



## **HOW TO RUN A SUCCESSFUL CHRISTMAS LIGHT BUSINESS MANUAL**

We Hang Christmas Lights will equip you with everything necessary to run a profitable holiday business. With our extensive experience in this industry, we can teach you our proven business concept and help you achieve success in this highly profitable and growing industry. Our manual will provide you with the tools and training necessary to start your own Christmas light installation business....And MOST IMPORTANTLY, succeed in your business venture.

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## INSTALLATIONS

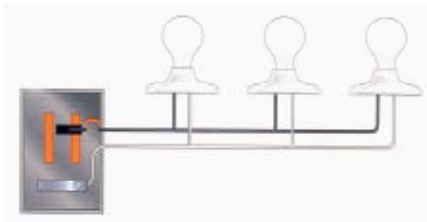
# VARIOUS TYPES OF LIGHTS

Primarily, there are five types of lights that you will be working with in the Christmas light industry, consisting of the three different light bulbs pictured below.



## C7 AND THE C9

The **two larger bulbs** run by using the exact same wire, either SPT-1 (18 gauge) or SPT-2 (16 gauge). Their differences are the size of their bulbs and the size of their sockets. C7's have what is referred to as a **candelabra base**, while the C9's have what is known as an **intermediate base**. Essentially, the base is the threaded part of the bulb. C7 and C9 lights are wired in parallel, which is the same as the wiring in a house.



### Definition of Parallel Wiring

When several light fixtures or receptacles operate on the same circuit, with the hot and neutral wires running together from one housing box to another; wires to individual devices, branch off from them.

There are some distinct advantages to lights being wired in parallel. First, if one bulb goes out, the rest of the lights will remain lit. Secondly, you can actually cut the wire of these lights along any section of the wire.

There are two different ratings for both C7 and C9 lights, 120v (2,000 hour lamp life) and 130v (3,000 hour lamp life). Many companies no longer carry the cheaper, lower life 120v bulbs, because the price difference between the two ratings was only about one cent. WHCL uses and recommends 130v bulbs exclusively. Bulb wattages differ slightly in the two different sizes; C7 bulbs come in 5 watt and 7 watt, while C9 bulbs come in 7 watt and 10 watt. We recommend choosing the lower available

wattage in both size bulbs; 5 watt for C7's and 7 watt for C9's. Power consumption is always an issue in the Christmas light business, and you will encounter fewer problems by using less energy. A rare exception to using the lower wattage bulbs is if you are installing lights on a high-rise building, consisting of more than 16 stories. In this situation, you will want to use the brighter, more visible, 10 watt, C9 bulbs.

## **MINI LIGHT**

Mini lights are on a thinner gauge of wire in comparison to C7's and C9's and they are wired in series.

### **Definition of Series Wiring**

This type of circuit passes the hot wire through a series of devices, before joining the neutral wire that returns to the source. Meaning, the flow of energy must pass through every bulb in order to complete the circuit.



The problem with this type of wiring is that when one bulb in the series burns out, the remaining bulbs will not stay lit. For this reason alone, you want to always replace the burnt out bulbs. Unlike C7's and C9's, you should never cut mini lights. This is because when any individual light in a series is missing, the remaining lights will have to consume the excess energy. The wire and bulbs of mini lights are not designed to handle extra energy. Cutting mini lights will result in an extreme fire hazard. Do not ever cut them.

### **Mini Lights, Icicles, Rope Light, C7, C9**

- **Mini Lights:** Small Lights usually used in trees or other landscaping.
- **Icicles:** (Mini Lights configured with icicle vertical drops). Used on rooflines.
- **Rope Light:** (Rope light is mini lights that are wrapped inside of a see through plastic rope. There are solder points at each individual bulb. Rope lighting is a good and very durable product, but only if it is installed in one place, and not removed or reconfigured repeatedly. This is because the solder points at each bulb risk being broken, each time you twist or bend the rope, causing a section of lights to burn out.)
- **C7:** Primarily used on house rooflines, they look similar to C-9 but use less energy.
- **C9:** Primarily used on commercial buildings or large homes.

# ELECTRICITY & CALCULATIONS

Electricity will be your primary concern and the biggest problem you will encounter in the Christmas light business.

## The electrical problems you will encounter are listed below:

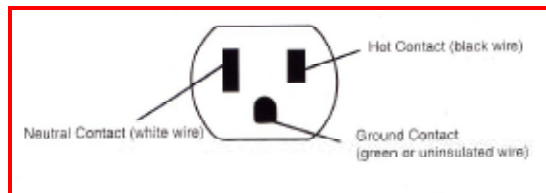
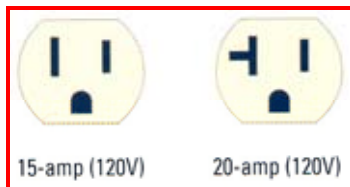
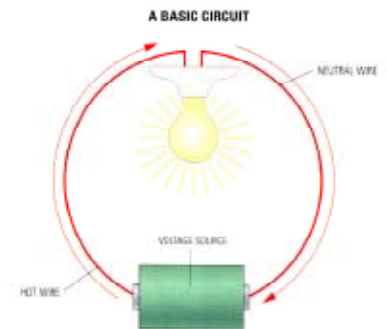
- Finding electricity.
- Finding enough electricity.
- How to route power cords—from outlets—to where you need electricity.
- MOISTURE.
- Other factors that cause tripping of GFCI's and circuits.

It is not necessary that you have extensive electrical knowledge to run a Christmas light installations company. However, a basic understanding of how electricity works may help you to solve some of the minor problems you will encounter.

## The most important aspects for you to know will be addressed below:

To help you better understand the flow of electricity, think of it as a garden hose. When you turn water on, it moves through the hose, and then out of the hose end. In a similar way, think of electricity as a current of very tiny particles (electrons) flowing inside a wire (conductor) and through a light bulb (device).

Now that you are thinking of electricity as a current flowing through conductors, let's look at a second basic concept: the continuous loop of a circuit. In order to flow, electricity must have a continuous, closed path, from start to finish; like a circle. The word "circuit" refers to the entire course an electric current travels, beginning at the source of power, through an electrical device, and back to the source. The current flows to the devices (called loads) through a "hot" wire, and returns via a "neutral" wire.



In houses there are two different size circuits on 120volt outlets, 15 amp and 20 amp. When deciding how much energy you may pull from a circuit, you must be aware that there is a recommendation from the National Electrical Code which states that you should leave 20% of the maximum rating of a circuit. Simply put, do not exceed 80% of the maximum rating. For instance, if you are plugging into an outlet on a 20-amp designated circuit, you should only attempt to pull 16 amps, which is 80% of 20. If you are

using a 15 amp dedicated circuit, you should only attempt to pull 12 amps. Notice the word dedicated is underlined. This is because it is important to keep in mind that if you are not using a circuit that is dedicated, it will be necessary to estimate, or use a tool to figure the additional power being consumed by any other devices that are sharing the circuit with the outlet you will be using (for example a lamp, computer, stereo, etc., before you can calculate 80%).

## ***WHERE TO FIND ELECTRICITY***

Power assessment should begin with the salesman. The salesman needs to be aware of general locations of power outlets, as well as any hidden power sources that may not be visible. He also needs to be aware of the approximate amount of power the installation will require. The salesman does not need to scout the entire house, looking for the power outlets; it is simply a very good idea that he do a simple check for available power. This way, if the customer is asking for an abundance of lights, and it is discovered that there is limited power outlets, the problem can be addressed at the time of the sale. As covered in your sales manual, the customer is usually willing to pay for the electrical upgrades required to power an extensive display. The individuals that will be assessing the power in depth will be the installations team.

### **A general assessment of the house will consist of the following:**

- Where the lights are being installed.
- Approximately, how many amps will be needed.
- The locations of all of the outlets you will be using.

At this point, if the job is small and you estimate total amps at about 8 to 10 you probably won't have to give electricity another thought, because one outlet (circuit) and cord should be able to handle this amount of energy. If the job is larger, and you determine that the total amps consumed will be more than 14 or 15, you will need to determine whether or not the outlets you will be using are on the same circuit. **(Use the information from the housing diagram, on the following page, as to the general location of circuits.)**

