

# Light'n Wire Productions

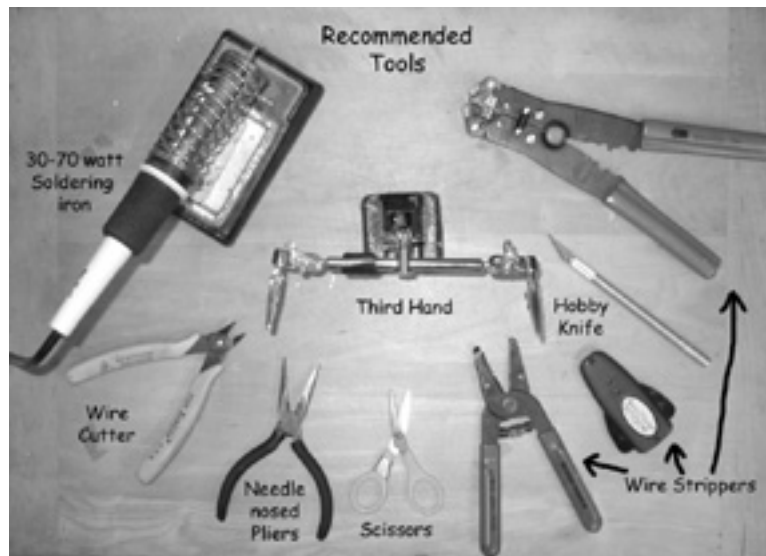
## Work Shop Guide

### Safety

Know proper use of tools, ventilate solder station, hold the cool end of the soldering iron

### Tools

30-70 watt soldering iron, wire cutters, needle nosed pliers, scissors, wire strippers, knife, helping hands.



### Supplies

60/40 ROSIN core solder, heat shrink tubing, copper tape, connectors, Lead wire, attachments (wire ties, tape, glue)



