OPEN FILE-881

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Introduction

The computer routines are written for an Apple II computer with 48K bytes memory and Epson MX100 Printer and at least one disk drive. Two disk drives are required for programs FASTNMO, FASTFILT and FASTNMOF.

Port No. 1 in the Apple II is used with the Apple II Epson Interface Kit Type 2A.

Port No. 2 in the Apple II is used with the RS-232 Interface to the Nimbus Model G724S tape recorder for input of seismic data.

Game paddles are required for interactive work with the video.

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NIMTODISK

```
0  REM  PROGRAM TRANSFERS DATA FROM NIMBUS G724S TAPE RECORDER TO
     DISK
1  REM  TAPE DATA MUST BE IN 8-BIT WORD FORMAT
2  REM  TAPE OUTPUT MUST BE CONNECTED TO SERIAL INTERFACE IN PORT
     #2
3  REM  SET BAUD RATE OF TAPE AND INTERFACE EQUAL AT 9600
4  REM  DISK FILE IN SEQUENTIAL FORMAT
5  REM  G.S.C. HEADER DATA AND 8 DIGIT NIMBUS TAPE HEADER WRITTEN
     FIRST ON TAPE
6  REM  PROGRAM TRANSFERS EVERY FOURTH SAMPLE TO DISK
7  REM   REVISED AUG.1982
10  REM  INPUT PARAMETERS
20  DIM GN(12),X%(256),H(8),T(22)
30 D$ =  CHR$ (4)
50  INPUT "INPUT FILE NAME ";R$
60  INPUT "INPUT SHOT OFFSET ";SF
70  INPUT "INPUT DIRECTION ";DR$
80  INPUT "INPUT GROUP INTERVAL ";GI
90  INPUT "INPUT NO OF STACKS ";SK
100  INPUT "IF ALL TRACE GAINS ARE THE SAME PUNCH 0";Z
110  IF Z = 0 THEN  INPUT "INPUT GAIN";GN(1): FOR I = 2 TO 12:GN(
    I) = GN(1): NEXT I: GOTO 130
120  IF Z <  > 0 THEN  PRINT "INPUT TRACE GAINS ONE AT A TIME": FOR
    I = 1 TO 12: INPUT GN(I): NEXT I
130  INPUT "INPUT HC FILTER ";HC
140  INPUT "INPUT LC FILTER ";LC
150  INPUT "INPUT TIME DELAY ";TD
160  INPUT "INPUT TIME SCALE ";TS
170  HOME : VTAB (10): FOR I = 1 TO 40: PRINT "*";: NEXT I: INVERSE
    : FLASH : PRINT
180  PRINT "         CHECK YOUR TAPE HEADER NUMBER    "
185  PRINT "         INSERT OUTPUT DATA DISK          "
190  NORMAL : FOR I = 1 TO 40: PRINT "*";: NEXT I
200  PRINT : PRINT : INPUT "YES OR NO ? ";Q$
210  IF Q$ <  > "N" AND Q$ <  > "Y" THEN  GOTO 200
220  IF Q$ = "N" THEN  PRINT "DO IT NOW": GOTO 200
230  IF Q$ = "Y" THEN  HOME : GOTO 240
240  PRINT "PUSH PLAYBACK ON NIMBUS TAPE"
260  PRINT D$;"PR#2"
270  PRINT ""
280  POKE 60,0
290  POKE 61,32
300  POKE 62,61
310  POKE 63,128
320  CALL  - 14019
330  PRINT D$;"PR#0"
340  REM  TRANSFERS EVERY FOURTH SAMPLE TO DISK
360  PRINT "PUSH ABORT BUTTON ON NIMBUS"
370 T(0) = 0:T(1) = 1:T(2) = 2:T(3) = 3:T(4) = 4:T(5) = 5:T(6) =
    6:T(7) = 7:T(8) = 8:T(9) = 9
380 T(17) = 10:T(18) = 11:T(19) = 12:T(20) = 13:T(21) = 14:T(22) =
    15
390  FOR I = 1 TO 8
400 H(I) =  PEEK (8193 + I) - 48: NEXT I
410  PRINT SF: PRINT DR$: PRINT GI: PRINT SK
420  FOR I = 1 TO 12: PRINT GN(I): NEXT I
430  PRINT HC: PRINT LC: PRINT TD: PRINT TS
```

NIMTODISK

```
440  PRINT H(1);H(2);H(3);H(4);H(5);H(6);H(7);H(8)
450 J =  - 6
470  PRINT D$;"OPEN ";R$
480  PRINT D$;"WRITE ";R$
490  PRINT SF: PRINT DR$: PRINT GI: PRINT SK
500  FOR I = 1 TO 12: PRINT GN(I): NEXT I
510  PRINT HC: PRINT LC: PRINT TD: PRINT TS
520  FOR I = 1 TO 8: PRINT H(I): NEXT I
530  FOR K = 0 TO 11
540 KK = 0
550  FOR I = 1 TO 1024 STEP 4
560 KK = KK + 1
570 J = J + 7
580 A =  PEEK (8205 + J) - 48:A = T(A)
590 J = J + 1
600 B =  PEEK (8205 + J) - 48:B = T(B)
610 X%(KK) = 16 * A + B - 127
620  NEXT I
630 J = J + 4
640  FOR I = 1 TO 256: PRINT X%(I): NEXT I
650  NEXT K
660  PRINT D$;"CLOSE ";R$
690  HOME : VTAB (12): FOR I = 1 TO 40: PRINT "*";: NEXT I
691 D$ = ""
700  PRINT  SPC( 8)"RECORD TRANSFER COMPLETE"
710  FOR I = 1 TO 40: PRINT "*";: NEXT I
720  PRINT : PRINT : PRINT "FOR DATA DISK CATALOG PRESS C "
725  PRINT : PRINT : PRINT "FOR NEXT RECORD TRANSFER PRESS RETURN
    "
730  GET Q$: IF Q$ <  > CHR$ (13) AND Q$ <  > CHR$ (67) THEN  END

740  IF Q$ =  CHR$ (13) THEN  GOTO 1000
750  IF Q$ =  CHR$ (67) THEN  GOSUB 2000
751 D$ =  CHR$ (4)
755  PRINT D$;"CATALOG"
760  PRINT "FOR NEXT RECORD TRANSFER PRESS RETURN"
765  GET Q$
770  IF Q$ <  > CHR$ (13) THEN  END
780  GOTO 1000
1000  REM  PARAMETER CHANGE ROUTINE
1110  CALL  - 936
1120  PRINT  SPC( 12)"PARAMETER LIST"
1130  PRINT "1-FILE NAME ": PRINT
1140  PRINT "2-SHOT OFFSET ": PRINT
1150  PRINT "3-DIRECTION ": PRINT
1160  PRINT "4-GROUP SPACING ": PRINT
1170  PRINT "5-NUMBER OF STACKS": PRINT
1180  PRINT "6-TRACE GAINS": PRINT
1190  PRINT "7-HC FILTER": PRINT
1200  PRINT "8-LC FILTER": PRINT
1210  PRINT "9-TIME DELAY": PRINT
1220  PRINT "10-TIME SCALE": PRINT
1230  PRINT "11-READY TO RUN": PRINT
1240  PRINT "WHICH PARAMETERS DO YOU WISH TO CHANGE"
1250  INVERSE : FLASH : INPUT "ENTER BY NUMBER ";C: NORMAL
1260  ON C GOTO 1270,1330,1400,1450,1520,1590,1680,1750,1820,1890
```

NIMTODISK

```
1270  HOME : PRINT "FILE NAME IS- ";R$
1280  INPUT "NEW FILE NAME ? ";R$
1320  GOTO 1110
1330  HOME : PRINT "SHOT OFFSET IS"
1340  PRINT SF
1350  INPUT "NEW SHOT OFFSET ";SF
1390  GOTO 1110
1400  HOME : PRINT "DIRECTION IS - ",DR$
1410  INPUT "NEW DIRECTION ";DR$
1440  GOTO 1110
1450  HOME : PRINT "GROUP SPACING IS"
1460  PRINT GI
1470  INPUT "NEW GROUP SPACING ";GI
1510  GOTO 1110
1520  HOME : PRINT "NUMBER OF STACKS IS"
1530  PRINT SK
1540  INPUT "NUMBER OF STACKS ";SK
1580  GOTO 1110
1590  HOME : PRINT "TRACE GAINS ARE "
1600  FOR I = 1 TO 12: PRINT GN(I): NEXT I
1610  INPUT "IF ALL TRACE GAINS ARE THE SAME PUNCH 0";Z
1620  IF Z = 0 THEN  INPUT "INPUT GAIN";GN(1): FOR I = 2 TO 12:GN
    (I) = GN(1): NEXT I: GOTO 1640
1630  IF Z <  > 0 THEN  PRINT "INPUT TRACE GAINS ONE AT A TIME": FOR
    I = 1 TO 12: INPUT GN(I): NEXT I
1640  INPUT "DID YOU MAKE ANY MISTAKES ? ";Q$
1650  IF Q$ <  > "Y" AND Q$ <  > "N" THEN  GOTO 1540
1660  IF Q$ = "Y" THEN  GOTO 1610
1670  IF Q$ = "N" THEN  GOTO 1110
1680  HOME : PRINT "HC FILTER IS-"
1690  PRINT HC
1700  INPUT "HC FILTER CHANGE  ";HC
1740  GOTO 1110
1750  HOME : PRINT "LC FILTER IS "
1760  PRINT LC
1770  INPUT "LC FILTER CHANGE ";LC
1810  GOTO 1110
1820  HOME : PRINT "TIME DELAY IS "
1830  PRINT TD
1840  INPUT "TIME DELAY CHANGE ";TD
1880  GOTO 1110
1890  HOME : PRINT "TIME SCALE IS "
1900  PRINT TS
1910  INPUT "TIME SCALE CHANGE ";TS
1950  GOTO 1110
1960  GOTO 170
1970  END
2000  PRINT D$;"CATALOG"
2010  RETURN
```

