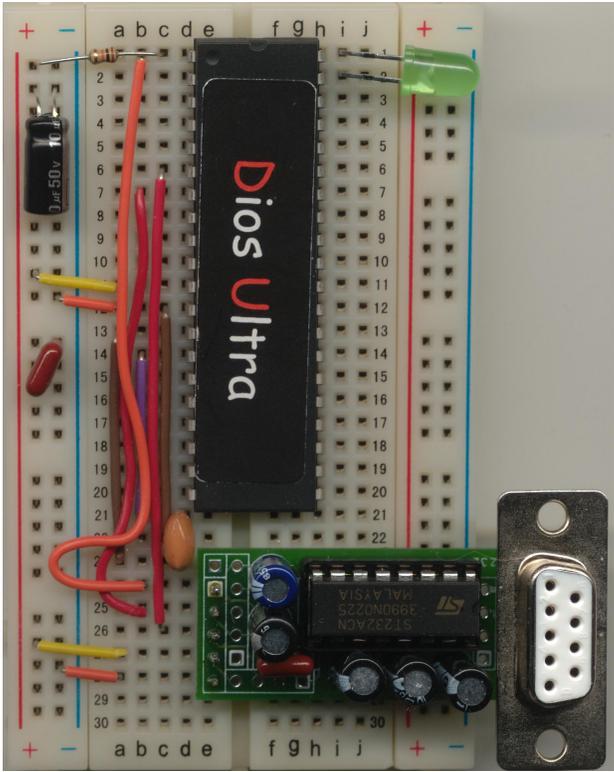


Dios Ultra OEM Chip Hookup



Kronos Robotics
and Electronics



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Dios Ultra OEM Chip Hookup

Chapter 1

Dios Ultra OEM Chip Hookup and Installation

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Installing the PC Software

Insert the CD into the CD-ROM drive. The installation will start automatically. Once installation starts follow the instructions. If auto insertion is turned off you will have to manually install the software. To do this open up the CD-ROM drive and double click the program labeled DiosSetup.exe.

If you are installing over top of a previous version then you must remove it first. You will be prompted with three options. Select the Remove options and click next. Once removal is complete reinsert the CD and install as normal.

Note: If prompted to remove shared components just answer yes and continue.

OEM 40 Pin Chip BreadBoard Hookup

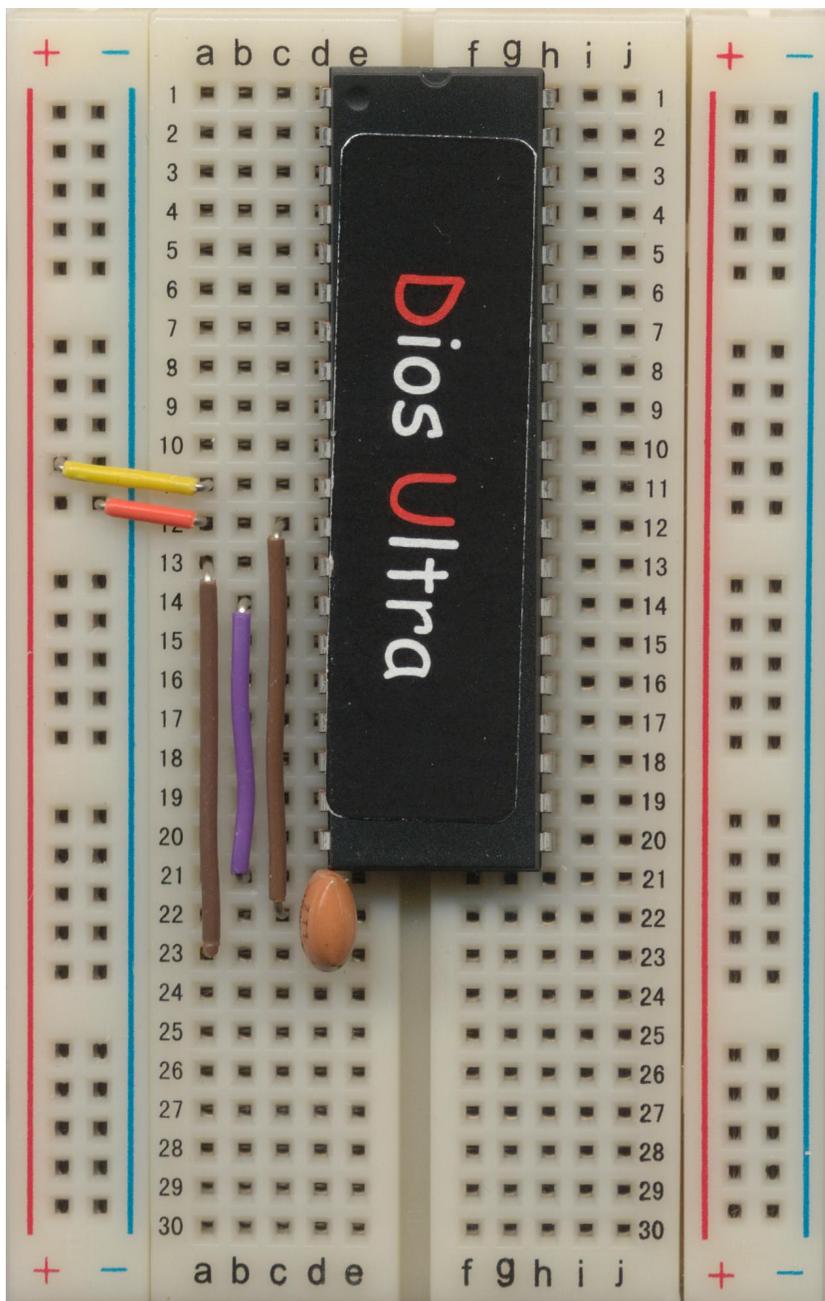


Figure 1

Step 1

The first step is to setup your power connections. You can use both pins 11 and 32 for Your Vdd (2.5-5.5Vdc) and pins 12 and 31 for Vss (Gnd). In figure 1 I'm using pins 11 and 12 tied to the breadboard bus.

Step 2

Connect the 10Mhz Resonator as shown. The two outside pins on the resonator connect to pins 13 and 14 on the Dios Ultra chip. The center pin on the resonator connects to Gnd.