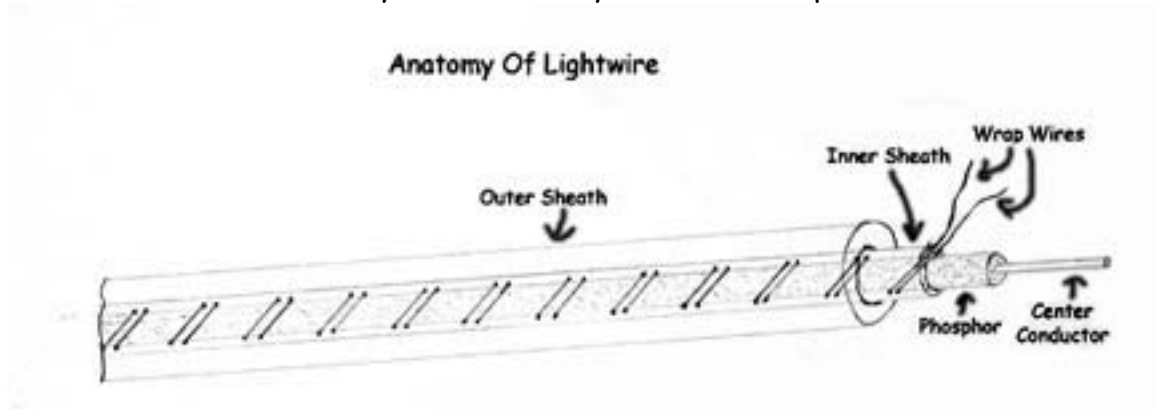
Light'n Wire Productions

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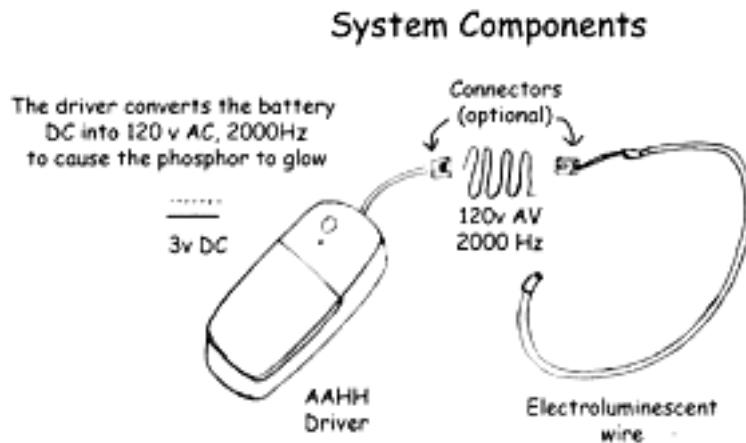
## Anatomy of Lightwire

Lightwire is a copper center conductor coated with a phosphor, two hair fine wires wrap around the phosphor-coated wire. This is covered with a thin clear vinyl sheath and an outer colored filter sheath covers everything. Angel wire does not have an outer sheath and the Phatt wire has a thicker outer sheath. Electrically, the assembly acts like a capacitor.



## System Components

- A driver converts DC voltage to AC voltage.
- The AC voltage creates a pulsating field that causes the phosphor in the wire to glow.
- The length of lightwire driven is dependent on how much power the driver can put out.
- Do not apply power to the driver without connecting it to the lightwire. The driver will be stressed without a load and its life will be reduced.



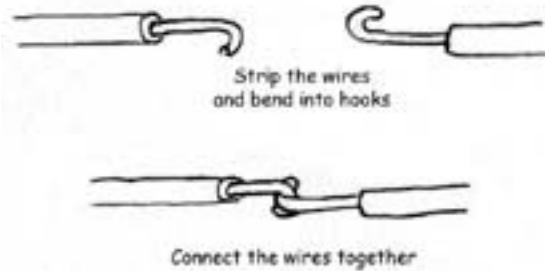
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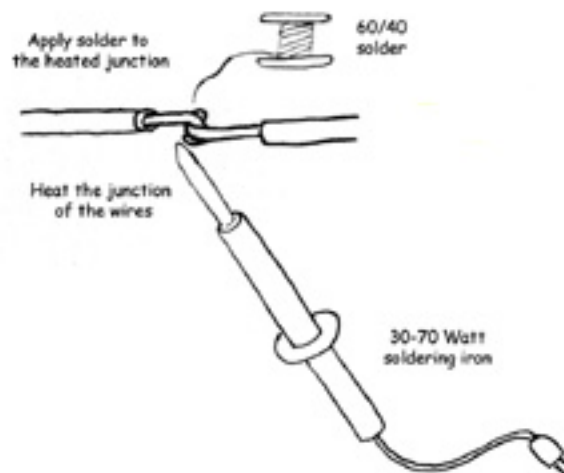
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## Basic Soldering

- Create a strong physical connection between two wires



- Heat the joint and apply solder, the solder will "wet" the heated areas to make an airtight electrical connection.



- Allow a short time to allow the joint to cool; this is to prevent a cold solder joint that will fail.

## Tinning

- Tinning is simply putting solder on metal such as connectors or wire
- This is done to make soldering easier
- To tin a wire, just heat it and apply solder to the exposed wire

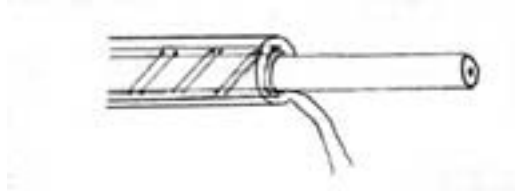
# Light'n Wire Productions

## Lab 1: Basic Lightwire connection

**Tools Used:** wire strippers, Soldering iron, knife, needle nosed pliers and wire cutters.

**Supplies Needed:** Lightwire, copper tape and heat shrink tubing.

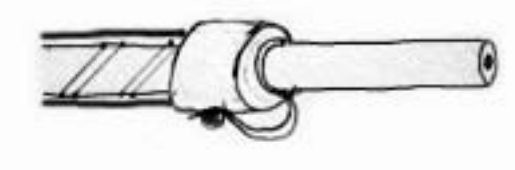
- Strip off approximately  $\frac{1}{2}$ " of outer sheath; strip more if you need room to work.



