```
SOURCE FILE: PHSRMIDI.SC0
SOURCE FILE: PHSRMIDI.SC1
SOURCE FILE: PHSRMIDI.SC2
0000:            1 ; PHASOR MIDI IN TONE GENERATOR
0000:            2 ;
----- NEXT OBJECT FILE NAME IS PHSRMIDI.OBJ
6000:            3                               ORG $6000
6000:            4 ;
6500:            5 PITCHLO      EQU       $6500           ;LOAD MIDI NOTE # TO P
ITCH MAP HERE
6580:            6 PITCHHI      EQU       $6580
C000:            7 APPLEKBD EQU $C000
C010:            8 KBDSTROB EQU $C010
6000:            9 ;
6000:           10 ; PASSPORT MIDI CONFIGURED FOR SLOT 2
6000:           11 ;
C0A8:           12 PPMIDICR EQU $C0A8               ; CONTROL REGISTER
C0A9:           13 PPMIDIDR EQU $C0A9               ; DATA REGISTER
6000:           14 ;
6000:           15 ; PHASOR CONFIGURED FOR SLOT 4:
6000:           16 ;
C0CD:           17 PHTRIG                  EQU $C0CD           ; INIT
C493:           18 PHRES1                  EQU $C493           ; RESET 1
C492:           19 PHRES2                  EQU $C492           ; RESET 2
C411:           20 CHIPAC                  EQU $C411           ; CHIP A CONTROL R
EGISTER
C410:           21 CHIPAD                  EQU $C410           ; CHIP A DATA REGI
STER
C481:           22 CHIPBC                  EQU $C481           ; CHIP B CONTROL R
EGISTER
C480:           23 CHIPBD                  EQU $C480           ; CHIP B DATA REGI
STER
6000:           24 ;
2000:           25 MIDIQ                    EQU $2000           ;256 BYTE CIRCULA
R QUEUE FOR MIDI DATA
C061:           26 BUTTON0      EQU       $C061           ;BUTTON 0 + NUMBER TO
MUTE A MIDI CHANNEL
C062:           27 BUTTON1      EQU       $C062           ;BUTTON 1 + NUMBER TO
SOLO A MIDI CHANNEL
6000:           28 ;
6000:4C A1 60   29                              JMP MAIN            ;INITIALIZE
CARDS
6003:4C 55 63   30                              JMP CHKMIDI         ;SEND MIDI I
N DATA TO PHASOR
6006:4C CF 60   31                              JMP PANIC           ;ALL PHASOR
SOUNDS OFF
6009:4C A8 60   32                              JMP TSTNOTON        ;FOR TESTING
 PHASOR NOTE ALLOCATION DIRECTLY
600C:4C B1 60   33                              JMP TSTNOTOF
600F:4C 15 63   34                              JMP PSPTMID1        ;TEST PROCES
SING A QUEUE OF MIDI BYTES
6012:4C 6B 64   35                              JMP TESTPSPT        ;TEST GRABBI
NG MIDI IN DATA FROM PASSPORT CARD
6015:           36 ;                            ;QUEUE GROWS AT THE TAIL, SHORTE
NS AT THE HEAD
6015:00         37 MQHEAD                  DFB $00             ;POINTS TO NEXT MI
DI BYTE TO BE PROCESSED
6016:00         38 MQTAIL                  DFB $00             ;POINTS TO BYTE AF
TER TAIL OF QUEUE
6017:           39 ;                            ;QUEUE IS EMPTY WHEN MQHEAD = MQ
TAIL
6017:           40 ;
6017:           41 ; MIDI CHANNELS TO SOLO OR MUTE:
6017:00         42 SOLOCHNL DFB $00                                     ;$80 +
```

```
 CHANNEL NUMBER TO SOLO
6018:00 00 00   43 MUTECHNL DFB $00,$00,$00,$00,$00,$00,$00,$00     ;SET HI BIT
TO MUTE CHANNEL
601B:00 00 00
601E:00 00
6020:00 FF 00   44                              DFB $00,$FF,$00,$00,$00,$00,$00,
$00     ;MUTE DRUMS ON CHNL 10
6023:00 00 00
6026:00 00
6028:           45 ;
6028:00 00 00   46 NOTESON      DFB       $00,$00,$00,$00,$00,$00,$00,$00,$00,$0
0,$00,$00
602B:00 00 00
602E:00 00 00
6031:00 00 00
6034:           47 ;                            ; WHICH MIDI NOTES ARE ON FOR EA
CH PHASOR VOICE
6034:           48 ;
6034:00 00 00   49 NOTEVELS DFB $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
6037:00 00 00
603A:00 00 00
603D:00 00 00
6040:           50 ;                            ; VELOCITIES FOR EACH VOICE PLAY
ING
6040:           51 ;
6040:           52 ; INTERNAL VARIABLES - NOT FOR EXTERNAL USE
6040:FF         53 MIDIPHAS DFB $FF                   ;STATE MACHINE PHASE. FF=A
WAITING COMMAND
6041:80         54 MIDISTS      DFB       $80             ;BYTES FOR MIDI SHORT
MESSAGES STORED HERE
6042:00         55 MIDIDAT1 DFB $00
6043:00         56 MIDIDAT2 DFB $00
6044:00         57 FREESLOT DFB $00                   ;FIRST FREE ELEMENT IN NOT
ESON AND NOTEVELS
6045:           58 ;
6045:           59 ;                            ;MAP 12 PHASOR VOICES TO CHIPS A
ND REGISTERS
6045:01 01 01   60 CHIPNUM      DFB       $01,$01,$01,$02,$02,$02,$03,$03,$03,$0
4,$04,$04
6048:02 02 02
604B:03 03 03
604E:04 04 04
6051:08 09 0A   61 VOFFSET      DFB       $08,$09,$0A,$08,$09,$0A,$08,$09,$0A,$0
8,$09,$0A
6054:08 09 0A
6057:08 09 0A
605A:08 09 0A
605D:00 02 04   62 NOFFSET      DFB       $00,$02,$04,$00,$02,$04,$00,$02,$04,$0
0,$02,$04
6060:00 02 04
6063:00 02 04
6066:00 02 04
6069:           63 ;
6069:           64 ;                            ; PHASOR SOUND REGISTER DATA FOR
 EACH CHIP