1 Hookup

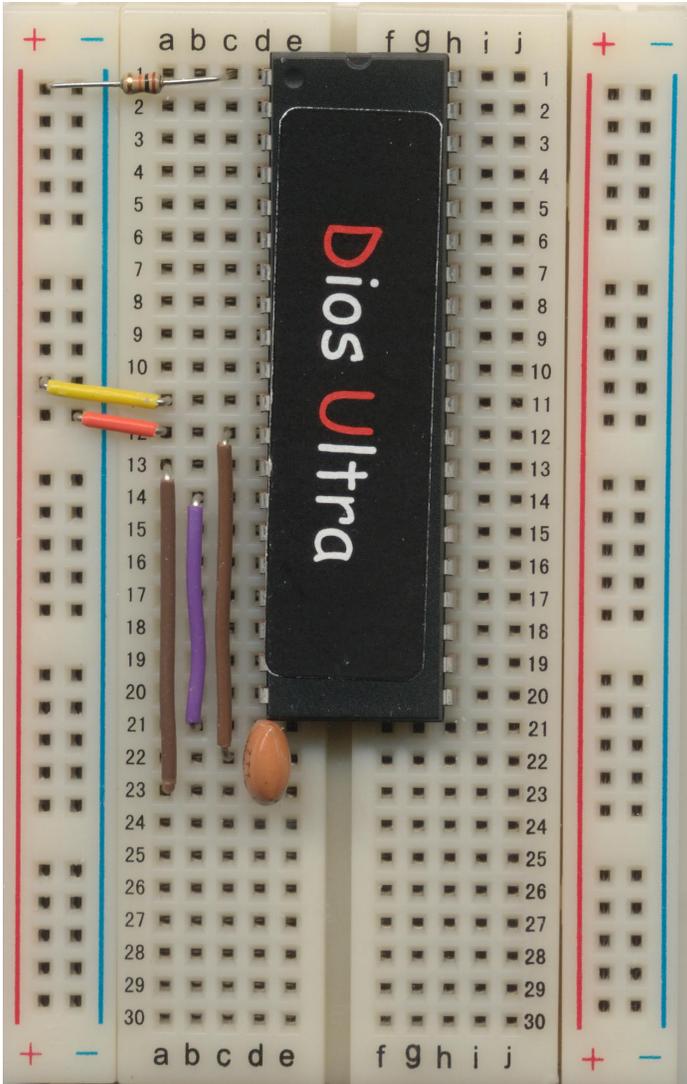


Figure 2

Step 3

Connect a 10K resistor to pin 1 and Vdd. This will hold the reset (Atn) pin high and keep the chip from resetting.

You can add a reset button by placing a button between pin 1 and Gnd.

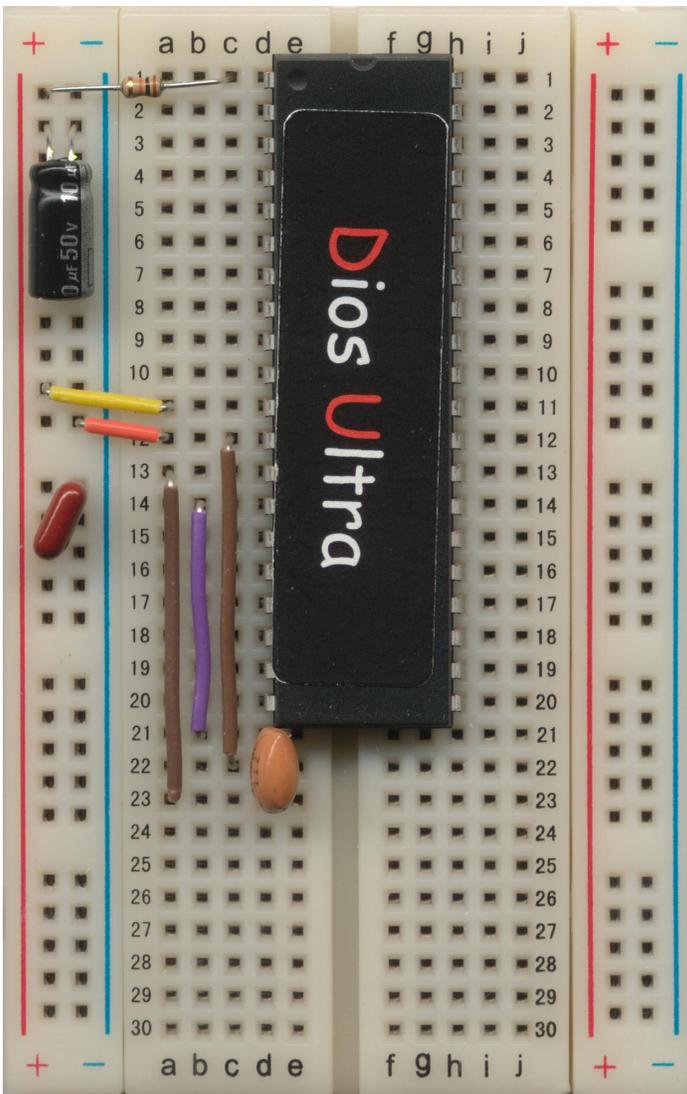


Figure 3

Step 4

Place a .1uF capacitor and a 10uF capacitor between Vdd and Vss.

Failing to add these two components will result in unpredictable results when operating the Dios Ultra chip.

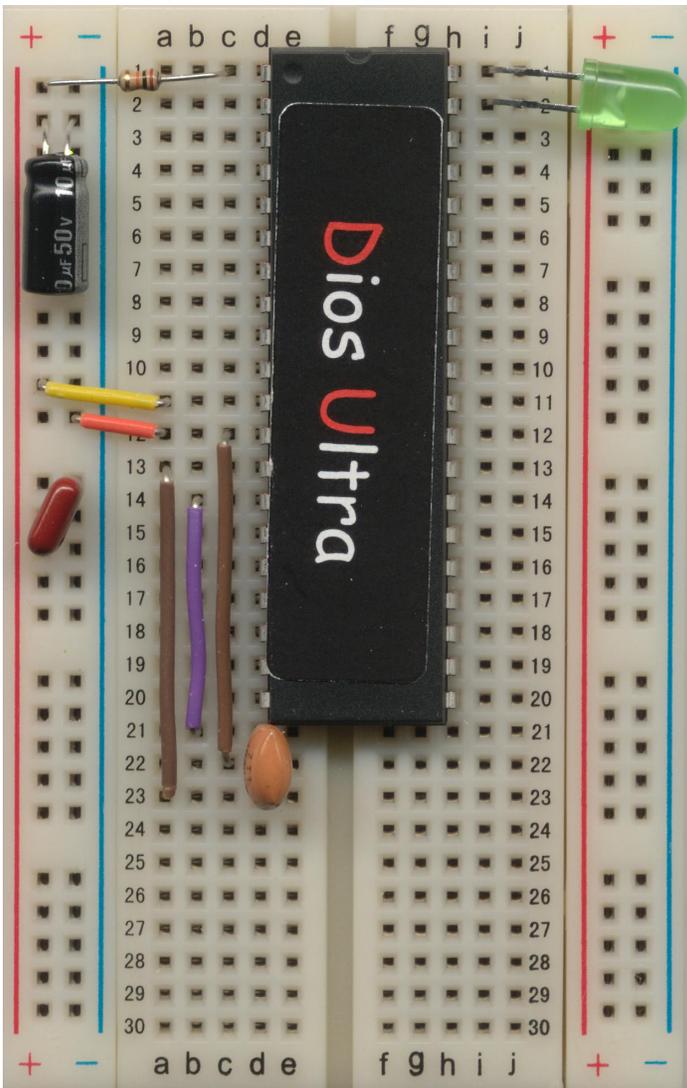


Figure 4

The Dios comes with a built-in test program. You should test your dios for proper operation before proceeding.

Step 5

Connect an LED to pins 39 and 40 (IO ports 2 and 1). Note that the LED shown here has a built in internal resistor. If you use a normal LED please use a 390ohm resistor in series with the LED.

The polarity does not mater as the Dios will be switching back and forth.

Step 6

Apply 3-5 volts power to the breadboard bus. If you have done everything correctly the LED should blink.

In order to program the Dios Ultra OEM 40 Pin Chip you will need a RS232 driver. The Driver converts the RS232 (-12, +12v) signals to TTL (0-5v).