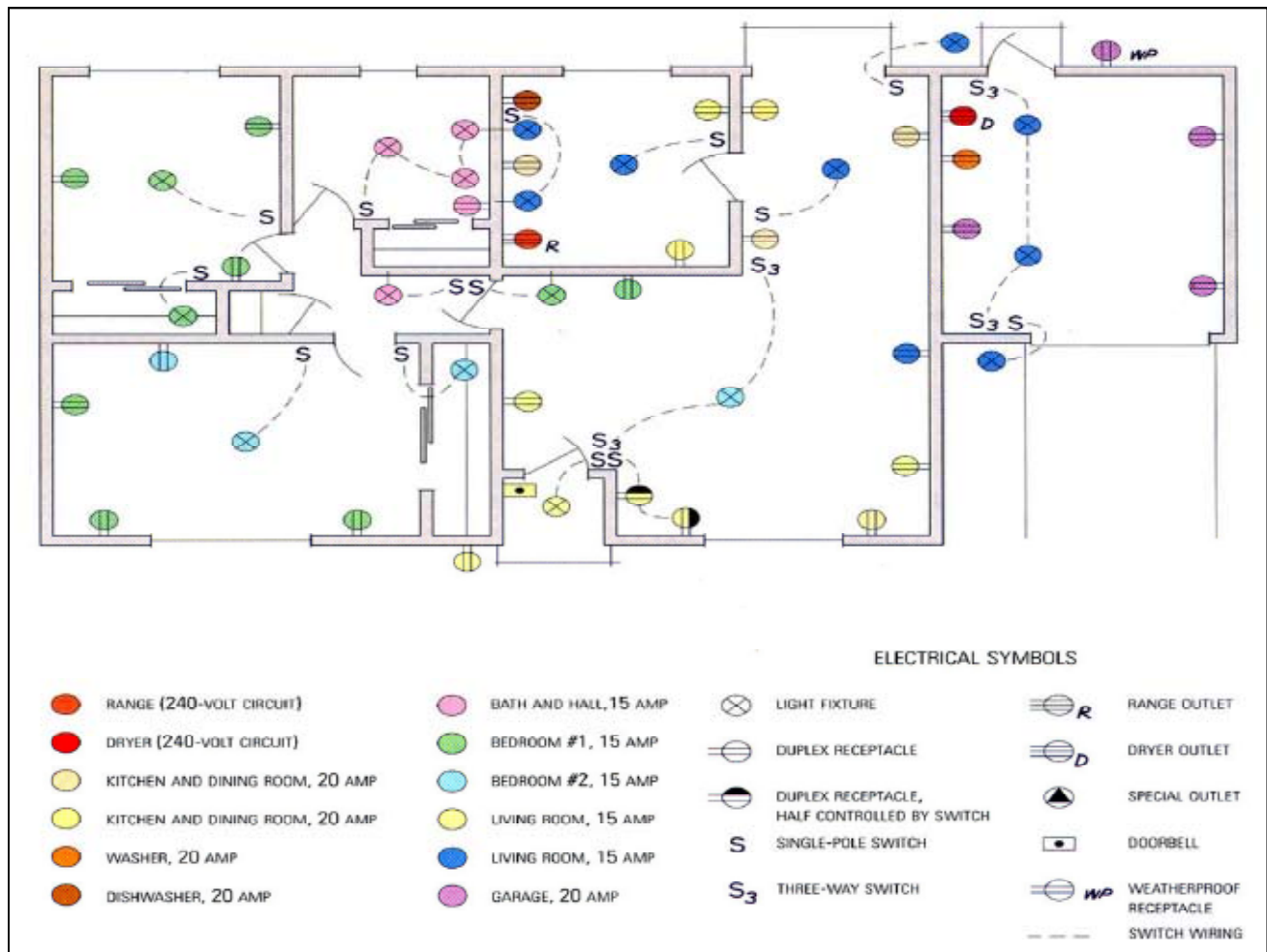
## ***SHARED OR DEDICATED***

The diagram on the following page shows two external plugs, one on the front of the house near the front porch and another on the rear of the house behind the garage. Notice that both of these outlets are connected on the same circuit, with outlets inside the home. This is called a shared circuit. The outlet by the front door is connected to outlets in the living room, as well as the entry hall lighting. The outlet behind the garage is connected with other outlets within the garage. Let's assume the outlet on the front porch is on a 15 amp circuit. We can see that the entry hall light is shared on the same circuit. We can also see that the outlets in the living room are also shared on the same circuit. *From this information,*

we can surmise that if the customer has the entry hall light on or any lamps or devices turned on that are plugged into the living room outlets, even though the circuit may be 15 amps; you will actually have less than 15 amps available. **Two things to think about here**, one, as I have said you probably won't have all 15 amps, and two, if you're installing lights during the day, when the customer is not using their interior lights, you won't know how much energy is actually available during night time hours.

**IMPORTANT**

Save yourself a possible service call, on the day of the installation, ask the customer to turn on all of the lights and appliances they commonly use, as well as any special ones they will be using during the holidays. They will only need to turn on lights and appliances in the areas you believe to be on the same circuit as that of the outlet you will be using, but you may want to eliminate any guesswork and ask them to turn everything on.



A circuit is **dedicated** when it feeds only one outlet (location). When a dedicated outlet has no other devices drawing power from it, the circuit will have all 15 or 20 amps available.

## **THE ORDER IN WHICH TO LOOK FOR POWER OUTLETS**

- 1. Eaves:** Many homes, especially newer ones, will have power outlets installed in their eaves. In fact, it is very likely that the power outlet installed in the eaves was designed specifically for Christmas lights. It is very common for these outlets to have been put onto a switch, photocell, or timer, enabling the customer to control all of their lights with one switch. You will want to check with the customer to determine if this is the case. However, your customers may not know where the switch is for these outlets. Solve this mystery by asking them if they have a switch in their home, in which that they're unsure of what it's connected to. Do not use this power source if the homeowner wants you to put lights powered by this outlet on a timer.
- 2. Front Porches:** You will commonly find a power outlet on the front porch or close to it.
- 3. Rear Patios:** You will commonly find power at many rear porches. If there are multiple rear porches, it is possible that all of them have outlets.
- 4. Outside Walls of Garage/ Within the Garage:** The Garage will be one of the more common areas for finding outlets. It is a good location because there is a possibility of multiple circuits, and they are usually 20 amps.
- 5. Within the House:** When you have exhausted your search for external outlets, and find that you do not have enough power to complete the job, it may be necessary to go into the house. Find power outlets that are on different circuits from the external outlets, which you may already be using, as this would defeat the purpose of going within the house for additional power. This will be explained further in the following diagram and information.
- 6. External Sources and Other Sources of Outlets:** Keep in mind that you may want to look for these outlet locations before step 5 (within the house).

### **Listed below are a number of locations to find possible outlets:**

- Outlets on posts. Next to trees or shrubs. This is a location that the customer would have had installed, and will probably notify you of.
- In laundry rooms. The outlet for the washer is usually a 20-amp circuit, and is designated for that outlet only. Plug in a Tri-Tap adapter, in order to accommodate their washer and your lights, and unless the customer is doing wash, which they can limit during nighttime hours if needed, the full 20 amps is all yours. The only problem with laundry rooms is the difficulty in routing a power cord to the outside of the house.
- Air conditioning units. Many air conditioning units will have a 120Volt outlet mounted next to them.
- Water heater outlets. Most water heaters require 240v, but they sometimes have other designated 120v outlets adjacent to them.

- Central vacuum systems. These are sometimes found in larger homes. Find the location of the motor, usually located in an external closet, which is a good source to find 20-amp designated circuits.
- Garage freezer outlets. These are also sometimes found in larger homes. Use precaution with these, as you could ruin the entire contents of food if the circuit trips.

## **POWER TROUBLESHOOTING**

The **G**round **F**ault **C**ircuit **I**nterrupter (GFCI or GFI) is designed to protect against electrical shock. When the amounts of incoming and outgoing currents are unequalled, which indicates a current leakage, the GFCI opens the circuit instantly, cutting off power. A **current leakage**, causing a variance in the flow of energy, can be caused by several different factors, all of which are causing a grounding effect. This means that the flow of energy is attempting to flow through a different conductor in order to complete the circuit, i.e. through the ground. GFCI's are designed to trip in 1/40th of a second in the event of a ground fault of 0.005 ampere. A GFCI receptacle monitors the flow of electricity to that receptacle, as well as to all devices installed in the circuit from that point onward (called "downstream").

**The following is a list of the most likely causes for GFCI's or Circuit Breakers to trip:**

- Lights on the ground or a connection that is on the ground.
- Lights or a connection in water, i.e. gutter, etc.
- Water in a connection.
- A broken light bulb.
- A staple too deep into the wire insulation, causing a connection.
- A bad light strand.
- A person coming in contact with both the hot and neutral wires at the same time.

*Inevitably, when installing lights, you will run across situations that a circuit breaker or GFCI will get tripped.*

**The best way to get through a situation like this is by following the procedures listed below:**

1. Try and determine if the outlet that has lost power is on a GFCI. If the house is a newer house and the plug is external, it should be on a GFCI. If you are dealing with a slightly older house it may not be on a GFCI.
2. Begin by trying to locate the GFCI. First, look on all external plugs for a GFCI. If not found:

3. Next, since the panel is usually, easier to access check the circuit breaker. If there are no tripped circuits, then:

4. Try to determine the location of the GFCI within the house.

- **Outlet is near the front of the house:** First, look in the garage, second, look inside entry bathrooms, or offices, and Third, if the master bedroom is close to the front of the house near the outlet location, check the master bedroom bathroom.

- Outlet is near the rear of the house: First, look in the garage, second, much of the time look in the master bedrooms bathroom, Third, look within the house close to the location of the outlet. (You should be able to ask the customer for all known GFCI's, but remember, they will know them as "the outlets with the buttons", and they may not know the location of all of them) You will note in most kitchens there are a lot of GFCI's, these will not be the ones for which you are looking, as they are usually designated for kitchen outlets only.

- A side note about searching for GFCI's in garages: This will be the most likely location for the GFCI's, if the customer has cabinets installed in their garage, it is very likely you will have to look against the back wall inside of the closets to locate the outlet with the GFCI. (they will be about stomach high)

## **SAVE TIME AND MONEY \$\$**

### ***Important Info***

You can save yourself a lot of time, money, and frustration by buying a GFCI plug adapter for each member of your crew. When they are installing lights they should have the GFCI adapter plugged into the outlet that they are using to power the lights. They will then plug all of the lights/cords for that outlet into the GFCI adapter (during the install). Once the section that they are working on is complete they will remove the GFCI adapter and plug the lights/extension cord directly into the outlet.

By utilizing this method you will usually never trip breakers or GFCI's that are within unknown and hard to find locations. The GFCI adapter (which will be right at the plug you are working off of) will usually be the only part of the circuit to trip. These GFCI adapters are readily available at Home Depot, Lowes, etc.

***PLEASE CALL US IF YOU HAVE ANY QUESTIONS ABOUT USING THESE ADAPTERS.  
They are very important.***

## ***SPLITTING THE POWER***

Before beginning an installation, it is always a good idea to assume that it will be necessary to split or divide your source of power. If you are in a situation where you believe that one circuit will handle the entire job, but you think that your power needs will be very close to the maximum allowed, it would be advised to split the power regardless. This is because—if you don't—you may end up tripping a circuit, causing employees additional time looking for circuits. Not only will this end up costing more money in labor hours, but it could also put you behind schedule.

