Reports File Posted 6/5

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

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PROJECT INITIATION

Date: 1/19/73

Project Title: Polarization Modulation Techniques

Project No.: A-1490

Project Director: Mr. R. J. Hodges

Sponsor: HQ. 4950th Test Wing (AFSC); Wright-Patterson AFB, Ohio 45433

Effective 2 January 1973 Estimated to run until: 31 January 1974

Type Agreement: Contract No. F33615-73-C-1014 Amount: $ 99,932*

*Partially funded at $ 60,000 thru 30 June 1973.

Reports Required: Program Schedule; Monthly Status Reports; Presentation Materials; TRACE Report: Final Technical Report

Sponsor Contact:

Technical Matters	Contractual Matters
Mr. James V. Kastle, AFAL/WRW	(thru GTRI)
Project Engineer	Mr. R. J. Whitcomb (ACO)
Air Force Avionics Laboratory	ONR Resident Representative
Wirght-Patterson AFB, Ohio 45433	Campus

Defense Priority Rating: DO-C9 under DMS Reg. 1.

Assigned to Radar Division

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GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT TERMINATION

Date Jan. 2, 1975

PROJECT TITLE: Polarization Modulation Techniques

PROJECT NO: A-1490

PROJECT DIRECTOR: R. J. Hodges

SPONSOR: Hq. 4950th Test Wing (AFSC); Wright-Patterson AFB, Ohio 45433

TERMINATION EFFECTIVE: 3-31-74 (Final Report due date)

CHARGES SHOULD CLEAR ACCOUNTING BY: N/A - all funds expended

CLOSEOUTE ITEMS REMAINING: Final Invoice & Closing Documents
Final Report of Inventions
Transfer residual property to A-1609 if not already done.
Classified Material Certificate

NOTE: Follow-on project is A-1609

RADAR DIVISION

COPIES TO:

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~~Sue Corbin~~
Project File

n EES 402 (R10-62)

PROGRAM SCHEDULE

SYSTEM (Project) NUMBER: 7636

SUBSYSTEM:

TYPE OF SCHEDULE: Program Schedule

AS OF DATE: 1 February 1973

LINE		PRIOR SCHEDULE DATES MO	YR	SYM
1	Polarimeter Development			
2	Analysis			
3	Design and Fabricate			
4	Test and Evaluation			
5				
6				
7	Field Test Evaluation			
8	Analysis			
9	Field Operations			
10	Data Reduction			
11				
12				
13	Final Technical Report			
14	Submit Draft			
15	Distribution			
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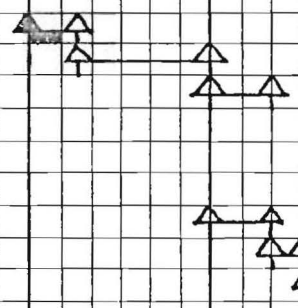

AUTHENTICATION

LIBRARY DOES NOT HAVE

STATUS REPORTS 1 and 2

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

17 April 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base,
Ohio 45433

Attention: Mr. James V. Kastle - AFAL/WRW

Subject: Status Report 3
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 March through 31 March 1973 is contained herein.

Technical Progress

The search for a radar system that can be used for the field test operations to be conducted under the subject contract has continued throughout this reporting period. A suitable radar that may be available for these tests has not been located, and the status of this investigation is the same as was reported in Status Report No. 2.

Georgia Tech received a copy of the engineering drawings that were used to fabricate the antenna furnished with the CPA on 22 March 1973. These drawings will be very beneficial if it becomes necessary to fabricate an antenna for the polarimeter.

Georgia Tech has two antennas and two rf switches that were purchased on Contract No. F33615-71-C-1497. A requirement for this equipment exists on the subject contract, and the Project Engineer has been requested to aid in having these items furnished as GFE to the subject contract.

The polarimeter design and fabrication is progressing on schedule. Specifications have been written for several major components of the polarimeter. The components include:

1. Two matched logarithmic IF amplifiers,
2. Two matched limiting IF amplifiers,
3. A phase comparator, and
4. Various hybrids.