6069:F4 00 C1   65 CHIP1PRM DFB $F4,$00,$C1,$00,$A3,$00,$00,$38,$00,$00,$00,$00,
$00,$00
606C:00 A3 00
606F:00 38 00
6072:00 00 00
6075:00 00
6077:F4 00 C1   66 CHIP2PRM DFB $F4,$00,$C1,$00,$A3,$00,$00,$38,$00,$00,$00,$00,
$00,$00
607A:00 A3 00
607D:00 38 00
6080:00 00 00
```

```
6083:00 00
6085:F4 00 C1   67 CHIP3PRM DFB $F4,$00,$C1,$00,$A3,$00,$00,$38,$00,$00,$00,$00,
$00,$00
6088:00 A3 00
608B:00 38 00
608E:00 00 00
6091:00 00
6093:F4 00 C1   68 CHIP4PRM DFB $F4,$00,$C1,$00,$A3,$00,$00,$38,$00,$00,$00,$00,
$00,$00
6096:00 A3 00
6099:00 38 00
609C:00 00 00
609F:00 00
60A1:           69 ;
60A1:20 B7 60   70 MAIN                     JSR INITPHSR
60A4:20 D9 62   71                          JSR INITMIDI
60A7:60         72                           RTS
60A8:           73 ;
60A8:AE 42 60   74 TSTNOTON LDX MIDIDAT1
60AB:AC 43 60   75                          LDY MIDIDAT2
60AE:4C 1A 62   76                          JMP NOTEON
60B1:           77 ;
60B1:AE 42 60   78 TSTNOTOF LDX MIDIDAT1
60B4:4C D8 61   79                          JMP NOTEOFF
60B7:           80 ;
60B7:2C CD C0   81 INITPHSR BIT PHTRIG            ; INIT AND RESET
60BA:A9 FF      82                          LDA #$FF
60BC:8D 93 C4   83                          STA PHRES1
60BF:8D 92 C4   84                          STA PHRES2
60C2:20 5C 61   85                          JSR PHPLAY1         ; INIT ALL S
OUND REGISTERS
60C5:20 7B 61   86                          JSR PHPLAY2
60C8:20 9A 61   87                          JSR PHPLAY3
60CB:20 B9 61   88                          JSR PHPLAY4
60CE:60         89                           RTS
60CF:           90 ;
60CF:20 6B 61   91 PANIC                  JSR PHSTOP1         ;STOP ALL SOUNDS
60D2:20 8A 61   92                          JSR PHSTOP2
60D5:20 A9 61   93                          JSR PHSTOP3
60D8:20 C8 61   94                          JSR PHSTOP4
60DB:60         95                           RTS
60DC:           96 ;
60DC:8A         97 PHSROUT1 TXA                         ;CHIP 1: X = REGISTER
Y=DATA
60DD:8D 11 C4   98                          STA CHIPAC
60E0:A9 0F      99                          LDA #$0F
60E2:8D 10 C4  100                          STA CHIPAD
60E5:A9 0C     101                          LDA #$0C
60E7:8D 10 C4  102                          STA CHIPAD
60EA:98        103                           TYA
60EB:8D 11 C4  104                          STA CHIPAC
60EE:A9 0E     105                          LDA #$0E
60F0:8D 10 C4  106                          STA CHIPAD
60F3:A9 0C     107                          LDA #$0C
60F5:8D 10 C4  108                          STA CHIPAD
60F8:20 E9 62  109                          JSR QUEUMIDI        ;CHECK FOR A
NY MIDI MESSAGES BEFORE EXIT
60FB:60        110                           RTS
60FC:8A        111 PHSROUT2 TXA                         ;CHIP 2: X = REGISTER
Y=DATA
60FD:8D 11 C4  112                          STA CHIPAC
6100:A9 17     113                          LDA #$17
6102:8D 10 C4  114                          STA CHIPAD
6105:A9 14     115                          LDA #$14
6107:8D 10 C4  116                          STA CHIPAD
610A:98        117                           TYA
```

```
610B:8D 11 C4  118                              STA CHIPAC
610E:A9 16     119                              LDA #$16
6110:8D 10 C4  120                              STA CHIPAD
6113:A9 14     121                              LDA #$14
6115:8D 10 C4  122                              STA CHIPAD
6118:20 E9 62  123                              JSR QUEUMIDI        ;CHECK FOR A
NY MIDI MESSAGES BEFORE EXIT
611B:60        124                               RTS
611C:8A        125 PHSROUT3 TXA                          ;CHIP 3
611D:8D 81 C4  126                              STA CHIPBC
6120:A9 0F     127                              LDA #$0F
6122:8D 80 C4  128                              STA CHIPBD
6125:A9 0C     129                              LDA #$0C
6127:8D 80 C4  130                              STA CHIPBD
612A:98        131                               TYA
612B:8D 81 C4  132                              STA CHIPBC
612E:A9 0E     133                              LDA #$0E
6130:8D 80 C4  134                              STA CHIPBD
6133:A9 0C     135                              LDA #$0C
6135:8D 80 C4  136                              STA CHIPBD
6138:20 E9 62  137                              JSR QUEUMIDI        ;CHECK FOR A
NY MIDI MESSAGES BEFORE EXIT
613B:60        138                               RTS
613C:8A        139 PHSROUT4 TXA                          ;CHIP 4
613D:8D 81 C4  140                              STA CHIPBC
6140:A9 17     141                              LDA #$17
6142:8D 80 C4  142                              STA CHIPBD
6145:A9 14     143                              LDA #$14
6147:8D 80 C4  144                              STA CHIPBD
