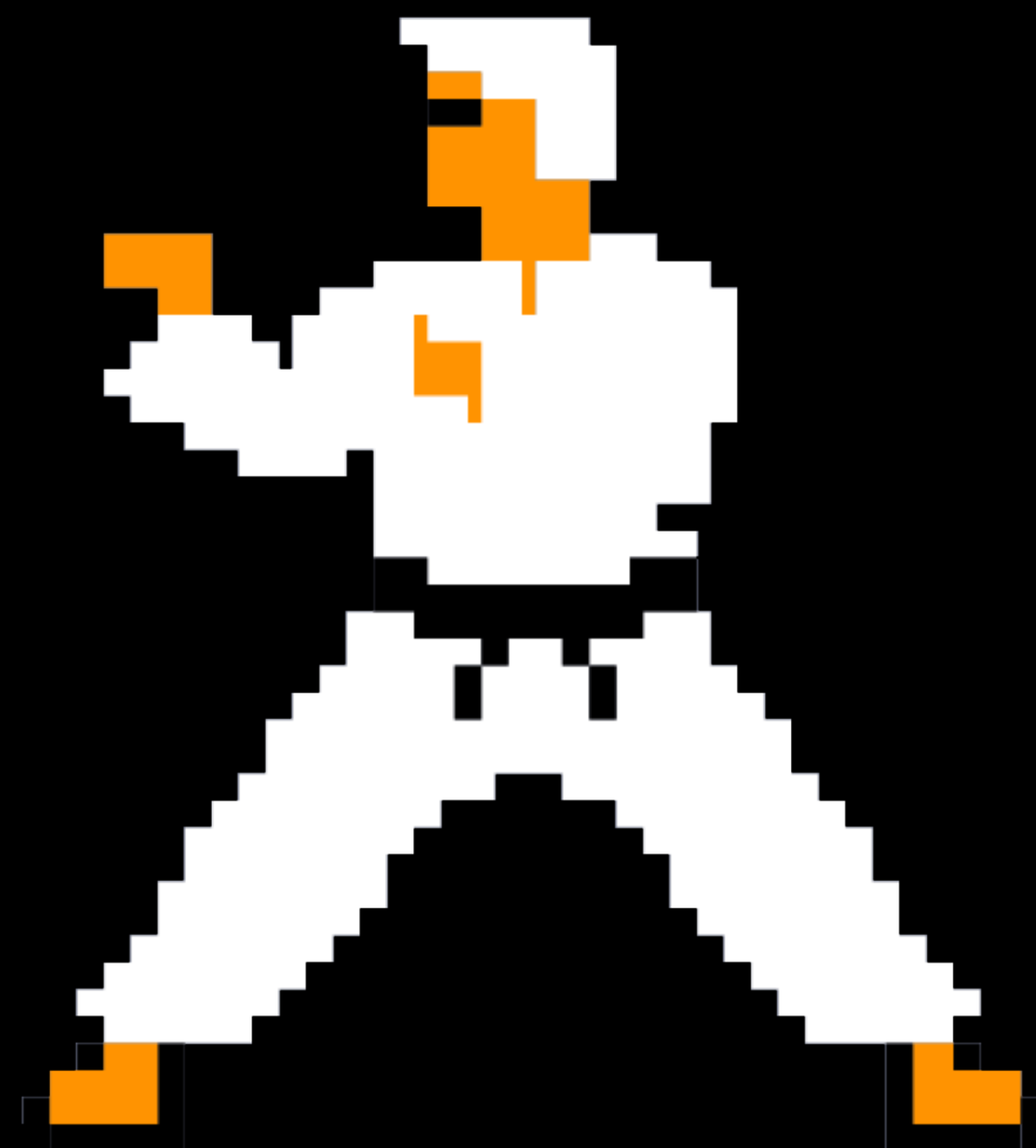
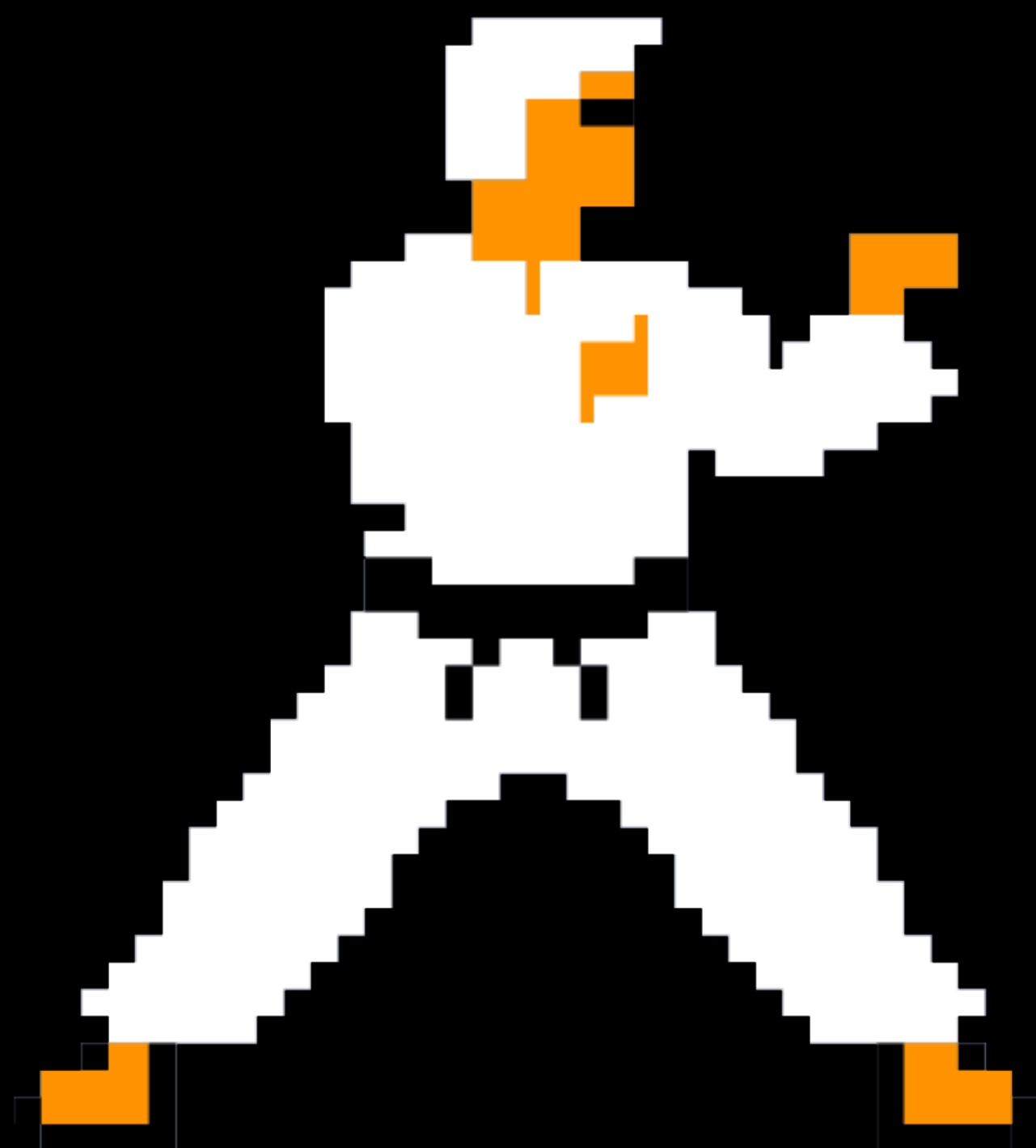


