

# ***Civil Construction***

## ***LIGO Technical Foundation Analyses***

### ***Appendix B -- Computer Results For Acoustically Induced Vibrations***

December 4, 1995

**LIGO**

**Laser Interferometer Gravitational-Wave Observatory**

**California Institute of Technology**

**The Ralph M. Parsons Company**

**Contract Number: PP150969**

**LIGO Document**

LIGO-0951297-00-11B

**Parsons-LIGO**



Laser Interferometer Gravitational-Wave Observatory

---

## Appendix B

### Computer Results For Acoustically Induced Vibrations

#### Section 1

- 68 Inch LVEA -- LIGO Acoustic Criteria
- 68 Inch LVEA -- Marshall Long's SPL
- 36 Inch LVEA -- LIGO Acoustic Criteria
- 36 Inch LVEA -- Marshall Long's SPL
- 18 Inch LVEA -- LIGO Acoustic Criteria
- 18 Inch LVEA -- Marshall Long's SPL

#### Section 2

- 68 Inch Mid Station -- LIGO Acoustic Criteria
- 68 Inch Mid Station -- Marshall Long's SPL
- 36 Inch Mid Station -- LIGO Acoustic Criteria
- 36 Inch Mid Station -- Marshall Long's SPL
- 18 Inch Mid Station -- LIGO Acoustic Criteria
- 18 Inch Mid Station -- Marshall Long's SPL

#### Section 3

- 68 Inch LVEA -- LIGO Acoustic Criteria Uncorrelated



```

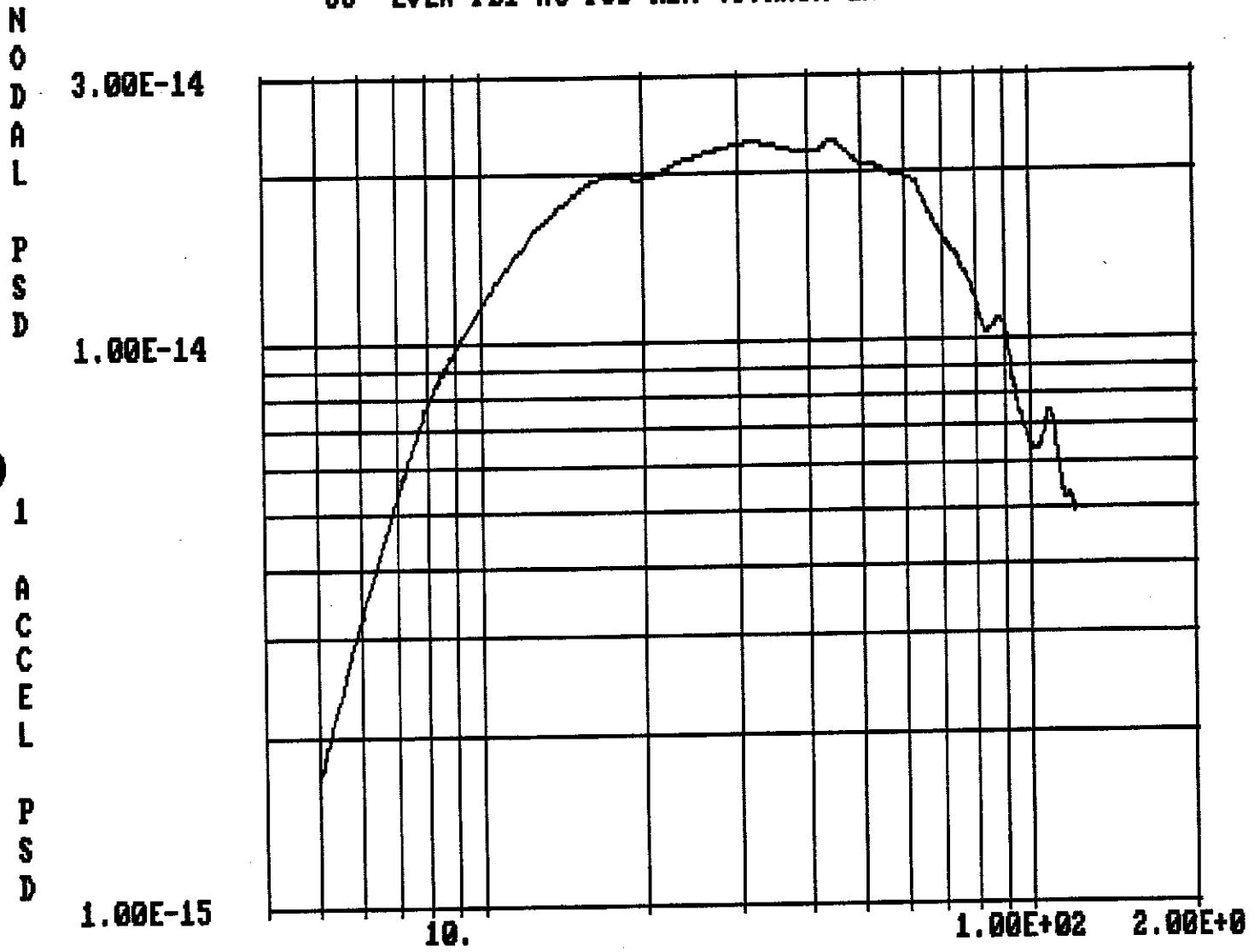
68" LVEAPB1 LIGO Acoustic Spectra (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS
PRINT
      2  230  230
      2  774  774
      2  792  792
      2 1520 1520
      2 2183 2183

END
MODES
      1          180          99.0

END
PSD      3          1
NODES          230          3          774          3          792          3
NODES          1520          3          2183          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0          2.9E-9          -81          1
  6          1          4.0          50.0          8.0          57.0          16.0          61.0
  6          -7          31.5          64.0          63.0          66.0          125.0          62.0
ALL DONE

```

Node 230 X3  
68" LVEA-PB1 AC PSD RUN (STRAIN ENERGY DAMPING)



FREQUENCY (HZ)

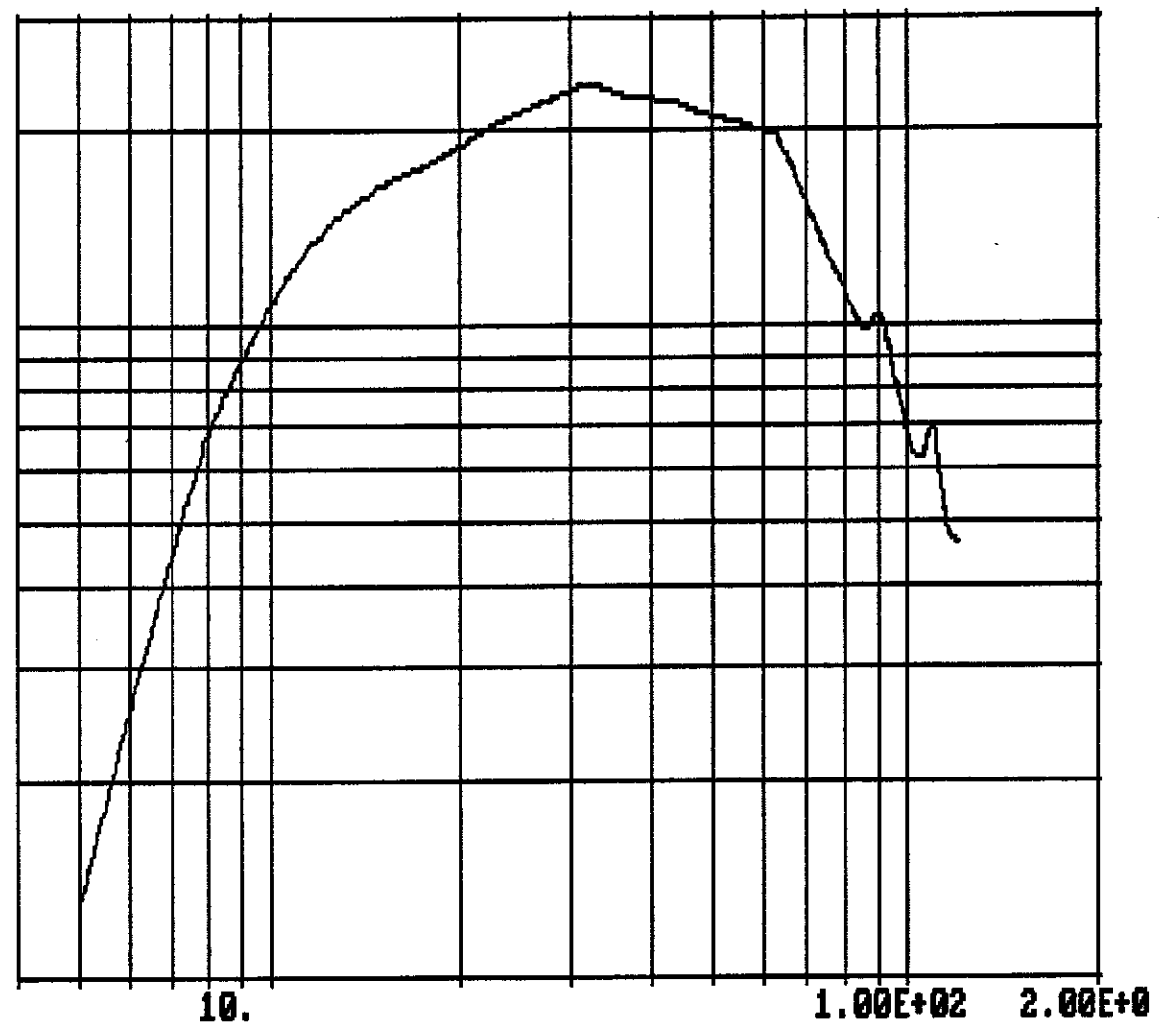
PLOT NO =

1

Node 774 X3  
68" LVEA-PB1 AC PSD RUN (STRAIN ENERGY DAMPING)

N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14  
  
1.00E-14  
  
  
  
  
  
  
  
  
  
  
1.00E-15



FREQUENCY (HZ)

PLOT NO =

2

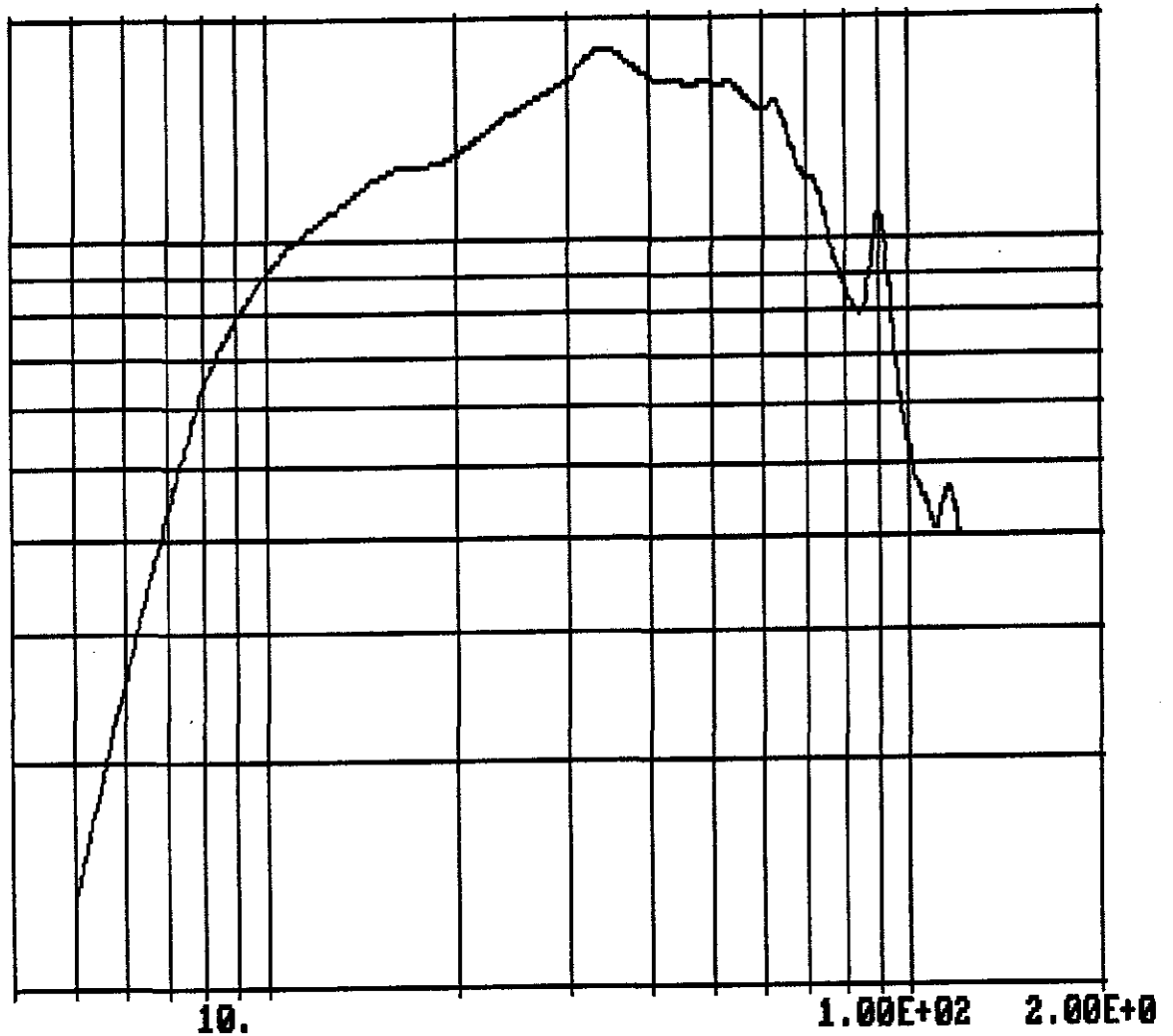
Node 792 X3  
68" LVEA-PB1 AC PSD RUN (STRAIN ENERGY DAMPING)

N  
O  
D  
A  
L  
  
P  
S  
D  
  
3  
  
A  
C  
C  
E  
L  
  
P  
S  
D

2.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

3

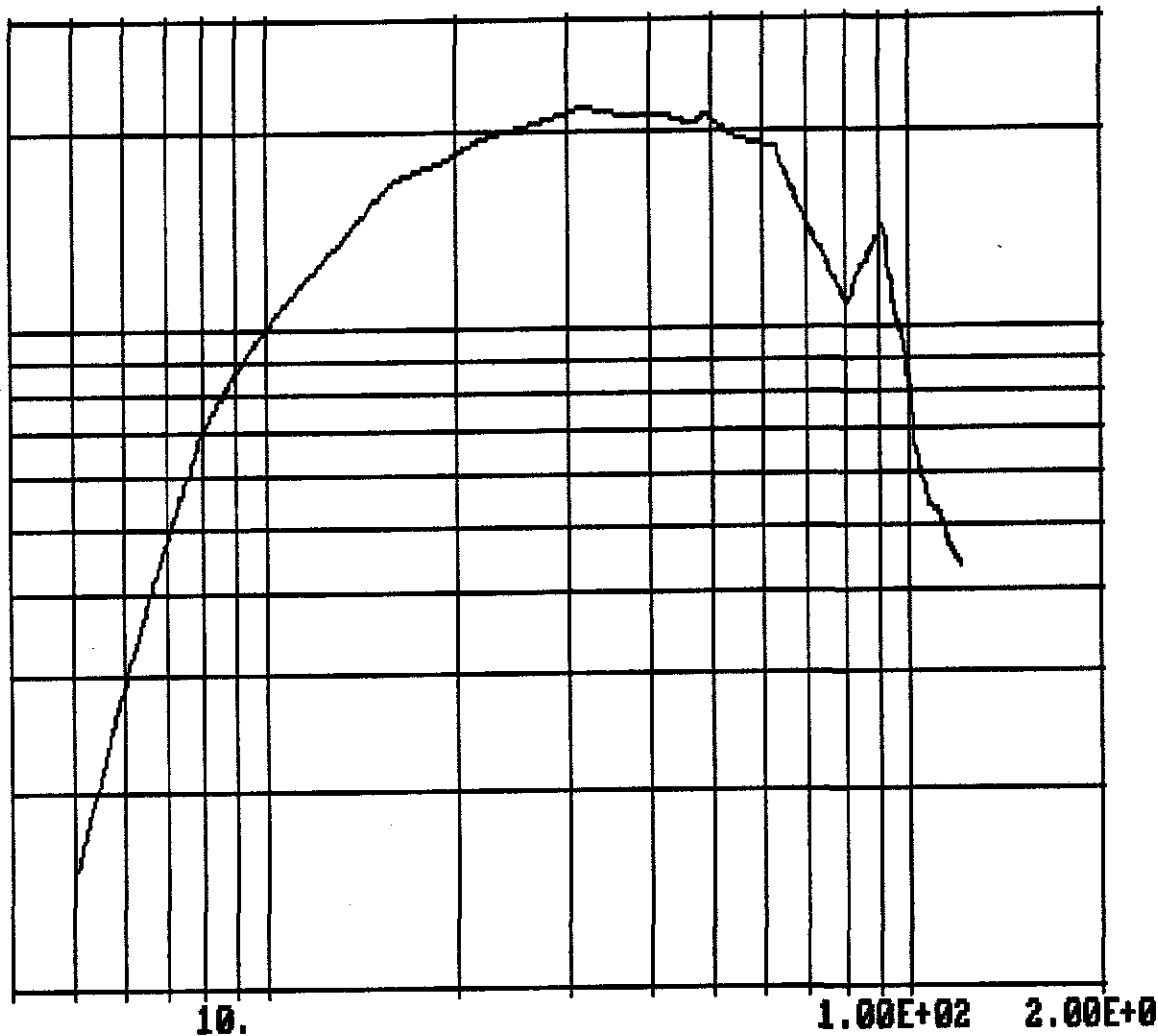
Node 1520 X3  
68" LVEA-PB1 AC PSD RUN (STRAIN ENERGY DAMPING)

N  
O  
D  
A  
L  
  
P  
S  
D  
  
4  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

4



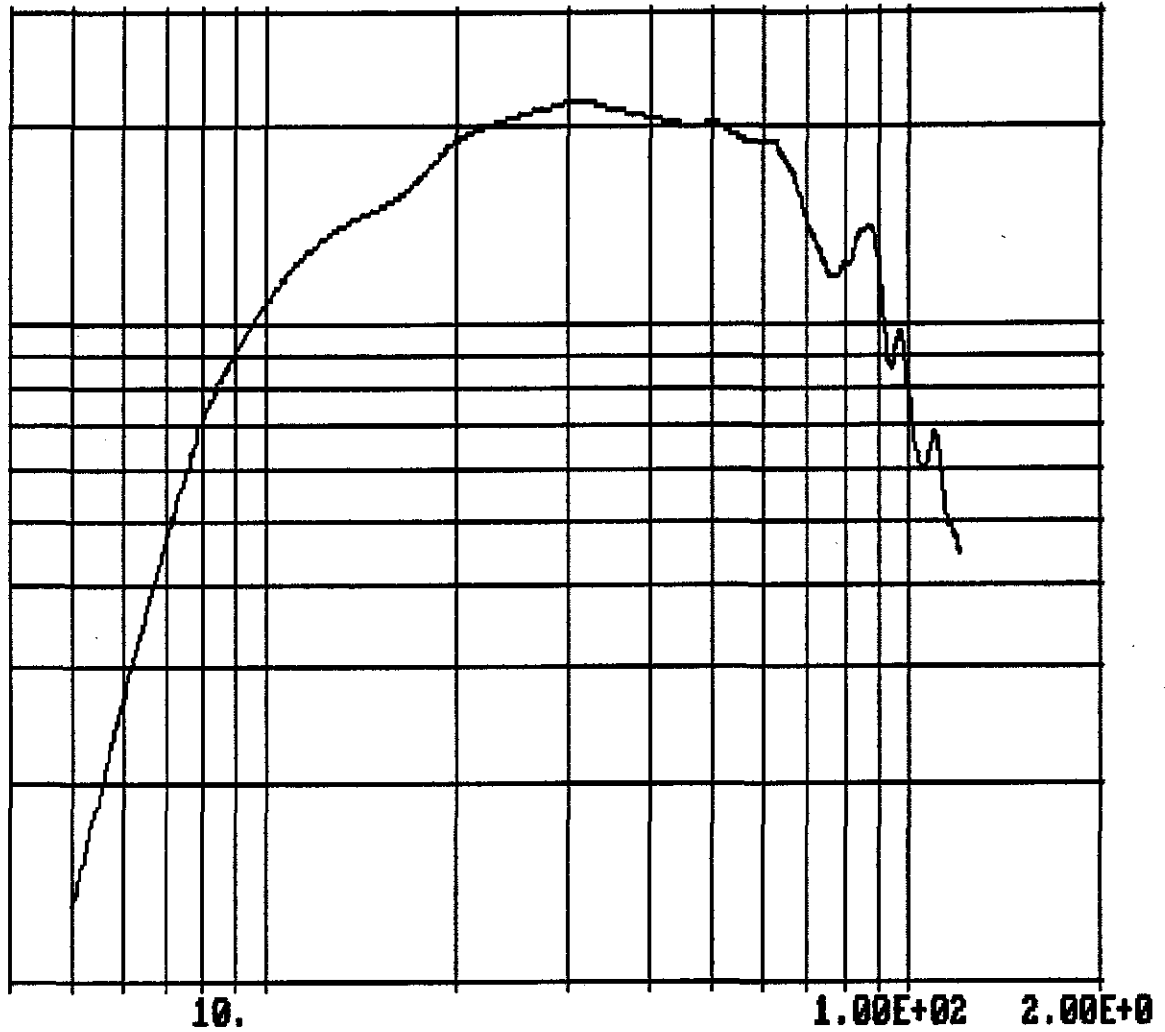
Node 2183 X3  
68" LVEA-PB1 AC PSD RUN (STRAIN ENERGY DAMPING)

N  
O  
D  
A  
L  
  
P  
S  
D  
  
5  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

5

68" LVEA-PB1 MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPING)