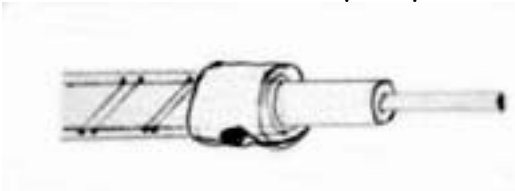
- Cut a 1/8" piece of copper tape and place it just below the cut, do not wrap around the wire yet.



- Look for the tiny wrap wires that are exposed, fold them over the tape.
- Solder the tiny wrap wires to the copper tape and finish wrapping the remainder of the tape around the wire. (Note: use just enough solder to hold the tiny wrap wires in place, too much heat will melt the vinyl sheath and the adhesive of the copper tape will melt and slide around).



- Scrape the phosphor from the outer half of the exposed center wire; scrape off enough to make a good physical connection with the lead wire, solder will not stick to phosphor.

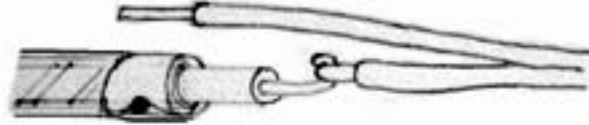


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## Light'n Wire Productions

- Cut  $\frac{1}{2}$ " from one of the pair of lead wires and strip off about  $\frac{1}{4}$ " insulation from the end.
- Connect the short wire to the center connector and solder.



- Strip just enough insulation from the short lead wire to allow a connection to the copper tape and solder.



- Cover the whole joint with a piece of heat shrink tubing to protect it. The offset connection and the insulative qualities of the phosphor will not short if protected by heat shrink.

### Terminating the wire

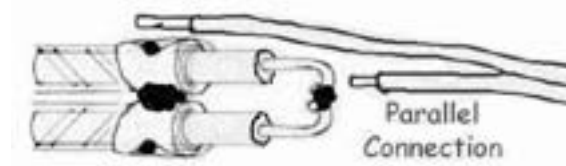
The center conductor and the wrap wires are NOT connected together at the free end. The free end must be protected from the environment and it is a safety hazard that could be shockingly unexpected. The free end can be covered with a piece of heat shrink or a dab of hot glue or vinyl glue.

## Light'n Wire Productions

### Lab 2: Connecting two or more lightwires together (multi strand, parallel connection)

**Tools Used:** wire strippers, Soldering iron, knife, needle nosed pliers and wire cutters.

**Supplies Needed:** Lightwire, copper tape and heat shrink tubing

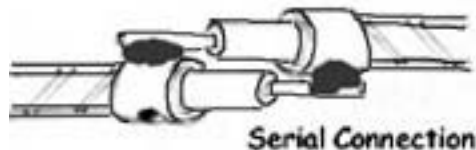


- Strip the lightwire, solder the wrap wires to copper tape and strip off the phosphor.
- Solder the lightwires together, copper tape to copper tape.
- Solder the center connectors together.
- Solder short lead wire to common center wires.
- Solder long lead wire to common copper tape.
- Cover with heat shrink tubing to protect the joint.

### Lab 3: Connecting two or more lightwires together (single strand, serial connection)

**Tools Used:** wire strippers, Soldering iron, knife, needle nosed pliers and wire cutters.

**Supplies Needed:** Lightwire, copper tape and heat shrink tubing.



- Strip the lightwire, solder the wrap wires to copper tape and strip off the phosphor.
- Connect the center wire of one to the copper tape of the other and solder, solder the other copper tape to the other center wire.
- Cover with heat shrink tubing to protect the joint.

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