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10 '
20 ' Sound Envelope Designer
30 '
40 IF HIMEM<40000 THEN 60
50 MEMORY 39999:OPENOUT "!DUMMY":MEMORY HIMEM-1:CLOSEOUT
60 MODE 1:CLG 0:INK 0,0:BORDER 0:INK 1,18:INK 2,2:INK 3,26:PEN 3:PAPER 2
70 PRINT"      SOUND ENVELOPE DESIGNER 1.0      "
80 ' M/C code for pointer
90 FOR i=40000 TO 40194:READ a$:v=VAL("&"+a$)
100 cs=cs+v:POKE i,v
110 NEXT i
120 IF cs<>22335 THEN PRINT"DATA ERROR - Check listing";CHR$(7):STOP
130 DATA CD,9C,9C,CD,24,B8,B7,28,FA,F5,CD,19,BD,CD,9C,9C,F1,CB,67,C0,CB,47
140 DATA C4,79,9C,CB,4F,C4,6A,9C,CB,57,C4,84,9C,CB,5F,C4,91,9C,18,D6,F5,3A
150 DATA 02,9D,FE,C4,30,05,3C,3C,32,02,9D,F1,C9,F5,3A,02,9D,B7,28,F7,3D,3D
160 DATA 18,F0,F5,3A,01,9D,B7,28,EC,3D,32,01,9D,F1,C9,F5,3A,01,9D,FE,9E,30
170 DATA DE,3C,18,F0,3A,02,9D,47,3E,C7,90,6F,26,00,11,00,00,CD,1D,BC,DD,21
180 DATA E1,9C,3A,01,9D,CB,3F,30,04,DD,21,F1,9C,4F,06,00,09,3A,02,9D,57,06
190 DATA 08,7E,DD,AE,00,77,23,DD,23,7E,DD,AE,00,77,2B,CD,26,BC,DD,23,14,7A
200 DATA FE,C8,30,02,10,E5,C9,88,00,CC,00,EE,00,FF,00,EE,00,AA,00,33,00,11
210 DATA 00,22,00,33,00,33,88,33,CC,33,88,22,88,00,CC,00,44,50,64
220 ' Set Error trap for possible error when checking for Discs
230 ON ERROR GOTO 250
240 disc=(I=1)::DISC:ON ERROR GOTO 0:GOTO 270
250 disc=0:RESUME NEXT
260 ' Reset all Stick definitions
270 FOR K=72 TO 78:KEY DEF K,0,0,0,0:NEXT
280 ' Function to remove leading space or minus sign
290 DEF FNs$(x)=MID$(STR$(x),2)
300 WINDOW #3,4,34,8,22
310 WINDOW #2,1,40,2,6
320   Define Icon characters
330 SYMBOL 254,126,129,153,255,153,129,126,0
340 SYMBOL 253,0,255,129,189,153,165,255,0
350 SYMBOL 252,0,255,195,165,189,129,255,0
360 SYMBOL 251,129,129,129,129,129,129,129,129
370 ' Display Icons on bottom line
380 LOCATE 1,25:PAPER 1:PRINT STRING$(40,32);:PAPER 2:sp$=CHR$(14)+CHR$(1)+
" "+CHR$(14)+CHR$(2)
390 LOCATE 13,25:PRINT CHR$(237);sp$;
400 PRINT CHR$(252);sp$;
410 PRINT CHR$(253);sp$;
420 PRINT CHR$(254);sp$;
430 PRINT CHR$(203);sp$;
440 PRINT CHR$(242);
450 sp$=CHR$(15)+CHR$(2)+CHR$(233)+CHR$(15)+CHR$(1)
460 GOTO 830
470 ' Program subroutines start here
480 ' Subroutine to update vibrato meters
490 PEN 3:FOR y=0 TO 8
500 IF vib.spd>y THEN PAPER 2 ELSE PAPER 0
510 LOCATE 36,22-y:PRINT CHR$(251);
520 IF vib.var>y THEN PAPER 2 ELSE PAPER 0
530 LOCATE 39,22-y:PRINT CHR$(251);
540 NEXT
550 PEN 1:PAPER 0:RETURN
560 ' Subroutine to print vertical text
570 LOCATE x,y:FOR i=1 TO LEN(a$):PRINT MID$(a$,i,1);CHR$(10);CHR$(8);:NEXT
:RETURN
580 ' Subroutine to Ring Bell
590 ENV 2,15,-1,2:SOUND 2,20,0,15,2:RETURN
