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ESTRUTURA E RESOLUÇÃO DE PRESSÕES FLUTUANTES
SUA ANÁLISE RANDÔMICA NA BASE DO RESSALTO HIDRÁULICO

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```
10  REM  VELOCITY PROFILE PROGRAM

20  DEF  FN A(X) = ( INT (X * 100
      + .5)) / 100
30  DEF  FN B(X) = ( INT (X * 100
     0 + .5)) / 1000
40  DIM Y(20),ML(20),MR(20),H(20)
     ,V(20)
45  DIM DT(20,20)
50 D$ =  CHR$ (4):PR = 0
60 S1 = 0.:S2 = 0.:S3 = 0.:V(0) =
     0:Y(0) = 0
70 SG = 2.95:G = 32.2
100  HOME : PRINT : PRINT D$;"PR#
     0"
110  VTAB (1): HTAB (15): PRINT "
     MAIN MENU"
120  VTAB (7): HTAB (10): PRINT "
     1. INPUT DATA"
130  VTAB (9): HTAB (10): PRINT "
     2. VEL. AND ALPHA CALC."
140  VTAB (11): HTAB (10): PRINT
     "3. CORRECT INPUT DATA"
150  VTAB (13): HTAB (10): PRINT
     "4. LIST DATA"
160  VTAB (15): HTAB (10): PRINT
     "5. STORE DATA ON DISK"
170  VTAB (17): HTAB (10): PRINT
     "6. GET DATA FROM DISK"
180  VTAB (19): HTAB (10): PRINT
     "7. PLOT DATA"
190  VTAB (21): HTAB (10): PRINT
     "8. PRINTER TOGGLE"
192  VTAB (23): HTAB (10): PRINT
     "9. V GIVEN H, H GIVEN V"
195  IF PR = 1 THEN  PRINT D$;"PR
     #1"
200  GET ANS$: PRINT
210  IF ANS$ = "1" GOTO 1000
220  IF ANS$ = "2" GOTO 2000
230  IF ANS$ = "3" GOTO 3000
240  IF ANS$ = "4" GOTO 4000
250  IF ANS$ = "5" GOTO 5000
260  IF ANS$ = "6" GOTO 6000
270  IF ANS$ = "7" GOTO 7000
280  IF ANS$ = "8" GOTO 8000
285  IF AN$ = "9" GOTO 9000
290  GOTO 100
1000  REM  DATA INPUT
1005  HOME
1010  PRINT "ENTER RUN #(X.XXXXXX
     ),"
1013  PRINT "       Q(CFS),GO(IN),
     "
1014  PRINT "       DIST. FROM GAT
     E(FT),"
```

```
1016  PRINT "       DIST. OFFCENTE
      R(IN)."
1017  PRINT "       (RIGHT = +, LE
      FT = -)"
1018  INPUT DN,Q,GO,XP,Z
1020  PRINT
1030  PRINT "ENTER DEPTH(Y),"
1040  PRINT "       MANOMETER LEFT
      (ML),"
1050  PRINT "  AND MANOMETER RIGH
      T(MR)."
1060  PRINT "       (ALL ZEROS TO
      EXIT)"
1062  FOR I = 1 TO 30
1064  PRINT "ENTRY #";I
1070  INPUT Y(I),ML(I),MR(I)
1080  IF Y(I) <  > 0 THEN  NEXT I

1085 NP = I - 1
1090  GOTO 100
2000  REM  VELOCITY AND ENERGY
2010  REM  COEF.(AL) COMPUTATION
2015 S1 = 0:S2 = 0:S3 = 0:V(0) =
      0:Y(0) = 0
2020  FOR I = 1 TO NP
2030 H(I) =  ABS (MR(I) - ML(I))
2040 V(I) =  SQR (2 * G * (SG - 1
      ) * H(I) / 12)
2050 DY = Y(I) - Y(I - 1)
2060 VM = (V(I) + V(I - 1)) / 2
2070 S1 = S1 + DY * VM * VM * VM
2080 S2 = S2 + DY * VM
2090 S3 = S3 + DY
2100  NEXT I
2110 VM = S2 / S3
2120 AL = S1 * S3 * S3 / (S2 * S2
      * S2)
2130  GOTO 4000
3000  REM  CORRECT INPUT DATA
3005  HOME
3010  PRINT "ENTER I,Y,ML,AND MR
                (ALL ZEROS TO EXI
      T)"
3015  INPUT I,Y(I),ML(I),MR(I)
3020  IF I <  > 0 GOTO 3000
3022  PRINT "CHANGE # OF PTS.?(Y
      OR N)": GET AN$
3024  IF AN$ = "N" GOTO 100
3026  INPUT "# OF PTS.? ";NP
3030  GOTO 100
4000  REM  LIST DATA
4005  HOME
4010  PRINT "RUN # VD";DN: PRINT

4020  PRINT "Q(CFS) = "; FN A(Q);
      "          GO(IN) = "; FN A(
      GO)
4030  PRINT "          LOCATION:"
```

```
4040  PRINT XP;" FT DS. GATE
     ";Z;" INCHES OFF CENTER"
4050  PRINT : PRINT
4060  PRINT "DEPTH       MANOMETER
           DH  VELOCITY"
4070  PRINT " (FT)  LEFT(IN) RIGH
     T(IN)   (IN)    (FPS)"
4075  FOR I = 1 TO NP
4080  PRINT  FN B(Y(I));"    "; FN
     A(ML(I));"      "; FN A(MR(I)
     );"    "; FN A(H(I));"    "; FN
     A(V(I))
4085  NEXT I
4090  PRINT
4100  HTAB (15): PRINT "AVERAGE V
     ELOCITY = "; FN A(VM)
4110  HTAB (15): PRINT "ALPHA = "
     ; FN A(AL)
4115  HTAB (15): PRINT "FROUDE #
     = "; FN A(VM /  SQR (G * Y(N
     P)))
4117  PRINT D$;"PR#0"
4120  PRINT : PRINT "PRESS A KEY"
     : GET AN$: PRINT
4130  GOTO 100
5000  REM  STORE DATA ON DISK
5005  PRINT D$;"PR#0"
5010  HOME
5020  PRINT "*** PUT DATA DISK IN
      D2 ***"
5030  PRINT : PRINT "PRESS A KEY"

5040  GET AN$: PRINT
5050  PRINT D$;"OPEN";"VD"DN",D2"

5060  PRINT D$;"WRITE";"VD"DN""
5070  PRINT DN: PRINT Q: PRINT GO

5080  PRINT XP: PRINT Z
5090  PRINT SG: PRINT NP
5100  PRINT VM: PRINT AL
5110  FOR I = 0 TO NP
5120  PRINT Y(I): PRINT ML(I)
5130  PRINT MR(I): PRINT H(I)
5140  PRINT V(I)
5150  NEXT I
5160  PRINT D$;"CLOSE";"VD"DN""
5180  PRINT "DATA IS STORED ON FI
     LE VD";DN
5190  FOR D = 0 TO 1000: NEXT D
5195  IF PR = 1 THEN  PRINT D$;"P
     R#1"
5200  GOTO 100
6000  REM   GET DATA FROM DISK
6005  PRINT D$;"PR#0"
6010  HOME
6020  PRINT "*** PUT DATA DISK IN
      D2 ***"
```

```
6030  PRINT : PRINT "ENTER FILE N
      AME (VD*.******)"
6040  INPUT NA$
6050  PRINT D$;"OPEN";"NA$,D2"
6060  PRINT D$;"READ";NA$
6070  INPUT DN: INPUT Q: INPUT GO

6080  INPUT XP: INPUT Z
6090  INPUT SG: INPUT NP
6100  INPUT VM: INPUT AL
6110  FOR I = 0 TO NP
6120  INPUT Y(I): INPUT ML(I)
6130  INPUT MR(I): INPUT H(I)
6140  INPUT V(I)
6150  NEXT I
6160  PRINT D$;"CLOSE";NA$
6180  IF PR = 1 THEN  PRINT D$;"P
      R#1"
6200  GOTO 100
7000  REM  GENERAL PLOT ROUTINE
7010  REM  ** SET THE VARIABLES
7020  REM  LISTED BELOW **
7030  REM  NP=# OF PTS.
7040  REM   HX,LX=HIGH AND LOW
7050  REM  HORIZONTAL PLOT MARGIN
      S
7060  REM   HY,LY=HIGH AND LOW
7070  REM   VERTICAL PLOT MARGINS
      ,
7080  REM   GX,GY=GRID INCREM. X,
      Y
7090  REM   DT(X,Y)= ARRAY OF PLO
      T
7100  REM  POINTS.
7110  REM  NOTE: CHECK DATA PTS
7120  REM  SO THAT ALL PTS ARE
7130  REM   WITHIN THE GIVEN
7140  REM  MARGINS LX,HX,LY,HY
7150  PRINT : PRINT D$;"PR#0": HOME

7152  PRINT "ENTER <1> FOR STD.PL
      OT"
7154  PRINT "       <2> FOR DIMENS
      IONLESS PLOT"
7156  PRINT "       <3> FOR SEMILO
      G PLOT"
7158  GET FL: PRINT : PRINT
7160  IF FL <  > 2 THEN  INPUT "E
      NTER PLOT MARGINS LOW(Y),HI(
      Y),LOW(V),HI(V)";LY,HY,LX,HX
      :YX = 1:VX = 1
7162  IF FL = 2 THEN  INPUT "ENTE
      R YMAX,VMAX";YX,VX:LY = 0:HY
       = 1:LX = 0:HX = 1
7170  IF FL = 3 THEN HY =  LOG (H
      Y) /  LOG (10):LY =  LOG (LY
      ) /  LOG (10)
7180  FOR I = 1 TO NP
```

```
7190 DT(I,1) = V(I) / VX
7200 DT(I,2) = Y(I) / YX
7202  IF FL = 3 THEN DT(I,2) =  LOG
     (Y(I)) /  LOG (10)
7210  NEXT I
7220 GY = .01:GX = 1
7222  IF FL = 2 THEN GX = .1:GY =
     .1
7230 KX = 280 / (HX - LX)
7240 KY = 192 / (HY - LY)
7242  REM  FL=3 THEN KY=192/((LOG
     (HY/LY))/LOG(10))
7250  HGR2
7260  HCOLOR= 3
7270  FOR I = 1 TO NP - 2
7280 Y =  ABS ((DT(I,2) - LY) * K
     Y - 191)
7290 X = (DT(I,1) - LX) * KX
7300 Y1 =  ABS ((DT(I + 1,2) - LY
     ) * KY - 191)
7310 X1 = (DT(I + 1,1) - LX) * KX

7320  HPLOT X,Y TO X1,Y1
7330  NEXT I
7331  REM  DRAW WATER SURFACE AND
      SYMBOL
7332 Y =  ABS ((DT(I + 1,2) - LY)
      * KY - 191)
7333  IF FL = 2 GOTO 7340
7334  HPLOT 235,Y - 3 TO 239,Y -
     3: HPLOT 236,Y - 2: HPLOT 23
     8,Y - 2: HPLOT 237,Y - 1
7335  FOR I = 0 TO 270 STEP 10
7336  HPLOT I,Y TO I + 5,Y
7338  NEXT I
7340  REM  HORIZONTAL LINES
7350  FOR I = 1 TO 30
7360 Y = (191 - (I * GY - LY) * K
     Y)
7362  IF FL = 3 THEN Y = (191 - (
      LOG (I * GY) /  LOG (10) -
     LY) * KY)
7364  IF Y <  = 0 GOTO 7385
7370  HPLOT 0, ABS (Y) TO 279, ABS
     (Y)
7380  NEXT I
7385  HPLOT 0,191 TO 279,191
7390  HPLOT 0,0 TO 279,0
7400  REM  VERTICAL LINES
7410  FOR I = 0 TO 40
7420 X = I * GX * KX
7425  IF X >  = 279 GOTO 7450
7430  HPLOT X,0 TO X,191
7440  NEXT I
7450  HPLOT 279,0 TO 279,191
7460  GET AN$
7470  TEXT
7480  IF PR <  > 1 GOTO 100
```

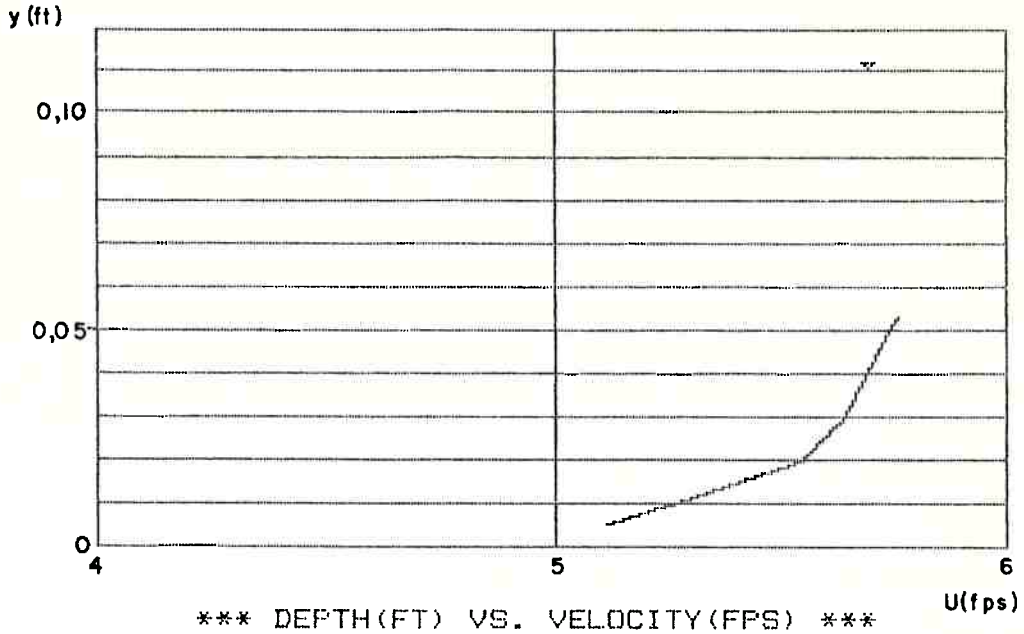
```
7490  PRINT : PRINT D$;"PR#1"
7492  IF FL = 2 THEN  HTAB (28): PRINT
      "*** Y/YMAX VS. V/VMAX ***":
      GOTO 7510
7500  HTAB (22): PRINT "*** DEPTH
      (FT) VS. VELOCITY(FPS) ***"
7510  PRINT : HTAB (20): PRINT "V
      ERTICAL LINES AT:": HTAB (40
      )
7512  PRINT LX;",";LX + GX;", TO
      ";HX
7520  HTAB (20): PRINT "HORIZONTA
      L LINES AT:"
7522  IF FL <  > 3 THEN  HTAB (40
      ): PRINT LY;",";LY + GY;", T
      O ";HY: GOTO 7540
7524  HTAB (40): PRINT  EXP (LY *
       LOG (10));",";GY;",";GY * 2
      ;", TO "; EXP (HY *  LOG (10
      ))
7540  REM  HARD COPY ROUTINE
7550  PRINT : PRINT D$;"PR#0"
7560 F =  FRE (0)
7570  FLASH
7580  HOME
7590  PRINT "HARD COPY IN PROGRES
      S PLEASE WAIT"
7600  NORMAL
7610  PRINT D$;"PR#1"
7620  HTAB (18): PRINT "RUN #VD";
      DN;"     ";XP;" FT. DOWNSTREA
      M GATE"
7630  PRINT  CHR$ (9);"G2"
7640  PRINT D$;"PR#0": HOME
7650  GOTO 100
8000  REM  PRINTER TOGGLE
8010  HOME : PRINT D$;"PR#0"
8020  PRINT "ENTER (Y) TO TURN ON
       PRINTER": GET AN$: PRINT
8040  IF AN$ = "Y" THEN  PRINT D$
      ;"PR#1":PR = 1: GOTO 100
8050  PRINT D$;"PR#0":PR = 0
8060  GOTO 100
9000  REM  V GIVEN HM OR
9010  REM  HM GIVEN V
9015  HOME
9020  INPUT "ENTER (1) FOR V, (2)
       FOR HM ";FF
9030  IF FF = 2 GOTO 9100
9040  PRINT : INPUT "HM = ? INCHE
      S (ZERO TO EXIT) ";HM
9050  IF HM = 0 GOTO 100
9060 VC =  SQR (2 * G * (SG - 1) *
      HM / 12)
9070  PRINT "VELOCITY = ";VC;" FP
      S"
9080  GOTO 9040
```

```
9100  PRINT : INPUT "V = ? FPS (Z
     ERO TO EXIT) ";VC
9110  IF VC = 0 GOTO 100
9120 HM = VC * VC * 12 / (2 * G *
     (SG - 1))
9130  PRINT "HM = ";HM;" INCHES"
9140  GOTO 9100

]
```

*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=2.94
(END)

VERTICAL LINES AT:
4,5, TO 6
HORIZONTAL LINES AT:
0,.01, TO .12

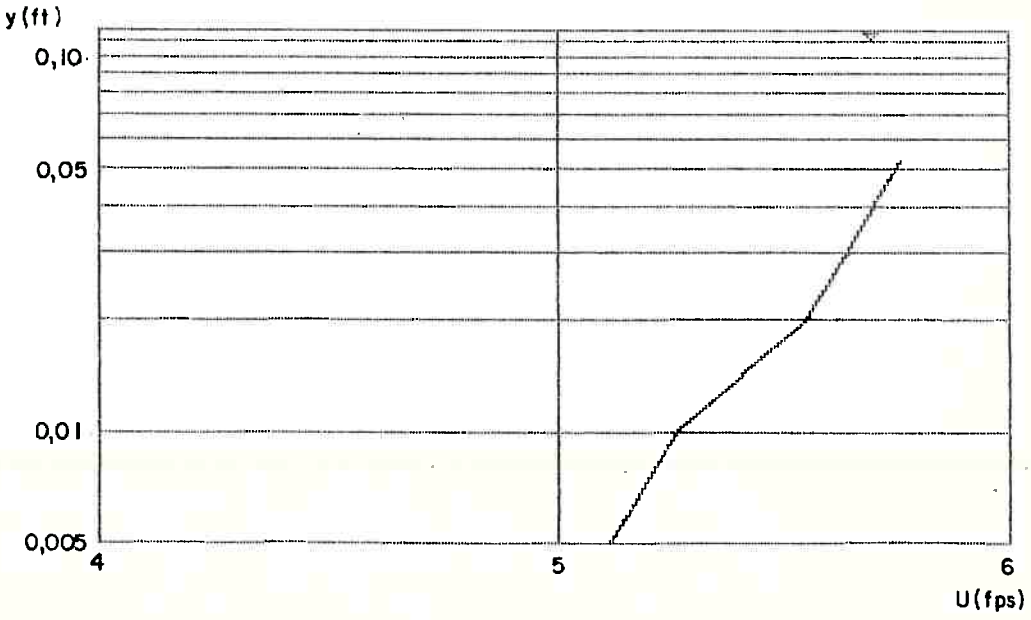
RUN #VD5.012912 1 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
4,5, TO 6
HORIZONTAL LINES AT:
5E-03,.01,.02, TO .12

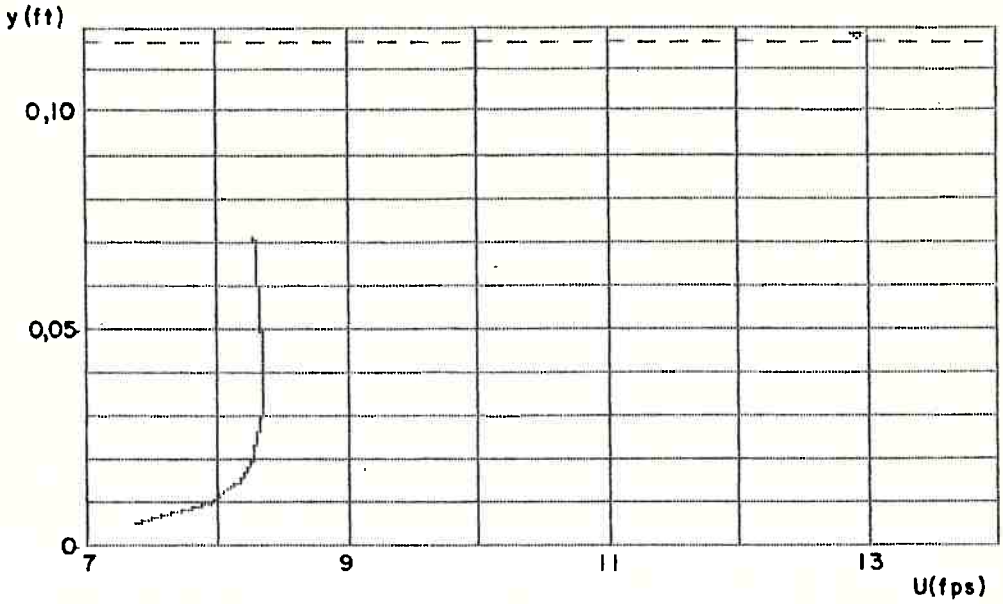
RUN #VD5.012912 1 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** **F1=4.18**
(END)

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
0,.01, TO .12

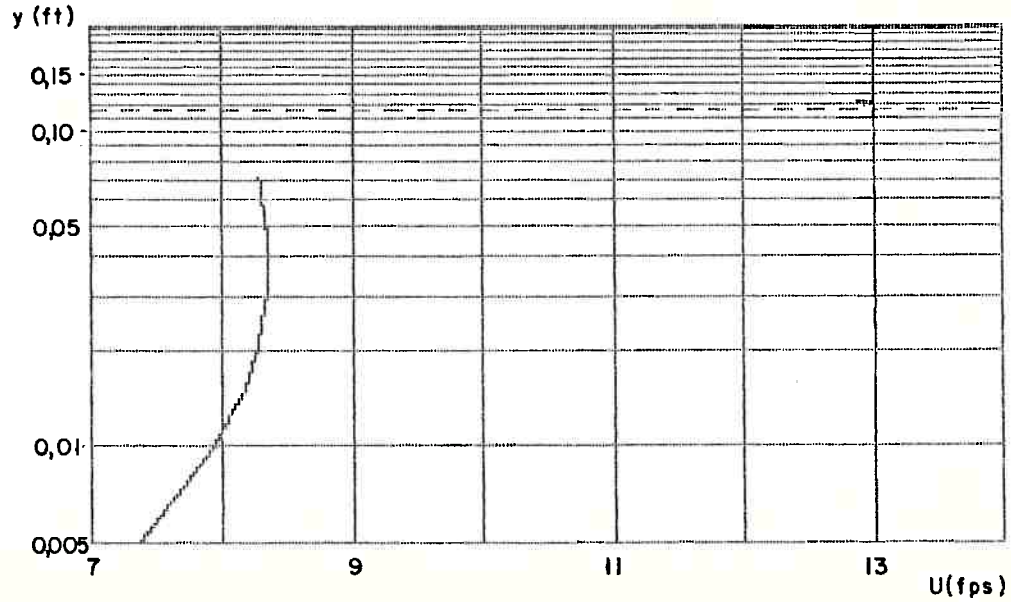
RUN #VD5.030204 .708 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
5E-03,.01,.02, TO .22

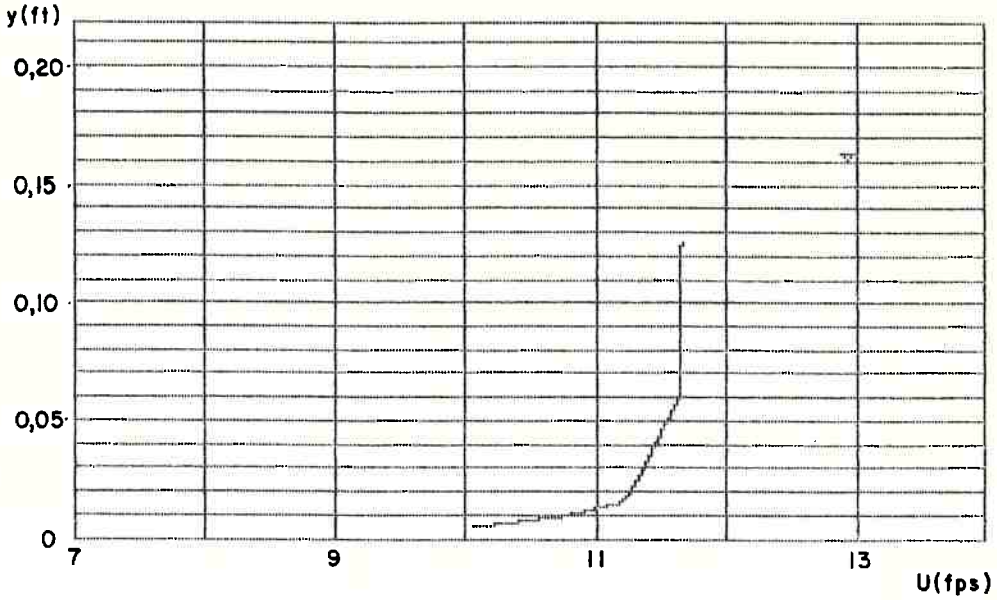
RUN #VD5.030204 .708 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=5.00
(END)

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
0,.01, TO .22

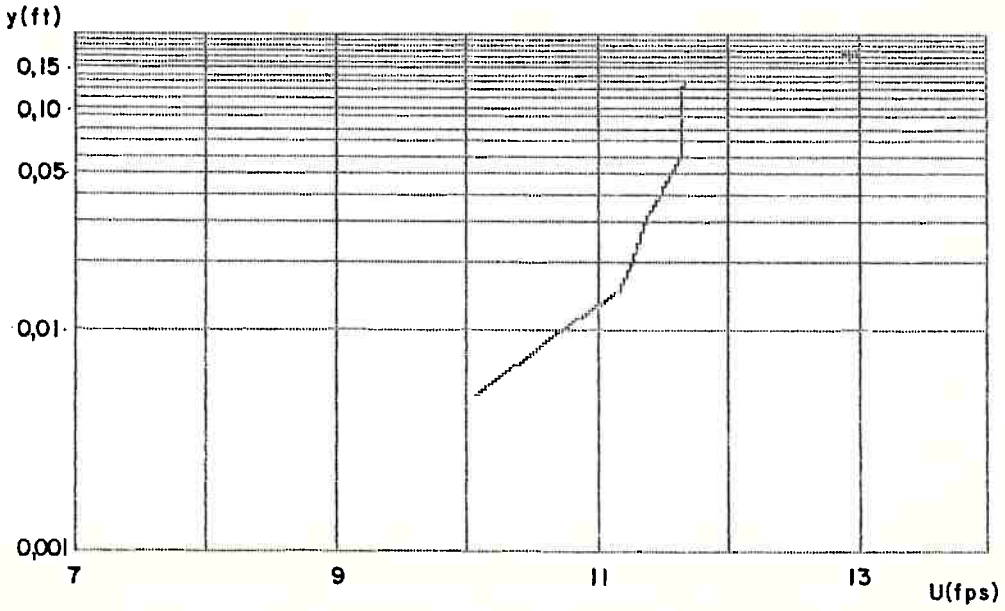
RUN #VD5.022709 .72 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .22

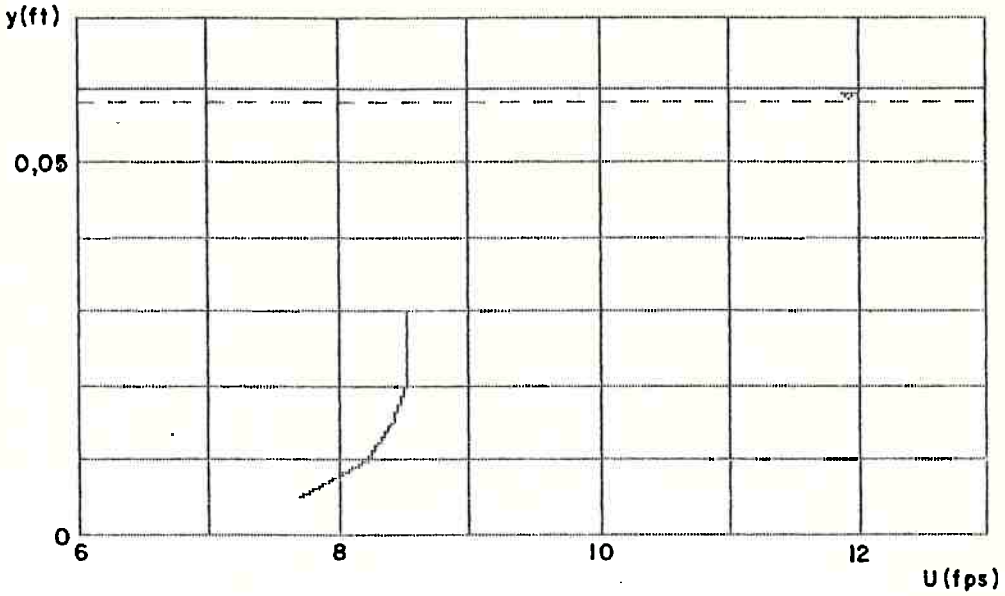
RUN #VD5.022709 .72 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=5.90
(END)

VERTICAL LINES AT:
6,7, TO 13
HORIZONTAL LINES AT:
0,.01, TO .07

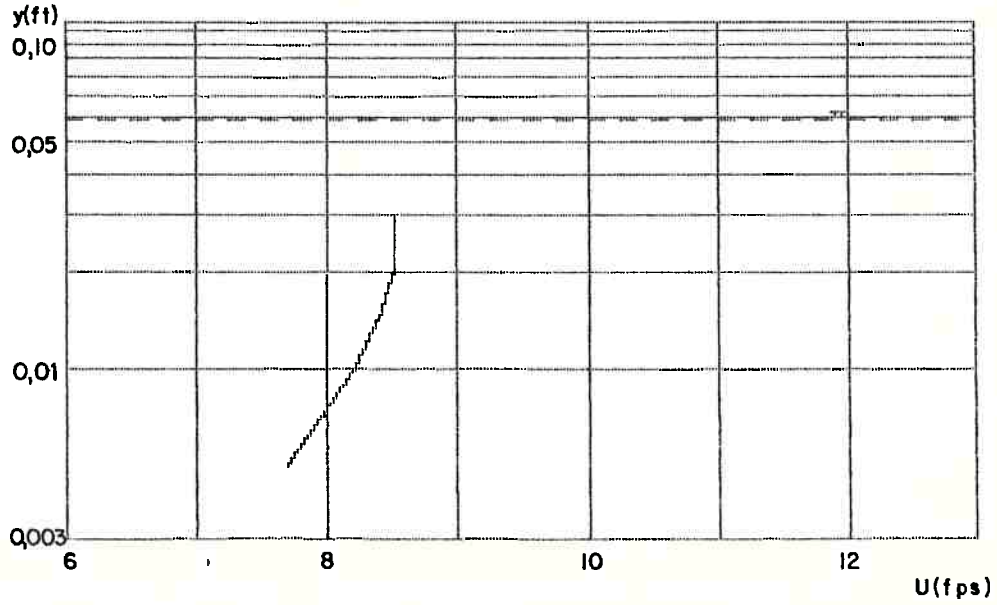
RUN #VD5.031302 .75 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
6,7, TO 13
HORIZONTAL LINES AT:
3E-03,.01,.02, TO .12

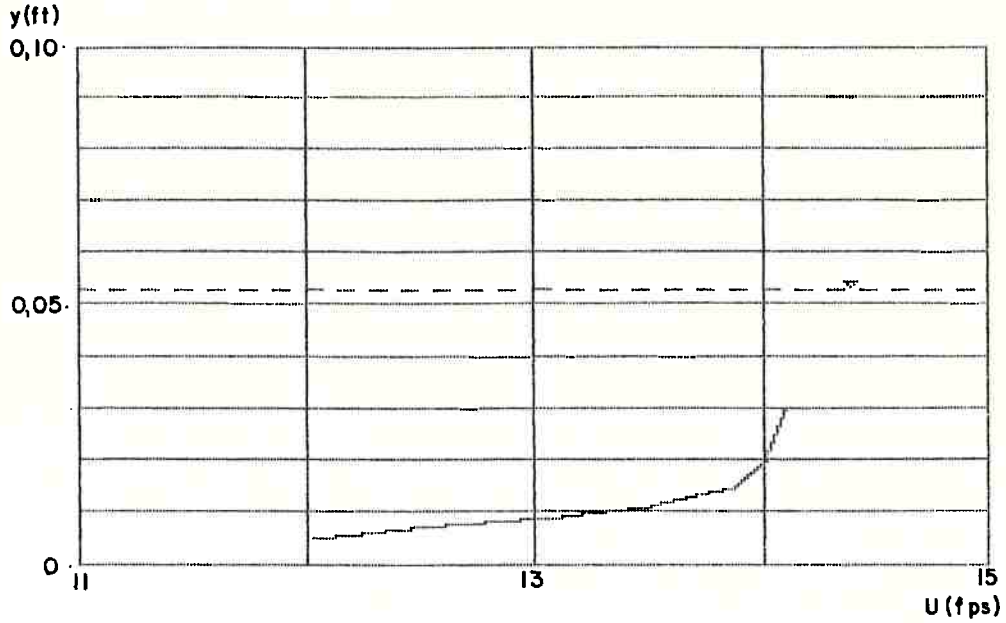
RUN #VD5.031302 .75 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=10.06
(END)

VERTICAL LINES AT:
11,12, TO 15
HORIZONTAL LINES AT:
0,.01, TO .1

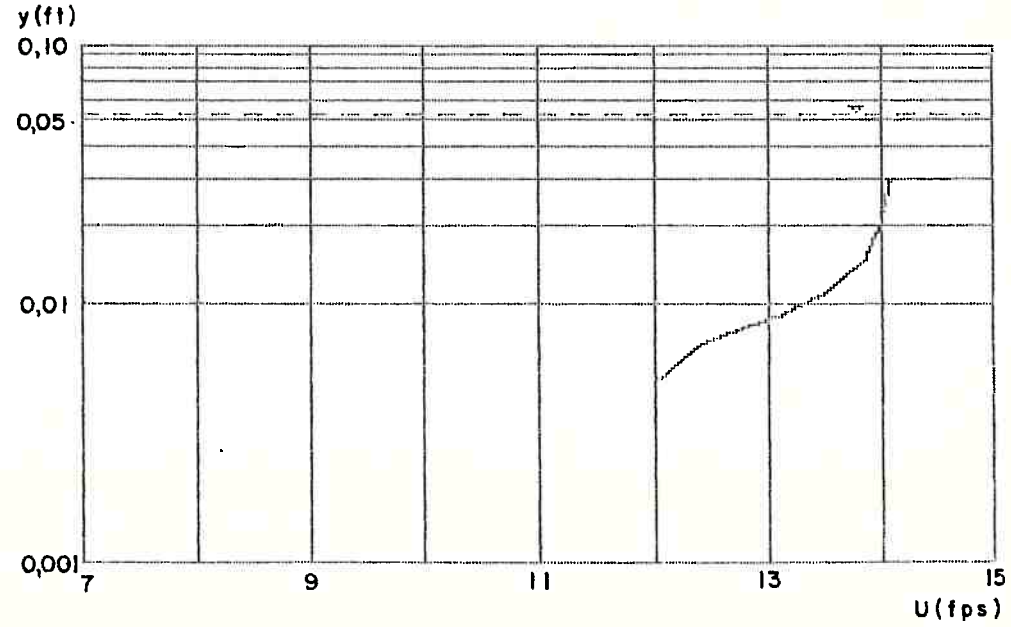
RUN #VD5.012901 .802 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
7,8, TO 15
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .1

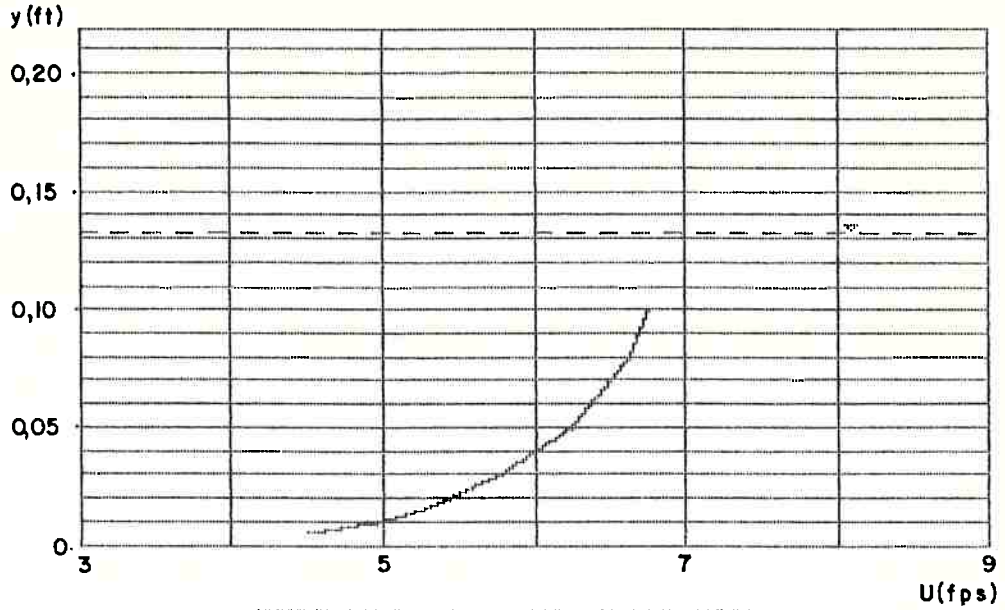
RUN #VD5.012901 .802 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=2.98
(ED)

VERTICAL LINES AT:
3,4, TO 9
HORIZONTAL LINES AT:
0,.01, TO .22

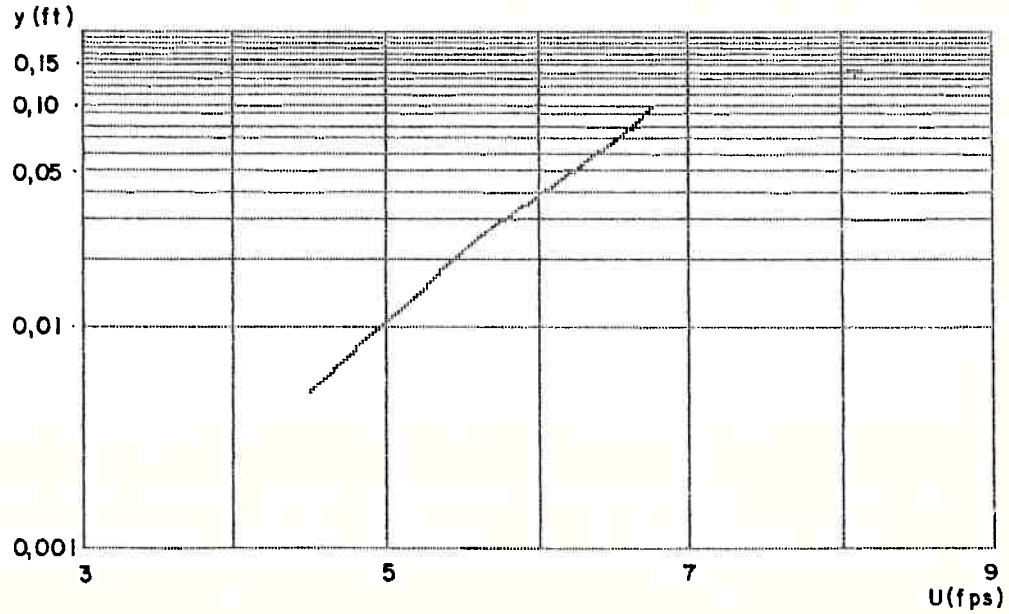
RUN #VD5.030602 7.29 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
3,4, TO 9
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .22

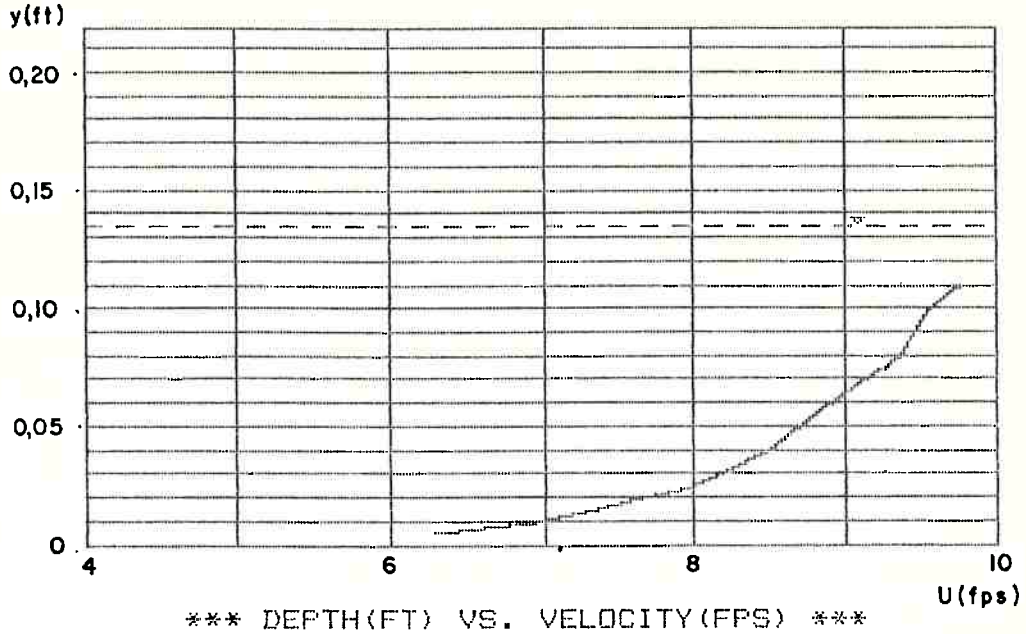
RUN #VD5.030602 7.29 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=4.17 (ED)

VERTICAL LINES AT:
4,5, TO 10
HORIZONTAL LINES AT:
0,.01, TO .22

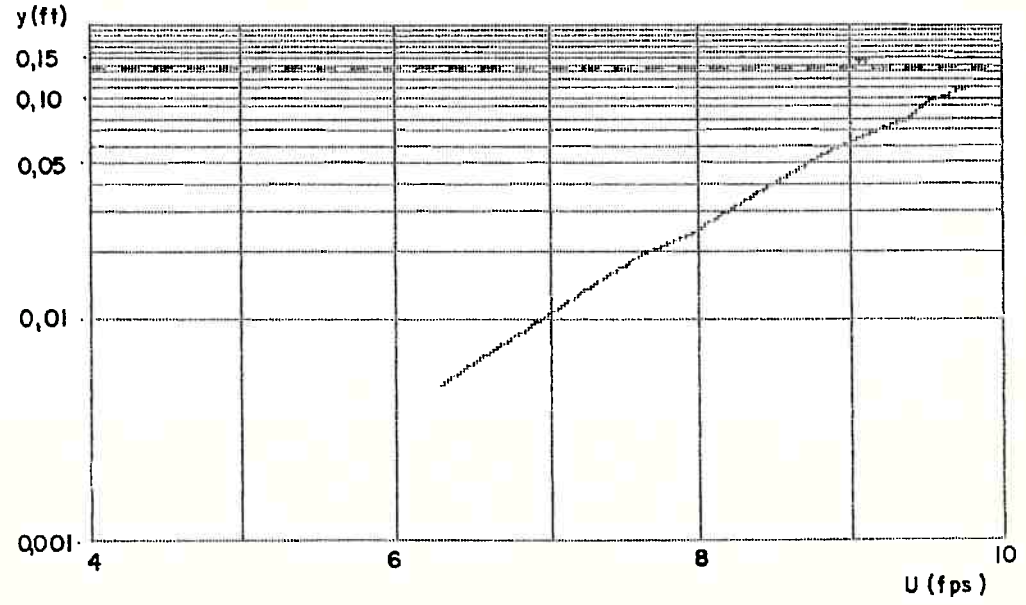
RUN #VD.020801 7.17 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
4,5, TO 10
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .22

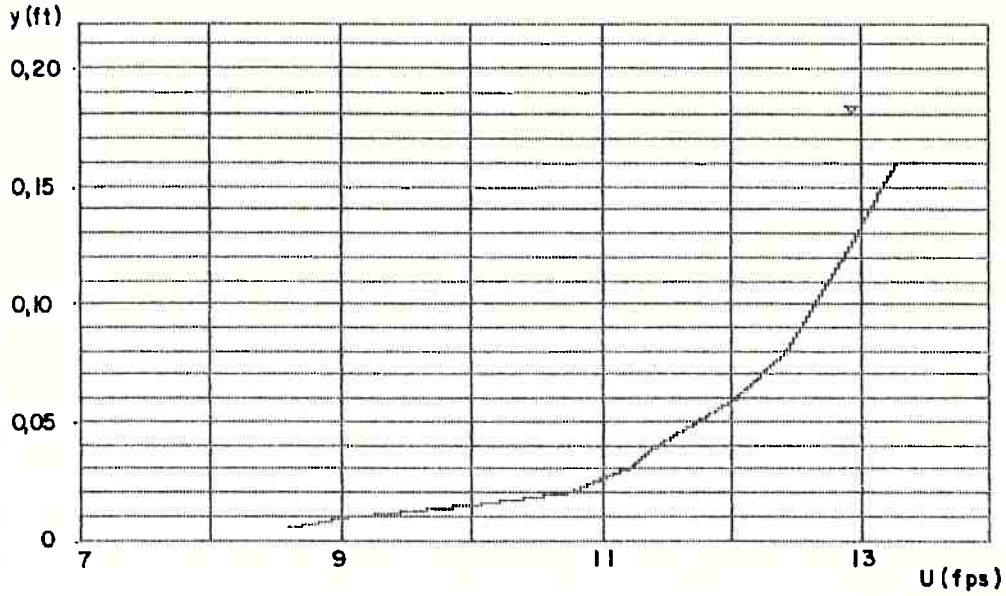
RUN #VD.020801 7.17 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=5.00
(ED)

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
0,.01, TO .22

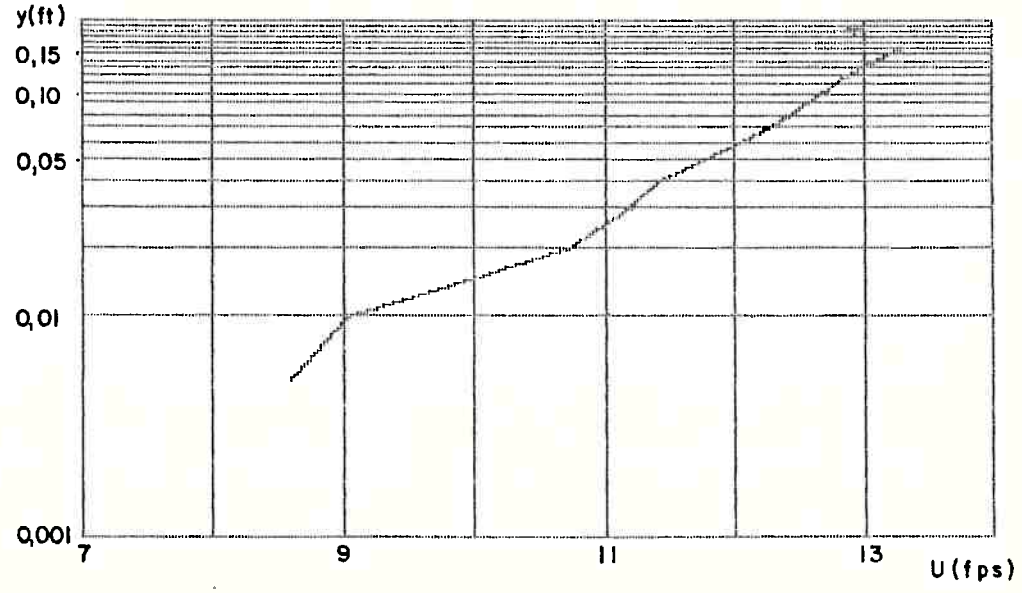
RUN #VD5.021901 7.08 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .22

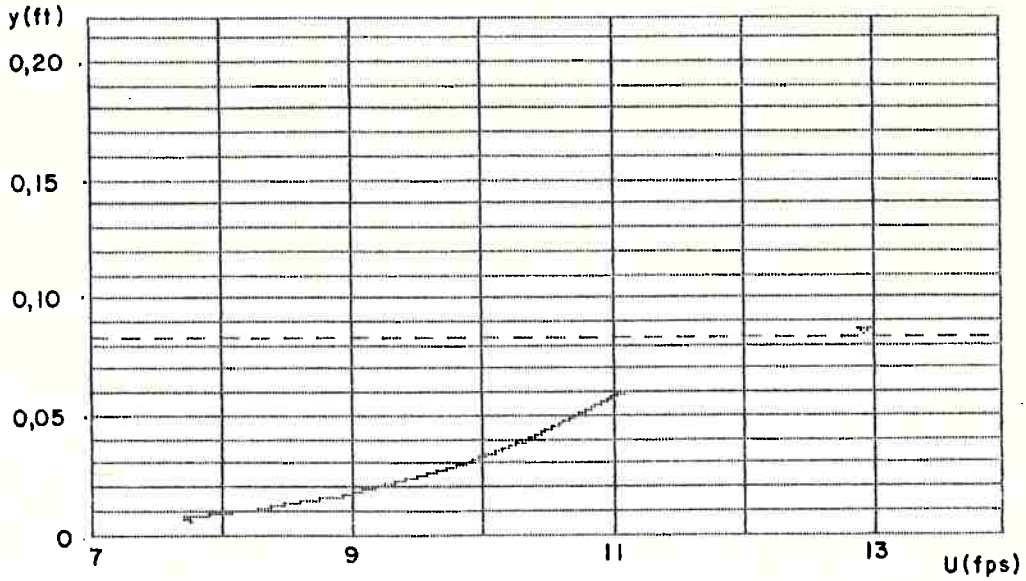
RUN #VD5.021901 7.08 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) *** F1=5.98 (E D)

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
0,.01, TO .22

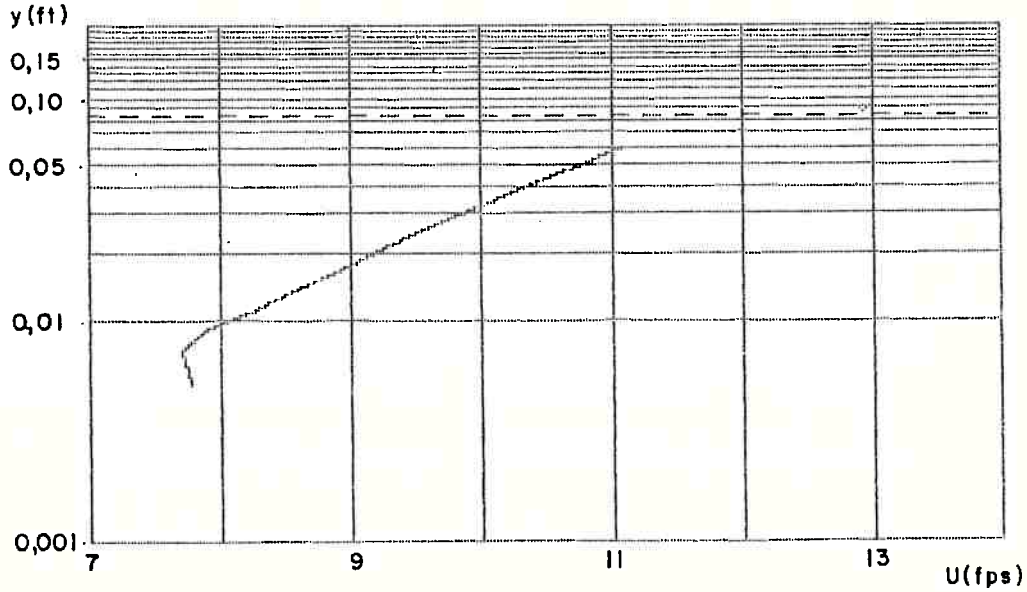
RUN #VD.012201 7.42 FT. DOWNSTREAM GATE



*** DEPTH(FT) VS. VELOCITY(FPS) ***

VERTICAL LINES AT:
7,8, TO 14
HORIZONTAL LINES AT:
1E-03,.01,.02, TO .22

RUN #VD.012201 7.42 FT. DOWNSTREAM GATE



```
10  REM  PROG."PLOT TEXT DATA" 1/
    10/85
20  REM  ROUTINE TO GET TEXT DATA
     FILES AND PLOT A HARD COPY
30  HOME :HF = 0:LF = 0
40 D$ =  CHR$ (4)
50  DIM DTA(280)
60  HOME : PRINT "PUT TEXT DATA F
    ILES IN DRIVE 2"
70  PRINT D$;"PR#1"
80  PRINT : PRINT "ENTER RUN # (.
    XXXXXX),"
90  PRINT "       STARTING FILE #,
    "
100  PRINT "       ENDING FILE #,"