Specifications are being prepared for the following components:

1. Mixer preamplifiers,
2. Analog/digital converters, and
3. Read-only memory integrated circuits.

A sample-and-hold circuit has been received on consignment, and this circuit is currently being evaluated. The questions being addressed are (1) will this circuit operate satisfactorily on the video from logarithmic amplifiers (0 to 2.5 volt range), and (2) will it operate satisfactorily on the signals from the phase comparator (±160 millivolt range). Preliminary investigations indicate that this sample-and-hold circuit can be used in both applications. The polarimeter will require a trigger generator to be used in conjunction with the sample-and-hold circuit. This trigger generator has been designed, breadboarded, and tested.

Report of Effort

Name	March Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	6	9	Engineering Assistance
Ecker, H. Allen Principal Research Engineer	9	26	Consulting
Foard, William W. Co-op Trainee	64	104	Engineering Assistance
Higgins, James D. Assistant Research Engineer	125	445	Analysis and Design
Hightower, Neale C. Assistant Research Engineer	125	374	Analysis and Design
Hodges, Richard J. Research Engineer	44	187	Project Director

Future Effort

The polarimeter design and fabrication will continue throughout the next reporting period.

The search for a radar having the desired operating characteristics will be continued.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:sp

Approved:

H. Allen Ecker
Chief, Radar Division

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

12 June 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base,
Ohio 45433

Attention: Mr. James V. Kastle - AFAL/WRW

Subject: Status Report 4
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 April through 30 April 1973 is contained herein.

Technical Progress

The search for a radar system that can be used for the field test operations to be conducted under the subject contract has continued throughout this reporting period. A suitable radar that may be available for these tests has not been located, and the status of this investigation is the same as was reported in Status Report No. 2.

A copy of the engineering drawings and the photographic plates that were used to fabricate the diode phase shifters furnished with the CPA were received on 3 April 1973. This information will be very beneficial if it becomes necessary to fabricate additional phase shifters.

The polarimeter design and fabrication is progressing on schedule. It is estimated that the polarimeter design is 50 percent complete and that the fabrication is 5 percent complete. Material Requests have been issued for most of the major components, especially the ones for which a slow delivery is anticipated. Thus far, no significant delivery problems have been encountered, and no changes to the original Program Schedule are anticipated.

Report of Effort

Name	April Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	72	81	Engineering Assistance

Report of Effort (Continued)

Name	April Hours	Cumulative Hours	Technical Area During Reporting Period
Ecker, H. Allen Principal Research Engineer		26	
Foard, William W. Co-op Trainee	64	168	Engineering Assistance
Higgins, James D. Assistant Research Engineer	133	578	Polarimeter Design
Hightower, Neale C. Assistant Research Engineer	104	478	Polarimeter Design
Hodges, Richard J. Research Engineer	76	263	Project Director

Visits

Mr. R. J. Hodges of Georgia Tech visited Mr. J. V. Kastle at the Air Force Avionics Laboratory on 5 April 1973. The purpose of this visit was to discuss the work to be performed on the subject contract.

Future Effort

The polarimeter design and fabrication will continue throughout the next reporting period.

The search for a radar having the desired operating characteristics will be continued.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

6 July 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base,
Ohio 45433

Attention: Mr. James V. Kastle - AFAL/WRW

Subject: Status Report 5
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 May through 31 May 1973 is contained herein.

Technical Progress

A search for a radar system that can be used for the field test operations to be conducted under the subject contract has continued throughout this reporting period. The signal processing test facility at Rome Air Development Center was visited on 3-4 May 1973. The signal processing test facility is an experimental high power wideband satellite tracking radar. This system is not suitable for two reasons. First, it operates with an open loop predictor track. Thus it would be difficult to determine the effectiveness against the tracking circuits. Second, at the present time this system is being modified to increase its capabilities, and the completion date for these modifications is not known. Thus, this facility may not be available for the proposed field test operations.

The Project Engineer has informed Georgia Tech that an AN/FPS-27A may be a suitable candidate for the proposed field test operations. The possibility of utilizing one of these systems will be investigated.

Georgia Tech was informed on 9 May 1973 that an antenna is available for use with the polarimeter. This antenna is identical to the one that was supplied with the CPA. The antenna is expected to arrive at the AFAL during the next reporting period, and it will be transferred to Georgia Tech as GFE as soon as possible after it arrives at AFAL.

