

**Multi-Antenna Versus Single  
Antenna Solutions for 1-10GHz RF  
Immunity Testing**



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**1-10 GHz, 10 volts/meter @ 3 meters  
(Telcordia GR-1089-CORE)**



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**A Recap on the Objectives**  
**High Gain / Low Gain Antennas - Characteristics of Each  
Approach**  
**The Upsides / Downsides**  
**Practical Implementation**



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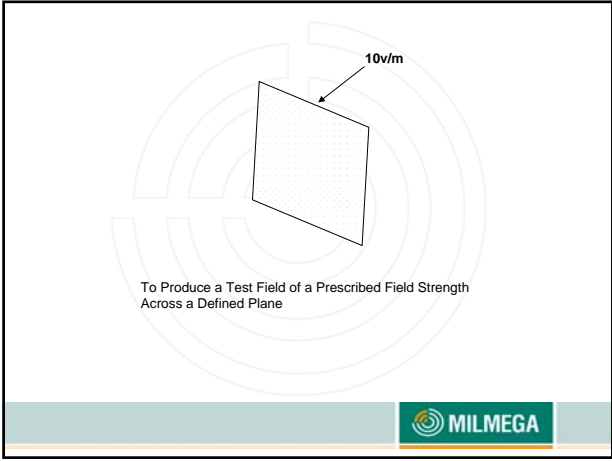
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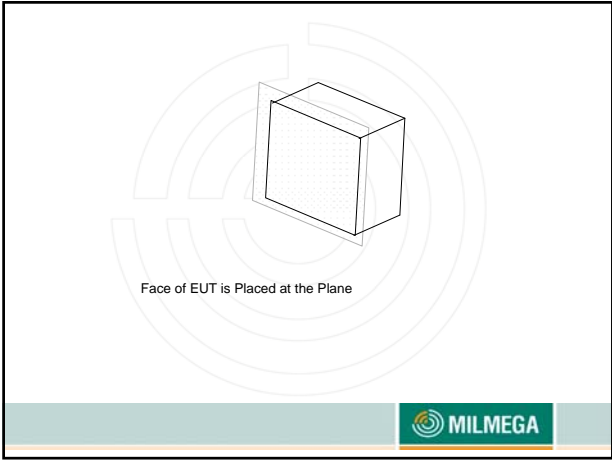
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16 Equi-distant Points

If prescribed field strength is 10 v/m, can be 10 v/m to 20 v/m at each point on grid

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16 Equi-distant Points

If prescribed field strength is 10 v/m, can be 10 v/m to 20 v/m at each point on grid

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**High Gain / Low Gain Antennas**