600 ' Subroutine to sound buzzer
610 ENT -2,3,-1,1,3,1,1:SOUND 2,500,20,15,0,2:RETURN
620 ' Subroutine to get text cursor position of pointer arrow
630 CURX=INT(PEEK(40193)/4)+1:CURY=INT(PEEK(40194)/8)+1:RETURN
640 ' Subroutine to construct ev$ and et$ for current envelope
650 EV$="ENV "+FNs$(enum)
660 FOR s=1 TO es(enum)
670 FOR p=1 TO 3:ev$=ev$+",":IF ev(enum,s,p)<0 THEN ev$=ev$+"-"
680 ev$=ev$+FNs$(ev(enum,s,p)):NEXT p,s
690 et$="ENT "+STR$(-enum):GOSUB 750
700 FOR i=1 TO 2:et$=et$+","+FNs$(et(enum,i,1))+",":IF i=2 THEN et$=et$+"-"
710 et$=et$+FNs$(et(enum,i,2))+","+FNs$(et(enum,i,3)):NEXT:RETURN
720 ' Subroutine to print current env and ent definitions
730 GOSUB 650:LOCATE 1,3:PEN 3:PAPER 0:PRINT ev$;:LOCATE 10,5:PRINT et$;"
";:PEN 1:RETURN
740 ' Subroutine to construct et array from vibrato values
750 IF vib.var=0 THEN FOR i=1 TO 2:et(enum,i,1)=1:et(enum,i,2)=0:et(enum,i,
3)=1:NEXT i:RETURN
760 etp=10-vib.spd:FOR i=1 TO 2:et(enum,i,1)=vib.var:et(enum,i,3)=etp:IF i=
2 THEN et(enum,i,2)=-1 ELSE et(enum,i,2)=1
770 NEXT i:RETURN
780 ' Subroutine to clear the graphics window
790 ORIGIN 0,0,32,542,48,288:CLG 0:ORIGIN 0,0,0,639,0,399:RETURN
800 ' ********************************
810 ' Main Program section starts here
820 ' ********************************
830 vib.spd=1:vib.var=0:GOSUB 490: ' Init & Draw Vib Meters
840 a$="VIB SPEED":x=37:y=14:GOSUB 570
850 a$="VIB RANGE":x=40:y=14:GOSUB 570
860 PLOT 30,46,3:DRAWR 514,0:DRAWR 0,244:DRAWR -514,0:DRAWR 0,-244
870 ' Draw vertical scale on window
880 FOR i=0 TO 15:PLOT 30,48+i*16,3:DRAWR -4,0:IF i/5=i\5 THEN DRAWR -4,0
890 NEXT
900 ' Draw horizontal scale on window
910 FOR i=0 TO 64:PLOT 32+i*8,46,3:DRAWR 0,-4:IF i/5=i\5 THEN DRAWR 0,-4
920 NEXT
930 a$="VOLUME":x=1:y=12:PEN 1:GOSUB 570
940 PLOT 800,800,1:MOVE 168,34:TAG:PRINT"1/100ths SECOND";:TAGOFF
950 ' Declare arrays and initialize variables
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960 DIM ev(15,5,3),et(15,2,3),es(15),ec(5,1)
970 ' env section # is -1 if non-existant
980 FOR i=2 TO 15:es(i)=-1:NEXT:es(1)=0
990 enum=1
1000 CLS #2:GOSUB 730:esec=1:lx=32:ly=48
1010 ' Main program loop
1020 ' M/C code routine displays & moves pointer until fire button is
     pressed
1030 WHILE (JOY(0) AND 16)<>0:WEND:CALL 40000
1040 ' Get the text position of the pointer
1050 GOSUB 630
1060 IF CURY=25 THEN 1440:  ' On Icon line
1070 IF CURX=36 THEN 1120 'On Vib Speed column
1080 IF CURX=39 THEN 1140 'On Vib Range column
1090 IF CURX>2 AND CURX<35 AND CURY>7 AND CURY<23 THEN 1170 'Insert next
     line of graph
