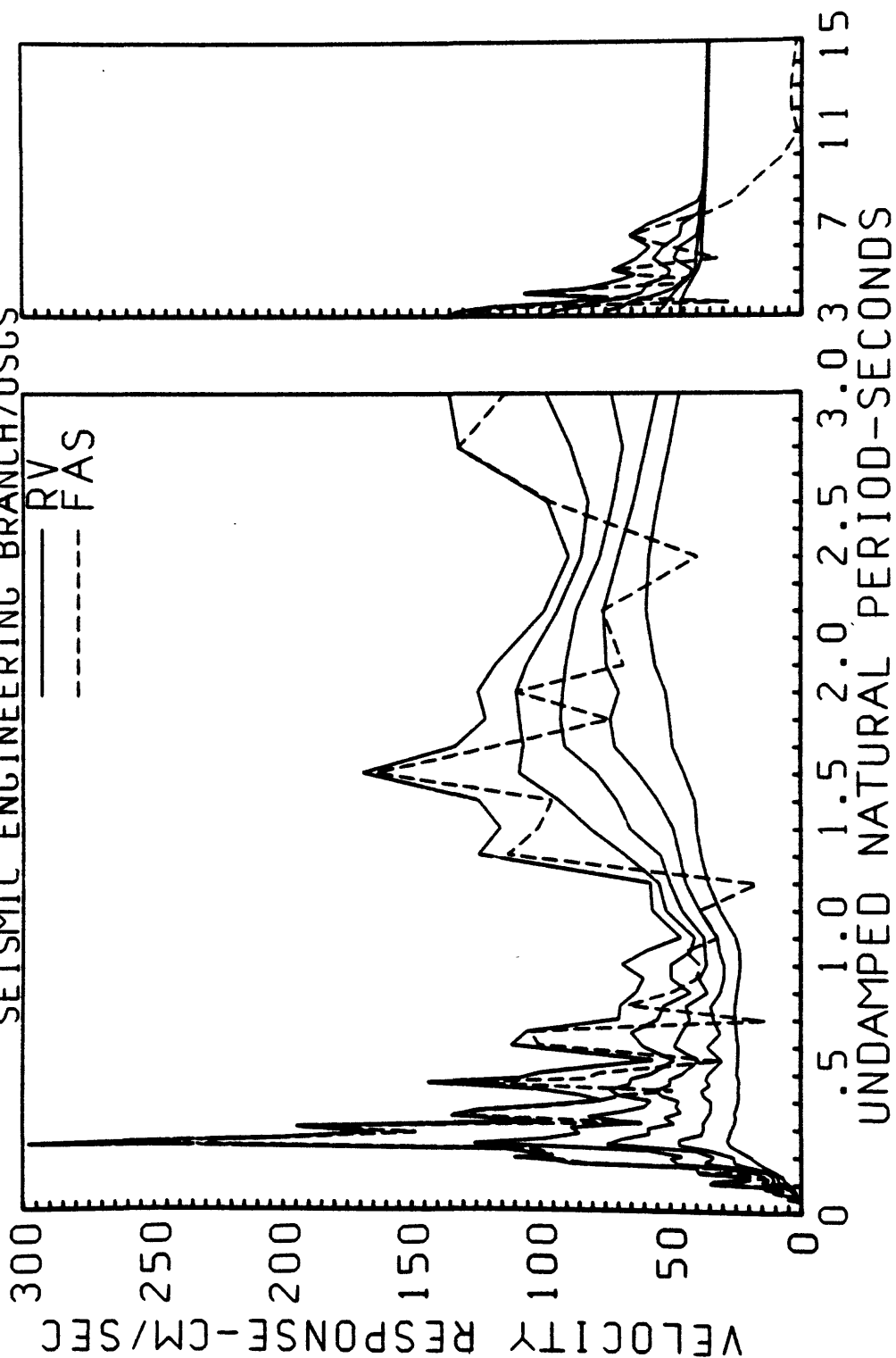
# RELATIVE VELOCITY RESPONSE SPECTRUM

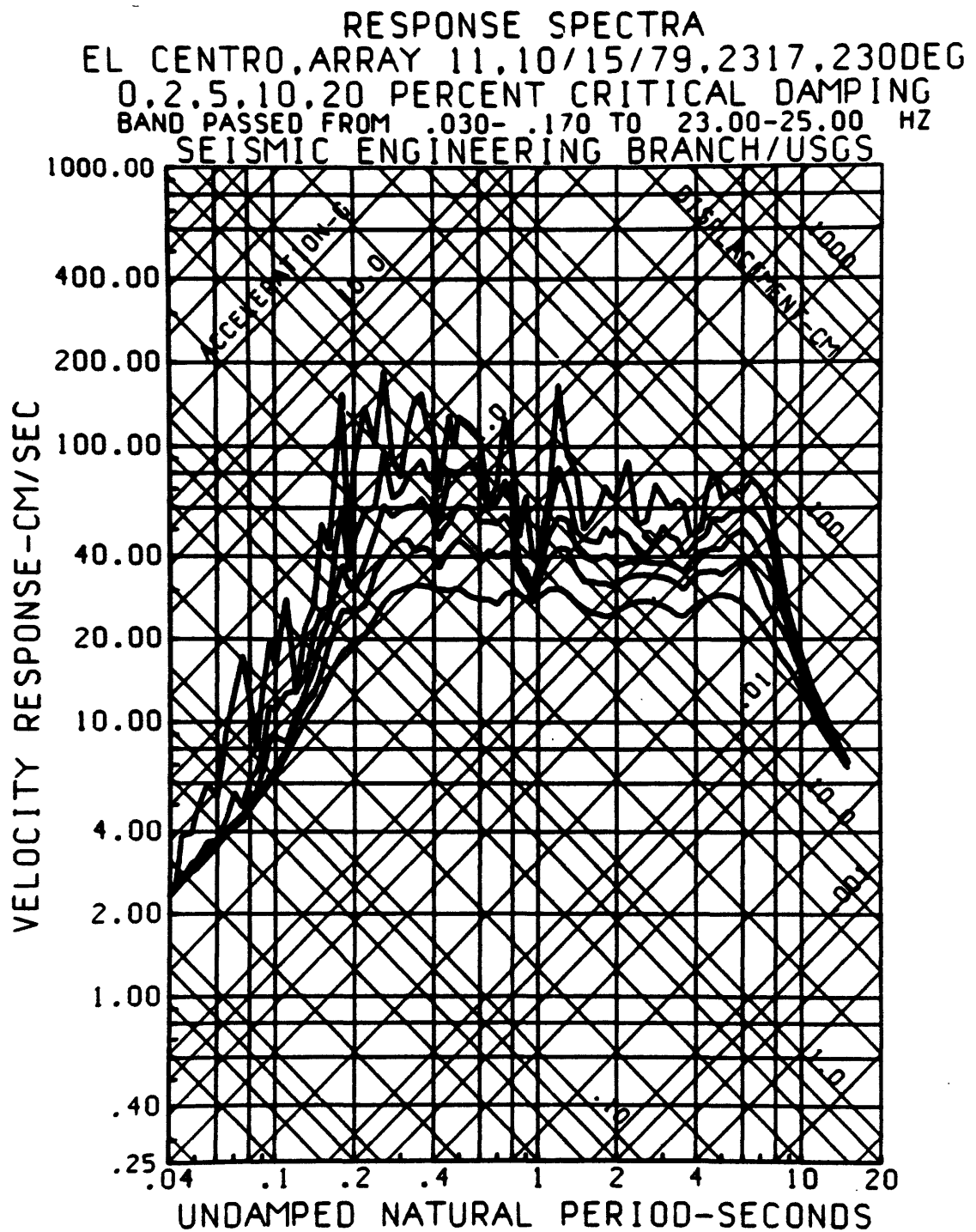
EL CENTRO, ARRAY 11.10/15/79, 2317.140 DEG

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

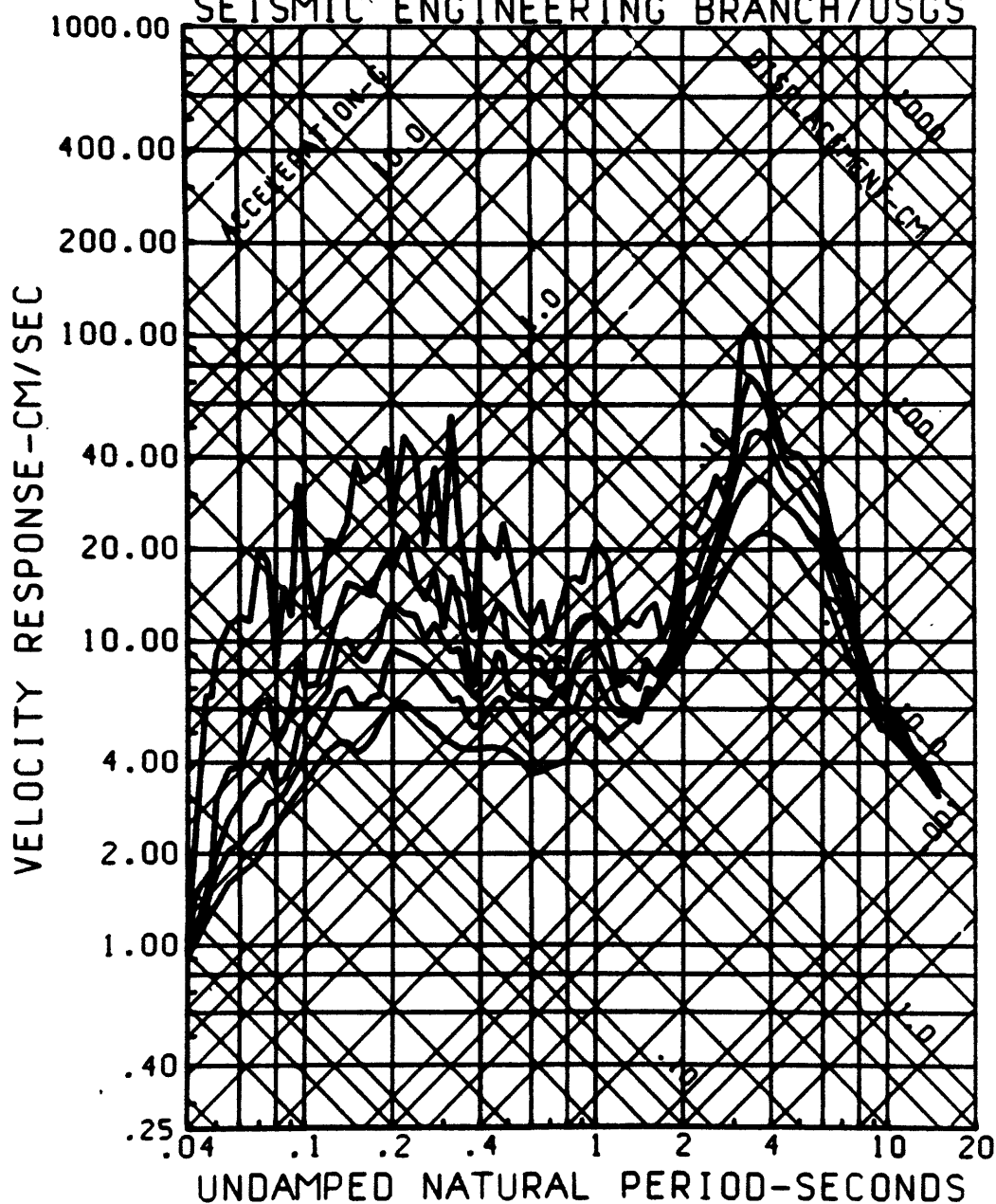
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

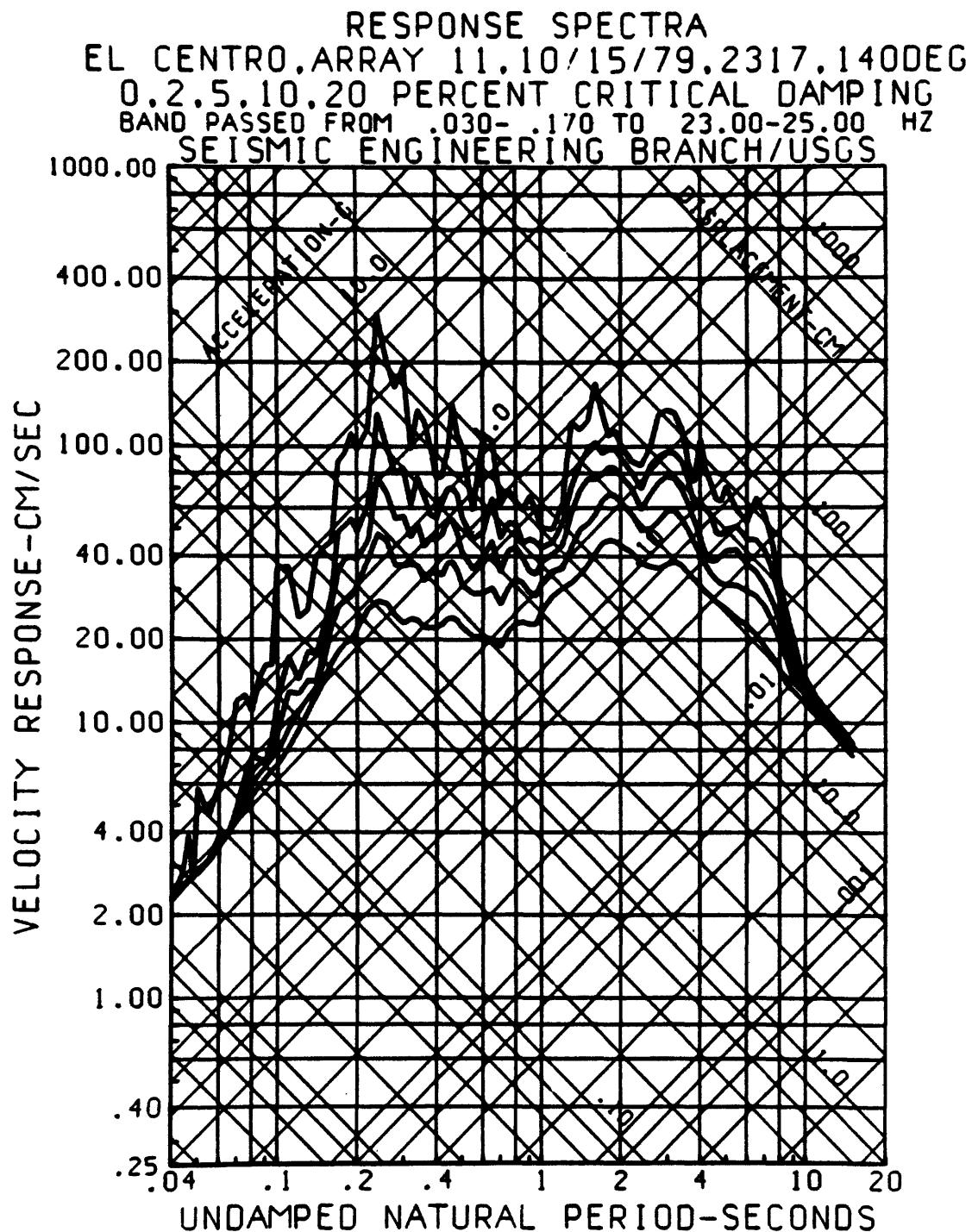




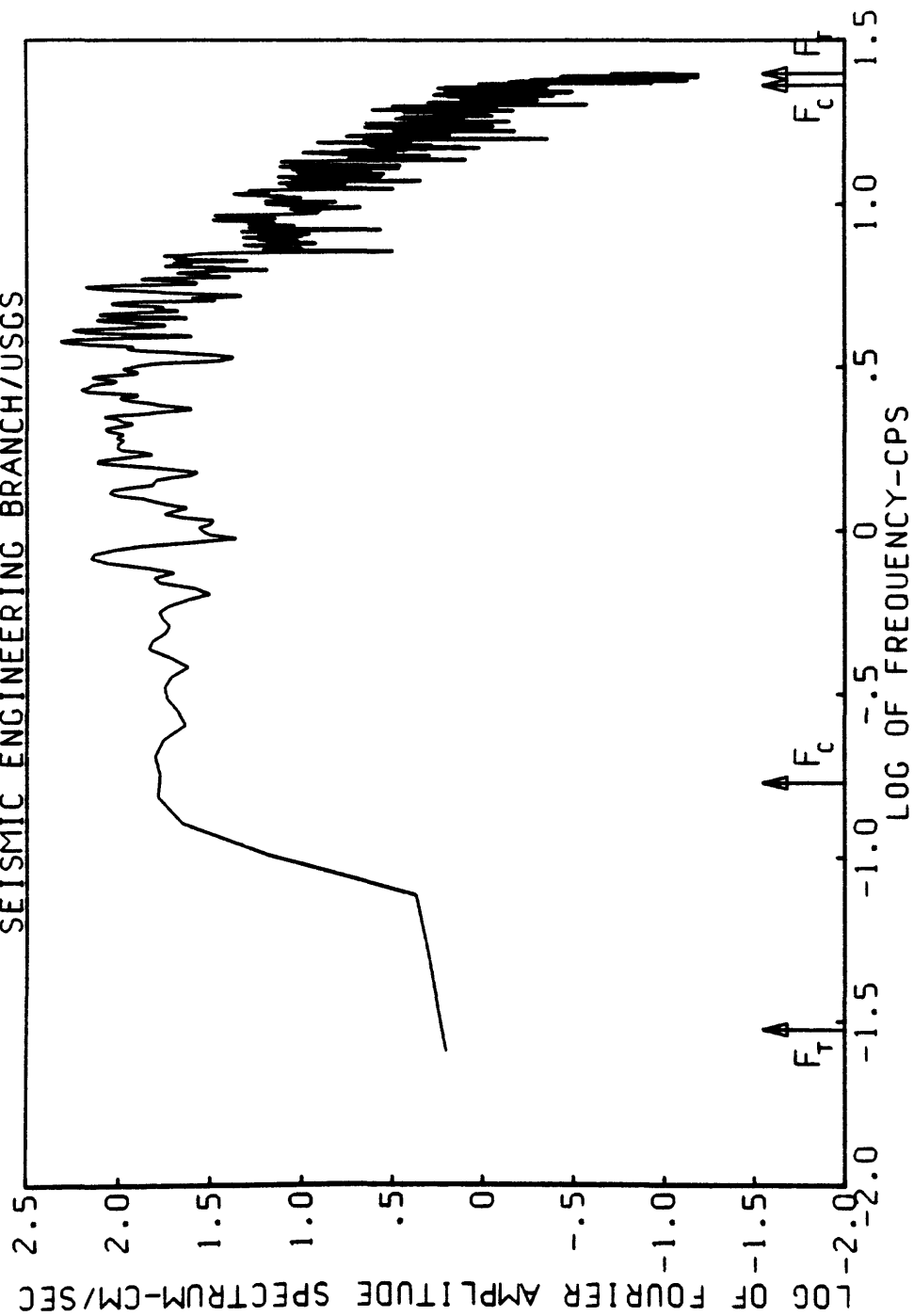
RESPONSE SPECTRA  
 EL CENTRO.ARRAY 11.10/15/79.2317UTC.UP  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



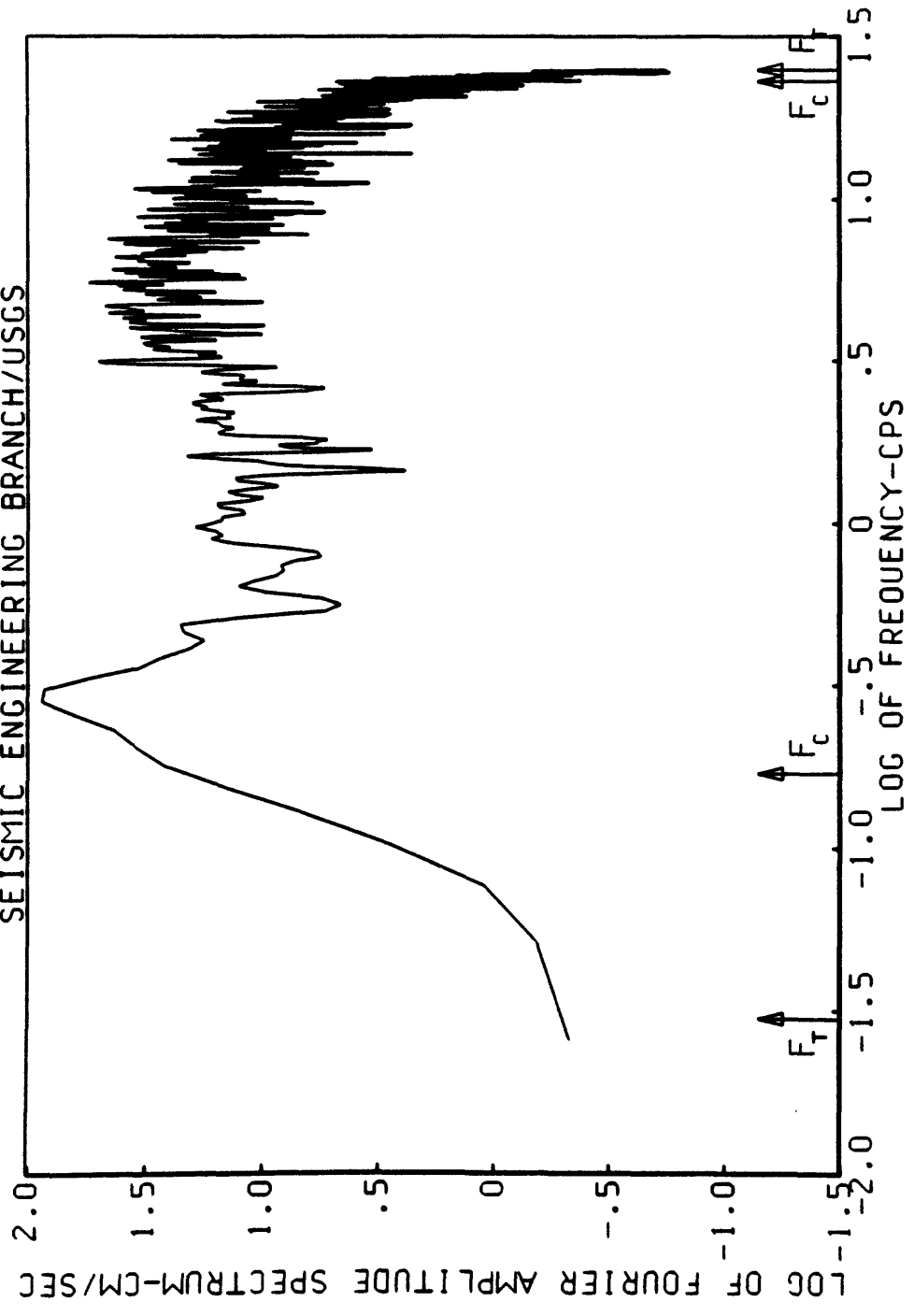




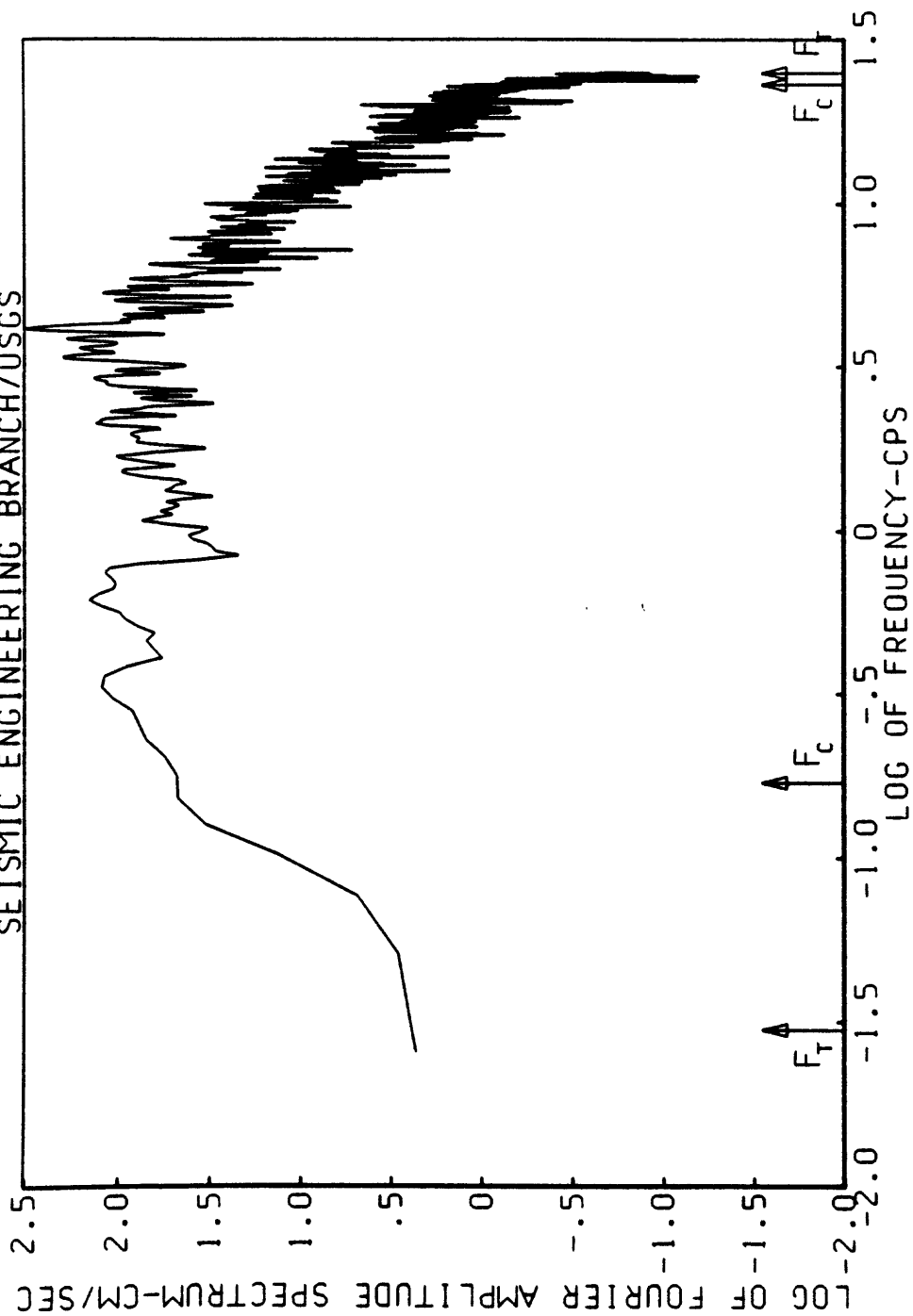
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



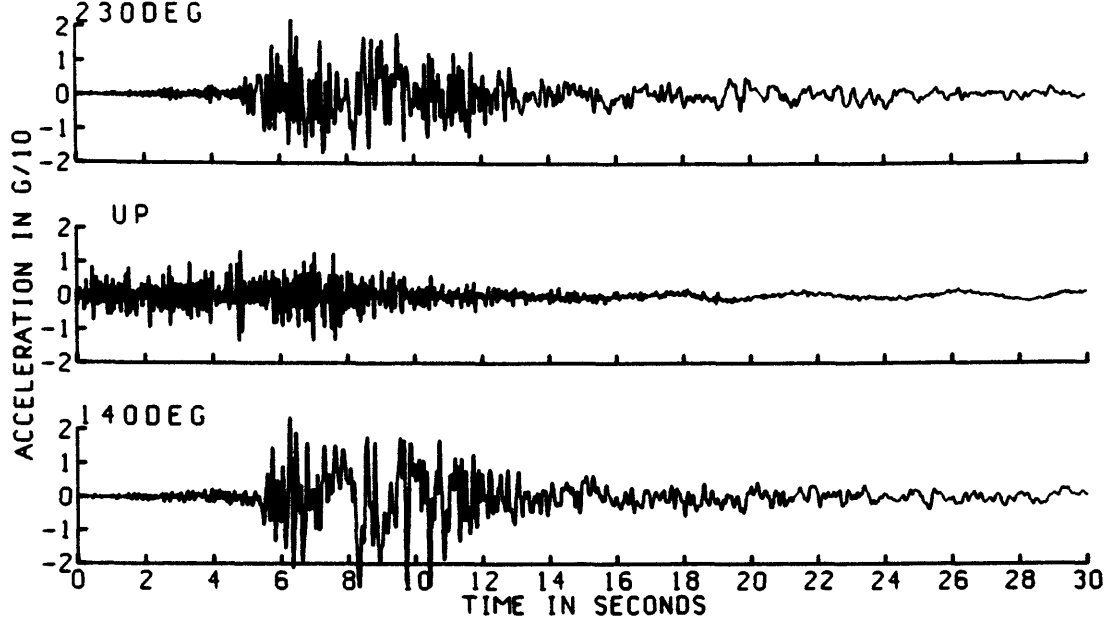
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



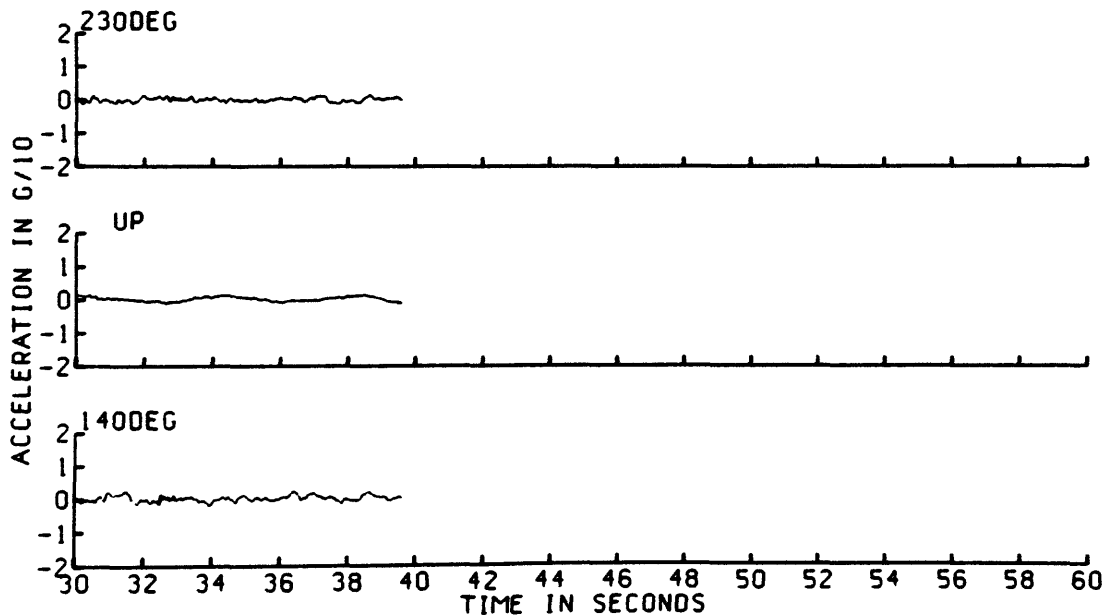
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 MCCABE SCHOOL, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



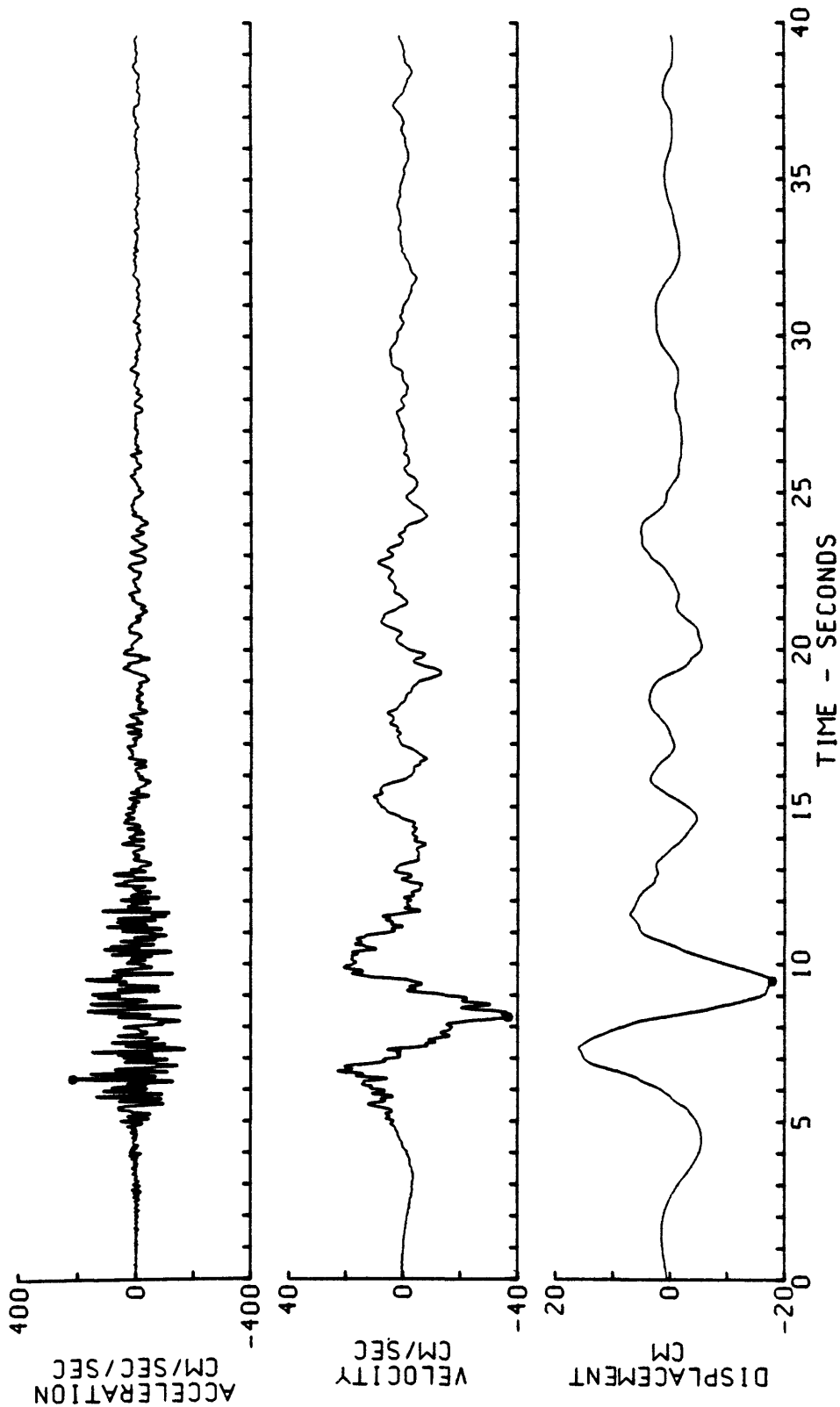
UNCORRECTED ACCELEROGRAM  
 EL CENTRO.ARRAY 3.PINE UNION SCH..10/15/79.2317UTC  
 THE 3 PEAK VALUES(G) ARE .2243 .1348 .2682



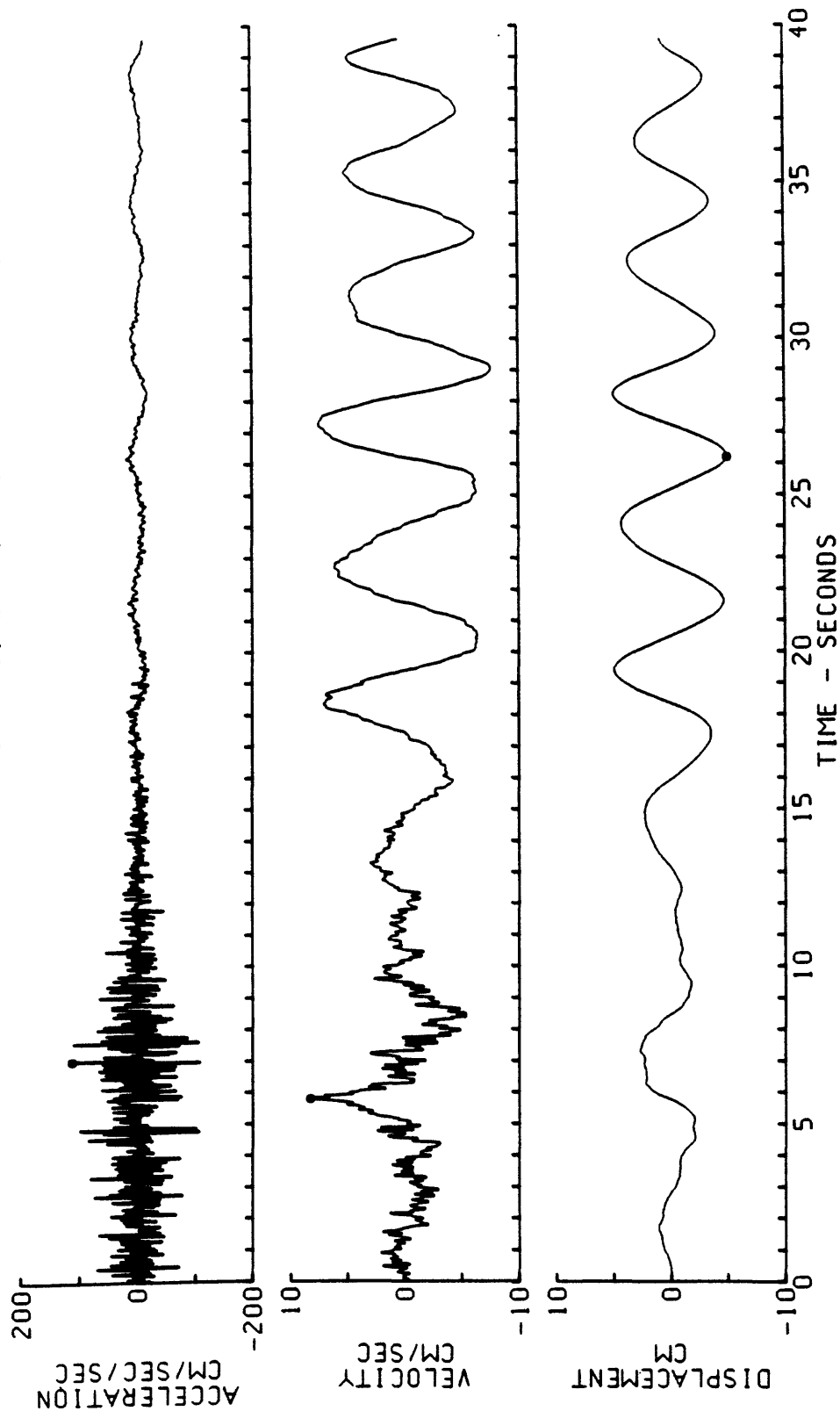
EL CENTRO.ARRAY 3.PINE UNION SCH..10/15/79.2317UTC



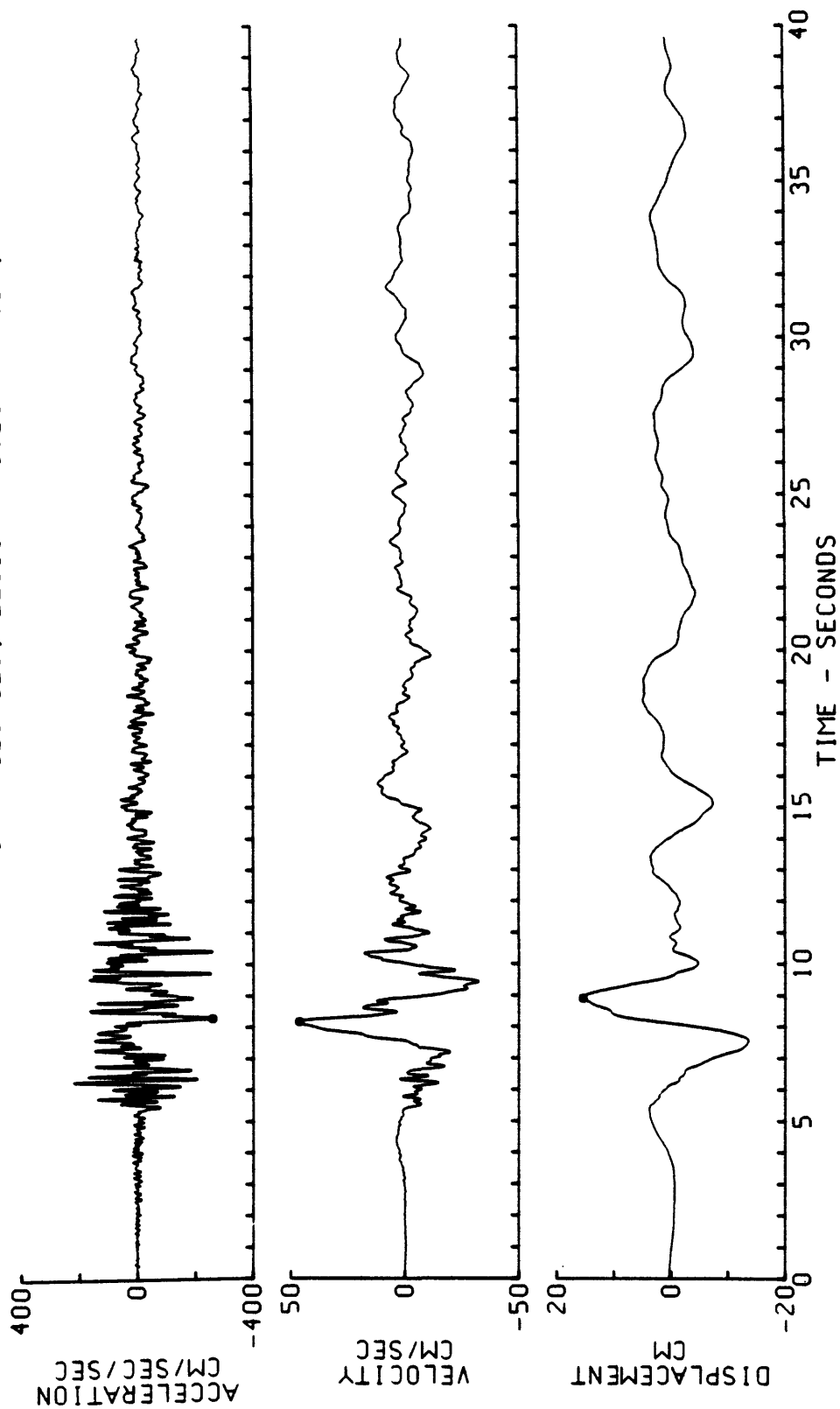
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=217.8 CM/SEC/SEC, VELOCITY=-36.69 CM/SEC, DISPL=-17.87 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=113.1 CM/SEC/SEC, VELOCITY=8.290 CM/SEC, DISPL=-5.010 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-258.6 CM/SEC/SEC, VELOCITY=46.23 CM/SEC, DISPL=15.35 CM





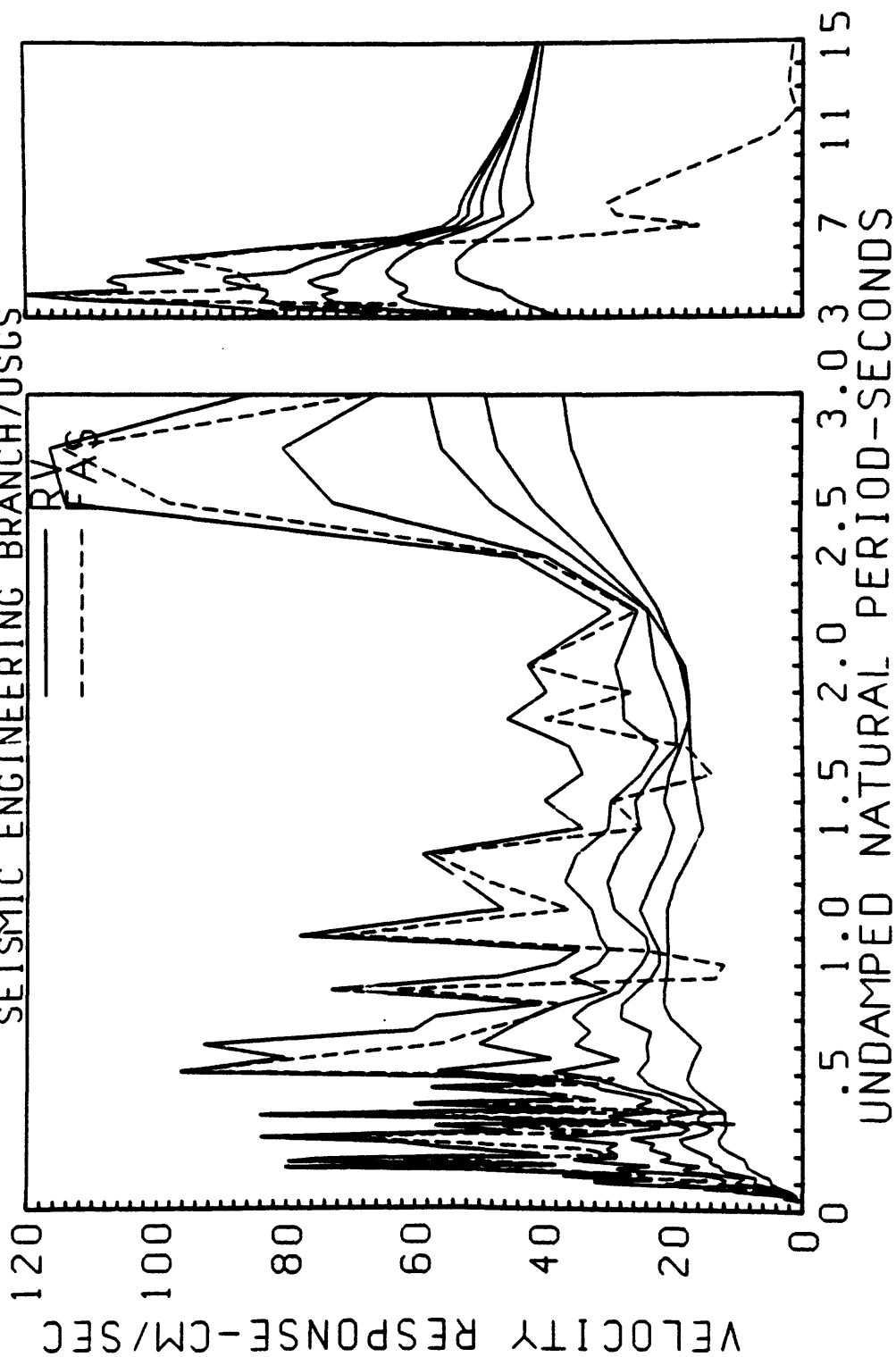
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 3.10/15/79.2317.230DEG

0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



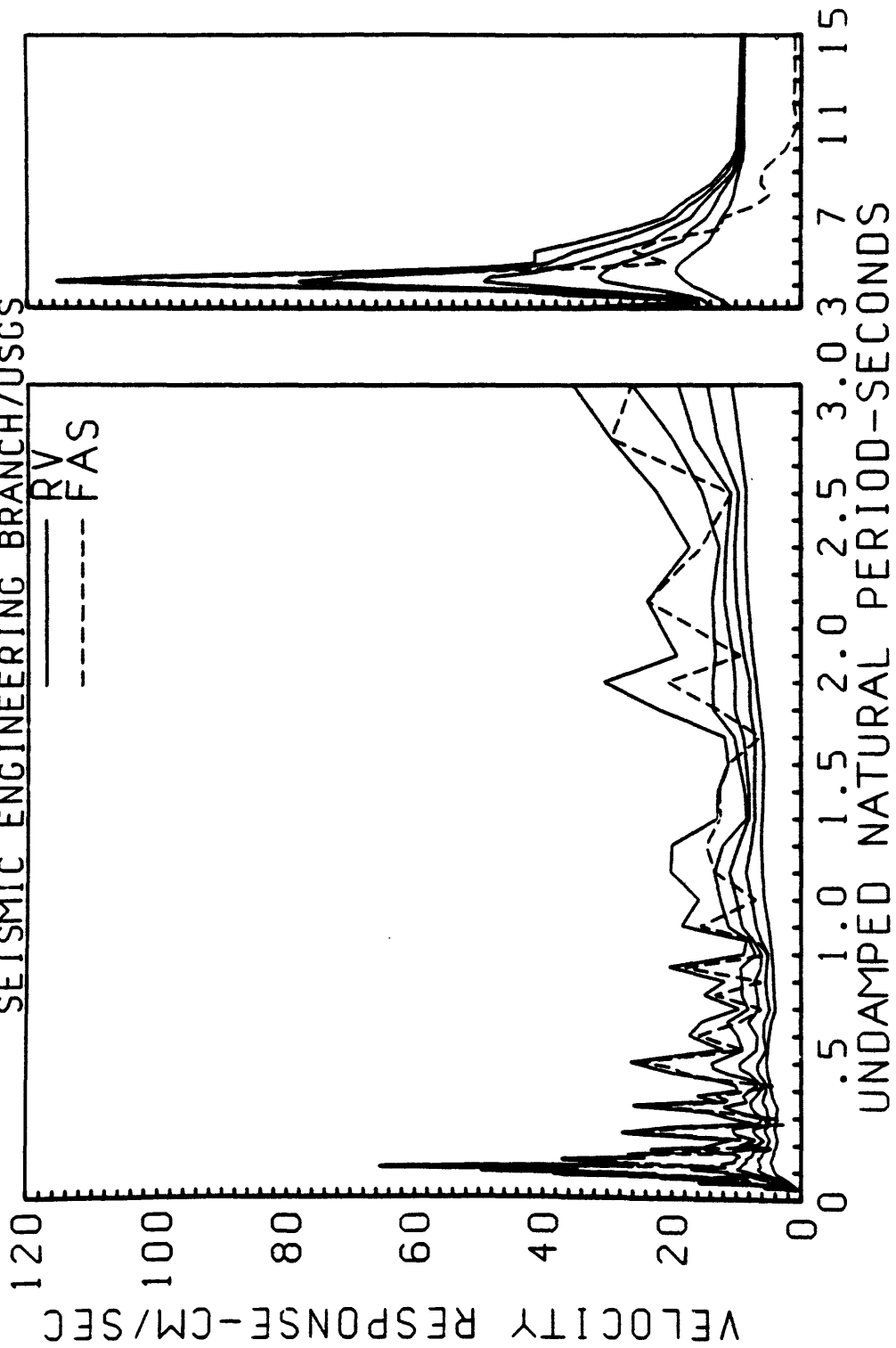
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO.ARRAY 3.10/15/79.2317UTC.UP

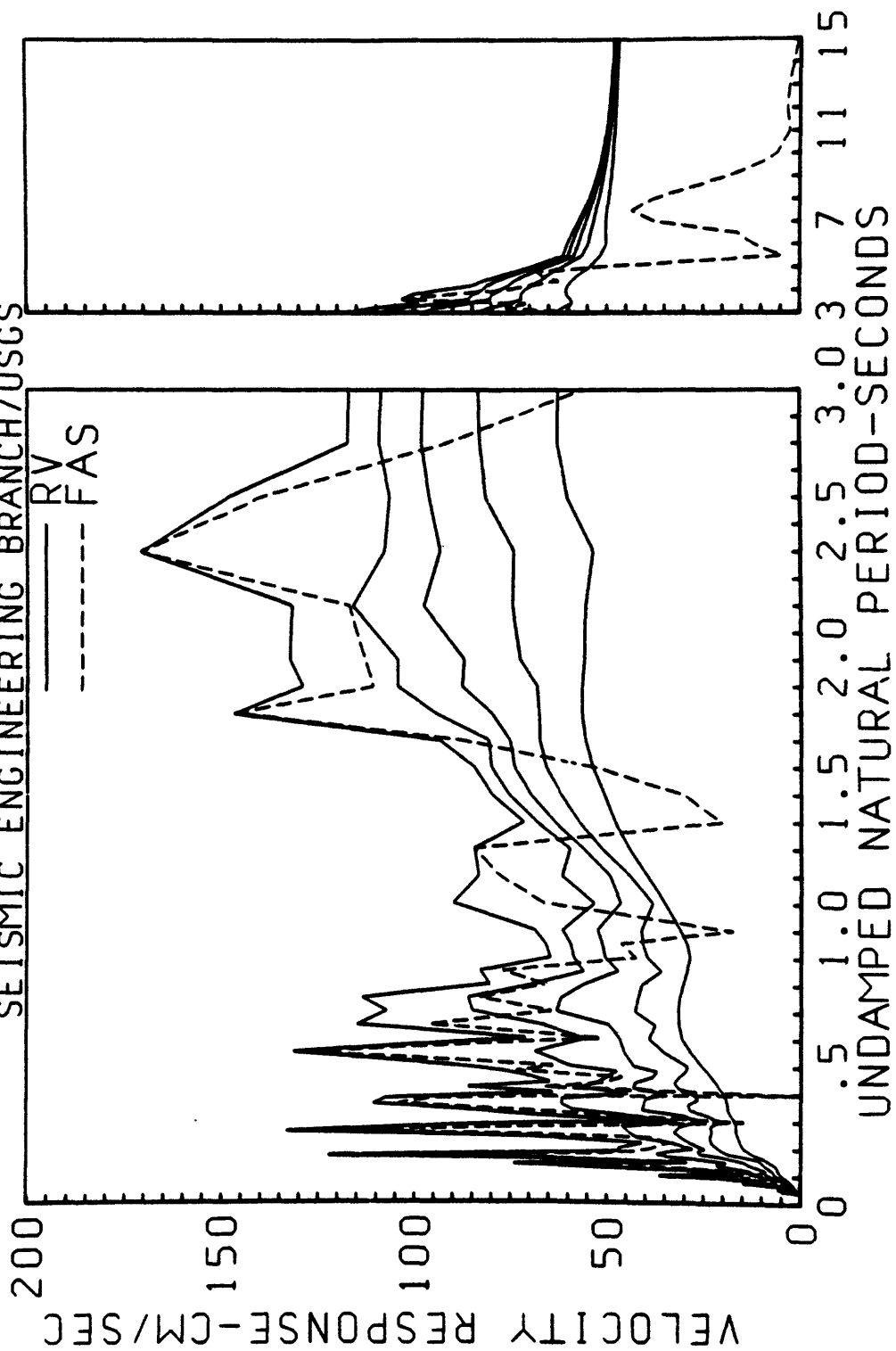
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

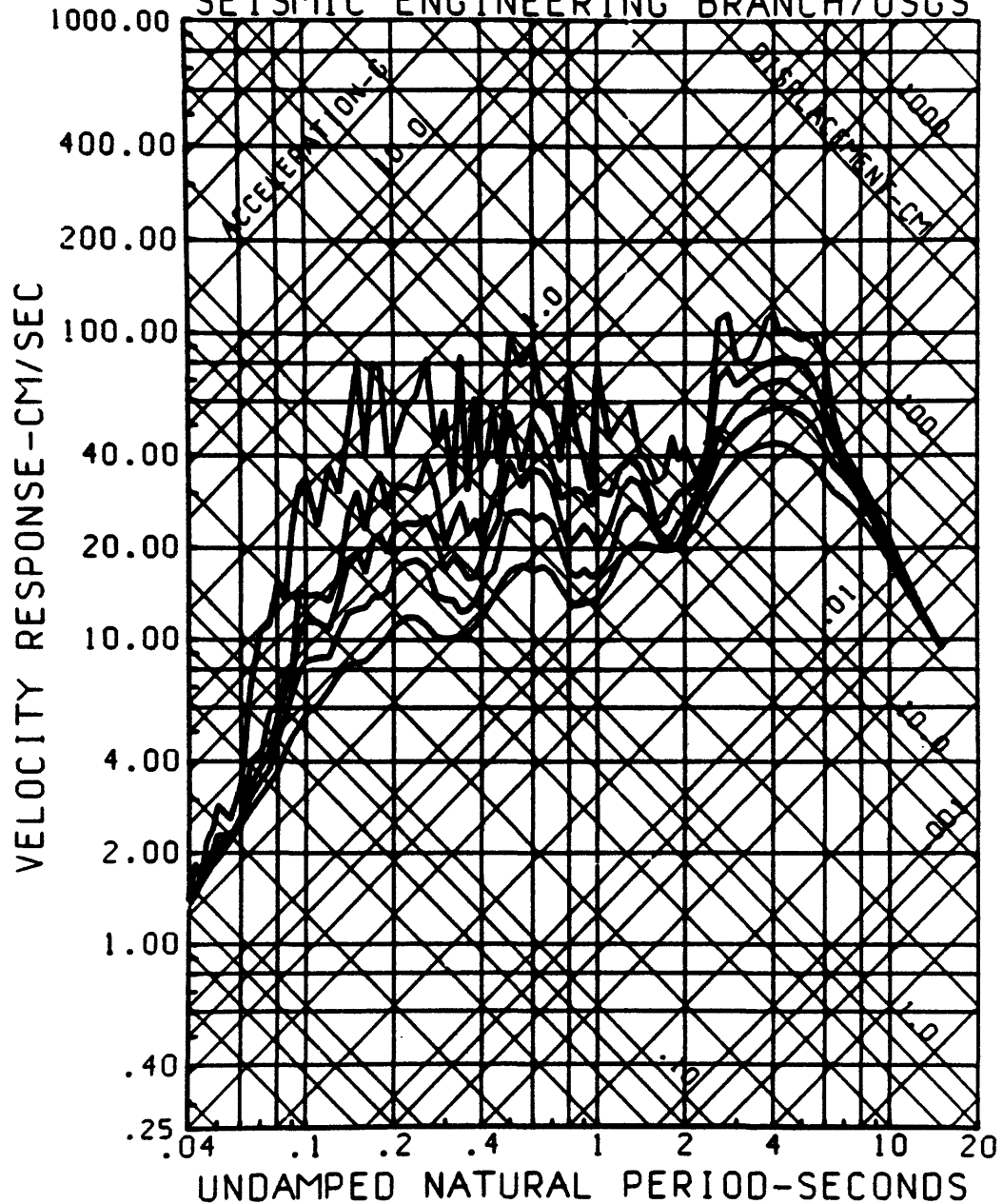
SEISMIC ENGINEERING BRANCH/USGS



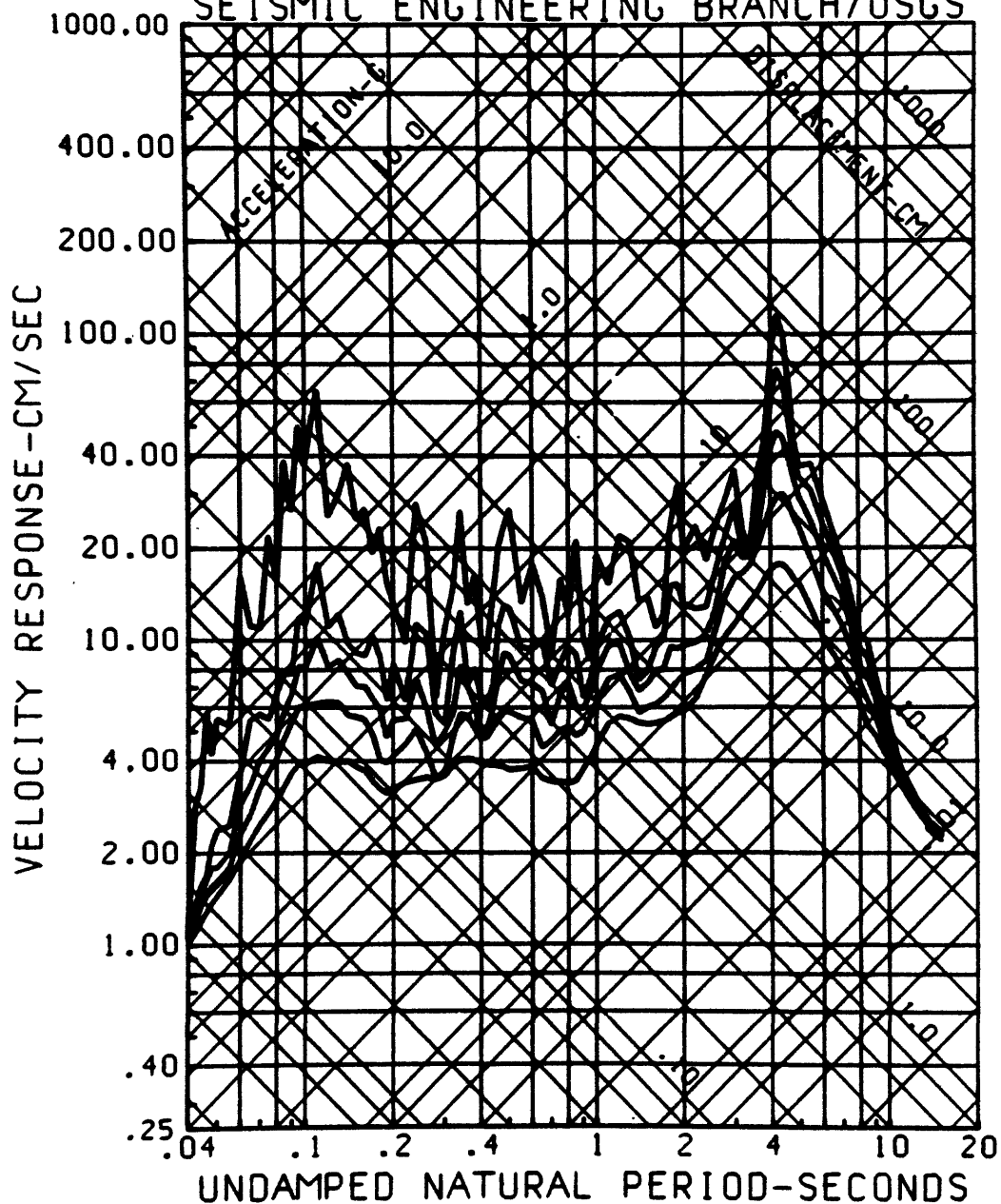
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 3.10/15/79, 2317, 140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



RESPONSE SPECTRA  
 EL CENTRO, ARRAY 3, 10/15/79, 2317, 230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



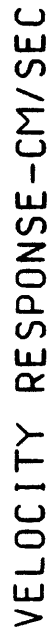
RESPONSE SPECTRA  
 EL CENTRO ARRAY 3, 10/15/79, 2317 UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



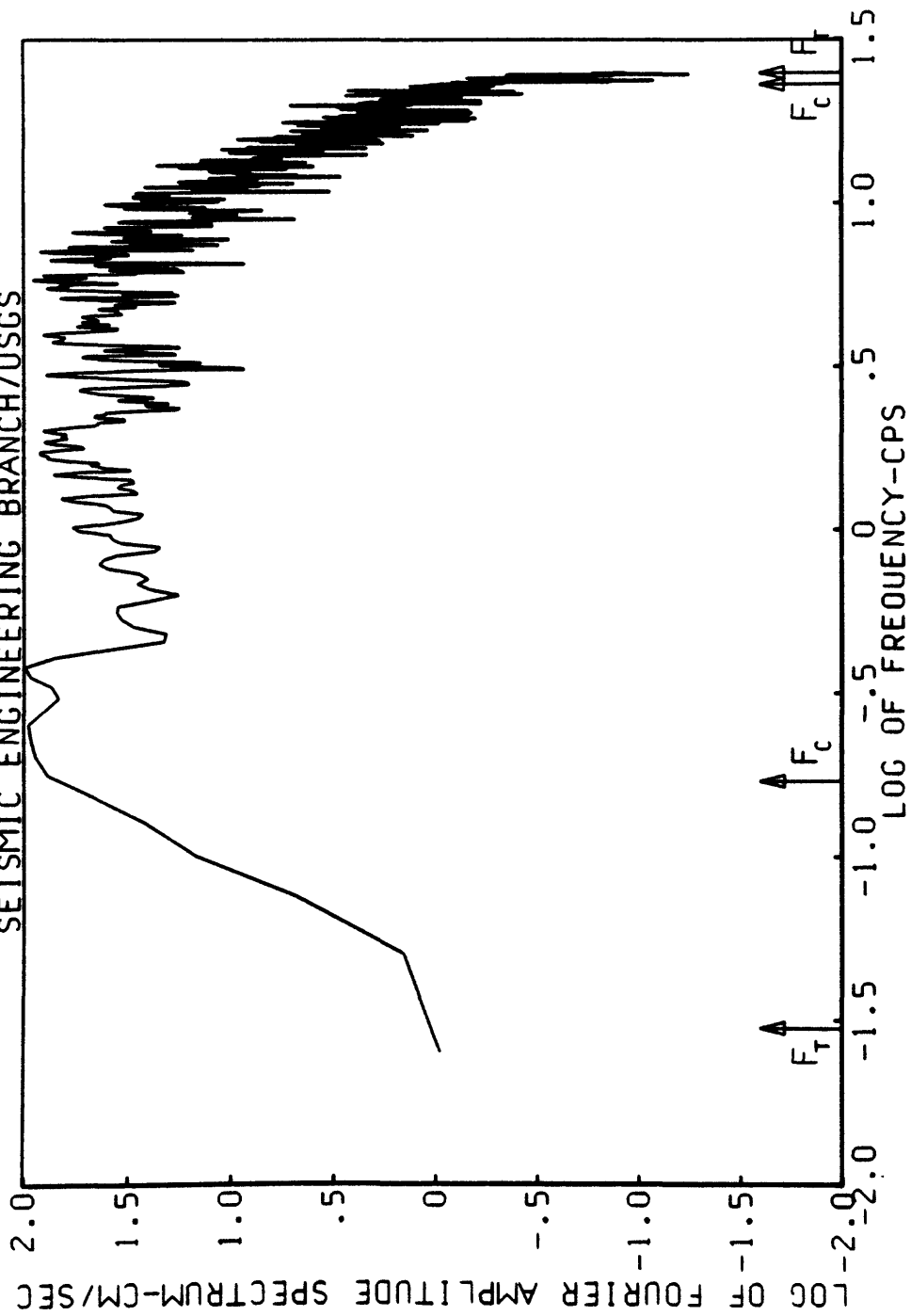
EL CENTRO, ARRAY 3, 10/15/79, 2317.140 DEG

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

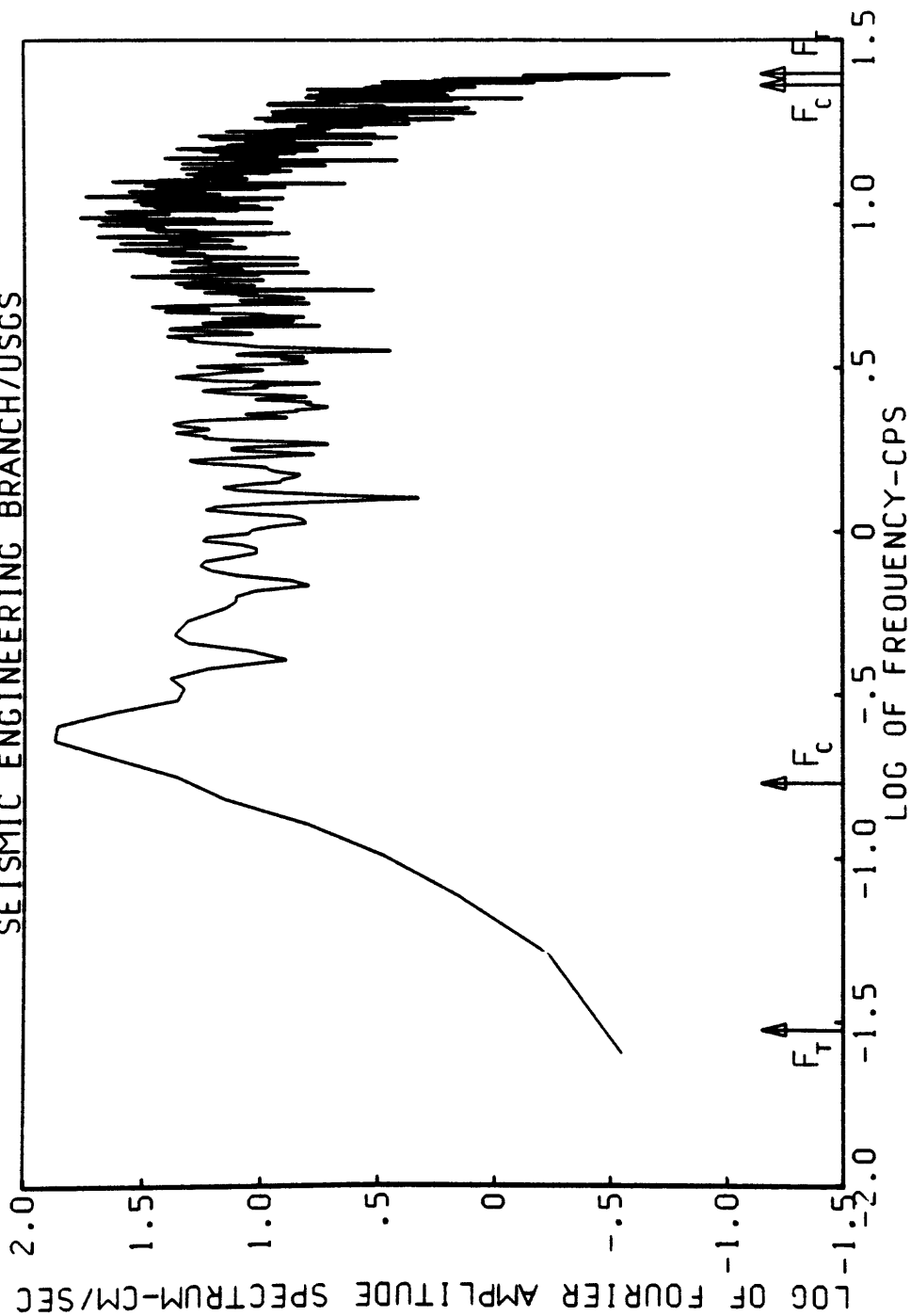
SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL.EL CENTRO.CALIFORNIA.COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

