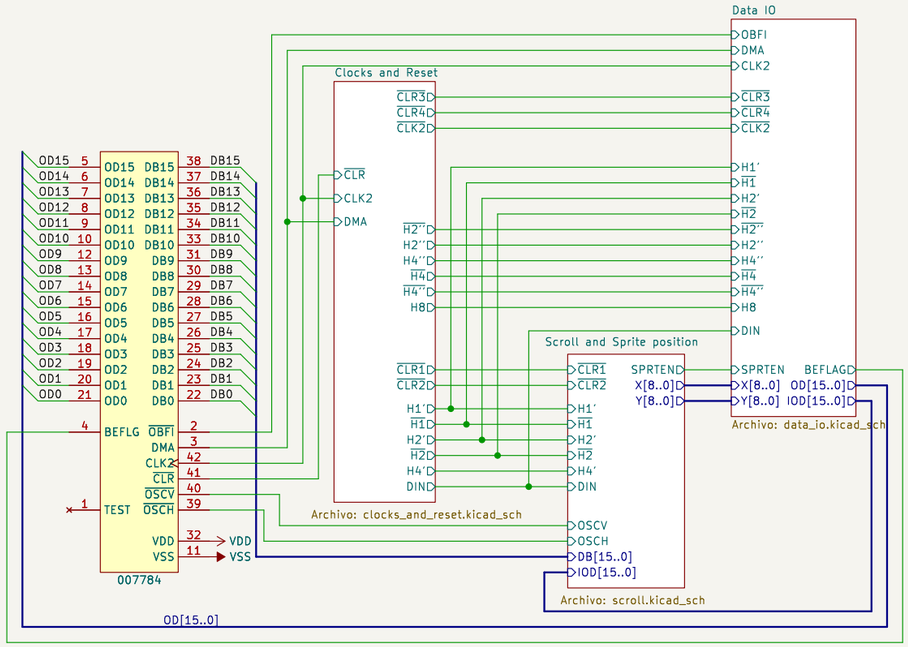
Words are parsed and written to sprite RAM in the following way:

Word 0 –> Sets/Clears BEFLAG according to bit 15.
Word 2 –> Word 3
Word 3 –> Word 0
Word 4 & 5 – XSCROLL –> Word 1
Word 6 & 7 – YSCROLL –> Word 2

The 007784 does the following things:

- Sets BEFLAG high if bit OD15 is set on every eight words in. Otherwise BEFLAG goes low. DMA does not need to be active.
- All other words in need DMA to be active to be parsed.
- Calculates the final vertical and horizontal positions of the sprite by using the sprite position in the unparsed object table and the horizontal and vertical scroll registers. It is written to a new parsed object table in RAM.
- The Sprite Enable (SPRTEN) bit is only set if the position is within the allowed range.
- When OBFI (OBJBUFINIT) in is high, only zeros are written to data out. That is to reset the object RAM table.



Ulf Skutnabba, twitter: @skutis77

Sheet: /
File: 007784.kicad_sch

Title: Konami 007784

Size: A3	Date: 2023-10-23	Rev:
KiCad E.D.A. kicad-cli 7.0.10-7.0.10~ubuntu20.04.1		Id: 1/4

Scroll Registers

Horizontal

Vertical

M29 DB15 SCH15 · M50 DB14 SCH14 · L22 DB13 SCH13 · L1 DB12 SCH12 · J53 DB11 SCH11 · L15 DB10 SCH10 · L8 DB9 SCH9 · M15 DB8 SCH8 · M8 DB7 SCH7 · M1 DB6 SCH6 · M36 DB5 SCH5 · M64 DB4 SCH4 · M22 DB3 SCH3 · M43 DB2 SCH2 · M57 DB1 SCH1 · M71 DB0 SCH0

P57 DB15 SCV15 · P64 DB14 SCV14 · P71 DB13 SCV13 · Q8 DB12 SCV12 · Q29 DB11 SCV11 · N15 DB10 SCV10 · N8 DB9 SCV9 · N1 DB8 SCV8 · N22 DB7 SCV7 · N57 DB6 SCV6 · N64 DB5 SCV5 · N36 DB4 SCV4 · N29 DB3 SCV3 · N50 DB2 SCV2 · N43 DB1 SCV1 · N71 DB0 SCV0

DB[15..0]

Horizontal and Vertical Positions

The scroll register bits are inverted and one is added to the result which yields a subtraction in 2's complement. In the difference the carry, and sign bit, is ignored making this a absolute value of the difference.