110  PRINT "       TRANSDUCER #,"
120  PRINT "       CALIBRATION COE
    F. FT/COUNT),"
130  PRINT "       SAMPLE RATE (SA
    MPLES/SEC),"
140  PRINT "       INITIAL TIME (S
    EC),"
150  PRINT "       ZERO READING (C
    OUNTS),"
160  PRINT "       DATA AVERAGE (C
    OUNTS),"
170  PRINT "       AND RESOLUTION
    (PLOT PTS./FT) TRY 180."
180  INPUT DN,J,NF,TN,W,SR,IT,Z,D
    A,M
190 K = TN
200  REM  PLOT HEADING
210  PRINT : PRINT : PRINT "*** P
    LOT OF PRESSURE (FT) VERSUS
    TIME (SEC) ***"
220  PRINT "      -- ROTATED CLOCK
    WISE 90 DEGREES"
230  PRINT "      -- VERTICAL ORIG
    IN AS THE AVERAGE PRESSURE =
     ";(DA - Z) * W;" FT."
240  PRINT "         (CENTERED DOT
    TED LINE)"
250  PRINT "      -- HORIZONTAL OR
    IGIN = ";IT;" SEC."
260  PRINT "      -- HORIZONTAL LI
    NES EVERY 0.10 FT. AROUND CE
    NTER"
270  PRINT "      -- VERTICAL LINE
    S EVERY 0.50 SEC."
280  PRINT "         (SAMPLE RATE
    = ";SR;" SAMPLES/SEC)"
285  PRINT : PRINT : PRINT
290  PRINT D$;"PR#0"
300  HOME : PRINT "PROCESSING DT"
    ;DN;K;J
```

J

```
310  PRINT D$;"OPEN";"DT"DN""K""J
     ",D2"
320  PRINT D$;"READ";"DT"DN""K""J
     ""
330  REM  ADJUST DATA FOR PLOTTIN
     G
340  FOR I = 0 TO 279: INPUT D
350  REM  CALC. DEVIATION FROM ME
     AN AND ADD
360 DTA(I) = (D - DA) * W * M + 9
     6
370  IF DTA(I) > 191 THEN DTA(I) =
     191:HF = HF + 1
380  REM   PREVENT PLOT LIMITS FR
     OM BEING EXCEEDED (0 TO 191
     VERT AND 0 TO 279 HOR)
390  IF DTA(I) < 0 THEN DTA(I) =
     0:LF = LF + 1
400  NEXT I
410  PRINT D$;"CLOSE";"DT"DN""K""
     J""
420  GOSUB 530
430 J = J + 1: IF J > NF GOTO 450

440  GOTO 300
450  PRINT D$;"PR#1": PRINT : HOME

460  IF HF > 0 THEN  PRINT "*** M
     AX. PLOT LIMIT WAS EXCEEDED
     ";HF;" TIME(S)"
470  IF LF > 0 THEN  PRINT "*** M
     IN. PLOT LIMIT WAS EXCEEDED
     ";LF;" TIME(S)"
475  PRINT : PRINT : PRINT
480  INPUT "ENTER NEW START AND E
     ND FILE #S, AND NEW INITIAL
     TIME (0,0,0 TO END)";J,NF,IT

490 XZ = 0
500  PRINT D$;"PR#0"
510  IF J = 0 GOTO 980
520  GOTO 300
530  REM  SUBROUTINE FOR PLOT SET
     UP
540  IF W = 0 THEN W = .025
550  HOME
560  HGR2
570  HCOLOR= 3
580  FOR I = 0 TO 279
590 Y =  ABS (DTA(I) - 191)
600 X = I
610  IF I = 279 THEN  GOTO 640
620 Y1 =  ABS (DTA(I + 1) - 191)
630 X1 = I + 1
640  HPLOT X,Y TO X1,Y1
650  NEXT I
660  REM  VERTICAL LINES
```

```
670  REM      PLOT 0.1 FT. DIVISIO
     NS AROUND MEAN LINE OF 96
680  FOR I = 1 TO 20
690 X = I * M / 10
700  IF X > 95 GOTO 760
710 Y = 96 - X
720  HPLOT 0,Y TO 279,Y
730 Y1 = 96 + X
740  HPLOT 0,Y1 TO 279,Y1
750  NEXT I
760  FOR I = 0 TO 270 STEP 10
770  HPLOT I,96 TO I + 5,96
780  NEXT I
790  REM  HORIZONTAL LINES
800  FOR I = 0 TO 50
810 X = I * SR / 2 + XZ
820  IF X > 279 GOTO 850
830  HPLOT X,Y TO X,Y1
840  NEXT I
850 XZ = X - 279
860  IF F = 1 THEN  GET ANS$
870  TEXT
880  REM  HARD COPY ROUTINE
890 F =  FRE (0)
900  FLASH
910  HOME
920  PRINT "HARD COPY IN PROGRESS
      PLEASE WAIT"
930  NORMAL
940  PRINT D$;"PR#1"
950  PRINT  CHR$ (9);"GR2"
960  PRINT D$;"PR#0"
970  RETURN
980  HOME : PRINT "PROGRAM END"

]
```

```
10  REM  THIS PROGRAM COMPUTES TH
     E CALIBRATION COEFF. FOR EAC
     H TRANSDUCER, BY READING TRA
     NSDUCER WITH KNOWN HEIGHT OF
      WATER.
20  REM   VARIABLE NUMBER OF TRAN
     SDUCERS ALLOWED
30 D$ =  CHR$ (4)
40  HOME
42  PRINT D$;"IN#2": PRINT D$;"PR
     #2"
44  INPUT ":";A$
46  PRINT D$;"IN#0": PRINT D$;"PR
     #0"
50  INPUT "PRINT CODE (NO HARD CO
     PY = 0,HARD COPY = 1),NUMBER
      OF TRANSDUCERS ";PC,NT
60  DIM T(NT),C(NT),Z(NT),ZI(NT),
     ZF(NT)
70  DIM K(NT),S(NT),R(NT),W(NT),A
     (NT),TT(NT)
80  DIM WM(NT,20),HAM(20),HBM(20)
     ,ZM(NT,20),RM(NT,20)
90 N = 1
100 CO = 4 * 16 + 49280
110  FOR I = 1 TO NT
120  INPUT "INPUT TRANSDUCER NUMB
     ER ";T(I)
130 S(I) = 0.0:K(I) = 0.0:TT(I) =
     0.0:W(I) = 0.0
140 C(I) = T(I) + CO
150  NEXT I
160  REM   THE ZERO TRANSDUCER RE
     ADINGS SHOULD BE TAKEN
170  INPUT "ENTER POINT GAGE ZERO
     , INITIAL DEPTH ";HO,HA
180  PRINT "THE INITAIL READINGS
     ARE:"
190  PRINT
200  FOR I = 1 TO NT
210 DUM =  PEEK (C(I))
220 Z(I) =  PEEK (C(I))
230 ZI(I) = Z(I)
240  PRINT "#";T(I);" = ";ZI(I)
250  NEXT I
260  REM   STORE ZERO READING HEI
     GHT
270 HZ = HA: PRINT : PRINT
280  PRINT D$;"PR#"PC""
285  HTAB (20): PRINT A$: PRINT :
      PRINT
290  PRINT "THE POINT GAGE ZERO =
      ";HO: PRINT : PRINT
300  PRINT D$;"PR#0"
310  INPUT "INCREASE WATER DEPTH
     AND ENTER NEW PT. GAGE READI
     NG (0 TO END) ";HB
```

```
320  IF HB = 0 GOTO 580
330  FOR I = 1 TO NT
340 DUM =  PEEK (C(I))
350 R(I) =  PEEK (C(I))
360  IF R(I) <  > Z(I) GOTO 390
370 K(I) = T(I):W(I) = 0.0: GOTO
     420
380  REM   DETERMINE HEIGHT /TRAN
     SDUCER COUNT FOR EACH TRANSD
     UCER
390 W(I) = (HB - HA) / (R(I) - Z(
     I))
400 S(I) = S(I) + W(I)
410 HAM(N) = HA:HBM(N) = HB:ZM(I,
     N) = Z(I):RM(I,N) = R(I)
420  NEXT I
430  REM   PRINT COEFFICIENTS FOR
      EACH HEIGHT READING
440  HOME
450  PRINT : PRINT "***TEST #";N;
     "***"
460  PRINT "FOR DEPTH CHANGE FROM
      ";HA;" TO ";HB
470  PRINT : PRINT "            RE
     ADINGS         COEFFICIENT"
480  FOR I = 1 TO NT
490  PRINT : PRINT "TRANSDUCER#";
     T(I);"  ";Z(I);;" AND ";R(I)
     ;"   ";W(I)
500  NEXT I
510  PRINT : PRINT
520 HA = HB
530  FOR I = 1 TO NT
540 Z(I) = R(I):WM(I,N) = W(I): NEXT
     I
550 N = N + 1
560  PRINT : PRINT
570  GOTO 310
580  REM  IF CALIBRATION IS COMPL
     ETE, FIND AVERAGE AND TOTAL
     COEF.
590  HOME
600  PRINT "DRAIN WATER TO INITIA
     L DEPTH FOR A RECHECK OF THE
      READING THERE, HIT ANY KEY
     TO CONTINUE ": GET ANS$
610  FOR I = 1 TO NT
620 A(I) = S(I) / (N - 1)
630  IF R(I) = ZI(I) THEN  GOTO 6
     50
640 TT(I) = (HA - HZ) / (R(I) - Z
     I(I))
645 ZR(I) = ZI(I) - (HZ - HO) * (
     1 / A(I))
650 DUM =  PEEK (C(I))
660 ZF(I) =  PEEK (C(I))
670  NEXT I
680  PRINT : PRINT
690  PRINT D$;"PR#"PC""
```

```
700  PRINT : PRINT "***SUMMARY OF
      ";N - 1;" TESTS***": PRINT

710  PRINT "FOR H FROM ";HZ;" TO
     ";HA
720  PRINT : PRINT " READINGS
               AVE.COEF          TO
     T.COEF.        ZERO READING"
730  PRINT "          (COUNT)
              (FT/COUNT)
            (COUNT)"
740  FOR I = 1 TO NT
750  PRINT "T#";T(I);"    ";ZI(I);
     " TO ";R(I);"    ";A(I);"    "
     ;TT(I);"    ";ZR(I)
760  NEXT I
770  PRINT : PRINT : PRINT : PRINT

780  FOR I = 1 TO NT: PRINT
790  PRINT "INITIAL TRANSDUCER #"
     ;T(I);" READING WAS ";ZI(I)
800  PRINT "FINAL TRANSDUCER #";T
     (I);" IS ";ZF(I)
810  IF K(I) <  > 0.0 THEN  PRINT
     "INVALID RESULTS FOR TRANSDU
     CER #";K(I)
820  NEXT I
830 NM = N - 1
840  REM  PLOT ROUTINE
850  HOME
860  REM  ADJUST DATA VALUES FOR
     PLOTTING
880  FOR I = 1 TO NT
890 TEST = 0
900  PRINT : PRINT : PRINT : PRINT
     "***TRANSDUCER #";T(I);" ***
     "
905  PRINT "          (FEET)    (C
     OUNT)    (FT/COUNT)"
910  PRINT : PRINT "TEST       DEP
     TH    READINGS    COEFFICIENT"

920  FOR J = 1 TO NM
930 TEST = TEST + 1
940  PRINT : PRINT "#";TEST;"    "
     ;HAM(J);" TO ";HBM(J);"    ";
     ZM(I,J);" TO ";RM(I,J);"    "
     ;WM(I,J)
950  NEXT J
960 CL = 191 / (2 * A(I))
970 TA =  ABS (TT(I) * CL - 191)
980  IF TA > 191 THEN TA = 191
990  FOR J = 1 TO NM
1000 WM(I,J) = WM(I,J) * CL
1010  IF  ABS (WM(I,J)) > 191 THEN
     WM(I,J) = 191
1020  NEXT J
1040  REM  PLOT DATA
```

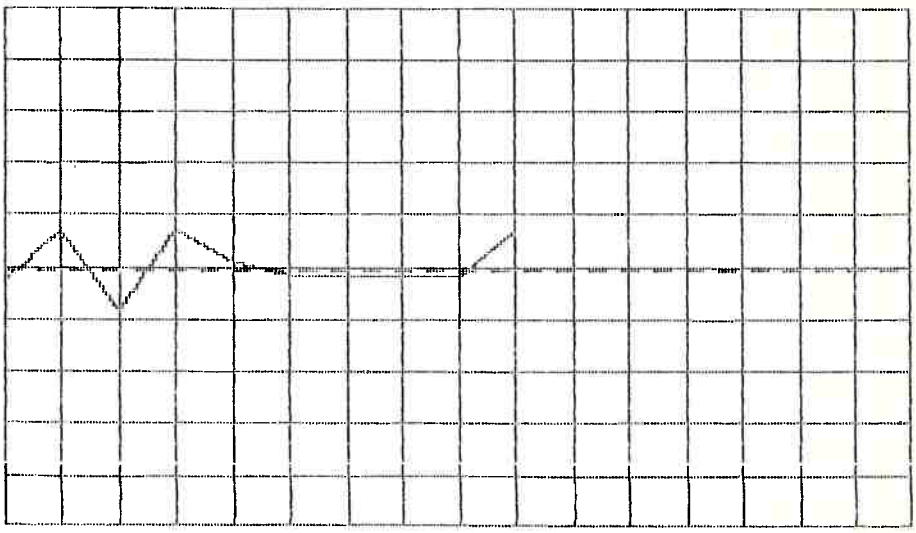
```
1050  PRINT : PRINT : PRINT "***
     PLOT OF CALIBRATION COEFFICI
     ENT VS. RUN # FOR TRANSDUCER
      #";T(I);" ***"
1060  PRINT : PRINT "(ONE VERT. D
     IV. = 20% OF AVE. COEF.)(CEN
     TER OF PLOT = AVE. COEF.)"
1070  PRINT "(ONE HORZ. DIV. = ON
     E RUN           )(DASHED LINE
      = TOT. COEF.)": PRINT
1080  HGR2
1090  HCOLOR= 3
1100  FOR J = 1 TO (NM - 1)
1110  IF WM(I,J) < 0 GOTO 1190
1120 Y =  ABS (WM(I,J) - 191)
1130 X = (J * 17.5) - 17.5
1140  IF X >  = 279 GOTO 1180
1150  IF WM(I,J + 1) < 0 GOTO 119
     0
1160 Y1 =  ABS (WM(I,J + 1) - 191
     )
1170 X1 = J * 17.5
1180  HPLOT X,Y TO X1,Y1
1190  NEXT J
1200  REM  PLOT HORZ. AND VERT. D
     IVISIONS
1210  REM  10 HORZ. LINES EACH EQ
     UAL TO 20 PERCENT OF THE AVE
      (PLOTTED IN THE MIDDLE)
1220  FOR H = 0 TO 9
1230 Y = 19.2 * H
1240  HPLOT 0,Y TO 279,Y
1250  NEXT H
1260  HPLOT 0,191 TO 279,191
1270  REM  ONE VERT. LINE FOR EAC
     H RUN (20 RUNS MAX)
1280  FOR H = 0 TO 15
1290 X = H * 17.5
1300  HPLOT X,0 TO X,191
1310  NEXT H
1320  HPLOT 279,0 TO 279,191
1330  REM  PLOT THE OVER ALL COEF
     . AS A DASHED LINE
1340  FOR H = 0 TO 270 STEP 10
1350  HPLOT H,TA TO H + 5,TA
1360  NEXT H
1370  TEXT : PRINT D$;"PR#0"
1380  HOME : PRINT "HARD COPY IN
     PROGRESS PLEASE WAIT"
1390  PRINT D$;"PR#"PC""
1400  PRINT  CHR$ (9);"G2"
1410  PRINT : PRINT : PRINT : PRINT
     : PRINT
1420  NEXT I
1430  PRINT D$;"PR#0"
1440  PRINT "PROGRAM END"
```

***TRANSDUCER #14 ***

TEST	DEPTH (FEET)	READINGS (COUNT)	COEFFICIENT (FT/COUNT)
#1	.869 TO 1.2	83 TO 115	.01034375
#2	1.2 TO 1.3	115 TO 123	.0125
#3	1.3 TO 1.4	123 TO 134	9.0909091E-03
#4	1.4 TO 1.5	134 TO 142	.0125
#5	1.5 TO 1.6	142 TO 151	.0111111111
#6	1.6 TO 1.8	151 TO 170	.0105263158
#7	1.8 TO 2	170 TO 189	.0105263158
#8	2 TO 2.2	189 TO 208	.0105263158
#9	2.2 TO 2.4	208 TO 227	.0105263158
#10	2.4 TO 2.5	227 TO 235	.0125

*** PLOT OF CALIBRATION COEFFICIENT VS. RUN # FOR TRANSDUCER #14 *

(ONE VERT. DIV. = 20% OF AVE. COEF.)(CENTER OF PLOT = AVE. COEF.)
(ONE HORZ. DIV. = ONE RUN)(DASHED LINE = TOT. COEF.)



```
10  REM   SIMSAM
20  REM  !INTEGER D,DT,E,I,NN,M,J
    ,JM,K,NT,T(4)
30  REM  SIMULTANEOUS SAMPLE
40  REM   ROUTINE (<=4 CHAN.)
42  REM  <39500 PTS. TOT.
44  REM  <32768 PTS./TRANSDUCER
50  HIMEM: 48499
55  DEF  FN A(XX) =  INT (XX * 10
    0 + .5) / 100
60 D$ =  CHR$ (4):M = 9000:J = 1:
     HOME : GOSUB 3000
100  PRINT D$;"BLOAD FS2,A$BD74,D
    1"
110  PRINT "*** PUT DATA DISK IN
    D2 ***": PRINT
120  PRINT D$;"PR#1"
130  PRINT "SIMSAM     ";A$: PRINT

140  PRINT "FIRST DATA #,TOT. # O
    F PTS.,RATE FACTOR,# OF TRAN
    SDUCERS,TOE LOCATION REL. TO
     GATE (IN.),Y1,AND # OF RUNS
    .": PRINT : INPUT DN,N,E,NT,
    X,Y1,JM
141  PRINT "ENTER TRANSDUCER # AN
    D LOCATION REL. TO GATE (IN.
    )"
142  FOR K = 1 TO NT
144  PRINT "(";K;")"
146  INPUT T(K),XT(K)
148  NEXT K
150  PRINT : PRINT "#1 MEMORY ADD
    RESS = ";M: PRINT : PRINT : PRINT
    D$;"PR#0"
160  POKE 48501,T(1) + 192: POKE
    48509,T(1) + 192: POKE 48515
    ,T(2) + 192: POKE 48523,T(2)
     + 192: POKE 48529,T(3) + 19
    2: POKE 48537,T(3) + 192: POKE
    48543,T(4) + 192: POKE 48551
    ,T(4) + 192
190  PRINT : PRINT "TAKING DATA P
    LEASE WAIT": PRINT
200 A(1) = 0:A(2) = 0:A(3) = 0:A(
    4) = 0
300 NN =  INT (N / NT) - 1
1000  FOR I = 0 TO NN
1010  CALL 48500
1020  FOR D = 0 TO E: NEXT D
1025 II = I:II = II * NT + M
1030 DT =  PEEK (48600): POKE II,
    DT:A(1) = DT + A(1):DT =  PEEK
    (48601): POKE II + 1,DT:A(2)
     = A(2) + DT:DT =  PEEK (486
    02): POKE II + 2,DT:A(3) = D
    T + A(3):DT =  PEEK (48603):
     POKE II + 3,DT:A(4) = A(4) +
    DT
```

```
1100  NEXT I
2000  REM  OUTPUT DATA
2010  GOSUB 3000
2030  PRINT D$;"PR#1": PRINT : PRINT
      : HTAB (20): PRINT A$
2040  PRINT "*** DATA FILE BDT";D
      N;"       ";N;" POINTS TOT. A
      T X (IN.) = ";X
2050  PRINT : PRINT " T#      X/Y1
           AVE": PRINT "____    __
      ____    _______": PRINT
2060  FOR K = 1 TO NT: PRINT " ";
      T(K);"     "; FN A((XT(K) - X
      ) / 12 / Y1);"      "; FN A(A
      (K) / N * NT): NEXT K
2090  PRINT D$;"PR#0": PRINT
2100  PRINT "DUMPING DATA TO DISK
      "
2110  PRINT D$;"BSAVE BDT"DN",A"M
      ",L"N",D2"
2120 DN = DN + 1E - 6
2130 J = J + 1: IF J <  = JM GOTO
      190
2131  PRINT : PRINT
2132  PRINT "ENTER NEXT LOCATION,
       TOT. # OF PTS., AND # OF RU
      NS TO TAKE THERE"
2134  PRINT " (ALL ZEROS TO END)"

2136  INPUT X,N,JM:J = 1: IF JM =
      0 GOTO 2140
2138  GOTO 190
2140  PRINT : PRINT "PROGRAM END"
      : END
3000  REM  READ CLOCK
3010  PRINT D$;"IN#2": PRINT D$;"
      PR#2"
3020  INPUT ":";A$
3030  PRINT D$;"IN#0": PRINT D$;"
      PR#0"
3040  RETURN

]PR#0
```

```
]BLOAD FS2
]CALL-155

*0800.0838

0800- AD C0 C0 EA EA EA EA EA
0808- AD C0 C0 8D D8 BD AD C1
0810- C0 EA EA EA EA EA AD C1
0818- C0 8D D9 BD AD C2 C0 EA
0820- EA EA EA EA AD C2 C0 8D
0828- DA BD AD C3 C0 EA EA EA
0830- EA EA AD C3 C0 8D DB BD
0838- 60
*0800L

0800-   AD C0 C0    LDA   $C0C0
0803-   EA          NOP
0804-   EA          NOP
0805-   EA          NOP
0806-   EA          NOP
0807-   EA          NOP
0808-   AD C0 C0    LDA   $C0C0
080B-   8D D8 BD    STA   $BDD8
080E-   AD C1 C0    LDA   $C0C1
0811-   EA          NOP
0812-   EA          NOP
0813-   EA          NOP
0814-   EA          NOP
0815-   EA          NOP
0816-   AD C1 C0    LDA   $C0C1
0819-   8D D9 BD    STA   $BDD9
081C-   AD C2 C0    LDA   $C0C2
081F-   EA          NOP
0820-   EA          NOP
0821-   EA          NOP
*L

0822-   EA          NOP
0823-   EA          NOP
0824-   AD C2 C0    LDA   $C0C2
0827-   8D DA BD    STA   $BDDA
082A-   AD C3 C0    LDA   $C0C3
082D-   EA          NOP
082E-   EA          NOP
082F-   EA          NOP
0830-   EA          NOP
0831-   EA          NOP
0832-   AD C3 C0    LDA   $C0C3
0835-   8D DB BD    STA   $BDDB
0838-   60          RTS
0839-   CC C9 D3    CPY   $D3C9
083C-   C1 AE       CMP   ($AE,X)
083E-   AE AE 00    LDX   $00AE
0841-   AD 83 C0    LDA   $C083
0844-   AD 83 C0    LDA   $C083
0847-   A9 00       LDA   #$00
0849-   8D 00 E0    STA   $E000
*
```

```
]BLOAD SHAPES123
]CALL-151

*1DFC.1E14

1DFC- 03 00 08 00
1E00- 0E 00 14 00 3E 24 2D 36
1E08- 07 00 3A 24 2D 36 07 00
1E10- 3A 60 15 06 00
*
```

```
5  REM   B TO T X2 1/9
10  REM  THIS PROGRAM TAKES DATA
     STORED IN BINARY FORM AND CO
     NVERTS IT TO TEXT FORM DATA
     STORED IN ARRAYS
20  DIM D(279): HOME :D$ =  CHR$
     (4):J = 1:M = 8500:X = M
42  PRINT "LOAD BDATA IN D1": PRINT
     "LOAD TDATA IN D2"
50  INPUT "ENTER # OF PTS.,BOTH T
     RANSDUCER #S, AND DATA # ";N
     ,T1,T2,DN
60  PRINT D$;"BLOAD BDT"DN",A"M",
     D1":K = T1
64  PRINT "READING DT";DN;K;J
70  FOR I = 0 TO 279:D(I) =  PEEK
     (X + I): NEXT I:X = X + I
99  PRINT "        STORING DT";DN;
     K;J
100  PRINT D$;"OPEN";"DT"DN""K""J
     ",D2
120  PRINT D$;"DELETE";"DT"DN""K"
     "J""
130  PRINT D$;"OPEN";"DT"DN""K""J
     ""
140  PRINT D$;"WRITE";"DT"DN""K""
     J""
150  FOR I = 0 TO 279: PRINT D(I)
     : NEXT I
180  PRINT D$;"CLOSE";"DT"DN""K""
     J""
190 J = J + 1
195  IF J > N / 2 / 280 AND K = T
     2 GOTO 300
200  IF J > N / 2 / 280 GOTO 220
210  GOTO 64
220 K = T2:J = 1:X = N / 2 + M: GOTO
     64
300  PRINT "PROGRAM END"

]
```

```
10  REM     PROCESS3
20  REM        ! INTEGER DT,I,J,K,L
     ,LL,M1,NB,NN,NR,NT,NX,P,PL,R
     N,T(4),X
30 D$ =  CHR$ (4): HOME : DEF  FN
     A(X) =  INT (X * 100 + .5) /
     100
40  PRINT "MASTER FILE IN D1 : BI
     NARY FILE IN D2": PRINT : PRINT

44  INPUT "ENTER MASTER FILE # AN
     D #1 MEMORY ADDRESS (OTOEXIT
     ) ";MN,M1: IF MN = 0 THEN  END

50  INPUT "ENTER INIT. BFILE #, A
     ND # OF FILES TO PROCESS (0'
     S TO RESTART) ";FB,NB: IF FB
      = 0 GOTO 30
54  FOR I = 0 TO NB - 1
56  PRINT D$;"BLOAD BDT";FB + I *
     1E - 6;",A";M1;",D2"
60  PRINT D$;"OPEN MF";MN;",L30,D
     1"
70  PRINT D$;"READ MF";MN;",R1": INPUT
     ID,NR,NT,RN,SC$:RN =  INT ((
     FB - ID + 5E - 7) * 1E + 6)
90  PRINT D$;"READ MF";MN;",R";15
      + RN + I: INPUT N,A,NT,T(0)
     ,T(1),T(2),T(3)
120  FOR J = 0 TO NT - 1
130 A = 0:P = 0:L = 256:SS = 0:NN
     = N / NT:SG = 0:SK = 0
160  IF SC$ = "D" THEN X = M1 + N
     N * J:NX = 1: GOTO 180
162  IF SC$ = "A" THEN NN = NN /
     2:X = M1:NX = 1: GOTO 180
164  IF SC$ = "B" THEN NN = NN /
     2:X = M1 + NN:NX = 1: GOTO 1
     80
170 X = M1 + J:NX = NT
180  FOR K = 0 TO NN - 1:XX = NX:
     XX = X + XX * K:DT =  PEEK (
     XX):DA = DT:A = A + DA
200  IF DT < L THEN L = DT:LL = K

210  IF DT > P THEN P = DT:PL = K

220  NEXT K:NY = NN:AV = A / NY
224  FOR K = 0 TO NN - 1:XX = NX:
     XX = X + XX * K:DT =  PEEK (
     XX):DA = (DT - AV)
226 SS = SS + DA * DA:SG = SG + D
     A * DA * DA:SK = SK + DA * D
     A * DA * DA
230  NEXT K:SD =  SQR (SS / NY):G
      = SG / NY / (SD * SD * SD):
     KU = SK / (SD * SD * SD * SD
     ) / NY
```

```
240  PRINT D$;"WRITE MF";MN;",R";
     15 + NR + NR * J * 2 + (RN +
     I) * 2: PRINT P: PRINT PL: PRINT
     L: PRINT LL
250  PRINT D$;"WRITE MF";MN;",R";
     16 + NR + NR * J * 2 + (RN +
     I) * 2: PRINT T(J): PRINT  FN
     A(AV): PRINT  FN A(SD): PRINT
      FN A(G): PRINT  FN A(KU)
260  NEXT J
270  PRINT D$;"CLOSE MF";MN
274  NEXT I
280  GOTO 50
290  END

]
```

```
1  REM  MASTER FILE
10  DIM N(50),X(50),NT(50),T(4,50
    )
20  ONERR  GOTO 100
45 D$ =  CHR$ (4): HOME
50  PRINT "*** PUT DATA DISK IN D
    2 ***"
65  PRINT
70  INPUT "ENTER MASTER FILE # ";
    MN
100  HOME : PRINT : PRINT D$;"PR#
    0"
110  VTAB (1): HTAB (15): PRINT "
    MAIN MENU"
115  VTAB (5): HTAB (12): PRINT "
    ENTER OR CHANGE (#1 THRU #4)
    "
120  VTAB (7): HTAB (10): PRINT "
    1. PRIMARY DATA"
130  VTAB (9): HTAB (10): PRINT "
    2. TRANSDUCER DATA"
140  VTAB (11): HTAB (10): PRINT
    "3. RUN DATA (# OF PTS., AND
     X)"
150  VTAB (13): HTAB (10): PRINT
    "4. RUN DATA (MAX,MIN,AVE,SD
    )"
160  VTAB (15): HTAB (10): PRINT
    "5. LIST FILE CONTENTS"
170  VTAB (17): HTAB (10): PRINT
    "6. PRINTER TOGGLE"
180  VTAB (19): HTAB (10): PRINT
    "7. INITILIZE FILE"
190  VTAB (21): HTAB (10): PRINT
    "8. NEW FILE"
200  GET AN$: PRINT
210  IF AN$ = "1" GOTO 1000
220  IF AN$ = "2" GOTO 2000
230  IF AN$ = "3" GOTO 3000
240  IF AN$ = "4" GOTO 4000
250  IF AN$ = "5" GOTO 5000
260  IF AN$ = "6" GOTO 6000
270  IF AN$ = "7" GOTO 7000
280  IF AN$ = "8" GOTO 70
290  GOTO 100
1000  REM  PRIMARY DATA
1010  PRINT D$;"OPEN MF"MN",L25,D
    2": HOME
1110  PRINT "ENTER INIT. RUN #,#
    OF RUNS,# OF TRANSDUCERS,#1
    MEMORY ADDR., AND SAMPLE COD
    E(D OR V)": PRINT
1120  INPUT ID,NR,NT,M1,SC$
1130  IF ID =  - 1 GOTO 1140
1135  PRINT D$;"WRITE MF"MN",R1"
1137  PRINT ID: PRINT NR: PRINT N
    T: PRINT M1: PRINT SC$
1138  PRINT D$;"CLOSE MF"MN""
1139  PRINT D$;"OPEN MF"MN",L25"
```

```
1140  INPUT "ENTER Q,GO,FR,Y2 ";Q
     ,GO,FR,Y2
1150  IF Q =  - 1 GOTO 1160
1155  PRINT D$;"WRITE MF"MN",R2"
1157  PRINT Q: PRINT GO: PRINT FR
     : PRINT Y2
1158  PRINT D$;"CLOSE MF"MN""
1159  PRINT D$;"OPEN MF"MN",L25"
1160  INPUT "ENTER V1,Y1,ALPHA ";
     V1,Y1,AL
1170  IF V1 =  - 1 GOTO 1980
1180  PRINT D$;"WRITE MF"MN",R3"
1190  PRINT V1: PRINT Y1: PRINT A
     L
1980  PRINT D$;"CLOSE MF"MN""
1990  GOTO 100
2000  REM  TRANSDUCER DATA
2010  PRINT D$;"OPEN MF"MN",L25,D
     2": HOME
2012  PRINT D$;"READ MF";MN;",R1"

2014  INPUT ID,NR,NT
2018  PRINT D$;"CLOSE MF"MN""
2020  PRINT "ENTER SERIAL #(XXXXX
     ),"
2030  PRINT "       CHANNEL #(XX),
     "
2040  PRINT "       DIST. TO GATE(
     XXX.XX IN.),"
2050  PRINT "       CALIB. COEF.(X
     .XXXXX FT/CT) AND,"
2060  PRINT "       ZERO READING(X
     XX.XXCTS.)"
2070  PRINT : FOR I = 1 TO NT
2080  PRINT "#";I
2090  INPUT SN(I),TT(I),XG(I),C(I
     ),Z(I)
2100  IF SN(I) =  - 1 GOTO 2120
2110  NEXT I
2120  PRINT "<1> TO SAVE ON DISK;
     <0> TO EXIT": GET AN
2130  IF AN <  > 1 GOTO 2980
2135  PRINT
2136  PRINT D$;"OPEN MF"MN",L25,D
     2": HOME
2140  FOR I = 1 TO NT
2150  PRINT D$;"WRITE MF";MN;",R"
     ;I + 3
2160  PRINT TT(I): PRINT C(I): PRINT
     Z(I): PRINT XG(I)
2162  NEXT I
2164  FOR I = 0 TO 2
2170  PRINT D$;"WRITE MF";MN;",R"
     ;I + 12
2180  PRINT SN(I * 3 + 1): PRINT
     SN(I * 3 + 2): PRINT SN(I *
     3 + 3)
2190  NEXT I
```

```
2980  PRINT D$;"CLOSE MF"MN""
2990  GOTO 100
3000  REM  # OF PTS., AND
3010  REM  TOE LOCATION(IN.)
3015  PRINT D$;"OPEN MF"MN",L25,D
      2": HOME
3020  PRINT "SEPARATE ENTRIES?(Y
      OR N)": GET AN$
3025  PRINT
3030  IF AN$ = "Y" GOTO 3200
3040  PRINT D$;"READ MF";MN;",R1"

3042  INPUT DF,NR: PRINT D$;"CLOS
      E MF";MN
3050  PRINT : PRINT "ENTER TOT.#
      OF PTS., DIST. FROM TOE TO G
      ATE (IN), # OF TRANSDUCERS U
      SED, AND FOUR CHAN. #'S (0 I
      F UNUSED)"
3060  FOR I = 1 TO NR
3070  PRINT "BDT";DF + (I - 1) *
      1E - 6
3080  INPUT "           :";N(I),X(
      I),NT(I),T(0,I),T(1,I),T(2,I
      ),T(3,I)
3090  NEXT I
3100  PRINT "<1> TO SAVE ON DISK;
      <0> TO EXIT": GET AN
3110  IF AN <  > 1 GOTO 3980
3115  PRINT
3118  PRINT D$;"OPEN MF"MN",L25,D
      2": HOME
3120  FOR I = 1 TO NR
3130  PRINT D$;"WRITE MF";MN;",R"
      ;14 + I
3140  PRINT N(I): PRINT X(I): PRINT
      NT(I): PRINT T(0,I): PRINT T
      (1,I): PRINT T(2,I): PRINT T
      (3,I)
3150  NEXT I
3160  GOTO 3980
3200  FOR I = 1 TO 50
3210  INPUT "ENTER RUN #(XX),N(TO
      T.),X(IN.),NT(I),T0(I),T1(I)
      ,T2(I),T3(I)  (0'S TO EXIT) :
      ";K,N(0),X(0),NT(0),T0(0),T1
      (0),T2(0),T3(0)
3220  IF K = 0 GOTO 3980
3225  PRINT D$;"OPEN MF"MN",L25,D
      2"
3230  PRINT D$;"WRITE MF";MN;",R"
      ;14 + K
3240  PRINT N(0): PRINT X(0): PRINT
      NT(0): PRINT T0(0): PRINT T1
      (0): PRINT T2(0): PRINT T3(0
      )
3245  PRINT D$;"CLOSE MF"MN""
3250  NEXT I
```

```
3980  PRINT D$;"CLOSE MF"MN""
3990  GOTO 100
4000  REM   MAX,MIN,AVE,SD,G,K
4010  PRINT D$;"OPEN MF"MN",L25,D
      2": HOME
4012  PRINT D$;"READ MF";MN;",R1"

4014  INPUT ID,NR
4016  PRINT D$;"CLOSE MF"MN""
4020  FOR I = 1 TO NR
4025  INPUT "ENTER RUN #(XX) AND
      # OF TRANSDUCERS ";K,NT
4030  PRINT "ENTER CHAN. #,MAX,PT
      #,MIN,PT#,AVE,SD,G,K  (FOR E
      ACH TRANSDUCER) ": PRINT "
           (0'S TO EXIT)": PRINT
4040  FOR J = 0 TO NT - 1
4050  INPUT K,CH(J),P(J),PL(J),L(
      J),LL(J),A(J),SD(J),G(J),KU(
      J)
4060  IF K = 0 GOTO 4980
4062  NEXT J
4064  FOR J = 0 TO NT - 1
4065  PRINT D$;"OPEN MF"MN",L25,D
      2"
4070  PRINT D$;"WRITE MF";MN;",R"
      ;15 + NR + NR * J * 2 + (K -
      1) * 2
4072  PRINT P(J): PRINT PL(J): PRINT
      L(J): PRINT LL(J)
4074  PRINT D$;"WRITE MF";MN;",R"
      ;16 + NR + NR * J * 2 + (K -
      1) * 2
4080  PRINT CH(J): PRINT A(J): PRINT
      SD(J): PRINT G(J): PRINT KU(
      J)
4082  NEXT J
4085  PRINT D$;"CLOSE MF"MN""
4090  NEXT I
4980  PRINT D$;"CLOSE MF"MN""
4990  GOTO 100
5000  REM  LIST FILE CONTENTS
5005  HOME
5010  PRINT D$;"OPEN MF";MN;",L25
      ,D2"
5020  PRINT D$;"READ MF";MN;",R1"

5030  INPUT ID,NR,NT,M1,SC$
5040  PRINT D$;"READ MF";MN;",R2"

5050  INPUT Q,GO,FR,Y2
5060  PRINT D$;"READ MF";MN;",R3"

5070  INPUT V1,Y1,AL
5080  FOR I = 1 TO NT
5090  PRINT D$;"READ MF";MN;",R";
      I + 3
5100  INPUT CH(I),C(I),Z(I),XG(I)
```

```
5102  NEXT I
5104  FOR I = 0 TO 2
5110  PRINT D$;"READ MF";MN;",R";
      I + 12
5120  INPUT SN(I * 3 + 1),SN(I *
      3 + 2),SN(I * 3 + 3)
5130  NEXT I
5140  FOR I = 0 TO NR - 1
5150  PRINT D$;"READ MF";MN;",R";
      I + 15
5160  INPUT N(I),X(I),NT(I)
5190  NEXT I
5200  PRINT D$;"CLOSE MF"MN""
5202  PRINT "READ CLOCK?(Y/N)": GET
      AN$: PRINT
5204  IF AN$ = "N" GOTO 5215
5210  GOSUB 9000
5215  PRINT D$;"PR#";PR
5220  HTAB (20): PRINT A$: PRINT
      : PRINT
5230  PRINT "RUN#";ID;" - ";ID +
      (NR - 1) * 1E - 6
5240  PRINT
5250  PRINT "      Q = ";Q;"    GO
      = ";GO;"    FR = ";FR
5260  PRINT "     Y1 = ";Y1;"    V1
      = ";V1;"    AL = ";AL
5270  PRINT : PRINT
5280  PRINT "TRANSDUCER DATA:": PRINT

5290  PRINT "  T#     SN         X(I
      N)        Z        C(FT/CT)"
5300  PRINT "_____  ______    ____
      ___  ________  ___________"
5310  FOR I = 1 TO NT
5320  PRINT "  ";CH(I); TAB( 8);S
      N(I); TAB( 18);XG(I); TAB( 2
      7);Z(I); TAB( 36);C(I)
5330  NEXT I
5340  PRINT : PRINT "RUN DATA:
      #1 MEMORY ADDR. = ";M1;"
      SAMPLE CODE ";SC$: PRINT
5350  PRINT "#  X(IN)    N    T#
      MAX     PT#    MIN     PT#
        AVE     SDEV      G       K"

5360  PRINT "__ _____ _____ __
      _____ _____ _____ _____
      _____  _____  _____  ____
      "
5370  FOR I = 0 TO NR - 1
5372  PRINT D$;"OPEN MF";MN;",L25
      ,D2"
5374  FOR J = 0 TO NT(I) - 1
5376  PRINT D$;"READ MF";MN;",R";
      15 + NR + NR * J * 2 + I * 2

5377  INPUT P(J),PL(J),L(J),LL(J)
```

```
5378  PRINT D$;"READ MF";MN;",R";
      16 + NR + NR * J * 2 + I * 2

5379  INPUT T(J,I),A(J),SD(J),G(J
      ),KU(J)
5380  NEXT J
5382  PRINT D$;"CLOSE MF"MN""
5384  FOR J = 0 TO NT(I) - 1
5386  PRINT I + 1; TAB( 4);X(I); TAB(
      10);N(I); TAB( 16);T(J,I); TAB(
      22);P(J); TAB( 28);PL(J); TAB(
      35);L(J);: POKE 36,40: PRINT
      LL(J);: POKE 36,49: PRINT A(
      J);: POKE 36,57: PRINT SD(J)
      ;: POKE 36,66: PRINT G(J);: POKE
      36,72: PRINT KU(J)
5388  NEXT J
5389  PRINT : NEXT I
5390  PRINT D$;"PR#0"
5392  PRINT "PRESS A KEY": GET AN
      $
5394  PRINT
5990  GOTO 100
6000  REM  PRINTER TOGGLE
6010  HOME
6020  PRINT "ENTER (Y) TO TURN ON
      PRINTER"
6030  GET AN$: PRINT
6040  IF AN$ = "Y" THEN PR = 1: GOTO
      100
6050  PRINT D$;"PR#0":PR = 0
6060  GOTO 100
7000  REM  INITIALIZE
7010  PRINT D$;"OPEN MF";MN;",L25
      ,D2": HOME
7015  PRINT "DELETE FILE?(Y/N)": GET
      AN$: IF AN$ = "N" GOTO 7030
7016  PRINT
7017  PRINT D$;"DELETE MF";MN
7030  PRINT "INIT. PRIMARY DATA?(
      Y/N)": GET AN$: IF AN$ = "N"
      GOTO 7060
7035  PRINT
7036  INPUT "ENTER # OF RUNS (<51
      ), AND # OF TRANSDUCERS (<4)
      ";NR,NT
7038  PRINT D$;"OPEN MF";MN;",L25
      "
7040  PRINT D$;"WRITE MF";MN;",R0
      "
7042  PRINT 0
7044  PRINT D$;"WRITE MF";MN;",R1
      "
7046  PRINT 0: PRINT NR: PRINT NT
      : PRINT 0: PRINT "0"
7048  PRINT D$;"WRITE MF";MN;",R2
      "
7050  PRINT 0: PRINT 0: PRINT 0: PRINT
      0
```

```
7052  PRINT D$;"WRITE MF";MN;",R3
      "
7054  PRINT 0: PRINT 0: PRINT 0
7057  PRINT D$;"CLOSE MF";MN
7060  PRINT "INIT. TRANSDUCER DAT
      A?(Y/N)": GET AN$: IF AN$ =
      "N" GOTO 7100
7065  PRINT
7066  PRINT D$;"OPEN MF";MN;",L25
      "
7070  FOR I = 1 TO 11
7080  PRINT D$;"WRITE MF";MN;",R"
      ;I + 3
7085  PRINT 0: PRINT 0: PRINT 0: PRINT
      0
7090  NEXT I
7095  PRINT D$;"CLOSE MF";MN
7100  PRINT "INIT. RUN DATA N,X?
      (Y/N)": GET AN$: IF AN$ = "N
      " GOTO 7150
7105  PRINT
7106  PRINT D$;"OPEN MF";MN;",L25
      "
7107  PRINT D$;"READ MF";MN;",R1"

7108  INPUT ID,NR,NT
7110  FOR I = 1 TO NR
7120  PRINT D$;"WRITE MF";MN;",R"
      ;I + 14
7130  PRINT 0: PRINT 0: PRINT 0: PRINT
      0: PRINT 0: PRINT 0: PRINT 0

7140  NEXT I
7145  PRINT D$;"CLOSE MF";MN
7150  PRINT "INIT. MAX,MIN,AVE,SD
      ?(Y/N)": GET AN$: IF AN$ = "
      N" GOTO 7200
7155  PRINT
7156  PRINT D$;"OPEN MF";MN;",L25
      "
7157  PRINT D$;"READ MF";MN;",R1"

7158  INPUT ID,NR
7160  FOR I = 0 TO NR - 1
7165  FOR J = 0 TO 3
7170  PRINT D$;"WRITE MF";MN;",R"
      ;15 + NR + NR * J * 2 + I *
      2
7180  PRINT 0: PRINT 0: PRINT 0: PRINT
      0
7182  PRINT D$;"WRITE MF";MN;",R"
      ;16 + NR + NR * J * 2 + I *
      2
7184  PRINT 0: PRINT 0: PRINT 0: PRINT
      0: PRINT 0
7185  NEXT J
7190  NEXT I
7200  PRINT D$;"CLOSE MF";MN
7210  GOTO 100
```

```
9000  REM     PRINT TIME & DATE
9010  PRINT D$;"IN#2": PRINT D$;"
     PR#2"
9020  INPUT ":";A$
9030  PRINT D$;"IN#0": PRINT D$;"
     PR#0"
9050  RETURN
```

```
10  REM  RESULTS 3/10/85
20  REM ! INTEGER
30  REM DIM XY(80),CP(80),CN(80),
     CS(80)
40  DEF  FN A(XX) =  INT (XX * 10
    0 + .5) / 100: DEF  FN B(YY)
     =  INT (YY * 1000 + .5) / 1
    000
45  PRINT D$;"BLOAD SHAPES123,D1"
    : POKE 232,252: POKE 233,29
46  DATA  5.012912,5.030201,5.020
    501,5.030501
50 D$ =  CHR$ (4): HOME
52  READ MN:PC = 1:PR = 1
70  PRINT D$;"OPEN MF";MN;",L25,D
    2"
80  PRINT D$;"READ MF";MN;",R1": INPUT
    ID,NR,KT,M1,SC$
90  PRINT D$;"READ MF";MN;",R2": INPUT
    Q,GO,FR
100  PRINT D$;"READ MF";MN;",R3":
     INPUT V,Y1
110  PRINT D$;"PR#";PR
120  PRINT "RUN#";ID" - ";ID + (N
    R - 1) * 1E - 6: PRINT
130  PRINT "      Q = ";Q;"    GO =
     ";GO;"    FR = ";FR;"    V =
    ";V:V = V * V / 64.4
140  PRINT "      V*V/2*G = "; FN
    A(V);"    Y1 = ";Y1: PRINT : PRINT

145  IF PC = 1 GOTO 1000
150  PRINT "  RUN#       SN#     X/
    Y1      MAX    MIN    AVE   SDEV
          CP+    CP-    CP'     TIM
    E": PRINT "________ ________
     _____     _____ _____ _____
    _____ "   _____ _____ _____
     _____"
152  HTAB (29): PRINT "(        FE
    ET        )
             (MIN)"
160  FOR I = 0 TO NR - 1
170  PRINT D$;"READ MF";MN;",R";1
    5 + I: INPUT N,X,NT
172  IF SC$ = "A" OR SC$ = "B" THEN
    N = N / 2
173  IF NT = 0 THEN NT = 1
174 TL =  FN A(N / NT / 50 / 60)
180  FOR J = 0 TO NT - 1
190  PRINT D$;"READ MF";MN;",R";1
    5 + NR + NR * J * 2 + I * 2:
     INPUT P,PL,L,LL
200  PRINT D$;"READ MF";MN;",R";1
    6 + NR + NR * J * 2 + I * 2:
     INPUT TJ,AV,SD
```

```
210  FOR K = 1 TO KT: PRINT D$;"R
     EAD MF";MN;",R";K + 3: INPUT
     T,C,Z,XG
220  IF T = TJ THEN KK =  INT (K /
     3 + .9): PRINT D$;"READ MF";
     MN;",R";KK + 11: INPUT S(KK *
     3 - 2),S(KK * 3 - 1),S(KK *
     3):SN = S(K): GOTO 240
230  NEXT K
240 PF = (P - AV) * C:LF = (AV -
     L) * C:AF = (AV - Z) * C:SF =
     SD *  ABS (C)
242  IF C < 0 THEN TT =  - PF:PF =
      - LF:LF = TT
244 CP =  FN A(PF / V):CN =  FN A
     (LF / V):CS =  FN B(SF / V)
250 RN = ID + I * 1E - 6:XY = (XG
      - X) / 12 / Y1: IF X = 0 THEN
     XY = X
260  PRINT RN;"  ";SN;"  "; FN A(
     XY);"      "; FN A(PF);"   "
     ; FN A(LF);"   "; FN A(AF);"
        "; FN A(SF);"       ";CP;"
        ";CN;"   ";CS;"   ";TL
270  NEXT J: PRINT : NEXT I: PRINT
     "PRESS A KEY": GET AN$: PRINT

280  PRINT D$;"CLOSE": PRINT D$;"
     PR#0": GOTO 50
290  END
1000  REM  PLOTTING ROUTINE
1020 XZ =  - .5:XM = 5:YZ =  - .5
     :YM = 2:YD = 5:XD = 11
1030 RX = 279 / (XM - XZ):RY = 19
     1 / (YM - YZ):PZ = (0 - YZ) *
     RY:LZ = (0 - XZ) * RX
1040 HF = 0:LF = 0: HOME : HGR2 :
      HCOLOR= 3: SCALE= 1: ROT= 0

1050  HPLOT 0,0 TO 279,0 TO 279,1
     91 TO 0,191 TO 0,0
1060  FOR I = 1 TO YD - 1:DY = 19
     1 * I / YD: HPLOT 0,DY TO 5,
     DY: HPLOT 274,DY TO 279,DY: NEXT
     I
1070  FOR I = 1 TO XD - 1:DX = 27
     9 * I / XD: HPLOT DX,0 TO DX
     ,5: HPLOT DX,186 TO DX,191: NEXT
     I
1100  FOR I = 0 TO NR - 1
1110  PRINT D$;"READ MF";MN;",R";
     15 + I: INPUT N,X,NT
1120  IF SC$ = "A" OR SC$ = "B" THEN
     N = N / 2
1130  IF NT = 0 THEN NT = 1
1150  FOR J = 0 TO NT - 1
```

```
1160  PRINT D$;"READ MF";MN;",R";
      15 + NR + NR * J * 2 + I * 2
      : INPUT D(1),PL,D(2)
1170  PRINT D$;"READ MF";MN;",R";
      16 + NR + NR * J * 2 + I * 2
      : INPUT TJ,D(3)
1180  FOR K = 1 TO KT: PRINT D$;"
      READ MF";MN;",R";K + 3: INPUT
      T,C,Z,XG
1190  IF T = TJ GOTO 1210
1200  NEXT K
1210 XX = (XG - X) / 12 * RX + LZ
      : IF X = 0 THEN XX = 0 + LZ
1212  IF XX < 0 THEN XX = 0
1214  IF XX > 279 THEN XX = 279
1220  FOR K = 1 TO 3:Y = (D(K) -
      Z) * C * RY + PZ
1230  IF Y > 187 THEN Y = 187:HF =
      HF + 1
1240  IF Y < 4 THEN Y = 4:LF = LF
       + 1
1250  DRAW K AT XX, ABS (Y - 191)
      : NEXT K
1260  NEXT J: NEXT I: PRINT D$;"C
      LOSE"
1270  PRINT D$;"PR#0": TEXT
2000  REM   HARD COPY ROUTINE
2010  PRINT D$;"PR#1"
2020  PRINT : HTAB (14): PRINT "*
      ** PLOT OF PRESSURE (FT) VS
      LOCATION IN JUMP (FT) ***"
2030  PRINT "      -- VERTICAL ORI
      GIN = ";YZ;" FT. WITH DIVISI
      ONS EVERY "; FN A(191 / YD /
      RY);" FT."
2050  PRINT "      -- HORIZONTAL O
      RIGIN = ";XZ;" FT. RELATIVE
      TO TOE WITH DIVISIONS EVERY
      "; FN A(279 / XD / RX);" FT.
      "
2090  IF HF > 0 THEN  PRINT "   *
      ** MAX. PLOT LIMIT WAS EXCEE
      DED ";HF;" TIME(S)"
2100  IF LF > 0 THEN  PRINT "   *
      ** MIN. PLOT LIMIT WAS EXCEE
      DED ";LF;" TIME(S)"
2110  PRINT : PRINT D$;"PR#0"
2120 F =  FRE (0): FLASH : HOME
2130  PRINT "HARD COPY IN PROGRES
      S PLEASE WAIT"
2140  NORMAL : PRINT D$;"PR#1"
2150  PRINT  CHR$ (9);"GDR2"
2152  PRINT  CHR$ (12)
2160  PRINT D$;"PR#0": HOME
2190  GOTO 50