1100 GOSUB 590 'Illegal so ring bell
1110 GOTO 1030
1120 IF CURY>22 OR CURY<14 THEN 1100 'Out of Range
1130 VIB.SPD=23-CURY:GOSUB 490:GOSUB 730:GOTO 1030 'Set new Vib Speed
1140 IF CURY>23 OR CURY<14 THEN 1100 'Out of Range
1150 VIB.VAR=23-CURY:GOSUB 490:GOSUB 730:GOTO 1030 'Set new Vib Range
1160 'Calculate & Display next line
1170 NY=INT((399-PEEK(40194)*2)/16+0.5)*16:NX=INT(PEEK(40193)/2)*8
1180 IF nx<lx THEN GOSUB 610:GOTO 1030
1190 IF esec>5 THEN LOCATE 9,6:PEN 1:PRINT"MAXIMUM OF 5 SECTIONS!"::
     GOSUB 6
10:FOR dd=1 TO 500:NEXT:LOCATE 1,6:PRINT STRING$(40,32);:GOTO 1030
1200 MOVE NX,50:DRAWR 0,236,2:MOVE LX,LY:DRAW NX,NY,3
1210 tim.dif=(nx-lx)/8
1220 vol.dif=(ny-ly)/16
1230 IF vol.dif=0 AND tim.dif=0 THEN GOSUB 610:GOTO 1030
1240 IF tim.dif=0 THEN step.count=0:step.size=vol.dif:pause.time=1:
     GOTO 1350
1250 IF vol.dif=0 THEN step.count=1:step.size=0:pause.time=tim.
     dif:GOTO 1350
1260 step.count=tim.dif:pause.time=1
1270 step.size=vol.dif/step.count
1280 IF step.size=INT(step.size) AND step.count=INT(step.count)
     THEN 1350
1290 pause.time=pause.time+1:step.count=tim.dif/pause.time
1300 IF pause.time>64 THEN 1320
1310 GOTO 1270
1320 'Can't form gradient
1330 GOSUB 610:MOVE NX,50:DRAWR 0,236,0:MOVE LX,LY:DRAW NX,NY,0
1340 GOTO 1030
1350 ec(esec,0)=lx:ec(esec,1)=ly
1360 lx=nx:ly=ny
1370 ev(enum,esec,1)=step.count
1380 ev(enum,esec,2)=step.size
1390 ev(enum,esec,3)=pause.time
1400 es(enum)=esec:esec=esec+1
1410 GOSUB 730
1420 GOTO 1030
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```
1430 'Calculate which Icon is being pointed to
1440 op=(curx-13)/3:IF op<>INT(op) OR op<0 OR op>5 THEN 1100
1450 ON op+1 GOTO 1480,1600,1880,2670,2700,2790
1460 GOTO 1100
1470 'Play Scale using current envelope
1480 FOR i=es(enua)+1 TO 3
1490 ev(enua,i,1)=1:ev(enua,i,2)=0:ev(enua,i,3)=1
1500 NEXT i
1510 ENV 1,ev(enua,1,1),ev(enua,1,2),ev(enua,1,3),ev(enua,2,1),ev(enua,2,2
),ev(enua,2,3),ev(enua,3,1),ev(enua,3,2),ev(enua,3,3),ev(enua,4,1),ev(enua,4
,2),ev(enua,4,3),ev(enua,5,1),ev(enua,5,2),ev(enua,5,3)
1520 ENT -1,et(enua,1,1),et(enua,1,2),et(enua,1,3),et(enua,2,1),et(enua,2,2
),et(enua,2,3)
1530 RESTORE 1580
1540 FOR i=1 TO 12:READ frec
1550 SOUND 1,frec,0,0,1,1
1560 NEXT i
1570 GOTO 1030
1580 DATA 478,451,426,402,379,358,338,319,301,284,268,253
1590 'Change Envelope number
1600 CLS #2:ednua=enua:POKE 40194,28
1610 LOCATE #2,5,2:PRINT#2,sp$;" EDIT ENV      ";cpt$;" CANCEL"
1620 LOCATE #2,5,3:PRINT#2,sp$;" ENV No UP     ";cpt$;" ENV No DOWN"
1630 PEN #2,3:LOCATE #2,13,5:PRINT#2,"ENVELOPE #";FNs$(ednua);" ":PEN #2,1
