

Build a IPAQ Serial Connector



You can purchase a serial cable for you IPAQ (Most of them) but it will cost you \$29 - \$49. The other problem is that the connector is designed to connect to a PC making it a DCE. In order to connect it to many of the devices out there we need to use a gender changer and null modem adapter.

The other problem is the cable is quite long and can weigh nearly as much as the IPAQ.

In this article we are going to build a DTE connector for your IPAQ Pocket PC. This should work with the IPAQ 1900,2200,2400,3800,5400 and 5500 series.

You can make the cable as long or small as you like. The one I made is only 6" long.

What You Need

In order to build this connector you will need a few things.

IPAQ Power Adapter

This adapter is used to charge and power the 12/22/24/38/39/54/5500 series IPAQ Pocket PC's
You can pick one up at the Kronos Robotics website.

<http://www.kronosrobotics.com/xcart/customer/product.php?productid=16502>



This is the heart of this project. We will be making modifications to this connector.

DB9 Male Connector

This will become the serial connector that we will use when we connect our Pocket PC to various devices.

They are sold at Radio Shack with a part number of 276-1537.



DB9 Connector Hood

This is used to make our serial connector a bit more fool proof and professional looking.

They are sold at Radio Shack with a part number of 276-1579.



Other Componets

You will also need a small amount of 1/16" heat shrink and a bit hookup wire. We used the colors Yellow, Black, White and Blue. You can use others but will need to keep track as in this document we will refer to the colors listed.

Tools

You will need a couple small screwdrivers. One Flathead and opn Philips. You will need a soldering Iron and some wire cutters.

Getting Started

Step 1

The first step in the process is to disassemble the connector.

Remove the two Philips screws from the connector as shown.

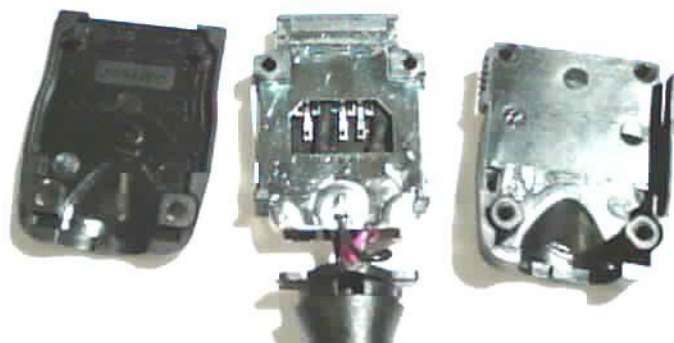


Step 2

Use a flathead screwdriver to seperate the two plastic covers. Try to get the tip of the screwdriver into the one of the grooves as shown.

The covers are held on by friction.

Store the covers along with the screws in a safe place.



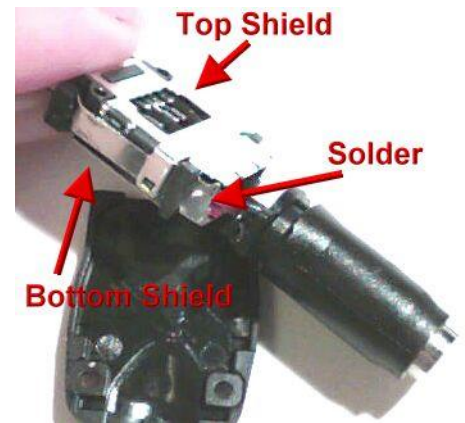
Step 3

There are two shields covering the connector. In most cases the top and bottom shields are connected near the rear with a small dab of solder as shown.

The easiest way to break this connection is to heat the solder with soldering iron while pushing the bottom shield away from the connector. You will probably bend it a bit but that is ok.

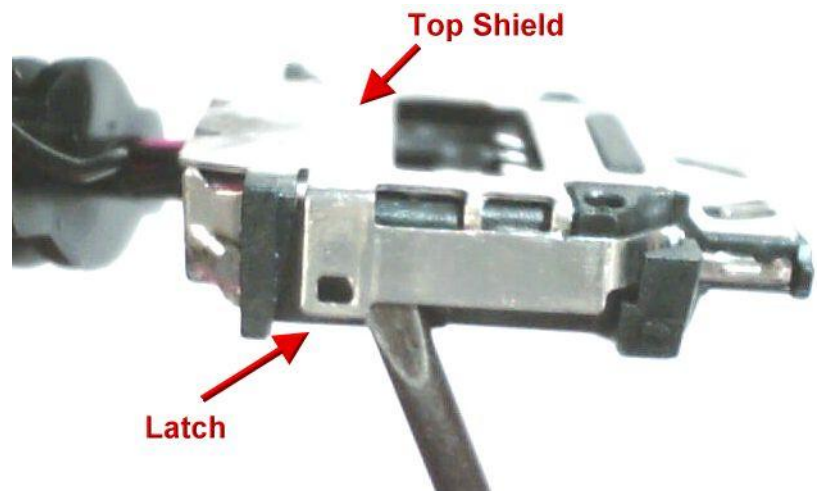
Once both solder joints are separated you can remove the bottom shield by separating it from the connector starting at the rear near the power connector.

