PONG SOUND EFFECTS

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Those of you who have purchased The First Book of KIM may have noticed the Ping Pong program on page 95. Did you also notice that something was missing? If you enter the bytes 20 59 03 EA starting at address 02E9,   enter the bytes 20 73 03 starting at address 031A,   rig up PAO for audio output, and add the modification given below, then the program will have BEEP, BOOP, and ZONK sound effects much like the commercial versions.

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****                    .LOC    00,89
0089  XX        MEMY LDA XX,
008A  XX        CNT  XX,
008B  XX        PNT  XX,


****                    .LOC    03,59
0359  A5 84     MBEP LDA Z  84,
035B  F0 13          BEQ R  RTN    NO SOUND IF GAME OVER
035D  08             PHP
035E  A9 02          LDA I  02,    MISSED THE BALL BEEP
0360  85 89          STA Z  MEMY   FREQUENCY COMPENSTTION
0362  A9 80          LDA I  80,    FREQUENCY
0364  85 8A          STA Z  CNT    DURATION
0366  20 BA 03       JSR A  ENTN   PRODUCE NOTE
0369  A9 FF          LDA I  FF,    NO BEEP, OR BOOP AFTER A ZONK
036B  85 8B          STA Z  PNT
036D  A5 84          LDA Z  84,
036F  28             PLP
0370  A2 04     RTN  LDX I  04,
0372  60             RTS


0373  E6 8B     HBEP INC Z  PNT    CHECK FOR LAST MOVE A ZONK
0375  F0 21          BEQ R  BACK   YES
0377  A5 84          LDA Z  84,    HIT, OR SERVE BEEP, GET DIRECTION
0379  F0 1D          BEQ R  BACK   NO SOUND IF GAME OVER
037B  30 0E          BMI R  LBEP   LEFT, OR RIGHT?
037D  A9 08          LDA I  08,
037F  85 89          STA Z  MEMY   FREQUENCY COMPENSATION
0381  85 8A          STA Z  CNT    DURATION
0383  A9 20          LDA I  20,    FREQUENCY
0385  20 BA 03       JSR A  ENTN
0388  4C 98 03       JMP A  BACK


038B  A9 04     LBEP LDA I  04,
038D  85 89          STA Z  MEMY
038F  A9 08          LDA I  08,
0391  85 8A          STA Z  CNT
0393  A9 40          LDA I  40,
0395  20 BA 03       JSR A  ENTN


0398  A5 84     BACK LDA Z  84,    GET DURATION FOR ORIGINAL REVERSE
039A  18             CLC           AND CLEAR CARRY
039B  60             RTS

                                   TONE GENERATOR LOOP
                                   PARAMS:
                                   A=FREQUENCY
                                   MEMY=FREQUENCY DURATION COMPENSATION
                                   CNT=DURATION
039C  AA        CLK  TAX           MOVE FREQUENCY TO X
039D  EE 00 17       INC A  UPA    TOGGLE OUTPUT PIN 14
03A0  CA        DLX  DEX           DECREMENT X
03A1  F0 07          BEQ R  COMP   REPEAT TIMES COMPENSATION IF ZERO
03A3  EA             NOP           WAIT OTHERWISE
03A4  EA             NOP
03A5  EA             NOP
03A6  EA             NOP
03A7  EA             NOP
03A8  D0 F6          BNE R  DLX    DELAY FOR FREQUENCY
03AA  88        COMP DEY           DECREMENT Y (FREQUENCY COMPENSATION)
03AB  F0 12          BEQ R  DUR    CHECK DURATION IF ZERO
03AD  EA             NOP           LOOP TIMING
03AE  EA             NOP
03AF  EA             NOP
03B0  EA             NOP
03B1  D0 00          BNE R  ON
03B3  D0 E7     ON   BNE R  CLK    KEEP TONE GOING
                                   ENTRY FOR REST
03B5  A2 00     RDUR LDX I  00,    INITIALIZE PORT FOR SILENCE.  USE A14.
03B7  4C BC 03       JMP A  DUR1
                                   ENTRY FOR NOTE
03BA  A2 01     ENTN LDX I  01,    INITIALIZE PORT FOR NOTE.  USE A14.
03BC  8E 01 17  DUR1 STX A  UPAD
03BF  C6 8A     DUR  DEC Z  CNT    DECREMENT DURATION
03C1  F0 04          BEQ R  DONE   RETURN IF ZERO
03C3  A4 89          LDY Z  MEMY   GET FREQUENCY COMPENSATION
03C5  D0 D5          BNE R  CLK    KEEP TONE GOING YET
03C7  60        DONE RTS           RETURN
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