☆ GPO : 1983 0 - 417-635

GTA 11-09-002

COMPUTING ANTENNA LOADS FOR AB-216 / U TOWER HEIGHTS

DISTRIBUTION: US Army Training Aids Centers

OCTOBER 1980

DETERMINING SAFE ANTENNA LOAD FOR VARIOUS TOWER HEIGHTS

The number of antennas that may be mounted on the tower is limited by the height of the tower, the size of the antenna, and the position of the antennas on the tower. As the height of the tower is increased, the number of antennas it may safely support is decreased on the tower. For each tower, there are three factors to be considered: the total number of antennas the tower will safely support; the total number of antennas that may be mounted at any one guy attachment level; and the total number of antennas that may be mounted on parallel sides of the tower.

- To determine the maximum number of antennas that may safely be mounted on a tower, proceed as follows:
  - From table I, determine the maximum allowable antenna area that can safely be added to the tower being used.
  - From table II, determine the area of the antenna to be used with the tower.

  - Divide the area of the antenna (table II) into the maximum allowable area that can be added to the tower (table I). This will give the maximum number of antennas that may be installed on the tower being used.

TABLE I. MAXIMUM ALLOWABLE ANTENNA AREA

TOWER HEIGHT (FT)	MAXIMUM ALLOWABLE AREA THAT CAN SAFELY BE ADDED (SQ FT)	MAXIMUM ALLOWABLE AREA PER GUY LEVEL (SQ FT)	MAXIMUM ALLOWABLE AREA ON PARALLEL SIDES (SQ FT)
204	230	115	115
162	345	115	230
120	560	115	345
78	200	200	455

TABLE II. AREA AND DIAMETER OF ANTENNAS

DIAMETER (FT)	AREA (SQ FT)
4	12.6
6	28.5
8	50.2
10	78
12	113
14	154
16	200

- To determine the maximum number of antennas that may be mounted at a guy level, proceed as follows:
  - From table I, determine the maximum allowable area an parallel sides of the tower being used.
  - From table II, determine the area of the antenna to be used with the tower.
  - Divide the area of the antenna (table II) into the maximum allowable area on parallel sides (table 1). This will give the maximum number of antennas that may be mounted on parallel sides of the tower.

- For example, to determine the maximum number of 8-foot antennas that may be mounted on parallel sides of a 204-foot tower, proceed as follows:
  - From table I, the maximum allowable area on parallel sides of a 204-foot tower is 115 square feet.
  - From table II, the area of an 8-foot antenna is 50.2 square feet.
  - Divide 50.2 ((b) above) INTO 115 ((a) above):

$$\frac{115 \text{ sq ft}}{50.2 \text{ sq ft}} = 2$$

(maximum number of antennas per guy level)

To determine the maximum number of antennas that may be mounted on parallel sides of the tower (fig 3), proceed as follows:

- From table I, determine the maximum allowable area that may be added at a guy level for the tower being used.
- From table II, determine the area of the antenna to be used with the tower.

- **Divide the area of the antenna (table II) into the maximum allowable area that may be mounted at a guy level table I. This will give the maximum number of antennas that may be mounted at a guy level for the tower height being used.**
- **For example, to determine the maximum number of 8-foot antennas that may be mounted at any one guy level on a 204-foot tower:**
  - **From table I, the maximum allowable per guy level for a 204-foot tower is 115 square feet.**
  - **From table II, the area of an 8-foot antenna is 50.2 square feet.**
  - **Divide 50.2 ((b) above) into 115 ((a) above):**

$$\frac{115 \text{ sq ft}}{50.2 \text{ sq ft}} = 2$$

(maximum number of antennas on parallel sides)

REFERENCE:

