Welcome to AntennaSelect™ Volume 31 – April 2017

Welcome to Volume 31 of our newsletter, AntennaSelect™. Every two months we will be giving you an "under the radome" look at Antenna and RF Technology. If there are subjects you would like to see covered, please let us know what you would like to see by emailing us at: info@micronetixx.com

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New THV Series of VHF High Band C/P Antennas

We are introducing our newest Repack-Ready Antenna for high band VHF, the **THV Series**. **THV** Series Antennas are side-mounted light weight antennas that produce an excellent Omni-directional right-hand C/P pattern. They are available as a single bay, and in two-bay increments, up to 10 bays The Antenna uses the time tested dual inverted-vee design found on FM antennas. We have scaled the antenna down in size for high-band applications. The single bay model is fed directly, while the multi-bay models are fed via a power divider. The bays are spaced 1/2 Lambda apart. The 1/2 Lambda-spaced models have much lower RFR at high depression angles, allowing them to be used lower on a tower or rooftop.

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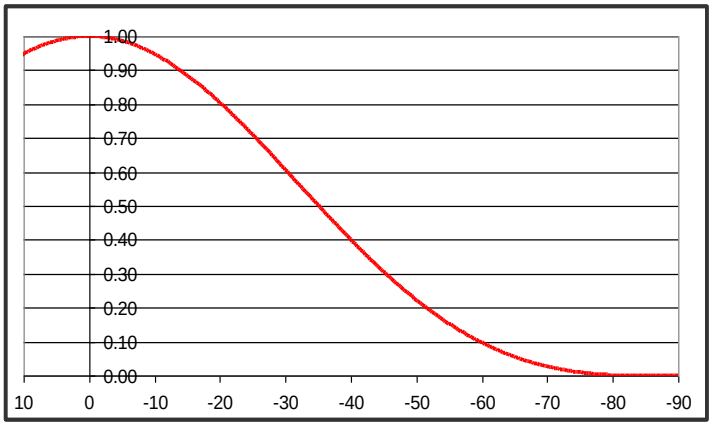
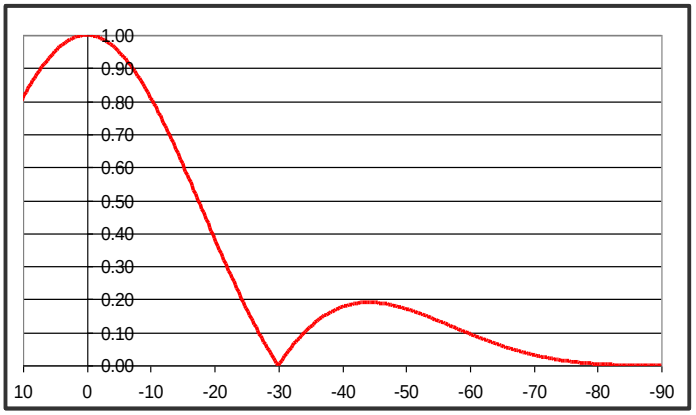
A single-bay **THV** is fed directly, while multi bay are fed with a power divider. Input power ranges from 1 kW with a single bay to 10 kW with the 10 bay antenna. The maximum ERP of the **THV** is 500 Watts with a single bay and 31 kW with a 10 bay antenna. Since the multi-bay **THV** Antennas are branch fed, there is no differential group delay across the channel, making this a perfect choice for ATSC 1.0 and 3.0 operations