Step 7

Connect the Driver to Vss and Vdd as shown. This is pin 1 and 2 of the Easy RS232 Driver. (Note that Pin1 is **not** the pin with the square marker)

Step 8

Connect pin 5 (the one with the square marker) to pin 1 of the Dios Ultra chip.

Step 9

Connect pin 4 of the driver to pin 7 of the Dios Ultra chip. Connect pin 3 of the driver to pin 6 of the Dios Ultra chip.

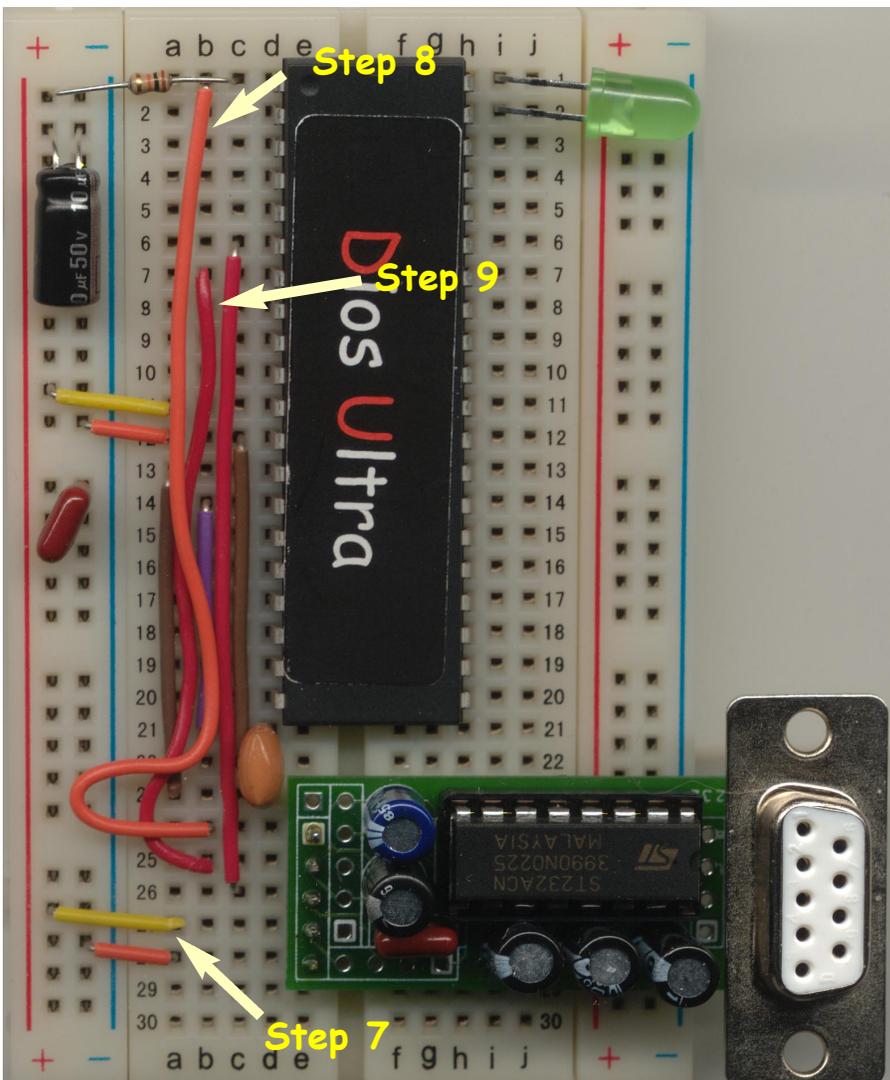


Figure 5

1 Hookup

OEM 28 Pin Chip BreadBoard Hookup

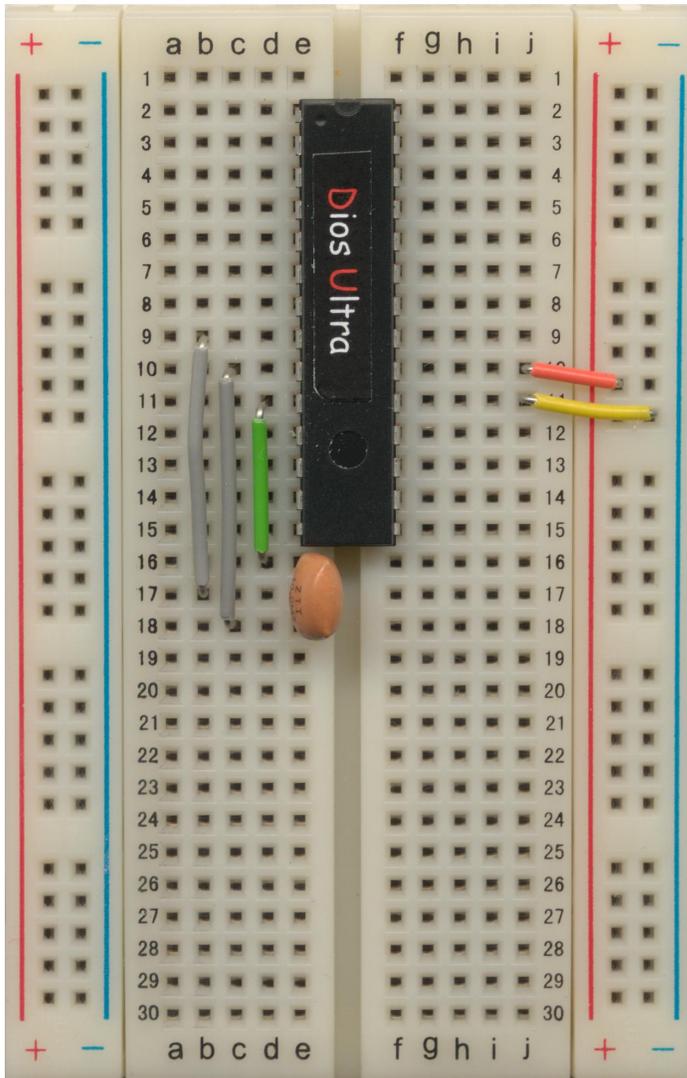


Figure 6

Step 1

The first step is to setup your power connections. Use pins 20 for Your Vdd (2.5-5.5Vdc) and pin 19 for Vss (Gnd).

Step 2

Connect the 10Mhz Resonator as shown. The two outside pins on the resonator connect to pins 9 and 10 on the Dios Ultra chip. The center pin on the resonator connects to Gnd.