**“People who know what they’re talking about don’t need PowerPoint”**

— Steve Jobs

# Ready Player Two

player vs player Karateka



# But first, Virtual II





**JSR PUNCH?**



Resume

Step Over

Step Into

Step Out

v

Break

65C02

A: DD    S: F6  
X: 04    PC: 1992  
Y: BD

N V - B D I Z C  
1 0 1 0 0 0 0 0

Cycle count  
62356216

Stack

01FE: B7C3 JSR  
01FC: BA18 JSR  
01FA: 0B5F JSR  
01F8: 1A47 JSR  
01F7: 04  
-Top of stack-

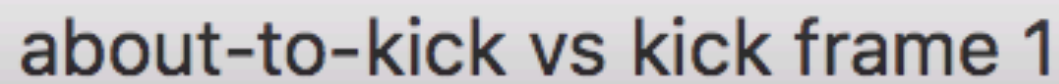
Disassembly			Memory	
<input type="checkbox"/>	1992: B9 C0 08	LDA \$08C0,Y	<input type="checkbox"/>	
<input type="checkbox"/>	1995: 18	CLC	<input type="checkbox"/>	
<input type="checkbox"/>	1996: 65 07	ADC \$07	<input type="checkbox"/>	
<input type="checkbox"/>	1998: 85 01	STA \$01	<input type="checkbox"/>	
<input type="checkbox"/>	199A: A5 03	LDA \$03	<input type="checkbox"/>	
<input type="checkbox"/>	199C: 18	CLC	<input type="checkbox"/>	
<input type="checkbox"/>	199D: 65 16	ADC \$16	<input type="checkbox"/>	
<input type="checkbox"/>	199F: 85 03	STA \$03	<input type="checkbox"/>	
<input type="checkbox"/>	19A1: 90 02	BCC \$19A5	<input type="checkbox"/>	
<input type="checkbox"/>	19A3: E6 04	INC \$04	<input type="checkbox"/>	
<input type="checkbox"/>	19A5: A4 16	LDY \$16	<input type="checkbox"/>	
<input type="checkbox"/>	19A7: F0 27	BEQ \$19D0	<input type="checkbox"/>	
<input type="checkbox"/>	19A9: A5 03	LDA \$03	<input type="checkbox"/>	
<input type="checkbox"/>	19AB: 38	SEC	<input type="checkbox"/>	
<input type="checkbox"/>	19AC: E9 01	SBC #\$01	<input type="checkbox"/>	
<input type="checkbox"/>	19AE: 85 03	STA \$03	<input type="checkbox"/>	
<input type="checkbox"/>	19B0: B0 02	BCS \$19B4	<input type="checkbox"/>	
<input type="checkbox"/>	19B2: C6 04	DEC \$04	<input type="checkbox"/>	
<input type="checkbox"/>	19B4: A0 00	LDY #\$00	<input type="checkbox"/>	
<input type="checkbox"/>	19B6: B1 03	LDA (\$03),Y	<input type="checkbox"/>	
<input type="checkbox"/>	19B8: 20 84 1A	JSR \$1A84	<input type="checkbox"/>	
<input type="checkbox"/>	19BB: A6 1A	LDX \$1A	<input type="checkbox"/>	
<input type="checkbox"/>	19BD: 86 19	STX \$19	<input type="checkbox"/>	
<input type="checkbox"/>	19BF: A5 03	LDA \$03	<input type="checkbox"/>	
<input type="checkbox"/>	19C1: 18	CLC	<input type="checkbox"/>	

