

S.O. 22948

VALIDATION OF GAIN CALCULATION

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MODEL 6810-6-DA

Elevation Gain of 6810-6-DA equals 3.28

The RMS values are calculated utilizing the data of a planimeter.

Horizontal RMS divided by Vertical RMS equals
 $0.823 \div 0.802 = 1.026$

Elevation Gain of Horizontal Component equals
 $3.28 \times 1.026 = 3.365$

Elevation Gain of Vertical Component equals
 $3.28 \times 0.975 = 3.197$

Horizontal Azimuth Gain equals $1/(\text{RMS})^2$
 $1/(0.823)^2 = 1.476$

Vertical Azimuth Gain equals $1/(\text{RMS} \div \text{Max Vert})^2$
 $1/(0.802 \div 0.990)^2 = 1.524$

* Total Horizontal Gain is Elevation Gain times Azimuth Gain
 $3.365 \times 1.476 = 4.967$

* Total Vertical Gain is Elevation Gain times Azimuth Gain
 $3.197 \times 1.524 = 4.872$

ERP divided by Horizontal Gain equals Antenna Input Power
 $60 \text{ kW} \div 4.967 = 12.08 \text{ kW}$

Antenna Input Power times Vertical Gain equals Vertical ERP
 $12.08 \times 4.872 = 58.85 \text{ kW}$

Maximum Value of the Vertical Component squared times the
Maximum ERP equals the Vertical ERP
 $(0.990)^2 \times 60 \text{ kW} = 58.81 \text{ kW}$

NOTE: Calculating the ERP of the Vertical Component by two
methods validates the total antenna gain calculations