614A:98        145                               TYA
614B:8D 81 C4  146                              STA CHIPBC
614E:A9 16     147                              LDA #$16
6150:8D 80 C4  148                              STA CHIPBD
6153:A9 14     149                              LDA #$14
6155:8D 80 C4  150                              STA CHIPBD
6158:20 E9 62  151                              JSR QUEUMIDI        ;CHECK FOR A
NY MIDI MESSAGES BEFORE EXIT
615B:60        152                               RTS
615C:          153 ;
615C:A2 00     154 PHPLAY1      LDX       #$00
615E:BD 69 60  155 PARMOUT1 LDA CHIP1PRM,X
6161:A8        156                               TAY
6162:20 DC 60  157                              JSR PHSROUT1
6165:E8        158                               INX
6166:E0 0E     159                              CPX #$0E
6168:90 F4     160                              BCC PARMOUT1
616A:60        161                               RTS
616B:A2 08     162 PHSTOP1      LDX       #$08
616D:A0 00     163                              LDY #$00
616F:20 DC 60  164                              JSR PHSROUT1
6172:E8        165                               INX
6173:20 DC 60  166                              JSR PHSROUT1
6176:E8        167                               INX
6177:20 DC 60  168                              JSR PHSROUT1
617A:60        169                               RTS
617B:          170 ;
617B:A2 00     171 PHPLAY2      LDX       #$00
617D:BD 77 60  172 PARMOUT2 LDA CHIP2PRM,X
6180:A8        173                               TAY
6181:20 FC 60  174                              JSR PHSROUT2
6184:E8        175                               INX
6185:E0 0E     176                              CPX #$0E
6187:90 F4     177                              BCC PARMOUT2
6189:60        178                               RTS
618A:A2 08     179 PHSTOP2      LDX       #$08
618C:A0 00     180                              LDY #$00
```

```
618E:20 FC 60  181                                  JSR PHSROUT2
6191:E8        182                                   INX
6192:20 FC 60  183                                  JSR PHSROUT2
6195:E8        184                                   INX
6196:20 FC 60  185                                  JSR PHSROUT2
6199:60        186                                   RTS
619A:          187 ;
619A:A2 00     188 PHPLAY3      LDX       #$00
619C:BD 85 60  189 PARMOUT3 LDA CHIP3PRM,X
619F:A8        190                                   TAY
61A0:20 1C 61  191                                  JSR PHSROUT3
61A3:E8        192                                   INX
61A4:E0 0E     193                                  CPX #$0E
61A6:90 F4     194                                  BCC PARMOUT3
61A8:60        195                                   RTS
61A9:A2 08     196 PHSTOP3      LDX       #$08
61AB:A0 00     197                                  LDY #$00
61AD:20 1C 61  198                                  JSR PHSROUT3
61B0:E8        199                                   INX
61B1:20 1C 61  200                                  JSR PHSROUT3
61B4:E8        201                                   INX
61B5:20 1C 61  202                                  JSR PHSROUT3
61B8:60        203                                   RTS
61B9:          204 ;
61B9:A2 00     205 PHPLAY4      LDX       #$00
61BB:BD 93 60  206 PARMOUT4 LDA CHIP4PRM,X
61BE:A8        207                                   TAY
61BF:20 3C 61  208                                  JSR PHSROUT4
61C2:E8        209                                   INX
61C3:E0 0E     210                                  CPX #$0E
61C5:90 F4     211                                  BCC PARMOUT4
61C7:60        212                                   RTS
61C8:A2 08     213 PHSTOP4      LDX       #$08
61CA:A0 00     214                                  LDY #$00
61CC:20 3C 61  215                                  JSR PHSROUT4
61CF:E8        216                                   INX
61D0:20 3C 61  217                                  JSR PHSROUT4
61D3:E8        218                                   INX
61D4:20 3C 61  219                                  JSR PHSROUT4
61D7:60        220                                   RTS
61D8:          221 ;
61D8:8A        222 NOTEOFF                TXA       ; X=MIDI NOTE NUMBER
61D9:A8        223                                   TAY
61DA:A2 0B     224                                  LDX #$0B
61DC:20 E9 62  225 FINDNOTE JSR QUEUMIDI            ;CHECK FOR NEW MIDI EACH TIME T
HRU LOOP
61DF:DD 28 60  226                                  CMP NOTESON,X
61E2:F0 08     227                                  BEQ FOUNDN
61E4:CA        228                                   DEX
61E5:10 F5     229                                  BPL FINDNOTE
61E7:E0 FF     230                                  CPX #$FF
