DRUMSYS 0.6
DEVELOPMENTAL VERSION
USER'S NOTES

Load DRUMSYS 0.6 into the PAIA 8700 Computer/Controller using the following entry sequence:

0-0-0-0-0-0-F-F-0-1-1-1-TAPE

When the program has loaded successfully the display will show "AA". There are at least two copies of the program on the tape. If for any reason the first one will not load, try the second.

When properly loaded, begin the program running form the starting location $0000 using this sequence:

0-0-0-0-RUN

With the program running, the control keys of the 8700 take on different meanings than that assigned by the PIEBUG Monitor, as outlined below:

DRUM SOUNDS ARE CONTROLLED BY THE KEYS 0-7

KEY#   DRUM SOUND

0   REST (NO DRUM)
1   LIGHT BASS
2   HEAVY BASS
3   SNARE
4   TOM-TOM
5   CONGA
6   WOOD BLOCK
7   CLAVE

Pressing any of the drum sound keys (0-7) causes termination of the current "mode" of operation and reversion to the "DRUM ENTRY" mode. Note that while touching drum sound keys, the corresponding drum sound is produced by the EK-2A and the displays count in hexadecimal. The number shown in the display is the "event number" of the drum sound produced.

In this version of the program, any of the keys 8-F cause the system to be reinitialized. Any score saved in memory when one of these keys is touched will be erased.

The various modes of operation for Drumsys are activated by touching one of the two rows of keys on the 8700 keyboard. Mode names and the corresponding keys that select them are as follows:

KEY NAME   MODE SELECTED

RUN   PLAY
DISP   SET TEMPO
BACK   BACK SPACE
ENTER   STOP/STEP
PCH   CONTINUE
PCL   DUMP SCORE
TAPE   LOAD SCORE
REL   STROBE DRUM

15

The actions produced by these various modes of operation are as follows:

PLAY - causes the drum score currently in memory to be played at the current tempo rate. Always starts at the beginning of the score (EVENT #0).

SET TEMPO - changes tempo value. When touched, this key causes a counter which will be the tempo value to begin counting. Counting is terminated by touching any other control key. Typically, this control would be used by touching first "TEMPO SET" then "PLAY". The time between touching these two keys is the time between events during playback.

BACK SPACE - causes the program to step through the current score backwards, for editing purposes. In all cases it is important to note that the number shown in the 8700's displays is the event number of the sound just produced.

STOP/STEP - when touched, produces a single step mode of operation. Using the BACK SPACE and STOP/STEP keys allows editing of individual drum sounds. Typical use would be to "STEP" through the score until the drum sound to be replaced (as indicated by sound and event number) is reached. At this point, touching the "BACK" key causes the same drum to sound again (Note that since this is the same "EVENT" as when stepping forward, the displays will not change). The old drum sound may now be replaced with the new simply by touching the proper drum sound key.
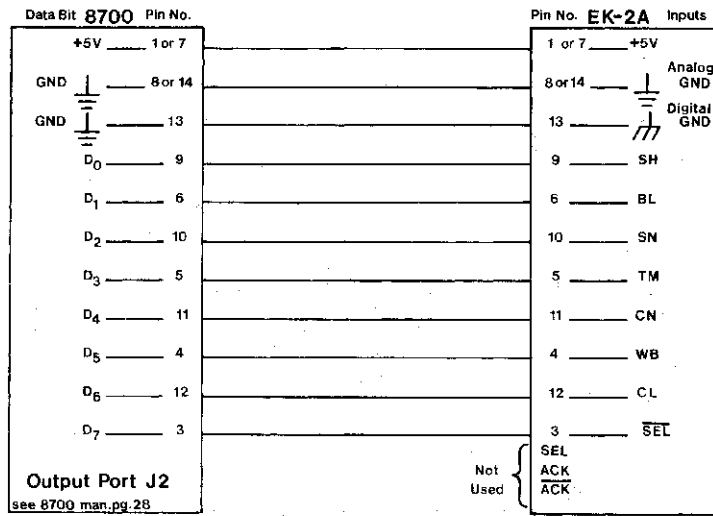
CONTINUE - very similar to the "PLAY" key except that the score will pick up from the event currently in the displays.

DRUM SCORE - this command key allows scores in memory to be saved on cassette tapes. When touched, there will be a couple of seconds of apparent inactivity followed by a counting of the displays as the score is transferred from computer memory to tape. Before touching the "DUMP" key, place your recorder in the record mode and allow it to run for several seconds to get beyond the sub-standard tape sections typically found at the beginning of tape cassettes. Note that relays for tape motion are controlled as outlined in the CS-87 manual.