START3            3    1    3.0   5.0   120.0

RMS

PRINT

2 230 230

2 774 774

2 792 792

2 1520 1520

2 2183 2183

END

MODES

1    180    99.0

END

PSD    3       1

NODES        230       3    774       3    792       3

NODES        1520       3    2183       3

END

START PSD INPUT 1

1 3 3 2 2       1.0   2.9E-9               -81               1

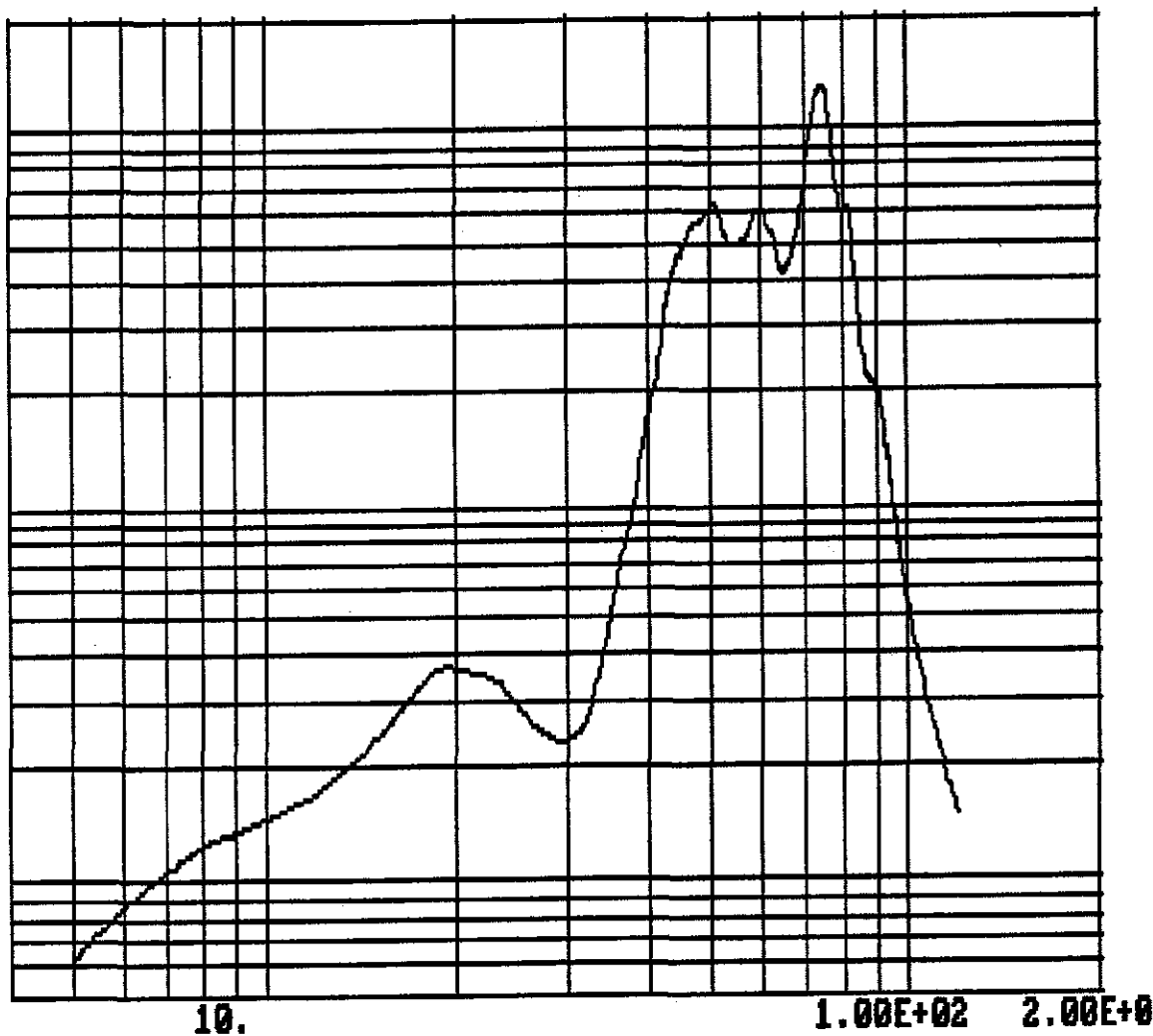
6    1    4.0    50.0    8.0    50.0    16.0    49.0

6    -7   32.0    48.0    63.0    58.0    125.0   49.0

ALL DONE

Node 230 X3  
68" LVEA-PBI MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
P  
S  
D  
1  
A  
C  
C  
E  
L  
P  
S  
D  
2.00E-15  
1.00E-15  
1.00E-16  
1.00E-17  
5.00E-18



FREQUENCY (HZ)

PLOT NO =

1

Node 774 X3  
68" LVEA-PB1 MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPI

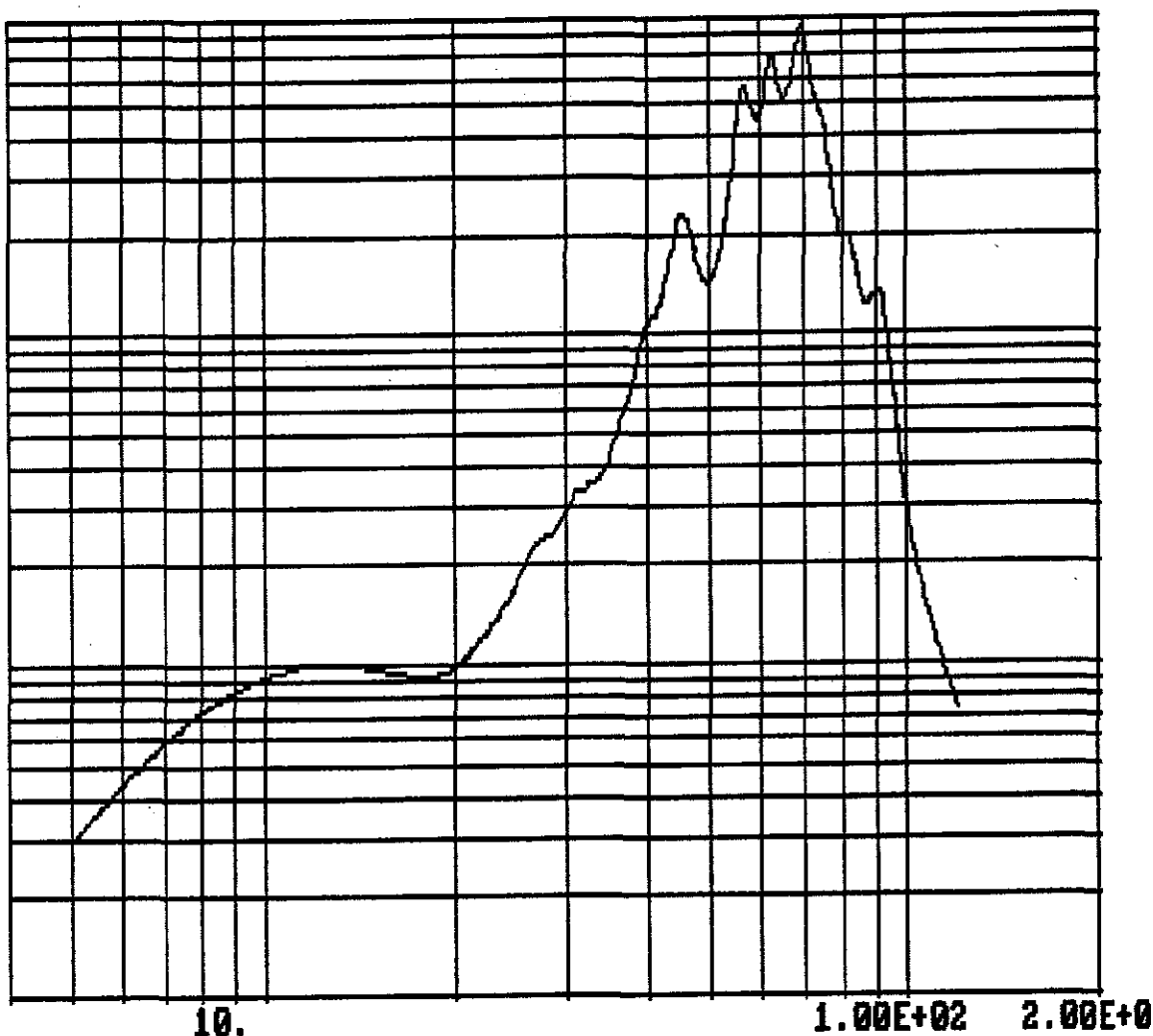
N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

9.00E-16

1.00E-16

1.00E-17

1.00E-18

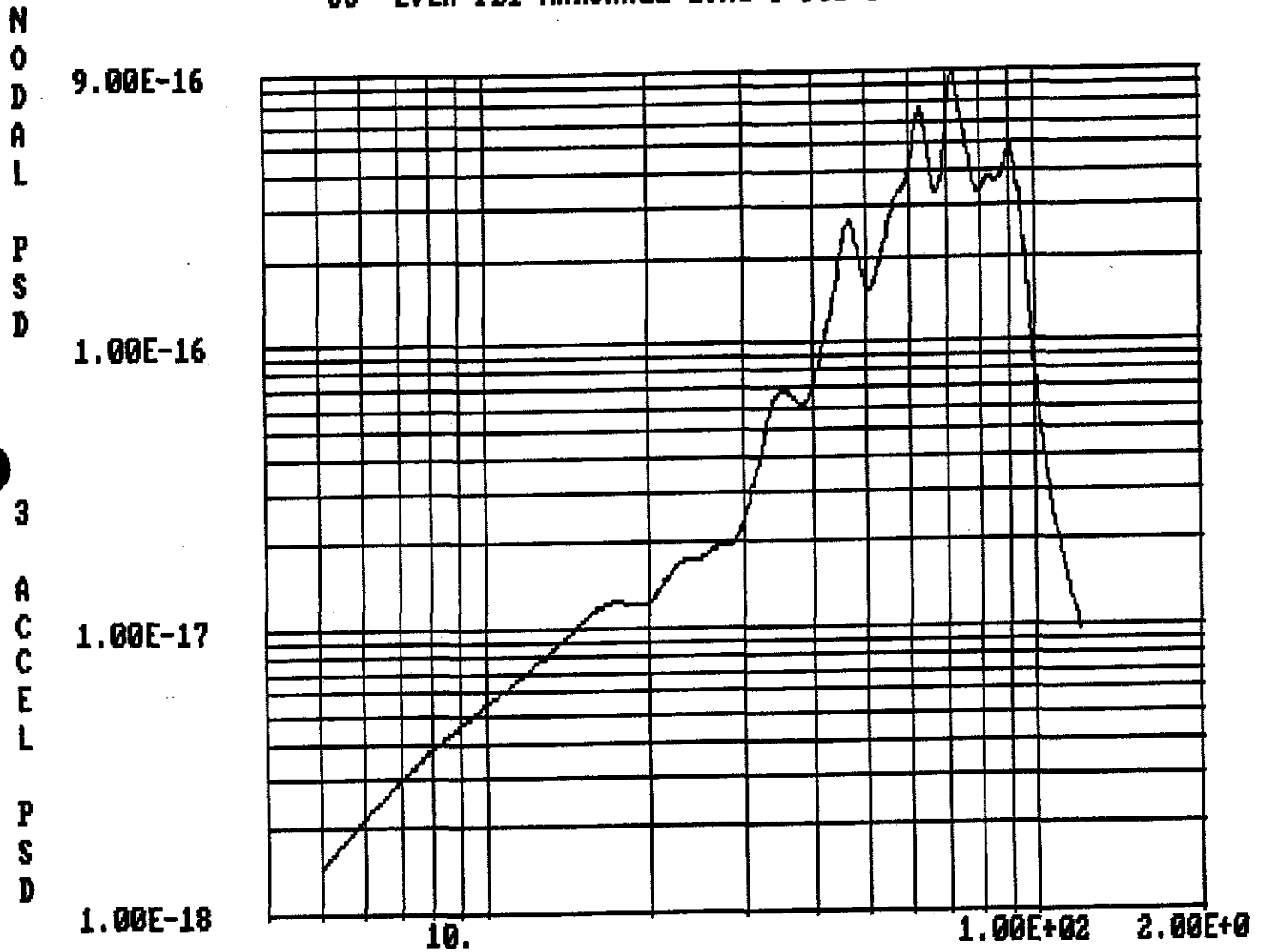


FREQUENCY (HZ)

PLOT NO =

2

Node 792 X3  
68" LVEA-PB1 MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPI



FREQUENCY (HZ)

PLOT NO =

3

Node 1520 X3  
68" LVEA-PBI MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
P  
S  
D  
  
4  
A  
C  
C  
E  
L  
P  
S  
D

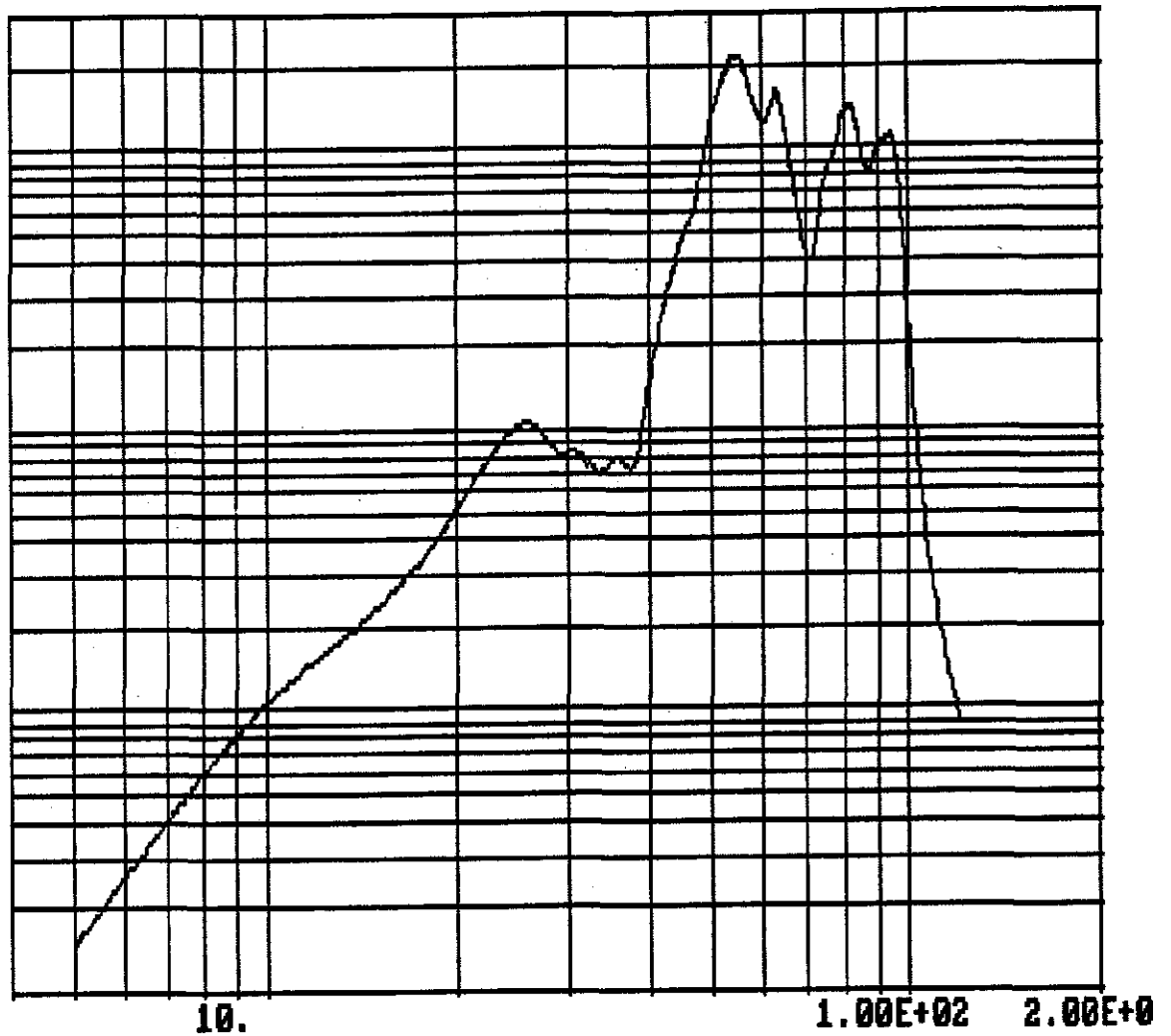
3.00E-16

1.00E-16

1.00E-17

1.00E-18

1.00E-19



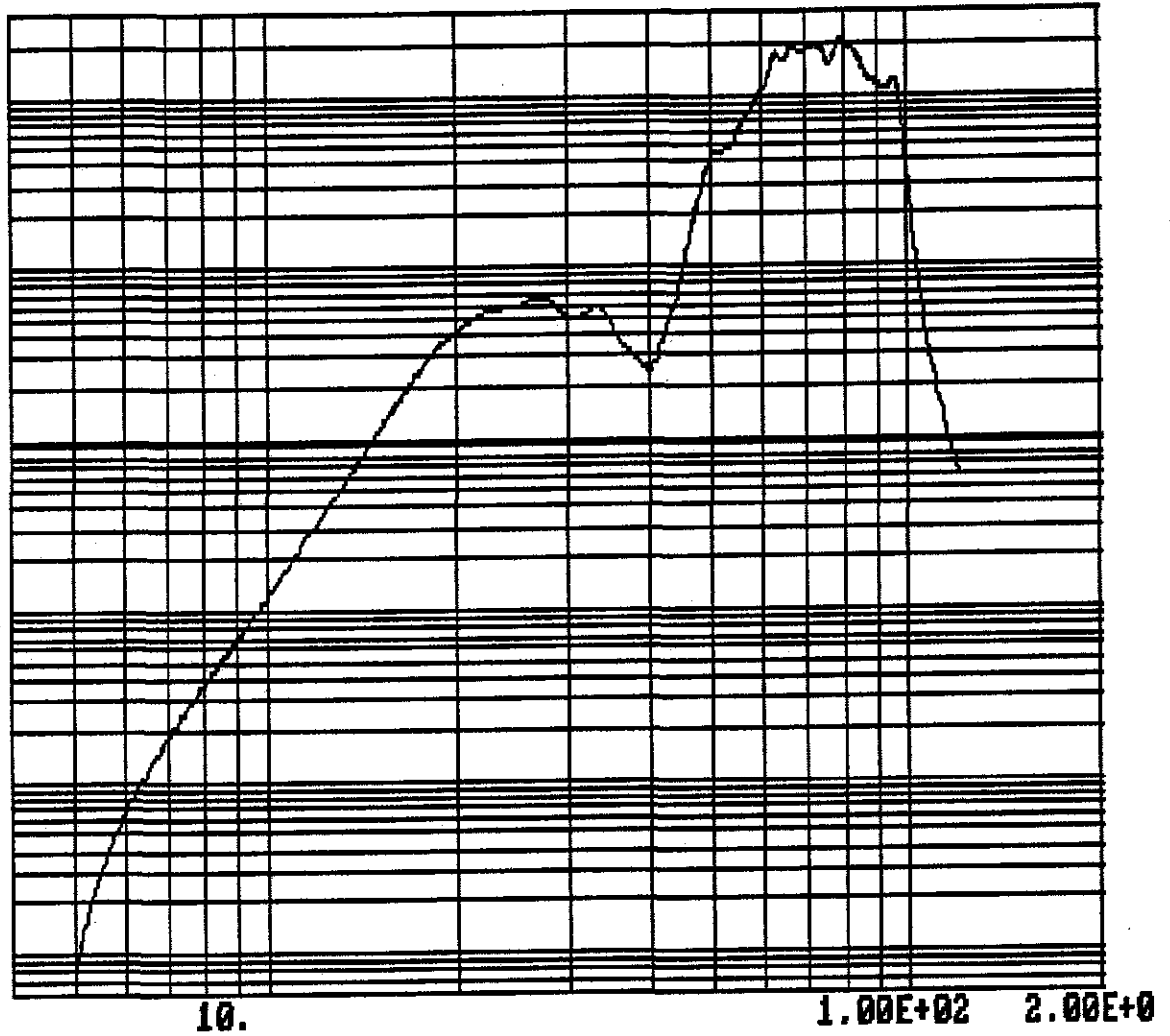
FREQUENCY (HZ)

PLOT NO =

4

Node 2183 X3  
68" LVEA-PB1 MARSHALL LONG'S PSD-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
P  
S  
D  
5  
A  
C  
C  
E  
L  
P  
S  
D  
3.00E-16  
1.00E-16  
1.00E-17  
1.00E-18  
1.00E-19  
1.00E-20  
1.00E-21



FREQUENCY (HZ) PLOT NO = 5

```

36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          110.0
RMS
PRINT
      2  230  230
      2  774  774
      2  792  792
      2 1520 1520
      2 2183 2183

END
MODES
      1          220          99.0

END
PSD      3          1
NODES          230          3          774          3          792          3
NODES          1520          3          2183          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0          2.9E-9          -81          1
  6          1          4.0          50.0          8.0          57.0          16.0          61.00
  6          -7          31.5          64.0          63.0          66.0          125.0          62.00
ALL DONE