NIMTODISK1

```
1  REM  MODIFIED VERSION OF NIMTODISK
2  REM  TRANSFERS 256 SAMPLES OF A SPECIFIED PORTION OF A SEISMOG
    RAM
3  REM     -REQUIRES THE SAME INPUT AS NIMTODISK
4  REM     -OUTPUT ON DISK IS THE SAME AS NIMTODISK
5  REM     - AUG.1982
9  DIM H(8),T(22),GN(12),X%(256)
10 D$ =  CHR$ (4)
11  INPUT "INSERT OUTPUT DATA DISK IN DRIVE 1 - PUNCH 1 ";PQ
12  INPUT "INPUT FILE NAME ";R$
14  INPUT "INPUT SHOT OFFSET ";SF
15  INPUT "INPUT DIRECTION ";DR$
16  INPUT "INPUT GROUP INTERVAL ";GI
18  INPUT "INPUT NO OF STACKS ";SK
19  INPUT "IF ALL TRACE GAINS ARE THE SAME PUNCH 0";Z
20  IF Z = 0 THEN  INPUT "INPUT GAIN";GN(1): FOR I = 2 TO 12:GN(I
    ) = GN(1): NEXT I: GOTO 24
22  IF Z <  > 0 THEN  PRINT "INPUT TRACE GAINS ONE AT A TIME": FOR
    I = 1 TO 12: INPUT GN(I): NEXT I
24  INPUT "INPUT HC FILTER ";HC
26  INPUT "INPUT LC FILTER ";LC
28  INPUT "INPUT TIME DELAY OF RECORDED DATA ";TD
29  INPUT "INPUT TIME SCALE OF RECORDED DATA ";TS
37  PRINT
38  INPUT "INPUT TIME DELAY FROM START OF RECORDED DATA TO START
    OF DESIRED PORTION ";DD
39 XD = TD + DD: PRINT
40  PRINT "TIME SCALE OF DESIRED PORTION OF RECORD SHOULD BE ";TS
     / 2;" OR ";TS / 4;" MSECS"
41  PRINT
42  INPUT "INPUT TIME SCALE ";DS
44  IF DS = TS / 2 THEN FAC = 2: GOTO 50
45  IF DS = TS / 4 THEN FAC = 4: GOTO 50
46  GOTO 39
50  PRINT "CHANGE COUNTER AND PUSH PLAYBACK ON     NIMBUS"
55  PRINT D$;"PR#2"
56  PRINT ""
60  POKE 60,0
65  POKE 61,32
70  POKE 62,61
75  POKE 63,128
80  CALL  - 14019
85  PRINT D$;"PR#0"
100  PRINT "PUSH ABORT BUTTON ON NIMBUS"
170 T(0) = 0:T(1) = 1:T(2) = 2:T(3) = 3:T(4) = 4:T(5) = 5:T(6) =
    6:T(7) = 7:T(8) = 8:T(9) = 9
```

NIMTODISK1

```
171 T(17) = 10:T(18) = 11:T(19) = 12:T(20) = 13:T(21) = 14:T(22) =
    15
180  FOR I = 1 TO 8
190 H(I) =  PEEK (8193 + I) - 48: NEXT I
192  PRINT SF: PRINT DR$: PRINT GI: PRINT SK
194  FOR I = 1 TO 12: PRINT GN(I): NEXT I
195  PRINT HC: PRINT LC: PRINT XD: PRINT DS
196  PRINT H(1);H(2);H(3);H(4);H(5);H(6);H(7);H(8)
300  REM  - TRANSFER DESIRED PORTION OF RECORD TO DISK
310 NS =  INT (DD / (TS / 1000))
315  IF FAC = 2 THEN KK = NS * 2 - 2:JJ = 3: GOTO 320
316  IF FAC = 4 THEN KK = NS * 2:JJ = 1
320  PRINT D$;"OPEN ";R$
325  PRINT D$;"WRITE ";R$
330  PRINT SF: PRINT DR$: PRINT GI: PRINT SK
331  FOR I = 1 TO 12: PRINT GN(I): NEXT I
333  PRINT HC: PRINT LC: PRINT XD: PRINT DS
335  FOR I = 1 TO 8: PRINT H(I): NEXT I
345 J = 0
350  FOR K = 0 TO 11
355 J = J + KK
360  FOR I = 1 TO 256
370 J = J + JJ
375 A =  PEEK (8205 + J) - 48:A = T(A)
380 J = J + 1
385 B =  PEEK (8205 + J) - 48:B = T(B)
390 X%(I) = 16 * A + B - 127
395  NEXT I
400 J = 2052 * (K + 1)
410  FOR I = 1 TO 256: PRINT X%(I): NEXT I
420  NEXT K
430  PRINT D$;"CLOSE ";R$
450  PRINT "RECORD TRANSFER COMPLETE"
470  PRINT : PRINT "CATALOG OF DISK IN DRIVE 1": PRINT
471  PRINT D$;"CATALOG"
480  PRINT
481  INPUT "PRINT E TO END PROGRAM NOW OR C TO CONTINUE ";Q$
485  IF Q$ = "E" THEN  GOTO 999
486  IF Q$ <  > "C" THEN  GOTO 480
490  INPUT "IS ONLY CHANGE FROM PREVIOUS RUN GOING TO BE THE OUTP
    UT FILE NAME? (Y/N) ";Q$
495  IF Q$ = "Y" THEN  GOTO 510
496  IF Q$ <  > "N" THEN  GOTO 490
500  PRINT "ENTER ALL HEADER INFO FOR NEXT RECORD ": GOTO 11
510  INPUT "INPUT FILE NAME FOR NEXT RECORD ";R$: GOTO 50
999  END
```

EPLOT

```
1  REM  PROGRAM EPLOT
3  REM  COPIES SEISMIC RECORDS IN WIGGLE TRACE MODE ON VIDEO
4  REM  COPIES VIDEO ON EPSON MX-100 PRINTER
5  REM  SEISMOGRAMS MUST RESIDE ON DISK IN STANDARD FORMAT AS GIV
    EN BY NIMTODISK PROGRAM
6  REM  ALL SEISMOGRAM FILES MUST RESIDE ON SAME DISK,DRIVE 1 IN
    PORT#6
7  REM   ROUTINES WRITTEN FOR APPLEII EPSON INTERFACE KIT TYPE2A
    IN PORT#1
10  REM  - PROGRAM REVISED AUG/82
100  DIM G(12),H(8),X%(11,256)
101  DIM A$(20)
110 D$ =  CHR$ (4)
111  INPUT "INPUT NO OF RECORDS ";NR
114  PRINT "INPUT RECORD NAMES ONE AT A TIME"
115  FOR I = 1 TO NR
120  INPUT A$(I)
125  NEXT I
130  INPUT "ENTER GAIN ";GG
135  FOR M = 1 TO NR
140  PRINT D$;"OPEN ";A$(M)
150  PRINT D$;"READ ";A$(M)
160  INPUT SF
170  INPUT E$
180  INPUT GI
190  INPUT SK
200  FOR I = 1 TO 12: INPUT G(I): NEXT I
210  INPUT HC
220  INPUT LC
230  INPUT DL
240  INPUT TS
250  FOR I = 1 TO 8: INPUT H(I): NEXT I
260  FOR L = 0 TO 11
270  FOR I = 1 TO 256: INPUT X%(L,I): NEXT I
280  NEXT L
290  PRINT D$;"CLOSE ";A$(M)
300  PRINT D$;"PR#1"
310  PRINT : PRINT : PRINT
320  PRINT "RECORD NO ";A$(M)
330  PRINT
340  PRINT "SHOT OFFSET ";SF
350  PRINT "DIRECTION ";E$
360  PRINT "GROUP INTERVAL ";GI
370  PRINT "NO. OF STACKS ";SK
380  PRINT "CHANNEL GAINS 1 TO 12 - ";
390  FOR I = 1 TO 12: PRINT G(I); SPC( 1);: NEXT I
```

EPLOT

```
400  PRINT
410  IF LC = 0 THEN  PRINT "LOW CUT FILTER OUT": GOTO 430
420  PRINT "LOW CUT FILTER ";LC
430  IF HC = 999 THEN  PRINT "HIGH CUT FILTER OUT": GOTO 450
440  PRINT "HIGH CUT FILTER ";HC
450  PRINT "TAPE IDENT. NO. ";
460  FOR I = 1 TO 8: PRINT H(I);: NEXT I
470  PRINT
480 ST = (TS / 2) + DL:TS = TS + DL
485  PRINT
490  PRINT DL; SPC( 39);ST; SPC( 39);TS
500  PRINT D$;"PR#0"
510  HGR2
520  HCOLOR= 3
530 SY =  - 8
540  FOR L = 0 TO 11
545 SY = SY + 16
550 XP = 1:YP = SY
560  FOR I = 1 TO 256
570 YY = SY + X%(L,I) * GG
580  IF YY < 1 THEN YY = 1
590  IF YY > 191 THEN YY = 191
600  HPLOT XP,YP TO I,YY
610 XP = I:YP = YY
620  NEXT I
630  NEXT L
640 XX =  - 24
650  FOR I = 1 TO 10
660 XX = XX + 25
670  HPLOT XX,1 TO XX,191
680  NEXT I
690  HPLOT 125,1 TO 125,191
700  HPLOT 250,1 TO 250,191
705  HPLOT 251,1 TO 251,191
710  PRINT D$;"PR#1"
720  POKE 1913,66
730 Q$ =  CHR$ (17)
740  PRINT Q$
750  PRINT D$;"PR#0"
760  TEXT
770  NEXT M
780  IF Z$ = "Y" THEN  GOTO 120
800  END
```

EPLOTVA

```
1  REM   PROGRAM EPLOTVA
3  REM  COPIES SEISMIC RECORDS IN VARIBLE AREA MODE ON VIDEO
4  REM  COPIES VIDEO ON EPSON MX-100 PRINTER
5  REM  SEISMOGRAMS MUST RESIDE ON DISK IN STANDARD FORMAT AS GIV
    EN BY NIMTODISK PROGRAM
6  REM  ALL SEISMOGRAM FILES MUST RESIDE ON SAME DISK,DRIVE 1 IN
    PORT#6
7  REM    ROUTINES WRITTEN FOR APPLEII EPSON INTERFACE KIT TYPE2A
     IN PORT#1
10  REM  - PROGRAM REVISED AUG/82
100  DIM G(12),H(8),X%(11,256)
101  DIM A$(20)
110 D$ =  CHR$ (4)
111  INPUT "INPUT NO OF RECORDS ";NR
114  PRINT "INPUT RECORD NAMES ONE AT A TIME"
115  FOR I = 1 TO NR
120  INPUT A$(I)
125  NEXT I
130  INPUT "ENTER GAIN ";GG
135  FOR M = 1 TO NR
140  PRINT D$;"OPEN ";A$(M)
150  PRINT D$;"READ ";A$(M)
160  INPUT SF
170  INPUT E$
180  INPUT GI
190  INPUT SK
200  FOR I = 1 TO 12: INPUT G(I): NEXT I
210  INPUT HC
220  INPUT LC
230  INPUT DL
240  INPUT TS
250  FOR I = 1 TO 8: INPUT H(I): NEXT I
260  FOR L = 0 TO 11
270  FOR I = 1 TO 256: INPUT X%(L,I): NEXT I
280  NEXT L
290  PRINT D$;"CLOSE ";A$(M)
300  PRINT D$;"PR#1"
310  PRINT : PRINT : PRINT
320  PRINT "RECORD NO ";A$(M)
330  PRINT
340  PRINT "SHOT OFFSET ";SF
350  PRINT "DIRECTION ";E$
360  PRINT "GROUP INTERVAL ";GI
370  PRINT "NO. OF STACKS ";SK
380  PRINT "CHANNEL GAINS 1 TO 12 - ";
390  FOR I = 1 TO 12: PRINT G(I); SPC( 1);: NEXT I
400  PRINT
```