]
```

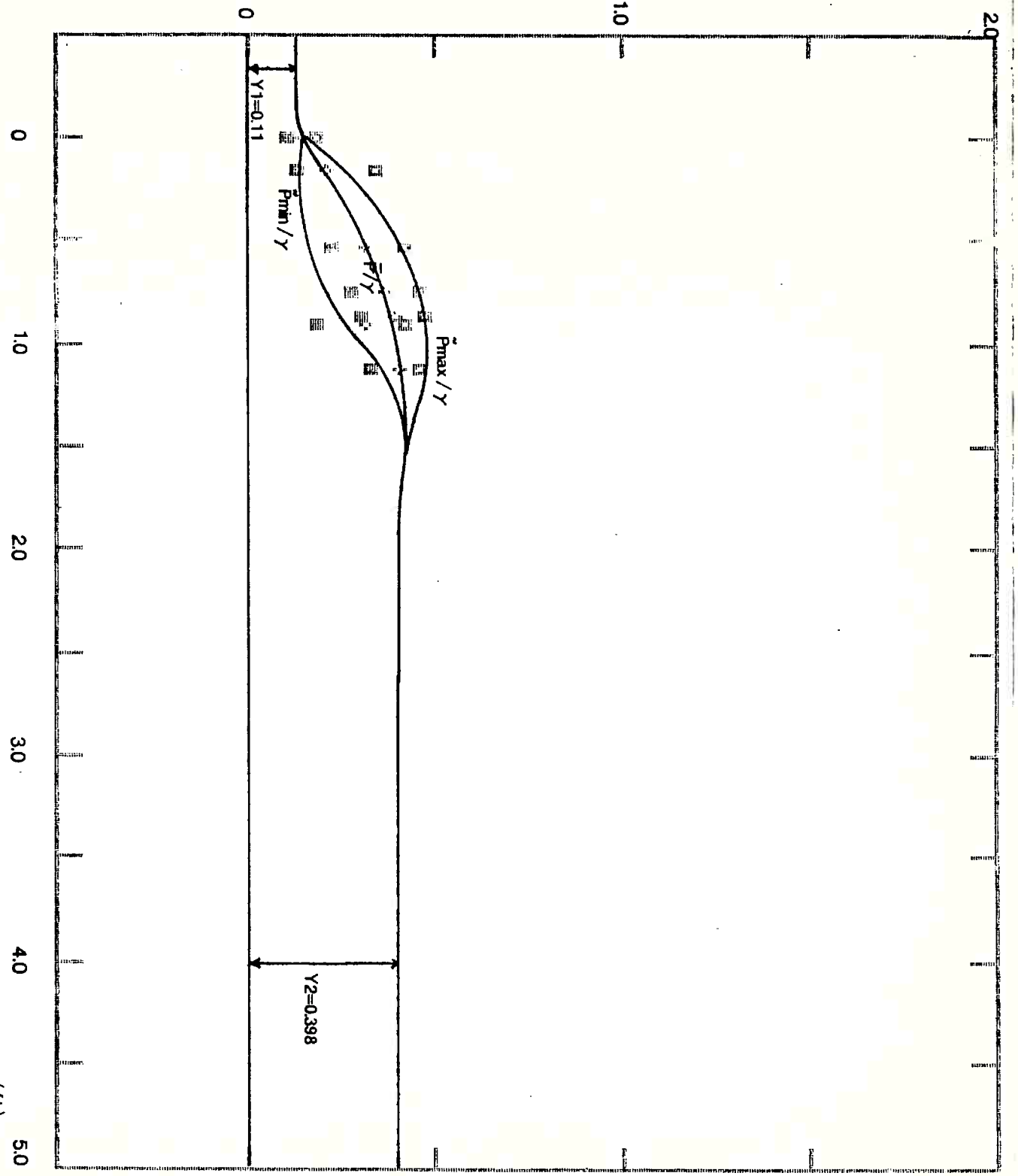
RUN#5.012912 - 5.012918 (END)

F2

Q=1.02 GO=2 F1=2.94 V=5.53

V*V/2g = 0.47 Y1=0.11

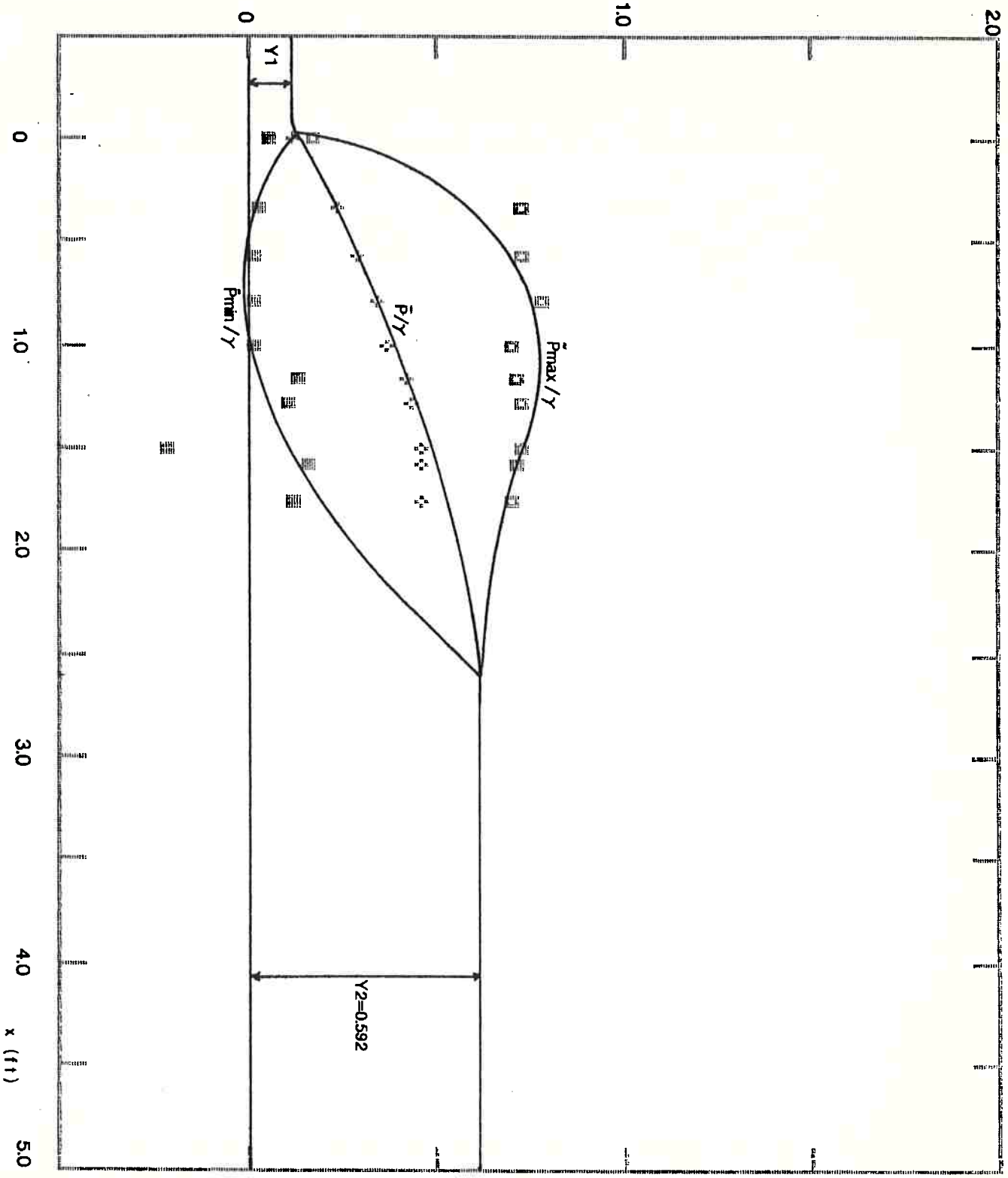
*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY 0,5 FT



Q=1.44 GO=2 F1=4.18 V=8.08

V*V/2g = 1.01 Y1=0.116

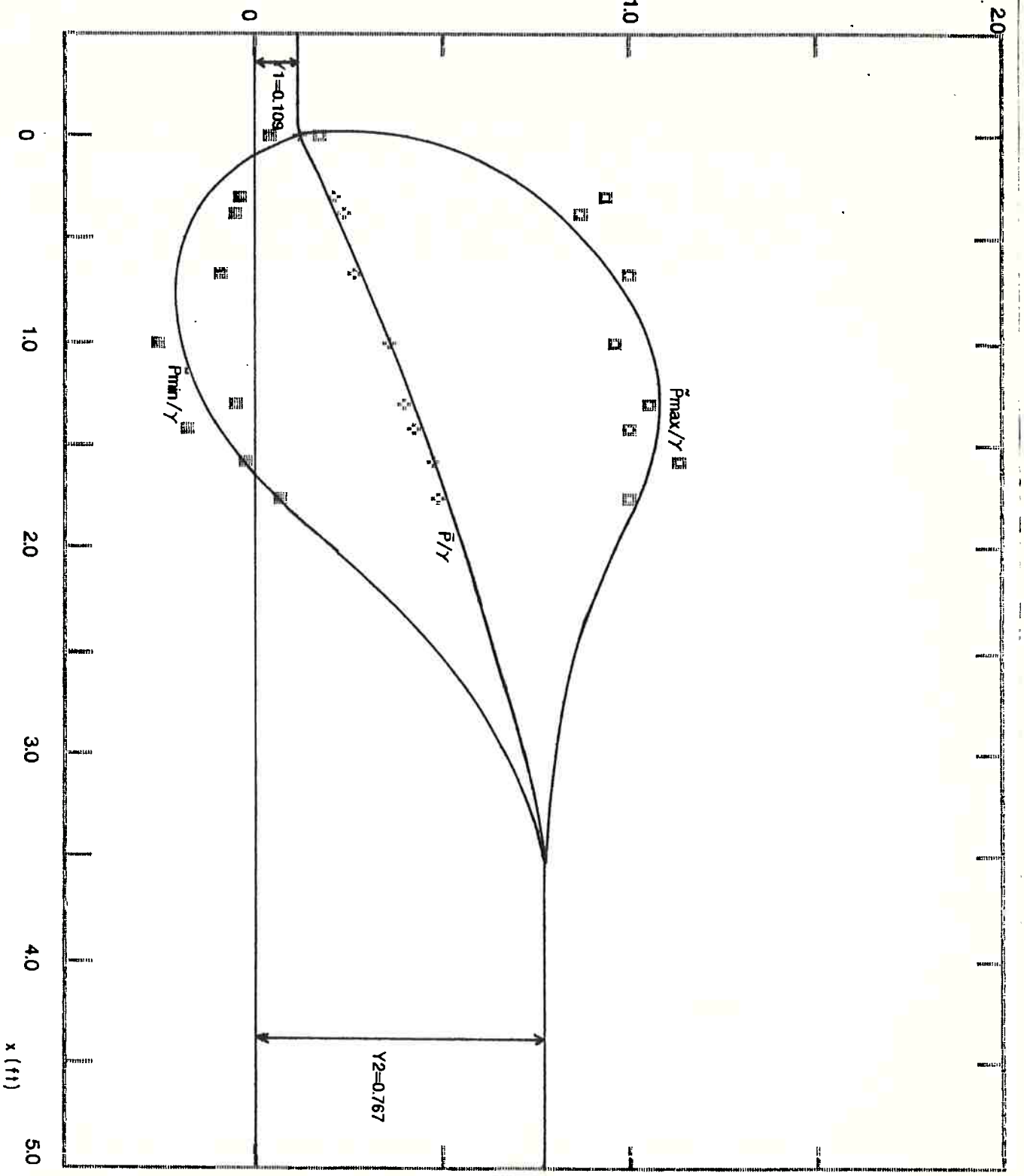
*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY 0,50 FT



Q=1.84 GO=2 F1=5.49 V=10.28

V*V/2g = 1.64 Y1=0.109

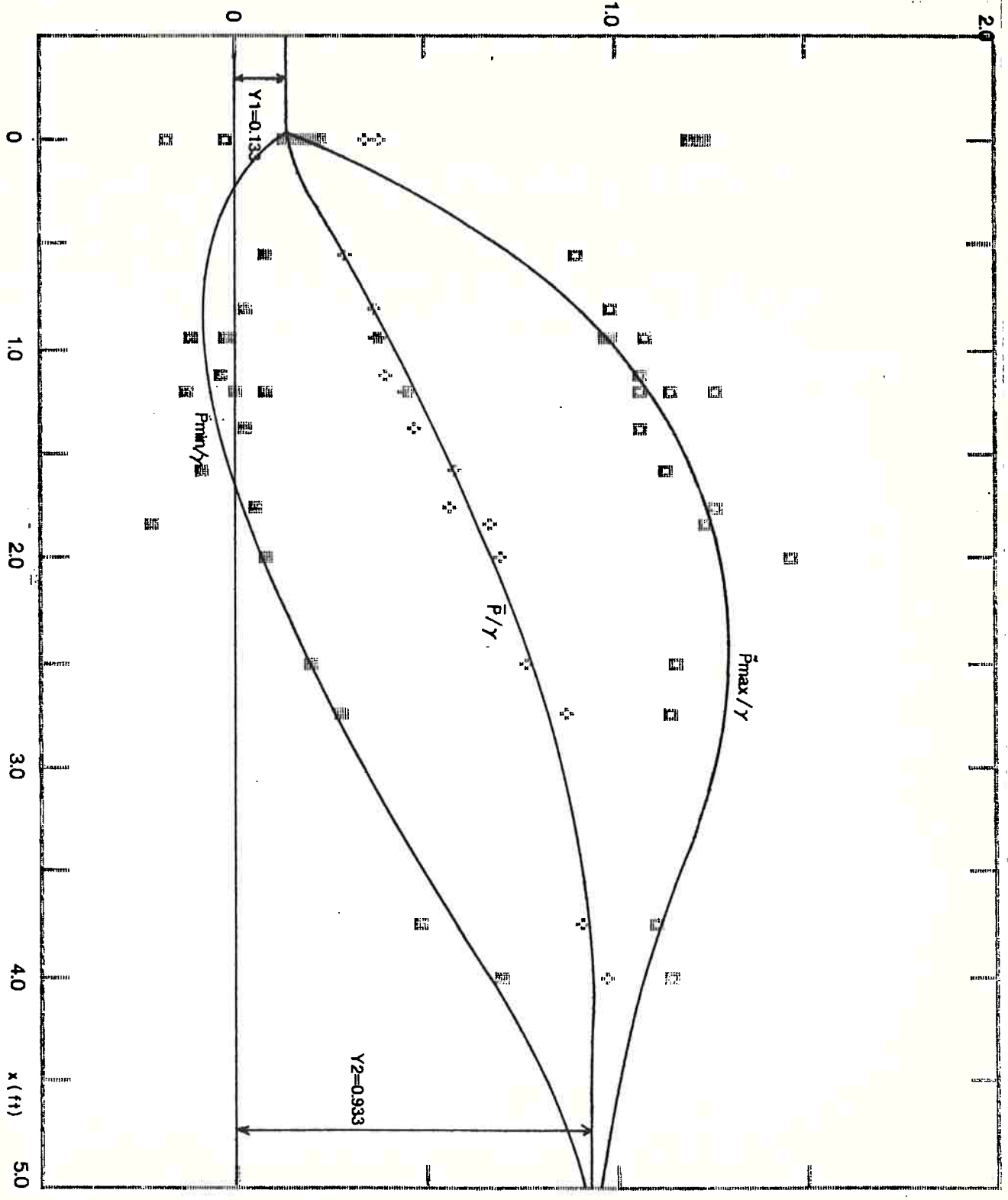
*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY 0,50 FT



Q=2.39 GO=2 F1=5.59 V=11.70

V*V/ 2g = 2.13 Y1=0.133

*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY 0,50 FT



```
10  REM   RESULTS2 3/10/85
20  REM ! INTEGER
30  REM DIM XY(80),CP(80),CN(80),
     CS(80)
40  DEF  FN A(XX) =  INT (XX * 10
    0 + .5) / 100: DEF  FN B(YY)
     =  INT (YY * 1000 + .5) / 1
    000
50 D$ =  CHR$ (4): HOME : PRINT "
    ** MASTER FILES IN D2 **": PRINT
    : PRINT "ENTER MASTER FILE #
    , AND PRINT CODE ": INPUT MN
    ,PC
70  PRINT D$;"OPEN MF";MN;",L25,D
    2"
80  PRINT D$;"READ MF";MN;",R1": INPUT
    ID,NR,KT,M1,SC$
90  PRINT D$;"READ MF";MN;",R2": INPUT
    Q,GO,FR
100  PRINT D$;"READ MF";MN;",R3":
     INPUT V,Y1
110  PRINT D$;"PR#";PC
120  PRINT "RUN#";ID" - ";ID + (N
    R - 1) * 1E - 6: PRINT
130  PRINT "     Q = ";Q;"   GO =
     ";GO;"   FR = ";FR;"   V =
    ";V:V = V * V / 64.4
140  PRINT "     V*V/2*G = "; FN
    A(V);"   Y1 = ";Y1: PRINT : PRINT

150  PRINT "  RUN#       SN#     X/
    Y1      MAX    MIN    AVE   SDEV
          CP+    CP-    CP'     TIM
    E": PRINT "________ ________
     ______     ______ ______ _____
    ______   ______ ______ ______
    _____"
152  HTAB (29): PRINT "(        FE
    ET        )
            (MIN)"
160  FOR I = 0 TO NR - 1
170  PRINT D$;"READ MF";MN;",R";1
    5 + I: INPUT N,X,NT
172  IF SC$ = "A" OR SC$ = "B" THEN
    N = N / 2
173  IF NT = 0 THEN NT = 1
174 TL =  FN A(N / NT / 50 / 60)
180  FOR J = 0 TO NT - 1
190  PRINT D$;"READ MF";MN;",R";1
    5 + NR + NR * J * 2 + I * 2:
     INPUT P,PL,L,LL
200  PRINT D$;"READ MF";MN;",R";1
    6 + NR + NR * J * 2 + I * 2:
     INPUT TJ,AV,SD
210  FOR K = 1 TO KT: PRINT D$;"R
    EAD MF";MN;",R";K + 3: INPUT
    T,C,Z,XG
```

```
220  IF T = TJ THEN KK =  INT (K /
     3 + .9): PRINT D$;"READ MF";
     MN;",R";KK + 11: INPUT S(KK *
     3 - 2),S(KK * 3 - 1),S(KK *
     3):SN = S(K): GOTO 240
230  NEXT K
240 PF = (P - AV) * C:LF = (AV -
     L) * C:AF = (AV - Z) * C:SF =
     SD *  ABS (C)
242  IF C < 0 THEN TT =  - PF:PF =
      - LF:LF = TT
244 CP =  FN A(PF / V):CN =  FN A
     (LF / V):CS =  FN B(SF / V)
250 RN = ID + I * 1E - 6:XY = (XG
      - X) / 12 / Y1: IF X = 0 THEN
     XY = X
260  PRINT RN;"  ";SN;"  "; FN A(
     XY);"       "; FN A(PF);"   "
     ; FN A(LF);"   "; FN A(AF);"
        "; FN A(SF);"       ";CP;"
        ";CN;"   ";CS;"   ";TL
270  NEXT J: PRINT : NEXT I: PRINT
     "PRESS A KEY": GET AN$: PRINT

280  PRINT D$;"CLOSE": PRINT D$;"
     PR#0": GOTO 50
290  END

]PR#1
```

RUN#5.030601 - 5.030615

Q = 1.26 GO = 2 FR = 2.98
Y1 = .132 V1 = 6.13 AL = 1.06

TRANSDUCER DATA:

T#	SN	X(IN)	Z	C(FT/CT)
11	39283	98	34.2	5.24E-03
12	39294	101	26.4	5.4E-03
13	31185	104	38.5	5.54E-03
14	39295	107.5	43.6	5.73E-03

RUN DATA: #1 MEMORY ADDR. = 9000 SAMPLE CODE V

#	X(IN)	N	T#	MAX	PT#	MIN	PT#	AVE	SDEV	G	K
1	0	12000	11	66	69	57	1806	61.73	1.19	-.19	3.12
1	0	12000	12	58	11	47	1809	52.99	1.6	-.04	3.17
1	0	12000	13	67	15	58	1811	62.98	1.2	.05	3.5
1	0	12000	14	63	1124	55	1845	58.93	1.11	.17	3.36
2	0	19000	11	67	1209	58	348	62.05	1.15	-.08	3.27
2	0	19000	12	60	1586	48	2364	53.78	1.55	-.02	3
2	0	19000	13	68	3557	58	451	62.82	1.16	.09	3.73
2	0	19000	14	63	3550	55	1022	58.49	1.05	.14	3.48
3	94.6	31000	11	112	1496	64	3801	80.9	6.15	.57	3.46
3	94.6	31000	12	142	4246	60	2599	87.27	6.36	.24	3.42
3	94.6	31000	13	127	5024	86	2762	104.96	4.58	.14	3.38
3	94.6	31000	14	122	4326	72	6810	106.88	3.94	-.42	5.09
4	95.2	31000	11	106	2552	64	2580	79.04	5.29	.57	3.93
4	95.2	31000	12	110	2559	56	2555	85.93	5.86	.24	3.21
4	95.2	31000	13	126	4643	73	4023	103.87	4.53	-.12	4.06
4	95.2	31000	14	123	2574	86	4804	106.39	3.94	-.2	3.79
5	93.7	31000	11	104	7212	64	1365	81.57	6.03	.3	2.95
5	93.7	31000	12	112	6510	62	1517	87.78	6.38	.07	3
5	93.7	31000	13	128	0	75	1794	104.93	4.69	.02	3.73
5	93.7	31000	14	134	1730	87	6187	107.3	3.93	-.17	3.79
6	96.3	31000	11	102	6125	62	3704	77.28	5.44	.62	3.64
6	96.3	31000	12	114	436	66	2740	83.66	6.18	.53	3.44
6	96.3	31000	13	128	3886	72	3297	103.02	4.7	.05	4
6	96.3	31000	14	127	5332	86	1215	105.81	4.04	-.18	4.06
7	95.6	31000	11	112	1854	63	4841	78.46	5.86	.15	2.73
7	95.6	31000	12	133	4627	59	5800	84.93	6.64	.18	2.98
7	95.6	31000	13	130	5128	84	112	103.64	4.82	-.03	3.34
7	95.6	31000	14	124	1425	81	5812	105.88	4.15	-.22	3.91
8	94.1	31000	11	103	1	67	4443	81.06	4.82	.44	3.43
8	94.1	31000	12	120	4603	62	5301	87.49	5.48	.29	3.52
8	94.1	31000	13	125	7138	80	5501	105.49	4.29	-.03	4.33
8	94.1	31000	14	125	7251	82	2957	106.62	3.83	-.29	4.33
9	92.3	31000	11	127	3205	80	2751	100.64	6.22	-.12	2.78
9	92.3	31000	12	117	1790	76	1209	97.6	4.67	.07	3.66
9	92.3	31000	13	129	5864	88	2710	111.77	4.13	-.19	3.98
9	92.3	31000	14	123	2278	95	3868	111.64	3.12	-.38	4.11

10	92.4	31000	11	123	608	42	6566	99.14	6.04	-.03	4.49
10	92.4	31000	12	122	2013	52	6713	97.42	4.8	-.23	5.03
10	92.4	31000	13	134	6713	88	3955	111.41	4.15	-.34	4.19
10	92.4	31000	14	141	6278	98	3663	112.01	3.23	-.11	4.61
11	93.3	31000	11	121	5663	71	4304	92.08	7.38	.31	2.79
11	93.3	31000	12	117	1338	62	5131	93.33	5.35	-.03	3.34
11	93.3	31000	13	133	6086	82	2594	109.78	4.29	-.13	3.93
11	93.3	31000	14	127	5972	91	4209	111.43	3.77	-.37	3.86
12	92.5	31000	11	127	537	78	282	98.73	5.28	.15	3.26
12	92.5	31000	12	118	4438	76	1787	96.6	4.45	.13	3.76
12	92.5	31000	13	130	7706	84	548	112.21	3.84	-.24	4.19
12	92.5	31000	14	128	1966	96	7079	113.92	3.08	-.15	3.67
13	91	31000	11	131	740	72	2847	106.71	5.39	-.43	3.9
13	91	31000	12	120	3966	80	6344	101.95	4.38	-.21	3.57
13	91	31000	13	132	3030	91	4103	114.93	3.59	-.31	4.28
13	91	31000	14	125	244	77	4102	114.28	2.82	-.7	8.01
14	89	31000	11	132	7213	88	608	108.54	4.45	-.02	3.54
14	89	31000	12	119	5689	82	1004	102.12	4.24	-.19	3.69
14	89	31000	13	128	2137	96	3769	115.45	3.29	-.15	3.51
14	89	31000	14	123	261	101	4862	114.11	2.45	-.2	3.81
15	91.5	31000	11	127	2201	85	2481	105.91	4.67	.16	3.5
15	91.5	31000	12	119	2556	57	6926	101.65	4.38	-.41	5.83
15	91.5	31000	13	128	850	82	5724	114.32	3.69	-.57	6.32
15	91.5	31000	14	125	152	99	1488	113.05	2.84	-.12	3.75

PR#0RUN#5.030601 - 5.030615

Q = 1.26 GO = 2 FR = 2.98 V = 6.13
V*V/2*G = .58 Y1 = .132

RUN#	SN#	X/Y1	MAX	MIN	AVE	SDEV	CP+	CP-	CP'	TIME
			(	FEET		)				(MIN
5.030601	39283	0	.02	.02	.14	.01	.04	.04	.011	1
5.030601	39294	0	.03	.03	.14	.01	.05	.06	.015	1
5.030601	31185	0	.02	.03	.14	.01	.04	.05	.011	1
5.030601	39295	0	.02	.02	.09	.01	.04	.04	.011	1
5.030602	39283	0	.03	.02	.15	.01	.04	.04	.01	1.58
5.030602	39294	0	.03	.03	.15	.01	.06	.05	.014	1.58
5.030602	31185	0	.03	.03	.13	.01	.05	.05	.011	1.58
5.030602	39295	0	.03	.02	.09	.01	.04	.03	.01	1.58
5.030603	39283	2.15	.16	.09	.24	.03	.28	.15	.055	2.58
5.030603	39294	4.04	.3	.15	.33	.03	.51	.25	.059	2.58
5.030603	31185	5.93	.12	.11	.37	.03	.21	.18	.043	2.58
5.030603	39295	8.14	.09	.2	.36	.02	.15	.34	.039	2.58
5.030604	39283	1.77	.14	.08	.23	.03	.24	.14	.048	2.58
5.030604	39294	3.66	.13	.16	.32	.03	.22	.28	.054	2.58
5.030604	31185	5.56	.12	.17	.36	.03	.21	.29	.043	2.58
5.030604	39295	7.77	.1	.12	.36	.02	.16	.2	.039	2.58
5.030605	39283	2.71	.12	.09	.25	.03	.2	.16	.054	2.58
5.030605	39294	4.61	.13	.14	.33	.03	.22	.24	.059	2.58
5.030605	31185	6.5	.13	.17	.37	.03	.22	.28	.045	2.58
5.030605	39295	8.71	.15	.12	.37	.02	.26	.2	.039	2.58
5.030606	39283	1.07	.13	.08	.23	.03	.22	.14	.049	2.58
5.030606	39294	2.97	.16	.1	.31	.03	.28	.16	.057	2.58
5.030606	31185	4.86	.14	.17	.36	.03	.24	.29	.045	2.58
5.030606	39295	7.07	.12	.11	.36	.02	.21	.19	.04	2.58
5.030607	39283	1.52	.18	.08	.23	.03	.3	.14	.053	2.58
5.030607	39294	3.41	.26	.14	.32	.04	.44	.24	.061	2.58
5.030607	31185	5.3	.15	.11	.36	.03	.25	.19	.046	2.58
5.030607	39295	7.51	.1	.14	.36	.02	.18	.24	.041	2.58
5.030608	39283	2.46	.11	.07	.25	.03	.2	.13	.043	2.58
5.030608	39294	4.36	.18	.14	.33	.03	.3	.24	.051	2.58
5.030608	31185	6.25	.11	.14	.37	.02	.19	.24	.041	2.58
5.030608	39295	8.46	.11	.14	.36	.02	.18	.24	.038	2.58
5.030609	39283	3.6	.14	.11	.35	.03	.24	.19	.056	2.58
5.030609	39294	5.49	.1	.12	.38	.03	.18	.2	.043	2.58
5.030609	31185	7.39	.1	.13	.41	.02	.16	.23	.039	2.58
5.030609	39295	9.6	.07	.1	.39	.02	.11	.16	.031	2.58
5.03061	39283	3.54	.13	.3	.34	.03	.21	.51	.054	2.58
5.03061	39294	5.43	.13	.25	.38	.03	.23	.42	.044	2.58
5.03061	31185	7.32	.13	.13	.4	.02	.21	.22	.039	2.58
5.03061	39295	9.53	.17	.08	.39	.02	.28	.14	.032	2.58
5.030611	39283	2.97	.15	.11	.3	.04	.26	.19	.066	2.58
5.030611	39294	4.86	.13	.17	.36	.03	.22	.29	.05	2.58
5.030611	31185	6.76	.13	.15	.39	.02	.22	.26	.041	2.58
5.030611	39295	8.96	.09	.12	.39	.02	.15	.2	.037	2.58

```
5.030612   39283   3.47      .15   .11   .34   .03     .25   .19   .047   2.58
5.030612   39294   5.37      .12   .11   .38   .02      .2   .19   .041   2.58
5.030612   31185   7.26      .1    .16   .41   .02     .17   .27   .036   2.58
5.030612   39295   9.47      .08   .1    .4    .02     .14   .18   .03    2.58

5.030613   39283   4.42      .13   .18   .38   .03     .22   .31   .048   2.58
5.030613   39294   6.31      .1    .12   .41   .02     .17   .2    .041   2.58
5.030613   31185   8.21      .09   .13   .42   .02     .16   .23   .034   2.58
5.030613   39295   10.42     .06   .21   .4    .02     .11   .37   .028   2.58

5.030614   39283   5.68      .12   .11   .39   .02     .21   .18   .04    2.58
5.030614   39294   7.58      .09   .11   .41   .02     .16   .19   .039   2.58
5.030614   31185   9.47      .07   .11   .43   .02     .12   .18   .031   2.58
5.030614   39295   11.68     .05   .08   .4    .01     .09   .13   .024   2.58

5.030615   39283   4.1       .11   .11   .38   .02     .19   .19   .042   2.58
5.030615   39294   6         .09   .24   .41   .02     .16   .41   .041   2.58
5.030615   31185   7.89      .08   .18   .42   .02     .13   .31   .035   2.58
5.030615   39295   10.1      .07   .08   .4    .02     .12   .14   .028   2.58

PRESS A KEY


END OF DATA

BREAK IN 270
]
```

Gráfico G4

Ensaio N.5.030601 (F_1 = 2.98 e ED)

Ensaio N.5.012912 (F_1 = 2.94 e END)

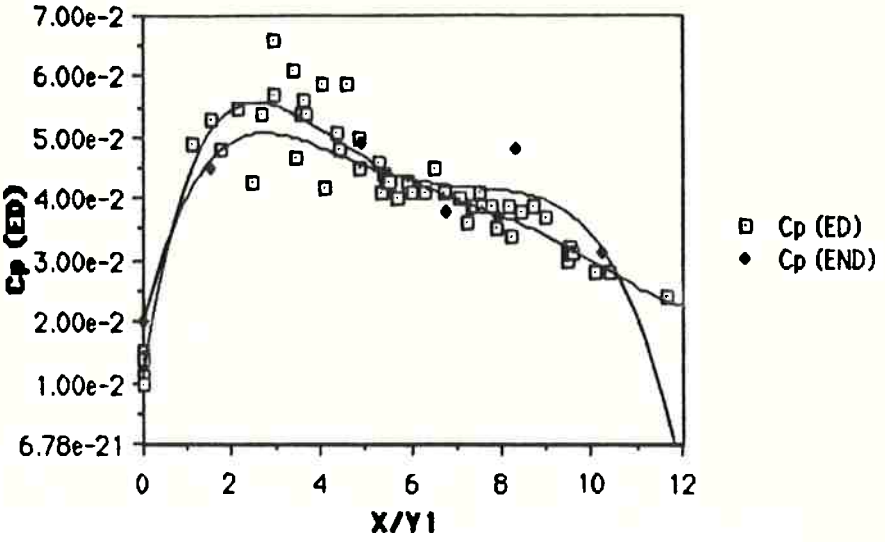


Gráfico G5

Ensaio Nº5.020801 (F_1 = 4.17 e ED)

Ensaio Nº5.030201 (F_1 = 4.18 e END)

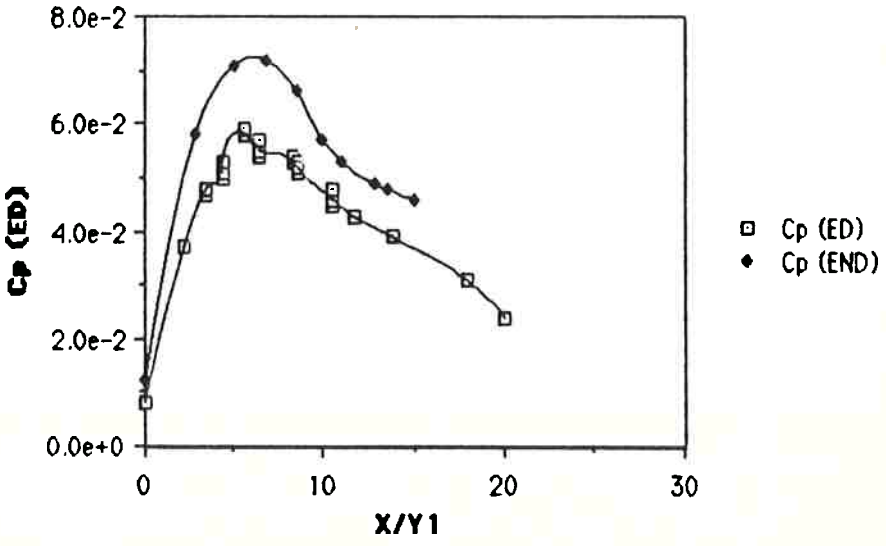


Gráfico G6

Ensaio Nº5.021901 (F_1 = 5.00 e ED)

Ensaio Nº5.022821 (F_1 = 5.00 e END)

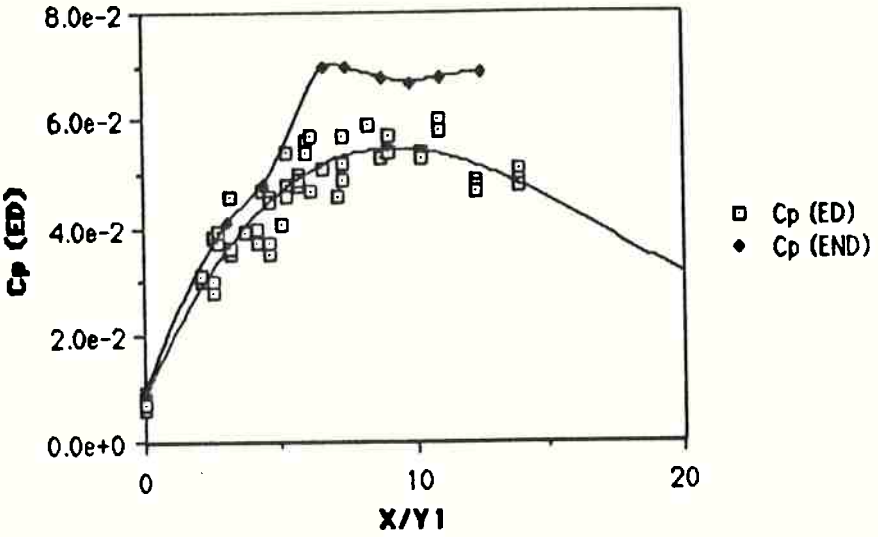


Gráfico G7

Ensaio Nº5.020501 (F_1 = 5.59 e ED)

Ensaio Nº5.030501 (F_1 = 5.49 e END)

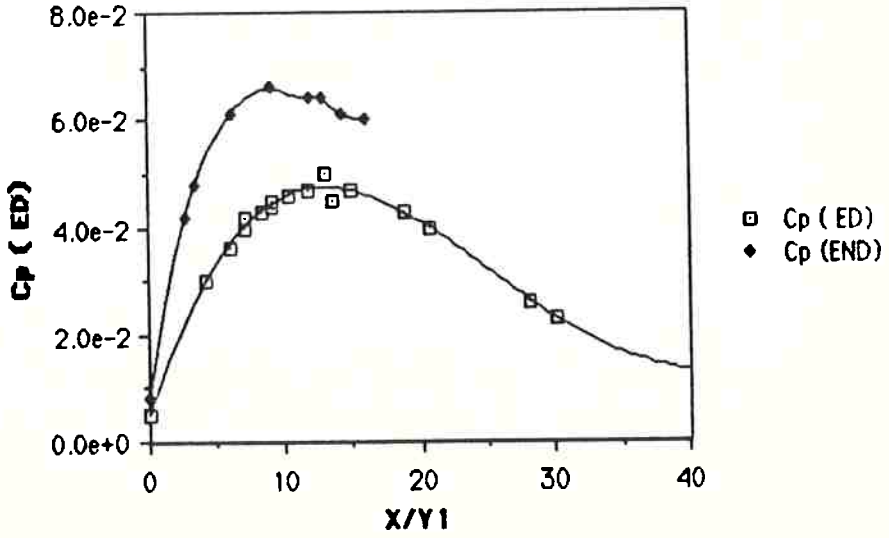


Gráfico G8

Ensaio Nº5.012201 (F_1 = 5.98 e ED)

Ensaio Nº5.031311 (F_1 = 5.90 e END)

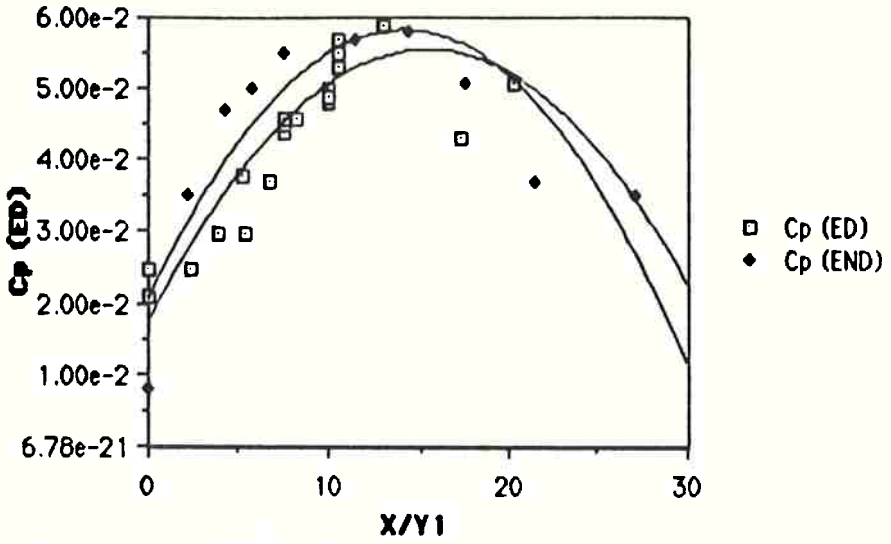


Gráfico G9

Ensaio Nº5.070601 (F_1 = 10.06 e END)

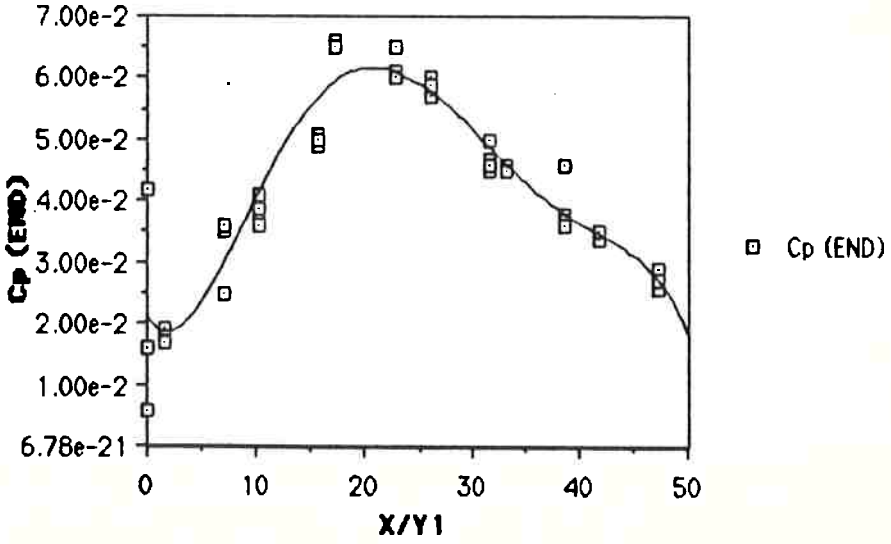


Gráfico G10

Ensaio Nº5.030601 (F_1 = 2.98 e ED)

Ensaio Nº5.012912 (F_1 = 2.94 e END)

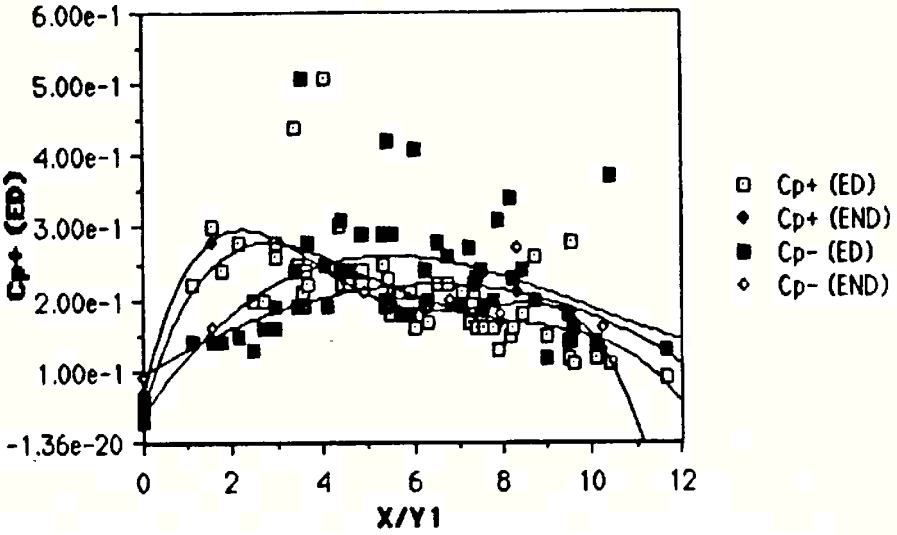


Gráfico G11

Ensaio Nº5.020801 (F_1 = 4.17 eED)

Ensaio Nº5.030201 (F_1 = 4.18 e END)

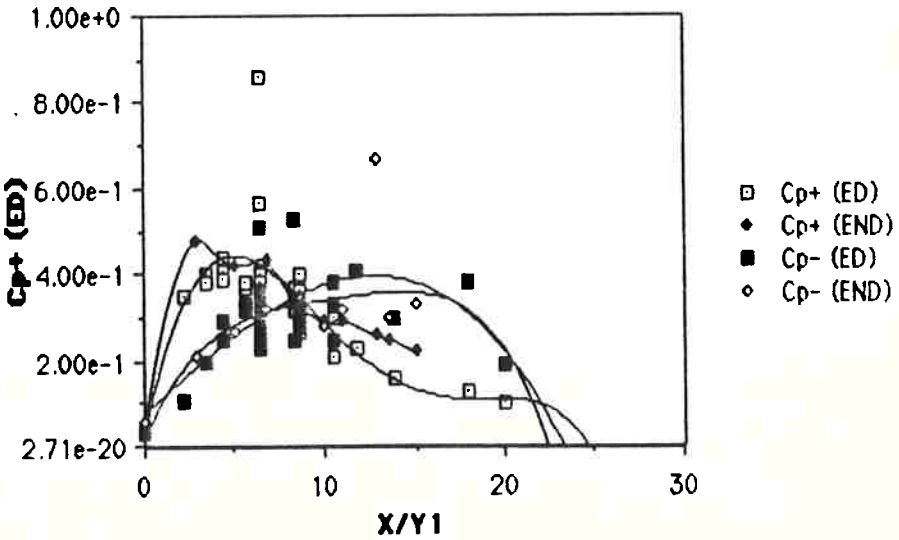


Gráfico G12

Ensaio Nº5.021901 (F_1 = 5.00 e ED)

Ensaio Nº5.022821 (F_1 = 5.00 e END)

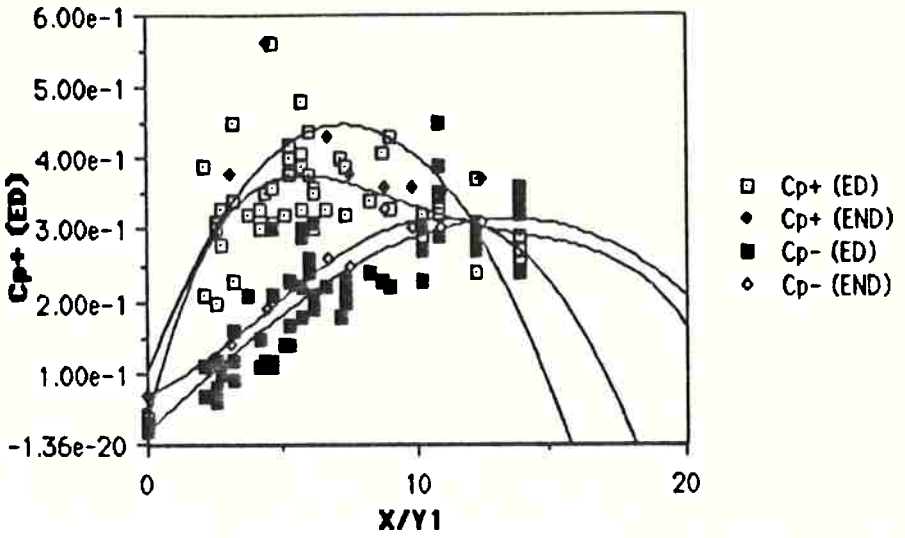


Gráfico G13

Ensaio Nº5.020501 (F_1 = 5.59 e ED)

Ensaio Nº5.030501 (F_1 = 5.49 e END)

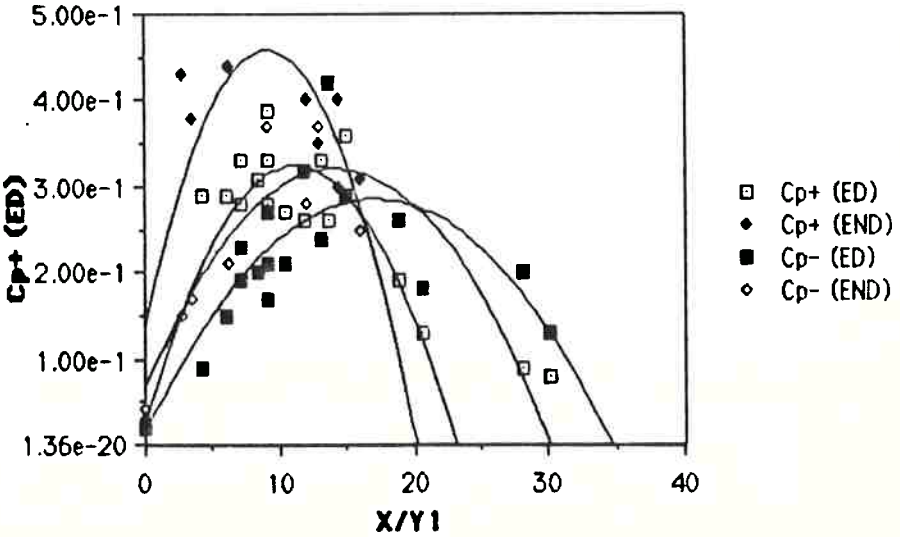


Gráfico G14

Ensaio Nº5.012201 (F_1 = 5.98 e ED)

Ensaio Nº5.031311 (F_1 = 5.90 e END)

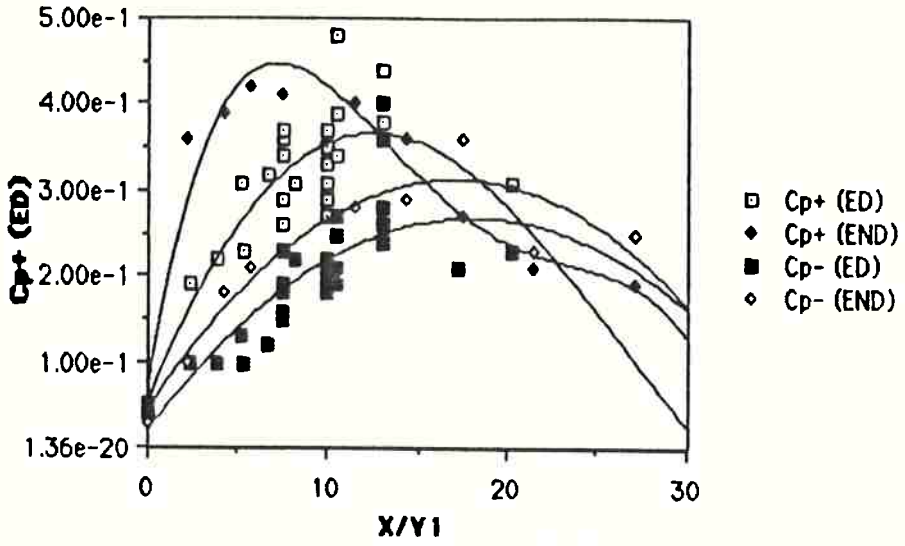
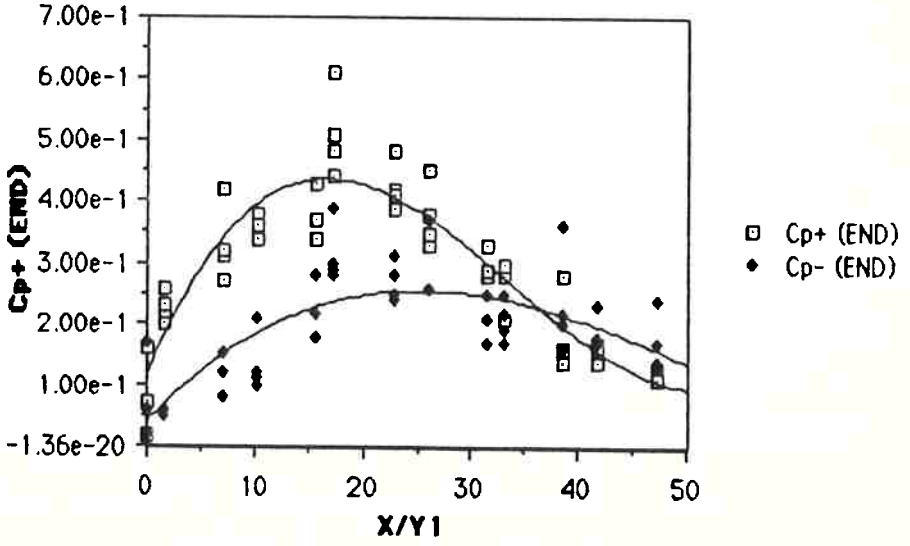


Gráfico G15

Ensaio Nº5.070601 (F_1 = 10.06 e END)

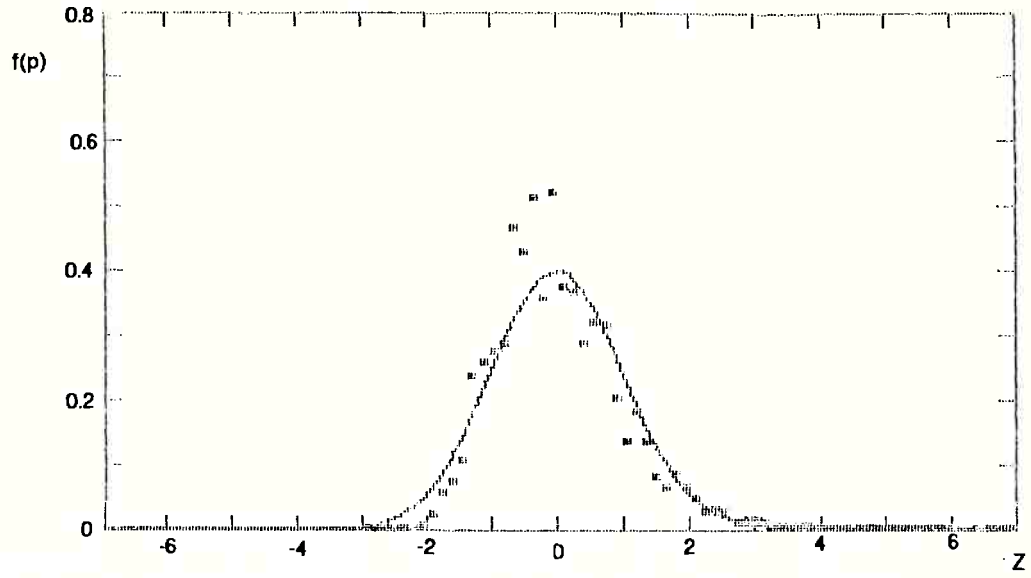