```



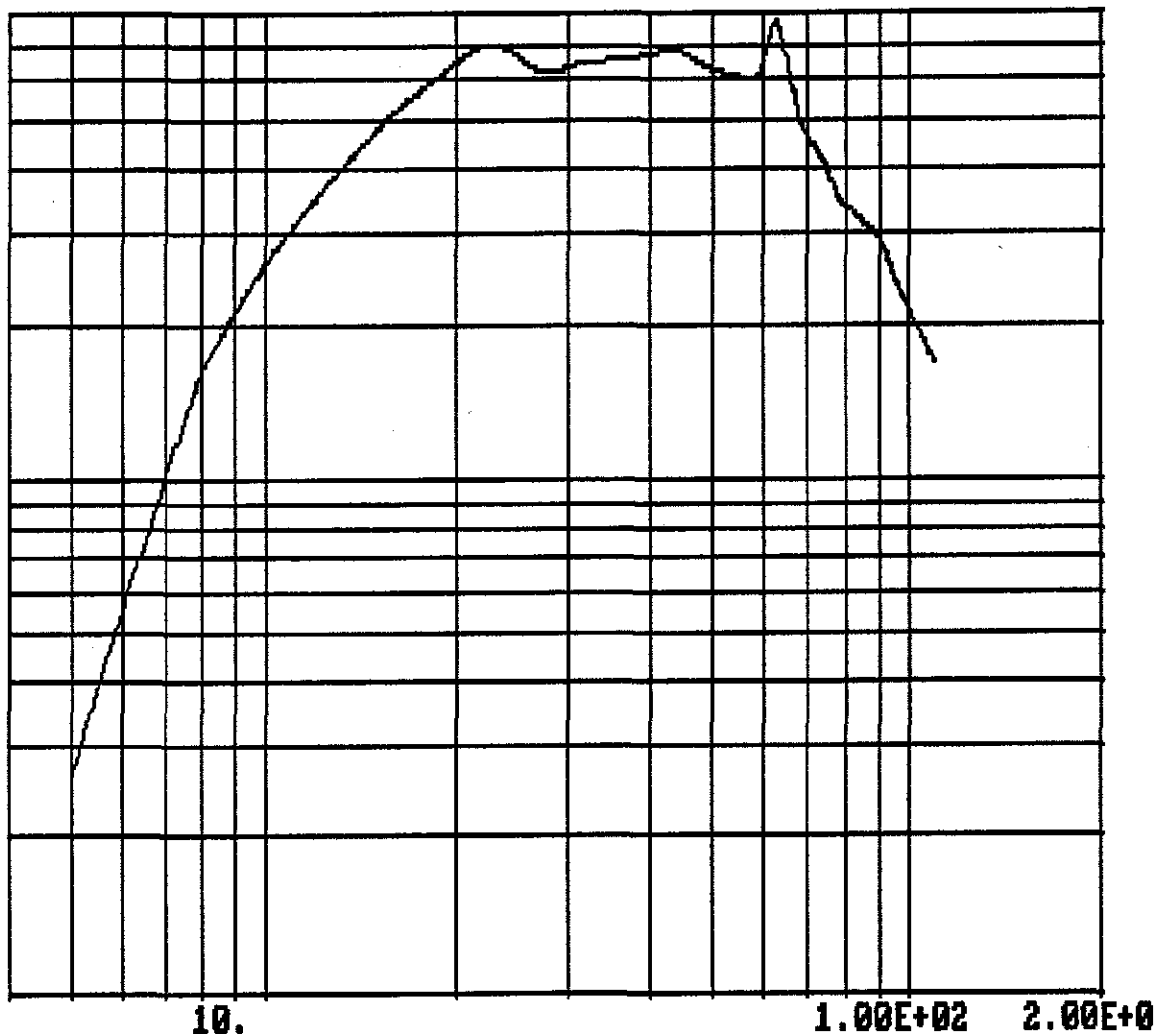
Node 230 X3  
36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

8.00E-14

1.00E-14

1.00E-15

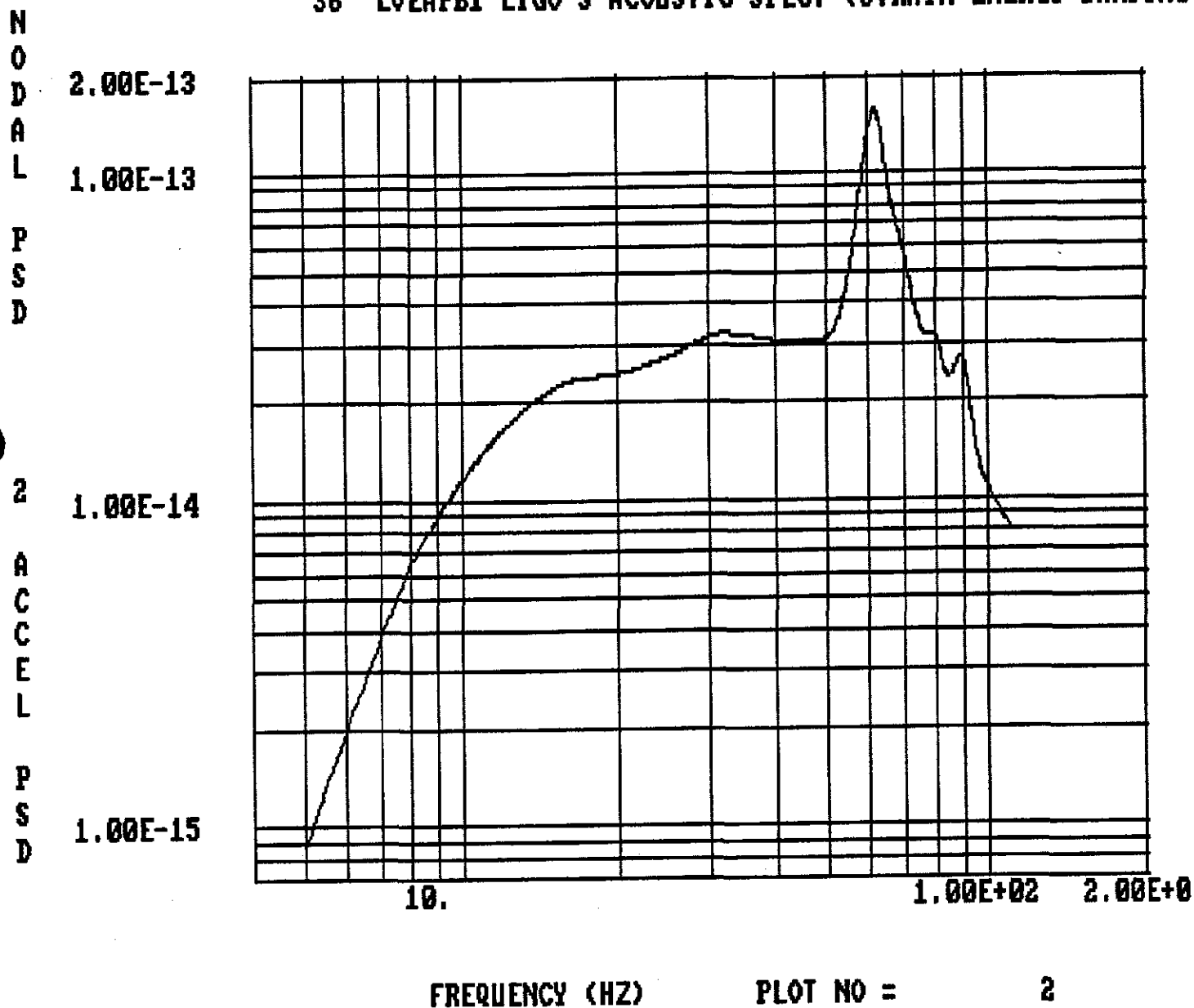


FREQUENCY (HZ)

PLOT NO =

1

Node 774 X3  
36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING



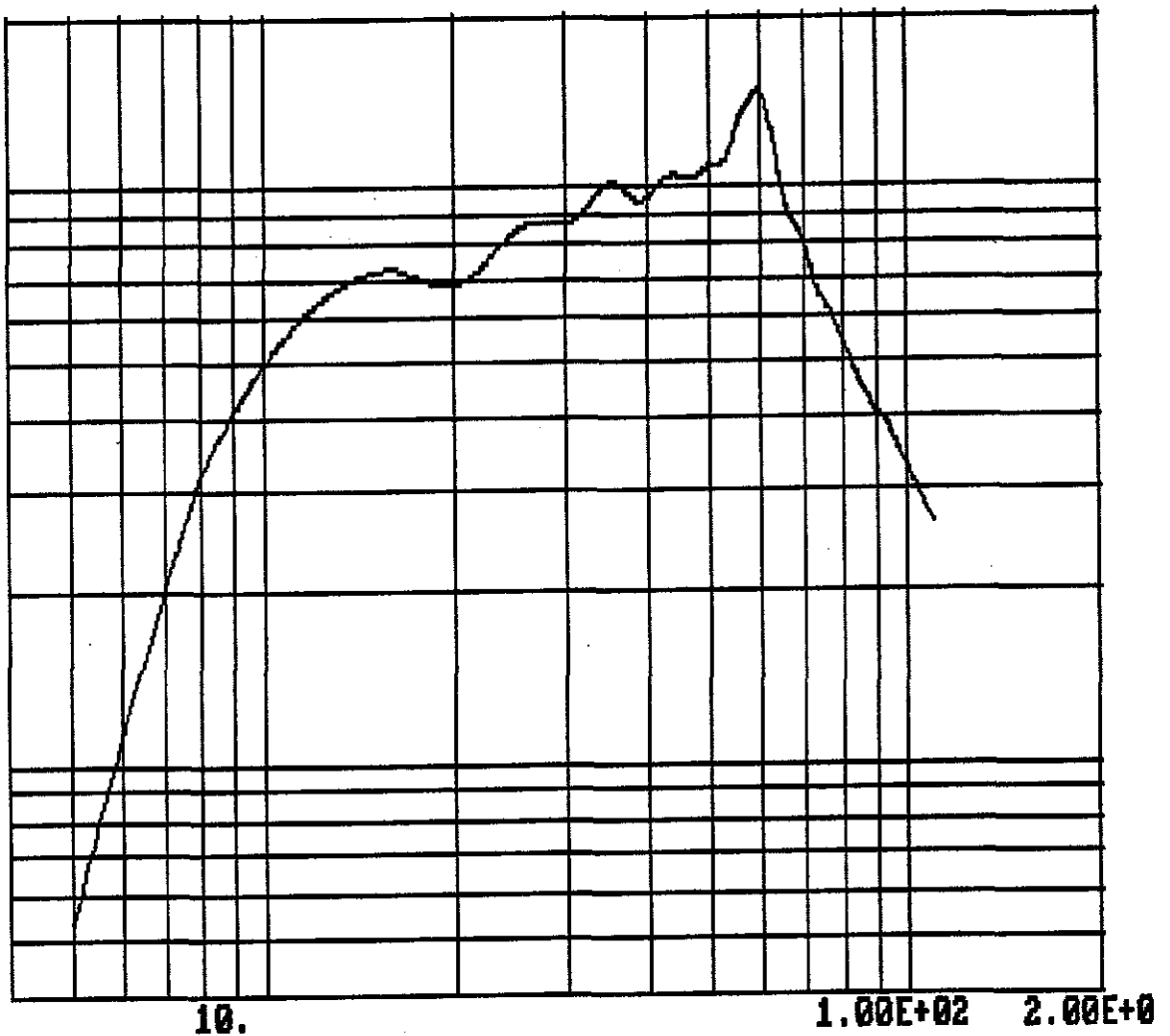
Node 792 X3  
36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING

N  
O  
D  
A  
L  
  
P  
S  
D  
  
3  
  
A  
C  
C  
E  
L  
  
P  
S  
D

2.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

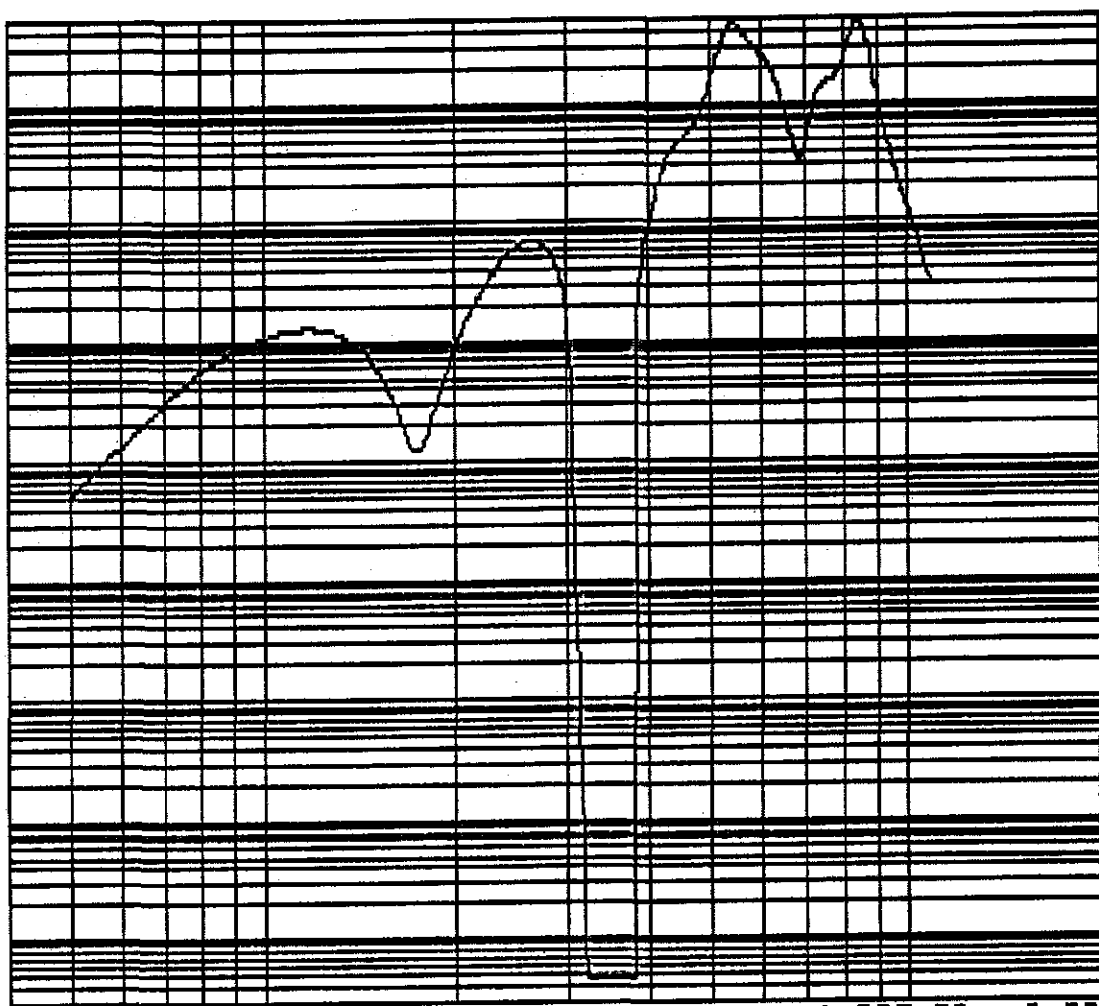
PLOT NO =

3

Node 1520 X3  
36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING

N  
O  
D  
A  
L  
P  
S  
D  
4  
A  
C  
C  
E  
L  
P  
S  
D

5.00E-14  
1.00E-14  
1.00E-15  
1.00E-16  
1.00E-17  
1.00E-18  
1.00E-19  
1.00E-20  
1.00E-21



10. 1.00E+02 2.00E+02

FREQUENCY (HZ)

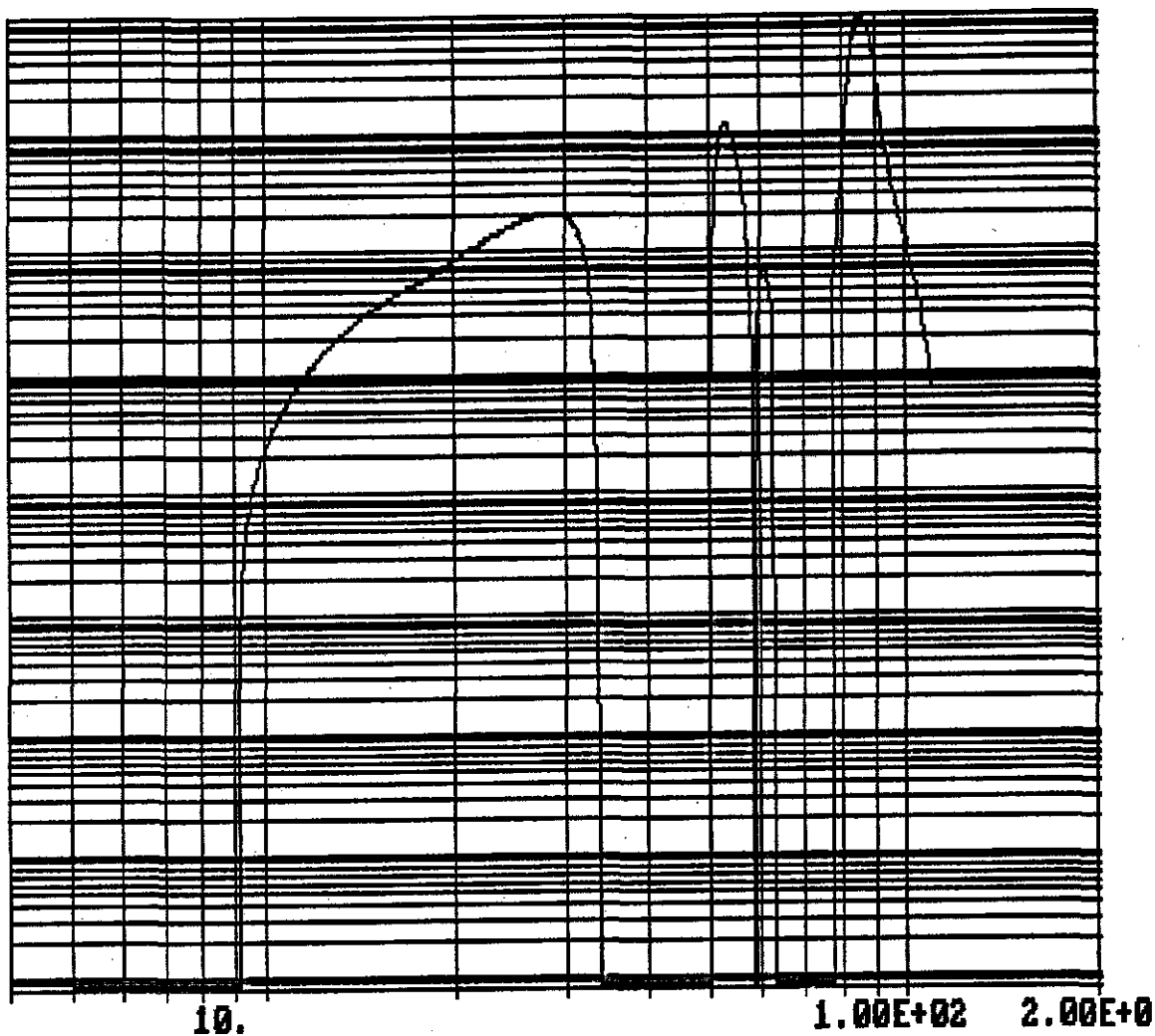
PLOT NO =

4

Node 2183 X3  
36" LVEAPB1 LIGO'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING

N  
O  
D  
A  
L  
P  
S  
D  
5  
A  
C  
C  
E  
L  
P  
S  
D  
1.00E-22

9.00E-15  
1.00E-15  
1.00E-16  
1.00E-17  
1.00E-18  
1.00E-19  
1.00E-20  
1.00E-21



FREQUENCY (HZ)

PLOT NO =

5

```

36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          110.0
RMS
PRINT
      2  230  230
      2  774  774
      2  792  792
      2 1520 1520
      2 2183 2183

END
MODES
      1          220          99.0

END
PSD
      3          1
NODES          230          3          774          3          792          3
NODES          1520          3          2183          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0          2.9E-9
  6          1          4.0          50.0          8.0          50.0          -81          16.0          49.00
  6          -7          31.5          48.0          63.0          58.0          125.0          49.00
ALL DONE

```

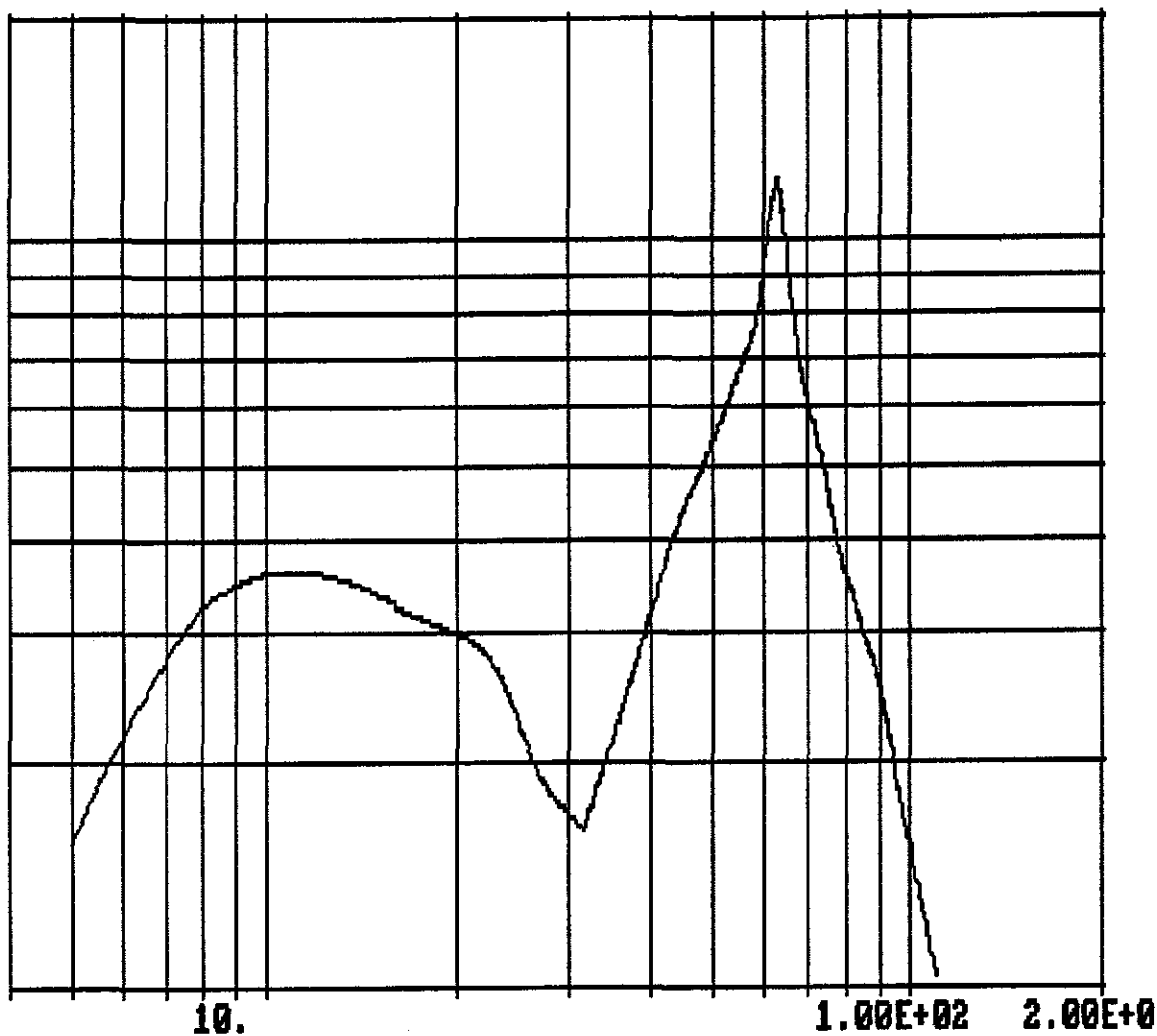
Node 230 X3  
36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERG

N  
O  
D  
A  
L  
  
P  
S  
D  
  
I  
A  
C  
C  
E  
L  
  
P  
S  
D

2.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

1

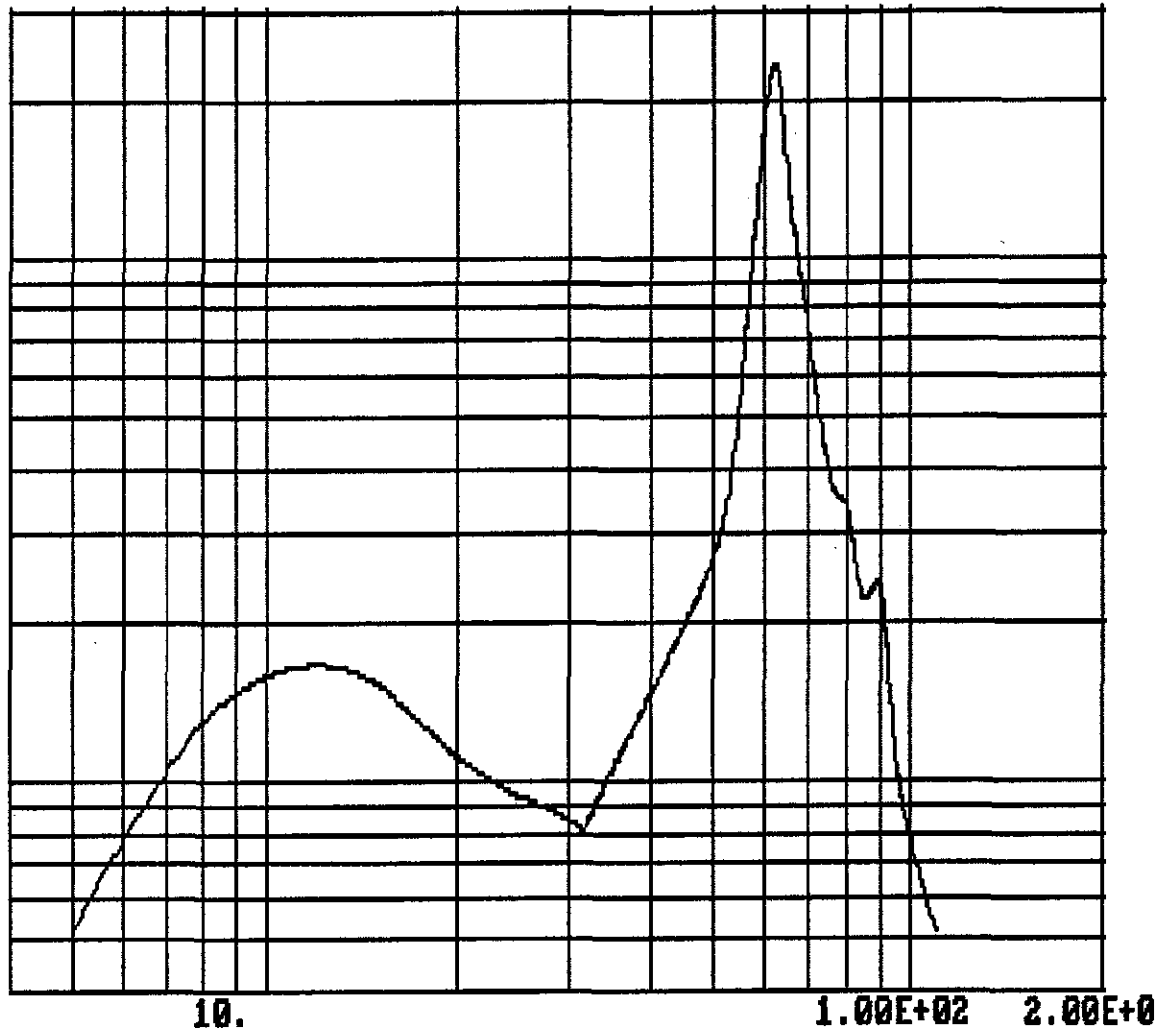
Node 774 X3  
36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERG

N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

2



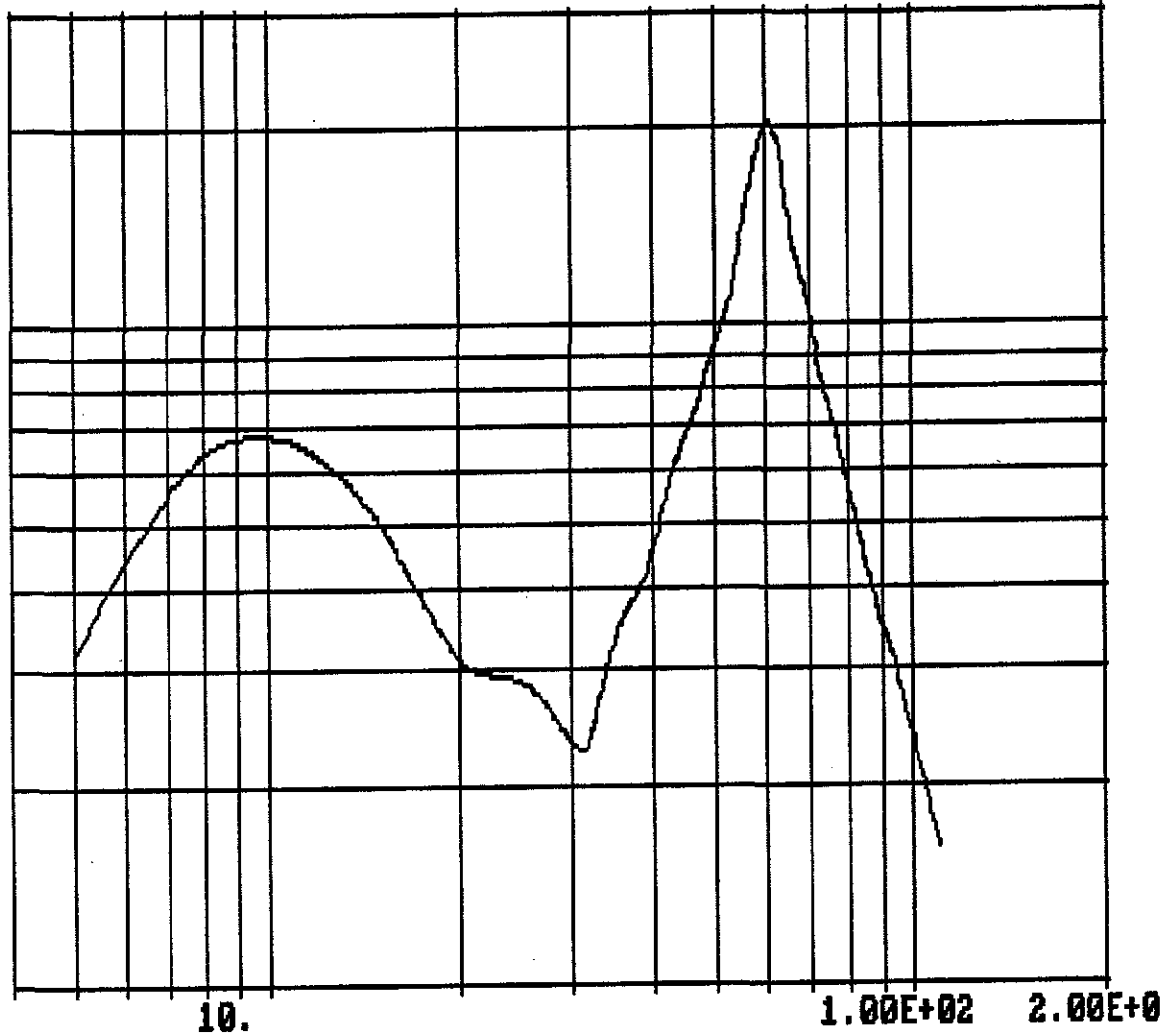
Node 792 X3  
36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERG

N  
O  
D  
A  
L  
  
P  
S  
D  
  
3  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-15

1.00E-15

1.00E-16



FREQUENCY (HZ)

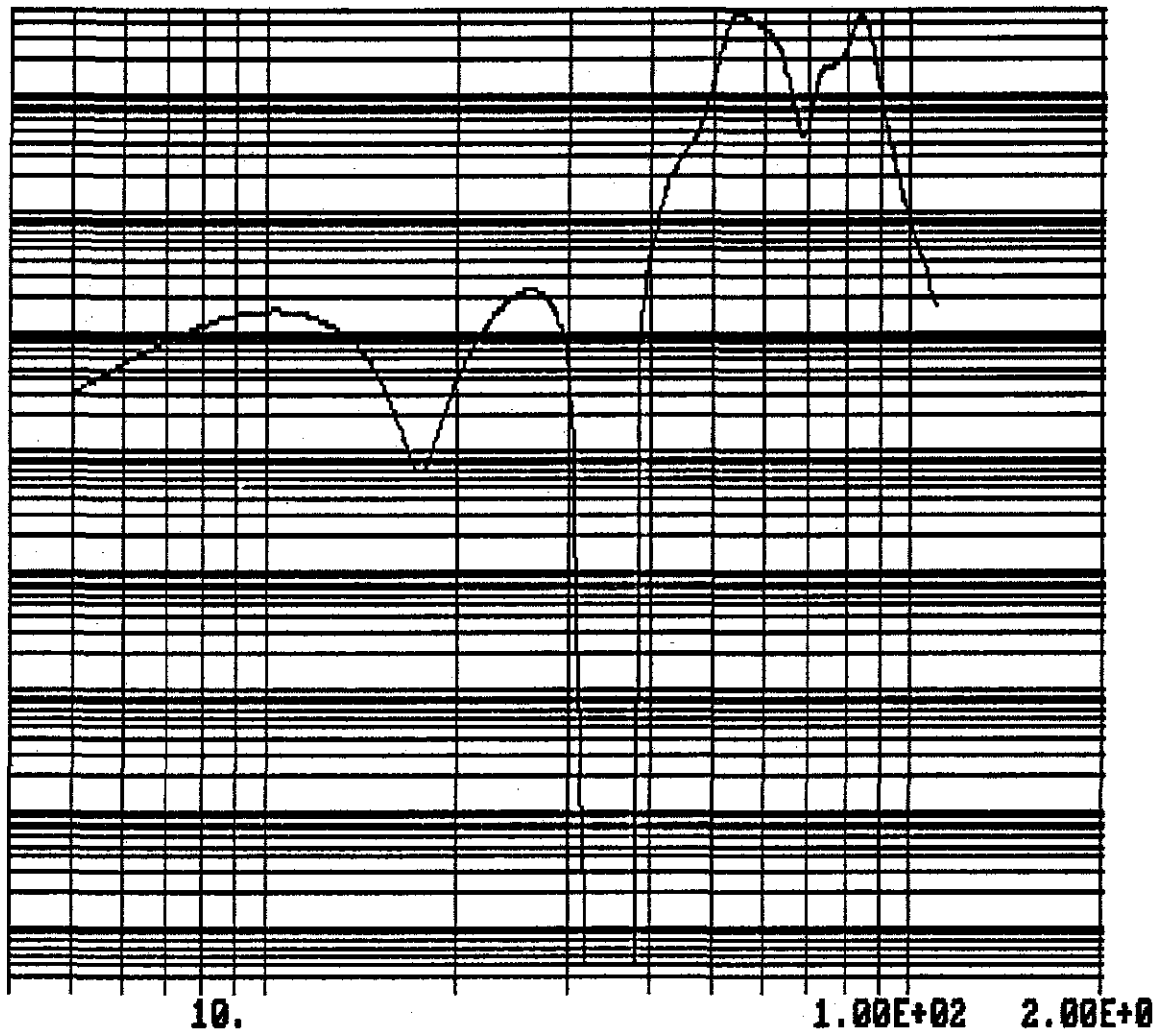
PLOT NO =

3

Node 1520 X3  
36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERG

N  
O  
D  
A  
L  
  
P  
S  
D  
  
4  
  
A  
C  
C  
E  
L  
  
P  
S  
D

5.00E-15  
1.00E-15  
1.00E-16  
1.00E-17  
1.00E-18  
1.00E-19  
1.00E-20  
1.00E-21  
1.00E-22



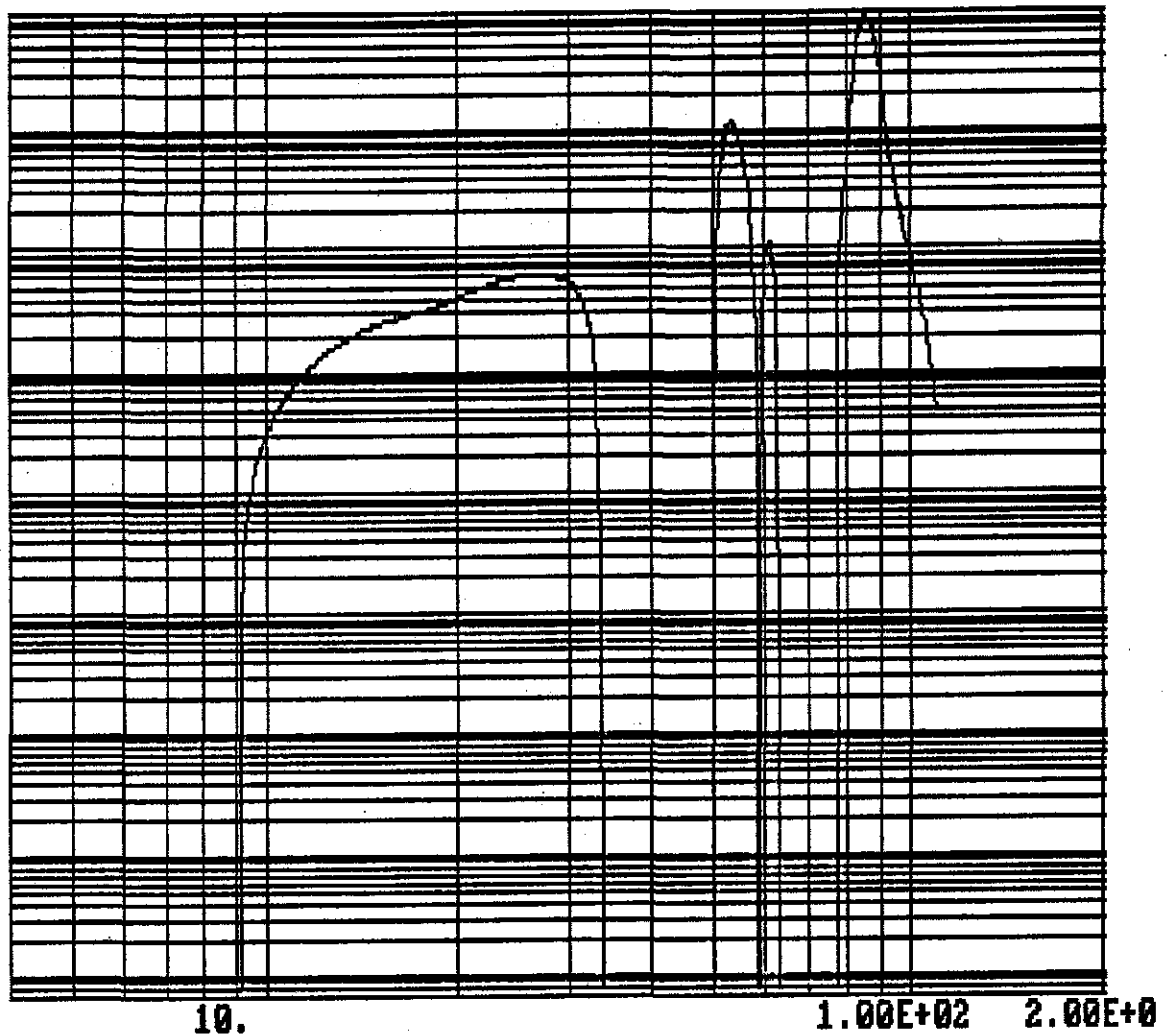
FREQUENCY (HZ)

PLOT NO =

4

Node 2183 X3  
36" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECT (STRAIN ENERG

N  
O  
D  
A  
L  
P  
S  
D  
5  
A  
C  
C  
E  
L  
P  
S  
D  
1.00E-23



FREQUENCY (HZ)

PLOT NO =

5

P  
 18" LVEAPB1 LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPING)  
 START3 3 1 3.0 5.0 100.0  
 RMS  
 PRINT

2 230 230  
 2 774 774  
 2 792 792  
 2 1520 1520  
 2 2183 2183

END  
 MODES 1 250 99.0

END  
 PSD 3 1  
 NODES 230 3 774 3 792 3  
 NODES 1520 3 2183 3

END  
 START PSD INPUT 1  
 1 3 3 2 1 1.0 2.9E-9 -81 1  
 6 1 4.0 50.0 8.0 57.0 16.0 61.00  
 6 -7 31.5 64.0 63.0 66.0 125.0 62.00

ALL DONE

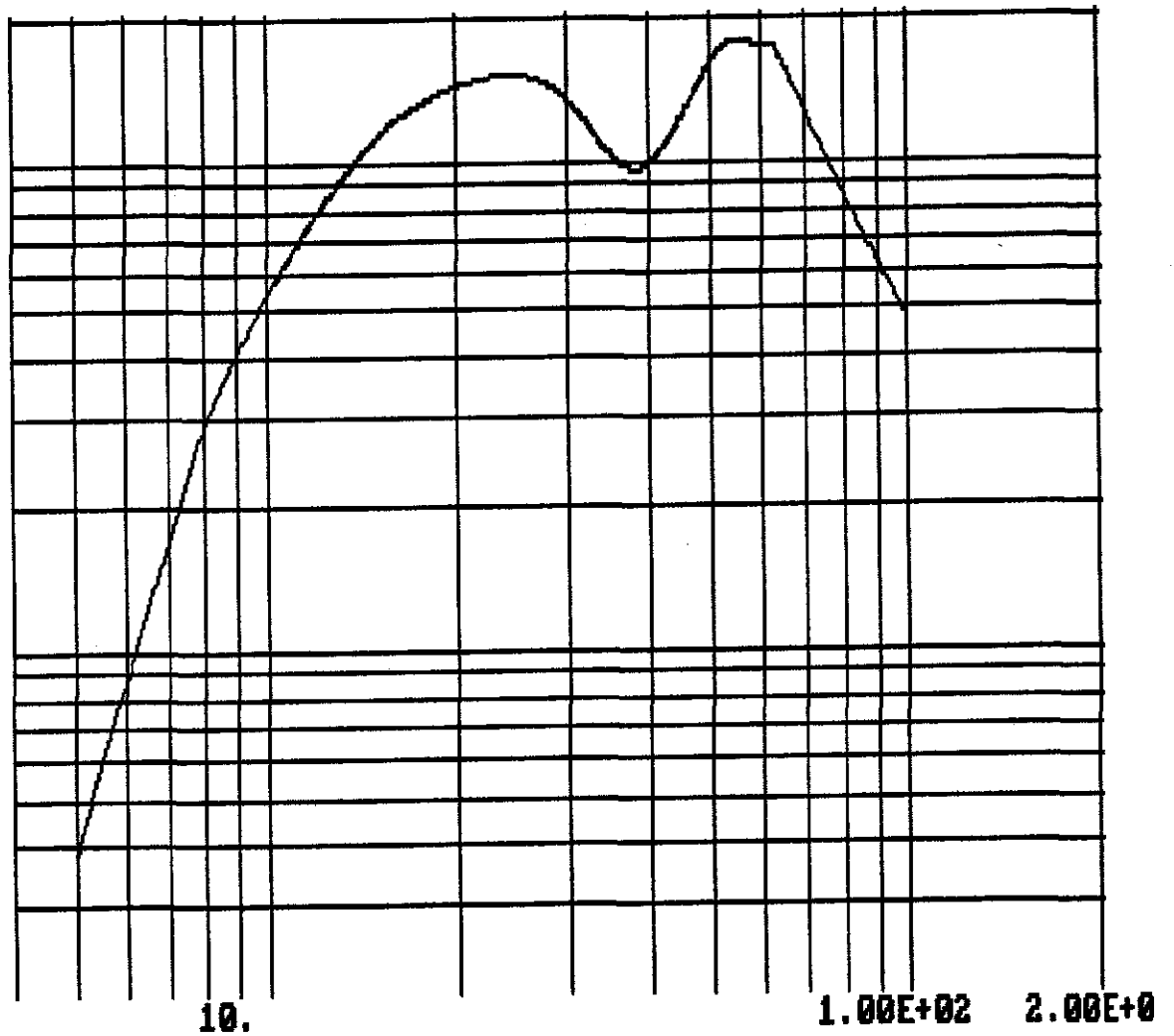
Node 230 X3  
18" LVEAPB1 LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPIN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

2.00E-13

1.00E-13

1.00E-14



FREQUENCY (HZ)

PLOT NO =

1

Node 774 X3  
18" LVEAPBI LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPIN

