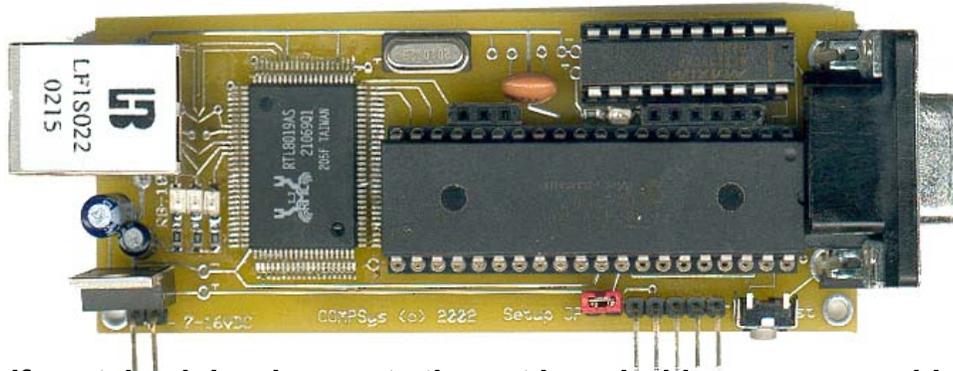


# *Web Development Board Assembly*



A very compact self contained development ethernet board with a programmable PIC(tm)\* Microcontroller. It is based upon Microchip's TCP/IP stack and includes a small webserver. Developers can use this as a tool to gain knowledge of embedded webserver and for possible use in their own designs. **Since this device is designed for a network, it is assumed that the user has at least a small local network with a hub to plug in the *Web Dev Board* .**

## **IMPORTANT**

Please be aware that all kits provided by COMPSys are designed for use by other developers and hobbyists as models that can be incorporated in their own designs. The kits are not intended to be end user plug'n'play devices and can serve little purpose unless the user has the capability, tools and software required to program microcontrollers.

Since this is a networked device which requires a MAC and IP address it is assumed that it will be used in a local intranet only. **For Internet applications one is required to have a valid MAC and IP address.**

Assembly of this kit requires that the user has the necessary tools and skills to work with SMD (surface mount device) components. If you are not comfortable with soldering miniature parts, then please seek assistance from someone who is capable to do so. **Small mistakes can cause many frustrating hours of grief in trouble shooting!**

Minimum tools required:

A fine point low power (25w max) soldering iron and thin solder. Ideally, 0.022" diameter (or less) silver-bearing non-corrosive rosin core should be used. In addition, narrow needle nose pliers, diagonal cutting plier, good quality tweezers, large magnifying glass, volt-ohm meter, and a 7 to 12 vdc power supply.

**Make sure that you work in a clean well lighted area and have adequate desk area. If you have carpeting then please be aware of static discharge as well as accidentally losing tiny components in the carpets fiber. SMD capacitors and resistors are very tiny and can quickly become lost in the carpeting.\***