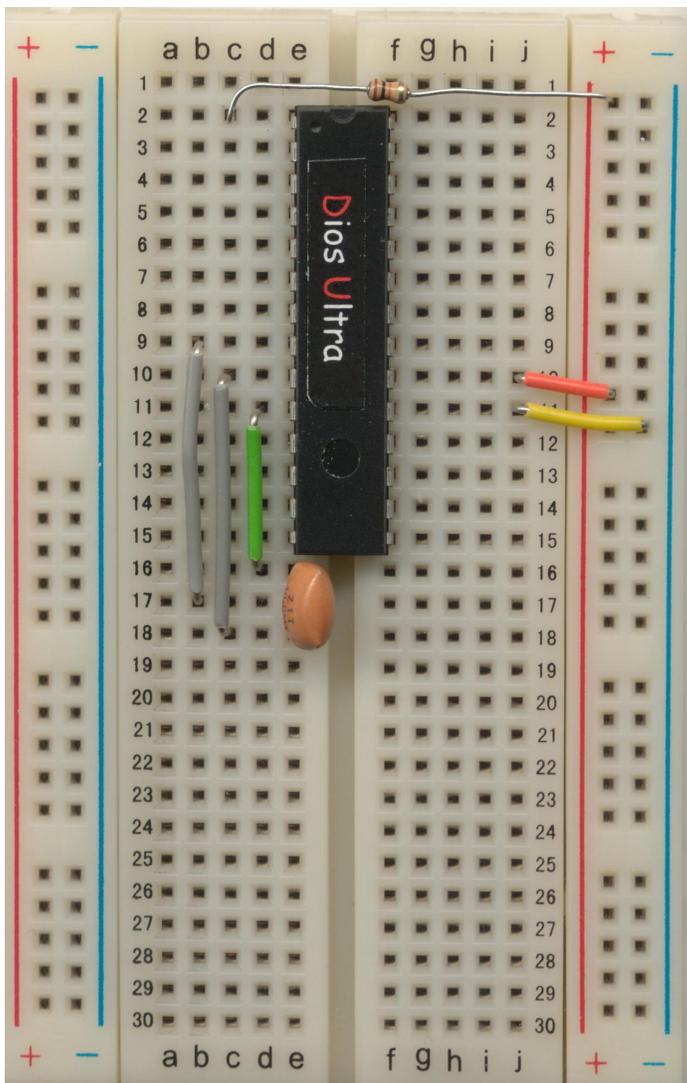


Figure 7

Step 3

Connect a 10K resistor to pin 1 and Vdd. This will hold the reset (Atn) pin high and keep the chip from resetting.

You can add a reset button by placing a button between pin 1 and Gnd.

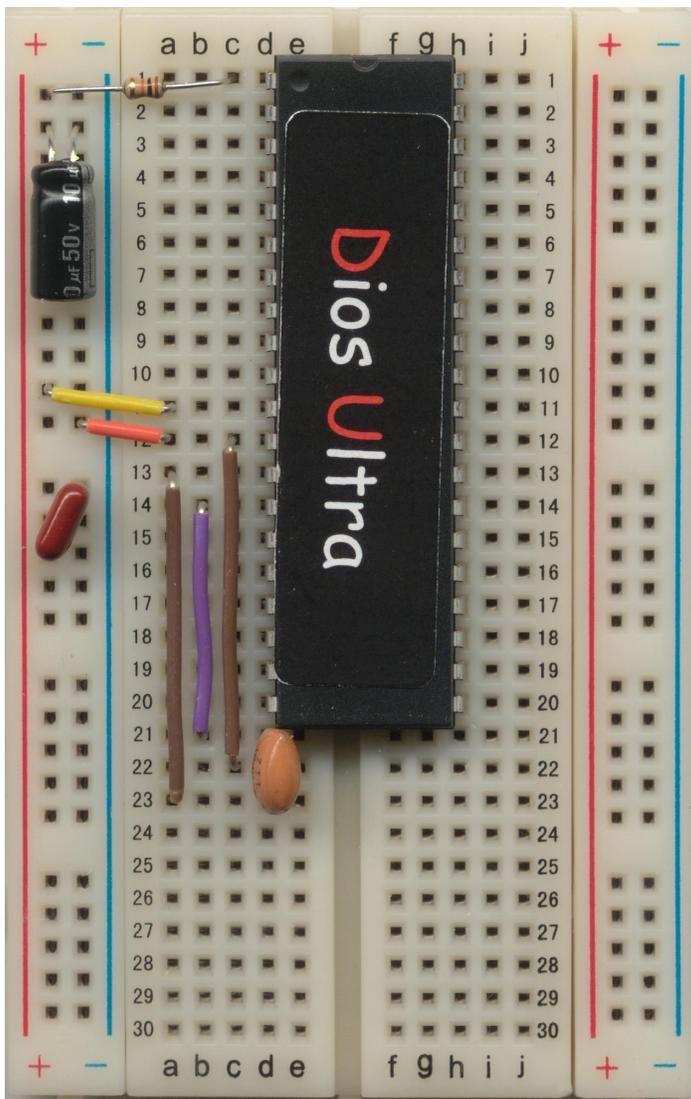


Figure 8

Step 4

Place a .1uf capacitor and a 10uf capacitor between Vdd and Vss.

Failing to add these two components will result in unpredictable results when operating the Dios Ultra chip.

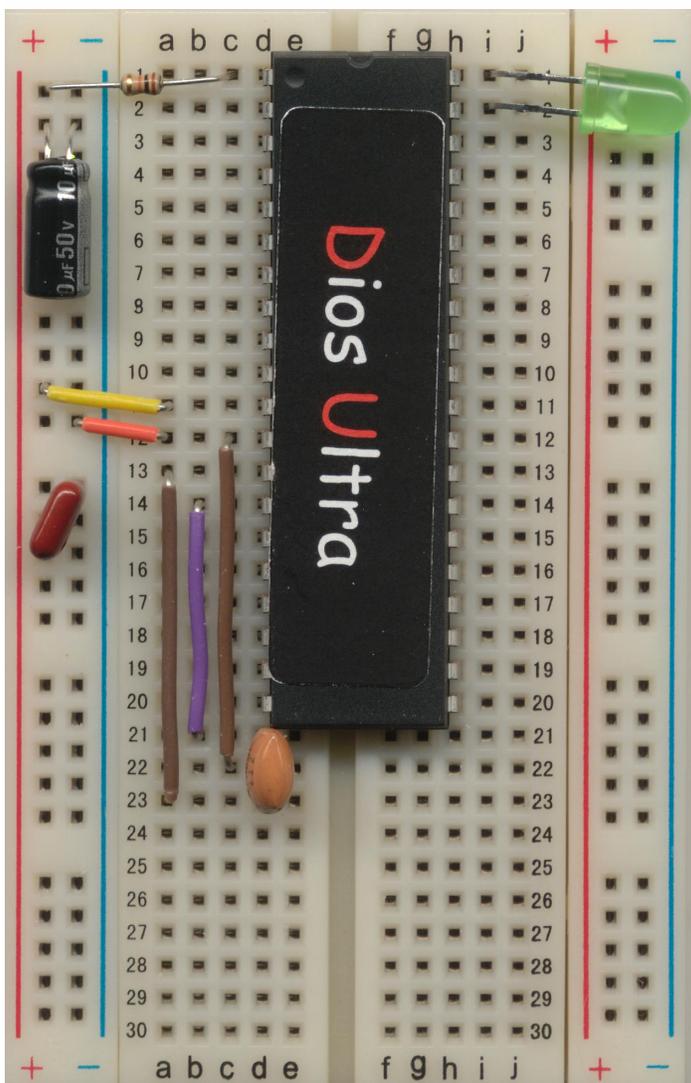


Figure 9

The Dios comes with a built-in test program. You should test your dios for proper operation before proceeding.

Step 5

Connect an LED to pins 27 and 28 (IO ports 2 and 1). Note that the LED shown here has a built in internal resistor. If you use a normal LED please use a 390ohm resistor in series with the LED.

The polarity does not mater as the Dios will be switching back and forth.