EPLOTVA

```
410  IF LC = 0 THEN  PRINT "LOW CUT FILTER OUT": GOTO 430
420  PRINT "LOW CUT FILTER ";LC
430  IF HC = 999 THEN  PRINT "HIGH CUT FILTER OUT": GOTO 450
440  PRINT "HIGH CUT FILTER ";HC
450  PRINT "TAPE IDENT. NO. ";
460  FOR I = 1 TO 8: PRINT H(I);: NEXT I
470  PRINT
480 ST = (TS / 2) + DL:TS = TS + DL
485  PRINT
490  PRINT DL; SPC( 39);ST; SPC( 39);TS
500  PRINT D$;"PR#0"
510  HGR2
520  HCOLOR= 3
530 SY =  - 8
540  FOR L = 0 TO 11
545 SY = SY + 16   --
550 XP = 1:YP = SY
560  FOR I = 1 TO 256
570 YY = SY + X%(L,I) * GG
580  IF YY < 1 THEN YY = 1
590  IF YY > 191 THEN YY = 191
600  HPLOT XP,YP TO I,YY
605  IF X%(L,I) < 0 THEN  HPLOT I,(SY - 1) TO I,YY
610 XP = I:YP = YY
620  NEXT I
630  NEXT L
640 XX =  - 24
650  FOR I = 1 TO 10
660 XX = XX + 25
670  HPLOT XX,1 TO XX,191
680  NEXT I
690  HPLOT 125,1 TO 125,191
700  HPLOT 250,1 TO 250,191
705  HPLOT 251,1 TO 251,191
710  PRINT D$;"PR#1"
720  POKE 1913,66
730 Q$ =  CHR$ (17)
740  PRINT Q$
750  PRINT D$;"PR#0"
760  TEXT
770  NEXT M
780  IF Z$ = "Y" THEN  GOTO 120
800  END
```

COMOFFSEC

```
10  REM  PROGRAM COMOFFSEC*****
15  REM  COPIES SEISMOGRAMS FROM DISK FILE TO VIDEO
20  REM  RECORDS ARE COPIED FROM SCREEN TO AN EPSON PRINTER
25  REM  RECORDS ARE PLOTTED CONTINUOSLY IN SECTION FORM
30  REM  UP TO 13 RECORDS CAN BE PRINTED USING 1 INPUT
40  REM  RECORDS MUST RESIDE ON 1 DISK
50  REM  GAIN TAPER AND ABILITY TO USE AGC FUNCTION
55  REM  SUGGESTED PARAMETERS WINDOW LENGHT-40,CONSTANT-20
60  REM  ABILITY TO MUTE FRONT END OF RECORDS
70  REM  REQUIRES APPLEII EPSON INTERFACE KIT IN PORT#1
80  REM  INPUT DATA ON DISK IN FORMAT GIVEN BY NIMTODISK
90  REM  INPUT DATA ON DISK PORT#6,DRIVE 1
100  DIM A$(14),X%(11,256)
101  DIM WT(14,14)
105 D$ =  CHR$ (4)
110  INPUT "ENTER TIME SCALE ";TS
111 DT = TS / 250
115  INPUT "HOW MANY RECORDS? ";N
116  PRINT "INPUT FILE NAMES ONE PER LINE"
117  FOR I = 1 TO N: INPUT A$(I): NEXT I
118  GOTO 9000
120  PRINT : PRINT
121  PRINT "PUT IN DATA DISK"
122  PRINT : PRINT
125  INPUT "INPUT INITIAL GAIN ";G
126 GA = G
130  INPUT "INPUT GAIN TAPER MULTIPLIER ";GT
131 GZ = (GT - 1) / 256
135  PRINT : INPUT "IS AGC TO BE APPLIED? (Y/N) ";AQ$
136  IF AQ$ <  > "Y" AND AQ$ <  > "N" THEN  GOTO 135
137  IF AQ$ = "N" THEN  GOTO 145
138  INPUT "INPUT AGC WINDOW LENGTH ";R2
139 R1 =  INT (R2 / 2)
140  INPUT "INPUT AGC CONSTANT ";RQ
141 GQ = G * RQ * R2
142  INPUT "INPUT MUTE TIME ";MT
143 MT = MT / DT
145  PRINT D$;"PR#1"
146  PRINT : PRINT
150  PRINT "RECORDS ";A$(1);" TO ";A$(N)
151  PRINT
152  PRINT "GAIN TAPER MULTIPLIER = ";GT
153  PRINT "INITIAL GAIN          = ";G
154  PRINT
155  IF AQ$ = "N" THEN  GOTO 160
156  PRINT "AGC WINDOW LENGTH = ";R2
157  PRINT "AGC CONSTANT      = ";RQ
160  PRINT D$;"PR#0"
161  PRINT
165  INPUT "ARE STATICS ALL ZERO? (Y/N) ";Q$
166  IF Q$ <  > "Y" AND Q$ <  > "N" THEN  GOTO 165
167  IF Q$ = "N" THEN  GOTO 170
168  FOR I = 1 TO N: FOR L = 0 TO 11:WT(I,L) = 0: NEXT L: NEXT I
169  GOTO 210
170  FOR I = 1 TO N
171  PRINT : PRINT "RECORD ";A$(I)
172  PRINT "INPUT STATICS ONE PER LINE"
173  FOR L = 0 TO 11: INPUT WT(I.L): NEXT I
```

COMOFFSEC

```
175  GOTO 9100
180  NEXT I
210 IX = 8
215  HGR2
216  HCOLOR= 3
220  FOR M = 1 TO N
230  PRINT D$;"OPEN ";A$(M)
240  PRINT D$;"READ ";A$(M)
250  INPUT A: INPUT Z$
260  FOR I = 1 TO 26: INPUT A: NEXT I
270  FOR I = 0 TO 11
280  FOR J = 1 TO 256: INPUT X%(I,J): NEXT J
290  NEXT I
300  PRINT D$;"CLOSE ";A$(M)
310  FOR I = 0 TO 11
320 SS = WT(M,I) / DT
331 IX = IX + 7
332  IF IX < 177 THEN  GOTO 350
333  HPLOT 1,1 TO 1,191
334  HPLOT 125,1 TO 125,191
335  HPLOT 250,1 TO 250,191
342 IX = 15:Q$ =  CHR$ (17)
343  PRINT D$;"PR#1"
344  POKE 1913,66
345  PRINT Q$
346  PRINT D$;"PR#0"
347  HGR2
348  HCOLOR= 3
350  FOR J = 1 TO 256
351 GG = 1 + (GZ * J)
352 AB = X%(I,J)
360  IF AQ$ = "Y" AND J < (256 - R1) THEN  GOTO 3000
365  IF MT > J THEN GA = G
366 XX = IX + AB * GA * GG
370 XX =  INT (XX)
380  IF XX < 1 THEN XX = 1
385  IF XX > 191 THEN XX = 191
390 JT = J - SS
395  IF JT < 1 OR JT > 256 THEN  GOTO 420
400  IF AB < 0 THEN  HPLOT JT,(IX - 1) TO JT,XX: GOTO 420
410  HPLOT JT,XX
420  NEXT J
430  NEXT I
440  NEXT M
441  HPLOT 1,1 TO 1,191
442  HPLOT 125,1 TO 125,191
443  HPLOT 250,1 TO 250,191
450  PRINT D$;"PR#1"
460  POKE 1913,66
470 Q$ =  CHR$ (17)
480  PRINT Q$
490  PRINT D$;"PR#0"
500  TEXT
510  INPUT "ANOTHER PLOT Y/N ";Y$
520  IF Y$ = "Y" THEN  GOTO 110
530  GOTO 9999
3000  IF J > (R1 + 1) THEN  GOTO 3050
3005  IF J <  > 1 THEN  GOTO 3055
```

COMOFFSEC

```
3010  REM  - SUM OVER FIRST R2 POINTS FOR J=1
3020 SM = 0
3025  FOR KI = 1 TO R2
3030 SM = SM +  ABS (X%(I,KI + 1))
3035  NEXT KI
3040  GOTO 3055
3050 SM = SM -  ABS (X%(I,J - R1)) +  ABS (X%(I,J + R1))
3055  IF SM = 0 THEN GA = G: GOTO 365
3060 GA = G + GQ / SM
3070  GOTO 365
9000  REM  - INPUT CORRECTION ROUTINE
9001  PRINT : PRINT
9010  PRINT "CHECK INPUT FILE NAMES"
9020  FOR I = 1 TO N: PRINT A$(I): NEXT I
9030  INPUT "OK? (Y/N) ";Q$
9035  IF Q$ <  > "Y" AND Q$ <  > "N" THEN  GOTO 9030
9040  IF Q$ = "Y" THEN  GOTO 120
9050  PRINT "REENTER FILE NAMES ONE PER LINE": GOTO 117
9100  PRINT : PRINT
9110  PRINT "CHECK STATICS FOR RECORD ";A$(I)
9120  PRINT
9130  FOR L = 0 TO 11: PRINT WT(I,L): NEXT L
9135  PRINT
9140  INPUT "OK? (Y/N) ";Q$
9141  PRINT
9142  IF Q$ <  > "Y" AND Q$ <  > "N" THEN  GOTO 9140
9145  IF Q$ = "Y" THEN  GOTO 180
9150  PRINT "REENTER STATICS FOR RECORD ";A$(I): GOTO 173
9999  END
```

SYN

```
2  REM  PROGRAM TO PRODUCE SYNETHETIC SEISMOGRAM ON VIDEO
4  REM  REQUIRED INPUT
6  REM --NO. OF LAYERS IN MODEL
8  REM --VELOCITY AND DEPTH OF EACH LAYER
10  REM -JUG SPACING
12  REM -SHOT OFFSET
14  REM  -RECORD LENGHT (TIME)
15  REM  -DELAY TIME TO START OF RECORD
16  REM -OPTION OF REFRACTION OR REFLECTION MODEL
18  REM -NO. OF RAY SEGMENTS
20  REM -WAVE CODE
22  REM -OPTION OF HARD COPY OUTPUT VIA PORT#1
24  REM -OUTPUT IN WIGGLE TRACE FORMAT
39  LOMEM: 16384
40  DIM V(10),Z(10),MM(20)
41  DIM X%(11,279),A(20)
50  PRINT "INPUT NUMBER OF LAYERS"
51 A(1) = 0:A(2) = 4:A(3) = 8:A(4) = 10:A(5) = 8:A(6) = 2:A(7) =
     - 5:A(8) =  - 8:A(9) =  - 6:A(10) =  - 2:A(11) = 0
60  INPUT N
70  FOR I = 1 TO N
80  PRINT "INPUT V AND Z FOR LAYER ";I
90  INPUT V(I),Z(I)
100  NEXT I
110  INPUT "INPUT JUG SPACING ";DX
120  INPUT "INPUT SHOT OFFSET ";SX
122  INPUT "INPUT TIME SCALE 50,100,200,500,1000 ";BK
123 AK = BK / 250
129  PRINT "INPUT START TIME IN MSECS": INPUT ST
142  INPUT "REFRAC-R REFLEX-F PRINT-P END-E ";E$
144  IF E$ = "P" THEN  GOTO 4020
145  IF E$ = "R" THEN  GOTO 3000
146  IF E$ = "E" THEN  GOTO 5000
152  IF JI = 1 THEN  GOTO 3000
158  PRINT "FOR REFLECTION INPUT NO OF RAY SEGMENTS"
159  PRINT "IN DOWN-GOING AND UP-GOING RAY"
160  INPUT M: IF M = 0 THEN  GOTO 900
170  PRINT "INPUT WAVE CODE"
172 TB = 0
174 SB = 0
180  PRINT "ONE NUMBER AT A TIME"
190  FOR I = 1 TO M: INPUT MM(I)
200  NEXT I
210 X = SX - DX
220 S = 0
221  HGR : HCOLOR= 3
222 SC = 0
223  FOR I = 1 TO 11
224 SC = SC + 25
225 SR = SC
226  HPLOT SR,1 TO SR,149
227  NEXT I
230  FOR L = 0 TO 11
240 S = S + 12
250 X = X + DX
260 P = 0
270 DP = 0.5
```