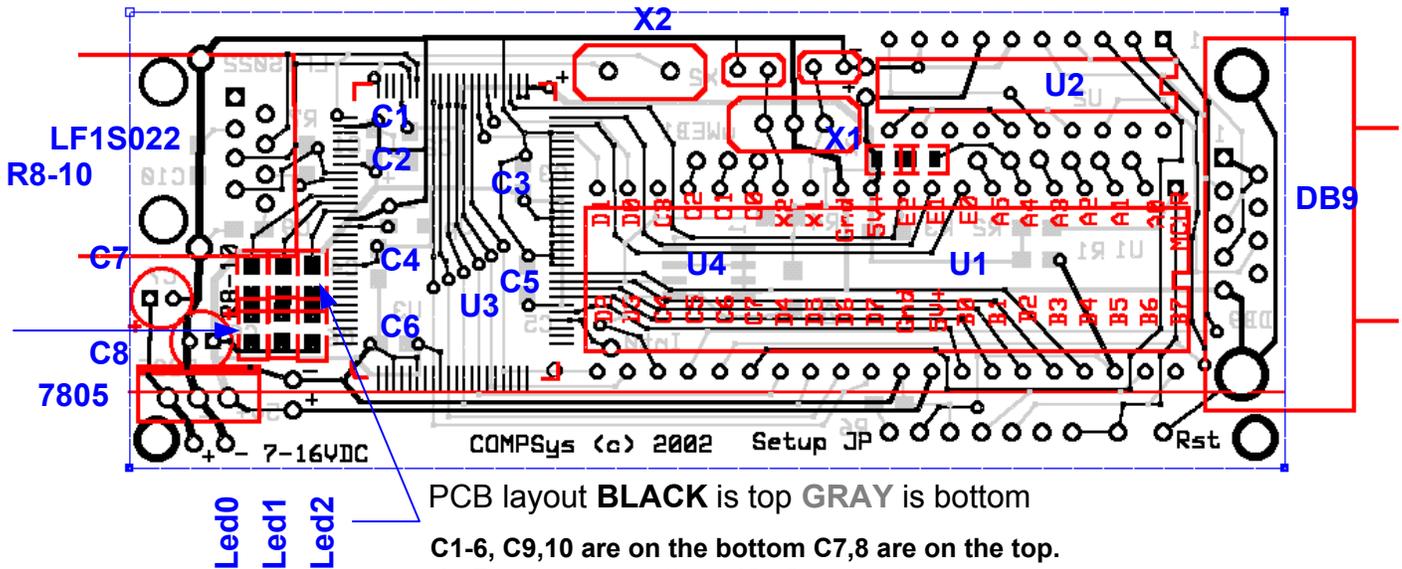
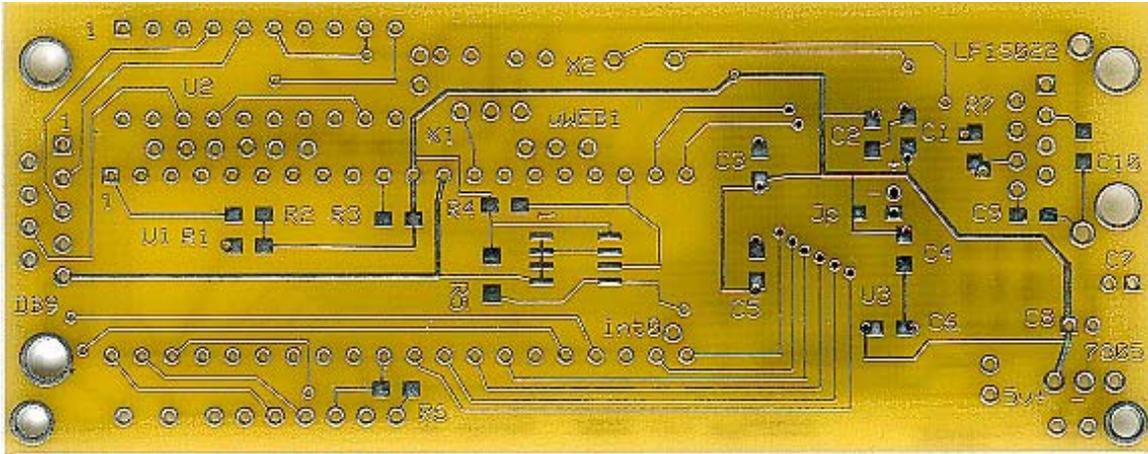
### **Disclaimer and Terms of Agreement**

As with any kit, only the individual parts supplied are guaranteed against defects and not the user assembled unit. All kit parts are purchased from reputable sources such as Digikey Inc, Allied Electronics and Mouser Inc, however, should a kit part be ascertained to be defective it will be replaced at no charge within 30 (thirty) days of the purchase date. Beyond that, COMPSys Workbench and / or the COMPSys developer(s) assume no liability and WILL NOT be held liable nor be held responsible wholly or in part for any damages caused by the construction of and / or use of their products sold .

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PIC is a trademark name of Microchip Corporation

# PCB Layout (bottom view)



## Parts List

- |  |                                 |
|--|---------------------------------|
| <b>C1-6, C9,10</b> 1 uf SMD capacitor    | 1 20 pin IC socket              |
| <b>C7</b> 10uf radial capacitor          | 1 40 pin IC socket              |
| <b>C8</b> 1 or .1 uf radial capacitor    | 1 DB9 RT female connector       |
| <b>R1,2,4,5</b> 4.7K SMD resistors (472) | 1 Momentary switch NO           |
| <b>R3</b> 22k SMD resistor (223)         | <b>U1</b> PIC18F452             |
| <b>R6</b> 100 ohm SMD resistor (101)     | <b>U2</b> MAX233                |
| <b>R7</b> 200 ohm SMD resistor (201)     | <b>U3</b> RTL8019AS*            |
| <b>R8-10</b> 1K SMD resistors            | <b>U4</b> 24LC256 SOIC eeprom   |
| <b>LED 1-3</b> SMD LEDs                  | <b>LF1S022</b> RJ45 w/magnetics |
| <b>X1</b> 20Mhz resonator                | <b>Printed circuit board*</b>   |
| <b>X2</b> 20Mhz xtal                     |                                 |
| <b>7805</b> LM7805 5v regulator          |                                 |

### MISC ITEMS

Header pins and jumper

\*The RTL8019 is usually mounted prior to shipment.

