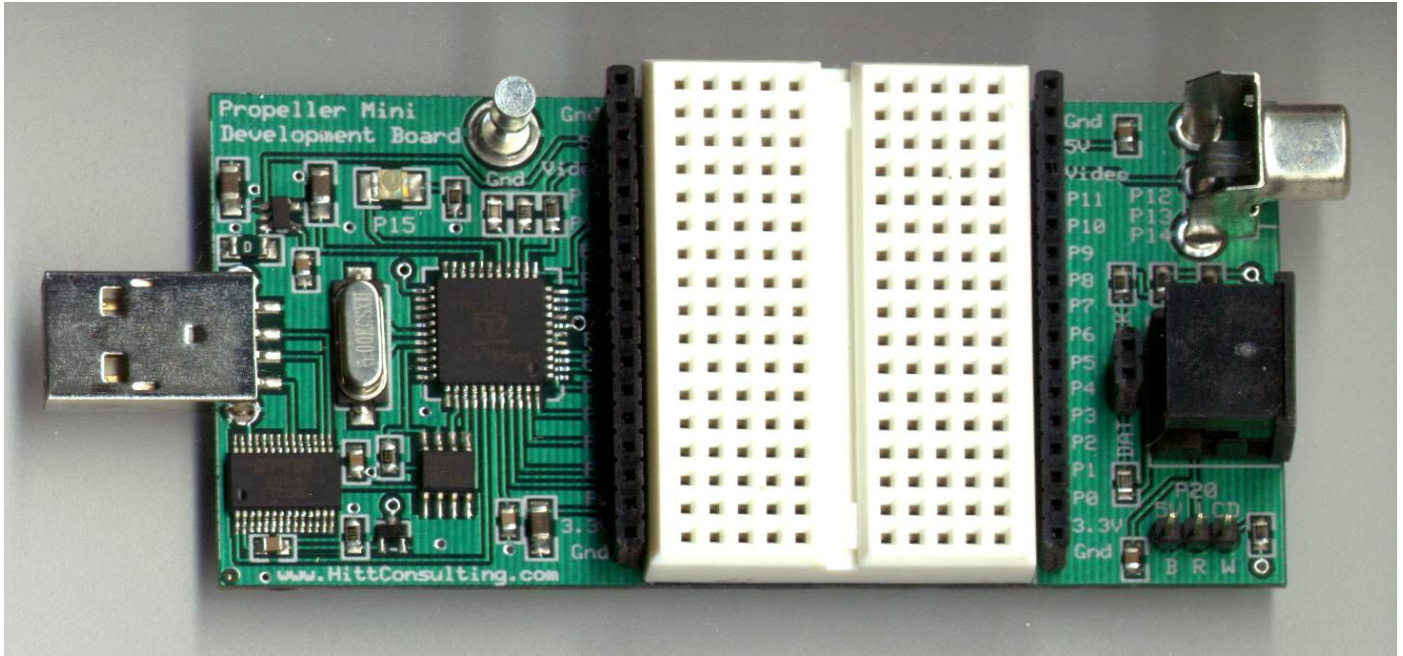


# Propeller Mini Development Board



## Propeller Mini Development Board

### Rev B Datasheet

- \* Complete Parallax Propeller Development Board
- \* No Programmer required, just plug it in
- \* No power supply required, uses USB for power
- \* On-board LED, Video, PS/2 and LCD connections
- \* Provides easy connection to 12 I/O pins
- \* USB connection can be used for PC communications
- \* Onboard breadboard area
- \* 64K EEPROM (32K available for data storage)
- \* PTC (Reset-able) Fuse protection

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## SPECS

Power:	From USB 200mA PTC Fused
Size:	3.75" x 1.8" (not including connectors)
Controller:	Parallax Propeller microcontroller operating at up to 80 MHz.
I/O Pins	12 I/O pins available on proto area
Indicators	1 LED on P15

## CONNECTOR FUNCTIONS

<b>USB</b>	USB Type A Connector
<b>Video</b>	RCA jack that provides video output from the propeller chip (with proper programming).
<b>LCD</b>	Used to connect to a 5 volt serial LCD module (B = Black = Gnd; R = Red = +5V; W = White = Signal)
<b>PS/2</b>	Connection for PS/2 keyboard or mouse.

## OVERVIEW

The Propeller Mini Development Board is a complete self-contained Parallax Propeller (r) development board. No cables, programmers or power supplies are needed. Only a PC with a USB port.