Memory		Find (hex)		First		Next	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
0000	DD 33 D5 18 0B 0D B9 20	71 02 06 00 00 07 01 01	.3.....	q.....			
0010	00 AA D5 AA 0D 01 00 FF	09 00 00 12 0B 00 00 00	.....	.....			
0020	18 06 0D 16 00 5C 16 FF	00 00 00 FF 01 00 00 00	.....\..	.....			
0030	00 00 02 09 FE 00 00 00	00 00 00 00 00 60 00 01	.....	.....`..			
0040	03 00 01 00 00 01 80 00	24 00 00 00 00 00 00 01	.....	\$......			
0050	02 25 27 02 00 00 05 00	00 00 00 01 19 01 01 00	.%'.....	.....			
0060	18 06 0D 00 00 5C 16 FF	00 00 00 FF 01 00 00 00	.....\..	.....			
0070	02 02 18 00 01 02 02 01	01 00 FF 00 FF 00 00 00	.....	.....			
0080	F7 00 00 00 07 00 01 00	00 07 00 00 00 00 00 00	.....	.....			
0090	05 47 10 00 50 00 00 00	07 00 00 80 00 0F FF 0E	.G..P...	.....			
00A0	05 00 00 01 02 02 00 00	00 00 00 25 25 00 00 00	.....	...%%...			
00B0	0E 0E 01 06 00 26 0B 0E	1E 1E 1E 00 00 00 00 00	.....&..	.....			
00C0	00 00 00 00 01 00 00 00	00 00 00 00 00 00 00 00	.....	.....			
00D0	01 00 01 00 00 00 00 E0	E0 FF 00 00 00 00 00 00	.....	.....			
00E0	27 27 0F 0F 18 18 00 00	00 00 00 00 00 00 00 00	''.....	.....			
00F0	00 00 00 00 00 00 4A 40	10 01 01 01 53 00 00 00	.....J@	....S...			
0100	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0110	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0120	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0130	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0140	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0150	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0160	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0170	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			
0180	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....	.....			

**Watch Zero Page?**





[illegible]



**Follow the White Rabbit**

**Blue Eagle**



Breakpoints

Watchpoints

I/O Addresses

The virtual machine goes into break mode when the value of a watchpoint changes

Enabled	Item

+

-

Enabled	Address	Comment
<input checked="" type="checkbox"/>	0021	enemy action?

+

-

Cancel

OK



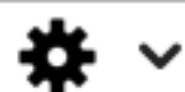
## Inspector - Untitled

Resume

Step Over

Step Into

Step Out



Break

65C02

Disassembly

Memory

A: 80 S: F6  
X: 00 PC: 19E8  
Y: 00

N V - B D I Z C  
0 0 1 0 0 0 1 0

Cycle count  
87106077

Stack

01FE: B7C3 JSR

01FC: B0CC JSR

6647

Show

Current PC

Show

Find (hex)

a5 21

First

Next

☒ 6647: A5 21 LDA \$21☐ 6649: C9 06 CMP #\$06☐ 664B: F0 08 BEQ \$6655☐ 664D: C9 1C CMP #\$1C☐ 664F: F0 04 BEQ \$6655☐ 6651: C9 1D CMP #\$1D☐ 6653: D0 C0 BNE \$6615☐ 6655: A9 06 LDA #\$06☐ 6657: C5 20 CMP \$20☐ 6659: D0 13 RNE \$666F