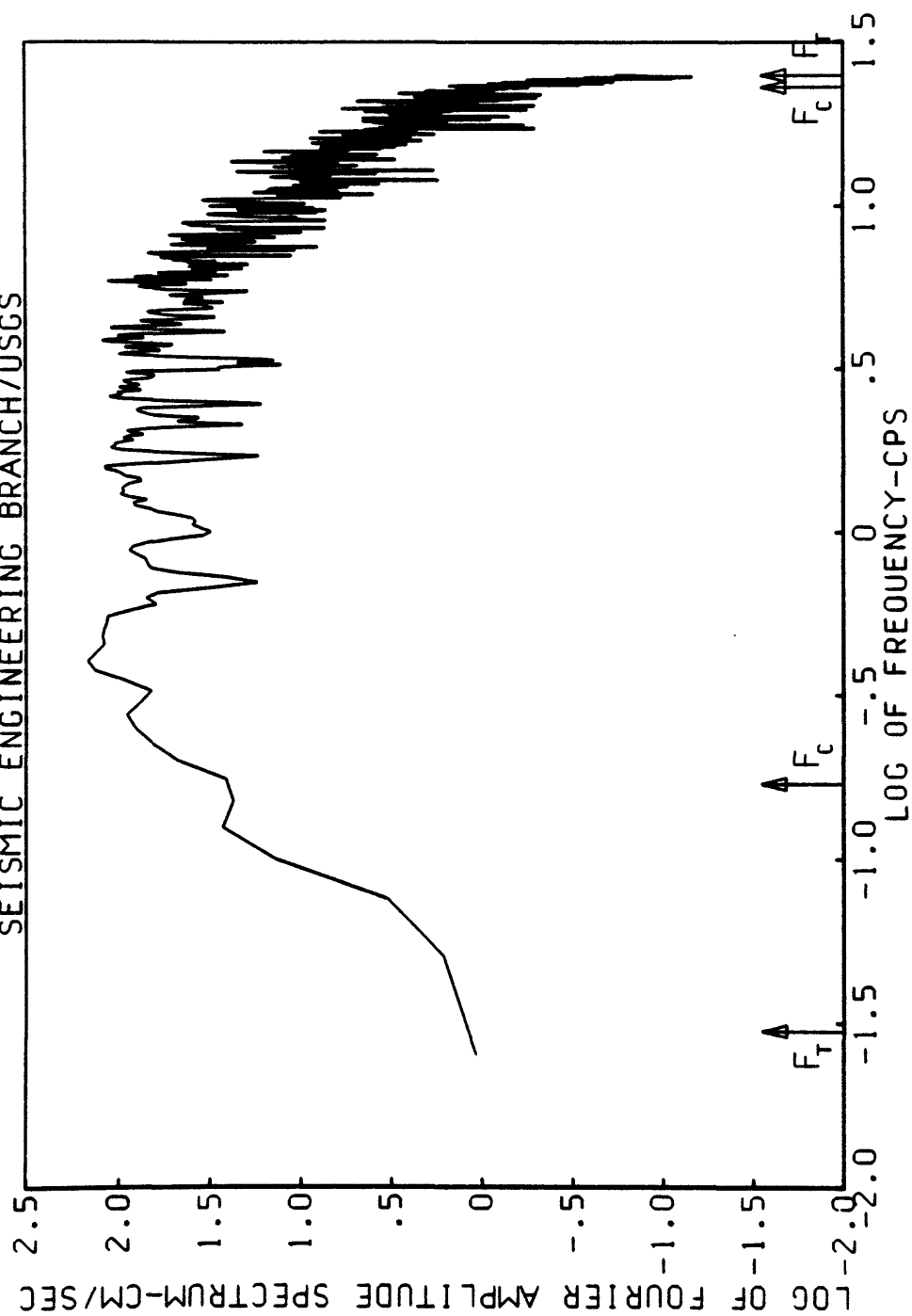


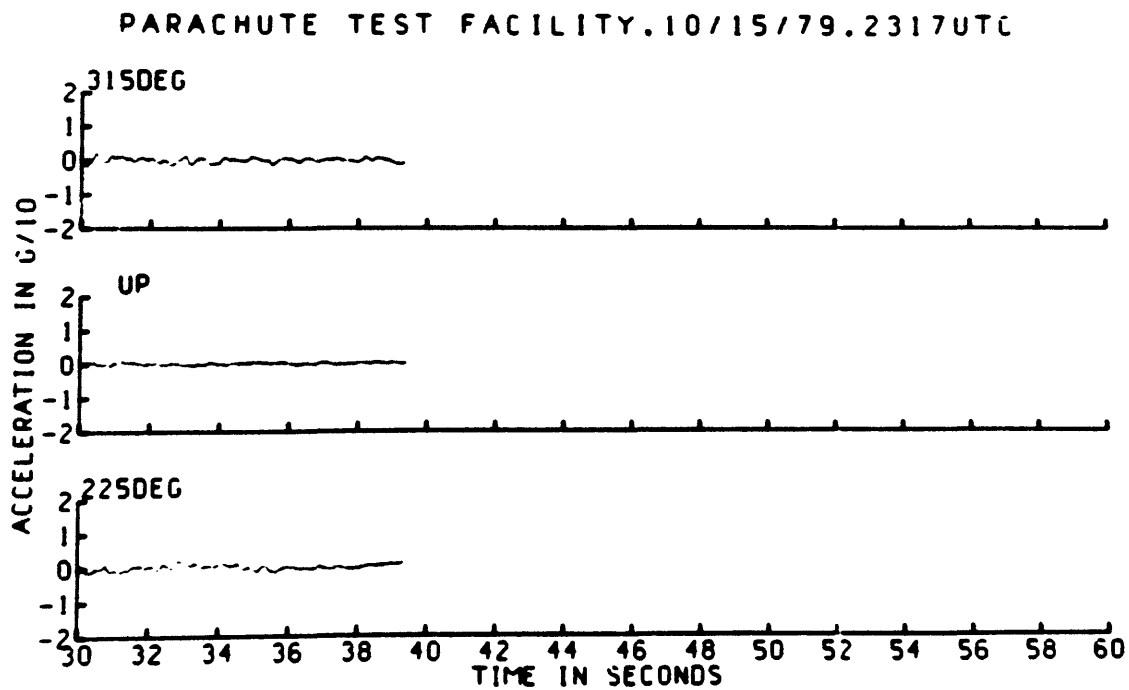
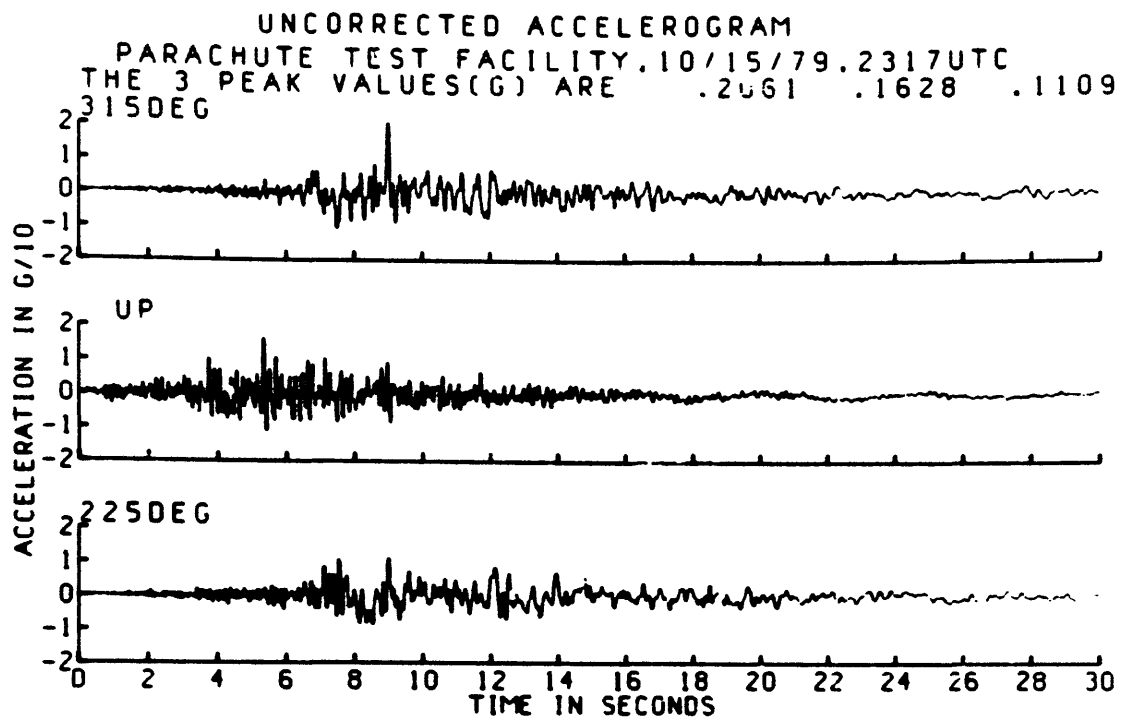
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL. EL CENTRO, CALIFORNIA. COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



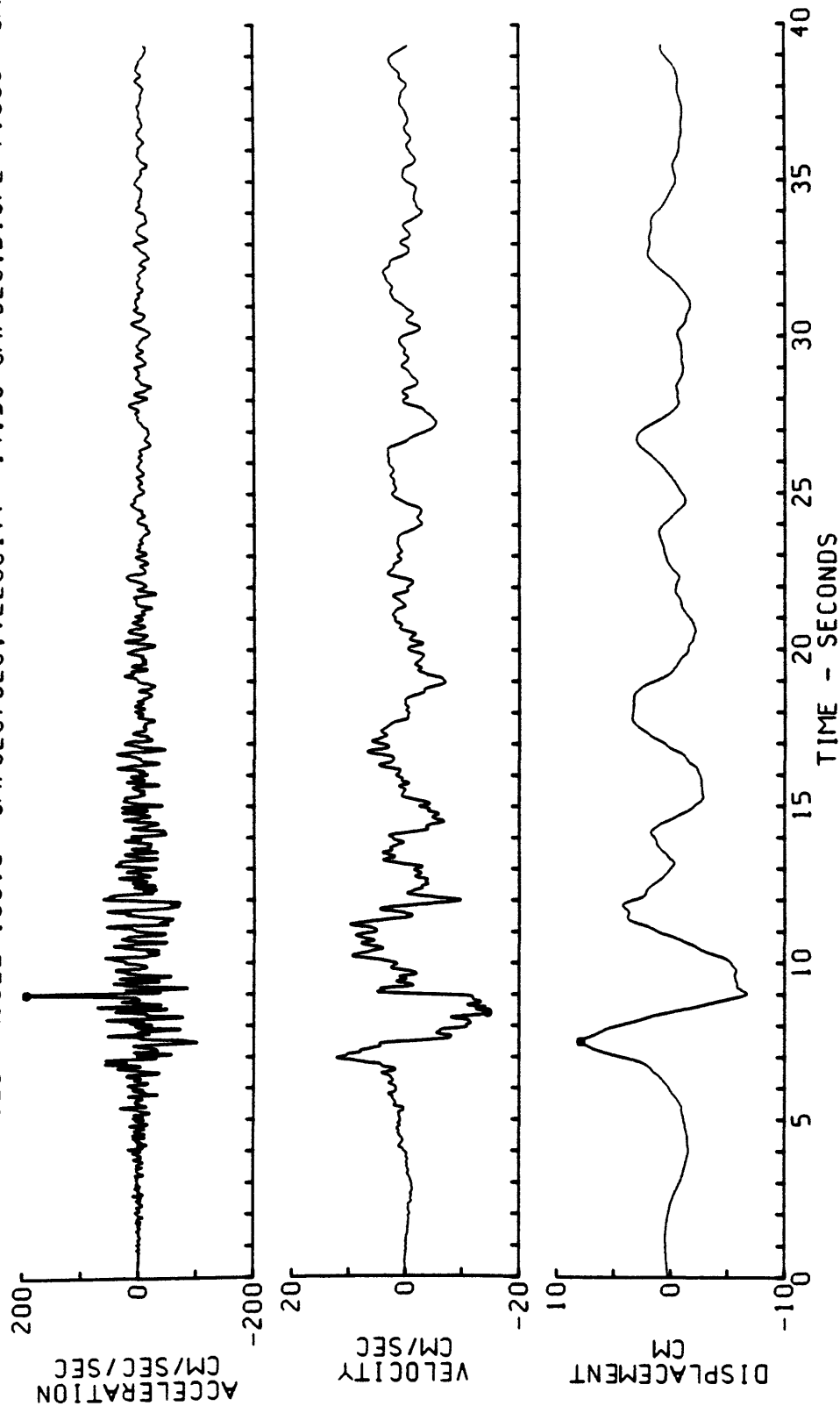


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PINE UNION SCHOOL, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

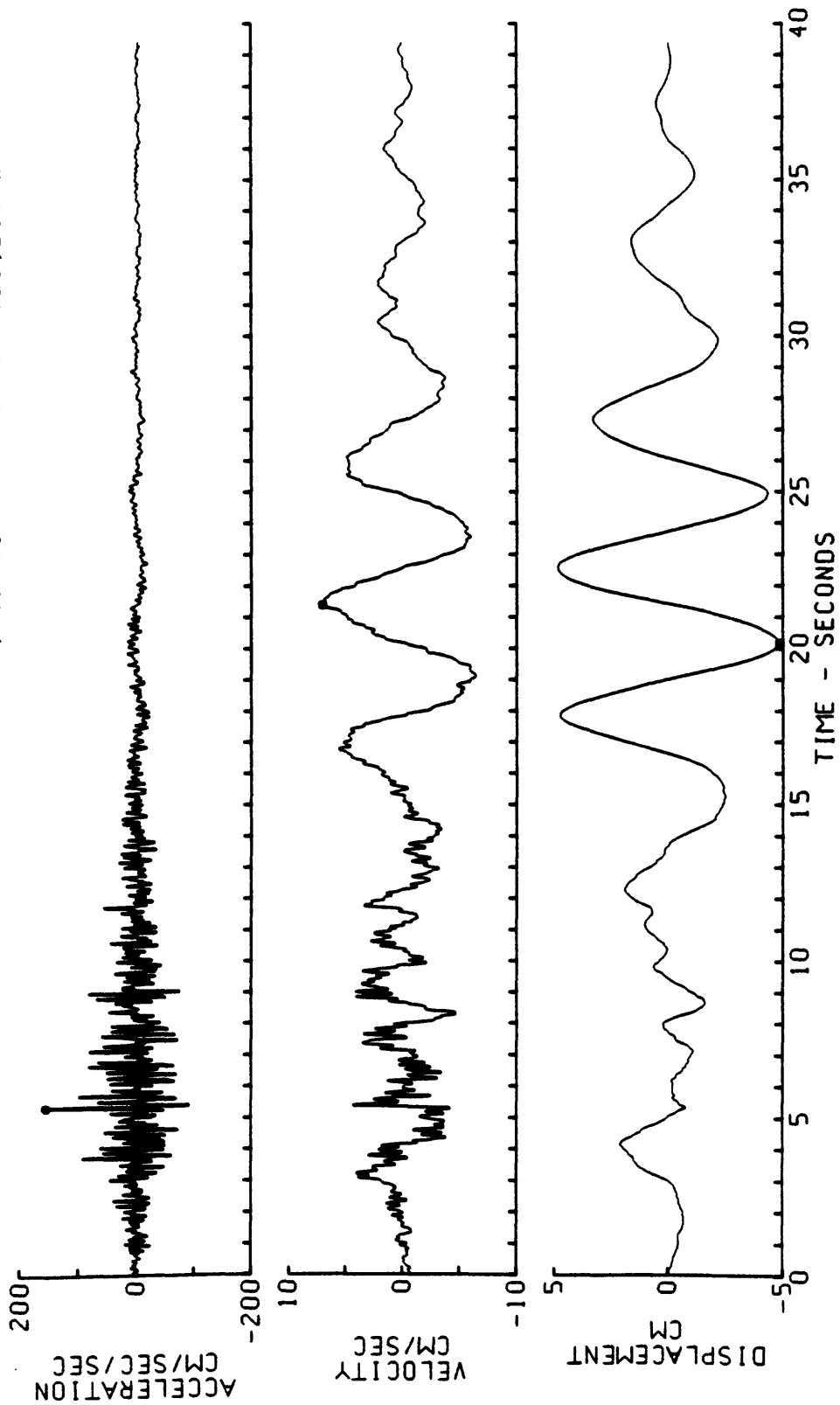




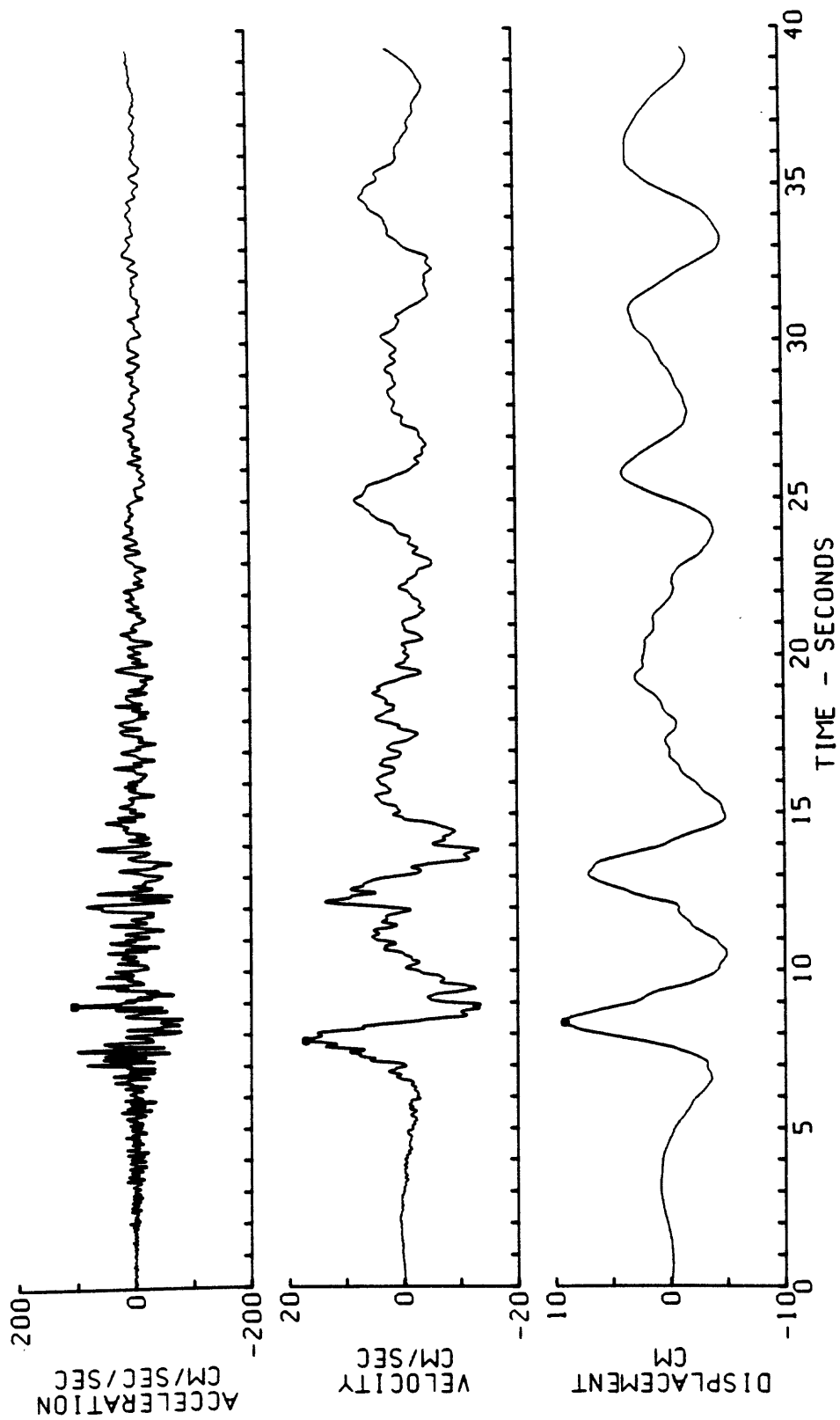
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP 315 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=196.8 CM/SEC/SEC, VELOCITY=-14.53 CM/SEC, DISPL=7.860 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=156.5 CM/SEC/SEC, VELOCITY=7.070 CM/SEC, DISPL=-4.860 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP 225 DEG  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=106.7 CM/SEC/SEC, VELOCITY=17.05 CM/SEC, DISPL=9.160 CM



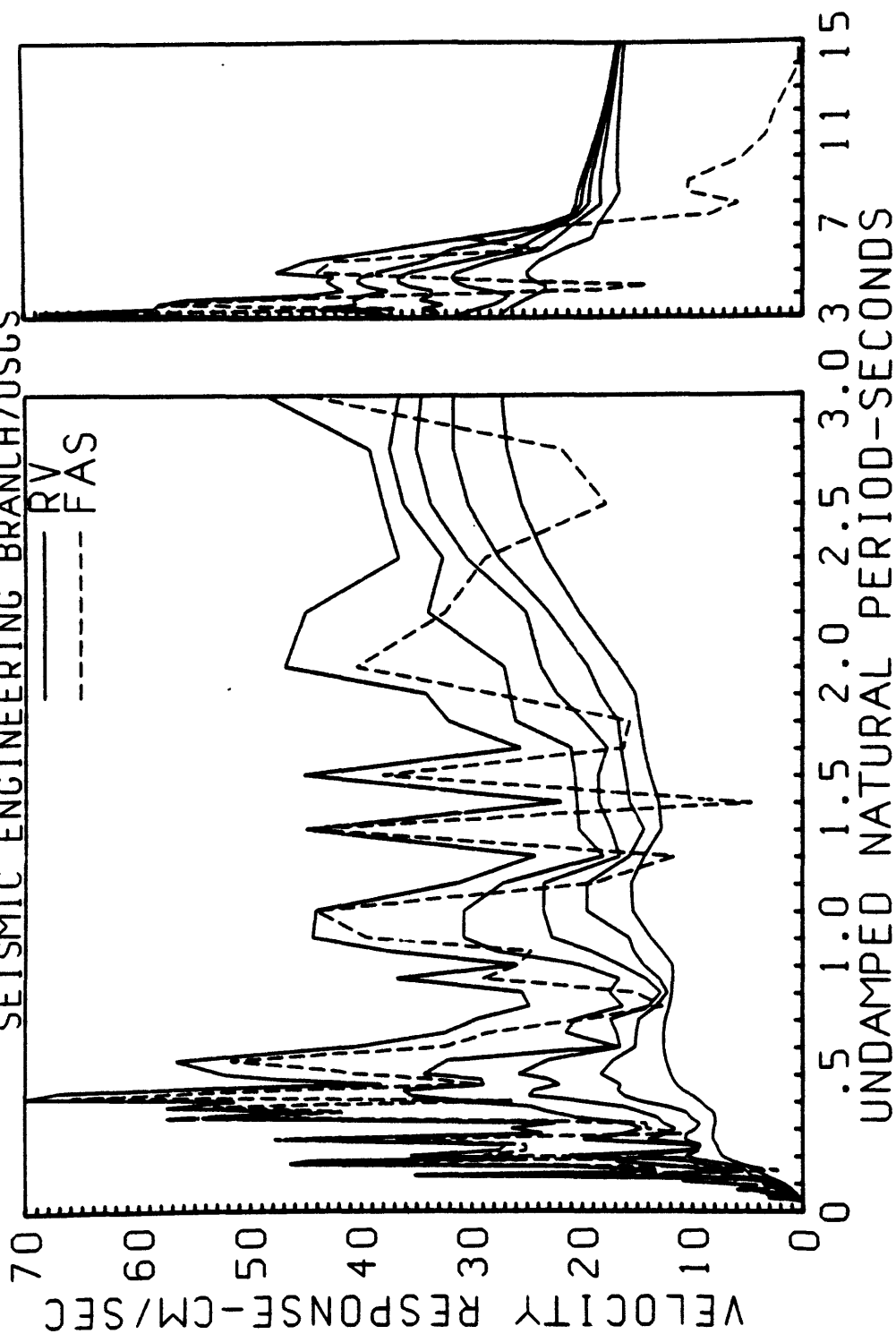
# RELATIVE VELOCITY RESPONSE SPECTRUM

PARACHUTE TST FACL..10/15/79.2317.315DEG

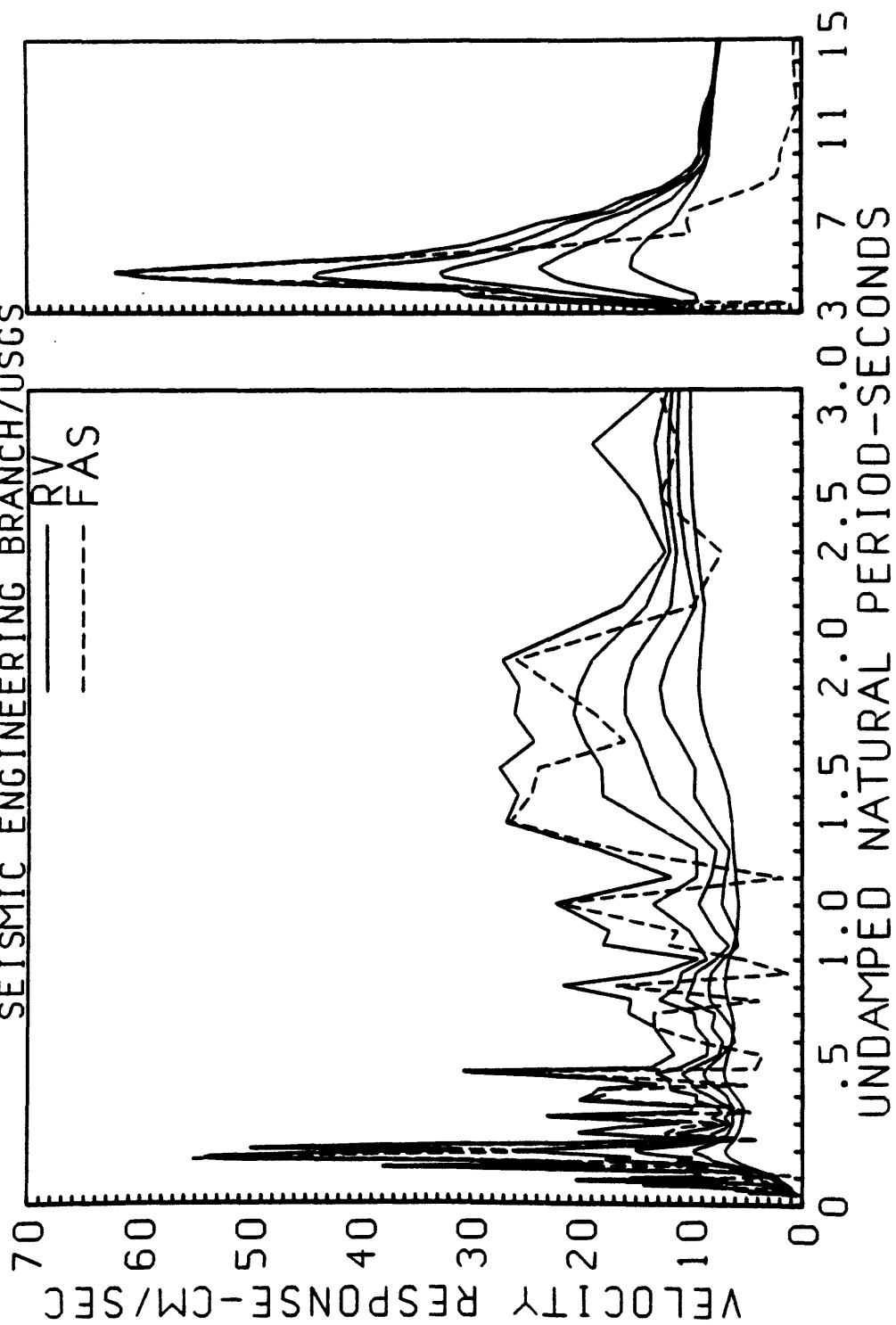
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



RELATIVE VELOCITY RESPONSE SPECTRUM  
 PARACHUTE TEST FACILITY, 10/15/79, 2317, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



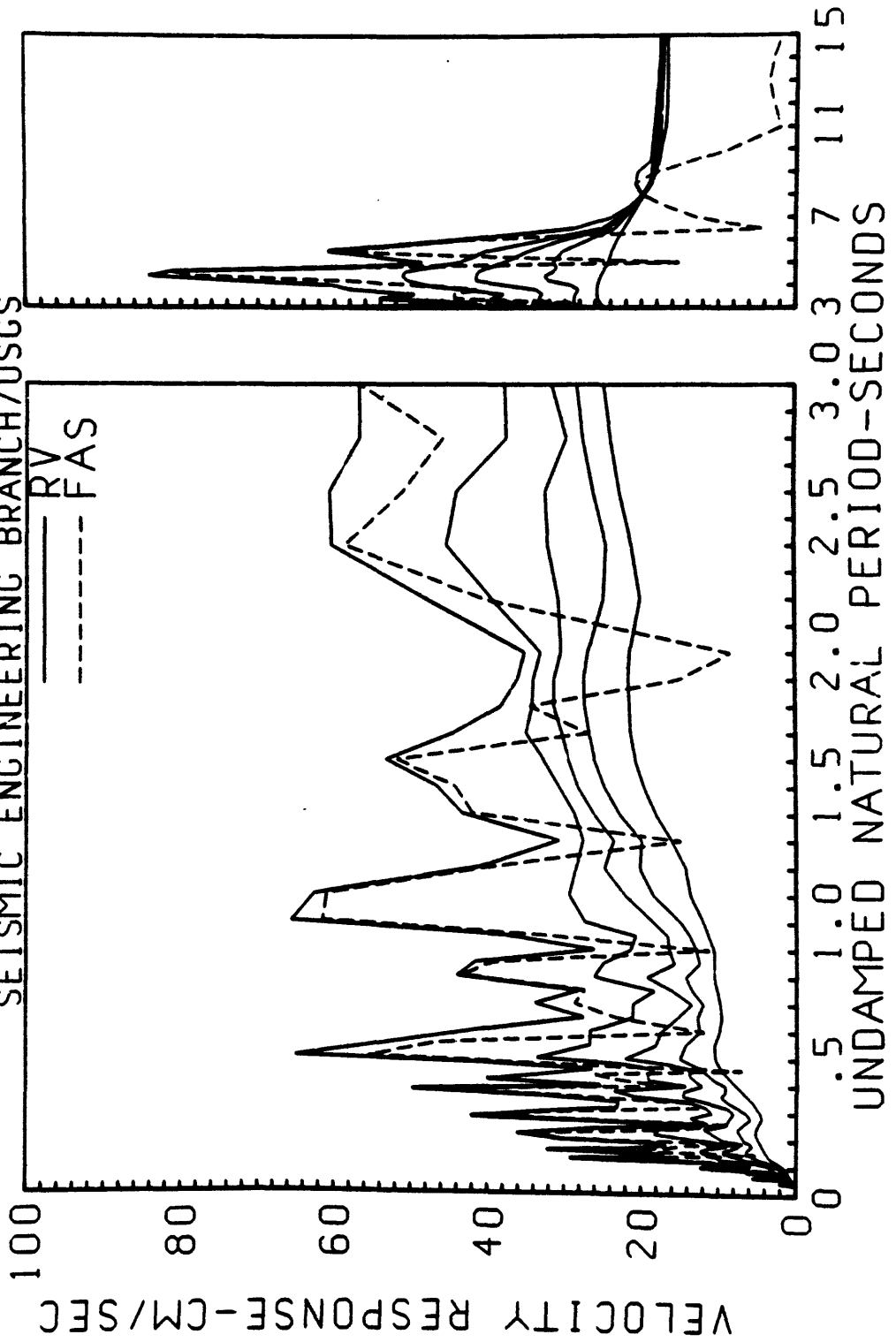
# RELATIVE VELOCITY RESPONSE SPECTRUM

PARACHUTE TST FACL..10/15/79.2317.225DEG

0.2.5.10.20 PERCENT CRITICAL DAMPING

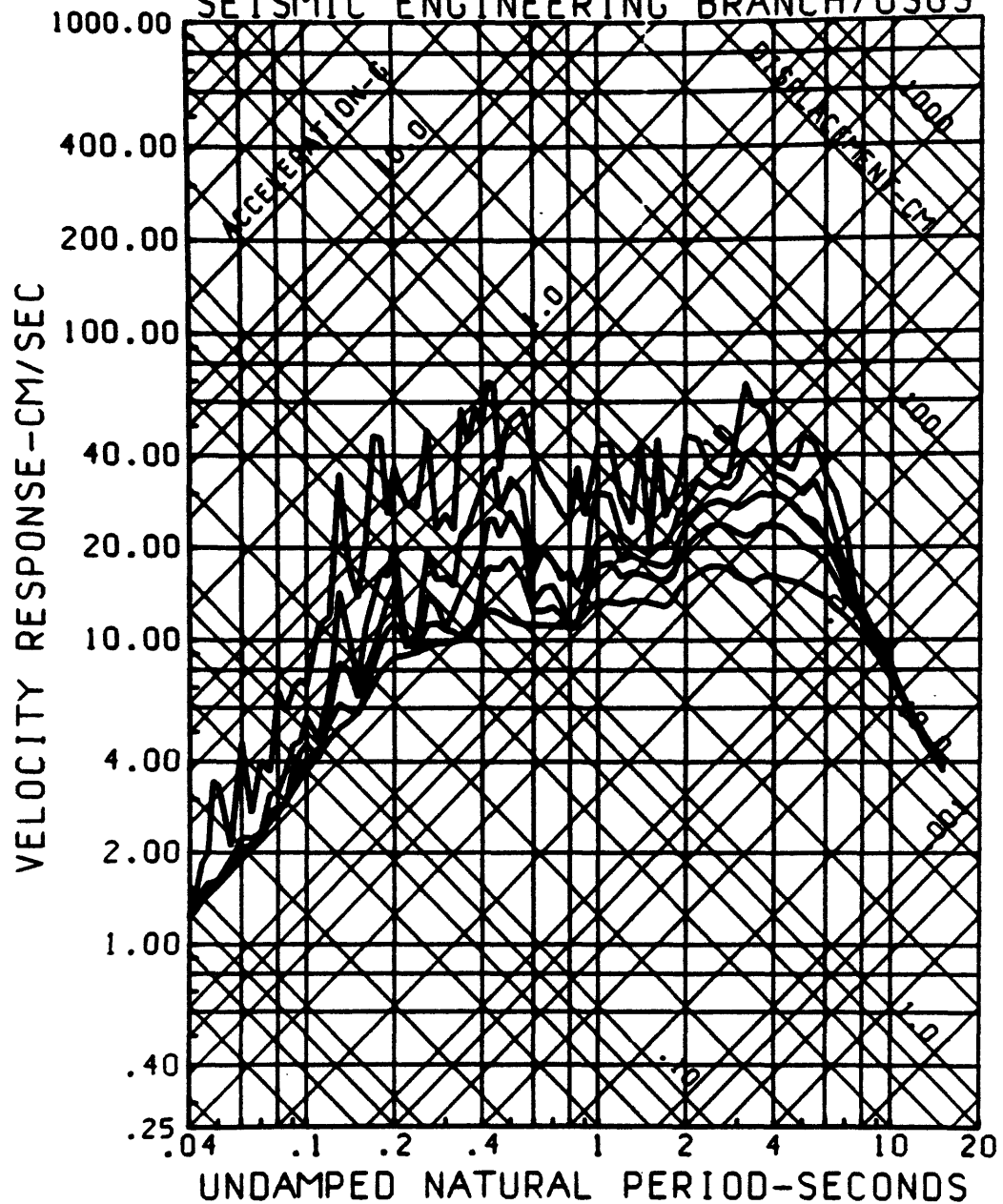
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

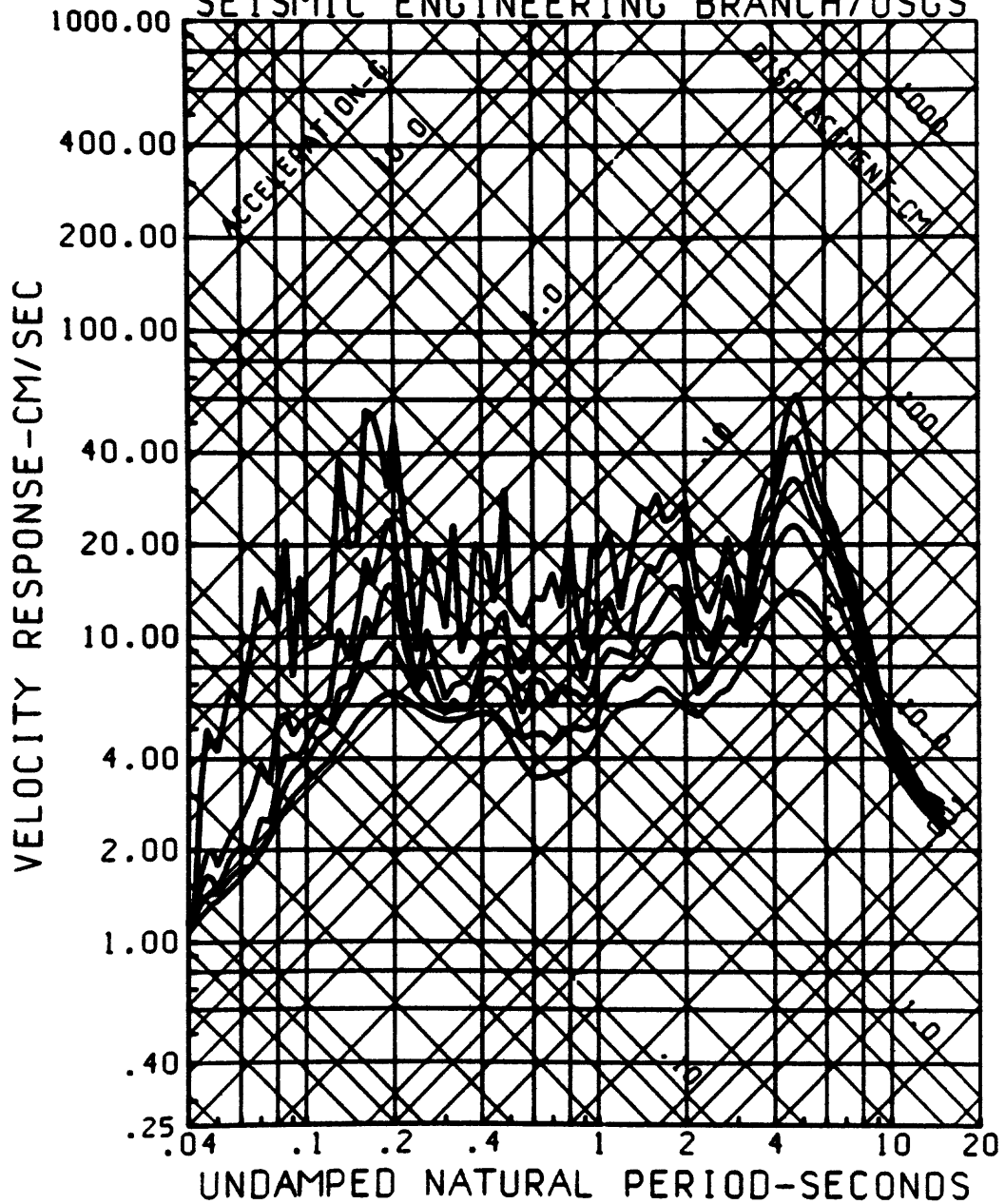




RESPONSE SPECTRA  
 PARACHUTE TST FACL..10/15/79.2317.315DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



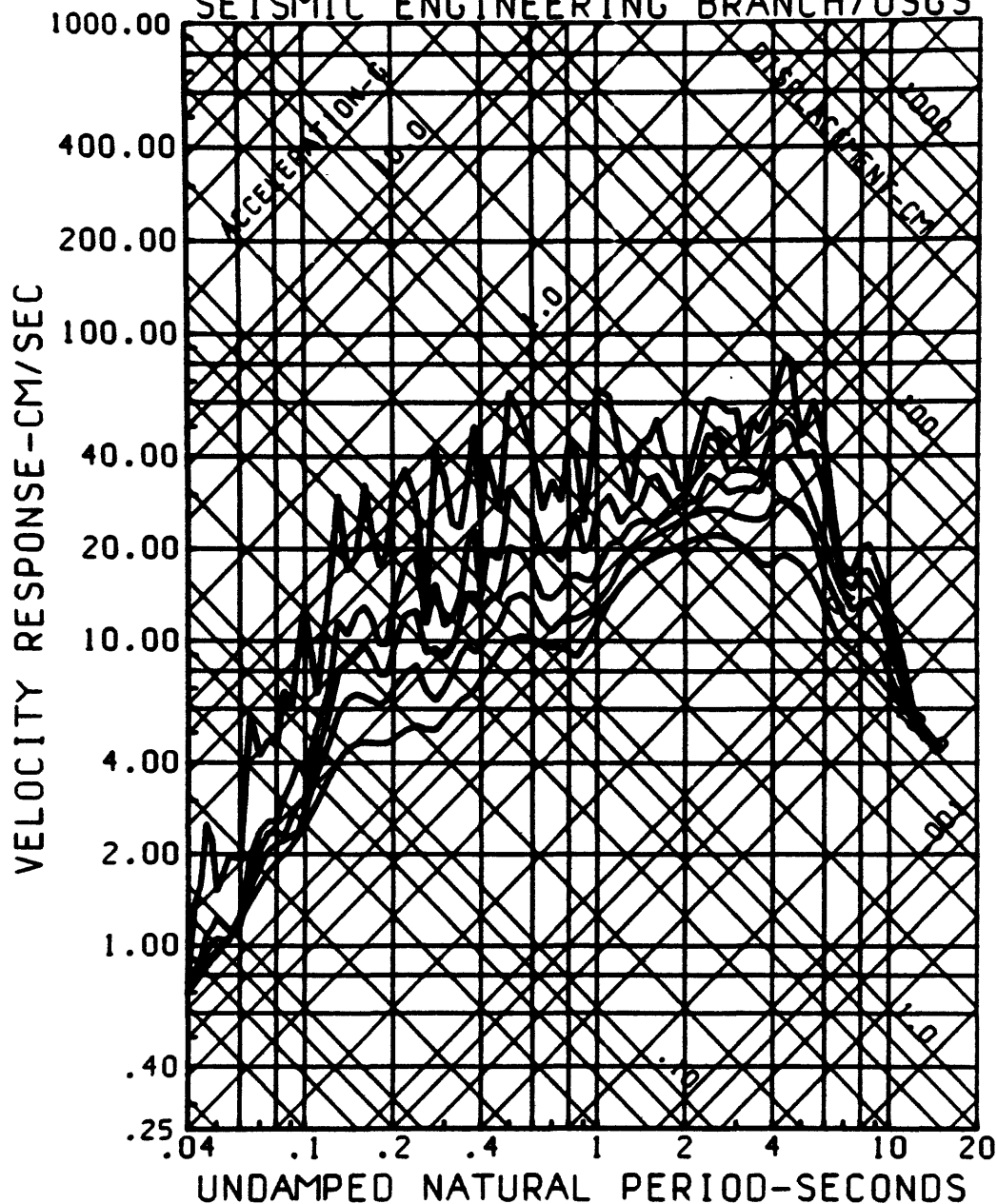
RESPONSE SPECTRA  
 PARACHUTE TEST FACILITY, 10/15/79, 2317, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



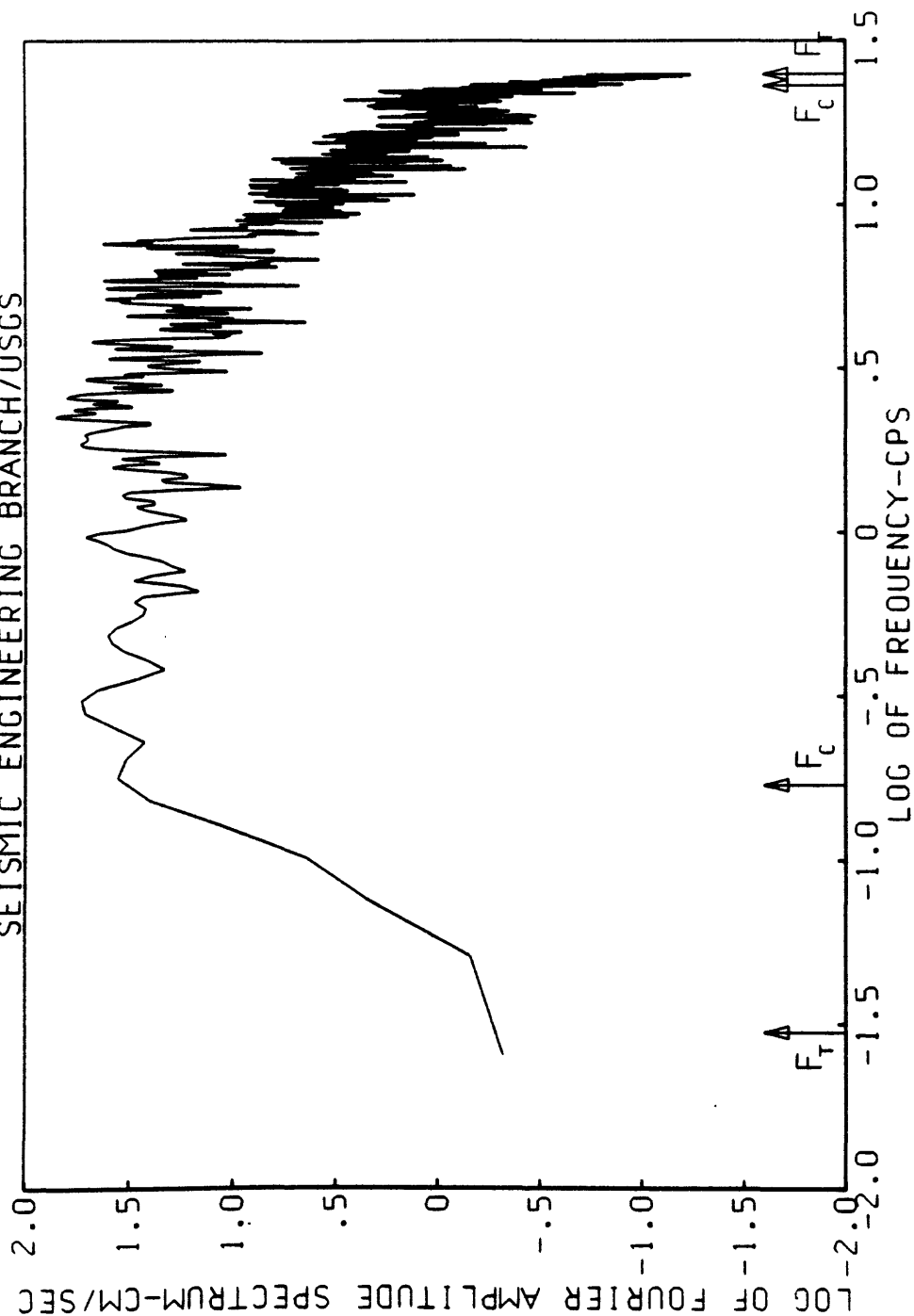
RESPONSE SPECTRA  
PARACHUTE TST FACL..10/15/79.2317.225DEG

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

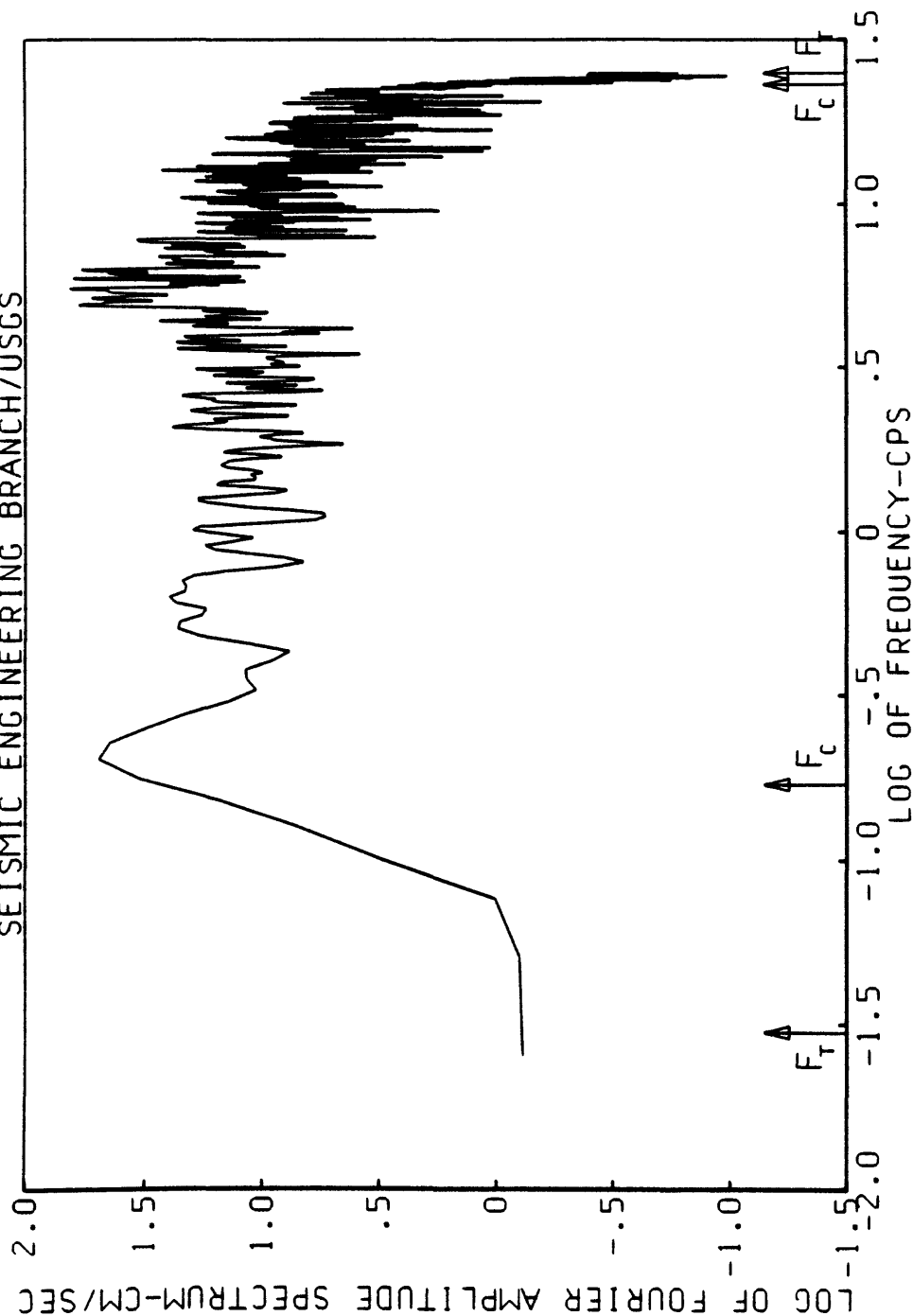
SEISMIC ENGINEERING BRANCH/USGS



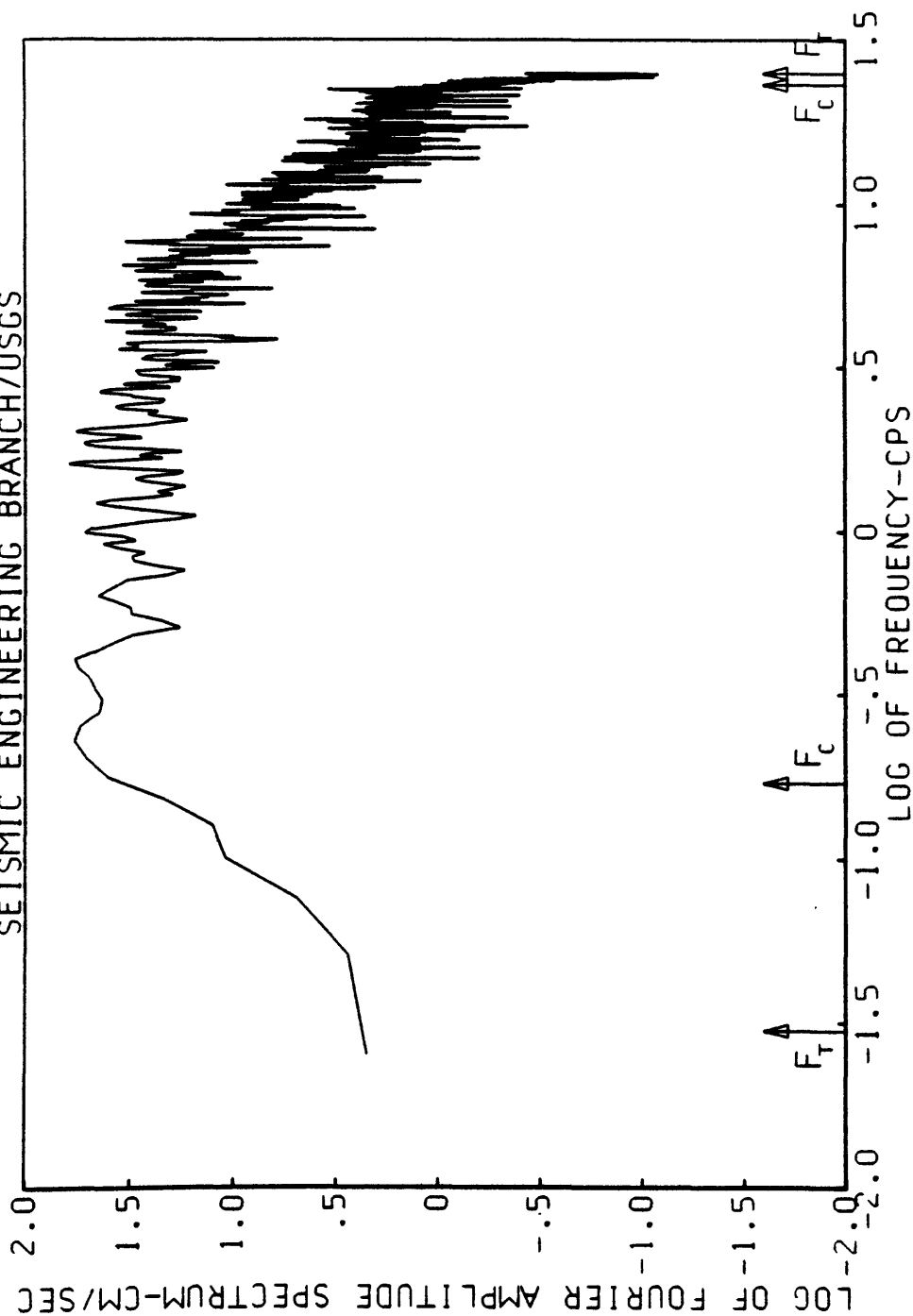
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP 315 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



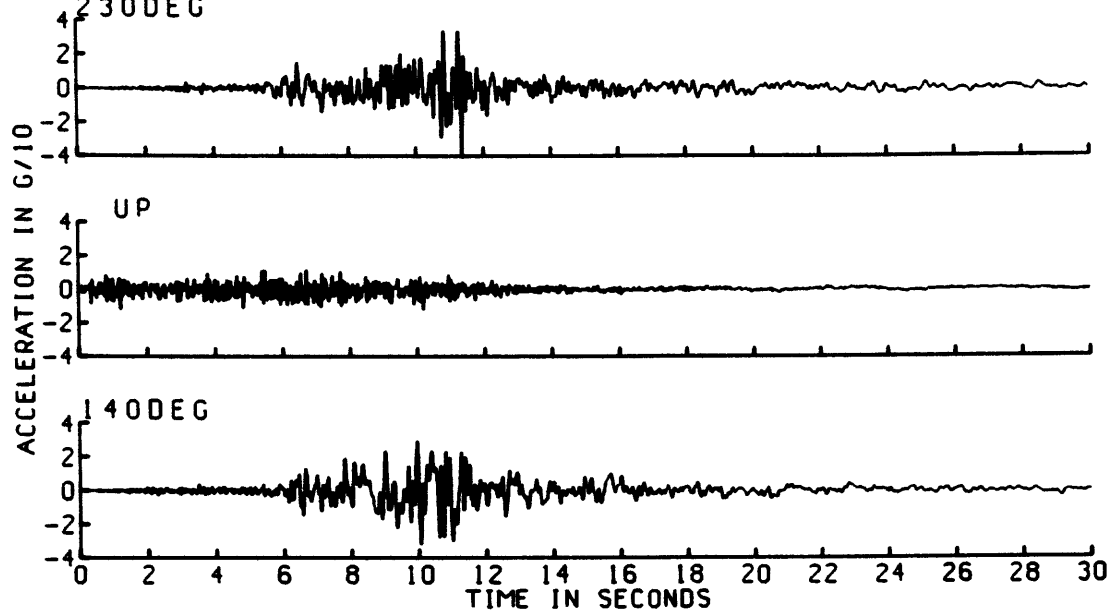
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



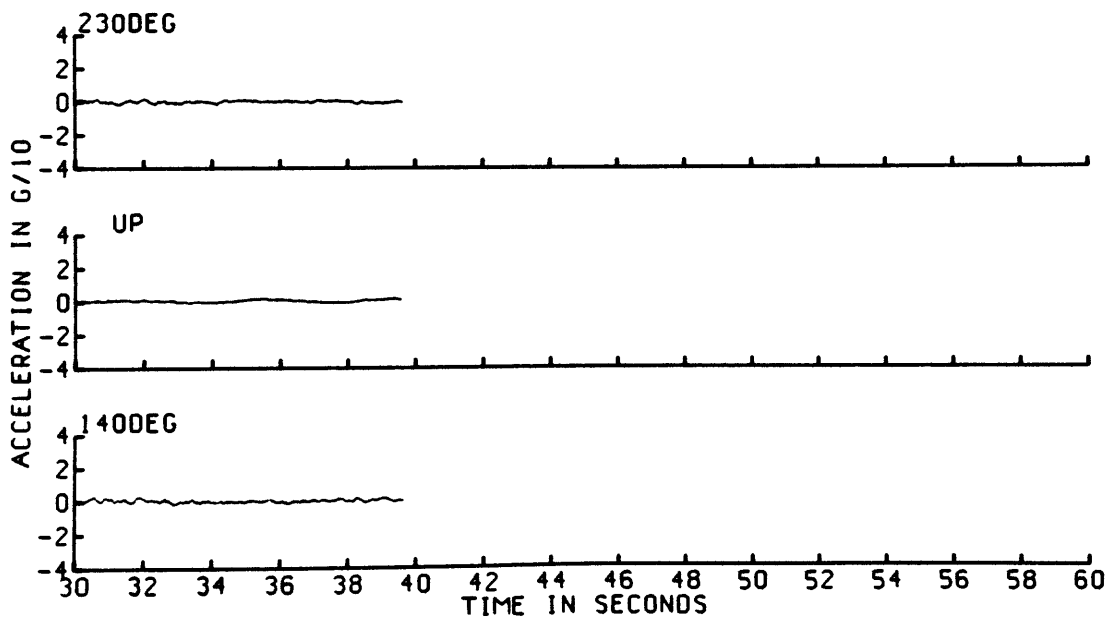
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 PARACHUTE TEST FACILITY, COMP 225 DEG  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



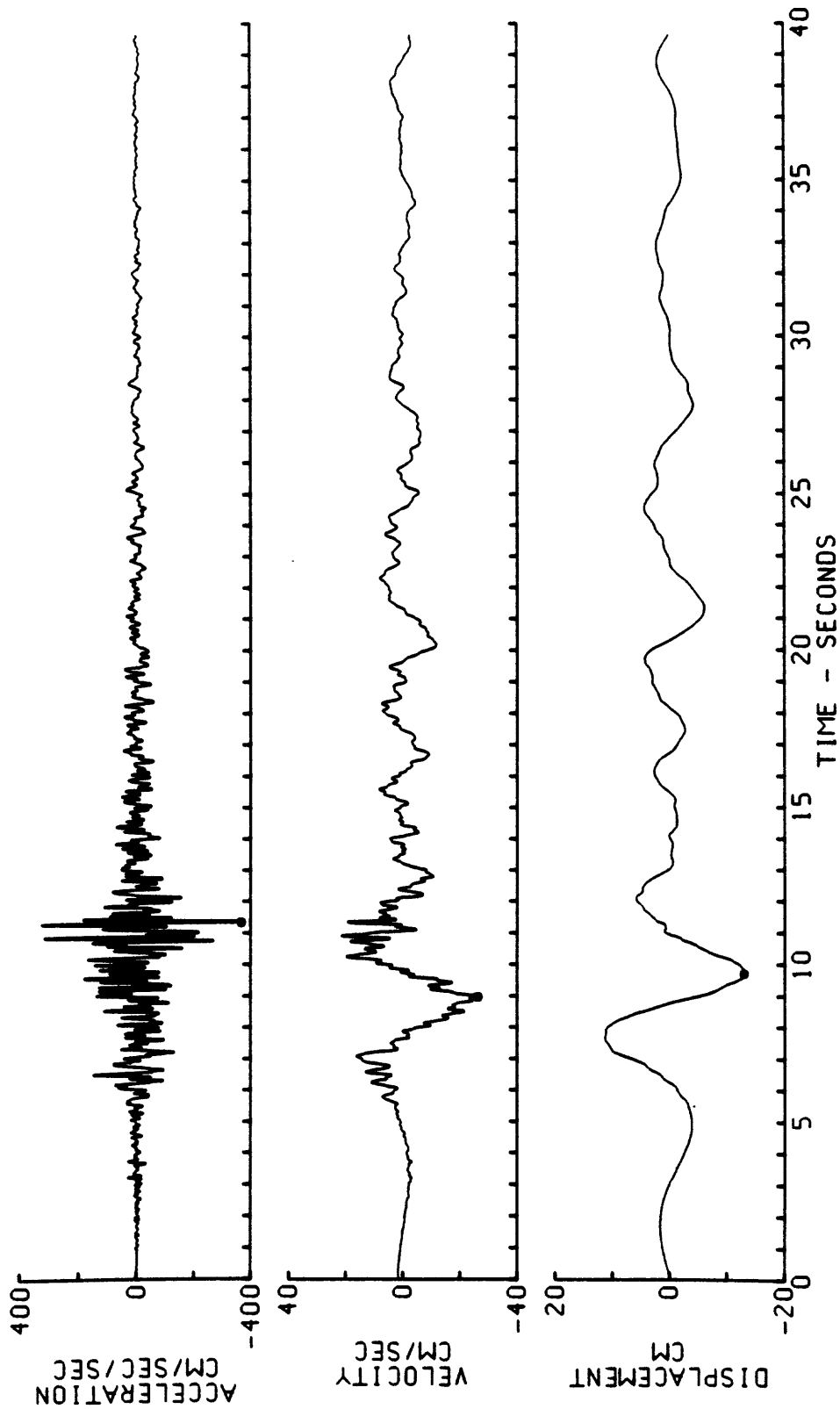
UNCORRECTED ACCELEROGRAM  
 EL CENTRO, ARRAY 2, KEYSTONE RD., 10/15/79, 2317UTC  
 THE 3 PEAK VALUES (G) ARE .4119 .1192 .3182  
 230DEG



EL CENTRO, ARRAY 2, KEYSTONE RD., 10/15/79, 2317UTC

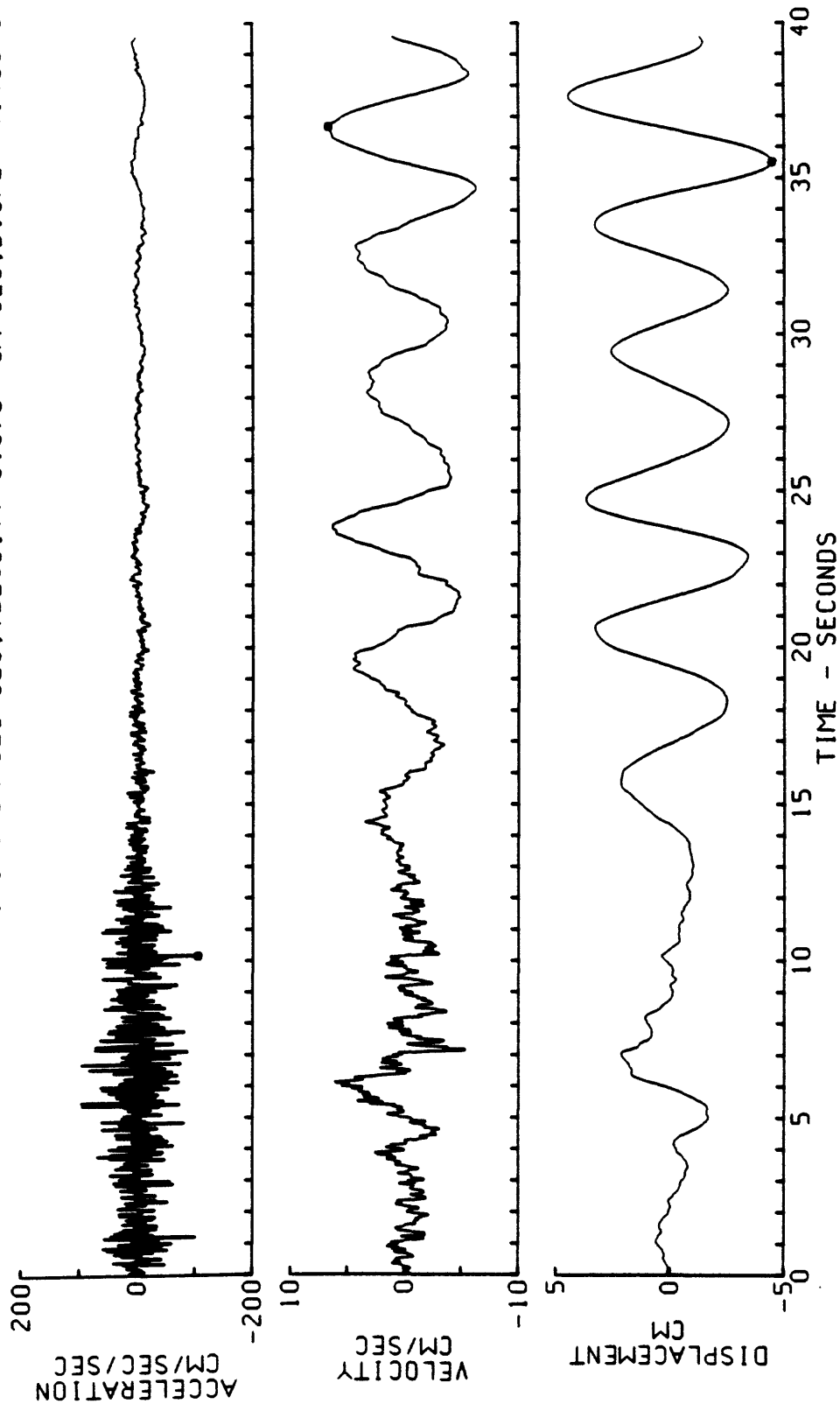


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-365.3 CM/SEC/SEC, VELOCITY=-26.15 CM/SEC, DISPL=-12.93 CM