```
10  REM  DEMOPDF
20  REM  ! INTEGER DT,FL,I,J,K,L,
     M1,NN,T1,CC,ZI,CI,IP
40 D$ =  CHR$ (4): HOME :CI = 0:M
     1 = 24600: DIM SM(281): DEF
      FN A(YX) =  INT (YX * 10000
      + .5) / 10000: DEF  FN B(YY
     ) =  INT (YY * 100 + .5) / 1
     00
50  PRINT "*** BINARY FILE IN D2
     ***": PRINT : PRINT
60  INPUT "ENTER DATA FILE #, # O
     F PTS., TRANSDUCER #, SANBOR
     N FLAG (+-1), DATA AVERAGE A
     ND STD. DEV. ";DN,NN,T1,FL,A
     V,SD
70  PRINT D$;"BLOAD BDT";DN;",A";
     M1;",D2"
140 BI = 7:ST = 1 / SD:CC =  INT
     (BI * 2 / ST + .5):LI = BI -
     ST / 2
150 AA = 0:SS = 0:SG = 0:SK = 0:F
      = 0: FOR K = 0 TO CC:SM(K) =
     0: NEXT K
200  FOR K = 0 TO NN - 1:DT =  PEEK
     (M1 + K):Z = (DT - AV) * FL /
     SD
220  IF  ABS (Z) <  = LI THEN Z =
     (Z + BI) / ST:ZI =  INT (Z +
     .5): GOTO 250
230  IF Z < 0 THEN ZI = 0: GOTO 2
     50
240 ZI = CC
250 SM(ZI) = SM(ZI) + 1
260  NEXT K
400  PRINT D$;"PR#1": PRINT : PRINT
     : PRINT "*** RUN#";DN;"  TRA
     NSDUCER #";T1;"   AV = ";AV;
     "   SD = ";SD
410  PRINT : PRINT "     Z
           PROBABILITY": PRINT "(
     P-Pav)/SD    DENSITY        D
     ISTRIBUTION": PRINT
420  FOR L = 0 TO CC
430 SM(L) = SM(L) / NN / ST:DA =
     ( - BI + L * ST) * SD:F = F +
     SM(L) * ST
440 TT = SM(L) * ST:AA = AA + (DA
      + AV) * TT:SS = SS + DA * D
     A * TT:SG = SG + DA * DA * D
     A * TT:SK = SK + DA * DA * D
     A * DA * TT
450  IF L = 0 THEN  PRINT " <"; FN
     B( - LI), FN A(SM(L)), FN A(
     F): GOTO 480
460  IF L = CC THEN  PRINT "=>"; FN
     B(LI), FN A(SM(L)), FN A(F):
      GOTO 480
```

```
470  PRINT "  "; FN B( - BI + L *
     ST), FN A(SM(L)), FN A(F)
480  NEXT L: PRINT : PRINT :S2 =
      SQR (SS)
490  PRINT "AVE = "; FN B(AA);"
     SDEV = "; FN B(S2);"   G = "
     ; FN B(SG / S2 ^ 3);"   K =
     "; FN B(SK / SS / SS)
1000  REM  PLOT ROUTINE
1010  PRINT D$;"BLOAD SHAPES123,A
     16000,D1": POKE 232,128: POKE
     233,62
1020 YD = 8:XD = BI * 2:HF = 0: HOME
     : HGR2 : HCOLOR= 3: ROT= 0: SCALE= 1
1030  HPLOT 0,0 TO 279,0 TO 279,1
     91 TO 0,191 TO 0,0
1040  FOR L = 1 TO YD - 1:DY = 19
     1 * L / YD: HPLOT 0,DY TO 5,
     DY: HPLOT 274,DY TO 279,DY: NEXT
     L
1050  FOR L = 1 TO XD - 1:DX = 27
     9 * L / XD: HPLOT DX,0 TO DX
     ,5: HPLOT DX,186 TO DX,191: NEXT
     L
1080 RX = 279 / (BI * 2):RY = 191
      / .8:PP = 2.506628: HPLOT 0
     ,191
1100  FOR L = 1 TO  INT (BI * 10 +
     .5)
1110 TT = (L * .2 - BI):X = L * .
     2 * RX:Y =  EXP ( - TT * TT /
     2) / PP * RY: IF Y > 191 THEN
     Y = 191
1120  HPLOT  TO X, ABS (Y - 191)
1140  NEXT L
1200  FOR L = 0 TO CC:X = L * ST *
     RX:Y = SM(L) * RY: IF Y > 19
     1 THEN Y = 191:HF = HF + 1
1205  IF X > 279 THEN X = 279
1210  DRAW 1 AT X, ABS (Y - 191)
1220  NEXT L
2000  REM   HARD COPY ROUTINE
2020  PRINT : HTAB (14): PRINT "*
     ** DENSITY FUNCTION COMPARIS
     ON WITH THE NORMAL DENSITY *
     **"
2030  HTAB (15): PRINT "-- VERTIC
     AL SCALE > 0 TO 0.80 "
2050  HTAB (15): PRINT "-- HORIZO
     NTAL SCALE > -";BI;" TO ";BI
     ;" (NORMALIZED)"
2090  IF HF > 0 THEN  PRINT "   *
     ** MAX. PLOT LIMIT WAS EXCEE
     DED ";HF;" TIME(S)"
2150  PRINT  CHR$ (9);"G2"
2160  PRINT D$;"PR#0": GET AN$: PRINT
     : TEXT : END

]PR#0
```

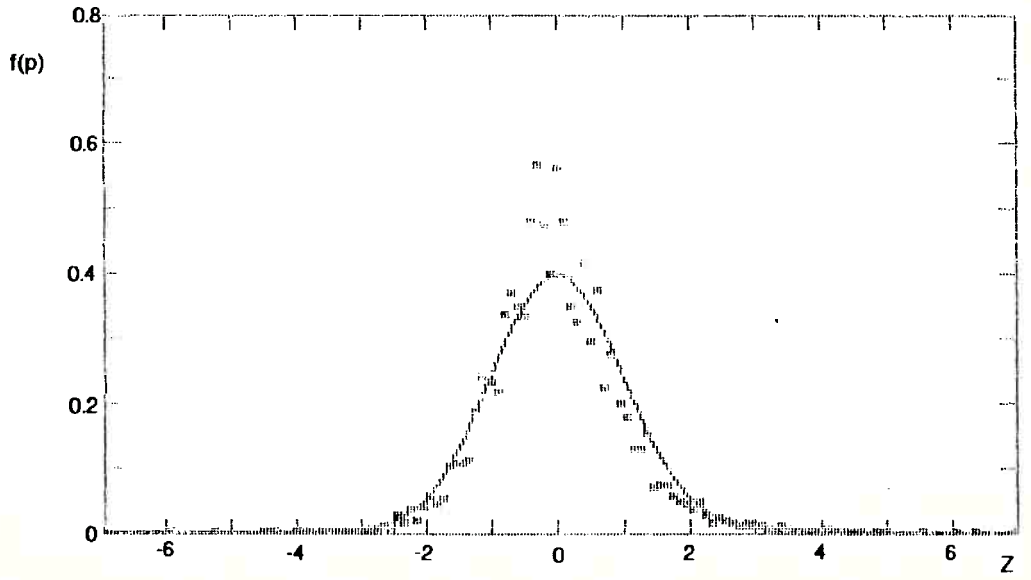
F1=4.17 (ED)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
--- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=2.22

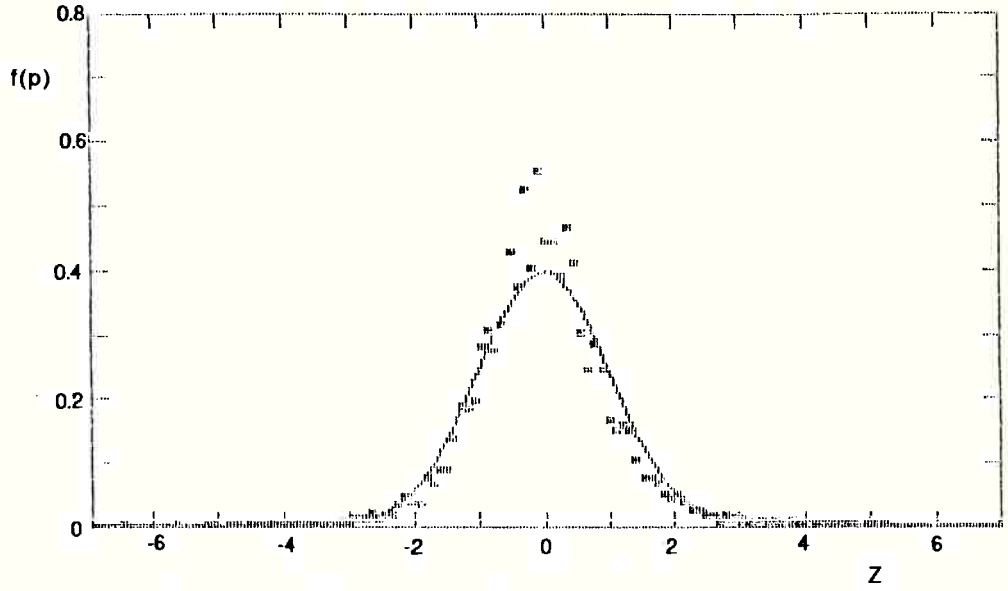
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
--- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=6.48

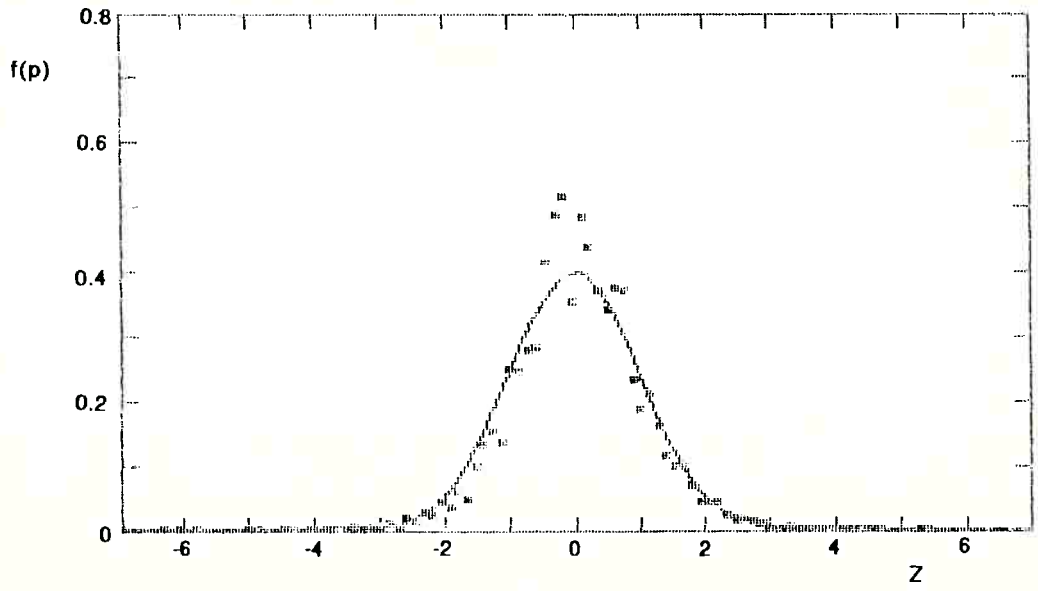
F1=4.17 (ED)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
--- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=8.33

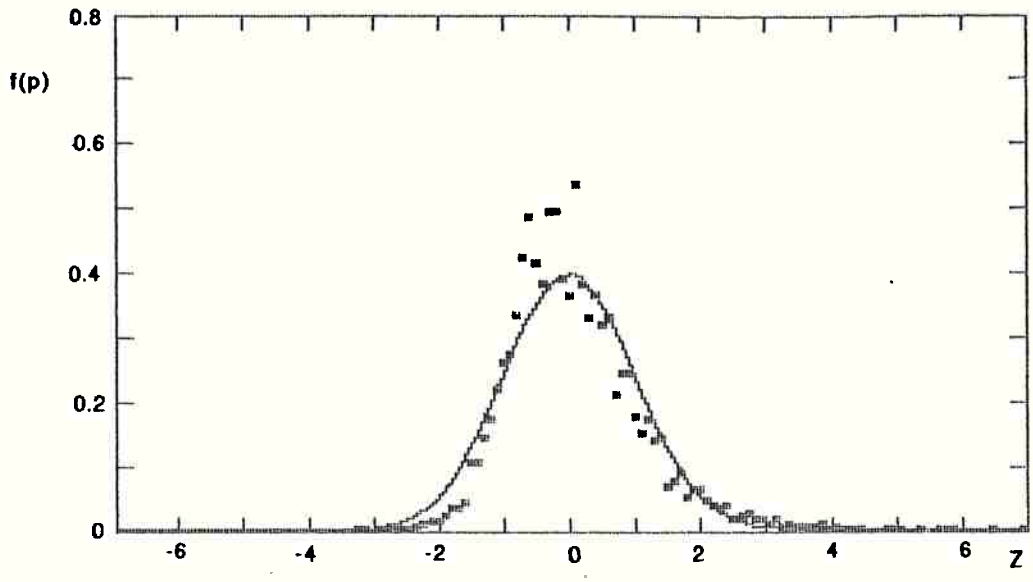
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=11.74

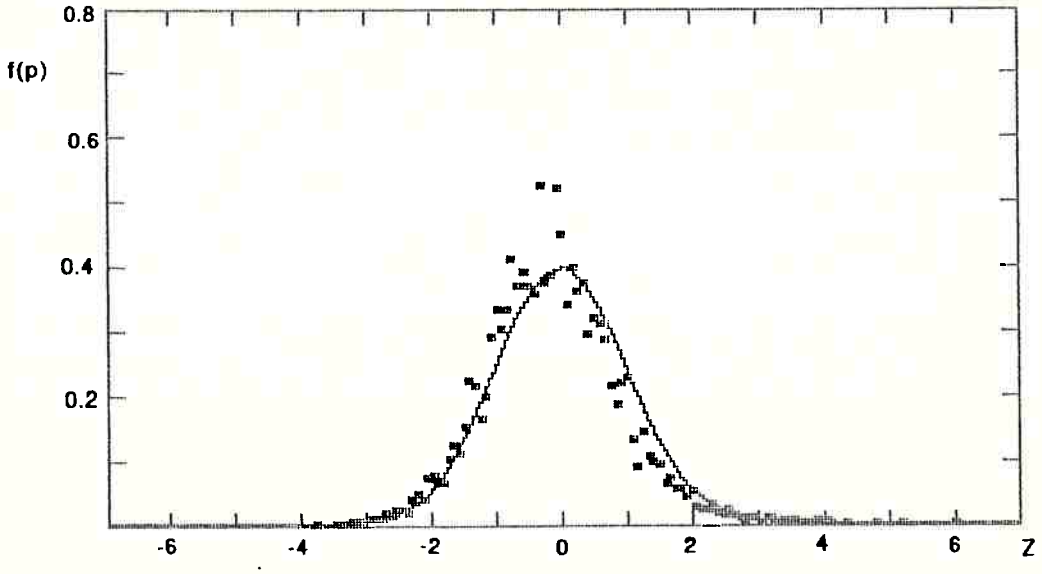
F1=4.18 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=2.88

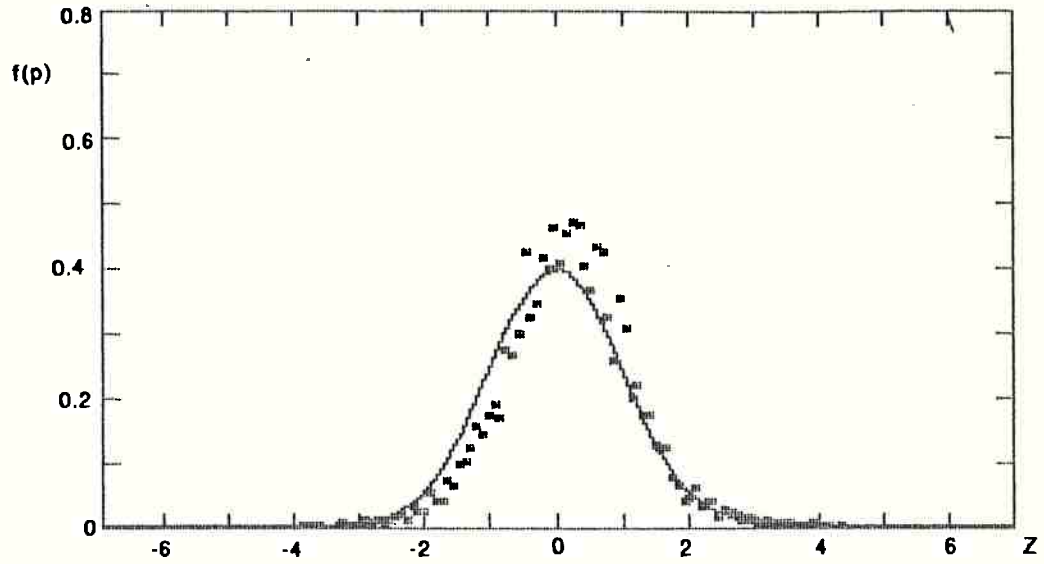
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=6.83

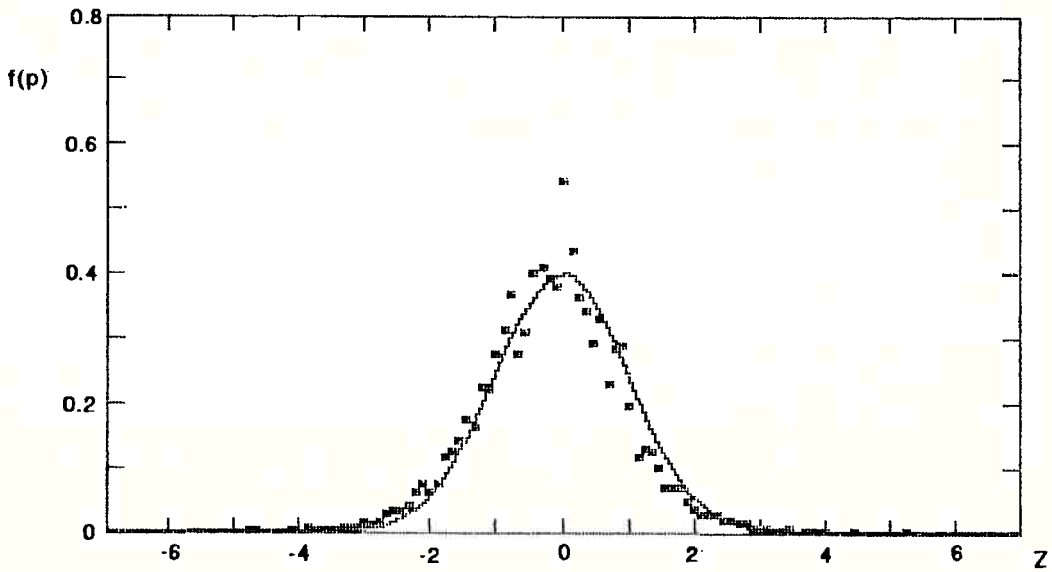
F1=4.18 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=8.63

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)

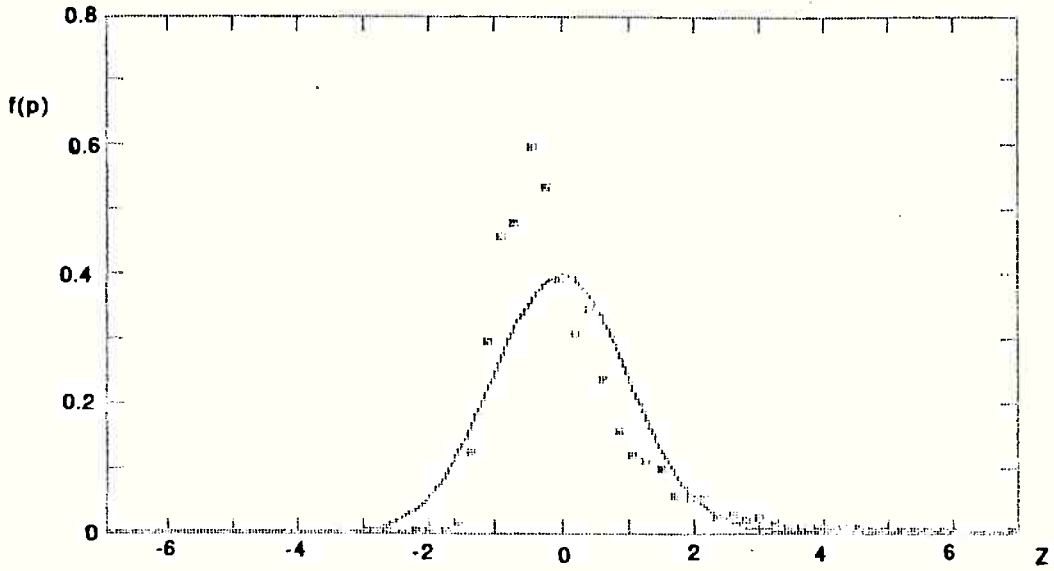


X/Y1=11.15

F1=5.98 (ED)

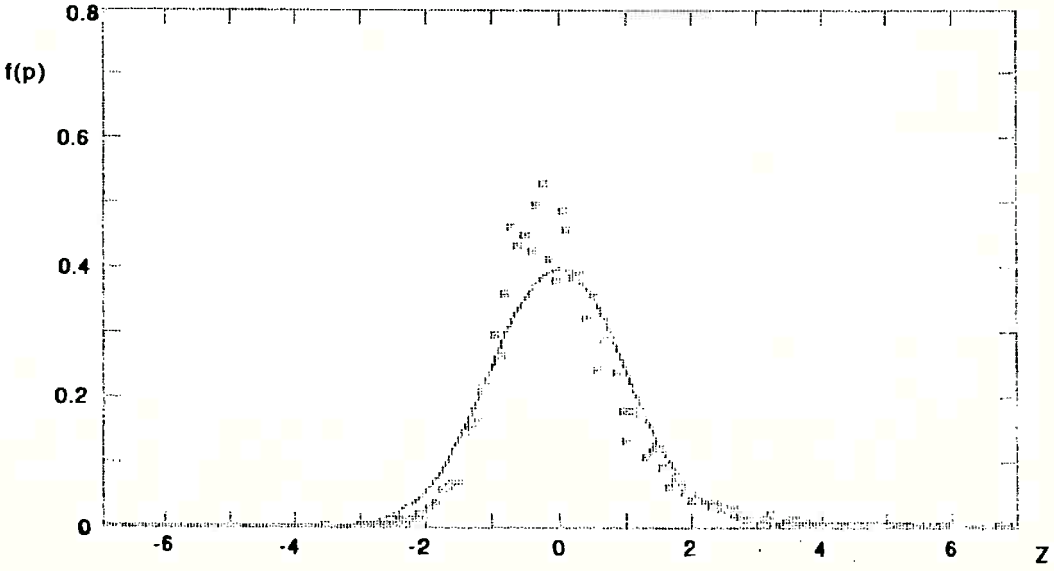
H3a.1

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
---- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=2.31

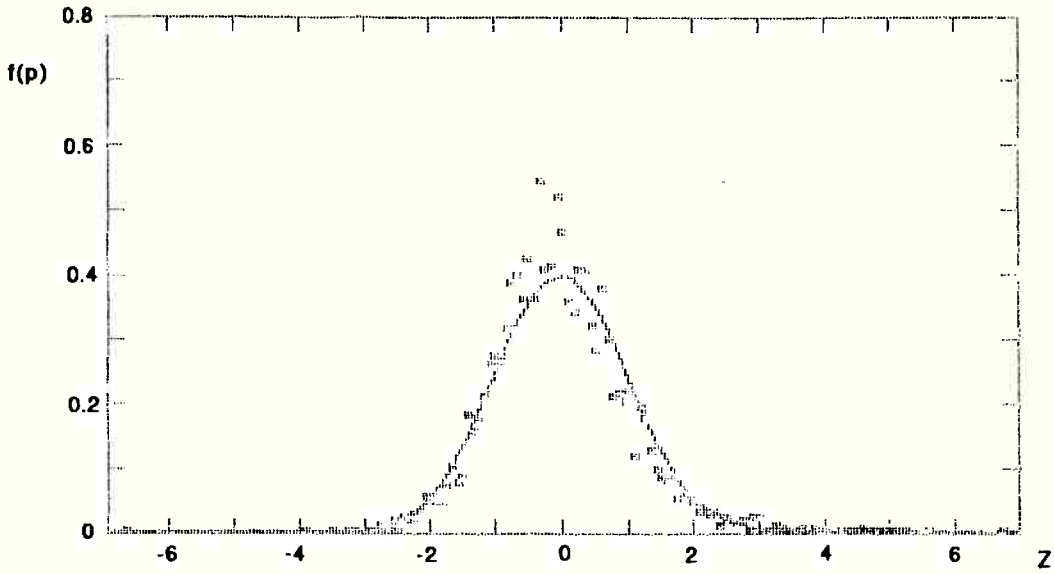
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
---- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=7.54

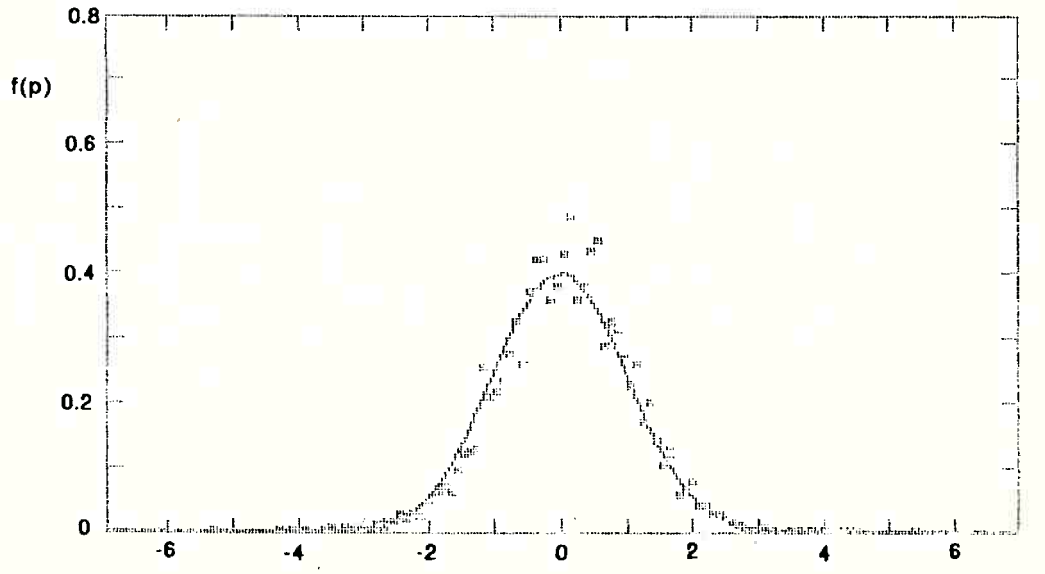
F1=5.98 (ED)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
--- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=10.05

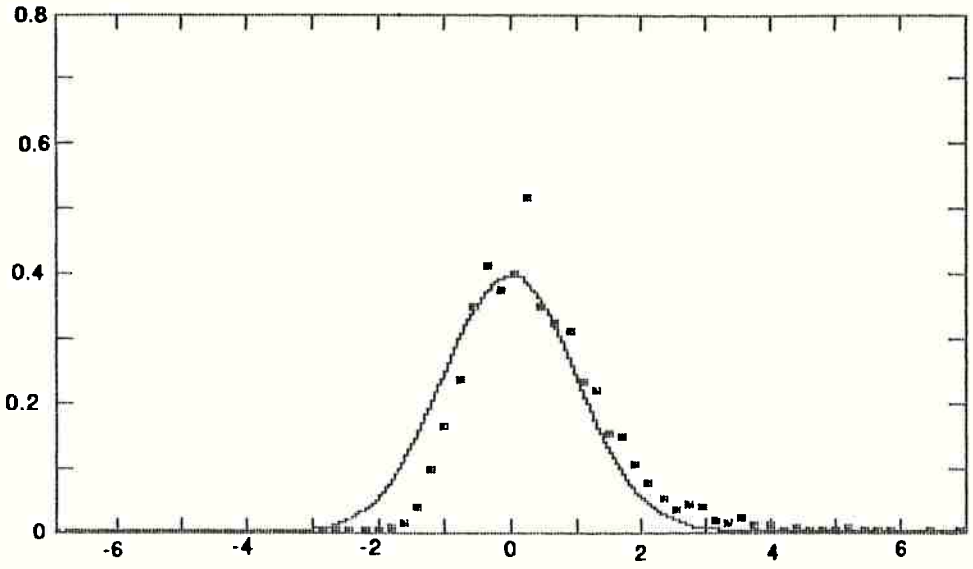
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
--- VERTICAL SCALE > 0 TO 0.80
--- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=17.29

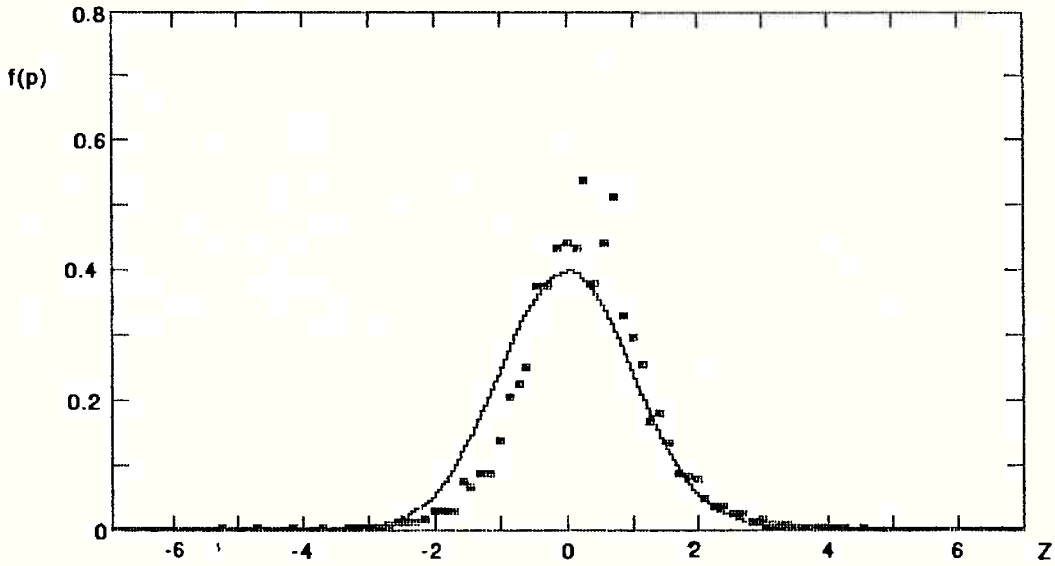
F1=5.90 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=2.16

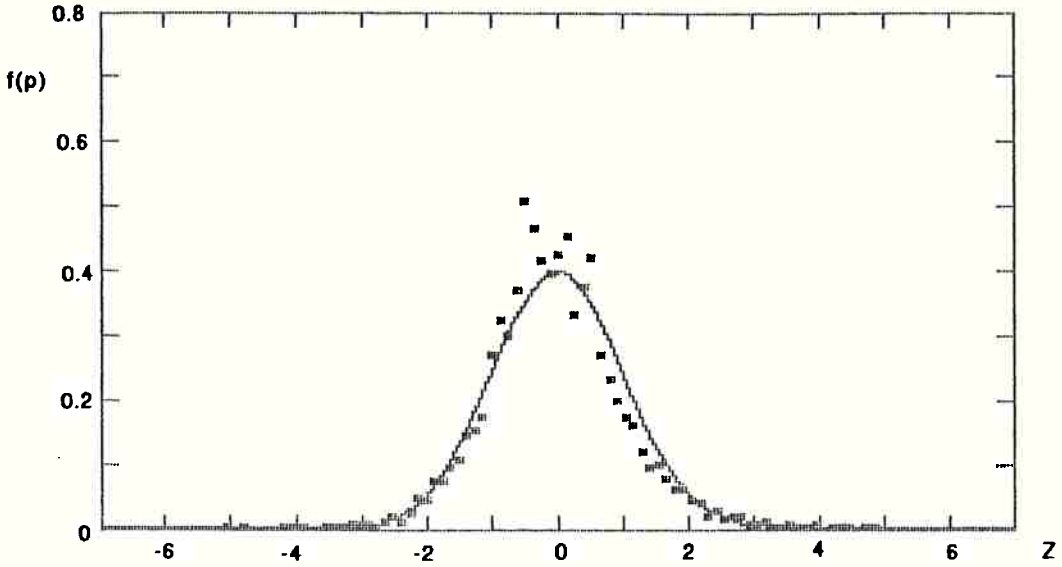
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=17.62

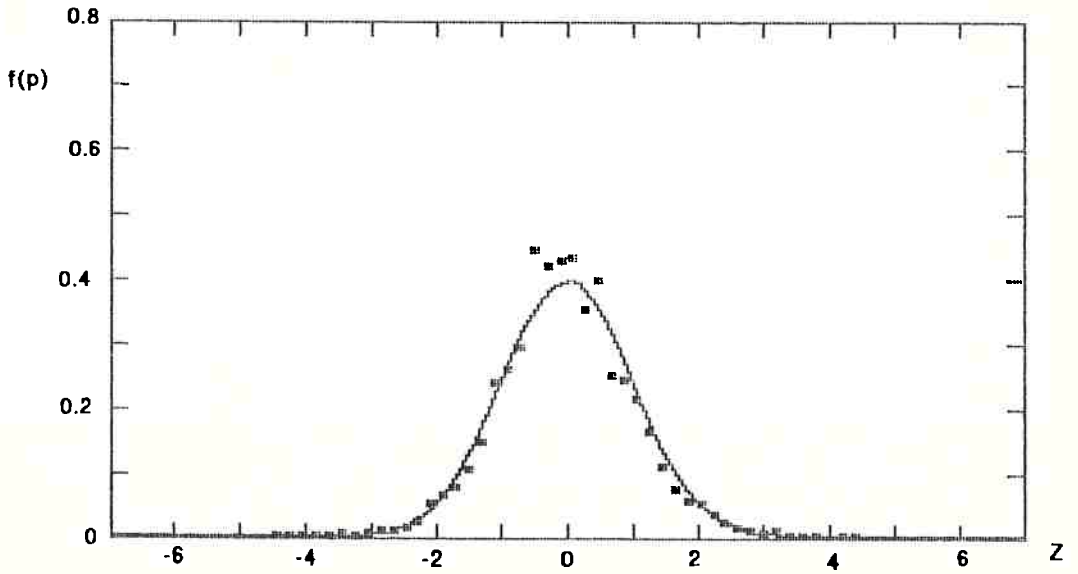
F1=5.90 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=14.38

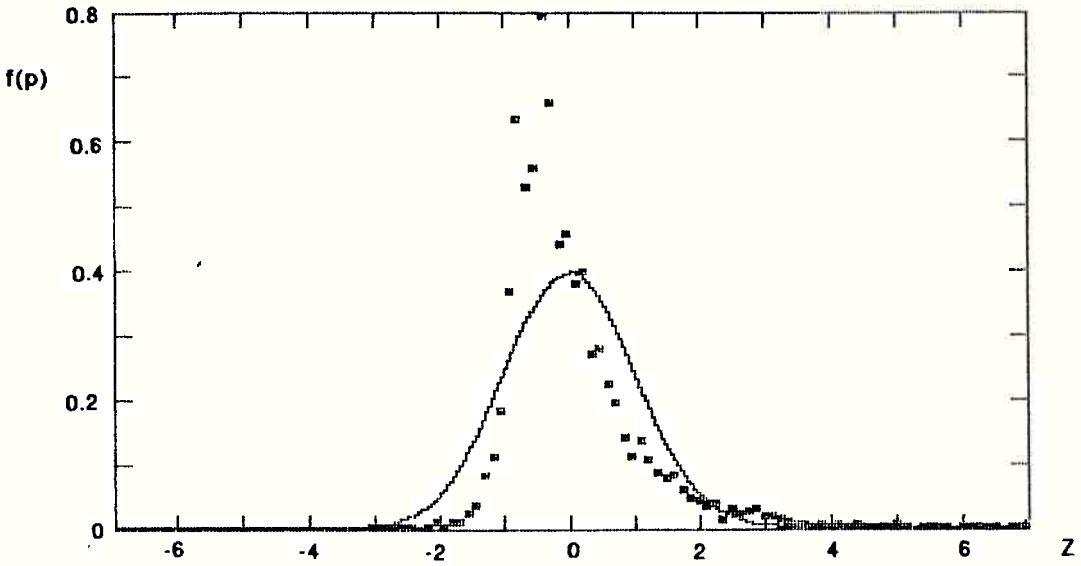
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=21.57

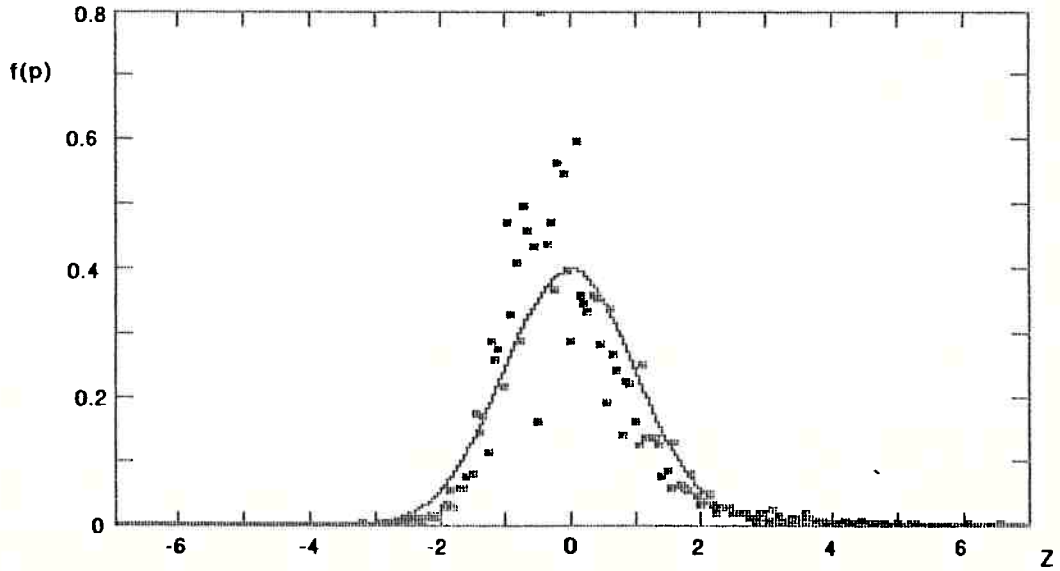
F1=10.06 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=2.36

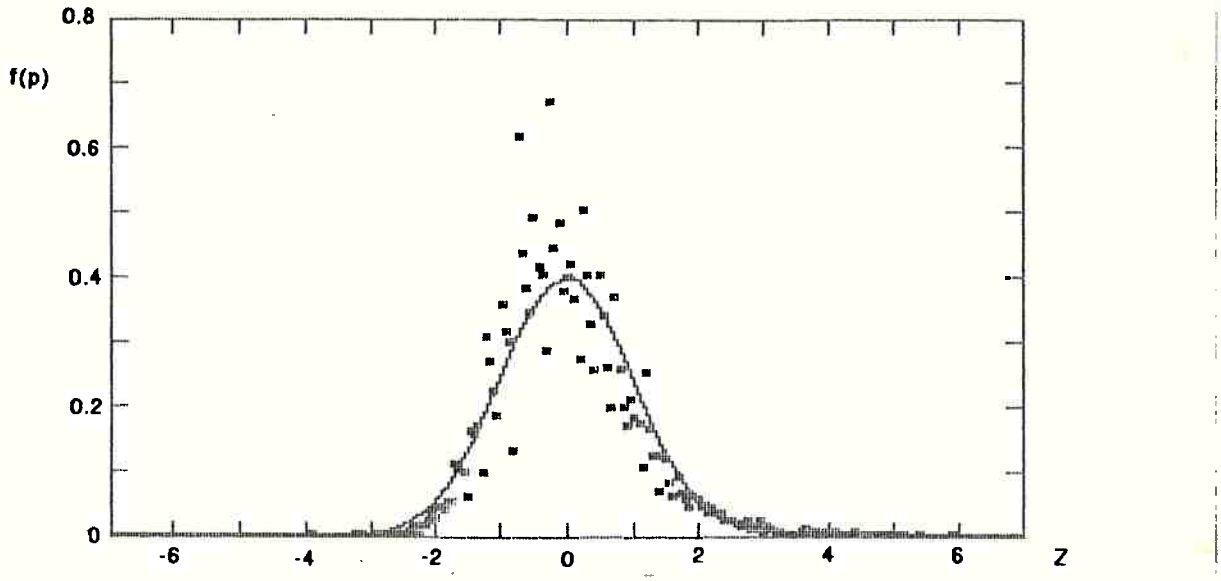
*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)
MAX. PLOT LIMIT WAS EXCEEDED 1 TIME(S)



X/Y1=15.74

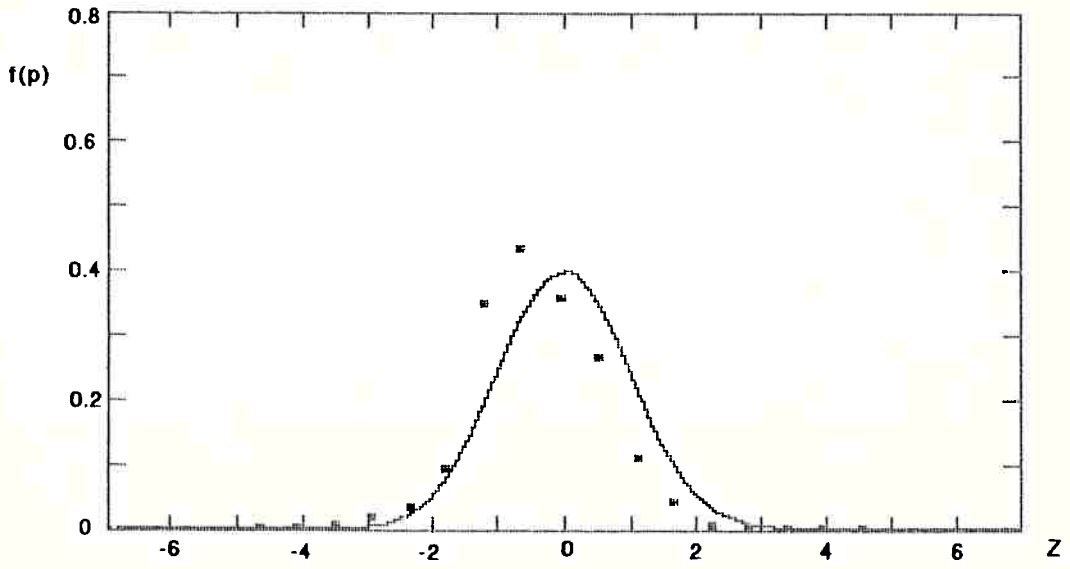
F1=10.06 (END)

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=22.03

*** DENSITY FUNCTION COMPARISON WITH THE NORMAL DENSITY ***
-- VERTICAL SCALE > 0 TO 0.80
-- HORIZONTAL SCALE > -7 TO 7 (NORMALIZED)



X/Y1=29.90

Gráfico H5a (assimetria)

Ensaio Nº5.030601 (F_1=2.98 e ED)

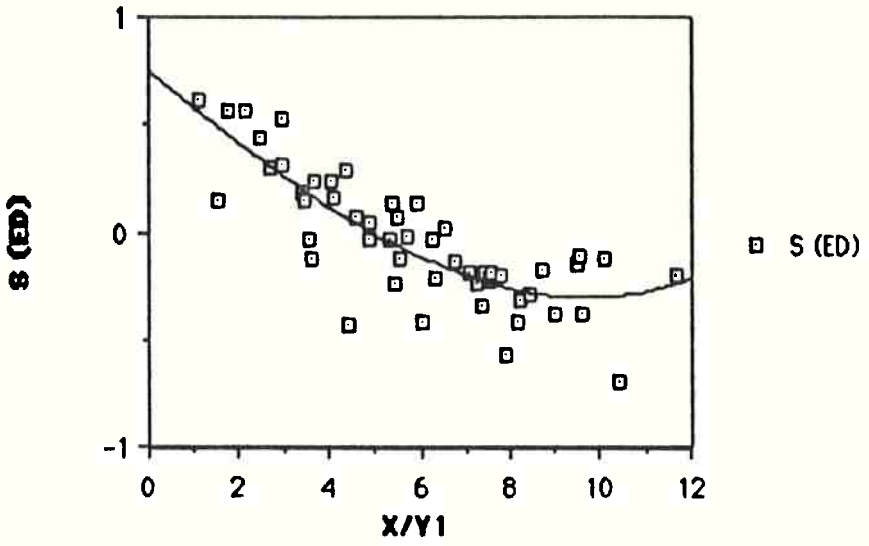


Gráfico H5b (curtose)

Ensaio Nº5.030601 (F_1=2.98 e ED)

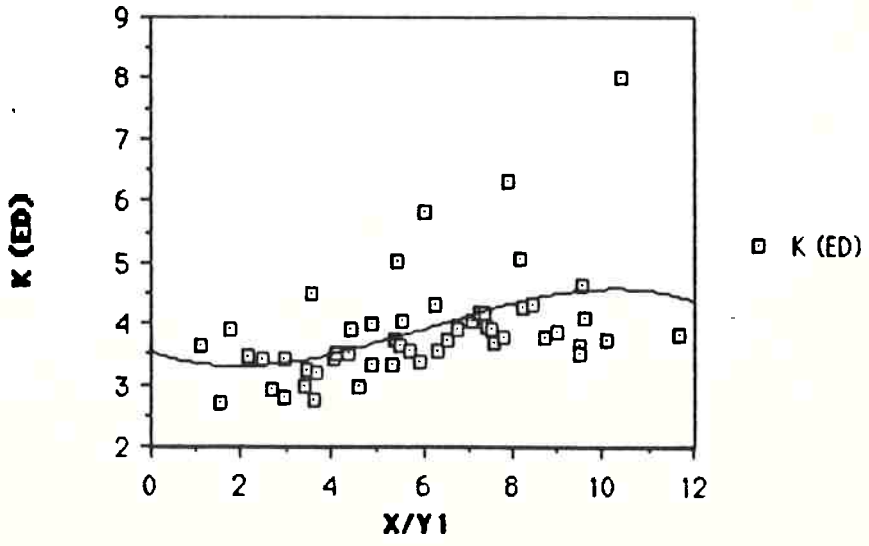


Gráfico H6a (assimetria)

Ensaio Nº5.020801 (F_1=4.17 e ED)

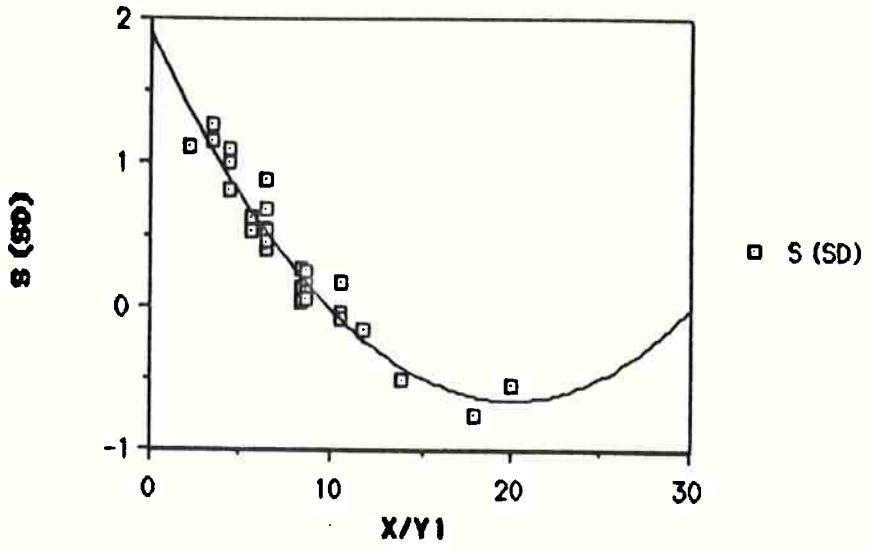


Gráfico H6b (curtose)

Ensaio Nº5.020801 (F_1=4.17 e ED)

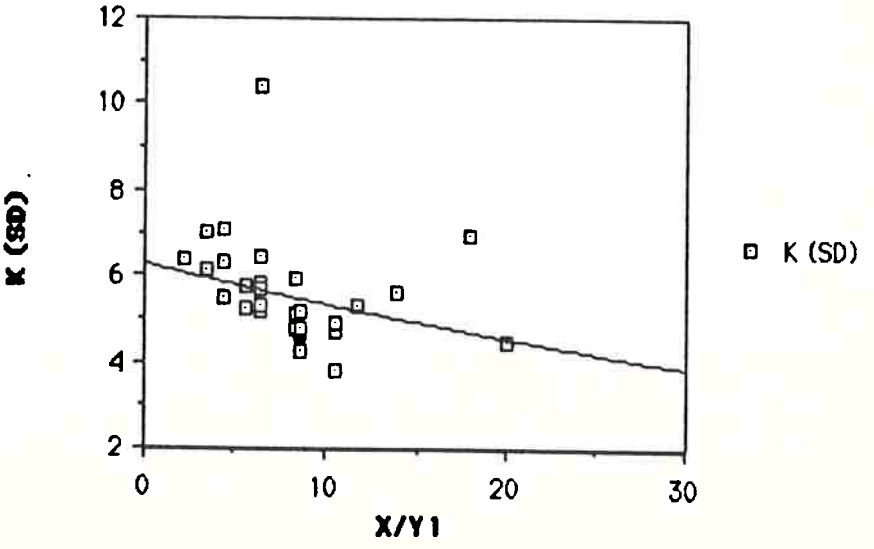


Gráfico H7a (assimetria)

Ensaio Nº 5.020501 (F_1=5.59 e ED)

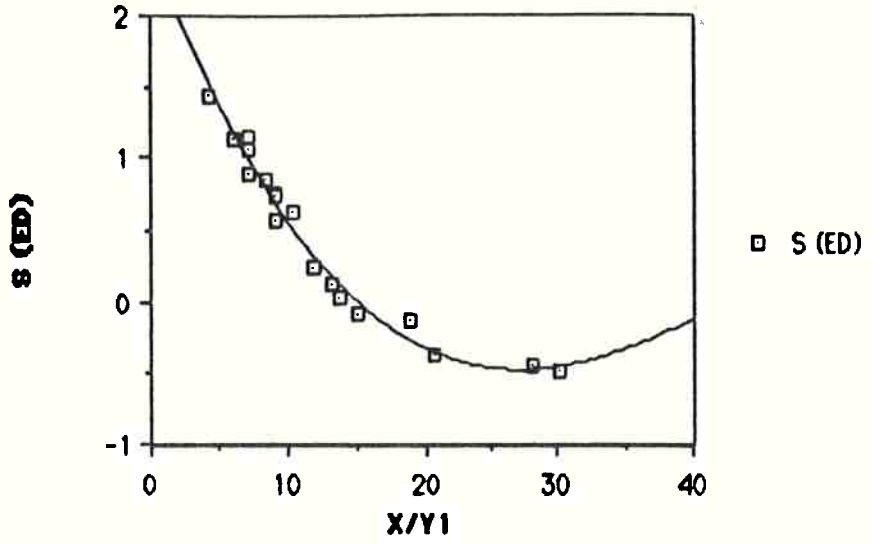


Gráfico H7b (curtose)

Ensaio Nº 5.020501 (F_1=5.59 e ED)

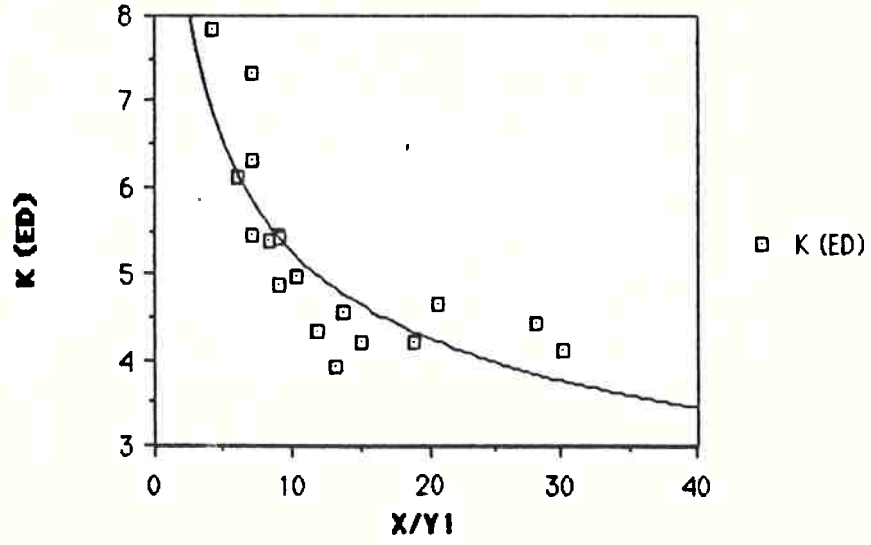


Gráfico H8a (assimetria)

Ensaio Nº5.012201 (F_1=5.98 e ED)

Ensaio Nº5.031311 (F_1=5.90 e END)

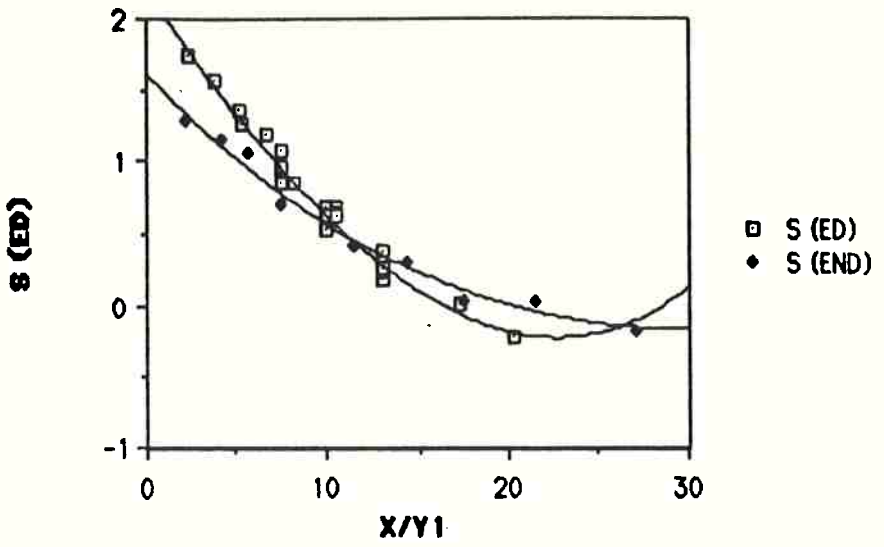


Gráfico H8b (curtose)

Ensaio Nº5.012201 (F_1=5.98 e ED)

Ensaio Nº5.031311 (F_1=5.90 e END)

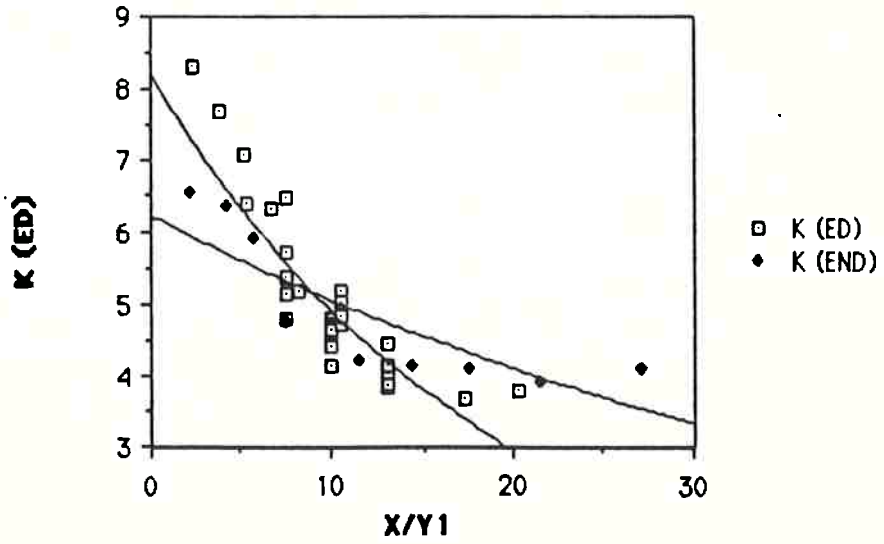


Gráfico H9a (assimetria)

Ensaio Nº5.070601 (F_1=10.06 e END)

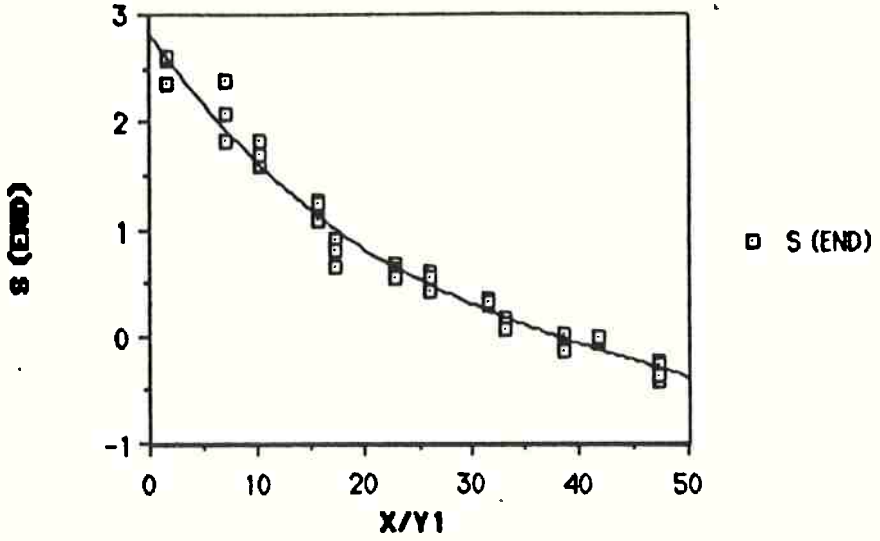


Gráfico H9b (curtose)

Ensaio Nº5.070601 (F_1=10.06 e END)

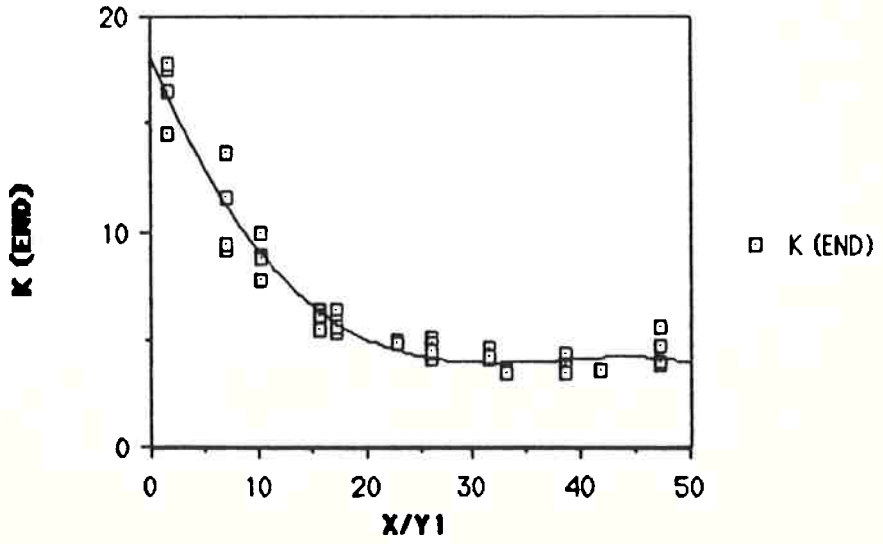


Gráfico H10a (assimetria)

Ensaio Nº5.020501 (F_1=5.59 e ED)

Res. VASILIEV & BUKREYEV (F_1=5.74)

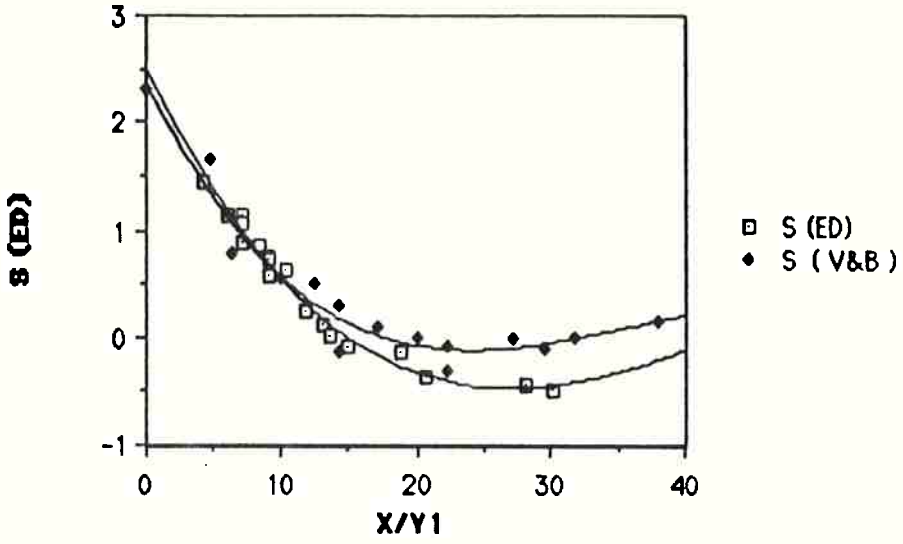


Gráfico H10b (curtose)

Ensaio Nº5.020501 (F_1=5.59 e ED)

Res. VASILIEV & BUKREYEV (F_1=5.74)

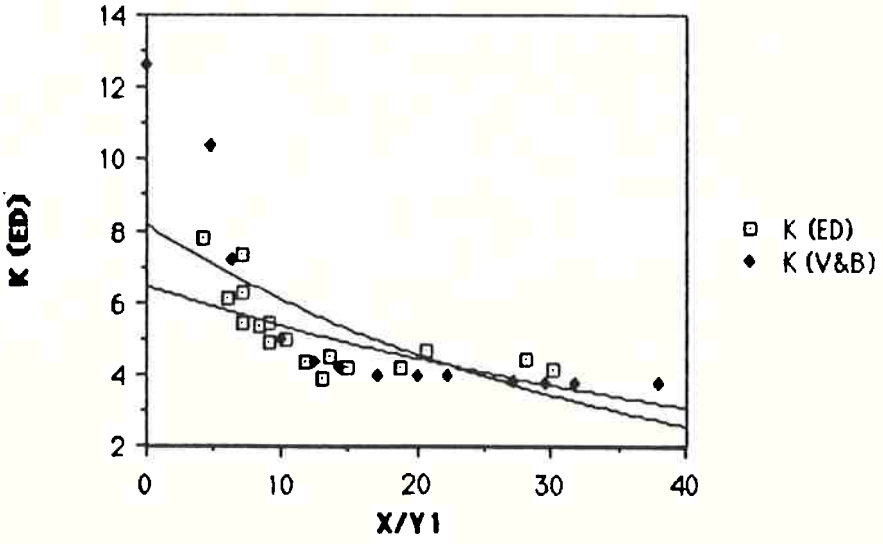


Gráfico H11

Ensaio Nº5.020801 (F_1 = 4.17 e ED)

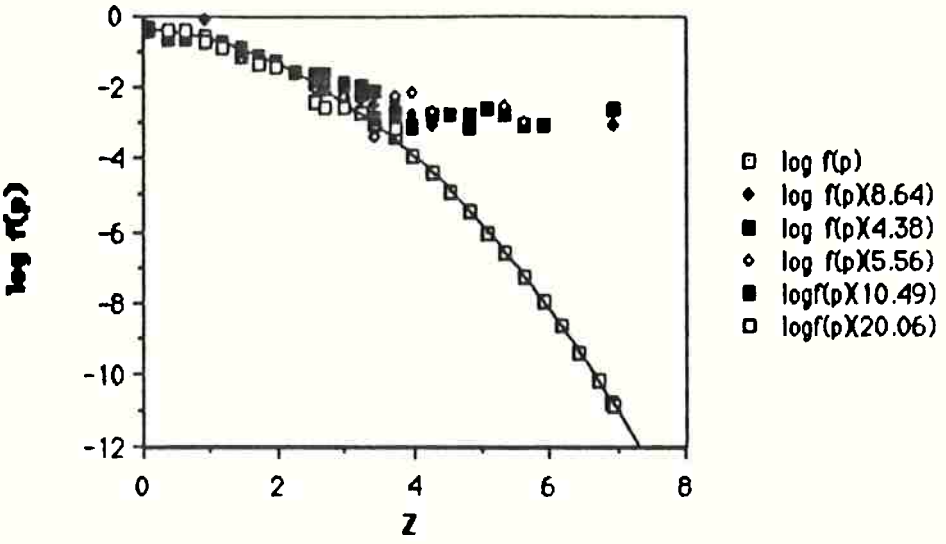


Gráfico H12

Ensaio Nº8.030201 (F_1 = 4.18 e END)

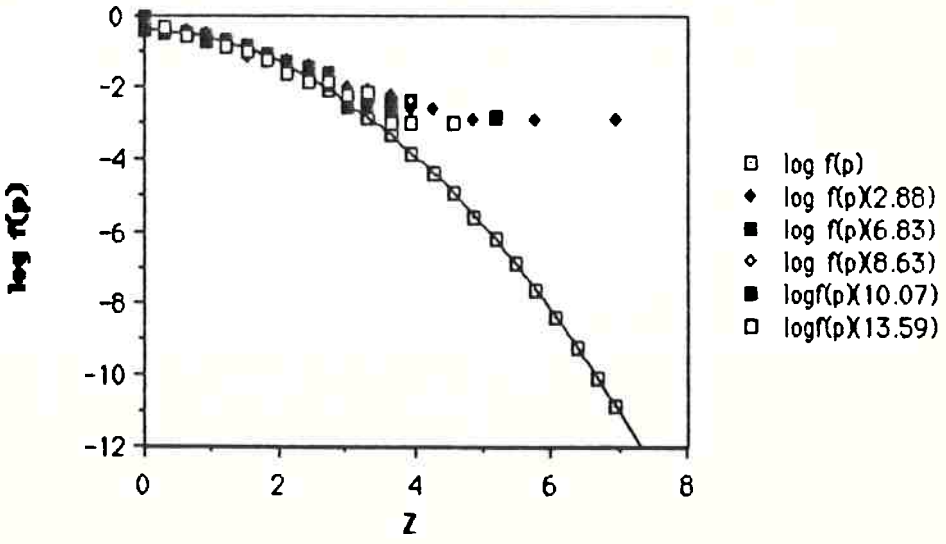


Gráfico H13

Ensaio Nº8.012201 (F_1 = 5.98 e ED)

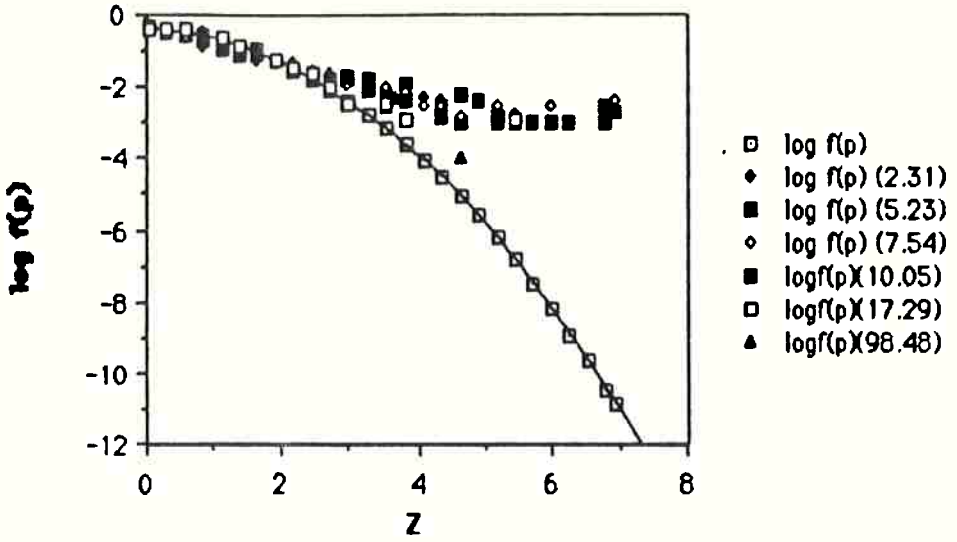


Gráfico H14

Ensaio Nº5.031311 (F_1 = 5.90 e END)

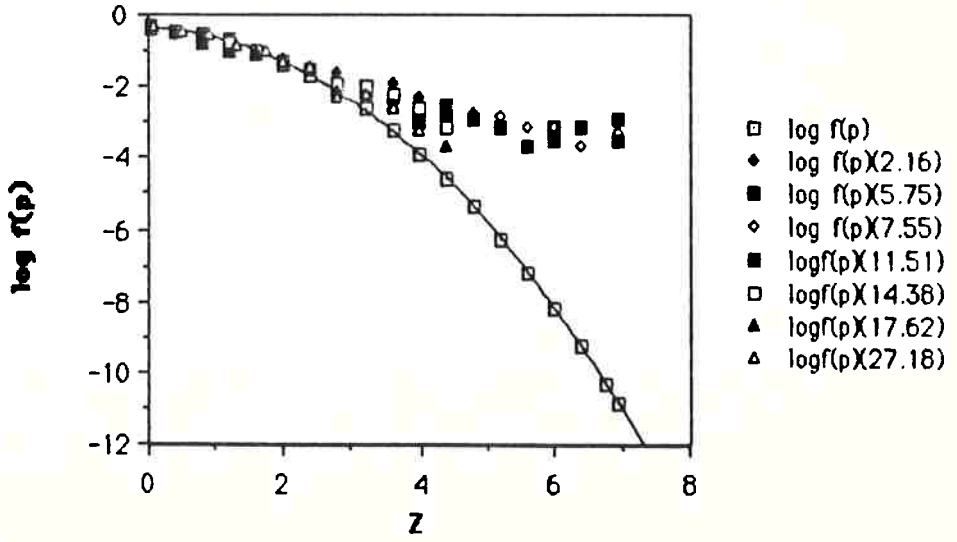
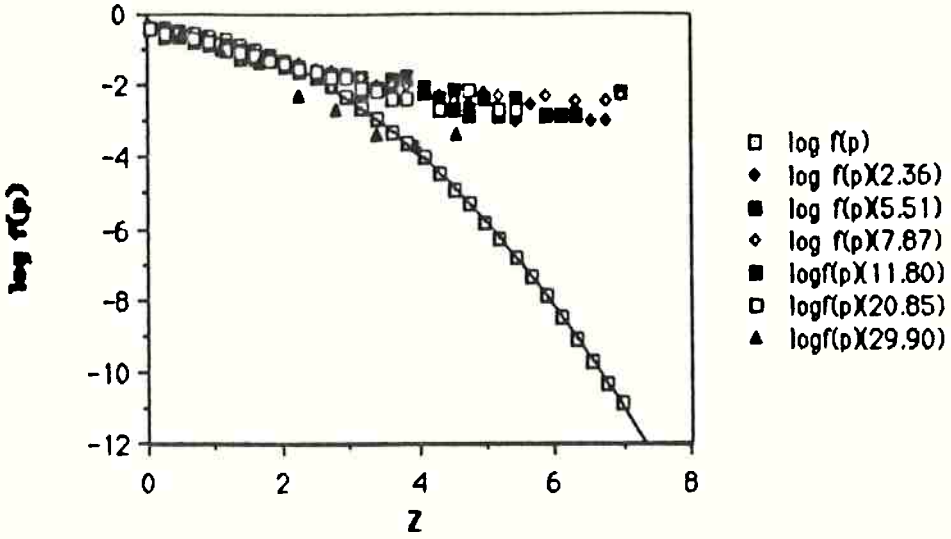


Gráfico H15

Ensaio Nº 8.030701 (F_1 = 10.06 e END)

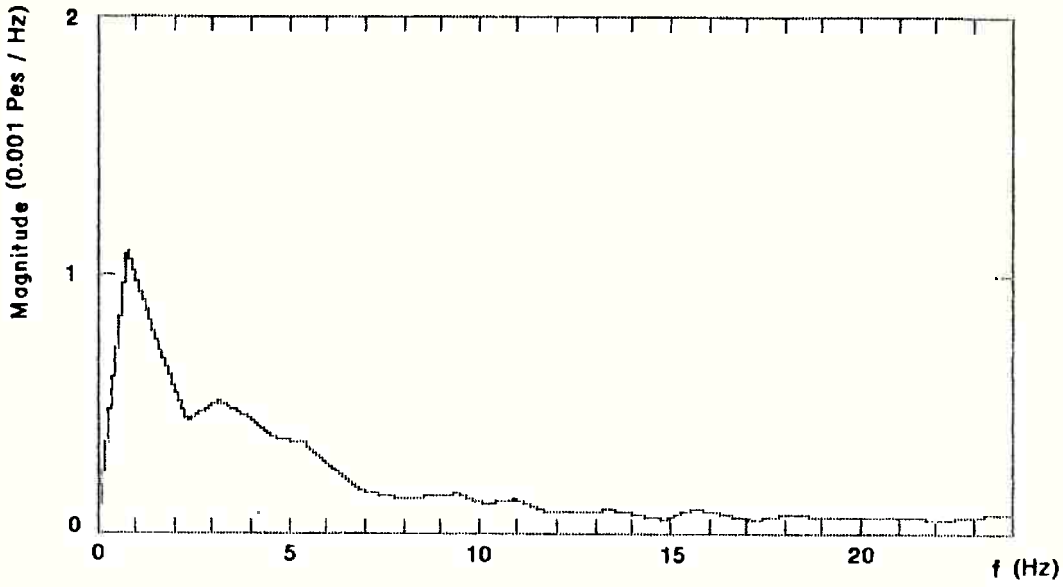