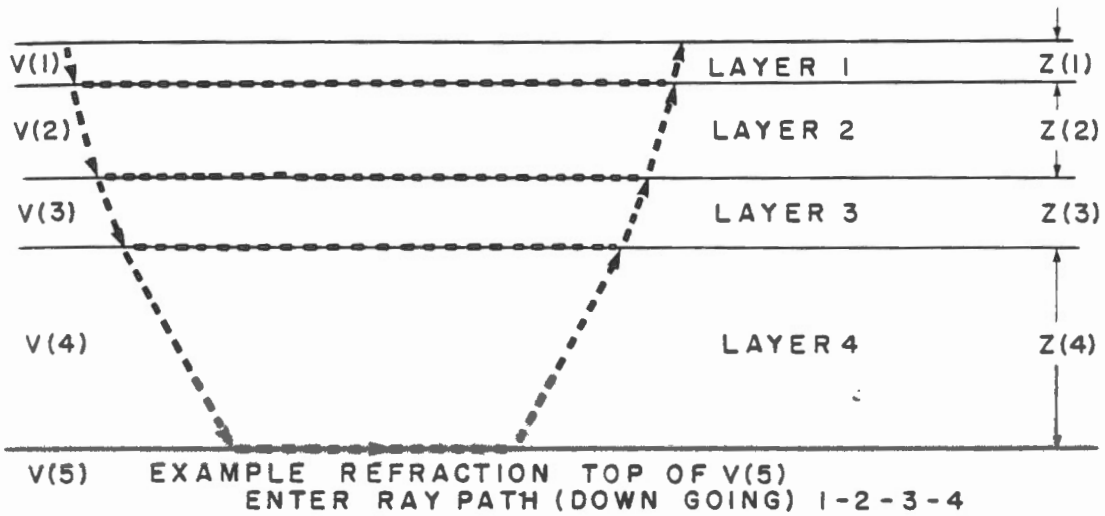
```
271 P = P + DP
280  GOSUB 500
300 XC =  ABS (XX - X)
310  IF XC < 1 THEN  GOTO 700
320 XC = XX - X
330  IF XC < 0 THEN  GOTO 350
340  IF XC > 0 THEN  GOTO 400
350 P = P + DP
360  GOSUB 500
370  GOTO 300
400 DP = DP / 2
410 P = P - DP
420  GOSUB 500
430  GOTO 300
500 XX = 0.0
510  FOR J = 1 TO M
520 K = MM(J)
525 B = 1 - V(K) * V(K) * P * P
526  IF B < 0 THEN XX = X * 2: GOTO 550
527  IF B < 0 THEN  GOTO 525
530 XX = XX + Z(K) * V(K) * P /  SQR (B)
540  NEXT J
550  RETURN
700 T = 0.0
710  FOR J = 1 TO M
720 K = MM(J)
730 T = T + Z(K) / (V(K) *  SQR (1 - V(K) * V(K) * P * P))
735  NEXT J
736 T = T - ST
737  IF T < 0 THEN  GOTO 850
740 TS = T / AK
741 TS =  INT (TS)
750  IF TS > 279 THEN  GOTO 765
758  FOR KK = 1 TO 11
760 I = TS - 1 + KK
762  IF I > 279 THEN  GOTO 764
763 X%(L,I) = X%(L,I) + A(KK)
764  NEXT KK
765 XB = 1
766 YB = S
767  FOR I = 1 TO 279
770 Y = S - X%(L,I)
780  IF Y < 1 THEN Y = 1
790  IF Y > 159 THEN Y = 159
800  HPLOT XB,YB TO I,Y
810 YB = Y
820 XB = I
830  NEXT I
850  NEXT L
860  GOTO 142
900 SC = 0
1000  PRINT "DO YOU WANT ANOTHER PLOT"
1010  PRINT "IF SO PRINT 1"
1020  INPUT KL
1030  IF KL = 1 THEN  GOTO 50
1040  GOTO 4000
3000  PRINT "INPUT REFRACTOR LAYER NO"
3010  INPUT IJ
```

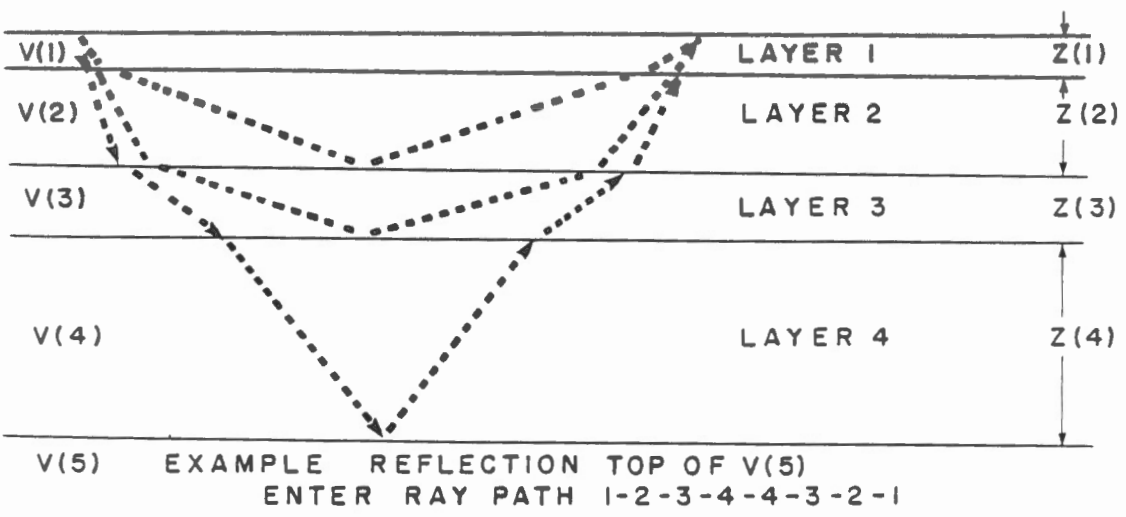
SYN

```
3015  IF IJ = 0 THEN  GOTO 900
3020 X = SX - DX
3030  PRINT "INPUT NO OF RAY SEGMENTS"
3040  PRINT "DOWN TO THE REFRACTOR"
3050  INPUT IK
3060  PRINT "INPUT WAVE CODE DOWN TO REFRACTOR"
3070  PRINT "ONE NUMBER AT A TIME"
3080  FOR L = 1 TO IK
3090  INPUT MM(L)
3100  NEXT L
3110 TB = 0
3120 SB = 0
3130 S = 0
3132  HGR : HCOLOR= 3
3133 SR = 0
3134  FOR I = 1 TO 11:SR = SR + 25: HPLOT SR,1 TO SR,149: NEXT I
3140  FOR L = 0 TO 11
3150 S = S + 12
3160 X = X + DX
3170 TE = X / V(IJ)
3180 TF = 0
3181  IF IJ = 1 THEN  GOTO 3250
3185 SX = 0
3186  FOR J = 1 TO IK
3187 LL = MM(J):SN = V(LL) / V(IJ)
3188 AN =  ATN (SN /  SQR ( - SN * SN + 1))
3189 SX = SX + Z(LL) *  TAN (AN)
3190  NEXT J
3191 SX = SX * 2
3192  IF X < SX THEN  GOTO 3325
3193  FOR J = 1 TO IK
3200 LL = MM(J)
3210 TF = TF + 2 * Z(LL) *  SQR (V(IJ) * V(IJ) - V(LL) * V(LL)) /
    (V(IJ) * V(LL))
3220  NEXT J
3250 T = TE + TF
3260 T = T - ST
3270  IF T < 0 THEN  GOTO 3350
3280 TS = T / AK
3285 TS =  INT (TS)
3287  IF TS > 279 THEN  GOTO 3325
3290  FOR KK = 1 TO 11
3300 I = TS - 1 + KK
3310 X%(L,I) = X%(L,I) + A(KK)
3320  NEXT KK
3325 XB = 1:YB = S
3330  FOR I = 1 TO 279
3335 Y = S - X%(L,I)
3336  IF Y < 1 THEN Y = 1
3337  IF Y > 159 THEN Y = 159
3338  HPLOT XB,YB TO I,Y
3340 YB = Y:XB = I
3345  NEXT I
3350  NEXT L
3360  GOTO 142
4000  INPUT "YA WANNA PRINTOUT Y/N ";YY$
4010  IF YY$ <  > "Y" THEN  GOTO 5000
```

SYN

```
4020  REM
4030 QQ$ =  CHR$ (17)
4040 D$ =  CHR$ (4)
4045  PRINT D$;"PR#1"
4046  PRINT "MODEL PARAMETERS"
4047  FOR I = 1 TO N
4048  IF I = N THEN  PRINT "LAYER ";I,"V= ";V(N): GOTO 4050
4049  PRINT "LAYER ";I,"V= ";V(I),"Z= ";Z(I)
4050  NEXT I
4051  PRINT "JUG SPACING ";DX
4052  PRINT "SHOT OFFSET ";SX
4053  PRINT "START TIME ";ST;" MSECS"
4054 BK = BK / 10
4055  PRINT "TIMING LINES ";BK;" MS INTERVALS"
4056  POKE.1913,65
4060  PRINT QQ$
4070  PRINT D$;"PR#0"
5000  END
```





