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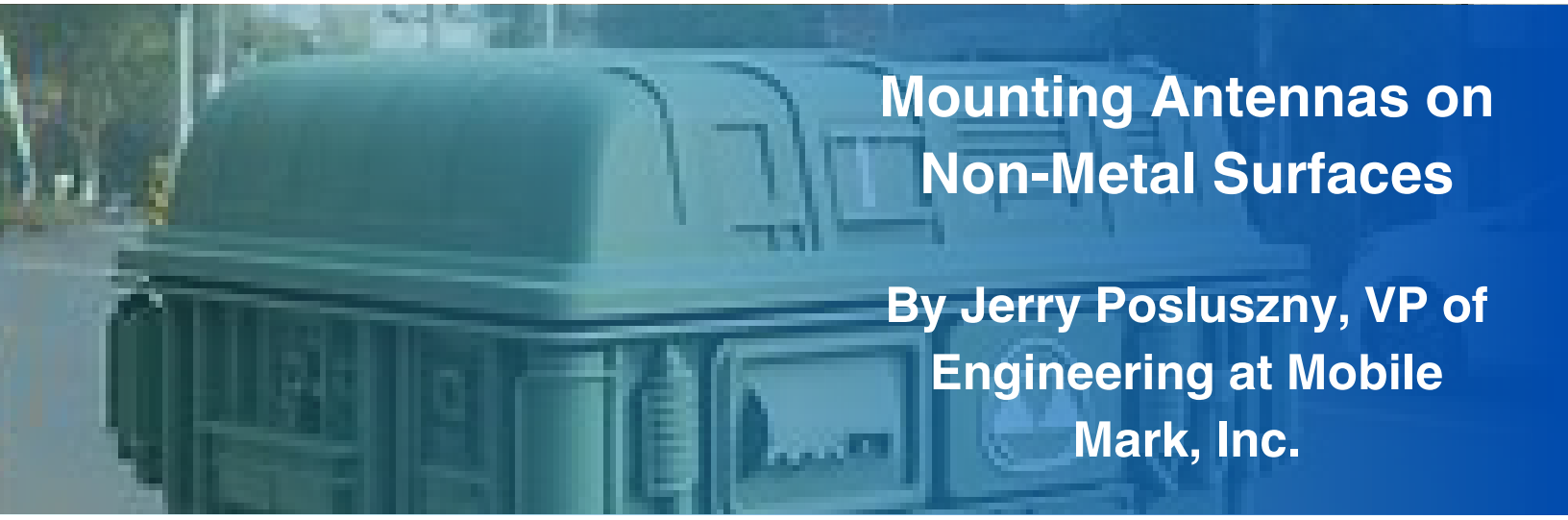

Mounting Antennas on Non-Metal Surfaces

By Jerry Posluszny, VP of Engineering at Mobile Mark, Inc.

Ground-Plane-Dependent Antennas on Non-Metal Surfaces

As many of you know, antennas designed for panel (surface) or mobile typically need some sort of metal ground plane to work at their best performance. Even many antennas that are designed to not require a metal ground plane, “Ground-Plane-Independent”, still benefit from the effects of being mounted on a metal surface typically in regard to the radiated pattern or the efficiency.

So, what do you do if you want to mount to a plastic NEMA box or a fiberglass vehicle roof? There are several approaches you can use.

The simplest approach is to add a metal plate on the surface where the antenna is to be mounted. This is the preferred solution and will give the best RF (Radio Frequency) performance, though it is not always practical in the real world. The metal plate can be attached to the top surface, but it also will work if it is attached to the underside of the non-metallic mounting surface.

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The second method is to have the inside of the enclosure coated with a metalizing treatment. Spray-on products are available for use as electrical shielding, and EMI reduction, these can be very effective. This is also a good electrical solution but can be costly and difficult to do in the field.

The third approach is to add a self-adhesive metal material on the inside of the mounting surface. This can be simple HVAC aluminum tape that can be purchased at a hardware store, or specially cut aluminum shapes that can be attached inside. This is a simple solution that has proven to be quite effective.

The only requirement is that the metalized surface is in contact with the mounting hardware of the antenna and that it is large enough to be effective. Typically, a quarter wavelength at the lowest frequency of metalizing is optimum. This is usually fairly easy to do on the inside of a non-metal vehicle roof, but not typically in an electrical cabinet or NEMA box. In that case, you would try and get the maximum amount of area covered.

Simple applications of one of the described methods could greatly increase the effectiveness of your antenna systems and the reliability of your communications link.

To learn more, please refer to our additional White Papers

or reach out to speak with an antenna expert.