

FREEMAN

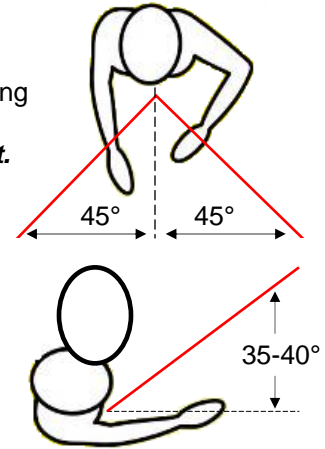
AUDIO VISUAL OPERATIONS STANDARD

LIGHTING TREES



Placement of Trees in Meeting Room

- **Trees should be placed as unobtrusively as possible, so as to prevent blocking of foot traffic areas and blocking audience sightlines** (i.e. placing near outside walls, etc.). **However, unless directed otherwise, achieving correct lighting angles should take priority over unobtrusive placement.**
- **When possible, trees should be placed such that a subject or platform area is lit from at least two points, as near as possible to the following optimal lighting angles:**
 - Horizontal (left/right of subject midline): 45°
 - Vertical (above floor/platform/stage): 35-40°



Building a Lighting Tree

- **Vertical poles should be only hand-tightened to tree bases.**
- **Crossbars are attached to vertical poles using a 90°-fixed Cheeseboro (Cheeseborough).**
 - **Cheeseboros must be attached in the correct orientation** (see photo, right) **such that the hinge bears the weight of the crossbar and attached lighting instruments.**
 - **Hinge-pins/wing-nuts must be tightened with a crescent-wrench to ensure strong grip.**
 - **Failure to adhere to these steps may result in a catastrophic accident!**
- **All tree bases must be weighted with at least 2-25# sandbags to counter-balance hanging lighting instruments and prevent tree from tipping over.**
- **Once lighting trees have been placed and raised, instruments should be hung and focused one-at-a-time through the use of a ladder.**
 - **At no time should a technician ever stand on the very top level of a ladder.** It is always a good idea for a second technician to hold the base of a ladder while the first technician is at working height on the ladder.
 - It is acceptable to hang all instruments on a lighting tree on the ground prior to standing the tree upright only if there are two or more setup technicians present. Instrument focusing must still be performed by a single technician on a ladder after the tree is raised.



- **Lighting instruments are attached to the crossbar by way of a 'C'-clamp.**
 - **Instruments must hang either directly above or below crossbar.** This will insure that lighting tree assembly stays stable (*i.e.* yoke is 90° perpendicular to the floor; see photo, right). The instrument center-of-gravity remains directly over the base.
 - **Instruments must never be hung at an angle to or parallel with the floor, as trees become off-balance and greatly increase the chance of an accident!**
 - **Dimmers must be attached to the crossbar as close to the vertical pole as possible, hanging down, with outlets facing the opposite direction of the fixture lenses.**



Lighting Tree Safety Procedures

- **Fall prevention:**
 - **Every flown instrument must be secured to pipe or truss with a safety cable/chain in addition to 'C'-clamp – NO EXCEPTIONS.**
 - **Trees must never be overloaded with any more than 8 conventional lighting instruments.**
 - **Trees must never be set to lean at any angle at any time.**
 - **Trees which are placed in high foot-traffic areas should have their bases and vertical poles outlined in Safety tape or white Gaffer's tape to draw passer-by's attention. This is especially true if set up in low-lighting environments.**
- **Floor cables** (see AV Standard 0005 – Cable Care and Taping for complete safety details):
 - **Cables running from floor to dimmer/lighting instruments should be neatly gathered together and attached to vertical pole with small rings of electrical or Gaffer's tape to make setup as neat and safe as possible.**
- **Electrical concerns:**
 - **All equipment must be properly grounded – equipment or cables with broken ground pins must never be used.**
 - **Circuits must never be overloaded – circuit loading must be performed prior to installation** (See AV Standard 0006 – Electrical Metering & Circuit Load Calculations for details).
 - **Attempts should always be made to contact the local site engineer or electrician to determine circuit layout (when using house power) and/or to locate circuit breaker box.**
- **Equipment condition:**
 - **All equipment must be visually inspected prior to installation. Equipment with obvious physical damage, especially to electrical components, must never be used at any time.**
 - Never use equipment with frayed, cut, or exposed wires.
 - Never use equipment with damaged connectors.
 - Never use lighting instruments with corroded or otherwise damaged lamp sockets.
 - Never use lighting instruments with broken reflectors or damaged or severely scratched lenses.
- **Lamps:**
 - **Lamps must never be touched with bare hands to prevent premature lamp burnout from skin moisture/oils. Always use a cloth, gloves, foam, or tissue when handling or replacing lamps.**
 - EXCEPTION: standard PAR lamps are safe to touch with bare hands.
 - **"Hot-hands" or leather gloves should always be worn when working with hot instruments to prevent burns.**
 - **Extreme care must be exercised when working with or near hot instruments, as even slight impacts or jars to instruments may result in premature filament failure and lamp burnout.**