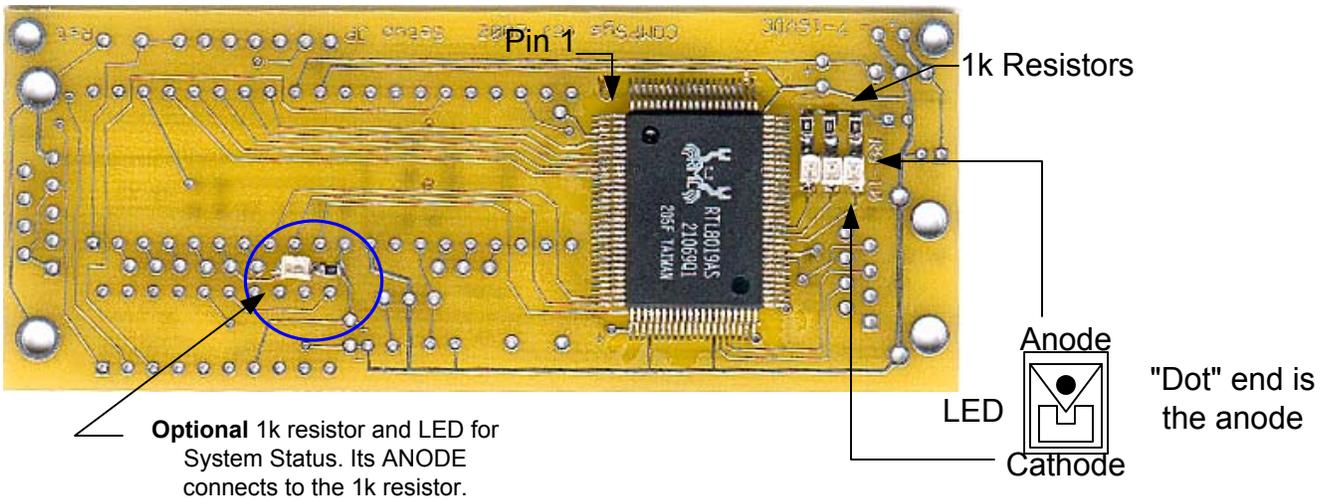
# Web Dev Board Assembly

**NOTES:** If the RTL8019 requires to be mounted, DO NOT apply any solder to its pads. For All other SMD parts, apply a small amount of solder to each pad before soldering the part. Use tweezers to hold the part in place and then apply heat to each end with the fine point soldering iron or pencil. The pads can accommodate type 1206 and 0805 SMD chips.

As soon as a resistor is soldered use an ohm meter to verify the connection. If you have a capacitance meter, do the same with the caps. *This will eliminate any doubt should trouble shooting become necessary at a later time!*