Step 6

Apply 3-5 volts power to the breadboard bus. If you have done everything correctly the LED should blink.

1 Hookup

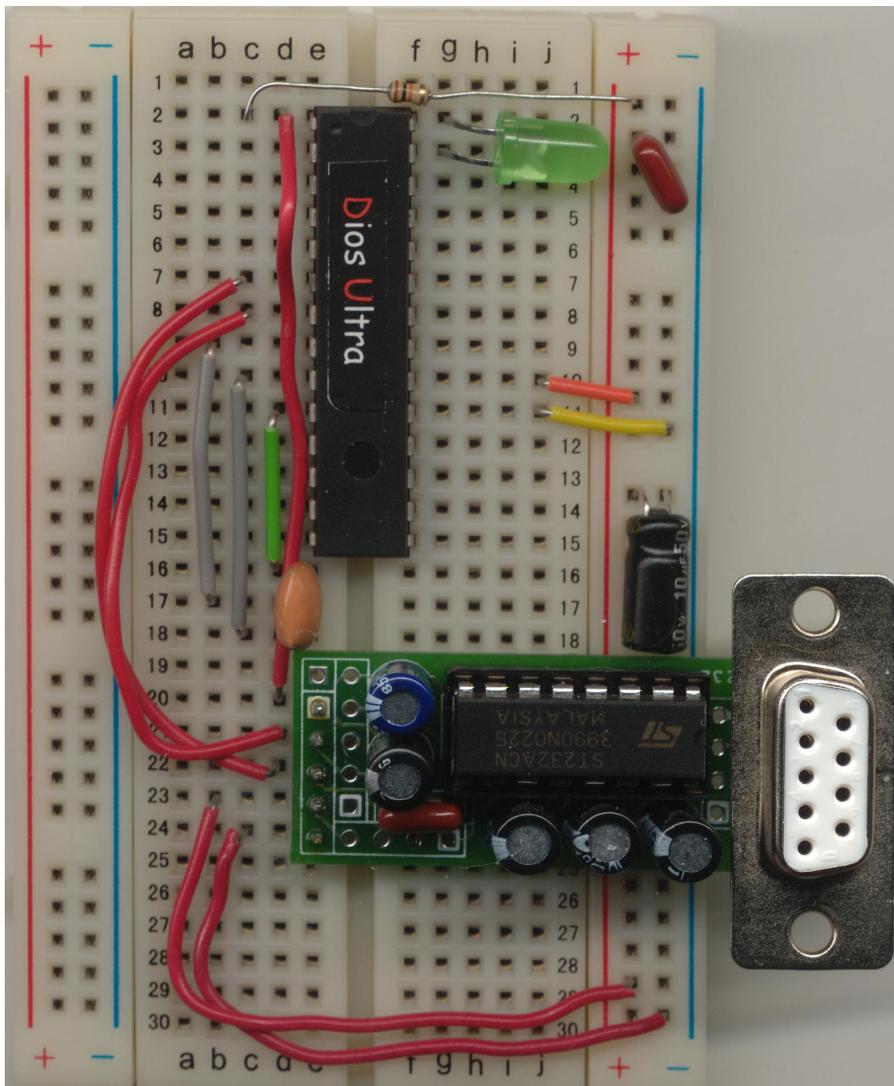


Figure 10

In order to program the Dios Ultra OEM 40 Pin Chip you will need a RS232 driver. The Driver converts the RS232 (-12, +12v) signals to TTL (0-5v).

Step 7

Connect the Driver to Vss and Vdd as shown. This is pin 1 and 2 of the Easy RS232 Driver. (Note that Pin1 is **not** the pin with the square marker)

Step 8

Connect pin 5 (the one with the square marker) to pin 1 of the Dios Ultra chip.

Step 9

Connect pin 4 of the driver to pin 7 of the Dios Ultra chip. Connect pin 3 of the driver to pin 6 of the Dios Ultra chip.

Connecting the Dios Ultra OEM Chips to the PC

There are 2 RS232 Drivers available from Kronos Robotics. If you wish to build your own see Appendix B.

Both the EZ232 and EZ232B drivers are available on the Kronos Robotics web site. See them at:

http://www.kronosrobotics.com/detail.asp?product_id=EZ232

and

http://www.kronosrobotics.com/detail.asp?product_id=EZ232B

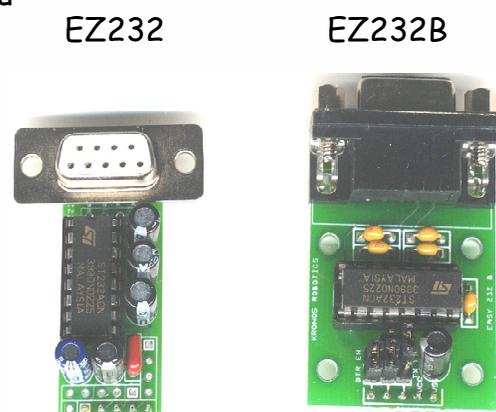


Figure 6

If you build your own driver use the following connections:

40 Pin Chip

28 Pin Chip

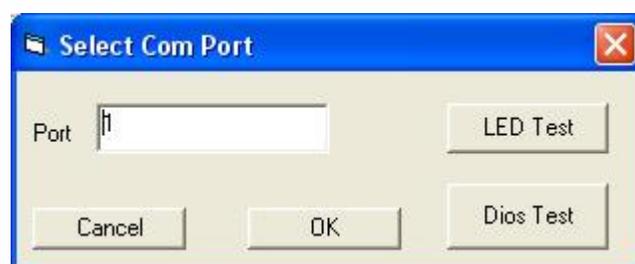
Pin 1	Atn	Pin 1	Atn
Pin 6	Receive	Pin 6	Receive
Pin 7	Transmit	Pin 7	Transmit
Pin 11	Vdd	Pin 20	Vdd
Pin 12	Vss	Pin 19	Vss

Connect the driver to the PC by connecting the male end of a 9 pin serial cable to the 9 pin connector on the driver. Connect the other end of the cable to an available serial port on your PC.

To test the connection start the software and from the Dios File Manager select **Change Com Port** from the **Settings** Menu.

Enter in the **Port** number corresponding with the serial port you plugged the cable into.

Select the **Dios Test** button.



