

To be run on MOS Technology 6502

1/11/77

UUUUUU	000000	HH	HH	NN	NN
UUUUUU	000000	HH	HH	NN	NN

DDDDDDDD	EEEEEEEEEE	NN	NN	KK	KK	EEEEEEEEEE	RRRRRRRR
DDDDDDDD	EEEEEEEEEE	NN	NN	KK	KK	EEEEEEEEEE	RRRRRRRR
DD	DD	EE	NN	NN	KK	KK	RR
DD	DD	EE	NN	NN	KK	KK	RR
DD	DD	EE	NNNN	NN	KK	KK	RR
DD	DD	EE	NNNN	NN	KK	KK	RR
DD	DD	EEEEEEEE	NN	NN	NN	KKKKKK	RRRRRRRR
DD	DD	EEEEEEEE	NN	NN	NN	KKKKKK	RRRRRRRR
DD	DD	EE	NN	NNNN	KK	KK	RR
DD	DD	EE	NN	NNNN	KK	KK	RR
DD	DD	EE	NN	NN	KK	KK	RR
DD	DD	EE	NN	NN	KK	KK	RR
DDDDDDDD	EEEEEEEEEE	NN	NN	KK	KK	EEEEEEEEEE	RR
DDDDDDDD	EEEEEEEEEE	NN	NN	KK	KK	EEEEEEEEEE	RR

```
*START* USER JOHN LENKER [26,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602.16 SYSTEM *START*
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*START* USER JOHN DENKER [26,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602,16 SYSTEM *START*
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*START* USER JOHN DENKER [25,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602,16 SYSTEM *START*
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*START* USER JOHN CENKER [26,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602.16 SYSTEM *START*
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*START* USER JOHN LENKER [25,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602.16 SYSTEM *SIART*
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*START* USER JOHN LENKER [26,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:20:35 MONITOR CALTECH 602,16 SYSTEM *START*
```

```

1
2
3
4 0000 # = 0
5 0000 00 .BYTE 0
6 0001 00 .BYTE 0
7 0002 00 WHC .BYTE 0
8 0003 00 LOCKER .BYTE 0
9 0004 00 OLDSW .BYTE 0
10 0005 00 TEMP .BYTE 0
11 0006 00 TRIALX .BYTE 0
12 0007 00 TRIALY .BYTE 0
13 0008 00 MAXX .BYTE 0
14 0009 00 .BYTE 0
15 000A 00 .BYTE 0
16 000B 00 .BYTE 0
17 000C 00 .BYTE 0
18 000D 00 .BYTE 0
19 000E 00 .BYTE 0
20 000F 00 .BYTE 0
21 0010 00 MANY .BYTE 0
22 0011 00 .BYTE 0
23 0012 00 .BYTE 0
24 0013 00 .BYTE 0
25 0014 00 .BYTE 0
26 0015 00 .BYTE 0
27 0016 00 .BYTE 0
28 0017 00 .BYTE 0
29 0018 00 BAR .BYTE 0
30 0019 00 .BYTE 0
31 001A 00 ODIST .BYTE 0
32 001B 00 OGEAR .BYTE 0
33 001C 00 MCYCLE .BYTE 0
34 001D 00 WSTER .BYTE 0
35 001E 00 TKLER .BYTE 0
36 001F 00 STATE .BYTE 0
37 0020 00 DEFH .BYTE 0
38 0021 00 DEFL .BYTE 0
39 0022 00 BLINKY .BYTE 0
40 0023 00 NOTE .BYTE 0
41 0024 00 RATE .BYTE 0
42 0025 00 TEMPOH .BYTE 0
43 0026 00 TEMPOL .BYTE 0
44 0027 00 DOWN .BYTE 0
45 0028 00 TOGO .BYTE 0
46 0029 00 LOS .BYTE 0
47 002A 00 POSS .BYTE 0
48 002B 00 SLEFT .BYTE 0
49 002C 00 SRIGHT .BYTE 0
50 002D 00 JUMPER .BYTE 0
51 002E 00 .BYTE 0
52 002F 00 BPTIME .BYTE 0
  
```

```

1
10CARD # LOC CODE CARD
53 0030 00 NPOSS .BYTE 0
54 0031 00 TIMEL .BYTE 0
55 0032 00 TIVER .BYTE 0
56 0033 00 TIMEYL .BYTE 0
  
```



```

57 0034 00 TIMEYH .BYTE 0
58 0035 00 BUZZY .BYTE 0
59 0036 00 BZTIME .BYTE 0
60 0037 00 LOSFIX .BYTE 0
61 0038 00 BUTTON .BYTE 0
62 0039 00 WHOM .BYTE 0
63 003A 00 .BYTE 0
64 003B 00 .BYTE 0
65 003C 00 .BYTE 0
66 003D 00 .BYTE 0
67 003E 00 .BYTE 0
68
69 ; MAIN
70 ;
71 ; HERE TO GO TO START THE PROGRAM
72 ;
73 003F * = $0200
74 0200 78 MAIN SETI ;PROTECT OURSELVES
75 0201 20 0B 02 JSR SETIO ;SET UP PIA, VECTORS, ETC.
76 0204 20 19 02 JSR SETVAR ;SET UP IMPURE DATA BASE
77 0207 58 CLI
78 0208 4C 08 02 JMP * ;THIS IS THE ENTIRE BACKGROUND PROGRAM
79
80 ;
81 ; INITI HARDWARE
82 ; THIS ROUTINE USES A TABLE OF ADDRESSES AND DATA
83 ; TO ALL OF THE MIXED UP MEMORY REFERENCES
84 ; REQUIRED TO INIT A PIA
85 ;!!!!
86 ; OF COURSE IT WOULD BE POSSIBLE TO REPLACE THIS
87 ; WITH A LOT OF LDA#...STA... CODE
88 ;
89 020B A2 EA SETIO LDX #IOTAB ;TABLE OF DATA, ADDR1, ADDR2, DATA, ADDR1...
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
90 020D B5 00 SETIO LDA 0,X
91 020F E8 INX ;X NOW POINTS TO ADDR FOR THIS DATA
92 0210 81 00 STA (0,X) ;INDEXED, INDIRECT
93 0212 E8 INX
94 0213 E8 INX
95 0214 E0 EA CPX #IOTAB ;FIRST ADDR NOT IN TABLE
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
96 0216 00 F5 BNE SETIO
97 0218 60 RTS
98
99 ;
100 ; INITIALIZE VARIABLES
101 ; THIS USES A TABLE CONTAINING THE INITIAL VALUES
102 ; OF ALL THE VARIABLES (I.E. VARTAB, WHICH IS IN HIGHER MEMORY)

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```

1
0CARD # LOC CODE CARD
103 ; TO SET THE VALUES OF THE PAGE ZERO STUFF AT THE
104 ; START OF EACH GAME
105 ;
106 0219 A2 EA SETVAR LDX #NVAR
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
107 021B CA SETVL DEX
108 021C BC EA EA LDA VARTAB,X
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
109 021F 9D EA EA STA RAM0,X
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

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110 0222 E0 00      CPX      #0
111 0224 D0 F5      BNE      SETVL
112 0226 60         RTS
113
114
115      ; INTERRUPT SERVICE
116
117      ; THE REST OF THE PROGRAM RUNS IN THE FOREGROUND
118      ; IRQ IS CONNECTED TO THE TIMER IN THE 6530
119      ; CLOCK INTERRUPTS OCCUR AT 2 KHZ
120      ; (NMI IS NOT USED BY THE PROGRAM)
121 0227 EA EA EA    CLOCK      *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
122      ; WE START BY SAVING THE REGISTERS
123 022A 40         PHA
124 022B 8A         TXA
125 022C 40         PHA
126 022D 90         TYA
127 022E 40         PHA
128
129      ; NOW TO RETRIEVE THE OLD FLAGS AND CHECK FOR BRK BIT
130      ; THEY ARE BURIED SOMEWHERE IN THE STACK
131 022F BA         TSX
132 0230 E0         INX      ;ONE FOR Y
133 0231 E0         INX      ;ONE FOR X
134 0232 E0         INX      ;ONE FOR A
135 0233 E0         INX      ;AND ONE FOR CHUCK PEDDLE
136 0234 BD 00 01    LDA      $100,X ;STACK STARTS AT 100
137 0237 29 0A      AND      #10     ;BRK BIT
138 0239 D0 03      BNE      #+5
139 023B 4C 4D 02    JMP      CRASH   ;PROGRAM ERROR!!!!!!
140
141 023E A9 08      LDA      #8
142 0240 BD 76 03    STA      TIMER   ;APPROX 2 KHZ
143
144      ; NOW WE HAVE TAKEN CARE OF ALL THE OVERHEAD
145      ; LET'S GO DO SOME USEFUL WORK
146
147 0243 D8         CLD
148 0244 20 57 02    JSR      SERVE   ;DECIMAL MODE STINKS
149
150      ; PUT EVERYTHING BACK AS IT WAS