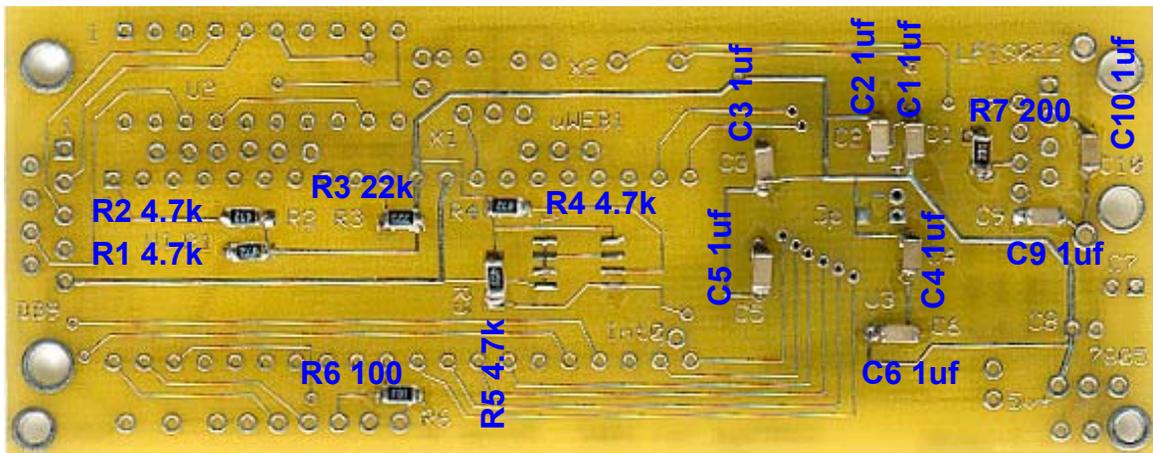
## Step 1

Mount the RTL8019 (if not already mounted) and then the 3 LEDs and 3 1k resistors



