

S.O. 22574

VALIDATION OF GAIN CALCULATION

WVSS MENOMONIE, WI

MODEL 6810-1D-DA

Elevation Gain of 6810-1D-DA equals 0.46

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

Horizontal RMS divided by Vertical RMS equals
 $0.810 \div 0.750 = 1.08$

Elevation Gain of Horizontal Component equals
 $0.46 \times 1.08 = 0.497$

Elevation Gain of Vertical Component equals
 $0.46 \times 0.926 = 0.426$

Horizontal Azimuth Gain equals $1/(\text{RMS})^2$
 $1/(0.810)^2 = 1.524$

Vertical Azimuth Gain equals $1/(\text{RMS} \div \text{Max Vert})^2$
 $1/(0.75 \div 0.99)^2 = 1.742$

* Total Horizontal Gain is Elevation Gain times Azimuth Gain
 $0.497 \times 1.524 = 0.757$

* Total Vertical Gain is Elevation Gain times Azimuth Gain
 $0.426 \times 1.742 = 0.742$

ERP divided by Horizontal Gain equals Antenna Input Power
 $0.590 \text{ kW} \div 0.757 = 0.779 \text{ kW}$

Antenna Input Power times Vertical Gain equals Vertical ERP
 $0.779 \times 0.74 = 0.577 \text{ kW}$

Maximum Value of the Vertical Component squared times the
Maximum ERP equals the Vertical ERP
 $(0.99)^2 \times 0.59 \text{ kW} = 0.578 \text{ kW}$

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