```

PAGE 4

CARD #	LOC	CODE	CARD
151	0247	68	PLA
152	0248	A0	TAY
153	0249	68	PLA
154	024A	AA	TAX
155	024B	68	PLA
156	024C	60	RTS
157			
158			
159			
160			
161			
162	024D	78	CRASH SEI
163	024E	20 E4 03	CRASHL JSR AUDIO
164	0251	20 EA EA	JSR WAIT
165	0254	4C 4E 02	JMP CRASHL

**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17


```

166
167
168 ; HERE ON EACH CLOCK TICK AFTER SAVING REGS
169
170 ; THE PROG IS DIVIDED INTO FIVE OR SIX MAJOR STATES
171 ; 2: RUN IN PROGRESS
172 ; 1: NOT USED
173 ; 2: WAIT AT L.O.S. FOR FIRST STEP
174 ; 3: SHOW DOWNS
175 ; 4: SHOW SCORE
176 ; 5: RUNNER TACKLED (BLINK)
177
178 ; THIS ROUTINE IS JUST FIVE WAY INDEXED JUMP
179 ; DEPENDING ON THE VARIABLE 'STATE'
180

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181 0257 A5 1F SERVE LDA STATE
182 0259 30 FE BMI ;NEGATIVE=OUT OF RANGE
183 025B C9 06 CMP #5+1 ;LAST STATE+1
184 025D 10 FE BPL ;TOO BIG

```

```

185 ; MULTIPLY BY THREE

```

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186 025F 18 CLC
187 0260 0A ASL A ;MULT BY TWO
188 0261 18 CLC

```

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189 0262 65 1F ADC STATE
190 ; ADD IN LSB OF TABLE ADDR
191 ; AT THIS POINT AC CONTAINS STATE*3

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192 0264 18 CLC
193 0265 69 EA ADC #TABLE-256/256 - / *

```

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**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18

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194 0267 8D EA EA STA JUMP1

```

```

**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

```

```

195 026A 6C EA EA JMP (JUMP1)

```

```

**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18

```

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196
197
198 ; STATE 0: RUN IN PROGRESS

```

1 PAGE 5

0CARD # LOC CODE GARD

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199
200 026D 20 BF 02 STATE0 JSR SHOMEN
201 0270 20 EA EA JSR STEPPS
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
202 0273 20 EA EA JSR DEFEND
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
203 0276 20 C9 03 JSR BEEPER
204 0279 20 C4 03 JSR BUZZER
205 027C 20 76 03 JSR TIMER ;GAME CLOCK
206 027F 60 RTS

```

