

# Titik Refleksi & Site Survey

Ref : Freeman

# Titik Refleksi

- Refleksi bumi penyebab utama terjadinya fading
- Refleksi dapat dikurangi atau dihilangkan dengan pengaturan ketinggian antenna, secara efektif memindahkan dari daerah reflektifitas tinggi ke reflektifitas rendah.
- Bila lintasan melalui diatas air atau padang pasir, perlu menggunakan cara lain seperti diversitas frekuensi atau diversitas ruang vertical untuk mitigasi multipath fading.
- Metode paling sederhana menentukan titik refleksi adalah dengan menggunakan grafik.
- Atmosfir tidak stabil sepanjang tahun tetapi dinamis, sehingga titik refleksi merupakan daerah tempat kedudukan pada garis sepanjang lintasan yg ditentukan oleh factor K ekstrim.
- Faktor K harus dilihat dari  $K = \infty$  sampai K grazing.

**TABLE 2.3 Approximate Values of  $R$  for Various Terrain**

Type of Terrain	$R^a$	Approximate Depth of Even Fresnel Zone Fade (dB)
Heavily wooded, forest land	0 to $-0.1$	0–2
Partially wooded (trees along roads perpendicular to path, etc.)	$-0.1$ to $-0.4$	2–5
Sagebrush, high grassy areas	$-0.5$ to $-0.7$	5–10
Cotton with foilage, rough seawater, low grassy areas	$-0.7$ to $-0.8$	10–20
Smooth seawater, salt flats, flat earth	$-0.9$ +	20–40 +

<sup>a</sup>The values of  $R$  given in this table are approximate, of course, but they do give an indication of signal degradation to be expected over various terrain should even-numbered Fresnel zone reflections occur.