## Step 2

Mount the SMD capacitors followed by the resistors on the bottom side

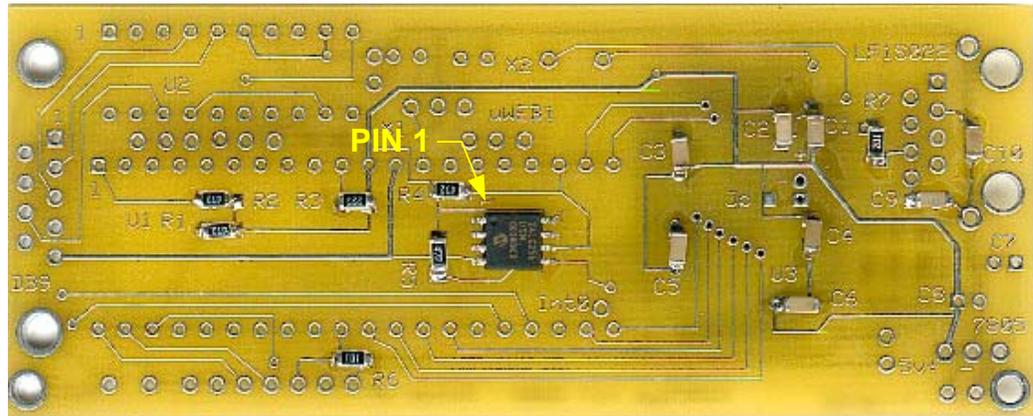


# Web Dev Board Assembly (continued)

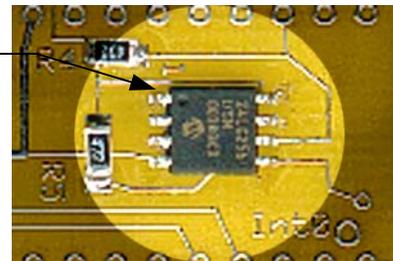
## Step 3

Mount the SOIC I2C eeprom Note: This may be an SOIC or an SO8 part

*Double check orientation before soldering!*



**Please note PIN 1 (dimple on IC) position before soldering in place!**



SOIC eeprom

## Step 4

Mount remaining components on the top side of the pcb

**Reset button**

**Header pins**

**40 pin IC socket**

**Optional pin headers**

**2 pin header for 7-16vdc supply.**

**X1 20Mhz resonator**  
(Optionally, a 20Mhz xtal can be used. Holes are provided for the capacitors)

**X2 20MHz xtal**

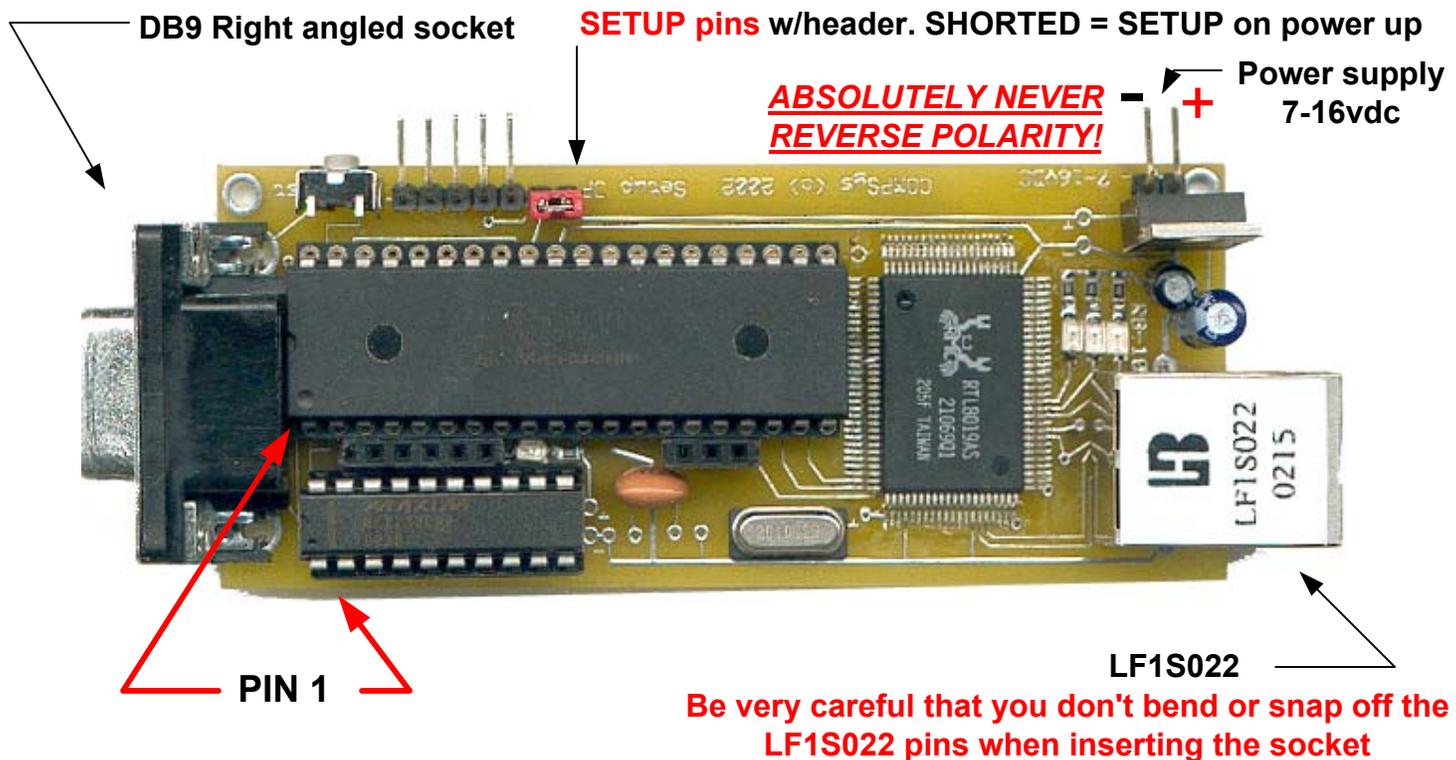
**Make sure the insulator is in place**

**20 pin IC socket**

**Mount the LM7805 regulator (TAB faces inward) and C7 10uf and C8 1uf radial caps. **OBSERVE POLARITY**, pcb square pad is +**