61E9:D0 01     231                                  BNE FOUNDN
61EB:60        232                                   RTS                   ;NOTE OFF N
OTE # NOT FOUND IN NOTES PLAYING
61EC:A9 00     233 FOUNDN                 LDA #$00
61EE:9D 28 60  234                                  STA NOTESON,X
61F1:9D 34 60  235                                  STA NOTEVELS,X
61F4:BD 45 60  236                                  LDA CHIPNUM,X
61F7:A8        237                                   TAY                   ;SELECT CHI
P THEN ZERO OUT VOLUME REGISTER
61F8:BD 51 60  238                                  LDA VOFFSET,X
61FB:AA        239                                   TAX                   ;X=REGISTER
 8, 9, OR A
61FC:C0 01     240                                  CPY #$01
61FE:D0 05     241                                  BNE OFFCHIP2
6200:A0 00     242                                  LDY #$00
```

```
6202:4C DC 60  243                              JMP PHSROUT1
6205:C0 02     244 OFFCHIP2 CPY #$02
6207:D0 05     245                              BNE OFFCHIP3
6209:A0 00     246                              LDY #$00
620B:4C FC 60  247                              JMP PHSROUT2
620E:C0 03     248 OFFCHIP3 CPY #$03
6210:D0 05     249                              BNE OFFCHIP4
6212:A0 00     250                              LDY #$00
6214:4C 1C 61  251                              JMP PHSROUT3
6217:4C 3C 61  252 OFFCHIP4 JMP PHSROUT4
621A:          253 ;
621A:98        254 NOTEON                TYA       ; X=MIDI NOTE NUMBER Y=MIDI
 VELOCITY (0-127)
621B:F0 BB     255                              BEQ NOTEOFF
621D:29 7F     256                              AND #$7F
621F:4A        257                              LSR A
6220:4A        258                              LSR A
6221:4A        259                              LSR A
6222:C9 00     260                              CMP #$00            ;PREVENT ZER
O VOLUME FOR VELOCITY < 8
6224:D0 02     261                              BNE NOTEON1
6226:A9 01     262                              LDA #$01
6228:48        263 NOTEON1               PHA                 ;CONVERT VEL TO 0-
15
6229:A9 FF     264                              LDA #$FF
622B:8D 44 60  265                              STA FREESLOT        ;FF IS SIGNA
L FOR NO FREE SLOTS
622E:8A        266                               TXA
622F:A2 0B     267                              LDX #$0B
6231:20 E9 62  268 CHKNOTE      JSR       QUEUMIDI        ;CHECK FOR NEW MIDI EA
CH TIME THRU LOOP
6234:DD 28 60  269                              CMP NOTESON,X
6237:F0 5A     270                              BEQ NOTEXIT         ;DONT STORE
NOTE IF ALREADY PLAYING ON ANY CHNL
6239:A8        271                               TAY
623A:BD 34 60  272                              LDA NOTEVELS,X      ;CHECK IF SL
OT IS FREE FOR A NEW NOTE
623D:D0 03     273                              BNE NOTFREE
623F:8E 44 60  274                              STX FREESLOT
6242:98        275 NOTFREE               TYA
6243:CA        276                               DEX
6244:10 EB     277                              BPL CHKNOTE         ;AFTER LOOP
WE KNOW WE HAVE A GOOD NOTE #
6246:AE 44 60  278                              LDX FREESLOT
6249:E0 FF     279                              CPX #$FF
624B:F0 46     280                              BEQ NOTEXIT         ;ALL VOICES
FULL, SUPPRESS ADDITIONAL NOTES
624D:9D 28 60  281                              STA NOTESON,X
6250:68        282                               PLA
6251:9D 34 60  283                              STA NOTEVELS,X
6254:48        284                               PHA                 ;PUSH VELOC
ITY
6255:BD 51 60  285                              LDA VOFFSET,X
6258:48        286                               PHA                 ;PUSH REGIS
TER NUMBER FOR VOLUME
6259:BD 28 60  287                              LDA NOTESON,X       ;GET MIDI NO
TE NUMBER IN Y
625C:A8        288                               TAY
625D:B9 80 65  289                              LDA PITCHHI,Y       ;PUSH PITCH
HI
6260:F0 25     290                              BEQ CHKZERO
6262:48        291 PNOTZERO PHA
6263:B9 00 65  292                              LDA PITCHLO,Y       ;PUSH PITCH
LO
6266:48        293                               PHA
6267:BD 5D 60  294                              LDA NOFFSET,X       ;PUSH REGIST
```

```
ER NUMBER FOR VOICE WITHIN CHIP IN X
626A:48        295                                PHA
626B:BD 45 60  296                                LDA CHIPNUM,X
626E:A8        297                                TAY                 ;SELECT CHI
P THEN POKE THE NOTE AND VOL REGISTERS
626F:C0 01     298                                CPY #$01
6271:D0 22     299                                BNE ONCHIP2
6273:68        300                                PLA