Note that the power connector may also be solder to one or more of the shields. If so remove that connection as well.



Step 4

To remove the top shield you need to pry the side of the shield away from the connector with a flathead screwdriver as shown. Once both sides have been slightly lifted you should be able to lift the shield away from the connector.



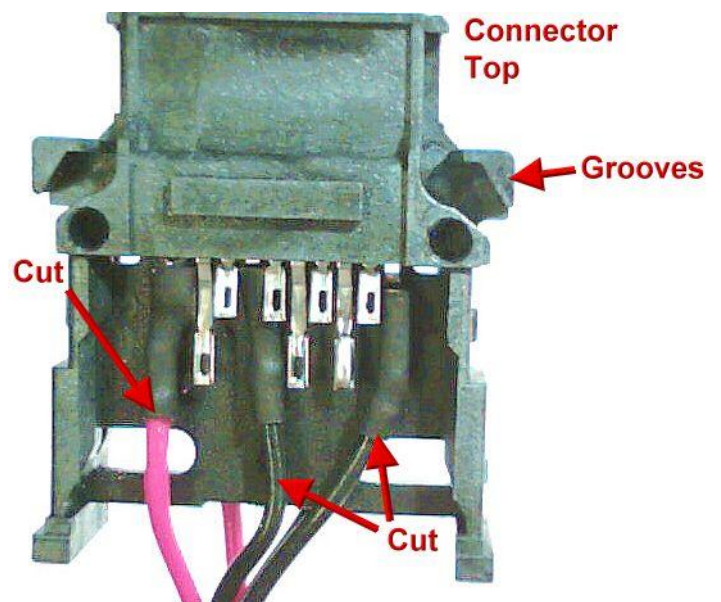
Step 5

Now we have to remove the wires that are connected to the power connector.

Warning! Don't pull the wires.

Cut the wire where the heatshrink ends as shown.

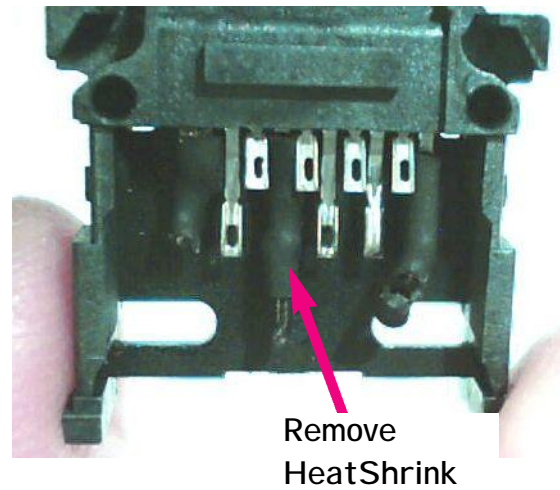
Notice that the top of the connector has two small grooves. This is how we tell the top of the connector from the bottom.



Step 6

On the Top of the connector the middle black wire needs to have the heatshrink removed. You must use a razor knife to do this. Move the knife back and forth until the heatshrink splits. Once split use the soldering iron and remove this wire.

This will become the GND connector.

