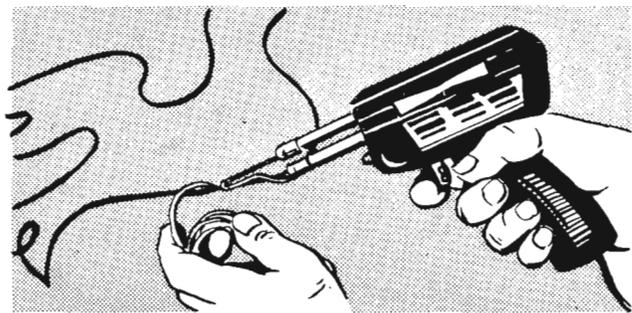
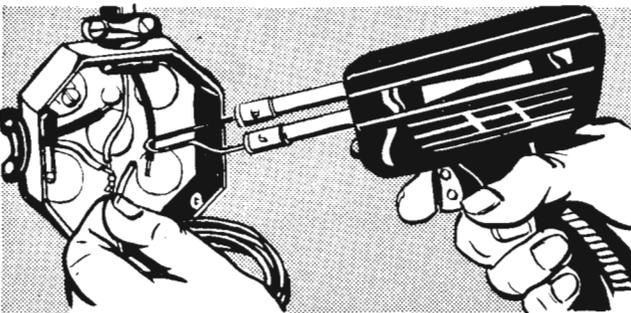
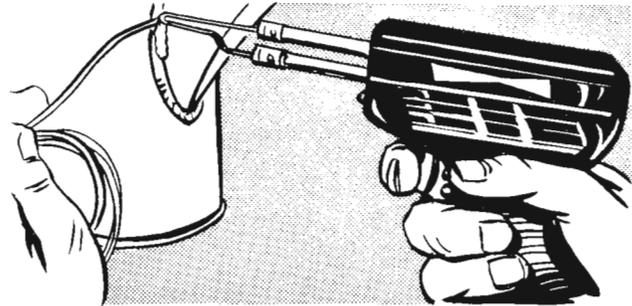
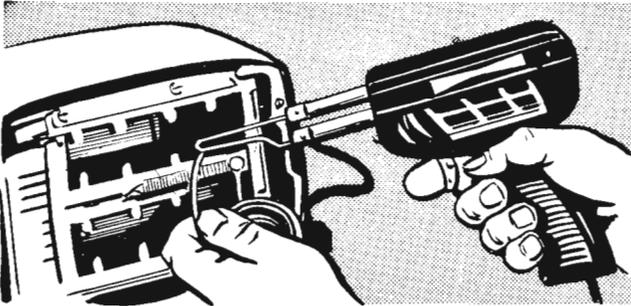




SUCCESSFUL SOLDERING



In any farm or home, metal objects will need to be repaired, built, or assembled with solder. Soldering requires a minimum of tools and supplies, and the needed skill can be learned quickly. Soldering is the process of joining 2 pieces of metal with another metal called solder. Solder is a combination of lead and tin.

Sometimes you have to join two or more electrical wires. These joints are called splices. They should be made as strong and conduct electricity as well as an unbroken wire. Poor electrical contact in the connections may cause heating, radio interference, or poor operation of equipment. Solder is used to make good tight connections so that there is no restriction to the flow of electricity.

What to Do: Learn to Solder

Decide on the proper size and type of electric soldering equipment for your needs. Learn the proper care of it.

Prepare, solder, and re-insulate a pigtail splice.

Repair a sheet-metal object such as a leaky pail.

What Size Equipment?

Often, a large "iron" (actually they're made of copper) can do a small job; a small one can never do a large job. Soldering irons come in three different styles. These are usually called pencil, conventional, and gun types. The pencil type is for use in cramped quarters and is usually rated from 20 to 35 watts. The conventional type comes in a variety of sizes and ranges from 45 to 300 watts. Eighty-five to 100 watts is commonly used for household and general purpose use. The gun type has a pistol type grip and is rated from 100 to 250 watts. It is used where quick heat is required such as in radio and TV repair work. Different styles of tips are available to help make varying jobs easier.

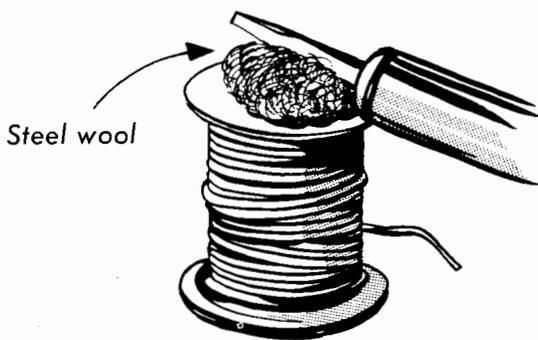


How to Care for It

Most home handy men have a piece of soldering equipment. Properly used and cared for, such equipment will give long years of dependable, efficient service. Abused, it will soon be a useless tool. In other words, it pays to take care of your soldering equipment.