The polarimeter design and fabrication is progressing on schedule. It is estimated that the polarimeter design is 85 percent complete and that the fabrication is 30 percent complete. Material Requests have been issued for most of the major components, especially the ones for which a slow delivery is anticipated. Thus far, no significant delivery problems have been encountered, and no changes to the original Program Schedule are anticipated.

Report of Effort

Name	May Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	94.5	175.5	Engineering Assistance
Ecker, H. Allen Principal Research Engineer	9	35	Consulting
Foard, William W. Co-op Trainee	133	201	Engineering Assistance
Higgins, James D. Assistant Research Engineer	162	740	Polarimeter Design
Hightower, Neale C. Assistant Research Engineer	140	618	Polarimeter Design
Hodges, Richard J. Research Engineer	110	373	Project Director
Trebits, Robert N. Research Scientist	74	74	Polarimeter Design

Visits

Mr. R. J. Hodges of Georgia Tech visited Messrs. Thomas Maggio and Richard A. Ackley at the Rome Air Development Center on 3-4 May 1973. The purpose of this visit was to discuss the possibility of conducting a field test operation at the signal processing test facility.

Future Effort

The polarimeter design and fabrication will continue throughout the next reporting period.

The search for a radar having the desired operating characteristics will be continued.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cmb

Approved:

H. Allen Ecker
Chief, Radar Division

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STATUS REPORT 6

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

28 August 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base
Ohio 45433

Attention: E. F. Mayleben - AFAL/WRW

Subject: Status Report 7
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 July through 31 July is contained herein.

Technical Progress

A search for a radar system that can be used for the field test operations to be conducted under the subject contract has continued throughout this reporting period. Mr. Varvel Carter, RAMPART Site Manager, of White Sands Missile Range has informed Georgia Tech that the RAMPART is scheduled to be deactivated by 31 August 1973. He indicated that operation of the site after 31 August will cost $35,000 per month. In order to avoid this exorbitant fee, the search for a radar possessing the desired operating characteristics will be intensified.

The final increment of funding for the subject contract was received during this reporting period. This funding increment is to support the technical effort through 31 December 1973.

The polarimeter design was completed during this reporting period with the completition of the program design for read-only memory integrated circuits. These integrated circuits are required to perform the transfer functions which will convert the received information to the desired output format.

The polarimeter fabrication and check-out is progressing on schedule. It is estimated that the fabrication is 95 percent complete and that the check-out is 50 percent complete. Thus far, no significant problems have been encountered, and no changes to the original Program Schedule are anticipated.

Report of Effort

Name	July Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	80	431.5	Engineering Assistance
Ecker, H. Allen Principal Research Engineer	7	50	Consulting
Foard, Willaim W., Jr. Co-op Trainee	168	428.5	Engineering Assistance
Harrison, A. Wayne Co-op Trainee		70	
Higgins, James D. Research Engineer	176	1084	Polarimeter Fabrication
Hightower, Neale C. Research Engineer	88	857	Polarimeter Fabrication
Hodges, Richard J. Research Engineer	46	563	Project Director
Langley, John B., II Research Engineer	62	62	Polarimeter Fabrication
Trebits, Robert N. Research Scientist	14	214	Polarimeter Fabrication

Visits

Mr. R. J. Hodges of Georgia Tech attended the Nineteenth Annual Tri-Service Radar Symposium at Colorado Springs, Colorado on 10-12 July 1973. The purpose of this visit was to present the paper entitled "Comparison of the Polarization Properties of Track-While-Scan Radars."

Future Effort

The polarimeter fabrication and check-out will continue throughout the next reporting period.

The search for a radar having the desired operating characteristics will be continued.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division

A-1490

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

4 October 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base,
Ohio 45433

Attention: Mr. James V. Kastle - AFAL/WRW

Subject: Status Report 8
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 August through 31 August 1973 is contained herein.

Technical Progress

The search for suitable radar systems to be used for the field test operations to be conducted under the subject contract has been completed. The tests will be conducted at NASA Wallops Station, Wallops Island, Virginia, and two of the Joint Air Force NASA (JAFNA) radars at this location will be used for these tests. Plans for the proposed field tests have been coordinated with the following personnel:

Joseph T. McGoogan	Director, Applied Sciences Group
Tom W. Perry, Jr.	Head, Project Management Section
John C. Howard	Field Engineer; Applied Physics Laboratory

NASA has agreed to provide communications and physical support, and the Applied Physics Laboratory will provide the personnel to operate the radar facilities.