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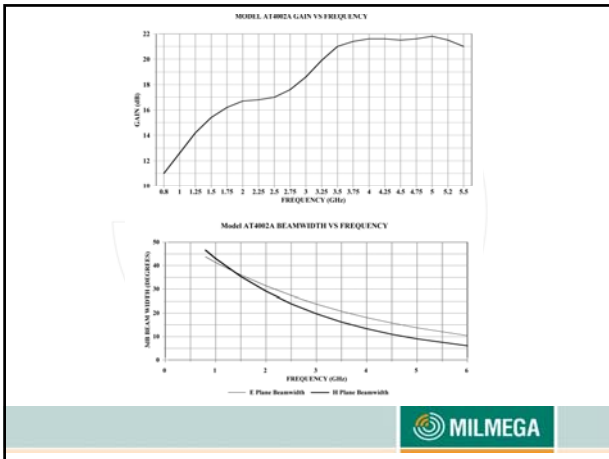
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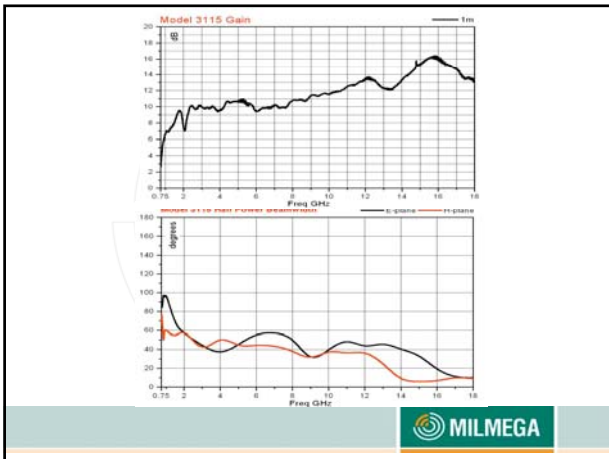
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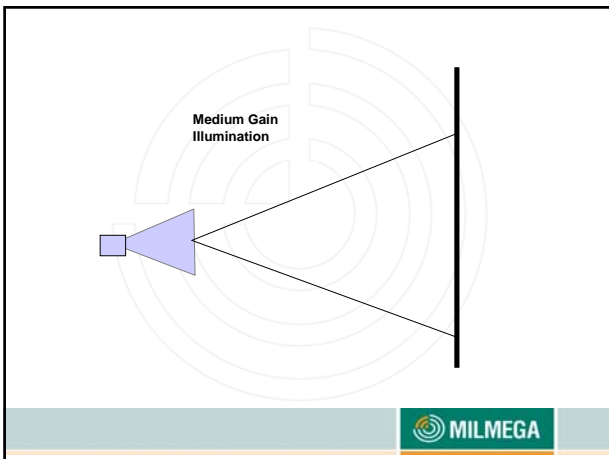
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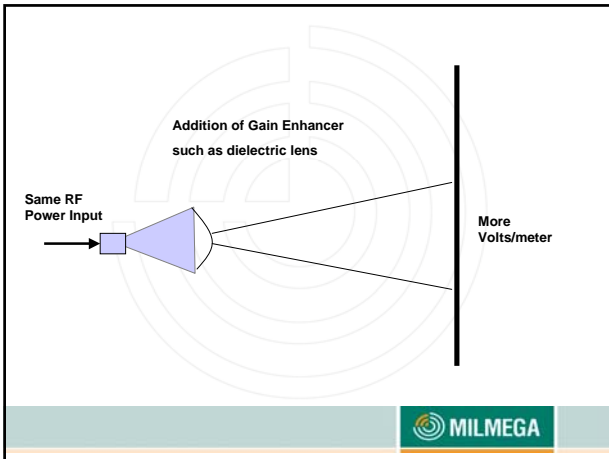
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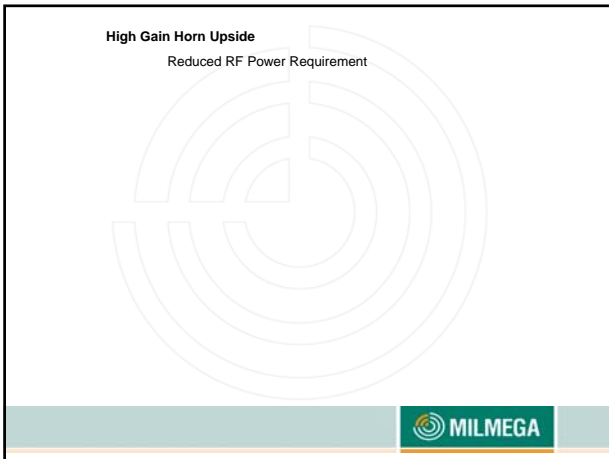
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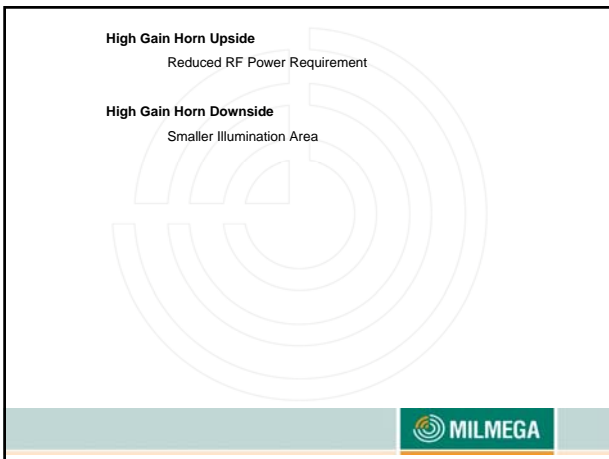
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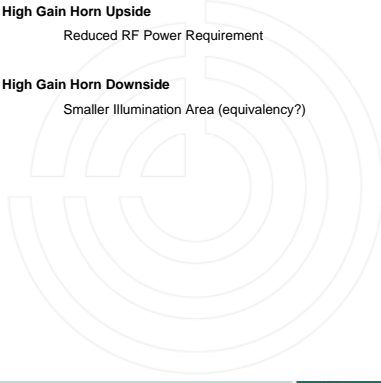

