

P3 (Revision 1.5) Bill of Materials - 21st April 2005

P3 (Revision 1.5) Bill of Materials - 21st April 2005												
	No.	Part / Value	Designation	Note	Rapid Electronics			Farnell				
<i>Main Board</i>					Code	Unit Price	Total	Code	Unit Price	Total		
Capacitors	2	33p	C1 C2	ceramic disc	08-0050	0.05	0.10	896-421	0.03			
	1	150p	C4	ceramic disc	08-0150	0.05	0.05	896-469	0.05			
	7	100n	C10 C11 C12 C14 C6 C8 C9	ceramic disc	08-0235	0.06	0.42	896-755	0.07			
	1	10n	C5	poly	10-1950	0.08	0.08	301-8866	0.09			
	3	10uF	C15 C3 C7	elect. 16v	11-0825	0.05	0.15	301-6948	0.07			
	1	1000uF	C13	elect. 16v	110-290	0.11	0.11	320-1612	0.41			
Resistors	1	10k hor. preset	VR1		67-0230	0.10	0.10	614-683	0.17			
all 0.6W	4	100R	R10 R11 R12 R13		* see note 1							
	4	10K	R18 R21 R25 R26		* see note 1							
	1 (+1)	10R	R27 (R19 optional)	<i>R19 only for LCD Backlight</i>	* see note 1							
	4	150R	R6 R7 R8 R9		* see note 1							
	2	1K	R28 R30		* see note 1							
	5 (+1)	220R	R1 R32 R33 R34 R35 R36	<i>R36 for optional midi clock out</i>	* see note 1							
	1	22K	R20		* see note 1							
	2	22R	R23 R24		* see note 1							
	7	4K7	R14 R15 R16 R17 R22 R29 R31		* see note 1							
	1	510R	R2		* see note 1							
Diodes	1	5V6 zener	D1		47-3016	0.04	0.04	368-982	0.05			
	4	1N4148	D2 D3 D4 D5 D7		47-3308	0.04	0.16	368-118	0.01			
	1	1N4001	D6		47-3130	0.04	0.04	365-117	0.04			
ICs	1	AT89C51ED2	U1	supplied with PCB								
	2	62256	U2 U3		n/a		0	334-5919	4.16			
	1	74HC573	U4		83-0152	0.45	0.45	380-829	0.59			
	2	74HC138	U5 U8		83-0084	0.28	0.56	380-544	0.25			
	1	DS1210	U6		82-0516	4.70	4.70	392-728	4.47			
	4	74HC574	U7 U10 U11 U15		83-0154	0.45	1.80	380-830	0.63			
	1	74HC245	U9		83-0124	0.32	0.32	380-714	0.41			
	2	74HC241	U12 U13		n/a		1.02	311-3322	0.51			
	1	ADC0804	U14		82-0474	2.6	2.60	353-9090	2.17			
	1	4051B	U16		83-0384	0.36	0.36	385-323	0.29			
	1	6N137 / 6N139	U17	6N139 = 58-0602	58-0640	0.65	0.65	326-770	0.63			
	1	7805	U18		47-3290	0.32	0.32	701-853	0.31			
	3	BC547B	Q1 Q2 Q3		81-0064	0.04	0.12	933-892	0.05			
	1	BC557	Q4		81-0070	0.06	0.06	933-855	0.05			
	1	12F629	U19	<i>for optional midi clock out</i>	* see notes 4							
Misc	1	500ma FUSE	F1		26-4610	0.60	0.60	772-306	0.70			
	3	3 PIN Header	J1 J6 J7		22-0955	0.11	0.33	143-140	0.32			
	1	4 PIN Header	J8		22-0960	0.13	0.13	143-141	0.41			
	4	IDC16 Header	J2 J3 J4 J5		19-0510	0.29	1.16	316-7057	0.33			
	1	24 MHz	XTAL1		90-0384	0.32	0.32	175-617	0.88			
	1	CR2032	VB		18-0490	0.65	0.65	419-9157	0.84			
	1	PCB CELL HOLDER			18-0498	0.40	0.40	676-469	1.30			
	1	TO220 Heatsink			36-0280	0.35	0.35	595-779	0.79			
	2	FERRITE	L1 L2		26-4860	0.09	0.18	323-4861	0.06			