```
1  REM  ! INTEGER CH,EF,I,IE,II,I
     1,I2,I3,I4,I5,J,JJ(2),K,L,M,
     M1,N,NE,NI,NX,P,PP,PX,T(4),U
     ,W,X,Y,Z
2  DIM X1(64),X2(64),XX(64),YY(64
     ),AC(64),PS(64): DEF  FN A(Z
     Z) =  INT (ZZ * 1000 + .5) /
     1000
10 N = 64:L = 6:P1 = 3.14159:PP =
     0:M1 = 16384:PX = 10:D$ =  CHR$
     (4): HOME
20  INPUT "ENTER INPUT FILE # ";N
     I
30  PRINT D$;"OPEN INPUT";NI;",D1
     ": PRINT D$;"POSITION INPUT"
     ;NI;",R";PP: PRINT D$;"READ
     INPUT";NI: INPUT NE,SR:DF =
     SR / N
40  INPUT DN,EF,NT: FOR II = 0 TO
     NT - 1: INPUT T(II): NEXT II
     :PP = PP + 5 + NT
50  PRINT D$;"CLOSE": IF DN = 0 THEN
      END
60  IF EF = 0 THEN  PRINT "*** IN
     SERT DATA DISK WITH BDT";DN;
     " IN D2": WAIT  - 16286,128
70  FOR II = 0 TO NT - 1
80  IF T(II) = 0 GOTO 1700
90  PRINT D$;"BLOAD BDT"DN",A"M1"
     ,D2"
100  FOR J = 0 TO N - 1:YY(J) = 0
     .:XX(J) = 0.: NEXT J:P = 0
110  FOR IE = 1 TO NE:AV = 0:A =
      FRE (0)
120  FOR I = 0 TO N - 1:X1(I) =  PEEK
     (M1 + II + NT * (P + I)):AV =
     AV + X1(I):X2(I) = 0.: NEXT
     I:P = P + I + PX:AV = AV / N

125  PRINT "ENSEMBLE ";IE;"  AVE
     = ";AV
130  FOR Z = 0 TO N - 1:X1(Z) = (
     X1(Z) - AV) / N: NEXT Z
140  GOSUB 2000
150  FOR I = 0 TO N - 1:YY(I) = X
     1(I) * X1(I) + X2(I) * X2(I)
      + YY(I): NEXT I
160  NEXT IE:SI = 0
170  FOR I = 0 TO N - 1:YY(I) = Y
     Y(I) / NE:SI = YY(I) + SI:X2
     (I) = 0: NEXT I
180 U = 0.
190 X = U: GOSUB 2000
200 X1(U) = YY(Y) / N:U = U + 1: IF
     U > N - 1 GOTO 220
210  GOTO 190
220  GOSUB 2000
```

```
230  FOR I = 0 TO N - 1:XX(I) = X
     1(I): NEXT I
240  PRINT D$;"PR#1": PRINT "DATA
      FILE BDT";DN;" (START PT. O
     FFSET = ";PX;")": PRINT
1120  REM  --OUTPUT TABLE OF VALU
     ES--
1122  PRINT : PRINT "Power Spectr
     a and Autocorrelation of Tra
     nsducer ";T(II);" (";NE;" En
     sembles )": PRINT : PRINT "H
     ARMONIC  FREQUENCY  MAGNITUD
     E  TIME   CORR. COEF.": PRINT

1130 U = 0.:TT = 0
1140 X = U: GOSUB 3000
1150  IF YY(Y) > TT THEN TT = YY(
     Y)
1160 PS(U) = YY(Y):AC(U) = XX(Y)
1180  PRINT  TAB( 3); FN A(U); TAB(
     13); FN A(U * DF); TAB( 24);
      FN A(YY(Y)); TAB( 33); FN A
     (U / SR); TAB( 40); FN A(XX(
     Y)):U = U + 1: IF U > N / 2 -
     1 GOTO 1420
1220  GOTO 1140
1420  PRINT : PRINT  TAB( 13);"SU
     M = "; TAB( 25); FN A(SI): PRINT
     : PRINT
1425  PRINT : PRINT  TAB( 16);"Po
     wer Spectra:  Magnitude vs.
     Frequency (1 HZ/Div)": PRINT