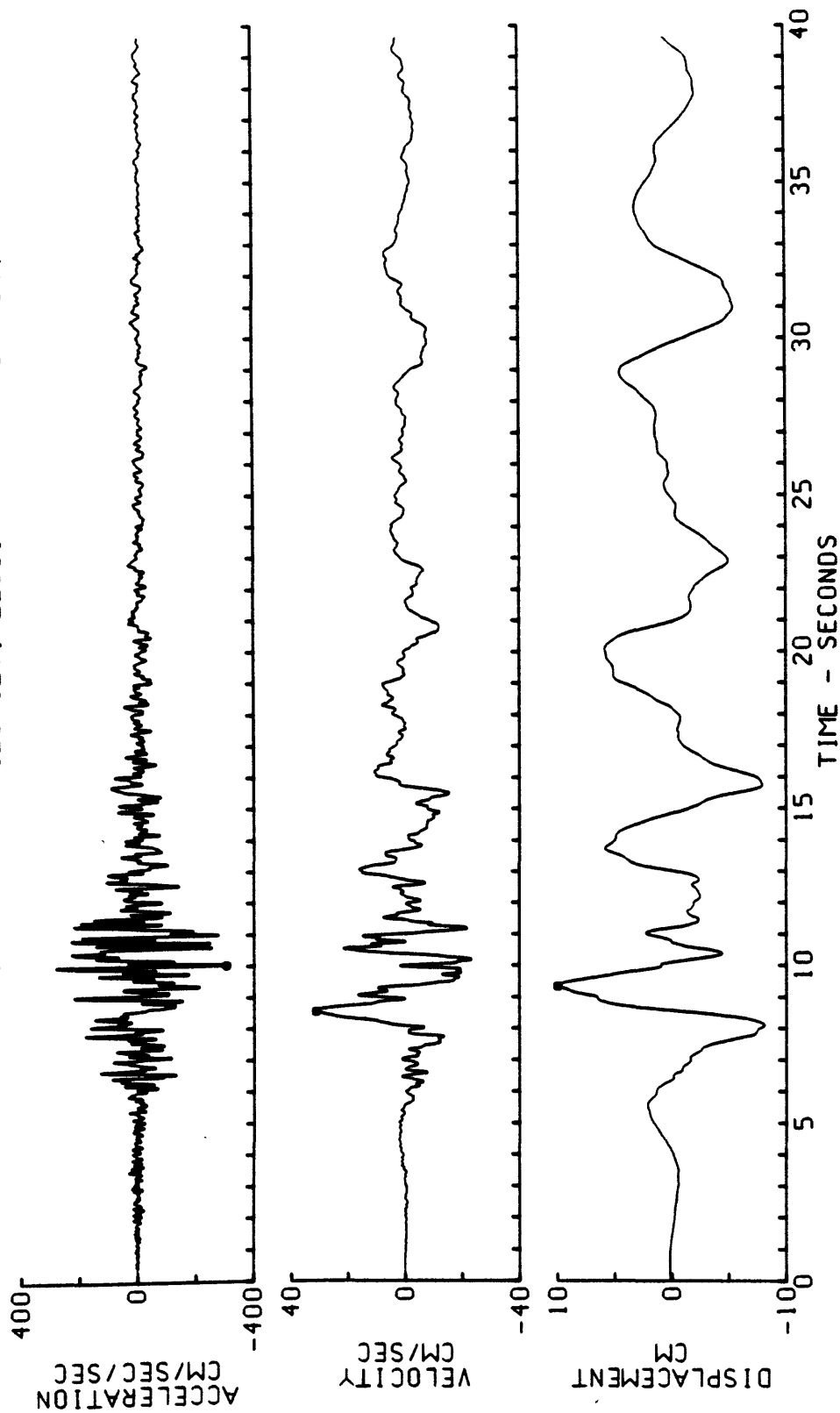




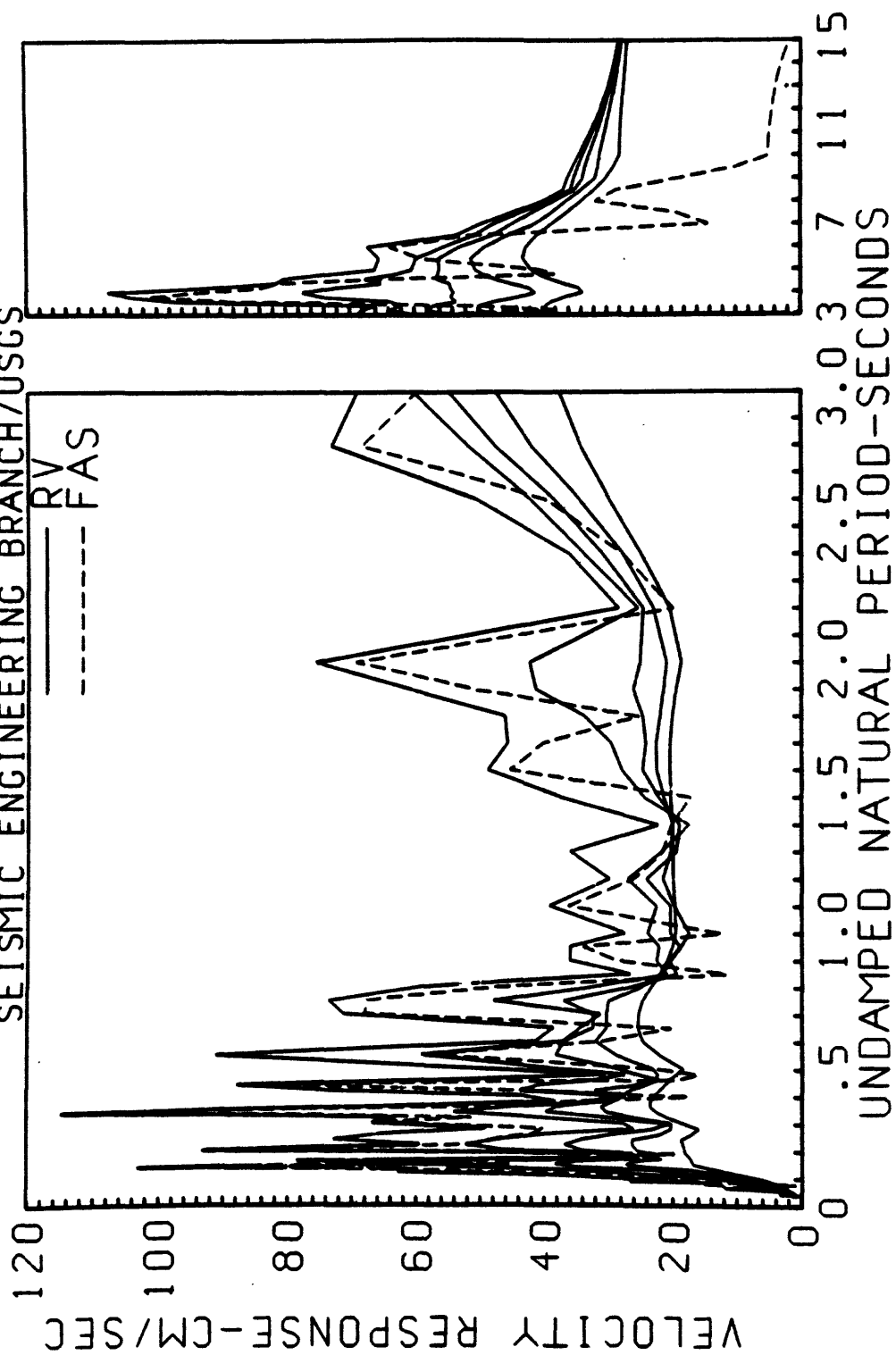
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-103.6 CM/SEC/SEC, VELOCITY=6.670 CM/SEC, DISPL=-4.480 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-307.0 CM/SEC/SEC, VELOCITY=31.16 CM/SEC, DISPL=9.970 CM

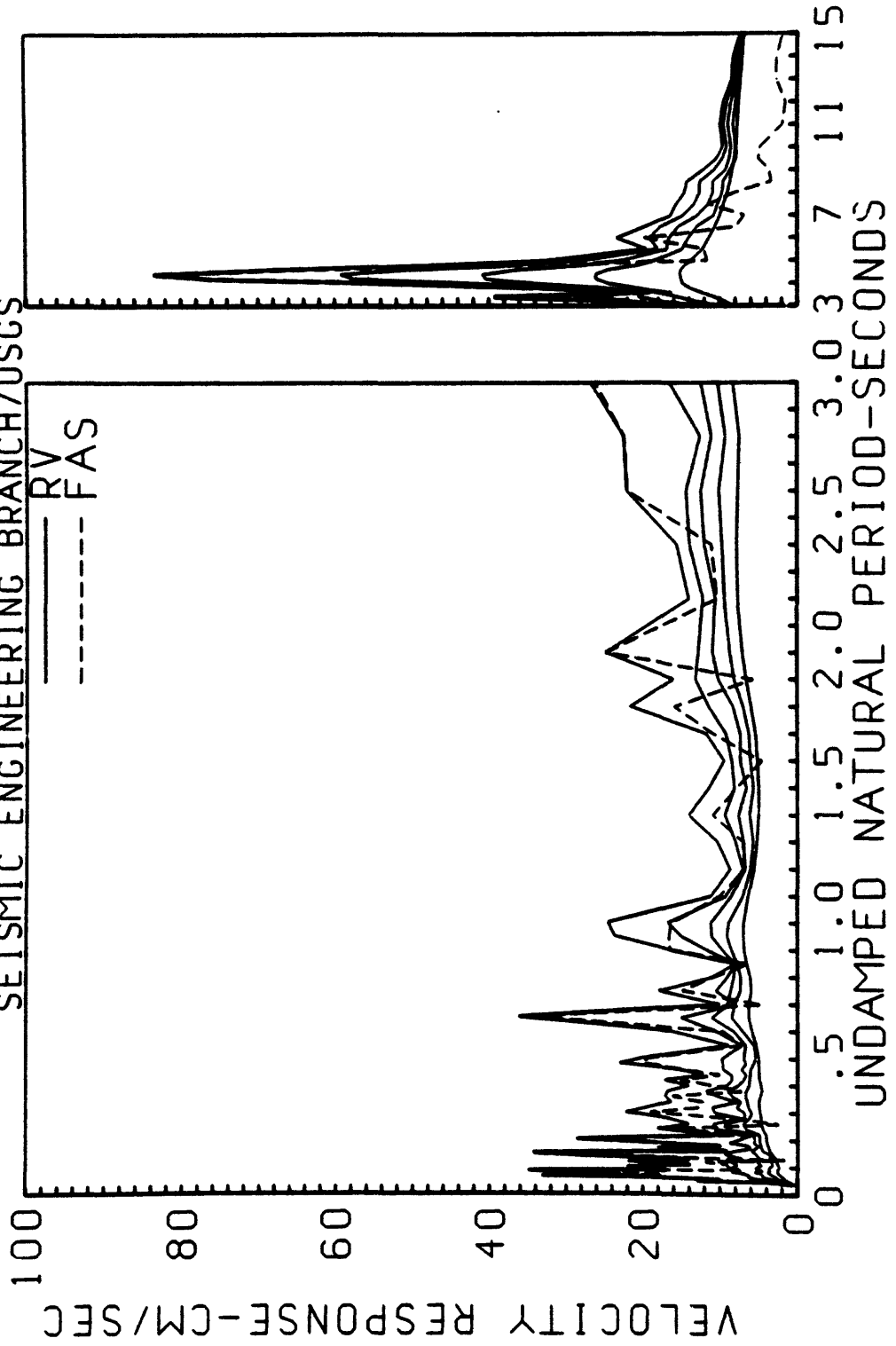


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 2, 10/15/79, 2317.230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

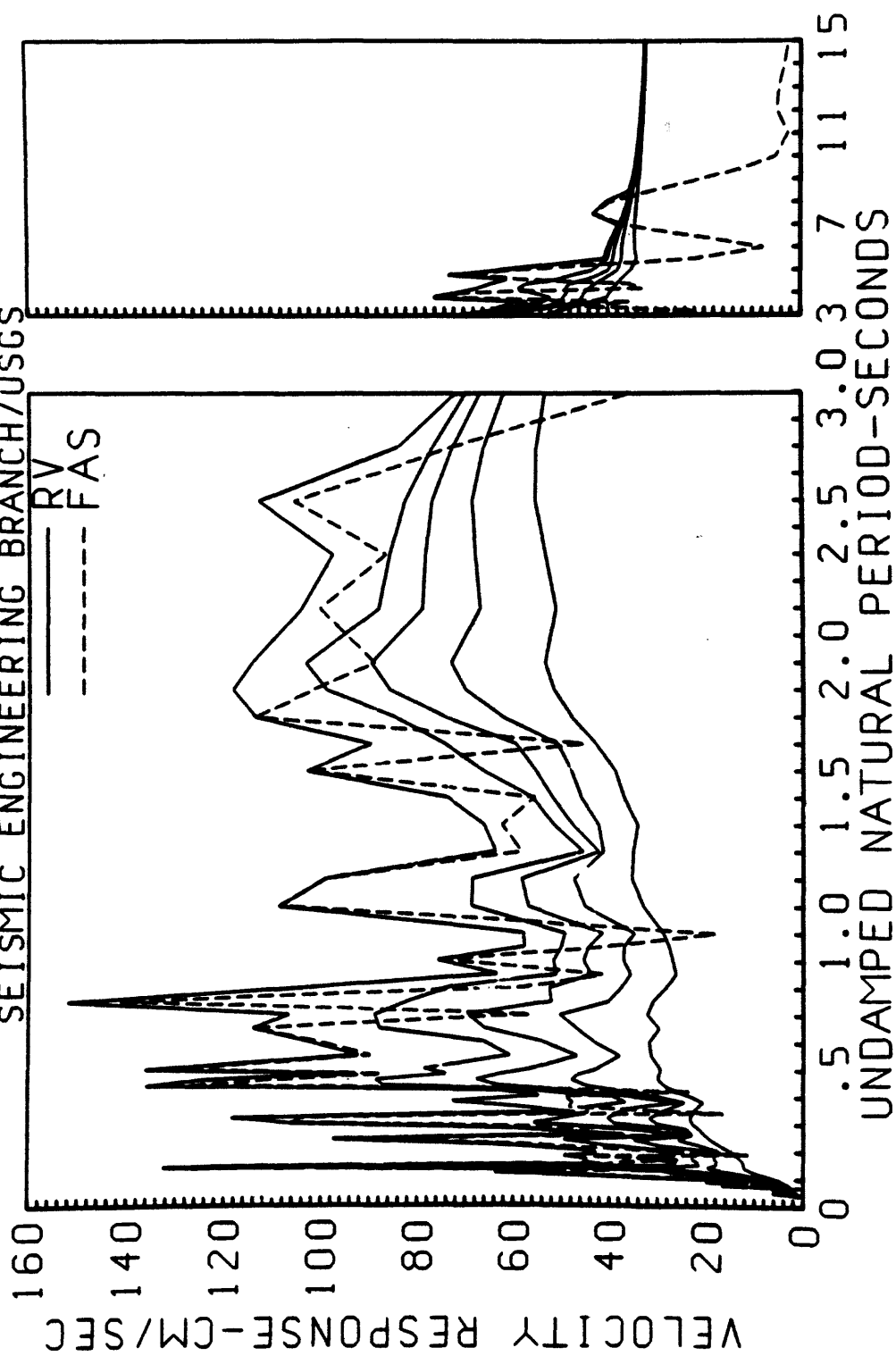


# RELATIVE VELOCITY RESPONSE SPECTRUM

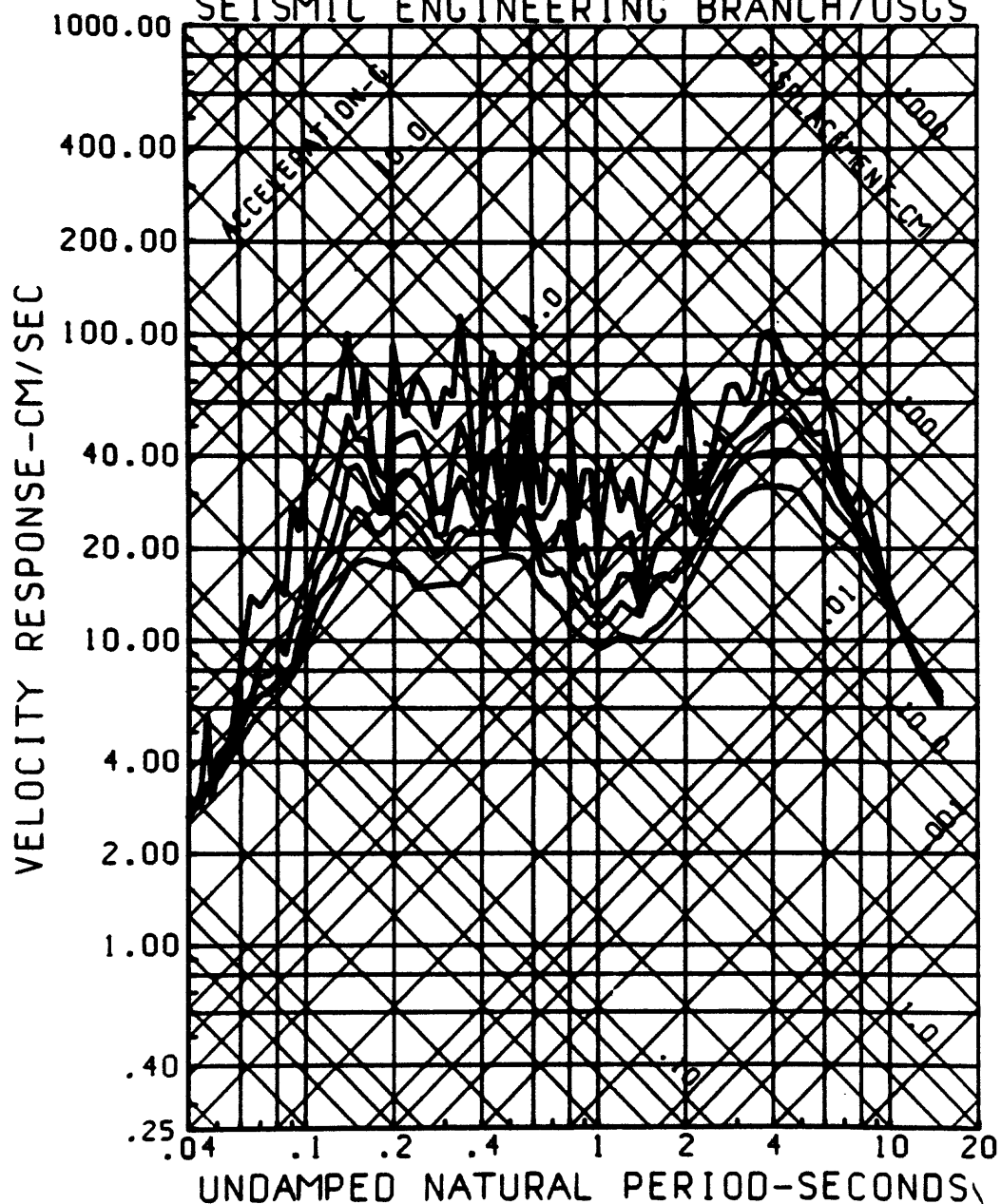
EL CENTRO.ARRAY 2.10/15/79.2317UTC.UP  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



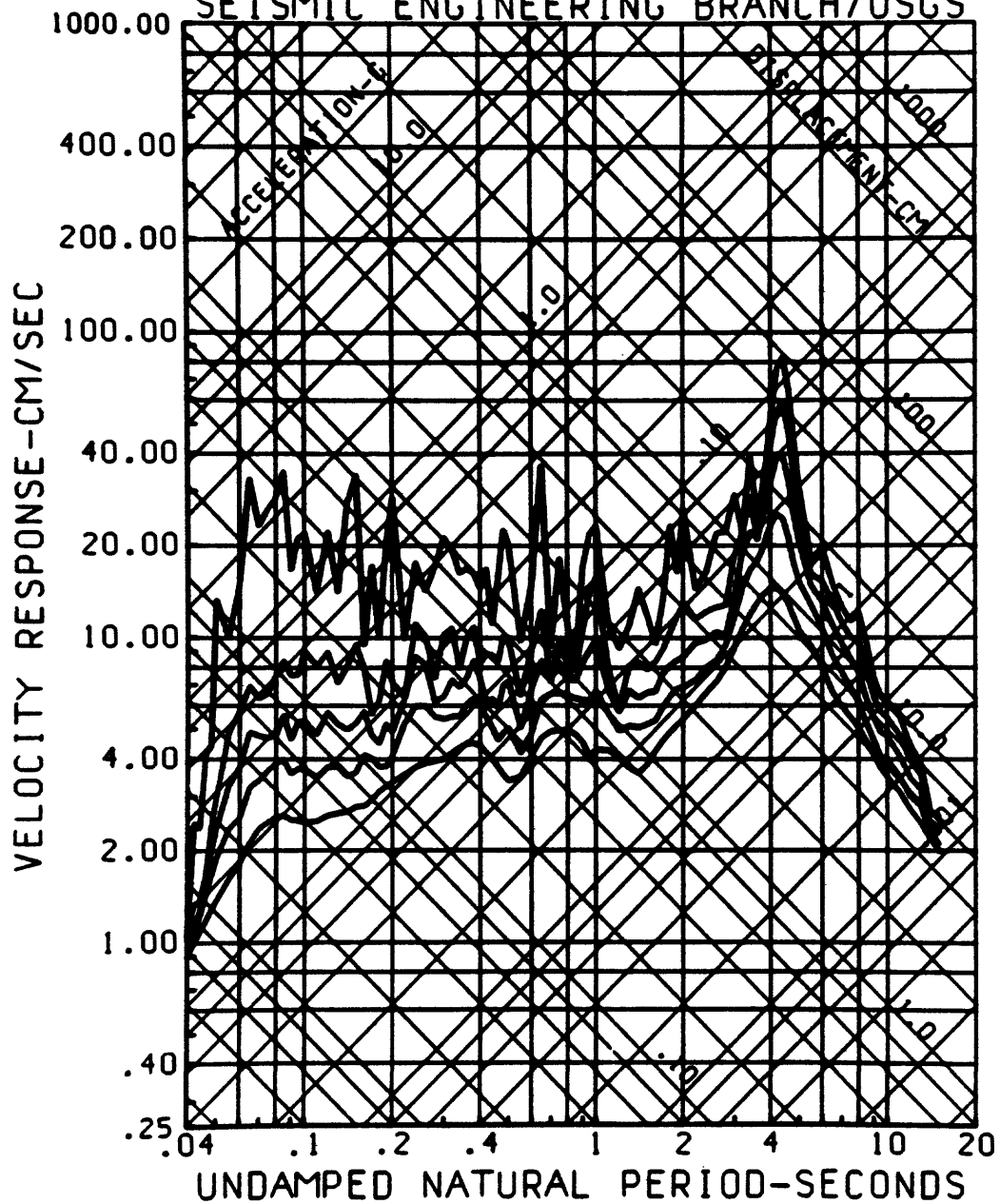
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO.ARRAY 2.10/15/79.2317.140DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



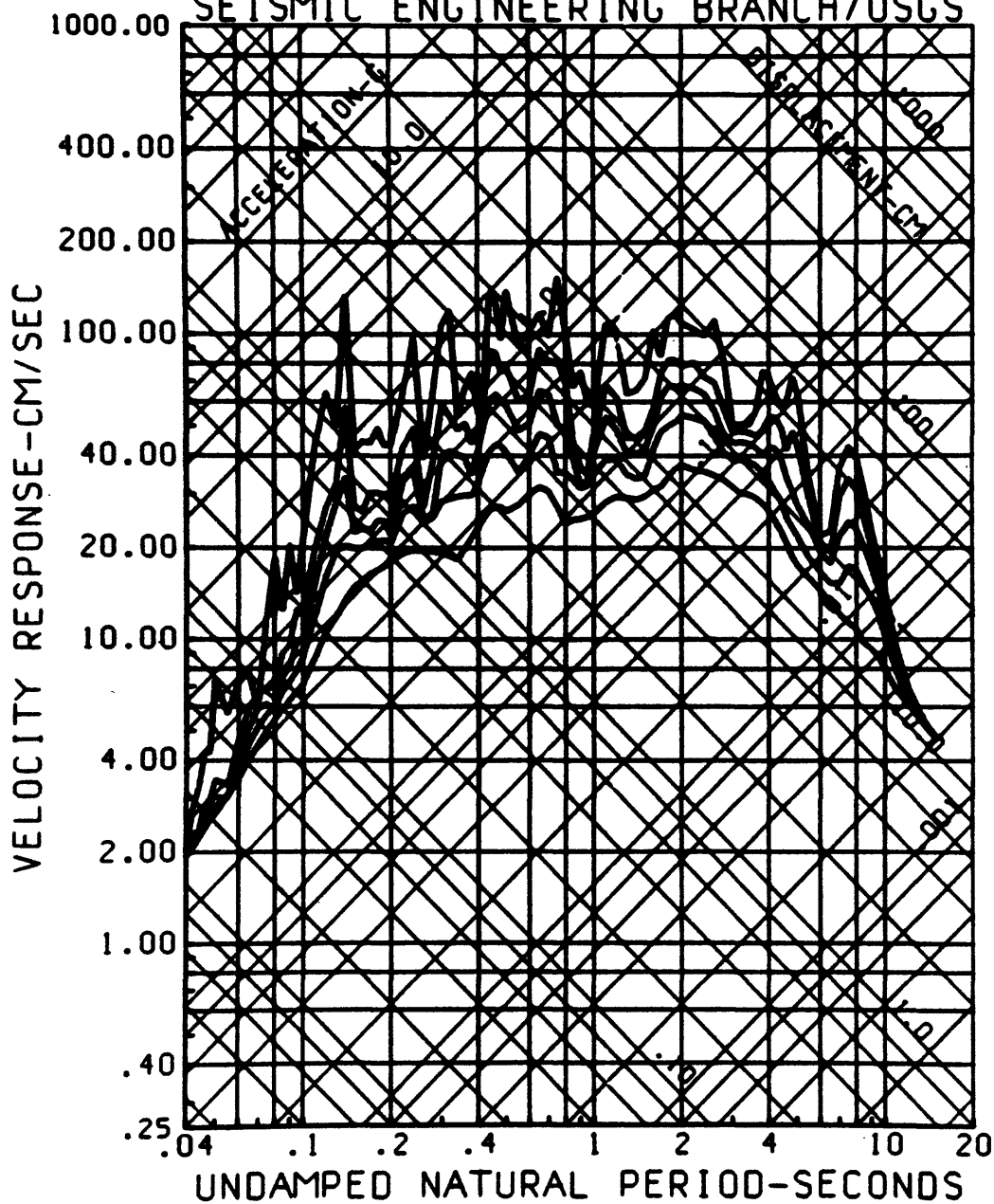
RESPONSE SPECTRA  
 EL CENTRO.ARRAY 2;10/15/79.2317.230DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



RESPONSE SPECTRA  
 EL CENTRO, ARRAY 2, 10/15/79, 2317 UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

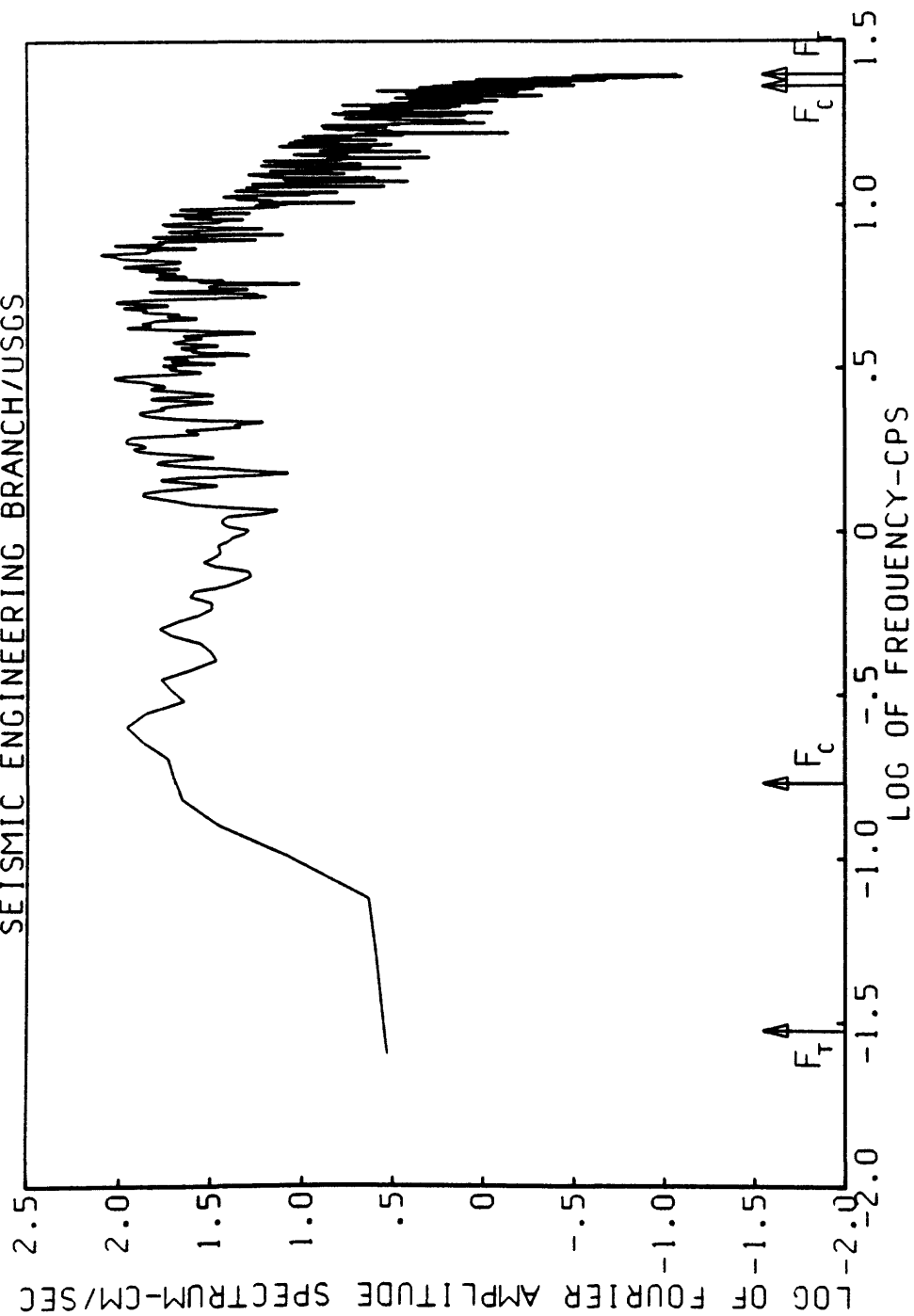


RESPONSE SPECTRA  
 EL CENTRO, ARRAY 2, 10/15/79, 2317.140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

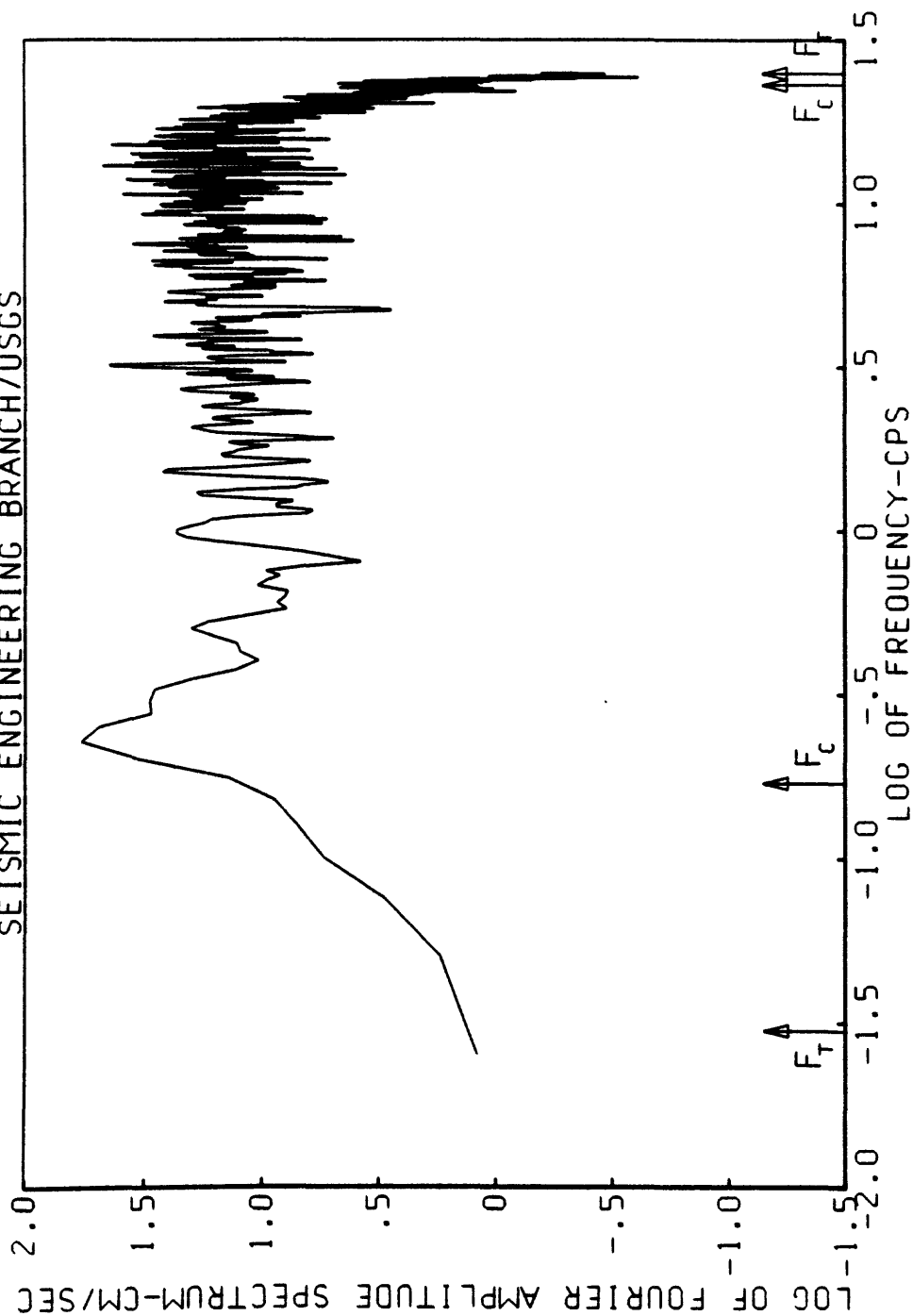




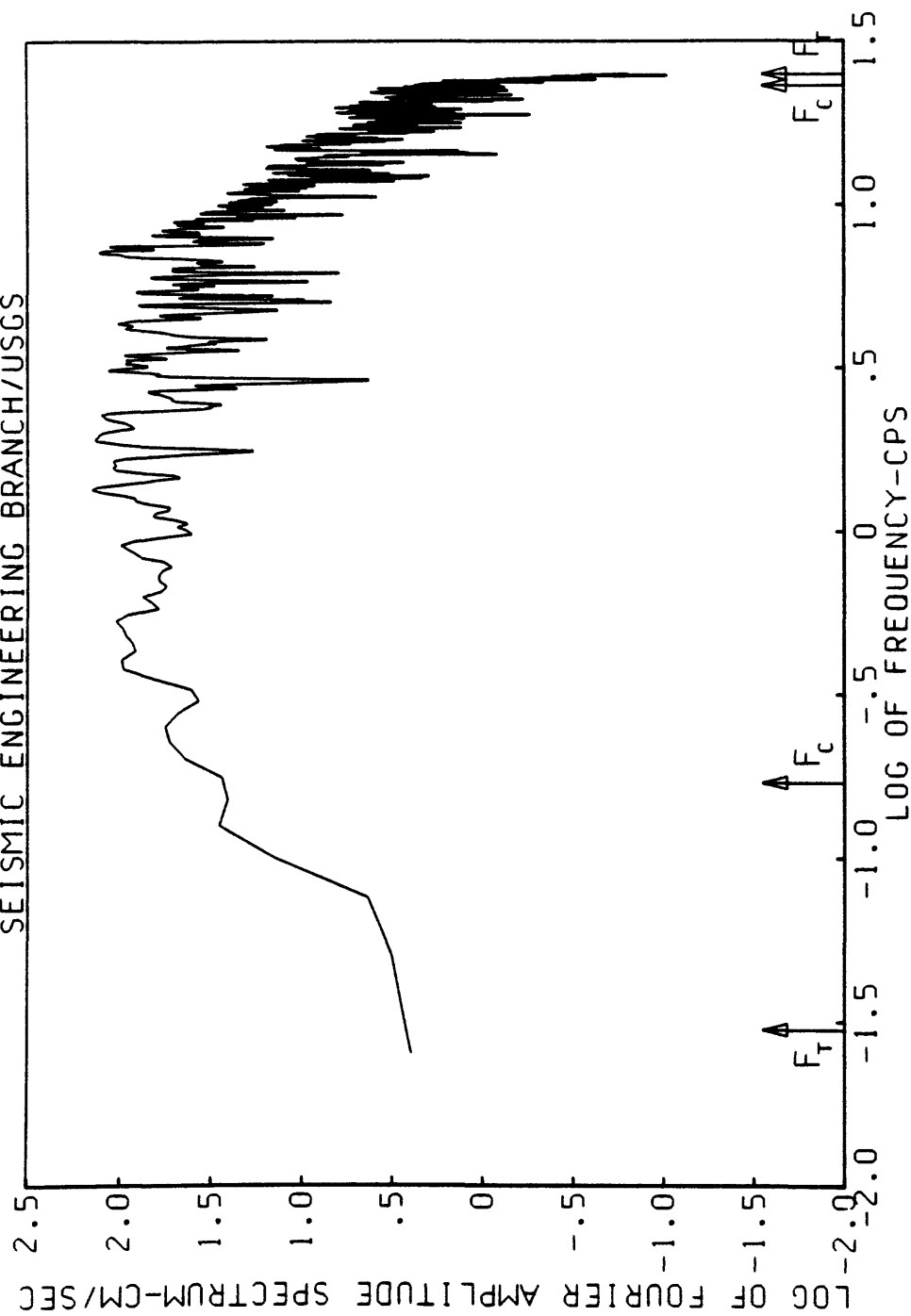
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

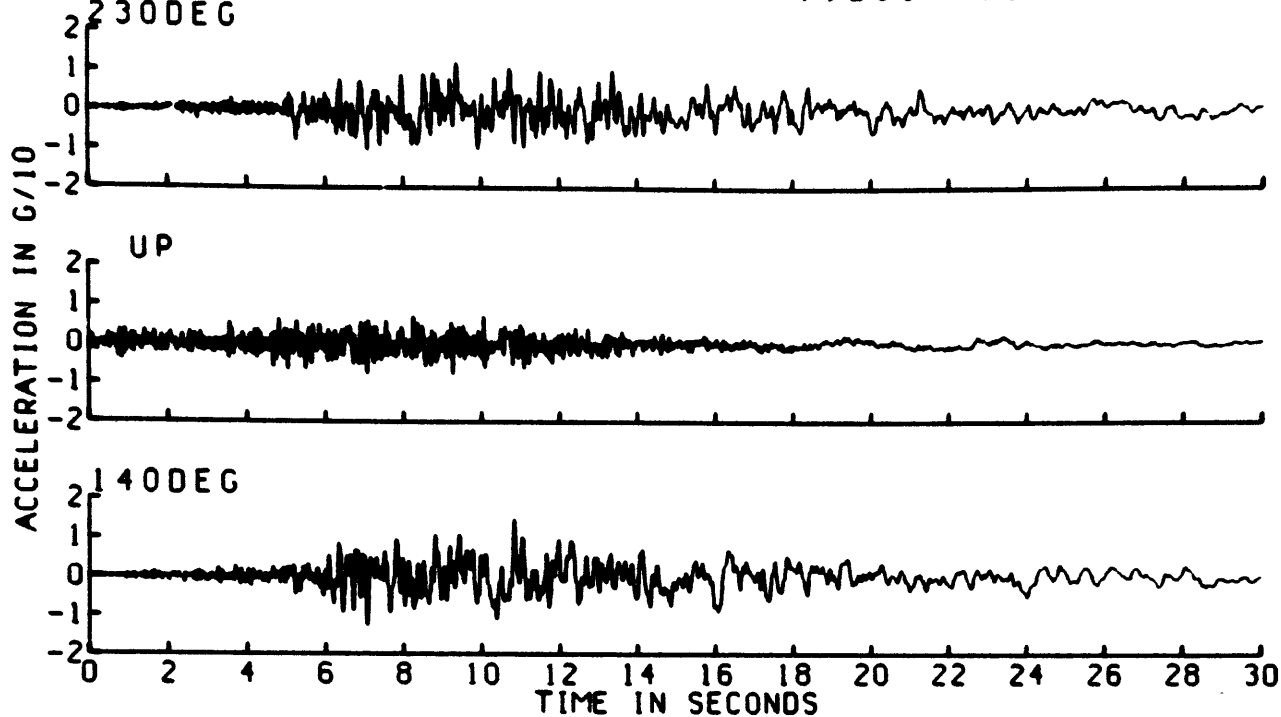


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 KEYSTONE RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

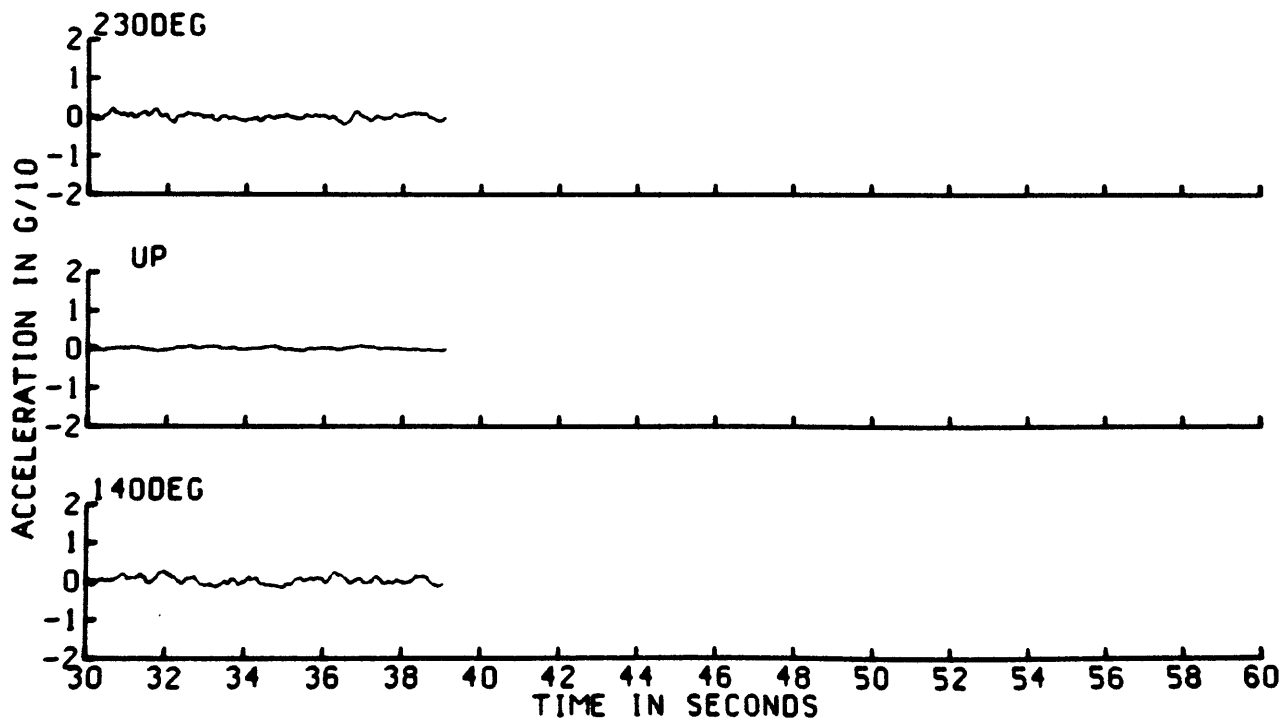


# UNCORRECTED ACCELEROGRAM

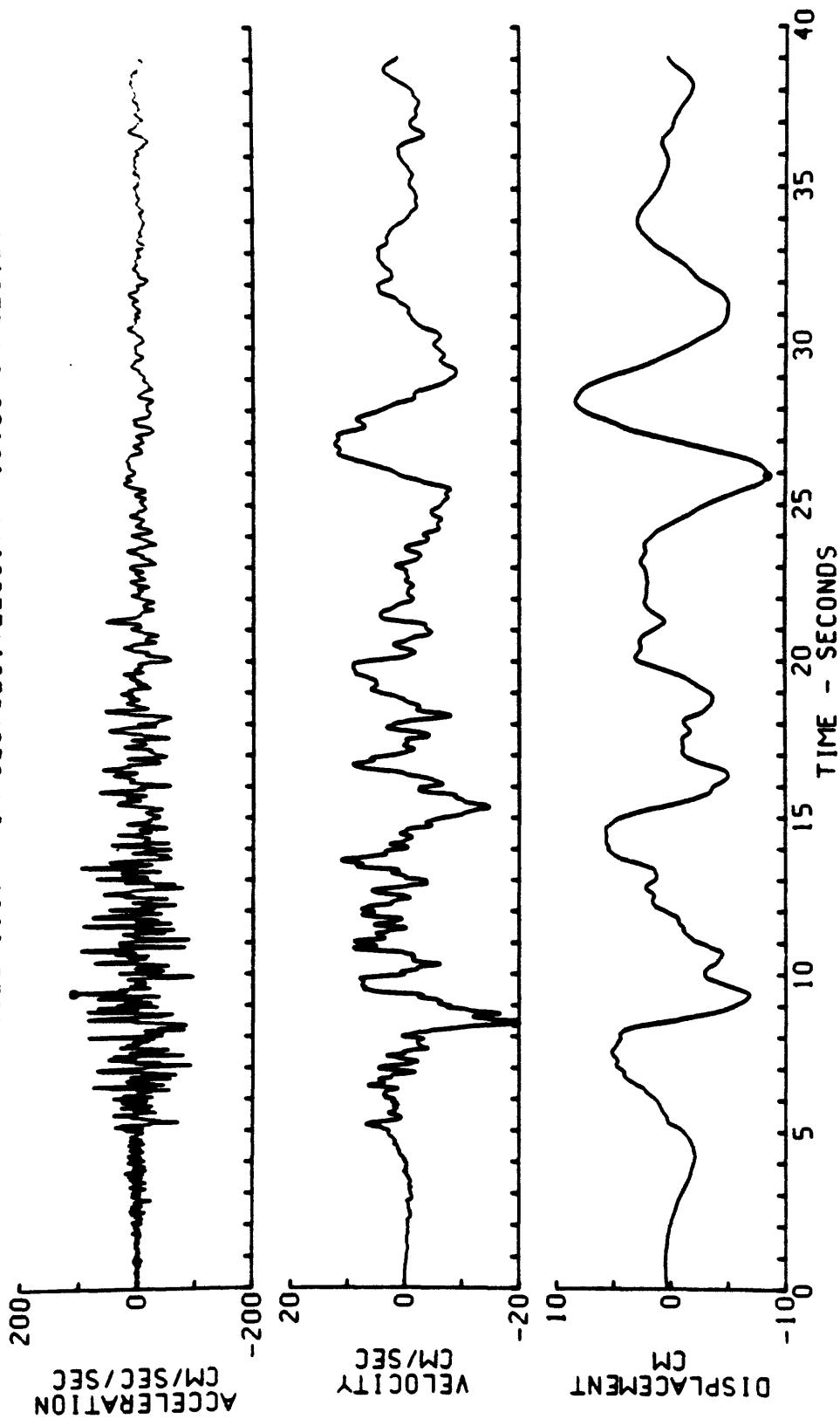
EL CENTRO, ARRAY 12, BROCKMAN RD., 10/15/79, 2317 UTC  
THE 3 PEAK VALUES (G) ARE .1209 .0743 .1471



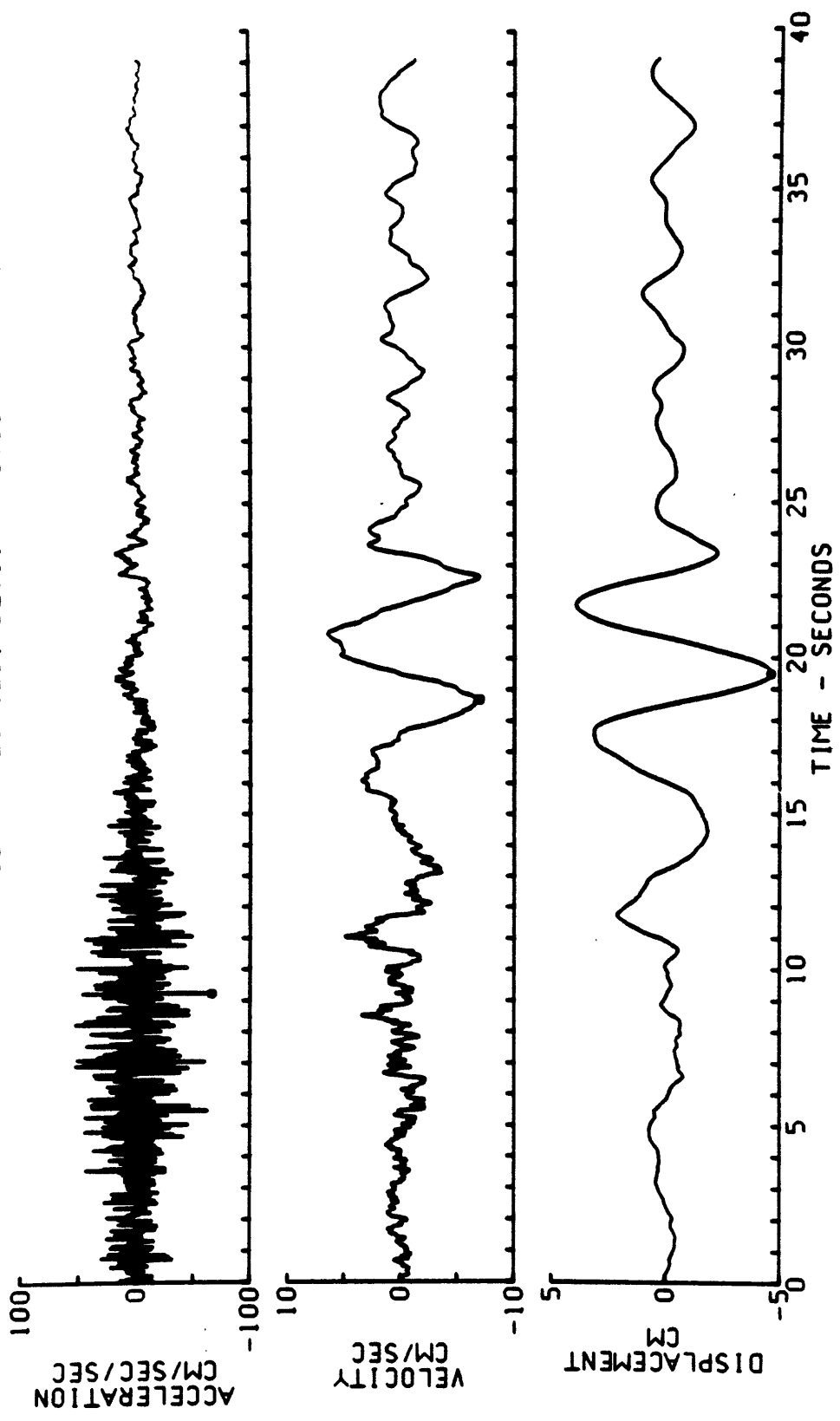
EL CENTRO, ARRAY 12, BROCKMAN RD., 10/15/79, 2317 UTC



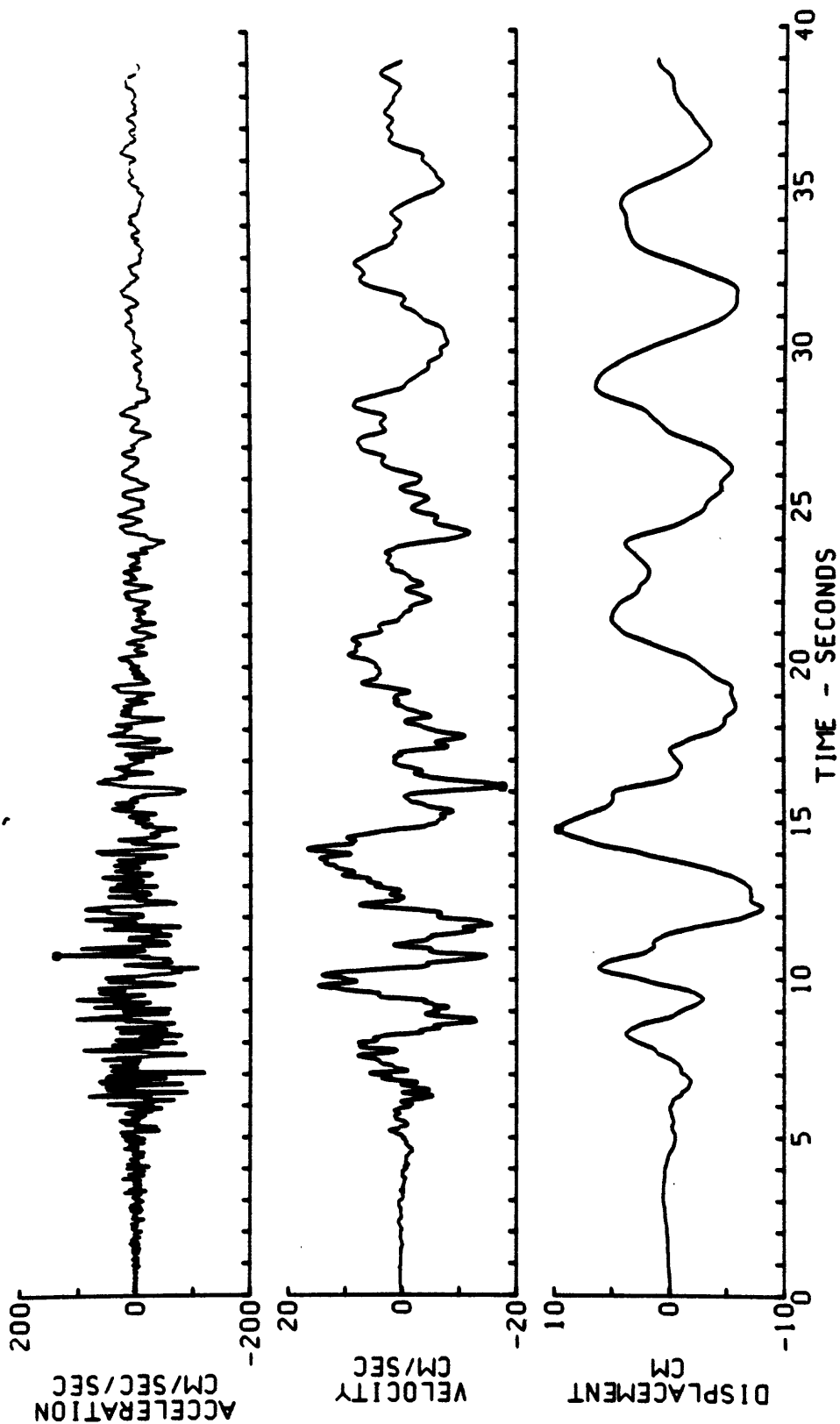
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=113.4 CM/SEC/SEC, VELOCITY=-19.38 CM/SEC, DISPL=-8.450 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317 UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-65.95 CM/SEC/SEC, VELOCITY=-6.930 CM/SEC, DISPL=-4.630 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=138.7 CM/SEC/SEC, VELOCITY=-17.52 CM/SEC, DISPL=9.630 CM



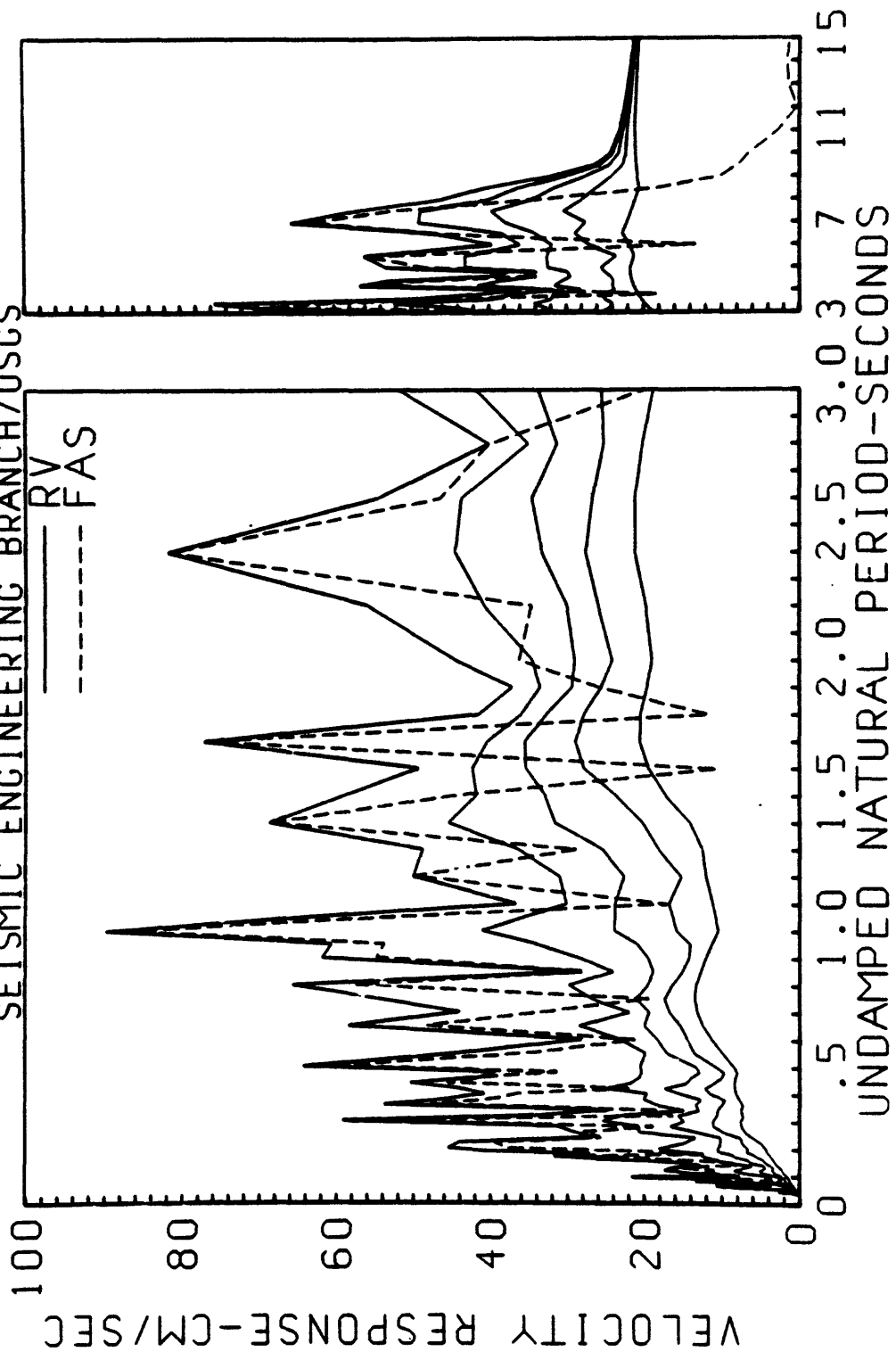
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 12.10/15/79.2317.230DEG

0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

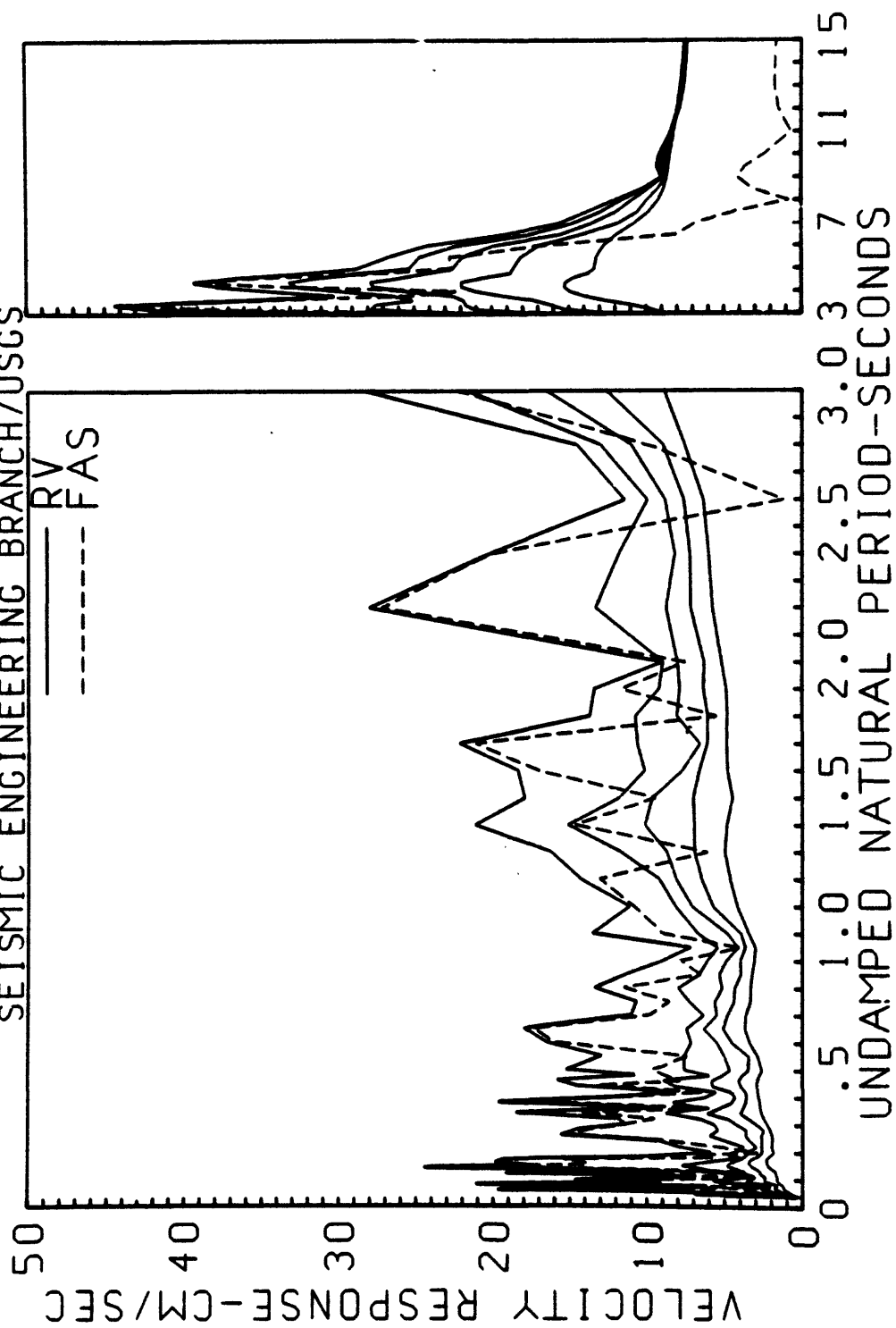
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

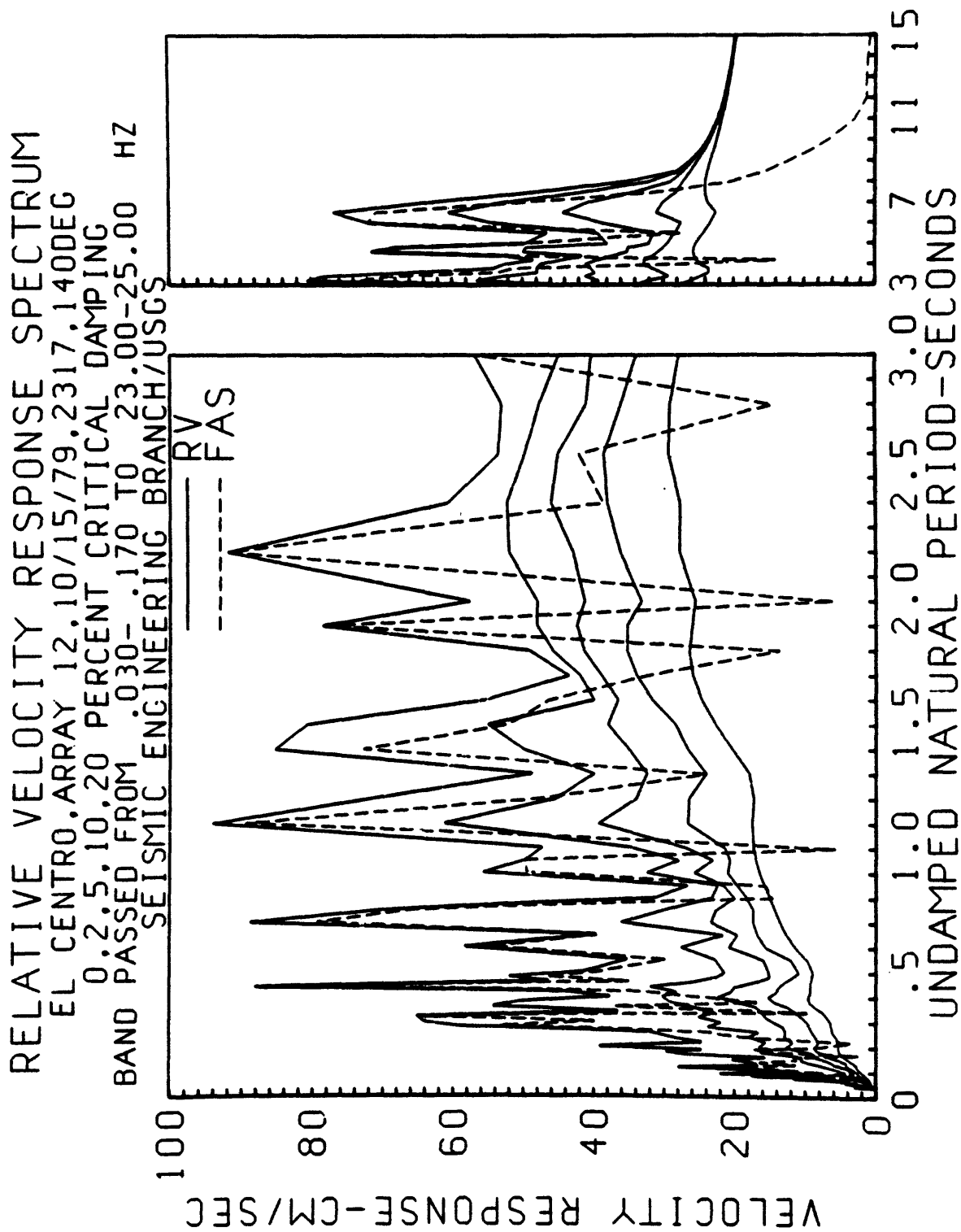
SEISMIC ENGINEERING BRANCH/USGS



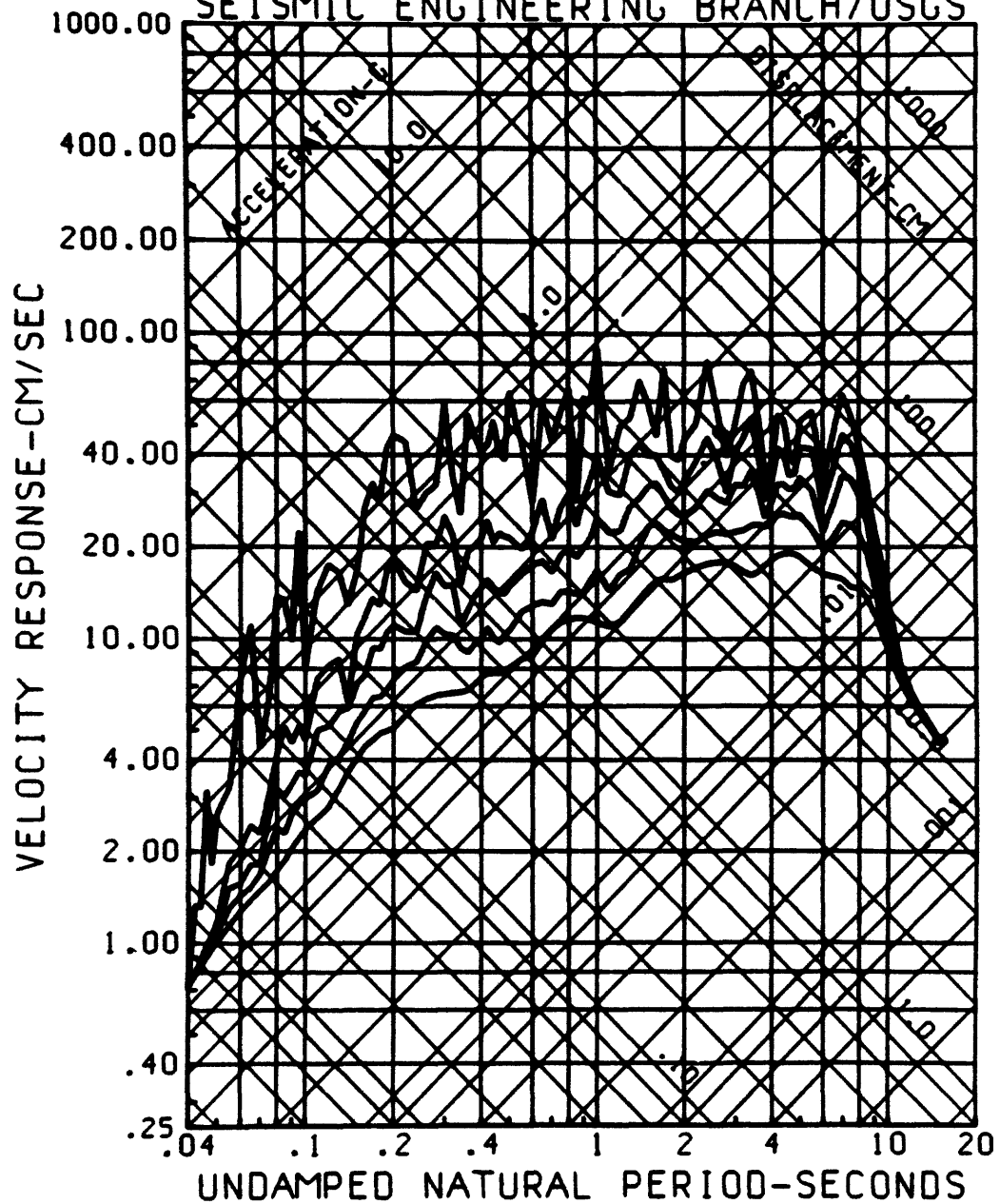


RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO.ARRAY 12.10/15/79.2317UTC.UP  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