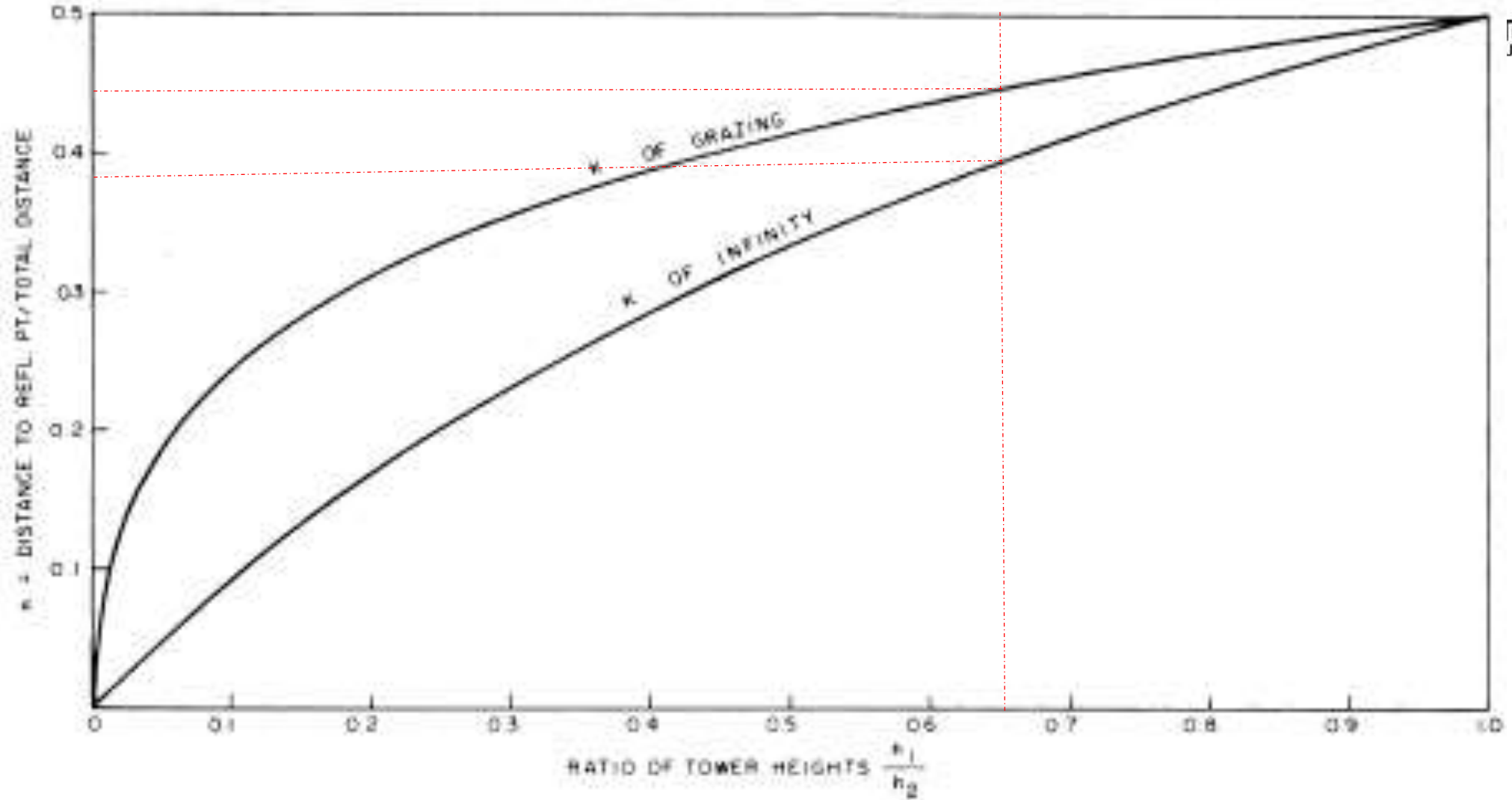
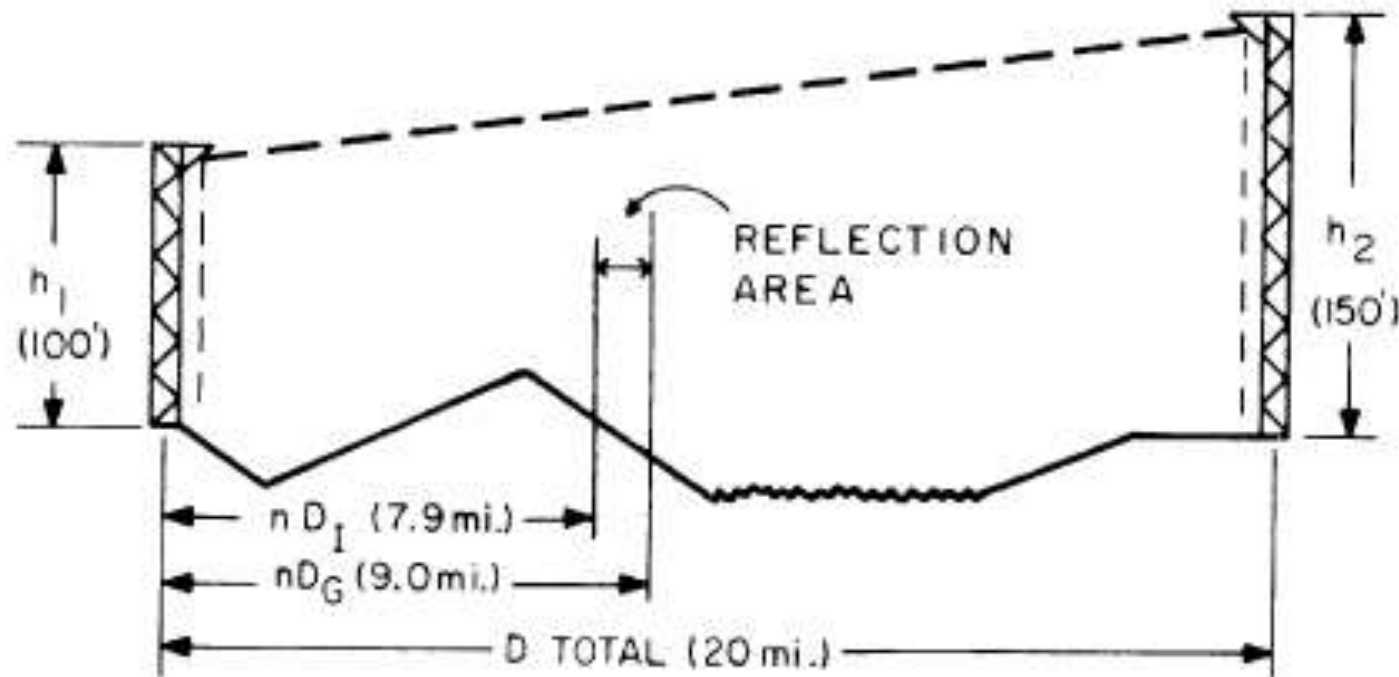


