

# **DIGITAL MICROWAVE SYSTEM MOBILE, ALL-TERRAIN SYSTEM FOR TELEMETRY OR COMMUNICATIONS**

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## **ABSTRACT**

Portable, mobile tactical microwave telemetry and/or communications systems have always been plagued with three major problems: antenna height for first fresnel zone clearance over the terrain between the two ends of the link, atmospheric multipath fading and multipath reflections from buildings, bodies of water, certain terrain features, etc.

This paper describes a digital microwave system with a modular capability to add additional digital channels, analog channels or voice channels as required. A modular Baseband Processor is used, which provides multiplexing capability and modulation of high speed digital data at a bandwidth of one bit per Hz using the Duobinary Technique which also provides error detection capability without the need for adding extra bits to the stream.

The unique and versatile feature of the system is that it involves three vehicles. The first is either a mobile land traversing test vehicle or a remote, mobile command post. The second is a mobile relocatable repeater. The third is the base station for the system, and can either gather data by computer, connect to land communication lines or transmit to a distant station via another RF link. Vehicles two and three have telescoping pneumatic towers up to 42 ft in height with two by four foot parabolic dish antennas for maximum gain with minimum wind loading. The parabolic antennas on vehicles two and three are equipped with automatic tracking systems, with additional manual slewing capability in both azimuth and elevation. Vehicle one has an omnidirectional vertical colinear array mounted on a short adjustable mast.

Vehicles two and three can track vehicle one simultaneously with a diversity switch, to virtually eliminate RF shadow problems from terrain variations. The telescoping towers can be set to any position for terrain clearance or to eliminate multipath reflections.

The three vehicles can also be used in a tandem configuration for a tactical communications link from a remote field command post. The system has full duplex capability.