# KNOB AND TUBE WIRING 2

Knob and tube wiring was installed in houses up until about 1950. This system consists or two wires, one **black** or **hot** wire and the other **white** or **neutral** to create a circuit. These two single wires are held in place with ceramic knobs and tubes. Knobs are used to clamp the wire to the structural member, while tubes are placed in holes in the structural members to prevent the wire from chafing.

In modern household wiring, these two wires are bundled together along with a ground wire in a single plastic sheathing cable that runs through holes in the structural members and is held in place with clamps. While knob and tube wiring is not inherently dangerous, it is old, and its insulation may no longer be intact. Much of this wire is concealed behind walls, ceilings and insulation where its condition cannot be completely evaluated.

In addition to the wire covering being deteriorated, these wires are connected by being soldered together and wrapped in electrical tape. After time, this tape either falls off or deteriorates. Knob and tube wiring is usually associated with older installations consisting of 60 amp service. The wire is fused with **15 amps**. Though the wire is **#12 AWG** (American Wire Gauge) from the panel, which is capable of handling 20 amps, some sections of wire may be **#14** gauge handling a maximum of 15 amps. This installation handled a total of 12 circuits, thus the houses have fewer receptacles than modern houses. To prevent fuses from constantly blowing, homeowners put in higher-rated fuses such as 20 or 30 amps! Given that the wire was not intended to carry this additional current, the insulation becomes brittle exposing more wiring, or worse, overheated to the point of causing fires.

Knob and tube wiring does not have a ground conductor. This is identified by two-prong receptacles as opposed to three-pronged receptacles. However, some homes built up until the mid 1960's used sheathed duplex electrical wire with no ground either. A ground conductor is necessary if you are plugging in appliances that have a three-prong plug. Modern receptacles also have one prong slightly larger than the other. This is necessary to prevent reverse polarization. The **black** or **hot** wire is connected to the brass terminal screw while the **white** or **neutral** wire is connected to the silver terminal screw on the receptacle.

### *LIMITATIONS WITH KNOB AND TUBE WIRING:*

- USUALLY RESTRICTED TO A MAXIMUM OF 60 AMP SERVICE
- THE WIRE IS OLD, AND ITS INSULATION MAY NO LONGER BE INTACT
- IT IS NOT A GROUNDED SYSTEM MAKING IT MORE HAZARDOUS THAN MODERN WIRING
- TWO-PRONG RECEPTACLES, RESTRICTING THE USE OF SMALL KITCHEN APPLIANCES

It is quite true that in bedrooms, living rooms, and dining rooms, plugging in a TV or lamp poses very little risk. The opposite is true in areas where you may come in contact with water such as bathroom, kitchens, basements, crawlspaces, and outdoors. An ungrounded system in these areas could be potentially hazardous. In fact, a good building practice across North America is to install GFCI (Ground Fault Circuit Interrupters) receptacles in these areas. Furthermore, newer stereo equipment or computers are affected by incorrect polarization – something that this type of wiring cannot prevent.

### *SAFETY TIPS:*

- NEVER REPLACE BLOWN FUSES WITH LARGER AMP FUSES
- NEVER CUT THE GROUNDING (THIRD) PRONG OFF A PLUG TO FIT INTO A TWO-HOLE RECEPTACLE
- DON'T USE OUTLET MULTIPLIER PLUGS TO CONNECT SEVERAL APPLIANCES OR LAMPS TO ONE RECEPTACLE

Knob and tube wiring, on its own, is not inherently a problem. It becomes a problem when it is abused. If you have such wiring, it would be wise to have the system evaluated by a licensed electrician. If necessary, it should be upgraded to modern wire. Some insurance companies require periodic evaluation.

For further information contact your local public utilities office or a licensed electrician.