# Web Dev Board Assembly (continued)

## Step 5 Finally, mount and solder the DB9 socket and the RJ45 jack (LF1S022)



**DOUBLE CHECK all your work. Check for solder splashes, loose connections, solder bridges, and broken traces!**

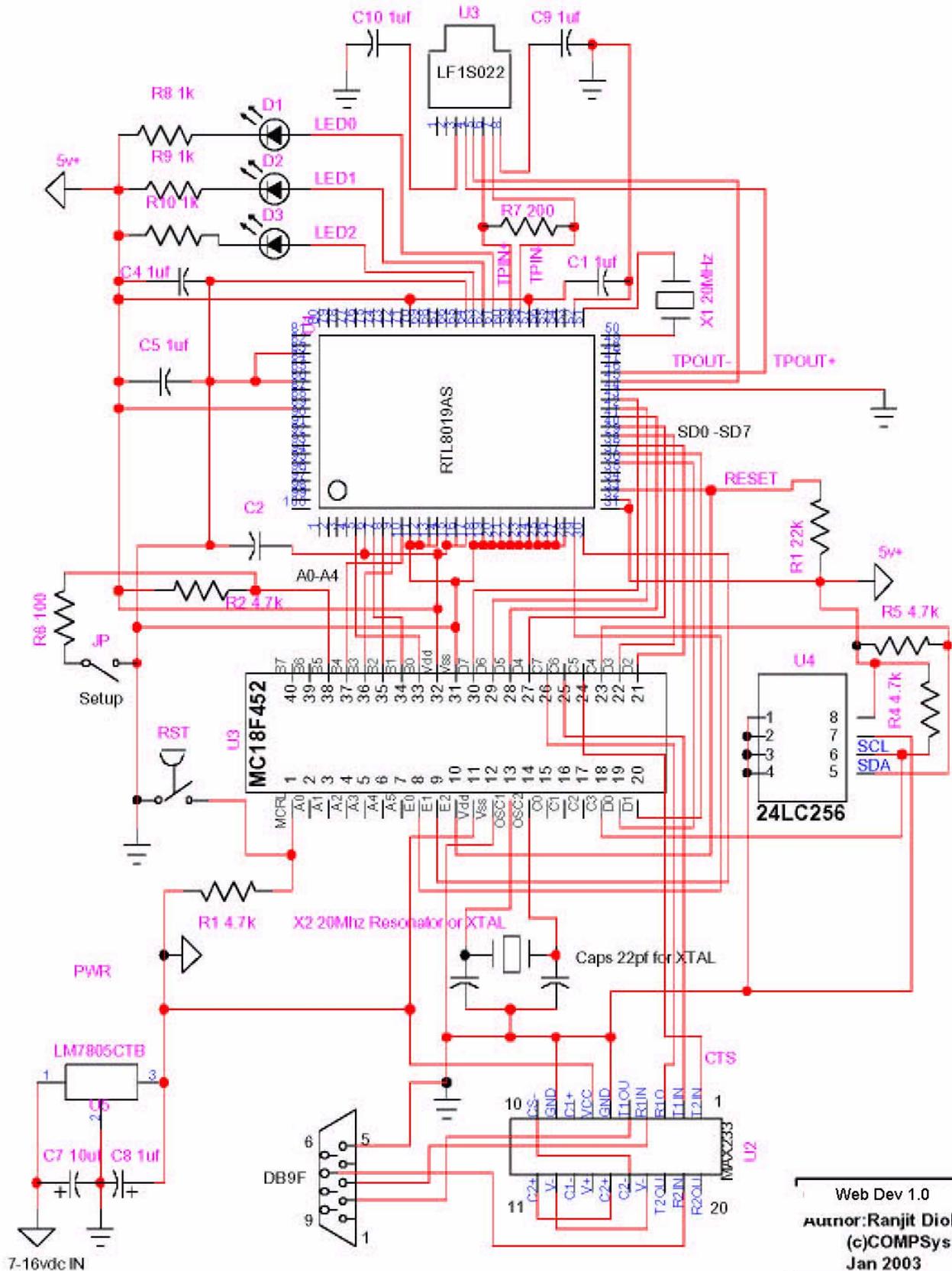
Before inserting the PIC18F452 and MAX233 apply 7-16vdc **OBSERVE POLARITY! There is no reverse polarity protection and you will destroy the RTL8019 if reverse power is applied!** If all is well two LEDs should light up. Remove power and insert the PIC16F452 and MAX233 (note PIN 1 position is towards the DB9 socket).

## Testing the Web Dev Board

Please note for more detailed operation and explanation refer to the documents from Microchip's web site ( [www.microchip.com](http://www.microchip.com) ) in reference to the PICDEM NET board and their TCP/IP Stack. The PIC is pre-loaded with a modified Microchip web server using their TCP/IP stack.