6274:AA        301                                TAX
6275:68        302                                PLA
6276:A8        303                                TAY
6277:20 DC 60  304                                JSR PHSROUT1
627A:E8        305                                INX
627B:68        306                                PLA
627C:A8        307                                TAY
627D:20 DC 60  308                                JSR PHSROUT1
6280:68        309                                PLA
6281:AA        310                                TAX
6282:68        311                                PLA
6283:A8        312                                TAY
6284:4C DC 60  313                                JMP PHSROUT1
6287:B9 00 65  314 CHKZERO      LDA       PITCHLO,Y       ;DONT STORE PITCH IF U
NUSED PART OF PITCH MAP
628A:F0 06     315                                BEQ ZEROEXIT
628C:B9 80 65  316                                LDA PITCHHI,Y
628F:4C 62 62  317                                JMP PNOTZERO
6292:68        318 ZEROEXIT PLA                           ;REMOVE 2 BYTES FROM S
TACK
6293:68        319 NOTEXIT                PLA                 ;REMOVE BYTE THAT
WAS PUSHED BEFORE RTS
6294:60        320                                RTS
6295:          321                                CHN PHSRMIDI.SC1
6295:            1 ; PHASOR MIDI IN TONE GENERATOR - SOURCE 1
6295:            2 ;
6295:C0 02       3 ONCHIP2      CPY       #$02
6297:D0 14       4                                BNE ONCHIP3
6299:68          5                                PLA
629A:AA          6                                TAX
629B:68          7                                PLA
629C:A8          8                                TAY
629D:20 FC 60    9                                JSR PHSROUT2
62A0:E8         10                                INX
62A1:68         11                                PLA
62A2:A8         12                                TAY
62A3:20 FC 60   13                                JSR PHSROUT2
62A6:68         14                                PLA
62A7:AA         15                                TAX
62A8:68         16                                PLA
62A9:A8         17                                TAY
62AA:4C FC 60   18                                JMP PHSROUT2
62AD:C0 03      19 ONCHIP3      CPY       #$03
62AF:D0 14      20                                BNE ONCHIP4
62B1:68         21                                PLA
62B2:AA         22                                TAX
62B3:68         23                                PLA
62B4:A8         24                                TAY
62B5:20 1C 61   25                                JSR PHSROUT3
62B8:E8         26                                INX
62B9:68         27                                PLA
62BA:A8         28                                TAY
62BB:20 1C 61   29                                JSR PHSROUT3
62BE:68         30                                PLA
62BF:AA         31                                TAX
62C0:68         32                                PLA
62C1:A8         33                                TAY
62C2:4C 1C 61   34                                JMP PHSROUT3
```

```
62C5:68         35 ONCHIP4                  PLA
62C6:AA         36                           TAX
62C7:68         37                           PLA
62C8:A8         38                           TAY
62C9:20 3C 61   39                          JSR PHSROUT4
62CC:E8         40                           INX
62CD:68         41                           PLA
62CE:A8         42                           TAY
62CF:20 3C 61   43                          JSR PHSROUT4
62D2:68         44                           PLA
62D3:AA         45                           TAX
62D4:68         46                           PLA
62D5:A8         47                           TAY
62D6:4C 3C 61   48                          JMP PHSROUT4
62D9:           49 ;
62D9:           50                          CHN PHSRMIDI.SC2
62D9:            1 ; PHASOR MIDI IN TONE GENERATOR - SOURCE 2
62D9:            2 ;
62D9:A9 13       3 INITMIDI LDA #$13
62DB:8D A8 C0    4                          STA PPMIDICR
62DE:A9 11       5                          LDA #$11
62E0:8D A8 C0    6                          STA PPMIDICR
62E3:A9 FF       7                          LDA #$FF
62E5:8D 40 60    8                          STA MIDIPHAS        ; INITIAL PH
ASE = WAITING FOR A MIDI COMMAND
62E8:60          9                           RTS
62E9:           10 ;                        ;TO AVOID MIDI DATA LOSS,
62E9:           11 ;                        ;QUEUMIDI MUST BE CALLED EVERY 2
40 MICROSEC
62E9:48         12 QUEUMIDI PHA
62EA:98         13                           TYA
62EB:48         14                           PHA
62EC:AD A8 C0   15 QUEUCHK      LDA       PPMIDICR