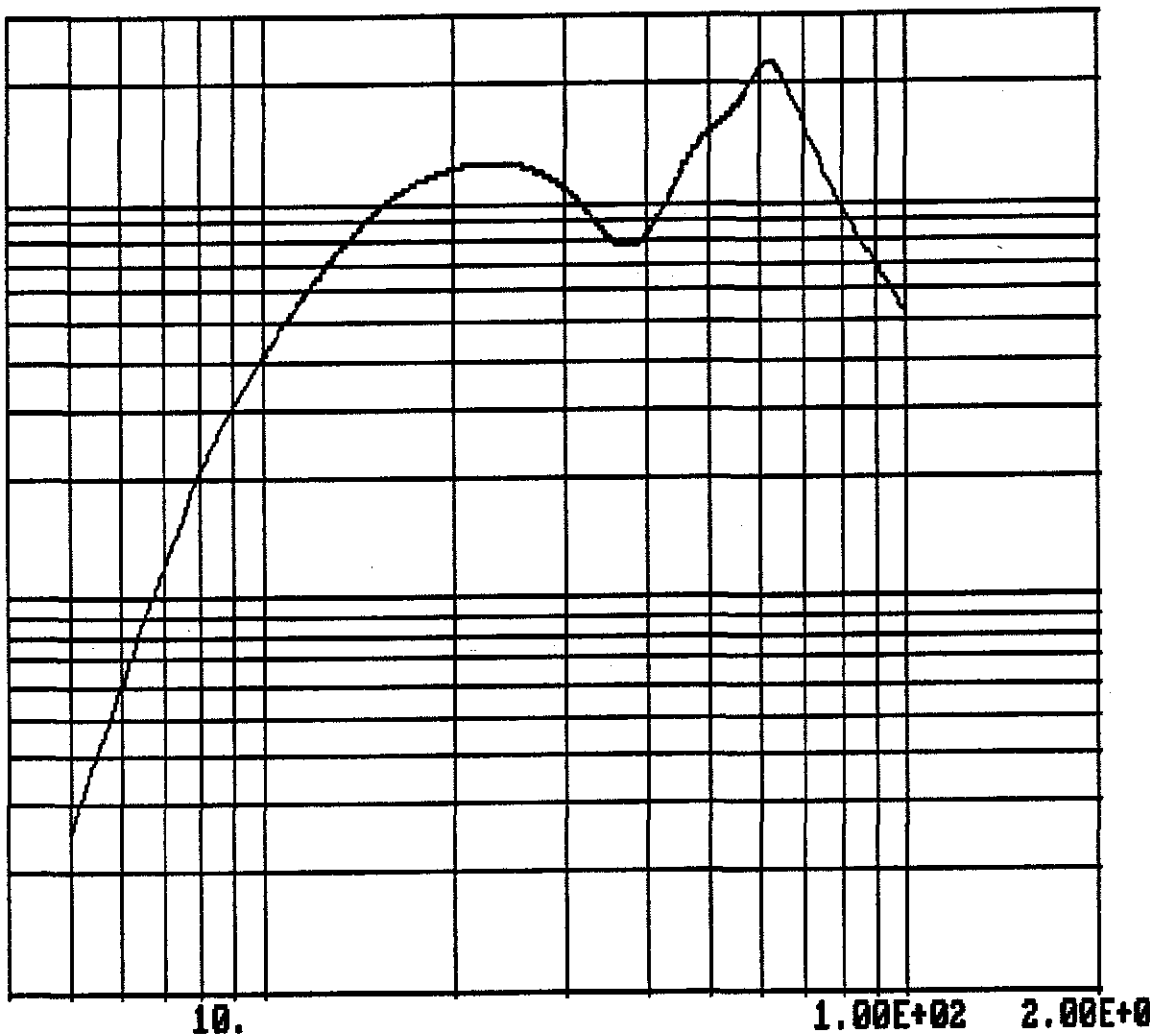
N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-13

1.00E-13

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

2

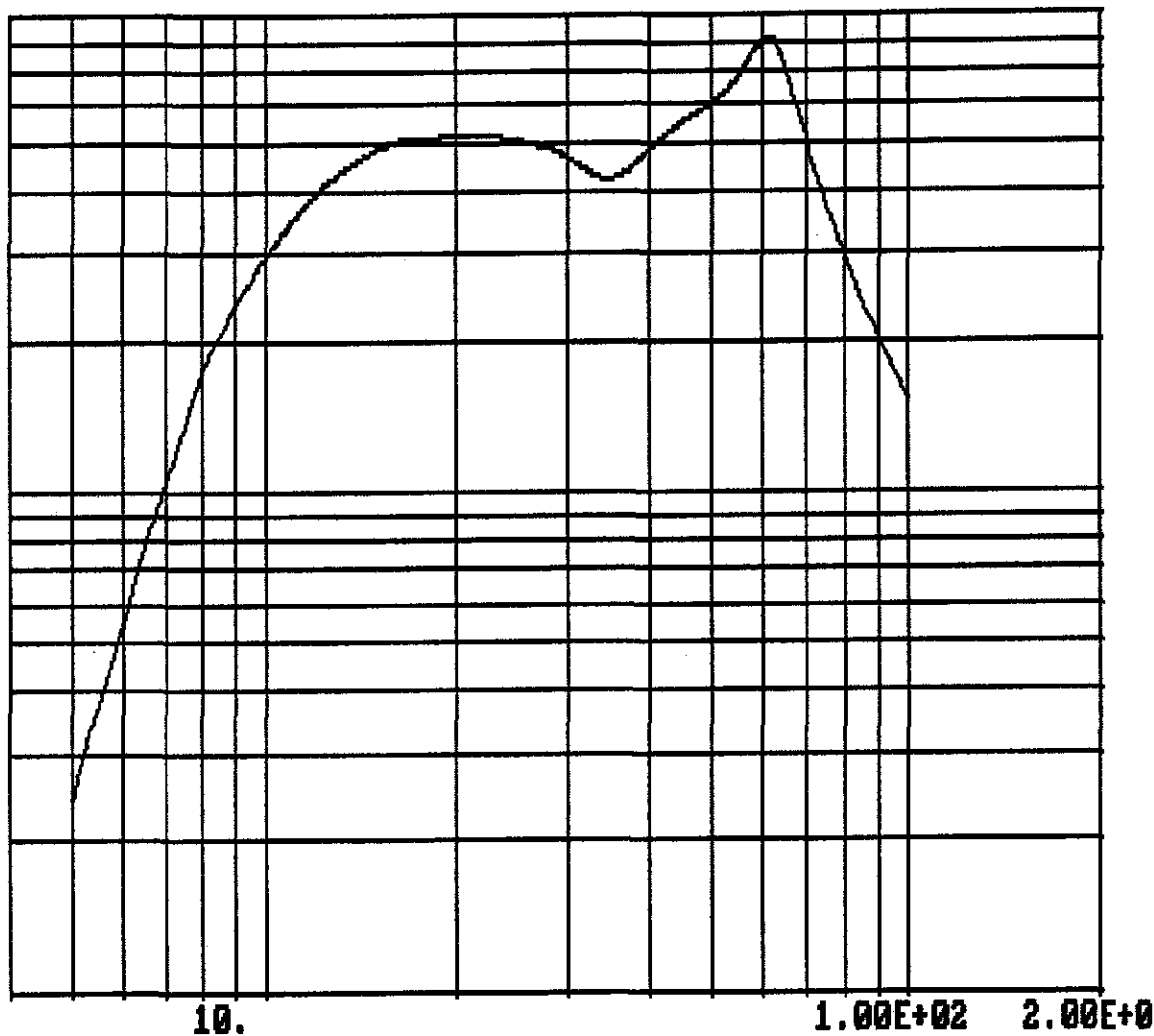
Node 792 X3  
18" LVEAPB1 LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPIN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
3  
  
A  
C  
C  
E  
L  
  
P  
S  
D

9.00E-14

1.00E-14

1.00E-15

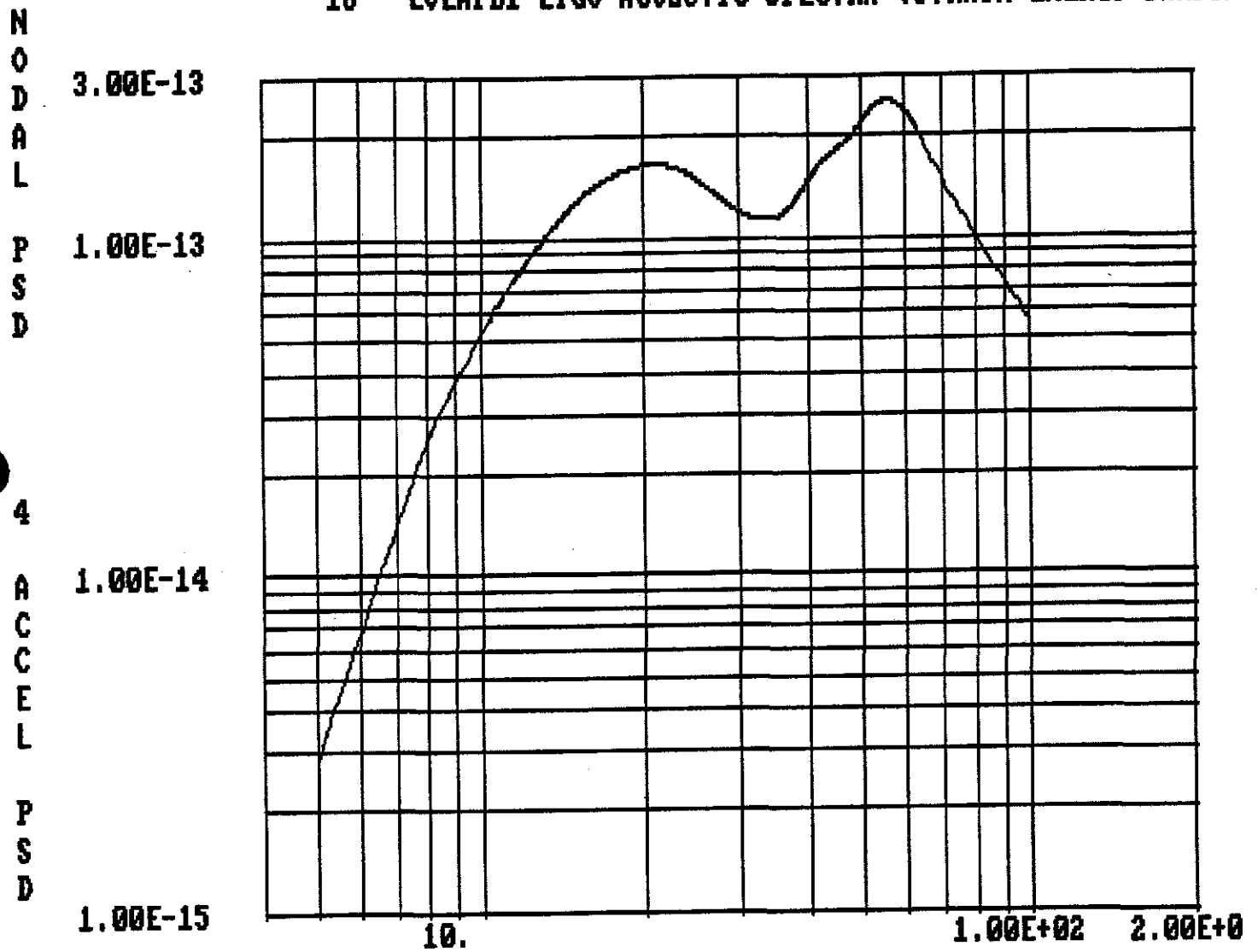


FREQUENCY (HZ)

PLOT NO =

3

Node 1520 X3  
18" LVEAPBI LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPIN



FREQUENCY (HZ)

PLOT NO =

4



Node 2183 X3  
18" LVEAPB1 LIGO ACOUSTIC SPECTRA (STRAIN ENERGY DAMPIN

N  
O  
D  
A  
L  
P  
S  
D

2.00E-13

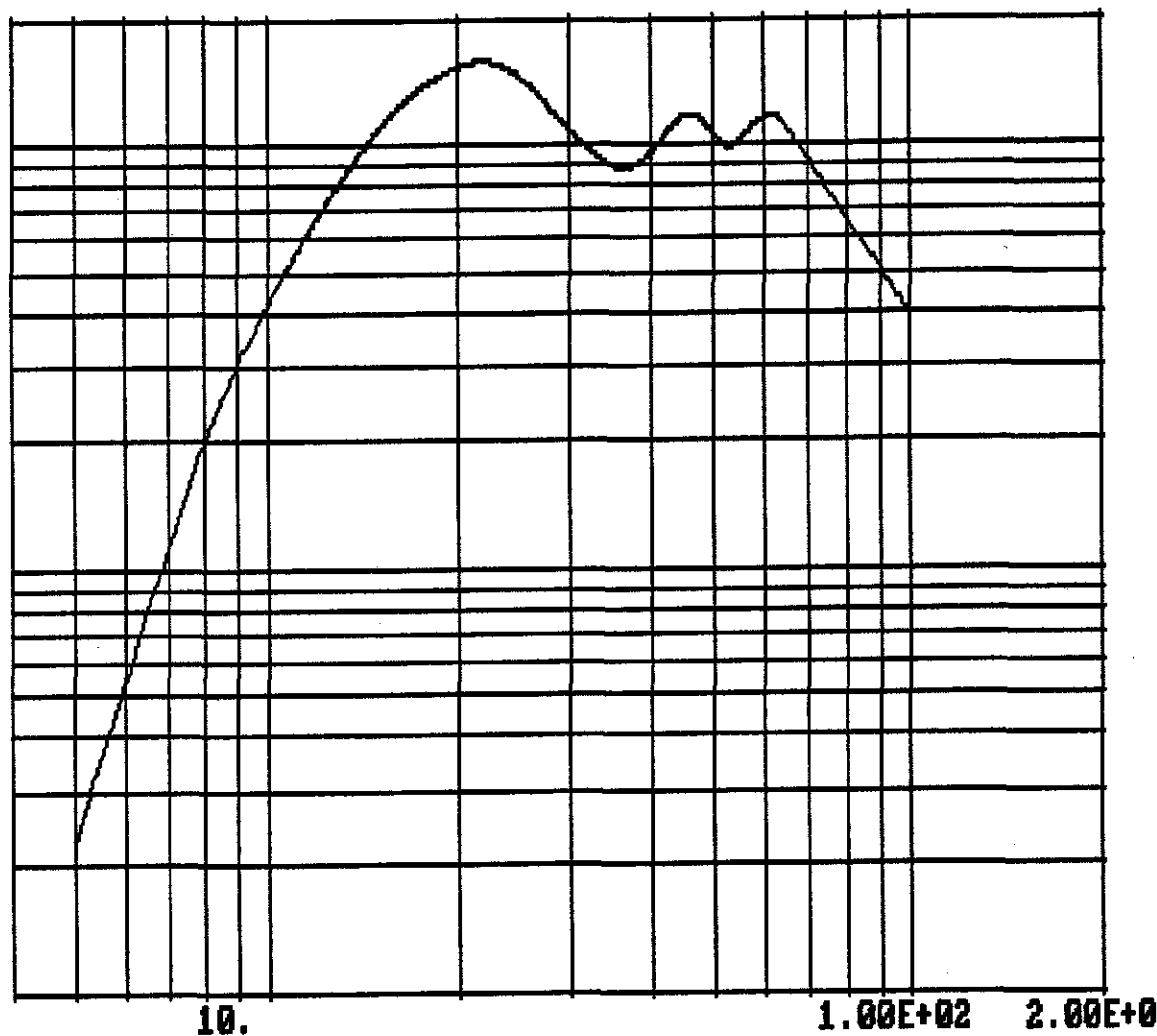
1.00E-13

5

A  
C  
C  
E  
L  
P  
S  
D

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

5

18" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN ENERGY DAMPING)  
 START3 3 1 3.0 5.0 100.0  
 RMS  
 PRINT

2 230 230  
 2 774 774  
 2 792 792  
 2 1520 1520  
 2 2183 2183

END  
 MODES

1 250 99.0

END

PSD

3 1

NODES

230 3 774 3 792 3

NODES

1520 3 2183 3

END

START PSD INPUT

1

1 3 3 2 1

1.0

2.9E-9

-81

1

6

1

4.0

50.0

8.0

50.0

16.0

49.00

6

-7

31.5

48.0

63.0

58.0

125.0

49.00

ALL DONE

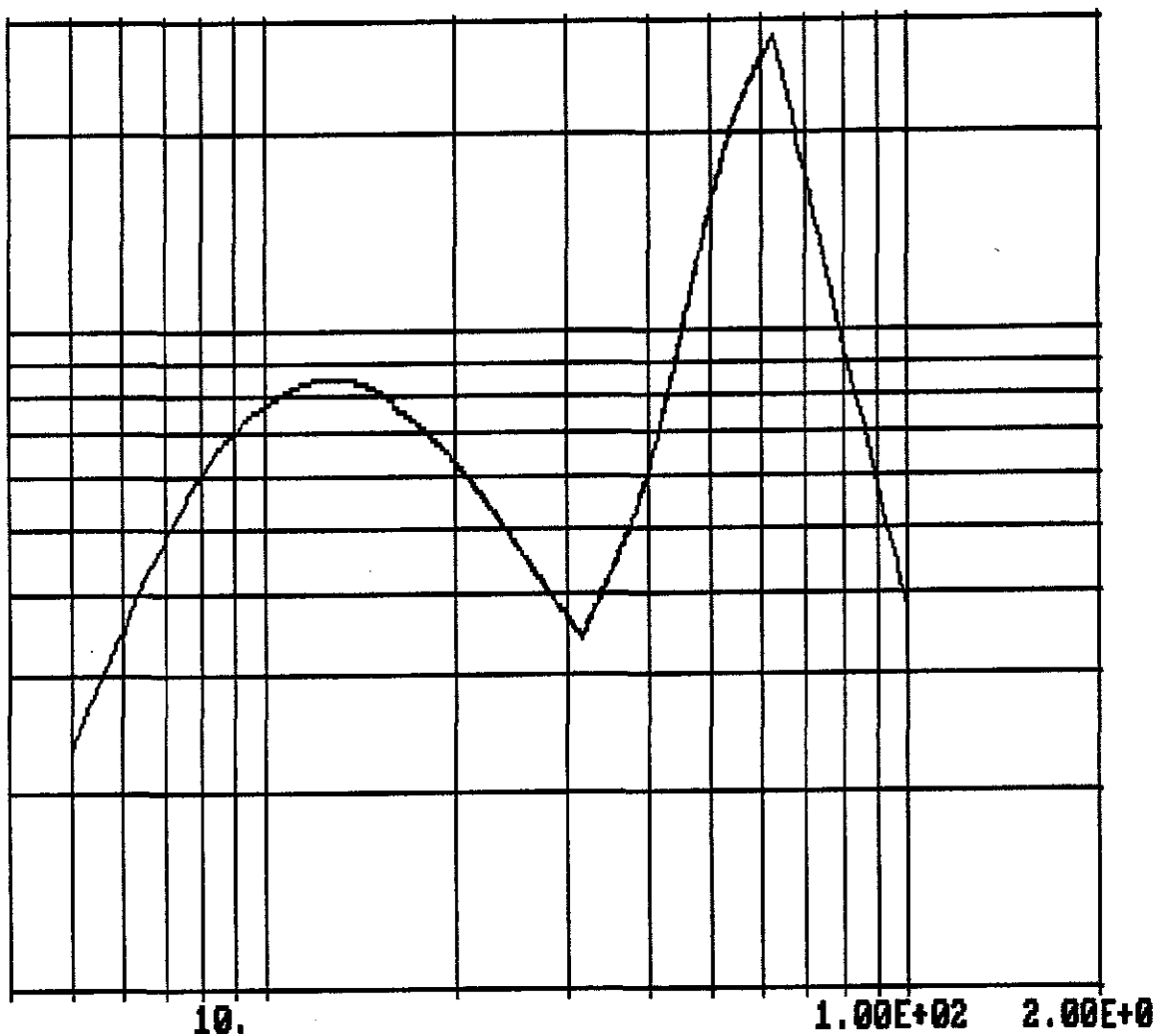
Node 230 X3  
18" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

1

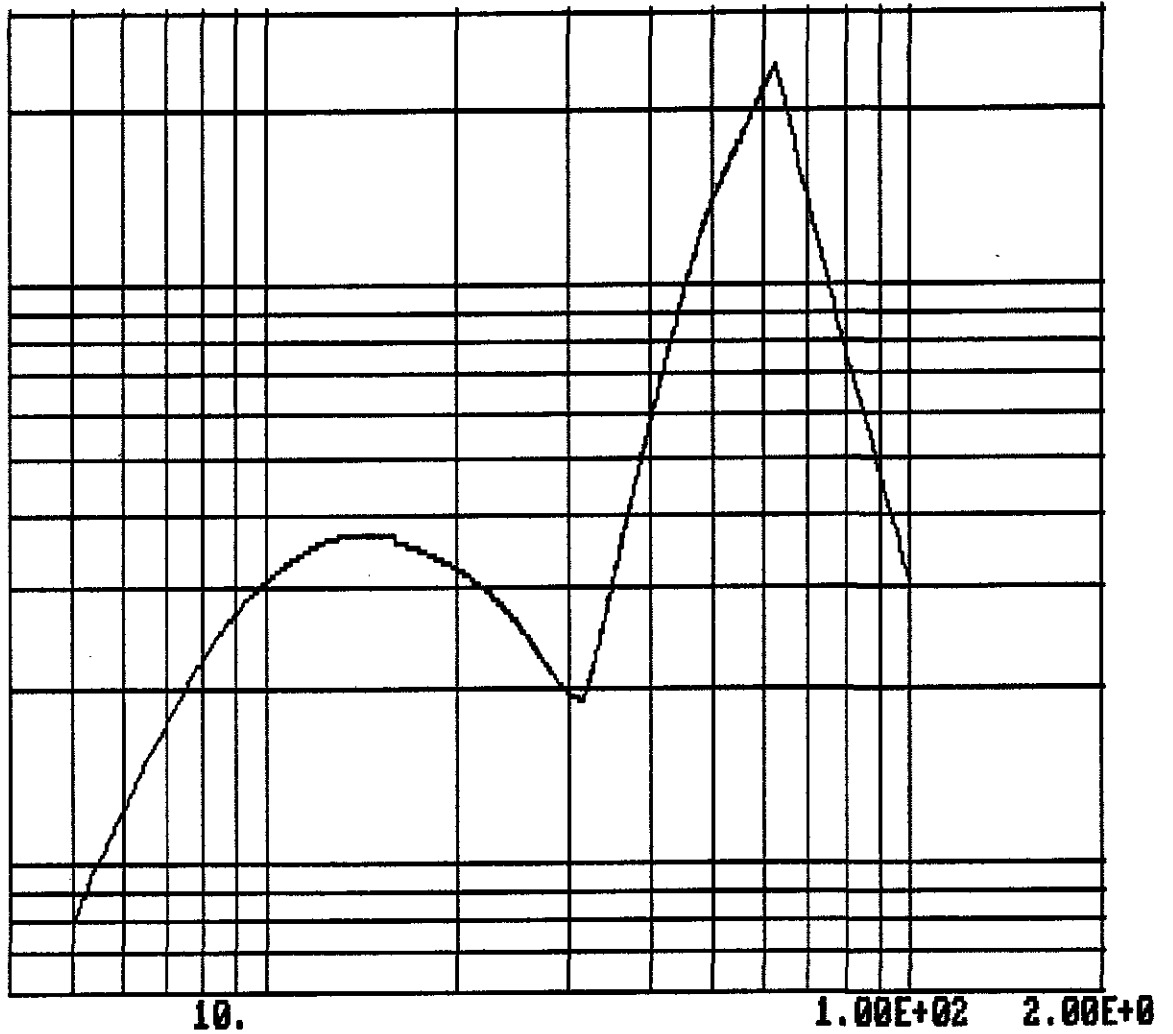
Node 774 X3  
18" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-14

