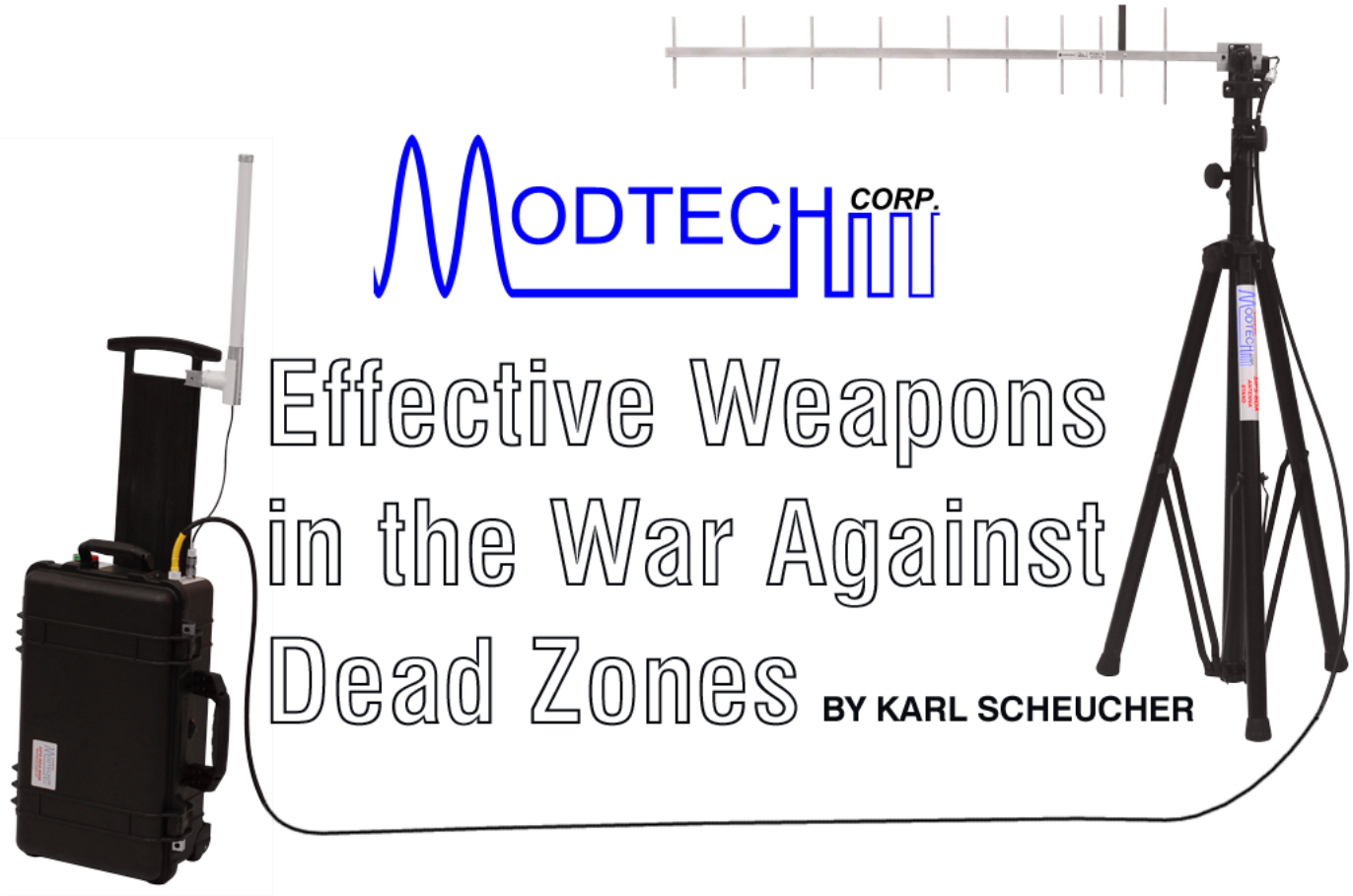

MODTECH CORP.

Effective Weapons in the War Against Dead Zones

BY KARL SCHEUCHER

A breakthrough in high-performance lithium ion power enables important new options for NFPA / ICC compliant in-building radio coverage. The NPSTC In-Building Task Group identifies three primary approaches: 1) adding antenna sites (expensive), 2) treating buildings by installing equipment (medium cost), and 3) deploying portable systems as needed (less costly). The merits of a fourth option, a hybrid solution using a portable signal booster and built-in antenna systems interfaced via a standard building interface, are considerable.