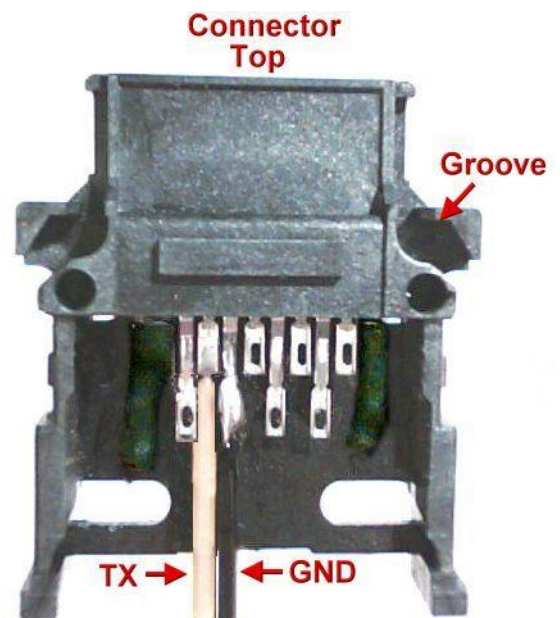


Step 7

On the top of the connector (Groove Side) connect a yellow and black wire as shown. Note that the first two leads are covered with heatshrink. Skip the third and place the yellow wire on the fourth lead. This is the TX lead.

Connect the black wire to the 5th lead as shown.

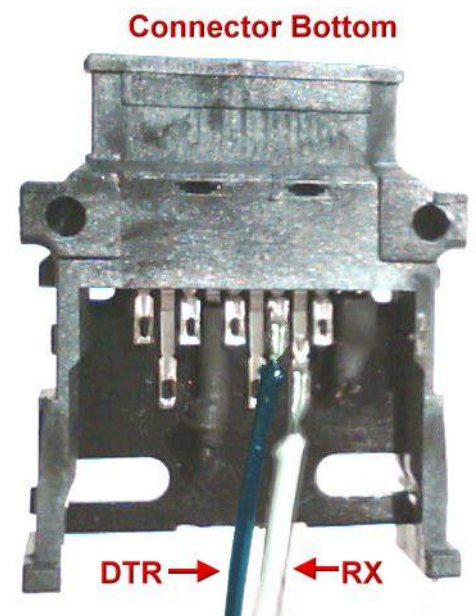
You can use different colored wires but create a legend on a piece of paper so you can keep track.



Step 8

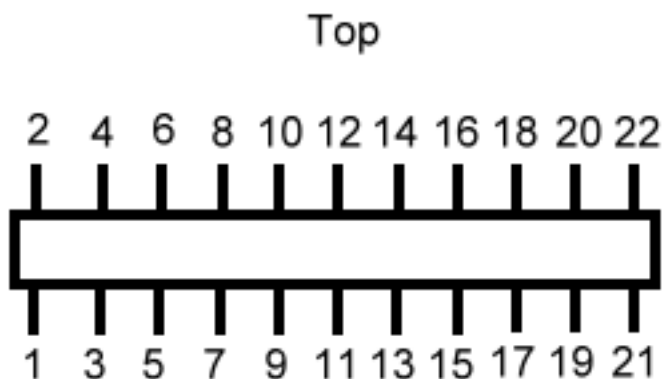
Counting from the right attach a white wire to the fourth lead. Note that the first two leads are connected together. The third lead is skipped.

Connect a blue wire to the 5th lead as shown.



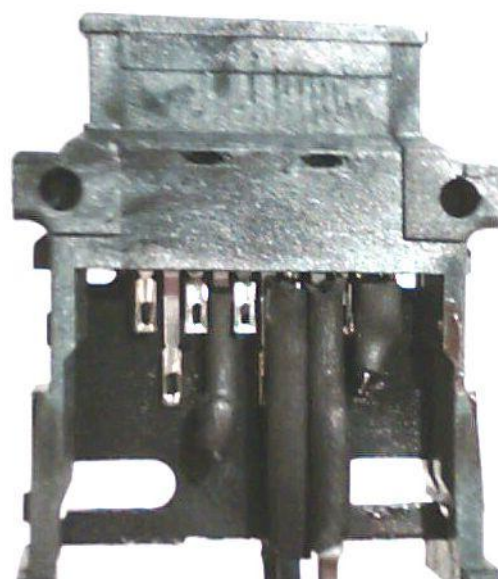
Here is a legend of the connections on the connector incase you want to add a few more wires.