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**High Gain Horn Upside**  
Reduced RF Power Requirement

**High Gain Horn Downside**  
Smaller Illumination Area (equivalency?)


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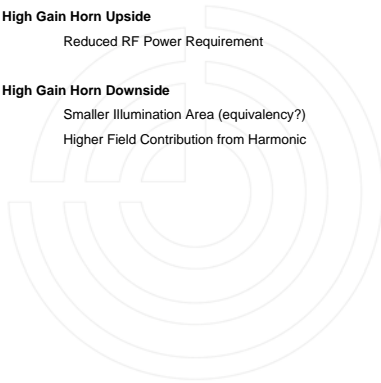

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**High Gain Horn Upside**  
Reduced RF Power Requirement

**High Gain Horn Downside**  
Smaller Illumination Area (equivalency?)  
Higher Field Contribution from Harmonic


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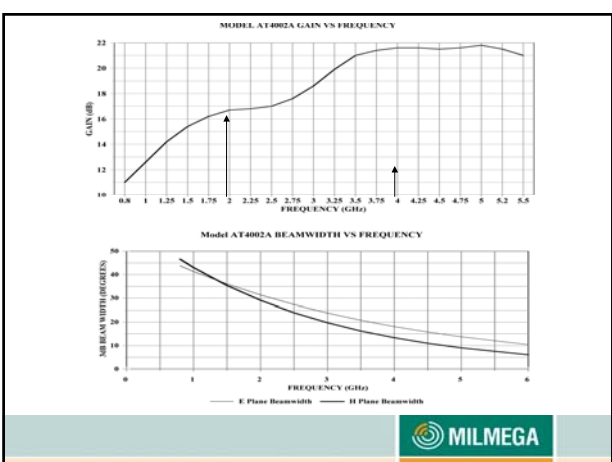
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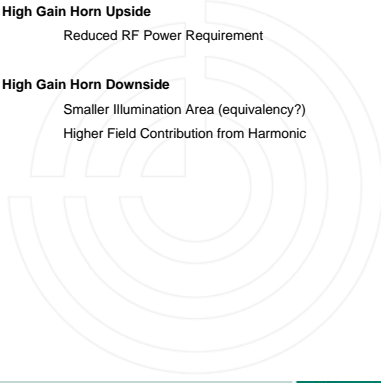
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**High Gain Horn Upside**  
Reduced RF Power Requirement

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Smaller Illumination Area (equivalency?)  
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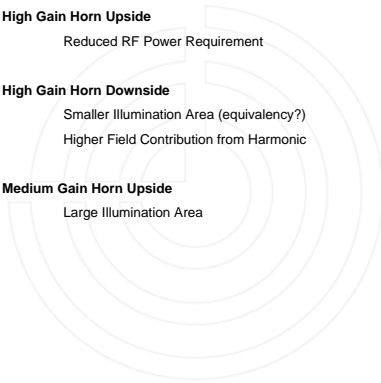
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**High Gain Horn Upside**  
Reduced RF Power Requirement

**High Gain Horn Downside**  
Smaller Illumination Area (equivalency?)  
Higher Field Contribution from Harmonic

**Medium Gain Horn Upside**  
Large Illumination Area



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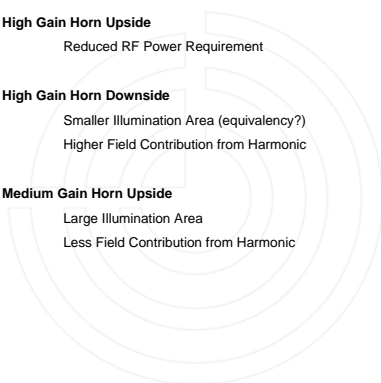
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**High Gain Horn Upside**  
Reduced RF Power Requirement

**High Gain Horn Downside**  
Smaller Illumination Area (equivalency?)  
Higher Field Contribution from Harmonic

**Medium Gain Horn Upside**  
Large Illumination Area  
Less Field Contribution from Harmonic



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**High Gain Horn Upside**  
Reduced RF Power Requirement