```

207
208
209
210 ; STATE 5: QB TACKLED (BLINK)
211

```

```

212 0280 20 BF 02 STATE5 JSR SHOMEN
213 0283 20 29 04 JSR BLINK
214 0286 20 C4 02 JSR SS
215 0289 60 RTS

```

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216
217
218

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```
219 ; STATE 3: SHOW DOWNS
220 ;
221 028A 20 C4 02 STATE3 JSR SS
222 028D 20 4F 04 JSR SHOWN
223 0290 60 RTS
224 ;
225 ;**
226 ;
227 ; STATE 4: SHOW SCORES
228 ;
229 0291 20 C4 02 STATE4 JSR SS
230 0294 20 6A 05 JSR SHOSCR
231 0297 60 RTS
232 ;
233 ;
234 ; STATE 2: L*O*S*
235 ;
236 0298 EA EA EA STATE2 EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
237 ; DETECT FIRST ACTION
238 ; SET STATE TO ZERO AS SOON AS PLAYER PUSHES A SWITCH
239 029B AD EA EA LDA SWITCH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
240 029E 49 FF EOR #$FF
241 02A0 29 E0 AND #$E0
242 02A2 F0 08 BEQ S2S2
243 02A4 A9 00 LDA #0
244 02A6 85 1F STA STATE
245 ; SINCE WE DON'T KNOW WHAT SWITCH WERE PUSHED WHEN
246 ; THE LAST PLAY STOPPED, TRICK THE DEBOUNCER
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0CARD # LOC CODE CARD
247 ; INTO THINKING NONE WERE
248 02AB A9 FF LDA #$FF
249 02AA 85 04 STA OLDSW
250 02AC EA EA EA S2S2 EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
251 ; IF THE GAME CLOCK HAS EXPIRED, THIS IS
252 ; THE TIME TO RESTART IT
253 02AF A5 32 LDA TIMEH
254 02B1 30 01 BMI S2S ;NEGATIVE MEANS EXPIRED
255 02B3 60 RTS
256 ;
257 02B4 AD EA EA S2S LDA TIMEH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
258 02B7 85 32 STA TIMEH
259 02B9 AD EA EA LDA TIMEH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
260 02BC 85 31 STA TIMEH
261 02BE 60 RTS
262 ;
263 ; CALL HERE ONCE A TICK TO MULTIPLEX THE
264 ; MEN ON THE DISPLAY
265 ;
266 ;>>> NOTE: THIS ROUTINE IS HIGHLY NON-REENTRANT
267 ; IT USES THE COUNTER 'WHOM' TO INDICATE
268 ; WHICH MAN GETS SHOWN DURING THIS TICK
269 ;
270 02BF A5 39 SHOWN LDA WHOM
271 02C1 A2 00 LDX #0 ;NEGATIVE VALUES USED TO INTENSIFY
;THE QB WHO IS MAN #0
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272      ; NOW WE HAVE CHOSEN WHO TO SHOW
273 02C3 20 34 03      JSR      SHOW1      ;SET UP LED'S
274      ; NOW UPDATE COUNTER FOR NEXT TIME
275 02C6 06 39      DEC      WHOM
276 02C8 A5 39      LDA      WHOM
277 02CA C9 F0      CMP      #$F0      ;THIS NUMBER SETS QB INTENSITY
278      ;                               ;THE MORE NEGATIVE, THE BRIGHTER
279 02CC D0 EA      BNE      SH15
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
280 02CE A1 EA EA      LDA      #0      ;7 PLUS THREE FOR CLOCK
**** ERROR ** INVALID EXPRESSION - NEAR COLUMN 19
281 02D1 85 39      STA      WHOM
282 02D3 60      RTS
283      ;
284      ;
285      ; STATE SHIFTERS
286      ;
287      ; THESE ROUTINES LOOK AT THE MODE SWITCH
288      ; AND ALTER THE STATE VARIABLE ACCORDINGLY
289      ;
290      ; THEY RESPECT THE MCYCLEE FLAG
291      ;
292 02D4 CE EA EA SS      DEC      SHIFTY
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

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1 0CARD # LOC CODE CARD
293 02D7 F0 01      BEQ      **3
294 02D9 60      RTS
295 02DA A1 EA EA      LDA      ISHIFTY
**** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
296 02DD 8D EA EA      STA      SHIFTY
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
297      ;
298 02E0 20 FD 02      JSR      GTMODE      ;{1234}
299 02E3 C9 03      CMP      #3
300 02E5 10 03      BPL      **5
301 02E7 4C 25 03      JMP      REQ2      ;SO HE WANTS MODE 2!
302      ;
303 02EA 85 1F      STA      STATE
304 02EC A9 14      LDA      #20      ;HOLD TIME
305 02EE 85 38      STA      BUTTON
306 02F0 A5 1C      LDA      MCYCLE
307 02F2 D0 01      BNE      **3
308 02F4 60      RTS
309 02F5 A9 00      LDA      #0
310 02F7 85 1C      STA      MCYCLE
311 02F9 20 14 03      JSR      SETMEN
312 02FC 60      RTS
313      ;
314      ; HERE TO READ AND DECODE THE MODE BITS
315      ; THIS ROUTINE RETURNS A NUMBER (1234)
316      ; REPRESENTING THE MODE THE GUY WANTS
317      ;
318 02FD AD EA EA GTMODE LDA SWITCH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
319 0300 49 FF      EOR      #$FF
320 0302 46 EA EA      LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
321 0305 46 EA EA      LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11

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15

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322 0308 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
323 030B 18 CLC
324 030C 69 01 ADC #501
325 030E 29 03 AND #503
326 0310 18 CLC
327 0311 69 01 ADC #501
328 0313 60 RTS
329

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330
331 ; SET MEN TO THEIR LINEUP POSITION
332

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333 0314 A2 10 SETMEN LDX #510
334 0316 CA SETL DEX
335 0317 EA EA EA LA IMANX,X
**** ERROR ** LABEL GREATER THAN SIX CHARACTERS - NEAR COLUMN 17
336 031A 95 08 STA MANX,X
337 031C E0 00 CPX #0

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PAGE 8

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1
0CARD # LOC CODE CARD
338 031E D0 F6 BNE SETL
339
340 0320 A5 30 LDA NPOSS
341 0322 85 2A STA POSS
342 0324 60 RTS
343
344 ; HERE WHEN NO MODE SWITCHES PUSHED
345 ; I.E. HE WANTS MODE 2
346
347 ; WE WONT LET HIM HAVE MODE 2 UNTIL
348 ; THE HOLD TIMER EXPIRES
349

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```

350 0325 A5 38 REG2 LDA BUTTON
351 0327 D0 01 BNE #+3
352 0329 60 RIS
353 032A C6 38 DEC BUTTON
354 032C F0 01 BEQ #+3
355 032E 60 RTS
356 032F A9 02 LDA #2
357 0331 85 1F STA STATE
358 0333 60 RTS
359

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360
361 ; HERE TO SET LED'S TO SHOW ONE MAN
362 ; CALL WITH WHOM INDEX IN X
363

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364 0334 EA EA EA SHCW1 EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
365 ;**KLUDGE**
366 ;THE FOLLOWING CODE CHECKS TO SEE IF X INDICATES
367 ; THAT WE SHOULD NOT DISPLAY A MAN
368 ; IF SO, DISPLAY A CLOCK DIGIT INSTEAD

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369 0337 E0 08 CPX #508
370 0339 EA EA EA BLT SH1S
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 17
371 033C 8A TXA
372 033D 38 SEC
373 033E E9 06 SBC #506 ;MAN #8 GOES TO CLOCK 2
374 0340 85 02 STA WHO ;PASS ARGUMENT
375 0342 20 6A 05 JSR SHOSCR

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376
 377 0345 20 08 03 SHIS JSR FAROUT
 378 0348 A1 EA EA LDA POSSESS
 ***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
 379 034B EA EA EA BNZ STRATE
 ***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 17
 380 ; HERE IF THE FIELD IS NOT REFLECTED
 381 034E A9 08 LDA #08
 382 0350 38 SEC
 383 0351 F5 10 SBC MANY,X
 384 0353 10 02 BPL SH1X ; ALWAYS BRANCH!!
 385

1
 0CARD # LOC CODE CARD
 386 0355 B5 10 STRATE LDA MANY,X
 387 0357 80 EA EA SH1X STA DIGPIA
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 388 035A B5 08 LDA MANX,X
 389 035C 10 02 BPL SHIS3
 390 035E A9 08 LDA #00 ; FOR BLINKING
 391 0360 AA SHIS3 TAX
 392 0361 80 EA EA LDA CARSEG,X
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 393 0364 80 EA EA STA MANPIA
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 394 0367 60 RTS
 395
 396
 397 ; HERE TO BLANK THE WHOLE DISPLAY
 398 ; IN SUCH A WAY THAT NO 'GROSSIS' ARE LEFT
 399
 400 0368 A9 08 FAROUT LDA #00
 401 036A 81 EA EA STA SEGPRT
 ***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
 402 036D 81 EA EA STA MANPRT
 ***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
 403 0370 A9 0F LDA #0F
 404 0372 81 EA EA STA DIGPRT
 ***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
 405 0375 60 RTS
 406
 407
 408 ; HERE TO KEEP THE GAME CLOCK UP TO DATE
 409
 410 0376 EA EA EA TIMER EQU *
 ***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
 411 ; FIRST, WE COUNT INTERRUPTS
 412 ; SO THAT WE TICK AT THE PROPER RATE
 413 0379 E6 33 INC TIMEYL
 414 037B F0 01 BEQ *+3
 415 037D 60 RTS
 416 037E E6 34 INC TIMEYH
 417 0380 F0 01 BEQ *+3
 418 0382 60 RTS
 419 0383 AD EA EA LDA ITIMYH
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 420 0386 85 34 STA TIMEYH
 421
 422 ; HERE AT HALF SECOND TICKS
 423 ; CHECK IF THE TIMER EXPIRED LAS TIME

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27
424 ; IF SO, CAUSE A LONG BUZZ SOUND.
425 ;
426 0388 AD EA EA LDA TIMERL
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
427 0386 EA EA EA OR TIMERH ;IT BOTH ZERO, THEN EXPIRED
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 17
PAGE 10
0CARD # LOC CODE CARD
428 038E F0 2A BEQ BUZZ
429 ; NOW CHECK IF IT HAS BEEN EXPIRED FOR A LONG TIME
430 ; IF SO, DO NOT KEEP COUNTING
431 ; LET IT STOP AT ZERO!!!
432 0390 AD EA EA LDA TIMERH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
433 0393 10 01 BPL **3
434 0395 60 RTS ;HERE IF SIGN BIT WAS SET
435 ;HERE IF WE ARE GOING TO DECREMENT THE TIMER
436 0396 A9 05 LDA #$05 ;CAUSE A TICKING SOUND
437 0398 85 36 STA BZTIME
438 039A AD EA EA LDA TIMERL
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
439 039D 18 CLC
440 039E F0 SED
441 039F 69 63 ADC #99 ;DECREMENT DECIMAL
442 03A1 8D EA EA STA TIMERL
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
443 03A4 08 CLD
444 03A5 C9 00 CMP #0 ;NECESSARY
445 03A7 10 0F BPL QUIT
446 ; HERE IF THE SECONDS PART UNDERFLOWED
447 ; SET IT TO 59 AND 'BORROW' OUT OF MINUTES
448
449 03A9 A9 59 LDA #$59
450 03AB 8D EA EA STA TIMERL
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
451 03AE AD EA EA LDA TIMERH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
452 03B1 F8 SED
453 03B2 18 CLC
454 03B3 69 99 ADC #$99
455 03B5 8D EA EA STA TIMERH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
456 ;
457 03B8 08 QUIT CLD
458 03B9 60 RTS
459 ; HERE WHEN WE FIRST NOTICE THAT IT HAS GONE TO ZERO
460 ; MAKE A NOISE AND STOP THE CLOCK BY TURNING ON
461 ; THE SIGN BIT
462 03BA A9 FF BUZZ LDA #$FF
463 03BC 85 36 STA BZTIME
464 03BE A9 80 LDA #$80
465 03C0 8D EA EA STA TIMERH ;STOP TIMER AT ZERO
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
466 03C3 60 RTS
467 ;
468 ;
469 ; AUDIO ROUTINES
470 ;**
471 ; FIRST, THE LOW FREQUENCY BUZZ
472 ;

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1
0CARD # LOC      CODE      GARD
473 03C4 C6 35 BUZZER DEC BUZZV
474 03C6 D0 01 BNE **3
475 03C8 60 RTS
476 03C9 AD EA EA LDA IBUZZY
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
477 03CC 85 35 STA BUZZY
478 ;
479 03CE A5 36 LDA BZTIME
480 03D0 D0 01 BNE **3
481 03D2 60 RTS
482 ;
483 03D3 20 E4 03 JSR AUDIO
484 03D6 C6 36 DEC BZTIME
485 03D8 60 RTS
486 ;
487 ;
488 ; HIGH FREQUENCY BEEP
489 ;
490 03D9 A5 2F BEEPER LDA BPTIME
491 03DB D0 01 BNE **3
492 03DD 60 RTS
493 03DE 20 E4 03 JSR AUDIO
494 03E1 C6 2F DEC BPTIME
495 ;
496 03E3 60 RTS
497 ;
498 ;
499 ; GENERAL PURPOSE ROUTINE TO OUTPUT HALF A CYCLE
500 ; TO THE SPEAKER
501 ;
502 03E4 AD EA EA AUDIO LDA SWITCH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
503 03E7 49 01 EOR #01
504 03E9 8D EA EA STA SWITCH
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
505 03EC 60 RTS
506 ;
507 ;
508 ; CALLIOPE
509 ;
510 ; HIGH CLASS ROUTINE TO PLAY MUSIC
511 ;
512 ; SONGS ARE STORED IN RAM
513 ; ONE NOTE PER BYTE
514 ; 02 WOULD BE A HIGH NOTE, 40 A LOW NOTE
515 ; THE SONG IS TERMINATED BY A ZERO BYTE
516 ; CALL WITH INDEX TO FIRST BYTE OF SONG IN AC
517 ; (INDEX = ADDR - 0600)
518 ;
519 ; NOTE THAT THIS ROUTINE HAS TO TURN OFF THE
520 ; INTERRUPT SYSTEM (THEN RESTORES IT)
521 ; IT WOULD BE WISE TO CALL FAROUT BEFORE

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1
0CARD # LOC      CODE      GARD
522 ; PLAYING A SONG OF ANY LENGTH
523 ; BUT THAT IS THE CALLER'S RESPONSIBILITY
524 ;
525 ; CALLIOPE HAS A FAST TEMPO (USED FOR WHISTLES)

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23

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526      CALLIOP2 HAS A SLOWER TEMPO (USED FOR 'CHARGE')
527 03ED EA EA EA CLIORE EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
528 03F0 A2 FE LDX #$FE ;FAST RATE
529 03F2 30 05 BMI CLIPES
530 03F4 EA EA EA CLIO2 EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
531 03F7 A2 F7 LDX #$F7 ;SLOWER
532 03F9 86 24 CLIPES STX RATE
533
534 03FB 08 PHP ;SAVE INTERRUPT MASK
535 03FC 78 SEI ;WE NEED THE WHOLE CPU OURSELVES
536 03FD AA TAX
537 03FE 20 0B 04 JSR PIPELD
538 0401 28 PLP ;RESTORE INTERRUPT MASK
539 0402 60 RTS
540
541
542 ; PIPE**THE GUTS OF CALLIOP2
543
544 ; THE ENTRY POINT IS AT PIPELOAD
545 ; DO NOT JSR PLAYIT!!!!
546
547 ; THIS ROUTINE IS ORGANIZED AS TWO INDEPENDENT COUNTERS
548 ; THE FIRST ONE COUNTS HOW LONG BETWEEN
549 ; SWITCHING THE AUDIO
550 ; THE OTHER COUNTS HOW LONG WE HOLD THE NOTE
551
552 ; NATURALLY, THE FREQUENCY COUNTER UNDERFLOWS MANY TIMES PER NOTE
553 ; SO WE HAVE TO RESTORE IT AND COUNT AGAIN
554 ; UNTIL THE TEMPO COUNTER EXPIRES
555 ; THEN WE INCREMENT X AND USE THE NEXT BYTE OF THE SONG
556 ; TO DETERMINE THE FREQUENCY
557
558 0403 A5 23 PLAYII LDA NOTE
559 0405 30 12 BMI NOPE ;REST A NOTE
560 0407 06 23 DEC NOTE
561 0409 D0 0E BNE NOPE
562 ; HERE WHEN THE NOTE OVERFLOWED
563 ; RESET COUNTER AND GOOSE THE SPEAKER
564 040B EA EA EA PIPELD EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
565 040E 8D EA EA LDA SONG,X
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
566 0411 30 01 BMI *+3
567 0413 60 RTS
568 0414 85 23 STA NOTE
569 0416 20 E4 03 JSR AUDIO