62EF:29 01      16                          AND #$01
62F1:F0 1A      17                          BEQ QUEUEXIT
62F3:AD A9 C0   18                          LDA PPMIDIDR
62F6:C9 F8      19                          CMP #$F8
62F8:B0 F2      20                          BCS QUEUCHK         ;REALTIME MS
GS MAY OCCUR ANYWHERE IN STREAM
62FA:AC 16 60   21                          LDY MQTAIL
62FD:99 00 20   22                          STA MIDIQ,Y
6300:EE 16 60   23                          INC MQTAIL
6303:AD 16 60   24                          LDA MQTAIL
6306:CD 15 60   25                          CMP MQHEAD
6309:F0 06      26                          BEQ QFULL
630B:D0 DF      27                          BNE QUEUCHK         ;CHECK IF AN
Y MORE BYTES AVAILABLE BEFORE EXIT
630D:68         28 QUEUEXIT PLA
630E:A8         29                           TAY
630F:68         30                           PLA
6310:60         31                           RTS
6311:68         32 QFULL                      PLA                ;256 MIDI BYTES
RECEIVED BEFORE ANY PROCESSED
6312:A8         33                           TAY
6313:68         34                           PLA
6314:00         35                           BRK
6315:           36 ;
6315:AD 16 60   37 PSPTMID1 LDA MQTAIL          ;IF QUEUE EMPTY, LOOP UNTIL M
IDI BYTES RECEIVED
6318:CD 15 60   38                          CMP MQHEAD
631B:F0 32      39                          BEQ PSPTLOOP
631D:AD 15 60   40                          LDA MQHEAD          ; GET A BYTE
 FROM QUEUE
6320:AA         41                           TAX
6321:EE 15 60   42                          INC MQHEAD
6324:BD 00 20   43 PSPTEXIT LDA MIDIQ,X       ; RETURN MIDI BYTE TO CALLER
```

```
6327:10 10      44                              BPL NOTSTSB
6329:8D 41 60   45                              STA MIDISTS         ;HANDLE PHAS
ING FOR STATUS MESSAGES
632C:C9 A0      46                              CMP #$A0
632E:B0 10      47                              BCS PSPTA0
6330:C9 90      48                              CMP #$90
6332:B0 06      49                              BCS PSPT91
6334:A9 81      50                              LDA #$81
6336:8D 40 60   51 NEXTPHAS STA MIDIPHAS
6339:60         52 NOTSTSB                  RTS
633A:A9 91      53 PSPT91                   LDA #$91
633C:8D 40 60   54                              STA MIDIPHAS
633F:60         55                               RTS
6340:C9 F0      56 PSPTA0                   CMP #$F0
6342:90 05      57                              BCC PSPTA1
6344:A9 FF      58                              LDA #$FF            ; MESSAGE BE
TWEEN F0 AND F7 - WAIT FOR STS BYTE
6346:8D 40 60   59                              STA MIDIPHAS        ; CURRENTLY
IGNORING SYSEX AND COMMON MESSAGES
6349:A9 A1      60 PSPTA1                   LDA #$A1
634B:8D 40 60   61                              STA MIDIPHAS
634E:60         62                               RTS
634F:20 E9 62   63 PSPTLOOP JSR QUEUMIDI
6352:4C 15 63   64                              JMP PSPTMID1
6355:20 9E 63   65 CHKMIDI      JSR        GETMIDI
6358:20 5E 63   66                              JSR CHKBUTTN
635B:4C 55 63   67                              JMP CHKMIDI
635E:2C 61 C0   68 CHKBUTTN BIT BUTTON0
6361:30 06      69                              BMI MUTE
6363:2C 62 C0   70                              BIT BUTTON1
6366:30 1E      71                              BMI SOLO
6368:60         72                               RTS
6369:AD 00 C0   73 MUTE                       LDA APPLEKBD
636C:10 17      74                              BPL NOKEY
636E:2C 10 C0   75                              BIT KBDSTROB
6371:C9 B0      76                              CMP #´0´
6373:90 10      77                              BCC NOKEY
6375:C9 B9      78                              CMP #´9´
6377:B0 0C      79                              BCS NOKEY
6379:38         80                               SEC
637A:E5 B0      81                              SBC ´0´
637C:8D 18 60   82                              STA MUTECHNL
637F:A9 FF      83                              LDA #$FF            ;TOGGLING MU
TE DISABLES SOLO MODE
6381:8D 17 60   84                              STA SOLOCHNL
6384:00         85                               BRK
6385:60         86 NOKEY                    RTS
6386:AD 00 C0   87 SOLO                       LDA APPLEKBD
6389:10 FA      88                              BPL NOKEY
638B:2C 10 C0   89                              BIT KBDSTROB
638E:C9 B0      90                              CMP #´0´
6390:90 F3      91                              BCC NOKEY
6392:C9 B9      92                              CMP #´9´
6394:B0 EF      93                              BCS NOKEY
6396:38         94                               SEC
6397:E9 B0      95                              SBC #´0´