6640	0D D0 04 A9 37 D0 EF A5 21 C9 06 F0 08 C9 1C F0	....7... !.....
6650	04 C9 1D D0 C0 A9 06 C5 20 D0 13 A9 00 85 24 A9	.....\$.
6660	01 85 27 85 28 A9 0A 85 25 85 26 4C 4C 67 A9 01	..'.'.(... %.&LLg..
6670	85 24 85 28 A9 38 85 26 20 4C 67 4C 72 65 A5 20	.\$.(.8.& LgLre.
6680	C9 06 D0 13 A9 07 85 25 85 26 A9 01 85 27 85 28	.....% .&...'.'(
6690	A9 00 85 24 4C 41 67 C9 01 D0 11 A5 24 C9 03 B0	...\$LA\$. ....\$...
66A0	1F E6 24 A9 01 85 25 85 26 4C 41 67 C9 17 90 10	..\$...%. &LA\$. ....
66B0	C9 1B D0 0C A5 27 30 08 A9 FF 85 25 85 26 D0 CA	.....'0. ...%&..
66C0	4C 72 65 A5 2F F0 19 A9 07 C5 20 D0 F3 C5 21 D0	Lre./... .. ...!
66D0	FE A9 01 85 27 85 28 A9 11 85 25 85 26 4C F2 66	' ( % & L f

## Inspector - Untitled

Resume

Step Over

Step Into

Step Out



Break

65C02

Disassembly

Memory

A: 80 S: F6  
X: 00 PC: 19E8  
Y: 00

N V - B D I Z C  
0 0 1 0 0 0 1 0

Cycle count  
87106077

Stack

6488

Show

Current PC

Show

Find (hex)

85 21

First

Next

☒ 6488: 85 21 STA \$21☐ 648A: 60 RTS☐ 648B: A5 2A LDA \$2A☐ 648D: 10 0D BPL \$649C☐ 648F: A0 00 LDY #\$00☐ 6491: A9 02 LDA #\$02☐ 6493: 85 20 STA \$20☐ 6495: 85 21 STA \$21

6480	D0 05 E6 45 4C 1F 65 60 85 21 60 A5 2A 10 0D A0	...EL.e` .!`.*...
6490	00 A9 02 85 20 85 21 E6 26 84 2B 60 C9 01 D0 06	.... .!. &.+`....
64A0	A0 02 A9 04 D0 ED A0 01 A9 03 D0 E7 A5 29 F0 08	.....)...
64B0	30 32 A5 33 C9 08 B0 1D A9 3A 85 25 A9 FF 85 27	02.3.... :.%...'
64C0	A9 01 85 28 A9 39 85 26 A5 22 18 65 2C 18 65 2C	...(9.& ."e,e,
64D0	85 22 4C 00 64 A9 39 85 25 85 26 A9 01 85 27 85	."L.d.9. %&...'.
64E0	28 4C 00 64 A9 05 85 25 D0 EF A9 39 85 26 A9 FF	(L.d...% ...9.&..
64F0	85 27 A9 30 85 25 4C 00 64 A5 2A 10 09 A0 06 A9	.'0.%L. d.*.....



Break

```
01FE: B7C3 JSR
01FC: B924 JSR
-Top of stack-
```

☐ C4B2: AF 32

## Apply

Next

```

FF  FF  FF  FF  FF  . . . . .