```

1

```

0CARD # LOC CODE SARD
570 ; HERE IF WE DON'T WANT TO OUTPUT ANYTHING THIS TIME THROUGH
571 ; COUNT THE TEMPO
572 0419 E6 26 NOPE INC TEMPO
573 041B D0 E6 BNE PLAYIT
574 041D E6 25 INC TEMPOH
575 041F D0 E2 BNE PLAYIT
576 ; RESET TEMPO COUNTER AND GO TO NEXT NOTE
577 0421 A5 24 LDA RATE
578 0423 85 25 STA TEMPOH
579 0425 E8 INX ;GO TO NEXT NOTE OF SONG

```


33

```

580 0426 4C 08 04      JMP PIPEL
581
582
583      ; THIS ROUTINE MARKS THE QB AND TACKLER
584      ; SO THAT THEY WILL NOT BE DISPLAYED
585
586      ; IT SETS THE SIGN BIT OF THE MANX
587
588 0429 E6 22      BLINK INC BLINKY
589 042B F0 01      BEQ  **3
590 042D 60          RTS
591 042E AD EA EA    LDA  BLNKY
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
592 0431 85 22      STA  BLINKY
593
594 0433 A6 1E      LDX  TKLER
595 0435 A5 08      LDA  MANX
596 0437 30 08      BMI  BLINKQ
597      ; HERE TO TURN OFF THE QB AND TURN ON THE TACKLER
598 0439 09 80      ORA  #580
599 043B 85 08      STA  MANX
600 043D 85 08      LDA  MANX,X
601 043F 29 7F      AND  #57F
602 0441 95 08      STA  MANX,X
603 0443 60          RTS
604
605 0444 29 7F      ; HERE TO DO THE REVERSE
        BLINKQ AND  #57F
606 0446 85 08      STA  MANX
607 0448 85 08      LDA  MANX,X
608 044A 09 80      ORA  #580
609 044C 95 08      STA  MANX,X
610 044E 60          RTS
611
612
613      ; SHOW DOWNS
614
615      ; THIS IS GIGANTIC SIGNPOST BRANCH
616      ; DEPENDING ON THE VARIABLE 'WHO'
617
618 044F 20 AB 04    SHOWDN JSR  SHOWKL      ;CALCULATE WHO*3
619 0452 18          CLC
620 0453 69 EA      ADC  #DNTAB=DNTAB/256*256      ;LSB

```

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1

```

0CARD # LOC CODE CARD
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
621 0455 85 2D      STA  JUMPER
622 0457 6C 2D 00    JMP  (JUMPER)
623
624
625 045A EA EA EA    DOWNTAB EQU  *
**** ERROR ** LABEL GREATER THAN SIX CHARACTERS - NEARCOLUMN 1
626 045D 4C EA EA    JMP  SD0
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
627 0460 4C 0D 04    JMP  SD1
628 0463 4C EA EA    JMP  RTS3
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
629 0466 4C 04 04    JMP  SD3
630 0469 4C E2 04    JMP  SD4
631 046C 4C F0 04    JMP  SD5
632 046F 4C EA EA    JMP  RTS3

```

34

35
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

633 0472 4C 1F 05 JMP SD7

634 0475 4C 2A 05 JMP SD8

635 ;

636 ;**

637 ;

638 0478 EA EA EA SCCKE1AB EQU *

***** ERROR ** LABEL GREATER THAN SIX CHARACTERS - NEAR COLUMN 1

639 047B 4C 7A 05 JMP SS0

640 047E 4C 7F 05 JMP SS1

641 0481 4C EA EA JMP RTS3

***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

642 0484 4C 84 05 JMP SS3

643 0487 4C 8C 05 JMP SS4

644 048A 4C 91 05 JMP SS5

645 048D 4C EA EA JMP RTS3

***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

646 0490 4C 96 05 JMP SS7

647 0493 4C 9B 05 JMP SS8

648 ;

649 ;

650 ;**

651 ;

652 0496 EA EA EA STATE1AB EQU *

***** ERROR ** LABEL GREATER THAN SIX CHARACTERS - NEAR COLUMN 1

653 0499 4C 6D 02 JMP STATE0

654 049C 4C 9C 04 JMP *

655 049F 4C 98 02 JMP STATE2

656 04A2 4C 8A 02 JMP STATE3

657 04A5 4C 91 02 JMP STATE4

658 04A8 4C 80 02 JMP STATE5

659 ;

660 ; SHOW KLUDGE

661 ; A) UPDATES WHO

662 ; B) SETS DIGPORT EQUAL TO WHO

663 ; C) RETURNS 3*WHO IN AC

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1
CARD # LOC CODE CARD

664 ; D) CLEARS SEGMENTS

665 ;

666 04AB E6 02 SHCWKL INC WHO

667 04AD A5 02 LDA WHO

668 04AF 30 05 BMI KRUMP

669 04B1 C9 09 CMP #S09

670 04B3 30 EA EA BMI SHCWKL2

***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17

671 ; HERE WHEN WE HAVE SHOWN EVERYBODY ONCE

672 ; START AGAIN AT 0

673 04B6 A9 00 KRUMP LDA #S00

674 04B8 85 02 STA WHO

675 04BA A0 00 SHCWKL2 LDY #0

676 04BC 84 EA EA STY SEGPORT

***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17

677 04BF 84 EA EA STY MANPORT

***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17

678 04C2 81 EA EA STA DIGPORT

***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17

679 04C5 18 CLC

680 04C6 06 EA EA ASL

***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11

681 04C9 18 CLC
 682 04CA 65 02 ADC WHO
 683 04CC 60 RTS

684 ;
 685 ;
 686 ; SHOWDOWN IS A SOW
 687 ; HERE ARE THE PIGLETS
 688 ;

689 04CD 80 EA EA SD1 LDA (SEGMENT,X)
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 690 04D0 80 EA EA STA SEGPIA
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 691 04D3 60 RTS

692 ;
 693 ; THESE ROUTINE MUST MAKE SPECIAL CHECKS
 694 ; SO THEY CAN DISPLAY THE LOS IN THE TRADITIONAL
 695 ; 0-T0-50-T0-0 NOTATION OF FOOTBALL YARDAGES
 696 ;

697 04D4 20 FE 04 SD3 JSR FIXUP
 698 04D7 A5 37 LDA LOSFIX
 699 04D9 E8 INX
 700 04DA F0 03 BEQ **5
 701 04DC 4C 35 05 JMP LINE
 702 04DF 4C EA EA JMP CVT10
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

703 ;
 704 04E2 20 FE 04 SD4 JSR FIXUP
 705 04E5 A5 37 LDA LOSFIX
 706 04E7 E8 INX
 707 04E8 F0 03 BEQ **5

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1
 0CARD # LOC CODE GARD
 708 04EA 4C EA EA JMP CVT10
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 709 04ED 4C 4A 05 JMP CVT1

710 ;
 711 04F0 20 FE 04 SD5 JSR FIXUP
 712 04F3 A5 37 LDA LOSFIX
 713 04F5 E8 INX
 714 04F6 F0 03 BEQ **5
 715 04F8 4C 4A 05 JMP CVT1
 716 04FB 4C 35 05 JMP LINE

717 ;
 718 ;
 719 ; HERE TO SET FLAGS FOR 0-50-0

720 ;
 721 ; THERE ARE FOUR CASES:
 722 ; 1) --> LOS > 50 (47)
 723 ; 2) --> LOS < 50 (147)
 724 ; 3) <--> LOS > 50 (147)
 725 ; 4) <--> LOS < 50 (47)

726 ;
 727 ; THIS SET LOSFIX TO BE THE YARDAGE
 728 ; IN THE OTHER NOTATION AND RETURNS WITH X SET TO FF
 729 ; IN CASES 2 AND 3 SO YOU CAN DO AN INX AND BRANCH
 730 ; TO DECIDE WHICH HALF OF THE FIELD YOU ARE ON