SYNVA

```
2  REM  PROGRAM TO PRODUCE SYNETHETIC SEISMOGRAM ON VIDEO
4  REM  REQUIRED INPUT
6  REM --NO. OF LAYERS IN MODEL
8  REM --VELOCITY AND DEPTH OF EACH LAYER
10  REM -JUG SPACING
12  REM -SHOT OFFSET
14  REM  -RECORD LENGHT (TIME)
15  REM  -DELAY TIME TO START OF RECORD
16  REM -OPTION OF REFRACTION OR REFLECTION MODEL
18  REM -NO. OF RAY SEGMENTS
20  REM -WAVE CODE
22  REM   OUTPUT VARIABLE AREA FORMAT
24  REM   OPTION OF HARD COPY
39  LOMEM: 16384
40  DIM V(10),Z(10),MM(20)
41  DIM X%(11,279),A(20)
50  PRINT "INPUT NUMBER OF LAYERS"
51 A(1) = 0:A(2) = 4:A(3) = 8:A(4) = 10:A(5) = 8:A(6) = 2:A(7) =
     - 5:A(8) =  - 8:A(9) =  - 6:A(10) =  - 2:A(11) = 0
60  INPUT N
70  FOR I = 1 TO N
80  PRINT "INPUT V AND Z FOR LAYER ";I
90  INPUT V(I),Z(I)
100  NEXT I
110  INPUT "INPUT JUG SPACING ";DX
120  INPUT "INPUT SHOT OFFSET ";SX
122  INPUT "INPUT TIME SCALE 50,100,200,500,1000 ";BK
123 AK = BK / 250
129  PRINT "INPUT START TIME IN MSECS": INPUT ST
142  INPUT "REFRAC-R REFLEX-F PRINT-P END-E ";E$
144  IF E$ = "P" THEN  GOTO 4020
145  IF E$ = "R" THEN  GOTO 3000
146  IF E$ = "E" THEN  GOTO 5000
152  IF JI = 1 THEN  GOTO 3000
158  PRINT "FOR REFLECTION INPUT NO OF RAY SEGMENTS"
159  PRINT "IN DOWN-GOING AND UP-GOING RAY"
160  INPUT M: IF M = 0 THEN  GOTO 900
170  PRINT "INPUT WAVE CODE"
172 TB = 0
174 SB = 0
180  PRINT "ONE NUMBER AT A TIME"
190  FOR I = 1 TO M: INPUT MM(I)
200  NEXT I
210 X = SX - DX
220 S = 0
221  HGR : HCOLOR= 3
222 SC = 0
223  FOR I = 1 TO 11
224 SC = SC + 25
225 SR = SC
226  HPLOT SR,1 TO SR,149
227  NEXT I
228 XX = 0
230  FOR L = 0 TO 11
240 S = S + 12
250 X = X + DX
260 P = 0
270 DP = 0.5
```

SYNVA

```
271 P = P + DP
280  GOSUB 500
300 XC =  ABS (XX - X)
310  IF XC < (0.01 * X) THEN  GOTO 700
320 XC = XX - X
330  IF XC < 0 THEN  GOTO 350
340  IF XC > 0 THEN  GOTO 400
350 P = P + DP
360  GOSUB 500
370  GOTO 300
400 DP = DP / 2
410 P = P - DP
420  GOSUB 500
430  GOTO 300
500 XX = 0.0
510  FOR J = 1 TO M
520 K = MM(J)
525 B = 1 - V(K) * V(K) * P * P
526  IF B < 0 OR B = 0 THEN XX = X * 2: GOTO 550
527  IF B < 0 THEN  GOTO 525
530 XX = XX + Z(K) * V(K) * P /  SQR (B)
540  NEXT J
550  RETURN
700 T = 0.0
710  FOR J = 1 TO M
720 K = MM(J)
730 T = T + Z(K) / (V(K) *  SQR (1 - V(K) * V(K) * P * P))
735  NEXT J
736 T = T - ST
737  IF T < 0 THEN  GOTO 850
740 TS = T / AK
741 TS =  INT (TS)
750  IF TS > 279 THEN  GOTO 765
758  FOR KK = 1 TO 11
760 I = TS - 1 + KK
762  IF I > 279 THEN  GOTO 764
763 X%(L,I) = X%(L,I) + A(KK)
764  NEXT KK
765 XB = 1
766 YB = S
767  FOR I = 1 TO 279
770 Y = S - X%(L,I)
780  IF Y < 1 THEN Y = 1
790  IF Y > 159 THEN Y = 159
800  HPLOT XB,YB TO I,Y
805  IF X%(L,I) > 0 THEN  HPLOT I,(S - 1) TO I,Y
810 YB = Y
820 XB = I
830  NEXT I
850  NEXT L
860  GOTO 142
900 SC = 0
1000  PRINT "DO YOU WANT ANOTHER PLOT"
1010  PRINT "IF SO PRINT 1"
1020  INPUT KL
1030  IF KL = 1 THEN  GOTO 50
1040  GOTO 4000
3000  PRINT "INPUT REFRACTOR LAYER NO"
```

SYNVA

```
3010  INPUT IJ
3015  IF IJ = 0 THEN  GOTO 900
3020 X = SX - DX
3030  PRINT "INPUT NO OF RAY SEGMENTS"
3040  PRINT "DOWN TO THE REFRACTOR"
3050  INPUT IK
3060  PRINT "INPUT WAVE CODE DOWN TO REFRACTOR"
3070  PRINT "ONE NUMBER AT A TIME"
3080  FOR L = 1 TO IK
3090  INPUT MM(L)
3100  NEXT L
3110 TB = 0
3120 SB = 0
3130 S = 0
3132  HGR : HCOLOR= 3
3133 SR = 0
3134  FOR I = 1 TO 11:SR = SR + 25: HPLOT SR,1 TO SR,149: NEXT I
3140  FOR L = 0 TO 11
3150 S = S + 12
3160 X = X + DX
3170 TE = X / V(IJ)
3180 TF = 0
3181  IF IJ = 1 THEN  GOTO 3250
3185 QX = 0
3186  FOR J = 1 TO IK
3187 LL = MM(J):SN = V(LL) / V(IJ)
3188 AN =  ATN (SN /  SQR ( - SN * SN + 1))
3189 QX = QX + Z(LL) *  TAN (AN)
3190  NEXT J
3191 QX = QX * 2
3192  IF X < QX THEN  GOTO 3325
3193  FOR J = 1 TO IK
3200 LL = MM(J)
3210 TF = TF + 2 * Z(LL) *  SQR (V(IJ) * V(IJ) - V(LL) * V(LL)) /
    (V(IJ) * V(LL))
3220  NEXT J
3250 T = TE + TF
3260 T = T - ST
3270  IF T < 0 THEN  GOTO 3350
3280 TS = T / AK
3285 TS =  INT (TS)
3287  IF TS > 279 THEN  GOTO 3325
3290  FOR KK = 1 TO 11
3300 I = TS - 1 + KK
3310 X%(L,I) = X%(L,I) + A(KK)
3320  NEXT KK
3325 XB = 1:YB = S
3330  FOR I = 1 TO 279
3335 Y = S - X%(L,I)
3336  IF Y < 1 THEN Y = 1
3337  IF Y > 159 THEN Y = 159
3338  HPLOT XB,YB TO I,Y
3339  IF X%(L,I) > 0 THEN  HPLOT I,(S - 1) TO I,Y
3340 YB = Y:XB = I
3345  NEXT I
3350  NEXT L
3360  GOTO 142
```

SYNVA

```
4000  INPUT "YA WANNA PRINTOUT Y/N ";YY$
4010  IF YY$ <  > "Y" THEN  GOTO 5000
4020  REM
4030 QQ$ =  CHR$ (17)
4040 D$ =  CHR$ (4)
4045  PRINT D$;"PR#1"
4046  PRINT "MODEL PARAMETERS"
4047  FOR I = 1 TO N
4048  IF I = N THEN  PRINT "LAYER ";I,"V= ";V(N): GOTO 4050
4049  PRINT "LAYER ";I,"V= ";V(I),"Z= ";Z(I)
4050  NEXT I
4051  PRINT "JUG SPACING ";DX
4052  PRINT "SHOT OFFSET ";SX
4053  PRINT "START TIME ";ST;" MSECS"
4054 BK = BK / 10
4055  PRINT "TIMING LINES ";BK;" MS INTERVALS"
4056  POKE 1913,65
4060  PRINT QQ$
4070  PRINT D$;"PR#0"
5000  END
```

T-X MULTIMODEL

```
2  REM  PROGRAM TO PRODUCE A T-X MODEL ON VIDEO
4  REM  REQUIRED INPUT
6  REM --NO. OF LAYERS IN MODEL
8  REM --VELOCITY AND DEPTH OF EACH LAYER
10  REM  -JUG SPACING -24 CHANNELS
12  REM -SHOT OFFSET
14  REM  -DIGITAL RATE (DEFINES RECORD TIME
16  REM -OPTION OF REFRACTION OR REFLECTION MODEL
18  REM -NO. OF RAY SEGMENTS
20  REM -WAVE CODE
22  REM  OPTION OF HARD COPY OUTPUT VIA PORT#1
40  DIM V(10),Z(10),MM(20)
50  PRINT "INPUT NUMBER OF LAYERS"
60  INPUT N
70  FOR I = 1 TO N
80  PRINT "INPUT V AND Z FOR LAYER ";I
90  INPUT V(I),Z(I)
100  NEXT I
110  PRINT "INPUT JUG SPACING": INPUT DX
120  PRINT "INPUT SHOT OFFSET": INPUT SX
122  PRINT "INPUT DIGITAL RATE IN MSECS"
124  INPUT AK
126 BK = AK / 2
128  PRINT "MULTIPLY TIME SCALE BY ";BK
129  PRINT "INPUT START TIME IN MSECS": INPUT ST
130  HGR : HCOLOR= 3
131 SC = 0
132  FOR I = 1 TO 55
133 SC = SC + 5
134  FOR J = 1 TO 149 STEP 2: HPLOT SC,J: NEXT J
135  NEXT I
```

