Using a Printer Port (LPT) to drive RPC

Application Note: 001

Using a printer port to drive the RPC

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Date: 27 May 1998 (updated)   Sabananthan Paramananthan

METHOD 1 , BI-DIRECTIONAL PORT (PS/2)
Port requirement - 8 bit bi-directional (PS/2 or ECP set to PS/2 Mode / Byte Mode)

Connections -   RPC   25 WAY 'D' printer

RPC pin			PC (Printer Port) pins		
Pin Labels	pin		PS/2 pins		Pin Labels
GND	1	▬	18 to 25		Ground
D0	2	⟷	2		Data 0
D1	3	⟷	3		Data 1
D2	4	⟷	4		Data 2
D3	5	⟷	5		Data 3
TXR	6	⟵	1		-Strobe
TXA	7	⟶	12		+Paper Out
RXR	8	⟶	13		+Printer Selected
RXA	9	⟵	14		-Auto Linefeed
RES	10	⟵	16		-Initialise Printer
5 volt	11	⟵	+5V supply		
GND	12	⟵	0V supply		
+ve interrupt		⟶	10		-Acknowledge

PC printer port registers (addresses given for base address of 0378)

0378	data reg				b7	b6	b5	b4	b3	b2	b1	b0
					-	-	-	-	D3	D2	D1	D0

0379	status reg	b7	b6	b5	b4	b3	b2	b1	b0
		-	int	TXA	RXR	-	-	-	-

037A	control reg	b7	b6	b5	b4	b3	b2	b1	b0
		-	-	dir	Ien	-	RES	RXA	TXR

For Extended Capabilities Port (ECP) only

077A	Extended Control Register (ECR)	b7	b6	b5	b4	b3	b2	b1	b0
		0	0	1	-	-	-	-	-

Printer Port can be configured to operate in ECP mode by changing the Printer Port setting in BIOS from SPP or EPP to ECP. Press DEL key for AWARD BIOS or F1 for AMI BIOS when booting the computer. Then go to Integrated Peripherals section to change the settings for Parallel Port. However, it may be necessary to change it back to SPP or EPP mode for some printers to operate properly.

int - +ve transition interupt bit, see "interupt drive"
Ien - bit is internal interrupt enable, not used if polling used
1 = interupt enable , 0 = disabled (polled operation)
dir - bit is internal, controls direction of data output / input
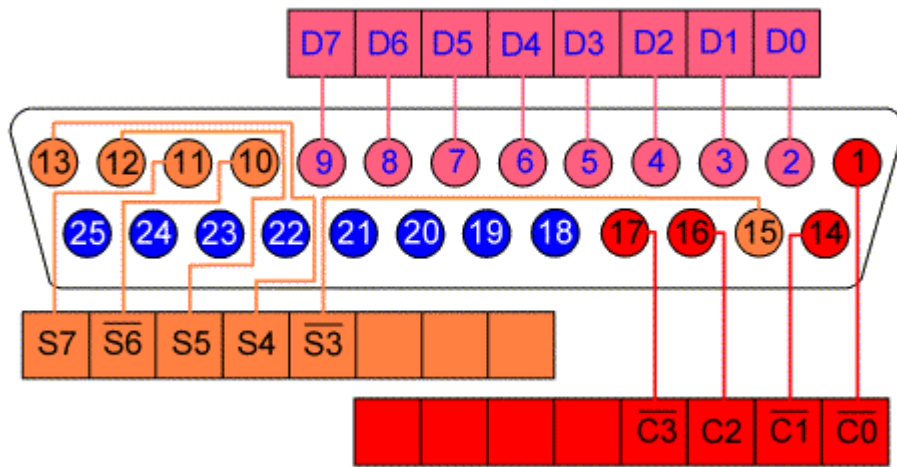0 = data pins are O/P's, ie drive data to RPC
1 = data pins are I/P's, ie read data from RPC
note - RXA and TXR pins are inverted drives from the register
ie a 1 in the control register gives a 0 on the pin
all other registers / bits are true.