```

FF FF FF FF FF FF FF FF

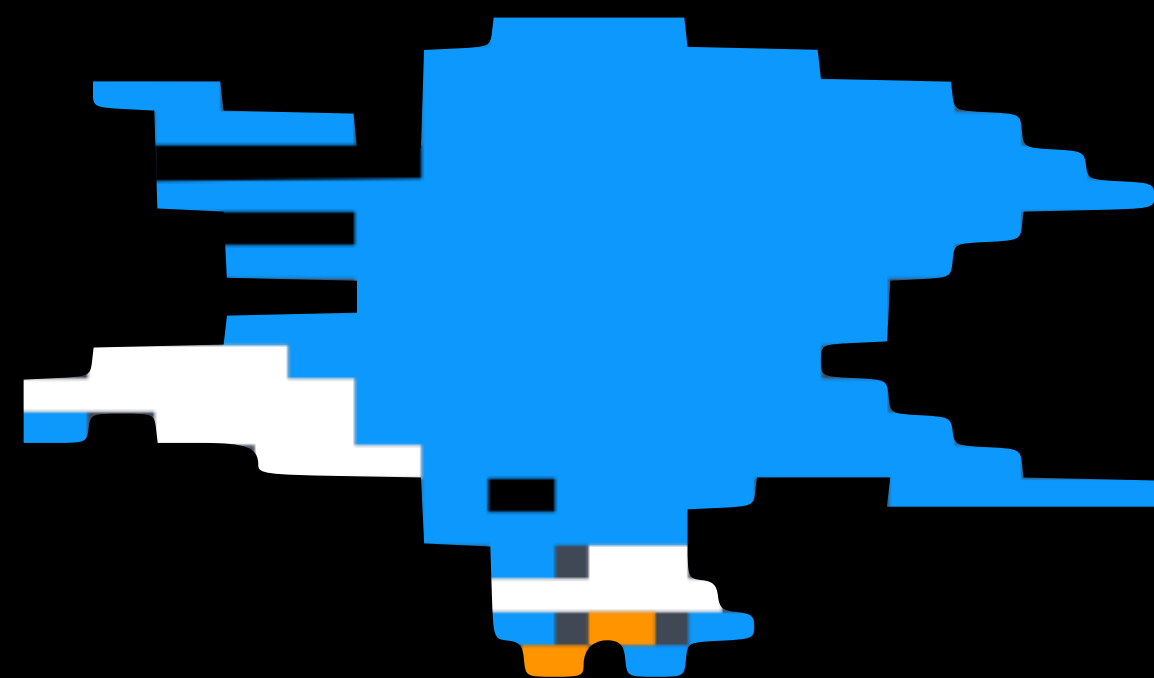
FF FF FF FF FF FF FF FF



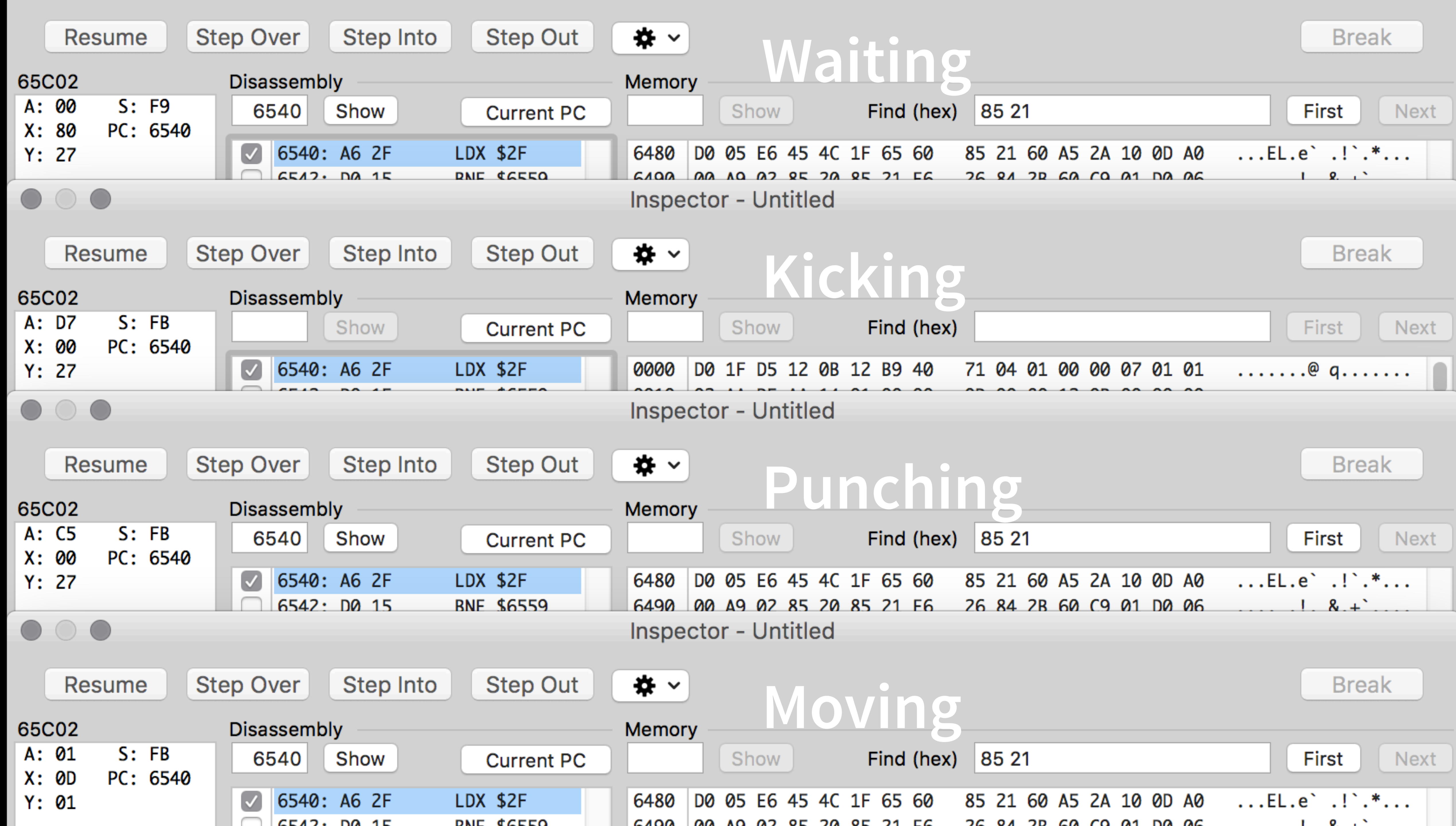


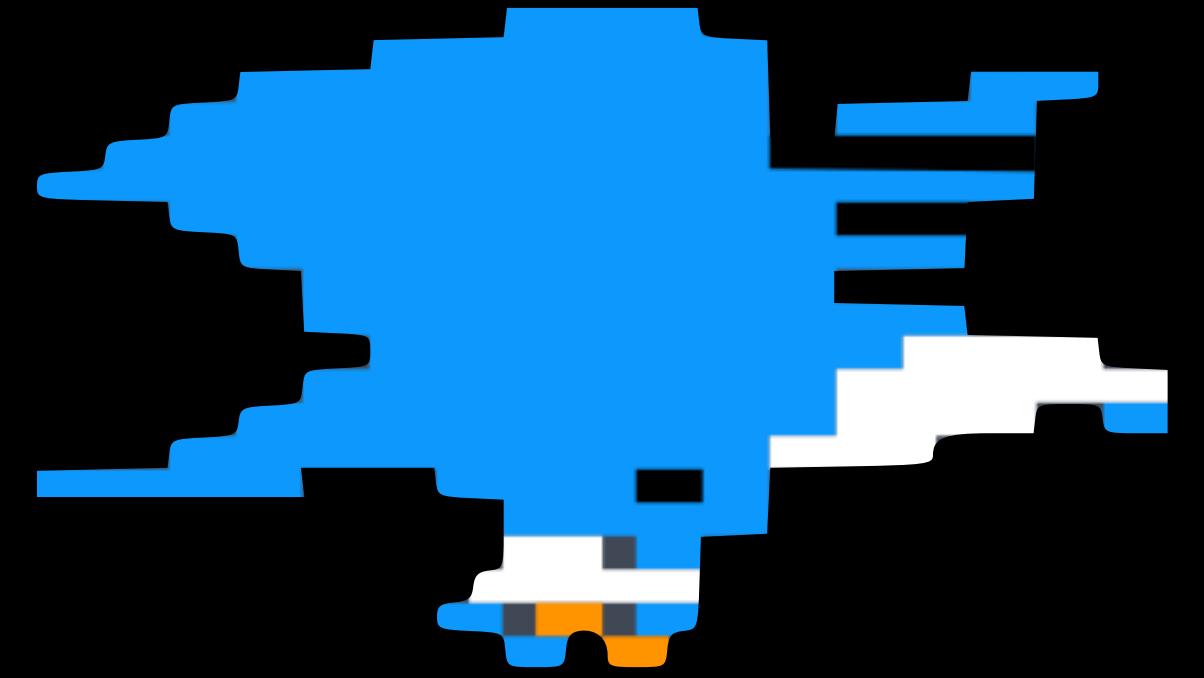
**Don't do something! Just stand there!**

# What's Happening Here?









**Flip It and Reverse It.**



Instruction Trail - Untitled						
Remember last		1000	instructions		Save As...	
Cycle count	Executed instruction		A	X	Y	P S
39949378	6C8C: A9 00	LDA #\$00	00	00	27	62 FS
39949380	6C8E: F0 02	BEQ \$6C92	00	00	27	62 FS
39949383	6C92: 85 2A	STA \$2A	00	00	27	62 FS
39949386	6C94: 60	RTS	00	00	27	62 FE
39949392	6BF9: A5 26	LDA \$26	16	00	27	60 FE
39949395	6BFB: C9 0D	CMP #\$0D	16	00	27	61 FE
39949397	6BFD: D0 08	BNE \$6C07	16	00	27	61 FE
39949401	6C07: A5 20	LDA \$20	06	00	27	61 FE
39949404	6C09: C9 16	CMP #\$16	06	00	27	E0 FE
39949406	6C0B: F0 0A	BEQ \$6C17	06	00	27	E0 FE
39949408	6C0D: A9 06	LDA #\$06	06	00	27	60 FE
39949410	6C0F: C5 20	CMP \$20	06	00	27	63 FE
39949413	6C11: D0 1C	BNE \$6C2F	06	00	27	63 FE
39949415	6C13: C5 21	CMP \$21	06	00	27	63 FE
39949418	6C15: D0 18	BNE \$6C2F	06	00	27	63 FE
39949420	6C17: A9 00	LDA #\$00	00	00	27	63 FE
39949422	6C19: 85 29	STA \$29	00	00	27	63 FE
39949425	6C1B: A9 D7	LDA #\$D7	D7	00	27	E1 FE
39949427	6C1D: 4C 40 65	JMP \$6540	D7	00	27	E1 FE