1430 YZ = 0:YM = 2 ^ ( INT ( LOG
     (TT) /  LOG (2)) + 1):XZ = 0
     :XM = (N / 2 - 1) * DF:XD =
      INT (XM + .5):YD = YM:EE =
     0
1440 RX = 279 / (XM - XZ):RY = 19
     1 / (YM - YZ):PZ = (0 - YZ) *
     RY:LZ = (0 - XZ) * RX
1450  FOR I = 0 TO N / 2 - 1:X2(I
     ) = PS(I) * RY + PZ:X1(I) =
     I * DF * RX: NEXT I
1460  GOSUB 4000
1465  PRINT : PRINT  TAB( 16);"Au
     tocorrelation: Correlation C
     oefficient vs Time Lag": PRINT
     : PRINT  TAB( 24);"X AXIS 0
     TO ";N / 2 - 1;"   Y AXIS -1
      TO +1"
1470 EE = 1:YM = 1.0:YZ =  - 1.0:
     YD = 10:XM = N / 2 - 1:XD =
      INT (XM + .5)
1480 RY = 191 / (YM - YZ):RX = 27
     9 / (XM - XZ):PZ = (0 - YZ) *
     RY:LZ = (0 - XZ) * RX
```

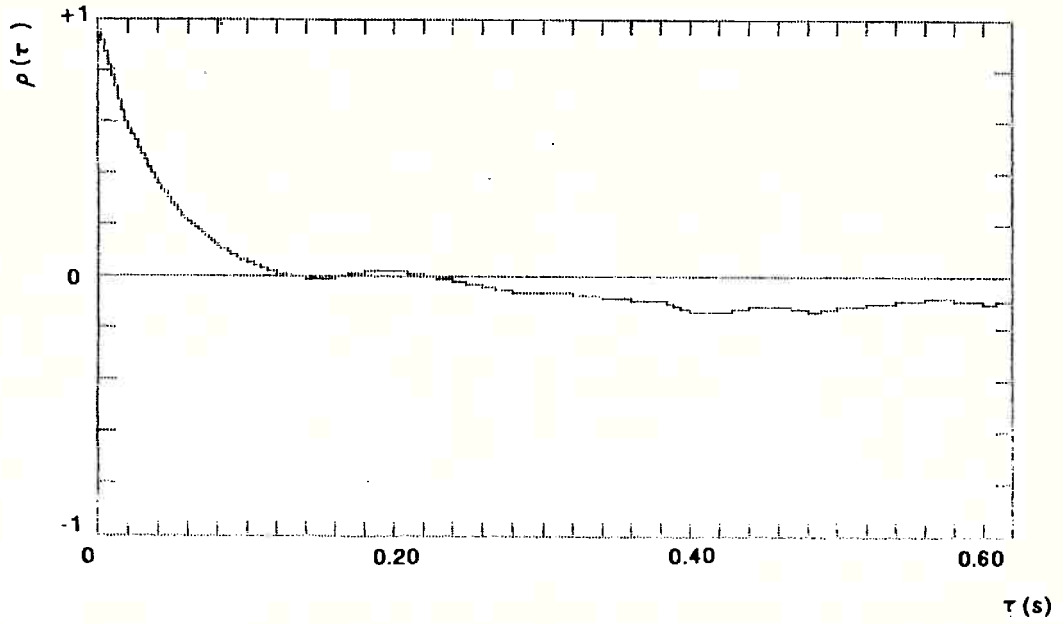
```
1490  FOR I = 0 TO N / 2 - 1:X2(I
      ) = AC(I) / AC(0) * RY + PZ:
      X1(I) = I * RX: NEXT I
1500  GOSUB 4000
1600  PRINT D$;"PR#0": TEXT
1700  NEXT II: GOTO 30
2000  REM   ---FFT IN-PLACE ALGORI
      THM---
2010 I1 = N / 2:I2 = 1:V = 2 * P1
       / N
2020  FOR I = 1 TO L
2030 I3 = 0:I4 = I1
2040  FOR K = 1 TO I2:X =  INT (I
      3 / I1): GOSUB 3000
2050 I5 = Y:Z1 =  COS (V * I5):Z2
       =  -  SIN (V * I5)
2060  FOR M = I3 TO I4 - 1
2070 A1 = X1(M):A2 = X2(M):B1 = Z
      1 * X1(M + I1) - Z2 * X2(M +
      I1):B2 = Z2 * X1(M + I1) + Z
      1 * X2(M + I1)
2080 X1(M) = A1 + B1:X2(M) = A2 +
      B2:X1(M + I1) = A1 - B1:X2(M
       + I1) = A2 - B2
2090  NEXT M
2100 I3 = I3 + 2 * I1:I4 = I4 + 2
       * I1
2110  NEXT K
2120 I1 = I1 / 2:I2 = 2 * I2
2130  NEXT I
2140  RETURN
3000 Y = 0:N1 = N
3010  FOR W = 1 TO L:N1 = N1 / 2
3020  IF X < N1 THEN  GOTO 3040
3030 Y = Y + 2 ^ (W - 1):X = X -
      N1
3040  NEXT W
3050  RETURN
4000  REM   PLOT ROUTINE
4010  HGR2 : HCOLOR= 3
4020  HPLOT 0,0 TO 279,0 TO 279,1
      91 TO 0,191 TO 0,0
4030  FOR I = 1 TO YD - 1:DY = 19
      1 * I / YD: HPLOT 0,DY TO 5,
      DY: HPLOT 274,DY TO 279,DY: NEXT
      I
4035  IF EE = 1 THEN  HPLOT 0,95.
      5 TO 279,95.5
4040  FOR I = 1 TO XD - 1:DX = 27
      9 * I / XD: HPLOT DX,0 TO DX
      ,5: HPLOT DX,186 TO DX,191: NEXT
      I
4050  HPLOT 0,0
4060  FOR I = 0 TO N / 2 - 1: HPLOT
       TO X1(I), ABS (191 - X2(I))
      : NEXT I
4070  PRINT  CHR$ (9);"G2": PRINT
      : PRINT
4080  RETURN
```

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

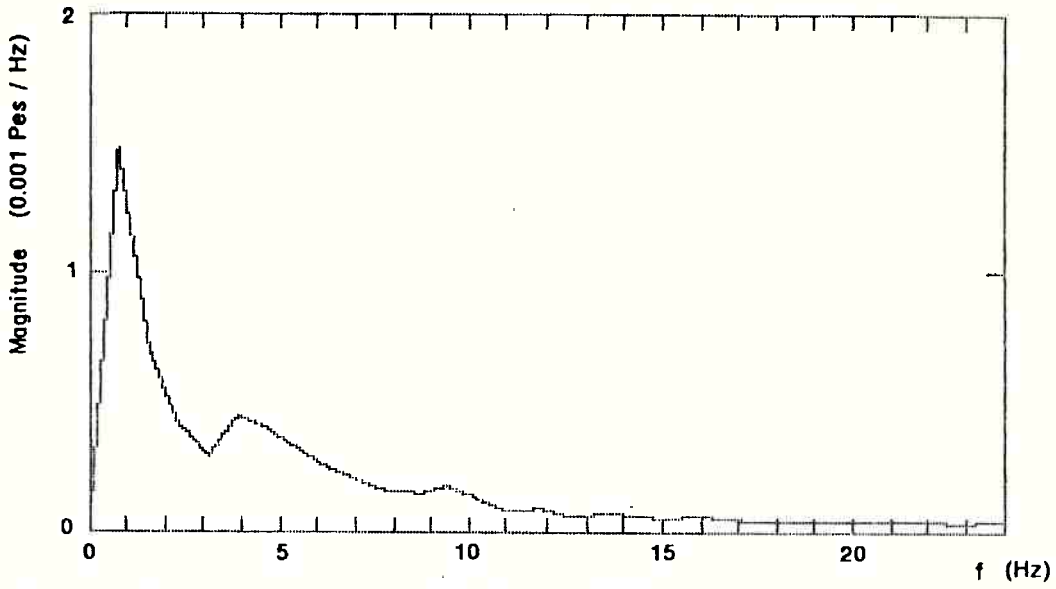
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.98 (ED)

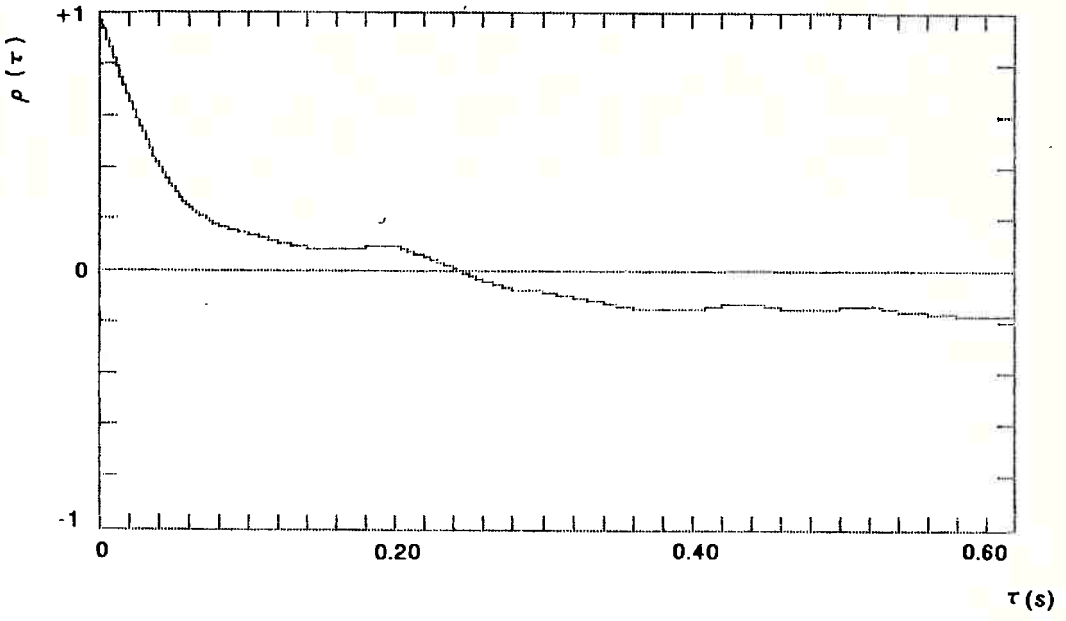
X/Y1 =1.07

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

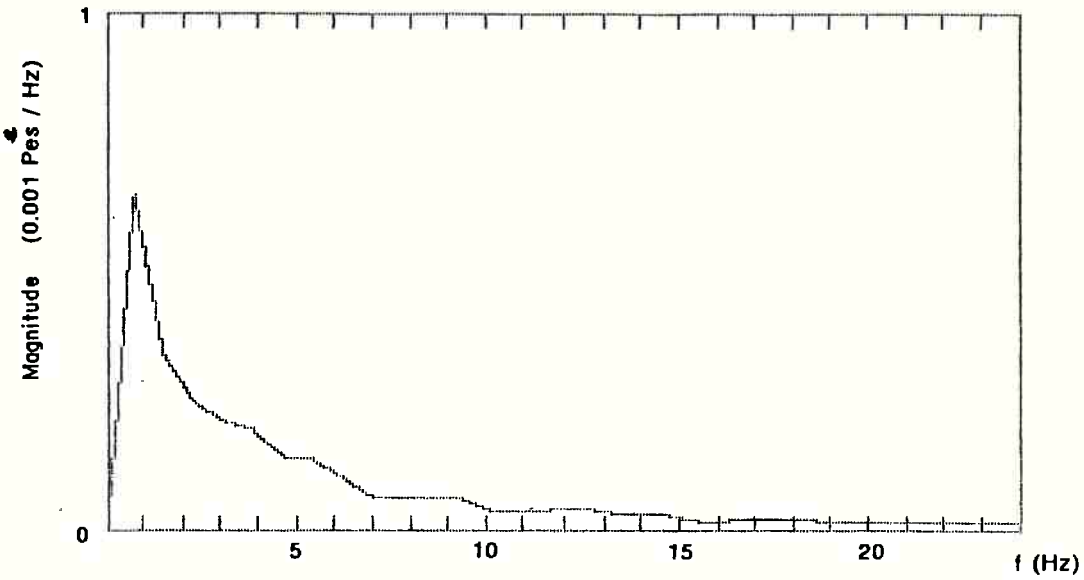
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.98 (ED)

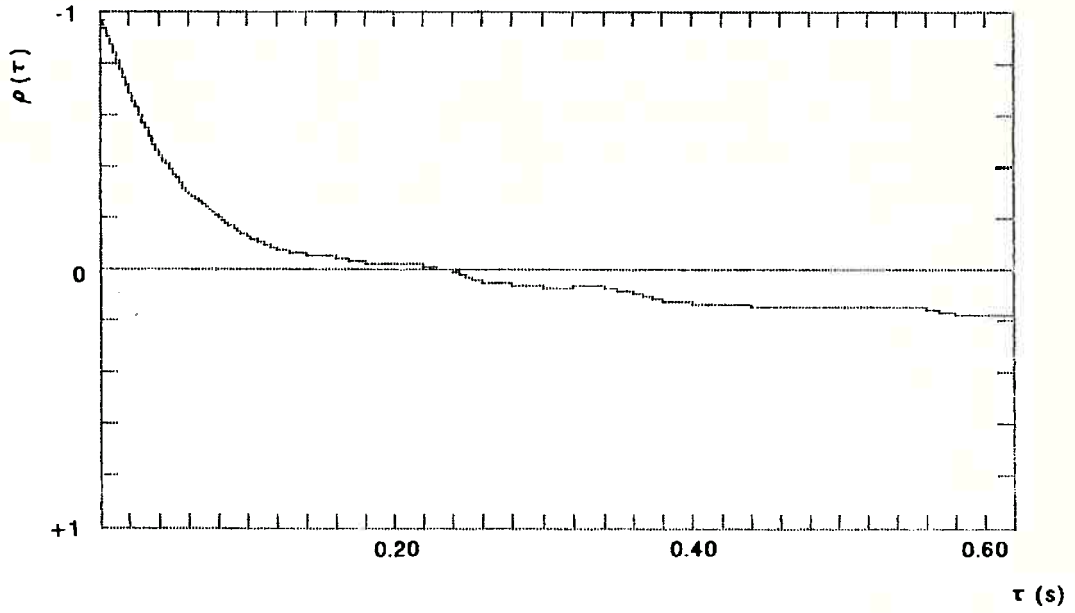
X/Y1=7.08

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

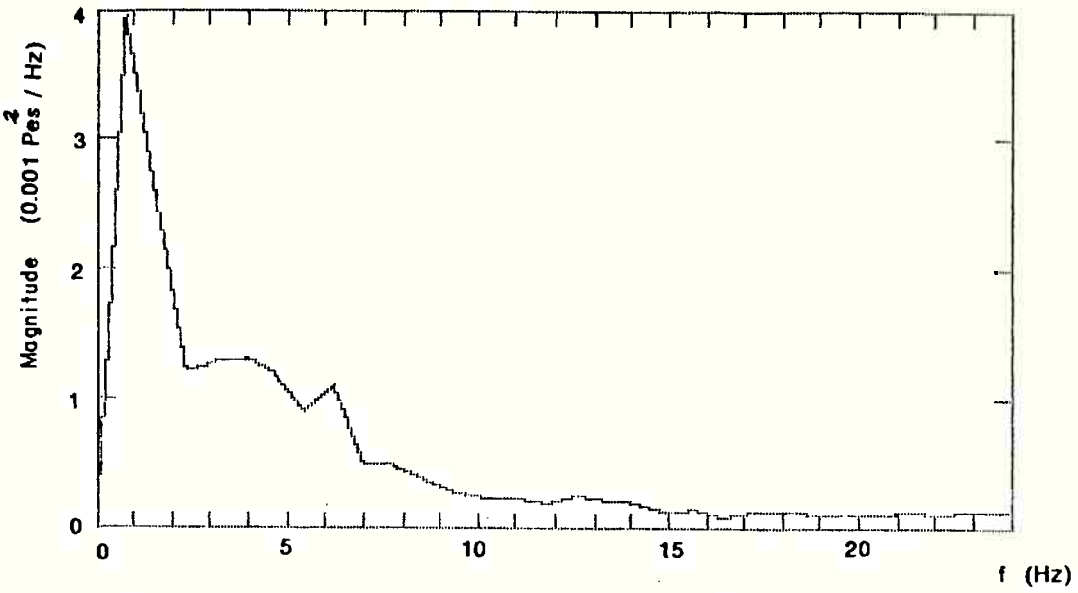
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.98 (ED)

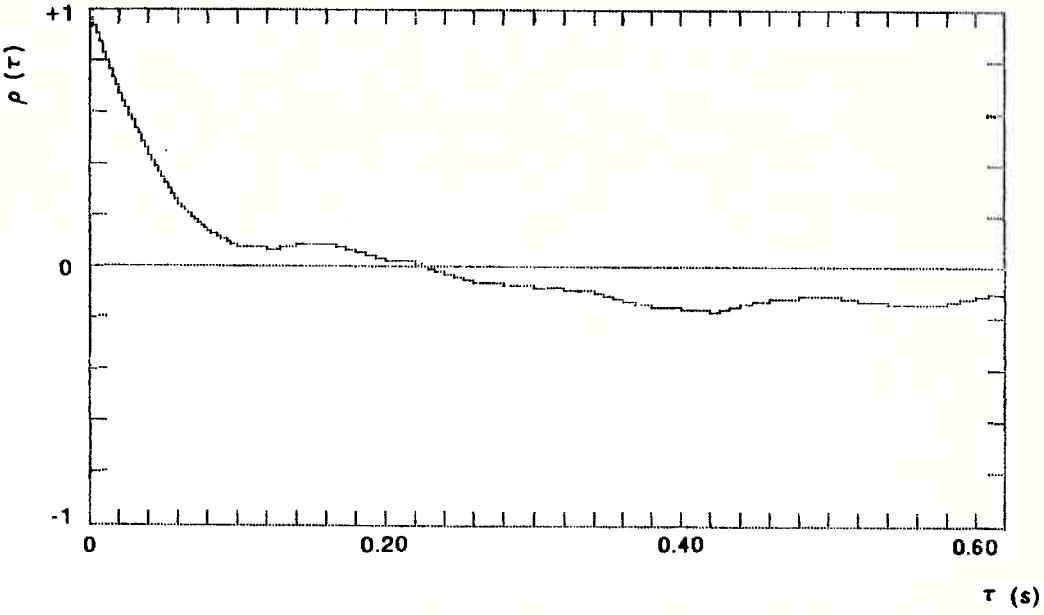
X/Y1 = 10.43

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

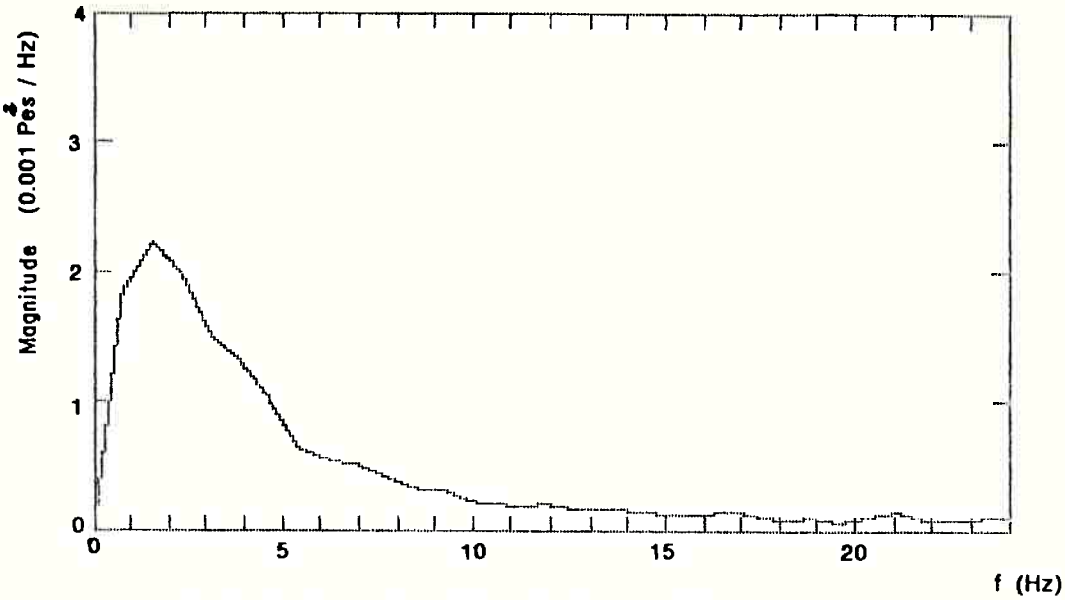
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.94 (END)

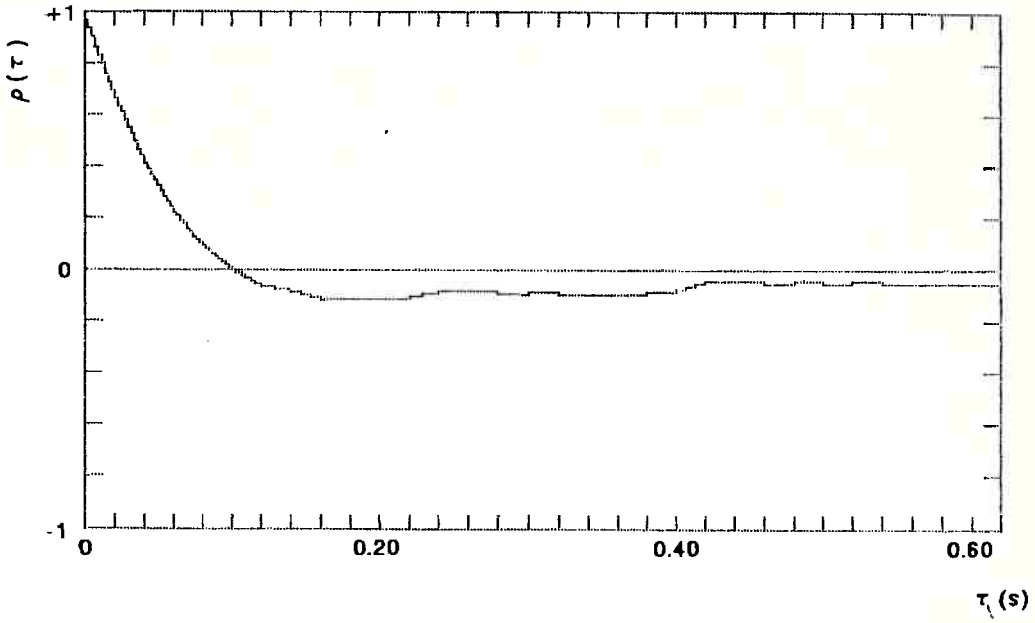
X/Y1=1.52

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

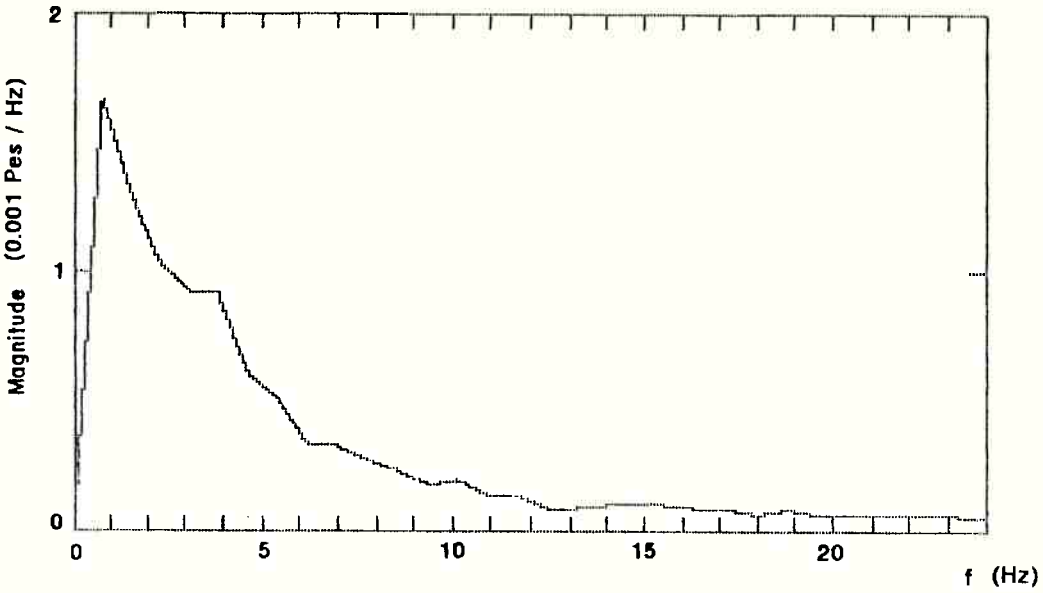
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.94 (END)

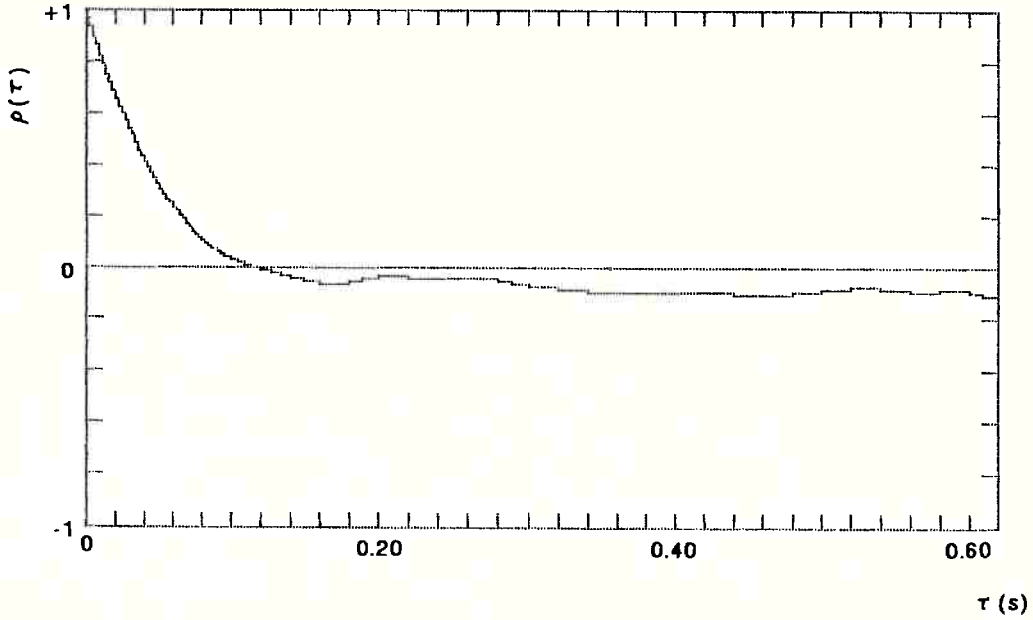
X/Y1=6.82

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

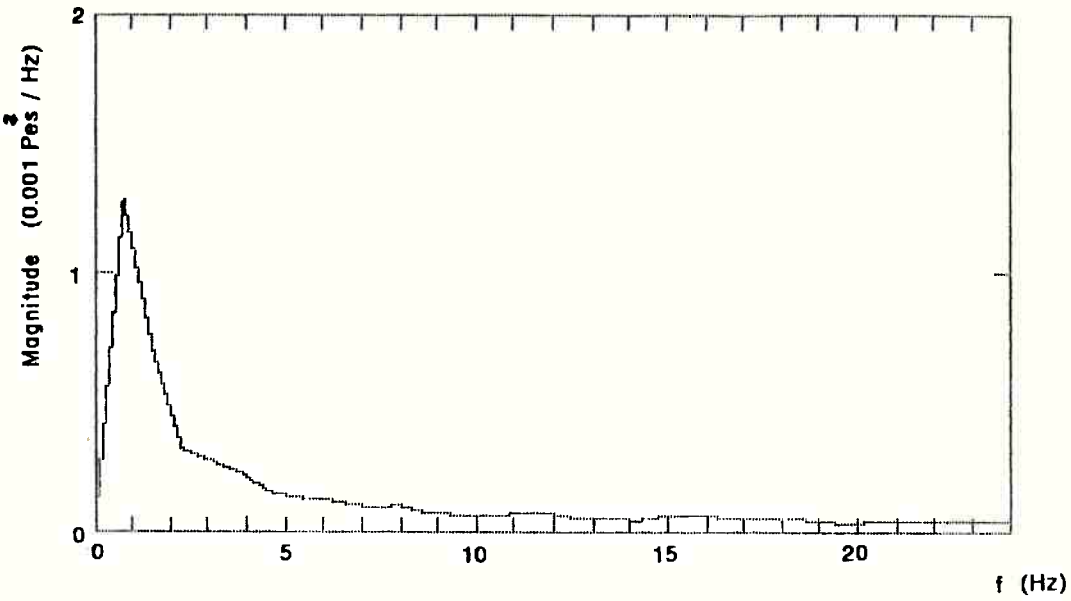
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.94 (END)

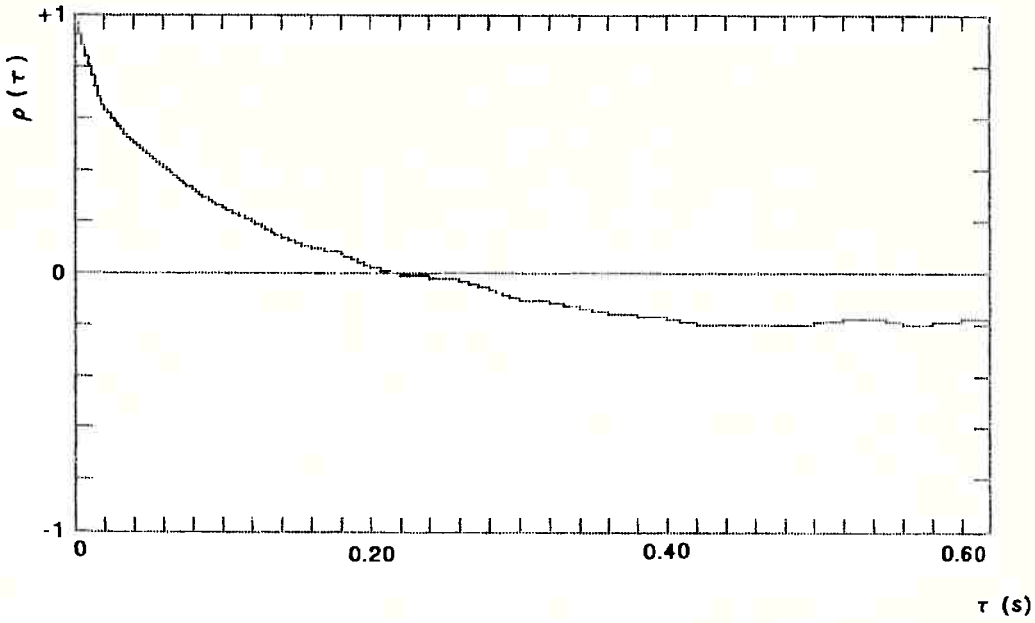
X/Y1=10.24

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

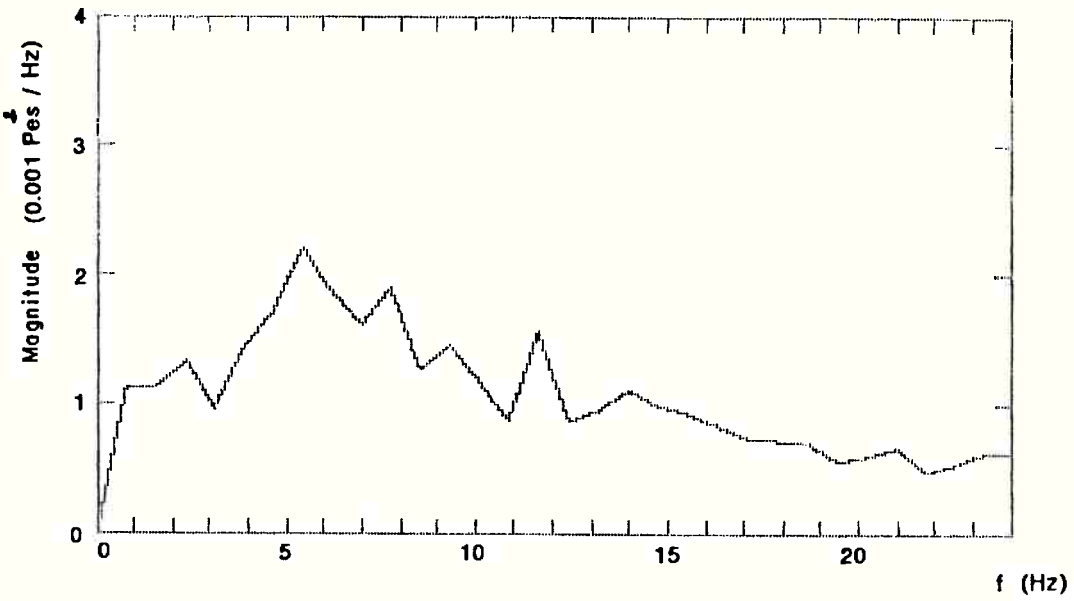
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=2.94 (END)

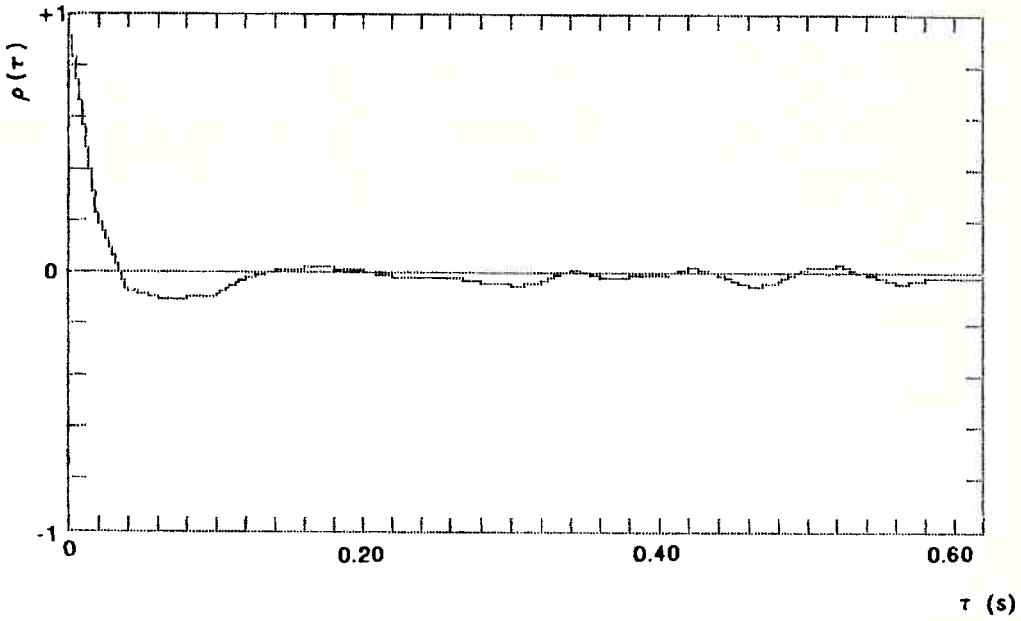
X/Y1=14.41

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

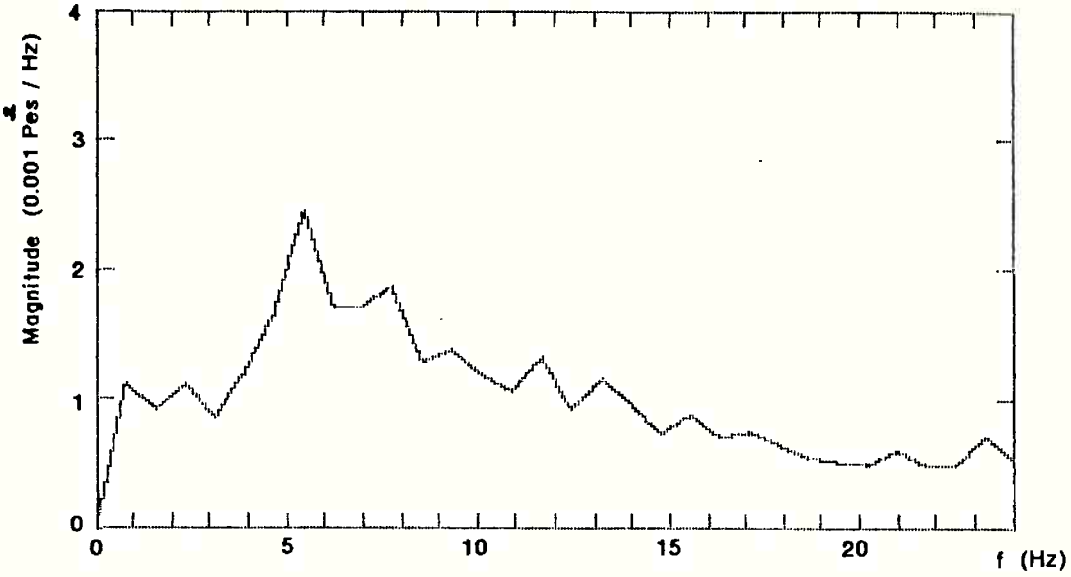
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.17 (ED)

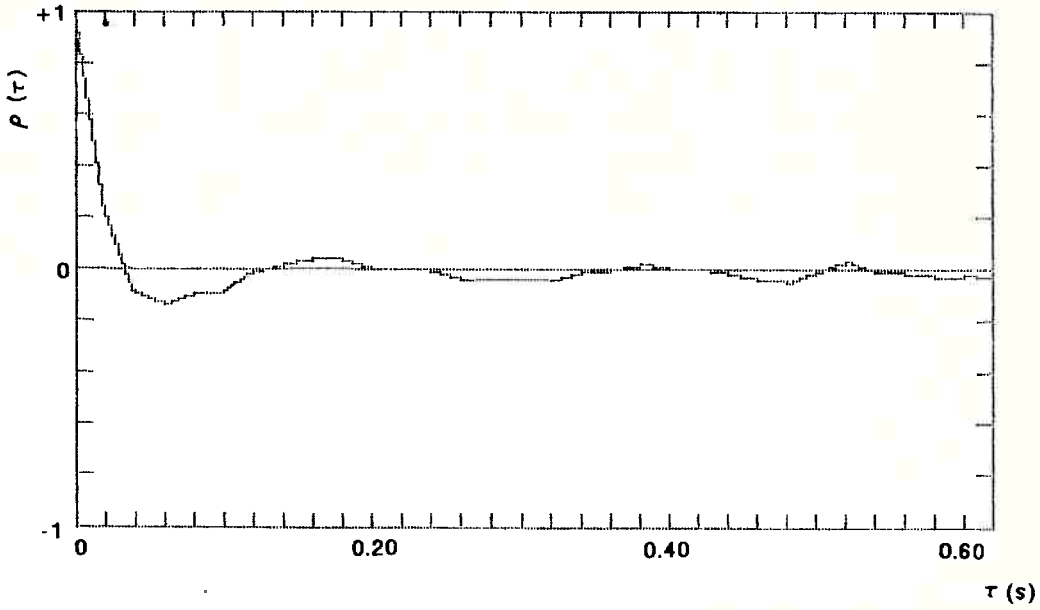
X/Y1=3.40

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

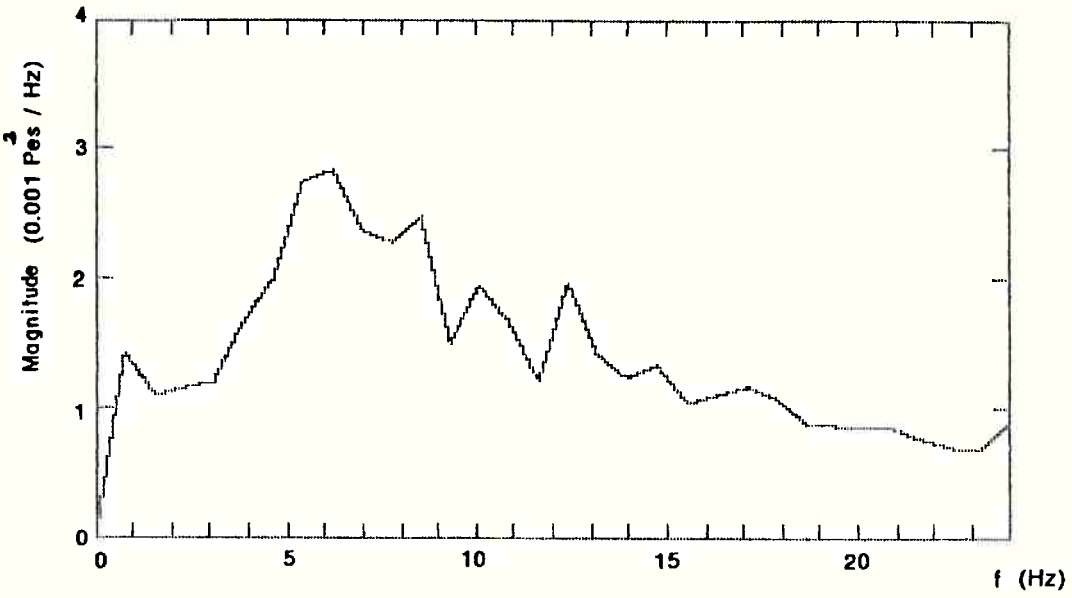
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.17 (ED)

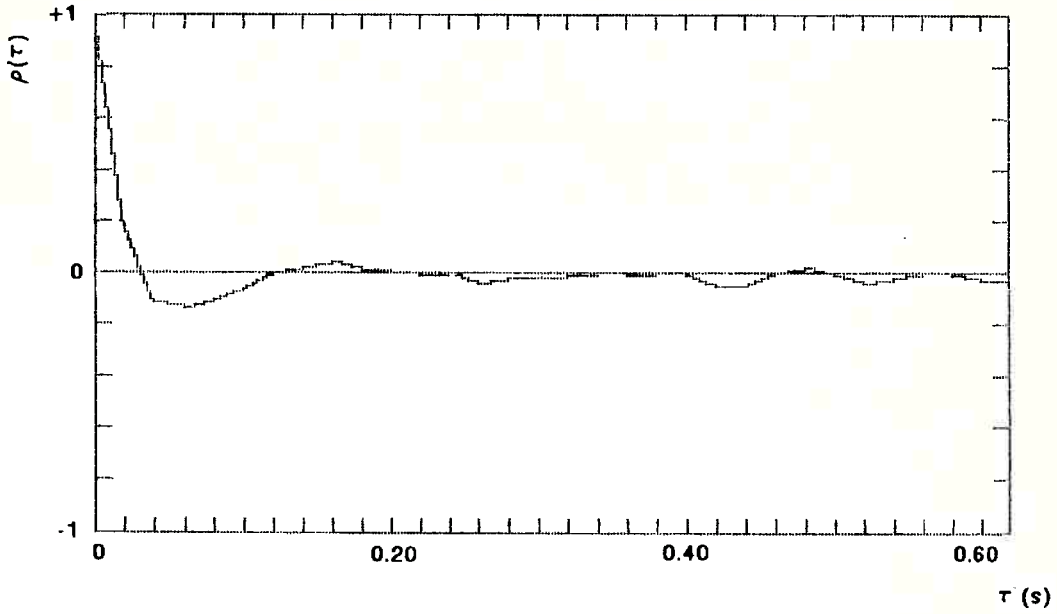
X/Y1=5.56

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

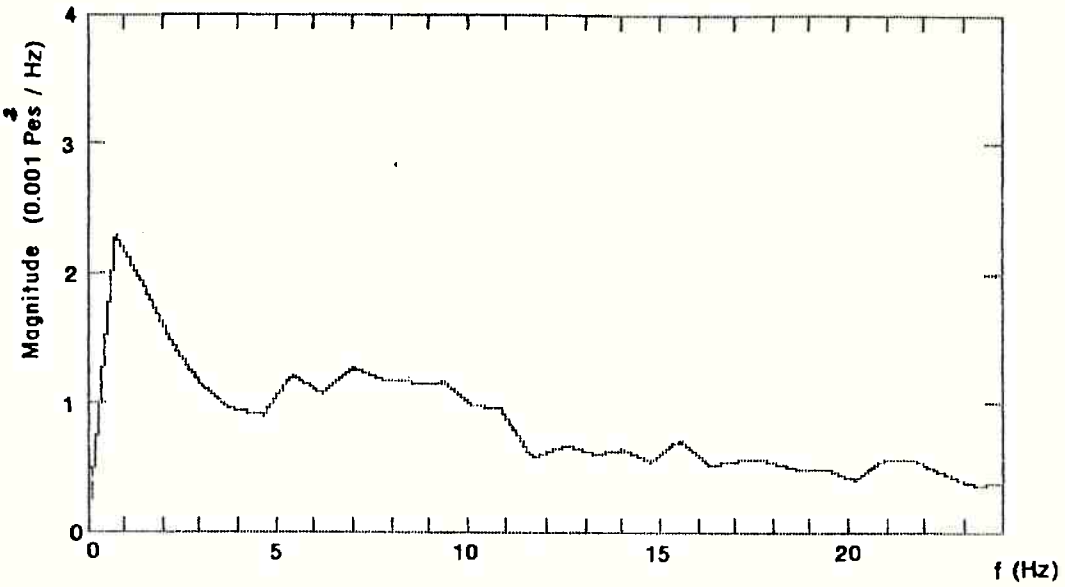
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.17 (ED)

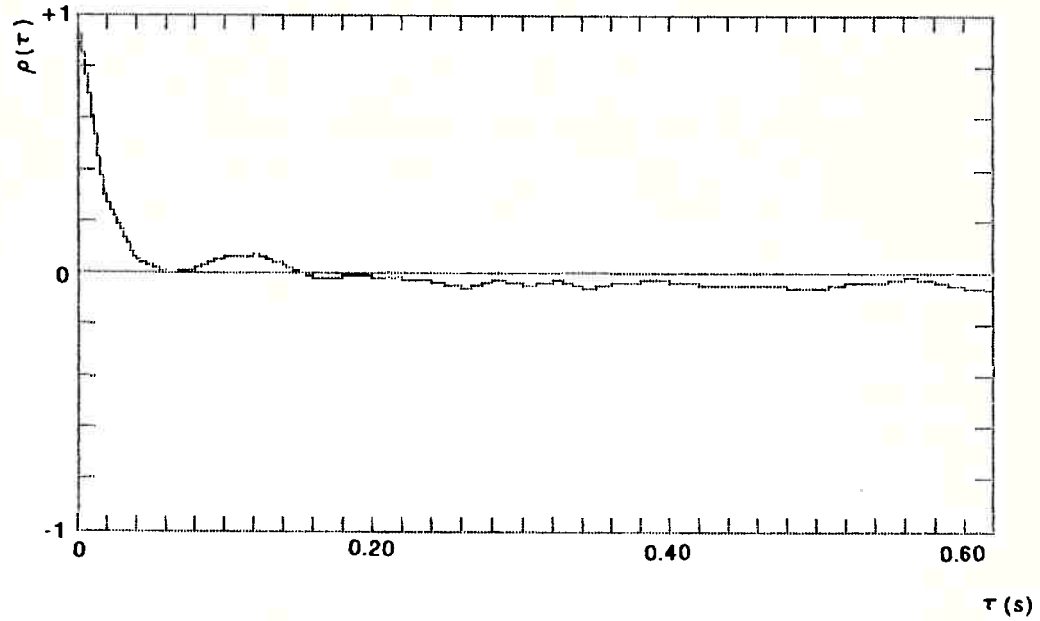
X/Y1=8.65

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

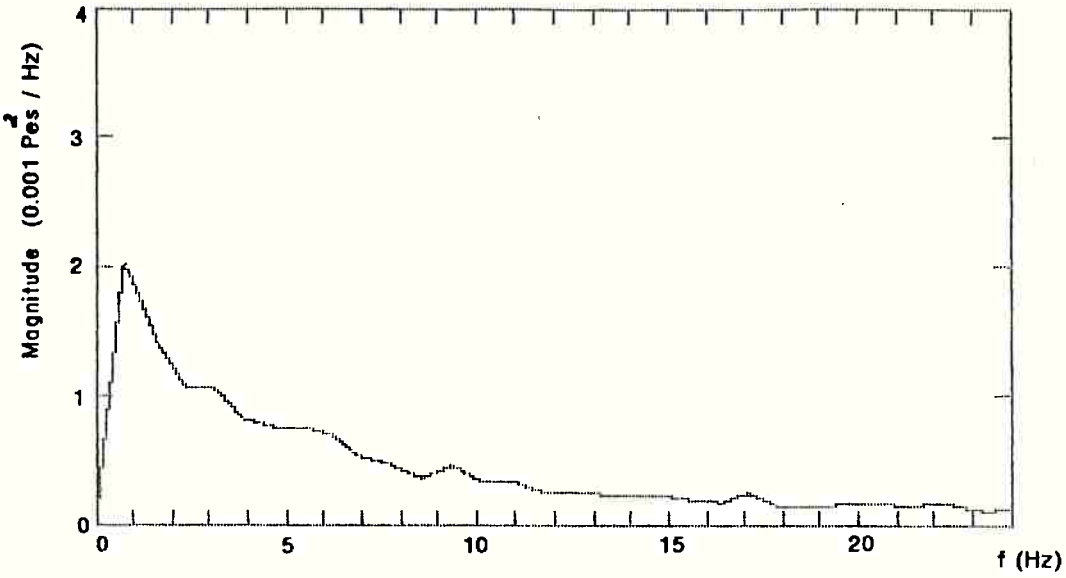
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.17 (ED)

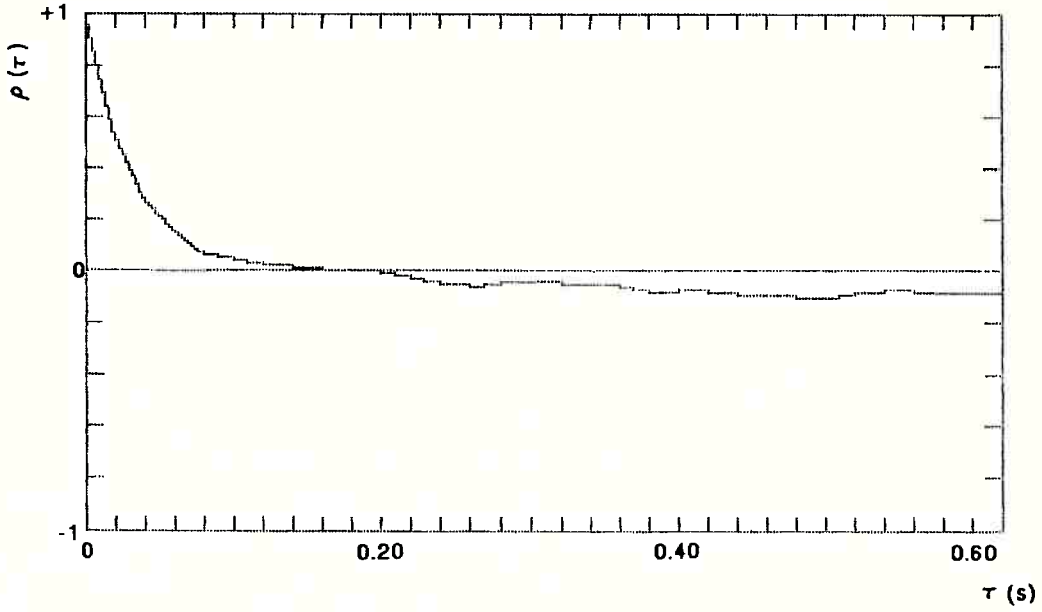
X/Y1=13.90

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

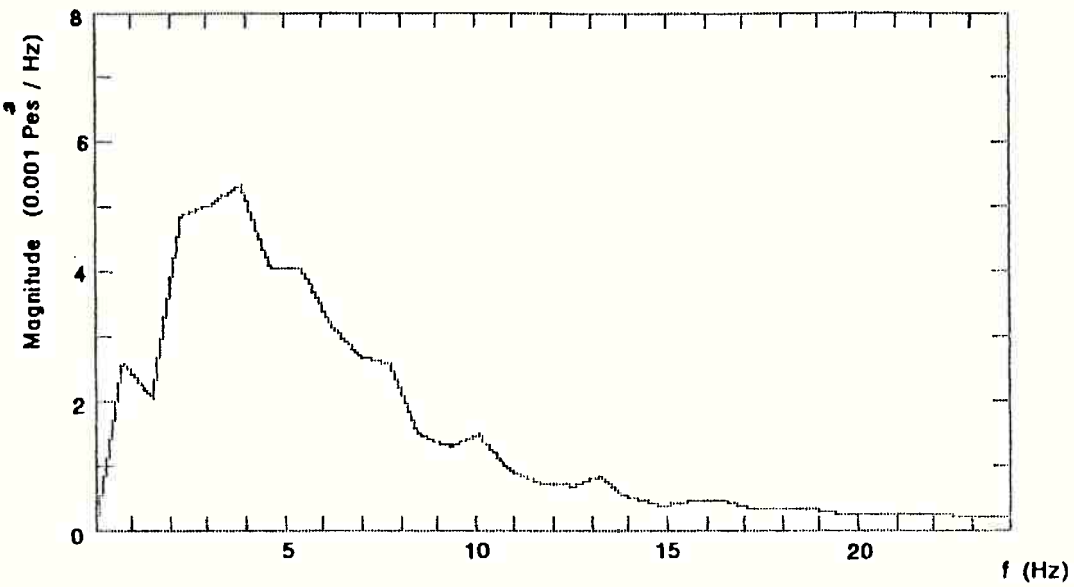
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.17 (ED)

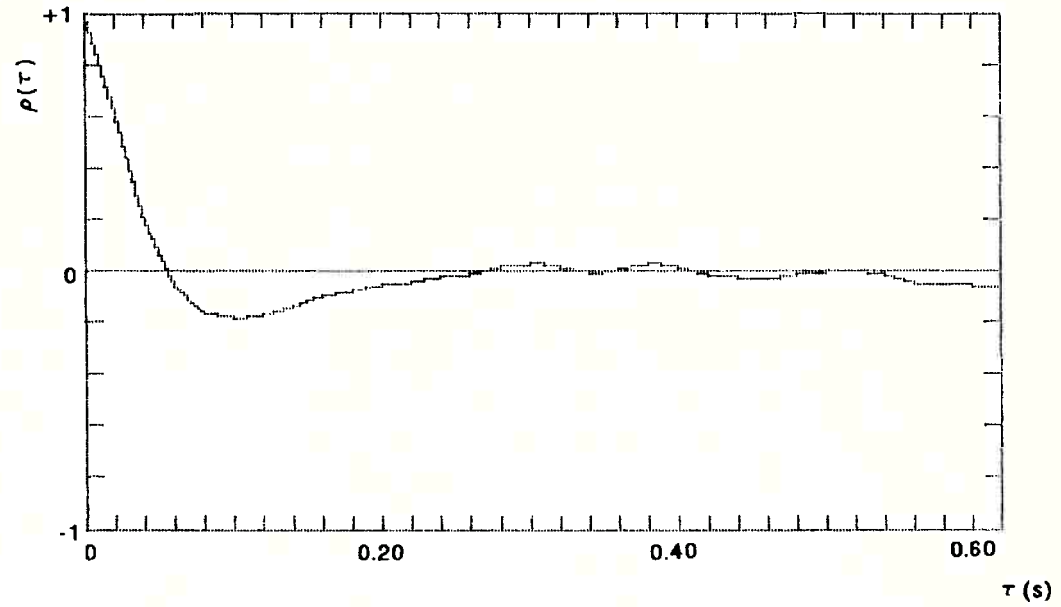
X/Y1=17.92

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

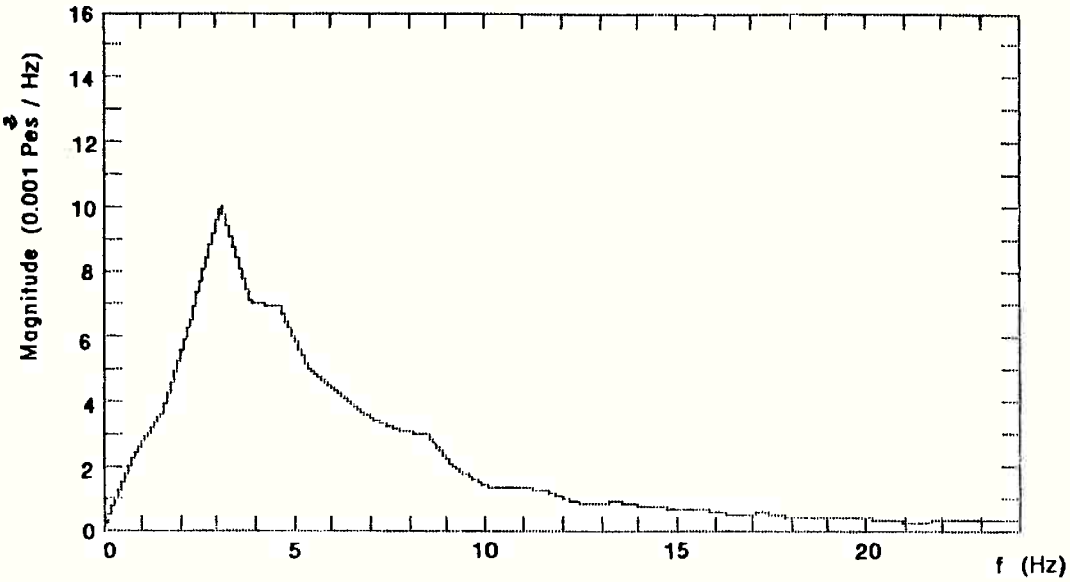
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.18 (END)

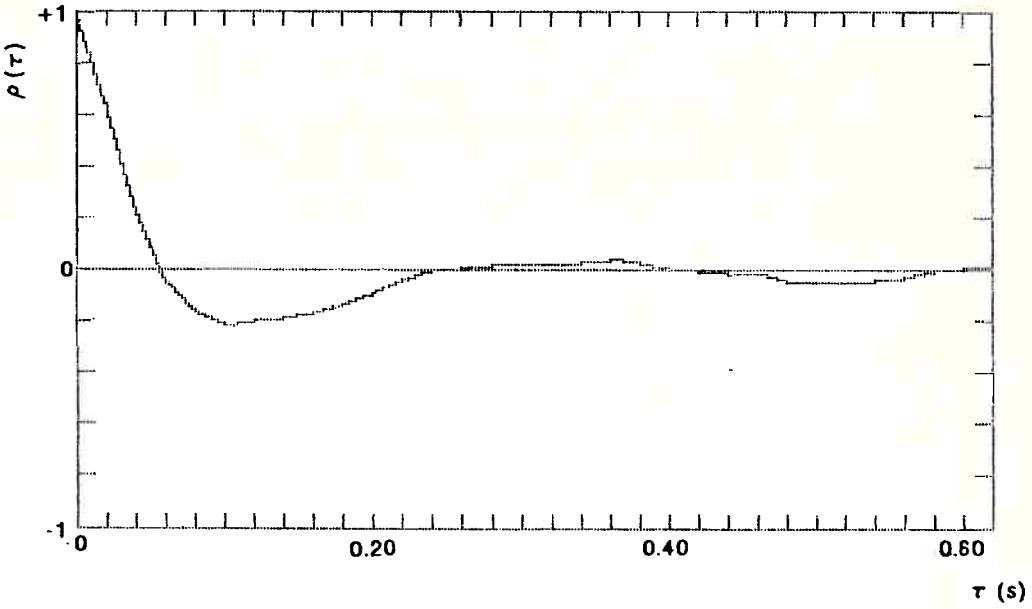
X/Y1=2.88

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

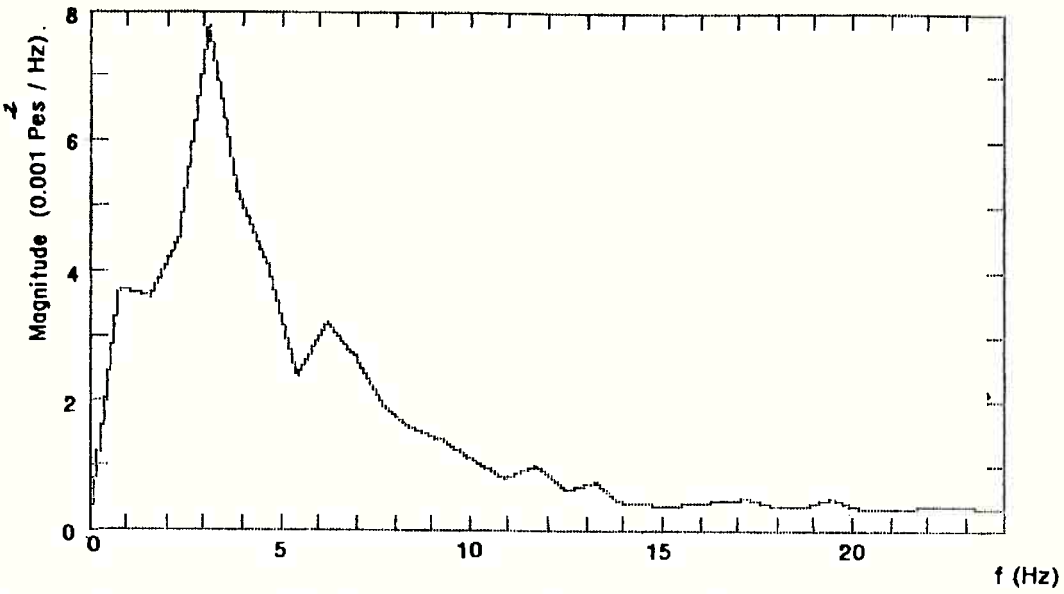
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.18 (END)

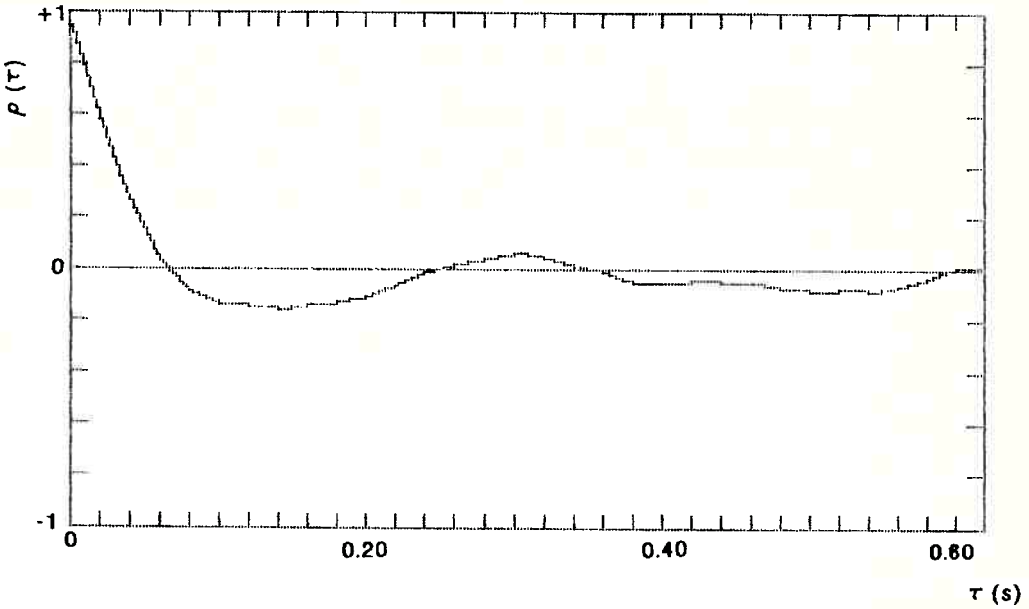
X/Y1=5.03

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

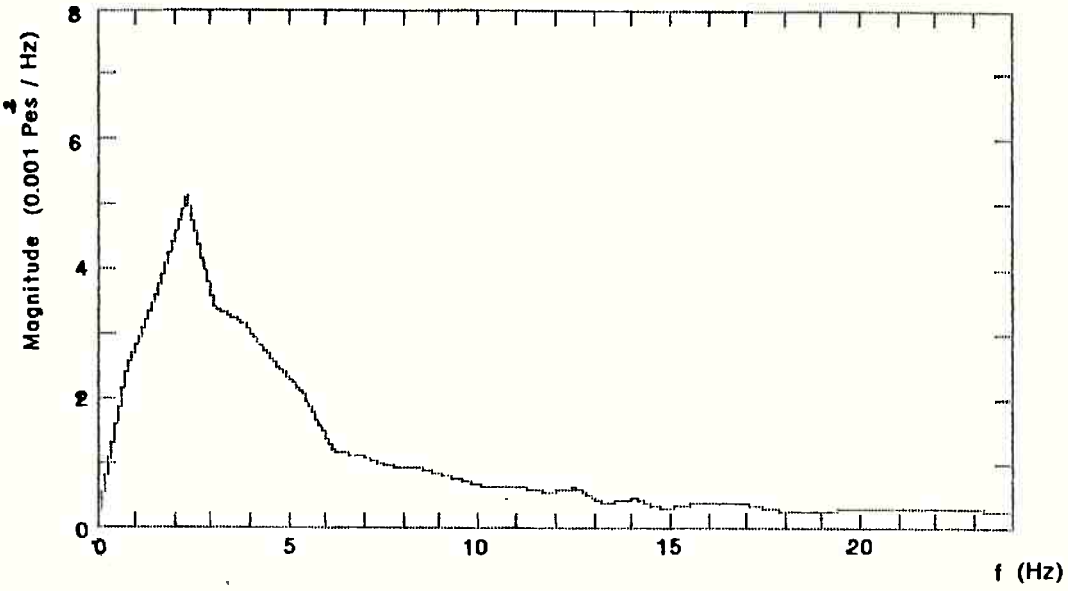
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.18 (END)

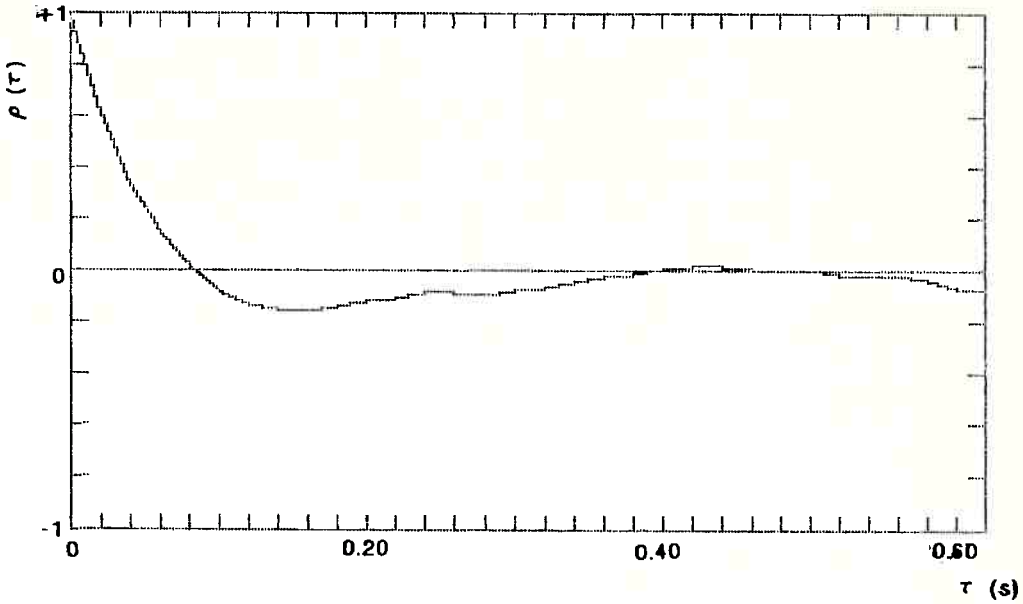
X/Y1=8.63

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

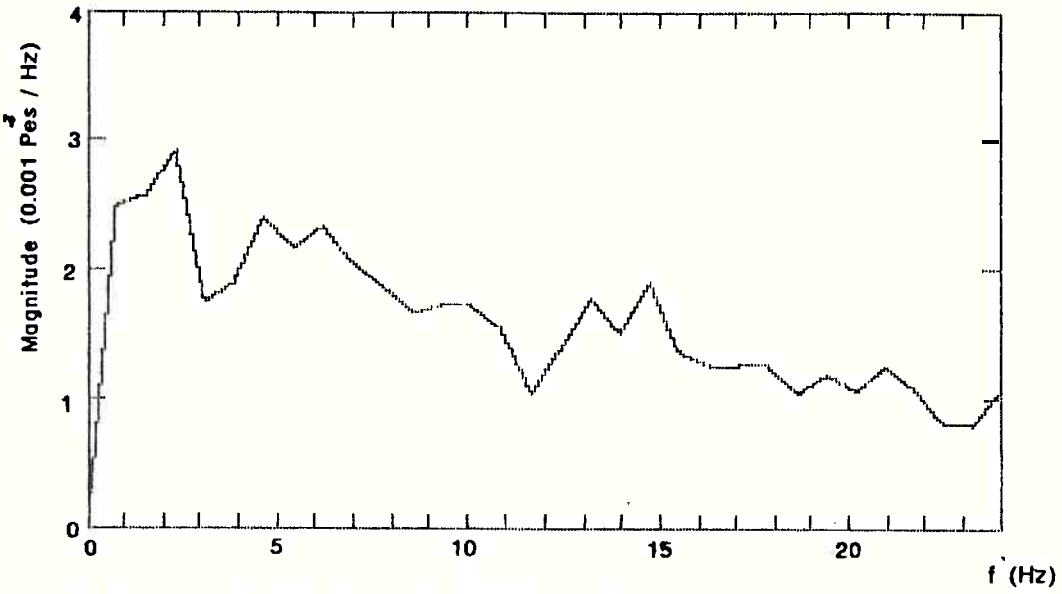
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=4.18 (END)

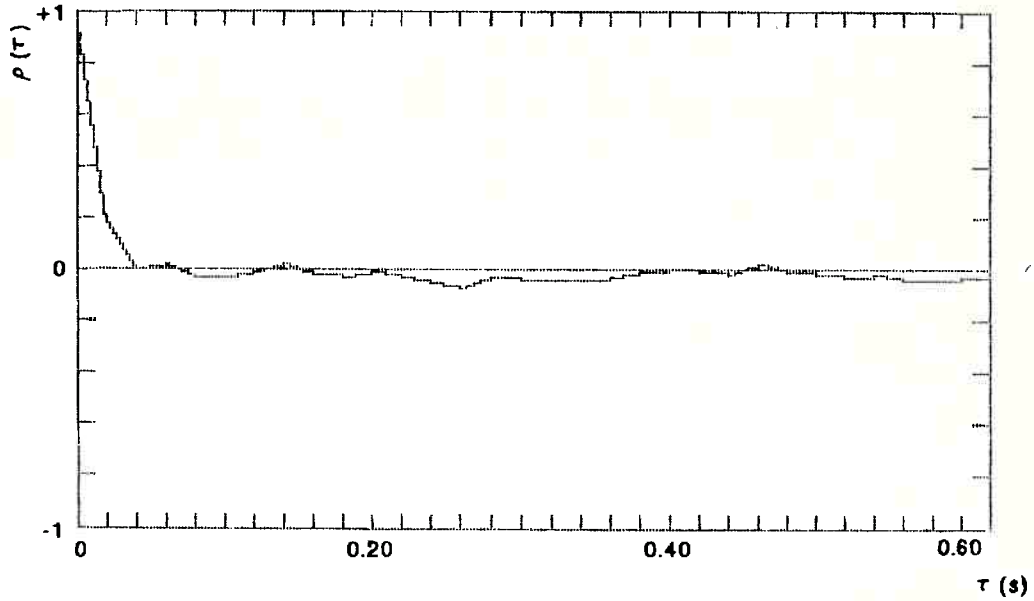
X/Y1=13.59

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

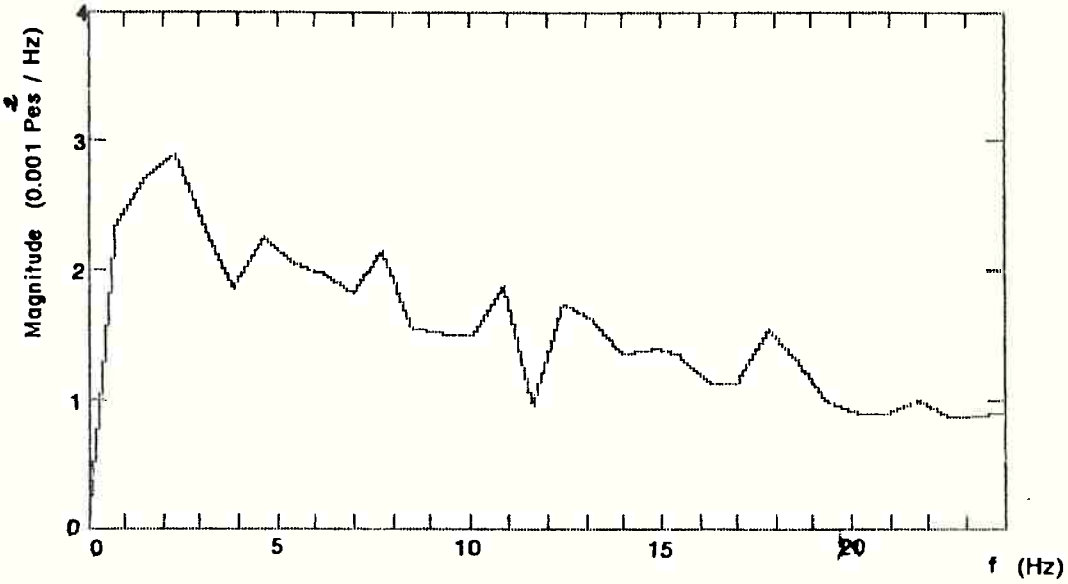
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.59 (ED)

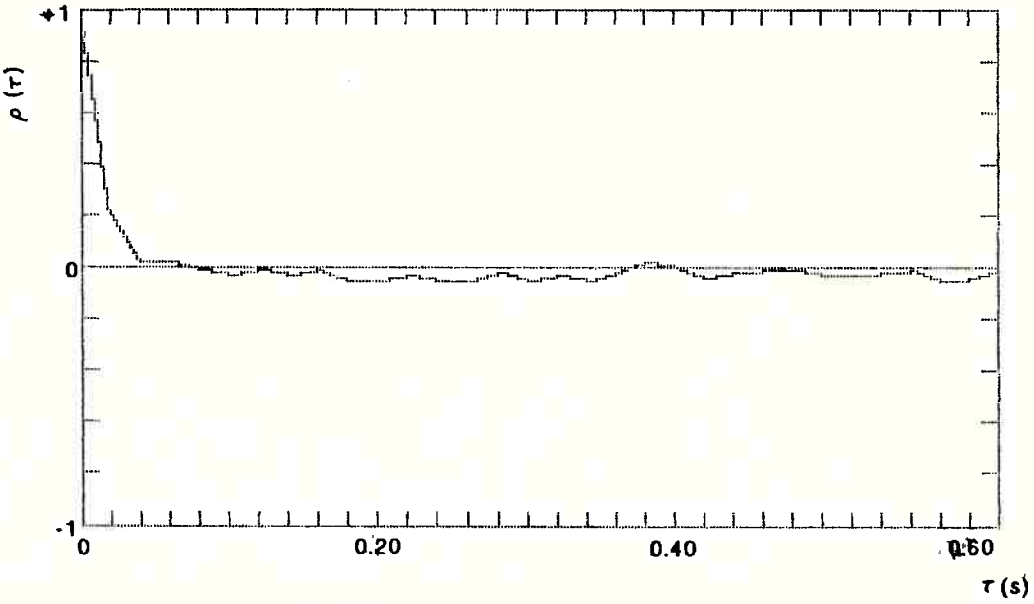
X/Y1=4.23

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

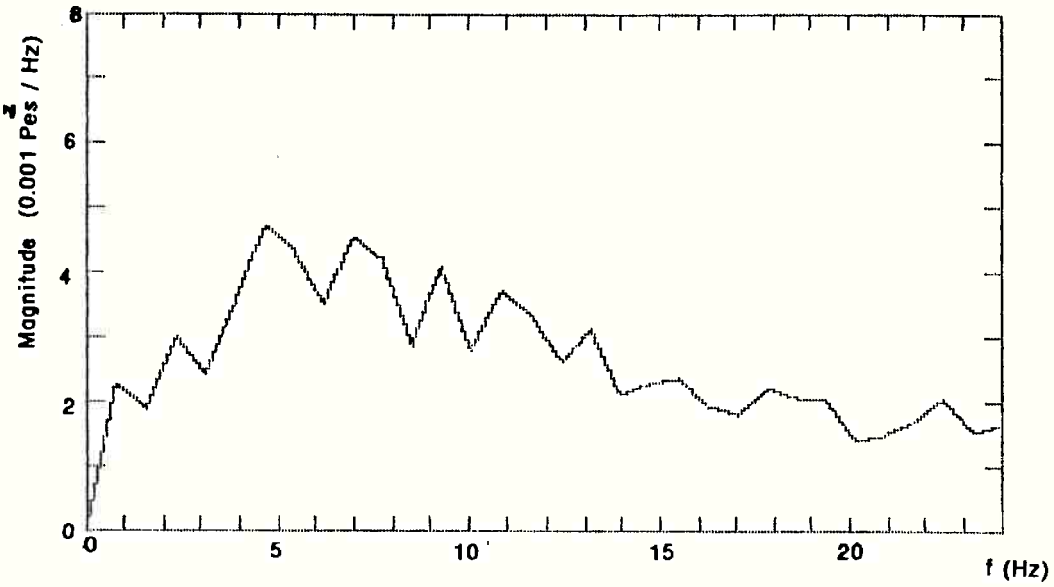
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.59 (ED)

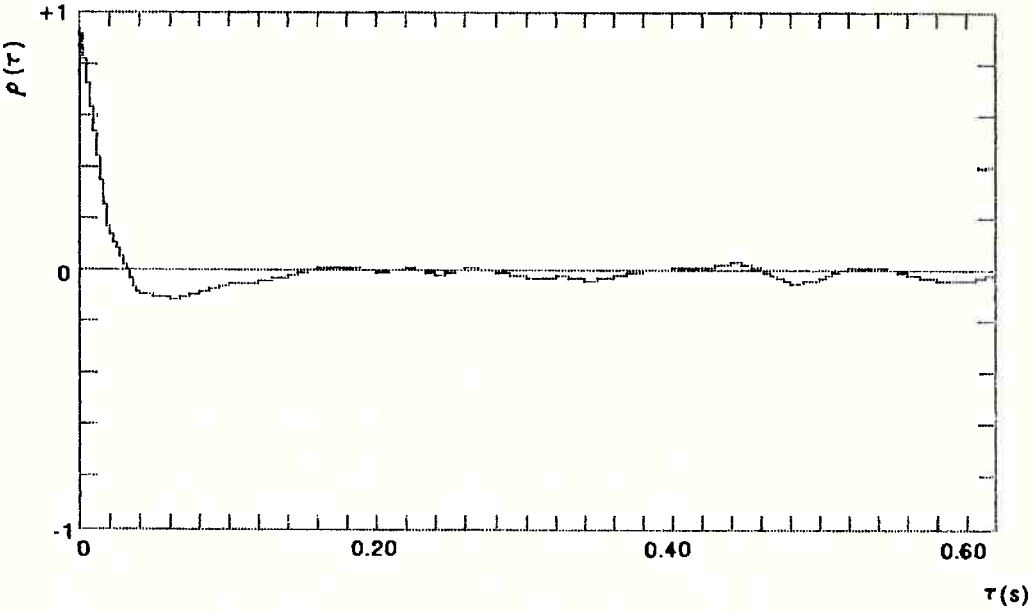
X/Y1=6.12

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

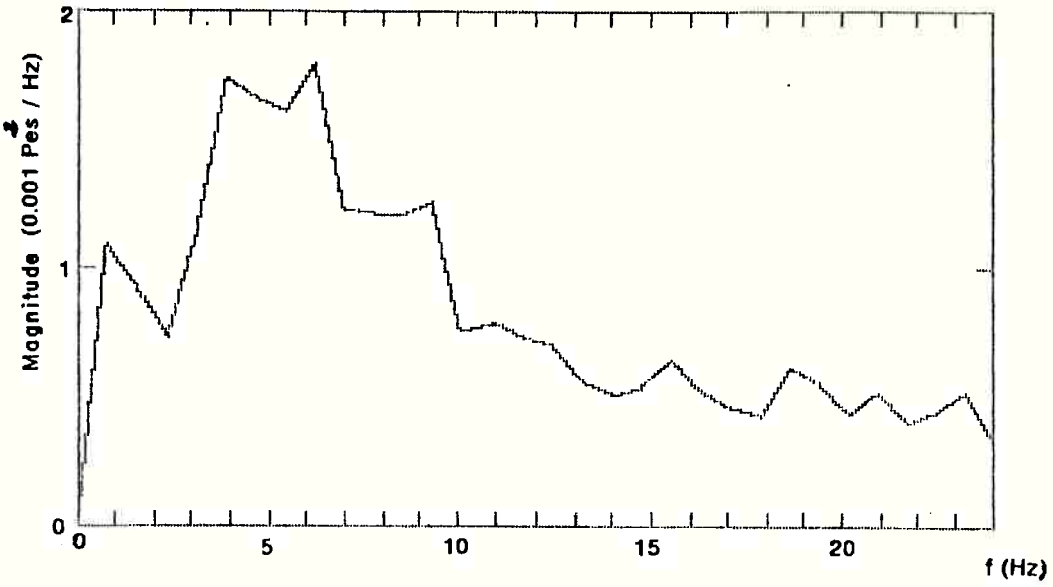
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.59 (ED)

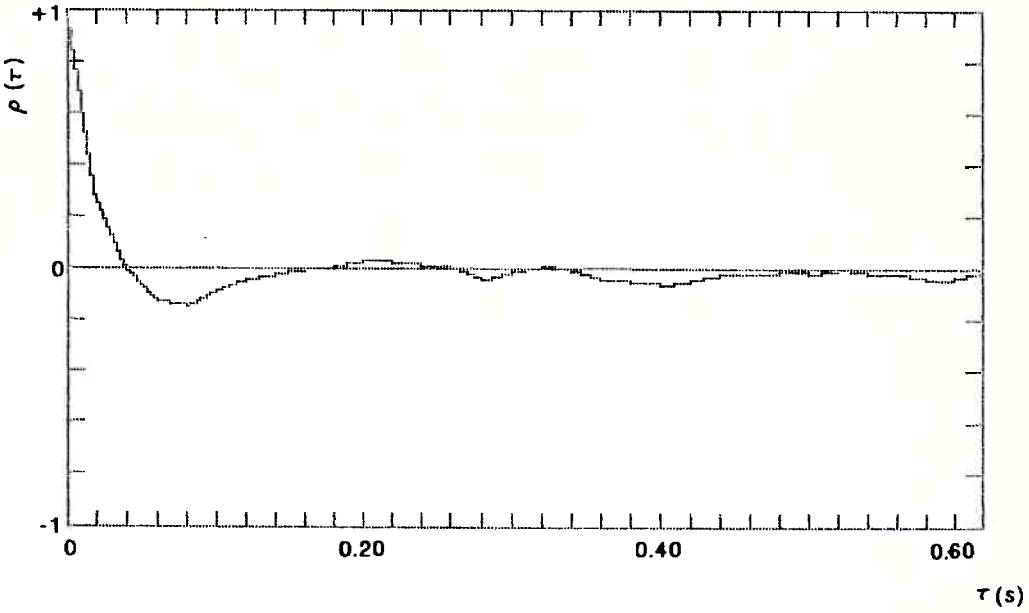
X/Y1=9.09

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

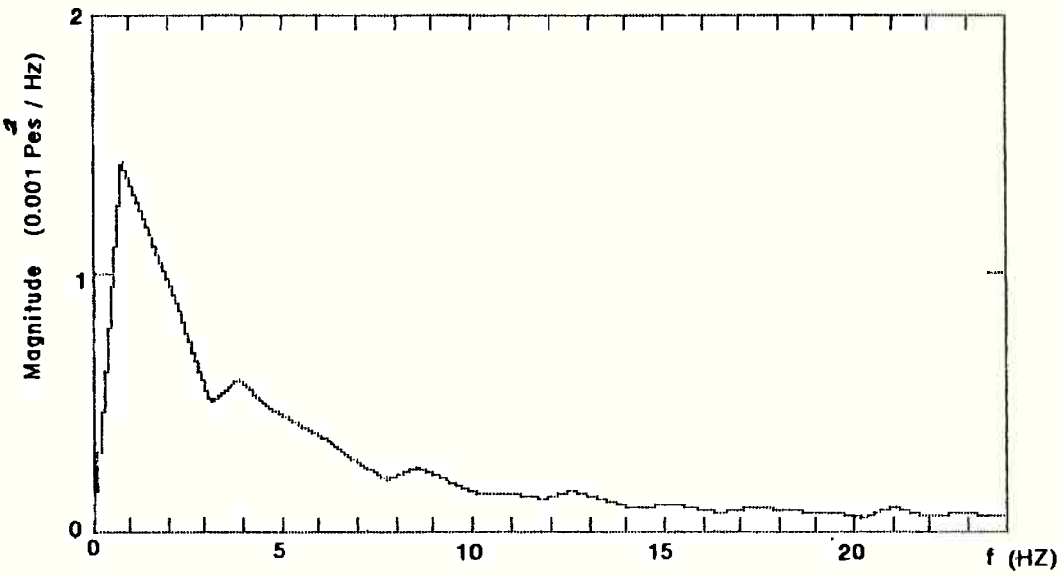
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.59 (ED)

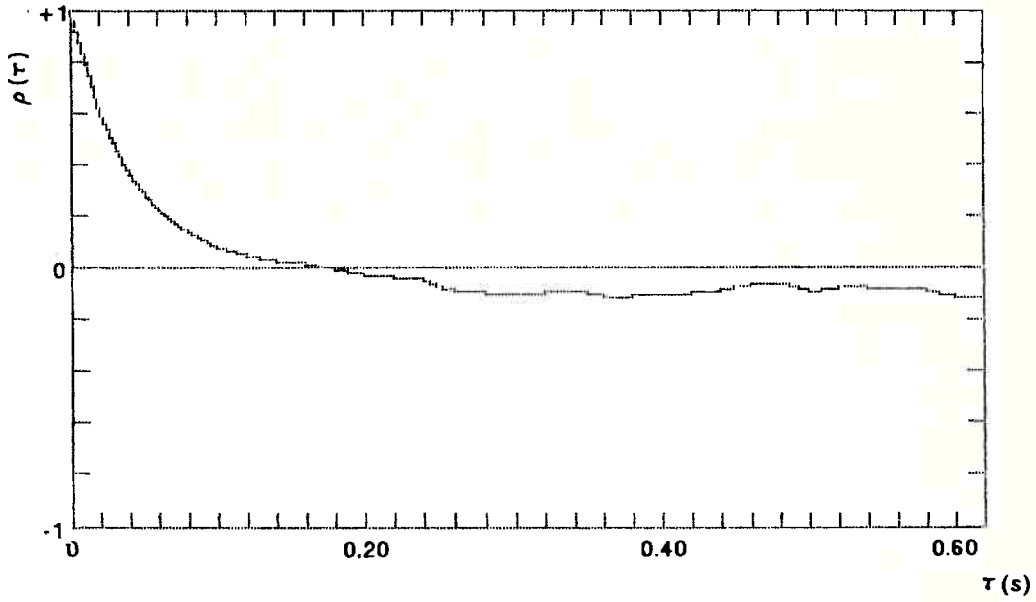
X/Y1=13.17

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

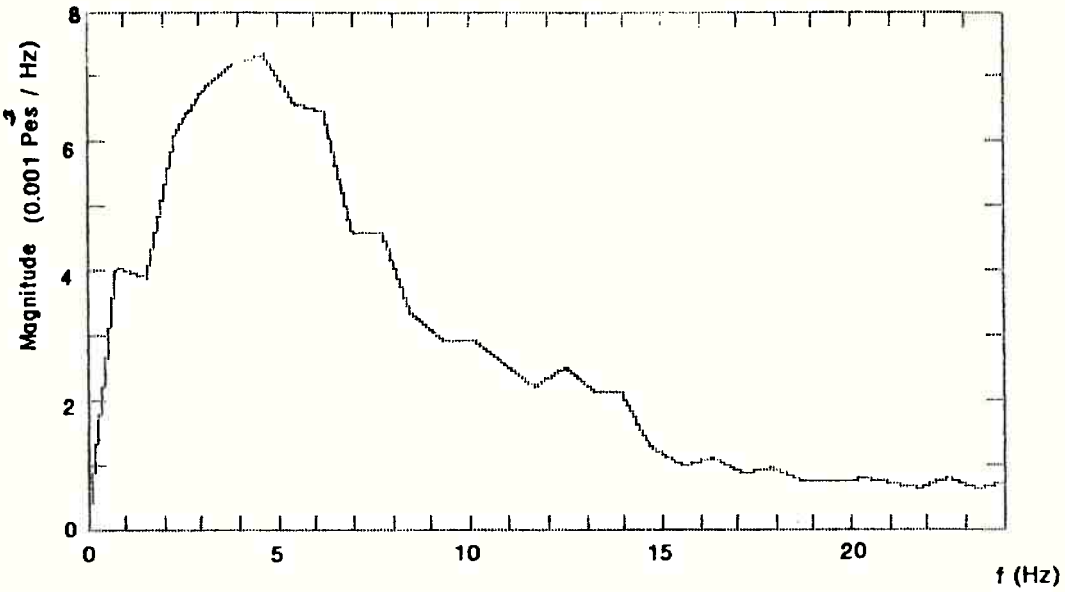
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.59 (ED)

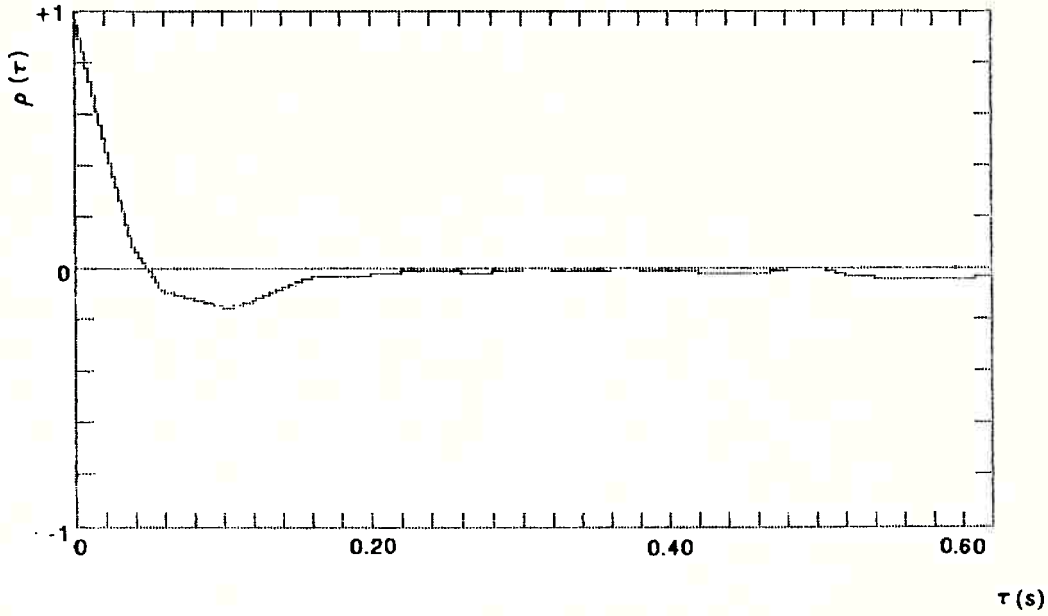
X/Y1=30.10

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

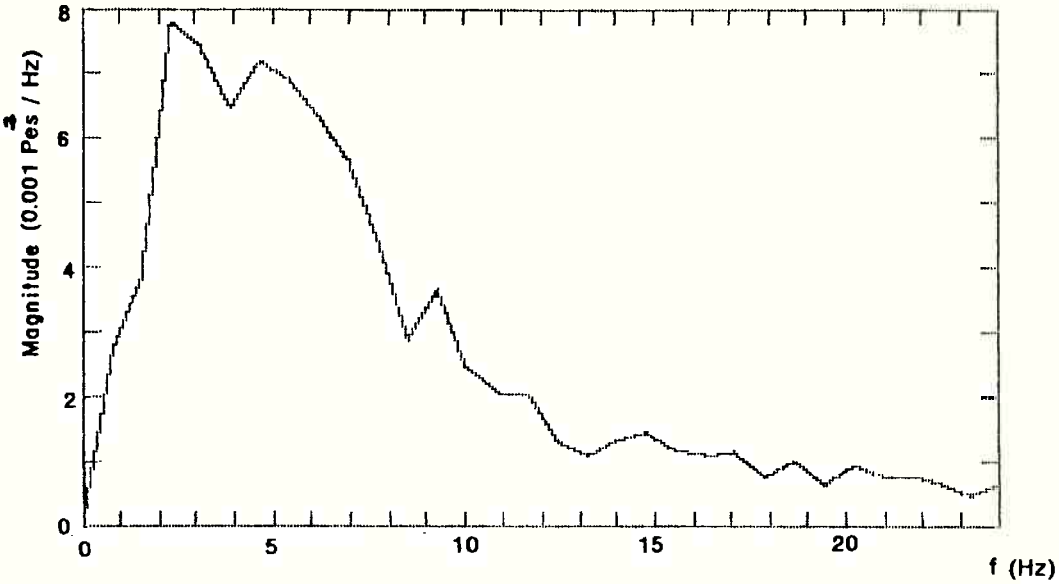
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.49 (END)

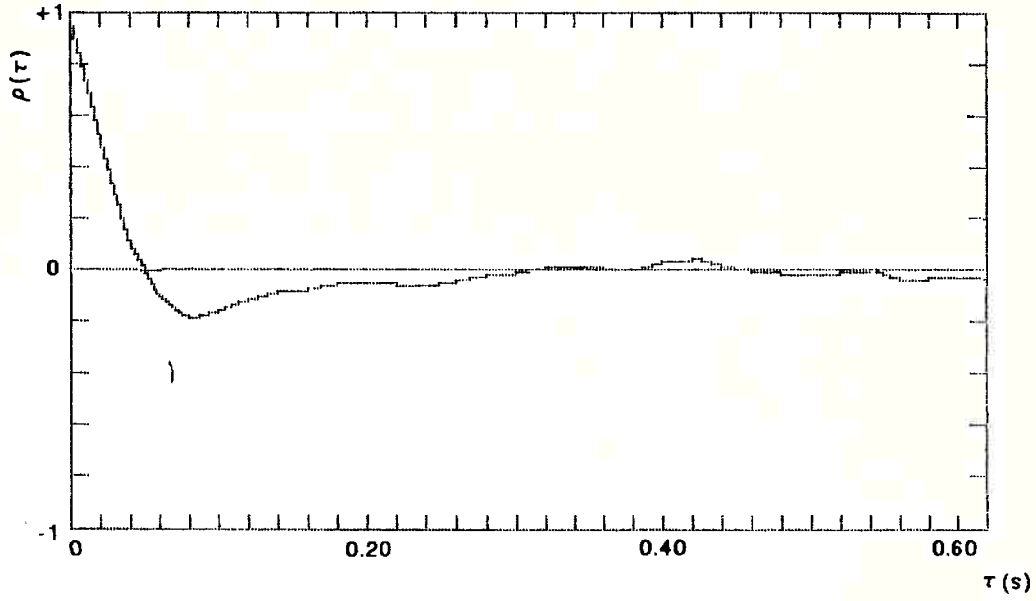
X/Y1=3.44

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

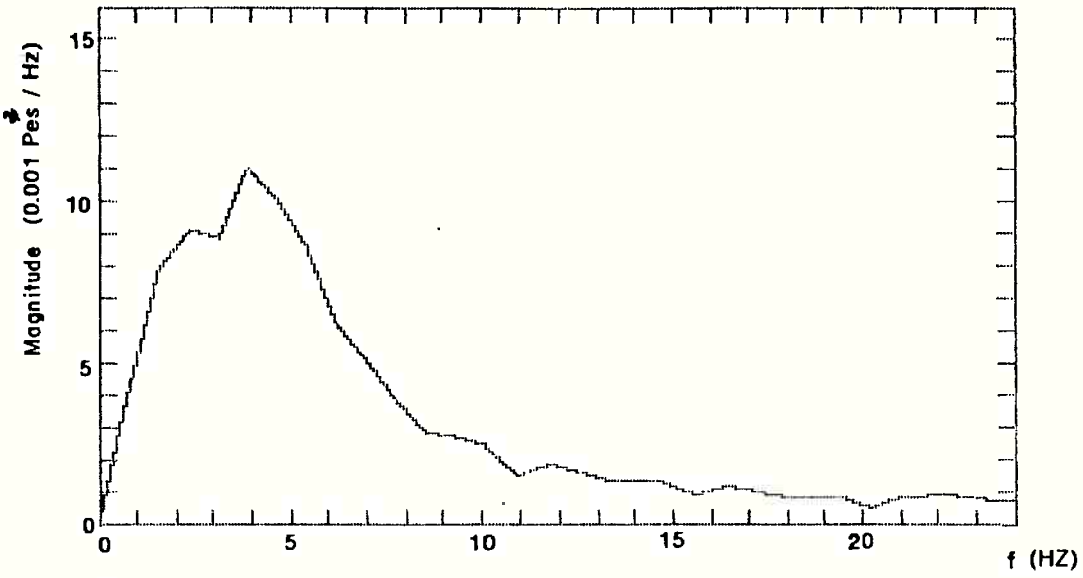
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.49 (END)

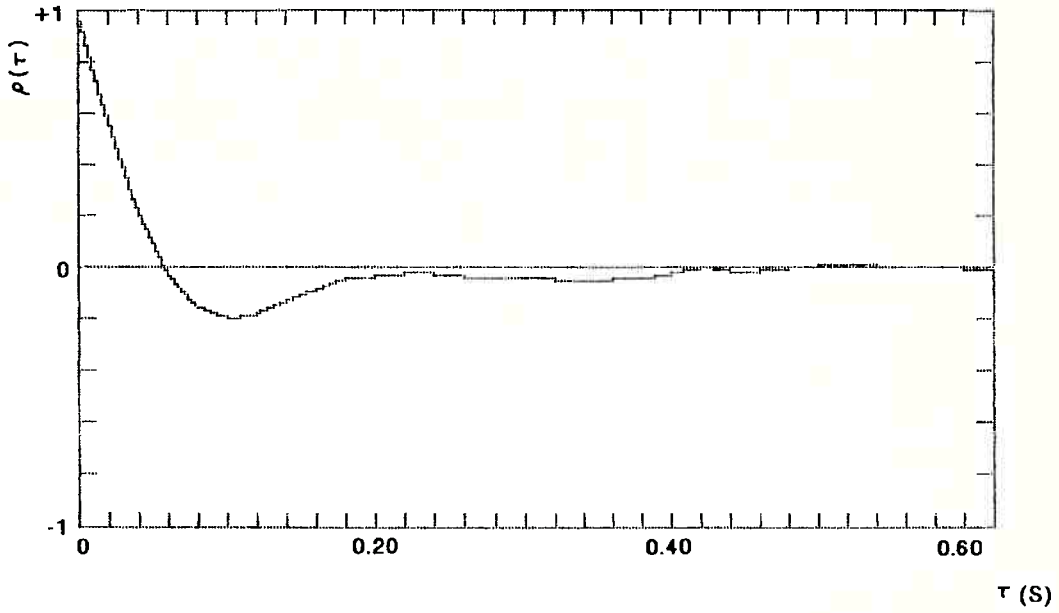
X/Y1=6.12

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

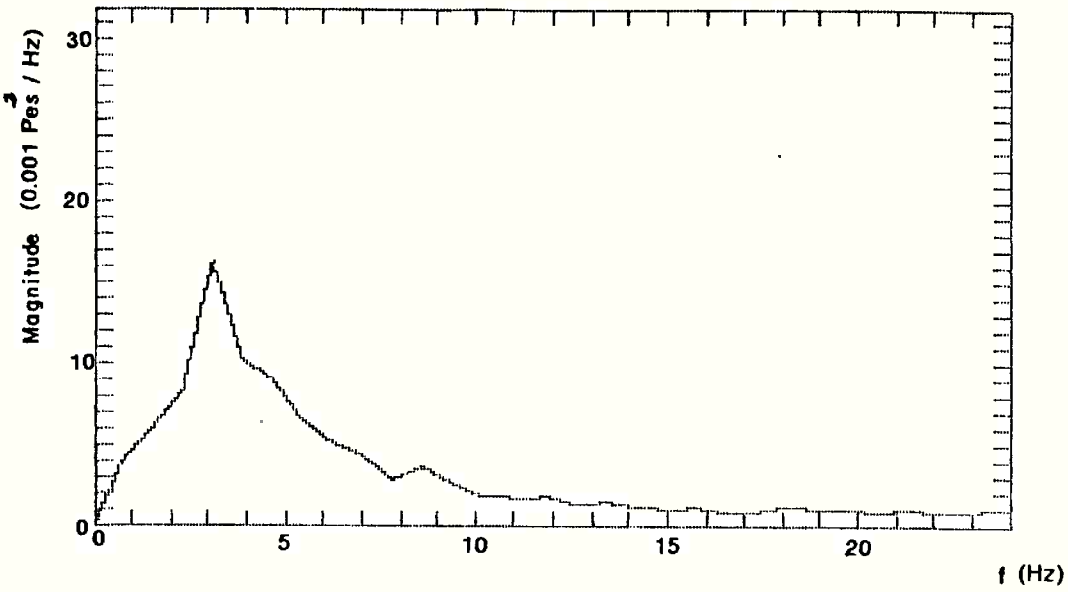
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.49 (END)

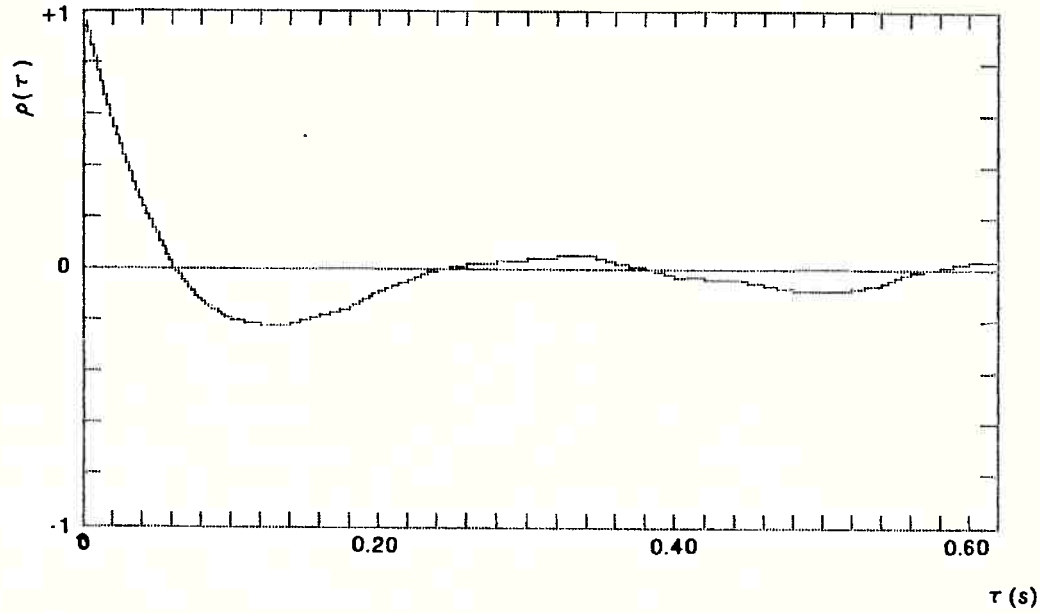
X/Y1=9.18

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

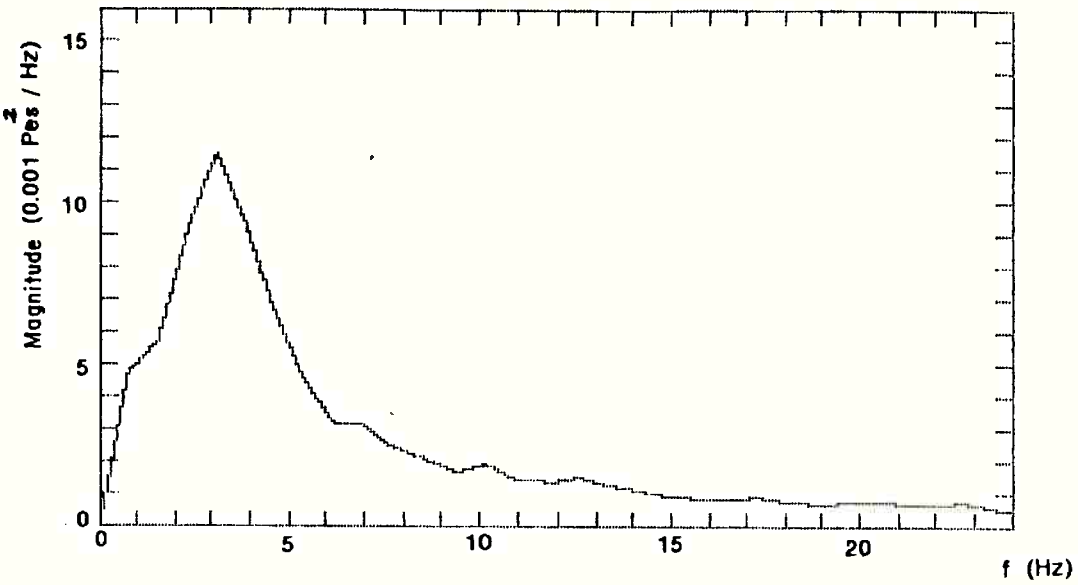
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.49 (END)

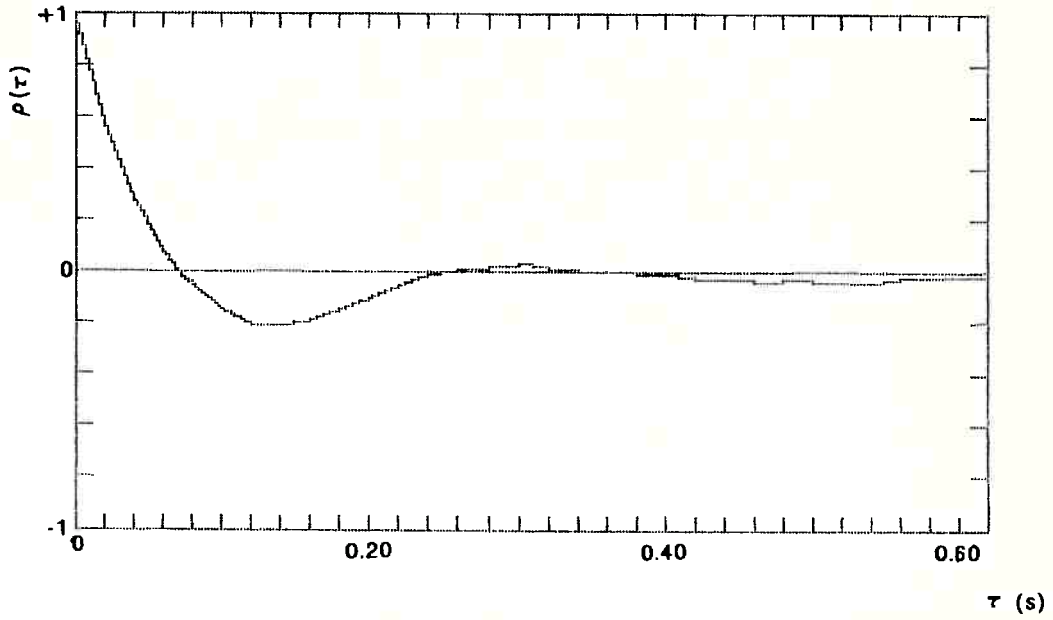
X/Y1=13.01

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

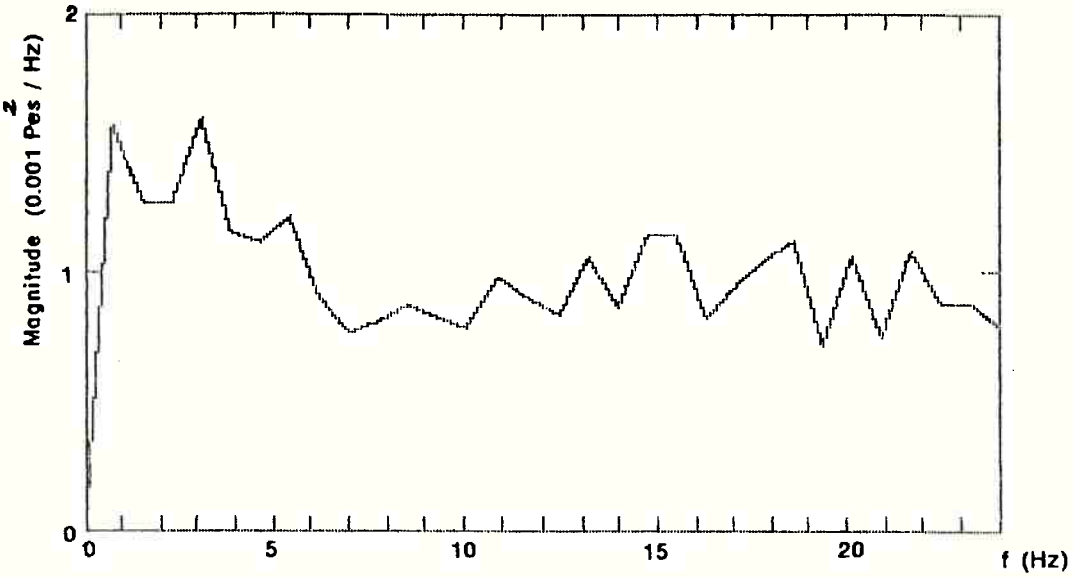
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=5.49 (END)

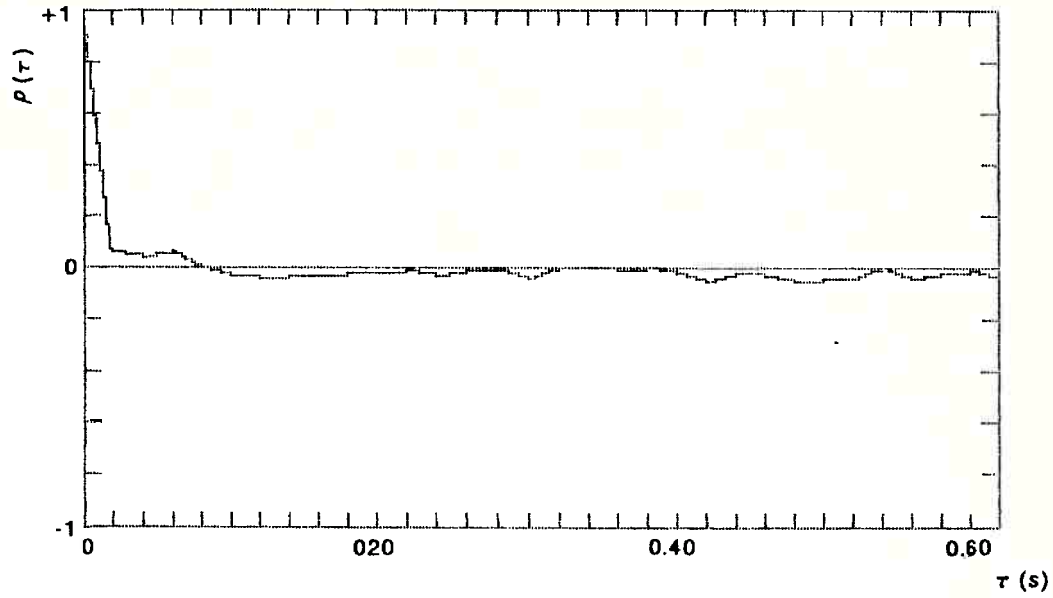
X/Y1=16.07

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

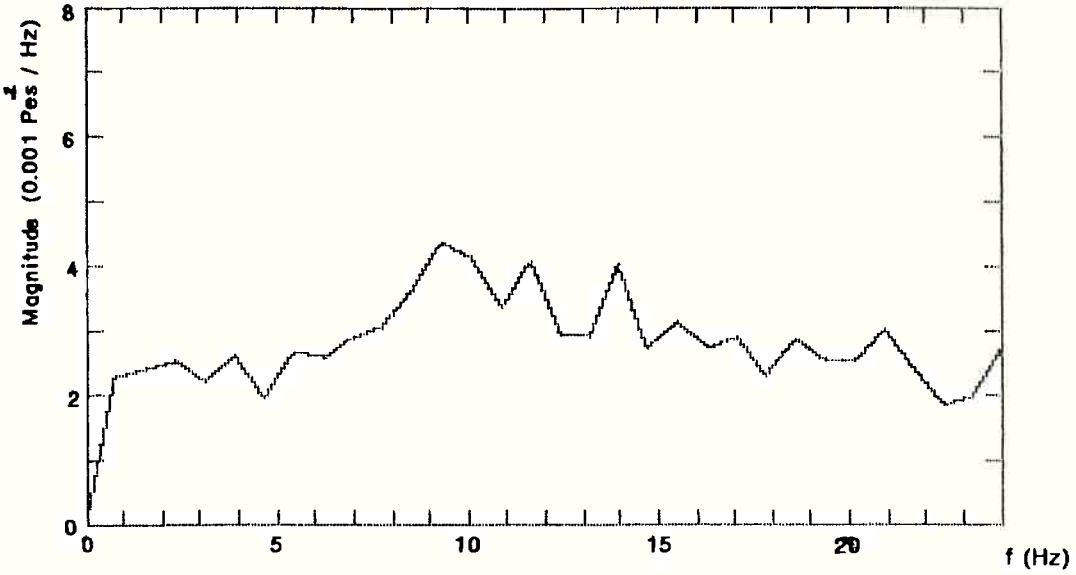
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=10.06 (END)

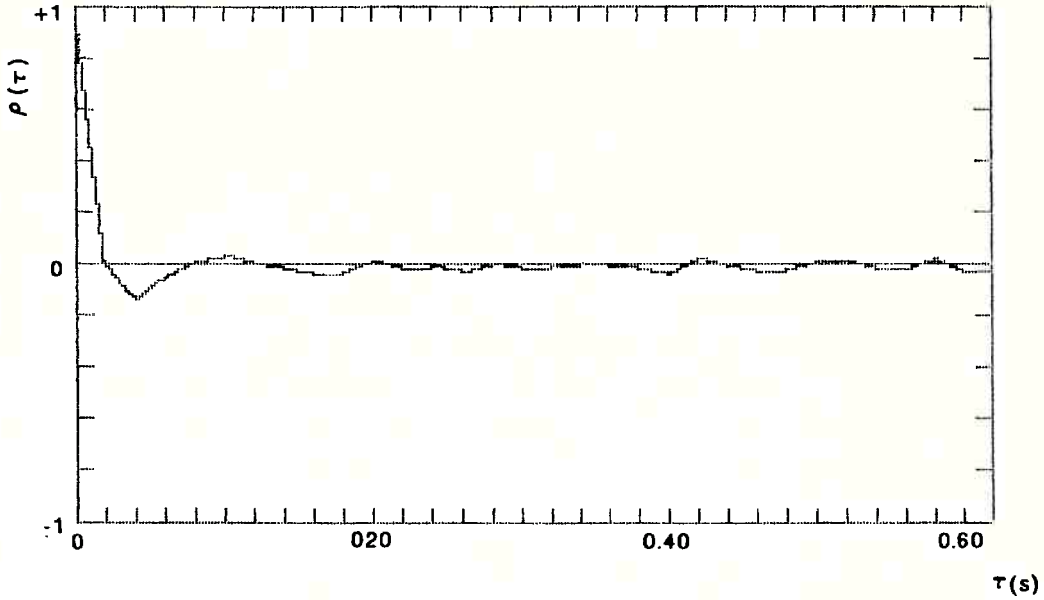
X/Y1=2.36

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

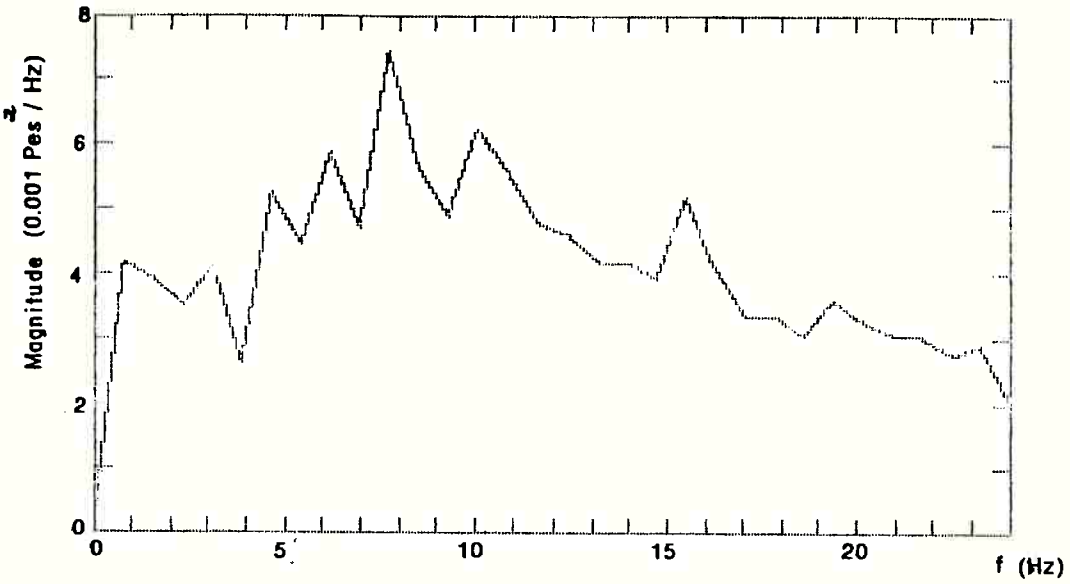
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=10.06 (END)

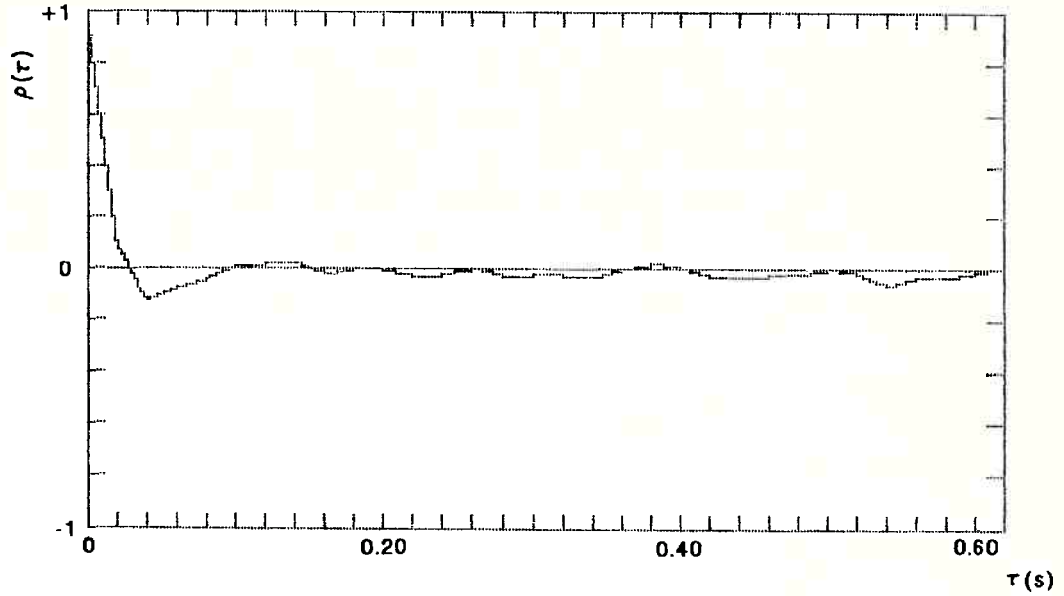
X/Y1=7.87

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

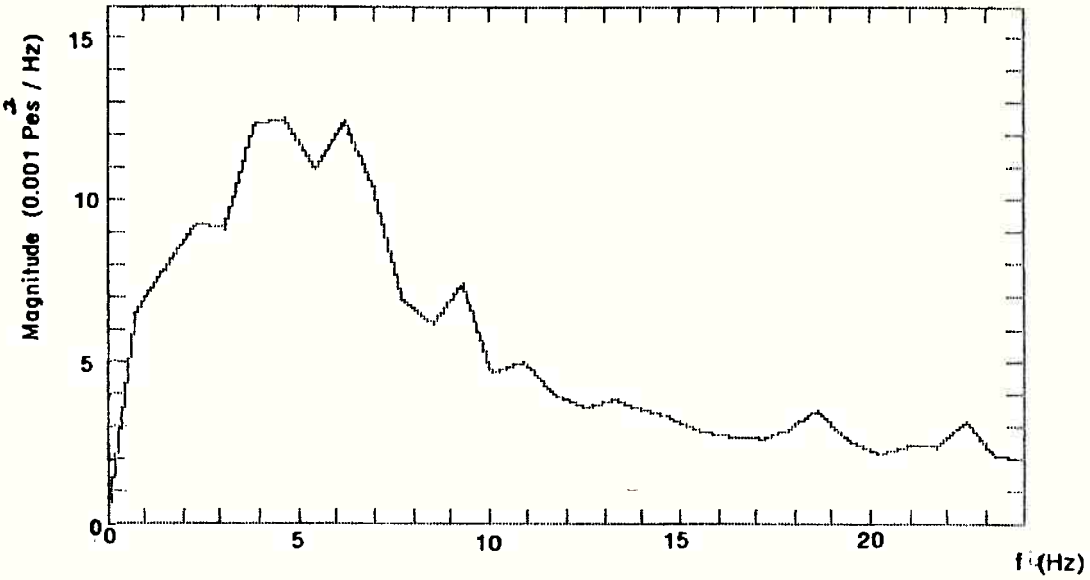
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=10.06 (END)

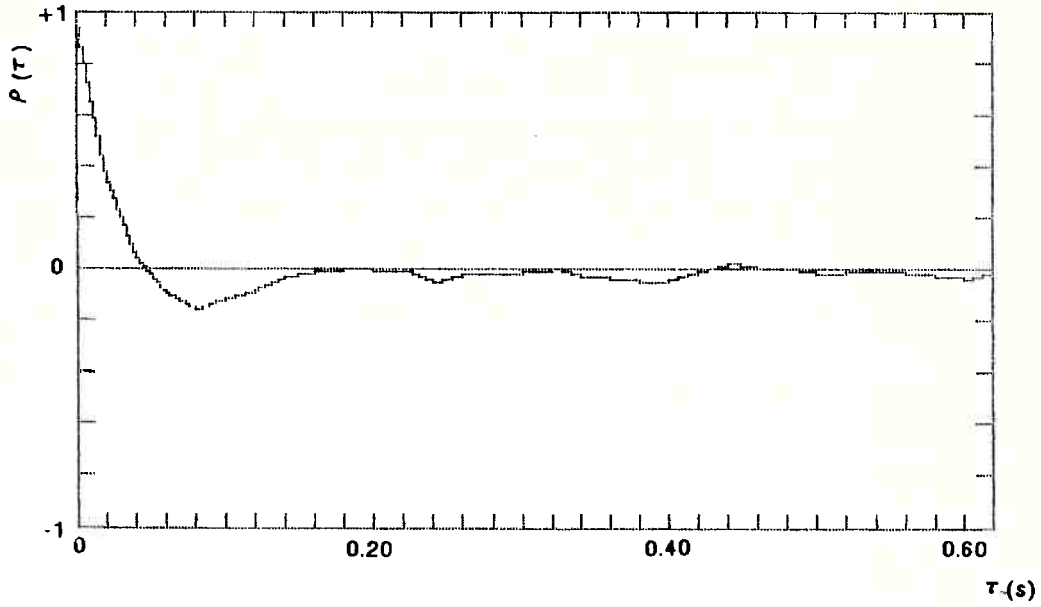
X/Y1=11.80

Power Spectra: Magnitude vs. Frequency (1 HZ/Div)



Autocorrelation: Correlation Coefficient vs Time Lag

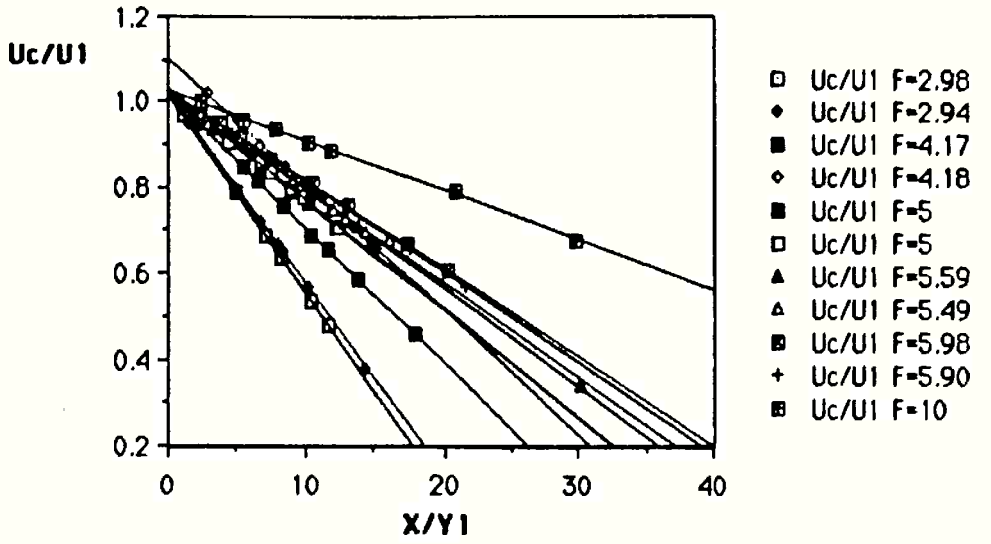
X AXIS 0 TO 31 Y AXIS -1 TO +1



F1=10.06 (END)

X/Y1=20.85

Gráfico I6


Uc/U1
1.2
1.0
0.8
0.6
0.4
0.2
0
10
20
30
40
X/Y1
Uc/U1 F=2.98
Uc/U1 F=2.94
Uc/U1 F=4.17
Uc/U1 F=4.18
Uc/U1 F=5
Uc/U1 F=5
Uc/U1 F=5.59
Uc/U1 F=5.49
Uc/U1 F=5.98
Uc/U1 F=5.90
Uc/U1 F=10

