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Glaser

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Verser, F.A.

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14. TITLE (U) Dosimetry of Radio-frequency and Microwave Radiation in Mammals (18)						
15. SCIENTIFIC OR TECH. AREA 014100 Radiobiology				16. STAFF DATE 08 61	17. CRIT. COMPL. DATE NA	18. FUNDING AGENCY OTHER DA
19. PROCURE. METHOD C. In-House	20. CONTRACT/GRANT A. NUMBER NA	21. DATE	22. RESOURCE EST. PRIOR FY 65 CURRENT FY 66	23. PERSONNEL 3	24. FUNDS (In thousands) 93	25. OTHER FUNDS (In thousands) 59
26. GOVT LAB INSTALLATION ACTIVITY NAME ADDRESS Headquarters US Army Medical Res & Dev Command Washington, D. C. 20315 DEPT. INVOY. Hawkes, G. R., Ph.D. TEL. 202-OX 66791			27. PERFORMING ORGANIZATION NAME ADDRESS US Army Medical Res Laboratory Fort Knox, Ky. 40121 INVESTIGATOR PRINCIPAL ASSISTANT Verser, Lt Col. F. A. Syracuse, N. Y. TEL. 502-45038 TYPE DA			
28. TECHNOLOGY UTILIZATION NA			29. CLASSIFICATION NA			
30. KEYWORDS Radio-frequency, Energy; Microwaves; Dielectric Constants; Transmission Characteristics						
31. OBJECTIVE (U) Tech Objective - Determine the reflection and absorption characteristics of the human body when exposed to microwave radiation. (U) Approach - The transmission characteristics of a sample exposed to microwave radiation inside a wave guide will be determined. Initial work will be performed in the X-band. This work will be extended to other frequencies, modes pulsed radiation and more complex systems. (U) Progress (Jul 63 - Apr 65) - Glass sensors capable of measuring temperature change in a sample exposed to RF radiation have been developed. An extensive literature search has been conducted covering the experimental and theoretical aspects of the work outlined in the approach. Equipment is being calibrated to accomplish the first phase of this project.						
32. COMMERCIAL AVAILABILITY a. Formed b. Unformed c. Other NA	33. ABSTRACTIVE	34. GPO CODE BR	35. SUBJECT CODE I	36. PARTICIPATION NA		
37. FUNDING AGENCY		38. SPECIAL EQUIPMENT				
39. EST. FUNDS (In thousands)		40.				

DD FORM 161A

(Change 1 to 26 identical to NADA Form 111)

B71P 04 07 (cont)

Progress (cont)

Calibration of the equipment was confined to work on the power meters and thermistors. It was found that the calibration curves obtained on different occasions were not always in statistical agreement. There are several possible reasons for this. The power meters and thermistors in use were not temperature compensated and hence the measurements are a function of the ambient conditions. In an attempt to determine the significance of ambient conditions, power measurements were made when the thermistor was exposed to a constant power level and the ambient temperature and humidity were varied. A detailed analysis of these data is in process but preliminary evaluation indicates that for a constant relative humidity, the thermistor sees less power with an increase in the ambient temperature, and for a constant temperature the thermistor sees more power for an increase in the relative humidity. Another problem encountered is the inaccuracy in the power meters. The power meters in use have an accuracy of $\pm 5\%$ of the full scale reading. Hence, when three meters are employed to measure the incident, reflected, and transmitted power in order to calculate the power absorbed, a total error of $\pm 20\%$ is very probable. Unless sophisticated methods can be employed to reduce this error, these power meters are not satisfactory for the determination of good dielectric constants.