1640 WHILE (JOY(0) AND 16)<>0:WEND:CALL 40000 'Get option required
1650 GOSUB 630:IF cury=3 OR cury=4 THEN 1670
1660 GOSUB 590:GOTO 1640
1670 IF cury=5 AND curx=2 THEN 1750
1680 IF curx=21 AND cury=3 THEN CLS #2:GOSUB 730:GOTO 1030
1690 IF curx<>5 THEN 1720
1700 ednua=ednua+1:IF ednua=16 THEN ednua=1
1710 GOTO 1630
1720 IF curx<>21 THEN 1660
1730 ednua=ednua-1:IF ednua=0 THEN ednua=15
1740 GOTO 1630
1750 enua=ednua ' EDIT Envelope
1760 CLS #2:IF es(enua)<>-1 THEN es(enua)=0:vib.spd=1:vib.var=0:GOSUB 750:GO
TO 1780
1770 IF et(enua,1,2)=0 THEN vib.var=0:vib.spd=1 ELSE vib.var=et(enua,1,1):v
ib.spd=10-et(enua,1,3)
1780 GOSUB 790:GOSUB 490:GOSUB 730:esec=1:lx=32:ly=48:FOR i=1 TO es(enua)
1790 n=lx+ev(enua,i,1)*ev(enua,i,3):n=8
1800 IF ev(enua,i,1)>0 THEN ny=ly+ev(enua,i,1)*ev(enua,i,2):lx=lx+8 ELSE ny=ly
+ev(enua,i,2)*16
1810 MOVE lx,50:DRAWR 0,236,2:MOVE lx,ly:DRAW n,ny,3
1820 et(esec,0)=lx:ec(esec,1)=ly
1830 lx=n:ly=ny
1840 esec=esec+1
1850 NEXT i:POKE 40194,100
1860 GOTO 1030
1870 'Tape options (force tape if Disc)
1880 IF disc THEN !TAPE
1890 tape=(j=1)
1900 'Disc/Tape I/O routines
1910 CLS #2
1920 LOCATE #2,7,3:PRINT#2,sp$;" LOAD FILE    ";cpt$;" SAVE FILE":LOCATE #2,7
,5:PRINT#2,sp$;" CANCEL       ";
1930 IF disc AND (NOT tape) THEN PRINT#2,sp$;" DIRECTORY";
1940 POKE 40194,32
1950 WHILE (JOY(0) AND 16)<>0:WEND:CALL 40000:GOSUB 630
1960 IF cury<>4 AND cury<>6 THEN GOSUB 590:GOTO 1950
1970 IF cury=4 AND curx=7 THEN 2270 'Load
1980 IF cury=4 AND curx=21 THEN 2110 'Save
1990 IF cury=6 AND curx=7 THEN CLS #2:GOSUB 730:GOTO 1030
2000 IF cury=6 AND curx=21 AND disc AND (NOT tape) THEN 2020 'Directory
2010 GOSUB 590:GOTO 1950
2020 GOSUB 790 'Clear graphics
2030 PEN #3,3:CLS #3
2040 WINDOW SWAP 3,0
2050 ab$="*.ENV":!DIR,@a$ 'Directory only .ENV files
2060 PEN 2:PRINT "Press Stick Button to Continue";
2070 WINDOW SWAP 0,3
2080 WHILE (JOY(0) AND 16)<>16:WEND
2090 GOSUB 790:CLS #2:GOTO 1760 'restore env graphics
2100 'Save Option
2110 CLS #2:PEN #2,2:LOCATE #2,4,3:PRINT#2,"Enter Filename:";
2120 PEN #2,3:LINE INPUT #2,ff$
2130 IF tape THEN maxlen=12 ELSE maxlen=8
2140 IF ff$="" OR LEN(ff$)>maxlen OR INSTR(ff$,".") THEN GOSUB 610:GOTO 2110
2150 ff$=ff$+".ENV":lin=500:cenua=enua:cvs=vib.spd:cvr=vib.var
2160 WINDOW SWAP 0,2:OPENOUT ff$
2170 FOR e=1 TO 15
2180 IF es(e)<>0 THEN 2230
2190 enua=e:IF et(enua,1,2)=0 THEN vib.var=0:vib.spd=1 ELSE vib.var=et(enua
,1,1):vib.spd=10-et(enua,1,3)
2200 GOSUB 650
2210 PRINT#9,FNs$(lin);" ";ev$:lin=lin+10
2220 PRINT#9,FNs$(lin);" ";et$:lin=lin+10
2230 NEXT e:enua=cenua:vib.var=cvr:vib.spd=cvs