```
10  REM  BINARY DATA PLOTTER 4/24
    /85
15  HIMEM: 49151
16  DEF  FN A(ZZ) =  INT (ZZ * 10
    0 + .5) / 100
20 M1 = 16384:SR = 50:D$ =  CHR$
    (4): HOME : PRINT "*** MASTE
    R FILES IN D1:BINARY FILES I
    N D2 ***": PRINT : INPUT "MA
    STER FILE #? ";MN: PRINT
30  INPUT "ENTER RUN # (XX), STAR
    T CHAN AND END CHAN (0 TO 3)
    , PLOT CENTER (>128), PLOT P
    TS/FT (TRY 180), AND PLOT PT
    S/SAMPLE (TRY 2) ";RN,JI,JE,
    PM,RY,RX: PRINT D$;"BLOAD BD
    T";MN + (RN - 1) * 1E - 6;",
    A";M1;",D2"
40  PRINT D$;"OPEN MF";MN;",L25,D
    1": PRINT D$;"READ MF";MN;",
    R1": INPUT ID,NR,TT: PRINT D
    $;"READ MF";MN;",R";14 + RN:
     INPUT N,XR,NT,T(0),T(1),T(2
    ),T(3)
50  FOR J = 0 TO TT - 1: PRINT D$
    ;"READ MF";MN;",R";J + 4: INPUT
    CH(J),C(J),Z(J),XG(J): PRINT
    D$;"READ MF";MN;",R";16 + NR
     + NR * J * 2 + (RN - 1) * 2
    : INPUT T(J),AV(J): NEXT J:P
    P = PM - 280 / RX / 2
60  GOSUB 2000: REM     PLOT HEAD
    ING AND SET POINTER
70  FOR J = JI TO JE: GOSUB 1000:
     NEXT J: REM   PLOT ROUTINE
80  PRINT D$;"PR#0": HOME : GOTO
    30
1000  REM   PLOT ROUTINE
1010 HF = 0: HOME : HGR : POKE  -
    16302,0: HCOLOR= 3: HPLOT 0,
    96
1020  FOR I = 1 TO  INT (279 / RX
    ):X = I * RX:Y = ( PEEK (M1 +
    J + NT * (I + PP)) - AV(J)) *
    C(J) * RY + 96: IF Y > 191 THEN
    Y = 191:HF = HF + 1
1030  IF Y < 0 THEN Y = 0:HF = HF
     + 1
1040  HPLOT  TO X, ABS (Y - 191)
1050  NEXT I
1060  REM    HORIZONTAL LINES (0.
    1 FT. DIVISIONS AROUND MEAN
    LINE)
1070  FOR I = 1 TO 20:X = I * RY /
    10: IF X > 95 GOTO 1100
1080 Y = 96 - X: HPLOT 0,Y TO 279
    ,Y:Y2 = 96 + X: HPLOT 0,Y2 TO
    279,Y2
```

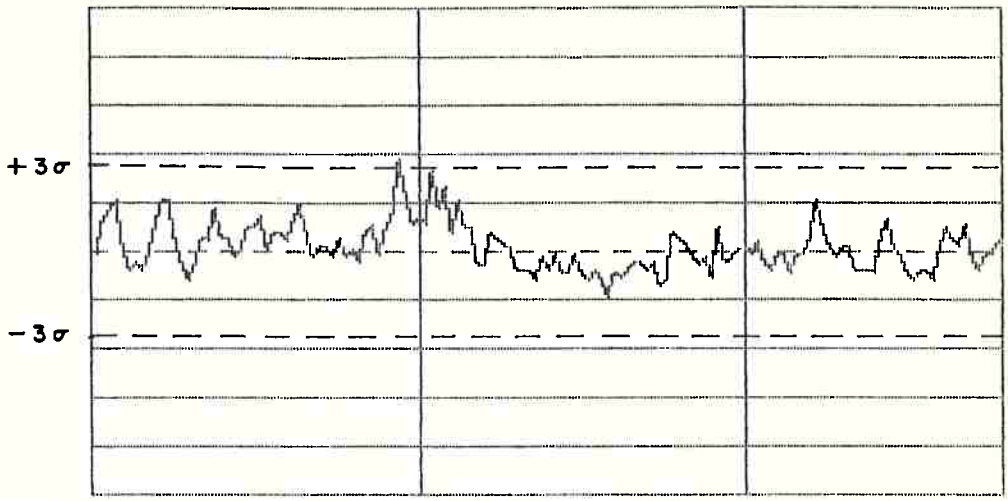
```
1090  NEXT I
1100  FOR I = 0 TO 270 STEP 10: HPLOT
      I,96 TO I + 5,96: NEXT I
1110  REM  VERTICAL LINES (ONE PE
      R SEC.)
1120  FOR I = 0 TO 50:X = I * SR *
      RX: IF X > 279 GOTO 1132
1130  HPLOT X,Y TO X,Y2: NEXT I
1132  HPLOT 279,Y TO 279,Y2
1140  PRINT D$;"PR#0":F =  FRE (0
      ): FLASH : HOME : PRINT "HAR
      D COPY IN PROGRESS PLEASE WA
      IT": NORMAL : PRINT D$;"PR#1
      ": PRINT  CHR$ (9);"G": TEXT

1150  PRINT "TRANSDUCER #";T(J); TAB(
      25)"AVE. PRESS. = "; FN A((A
      V(J) - Z(J)) * C(J));" FT.
              ";XG(J) - XR;" INCHE
      S DS. OF TOE": IF HF > 0 THEN
       PRINT " **PLOT LIMIT EXCEED
      ED ";HF;" TIMES"
1200  RETURN
2000  REM  HEADING FOR PLOT
2010  PRINT D$;"PR#1": PRINT : PRINT
      : PRINT "RUN #BDT";MN + (RN -
      1) * 1E - 6: PRINT  TAB( 16)
      ;"*** PLOT OF PRESSURE (FT)
      VERSUS TIME (SEC) ***": PRINT
       TAB( 18);"0.10 FT/DIV -- HO
      RIZ. : 1 SEC/DIV -- VERT."
2020  PRINT : PRINT  TAB( 12);"SA
      MPLE RATE = ";SR;"HZ :";RY;"
       PLOT PTS/FT  :";RX;" PLOT P
      TS/SAMPLE": PRINT  TAB( 21);
      "INITIAL TIME = "; FN A(PP /
      SR);" SEC. (PT #";PP;")"
2030  RETURN