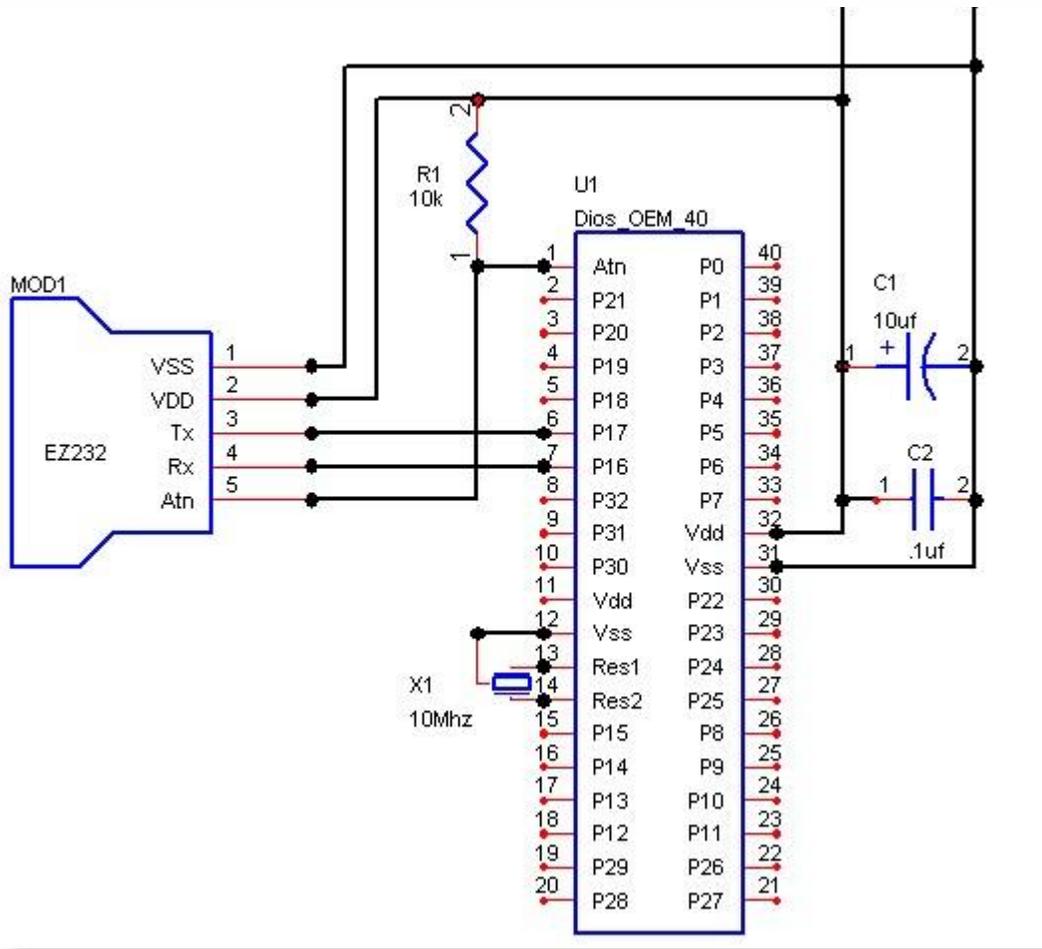
If the Dios Ultra chip is connected properly you will be presented with a successful test message.



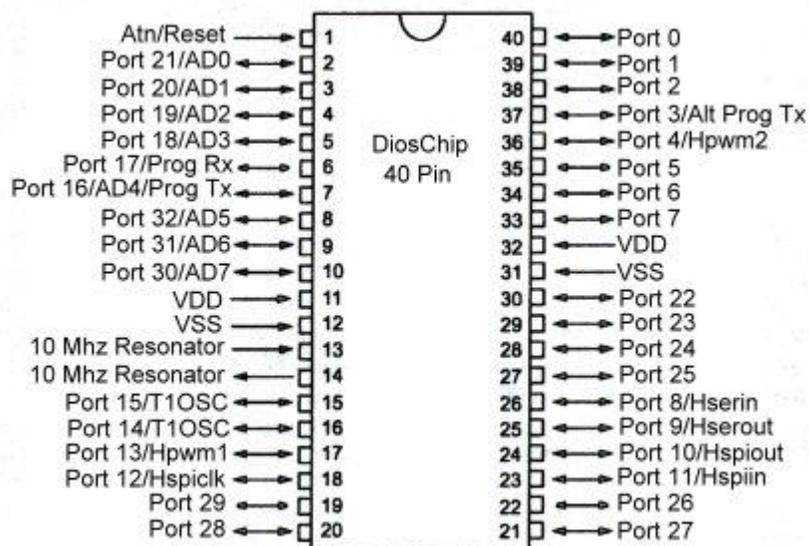
If you do not get a successful test message check the following:

- Verify the serial port you plugged the cable into is the correct port you set in the Port field.
- Verify you have power on the Dios Ultra chip.
- Verify that your PC serial ports can communicate at 115K baud.
- Verify the correct transmit and receive leads on the driver are connected to the correct chip pin.

