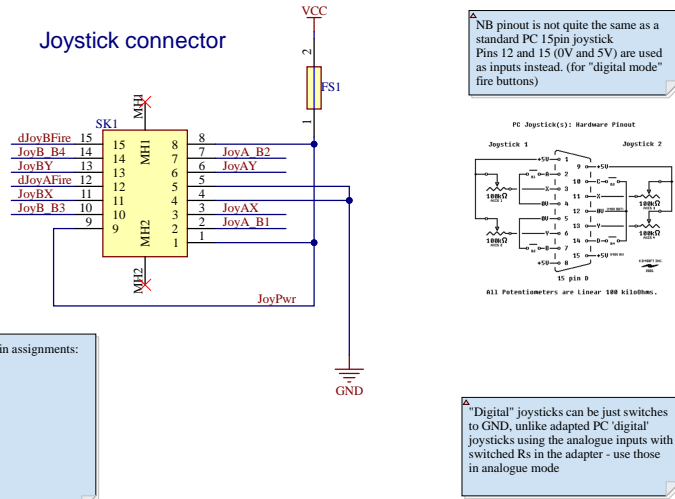


A7000 / RiscPC Joystick adapter - reverse engineered from sample hardware

Reference RISC OS 'Black' (3.6) source code:
https://github.com/barryc-ro/RiscOS_2003/tree/Black/RiscOS/Sources/HWSupport/Joystick

Joystick connector



▲ NB pinout is not quite the same as a standard PC 15pin joystick
Pins 12 and 15 (0V and 5V) are used as inputs instead. (for "digital mode" fire buttons)

PC Joystick(s): Hardware Pinout

Joystick 1

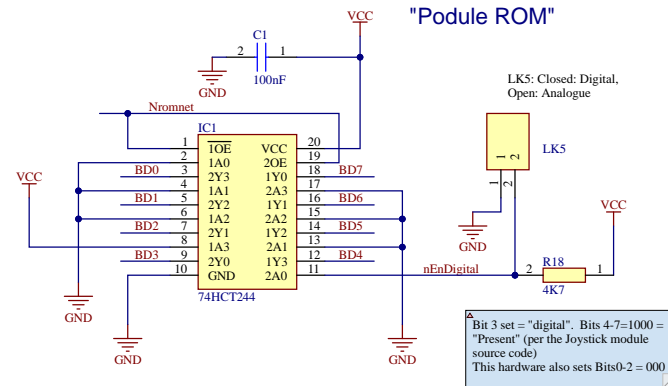
Joystick 2

15 pin 0

All Potentiometers are Linear 100 kilohms.

"Digital" joysticks can be just switches to GND, unlike adapted PC 'digital' joysticks using the analogue inputs with switched Rs in the adapter - use those in analogue mode

"Podule ROM"



Bit 3 set = "digital". Bits 4-7=1000 = "Present" (per the Joystick module source code)
This hardware also sets Bits 0-2 = 000

A7000 / RiscPC 'NIC' interface

Name	Function	Signal Threshold
rst	Reset input	TTL level
Nior	I/O read input	TTL level
Niow	I/O write input	TTL level
bd[15:0]	Peripheral data bus bidirectional	TTL level
Interrupt	Interrupt output, Level triggered, programmable	TTL level
ready	Cycle Strech or ready signal (low to extend cycle) output - open drain	TTL level
Ncselect	Network chip select input	TTL level
la[9:2]	Latched addresses input	TTL level
Nromen	ROM select strobe input	TTL level
Pip[8:1]	Product specific pins	TTL/Analogue

Product variant A - IOMD based system (such as Risc PC).

Psp8 assigned as	Ndack0	DMA acknowledge input	TTL level
Psp7 assigned as	Dreq0	DMA request output	TTL level
Psp6 assigned as	Tc	Terminal Count	TTL level
Psp5 reserved			
Psp4 reserved			
Psp[3:1] are not connected			

Product variant B - Morris based system.