**High Gain Horn Downside**  
Smaller Illumination Area (equivalency?)  
Higher Field Contribution from Harmonic

**Medium Gain Horn Upside**  
Large Illumination Area  
Less Field Contribution from Harmonic

**Medium Gain Horn Downside**  
Higher RF Power Requirement



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**Practicalities**



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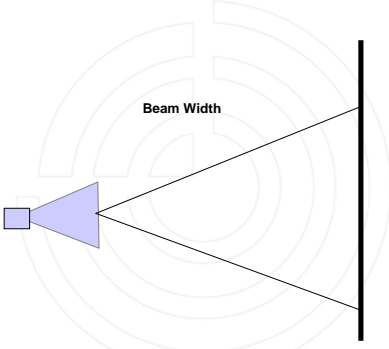
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**Beam Width**



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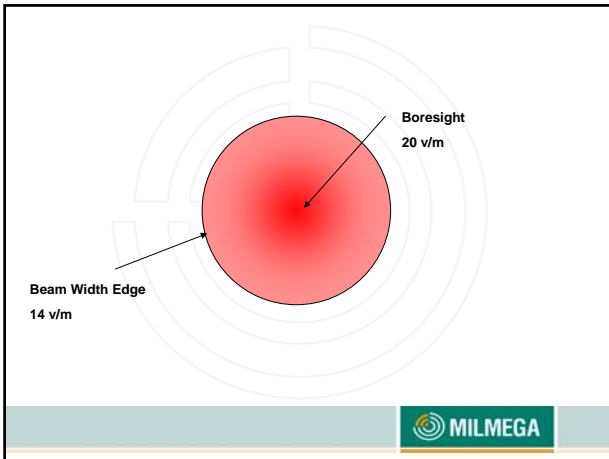
