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**Abstract :** The possibility of creating a stable, efficient scatter propagation communication path below the ionosphere was investigated. This communication path would be free from interruptions due to ionospheric storms. Quite often communication by sky wave propagation is made impossible at any frequency and only ground waves and tropospheric scatter are useful for propagation beyond line-of-sight. Neither the low frequency channels, which must be resorted to for efficient ground wave transmission, nor tropospheric scatter circuits are very useful for tactical communication purposes. Both require high power, and elaborate antenna structures. Communication by tropospheric scatter is normally limited to a few hundred miles. The general approach taken in this study was suggested by Dr. William J. Thaler of the Office of Naval Research: Efficient scattering elements are to be generated and placed in the lower stratosphere within line of sight of two stations wishing to communicate. The majority of the work on this contract has centered on two important considerations; one, what will do the job of scattering, and two, how can we place the scatterers in the proper position and maintain them there. To be considered workable the scattering system must be capable of fulfilling the requirements of both considerations. (Author)

**Descriptors :** \*RADIO TRANSMISSION, \*REFLECTORS, SCATTERING, PROPAGATION, COMMUNICATION AND RADIO SYSTEMS, MAINTENANCE, SPHERES, X BAND, GRATINGS (SPECTRA), LIFE EXPECTANCY(SERVICE LIFE), IONOSPHERE.

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