## ***WEATHERPROOFING***

This will be your biggest concern with regards to service calls.

**There is no such thing as a waterproof Christmas light or extension cord, but the precautions listed below will help prevent weather related problems:**

- **Do not tape connections.** If you tape a connection, even if you are able to keep it directly out of water, you will have a problem with condensation building up under the electrical tape. The tape will actually hold the water in, leaving no place which to escape, and the connection will never dry out.
- **Keep the lights, cords, and connections off of the ground.** Obviously, you will have to have the extension cords go across the ground, which should be fine since they are fully insulated. The problem occurs when you have connections or lights on the ground, allowing electricity leakage, resulting in tripping GFCI's or the circuit breaker. Surprisingly, you will find that when you keep lights and connections off the ground, they will endure a substantial amount of moisture without tripping circuits.
- **Wrap trees that have a tendency to hold less moisture.** Trees can present a major moisture related problem. Some trees have a tendency to hold a lot of moisture in their trunks. When you wrap these types of trees, they may act as a ground for the lights, tripping the circuit.

**Unfortunately, employees cause many electrical problems. Below is a list of what can cause employee related electrical problems:**

- Allowing cord plugs, light plugs, or lights to rest in gutters.
- Forgetting to elevate ALL plugs and lights off of the ground.
- Cutting C7 or C9 wire, and Not separating and capping off their ends.
- Stapling through wire.

*Teach your employees to avoid causing these problems.*

## ROUTING POWER CORDS

At some point in an installation you will need to get power to a location where crossing a driveway or walkway with an extension cord will be necessary. Remember that you are not installing permanent lights, just temporary Christmas lights, which means most people are understanding about extension cords. Think of this as **PRO-TEMP**. Do a professional job, but remember that it's temporary. Do a good job, don't waste too much time, and don't leave lasting and permanent marks, such as glue and holes.

### Where should you cross power cords?

- At the crack or cement joints, where two slabs of concrete meet. Try using the largest, most out of the way, crack.
- At the base of stairs, tucked neatly up against the first stair. If there is metal railing, you can sometimes zip tie from one ground post to the other ground post of the railing. (Only if it can be tucked tightly and won't present a tripping situation.)

### What materials will you need to use?

- **Glue** – 2 part epoxy or liquid nails. When using glue, you will only need to apply a dab of glue in about three or four spots in the crack or cement joint, and then lay the cord in the crack on top of the glue. Next, apply a small piece of duct tape across the glued location—or on either side of the glued location—to hold the cord in place until the glue is dry.
- **Nails** – Two large nails, 12" long, on each side of the driveway. Wrap the cord around the head of the nail then drive the large nail or spike into the ground. Pull tension across the walkway/driveway and drive the nail/ spike into the ground on the other side. This should hold the cord tight against the ground in the crack or cement joint. (Be careful not to use this technique if there is no crack, and the cord does not fit against the ground tightly, because you may be creating a hazard of tripping people if done improperly.)

*Whenever possible do not cross driveways or walkways, especially well traveled ones. In addition, you may only cross walkways at residential jobs, Never On Commercial Jobs.*

## LIGHT BULB SOCKET ADAPTERS

We strongly recommend not using light bulb socket adapters, or if you must, using them very sparingly. These outlets are usually only rated at 40 to 60 Watts maximum, and because they are encased or recessed the heat generated is greater than standard sources of electricity. If you give the approval to use this source of electricity, make sure your employees are aware of the fire risks. They should never overload the outlet. (This is an Outlet overload danger, not a circuit overload danger).

## Electrical Calculation Formula:

- Convert Watts into Amps: Total Watts divided by 120Volts = Amps
- Convert Amps into Watts: Total Amps multiplied by 120Volts = Watts

## DEFINITIONS

The following definitions are given only as a general reference. They may help some to understand electricity a little better, while confusing others. If they confuse you, do not worry, as they are not necessary. In the Christmas light business, extensive electrical knowledge is not required. A basic understanding is helpful, however.

- **Current**: The flow or rate of flow of electric charge in a conductor or medium between two points having a difference in potential, generally expressed in amperes.
- **Amperage**: The strength of an electric current, measured in amperes.
- **Ampere**: The standard unit for measuring the strength of an electric current; rate of flow of charge in a conductor or conducting medium of one coulomb per second.
- **Coulomb**: The meter – kilogram – second (mks) unit of electric charge equal in magnitude to the charge of  $6.28 \times 10^{18}$  electrons; charge transported through a conductor by a current of one ampere flowing for one second.
- **Conductivity**: The current that will flow from one face of a unit cube of a given substance to the opposite face when a unit potential difference is maintained between these faces.
- **Volt**: The practical mks unit of electromotive force or difference in potential between two points in an electric field that requires one joule of work to move a positive charge of one coulomb from the point of lower potential to the point of higher potential.
- **Voltage**: Electromotive force, or difference in electrical potential, expressed in volts.
- **Watt**: The practical mks unit of electrical power, equal to one joule per second or to the power developed in a circuit by a current of one ampere flowing through a potential difference of one volt; 1/746 of a horsepower.
- **Wattage**: Amount of electrical power expressed in watts.

# TOOLS & MATERIALS

## ***EACH CREW MEMBER***

Portable GFCI Adapter  
Stapler  
Staples 3/8 or 10mm  
Razor Knife  
Dikes  
Electrical Tape  
Twist Tie  
Zip Ties  
Pen & 3x5 index card

## ***GEAR***

Rain Gear  
Gloves

## ***EQUIPMENT***

Flyers or Business Cards  
Map Book  
Clip Board  
Calculator  
Pens  
Ladder Rack  
Storage Bins (36 per crew)  
Extendable Painter pole  
Ladders:  
1 – 32' Extension Aluminum  
1 – 28' Extension Aluminum  
2 – 24' Extension Aluminum  
3 – 16' or 20' Ext. Aluminum  
1 – 12' orchard Aluminum  
1 – 14' orchard Aluminum  
2 – 8' step ladders Fiberglass

## ***ON TRUCK***

Amp Tester  
Wire Splitter for Amp Tester  
Circuit Finder  
Commercial Mini light Tester  
Flashlights  
Trash Bags  
Broom  
Dust Pan  
Tape Measurer  
Screw Drivers – Flat / Phillips  
Cordless Drill  
Cement Drill Bits  
Drywall Anchors  
Cement Anchors  
Screws Assorted Sizes  
Hammer  
Nails Assorted Sizes  
Thin Cable  
Glue Gun  
Household screw/fastener set  
Glue sticks  
Electrical Glue / Heavy Grease  
Caulking Gun  
Liquid Nails  
2 – Part Epoxy  
Duct Tape  
Silicone  
Wire Nuts  
Cable Tacks

# ROOFLINES - RESIDENTIAL & COMMERCIAL

This section, will give a step by step procedure for installing different types of lights on all of the following roof line constructions: Gutters, Shingles, Tile, Wood, Concrete, Stucco, Aluminum, Plus – Soffits, Set back Peaks, Peaks and Corners.



## **INSTALLING ICICLES ON GUTTERS**

Use the **All in One Plus Clip**; place a clip about every 3rd or 4th vertical drop. When hanging Icicles, you want to make sure that the main horizontal line remains tight; you do not want any sagging in the main horizontal wire. To keep the main wire tight, each clip should be placed on the horizontal wire, against an Icicle or vertical drop, then slid until the wire is tight. Keep repeating the process, always making sure wire is stretched tight. If you are getting any sagging in the main horizontal wire, you should use more clips. Another common concern when hanging Icicles is.... what should be done with the connections? The answer is that you just let them dangle with the Icicles; they look fine during the day, and are unnoticeable at night. Do not have your employees hide the connections in the gutter in an attempt to make it look more professional. Remember to make sure your employees always tie the connections together (this is very important for removal).

## **INSTALLING MINI LIGHTS ON GUTTERS**

Although you will rarely install mini lights on a roofline, some customers will request them, and they are very easy to install. Your biggest problem will be when you encounter gutters, along the roofline. When you are installing mini lights on the roofline, it would be wise to use the small bottom loop of the **All In One Plus Clip**. This will prevent half of the lights from facing into the gutter, making them invisible from the ground.

## **INSTALLING C-7 AND C-9 LIGHTS ON GUTTERS**

The **All in One Plus Clip** is designed to hold the socket of either of these lights; one clip per socket. You should make an effort to keep the bulbs straight; however they do not have to be perfect, only relatively straight. Bulbs that may not appear straight during the day, will appear to be perfectly aligned at night. Remember **PRO-TEMP**.

## **WOOD SHINGLES**

Attaching lights along the edge of a roofline, onto shingles, can be done using two different styles of clips. You can either use the less expensive all in one plus clip or you can use the shingle tab, which is

primarily used on commercial buildings. If you want to outline a roofline with lights by stapling them to the peak of a shake shingle roof, you may need to use a larger staple gun. We recommend the Arrow **T-25 with 9/16 staples**. This stapler is designed to install cable because it contains a round cable guide and uses a thicker staple, which will go into the shingle and grip better.

## **TILE**

Tile roofs are very common in the state of California, and running into a situation where there is nothing else to attach a clip to, will certainly happen. If you are going to install clips to tile, along the edge of a roofline, you should be bidding this at a slightly higher price. This is due to the fact that it is sometimes more difficult and time consuming to attach lights in this manner. You should use the All in One Plus clip, but you may need to invert the clip depending on the size of the lip you will be attaching it to. When installing lights onto the edge of tile, it is wise to use a clamp (such as a black alligator clip) approximately every 10 feet. This will prevent you from bumping a few lights, and having the entire roofline come down in one large domino effect (we speak from experience).