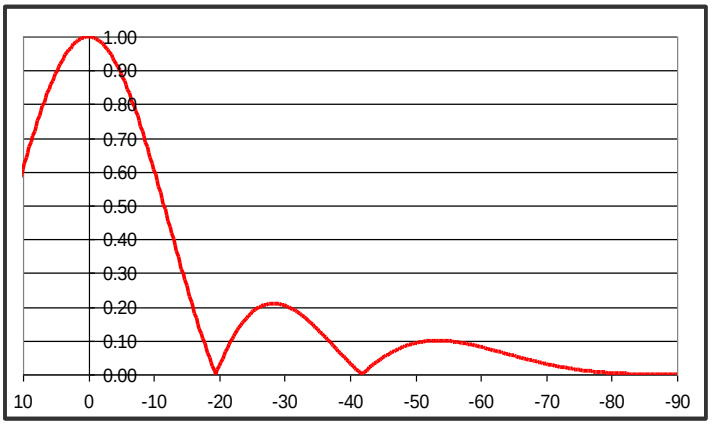
Sample THV antenna elevation patterns



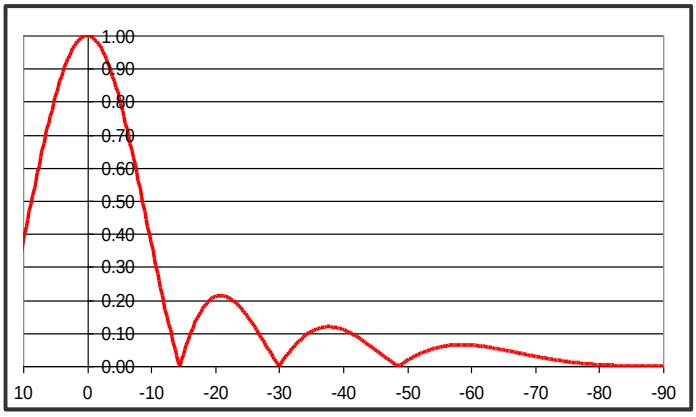
2 Bay elevation pattern



4 Bay elevation pattern



6 Bay elevation pattern



8 Bay elevation pattern

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THV Antenna Electrical Information

Number of Bays	Antenna Gain (C/P)	Antenna Max Input Power	Maximum ERP
1	0.49 (-3.1 dB)	1 kW (0.0 dBk)	500 Watts (-3.01 dBk)
2	0.69 (-1.61 dB	2 kW (3.01 dBk)	1.3 kW (1.14 dBk)
4	1.30 (1.14 dB)	4 kW (6.02 dBk)	5 kW (6.99 dBk)
6	1.90 (2.78 dB)	6 kW (7.78 dBk)	11 kW (10.41 dBk)
8	2.50 (3.98 dB)	8 kW (9.03 dBk)	20 kW (13.01 dBk)
10	3.10 (4.91 dB)	10 kW 10.00 dBk)	31 kW (14.91 dBk)

The table above shows the gain, input power rating and maximum ERP of the antenna with an Omni-directional pattern. Micronetixx **THV** Antennas can also be made with a broad cardioid pattern. To get maximum ERP for the cardioid models, multiply the maximum ERP shown in the table above by 1.8.

The **THV** antennas are built from rugged schedule 304 stainless steel. All of the elements are welded together and are at DC ground for superb lightning protection. Micronetixx **THV** antennas mount to an outrigged pole or tower leg. Multi-bay models come with a cut-to-frequency feed system and a power divider. The input to the power divider can be furnished with either a 1-5/8” or 3-1/8 EIA input.

The chart below shows the space needed to mount the antenna and its wind load area and weight. The **THV** is the lowest weight and wind area high band VHF antenna on the market.

THV Antenna Mechanical Information

Number of Bays	Antenna Length	Reccomended tower space	Antena Weight	Antenna Load Area
1	2.0 ft. (0.61 m)	10 ft. (3.05 m)	15 lbs. (6.81 kg)	0.5 ft^2 (0.04 m^2)
2	4.5 ft. (1.37 m)	12.5 ft. (3.81 m)	37 lbs. (16.1kg)	1.4 ft^2 (0.13 m^2)
4	9.6 ft. (2.93 m)	19.6 ft. (5.97 m)	77 lbs. (35 kg)	2.4 ft^2 (0.22 m^2)
6	14.6 ft. (4.45 m)	24.6 ft. (7.50 m)	97 lbs. (44.1 kg)	3.4 ft^2 (0.32 m^2)
8	19.7 ft. (6.00 m)	29.7 ft. (9.05 m)	127 lbs. (57.7 kg)	4.4 ft^2 (0.41 m^2)
10	24.7 ft. (7.52 m)	34.7 ft. (10.58 m)	157 lbs. (71.4 kg)	5.4 ft (0.50 m^2)

Note: Mechanicals are for a channel 10 antenna

The Micronetixx **THV** is repack-ready and is great for temporary or permanent standby applications. Call us today for the details.

Lindenblad C/Pantenna for low band VHF

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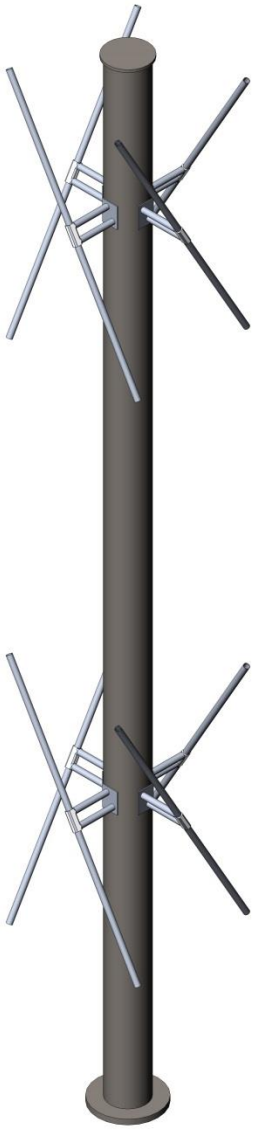

Two Bay LB antenna

The **LB** Series of antennas are an excellent solution for low-band VHF operations. The antenna has an excellent Omni-directional azimuth pattern in both horizontal and vertical planes. The offset elements of the **LB** Antenna produce a right-hand rotated C/P signal. Having a C/P transmitting antenna can increase received field strength of up to 20 dB, versus a H pol only antenna, in areas where Faraday rotation has occurred.

