Hydrogen Line Horn Notes

Signal ratio from 0.73 dB above background:

10^(0.73/10) ≈ 1.183

The hydrogen-line peak is about 18.3% stronger than the background power.

Horn gain formula:

$G = \eta \cdot (4\pi A / \lambda^2)$

A = aperture area

λ = wavelength

η = aperture efficiency

For a 4 ft × 3 ft (1.22 m × 0.91 m) horn at 1420.405 MHz:

$A \approx 1.11\ m^2$

$\lambda \approx 0.211$ m

Ideal gain ≈ 25.0 dBi

Practical gain (55–65% efficiency) ≈ 22.4–23.1 dBi