## **ATTACHING ICICLES TO WOOD FASCIA**

When attaching Icicles to a house with a wood fascia, simply staple the Icicles along the very bottom, front facing part of the fascia. This is the easiest way to install the lights, although every once in a while you will have a picky customer who will request that you staple the Icicles on the inside of the fascia or along the bottom of the fascia. Installing the lights on the inside of the fascia does give the Icicles a more professional look, but never agree to do it without charging the customer more money; a lot more (go up a difficulty level in your estimating formulas). Installing Icicles on the inside of the fascia is about twice as difficult on the installation, but four times more difficult on the removal. Installing them on the bottom of the fascia is about 50% more difficult on the install, and adds no difficulty to the removal. However it looks the same as on the front of the fascia. Again, when installing Icicles, try not to have any drooping in the main horizontal line. Use as few staples as possible, stapling approximately every 4th Icicle.

## **ATTACHING MINI LIGHTS TO WOOD FASCIA**

Simply staple the lights to the bottom front facing part of the fascia placing enough staples to keep the lights from sagging. Let the customer know that the light bulbs will not all be facing the same direction.

## **ATTACHING C-7 AND C-9 LIGHTS TO WOOD FASCIA**

Installing bulk light line (off of a 1000' spool), without the lights in the sockets, is the easiest way to

install C7's and C9's. You will want to place the socket against the very bottom, front facing part of the fascia. Guide position of the lights by using your thumb halfway on the socket and the other half on the bottom of the fascia. You will then place one staple on each side of the socket, making sure the staple is close enough to the socket to hold the socket straight, but not too close as to pinch or cut the wire due to the raised wire going through the rear of the socket.

**The distance you will want to staple on each side of the socket will be approximately one inch.** Once the socket is firmly in place, take a light bulb and screw it into the socket, being careful not to cross thread. Make sure that you or your employees screw the bulbs in firmly and tightly, because if the bulb is not tight in the socket it will have a tendency to lose connection and go out. This won't happen for about 24 hours after the installation, causing you to go back immediately for a service call.

When stapling lights it is always better to 1. keep the bulbs in your pocket or tool pouch, 2. install the light line without the bulbs, and then 3. screw the bulbs into the socket. This will prevent the bulbs from becoming damaged due to the impact of the staple gun. If you are installing a stringer or set of lights with the bulbs in the sockets already, you will follow the same process as above. However, you should take special care not to staple too close to the socket, as stapling too close to the socket will jar the filament in the bulb, causing it to burn out prematurely. If you are installing clear bulbs, it is easy to see when you have damaged the filament in the bulb (it will burn very bright), but when dealing with colored bulbs it is not as easy to see damaged filament.

## **RESIDENTIAL CONCRETE AND STUCCO**

There are simply no really easy or non-intrusive ways to install lights to either of these surfaces. You should use glue on both, but limit the amount and let your customer know that the glue may be permanent. You may also need to screw into either of these materials. Screwing into concrete is usually not a problem if you do not pierce through the outer surface. Screwing into stucco will pierce the outer surface, allowing moisture into the structure. If you intend on screwing into either of these materials, you may want to apply some silicone around the hole to prevent moisture from entering the structure.

## **ATTACHING LIGHTS TO ALUMINUM SOFFITS**

When installing C7 or C9 lights on aluminum soffits, you should use the clip that comes affixed to the socket. Since there is only a small, thin gap to fit a clip onto, the pre-existing clip on the socket works perfectly in this situation. This will be one of the only times that you will use this clip on the back of the bulb. In the unusual circumstance that you will be installing icicles or mini lights to an aluminum soffit, use the All In One Plus clip with a little adhesive such as glue (and certainly charge more, as this will be a very time consuming process).

## PEAKS AND CORNERS

Whether stapling to wood, using gutter clips, or gluing to the surface, new installers are always concerned about where to place lights on peaks or corners. Most new installers think that you will need to take out slack or loop the wire in order to place a bulb right at the peak or right on the corner. This is a common and understandable misconception. The fact of the matter is that you should make NO attempts to place a bulb right on a peak or corner. This does Not matter one bit, due to the fact that at night you will not be able to tell if a light has been placed right on the peak or right on the corner. However, you should make sure that the wire follows the edge of the building around corners and that the wire follows the path of a peak. This will do nothing for the nighttime visual effect, but it will look much more professional during daytime hours.

## COMMERCIAL ROOFLINES

To many installers, commercial business may appear to be more difficult than residential, **yet this could not be any further from the truth**. Commercial business is usually much easier than residential, so never hesitate to aggressively pursue all commercial leads. A lot of commercial buildings consist of a flat roof with pea gravel, and a small cement wall with a flat aluminum surface on the wall. Usually, you will not need a ladder, once you have found access to the roof. From that point on, you will simply be standing on a nice solid flat roof and gluing parapet clips to the aluminum.



**You should use Parapet Clips and Shingle Tabs for commercial rooflines.** The parapet clip is the base clip, which is either glued or screwed to a surface, and it is always used in conjunction with the shingle tab. The shingle tab is the part of the clip that either the C7 or C9 lights are attached to. They can actually be used without the parapet clip when used on residential shingles or used with the Parapet Clip on commercial buildings, which is the case here.

Assuming that you are using 12" spacing light line, you will want to use a tape measure or some sort of scribe. You will then want to mark along the edge of the building, approximately an inch from the edge, every 10". The next step will be to go along and glue a Parapet Clip at every spot you have made a mark, making sure that you are gluing the clips 10" **on center**, not from edge to edge. When gluing the clips, you will only need to put a small to medium size dab of glue, preferably liquid nails that is in the tube, designed to be used with a caulking gun. The glue will need some time to dry, before you install the light line and lights, using the shingle tabs.

If you do not have time to allow the glue to dry properly, a quick way of installing the parapet and shingle tab combination to a roofline is to have the entire assembly together (light line, lights, Shingle Tabs and Parapet Clips) before you get to the jobsite. After you glue the clip to the roofline, have someone follow you with a small strip of duct tape, putting it over the back part of each shingle tab. This will prevent the clip from twisting due to the wire tension. When you return to take the lights down, simply put your finger on the clip and remove the duct tape. You may then gently unsnap the Shingle Tab from the Parapet clip, leaving the Parapet Clip in place year after year. (The following year you will need to check for clips that have come unglued or have become loose.)

**If you attach the clips at your warehouse, before going to the job site, remember you can cut the light line at the maximum lengths allowed, and then place these sections into storage bins. Even if you don't use these entire sections, you may cut the wire again and have small sections that can always be used. Remember, you can splice C7 or C9 wire or add a male or female plug at any point.**

### ***PRE-EXISTING C-7 OR C-9 CLIP***

As is the case with residential aluminum soffits, there are some occasions on commercial buildings where you can use the small clip that is built on to the socket of C7's and C9's. You would use this built in clip in order to attach lights to the aluminum flange along the commercial roofline.

### ***BEAM TO BEAM STAPLING***

Stapling lights from one beam to another, leaving lights hanging in mid-air, is almost never acceptable. There are situations you will encounter that may require you to staple from beam to beam. If you encounter a situation like this, you should staple the lights as close to the very top of the beam so the lights appear that they are attached to the roof line, and not dangling in mid-air.

# PILLARS & IRON GATES

## PILLARS

Pillars are usually wrapped with mini lights. Begin at the bottom of the pillar and wrap upwards; wrap the lights tight, as the tightness is the only thing that will keep them from slipping. You will end your wrap with the female end at the top of the pillar. At the top, you will have nothing to affix the end of the cord to; just take some electrical tape (white if the pillar is white) and wrap the tape around the pillar over the end of the light string, making sure to go around at least twice, as the tape will stick better to itself.



The biggest difficulty, with regards to cement pillars, will be keeping the gap between wraps as even as possible, while trying to run out of lights at the top of the pillar.

### **In addition, follow the guidelines listed below:**

- Wash your hands before wrapping pillars (especially white ones).
- Always use ladder pads.
- Before using a ladder, check to make sure both the pillar and especially the base are made of a solid material, and not foam.
- Try to use lights with white wire

## IRON GATES

When installing lights onto an iron gate, keep the lights free from its working hinges. Also make sure that the lights will not be pinched when the gate is fully opened. You should use zip ties, twisty ties, or electrical tape, when attaching lights to an iron gate. (Zip ties are the best choice.) Remember to match the color of the zip tie, twisty tie, or electrical tape to the color of the gate. Iron gates are sometimes very intricate, and you will be using a great deal of zip ties (or other form of adhesive) to attach the mini lights to them.

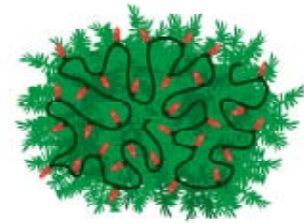
## SWAGS (HALF MOONS)

Swags will go onto the railing of a balcony or along a fence line. When swaging a balcony or fence, you will have to judge how deep or long you want to make it, based on the size of the balcony or fence. When swaging a short balcony, you may want to make your swags short and deep, which will enable you to use up all of the lights. Gauge the length of a swag by counting the vertical bars on the railing, and then dividing the number of bars evenly. If you run into a situation where the last swag does not match the other swags in length, just leave it, assuming that the difference isn't too immense. If you are swaging along a fence line, you may want to make very long and shallow swags, in order to get the longest distance out of your lights.

