UCLA Rocket Project Electronics Workshop 6

2016/11/18

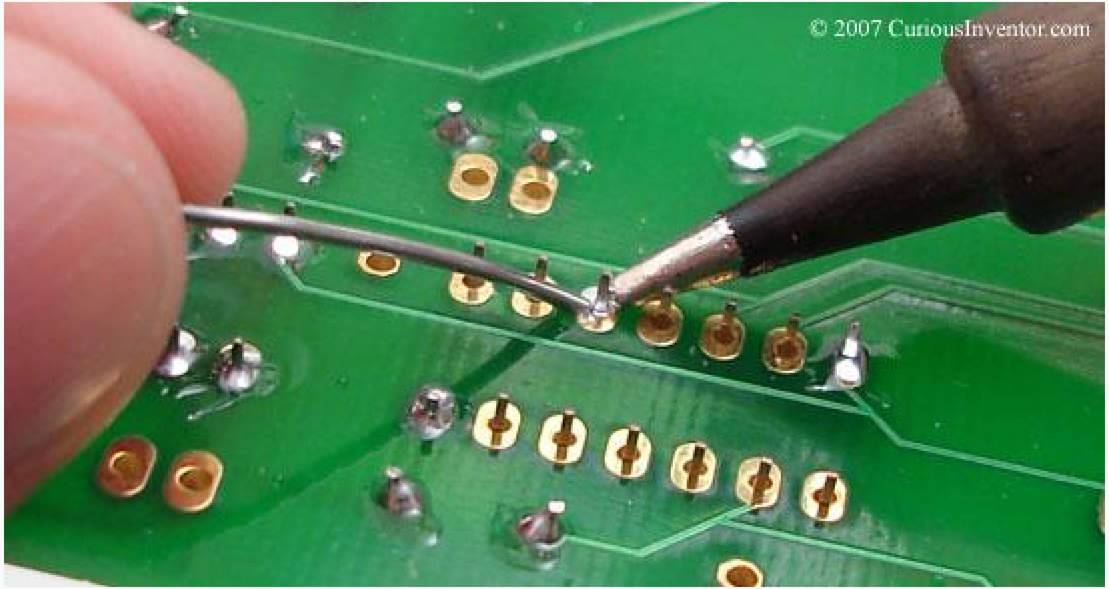
Next Wednesday - WiFi

1. Router setup
2. Understanding the concepts of WiFi technology
3. Network setup (multiple routers)

Soldering - Theory

1. Soldering is a technique of melting a metal which adheres to two terminals we want to connect
2. Soldering is used to easily and robustly making electrical connections
3. Soldering vs Welding
   a. soldering needs not provide structural strength
   b. soldering needs to provide electrical connection
   c. soldering metal - low melting point (200 C, 400 F)

Soldering - picture



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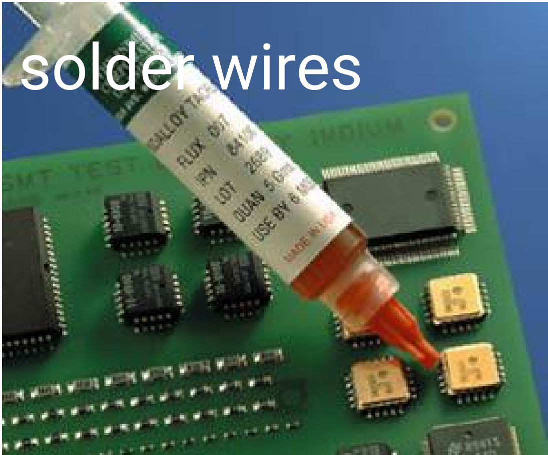
Soldering - flux

1. Soldering metal needs flux to reduce its melted surface tension and be able to adhere to connections
2. Flux already contained as “resin” in many solder wires
3. Flux can be added separately
4. Flux is toxic!



Soldering - common mistakes

1. The amount of heat transferred from the soldering tip to the elements is proportional to the surface area - touch with the side 2-3 mm away from the tip
2. Soldering iron tip needs heat conductive surface coat to be able to conduct heat, tip should be silverish; prolonged use and idle heating will destroy the surface coat; burn off some solder on the tip itself to re-coat

Soldering - common mistakes

1. For solder to adhere, three elements must be heated: terminal 1, terminal 2 and solder; if still not adhering then not enough flux; burn off some solder on the tip to extract flux from the resin core of solder wire
2. Don’t overheat components
3. Practice!

TCP programming in Unix

1. TCP is a family of protocols
2. Requires address (IP) of receiver and cooperation
3. Client: create socket -> connect to socket -> write to socket -> receive on socket -> close socket
4. Server: create server socket -> accept connections to server socket -> wait -> receive client socket -> receive on socket -> write to socket -> close client socket

TCP specificity

1. Consists of packets
2. Packets have a limited size (~1500 bytes)
3. real time cooperation of sender and receiver required
4. Fastest possible connection
5. Hard, but very useful
6. Implemented in all programming languages (almost)
7. Can be used locally or on the internet

TCP - best to learn in your own language, OS

1. However, we’ll be learning it in C and Unix
2. We’ll write two programs “client” and “server”
3. We’ll use to first communicate between them locally
4. Then we’ll communicate between different computers
5. We’ll be working with:
   a. http://www.binarytides.com/socket-programming-c-linux-tutorial/