The field test operations to be conducted at Wallops Island will utilize the S-Band Monopulse radar and the SPANDAR (conical scan) radar, lists of the important parameters for these systems are attached, and the primary emphasis will be on the monopulse system. The operations will be divided into two phases. Phase I will be a measurements phase, and it will cover the period 4 through 14 September 1973. Phase II will be comprised of the active tests to be conducted, and it will cover the period 15 October through 2 November 1973.

The polarimeter fabrication and check-out is progressing on schedule. It is estimated that the fabrication is 99 percent complete and that the check-out is 95 percent complete. Thus far, no significant problems have been encountered, and no major changes to the original Program Schedule are anticipated.

Report of Effort

Name	August Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	48	479.5	Engineering Assistance
Ecker, H. Allen Principal Research Engineer	9	59	Consulting
Foard, William W., Jr. Co-op Trainee	168	596.5	Engineering Assistance
Harrison, A. Wayne Co-op Trainee		70	
Higgins, James D. Research Engineer	184	1268	Polarimeter Fabrication
Hightower, Neale C. Research Engineer	173	1030	Polarimeter Fabrication
Hodges, Richard J. Research Engineer	166	729	Project Director
Langley, John B. II Research Engineer		62	
Trebits, Robert N. Research Scientist		214	
Vogt, John V. Assistant Research Engineer	127	127	Polarimeter Fabrication
Weaver, E. Eugene Assistant Research Engineer	10	10	Polarimeter Fabrication

Visits

Messrs. J. D. Higgins and R. J. Hodges of Georgia Tech visited Messrs. J. T. McGoogan, T. W. Perry, Jr. and J. C. Howard at the NASA Wallops Station, Wallops Island, Virginia on 22 August 1973. The purpose of this visit was to discuss the possibility of conducting a field test operation at this location.

Mr. J. V. Kastle of the Air Force Avionics Laboratory visited Georgia Tech on 28, 29 August 1973. The purposes for this visit were to receive a demonstration of the polarimeter's capabilities and to discuss work to be performed on the subject contract.

Future Effort

The field test operations at NASA Wallops Station, Wallops Island, Virginia will be initiated during the next reporting period. The measurements phase will be conducted during the period 4-14 September, and the remainder of the next reporting period will be utilized to perform a preliminary analysis of the measurement data.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division

JAFNA S-BAND MONOPULSE RADAR SYSTEM PARAMETERS

RF frequency	2700-2900 MHz 2828 MHz Nominal
Peak power	5 MW
Pulse width	2.2 or 0.1 to 1.3 msec
PRF	320 or 960
Antenna type	60 ft parabola
Antenna beamwidth	0.39^{o}
Antenna feed	4 horn
Polarization	Vertical
Antenna gain	52.8 dB
Azimuth coverage	360^{o} one way
Elevation coverage	0^{o} to $+90^{o}$
Antenna tracking rates	4^{o}/sec azimuth and elevation
Antenna slew rates	8^{o}/sec azimuth and elevation
Angle precision	1 mill
MDS	-112 dBm

JAFNA SPANDAR RADAR SYSTEM PARAMETERS

RF frequency	2700-2900 MHz 2840 MHz Nominal
Peak power	5 MW
Pulse width	1, 2, or 5 μsec
PRF	160, 320, or 640
Pulse coding	1 to 3 pulses
Antenna type	60 ft parabola
Antenna beamwidth	0.39^{o}
Antenna feed	Nutating (30 Hz conical scan)
Polarization	Vertical, horizontal, or circular
Antenna gain	52.8 dB
Azimuth coverage	360^{o} continuous
Elevation coverage	0^{o} to 90^{o}
Antenna tracking rates	5^{o}/sec azimuth and elevation
Antenna slew rates	12^{o}/sec azimuth 17^{o}/sec elevation
Angle precision	$\pm$ 1 mill
MDS	-119 dBm

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

10 October 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base
Ohio 45433

Attention: Mr. James V. Kastle - AFAL/WRW

Subject: Status Report 9
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 September through 30 September 1973 is contained herein.