- Pin 1 VIn
- Pin 2 VIn
- Pin 3 VIn
- Pin 4 VIn
- Pin 5 NA
- Pin 6 DCD RS232
- Pin 7 RXD RS232
- Pin 8 TXD RS232
- Pin 9 DTR RS232
- Pin 10 GND
- Pin 11 DSR RS232
- Pin 12 RTS RS232
- Pin 13 CTS RS232
- Pin 14 RI RS232
- Pin 15 GND
- Pin 16 NA
- Pin 17 USB Detect
- Pin 18 NA
- Pin 19 USB UDC +
- Pin 20 NA
- Pin 21 USB UDC -
- Pin 22 GND



Step 9

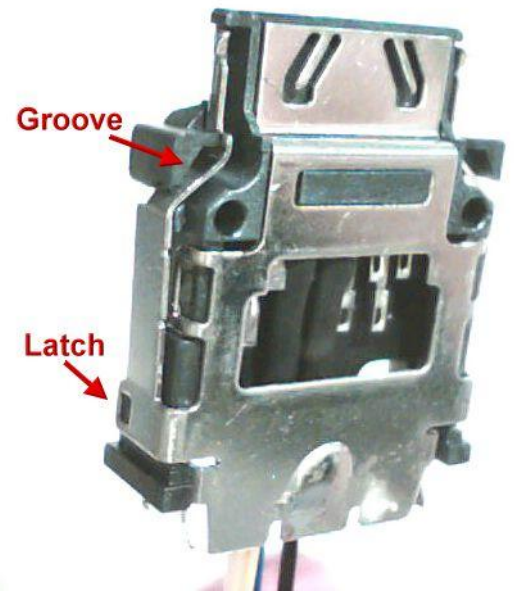
Add heatshrink to each of your connected wires. It is important that you keep the leads from touching.



Step 10

Take the top shield and insert it into the grooves as shown.

The small latch holes at the rear should snap into place. If they dont you may need to bend them back into shape.



Step 11

Add the bottom shield. This shield is only indexed by two small slnotches at the front as shown.



Step 12

This is an optional step but will make the connector much more reliable. This involves removing the metal insert from the power connector. I have done it with 3 connectors and found the easiest way is with a pair of vice grips by rocking back and forth.

Once removed drill a small 1/8 hole down the center of the plastic.



Step 13

Slip the wires through the strain relief that you created in step 12.

Snap the top cover on to the connector. The top cover is the one with the screw holes.

Place the strain relief into the slots at the rear of the top cover.

Add the bottom cover.

Tighten the screws.



You now have a RS232 connector for your IPAQ.

BlackGND
YellowTX
WhiteRX
BlueDTR

Step 14

Now it is time to connect the wires to a DB9 male connector.

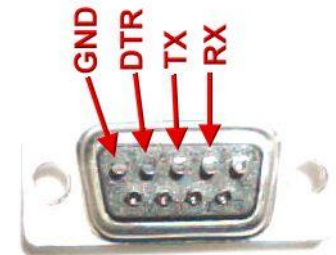
Cut 4 small 3/8" pieces of heatshrink and insert them over the 4 wires.

Connect the black wire to pin 5 (GND)

Connect the blue wire to pin 4 (DTR)

Connect the yellow wire to pin 3 (TX)

Connect the white wire to pin 2 (RX)



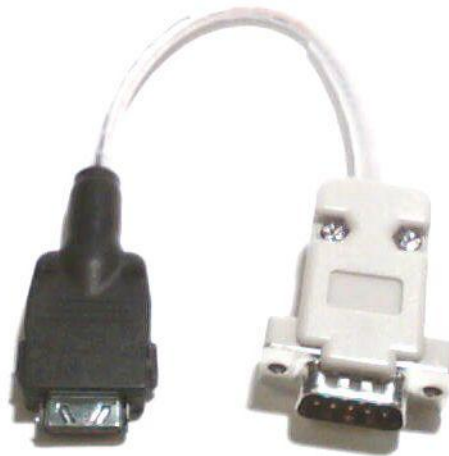
Step 15

In order to use the small metal strain relief on the hood you need to build up the wires. I used some plastic wire wrap on mine. You can also use tape.

Dry fit the relief before you tighten the screws.

Once done add the hood and insert the two machine screws. Add the nuts and tighten.

Your connector is now complete. If you want you can now add some plastic wrap to the 4 wires.



Here is a small PocketZeus program that will test your connector. Place a jumper between pins 2 and 3 and run the program. You should see a series of A's displayed on the screen.

```
func main()
  dim x as integer
  dim tstr as string
  const Channel1 1

  x=ComOpen(Channel1,baud=115200,port=1)
  print "Open Status = ";x

  'Send byte values 0,1 2
tx:
  ComOutput Channel1,chr(65)
  comdtr 1,0
  pause 100
  comdtr 1,1
  pause 100

  x = ComBuff(Channel1)
  if x > 0 then
    tstr = ComInput(Channel1)
    print tstr;
  endif

  goto tx

endfunc
```