The design efforts for this antenna technology started before WW II and was mainly developed for air to ground communications for aviation uses. The technology had been overlooked once TV broadcasting had started to expand. Almost all TV stations used a different antenna, the Batwing. With a number of stations moving to low band VHF, we decided to dust off and adapt this very useful technology.

The antenna has one input that interfaces to a 90 degree hybrid. The output of the hybrid connects to a set of two power dividers. The power dividers feed the individual antenna elements. This is very similar to how a batwing antenna works. The antenna bays are spaced one wavelength apart along its vertical aperture. Since the antenna elements need a good free space area to operate, the **LB** is a top mounted only technology.

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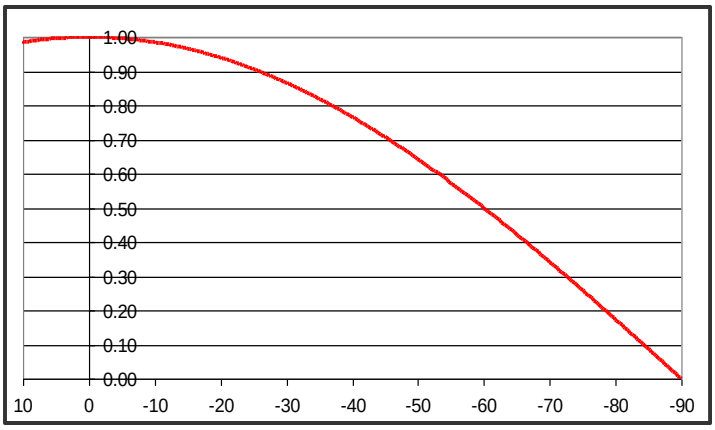
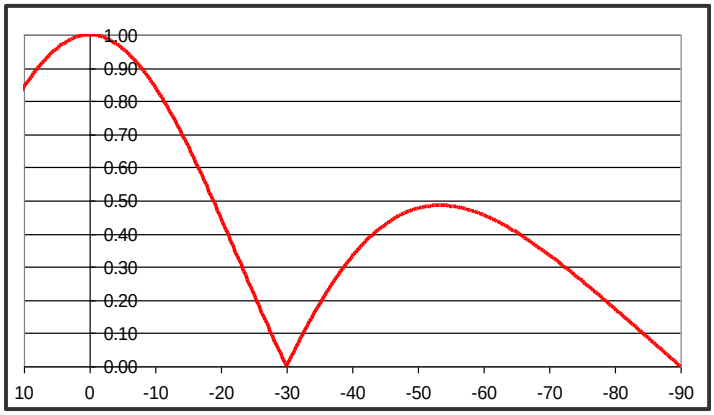
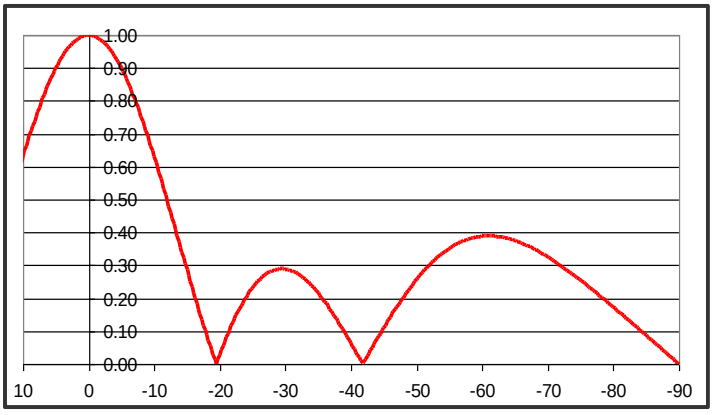
The LB antennas are available in one to four bay counts. Below are sample elevation patterns