2240 CLOSEOUT:WINDOW SWAP 0,2
2250 CLS #2:GOSUB 730:GOTO 1030
2260 'Load file option
2270 CLS #2:PEN #2,2:LOCATE #2,4,3:PRINT#2,"Enter Filename";
2280 PEN #2,3:LINE INPUT #2,ff$
2290 IF tape THEN maxlen=12 ELSE maxlen=8
2300 IF ff$="" OR LEN(ff$)>maxlen OR INSTR(ff$,".") THEN GOSUB 610:GOTO 2270
2310 ff$=ff$+".ENV":cenua=enua
2320 WINDOW SWAP 0,2:OPENIN ff$
2330 WHILE NOT EOF
2340 'Get Input & Convert to Internal Array Format
2350 LINE INPUT #9,basic$
2360 IF VAL(basic$)<>0 THEN 2600
2370 basic$=MID$(basic$,INSTR(basic$," ")+1)
2380 IF LEFT$(basic$,3)<>"ENV" THEN 2600 ELSE basic$=MID$(basic$,5)
2390 GOSUB 2630:enua=number
2400 es(enua)=0
2410 WHILE basic$<>"" AND ASC(basic$+" ")<32
2420  es(enua)=es(enua)+1
2430  GOSUB 2630:ev(enua,es(enua),1)=number
2440  GOSUB 2630:ev(enua,es(enua),2)=number
2450  GOSUB 2630:ev(enua,es(enua),3)=number
2460 WEND
2470 IF EOF THEN 2600
2480 LINE INPUT #9,basic$
2490 IF VAL(basic$)<>0 THEN 2600
2500 IF INSTR(basic$,"ENT -")=0 THEN 2600
2510 basic$=MID$(basic$,INSTR(basic$,"ENT -")+4):GOSUB 2630
2520 FOR s=1 TO 2
2530  GOSUB 2630:et(enua,s,1)=number
2540  GOSUB 2630:et(enua,s,2)=number
2550  GOSUB 2630:et(enua,s,3)=number
2560 NEXT s
2570 WEND
2580 CLOSEIN:WINDOW SWAP 0,2:enua=cenua:IF et(enua,1,2)=0 THEN vib.var=0:vi
b.spd=1 ELSE vib.var=et(enua,1,1):vib.spd=10-et(enua,1,3)
2590 GOTO 1760
2600 CLS:PEN 3:LOCATE 6,3:PRINT"File Error - Load Aborted":GOSUB 610
2610 FOR dd=1 TO 1500:NEXT:GOTO 2580
2620 'Routine to get a number from basic$
2630 WHILE LEFT$(basic$,1)=" ":basic$=MID$(basic$,2):WEND
2640 number=VAL(basic$):IF INSTR(basic$,",")=0 THEN basic$="" ELSE basic$=M
ID$(basic$,INSTR(basic$,",")+1)
2650 RETURN
2660 'Disc Icon Options
2670 IF NOT disc THEN GOSUB 590:GOTO 1030
2680 tape=0:!DISC:GOTO 1910
2690 'Clear Entire Env Option
2700 CLS #2
2710 PEN #2,3:LOCATE #2,10,2:PRINT#2,"CLEAR ENVELOPE #";FNs$(enua)
2720 LOCATE #2,12,4:PRINT#2,sp$;" YES      ";cpt$;" NO":POKE 40193,4:POKE 40
194,28
2730 WHILE (JOY(0) AND 16)<>0:WEND:CALL 40000:GOSUB 630
2740 IF cury<>5 THEN GOSUB 590:GOTO 2730
2750 IF curx=22 THEN CLS #2:GOSUB 730:GOTO 1030
2760 IF curx<>12 THEN GOSUB 590:GOTO 2730
2770 CLS #2:GOSUB 790:vib.spd=1:vib.var=0:esec=1:lx=32:ly=48:es(enua)=-1:GO
SUB 750:GOSUB 490:GOTO 1030
2780 'Clear Last line of graph (delete 1 section of env)
2790 IF esec=1 THEN GOSUB 610:GOTO 1030
2800 MOVE lx,50:DRAWR 0,236,0
2810 esec=esec-1:es(enua)=es(enua)-1:MOVE lx,ly:lx=ec(esec,0):ly=ec(esec,1)
:DRAW lx,ly,0
2820 CLS #2:GOSUB 730:GOTO 1030
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