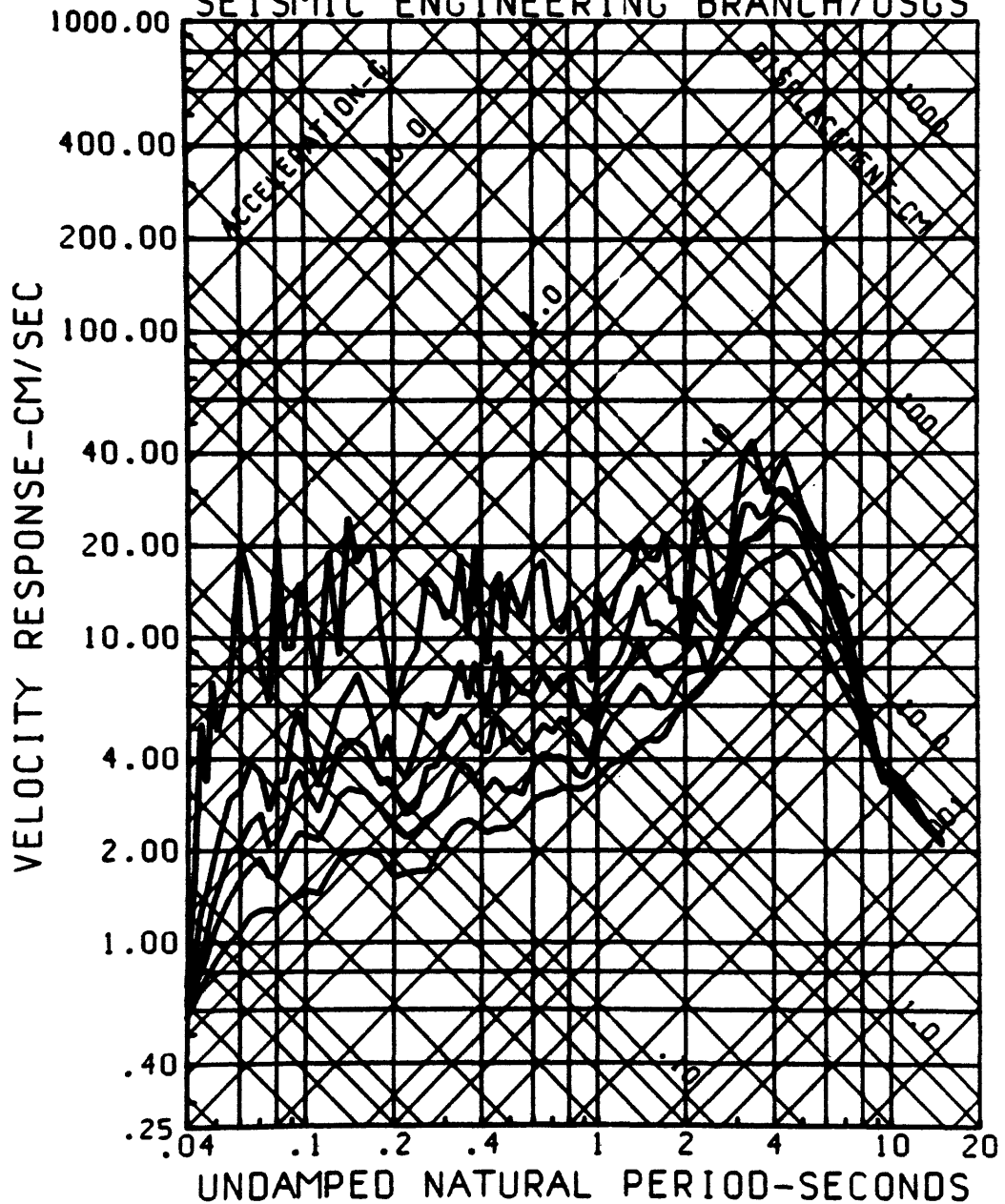




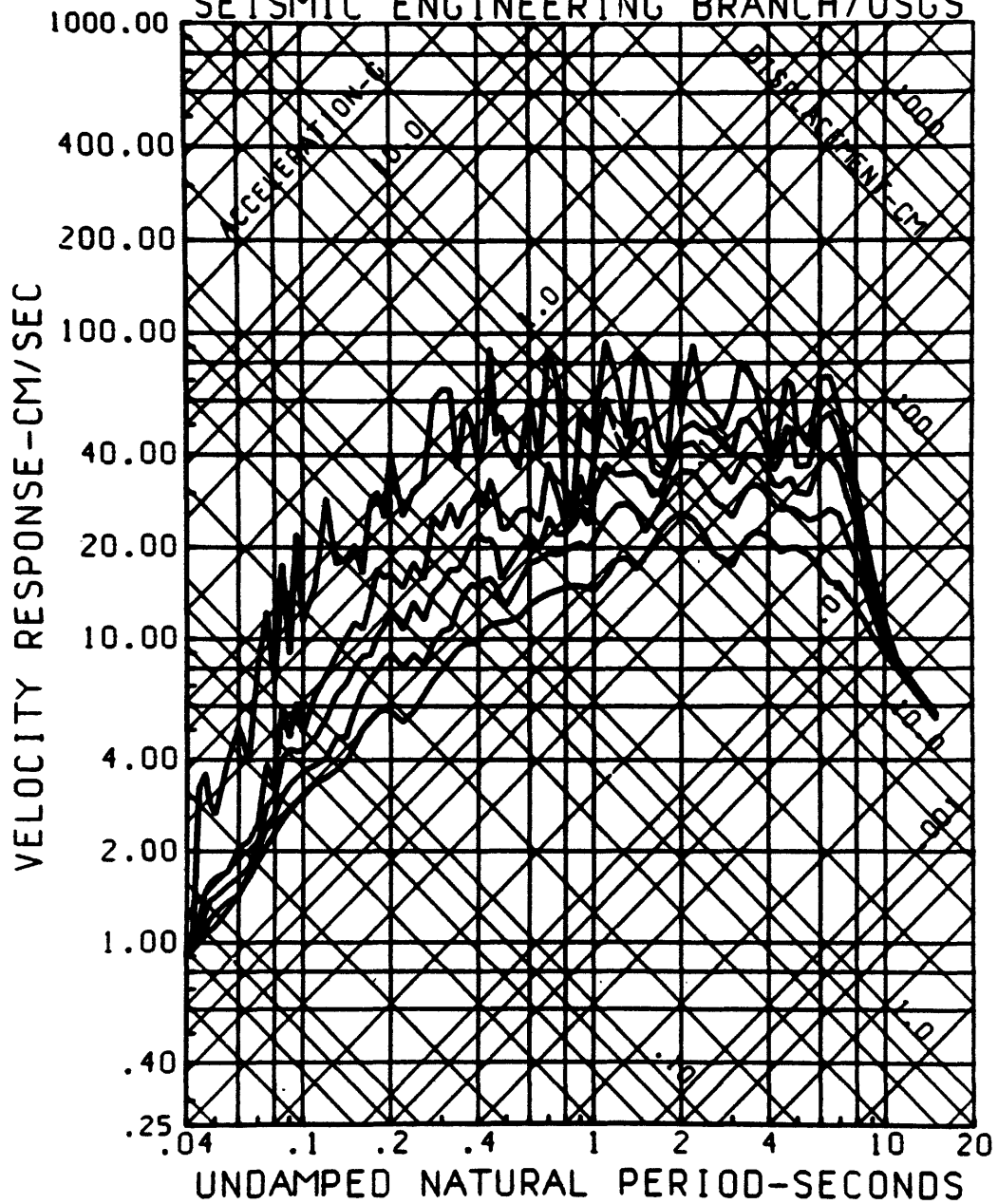
RESPONSE SPECTRA  
 EL CENTRO, ARRAY 12, 10/15/79, 2317, 230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



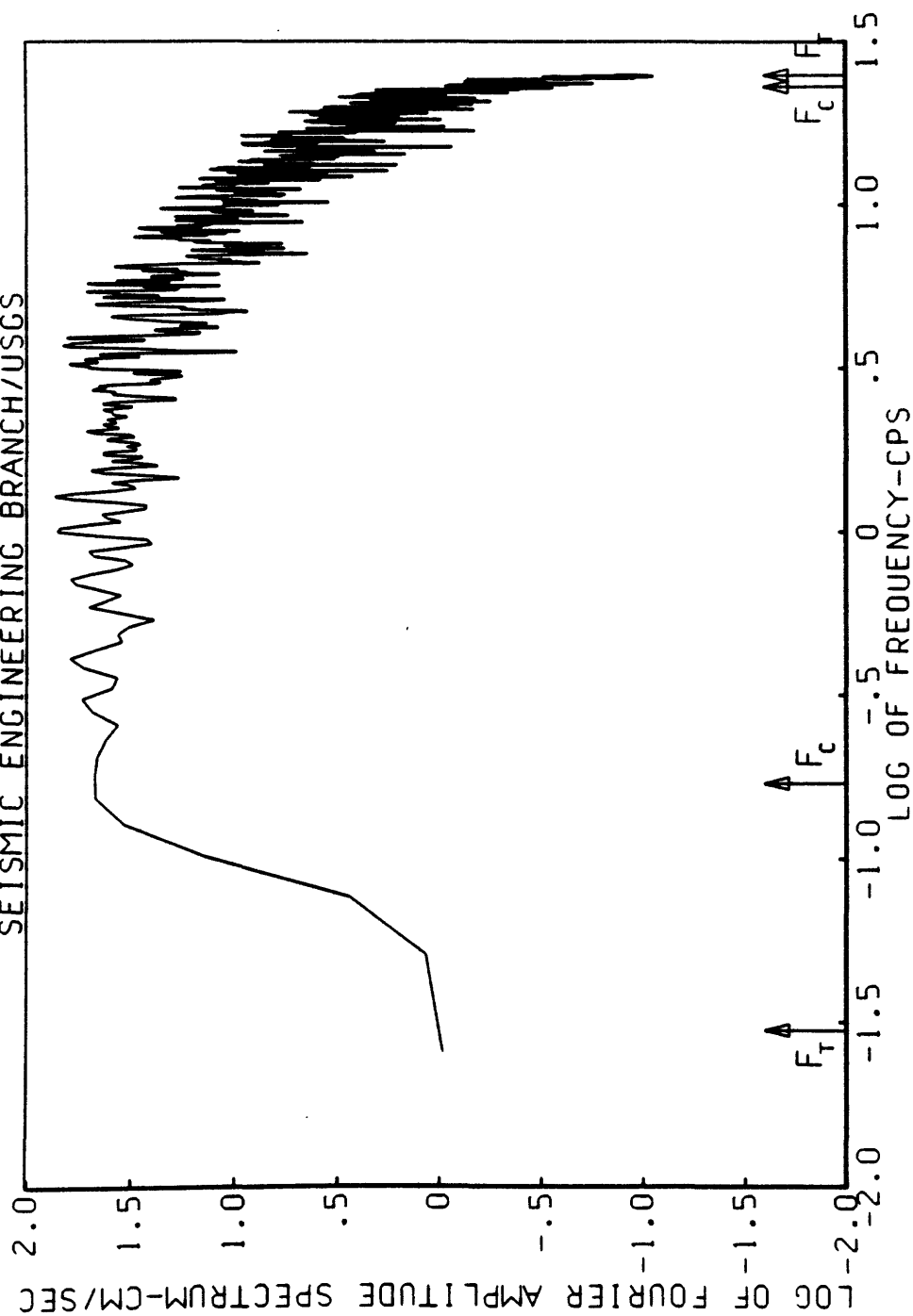
RESPONSE SPECTRA  
 EL CENTRO, ARRAY 12, 10/15/79, 2317 UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



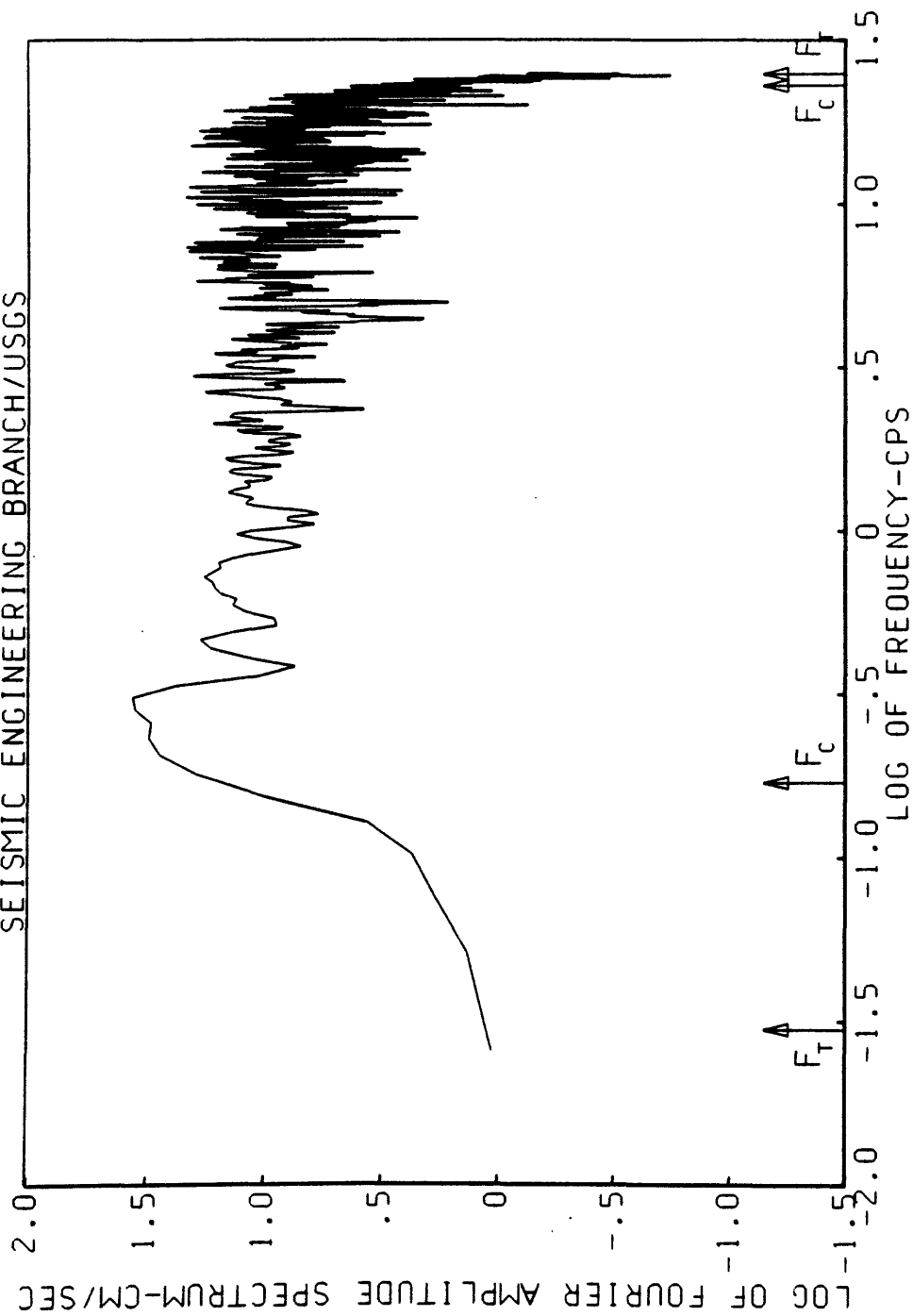
RESPONSE SPECTRA  
 EL CENTRO, ARRAY 12.10/15/79.2317.140 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



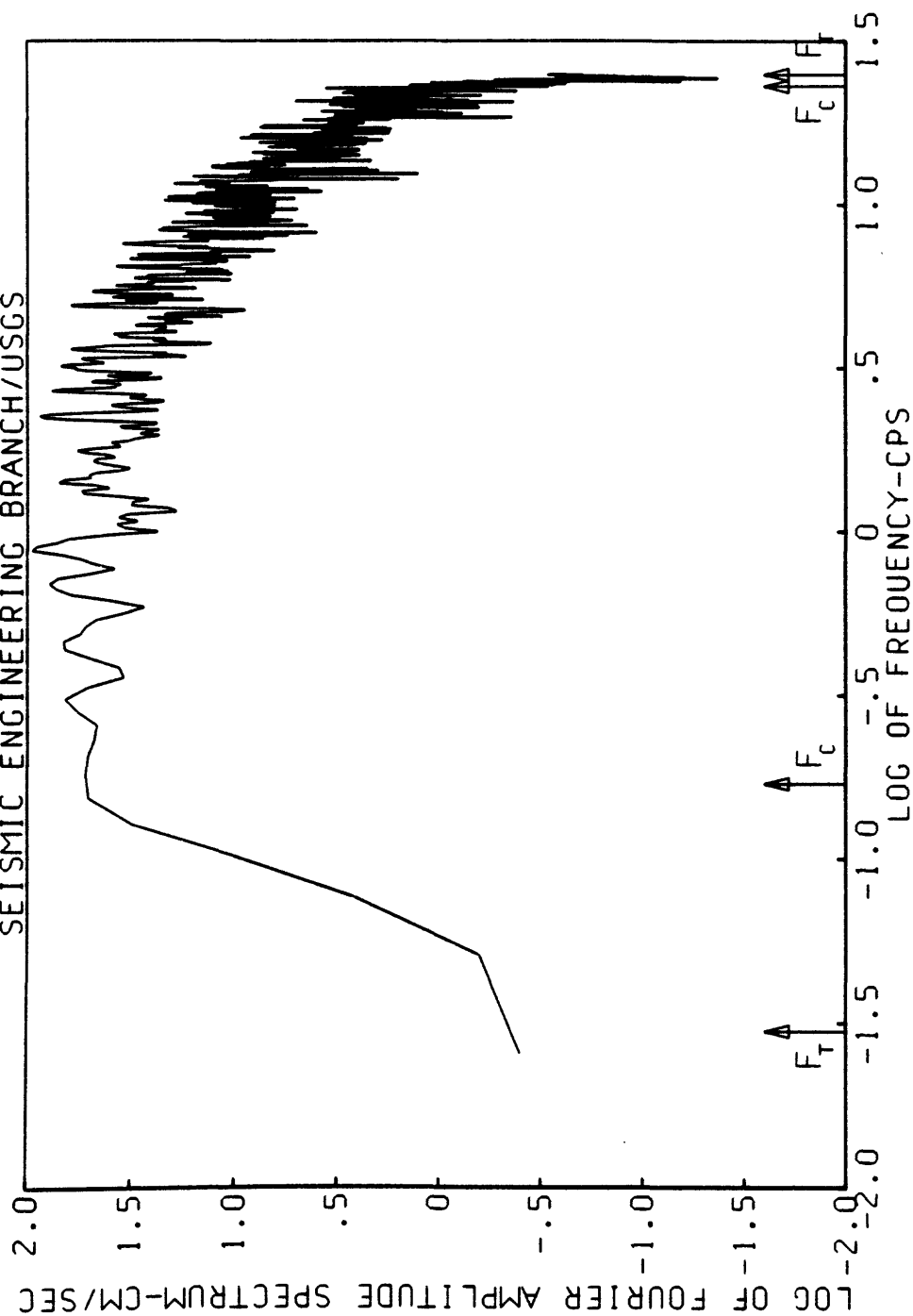
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

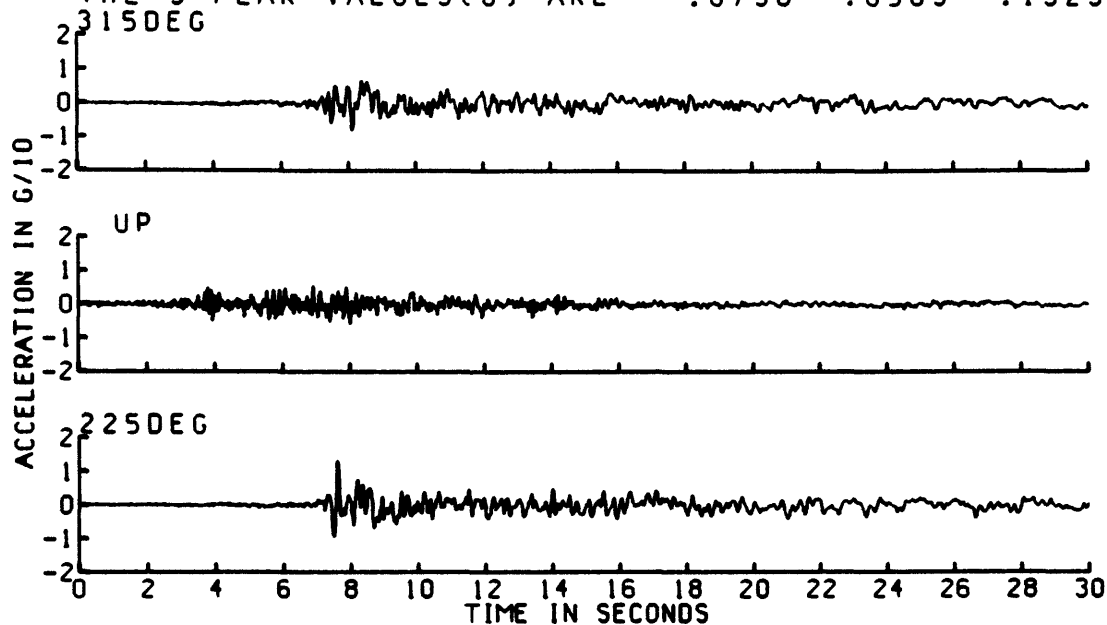


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BROCKMAN RD., EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

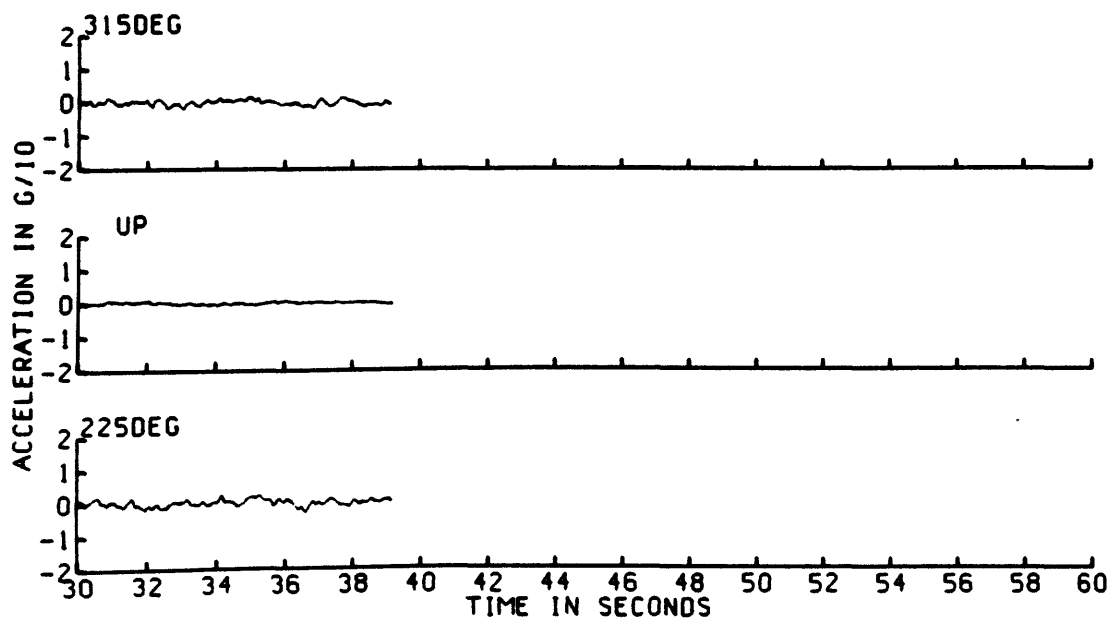




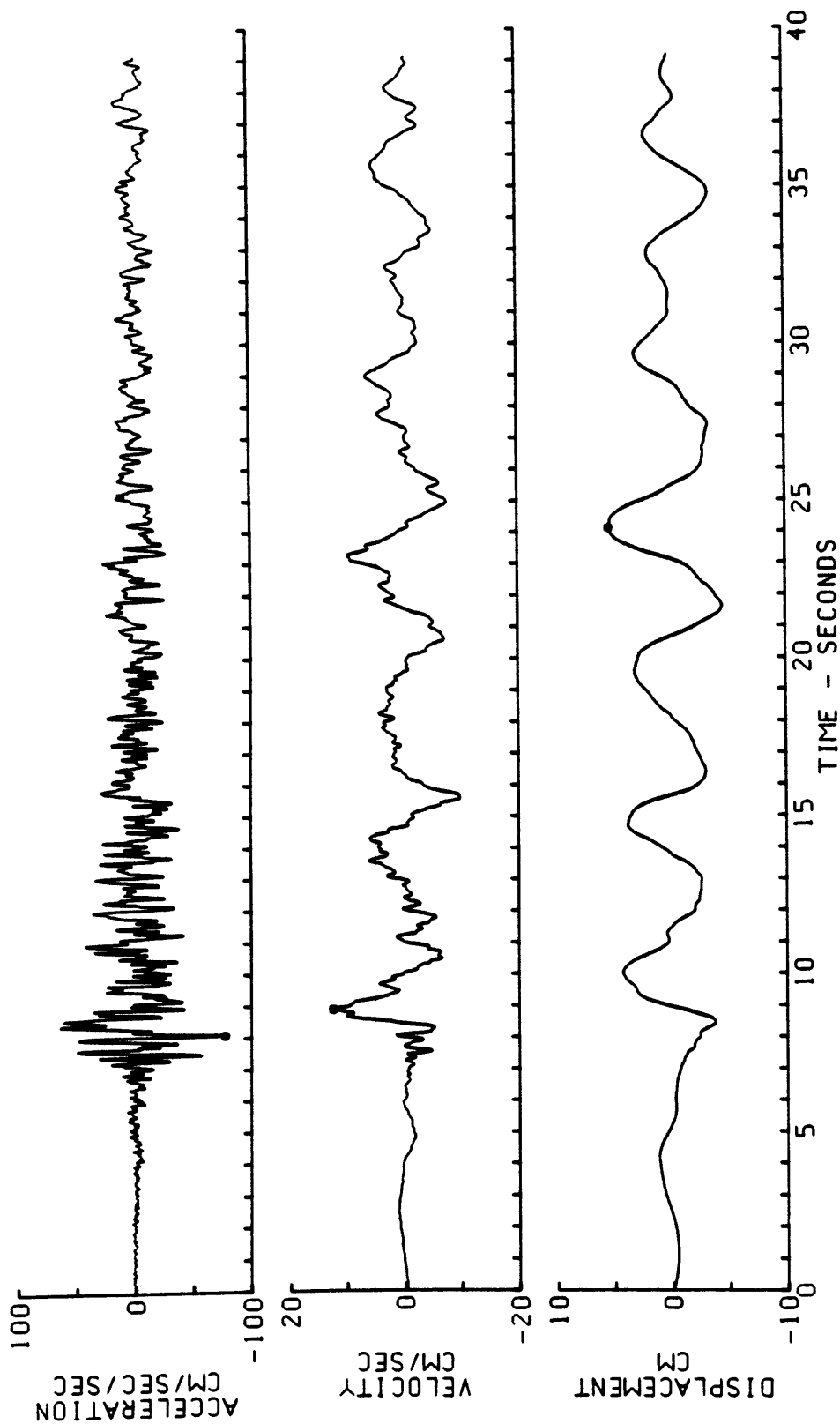
UNCORRECTED ACCELEROGRAM  
 CALIPATRIA, CALIF., FIRE STATION, 10/15/79, 2317UTC  
 THE 3 PEAK VALUES (G) ARE .0790 .0563 .1323



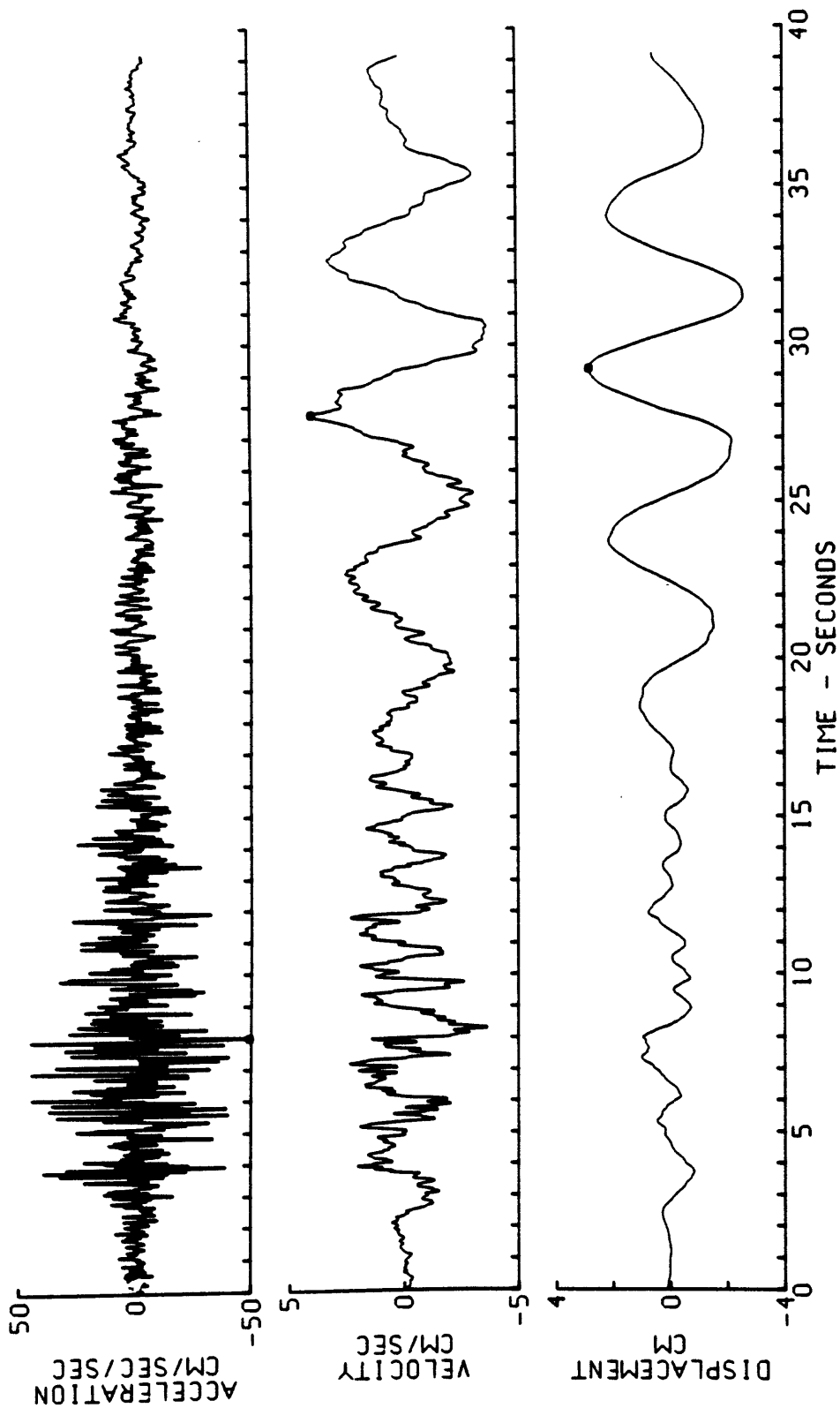
CALIPATRIA, CALIF., FIRE STATION, 10/15/79, 2317UTC



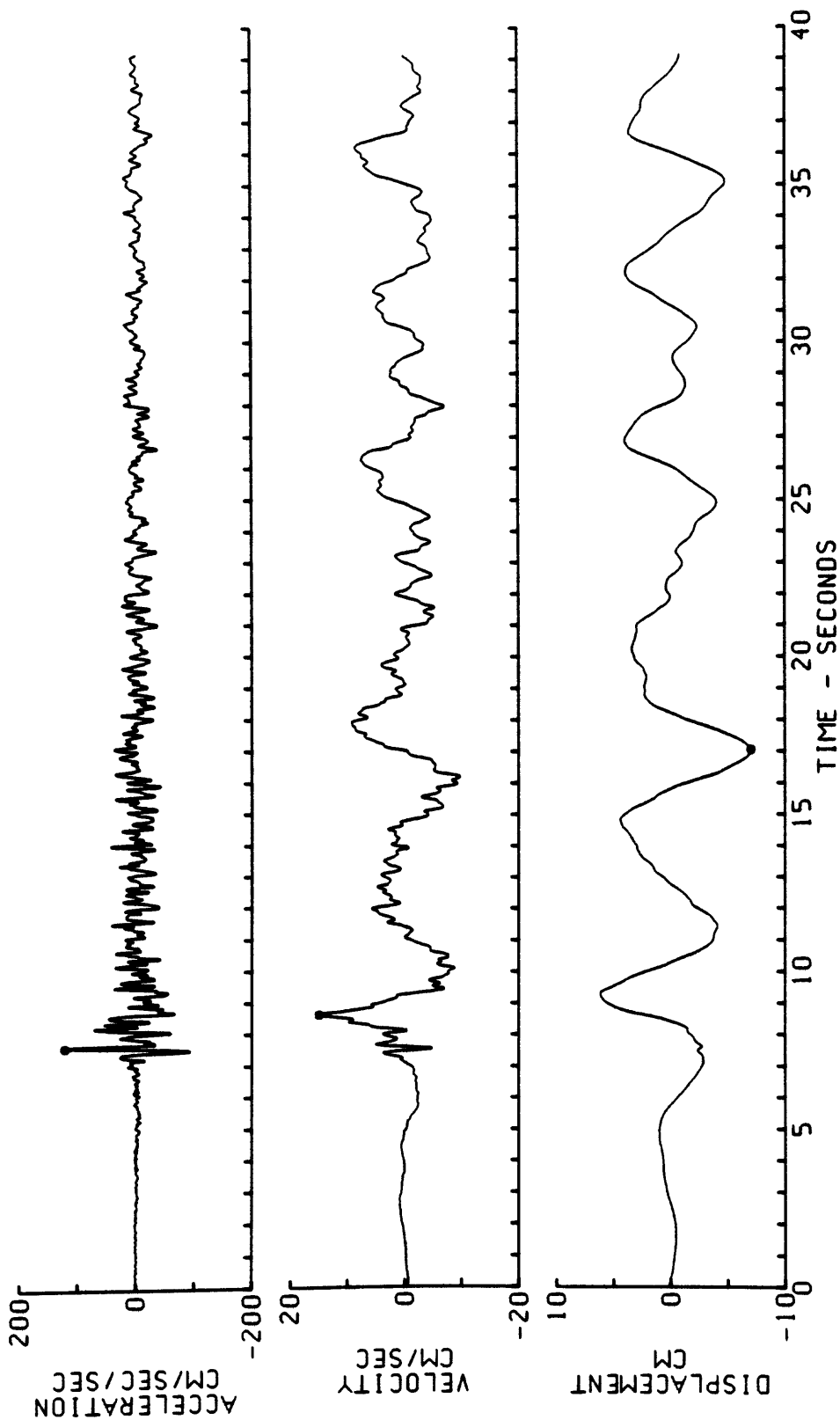
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP 315 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-77.00 CM/SEC/SEC, VELOCITY=12.41 CM/SEC, DISPL=5.350 CM



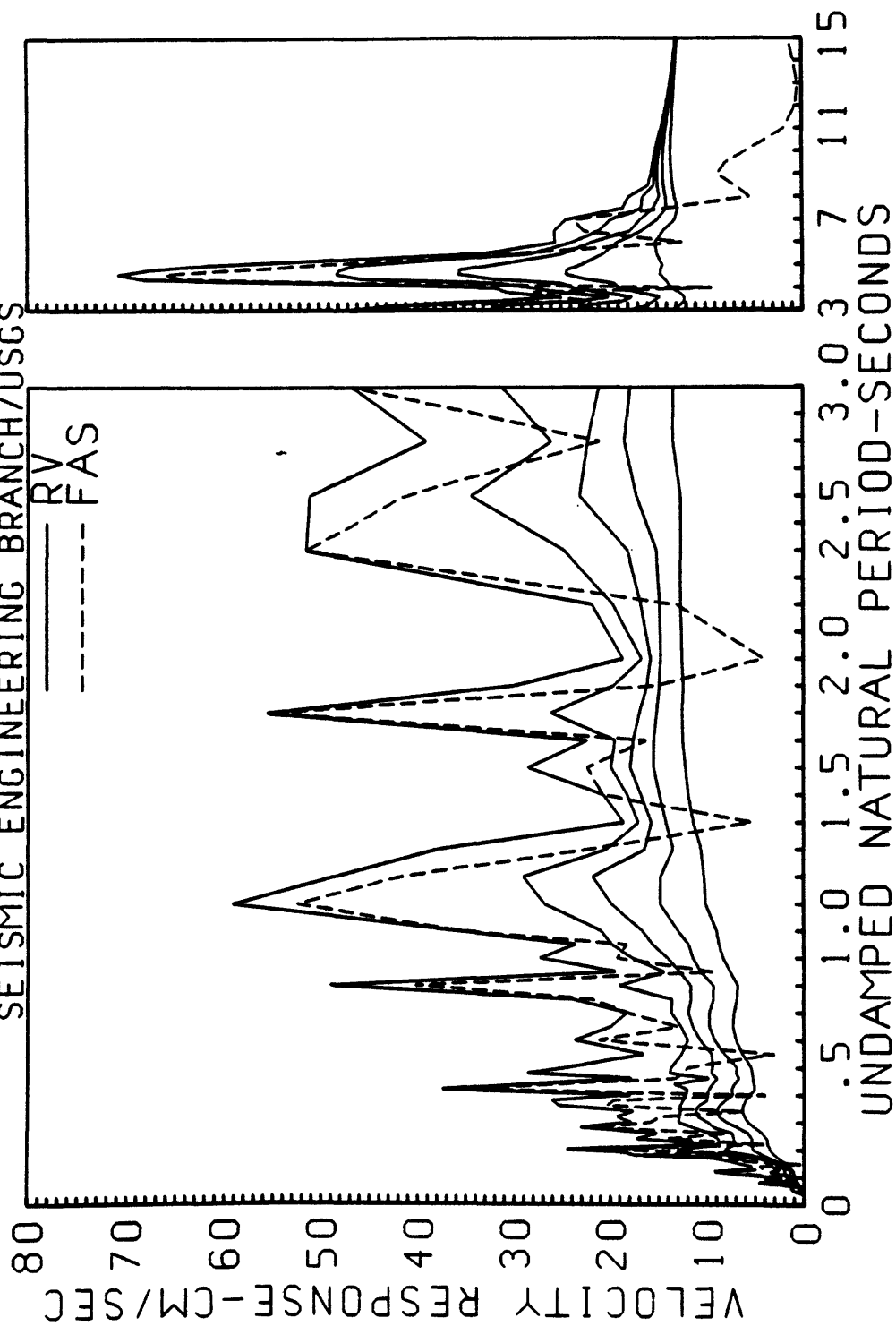
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317 UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-48.99 CM/SEC/SEC, VELOCITY=4.000 CM/SEC, DISPL=2.790 CM



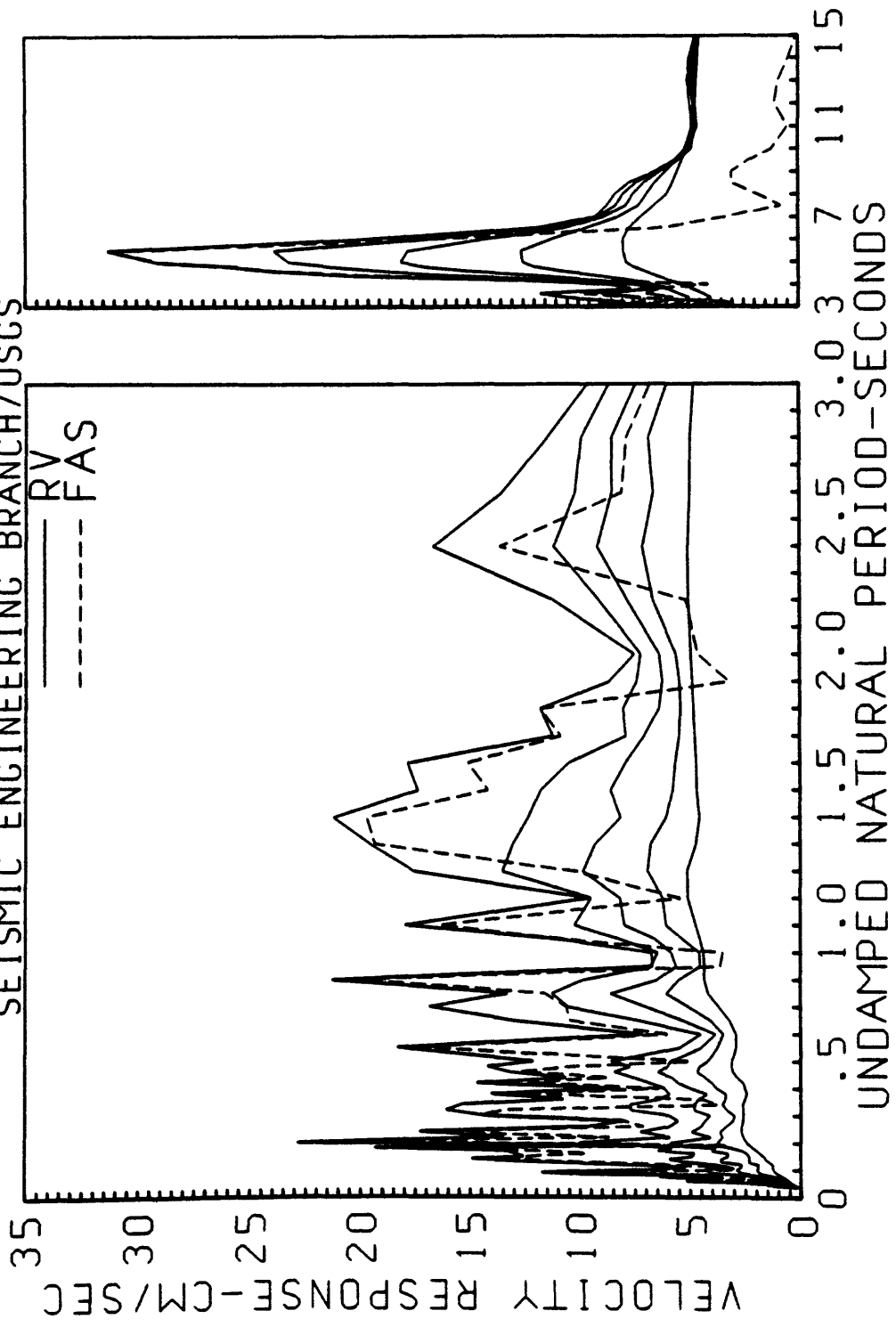
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP 225  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=125.1 CM/SEC/SEC, VELOCITY=14.96 CM/SEC, DISPL=-7.040 CM



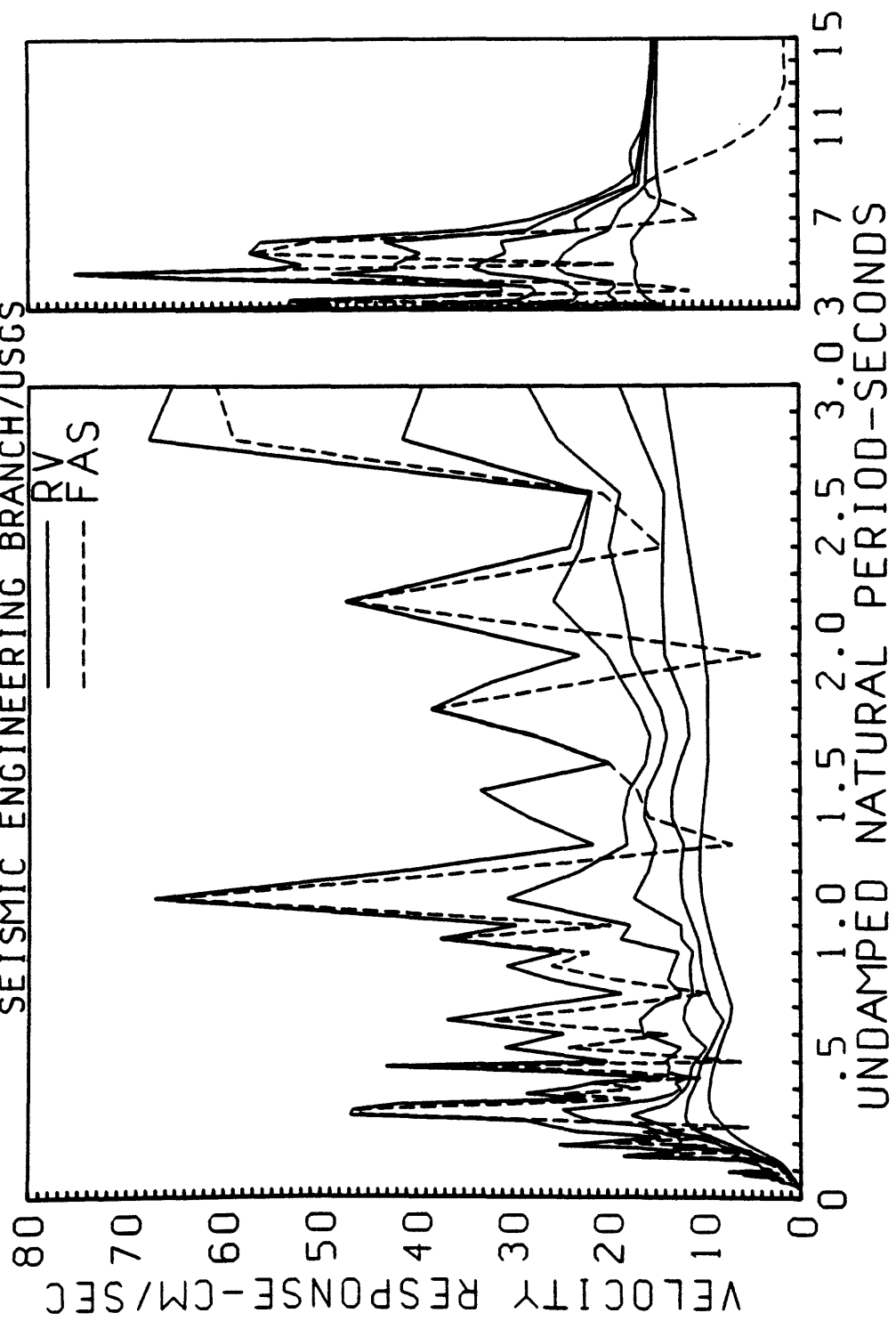
RELATIVE VELOCITY RESPONSE SPECTRUM  
 CALIPATRIA,CALIF..10/15/79.2317.315 DEG  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

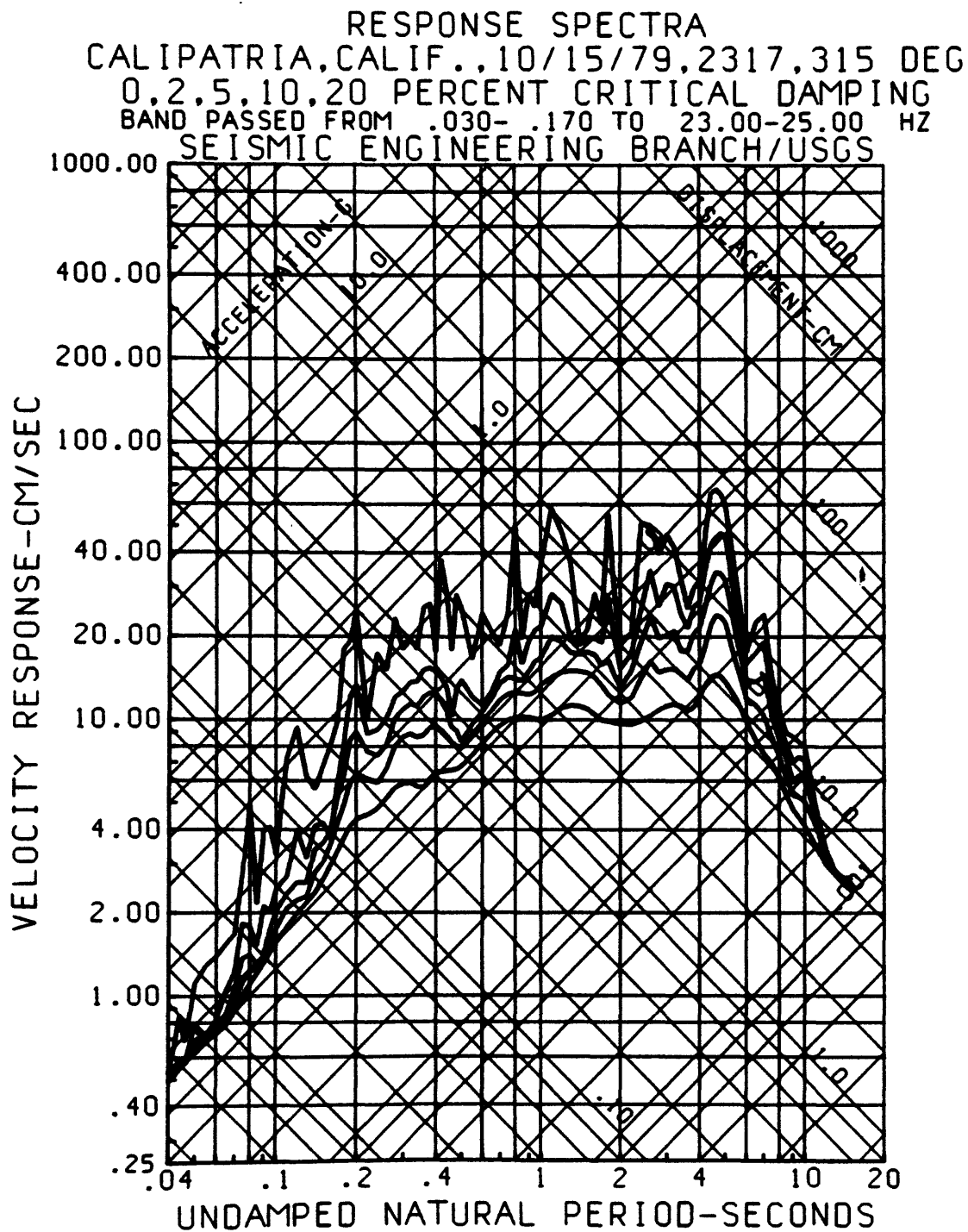


RELATIVE VELOCITY RESPONSE SPECTRUM  
 CALIPATRIA,CALIF.,10/15/79,2317UTC,UP  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

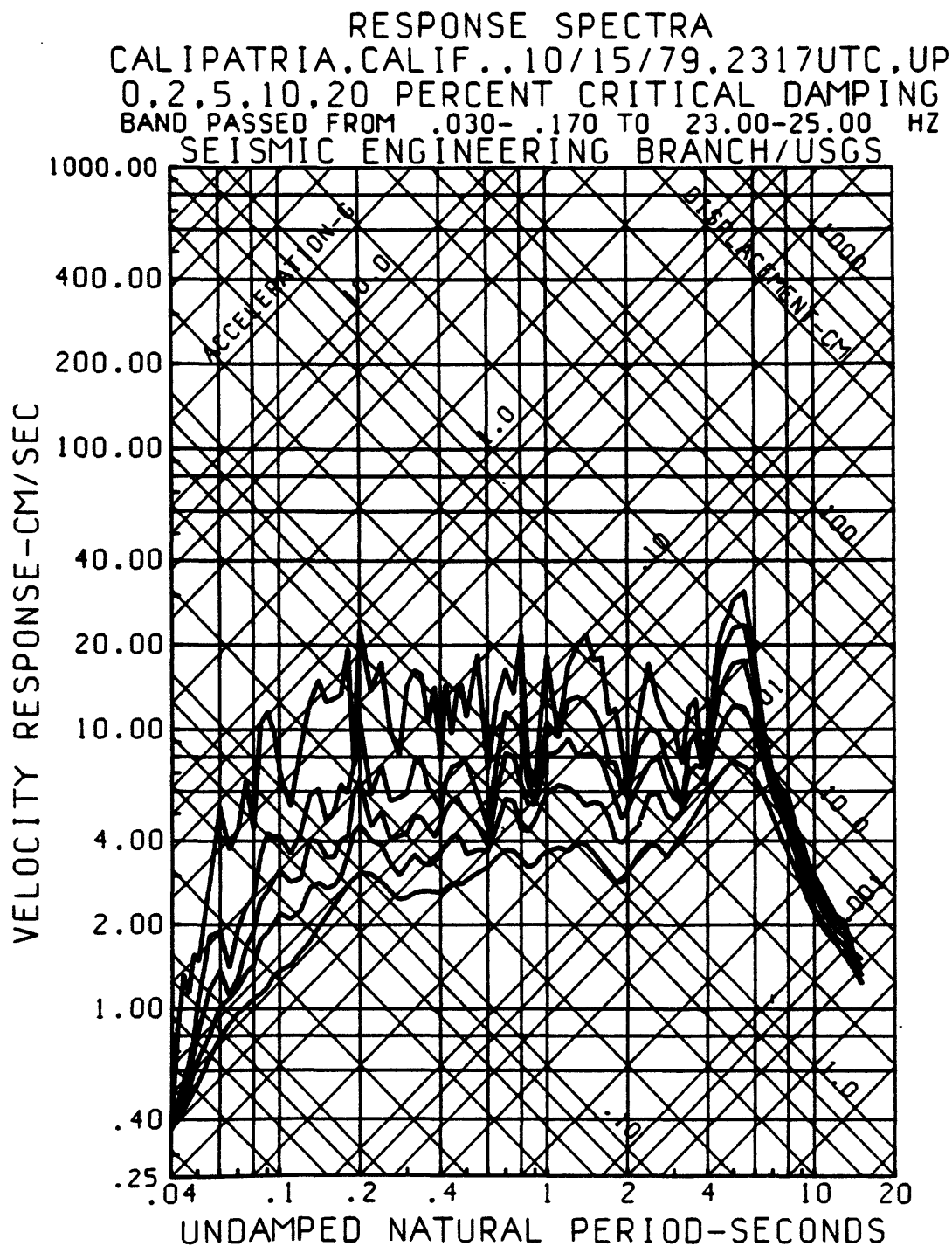


RELATIVE VELOCITY RESPONSE SPECTRUM  
 CALIPATRIA,CALIF.,10/15/79,2317.225 DEG  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



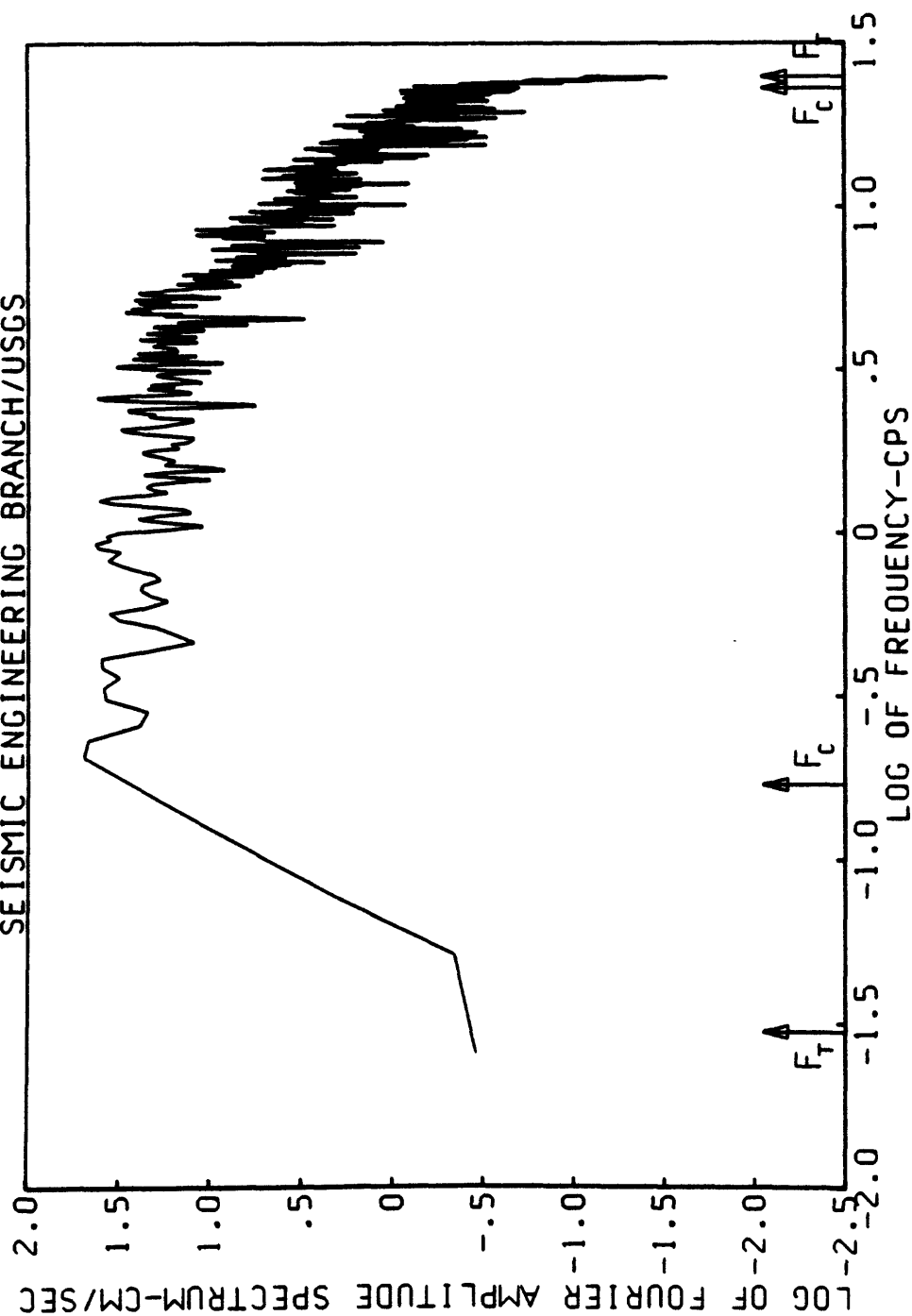




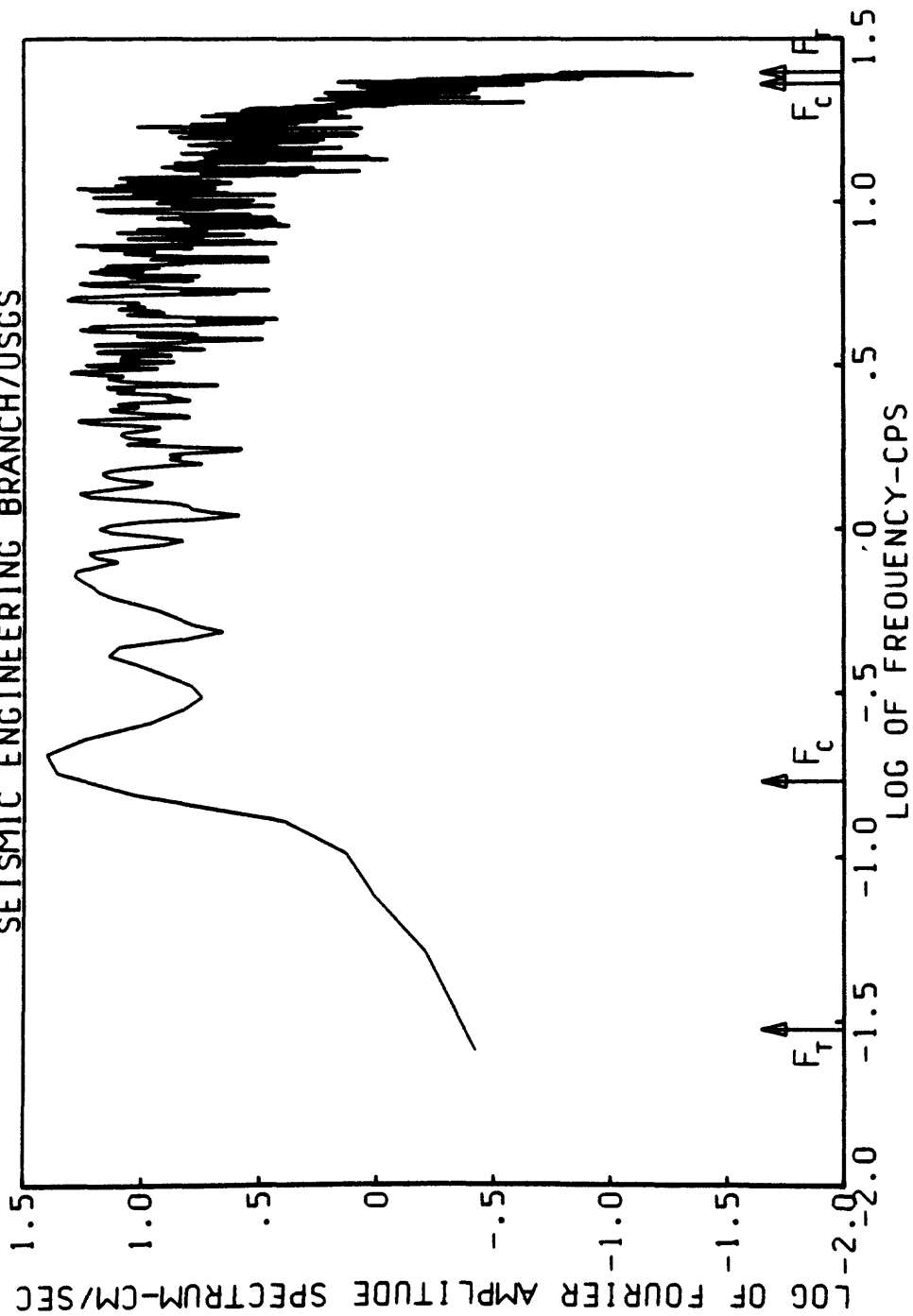




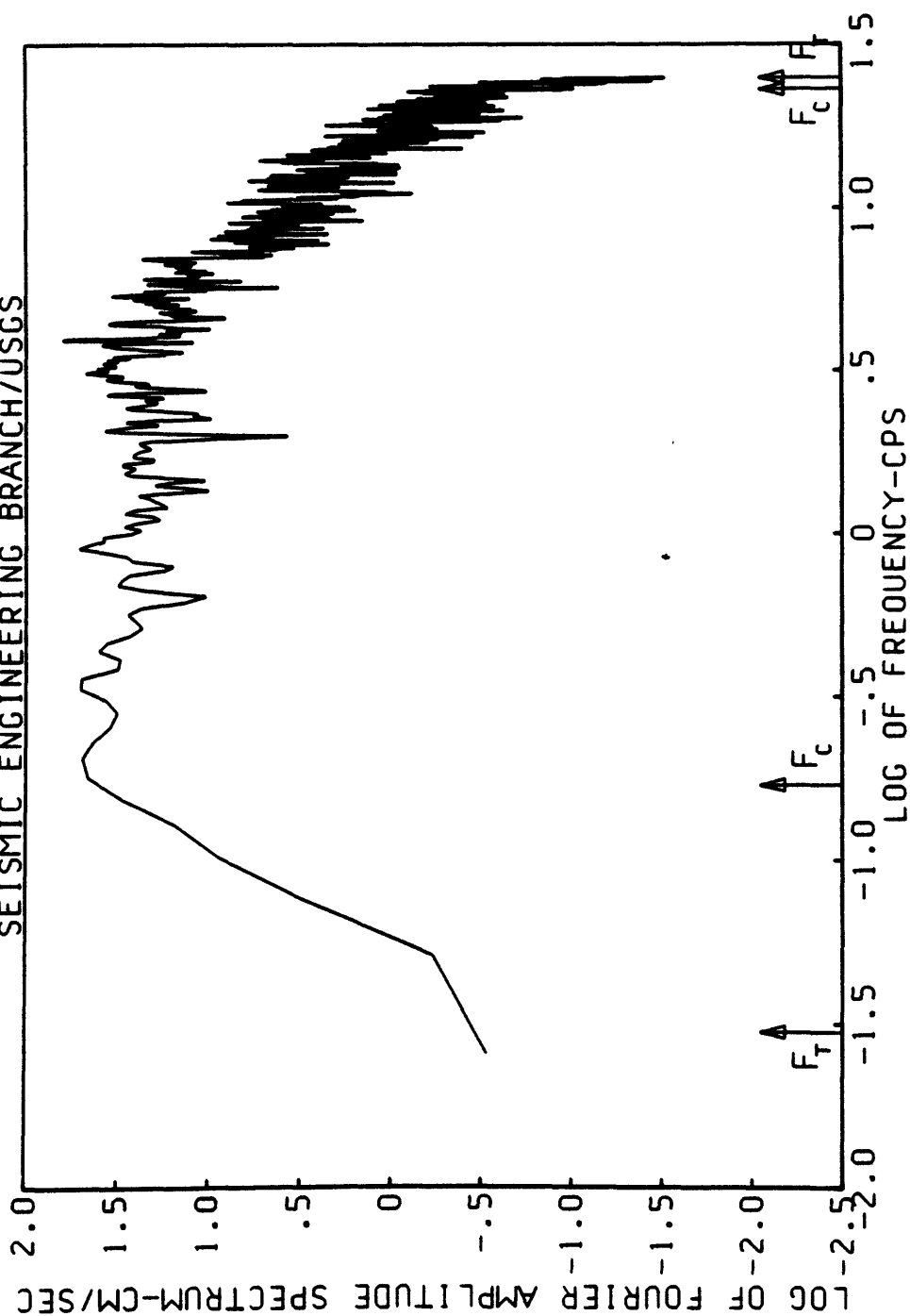
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP 315 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



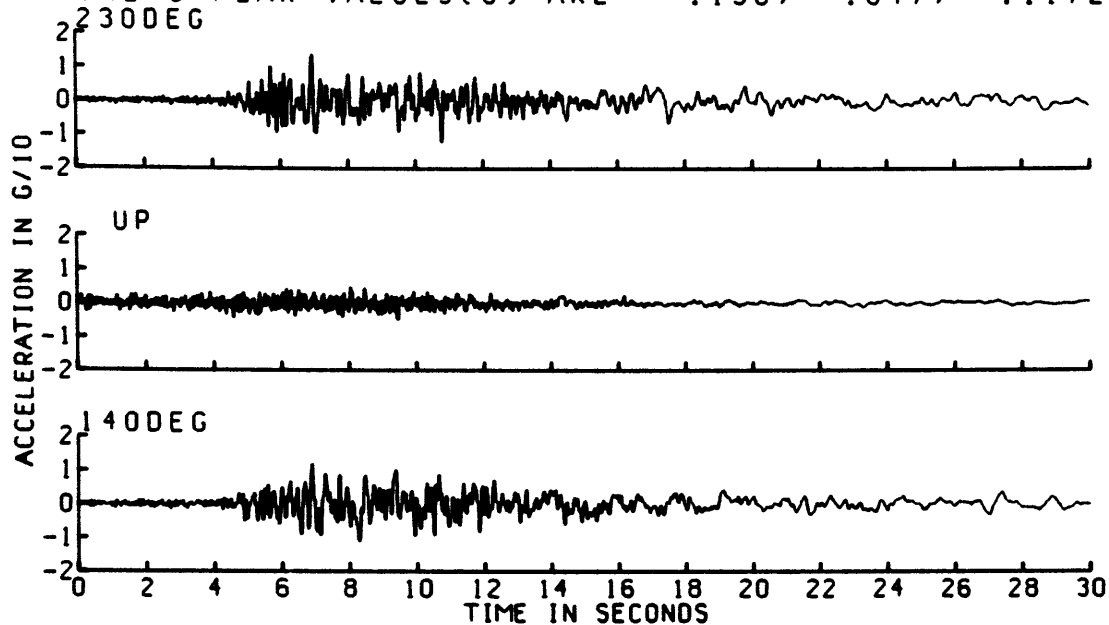
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