731 04FE A5 29 FIXUP LDA LOS
 732 0500 A2 00 LDX #0
 733 0502 C9 50 CMP #\$50
 734 0504 30 10 BMI NOFIX

39

40

```

735 0506 A9 00 LDA #0
736 0508 F8 SED
737 0509 38 SEC
738 050A E5 29 SBC LOS
739 050C D8 CLD
740 050D 85 37 STA LOSFIX
741 050F A5 2A LDA POSS
742 0511 D0 02 BNE #+4
743 0513 A2 FF LDX #SEF
744 0515 60 RTS
745
746 0516 85 37 NOFIX STA LOSFIX
747 0518 A5 2A LDA POSS
748 051A F0 02 BEQ #+4
749 051C A2 FF LDX #SEF
750 051E 60 RTS
751
752
753 ; THESE TWO ROUTINES MUST CHECK FOR THE
754 ; SPECIAL CASE WHERE LOS<IOGO
755 ; IF SO, PRETEND TOGO REPLACED BY LOS
756
757 ; WE HAVE TO MAKE SOME WIEND DECISIONS
758 ; BECAUSE CHUCK WAS TOO LAZY TO PUT IN

```

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```

1
0CARD # LOC CODE GARD
759 ; THE FULL COMPLEMENT OF BRANCHES
760
761 051F A5 29 SD7 LDA LOS
762 0521 C5 28 CMP TOGO
763 0523 90 02 BCC SD7X
764 0525 A5 28 LDA TOGO
765 0527 4C EA EA SD7X JMP CVT10 ✓
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
766
767 052A A5 29 SD8 LDA LOS
768 052C C5 28 CMP TOGO
769 052E 90 02 BCC SD8X
770 0530 A5 28 LDA TOGO
771 0532 4C 4A 05 SD8X JMP CVT1
772
773 0535 A9 02 LINE LDA #S02
774 0537 8D EA EA STA SEGPIA ✓
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
775 053A 60 RTS
776
777
778 ; HERE TO CONVERT THE HIGHER HALFBYTE OF AC
779 ; TO SEVEN-SEGMENT CODE AND STORE IT IN SEGPIA
780
781 053B 46 EA EA CVT10X LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
782 053E 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
783 0541 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
784 0544 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
785 0547 4C 05 JMP CVT1
786

```



```

787      ; HERE FOR LOW ORDERHALF BYTE
788      ;
789 054A 29 0F CVT1 AND #00F
790 054C AA TAX
791 054D BD EA EA LDA SEG7 X
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
792 0550 8D EA EA STA SEGPIA
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
793 0553 60 RTS
794      ;
795      ; SAME AS CVT10X BUT SUPPRESSES LEADING ZEROES
796      ;
797 0554 46 EA EA CVT10B LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
798 0557 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
799 055A 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11

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1 0CARD # LOC CODE GARD
800 055D 46 EA EA LSR
**** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
801 0560 F0 04 BEQ STORIT
802 0562 AA TAX
803 0563 BD EA EA LDA SEG7 X
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
804 0566 8D EA EA STORIT STA SEGPIA
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
805 0569 60 RTS
806      ;
807      ;
808      ; SHOW SCORES AND CLOCK
809      ;
810 056A EA EA EA SHOSCR EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
811 056D 20 AB 04 JSR SHOWKL
812 0570 18 CLC
813 0571 61 EA EA ADC #SCRTAB-SCRTAB/256*256
**** ERROR ** INVALID EXPRESSION - NEAR COLUMN 19
814 0574 8D EA EA STA JUMP1
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
815 0577 6C EA EA JMP (JUMP1)
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
816      ;
817      ;
818 057A A5 2B SS0 LDA SLEFT
819 057C 4C 54 05 JMP CVT10B
820      ;
821 057F A5 2B SS1 LDA SLEFT
822 0581 4C 4A 05 JMP CVT1
823      ;
824 0584 A5 31 SS3 LDA TIMEL
825 0586 4C 3B 05 JMP CVT10X
826 0589 4C 4A 05 JMP CVT1
827      ;
828 058C A5 31 SS4 LDA TIMEL
829 058E 4C 3B 05 JMP CVT10X
830      ;
831 0591 A5 31 SS5 LDA TIMEL
832 0593 4C 4A 05 JMP CVT1

```

43

```

833      ;
834 0596 A5 2C SS7 LDA SRIGHT
835 0598 4C 54 05 JMP CVT10B
836      ;
837 059B A5 2C SS8 LDA SRIGHT
838 059D 4C 4A 05 JMP CVT1
839      ;
840      ;
841      ;**
842      ;
843      ;

```

END

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1
 0CARD # LOC CODE CARD
 END OF MCS/TECHNOLOGY 650X ASSEMBLY VERSION 4
 NUMBER OF ERRORS = 92, NUMBER OF WARNINGS = 0
 1 SYMBOL TABLE

SYMBOL VALUE LINE DEFINED CROSS-REFERENCES

AUDIO	03E4	502	163	483	493	569
BAR	0018	29	****			
BEEPER	03D9	490	203			
BLINK	0429	588	213			
BLINKQ	0444	605	596			
BLINKY	0022	39	588	592		
BLT	0339	372	****			
BNZ	034B	379	****			
BPTIME	002F	52	490	494		
BUITON	0038	61	305	350	353	
BUZZ	03BA	462	428			
BUZZER	03C4	473	204			
BUZZY	0035	58	473	477		
BZTIME	0036	59	437	463	479	484
CARSEG	*UNDEFINED*	2	392			
CLIOF2	03F4	532	****			
CLIOPE	03ED	527	****			
CLIPES	03F9	532	529			
CLOCK	0227	121	****			
CRASH	024D	162	138			
CRASHL	024E	163	165			
CVT10B	0554	797	819	835		
CVT10	*UNDEFINED*	2	702	708	765	
CVT10X	0538	781	825	829		
CVT1	054A	789	709	715	771	785 822 826 832 838
DEFFEND	*UNDEFINED*	2	202			
DEFH	0020	37	****			
DEFL	0021	38	****			
DIGPIA	*UNDEFINED*	2	387			
DNTAB	*UNDEFINED*	2	620			
DOWN	0027	44	****			
FAROUT	0368	400	377			
FIXUP	04FE	731	697	704	711	
GMODE	02FD	318	298			
IBLNKY	*UNDEFINED*	2	591			
IBUZZY	*UNDEFINED*	2	476			
IOTAB	*UNDEFINED*	2	89			
IOTABN	*UNDEFINED*	2	95			
IIMEH	*UNDEFINED*	2	257			
ITIMEL	*UNDEFINED*	2	259			
IIMYH	*UNDEFINED*	2	419			

XB

45

JUMP1	*UNDEFINED*	0	194	195	814	815
JUMPER	0020	50	621	622		
KRUMP	04B6	673	668			
LA	0317	335	****			
LINE	0535	773	701	716		
LOOKER	0003	8	****			
LUS	0029	46	731	738	761	767
LUSFIX	0037	60	698	705	712	740 746
MAIN	0200	74	****			

MANPIA	*UNDEFINED*	0	393			
1 SYMBOL	VALUE	LINE	DEFINED	CROSS=REFERENCES		

MANX	0008	13	336	388	595	599	600	602	606	607	609
MANY	0010	21	383	386							
MCYCLE	001C	33	306	310							
NOFIX	0516	746	734								
NOPE	0419	572	559	561							
NOTE	0023	40	558	560	568						
NPOSS	0030	53	340								
NVARS	*UNDEFINED*	2	106								
ODIST	001A	31	****								
OGEAR	001B	32	****								
OLDSW	0004	9	249								
OK	038B	427	****								
PIPELO	040B	564	537	580							
PLAYIT	0403	558	573	575							
POSS	002A	47	341	741	747						
QUIT	038B	457	445								
RAM0	*UNDEFINED*	0	109								
RATE	0024	41	532	577							
REQ2	0325	350	301								
RTS3	*UNDEFINED*	0	628	632	641	645					
S2S	02B4	257	254								
S2S2	02AC	250	242								
SD0	*UNDEFINED*	0	626								
SD1	04C0	689	627								
SD3	04D4	697	629								
SD4	04E2	704	630								
SD5	04F0	711	631								
SD7	051F	761	633								
SD7X	0527	765	763								
SDB	052A	767	634								
SDBX	0532	771	769								
SEG7	*UNDEFINED*	0	791	803							
SEGMNT	*UNDEFINED*	0	689								
SEGPJA	*UNDEFINED*	0	690	774	792	804					
SERVE	0257	181	147								
SETIO	020B	89	75								
SETIOL	020D	90	96								
SETL	0316	334	338								
SETMEN	0314	333	311								
SETVAR	0219	106	76								
SETVL	021B	107	111								
SH1S	0345	377	****								
SH1S3	0360	391	389								
SH1X	0357	387	384								
SHIFTY	*UNDEFINED*	0	292	296							
SHMS	*UNDEFINED*	0	279								
SHOKL2	04BA	675	****								
SHOMEN	02BF	270	200	212							

SHOSCR	056A	810	230	375		
SHOW1	0334	364	273			
SHOWDN	044F	618	222			
SHOWKL	04AB	666	618	811		
SLEFT	002B	48	818	821		
SUNG	*UNDEFINED*	0	565			
SYMBOL	VALUE	LINE	DEFINED	CROSS-REFERENCES		

SRIGHT	002C	49	834	837		
SS	0204	292	214	221	229	
SS0	057A	818	639			
SS1	057E	821	640			
SS3	0584	824	642			
SS4	058C	828	643			
SS5	0591	831	644			
SS7	0596	834	646			
SS8	059B	837	647			
STATE	001F	36	181	189	244	303 357
STATE0	0260	202	653			
STATE2	0298	236	655			
STATE3	028A	221	656			
STATE4	0291	229	657			
STATE5	0280	212	658			
STEPQB	*UNDEFINED*	0	201			
STORIT	0566	804	801			
STRATE	0355	386	****			
SWITCH	*UNDEFINED*	0	239	318	502	504
TABLE	*UNDEFINED*	0	193			
TEMP	0005	10	****			
TEMPOH	0025	42	574	578		
TEMPOL	0026	43	572			
TIMH	0032	55	253	258		
TIMEL	0031	54	260	824	828	831
TIMER	0376	410	141	205		
TIMERH	*UNDEFINED*	0	432	451	455	465
TIMERL	*UNDEFINED*	0	426	438	442	450
TIMEYH	0034	57	416	420		
TIMEYL	0033	56	413			
TKLER	001E	35	594			
TUGO	0028	45	762	764	768	770
TRIALX	0006	11	****			
TRIALY	0007	12	****			
VARTAB	*UNDEFINED*	0	108			
WAIT	*UNDEFINED*	0	164			
WHO	0002	7	374	666	667	674 682
WHOM	0039	62	270	275	276	281
WSTEP	0010	34	****			

50

##END## USER JOHN DENKER [26,JSD] JOB LIST SEQ. 1886 DATE 03-SEP-76 02:23:24 MONITOR CALTECH 602,16 SYSTEM ##END##

Advance business forms, inc.

