

CLAIMS

1. A multimode antenna structure for transmitting and receiving electromagnetic signals in a communications device, the communications device including circuitry for processing signals communicated to and from the antenna structure, the antenna structure configured for optimal operation in a given frequency range, the antenna structure comprising:

a plurality of antenna ports operatively coupled to the circuitry;

a plurality of antenna elements, each operatively coupled to a different one of the antenna ports, each of said plurality of antenna elements being configured to have an electrical length selected to provide optimal operation within said given frequency range; and

one or more connecting elements electrically connecting the antenna elements such that electrical currents on one antenna element flow to a connected neighboring antenna element and generally bypass the antenna port coupled to the neighboring antenna element, the electrical currents flowing through the one antenna element and the neighboring antenna element being generally equal in magnitude, such that an antenna mode excited by one antenna port is generally electrically isolated from a mode excited by another antenna port at a given desired signal frequency range without the use of a decoupling network connected to said antenna ports, and the antenna structure generates diverse antenna patterns.