

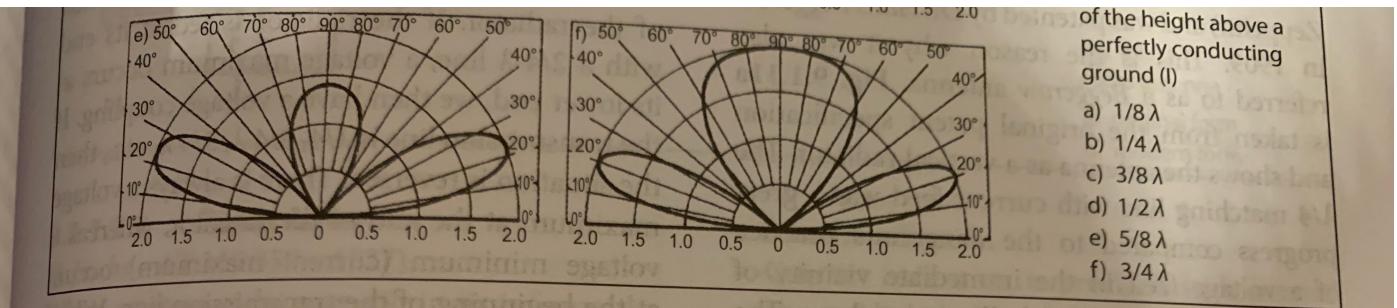
is transferred. We must therefore have a certain length, depending on whether a current or a voltage coupling is used. In the case of current coupling, the length of the transmission line is $\lambda/2$ or generally $n \cdot \lambda/2$ with odd values of n .

In the case of voltage coupling, the length is $\lambda/4$ or generally $n \cdot \lambda/4$ with n being any odd number (1, 3, 5, etc.). This is a quarter-wave transformation (cf. Section 6.6.1).

9.1.1.2 End-Fed Half-Wave Antennas

At the ends, we have a voltage maximum with high impedance on an end-fed half-wave dipole antenna ($\lambda/2$ dipole). Since there are no transmission lines available with high impedance $\gg 600 \Omega$, there can be no traveling-wave feed.

Only a standing-wave feed with any characteristic impedance of the transmission line (Zeppelin antenna) or other possibilities of coupling (Fuchs antenna, etc.) are possible. Every end-fed half-wave antenna need a counterpoise.



of the height above a perfectly conducting ground (I)

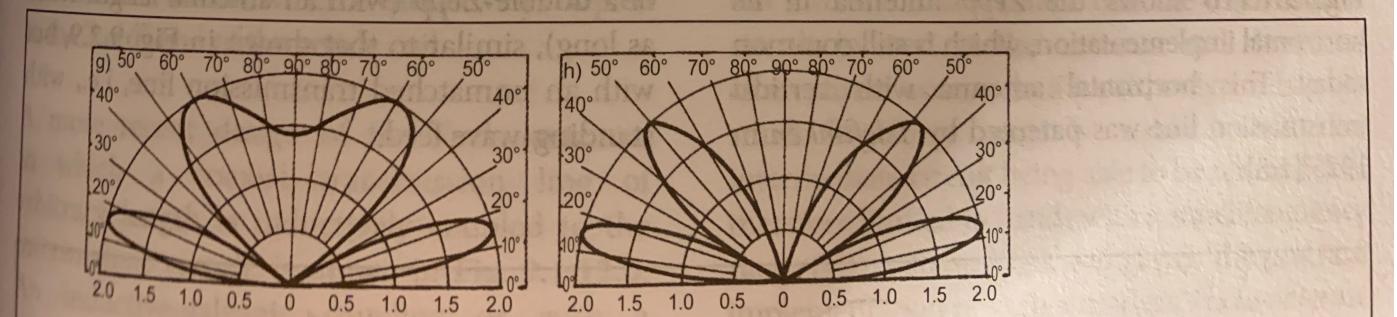
- a) $1/8\lambda$
- b) $1/4\lambda$
- c) $3/8\lambda$
- d) $1/2\lambda$
- e) $5/8\lambda$
- f) $3/4\lambda$

This does not mean, however, that end-fed antennas without counterpoise system would not work. They will work with anything that might have the same effect as a counterpoise.

This may be the transmission line, or, when using a coaxial cable, the outer screen or other lines or metal surfaces in the vicinity. This causes common-mode currents on the transmission

line, which may produce radio and television interference (BCI and TVI).

A connection between the lower end of the transmission line to ground either directly or via coupling should also be avoided. Otherwise it may happen that the transmission line radiates more than the antenna itself. This occurs e.g. when a $3/4\lambda$ matching line has a ground connection at



the lower end. W8JI has calculated this by means of the EZNEC + 4 software and published it on his website [1.1d]. Common-mode currents may be avoided by having no ground connection, a larger counterpoise or a sheath-current filter at the bottom of the transmission line. The common-mode problem applies to all end-fed antennas, i.e. also to vertical antennas.

9.1.1.2.1 Zeppelin Antenna

(H. Beggerow – DE 225 204 – 1909)

This antenna was used in airships (balloon, Zeppelin) and was patented by Dr. Hans Beggerow in 1909. This is the reason why it was also referred to as a *Beggerow* antenna. Fig. 9.1.11a is taken from the original patent specification and shows the antenna with a vertical radiator. The $\lambda/4$ matching line feed was a great