T-X MULTIMODEL

```
136 SC = 0
137  FOR I = 1 TO 11
138 SC = SC + 25
139 SR = SC
140  HPLOT SR,1 TO SR,149
141  NEXT I
142 S = 0
143  FOR I = 1 TO 24
144 S = S + 6
145  HPLOT 1,S TO 275,S
146  NEXT I
147  GOSUB 1100
148 SS = ST + 550 * BK: PRINT "TIME WINDOW ";ST;" TO ";SS;" MSECS"
150  PRINT "REFRACTION PUNCH 1, REFLECTION PUNCH 0"
151  INPUT JI
152  IF JI = 1 THEN  GOTO 3000
158  PRINT "FOR REFLECTION INPUT NO OF RAY SEGMENTS"
159  PRINT "IN DOWN-GOING AND UP-GOING RAY"
160  INPUT M: IF M = 0 THEN  GOTO 900
170  PRINT "INPUT WAVE CODE"
172 TB = 0
174 SB = 0
180  PRINT "ONE NUMBER AT A TIME"
190  FOR I = 1 TO M: INPUT MM(I)
200  NEXT I
210 X = SX - DX
220 S = 0
230  FOR I = 1 TO 24
240 S = S + 6
250 X = X + DX
260 P = 0
270 DP = 0.5
271 P = P + DP
280  GOSUB 500
300 XC =  ABS (XX - X)
310  IF XC < 1 THEN  GOTO 700
320 XC = XX - X
330  IF XC < 0 THEN  GOTO 350
340  IF XC > 0 THEN  GOTO 400
350 P = P + DP
360  GOSUB 500
370  GOTO 300
400 DP = DP / 2
410 P = P - DP
420  GOSUB 500
430  GOTO 300
500 XX = 0.0
510  FOR J = 1 TO M
520 K = MM(J)
525 B = 1 - V(K) * V(K) * P * P
526  IF B < 0 THEN XX = X * 2: GOTO 550
527  IF B < 0 THEN  GOTO 525
530 XX = XX + Z(K) * V(K) * P /  SQR (B)
540  NEXT J
550  RETURN
700 T = 0.0
710  FOR J = 1 TO M
720 K = MM(J)
730 T = T + Z(K) / (V(K) *  SQR (1 - V(K) * V(K) * P * P))
```

```
735  NEXT J
736 T = T - ST
737  IF T < 0 THEN  GOTO 850
740 TS = T / AK
750  IF TS > 279 THEN  GOTO 860
760  IF TB = 0 THEN TB = TS
770  IF SB = 0 THEN SB = S
780  HPLOT TB,SB TO TS,S
790 TB = TS
800 SB = S
850  NEXT I
860  GOTO 150
900 SC = 0
1000  PRINT "DO YOU WANT ANOTHER PLOT"
1010  PRINT "IF SO PRINT 1"
1020  INPUT KL
1030  IF KL = 1 THEN  GOTO 50
1040  GOTO 4000
1100  HPLOT 24,150 TO 22,150
1110  HPLOT 22,150 TO 22,152
1120  HPLOT 22,152 TO 24,152
1130  HPLOT 24,152 TO 24,154
1140  HPLOT 24,154 TO 22,154
1150  HPLOT 26,150 TO 28,150
1160  HPLOT 28,150 TO 28,154
1170  HPLOT 28,154 TO 26,154
1180  HPLOT 26,154 TO 26,150
1190  HPLOT 49,150 TO 51,150
1200  HPLOT 51,150 TO 51,154
1210  HPLOT 51,154 TO 49,154
1220  HPLOT 49,154 TO 49,150
1230  HPLOT 47,150 TO 47,154
1240  HPLOT 53,150 TO 55,150
1250  HPLOT 55,150 TO 55,154
1260  HPLOT 55,154 TO 53,154
1270  HPLOT 53,154 TO 53,150
1280  HPLOT 95,150 TO 97,150
1290  HPLOT 97,150 TO 97,152
1300  HPLOT 97,152 TO 95,152
1310  HPLOT 95,152 TO 95,154
1320  HPLOT 95,154 TO 97,154
1330  HPLOT 99,150 TO 101,150
1340  HPLOT 101,150 TO 101,154
1350  HPLOT 101,154 TO 99,154
1360  HPLOT 99,154 TO 99,150
1370  HPLOT 103,150 TO 105,150
1380  HPLOT 105,150 TO 105,154
1390  HPLOT 105,154 TO 103,154
1400  HPLOT 103,154 TO 103,150
1410  HPLOT 145,150 TO 147,150
1420  HPLOT 147,150 TO 147,152
1430  HPLOT 147,152 TO 145,152
1440  HPLOT 147,152 TO 147,154
1450  HPLOT 147,154 TO 145,154
1460  HPLOT 149,150 TO 151,150
1470  HPLOT 151,150 TO 151,154
1480  HPLOT 151,154 TO 149,154
1490  HPLOT 149,154 TO 149,150
```

```
1500  HPLOT 153,150 TO 155,150
1510  HPLOT 155,150 TO 155,154
1520  HPLOT 155,154 TO 153,154
1530  HPLOT 153,154 TO 153,150
1540  HPLOT 195,150 TO 195,152
1550  HPLOT 195,152 TO 197,152
1560  HPLOT 197,151 TO 197,154
1570  HPLOT 199,150 TO 201,150
1580  HPLOT 201,150 TO 201,154
1590  HPLOT 201,154 TO 199,154
1600  HPLOT 199,154 TO 199,150
1610  HPLOT 203,150 TO 205,150
1620  HPLOT 205,150 TO 205,154
1630  HPLOT 205,154 TO 203,154
1640  HPLOT 203,154 TO 203,150
1650  HPLOT 247,150 TO 245,150
1660  HPLOT 245,150 TO 245,152
1670  HPLOT 245,152 TO 247,152
1680  HPLOT 247,152 TO 247,154
1690  HPLOT 247,154 TO 245,154
1700  HPLOT 249,150 TO 251,150
1710  HPLOT 251,150 TO 251,154
1720  HPLOT 251,154 TO 249,154
1730  HPLOT 249,154 TO 249,150
1740  HPLOT 253,150 TO 255,150
1750  HPLOT 255,150 TO 255,154
1760  HPLOT 255,154 TO 253,154
1770  HPLOT 253,154 TO 253,150
1780  HPLOT 277,4 TO 277,8
1790  HPLOT 279,34 TO 277,34
1800  HPLOT 277,34 TO 277,38
1810  HPLOT 277,38 TO 279,38
1820  HPLOT 279,38 TO 279,36
1830  HPLOT 279,36 TO 277,36
1840  HPLOT 274,70 TO 274,74
1850  HPLOT 277,70 TO 279,70
1860  HPLOT 279,70 TO 279,72
1870  HPLOT 279,72 TO 277,72
1880  HPLOT 277,72 TO 277,74
1890  HPLOT 277,74 TO 279,74
1900  HPLOT 274,106 TO 274,110
1910  HPLOT 277,106 TO 279,106
1920  HPLOT 279,106 TO 279,110
1930  HPLOT 279,110 TO 277,110
1940  HPLOT 277,110 TO 277,106
1950  HPLOT 277,108 TO 279,108
1960  HPLOT 272,142 TO 274,142
1970  HPLOT 274,142 TO 274,144
1980  HPLOT 274,144 TO 272,144
1990  HPLOT 272,144 TO 272,146
2000  HPLOT 272,146 TO 274,146
2010  HPLOT 277,142 TO 277,144
2020  HPLOT 277,144 TO 279,144
2030  HPLOT 279,142 TO 279,146
2040  RETURN
3000  PRINT "INPUT REFRACTOR LAYER NO"
3010  INPUT IJ
```

```
3015  IF IJ = 0 THEN  GOTO 900
3020 X = SX - DX
3030  PRINT "INPUT NO OF RAY SEGMENTS"
3040  PRINT "DOWN TO THE REFRACTOR"
3050  INPUT IK
3060  PRINT "INPUT WAVE CODE DOWN TO REFRACTOR"
3070  PRINT "ONE NUMBER AT A TIME"
3080  FOR L = 1 TO IK
3090  INPUT MM(L)
3100  NEXT L
3110 TB = 0
3120 SB = 0
3130 S = 0
3140  FOR I = 1 TO 24
3150 S = S + 6
3160 X = X + DX
3170 TE = X / V(IJ)
3180 TF = 0
3185  IF IJ = 1 THEN  GOTO 3250
3190  FOR J = 1 TO IK
3200 LL = MM(J)
3210 TF = TF + 2 * Z(LL) *  SQR (V(IJ) * V(IJ) - V(LL) * V(LL)) / (V(IJ) * V(LL)
3220  NEXT J
3250 T = TE + TF
3260 T = T - ST
3270  IF T < 0 THEN  GOTO 3350
3280 TS = T / AK
3290  IF TS > 279 THEN  GOTO 150
3300  IF TB = 0 THEN TB = TS
3310  IF SB = 0 THEN SB = S
3320  HPLOT TB,SB TO TS,S
3330 TB = TS
3340 SB = S
3350  NEXT I
3360  GOTO 150
4000  INPUT "YA WANNA PRINTOUT Y/N ";YY$
4010  IF YY$ <  > "Y" THEN  GOTO 5000
4020  POKE 1913,65
4030 QQ$ =  CHR$ (17)
4040 D$ =  CHR$ (4)
4045  PRINT D$;"PR#1"
4046  PRINT "MODEL PARAMETERS"
4047  FOR I = 1 TO N
4048  IF I = N THEN  PRINT "LAYER ";I,"V= ";V(N): GOTO 4050
4049  PRINT "LAYER ";I,"V= ";V(I),"Z= ";Z(I)
4050  NEXT I
4051  PRINT "JUG SPACING ";DX
4052  PRINT "SHOT OFFSET ";SX
4053  PRINT "START TIME ";ST;" MSECS"
4054  PRINT "MULTIPLY TIME SCALE BY ";BK
4060  PRINT QQ$
4070  PRINT D$;"PR#0"
5000  END
```

FASTNMO

```
1  REM   PROGRAM PERFORMS NORMAL MOVE-OUT CORRECTIONS
2  REM  NMO VELOCITIES ARE ENTERED AS VEL-TIME PAIRS
3  REM  ENTIRE TIME SECTION MUST BE DESCRIBED
4  REM  FOR EXAMPLE
5  REM  ....RECORD DIGITIZED AT 0.8 SAMPLE RATE
6  REM  ....RECORD CONTAINS 256 SAMPLES PER TRACE
7  REM  ....RECORD TOTAL TIME PERIOD IS 204.8 MSEC
8  REM  ....RECORD HAS A 20 MSEC DELAY TIME
10  REM   IN THE EXAMPLE LAST NMO VELOCITY IS THE VELOCITY AT 224
    .8 MSEC
15  REM   INPUT MUST BE IN STANDARD NIMTODISK FORMAT
20  REM   UP TO 13 SEISMOGRAPH FILES MAY BE ENTERED AT ONE TIME
25  REM    ALL INPUT MUST BE ON THE SAME DISK DRIVE#1 OF PORT#6
26  REM  ALL RECORDS MUST HAVE THE IDENTICAL SPREAD GEOMETRY
27  REM  ALL RECORDS MUST HAVE THE IDENTICAL DELAY TIMES
30  REM   OUTPUT IS ON DRIVE#2 OF PORT#6
90  REM  NORMAL MOVE-OUT ROUTINE
95  PRINT "INPUT DATA ON DISK 1, OUTPUT ON DISK 2"
100  DIM T%(12,300),H(8),TR(20),V(20),VV(257)
101  DIM F(50),XS%(12,256),A$(13),B$(13),PZ%(12,256)
102  DIM QC(18)
110 D$ =  CHR$ (4)
111  INPUT "INPUT DIGITAL RATE ";DT
114  INPUT "INPUT NO OF RECORDS ";KQ
116  FOR J = 1 TO KQ
120  INPUT "ENTER INPUT RECORD FILE NAME ";A$(J)
125  INPUT "ENTER OUTPUT RECORD FILE NAME ";B$(J)
126  NEXT J
150  INPUT "INPUT SHOT OFFSET IN M ";SX
160  INPUT "INPUT GROUP SPACING IN M ";DX
161  INPUT "INPUT SHIFT DELAY";LD
162  INPUT "INPUT TIME DELAY";TD
163 TD = TD / DT:TD =  INT (TD)
165 SL = LD / DT:SL =  INT (SL)
170  PRINT "INPUT TIMES AND NMO VEL PAIRS"
180  PRINT "FOR THE BOTTOM OF EACH ZONE"
190  PRINT "PUNCH 0,0 TO END"
195 F(1) =  - 0.0275:F(2) =  - 0.0735:F(3) =  - 0.0458:F(4) = 0.0
    740:F(5) = 0.16
200 IK = 0
210 IK = IK + 1
220  INPUT TR(IK),V(IK)
230  IF TR(IK) = 0 THEN  GOTO 250
240  GOTO 210
250 IK = IK - 1
251 IP = 0:V(0) = V(1)
252  FOR L = 1 TO IK
253 K = TR(L) / DT:K =  INT (K) - TD + 1:BT = K - IP:VD = (V(L) -
    V(L - 1)) / BT:KM = 0
254  FOR I = IP TO K
255 KM = KM + 1:VV(I) = V(L - 1) + KM * VD
256  NEXT I
257 IP = K
258  NEXT L
259 X = SX - DX
260  FOR L = 1 TO 12
261 X = X + DX:XX = X * X
262  FOR I = 1 TO 256
```