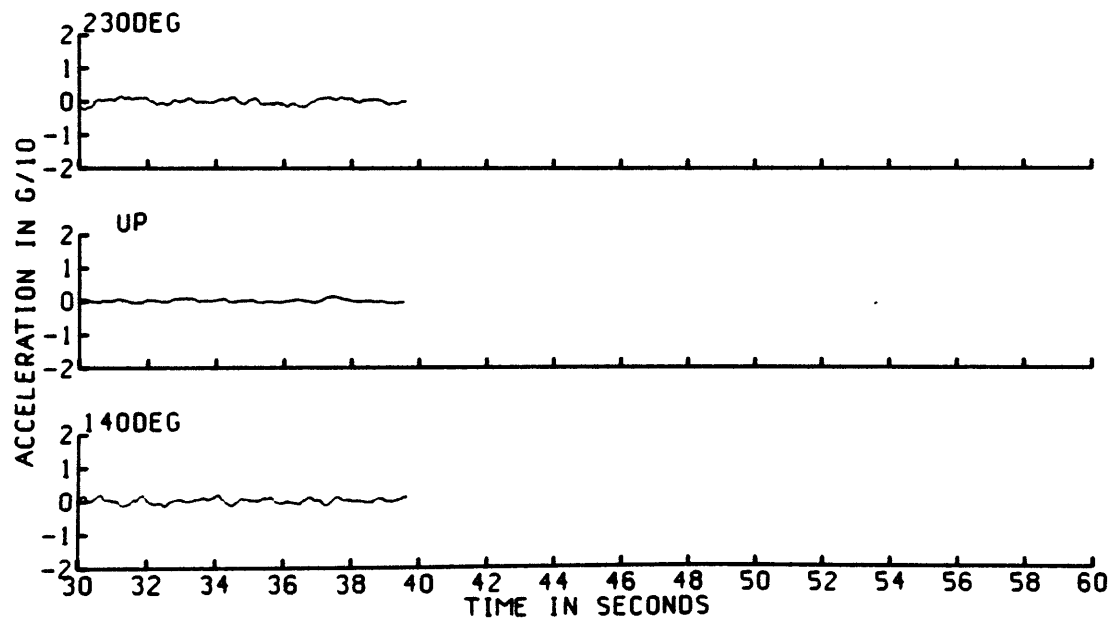
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 FIRE STATION, CALIPATRIA, CALIFORNIA, COMP 225  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



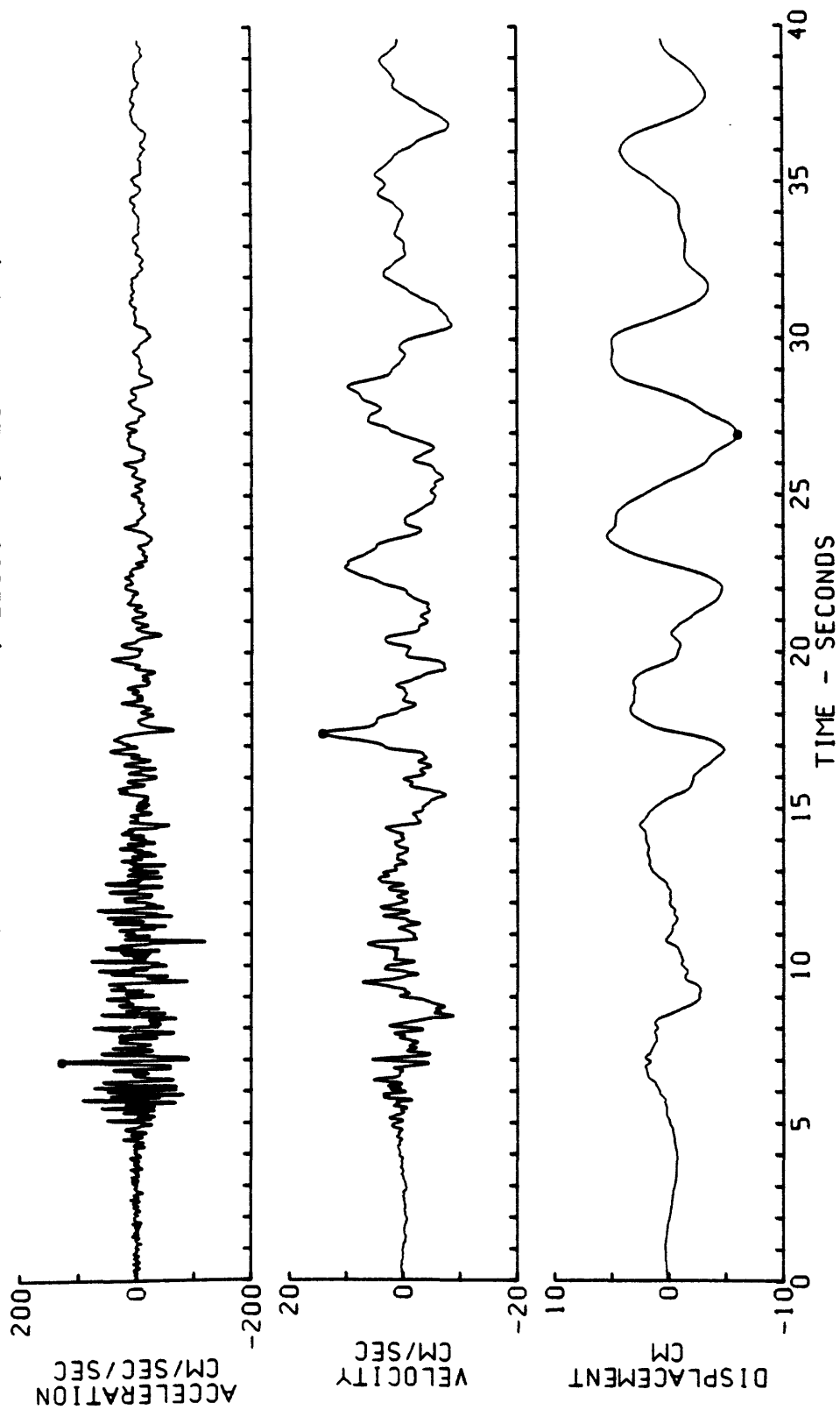
UNCORRECTED ACCELEROGRAM  
 EL CENTRO, ARRAY 13, STROBEL RESION, 10/15/79, 2317UTC  
 THE 3 PEAK VALUES(G) ARE .1387 .0477 .1172



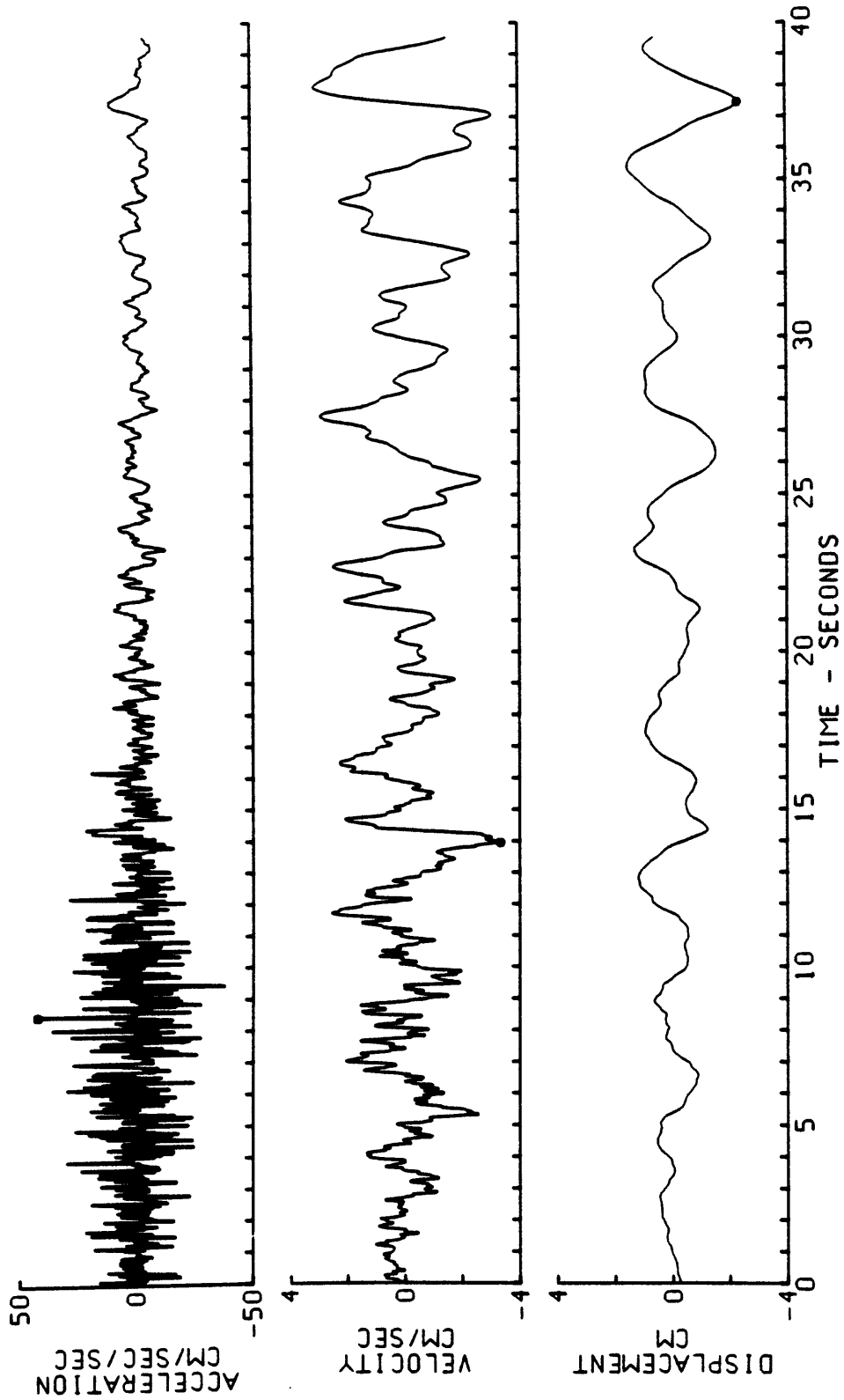
EL CENTRO, ARRAY 13, STROBEL RESION, 10/15/79, 2317UTC



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=131.6 CM/SEC/SEC, VELOCITY=14.20 CM/SEC, DISPL=-6.040 CM

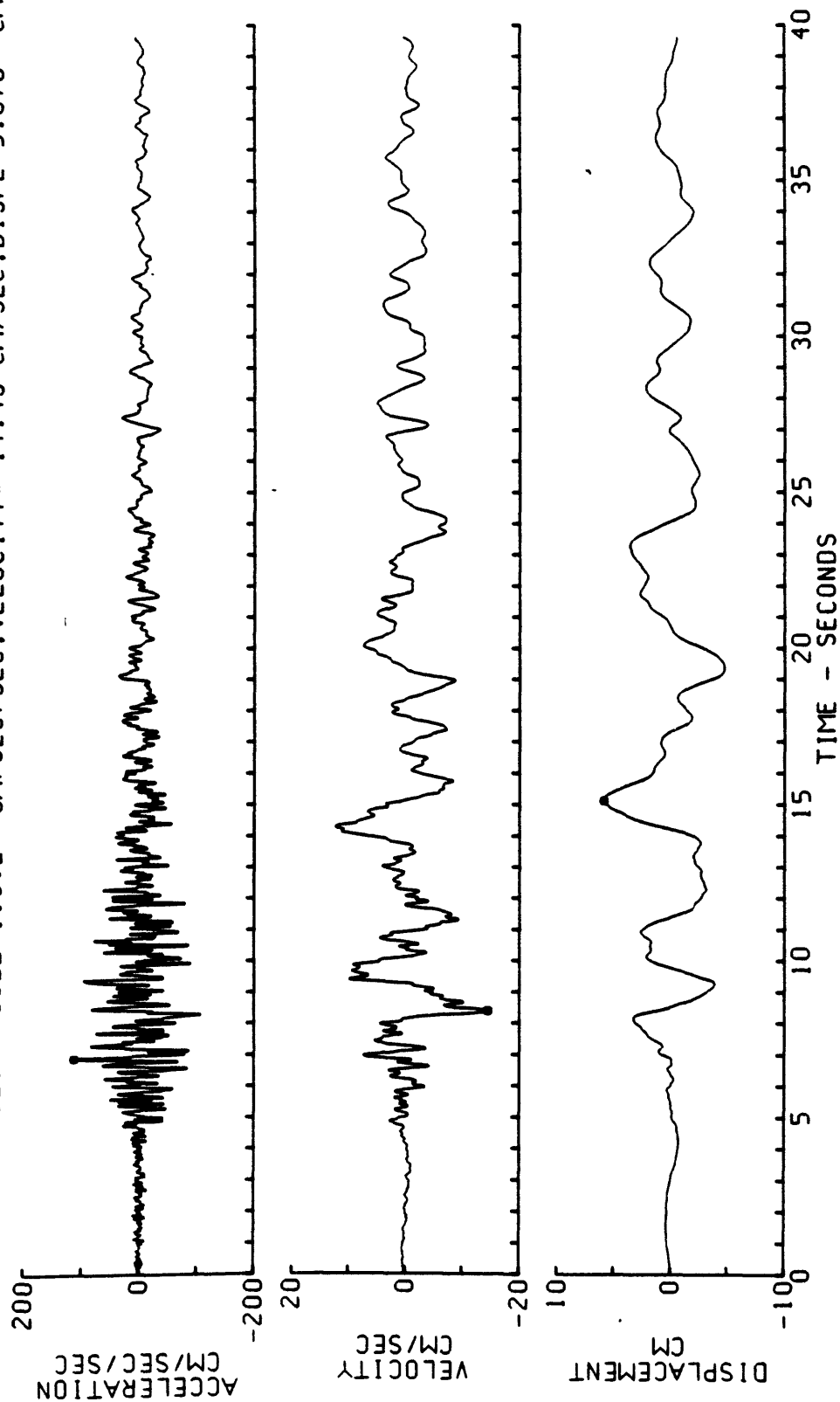


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=42.76 CM/SEC/SEC, VELOCITY=-3.340 CM/SEC, DISPL=-2.330 CM

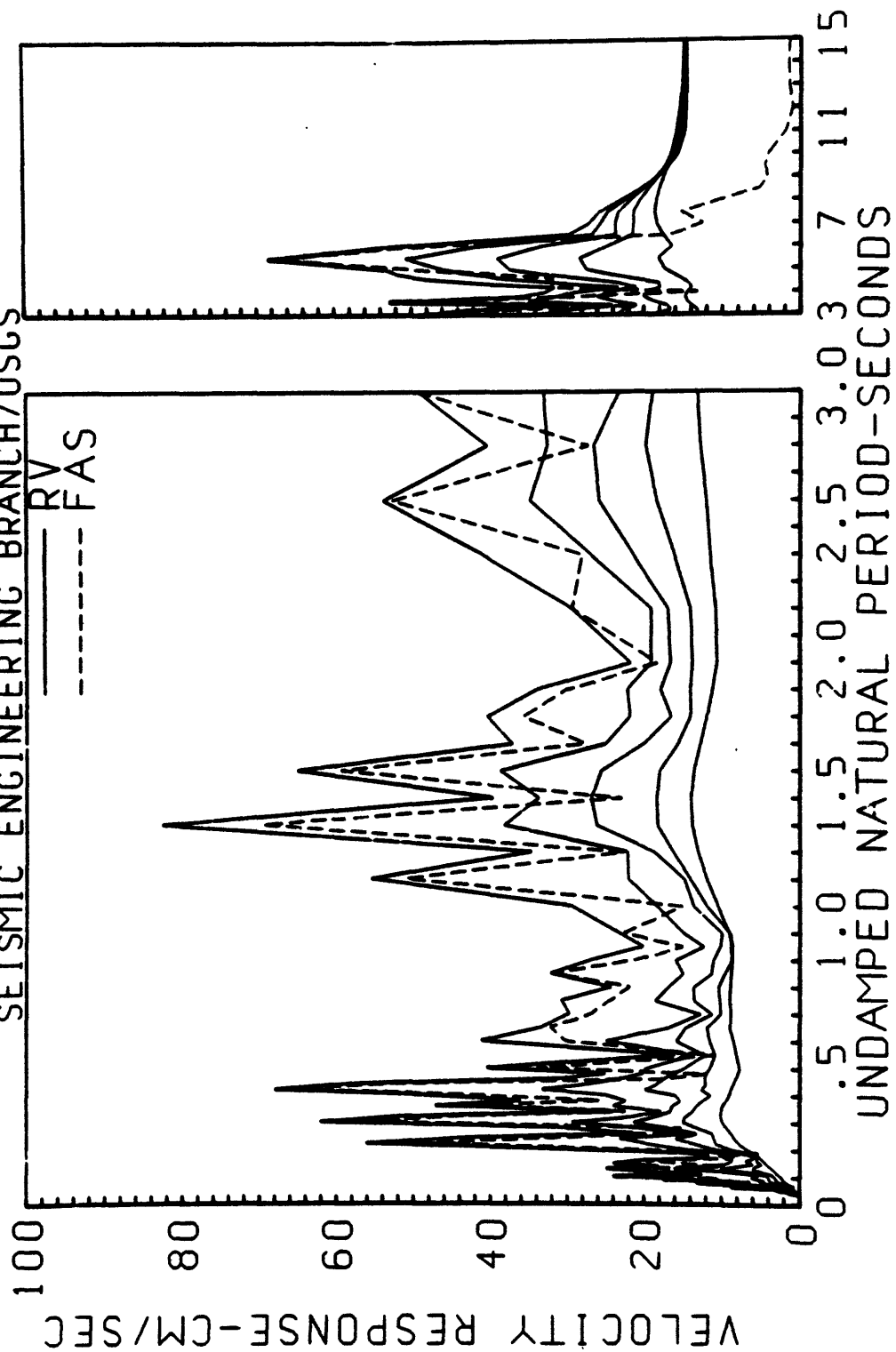




CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .02000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=113.2 CM/SEC/SEC, VELOCITY=-14.49 CM/SEC, DISPL=5.870 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO ARRAY 13.10/15/79, 2317.230 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



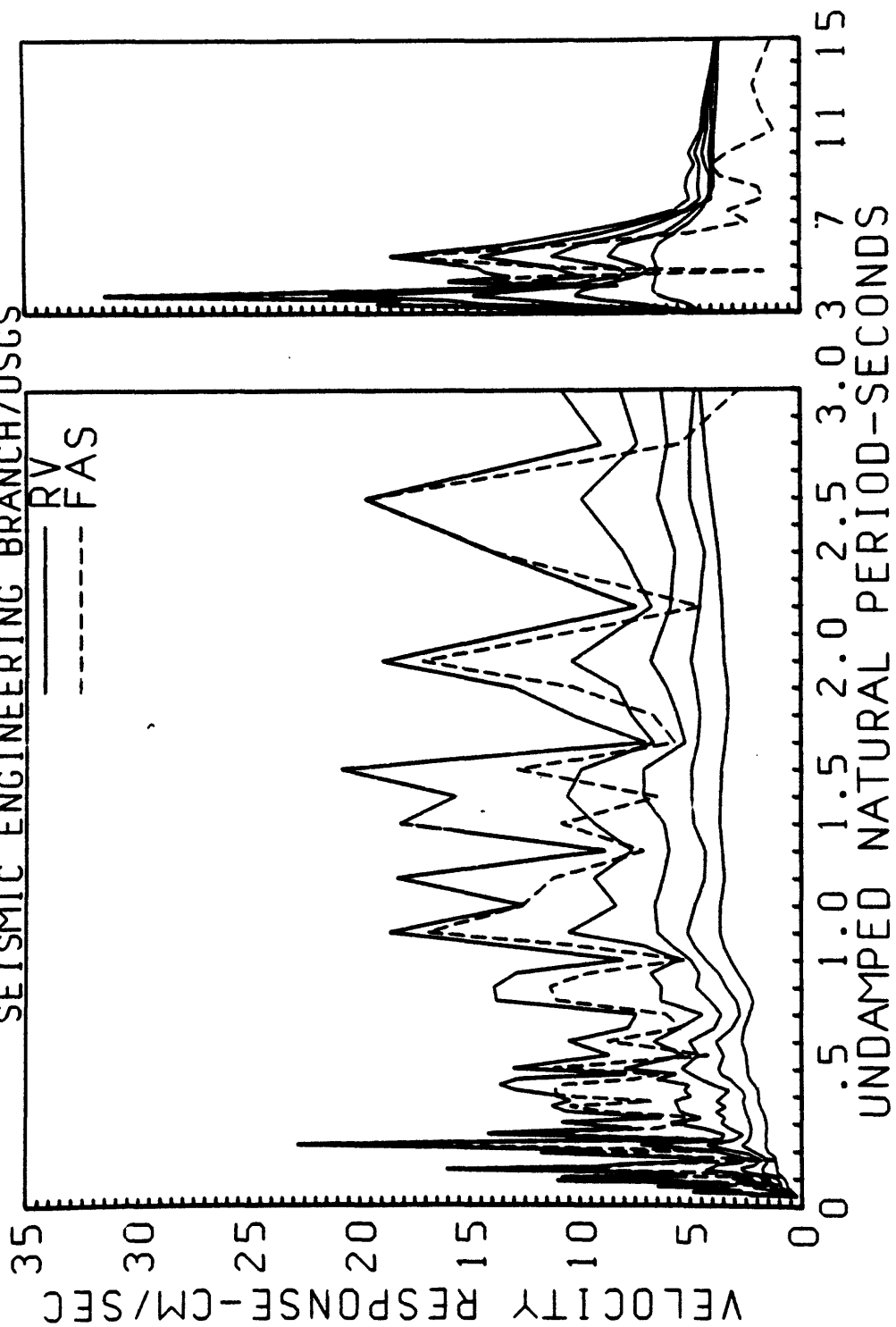
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 13.10/15/79.2317UTC.UP

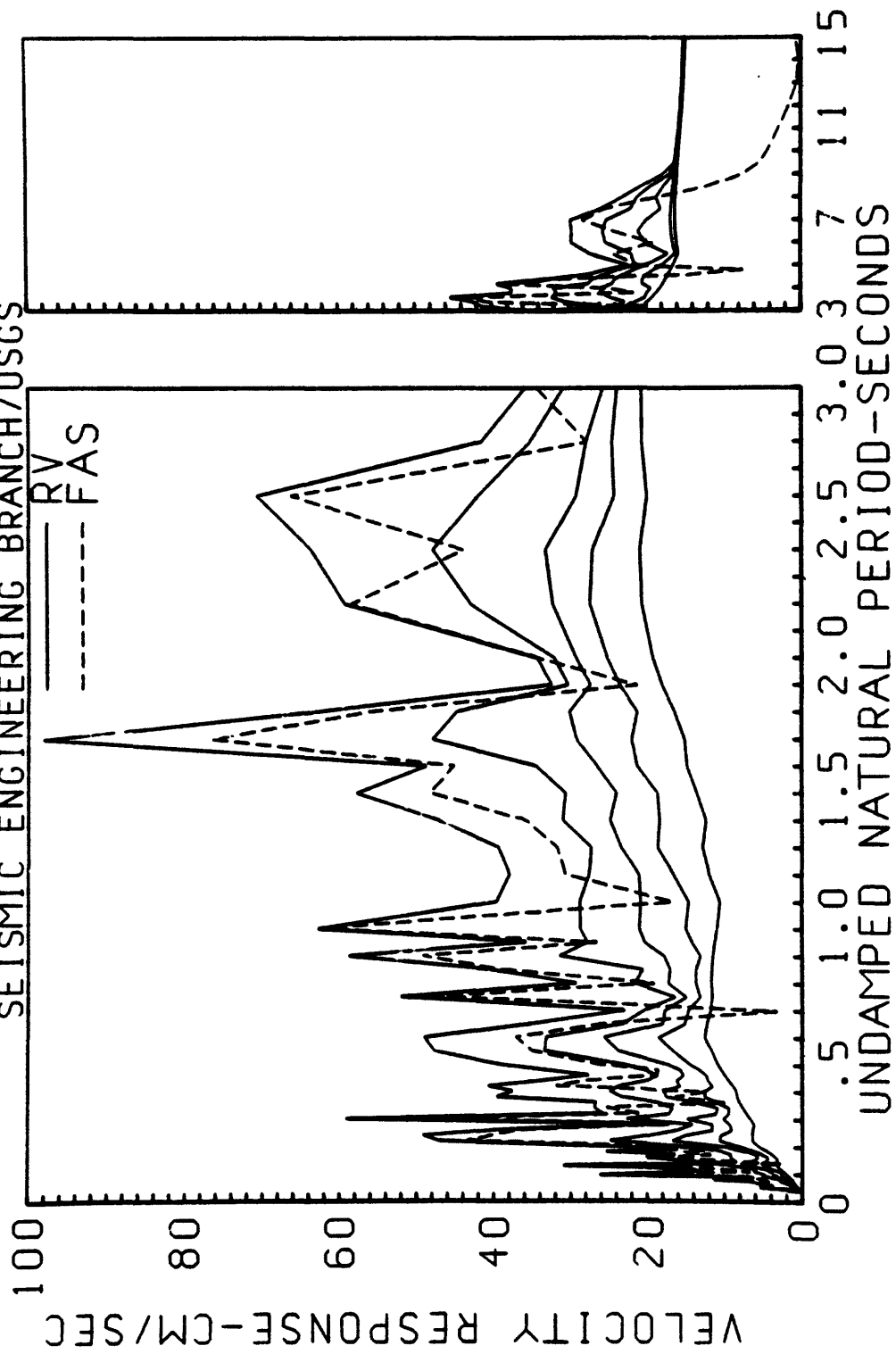
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

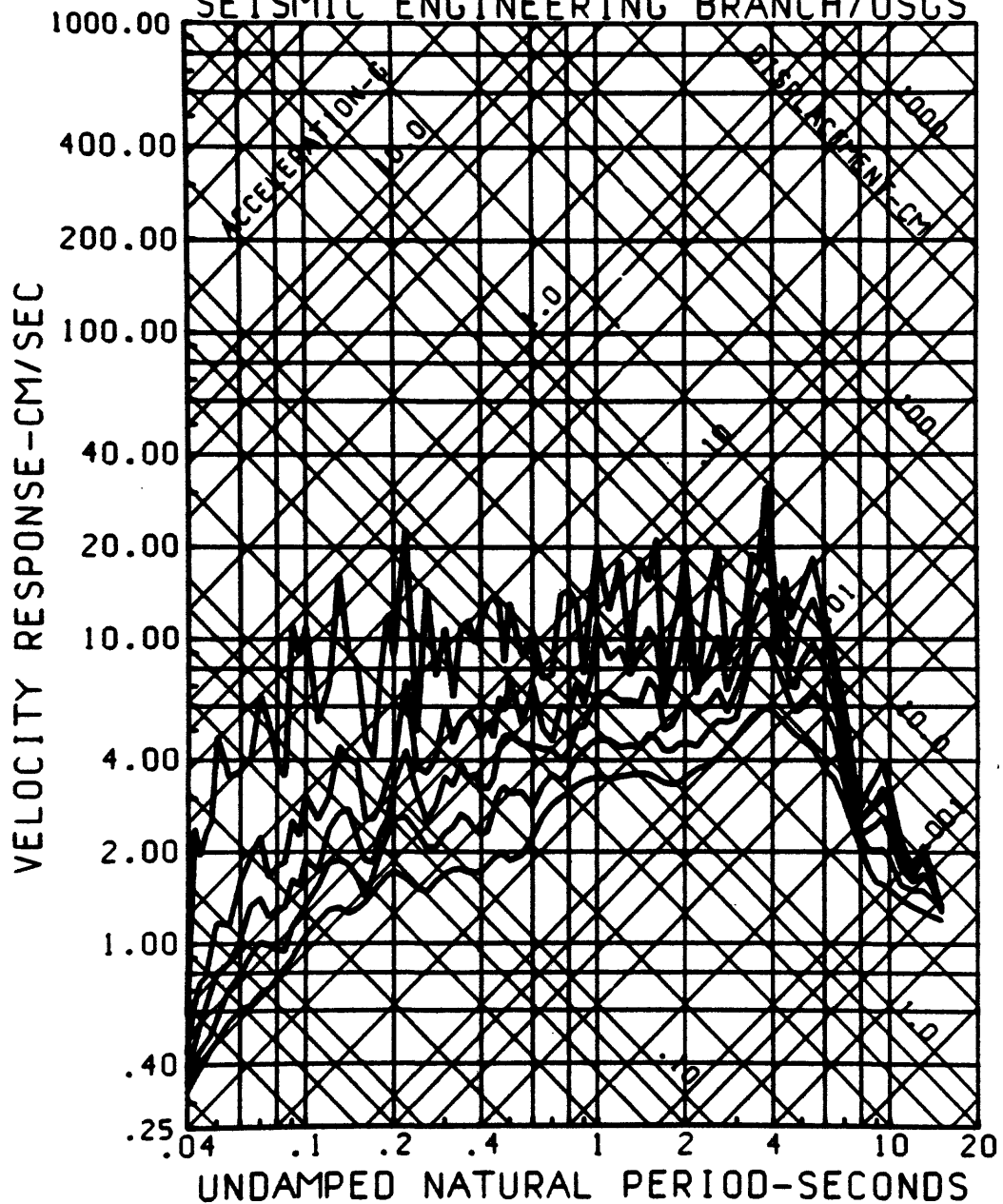


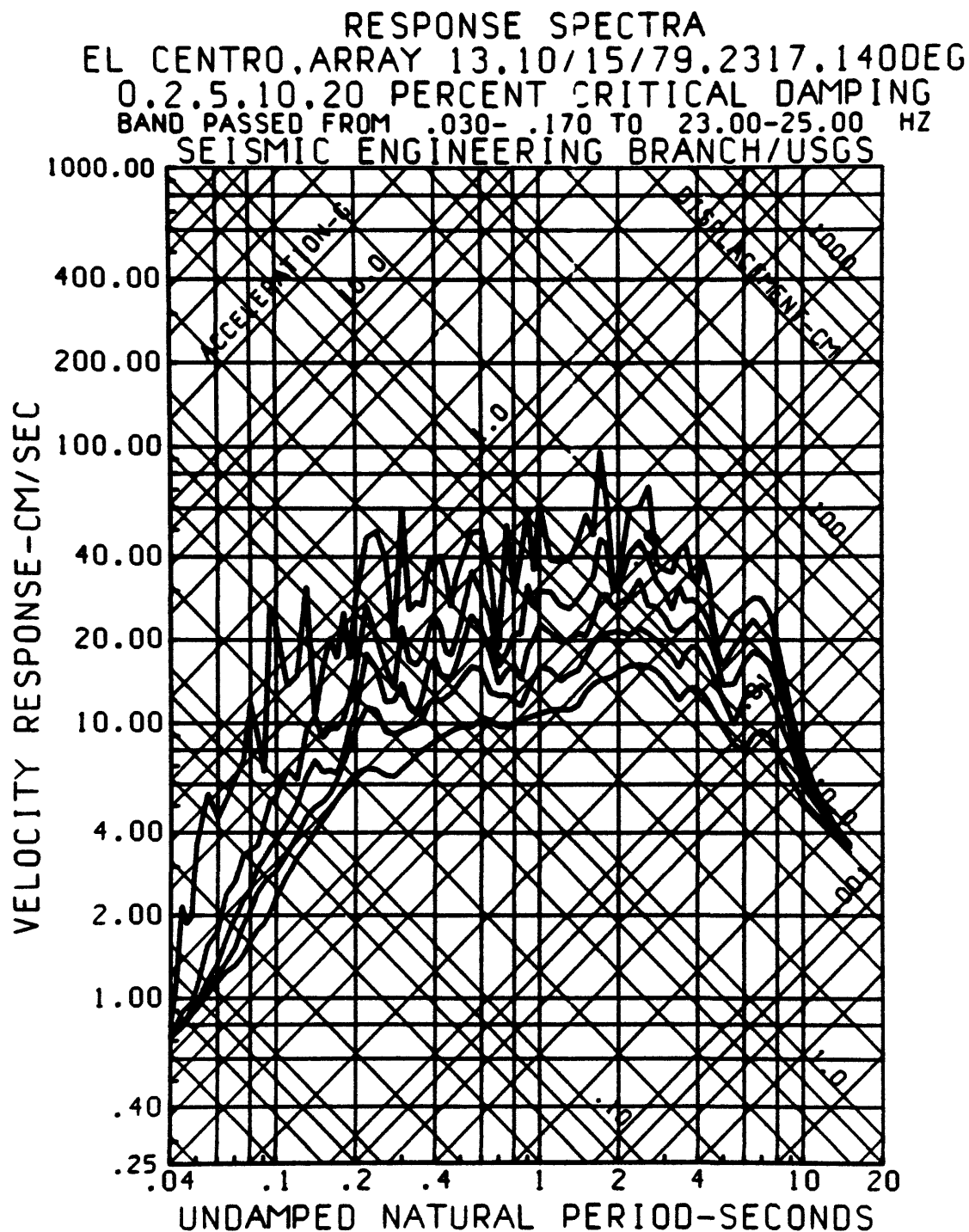
RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 13, 10/15/79, 2317.140 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



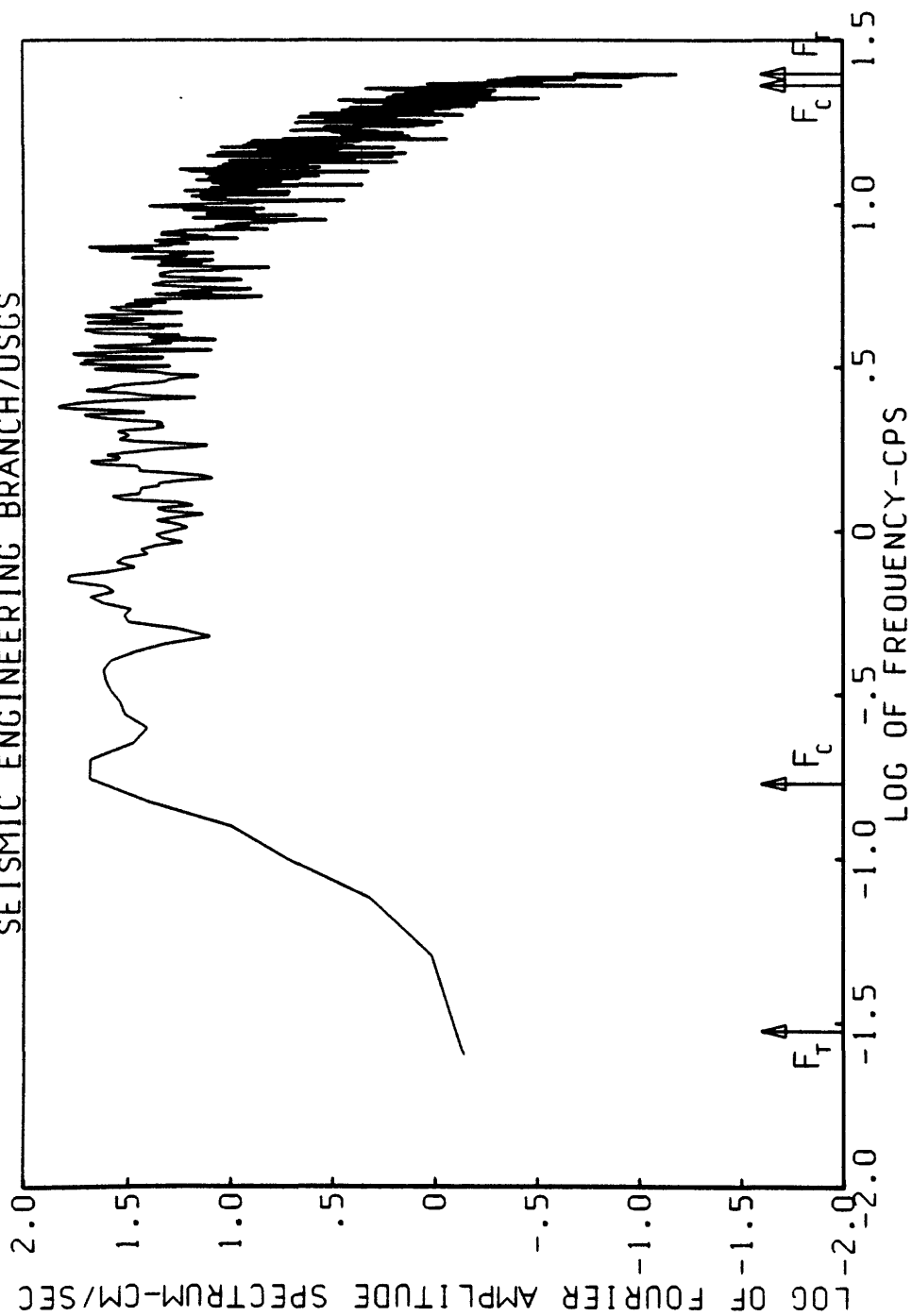


RESPONSE SPECTRA  
 EL CENTRO.ARRAY 13.10/15/79.2317UTC.UP  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



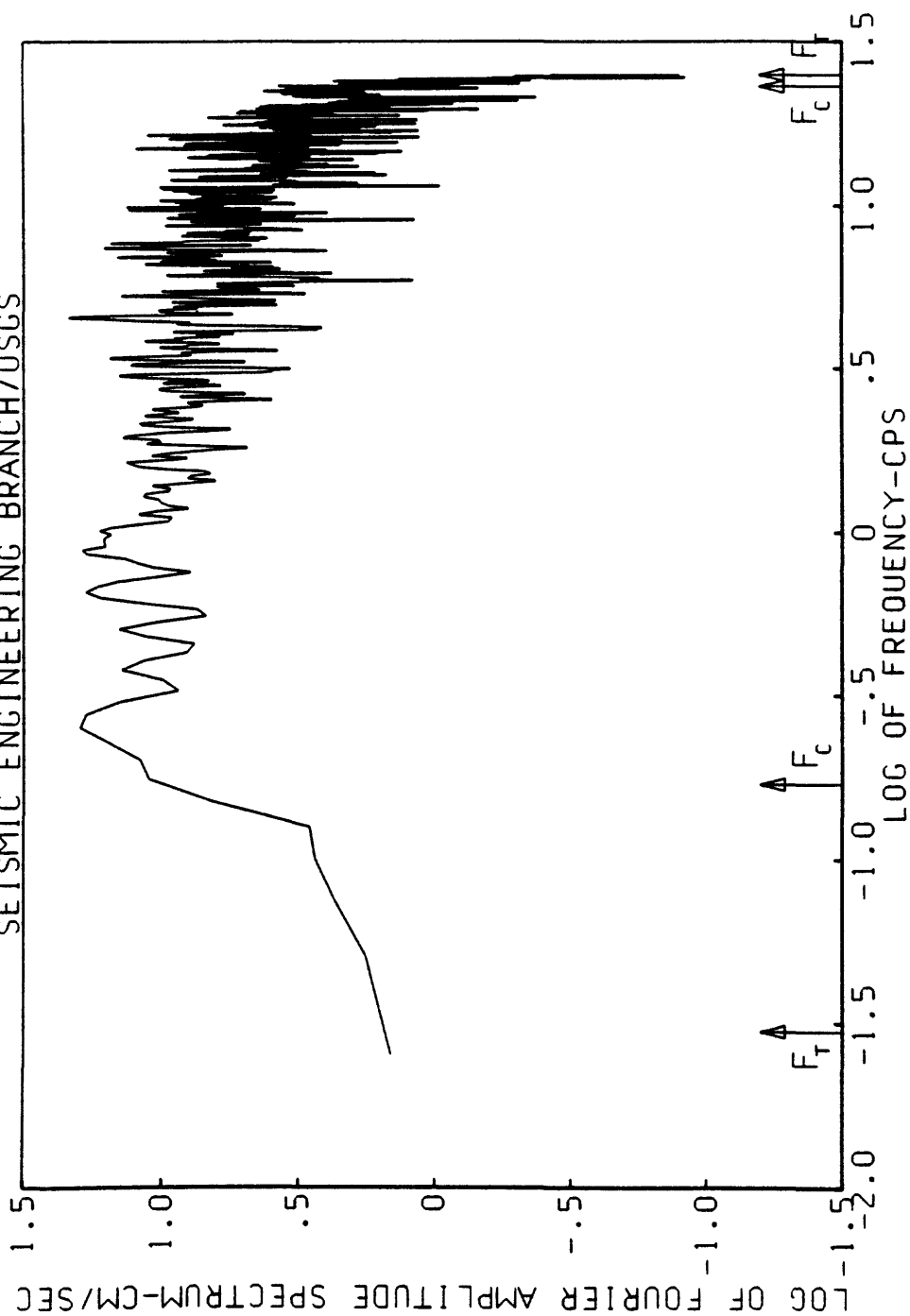


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

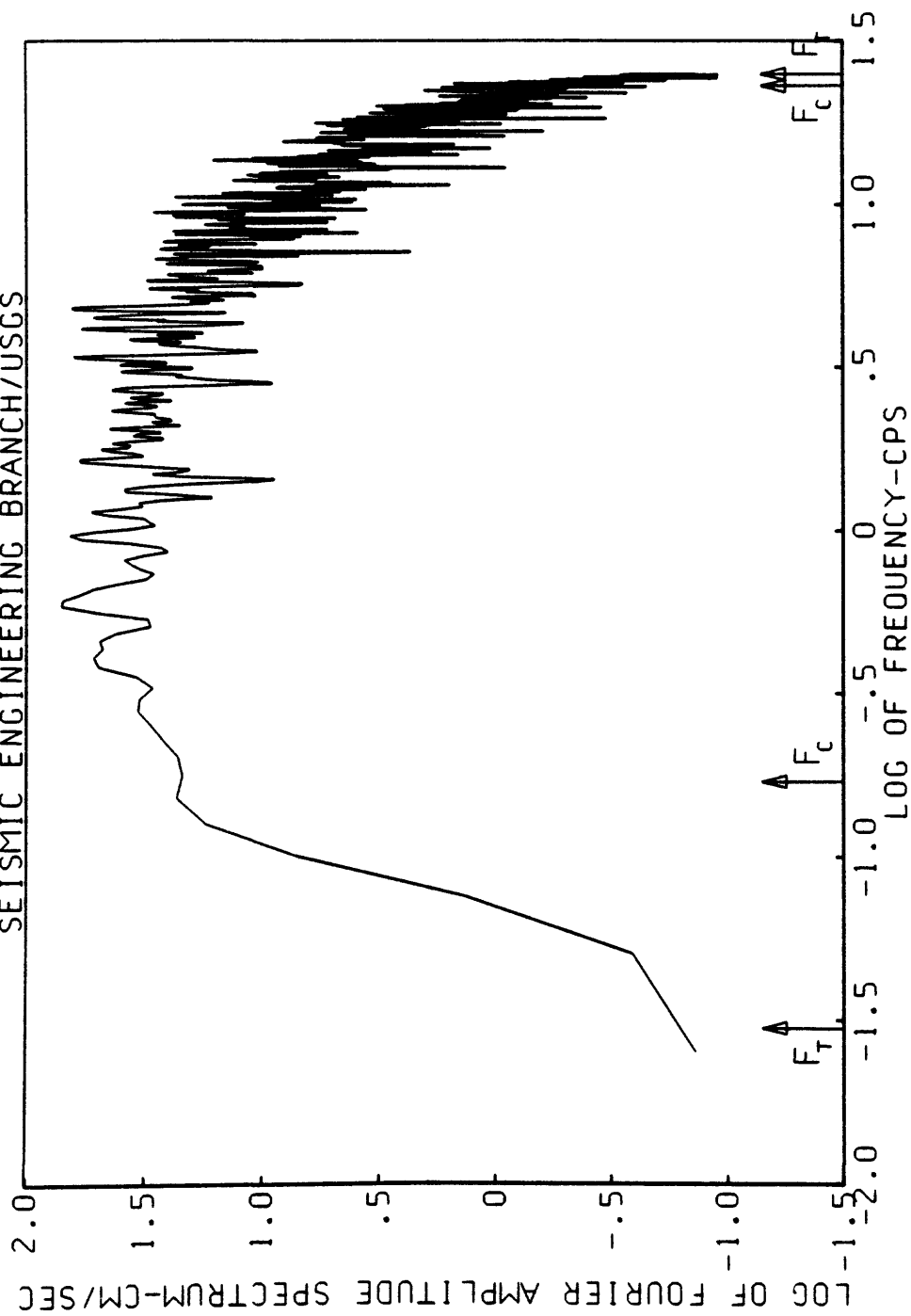




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030-- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

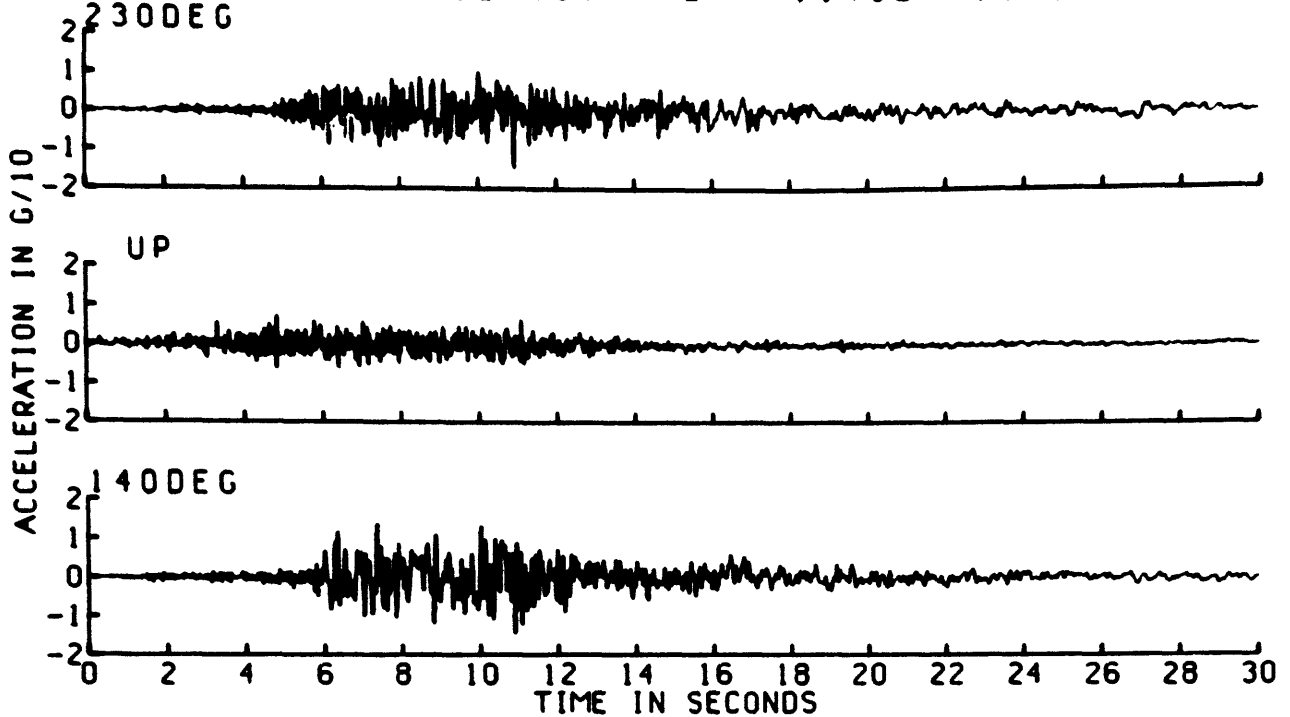


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STROBEL RESIDENCE, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

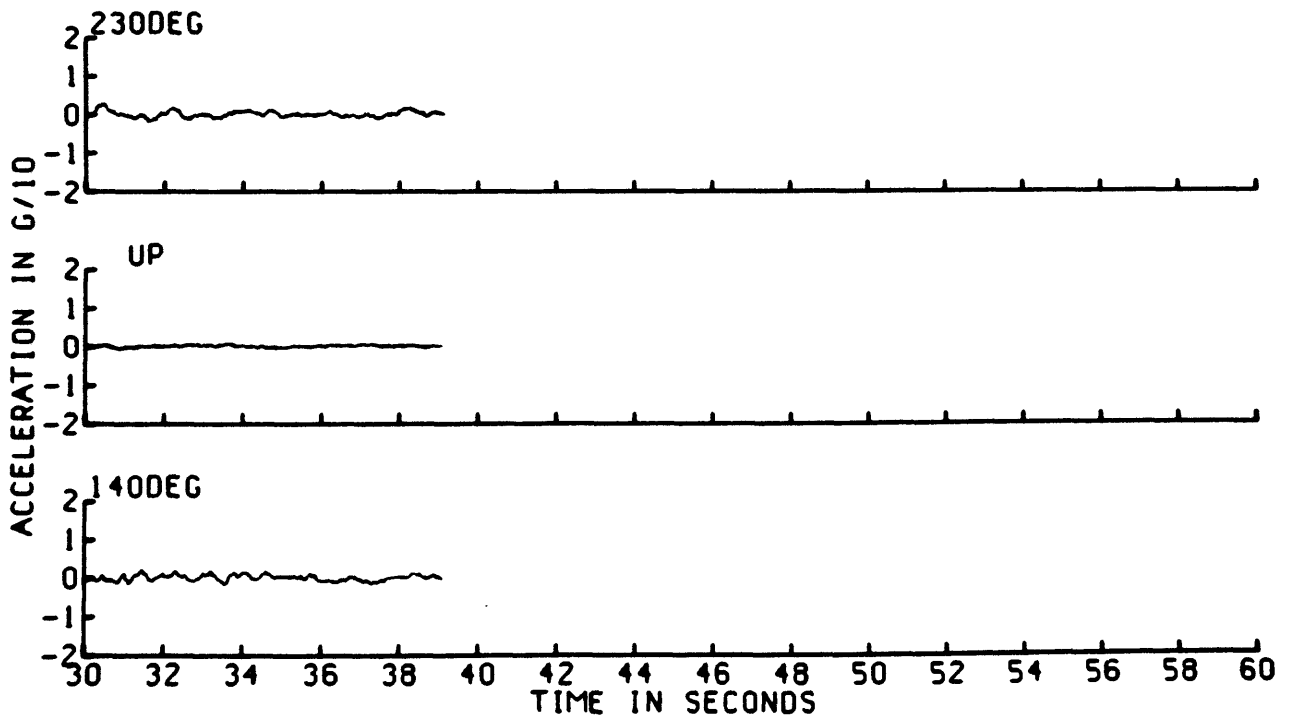


# UNCORRECTED ACCELEROGRAM

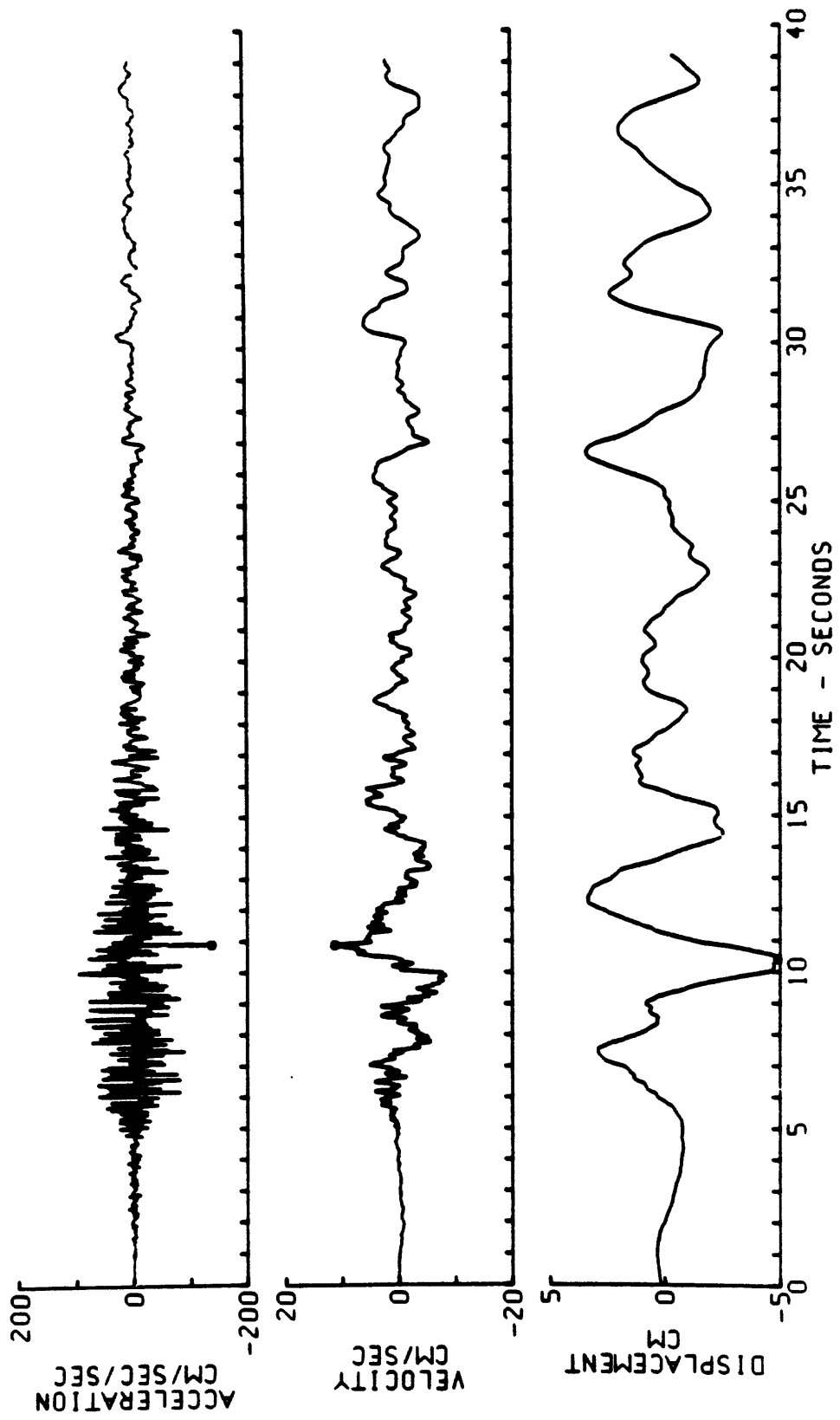
EL CENTRO, ARRAY 1, BORCHARD RANCH, 10/15/79, 2317UTC  
 THE 3 PEAK VALUES(G) ARE .1432 .0714 .1446



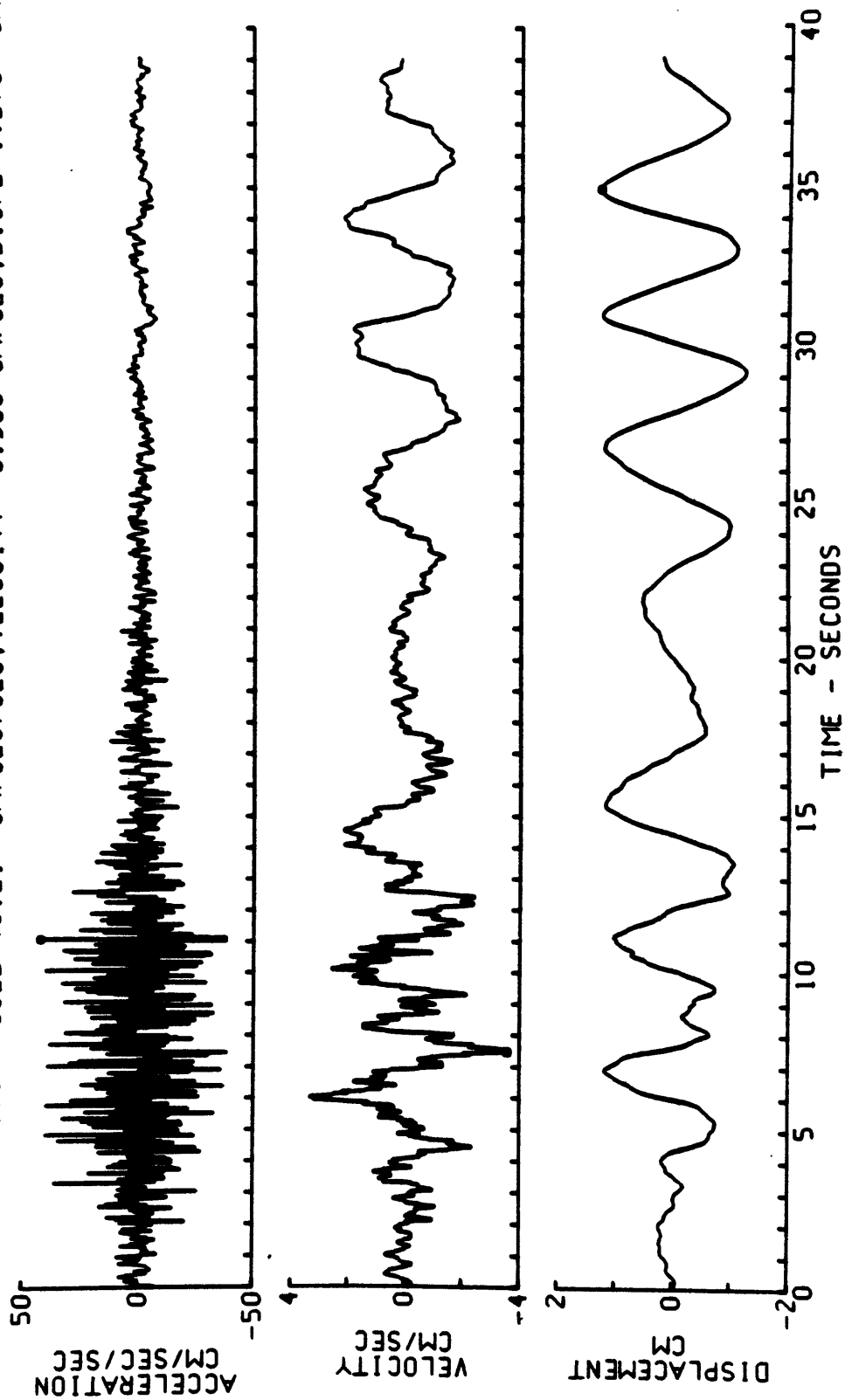
EL CENTRO, ARRAY 1, BORCHARD RANCH, 10/15/79, 2317UTC



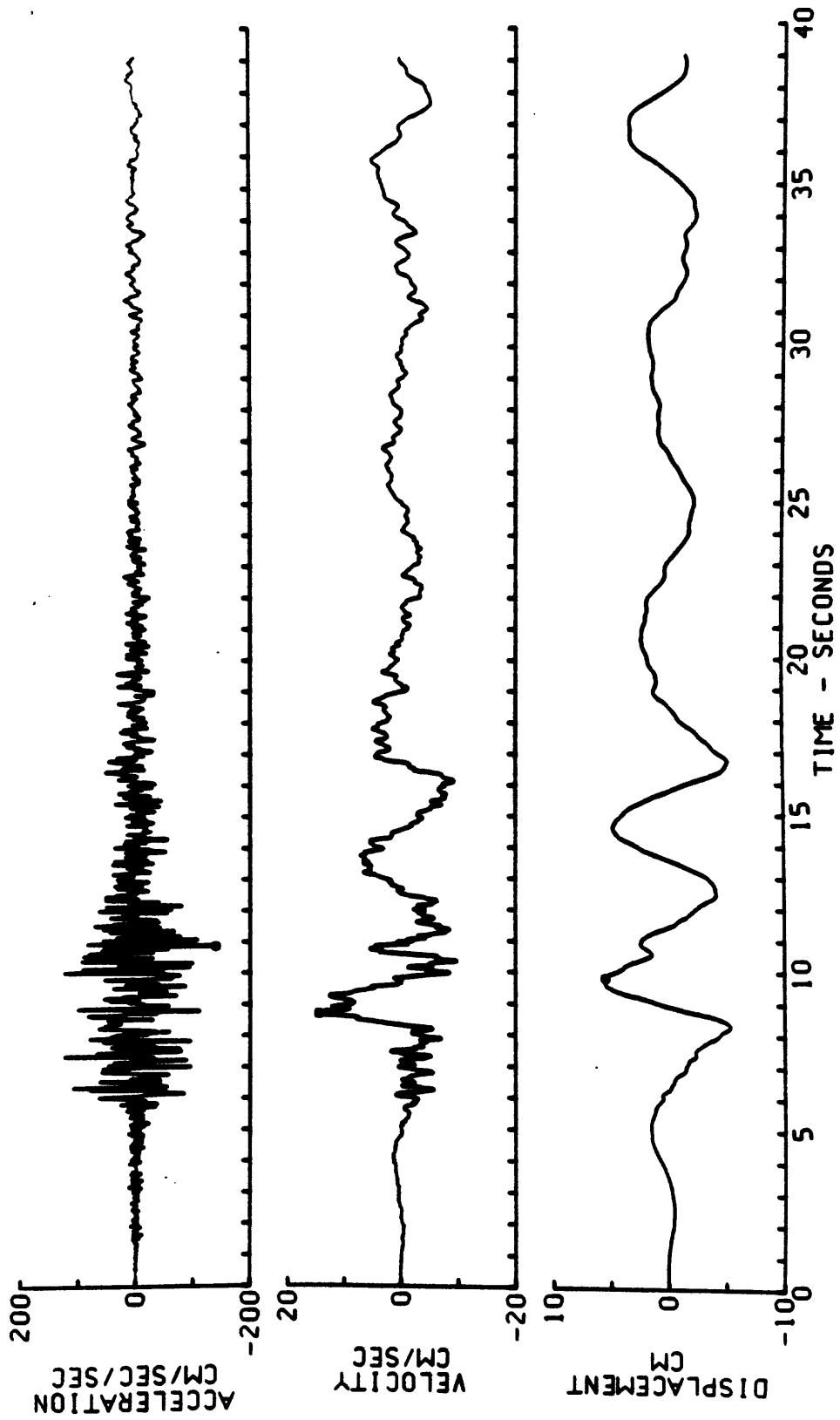
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-136.2 CM/SEC/SEC, VELOCITY=11.23 CM/SEC, DISPL=-4.900 CM



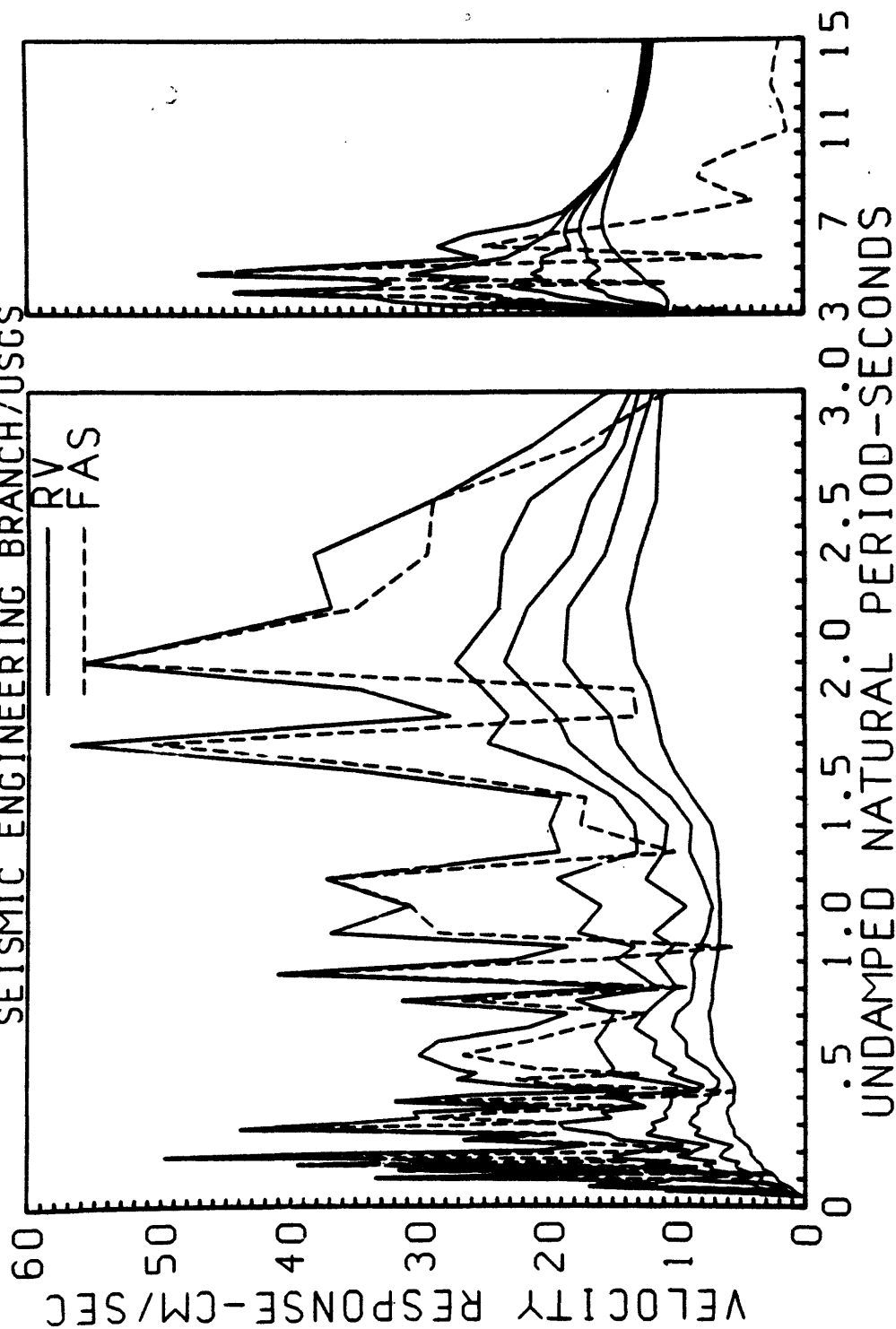
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP UP  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=43.21 CM/SEC/SEC, VELOCITY=-3.560 CM/SEC, DISPL=1.270 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-139.3 CM/SEC/SEC, VELOCITY=14.54 CM/SEC, DISPL=5.480 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 EL CENTRO, ARRAY 1.10/15/79.2317.230 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



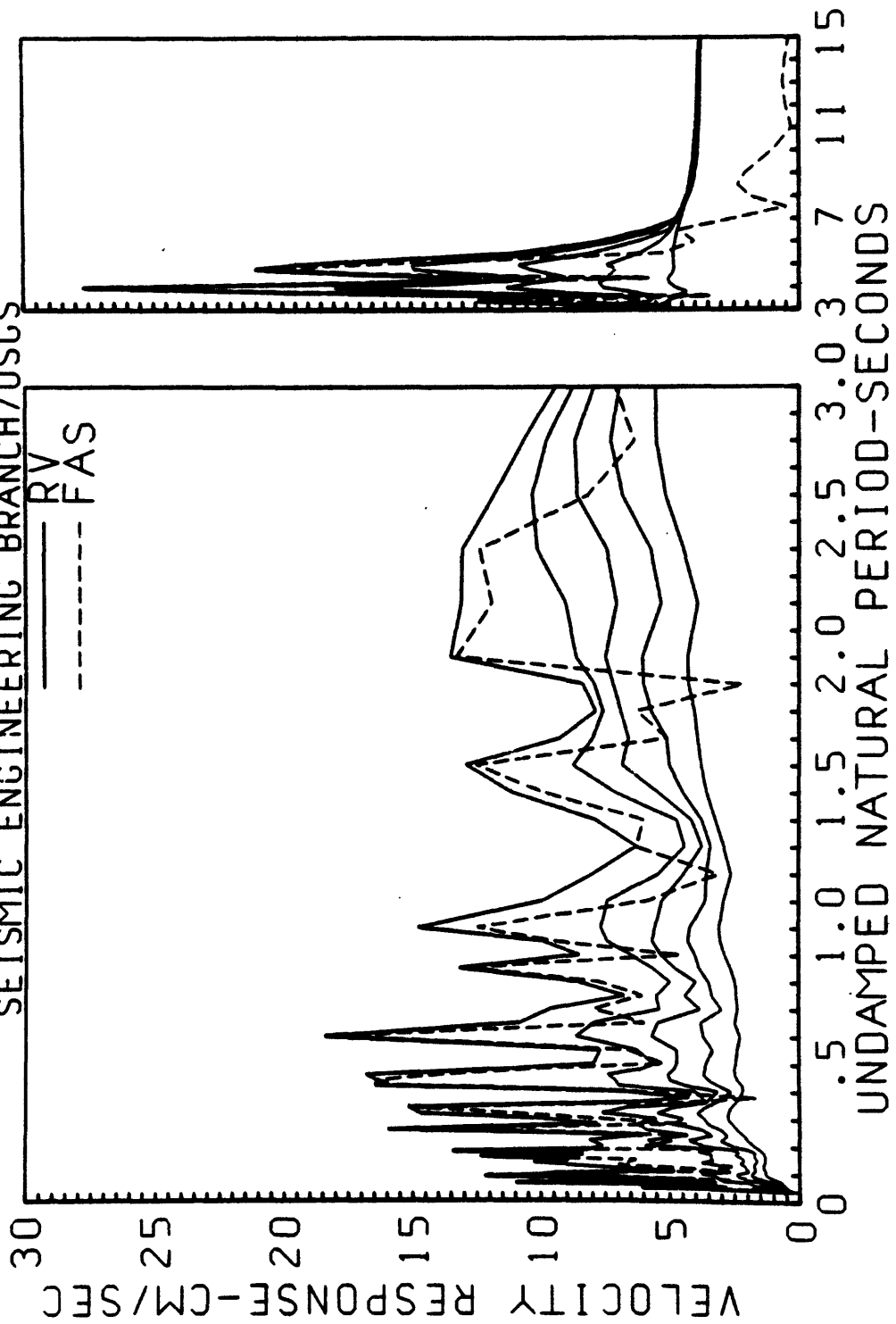
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 1.10/15/79.2317UTC.UP