You should remember that it is the copper tip of the iron that transmits the heat. Unless the tip is kept properly "tinned", a crust may form that will restrict the flow of heat to the work. To tin an iron, first see that the tip is smooth, clean, and free from pits. If necessary, use a file to recondition the faces. Then apply solder to the tip just before it reaches maximum heat. Rosin-core solder, which we will talk more about later, is best for this purpose.



When using the iron, watch the tinning on the tip. If it becomes discolored, dip it into clean water and instantly withdraw it. This will not only expose the bright tin, but also bring the iron back to a safe temperature if the browning is due to overheating. Tinning may also be cleaned by rubbing the iron on steel wool. Prevent overheating by disconnecting the iron right after you have finished soldering.

The tip of the gun-type soldering iron should also be kept well tinned. Overheating of a soldering gun should be strictly avoided. Since this iron will heat up in about 5 seconds, there is no need to leave it turned on when not in use.

Soldering Materials

Solder comes in various shapes and hardnesses for different jobs. For electrical work, soft wire solder is nearly always used. It can either be a solid wire or hollow and contain a flux.

The purpose of a flux when soldering is to make the solder stick. A cleaning agent is often included in fluxes to assist in removing dirt. The flux can either be contained in the solder or be applied as a paste.

For most non-electrical work, you may use a paste flux, but for galvanized iron, always use acid flux.

For electrical and electronic work (radio, TV, etc.) use only rosin core solder.

Metal Must Be Clean

A soldered joint requires that the solder come in contact with pure metal. If any dirt is in the way, the solder has trouble sticking and makes a poor connection. Wires and metal may be cleaned by scraping with a knife, sandpaper, or emery cloth. They should be bright and shiny before you start soldering.

Rules Get Results

There are no "tricks" to soldering. Anyone who follows the simple rules can successfully solder with a little practice. The four requirements are:

1. The wires or metal to be soldered must be shining clean and free of oil or grease.
2. A little flux must be applied as a paste or be contained in the wire solder.
3. Enough heat must be applied to bring the object up to solder melting temperature. If you are soldering wires, a drop of solder melted on the iron, as it is heating directly under the wires, hastens heating.

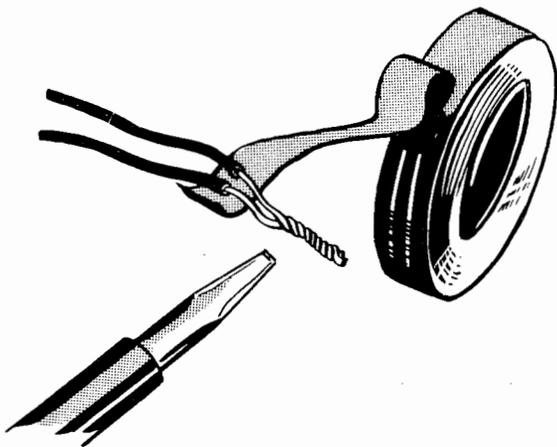
4. When the wires or metal are hot, put the wire solder directly on the wire joint.

For a good job, solder should flow into and around all the wires, or between the pieces of metal you are joining.

Replace the Insulation

After a pair of wires have been soldered, you will have to replace the insulation. This protects the splice from mechanical injury and permits you to handle the wire without shock.

1. Rubber Tape - Any wire which has had rubber insulation must have a layer of rubber or plastic tape around the new joint. Place the tape over the tapered end of the rubber insulation. Wind spirally to the other end, letting the turns overlap a little. Keep the tape stretched so it will come together and seal out dirt and moisture. Put on as many layers as you need to build up the insulation to match what you took off. Be sure all the wire is covered where you have removed any insulation.



2. Friction Tape - Friction tape is used to replace the tough outer braid on the wire. It is made of cloth soaked in a sticky compound. Put it on the same way as the rubber tape, winding diagonally from one end to the other. Two layers are usually enough.

3. Plastic Tape - This kind of tape has many uses. It is a very good insulator, stretches easily, sticks to most anything,

and the glossy backing does not gather dirt or lint. In covering splices, it can take the place of both rubber and friction tape. However, with plastic tape, extra care should be taken to protect pigtail and center tap splices. Make sure enough material is around sharp points to prevent them from rubbing through the tape.

What Have You Learned? (True or False)

1. Solder is a combination of zinc and tin.
2. A poorly soldered joint can cause static on a radio.
3. The expected life of a soldering iron is two years.
4. The conventional type soldering iron is widely used for radio and TV repair work.
5. When the tinning wears off the tip of the soldering iron, a new tip should be installed.
6. A paste flux is usually not necessary for soldering wires when rosin-core solder is used.
7. When the splice becomes hot, apply solder directly to the wires for a good job.
8. Plastic tape would be a practical tape for your tool kit.

Demonstrations You Can Give

Show and tell how to prepare, splice, solder, and tape the wires that need to be connected when a ceiling fixture is replaced in the home.

Show and tell how to repair a leak in the spout of a sprinkling can.

For More Information

See the instruction book that accompanies a soldering gun or soldering iron. Read the soldering instructions that accompany electronic kits.

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