Precision Communications, Inc.

Shively Labs®
A Division of Howell Laboratories, Inc. Bridgton, Maine 04009 USA

Adding Vertical Polarization to Boost VHF DTV Coverage

Adding a vertical component to a station's broadcasting channel can greatly improve penetration into buildings and homes, especially when viewers are only using indoor antennas.

The vertical component also helps increase the separation between the DTV signal and competing 'noise' generated by household electronics, which can push the DTV signal over the '15 dB' threshold. And of course, to grow into the mobile or portable TV market, a vertical signal component is required.

These issues that are minimized by adding vertical polarization have plagued VHF broadcasters ever since the DTV switchover, which ran from February 17th through June 12th, 2009. Since that time, other approaches have been attempted to address all the viewer complaints that poured in after the switch, with varying results. The stations that were able to finally get an FCC license adjustment to increase power realized some improvement, although viewer complaints still exist at ERP levels below 100Kw. A few bought new main broadcasting antennas that were either circularly polarized or had both horizontal and vertical components.

For all the other horizontal VHF broadcasters, there is another way to add vertical signal to your system, ranging from a half to a third of the cost of replacing your existing antenna. Precision Communications, Inc. in a joint effort with Shively Labs, has developed an answer that features lower costs, customizable configurations and is readily deployable. The solution begins with a consultation to assess your current system and needs and then integrates, among other equipment, a scalable side mounted antenna broadcasting vertical signal.

- 6 to 12 MHz bandwidth.
- Up to 1Kw input power per bay.
- 1 5/8" to 3 1/8" inputs.
- Multiple azimuth and bay configurations.
- Stainless steel construction.
- Pressurized Bays.
- Available with or without radomes.
- Excellent frequency response.
- VSWR ≤ 1.1:1
- Low weight and surface area.
  (see table on reverse for details)

Pictured Above: V Pol Test Site WGEM Quincy, IL

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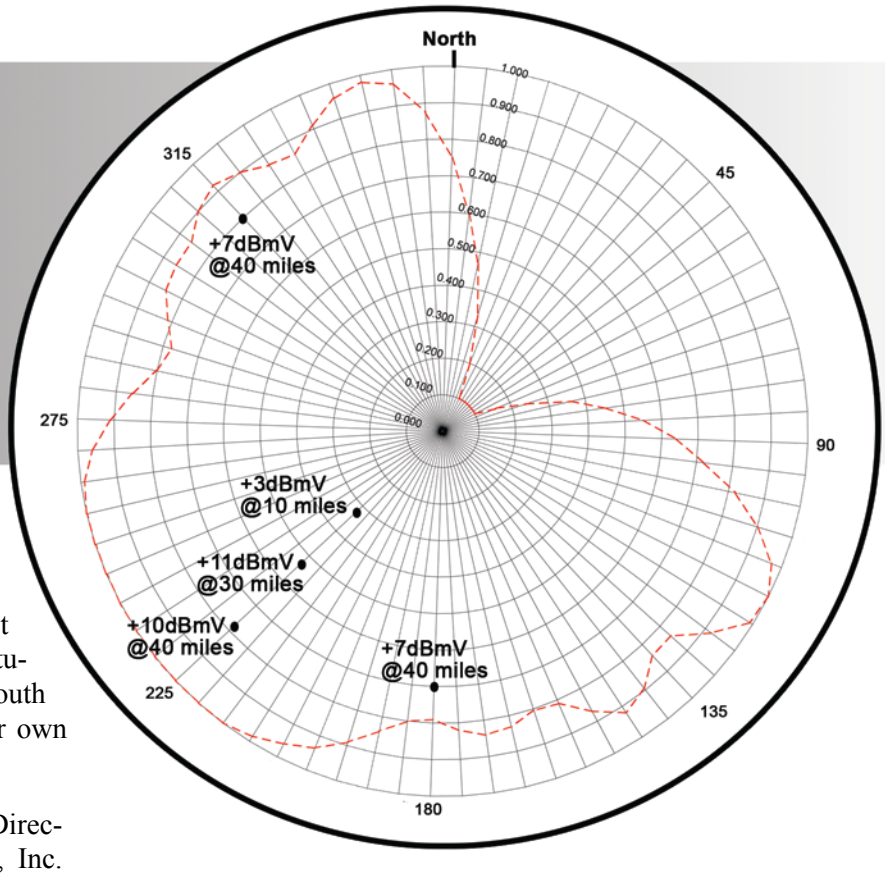
A Case Study: WGEM Quincy, IL DTV CH10

"Now We're Making Pictures. It's That Simple."

- Brady Dreasler, QNI



Signal strength gains at WGEM after V Pol based on measurements by CRMC.

On February 17th, 2009, WGEM switched their digital signal broadcasting operations over to their legacy channel 10 antenna system. Immediately, the viewer complaints began, but not just from home viewers. Personnel in the WGEM studio and office building located about 10 miles south of the transmitting tower could not pick up their own DTV channel.

Discussions were initiated with Brady Dreasler, Director of Engineering for the Quincy Newspapers, Inc. which is the corporate owner of WGEM and other TV stations. After determining available transmitter output and current line configuration, Precision Communications specified a Shively 6 bay Vertically Polarized antenna with a 60/40 power divider and the associated transmission line parts to properly operate the main batwing antenna simultaneously with the additional vertical antenna.

Before and after measurements were taken with the highlights of the gains in the vertical antenna's coverage area being noted on the accompanying graph. The station's measurements at the studio also showed marked improvement inside their office. Brady said, "It's easier to pick up our signal, inside or out. Here in the office, we couldn't get H, but we are getting V." He added that viewer complaints in the vertical antenna's coverage area have stopped. Brady is now looking at adding V Polarization to his other VHF stations and concluded his evaluation of the added vertical signal component by saying, "Now we're making pictures. It's that simple."

Number of Bays	Without Ice			With ½" Radial Ice		
	EPA_N	EPA_T	Weight	EPA_N	EPA_T	Weight
1	1.1	0.4.	116	1.5	0.5	151
2	4.6	3.2	232	7.2	5.3	313
3	8.0	5.9	348	13.2	10.3	490
4	15.3	12.5	464	24.8	20.8	706
6	22.6	18.3	696	36.0	30.2	1086
8	33.3	27.6	944	54.9	47.1	1523

Typical high VHF dipole Effective Projected Areas, Normal and Tangential, are in square feet and are based on the G revision of the EIA/TIA RS-222 Code. Weights are in pounds.

For more information or to set up a consultation, please contact Precision Communications, Inc. at 918-786-8084 or at pci@pcitower.com. Precision Communications is an antenna and tower service company located in Grove, OK, and provides service to broadcasters throughout the U.S. and overseas.

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