0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS





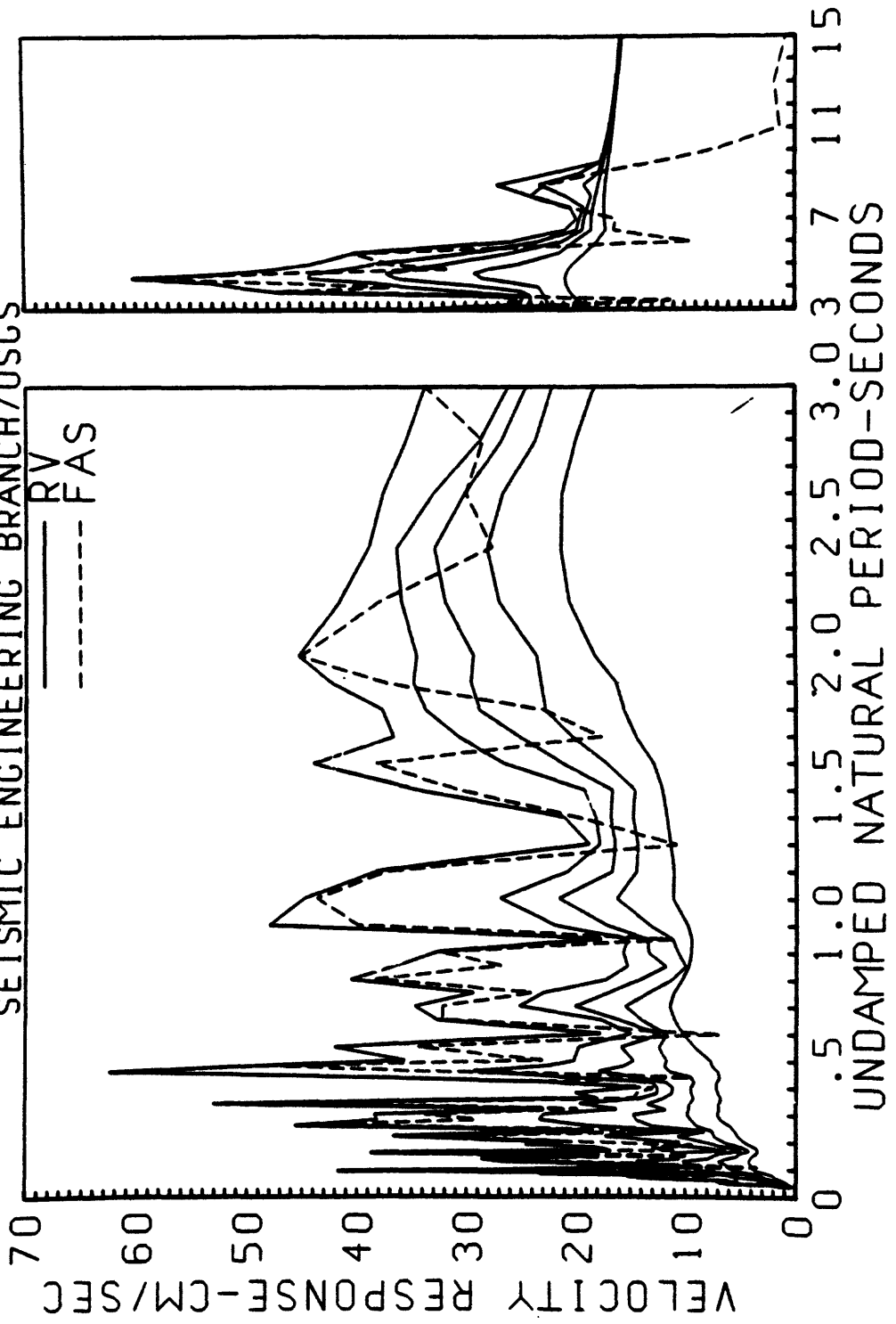
# RELATIVE VELOCITY RESPONSE SPECTRUM

EL CENTRO, ARRAY 1.10/15/79.2317.140 DEG

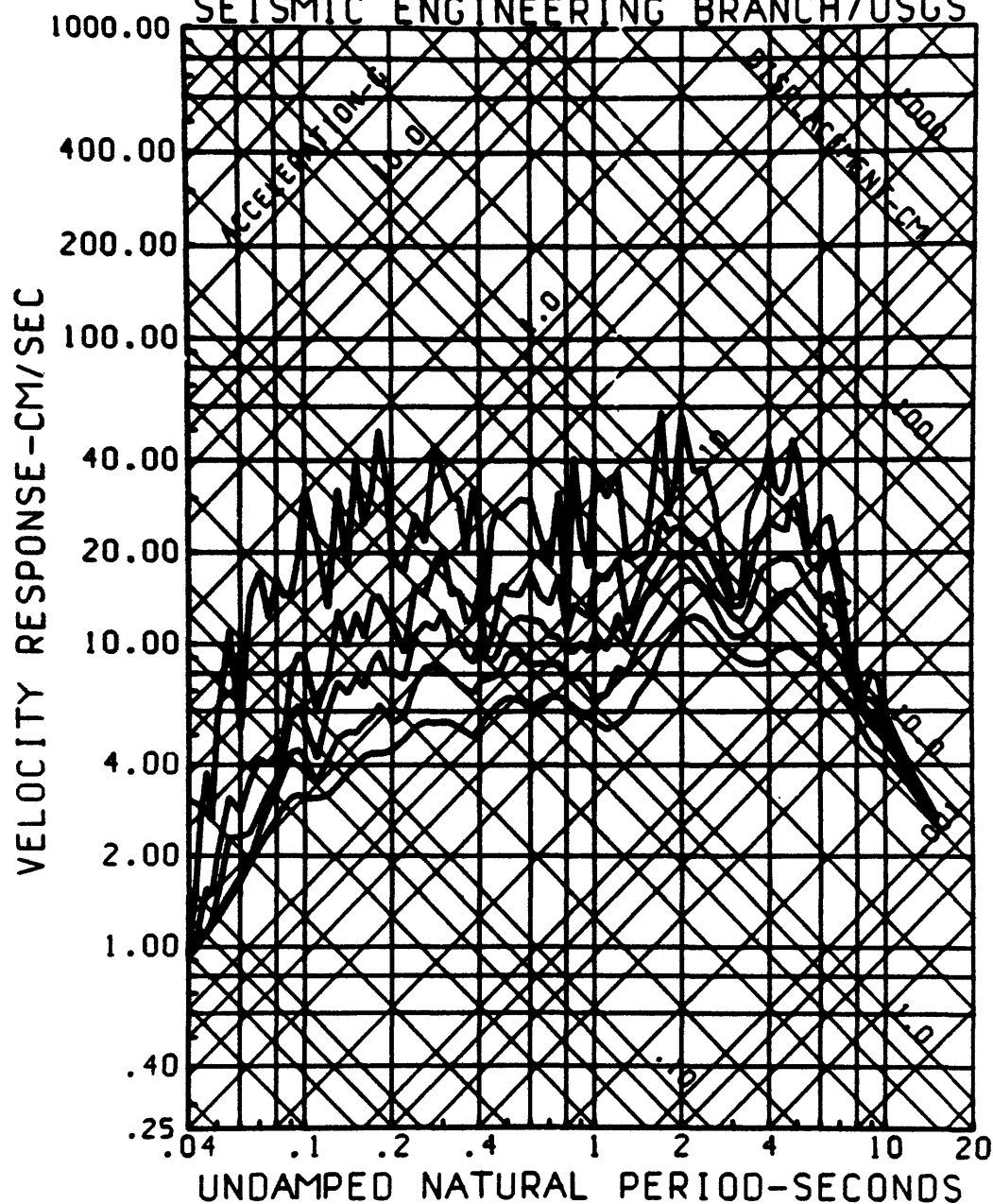
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS



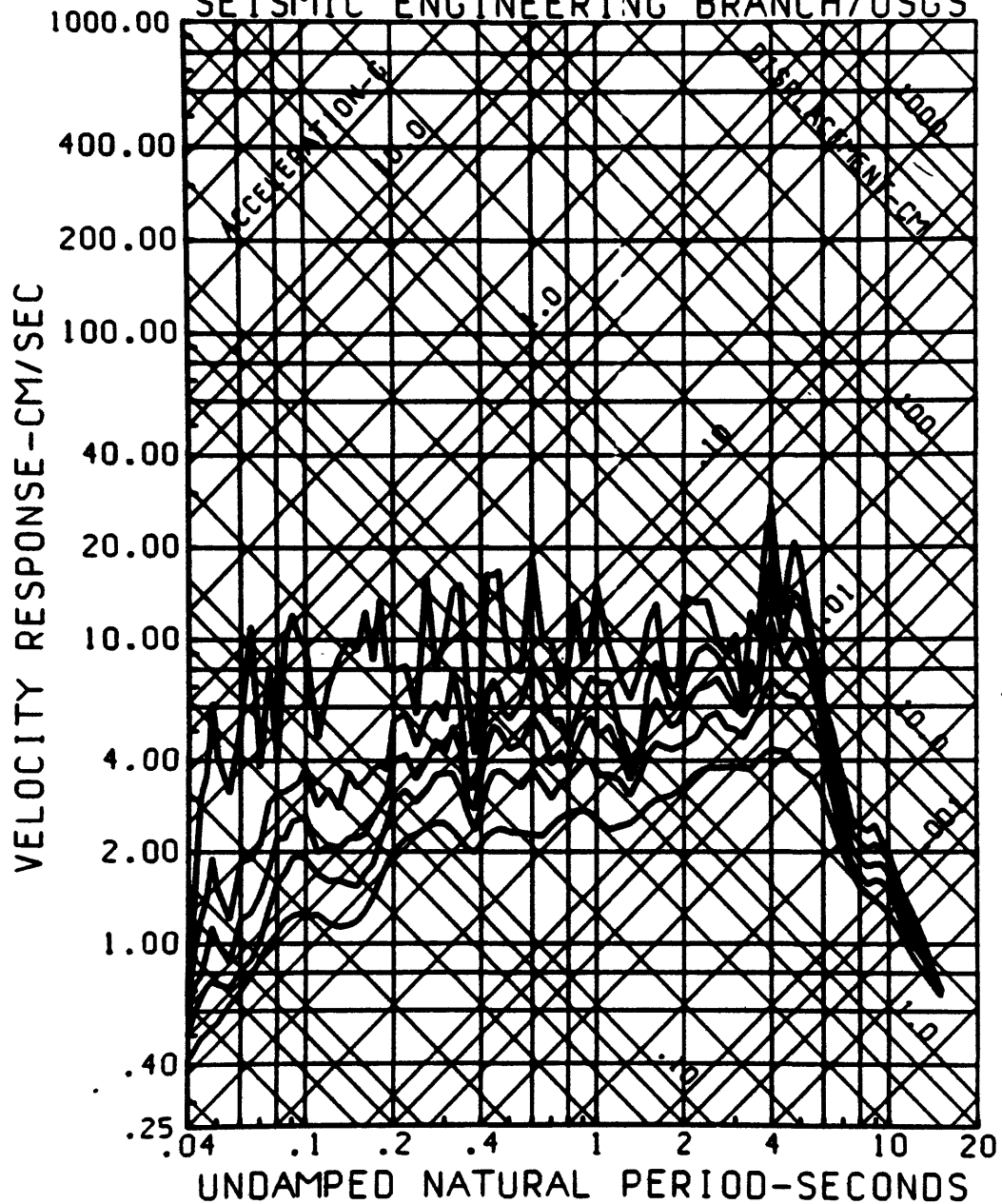
RESPONSE SPECTRA  
 EL CENTRO ARRAY 1.10/15/79.2317.230 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

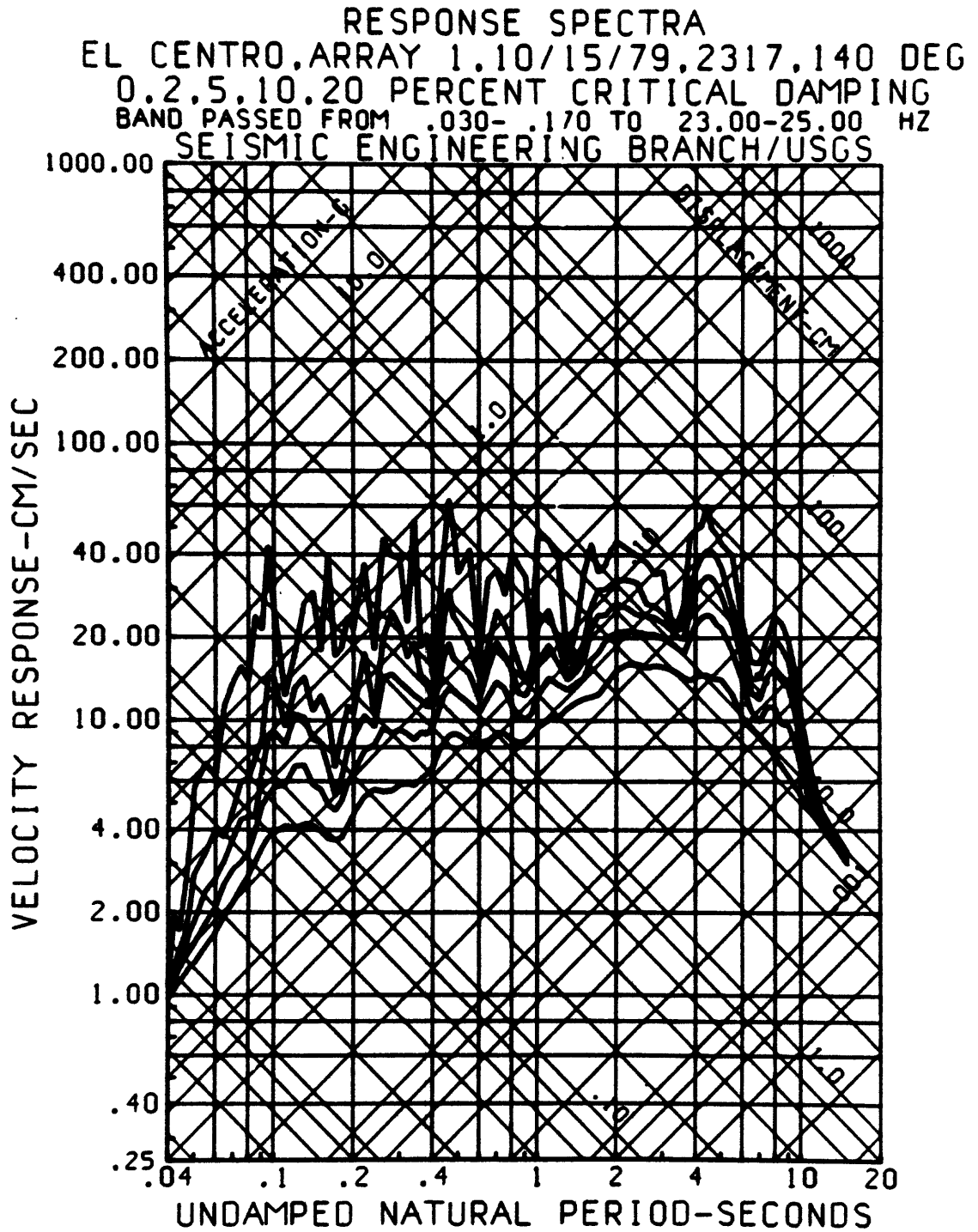


EL CENTRO.ARRAY 1.10/15/79.2317UTC.UP

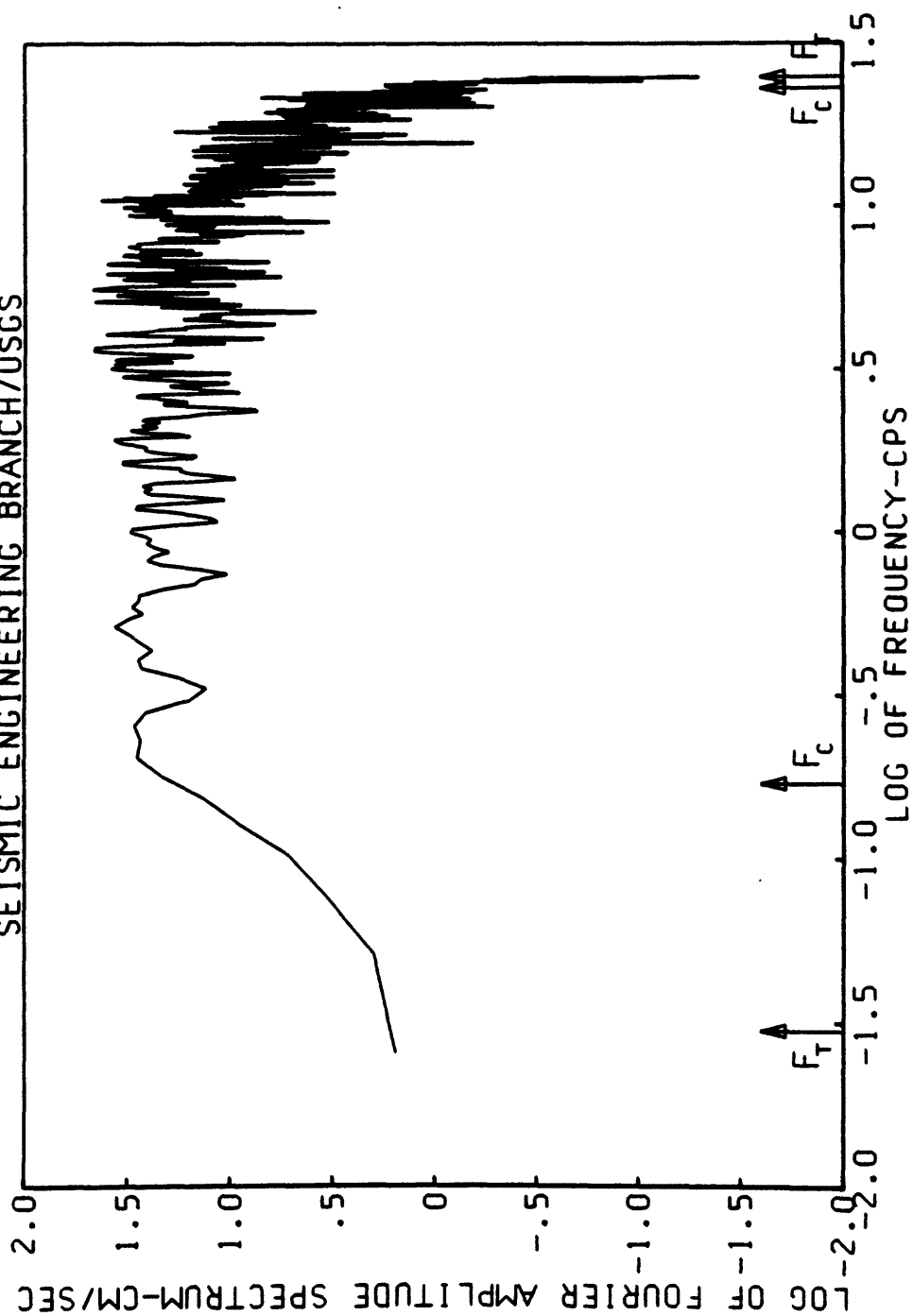
BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

SEISMIC ENGINEERING BRANCH/USGS

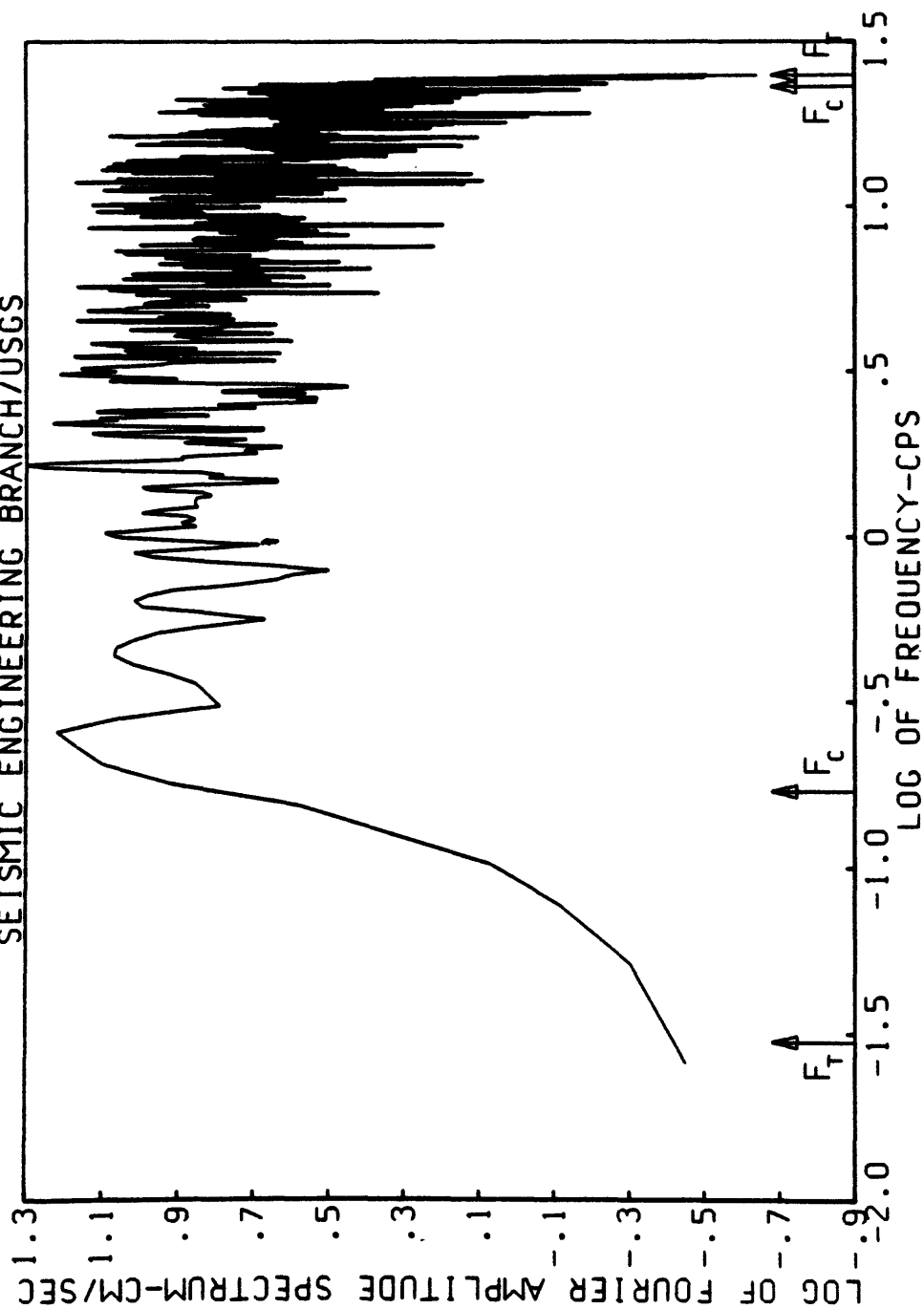




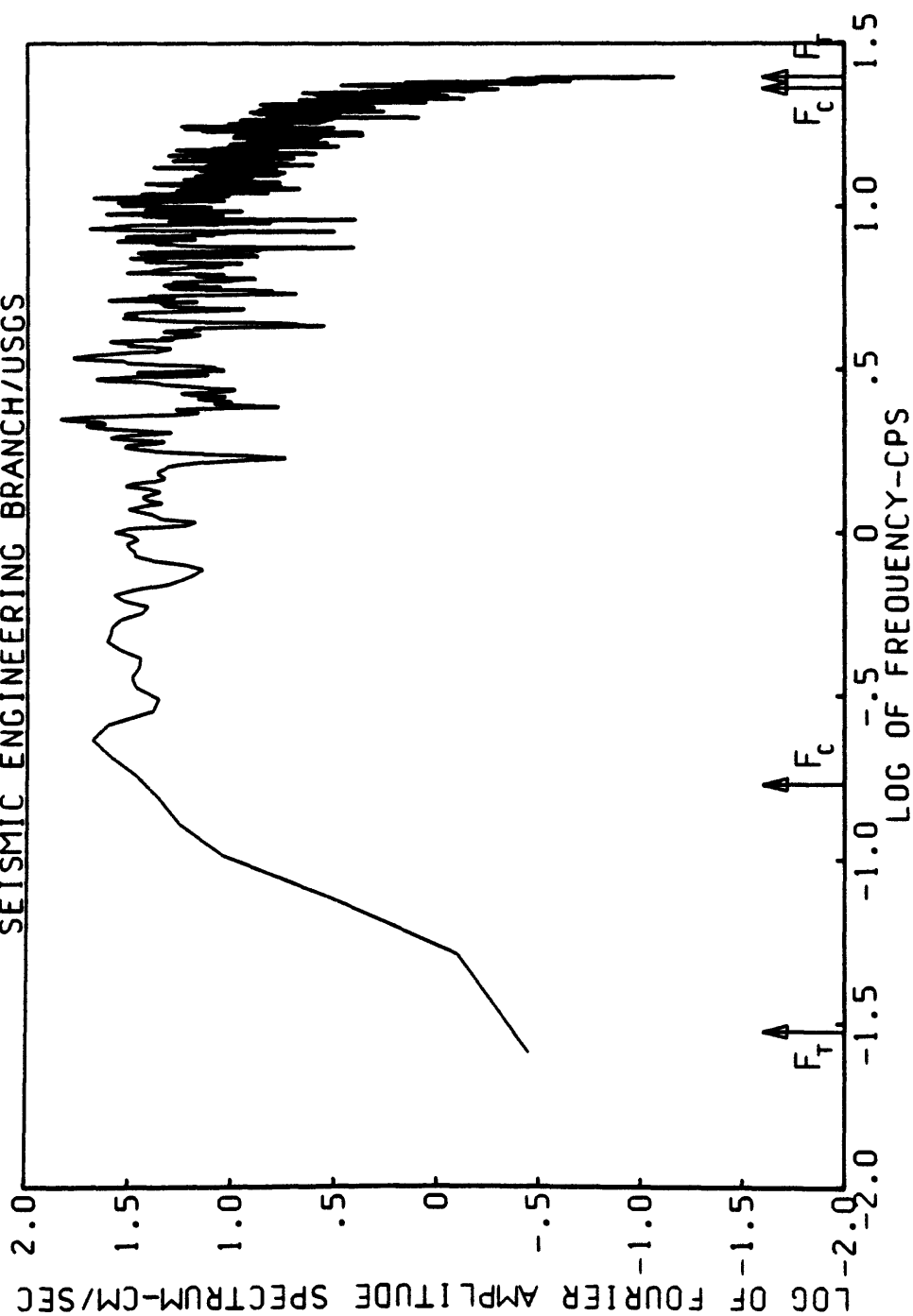
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP 230 DEGREES  
 BAND PASSED FROM .030-.170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



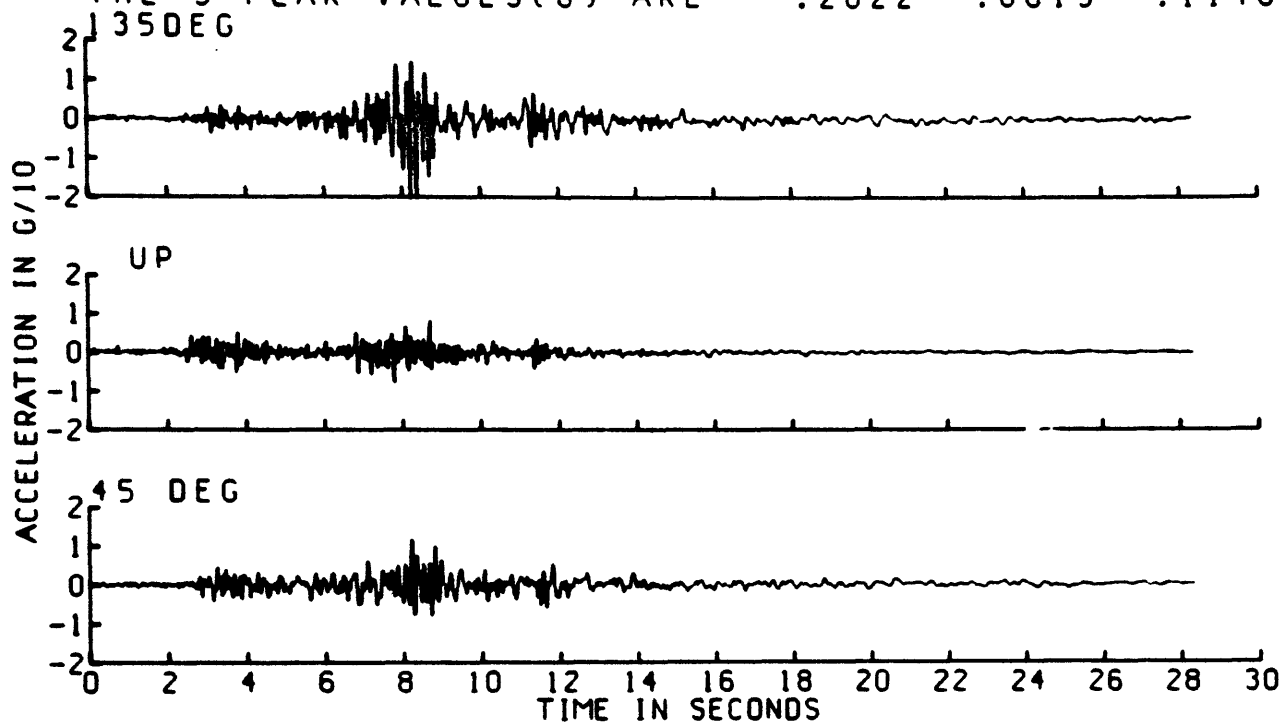
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 BORCHARD RANCH, EL CENTRO, CALIFORNIA, COMP 140 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



UNCORRECTED ACCELEROGRAM  
SUPERSTITION MOUNTAIN.CALIF..10/15/79.2317UTC  
THE 3 PEAK VALUES(G) ARE .2022 .0819 .1148

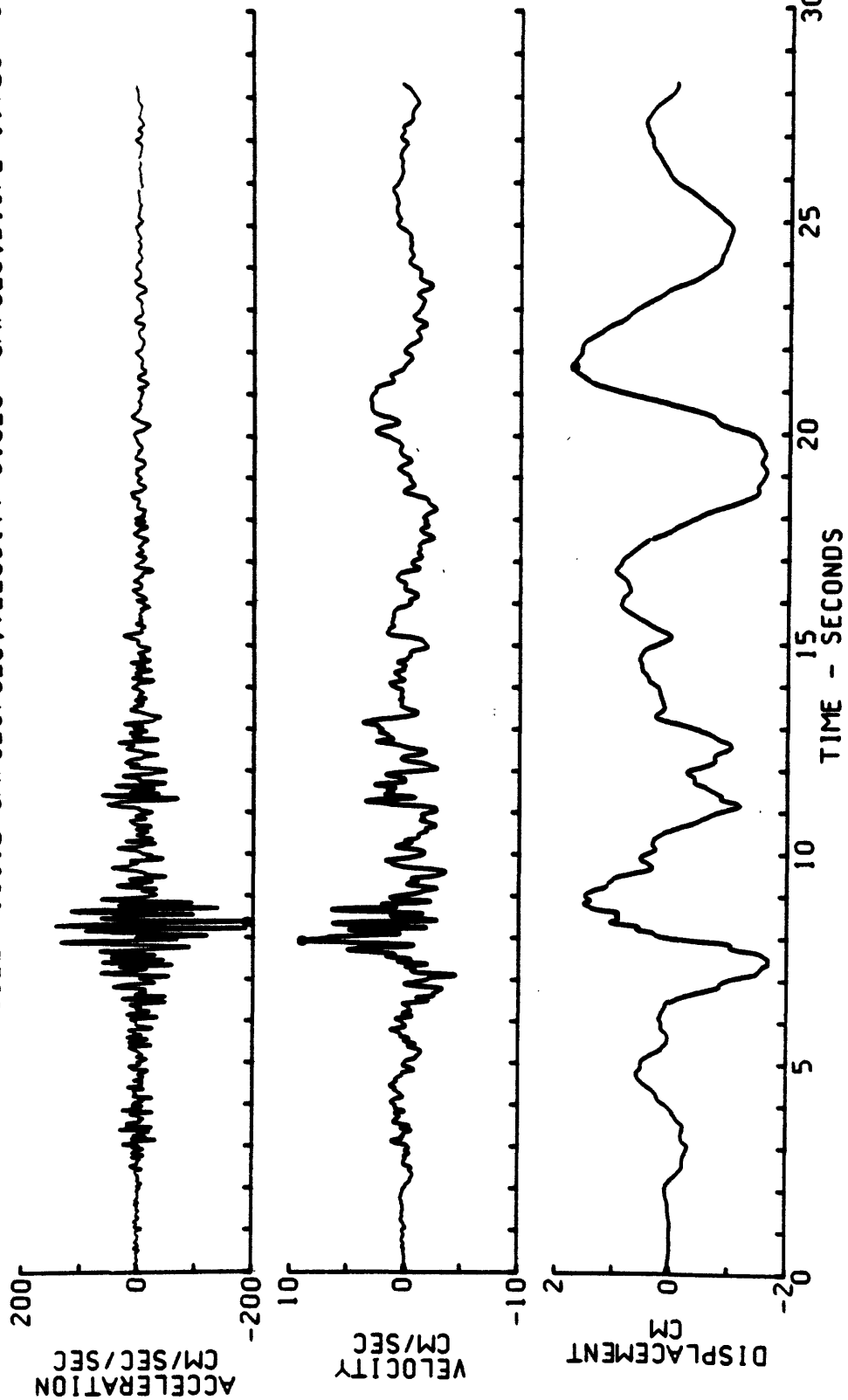




CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
SUPERSTITION MOUNTAIN, CALIFORNIA, COMP 135 DEGREES

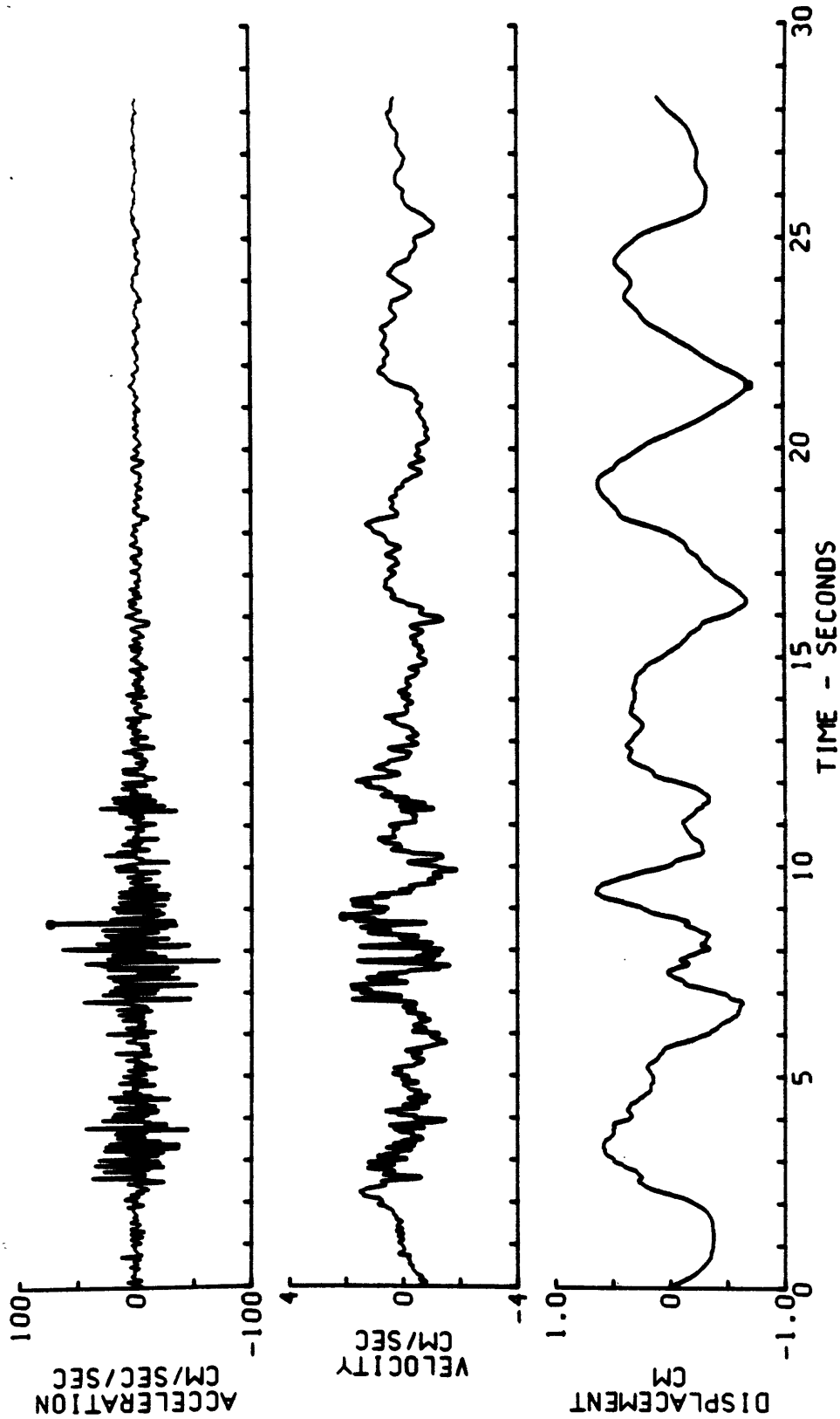
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC

ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
• PEAK VALUES ACCEL=-189.2 CM/SEC/SEC, VELOCITY=9.020 CM/SEC, DISPL=1.720 CM

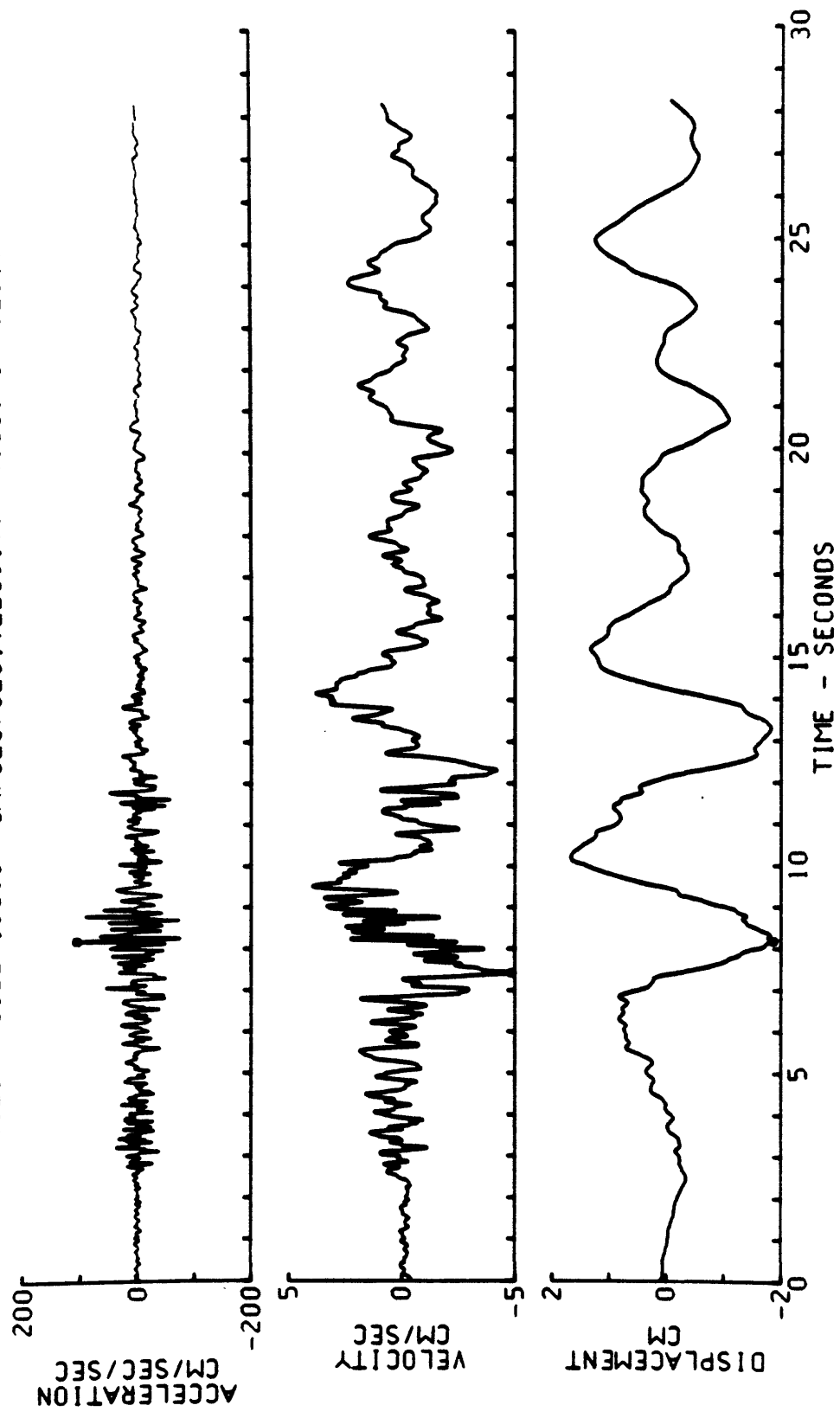


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
SUPERSTITION MOUNTAIN, CALIFORNIA, COMP UP

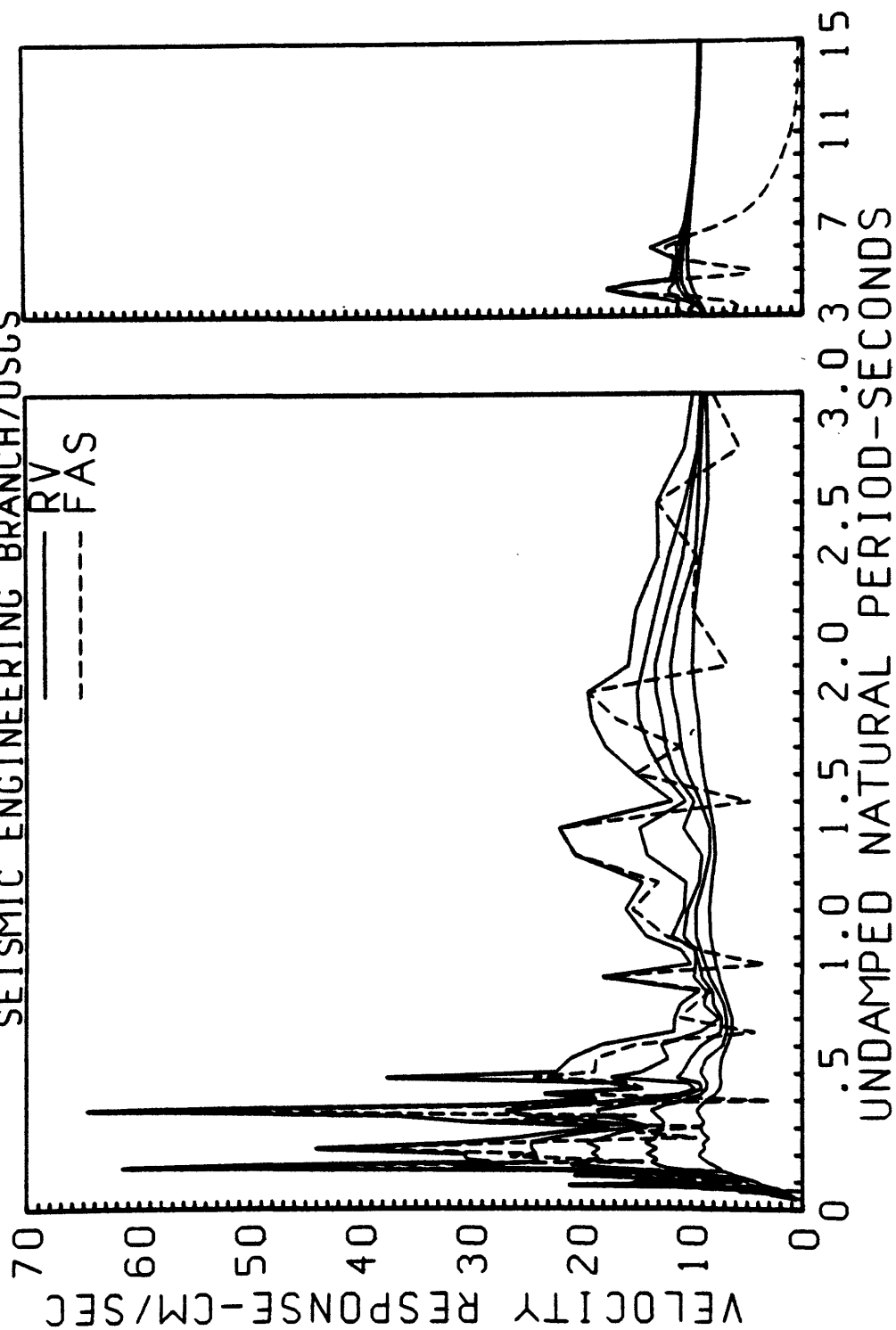
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
• PEAK VALUES ACCEL=75.47 CM/SEC/SEC, VELOCITY=2.100 CM/SEC, DISPL=-.700 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 SUPERSTITION MOUNTAIN, CALIFORNIA, COMP 45 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=108.0 CM/SEC/SEC, VELOCITY=-4.860 CM/SEC, DISPL=-1.870 CM



RELATIVE VELOCITY RESPONSE SPECTRUM  
 SUPERSTITION MT. CAL. 10/15/79. 2317.135 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



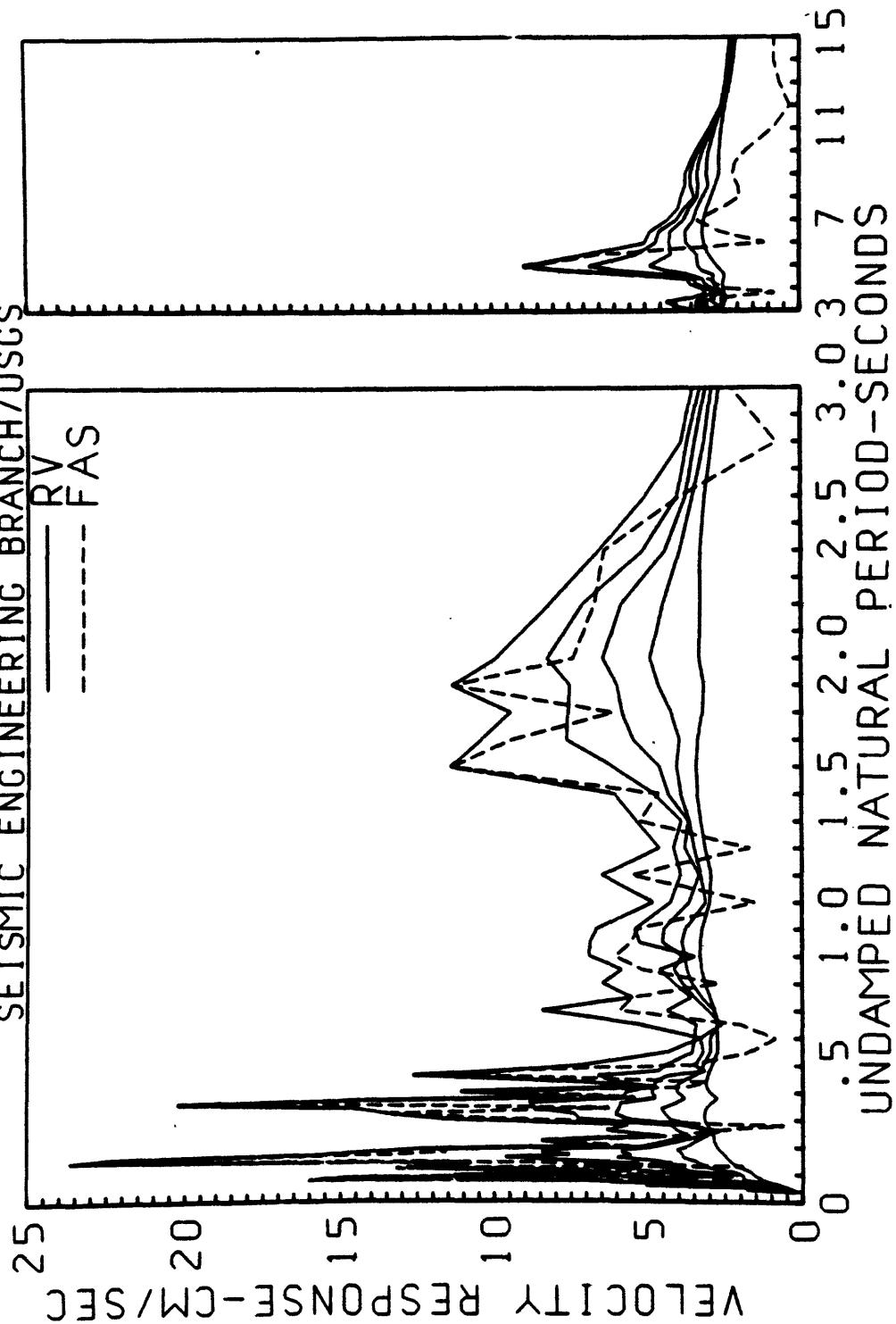
# RELATIVE VELOCITY RESPONSE SPECTRUM

SUPERSTITION MT., CAL. 10/15/79, 2317UTC, UP

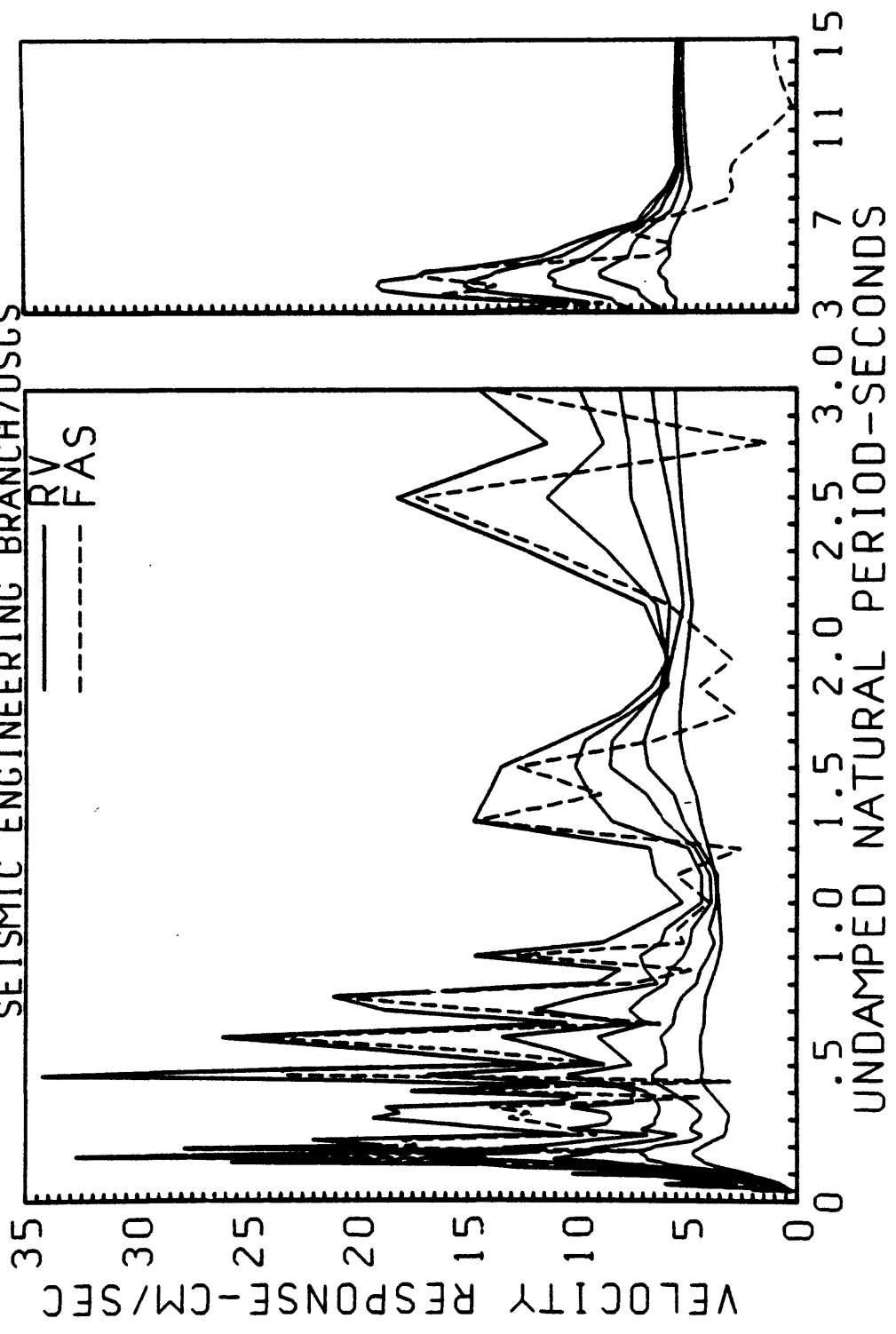
0.2, 5, 10, 20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

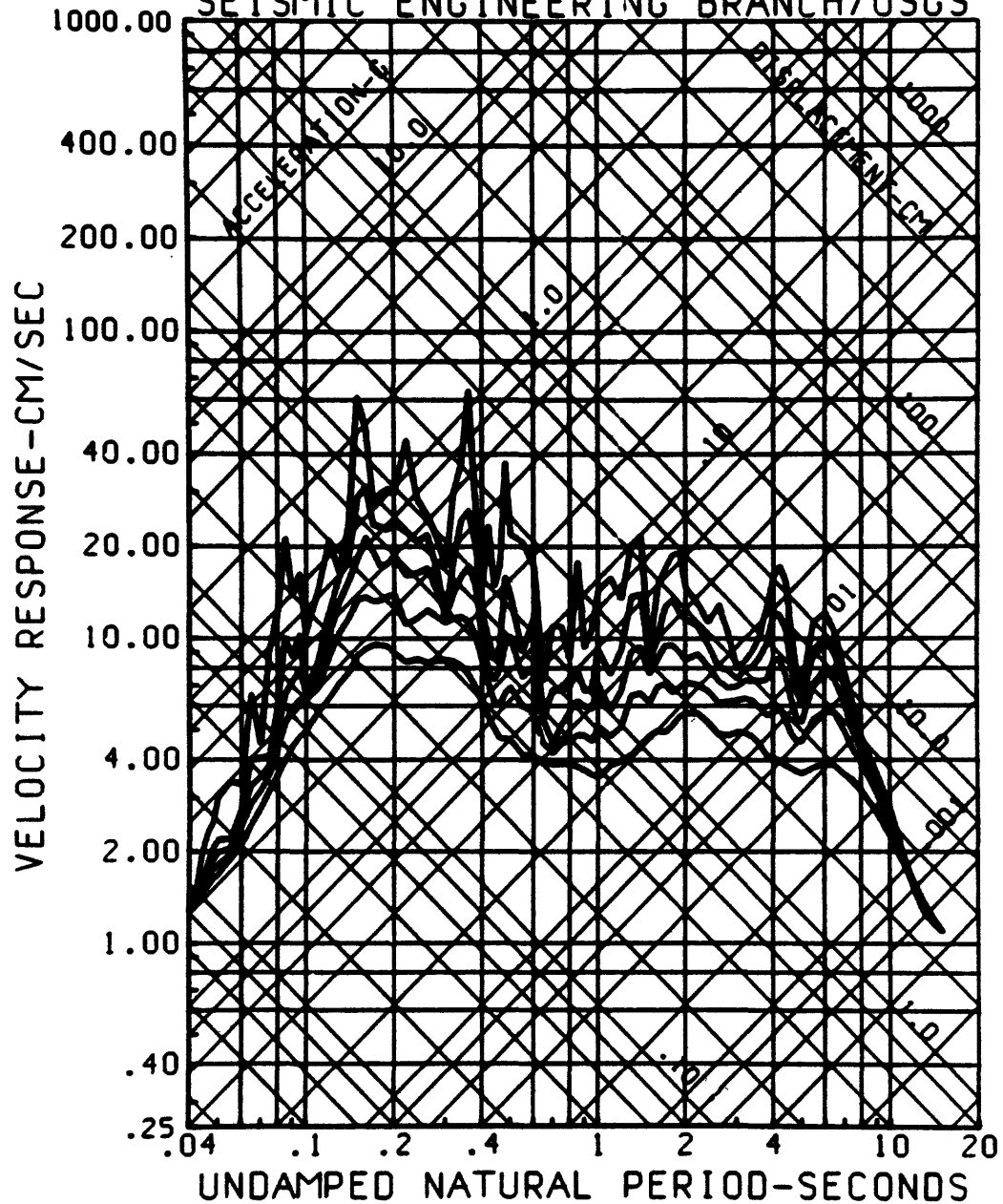
SEISMIC ENGINEERING BRANCH/USGS



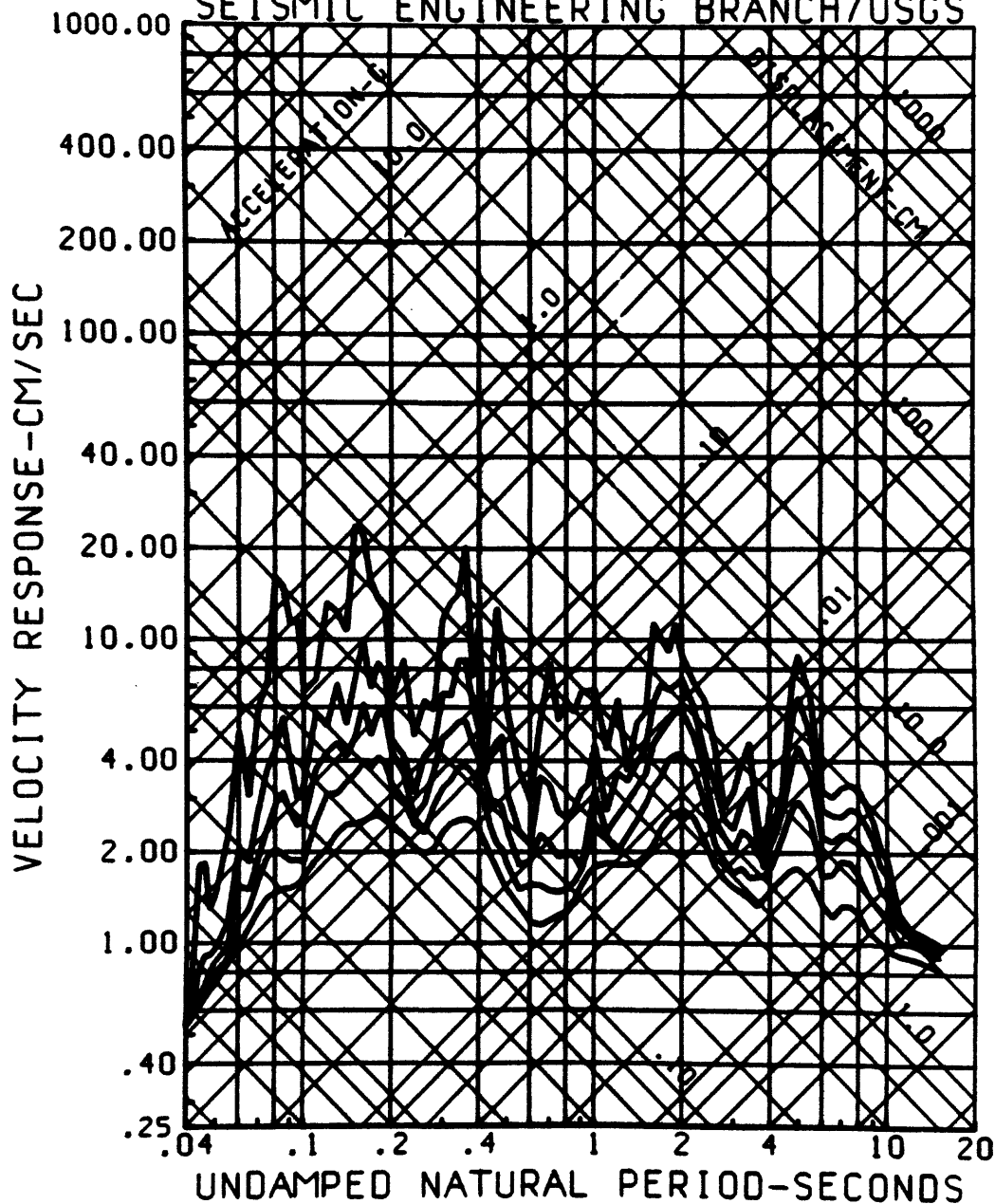
RELATIVE VELOCITY RESPONSE SPECTRUM  
 SUPERSTITION MT., CAL. 10/15/79. 2317.45 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



RESPONSE SPECTRA  
 SUPERSTITION MT. CAL. 10/15/79. 2317.135 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

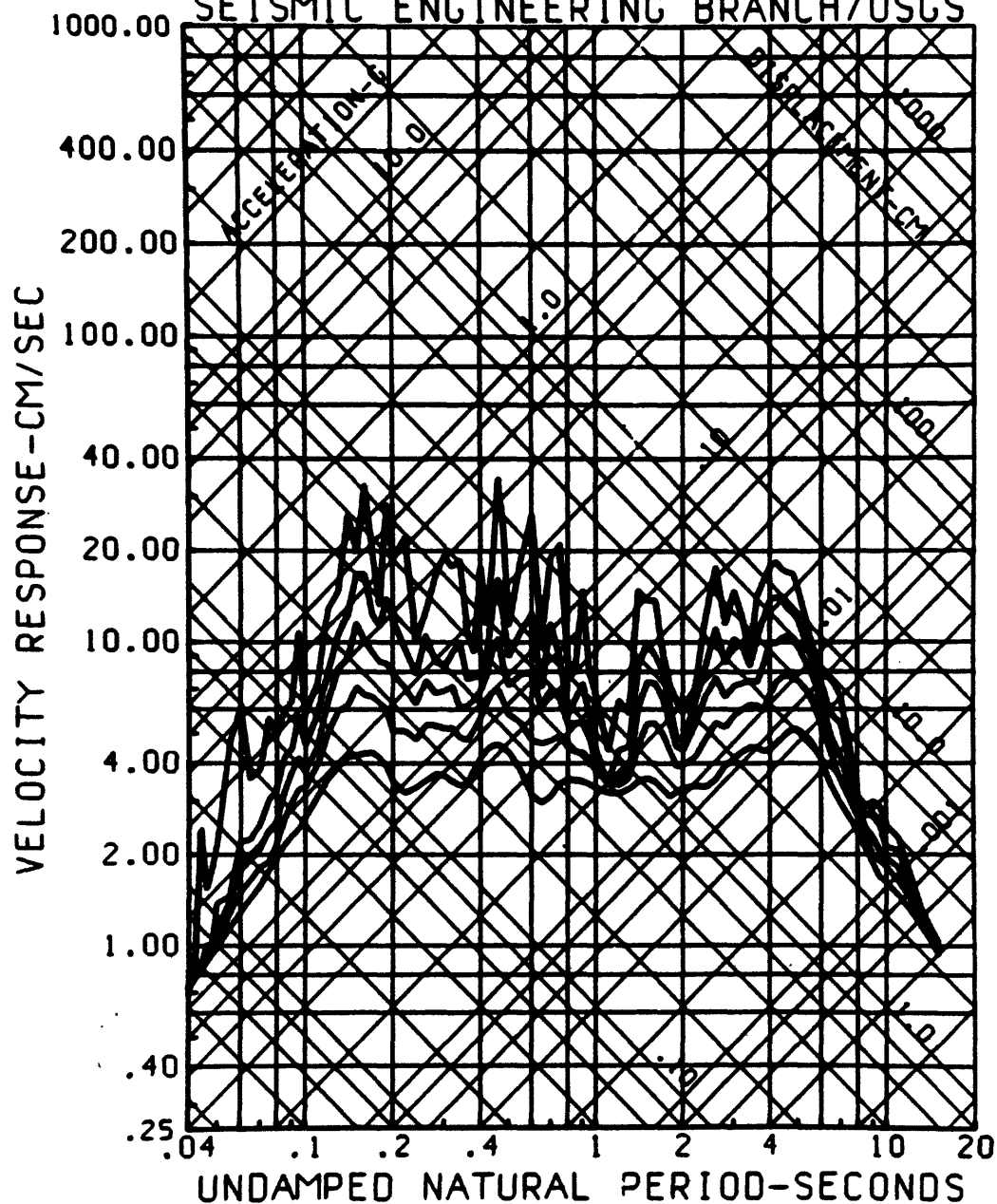


RESPONSE SPECTRA  
 SUPERSTITION MT., CAL. 10/15/79. 2317 UTC. UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

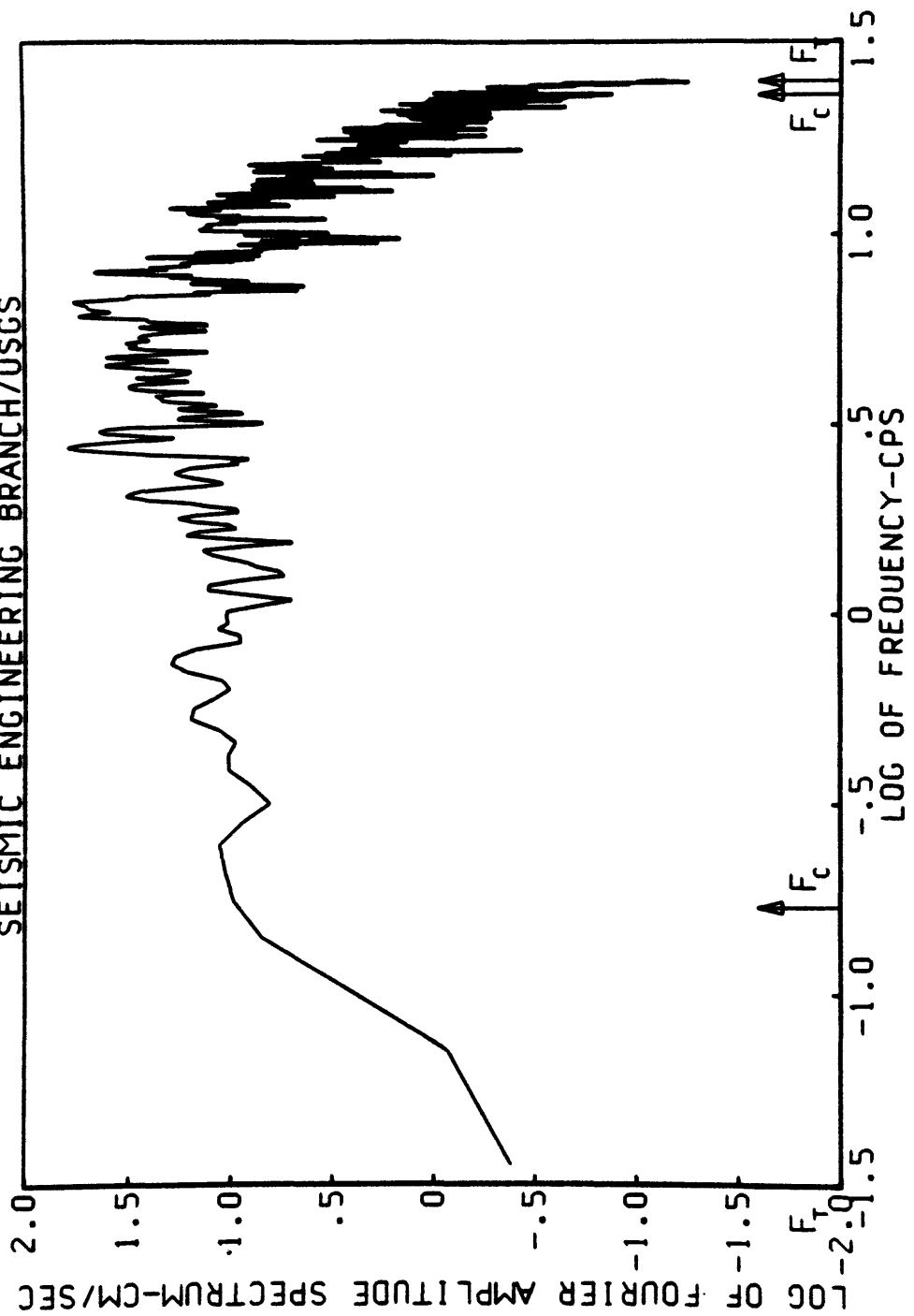




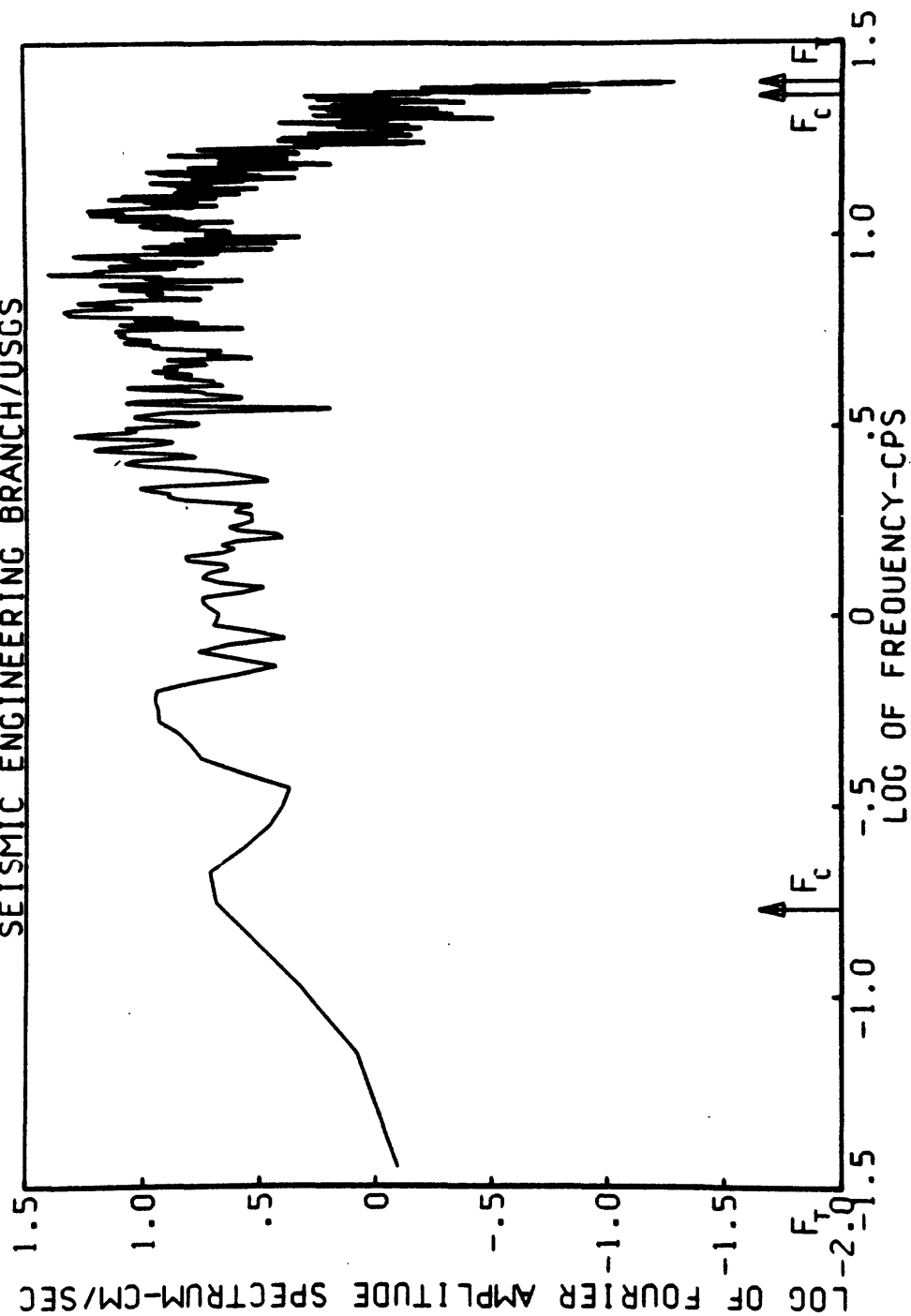
RESPONSE SPECTRA  
 SUPERSTITION MT., CAL. 10/15/79, 2317.45 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