Technical Progress

Phase I of the field test operations was conducted during the period 4-14 September 1973. These operations were conducted at NASA Wallops Station, Wallops Island, Virginia. This phase of the operations was utilized to check out the polarimeter in a field evnironment and to make antenna measurements on the test radars. A comprehensive set of data were collected for the S-Band Monopulse System. However, inclement weather prevented the desired data from being collected for the SPANDAR.

A preliminary analysis of the data collected during Phase I of the field test operations has been initiated. This analysis will provide the information required to design the test plans for the active tests to be conducted during Phase II of the field test operations.

Phase II of the Wallops Island tests is scheduled to be conducted during the period 15 October through 2 November 1973. This phase of the operations will be utilized to collect the remaining desired antenna measurement data and to perform a comprehensive series of active tests.

The polarimeter fabrication and check-out were completed during this reporting period. It has been demonstrated that the polarimeter successfully meets its design criteria.

Report of Effort

Name	September Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E., III Co-op Trainee	107	586.5	Engineering Assistance
Ecker, H. Allen Principal Research Engineer	16	75	Consulting
Foard, William W., Jr. Co-op Trainee	144	740.5	Engineering Assistance
Harrison, A. Wayne Co-op Trainee		70	
Higgins, James D. Research Engineer	147	1415	Field Operations
Hightower, Neale C. Research Engineer	138	1168	Field Operations
Hodges, Richard J. Research Engineer	112	841	Project Director
Langley, John B., II Research Engineer		62	
Trebits, Robert N. Research Scientist		214	
Vogt, John V. Assistant Research Engineer	32	159	Polarimeter Fabrication
Weaver, E. Eugene Assistant Research Engineer		10	

Visits

Several Georgia Tech personnel visited NASA Wallops Station, Wallops Island, Virginia to perform Phase I of the field test operations. These personnel and their dates of visit are as follows:

Visits (Continued)

Mr. Joseph E. DeCastra	4-14 September 1973
Mr. James D. Higgins	3-15 September 1973
Mr. Neale C. Hightower	4-14 September 1973
Mr. Richard J. Hodges	2-6 September 1973 12-14 September 1973

Messrs. J. V. Kastle and E. F. Mayleben of the Air Force Avionics Laboratory visited NASA Wallops Station, Wallops Island, Virginia on 12-14 September 1973. The purpose of these visits was to observe the field test operations being conducted.

Future Effort

The preliminary analysis of the measurement data from Phase I of the field test operations will be continued.

The field test operations are scheduled to resume on 15 October and continue through 2 November 1973.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division

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STATUS REPORT 10

A-1490

ENGINEERING EXPERIMENT STATION

GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

10 December 1973

Air Force Avionics Laboratory
Wright-Patterson Air Force Base
Ohio 45433

Attention: Mr. David W. Misek - AFAL/WRW

Subject: Status Report 11
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 November through 30 November 1973 is contained herein.

Technical Progress

The field test operations being conducted at NASA Wallops Station, Wallops Island, Virginia were concluded during this reporting period. The field operations were conducted in two phases. Phase I was a measurements phase and it covered the period 4-14 September 1973. Phase II covered the period 15 October through 2 November 1973, and it was used primarily to conduct active tests against the S-Band Monopulse and SPANDAR (conical scan) radars. However, this phase was also used to collect the additional antenna measurement data that were deemed desirable after studying (during the interim between phases) the data collected during Phase I.

A second traveling wave tube amplifier failure was encountered during the visit to Wallops Island, Virginia. The cause for this failure has not been determined; however, it is believed to be either the cooling fan or the power supply. The problem does not appear to be another tube failure.

A task to reduce and analyze the Wallops Island data was initiated during this reporting period. This is the last task to be conducted on the subject contract prior to preparing the Final Technical Report.