FASTNMO

```
263 HH = (I + TD) * DT * VV(I) / 2
264 TT =  SQR (XX + 4 * HH * HH) / VV(I)
265 TT = (TT / DT) - TD:II =  INT (TT)
266  IF II > 256 THEN II = 256
267 PZ%(L,I) = II
268  NEXT I
269  NEXT L
270  FOR JH = 1 TO KQ
271  PRINT D$;"OPEN ";A$(JH);",D1"
272  PRINT D$;"READ ";A$(JH)
273  INPUT QA
274  INPUT QB$
275  FOR I = 1 TO 18: INPUT QC(I): NEXT I
280  FOR I = 1 TO 8: INPUT H(I): NEXT I
290 AZ = SL + 255
310  FOR K = 1 TO 12
320  FOR I = SL TO AZ: INPUT T%(K,I): NEXT I
350  NEXT K
360  PRINT D$;"CLOSE ";A$(JH)
364  PRINT A$(JH)
400  PRINT "STARTING NMO"
410  FOR L = 1 TO 12
420  FOR I = 1 TO 256
430 II = PZ%(L,I)
440 T%(L,I + SL) = T%(L,II + SL)
450  NEXT I
460  NEXT L
470  PRINT "END NMO"
690  PRINT "STARTING WRITE TO DISK"
710  PRINT D$;"OPEN ";B$(JH);",D2"
720  PRINT D$;"DELETE ";B$(JH);",D2"
730  PRINT D$;"OPEN ";B$(JH);",D2"
740  PRINT D$;"WRITE ";B$(JH)
741  PRINT QA
742  PRINT QB$
743 QC(17) = QC(17) - LD
745  FOR I = 1 TO 18: PRINT QC(I): NEXT I
750  FOR I = 1 TO 8
755  PRINT H(I)
760  NEXT I
762  FOR L = 1 TO 12
765  FOR I = 1 TO 256
775  PRINT T%(L,I)
780  NEXT I
830  NEXT L
840  PRINT D$;"CLOSE ";B$(JH)
860  PRINT "OUTPUT FILE NAME= ";B$(JH)
870  NEXT JH
880  GOTO 1100
1100  END
```

FASTFILT

```
5  REM  THIS PROGRAM CONVOLVES A BAND-PASS FILTER FUNCTION WITH EACH SEISMIC TRACE
10  REM  FILTER IS SINC FUNCTION WITH A FEJER WEIGHTED WINDOW
15  REM  FOR 200 MSEC RECORDS 200-600 HZ
20  REM  FOR 100 MSEC RECORDS 100-300 HZ
25  REM  FOR  50 MSEC RECORDS 300-1200 HZ
30  REM  UP TO 13 SEISMOGRAPH FILES MAY BE INPUT AT ONE TIME
35  REM  ALL SEISMOGRAPHS MUST BE ON THE SAME DISK
40  REM  INPUT MUST BE IN THE FORMAT OF NIMTODISK PROGRAM
45  REM  REQUIRES TWO DISK DRIVES
50  REM  INPUT PORT#6,DRIVE 1
55  REM  OUTPUT PORT#6,DRIVE 2
90  REM  NORMAL MOVE-OUT AND FILTER ROUTINE
95  PRINT "INPUT DATA ON DISK 1, OUTPUT ON DISK 2"
100  DIM T%(12,257),H(8),TR(20),V(20),VV(257)
101  DIM F(50),XS%(12,256),A$(13),B$(13),PZ%(12,256)
102  DIM QC(18)
110 D$ =  CHR$ (4)
114  INPUT "INPUT NO OF RECORDS ";KQ
116  FOR J = 1 TO KQ
120  INPUT "ENTER INPUT RECORD FILE NAME ";A$(J)
125  INPUT "ENTER OUTPUT RECORD FILE NAME ";B$(J)
126  NEXT J
195 F(1) = 0:F(2) = 0.00323:F(3) = 0.00115:F(4) =  - 0.00366:F(5) = 0.00258
196 F(6) = 0.00578:F(7) =  - 0.0275:F(8) =  - 0.0735:F(9) =  - 0.0458:F(10) = 0.0
    0:F(11) = 0.16
197  FOR I = 1 TO 11:F(I) = F(I) * 1000: NEXT I
270  FOR JH = 1 TO KQ
271  PRINT D$;"OPEN ";A$(JH);",D1"
272  PRINT D$;"READ ";A$(JH)
273  INPUT QA
274  INPUT QB$
275  FOR I = 1 TO 18: INPUT QC(I): NEXT I
280  FOR I = 1 TO 8: INPUT H(I): NEXT I
310  FOR K = 1 TO 12
320  FOR I = 1 TO 256: INPUT T%(K,I): NEXT I
350  NEXT K
360  PRINT D$;"CLOSE ";A$(JH)
364  PRINT A$(JH)
570  PRINT "STARTING FILTER"
580 AM = 0
600  FOR I = 11 TO 246
610  FOR L = 1 TO 12
619 XS%(L,I) = 0
620  FOR KK = 1 TO 9
621 XS%(L,I) = XS%(L,I) + (T%(L,I - 10 + KK) + T%(L,I + 10 - KK)) * F(KK + 1)
622  NEXT KK
623 XS%(L,I) = XS%(L,I) + T%(L,I) * F(11)
624 XS%(L,I) = XS%(L,I) * 0.00336
630  NEXT L
640  NEXT I
690  PRINT "STARTING WRITE TO DISK"
710  PRINT D$;"OPEN ";B$(JH);",D2"
720  PRINT D$;"DELETE ";B$(JH);",D2"
730  PRINT D$;"OPEN ";B$(JH);",D2"
740  PRINT D$;"WRITE ";B$(JH)
```

FASTFILT

```
741   PRINT QA
742   PRINT QB$
743   FOR I = 1 TO 18: PRINT QC(I): NEXT I
750   FOR I = 1 TO 8
755   PRINT H(I)
760   NEXT I
762   FOR L = 1 TO 12
765   FOR I = 1 TO 256
775   PRINT XS%(L,I)
780   NEXT I
830   NEXT L
840   PRINT D$;"CLOSE ";B$(JH)
860   PRINT "OUTPUT FILE NAME= ";B$(JH)
870   NEXT JH
880   GOTO 1100
1100   END
```

FASTNMOF

```
5   REM   PROGRAM PERFORMS NORMAL MOVE-OUT AND BAND PASS FILTERING
10   REM   NMO VELOCITIES ARE ENTERED AS VEL-TIME PAIRS
15   REM   ENTIRE TIME SECTION MUST BE DESCRIBED
20   REM   FOR EXAMPLE
25   REM   ....RECORD DIGITIZED AT 0.8 SAMPLE RATE
30   REM   ....RECORD CONTAINS 256 SAMPLES PER TRACE
32   REM    ....RECORD HAS 20 MSEC. DELAY
35   REM    ....RECORD TOTAL TIME PERIOD IS 224.8 MSEC
40   REM    IN THE EXAMPLE LAST NMO VELOCITY IS THE VELOCITY AT 224
     .8 MSEC.
45   REM   INPUT MUST BE IN STANDARD NIMTODISK FORMAT
50   REM UP TO 13 SEISMOGRAPH FILES MAY BE INPUTTED AT ONE TIME
55   REM   ALL INPUT MUST BE ON THE SAME DISK
60   REM   OUTPUT IS ON DRIVE#2 OF PORT#6
65   REM   FILTER IS A BAND-PASS FILTER FUNCTION IN THE TIME DOMAIN

70   REM   ALL RECORDS RUN MUST HAVE THE IDENTICAL SPREAD GEOMETRY
75   REM   ALL RECORDS RUN MUST HAVE THE IDENTICAL DELAY TIMES
80   REM   SEE REM IN FASTFILT FOR FILTER PARAMETERS
90   REM   NORMAL MOVE-OUT AND FILTER ROUTINE
95   PRINT "INPUT DATA ON DISK 1, OUTPUT ON DISK 2"
100   DIM T%(12,300),H(8),TR(20),V(20),VV(257)
101   DIM F(50),XS%(12,256),A$(13),B$(13),PZ%(12,256)
102   DIM QC(18)
110 D$ =  CHR$ (4)
111   INPUT "INPUT DIGITAL RATE ";DT
114   INPUT "INPUT NO OF RECORDS ";KQ
116   FOR J = 1 TO KQ
120   INPUT "ENTER INPUT RECORD FILE NAME ";A$(J)
125   INPUT "ENTER OUTPUT RECORD FILE NAME ";B$(J)
126   NEXT J
150   INPUT "INPUT SHOT OFFSET IN M ";SX
160   INPUT "INPUT GROUP SPACING IN M ";DX
161   INPUT "ENTER SHIFT DELAY";LD
162   INPUT "INPUT TIME DELAY";TD
```

```
163 TD = TD / DT:TD =  INT (TD)
165 SL = LD / DT:SL =  INT (SL)
170  PRINT "INPUT TIMES AND NMO VEL PAIRS"
180  PRINT "FOR THE BOTTOM OF EACH ZONE"
190  PRINT "PUNCH 0,0 TO END"
195 F(1) = 0:F(2) = 0.00323:F(3) = 0.00115:F(4) =  - 0.00366:F(5)
    = 0.00258
196 F(6) = 0.00578:F(7) =  - 0.0275:F(8) =  - 0.0735:F(9) =  - 0.
    0458:F(10) = 0.0740:F(11) = 0.16
197  FOR I = 1 TO 11:F(I) = F(I) * 1000: NEXT I
200 IK = 0
210 IK = IK + 1
220  INPUT TR(IK),V(IK)
230  IF TR(IK) = 0 THEN  GOTO 250
240  GOTO 210
250 IK = IK - 1
251 IP = 0:V(0) = V(1)
252  FOR L = 1 TO IK
253 K = TR(L) / DT:K =  INT (K) - TD + 1:BT = K - IP:VD = (V(L) -
    V(L - 1)) / BT:KM = 0
254  FOR I = IP TO K
255 KM = KM + 1:VV(I) = V(L - 1) + KM * VD
256  NEXT I
257 IP = K
258  NEXT L
259 X = SX - DX
260  FOR L = 1 TO 12
261 X = X + DX:XX = X * X
262  FOR I = 1 TO 256
263 HH = (I + TD) * DT * VV(I) / 2
264 TT =  SQR (XX + 4 * HH * HH) / VV(I)
265 TT = (TT / DT) - TD:II =  INT (TT)
266  IF II > 256 THEN II = 256
267 PZ%(L,I) = II
268  NEXT I
269  NEXT L
270  FOR JH = 1 TO KQ
271  PRINT D$;"OPEN ";A$(JH);",D1"
272  PRINT D$;"READ ";A$(JH)
273  INPUT QA
274  INPUT QB$
275  FOR I = 1 TO 18: INPUT QC(I): NEXT I
280  FOR I = 1 TO 8: INPUT H(I): NEXT I
290 AZ = SL + 255
310  FOR K = 1 TO 12
320  FOR I = SL TO AZ: INPUT T%(K,I): NEXT I
350  NEXT K
360  PRINT D$;"CLOSE ";A$(JH)
364  PRINT A$(JH)
400  PRINT "STARTING NMO"
410  FOR L = 1 TO 12
420  FOR I = 1 TO 256
430 II = PZ%(L,I)
440 T%(L,I + SL) = T%(L,II + SL)
450  NEXT I
460  NEXT L
470  PRINT "END NMO"
570  PRINT "STARTING FILTER"
```

```
600  FOR I = 11 TO 246
610  FOR L = 1 TO 12
619 XS%(L,I) = 0
620  FOR KK = 1 TO 9
621 XS%(L,I) = XS%(L,I) + (T%(L,I - 10 + KK) + T%(L,I + 10 - KK))
     * F(KK + 1)
622  NEXT KK
623 XS%(L,I) = XS%(L,I) + T%(L,I) * F(11)
624 XS%(L,I) = XS%(L,I) * 0.00336
630  NEXT L
640  NEXT I
690  PRINT "STARTING WRITE TO DISK"
710  PRINT D$;"OPEN ";B$(JH);",D2"
720  PRINT D$;"DELETE ";B$(JH);",D2"
730  PRINT D$;"OPEN ";B$(JH);",D2"
740  PRINT D$;"WRITE ";B$(JH)
741  PRINT QA
742  PRINT QB$
743 QC(17) = QC(17) - LD
745  FOR I = 1 TO 18: PRINT QC(I): NEXT I
750  FOR I = 1 TO 8
755  PRINT H(I)
760  NEXT I
762  FOR L = 1 TO 12
765  FOR I = 1 TO 256
775  PRINT XS%(L,I)
780  NEXT I
830  NEXT L
840  PRINT D$;"CLOSE ";B$(JH)
860  PRINT "OUTPUT FILE NAME= ";B$(JH)
870  NEXT JH
880  GOTO 1100
1100  END
```