```

1
CARD # LOC CODE CARD
53 0030 00 NPCSS .BYTE 0
54 0031 00 TIME .BYTE 0
55 0032 00 TIMEH .BYTE 0
56 0033 00 TIMEYL .BYTE 0

```

chasing
pop
pop
lock

55

56

```

57 0034 00 TIMEYH .BYTE 0
58 0035 00 BUZEY .BYTE 0
59 0036 00 BZTIME .BYTE 0
60 0037 00 LOSFIX .BYTE 0
61 0038 00 BUTTON .BYTE 0
62 0039 00 WHCM .BYTE 0
63 003A 00 .BYTE 0
64 003B 00 .BYTE 0
65 003C 00 .BYTE 0
66 003D 00 .BYTE 0
67 003E 00 .BYTE 0

```

hand = \$005E
add hand = \$005F

10 def

SWPIA = 1700
swpia 1702
diopia = 1000
swpia = 1002
init

```

68 ;
69 ; NOW FOR THE FUN PART
70 ; THIS ROUTINE LOOKS AT THE SWITCHES, DEBOUNCES THEM
71 ; AND DECIDES HOW TO MOVE THE QB
72 ;
73 ; IT CHECKS FOR HITTING A DEFENDER
74 ; RUNNING OFF THE END
75 ; REACHING THE END ZONE
76 ; TRYING TO RUN OFF THE SIDES
77 ;

```

```

78 003F * = $0C00
79 STEP0B = *
80 ; FIRST, THE RATE-LIMITING AND DEBOUNCING
81 0C00 C6 03 DEC LOOKER
82 0C02 F0 01 BEQ *+3
83 0C04 60 RTS
84 0C05 AD EA EA LDA HLR +init
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
85 0C08 85 03 STA LOOKER

```

```

86 ;
87 ; HERE TO LOOK FOR AN EDGE
88 ; THE INTERESTING BITS ARE $E0
89 ; POSITIVE EDGE MEANS THAT THE BIT WAS
90 ; ONE LAST TIME AND ZERO THIS TIME
91 ;

```

```

92 0C0A AD EA EA LDA SWITCH swpia
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
93 0C0D AA TAX
94 0C0E 49 FF EOR #$FF
95 0C10 25 04 AND ULDSH
96 0C12 29 E0 AND #$E0
97 0C14 86 04 STX ULDSH

```

```

98 ;
99 ;
100 ; AT THIS POINT, AC CONTAINS 1'S FOR EVERY NEW BIT
101 ; >>>NOTE: THIS MEANS THAT IF THE PLAYER
102 ; MANAGED TO HIT SWITCHES SIMULTANEOUSLY, ALL BUT ONE
PAGE 3

```

1	OCARD #	LOC	CODE	CARD	
	103				; WOULD BE 'LOSI', BECAUSE THIS ROUTINE GRABS ALL BITS
	104				; BUT ONLY ONE WILL GET PROCESSED,
	105				;
	106				;
	107				; HERE WITH A BIT IN THE AC
	108				; INDICATING WHICH DIRECTION TO GO
	109				;
	110	0C16	EA EA EA	DOPLAY EQU *	
	****	ERROR	** ILLEGAL OR MISSING OP CODE	- NEAR COLUMN 9	
	111	0C19	48	PHA	

```

112 0C1A A2 00 LDX #0 ;WE WANT TO MOVE MAN #0
113 0C1C 20 00 00 JSR TRY
114
115
116 0C1F 90 05 ASLA ✓
117 BCC NOTUP
; HERE IF HE WANTS TO MOVE 'UP'
118 0C21 06 06 DEC TRIALX
119 0C23 40 3B 0C JMP FIN
120
121 0C26 EA EA EA NOTUP ASLA ✓
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
122 0C29 90 05 BCC NOTDN
123 ; HERE TO MOVE DOWN
124 0C2B E6 06 INC TRIALX
125 0C2D 40 3B 0C JMP FIN
126
127 0C30 EA EA EA NOTDN ASLA ✓
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
128 0C33 90 13 BCC RTS1
129 0C35 20 4E 0C JSR ADV
130 0C38 40 3B 0C JMP FIN
131
132
133 ; COMMON CODE FOR ALL QB MOTIONS
134
135 0C3B 20 0B 0D FIN JSR NFORCE ;CHECK FOR OFF SIDES
136 0C3E 20 05 0D JSR HITDEF ;CHECK FOR COLLISIONS
137 0C41 80 06 BCS TKL
138 ; HERE IF MOTION IS LEGAL
139 ; MOVE QB TO HIS NEW PLACE
140
141 ;>>>>THIS LDX NOT IN MANUSCRIPT!??
142 0C43 A2 00 LDX #0
143 0C45 20 E6 0D JSR UNTRY
144 0C48 60 RTS1 RTS
145
146 ; HERE WHEN THERE IS A TACKLE DUE TO MOTION OF QB
147 ; (AS OPPOSED TO MOTION OF TACKLER!)
148 0C49 8A TKL TXA ;WHODUNNII?
149 0C4A 20 7E 0C JSR TACKLE
150 0C4D 60 RTS
151

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PAGE 4

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1
0CARD # LOC CODE CARD
152
153 ; HERE TO ADVANCE QB ONE STEP
154 ; (A SUBROUTINE OF STEPQB)
155
156 0C4E 06 07 ADV DEC TRIALY
157 0C50 10 03 BPL ADVS
158 0C52 20 06 0D JSR OFFEND ;WRAP AROUND TO BEGINNING
159
160 0C55 20 05 0D ADVS JSR HITDEF ;IF SOMEONE'S IN YOUR WAY
161 0C58 90 01 BCC YARDS
162 0C5A 60 RTS ;YOU CANNOTMAKE YARDS!!
163
164 0C5B A5 28 YARDS LDA TOGO
165 0C5D F0 0E BEQ LINE
166 0C5F 10 CLC
167 0C60 F8 SED