L29 L57 L64 L71 K71 L36 L43 L50 G82 G71 F60 F19 F70 F28 F78 F86 — IOD7 … IOD8, CLR1, FDO

A4H K1 — SCH15 SCH14 SCH13 SCH12 → X15 X14 X13 X12

A4H J1 — SCH11 SCH10 SCH9 SCH8 → X11 X10 X9 X8 → X[8..0]

A4H G21 — SCH7 SCH6 SCH5 SCH4 → X7 X6 X5 X4

A4H E28 — SCH3 SCH2 SCH1 SCH0 → X3 X2 X1 X0

VDD

Word 4 in: DIN R21 H4' H2 H1 N4B

Word 5 in: DIN R63 H4' H2 H1' N4B

Word 6 in: DIN R17 H4' H2' H1 N4B

Word 7 in: DIN R59 H4' H2' H1' N4B

IOD[15..0]

Q22 O57 O64 O73 Q50 Q15 Q36 Q1 I86 H48 H41 I71 A71 F52 E78 E86 — IOD7 … IOD8, CLR2, FDO

A4H O1 — SCV15 SCV14 SCV13 SCV12 → Y15 Y14 Y13 Y12

A4H P1 — SCV11 SCV10 SCV9 SCV8 → Y11 Y10 Y9 Y8 → Y[8..0]

A4H I21 — SCV7 SCV6 SCV5 SCV4 → Y7 Y6 Y5 Y4

A4H D28 — SCV3 SCV2 SCV1 SCV0 → Y3 Y2 Y1 Y0

VDD

Sprite Enable

Sprites are enabled on vertical positions 0..384 and 65280..65535

Y15 Y14 Y13 Y12 Y11 Y10 Y9 Y8

O51 N8B · O79 V1N · P51 R8B · Q57 N2B · P78 N2P · Q80 R2P · L78 N2P → SPRTEN

VSS

X15 X14 X13 X12 X11 X10 X9 X8

J66 N8B · H79 R2N · X7 X6 · J81 R2N · K80 R2P · J60 R8B · J75 N2B · X7 X8 · J78 N2P

VSS

Sprites enabled between horizontal positions 0..384 and ...

Sheet: /Scroll and Sprite position/	
File: scroll.kicad_sch	
Title: Konami 007784	
Size: A3	Date: 2023-10-23
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Word 0 in

Word 3, bit 15, out is SPRTEN (Sprite Enable)

Word 0 out

Word 1 out

Word 2 out

Word 3 out

Word 2 in

Word 3 in

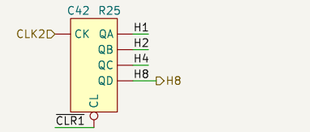
OD[15..0]

IOD[15..0]

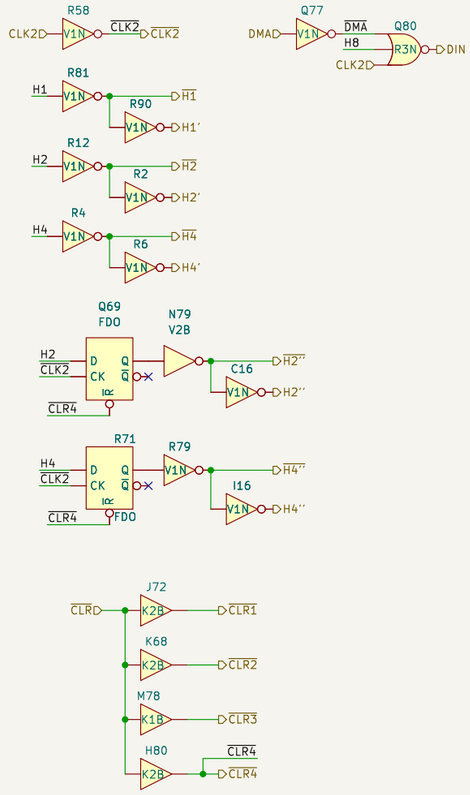
X[8..0]

Y[8..0]

Sheet: /Data IO/	
File: data_io.kicad_sch	
Title: Konami 007784	
Size: A3	Date: 2023-10-23
KiCad E.D.A.	kicad-cli 7.0.10-7.0.10~ubuntu20.04.1
Rev:	
Id: 3/4	



DIN = -H8 & -CLK2 & DMA



Sheet: /Clocks and Reset/		
File: clocks_and_reset.kicad_sch		
Title: Konami 007784		
Size: A3	Date: 2023-10-23	**Rev:**
KiCad E.D.A. kicad-cli 7.0.10-7.0.10~ubuntu20.04.1		Id: 4/4