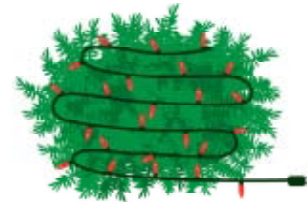
# BUSHES, SHRUBS & HEDGES

For the sake of discussion, this manual will refer to all bushes, shrubs, and hedges as shrubs. The type of lights that you will use for most shrubs are mini lights. When installing lights on shrubs, you will be placing them on the surface of the shrub, because any lights placed deep into a thick shrub will not be visible. When lighting the vertical sides of a shrub, it may be necessary to push some lights into the shrub to keep them from falling. Most importantly, you want the lights to appear to be completely random, making sure that you do not see any straight line of lights. You will want to be able to stand some distance from the shrub, and have the lights appear as if they are each separately placed randomly and evenly in the plant. There is actually a pattern to this scattering of lights in shrubs. The following diagram will best show you the pattern to use as a guideline:

The pattern is not a precise pattern by any means, but rather consists of many random S turns and filling in gaps wherever you see them. It's okay to crisscross over lights, while making this pattern; just try to keep the crisscrossing to a minimum. The reason to limit the crossing is that during removal, if you are unable to find the very last female plug end, it will be tough to remove the lights without getting them very tangled. **Labeling the very last female plug end**, where you ended your run of lights, is a good idea. You should use a bright strip of plastic, about 3" or 4" inches in length, and be sure to hide it just beneath the surface of the foliage so that it will not be visible to the casual eye, but can be spotted by someone looking for it.



Outside Surface Lighting Diagram For Small Bushes



Avoid Circling Or Zig-Zag Patterns Which Highlight Flaws

## TRIPPING CIRCUITS

**Remember**, when installing lights on any low lying bush or shrub, it is very important that you keep all of the light strands and power cord connections off of the ground. If at all possible, do not allow so much as one bulb to be touching the ground, or you will risk tripping circuits, due to current leakage. Although keeping lights and cords off of the ground will not be the cure all for tripping GFCI's and circuit breakers, it will help substantially. Electricity and water do not mix, and therefore you will always have some problems with electricity at certain times.

## THIN FOLIAGE

Something to remember when doing plants is that you can actually put mini lights into almost any imaginable type of plant. In plants that have scattered leaves or foliage, you may have to crisscross from

foliage to foliage, in order to place them in the plant evenly. During the day it may appear as though there is a pile of lights on the plant. However, at night, if they are placed evenly, they will light up like a bush or shrub. We have put mini white lights throughout a patch of weeds, and at night, it looked as though they were covering a beautiful bush or hedge! Remember, on shrubs, you will not be placing the lights within the plant, but instead on the surface.

# TREES

Trees are much more time consuming than rooflines, and are more difficult to assess. Deciding what method of lighting a tree and determining how many lights you will put in the tree, may come down to one simple question: How much is the customer willing to pay? (Address this issue at the initial sales call)



## TRUNK AND LIMB WRAPS & OUTSIDE WRAPS

There are two different ways in which to wrap a tree, an outside wrap or a trunk and limb wrap. The question is which method you should choose. There is not a simple answer to this question, because there are pros and cons to each type of tree wrap.

Outside wraps, compared to trunk and limb wraps, are more subjective to individual tastes and styles. This is a bad thing in Christmas lights, because you may finish a tree and think that you have done a wonderful job, while your customer hates it. Make sure you are up front and honest with your customer, letting them know exactly what you think it will look like when you are finished. For instance, if they are only willing to pay for 4 strands, and they would like you to wrap a 30'x 20' tree, it won't look very good; be honest and let them know this up front (you should let them know if you are quoting them a price for an extensive wrap or a moderate wrap; see formula book).

### Trunk and Limb Wraps:

- Trunk and Limb wraps will be done with the use of a ladder (such as an orchard ladder).
- Trunk and Limb wrap is a straight forward method that's easier during the day to get a mental picture of.
- Trunk and Limb wraps can be done by one person.
- Trunk and Limb wraps are more time consuming. In addition, they require more lights, and take down requires about 50% to 60% of the installation time.

### Outside Wraps:

- Outside wraps will be done using an extendable painter's pole with a bent paint roller arm.
- Outside wraps are sometimes difficult to get a mental picture of. It is also difficult to see if you have placed enough lights in the tree and if they are evenly placed throughout the tree without gaps.
- Outside wraps usually require two people.
- Outside wraps are usually faster, require fewer lights, and take down is about 25% of the installation time.

**Note:** *This may not always be the case, since there are literally hundreds of types of trees. There will be many situations where it would be much easier and quicker to trunk wrap, as opposed to outside wrap. Therefore, you will have to decide which you prefer, depending on the characteristics of the tree. It may also be a question of personal preference. Some installers may simply prefer one style of wrap to the other.*

## ***LIGHT BALLS***

The term light balls refers to a bundle (or ball) of lights; you will become very familiar with this term in the Christmas light business. When wrapping lights around the branches of trees, if you are attempting to wrap them from a loose bundle of lights that are sitting in the palm of your hand, you will probably become extremely frustrated by the time you finish lighting the tree. The lights will begin to get tangled, and before you know it, you will be working with a bunch of wires that look more like a tangled mess of spaghetti. This is why you will be wrapping the lights into a light ball, before you begin to wrap them around tree branches.

### **To make a light ball follow the directions listed below:**

First, you will need to find a location with soft soil or grass. Second, take the female end of the light strand, allowing the remaining lights to rest on the ground. Begin making the light ball by first wrapping the lights around three of your index fingers, about three or four times. Finally, take this small bundle off of you fingers and begin to wrap the lights around that bundle. Be sure to continuously turn the bundle as you wrap around the outside of it. This will give you a nice, even light ball that will not fall apart when you are working with it.

## ***CUTTING OFF LABELS***

When wrapping trees, the lights will not be very visible during the day because they are green in color, and will blend in with the trunk or foliage of the tree. The white and silver labels that Christmas lights have on them, however, will not blend in. During the day, when you look at a tree that has not had the labels removed, it appears as though someone has stapled little pieces of trash to it. An added, professional touch is to take your dikes, grab the label, and then pull the label off. It will tear off easily.

## ***TAGGING THE LAST FEMALE END***

You have been instructed to get rid of the plastic tags on the lights, and you will now be instructed to put a plastic tag on the lights. Seems like an oxymoron, but don't worry; the tag that we are advising you to put on will usually be higher up in the tree and invisible to those who are not searching for it. When installing the lights, it is a good idea to mark the last female end by tying a bright colored piece of plastic, about 1" or 2" inches in length, to it. This will help you locate the end, should you decide to add more lights after you have had a chance to view the tree. However, the main purpose is to help locate the end during take down.

## **TRUNK AND LIMB WRAP (LARGE TREE)**

Wrapping every branch on a large tree would not only require far more lights than most customers are willing to pay for, but also would not look good. When doing a trunk and limb wrap on a large tree, one of the main things to understand is that there is a balance between wrapping too many branches and not enough branches. Typically you will want to wrap between 25% – 60% of the branches on the tree. However, you will have to make your own judgment call, regarding the amount you will be wrapping, since there are literally hundreds of different styles of trees. (price according to formula book).

The best way to decide on how many branches to wrap, and which ones you will be wrapping, is to stand away from the tree and envision the tree at night with lights on it. You will need to decide which branches you should light to give the tree a full and complete look from the angles that the customer will be viewing the tree from, and what angles will make the tree most appealing to passers by.

First decide which angles you want to make the tree most appealing from, and then decide which branches should be done. You will want to choose the branches that are more exterior and the ones that don't get blocked by other, non-lit branches. You will, nonetheless, want to do some of the interior branches to give the tree depth and fullness, but try not to do too many lit branches that will overlap one another. Remember, several branches will overlap, which is fine; just try to limit the number. Too many lit branches will make the tree glow like a giant candle stick, appearing as a large mass of light and losing the intricate character and beauty that limb wraps can give to your customer. On the other hand, if you use too few lights, it will appear as though you were attempting to rush the job and the tree will not look complete.

***See trunk and limb wrap sheet for examples of how to decorate trees in this manner.***

## **TRUNK AND LIMB WRAP SMALL DECIDUOUS TREE**

On smaller trees, you will be wrapping many more branches than the larger ones. The fact that the branches are very thin will allow you to cover several branches with one strand of lights. You will begin at the trunk, where you have installed your power drop, wrapping out to the end of the branch, and then wrapping back down the branch, and over the lights you have just wrapped out. You should NEVER wrap from the tip of one branch to another, leaving lights hanging in midair. On extremely thin branches, you may want to group the branches together, and then wrap around the outside of them.

## **OUTSIDE WRAPS**

Outside wraps are done with the use of an extendable painter's pole (largest one that you can find), with a screw on paint roller attachment that obviously does not have the paint roller. Outside wraps will usually require two people to do the job. One person can perform the task on small trees, but it is much more difficult (if not impossible) for one person to efficiently complete an outside wrap on larger trees.

When doing an outside wrap, you will have the person in charge of the pole, called “The Director”, as well as the person who will be assisting him and handling the lights on the ground, called “The Helper”.

The helper will lay the lights in a large circle around the outside of the tree. He will then hold the lights in the air. The director will use the pole with the hook, in order to hook the lights, elevate them into the tree, and then place them onto a branch which will be strong enough to support their weight. This process is continued around the tree, maintaining a nice even gap all the way around the tree. The helper will actually be some distance in front of the commander. The helper can even help by giving tension or slack to the lights, in order to help the commander properly place the lights onto the tree. Remember to push some of the lights deeper into the tree than others.