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

2

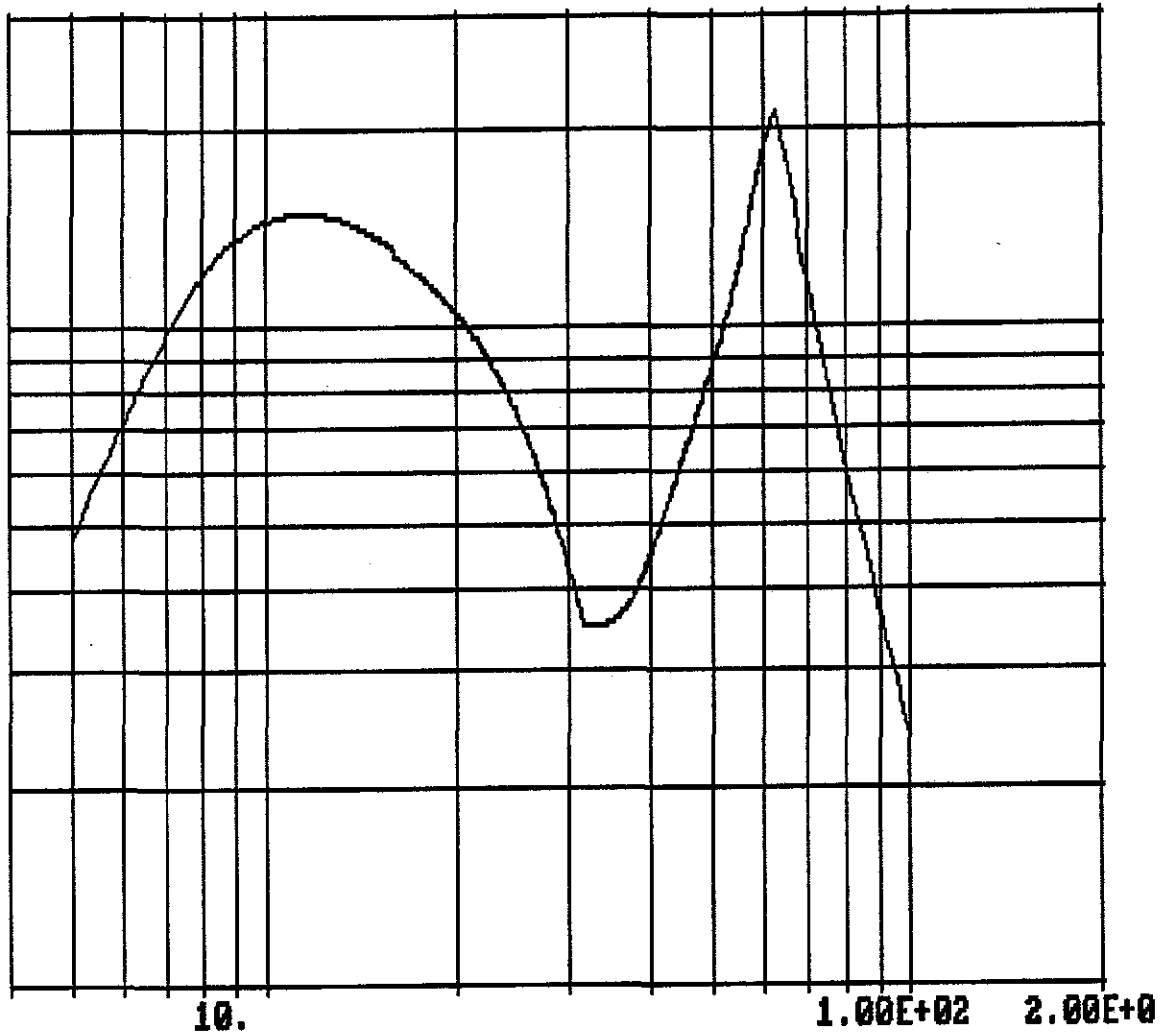
Node 792 X3  
18" LVEAPBI MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
3  
  
A  
C  
C  
E  
L  
  
P  
S  
D

3.00E-15

1.00E-15

1.00E-16



FREQUENCY (HZ)

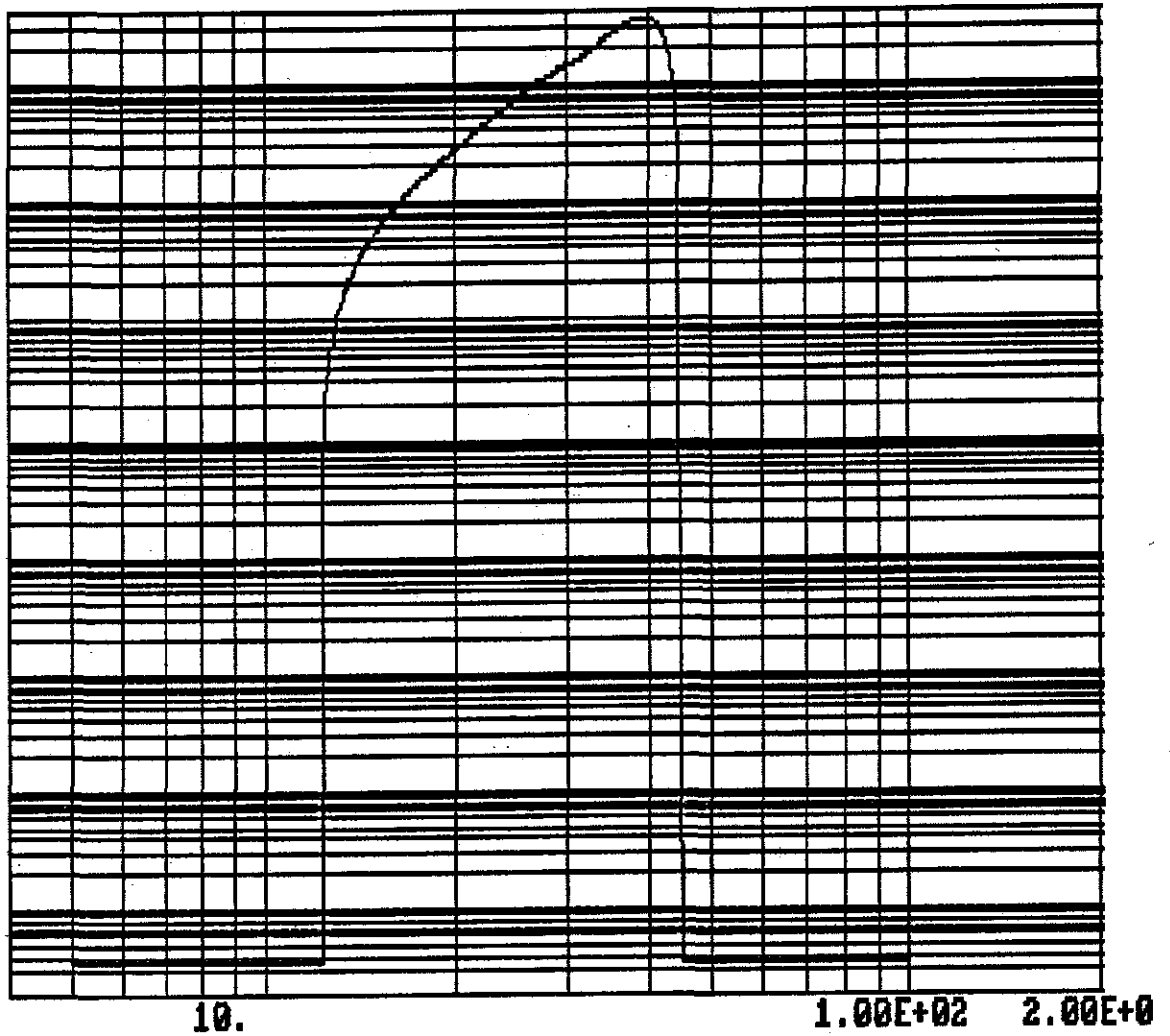
PLOT NO =

3

Node 1520 X3  
18" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
4  
  
A  
C  
C  
E  
L  
  
P  
S  
D

1.00E-16  
1.00E-17  
1.00E-18  
1.00E-19  
1.00E-20  
1.00E-21  
1.00E-22  
1.00E-23  
2.00E-24



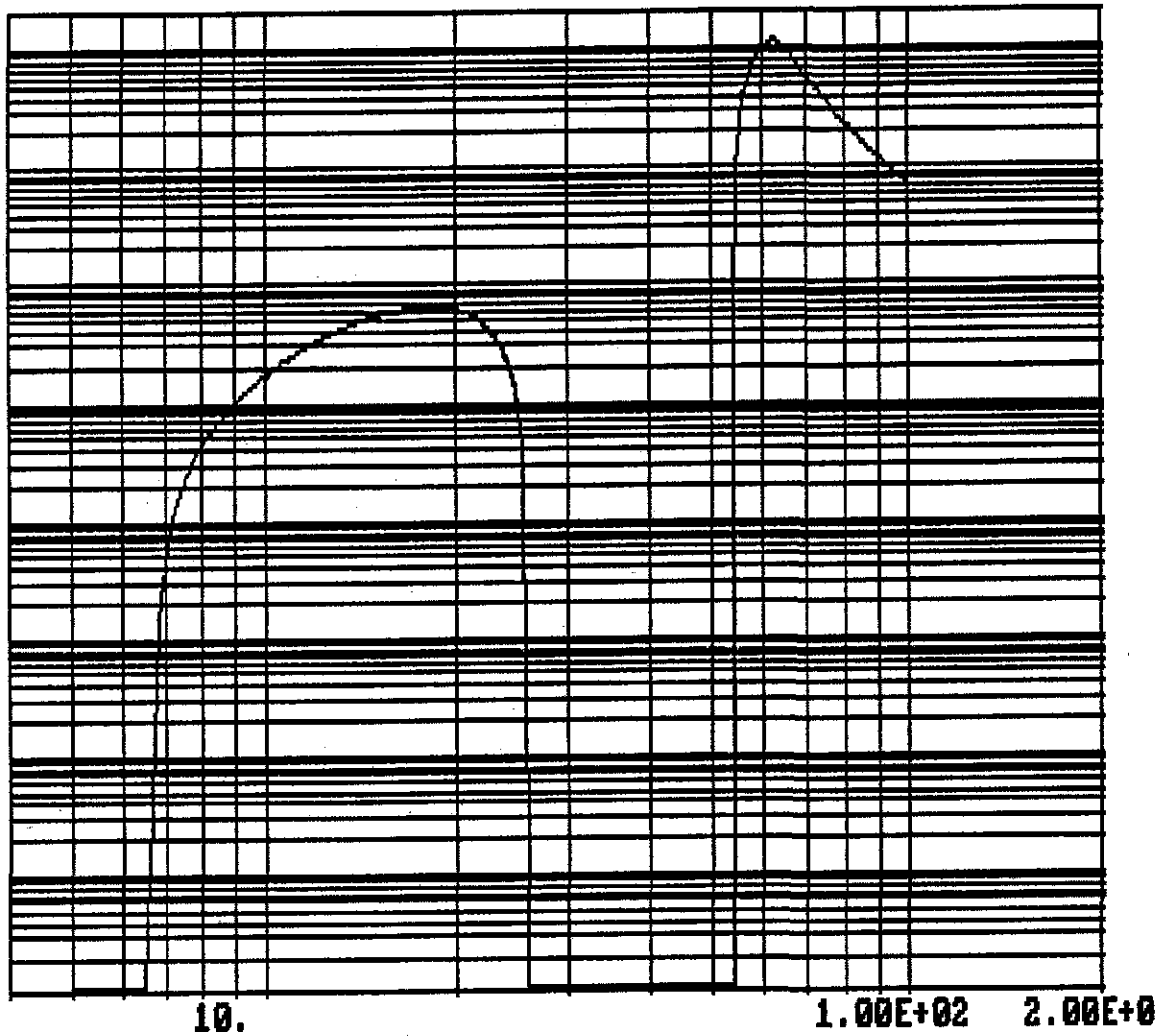
FREQUENCY (HZ)

PLOT NO =

4

Node 2183 X3  
18" LVEAPB1 MARSHALL LONG'S ACOUSTIC SPECTRA (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
5  
  
A  
C  
C  
E  
L  
  
P  
S  
D  
  
2.00E-16  
1.00E-16  
  
1.00E-17  
  
1.00E-18  
  
1.00E-19  
  
1.00E-20  
  
1.00E-21  
  
1.00E-22  
  
1.00E-23  
  
1.00E-24



FREQUENCY (HZ)

PLOT NO =

5

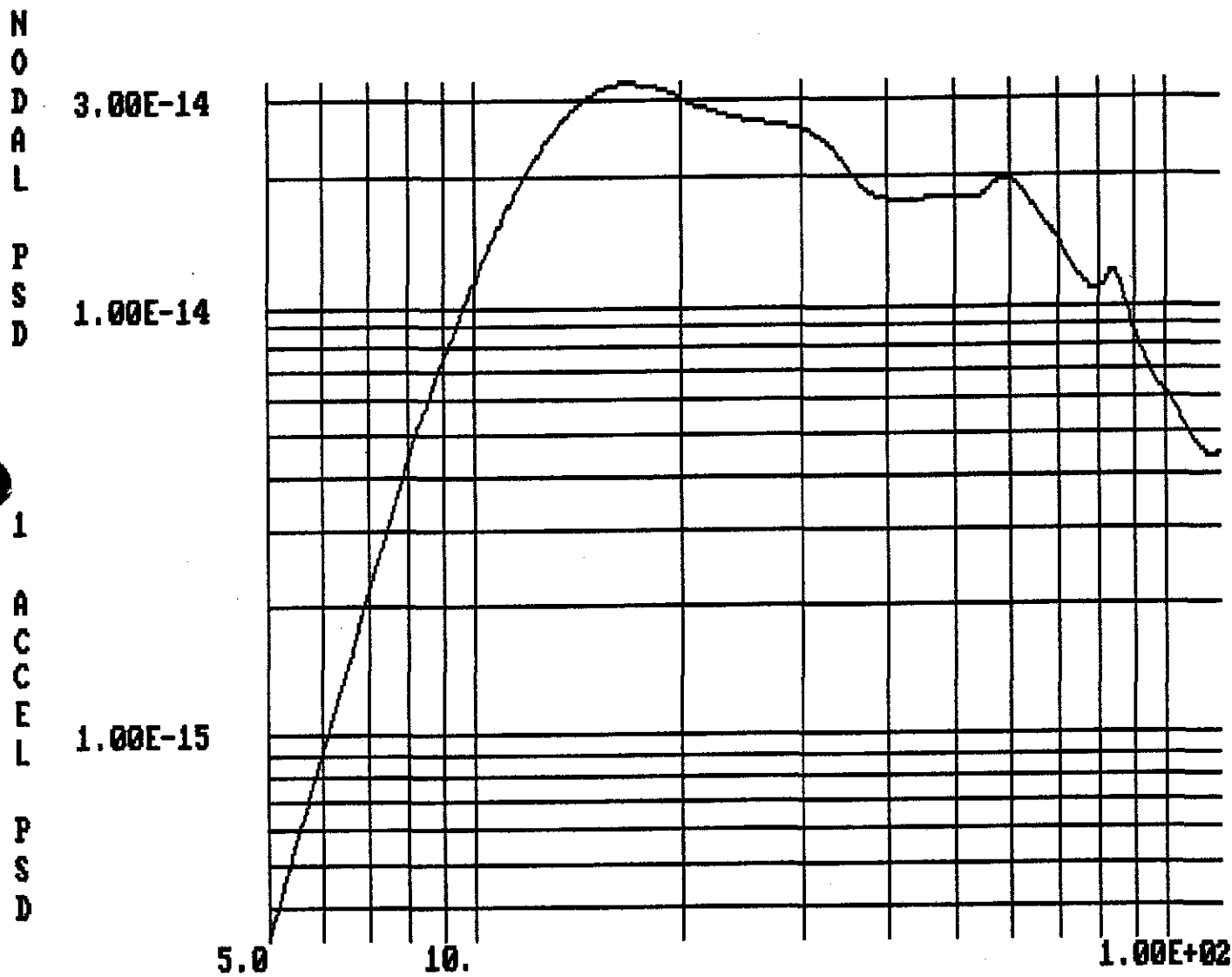
```

68" MIDPB1 LIGO ACOUSTIC SPECT (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS              1
PRINT           1
                2      9      9
                2     13     13
END
MODES
                1          6          99.0
                7          36         99.0
END
PSD              1          1
NODES           150          3
END
START PSD INPUT  1
 1 3 3 2 1      1.0      2.9E-9
 6              1        4.0      50.0      8.0      57.0      16.0      61.0
 6              -7       31.5     64.0     63.0     66.0     125.0     62.0
ALL DONE

```



68" MIDPB1 LIGO ACOUSTIC SPECT (STRAIN ENERGY DAMPING)



FREQUENCY (HZ)

PLOT NO =

1

```

68" MID-PB1 ACOUSTIC PSD SPECT (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS              1
PRINT              1

      2      9      9
      2     13     13

END
MODES

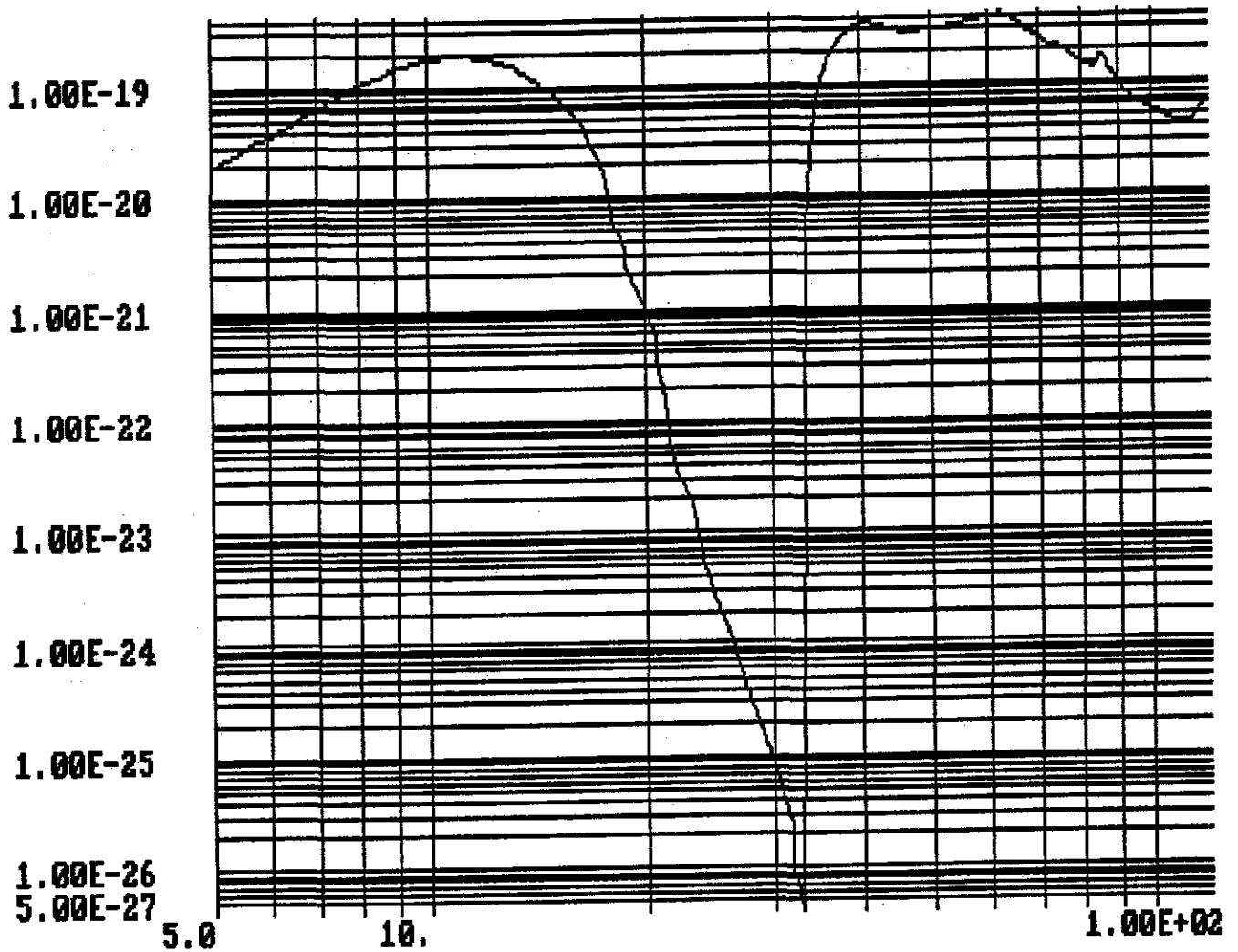
      1          6          99.0
      7          36         99.0

END
PSD          1          1
NODES        150          1          150          2          150          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0          2.9E-9
  6          1          4.0          50.0          8.0          50.0          16.0          49.0
  6          -7         32.0          48.0          63.0          58.0          125.0          49.0
ALL DONE

```

68" MID-PB1 ACOUSTIC PSD SPECT (STRAIN ENERGY DAMPING)