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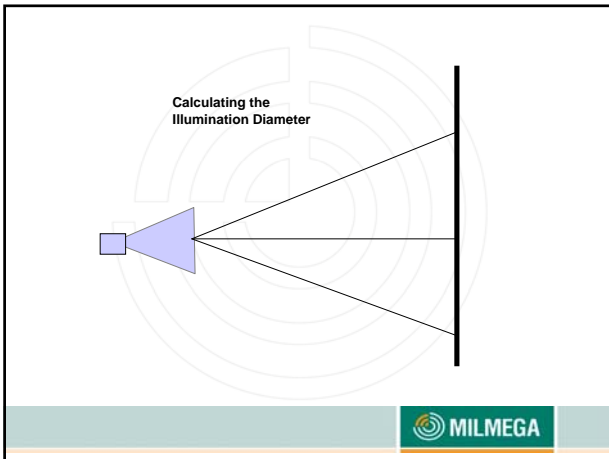
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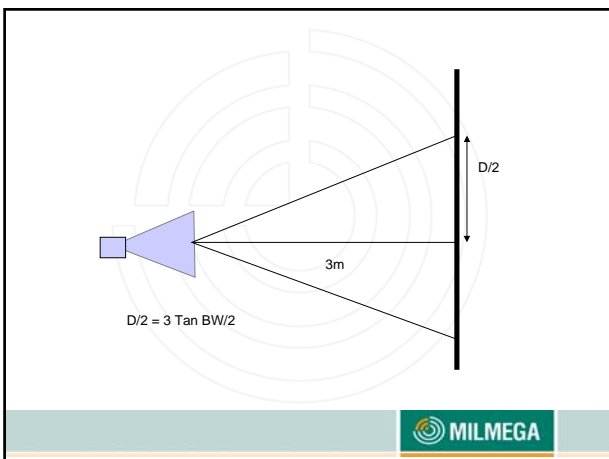
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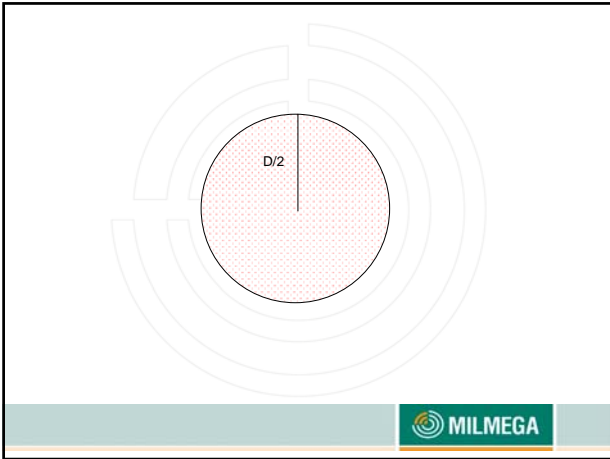
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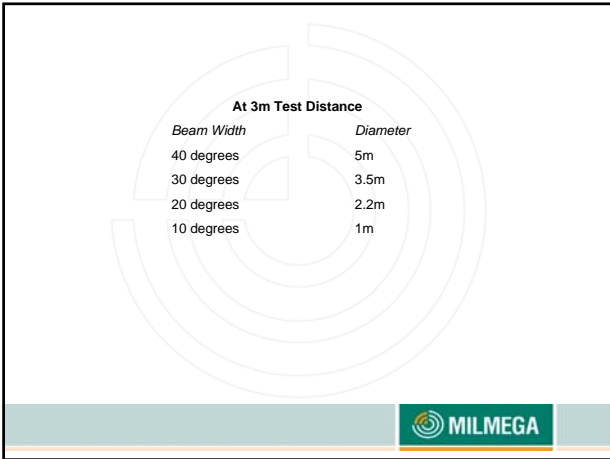
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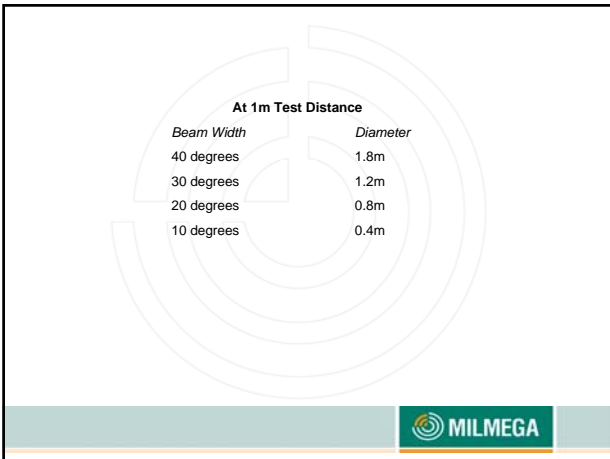
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**High Gain Horn Upside**

