Over the course of the contract Dr. Moses published 12 papers with one still pending. His work on novel electromagnetic wave propagation, together with insights regarding possible transmitters, is nothing short of terminal. Dr. Moses was the first to rigorously characterize the universal character of far field patterns produced by a source that operated over a finite time frame. Such patterns could be "requested" and then the design/operating procedure of the source would be the fundamental unknown. Such possibilities were communicated to government lab researchers at AL (Brooks AFB) and subsequent work will be pursued by them and Dr. Moses.
FINAL REPORT

CONTRACT F 49620-88-C-0070
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

1. Period of Performance: April 1, 1988-March 31 1993

2. Papers Published:


3. **Paper in Press.**


4. **Submitted Paper.**


5. **Reports Written.**

   Two reports were written without intending immediate publication. They were for the use of Dr. R. A. Albanese. One report was to evaluate the electrostrictive effect of an electromagnetic pulse travelling through a dielectric medium. The second concerned the propagation of a pulse in a moving dielectric medium.

6. **Current Research.**

   During the 6 month period immediately before March 31, 1993, the effect of time-dependent propagation through a chiral-like medium was studied. This is probably the first *time-dependent* study. Results will be used for the Doctoral thesis of S.B. Bronson, who is on the contract as a consultant. Ultimately, it is expected that some of the results will be published. Some research is also going on in which light is considered to consist of photons. We seek to see how the wave and particle picture of light leads to overlapping and (in some cases) contrasting results in terms of propagation.

7. **Total Funding.**

   The total authorized funding under the contract was $582,061. The actual funding, however, was $554,812. The difference of $27,249 is to be paid to the Harry E. Moses-Applimath Co. on receipt and acceptance of this final report.

8. **Consultants Supported.**

   1. Mr. J.W. Penn of the Special Projects Division, Armstrong Laboratories, Brooks AFB.
   2. Prof. P.R. Kotiuga and Prof. G. v.H. Sandri of Boston University.
   3. Prof. R. T. Prosser of Dartmouth College
   3. Graduate Students S.D. Bronson and C. Konstantopoulos of Boston University.

10. **Talks.**

    H.E. Moses and R.T. Prosser have given talks on the material of the published papers at: SPIE meetings at Los Angeles in January 1989-1991, at Boston University, Harvard University, Dartmouth College, University of Lowell, Armstrong Laboratories at Brooks AFB, and Geophysics Laboratories at Hanscom AFB.

Yearly reports have been sent to the monitor, Dr. Arje Nachman. They have also been sent to Dr. R.A. Albanese of Armstrong Laboratories. Preprints and reprints of all papers have been sent to Dr. Nachman and Dr. Albanese. The Harry E. Moses-Applimath Company has also complied with all other provisions of the contract.

Sincerely yours,

Harry E. Moses