]PR#0
```

RUN #BDT5.021902 F1 = 5,00 ED

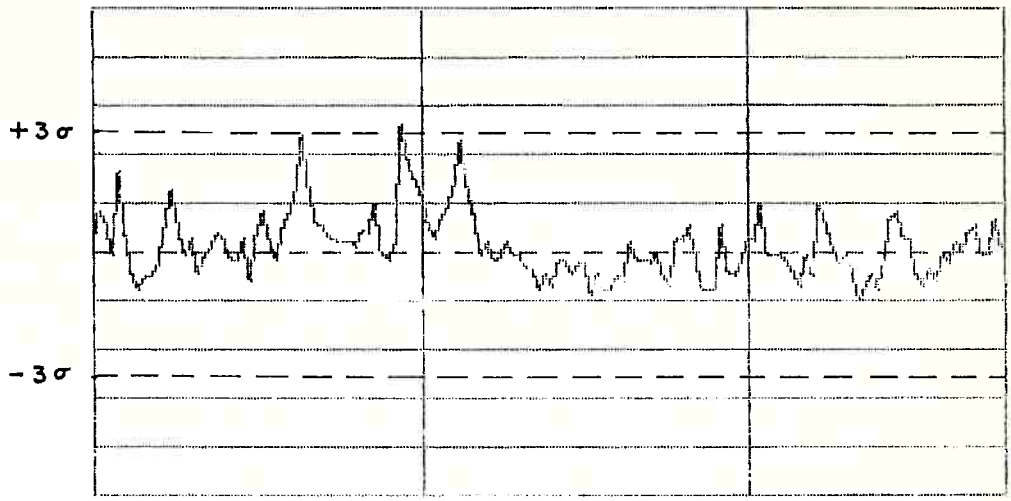
J2.a

*** PLOT OF PRESSURE (FT) VERSUS TIME (SEC) ***
0.10 FT/DIV --- HORIZ. : 1 SEC/DIV --- VERT.

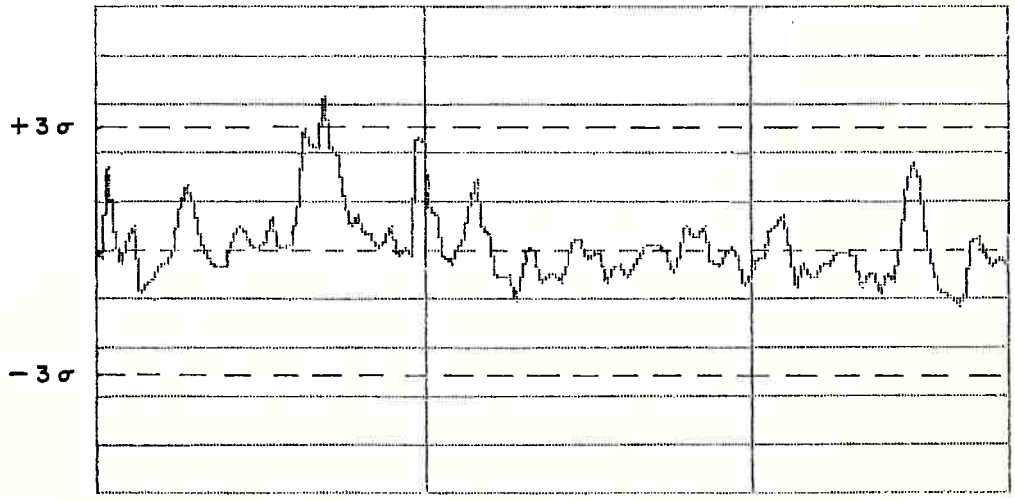
SAMPLE RATE = 50HZ :180 PLOT PTS/FT :2 PLOT PTS/SAMPLE
INITIAL TIME = 1.2 SEC. (PT #60)



TRANSDUCER #11 AVE. PRESS. = .29 FT. 5.5 INCHES DS.OF TOE



TRANSDUCER #12 AVE. PRESS. = .3 FT. 7 INCHES DS. OF TOE

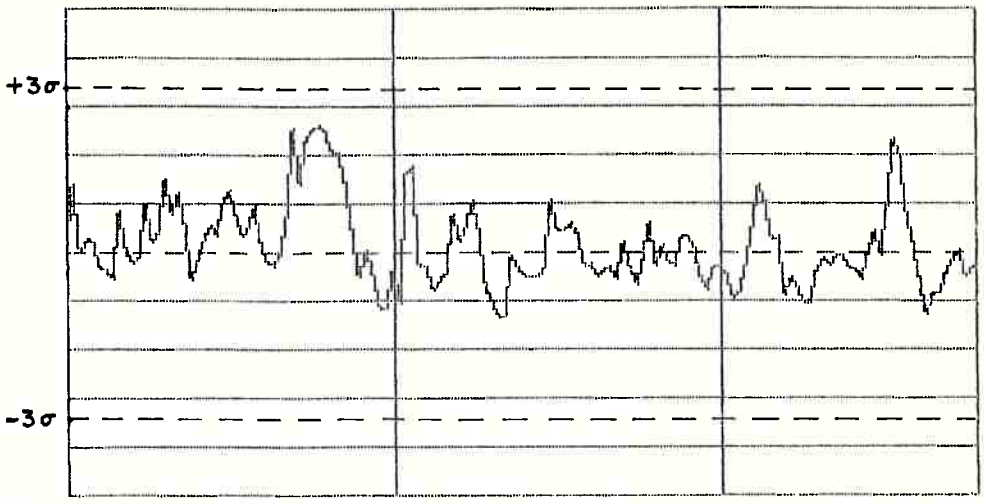


TRANSDUCER #13 AVE. PRESS. = .4 FT. 10 INCHES DS OF TOE

RUN #BDT5.021902 FI = 5,00 (ED) J2b

*** PLOT OF PRESSURE (FT) VERSUS TIME (SEC) ***
0.10 FT/DIV --- HORIZ. : 1 SEC/DIV --- VERT.

SAMPLE RATE = 50HZ :180 PLOT PTS/FT :2 PLOT PTS/SAMPLE
INITIAL TIME = 1.2 SEC. (PT #60)



TRANSDUCER #14 AVE. PRESS. = .41 FT. 13.5 INCHES
DS.OF TOE

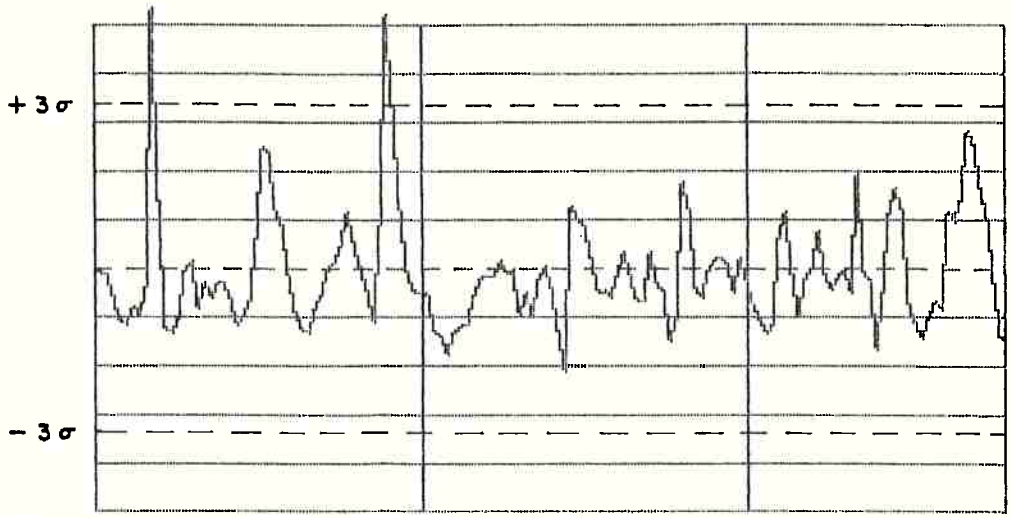
RUN #BDT5.021909 FI=5,00 (ED) J2c

*** PLOT OF PRESSURE (FT) VERSUS TIME (SEC) ***

0.10 FT/DIV --- HORIZ. : 1 SEC/DIV --- VERT.

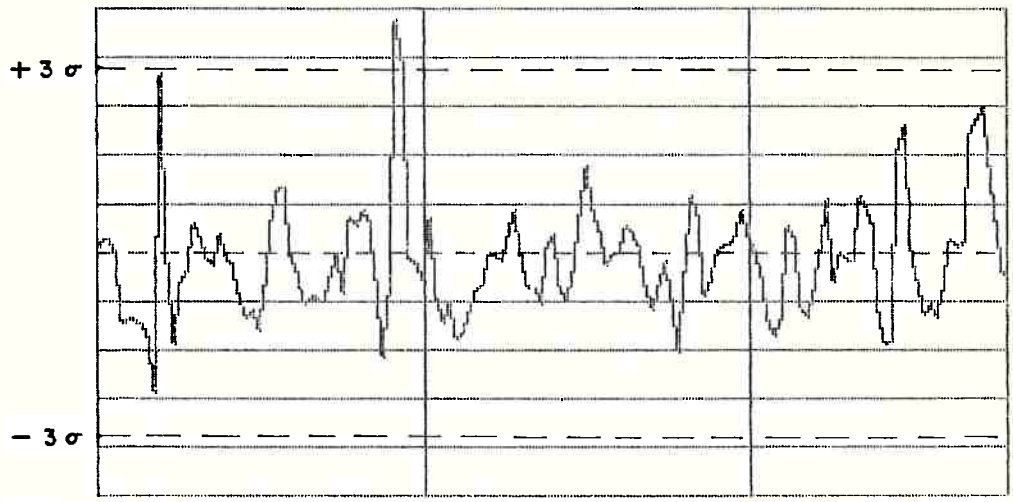
SAMPLE RATE = 50HZ :180 PLOT PTS/FT :2 PLOT PTS/SAMPLE

INITIAL TIME = 1.2 SEC. (PT #60)



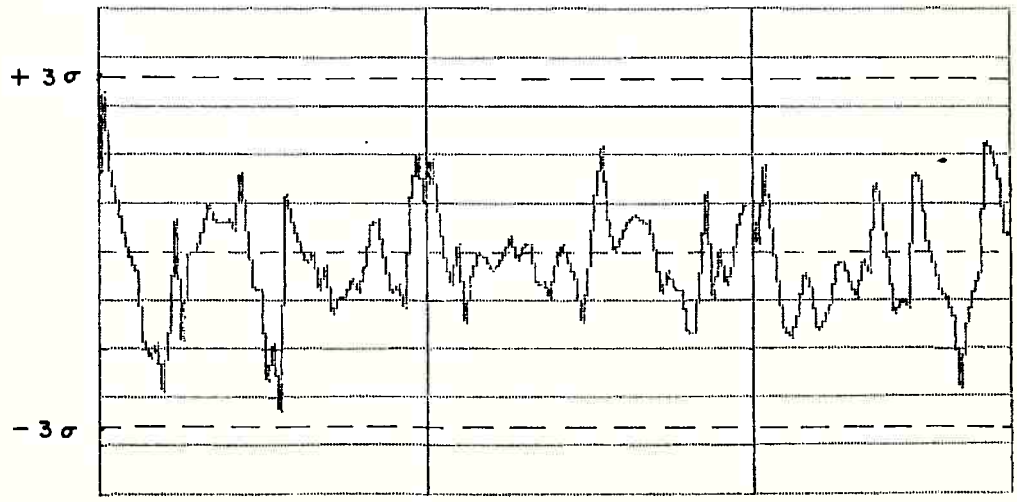
TRANSDUCER #11 AVE. PRESS. = .43 FT. 11.5 INCHES

**PLOT LIMIT EXCEEDED 1 TIMES DS. OF TOE



TRANSDUCER #12 AVE. PRESS. = .44 FT. 13 INCHES D

DS. OF TOE

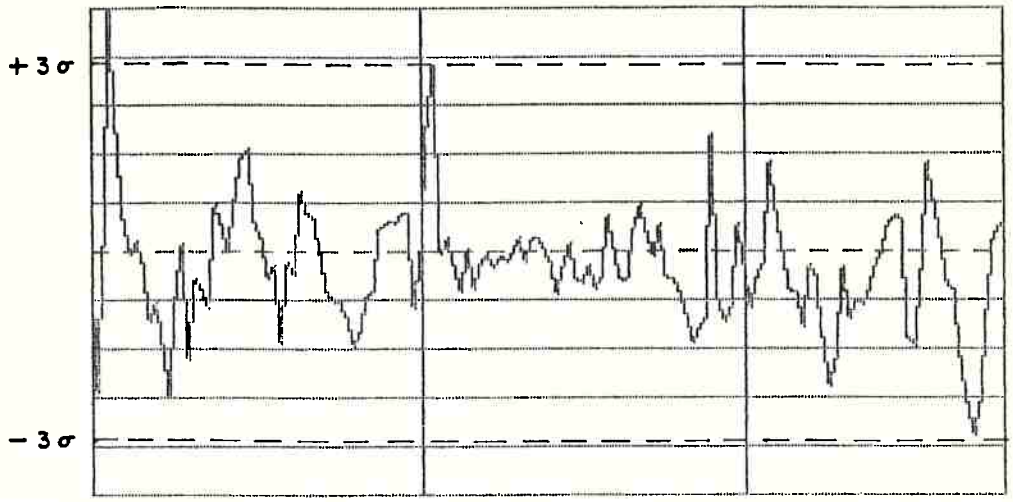


TRANSDUCER #13 AVE. PRESS. = .54 FT. 16 INCHES D

RUN #BDT5.021909 FI= 5,00 (ED) J2d

*** PLOT OF PRESSURE (FT) VERSUS TIME (SEC) ***
0.10 FT/DIV -- HORIZ. : 1 SEC/DIV -- VERT.

SAMPLE RATE = 50HZ :180 PLOT PTS/FT :2 PLOT PTS/SAMPLE
INITIAL TIME = 1.2 SEC. (PT #60)

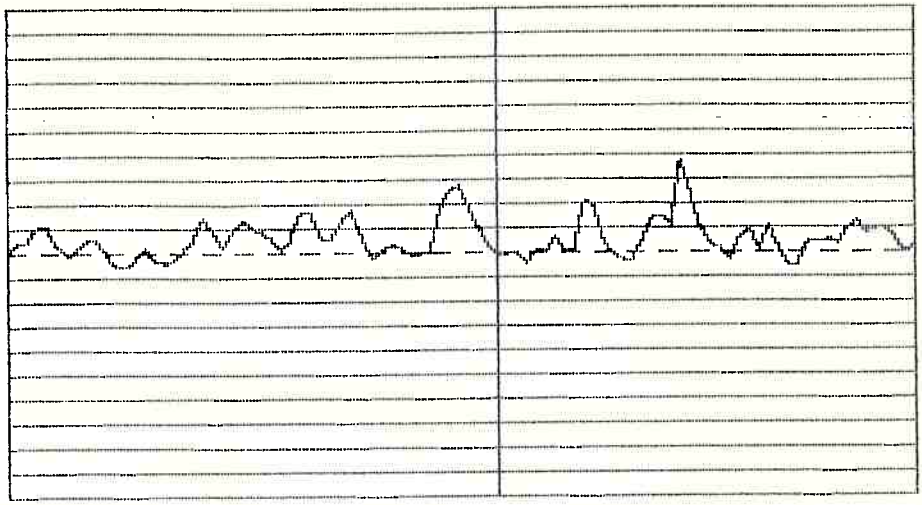


TRANSDUCER #14 AVE. PRESS. = .55 FT. 19.5 INCHES
DS. OF TOE

RUN #BDT5.022804

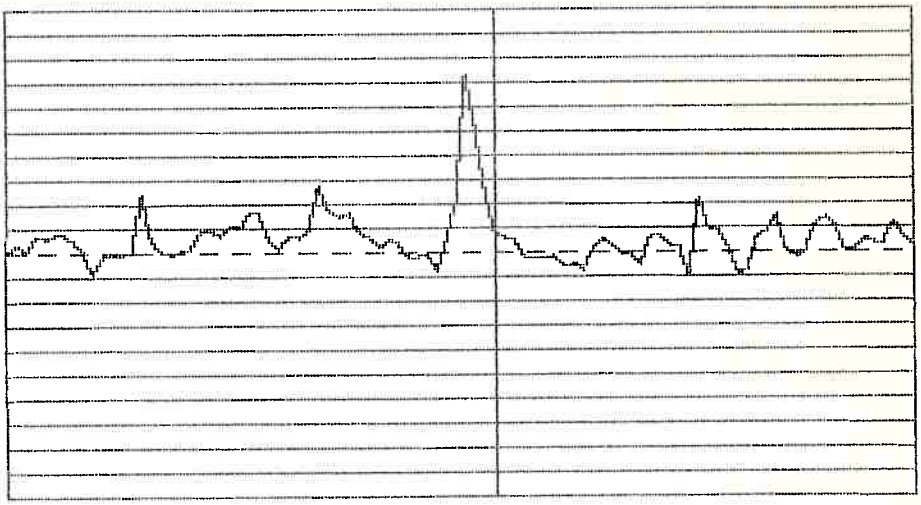
*** PLOT OF PRESSURE (FT) VERSUS TIME (SEC) ***
0.10 FT/DIV -- HORIZ. : 1 SEC/DIV -- VERT.

SAMPLE RATE = 50HZ :90 PLOT PTS/FT :3 PLOT PTS/SAMPLE
INITIAL TIME = 47.94 SEC. (PTS#2397 - 2490)



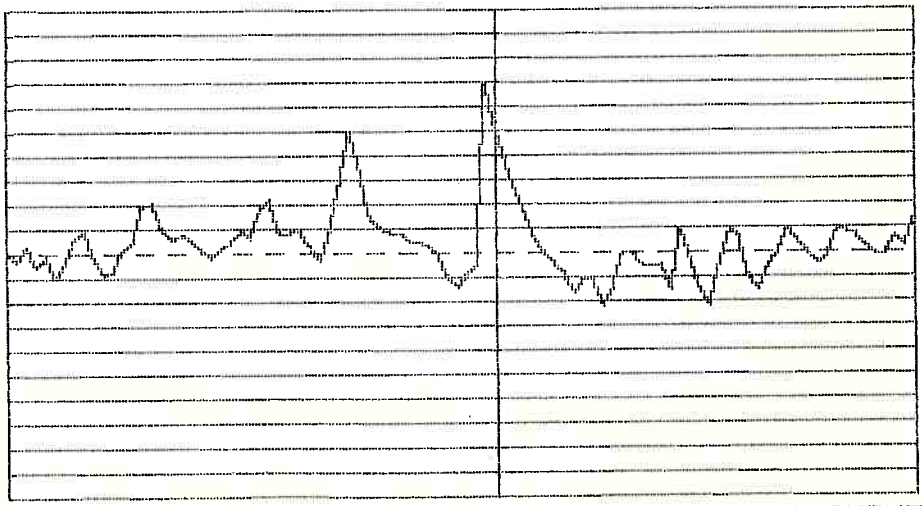
X/Y1=2.65

TRANSDUCER #11 AVE. PRESS. = .35 FT. 6 INCHES DS OF TOE



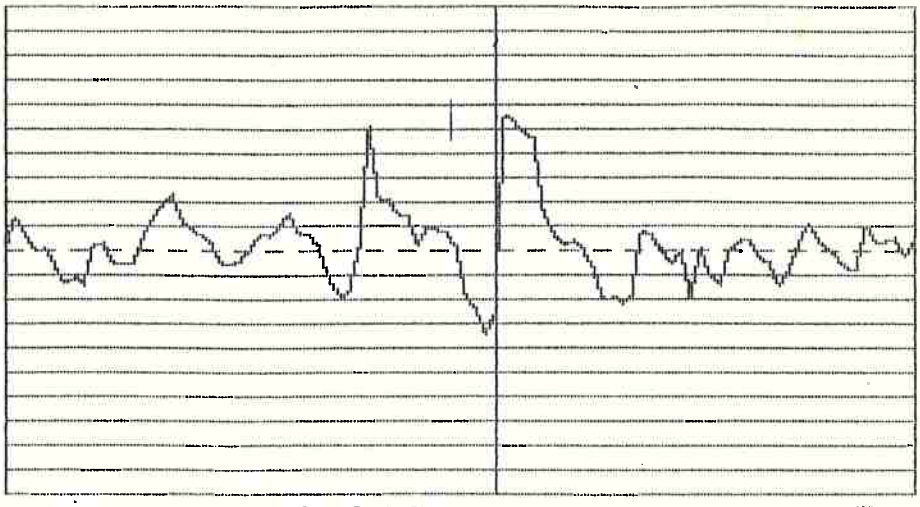
X/Y=3.97

TRANSDUCER #12 AVE. PRESS. = .4 FT. 9 INCHES DS. OF TOE



X/Y1=5.29

TRANSDUCER #13 AVE. PRESS. = .42 FT. 12 INCHES D



X/Y 1=6.83

TRANSDUTOR #14

AVE. PRESS. = .35 FT

6 INCHES DS. OF TOE

```
1  REM  CROSS SPECTRA AND CORR. W
     / PLOT 10/23/85
2  REM   ! INTEGER CH,I,IE,I1,I2,
     I3,I4,I5,J,JJ(2),K,L,M,M1,N,
     NE,NX,P,PX,T1,T2,U,W,X,Y,Z
3  DIM X1(64),X2(64),Y1(64),Y2(64
     ),RE(64),IM(64),DT(64),MA(64
     ),PH(64): DEF  FN A(ZZ) =  INT
     (ZZ * 1000 + .5) / 1000
4 N = 64:L = 6:P1 = 3.14159:M1 =
     16000:PX = 20:D$ =  CHR$ (4)
     :P = PX + M1: HOME : PRINT "
     *** INSERT DATA DISK ***": PRINT

10  INPUT "ENTER DATA FILE #, TOT
     . # OF PTS., SAMPLE RATE,  B
     OTH TRANSDUCER #S AND INDEX
     #S (0 TO 3), TOT. # OF TRANS
     DUCERS, AND # OF ENSEMBLES.
     ";DN,NX,SR,T1,T2,JJ(1),JJ(2)
     ,NT,NE
30  PRINT D$;"BLOAD BDT"DN",A"M1"
     ,D2":DF = SR / N
40  FOR J = 0 TO N - 1:RE(J) = 0.
     :IM(J) = 0: NEXT J:SD(1) = 0
     .:AV(1) = 0.:SD(2) = 0:AV(2)
      = 0: PRINT D$;"PR#1": PRINT
     "DATA FILE BDT";DN;" (START
     PT. OFFSET = ";PX;")": PRINT
     : PRINT "ENSEMBLE      A: MEA
     N      SDEV B: MEAN      SDEV"

50  FOR IE = 1 TO NE: PRINT : PRINT
      TAB( 4);IE;:AE(1) = 0:AE(2)
      = 0:SE(1) = 0:SE(2) = 0
60  FOR CH = 1 TO 2:AA(CH) = 0.:S
     S(CH) = 0.
80  FOR I = 0 TO N - 1:DT(I) =  PEEK
     (P + JJ(CH) + NT * I):AA(CH)
      = AA(CH) + DT(I):SS(CH) = S
     S(CH) + DT(I) * DT(I): NEXT
     I
110 AE(CH) = AA(CH) / N:SE(CH) =
      SQR ((SS(CH) - (AA(CH) * AA
     (CH)) / N) / (N - 1)):AV(CH)
      = AV(CH) + AA(CH):SD(CH) =
     SD(CH) + SS(CH)
116  PRINT  TAB( 17 * CH); FN A(A
     E(CH));"  "; FN A(SE(CH));
120  FOR I = 0 TO N - 1:X1(I) = D
     T(I) - AE(CH):X2(I) = 0.: NEXT
     I
130  FOR Z = 0 TO N - 1:X1(Z) = X
     1(Z) / N: NEXT Z
140  GOSUB 1000
150  IF CH = 2 GOTO 210
200  FOR J = 0 TO N - 1:Y1(J) = X
     1(J):Y2(J) = X2(J): NEXT J
```

```
210  NEXT CH:P = P + N * 2 + PX
220  FOR I = 0 TO N - 1:RE(I) = X
     1(I) * Y1(I) + X2(I) * Y2(I)
      + RE(I):IM(I) = X2(I) * Y1(
     I) - X1(I) * Y2(I) + IM(I): NEXT
     I
230  NEXT IE:SI = 0
240  FOR I = 0 TO N - 1:RE(I) = R
     E(I) / NE:IM(I) = IM(I) / NE
     :MA(I) = RE(I) * RE(I) + IM(
     I) * IM(I):SI = SI + MA(I):P
     H(I) = ( ATN (IM(I) / RE(I))
     ) / P1: IF RE(I) < 0 THEN PH
     (I) = IM(I) -  SGN (IM(I))
250  NEXT I
260 U = 0.
270 X = U: GOSUB 1300
280 X1(U) = RE(Y) / N:X2(U) =  -
     IM(Y) / N:U = U + 1: IF U >
     N - 1 GOTO 300
290  GOTO 270
300  GOSUB 1000
400  PRINT : PRINT : PRINT "OVERA
     LL";: FOR CH = 1 TO 2:SD(CH)
      =  SQR ((SD(CH) - (AV(CH) *
     AV(CH)) / (N * NE)) / (N * N
     E - 1)):AV(CH) = AV(CH) / (N
     E * N): PRINT  TAB( 17 * CH)
     ; FN A(AV(CH));"  "; FN A(SD
     (CH));: NEXT CH: PRINT
410  REM   --OUTPUT TABLE OF VALU
     ES--
420  PRINT : PRINT "Cross Spectra
      and Correlation of Transduc
     er ";T1;" AND ";T2;" (";NE;"
      ENSEMBLES )": PRINT : PRINT
     "HARMONIC   FREQUENCY   MAGN
     ITUDE   PHASE/PI": PRINT
430 U = 0.
440 X = U: GOSUB 1300
450  PRINT  TAB( 3); FN A(U); TAB(
     13); FN A(U * DF); TAB( 25);
      FN A(RE(Y)); TAB( 37); FN A
     (IM(Y)); TAB( 45); FN A(U /
     SR); TAB( 60); FN A(X1(Y)
460 U = U + 1: IF U > N - 1 GOTO
     480
470  GOTO 440
480  PRINT : PRINT  TAB( 13);"SUM
      = "; TAB( 25); FN A(SI): PRINT
     : PRINT
490 TT = 2:YZ = 0:YM = 2 ^ ( INT
     ( LOG (TT) /  LOG (2)) + 1):
     XZ = 0:XM = (N / 2 - 1) * DF
     :XD =  INT (XM + .5):YD = YM

500 RX = 279 / (XM - XZ):RY = 191
      / (YM - YZ):PZ = (0 - YZ) *
     RY:LZ = (0 - XZ) * RX
```

```
510  FOR I = 0 TO N / 2 - 1:Y1(I)
      = RE(I) * RY + PZ:X1(I) = I
      * DF * RX: NEXT I
520  GOSUB 4000
530 YM = 1.0:YZ =  - 1.0:YD = 8
540 RY = 191 / (YM - YZ):PZ = (0 -
    YZ) * RY
560  FOR I = 0 TO N / 2 - 1:Y1(I)
      = IM(I) * RY + PZ: NEXT I
570  GOSUB 4000
580  TEXT : PRINT D$;"PR#0": END

1000  REM   --FFT IN-PLACE ALGORI
    THM--
1010 I1 = N / 2:I2 = 1:V = 2 * P1
      / N
1020  FOR I = 1 TO L
1030 I3 = 0:I4 = I1
1040  FOR K = 1 TO I2:X =  INT (I
    3 / I1): GOSUB 1300
1050 I5 = Y:Z1 =  COS (V * I5):Z2
      =  -  SIN (V * I5)
1060  FOR M = I3 TO I4 - 1
1070 A1 = X1(M):A2 = X2(M):B1 = Z
    1 * X1(M + I1) - Z2 * X2(M +
    I1):B2 = Z2 * X1(M + I1) + Z
    1 * X2(M + I1)
1080 X1(M) = A1 + B1:X2(M) = A2 +
    B2:X1(M + I1) = A1 - B1:X2(M
     + I1) = A2 - B2
1090  NEXT M
1100 I3 = I3 + 2 * I1:I4 = I4 + 2
      * I1
1110  NEXT K
1120 I1 = I1 / 2:I2 = 2 * I2
1122  PRINT : PRINT "CROSS SPECTR
    A OF TRANSDUCER ";T1;" AND "
    ;T2;" (";NE;" ENSEMBLES )": PRINT
    : PRINT "HARMONIC   FREQUENC
    Y   MAGNITUDE   PHASE/PI": PRINT

1130  NEXT I
1140  RETURN
1180  PRINT  TAB( 3); FN A(U); TAB(
    13); FN A(U * DF); TAB( 25);
     FN A(RE(Y)); TAB( 37); FN A
    (IM(Y)):U = U + 1: IF U > N -
    1 GOTO 1420
1220  GOTO 1140
1300 Y = 0:N1 = N
1310  FOR W = 1 TO L:N1 = N1 / 2
1330  IF X < N1 THEN  GOTO 1360
1340 Y = Y + 2 ^ (W - 1):X = X -
    N1
1360  NEXT W
1370  RETURN
1420  PRINT : PRINT  TAB( 13);"SU
    M = "; TAB( 25); FN A(SI): PRINT
    : PRINT
```

```
2000 TT = 2:YZ = 0:YM = 2 ^ ( INT
     ( LOG (TT) /  LOG (2)) + 1):
     XZ = 0:XM = (N / 2 - 1) * DF
     :XD =  INT (XM + .5):YD = YM

2010 RX = 279 / (XM - XZ):RY = 19
     1 / (YM - YZ):PZ = (0 - YZ) *
     RY:LZ = (0 - XZ) * RX
2020  FOR I = 0 TO N / 2 - 1:Y1(I
     ) = RE(I) * RY + PZ:X1(I) =
     I * DF * RX: NEXT I
2030  GOSUB 4000
3000 YM = 1.0:YZ =  - 1.0:YD = 8
3002 RY = 191 / (YM - YZ):PZ = (0
      - YZ) * RY
3010  FOR I = 0 TO N / 2 - 1:Y1(I
     ) = IM(I) * RY + PZ: NEXT I
3020  GOSUB 4000
3030  TEXT : PRINT D$;"PR#0": END

4000  REM   PLOT ROUTINE
4010  HGR2 : HCOLOR= 3
4020  HPLOT 0,0 TO 279,0 TO 279,1
     91 TO 0,191 TO 0,0
4030  FOR I = 1 TO YD - 1:DY = 19
     1 * I / YD: HPLOT 0,DY TO 5,
     DY: HPLOT 274,DY TO 279,DY: NEXT
     I
4040  FOR I = 1 TO XD - 1:DX = 27
     9 * I / XD: HPLOT DX,0 TO DX
     ,5: HPLOT DX,186 TO DX,191: NEXT
     I
4100  HPLOT 0,0
4110  FOR I = 0 TO N / 2 - 1: HPLOT
      TO X1(I), ABS (191 - Y1(I))
     : NEXT I
4120  PRINT  CHR$ (9);"G2": PRINT
     : PRINT
4130  RETURN

]
```

RUN#5.092901 - 5.092908

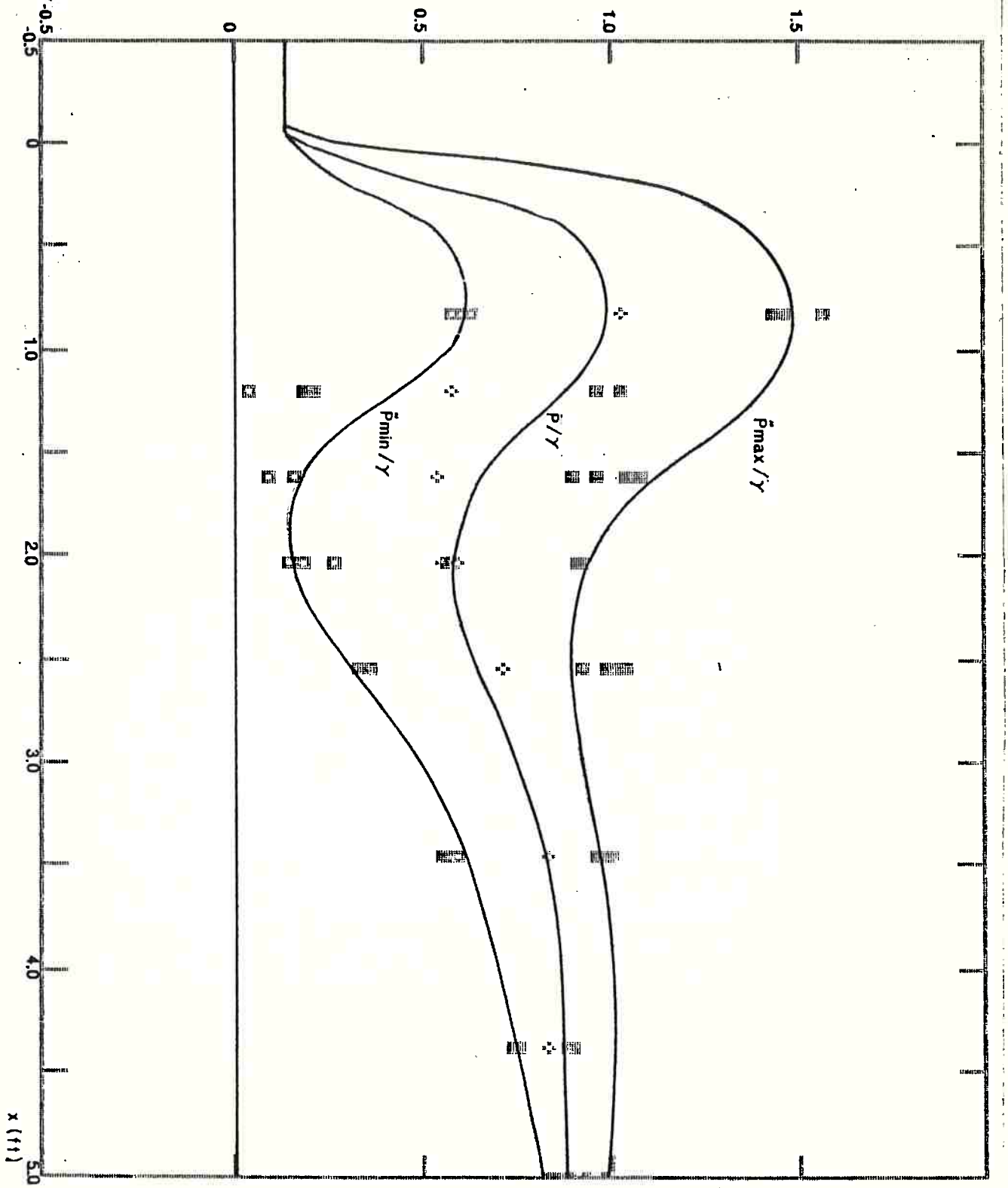
L1

Q=2.40 GO=0 F1=5.12 V=10.67

V*V/2g = 1.77 Y1=0.135

BII - USBR

*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY 0.50 FT



RUN#5.092901 - 5.092908

L2

Q=2.40 GO=0 F1=5.12 V=10.67

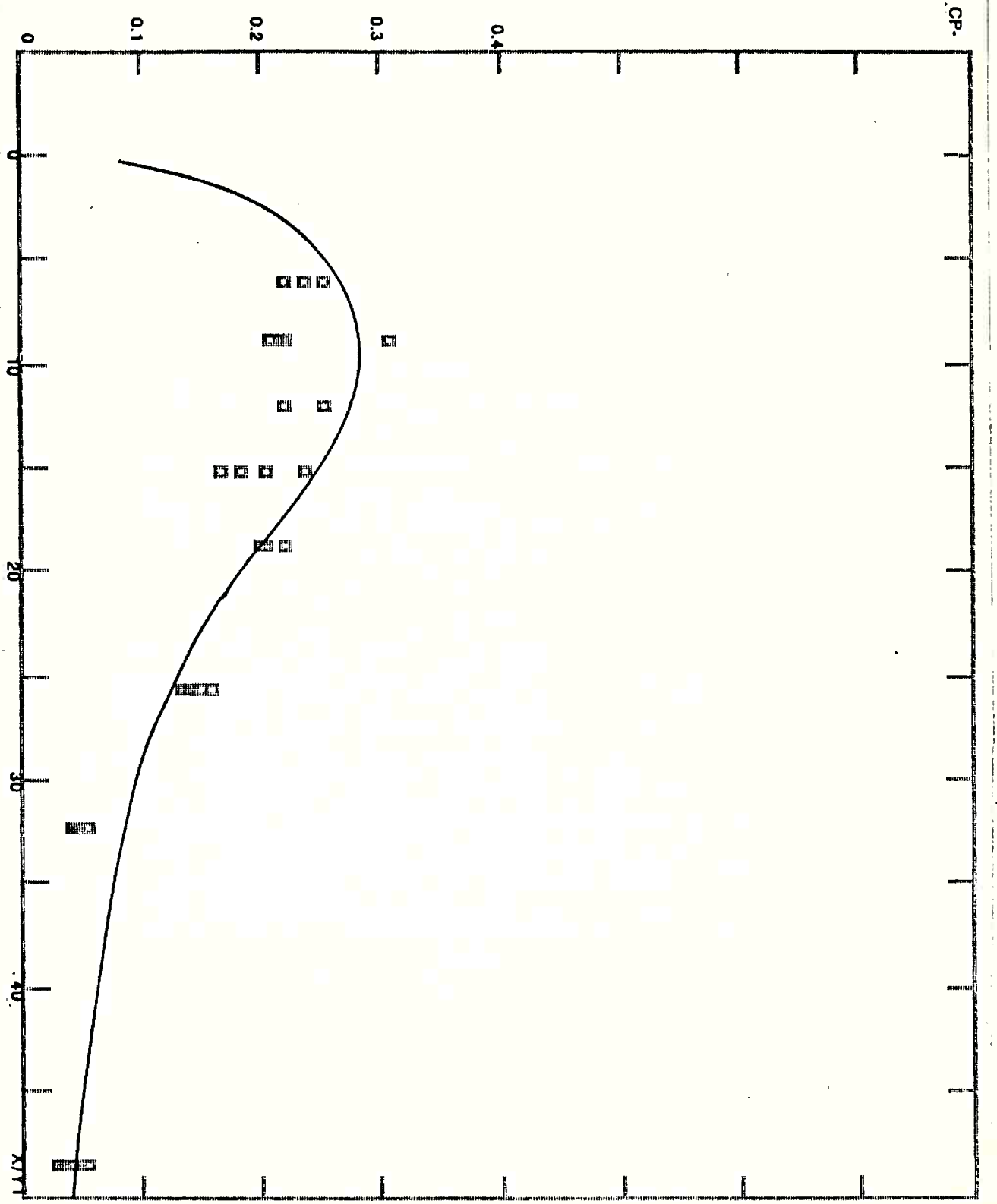
V*V/2g = 1.77 Y1=0.135

BII - USBR

*** CP-- VS X/Y1 ***

VERTICAL AXIS = 0, .1 TO .8

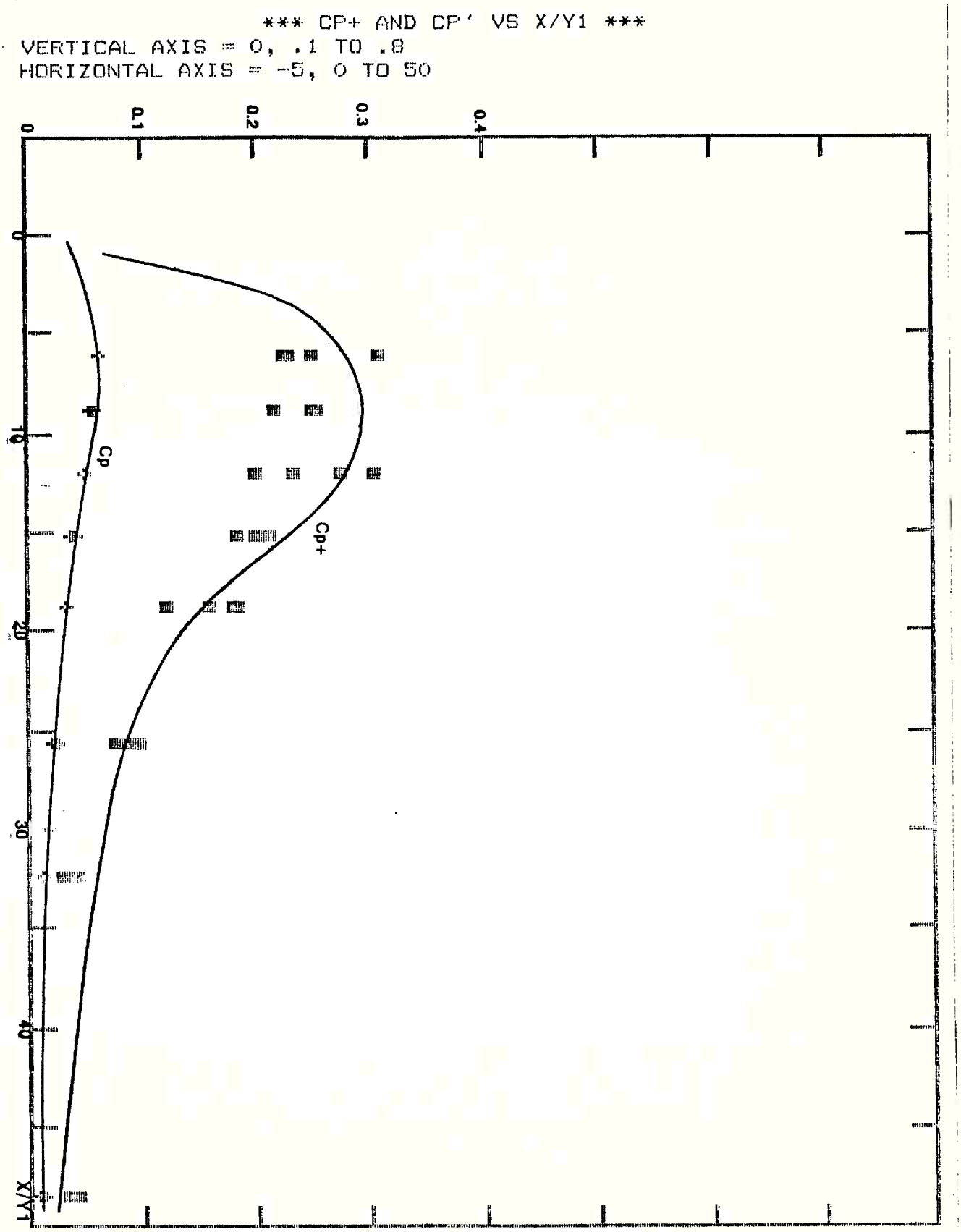
HORIZONTAL AXIS = -5, 0 TO 50



Q=2.40 GO=0 F1=5.12 V=10.67

V*V/2g = 1.77 Y1=0.135

BII - USBR

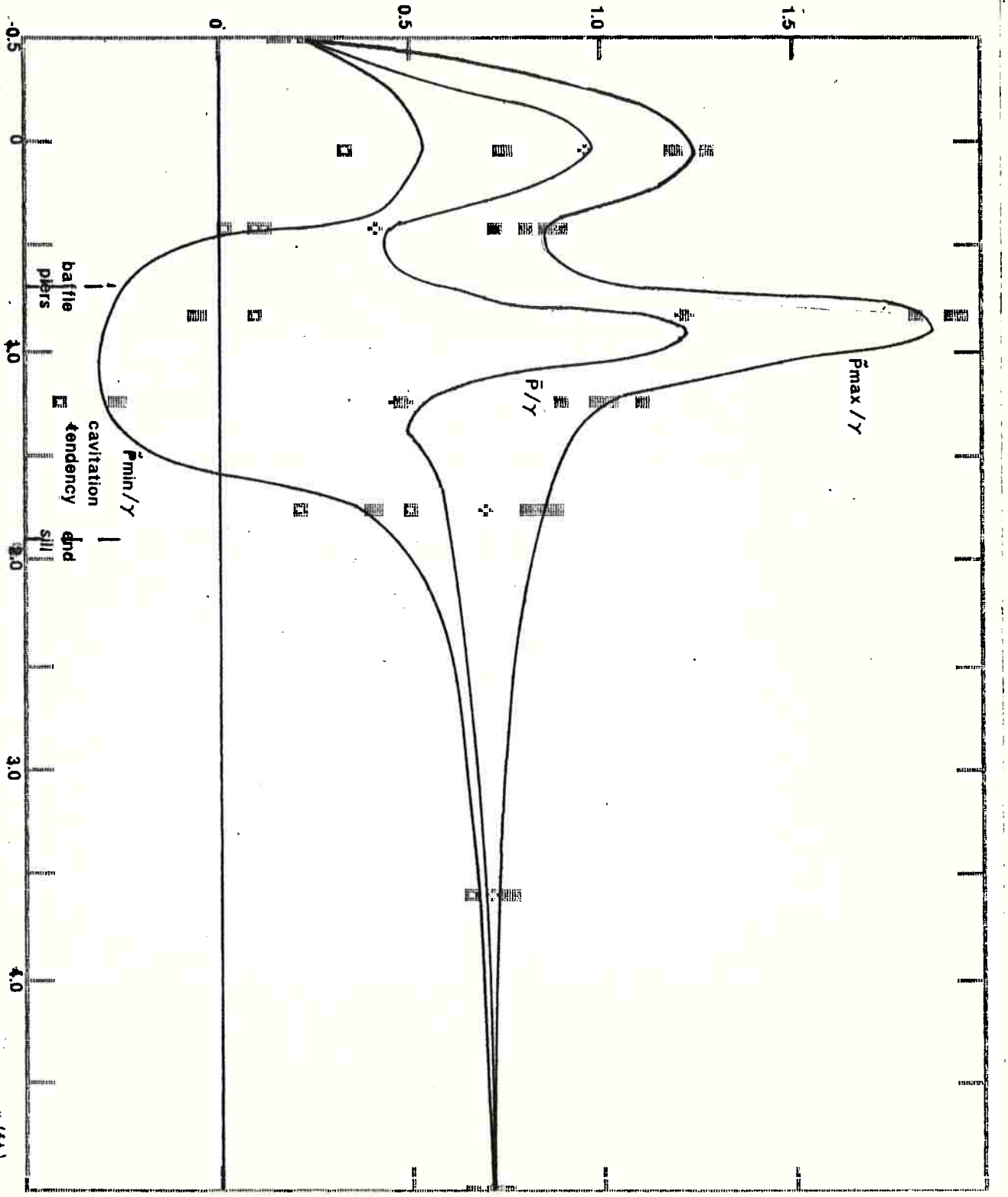


Q=2.40 GO=2 F1=5.12 V=10.67

V*V/2g = 1.77 Y1=0.135

BIII - USBR

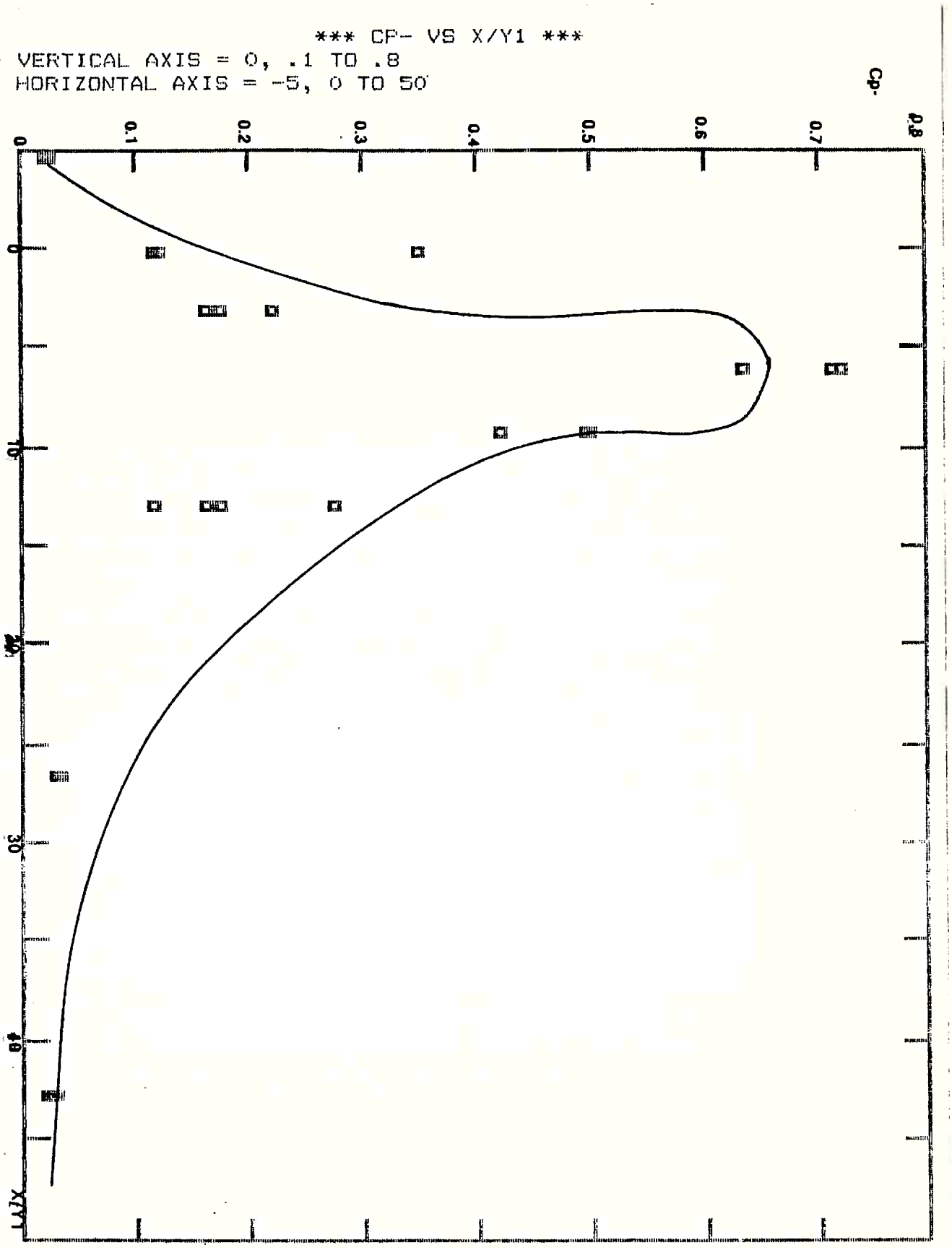
*** PLOT OF PRESSURE (FT) VS LOCATION IN JUMP (FT) ***
VERTICAL ORIGIN = -.5 FT. WITH DIVISIONS EVERY .5 FT.
HORIZONTAL ORIGIN = -.5 FT. RELATIVE TO TOE WITH DIVISIONS EVERY
MAX. PLOT LIMIT WAS EXCEEDED 2 TIME(S)
0,50 FT



Q=2.40 GO=2 F1=5.12 V=10.67

V*V/2g = 1.77 Y1=0.135

BIII - USBR



RUN#5.092209 - 5.092216

L6

Q=2.40 GO=2 F1=5.12 V=10.67

V*V/2g = 1.77 Y1=0.135 Y2=0.705

BIII - USBR

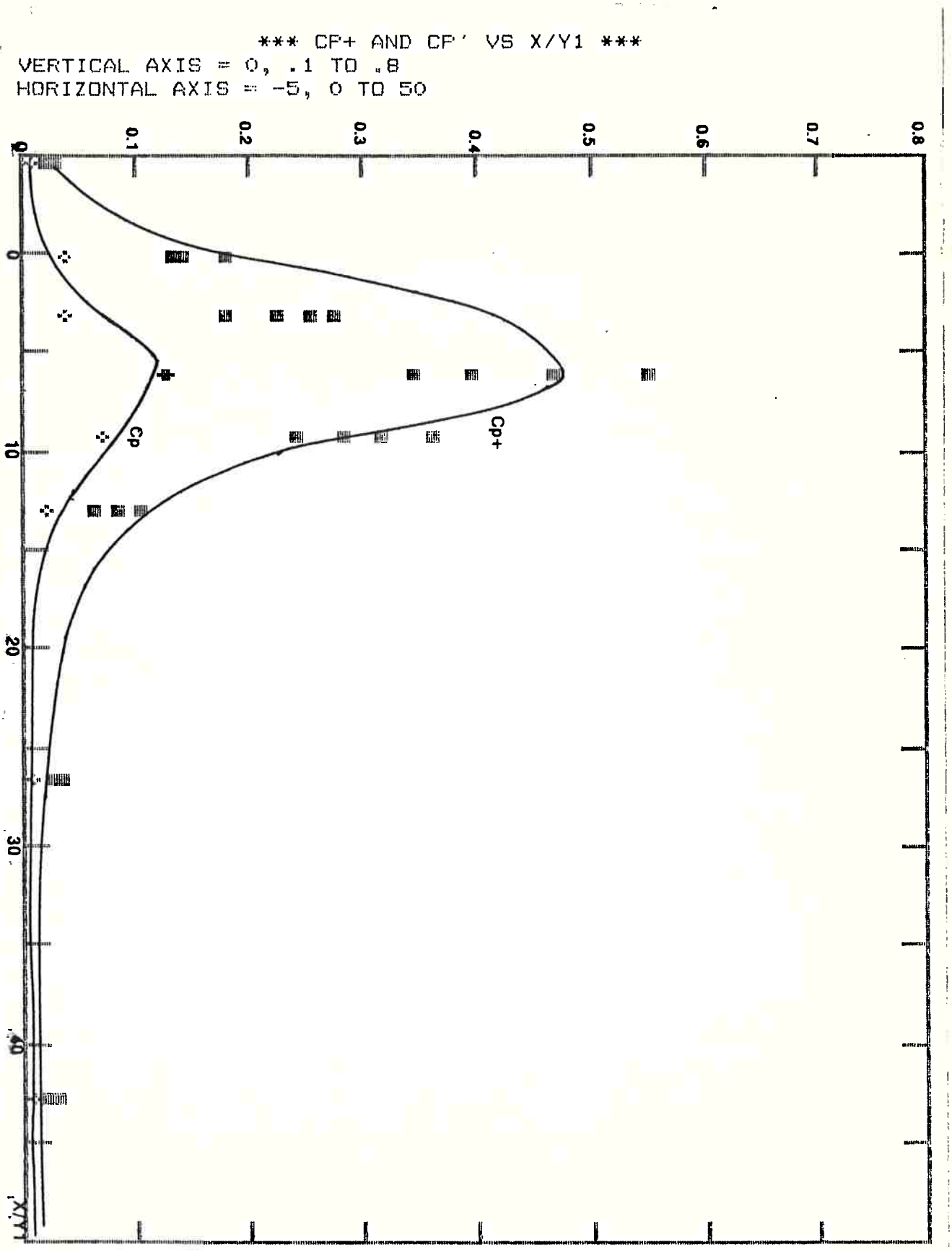


Gráfico L7 (assimetria)

Bacias tipo II e III - USBR

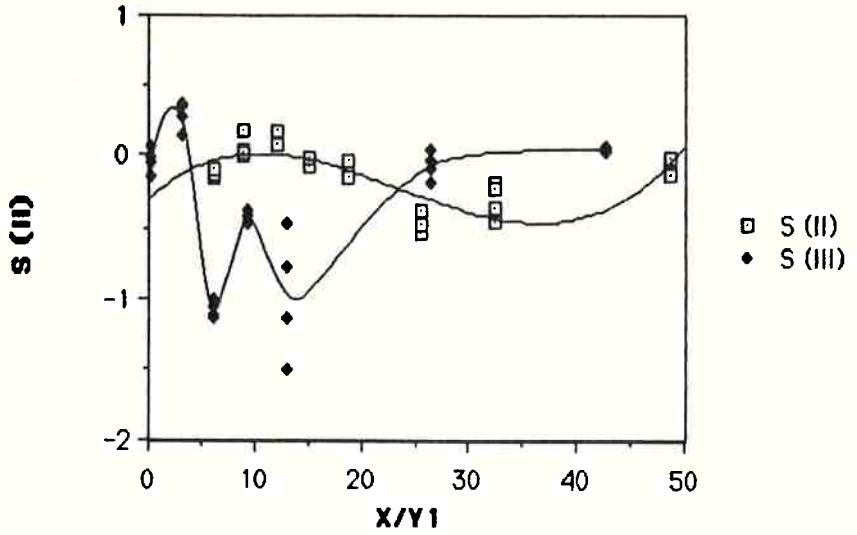


Gráfico L8 (curtose)

Bacias tipo II e III - USBR