- Reduced RF Power Requirement
- Higher Field Contribution from Harmonic

**High Gain Horn Downside**

- Smaller Illumination Area (equivalency?)  
(Field uniformity, increased test time / complexity)

**Medium Gain Horn Upside**

- Large Illumination Area (reduced test time / complexity)
- Less Field Contribution from Harmonic

**Medium Gain Horn Downside**

- Higher RF Power Requirement (Low Gain at 1GHz and at 2GHz)



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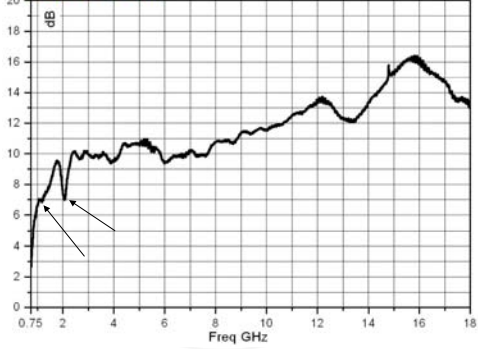
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Model 3115 Gain



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**Cable Loss**



Schwarzbeck 1-6GHz Horn



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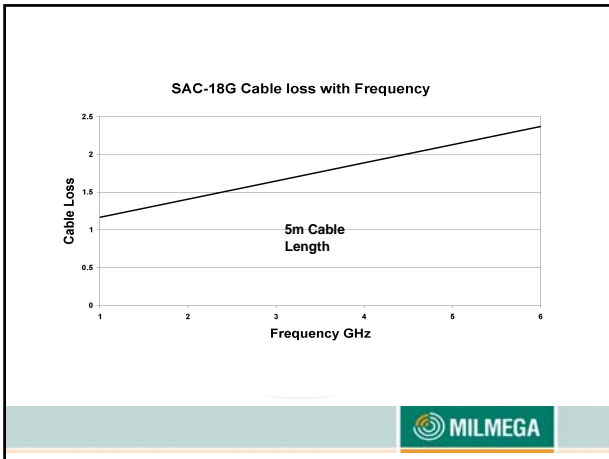