# D7 = Kicking

Inspector - Untitled

Resume Step Over Step Into Step Out ⚙️ Break

65C02

A: D7 S: FB  
X: 00 PC: 6540  
Y: 27

N V - B D I Z C  
1 0 1 0 0 0 0 1

Cycle count  
57749768

Stack  
01FE: B7C3 JSR  
01FC: B921 JSR  
-Top of stack-

Disassembly

Current PC

6540: A6 2F LDX \$2F  
6542: D0 15 BNE \$6559  
6544: C9 D1 CMP #\$D1  
6546: D0 03 BNE \$654B  
6548: 4C F4 65 JMP \$65F4  
654B: C9 D7 CMP #\$D7  
654D: D0 03 BNE \$6552  
654F: 4C 18 66 JMP \$6618  
6552: C9 C5 CMP #\$C5  
6554: D0 03 BNE \$6559  
6556: 4C 7E 66 JMP \$667E  
6559: C9 C6 CMP #\$C6  
655B: D0 03 BNE \$6560  
655D: 4C 17 67 JMP \$6717  
6560: C9 9B CMP #\$9B  
6562: D0 03 BNE \$6567  
6564: 4C C3 66 JMP \$66C3  
6567: A6 2F LDX \$2F

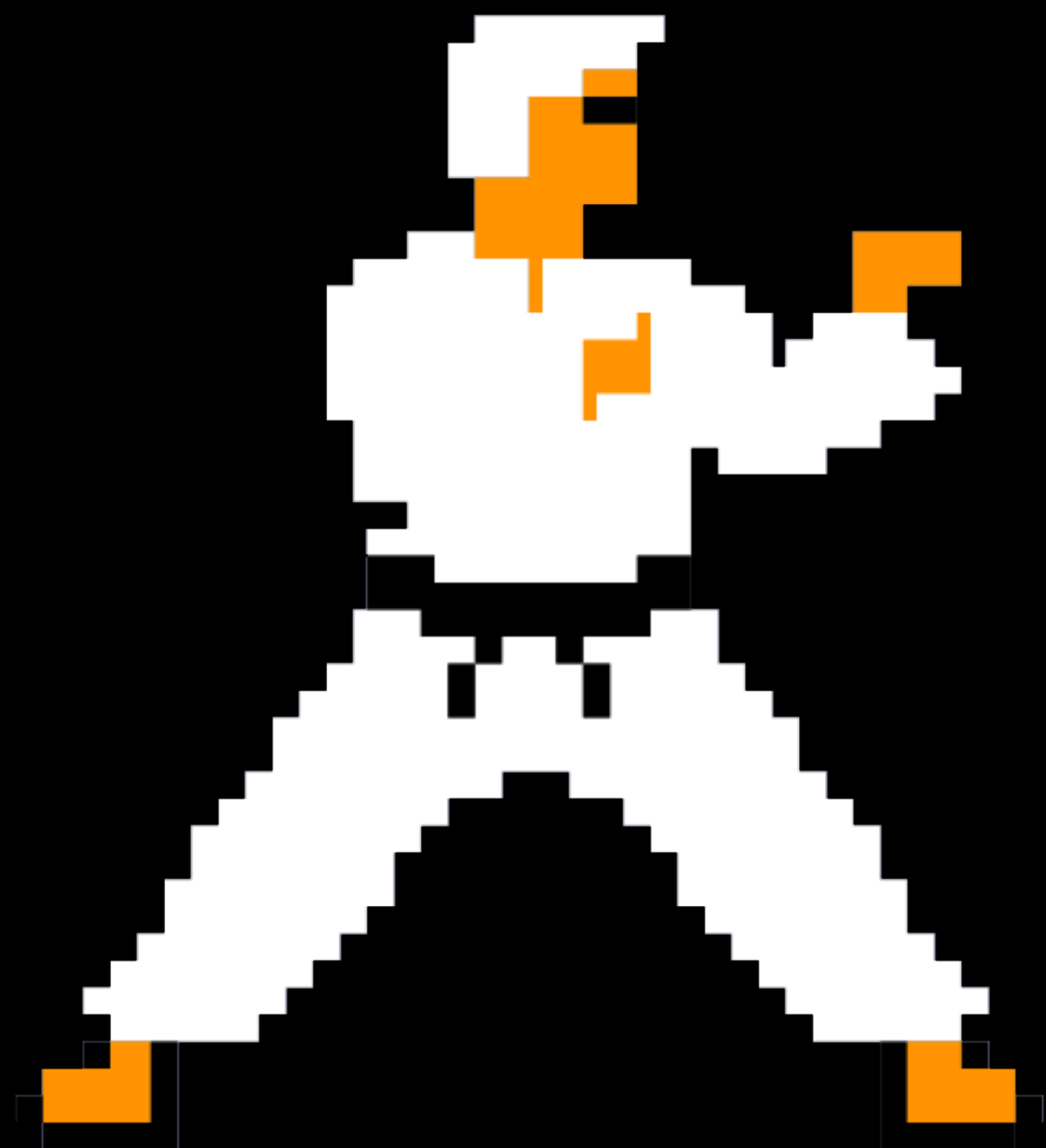
Memory

Find (hex)