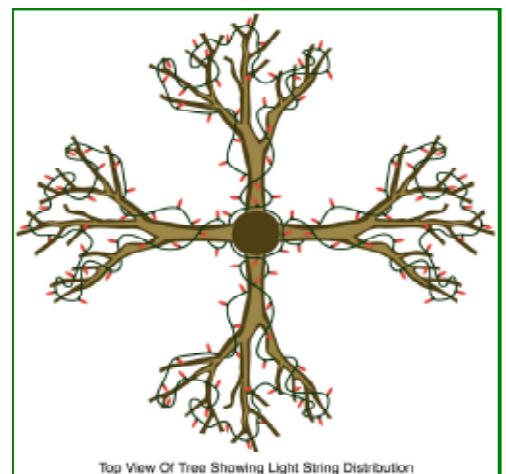
### ***OUTSIDE WRAPS (DECIDUOUS TREES)***

Do not be afraid to outside wrap deciduous trees, as you are going for the visual effect at night. At night, it will appear as though you have wrapped an evergreen, with even more of your design showing through.

### ***EVERGREENS /CHRISTMAS TREES***

If you are wrapping an outside evergreen tree, it is appropriate to do an outside wrap, but this will not fill the tree with lights in the manner many customers will expect. The following method is how you will wrap indoor Christmas trees, as well as outdoor evergreen trees. (We recommend that you do not decorate indoor Christmas trees, unless the customer is willing to pay between \$800.00 to \$1,600.00 for an 8' to 14' tree, as it is very time consuming and requires a great deal of lights).

You will begin by placing your power drop, about 1/3 the way up the tree, near the trunk. Plug your lights into your power drop and head out on a main branch, weaving the lights over and under the smaller needle branches. The lights should be placed loosely. As you get to the outer edge of the branch, continue weaving over and under the needle branches, crossing along the outside edge of the branch, and heading back towards the trunk on the other side of the branch. Near the bottom of the tree, you will want to place most of the lights on top of the needles, with only a few lights going under, as the lights under the needle branches are for support only and will not be seen.

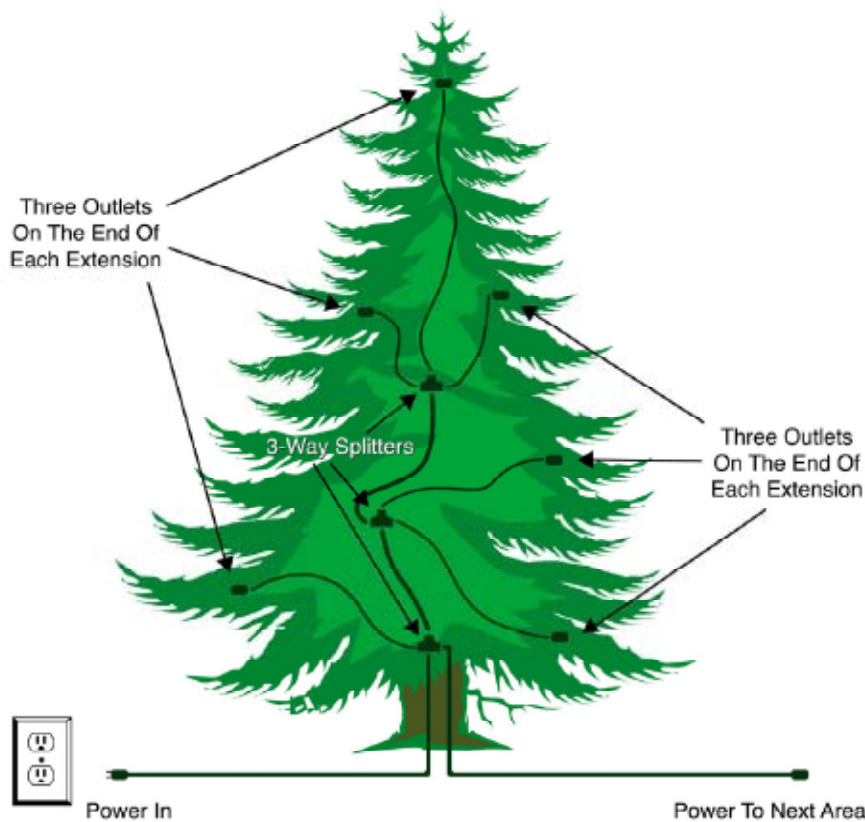


Since the bottom of the tree can only be seen from a distance, you may want to save lights and time by beginning near the trunk wrapping around and around the tree, coming out towards the tips of the

branches as you go around. If you lay the lights properly, it will look as if each branch has been wrapped separately. Once you have wrapped the bottom 25% of the tree in this manner, you should begin wrapping each branch independently, as already explained.



### Wiring Diagram For Medium-Size Evergreen Tree



Three (3) sets of six (6) 35-lite or 50-lite strings plugged end-to-end in two (2) different sections of the tree.

### CANDY CANING A TREE

First decide whether to do **blocks** or **spirals**. Spiraling (making it look like a peppermint) two different colors of lights is very difficult to do, while doing blocks of lights is much easier.

Blocking a tree will be completed by measuring the entire length of the trunk, and then deciding how many blocks of each color you would like. Three is an average amount for a medium height trunk. If the trunk of your tree is 12' tall, divide that number by 3, as this will give you 4' for the 2 different colors of lights. Therefore, divide 4' by 2, and this will give you the thickness of each block of lights, which in this case is 2'. Sometimes, looking at the tree, and deciding about how thick you want each block to be, may be your starting point. I would advise staying with blocks that are at least 1 and a 1/2 feet thick.

Once you have decided the thickness of your blocks, measure off each block, and then drive a nail or marker in at every point at which you will begin a new block; every 2' for example. This will give you a point to start and stop the different colors when wrapping the tree. You do not have to be perfectly accurate just as long as you are within a few inches, you'll be fine.

If you are going higher into the tree branches, repeat the same process of measuring and spiking. Going into the branches can be difficult because you will want to keep the blocks as even as you possibly can.

# WREATHS & GARLAND

Wreaths and Garland are very big sellers in commercial settings. However, you will also be selling a lot of them to your residential customers. You will have to decide where to install the wreaths and how to attach them.

## WREATHS

Wreaths are a very profitable added touch that many of your customers will request, or you will want to suggest. If the customer requests a wreath, they will usually tell you where they would like it to be installed. However, it may be up to you to decide the size of the wreath, which primarily depends on the location. When choosing a wreath, you will want to fill about 70% of the chosen area, from side to side, as well as top to bottom. Remember, 70% is just an estimated guideline; because there are so many different locations to install a wreath, the size of the wreath will have to be determined by you and your customer. The difficulty with wreaths is in attaching them to the house without being overly intrusive. Unfortunately, many of the locations where wreaths are hung require doing so by using either a nail or screw. Be sure to address this with your customer at the time of the sale.



### The following is a list of the most common locations to hang wreaths:

1. **Front Doors:** More than likely you will need to place a nail or screw in the front door. In windy areas, you should not put side anchors in a front door; as you would in elevated locations (3 & 4 below). On a front door, if the wreath falls off in the wind, the customer can easily re-hang it. Several holes in a front door would be too intrusive.
2. **Above front doors:** On some larger homes, areas above the front door are a good location.
3. **Over windows:** Install the wreath so that it hangs in the top 2/3 section of the window. This will be one of the more difficult locations to install a wreath. You will need to place an anchor screw in a mortar joint, directly above the window. If there is no mortar joint above the window (stucco house), another good solution—and less intrusive way in which to hang the wreath—will be to screw into the wood eaves, directly above the window and hang the wreath. In windy areas you may also have to affix the wreath to both sides of the window. Again, if you cannot use an anchor screw, another way of anchoring to both sides of the window can be done using 2-part epoxy and a small piece of twist tie as your anchor. Use a very small amount of 2-part epoxy, because the 2-PART EPOXY MAY BECOME PERMANENT.
4. **Peaks over garages:** If you need to be less intrusive you can hang the wreath on a thin cable from an anchor screw placed in the eaves. In windy areas you will probably need to place three anchors: one at the top and one on each side of the wreath. Also, simply hanging the wreath on the screw

anchors in windy areas will not be sufficient to hold the wreath in place. What you will do is take a thin piece of wire, affix it to the anchor screw, and then affix the wire to the frame of the wreath.

5. **Gates:** Simply anchor the wreath to the gate, in 3 locations, using thin wire; one at the top and one on each side. The only difficulty with gates will be if the wreath is lighted. In this case, route the power cord, making sure to keep it free from all working hinges. Open and close the gate several times to make sure that the wire does not get pinched or hung up near the hinges.

6. **Balconies:** Simply anchor the wreath to the railing, in 3 locations, using thin wire; once at the top and once on each side.

## **GARLAND**

Garland comes in many different shapes and sizes. Garland available on the retail market (at specialty stores) will usually be made of very short sections (about 2 feet long and only 4 or 5 inches thick). It is quite expensive, considering the small amount of space that it covers.

Most of the customers that you will be servicing will expect a much thicker and more professional looking garland. There are only two types of garland you should be concerned with: Commercial grade and Live. I recommend using the commercial garland that We Hang Christmas Lights can supply you with. Commercial garland is much easier to work with, and will not fall apart (which is possible when working with live garland).



If you have a customer who requests live garland (and will not accept an alternative) there are a few things to keep in mind. First, when purchasing live garland you can expect to purchase it at the retail level; purchasing live garland at the wholesale level usually must be done in large quantities, with guaranteed orders. Keep this in mind when giving your estimate. The best way to get live garland at a discount is to talk with local seasonal tree lots, before the season begins. Secondly, live garland is better placed on mantles or on top of shelves; it is much more difficult to hang.