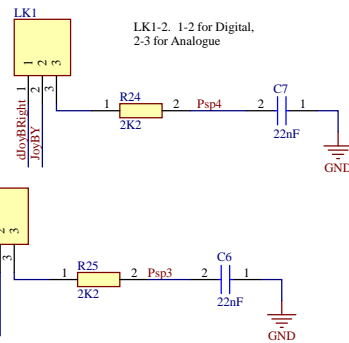
Psp[8:5] are not connected		
Psp4 assigned as AnlgBY	Analogue output channel B(Y)	Analogue level
Psp3 assigned as AnlgBX	Analogue output channel B(X)	Analogue level
Psp2 assigned as AnlgAY	Analogue output channel A(Y)	Analogue level
Psp1 assigned as AnlgAX	Analogue output channel A(X)	Analogue level

18.10 Analog to Digital Converter Interface

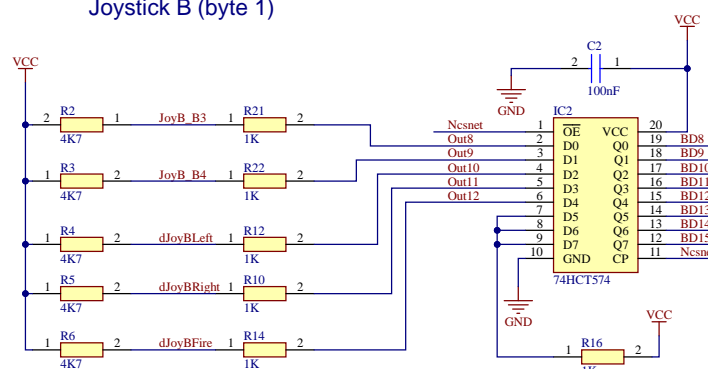
ARM7500FE contains four analog comparators with 16-bit timers, which are designed primarily for the implementation of an analog joystick interface. Each converter is of the slope integration type, using an external RC network attached to the appropriate ATOD[3:0] pin to generate a variable ramp delay.

The time taken for the voltage at the input to the comparator to reach the comparator's threshold is measured by a 16-bit counter which is stopped when the threshold of the comparator is reached. At this point an internal 'stop' flag for that channel is set. The value is held in the counter until it has been read and the channel is then reset. Discharge transistors on the analog inputs are used to discharge the external capacitor and to initiate a new integration cycle.

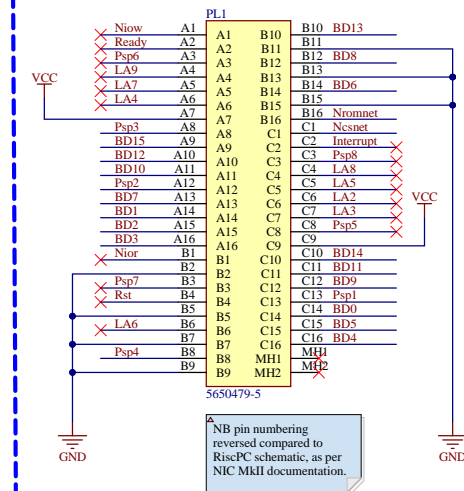
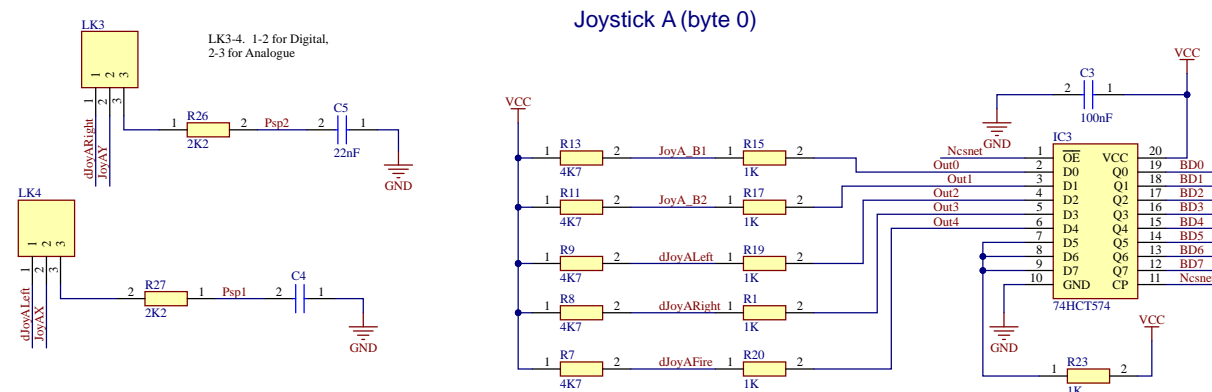
Arm7500 is not a plain ADC input for analog pins, which explains the 22nF caps present. The RISC OS Joystick module runs these at VSync rate




Joystick B (byte 1)



Joystick A (byte 0)



▲ NB pin numbering reversed compared to RiscPC schematic, as per NIC MkII documentation.

		TITLE A7000RiscPC_Joystick	
SIZE A3	DIMENSIONS	VARIANT [No Variations]	REVISION 2
DATE December 2024		SHEET 1 OF 1	
FILE A7000RiscPC_Joystick.SchDoc		DRAWN BY Ian Jeffray	