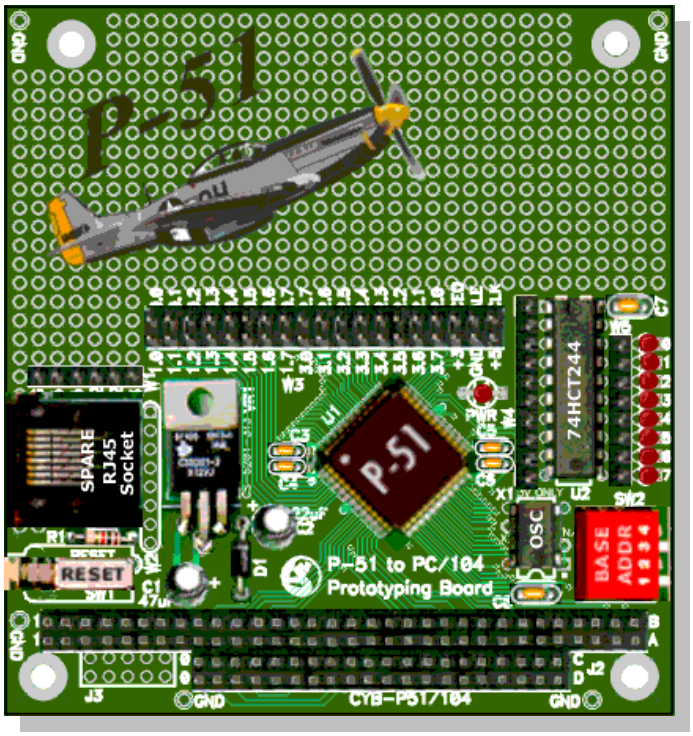
CYB-P51/104 Prototyping Board

The CYB-P51/104 Prototyping Board supports the P51 interface to the PC/104 bus and provides wire-wrap posts at the I/O ports of the 8051. While adhering to the PC/104 format, almost half the board is wire-wrap area for customization. All components, except the P-51, are through-hole for easy probing and replacement of parts.



- The board provides an oscillator circuit for the P-51, although a crystal circuit may be substituted in the wire-wrap area by picking up Xtal1 and Xtal2 at pads under the Oscillator pattern (X1,X2). The Oscillator must be a 3.3v component, as required by the P-51. See the clock circuits in the user manual for support components for a crystal circuit.

- An external pushbutton switch (SW1) can be used to manually reset the P-51 while in an active PC/104 slot. The host software must release this hard reset of the P-51 (see P-51 Code RAM in manual).

- The base address from the PC/104 host is switch selectable on a DIP-switch that is accessible at the edge of the board. See the table below for switch settings. The required IRQ is software selectable.

- On-board Voltage regulator provides 3.3 volts to the P-51 and oscillator using the computer system's 5-volt supply. The P-51 I/O pins drive 3.3 volts and are 5-volt tolerant.

- All of the relevant PC/104-bus signals are brought to the elevated socket at the bottom of the board. Alternatively, a micro-controller host could interface to the P-51 at the same interconnect posts.

- The four 8-bit 8051 I/O ports of the P-51 are brought to wire-wrap posts at W3.

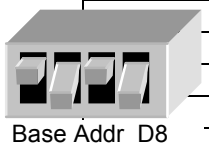
- Of the remaining dedicated 8051 signals, X1 and X2 are available at the Oscillator circuit, Reset is replaced by ResetDrv from the PC/104-bus, and EA and PSEN are not implemented in the P-51.

- Of the remaining P-51 signals, CE_out, ALE, and Clk_Out are available on W3, and CE and ALI are hardwired near C6. CE is tied low and ALI is pulled high.
- As a convenience to your application, eight LEDs, buffered through a 74HCT244, are provided. Wire-wrap posts at W4 connect to the inputs of the buffer and W5 connects to the outputs. The buffer and LEDs are 5v components.
- An RJ-45 jack pattern allows eight signals to be brought off-board. Alternatively, a wire-wrap grid is also available at that location.
- System power may be accessed at W1.
- A power indicator LED is connected to 5v.