6399:8D 17 60   96                              STA SOLOCHNL
639C:00         97                               BRK
639D:60         98                               RTS
639E:AD 40 60   99 GETMIDI      LDA        MIDIPHAS
63A1:C9 91     100                              CMP #$91
63A3:F0 76     101                              BEQ GETDAT1         ;GET FIRST D
ATA BYTE OF NOTE ON
63A5:C9 81     102                              CMP #$81
63A7:F0 72     103                              BEQ GETDAT1         ;GET FIRST D
ATA BYTE OF NOTE OFF
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```
63A9:C9 92     104                              CMP #$92
63AB:F0 7A     105                              BEQ GETDAT2         ;GET 2ND DAT
A BYTE OF NOTE ON OR NOTE OFF MESSAGE
63AD:C9 A1     106                              CMP #$A1            ;SOLO OR MUT
E - EAT NEXT 2 DATA BYTES
63AF:F0 4C     107                              BEQ EATDAT1
63B1:C9 A2     108                              CMP #$A2
63B3:F0 51     109                              BEQ EATDAT2         ;NON-NOTE ME
SSAGE - EAT 2ND DATA BYTE
63B5:C9 90     110                              CMP #$90
63B7:D0 06     111                              BNE GETMIDI1        ;PROCESS STA
TUS BYTE WHEN NOT RUNNING STATUS
63B9:AD 41 60  112                              LDA MIDISTS         ;PHASE 90 -
CHECK MIDI BYTE
63BC:4C C2 63  113                              JMP SKIPMIDI
63BF:20 15 63  114 GETMIDI1 JSR PSPTMID1         ;PHASE FF - GET MIDI BYTE
63C2:C9 80     115 SKIPMIDI CMP #$80
63C4:90 8F     116                              BCC CHKMIDI
63C6:C9 A0     117                              CMP #$A0
63C8:B0 2B     118                              BCS NOTNOTE
63CA:C9 90     119                              CMP #$90
63CC:B0 06     120                              BCS SETPH91
63CE:A9 81     121                              LDA #$81
63D0:8D 40 60  122                              STA MIDIPHAS
63D3:60        123                               RTS
63D4:AD 41 60  124 SETPH91      LDA       MIDISTS
63D7:29 0F     125                              AND #$0F
63D9:AA        126                               TAX
63DA:2C 17 60  127                              BIT SOLOCHNL
63DD:30 0B     128                              BMI SOLOING
63DF:BD 18 60  129                              LDA MUTECHNL,X
63E2:D0 0B     130                              BNE MUTING
63E4:A9 91     131 PHAS91                   LDA #$91
63E6:8D 40 60  132                              STA MIDIPHAS
63E9:60        133                               RTS
63EA:EC 17 60  134 SOLOING      CPX       SOLOCHNL
63ED:F0 F5     135                              BEQ PHAS91
63EF:A9 A1     136 MUTING                   LDA #$A1
63F1:8D 40 60  137                              STA MIDIPHAS
63F4:60        138                               RTS
63F5:C9 C0     139 NOTNOTE      CMP       #$C0
63F7:90 16     140                              BCC NOTPC
63F9:C9 D0     141                              CMP #$D0
63FB:B0 12     142                              BCS NOTPC
63FD:20 15 63  143 EATDAT1      JSR       PSPTMID1        ;SOLO OR MUTE, AND NOT
 PLAYING THIS MESSAGE
6400:A9 A2     144                              LDA #$A2
6402:8D 40 60  145                              STA MIDIPHAS
6405:60        146                               RTS
6406:20 15 63  147 EATDAT2      JSR       PSPTMID1        ;PROGRAM CHANGE HAS 1
DATA BYTE
6409:A9 FF     148                              LDA #$FF
640B:8D 40 60  149                              STA MIDIPHAS
640E:60        150                               RTS
640F:8D 41 60  151 NOTPC                     STA MIDISTS
6412:20 15 63  152                              JSR PSPTMID1        ;OTHER MIDI
MESSAGES HAVE 2 DATA BYTES
6415:A9 A2     153                              LDA #$A2
6417:8D 40 60  154                              STA MIDIPHAS
641A:60        155                               RTS
641B:20 15 63  156 GETDAT1      JSR       PSPTMID1
641E:8D 42 60  157                              STA MIDIDAT1
6421:A9 92     158                              LDA #$92
6423:8D 40 60  159                              STA MIDIPHAS
6426:60        160                               RTS
6427:20 15 63  161 GETDAT2      JSR       PSPTMID1
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```
642A:8D 43 60  162                                STA MIDIDAT2
642D:A9 FF     163                                LDA #$FF
642F:8D 40 60  164                                STA MIDIPHAS
6432:AD 43 60  165                                LDA MIDIDAT2
6435:F0 13     166                                BEQ DONOTOFF
6437:AD 41 60  167                                LDA MIDISTS
643A:C9 90     168                                CMP #$90
643C:90 0C     169                                BCC DONOTOFF
