

## *Measurement of Maximum Permissible Exposure*

According to **OET BULLETIN 56 Fourth Edition/August 1999**,

**Equation for Predicting RF Fields:**

$$S(\text{W/m}^2) = PG/4\pi R^2;$$

$$R = \sqrt{\frac{PG}{4\pi S}} \quad r = \sqrt{\frac{5662 \times 10}{4\pi (470 / 300)}} = 53.63\text{cm}$$

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

The Numeric gain G of antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} (\text{dBi antenna gain}/10)$$

$$G = \text{Log}^{-1} (2/10) = 1.58$$

## **Limits for Maximum Permissible Exposure (MPE)**

| Frequency Range (MHz)                                          | Electric Field Strength (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes) |
|----------------------------------------------------------------|-------------------------------|-----------------------------------|-----------------------------------------|-------------------------------------------------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                                   |                                         |                                                                   |
| 0.3-3.0                                                        | 614                           | 1.63                              | 100                                     | 6                                                                 |
| 3.0-30                                                         | 1842/f                        | 4.89/f                            | 900/f <sup>2</sup>                      | 6                                                                 |
| 30-300                                                         | 61.4                          | 0.163                             | 1.0                                     | 6                                                                 |
| 300-1500                                                       | --                            | --                                | f/300                                   | 6                                                                 |
| 1500-100,000                                                   | --                            | --                                | 5                                       | 6                                                                 |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                                   |                                         |                                                                   |
| 0.3-1.34                                                       | 614                           | 1.63                              | 100                                     | 30                                                                |
| 1.34-30                                                        | 824/f                         | 2.19/f                            | 180/f <sup>2</sup>                      | 30                                                                |
| 30-300                                                         | 27.5                          | 0.073                             | 0.2                                     | 30                                                                |
| 300-1500                                                       | --                            | --                                | f/1500                                  | 30                                                                |
| 1500-100,000                                                   | --                            | --                                | 1.0                                     | 30                                                                |