

THE TALLEST TOWER: KEEPING IT LIT

KWTV (TV) SPENT \$20,000 TO MAKE SURE IT STAYS VISIBLE

HAVING the tallest man-made structure in the world—a shimmering steel shaft jutting skyward 1,572-ft. above the Oklahoma plains—poses a special responsibility for KWTV (TV) Oklahoma City. This is that the tower must be easily identifiable as an obstacle to aircraft.

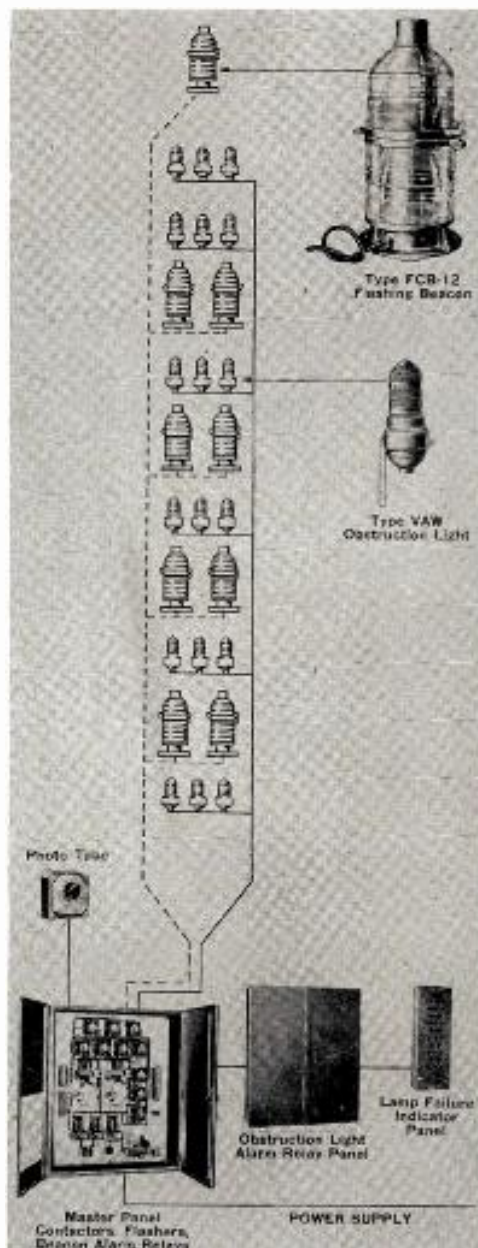
A specially-designed \$20,000 lighting system is KWTV's answer to that obligation. The sky-reaching tower—higher by 100 ft. than the Empire State Bldg., taller by 587 ft. than the Eiffel Tower—is equipped with nine Crouse-Hinds flashing beacons and 18 obstruction lights.

This makes the tower visible for a distance of 50 miles on a clear night, according to best estimates.

Though the tower's identification lights provide pilots with adequate notice of the location of the tower under normal visibility conditions, they basically form only a segment of this unique installation's obstruction lighting system. Several other devices must work properly for the lighting units to serve their essential purpose. Since replacing just one bulb of one of the tower's lighting fixtures is costly, requiring a specialist to work hazardously on the upper levels of the giant antenna rig, each lamp bulb must possess long burning life. Maintenance personnel must also know instantly when a lamp has failed. Finally, the lighting controls must function automatically to assure that the lighting system operates when necessary.

Fabricated and installed by Ideco Division, Dresser-Stacey Company, Columbus, Ohio, the tower is triangular in cross section, 12 feet on a side up to the 1,420-ft. level. Two television antennas (the antenna of Oklahoma's educational ch. 13 KETA [TV] will also be located on the KWTV tower), one atop the other, extend 152 feet upward above the 1,420-ft. level. From the ground up to the 300-ft. level, the three support legs are 14-inch wide flange steel beams; above that height, the legs are solid steel round that vary from 10¼- to 4-inches in diameter. The structure rests on a base insulator, capable of withstanding four times the 2.8 million pound working load. The entire assembly is mounted on a 10-ft. deep reinforced concrete foundation.

Of the nine Type FCB-12 flashing beacons used, one is mounted at the top of the antennas, and two each are installed at four lower levels. Each beacon is equipped with



THIS schematic of the lighting system on the 1,572-ft. tower of KWTV (TV) Oklahoma City details the placement of the nine flasher beacons and 18 obstruction lights which make up one of the most extensive visual markings on any tv tower. Also shown is the circuitry which connects each individual light to the master, alarm relay and lamp failure indicator panels.

two 620-watt, 3,000-hour lamps. All three corners at six lower levels are equipped with type VAW obstruction lights. One 111-watt, 3,000-hour lamp is used in each obstruction light.

Separate control circuits for the flashing beacons and obstruction lights run from the tower down to a master panel, and on to a lamp failure indicator board. The master panel contains the main contactors, flashing switches, photoelectric amplifier and beacon lamp failure alarm relays. Housed separately are the obstruction light alarm relays which feed directly to the lamp failure indicator panel.

The absence or presence of light upon a photoelectric cell actuates the master panel amplifier, causing the system's main contactors either to turn on or turn off the tower lighting automatically. The light-sensitive phototube, located on an exterior wall of the tower maintenance building and protected by a windowed, weatherproof aluminum box, can be accurately adjusted to react to predetermined ranges of light.

The master panel, specially-designed by Grouse-Hinds to handle the tall tower's unusual lighting requirements, consists of two double-circuit TSS flasher switches, powered by shaded pole, induction disc motors. The beacon circuits are flashed at a cycle rate of 40 flashes per minute by four 35 ampere mercury switches.

All 27 lighting units are wired to individual lamp failure relays, which activate the particular pilot lamps on the lamp failure indicator board. A relay coil in series with each tower lighting fixture drops out whenever the fixture bulb fails, closing relay contacts that energize the pertinent pilot light on the indicator board.

This arrangement for indicating lamp failures allows the KWTV tower to be checked easily and quickly by merely observing the lamp failure indicator panel. The board itself is in effect a miniature physical diagram of the tower lighting. The large red pilot lights monitor the flasher beacons. The two top lights indicate the bulb condition of the two bulbs in the highest mounted beacon on the tower. The smaller red pilot lights denote the condition of the VAW obstruction lights. Anyone of them is illuminated only when a tower lamp has failed. The green light at the bottom of the panel burns whenever the power to the tower lights is on.