Update on Slot Antennas in different size waveguides
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Some experimental work by WA6EXV and N6CA has uncovered some discrepancies in the waveguide slot antenna calculations when using small waveguide sizes as described in **Section 7.2.9**. Results were particularly bad using WR-284 waveguide at 2304 MHz, where it is very close to cutoff and far below the "recommended" frequency range of 2.60 to 3.95 GHz.

Most of the slot antenna literature is based on experimental work by R.J. Stegen in WR-90 guide at 9.375 GHz, well within the "recommended" 8-12 GHz range. Others have demonstrated that successful slot antennas are possible in WR-75 at 10.368 GHz, at the very low end of the 10-15 GHz "recommended" range.

At the other end of the waveguide "recommended" range, we have calculated radiation patterns for WR-112 guide at 10.368 GHz, just above the recommended 7.05-10.0 GHz range. These patterns, in Figure 7-25, are inferior to the WR-75 and WR-90 patterns in the same figure.

Thus, we may infer that the useful range of waveguide for slot antennas *designed using the published equations (and software)* is probably close to the "recommended" frequency range in the books. The useful frequency range as transmission line can be stretched a bit. Therefore, I have added checks and warnings to the **slotantenna.xls** spreadsheet, and W6OYJ has done the same with his **BASIC** program. Please download the latest version.

The design recommendation in **Section 7.2.9** still stands: **Use the standard waveguide size with the design frequency near the center of the recommended frequency range for the guide.** Following this guideline will keep the dimensions in a range where the calculations have been shown to work.

WA6EXV is working on empirically designing a slot antenna in WR-284 waveguide. When enough data is available to improve the design calculations, further updates will be added.