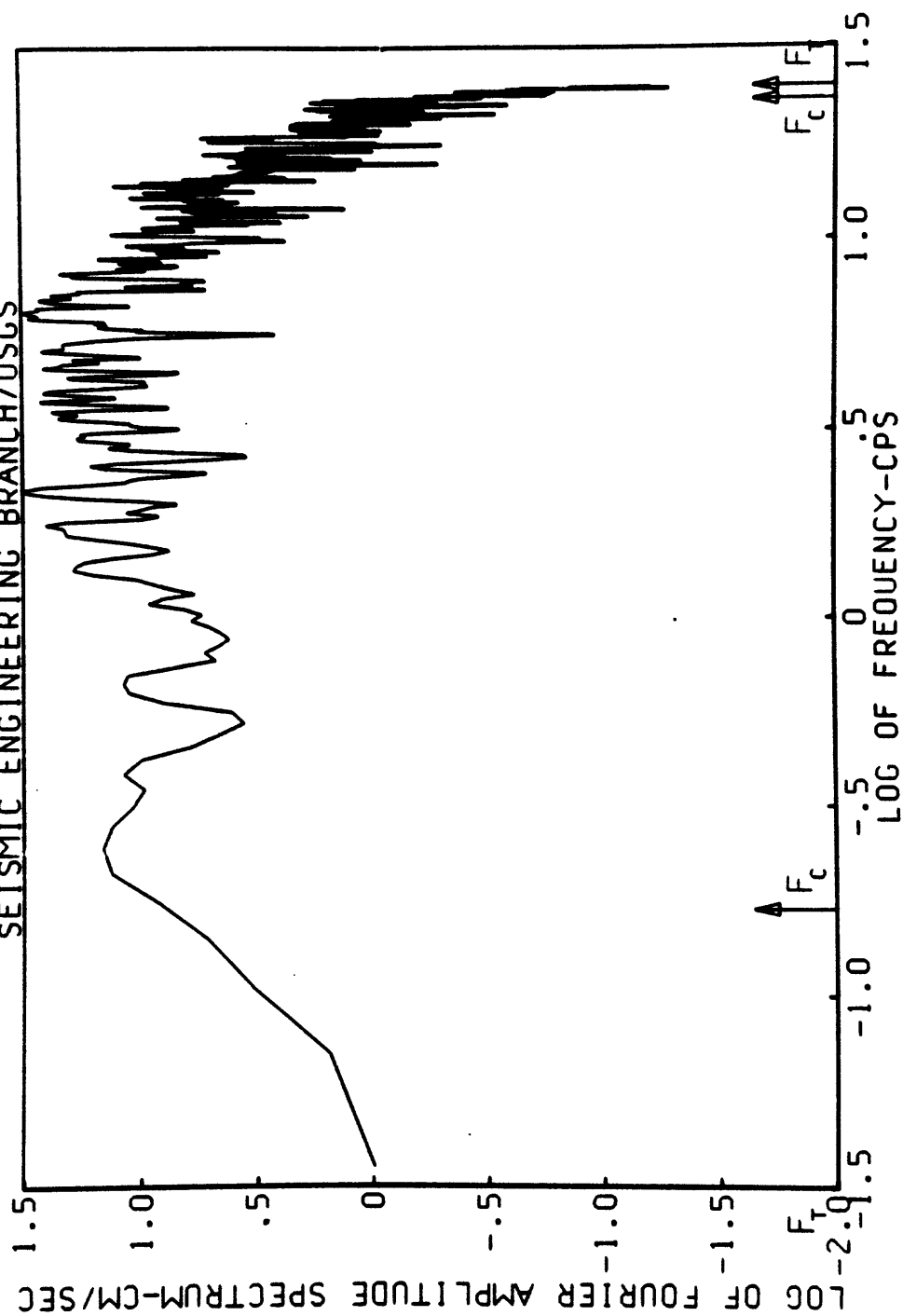
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 SUPERSTITION MOUNTAIN, CALIFORNIA. COMP 135 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



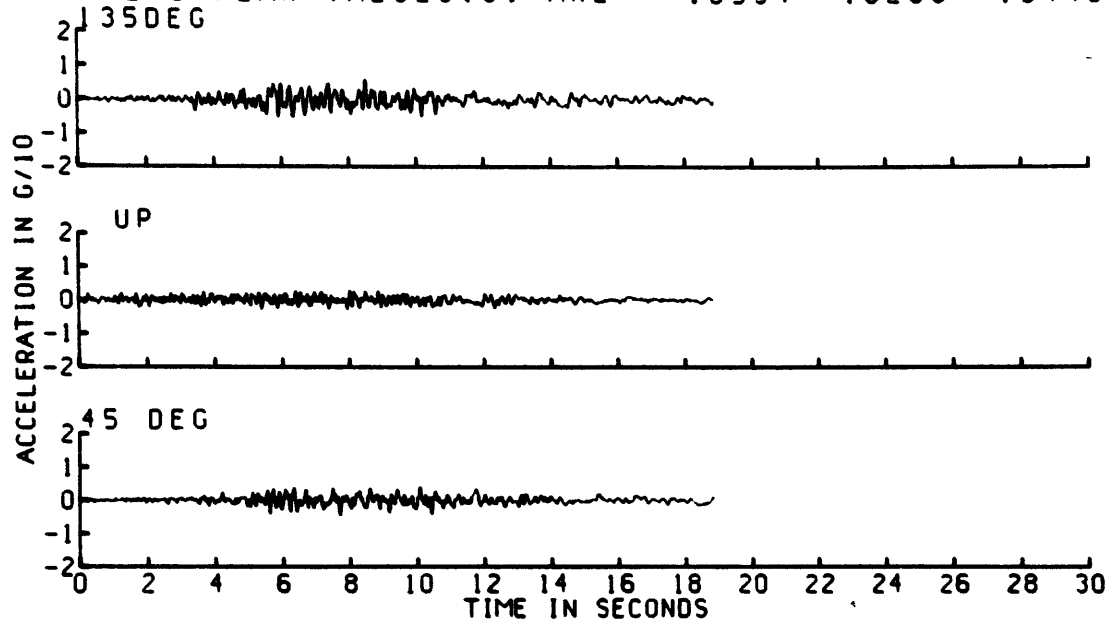
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 SUPERSTITION MOUNTAIN, CALIFORNIA, COMP UP  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



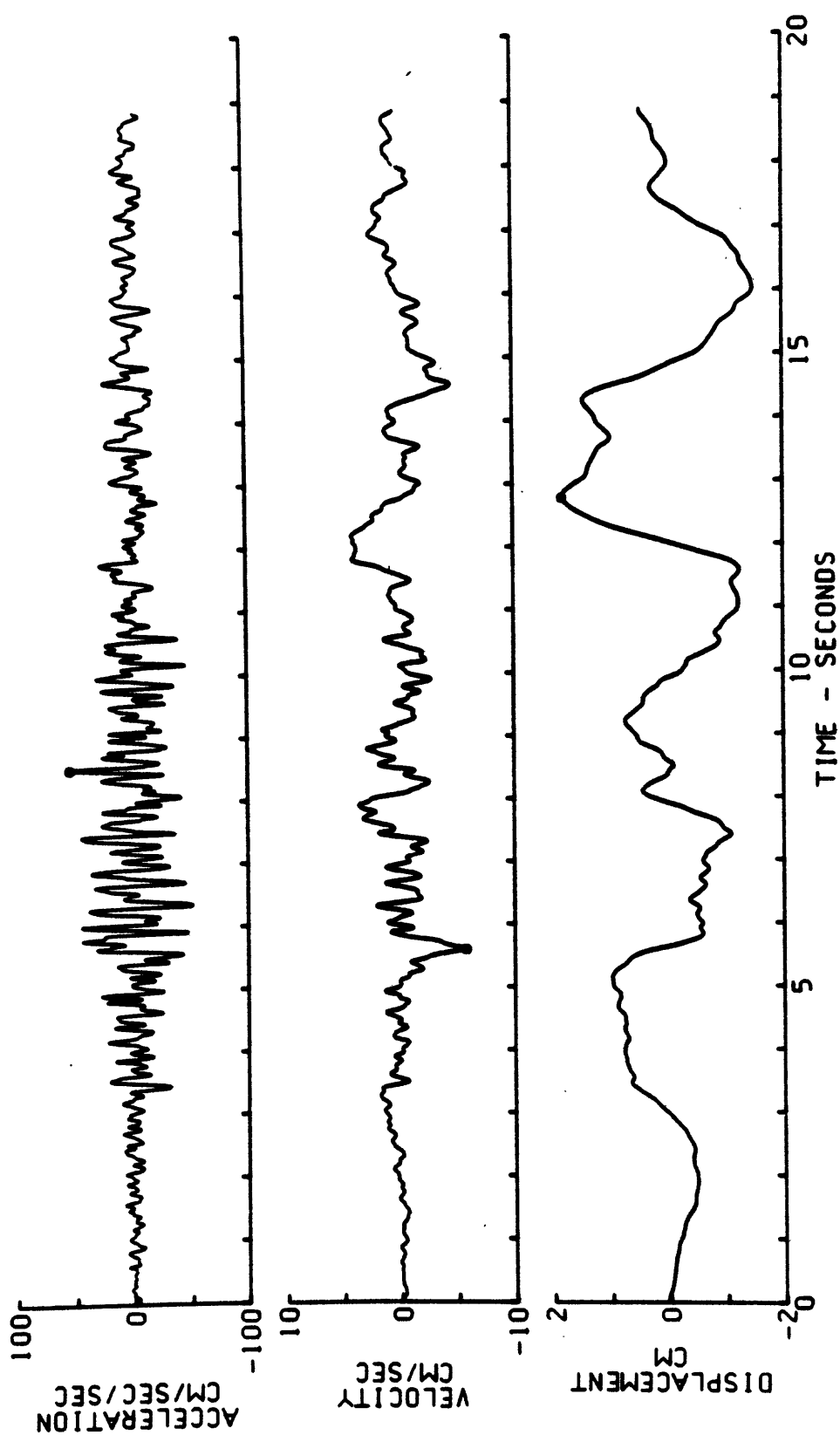
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 SUPERSTITION MOUNTAIN, CALIFORNIA, COMP 45 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



UNCORRECTED ACCELEROGRAM  
PLASTER CITY,CALIF.,STOREHOUSE,10/15/79,2317UTC  
THE 3 PEAK VALUES(G) ARE .0594 .0266 .0445

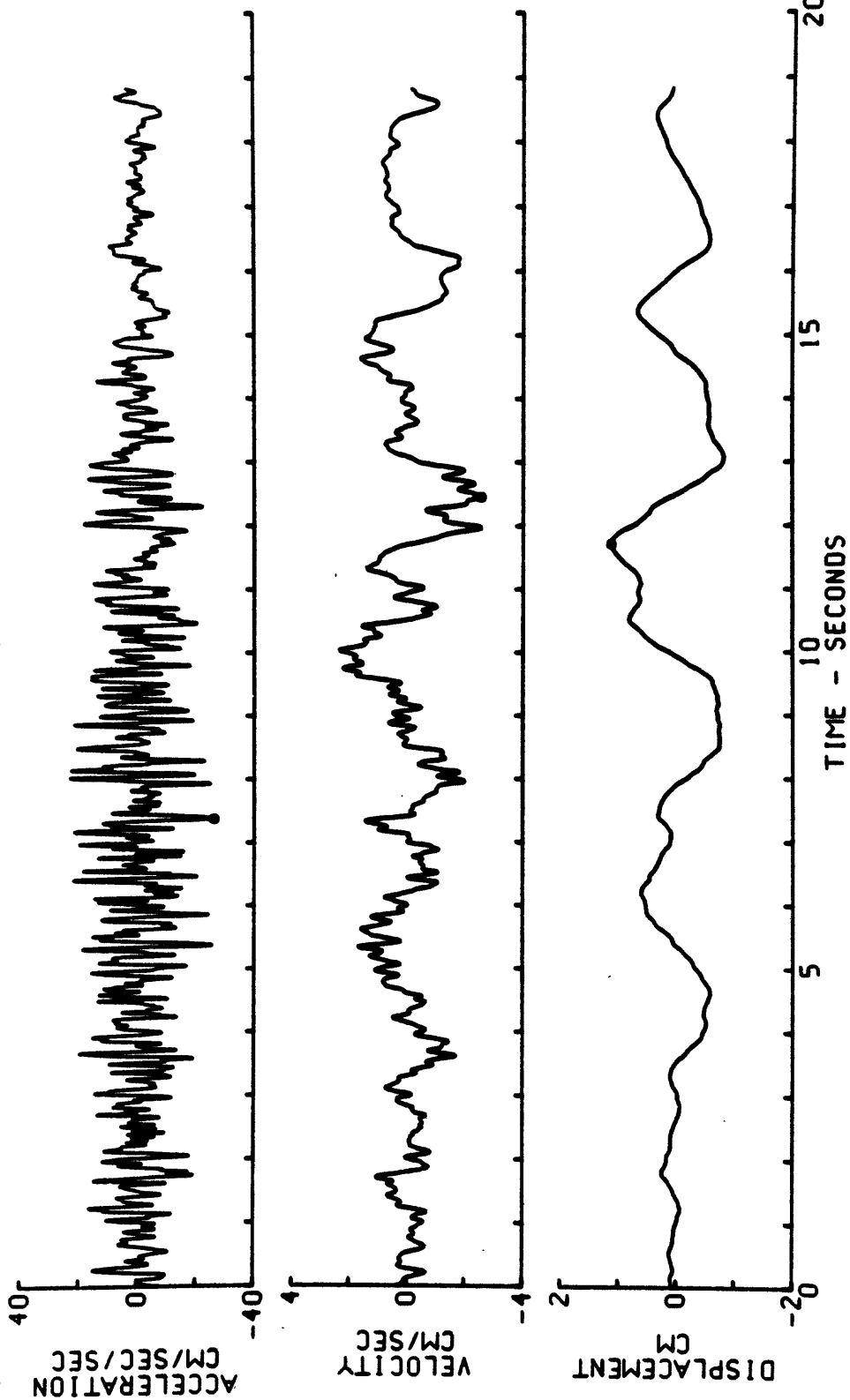


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STOREHOUSE, PLASTER CITY, CALIFORNIA, COMP 135 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=55.49 CM/SEC/SEC, VELOCITY=-5.770 CM/SEC, DISPL=1.810 CM

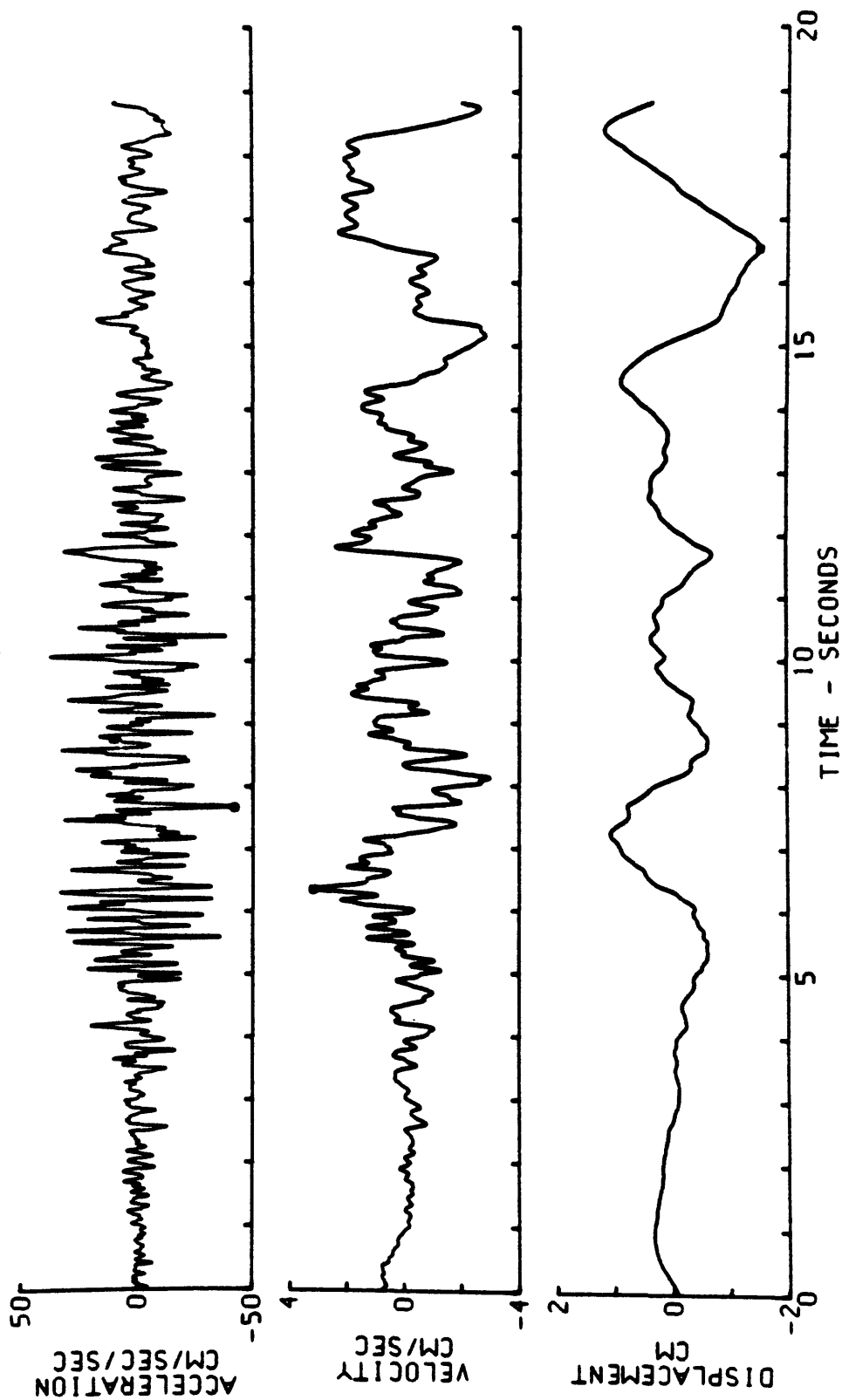


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
STOREHOUSE, PLASTER CITY, CALIFORNIA, COMP UP

DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
• PEAK VALUES ACCEL=-26.00 CM/SEC/SEC, VELOCITY=-2.550 CM/SEC, DISPL=1.130 CM



CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STOREHOUSE, PLASTER CITY, CALIFORNIA, COMP 45 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-41.93 CM/SEC/SEC, VELOCITY=3.220 CM/SEC, DISPL=-1.520 CM





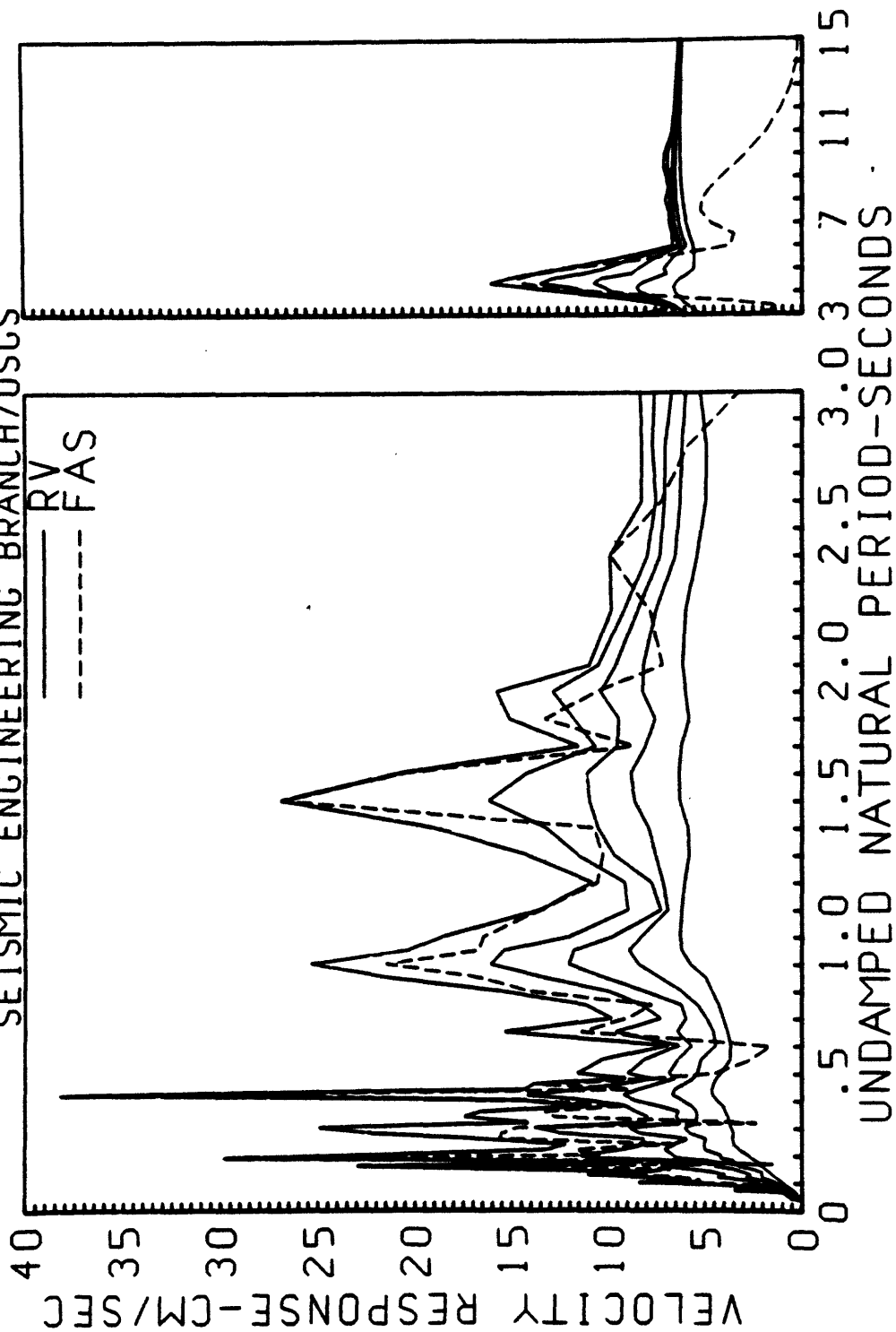
# RELATIVE VELOCITY RESPONSE SPECTRUM

PLASTER CITY, CALIF. 10/15/79. 2317.135 DEG

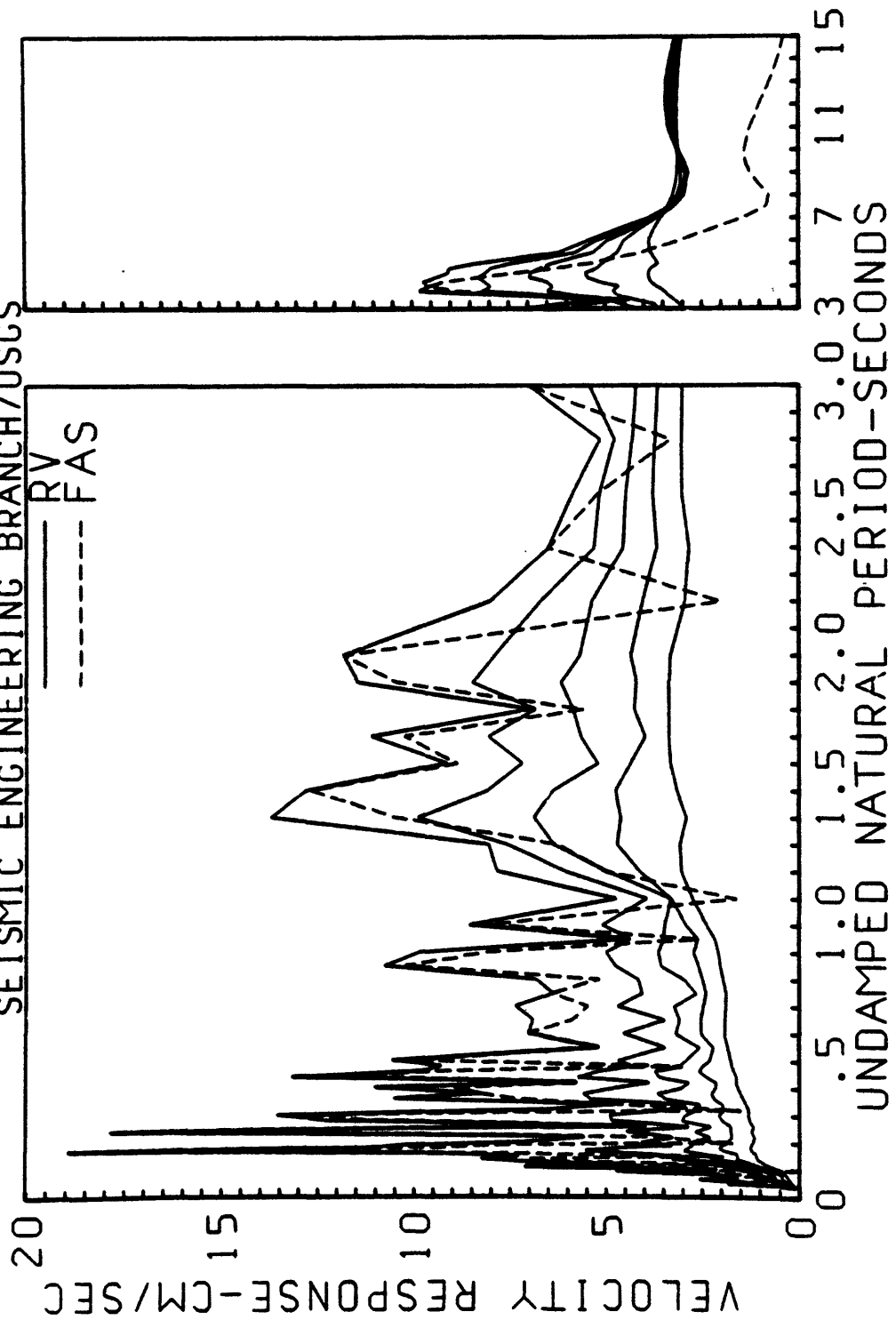
0.2.5.10.20 PERCENT CRITICAL DAMPING

BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ

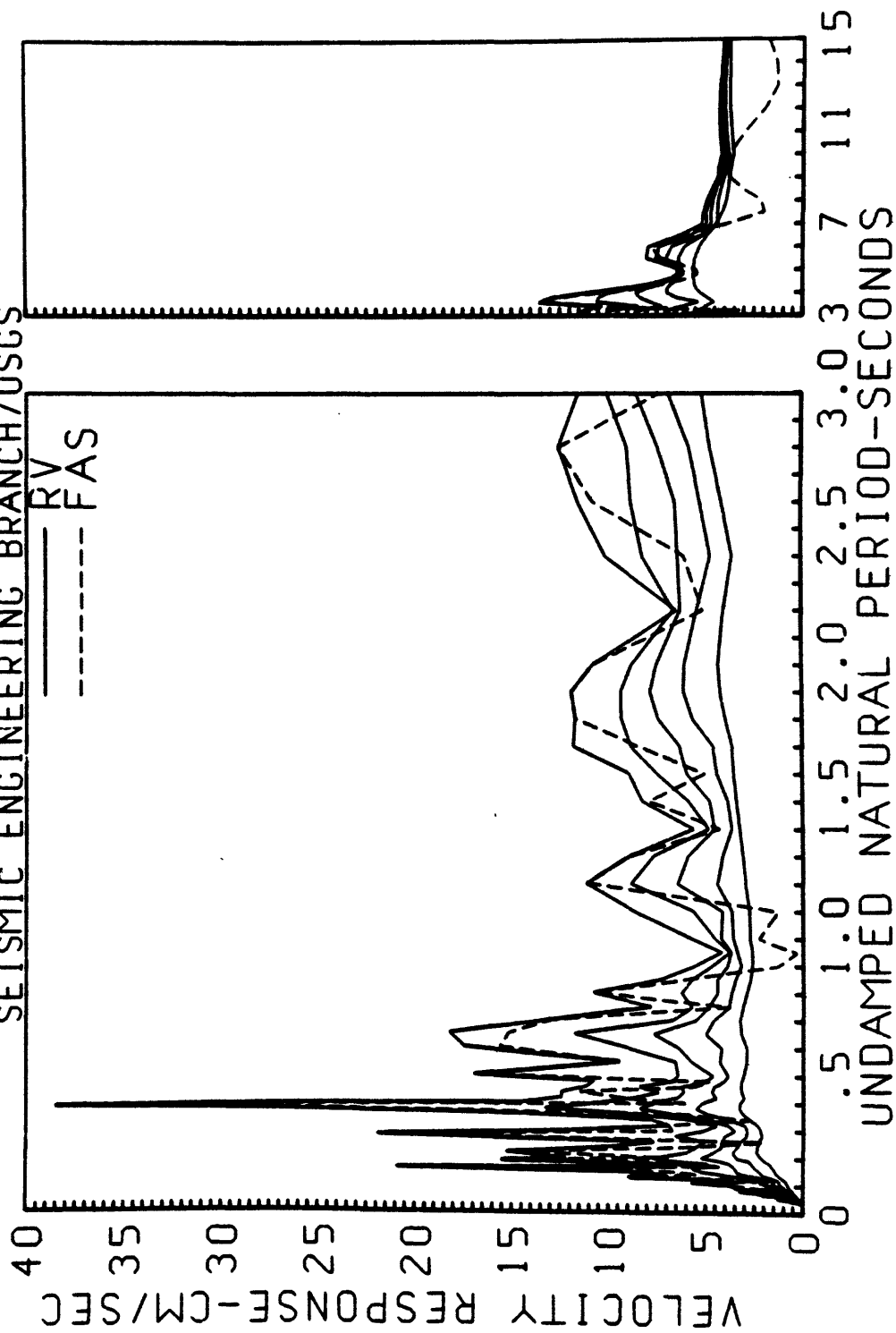
SEISMIC ENGINEERING BRANCH/USGS



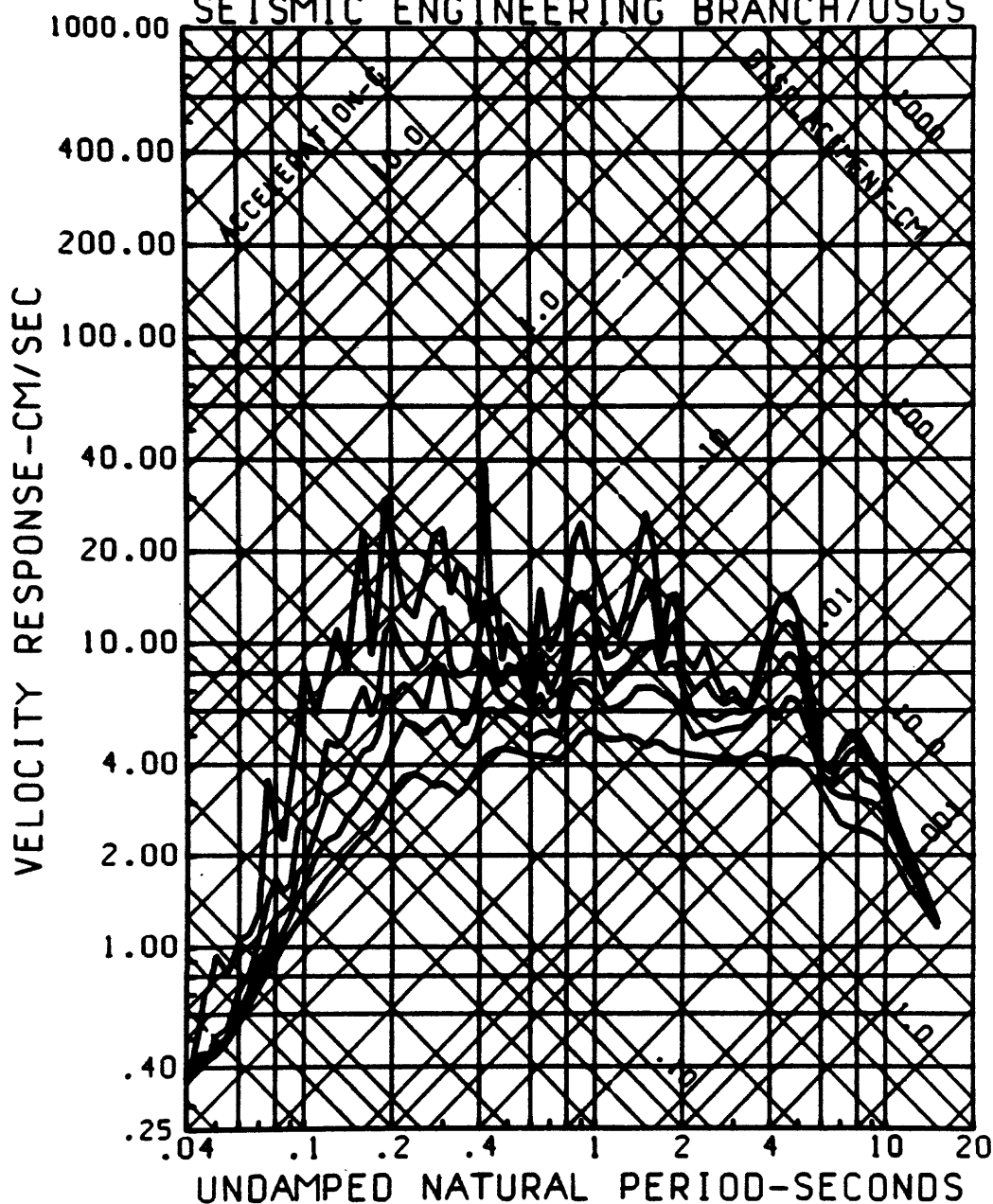
RELATIVE VELOCITY RESPONSE SPECTRUM  
 PLASTER CITY, CALIF., 10/15/79, 2317UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



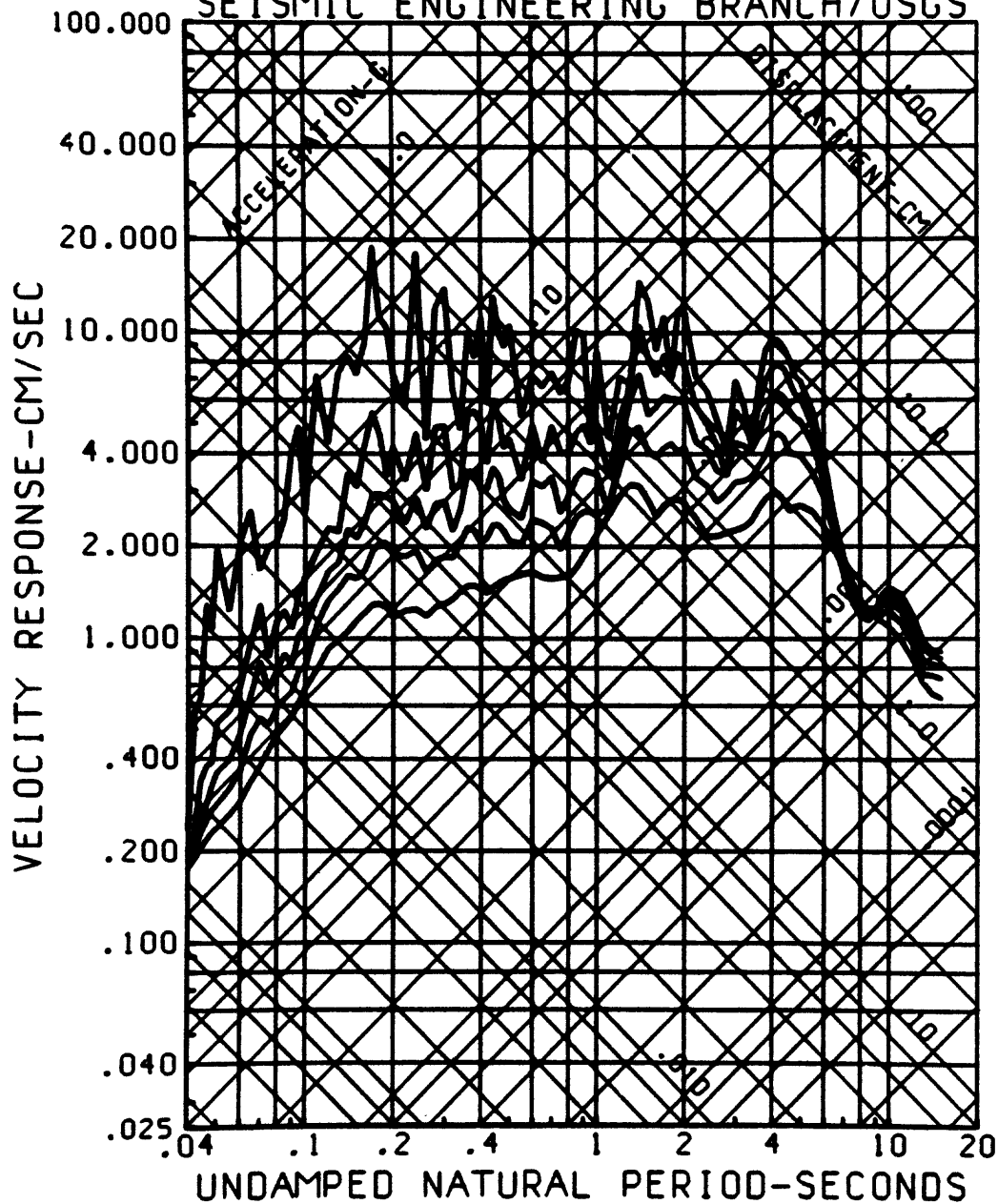
RELATIVE VELOCITY RESPONSE SPECTRUM  
 PLASTER CITY, CALIF..10/15/79.2317.45 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

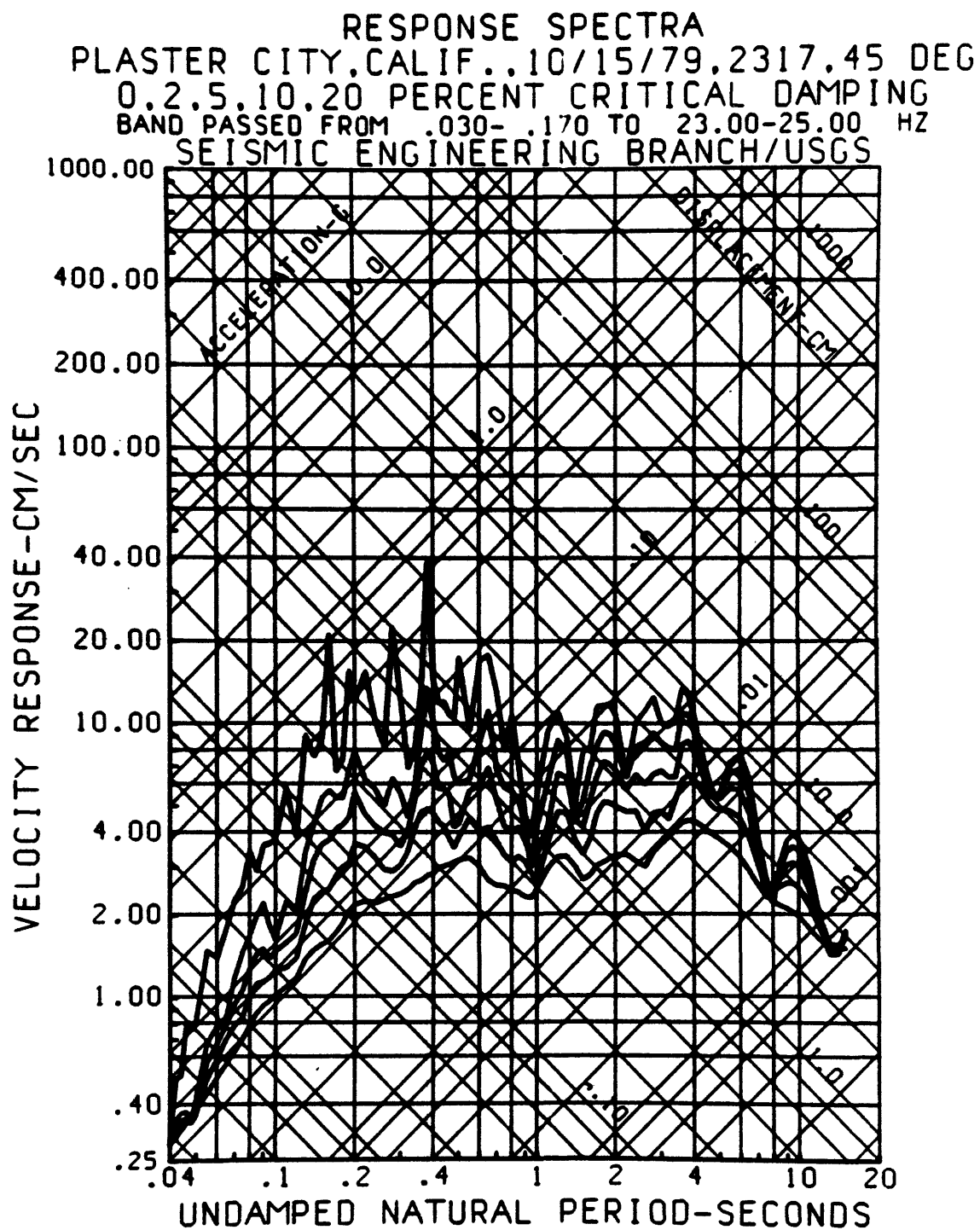


RESPONSE SPECTRA  
 PLASTER CITY, CALIF. 10/15/79. 2317.135 DEG  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

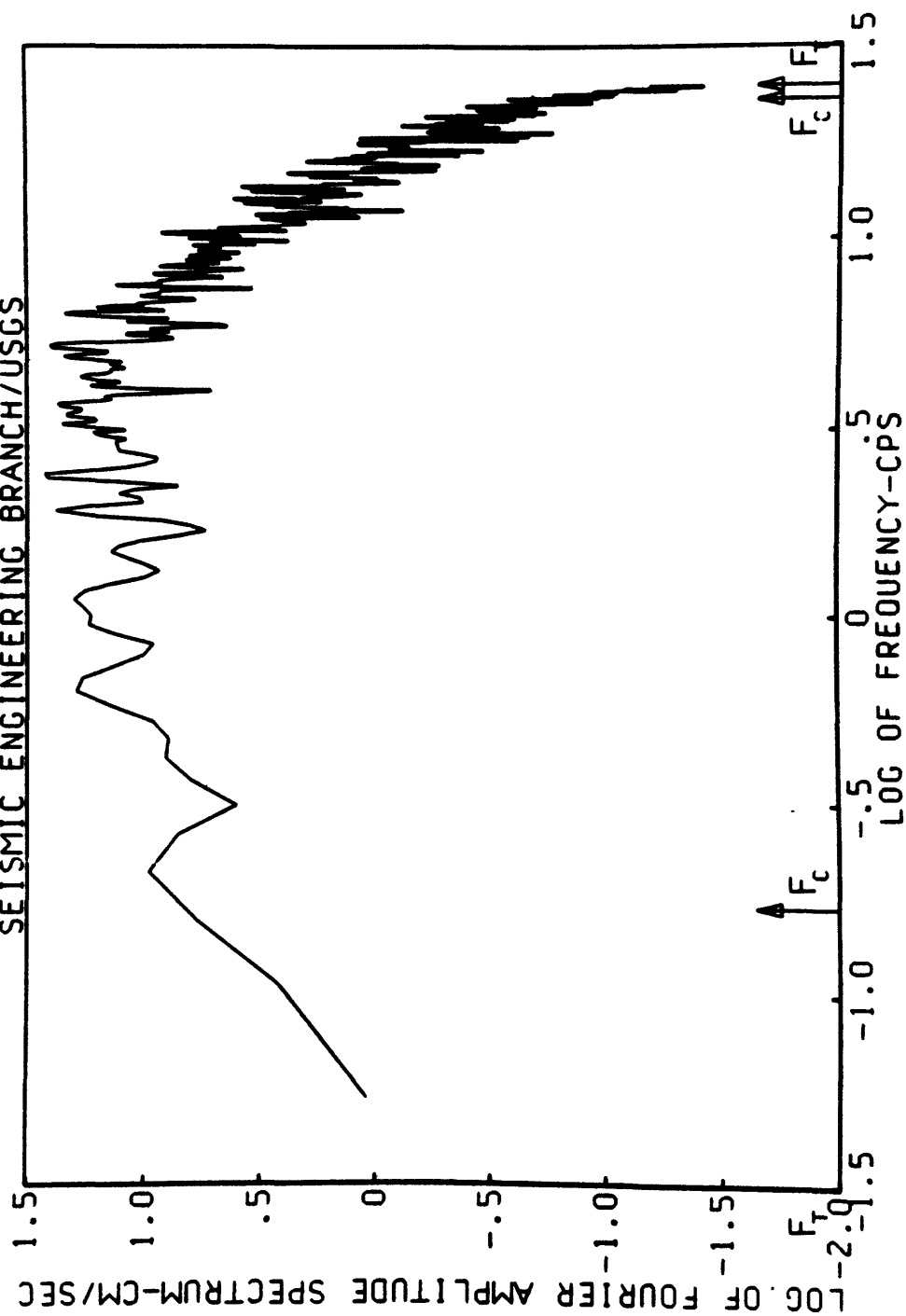


RESPONSE SPECTRA  
 PLASTER CITY, CALIF., 10/15/79, 2317UTC, UP  
 0.2, 5, 10, 20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

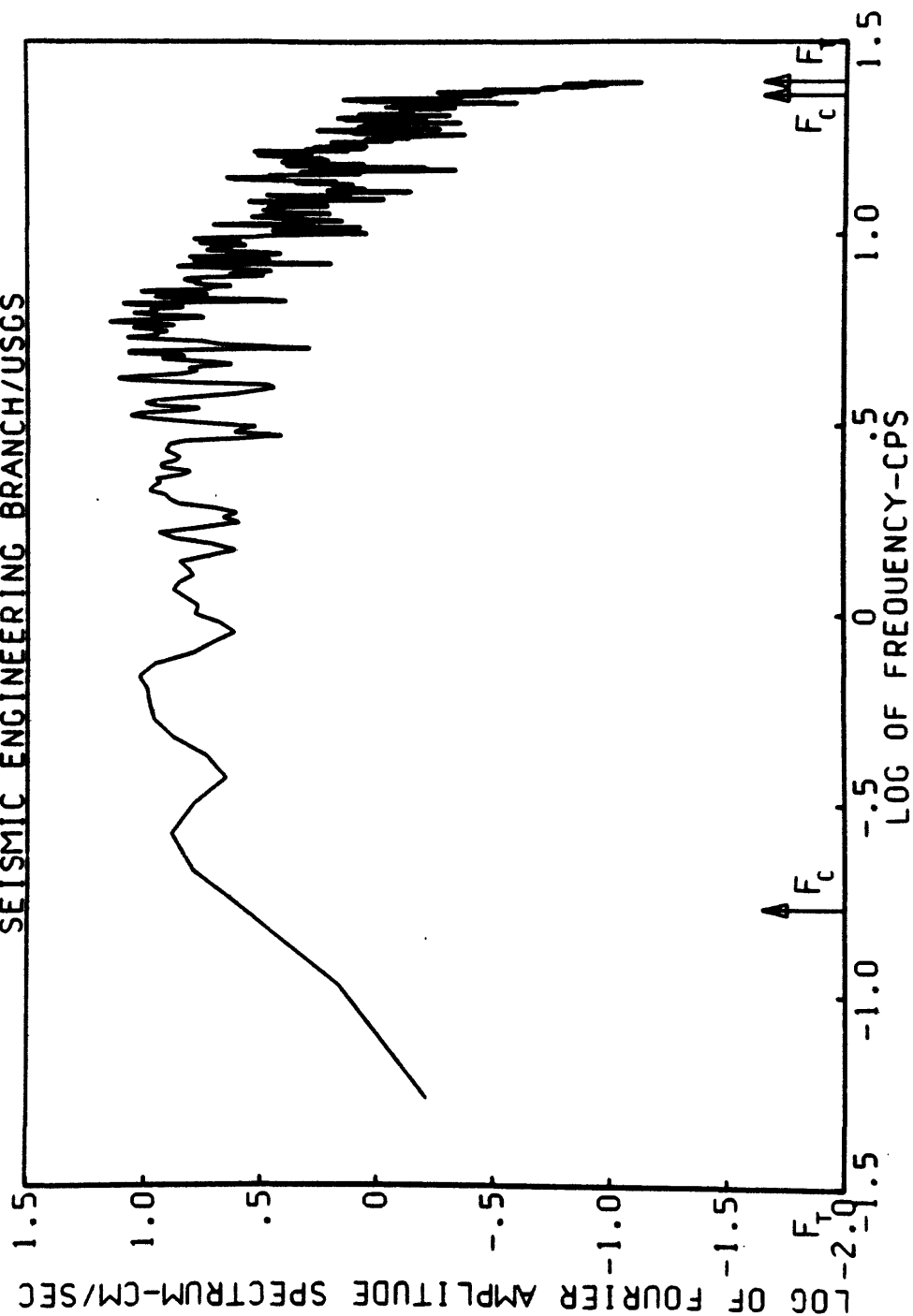




FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STOREHOUSE, PLASTER CITY, CALIFORNIA, COMP 135 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

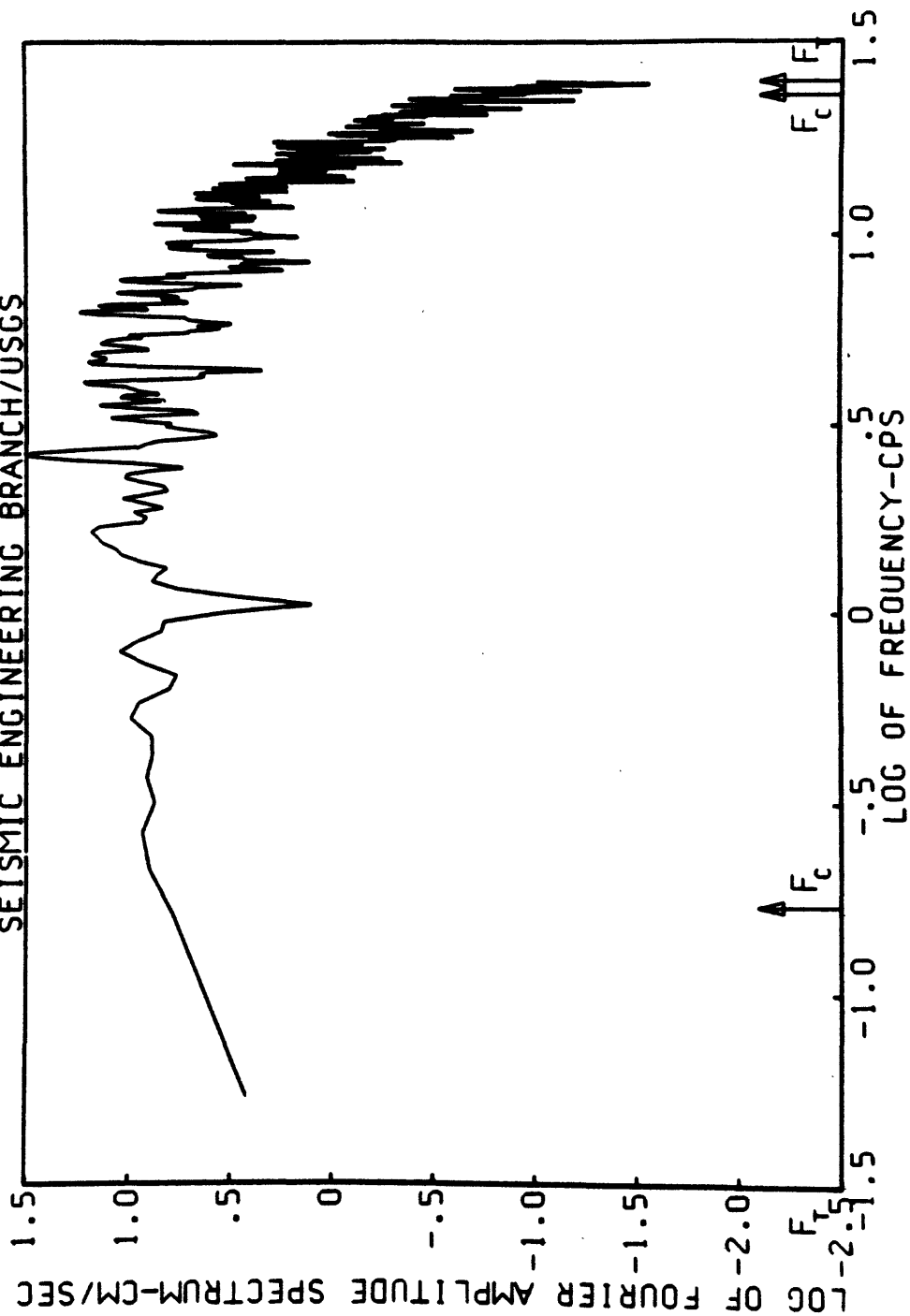


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STOREHOUSE, PLASTER CITY, CALIFORNIA. COMP UP  
 BAND PASSED FROM .03G - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

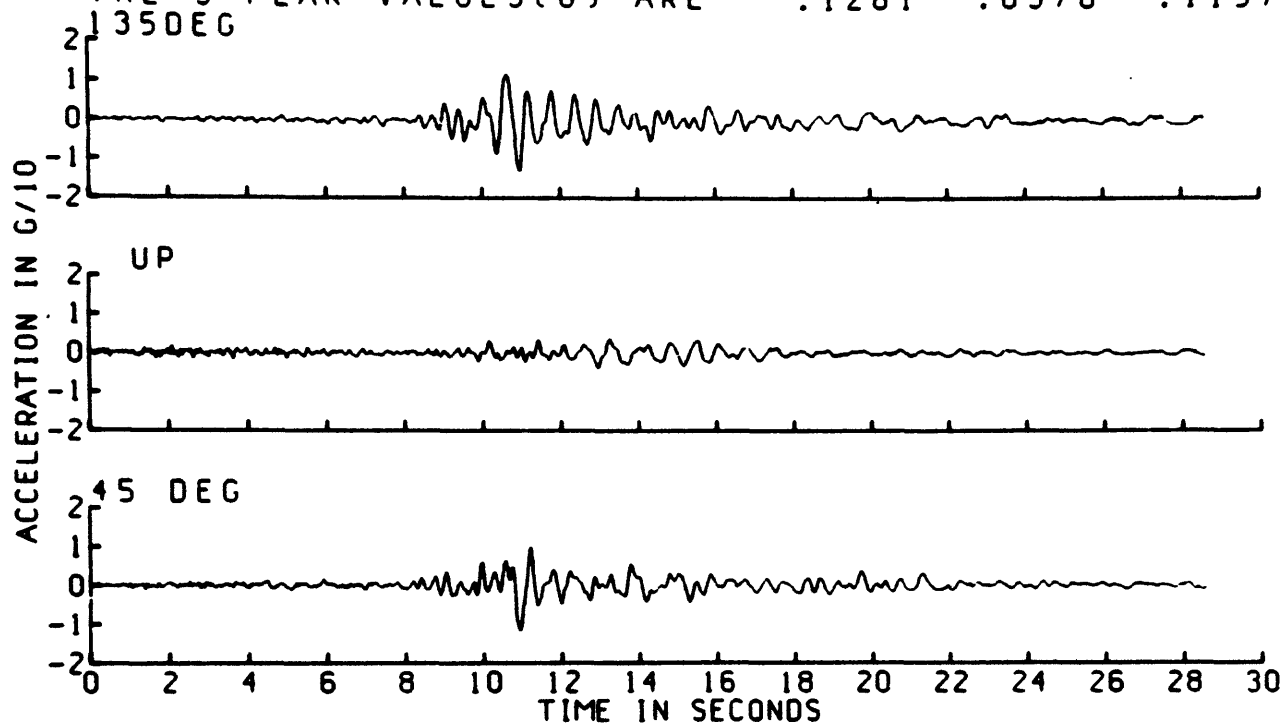




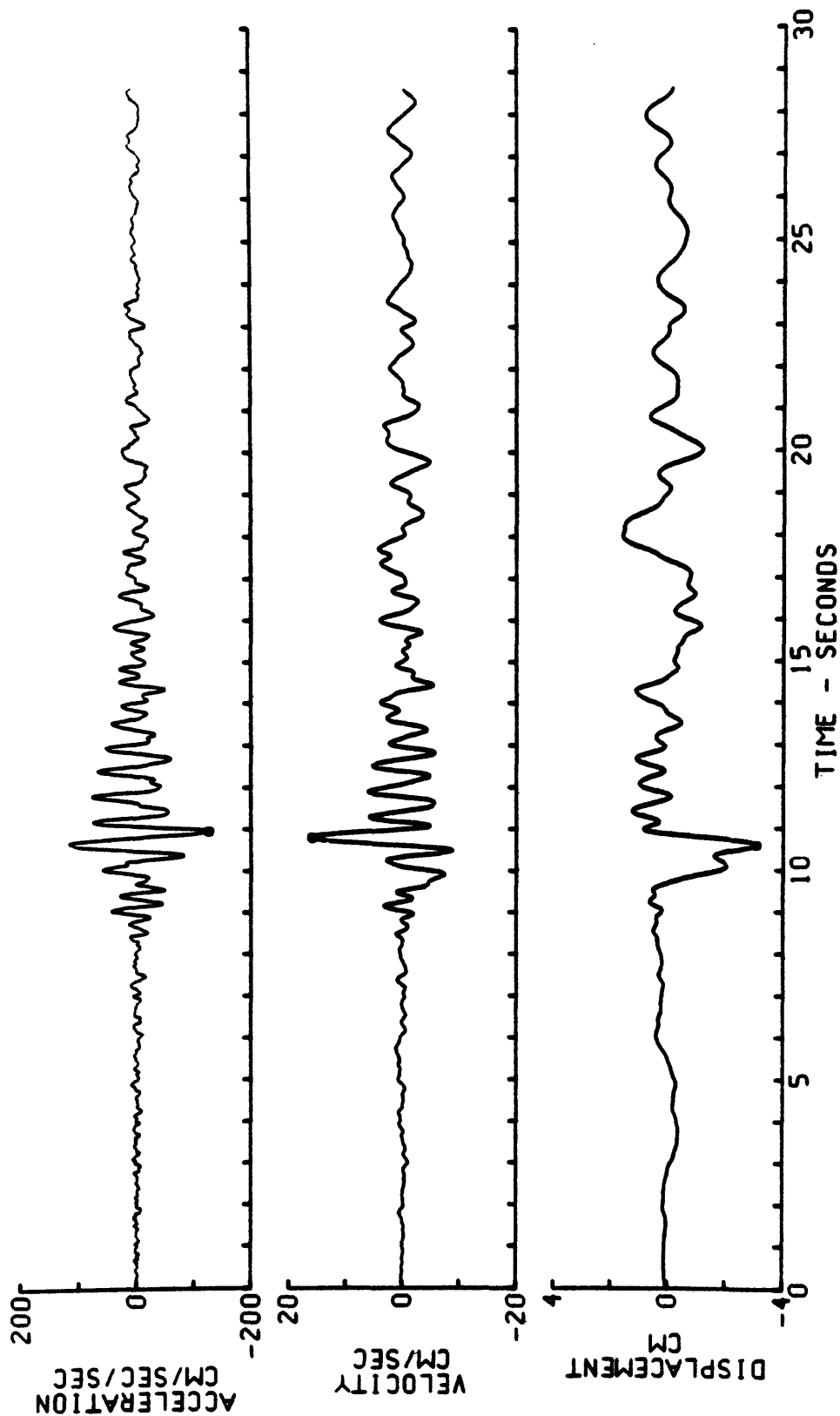
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 STOREHOUSE, PLASTER CITY, CALIFORNIA, COMP 45 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



UNCORRECTED ACCELEROGRAM  
COACHELLA CANAL NO. 4. CALIFORNIA. 10/15/79. 2317UTC  
THE 3 PEAK VALUES(G) ARE .1281 .0378 .1157

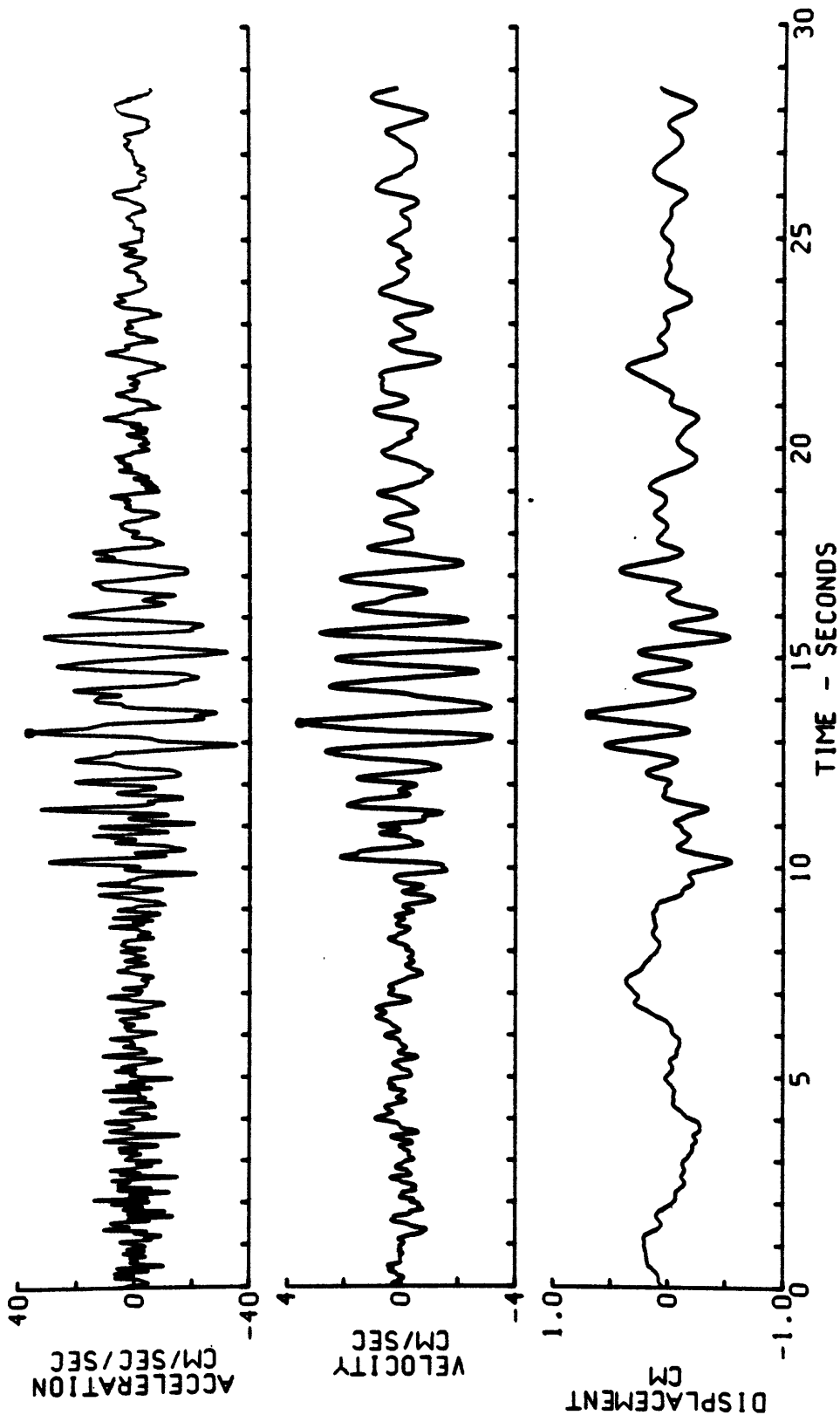


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA, COMP 135 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-125.7 CM/SEC/SEC, VELOCITY=15.95 CM/SEC, DISPL=-3.080 CM

