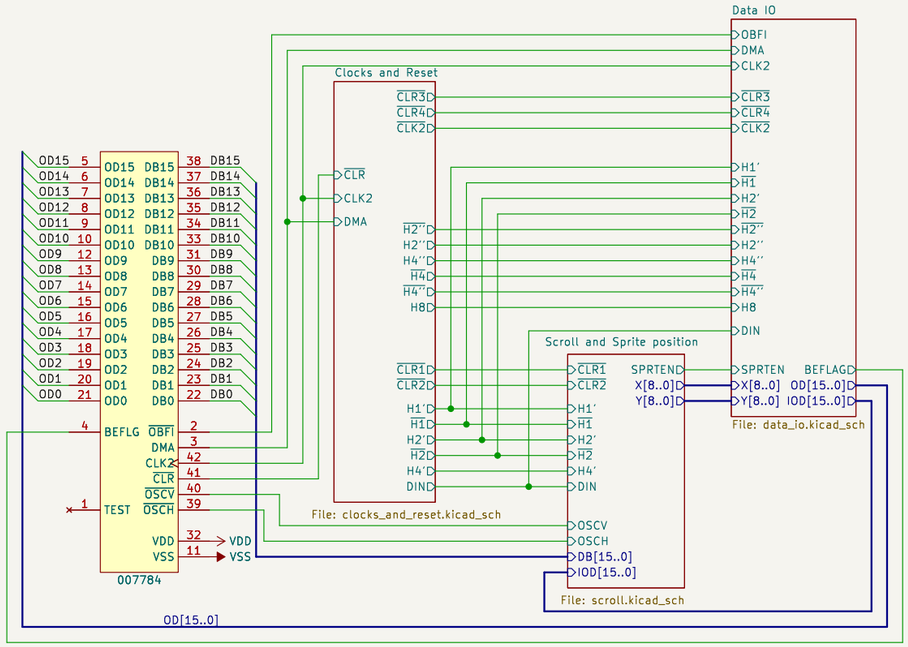
Words are parsed and written to sprite RAM in the following way:

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:**
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Scroll Registers

Horizontal

Vertical

M29 FDN — DB15 — SCH15 / SCV15
M50 FDN — DB14 — SCH14 / SCV14
L22 FDN — DB13 — SCH13 / SCV13
L1 FDN — DB12 — SCH12 / SCV12
J53 FDN — DB11 — SCH11 / SCV11
L15 FDN — DB10 — SCH10 / SCV10
L8 FDN — DB9 — SCH9 / SCV9
M15 FDN — DB8 — SCH8 / SCV8
M8 FDN — DB7 — SCH7 / SCV7
M1 FDN — DB6 — SCH6 / SCV6
M36 FDN — DB5 — SCH5 / SCV5
M64 FDN — DB4 — SCH4 / SCV4
M22 FDN — DB3 — SCH3 / SCV3
M43 FDN — DB2 — SCH2 / SCV2
M57 FDN — DB1 — SCH1 / SCV1
M71 FDN — DB0 — SCH0 / 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 — FDN — IOD7 … IOD0

A4H K1 — SCH15 SCH14 SCH13 SCH12 — X15 X14 X13 X12
A4H J1 — SCH11 SCH10 SCH9 SCH8 — X11 X10 X9 X8
A4H G21 — SCH7 SCH6 SCH5 SCH4 — X7 X6 X5 X4
A4H E28 — SCH3 SCH2 SCH1 SCH0 — X3 X2 X1 X0

X[8..0]

Word 4 in: DIN, H4', H2, H1 — R21 — N4B
Word 5 in: DIN, H4', H2, H1' — R63 — N4B

Q22 O57 O64 O73 Q50 Q15 Q36 Q1 I86 H48 H41 I71 A71 F52 E78 E86 — FDN — IOD7 … IOD0

A4H O1 — SCV15 SCV14 SCV13 SCV12 — Y15 Y14 Y13 Y12
A4H P1 — SCV11 SCV10 SCV9 SCV8 — Y11 Y10 Y9 Y8
A4H I21 — SCV7 SCV6 SCV5 SCV4 — Y7 Y6 Y5 Y4
A4H D28 — SCV3 SCV2 SCV1 SCV0 — Y3 Y2 Y1 Y0

Y[8..0]

Word 6 in: DIN, H4', H2', H1 — R17 — N4B
Word 7 in: DIN, H4', H2', H1' — R59 — N4B

IOD[15..0]

Sprite Enable

Sprites are enabled on vertical positions
0..384 and 65280..65535
$0000..$0180 and $FF00..$FFFF

Y15 Y14 Y13 Y12 Y11 Y10 Y9 Y8

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

X15 X14 X13 X12 X11 X10 X9 X8

J66 N8B — H79 R2N — J81 R2N — K80 R2P
J60 R8B — J75 N2B — J78 N2P

VSS

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

Sheet: /Scroll and Sprite position/		
File: scroll.kicad_sch		
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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	
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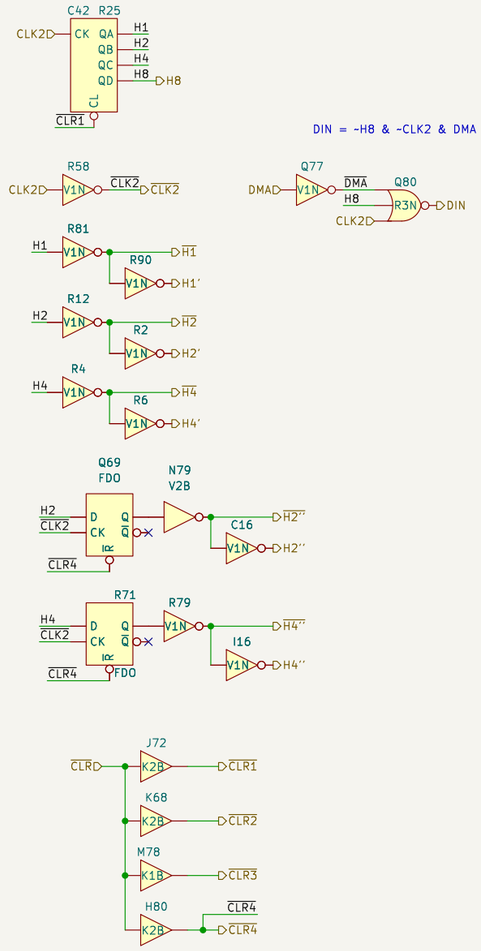

Sheet: /Clocks and Reset/		
File: clocks_and_reset.kicad_sch		
Title: Konami 007784		
Size: A3	Date: 2023-10-23	**Rev:**
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