SM/CM	TASK NO.
36D	36D-34-008

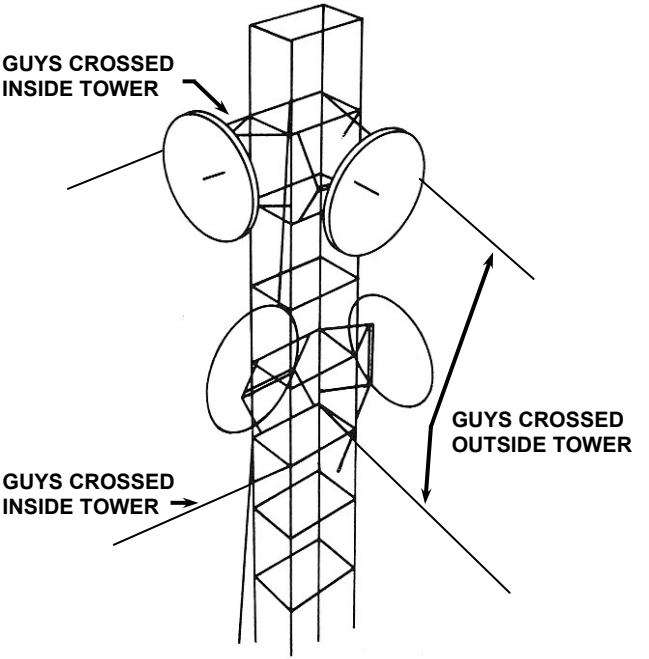

Figure 1.

Typical antenna installation: two 8-foot antennas mounted on adjacent sides of the tower at the same level.

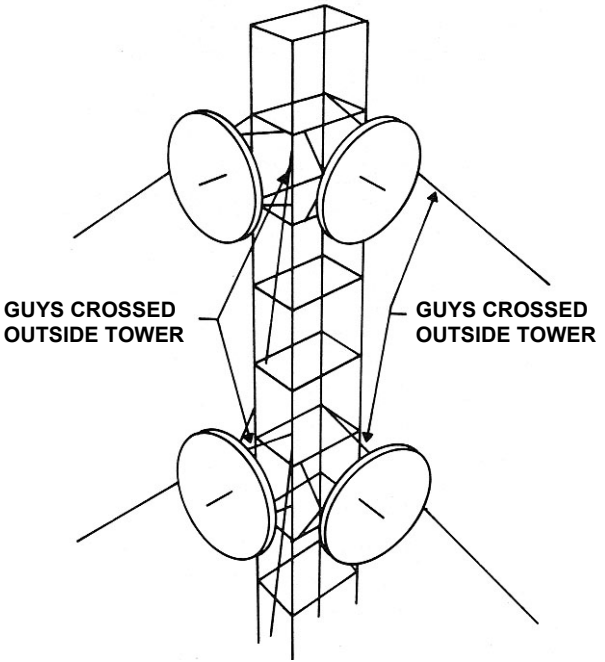

Figure 2.

Typical antenna installation: two 8-foot antennas mounted on adjacent sides of the tower, one above and one below the guy attachment level.

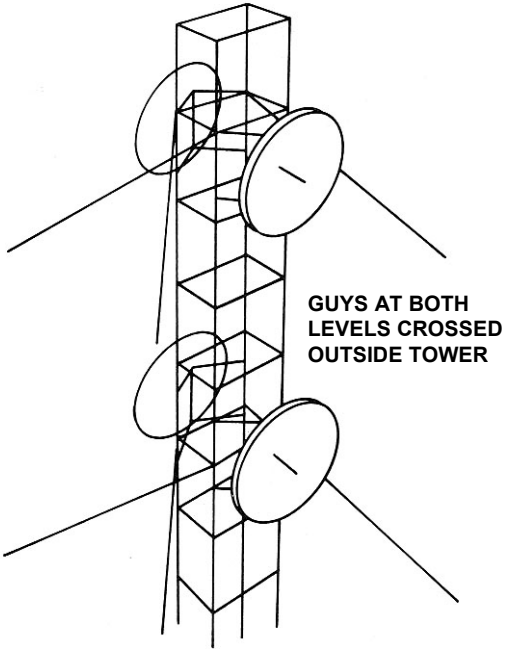

Figure 3.

Typical antenna installation: two 8-foot antennas mounted on parallel sides, opposite each other, at the same level.