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59

60

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168 0C61 69 63      ADD      #99
169 0C63 08          CLD
170 0C64 85 28      STA      LOGO
171 0C66 09 00      CMP      #00      ;NECESSARY!!!!
172                ;>>>>DECIMAL MODE ADD DOES NOT SET Z FLAG CORRECTLY
173 0C68 00 03      BNE      LINE
174 0C6A 20 00 0C    JSR      FRST0N      ;CREDIT HIM WITH THE FIRST
175                ;
176 0C6D A5 29      LINE     LDA      LOS
177 0C6F 18          CLC
178 0C70 F8          SED
179 0C71 69 63      ADC      #99
180 0C73 08          CLD
181 0C74 85 29      STA      LOS
182 0C76 09 00      CMP      #00      ;NECESSARY!!!
183 0C78 00 03      BNE      *+5
184 0C7A 20 02 0C    JSR      TD
185 0C7D 60          RTS
186                ;
187                ;
188                ; HERE WHEN QB GETS TACKLED
189                ; AC CONTAINS WHO DID IT
190                ;
191 0C7E 81 EA EA     TACKLE STA     TACKLER
***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
192 0C81 20 EA EA     JSR      TACKOUT
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
193                ; CHECK TO SEE IF HE WENT TENYARDS OR MORE
194                ; IF SO, GIVE HIM A FIRST&TEN
195                ;
196 0C84 A5 28          LDA      TOGO
197 0C86 F0 14          BEQ      FRST10
198                ; NO FIRST---- LETS SEE WHICH SONG TO PLAY
199                ; ONE TWEET IF DOWN 1,2,3
200                ; TWO TWEET IF 4TH DOWN, LOSS OF POSSESSION
201 0C88 E6 27          INC      DOWN      ;HEGOT TACKLED, NEW DOWN #
                                           PAGE      5
```

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1
CARD # LOC CODE CARD
202 0C8A A5 27      LDA      DOWN
203 0C8C 09 05      CMP      #05
204 0C8E F0 05      BEQ      LOSS
205                ;
206 0C90 A9 EA          LDA      #TWEET1
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
207 0C92 EA EA EA      BNZ      CODA      ;ALWAYS
***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 17
208 0C95 20 B9 0C     LOSS     JSR      STLOSS      ;CHANGE POSSESSION
209 0C98 A9 EA          LDA      #TWEET2
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
210 0C9A 00 05      BNE      CODA
211                ;
212 0C9C 20 B0 0C     FRST10 JSR      SETON
213 0C9F A9 EA          LDA      #TWEET1
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
214                ;
215 0CA1 EA EA EA     CODA     EQU      *
***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
216                ; HERE WITH SONG # 1 AS
217 0CA4 20 EA EA      JSR      CLIOPE
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
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218 0CA7 A9 05 LDA #05
219 0CA9 85 1F STA STATE
220 0CAB A9 FF LDA #FF
221 0CAD 85 1C STA MCYCLE
222 0CAF 60 RTS
223 ;
224 ;
225 ; HERE TO CREDIT HIM WITH A FIRST AND TEN
226 ;
227 0CB0 A9 10 SETDN LDA #10
228 0CB2 85 28 STA TOGO
229 0CB4 A9 01 LDA #1
230 0CB6 85 27 STA DOWN
231 0CB8 60 RTS
232 ;
233 ; HERE WHEN HE LOSES POSSESSION
234 ;
235 0CB9 A5 2A STLOSS LDA POSS
236 0CBB A9 FF EOR #FF
237 0CBD 85 30 STA NPOSS
238 0CBF A9 00 LDA #0
239 0CC1 38 SEC
240 0CC2 F8 SED
241 0CC3 E5 29 SBC LOS
242 0CC5 08 CLD
243 0CC6 85 29 STA LOS
244 0CC8 20 E0 0C JSR SETDN ; OTHER GUY GETS FIRST & TEN
245 0CCB 60 RTS
246 ;
247 ;

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1 0CA0 # LOC COLE CARD
248 ; HERE WHEN QB CROSSES TEN YARD
249 ; REWARD HIM WITH A BEEP
250 ;
251 ;
252 0CCC A9 FF PRSDN LDA #FF
253 0CCE 81 EA EA STA BEEPTIME
**** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
254 0CD1 60 RTS
255 ;
256 ; HERE WHEN HE MAKES A TOUCHDOWN
257 ;
258 0CD2 EA EA EA TO EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
259 0CD5 A9 FF LDA #FF
260 0CD7 85 1E STA TKLER ; NO TACKLER, NO BLINK
261 ;
262 0CD9 A9 05 LDA #05 ; 'HOLD' MODE
263 0CDB 85 1F STA STATE
264 ;
265 ; THE CONDITION WE IMPOSE FOR RESUMING PLAY
266 ; IS THAT THE PLAYER LOOK AT HIS SCORE OR DOWNS
267 ; THE MCYCLEE FLAG KEEPS US FROM GOING TO STATE 2 UNTIL
268 ; HE DOES.
269 ;
270 0CDD A9 FF LDA #FF
271 0CDF 81 EA EA STA MCYCLEE
**** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
272 ;

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63

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273 0CE2 20 EA EA JSR FAROUT
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
274 0CE5 A9 EA LDA #CHARGE
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 18
275 0CE7 20 EA EA JSR CLIP2
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
276 ; NOW GIVE HIS OPPONENT A TURN
277 0CEA A5 2A LDA POSS
278 0CEC 49 FF EOR #5FF
279 0CEE 85 30 STA NPOSS
280 ; DON'T FORGET TO GIVE HIM HIS POINTS
281 0CF0 49 FF EOR #5FF
282 0CF2 29 01 AND #501
283 0CF4 AA TAX
284 ; AT THIS POINT, X=0 FOR LEFT, X=1 FOR RIGHT
285 0CF5 85 2B LDA SLEFT,X
286 0CF7 18 CLC
287 0CF8 F8 SED
288 0CF9 69 07 ADC #507
289 0CFB 08 CLD
290 0CFC 95 2B STA SLEFT,X
291 ; THE OTHER GUY TAKES OVER ON THE 40
292 ; I.E. SIXTY YARDS TO GO
293 0CFE A9 60 LDA #560

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1

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0CARD # LOC CODE CARD
294 0D00 85 29 STA LOS
295 0D02 20 00 0C JSR SETON
296 0D05 60 RTS
297 ;
298 ;
299 ; SIMPLE ROUTINE TO RESET QB TO BACK OF FIELD
300 ;
301 0D06 A9 08 OFFEND LDA #508
302 0D08 85 07 STA TRIALX
303 0D0A 60 RTS
304 ;
305 ; HERE TO CHECK IF A MAN TRIED TO GO OFF THE SIDES
306 ; WORKS FOR QB AND OTHERS
307 ;
308 0D0B A5 06 NFORCE LDA TRIALX
309 0D0D EA EA EA ENFS ENFS
**** ERROR ** LABEL PREVIOUSLY DEFINED - NEAR COLUMN 17
310 0D10 A9 01 LDA #501
311 0D12 85 06 STA TRIALX
312 ;
313 0D14 C9 04 ENFS CMP #504
314 0D16 30 04 BMI ENFTOP
315 0D18 A9 03 LDA #503
316 0D1A 85 06 STA TRIALX
317 ;
318 0D1C A5 07 ENFTOP LDA TRIALX
319 0D1E 10 04 BPL ENFBOT
320 0D20 A9 00 LDA #500
321 0D22 85 07 STA TRIALX
322 ;
323 0D24 C9 09 ENFBOT CMP #509
324 0D26 30 04 BMI ENFEND
325 0D28 A9 08 LDA #508
326 0D2A 85 07 STA TRIALX

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327 0020 60 ENFEND RTS
 328 ;
 329 ;
 330 ; DEFENSE MOTION
 331 ;
 332 0020 EA EA EA DEFEND EQU *
 ***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
 333 0030 E6 21 INC DEFL
 334 0032 F0 01 BEQ *+3
 335 0034 60 RTS
 336 0035 E6 20 INC DEFH
 337 0037 F0 01 BEQ *+3
 338 0039 60 RTS
 339 ;
 340 003A 20 13 0E JSR RANDOM
 341 003D 85 21 STA DEFL ;PARTLY RANDOM RATE
 342 003F AD EA EA LDA DEFL
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17

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0CARD # LOC CODE CARD
 343 0042 85 20 STA DEFH
 344 0044 20 48 0D JSR STEPX
 345 0047 60 RTS
 346 ;
 347 ;
 348 ; CHOOSE A RANDOM DEFENDER
 349 ;
 350 0048 EA EA EA STEPX EQU *
 ***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 7
 351 0048 20 13 0E GETX JSR RANDOM
 352 004E 29 07 AND #07
 353 0050 F0 F9 BEQ GETX ;PLAYER >0 IS DEFENDER
 354 ; HERE WITH CANDIDATE IN AC
 355 ; CHECK HOW MANY PLAYERS ARE ACTUALLY ON THE FIELD
 356 0052 8D EA EA STA WHOSTP
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 357 0055 AA TAX
 358 0056 85 08 LDA MANX,X
 359 0058 F0 EA EA BEQ GETSONE ;NON-EXISTENT MAN
