

PROJECT ADMINISTRATION DATA SHEET

ORIGINAL REVISION NO. _____

Project No. A-3932 GTRI/~~XXX~~ DATE 8 / 27 / 84

Project Director: Dr. Thomas B. Wells ~~XXXXX~~Lab ECSL

Sponsor: VERSAR, Inc.

Type Agreement: P.O. No. 17518 (under Gov't Prime N00019-83-C-0418)

Award Period: From 8/1/84 To 9/30/84* (Performance) _____ (Reports) _____

Sponsor Amount: 1-31-85
This Change _____ Total to Date _____

Estimated: \$ 6,375 \$ 6,375

Funded: \$ 6,375 \$ 6,375

Cost Sharing Amount: \$ None Cost Sharing No: N/A

Title: Testing Services

ADMINISTRATIVE DATA

OCA Contact Brian J. Lindberg X4820

1) Sponsor Technical Contact:
Dr. Bob Shaver
VERSAR, Inc.
6850 Versar Center
P.O. Box 1549
Springfield, VA 22151
(703) 750-3000

2) Sponsor Admin/Contractual Matters:
Walter H. Rogers, Jr.
Vice President & Treasurer
VERSAR, Inc.
6850 Versar Center
P.O. Box 1549
Springfield, VA 22151

Defense Priority Rating: N/A Military Security Classification: N/A

(or) Company/Industrial Proprietary: N/A

RESTRICTIONS

See Attached N/A Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval - Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of \$500 or 125% of approved proposal budget category.

Equipment: Title vests with N/A

COMMENTS:

* Performance date is flexible based on receipt of samples (not to exceed 86 days from receipt of samples).

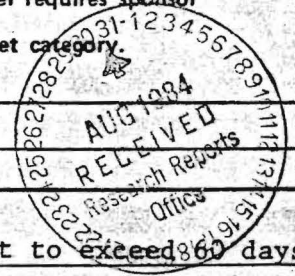
COPIES TO:

Sponsor I.D. #01.221.000.85.001

Project Director (Wells)
Research Administrative Network
Research Property Management
Accounting

Procurement/EES Supply Services
Research Security Services
Reports Coordinator (OCA)
Research Communications (2)

GTRI
Library
Project File
Other _____



SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date 3/18/85

Project No. A-3932 & A3932-002

~~XXXXXX~~ Lab ECSL

Includes Subproject No.(s) _____

Project Director(s) Dr. Thomas B. Wells GTRI / ~~XXXX~~

Sponsor Versar, Inc.

Title Testing Services

Effective Completion Date: 1/31/85 (Performance) _____ (Reports)

Grant/Contract Closeout Actions Remaining:

- None
- Final Invoice or Final Fiscal Report
- Closing Documents
- Final Report of Inventions
- Govt. Property Inventory & Related Certificate
- Classified Material Certificate
- Other _____

Continues Project No. _____ Continued by Project No. _____

COPIES TO:

- Project Director
- Research Administrative Network
- Research Property Management
- Accounting
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- Research Security Services
- Reports Coordinator (OCA)
- Legal Services

- Library
- GTRI
- Research Communications (2)
- Project File
- Other M. Heyser
- A. Jones

A-3932

GEORGIA TECH RESEARCH INSTITUTE
GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332



28 November 1984

TECHNICAL MEMORANDUM

TO: VERSAR, Inc.
Attn: Dr. R. Shaver

FROM: Dr. Tom Wells
GTRI

SUBJECT: Data Compilation Satisfying P. O. 17518,
Georgia Tech Project A-3932

Attached is a tabulation of measured complex permittivities and permeabilities for waveguide samples of materials with VERSAR designations "3", "4", and "6". Waveguide band average and standard deviations of ϵ and μ , as well as their product and ratio are provided.

TBW:bg

Attachment

Band	Frequencies (GHz)	Sample	ϵ	μ	$\epsilon\mu$	ϵ/μ
S	2-60 - 3.95	3	(18.69, 2.26) \pm (.35, .40)	(1.51, -.88) \pm (.14, .07)	(30.21, -12.96) \pm (2.23, 1.39)	(8.54, 6.54) \pm (.33, 1.15)
		4	(20.11, .89) \pm (.43, .50)	(1.26, -.51) \pm (.06, .04)	(25.73, -9.16) \pm (1.16, .53)	(13.47, 6.21) \pm (.58, .84)
		6	(14.80, .07) \pm (.24, .24)	(3.01, -1.69) \pm (.14, .08)	(44.63, -24.82) \pm (2.52, 1.01)	(3.73, 2.13) \pm (.14, .17)
C	3.95 - 5.85	3	(17.42, -.06) \pm (.45, .35)	(1.63, -.83) \pm (.13, .05)	(28.45, -14.64) \pm (2.69, 1.18)	(8.47, 4.32) \pm (.30, .63)
		4	(17.84, -.13) \pm (.55, .32)	(1.50, -.56) \pm (.07, .04)	(26.72, -10.19) \pm (1.77, .98)	(10.46, 3.82) \pm (.33, .49)
		6	(13.22, 1.32) \pm (.21, .69)	(3.80, -3.30) \pm (.56, .32)	(54.96, -38.86) \pm (5.46, 1.83)	(1.76, 1.91) \pm (.26, .38)
Xn	5.85 - 8.20	3	(20.03, -1.26) \pm (.12, .47)	(1.04, -.52) \pm (.03, .04)	(20.13, -11.77) \pm (.75, .42)	(15.91, 6.76) \pm (.96, .52)
		4	(22.73, -1.13) \pm (.15, .74)	(.98, -.36) \pm (.02, .04)	(21.81, -9.38) \pm (.52, .14)	(20.79, 6.57) \pm (.89, 1.15)
		6	Sample Unusable			
X	8.20 - 12.40	3	(17.94, -.15) \pm (.09, .20)	(.92, -.49) \pm (.06, .02)	(16.37, -8.99) \pm (.98, .49)	(15.28, 8.08) \pm (.82, .83)
		4	(18.30, -2.57) \pm (.12, .13)	(.97, -.29) \pm (.04, .01)	(16.99, -7.79) \pm (.64, .09)	(18.08, 2.76) \pm (.66, .38)
		6	(12.76, -.78) \pm (.07, .12)	(1.53, -1.57) \pm (.18, .05)	(18.23, -21.25) \pm (2.04, .85)	(4.30, 3.98) \pm (.13, .54)
Ku	12.4 - 18.00	3	(19.15, -1.27) \pm (.38, .57)	(.80, -.38) \pm (.04, .01)	(14.95, -8.26) \pm (.80, .52)	(20.07, 7.88) \pm (.35, 1.17)
		4	(20.09, -1.56) \pm (.21, .55)	(.84, -.30) \pm (.04, .02)	(16.45, -7.38) \pm (.90, .18)	(21.71, 5.99) \pm (.34, 1.56)
		6	(13.25, -.32) \pm (.25, .12)	(1.07, -1.32) \pm (.15, .05)	(13.77, -17.87) \pm (2.12, 1.17)	(5.02, 6.00) \pm (.09, .65)