

F R E E M A N

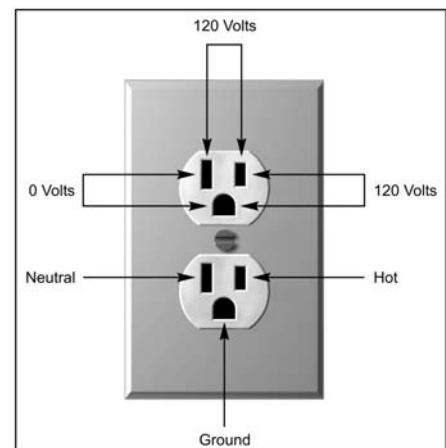
AUDIO VISUAL OPERATIONS STANDARD

ELECTRICAL METERING & CIRCUIT LOAD CALCULATION



METERING ELECTRICAL OUTLETS

- **All electrical outlets should be metered prior to plugging in any electrical equipment to ensure the outlet is properly wired and grounded, and is outputting the expected voltage. House electricians will generally meter power on the front end of any temporary boxes, however, each output should be metered to ensure a safe system.**
 - Improperly grounded electrical circuits are dangerous and can cause serious injury or death.
 - Outlets with voltage readings below 100 VAC or above 120 VAC could cause problems with electrical equipment including fire and irreparable damage.
 - An item designed to run on 110V must NEVER be plugged into an outlet metering in the 200V range or more.
- **Electrical outlets or boxes can be checked for proper wiring by using a simple CIRCUIT ANALYZER which will show one of the following:**
 - Open Ground
 - Open Neutral
 - Open Hot
 - Hot / Ground reversed
 - Hot / Neutral reversed
 - Correct
- **Electrical outlets or boxes can also be checked for proper wiring by using a digital or analog MULTI-METER by plugging the separate test leads into the outlet as shown in the example to the right:**
 - **NOTE:** Analog multi-meters have different range settings to accommodate a wide variety of voltage levels. The meter should be set according to the expected voltage range.



CALCULATING POWER NEEDS

- ***In many hotels or other facilities with permanently installed electrical outlets, the electrical CIRCUIT and CIRCUIT BREAKER may supply power to just one outlet, but the more common practice is to have several outlets coming from the same circuit.***
 - The House Electrician should know if the outlets in the room are 15 AMP or 20 AMP circuits, but may not know exactly which outlets are sharing that circuit.
 - Every effort must be taken to note which outlets share circuits, and balance power needs and consumption accordingly.
 - **EXAMPLE:** If there are 12 AMPS of A/V equipment plugged into a 15 AMP circuit, and a Banquet person plugs in a food warmer that draws 5 AMPS into that same circuit, it is likely that a circuit breaker or FUSE will trip, rendering all items plugged into that circuit unusable.
- ***Total power consumption by all equipment should be calculated ahead of time to prevent circuit overload.***
 - ***Total possible WATTAGE (power consumption) is calculated by a simple equation:***
 - ***$W = V \times A$ (Watts = Volts x Amps)***
 - ***Commonly remembered as WVA, or “West Virginia.”***
 - A 115V outlet rated at 15A will deliver up to 1725W of power. ($1725W = 115V \times 15A$). The same outlet rated at 20A will provide power for up to 2300W.
 - Wattage information can usually be found on electrical equipment on a sticker near the power cord. This information can be added up to determine total power needs.
 - **EXAMPLE:** If the following equipment is in use in a room, we can determine how much power is required.
 - 1 Grass Valley Turbo = 300W
 - 2 Panasonic 65” Plasma displays = 790W each
 - $300W + 790W + 790W = 1880W$
 - If the voltage reading from the outlet is 110V, and the circuit is rated at 20A, the total available wattage is 2200W, providing 320W of electrical headroom.