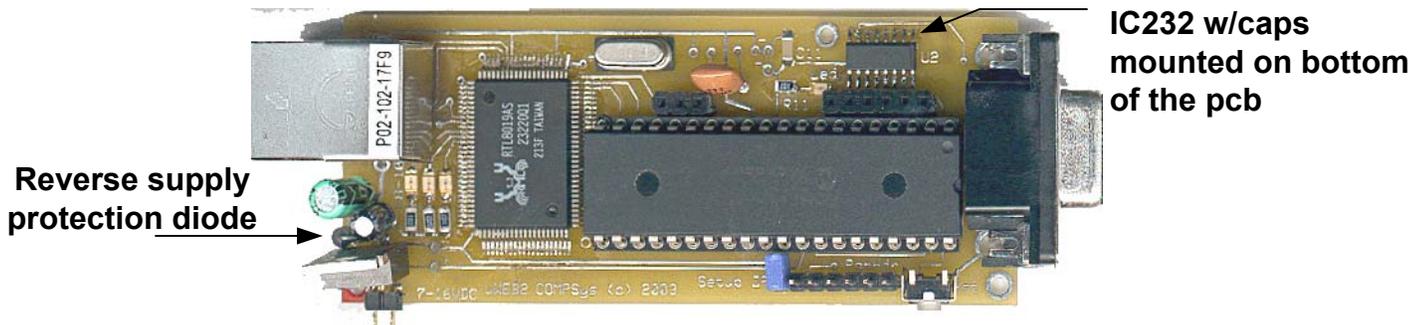
- (1) Attach an RS232 cable between the Web Dev Board and a PC with a terminal such as MS Windows' HyperTerm with the settings at 19200 baud 8N1 and no handshake. Open the terminal and set it to the same port that the Web Dev Board is connected to.
- (2) If you have a local ethernet network with a hub, then plug in the Web Dev Board using the RJ45 jack and a network cable.
- (3) Apply power to the Web Dev Board (two leds should light, if the optional system led is installed it should be blinking).
- (4) Place a jumper on the Web Dev Board's **SETUP** pins. Observe the terminal and press the Web Dev Board reset button or recycle power. A menu selection should be seen. If you are on a network, change the IP address to one that is available for you network and select save. Open a browser on your PC and enter the Web Dev Board IP for the URL. A demo website should open.

# WEB DEV



Web Dev 1.0  
Author: Ranjit Diol  
(c)COMPSys  
Jan 2003

# Web Dev Board Rev 2 addendum

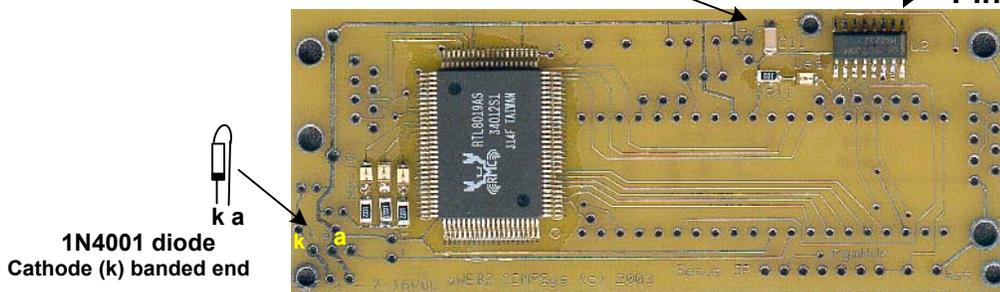


The Web Dev Board Rev 2 board has a few changes:

- 1) Replaced IC233 20 pin dip with a surface mount IC232 along with surface mount 1uf caps
- 2) Added option to install a power supply protection diode and 0.1uf decouple cap

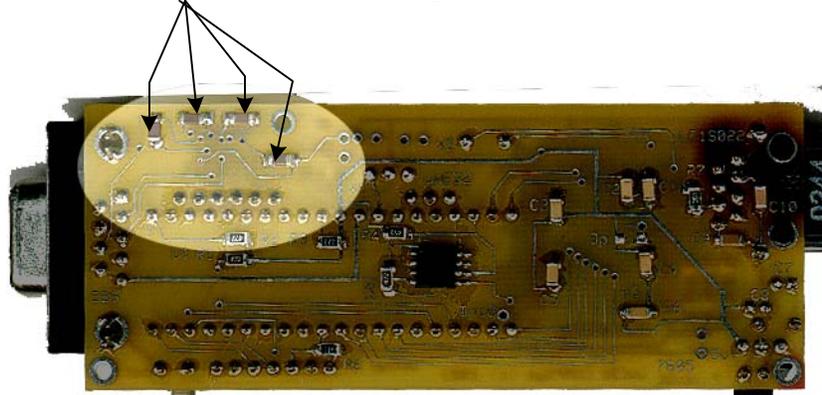
0.1uf capacitor (non-polar, no markings **light** tan color)

Surface mount IC232  
Pin 1 (banded side of the IC)



**PLEASE** be sure to orient the IC232 as shown above.

1uf capacitors (non-polar, no markings, **dark** color)



Bottom side of the pcb

## **IMPORTANT NOTES**

IC232 capacitors, 1uf chips non-polar and have no markings.  
The 1uf chips and are darker in color than the light tan 0.1uf capacitors.