P-PICKER

```
1800  REM  A PROGRAM FOR SCREEN DISPLAY OF SEISMOGRAM
1810  REM  DISPLAY FOR INTERACTIVE PICKING OF EVENTS
1820  REM  GAME PADDLES ARE USED TO MOVE CURSOR
1830  REM  OPTION OF 1ST HALF,MIDDLE HALF,OR END HALF DISPLAY
1840  REM  INPUT DATA MUST BE IN FORMAT OF NIMTODISK PROGRAM
1850  REM  MOVE CURSOR OM SCREEN WITH PADDLE KNOBS
1860  REM  HORIZONTAL CONTROL SIDE BUTTON ENTERS TIME DATA
1870  REM  ENTER UP TO 12 TRACE TIME PICKS
1880  REM  IF LESS THAN 12 ENTER TRACE NUMBER >12 TO EXIT
1890  REM  REFRACTION OR REFLECTION PICK OPTION
1900  REM  LEAST SQUARES VELOCITIES COMPUTED
1910  REM  OPTION OF TIME-DISTANCE DATA SAVE ON DISK OR PRINTER
1   REM  REFLECTION PICK
2   GOTO 100
3   REM  CURSOR MONITOR ROUTINE
4   FOR I = 1 TO 5
10  TX =  PDL (0)
20  TY =  PDL (1)
30   NEXT I
40  TY = TY * 159 / 255
50   FOR I = 1 TO 5: HPLOT TX,TY: NEXT I
51   HCOLOR= 0
52   HPLOT TX,TY
53   HCOLOR= 3
60   FOR I = 1 TO 5:CK =  PEEK ( - 16286): NEXT I
70   IF CK > 127 THEN  GOTO 90
80   GOTO 4
90   RETURN
100   DIM X(256),H(8),D(12),T(12),R(12),TT(12)
105   DIM G(12)
110  D$ =  CHR$ (4)
120   INPUT "ENTER INPUT FILE NAME ";A$
131  GN = GN / 2
140   INPUT "1ST HALF PNCH 1, 2ND PNCH 2, MIDDLE PNCH 3 ";PP
142   INPUT "ENTER GAIN ADJUST ";GN
144  GN = GN / 2
163   PRINT D$;"OPEN ";A$
170   PRINT D$;"READ ";A$
171   INPUT SX
172   INPUT DR$
173   INPUT DX
174   INPUT SK
175   FOR I = 1 TO 12: INPUT G(I): NEXT I
176   INPUT HC
177   INPUT LC
178   INPUT TD
179   INPUT TS
180   IF TS = 50 THEN DT = 0.2
181   IF TS = 100 THEN DT = 0.4
182   IF TS = 200 THEN DT = 0.8
183   IF TS = 500 THEN DT = 2.0
184   FOR I = 1 TO 8: INPUT H(I): NEXT I
190   HGR
200   HCOLOR= 3
210  XX = 1
220   FOR L = 1 TO 12
222   IF PP = 1 THEN  GOTO 240
```

```
224  IF PP = 3 THEN  GOTO 232
226  FOR I = 1 TO 128: INPUT PQ: NEXT I
228  FOR I = 1 TO 128: INPUT X(I): NEXT I
230  GOTO 244
232  FOR I = 1 TO 64: INPUT PQ: NEXT I
234  FOR I = 1 TO 128: INPUT X(I): NEXT I
236  FOR I = 1 TO 64: INPUT PQ: NEXT I
238  GOTO 244
240  FOR I = 1 TO 128: INPUT X(I): NEXT I
242  FOR I = 1 TO 128: INPUT PQ: NEXT I
244 XX = XX + 12
250 XP = 1
260 YP = XX
269 II = 0
270  FOR I = 1 TO 256 STEP 2
275 II = II + 1
280 Y = XX + X(II) * GN
285 Y =  INT (Y)
286  IF Y < 1 THEN Y = 1
287  IF Y > 159 THEN Y = 159
290  HPLOT XP,YP TO I,Y
300 XP = I
310 YP = Y
320  NEXT I
330  NEXT L
340  PRINT D$;"CLOSE ";A$
350 XP = 0
360  FOR I = 1 TO 10:XP = XP + 25: HPLOT XP,1 TO XP,159: NEXT I
370  PRINT "TO PICK REFLEXIONS ENTER TRACE USE CURSOR BUTTON"
380 J = 0
382  INPUT "ENTER DELAY TIME IN MS ";TQ
385  INPUT "REFLEXTION PNCH 0 REFRACTION PNCH 1 ";KI
386  IF KI > 1 THEN  GOTO 1000
390 J = J + 1
400  IF J > 12 THEN  GOTO 520
410  INPUT "ENTER TRACE NO ";TR
420  IF TR > 12 THEN  GOTO 520
430 R(J) = TR
440 TR = TR - 1
450 D(J) = SX + TR * DX
455  IF KI = 1 THEN  GOTO 470
460 D(J) = D(J) * D(J)
470  GOSUB 3
480 TT(J) = TX / 2
482 T(J) = TX / 2
484  IF PP = 2 THEN T(J) = T(J) + 128
485  IF PP = 3 THEN T(J) = T(J) + 64
490 T(J) = T(J) * DT
495 T(J) = T(J) + TD - TQ
496  IF KI = 1 THEN  GOTO 510
500 T(J) = T(J) * T(J)
510  GOTO 390
520 J = J - 1
530  REM  LEAST SQRS FIT
540 MX = 0:MY = 0:X2 = 0:XY = 0
550  FOR I = 1 TO J
560 MX = MX + D(I)
570 MY = MY + T(I)
580 X2 = X2 + D(I) * D(I)
```

P-PICKER

```
590 XY = XY + D(I) * T(I)
600  NEXT I
610 V = (J * X2 - MX * MX) / (J * XY - MX * MY)
620 TC = (X2 * MY - MX * XY) / (J * X2 - MX * MX)
625  IF KI = 1 THEN  GOTO 650
630 V =  SQR (V)
640 TC =  SQR (TC)
650 RP = R(1) * 12 + 1
660 SP = TT(1) * 2
670  FOR I = 2 TO J
680 RR = R(I) * 12 + 1
690 SS = TT(I) * 2
700  HPLOT SP,RP TO SS,RR
710 RP = RR
720 SP = SS
730  NEXT I
740  PRINT "INT TIME= ";TC,"V= ";V
750  PRINT D$;"PR#1"
760  PRINT "  "
770  PRINT A$
780  FOR I = 1 TO 8: PRINT H(I);
790  NEXT I
795  PRINT "   "
796  IF KI = 1 THEN  GOTO 805
800  PRINT "REFLEC INT T= ";TC,"VEL= ";V
804  GOTO 810
805  PRINT "REFRAC INT T= ";TC,"VEL= ";V
810  PRINT D$;"PR#0"
811  INPUT "TO OUTPUT T-X DATA TO PRINTER PNCH 1 ";IK
812  IF IK = 1 THEN  GOTO 850
813  INPUT "TO OUTPUT T-X DATA TO DISK PNCH 1 ";IK
814  IF IK = 1 THEN  GOTO 900
820  INPUT "TO CONTINUE ON THIS HALF PNCH 1 ";IK
830  IF IK <  > 1 THEN  GOTO 1000
840  GOTO 380
850  PRINT D$;"PR#1"
855  FOR I = 1 TO J
860  IF KI = 0 THEN D(I) =  SQR (D(I)):T(I) =  SQR (T(I))
865  PRINT D(I),T(I)
870  NEXT I
875  PRINT D$;"PR#0"
880  GOTO 813
900  INPUT "INPUT DISK FILE NAME ";F$
910  INPUT "INSERT OUTPUT DISK PNCH 1 ";QL
920  PRINT D$;"OPEN ";F$
930  PRINT D$;"WRITE ";F$
940  PRINT J
950  FOR I = 1 TO J
960  IF KI = 0 THEN D(I) =  SQR (D(I)):T(I) =  SQR (T(I))
970  PRINT D(I)
975  PRINT T(I)
980  NEXT I
985  PRINT D$;"CLOSE ";F$
990  PRINT "TRANSFER TO DISK COMPLETE"
995  GOTO 820
1000  INPUT "TO VIEW OTHER HALF PNCH 1 ";IK
1010  IF IK = 1 THEN  GOTO 140
1020  END
```