METHOD 2 , STANDARD PRINTER PORT (SPP)

Port requirement	Standard Printer Port (SPP) with Open Collector / Pull-up Control lines

Connections -   RPC   25 WAY 'D' printer

RPC pin			PC (Printer Port) pins		
Pin Labels	pin		Pin		*Pin Labels*
GND	1	————	18 to 25		Ground
D0	2	←——→	1		-Strobe
D1	3	←——→	14		-Auto Linefeed
D2	4	←——→	16		-Initialise Printer
D3	5	←——→	2		-Select Printer
TXR	6	←——	1		Data 0
TXA	7	——→	12		Paper Out
RXR	8	——→	13		Printer Selected
RXA	9	←——	3		Data 1
RES	10	←——	4		Data 2
5 volt	11	←——	+5V supply		
GND	12	←——	0V supply		
+ve interrupt		——→	10		-Acknowledge

PC printer port registers (addresses given for base address of 0378)

0378	data reg	b7	b6	b5	b4	b3	b2	b1	b0
		-	-	-	-	-	RES	RXA	TXR

0379	status reg	b7	b6	b5	b4	b3	b2	b1	b0
		-	Int	TXA	RXR	-	-	-	-

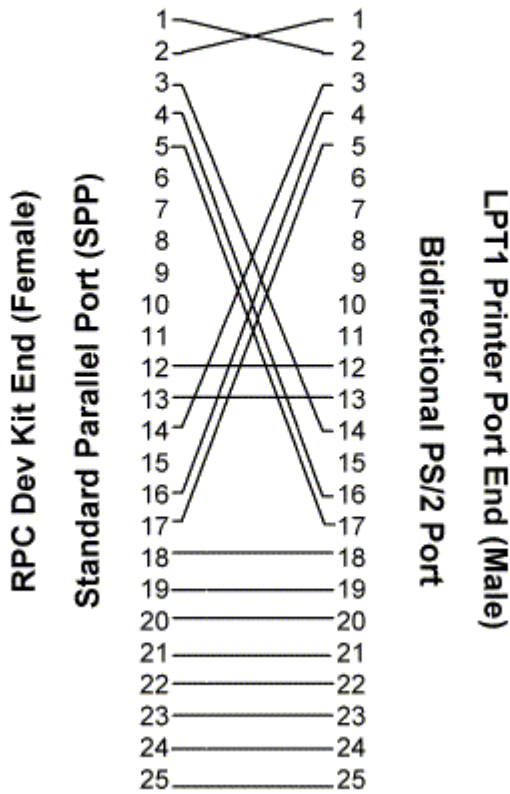| 037A	control reg	b7	b6	b5	b4	b3	b2	b1	b0
		-	-	dir	Ien	D3	D2	D1	D0

(B'00000100'= QUIECENT I/P) (ie. 1111 on data lines)

int - +ve transition interupt bit, see "interupt drive"
Ien - bit is internal interupt enable, not used if polling used
1 = interupt enable , 0 = disabled (polled operation)
note - D0, D1 and D3 pins are inverted drives from the register
ie a 1 in the control register gives a 0 on the pin
all other registers / bits are true.

RPC Dev Kit comes with a DB25 Plug (Male Connector) for Standard Parallel Port with Open Collector / pull -up control lines. To use the RPC Dev Kit in PS/2 Mode, a special pair of interface cables are also provided.

SPP to PS/2 Interface Cable
Radiometrix Part No: RPCPS2CAB

RPC Dev Kit End (Female) — Standard Parallel Port (SPP)

LPT1 Printer Port End (Male) — Bidirectional PS/2 Port

```
 1 ──┐ ┌── 1
 2 ──┘ └── 2
 3 ──┐   ┌─ 3
 4 ─┐ \  │ 4
 5 ─┤  \ │ 5
 6 ───── 6
 7 ───── 7
 8 ───── 8
 9 ───── 9
10 ───── 10
11 ───── 11
12 ───── 12
13 ───── 13
14 ───── 14
15 ───── 15
16 ───── 16
17 ───── 17
18 ───── 18
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25 ───── 25
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Internet sources of further information

Interfacing the IBM PC Parallel Printer Port.

Overview
This document is called an FAQ because it answers many commonly asked questions about the IBM parallel port, but it is formatted more as a brief tutorial. Read it twice before asking for more info; some stuff comes late.

ftp://ftp.rmii.com/pub2/hisys/parport
http://www.rmii.com/~hisys/parport.html

==== Version 0.96 9/1/94----- Zhahai Stewart----- zstewart@hisys.com

Here are some useful links for detailed information on Parallel Port Interface.

ftp://ftp.armory.com/pub/user/rstevew/LPT
Use of a PC Printer Port for Control and Data Acquisition
Kris Heidenstrom's PC Parallel Port Mini-FAQ Release 10
Interfacing to the IBM-PC Parallel Printer Port
Interfacing the Parallel Port
Craig Peacock's Interfacing the PC.

Parallel.Exe, v1.34
Parallel Port Information Utility
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