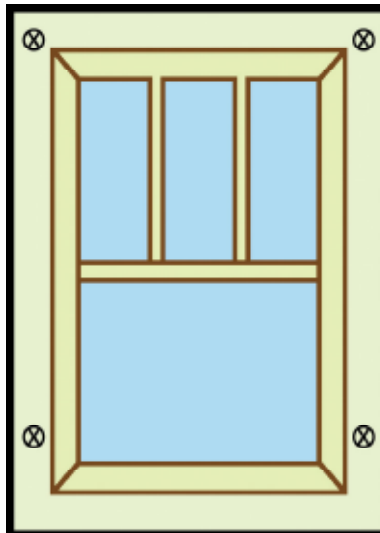
*Be sure to tell your customer that live garland will dry up after a couple of weeks.*

When installing garland, a shallow swag is more common than deep swags. Try to keep all of the swags even in their length and depth. It is also common to wrap around the top of a horizontal rail.

**Below is a list of common locations for Garland:**

1. **Railing:** swags or horizontal – Affix to railing with green twisty tie from spool.

2. **Balconies:** swags or horizontal – Affix to railing with green twisty tie from spool.
3. **Gates:** swags or horizontal – Affix to railing with green twisty tie from spool.
4. **Commercial Rooflines:** swags – Affix by drilling anchor screws into roofline. If drilling is inappropriate, due to water intrusion, glue a piece of wire to the roof line using 2-part epoxy.
5. **Around windows:** Below is a diagram with 4 anchor points, for installing garland around a window. Allow the garland to have a shallow swag across the top of the window, straight down along the sides, anchor near the bottom.



# PATHWAYS

## ***DRIVEWAYS, PATIOS, & SIDEWALKS***

Outlining cement pathways will be done by using C7 or C9 bulbs and light stakes (see photo below). Light stakes are essentially a 15” plastic stake, with an all in one plus clip on the top. When installing light stakes, the key will be to keep the lights straight and even. When lighting a pathway, uneven or crooked lights will be the very noticeable. An unfortunate aspect of using light stakes around a pathway is that it is one of the most difficult locations to keep lights in a straight line.



### **Concerns with light stakes:**

- The bulbs will be facing upward, which can allow moisture into the socket. To prevent water from seeping into the socket, make sure that the bulbs are screwed in tight.
- You will be installing light sockets and connections close to the ground so be sure to elevate all lights and connections off of the ground, in order to prevent ground leakage, which will trip GFCI's and Circuit breakers.
- In warm climates, you may want to ask your customers to turn their sprinklers off for the season, or at least limit their use to the daytime only.
- Vandalism & Accidents – Since light stakes are usually installed close to sidewalks, passers by have easy access for kicking the lights, or accidentally running them over.
- In areas with hard pack soil or frozen ground, you may need to use a screw driver to punch holes in the soil.

# WINDOWS

## **WOOD BORDER**

Wood border makes outlining windows very easy. Begin by finding out where your power source will be located, then pick the closest corner of the window to begin your strand of lights.

## **MINI LIGHTS ON A WOOD BORDER**

If you are using mini lights, staple the strand between approximately every 4th bulb. The individual bulbs will flop from side to side, pointing in all different directions, with no pattern. It is okay to allow them to do this, because it is the look you are trying to achieve when using mini lights. If your customer is trying to achieve a straighter look, you should use either C7's or C9's (address this with the customer at the time of sale).

If necessary, double up the lights around the window, until you run out. Don't worry about how it will look; it is almost impossible to tell the lights have been doubled up. Besides, when you are outlining a window with mini lights, you are not going for that perfectly aligned look, but rather a glistening, snow like effect.

## **C7 & C9 LIGHTS ON A WOOD BORDER**

When stapling C7 or C9's around a window, staple on each side of both sockets (same as you would on a wood fascia). When you reach corners, round them with the wire; it is not necessary for a bulb to be placed at the corner (same as peaks and roofline corners). Since the C7 and C9 are run in parallel, you can cut the wire when you have gone around the entire window. Just remember that you must separate the two wires and tape them off or use wire nuts to cap off each wire independently.

## **ALUMINUM BORDER**

This type of border is not as easy to deal with as wood is. It will be less intrusive if you install mini lights as opposed to C7's or C9's, due to the fact that much less glue will be used with the minis. There is no perfect means for attaching lights around aluminum border; hot glue applied with a hot glue gun seems to be the least intrusive. Gluing to brick around a window is the best surface to choose and easiest to remove. Gluing to stucco is also a surface that the glue can be removed fairly easily. Gluing directly to the glass will work as well, however in really cold weather some or several lights could fall off. Gluing to the aluminum may destroy it and is not recommended. In cold weather, the glue cools faster and can **usually be removed fairly easily. The longer the glue is in place, the harder it will be to remove. (REMEMBER, YOU ARE RESPONSIBLE FOR TESTING, AS WELL AS THE MATERIAL YOU ATTACH IT TO. THE GLUE MAY BECOME PERMANENT OR DISCOLOR THE SURFACE.)**

## ***INSTALLING MINI LIGHTS ON AN ALUMINUM BORDER***

Take a small piece of twisty tie, approximately 3 to 4 inches in length, and put a dab of hot glue onto the twisty tie. Then place a twisty tie at all four corners of the window. Next, glue another one or two along each side, and then two to six across the top and bottom (depending on the size of the window), in order to prevent sagging. Be sure to hold the twisty tie in place until the glue has set up (dried), which should only take a few extra seconds. Begin gluing twisty ties in the locations that you plan on hanging the lights. This way, by the time you are finished making the rounds, the glue will have dried more solidly, helping them hold the lights. (The glue will actually dry rather quickly, especially in cold weather. You should be able to hang the lights as you go, so you won't have to move the ladder a second time, when installing the lights.)

## ***INSTALLING C7 & C9 LIGHTS ON AN ALUMINUM BORDER***

Apply a dab of glue to the back of the socket and press gently against the glass or aluminum. Hold it in place for a few seconds, allowing the glue to set. Continue this process around the window.

## ***DORMER WINDOWS***

The main issue, when dealing with dormer windows, will be deciding where to draw your power from. Most often, you will draw your power from the lights installed along the roof line, closest to the window. As a professional installer, you should never cross over the space between the roofline and dormer window, with lights. Instead, you should find the nearest connection and draw power from there using a lamp cord. If the roofline lights are C7 or C9, you will be able to attach a female end in the middle of the light line, and draw power from there. Be sure to add the lights on the dormer windows together with the roofline lights, when making your total wattage or amp calculations.

## ***CHOOSING A LOOK***

There is not a specific type of light that you should use to outline your customer's windows. If you have installed Icicles on the roofline and some mini clear in the bushes, perhaps it would look good to give just a touch of uniformity by using C7 clears around the windows. This is assuming that the customer wants an all clear look. If you use Multi color C7 or C9's on the roofline, it is beautiful to combine them with mini clear around the windows and around the trees or bushes; it gives it that complete Christmas look, with a touch of both types of lights. The fact of the matter is that you can use any type of lights and any color combination. It's up to you and, of course, your customer's preferences.

# TIMERS

When a customer has hired a professional company to install their Christmas lights, they will usually not want to be responsible for plugging them in and unplugging them every evening.

**If you are using Intermatic Timers, you should always set the timers to come on about an hour before sunset. The reason for this is best described in the following example:**

You have just completed installing lights on a house and have installed 4 timers, each controlling about 25% of the house. The customer tells you that they would like all of the lights to come on at sunset. The problem is that the timer you are using is not digital, and as a result, is not extremely accurate. In fact, these timers are usually hard to set within 1/2 hour accuracy.

Say you listen to the customer and do exactly what he tells you to do, making all of the lights come on right at sunset. If you try and set these timers perfectly the first time, it is very probable that when the sun sets, 50% of the house will be lit and the other 50% will still be dark. In this case, your phone will ring, your customer will tell you there is a major problem, and you will have to go back for a service call.

**The solution is to make sure that you always set the lights to come on 1 hour before sunset.** This way, by the time that it is completely dark, 100% of the lights will be on. Intermatic timers are the most widely used timers in the world; they are not designed to have exact on or off times, but instead they are designed to be durable and keep accurate time. This is why they are used for outdoor environments and on systems such as, landscape lighting and Christmas lighting, where it is not a life or death concern to have precise on or off times. Don't get the wrong idea, these timers can be set accurately, it just might take a few nights of tinkering, something most customers are not willing to do.

## **Take the following steps to install timers:**

1. Drill into the wall of the house.
2. Insert and anchor the screw.
3. Apply silicone to prevent moisture.
4. Finally, hang the timer.



This may seem time consuming, but if you have a cordless drill ready to go, it should only take a matter of seconds for the entire process. **An easier**, less intrusive method is to have a bunch of stakes on your truck. Each stake should have one screw imbedded near the top of it, ready for you to hang the timer on. As long as the ground near the outlet is dirt, you will only need to hammer the stake into the ground, hang the timer, plug it in, and your ready to go.

One more way that you can attach a timer to a house is by using a hot glue gun. Apply glue around the outer edge of the back of the timer, press against the wall, and hold it down until it is dry.

Saving Time is crucial in the Christmas light business. In many cities, it's not how many jobs you will get, but rather how many you will be able to handle. Anything you can do before you get to a jobsite ,whether it's the day before, the night before, or before the season begins, will help your profits rise. For instance, if you have a commercial roofline that you plan on doing with C9's, make up several strands of light line at the maximum length, label them, and then place them in a tub, ready to be stretched out and installed.

**The following techniques will save you time and money. They are very important to your success, and should be followed as closely as possible.**

## ***WORK FROM THE ROOF***

In dry, warm climates your employees should work from the roof anytime that they can. Working from the roof is much faster than working from a ladder.