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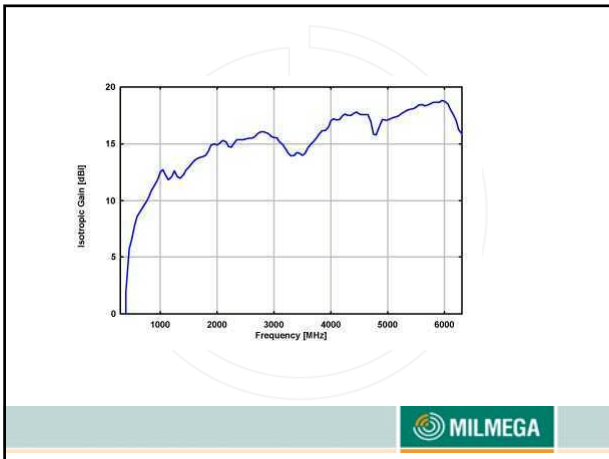
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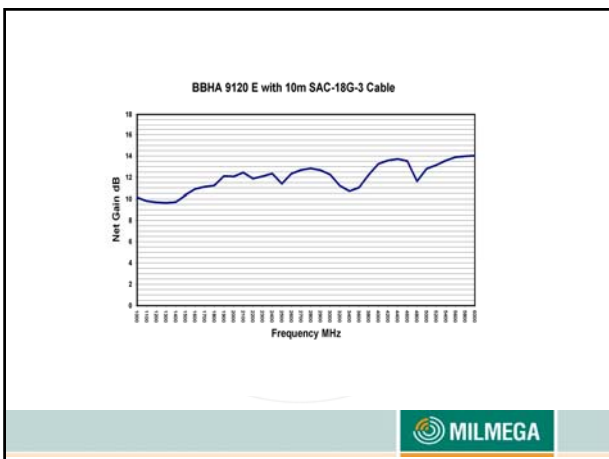
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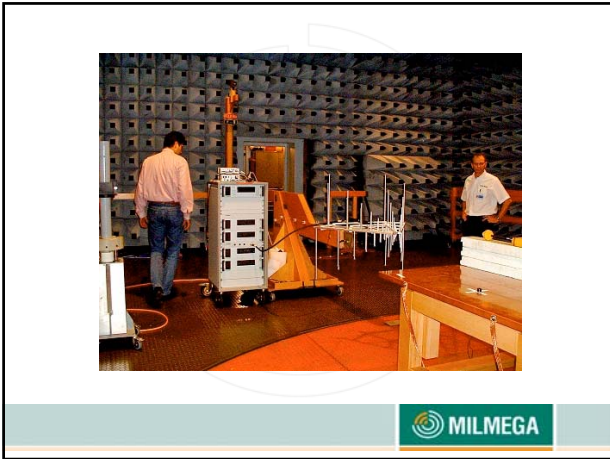
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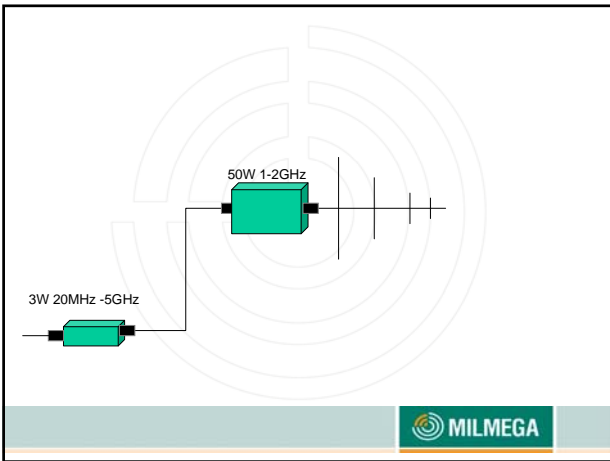
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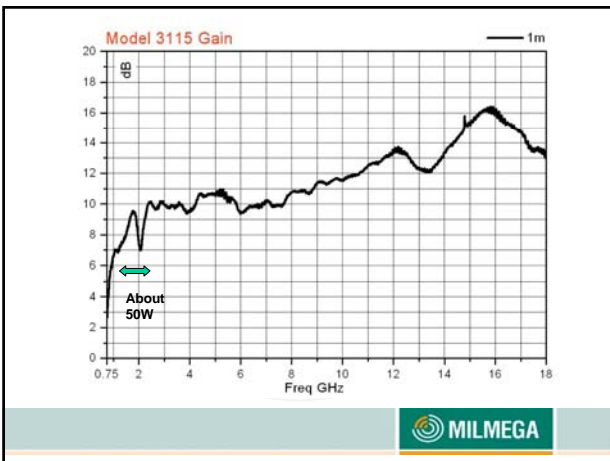
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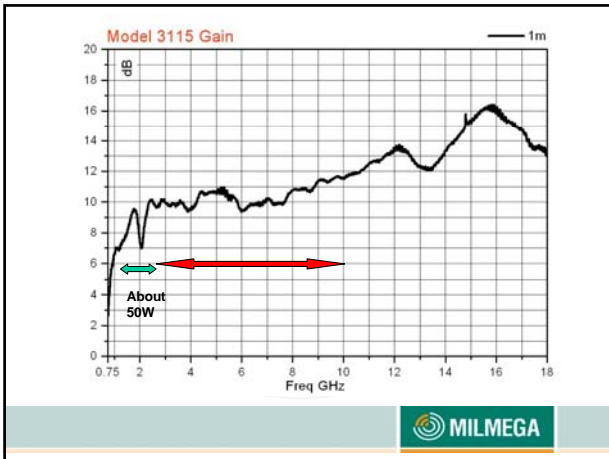
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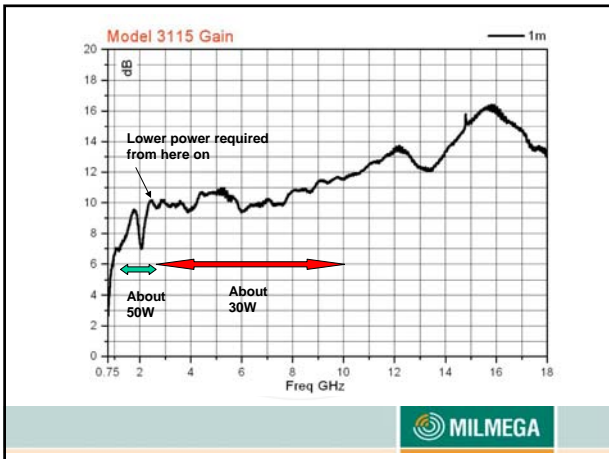