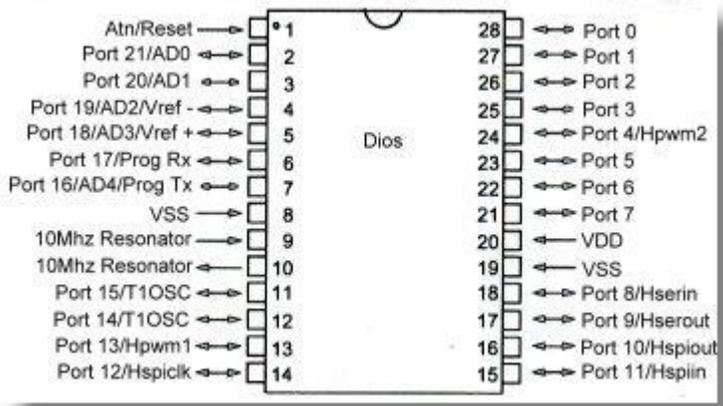
Dios Ultra OEM 40 Pin Chip Schematic



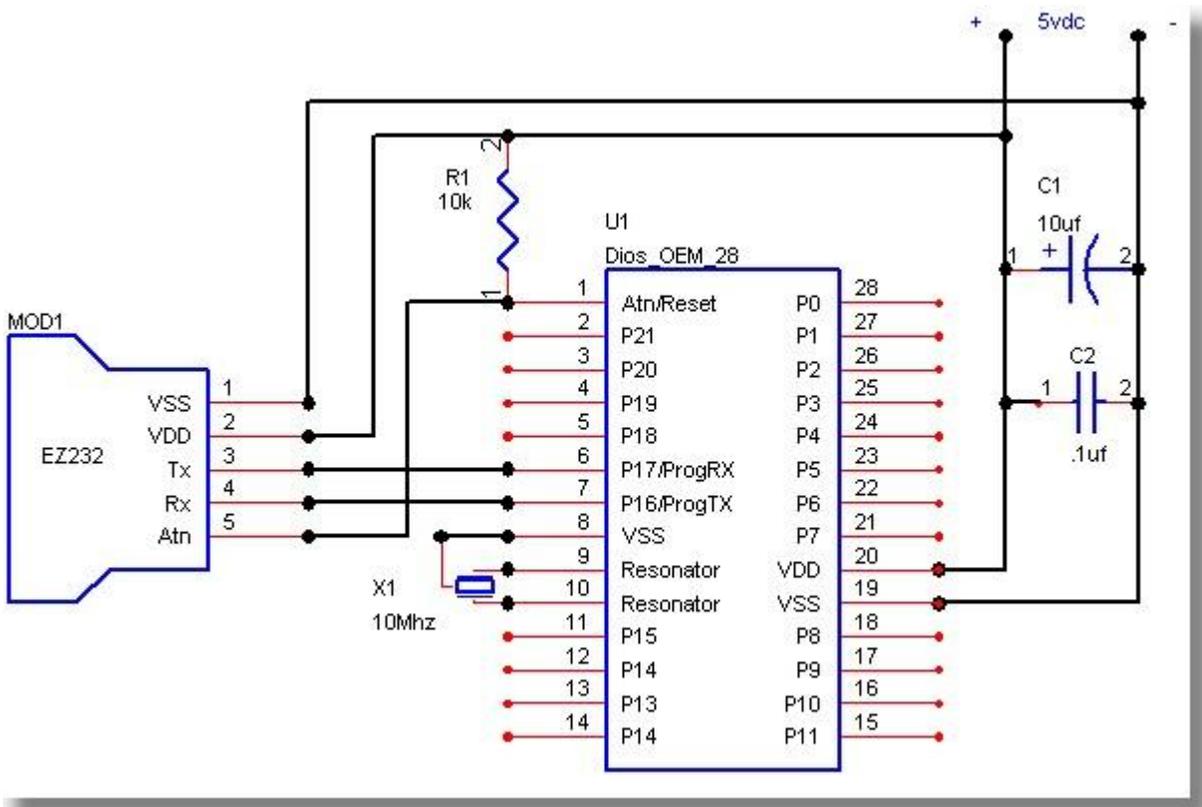
Dios Ultra OEM 40 Pin Chip Pinout



Dios Ultra OEM 28 Pin Chip Schematic



Dios Ultra OEM 28 Pin Chip Pinout



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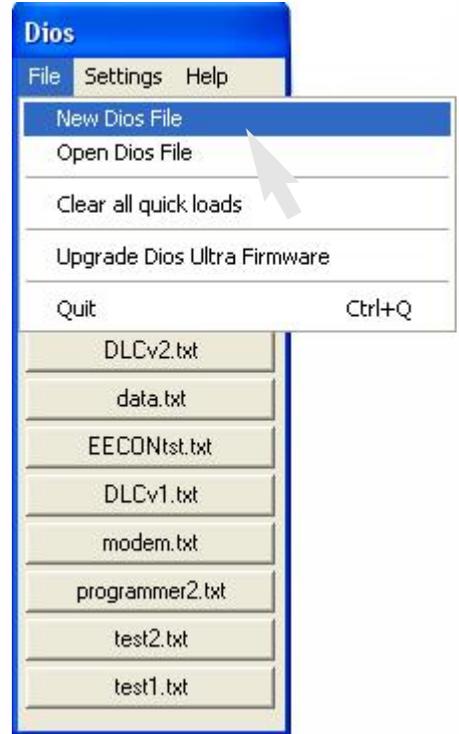
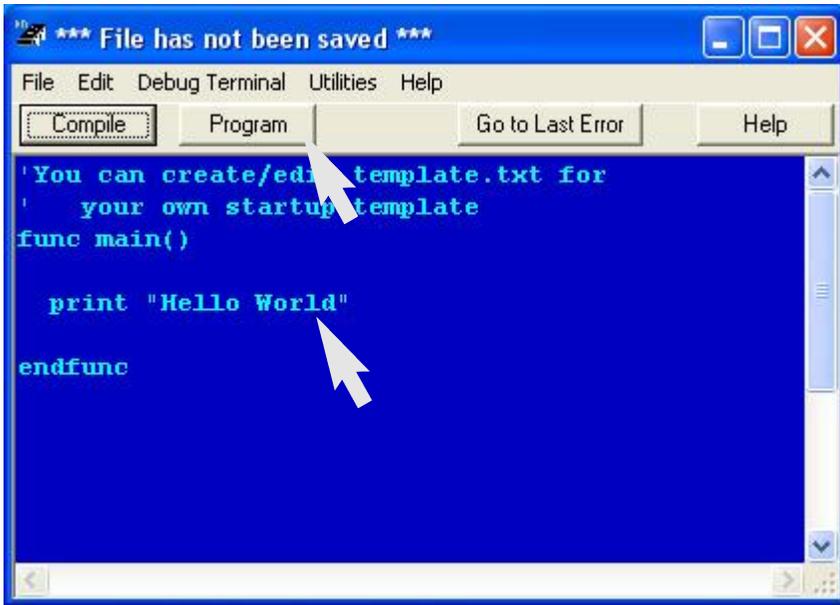
Writing your First Program

Lets jump right in and create your first program.

Start the Dios Editor Software.

On the Dios File manager select **New Dios File** from the File menu.

This will create an edit form with a default template ready for you to type in your program.



Type in the command **print "Hello World"** as shown then hit the program button.

The Dios Compiler form will pop up.

You will see the software detect your Versa Board and start to upload the program. This will take a few seconds and you can see the progress by watching the two progress bars.

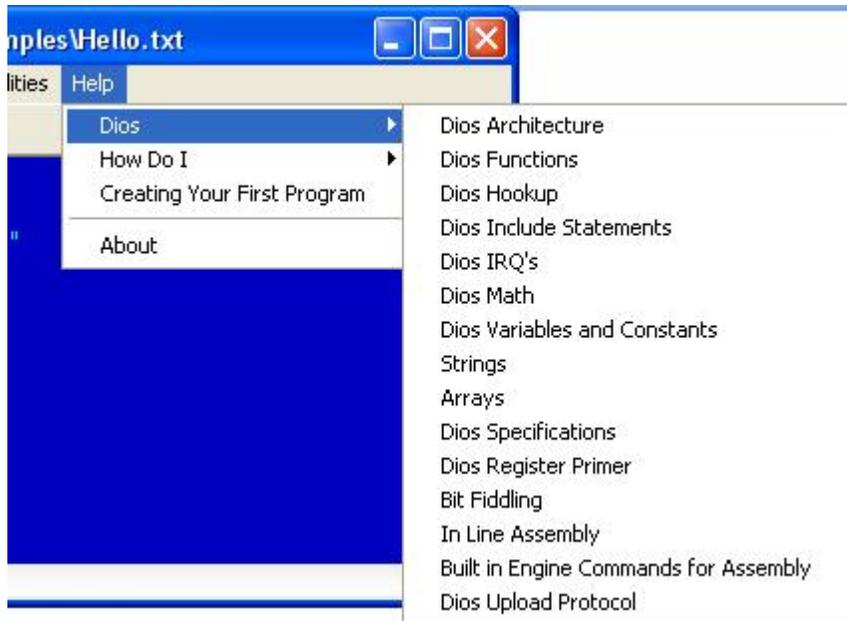
Once the program is uploaded the debug terminal will pop up automatically.



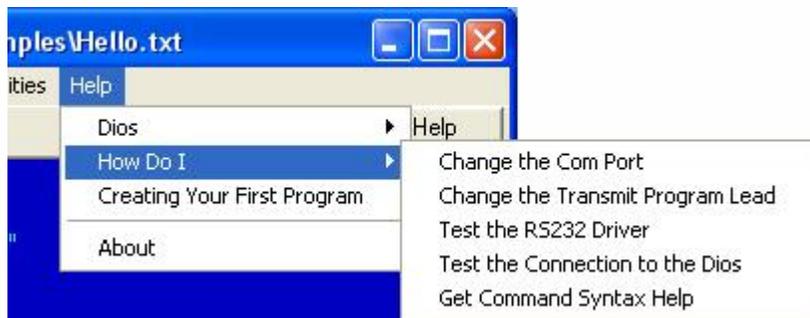
Any time the Compiler detects a debug or print command it will pop up the debug terminal for you. You can bring the debug terminal up manually at any time by clicking the Debug Terminal button or menu option.

Dios Online Help

The Dios Editor has an extensive online help system.



You can get help on specific items or generic help. There is even a writing your first program tutorial. This will take you through the compiling and error handling process.



You can even get help about a specific command.