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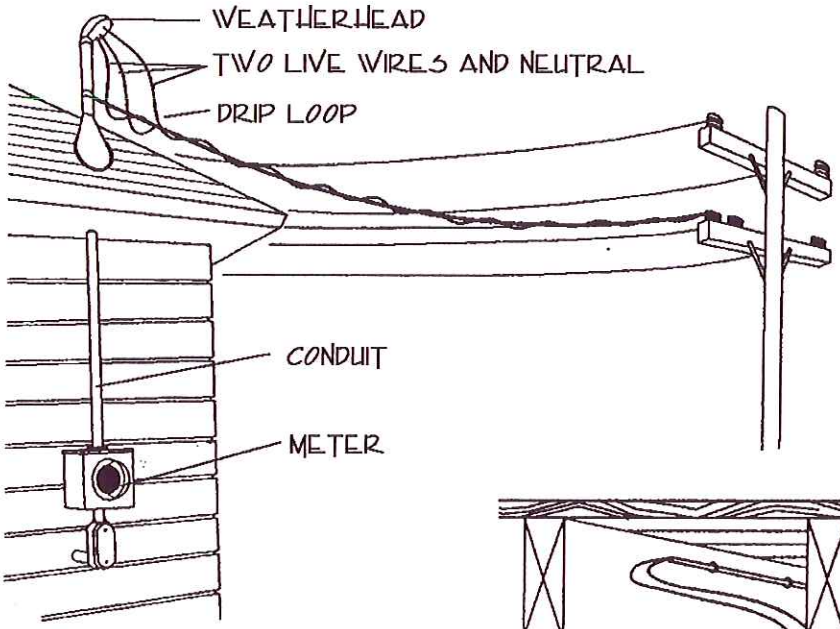
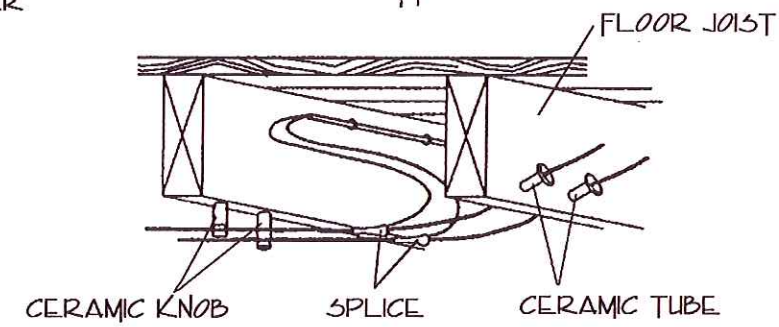
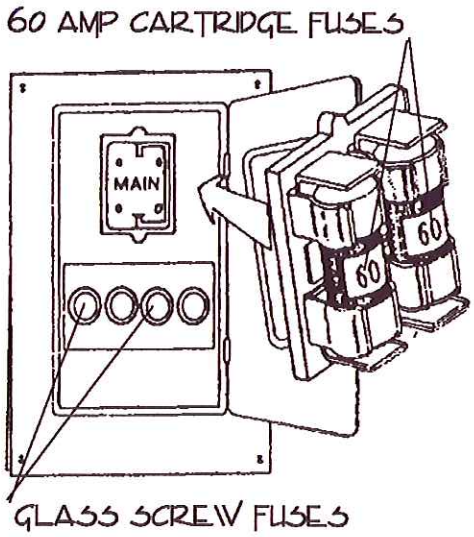


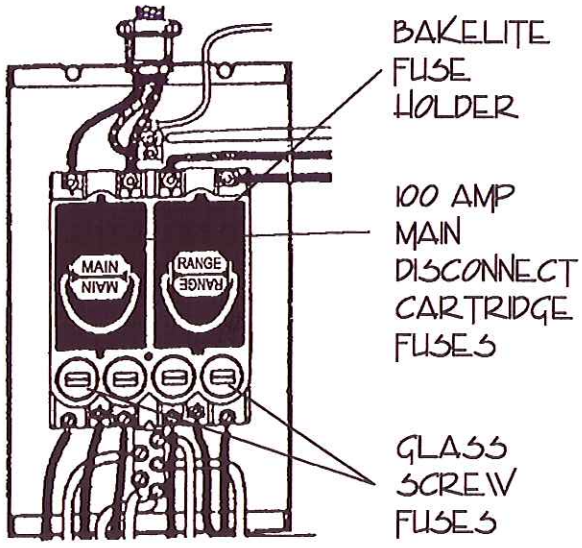

**Overhead 120/240-volt service**




**Typical Knob and Tube installation with floor**




**60 amp fuse panel - no major appliance**




**100 amp fuse panel - 40 amp appliance and 60 amp lighting**