643E:          170 ;
643E:AE 42 60  171 DONOTEON LDX MIDIDAT1
6441:AC 43 60  172                                LDY MIDIDAT2
6444:20 1A 62  173                                JSR NOTEON
6447:4C 50 64  174                                JMP NEXTBYTE
644A:AE 42 60  175 DONOTOFF LDX MIDIDAT1
644D:20 D8 61  176                                JSR NOTEOFF
6450:20 15 63  177 NEXTBYTE JSR PSPTMID1
6453:10 0B     178                                BPL SETRUNNG
6455:8D 41 60  179                                STA MIDISTS
6458:A9 90     180                                LDA #$90
645A:8D 40 60  181                                STA MIDIPHAS
645D:4C 55 63  182                                JMP CHKMIDI
6460:8D 42 60  183 SETRUNNG STA MIDIDAT1
6463:A9 92     184                                LDA #$92
6465:8D 40 60  185                                STA MIDIPHAS
6468:4C 55 63  186                                JMP CHKMIDI
646B:          187 ;
646B:AD A8 C0  188 TESTPSPT LDA PPMIDICR          ;TEST GRABBING MIDI BYTES AS FA
ST AS POSSIBLE
646E:29 01     189                                AND #$01
6470:F0 F9     190                                BEQ TESTPSPT
6472:AD A9 C0  191                                LDA PPMIDIDR
6475:C9 F8     192                                CMP #$F8
6477:B0 F2     193                                BCS TESTPSPT
6479:8D 00 20  194 SELFMOD      STA       $2000
647C:EE 7A 64  195                                INC SELFMOD+1
647F:AD 7A 64  196                                LDA SELFMOD+1
6482:D0 E7     197                                BNE TESTPSPT
6484:EE 7B 64  198                                INC SELFMOD+2
6487:AD 7B 64  199                                LDA SELFMOD+2
648A:C9 60     200                                CMP #$60
648C:D0 DD     201                                BNE TESTPSPT
648E:00        202                                 BRK
648F:          203 ;

*** SUCCESSFUL ASSEMBLY: NO ERRORS
```

C000 APPLEKBD
C061 BUTTON0
C062 BUTTON1
6069 CHIP1PRM
6077 CHIP2PRM
6085 CHIP3PRM
6093 CHIP4PRM
C411 CHIPAC
C410 CHIPAD
C481 CHIPBC
C480 CHIPBD
6045 CHIPNUM
635E CHKBUTTN
6355 CHKMIDI
6231 CHKNOTE
6287 CHKZERO
?643E DONOTEON
644A DONOTOFF
63FD EATDAT1
6406 EATDAT2
61DC FINDNOTE
61EC FOUNDN
6044 FREESLOT
641B GETDAT1
6427 GETDAT2
63BF GETMIDI1
639E GETMIDI
62D9 INITMIDI
60B7 INITPHSR
C010 KBDSTROB
60A1 MAIN
6042 MIDIDAT1
6043 MIDIDAT2
6040 MIDIPHAS
2000 MIDIQ
6041 MIDISTS
6015 MQHEAD
6016 MQTAIL
6369 MUTE
6018 MUTECHNL
63EF MUTING
6450 NEXTBYTE
?6336 NEXTPHAS
605D NOFFSET
6385 NOKEY
61D8 NOTEOFF
6228 NOTEON1
621A NOTEON
6028 NOTESON
6034 NOTEVELS
6293 NOTEXIT
6242 NOTFREE
63F5 NOTNOTE
640F NOTPC
6339 NOTSTSB
6205 OFFCHIP2
620E OFFCHIP3
6217 OFFCHIP4
6295 ONCHIP2
62AD ONCHIP3
62C5 ONCHIP4
60CF PANIC
615E PARMOUT1
617D PARMOUT2
619C PARMOUT3
61BB PARMOUT4
63E4 PHAS91
615C PHPLAY1
617B PHPLAY2
619A PHPLAY3
61B9 PHPLAY4
C493 PHRES1
C492 PHRES2
60DC PHSROUT1
60FC PHSROUT2
611C PHSROUT3
613C PHSROUT4
616B PHSTOP1
618A PHSTOP2
61A9 PHSTOP3
61C8 PHSTOP4
C0CD PHTRIG
6580 PITCHHI
6500 PITCHLO
6262 PNOTZERO
C0A8 PPMIDICR
C0A9 PPMIDIDR
633A PSPT91
6340 PSPTA0
6349 PSPTA1
?6324 PSPTEXIT
634F PSPTLOOP
6315 PSPTMID1
6311 QFULL
62EC QUEUCHK
630D QUEUEXIT
62E9 QUEUMIDI
6479 SELFMOD
63D4 SETPH91
6460 SETRUNNG
63C2 SKIPMIDI
6017 SOLOCHNL
63EA SOLOING
6386 SOLO
646B TESTPSPT
60B1 TSTNOTOF
60A8 TSTNOTON
6051 VOFFSET
6292 ZEROEXIT

2000 MIDIQ
6015 MQHEAD
6016 MQTAIL
6017 SOLOCHNL
6018 MUTECHNL
6028 NOTESON
6034 NOTEVELS
6040 MIDIPHAS
6041 MIDISTS
6042 MIDIDAT1
6043 MIDIDAT2
6044 FREESLOT
6045 CHIPNUM
6051 VOFFSET
605D NOFFSET
6069 CHIP1PRM
6077 CHIP2PRM
6085 CHIP3PRM
6093 CHIP4PRM
60A1 MAIN
60A8 TSTNOTON
60B1 TSTNOTOF
60B7 INITPHSR
60CF PANIC
60DC PHSROUT1
60FC PHSROUT2
611C PHSROUT3
613C PHSROUT4
615C PHPLAY1
615E PARMOUT1
616B PHSTOP1
617B PHPLAY2
617D PARMOUT2
618A PHSTOP2
619A PHPLAY3
619C PARMOUT3
61A9 PHSTOP3
61B9 PHPLAY4
61BB PARMOUT4
61C8 PHSTOP4
61D8 NOTEOFF
61DC FINDNOTE
61EC FOUNDN
6205 OFFCHIP2
620E OFFCHIP3
6217 OFFCHIP4
621A NOTEON
6228 NOTEON1
6231 CHKNOTE
6242 NOTFREE
6262 PNOTZERO
6287 CHKZERO
6292 ZEROEXIT
6293 NOTEXIT
6295 ONCHIP2
62AD ONCHIP3
62C5 ONCHIP4
62D9 INITMIDI
62E9 QUEUMIDI
62EC QUEUCHK
630D QUEUEXIT
6311 QFULL
6315 PSPTMID1
?6324 PSPTEXIT
?6336 NEXTPHAS
6339 NOTSTSB
633A PSPT91
6340 PSPTA0
6349 PSPTA1
634F PSPTLOOP
6355 CHKMIDI
635E CHKBUTTN
6369 MUTE
6385 NOKEY
6386 SOLO
639E GETMIDI
63BF GETMIDI1
63C2 SKIPMIDI
63D4 SETPH91
63E4 PHAS91
63EA SOLOING
63EF MUTING
63F5 NOTNOTE
63FD EATDAT1
6406 EATDAT2
640F NOTPC
641B GETDAT1
6427 GETDAT2
?643E DONOTEON
644A DONOTOFF
6450 NEXTBYTE
6460 SETRUNNG
646B TESTPSPT
6479 SELFMOD
6500 PITCHLO
6580 PITCHHI
C000 APPLEKBD
C010 KBDSTROB
C061 BUTTON0
C062 BUTTON1
C0A8 PPMIDICR
C0A9 PPMIDIDR
C0CD PHTRIG
C410 CHIPAD
C411 CHIPAC
C480 CHIPBD
C481 CHIPBC
C492 PHRES2
C493 PHRES1