Noise issues and considerations:

As a matter of good design practice, the signals from the P-51 should not be driven off-board without buffering, and should be protected from noisy circuitry. Your low-noise digital circuitry should be added to the on-board wire-wrap area, rather than cabling to a neighboring board. Noisy circuitry should be separated and buffered from the 3-volt area. Your production design should include a ground plane with a good grounding connection to all eight P-51 ground pins.

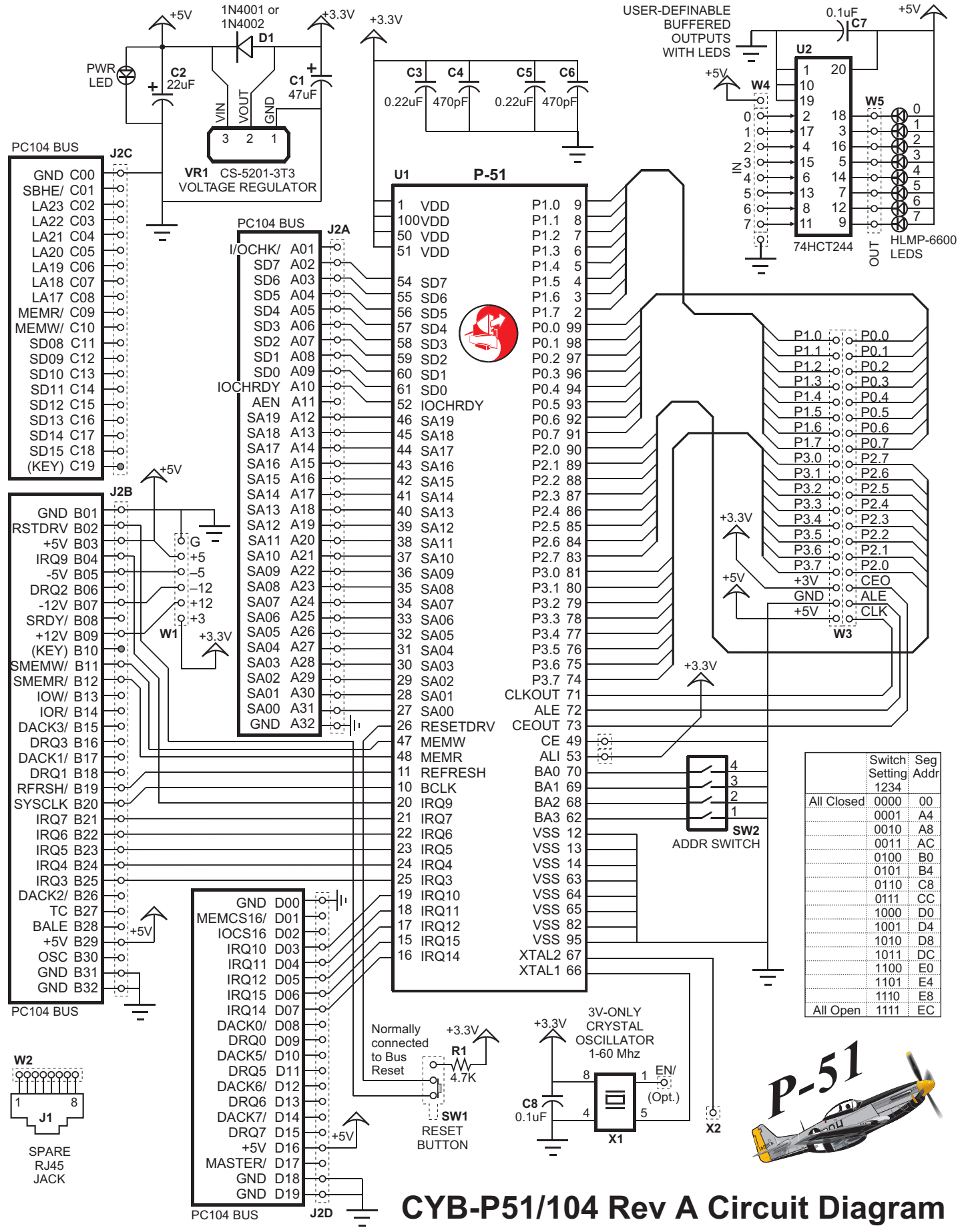
Base Address Switch Settings:



	Switch Setting 1234	Seg Addr
All Closed	0000	00
	0001	A4
	0010	AB
	0011	AC
	0100	B0
	0101	B4
	0110	C8
	0111	CC
	1000	D0
	1001	D4
	1010	D8
	1011	DC
	1100	E0
	1101	E4
	1110	E8
All Open	1111	EC

Parts List

Qty	Location	Part#	Description	Manufacturer
1		CYB-P51/104-PWB	Circuit Board	Cybernetic Micro Systems
1	U1	P-51	Micro-controller	Cybernetic Micro Systems
1	VR1	CS-5201-3T3	Voltage Regulator	Cherry Semiconductor
1	SW2	BP04	Dip switch, 4-pos piano	C&K
1	SW1	PN11SHNA03QE	SPDT Mom Pushbutton Reset Switch	C&K www.ckcomponents.com
1	U2	74HCT244N	Octal Buffer/Driver	Philips, TI, etc
1	D1	1N4001 or 4002	Diode for Volt regulator	any
1	C1	47uF tant cap	Tantalum 3v power cap	any
1	C2	22uF tant cap	Tantalum 5v power cap	any
3	C7, C8	0.1 uF mono cap	Mono dip filter caps	any
2	C3, C5	0.22 uF mono cap	Mono dip filter caps	any
2	C4, C6	470 pF mono cap	Mono dip filter caps	any
1	R1	4.7K ohm	Reset resistor	any
9	(9)	HLMP-6600	LED w/internal resistor	HP
1	J2AB	ESQ-132-14-G-D	Elevated Board Intercon	Samtec
1	J2CD	ESQ-120-14-G-D	Elevated Board Intercon	Samtec
1	W1	TSW-136-07-T-S Breakable strips (qty 2)	Posts, WW, 1x6	Samtec, any
1	W3		Posts, WW, 2x19	"
1	W4		Posts, WW, 1x10	"
1	W5		Posts, WW, 1x8	"
1	X1	SG-8002DC-ST-CB @ xx Mhz	3V Oscillator, DIP	Epson www.eea.epson.com/pdfs/sg8002db.pdf
Optional Items:				
1	J1	555-162-1	RJ45 Jack, Low Profile	AMP
1	W2		WW, 1x8	
4	MH (4 each)		Nylon Spacers, M-F	
Alternate Xtal Circuit (Omit Oscillator):				
1	WW area	4-51 MHz Xtal	See clock circuits	
2	WW area	5-30pF Mono Dip Cap	Xtal cap	any
1	WW area	0.01uF Mono Dip Cap		any
1	WW area	1M Ohm Resistor	5%	any
1	WW area	0-200 Ohm Resistor	5%	any
1	WW area	3.3uH	Inductor (over 24MHz)	any