The main component is the Parallax Propeller chip P8X32A. This microcontroller contains 8 32-bit processors (called cogs) each with 2K of RAM. And 32K of hub RAM (common to all cogs). A 5Mhz crystal is connected which will allow the propeller to be operated at 5, 10, 20, 40 or 80 MHz using the internal PLL contained within the propeller chip.

The development board provides a standard FTDI USB serial port for programming the Propeller chip. This can also be used for communication with the PC by your program via the same USB port.

A 64KB EEPROM is also provided. The propeller program can use up to 32KB, leaving at least 32KB of space of non-volatile storage for your project. See the AT24C512 datasheet for programming.

A single LED (on pin P15), a video RCA jack output (on pins P12 - P14), and a serial LCD header (pin 20) allows your program to output information.

The breadboard area allows easy connection to pins P0 through P11, 3.3V, 5.0V, and ground.

The PS/2 port connections (CLK and DAT) are not committed to any particular pins. Simply connect CLK and DAT to whichever I/O pins you wish. Make sure you make your program match the pin number you choose.

## REGULATORY WARNINGS

This device is NOT FCC approved. It is not in finished product form. It is strictly intended for experimental purposes only. If you wish to use these modules in an actual product (a non-experimental capacity), the modules must first be designed into the product, then the whole product must be approved by the FCC.

## LIMITED LIABILITY

Hitt Consulting's liability shall be limited to the purchase price of the board. The boards may NOT be used in any situation where harm to humans, animals or property could result.

## HEALTH WARNINGS

This product contains lead, a chemical known by the state of CA to cause cancer and birth defects and other reproductive harm.

## CUSTOMIZATIONS

Customizations to the Mini Development Board is available from the developer Hitt Consulting. Please contact [info@hittconsulting.com](mailto:info@hittconsulting.com).

## RESOURCES

Parallax Inc. Website  
[www.parallax.com](http://www.parallax.com)

Propeller Website  
[www.parallax.com/propeller](http://www.parallax.com/propeller)

Propeller Manual, Datasheet, AppNotes, etc  
[www.parallax.com/propeller/downloads.asp](http://www.parallax.com/propeller/downloads.asp)

## ERRATA

None

## GETTING STARTED

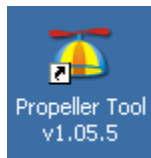
DO NOT INSERT THE MINI DEVELOPMENT BOARD UNTIL AFTER YOU INSTALL THE "PROPELLER TOOL SOFTWARE".

To get started with the Propeller microcontroller you need to download the development IDE software from the Parallax website. Go to <http://www.parallax.com/propeller/downloads.asp> and download and install the "Propeller Tool Software".

Now insert the Mini Development board into a USB port (or use a USB extension cable), and windows will install the FTDI RL232 USB to Serial driver. The board has been pre-programmed with the Parallax Graphics Demo program. If you have a TV available you can connect it to the RCA jack and you should see a color video animation similar to the image below.



Now start the Propeller Tool software by clicking on the icon that looks like this:



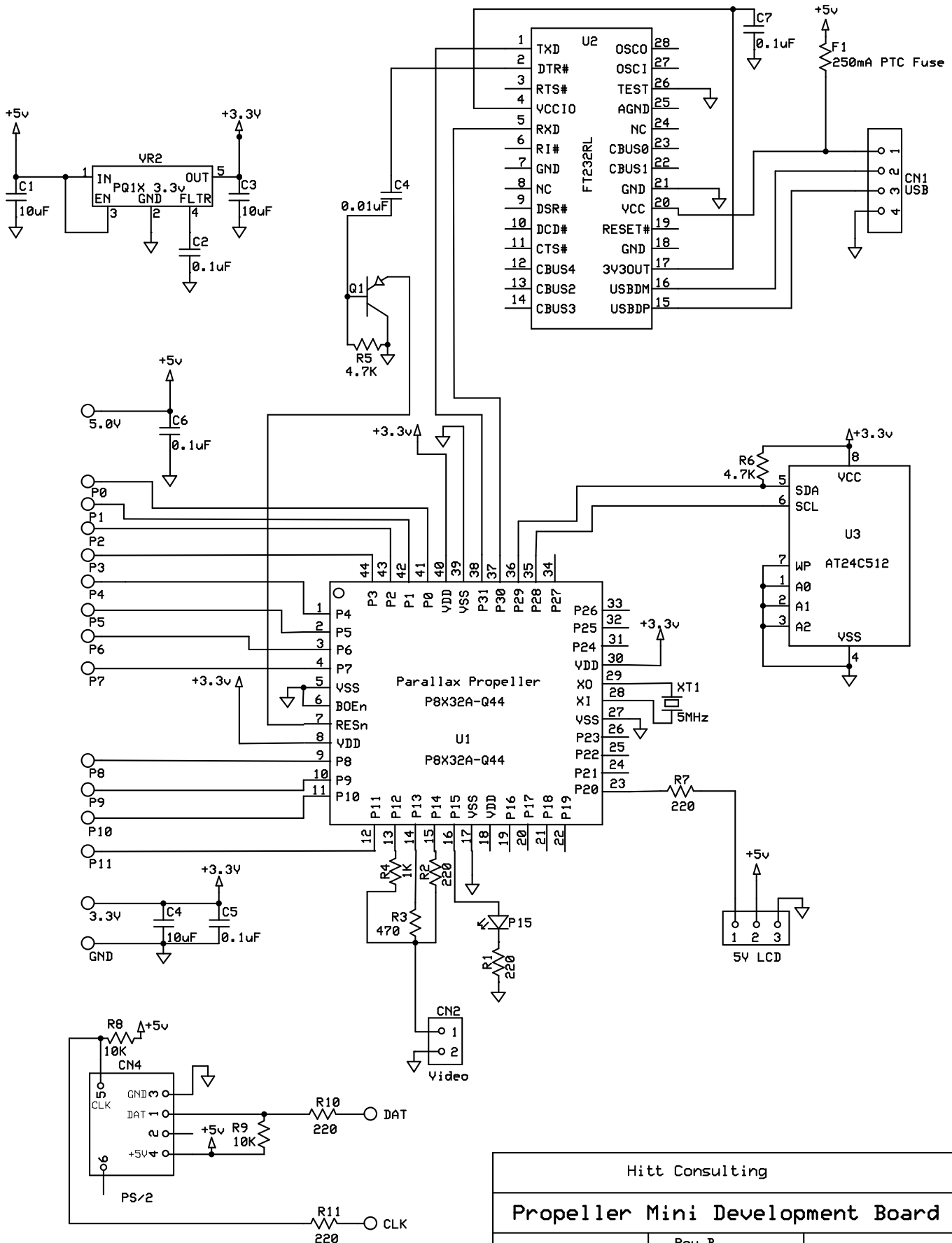
Now type in this simple program that will flash the on-board LED.

```
PUB Blink
  dira[15]~~
  repeat
    !outa[15]
    waitcnt(3_000_000 + cnt)
```

Double check to make sure the program is typed correctly. The 2<sup>nd</sup> and 3<sup>rd</sup> line have two leading spaces, and the 4<sup>th</sup> and 5<sup>th</sup> line have 4 leading spaces. Then press the F10 key. You should briefly see a box that says "Loading RAM", then "Verifying RAM". Now the LED on the board should be blinking.

The F10 key will only load the program into the Propeller chip's RAM. So if you remove the board and reinsert it, it will load the graphics demo program from the EEPROM again. If you want to load a program into the EEPROM (making it permanent) you use the F11 key.

Now I would suggest you download the Propeller Manual from the Parallax website. And check out the Propeller support forum at <http://forums.parallax.com/forums/default.aspx?f=25>



## Propeller ® Example Programs

```
' ' Blink LED on Prop Dongle

PUB Toggle
  dira[15]~~          ' Make P15 an output
  repeat             ' Create an infinite loop
    !outa[15]        ' Toggle P15 state (high to low, low to high)
    waitcnt(3_000_000 + cnt) ' Wait awhile
```

```
' ' Display data on an LCD display connected to the 3 pin LCD port on the Mini Dev Board
' ' LCD tested was Parallax 27979 4x20 character serial LCD
```

```
CON
  _clkmode = xtall + pll16x
  _xinfreq = 5 000 000

  ' LCD commands
  CLS =          $0C ' Must pause 5mSec after this command
  CR =          $0D ' Carriage Return
  BackLiteOn = $11 ' Turns on the backlight
```

```
OBJ
  LCD: "Simple Serial"
```

```
PUB LCD_Test
  LCD.Start(-1, 20, 9600)
  WaitCnt(clkfreq / 200 + cnt) ' Wait for pin to stabilize
  LCD.tx(CLS)
  WaitCnt(clkfreq / 200 + cnt) ' Wait 5mSec for CLS command
  LCD.tx(BackLiteOn)
  REPEAT
    LCD.str(String("Mini Dev Board Rules!"))
    WaitCnt(clkFreq + cnt) ' Wait 1 second
    LCD.tx(CR)
```