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

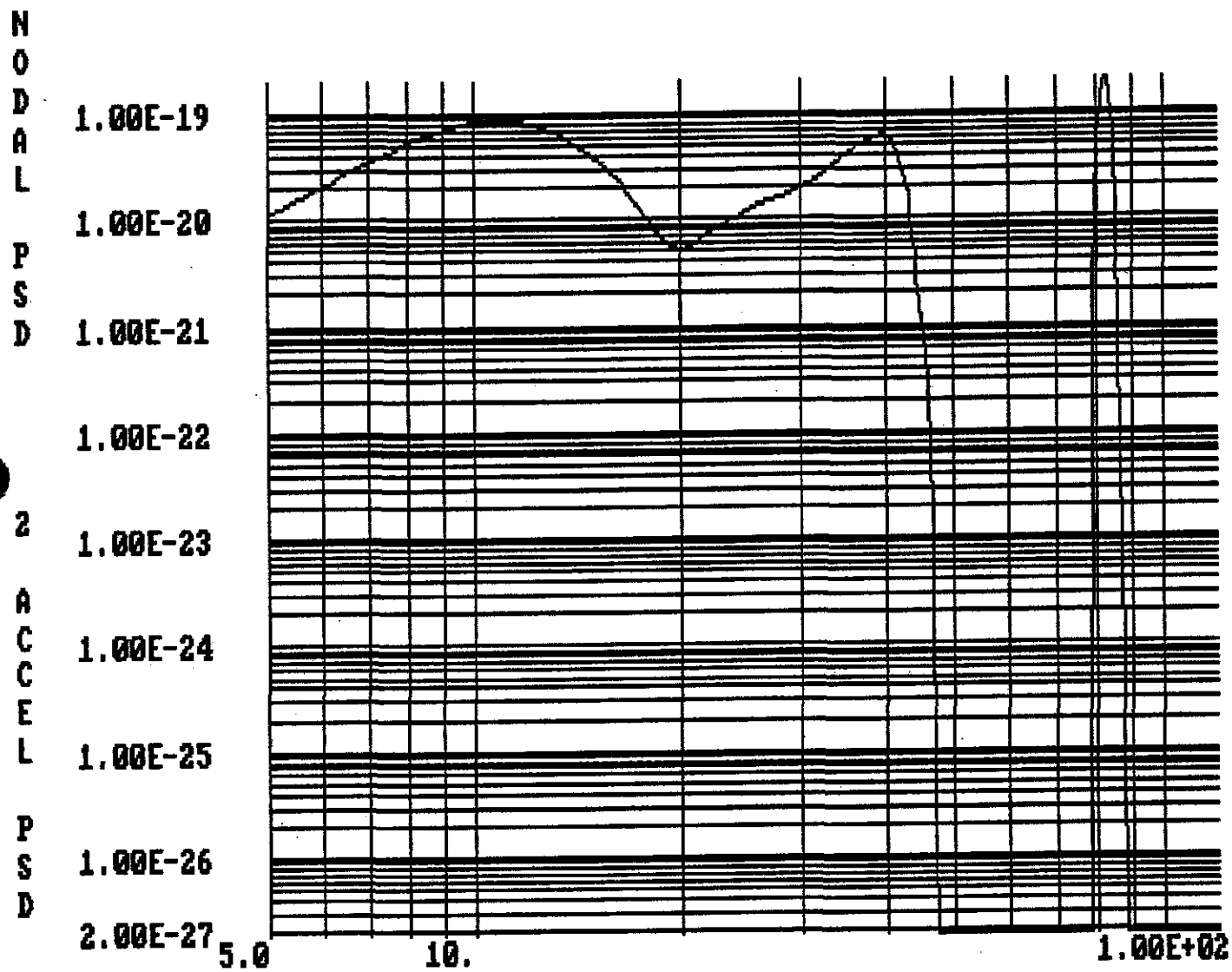


FREQUENCY (HZ)

PLOT NO =

1

68" MID-PBI ACOUSTIC PSD SPECT (STRAIN ENERGY DAMPING)

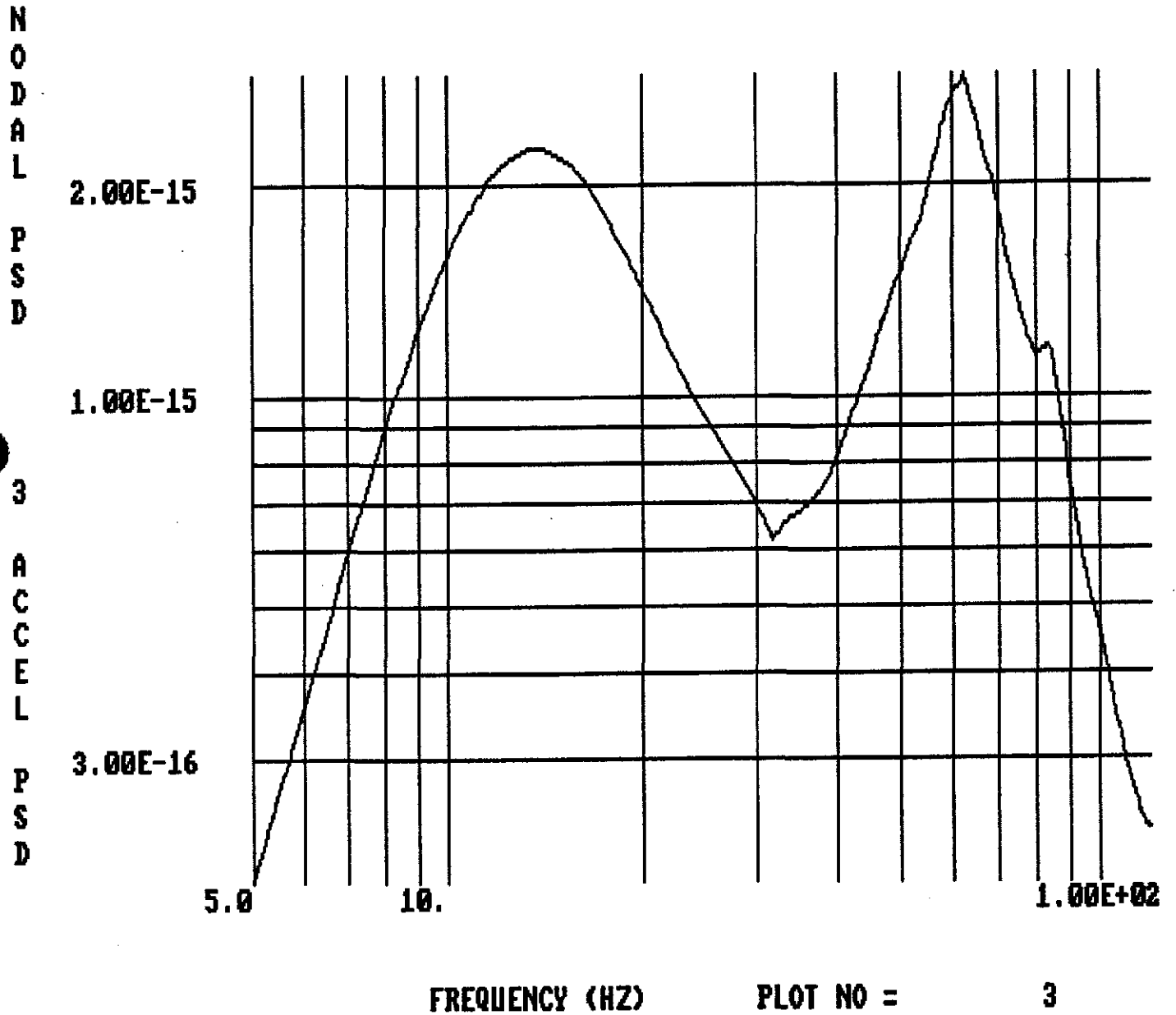


FREQUENCY (HZ)

PLOT NO =

2

68" MID-PB1 ACOUSTIC PSD SPECT (STRAIN ENERGY DAMPING)

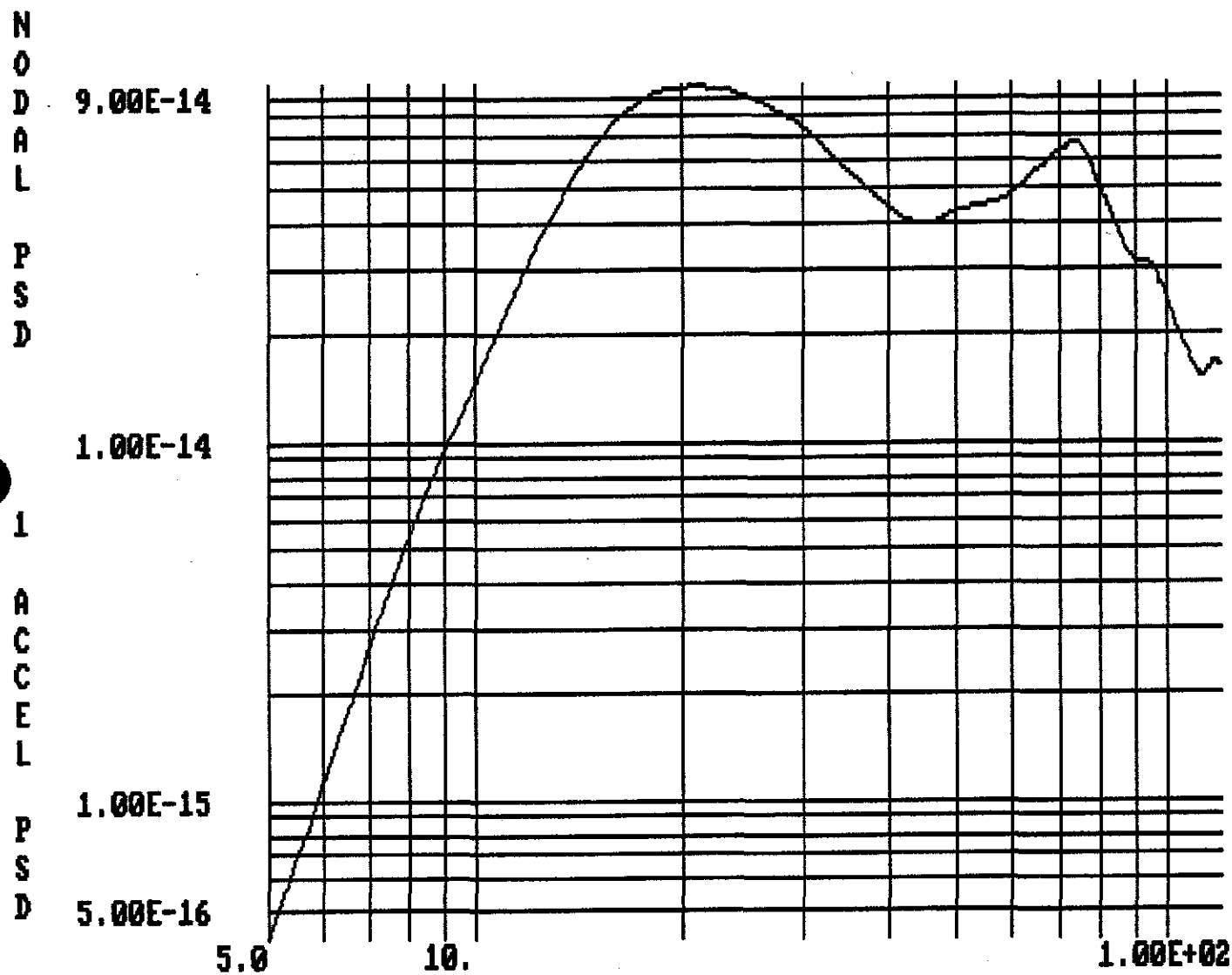


```

36" MIDPB1 LIGO Acoustic Spect (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS
PRINT          2          9          9
END
MODES
          1          6          99.0
          7          50          99.0
END
PSD          1          1
NODES          150          3
END
START PSD INPUT          1
  1 3 3 2 1          1.0          2.9E-9
  6          1          4.0          50.0          8.0          57.0          16.0          61.0
  6          -7          31.5          64.0          63.0          66.0          125.0          62.0
ALL DONE

```

### 36" MIDPBI LIGO Acoustic Spect (STRAIN ENERGY DAMPING)



FREQUENCY (HZ)

PLOT NO =

1

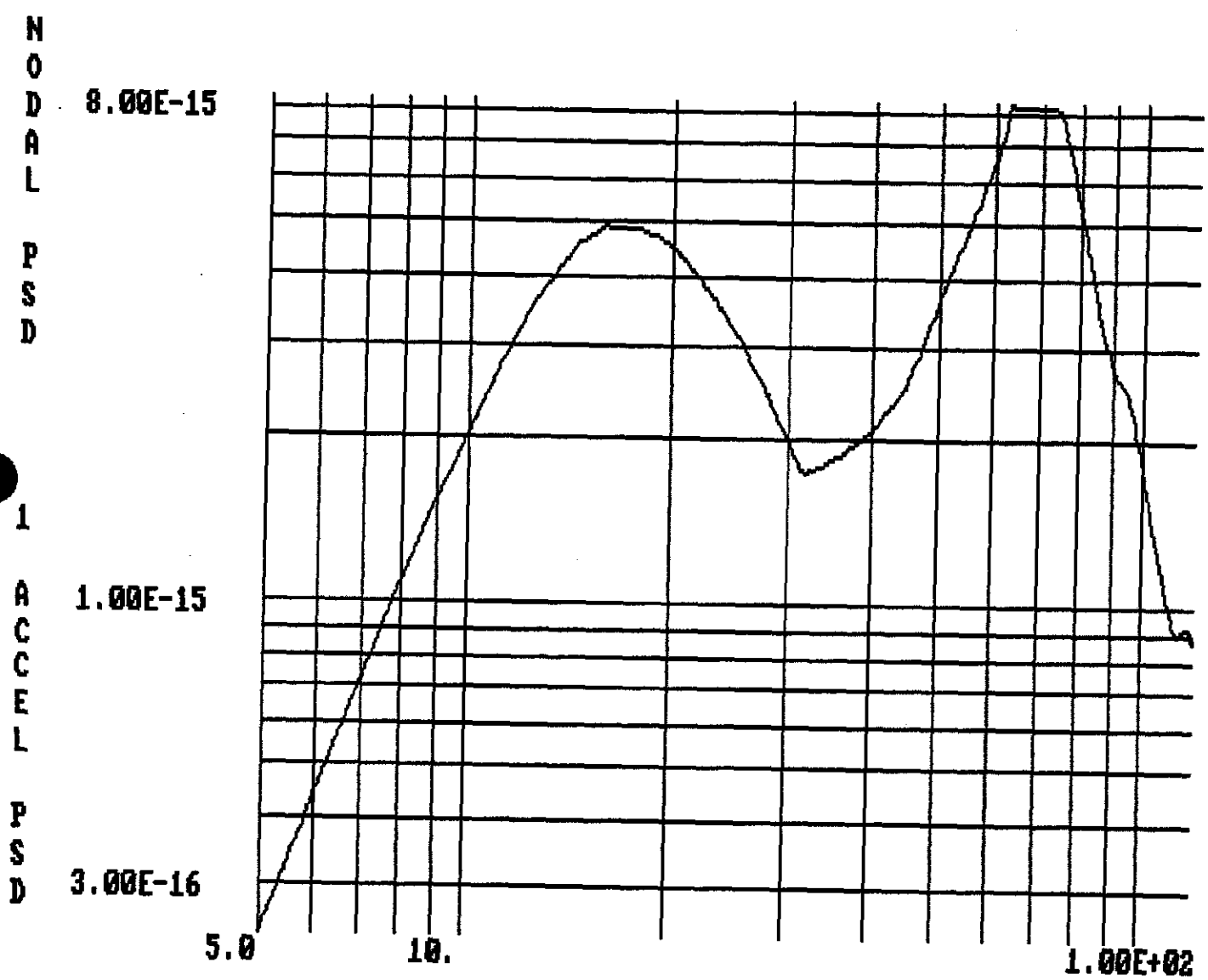
```

36" MIDPB1 Marshall Long's Acoustic Spect (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS
PRINT          1
END
MODES          2          9          9
END
MODES          1          6          99.0
              7          50          99.0
END
PSD            1          1
NODES          150          3
END
START PSD INPUT 1
1 3 3 2 1      1.0      2.9E-9
6              4.0      50.0      8.0      50.0      -81      16.0      49.0
6              -7      31.5      48.0      63.0      58.0      125.0      49.0
ALL DONE

```



36" MIDPB1 MARshall Long's Acoustic Spect (STRAIN ENERGY



FREQUENCY (HZ)

PLOT NO =

1

```

18" MIDPB1 LIGO ACOUSTIC SPECTRUM (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS              1
PRINT           1

      2      9      9
      2     13     13

END
MODES

      1          6          99.0
      7          70         99.0

END
PSD      1          1
NODES           150          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0      2.9E-9
  6          1          4.0      50.0          8.0          57.0          16.0          61.0
  6          -7         31.5      64.0          63.0          66.0          125.0          62.0
ALL DONE

```

Node 150 X3  
18" MIDPB1 LIGO ACOUSTIC SPECTRUM (STRAIN ENERGY DAMPIN

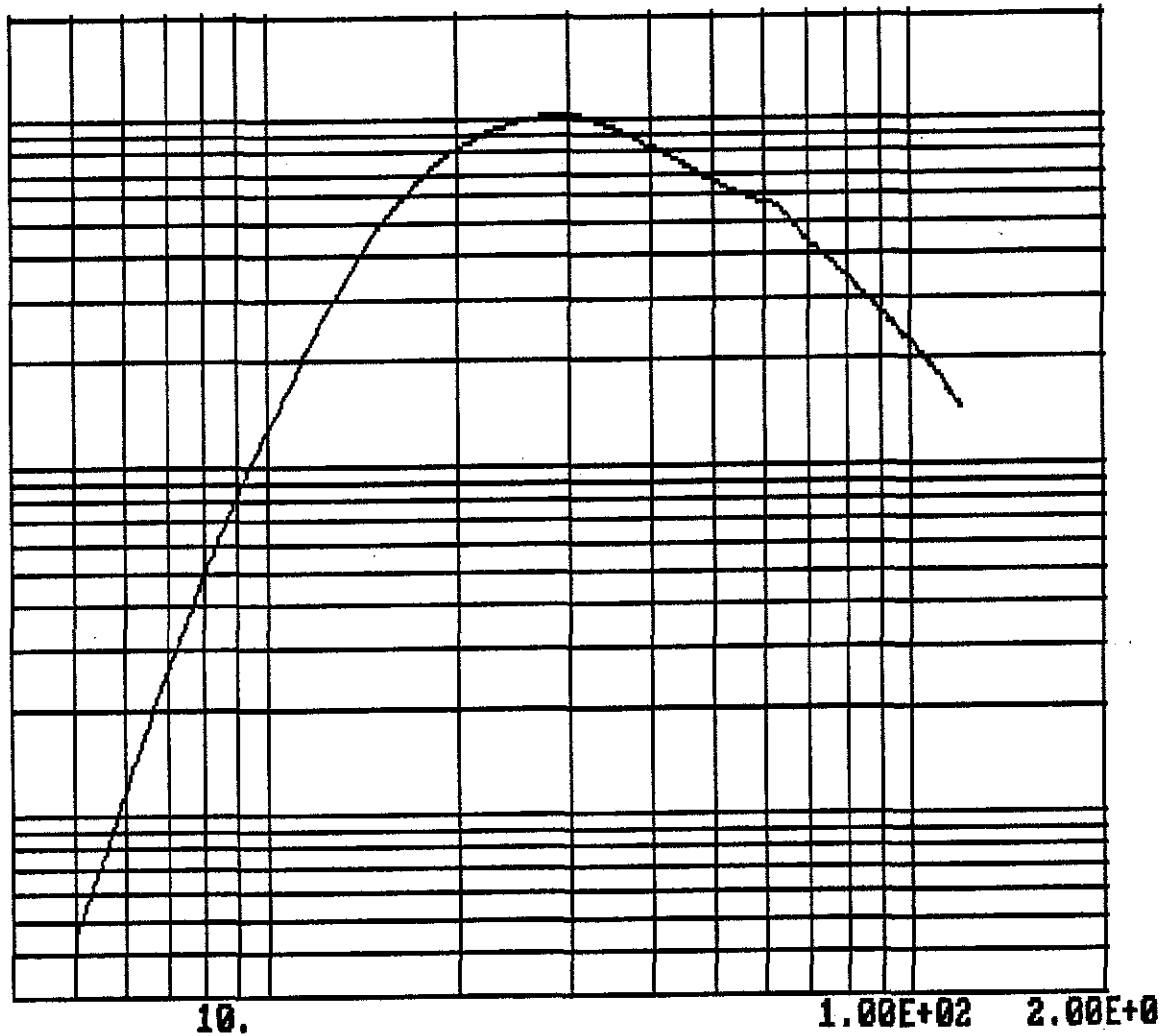
N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

2.00E-13

1.00E-13

1.00E-14

1.00E-15



FREQUENCY (HZ)

PLOT NO =

1

```

18" MIDPB1 MARSHALL LONG'S ACOUSTIC SPECTRUM (STRAIN ENERGY DAMPING)
START3          3          1          3.0          5.0          120.0
RMS              1          1
PRINT
      2      9      9
      2     13     13
END
MODES
      1          6          99.0
      7          70         99.0
END
PSD          1          1
NODES          150          3
END
START PSD INPUT      1
  1 3 3 2 1          1.0      2.9E-9
  6          1          4.0      50.0      8.0      50.0      16.0      49.0
  6          -7         31.5      48.0      63.0      58.0      125.0      49.0
ALL DONE

```

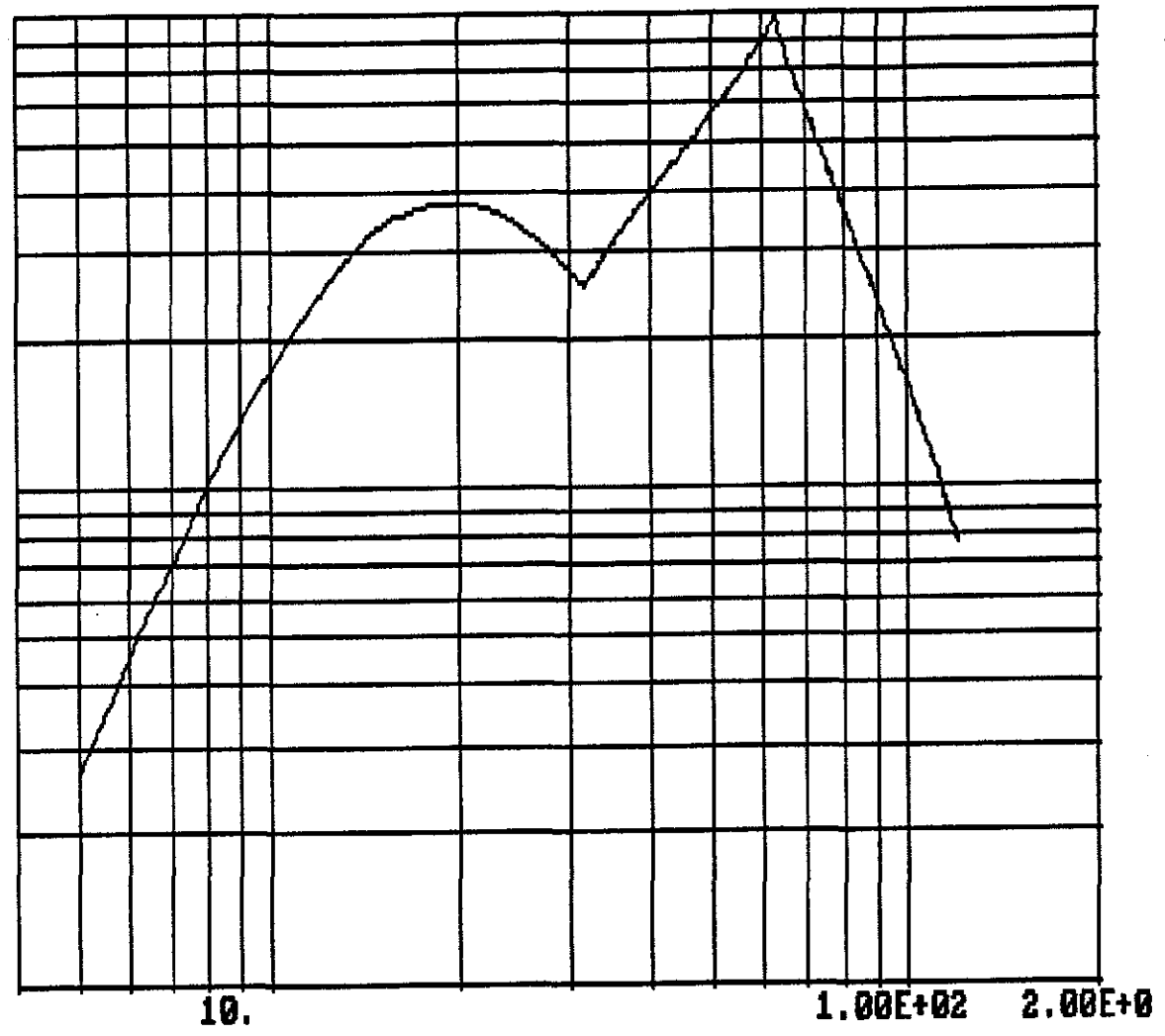
Node 150 X3  
18" MIDPBL MARSHALL LONG'S ACOUSTIC SPECTRUM (STRAIN EN