+5V
1N4001 or
1N4002
D1
+3.3V
+3.3V
PWR
LED
C2
22uF
C1
47uF
VIN
VOUT
GND
3 2 1
VR1 CS-5201-3T3
VOLTAGE REGULATOR
C3 C4 C5 C6
0.22uF 470pF 0.22uF 470pF
USER-DEFINABLE
BUFFERED
OUTPUTS
WITH LEDS
0.1uF
C7
+5V
U2
W4
W5
IN
OUT
74HCT244
HLMP-6600
LEDS
PC104 BUS
J2C
GND C00
SBHE/ C01
LA23 C02
LA22 C03
LA21 C04
LA20 C05
LA19 C06
LA18 C07
LA17 C08
MEMR/ C09
MEMW/ C10
SD08 C11
SD09 C12
SD10 C13
SD11 C14
SD12 C15
SD13 C16
SD14 C17
SD15 C18
(KEY) C19
U1
P-51
PC104 BUS
J2A
I/OCHK/ A01
SD7 A02
SD6 A03
SD5 A04
SD4 A05
SD3 A06
SD2 A07
SD1 A08
SD0 A09
IOCHRDY A10
AEN A11
SA19 A12
SA18 A13
SA17 A14
SA16 A15
SA15 A16
SA14 A17
SA13 A18
SA12 A19
SA11 A20
SA10 A21
SA09 A22
SA08 A23
SA07 A24
SA06 A25
SA05 A26
SA04 A27
SA03 A28
SA02 A29
SA01 A30
SA00 A31
GND A32
1 VDD
100 VDD
50 VDD
51 VDD
54 SD7
55 SD6
56 SD5
57 SD4
58 SD3
59 SD2
60 SD1
61 SD0
52 IOCHRDY
46 SA19
45 SA18
44 SA17
43 SA16
42 SA15
41 SA14
40 SA13
39 SA12
38 SA11
37 SA10
36 SA09
35 SA08
34 SA07
33 SA06
32 SA05
31 SA04
30 SA03
29 SA02
28 SA01
27 SA00
26 RESETDRV
47 MEMW
48 MEMR
11 REFRESH
10 BCLK
20 IRQ9
21 IRQ7
22 IRQ6
23 IRQ5
24 IRQ4
25 IRQ3
19 IRQ10
18 IRQ11
17 IRQ12
15 IRQ15
16 IRQ14
P1.0 9
P1.1 8
P1.2 7
P1.3 6
P1.4 5
P1.5 4
P1.6 3
P1.7 2
P0.0 99
P0.1 98
P0.2 97
P0.3 96
P0.4 94
P0.5 93
P0.6 92
P0.7 91
P2.0 90
P2.1 89
P2.2 88
P2.3 87
P2.4 86
P2.5 85
P2.6 84
P2.7 83
P3.0 81
P3.1 80
P3.2 79
P3.3 78
P3.4 77
P3.5 76
P3.6 75
P3.7 74
CLKOUT 71
ALE 72
CEOUT 73
CE 49
ALI 53
BA0 70
BA1 69
BA2 68
BA3 62
VSS 12
VSS 13
VSS 14
VSS 63
VSS 64
VSS 65
VSS 82
VSS 95
XTAL2 67
XTAL1 66
P1.0 P0.0
P1.1 P0.1
P1.2 P0.2
P1.3 P0.3
P1.4 P0.4
P1.5 P0.5
P1.6 P0.6
P1.7 P0.7
P3.0 P2.7
P3.1 P2.6
P3.2 P2.5
P3.3 P2.4
P3.4 P2.3
P3.5 P2.2
P3.6 P2.1
P3.7 P2.0
+3V CEO
GND ALE
+5V CLK
W3
+3.3V
+5V
+3.3V
SW2
ADDR SWITCH
Switch Setting 1234
Seg Addr
All Closed 0000 00
0001 A4
0010 A8
0011 AC
0100 B0
0101 B4
0110 C8
0111 CC
1000 D0
1001 D4
1010 D8
1011 DC
1100 E0
1101 E4
1110 E8
All Open 1111 EC
PC104 BUS
J2B
GND B01
RSTDRV B02
+5V B03
IRQ9 B04
-5V B05
DRQ2 B06
-12V B07
SRDY/ B08
+12V B09
(KEY) B10
SMEMW/ B11
SMEMR/ B12
IOW/ B13
IOR/ B14
DACK3/ B15
DRQ3 B16
DACK1/ B17
DRQ1 B18
RFRSH/ B19
SYSCLK B20
IRQ7 B21
IRQ6 B22
IRQ5 B23
IRQ4 B24
IRQ3 B25
DACK2/ B26
TC B27
BALE B28
+5V B29
OSC B30
GND B31
GND B32
G
+5
–5
–12
+12
+3
W1
+3.3V
+5V
+5V
PC104 BUS
J2D
GND D00
MEMCS16/ D01
IOCS16 D02
IRQ10 D03
IRQ11 D04
IRQ12 D05
IRQ15 D06
IRQ14 D07
DACK0/ D08
DRQ0 D09
DACK5/ D10
DRQ5 D11
DACK6/ D12
DRQ6 D13
DACK7/ D14
DRQ7 D15
+5V D16
MASTER/ D17
GND D18
GND D19
Normally
connected
to Bus
Reset
+3.3V
R1
4.7K
SW1
RESET
BUTTON
+3.3V
3V-ONLY
CRYSTAL
OSCILLATOR
1-60 Mhz
C8
0.1uF
EN/
(Opt.)
X1
X2
W2
J1
SPARE
RJ45
JACK
P-51
CYB-P51/104 Rev A Circuit Diagram
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