



The relative distribution of observable meteor trails in forward-scatter meteor communications
by Norman James Rudie

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY in Electrical Engineering
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Abstract:

A method for calculating the relative distribution of observable trails for a forward-scatter meteor communication link is developed. The theoretical distribution is a function of the following variables: (1) the gain and polarization of the transmitting and receiving antennas; (2) geographical location of the communicants; and (3) the time of day and month of operation.

An ecliptic radiant distribution is synthesized from the existing information on meteor orbits. The radiant distribution closely approximates the distribution derived by the scientists at Jodrell Banks, Manchester, England. Their radiant distribution is based on radar observations of meteors.

Topological maps are used to illustrate the effect of the above-mentioned variables on the relative distribution of observable trails. Whenever possible, the maps conform to an existing link between The Boeing Company, Seattle, Washington, and the Electronics Research Laboratory, Bozeman, Montana.

The agreement between theory and experiment appears to confirm the validity of this method of calculating the relative distribution of observable trails.

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