Type the command you want help on and select it by double clicking it.

Once selected hit the F1 button and if that command is valid built in command it will appear in a help window.

If it does not a generic help form will pop up.



Dios Library System

The most powerful feature of the Dios Ultra is its libraries. This feature will allow reuse code so your development time will be drastically reduced.

The Dios Editor software has a library manager to make managing these libraries easier.

By double clicking on a entry in the list you can bring up a help file on the library you selected. This help file will give you all the information you need to use the file including syntax a program examples.



Dios Library Help

File Edit Bookmark Options Help

Print

DS1302 Real Time Clock Library

Version 1.0

This is a Dios Library for interfacing to a DS1302 Real Time Clock.

Hookup

The diagram shows a DiosChip28 with pins 1-16 on the left and P0-P12, VSS, VDD, Atn on the right. The DS1302 is connected to pins 17 (VDD), 18 (VSS), 19 (IO), 20 (RST), and 21 (CLK). A 3VDC battery (BT1) is connected to the IO pin. A 32.768KHz crystal (Y1) is connected to pins 22 and 23. An optional NiCad battery (3 cells) is also shown connected to the IO pin.

The nicad battery is optional and can be omitted. Both the DS1302 and 32.768 xtal can be purchased from the [Kronos Robotics web site](http://www.kronosrobotics.com).

Test Program1

```
func main()
```

Appendix A: Dios Versa Board Specifications

Power Supply Requirements	.7-14 Volts DC 200ma
Maximum Regulator Load (TO220 Reg)	.900ma
Maximum Regulator Load (TO92 Reg)	.100ma
Normal Operation No Load	.52ma
Sleep Mode	.39ua
Max Load on IO Port	.20ma
Operating Temperature	.0-40 centigrade
Clock Speed External	.10Mhz
Clock Speed Internal	.40Mhz
Total Memory	.32K
Program Memory	.16K
EEProm Memory	.256 Bytes
Total Ram	.1536 Bytes
String Variables	.256 Bytes
Local VArIables	.256 Bytes
Global Variables	.256 Bytes
Timers	.4
Command Speed	.130,000 - 300,000 per second
Dios Chip Used	.Dios 28
PC Connection Speed	.115200 Baud
PC Software	.Version 1.0.66 or above
IO Ports	.Up to 22 input or output
Analog Ports	.Up to 5, 10 bit

Appendix B: Build your Own RS232 Driver

You will need a level converter chip. I recommend the ST232ACN as it will work at speeds up to 250K baud and will accept .1 uf or 1uf capacitors.

The Kronos Robotics Part number is MAX1 and can be purchased at http://www.kronosrobotics.com/detail.asp?product_id=MAX1

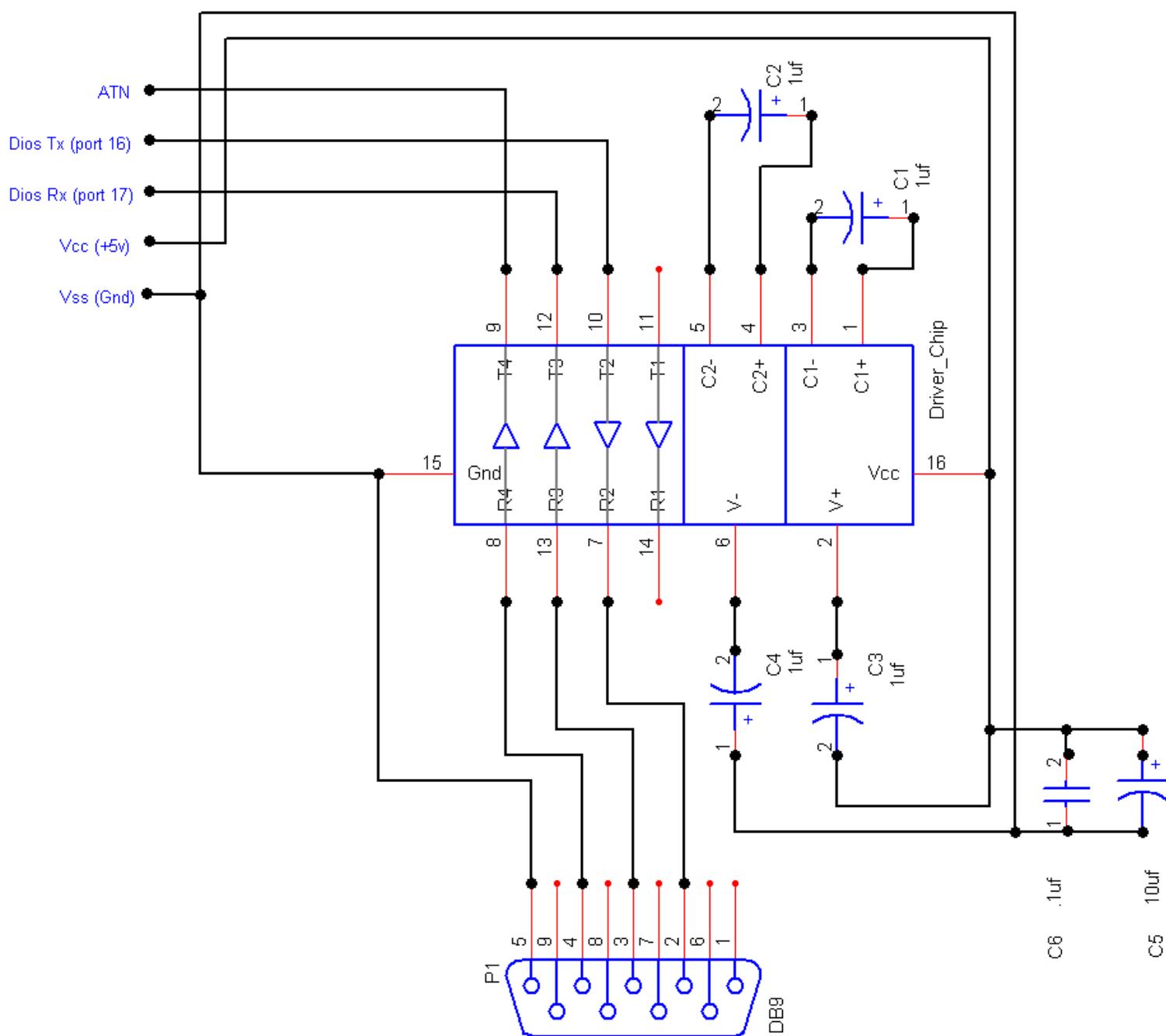
With the ST232ACN you can use ether .1 or 10 uf capacitors for C1-C4.

Note that the Dios Transmit port can be IO port 16 or port 3. On the Dios Ultra 32 pin module and the Dios Versa Board this is jumper selectable. You must also set it up via the Dios Software.

While the Dios can operate at voltage down to 2.5v the RS232 drivers can not. Most require at least 4.5v. Some can go as low as 3.5v.

Dios Ultra OEM 32 Module and Dios Versa Board Port Pins

- Dios Tx Port 16 = Pin 4
- Dios Rx Port 17 = Pin 3
- Dios Atn = Pin 5



Appendix C: Links

Web Site

<http://www.kronosrobotics.com>

Full Color Instructions

<http://www.kronosrobotics.com/products/pdfs/pdfs.htm>

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