The Portable System

An advanced, lithium ion powered, portable system includes a) directional outdoor antenna with stand and cable, b) indoor antenna with stand and cable, and c) weatherproof BDA kit with 12-hour minimum runtime (fig. 1). With lightweight lithium ion power, BDA kits weighing 45 lbs. or less having 65 to 80 dB gain and output power of ½ to 1 W are now available. Engineered for efficiency, a portable system may be setup in two to three minutes.

Portable systems solve dead zones whenever they arise in practice. First responders, premise personnel, or system operators can deploy them easily. Incorporating broadband BDAs having automatic gain control and oscillation suppression assures these systems are non-interfering. Powered only when needed, portable systems consume no energy and generate no RF the rest of the time making them inexpensive to operate and friendly to both RF and earth's environments (green).

Building codes often target new construction and renovations exempting important, existing structures. Available wherever and whenever radio deficits are encountered, portable systems are key to coverage in grandfathered structures. Equipment cost distributed over all buildings in an area may be slight and willingly subsidized by premise owners. Portable equipment is eligible under Assistance to Firefighters Grants (AFG) and is aligned with the objectives of State Communications Interoperability Plans (SCIP) as well.

Portable system including outdoor antenna, portable BDA, and indoor antenna. Lithium ion powered, the system is light and has 12-hour minimum runtime.

Portable systems remain intact following destructive events such as fire, hose-down, explosion, chemical spill, storms, etc., events that may destroy built-in equipment just when it is most needed. Portable antennas can be flexibly aimed at many in-range towers allowing portable systems to interoperate with local, county, state, or other systems. A valuable component in the overall communications scheme, portable systems represent cost-effective, flexible insurance for universal in-building coverage.

The Hybrid Solution

A lithium ion powered, portable signal booster can interface built-in antenna systems forming a hybrid solution that's ready in seconds when needed. Buildings install only passive equipment (cabling, splitters, couplers, antennas). Material, installation, and maintenance costs are significantly reduced making this economically attractive to owners. First responders carry a complete portable system but deploy only the portable booster equipment keeping the portable antennas stowed unless needed. Key to the hybrid solution is a standard building interface enabling building antennas and responders' portable boosters to be quickly and reliably interconnected.

The hybrid approach is being evaluated in several locations. The characteristics of an effective building interface are becoming apparent and are now briefly summarized.

A standard building interface for radio enhancement should use a NEMA 4-type enclosure approximately 10" x 12" in size, mounted on the building's exterior near the entry point used by emergency personnel. Standard labeling should be conspicuous (fig. 2). Within the enclosure one finds a panel hosting two rugged RF connectors, a male 7/16 DIN-type and a female 7/16 DIN-type designated "Indoor Antenna" and "Outdoor Antenna" respectively (fig. 3). Vital information including a grid map revealing regional tower locations and control frequencies and plans depicting building antenna schema is available in a literature pocket. Compatible portable boosters may be quickly connected with standard cables. Gender prevents misconnection.

A standard building interface for radio enhancement uses a NEMA 4-type enclosure approximately 10" x 12" in size, is mounted on the building's exterior near the entry point used by emergency personnel, and has standard, conspicuous markings.Enhanced Built-in Solution

Enhanced Built-in Solution

Assume a complete system including built-in amplifier is planned. Use of the standard building interface is again advantageous. The building booster up/downlink ports route to two additional RF connectors within the standard interface. Designated “Building Amplifier Indoor Port” and “Building Amplifier Outdoor Port”, they are connected using short jumper cables to the aforementioned building antenna connectors by default. In the event that building components become damaged, portable components can be efficiently substituted at the standard interface.

Can you hear me now?

Lithium ion portable systems are available to solve building dead zones economically, flexibly, and reliably. They represent universal coverage insurance. Hybrid solutions leveraging built-in and portable equipment in combination and using a standard building interface have important advantages. Use of the standard building interface enhances full built-in solutions as well.

A standard building interface for radio enhancement incorporates two rugged RF connectors, a male 7/16 DIN-type and a female 7/16 DIN-type designated “Indoor Antenna” and “Outdoor Antenna” respectively. Gender prevents misconnection.

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