Switch/LED										
	Diode	16	1N4148	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16		47-3308	0.04	0.64	368-118	0.01
		16	TRI-COLOUR LED	D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32	common cathode, 3 pin tri- colour (red/green)	55-0170	0.11	1.76	637-282	0.26
	Misc	1	IDC16 Header	J1		19-0510	0.29	0.29	316-7057	0.33
		16	KEYSWITCH	S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16		* see note 6				
Keypad										
	Diode	9	1N4148	D1 D2 D3 D4 D5 D6 D7 D8 D9		47-3308	0.04	0.36	368-118	0.01
	Misc	1	IDC16 Header	J1		19-0510	0.29	0.29	316-7057	0.33
		9	KEYSWITCH	S1 S2 S3 S4 S5 S6 S7 S8 S9		* see note 6				
Function										
	Diode	4	Red LED	D1 D3 D5 D7		55-0102	0.07	0.28	329-9478	0.07
		4	Green LED	D2 D4 D6 D8		55-0105	0.07	0.28	329-9480	0.08
		2	1N4148	D9 D10		47-3308	0.04	0.08	368-118	0.01
	Misc	2	KEYSWITCH	S1 S2	multimec tact switch	78-0655	0.75	1.50	674-825	0.95
		1	Switch cap - red	for S1	10mm circular cap	78-0675	0.16	0.16	674-850	0.22
		1	Switch cap - blue	for S2	10mm circular cap	78-0665	0.16	0.16	678-405	0.22
		1	IDC16 Header	J1		19-0510	0.29	0.29	316-7057	0.33
		1	2 PIN Header	J2		22-0950	0.07	0.07	143-139	0.27
Pot Boards * all designations duplicated on upper and lower boards										
	Resistor	32	4k7 or 10k linear	VR1 VR2 VR3 VR4 VR5 VR6 VR7 VR8 VR9 VR10 VR11 VR12 VR13 VR14 VR15 VR16	4k7 is 65-0710	65-0715 * see note 7	0.38	12.16	* see note 9	
	Capacitor	4	100n	C1 C2	ceramic disc	08-0235	0.06	0.24	896-755	0.07
	IC	4	4051	U1 U2		83-0384	0.36	1.44	385-323	0.29
	Misc	2	IDC16 Header	J1		19-0510	0.29	0.58	316-7057	0.33
		8	Red knob			32-0450	0.12	0.96	* see note 9	
		8	Blue knob			32-0465	0.12	0.96	* see note 9	
		8	Yellow knob			32-0460	0.12	0.96	* see note 9	
		8	Green knob			32-0455	0.12	0.96	* see note 9	
I/O Board										
		6	5 PIN DIN Socket			20-0550	0.18	1.08	809-883	0.47
		1	IDC16 Header	J1		19-0510	0.29	0.29	316-7057	0.33
		5	220R	R1 R2 R3 R4 R5		* see note 1				
		8 (+1)	RFI filter	F1 - F10	Not essential - see build notes	26-6202	0.26	2.08	108-263	0.29
Other										
		1	PLED Module	DELTA OPTO PDC1602M		* see note 5		25.00	414-1921	28.08 28.08

	1	PCB header			22-0545	0.17	0.17	412-9416	0.55
	1	IDC16 RA Header		right angled	19-0560	0.34	0.34	316-6958	0.40
	1	Power switch			75-0480	0.45	0.45	* see note 10	
	1	Power socket 2.1mm		2.5mm is 20-0985	20-0980	0.46	0.46	* see note 10	
	1	PSU			85-2911	3.90	3.90	* see note 10	
	11	IDC16 Plug			19-0305	0.22	2.42	316-6879	0.26
	1	2 PIN Housing		F/B Aux Connector	22-0905	0.04	0.04	143-126	0.12
	3	3 PIN Housing		Power, Tempo & Data pot	22-0910	0.05	0.15	143-127	0.13
	1	4 PIN Housing		M/B Aux connector	22-0915	0.07	0.07	143-128	0.15
		Crimp terminal			* see note 3				
	2	4k7 or 10k linear pot	VR-Tempo VR-Data	4k7 is 65-0710	65-0715 * see note 6	0.38	0.76	* see note 9	
	1	Orange knob		Tempo knob	32-0480	0.12	0.12	* see note 9	
	1	White knob		Data knob	32-0470	0.12	0.12	* see note 9	
		16W Ribbon cable			* see note 2				
	3	8 Pin DIP Socket			22-0400	0.14	0.42	424-2348	0.14
	7	16 Pin DIP Socket			22-0410	0.27	1.89	424-2361	0.27
	9	20 Pin DIP Socket			22-0420	0.34	3.06	424-2385	0.34
	2	28 Pin DIP Socket			22-0435	0.47	0.94	424-2427	0.47
	1	40 Pin DIP Socket			22-0440	0.68	0.68	424-2440	0.68
Notes						TOTAL	87.19		
		I use Rapid for all parts except those they don't carry. Farnell are more expensive, and often have order multiples of 5 or 10, so you'll end up with extra parts.							
1		Rapid only sell resistors in 100s, so it may be cheaper to buy the required quantities from Maplin.							
2		Rapid sell ribbon cable on 30m reels, so this also may be cheaper at Maplin.							
3		Crimp terminals now only available on 500 reels from Rapid - order code 22-1096, £6.90 Maplin sell them in 10s - part no YW25C Farnell housings/headers listed are Molex parts, their crimp terminals are Farnell order code 143-116, £3.81 per 100							
4		PIC 12F629 with DIN to MIDI conversion software can be installed on mainboard so the SYNC output can be used to provide clock only midi output. Programmed PICs are available for £3 with kits							
5		PLED Modules are available with the kit for an extra £25. This may be cheaper than local suppliers. Note that www.crystalfontz.com do these modules in the US for less than I get them in the UK, even in quantity.							
6		Custom engraved Cherry keycaps with switches are now available as an option with the kit. Current price for these is £40 when ordered with PCB/CPU Alternative keyswitches available from Maplin can be used - DM76H / DM77J Or the same Multimec tactswitches used for the step and upper mode switches can be used in all locations. STANDARD TACT SWITCHES NO LONGER SUPPORTED							
7		For all potentiometers, I now use 4k7 parts on ready-built units. These are slightly more resistant to noise, but this is largely irrelevant since an anti-ghosting algorithm was added to the firmware.							
8		RFI filtering is used to ensure ready-built units exceed CE compliance requirements by a significant margin. For kit builders, these are not legally required, and can be replaced with wire links. For MIDI CLOCK sync option, on I/O board, fit F8 and R5. For DIN SYNC output, fit F9 and F10.							