LOAD SCORE - similar to DUMP SCORE except that the memory of the computer is loaded from the cassette tape. Make sure that there is a cassette to be loaded before touching this control as the computer will wait for data transfer completion before continuing with any further action. If this contro is inadvertently touched, you may recover by pressing the reset key and running the program again. There is a soft start location location of sorts at $014 which can often be used to start the program running without destroying the saved score.

STROBE DRUM - this special effect causes the score to be played at the current tempo rate, but essentially strikes each drum event many times rather than just once. The result is a very unusual bass instrument sounding voice.

EK-2A / 8700 Wiring Connections
For use with Drumsys Program

Data Bit 8700 Pin No.			Pin No. EK-2A Inputs	
+5V — 1 or 7			1 or 7 — +5V	
GND ⏚ — 8 or 14			8 or 14 — ⏚	Analog GND
GND ⏚ — 13			13 — 📐	Digital GND
D_0 — 9			9 — SH	
D_1 — 6			6 — BL	
D_2 — 10			10 — SN	
D_3 — 5			5 — TM	
D_4 — 11			11 — CN	
D_5 — 4			4 — WB	
D_6 — 12			12 — CL	
D_7 — 3			3 — $\overline{SEL}$	

Output Port J2
see 8700 man.pg.28

Not Used { SEL, ACK, $\overline{ACK}$

NOTES

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0010  :
0020  :
0030  :******************************
0040  :*                            *
0050  :*        DRUMSYS 0. 6        *
0060  :*                            *
0070  :*   8700/EK-2 DRUM OPERATING *
0080  :*         SYSTEM             *
0090  :*          BY               *
0100  :*      JOHN SIMONTON         *
0110  :*                            *
0120  :*(C) 1978 - PAIA ELECTRONICS, INC*
0130  :*                            *
0140  :******************************
0150  :
0160  BUFF .DL 00F0
0170  CNTR .DL 00EC
0180  EXP  .DL 00EB
0190  TMPO .DL 00EA
0200  PNTR .DL 00E9
0210  DSP  .DL 0820
0220  DECD .DL FF00
0230  BEEP .DL 0F22
0240  SCOR .DL 0100
0250  DUMY .DL 0086
0260  OUTP .DL 0840
0270  SNBT .DL 0E25
0280  CASS .DL 0EAA
0290  :-----------------------
0300  :00E8
0310  :    S-TABLE (CONTROL CODES)
0320  :00E1
0330  :-----------------------
0340  STBL .DL 00D1
0350  :-----------------------
0360  :00E0
0370  :    DRUM SIGNATURES
0380  :00D9
0390  :-----------------------
0400  :******************************
0410        . OR 10D1
0420  :******************************
0430  :
0440  TAPE .HS FF00800100010001
0450  DSIG .HS FFFEFDF3F7EFDFBF
0460  CRL  .HS 6A9D8D877CB2B9CD000820
0470  :
0480        . OR 10ED
0490  PARM .HS FF
0500        . OR 10F6
0510  PAR1 .HS F6F7F8F9FAFBFCFDFF00
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18