Report of Effort

Name	November Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E. III Co-op Trainee	184	930.5	Engineering Assistance

Report of Effort (continued)

Name	November Hours	Cumulative Hours	Technical Area During Reporting Period
Ecker, H. Allen Principal Research Engineer	18	102	Consulting
Foard, William W., Jr. Co-op Trainee		740.5	
Harrison, A. Wayne Co-op Trainee		96	
Higgins, James D. Research Engineer	169	1764	Data Reduction
Hightower, Neale C. Research Engineer	148	1467	Data Reduction
Hodges, Richard J. Research Engineer	151	1143	Project Director
Langley, John B., II Research Engineer		62	
McKee, Lewis G. Co-op Trainee	6	48	Engineering Assistance
Trebits, Robert N. Research Scientist		214	
Vogt, John V. Assistant Research Engineer		159	
Weaver, E. Eugene Assistant Research Engineer		10	

Visits

Several Georgia Tech personnel were at NASA Wallops Station, Wallops Island, Virginia early in this reporting period. These personnel and their exact dates of visit are as follows:

Mr. Joseph E. DeCastra III	1-2 November 1973
Mr. James D. Higgins	1-2 November 1973
Mr. Neale C. Hightower	1-2 November 1973

Mr. Richard J. Hodges 1-3 November 1973

These visits concluded the Wallops Island field test operations.

Messrs. Jack W. Sarver and David W. Misek of the Air Force Avionics Laboratory visited NASA Wallops Station, Wallops Island, Virginia on 1-2 November 1973. The purpose of these visits was to observe the field operations being conducted.

Messrs. Jack W. Sarver, James V. Kastle, John E. Tehan, and David W. Misek of the Air Force Avionics Laboratory visited Georgia Tech on 20 November 1973. The purposes for these visits were to discuss efforts to be conducted on the subject contract and to determine Georgia Tech's recommendations for future exploratory development efforts in the area of Expendible Countermeasures. While visiting Georgia Tech, these personnel were also briefed on preliminary results from the Wallops Island field test operations.

Future Effort

The Wallops Island data reduction and analysis will continue throughout the next reporting period. This is the final task to be conducted under the technical effort of the subject contract.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

21 January 1974

Air Force Avionics Laboratory
Wright-Patterson Air Force Base
Ohio 45433

Attention: Mr. David W. Misek - AFAL/WRW

Subject: Status Report 12
Project 7636
"Polarization Modulation Techniques"
Contract No. F33615-73-C-1014

Gentlemen:

A summary of the progress for the period 1 December through 31 December 1973 is contained herein.

Technical Progress

The task to reduce and analyze the data collected at NASA Wallops Station, Wallops Island, Virginia continued throughout this reporting period. This task was completed with the conclusion of this reporting period. This effort was the last task to be conducted on the subject contract prior to preparing the Final Technical Report.

Georgia Tech has been notified by the Project Engineer that the subject contract is to be amended to increase its Scope. This increase in scope will encompass a fourteen month technical period, and it will be used to continue the polarization modulation investigations. The additional work is expected to begin on 1 February 1974 in order to insure that the polarization modulation investigations will continue without experiencing a discontinuity in time.

Report of Effort

Name	December Hours	Cumulative Hours	Technical Area During Reporting Period
DeCastra, Joseph E. III Co-op Trainee	112	1042.5	Engineering Assistance

Report of Effort (continued)

Name	December Hours	Cumulative Hours	Technical Area During Reporting Period
Ecker, H. Allen Principal Research Engineer	17	119	Consulting
Foard, William W., Jr. Co-op Trainee		740.5	
Harrison, A. Wayne Co-op Trainee		96	
Higgins, James D. Research Engineer		1764	
Hightower, Neale C. Research Engineer	141	1608	Data Reduction
Hodges, Richard J. Research Engineer	118	1261	Project Director
Langley, John B. III Research Engineer		62	
McKee, Lewis G. Co-op Trainee		48	
Trebits, Robert N. Research Scientist		214	
Vogt, John V. Assistant Research Engineer		159	
Weaver, E. Eugene Assistant Research Engineer		10	

Future Effort

The next reporting period will be utilized to prepare the draft copy of the Final Technical Report. This volume of the report will cover the technical efforts expended on the subject contract during the period 2 January through 31 December 1973.

The additional technical efforts to be conducted in accordance with the contract amendment to increase the Scope of the subject contract are scheduled to begin on 1 February 1974.

Respectfully submitted,

Richard J. Hodges
Project Director

RJH:cb

Approved:

H. Allen Ecker
Chief, Radar Division