Figure 2.5. Reflection point nomogram.



EXAMPLE:

$$h_1 = 100' \quad h_2 = 150'$$

$$D_T = 20 \text{ mi.}$$

Ratio of tower heights:

$$\frac{h_1}{h_2} = \frac{100}{150} = .66$$

Enter .66 on bottom scale of graph E and read distance from shortest tower to point of reflection.

For  $K = \text{Infinity}$ ,

$$D_1 = .395 \times 20 = 7.9 \text{ mi.}$$

For  $K = \text{Grazing}$ ,

$$D_G = .45 \times 20 = 9.0 \text{ mi.}$$

# Site Survey

- Bila profil lintasan telah lengkap perlu dilakukan survey lokasi ke dua site dan lapangan di lintasan.
- Kepentingan utama adalah verifikasi site dan lapangan harus sesuai dengan profil lintasan.
- Daftar informasi :
  - Lokasi site
  - Rencana lay out site
  - Uraian site
  - Uraian lintasan
  - Ketersediaan daya listrik
  - Pengadaan bahan bakar
  - Material dan kontraktor local
  - Larangan zona local
  - Data seismic dan geologi
  - Data cuaca
  - Interferensi elektromagnet

Site Name and Number \_\_\_\_\_  
Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ (Degrees, Min, Sec) \_\_\_\_\_  
Map reference (most detailed topographic) \_\_\_\_\_  
Nearest town (post office) \_\_\_\_\_  
Access route: (all year?) \_\_\_\_\_

Property owner; local contact: \_\_\_\_\_  
Site sketch \_\_\_\_\_ Site photograph \_\_\_\_\_ General description \_\_\_\_\_  
Reference baseline \_\_\_\_\_ By Polaris \_\_\_\_\_ Other \_\_\_\_\_  
Antenna No. \_\_\_\_\_ True bearing \_\_\_\_\_  
Ground elev. MSL \_\_\_\_\_ Takeoff angle (beam centerline) \_\_\_\_\_  
Takeoff angles to 45° right and left of centerline \_\_\_\_\_  
(Significant changes in horizon)  
Critical Points: (include horizon)  
Distance \_\_\_\_\_ Map elev. \_\_\_\_\_ Survey elev. \_\_\_\_\_  
Tree height \_\_\_\_\_ Required clearance \_\_\_\_\_  
Description:  
Horizon sketch \_\_\_\_\_ Horizon photograph \_\_\_\_\_

Power availability:  
a. Nearest transmission line \_\_\_\_\_ b. Voltage \_\_\_\_\_  
c. Frequency \_\_\_\_\_ d. Phase \_\_\_\_\_ e. Operating utility \_\_\_\_\_  
Drinking water source \_\_\_\_\_ Estimated depth to groundwater \_\_\_\_\_  
Sewage disposal \_\_\_\_\_ Type and depth of soil on and near site \_\_\_\_\_  
Nearest airport \_\_\_\_\_ railroad \_\_\_\_\_ highway \_\_\_\_\_  
navigable river \_\_\_\_\_

**Figure 2.7.** Sample checklist for site survey (Ref. 5).