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                              0520  :***************************
                              0530       OR 1000
                              0540  :***************************
                              0550  :
1000-   A9 86                 0560  SPHK  LDA 86        :SPARE HOOK KEYS 8-F
1002-   85 39                 0570        STA *ACTN+01  :USED ONLY TO RE-START
1004-   EA                    0580        NOP           :SYSTEM.   IN LATER VERSIONS
1005-   EA                    0590        NOP           :WILL PROVIDE ADDITIONAL
                              0600  :                   FEATURES
                              0610  :
1006-   A9 00                 0620  STAR  LDA 0         :PREPARE ACCUMULATOR AND
1008-   85 E9                 0630        STA *PNTR     :ZERO SCORE POINTER
100A-   8D 20 08              0640        STA DSP       :AND DISPLAYS
100D-   AA                    0650        TAX           :PREPARE X REG AS POINTER
100E-   9D 00 01              0660  SLP0  STA SCOR,X    :AND USE IT TO CLEAR SCORE
1011-   E8                    0670        INX
1012-   D0 FA                 0680        BNE SLP0      :LOOP UNTIL DONE
1014-   20 53 10              0690  SLP1  JSR RDKY      :GO READ THE KEYBOARD, ETC.
1017-   B0 1F                 0700        BCS ACTN      :AND IF NO NEW KEYS, BRANCH
1019-   C9 10                 0710  TSTS  CMP 10        :NEW KEY - A "CONTROL" KEY?
101B-   B0 16                 0720        BCS CTRL      :YES - BRANCH TO CONTROL
101D-   C9 08                 0730        CMP 08        :ONE OF "SPARE" KEYS?
101F-   B0 DF                 0740        BCS SPHK      :YES- BRANCH
                              0750  :           **
1021-   A9 86                 0760  NTRY  LDA 86        :DRUM ENTRY MODE, GET LINK
1023-   85 39                 0770        STA *ACTN+01  :SET LINK
1025-   B9 D9 10              0780        LDA DSIG,Y    :GET DRUM SIGNATURE
1028-   A6 E9                 0790        LDX *PNTR     :GET SCORE POINTER
102A-   9D 00 01              0800        STA SCOR,X    :SAVE DRUM SIG IN SCORE
102D-   20 3E 10              0810        JSR PLAY      :PLAY THE DRUM BEAT
1030-   4C 14 10              0820        JMP SLP1      :LOOP FOR MORE
1033-   B9 D1 00              0830  CTRL  LDA STBL,Y    :GET COMMAND ADDRESS LINK
1036-   85 39                 0840        STA *ACTN+01  :AND SET LINK IN JSR DUMY
1038-   20 86 00              0850  ACTN  JSR DUMY      :AND GO TO COMMAND SUBROUTINE
103B-   4C 14 10              0860        JMP SLP1      :THEN LOOP FOR MORE
                              0870  :
                              0880  :PLAY SUBROUTINE
                              0890  :
103E-   A4 EB                 0900  PLAY  LDY *EXP      :GET EXPRESSION VARIABLE
1040-   8D 40 08              0910        STA OUTP      :OUTPUT CONTROL TO EK-2
1043-   29 7F                 0920        AND 7F        :RESET STROBE BIT
1045-   88                    0930  PLA0  DEY           :DELAY FOR THE EXP. TIME
1046-   D0 FD                 0940        BNE PLA0      :LOOP UNTIL DONE
1048-   8D 40 08              0950        STA OUTP      :AND TURN DRUM "OFF"
104B-   E6 E9                 0960        INC *PNTR     :INCREMENT SCORE POINTER
104D-   A6 E9                 0970        LDX *PNTR     :PLACE IN X REGISTER
104F-   8E 20 08              0980        STX DSP       :AND SHOW IN DISPLAYS
1052-   60                    0990        RTS           :THEN RETURN
                              1000  :
                              1010  :READ KEY-ALSO IMPORTANT TO TEMPO
                              1020  :
1053-   20 00 FF              1030  RDKY  JSR DECD      :PIEBUG KEYBOARD SUBROUTINE
1056-   B0 05                 1040        BCS DLY       :SAME KEY - JUST DELAY
1058-   A2 00                 1050        LDX 0
105A-   86 EC                 1060        STX *CNTR     :ZERO TEMPO COUNTER
105C-   60                    1070        RTS
105D-   A2 20                 1080  DLY   LDX 20        :SET X AND Y REGISTER
105F-   A0 3F                 1090  NXTX  LDY 3F        :DELAY PARAMETERS
1061-   88                    1100  DELY  DEY           :AND DO DELAY.
1062-   D0 FD                 1110        BNE DELY
1064-   CA                    1120        DEX
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19