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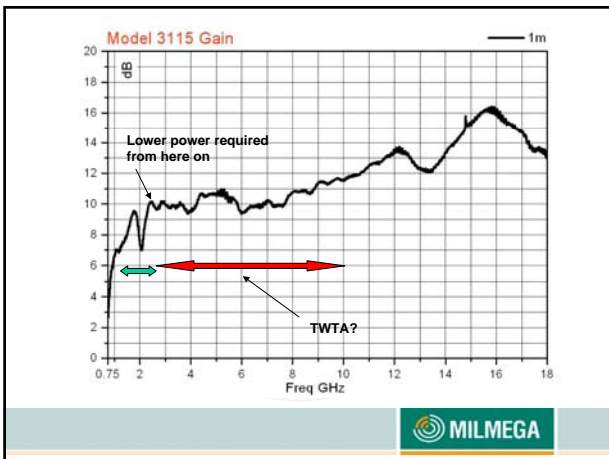
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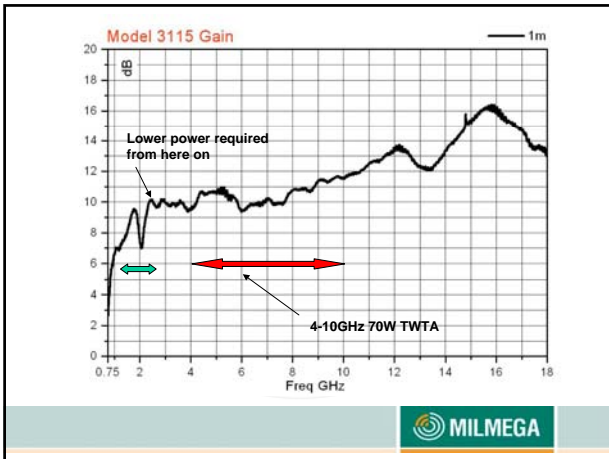
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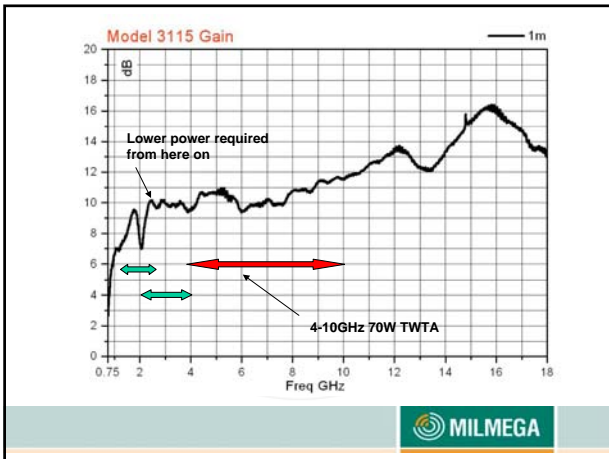
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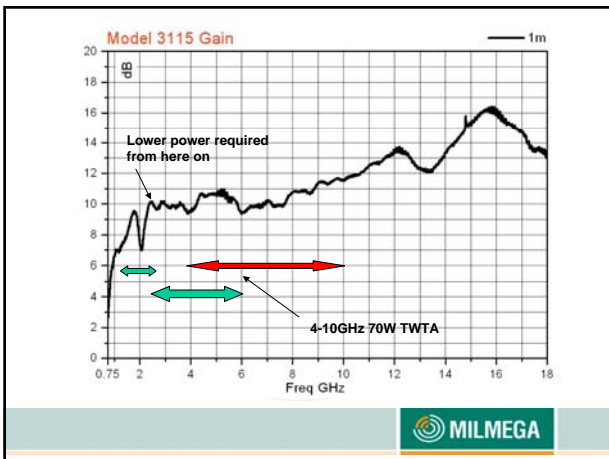
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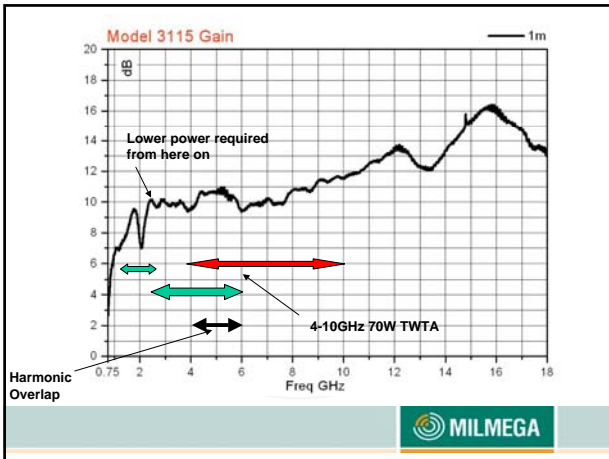


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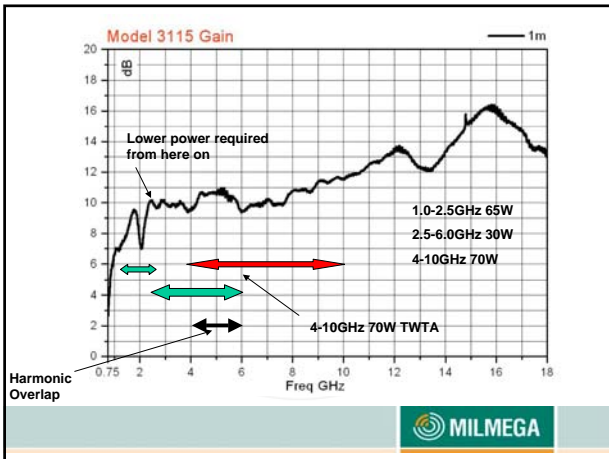
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END OF

Multi-Antenna Versus Single  
Antenna Solutions RF Immunity  
Testing

QUESTIONS??

MILMEGA

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