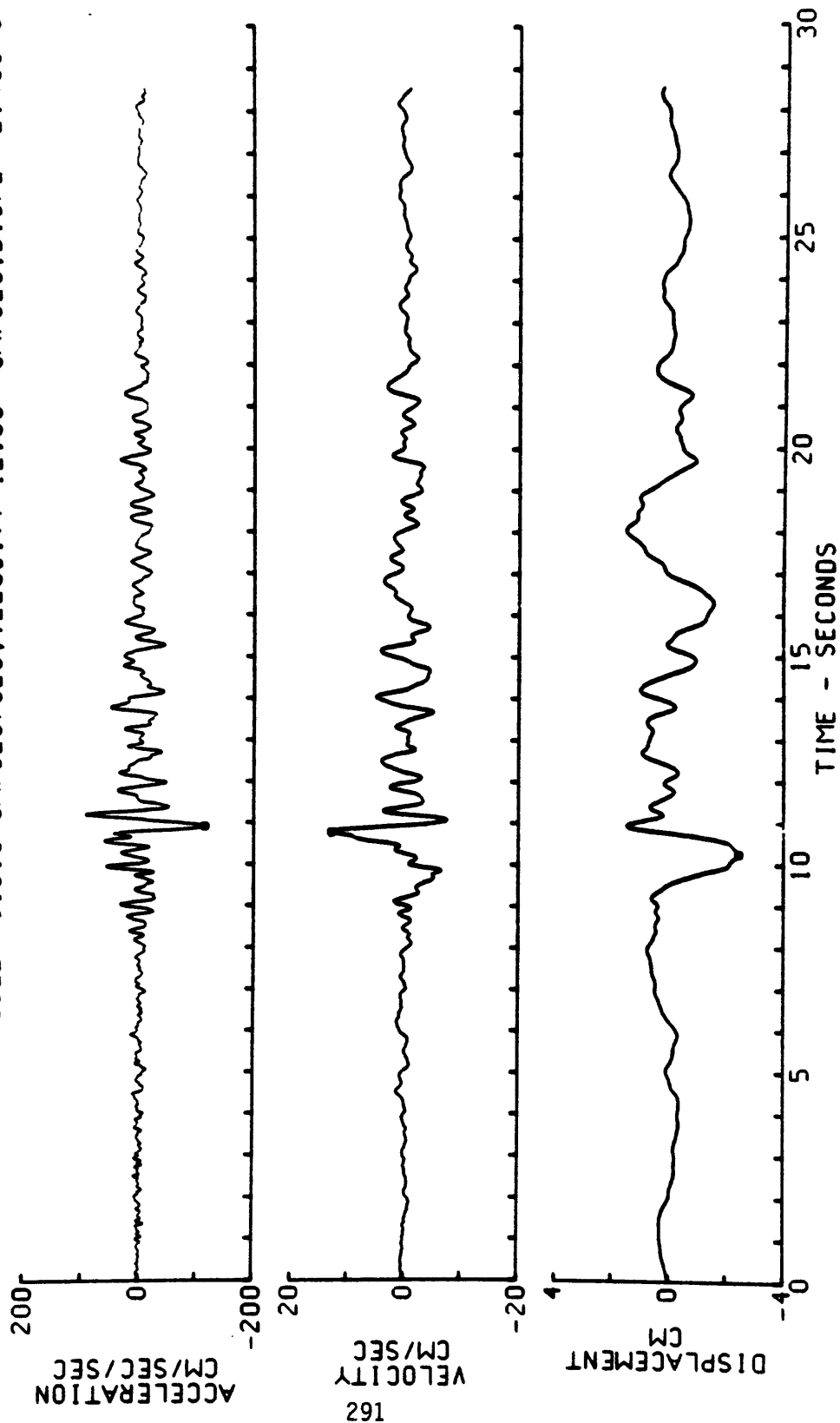


CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA, COMP UP

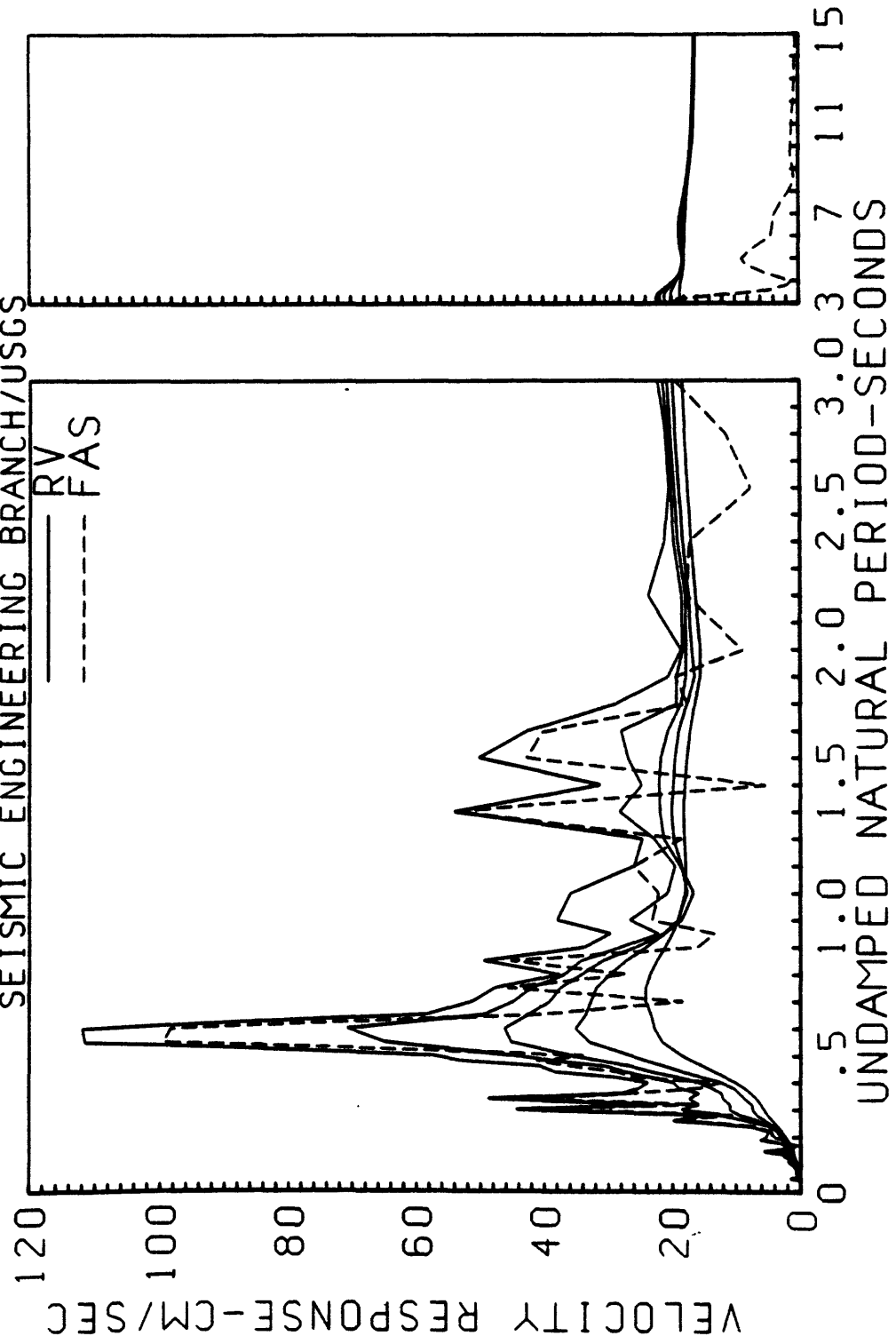
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=37.08 CM/SEC/SEC, VELOCITY=3.560 CM/SEC, DISPL=.680 CM



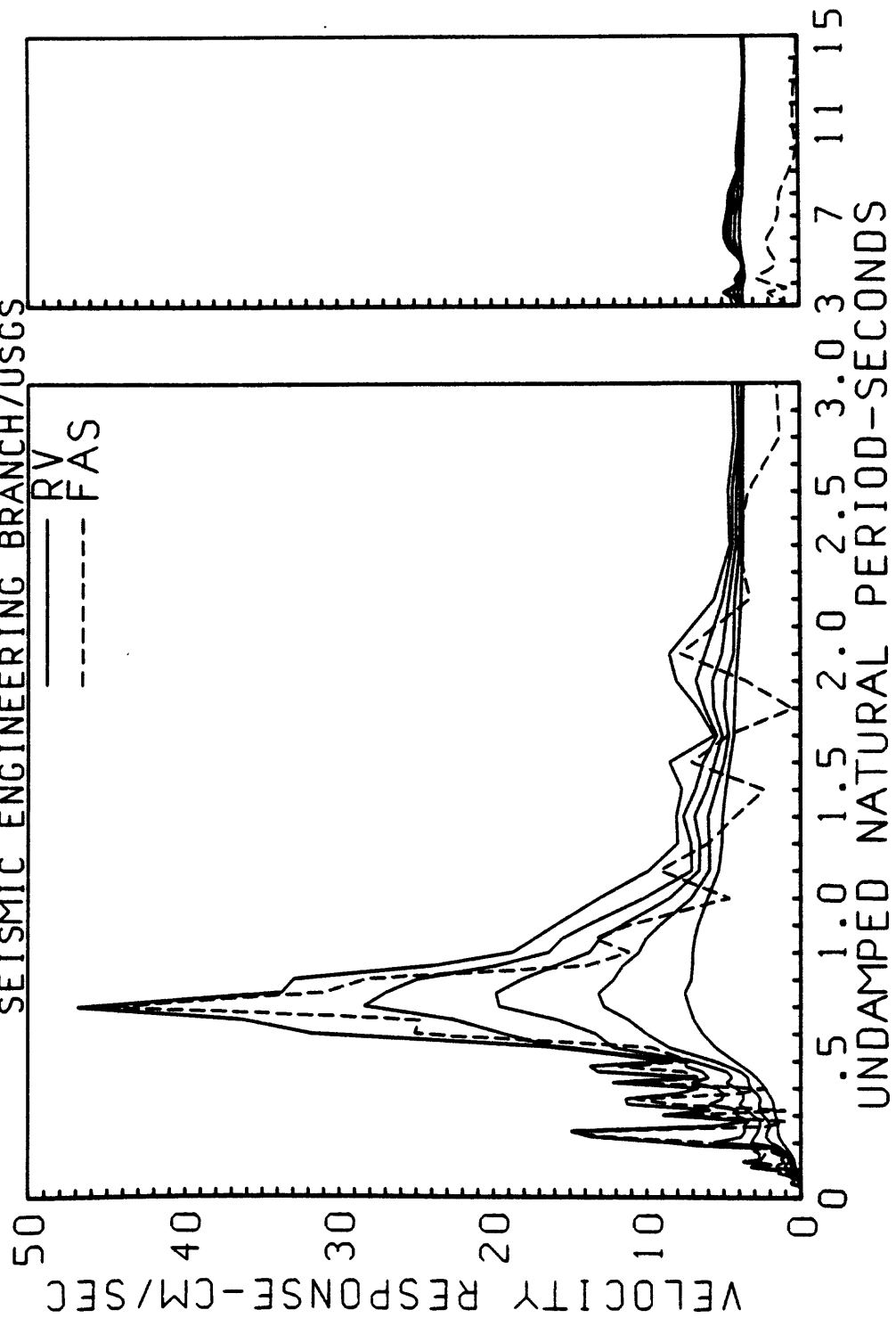
CORRECTED ACCELERATION, VELOCITY, DISPLACEMENT  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA, COMP 45 DEGREES  
 DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC  
 ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .030 - .170 AND 23.00 - 25.00 CYC/SEC  
 • PEAK VALUES ACCEL=-113.6 CM/SEC/SEC, VELOCITY=12.89 CM/SEC, DISPL=-2.460 CM



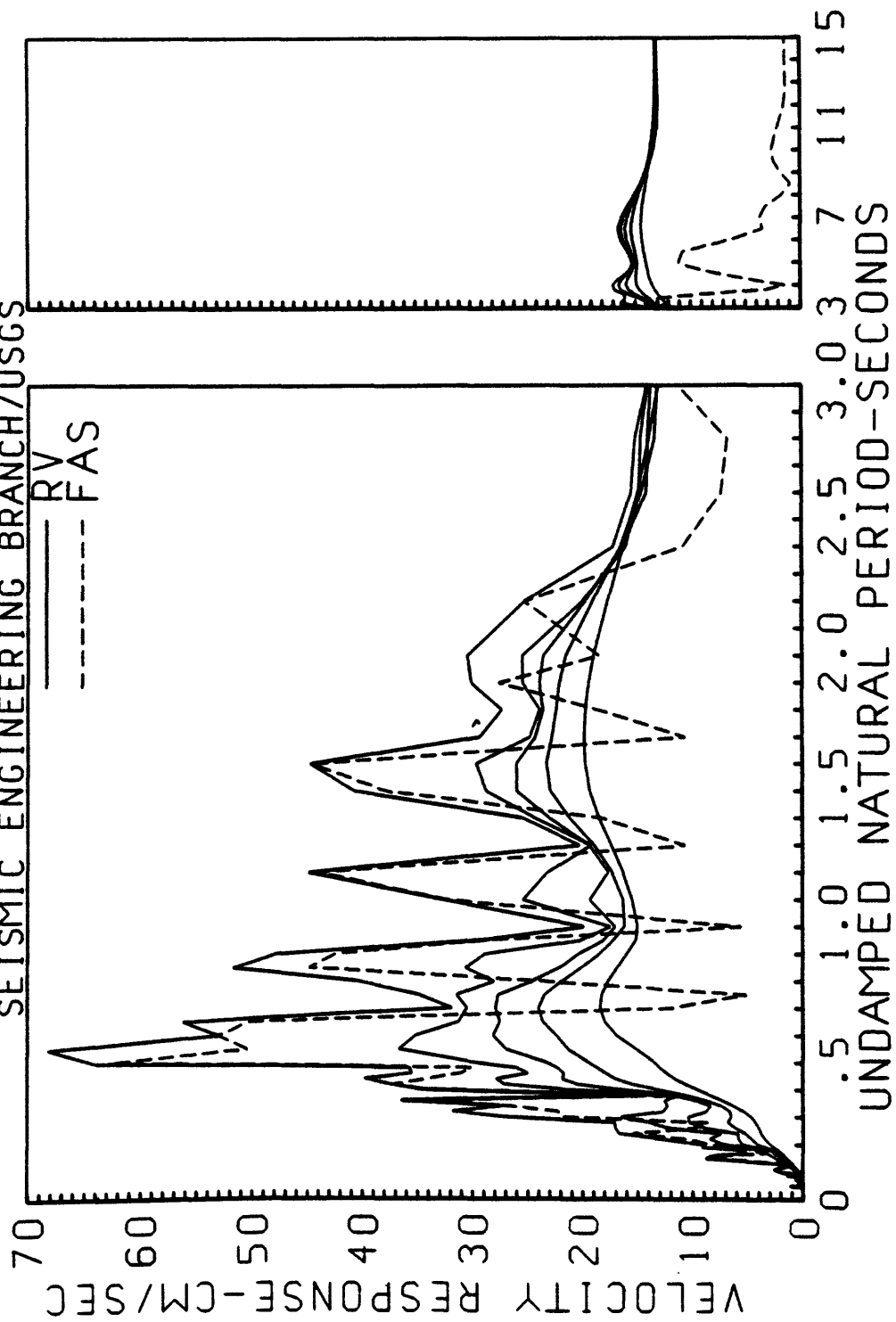
RELATIVE VELOCITY RESPONSE SPECTRUM  
 COACHELLA CANAL 4.10/15/79.2317.135 DEG  
 0.2,5,10,20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



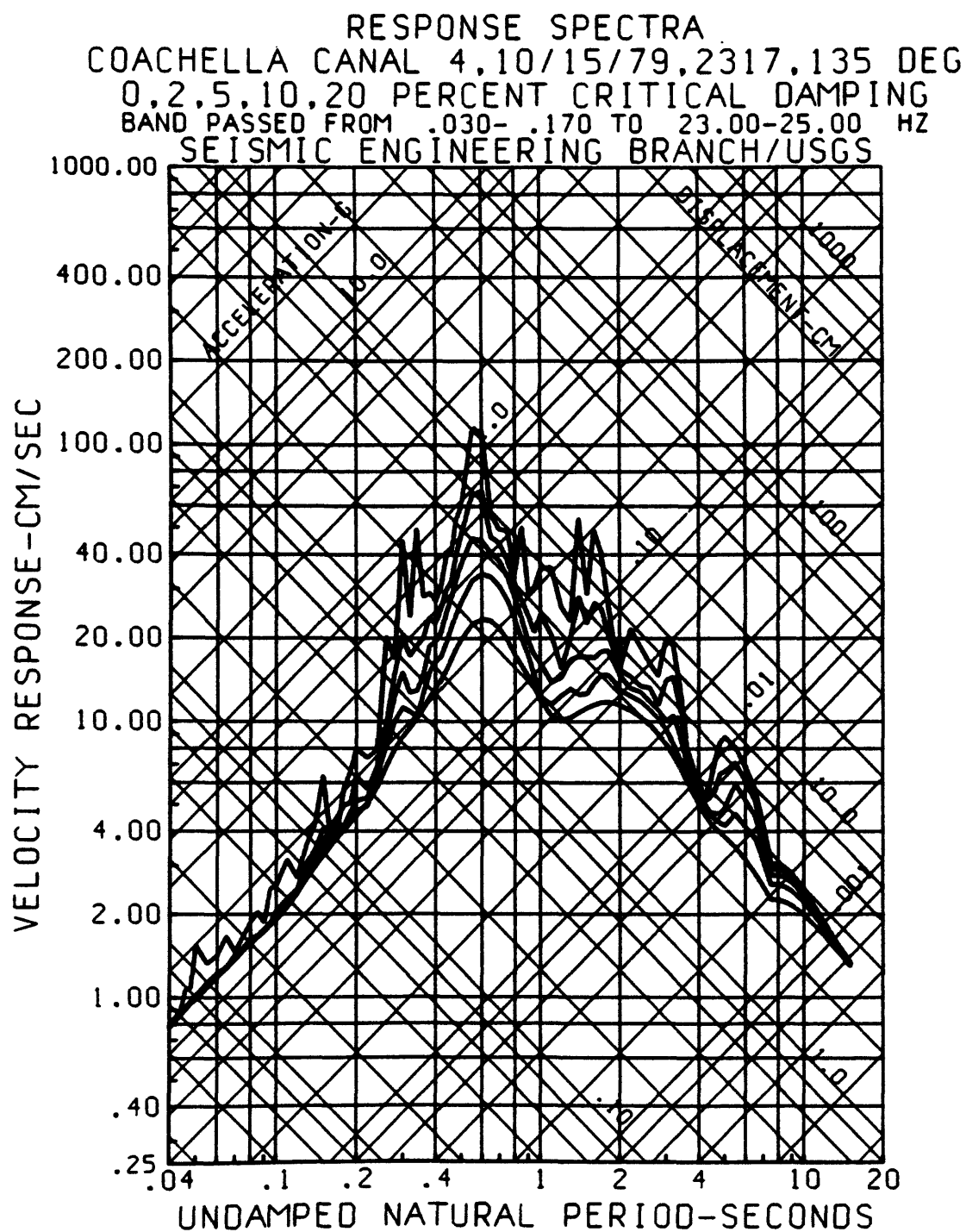
RELATIVE VELOCITY RESPONSE SPECTRUM  
 COACHELLA CANAL 4.CALIF.10/15/79.2317.UP  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS

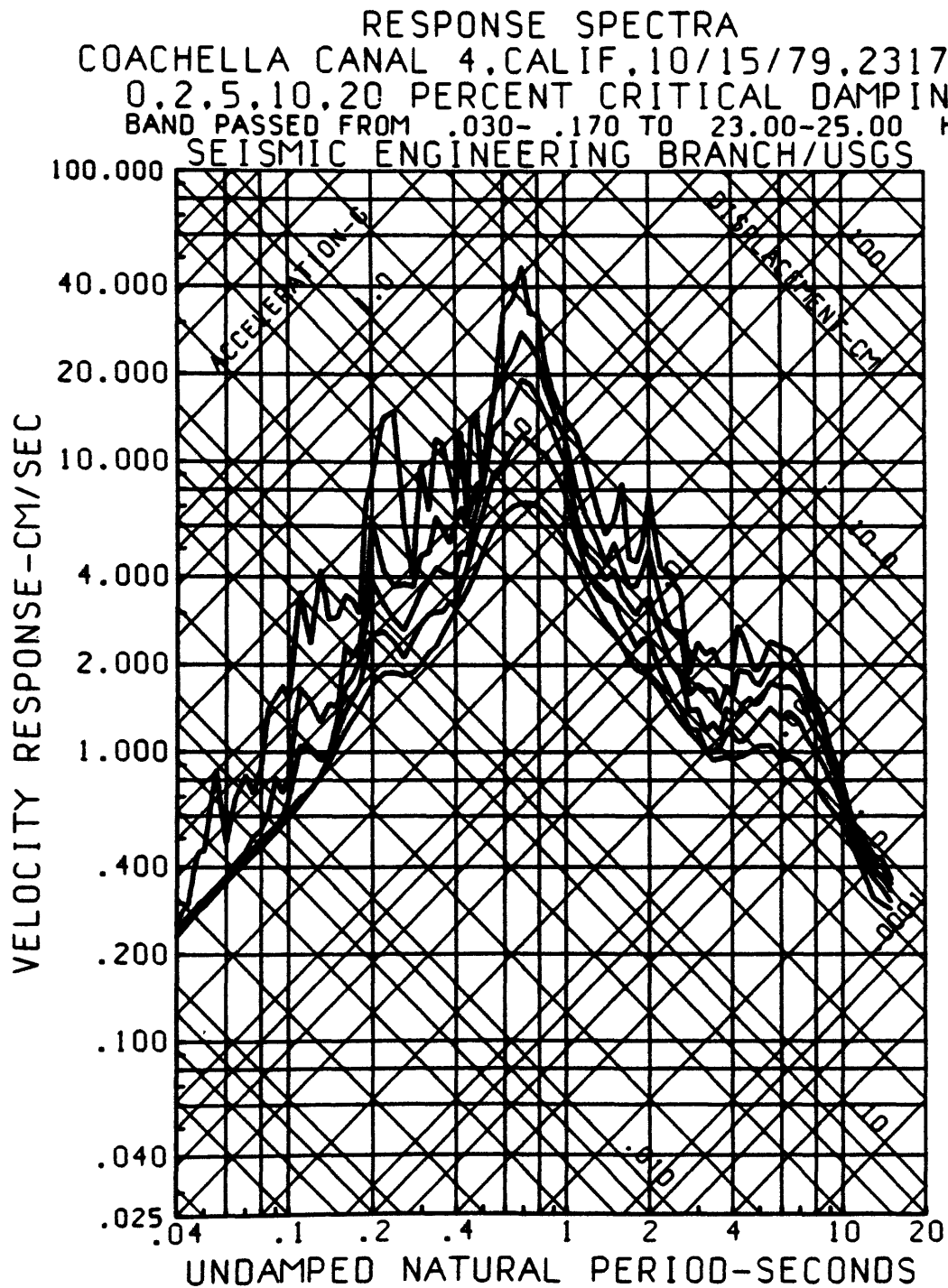


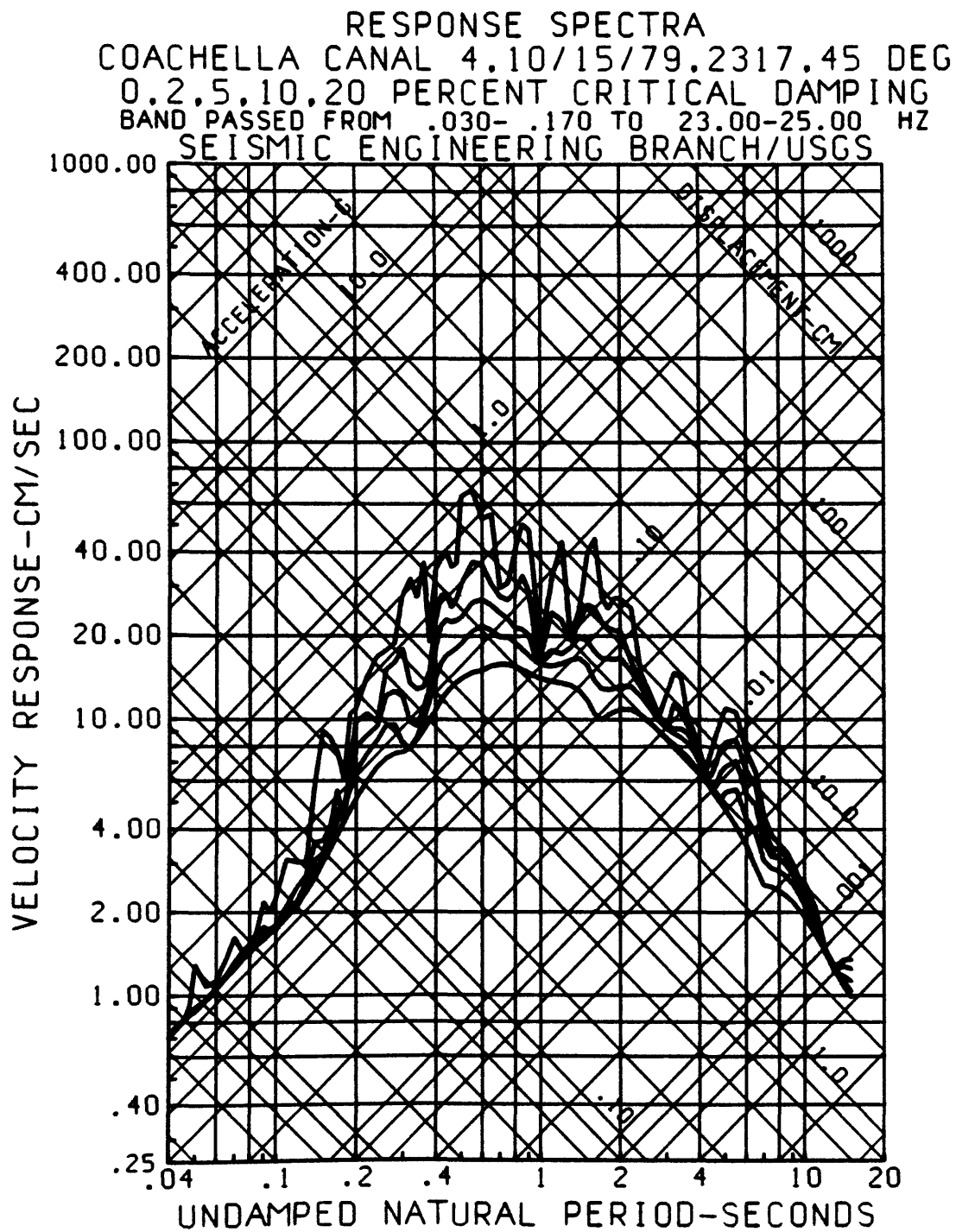
RELATIVE VELOCITY RESPONSE SPECTRUM  
 COACHELLA CANAL 4.10/15/79.2317.45 DEG  
 0.2.5.10.20 PERCENT CRITICAL DAMPING  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



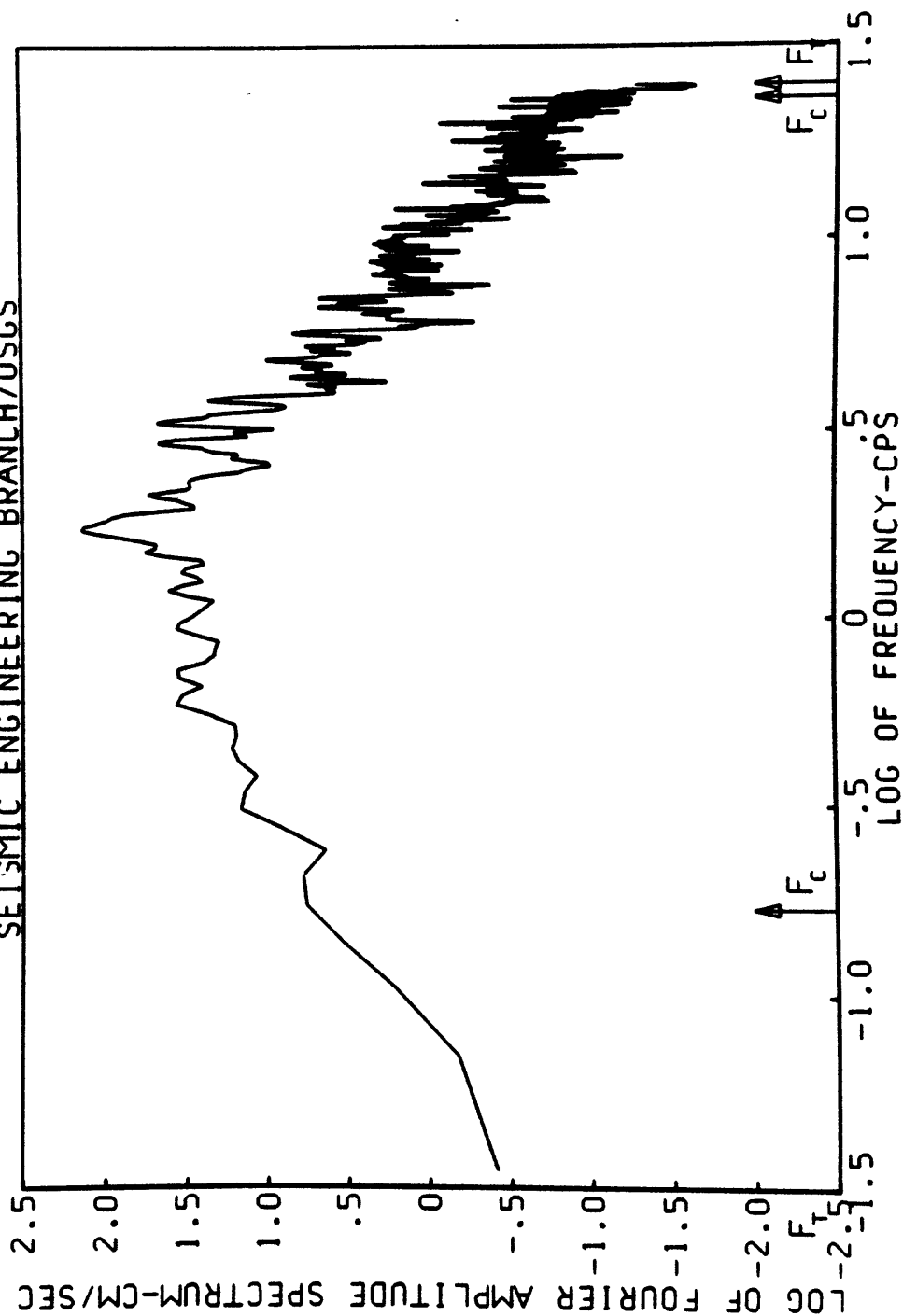




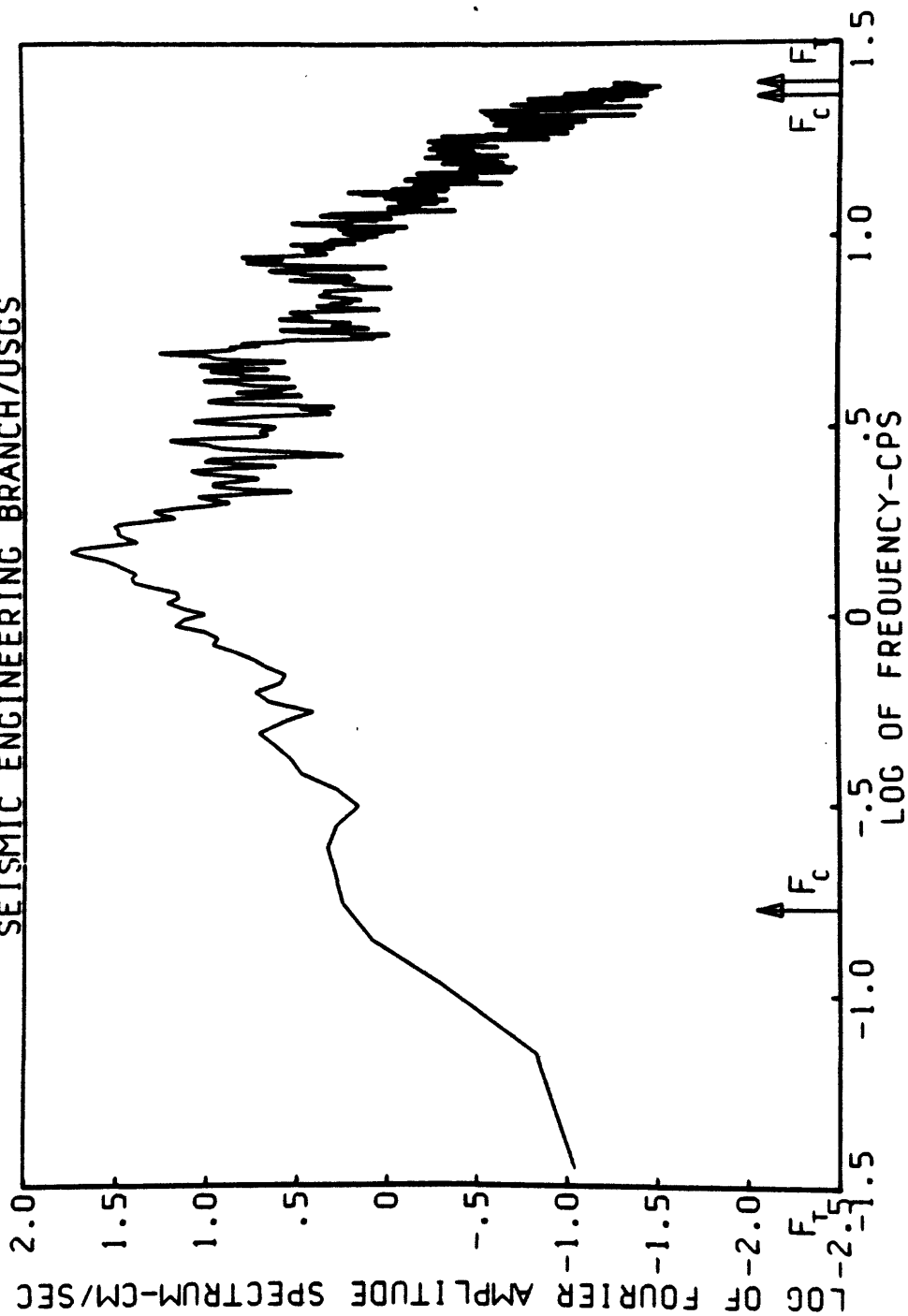




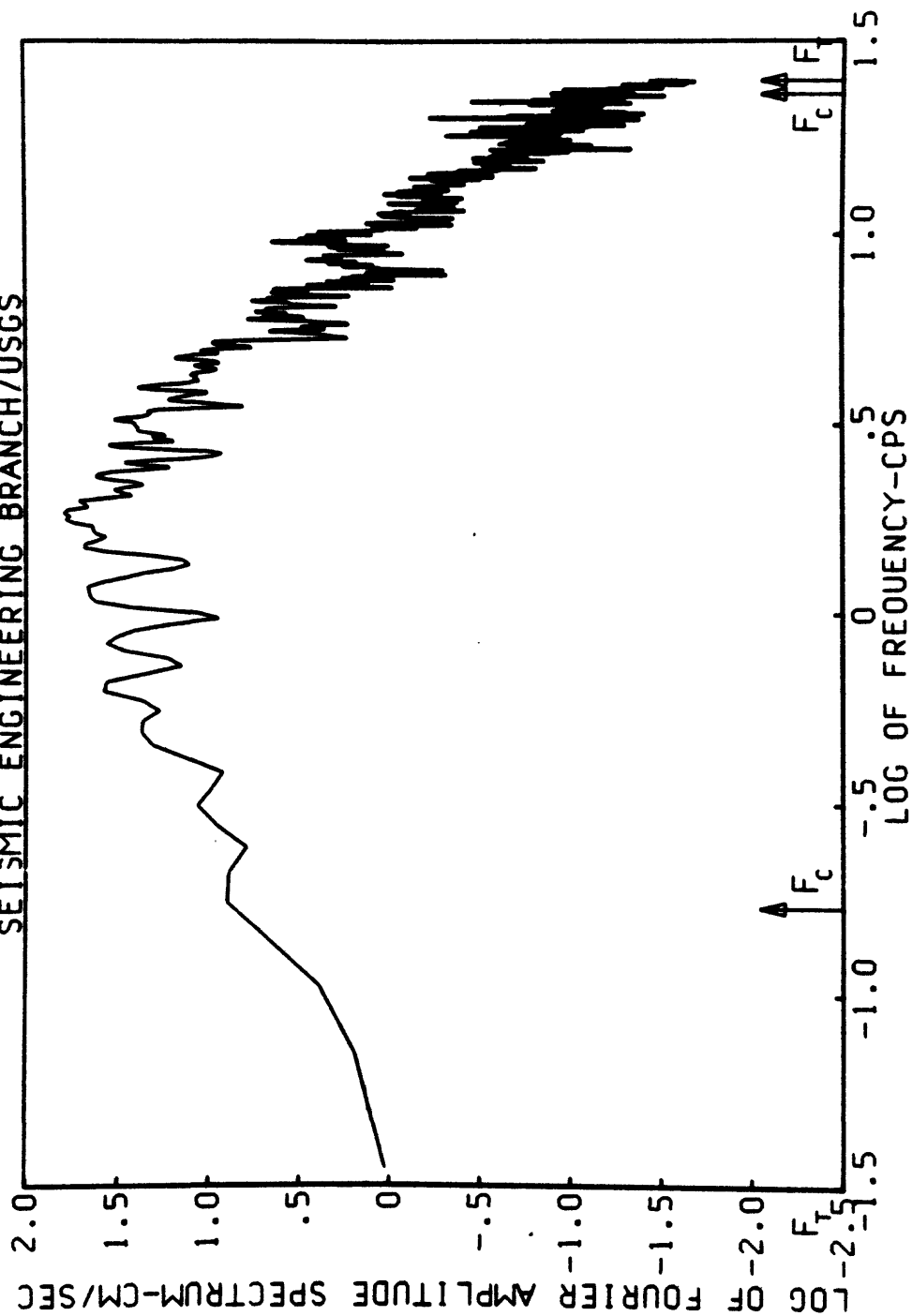
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA, COMP 135 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA. COMP UP  
 BAND PASSED FROM .030 - .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION  
 IMPERIAL VALLEY EARTHQUAKE OF OCTOBER 15, 1979 - 2317UTC  
 COACHELLA CANAL NUMBER 4, CALIFORNIA, COMP 45 DEGREES  
 BAND PASSED FROM .030- .170 TO 23.00-25.00 HZ  
 SEISMIC ENGINEERING BRANCH/USGS



Appendix 3:  
Documentation of tape of Mexico records  
(Brune and others, 1980)

April 14, 1980

IGPP  
IMPERIAL VALLEY (15 OCTOBER 1979) MAIN EARTHQUAKE  
STRONG MOTION DATA TAPE

TRACKS: 9                      DENSITY: 800                      MODE: ASCII (UNBLOCKED)

This tape contains one file for each component of recorded data, or a total of 20 files, in the following order:

FILE	STATION	MNEMONIC	CHAN.NO.	COMPONENT*	SENSITIVITY+	FREE PER. (SECS)	DAMPING
1	Agrarias	AG	1	UP	.9195	.033	.7
2	Agrarias	AG	2	N 3° E	.9362	.033	.7
3	Agrarias	AG	3	N 87° W	.9067	.033	.7
4	Cerro Prieto	CP	1	UP	.5365	.033	.7
5	Cerro Prieto	CP	2	S 57° W	.5132	.033	.7
6	Cerro Prieto	CP	3	S 33° E	.5047	.033	.7
7	Chihuahua	CH	1	UP	.9335	.033	.7
8	Chihuahua	CH	2	N 12° E	.8479	.033	.7
9	Chihuahua	CH	3	N 78° W	.9407	.033	.7
10	Compuertas	CM	1	UP	.9009	.033	.7
11	Compuertas	CM	2	N 15° E	.9034	.033	.7
12	Compuertas	CM	3	N 75° W	.9127	.033	.7
13	Delta	DT	1	UP	.5135	.033	.7
14	Delta	DT	2	N 8° W	.4948	.033	.7
15	Delta	DT	3	S 82° W	.4918	.033	.7
16	Cucapah	CC	1	N 85° E	.4790	.019	.63
17	Cucapah	CC	2	UP	.4790	.019	.63
18	Victoria	VC	1	N 75° E	.4790	.019	.63
19	Victoria	VC	2	UP	.4790	.019	.63
20	Victoria	VC	3	N 15° W	.4790	.019	.63

\* Direction of ground motion corresponding to positive-going numbers

+ gals per count

The data in each file are in a 2016 format (120 bytes = 1 logical rec = 1 physical rec), preceded by a single header record written by the following statement:

```
WRITE(8,2222)NAMPIP,LECHAN,IDAY,IHRS,ININS,SECS,NFRAMS,MULT /*WRITE HEADER
2222 FORMAT(5A2,'X',CH='12',J='15',HR='12',MN='12',
      SC='F5.2',NSAMPS='15',MULT='12)
```

April 14, 1980

A sample header with (partial) explanation follows:

VCJ163	CH=	D=	HR=	MN=	SC=	NSAMPS=	MULT=
Station Mnemonic	Channel No.	Time of first sample in file (if known)- time correction <u>not</u> included (see attachment)				Total No. of Samples in file	

All data are sampled at a rate of 100 samples per sec.

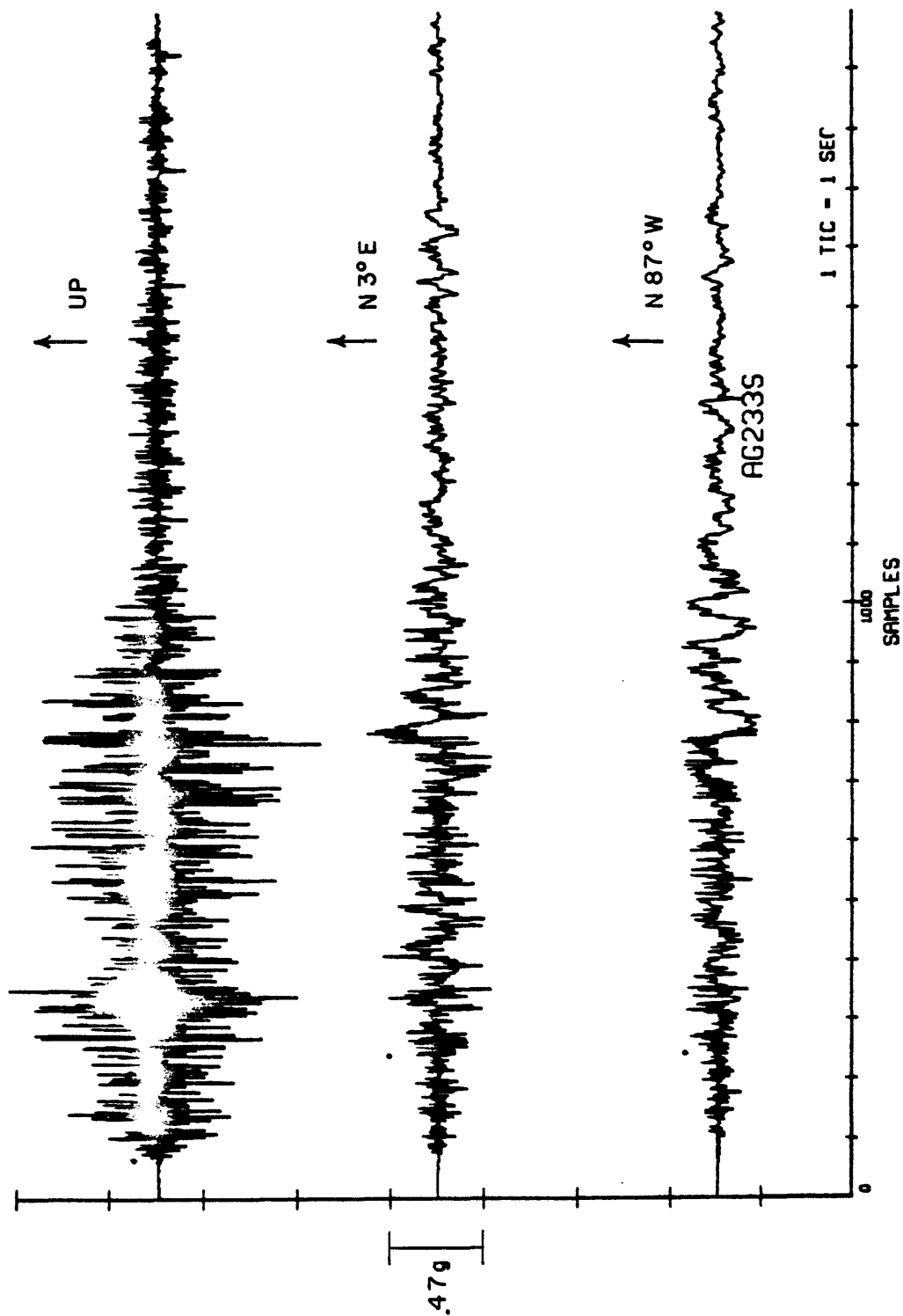
The first five records of the first file are:

RECORD	1 CONTAINS 60 16-BIT WORDS												
	A6233S	CH= 1	D= 288	HR= 23	MN= 16	SC=54.66	NSAMPS= 2844	MULT= 0					
RECORD	2 CONTAINS 60 16-BIT WORDS												
	-13	-11	-11	-11	-17	-11	-13	-17	-11	-17	-13	-10	-11
	-11	-11	-17	-13	-17	-13	-13						
RECORD	3 CONTAINS 60 16-BIT WORDS												
	-13	-17	-11	-13	-13	-11	-13	-13	-13	-13	-13	-17	-13
	-17	-13	-13	-11	-17	-11	-11						
RECORD	4 CONTAINS 60 16-BIT WORDS												
	-13	-11	-11	-11	-11	-13	-13	-13	-13	-13	-17	-17	-13
	-17	-13	-11	-11	-13	-13	-9						
RECORD	5 CONTAINS 60 16-BIT WORDS												
	-4	-17	-17	-1	-23	-28	-1	-4	-13	-1	-1	-31	-30
	-25	-32	32	64	-81	-45	80						

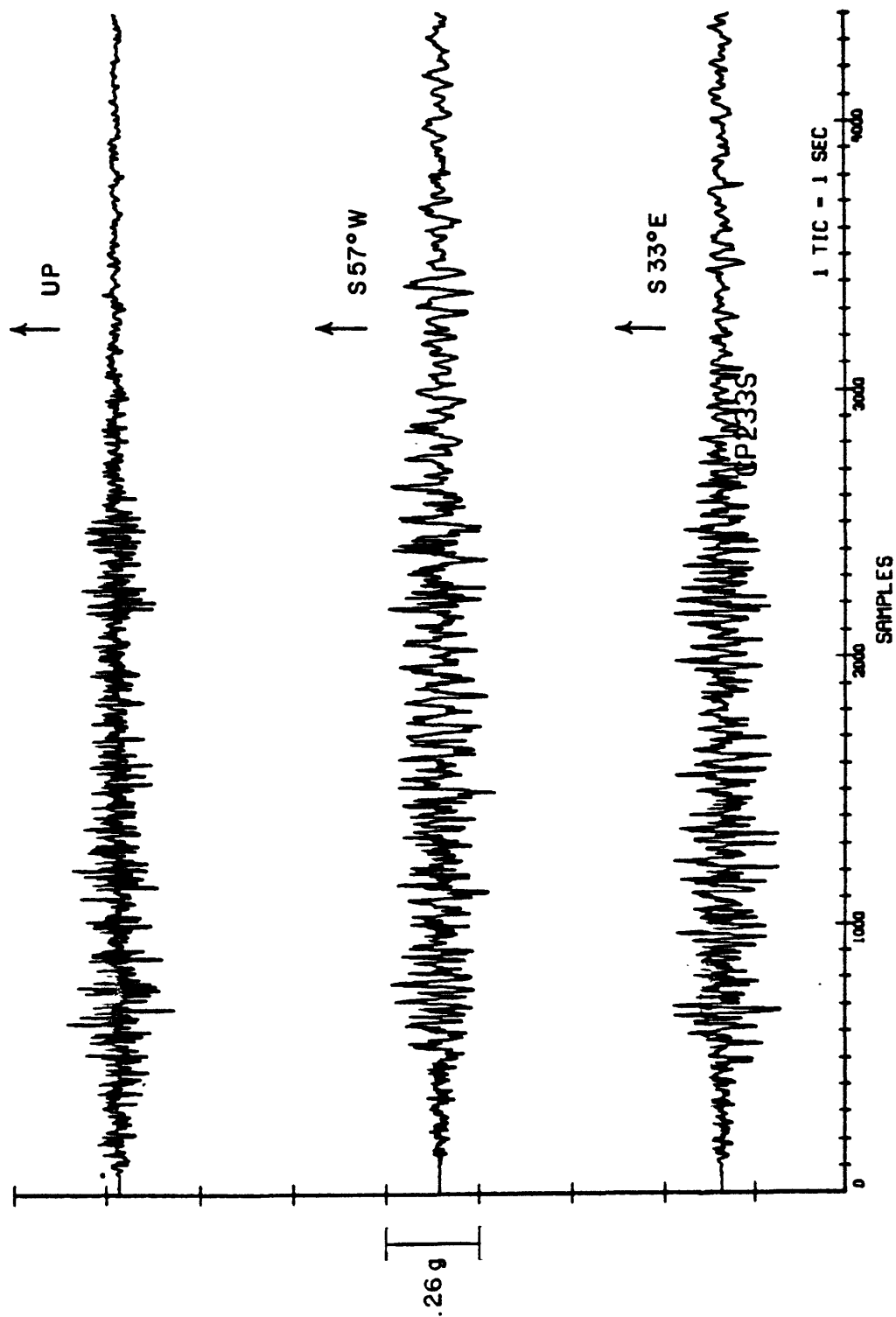
# TIME CORRECTIONS AT TIME OF 15 OCTOBER 1979 IMPERIAL VALLEY EARTHQUAKE

AG	+ 1.43 secs
CH	+ 15.35 secs
CP	+ 11.54 secs
DT	+ 2.78 secs
CM	(unknown)
CC	(unknown)
VC	(unknown)

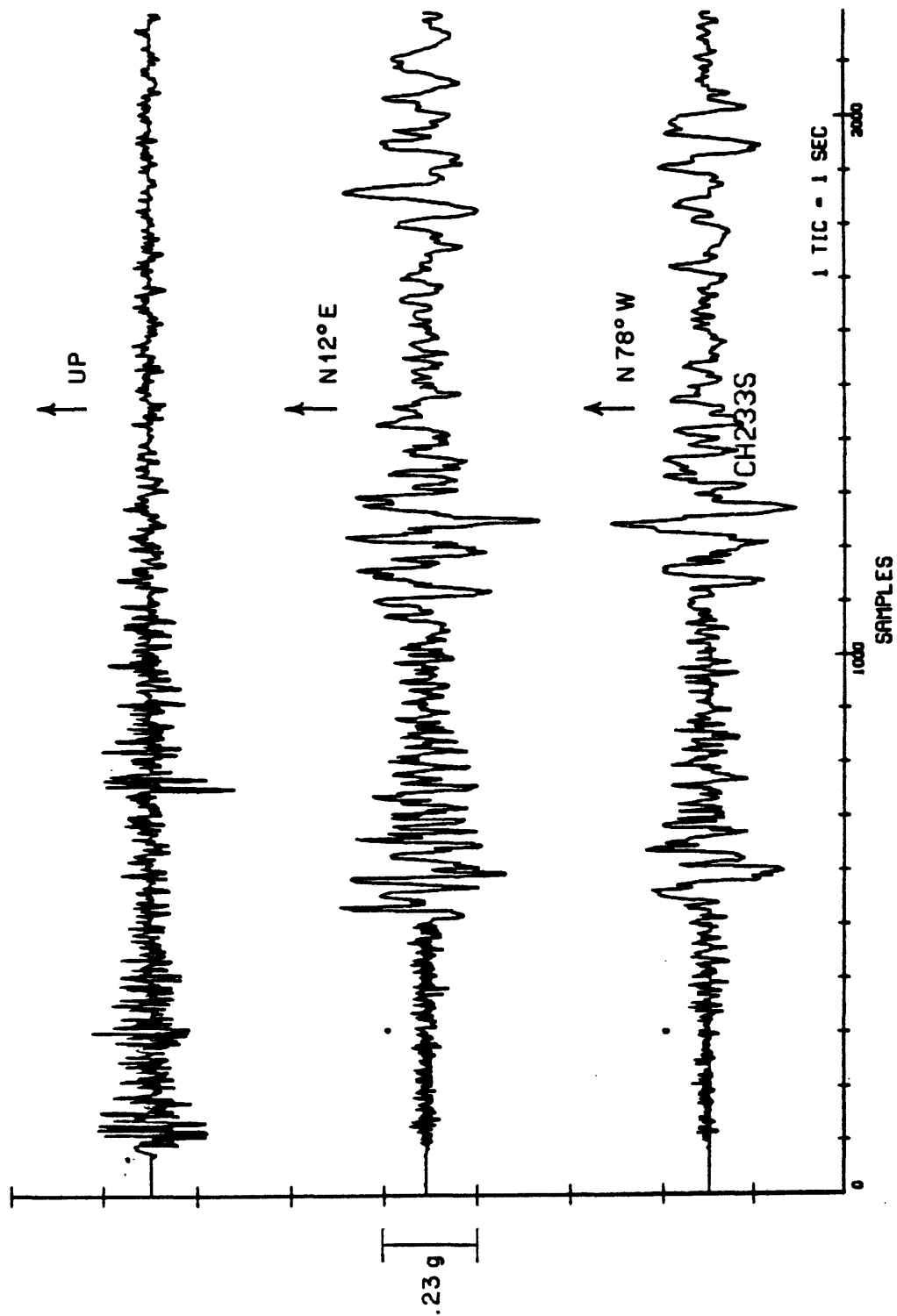




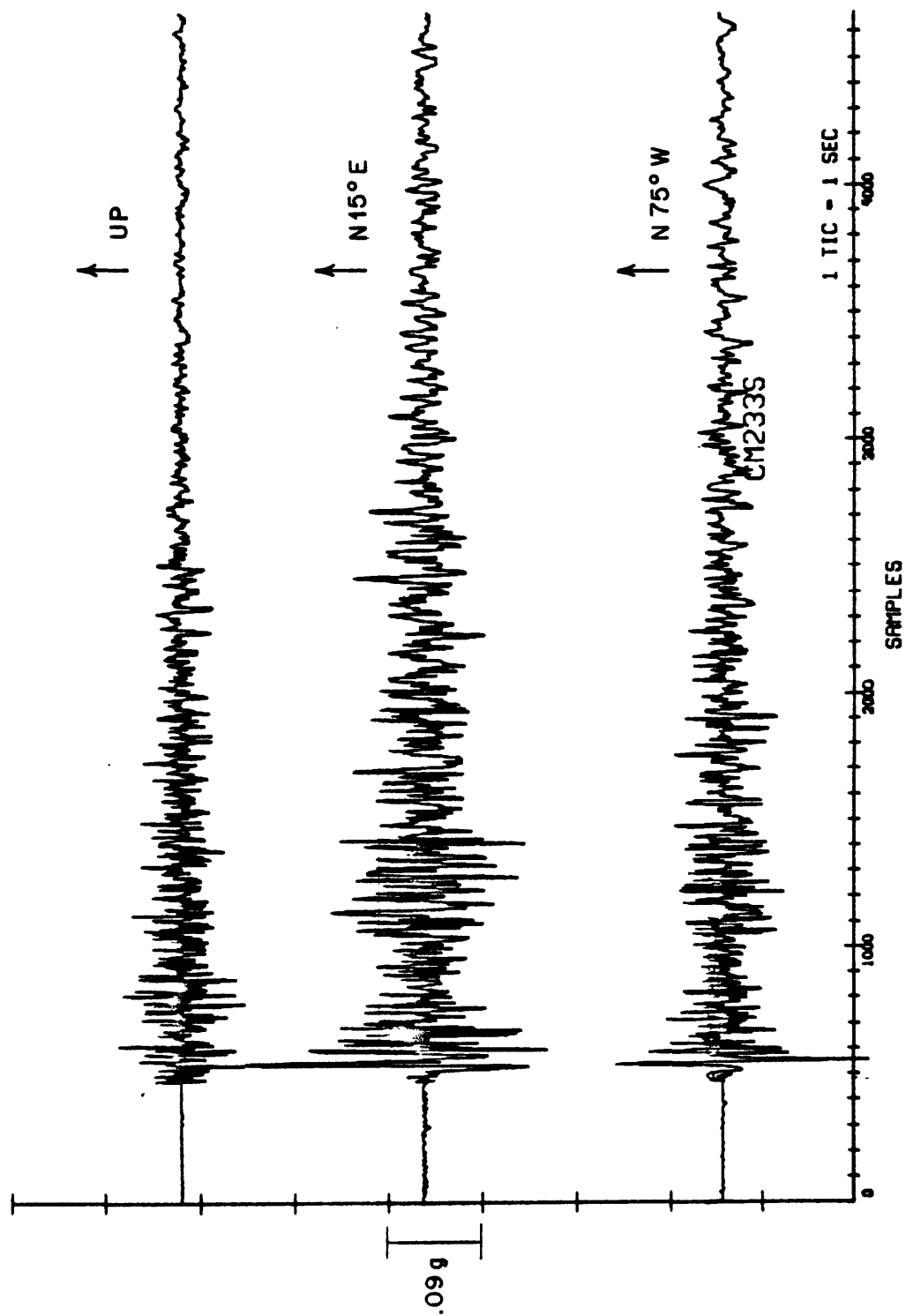
Strong motion record from Agrarias for October 15, 1979  
Imperial Valley earthquake (main shock).



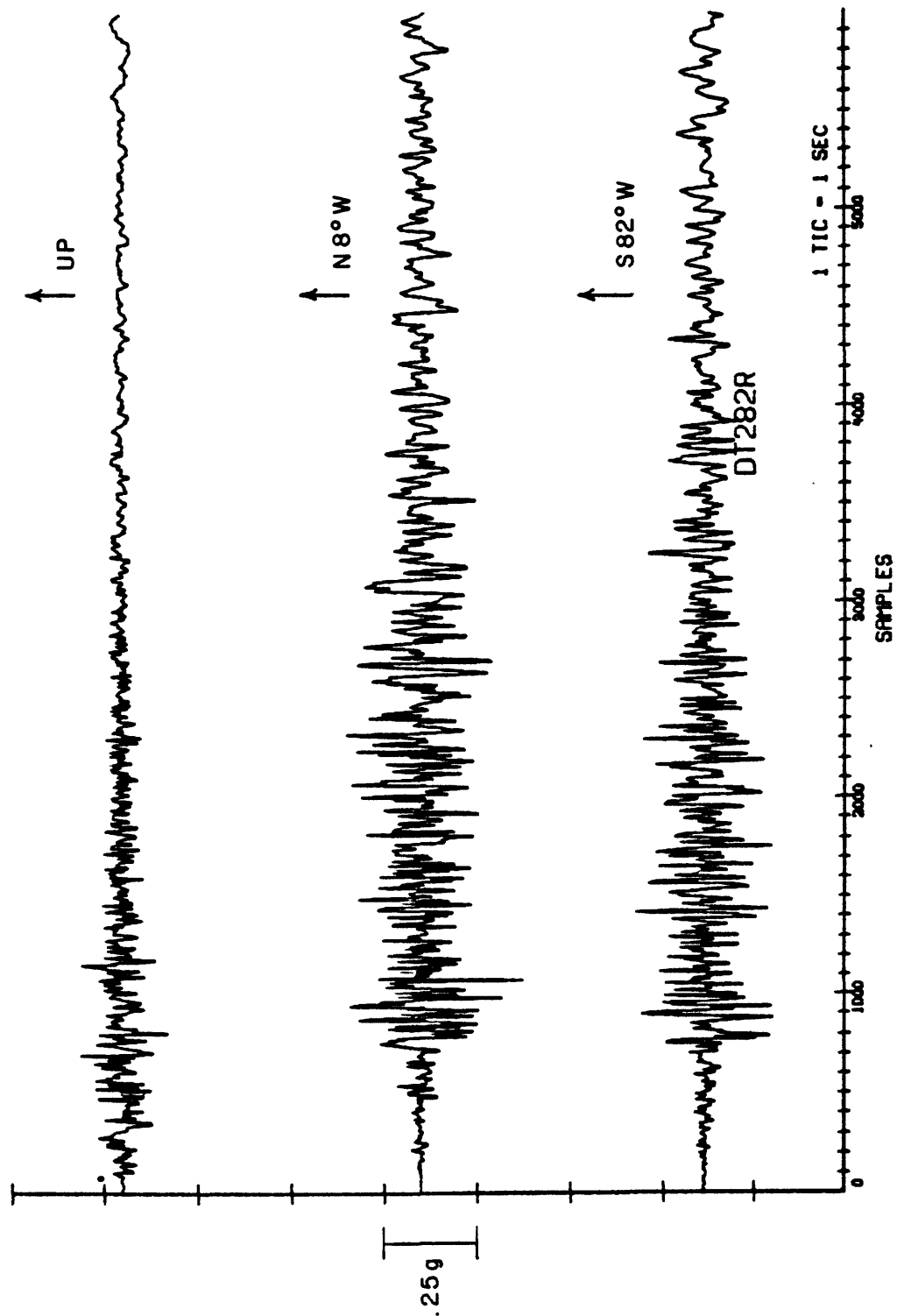
Strong motion record from Cerro Prieto for October 15, 1979  
Imperial Valley earthquake (main shock).



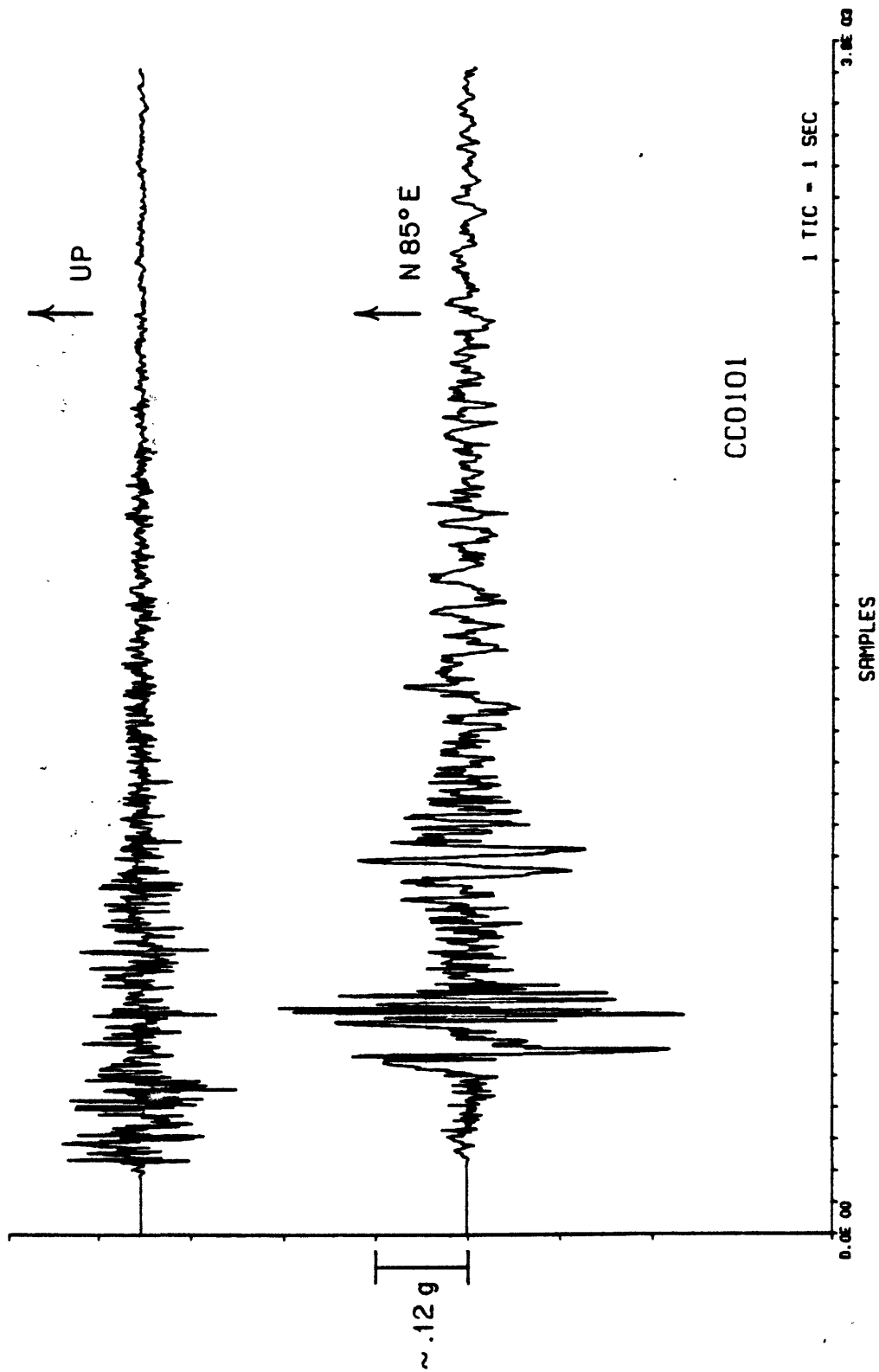
Strong motion record from Chihuahua for October 15, 1979  
Imperial Valley earthquake (main shock).



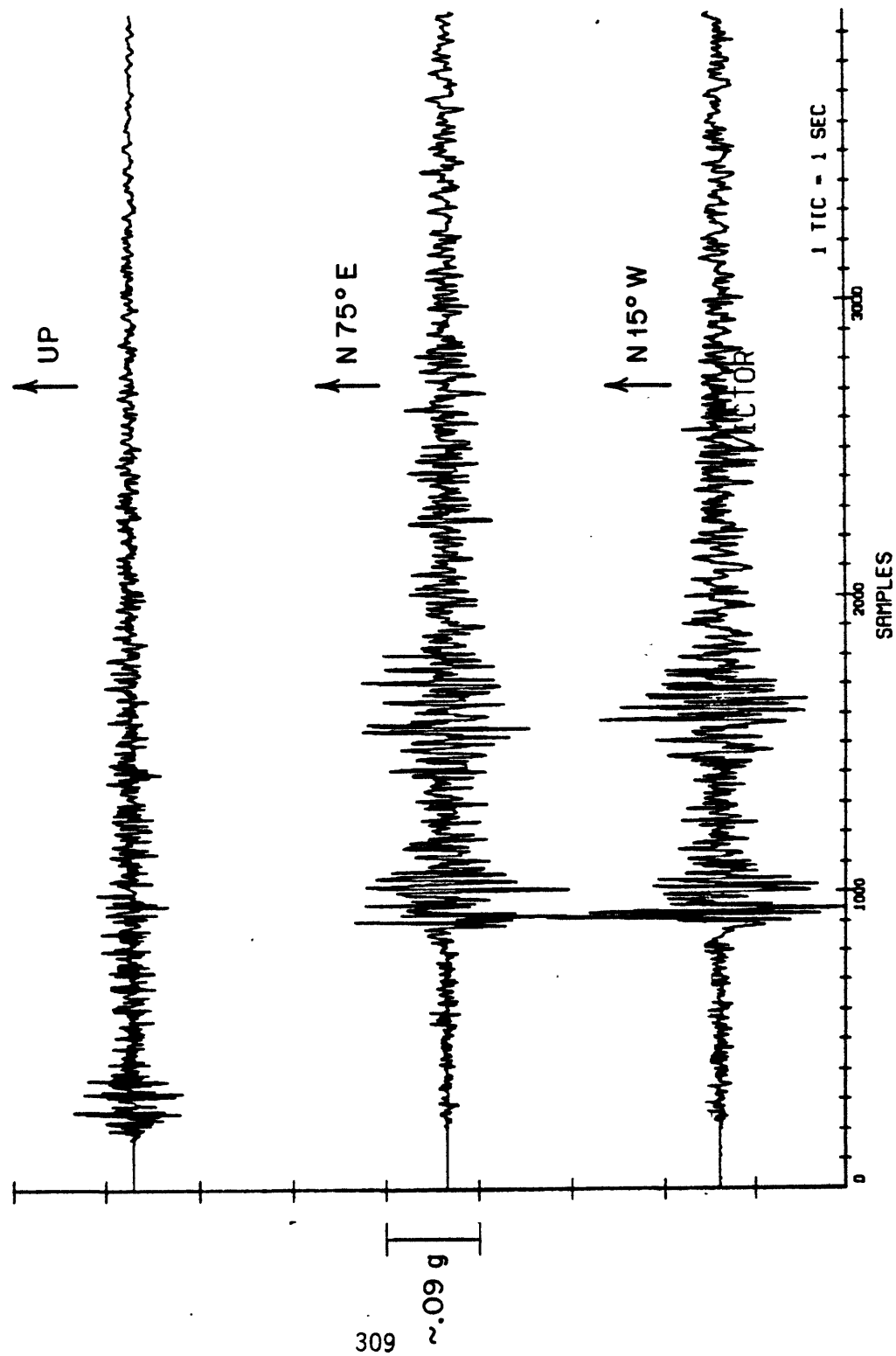
Strong motion record from Computas for October 15, 1979  
Imperial Valley earthquake (main shock).



Strong motion record from Delta for October 15, 1979  
Imperial Valley earthquake (main shock).



Strong motion record from Cucapah for October 15, 1979  
Imperial Valley earthquake (main shock).



Strong motion record from Victoria for October 15, 1979  
Imperial Valley earthquake (main shock).