 ***** ERROR ** INVALID EXPRESSION - NEAR COLUMN 17
 360 ; HERE WITH REAL MAN IN WHOSTP
 361 ; AND IN X
 362 005B 20 0D 0D JSR TRY
 363 005E 20 80 0D JSR STPHM
 364 ; HERE TO SEE IF IT WAS A LEGAL STEP
 365 ; FIRST, CHECK FO TACKLE
 366 0061 A5 06 LDA TRIALX
 367 0063 C5 08 CMP MANX
 368 0065 D0 0D BNE TEAM
 369 0067 A5 07 LDA TRIALY
 370 0069 C5 10 CMP MANY
 371 006B D0 07 BNE TEAM
 372 006D AD EA EA LDA WHOSTP
 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
 373 0070 20 7E 0C JSR TACKLE
 374 0073 60 RTS
 375 ;
 376 0074 20 C5 0D TEAM JSR HITDEF ;DID HE HIT A TEAMMATE?
 377 0077 B0 06 BCS RTS2 ;YES, OH, WELL; NOBODY MOVES THIS TIME
 378

379 0079 AE EA EA LDX WHOSTP
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17 ;NO, GOOD, PUT HIM IN NEW PLACE
380 007C 20 E6 00 JSR UNTRY
381 007F 60 RTS
382 ;
383 ;
384 ; HERE WITH SOME DEFENDER NAMED IN WHOSTEP
385 ; THIS ROUTINE CALLS TRIAL STEP UNTIL IT
386 ; FINDS A STEP THAT PUTS DEFENDER CLOSER TO THE QB
387 0080 EA EA EA STPHIM *
***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
388 0083 20 EF 00 JSR GMUNU ;THE METRIC

1
0CARD # LOC CODE CARD PAGE 9

389 0086 85 1A STA ODIST
390 0088 AE EA EA STEPL LDX WHOSTP
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
391 008B 20 00 00 JSR TRY
392 008E 20 EA EA JSR TRYSTP
***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
393 0091 20 EF 00 JSR GMUNU
394 0094 C5 1A CMP ODIST
395 0096 10 F0 BPL STEPL
396 0098 60 RTS
397 ;
398 ;
399 ; HERE TO STEP TRIALYY IN A RANDOM DIRECTION
400 ; NO GUARANTEE THAT IT IS TOWARD QB
401 ;
402 ;

403 0099 EA EA EA TRYSTP JSR RANDOM
***** ERROR ** LABEL GREATER THAN SIX CHARACTERS - NEAR COLUMN 1
404 009C 06 EA EA ASL
***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
405 009F 06 EA EA ASL
***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
406 00A2 29 0C AND #30C
407 00A4 18 CLC
408 00A5 69 B3 ADC #INCDCE 250/250 - index *
***** ERROR ** ADDRESS NOT VALID - NEAR COLUMN 18
409 00A7 85 18 STA BAR
410 00A9 20 18 00 JSR BAR
411 00AC 20 0B 00 JSR NFORCE
412 00AF 60 RTS
413 ;

414 00B0 6C 18 00 F00 JMP (BAR)
415 ;
416 00B3 EA EA EA INCDCE *
***** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
417 00B6 E6 06 INC TRIALX
418 00B8 60 RTS
419 ;
420 00B9 EA NOP
421 00BA C6 06 DEC TRIALX
422 00BC 60 RTS
423 00BD EA NOP
424 00BE E6 07 INC TRIALY
425 00C0 60 RTS
426 00C1 EA NOP
427 00C2 C6 07 DEC TRIALY

19
428 00C4 60 ; RTS
429 ;
430 ;
431 ; HERE TO DETERMINE IF DATA IN TRIALX/Y
432 ; COINCIDES WITH SOME DEFENDER
433 ;

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1
0CARD # LOC CODE GARD
434 00C5 EA EA EA HITDEF EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
435 00C8 A2 08 LDX #308 ;NUMBER OF PLAYERS
436 00CA CA HITL DEX
437 00CB 00 02 RNE CHECK
438 00CD 18 CLC
439 00CE 60 RTS
440 ;
441 00CF B5 08 CHECK LDA MANX,X
442 00D1 C5 06 CMP TRIALX
443 00D3 00 F5 RNE HITL
444 00D5 B5 10 LDA MANY,X
445 00D7 C5 07 CMP TRIALY
446 00D9 00 EF RNE HITL
447 00DB 38 SEC
448 00DC 60 RTS
449 ;
450 ;
451 ; THESE ROUTINES COPY STUFF INTO TRIALX/Y
452 ; CALL WITH MAN # IN X
453 ;
454 00DD B5 08 TRY LDA MANX,X
455 00DF 85 06 STA TRIALX
456 00E1 85 10 LDA MANY,X
457 00E3 85 07 STA TRIALY
458 00E5 60 RTS
459 ;
460 00E6 A5 06 UNTRY LDA TRIALX
461 00E8 95 08 STA MANX,X
462 00EA A5 07 LDA TRIALY
463 00EC 95 10 STA MANY,X
464 00EE 60 RTS
465 ;
466 ;
467 ; THE METRIC
468 ; COMPUTES THE DISTANCE BETWEEN TRIAL AND QB
469 ;
470 00EF EA EA EA GMUND EQU *
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 9
471 00F2 A5 06 LDA TRIALX
472 00F4 38 SEC
473 00F5 EA EA EA SUB SAC MANX
**** ERROR ** ILLEGAL OR MISSING OP CODE - NEAR COLUMN 17
474 00F8 20 09 0E JSR ABS
475 00FB 85 05 STA TEMP
476 00FD A5 07 LDA TRIALY
477 00FF 38 SEC
478 0E00 E5 10 SBC MANY
479 0E02 20 EA EA JSR ABS
**** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
480 0E05 18 CLC
481 0E06 65 05 ADC TEMP


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1  MCARD # LOC CODE CARD
2  482 0E08 60 RTS
3  483 ;
4  484 ; ABSOLUTE VALUE
5  485 ;
6  486 0E09 09 00 ABS CMP #000
7  487 0E0B 10 05 BPL ABSEND
8  488 0E0D 49 FF EOP #0FF
9  489 0E0F 18 CLC
10 490 0E10 69 01 ADC #01
11 491 0E12 60 ABSEND RTS
12 492 ;
13 493 ;
14 494 ; RANDOM NUMBER GENERATOR
15 495 ; R = R * 5 + A
16 496 ; A = A + 1
17 497 ; RETURN(R)
18 498 ;
19 499 0E13 AD EA EA RANDOM LDA RAND
20 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
21 500 0E16 26 EA EA ROL
22 ***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
23 501 0E19 26 EA EA ROL
24 ***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
25 502 0E1C 26 EA EA ROL
26 ***** ERROR ** RAN OFF END OF CARD - NEAR COLUMN 11
27 503 0E1F 6D EA EA ADC RAND
28 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
29 504 0E22 6D EA EA ADC ADDEND
30 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
31 505 0E25 8D EA EA STA RAND
32 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
33 506 0E28 EE EA EA INC ADDEND
34 ***** ERROR ** UNDEFINED SYMBOL -- NEAR COLUMN 17
35 507 0E2B 60 RTS
36 508 ;
37 509 ;
38 510 ; END OF THE MOJION PACKAGE
39 511 ;
40 512 ;END

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END OF MOS/TECHNOLOGY 650X ASSEMBLY VERSION 4
NUMBER OF ERRORS = 47, NUMBER OF WARNINGS = 0

1 SYMBOL TABLE

SYMBOL VALUE LINE DEFINED CROSS-REFERENCES

ABS	0E09	486	474
ABSEND	0E12	491	487
ABX	*UNDEFINED*	2	479
AUDEDN	*UNDEFINED*	2	506
AUDEND	*UNDEFINED*	2	504
AUV	0C4E	156	129
AUVS	0C55	162	157
ASLA	0C1F	119	****
BAH	0018	29	409 410 414
BLINKY	0022	39	****
BNZ	0C92	207	****

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BPTIME	002F	52	****				
BUTTON	0038	61	****				
BUZZY	0035	58	****				
BZTIME	0036	59	****				
CHARGE	*UNDEFINED*	0		274			
CHECK	00CF	441		437			
CLIOF2	*UNDEFINED*	0		275			
CLIOPE	*UNDEFINED*	0		217			
CUDA	00A1	215		210			
DEFEND	0020	332	****				
DEFH	0020	37		336	343		
DEFL	0021	38		333	341		
DOPLAY	0016	112	****				
DOWN	0027	44		201	202	230	
ENFBOT	0024	323		319			
ENFEND	0020	327		324			
ENFS	0014	313	****				
ENFTOP	0010	318		314			
FAROUT	*UNDEFINED*	0		192	273		
FIN	003B	135		119	125	130	
FUD	00B0	414	****				
FRST10	0090	212		197			
FRSTDN	0000	252		174			
GETX	004B	351		353			
GMUNU	00EF	472		388	393		
HITDEF	00C5	434		136	160	376	
HITL	00CA	436		443	446		
IDEFH	*UNDEFINED*	0		342			
ILKR	*UNDEFINED*	0		84			
INCDEC	00B3	416		408			
JUMPER	0020	50	****				
LINE	0060	176		165	173		
LOOKER	0003	3		81	85		
LOS	0029	46		176	181	241	243 294
LUSFIX	0037	60	****				
LUSS	0095	208		204			
MANX	0008	13		358	367	441	454 961
MANY	0010	21		370	444	456	463 478
MCYCLE	0010	33		221			
NFORCE	000E	308		135	411		

1 SYMBOL VALUE LINE DEFINED CROSS-REFERENCES

NOTDN	0030	127	122				
NOTE	0023	40	****				
NOTUP	0026	121	116				
NPOSS	0030	53	237	279			
ODIST	001A	31	389	394			
OFFEND	0006	301	158				
OGEAR	001B	32	****				
OLDSW	0004	9	95	97			
PUSS	002A	47	235	277			
RAND	*UNDEFINED*	0	499	503	505		
RANDOM	0013	499	340	351			
RATE	0024	41	****				
RIS1	0048	144	128				
RIS2	007F	381	377				
SEIDN	00B0	227	212	244	295		
SLEFT	002B	48	285	290			
SKIGHT	0020	49	****				
SIATE	001F	36	219	263			

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[illegible]