



The power of a typical lightning bolt is approximately 100 million volts.

Tree Lightning Protection and How It Should Impact Play

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THOUSANDS of trees on golf courses are severely damaged or killed every year by lightning. Proper lightning protection equipment can help reduce these landscape losses without adversely affecting play.

The main features of a lightning protection system are the air terminal, conduction cable, and the grounding rod. The first step involves having a skilled climber attach a copper bronze air terminal, as high as possible, into the upper tree. If possible, attach the air terminal within 10 feet of the top of the tree for optimum protection. The main down conductor must be a 32-strand, 17-gauge, braided copper wire that

weighs a minimum of 187.5 pounds per thousand linear feet. Secondary air terminals and cables are essential if the tree crown is comprised of more than one main leader. All connecting cables are attached to a 10-foot long, 5/8-inch diameter, cooper-clad ground rod driven vertically into the ground at least 30 feet from the trunk of the tree or to a distance beyond the major root system. The cable to the ground rod should be buried to a sufficient depth (usually 2 to 4 inches) to prevent later damage.

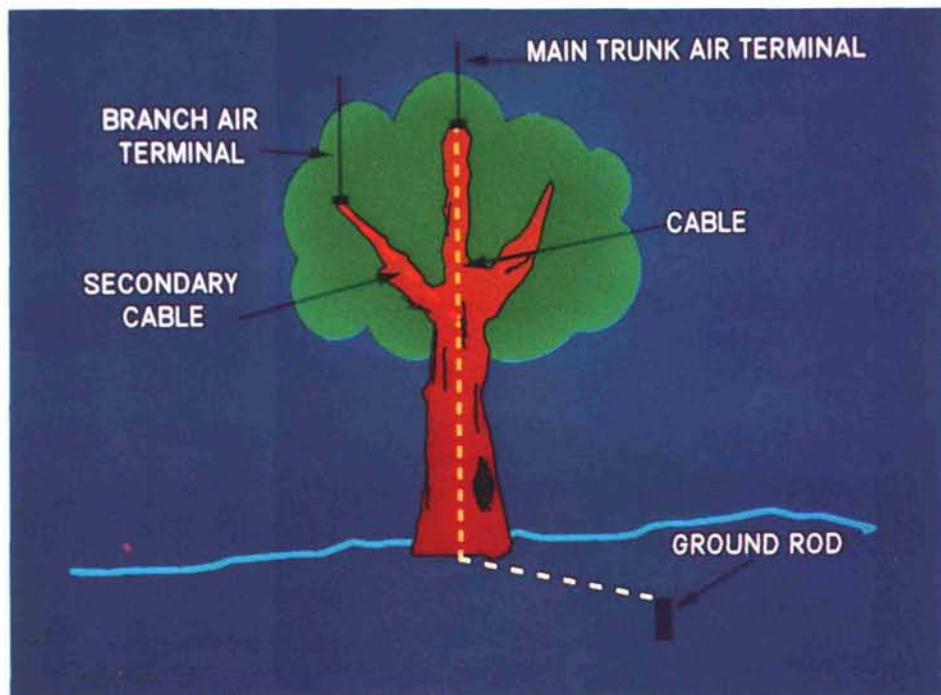
Two primary grounding cables and two ground rods are recommended if the tree trunk is greater than 36 inches

in diameter. These should be installed at approximately 180 degrees to each other. Follow all other specifications in accordance with Underwriters Laboratories, the Lightning Protection Institute, and the National Arborist's Association codes for lightning protection systems. A skilled consulting arborist can determine which trees to protect and how to protect them.

When providing tree lightning protection, there is an unavoidable exposed wire on the tree trunk that may interfere with play. The cable is, by definition, an immovable obstruction, and relief is provided without penalty under the Rules of Golf. Typically, a



player has a difficult shot when his ball comes to rest next to a tree, and affording free relief can result in getting a free pass out of trouble! However, the Rules Committee at a course can declare the grounding cable on the tree trunk to be an integral part of the course (in the Notice to the Competitors or Local Rules sheet). In this case, the ball must be played as it lies next to the cable or else the player must proceed under the unplayable ball rule. Since free relief from this cable will not be given in most competitions, USGA Committeeman Joseph Chalmers of Tennessee has suggested installing the grounding cable on the putting green side or the back of the tree. This placement would be less likely to create a problem with play of a given hole. By following this advice, a functional lightning protection system and the playing of the game of golf are least likely to interfere with each other.



(Top) The ground cable should be installed on the back of the tree, where it will least likely affect play. (Above) Specifications for lightning protection systems are available from the National Arborist's Association.