1. A circular parabolic dish has an efficiency of 91%, a radius of 1 m, and Gain of 300. What frequency is the antenna designed for?

$f =$ ☐

2. A circular parabolic dish with a diameter of 600 mm is used receive a satellite TV signal at 18 GHz. The dish has an efficiency of 90%. What is the dish's gain?

Gain = ☐

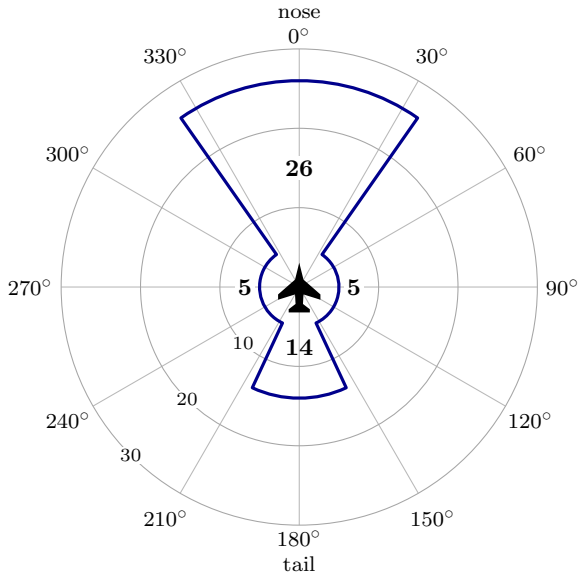
3. A TACAMO aircraft is used to send messages to a submarine using a carrier frequency of 30 KHz. How long of an antenna must the aircraft use to send the signal (assume a dipole antenna is used)?

Length = ☐

4. A circular dish antenna is to be used to communicate with a satellite communication system, using a frequency of 4.6 GHz. The dish has a diameter of 300 mm and an efficiency of 86%. What is the gain of the antenna?

Gain = ☐

5. The plot below is the gain pattern of the datalink antenna on a fighter, seen from above. The angle is the direction you look from the aircraft: 0° is the nose, and the angle increases clockwise, so 90° is directly off the right wing. The distance from the center is the antenna's gain in that direction, a linear ratio (not dB), read against the labeled rings. The bold number on each lobe is that lobe's gain.



Top view. The rings mark a gain of 10, 20 and 30. 0° is the nose, and the angle increases clockwise.

(a) What is the antenna's gain toward a tanker directly behind the fighter? $G =$ ____

(b) What is the antenna's gain toward a wingman directly off the fighter's left wing? $G =$ ____

6. A weather RADAR operates at 5.6 GHz. Its circular parabolic dish must have a gain of 12,000, and the dish has an efficiency of 55%. What diameter must the dish have?

Diameter = ____