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1065-   D0 F8   1130          BNE NXTX     :LOOP UNTIL DONE
1067-   E6 EC   1140          INC *CNTR    :INCREMENT TEMPO COUNTER
1069-   60      1150          RTS          :AND RETURN
                1160     :
                1170     :RUN SUBROUTINE
                1180     :
                1190     :         **
106A-   A9 7C   1200     RUN  LDA 7C       :COMMAND LINK TO "WAIT"
106C-   85 39   1210          STA *ACTN+01 :SET COMMAND LINK
106E-   A9 00   1220     CYCL LDA 00       :PREPARE AND SET
1070-   85 E9   1230          STA *PNTR    :SCORE POINTER TO 0
1072-   A6 E9   1240     CONT LDX *PNTR    :GET CURRENT SCORE POINTER
1074-   BD 00 01 1250         LDA SCOR,X   :GET CURRENT DRUM SIGNATURE
1077-   F0 F5   1260          BEQ CYCL     :ZERO, END OF SCORE-BRANCH
1079-   20 3E 10 1270         JSR PLAY     :GO PLAY DRUM SOUND, ETC.
107C-   A5 EC   1280     WAIT LDA *CNTR    :GET TEMPO COUNTER AND
107E-   45 EA   1290          EOR *TMPO    :COMPARE TO TEMPO VARIABLE
1080-   D0 04   1300          BNE RETN     :IF NOT TIMED OUT, RETURN
1082-   85 EC   1310     0CNT STA *CNTR    :TIMED OUT - ZERO COUNTER
1084-   F0 EC   1320          BEQ CONT     :BRANCH ALWAYS TO PLAY, ETC.
1086-   60      1330     RETN RTS          :RETURN
                1340     :
                1350     :SINGLE STEP SUBROUTINE
                1360     :
                1370     :         **
1087-   A9 86   1380     STEP LDA 86       :COMMAND LINK TO "RETN"
1089-   85 39   1390          STA *ACTN+01 :SET COMMAND LINK
108B-   D0 E5   1400          BNE CONT     :BRANCH ALWAYS TO PLAY, ETC.
                1410     :
                1420     :BACKSPACE SUBROUTINE
                1430     :
                1440     :         **
108D-   A9 96   1450     BACK LDA 96       :COMMAND LINK TO "NEXT"
108F-   85 39   1460          STA *ACTN+01 :SET COMMAND LINK
1091-   C6 E9   1470          DEC *PNTR    :SCORE POINTER BACK ONE
1093-   D0 DD   1480          BNE CONT     :GO PLAY SCORE, ETC.
1095-   60      1490          RTS          :AND RETURN
                1500     :         **
1096-   A9 86   1510     NEXT LDA 86       :COMMAND LINK TO "RETN"
1098-   85 39   1520          STA *ACTN+01 :SET COMMAND LINK
109A-   C6 E9   1530          DEC *PNTR    :SCORE POINTER BACK ONE
109C-   60      1540          RTS          :RETURN
                1550     :
                1560     :TEMPO
                1570     :
                1580     :         **
109D-   A9 A5   1590     TMP  LDA 0A5      :COMMAND LINK TO "NXT2"
109F-   85 39   1600          STA *ACTN+01 :SET COMMAND LINK
10A1-   A9 00   1610          LDA 00       :INITIALIZE TEMPO COUNTER
10A3-   85 EA   1620          STA *TMPO    :AND START COUNTIN
10A5-   E6 EA   1630     NXT2 INC *TMPO    :UNTIL NEXT COMMAND
10A7-   60      1640          RTS          :RETURN
                1650     :
                1660     :SET UP FOR TAPE TRANSFER
                1670     :
10A8-   A2 07   1680     STTP LDX 07       :TRANSFER SEVEN BYTES
10AA-   B5 D1   1690     STP  LDA *TAPE,X  :GET PARAMETER
10AC-   95 F0   1700          STA *BUFF,X  :PLACE PARAMETER
10AE-   CA      1710          DEX          :POINT TO NEXT
10AF-   D0 F9   1720          BNE STP      :LOOP UNTIL ALL TRANSFERED
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10B1-    60            1730        RTS           :THEN RETURN
                       1740    :
                       1750    :TAPE IN AND OUT ROUTINES
                       1760    :
10B2-    20 A8 10      1770    TOUT JSR STTP      :SET UP PARAMETERS
10B5-    A9 DD         1780        LDA #DD        :SET DUMP "SWITCH"
10B7-    D0 05         1790        BNE DO         :BRANCH ALWAYS
10B9-    20 A8 10      1800    TIN  JSR STTP      :SET UP PARAMETERS
10BC-    A9 11         1810        LDA #11        :SET LOAD "SWITCH"
10BE-    20 25 0E      1820    DO   JSR SNBT      :TURN ON RELAYS
10C1-    20 AA 0E      1830        JSR CASS       :DO CASSETTE ROUTINE
                       1840    :        **
10C4-    A9 86         1850        LDA #86        :COMMAND LINK TO "RETN"
10C6-    85 39         1860        STA *ACTN+01   :SET LINK
10C8-    18            1870        CLC            :PREPARE FOR BEEP
10C9-    20 22 0F      1880        JSR BEEP       :TURN OFF RELAYS AND BEEP
10CC-    60            1890        RTS            :AND RETURN
                       1900    :
                       1910    :STROBE DRUM EFFECT
                       1920    :
10CD-    C6 E9         1930    STRB DEC *PNTR     :PREPARE TO GET SAME DRUM
10CF-    4C 72 10      1940        JMP CONT       :PLAY DRUM
                       1950    :
                       1960    :
                       1970    :
                       1980    :
                       1990    END  . EN
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NOTES