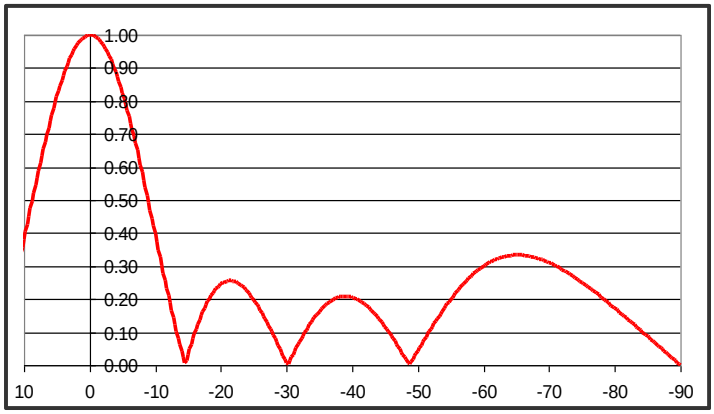
One Bay Antenna
Gain: 0.49 (-3.10 dB)



Two Bay Antenna
Gain 1.00 (0.00 dB)



Three Bay Antenna
Gain: 1.50 (1.76 dB)



Four Bay Antenna
Gain: 2.00 (3.01 dB)

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The **LB** Antenna produces an Omni-directional azimuth pattern very similar to the Batwing antenna. The ratio of H to V field values are very well controlled at all azimuths.

The antenna uses a galvanized pylon that can be furnished either as a flange mount or bury mount section. The antenna elements are fabricated from rugged stainless steel and are DC grounded for excellent lightning immunity.

Low band antennas are quite large, with a two-bay **LB** Antenna being about 35 feet long. A two-bay model on channel 2 weighs about 4500 pounds and has a wind load area of 45 square feet. These loads are smaller than many of the top mount UHF slot antennas they will replace. This is very helpful where the tower is at, or over capacity.

The antenna is fed with a single 3-1/8" input, with a 30 kW RF power rating. A single-bay **LB** Antenna can produce up to a 15 kW ERP, while a 4 bay model can produce up to 60 kW. Stations moving to low band VHF in the Spectrum Auction were given ERP's from 459 Watts to a maximum of 10 kW, with the great majority getting under 2 kW. So with possible maximumization down the road, these antennas will have plenty of headroom.

The biggest advantage to the **LB** Lindenblad is the circular polarization it produces. At low band, impulse noise can be problematic. Making sure every Watt of signal gets out is job one. Even if a viewer has a good all band outdoor antenna, Faraday Rotation can decrease the received signal level up to 20 dB. Something simple like a metal barn roof a few hundred feet away from the receive antenna can cause polarity changes. For the station who ended up with a 459 Watt ERP, with polarization shift, the effective ERP drops to 4.59 Watts. For indoor viewers C/P offers the best chance of getting received. If you are moving to low band, C/P is the best possible investment you can make.

TV Spectrum Re-packing Antenna Guide V2.0

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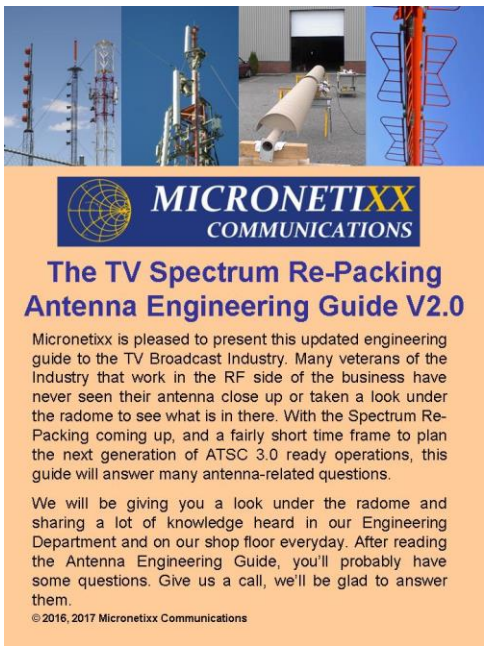

Last Summer we issued our TV Spectrum Antenna Engineering Guide. Nine months later our V2.0 of the Guide is available. The Guide has now grown to 87 pages. More subject material has been added - some that readers have asked about. We are now in the repack race by just over a week. Based on the first week so far, there may well be a V3.0 version of the Guide coming out not that far in the future. Stay tuned.

The guide can be found at:

http://www.micronetixxantennas.com/Micronetixx Repacking Guide.pdf

Here is a global answer to where to put you money into the repack. One – lower gain antennas are better. Aim to hit your target. Two - go to elliptical or circular polarization. This is true for VHF and UHF stations. As the viewers change the devices they use for content, your signal needs to be everywhere. Three – with antennas get a solution that is customized for your station. What is on page 8 of a manufacturers catalog may not give you the best performance. Our custom solutions do not cost extra. Why not give us a try!

Be on the lookout for the next volume of AntennaSelect™ coming out in June

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