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

9.00E-15

1.00E-15

1.00E-16



FREQUENCY (HZ)

PLOT NO =

1

68" LVEA-PBI LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPING)

START3 3 1 3.0 5.0 120.0

RMS

PRINT

2 230 230

2 774 774

2 792 792

2 1520 1520

2 2183 2183

END

MODES

1 180 99.0

END

PSD 3 1

NODES 230 3 774 3 792 3

NODES 1520 3 2183 3

END

START PSD INPUT 1

1 3 3 2 2 1.0 2.9E-9 -81 1

6 1 4.0 50.0 8.0 57.0 16.0 61.0

6 -7 31.5 64.0 63.0 66.0 125.0 62.0

ALL DONE

Node 230 X3  
68" LVER-PB1 LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
  
P  
S  
D  
  
1  
  
A  
C  
C  
E  
L  
  
P  
S  
D

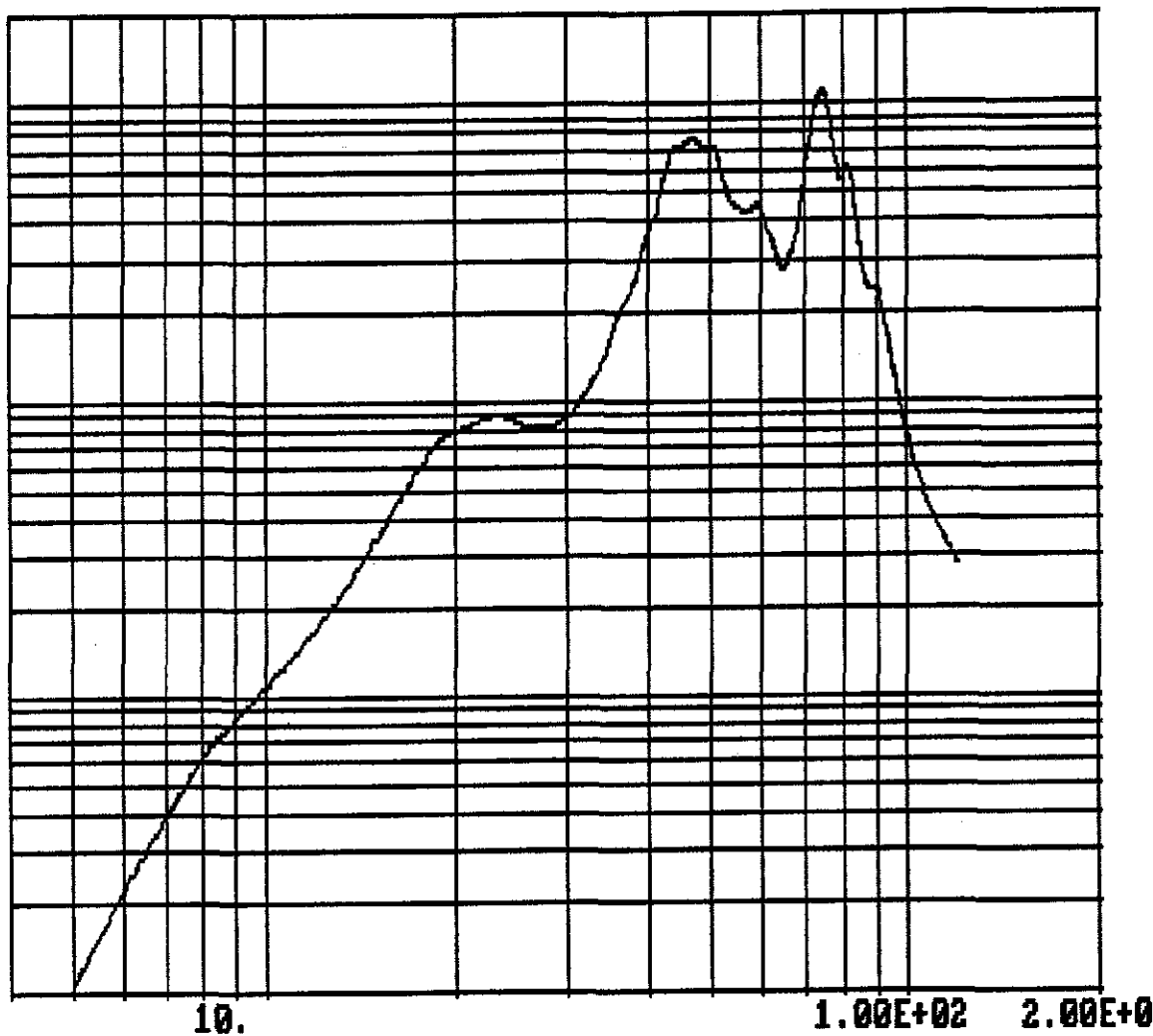
2.00E-14

1.00E-14

1.00E-15

1.00E-16

1.00E-17



FREQUENCY (HZ)

PLOT NO =

1

Node 774 X3  
68" LVEA-PB1 LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPI

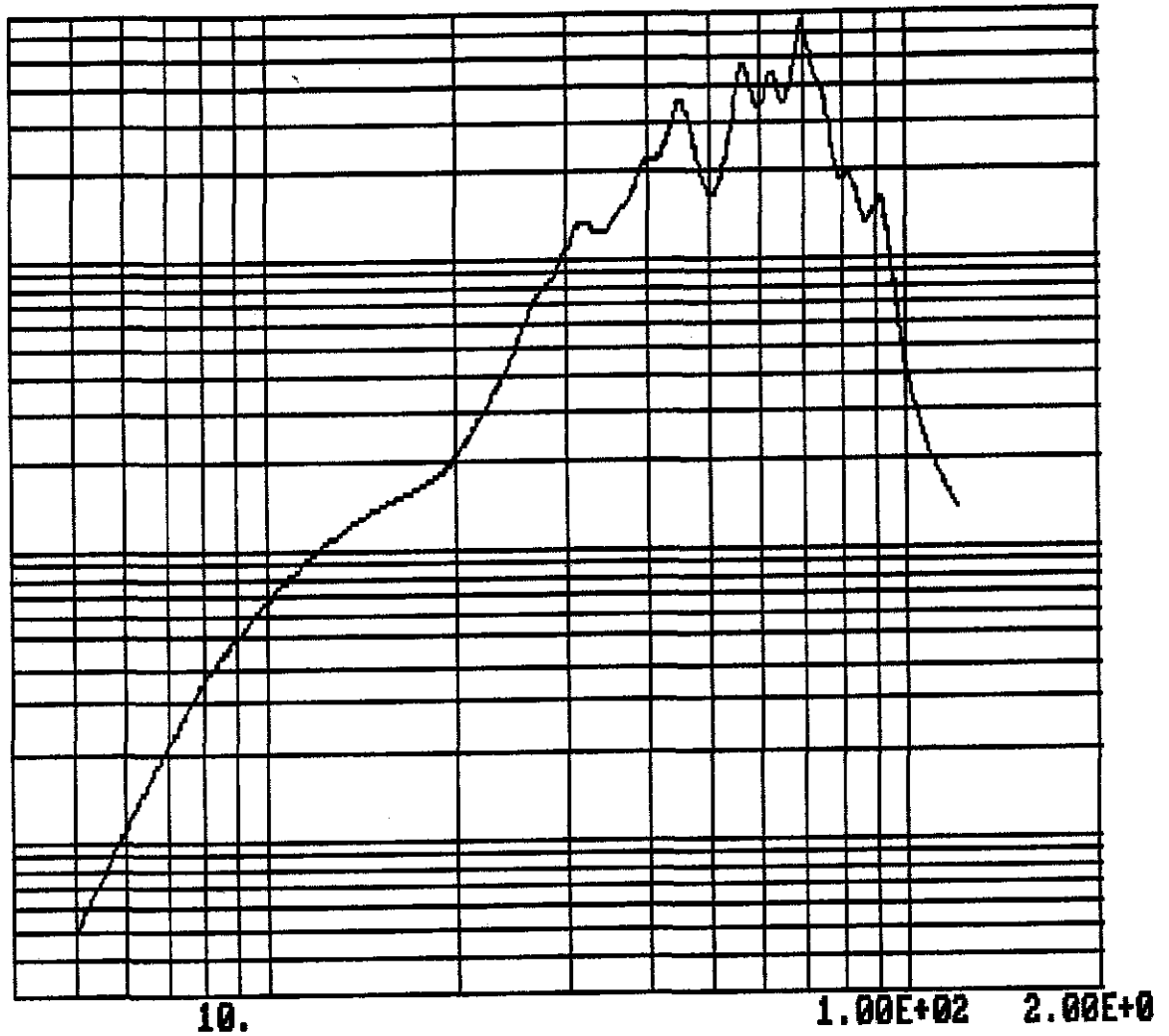
N  
O  
D  
A  
L  
  
P  
S  
D  
  
2  
  
A  
C  
C  
E  
L  
  
P  
S  
D

7.00E-15

1.00E-15

1.00E-16

1.00E-17



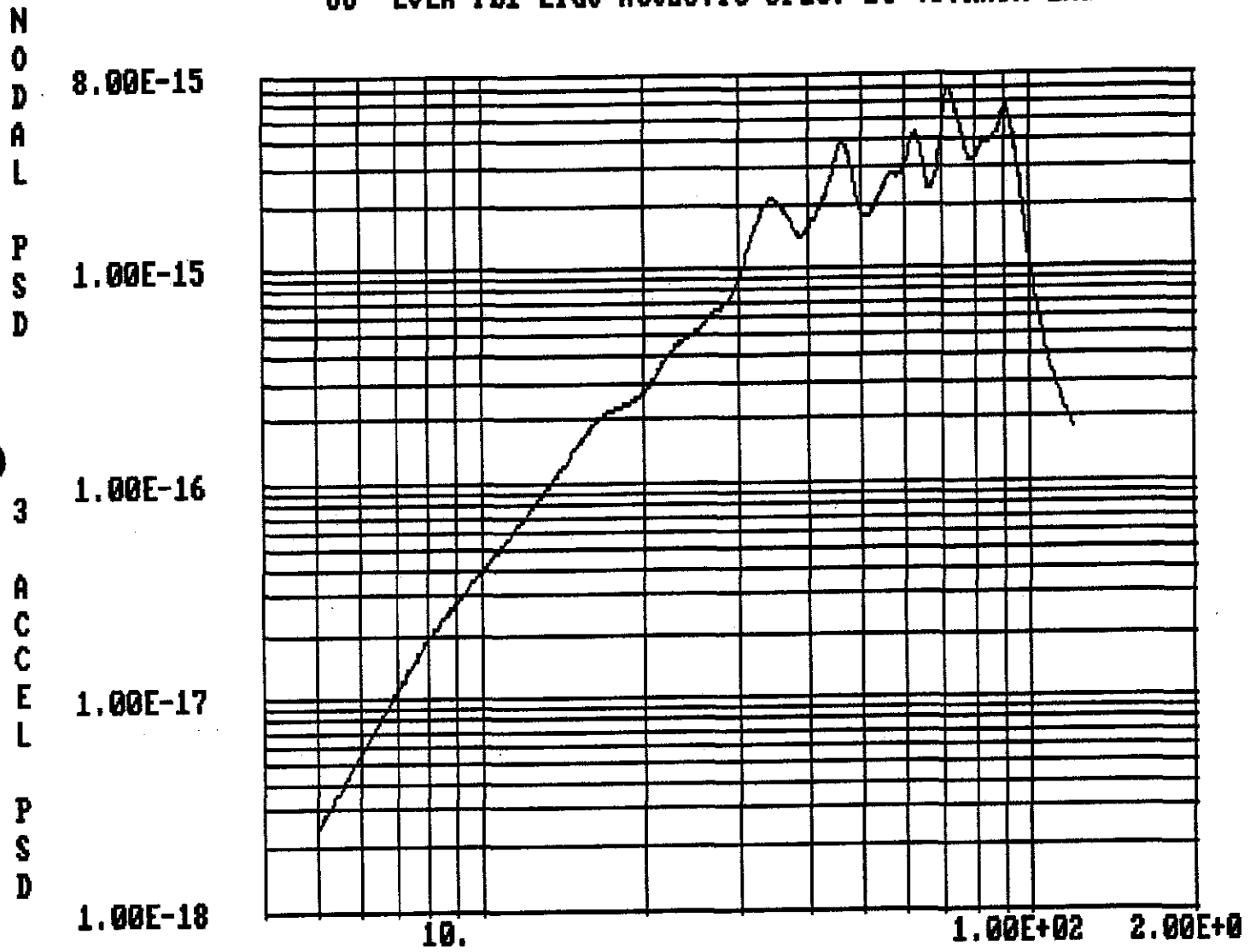
FREQUENCY (HZ)

PLOT NO =

2



Node 792 X3  
68" LVEA-PB1 LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPI



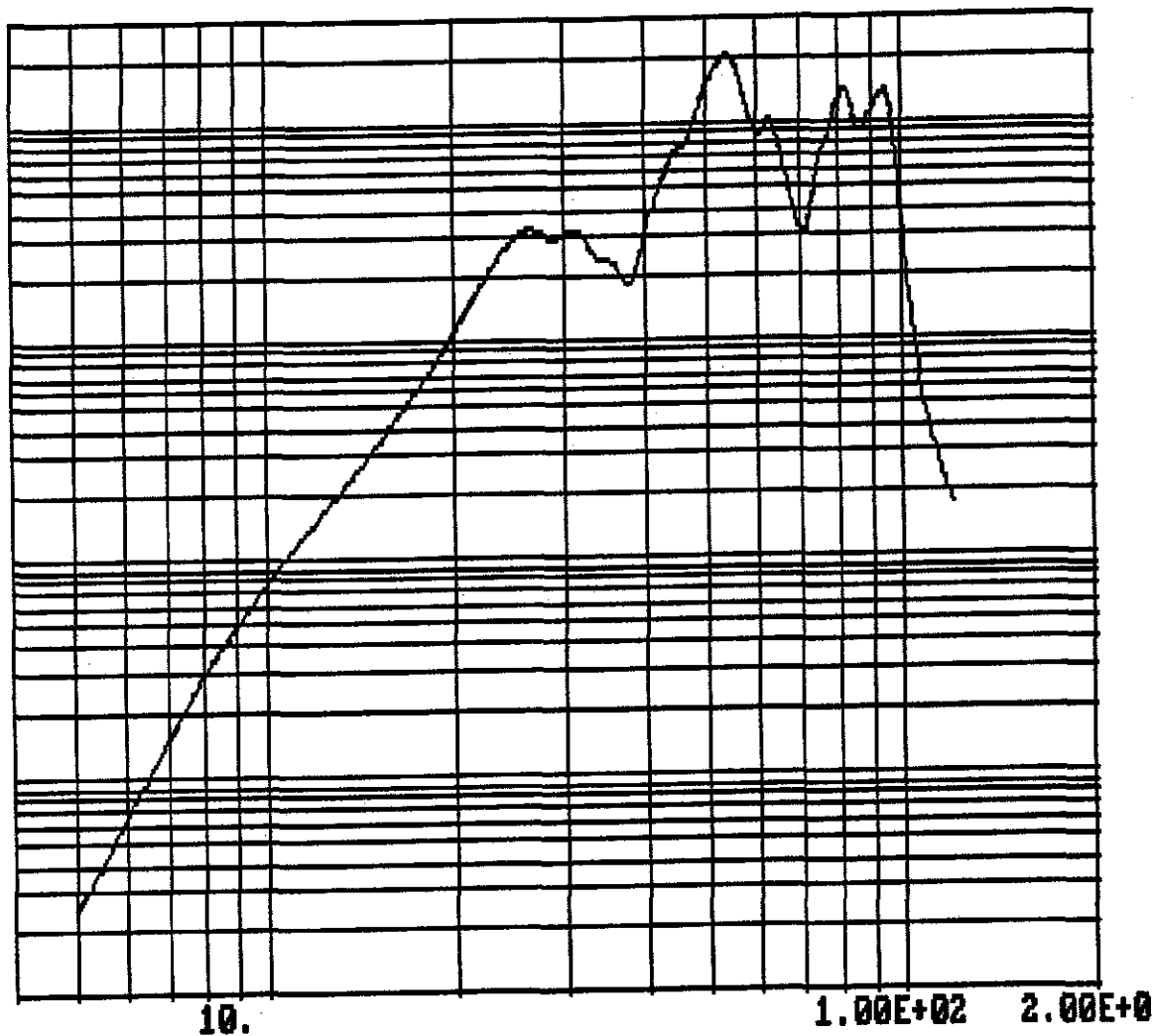
FREQUENCY (HZ)

PLOT NO =

3

Node 1520 X3  
68" LVEA-PB1 LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
P  
S  
D  
  
4  
A  
C  
C  
E  
L  
P  
S  
D  
  
3.00E-15  
1.00E-15  
  
1.00E-16  
  
1.00E-17  
  
1.00E-18  
  
1.00E-19



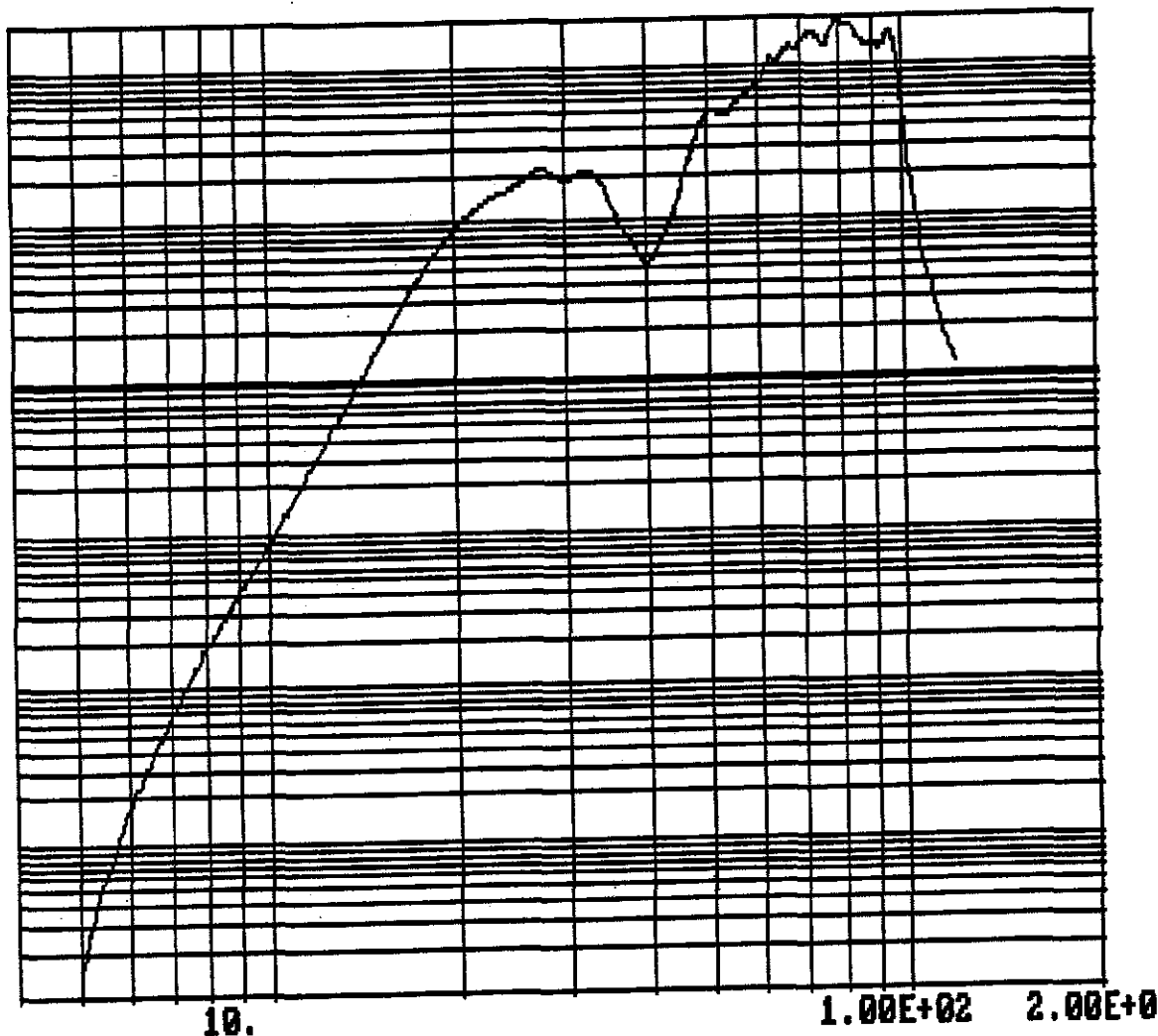
FREQUENCY (HZ)

PLOT NO =

4

Node 2183 X3  
68" LVEA-PB1 LIGO ACOUSTIC SPECT-UC (STRAIN ENERGY DAMPI

N  
O  
D  
A  
L  
  
P  
S  
D  
  
5  
  
A  
C  
C  
E  
L  
  
P  
S  
D  
  
2.00E-15  
1.00E-15  
  
1.00E-16  
  
1.00E-17  
  
1.00E-18  
  
1.00E-19  
  
1.00E-20  
  
1.00E-21



FREQUENCY (HZ)

PLOT NO =

5