**A few things you should know about working from the roof are listed below:**

1. Only work from a roof if it is dry and not slippery.
2. If the pitch is steep enough to create a dangerous situation, than do not work from the roof unless you are secured by a harness. Only work on down facing slope edges if they are close to flat.
3. Determine if the roof tiles are made of materials strong enough to support your weight.
4. When walking on roof tiles, always place your foot on the bottom 2 inches of the tile, where it overlaps the tile beneath it. This is the strongest point. If your foot shifts more than about 5 inches up the tile, this is an area with no support, and your foot will crash through the tile forming a hole. On Spanish tile roofs, walk in the gullies that are near the bottom 2 inches of the tile. When walking on any tile, step slowly and distribute your weight evenly between both feet.
5. Many employees will not feel safe working from the roof; never force them to do anything that doesn't feel safe.

## ***USE CLIPS WHENEVER POSSIBLE***

Using a stapler, in some situations, may appear to be faster. However, after you factor in removing the staples during takedown, as well as the fact that during the 2nd year clips are incredibly fast since they are already installed on the lights, it is always best to use clips.

## ***PREVENT TRIPPING GFCI'S AND CIRCUIT BREAKERS***

When installing Christmas lights you should always plug the strand in and turn the power on. This way you will know if any of the lights are broken before spending hours putting them up. **You will notice a GFCI extension cord pictured in our catalog. Every member of your crew should have one of these, and be using them frequently.** First and foremost, it is a safety device. Secondly, they will save you money.

Without this device (GFCI Adapter), if you were to trip a GFCI circuit breaker on the main panel, or even worse, a circuit breaker on a hidden sub panel, every employee would have to stop working and search for the tripped location. This could take more than an hour to locate—or even worse—you could have to stop working altogether if the customer was not home to give you access to the source.

## ***STRETCH NEW ICICLES AT THE WAREHOUSE***

You should stretch each individual strand Icicles before installing them on a customer's house. If you don't, they will stay bunched up, and not look like Icicles should. If you can, stretch the icicles before sending them into the field for installation.

Surprisingly, Icicles are much easier to deal with the second year, as opposed to brand new ones that are out of the box. They actually come out of the storage container and separate very easily, and best of all, they were already stretched out the previous year.

## ***LADDER HANDLING***

Teach your employees to handle the ladders as a team. If each employee handles the ladders in the same way (in an almost regimented, military fashion) they will speed things up tremendously. Even more importantly, it will keep them from getting frustrated with one another.

The person grabbing the feet of the ladder should be the individual who knows where the ladder needs to be placed; he is in command (the Director). He should begin by pulling the ladder from the truck. As the ladder gets close to the end, the second person (or helper) should step in and grab the other end of the ladder. The director is to lead the way. As he approaches the point where he wants the foot of the ladder, he should notify the helper that he is going to be stopping to place the feet. He should place the feet of the ladder at the approximate location, and immediately put his foot on the ladder. At this point, the helper should begin to raise the ladder, walking closer and closer to the director, until the ladder is vertical. Once the ladder is vertical, the two men can pivot the ladder toward the building and align it to its final location. The director will stabilize the ladder, as the helper raises the ladder using the rope. As the ladder is being raised, the director will tell the helper when to stop raising it. At this point, the director will again foot the

ladder to prevent it from kicking out. The helper will gently lean the ladder toward the house, while the director notifies him of distance from the house. Once the ladder is against the house, the feet can be set, and they are ready for business. (Check safety section for proper settings of ladders.)

## **TWO STAPLERS**

Always carry two fully loaded staplers. This way, when your stapler runs out and you are on a tall ladder, you will not be forced to reload.

## **IF USING CLIPS ON A JOB**

Install the clips and lights at the warehouse prior to going to a jobsite.

## **TAKEDOWN**

Everything you and your employees install, should be done so, keeping in mind that you will not want to use a ladder when you go back for takedown. Remember, takedown should always be a much faster process than installing the lights. You will be taking down 10 times the number of jobs in a day, than you put up. For example, say your crew can remove 16 jobs, in an eight-hour day, assuming you do not have to remove any ladders from your truck. Now let's assume that your crews did something at every job that requires you to remove a ladder. That would be an additional 12 minutes per job, multiplied by 16 jobs in a day, which equals 3 hours and 4 minutes extra per day. **Assuming you have a total of 6 days removal, at 16 per day, you will have added approximately 2 1/2 days to your takedown schedule.**

**The most common things that your employees will do during an installation that can make takedown longer are listed below. Watch for this, and train your employees not to do them:**

1. Wrap cords around downspouts
2. Go under cross members in gutters
3. Go over the roof with extension cord (sometimes necessary – but if you allow them to do it once, they will often make a habit out of it, looking first to run power this way.)
4. Use too many staples.
5. Use electrical tape, zip ties, etc. to attach cords or lights to anything.

# SAFETY

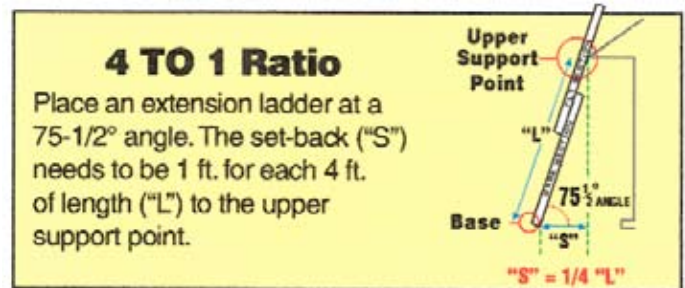
**Rule Number One:** You are dealing with electricity. **Never** take chances; **Never** overload; **Never** get complacent. As professional installers, it is wise to not go beyond the recommended parameters of the electrical products you are using. This could endanger lives, and place responsibility and liability on you.

## LADDER SAFETY

You will usually find information stickers on the side of every ladder. It is a good idea to have your employees read the stickers before they climb a ladder. Always determine the safest angle in which to place a ladder. The best way to determine a safe angle is to stand on the ground with your toes firmly against the side rails, as if you were spotting the ladder, then reach straight out, without bending, allow your finger tips to touch the rung directly in front of you. An individual should not set foot onto a ladder without setting the ladder properly himself. (don't rely only on the spotter)

### Spotting Ladders

There are two key issues when it comes to spotting ladders in this business. The first, and most obvious one, is spotting the ladder in unsafe situations. Such as when an employee is working on an uneven or slippery surface. We also highly recommend that any time someone is working at 28 feet or higher, a spotter is used. Any time a person is spotting a ladder, they must take extreme caution in watching for anything that could possibly fall from the workers tool belt or hands. It is very common for workers to drop staplers, while installing Christmas lights. To prevent this from happening, try tethering all of your tools to your work belts. To further prevent injury to a spotter, have them wear a hard hat.



### Choose the Right Stepladder

Average Heights

Maximum Height You Want to Reach†	This Size Stepladder
7'	3'
8'	4'
9'	5'
10'	6'
11'	7'
12'	8'
14'	10'
16'	12'
18'	14'
20'	16'

† Assumes a 5' 6" person with a vertical 12" reach.

### Choose the Right Extension Ladder

Height To Gutter or Top Support Point	This Size Extension Ladder*
9' max.	16'
9' to 13'	20'
13' to 17'	24'
17' to 21'	28'
21' to 25'	32'
25' to 28'	36'
28' to 31'	40'

\* Reflects section overlap, ladder angle, and 3' extension above roof line.

## **ROOF SAFETY**

In a dry, safe environment, installing Christmas lights from a roof top can speed up the process substantially.

**Some general rules when working from the roof are listed below:**

- Never let your employees work from the roof if the roof exceeds a reasonably safe pitch.
- If they are going up the sides of peaks, you will find that they are usually very safe. However, as they approach the down slope corner, they should climb down from the roof and work from the ladder.



# TROUBLESHOOTING

## ***ALL OF THE LIGHTS ARE OUT, AND THEY ARE ALL ON THE SAME POWER SOURCE?***

### **Possible Problem / Causes:**

#### **1. A GFCI or Circuit Breaker has tripped**

- Moisture
- Damaged bulb
- Damaged wire

#### **2. Fuse in First stand burned out.**

- Too many strands plugged end to end
- Broken bulb
- Damaged wire

### **Solution:**

Check to see if power source (outlet) is working. (using a strand of mini lights is a useful tool to check if an outlet is functioning.)

If the outlet is not functioning, see if the Non-functioning circuit is the problem.

- Find the circuit breaker, if all breakers are un-tripped, find the nearest GFCI.

If the outlet is functioning:

- Check to see if the lights are all coming from one starting strand plugged into the power source.
- Check to see if fuse needs replacing

## ***TWO TREES ARE PLUGGED INTO THE SAME CIRCUIT; ONE ENTIRE TREE IS NOT WORKING?***

**Problem: The fuse in the very first strand of lights not working has burned out.**

### **Possible causes:**

1. Too many strands have been plugged end to end (more than 6 for commercial grade lights).
2. The wire on the strand of lights has been damaged.
3. There is a broken bulb on the light strand.

1/3 of a Mini light strand is not working?

1. Burned out bulb, and the insulation around the shunt did not burn off.
2. Wire on the bulb is twisted in the socket, and is failing to make a connection.

# QUESTIONS & ANSWERS

## **QUESTION: CAN I CUT MINI LIGHTS?**

**Answer:** Absolutely NOT; you may not cut any lights which are run in series.

## **QUESTION: CAN I CUT ICICLES?**

**Answer:** Absolutely NOT; they are also mini lights and they run in series.

## **QUESTION: CAN I CUT C7 AND C9 COMMERCIAL LIGHT LINE?**

**Answer:** Yes, anywhere you need to. Make sure to cap off\* the female end.

**\*Capping off means that you split the 2 wires at the female end and either tape them very well, or put wire caps on them.**

## **QUESTION: CAN I CUT C7 AND C9 STRINGER SETS?**

**Answer:** Yes, anywhere you need to. Make sure you do not exceed the maximum wattage rating listed on the set. The wire gauge on sets is thinner and not commercial grade.