First Next

0000	D0 1F D5 12 0B 12 B9 40	71 04 01 00 00 07 01 01	.....@ q.....
0010	02 AA D5 AA 14 01 00 00	0D 00 80 12 0B 00 00 00	.....
0020	06 06 16 00 01 3D 3B 01	00 00 01 FF FF 00 00 00	.....=;. ....
0030	00 00 06 07 FE 00 00 00	00 00 00 00 00 60 00 01	.....`..
0040	00 00 00 00 00 00 00 00	DE 00 00 00 00 00 00 01	.....
0050	02 27 29 00 00 00 05 00	00 00 00 13 0B 01 01 00	.'').....
0060	06 06 0F 00 00 59 16 00	00 00 00 FF 01 00 00 00	.....Y..
0070	06 06 16 00 01 3D 3B 01	00 00 00 FF FF 00 00 00	.....=;. ....
0080	16 02 00 00 07 00 01 00	00 07 00 00 00 00 00 00	.....
0090	05 49 10 00 50 00 00 00	07 00 00 80 00 0F FF 0E	.I..P... ..
00A0	05 00 00 01 02 02 00 00	00 00 00 27 27 02 02 00	.....'...'..
00B0	0E 0E 01 06 00 26 0B 0E	1E 1E 1E 00 00 00 00 00	.....&..
00C0	00 00 00 00 01 00 00 00	00 00 00 00 00 00 00 00	.....
00D0	01 00 01 00 00 00 00 E0	E0 FF 00 00 00 00 00 00	.....
00E0	29 29 0F 0F 16 16 00 00	00 00 00 00 00 00 00 00	)).....
00F0	00 00 00 00 00 00 4A 40	10 01 01 01 53 00 00 00	.....J@ ....S...
0100	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0110	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....

**Difficulty Level: Easy**



**Patch.**



Resume

Step Over

Step Into

Step Out

65C02

A: 80    S: F6  
X: 00    PC: 19D9  
Y: 00

N V - B D I Z C  
1 0 1 0 0 0 0 0

Cycle count  
98219014

Stack

01FE: B7C3 JSR  
01FC: B9DB JSR  
01FA: B170 JSR  
01F8: 1A47 JSR  
01F7: 17  
-Top of stack-

Disassembly

6c11

Show

Current PC

<input type="checkbox"/>	6C11: AD 00 C0	LDA \$C000
<input type="checkbox"/>	6C14: C9 CD	CMP #\$CD
<input type="checkbox"/>	6C16: D0 02	BNE \$6C1A
<input type="checkbox"/>	6C18: A9 D7	LDA #\$D7
<input type="checkbox"/>	6C1A: 8D 10 C0	STA \$C010
<input type="checkbox"/>	6C1D: 4C 40 65	JMP \$6540
<input type="checkbox"/>	6C20: 20 95 6C	JSR \$6C95
<input type="checkbox"/>	6C23: C5 D7	CMP \$D7
<input type="checkbox"/>	6C25: B0 08	BCS \$6C2F
<input type="checkbox"/>	6C27: 20 71 6C	JSR \$6C71
<input type="checkbox"/>	6C2A: A9 C5	LDA #\$C5
<input type="checkbox"/>	6C2C: 4C 40 65	JMP \$6540
<input type="checkbox"/>	6C2F: A5 25	LDA \$25
<input type="checkbox"/>	6C31: C9 03	CMP #\$03
<input type="checkbox"/>	6C33: D0 13	BNE \$6C48
<input type="checkbox"/>	6C35: 20 95 6C	JSR \$6C95
<input type="checkbox"/>	6C38: DD F2 BF	CMP \$BFF2,X
<input type="checkbox"/>	6C3B: B0 04	BCS \$6C41
<input type="checkbox"/>	6C3D: A9 01	LDA #\$01
<input type="checkbox"/>	6C3F: D0 02	BNE \$6C43
<input type="checkbox"/>	6C41: A9 00	LDA #\$00
<input type="checkbox"/>	6C43: 85 29	STA \$29
<input type="checkbox"/>	6C45: 4C 58 6C	JMP \$6C58
<input type="checkbox"/>	6C48: 4C 80 6B	JMP \$6B80

Memory Editor - Untitled

While in a breakpoint, enter hexadecimal values for the Apple II address (either in RAM or ROM) and the byte values to be written to memory, starting at that location. Separate the bytes by space characters, just like in the Apple II monitor program.

The addresses are interpreted according to the memory banks configuration currently selected in the Inspector.

Address 

6C11

AD 00 C0 C9 CD D0 02 A9 D7 8D 10 C0

Apply

0120	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0130	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0140	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0150	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0160	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....
0170	FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF	.....

**<https://archive.org/details/karateka-two-player>**

